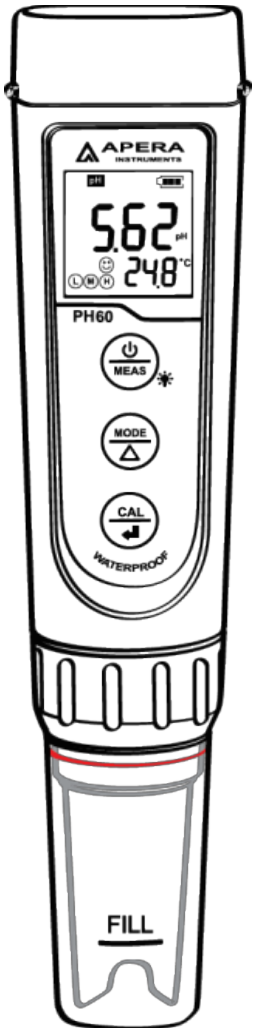
APERA INSTRUMENTS
Fluid Precision since 1991

Premium Series PH60 pH Tester

pH | mV | Temperature

User Manual



RoHS compliant | ISO 9001: 2015 | CE | IP67

APERA INSTRUMENTS, LLC
aperainst.com

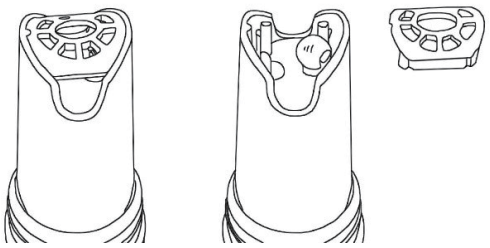
Table of Contents

Thank you for purchasing Apera Instruments PH60 Premium pH Tester. Please read this manual before use in order to properly use and maintain the product.

