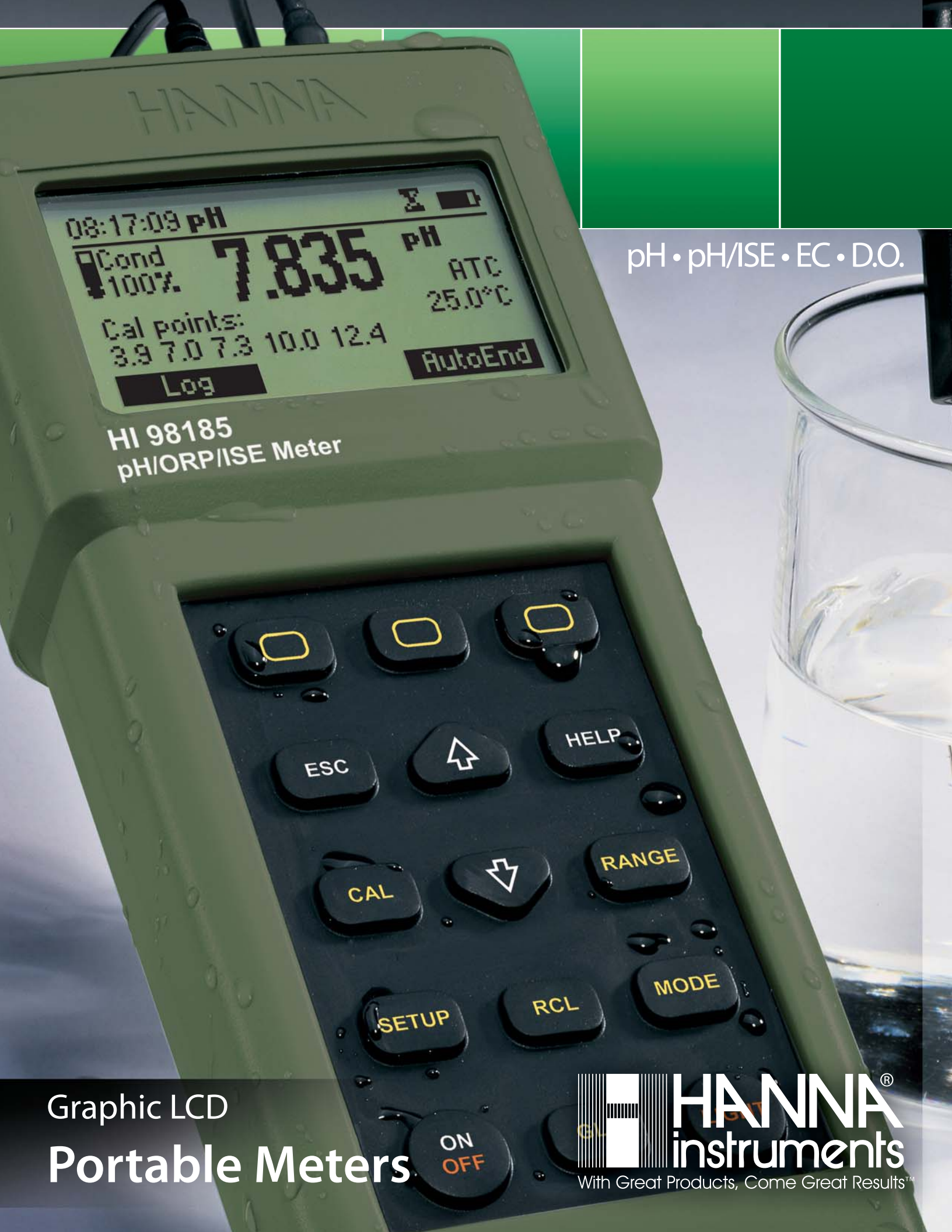


pH • pH/ISE • EC • D.O.

Graphic LCD

Portable Meters

HANNA® instruments

With Great Products, Come Great Results™

Portable Meters with Graphic LCD

Ease of use and high-end features come together in our new family of pH, ISE, Conductivity and Dissolved Oxygen field instruments.

