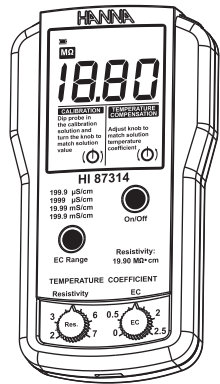


Instruction Manual

HI 87314 EC/Resistivity Meter



HANNA
instruments

www.hannainst.com

WARRANTY

HI 87314 is guaranteed for two years against defects in workmanship and materials when used for their intended purpose and maintained according to instructions. Electrodes and probes are guaranteed for 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 the dealer from whom you purchased the instrument. 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 number from the Technical Service department and then send it with shipping costs prepaid. When shipping any instrument, make sure it is properly packed for complete protection.

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Dear Customer,

Thank you for choosing a Hanna 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 or view our worldwide contact list at 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 there is any damage, notify your Dealer.

The meter is supplied complete with:

- HI 76302W 4-ring conductivity probe
- HI 3316D resistivity probe
- HI 70030 calibration solution sachet
- 9 V battery (not rechargeable)
- calibration screwdriver and instructions.

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

HI 87314 is a combination portable meter that can read conductivity in 4 different ranges, and resistivity.

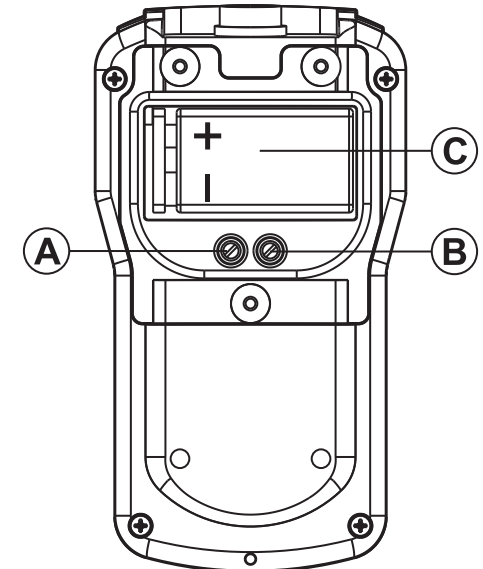
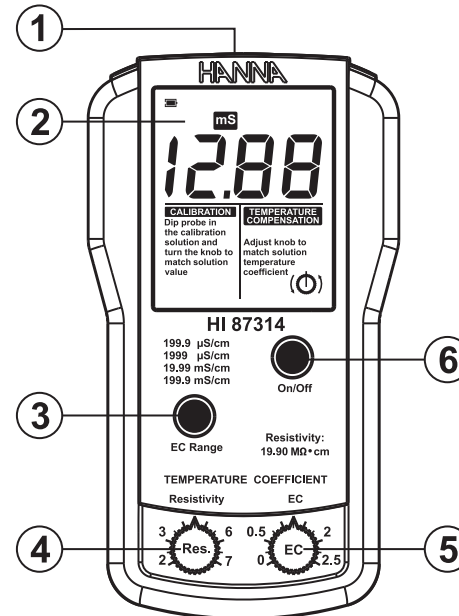
For conductivity measurements, the calibration is a simple 1 point procedure through a trimmer located in the battery compartment, and the supplied probe does not require recalibration when switching from one range to another. The 4-stainless-steel-ring probe has a built-in temperature sensor that automatically compensates for temperature changes, and the temperature coefficient can be adjusted from 0 to 2.5% through a knob on the front panel.

For resistivity measurements, the meter is factory calibrated and, if necessary, calibration can be adjusted by acting on the proper trimmer located in the battery compartment. The HI 3316D resistivity probe is easy to clean and requires little maintenance. It also features a built-in temperature sensor to automatically compensate for temperature variations, with an user-selectable (from 2 to 7%) coefficient.

Both probes use the same DIN plug on the top of the instrument, and the meter automatically recognizes which probe is connected.

