APERA INSTRUMENTS

Premium Series PR60F pH/ORP Tester Kit

pH | mV | Temperature

SKU: AI317

User Manual

Table of Contents

Scan for video tutorial

Scan for SDS (SAFETY DATA SEET)

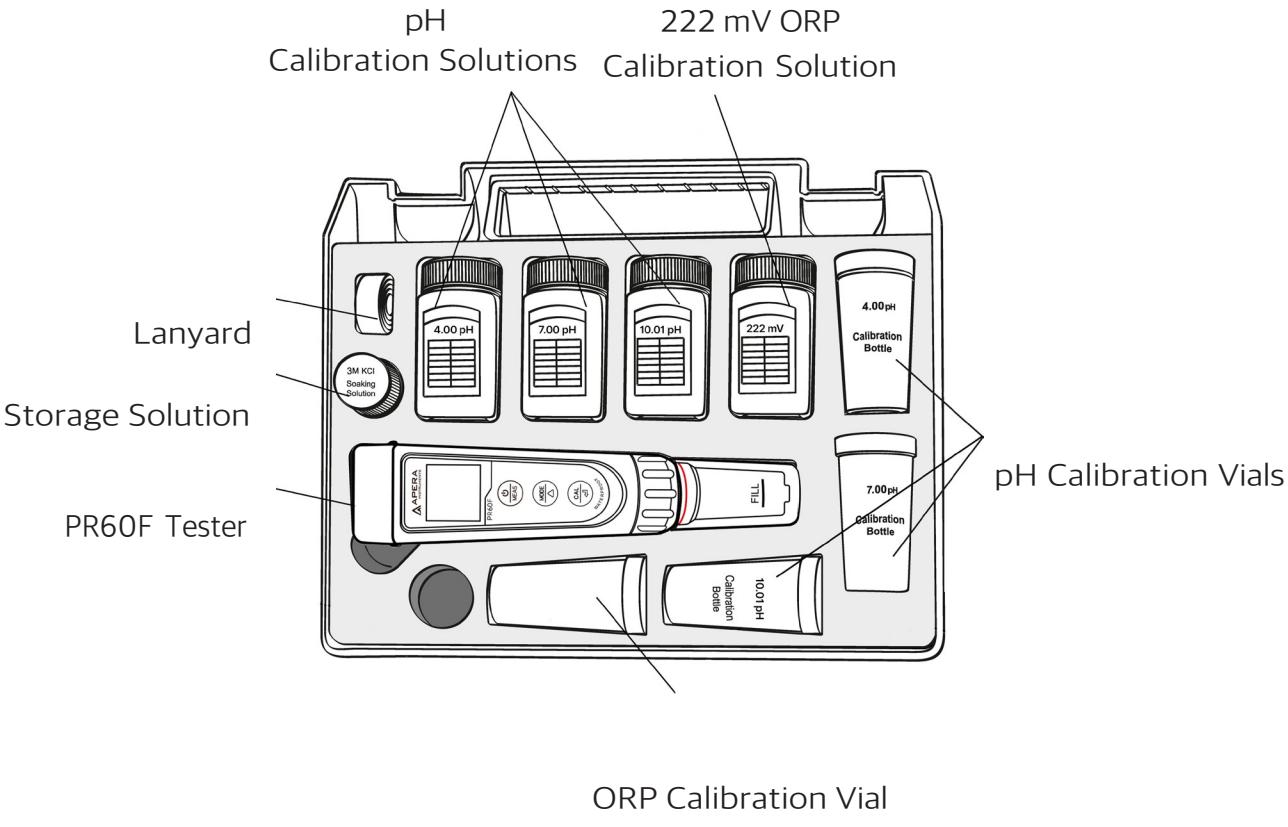
ATTENTION

- 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.

