Professional
Waterproof Meters

pH, pH/ISE, EC/TDS and DO

HANNA®
instruments

HI9819X Series
Professional Waterproof Meters

New Quick Connect Probes
(HI98190, HI98192 and HI98193 only)

Benchtop Performance in a Portable Meter

The HI9819X series of meters combine all of the features of a benchtop into a portable IP67 rated waterproof enclosure making them one of the most versatile meters on the market.

All meters in the series are supplied with a rugged, custom carrying case that securely holds the meter and all accessories.

A backlit, graphic LCD provides easy to read resolution even in low-lit areas. A combination of dedicated and soft keys allows for intuitive operation in a choice of languages while the extended battery life assures long operation.

GLP and On-Screen Help

Comprehensive GLP data is directly accessible by pressing the GLP key; the contextual help menu can be accessed to obtain on-screen information and assistance at the touch of a button.

AutoHold

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

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 range.

Series Features

- Designed for professionals
  - These instruments can be easily operated with one hand and is housed in an IP67 rated waterproof, rugged enclosure. The meter and accessories all fit in our rugged carrying case with custom insert.

- Waterproof
  - IP67 rated waterproof, rugged enclosure

- Clear display
  - Dot matrix display with multifunction virtual keys

- AutoHold
  - 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
  - Most of the available options such as GLP information, help, range, calibration and backlight have a dedicated button

- Supplied complete
  - Each meter is supplied complete with sensor, calibration solution, beakers, PC software and connection cable, instruction manual, quick start guide and batteries in a rugged, custom carrying case.

On-screen Features
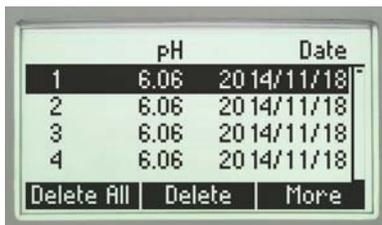
- Backlit LCD
  - Press the backlight button to view the display in low-light conditions

- Log-on-demand
  - Store measurement data at the press of a button. Data can be viewed on-screen or transferred to a PC

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

- 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

- Calibrate right in the case with custom beaker holders
  - Our custom carrying case features beaker holders for calibration out in the field

HI98190 • HI98191

Professional Waterproof Meters

pH/ORP and pH/ORP/ISE

- **ISE measurement units (HI98191 only)**
  - Extensive choice of units to display readings (ppm, ppt, g/L, µg/L, mg/L, M, mol/L, mmol/L, %, w/v, user)
- **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 available
- **Approximately 200 hour battery life**
  - Powered by (4) 1.5V AA batteries

For Universal Applications

HI98190 and HI98191 are IP67 rated waterproof meters designed for universal applications. HI98190 measures pH/ORP and temperature while HI98191 also includes ISE measurements.

Exchange out the pH probe for an ORP probe to obtain mV readings in the ±2000 mV range. HI98191 adds direct ion concentration readings for ISEs with a choice of units for calibration and display.

Quick Connect Probe

The HI98190 features the HI12963 titanium bodied pH/temperature electrode with a quick connect DIN connector to make attaching and removing the probe simple and easy. The HI98191 is supplied with the HI72911B titanium bodied pH/temperature electrode with BNC and RCA connectors.

ISE Sensors and Calibration

HI98191 has 17 different standard ISE sensors pre-programmed in the meter. Selecting the appropriate sensor will automatically update the ion charge for slope calibration and can be calibrated up to five points with the choice of seven standards and five custom standards (choice of units). This meter allows an extensive choice of measurement units (ppm, ppt, g/L, ppb, µg/L, mg/mL, M, mol/L, mmol/L, % w/v, user) and has an expanded measuring range of 1.00×10^{-7} to 9.99×10^{10}.

