Benchtop pH/Ion Meter
DW-105 Series

User
Manual

CAS TECHNOLOGY
中科特肯

Declaration

The functions described in this manual are for the entire benchtop pH/ion meter. The specific available functions and parameters depend on the configuration of the model you purchased.

- We have compiled this manual with great care, but we cannot guarantee the complete accuracy of its content and shall not be liable for any losses incurred by users due to this manual. Meanwhile, our products are constantly being improved, including this manual, so we reserve the right to modify this manual at any time without notice.

Notes

Dear User,

Thank you very much for purchasing the instruments and meters of Zhongke Tk (Shandong) Intelligent Technology Co., Ltd. To ensure the designed performance and service life of this product, anyone who uses or maintains this product must fully comply with this instruction manual. By reading and understanding this instruction manual carefully, you can fully understand the functions, operation and maintenance methods of this product.

Attention

Zhongke Tk benchtop pH/ion meter is a precision testing instrument. Please maintain good usage norms and maintenance to exert the best performance of the instrument.

- Use and store the instrument in a suitable environment.
- Avoid severe shaking, collision and pulling during transportation and use.
- Do not disassemble or assemble the instrument without permission except for battery replacement. Maintenance shall be carried out by special personnel.

Product Quality Statement

We warrant that our products are free from defects in materials and workmanship. All customers who purchase our products and operate them in accordance with our guidelines are entitled to a one-year warranty. Within the warranty period, the company is responsible for free repair in case of malfunctions caused by the instrument's own quality problems (non-man-made). Beyond the warranty period, the company provides lifetime repair services.

Content

1. Product Introduction

1.1 Overview

Our pH/ion meter is not only a cost-effective and easy-to-operate benchtop measuring instrument, but also has the following outstanding features:

- Intelligent Electrode Management Technology: The meter can automatically identify high-precision intelligent electrodes and transmit the latest set of calibration data from the electrode chip to the meter, making data more secure and reducing errors.
- User-Friendly Interface: 7-inch full-view LCD screen with intuitive menu wizard for easier operation.
- Easy Measurement Switching: Switch between various parameters easily before and after measurement.
- Built-in Multiple Ion Modes: Including Na^+, K^+, F^-, Cl^-, CN^-, NO_3^-, Ca^{2+}, etc., for quick switching and selection.
- Multiple Ion Concentration Units: PX, mV, mol/L, mmol/L, μg/L, mg/L, g/L, ppm for quick switching.
- IP54 Water Resistance: Subject to the meter, electrode and connection. The meter housing is resistant to liquid leakage and can be cleaned with a damp cloth.
- Strong Flexibility: An electrode stand is configured on the right side of the meter for more flexible operation. The new structure of the electrode stand can be operated with one hand and moved up and down vertically to place the electrode in an ideal position for optimal measurement performance, making measurement faster and more convenient, and reducing the risk of overturning sample containers or damaging measuring electrodes.
- Easy Measurement Operation: One-key operation for measurement, calibration, storage and other functions, simple and convenient.
- Multiple Data Storage and Transmission Modes: Direct data printing is available.

- In addition to the new functional features, the meter is compatible with single electrodes, combination electrodes, ordinary three-in-one electrodes and high-precision intelligent three-in-one electrodes, with the same high-quality standards: excellent ergonomic design makes the instrument feel integrated with the human body.

1.2 Safety Measures

1.2.1 Operator Protection Measures

Do not work in an explosive environment! The meter housing is not airtight (explosion risk may be caused by sparks or corrosion from intruding gases). When using chemicals or solvents, follow the operating guidelines provided by the supplier and laboratory safety regulations.

1.2.2 Operator Operational Safety Precautions

Do not separate the meter housing; only our technical staff are allowed to repair the meter! Wipe off any liquid splashed on the instrument immediately! Some solvents may cause housing corrosion.

1.2.3 Avoid the Following Environmental Factors

Severe vibration, long-term direct sunlight, atmospheric humidity exceeding 80%, corrosive gases, ambient temperature below 0℃ or above 45℃, strong electric or magnetic fields.

1.3 Appearance and Composition

1.4 Installation

1.4.1 Unpacking

Carefully unpack and take out the meter, keep the outer box, certificate of conformity and instruction manual properly, and connect the 12V DC power supply to the matching connector of the meter.

