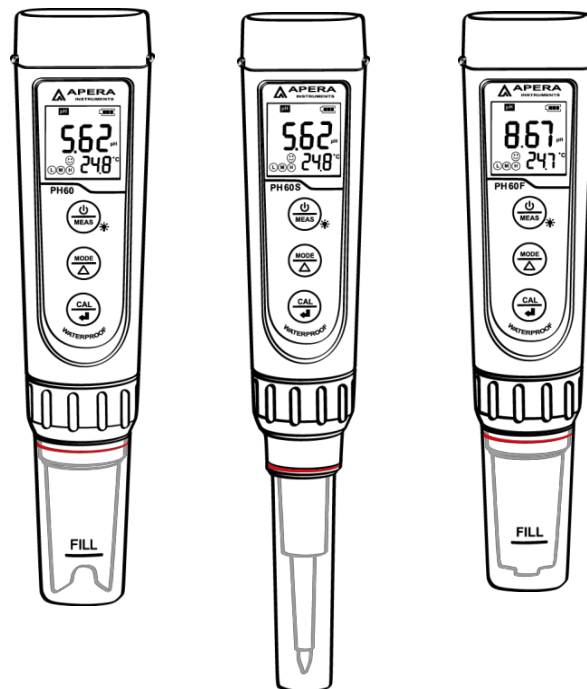


PH60 Series Premium Line pH Testers

User Manual

- PH60 pH Tester for General Purpose
- PH60S Spear pH Tester for Food and Solid Samples
- PH60F Flat pH Tester for Surface Testing



APERA INSTRUMENTS, LLC

aperainst.com

Thank you for purchasing Apera Instruments 60 Series Premium Line pH Tester Kit. Please read this manual carefully before use in order to properly use and maintain the product.

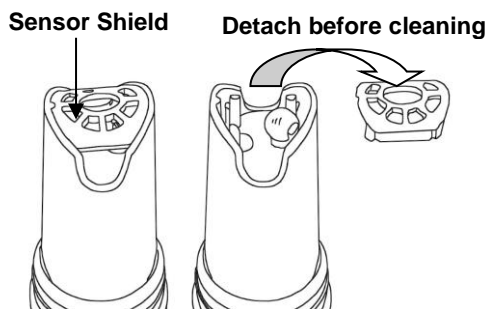
For video tutorials, please go to support.aperainst.com

Table of Contents

1 Battery Installation	3
2 Keypad Functions	3
3 Complete Kit	4
4 Preparation Before Use	4
5 pH Calibration	4
6 pH Measurement	6
7 Parameter Setting	8
8 ORP Measurement	10
9 Technical Specifications	10
10 Other Specifications	10
11 Probe Replacement	11
12 Warranty	12

SPECIAL NOTES

- For PH60 and PH60F models, we added a few drops of water in the probe cap before the product left factory in order to keep the sensitivity of the pH electrode. So it's normal if you find some water droplets in the probe cap for the first time use.
- When storing the tester, you can also add a few drops of water or pH 4.00 buffer in the probe cap to keep the electrode in an active state.
- The AAA alkaline batteries are pre-installed. Please pull off the insulation paper before powering on the tester.
- For PH60, there is a **sensor shield** on top of the pH electrode, protecting the glass bulb sensor from accidental damage. You can also detach the sensor shield when rinsing and cleaning the electrode as shown in the graph below. After cleaning, you can put the sensor shield back.



