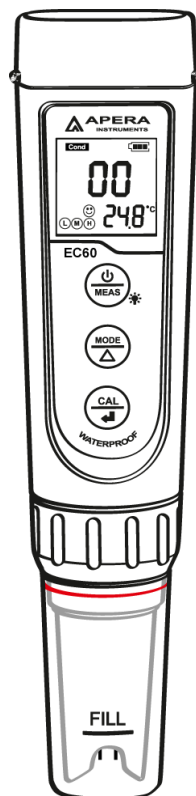# Premium Series

EC60 Conductivity Tester Kit

(Conductivity/TDS/Salinity/Temp.)

User Manual

**APERA INSTRUMENTS (Europe) GmbH**

aperainst.de

Thank you for purchasing Apera Instruments EC60 Premium Conductivity Tester. Please carefully read this manual before using the product in order to take reliable measurements and avoid unnecessary damage to the product.

Contents

1. Battery Installation

Please install the batteries according to the following steps. *Please pay attention to the direction of batteries: **All POSITIVE SIDES ("+") FACING UP. (Wrong installation of batteries will cause damage to the tester and potential hazards)**
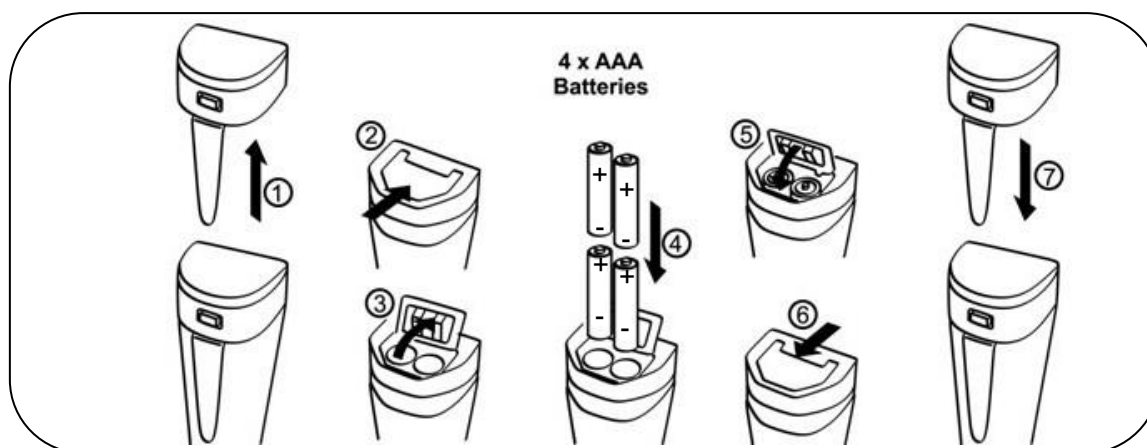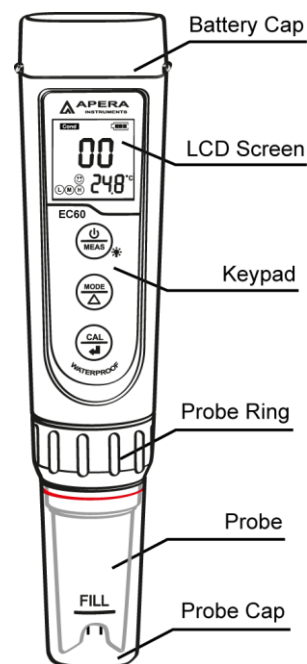

① Pull the battery cap up

② Slide the battery cap along to the direction of arrow

③ Open the battery cap

④ Insert the batteries (ALL POSITIVE SIDES FACING UP) (see graph)