1.4.2 Stand Installation

The electrode stand can be installed on the right side of the meter as required, and the height of the electrode stand can be adjusted up and down according to usage habits. Use tools to connect the stand.

1.5 Description

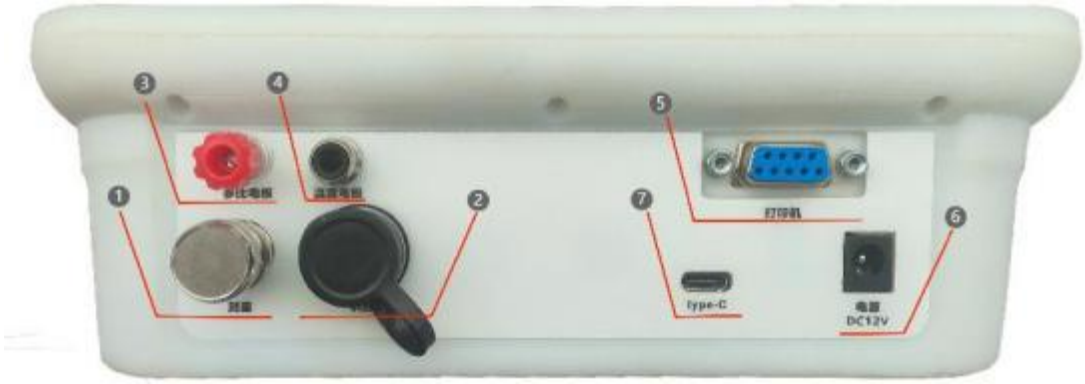
1.5.1 Key Control

This product adopts key operation mode, with 12 keys on the instrument.

Key	**Function**
Power On/Off	Short press to power on or off the instrument
Calibration	Press to enter the calibration mode and confirm the calibration result
Measurement	Short press to start or end the sample measurement
Confirm	Has different functional effects under different operation interfaces (refer to the detailed operation steps)
Return	Short press to return to the main test interface; long press to restore factory settings
Setting	Short press to enter the instrument setting mode
Delete	Long press to delete all stored measurement data
Print/Direction Left	Short press to print measured or stored data; act as the left direction key for parameter adjustment
Store/Direction Up	Short press to manually store measured data; act as the up direction key for parameter adjustment

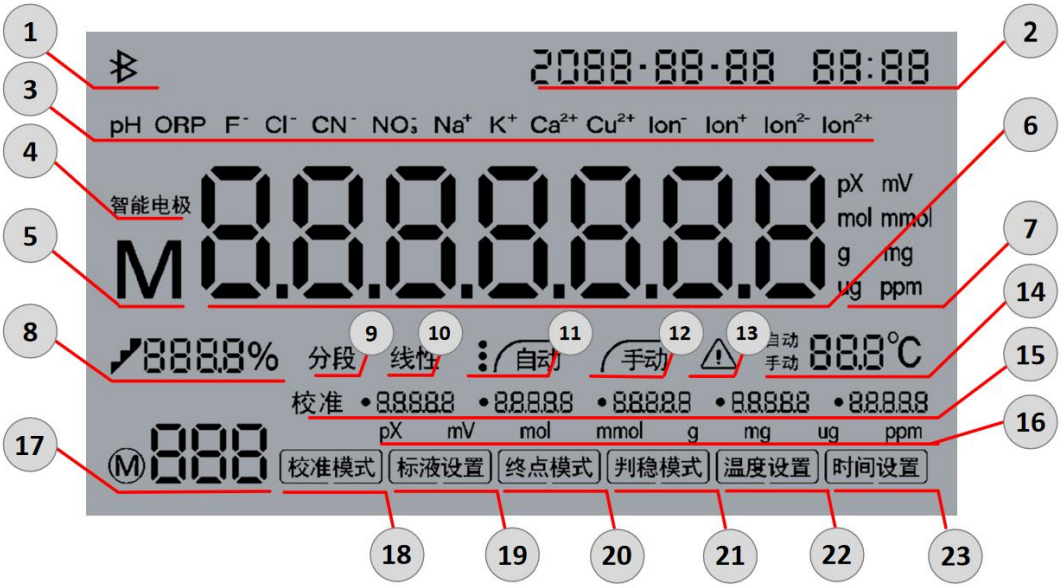
Key	Function
Recall/Direction Down	Short press to view stored measurement data; act as the down direction key for parameter adjustment
Switch/Direction Right	Short press to quickly switch measurement modes; act as the right direction key for parameter adjustment
Unit	Short press to quickly switch the measurement unit of ion concentration

