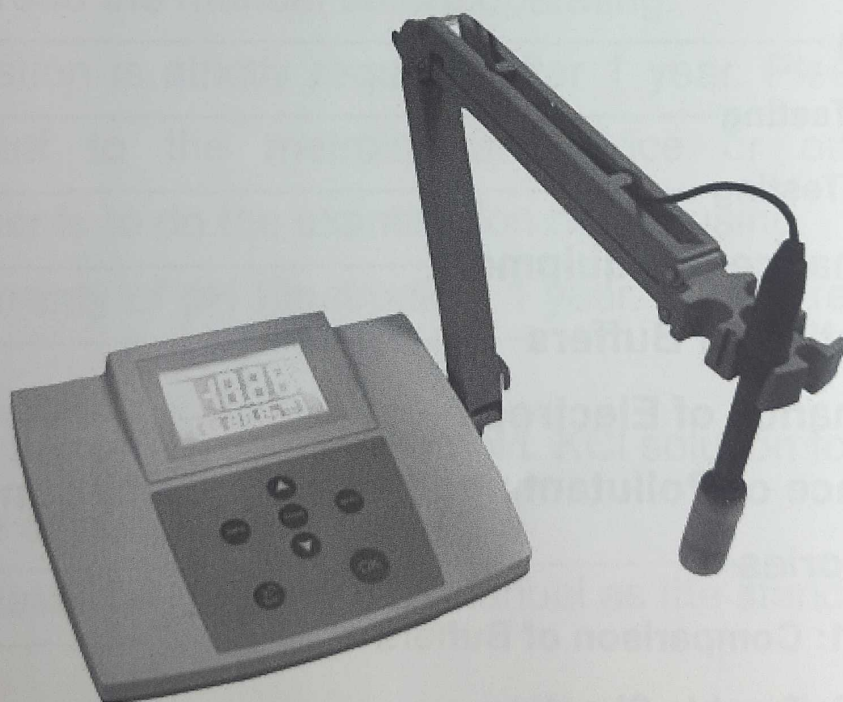


INSTRUCTION

PH-Meter

Model: PHS-3C

PHS-25



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1.Overview

PHS-25/3C model pH meter is widely used in laboratory. Using new appearance, big character LCD. Can recognize 4.00pH, 6.86pH, 9.18pH, 3 normal buffers automatically. It also has protection and reminder function for easy operating.

PHS-25/3C is very popular in university, academe, laboratory to text the pH, mV of the sample solution. Most of all, you can test the potential of the ion-selective electrode.

NOTE:

10. Please read the manual before operating.
11. Examination is strictly required after 1 year. Please send the equipment to the metrological service or other relevant departments to do the examination before using.
12. The warranty of pH Electrode is 1 year. Please replace it after 1 year.
13. Dipping the pH electrode in 3mol/L KCl solution for 24 hours in first time or nonuse for long time.
14. Please take the pH electrode manual as the standard.

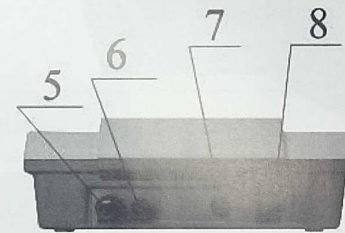
2. Technical Parameter

Model:	PHS-25	PHS-3C
Class:	0.05 Class	0.01 Class
Range:	pH: (0.00~14.00)pH	pH: (0.00~16.00)pH
	mV: (0~±1599)mV	mV: (0~±1999)mV
Accuracy:	0.05pH	0.01pH
	1mV	1mV
Automatic recognition of 4.00pH, 6.86pH, 9.18pH, 3 buffers function.		
Temperature Compensation:	Hand (0~60)°C	Hand (0~60)°C
Error of electronic unit:	pH:±0.05pH	pH:±0.01pH
	mV:±1mV±1d	mV:±1mV±1d
Error of equipment:	±0.05pH±1d	±0.02pH±1d
Electronic unit input current:	≥1×10 ¹² A	
Electronic unit input impedance:	≥1×10 ¹² Ω	
Error of temperature compensation:	±0.01pH	
Error of electronic unit repeatability:	pH: 0.05pH	pH: 0.01pH
	mV: 1mV	mV: 1mV
Error of equipment repeatability:	≤0.05pH	≤0.01pH
Stability of electronic unit:	±0.05pH±1d/3h	±0.01pH±1d/3h
Packing size:	220mm×175mm×75mm	
N.W.:	1.5kg	
Using Condition:	a) Temperature: (5~40)°C	
	b) Humidity: ≤85%	
	c) Power: DC(9v, 1.0A)V, (50-60)Hz	
	d) No magnetic interference	

