SX711 Portable pH/mV Meter

User Manual

IP57 WATERPROOF

APERA INSTRUMENTS, LLC

aperainst.com

v3.0

Table of Contents

Scan the QR code below to watch the tutorial video on Youtube.

1 Brief Introduction

Thank you for choosing Apera Instruments SX711 Portable pH/mV Meter (will be called “the meter” in short in the following content). Before using the meter, please read this instruction manual carefully to help you properly use and maintain it.

The meter can measure the parameters of pH and temperature of water solutions with high accuracy. It is suitable for applications in general water solutions e.g., water treatment, aquaculture, horticulture, pools, beverage making, mining, power plants, environmental monitoring, etc., especially ideal for in-field use.

The meter has the following features:

1.1. Built-in microprocessor chip with the intelligent functions of auto. calibration, auto. temperature compensation, auto. salinity compensation, manual baromatric pressure compensation, data storage, function settings, auto. power off, and low voltage display etc.

1.2. Adopts digital filter technology to intelligently improve meter’s response speed and accuracy. The smiley face icon will appear when the reading is stable.

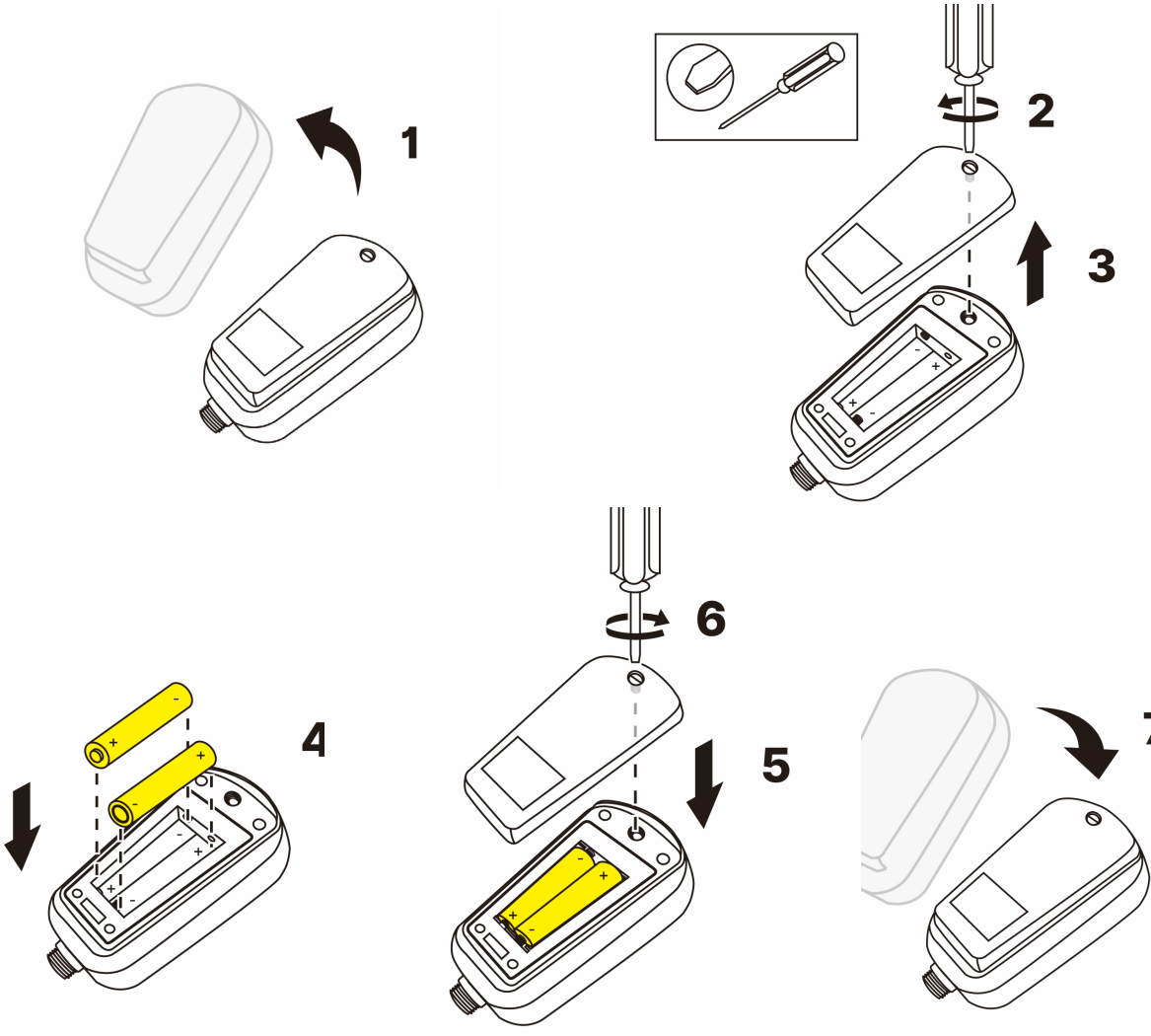
1.3. Pure water modes available for pH, significantly increasing the accuracy.

