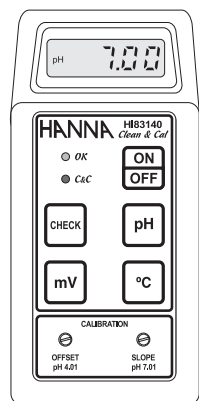


## Instruction Manual

# HI 83140

## Portable pH/mV/°C meter with Probe Check



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

Dear Customer,

Thank you for choosing a Hanna product. This manual will provide you with the necessary information for 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](mailto:tech@hannainst.com).

This 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, notify your Dealer.

Each meter is supplied with:

- HI 1217-6, amplified, combination, double-junction, plastic-body, gel pH electrode with built-in temperature sensor;
- HI 70007 pH 7.01 sachet (1 pc)
- HI 70004 pH 4.01 sachet (1 pc)
- HI 700661 Cleaning Solution sachet (2 pcs)
- HI 50021 Check Solution sachet (2 pcs)
- Instruction Manual
- Calibration screwdriver
- 1 x 9V alkaline battery.

**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 83140 is an hand-held pH/mV/°C meter designed for simplicity of use in taking pH, mV (ORP) and temperature measurements.

The pH, mV and °C ranges are easily selected using a membrane keyboard on the front panel.

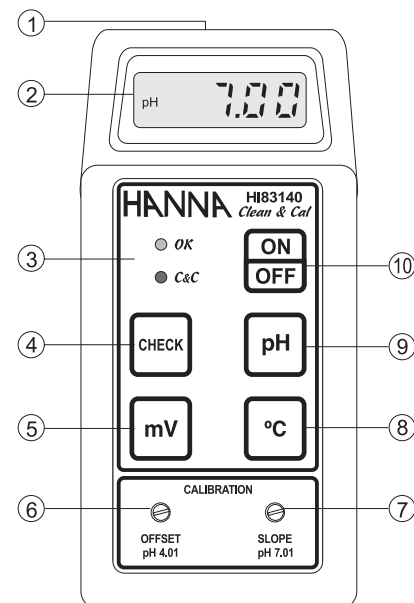
Calibration procedure is very simple and adjustments are easily made with two trimmers on the front panel.

The meter is also provided with Probe Check feature, which allows the user to easily check the probe calibration status at any time.

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

Moreover HI 83140 has been designed with a low battery detector feature and a lightweight ABS plastic housing.

## FUNCTIONAL DESCRIPTION



- 1) DIN connector for combination pH or ORP electrode.
- 2) Liquid Crystal Display.
- 3) Green and Red LED's for Probe Check.
- 4) Check key.
- 5) 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.
- 6) OFFSET trimmer for pH calibration.
- 7) SLOPE trimmer for pH calibration.
- 8) °C key, to display the temperature measurement.
- 9) pH key, to display the pH value.
- 10) ON/OFF key.

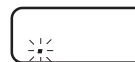
## SPECIFICATIONS

|                             |   |               |
|-----------------------------|---|---------------|
| Range                       | pH  | 0.00 to 14.00 |
|                             | mV  | ±1999         |
|                             | °C  | 0.0 to 100.0  |
| Resolution                  | pH  | 0.01          |
|                             | mV  | 1             |
|                             | °C  | 0.1           |
| Accuracy<br>(@20°C/68°F)    | pH  | ±0.01         |
|                             | mV  | ±1            |
|                             | °C  | ±0.4          |
| Typical EMC<br>Deviation    | pH  | ±0.05         |
|                             | mV  | ±5            |
|                             | °C  | ±0.5          |
| pH Calibration              | Manual, 2-point through trimmers  |               |
| Temperature Compensation    | Automatic from 0 to 70°C (32 to 158°F)                                    |               |
| Electrode (*)<br>(included) | HI 1217-6 pH-electrode with built-in temperature sensor and DIN connector |               |
| Battery Type                | 1 x 9V (IEC 6LR61) alkaline   |               |
| Battery Life                | approx. 150 hours of continuous use                                       |               |
| Environment                 | 0 to 50°C (32 to 122°F);<br>max 95% RH non-condensing                     |               |
| Dimensions                  | 164 x 76 x 45 mm (6.5 x 3.0 x 1.8")                                       |               |
| Weight                      | 250 g (8.8 oz.)   |               |

(\*) The max. operating temperature of the HI 1217-6 pH electrode is 80°C. To perform measurements at higher temperature use adequate electrodes.

## 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 soon.

Unscrew the 3 screws on the back of the meter, remove the battery cover and replace the battery while paying attention to its polarity.

Replacement must only take place in a non-hazardous area using an alkaline 9V battery.

## OPERATIONAL GUIDE

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.

