

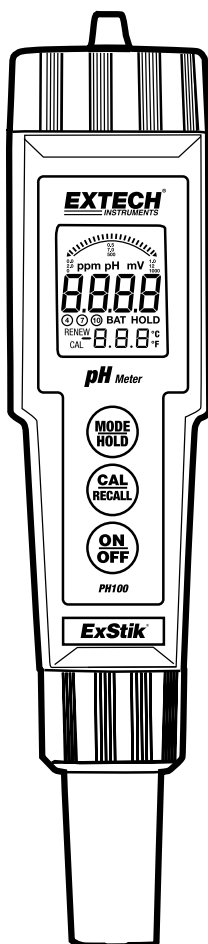


USER GUIDE

ExStik™ Waterproof pH Meters

Models PH100 and PH110

Patent Pending



Introduction

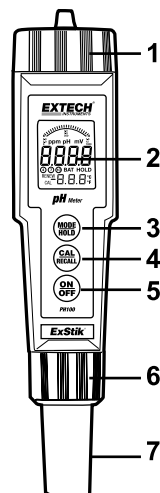
Thank you for selecting the Extech Model PH100 and/or the model PH110 (refillable) meter. This instrument is designed for high accuracy pH testing. This device is shipped fully tested and calibrated and, with proper use, will provide years of reliable service. Please visit our website (www.extech.com) to check for the latest version of this User Guide, Product Updates, Product Registration, and Customer Support.

ExStik™ Description

Front Panel Controls

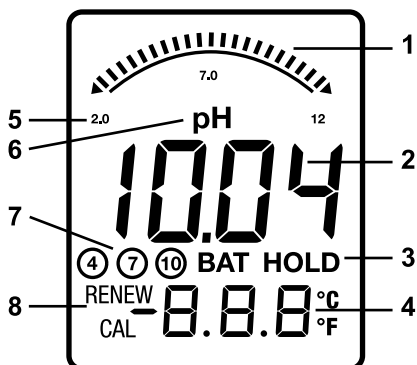
1. Battery compartment cap
2. LCD Display
3. MODE / HOLD button
4. CAL / RECALL button
5. ON/OFF button
6. Electrode collar
7. Electrode (refillable)

(Electrode cap is not shown)



Display

1. Bargraph reading
2. Measurement reading
3. BAT (low battery) and HOLD (data hold) indicators
4. Temperature display
5. Bargraph scale designations
6. Units of measure
7. Calibration indicators
8. RENEW and CAL indicators



CAUTIONS

- This device is not a toy and must not reach children's hands. It contains hazardous objects as well as small parts that the children could swallow. In case a child swallows any of them, please contact a physician immediately
- Do not leave batteries and packing material lying around unattended; they can be dangerous for children if they use them as toys
- In case the device is going to be unused for an extended period of time, remove the batteries to prevent them from draining
- Expired or damaged batteries can cause cauterization on contact with the skin. Always, use suitable hand gloves in such cases
- See that the batteries are not short-circuited. Do not throw batteries into the fire.

Overview

pH Overview

pH is a unit of measure (ranging from 0 to 14pH) indicating the degree of acidity or alkalinity of a solution. pH tests are the most commonly performed measurements in water analysis and reports the negative log of the hydrogen ion activity of a solution which is an indicator of acidity or alkalinity. Solutions with a pH less than 7 are considered acidic, solutions with a pH higher than 7 are known as bases, and solutions with a pH of exactly 7 are neutral.

The pH scale is logarithmic so, for example, if sample A is 1 pH less than Sample B, this means that Sample A is 10 times more acidic than Sample B. A difference of 1 pH represents a ten-fold difference in acidity.

Getting Started

- For new meters, remove the battery cap and then remove the battery insulating strip.
- Remove the cap from the bottom of the ExStik™ to expose the electrode glass surface and reference junction
- Before first use or after extended storage, soak the electrode (with its cap removed) in a pH 4 solution for about 10 minutes
- White KCL crystals may be present in the cap. These crystals will dissolve in the soak or they can be simply rinsed with tap water
- Always calibrate close to the expected measurement value
- A sponge is located in the electrode protective cap. Keep this sponge soaked with a pH 4 solution to preserve Electrode life during storage

Replacing Electrodes

The ExStik™ is shipped with an electrode attached. Electrode life is limited and is dependent on (among other factors) frequency of use and care. If the electrode needs to be replaced, follow these steps for removing and connecting electrodes. Note that the PH110 has a refillable electrode.

