PH700-PW Benchtop pH Meter

for Pure Water and Low Ionic Strength Solutions

User Manual

v4.0

Table of Contents

1. Brief Introduction

This meter is a combination of advanced electronics design and sensor technology. Please read this manual carefully to properly use and maintain the product.

Main Features

1. Intelligent functions such as automatic calibration, self-diagnosis, automatic temperature compensation, data logging, max/min reading display, etc.
2. Simple electrode holder for easy operation and workbench space saving
3. Swiss LabSen pH electrode designed for pure water & low ionic strength solutions.

1.1 What's in the Box?

Content	Quantity
PH700 Benchtop pH Meter	1
LabSen 803 pH/Temp. Electrode	1
pH buffer solutions (4.00/7.00/10.01 pH, 50ml for each)	1 for each
9V Power Adapter	1
Electrode Holder	1 set
User Manual	1

1.2 Technical Specifications (Instrument Only)

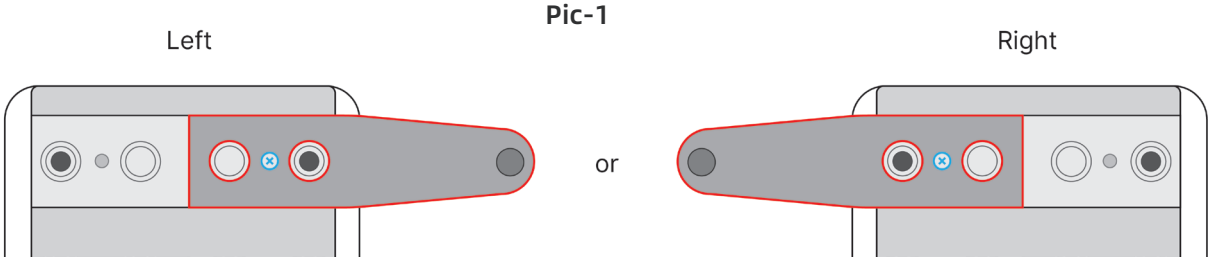
pH	Range	0 to 14.00 pH
	Resolution	0.01/0.1 pH
	Accuracy	±0.01 pH ±1 digit
	Temperature Compensation	0 to 100 ˚C (Auto or Manual)
	Calibration	1 to 3 points automatic
mV	Range	-1999 mV - 0 - 1999 mV
	Resolution	1 mV
	Accuracy	±0.1% F.S
Temp.	Range	0 to 100˚C; 32 to 212° F
	Resolution	0.1˚C; 0.1/1° F
	Accuracy	±0.5˚C
Others	Data Storage	50 sets
	Storage Content	Numberings, Measurement, Unit, Temperature, Temperature Compensation Status
	Power	DC9V/300mA
	IP Rating	IP54 dustproof and spillproof
	Dimension& Weight	(240*235*103) mm/1kg

2. Installation

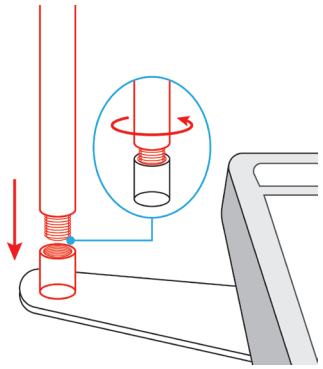
2.1 Install the electrode holder

The electrode holder is composed of a metal stand base, a supporting bar, and an electrode clip. First, screw on the metal stand base to the meter on either side (Pic-1). Then install the supporting bar on the metal stand base (Pic-2). Lastly, install the electrode clip on the supporting bar (Pic-3).

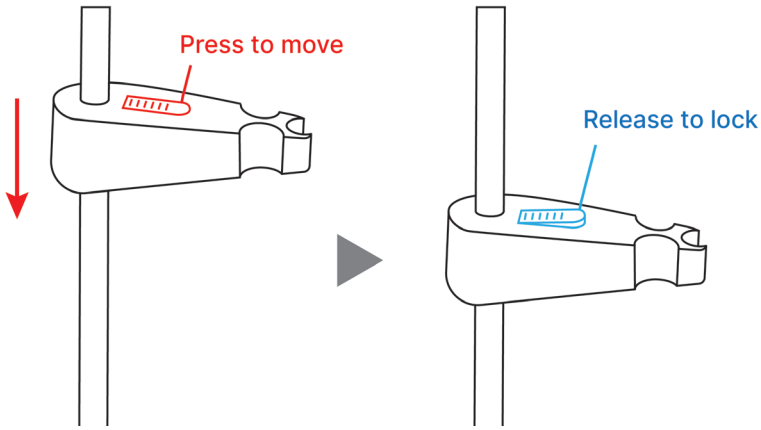
Pic-1



Pic-2



Pic-3



2.2 Connect the power adapter

Plug the power adapter tightly into the DC9V socket.

2.3 Connect the pH Electrode

Clip on the pH electrode to the electrode holder. Plug the blue BNC connector into the **pH/mV** socket, and black RCA connector to the **TEMP** socket.