1.4. Meter’s LCD screen has clear and bright backlit display.

1.6. Built-tough. IP57 water and dust resistant.

⚠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.

How to Replace the Batteries



⚠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.	

2 Technical Specifications

2.1 pH

Range	(-2.00 to 19.99) pH
Resolution	0.1/0.01 pH
Accuracy	Meter Body: ±0.01pH; Overall: ±0.02pH
Input current	≤2×10^{-12} A
Input impendance	≥1×10^{12} Ω
Stability	±0.01 pH/3h
Temp. compensation range	(0 to 100) ˚C (automatic)

2.2 mV

Measurement range (mV/ORP/EH)	-1999 mV to 0 to 1999mV
Resolution	1mV
Accuracy	Meter: ±0.1% FS, Overall: ±15mV

2.3 Other Technical Parameters

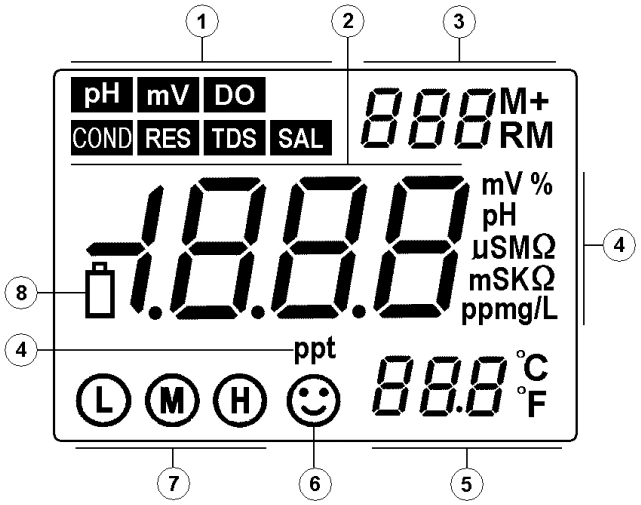
Data storage	200 sets
Data content	Serial number, measurement value, measurement unit, and temperature
Power Supply	Two AA alkaline batteries (1.5V x2)
Dimensions and weight	Meter: (65×120×31) mm/180g Complete Kit: (255 x 210x 50) mm/1760g

2.4 Working Condition

Working environment temperature	5 to 50˚C
Working humidity	≤85%
IP rating	IP57 water-resistant

3 About the Meter

3.1 Screen Display



① —— Parameter icon ② —— Measurement value

③ —— Serial number and icon as measurement to be saved and recalled and indication icon for special states.

M+ — measurement value to be saved; **RM** — Saved data to be recalled

④ —— Measurement unit ⑤ —— Temperature measurement value and unit

⑥ —— Measurement stabilization icon ⑦ —— Electrode calibration indication icon

⑧ —— Indication icon of low battery power; appears when the voltage is less than 2.6V, calling attention to replace the batteries.

3.2 Keypad

The meter has 5 operation keys in total.

Short press: press time <1 seconds; Long press: press time >2 seconds

3.2.1. ON/OFF — Short press to power on or off.

3.2.2. CAL — Calibration key

(a) When in measurement mode, short press to enter calibration mode.

(b) When in parameter setting mode, short press to make changes.

3.2.3. MODE — Function key

(a) In pH measurement mode, short press (<1.5s) to switch between pH and mV . Long press

to enter parameter setting (P1, P2, P3…)

(b) In other measurement mode, short press this key to enter the parameter setting mode (P1, P2, P3…)

3.2.4. ENTER — Backlight and confirmation key

(a) In measurement mode, short press to turn on or off the backlight.

