

2. Technical Parameters:

2.1. pH:

Measuring range	(-2.00 - 19.99) pH (Depending on type of electrode used)
Resolution	0.1/0.01 pH
Accuracy	Meter: ± 0.01 pH; Complete Kit: ± 0.02 pH
Input current	$\leq 2 \times 10^{-12}$ A
Input impedance	$\geq 1 \times 10^{12} \Omega$
Stability	± 0.01 pH/3h
Temp. Compensation range	(0 - 100) °C (auto/manual)

2.2. mV:

Measuring range (mV/ORP/E _H)	-1999 mV - 0 - 1999mV
Resolution	1mV
Accuracy	Meter: $\pm 0.1\%$ FS

2.3. Other Technical Parameters:

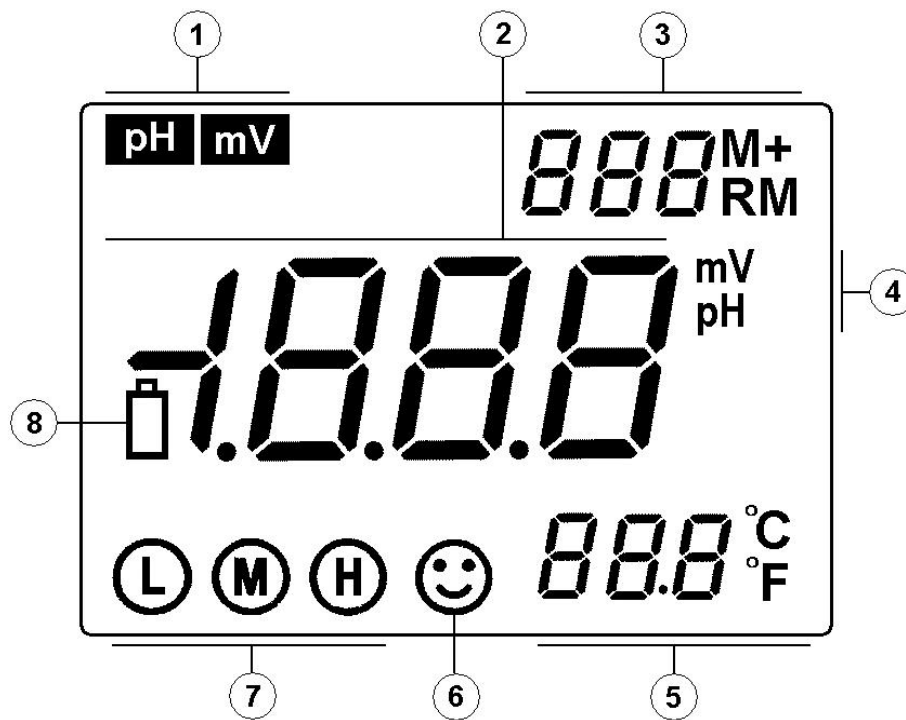
Data storage	150 groups
Storage content	Series number, measuring value, measuring unit and temperature
Power	Two AA batteries (1.5V x2)
Size and weight	Meter: (165×90×32)mm/310g
Quality and safety certification	ISO9001:2000, CE and CMC

2.4. Working Condition:

Environment temperature	5 - 35 °C (0.01 grade)
Environmental humidity	$\leq 85\%$
IP rating	IP54 dust and water resistant.

3. Instructions to the Meter:

3.1. LCD Display:



- ① — Parameters mode icon
- ② — Measuring value
- ③ — Serial number and icon as measuring value to be stored and recalled.
M+ — measuring value to be stored icon;
RM — reading to be recalled icon;
- ④ — Measuring unit
- ⑤ — Temperature measuring value and unit
- ⑥ — Measuring value to be stable icon
- ⑦ — Electrode calibration indicate icon


- ⑧ ——— Indication icon of low voltage, appears when the voltage less than 2.4V, call attention to change the batteries.

3.2. Operation Keys:

The meter has 7 operation keys in all.

- 3.2.1.  — Switch key

In the measurement mode open and shutdown function , other mode keys do not work.

- 3.2.2.  — Calibration key

(a) When in the measurement state, press this key to enter into calibration mode.

(b) When in the non - measurement state, the key is returned as the exit key.