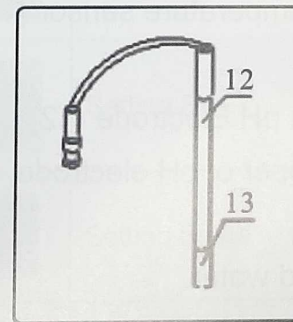
3. Installation



1. Main frame
2. Panel
3. Display screen
4. Electrode stand

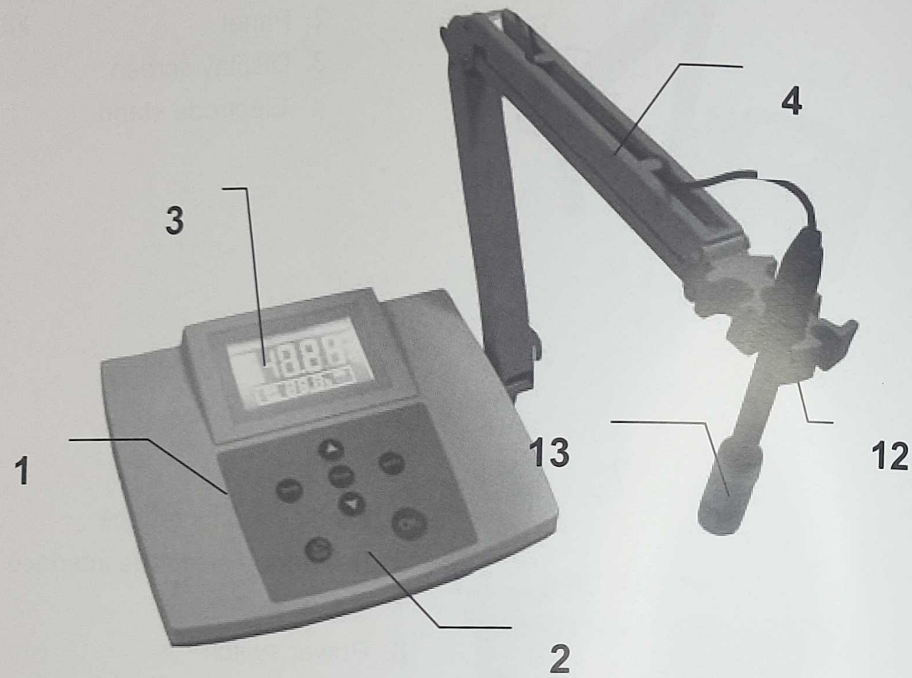


5. pH electrode interface
6. Reference electrode interface
7. Power outlet
8. Power switch



