

## Instruction Manual

# HI 83141V

## Complete Portable Kit for pH, mV & Temperature Measurements in Wine, Must and Grape Juice



## 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.

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.  
Please read carefully this instruction manual 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 the CE directives.

## PRELIMINARY EXAMINATION

Remove the kit 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 kit includes:

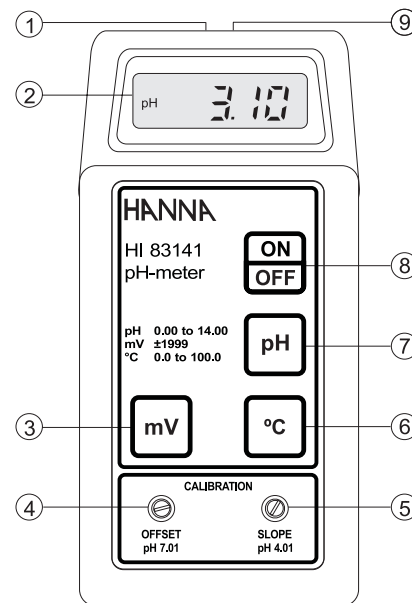
- HI 83141 portable pH meter
- HI 1048B pH electrode
- HI 7669AW temperature probe
- pH 3 and pH 7 buffer solutions (20 mL sachet each)
- HI 700635 and HI 700636 specific cleaning solutions
- electrode refilling solution (30 mL bottle) and syringe
- 9V battery, screwdriver and instructions.

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

## ACCESSORIES

- |           |  |
|-----------|--|
| HI 1048B  | Glass body, double-junction, refillable pH electrode with BNC connector and 1 m (3.3') cable |
| HI 3131B  | Glass-body, refillable, platinum ORP electrode with BNC connector and 1 m (3.3') cable       |
| HI 7669AW | Temperature probe with 1 m (3.3') cable  |
| HI 5003   | pH 3.00 buffer solution, 500 mL bottle   |
| HI 5068   | pH 6.86 buffer solution, 500 mL bottle   |
| HI 5007   | pH 7.01 buffer solution, 500 mL bottle   |
| HI 70300L | Storage solution, 500 mL bottle  |
| HI 70635L | Cleaning solution for wine deposits, 500 mL  |
| HI 70636L | Cleaning solution for wine stains, 500 mL  |
| HI 7082   | Electrolyte solution, 3.5M KCl, 4 x 30 mL bottle   |
| HI 7091L  | Reducing pretreatment solution, 500 mL   |
| HI 7092L  | Oxidizing pretreatment solution, 500 mL  |
| HI 731326 | Calibration screwdriver (20 pcs)   |

## FUNCTIONAL DESCRIPTION



- 1) BNC connector for pH (or ORP) electrode.
- 2) Liquid Crystal Display.
- 3) 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.
- 4) Trimmer for pH OFFSET calibration.
- 5) Trimmer for pH SLOPE calibration.
- 6) °C key, to display the temperature measurement.
- 7) pH key, to display the pH value.
- 8) ON/OFF key.
- 9) Socket for HI 7669AW temperature probe.

## SPECIFICATIONS

Range	0.00 to 14.00 pH / $\pm 1999$ mV 0.0 to 100.0°C
Resolution	0.01 pH / 1 mV / 0.1°C
Accuracy (@20°C/68°F)	$\pm 0.01$ pH / $\pm 1$ mV / $\pm 0.4$ °C
Typical EMC Deviation	$\pm 0.07$ pH / $\pm 5$ mV / $\pm 1$ °C
pH Calibration	Manual, 2 point, through offset ( $\pm 1$ pH) and slope (85 to 105%) trimmers
ORP Calibration	Factory calibrated
Temperature Calibration	Factory calibrated
Temperature Compensation	Automatic, from 0 to 70°C
Probes (included)	HI 1048B pH-electrode HI 7669AW temperature probe
Battery Type	1 x 9V, alkaline
Battery Life	100 hours of continuous use
Environment	0 to 50°C (32 to 122°F); RH max 95% non-condensing
Dimensions	164 x 76 x 45 mm (6.5 x 3.0 x 1.8")
Weight	180 g (6.3 oz.)

### Recommendations for Users

Before using this product, make sure that it is entirely suitable for the environment in which it is used. Operation of this instrument in residential area could cause unacceptable interference to radio and TV equipment, requiring the operator to take all necessary steps to correct interference.

The glass bulb at the end of the electrode is sensitive to electrostatic discharges. Avoid touching this glass bulb at all times.

To maintain the EMC performance of equipment, the recommended cables noted in the user's manual must be used. Any variation introduced by the user to the supplied equipment may degrade the instruments' EMC performance.

To avoid electrical shock, do not use these instruments when voltages at the measurement surface exceed 24 Vac or 60 Vdc.

To avoid damage or burns, do not perform any measurement in microwave ovens.

## 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 and the temperature probe to the proper connectors on the top of the instrument.

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

**To take pH measurements** simply submerge the pH electrode (at least 4cm/1½") and the temperature probe (as close as possible to the electrode) into the sample to be tested.

The temperature probe can be used independently to take temperature measurements, or it can be used in conjunction with the pH electrode to utilize the meter's ATC capability.

