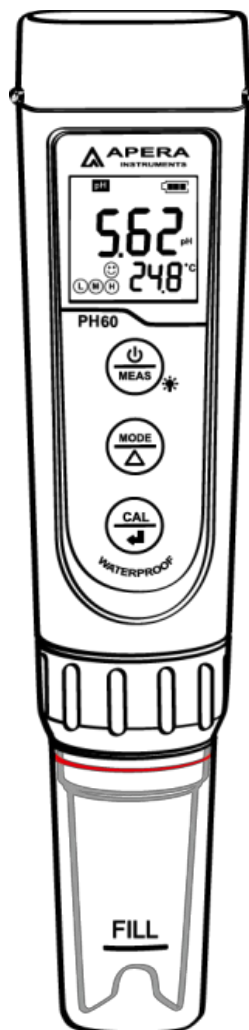


Premium Series PH60 pH Tester

pH | mV | Temperature

User Manual



ISO 9001: 2015



IP67

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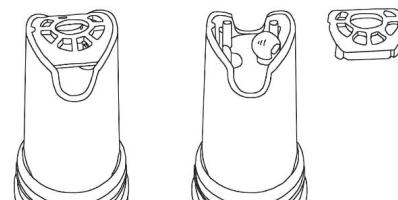


[scan to watch video tutorial](#)

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

ATTENTION

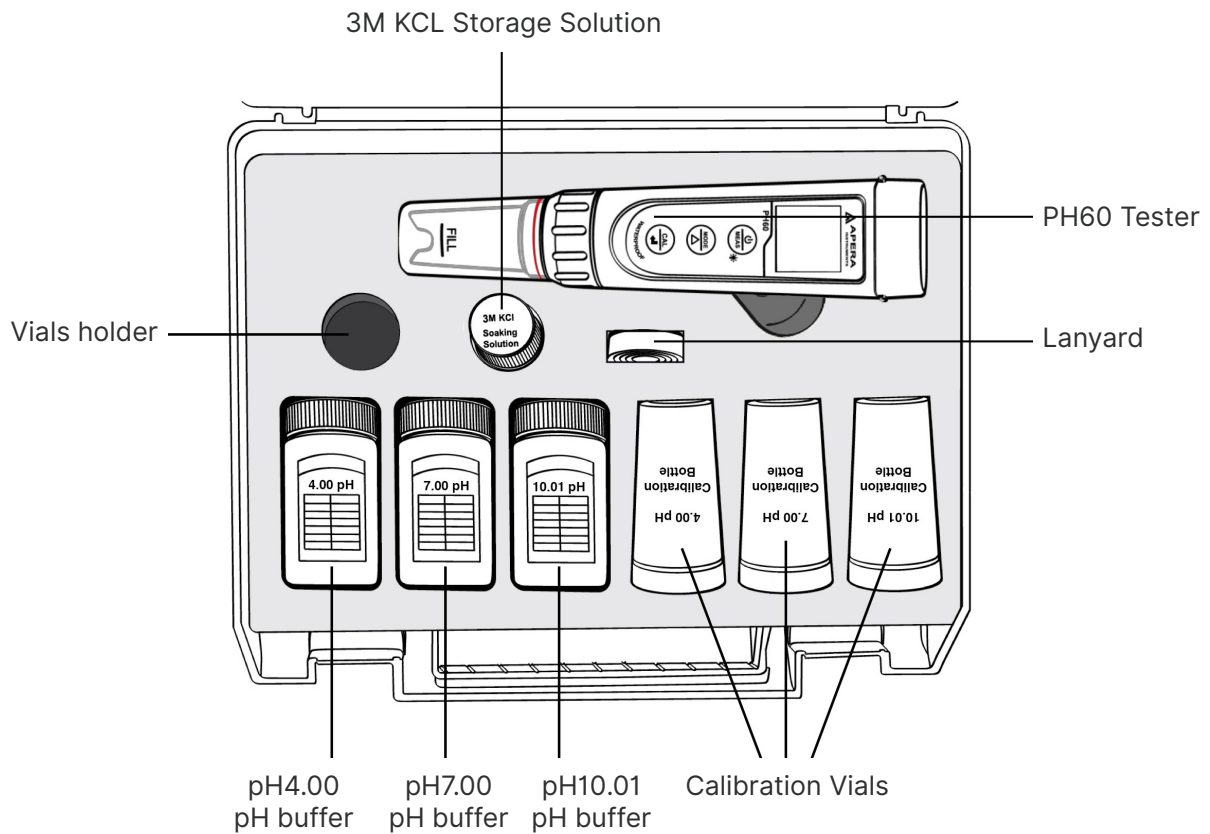
- Water droplets are added during production to maintain the moisture of the probe. This is normal practice and should not be attributed to used product.
- Never use the product when it's freezing cold. Let it warm to room temperature before using.
- The latest PH60 Tester comes with an upgraded probe structure equipped with a sensor shield that prevents glass bulb breakage from accidental collisions (see picture below). You can remove the shield when cleaning the sensor and put it back on after cleaning.