1. To remove an electrode, unscrew and completely remove the electrode retaining collar.
2. Gently rock the electrode from side to side, pulling it away from the meter, until it disconnects.
3. To attach an electrode, carefully plug the electrode into the meter socket (note that the electrode connector is keyed, ensuring proper connection).
4. Secure the electrode in place by tightly turning the collar in place. (a rubber gasket seals the electrode with the meter).

Automatic Electrode Recognition

When the ExStik™ is turned on, it recognizes the type of electrode that is connected and displays the appropriate unit of measure. Attach electrode before turning the ExStik™ on.

Powering the ExStik™

If the batteries are weak, the 'BAT' indicator appears on the LCD. Press the ON/OFF key to turn the ExStik™ on or off. The auto power off feature shuts the ExStik™ off automatically after 10 minutes of inactivity to preserve battery life.

Operation

Overview

When the electrode is placed in a solution, the main display and bargraph indicate the pH reading while the lower display reads temperature (readings flash until they have stabilized). The bargraph is 'center zero', i.e. at pH 7 there is no display. As the pH rises, the bar moves from the center to the right. If the pH drops, the bar moves from the center to the left.

pH Calibration (1, 2, or 3 points)

A two point calibration with a buffer of 7 plus 4 or 10 (whichever is nearest to the expected sample value) is always recommended. A one point calibration (choose the value closest to the expected sample value) is also valid. For best accuracy, always calibrate at the sample temperature.

1. Place the electrode into a buffer solution (4, 7, or 10) and momentarily press the CAL key. pH 7 should be calibrated first, then 4 and/or 10 pH.
2. The ExStik™ automatically recognizes the solution and calibrates itself to that value. Note: If the solution is more than 1pH off from the 4, 7, or 10pH standard, the ExStik™ will assume an error and abort the calibration. CAL and END will be displayed.
3. During calibration, the pH reading flashes on the main display.
4. When calibration is complete, the ExStik™ automatically displays 'END' and returns to normal operation mode.
5. The appropriate circled indicator ④, ⑦, or ⑩ will appear on the LCD when a calibration has been completed. The calibration data is stored until a new calibration is performed.
6. For a two or three point calibration, repeat steps 1-4.

Note: Always turn the meter off and then on before calibrating to allow sufficient time to complete the calibrations during one power cycle. If the meter auto powers off during calibration the calibrations remain valid, but new calibrations will turn the circled indicators off.

Note: The Automatic Temperature Compensation (ATC) circuit is not active during calibration. To ensure a more accurate calibration, make sure that the calibration buffers are at 25°C (77°F).

RESET

If the meter will not calibrate or displays a -1, reset the meter and attempt to re-calibrate.

1. Turn off the meter.
2. Remove the battery cartridge from the top of the meter.
3. Press the On/Off button for 10 seconds to bleed off all charges within the meter.
4. Re-insert the batteries and power on the meter.
5. Attempt to re-calibrate the meter.

Changing the Displayed Temperature Units

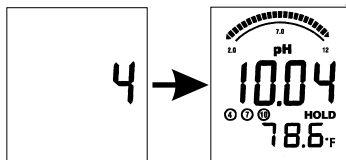
Press and hold the CAL button for approx. 3 seconds. The °C or °F icon will change first and the numerical temperature value will change *after* the button is released. If the Calibration mode is accidentally accessed 'CAL' appears on the LCD. Simply turn the ExStik™ off and start again.

Data Hold

Momentarily press the MODE button to freeze the current reading. The HOLD display icon will appear along with the held reading. The held reading will also be stored in memory. Momentarily press the MODE key to return to normal operation.

15-Storing Readings into Memory

1. Momentarily press the MODE button to store a reading. The LCD will briefly display the memory location number and then the value stored (Data Hold will activate).
2. Momentarily press MODE again to return to normal operation.
3. Repeat step 1 to store the next reading and so on.
4. After 15 readings are stored the ExStik™ will return to memory location 1 and start overwriting existing data with newly stored data.



Recalling Stored Readings

Note: Check that the HOLD symbol is not displayed. If it is, exit the HOLD function by momentarily pressing the MODE button.

1. Momentarily press the CAL button and then press the MODE button immediately after CAL is displayed; the storage location number (1 through 15) will flash. If the CAL mode is accidentally accessed (display flashing), press the CAL button again to exit.
2. The last reading stored will be displayed first. To advance through the stored readings, momentarily press the MODE button. The location number is displayed first, followed by the reading stored in that location.
3. To exit the recall mode, momentarily press the CAL button and the ExStik™ will return to normal operation.

CAL Reminder Display

When the ExStik™ is turned on in the pH mode for the 15th time without recalibration, the 'CAL' icon appears on the LCD indicating that the ExStik™ may require calibration. Some applications may require recalibration of the electrode more frequently than others. The CAL display is simply a reminder and will turn off when the pH electrode is recalibrated.