(b) In calibration mode or the parameter setting, press this key to make confirmation, and return to measurement mode.

(c) When in **pH** mode, hold this key to change pH resolution: 0.01→0.1 pH in turn. Release key when you confirm the selection.

3.2.5. M+ RM — The key for data saving and recalliing

(a) When in measurement mode, short press to save the measurement data; Long press to recall the saved data.

(b) When in parameter setting mode, press the key to make changes.

3.3 Data Log, Recall and Delete

3.3.1. Save the measurement:

In measurement mode, when the reading is stable and ☺ stays on screen, short press M+ RM to save the measurement data. **M+** icon and the data serial number will show up on the upper right corner. The meter can store up to 400 sets of data.

3.3.2. Recall saved data:

(a) In measurement mode, long press M+ RM , the meter will recall the last saved data and the serial number. **RM** icon will appear in the upper right corner of the screen.

Short press CAL again, the meter will recall all the data in turn, hold CAL or M+ RM to quickly review the data.

(b) In data recalling mode (**RM** and serial number in the upper right corner), short press ENTER to return to measurement mode.

3.3.3. Delete data:

In data recalling mode, hold ENTER for 5 seconds, CLr will show up for 2 seconds, meaning that all the saved data have been eliminated. Then the meter will return to measurement mode.

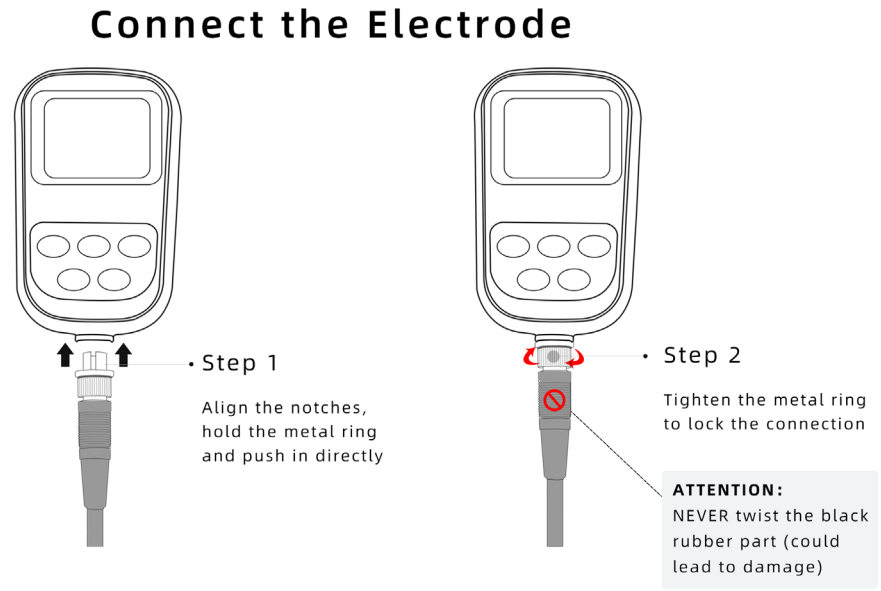
4 What's in the Kit

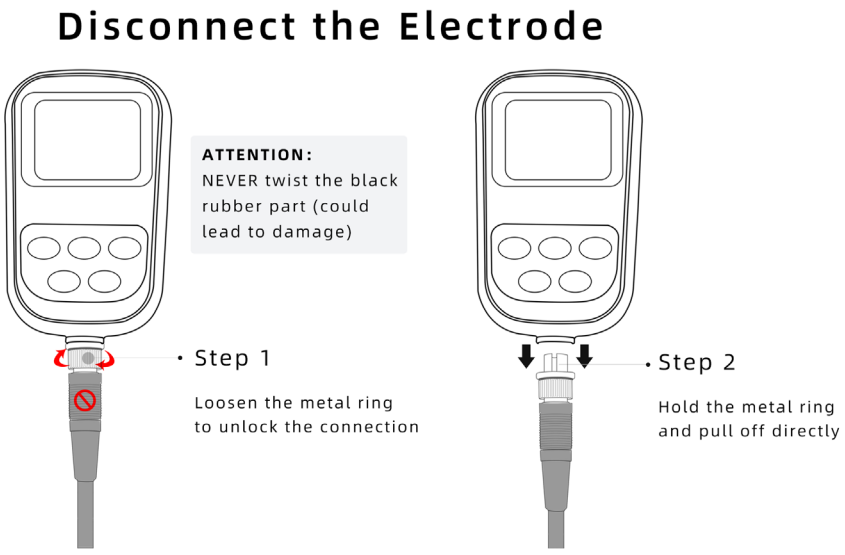
SX711 pH/mV meter *1	201T-S pH/temp. electrode *1
Silicone boot *1	Spare AA batteries *2
pH buffer solutions (pH4.00, pH7.00, pH10.01, 50ml bottle/each)	Screw driver *1
User manual *1	Carrying case *1

