INSTRUCTION MANUAL

GroLine

HI9814

pH / EC / TDS / Temperature Meter with Quick Calibration

HANNA® instruments

Thank You

Thank you for choosing a Hanna Instruments product. Please read this instruction manual carefully before using the instrument.

For more information about Hanna and our products, visit **www.hannainst.com** or e-mail us at sales@hannainst.com.

For technical support, contact your local Hanna office or email us at tech@hannainst.com

Find your local Hanna office on www.hannainst.com

Preliminary Examination

Remove the instrument from the packing material and examine it carefully to make sure that no damage has occurred during shipment. If noticeable damage is evident, contact your local Hanna office.

Note: Save all packing material until you are sure that the instrument functions correctly. All defective items must be returned in the original packing together with the supplied accessories.

General Description

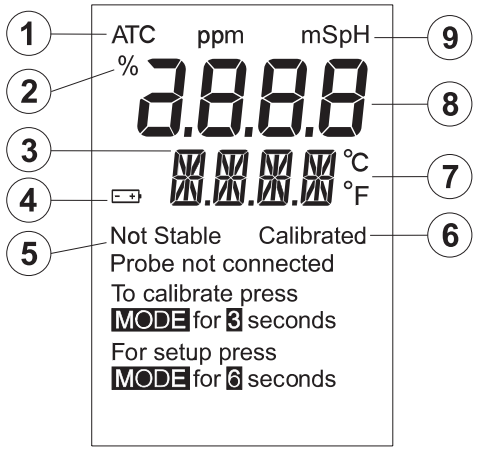
HI9814 is designed to offer you the combination of pH, conductivity, total dissolved solids, and temperature measurements. All operations and settings, including calibration buffers and temperature scale selections, are made through only two buttons. The housing is waterproof and rated for IP67 conditions.

The supplied HI1285-7 multiparameter probe measures pH, EC/TDS, and temperature in one convenient, rugged probe. A solid-state preamplifier is integrated into the probe to protect the pH measurement from transient electrical noise. Sources of electrical noise include ballasts used in lighting and pumps to circulate water and nutrient solutions. Other user-selectable features include selectable TDS factors of 0.5 and 0.7 as well as auto-off after 8 minutes, 60 minutes, or disabled.

Each meter is supplied with:

- HI1285-7 pH/EC/TDS probe with built-in temperature sensor, DIN connector and 1 m (3.3') cable
- HI5036 Quick Calibration solution sachets (3)
- HI700661P Electrode cleaning solution sachets for agriculture (3)
- 1.5V AAA batteries (3)
- Visual quick start guide
- Instruction manual

LCD Description



1. Automatic Temperature Compensation indicator
2. Battery percentage (visible at power up)
3. Secondary display
4. Low battery indicator
5. Stability indicator
6. Calibration indicator
7. Selectable temperature unit
8. Primary display
9. Measuring unit for primary display

Maintenance:

- While unpacking, the appearance of salt deposits around the protective cap is normal. The salt deposits will dissolve when rinsed with water.
- After use, rinse the electrode with water and replace the protective cap filled with a few drops of HI70300 storage solution. If HI70300 is not available, use pH buffer.

DO NOT USE DISTILLED OR DEIONIZED WATER FOR STORAGE PURPOSES.

Warranty

The meter is warranted for a period of two years against defects in workmanship and materials when used for their intended purpose and maintained according to instructions. The electrode is warranted for a period of six months. This warranty is limited to repair or replacement free of charge. Damage due to accidents, misuse, tampering or lack of prescribed maintenance is not covered. If service is required, contact your local Hanna office. If under warranty, report the model number, date of purchase, serial number and the nature of the problem. If the repair is not covered by the warranty, you will be notified of the charges incurred. If the instrument is to be returned to Hanna Instruments, first obtain a Returned Goods Authorization (RGA) number from the Technical Service department and then send it with shipping costs prepaid. When shipping any instrument, make sure it is properly packaged for complete protection.

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Specifications

pH	Range*	0.00 to 14.00 pH
	Resolution	0.01 pH
	Accuracy	±0.01 pH
	Calibration	automatic, one or two-point calibration (using pH 4.01, 7.01, 10.01 buffers); one-point calibration using quick calibration solution
	Temperature Compensation	automatic
EC	Range	0.00 to 6.00 mS/cm
	Resolution	0.01 mS/cm
	Accuracy	±2% F.S.
	Calibration	automatic, one-point at 1.41 mS/cm or 5.00 mS/cm; one-point calibration using quick calibration solution
	Temperature Compensation	automatic, with β = 1.9%/°C
TDS	Range	0 to 3000 ppm (500 CF); 0 to 3999 ppm (700 CF)
	Resolution	10 ppm (mg/L)
	Accuracy	±2% F.S.
	Conversion Factor (CF)**	0.5 (500 ppm) or 0.7 (700 ppm)
Temperature	Range*	0.0 to 60.0°C/32.0 to 140.0°F
	Resolution	0.1°C/0.1°F
	Accuracy	±0.5°C/±1°F
Additional Specifications	Typical EMC Deviation	±0.02 pH; ±0.2°C or ±0.4°F
	Probe (included)	HI1285-7 pH/EC/TDS/ temperature with DIN connector and 1 m (3.3') cable
	Battery Type/ Life	1.5V AAA (3) /approximately 500 hours of continuous use
	Auto-Off	after 8 minutes, 60 minutes, or disabled
	Environment	0 to 50°C (32 to 122°F); RH max. 100%
	Dimensions	152 x 58 x 30 mm (6.0 x 2.3 x 1.2")
	Weight	205 g (7.2 oz)