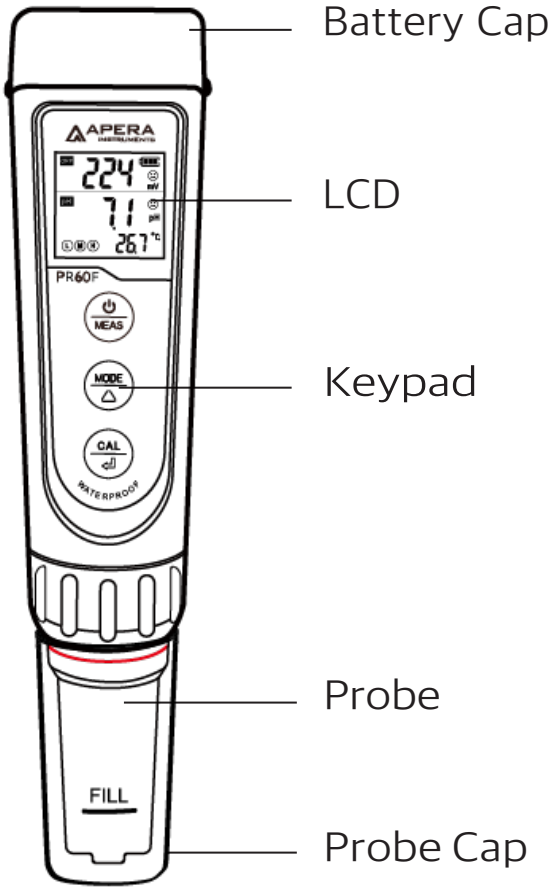
Thank you for choosing Apera Instruments **Premium Series PR60F pH/ORP Tester Kit**. Please read this manual carefully to properly use and maintain the product. This product is featured with:

- pH/ORP dual-channel simultaneous measurement.
- Suitable for general water solutions, such as pools and spas, water treatment, skincare products, environmental monitoring, hydroponics, aquaculture, as well as flat surface measurement such as skin, food, fruits, soil, etc.
- Double-junction reference system is highly resistant to contamination, significantly extending service life of the probe.
- The flat platinum ORP sensor with macro-molecule coating is 60% faster in response rate and has high resistance to oxidation and contamination.
- StableRead measurement mode available for easy measurement taking — no more guesswork on when to record the reading.

1. What's in the Kit



2. Meter Structure and Keypad Functions



ORP

The flat platinum ORP sensor with macromolecule coating

pH

Lithium sensitive glass membrane

Short press (tap) — < 1 second

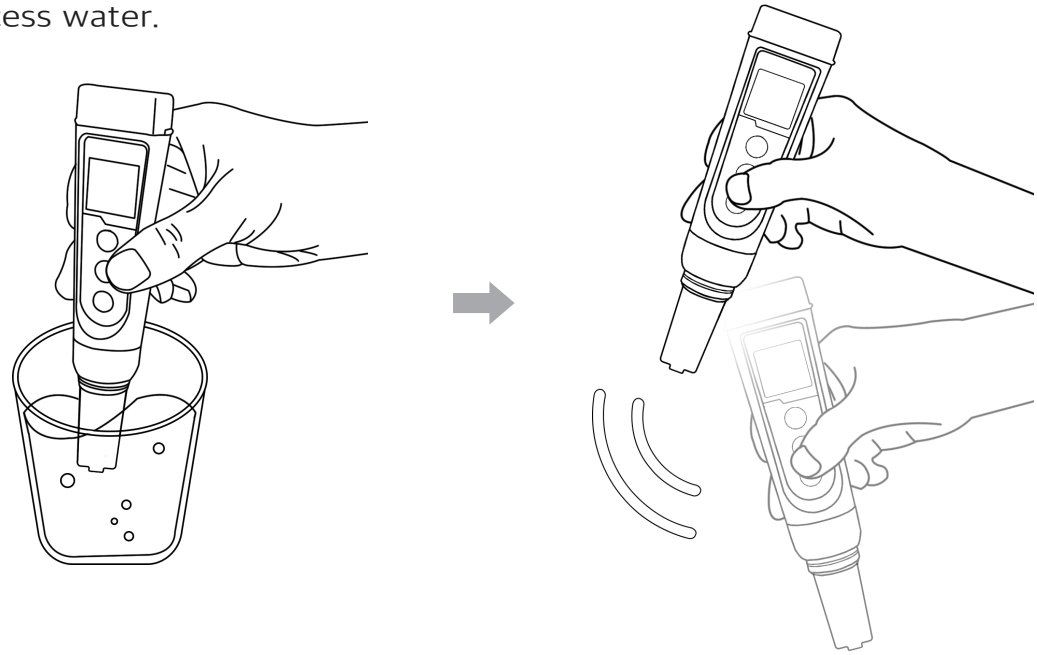
Long press (hold) — >2 seconds then release