5 Preparation

What you need in addition to what's in the kit:

- Pure water (distilled or deionized water) for rinsing off the electrode
- Clean tissue or Kimwipes for removing excess water on the electrode





6 pH Measurement

Short press ON/OFF to turn on the meter. Connect 201T-S pH electrode to the meter (See Section 5 for connection tutorial). The meter will automatically enter pH measurement mode.

6.1 pH Electrode

The meter comes with the 201T-S 3-in-1 combination electrode with a built-in temperature sensor, which enables automatic temperature compensation. **This electrode is only suitable for general water solutions' pH testing.** Please refer to Section 6.6 for ideal pH electrodes to use for other applications. A 3M KCL storage bottle comes with the electrode, which is for storing the electrode when not in use to keep the sensitivity of the electrode.

6.1.1 Technical Specifications of the 201T-S pH Electrode

Measurement Range: 0 - 14 pH, 0 - 80˚C (32 – 176˚F) ; Junction: Single Ceramic

Reference Electrode: Ag/AgCl Connector: 8-pin

Size: ø12*160 mm; cable length: 1 meter

Temperature unit: 30K Thermistor

6.1.2 Use the Electrode

Screw off the electrode storage vial, and put it aside (do not dump or spill the KCL solution inside). Rinse the electrode with distilled or deionized water. Shake off excess water or blot-dry with clean tissue or kimwipe. Stir the electrode for a few seconds after it's dipped into the test solution and then hold it still. Wait for the reading to get fully stabilized (☺ appears and stays) and then take the measurement. When the test is finished, place the electrode in the storage bottle and tighten the cap to keep the sensitivity of the pH sensor.

6.2 pH Calibration

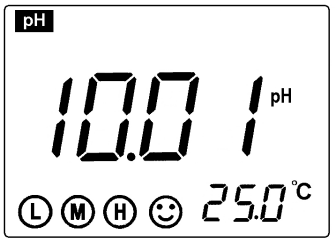
6.2.1 After powering on the meter, short press CAL to enter calibration mode, C 1 flickers on LCD, indicating the meter enters the first point calibration.

6.2.2 Rinse off the pH electrode in pure water and remove excess water, then insert it into the pH 7.00 buffer solution, make a quick stir and then hold it still. When the reading is stabilized and ☺ stays on

screen, short press CAL again to finish the 1st point calibration. "**7.00 pH**" will start flickering and a flickering C2 will show up, indicating the 1st point calibration has been finished and the meter is entering the 2nd point calibration.

6.2.3. Rinse off the pH electrode in pure water and remove excess water, then insert it into the pH 4.00 buffer solution, make a quick stir and then hold it still. When the reading is stabilized and ☺ stays on screen, short press CAL again to finish the 2nd point calibration. "**4.00 pH**" will start flickering and a flickering C3 will show up, indicating the 2nd point calibration has been finished and the meter is entering the 3rd point calibration.

6.2.4. Rinse off the pH electrode in pure water and remove excess water, then insert it into the pH 10.01 buffer solution, make a quick stir and then hold it still. When the reading is stabilized and ☺ stays on screen, short press CAL again to finish the 3rd point calibration. "**10.01 pH**" will start flickering and then the meter will return to measurement mode.



Picture (4-1)

Ⓛ Ⓜ Ⓗ will show up at the bottom left (see picture 4-1), indicating all three points of calibration are finished.