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.

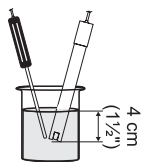
If measurements are taken in different samples successively, it is recommended to rinse the electrode thoroughly to avoid cross-contamination. After cleaning, rinse the electrode with some of the sample to be measured.

### To take temperature measurements

make sure the temperature probe is connected to the meter, immerse it in the sample to be measured and press the °C key to enter the temperature mode.

**Note:** If the temperature probe is not connected, the pH reading will be compensated at 25°C.

**To take ORP (mV) measurements** connect an ORP electrode (optional) to the BNC connector on the top of the meter, submerge the tip (at least 4 cm/1½") into the solution, enter the "mV" mode by pressing the mV key and wait a few minutes for the reading to stabilize.



## CALIBRATION

The ORP (mV) and temperature ranges are factory calibrated. Contact the nearest Hanna Service Center for recalibration, if needed.

For greatest accuracy, a frequent **pH calibration** is recommended. The instrument should be recalibrated for pH whenever the pH electrode is replaced, where extreme accuracy is required, and at least once a month.

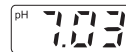
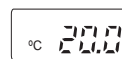
- Pour small quantities of pH7.01 (**HI 5007**) and pH3.00 (**HI 5003**) buffer solutions into two clean beakers.

For an accurate calibration use two beakers for each buffer solution, the first one for rinsing the tip of the electrode, the second one for calibration. If a calibration with NBS standards is needed, use pH6.86 (**HI 5068**) instead of pH7.01.

- Connect pH electrode and temperature probe to the meter and switch it ON.
- Remove the protective cap, rinse the tips of pH electrode and temperature probe with some pH7.01 solution. Immerse them into pH7.01 buffer solution, stir gently and wait a couple of minutes for stable reading.

**Note:** The electrode should be submerged approximately 4 cm (1½") into the solution and the temperature probe should be located as close as possible to the electrode.

- Press the °C key to display the temperature of the buffer (e.g. 20°C). Then 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 and immerse the pH electrode in pH3.00 buffer solution (2<sup>nd</sup> calibration point) 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.



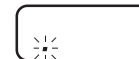
The pH calibration is now complete.

## pH VALUES AT VARIOUS TEMPERATURES

TEMP °C	pH VALUES		
	3.00	7.01	6.86
0	3.07	7.13	6.98
5	3.05	7.10	6.95
10	3.03	7.07	6.92
15	3.02	7.04	6.90
20	3.00	7.03	6.88
25	3.00	7.01	6.86
30	3.00	7.00	6.85
35	3.00	6.99	6.84
40	2.99	6.98	6.84
45	2.99	6.98	6.83
50	2.99	6.98	6.83
55	2.99	6.98	6.84
60	2.99	6.98	6.84
65	2.99	6.99	6.85
70	3.00	6.99	6.85

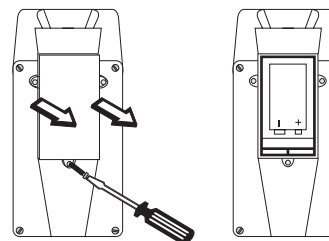
## BATTERY REPLACEMENT

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. Replacement must only take place in a safe area and using an alkaline 9V battery.

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



## pH ELECTRODE MAINTENANCE

### Preparation

Remove the electrode protective cap. Do not be alarmed if any salt deposits are present: this is normal with electrodes and they will disappear when rinsed with water.

During transport tiny bubbles of air may have formed inside the glass bulb. The electrode cannot function properly under these conditions. These bubbles can be removed by "shaking down" the electrode as you would do with a glass thermometer.

### Sensitive bulb

To avoid clogging problems and ensure a fast response, the bulb must be kept moist at any time. Store the electrode with few drops of **HI 70300** storage solution in the protective cap. NEVER USE DISTILLED OR DEIONIZED WATER FOR STORING PURPOSES.

### Periodic maintenance

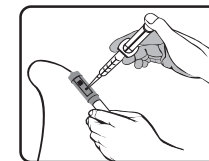
Inspect electrode and cable. The cable used for the connection to the meter must be intact and there must be no points of broken insulation. The connector must be perfectly clean and dry. If any scratches or cracks are present, replace the electrode.

### Refilling the electrode

ALWAYS VERIFY THE ELECTROLYTE LEVEL.

If the electrolyte level is more than 2 cm below the refilling hole, unscrew and remove the refilling hole cap.

Add the 3.5M KCl electrolyte solution (**HI 7082**) by using the supplied syringe. Tighten back the cap. Wait at least 1 hour before using the electrode.



### Cleaning procedure

After use, clean the electrode by immersing it in the proper cleaning solution (**HI 700635** or **HI 700636**) for 5 minutes.

If case of slow and unreliable readings, it is recommended to perform the following procedure for cleaning the junction:

1. Shift upwards the PTFE collar. If the collar does not shift easily, immerse it into warm water.
2. Wipe gently the electrode surface with a soft and clean tissue.
3. In case of persistent wine or must residual, wet the tissue with cleaning solution (**HI 700635** or **HI 700636**).
4. Put back the collar in its original position.

