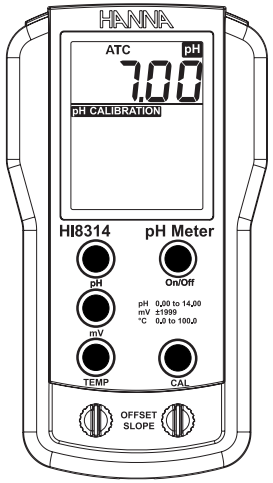
Instruction Manual

HI8314
Portable pH/mV/°C meter



Dear Customer,

Thank you for choosing a Hanna Instruments product. This manual will provide you with the necessary information for the correct operation of the meter. Please read it carefully before using the meter. If you need additional technical information, do not hesitate to e-mail us at **tech@hannainst.com**.

The instrument is in compliance with CE directives.

PRELIMINARY EXAMINATION

Remove the instrument from the packing material and examine it carefully to make sure that no damage has occurred during shipment. If there is any damage, please contact your local Hanna Instruments Office.

The meter is supplied complete with:

- **HI1217D** pH electrode
- calibration and cleaning solution sachets
- 9 V battery, calibration screwdriver and instructions
- quality certificate

__Note:__ Conserve all packing material until the instrument has been observed to function correctly. Any defective item must be returned in its original packing.

GENERAL DESCRIPTION

HI8314 is an hand-held pH/ mV/ temperature meter designed to be rugged, easy-to-use, reliable and practical.

It is ideal for education and for measurements on the field.

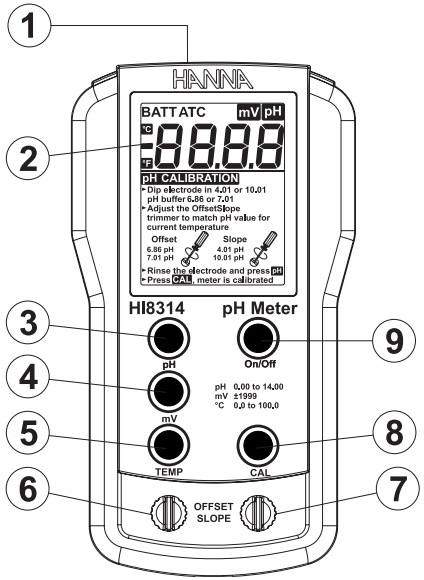
The pH, mV and temperature ranges are easily selected using the rubber keyboard on the front panel.

Calibration procedure is very simple with clear help messages displayed on LCD and adjustments are easily made with two trimmers on the front panel.

The built-in temperature sensor in the pH electrode allows automatic temperature compensation of pH readings.

Moreover, **HI8314** features a low battery indicator that alerts the user when the battery needs to be replaced.

FUNCTIONAL DESCRIPTION



1) DIN connector for pH or ORP electrode
2) Liquid Crystal Display (LCD)
3) **pH** key, to display the pH value
4) **mV** key, to display the mV (ORP) readings when using an ORP electrode or the mV equivalent to pH values when using a pH electrode
5) **TEMP** key, to display the temperature measurement or to select temperature unit while temperature is displayed
6) **OFFSET** trimmer for OFFSET calibration of pH
7) **SLOPE** trimmer for SLOPE calibration of pH
8) **CAL** key, to enter pH calibration
9) **ON/OFF** key, to turn the meter ON and OFF

DISPLAY CODE GUIDE

°C or **°F**	symbol indicates the meter is in temperature mode.
pH	symbol indicates the meter is in pH mode.
mV	symbol indicates the meter is in mV mode.

Hanna Instruments reserves the right to modify the design, construction or appearance of its products without advance notice.