6.3 Notes about pH Calibration

1) Keeping the freshness and cleanliness of calibration buffers is essential for accurate pH measurement. The small bottles of pH buffers come with the meter should be replaced within 3 months after opening. The new buffer solutions should be made by a legitimate lab supply manufacturer. Avoid sunlight and air contact when the buffers are not being used, and store at room temperature.
2) This meter can adopt random 1-point, 2-point or 3-point automatic calibration. During calibration, short press ENTER to return to measurement mode. When the measurement accuracy is ≤±0.1pH, choose a buffer that's close to the estimated measurement range and perform 1-point calibration would be good. Choose pH4.00 and pH7.00 to calibrate if the measurement range is within the acidity range (<pH 7) and choose pH7.00 and pH10.01 to calibrate if just within the alkalinity range (>pH 7).
3) Choose 3-point calibration to achieve a more accurate measurement if the measurement range is wide, or if the electrode has not been used for long. When connecting a new pH electrode, it must

be calibrated at 3 points.

4) The frequency that you need to calibrate your meter depends on the tested samples, condition of electrodes, and the requirement of the accuracy. For High-Accuracy measurements (≤ ±0.02pH), the meter should be calibrated before test every time; For ordinary-accuracy measurements (≥±0.1pH), once calibrated, the meter can be used for about a week or longer. In the following cases, the meter must be re-calibrated:
   - The electrode hasn't been used for a long time or a new electrode is connected.
   - After measuring strong acid (pH<2) or strong base (pH>12) solutions.
   - After measuring fluoride-containing solution and strong organic solution.
   - There is a significant temperature difference between the test sample and the buffer solution.

6.4 Sample Measurement

Power on the meter. Connect the pH electrode and the meter goes to pH measurement mode automatically. Screw off the KCL storage bottle. Rinse the electrode with pure water. Shake off excess water or blot-dry with clean tissue or kimwipe. Stir the electrode for a few seconds after it's dipped into the sample solution and then hold it still. Wait for the reading to get fully stabilized (☺ appears and stays). Then save the measurement by pressing M+/RM.

According to the pH isothermal measurement principle, the closer the test sample's temperature is to the calibration solution's, the higher the accuracy of the measurement. This principle is recommended to follow for the best result. For example, if you must test at 150˚F, we recommend warming up the calibration solutions to the same temperature before performing calibration in order to get the most accurate readings.

6.5 Pure Water pH Measurement

When testing pure water like tap water, drinking water, RO water or 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 electrode 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.

6.6 Recommended pH Electrodes for Different Applications

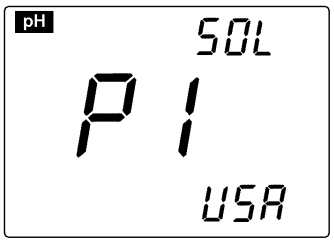
Application	Ideal Apera pH Electrode Model
General water solutions	201T-S
Beverage, beer, wine	LabSen 335
Low ionic strength solutions (RO water, distilled water, deionized water…)	LabSen 805
High-Temperature solutions	LabSen 865
Viscous liquid e.g. cosmetics, skin care products, paints, coatings, glues, resin, etc	LabSen855
High salinity solutions	LabSen 845
Complex and caustic solutions (e.g. electroplating)	LabSen 865
Raw meat, meat products, foods, fruits, cheese, vegetables	LabSen 765
Micro sample testing	LabSen 246-5
Strong acid solutions, HF containing solutions (HF concentration<1%)	LabSen 835
Strong alkaline solutions	LabSen 845
Wastewater, emulsions, suspensions, slurries	LabSen 335

*** Visit aperainst.com/product/electrode/labsen or contact us at info@aperainst.com for more details.**

6.7 Parameter Settings

Prompt Mark	Parameter Setting Items	Code	Parameters
P1	pH buffer solution series selection	SOL	USA (U.S.A series) NIS (NIST series) CH (China series)
P2	Pure water pH temperature compensation setting	PU 1	OFF-On (shut-set)
P3	Ammonia added pure water pH temperature compensation setting	PU 2	OFF-On (shut-set)
P4	Temperature unit setting		˚C - ˚F
P5	Backlight display time setting	bL	0-1-3-6min
P6	Auto power off setting	AC	0-10-20min
P7	Restore to producer setting		OFF-On

6.7.1 *pH buffer solution series selection (P1)*



Picture (4-2)

(a) Long press MODE, meter enters P1 mode: see picture (4-2).