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

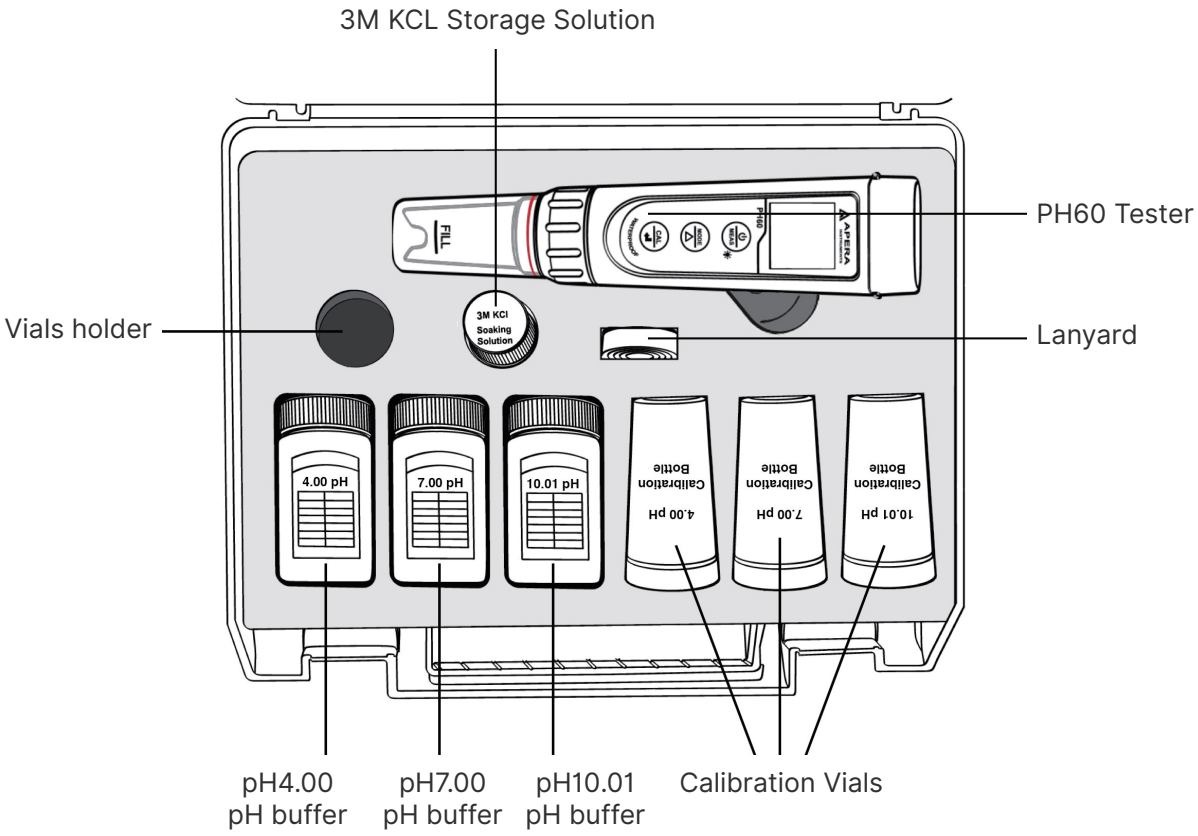
ATTENTION

- Water droplets are added during production to maintain the moisture of the probe. This is normal practice and should not be attributed to used product.
- Never use the product when it's freezing cold. Let it warm to room temperature before using.
- here is a sensor shield on top of the pH sensor, protecting the glass bulb sensor from accidental damage. You can detach the sensor shield when rinsing and cleaning the sensor as shown in the graph below. Put back the sensor shield after cleaning



Sensor Shield Detach before cleaning

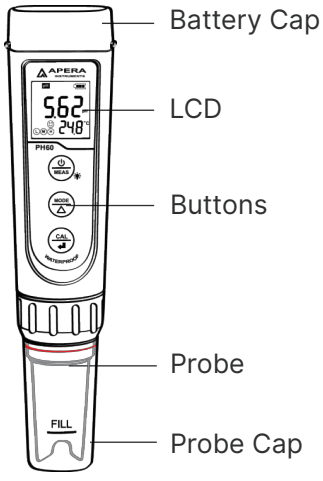
1. What's in the Kit



2. Keypad Functions

Short press: < 2 seconds **Long press:** > 2 seconds

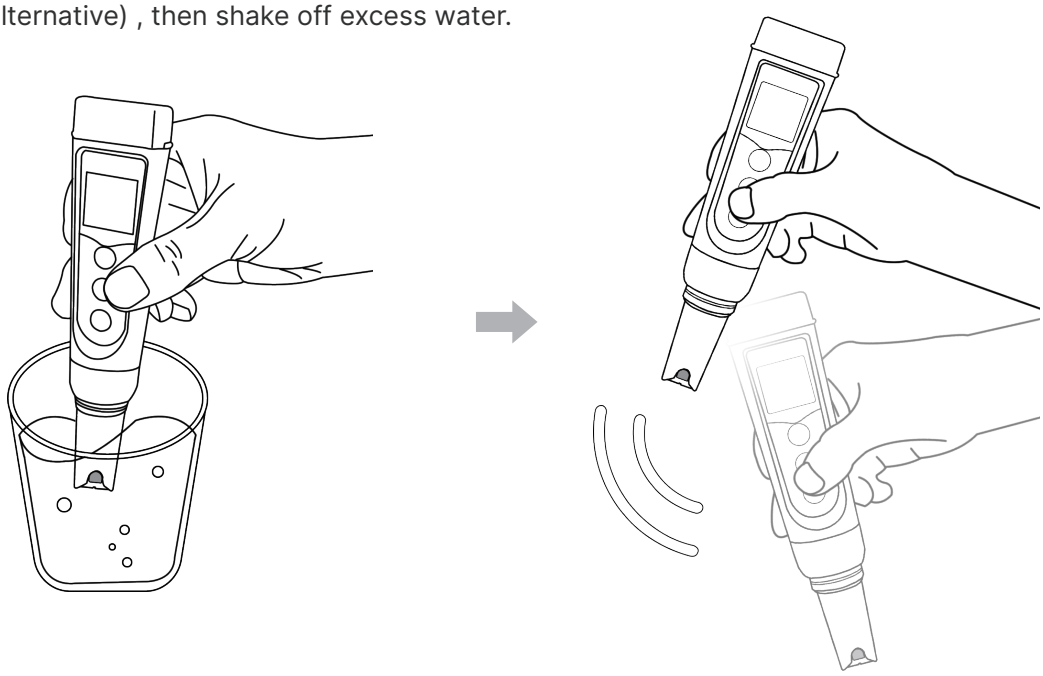
MEAS	1. Short press to turn on the tester and long press to turn off the tester. 2. When turned off, long press to enter parameter setting. 3. In measurement mode, short press to turn on backlight. 4. In calibration mode, short press to cancel calibration.
MODE	1. In measurement mode, short press to switch between pH and mV measurement mode. 2. In settings, short press to change parameters (Unidirectional).
CAL	1. Long press to enter calibration mode. 2. In calibration mode, short press to confirm calibration. 3. When reading is locked (auto. HOLD on), short press to unlock.