- 3.2.3.  — Function key



When in the measuring state, Short-time press (time \leq 1.5s) , cyclic changing unit:

pH → **mV**


- 3.2.4.  — Back light and Data deleting key

(a) When in the measuring state, short press (less than 1.5s) to open or close the back light display;

(b) When in the storage record query state, long press (more than 5s) delete save data.

- 3.2.5.  —increase and query key,  —reduce and save key

(a) When in the measuring state, short press  (\leq 1.5s), save measure data,

Short press  (\leq 1.5s), resume shows the save data

(b) When in the parameter setting state,  and  change parameter size

- 3.2.6.  — The entrance key and return key


(a) When in the measuring state, long press ($\geq 2s$) this key to set parameter.

(b) When in the non-measuring state, short press ($\leq 1.5s$), determine current selection.


3.3. The Storage, Recall and Elimination of the Measuring Information:



3.3.1. Store the measuring information:

In the measuring mode, when the measuring data is stable and appear the “ 😊 ”,

short-time press  key (less than 1.5s), LCD will display “ **M+** ” icon and storage serial number, and meanwhile memory all the measuring information. Meter can storage 100 groups data (Two different units altogether storage 150 groups data)


3.3.2. Recall measuring information:

(a) Under the measuring mode, short press the  key ($\leq 1.5s$), meter will recall the last stored information, and the storage number and “ **RM** ” icon and the complete measuring information will appear in the lower right corner of the LCD. Again press

 and  key, meter will in turn recall all the measuring information

(b) In the recalling state, press  key will return the measurement mode

3.3.3. Eliminate the stored measuring information:

In the recalling mode, depress the  key for 5 seconds, LCD will appear “ **CLr** ” for 2 seconds. It means the storage has been eliminated, and returns to measuring mode.

4. pH Measurement:



4.1. Preparation Work:






4.1.1. Press  key to turn on, press  key, select PH measurement mode






4.1.2. Check E-201pH composite electrode, check pH composite electrode glass bulb whether or not keep wet, if the glass bulb damaged, the electrode cannot be used, if glass bulb's surface too dry need to be immersed into a saturated potassium chloride solution for 24 hours to activate and reuse.


4.1.3 Insert the PH composite electrode and the temperature electrode into the corresponding interface.






4.2. Meter Calibration:

4.2.1. Press  to enter into calibration mode, LCD displays the twinkling “” indicate to enter into the first point calibration.






4.2.2. Wash the pH electrode in purified water and dry it, then immerse it into the pH 7.00 buffer solution, rock the electrode holder and then still, waiting for the data stable and appear “”, then again press key , the LCD will appear a twinkling 7.00 pH, confirm the calibration is right then press  key to confirm the first point, the “” will appear in the upper right corner, prompt into the second point calibration or press  key exit calibration mode.

4.2.3. Wash the pH electrode in purified water and dry it, then immerse it into the pH 4.00 buffer solution, rock the electrode holder and then still, waiting for a stable data and appear “”, then again press key , the LCD will appear a twinkling 4.00pH, confirm the calibration is right then press  key to confirm the second point, the “” will appear in the upper right corner, prompt into the third point calibration or press  key exit calibration mode.


4.2.4. Wash the pH electrode in purified water and dry it, then immerse it into the pH 10.01 buffer solution, rock the electrode holder and still, waiting “” for the data stable and appear,

then again press key , LCD will appear a twinkling 10.01 pH, confirm the calibration is right then press  key to confirm the third point, at this time exit calibration mode into measuring mode, the LCD will appear “    ” in the lower left corner, it means meter was third times calibrated.

4.2.5. Note:

- (a) This meter can adopt random one-point, two-point or three-point automatic calibration, after the first point calibration (see item 4.2.2.), press  to exit calibration mode and enters into measuring mode. The indication icon “  ” for one-point calibration will appear on the lower left corner of LCD. When the measuring accuracy is $\leq \pm 0.1\text{pH}$, user just need to choose one kind buffer solution to take one-point calibration according to the measuring range.
- (b) After the second point calibration, (see item 4.2.3.), press  to exit calibration mode and enter into measuring mode. The indication icon “   ” for tow-point calibration will appear on the lower left corner of LCD. User can choose pH4.00 and pH 7.00 to calibrate if the measurement is just within the acidity range and choose pH7.00 and pH 10.01 to calibrate if just within the alkalinity range.
- (c) User should choose three-point calibration so as to reach a more accurate measurement if the measuring range is wide, or if the electrode has been used for long or has ageing phenomenon. As to the new electrode which be used for the first time, it must be calibrated by three-point calibration to keep the unanimity of the meter slope adjustment with the pH electrode.