12. E-201-C model pH Electrode
13. Protection cover of electrode

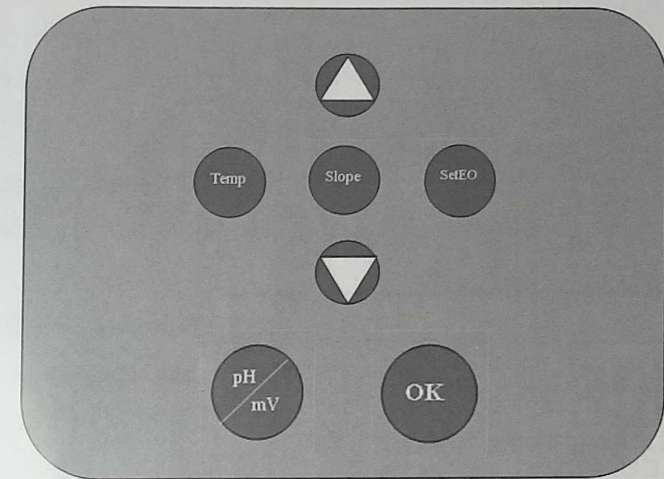
3.1 Components Installation








15. Fix the electrode stand (4) on the right side of pH meter and tighten the bolt.
16. Place the pH Electrode (12) and Temperature sensor (15) on the electrode stand (4).
17. Take the protection cover (13) from pH Electrode (12) and move the red rubber cover on the upper of pH electrode, make the hole exposed.
18. Wash the pH electrode with distilled water.

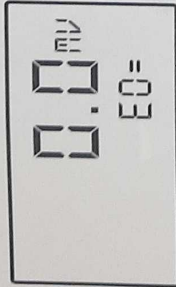
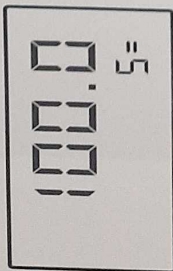
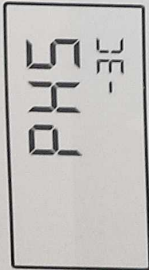
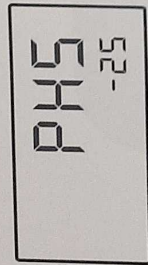
4. Operating

4.1 Operation Panel



Key	Meanings		
	Testing mode	Switch "pH" mode and "mV" mode	
	Setting mode	Cancel current setting, back to testing mode	
	Confirm the value and save		
	Setting EO	Press "△"	EO rise
		Press "▽"	EO reduce
	Setting Slope	Press "△"	Slope rise
		Press "▽"	Slope reduce
	Setting Temp	Press "△"	Temperature rise
		Press "▽"	Temperature reduce

4.2 Operation



1. Plugging the pH meter and turn on. It shows "PHS-3CB" the model of the pH meter.

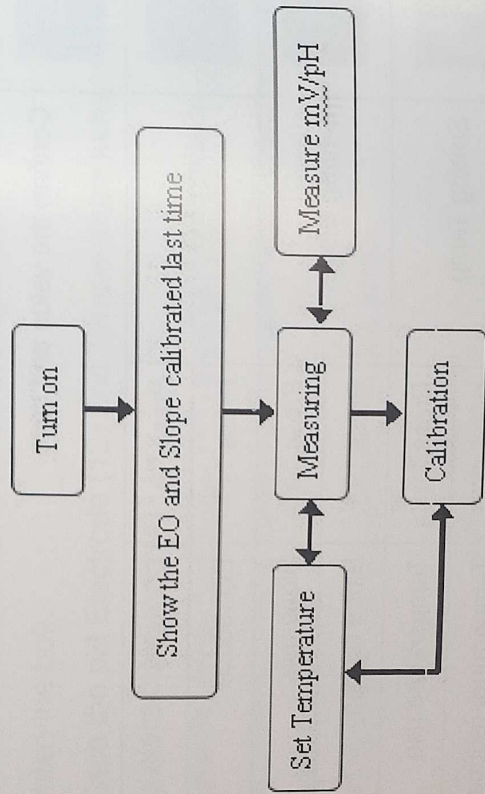
2. Show the Slope and EO calibrated last time.

3. Enter into the testing mode, show the current mV or pH.


In testing mode, press "pH/mV" can switch the mV and pH.

Press "Temp" to set the current temperature.

Press "Set EO" or "Slope" to calibrate the current EO and Slope.



Flowchart of Operating

- 
1. Please make sure the electrodes or the Q9 short-circuit plug (11) connect to the electrode interface (6) before turning on.
 2. Connect the Q9 short-circuit plug to the electrode interface (6), even you don't use it.
 3. Warm up the equipment for over 0.5h before using.

4.3 Temperature Setting



If you need set the temperature by hand. Press "Temp△" or "Temp▽" to set the temperature. It is the temperature of the test solution.

Press "OK", confirm and save the value. Press "pH/mV" to exit and back to the testing mode.