3. Preparation before Use

3.1 Pull out the battery insulation slip, and take off the probe cap.

3.2 Rinse off the probe in pure water (preferably distilled or deionized water. RO water or tap water is the alternative) , then shake off excess water.



3.3 Perform at least a 2-point calibration. For tutorial, refer to Section 4.

3.4 If the tester hasn't been used for a long time (over 1 month), please soak the probe in the 3M KCL soaking solution for 15 minutes, then calibrate it before test.

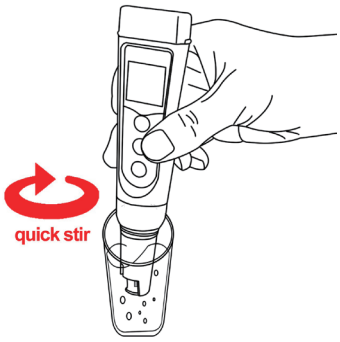
4. pH Calibration

4.1 How to Calibrate

4.1.1 Short press (MEAS) to power on.

4.1.2 Pour pH buffer solutions into the corresponding calibration vials to about half volume.

4.1.3 Rinse the probe in pure water; Shake off excess water. Dip the probe in the pH 7.00 buffer solution first, and make a quick stir in the solution, then hold still.



4.1.4 Long press (CAL) to enter calibration mode, the screen will turn green (Short press (MEAS) if you decide to quit calibration and return to measurement mode).

4.1.5 Wait for the reading to stabilize (when ☺ stays on the screen), then short press CAL to finish the first point calibration. The tester returns to measurement mode and icon (M) will appear at the bottom left, indicating a successful 1-point calibration (the middle point).

4.1.6 To calibrate second point, use pH 4.00 buffer and repeat Step 4.1.3 to 4.1.5 (Do NOT turn off the tester after you finish pH 7 calibration). (L) will display next to (M) , indicating a successful 2-point calibration (low and middle points).

4.1.7 To calibrate third point, use pH 10.01 buffer and repeat Step 4.1.3 to 4.1.5 (Do NOT turn off the tester after you finish second point calibration), (H) will show up next to (L) and (M) , indicating a successful 3-point calibration (high, low, and middle points).

4.2 Notes about Calibration

a) The first point calibration must be 7.00 pH. Perform the second and third point calibrations (4.00, 10.01, 1.68, or 12.45) immediately after the first point calibration is finished. Do NOT turn off the meter before you calibrate second or third point. Otherwise, you will need to restart the calibration process with 7.00 pH first.

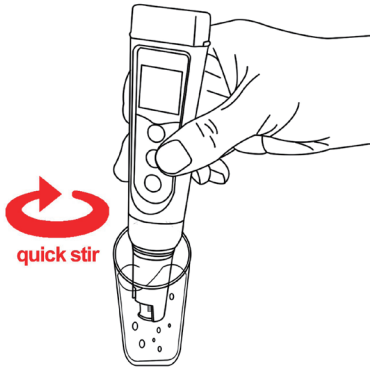
b) The pH 4.00 and 7.00 buffer solutions poured into the calibration vials can be used for up to 10 times as long as they are not contaminated and the bottles are capped when not in use. pH 10.01 can only be used for up to 5 times as it will lose its accuracy much faster. After that, replace the buffer solutions in the calibration vials with new ones to keep the accuracy. Keeping the freshness and cleanliness of calibration buffers is essential for accurate pH measurement.

c) The tester can perform 1 to 3 points of automatic calibration and can recognize 5 types of pH standard solutions. For details, please refer to the following table:

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

5. pH Measurement

5.1 How to take pH measurements



Short press (MEAS) to turn on the tester. Rinse the probe in pure water, shake off excess water. Insert the probe in your sample solution, make a quick stir and hold still. Record the reading when it is stabilized (☺ comes up and stays on screen). Or if you turn on the Auto-Hold function (refer to Section 8.3.3), the reading will be automatically locked when it's stable for more than 10 seconds. Short press (CAL) to cancel the Auto-Hold and keep measuring.

