

Products  
for

# Hydroponics

Testers | Meters | Test Kits | Monitors | Photometers | Controllers | Enclosures



ISO 9001:2000  
CERTIFIED

 **HANNA**<sup>®</sup>  
instruments  
With Great Products, Come Great Results™

# pHep® 4 & pHep® 5

## pH/Temperature Testers

with Replaceable pH Electrode Cartridge

- 1 YEAR WARRANTY

The pHep®4 and pHep®5's are the most advanced pH testers in the market today. These testers are for users that require the greatest accuracy without breaking the budget. The pHep®4 has a 0.1 pH resolution, and pHep®5 reads up to 0.01 pH. Both models have BEPS (battery error preventing system) as well as user selectable automatic shut-off, replaceable pH electrode cartridge, stability indicator and automatic calibration.



### Snap on pH Electrode

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



### Cloth renewable junction

When the cloth junction becomes dirty from routine testing, pull out 1/8" to rejuvenate the electrode.

Specifications	HI 98127 (pHep®4)	HI 98128 (pHep®5)
Range	pH -2.0 to 16.0 pH Temp. -5.0 to 60.0°C / 23.0 to 140.0°F	pH -2.00 to 16.00 pH Temp. 0.1 pH / 0.01 pH
Resolution	pH 0.1 pH Temp. 0.1°C / 0.1°F	pH 0.01 pH Temp. ±0.05 pH
Accuracy (@20°C)	pH ±0.1 pH Temp. ±0.5°C / ±1°F	pH ±0.01 pH Temp. ±0.05°C / ±0.1°F
pH Calibration	automatic, at 1 or 2 points with 2 sets of memorized buffers (pH 4.01/7.01/10.01 or pH 4.01/6.86/9.18)	
Temp. Compensation	automatic	
Battery Type/Life	4 x 1.5V with BEPS/approx. 300 hours of continuous use	
Environment	-5 to 50°C (23 to 122°F); RH max 100%	
Dimensions	163 x 40 x 26 mm (6.4 x 1.6 x 1.0")	
Weight	100 g (3.5 oz.)	

### ORDERING INFORMATION

HI 98127 (pHep®4) & HI 98128 (pHep®5) are supplied with protective cap, electrode removal tool, (4) 1.5V batteries and instructions.

## pH GRO'CHEK® pH Stick Tester

with replaceable electrode

- 1 YEAR WARRANTY



The pH Gro'Chek® is an ideal tester for use in nutrient mixing tanks or vats. The stick type rugged sensor is designed for mixing solution. The sensor also has a cloth-renewable junction. pH readout is 0.1 and calibration is 1 point with the knob.

Specifications	HI 981408 (pH Gro'Chek®)
Range	0.0 to 14.0 pH
Resolution	0.1 pH
Accuracy (@20°C/68°F)	±0.2 pH
Calibration	manual, 1 point
Electrode (included)	HI 1219 pH electrode, 240 mm (9.4") long, with double junction and DIN connector
Battery Type/Life	2 x 1.5V AA / approx. 2000 hours of continuous use
Environment	0 to 50°C (32 to 122°F); RH max 100%
Dimensions (meter only)	86 x 94 x 33 mm (3.4 x 3.7 x 1.3")
Weight (meter only)	150 g (5.3 oz.)

### ORDERING INFORMATION

HI 981408 (pH Gro'Chek®) is supplied with HI 1219 interchangeable pH electrode, pH 7 calibration solution, (2) 1.5V batteries and instructions.



**pHep® pH Tester**

pH Electronic Paper

- **1 YEAR WARRANTY**
- **Cloth Renewable Junction**
- **Large LCD**
- **2-Point Calibration**
- **0.1 pH Accuracy**



**pHep®**, the standard in pH measurement with 0.1 pH accuracy, has 2-point calibration, large LCD, pull-out, replenishable junction and 700 hours of battery life. The **pHep®** pH tester features a casing that is more rugged and has been ergonomically enhanced to better fit your hand. The **pHep®** comes with a protective cap that can be used as a measurement vessel. With the latest innovation of a non-clogging fiber junction, the **pHep®** lasts long.

Specifications	HI 98107 (pHep®)
Range	0.0 to 14.0 pH
Resolution	0.1 pH
Accuracy (@20°C/68°F)	±0.1pH
Calibration	manual, 2 point
Battery Type / Life	4 x 1.5V / approx. 700 hours of continuous use
Environment	0 to 50 °C (32 to 122°F); RH max 95%
Dimensions	175 x 41 x 23 mm (6.9 x 1.6 x 0.9")
Weight	95 g (3.4 oz.)

**ORDERING INFORMATION**

**HI 98107** (pHep®) is supplied with cap, (4) 1.5V batteries and instructions.

**Checker® 1****Economical pH Tester**

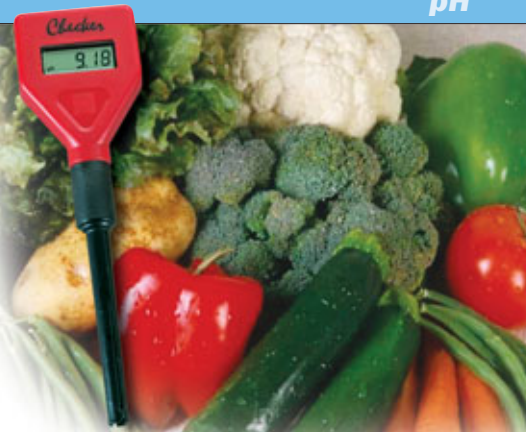
- **1 YEAR WARRANTY**
- **Replaceable Electrode**
- **Easy Calibration**
- **3000 Hours Battery Life**

The **Checker®1** provides growers with fast and accurate pH readings. The **Checker®1** is easy to calibrate, uses a replaceable pH electrode and works for 3000 hours before you have to change the batteries!

Specifications	HI 98103 Checker®
Range	0.00 to 14.00 pH
Resolution	0.01 pH
Accuracy (@20°C/68°F)	±0.2 pH
Calibration	manual, 2 points
Electrode	HI 1270 (included)
Battery Type/Life	2 x 1.5V/approx. 3000 hours of continuous use
Environment	0 to 50 °C (32 to 122°F); RH max 95%
Dimensions	66 x 50 x 25 mm (2.6 x 2 x 1") - without probe
Weight	50 g (1.8 oz.)

**ORDERING INFORMATION**

**HI 98103** (Checker®1) is supplied complete with HI 1270 combination pH electrode, (2) 1.5V batteries and instructions.

**Growers Field Checker®  
Direct Sample pH Tester**

- **1 YEAR WARRANTY**
- **Take Measurements Directly on the Sample**
- **High Accuracy with 0.01 pH Resolution**
- **2-point fast and accurate calibration**

The **Growers Field Checker®** (HI 98103GC) allows users to determine the pH of fruit and plant tissue with just a few drops of sap or juice. If your sample does not contain sufficient liquid, add an equal portion of deionized water to extract the sample pH. **HANNA's Growers Field Checker®** works with you to obtain superior crops.



Specifications	HI 98103GC (Growers Field Checker®)
Range	0.00 to 14.00 pH
Resolution	0.01 pH
Accuracy (@20°C/68°F)	±0.2 pH
Calibration	manual, 2 points
Electrode	flat sensor probe (included)
Battery Type/Life	2 x 1.5V/approx. 3000 hours of continuous use
Environment	0 to 50 °C (32 to 122°F); RH max 95%
Dimensions	66 x 50 x 25 mm (2.6 x 2 x 1") - without probe
Weight	50 g (1.8 oz.)

**ORDERING INFORMATION**

**HI 98103GC** (Growers Field Checker®) is supplied with a flat sensor pH probe which allows for minimal liquid sample, soft carrying case, pH 4 and 7 calibration solutions, deionized water sachet, 100 mL sample beaker, (2) 1.5V batteries and screwdriver!



## pH GRO'CHEK® Monitor

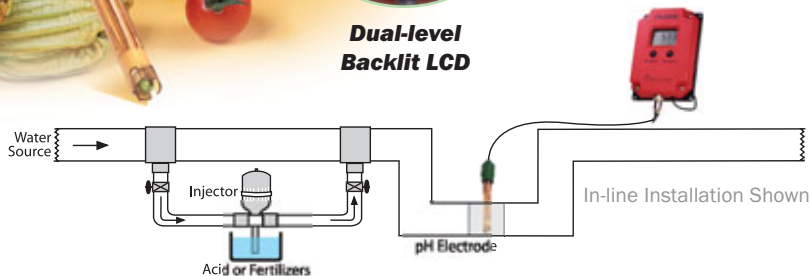
pH/Temperature Monitor Featuring a Large, Backlit LCD

- **Waterproof**
- **Stability Indicator**
- **Extra-Large Display**
- **12 VDC Power Supply**

The **pH Gro'chek®** from **HANNA** features a dual-level backlit LCD to provide you with instantaneous readings of both pH and temperature. The microprocessor provides automatic calibration, automatic buffer selection and automatic temperature compensation. The **HI 991401** incorporates a BNC connector for using a variety of probes.



**Dual-level Backlit LCD**



**ORDERING INFORMATION**  
**HI 991401** is supplied with HI 1293D pH electrode, HI 1294 temperature probe (fixed), pH 4 and 7 buffers (20 mL ea.), 12 VDC adapter and instructions.

Specifications	HI 991401
Range	pH: 0.0 to 14.0; Temperature: 0.0 to 60.0°C (32.0 to 140.0°F)
Resolution	pH: 0.1; Temperature: 0.1°C (0.1°F)
Accuracy (@20°C/68°F)	pH: ±0.1; Temperature: ±0.5°C (±1°F)
Probes	HI 1293D pH electrode (included) and HI 1294 temperature probe (fixed)
pH calibration	automatic, 1 or 2 points with 2 sets of memorized buffers (pH 4.01 / 7.01 / 10.01 or pH 4.01 / 6.86 / 9.18)
Temperature compensation	automatic
Power supply	12 Vdc adapter (included)
Environment	0 to 50°C (32 to 122°F); RH max 95%
Dimensions / Weight	160 x 105 x 31 mm (6.3 x 4.1 x 1.2) / 190 g (6.7 oz.) - meter only

## GRO'CHEK® pH Monitor

With Large LCD & Waterproof Casing

- **Waterproof**
- **Rugged Housing**
- **High Accuracy**
- **12 VDC Adapter included**

The popular **Gro'Chek®** pH monitor has been updated with a larger, easy-to-read LCD. Waterproof casing guarantees operation after incidental exposure to water and professional pH electrode provides accurate results every time.