2.4 pH Electrode

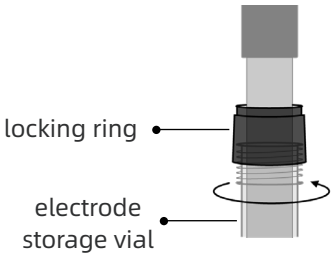
The meter comes with Apera LabSen® 803 pH/temp. electrode designed for accurate measurement in pure water e.g. distilled/deionized/RO/drinking/well water and low ionic strength water solutions as well as general water solutions.

2.5 Technical Specifications of LabSen 803 pH/temp. Electrode

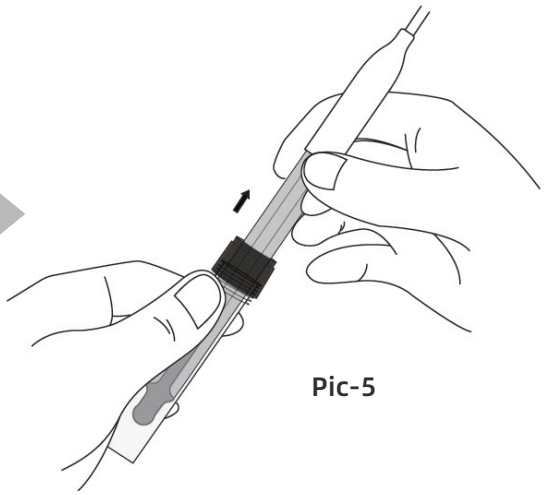
Measurement Range	1 - 11 pH, 0 - 80˚C (32 - 176˚F)
Membrane	L
Junction	Movable Sleeve
Reference Electrode	Silver Ion Trap
Electrolyte	3M KCl
Connector	BNC/RCA
Temperature unit	30K NTC
Dimension	ø12*120 mm
Cable Length	1 meter

2.6 Prepare the pH Electrode

2.6.1 Loosen the locking ring of the electrode storage vial by twisting it counterclockwise (Pic-4). Put the electrode storage vial aside. Then pull out the electrode slowly (Pic-5).



Pic-4

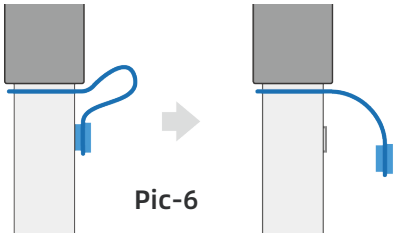


Pic-5

2.6.2 Rinse off the electrode with pure water (distilled or deionized water. RO water is the alternative), then blot dry the electrode with Kimwipe/filter paper/clean tissue to remove excess water (**NEVER** rub the glass membrane).

2.6.3 Open the Refilling Hole

Before measuring or calibrating, open the blue rubber stopper on the refilling hole of the pH electrode to maintain a smooth flow of electrolyte. When not in use, tightly close on the stopper (Pic-6).