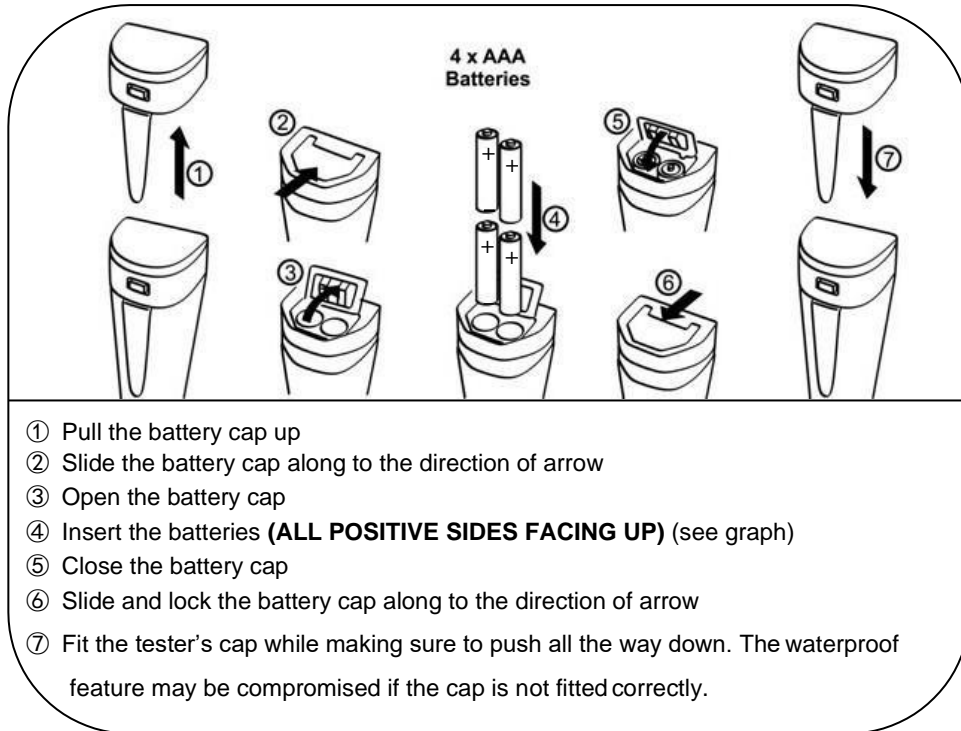
1 Battery Installation

Please install batteries according to the following steps. * Note the direction of batteries:

The anode (“+”) OF EVERY SINGLE Battery MUST face UP.

(WRONG INSTALLATION OF BATTERIES WILL CAUSE DAMAGE TO THE TESTER

AND POTENTIAL HAZARDS

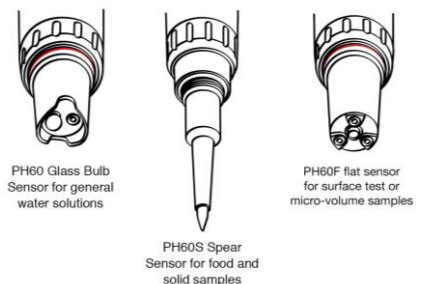
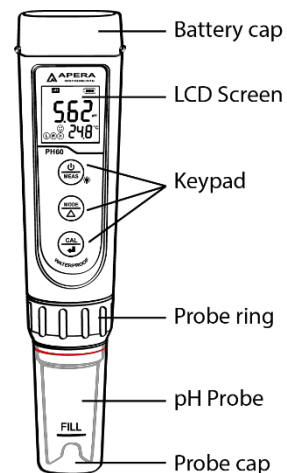


2 Keypad Functions

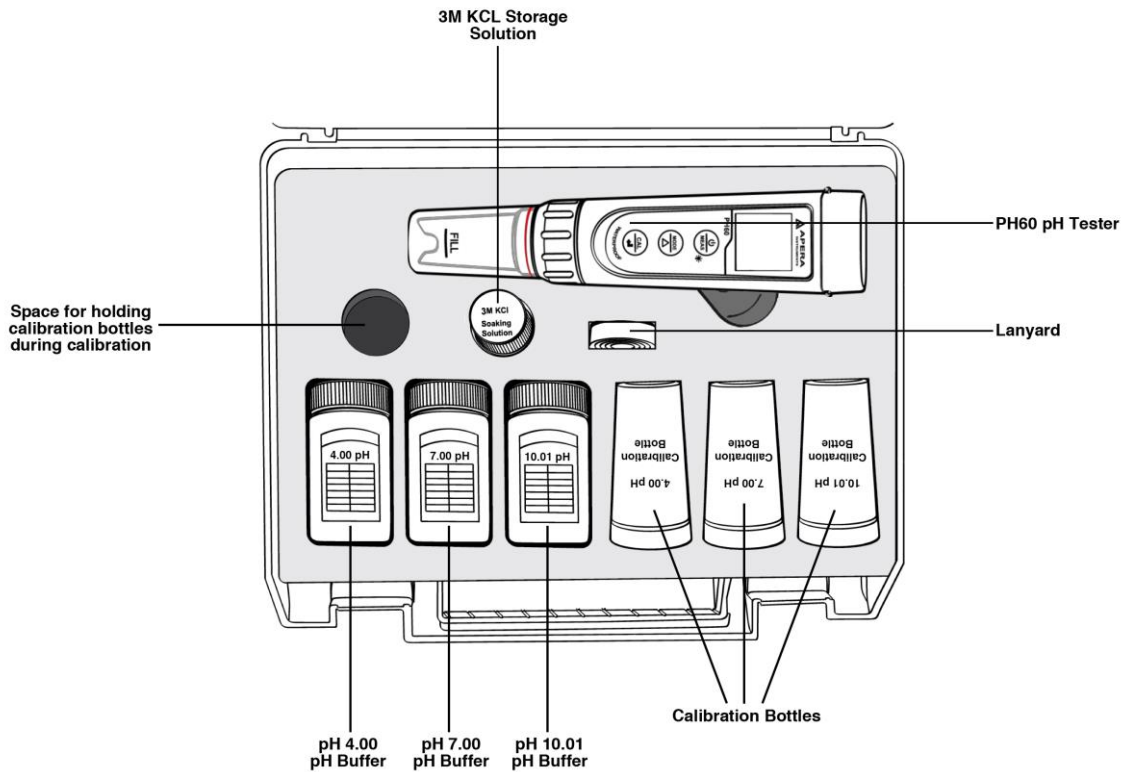
Short press: < 2 seconds

Long press: > 2 seconds

	<ol style="list-style-type: none"> 1. Short press to turn on the tester and long press to turn off the tester. 2. When turned off, long press to enter parameter setting. 3. In measurement mode, short press to turn on backlight.
	<ol style="list-style-type: none"> 1. In measurement mode, short press to switch parameter from pH → ORP (Oxidation Reduction Potential), ORP probe sold separately. 2. In mode setting, short press to change parameter (Unidirectional).
	<ol style="list-style-type: none"> 1. Long press to enter calibration mode; 2. In calibration mode, short press to confirm calibration; 3. When measured value is locked, short press to unlock.



3 Complete Kit




4 Preparation Before Use



- 4.1 Things needed in addition to what's in the box: A cup of distilled water (8-16oz) for rinsing the probe, and clean tissue paper for removing excess water.
- 4.2 For PH60 and PH60F: If the tester hasn't been used for a long time (> 1 month), or the tester's response is very slow, you can soak the probe in the 3M KCL storage solution overnight before use to restore the electrode's sensitivity. The storage solution is 3M KCL (SKU: A11107). One bottle of 10mL storage solution comes with the tester kit. If the storage solution was contaminated, please replace with new ones timely. ***DO NOT** use any other brand's storage solutions as potential damage could be caused to the probe.
- 4.3 For PH60S: **NEVER** store the spear pH probe in a dry condition because permanent damage can be caused. The spear probe should always be stored in the 3M KCL soaking solution when not in use.

5 pH Calibration



5.1 How to Calibrate


- 5.1.1 Short press  to power on. Rinse the probe in distilled water; Use clean tissue paper to dap off excess water.
- 5.1.2 Pour pH buffer solutions in the correspondent calibration bottles to about half volume.

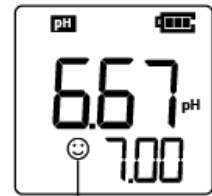
5.1.3 Dip the probe in the pH 7.00 buffer solution.

5.1.4 Long press  to enter calibration mode, the screen will turn green (in calibration mode, if you decide to quit calibration, short press  to return to measurement).



5.1.5 Stir the probe for a few seconds to eliminate potential air bubbles on the probe.




5.1.6 Allow it to stand still in the buffer solution until a stable reading is reached – when  appears and stays on the screen; short press  to complete 1st point calibration and the tester will return to measurement mode.

Icon  will appear at the bottom left of the screen, indicating the middle point of calibration has completed.



5.1.7 Rinse the probe in distilled water and dap off excess water with tissue paper. Dip the probe in pH 4.00 buffer solution, follow the steps from 5.1.5

to 5.1.7 to complete 2nd point calibration. Icons   will appear at the bottom left of the screen.

