S-610H pH Meter

User Manual

PEAK INSTRUMENTS INC
Version 1801

CONTENTS

I. General Information

Thanks for using S-610H pH meter. In order to help you operate and maintain the instrument properly, please read the user manual before using it. We reserve the rights to update the manual and its parts subject to the purpose of improving the instrument's performance.

This instrument combines the technologies of advanced electronics, sensors and software design, which can be used to test the pH value, temperature and other parameters of water solutions. This model is very suitable for industrial and mining enterprises, power plant, environment protection, etc.

This pH meter has built-in microprocessor chip with beautiful design, variable functions and the following features:

1. Built-in microprocessor chip, with automatic calibration, automatic / manual temperature compensation, data storage, and other function settings. Easy to use.

2. Digital filtering and slip techniques are used to improve meter's response speed and data accuracy. The symbol of "☺" is displayed when the measured value is stable.

3. Equipped with new type of pH electrode and temperature probe and have automatic and manual temperature compensation functions, which make the measurement more accurate and operation easier.

4. Automatic recognition of 15 buffers with three kinds of options: European & USA, NIST and China.

5. Support 1, 2 or 3 point calibration.

6. The circuit board adopts Surface Mounted Technology to improve the reliability of product processing.

7. White backlit LCD screen.

II. Specifications

pH

Measuring Range	(-2.000～18.000) pH
Resolution	0.1/0.01/0.001 pH
Accuracy	Electrode: ±0.01pH Instrument: ±0.02 pH
Input Current	≤2×10^{-12} A
Input Impedance	≥1×10^{12} Ω
Stability	±0.01 pH/3h
Temperature Compensation	(0～100)℃(Auto/Manual)

mV

Measuring Range	-1999 mV～0～1999 mV
Resolution	1mV
Accuracy	±0.1%FS

Other parameters

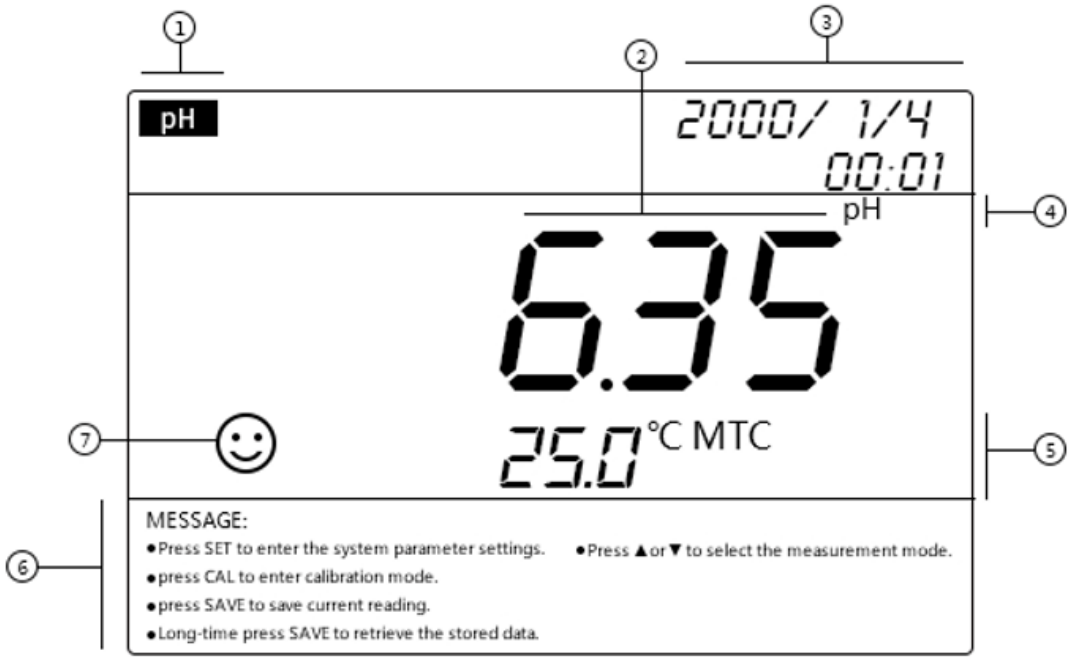
Data Storage	500 sets
Storage Contents	Series number, measuring value, unit, temperature and time
Power	12V/1A
Size & Weight	240×170×70 mm/600g
Certificates	ISO9001:2000, CE

Working conditions

Ambient Temperature	5～35℃
Humidity	≤85%
IP Rating	IP54

III. Device Instructions

1. Display indicators



① Parameter mode tag
② Measurement value
③ Date and time
④ Measurement unit
⑤ Temperature and unit
⑥ Prompt message
⑦ Stability symbol

2. Operation keys

There are eight operating buttons

2.1. 