A backlit 128 x 64 pixel graphic LCD provides a clear display of measured parameters and set-up screens, and the use of dedicated and soft-keys allows fast, intuitive operation in a choice of languages. In addition, content sensitive on-screen help is always available.

For use in the field, these instruments can be easily operated with one hand and are housed in a rugged waterproof casing (see charts for models). The function key operation allows the user to navigate from screen to screen with immediate access to important information such as calibration status, methods set up, units and logged data.

All instruments feature log-on-demand and a USB port to download stored data to a computer. Other common features include a CALIBRATION DUE warning (to prevent errors due to old calibration), auto endpoint of measurement (the instrument freezes the LCD when the reading is stable), comprehensive GLP functions and temperature displayed in °C or °F.

Feature Highlights ...

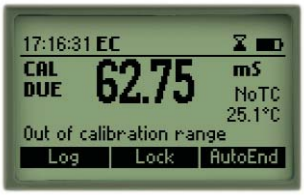
pH
- Calibration Check™: pH electrode condition, clean electrode/contaminated buffer warning, outside calibration range warning
- 0.001 pH resolution
- Stainless steel pH electrode with built-in temperature sensor
- Up to 5 calibration points with standard or custom buffers
- Relative mV scale

ISE
- Direct measurement in multiple units (ppm, ppt, g/L, mg/L, ppb, µg/L, mg/mL, M, mol/L, mmol/L, %w/v, user)
- Electrode type selection
- Up to 5 calibration points

Conductivity
- Autorange from 0.001 uS/cm to 400 mS/cm
- Resistivity up to 100 Mohm•cm
- 2 or 4-ring probe with auto recognition
- USP <645> stages 1, 2 and 3
- Memorize up to 10 user profiles
- Up to 5 calibration points
- Linear and natural water temperature compensation
- Three salinity scales
- Interval Logging

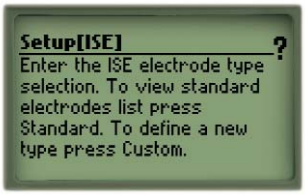
Dissolved Oxygen
- Extended range up to 50 ppm and 600% saturation
- Barometric pressure measurement
- Salinity, pressure and temperature compensation
- Direct D.O., BOD, OUR and SOUR

... and Screen Highlights



Measurement
Large backlit graphic display shows multiple messages along with the current measurement readings.

Language Selection
Help screens and guides are available in a choice of languages.



Help
Users can consult the on-screen help from any mode simply by pressing the HELP key. The instrument will then explain the function and options currently available.

GLP
Comprehensive GLP functions are directly accessible by pressing the GLP key.

Rechargeable batteries with inductive recharger

These models have up to 200 hour extended battery life to guarantee long operation in the field. When the batteries are low, you don't have to worry about carrying a spare set with you—the batteries can be recharged with HANNA's inductive recharger. Simply leave the meter on the recharger for a few hours and you're ready to go. The recharger can either be plugged in a standard 115V socket using the included HANNA adapter or a 12 VDC source such as a car's 12 volt accessory outlet.

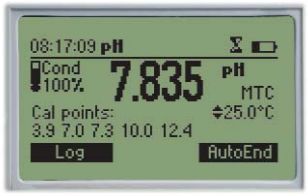
Meters with pH and ORP...

Six models are available to cover all applications. All meters feature HANNA's exclusive Calibration Check™: the pH electrode state is compared to the previous calibration and the user is warned in the event of significant changes to avoid erroneous calibration due to a bad/dirty electrode or a contaminated buffer. The electrode condition is always displayed on the LCD and the OUT OF CALIBRATION RANGE warning alerts the user if the measurement is taken too far from the calibration points.

These instruments offer up to 5 calibration points using either HANNA's standard or user selectable buffer values for added versatility.

A relative mV scale is also available for ORP measurements.