1.5.2 Jack Indication



1. BNC Jack: mV/pH/ion concentration signal input
2. 6-pin Aviation Jack: Identification and temperature input
3. Reference Electrode Jack
4. Temperature Electrode Jack
5. RS232 Printer Connector: Connect printer for signal transmission
6. DC Power Jack: 12V dedicated power input
7. Type-C Jack: For manufacturer to connect, upgrade and maintain the meter

1.5.3 Display Description



1. Bluetooth connection prompt
2. Date and time
3. Ion display
4. Intelligent electrode prompt
5. Data storage icon
6. Measured value
7. Measurement unit
8. Electrode status icon:
   - Good electrode slope: 95.0-105.0%
   - Electrode needs cleaning: 94.0-90.0%
   - Electrode fault, need maintenance/replacement: 89.0-80.0%
9. Segmented calibration mode
10. Linear calibration mode
11. Automatic stability judgment standard: 自动 Strict, 自动 Normal, 自动 Fast
12. Manual stability judgment mode
13. Warning prompt
14. Manual/Automatic temperature compensation prompt
15. Calibration buffer solution group
16. Calibration buffer solution unit
17. Stored data number
18. Calibration mode: Select to enter calibration mode
19. Standard solution setting: Select to enter standard solution setting
20. End point mode: Select manual/automatic end point mode
21. Stability judgment mode: Select stability standard in automatic mode
22. Temperature mode: Select manual/automatic temperature compensation mode
23. Time setting: Enter to change date and time

1.6 Technical Parameters

Item		**DW-105A**	**DW-105B**
Instrument Grade -		0.01	0.001
Measuring Parameters -		Potential, pH, pX, ion concentration and temperature	
mV	Measuring Range	-2000.0~2000.0 mV	-2000.00~2000.00 mV
	Minimum Resolution	0.1 mV	0.01 mV
	Accuracy	±0.3 mV	±0.1 mV
pH	Measuring Range	-2.00~20.00 pH	-2.000~20.000 pH
	Minimum Resolution	0.01 pH	0.001 pH
	Accuracy	±0.01 pH	±0.002 pH
pX	Measuring Range	-2.00~20.00 pX	-2.000~20.000 pX
	Minimum Resolution	0.01 pX	0.001 pX
	Accuracy	±0.01 pX	±0.002 pX
Ion Concentration	Measuring Range	(1.000e-^{9}~9.999e^{9}), mol/L, mmol/L ,g/L, mg/L, μg/L	
	Minimum Resolution	4 significant figures	4 significant figures
	Accuracy	±0.5%	±0.3%
Temperature	Measuring Range	-5.0~110.0℃	-10.0~135.0℃

Item		**DW-105A**	**DW-105B**
	Minimum Resolution	0.1℃	0.1℃
	Accuracy	±0.2℃	±0.1℃
Power Supply	Input: AC100~240V; Output: DC12V		
Dimension (mm)	203×163×70		

2. Product Operation

2.1 Electrode Connection

2.1.1 General Electrode Connection

When connecting pH, temperature or ion electrodes to the meter, first remove the protective cap of the BNC plug at the meter interface, then connect the electrode and ensure the electrode connector is inserted into the interface. If a three-in-one electrode with a built-in temperature probe or an independent temperature electrode is used, connect the other cable to the ATC plug and rotate the BNC plug to ensure the electrode is fully connected to the meter.

2.1.2 Intelligent Three-in-One Electrode Description

When connecting an intelligent three-in-one electrode to the meter, connect the other cable to the 6-pin aviation plug. Align the red dot of the plug when connecting the aviation plug to the device, and it will lock automatically with a "click" sound. The internal calibration data of the electrode will be automatically transmitted from the chip to the meter during meter power-on, calibration and measurement for measurement.

Note: Turn off the meter before disconnecting the electrode to ensure the electrode is not disconnected from the meter when the meter reads and writes data to the electrode identification chip.