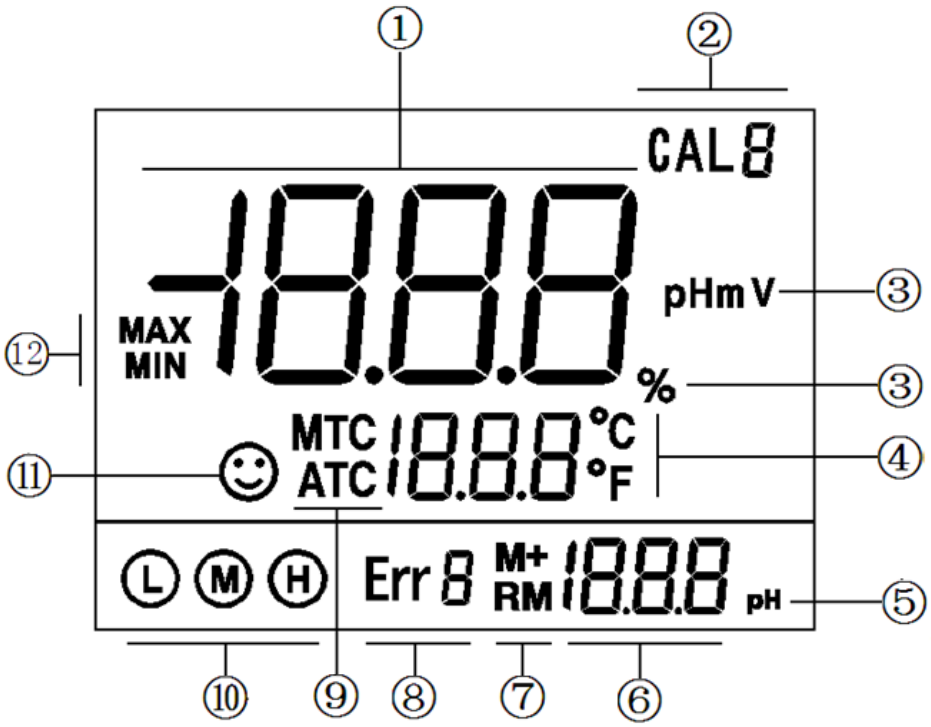


Pic-6

2.6.4 Perform at least a 2-point calibration before first-time use. For calibration details, refer to Section 4.

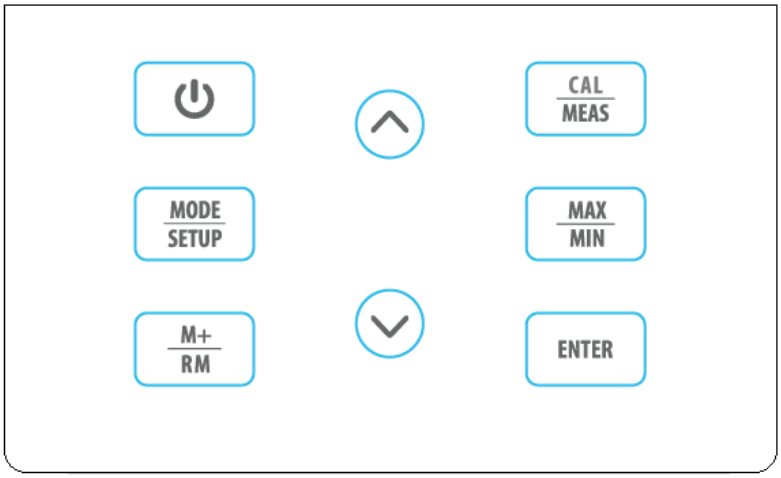
3. Instrument Description

3.1 LCD Display



1) Measurement value
2) Calibration icons and numberings
3) Measurement unit
4) Temperature and reminder icons
5) The pH unit displayed during calibration
6) The pH value displayed during calibration, numberings for storage and recall, and reminder icons
7) Icons for data storage and recall — M+: save measurement data; RM: Recall measurement data
8) Self-Diagnosis icons and numberings
9) Temperature compensation mode icons — ATC: Auto Temperature Compensation; MTC: Manual Temperature Compensation
10) Completed calibration icons
11) Stable reading icon
12) Icons for maximum and minimum values

3.2 Keypad



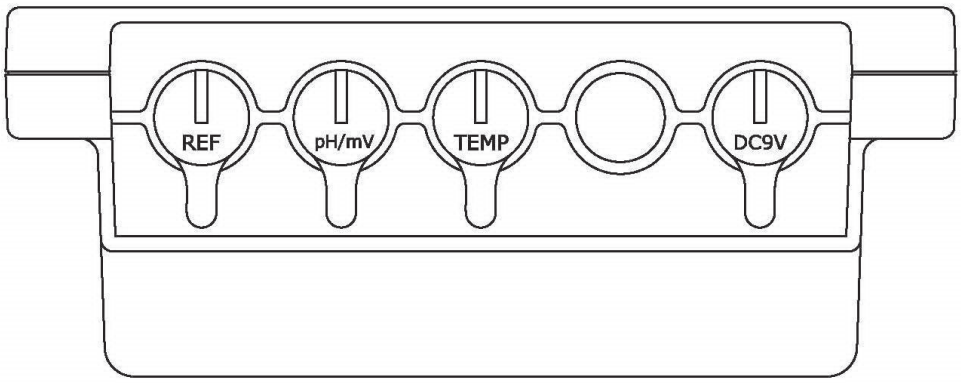
3.2.1 Keypad Operation

Short Press: 0.5 seconds **Long Press:** 2 seconds

3.2.2 For keypad functions, refer to the following table.

Keypad	Operation	Functions
⏻	Short Press	Power on/off
MODE SETUP	Short Press	Select measuring mode: pH → mV
	Long Press	Enter parameter setting: P1 → P2 →...P4
CAL MEAS	Short Press	• Enter Calibration mode • Cancel any operation and go back to measurement mode
ENTER	Short Press	• In calibration mode, press to conduct calibration • In parameter setting, press to confirm selection
M+ RM	Short Press	Save measurement data
	Long Press	Recall saved measurement data
∧ ∨	Short Press or Long Press	• In manual temperature compensation mode, short press to change temperature, long press to change quickly. • In parameter setting mode, short press to change parameter and settings. • In recall mode, short press to change numberings, long press to change quickly.
MAX MIN	Short Press	Enter Max/Min measurement mode (refer to section 4.6)

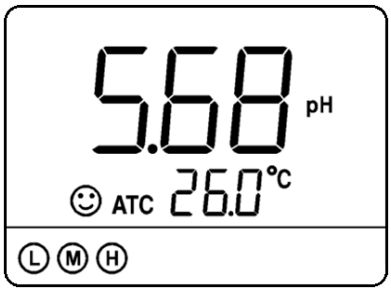
3.3 Connection



Symbol	Connector Name	Connector Type
REF	Socket for reference electrode	Φ2 banana type
pH/mV	Socket for pH and ORP electrode	BNC
TEMP	Socket for temperature sensor	RCA
DC9V	DC9V power socket	Φ2.5 direct type

3.4 Stable Reading Display Mode

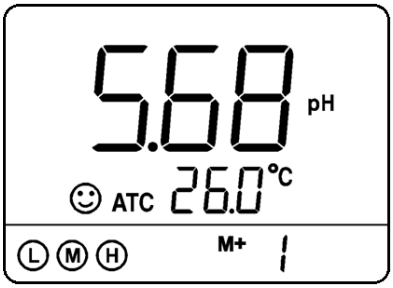
When the measuring value is stable, ☺ appears on LCD, see Pic-7. Do not record the reading value or make calibration until the ☺ appears and stays.