Specifications	HI 981401N
Range	0.0 to 14.0 pH
Resolution	0.1 pH
Accuracy (@20°C/68°F)	±0.2 pH
Calibration	manual 2 point, at pH 4 and 7
pH electrode	HI 1286, plastic body, double junction, with 2 m (6.6') cable and BNC connector (included)
Power supply	12 Vdc power adapter (included)
Environment	0 to 50°C; RH max 100%
Dimensions	86 x 110 x 43 mm (3.4 x 4.3 x 1.7 ")
Weight	150 g (5.3 oz.)

**ORDERING INFORMATION**  
**HI 981401N** is supplied with HI 1286 pH electrode, HI 1283 stainless steel grounding pin, pH 4 and 7 buffers (20 mL ea.), calibration screwdriver, 12 VDC adapter and instructions.



**pH/TDS/Temperature Monitor**

with Simultaneous Parameter Display

**NEW**

- **Extra-large Simultaneous Displays**
- **3 Backlit LCDs**
- **°C or °F measurement**
- **12 VDC Power Supply**

Designed for continuous monitoring of pH, TDS and temperature, the **HI 981504** is simple to install and can be placed above the sample to be tested. pH, TDS and temperature measurements are simultaneously displayed on 3 backlit LCDs which can be easily viewed at a distance—even in low light. This means no more switching between parameters.

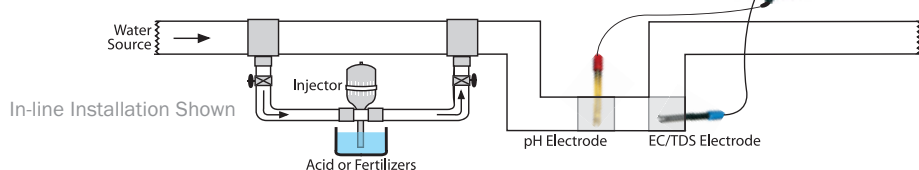
The **HI 1286** gel-filled pH electrode is provided with a waterproof sheath to protect the BNC connector. The unique design of the electrode provides longer life in aggressive solutions. The **HI 7634** TDS probe is easy to clean and requires little maintenance. Measurements are accurate and the meter can be calibrated at one or two points for pH and at a single point for TDS. Temperature range is factory calibrated.

**SPECIFICATIONS****HI 981504**

Range	pH: 0.0 to 14.0; TDS: 0 to 1990 ppm; Temperature: -10.0 to 60.0°C or -14.0 to 140.0°F
Resolution	pH: 0.1; TDS: 10 ppm; Temperature: 0.1°C or 0.1°F
Accuracy	pH: ±0.2; TDS: ±2% F.S.; Temperature: ±0.3°C or ±0.5°F
pH Calibration	manual 2 points through trimmers
TDS Calibration	manual 1 point through trimmer
TDS Factor	0.5 (HI 981504/5) or 0.7 (HI 981504/7)
Probes	pH: HI 1286 (included); TDS: HI 7634 (fixed); Temp.: Stainless steel, 2 m cable (fixed)
Temp. Compensation	automatic, 5 to 50°C (41 to 122°F), for TDS readings only
Power Supply	12 VDC power adapter (included)
Environment	0 to 50°C (32 to 122°F); 95% RH
Dimensions / Weight	160 x 110 x 35 mm (6.3 x 4.3 x 1.4") / 560 g (1.2 lb.)

**ORDERING INFORMATION**

**HI 981504/5** (with 0.5 TDS factor) and **HI 981504/7** (with 0.7 TDS factor) is supplied with HI 1286 pH electrode, HI 7634 TDS probe, temperature probe, TDS sachet, (2) cleaning solution sachets, screwdriver, 12 VDC power adapter and instructions.



**No More Switching  
Between Parameters!**

**HYGROCHECK®**

Relative Humidity Tester

- Large LCD
- Pocket sized
- Common sense construction
- No conversions necessary

Housed in rugged ABS plastic, the **Hygrocheck®** uses **HANNA instruments®** Thin Film Polymer Capacitor Sensor. Now growers can have accurate readings in a pocket sized tester! The **Hygrocheck's** large LCD can be seen from any angle.

SPECIFICATIONS	HI 98601 (Hygrocheck®)
Range	10.0 to 90.0% RH
Resolution	0.1% RH
Accuracy (@20°C/68°F)	±3% F.S.
Battery Type/Life	(3) 1.5V/Approx. 100 hours continuous use
Environment	0 to 50°C (32 to 122°F); 95% RH
Dimensions	175 x 41 x 23 mm (7.9 x 1.6 x 0.8")
Weight	78 g (2.7 oz.)

**ORDERING INFORMATION**

**HI 98601** (Hygrocheck®) is supplied with protective cap, batteries, soft carrying case and instructions.

**Aqua Dip™**

EC/TDS/Temperature Tester

- Waterproof
- Dual Level LCD
- HOLD button to freeze Display
- Auto Shut-off
- No Need to Calibrate

**NEW**

To perform simple and fast EC, TDS and temperature measurements in places with a high percentage of humidity, **HANNA instruments®** offers the **Aqua Dip™**. With only two operation buttons, the **Aqua Dip™** allows an immediate and precise response.

**Aqua Dip™** is factory calibrated and offers total protection against humidity making **Aqua Dip™** ideal for analysis in the field.

SPECIFICATIONS	HI 983311 (Aqua Dip™)
Range	EC: 0 to 3999 µS/cm; TDS: 0 to 2000 ppm; Temp.: 0.0 to 60.0°C
Resolution	EC: 1 µS/cm; TDS: 1 ppm; Temperature: 0.1°C
Accuracy (@20°C/68°F)	EC/TDS: ±2% F.S.; Temperature: ±0.5°C
TDS Factor	0.5 or 0.7 (available upon request)
Temp. Compensation	automatic with $\beta=2.1\%/^{\circ}\text{C}$
Battery Type / Life	(2) 1.5V AAA / Approx. 180 hours continuous use
Environment	0 to 50°C (32 to 122°F); 100% RH
Dimensions / Weight	94 x 38 x 440 mm (3.7 x 1.5 x 17.3") / 200 g (7.8 oz.)

**ORDERING INFORMATION**

**HI 983311** (Aqua Dip™) is supplied with batteries and instructions.



TDS Model  
Available

## EC Gro'Chek® EC Floating Stick Tester

with User-replaceable Electrode

- 2 YEAR WARRANTY
- Ideal for Mixing Fertilizer
- Water Resistant

The EC Gro'Chek® is ideal for use in tanks and vats where nutrient solution is prepared. The rugged sensor was designed for mixing, while the water and shock resistant casing stands up to even harsh greenhouse environments.

Specifications	HI 981410 (EC GRO'CHEK)
Range	0.00 to 10.00 mS/cm
Resolution	0.01 mS/cm
Accuracy (@20°C/68°F)	±2% F.S.
Calibration	automatic, at 5.00 mS/cm
Temp. Compensation	automatic, 5 to 50°C (41 to 122°F) with $\beta = 2\%/^{\circ}\text{C}$
Probe (included)	HI 1220, replaceable EC/TDS probe, 240 mm (9.4") long, with DIN connector
Battery Type / Life	(2) 1.5V AA / approx. 3000 hours continuous use; auto-off after 5 minutes of non-use
Environment	0 to 50°C (32 to 122°F); RH max 95%
Dimensions (meter only)	86 x 94 x 33 mm (3.4 x 3.7 x 1.3")
Weight (meter only)	150 g (5.3 oz.)

### ORDERING INFORMATION

**HI 981410** (EC Gro'Chek®) is supplied with HI 1220 interchangeable EC probe, 5000  $\mu\text{S}/\text{cm}$  calibration solution, batteries and instructions.

## Waterproof EC/TDS Testers

- 2 YEAR WARRANTY

For users who need an accurate, versatile instrument, HANNA offers **DIST®5** and **DIST®6** for EC and TDS measurements. These advanced testers offer features such as a replaceable graphite electrode, adjustable TDS ratio, temperature in  $^{\circ}\text{C}$  or  $^{\circ}\text{F}$ , automatic temperature compensation with adjustable  $\beta$ , battery level indicator, stability indicator, automatic shut-off, and automatic calibration all in a floating, waterproof casing. These 3-in-1 testers are unmatched in EC/TDS/ Temperature measurement!

### Replaceable graphite electrode

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



### High accuracy

The graphite conductivity electrode provides greater accuracy because it cannot be contaminated by salt deposits in the solution.

Specifications	HI 98311 (DIST®5)	HI 98312 (DIST®6)
Range	EC 0 to 3999 $\mu\text{S}/\text{cm}$ TDS 0 to 2000 ppm Temperature 0.0 to 60.0 $^{\circ}\text{C}$ / 32.0 to 140.0 $^{\circ}\text{F}$	EC 0.00 to 20.00 mS/cm TDS 0.00 to 10.00 ppt Temperature 0.1 $^{\circ}\text{C}$ / 0.1 $^{\circ}\text{F}$
Resolution	EC 1 $\mu\text{S}/\text{cm}$ TDS 1 ppm Temperature 0.1 $^{\circ}\text{C}$ / 0.1 $^{\circ}\text{F}$	EC 0.01 mS/cm TDS 0.01 ppt Temperature $\pm 2\%$ F.S.
Accuracy (@20 $^{\circ}\text{C}$ )	EC $\pm 2\%$ F.S. TDS $\pm 2\%$ F.S. Temperature $\pm 0.5^{\circ}\text{C}$ / $\pm 1^{\circ}\text{F}$	EC $\pm 2\%$ F.S. TDS $\pm 2\%$ F.S. Temperature $\pm 0.5^{\circ}\text{C}$ / $\pm 1^{\circ}\text{F}$
Calibration	automatic, 1 point	automatic, 1 point
TDS Conversion Factor	adjustable from 0.45 to 1.00	adjustable from 0.45 to 1.00
Temperature Compensation	automatic, with $\beta$ adjustable from 0.0 to 2.4%/ $^{\circ}\text{C}$	automatic, with $\beta$ adjustable from 0.0 to 2.4%/ $^{\circ}\text{C}$
Environment	0 to 50 $^{\circ}\text{C}$ (32 to 122 $^{\circ}\text{F}$ ); RH max 100%	0 to 50 $^{\circ}\text{C}$ (32 to 122 $^{\circ}\text{F}$ ); RH max 100%
Battery Type / Life	4 x 1.5V with BEPS / approx. 100 hours of continuous use, auto-off after 8 minutes of non-use	4 x 1.5V with BEPS / approx. 100 hours of continuous use, auto-off after 8 minutes of non-use
Dimensions	163 x 40 x 26 mm (6.4 x 1.6 x 1.0")	163 x 40 x 26 mm (6.4 x 1.6 x 1.0")
Weight	100 g (3.5 oz.)	100 g (3.5 oz.)