On/off button, to switch on/off the device.

2.2. 

Calibration button and move to left key

2.2.1. Press this button to enter calibration in measuring status.

2.2.2. Used to move to left when setting system time and manual temperature compensation.

2.3. 

Record save, view and move to right key

2.3.1. In measuring status, short press this button to save measurement data (record number M+ will be shown one second at the lower right corner when saving data).

2.3.2. In measuring status, long press this button to view the saved data of each mode (shows RM and number).

2.3.3. Used to move to right when setting system time and manual temperature compensation.

2.4. 

Print/back key

2.4.1. In measuring status can be used to print via Bluetooth printer.

2.4.2. Used as “back key” in other status.

2.5. 

System setup

Used to enter system setup in measuring status.

2.6. 

Function switching and move to up key.

2.6.1. In measuring status, short press(less than one second) to switch different functions between pH, conductivity and dissolved oxygen (PH-COND-DO).

2.6.2. Used to move to up when setting system time and manual temperature compensation.

2.7. 

Parameter switching and downward move key

2.7.1. In measuring status, used to switch different parameters as follows.

pH electrode: PH - MV - PH

Conductivity electrode: COND - RES - TDS - SAL - COND

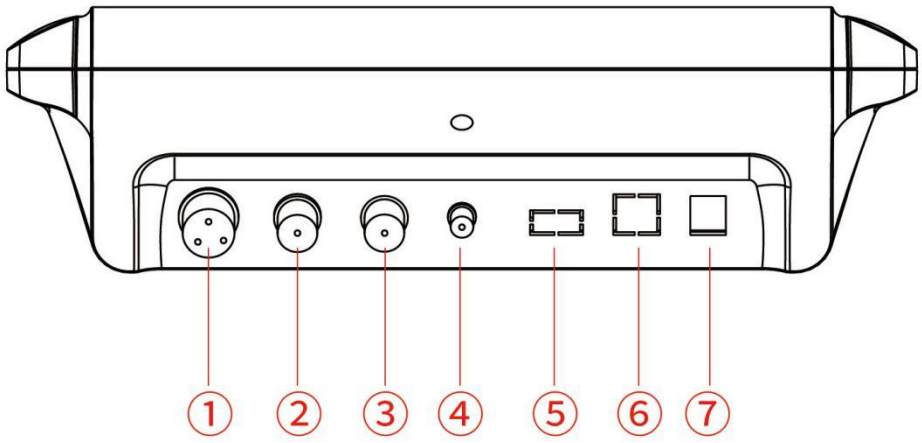
DO electrode: mg/L - ppm - % - mg/L

2.7.2. Used for downward move when setting system time and manual temperature compensation.

2.8. 

Confirmation key.

3. Interface Diagram



① Conductivity electrode connector
② pH electrode connector
③ DO electrode connector
④ Temperature electrode connector
⑤ USB port for data transfer
⑥ Data cable interface
⑦ Power supply connector

IV. pH Measurement

1. Preparations

1.1. Press ON OFF to switch on device, then press UP to choose pH measuring mode.

1.2. Check if the glass bulb of pH combined electrode is moist and complete. If the bulb is broken, then the electrode will not work, if the bulb is too dry, it should be soaked in saturated KCL solution for 24 hours.

1.3. Connect pH electrode and temperature probe to its right ports.

2. Calibration

2.1. Press CAL to enter calibration mode, the screen will show C1 to indicate first point calibration.

2.2. Wash pH and temperature electrodes in pure water and make them dry, dip the electrode in the pH 6.86 buffer solution, shake the electrode and let it be static until the reading is stable (the symbol ☺ will be shown on the screen), then press OK and display shows 6.86, next press OK to confirm the first point calibration, the screen will show C2 to indicate second point calibration or press ESC PRN to quit calibration mode.

2.3. Wash pH and temperature electrodes in pure water and wave them dry, dip the electrode in the pH 4.00 buffer solution, shake the electrode and let it be static until the reading is stable (the symbol ☺ will be shown on the screen), then press OK and display shows 4.00, next press OK to confirm the second point calibration, the screen will show C3 to indicate the third point calibration or press ESC PRN to quit calibration mode.

2.4. Wash pH and temperature electrodes in pure water and make them dry, dip the electrode in the pH 9.18 buffer solution, shake the electrode and let it be static until the reading is stable(the symbol ☺ will be shown on the screen), then press OK and display shows 9.18, next press OK to confirm the third point calibration and quit calibration mode and enter measuring mode, “L M H” will be shown on the bottom left screen and means the instrument is calibrated at three points.