(b) Press CAL or M+/RM to choose buffer solution series:

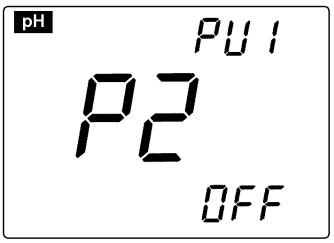
(U.S.A series) — 1.68, 4.00, 7.00, 10.01and 12.45 pH

(NIST series) — 1.68, 4.01, 6.86, 9.18 and 12.45 pH

(China series) — 1.68, 4.00, 6.86, 9.18 and 12.46 pH

(c) Press MODE to enter next parameter setting or press ENTER to confirm and return to measurement mode.

6.7.2 *Pure water pH temperature compensation setting (P2)*



Picture (4-3)

(a) Short press MODE in P1, the meter enters mode P2, see picture (4-3).

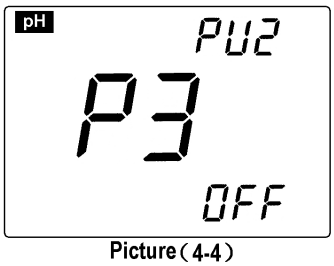
(b) Press CAL or M+/RM to choose On (pure water pH temperature compensation setting) or OFF

(c) Press MODE to enter next parameter setting or press ENTER to confirm and return to measurement mode.

(d) The factory default setting is OFF

Note: PU 1 will appear in the upper right corner of the LCD if pure water temperature compensation function is set.

6.7.3 *Ammonia added pure water pH temperature compensation setting (P3)*



Picture (4-4)

(a) Short press MODE in mode P2 to enter mode P3, see picture (4-4).

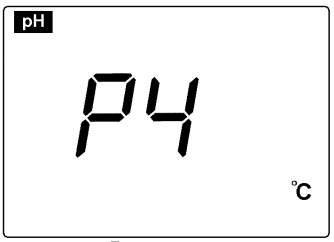
(b) Press CAL or M+/RM to choose On (ammonia added pure water pH temperature compensation setting) or OFF

(c) Press MODE to enter next parameter setting or press ENTER to confirm and return to measurement mode.

(d) The factory default setting is OFF

Note: If the ammonia pure water pH temperature compensation function is set, PU 2 will appear in the right upper corner of the LCD when in measurement mode.

6.7.4 ***Temperature unit ˚C/˚F setting (P4)***



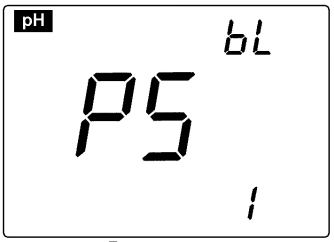
Picture（4-5）

(a) Short press MODE in P3 to enter P4, see picture (4-5).

(b) Press CAL or M+ RM to choose temperature unit: ˚C or ˚F.

(c) Press MODE to enter next parameter setting or press ☼ ENTER to confirm and return to measurement mode.

6.7.5 ***Backlight display time setting (P5)***



Picture（4-6）

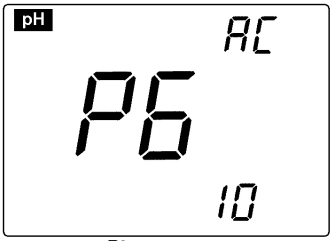
(a) Short press MODE in P4 to enter P5, see picture (4-6).

(b) Press CAL or M+ RM to choose the time of backlight auto off: 0 min, 1 min, 3 min or 6 min. The backlight will be closed if choosing 0 min.

(c) Press MODE to enter next parameter setting or press ☼ ENTER to confirm and return to measurement mode.

(d) The factory default setting for P5 is 1min.

6.7.6 ***Auto power off time setting (P6)***



Picture（4-7）

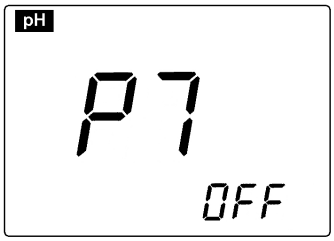
(a) Short press MODE in P5 to enter P6, see picture (4-7).