### ORDERING INFORMATION

**HI 98311** (DiSt®5) & **HI 98312** (DiSt®6) are supplied with protective cap, electrode removal tool, (4) 1.5V batteries and instructions.

# DiSt®5 & DiSt®6





## Cup Style EC/TDS Testers

with Temperature Readout

The **DIST\*7** and **DIST\*8** are the latest innovation in the line of testers by HANNA Instruments. They are the most economical cup style testers in the market today. These models are ideal for measuring small samples of nutrient solution. **DIST\*7** measures low range and **DIST\*8** is ideal for high range applications. Both models feature BEPS so you are sure not to make an erroneous measurement when the batteries run low.

At startup the **DIST\*7** and **DIST\*8** display the battery level. Other features include ATC, auto-cal, temperature readout as well as reading stability indicator and HOLD function.

- **2 YEAR WARRANTY**
- **The most economic cup style in the market**
- **Multiple Ranges**
- **Automatic Calibration and ATC**
- **BEPS (Battery Error Prevention System)**
- **HOLD function**

Specifications		HI 98323 (DIST*7)	HI 98324 (DIST*8)
Range	EC	0 to 3999 µS/cm	0.00 to 20.00 mS/cm
	TDS	0 to 2000 ppm	0.00 to 10.00 ppt
	Temperature	0.0 to 60.0°C / 32.0 to 140.0°F	
Resolution	EC	1 µS/cm	0.01 mS/cm
	TDS	1 ppm	0.01 ppt
Accuracy (@20°C)	EC	±2% F.S.	
	TDS	±2% F.S.	
Calibration	EC	±0.5°C / ±1°F	
	Temperature	0.1°C / 0.1°F	
TDS Conversion Factor		adjustable from 0.45 to 1.00	
Temperature Compensation		automatic, with β adjustable from 0.0 to 2.4%/°C	
Environment		0 to 50°C (32 to 122°F); RH max 100%	
Battery Type / Life		(4) 1.5V with BEPS / approx. 2000 hours of continuous use, auto-off after 8 minutes of non-use	
Dimensions		120 x 53 x 81 mm (4.7 x 2.1 x 3.2")	
Weight		205 g (7.2 oz.)	

### ORDERING INFORMATION

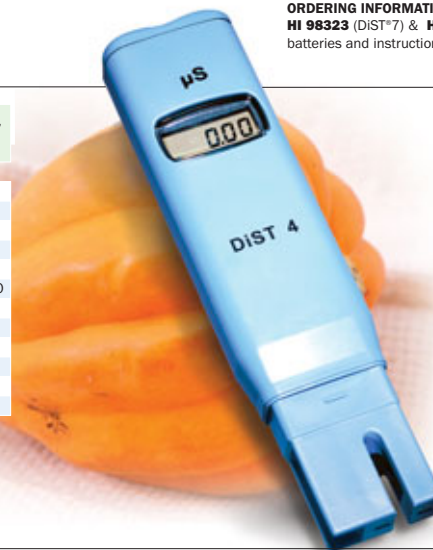
**HI 98323** (DIST\*7) & **HI 98324** (DiST\*8) are supplied with calibration solutions, (4) 1.5V batteries and instructions.

Choose the appropriate tester for your application: **DIST\* 1** and **DIST\* 2** measure high and low TDS, while **DIST\* 3** and **DIST\* 4** measure high and low conductivity.

Specifications	HI 98300/ HI 98301 (DIST* 1)	HI 98302 (DIST* 2)	HI 98303 (DIST* 3)	HI 98304 (DIST* 4)
Range	1999 ppm (mg/L)	10.00 ppt (g/L)	1999 µS/cm	19.99 mS/cm
Resolution	1 ppm (mg/L)	0.01 ppt (g/L)	1 µS/cm	0.01 mS/cm
Accuracy (@20°C/68°F)	±2% F.S.	±2% F.S.	±2% F.S.	±2% F.S.
TDS Factor	0.65 / 0.5	0.5	-	-
Calibration Solution	HI 70442 / HI 70032	HI 70038	HI 70031	HI 70039 or HI 70030
Calibration	manual, 1 point	manual, 1 point	manual, 1 point	manual, 1 point
Probe	HI 73301	HI 73302	HI 73303	HI 73304
Temp. Compensation	automatic, 0 to 50°C (32 to 122°F)			
Battery Type / Life	4 x 1.5V / approx. 200 hours of continuous use			
Environment	0 to 50°C (32 to 122°F); RH max 95%			
Dimensions / Weight	175 x 41 x 23 mm (6.9 x 1.6 x 0.9") / 95 g (3.4 oz.)			

### ORDERING INFORMATION

- HI 98300** (TDS factor = 0.65) (DIST\* 1) is supplied complete with protective cap, (4) 1.5V batteries and instructions.
- HI 98301** (TDS factor = 0.5) (DIST\* 1) is supplied complete with protective cap, (4) 1.5V batteries and instructions.
- HI 98302** (TDS factor = 0.5) (DIST\* 2) is supplied complete with protective cap, (4) 1.5V batteries and instructions.
- HI 98303** (DiST\* 3) is supplied complete with protective cap, (4) 1.5V batteries and instructions.
- HI 98304** (DiST\* 4) is supplied complete with protective cap, (4) 1.5V batteries and instructions.



## DISSOLVED SOLIDS TESTER

The Original Conductivity & TDS Testers

- **2 YEAR WARRANTY**
- **Automatic Temperature Compensation**
- **Simple 1 point calibration**

The **DIST\*** series of testers is a reliable, easy-to-use and inexpensive way to measure nutrient solution. The graphite sensors provide better repeatability over conventional stainless steel pins.

To calibrate, dip the electrode tip into calibration solution and adjust the easily accessible trimmer on the side of the tester.

## GRO'CHEK® EC and TDS Monitors

Waterproof and Featuring a Large LCD

• 2 YEAR WARRANTY

The original Gro'Chek® EC and TDS monitors by HANNA are still unsurpassed in price and performance. They are the ideal tool to monitor your nutrient solution continuously without having to worry about dead batteries. These models have been upgraded with a larger LCD. Choose the range that best fits your application.

Specifications	HI 983301N	HI 983301N/5	HI 983302N
Range	0 to 1990 ppm (mg/l)	0 to 1990 ppm (mg/l)	0.00 to 9.99 mS/cm
Resolution	10 ppm	10 ppm	0.01 mS/cm
Accuracy (@20°C/68°F)	2% F.S.		
Calibration	manual at 1 point, through trimmer		
Temp. compensation	automatic, 5 to 50 °C (41 to 122 °F) with $\beta=2\%/^{\circ}\text{C}$		
TDS conversion factor	0.7	0.5	—
Probe	HI 7634 (included)	HI 7632 (included)	HI 7632 (included)
Power supply	12 Vdc adapter (included)		
Environment	0 to 50 °C (32 to 122 °F); RH max 100%		
Dimensions / Weight	86 x 110 x 43 mm (3.4 x 4.3 x 1.7") / 215 g (7.6 oz)		

### ORDERING INFORMATION

**HI 983301N** is supplied with HI 7634 TDS probe, 12 VDC adapter, 1500 ppm calibration solution, calibration screwdriver and instructions.

**HI 983301N/5** is supplied with HI 7634 TDS probe, 12 VDC adapter, 1382 ppm calibration solution, calibration screwdriver and instructions.

**HI 983302N** is supplied with HI 7632 EC probe, 12 VDC adapter, 5.00 EC calibration solution, calibration screwdriver and instructions.



## EC TDS GRO'CHEK® Monitor

EC/TDS/Temperature Monitor With Backlit LCD

- 2 YEAR WARRANTY
- Adjustable TDS Ratio
- Adjustable  $\beta$
- Extra-Large Display
- 12 VDC adapter

The microprocessor based EC/TDS Gro'Chek® from HANNA has been designed to meet the grower's need for equipment suited to the aggressive environments found in agricultural and hydroponics applications.

