

## WARRANTY

### ONE YEAR LIMITED WARRANTY

This HM Digital, Inc. ("the Company") product ("PH-200") is warranted to the purchaser against defective materials and workmanship for one (1) year from the date of purchase.

**What is covered:** Repair parts and labor, or replacement at the Company's option. Transportation charges for repaired or new product to be returned to the purchaser.

**What is not covered:** Transportation charges for the defective product to be sent to the Company. Any consequential damages, incidental damages, or incidental expenses, including damages to property. This includes damages from abuse or improper maintenance such as tampering, wear and tear, water damage, or any other physical damage. The PH-200 is watertight and completely submersible. However, please ensure that the battery compartment and probe gasket ring are firmly tightened before submersing in water. The warranty does not cover water damage to the PH-200 due to parts not securely closed. The warranty also does not cover damage to the sensor due to poor care or maintenance.

**How to obtain warranty performance:** Include with the product your name, address, phone number, description of the problem, and proof of date of purchase (receipt, invoice, etc.) and return to:

HM Digital, Inc.  
ATTN: Returns  
5819 Uplander Way  
Culver City, CA 90230  
USA

**\* If a returned product does not include the abovementioned items, the Company reserves the right to refuse warranty service.**

**Implied Warranties:** Any implied warranties, including implied warranties of merchantability and fitness for a particular purpose, are limited in duration to five years from date of purchase. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. To the extent any provision of this warranty is prohibited by federal and state law and cannot be preempted, it shall not be applicable. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

**NOTE:** Warranties are product-specific. Third-party products and products deemed by HM Digital as "accessories" are not covered under warranty. Third-party products include, but are not limited to, batteries and fittings. Accessories include, but are not limited to, lanyards and product boxes.

## USER'S GUIDE



**PH-200**  
**pH / TEMP METER**



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**OVERVIEW**

Thank you for purchasing HM Digital's PH-200 Meter. The PH-200 is an advanced, micro-processor based handheld, watertight pH meter with superior accuracy. It can be used for testing the acidity or alkalinity of almost any liquid, in a wide variety of applications, provided the liquid contains less than 50% alcohol and a conductivity of at least 10 µS (5 ppm in TDS). *(It may not be stable in pure, distilled or de-ionized water.)* The PH-200 also measures temperature in both Celsius and Fahrenheit. The meter incorporates automatic temperature compensation (ATC) to accommodate for discrepancies in temperature that would naturally occur. The meter also features digital calibration for easy and precise calibration that will yield better results.

**CONTACT INFORMATION**

If you have any problems or questions regarding your meter, please contact HM Digital, Inc.

**HM Digital, Inc.**  
 5819 Uplander Way  
 Culver City, CA 90230

[info@hmdigital.com](mailto:info@hmdigital.com)  
[www.hmdigital.com](http://www.hmdigital.com)  
 1-800-383-2777

**SPECIFICATIONS**

**pH Range:** 0.00 – 14.0 pH  
**Temperature Range:** 0-80 °C; 32-176 °F  
**Resolution:**  
     **pH:** 0.01 pH  
     **Temperature:** 0.1 °C/F  
**Accuracy:** +/- 0.02 pH  
**Temperature Compensation:** Automatic (ATC) to 25°C (ATC range: 1-50°C)  
**Calibration:** Auto-calibration to 4, 7 or 10 pH with fine tune digital calibration by push button.  
**Auto Shut-Off:** After 5 minutes  
**Probe:** Glass sensor and glass reference tube (single junction)  
**Safe Operating Temperature:** 0-80 °C; 32-176 °F (measuring in extreme temperatures is not recommended)  
**Minimum Conductivity:** For accurate and stable readings, the liquid to be tested must have a conductivity of at least 10 µS (approx. 5 ppm in TDS).  
**Display:** LCD panel  
**Housing:** Waterproof (submersible); floats  
**Power source:** 3 x 1.5V button cell batteries (included), model 357A  
**Battery Life:** Approx. 100 hours of usage  
**Dimensions:** 18.5 x 3.4 x 3.4 cm (7.3 x 1.3 x 1.3 inches)  
**Weight:** 95 grams (3.35 ounces)

**Changing the Batteries**

When the meter displays a flashing battery symbol, your batteries are getting weak and should be replaced soon. To change the batteries:

1. Twist open the battery compartment on the top of the meter.
2. Remove the three batteries.
3. Insert new batteries in the direction as depicted inside the compartment. The meter uses battery size 357A.
4. Close and tighten the battery compartment to maintain waterproofness.