* The sensor is rated 0 to 12 pH and -5 to 30°C
**1000 µS/cm = 500 ppm with 0.5 CF

Accessories

Code	Description
HI1285-7	pH/conductivity probe with built-in temperature sensor, DIN connector and 1 m (3.3') cable
HI5036P	Quick calibration solution, 20 mL sachets (25)
HI5036-023	Quick calibration solution, 230 mL
HI5036-050	Quick calibration solution, 500 mL
HI70004P	pH 4.01 buffer solution, 20 mL sachets (25)
HI70007P	pH 7.01 buffer solution, 20 mL sachets (25)
HI70010P	pH 10.01 buffer solution, 20 mL sachets (25)
HI70031P	1413 µS/cm (1.41 mS/cm) solution, 20 mL sachets (25)
HI70039P	5000 µS/cm (5.00 mS/cm) solution, 20 mL sachets (25)
HI70300M	electrode storage solution, 230 mL bottle
HI700661P	general purpose cleaning solution for agriculture, 20 mL sachets (25)
HI710025	shockproof boot (green)

Operational Guide

Before using the instrument for the first time, open the battery compartment and insert batteries, observing the polarity.

To connect the probe

With the meter turned off, connect the **HI1285-7** probe to the DIN socket on the bottom of the meter by aligning the pins and pushing in the plug. Tighten the nut to ensure a good connection. Remove the protective cap from the probe before taking any measurements.

To turn the meter ON and check the battery status

Press the **ON/OFF/MODE** button to turn the meter on. At start-up, all the LCD segments are displayed for 1 second, then the percent indication of the remaining battery life is displayed for another second. The meter then enters the normal measuring mode.

Note: Keeping the **ON** button pressed while turning the meter on will display all LCD segments as long as the button is pressed.

To select the measurement range

While in normal measurement mode, press the **SET/HOLD** button quickly to toggle between pH and EC or TDS reading on the primary LCD, while temperature will be simultaneously displayed on the secondary LCD.

To freeze the display

While in measurement mode, press and hold the **SET/HOLD** button until "**HOLD**" appears on the secondary display and the reading will be frozen on the LCD. Press any button to return to normal mode.

To turn the meter OFF

While in normal measurement mode, press the **ON/OFF/MODE** button. "**OFF**" will appear on the secondary display.

Note: When the meter detects the absence of probe at its input, the message "**Probe not connected**" appears on LCD and "**----**" blinks on LCD lines. When a probe is connected, the "**Probe not connected**" tag is turned off, and the readings are displayed on the LCD.

To enter calibration mode

Press and hold down the **ON/OFF/MODE** button until "**OFF**" is replaced by "**CAL**." Release the button.

To enter setup mode

Press and hold **ON/OFF/MODE** button until "**CAL**" is replaced by "**UNIT**" on the secondary display. Release the button.

Meter Setup

While in measurement mode, press and hold the **ON/OFF/MODE** button until "**UNIT**" appears on the secondary display. Pressing the **ON/OFF/MODE** button will now cycle through the various units and features below which can then be modified with the **SET/HOLD** button.

To select EC or TDS

To select TDS measurement with 0.5 TDS factor press **SET/HOLD** until "**500 UNIT**" is displayed. To select TDS measurement with 0.7 TDS factor press **SET/HOLD** until "**700 UNIT**" is displayed. By pressing **SET/HOLD** again "**EC UNIT**" unit is selected.

To select calibration type

Press the **ON/OFF/MODE** until "**CAL**" appears on primary display. Press the **SET/HOLD** button to choose from "**CAL STD**" (standard calibration) or "**CAL QUIK**" (one-point quick calibration).

To select the temperature unit (°C/°F)

Press **ON/OFF/MODE** button until "**TEMP**" and the selected temperature unit "**°C**" or "**°F**" is displayed. Press **SET/HOLD** button to select temperature unit.

To select the Auto-Off time

Press **ON/OFF/MODE** button until "**AOFF**" appears on the secondary display and selected time "**8**," "**60**" or "**----**" (disabled) is displayed on the primary display. Press **SET/HOLD** button to select Auto-Off interval.

To return to measurement mode

Press **ON/OFF/MODE** button.

Quick Calibration†

Select calibration type "**CAL QUIK**" from meter setup.