Specifications	HI 993301	HI 993302
Range	EC 0 to 3999 $\mu\text{S}/\text{cm}$ TDS 0 to 2000 ppm Temperature 0.0 to 60.0 °C / 32.0 to 140.0 °F	0.00 to 20.00 mS/cm 0.00 to 10.00 ppt 0.0 to 60.0 °C / 32.0 to 140.0 °F
Resolution	EC 1 $\mu\text{S}/\text{cm}$ TDS 1 ppm Temperature 0.1 °C (0.1 °F)	0.01 mS/cm 0.01 ppt 0.1 °C (0.1 °F)
Accuracy (@20 °C/68 °F)	EC $\pm 2\%$ F.S. TDS $\pm 2\%$ F.S. Temperature $\pm 0.5^{\circ}\text{C}$ ( $\pm 1^{\circ}\text{F}$ )	$\pm 2\%$ F.S. $\pm 2\%$ F.S. $\pm 0.5^{\circ}\text{C}$ ( $\pm 1^{\circ}\text{F}$ )
EC/TDS calibration	automatic, 1 point, at 1413 $\mu\text{S}/\text{cm}$	automatic, 1 point, at 12.88 mS/cm
Probe	HI 7630 (included)	
EC/TDS conversion factor	adjustable from 0.45 to 1.00	
Temp. compensation	automatic with $\beta$ adjustable from 0.0 to 2.4% / °C	
Power supply	12 Vdc adapter (included)	
Environment	0 to 50 °C (32 to 122 °F); RH max 95%	
Dimensions	160 x 105 x 31 mm (6.3 x 4.1 x 1.2)	
Weight	190 g (6.7 oz) - meter only	

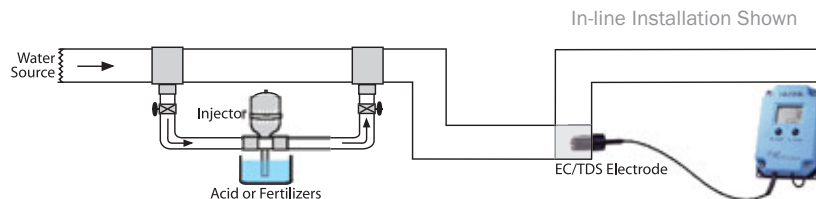


Dual-level  
Backlit LCD

### ORDERING INFORMATION

**HI 993301** is supplied with HI 7630 EC/TDS probe, 1413  $\mu\text{S}/\text{cm}$  cal. solution, 12 VDC adapter and instructions.

**HI 993302** is supplied with HI 7630 EC/TDS probe, 12.88 mS/cm cal. solution, 12 VDC adapter and instructions.





## Combo pH/EC/TDS/Temperature Testers

Waterproof with Replaceable pH Electrode

The HI 98129 and HI 98130 Combo waterproof testers offer the highest accuracy in pH, EC/TDS and temperature measurements with a single tester. pH and EC/TDS measurement combined is technically very difficult to achieve, and HANNA is the only company in the world that was able to solve the challenges of combined measurement in a tester.

Specifications	HI 98129	HI 98130
Range	pH	0.00 to 14.00 pH
	EC	0 to 3999 µS/cm
	TDS	0 to 2000 ppm
	Temperature	0.0 to 60.0°C / 32.0 to 140.0°F
Resolution	pH	0.01 pH
	EC	1 µS/cm
	TDS	1 ppm
	Temperature	0.1°C / 0.1°F
Accuracy (@20°C)	pH	±0.05 pH
	EC / TDS	±2% F.S.
	Temperature	±0.5°C / ±1°F
Temp. Compensation	pH: automatic; EC/TDS: automatic with β adjustable from 0.0 to 2.4% / °C	
Calibration	pH	automatic, 1 or 2 points with 2 sets of memorized buffers (pH 4.01 / 7.01 / 10.01 or 4.01 / 6.86 / 9.18)
	EC / TDS	automatic, 1 point
TDS Conversion Factor	adjustable, from 0.45 to 1.00	
pH Electrode	HI 73127 (replaceable; included)	
Environment	0 to 50 °C (32 to 122 °F); RH max 100%	
Battery Type / Life	4 x 1.5V / approx. 100 hours of continuous use, auto-off after 8 minutes of non-use	
Dimensions / Weight	163 x 40 x 26 mm (6.4 x 1.6 x 1.0") / 100 g (3.5 oz.)	

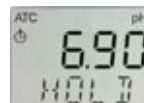
### LCD Display Features



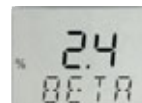
**Dual-Level LCD Display**  
Simultaneous display of measurement reading and temperature.



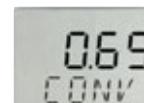
**On-screen Battery Life**  
When turned on, the LCD indicates the percentage of battery power remaining.



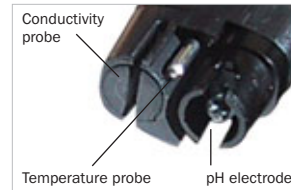
**HOLD Function**  
The HOLD function temporarily "freezes" the LCD display.



**Adjustable Temp. Coefficient Factor**  
Select any β (BETA) value between 0.0 and 2.4% per °C in increments of 0.1.



**Adjustable TDS Ratio**  
For TDS measurements, users can choose a conversion factor between 0.45 and 1.00 in increments of 0.01.



### Replaceable pH electrode cartridge

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

### High accuracy

The graphite conductivity electrode provides greater accuracy because it cannot be contaminated by salt deposits in the solution.

The exposed temperature sensor provides fast response times, and its close proximity guarantees accurate temperature compensated readings.

## pH/EC/TDS/°C Meters

Waterproof pH/EC/TDS/°C Meters for Growers

- 4 Meters in 1
- Fast Response Probe
- Available with °C display
- Exclusive Cal-Check Feature (HI 9813-6)

These multi-parameter instruments test 4 of the most important factors for hydroponics. **HI 9813** is a rugged all around waterproof meter for easy pH/EC/TDS measurements. **HI 9813-5** has all the popular features of the **HI 9813** and will also display °C with the press of a button. **HI 9813-6** has an added Cal-Check™ feature that can assess the calibration status of the specialized probe in seconds. Accuracy is ensured with ATC and an advanced sensor which completely eliminates polarization and oxidation problems. The **HI 9813** comes complete probe, solutions sachets, batteries and protective case.

### With the HI 9813's Cal Check feature, calibration status can be determined in just a few easy steps



Immerse the probe in HI 50021 check solution



Press the "CHECK" key  
A green light indicates the meter is calibrated



A red light indicates cleaning is needed

Specifications	HI 9813	HI 9813-5	HI 9813-6
Range	pH: EC; TDS Temperature	pH: 0.0 to 14.0; EC: 0.00 to 4.00 mS/cm; TDS: 0 to 1999 ppm (mg/L)	0.0 to 60.0 °C
Resolution	pH; EC; TDS Temperature	pH: 0.1; EC: 0.01 mS/cm; TDS: 1 ppm (mg/L)	0.1 °C
Accuracy (@20 °C/68 °F)	pH; EC; TDS Temperature	pH: ±0.1; EC: ±2% F.S.; TDS: ±2% F.S.	±0.5 °C
TDS Conversion Factor		0.56 to 0.72 ppm = 1 µS/cm	
Cal Check™	no	no	Yes
Calibration	manual at 1 point (all parameters except temperature)		
Temperature Compensation	automatic, 0 to 50 °C (32 to 122 °F) with β=2%/°C (EC/TDS only)		
Probe (included)	HI 1285-0, pH/EC/TDS	HI 1285-5, pH/EC/TDS/T	HI 1285-6, pH/EC/TDS/T, with Clean & Cal
Battery Type / Life	1 x 9V / approximately 150 hours of continuous use		
Environment	0 to 50 °C (32 to 122 °F); RH max 100%		
Dimensions / Weight	165 x 75 x 45 mm (6.9 x 2.9 x 1.8") / 180 g (6.3 oz.)		



#### ORDERING INFORMATION

**HI 9813-0** is supplied with HI 1285-0 pH/EC/TDS/°C probe, pH 7 sachet, 1413 µS/cm sachet, 1500 ppm sachet, cleaning solution sachet, (1) 9V battery and instruction manual in a protective case.

**HI 9813-5** is supplied with HI 1285-5 pH/EC/TDS/°C probe, pH 7 sachet, 1413 µS/cm sachet, 1500 ppm sachet, cleaning solution sachet, (1) 9V battery and instruction manual in a protective case.

**HI 9813-6** is supplied with HI 1285-6 pH/EC/TDS/°C probe with Cal-Check feature, Check solution sachet, pH 7 sachet, 1413 µS/cm sachet, 1500 ppm sachet, cleaning solution sachet, (1) 9V battery and instruction manual in a protective case.

**pH/EC/TDS/Temperature Megameter**

Waterproof 4-in-1 Meter

- 4 Parameters - 1 Probe!
- Automatic Calibration
- 2 Button Operation



This multi-parameter instrument tests for 4 of the most important factors in the growing environment. Calibration is performed at the touch of a button with memorized pH and EC buffers. Accuracy is ensured with Automatic Temperature Compensation and the advanced sensor which completely eliminates polarization and oxidation problems. Beta factor and TDS ratio are user-selectable as is the ability to read in °C or °F. The HI 991300 is supplied complete with probe and carrying case.

SPECIFICATIONS	HI 991300
Range	pH: 0.00 to 14.00; EC: 0 to 3999 µS/cm; TDS: 0 to 2000 ppm; Temp.: 0.0 to 60.0° or 32 to 140°F
Resolution	pH: 0.01; EC: 1 µS/cm; TDS: 1 ppm; Temp.: 0.1°C or 0.1°F
Accuracy	pH: ±0.01; EC/TDS: ±2% F.S.; Temp.: ±0.5°C or ±1.0°F
Temp. Comp.	pH: Automatic; EC/TDS: Automatic with a BETA factor 0.0-2.4%
Battery Life	approx. 500 hours continuous use.
Dimensions	143 x 80 x 38 mm (5.6 x 3.1 x 1.5")
Weight	320 g (11.3 oz.)

**ORDERING INFORMATION**

HI 991300 is supplied with HI 1288 pH/EC/TDS/°C probe, (4) 1.5V batteries and instruction manual in a hard carrying case.

**pH/EC/TDS Meters**

Versatile & Accurate Field Meter

- Water Resistant
- 1 Probe for All Parameters
- 0.0 to 70.0° Temperature Range (HI 9811-5)
- Battery Error Prevention System (BEPS)



**HI 9811-5 Measures °C!**

HI 9811-0 and HI 9811-5 are portable meters for field measurement of pH, conductivity and TDS. HI 9811-5 features additional temperature measurement in °C. These versatile instruments are ideal for use in hydroponics. This rugged instrument has been specifically designed for easy field use and reduces the number of instruments required for water quality analysis.

HI 9811-0 and HI 9811-5 are equipped with Automatic Temperature Compensation and BEPS (Battery Error Prevention System) which alerts the user when low batteries could affect the readings.