Pic-7

3.5 Data Logging

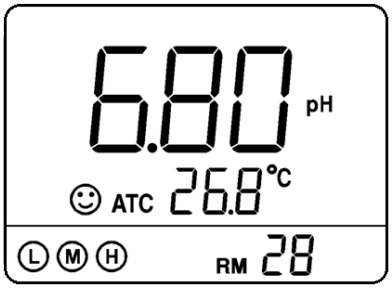
When readings are stable, short press M+/RM, the meter displays **M+** icon and data numberings on LCD, and saves the measurement data. In Pic-8, the meter has saved the first set of the measurement data. Short press M+/RM again to keep logging more data.



Pic-8

3.6 Data Recalling

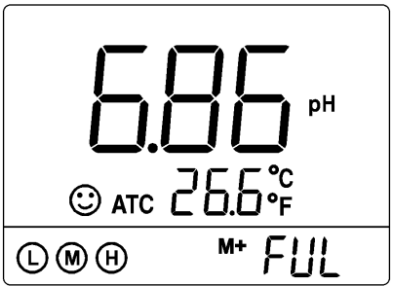
In measurement mode, long press M+/RM to recall the last set of saved data. The meter displays **RM** icon and data numberings. In Pic-9, the meter is recalling the 28th set of data. Keep pressing ∧ or ∨ to recall the data successively. Hold ∧ or ∨ to quickly recall the data. Short press CAL/MEAS to return to measurement mode.



Pic-9

3.7 Delete Storage

The meter can store up to 50 sets of data. Once the storage is full, if you press M+/RM again, the **FUL** icon will be displayed on LCD (see Pic-10). The storage needs to be deleted in parameter setting P4 to save new data. The numberings in M+ indicates the total number of stored data.



Pic-10

The numberings in RM indicates the number of stored data in the current mode (pH/mV). For example, if 20 sets of data is stored in pH mode, and 10 sets in mV mode, then the numberings for M+ will be **M+30** in both pH and mV mode; the numberings for RM in pH mode would be **RM20**; in mV mode would be **RM10**.

3.8 Max/Min Mode

Use this function to display the maximum or minimum records out of readings in a period of time. In measurement mode, short press MAX/MIN, flashing icons of **MAX/MIN** will show up, indicating the meter has entered the max/min mode. After testing is finished, short press MAX/MIN again, the maximum and minimum values from the past readings since you entered the max/min mode will show up alternately. Short press CAL/MEAS to return to the regular measurement mode.

4. pH Calibration

4.1 pH Buffer Solution Series

The meter has 2 series of standard buffer solutions: USA and NIST (see table below). They can be selected in parameter P1 (see Section 6.1).

Calibration Icon		pH Standard Buffer Series	
		USA	NIST
3-Point Calibration	Ⓛ	4.00 pH or 1.68 pH	4.01 pH or 1.68 pH
	Ⓜ	7.00 pH	6.86 pH
	Ⓗ	10.01 pH or 12.45 pH	9.18 pH or 12.45 pH

4.2 3-Point Calibration

The meter can adopt 1 to 3 points of calibration. The 1st point must be with 7.00 pH buffer solution (or 6.86 pH in NIST Series). Refer to the following table for details. At the end of 2-point and 3-point calibration, the electrode slope data of acidity range and alkalinity range will be displayed, which indicates the health of your electrode. The closer it is to 100%, the better the condition of the electrode is.

Calibration	USA Series		NIST Series		Icon	When to use
1-point	7.00 pH		6.86 pH		(M)	Error Tolerance > ±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	(L)(M)	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	(M)(H)	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		(L)(M)(H)	Range: 0 to 14.00 pH

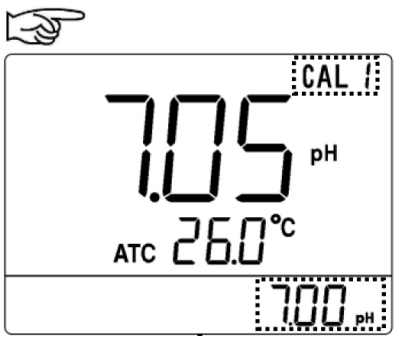
4.3 How often to calibrate

The frequency that you need to calibrate your meter depends on the tested samples, condition of electrodes, and the requirement of the accuracy. For higher accuracy measurement (error tolerance < ±0.03pH), the meter is recommended to be calibrated at least once a week; For lower accuracy measurement (error tolerance > ±0.1pH), calibration is only necessary once a month. However, in the following cases, the meter must be re-calibrated before measurement:

- The electrode hasn't been used for a long time or when a new electrode is connected.
- After measuring strong acidic (pH<2.00) or strong alkaline (pH>12.00) solutions.
- After measuring fluoride-containing solution and strong organic solution.
- There is a significant temperature difference between the test sample and the buffer solutions.

4.4 How to calibrate (use 3-point calibration 7.00/4.00/10.01 as an example)

4.4.1 Power on the meter. Long press CAL MEAS to enter calibration mode. **CAL1** icon will flash in the upper right corner. 7.00 pH will flash in the lower right corner, reminding you to use pH 7.00 buffer to perform the 1st point of calibration.