*NOTE: Do not reverse the polarity of the batteries. This may short circuit the meter.*

**Cleaning and Sensor Care**

1. Never touch the glass electrode or reference tube!
2. To clean the body, use a soft rag or towel. Wipe with water and a mild soap or rubbing alcohol.
3. To clean the electrode (glass bulb) rinse in distilled water or a pH 7 buffer solution. If cleaning with a pH 7 buffer, lightly dab (touch) the sensor on a soft tissue after. Never rub the electrode with any type of material, as this may scratch the glass.
4. If the glass electrode is scratched or broken, it must be replaced.
5. There is a gel encased in the electrode. If this is dried, you can attempt to re-moisten it by keeping it in a pH 7 solution for at least two hours. If the meter still does not function properly or accuracy is not at optimum performance, the sensor may be irreparably damaged.
6. For best results, clean the sensor after each use, especially if used in very low or very high pH liquids, or liquids other than water. If testing liquid that is not clear, clean in distilled water.
7. **SENSOR STORAGE:** HM Digital's electrode storage solution is preferred. The meter is shipped with this solution in the cap, and a small extra bottle. Additional solution (OP-STOR) can be purchased. It is okay to rinse the sensor in distilled water, but never store it in distilled water.

**Sensor Replacement**

If your sensor has been damaged, you can purchase a new one without having to purchase a new meter. The part number is SP-P2. To replace the sensor:

1. Remove the sensor gasket ring by twisting counter-clockwise.
2. Gently pull the sensor off the unit.
3. Gently insert the new sensor into the unit. Be sure to align the grooves properly. Never force the sensor into the unit!
4. Make sure the rubber gasket o-ring is properly positioned on the sensor.
5. Screw the orange gasket ring back onto the unit by twisting it clockwise. Hand tighten.
6. Reset to the factory default and calibrate to pH 7.0 (see pages 4 and 5).

**Sponge Care**

1. Never add distilled or tap water to the sponge/cotton ball, as mildew or mold may form.
2. Rewet with HM Digital's storage solution (OP-STOR).

**Message Symbols and Troubleshooting**

You will see the corresponding message symbol(s) with the issues listed below:

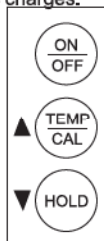
The sensor has been disconnected	▲	---	Err
The electrode is broken, damaged or old	▲		
The TDS level of the water is less than 3 ppm	▲		
The pH level is below 0 or greater than 14		---	
There is internal damage			Err
The meter cannot calibrate		---	Err
The temperature is out of range			Err

## TAKING MEASUREMENTS

The PH-200 can take measurements of pH levels and temperature.

### pH Measurements

1. Remove the cap.
2. Click the ON/OFF button. The display will activate.
3. Dip the meter into the water sample, liquid or solution to be tested.
4. Lightly swirl the meter to ensure the removal of trapped air bubbles or electric charges.  
**Do not tap it against the glass.**
5. The meter will display a reading almost immediately. Keep the meter in the liquid until the reading stabilizes (approx. 5-30 seconds) for an accurate reading. **NOTE - Minor fluctuations are a normal function of pH in certain environmental situations.**
6. To view the reading out of the liquid, click the HOLD button while the meter is in the liquid. This will freeze the reading on the screen. Clicking the HOLD button again will release it.
7. Click the ON/OFF button to turn the meter off.
8. Shake any excess water off the meter. For best results, rinse with distilled or deionized water after each usage and wipe with a tissue. Put the cap back on. Store the meter standing upright to ensure complete saturation of the sensor.



**NOTE** - The PH-200 is extremely sensitive in low conductivity water (below 50  $\mu$ S). It is not recommended to use this meter in water below 10  $\mu$ S. If you do use the meter in such water, it is better to test in flowing water, or by swirling the meter continuously while obtaining the reading. The reading should stabilize in 30-45 seconds.

### Temperature Measurements

The temperature reading is always displayed on the LCD panel during measurement mode, and is shown simultaneously for pH readings. It is not shown when the meter is in calibration mode. The default reading for the meter is in Celsius.

1. Remove the cap.
2. Click the ON/OFF button. The display will activate.
3. The temperature reading is always displayed on the LCD screen (except in calibration and reset mode), and can be used to take air or liquid temperature measurements.
4. To measure the temperature of a water sample or solution, dip the meter into it. The temperature reading will change immediately (unless the liquid is at room temperature). For very hot or cold liquids, the reading may take slightly longer to stabilize.
5. Click the ON/OFF button to turn the meter off.
6. Shake any excess water off the meter and rinse with distilled or deionized water. Wipe the outside of the sensor dry with a soft tissue and put the cap back on.