4.3. Sample Test:

Immerge pH electrode into the sample solution after washing and dry it, rock the electrode holder and still, when the LCD appears the icon “  ” to take the reading

after displaying value to be stable.

Note: According to the pH equal temperature measuring theory: the closer the temperature of the sample solution with the calibration solution, the more accurate the measuring value will be acquired. So please comply with this theory.

4.4. Parameter Setting:



4.4.1. pH parameter schedule (Chart (4-1))



Chart (4-1)

Prompt	Parameter Setting Items	Parameters
P1	Manual temperature compensation setting	(0-99.9)°C
P2	Resolution selection	0.1pH/0.01pH
P3	pH standard buffer solution selection	CH、USA、NIST
P4	Temperature unit setting	°C °F
P5	Purified water,Ammonia added purified water pH restitution	OFF-ON
P6	Backlight timing shutdown time setting	(0-20)m/0 means closes this function
P7	Auto power off setting	(0-20)m/0 means closes this function
P8	Restore to producer setting	OFF-ON


 OK

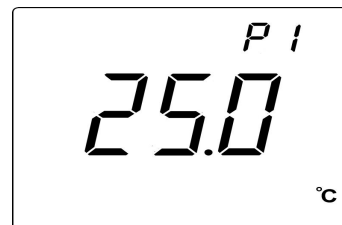
4.4.2. Manual temperature compensation settings(P1)

(a) Depress  key enter into setting mode,press  enters into P1 mode: see picture (4-2).



(b) Press  or  key to change the temperature value;

Long press the two settings keys can be changed quickly;



Press  key determines the current settings and returns.






picture 4-2

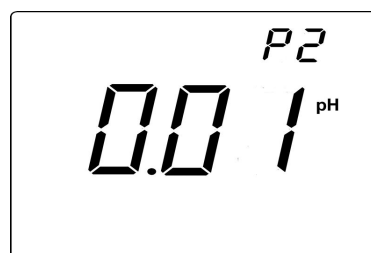
(c) Press  key to enter into next parameter setting or press  key to return to measuring mode.

4.4.3. Resolution selection (P2)



(a) Press  key in the mode P1 choose P2 , press  key enters into mode P2, see picture (4-3).

(b) Press  or  to choose resolution :
0.1→0.01;



Press  key determine the choice.








picture 4-3

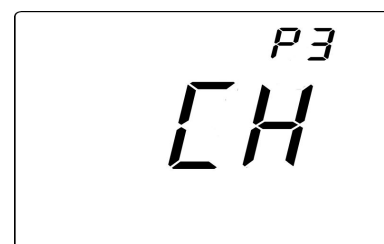
(c) Press  key to enter into next parameter setting or press  key to return to measuring mode.

4.4.4. pH standard buffer solution selection (P3)

(a) press  key in mode P2 to choose mode P3,press  key enters into mode P3 see picture (4-4).

(b) Press  key or  change buffer solution selection;there are Europe & U.S.A series,NIST series and China series;press  key determines the current settings and returns;

(c) press  key enter into next parameter setting or press  key to return to measuring mode.



picture 4-4








Three series standard buffer solution values:

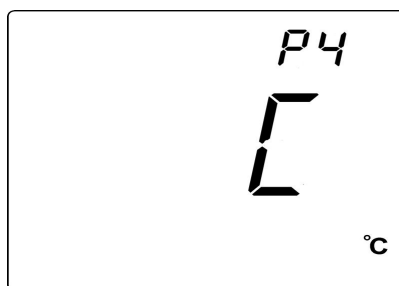
CH(China series): 1.68ph 4.00ph 6.86ph 9.18ph 12.46ph

NIS(NIST series):1.68ph 4.00ph 6.86ph 9.18ph 12.46ph

USA(Europe & U.S.A series):1.68ph 4.00ph 7.00ph 10.01ph 12.46ph







4.4.5. Temperature unit °C/°F setting (P4)

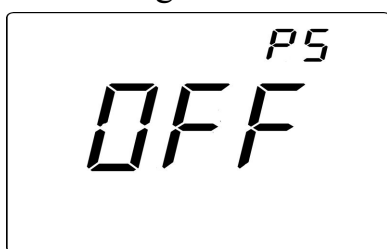
- (a) Short press  key in mode P3 to choose mode P4, press  key enters into P4 see picture (4-5).
- (b) Press  or  key to choose temperature unit: °C or °F, press  key determines and returns;
- (c) Press  key to enter into next parameter setting or press  key return to measuring mode.