4.4 Calibration

Calibrate the equipment before using. It's better to calibrate it every day.

It can recognize 4.00pH, 6.86pH, 9.18pH 3 standard buffers automatically. Only need to press "Set EO" or "Slope" then press "OK" to finish the calibration with these 3 solutions. Press "Set EO" to do the 1 point calibration; Press "Slope" to do the 2 point calibration. To other non-standard buffers, set the pH value as same as the value of solution in current temp., then press "OK".



1. When use non-standard buffers to calibrate the pH electrode, you have to know the standard pH value in different temperatures.
2. Advice: Calibrate the electrode before every single testing. The calibration data will cover the last one.
3. After 1 point calibration, the equipment will delete the last calibration data automatically and the slope is 100.0%

4.4.1 1 point calibration

This is an easier calibration when you do low requirement testing. Only use 1 kind standard buffer to set EO and the slope is 100.0% as default.

NOTE: The new calibration data will cover the last data automatically, slope is 100.0%.



- a) Wash the electrode with distilled water in measuring mode. Then dip the pH electrode into the standard buffer.(e.g. pH=6.86pH buffer solution);
- b) Put the thermograph into the buffer, compensating the temperature by hand;
- c) Press "Set EO" after the reading stable, show "STD YES". Press , enter the 1 point calibration mode. Press "pH/mV", exit calibration and back to the testing mode.

In calibration mode, the equipment can recognize the standard pH of solution in current temperature automatically.

At this moment, the pH reading maybe different from the one in testing mode. Press "OK", confirm and save the data and show the slope and EO, then back to the testing mode.

If you need to quit the calibration mode, press "pH/mV", exit calibration and back to the testing mode.

- d) If you use non-standard buffer solution, press press "Set EO" then press " Δ " or " ∇ " to set the reading, make pH value as same as the standard one in current temperature, then press "OK".

4.4.2 2 point calibration

2 point calibration is used to calibrate the slope of electrode.



4. Prepare 2 standard buffers. (e.g.: 4.00pH, 9.18pH, etc.)
5. Wash the electrodes with distilled water in testing mode. Dip the thermograph (pH electrode and temperature sensor) into the buffer 1 (pH=4.00pH), temperature compensated by hand. Press "Set EO" after the reading stable, press "OK" enter the 1 point calibration mode. Equipment recognize and show the pH value is 4.00pH in current temperature, then press "OK", save the data and back to the testing mode.
6. As same as step (b), wash the electrodes again. Dip the thermograph into the standard buffer 2 (pH=9.18pH), press "Slope" after the reading stable, then press "OK". The equipment

recognize and show the pH value (9.18pH).

2. Press "OK", confirm and save the data. Show the reading of slope and EO. Then back to the testing mode.
3. If you use non-standard buffer solution, press "Set EO" then press " Δ " or " ∇ " to set the reading, make pH value as same as the standard one in current temperature, then press "OK".

If you need 3 point calibration, test the standard buffer 3 according to the steps of 2 point calibration.

4.4.3 Slope Restoring

The slope may be not correct because of some reasons, such as point interruption. (The equipment shows last slope data of the electrode when turned on).

There are 2 ways to restore the slope.

- A: Re-calibrate the slope according to the 2 point calibration.
- B: Press "OK" and hold, then turn on the equipment. It shows "-1888" and flicker 3 times, that means the system is resetting. Then move the finger away from "OK", back to the testing mode.

4.5 Testing

4.5.1 pH Testing

Calibrating the equipment before testing.

3. The test solution and the calibration solution should have the same temperature or the equipment has a temperature sensor:
 - a) Wash the pH electrode with distilled water, then wash it again with test solution;

- b) Dip the electrodes (pH electrode and temperature sensor) into the test solution. Stirring the test solution with glass rod. Show the pH value of the test solution.

25. The test solution and the calibration solution are at different temperatures or the equipment doesn't have a temperature sensor:

- a) Wash the pH electrode with distilled water, then wash it again with test solution;
- b) Measure the temperature of the test solution with thermometer.
- c) Press "Temp", show the temperature of the test solution. Press "OK".
- d) Dip the electrode into the test solution, stirring the test solution with glass rod. Show the pH value of the test solution.