	1. Short press to turn on the tester and long press to turn off the tester. 2. In StableRead measurement mode (S.r), short press to take a measurement of pH and ORP. 3. In calibration mode, short press to cancel calibration. 4. When powered off, long press to enter parameter settings. 5. In parameter settings, short press to enter measurement mode.
	1. In measurement mode, long press to switch between GeneralRead mode (G.r) and StableRead mode (S.r). 2. In calibration mode, long press to switch between pH and ORP calibration. 3. In ORP calibration mode, short press to adjust the ORP value. 4. In parameter settings, short press to change parameters (Unidirectional).
	1. In measurement mode, long press to enter calibration mode. 2. In calibration mode, short press to confirm calibration. 3. In parameter settings, short press to confirm the change.

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** (distilled or deionized water) , then shake off excess water.



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

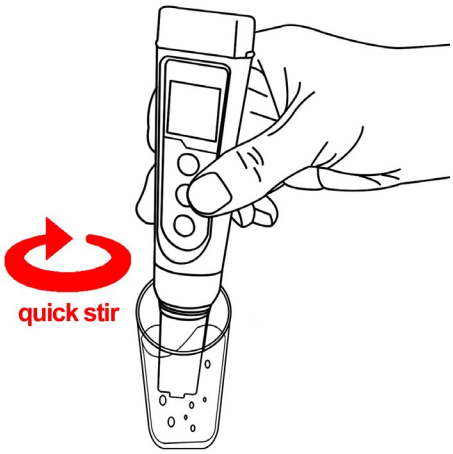
3.4 For new testers, or If the tester hasn't been used for a long time (>1 month), please soak the probe in the 3M KCl soaking solution for about 10 minutes, then calibrate it before test. For calibration tutorial, refer to Section 4 and 5.

4. pH Calibration

4.1 How to Calibrate

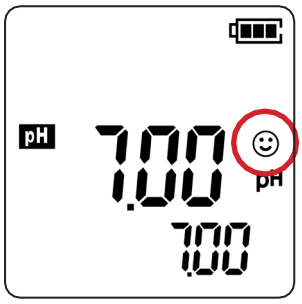
4.1.1 Pour pH buffer solutions into their designated calibration vials, filling each to approximately half volume.

4.1.2 Rinse the probe in pure water; Shake off excess water. Immerse the probe into **pH 7.00 buffer solution first**. Make a quick stir in the solution, and hold still.



4.1.3 Short press (MEAS) to power on the tester. Long press (CAL) to enter calibration mode, the screen will turn green (short press (MEAS) if you decide to exit without calibrating).

4.1.4 Wait for the reading to stabilize (when ☺ stops flashing on screen), then short press CAL again to finish the first point calibration (pressing CAL too early could lead to Er2 error). **"7.00"** will be flashing and the meter will return to measurement mode. Icon Ⓜ (the middle point) will appear at the bottom left, indicating a successful 1-point calibration.



4.1.5 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).

4.1.6 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 pH Calibration

4.2.1 **Always begin calibration with the pH 7.00 buffer solution. If a second or third calibration point is needed, perform them immediately after completing the first point, without turning off the meter.**

⚠ Do NOT power off the meter between calibration points. If the device is turned off before completing the second or third point, and you attempt to calibrate with pH 4.00 or pH 10.01 after rebooting, the meter will display an Er1 error. In this case, you must restart the calibration sequence from pH 7.00. For additional calibration troubleshooting, please refer to Section 15.

4.2.2 **How often to replace the calibration solutions**. The pH 4.00 and 7.00 solutions poured out into the calibration vials can be used for up to 10 times or 3 days (whichever comes first). pH 10.01 can only be used for up to 5 times or up to 1 day (whichever comes first). After that, replace the solutions in the calibration vials to

keep the accuracy. Keeping the freshness and cleanliness of calibration buffers is essential for accurate pH measurement.

4.2.3 How often to calibrate?

The frequency that you should calibrate your pH meter depends on many factors such as the nature of your test samples, requirement of accuracy, and how well you maintain the probe. For high-accuracy measurement (error tolerance <±0.02pH), the tester should be calibrated before test every time; For general-accuracy measurement (error tolerance >±0.05 pH), the tester can be used without calibration for up to 1 month.