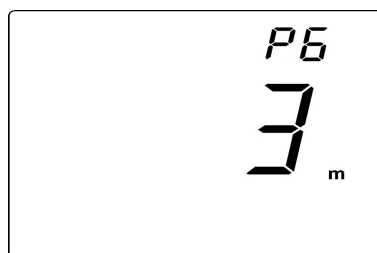
picture4-5

4.4.6. Purified water, Ammonia added purified water pH restitution (P5)

- (a) Press  key in mode P4 to choose mode P5, press  key enters into P5 see picture (4-6).
- (b) Press  key and  key modified, " OFF "no compensation," H2O "Purified water pH compensation;" nH3 "ammonia added purified water compensation;"
- (c) Press  key to enter into next parameter setting or press  key return to measuring mode.







picture4-6





picutre 4-7



4.4.7. Back light display time setting (P6)




- (a) Press  key in mode P5 to choose mode P6, press  key enters into P6 see picture (4-7).
- (b) Press  and  key to choose the time of back light auto power off, press



 key determines and returns;

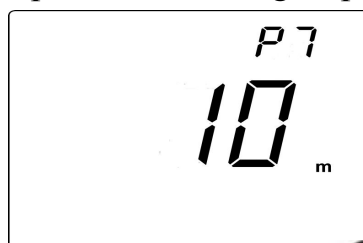
(c) Press  key to enter into next parameter setting or press  key to confirm and return to measuring mode.

4.4.8. Auto power off time setting (P7)

(a) Press  key in mode P6 to choose mode P7, press  key enters into P7 see picture (4-8).



(b) Press  or  key to choose the auto power off time, press  key determines and returns; "0" means to shut off auto power function;





(c) Press  key to enter into next parameter setting or press  key return to measuring mode.



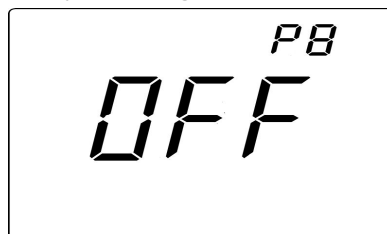
picture 4-8

4.4.9. Restore to producer setting (P8)

(a) Press  key in mode P7 to choose mode P8, press  key enters into P8 see picture (4-9).

(b) Press  or  key to choose "ON", then press  key determines, "888" flicker means restore to producer setting; press  key return to measuring mode.

(c) This function is used carefully. Once the factory setting is restored, the data that is stored before the calibration will be deleted.



picture 4-9

4.5. Considerations:

4.5.1. Calibration times of meter rely on the sample, electrode performance and required accuracy. For high accurate measurement ($\leq \pm 0.02\text{pH}$), which should be calibrated immediately with high accurate standard buffer solution, for general accuracy measuring ($\leq \pm 0.1\text{pH}$), which can be used almost one week or long time once be

calibrated.

4.5.2. The meter must be re-calibrated in the following situations:

- (a) New changed or unused electrode for a long time;
- (b) After measuring acid ($\text{pH} < 2$) or alkaline ($\text{pH} > 12$) solution;
- (c) After measuring solution which contains fluoride and concentrated organic solution;
- (d) The solution's temperature is much different with calibration temperature.

4.5.3. The soaking solution in the protecting bottle of front pH electrode is to keep the glass bulb and junction activating. Loose the capsule, pull out the electrode and wash it in purified water before measuring. Insert the electrode and screw tight the capsule after measuring to prevent the solution leaking. If the soaking solution is turbid or moldy, please wash and change a new one at once.

4.5.4. The preparation of the soaking solution: take 25g analytical pure KCL, dissolved with purified water and dilute to 100mL. Electrode should avoid soaking in purified water protein solution and acid fluoride solution for a long time as well avoid getting touching with organic silicon lipidic matters.

4.5.5. To calibrate the meter with the given value pH buffer solution, the pH value of the standard buffer solution must be reliable so as to improve the accuracy. Buffer solution should be changed in time after many times using.