SPECIFICATIONS	HI 9811-0	HI 9811-5
Range	pH: 0.0 to 14.0; EC: 0 to 6000 µS/cm; TDS: 0 to 3000 ppm (mg/L)	pH: 0.0 to 14.0; EC: 0 to 6000 µS/cm; TDS: 0 to 3000 ppm (mg/L); Temperature: 0.0 to 70.0°C
Resolution	pH: 0.1; EC: 10 µS/cm; TDS: 10 mg/L	pH: 0.1; EC: 10 µS/cm; TDS: 10 mg/L; Temperature: 0.1°C
Accuracy (@20°C/68°F)	pH: ±0.1; EC/TDS: ±2% F.S.	pH: ±0.1; EC/TDS: ±2% F.S.; Temperature: ±0.5°C
Calibration	manual at 1 point (all parameters except temperature)	
Temp. Compensation	automatic 0 to 50°C with β = 2% / °C (EC/TDS only)	
TDS Conversion Factor	0.5 mg/L = 1 µS/cm	
Probe	HI 1285-0 pH/EC/TDS, 1 m cable (included)	HI 1285-5 pH/EC/TDS/T, 1 m cable (included)
Battery Type / Life	(1) 9V / approximately 150 hours of continuous use	
Environment	0 to 50°C (32 to 122°F); 100% RH	
Dimensions / Weight	165 x 75 x 45 mm (6.9 x 2.9 x 1.8") / 180 g (6.3 oz.)	

**ORDERING INFORMATION**

HI 9811-0 and HI 9811-5 are supplied complete with HI 1285-0 (-0) or HI 1285-5 (-5) probe with 1 m (3.3') cable, pH 7 calibration solution, 1382 ppm and 1413 µS/cm calibration solutions (1 each), cleaning solution (2 pcs), blue protective case, battery and instructions.



## ComboGRÖ'CHEK®

pH, EC/TDS and Temperature Monitor with Large Backlit LCD

- **Waterproof**
- **Dual-level Backlit LCD**
- **Adjustable, TDS Ratio**
- **Adjustable  $\beta$**
- **Stability Indicator**
- **Extra-Large Display**
- **12 VDC Power Supply**



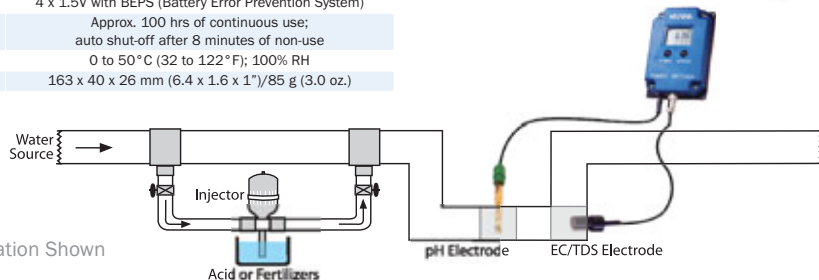
**Dual-level  
Backlit LCD**

The **Combo Gro'Chek®** from **HANNA** continuously monitors the three most important nutrient parameters in greenhouses, hydroponics and horticultural applications. The **HI 991404** and **HI 991405** are supplied with an advanced, non-clogging, double-junction pH electrode and a rugged, conductivity probe that will stand up to the most aggressive environments.

SPECIFICATIONS	HI 991404	HI 991405
Range	pH: 0.00 to 14.00; EC: 0 to 3999 $\mu$ S/cm; TDS: 0 to 2000 ppm; Temperature: 0.0 to 60.0 °C or 32.0 to 140.0 °F	pH: 0.00 to 14.00; EC: 0.00 to 20.00 mS/cm; TDS: 0.00 to 10.00 ppt; Temperature: 0.0 to 60.0 °C or 32.0 to 140.0 °F
Resolution	pH: 0.01; EC: 1 $\mu$ S/cm; TDS: 1 ppm; Temperature: 0.1 °C or 0.1 °F	pH: 0.01; EC: 0.01 mS/cm; TDS: 0.01 ppt; Temperature: 0.1 °C or 0.1 °F
Accuracy	pH: $\pm$ 0.05; EC/TDS: $\pm$ 2% F.S.; Temperature: $\pm$ 0.5 °C or $\pm$ 1 °F	
pH Calibration	1 or 2 points with 2 sets of memorized buffers	
EC/TDS Calibration	automatic 1 point	
EC/TDS Conv. Factor	adjustable from 0.45 to 1.00	
Temp. Compensation	pH: automatic; EC/TDS: automatic, BETA ( $\beta$ ) is adjustable from 0.0 to 2.4%/°C	
Battery Type	4 x 1.5V with BEPS (Battery Error Prevention System)	
Battery Life	Approx. 100 hrs of continuous use; auto shut-off after 8 minutes of non-use	
Environment	0 to 50 °C (32 to 122 °F); 100% RH	
Dimensions/Weight	163 x 40 x 26 mm (6.4 x 1.6 x 1")/85 g (3.0 oz.)	

### ORDERING INFORMATION

**HI 991404 & HI 991405** is supplied complete with HI 1293D pH electrode, fixed HI 7630 probe, pH and EC calibration solutions, 12 Vdc power adapter and instructions.



## GRÖ'CHEK® pH/EC and pH/TDS Monitors

Featuring pH and EC Simultaneous Display

These monitors are ideal for agricultural, horticultural and hydroponics applications where pH and EC levels need to be continuously monitored for optimal plant growth. These wall-mount monitors feature a large, easy-to-read LCD that displays pH and EC readings simultaneously.

SPECIFICATIONS	HI 981404N	HI 981405N
Range	pH: 0.0 to 14.0 TDS: 0 to 1990 ppm (mg/L)	pH: 0.0 to 14.0 pH EC: 0.00 to 9.99 mS/cm
Resolution	pH: 0.1; TDS: 10 ppm (mg/L)	pH: 0.1; EC: 0.01 mS/cm
Accuracy (@20°C/68°F)	$\pm$ 0.2 pH; TDS: $\pm$ 2% F.S.	$\pm$ 0.2 pH; EC: $\pm$ 2% F.S.
Calibration	manual, 1 or 2 points (pH); manual, 1 point (TDS)	manual, 1 or 2 points (pH); manual, 1 point (EC)
Temp. compensation	Automatic 5 to 50 °C (TDS only)	
EC/TDS conv. factor	0.7 ppm = 1 $\mu$ S/cm	—
Power supply	12 Vdc adapter (included)	
Environment	0 to 50 °C (32 to 122 °F); RH max 95%	
Dimensions/Weight	160 x 110 x 35 mm (6.3 x 4.3 x 1.4")/300 g (10.6 oz.)	

### ORDERING INFORMATION

**HI 981404N** is supplied with HI 1286 pH electrode, HI 7634 TDS probe, HI 1283 grounding bar, cal. solutions, calibration screwdriver, 12 VDC adapter and instructions.

**HI 981405N** is supplied with HI 1286 pH electrode, HI 7632 EC probe, HI 1283 grounding bar, cal. solutions, calibration screwdriver, 12 VDC adapter and instructions.



- **Continuous Monitoring**
- **Displays Both pH and EC**
- **Adjustable Setpoints**

## Lux Meter

Portable Lux Meter for Rapid Light Measurements in a Waterproof Case

The **HI 97500** portable Lux Meter from HANNA instruments® has been designed for simplicity of use in taking rapid light measurements.

Monitoring the light a plant is subjected to is critical for optimal plant growth. This portable instrument can be taken with you for spot measurements around your greenhouse.

This meters offers 3 different ranges to cover all applications

SPECIFICATIONS	HI 97500
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 AA/approx. 200 hours of continuous use; Auto-off after 7 minutes of non-use
Environment	0 to 50 °C (32 to 122 °F); 100% RH
Dimensions	164 x 76 x 45 mm (6.5 x 3.0 x 1.8")
Weight	180 g (6.3 oz.)



- Three measurement ranges
- Light sensor attached to 1.5 meter coaxial cable
- Rugged, waterproof case

### ORDERING INFORMATION

**HI 97500** is supplied with (1) 9V battery and instruction manual.

## Light Intensity

Luminous intensity is measured and reported in foot-candles (ft-c) or in lux (lx). Light meters are commonly referred to as lux meters. 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 formulae:

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

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

HANNA's light measuring sensor is a photo diode that converts incident light into an electronic signal that is read and displayed on the meters LCD as Klx which is 1,000 lx. So multiply the reading by 92.9 to get the measurement in foot candles.

### Common examples of light intensities

Full Moon	.001 Klx	1 lx	.0929 ft-c
Street Lighting	.01 Klx	10 lx	.929 ft-c
Workspace Lighting	.1 - 1 Klx	100 - 1,000 lx	9.29 - 92.9 ft-c
Surgery Lighting	10 Klx	10,000 lx	929 ft-c
Sunshine	100 Klx	100,000 lx	9,290 ft-c

## 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.



## Chemical Test Kits for Hydroponics

In hydroponics, monitoring the quality of nutrient solution is extremely important for healthy growth of plants. The pH level is an excellent guide as to which plants may thrive in a particular growth media, as well as indicating which fertilizers to use. HANNA's combination test kits allow you to test not only for pH, but for nitrogen, phosphorous and potassium as well, which are just as important for the quality of nutrient solutions.

**HI 3895** comes with all the necessary components for 10 tests. **HI 3896** provides for 25 tests and includes a useful guide to measurement.

### HI 3895 - Agriculture test kit

Parameter	Method	Range	Chemical Method	Number of Tests
Nitrogen	Colorimetric	traces, low, medium, high	Ned	10
Phosphorus	Colorimetric	traces, low, medium, high	Ascorbic acid	10
pH	Colorimetric	4 to 9 pH (1 pH increments)	pH indicator	10
Potassium	Turbidimetric	traces, low, medium, high	Tetraphenylborate	10
<b>Other Information</b>				
Dimensions	113 x 113 x 62 mm (4.4 x 4.4 x 2.4")			
Weight	105 g (3.7 oz.)			