SPECIFICATIONS		HI 98180	HI 98181	HI 98182	HI 98183
pH	Range	-2.0 to 16.0; -2.00 to 16.00 pH		-2.0 to 20.0; -2.00 to 20.00; -2.000 to 20.000 pH	
	Resolution	0.1; 0.01 pH		0.1; 0.01; 0.001 pH	
	Accuracy	±0.01		±0.01; ±0.002 pH	
mV	Range	—	±2000 mV	±2000 mV	
	Resolution	—	0.1 mV	0.1 mV	
	Accuracy	—	±0.2 mV	±0.2 mV	
Temperature	Range	-20.0 to 120.0 °C (-4.0 to 248.0°F)		-20.0 to 120.0 °C (-4.0 to 248.0°F)	
	Resolution	0.1°C (0.1°F)		0.1°C (0.1°F)	
	Accuracy	±0.4°C (±0.8°F) (excluding probe error)		±0.4°C (±0.8°F) (excluding probe error)	
Calibration	pH	Up to 2 point calibration, 7 standard buffers available (1.68, 4.01, 6.86, 7.01, 9.18, 10.01, 12.45)	Up to 3 point calibration, 7 standard buffers available (1.68, 4.01, 6.86, 7.01, 9.18, 10.01, 12.45)	Up to 5 point calibration, 7 standard buffers available (1.68, 4.01, 6.86, 7.01, 9.18, 10.01, 12.45) + 5 custom buffers	
	Slope	From 80 to 110%		From 80 to 110%	
Temperature Compensation		Manual or automatic from -20.0 to 120.0°C (-4.0 to 248.0°F)		Manual or automatic from -20.0 to 120.0°C (-4.0 to 248.0°F)	
Probes		HI 1230B pH electrode w/BNC and HI 7662 temperature		HI 1230B pH w/BNC and HI 7662 temperature	HI 72911B pH w/BNC and temperature combined
Logging		Single reading		Log-on-demand 200 samples	
PC Connectivity		—		Opto-isolated USB (with HI 92000 software)	
Input Impedance		10^{12} Ohms		10^{12} Ohms	
Battery Type/Life		(4) 1.2V AA rechargeable batteries/ approx. 200 hrs continuous use (without backlight)		(4) 1.2V AA rechargeable batteries/ approx. 200 hrs continuous use (without backlight)	
Recharger		Inductive recharger (included)		Inductive recharger (included)	
Auto-off		User Selectable: 5, 10, 30, 60 min or can be disabled		User Selectable: 5, 10, 30, 60 min or can be disabled	
Environment		0 to 50°C (32 to 122°F); RH 95%		0 to 50°C (32 to 122°F); RH 95%	IP67
Dimensions		226.5 x 95 x 52 mm (8.9 x 3.75 x 2")		226.5 x 95 x 52 mm (8.9 x 3.75 x 2")	
Weight		525 g		525 g	



Measurement Screen
Electrode condition and calibration points shown.

pH Calibration
Detailed Calibration Check™ messages.

ORDERING INFORMATION

HI 98180, **HI 98181** and **HI 98182** are supplied with HI 1230B pH electrode and HI 7662 temperature probe, pH 4.01 and pH 7.01 buffer solutions; (4) 1.2V AA, 1300 mAh rechargeable batteries; HI 710042-01 inductive battery charger with power adapter; rugged carrying case and instructions.

HI 98183 is supplied with HI 72911B combined pH/Temperature electrode, pH 4.01 and pH 7.01 buffer solutions; (4) 1.2V AA, 1300 mAh rechargeable batteries; HI 710042-01 inductive battery charger with power adapter; rugged carrying case and instructions.

... and ISE

In addition to all the features of the pH models, these meters also include direct ion concentration determination with ISEs.

HI 98185 allows a choice of measurement units (ppm, ppt, g/L, mg/L, ppb, µg/L, mg/mL, M, mol/L, mmol/L, % w/v, user) and ISE electrode type selection (ammonia, bromide, cadmium, calcium, carbon dioxide, chloride, cupric, fluoride, iodide, lead, nitrate, potassium, silver, sulfate and sulfide).

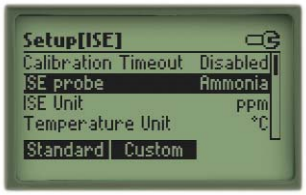
HI 98184 measures in ppm and the ion charge or nominal electrode slope can be entered manually.