SPECIFICATIONS

Range	0.00 to 14.00 pH
	±1999 mV
	0.0 to 100.0 °C/ 32.0 to 212.0 °F
Resolution	0.01 pH/ 1 mV/ 0.1 °C (0.1 °F)
Accuracy (@20 °C/ 68 °F)	±0.01 pH
	±1 mV
	±0.4 °C/ ±0.8 °F (excluding probe error)
pH Calibration	Manual, 2 point, through trimmers
Offset Calibration	±1 pH
Slope Calibration	80 to 110%
Temperature Compensation	Automatic, 0 to 100 °C (32 to 212 °F)
Electrode (*)	HI1217D (included)
Battery Type	1 x 9V alkaline
Battery Life	450 hours of continuous use
Environment	0 to 50 °C (32 to 122 °F) RH max 95% non-condensing
Auto-Shut off	after 8' of non-use
Dimensions	145 x 80 x 36 mm (5.7 x 3.1 x 1.4")
Weight	230 g (8.1 oz.)

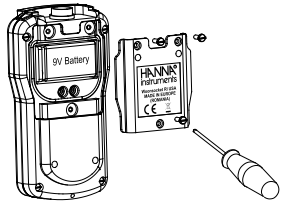
BATTERY REPLACEMENT

This meter is powered by a 9V alkaline battery.

When "**BATT**" tag is displayed blinking a low battery condition is indicated. When the low battery indication appears, only a few hours of working time are left. It is recommended to replace the battery.

When the battery level is too low to ensure reliable measurements, the meter turns off. It is recommended to replace the battery immediately. Battery replacement must only take place in a nonhazardous area using a 9V alkaline battery.

Unscrew the three screws on the rear of the meter, remove the battery compartment cover and replace the 9V battery with a new one, while observing the correct polarity.



Make sure the battery contacts are tight and secure before replacing the cover.

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OPERATIONAL GUIDE

INITIAL PREPARATION

The meter is supplied complete with a 9V battery. Remove the battery compartment cover on the back of the meter, install the battery while paying attention to its polarity.

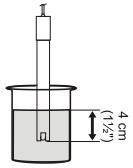
Always remove the electrode protective cap before taking any measurements. If the electrode has been left dry, soak the tip in **HI70300** storage solution for half an hour to reactivate it.

Connect the pH electrode to the DIN connector on the top of the instrument. Turn the meter ON by pressing the **ON/OFF** key.

The instrument will display all used tags for few seconds followed by the battery percentage.

TAKING pH MEASUREMENTS

To take a pH measurement simply submerge the electrode tip (at least 4 cm / 1½") into the sample to be tested.



Select the pH mode. Shake briefly and wait a couple of minutes for the reading to stabilize. The display will show the pH value automatically compensated for temperature variations.

In order to take accurate pH measurements, make sure that the instrument has been calibrated for pH before use. If measurements are taken in different samples successively, it is recommended to rinse the electrode thoroughly to avoid cross-contamination. After cleaning, rinse the electrode with some of the sample to be measured.

TAKING ORP MEASUREMENTS

Connect the ORP electrode to the DIN connector on the top of the meter.

To enter the "mV" mode (ORP, Oxidation Reduction Potential) turn the instrument ON and press the **mV** key. To take the mV measurement of a sample submerge the ORP electrode tip (at least 4 cm / 1½") into the solution to be tested. Wait a few minutes for the reading to stabilize.

TAKING TEMPERATURE MEASUREMENTS

Turn the instrument ON, press the **TEMP** key and allow the reading to stabilize. To select temperature unit press **TEMP** key while in temperature mode.

Note: If the reading is out of the specific range the range limit is displayed blinking.

pH CALIBRATION

For greatest accuracy, frequent calibration of the instrument is recommended. The instrument should be recalibrated for pH:

a) whenever the pH electrode is replaced
b) at least once a month
c) after testing aggressive chemicals
d) where extreme accuracy is required

PREPARATION

Pour small quantities of pH7.01 (**HI7007**) and pH4.01 (**HI7004**) buffer solutions into two clean beakers.

For accurate calibration use two beakers for each buffer solution, the first one for rinsing the tip of the electrode, the second one for calibration. In this way contamination of the buffers is minimized.

To obtain accurate readings, use pH7.01 (**HI7007**) and pH4.01 (**HI7004**) buffers if you are going to measure acidic samples, or pH7.01 (**HI7007**) and pH10.01 (**HI7010**) for alkaline measurements.