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FUNCTIONAL DESCRIPTION



- 1) DIN connector for EC and resistivity probe
- 2) Liquid Crystal Display
- 3) EC RANGE key, to select the conductivity range
- 4) Resistivity temperature coefficient knob
- 5) Conductivity temperature coefficient knob
- 6) ON/OFF key, to turn the meter ON and OFF

- A) Conductivity calibration trimmer
- B) Resistivity calibration trimmer
- C) 9 V battery

SPECIFICATIONS

Range	199.9 $\mu\text{S}/\text{cm}$ / 1999 $\mu\text{S}/\text{cm}$ 19.99 mS/cm / 199.9 mS/cm 0 to 19.90 $\text{M}\Omega \cdot \text{cm}$
Resolution	0.1 $\mu\text{S}/\text{cm}$ / 1 $\mu\text{S}/\text{cm}$ / 0.01 mS/cm / 0.1 mS/cm 0.10 $\text{M}\Omega \cdot \text{cm}$
Accuracy (@20°C/68°F)	$\pm 1\%$ FS for EC $\pm 2\%$ FS for resistivity
Calibration	Manual, 1 point, for both EC and resistivity
Temperature Compensation	Automatic from 0 to 50°C with β selectable from 0 to 2.5%/°C for EC and from 2 to 7%/°C for resistivity
Probes (included)	HI 76302W for conductivity HI 3316D for resistivity
Battery Type	1 x 9V (also rechargeable)
Battery Life	Approx. 100 hours of use
Environment	0 to 50°C (32 to 122°F); RH max 100%
Dimensions	145 x 80 x 36 mm (5.7 x 3.1 x 1.4")
Weight	230 g (8.1 oz.)

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 observing its polarity.

Connect the desired probe (**HI 76302W** for EC or **HI 3316D** for resistivity measurements) to the DIN socket on the top of the meter. The instrument will automatically recognize which probe is connected.

Turn the meter ON by pressing the **ON/OFF** key.

TAKING CONDUCTIVITY MEASUREMENTS

- Immerse the **HI 76302W** probe in the solution, while making sure that the holes of the sleeve are completely submerged. Tap the probe lightly on the bottom of the beaker to remove any air bubbles trapped inside.
- Adjust the conductivity TC knob to the temperature coefficient value of the solution.
- Select the appropriate conductivity range, by pressing **EC RANGE** key.

Note: If the display shows "1", the reading is over-range. Select the next higher range.

- Allow a few minutes for the reading to stabilize, and the LCD will display the temperature compensated conductivity reading.

TAKING RESISTIVITY MEASUREMENTS

- Immerse the **HI 3316D** probe in the solution, while making sure that the hole on the probe body is completely submerged.
- Wait for a few seconds to allow the reading to stabilize. The resistivity value of the solution will be displayed on the LCD.

Note: If the display shows "1", the reading is over-range.

- The reading is automatically corrected for temperature variations by using the linear compensation method:

$$R_t = R_1(1 + \beta(t-25))$$

where R_1 is the resistivity at the temperature t , and the reference temperature is 25°C.

- The temperature coefficient β is selectable through a front knob, from 2 to 7%/°C.

CALIBRATION

CONDUCTIVITY CALIBRATION

- It is recommended to calibrate the instrument for the conductivity range at least once a week, or when the probe is changed.
- For better accuracy, choose a solution with a conductivity value close to the sample to be measured.

If you are measuring in the mS ranges, calibrate the meter using the **HI 7030** (12.88 mS/cm) or **HI 7034** (80 mS/cm) conductivity solution.

For the μ S ranges, use **HI 7031** (1413 μ S/cm) for the 0 to 1999 μ S/cm range, or **HI 7033** (84 μ S/cm) for the 0 to 199.9 μ S/cm range.