2.5. Calibration instructions

2.5.1. This instrument has one point, two point or three point calibration, after the first point calibration is finished, press ESC PRN to quit calibration mode and enter measuring mode, “L” will be shown on the bottom left screen. When measurement accuracy is no more than ±0.1pH, choose one buffer solution to calibrate one point is enough according to the measurement range.

2.5.2. When the second point calibration is finished, press 

to quit calibration mode and enter measuring mode, the symbol of two point calibration “L M” will be shown on the bottom left screen. If you only measure acidic solutions, then choose pH 4.0 & 6.86 buffers for calibration. If you only measure alkaline solutions, then choose pH6.86 & 9.18 buffers for calibration.

2.5.3. If the measurement range is wide or the pH electrode is ageing after a long time, three point calibration is required, which will lead to higher accuracy. For the first time use of a new pH electrode, it must be calibrated at three points and adjust the slope of the instrument same as the pH electrode.

3. pH Solution Measurement

Wash the pH electrode & temperature electrode and wave them dry, put them into the solution, shake the electrode and let it be static, then wait until the reading is stable and the symbol ☺ appear on the screen, then the reading is its pH value.

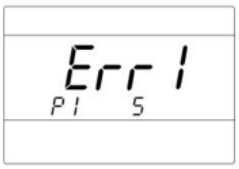
NOTE: Based on principle of isothermal measurement, the closer of the temperature of tested solution with that of buffer solution, the more accurate of the measurement, please obey this rule when doing the test.

4. Parameter setup

4.1. Table of pH meter parameter setup

Indicator	Description
P1	Export data to Excel format
P2	System date setup
P3	Clear data setup
P4	Temperature unit setup
P5	View machine code
P6	APP authorization code setup
P7	System restore setup
P8	Manual temperature compensation setup
P9	Bluetooth mode setup
P10	pH resolution setup
P11	pH buffer setup
P12	Ammonia pure water compensation setup

4.2. Export data to Excel format.



4.2.1. Press SET to enter setting mode and press OK to enter P1.

4.2.2. Press OK to export data if USB is connected.

Error will be shown on screen if there is no USB connected.

4.2.3. Press ESC PRN to back to measuring mode.

4.3. System date setup

4.3.1. Press UP to select P2 in mode P1, press OK to enter P2.

4.3.2. Press UP or DOWN to modify date and time, press CAL to move to left, press SAVE to move to right, press OK to confirm.

4.3.3. Press ESC PRN to back to measuring mode.

4.4. Clear records setup

4.4.1. Press UP to select P3 in mode P2, press OK to enter P3.

4.4.2. Press UP or DOWN to choose the records to be deleted and press OK to clear.

4.4.3. Press ESC PRN to back to measuring mode.

4.5. Temperature unit setup

4.5.1. Press UP to select P4 in mode P3, press OK to enter P4.

4.5.2. Press UP or DOWN to change temperature unit ℃ or ℉ and press OK to confirm.

4.5.3. Press ESC PRN to back to measuring mode.

4.6. View machine code setup

4.6.1. Press UP to select P5 in mode P4, press OK to enter P5.

4.6.2. Press ESC PRN to back to measuring mode.

4.7. App authorization code setup

4.7.1. Press UP to select P6 in mode P5, press OK to enter P6.

4.7.2. Press UP or DOWN to modify authorization code, press CAL to move to left, press SAVE to move to right, press OK to confirm after setup.

4.7.3. Press ESC PRN to back to measuring mode.

4.8. System restoration setup

4.8.1. Press UP to select P7 in mode P6, press OK to enter P7.

4.8.2. Shows 8888 and press OK to confirm.

4.8.3. Press ESC PRN to back to measuring mode.

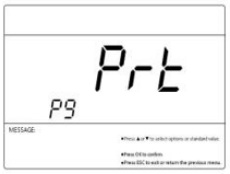
4.9. Manual temperature compensation setup

4.9.1. Press UP to select P8 in mode P7, press OK to enter P8.

4.9.2. Press UP or DOWN to modify compensation temperature, press CAL to move to left, press SAVE to move to right, press OK to confirm after setup.

4.9.3. Press ESC PRN to back to measuring mode.

4.10. Bluetooth mode setup



4.10.1. Press UP to select P9 in mode P8, press OK to enter P9.

4.10.2. Press UP or DOWN to set Bluetooth or App, press OK to confirm after setup.

4.10.3. Press ESC PRN to back to measuring mode.

4.11. pH resolution setup

4.11.1. Press UP to select P10 in mode P9, press OK to enter P10.

4.11.2. Press UP or DOWN to choose resolution(0.1 or 0.01), press OK to confirm setup.

4.11.3.Press ESC PRN to back to measuring mode.