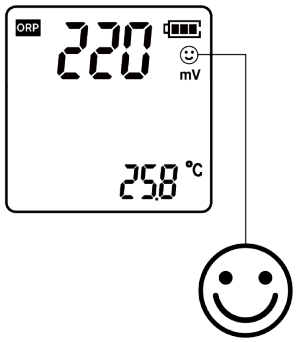
4.2.4 The tester can perform 1 to 3 points of automatic calibration and can recognize 5 types of pH standard solutions. For details, please refer to the following table:

Calibration	USA Series		NIST Series		Icon	When to use
1-point	7.00 pH		6.86 pH		Ⓜ	Accuracy requirement ≥ 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	Ⓛ Ⓜ	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. ORP Calibration

5.1 Pour 222 mV ORP standard solution into the calibration vial (about half volume).

5.2 Rinse the probe in pure water; Shake off excess water.
Immerse the probe into the 222mV standard solution, and make a quick stir in the solution, then hold it still.



5.3 Short press (MEAS) to power on the tester. Long press (CAL) to enter calibration mode. Long press (MODE) to switch to ORP calibration mode. If you decide to quit the calibration and return to measurement mode, short press (MEAS).

5.4 When the reading is stable (☺ stops flashing), short press or long press (MODE) to adjust the calibration value according to the table below (also on the 222mV bottle's label). Short press (CAL) to finish the calibration and return to measurement mode.

222 mV ORP Standard Reference Table

˚C	˚F	mV	˚C	˚F	mV
10	50	242	30	86	215
15	59	235	35	95	209
20	68	227	38	100.4	205
25	77	222	40	104	201

※ For example, if the temperature is around 25˚C, then adjust the reading to 222 mV. If the temperature is around 20˚C, then adjust the reading to 227 mV.

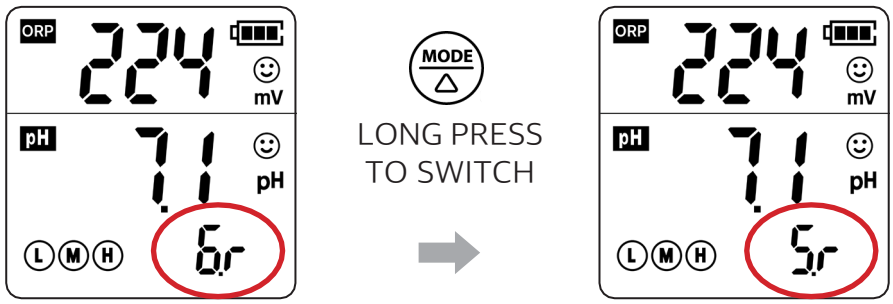
Notes about ORP Calibration

◆ Typically, there's no need to calibrate ORP probe often. When there is doubt on the accuracy, users can take a measurement in 222 mV or 470 mV ORP standard solution. If the error is large according to ORP/temperature reference table above , please calibrate ORP the probe according to the steps in 5.1 to 5.4.

6. Measurement Taking

6.1 Measurement Mode

The PR60F Tester adopts a dual-channel measurement system for simultaneously measuring pH and ORP. It comes with two measurement modes: GeneralRead Mode (6r) and StableRead Mode (5r).



GeneralRead Mode (6r)

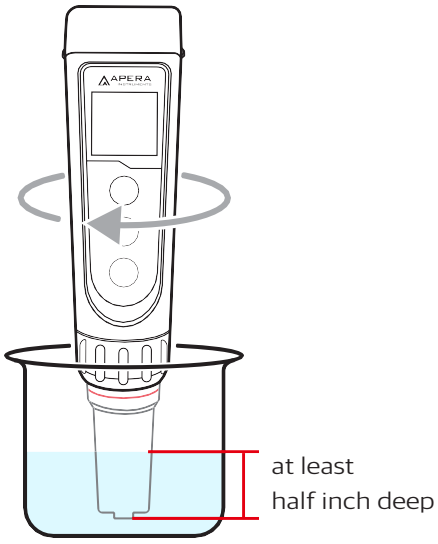
StableRead Mode (5r)

6r — The classic mode that reflects the live reading numbers of both pH and ORP.

5r — A new mode that will pop up a fully stabilized reading as the measurement value when it's ready (the measurement process will be hidden with floating ---) just so users don't have to guess when to take the measurement.