5.2 Pure Water pH Measurement

When testing pure water like tap water, drinking water, RO water and distilled water, it will take longer for the readings to get fully stabilized (typically 1-5 minutes). Please be patient. If still not working, add Apera 3M KCL (AI1107) to your pure water at the ratio of 1:1000 (e.g. 1 ml KCL to 1000 ml water) to accelerate stabilization while minimizing pH change. If the accuracy is not meeting your requirement, please contact us at info@aperainst.com to find the specialized meter designed for pure water pH test.

6. Probe Cleaning

6.1 The tester is only as accurate as the probe is clean. Always thoroughly rinse off the probe before and after each measurement with pure water in a container or with a wash bottle.

6.2 For tough contaminants, detach the sensor shield, soak the probe in Apera probe cleaning solution (AI1166) or detergent water for 30 minutes. Then use a soft brush to remove the contaminants. Afterwards, soak the probe in 3M KCL soaking solution for at least 1 hour. Rinse it off, then re-calibrate the tester before using again.

7. Probe Storage

7.1 Add 3M KCL soaking solution to the Fill line in the probe cap and store the probe in it. Close on the probe cap tightly with the O-ring.

7.2 If you find white crystals inside or outside the probe cap, it is perfectly normal. It is the 3M KCL soaking solution that crystalizes over time by its nature. Just rinse them off and add in new soaking solution. This chemical is not poisonous nor dangerous, and the probe's performance will not be affected at all.

7.3 **NEVER** store the probe in pure water like tap, RO, distilled, or deionized water as they could damage the pH probe. If this happens, immediately soak the pH probe Apera 3M KCL soaking solution overnight, then re-calibrate it before using. Pure water is only for rinsing the probe.

8. Parameter Settings

8.1 Setup Menu

Symbol	Parameter Setting Contents	Code	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	Auto. Hold	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

8.2 Parameter Setup

When turned off, long press (MEAS) to enter parameter settings → Short press (MODE) to switch P1-P2-P3...P7 → Short press (CAL) to select parameter (starts flickering) → Short press (MODE) to change parameter → Short press (CAL) to confirm the change → Long press (MEAS) to return to measurement mode.

8.3 Parameter Setting Instruction

8.3.1 **Standard pH Buffer Series (P1)**

There are two options of standard buffer series: USA series and NIST series. Factory default is USA series, for details see section 4.2.

8.3.2 **Alarm Function (P2&P3) Examples**

a) Alarm triggered when reading ≤ 3.20 pH:

Set lowest value (P2) to 3.20 pH, highest value (P3) to 14.00 pH, when stable reading is less than 3.20 pH , the screen turns red to send off the alarm.

b) Alarm triggered when reading ≥ 8.60 pH:

Set highest value (P3) to 8.60 pH, lowest value (P2) to 0.00 pH, when the stable reading is greater than 8.60 pH, the screen turns red to send off the alarm.

c) Alarm triggered when reading ≤ 3.20 pH or ≥ 8.60 pH

Set lowest value (P2) = 3.20 pH, highest value (P3) = 8.60 pH, when the stable reading is less than 3.20 pH or greater than 8.60 pH, the screen turns red to send off the alarm.

8.3.3 **Aut0-Hold (P4)**: Select "**On**" to activate the Auto-Hold function. When reading is stable for more than 10 seconds, the tester will lock the value automatically, and **HOLD** icon will show up on LCD. Short-press (CAL) to cancel the auto-hold (**HOLD** icon will go off).

8.3.4 **Backlight (P5)**: "**Off**"-turn off backlight, "**On**"-turn on backlight, **1**- backlight will last for 1 minute.

8.3.5 **Temperature Unit (P6)**: Select between C° and F°.

8.3.6 **Factory default setting (P7)**: Select "**Yes**" to set the meter to its default status (erase all calibration record and return all parameter settings to the default value). This function can be used when the meter does not work well in calibration or measurement. Calibrate the meter again after setting the meter to factory default.

9. ORP Measurement

ORP stands for Oxidation-Reduction Potential. ORP is a measure of the cleanliness of the water & its ability to break down contaminants. An ORP probe needs to be installed to test ORP (sold separately, SKU: AI1207). After powering on the tester, press MODE to enter ORP mode (mV). Rinse the probe in distilled water and dry it. Dip the probe in your sample solution, make a quick stir, and hold still. Record the reading after it is fully stabilized.