Specifications

Specifications		HI98190/HI98191
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
ISE (HI98191 only)	Range	from 1.00 E^{-7} to 9.99 E^{10} concentration
	Resolution	3 digits 0.01; 0.1; 1; 10 concentration
	Accuracy	±0.5% of reading (monovalent ions), ±1% of reading (divalent ions)
	Calibration	up to five point calibration, seven standard solutions available
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	HI98190: HI12963 titanium body, pH electrode with internal temperature sensor, quick DIN connector and 1 m (3.3' cable)
		HI98191: HI72911B titanium body, pH electrode with internal temperature sensor, BNC connector and 1 m (3.3' cable)
	Slope Calibration	from 80 to 110%
	Log-on-demand	HI98190: 200 samples (100 each pH/mV range) HI98191: 300 samples (100 each pH/mV/ISE range)
	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.)

- Log-on-demand
  · Store measurement data at the press of a button

On-screen Features

- ISE measurements
  · The HI98191 includes ISE measurements when used with our wide selection of ISE electrodes or a custom version

- Calibration
  · pH calibration features detailed CAL Check™ messages. Users are guided through the calibration procedure with step-by-step on-screen instructions.

pH Calibration

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

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.

Data Logging

The log-on-demand feature allows users to store up to 200 samples (HI98190) or 300 samples (HI98191) that can be later transferred to a PC with the HI920015 USB cable and HI92000 software.

GLP and On-Screen Help

Comprehensive GLP data is directly accessible by pressing the GLP key; the contextual help menu can be accessed to obtain on-screen information and assistance at the touch of a button.

HI98192

Professional Waterproof Meters

EC/TDS/Resistivity/Salinity Meter with USP <645>

- Salinity readings
  - Salinity can be displayed as % NaCl, seawater scale (ppt) or practical salinity scale (PSU)

- Calibration
  - Perform up to a five point calibration for enhanced accuracy

- Temperature compensation
  - Automatic Temperature Compensation
  - Configurable temperature coefficient range from 0.00 to 10.00%.°C

- Approximately 100 hour battery life
  - Powered by (4) 1.5V AA batteries

- Four-ring platinum probe
  - This probe can cover low EC samples to 1000 mS/cm (actual EC)

For Universal Applications

HI98192 is a waterproof, portable conductivity meter that has an expanded conductivity range from 0.000 μS/cm to 400 mS/cm, as well as TDS, resistivity and three salinity scales. This meter automatically recognizes the probe type (two or four ring) and allows the user to adjust the nominal cell constant. HI98192 is also ready to perform all three stages of USP <645> method required for EC measurement of ultrapure water.

Choose from seven memorized standards and obtain up to a five point conductivity calibration. For salinity (% range), HI7037 standard allows users to perform a one point calibration.

EC and TDS measurements are fully customizable and include: cell constant selection between 0.010 and 10.000, selection of linear or natural water (non-linear) or no temperature compensation (for actual conductivity reading), configurable temperature compensation coefficient range from 0.00 to 10.00%/°C, choice of reference