5.1.8 If you are to test alkaline samples, rinse the probe and dip it in pH 10.01 buffer solution, follow the steps from 5.1.5 to 5.1.7 to complete the 3rd point calibration. Icons    will appear at the bottom left of the screen.

5.2 Notes about Calibration

- The 1st point calibration must be 7.00 pH. Perform the 2nd and 3rd point calibrations (4.00, 10.01, 1.68, or 12.45) immediately after the 1st point calibration is finished. Do NOT turn off the meter before you calibrate 2nd or 3rd point. Otherwise, you will need to restart the calibration process with 7.00 pH first.
- The pH 4.00 and 7.00 buffer solutions poured into the calibration bottles can be used for about 10 times as long as they are not contaminated and the bottles are capped when not in use. pH 10.01 can only be used for less than 5 times of calibration as it will lose its accuracy faster. After that, replace the buffer solutions in the calibration bottles with new ones that are in the buffer bottles (50ml each) to keep the accuracy of the standard buffer solutions. Keeping the freshness and cleanliness of calibration buffers is the basis for accurate pH measurement. Do not pour used buffer solutions back into the buffer bottles in case of contamination.
- The tester can perform 1 to 3 points of automatic calibration. The tester can recognize 5 kinds of pH buffer solutions. For details, please refer to the following table:

Calibration	USA Series		NIST Series		Indication icon	Recommended
1-pt	7.00 pH		6.86 pH			Accuracy requirement \geq 0.1 pH
2-pt	Option A	1 st pt: 7.00 pH 2 nd pt: 4.00 pH or 1.68 pH	Option A	1 st pt: 6.86 pH 2 nd pt: 4.01 pH or 1.68 pH		Range < 7.00 pH
	Option B	1 st pt: 7.00 pH 2 nd pt: 10.01 pH or 12.45 pH	Option B	1 st pt: 6.86 pH 2 nd pt: 9.18 pH or 12.45 pH		Range >7.00 pH
3-pt	1 st pt: 7.00 pH 2 nd pt: 4.00 or 1.68 pH 3 rd pt: 10.01 or 12.45 pH		1 st pt: 6.86 pH 2 nd pt: 4.01 or 1.68 pH 3 rd pt: 9.18 pH or 12.45 pH			Range: 0 to 14.00 pH

5.3 Self-diagnosis

Icons	Self-diagnostic information	Checking and how to fix
<i>Er 1</i>	Wrong pH buffer solution or the range of calibration solution exceeds standard.	<ul style="list-style-type: none"> a) Check whether pH buffer solution is correct (1st point calibration must be 7.00). b) Check whether pH buffer solution is in good condition (fresh and clean) c) Check whether the probe is damaged. d) Check if there is any air bubble in the glass bulb. If so, shake it off.
<i>Er 2</i>	Press key when reading is not stable yet during calibration	Wait for the smiley face icon to appear and stay, then press to finish calibration

* If you find any air bubble in the glass bulb of the pH electrode, simply shake the tester in the air with force for a few times, and the bubble should disappear right after. The existence of an air bubble in the glass bulb will cause instable measurements.

6 pH Measurement

6.1 How to take pH measurements

Short press to turn on the tester. Rinse the probe in distilled water, shake the meter and dap off excess water with tissue paper (do not rub or wipe the glass sensor). Dip the probe in sample solution, stir gently, and allow it to stand until a stable reading is reached. Record readings after

appears and stays on the screen.

6.2 Applications of each model:

Model/Probe	Application
PH60/Bulb probe	<ul style="list-style-type: none">• General water solutions' pH measurement such as hydroponics, greenhouse, aquaculture, aquarium, pools and spas, water treatment, beverage making, drinking water, education, environmental monitoring, etc.
PH60S/Spear probe	<ul style="list-style-type: none">• Cheese, sushi rice, meat, fruit, dough, soil, solid culture medium and semi-solid medium measurement;• Also works well for general water solutions.
PH60F/Flat probe	<ul style="list-style-type: none">• Flat surface measurement such as skin, paper, fabric, leather and so on;• Small sample test (place sample fluid in the probe cap);• Also works well for general water solutions.