10. Technical Specifications

pH	Measuring Range	-2.00 – 16.00 pH
	Resolution	0.01 pH
	Accuracy	±0.01 pH ±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

11. Other Specifications

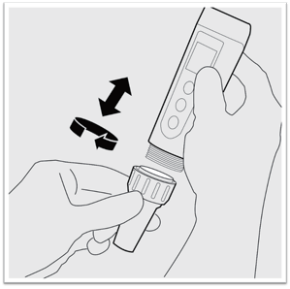
Screen	3-color LCD screen, Blue: Measurement; Green: Calibration; Red: Alarm
Reading Lock	**HOLD** comes up on screen
Low-Voltage Warning	flashing, reminder of battery replacement needed
Auto. Power-Off	In 8 minutes without operation
Waterproof Rating	IP67
Power	DC3V, AAA alkaline batteries×4
Battery Life	Operation up to 2000 hours
Dimension& weight	Tester: 40×40×178mm/133g; Case: 255×210×50mm/700g;

12. Probe Replacement

12.1 Every pH probe gradually loses its sensitivity and will eventually fail. 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 every 1 to 2 years to guarantee the optimal performance.

12.2 To replace a probe:

1) Take off the probe cap
2) Screw off the probe ring
3) Unplug the probe
4) Plug in the new replacement probe (pay attention to the probe's position);
5) Screw on the probe ring tightly. Soak the probe in 3M KCL for 5-15 minutes. Then perform calibration before testing.



12.3 The replacement probes compatible with PH60:

- AI1201 PH60-E (Regular pH glass bulb probe for general water solutions)
- AI3711-E PH60-DE (Double-junction pH glass bulb probe for complex solutions)
- AI1205 PH60S-E (Spear pH probe for soft-solids pH testing)
- AI1203 PH60F-E (Flat pH probe for surface pH testing)
- AI1207 ORP60-E (ORP probe)

13. Notes

a) Avoid testing in very high (>113°F) or very low (<41°F) temperature solutions as it will cause greater measurement error and potential damage to the probe. Test your samples and perform calibration close to room temperature as much as possible.

b) NEVER store the probe in pure water like tap, RO, distilled, or deionized water as they could damage the pH probe. If this happens, immediately soak the pH probe Apera 3M KCL soaking solution overnight, then re-calibrate it before using. Pure water is only for rinsing the probe.

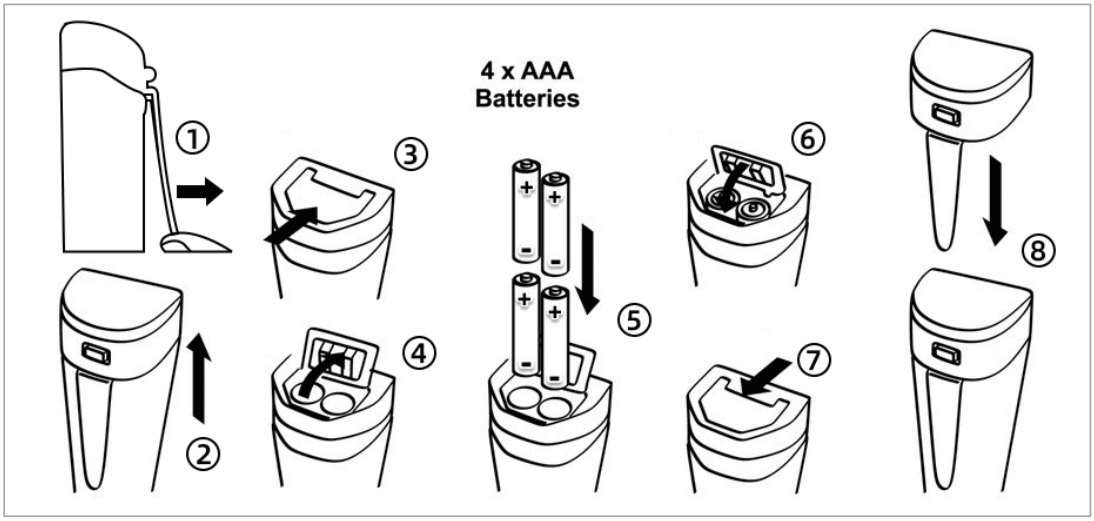
c) Never use your finger to touch the glass membrane or use other material to rub it. Doing so could generate static electricity and cause measurement errors. Never test oily liquids.

d) Make sure the battery cap is completely closed with the red O-ring. Otherwise, the waterproof rating could be compromised.