- Enter calibration mode.
- Immerse the probe in the **HI5036** calibration solution.
- When the standard value is recognized and stability is reached the meter automatically accepts the calibration.
- The LCD will display "**OK**" for 1 second and return to normal measurement mode.
- If the standard is not recognized or the slope is out of accepted range "**---- WRNG**" is displayed. Change the calibration solution, clean the electrode or press any key to exit calibration.
- When the calibration procedure is completed, the "**Calibrated**" tag is turned on.

To exit calibration and reset default values

- After entering the calibration mode and before the point is accepted, it is possible to quit the procedure and return to the last calibration data by pressing the **ON/OFF/MODE** button. The LCD displays "**---- ESC**" for 1 second and the meter returns to measurement mode.
- To reset the default values and clear a previous calibration, press the **SET/HOLD** button after entering the calibration mode, before the first point is accepted. The LCD displays "**----CLR**" for 1 second, the meter resets to the default calibration and the "**Calibrated**" tag on the LCD disappears.

pH Measurement and Calibration†

- Make sure the meter has been calibrated before use.
- If the probe is dry, soak it in **HI70300** storage solution for 30 minutes to reactivate it.
- Submerge the probe in the sample to be tested while stirring it gently. Wait until the "**Not Stable**" tag on the LCD disappears.
- The LCD displays the pH value (automatically compensated for temperature) on the primary LCD, while the secondary LCD displays the sample temperature.
- If measurements are taken in different samples successively, rinse the probe tip thoroughly† to eliminate cross-contamination. After cleaning, rinse the probe tip with some deionized water and some of the sample to be measured.

pH calibration

Select calibration type "**CAL STD**" from meter setup.

- Enter calibration mode while in pH measurement mode.
- Place the sensor into the first calibration buffer. If performing a two-point calibration, use pH 7.01 buffer first.
- The meter will enter the calibration mode, displaying "**pH 7.01 USE**."

Follow directions for single and two-point calibration below:

Single-point calibration

1. Place the probe in any buffer from the selected buffer set. The meter will automatically recognize the buffer value.
2. If the buffer is not recognized or the calibration offset is out of the accepted range "**---- WRNG**" is displayed.
3. If the buffer is recognized "**REC**" is displayed until the reading is stable and the calibration is accepted.

- If using pH 7.01, after acceptance of the buffer press any key to exit. "**OK1**" message is displayed and meter returns to pH measurement mode.
- If using 4.01 or 10.01 buffer the "**OK1**" message is displayed and meter returns to pH measurement mode.

Two-point calibration

Proceed with steps 1 through 3 under single-point calibration using 7.01 pH buffer first. Then follow steps below:

- The "**pH 4.01 USE**" message is then displayed.
- Place the probe in the second calibration buffer (pH 4.01 or 10.01). When the second buffer is accepted, the LCD will display "**OK2**" for 1 second and the meter will return to the normal measurement mode.
- If the buffer is not recognized or the slope is out of accepted range "**---- WRNG**" is displayed. Change the buffer, clean the electrode or press any key to exit calibration.

Note: When the calibration procedure is completed, the "**Calibrated**" tag is turned on.

It is always recommended to carry out a two-point calibration for better accuracy.

EC Measurement and Calibration†

- Place the probe in the sample to be tested. Use plastic beakers or containers to minimize any electromagnetic interference.
- Tap the probe lightly on the bottom of the container to remove air bubbles that may be trapped inside the tip.
- Wait for a few minutes for the temperature sensor to reach thermal equilibrium, when the "**Not Stable**" tag disappears.
- The LCD displays the EC or TDS value (automatically compensated for temperature) on the primary LCD, while the secondary LCD displays the sample temperature.

EC calibration

Select calibration type "**CAL STD**" from meter setup.

- Enter calibration mode while in EC measurement mode.
- The meter enters the calibration mode and "**USE**" is displayed. Immerse the probe in 1.41 mS/cm or 5.00 mS/cm calibration solution.
- If the standard value is recognized "**REC**" is displayed until the reading is stable and calibration is accepted.
- The LCD will display "**OK**" for 1 second and return to normal measurement mode.
- If the standard is not recognized or the slope is out of accepted range "**---- WRNG**" is display. Change the buffer, clean the electrode or press any key to exit calibration.
- When the calibration procedure is completed, the "**Calibrated**" tag is turned on.

Battery Replacement

The meter is supplied with batteries.

The meter displays the remaining battery percentage when turned on. When the level is below 5%, the symbol on the LCD blinks to indicate a low battery condition. If the battery level is low enough to cause erroneous readings, the Battery Error Prevention System (BEPS) turns the meter off. It is recommended to replace the batteries as soon as the display flashes the battery symbol. To replace the batteries:

- Open the battery compartment cap (on the bottom of the instrument).
- Remove old batteries.
- Replace new batteries, observing the polarity on the rear of the instrument.
- Close the battery compartment cap.

† *The probe tip should be rinsed with purified water (reverse osmosis, distilled, or deionized) before and after placing in any solution (buffer, storage or sample).*