**NOTE** - Because of the sensitivity of the pH sensor and reference tube, it is not recommended to use your meter as a thermometer in very hot or very cold liquids. Do not keep the meter in very hot or cold liquids for extended periods of time.

### Switching Temperature Modes

The default temperature reading is in Celsius. To change the temperature mode, click the TEMP/CAL button to switch from Celsius to Fahrenheit or from Fahrenheit to Celsius.

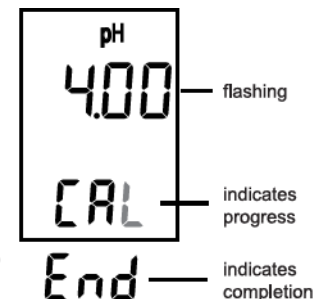
## CALIBRATION

Your PH-200 has been factory calibrated to pH 7.0. While this is suitable for many applications, it is recommended to recalibrate the meter as close as possible to the pH level that will be tested, and recalibrating prior to every test will provide superior results (though this is not required). The PH-200 should be recalibrated at least once per month. If tests are conducted between wide ranges, calibration should be done more frequently. Additionally, it should be noted that liquid pH buffer accuracy may vary. For best results, use HM Digital's pH buffers (model PH-BUF).

The PH-200 features digital auto-calibration to pH 4.0, 7.0 or 10.0 and digital manual calibration to any value within the meter's range. Manual calibration can also be used as "fine tuning." For example, if calibrating to 10.01, it is recommended to use auto-calibration to 10.00, and then manual calibration to 10.01. **NOTE** - If calibrating to 10 after the meter was calibrated to 4 (or vice-versa), it is recommended to calibrate to 7 first, prior to calibrating to the next value. Also, if you are having trouble calibrating to 4 or 10, calibrate to 7 first, then 4 or 10.

### Automatic Calibration

1. Turn the meter on by clicking the ON/OFF button. Note that the reading will fluctuate if the meter is not submerged in a liquid (it will stabilize in liquid).
2. Insert the meter into a pH buffer solution of 4.0, 7.0 or 10.0. Press and hold the CAL button for 5 seconds.
3. The temperature reading will change to a flashing 'CAL' image for 10 seconds. Do not press any buttons.
4. The meter will automatically recognize the solution it is in (or the closest to it). This number will flash and the letters of 'CAL' will flash as 'C...CA...CAL' indicating progress. Allow 5 - 60 seconds during this stage. Do not press any buttons and do not move the meter.
5. When the meter is calibrated, 'End' will flash briefly and the screen will revert to measurement mode. Your meter is now recalibrated.



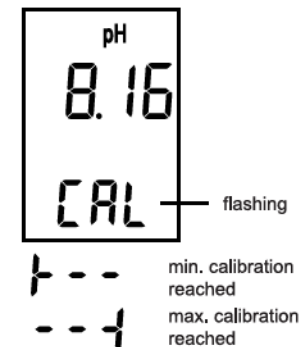
### Manual Calibration (Fine Tuning)

1. Turn the meter on by clicking the ON/OFF button.
2. Insert the meter into a known pH buffer solution.
3. Press and hold the CAL button for 5 seconds.
4. The temperature will change to a flashing 'CAL' image for 10 seconds before entering automatic calibration. During this time, click either the UP button (TEMP/CAL) or DOWN button (HOLD) to remain in manual calibration mode.
5. Change the reading so that it matches the value of the calibration solution. To increase the reading, click the UP button and to decrease the reading click the DOWN button. Press and hold either button for rapid advancement.

- If the calibration reading reaches the minimum or maximum offset from the buffer value (approx. +/- 3.3 pH), the screen will display the 'minimum calibration reached' icon or 'maximum calibration reached' icon, respectively. (e.g., if the meter is in a 7.0 solution, the highest it can be calibrated to is 10.3.)

6. To set the calibration, click the ON/OFF button once. 'C...CA...CAL' will flash briefly, followed by 'End' and the temperature will return to the screen. Your meter is now recalibrated.

**NOTE** - the sensor is very sensitive. It is normal for the reading to shift by .01 or .02.



## CARE, MAINTENANCE & TECHNIQUES

As with all pH meters, the PH-200 requires proper maintenance to ensure a healthy lifespan.