2.1.3 Intelligent Electrode

The meter adopts intelligent electrode management technology, which is compatible with our intelligent three-in-one electrodes, making data more secure and reducing errors.

After connecting the intelligent electrode, the electrode will be automatically identified, and the internal calibration data, electrode slope and other information of the electrode will be automatically transmitted to the meter, allowing intuitive understanding of the electrode status and easy determination of whether the electrode needs calibration, cleaning or replacement.

After connecting the intelligent electrode, the calibration data of the meter is automatically transmitted to the electrode chip. The electrode can store the latest set of calibration data, so that the latest calibration data is always stored in the intelligent electrode and automatically used for measurement.

2.2 Power On

Press the power key, and the device will power on with a "beep". The device automatically detects the used electrode, and the meter displays the date, time, intelligent electrode (only

displayed for intelligent three-in-one electrodes), test value, test value unit, manual/automatic test temperature (℃), electrode performance (%), calibration mode (linear/segmented), stability judgment mode (automatic/manual), storage quantity and calibration point display. The backlight function is automatically turned on when powered on, and the backlight function turns off automatically after 10 minutes, activating the screen saver program. Press any key to activate the screen backlight function. The device has an automatic power-off function and will power off automatically if there is no operation for 30 minutes after power-on.

2.3 Meter Settings

Press the Setting Key to enter the setting mode. Use the Left Direction Key (Print) and Right Direction Key (Switch) to select Calibration Mode, Standard Solution Setting, End Point Mode, Stability Judgment Mode, Temperature Setting and Time Setting, and press Confirm to enter.

2.3.1 Calibration Mode

Press the Setting Key, the Calibration Mode flashes; press the Confirm Key to enter the mode. The meter provides two calibration modes for selection (use the direction keys to select):
Segmented: The calibration curve consists of linear segments connecting individual calibration points. Recommended for higher accuracy.
Linear: The calibration curve is determined by linear regression. Recommended for samples with large pH changes.

The meter automatically exits to the setting mode after selection.

2.3.2 Standard Solution Setting

Use the Left Direction Key to select Standard Solution Setting and press the Confirm Key to enter. Use the Right Direction Key to select the standard solution to be modified, press the Confirm Key to enter the edit mode. Use the Left/Right Direction Keys to select the digit of the value to be edited (five digits adjustable, decimal point adjustable). After selecting the digit, use the Up (Store) and Down (Recall) Direction Keys to edit the value one by one. Press the Confirm Key to confirm the standard solution value (5 different standard solution values can be edited). Press the Return Key to return to the standard solution selection mode.

The device automatically judges the corresponding unit under different electrode modes. For standard solutions with special unit requirements, the Unit Key can be used to switch the unit of the standard solution in the setting mode.

Press the Return Key to return to the previous menu edit mode.

2.3.3 End Point Mode

Use the Right Direction Key to select End Point Mode and press the Confirm Key to enter. Use any direction key to select Automatic or Manual and press the Confirm Key to confirm.

Automatic End Point: The meter determines the end of a measurement process according to the connected electrode and the selected stability standard, ensuring simple, fast and accurate measurement.
Manual End Point: The user needs to operate manually and press the Measurement Key to end the measurement.

2.3.4 Stability Judgment Mode

Use the Right Direction Key to select Stability Judgment Mode and press the Confirm Key to enter. Use any direction key to select  Strict,  Normal or  Fast standard.

Stability standards for pH and mV measurement:
Strict: The measurement signal changes by no more than 0.03 mV within 8 seconds or no more than 0.1 mV within 30 seconds.
Normal: The measurement signal changes by no more than 0.1 mV within 6 seconds.
Fast: The measurement signal changes by no more than 0.1 mV within 4 seconds.

2.3.5 Temperature Setting

Set the manual temperature. If the meter does not detect a temperature probe, Manual is displayed on the screen. In this case, the sample temperature needs to be entered manually (a temperature value between 00.0℃ and 99.9℃ can be entered). Immerse the electrode in a constant temperature water/air of known accurate temperature for stabilization.

Use the Right Direction Key to select Temperature Setting and press the Confirm Key to enter the temperature setting interface (the detected temperature flashes on the meter display). Use the Left/Right Direction Keys to select the position to be edited (flashing), use the Up/Down Direction Keys to increase/decrease and adjust the actual temperature value, then press the Confirm Key to save the setting data and exit automatically to complete the temperature setting.