6.2 How to Take Measurement in GeneralRead Mode (6r)

- Short press MEAS to turn on the tester.
- Rinse the probe in pure water, shake off excess water.
- Immerse the probe into your sample solution, make a quick stir and hold still.
- When ☺ stops flashing, take the stabilized pH& ORP readings as your measurements.



It's normal that the reading will be randomly jumping if the probe is left in the air.

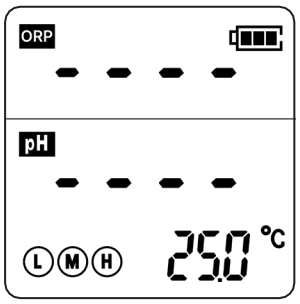
6.3 How to Take Measurement in StableRead Mode (Sr)

6.3.1 Short press (MEAS) to turn on the tester.

6.3.2 Rinse the probe in pure water, shake off excess water.

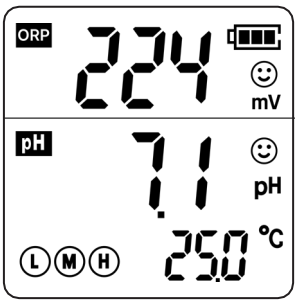
6.3.3. Immerse the probe into your sample solution and make a quick stir.

Long press (MODE) to enter Sr



Waiting for a fully stablized reading

Wait a moment



Measurement results show up

6.3.4 Long press (MODE) to switch to StableRead Mode (Sr will pop up at the lower right corner). The tester will start the measuring process and you will see —— starts flashing, meaning it's waiting for a fully stabilized reading for both pH and ORP.

6.3.5 Once it's ready, a frozen pH & ORP reading will be displayed and can be tak- en as the measurement (frozen pH and ORP readings do not usually appear at the same time).

* If you want to check the validity of the previous measurement, simply short press (MEAS) again and restart the StableRead process. If the new numbers are close to the previous reading, then you can be confident about the result.
* Typically, it takes 20-60 seconds for the measurement value to pop up in StableRead Mode depending on the nature of your sample solution and temperature change. For example, it will take longer to get the measurement pop up when testing solutions with low ionic strength compared to general water solutions.
* If the reading process takes longer than 3 minutes, Er3 will pop up. And the tester will automatically switch back to GeneralRead mode. Gr will pop up at the lower right corner, indicating you are in the GeneralRead Mode.

6.4 Pure Water pH Measurement

When testing pure water like drinking water, RO water, distilled water, etc. it will take longer for the readings to get fully stabilized (typically 1-5 minutes). We'd recommend GeneralRead mode in this case.

Before taking the measurement, soak the probe in pH 4.00 buffer solution for about 30 seconds. Then start the pure water test. If the reading is still not stabilized after 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/probe designed for pure water pH test.*

6.5 Flat Surface Test

The PR60F flat pH/ORP probe not only tests water solutions, but also works well for surface pH and ORP test.

6.5.1 For skin test

To avoid adding measurement error, the test skin area should be without sweat or dirt, and not overly cleaned (do not use skin-wash products before testing). Dampen skin with some distilled or deionized water, gently press the flat probe onto the skin, and then take the measurement in GeneralRead or StableRead mode according to Section 6.2 and 6.3.

6.5.2 For paper, fabric, leather and other surface test

Add several drops of distilled or deionized water onto the surface if it's dry, then take the measurement in GeneralRead or StableRead mode according to Section 6.2 and 6.3.

6.6 Notes about Measurement Taking

6.6.1 The temperature compensation function of the meter is limited, and cannot guarantee 100% compensation for errors caused by temperature change. To minimize the measurement error, calibrating the probe at the similar temperature as your sample is critical (temperature difference < 10 ˚C).

6.6.2 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 probe's life span.

6.6.3 Memory Effect of ORP Probes

When measuring multiple samples consecutively, ORP probes may be affected by the previous sample. This can result in sluggish response or inaccurate readings (higher or lower than expected) for the new sample. The effect is particularly noticeable when switching between strongly oxidizing (very high ORP solutions) and strongly reducing solutions (very low ORP solutions).

6.6.4 Solutions and Recommendations for Memory Effect

1. Rinse the probe thoroughly with pure water between different samples.
2. When switching between strong oxidizing and reducing samples, immerse the probe in ORP standard buffer solution (e.g., 220 mV or 470 mV) for about 5 minutes to reactivate the surface.
3. Allow sufficient stabilization time in the new sample, usually 2-5 minutes, until the reading becomes steady.