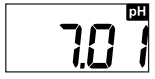
If you need to calibrate the meter to NIST standards, use pH6.86 (**HI7006**) instead of pH7.01 and pH9.18 (**HI7009**) instead of pH10.01.

PROCEDURE

- Connect the pH electrode and switch the meter ON.
- Remove the protective cap from the electrode, rinse the tip with some pH7.01 solution, then immerse the electrode into a pH7.01 buffer solution; stir gently and wait a couple of minutes for thermal equilibrium to be reached.
  Note: The electrode should be submerged approximately 4 cm (1½") into the solution.
- Press **CAL**. The calibration buffer is automatically recognized and the corresponding help menu for offset / slope calibration is displayed.

- Press the **TEMP** key to read the temperature of the buffer.

- Press the **pH** key to read pH values. Stir gently and wait for a couple of minutes.
- In 7.01/6.86 pH adjust the OFFSET trimmer on the lower left of the front panel until LCD shows the pH value at the noted temperature.



- Press **pH**.
- Rinse and immerse the pH electrode in pH4.01 or pH10.01 buffer (2nd calibration point) and stir gently.
- Press **TEMP** to read buffer temperature.
- Press **pH** to display pH reading.
- Wait a couple of minutes and adjust the SLOPE trimmer on the lower right of the front panel until the LCD shows the pH value at the noted temperature.

- Press **CAL**.
  The pH calibration is now complete.

pH BUFFER VALUES AT VARIOUS TEMPERATURES

TEMP	pH VALUES		
°C	**4.01**	**7.01**	**10.01**
0	4.01	7.13	10.32
5	4.00	7.10	10.24
10	4.00	7.07	10.18
15	4.00	7.04	10.12
20	4.00	7.03	10.06
25	4.01	7.01	10.01
30	4.02	7.00	9.96
35	4.03	6.99	9.92
40	4.04	6.98	9.88
45	4.05	6.98	9.85
50	4.06	6.98	9.82
55	4.07	6.98	9.79
60	4.09	6.98	9.77
65	4.11	6.99	9.76
70	4.12	6.99	9.75
75	4.14	7.00	9.74
80	4.16	7.01	9.73
85	4.17	7.02	9.74
90	4.19	7.03	9.75
95	4.20	7.04	9.76

ACCESSORIES

HI1217D	Double junction, gel filled pH-electrode with built-in temperature sensor, DIN connector and 1 m (3.3') cable
HI3618D	Platinum ORP-electrode with built-in temperature sensor, DIN connector and 1 m (3.3') cable
HI4619D	Gold ORP-electrode with built-in temperature sensor, DIN connector and 1 m (3.3') cable
HI7004M	pH4.01 buffer solution, 230 mL bottle
HI7007M	pH7.01 buffer solution, 230 mL bottle
HI7010M	pH10.01 buffer solution, 230 mL bottle
HI70300M	Storage solution, 230 mL bottle
HI7061M	General cleaning solution, 230 mL bottle
HI7091M	Reducing pretreatment solution, 230 mL bottle
HI7092M	Oxidizing pretreatment solution, 230 mL bottle
HI731326	Calibration screwdriver (20 pcs)
HI76405	Electrode holder

RECOMMENDATIONS FOR USERS

Before using this product, make sure it is entirely suitable for your specific application and for the environment in which it is used. Any variation introduced by the user to the supplied equipment may degrade the meters' performance. For yours and the meter's safety do not use or store the meter in hazardous environments.

WARRANTY

All Hanna Instruments meters are warranted for two years against defects in workmanship and materials when used for their intended purpose and maintained according to instructions. The electrodes and the probes are warranted for a period of six months. This warranty is limited to repair or replacement free of charge.

Damages due to accident, misuse, tampering or lack of prescribed maintenance are not covered.

If service is required, contact your local Hanna Instruments Office.

If under warranty, report the model number, date of purchase, serial number and the nature of the failure. 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 Number from the Customer Service department and then send it with shipment costs prepaid. When shipping any instrument, make sure it is properly packaged for complete protection.

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