4.5.2 mV Testing

2. Clasp the pH electrode and reference electrode (Optional) on the electrode stand;
3. Wash the electrodes with distilled water, then wash it again with test solution;
4. Connect the pH electrode to the pH electrode interface (6);
5. Connect the reference electrode to the reference electrode interface (7);
6. Dip the pH electrode, reference electrode and temperature sensor into the test solution, stirring the solution, show the mV value of the electrode and " \pm " pole.
7. If the test subject is over the testing range of the equipment, it will show "over";
8. When test the mV of the pH electrode, connect the Q9 plug (11)

to the pH electrode interface (6), connect the pH electrode cable to the Q9 plug; Or use electrode converter, connect converter to the potential electrode interface (6), then connect the metallic electrode to the other head of converter. Connect the reference electrode to the reference electrode interface (7).

5. Maintenance of Equipment

pH meter has high input impedance. It is very important to use correctly and maintain it frequently.

19. pH electrode interface (6) should keep dry and clean. Connect the Q9 plug to the interface (6) to prevent the moisture and dust when it laid up.
20. Keep the electrode converter (optional) away from the moisture and dust.
21. Make sure the lead of the electrode unmoved when testing, otherwise the value is not stable
22. Make sure the plug earthed.
23. Equipment use MOS integrated circuit. Make sure the electric soldering iron earthed when repairing.
24. Make sure the standard solution is correct, otherwise the testing result will be wrong.

6. Preparation of Buffers

1. **pH 4.00 solution:** Dissolve 10.12g GR Potassium hydrogen phthalate in 1000ml high-purity deionized water.

1. **pH 6.86 solution:** Dissolve 3.387g GR Monopotassium phosphate, 3.533g Monosodium orthophosphate in 1000ml high-purity deionized water.
2. **pH 9.18 solution:** Dissolve 3.80 borax in 1000ml high-purity deionized water.

NOTE: Boiled the 1000ml high-purity deionized water for 15~30 min before preparing Solution 2 and Solution 3 to remove Carbon dioxide. Keep the deionized water away from air when cooling, in case Carbon dioxide polluted it.

7. Maintenance of Electrode

1. Calibrate the electrode with standard buffers before testing. It is much better that the pH value of standard buffers close to the test solution.
2. Take the protection cover of electrode away, keep the glass bulb of electrode away from hard stuffs. Any breaking or scuffing will make the electrode failure.
3. Cover the electrode with protection cover after testing. Put some external reference fluid to keep the glass bulb moist. Don't dip the electrode in the distilled water for long time.
4. The external reference fluid of pH electrode is 3mol/L KCl solution. Put the fluid in the protection cover from the hole on the upper of the electrode. Cover the hole with protection cover (rubber cover), in case the fluid try.
5. Keep the electrode interface dry, in case the short circuit.
6. Please use the electrode supported with equipment.
7. Don't dip the electrode in distilled water, protein solution, acid fluoride solution for long time.
8. Keep the electrode away from organic oil.
9. If the slope of electrode reduced after using for a long time. Dip

the lower of electrode in 4%HF(Hydrofluoric acid) for 3~5s, then clean it with distilled water, than dip it in 0.1mol/L HCl solution.

Then you can reuse it.

1. If the test solution has some substances is very easy to pollute the glass bulb or block the contact surface with solution of electrode and make the electrode passivation. The slope will be reduced and the reading is not correct. Please use suitable solution to wash the electrode according the pollution substance to make the electrode reused (see Part 8).

NOTE:

1. Don't use Carbon tetrachloride solution, Trichloroethylene solution, Tetrahydrofuran solution and others can dissolve Polycarbonate resin to wash the electrode. It will damage the electrode. Please test above solutions with 65-1 model pH electrode instead of E-201-C model pH electrode.
2. The contact surface with solution of electrode is very easy to be blocked by the pollution substance and caused error result.