When a three-in-one combination electrode with a temperature electrode or an independent temperature electrode is used, Automatic is displayed, and the temperature setting function is not required.

2.3.6 Time Setting

Use the Right Direction Key to select Time Setting and press the Confirm Key to enter the time setting interface. Use the Left/Right Direction Keys to select the position to be edited (flashing), and use the Up/Down Direction Keys to increase/decrease and adjust the date (Year-Month-Day) and time (24-hour format).

2.4 Calibration

2.4.1 pH Calibration

The meter can edit and select any five calibration buffer solutions (one group) in the standard solution setting mode, and support 1-point to 5-point calibration.

Calibration can only be performed in the calibration mode. The required standard solutions can be edited arbitrarily through the standard solution setting function, and up to five standard solutions can be displayed for calibration.

Calibration with five standard buffer solutions: for each buffer solution, the temperature compensation method can be automatically selected according to whether a temperature electrode is connected.

2.4.2 pH One-Point Calibration

1. Immerse the electrode in the standard solution and press the Calibration Key to enter the calibration mode (all calibration values are displayed on the meter screen).
2. After the signal is stable, the meter follows the pre-selected end point mode.
3. Automatic End Point Mode: The meter automatically identifies and displays the type of standard buffer solution, the indicator point flashes before the displayed value. After the value is stable, a "beep" sounds to complete automatic calibration. The calibration result is displayed on the screen; press the Confirm Key to save the calibration data and exit automatically.
4. Manual End Point Mode: The meter automatically identifies and displays the type of standard buffer solution (flashing). Check the corresponding standard buffer solution and wait for the value to be stable, then press the Confirm Key (the calibration result is displayed on the screen). Long press the Confirm Key until a "beep" sounds to save the calibration data and exit automatically.
5. To abandon calibration, press the Return Key to abandon the current calibration, and the meter automatically returns to the measurement interface.

Note: One-point calibration only corrects the zero potential of the electrode. If the electrode has been calibrated with multiple points before, the meter will use the previously saved slope.

2.4.3 pH Multi-Point Calibration

The meter supports up to 5-point pH calibration.

1. Perform one-point calibration according to steps 1-2 in "pH One-Point Calibration".
2. Rinse the electrode with deionized water.
3. Immerse the electrode in the next standard buffer solution.

Automatic End Point Mode: The meter automatically identifies and displays the type of standard buffer solution (the indicator point flashes). After the value is stable, a "beep" sounds to complete automatic calibration (the calibration result is displayed on the screen). Repeat the steps; after completing the multi-point calibration (or 5-point calibration), press

the Confirm Key to complete the calibration of the group of buffer solutions.

Manual End Point Mode: The meter automatically identifies and displays the type of standard buffer solution (flashing). Check the corresponding standard buffer solution and wait for the value to be stable, then press the Confirm Key (the calibration result is displayed on the screen) to complete the calibration of the buffer solution. Immerse the electrode in the next standard buffer solution and repeat the steps; after completing a group of calibration data, long press the Confirm Key until a "beep" sounds to save the current group of calibration data and exit automatically.

4. To abandon calibration, press the Return Key to abandon the current calibration, and the meter automatically returns to the measurement interface.

2.5 Automatic Identification of Standard Buffer Solutions

The meter has the function of automatic identification of preset standard buffer solutions. During calibration, the meter can automatically identify the concentration of the buffer solution and display it.

This function allows calibration to be performed in any order with preset pH buffer solutions.

2.6 Sample Measurement

pH Measurement

Immerse the electrode in the sample and press the Measurement Key to start measurement (the measured value of the sample is displayed on the meter screen).

The end point mode icon flashes (Automatic/Manual), indicating that the measurement is in progress. Once the measurement reaches stability according to the selected stability standard, the stability icon (Automatic/Manual) stops flashing.

If Automatic End Point mode is selected, the measurement stops automatically and the measured value is locked after the stability icon stops flashing.

If Manual End Point mode is selected, press the Confirm Key to stop the measurement manually and lock the measured value.

Note: After the meter locks the measured value, the lock is automatically released when the pH value of the test sample solution fluctuates by more than ±0.2 pH.