7. Self-Diagnosis

◆ The meter has a self-diagnosis function. Please refer to the chart below for detailed information.

Symbol	Self-Diagnosis information	How to fix
Er 1	Calibration Error	Refer to Section 15 for troubleshooting guide
Er2	CAL is pressed before reading is fully stabilized.	Do not press CAL untill ☺ stops flashing on screen.
Er3	Readings can't get fully stabilized after 3 minutes in StableRead mode	Switch to GeneralRead mode and take measurement again or refer to Section 6.4

8. Probe Cleaning

8.1 The tester's accuracy depends on a clean probe. Always thoroughly rinse the probe with pure water before and after each test to prevent contamination.

8.2 For tough contaminants, soak the probe in Apera Probe Cleaning Solution (SKU: AI1166) or detergent water for 30 minutes. Then use a soft brush to remove the contaminants. Afterwards, soak the probe in the 3M KCl solution (SKU: AI1107) for at least 1 hour. Rinse it off, then recalibrate the probe before testing.

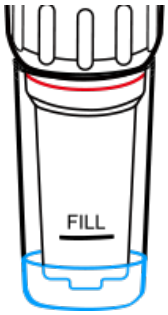
8.3 If the platinum ORP sensor surface is severely contaminated and develops an oxide film, apply a small amount of toothpaste to gently clean the platinum surface, and rinse it with pure water. Then soak the probe in 3M KCl solution (SKU: AI1107) for at least 6 hours and recalibrate the probe before use.

8.4 Never use your finger to touch the sensor membranes or use other material to rub it. This can generate static electricity and cause inaccurate readings. To remove excess water, just shake it off or use clean tissue paper or Kimwipes to lightly dap the surface.

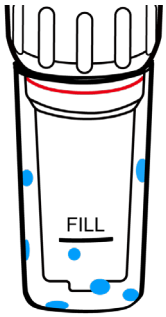
9. Probe Storage

9.1 **Optimal Storage Method:** Add a bit 3M KCl soaking solution (SKU: AI1117) in the probe cap. Close on the probe cap tightly with the O-ring.

9.2 **OK Storage Method:** Store the probe in a wet cap to keep the moisture.



Optimal Storage Method



OK Storage Method

9.3 If the probe is accidentally dried out, just soak the probe in 3M KCl soaking solution (SKU: AI1117) for at least 2 hours to recover.

9.4 ⚠ **NEVER** store the probe in pure water like tap, RO, distilled, or deionized water. If this happens, immediately soak the pH probe in Apera 3M KCL soaking solution overnight, then recalibrate before testing. Pure water is only for rinsing off the probe.

9.5 **Note on White Crystals in Probe Cap**

If you notice white crystals inside or around the probe cap, this is simply crystallized 3M KCl solution, which naturally occurs over time due to evaporation. This substance is non-hazardous and will not affect the probe's performance. Simply rinse the crystals off with water before use.

10. Parameter Settings

10.1 Settings Menu

Symbol	Parameter Setting Contents	Code	Factory Default	Parameter Options
P1	pH calibration buffer standard series	bUF	USA	USA - NIST
P2	pH resolution	rES	0.01	0.01 - 0.1
P3	pH calibration due reminder	dUE	OFF	1 - 2 - 3 - 4 - 5 - 6- 7 - 14 - 28 (days)-OFF
P4	Temperature unit	Unt	°F	℃ - °F
P5	Automatic power off	AC	8	8 - 15- 30 - 60 - 90 - 120 (min) - OFF
P6	Back to factory default setting	dF	no	No - Yes

10.2 Parameter Settings Instruction

1) When the tester is powered off, long press (MEAS) to enter parameter settings.

2) Short press (MODE △) to switch P1-P2-P3⋯P6.

3) Short press (CAL ↵) to select parameter (the parameter starts flashing).

4) Short press (MODE △) to change parameter.

5) Short press (CAL ↵) to confirm the change.

6) Short press (MEAS) to return to measurement mode.

10.3 pH Calibration Buffer Standard Series

You only need to make this change in P1 if you are using NIST series pH standard buffers, which are pH 6.86, 4.01, and 9.18.