8. Reference of Pollutant and Cleaning Compound

Pollutant	Cleaning Compound
Inorganic metallic oxides	Lower than 1mol/L Diluted acid
Organic fats and oil substances	Dilute detergent (alkalinescence)
High-molecular resin substances	Alcohol, acetone, aether (wash glass bulb)
Deposits of protein blood	5% pepsin + 0.1mol/L HCl solution
Substances of paint	Dilute bleach, Hydrogen peroxide

9. Accessories

PHS25/3C main equipment	1
E201C model pH electrode assembly	1
Supplied accessories	1

If you need to test the ORP of redox or the mV of ion-selective electrode, please purchase electrode converter (optional).

Appendix 1: Comparison table of Buffers

Temp. °C	0.05mol/kg Potassium hydrogen phthalate	0.025mol/kg Monopotassium phosphate + Monosodium orthophosphate	0.01mol/kg Borax
5	4.00	6.95	9.39
10	4.00	6.92	9.33
15	4.00	6.90	9.28
20	4.00	6.88	9.23
25	4.00	6.86	9.18
30	4.01	6.85	9.14
35	4.02	6.84	9.11
40	4.03	6.84	9.07
45	4.04	6.84	9.04
50	4.06	6.83	9.03
55	4.07	6.83	8.99
60	4.09	6.84	8.97

Appendix 2: Trouble Shooting

Display	Reasons	Solution
Show "Err" all the time after turning on	The memory chip goes wrong	Turn off and wait. Try several times. If the problem is still exist. Please contact with your distributor
mV area shows "over" but temperature area is normal	Input potential is over the testing range	Connect the Q9 plug (11) to the pH electrode interface. If the problem is still exist, please contact with your distributor
Press "OK" for 3s, show "5Y5 r5t", in testing mode.	System reset function, remind you wether need to reset the system	Press "OK", if you need. Otherwise press other keys to exit.
Press "Set EO" or "Slope", show flicker "5Y5 Ye5"	Protection for pressing key in error. Remind you wether need to calibrate	Press "OK", if you need. Otherwise press other keys to exit.
Wrong Data	Display Problem	Please contact with your distributor

Product Certificate

Model	PHS-25
identification number	051704
Checker	test 01
Date	12.2024

electrical conductivity?

A. Common water sample with low electrical conductivity: rainwater, running water, deionized water, boiler water, river water, etc.

B. This model is not suitable for measurement of above water samples.

6. How to verify measurement accuracy of electrode?

A. Use two different standard buffer solutions to calibrate electrode correctly.

B. Measure the 3rd standard buffer reagent, and compare the measured value with standard pH value under this temperature.

7. Why temperature compensation is needed during measurement?

A. PH value of solution is relevant with temperature. PH value of solution varies under different temperatures.

B. When sample is tested under 10 °C, the meter displays pH value at 10 °C. If need to obtain pH value at 25 °C, should increase sample temperature to 25°C before measurement.

Temperature compensation function can't convert pH value measured under 10°C to pH value at 25°C.

8. Why values from two measurements may be different for the same sample?

A. The tested sample itself changed. For example, when pure water exposed to air, it will continuously absorb CO₂ in the air, causing pH value decreased; or sample had a chemical change due to its instability.

B. Temperature of tested sample changed. If use manual temperature compensation, should adjust in time according to the actual temperature of solution.

C. During electrode calibration, it is suggested electrode should be dipped in buffer solution over 30seconds before

any operation is carried out. Otherwise electrode reading may not be stable, causing calibration error.

9. How often to do electrode calibration?

A. Before every use, should use standard buffer solution to calibrate electrode.

B. If sample's pH value accuracy is high, it is suggested electrode calibration should be made after 2 hour use.

10. Why measured values from two meters may be different for the same sample?

A. Should calibrate electrode in the same standard buffer solution at the same time, then measure the sample simultaneously.

11. Why is there white powder attached to electrode cap or housing surface?

A. It is precipitation of KCL salt from reference solution and will not affect the use of electrode. Just wipe it away by gauze or paper.