## HOUSING AND SCREEN DESCRIPTION



## General Techniques

1. Store the meter upright (standing on the cap, so that you can read the text).
2. Do not store the meter in high temperature or direct sunlight.
3. Never touch the glass sensor! Skin oils may adversely affect the reading. If you do touch the sensor, rinse immediately in a pH 7 buffer solution and soak in the solution for 2 hours.
4. Always immediately replace the cap when the meter is not in use. The PH-200 cap contains a small wetted sponge or cotton ball to ensure that the gel within the glass sensor does not dry up. *NOTE - A tightened cap will ensure a longer lifespan for your sensor!*
5. It is normal for salt deposits to form on the outside of the cap or rim of the cap. This is from the storage solution contained within the cap, which is very high in NaCl concentration. If salt deposits appear, simply wipe off with a soft tissue or rubbing alcohol.
6. Using the PH-200 in high temperature liquid, such as hot coffee or spas, will shorten the lifespan of the sensor. If testing in hot liquid is essential, be sure to not keep the meter in the hot liquid for an extended period of time. (Room temperature coffee will not affect the sensor.)
7. After repeated usage in high TDS liquids, it is advised to rinse the sensor in distilled water to prevent residue build-up.
8. If testing two samples over a wide range (e.g., pH 4 and pH 10), make sure to rinse the sensor in distilled water or a pH 7 buffer solution between and after tests.
9. For optimum performance, it is best to use the meter at least once per month.

## For Best Measurement Results

1. Though it is not necessary, the PH-200 will be more accurate if calibrated before each use.
2. Rinse the sensor in distilled water or a pH 7 buffer solution after each test.
3. If an air bubble is lodged in the sensor, dip the meter in distilled water and stir. Remove the meter and shake any excess water off. Wipe the outside of the sensor dry with a soft tissue.
4. If the glass sensor is scratched, it must be replaced.
5. If the readings seem to slow down, or the meter has become unresponsive or sluggish, you may need to change the batteries or replace the sensor. Lifespans of sensors are limited and vary depending upon usage. It is normal for a sensor to wear out.

## FOR ADVANCED USERS ONLY - Resetting to the factory default. Follow these steps only if:

- A. You have replaced the sensor.
- B. Your meter has been used to continuously check widely varying pH levels.
- C. You find your meter is not working at optimum performance.

### To reset to the default pH settings:

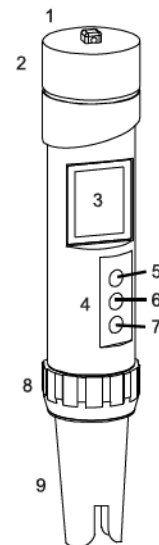
1. Turn on the meter in the air with the cap off (do not submerge in a liquid for this process).
2. Press and hold the HOLD button for 10 seconds.
3. 'End' will briefly appear. Release the HOLD button. Turn the meter off.
4. Recalibrate to pH 7.0 (see page 4).
5. Turn the meter off again. Your meter has been reset to the factory default settings.

### Calibrating the temperature (only do this if the temperature is incorrect):

1. You must have a correct thermometer next to the PH-200. Double-check the temperature first.
2. With the PH-200 off and the cap off and the meter in the air, press and hold ON/OFF and TEMP/CAL for 5 seconds. The meter will enter temperature calibration mode.
3. Adjust to the correct temperature by pressing the UP or DOWN buttons.
4. Once correct, click the ON/OFF button. The temperature will flash and the screen will display a flashing C...CA...CAL.
5. The screen will briefly display 'End' and then revert to measurement mode. The temperature is now calibrated.

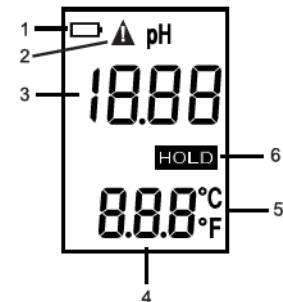
## Housing

1. Lanyard hook
2. Battery compartment
3. LCD display
4. Button panel
5. Power button
6. Calibration mode, temperature mode, calibration-up button
7. Hold, calibration-down button
8. Sensor gasket ring
9. Detachable sensor (electrode)



## LCD Display

1. Low battery indicator
2. Warning symbol
3. pH measurement
4. Temperature measurement
5. Celsius/Fahrenheit mode
6. Hold mode



## BEFORE YOU START!

1. The meter is shipped with the cap on tight to ensure proper condition of the electrode, which must remain wet. You will notice that there is liquid in the translucent cap (an electrode storage solution). Be careful not to spill it. To remove the cap, hold the meter and twist the cap off.
2. For new meters, for your first few tests, lightly swirl the meter in the water or solution you are testing 3 times and allow the meter to sit while adjusting to the reading.
3. If you need to test the pH of low conductivity/TDS water (below 50  $\mu$ S/25 ppm), you should do so only after using the meter a few times in a pH buffer solution or higher conductivity water.
4. Never touch the glass sensor or reference tube with your fingers. Be sure not to hit the sensor or reference tube against a glass or beaker, to avoid cracking it.
5. Always make sure that the cap is on tight after usage.