10.4 pH Calibration Due Reminder

After finishing pH calibration, you can change this setting in P3 to remind you when to recalibrate. The options are every 1 to 7 days, 14 days, or 28 days. For recommended calibration frequency, refer to Section 4.2. When it's due for pH calibration, (L) (M) (H) icons will disappear on screen.

10.5 Automatic Power Off

You can choose to let the tester automatically power off if there is no operation in 8/15/30/60/90/120 minutes, or turn off this function (it will never automatically power off until the batteries die).

10.6 Restore Factory Default Settings

To reset the tester to its original settings, go to Parameter P6 and select "Yes". This will restore the meter to its theoretical values, including pH offset back to 0 mV, pH slope back to 100%, and all other parameter back to default settings. This function is useful if the tester is not operating properly or after replacing the probe.

 After restoring factory settings, be sure to perform a full calibration before using.

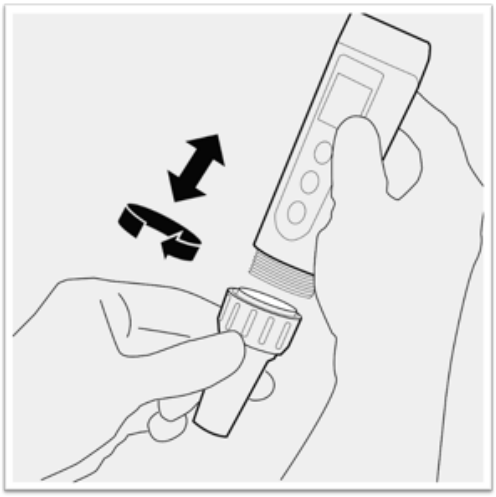
11. Technical Specifications

pH	Measurement Range	-2.00 - 16.00 pH
	Resolution	0.01/0.1 pH
	Accuracy	±0.01 pH ±1 digit
	Calibration Points	1 - 3 points
	Automatic Temperature Compensation (ATC)	0 - 50˚C (32 - 122˚F)
ORP	Measurement Range	-1000 to 1000 mV
	Resolution	1 mV
	Accuracy	±2 mV
Temp.	Measurement Range	0 - 50˚C (32 - 122˚F)
	Resolution	0.1˚C/˚F
	Accuracy	±0.5˚C
Screen	2-color backlit LCD screen, White: Measurement; Green: Calibration	
Low-battery Warning		
Waterproof Rating	IP67	
Power	DC3V, AAA alkaline batteries×4	
Battery Life	up to 1000 hours	
Dimension& weight	Tester: 40×40×178mm/133g; Kit:255×210×50mm/700g	

12. Probe Replacement

12.1 Every pH/ORP probe gradually loses its sensitivity and will eventually fail. A typical service life of a pH/ORP 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 ensure the optimal performance.

12.2 How 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.
6) Set the tester back to factory default
7) Calibrate the probe before testing (refer to Section 4.1)