6.3 PH60S Spear probe testers are widely used for solids containing water or semi-solid medium. When conducting such tests, pay attention to insert probe evenly, and be careful to prevent probe from damage. ***If the medium is too hard (such as meat or fruits), please bore a small hole with a knife before inserting the probe.***

* For pH measurement of any food (such as sushi, cheese, etc.), it should always be a sampling test, which means test samples should no longer be edible.

6.4 How to direct-test soil pH with PH60S

- 1) If the soil is dry, add a small amount of distilled water to moisten the soil (do NOT add tap water since it will affect the pH value significantly). Ideally, wait 24 hours before you take a measurement.
- 2) Rinse the probe with distilled water before inserting it into the soil.
- 3) If measuring outside of solution, rockwool or small pots, remove the top 5cm/2inch soil from the surface of the sample area.
- 4) Insert the probe approximately 4 inches (10 cm) into the soil samples from various locations (3 to 4), wait for the stable readings before recording (smiley face icon stays on the screen).
- 5) Record the measurements, then take the average of the data as the representative pH level of the sample area.
- 6) Do NOT use extra force to insert the probe. If you feel like the probe can't be inserted any deeper, stop inserting. The spear tip could break.
- 7) Rinse off the soil residue between tests using distilled water for the best results.

6.5 PH60F Flat probe testers are mostly for flat surface sample test.

- For skin test: skin should be without sweat or dirt, nor be overly cleaned (do not use facewash products before testing) to avoid affecting measurement results, dampen skin with some distilled water, slightly force flat probe onto the skin, get readings after value stabilized.
- For paper, fabric, leather and other surface test: add 1~2 drops of distilled water on surface, then perform measurements.

6.6 Special Notes







- a) The pH probe must be rinsed thoroughly after each use. Warm soap water can be used to clean off grease or other contaminants.
- b) *The PH60 series testers are not designed for **testing low ion-concentration liquid such as distilled or deionized water**. To get a good measurement of these liquid, users need to use a specialized meter such as PH850-PW (AI5541). Contact us at info@aperainst.com for more details.*
- c) *When testing drinking water or RO water, it might take longer for the readings to get fully stabilized (typically 2-5 minutes).*
- d) *Do **NOT store probe in distilled or deionized water** because those low ion-concentration liquids could damage the pH electrode. They are only recommended for rinsing the probe.*

7 Parameter Setting

7.1 Setup Menu

Symbol	Contents	Parameter	Factory Default
P1	Select pH buffer solution	USA – NIST	USA
P2	Low value measurement alarm setting	0 to 14.00pH	0
P3	High value measurement alarm setting	0 to 14.00pH	14.00
P4	Select automatic lock	Off – On	Off
P5	Select backlight	Off - 1 - On	1
P6	Select temperature unit	°C - °F	°F
P7	Restore to factory default	No – Yes	No

7.2 Parameter setup method

When turned off, long press  to enter parameter setting → Short press  to switch P1-P2-...P7 → Short press , parameter flashing → Short press  to choose parameter → Short press  to confirm → Long press  to go back to measurement mode.




7.3 Parameter setting instruction

7.3.1 Select standard pH buffer solution (P1):

There are two options of standard buffer solutions: USA series and NIST series. Factory default is USA series, for details see clause 5.7.


7.3.2 Alarm Function (P2&P3)

Examples:

- Alarm triggered when measurement ≤ 3.20 pH:
Preset lowest value (P2) = 3.20 pH, highest value (P3) = 14.00 pH, when measured value ≤ 3.20 pH (stable  displays on LCD); LCD displays red backlight.
- Alarm triggered when measurement ≥ 8.60 pH:
Preset highest value (P3) = 8.60 pH, lowest value (P2) = 0.00 pH, when measured value ≥ 8.60 pH (stable  displays on LCD); LCD displays red backlight.
- Alarm triggered when measurement ≤ 3.20 pH or ≥ 8.60 pH
Preset lowest value (P2) = 3.20 pH, highest value (P3) = 8.60 pH, when measured value is lower than 3.20 pH or higher than 8.60 pH (stable  displays on LCD), LCD displays red backlight.

7.3.3 Automatic Lock (P4)

Select "On" to activate auto lock function. When reading is stable for more than 10 seconds, the tester will lock the value automatically, and **HOLD** icon will display on LCD. Short press

 key again to cancel the lock.

7.3.4 Backlight (P5)

"Off"-turn off backlight, "On"-always turn on backlight, "1"- backlight will last for 1 minute.