Ion Measurement

The following ion concentration units are available for measurement and calibration: mmol/L, mol/L, ppm, µg/L, mg/L, g/L, pX, mV.

In specific cases, if the measurement unit needs to be changed, the electrode must be recalibrated before starting the measurement; otherwise, large data deviations will occur. It is important to select the correct ion type when using a previously determined ion electrode, because the theoretical slope depends on the ion charge. Eight dedicated ion types and four general ion types are available: F^- (Fluoride ion), Cl^- (Chloride ion), CN^- (Cyanide ion), NO_3^- (Nitrate ion), Na^+ (Sodium ion), K^+ (Potassium ion), Ca^{2+} (Calcium ion), Cu^{2+} (Copper ion), Ion^-, Ion^+, Ion^{2-} and Ion^{2+}.

The theoretical slope varies with the ion charge depending on the electrode type. For example, the theoretical slope of a fluoride ion electrode is 459.16 mV/X, while that of a calcium ion electrode is -29.58 mV/pX. This theoretical value is automatically read when a new electrode is connected, and there will be differences between different electrodes until the electrode is calibrated.

2.7 Data Storage

The meter can store 999 measured data points. The number of stored data in the memory is displayed on the screen in the format of M***.

The storage prompt is displayed on the screen immediately after the measurement reaches the end point; press the Store Key to store the reading at the end point. After the data is saved, M1 is displayed on the meter screen (indicating one measured data is stored), and M999 (indicating 999 measurement results are stored).

When the storage reaches M999, the next storage will overwrite the last measured data point.

2.8 Recall Stored Readings

Press the Recall Key to retrieve stored data from the memory. Use the Up (Store) and Down (Recall) Direction Keys to browse the stored readings (M1-M999 indicates the serial number of the result; M0 is the starting point). Press the Return Key to return to the measurement interface.

2.9 Data Printing and Transmission

All data can be transmitted from the meter memory to the printer for printing. The following details how to perform transmission with different configurations:

1. Connect the RS232 cable to the corresponding interfaces on the back of the meter and the printer.
2. Find the data to be printed in the memory and press the Print Key to print the

corresponding content (the printed content includes measurement date, time, measured value, measurement temperature, electrode slope, calibration mode type, end point mode type and stability judgment mode type).
3. For some printers, the following data transmission settings in the printer need to be adjusted:

Baud rate: 9600
Data bits: 8 bits
Stop bits: 1 bit
Parity: None
Handshake: None

2.10 Data Deletion

The meter can clear all stored data in the memory: press the Recall Key to retrieve stored data from the memory, and long press the Setting/Delete Key until a "beep" sounds to clear all data in the memory.

2.11 Restore Factory Settings

The meter can clear stored calibration data and measured data and restore factory settings with one key:
1. In the measurement interface, long press the Return Key until a "beep" sounds, and the meter automatically clears all data stored in the meter memory.
2. In the measurement interface, long press the Calibration Key until a "beep" sounds, and the meter automatically clears the calibration data stored in the device and the intelligent electrode.

2.12 Temperature Compensation

We recommend using a built-in or independent temperature electrode. If a temperature electrode is used, Automatic and the sample temperature are displayed on the meter screen. If no temperature electrode/probe is used, Manual is displayed, and the sample temperature should be entered manually (refer to "Temperature Setting" in "Meter Settings" for details).

The meter only accepts NTC 10 kΩ temperature electrodes.

In the pH measurement mode, the meter uses the temperature to calculate the temperature-adjusted electrode slope and displays the pH value at the current temperature on the measurement screen.

2.13 Power Off and Storage

2.13.1 Power Off

After using the instrument, press the power key to turn it off. Wipe the body and probe surface with a paper towel (do not touch the membrane). Remove the electrode: unscrew the BNC plug, unlock the aviation plug first and then remove the electrode. Fix the protective caps on the BNC plug and the female aviation plug.

2.13.2 Instrument Storage

Store the instrument in a clean, dry and dark environment; strictly prohibit exposure to direct sunlight and storage in an environment below 0℃.

It is recommended to turn off the power switch when the instrument is not in use. Turn on the instrument weekly to check the value change, and prepare standard solutions for testing monthly to maintain electrode performance.