4.12. pH buffer solution standard setup

4.12.1. Press UP to select P11 in mode P10, press OK to enter P11.

4.12.2. Press UP or DOWN to choose standard, press OK to confirm selection.

CH: 1.68 pH, 4.00 pH, 6.86 pH, 9.18 pH, 12.46pH

NIST: 1.68 pH, 4.01 pH, 6.86 pH, 9.18 pH, 12.45pH

USA: 1.68 pH, 4.00 pH, 7.00 pH, 10.01 pH, 12.45pH

4.12.3. Press ESC PRN to back to measuring mode.

4.13. Ammonia pure water compensation setup

4.13.1. Press UP to select P12 in mode P11, press OK to enter P12.

4.13.2. Press UP or DOWN to select compensation mode, “OFF” mean no compensation, “H_2O” mean pure water compensation, “NH_3” mean ammonia pure

water compensation. Press 

to confirm.

4.13.3. Press 

to back to measuring mode.

5. Notes

5.1. Times to be calibrated depend on test sample, electrode and measurement accuracy. For high accuracy test (≤±0.02pH), it should be calibrated in time with high accuracy buffers. For normal accuracy measurements (≥ ±0.1pH), after being calibrated one time, it can be used for one week or even longer.

5.2. The instrument should be calibrated again in the following situations.

5.2.1. For new electrode and the one that has not been used for a long time.

5.2.2. After testing strong acidic solution(pH<2) or strong alkaline solution(pH>12).

5.2.3. After testing fluoride solution or high concentration organic solution.

5.2.4. The temperature difference is big for the tested solution and calibration solution.

5.3. There is electrode immersion solution in the protection bottle where the electrode probe is soaked and used to keep glass bulb moist and liquid interface activated. When to use it, just rotate the bottle cap, take out the electrode and wash it clean. After use, put it back to the bottle and tighten the bottle cap to prevent solution leaking. If the immersion solution is turbid or mouldy, please clean the bottle in time and change soaked liquid.

5.4. It is forbidden to be soaked long time in pure water, protein solution and acidic fluoride solution, and no contact with organic fat.

5.5. In order to increase measurement accuracy, the pH value of the standard buffer must be accurate which is used to calibrate the instrument.

5.6. Keep the instrument clean and dry, especially for the connection interfaces, otherwise the measurements will not be accurate or wrong.

5.7. The glass bulb can’t touch solid things, any bulb damage will cause the electrode failure. The electrode should be washed before and after using it, then wave or absorb it dry, don’t wipe it with paper tissue which will make the electric potential unstable and prolong response time. After the use in viscous sample, the electrode should be washed for a few time in order to remove sample stuck to the surface, or use suitable solvent to clean it.

5.8. After long use, the electrode will be passivated because the bulb is polluted or the liquid interface is blocked, which will make the electrode sensitive gradient lower, response slow, reading inaccurate. The following methods could be used in different situations.

5.8.1. The glass bulb is passivated: Soak the bulb in 0.1mol/L dilute hydrochloric acid(add pure water into 9ml hydrochloric acid to 1000ml) for 24 hours, wash it with pure water, then soak it in electrode immersion solution for 24 hours. If passivation is serious, put the glass bulb in 4%HF (hydrofluoric acid) for 3-5 seconds, wash it with pure water, then soak it in electrode immersion solution for 24 hours.

5.8.2. Reference cleaning of glass bulb and liquid interface.

Contaminant	Detergent
Inorganic metal oxide	Less than 1mol/L dilute hydrochloric acid
Organic fat	Dilute detergent(alkalescent)
Resin polymer substance	Dilute alcohol, acetone, aether
Protein blood cell sediment	Acid enzyme solution(like Saccharated Yeast Tablets)
Pigment substance	Dilute bleach solution, hyperoxide

5.9. pH electrode can usually be used for one year, if the working conditions are very bad, being misused or in improper maintenance, its lifespan will be shortened. If the electrode is passivated or not working well, please replace it.

5.10. When the instrument is abnormal, please set P7 and restore default settings, then do the calibration and test.

V. mV measurement

1. Press 

to switch on the instrument, press 

to choose mV measuring mode

2. Connected to ORP or ion composite electrode(optional). Wash it and wave it dry, put them into tested solution, stir the electrode and let it be static, then wait until the reading is stable and the symbol ☺ appear on the screen, then the reading is its mV value.

VI. Packing list

Description	Number
S-610H pH meter	1 unit
pH electrode	1 piece
Temperature electrode	1 piece
Standard buffers(4.00, 6.86, 9.18pH)	1 set
Power adapter	1 set
User manual	1 copy

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