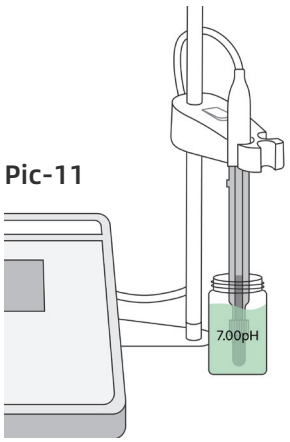


Note:

The 1st point calibration must be with 7.00 pH (or 6.86 pH if using NIST series standard buffers).

4.4.2 Screw off the electrode storage vial and use pure water to rinse off electrode; Blot dry the electrode with Kimwipe/filter paper/clean tissue to remove excess water (**NEVER** rub the glass membrane). Then dip electrode into pH 7.00 buffer at least 1 inch deep (see Pic-11), stir it for a few seconds and let it stand. Then wait for the reading to stabilize. Pressing ENTER before the reading is stable will generate **Er2** (refer to Section 6.3).

Pic-11



4.4.3 When the reading is stabilized, ☺ appears and stays. Short press ENTER to calibrate the 1st point. **End** icon appears after calibration is finished. In the meantime, **CAL2** will start flashing, and **4.00 pH & 10.01 pH** will flash alternately, reminding you to perform the 2nd point calibration.

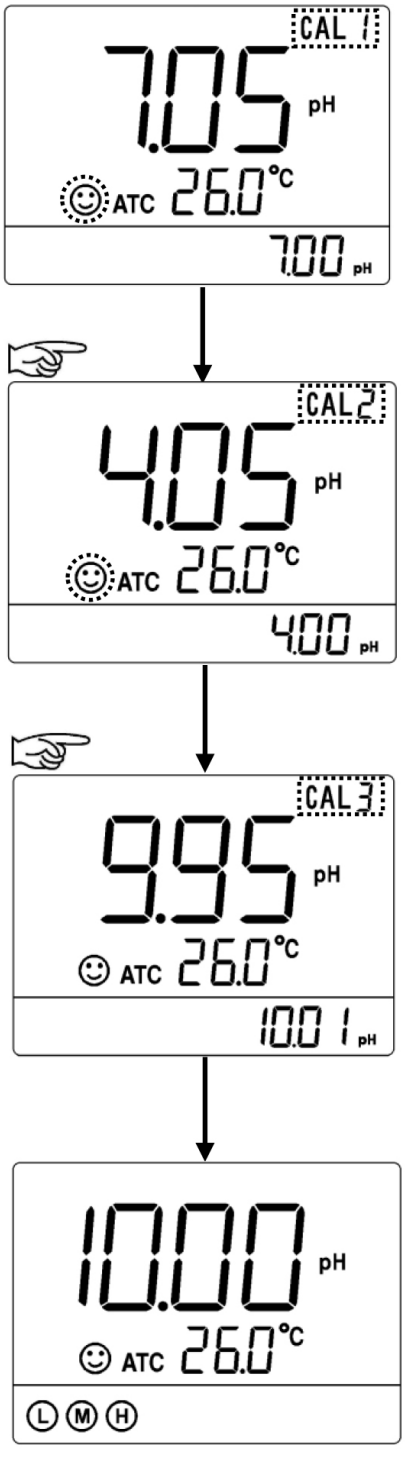
4.4.4 Use 4.00 pH buffer and follow the steps in 4.4.2. When the reading is stabilized, ☺ appears and stays. Short press ENTER to start calibration. **End** icon and the electrode slope of acidity range will show up after calibration is finished. In the meantime, **CAL3** will start flashing, and **10.01 pH** will flash at the lower right, reminding you to continue to the 3rd point calibration.

4.4.5 Use pH 10.01 buffer and follow the steps in 4.4.2. When the reading is stabilized, ☺ shows up and stays. Short press ENTER to start calibration. **End** icon and the electrode slope of alkalinity range will display after calibration is finished. The meter returns to measurement mode, the calibration icons **L M H** will show up, indicating the low, medium, and high points are all calibrated.

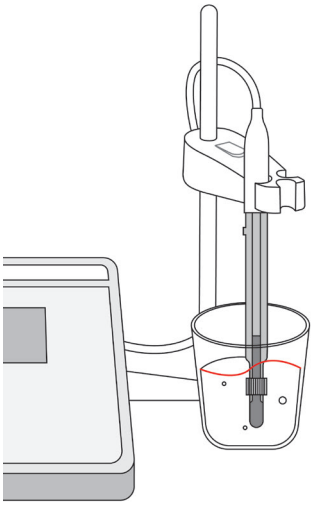
4.4.6 During calibration, short press CAL MEAS to exit calibration and return to measurement mode.

NOTE:

Pure water refers to distilled or deionized water. RO water is the alternative.



5. pH Measurement



Pic-12

5.1 How to Take pH Measurement

5.1.1 Power on the meter to enter measurement mode.

5.1.2 Rinse the electrode with pure water for a few seconds. Blot dry the electrode with Kimwipe/filter paper/clean tissue.

5.1.3 Submerge the electrode into your sample solution at least 1 inch deep (see Pic-12). Stir the electrode for a few seconds and let it stand still. Wait for the reading to get fully stabilized (☺ appears and stays) and then record it as the pH measurement.

5.1.4 In measurement mode, short press M+ RM to save the stabilized reading as the pH measurement. Long press M+ RM to recall all the saved data. In data recalling mode, short press CAL MEAS to return to measurement mode. For details of data management, refer to Section 3.5 to 3.7.