(b) Press CAL or M+ RM to choose the time: 0min, 10min or 20min. The auto power off function will be closed if choosing 0min.

(c) Press MODE to enter next parameter setting or press ☼ ENTER to confirm and return to measurement mode.

(d) The factory default setting for P6 is 10min.

6.7.7 ***Restore to factory default setting (P7)***



Picture（4-8）

(a) Short press MODE in P6 to enter P7, see picture (4-8).

(b) Press CAL or M+ RM to choose On , meaning that the parameters have been restored to the producer setting mode, and return to measurement mode after 2 seconds. Returning to factory default setting is to restore the meter to theoretical value (zero potential pH is 7.00, slope is 100%), and set all the parameters to default settings. When the meter's calibration or measurement is performing abnormally, users can use this function, and then calibrate and test again. Please note that this function is irreversible once used.

6.8 pH Electrode Cleaning

1) The measurement is only as accurate as the electrode is clean. Always thoroughly rinse off the electrode before and after each test with pure water. Use soap water if necessary.
2) For tough contaminants, soak the electrode in Apera electrode cleaning solution (AI1166) for at least minutes. Then use a soft brush to remove the contaminants. Afterwards, soak the electrode in 3M KCL soaking solution for at least 1 hour. Rinse it off, then re-calibrate the electrode before measurement.

6.9 The Self-diagnose Information

During usage, the following icons may show up on LCD. This is the meter's self-diagnose information, which can help you understand what may go wrong with the meter or electrode.

6.8.1. The stable icon **-2.00 pH** or **19.99 pH** — this icon appears when the pH value exceeds the measurement range. This icon will also show up when the electrode is not well connected with the meter or when the electrode is not insertd into solution. This is a normal phenomenon.

6.8.2. Err 1 — Electrode offset out of range (<-60mV or >60mV)

6.8.3. Err2 — Electrode slope out of range (< 85% or >105%)

When Err 1 or Err2 shows up:

1) Make sure there is no damage on the electrode's glass bulb (if so, an electrode replacement is necessary). Check if there is air bubble inside the glass bulb. If so, shake the electrode with force for several seconds to remove the bubble.
2) Check the quality of buffer solution. Make sure it's fresh and clean and conforms to the meter's buffer series setting.
3) Set the meter to factory default setting mode (refer to section 6.6.7), then recalibrate it.

See more details in Troubleshooting Guide in Section 8.

6.10 pH Electrode Maintenance

1) Never store pH electrode in pure water as it will damage the electrode. Always store the electrode in 3M KCL soaking solution (AI1107).
2) If you find any air bubble in the glass bulb of the pH sensor, simply shake the electrode with force for a few times to remove it. The existence of an air bubble in the glass bulb will significantly decrease the stableness of measurement.

3) Always keep the meter's connector clean and dry, otherwise it may lead to an inaccurate measurement. If contaminated, clean the connector with alcohol prep pads and blow-dry.

4) pH electrode is technically a chemical battery. Every pH electrode will eventually die even if you don't use it at all. The typical service life of a pH electrode is 1-2 years depending on how you use and maintain it. We recommend replacing your pH electrode after one year of use to ensure the best result.

7 ORP (mV) Measurement

7.1 mV Measurement with the Connection of a pH Electrode

When connected to a pH electrode, if you press MODE to switch the meter to mV mode, it displays the raw electrical potential used to calculate pH, which is essential for troubleshooting electrode health and accuracy during calibration.

7.2 ORP Measurement

Press ON/OFF to power on, connect the ORP combination 301 Pt-S electrode (sold separately), the meter will enter ORP measurement mode (mV) automatically. Screw off the storage bottle. Rinse the electrode with pure water. Shake off excess water or blot-dry with clean tissue or kimwipe. Stir the electrode for a few seconds after it's dipped into the sample solution and then hold it still. Wait for the reading to get fully stabilized (☺ appears and stays). Then save the measurement by pressing M+/RM.

7.3 Notes about ORP

When you are not sure about the ORP electrode's condition, use 222mV ORP standard solution to test mV value and see whether the ORP electrode works properly. Table-9 is the data of standard ORP solution for 222 mV. When the error is within ±15 mV, the ORP electrode is in good condition.