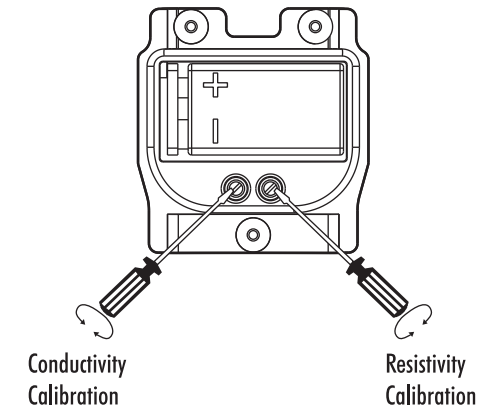
- Rinse the probe thoroughly with distilled water and, if possible, use plastic beakers to minimize any EMC interferences.
- Pour a small quantity of the desired conductivity solution into a plastic beaker, and immerse the probe while making sure that the holes of the sleeve are completely submerged. Tap the probe lightly on the bottom of the beaker to remove any air bubbles trapped inside the sleeve.
- Adjust the conductivity TC knob to 2%/°C.
- Select the appropriate measurement range: 199.9 μ S for **HI 7033** solution, 1999 μ S for **HI 7031**, 19.99 mS for **HI 7030**, or 199.9 mS for **HI 7034**.

Note: If the display shows "1", the reading is over-range. Select the next higher range.

- Allow a few minutes for the reading to stabilize and adjust the conductivity calibration trimmer located in the battery compartment, to read the calibration solution value @25°C (77°F).
- All subsequent measurements will be referenced to 25°C.
- If you need to reference the measurements to 20°C, adjust the calibration knob to read the calibration solution value @20°C (68°F). See conductivity vs. temperature chart on the calibration solution sachet or bottle label.
- Calibration is now complete and the instrument is ready for use.

RESISTIVITY CALIBRATION

- The meter is factory calibrated for resistivity range, and usually needs recalibration only after a resistivity probe replacement. In this case, follow the instructions below.
- Immerse the probe in a solution of known resistivity value, and wait for the reading to stabilize.
- Adjust the resistivity calibration trimmer located in the battery compartment, until the resistivity value of the reference solution is displayed.



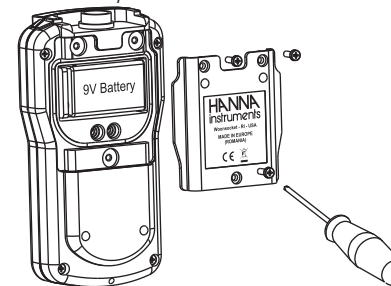
BATTERY REPLACEMENT

When the battery becomes weak, the meter displays a blinking additional decimal point on the left side of the LCD.



When the low battery indicator appears only a few hours of battery life is remaining. A low battery level may also result in unreliable measurements. It is recommended to replace the battery immediately.

Unscrew the 3 screws on the back of the meter, remove the battery cover and replace the battery while observing its polarity. Replacement must only take place in a safe area using an alkaline 9V battery.



ACCESSORIES

HI 76302W	4-ring conductivity probe with built-in temperature sensor, DIN connector and 1 m (3.3') cable
HI 3316D	Resistivity probe with built-in temperature sensor, DIN connector and 1 m (3.3') cable
HI 7030M	12880 μ S/cm, 230 mL bottle
HI 7031M	1413 μ S/cm, 230 mL bottle
HI 7033M	84 μ S/cm, 230 mL bottle
HI 7034M	80000 μ S/cm, 230 mL bottle
HI 7035M	111800 μ S/cm, 230 mL bottle
HI 7039M	5000 μ S/cm, 230 mL bottle
HI 7061M	General cleaning solution, 230 mL bottle
HI 710007	Shockproof rubber boot, blue
HI 710008	Shockproof rubber boot, orange
HI 731326	Calibration screwdriver (20 pcs)
HI 76405	Electrode holder

Recommendations for Users

Before using these products, make sure that they are entirely suitable for the environment in which they are used. Operation of these instruments in residential area could cause unacceptable interferences to radio and TV equipment, requiring the operator to take all necessary steps to correct interferences. Any variation introduced by the user to the supplied equipment may degrade the instruments' EMC performance. To avoid damages or burns, do not perform any measurement in microwave ovens.