5.1.5 To use the Max/Min measurement mode, refer to Section 3.8.

5.1.6 For mV/ORP measurement, refer to Section 9.

5.2 How to Measure pH of Pure Water

5.2.1 Pour at least 8 oz. (250 mL) of the pure water that you need to test into a beaker (too little water may cause inaccuracy).

5.2.2 ***Soak the electrode in pH 4.00 calibration solution for half a minute***.

5.2.3 Follow the steps in 5.1 to take pH measurement of your pure water sample.

5.2.4 When testing pure water, it will take longer for the readings to get fully stabilized (typically 2-5 minutes). Pure water is susceptible to the influence of CO_2 in the air. If you leave the electrode in pure water for too long, its pH will be slowly changing. Here is a tip to minimize this interference:

- Use a closed system — Minimize the time that the water sample is exposed to the air before and during the pH measurement. Use a lid or cover on top of the water sample and make a hole to insert the electrode for testing when possible.

5.4 Tip to Minimize Measurement Error

According to the pH isothermal measurement principle, the closer the test sample's temperature is to the calibration solution's, the lower the measurement error. This principle is recommended to follow when conducting tests for the best result. Example: If users were to test samples at 100˚F, we recommend warming up the calibration solutions to be close to that temperature before performing calibration in order to minimize the error caused by different temperatures.

5.5 Manual Temperature Compensation

The default pH electrode has a built-in temperature sensor so the temperature compensation will be automatic (**ATC** on screen). When you use a pH electrode without a temperature sensor, you would want to use the manual temperature compensation function to lower the pH measurement error. First, use an external thermometer to get the temperature of your sample; Then power on the meter (**MTC** on screen when there is no temperature sensor connected). In measurement mode, short press ∧ or ∨ to adjust the temperature to the correct value to achieve the manual temperature compensation.

5.5 Self-Diagnosis

In the process of calibration and measurement, the meter has a self-diagnosis function (see the table below). For troubleshooting, refer to Section 11.

Display Icon	Information
Er 1	Failed calibration.
Er2	pH electrode zero electric potential out of range (<-60mV or >60mV)
Er3	pH electrode slope is out of range (<85% or >110%)
Er4	Press ENTER key when reading is not stable during calibration.
Er5	During calibration, the measuring value is not stable for ≥ 3min.

5.6 Factory Default Settings

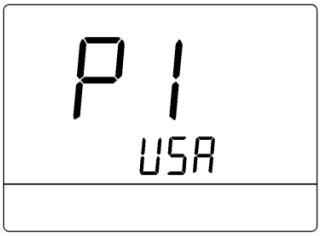
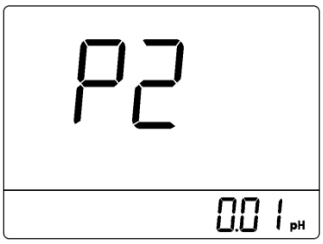
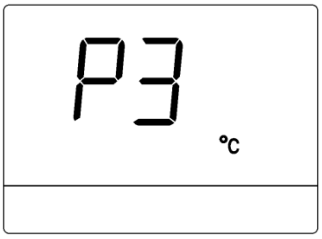
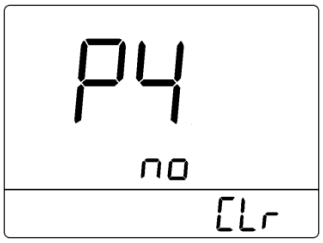
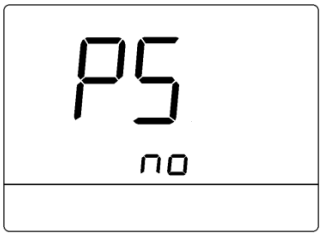
The instrument has a function of returning to factory default settings, which can be set up in P5 (refer to section 5.6). This is to restore the meter to theoretical value (zero potential being 0 mV, slope 100%), and set all the parameters to default settings. When the meter's calibration or measurement is performing abnormally, you can try this function, and then perform calibration and measurement again. Please note that this function is irreversible once used.

6. Parameter Settings

Symbol	Parameter setting content	Parameter	Factory default setting
P1	Select pH buffer series	USA - NIST	USA
P2	Select resolution	0.1/0.01 pH	0.01 pH
P3	Select temperature unit	℃ - ℉	℃
P4	Clear stored data	No-Yes	No
P5	Return to factory default	No-Yes	No

6.1 How to do the parameter setting

In measurement mode, long press MODE SETUP to enter parameter setting P1. Then press ∧ to change menu from P1 to P2...P5. For details, please see the following table.