### HI 3896 - Agriculture test kit

Parameter	Method	Range	Chemical Method	Number of Tests
Nitrogen	Colorimetric	traces, low, medium, high	Ned	25
Phosphorus	Colorimetric	traces, low, medium, high	Ascorbic acid	25
pH	Colorimetric	4 to 9 pH (1 pH increments)	pH indicator	25
Potassium	Turbidimetric	traces, low, medium, high	Tetraphenylborate	25
<b>Other Information</b>				
Dimensions	235 x 176 x 117 mm (9.2 x 6.9 x 4.6")			
Weight	710 g (1.6 lb)			

## HI 83215 Grow Master

*Nitrogen, Phosphorus, Potassium and Ammonia Meter*

HI 83215 is a practical instrument made to measure nutrients commonly present in fertilizer-enriched solutions. This professional photometer measures ammonia, phosphorus, nitrate and potassium in three distinct ranges of low, medium and high concentrations. This way, accuracy is maximized for each nutrient and for every concentration.

Using the HI 83215, you can test the presence and strength of nutrients right on the spot. This can translate itself into a substantial savings and improved yield.

SPECIFICATIONS		HI 83215
Light Source	3 tungsten lamps with narrow band interference filter	420/525/610 nm
Light Detector	4 Silicon Photocells	
Power Supply	2 x 9V battery or 12 Vdc adapter	
Auto-off	after 10 minutes of non-use	
Environment	0 to 50°C (32 to 122°F); RH max 95% non-condensing	
Dimensions / Weight	230 x 165 x 70 mm / 640 g	

Test	Range	Method	Accuracy
Ammonia LR	0.0 to 10.0 mg/L	Nessler	±0.1 mg/L ±4% of reading
Ammonia MR	0.0 to 50.0 mg/L	Nessler	± 0.5 mg/L ±4% of reading
Ammonia HR	0 to 100 mg/L	Nessler	±1 mg/L ±4% of reading
Nitrate LR	0.0 to 30.0 mg/L	Cadmium Reduction	±1 mg/L ±8% of reading
Nitrate MR	0 to 150 mg/L	Cadmium Reduction	±5 mg/L ±8% of reading
Nitrate HR	0 to 300 mg/L	Cadmium Reduction	±10 mg/L ±8% of reading
Phosphorus LR	0.0 to 10.0 mg/L	Amino Acid	±0.5 mg/L ±4% of reading
Phosphorus MR	0.0 to 50.0 mg/L	Amino Acid	±2.5 mg/L ±4% of reading
Phosphorus HR	0 to 100 mg/L	Amino Acid	±5 mg/L ±4% of reading
Potassium LR	0.0 to 20.0 mg/L	Turbidimetric	±3.0 mg/L ±7% of reading
Potassium MR	10 to 100 mg/L	Turbidimetric	±15 mg/L ±7% of reading
Potassium HR	20 to 200 mg/L	Turbidimetric	±30 mg/L ±7% of reading

mg/L = ppm  
 LR = Low Range  
 MR = Medium Range  
 HR = High Range

- Accurate
- 4 Parameters in 1 Meter
- Three Ranges for Each Parameter
- Easy to use
- Economical Tests

Don't wait for lab results!



### ORDERING INFORMATION

**BL 83215** is supplied with 4 measuring cuvettes, batteries, 12 Vdc adapter and instructions.

**BL 83215K** kit includes accessories for HI 83215: rugged carrying case, 100 mL and 170 mL beaker, 60 mL and 5 mL syringes, 1 filter-holder and 25 filters, 100 mL cylinder, demineralizer bottle, 2 pipettes, 1.5 mL spoon and active carbon for 50 tests.

## Plant Nutrition

The three elements that are most needed by plants are nitrogen (N), phosphorous (P) and potassium (K). This is the reason why they are called macronutrients and should be given to plants.

**Nitrogen** is indispensable for the plant's life and is a key factor in fertilization. Nitrogen allows the development of the vegetative activity of the plant, in particular, causes 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 & 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 plant, slow growth, a reduction of production, smaller fruits and a lower expansion of the roots.

Even if **Potassium** is not a constituent of important compounds, it plays a remarkable role in many physiological activities 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.

## Wall Mount pH/EC and pH/TDS Controllers

Proportional Control for Hydroponics

- **2-in-1: pH/EC or pH/TDS**
- **Economical**
- **Automatic Temperature Compensation**
- **Alarm Relay**

These controllers are ideal for automation of your plant nutrition system. They monitor pH and EC (TDS) levels and automatically activate the dosing of acid and nutrient solution when the values drop below the optimal set-point (user selectable).

These turn-key systems also feature a maximum dosing timeout control (user selectable) which eliminates over feeding which can become toxic to plants.

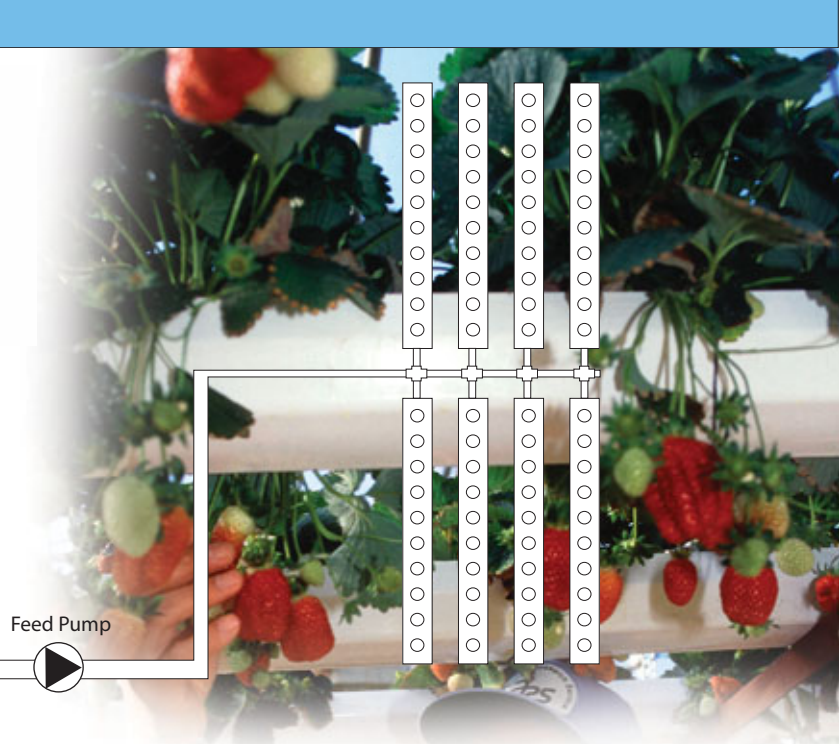
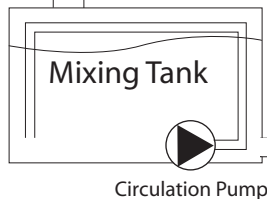
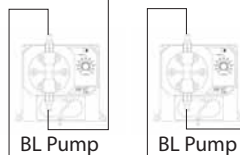
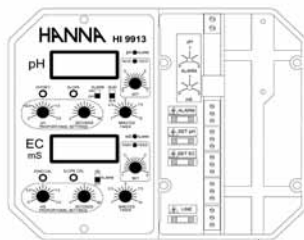
Models are available in pH/EC or pH/TDS.



### ORDERING INFORMATION

**HI 9913** pH and Conductivity controller for Hydroponics.

**HI 9935** pH and TDS controller for Hydroponics.



### SPECIFICATIONS

	HI 9913	HI 9935
Range	0.00 to 14.00 pH; 0.00 to 10.00 mS/cm	0.00 to 14.00 pH; 0 to 1999 ppm (mg/L)
Resolution	0.01 pH; 0.01 mS/cm	0.01 pH; 1 ppm (mg/L)
Accuracy	±0.02 pH; ±2% F.S.	±0.02 pH; ±2% F.S.
Calibration	2 points for pH and for EC through "ZERO" and "SLOPE CAL" trimmers	2 points for pH and for TDS through "ZERO" and "SLOPE CAL" trimmers
Setpoint	selectable from 4.00 to 7.00 pH and from 1.00 to 4.00 mS/cm	selectable from 4.00 to 7.00 pH and from 900 to 1800 ppm
Temp. Compensation (TDS)	automatic from 0 to 50 °C with β of 2% per °C	automatic from 0 to 50 °C with β of 2% per °C
TDS Ratio		0.65 ppm = 1 μS/cm
Dosing Contacts	two powered terminals for EC and pH correction (240V) max 2 A, 1,000,000 strokes; Proportional dosage: activated when pH > set point or EC < set point	two powered terminals for TDS and pH correction (240V) max 2 A, 1,000,000 strokes; Proportional dosage: activated when pH > set point or ppm < set point
Alarm Relay	one, activated when the pH drops below (selectable 0 to 2 pH) the set point or activated when the EC exceeds (selectable 0 to 2 mS/cm) from the set point or max. dosage time (1 to 10 minutes) elapses. Isolated, max. 2 A/240V, resistive load, 1,000,000 strokes	one, activated when the pH drops below (selectable 0 to 2 pH) the set point or activated when the ppm exceeds (selectable 0 to 400 ppm) from the set point or max. dosage time (1 to 10 minutes) elapses. Isolated, max. 2 A/240V, resistive load, 1,000,000 strokes
Power Supply		110/115V or 220/240V; 50/60Hz
Dimensions / Weight		181L x 221W x 142H mm (7.1L x 8.7W x 5.6H") / 1.6 Kg (3.5 lb)

## Mini Panel Mount pH Controller

**BL 981411** is a simple-to-operate pH controller specially designed for hydroponics where space or cost are a major concern. **BL 981411** measures 3 x 2" and it can be mounted in confined spaces and right next to nutrient tanks or vats. Use this minicontroller when you want to automate your acid feeding requirements.

Specifications	BL 981411
Range	0.0 to 14.0 pH
Resolution	0.1 pH
Accuracy (@20°C/68°F)	±0.1 pH
Calibration	manual, with offset trimmer
Dosing Relay	1, max 2A (fuse protected), 250 Vac, 30 Vdc
Dosing Selection	acid or alkaline
Setpoint	adjustable from 0.0 to 14.0 pH
Overtime	adjustable, typically from 5 to approx. 30 min.
Power Supply	-0: 12 VDC adapter; -1: 115/220V
Dimensions	83 x 53 x 99 mm (3.3 x 2.1 x 3.9")
Weight	200 g (7.1 oz.)