Up to 5 calibration points with six standard values are available.

SPECIFICATIONS		HI 98184	HI 98185
pH	Range	-2.0 to 20.0; -2.00 to 20.00; -2.000 to 20.000 pH	
	Resolution	0.1; 0.01; 0.001 pH	
	Accuracy	±0.01; ±0.002 pH	
mV	Range	±2000 mV	
	Resolution	0.1 mV	
	Accuracy	±0.2 mV	
ISE	Range	From 1.00 x 10^{-3} to 1.00 x 10^{5} ppm	From 1.00 x 10^{-7} to 9.99 x 10^{10} concentration (choice of units)
	Resolution	3 digits 0.01; 0.1; 1; 10 concentration	
	Accuracy	±0.5% of reading (monovalent ions), ±1% of reading (divalent ions)	
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)	
Calibration	pH	Up to 5 point calibration, 7 standard buffers available (1.68, 4.01, 6.86, 7.01, 9.18, 10.01, 12.45) + 5 custom buffers	
	ISE	Up to 2 point calibration, 6 standard solutions (0.1, 1, 10, 100, 1000, 10000 ppm)	Up to 5 point calibration, 6 standard solutions (choice of units)
	Slope	From 80 to 110%	
Temperature Compensation (pH)		Manual or automatic from -20.0 to 120.0°C (-4.0 to 248.0°F)	
Probes		HI 72911B pH w/BNC and temperature combined	
Logging		Log-on-demand 300 samples	
PC Connectivity		Opto-isolated USB (with HI 92000 software)	
Input Impedance		10^{12} Ohms	
Battery Type/Life		(4) 1.2V AA rechargeable batteries/ approx. 200 hrs continuous use (without backlight)	
Recharger		Inductive recharger (included)	
Auto-off		User Selectable: 5, 10, 30, 60 min or can be disabled	
Environment		IP67	
Dimensions		226.5 x 95 x 52 mm (8.9 x 3.75 x 2")	
Weight		525 g	

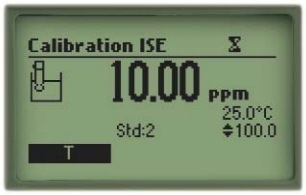
Measurement Screen

Direct ISE readings shown in a choice of units (HI 98185). LCD also displays electrode type used, current temperature, remaining battery life, and time simultaneously.



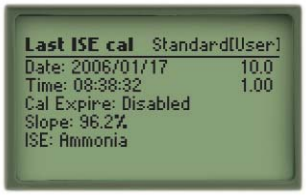
Setup Screen

HI 98185 allows direct choice of probe type and measurement unit while the HI 98184 requires manual setting of sensor parameters.



ISE Calibration

Up to 5 point calibration with 6 standard solutions. Users are guided through the calibration procedure with step-by-step on-screen instructions.



Good Laboratory Practice

Calibration data, date and ID information are stored for retrieval at a later time.

ORDERING INFORMATION

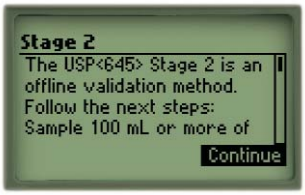
HI 98184 and **HI 98185** are supplied with HI 72911B combined pH/Temperature electrode, pH 4.01 and pH 7.01 buffer solutions; (4) 1.2V AA, 1300 mAh rechargeable batteries; HI 710042-01 inductive battery charger with power adapter; rugged carrying case and instructions.

EC Meter with USP

HI 98188 conductivity meter has an extended range from 0.001 µS/cm to 400 mS/cm, as well as resistivity and 3 salinity scales. This meter also automatically recognizes the probe type (2 or 4-ring and nominal cell constant). Both linear and natural water temperature compensation is available and the reference temperature is user adjustable. Ten sets of measurement parameters (such as reference temperature, temperature compensation mode, TDS factor, calibration etc.) can be stored as a user profile for later use. Other features include USP <645> stages 1, 2 and 3 mode, up to 5 calibration points, log-on-demand and interval logging.