Specifications

HI98192

		HI98192
EC	Range	0 to 400 mS/cm (shows values up to 1000 mS/cm actual conductivity)** 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)
	Calibration	automatic up to five points with seven 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)
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)
Resistivity	Range	1.0 to 99.9 Ω•cm; 100 to 999 Ω•cm; 1.00 to 9.99 KΩ•cm; 10.0 to 99.9 KΩ•cm; 100 to 999 KΩ•cm; 1.00 to 9.99 MΩ•cm; 10.0 to 100.0 MΩ•cm* (autoranging)
	Resolution	0.1 Ω•cm; 1 Ω•cm; 0.01 KΩ•cm; 0.1 KΩ•cm; 1 KΩ•cm; 0.01 MΩ•cm; 0.1 MΩ•cm*
	Accuracy	±1% of reading (±10 Ω or 1 digit, whichever is greater)
Salinity	Range	% NaCl : 0.0 to 400.0%; practical salinity: 0.00 to 42.00 (PSU); seawater scale: 0.00 to 80.00 (ppt)
	Resolution	0.1%; 0.01
	Accuracy	±1% of reading
	Calibration	max. one point only in % NaCl range with HI7037 standard; use conductivity calibration for all other ranges
Temperature	Range	-20.0 to 120.0°C; -4.0 to 248.0°F
	Resolution	0.1°C; 0.1°F
	Accuracy	±0.2°C; ±0.4°F (excluding probe error)
	Calibration	one or two points
Additional Specifications	Cell Constant Setup	0.010 to 10.000
	Temperature Compensation	NoTC, linear (-20.0 to 120.0°C (-4.0 to 248.0°F)), non linear (0 to 36°C (32 to 98.6°F)) ISO/DIS 7888 std
	Reference Temperature	15°C, 20°C and 25°C
	Temperature Coefficient	0.00 to 10.00 %/°C
	TDS Factor	0.40 to 1.00
	Probe	HI763133 platinum, four-ring conductivity/TDS probe with internal temperature sensor and 1 m (3.3') cable (included)
	Logging	log-on-demand: 400 samples; lot logging: 5, 10, 30 sec, 1, 2, 5, 10, 15, 30, 60, 120, 180 min (max 1000 samples)
	Memorized Profiles	up to 10
	Measurement Modes	autorange, autoend, lock and fixed range
	PC Connectivity	opto-isolated sealed USB (with HI92000 software and micro USB cable)
	Battery Type / Life	1.5V AA batteries (4) / approximately 100 hours of continuous use (without backlight), 25 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.)

temperatures of 15°C, 20°C and 25°C, and a selectable TDS factor between 0.40 and 1.00.

Ten sets of customized measurement parameters can be stored as a user profile and later recalled.

Quick connect probe

The HI763133 four-ring platinum conductivity probe features a quick connect DIN connector to make attaching and removing the probe simple and easy.

* The 0.000 µS/cm EC range and 0.1 MΩ•cm resistivity range are not available with the optional 4m cable probe
**Uncompensated temperature reading

Data Logging

The HI98192's allows storage of up to 400 log-on-demand samples or 1000 lot logging samples that can be later transferred to a PC with the supplied HI920015 USB cable and HI92000 software.

GLP and On-Screen Help

Comprehensive GLP data is directly accessible by pressing the GLP key; the contextual help menu can be accessed to obtain on-screen information and assistance at the touch of a button.

On-screen Features
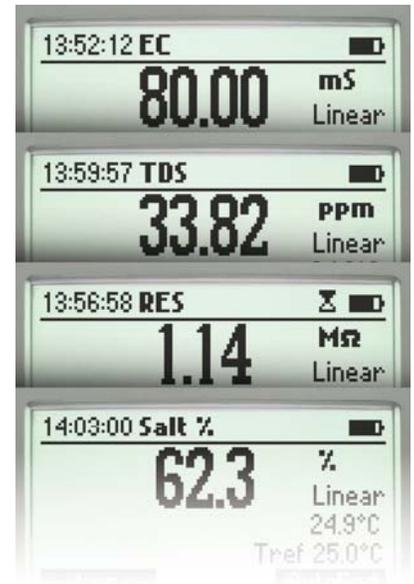
- EC, TDS, resistivity and salinity measurements in one meter

- Three stages of conformity
  - Performs all 3 stages of USP <645> water quality testing requirements
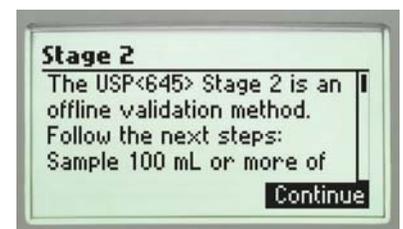
- On-screen guide
  - Users are provided with on-screen instructions for each USP stage

- Progress bar
  - Displays reading stability progress towards meeting stage 2 requirements