### ORDERING INFORMATION

**BL 981411-0** is supplied with 12 VDC adapter, mounting brackets and instruction manual.

**BL 981411-1** is supplied with mounting brackets and instruction manual.



**NEW**

## Controller & Monitor with Industrial Enclosure

Make Your Own Control and Injection Systems

- LCD Display
- Alarm Contact
- Key Pad Touch Setting
- Calibration and Adjustable Set points
- Multi-ranges for TDS and Conductivity
- Available in 115 V or 12 VDC



Choose from TDS, Conductivity, pH, Resistivity or ORP. They will allow any system to be cost effectively monitored 24 hours a day.

### ORDERING INFORMATION

**HI 1211** with single meter capability

**HI 1222** with dual meter capability



Combine any of our Mini Controllers into the HI 1222 for versatile monitoring and control.

## Mini Panel Mount EC and TDS Controllers

These simple-to-operate pH controllers are specially designed for hydroponics where space or cost are a major concern. Measuring 3 x 2" they can be mounted in confined spaces right next to nutrient tanks or vats.

Use these minicontrollers when you want to automate your acid feeding requirements.

SPECIFICATIONS	BL 983313	BL 983319
Range	0 to 1999 µS/cm	0 to 1999 mg/L (ppm)
Resolution	1 µS/cm	1 mg/L (ppm)
Accuracy	±2% F.S.	±2% F.S.
Temp. Compensation	Automatic, 5 to 50 °C (41 to 122 °F) with β=2%/°C	
TDS Conversion Factor	—	0.65
Calibration	manual with CAL trimmer	
Setpoint	adjustable from 0 to 1999 µS/cm	adjustable from 0 to 1999 ppm
Probe	HI 7634-00 (not included)	
Power Supply	-0: 12 VDC adapter; -1: 115/220V	
Dimensions / Weight	83 x 53 x 99 mm (3.3 x 2.1 x 3.9") / -0: 200 g (7.1 oz.); -1: 300 g (10.6 oz.)	

### ORDERING INFORMATION

**BL 983313-0** is supplied with 12 VDC adapter, mounting brackets and instruction manual.

**BL 983313-1** is supplied with mounting brackets and instruction manual.

**BL 983319-0** is supplied with 12 VDC adapter, mounting brackets and instruction manual.

**BL 983319-1** is supplied with mounting brackets and instruction manual.

**NEW**

## HI 98127 (pHep\*4) & HI 98128 (pHep\*5)

HI 7004M	.....pH 4.01 buffer solution, 230 mL
HI 7007M	.....pH 7.01 buffer solution, 230 mL
HI 7010M	.....pH 10.01 buffer solution, 230 mL
HI 70004P	.....pH 4.01 buffer solution, (25) 20 mL sachets
HI 77400P	.....pH 4 & 7 solution, (10) 20 mL sachets, 5 ea.
HI 70007P	.....pH 7.01 buffer solution, (25) 20 mL sachets
HI 70010P	.....pH 10.01 buffer solution, (25) 20 mL sachets
HI 70300L	.....Electrode storage solution, 460 mL
HI 73127	.....pH electrode for HI 98127 & HI 98128

## HI 981408 (pH GRO-CHEK\*)

HI 77400P	.....pH 4 & 7 solution, (10) 20 mL sachets, 5 ea.
HI 77700P	.....pH 7 Cal. kit, (10) 20 mL sachets
HI 70000P	.....Rinse solution, (25) 20 mL sachets
HI 70300L	.....Storage solution, 460 mL
HI 7061M	.....Electrode cleaning solution, 230 mL
HI 1219	.....Double junction pH electrode

## HI 98107 (pHep\*)

HI 77400P	.....pH 4 & 7 solution, (10) 20 mL sachets, 5 ea.
HI 770710P	.....pH 7 & 10 Cal. kit, (10) 20 mL sachets, 5 ea.
HI 7004M	.....Buffer solution pH 4.01, 230 mL
HI 7007M	.....Buffer solution pH 7.01, 230 mL
HI 7010M	.....Buffer solution pH 10.01, 230 mL
HI 70300M	.....Electrode storage solution, 230 mL

## HI 98103 (Checker\*1)

HI 77400P	.....pH 4 & 7 solution, (10) 20 mL sachets, 5 ea.
HI 7004M	.....pH 4.01 buffer solution, 230 mL
HI 7007M	.....pH 7.01 buffer solution, 230 mL
HI 7010M	.....pH 10.01 buffer solution, 230 mL
HI 70300L	.....Electrode storage solution, 460 mL
HI 7061L	.....Electrode cleaning solution, 460 mL

## HI 98103GC (Growers Field Checker\*)

HI 77400P	.....pH 4 & 7 solution, (10) 20 mL sachets, 5 ea.
HI 7004M	.....pH 4.01 buffer solution, 230 mL
HI 7007M	.....pH 7.01 buffer solution, 230 mL
HI 7010M	.....pH 10.01 buffer solution, 230 mL
HI 70300L	.....Electrode storage solution, 460 mL
HI 7061L	.....Electrode cleaning solution, 460 mL

## HI 991401

HI 77400P	.....pH 4 & 7 solution, (10) 20 mL sachets, 5 ea.
HI 77700P	.....pH 7 Cal. kit, (10) 20 mL sachets
HI 770710P	.....pH 7 & 10 Cal. kit, (10) 20 mL sachets, 5 ea.
HI 7004M	.....Buffer solution, pH 4.01, 230 mL
HI 7007M	.....Buffer solution, pH 7.01, 230 mL
HI 7010M	.....Buffer solution, pH 10.01, 230 mL
HI 70300M	.....Electrode storage solution, 230 mL
HI 1293D	.....pH electrode with DIN connector

## HI 981401M

HI 7004M	.....Buffer solution, pH 4.01, 230 mL
HI 7007M	.....Buffer solution, pH 7.01, 230 mL
HI 7010M	.....Buffer solution, pH 10.01, 230 mL
HI 70300M	.....Storage solution, 230 mL
HI 70000P	.....Electrode rinse solution, 230 mL
HI 7061M	.....Electrode cleaning solution, 230 mL
HI 1286D	.....pH electrode with 2 m (6.6') cable

## HI 981504

HI 7004M	.....pH 4.01 buffer solution, 230 mL
HI 70004P	.....pH 4.01 buffer solution, (25) 20 mL sachets
HI 7007M	.....pH 7.01 buffer solution, 230 mL
HI 70007P	.....pH 7.01 buffer solution, (25) 20 mL sachets
HI 7010M	.....pH 10.01 buffer solution, 230 mL
HI 70010P	.....pH 10.01 buffer solution, (25) 20 mL sachets
HI 7032M	......1382 ppm cal. solution, 230 mL
HI 70032P	......1382 ppm cal. solution, (25) 20 mL sachets
HI 70442M	......1500 ppm cal. solution, 230 mL
HI 70442P	......1500 ppm cal. solution, (25) 20 mL sachets
HI 70300M	.....Electrode storage solution, 230 mL
HI 7061M	.....Electrode cleaning solution, 230 mL
HI 1286	.....Double junction, plastic body pH electrode with 2 m (6.6') cable and BNC connector.

## HI 981410 (EC GRO-CHEK)

HI 70039P	.....5000 µS/cm@25°C cal. kit, (25) 20 mL sachets
HI 7061M	.....Electrode cleaning solution, 230 mL
HI 70300M	.....Electrode storage solution, 230 mL
HI 1220	.....Conductivity probe, L: 240 mm, DIN conn.

## HI 98311 (DiST\*5) & HI 98312 (DiST\*6)

HI 70031P	......1413 µS/cm cal. kit, (25) 20 mL sachets
HI 70032P	......1382 ppm cal. kit, (25) 20 mL sachets
HI 70038P	......6.44 ppt cal. kit, (25) 20 mL sachets
HI 70030P	......12.88 mS/cm cal. kit, (25) 20 mL sachets
HI 70442P	......1500 ppm cal. kit, (25) 20 mL sachets
HI 73311	.....Probe for HI 98311 & HI 98312

## HI 98323 & HI 98324

HI 70031P	......1413 µS/cm cal. kit, (25) 20 mL sachets
HI 70032P	......1382 ppm cal. kit, (25) 20 mL sachets
HI 70038P	......6.44 ppt cal. kit, (25) 20 mL sachets
HI 70030P	......12.88 mS/cm cal. kit, (25) 20 mL sachets
HI 70442P	......1500 ppm cal. kit, (25) 20 mL sachets

## DIST\*

HI 73302	.....Probe for HI 98302
HI 73303	.....Probe for HI 98303
HI 73304	.....Probe for HI 98304
HI 70300M	......12.88 mS/cm cal. sol., 230 mL
HI 70030P	......12.88 mS/cm cal. kit, (25) 20 mL sachets
HI 7031M	......1413 µS/cm cal. sol., 230 mL
HI 70031P	......1413 µS/cm cal. kit, (25) 20 mL sachets
HI 7032M	......1382 ppm cal. sol., 230 mL
HI 70032P	......1382 ppm cal. kit, (25) 20 mL sachets
HI 70442P	......1500 ppm cal. kit, (25) 20 mL sachets
HI 70038P	......6.44 ppt cal. kit, (25) 20 mL sachets
HI 7039M	......5000 µS/cm cal. sol., 230 mL
HI 70039P	......5000 µS/cm cal. kit, (25) 20 mL sachets
HI 73301	.....Probe for HI 98300 & HI 98301

## HI 983302, HI 983301N & HI 983301N/5

HI 70031P	......1413 µS/cm (EC) cal. kit, (25) 20 mL sachets
HI 70442P	......1500 ppm (TDS) cal. kit, (25) 20 mL sachets
HI 70032P	......1382 ppm (TDS) cal. kit, (25) 20 mL sachets
HI 7031L	......1413 µS/cm (EC) cal. sol., 460 mL
HI 70442L	......1500 ppm (TDS) cal. sol., 460 mL
HI 7032L	......1382 ppm (TDS) cal. sol., 460 mL
HI 7061L	.....Electrode cleaning sol., 460 mL