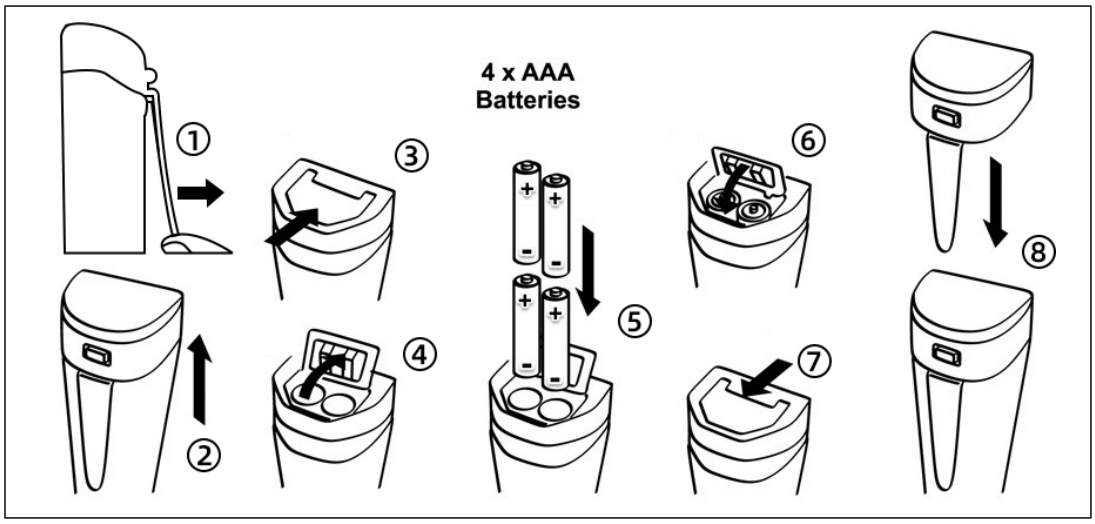
13. Accessories

SKU	Product
AI317-E	PR60F-DE Replacement pH/ORP Probe
AI1160	222mV ORP Calibration Solution (8 oz.)
AI1163	470 mV ORP Calibration Solution (8 oz.)
AI1107	3M KCl Storage Solution
AI1115	8 oz. pH Calibration Buffer Solution Kit (pH 4.00, 7.00 & 10.01)
AI1116	16 oz. pH Calibration Buffer Solution Kit (pH 4.00, 7.00 & 10.01) with Apera CalPod for Easy Calibration
AI1166	Electrode Cleaning Solution 8 oz.

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 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.

15. Troubleshooting Guide for pH

Trouble	Reasons	How to Fix
Cannot calibrate	Pressing CAL too soon (Er2)	Wait for the reading to get stabilized (smiley face to stay on the screen) before pressing CAL button to finish calibration.
	Incorrect calibration order (Er 1)	Refer to Section 4.2.1
	Poor quality calibration buffer solutions (Er 1)	Make sure your calibration standard solutions are fresh and clean, and made by a legitimate manufacturer.
	Dirty probe or clogged junction (Er 1)	Thoroughly clean off the probe. Refer to Section 8.
	Aged probe(Er 1)	Replace the probe.
	Dried-out probe(Er 1)	Soak the probe in Apera 3M KCL soaking solution for at least 2 hours. And refer to Section 9 for proper probe storage.
	Probe is not fully immersed in the solution (Er 1)	Make sure the probe is immersed in the solution at least half inch deep.
	Broken pH glass (Er 1)	Replace the probe.
Reading is always slowly changing, won't stabilize.	Dirty probe or clogged junction	Thorougly clean off the probe. Refer to Section 8.
	Aged probe	Replace the probe.
	Testing pure water like tap/drinking/well/RO/ distlled/deionized water	Refer to Section 6.4.

Display similar readings in any solutions or always display 7	Broken probe	If you see a broken pH glass membrane, just replace the probe as it's caused by accidental physcial damage. If you don't find any visible damage on the pH glass membrane, contact Apera for warranty fulfillment.
	Instrument defect	Contact Apera for warranty fulfillment
Reading keeps jumping erratically	Probe is not fully immersed in the solution	Make sure the probe is immersed into the solution for at least 1 inch.
	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	Comparison with other meters, test strips, or drop tests	To compare with other pH meters, make sure to perform a 2-point calibration for all meters 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'.
	The temperature of your calibration solution is significantly different to the temperature of your test sample.	Refer to Section 6.6.1
	The probe is not suitable for your application	Contact Apera to find the appropriate model for your specific application.

16. Troubleshooting Guide for ORP

Trouble	Reasons	How to Fix
Cannot calibrate	Pressing CAL too soon (Er2)	Wait for the reading to get stabilized (smiley face to stay on the screen) before pressing CAL button to finish calibration.
Reading is always slowly changing, won't stabilize.	Dirty probe or clogged junction	Thorougly clean off the probe (refer to section 8) or soak the probe in 222 mV ORP calibration solution for 15-30 minutes for conditioning.
	Aged probe	Replace the probe.
Calibration is successful, but reading is not accurate	Comparison with other meters or experience	Make sure to compare readings in the same fresh ORP standard solution at the same temperature (e.g. 222/470/650 mV at 25˚C). Whichever gives a closer reading to the standard value is the winner.
	Dirty probe or clogged junction	Thorougly clean off the probe (refer to Section 8) or soak the probe in 222 mV ORP calibration solution for 15-30 minutes for conditioning.
	Memory effect	Refer to Section 6.6.3

17. 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.

APERA INSTRUMENTS, LLC

Address: 6540 Singletree Dr, Columbus, OH 43229
Tel: 1-614-285-3080
Email: info@aperainst.com
Website: aperainst.com