14. Battery Replacement

Please install batteries according to the following steps. *Please note the correct direction of battery installation: **The Positive Side ("+") OF EVERY SINGLE Battery MUST FACE UP.**

⚠ **(WRONG INSTALLATION OF BATTERIES WILL CAUSE DAMAGE TO THE TESTER& BATTERY LEAK!)**



① Loosen the battery cap lock ② Pull off the battery cap

③ Slide and unlock battery compartment ④ Open the battery compartment

⑤ Insert the batteries (all POSITIVE sides FACE UP) ⑥ Press down the battery compartment

⑦ Slide and lock the battery compartment ⑧ Close on the battery cap

15. Troubleshooting Guide

Trouble	Potential Reasons	How to Fix
Cannot calibrate	Incorrect calibration order	When powered on, calibrate pH 7 first, then pH 4. After pH 4 is calibrated, if you want to calibrate pH7 again, you need to power off and restart the tester.
	Bad standard solutions	Replace with a new reliable buffer solution.
	Contaminated probe	Clean the electrode, it is best to use a cleaning solution.
	Aged probe	Replace the probe.
	Dried-out probe	Soak in the soaking solution overnight.
	Probe is not fully submerged in the solution	Make sure the electrode is immersed in the solution at least 3 cm.
	Air bubbles around the sensor	Make a quick stir in the solution to remove air bubbles.
Reading is always slowly changing, won't stabilize.	Contaminated probe	Clean the electrode, it is best to use a cleaning solution.
	Clogged junction	Clean the electrode with cleaning solution, then soak it in 3M KCL storage solution overnight.
	Aged probe	Replace the probe.
	Testing purified water like tap water, drinking water and RO water	Be patient, wait for 2-5 minutes to fully stabilize. If still not stabilizing, add in 1ml of 3M KCL solution to 1000ml of test solution.
	Testing low ion concentration solutions e.g. distilled water and deionized water	Contact Apera for a specialized pH electrode suitable for low ion concentration solutions.
Display similar readings in any solutions or always display 7.0 pH	Broken probe	If you don't find any visible damage of the electrode and it's within the 6-month electrode warranty, contact us for warranty fulfillment; If there is visible damage, replace the electrode.
	Instrument defect	Contact us for warranty fulfillment
Reading keeps jumping	Probe is not fully submerged in the solution	Make sure the electrode is immersed into the solution for at least 1 inch.
	Air bubbles around the sensor shield	Make a quick stir in the solution to remove air bubbles.
	Probe is not properly connected or the connector is broken.	Check the electrode's connector, make sure it's not broken and is correctly connected. Align the electrode and instrument correctly before plugging in. Never force it. Ensure that the electrode connector is not exposed to the air too long.
Calibration is successful, but reading is not accurate	Aged probe	Replace the probe.
	Air bubbles around the sensor	Make a quick stir in the solution to remove air bubbles.
	Clogged junction	Clean the electrode with cleaning solution, then soak it in 3M KCL storage solution overnight.
	Comparison with other testers, test strips, or drop tests	To compare with other testers, make sure to perform a 2-point calibration for all testers in the same standards, then test a 3rd point. Whichever gives more accurate reading in the 3rd point standard is the most accurate one. Test strips or drop tests' accuracy is not comparable to pH meters'.
	Calibration standards are not in good condition	Make sure your calibration standards are fresh and clean, and made by a legitimate scientific equipment manufacturer.
	Your electrode is not suitable for your test sample or testing environment	Contact us to find the most appropriate electrode for your specific application.

16. 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:
Accidental damage, transportation, storage, improper use, failure to follow the product instructions or to perform any preventive maintenance, unauthorized repair or modifications, normal wear and tear, or other external causes or actions beyond our reasonable control.

To get the fastest warranty fulfillment, go to support.aperainst.com and click “New Support Ticket” on the upper right corner. Then fill in the form and click Submit. One of our customer care specialists will help you fulfill the warranty within one business day.

APERA INSTRUMENTS, LLC

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