Table-9

°C	10	15	20	25	30	35	38	40
mV	242	235	227	222	215	209	205	201

7.4 Clean and activate ORP electrode

After the electrode has been used over a long period of time, the platinum surface will get polluted which causes inaccurate measurement and slow response. Please refer to the following methods to clean and activate ORP electrode:

- In general, soaking the ORP electrode in 222mV for 30 minutes will help activate the ORP sensor and restore its accuracy.
- For inorganic pollutant, submerge the electrode in 0.1mol/L dilute hydrochloric acid for 30 minutes, then wash it in distilled water, then submerge it in the soaking solution for 6 hours.
- For organic or lipid pollutant, clean the platinum surface with detergent, then wash it in distilled water, then submerge it in the soaking solution for 6 hours.
- For heavily polluted platinum surface on which there is oxidation film, polish the platinum surface with toothpaste, then wash it in distilled water, then submerge it in the 3M soaking solution for 6 hours.

8 Troubleshooting Guide

Trouble	Reasons	How to Fix
Cannot calibrate	Pressing CAL too soon	Wait for the reading to get fully stabilized before pressing CAL to finish calibration.
	Poor quality calibration buffer solutions	Make sure your calibration standard solutions are fresh and clean, and made by a legitimate manufacturer.
	Dirty electrode	Thoroughly clean off the electrode. Refer to Section 6.8
	Aged electrode	Replace the electrode.
	Dried-out electrode	Soak the electrode in Apera 3M KCL soaking solution for at least 1 hour.
	pH electrode is not fully submerged in the solution	Make sure the electrode is immersed in the solution at least 1 inch deep.
	Air bubbles around/inside the electrode	Make a quick stir in the solution to remove air bubbles.
	Broken electrode	If there is visible damage, replace the electrode. If not, contact Apera for warranty fulfillment.
Reading is always slowly changing, won't stabilize	Dirty electrode	Thorougly clean off the electrode. Refer to Section 6.8
	Aged electrode	Replace the electrode.
	Measuring pure water like drinking/RO/distlled/deionized water	Refer to Section 6.5

Display similar readings in any solutions or always display 7	Broken electrode	If you don't find any visible damage of the electrode, contact Apera for warranty fulfillment. If there is visible damage, replace the electrode.
	Instrument defect	Contact Apera for warranty fulfillment
Reading keeps jumping erratically	Electrode is not fully submerged in the solution	Make sure the electrode is immersed into the solution for at least 1 inch.
	Air bubbles around/inside the electrode	Make a quick stir in the solution to remove air bubbles.
	Electrode is not properly connected or the connector is broken.	Check the electrodes 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 electrode	Replace the electrode.
	Comparison with other meters, test strips, or drop tests	To compare with other meters, make sure to perform a 2-point calibration for all devices 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 pH electrode is not suitable for your application.	Refer to Section 6.6 or contact Apera to find the appropriate model for your specific application.

9 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
201T-S ATC pH electrode	AI1312	1 pc
pH buffer solution kit	AI1115	8 oz. each
pH buffer solution kit with CalPod Solution Organizer	AI1116	16 oz. each
3M KCl Electrode Storage Solution	AI1107	8 oz.
Electrode Protective Cap	AIX201	1 pc
Electrode Storage Vial	AI2511	3 pcs

Accessories

Description	SKU	Quantity
301Pt-S ORP Electrode	AI1315	1 pc
600 Simple Electrode Holder	AI2813	1 pc
Electrode Cleaning Solution	AI1166	8 oz.
pH Electrode Maintenance Kit	AI1170	1 pc
8-pin to BNC/RCA Converter	AI7103	1 pc

For pH electrodes for special applications, refer to Section 6.6

10 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 THREE YEARS (SIX MONTHS for the electrodes) from the delivery.

This limited warranty does not cover any damages due to:

Transportation, storage, improper use, failure to follow the product instructions or to perform any preventive maintenance, modifications, combination or use with any products, materials, processes, systems or other matter not provided or authorized in writing by us, unauthorized repair, normal wear and tear, or external causes such as accidents, abuse, or other actions or events beyond our reasonable control.

APERA INSTRUMENTS, LLC (USA)

Address: 6540 Singletree Dr, Columbus OH 43229

Tel: +1 (614) 285 3080

Email: info@aperainst.com

Website: aperainst.com