7.3.5 Temperature Unit (P5)

Select C° or F°, the factory default is °F.

7.3.6 Factory default setting (P7)

Select “Yes” to recover instrument calibration to the theoretical value (pH value in zero potential is 7.00pH, slope is 100%), parameter setting return to initial value. This function can be used when instrument does not work properly in calibration or measurement. Calibrate and measure again after recovering the instrument to factory default status.


8 ORP Measurement

ORP stands for Oxidation-Reduction Potential. ORP is a measure of the cleanliness of the water & its ability to break down contaminants. Refer to Section 11 to replace ORP probe (sold separately, SKU: AI1207), press  key to enter ORP mode. Rinse the probe in distilled water and dry it. Dip the probe in sample solution, stir gently, and allow it to stand still until a stable reading is reached. Record readings after  appears and stays.

9 Technical Specifications

pH	Measuring Range	-2.00 – 16.00 pH
	Resolution	0.01pH
	Accuracy	±0.01pH ±1 digit
	Calibration Points	1 – 3 points
	Automatic Temperature Compensation (ATC)	0 – 50°C (32 – 122°F)
ORP (mV)	Measuring Range	± 1000mV
	Resolution	1mV
	Accuracy	±0.2% F.S
Temp.	Measuring Range	0 – 50°C (32 – 122°F)
	Resolution	0.1°C
	Accuracy	±0.5°C

10 Other Specifications

LCD	3-color LCD screen, Blue: Measurement; Green: Calibration; Red: Alarm
Reading Lock	HOLD
Low-Voltage Warning	 Flashing, reminder of battery replacement needed
Auto. Power-Off	In 8 minutes without operation

Water Proof Rating	IP67
Power	DC3V, AAA batteriesx4
Battery Life	Continuous operation > 2000 hours
Dimension/Weight	Tester: 40x40x178mm/133g; Case: 255x210x50mm/700g;

11 Probe Replacement

11.1 Every pH probe gradually loses its sensitivity as it's being used. A typical service life of a pH probe is 1-2 years depending on many factors such as frequency of use, nature of test samples, and how well it is maintained, etc. Apera Instruments recommends replacing the pH probe after one year of frequent use to guarantee the optimal performance of a pH meter.

11.2 How to replace the probe: Twist off the probe ring, unplug the probe, plug in new probe (pay attention to probe's position), and twist on the probe ring.

11.3 The model numbers of the replacement probes that are compatible with the PH60 Series Meters:

- **AI1201 PH60-E (Regular pH glass bulb probe)**
- **AI3711-E PH60-DE (Double-junction pH glass bulb probe)**
- **AI1205 PH60S-E (Spear pH probe for solids/semi-solids pH testing)**
- **AI1203 PH60F-E (Flat pH probe for surface pH testing)**
- **AI1207 ORP60-E (ORP probe)**

12 Warranty

We warrant this instrument to be free from defects in material and workmanship and agree to repair or replace free of charge, at option of APERA INSTRUMENTS, LLC, any malfunctioned or damaged product attributable to responsibility of APERA INSTRUMENTS, LLC for a period of TWO YEARS (SIX MONTHS for the probe) from the delivery.

This limited warranty does not cover any damages due to:

Transportation, storage, improper use, failure to follow the product instructions or to perform any preventive maintenance, modifications, combination or use with any products, materials, processes, systems or other matter not provided or authorized in writing by us, unauthorized repair, normal wear and tear, or external causes such as accidents, abuse, or other actions or events beyond our reasonable control.

To submit a warranty request, go to support.aperainst.com and click “**New Support Ticket**” on the upper right corner. Type your email in the requester field, Warranty in the Subject field, and then input the following information in the description field:

- Your full name
- Product model that needs warranty fulfillment
- Serial number of the product (can be found on the back sticker of the tester body)
- What problem or issue you had experienced with the product
- Attach a purchase receipt screenshot or photo

Then click Submit. One of our customer care specialists will help you fulfill the warranty in one business day.

APERA INSTRUMENTS, LLC

Address: 6656 Busch Blvd, Columbus Ohio 43229

Tel: 1-614-285-3080

Email: info@aperainst.com

Website: [aperainst.com](https://www.aperainst.com)