12. Why is reading not stable during calibrating or measuring with slow drift?

A. Blocked electrode bridge may cause meter reading drift during measurement. Please assemble electrode cover rapidly on measuring end then unplug. Repeat 2-3 times

B. Electrode performance reduced. Please test electrode performance as per required steps.

13. How to clean electrode?

A. Metal ion adhesion: dip electrode in 0.5mol/L HCL solution for 5min. Shake (stir) electrode fast several times before taking out. Rinse it by deionized water after taking out and then dip it in 3mol/L KCL solution for 4hours.

B. Organic contamination: dip electrode in absolute ethyl alcohol (or other solvent that can dissolve this organic matter) for 15min. Shake (stir) electrode fast several times

before taking out. Rinse it by deionized water after taking out and then dip it in 3mol/L KCL solution for 4hours.

Attention: Housing of electrode is made of PC

(Polycarbonate). Tested sample that contains organic matters or detergents may corrode the housing.

C. Inorganic matter cleaning: dip electrode in 0.1mol/L EDTA solution or 0.1mol/L HCL solution for 15min. Shake (stir) electrode fast several times before taking out. Rinse it by deionized water after taking out and then dip it in 3mol/L KCL solution for 4hours.

D. Protein precipitation: dip electrode in 1% HCL pepsase solution (concentration of HCL 0.1mol/L) for 15min. Shake (stir) electrode fast several times before taking out. Rinse it by deionized water after taking out and then dip it in 3mol/L KCL solution for 4hours.

E. Grease adhesion: dip electrode in weak basic detergent solution for 15min. Shake (stir) electrode fast several times before taking out. Rinse it by deionized water after taking out and then dip it in 3mol/L KCL solution for 4hours.

F. Sensitive glass film regeneration: dip it in 4% HF solution 3-5 seconds, then rinse it by 1:1 HCL 10seconds. Clean it by distilled water and then put away in 3mol KCL solution for 24hours.

Attention: Repeated regeneration treatments to sensitive glass film may finally make it completely damaged.

Warranty Period

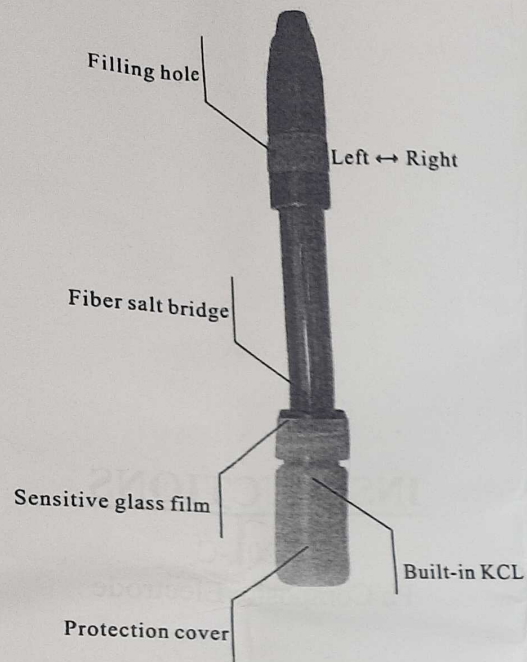
1. Within one year starting from manufacturing date product should comply with state-specified standards when customer opens box to use.

2. If product can't work properly due to quality problem when customer opens box to use, our company is responsible for detection and exchange.

INSTRUCTIONS

E-201-C

Ph Composite Electrode



Product Description

Liquid fillable composite electrode, plastic housing(pc), Q9 plug, noise shielding wire (800mm), fiber salt bridge, silver-AgCL reference, 3mol/L KCL external reference solution (AgCL contained).

Application Range

Suitable: clear water sample(acid-base inorganic solutions).
 Unsuitable: viscous liquid (cosmetics), foul water, oily liquid.

Steps of Use

1. Check the height of electrode external reference liquid. Keep it at fully charged status as possible. If found difficult to use the attached plastic bottle to replenish liquid, can inject the liquid in slowly by other types of injecters.
2. Take off protection cover from electrode measuring end and then put it on back. Repeat 2-3 times to ensure salt

bridge clear. Rinse electrode measuring end by deionized water. Then wipe off deionized water residue on housing.