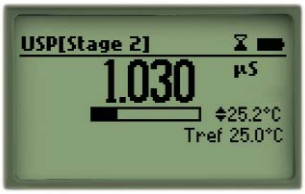
3 Stage Conformity

This meter can perform all 3 stages of USP <645> water quality testing requirements.



On-screen Guide

Users are provided with on-screen instructions for each USP stage.



Progress Bar

Meter displays progress towards meeting stage 2 stability requirements.

User Profiles

10 sets of measurement parameters can be stored in user profiles for later retrieval.

SPECIFICATIONS		HI 98188
EC	Range	0 to 400mS/cm (actual conductivity 1000 mS/cm) 0.001 to 9.999 µS/cm; 10.00 to 99.99 µS/cm; 100.0 to 999.9 µS/cm; 1.000 to 9.999 mS/cm; 10.00 to 99.99 mS/cm; 100.0 to 1000.0 mS/cm (autoranging)
	Resolution	0.001 µS/cm; 0.01 µS/cm; 0.1 µS/cm; 0.001 mS/cm; 0.01 mS/cm; 0.1 mS/cm
	Accuracy	±1% of reading (±0.01 µS/cm or 1 digit, whichever is greater)
Resistivity	Range	1 to 999.9 Ohm•cm; 1.000 to 9.999 kOhm•cm; 10.00 to 99.99 kOhm•cm; 100.0 to 999.9 kOhm•cm; 1.0 to 100.0 MOhm•cm (autoranging)
	Resolution	0.1 Ohm•cm; 0.001 kOhm•cm; 0.01 kOhm•cm; 0.1 kOhm•cm; 0.1 MOhm•cm
	Accuracy	±2% of reading (±1 Ohm•cm or 1 digit, whichever is greater)
TDS	Range	0.00 to 99.99 ppm; 100.0 to 999.9 ppm; 1.000 to 9.999 g/L; 10.00 to 99.99 g/L; 100.0 to 400.0 g/L (autoranging)
	Resolution	0.01 ppm; 0.1 ppm; 0.001 g/L; 0.01 g/L; 0.1 g/L
	Accuracy	±1% of reading (±0.05 ppm or 1 digit, whichever is greater)
NaCl	Range	%: 0.0 to 400.0%; seawater scale: 0.00 to 80.00 (PSU); Practical salinity: 0.01 to 42.00
	Resolution	0.1%; 0.01
	Accuracy	±1% of reading
Temperature	Range	-20.0 to 120.0°C
	Resolution	0.1°C
	Accuracy	±0.2°C (excluding probe error)
Calibration	EC	Automatic up to 5 points with 7 memorized standards (0.00 µS/cm, 84.0 µS/cm, 1.413 mS/cm, 5.00 mS/cm, 12.88 mS/cm, 80.0 mS/cm, 111.8 mS/cm)
	NaCl	1 point only in % range (with HI 7037 buffer); Use conductivity calibration for all other ranges
	Temperature	1 or 2 points
Temperature Compensation		-20.0 to 120.0°C
Reference Temperature		15°C, 20°C and 25°C
TDS Factor		0.40 to 1.00
Probe		HI 76310 4-ring EC probe with built-in temperature sensor
Logging	Log-on-demand	400 samples
	Interval	5 seconds to 1 minute
PC Connectivity		Opto-isolated USB (with HI 92000 software)
Battery Type/Life		(4) 1.2V AA rechargeable batteries/approx. 100 hrs continuous use (without backlight)
Recharger		Inductive recharger (included)
Auto-off		User Selectable: 5, 10, 30, 60 min or can be disabled
Environment		IP67
Dimensions		226.5 x 95 x 52 mm (8.9 x 3.75 x 2")
Weight		525 g

ORDERING INFORMATION

HI 98188 is supplied with HI 76310 4-ring conductivity probe with built-in temperature sensor, calibration solution; (4) 1.2V AA, 1300 mAh rechargeable batteries; HI 710042-01 inductive battery charger with power adapter; rugged carrying case and instructions.