## HI 993301 & HI 993302

HI 7030M	......12.88 mS/cm calibration solution, 230 mL
HI 70030P	......12.88 mS/cm cal. kit, (25) 20 mL sachets
HI 7031M	......1413 µS/cm cal. solution, 230 mL
HI 70031P	......1413 µS/cm cal. kit, (25) 20 mL sachets
HI 7032M	......1382 ppm cal. solution, 230 mL
HI 70032P	......1382 ppm cal. kit, (25) 20 mL sachets
HI 7038M	......6.44 ppt, cal. solution, 230 mL
HI 70038P	......6.44 ppt cal. kit, (25) 20 mL sachets

## HI 98129 (Combo) & HI 98130 (Combo)

HI 7004M	.....pH 4.01 buffer solution, 230 mL
HI 70004P	.....pH 4.01 buffer solution, (25) 20 mL sachets
HI 7007M	.....pH 7.01 buffer sol., 230 mL
HI 70007P	.....pH 7.01 buffer solution, (25) 20 mL sachets
HI 7010M	.....pH 10.01 buffer sol., 230 mL
HI 70007P	.....pH 10.01 buffer solution, (25) 20 mL sachets
HI 77400P	.....pH 4 & 7 solution, (10) 20 mL sachets, 5 ea.
HI 770710P	.....pH 7 & 10 cal. kit, (10) 20 mL sachets, 5 ea.
HI 70030P	......12.88 mS/cm cal. kit, (25) 20 mL sachets
HI 70031P	......1413 µS/cm cal. kit, (25) 20 mL sachets
HI 70032P	......1382 ppm cal. kit, (25) 20 mL sachets
HI 70038P	......6.44 ppt cal. kit, (25) 20 mL sachets
HI 70039P	......5000 µS/cm cal. kit, (25) 20 mL sachets
HI 70442P	......1500 ppm cal. kit, (25) 20 mL sachets
HI 7061M	.....Electrode cleaning solution, 230 mL
HI 70300M	.....Electrode storage solution, 230 mL
HI 73127	.....Probe for HI 98129 & HI 98130

**HI 9813-0, HI 9813-5 & HI 9813-6**

HI 77100P	.1413 µS & pH 7 sol., (20) 20 mL sachets, 10 ea.
HI 77200P1500	ppm & pH 7 sol., (20) 20 mL sachets, 10 ea.
HI 77400P	.pH 4 & 7 solution, (10) 20 mL sachets, 5 ea.
HI 70300L	.Storage solution, 460 mL
HI 7061L	.Cleaning solution, 460 mL
HI 50021	.Check sol., (25) 20 mL sachets (for HI 9813-6 only)
HI 710009	.Blue rubber boot
HI 721312	.Rugged carrying case
HI 710001	.Soft carrying case

**HI 991300**

HI 70030P	.12880 µS/cm cal. sol., (25) 20 mL sachets
HI 77100P	.1413 µS & pH 7 sol., (20) 20 mL sachets, 10 ea.
HI 70038P	.6.44 ppt cal. sol., (25) 20 mL sachets
HI 77200P1500	ppm & pH 7 sol., (20) 20 mL sachets, 10 ea.
HI 77400P	.pH 4 & 7 solution, (10) 20 mL sachets, 5 ea.
HI 710007	.Shockproof rubber boot
HI 1288	.pH/EC/TDS/°C probe

**HI 9811 & HI 9811-5**

HI 77100P	.1413 µS & pH 7 sol., (10) 20 mL sachets
HI 77300P	.1382 ppm & pH 7 sol., (10) 20 mL sachets
HI 77400P	.pH 4 & 7 solution, (10) 20 mL sachets, 5 ea.
HI 70300L	.Electrode storage solution, 460 mL
HI 7061L	.Cleaning solution, 460 mL
HI 710010	.Orange rubber boot
HI 721312	.Rugged carrying case
HI 710001	.Soft carrying case
HI 1285	.pH/EC/TDS/°C probe

**HI 991404 & HI 991405**

HI 7004M	.pH 4.01 buffer solution, 230 mL
HI 7007M	.pH 7.01 buffer solution, 230 mL
HI 7010M	.pH 10.01 buffer solution, 230 mL
HI 70030P	.12.88 mS/cm cal. kit, (25) 20 mL sachets
HI 70031P	.1413 µ/cm cal. kit, (25) 20 mL sachets
HI 70032P	.1382 ppm cal. kit, (25) 20 mL sachets
HI 70038P	.6.44 ppt cal. kit, (25) 20 mL sachets
HI 70442P	.1500 ppm cal. kit, (25) 20 mL sachets
HI 70300M	.Electrode storage solution, 230 mL
HI 7061M	.Electrode cleaning solution, 230 mL

**HI 981404N & HI 981405N**

HI 70004P	.pH 4.01 buffer solution, (25) 20 mL sachets
HI 70007P	.pH 7.01 buffer solution, (25) 20 mL sachets
HI 70442P	.1500 ppm cal. kit, (25) 20 mL sachets
HI 70039P	.5000 µS/cm cal. kit, (25) 20 mL sachets
HI 70000P	.Electrode rinsing solution, (25) 20 mL sachets
HI 70300M	.Electrode storage solution, 230 mL
HI 7061M	.Electrode cleaning solution, 230 mL
HI 1286	.pH electrode with BNC connector and 2 m (6.6') cable
HI 1283	.Stainless steel grounding probe with 2 m (6.6') cable*
HI 7632	.EC probe with 2 m (6.6') cable*
HI 7634	.TDS probe w/2 m (6.6') cable*

\* to be replaced by authorized personnel only

**HI 83215**

HI 731318	.Tissue for wiping cuvetts (4 pcs)
HI 731321	.Spare measurement cuvetts (4 pcs)
HI 731325	.Cap for cuvetts (4 pcs)

**HI 83215 Reagents**

HI 93715-01	.Reagents for Ammonia (100 tests)
HI 93728-01	.Reagents for Nitrate (100 tests)
HI 93706-01	.Reagents for Phosphorus (100 tests)
HI 93750-01	.Reagents for Potassium (100 tests)
HI 76407A/P	.Pack of 5 replacement membranes
HI 721317	.Rugged carrying case

**HI 9935**

HI 1002/5	.Plastic in-line pH electrode + 5 m cable
HI 1090B/5	.Glass pH electrode. BNC + 5 m (16.5') cable
HI 1090T	.Glass pH electrode for T connector
HI 7638	.Immersion TDS/°C probe
HI 3001D	.In-line TDS/°C probe
HI 6054B	.Electrode holder for in-line applications
HI 7004L	.pH 4.01 buffer solution, 500 mL
HI 7007L	.pH 7.01 buffer solution, 500 mL
HI 70442L	.1500 ppm TDS sol., 460 mL

**HI 9913**

HI 1002/5	.Plastic in-line pH electrode + 5 m cable
HI 1090B/5	.Glass pH electrode. BNC+5 m (16.5') cable
HI 1090T	.Glass pH electrode for T connector
HI 7638	.Immersion conductivity/°C probe
HI 3001D	.In-line conductivity/°C probe
HI 6054B	.Electrode holder for in-line applications
HI 7004L	.pH 4.01 buffer solution, 500 mL
HI 7007L	.pH 7.01 buffer solution, 500 mL
HI 7031L	.1413µS/cm conductivity sol., 460 mL
HI 7039L	.5000 µS/cm conductivity sol., 460 mL

**HI 981411**

HI 1001	.Plastic in-line pH electrode
HI 1286	.pH electrode with 2 m (6.6') cable
HI 77400P	.pH 4 & 7 solution, (10) 20 mL sachets, 5 ea.
HI 77700P	.pH 7 Cal. kit, (10) 20 mL sachets
HI 70300L	.Storage solution, 460 mL
HI 7061L	.Electrode cleaning solution, 460 mL
HI 70000P	.Electrode rinsing solution, (25) 20 mL sachets

**HI 983313**

HI 7634-00	.Conductivity probe with ATC
HI 70039P	.5000 µS/cm cal. kit, (25) 20 mL sachets
HI 7039M	.Cal. Sol. 5000 µS/cm, 230 mL

**HI 983319**

HI 7634-00	.TDS probe with ATC
HI 70039P	.1382 ppm cal. sol., (25) 20 mL sachets
HI 7032M	.1382 ppm cal. sol., 230 mL



# HI 10,000 SERIES FERTIGATION SYSTEMS

## Complete Fertigation Control.

- **2 YEAR WARRANTY** (excluding probes)
- **Precise control by continuous EC and pH monitoring**
- **8 to 300 GPA flow rate range**
- **3 fertilizer injectors and 1 mild acid**
- **10 programs for various EC and pH set points and fertilizer percentages**

Specifications	HI 8000 Series F1 Controllers
Range	pH : 0.0 to 14.0; EC: 0.0 to 10.0 mS/cm
Resolution	0.1 pH / 0.1 mS/cm
Accuracy (@20°C/68°F)	pH: ±0.0546; EC: ±0.078 mS/cm
Typical Inputs	2 pH electrodes, 3 conductivity probes, 4 fertilizer tanks, 1 acid tank, 5 tank level controls, 1 mixing tank level control, 2 differential pressures, 1 irrigation counter, 1 temporary break, 1 conditional stoppage
Typical Outputs	2 non-consent alarms, up to 32 zone valves, 2 filter flushing, pump, agitator, 4 fertilizer tank electro-valves, 1 pH tank electro-valve
Number of Programs	10
Program Method	with keypad or through a PC using proprietary software
Irrigation Capacity	1, 4, 8 and 32 zone valves
Irrigation Control	time/volume control, 1 to 6 different timetables per program,
Readout	20-digit, 4 level LCD with graphic symbols and messages
Power Supply	115V/220V; 50Hz/60Hz
Environment	HI 8002: NEMA 4X specifications

**NEW**



# Quality and Service

Above all, **HANNA** systems are reliable, durable and require little to no maintenance. Each of our units are backed by impeccable training and support ... just ask our clients!

## Pro's Choice

**HANNA's** Fertigation and pH Control Systems can be found in a number of notable greenhouses: Van Wingerden Greenhouses NJ, Gro-Rite NJ, Van Vugt NJ, Michael's Greenhouse CT. Additional installations include such greenhouse leaders such as OWW Greenhouse NJ, and De Groot Greenhouse NJ, Van Wingerden Greenhouses WA.

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