3. Maintenance

Do not separate the instrument housing. The meter requires no special maintenance, only occasional wiping of the outer casing with a damp cloth and replacement of exhausted batteries. The meter housing is made of ABS/PC (Acrylonitrile-Butadiene-Styrene/Polycarbonate), which is susceptible to erosion by some organic solvents such as toluene, xylene and methyl ethyl ketone (MEK). Wipe off any such solvents splashed on the housing immediately if they come into contact.

Electrode Maintenance

1. Ensure the pH electrode is always stored in a suitable filling solution.
2. For maximum accuracy, any filling solution adhering to or solidifying on the outside of the electrode must be removed immediately with distilled water.
3. Always store the electrode in accordance with the manufacturer's instructions; do not let it dry out.
4. If the electrode slope drops rapidly or the response speed becomes slow, solve the problem with the following steps. Try one of the methods according to the sample type.

Common Problem	**Corresponding Solution**
Contamination by oily substances or grease	Gently clean the electrode membrane with cotton dipped in a small amount of acetone or soapy water to remove the oily contaminants, then rinse thoroughly with distilled water
Dried pH electrode sensitive membrane	Immerse the electrode head (only the sensitive membrane part) in 0.1 M HCl solution and let it stand overnight to rehydrate the membrane, then rinse and calibrate

Common Problem	Corresponding Solution
Contamination by protein substances in the pH electrode diaphragm	Immerse the electrode in a proper concentration of HCl solution for a certain time to dissolve and remove the protein contaminants, then rinse thoroughly
Contamination of pH electrode by silver sulfide	Immerse the electrode in a proper concentration of thiourea solution to remove the silver sulfide contaminants, then rinse with distilled water
Recalibration Requirement	No matter which cleaning method is used, the electrode must be recalibrated with the standard solution before subsequent measurement to ensure the measurement accuracy

Note: Dispose of cleaning solutions or filling solutions in accordance with the regulations for toxic or corrosive substances. For the maintenance of ion electrodes, refer to the ion electrode instruction manual.

4. Accessories

Adapted Electrodes

Model	No.	Measuring Range	Detailed Description
PH-100P	04010332	0-14 pH	pH combination electrode, PC housing, ϕ12×120mm, 1m cable, no temperature sensor, BNC plug, no identification chip
PH-100G	04010333	0-14 pH	pH combination electrode, glass housing, ϕ12×120mm, 1m cable, no temperature sensor, BNC plug, no identification chip
PH-200P	04010335	0-14 pH	Three-in-one electrode, PC housing, electrode slope > 97%, response time 30s, 10K thermistor, no identification chip, 1m cable, BNC + RCA plug, injection molded splitter
PH-200G	04010334	0-14 pH	Three-in-one electrode, glass housing, electrode

Model	No.	Measuring Range	Detailed Description
			slope > 97%, response time 30s, 10K thermistor, no identification chip, 1m cable, BNC + RCA plug, injection molded splitter
PH-300PR	02020385	0-14 pH	Intelligent pH three-in-one combination electrode, blue PC housing, ϕ12×120mm, ASG#8 global bulb, double salt bridge, Ag/AgCl reference, NTC-10K temperature compensation, 1m cable, BNC + 6-pin aviation plug, built-in identification chip
PH-300GR	02020386	0-12 pH	Intelligent pH three-in-one combination electrode, ASG9# half bulb, ϕ12x120mm, glass housing, NTC-10K temperature compensation, black electrode cap, 1m cable, BNC + 6-pin aviation plug, built-in identification chip
PH-400PG	04010521	0-11 pH	Three-in-one pure water electrode, ϕ12x120mm, glass housing, NTC-10K temperature compensation, 1m cable, BNC + RCA plug
PH-400SG	04010522	0-14 pH	Three-in-one sewage electrode, ϕ12x120mm, glass housing, NTC-10K temperature compensation, 1m cable, BNC + RCA plug, fast heat conduction pH/temperature combination electrode structure, 40% higher temperature sensing speed
ORP-100P	04010505	-2000 ~ +2000 mV	ORP combination electrode, Ø2.45mm platinum sheet, Ø12mm×120mm, red PC housing, 1m coaxial cable, BNC plug, red sheath, black ABS electrode cap, small soaking bottle
ISE-100CL	04010492	1.8 - 36,000	Chloride ion combination electrode, Ø12mm×120mm, black epoxy housing, black new electrode cap, 1m coaxial cable, BNC plug; equipped with 1438 box, cable label, engraving, 1000ppm chloride ion standard solution, chloride ion ISA, polishing strip, Chinese instruction manual, three-line box label
ISE-100NO	04010484	6×10^{-3} -	Nitrate ion combination electrode,