Sensor Shield




Detach before cleaning

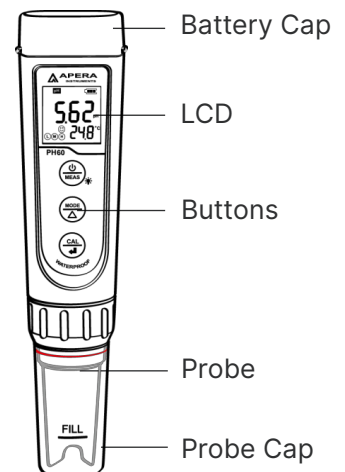
1. What's in the Kit



2. Keypad Functions

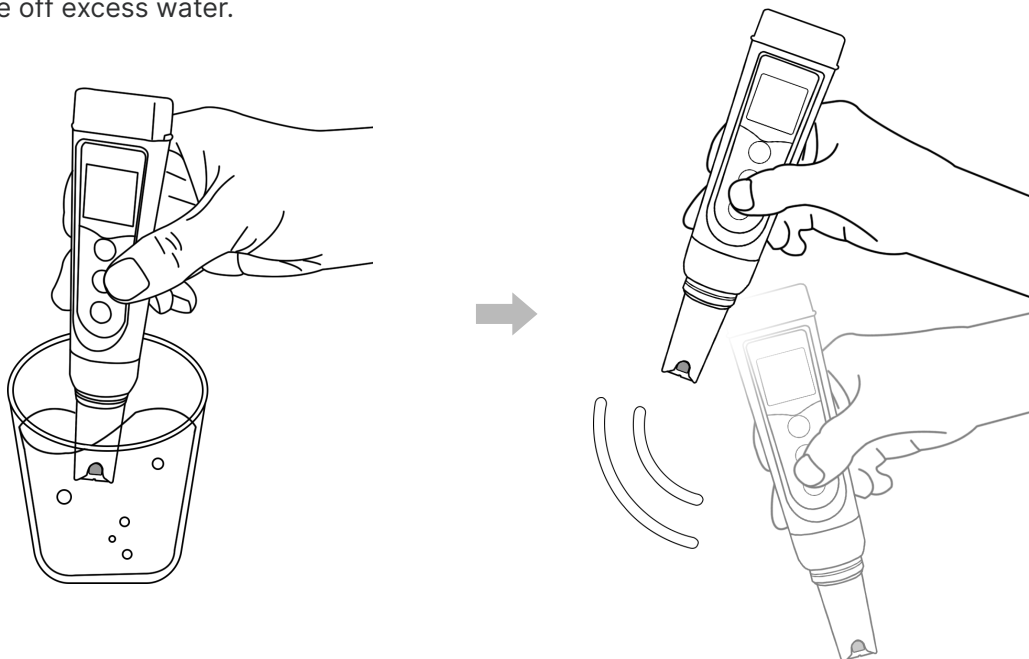
Short press (tap): < 2 seconds **Long press (hold):** > 2 seconds

	<ol style="list-style-type: none"> Short press to turn on the tester and long press to turn off the tester. When turned off, long press to enter parameter setting. In measurement mode, short press to turn on backlight. In calibration mode, short press to cancel calibration.
	<ol style="list-style-type: none"> In measurement mode, short press to switch between pH and mV measurement mode. In settings, short press to change parameters (Unidirectional).
	<ol style="list-style-type: none"> Long press to enter calibration mode. In calibration mode, short press to confirm calibration. 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 is ok.) , then shake off excess water.

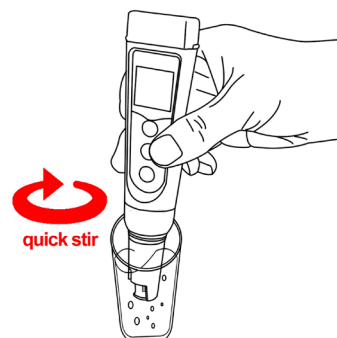










- 3.3 Perform at least a 2-point calibration. For tutorial, refer to Section 4.
- 3.4 If the tester hasn't been used for a long time (over 1 month), please soak the probe in the 3M KCL soaking solution for 15 minutes, then calibrate it before test.

4. pH Calibration

4.1 How to Calibrate









- 4.1.1 Short press  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 let it stand.
- 4.1.4 Long press  to enter calibration mode, the screen will turn green (Short press  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  again to finish the first point calibration (**pressing  too early could lead to Er2 error**). "7.00" will be flickering and the meter will return to measurement mode. Icon  (the middle point) will appear at the bottom left, indicating a successful 1-point calibration.
- 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). "4.00" will be flickering and  will display next to , 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). "10.01" will be flickering and  will show up next to  and , indicating a successful 3-point calibration (high, low, and middle points).