3. Hold the cap of electrode (where wires go out) with measuring end downward, and toss it several times to check if the inside of sensitive glass film and reference salt bridge are full of solution without bubble.

4. Keep electrode filling hole open and connect it to acidometer. Calibrate electrode slope in two different standard buffer solutions. (Calibration procedure refers to acidometer user manual)

Electrode Preservation

1. Add 18mm high 3mol/L KCL solution in the protection cover of electrode. Hold and pinch gently the opening of cover flat, and assemble it on measuring end to keep sensitive glass film and salt bridge moist.
2. Close filling hole and put electrode back in the box. Preserve under room temperature.

Attentions

1. Operate electrode as per "Steps of Use" for every use.
2. When electrode immersed in standard buffer solution or in tested liquid, hold electrode and stir rapidly several times, to make the surroundings of sensitive glass film and salt bridge filled with solution.
3. During calibrating or measuring, keep filling hole open. Close it after use.
4. To get accurate measuring results, when calibrating or testing, temperature compensation function of acidometer should be used. (Refer to acidometer user manual)
5. When calibrating or measuring, before to dip it in different solutions, should rinse sensitive glass film at measuring end as well as fiber bridge by deionized water, and wipe dry deionized water residue on housing.

6. Liquid for calibration or measurement should immerse electrode measuring end over 13mm.

7. Always keep electrode plug clean and dry.

8. Housing of electrode is made of PC (Polycarbonate).

Make sure the sample solution has no harm to this material before use.

Trouble shooting

1. Electrode slope can't be adjusted correctly?

- A. Please check if your every step of operation follows "Steps of Use" and "Attentions" in this User Manual.

- B. Please read acidometer User Manual carefully and do electrode slope calibration and use

- C. Please check if electrode preservation status before use follows the requirements under "Electrode Preservation". If not preserved appropriately, dip electrode in 3mol/L KCL solution over 2hours.

- D. Please make standard buffer solution correctly.

- E. Please check if electrode performance is up to standard: set meter display mode to MV, then dip electrode in pH4.00 standard buffer solution and then in pH9.18 buffer solution. Record readings on acidometer. The add up absolute value should be above 290mv.

- F. If electrode performance is not up to standard, please try to clean the electrode. (Refer to Trouble shooting)

2. What type of standard buffer solution should be used for electrode calibration?
 - A. Standard buffer solution for electrode calibration usually is with pH4.00, or pH6.84, or pH9.18. Please keep every type of buffer solution fresh. Recommended usage period for newly made buffer solution is 3months. Should use high-purity deionized water to make buffer solution.

- B. Use pH4.00 or pH6.86 buffer solution to calibrate electrode if testing sample is acidic; use pH6.86 or pH9.18 buffer solution to calibrate electrode if testing sample is alkaline.

3. How to make external reference solution for electrode?
 - A. In package box there is a plastic bottle containing KCL in powder. Add appropriate amount of deionized water to the mark of bottle. Shake well before use.
 - B. Weigh 57.74g accurately analysis pure KCL and dissolve it into 250ml deionized water.

4. How to prolong electrode service life?
 - A. If tested sample contains suspended solids, when measuring, the sample may block salt bridge or solids may attach to the surface of sensitive glass film and cause performance reduction. Before measurement of this type of sample, please treat the sample in advance (like filtering), or can choose our cleanable pH composite electrode.
 - B. If tested sample contains grease or organic matters, when measuring, the sample may contaminate sensitive glass film and cause electrode slope decrease. Before measuring this type of sample, should use clean agent that can effectively dissolve grease or organic matters in the sample, and after measurement, should clean in time the electrode measuring end thoroughly.
 - C. This model is not suitable for nonaqueoustitration.
 - D. Preserve electrode well. Don't dip it in tested sample for long time. After every measurement, should immediately clean the electrode measuring end and preserve it appropriately.
 - E. Keep electrode plug dry. In case get it wet by accident, should immediately clean and dry it.

5. Can this product measure water sample with low