Model	No.	Measuring Range	Detailed Description
		Saturated	Ø12mm×120mm, industrial on-line, black epoxy housing, black new electrode cap, 1m coaxial cable, BNC plug; equipped with 1438 box, cable label, engraving, 1000ppm nitrate ion standard solution, nitrate ion ISA, Chinese instruction manual, three-line box label
ISE-100CN	04010485	0.13 - 260	Cyanide ion combination electrode, Ø12mm×120mm, industrial on-line, black epoxy housing, black new electrode cap, 1m coaxial cable, BNC plug; equipped with 1438 box, cable label, engraving, English instruction manual, cyanide ion ISA, three-line box label
ISE-100K	04010486	0.04 - Saturated	Potassium ion combination electrode, Ø12mm×120mm INS, black epoxy resin housing, double salt bridge sand core, Ag/AgCl reference, gel, PVC sensing membrane, black cap, 3ft coaxial cable, BNC plug, semi-finished ASI production
ISE-100CA	04010487	0.5 - 40,000	Calcium ion combination electrode, PVC membrane, Ø12×120mm, black epoxy housing, black electrode cap, new anti-twist part, 1m coaxial cable, BNC plug, soaking bottle; equipped with 1438 box, engraving, cable label, soaking bottle with 1000PPM calcium ion standard solution and label, soaking bottle with calcium ion ISA standard solution and label, Chinese instruction manual, two-line box label
ISE-100NA	04010519	0.02 - Saturated	Sodium ion electrode, glass sensitive membrane, ϕ12x165mm, combination electrode, PC housing, 1m cable, BNC plug; measuring range: 2300-0.02ppm, slope: 56±4mV, applicable pH≥10, filling solution: 2M (NH4Cl)
ISE-100F	04010520	0.02 - Saturated	Fluoride ion electrode, single crystal sensitive membrane, ϕ12x165mm, combination electrode, PC housing, 1m cable, BNC plug; measuring range: 2000-0.02ppm, slope: 56±4V, applicable pH range: 5-7, filling solution: 2M KCl

5 Appendix Table

Temperature (℃)	Oxalate Standard Buffer Solution	Tartrate Standard Buffer Solution	Phthalate Standard Buffer Solution	Phosphate Standard Buffer Solution	Borate Standard Buffer Solution	Calcium Hydroxide Standard Buffer Solution
0	1.67	-	4.00	6.98	9.46	13.42
5	1.67	-	4.00	6.95	9.40	13.21
10	1.67	-	4.00	6.92	9.33	13.00
15	1.67	-	4.00	6.90	9.27	12.81
20	1.68	-	4.00	6.88	9.22	12.63
25	1.68	3.56	4.01	6.86	9.18	12.45
30	1.69	3.55	4.01	6.85	9.14	12.30
35	1.69	3.55	4.02	6.84	9.10	12.14
40	1.69	3.55	4.04	6.84	9.06	11.98

About Zhongke Tk

Zhongke Tk (Shandong) Intelligent Technology Co., Ltd. was founded in 2015, with its headquarters located in Jinan, Shandong Province. It is a high-tech enterprise specializing in the R&D, production, sales and service of water quality analysis equipment.

The company has a professional R&D team. With profound professional knowledge and rich practical experience, the team members continuously promote the innovation and progress of water quality analysis technology to ensure that the products are always at the advanced level of the industry.

Our products cover a variety of water quality analysis equipment, including hydrogen conductivity meter, dissolved oxygen meter, pH meter, conductivity meter, multi-parameter water quality analyzer, etc. At the same time, the company also provides customized solutions for customers, tailoring suitable water quality analysis equipment and monitoring schemes according to their specific needs.

Adhering to the business philosophy of Technological Innovation, Quality First, Service Supreme, we continuously improve product quality and service level, provides customers with suitable water quality analysis equipment and solutions, and makes greater contributions to the development of the water quality analysis industry.

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