4.2 Notes about Calibration

- 4.2.1 **Always start calibrating with pH 7.00 first.** Perform the 2nd and 3rd point calibration immediately after the 1st point is finished. **Do NOT turn off the meter before you calibrate the second or third point.** Otherwise, after you restart the meter and perform calibration in pH 4.00 or pH 10.01, Er1 error will be generated and you will have to calibrate with pH 7.00 again. For more troubleshooting tips with calibration, refer to Section 14.
- 4.2.2 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. **NEVER pour back** the used calibration solutions into the solution bottles.
- 4.2.3 **How often to calibrate?** — The frequency that you should calibrate your pH meter depends on many factors such as the type of your test samples, performance of electrodes, and the requirement of the accuracy. For high-accuracy measurement (error tolerance $< \pm 0.02 \text{pH}$), the meter should be calibrated before test every time; For general-accuracy measurement (error tolerance $> \pm 0.05 \text{pH}$), the meter can be used for a week or longer after calibration.
- 4.2.4 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		Icon	When to use
1-point	7.00 pH		6.86 pH			Accuracy requirement $\geq 0.1 \text{pH}$
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	 	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	 	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		  	Range: 0 to 14.00 pH

5. pH Measurement

5.1 How to Take pH Measurement

- 5.1.1 Short press  to turn on the tester. Rinse the probe in pure water, shake off excess water. Submerge the probe in your sample solution for at least 1 inch deep, make a quick stir and hold still. Record the stabilized reading as your pH measurement ( comes up and stays on screen). Note that when the pH probe is in the air, it's normal that the reading is randomly jumping.
- 5.1.2 If you turn on the Auto-Hold function (refer to Section 8.3.5), the reading will be automatically locked when it's stable for more than 10 seconds. Short press  to cancel the Auto-Hold and keep measuring.
- 5.1.3 To achieve the best measurement accuracy, calibrate the pH probe at the same/similar temperature as your sample.
- 5.1.4 **Avoid** testing in very high (>113°F) or very low (<41°F) temperature solutions as it will cause greater measurement error and will shorten the pH probe's life span.

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. Before taking measurement, soak the probe in pH 4.00 buffer solution for 30 seconds. If reading is not stabilized in 5 minutes, 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 does not meet your requirement, please contact Apera 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 test with clean water in a container and shake off excess water.
- 6.2 For tough contaminants, detach the sensor shield, soak the probe in Apera's cleaning solution (AI1166) or detergent water for 30 minutes. Then use a soft brush to remove the contaminants. Afterwards, soak the probe in Apera 3M KCL soaking solution (AI1107) for at least 1 hour. Rinse it off, then re-calibrate the tester before using.
- 6.3 **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. To remove excess water, just shake them off or use clean tissue paper or Kimwipe to dap off.

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, don't worry. 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 or 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 standard series	USA – NIST	USA
P2	Low value reading alarm setting	0 to 14.00 pH	0
P3	High value reading alarm setting	0 to 14.00 pH	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 the tester is turned off, long press  to enter parameter settings → Short press  to switch P1-P2-P3...P7 → Short press  to select parameter (starts flickering) → Short press  to change parameter → Short press  to confirm the change → Long press  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 4.2.4.

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

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

8.3.4 Reading 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.

8.3.5 **Auto-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 stay on LCD. Short-press  to cancel the auto-hold (**HOLD** icon will go off).

8.3.6 **Factory default setting (P7):** Select “Yes” to recover instrument calibration to the theoretical value (pH value in zero potential is 7.00 pH, slope is 100%), parameter setting return to initial value. This function can be used when the tester does not work properly or after you replace a new probe. Calibrate and measure again after recovering the tester 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  to enter ORP mode (mV). Rinse the probe in distilled water and shake off excess water. Dip the probe in your sample solution, make a quick stir, and hold still. Record the stabilized reading as the ORP measurement.

10. Technical Specifications

pH	Measurement 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)
mV	Measurement Range	-1000 to 1000 mV
	Resolution	1 mV
	Accuracy	$\pm 0.2\%$ F.S
Temp.	Measurement Range	0 – 50°C (32 – 122°F)
	Resolution	0.1°C/°F
	Accuracy	$\pm 0.5^\circ\text{C}$

11. Other Specifications

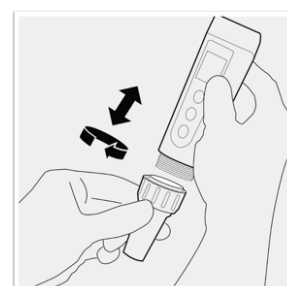
Screen	3-color LCD screen, Blue: Measurement; Green: Calibration; Red: Alarm
Reading Lock	HOLD stays on screen
Low-Voltage Warning	 flashing, reminder of battery replacement needed
Auto. Power-Off	In 8 minutes without operation
Waterproof Rating	IP67
Power	DC3V, AAA alkaline batteries×4
Battery Life	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.