HI98193

Professional Waterproof Meters

Dissolved Oxygen and BOD

- **Choice of units**
  - Display units in % saturation or mg/L (ppm)
- **Salinity compensation**
  - Users can set the salinity value
- **Automatic pressure compensation**
  - Built-in barometer with user-selectable units (mmHg, inHg, atm, psi, kPa, mbar)
- **Built-in calculations**
  - Determination of Biochemical Oxygen Demand (BOD), Oxygen Uptake Rate (OUR) and Specific Oxygen Uptake Rate (SOUR)
- **Polarization**
  - Automatic polarization of probe at startup
- **Membrane caps**
  - Ready-to-use PTFE preformed membrane caps
- **200 hour battery life**
  - Approximately 200 hours of continuous use

For Universal Applications

The HI98193 portable dissolved oxygen meter has extended ranges of up to 50 ppm and 600% saturation. When measuring dissolved oxygen, compensations for salinity, temperature and pressure are essential to improve the accuracy and precision of readings.

Salinity compensation allows for direct determination of dissolved oxygen in saline waters. Temperature compensation is automatic with the probes built-in sensor, which features

a one or two-point calibration. Pressure compensation with the meter's built-in barometer can be validated against a reference barometer, and if needed, can be recalibrated in user-selectable units (mmHg, inHg, atm, psi, kPa, mbar). With the internal barometer, the HI98193 is able to compensate for changes in barometric pressure so there is no need for charts, altitude information or external barometric pressure information.

Other features include measurement, methods and calculations for BOD, OUR and SOUR.

Specifications

		HI98193
DO	Range	0.00 to 50.00 mg/L (ppm); 0.0 to 600.0% saturation
	Resolution	0.01 mg/L (ppm); 0.1% saturation
	Accuracy (@25°C/77°F)	±1.5% of reading ±1 digit
	Calibration	automatic one or two point at 100 % (8.26 mg/L) and 0 % (0 mg/L).; manual one point using a value entered by the user in % saturation or mg/L
Atmospheric Pressure	Range	450 to 850 mmHg
	Resolution	1 mmHg
	Accuracy (@25°C/77°F)	± 3 mmHg within ±15% from the calibration point
	Calibration	one point at any in range pressure value
Temperature	Range	-20.0 to 120.0°C; -4.0 to 248.0°F
	Resolution	0.1°C; 0.1°F
	Accuracy (@25°C/77°F)	±0.2°C; ±0.4°F (excluding probe error)
	Calibration	one or two point at any in range temperature value
Additional Specifications	Measurement Modes	direct DO; BOD (biochemical oxygen demand); OUR (oxygen uptake rate); SOUR (specific oxygen uptake rate)
	Barometric Compensation	automatic from 450 to 850 mmHg
	Salinity Compensation	automatic from 0 to 70 g/L
	Temperature Compensation	automatic from 0.0 to 50.0 °C (32.0 to 122.0 °F)
	Probe	HI764073 polarographic DO probe with protective sleeve, internal temperature sensor, DIN connector and 4m (13') cable (included)
	Logging	log-on-demand up to 400 samples
	PC Connectivity	opto-isolated USB (with HI92000 software)
	Battery Type / Life	1.5V (4) AA batteries / approximately 200 hours of continuous use without backlight (50 hours with backlight)
	Auto-off	user-selectable: 5, 10, 30, 60 min or can be disabled
	Environment	0 to 50°C (32 to 122°F); RH 100% IP67
	Dimensions	185 x 93 x 35.2 mm (7.3 x 3.6 x 1.4")
	Weight	400 g (14.2 oz.)

- Automatic barometric pressure compensation

- Results in mg/L (ppm) or % saturation

Quick connect probe

The HI764073 polarographic dissolved oxygen probe features a quick connect DIN connector to make attaching and removing the probe simple and easy.

Data Logging

The HI98193's log-on-demand features allows users to store up to 400 samples that can be later transferred to a PC with the HI920015 USB cable and HI92000 software.