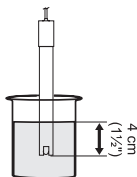
Always remove the electrode protective cap before taking any measurements. If the electrode has been left dry, soak the tip in **HI 70300** Storage Solution for half an hour to reactivate it.

Connect the pH electrode to the DIN connector on the top of the instrument and remove the protective cap.

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

### TAKING pH MEASUREMENTS

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



Press the pH key to select the pH mode.

Stir 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 and remove the protective cap.

Turn the instrument ON and enter the mV (ORP) mode by pressing the mV key.

Submerge the ORP electrode tip (at least 4 cm/1½") into the solution to be tested, stir gently and wait a few minutes for the reading to stabilize.

### TAKING TEMPERATURE MEASUREMENTS

Turn the instrument ON, press the °C key and allow the reading to stabilize.

**Note:** It is recommended to clean often the probe with the **HI 700661** Cleaning Solution.

**Note:** After measurements have been completed, the instrument should be switched off, and the probe cleaned and covered with the protective cap.

## pH CALIBRATION

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

- Whenever the pH electrode is replaced.
- At least once a month.
- After testing aggressive chemicals.
- Where extreme accuracy is required.
- Whenever requested by the Probe Check.

### PREPARATION

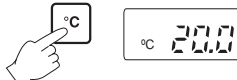

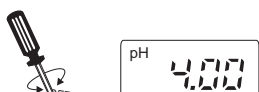
Pour small quantities of pH 4.01 and pH 7.01 buffer solutions into two clean beakers.

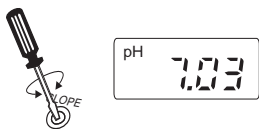
For accurate calibration use two beakers for each buffer solution, the first one for rinsing the tip of the electrode, the second one for calibration. In this way contamination of the buffers is minimized.

### PROCEDURE

- Connect the pH electrode and switch the meter ON.
- Remove the protective cap from the electrode, rinse the tip with some pH 4.01 solution, then immerse the electrode into a pH 4.01 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 the °C key to display the temperature of the buffer (e.g. 20°C). 
- Press the pH key to read pH values. Stir gently and wait for a couple of minutes. 
- Adjust the OFFSET trimmer on the lower left of the front panel until LCD shows the pH value at the noted temperature. 

- Rinse the electrode, immerse it in pH 7.01 and stir gently.
- 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. 

The pH calibration is now complete.


## PROBE CHECK FEATURE CLEAN & CAL PROCEDURE


The unique Probe Check feature allows the user to check the probe status at any time. Simply follow the below procedure to check if the response of your electrode is still satisfactory or maintenance is needed.

- Rinse thoroughly the probe with water.
- Immerse the probe in **HI 50021** Check Solution.

**Note:** If the reading is around pH 4.0, the probe is broken and has to be replaced.

- Wait a couple of minutes and then press the CHECK key. 

- If the green LED lights up, the electrode can still be used. 

- If the red LED lights up, Cleaning is needed: 

- immerse the probe in **HI 700661** Cleaning Solution for 5 minutes, then rinse it with tap water;
- immerse again in **HI 50021** Check Solution and press the CHECK key;
- if the green LED lights up, the electrode can still be used;
- if the red LED lights up, calibrate the meter (see "pH Calibration").

**Note:** If it is not possible to calibrate, the probe has to be replaced with a new one.

**Note:** For field applications, it is always recommended to keep a spare probe handy. When anomalies are not resolved with simple maintenance, change the probe and recalibrate the meter.

#### 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 equipments, 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.

## pH VALUES AT VARIOUS TEMPERATURES

| TEMP<br>°C | pH VALUES |      |       |
|------------|-----------|------|-------|
|            | 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  |

## ACCESSORIES

- HI 1217-6** amplified, combination pH-electrode with built-in temperature sensor and DIN connector
- HI 3618D** amplified, combination, Platinum ORP-electrode with built-in temperature sensor and DIN connector
- HI 4619D** amplified, combination, Gold ORP-electrode with built-in temperature sensor and DIN connector
- HI 70004P** pH 4.01 buffer sachet, 20 mL (25 pcs)
- HI 70007P** pH 7.01 buffer sachet, 20 mL (25 pcs)
- HI 70010P** pH 10.01 buffer sachet, 20 mL (25 pcs)
- HI 70300M** Storage Solution, 230 mL bottle
- HI 700661P** Cleaning Solution, 20 mL sachet (25 pcs)
- HI 50021P** Check Solution, 20 mL sachet (25 pcs)
- HI 7082** 3.5M KCl Electrolyte, 4 x 50 mL
- HI 7091M** Reducing Pretreatment Solution, 230 mL bottle
- HI 7092M** Oxidizing Pretreatment Solution, 230 mL bottle
- HI 731326** Calibration screwdriver (20 pcs)