4.5.6. Always keep the meter clean and dry; especially for the socket of meter and electrode, otherwise it may lead to an inaccurate measurement or invalidity. To clean and dry them with medical cotton with dehydrated alcohol if there are any dirty.

4.5.7. The sensitive glass bulb in the front of combination electrode should not touch with hard things, any broken and rough will make the electrode invalidity. Before and after measuring, the electrode should be washed with purified water, and dry electrode after washing, don't clean glass bulb with tissue for it will effect stability of electrode potential and enlarge response time. The electrode should be washed many times for

removing the sample stuck on the electrode, or wash with suitable solvent then clean the solvent with purified water after measuring sticky sample.

4.5.8. An electrode be used for a long time, or measured solution which contains a polluting solute easily for the sensitive bulb, or a substance resulting in jam at the junction, the electrode will be getting passivated, its sensitivity will decrease and its response is getting slow, the reading are not correct. It could adopt the following method for various cases:

(a) The glass bulb is contaminated and aging: Put the electrode into 0.1mol/L dilute hydrochloric acid (Preparation: diluted 9mL hydrochloric acid to 1000mL with purified water) for 24h. Rinse it with purified water, then dipped it into the electrode dipping solution for 24h. If the passivation is serious, then user can also put the bulb of electrode into 4% HF (hydrofluoric acid) or the electrode activation solution for 3 to 5 seconds, rinsing it with purified water, and dipped it in the electrode soaking solution for 24h to renew it.

(b) Wash for contaminated glass bulb and junction: (For reference)

Contamination	Abluent
Inorganic metal oxide	diluted acid less than 1mol/L
Organic lipidic matter	dilute washing (weak alkaline)
Resin macromolecule matter	dilute alcohol, acetone, ether
Proteinic haematocyte sediment	Acidic enzymatic solution (such as dried yeast)
Kinds of paint	dilute bleacher, peroxide

4.5.9. pH electrode using period is about 1 year, but its life will be shortened if using condition is poor or incorrect maintenance. So it should be replaced immediately after electrode become aging or invalid.

4.5.10. When it appears an abnormal reading when calibration or displaying, please set P8 as

“ON” to restore the meter to producer setting mode, and then to calibrate and measure again.

4.6. The Self-diagnose Information:

When using, there might appear the following icons. This is the meter's self-diagnose information, which can help to know some information about the meter or the electrode when using:

4.6.1. The stable icon -2.00 pH or the 19.99 pH — this icon appeared when the value has surpassed the measuring range. There will also appear such signs when the electrode is not well connected with the meter or when the electrode is not immersed into the solution. This is a normal phenomenon.

4.6.2. “Err 1” — Electrode zero potential to be exceeded ($<-60\text{mV}$ or $>60\text{mV}$)

4.6.3. “Err 2” — Electrode slope to be exceeded ($< 50\%$ or $>105\%$)


When appear “Err 1” or “Err 2”, the meter can not work, please take the following check:

- (a) Check if the electrode bulb has air bubble, if has, please shake it hardly.
- (b) Check the quality of buffer solution, if it goes bad or the value has biggish error.
- (c) Set the meter to producer setting mode (for details see P12 item 4.4.9.), then re-calibrate it.

If still can not recover the normal state after doing the above checking, please replace a new pH electrode.

5. mV Measurement:

5.1. Press  key to turn on, and short press  switch to **mV** mode;

5.2. Connect the ORPC composite electrode or the ion composite electrode (sold separated), the electrode is washed and dried in pure water and immersed in the measured solution., slowly stir and then still. When there appear a “” and a stable

reading, that is the value.

6. Meter's Complete Kit:

6.1. Model P611 pH meter	1unit
6.2. E-201-9 combination electrode	1pc
6.3. T-10-Q temperature electrode	1pc
6.4. standard buffer solution (4.00,7.00,10.01)	1sets
6.5. Manual	1pc
6.6. Carrying case	1pc

7. Warranty:

- 7.1. We warrant this meter to be free of charge maintain, replace the parts or products under normal using circumstances, from purchased time within one year caused by manufacturing bad and unable to work.
- 7.2. Attached electrodes do not belong to this warrant range. But, if the newly purchased electrode went wrong without using, it's free of charge to maintain and replace.
- 7.3. The above warranty is not apply to defects resulting from action of user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification.