APERA INSTRUMENTS

ORP60F ORP Tester Kit

ORP (Redox) | Temperature

SKU: AI319

User Manual



APERA INSTRUMENTS, LLC
aperainst.com

v1.3

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Thank you for choosing Apera Instruments. This Premium Series ORP60F ORP (redox) Tester is designed for testing in general water applications. Please read this manual carefully in order to properly use and maintain the product. This product is featured with:

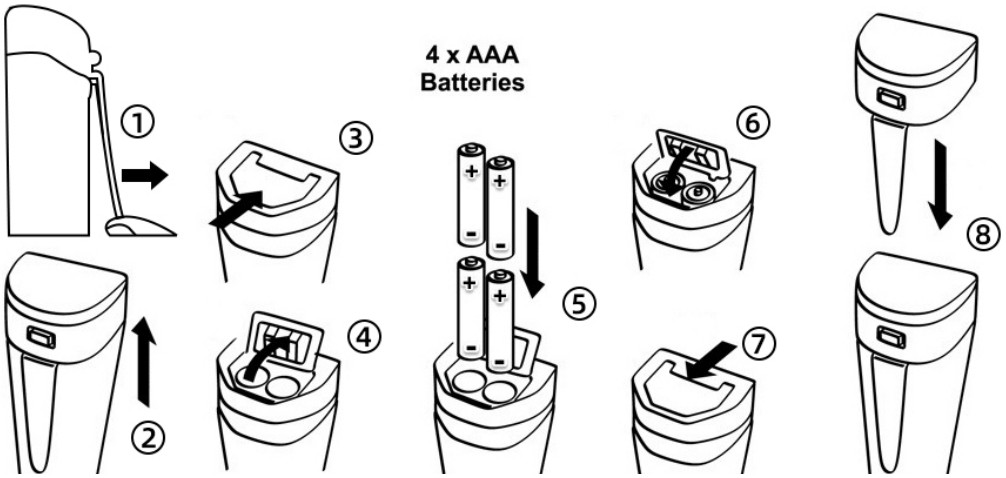
- Suitable for general water solutions, such as pools and spas, water treatment, environmental monitoring, hydroponics, aquaculture, as well as flat surface measurement such as skin, food, soil, etc.
- Double-junction reference system is highly resistant to contamination, significantly extending service 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.

⚠ CAUTION		
	Chemical exposure hazard. Obey laboratory safety procedures and wear all of the personal protective equipment appropriate to the chemicals that are handled. Refer to the current safety data sheets (MSDS/SDS) for safety protocols by scanning the QR code on the right.	

⚠ CAUTION	
	Explosion hazard. Incorrect battery installation can cause the release of explosive gases. Be sure that the batteries are of the same approved chemical type and are inserted in the correct orientation. Do not mix new and used batteries.
⚠ WARNING	
	Fire hazard. Battery substitution is not permitted. Use only alkaline batteries.

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.**

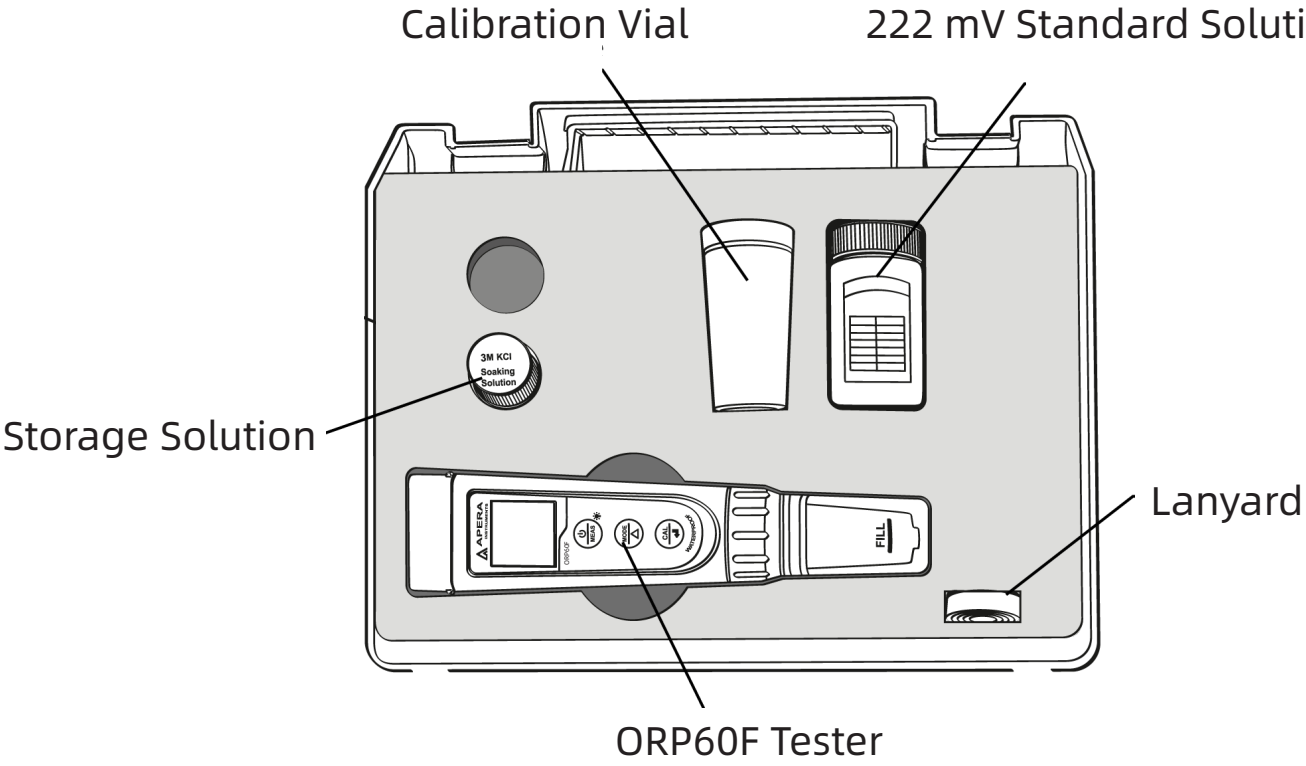
⚠ **(WRONG INSTALLATION OF BATTERIES WILL CAUSE DAMAGE TO THE TESTER& BATTERY LEAK!)**



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.

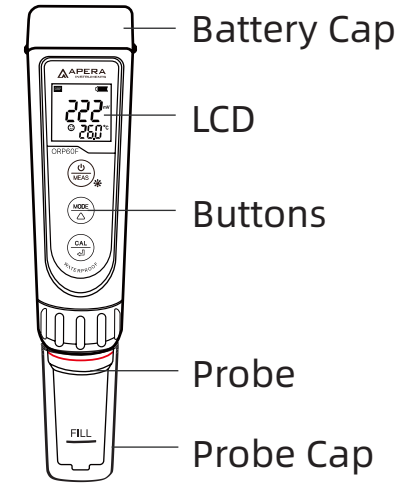
1. What's in the Kit

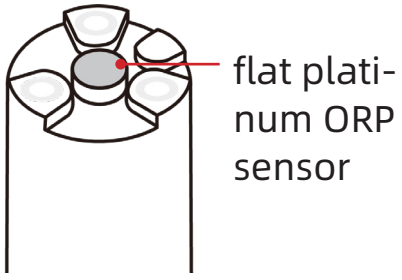


2. Keypad Functions

Short press (tap): <1 second **Long press (hold):** > 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.
MODE △	1. In calibration mode, press to change calibration value (unidirectional) 2. In parameter settings, short press to change the parameter (unidirectional)
CAL ↵	1. Long press to enter calibration mode. 2. In calibration mode, short press to confirm calibration. 3. When the reading is automatically locked, short press to unlock.





3. Technical Specifications

ORP (mV)	Measuring Range	-1000 to 1000 mV
	Resolution	1 mV
	Accuracy	±0.2% F.S
Temperature	Measurement Range	0 – 50 ˚C
	Resolution	0.1 ˚C
	Accuracy	±0.5 ˚C

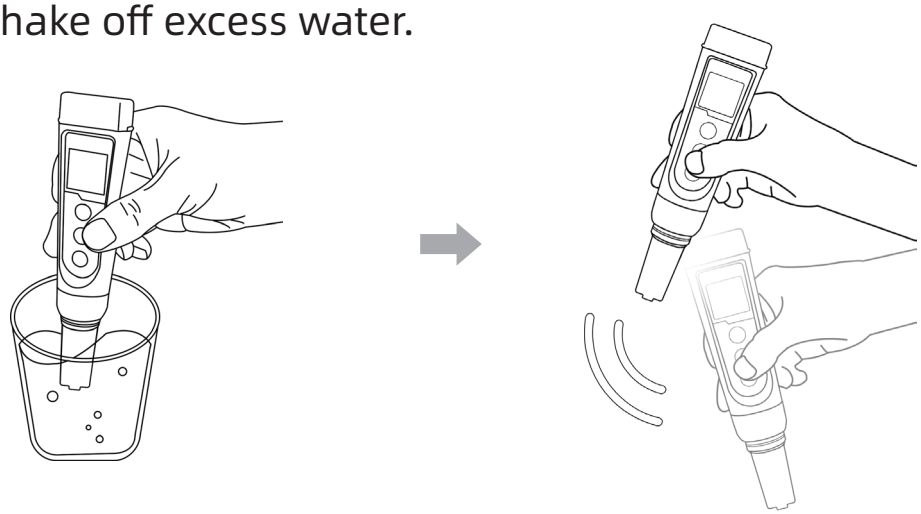
Other Specifications

Stable reading indicator	☺	Self-Diagnostic Information:	Er2
Reading Lock	HOLD	Screen Back-light	Blue: Measurement mode; Green: Calibration mode; Red: Reading alarm
Low power reminder	▭	Auto. Power	power off in 8 minutes without operation
Environment	0 to 50° C (32 to 122° F), RH 100% max		

4. Preparation Before Use

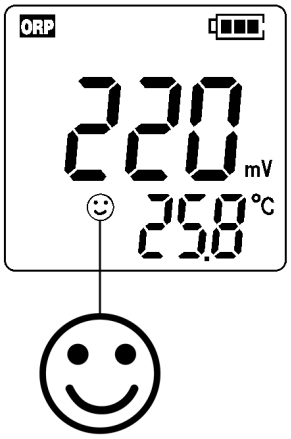
4.1 Pull out the battery insulation slip, and take off the probe cap.

4.2 Rinse off the probe in pure water (distilled or deionized water) , then shake off excess water.



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 in 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. 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.

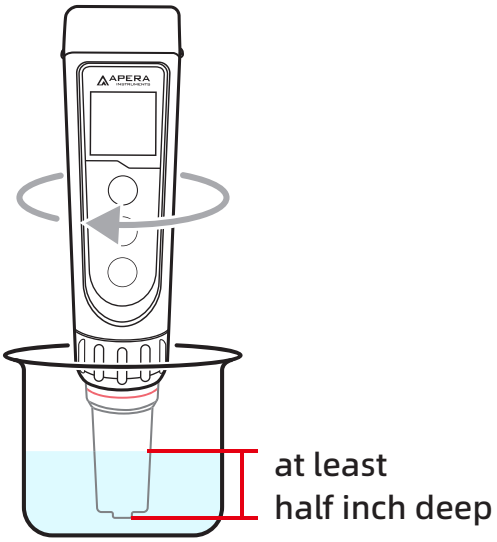
Notes about ORP Calibration

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

6. ORP Measurement

6.1 Test in Water Solutions

- 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 ORP reading as your measurement.



6.2 Flat Surface Test

The ORP60F flat ORP probe not only tests water solutions, but also works well for surface ORP test.

6.2.1 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..

6.2.2 For other surface test, add several drops of distilled or deionized water onto the surface if it's dry, then take the measurement.

6.3 Notes about Measurement Taking

6.3.1 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.

6.3.2 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).

6.3.3 Solutions and Recommendations for Memory Effect

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

7. Probe Cleaning

7.1 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.

7.2 For tough contaminants, soak the probe in Apera Probe Clean-

ing 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.

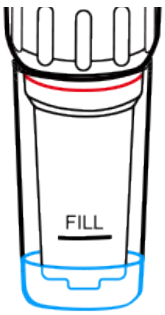
7.3 If the platinum ORP sensor surface is severely contaminated and develops an oxide film, apply a small amount of toothpaste to gently clean the platinum surface, and rinse it with pure water. Then soak the probe in 3M KCl solution (SKU: AI1107) for at least 6 hours and recalibrate the probe before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

7.4 Never use your finger to touch the sensor membrane 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.

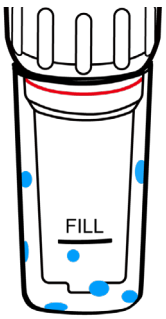
8. Probe Storage

8.1 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.

8.2 OK Storage Method: Store the probe in the cap with a few water droplets inside.



Optimal Storage Method



OK Storage Method

8.3 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.

8.4 ⚠ 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.

8.5 Note on White Crystals in Probe Cap

If you notice white crystals inside or around the probe cap, this is the 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.

9. Parameter Settings

9.1 Settings Table

	Parameter Setting Contents	Content	Factory Default
P1	Low reading alarm	-1000 to 1000 mV	-1000
P2	High reading alarm	-1000 to 1000 mV	1000
P3	Automatic Hold	Off - On	Off
P4	Screen backlight	Off - 1 - On	1 (1 min auto off)
P5	Temperature unit	˚C - ˚F	˚C
P6	Restore to factory default	No - Yes	No

9.2 Parameter setting instruction

When the tester is turned off, long press MEAS to enter parameter setting mode; Press MODE to switch from P1-P2-...P6. Press CAL , the parameter flashes; Press MODE to choose parameter Press CAL to confirm; Long press MEAS to power off.

9.2.1 High-Low Reading Alarm Examples (P1 and P2)

- Alarm goes off when reading is ≤ 120 mV:
  Set low value = 120 mV, highest value = 1000 mV, when the stabilized reading <120 mV, red backlight will turn on.
- Alarm goes off when reading is ≥ 150 mV:
  Set high value = 150 mV, lowest value = -1000 mV, when the stabilized reading >150 mV, red backlight will turn on.
- Alarm goes off when reading is in the range of 120 mV and 150 mV:
  Set low value = 120 mV, highest value = 150 mV, when the stabilized reading is <120mV or >150mV, red backlight will turn on.

9.2.2 Automatic Hold (P3): Select "On" to activate auto-hold function. When reading is stable for more than 10 seconds, the tester will lock the reading automatically, and HOLD icon will display on LCD. Press CAL key to cancel auto hold.

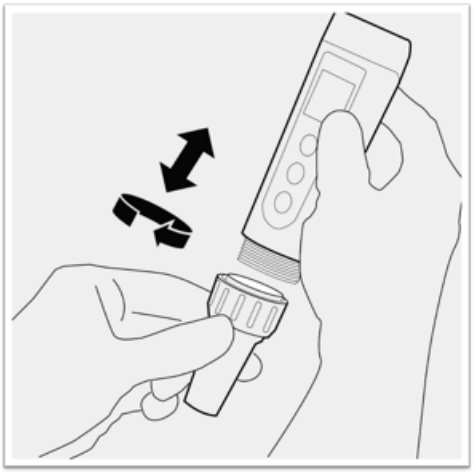
9.2.3 Backlight (P4): "Off" -turn off backlight, "On" -turn on backlight, "1" - backlight will last for 1 minute.

9.2.4 Temperature Unit (P5): Select C˚ or F˚, the factory default is ˚F.

9.2.5 Factory default setting (P6): To reset the tester to its original settings, go to Parameter P6 and select "Yes". This will restore the meter to its theoretical values.

10. Probe Replacement

Every ORP probe gradually loses its sensitivity and will eventually fail. A typical service life of a 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. We recommend replacing the ORP probe every 1 to 2 years to ensure the optimal performance. Here is how to replace the 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 10 minutes.
6) Set the tester back to factory default.
7) Calibrate the probe before testing (refer to Section 5.1)

11. Replacement Parts and Accessories

⚠ WARNING

	Use of non-approved parts may cause damage to the instrument or equipment malfunction. The replacement parts in this section are approved by the manufacturer.

Replacement Parts

Description	SKU	Quantity
ORP60F-DE Replacement Probe	AI319-E	1 pc
222mV ORP Calibration Solution	AI1160	8 oz.
3M KCL Soaking Solution	AI1107	1 pc
60 Series Probe Cap	AI2512	1 pc
60 Series Spare Parts Package	AI7105	1 pc
Vials for Sample Measurement and Calibration	AI901	1 set (3 pcs)

Accessories

Description	SKU	Quantity
CalPod for Organizing Calibration Solutions	AI2910	1 pc
Electrode Cleaning Solution	AI1166	8 oz.

12. Troubleshooting Guide

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 6.3.2

13. 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 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 photo of your proof of purchase
- Attach a photo of the problematic product

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

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