GLP and On-Screen Help

Comprehensive GLP data is directly accessible by pressing the GLP key; the contextual help menu can be accessed to obtain on-screen information and assistance at the touch of a button.

On-screen Features

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

- BOD parameters and records
  - All necessary parameters for BOD testing can be set and displayed at once.
  - A list of all saved BOD data can be easily retrieved and shown on the LCD display.

- OUR results
  - Measured in mg of oxygen consumed per L per hour.

- SOUR results
  - Measured in mg of oxygen consumed per g of volatile suspended solids per hour.

Shown in HI720190 rugged carrying case with custom insert (included)

Shown in HI720191 rugged carrying case with custom insert (included)

HI98190 includes:

HI12963 titanium body, pH electrode with internal temperature sensor, quick DIN connector and 1 m (3.3' cable)

HI7004M pH 4.01 buffer solution (230 mL)

HI7007M pH 7.01 buffer solution (230 mL)

electrode general cleaning solution sachet (2)

HI98191 includes:

HI72911B titanium body, pH electrode with internal temperature sensor, BNC connector and 1 m (3.3' cable)

HI7662 temperature probe (for use with optional ISE's)

HI7004M pH 4.01 buffer solution (230 mL)

HI7007M pH 7.01 buffer solution (230 mL)

electrode general cleaning solution sachet (2)

All meters are also supplied with:

100 mL plastic beaker (2)

HI92000 PC software

HI920015 micro USB cable

1.5V AA batteries (4)

rugged carrying case with custom insert

quality certificate

instruction manual

quick start guide

Shown in HI720192 rugged carrying case with custom insert (included)

Shown in HI720193 rugged carrying case with custom insert (included)

HI98192 includes:

HI763133 platinum, four-ring conductivity/TDS probe with internal temperature sensor and 1 m (3.3') cable

HI7031M 1413 µS/cm calibration solution (230 mL)

HI7035M 111.8 mS/cm calibration solution (230 mL

HI98193 includes:

HI764073 polarographic DO probe with protective sleeve, internal temperature sensor, DIN connector and 4m (13') cable

HI7040 bi-component zero oxygen solution (230 mL + 30 mL)

HI7041S electrolyte solution (30 mL)

preformed PTFE membrane caps (2)

DO protective cap

O-rings (2)

Optional Electrodes for HI98190 pH/ORP Meter

pH Electrodes

HI11313

Single ceramic, double junction, glass body, refillable pH electrode with temperature sensor

Recommended for laboratory and general purpose

HI11103

Single ceramic, single junction, gel filled, glass body, pH electrode with temperature sensor

Recommended for laboratory and general purposee

HI12303

Single ceramic, double junction, gel filled, PEI body, pH electrode with temperature sensor

Recommended for field applications

FC2323

Open viscolene reference electrolyte, double junction, PVDF body pH electrode with conical tip and temperature sensor

Recommended for meat applications with use of optional FC098 20 mm (0.8") or FC099 35 mm (1.4") stainless steel blade

HI10533

Triple ceramic, double junction, glass body, refillable pH electrode with conical tip and temperature sensor

Recommended for fats, creams, soil and low conductivity samples

FC2023

Open viscolene reference electrolyte, double junction, PVDF body pH electrode with conical tip and temperature sensor

Recommended for dairy analysis including cheese, yogurt, and other semi-solids

ORP Probe

HI36183

Single ceramic, double junction, glass body, refillable ORP probe with temperature sensor

Recommended for laboratory and general purpose

WolfLabs

Pricing on any accessories shown can be found by keying the part number into the search box on our website.

The specifications listed in this brochure are subject to change by the manufacturer and therefore cannot be guaranteed to be correct.
If there are aspects of the specification that must be guaranteed, please provide these to our sales team so that details can be confirmed.

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Please contact us if this literature doesn't answer all your questions.