	**P1 — Select pH buffer series (USA— NIS)** 1. Long press MODE SETUP to enter P1. 2. Short press ENTER , **USA** flashes, short press ∧ to select **USA** or **NIS**, short press ENTER to confirm; USA — USA Series; NIS — NIST Series 3. Short press ∧ to enter P2 or short press CAL MEAS to return to measurement mode.
	**P2 — Select resolution (0.01—0.1)** 1. Short press ENTER , **0.01** flashes, short press ∧ to select **0.01** or **0.1**, short press ENTER to confirm; 2. Short press ∧ to enter P3 or short press CAL MEAS to return to measurement mode.
	**P3 — Select temperature unit (° C—° F)** 1. Short press ENTER , **° C** flashes, short press ∧ to select **° C** or **° F**, short press ENTER to confirm; 2. Short press ∧ to enter P4 or Short press CAL MEAS to return to measurement mode.
	**P4 — Clear stored data (No—Yes)** 1. Short press ENTER , **No** flashes, short press ∧ to select **No** or **Yes**, short press ENTER to confirm; 2. Short press ∧ to enter P5 or short press CAL MEAS to return to measurement mode.
	**P5 — Restore to factory default setting (No—Yes)** 1. Short press ENTER , **No** flashes, short press ∧ to select **No** to **Yes**, short press ENTER to confirm; The meter returns to measurement mode. 2. If not selecting **Yes**, short press CAL MEAS to return to measurement mode.

7. Electrode Cleaning

The meter is only as accurate as the electrode is clean. Always thoroughly rinse off the electrode before and after each measurement with distilled water or deionized water in a container or with a wash bottle.

To remove excessive water, just shake them off or blot dry with Kimwipe/filter paper/clean tissue. **Never rub** the glass membrane of the electrode. Otherwise static electricity will be generated and cause measurement error.

For tough contaminants staying on the glass membrane or junction, refer to the table-8 for the proper cleaning procedures for different contaminants:

Table-8

Type of Contamination	Cleaning Agent	Soaking Time
Lipophilic substances, e.g. oil and fat deposits	Dish soap water	5 - 10 min
Proteins	Apera Electrode Cleaning Solution (SKU: AI1166)	30 - 60 min
Inorganic coatings such as hydrocarbons	Commercially available glass cleaning solutions	5 - 10 min
Hard, scale-type calcium deposits	Apera Electrode Cleaning Solution (SKU: AI1166)	5 - 10 min
Alkaline coatings	Apera Electrode Cleaning Solution (SKU: AI1166)	5 - 10 min
Acidic coatings	0.1M NaOH solution	5 - 10 min
Sulfide-containing solutions	Thiourea	30- 60 min, leave until junction discoloration disappears.
Unknown substances	Apera Electrode Cleaning Solution (SKU: AI1166)	30 - 60 minutes

NOTES

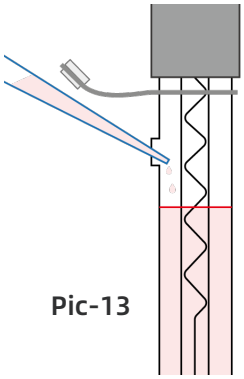
Use a soft brush to help thoroughly clean off the contaminants. After the cleaning procedure, the pH electrode should always be soaked in 3M KCl solution for 12-24 hours for re-hydration. A re-calibration is also necessary before a new pH measurement.

8. Electrode Maintenance

8.1 Add 3M KCL soaking solution to the electrode storage vial and store the electrode in it. Twist on the vial locking ring tightly. If the 3M KCL soaking solution is contaminated, replace it with fresh solution. As a rule of thumb, replace the soaking solution on a monthly basis. If you ever find white crystals outside the storage vial, it is perfectly normal. It is the 3M KCL soaking solution or the reference electrolyte that crystallizes over time by its nature. Just rinse them off and add in new soaking solution. This chemical is not poisonous or dangerous, and the electrode's performance will not be affected.

8.2 **NEVER** store the electrode in pure water like tap, RO, distilled, or deionized water as they could damage the pH electrode. If this happens, immediately soak the pH electrode in 3M KCL soaking solution overnight, then re-calibrate it before use.

8.3 The electrolyte will run low overtime. Whenever the electrolyte level is lower than half of the glass tube, open the blue stopper on the refilling hole and use a syringe to fill in new 3M KCl electrolyte solution (SKU: AI1107) to about 1 inch below the refilling hole (see Pic-13).



Pic-13

9. mV Measurement

9.1 mV and ORP measurement

In measurement mode, short press MODE SETUP to switch between pH and mV measurement mode. If a pH electrode is connected, the mV value stands for the original millivolt value of pH measurement. If ORP measurement is needed, users need to connect an ORP electrode (e.g. Apera 301Pt-C combination ORP electrode) and perform the test. ORP is short for Oxidation Reduction Potential, a measure of the cleanliness of the water and its ability to break down contaminants. The unit of ORP value is mV.

9.2 Notes on ORP measurement

ORP measurement does not require calibration. When you are not sure about ORP electrode's condition, test an ORP standard solution to see whether the ORP electrode works properly. When the measurement error is <±15 mV to the standard value at certain temperature, the ORP electrode is in good condition. The table below is the data of standard ORP solution for 222 mV and 650 mV at different temperatures.