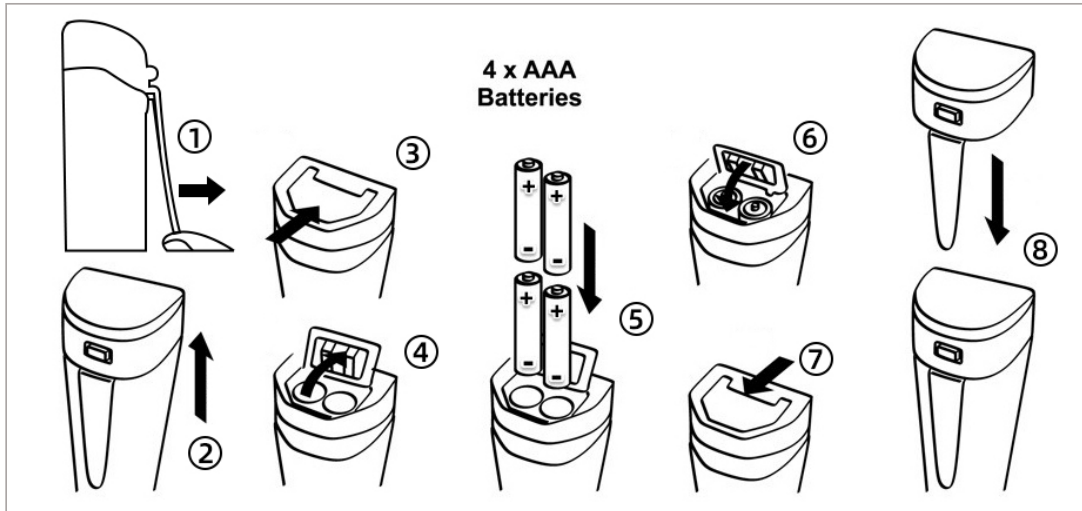
12.3 The replacement probes compatible with PH60:

- 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. 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 pocket clip
- 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

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

14. Troubleshooting Guide

Trouble	Reasons	How to Fix
Cannot calibrate	Pressing  too soon (E_{r2})	Wait for the reading to get stabilized (smiley face to stay on the screen) before pressing  button to finish calibration.
	Incorrect calibration order (E_{r1})	Refer to Section 4.2.1
	Poor quality calibration buffer solutions (E_{r1})	Make sure your calibration standard solutions are fresh and clean, and made by a legitimate manufacturer.
	Dirty probe or clogged junction (E_{r1})	Thoroughly clean off the probe. Refer to Section 6.
	Aged probe (E_{r1})	Replace the probe.
	Dried-out probe (E_{r1})	Soak the probe in Apera 3M KCL soaking solution for at least 1 hour. And refer to Section 7 for proper probe storage.
	Probe is not fully submerged in the solution (E_{r1})	Make sure the probe is immersed in the solution at least 1 inch deep.
	Air bubbles around/inside the probe (E_{r1})	Make a quick stir in the solution to remove air bubbles.
	Broken Probe (E_{r1})	If you don't find any visible damage of the probe, contact Apera for warranty fulfillment. If there is visible damage, replace the probe.
Reading is always slowly changing, won't stabilize.	Dirty probe or clogged junction	Thoroughly clean off the probe. Refer to Section 6.
	Aged probe	Replace the probe.
	Testing pure water like tap/drinking/well/RO/distilled/deionized water	Refer to Section 5.2
Display similar readings in any solutions or always display 7	Broken probe	If you don't find any visible damage of the probe, contact Apera for warranty fulfillment. If there is visible damage, replace the probe.
	Instrument defect	Contact Apera for warranty fulfillment
Reading keeps jumping erratically	Probe is not fully submerged in the solution	Make sure the probe is immersed into the solution for at least 1 inch.
	Air bubbles around/inside the probe	Make a quick stir in the solution to remove air bubbles.
	Probe is not properly connected or the connector is broken.	Check the probes 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.
	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'.
	Your pH probe is not suitable for your application	Contact Apera to find the appropriate model for your specific application.

15. Limited 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. 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
- Serial number (can be found on the back sticker of the tester body)
- What problem or issue you had experienced with the product
- Attach a photo of your proof of purchase
- Attach a photo/video of the problematic product

Then click Submit. One of our customer service specialists will get in touch with you within one business day.

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