RENEW Display

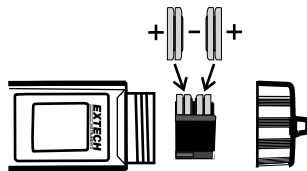
A flashing 'RENEW' warning indicates that the probe may be nearing the end of its useful life. If cleaning or recalibration does not cause the RENEW icon to disappear, replace the electrode. The RENEW display appears when the output of the pH electrode fails a diagnostic test.

Considerations

- If the unit appears to be locked (display frozen) it is possible that the Data Hold mode has been inadvertently accessed by pressing the MODE button. Simply press the MODE button again or turn the meter off and restart if the display appears frozen.
- If the meter does latch up and no button presses revive it, remove the batteries, push the ON button for 10 seconds and then reinsert the batteries.
- Note that if the batteries are removed, any stored readings will be discarded. Also, the user calibration data for pH will be cleared. New user pH calibration data is required. Factory calibration data for all models will be retained, however.

Battery Replacement

1. Twist off the battery compartment cap
2. Replace the four (4) 2032 batteries observing polarity.
3. Replace the battery compartment cap



Never dispose of used batteries or rechargeable batteries in household waste. As consumers, users are legally required to take used batteries to appropriate collection sites, the retail store where the batteries were purchased, or wherever batteries are sold.

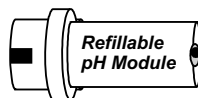
Disposal: Do not dispose of this instrument in household waste. The user is obligated to take end-of-life devices to a designated collection point for the disposal of electrical and electronic equipment.

Other Battery Safety Reminders

- Never dispose of batteries in a fire. Batteries may explode or leak.
- Never mix battery types. Always install new batteries of the same type.

pH Electrode Refilling (pH110/115 refillable electrode only)

The refillable electrode does not need to be detached from the body of the ExStik™ in order to perform the refilling procedure. Refillable electrodes (PH115) have a removable reference junction (slotted) and the word REFILLABLE on the side of the electrode housing.



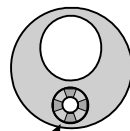
Removing the Reference Junction

The removal tool supplied with the PH113 Refill Kit is used to remove the reference junction from the sensing surface of the electrode. If the reference junction does not have slots for the 'teeth' of the removal tool to lock onto, the electrode is NOT refillable.

Holding the electrode upside down, unscrew and remove the reference junction using the removal tool.



Junction removal tool



Reference junction

Filling the Electrode

1. Once the reference junction  is removed, fill the cavity with the refill solution supplied in the Refill Kit.
2. Replace the reference junction using the removal/installation tool. (Spare junctions are provided if needed).

Filling Solution

The supplied container includes 15ml of filling solution. There is enough solution for 4 to 5 refills. Use only the supplied solution for refilling the electrode.

Specifications

Display	Multifunction LCD with Bargraph
Operating conditions	32 to 122°F (0 to 50°C) / < 80% RH
Range and Accuracy	0.00 to 14.00 / ± 0.01 pH typical
Temp. Compensation	Automatic from 32 to 194°F (0 to 90°C)
Temperature Range	23 to 194°F (-5 to 90°C)
Temperature Resolution	0.1° up to 99.9 then 1° thereafter
Temperature Accuracy	$\pm 1^\circ\text{C}/1.8^\circ\text{F}$ [from -5 to 50°C (23 to 122°F)] $\pm 3^\circ\text{C}/5.4^\circ\text{F}$ [from 50 to 90°C (122 to 194°F)]
Measurement storage	15 tagged (numbered) readings
Power	Four (4) CR2032 button batteries
Low battery indication	'BAT' appears on the LCD
Auto power off	After 10 minutes of inactivity
Dimensions	1.4x6.8x1.6"(35.6x172.7x40.6mm); 3.85oz (110g)

Optional Accessories

- Tripak buffers with 4, 7 & 10 pH capsules (6 each) plus two rinsing solutions (Part Number: PH103)
- pH 4.01 buffer, pint, (Part Number PH4-P)
- pH 7.00 buffer, pint, (Part Number PH7-P)
- pH 10.00 buffer, pint, (Part Number PH10-P)
- Spare pH Electrode – non-refillable (Part Number: PH105)
- Spare pH Electrode - refillable (Part number PH115)
- Electrode Refill solution (Part number PH113)
- Spare ORP electrode (Part Number: RE305)
- Spare Chlorine electrode (Part Number: CL205)
- Weighted base with 5 solution cups (Part Number: EX006)

Note: If the unit is to be converted for ORP or Chlorine use by attaching the proper electrode, please visit www.extech.com to download the proper User Guide