° C	10˚C	15˚C	20˚C	25˚C	30˚C	35˚C	40˚C	45˚C	50˚C
222 mV	242 mV	235 mV	227 mV	222 mV	215 mV	209 mV	200 mV	192 mV	185 mV
650 mV	672 mV	665 mV	657 mV	650 mV	642 mV	635 mV	627 mV	620 mV	612 mV

10. Ideal pH Electrodes for Various Applications

Applications	Ideal Apera pH Electrodes to Use
General water solutions	201T-F, LabSen 211/213
Dirty liquids such as wastewater,emulsions, suspensions, slurries, etc.	LabSen 331/333, LabSen 231
Biotechnology and pharmaceuticals	LabSen 821/823, LabSen 241-3SP
High-Temperature solutions	LabSen 861/863
Low-temperature liquid	LabSen 881
High salinity/ Strong alkaline solutions	LabSen 841/843
Complex and caustic solutions (e.g. electro-plating solutions)	LabSen 861/863
Pure Water (distilled/deionized/RO/drinking/well/storm/boiler water)	LabSen 801/803
Liquid food and beverage (milk, yogurt, sauce, jam, etc.)	LabSen 821/823
Micro-volume liquid samples	LabSen 241-3S, LabSen 241-3SP
Semi-micro volume liquid samples	LabSen 243-6, LabSen 241-6
Frozen/raw meats	LabSen 761/763
Soil direct test	LabSen 551/553
Solid or semi-solid samples (cheese, dough, fruits, sushi rice, meat products, etc.)	LabSen 751/753
Strong acid solutions, HF containing solutions (HF concentration<2000 ppm)	LabSen 831/833
Surface test (skin, paper, culture medium...)	LabSen 371/373
TRIS buffer solutions	LabSen 213/211/221/821/823
Viscous liquid e.g. skincare products, coatings, syrups, sugarcane juice, etc.	LabSen 851-S/853-S/851-H/853-H
Organic solvents, non-aqueous solutions	LabSen 871/873

Note:

- Every pH electrode gradually ages and will eventually fail. A typical service life of a pH electrode is 1-2 years depending on many factors such as frequency of use, nature of test samples, how well it is maintained, etc. We recommend replacing your pH electrode at least every 1 to 2 years to guarantee the optimal performance.
- For more information, go to https://aperainst.com/sensors/labsen or contact us at info@aperaint.com or +1 (614) 2853080.

11. Troubleshooting Guide

Trouble	Potential Causes	How to Fix
Calibration Error	Incorrect calibration order **(Er1)**	Always calibrate pH 7 first, then pH 4 or pH 10. Refer to Section 4.4.
	Calibration solutions are in poor condition **(Er1)**	Make sure your calibration standard solutions are fresh and clean, and made by a legitimate manufacturer.
	Contaminated electrode **(Er1)**	Thoroughly clean off the electrode. Refer to Section 7.
	Aged electrode **(Er3)**	Replace the electrode.
	Dried-out electrode **(Er1)**	Soak in the soaking solution overnight to restore.
	Electrode is not in full contact with solutions **(Er1)**	Make sure the storage vial is taken off and the electrode is fully immersed in the solution (above the junction).
	Air bubbles around the sensor **(Er1)**	Make a quick stir in the solution to remove air bubbles.
	Pressing CAL too fast **(Er4)**	Wait for the reading to be fully stabilized before pressing CAL to finish the calibration
Reading is always slowly changing, won't stabilize. **(Er5)**	Contaminated electrode	Thoroughly clean off the electrode. Refer to Section 7.
	Clogged junction	Refer to Section 7 to thoroughly clean off the junction.
	Aged electrode	Replace the electrode.
	Testing low ionic strength solutions e.g. distilled water and deionized water	Refer to Section 5.2 for pure water measurement
Display similar readings in any solutions or stuck at 7.00 pH	Broken electrode	1. If you don't see any physical damage of the electrode and it's within the 6-month electrode warranty, contact us for warranty fulfillment; 2. If there is visible damage, replace the electrode.
	Instrument defect	Contact us for warranty fulfillment

Trouble	Potential Causes	How to Fix
Jumping Readings (generating random numbers)	Electrode is not in full contact with solutions	Make sure the storage vial is taken off and the electrode is fully immersed in the solution (above the junction).
	Air bubbles around the sensor	Make a quick stir in the solution to remove air bubbles.
	Electrode is not properly connected or the connector is broken.	1. Check the electrode's connector, make sure it's not broken and is correctly connected. 2. Screw on the connector cap to protect the connector when no electrode is connected.
Calibration is successful, but I think measurement is not accurate	Aged electrode	Replace the electrode.
	Air bubbles around the sensor	Make a quick stir in the solution to remove air bubbles.
	Wrong buffer standard is selected	Match the buffer standard with the calibration buffers you use by changing the settings in P1.
	Clogged junction	Refer to Section 7 to thoroughly clean off the junction.
	Comparison with other meters, test strips, or drop tests	1. To compare with other meters, make sure to perform a 2-point calibration for all meters in the same standards, then measure a 3rd standard solution. Whichever gives more accurate reading in the 3rd standard solution is the more accurate meter. 2. Test strips or drop tests' accuracy is not comparable to pH meters'.
	Calibration solutions are in poor condition	Make sure your calibration standard solutions are fresh and clean, and made by a legitimate manufacturer.
	The electrode is not suitable for your test sample or testing environment	Contact us to find the most appropriate electrode for your specific application.

12. 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 electrode) from the delivery.

This limited warranty does NOT cover any damages due to:

1. Accidental damage
2. Transportation
3. Storage
4. Improper use
5. Failure to follow the user manual or to perform any preventive maintenance
6. Unauthorized repair or modifications
7. Normal wear and tear
8. 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. Then fill out the form and click Submit. Our customer care specialists will be in touch and help you fulfill the warranty as soon as possible.

APERA INSTRUMENTS, LLC

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