⑤ Close the battery cap

⑥ Slide and lock the battery cap along to the direction of arrow

⑦ Fit the tester's cap while making sure to push all the way down. The tester's waterproof design may be compromised if the cap is not fitted correctly.
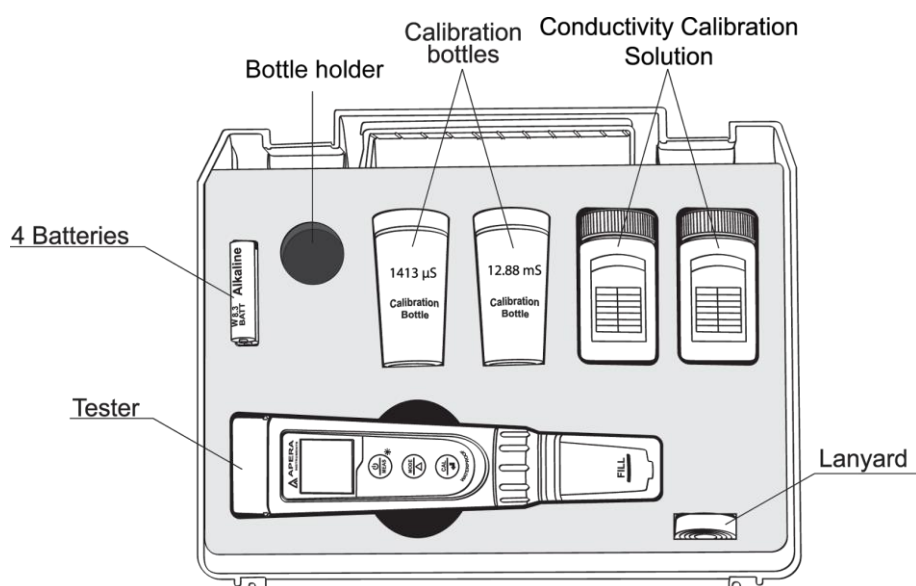
2. Keypad Functions

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.
(MODE △)	1. In measurement mode, short press to switch parameter COND → TDS → SAL 2. In mode setting, short press to change parameter (Unidirectional)
(CAL ↵)	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

Battery Cap
LCD Screen
Keypad
Probe Ring
Probe
Probe Cap

3. Complete Kit

Bottle holder
Calibration bottles
Conductivity Calibration Solution
4 Batteries
Alkaline
1413 µS Calibration Bottle
12.88 mS Calibration Bottle
Tester
Lanyard

4. Conductivity Calibration

4.1 Press (MODE △) key to switch to conductivity measurement mode. Rinse the probe in distilled water and dry it.

4.2 Pour certain amount (about half volume of the calibration bottle) of 1413 µS/cm and 12.88 mS/cm conductivity calibration solution into accordant calibration bottles.

4.3 Long press (CAL) key to enter calibration mode, short press (MEAS) to exit.

4.4 Dip the probe in 1413 µS/cm conductivity calibration solution, stir gently and allow it to stand still in the solution until a stable reading is reached. When stable icon ☺ appears and stays on the LCD screen, short press (CAL) key to complete one-point calibration, the tester returns to measurement mode and indication icon (M) will appear at the bottom left of the LCD screen.

4.5 After calibration, dip the probe in 12.88 mS/cm conductivity calibration solution. If the value is accurate, it is not necessary to conduct 2nd point calibration. If it is inaccurate, follow the steps in 4.1 to 4.4 to complete the 2nd point of calibration using 12.88 mS/cm standard solution.

4.6 If you need to test conductivity lower than 100 µS/cm, we recommend calibrating 84 µS/cm standard solution (sold separately) in addition to 1413 µS/cm following the steps in 4.1 to 4.4.

* 1000 µS/cm = 1 mS/cm
* 1000 ppm = 1 ppt

5. Conductivity Measurement

Press (MEAS) key to turn on the tester. Rinse the probe in distilled water and dry it.
Dip the probe in sample solution, stir gently, and allow it to stand still in the solution until a stable reading is reached. Take readings after ☺ comes up and stays. Press (MODE) to switch from conductivity to TDS, or salinity.

■ **Notes**
   a) TDS and Salinity measurements are converted from the conductivity measurements via a certain conversion factor.
   b) The tester can calibrate 84µS/cm, 1413 µS/cm, and 12.88 mS/cm conductivity calibration solution. User can conduct 1 to 3 points calibration. Refer to the table below. Usually calibrating the tester with 1413 µS/cm conductivity buffer solution alone shall meet the testing requirement.

Calibration Indication Icon	Calibration Standards	Measuring Range
(L)	84 µS/cm	0 - 100 µS/cm
(M)	1413 µS/cm	100 - 2000 µS/cm
(H)	12.88 mS/cm	2 - 20 mS/cm

5.1 The tester has been calibrated before leaving the factory. Generally, users can use the tester directly or users can test conductivity buffer solutions first. If the error is large, then calibration is needed.

5.2 For conductivity calibration solutions, we recommend that users replace new solutions after up to 5 times of use to ensure the standard solution's accuracy. Close the cap after use. Do NOT pour the used calibration solutions back into the solution bottles in case of contamination.

5.3 Temperature compensation factor: The default setting of the temp. compensation factor is 2.0%/°C. User can adjust the factor based on test solution and experimental data in parameter setting P4.

Solution	Temperature compensation factor	Solution	Temperature compensation factor
NaCl	2.12%/˚C	10% Hydrochloric acid	1.32%/˚C
5% NaOH	1.72%/˚C	5% Sulfuric acid	0.96%/˚C
Dilute ammonia	1.88%/˚C		

5.4 TDS and conductivity is linear related, and its conversion factor is 0.40-1.00. Adjust the factor in parameter setting P4 based on the requirements in different industries. The factory default setting is 0.71. Salinity and conductivity is linear related, and its conversion factor is 0.5. The tester only needs to be calibrated in Conductivity mode, then after calibration of conductivity, the meter can switch from conductivity to TDS or salinity.

5.5 **Conversion Example**: if conductivity measurement is 1000µS/cm, then the default TDS measurement will be 710 ppm (under the default 0.71 conversion factor), and the salinity be 0.5 ppt.

5.6 For the self-diagnosis information, please refer to the table below:

Symbol	Self-Diagnosis information	How to fix
$Er1$	Wrong conductivity calibration solution	1. Check if standard calibration solution is expired or contaminated. 2. Check if the probe is damaged.
$Er2$	(CAL) is pushed before ☺ stays on screen.	Wait for the smile icon to stay on screen and then press (CAL) to confirm calibration.

6. Probe Care

When not using the tester, fill up the probe cap with some distilled or tap water, let the conductivity probe store in it and close the cap to keep its sensitivity. When the conductivity probe is contaminated, use a soft brush and soap water to wash off the contaminants, then rinse with clean water. Do not rub the black pins just so the platinum black coating will not be peeled off.

7. Parameter Setting

7.1 Settings Chart

Symbol	Content	Parameter	Factory Default
P1	Auto Hold	Off – On	Off
P2	Backlight	Off – 1 – On	1 (1 min auto-off)
P3	Temp. Compensation Coefficient	0.00 to 4.00%	2.00%
P4	TDS Coefficient	0.40 to 1.00	0.71
P5	Salinity Unit	Ppt - mg/L	ppt
P6	Temperature Unit	˚C – ˚F	˚C
P7	Restore to Factory Default	No – Yes	No

7.2 Parameter Setting

When turned off, long press (⏻/MEAS) to enter parameter setting → short press (MODE/△) to switch P1-P2… → P8. Short press (CAL/↵), parameter flashes → short press (MODE/△) to choose parameter → short press (CAL/↵) to confirm → long press (⏻/MEAS) to go back to measurement mode.

7.3 Parameter Setting Instruction

a) Automatic lock (P1):
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. Press (CAL/↵) key to cancel auto hold.

b) Backlight (P2)
"Off" - turn off backlight, "On" - turn on backlight, 1 - backlight will last for 1 minute.

c) Factory default Setting (P7)
Select "Yes" to recover instrument calibration to theoretical value, parameter setting return to initial value. This function can be used when instrument does not work well in calibration or measurement. Calibrate and measure again after recover the instrument to factory default status.

8. Technical Specifications

Conductivity	Range	0-200.0 µS, 0-2000 µS, 0-20.00 mS
	Resolution	0.1/1 µS, 0.01 mS
	Accuracy	±1% F.S
	Calibration	1-3 points automatic calibration
TDS	Range	0-100.0 ppm, 0-1000 ppm, 0-10.00 ppt
	Resolution	0.1/1 ppm, 0.01 ppt
Salinity	Range	0-10.00 ppt
	Resolution	0.01 ppt
Temperature	Range	0-50˚C
	Resolution	0.1˚C
	Accuracy	±0.5˚C

9. Icons and Functions

① Calibration points indication: Ⓛ Ⓜ Ⓗ

② Stable Measurement: ☺

③ Reading value Auto. Lock: **HOLD**

④ Self-Diagnostic Information: **Er1, Er2**

⑤ Low-Voltage warning: 🔲 flashes, reminder of battery replacement

⑥ Two-Color backlight:

  Blue — Measurement Mode; Green — Calibration Mode;

⑦ Auto. Power Off in 8 minutes if no operation.

10. Probe Replacement

Screw off the probe ring, unplug the probe, plug in the new replacement probe (pay attention to the probe's position), and screw on the probe ring. The model numbers of replacement probes that are compatible with EC60 is:

- EC60-E conductivity probe

11. 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 (Europe) GmbH, any malfunctioned or damaged product attributable to responsibility of APERA INSTRUMENTS (Europe) GmbH for a period of **two years** from the delivery (a **six-month** limited warranty applies to probes). This warranty does not apply to defects resulting from actions such as misuse (violation of the instructions in this manual or operations in the manner not specified in this manual), improper maintenance, or unauthorized repairs. Warranty period is the time limit to provide free service for the products purchased by customers, not the service life of the tester or probe.

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