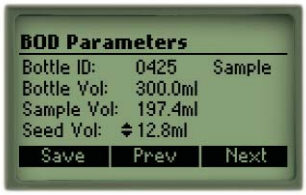
Dissolved Oxygen Meter with Barometer

HI 98186 dissolved oxygen meter has an extended range to 50 ppm and 600% saturation. This instrument includes barometric pressure measurement and calibration with a user selectable unit (mmHg, inHg, atm, mbar, psi, kPa) and salinity, pressure and temperature compensation. Other features include measurement of BOD (biochemical oxygen demand), OUR (oxygen uptake rate) and SOUR (specific oxygen uptake rate).

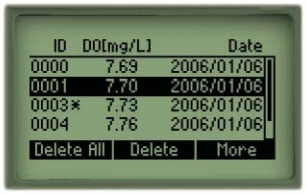
SPECIFICATIONS		HI 98186
Dissolved Oxygen	Range	0.00 to 50.00 ppm; 0.0 to 600.0 % saturation
	Resolution	0.01 ppm; 0.1% saturation
	Accuracy	0 to 300%: ±1.5% of reading or ±1.0%, whichever is greater; 300 to 600%: ±3% of reading; 0 to 30 mg/L: ±1.5% of reading or 0.10 mg/L, whichever is greater; 30 mg/L to 50 mg/L: ±3% of reading
Barometric Pressure	Range	450 to 850 mmHg
	Resolution	1 mm Hg
	Accuracy	± 3 mmHg within ±15°C from the calibration point
Salinity Compensation	Range	0 to 70 ppt (g/L)
Measurement Modes		Direct D.O.; BOD (biochemical oxygen demand); OUR (oxygen uptake rate); SOUR (specific oxygen uptake rate)
Temperature	Range	-20.0 to 120.0°C
	Resolution	0.1°C
	Accuracy	±0.2°C (excluding probe error)
Calibration	D.O.	Automatic, 1 or 2 points or manual, 1 point
	Pressure	1 point
	Temperature	1 or 2 points
Temperature Compensation		Automatic between 0.0 to 50.0°C
Probe		HI 76407/4F Polarographic with built-in temperature sensor
Logging		Log-on-demand 400 samples
PC Connectivity		Opto-isolated USB (with HI 92000 software)
Battery Type/Life		(4) 1.2V AA rechargeable batteries/ approx. 200 hrs continuous use (without backlight)
Recharger		Inductive recharger (included)
Auto-off		User Selectable: 5, 10, 30, 60 min or can be disabled
Environment		IP67
Dimensions		226.5 x 95 x 52 mm (8.9 x 3.75 x 2")
Weight		525 g

BOD gives an indication of the biodegradable organic material present in a sample of water. The dissolved oxygen concentration is measured before and after an incubation period of 5 days and the BOD is calculated in mg per liter from the difference.

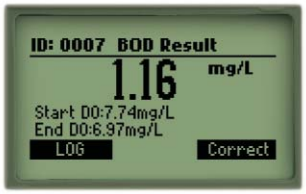
OUR and **SOUR** are used to determine the oxygen consumption or respiration rate. OUR is measured in mg of oxygen consumed per liter per hour, and SOUR is measured in mg of oxygen consumed per gram of volatile suspended solids per hour.



BOD Parameters
All necessary parameters for BOD testing can be set and displayed at once.



BOD Records
A list of all saved BOD data can be easily retrieved and shown on the LCD display. Seed records have an "*" after the bottle ID.



BOD Results
BOD is calculated in mg per liter from the difference between the initial and final dissolved oxygen concentration readings.

OUR Results
Measured in mg of oxygen consumed per liter per hour.

SOUR Results
Measured in mg of oxygen consumed per gram of volatile suspended solids per hour.

ORDERING INFORMATION

HI 98186 is supplied with HI 76407/4F dissolved oxygen probe with built-in temperature sensor with 4 m (13') cable; (2) spare membranes; electrolyte solution; (4) 1.2V AA, 1300 mAh rechargeable batteries; HI 710042-01 inductive battery charger with power adapter; rugged carrying case and instructions.

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