Portable Hydrogen Conductivity Meter

HC-100 Series

User Manual

CAS TECHNOLOGY
中科特肯

Declaration

The functions described in this manual apply to the entire HC-100 series of portable hydrogen conductivity meters. 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.

WARNING: This instrument **shall not be used** in flammable and explosive environments.

NOTES:

1. The equipment operating environment shall comply with the requirements of GB/T 12145 standard, and the host operating temperature range is 0 ℃ - 50 ℃.
2. When the instrument is not in use for a long time, block the water inlets and outlets with plugs and turn off the power supply.
3. Use only the **dedicated charger (220V, 50HZ)** for charging. Avoid charging with high-power equipment on the same circuit. The dedicated charger for the host shall not be used for other purposes, otherwise the user shall bear all responsibilities!
4. The working environment shall be free of severe vibration and strong electromagnetic interference.

Equipment Usage Precautions:

1. Use only the special color-changing resin particles provided by the manufacturer for the resin column, otherwise the electrode sensor of the equipment may be damaged.

2. Pay close attention when connecting the water inlets and outlets; **strictly prevent any foreign matter** from entering the through holes of the inlets and outlets.
3. Connect the tested sample to the water inlets and outlets **before turning on the power** to flush out air bubbles in the equipment.
4. The instrument requires a preheating time of about 60 seconds after power-on.
5. Contact the manufacturer if the ion column is discolored, invalid or the measured values are inaccurate.
6. Keep the equipment clean. Turn off the power and cover the host with a dust cloth when not in use.

Special Usage Notes:

1. **Unauthorized disassembly or modification** of the equipment by the customer is strictly prohibited, otherwise all warranties shall be invalid.
2. The customer shall operate the equipment in strict accordance with the requirements in this manual. The manufacturer shall not be liable for any damage to the equipment caused by failure to follow the usage requirements or specified operations, and the user shall bear all responsibilities!

Content

1 Equipment Overview

1.1 Equipment Application

This equipment is designed and manufactured in accordance with the relevant provisions of the national standard GB/T 12145 technical requirements, meeting the needs of portable inspection and testing for power plant users and special equipment inspection institutions. It is an **initiative in China** compared with the current detection methods, saving user costs, reducing enterprise safety hazards, and contributing to carbon neutrality. It is the optimal choice for on-site simultaneous measurement of key parameters such as hydrogen conductivity, conductivity and pH value of water and steam quality in power plants.

The equipment can be equipped with a variety of electrodes according to user needs to meet the detection requirements of different water samples. It can measure not only the hydrogen conductivity and conductivity of high-purity water and steam, but also the conductivity of tap water, groundwater and various industrial wastewater at the same time, with an **extremely wide range coverage**.

1.2 Equipment Features

1. Equipped with styrene-divinylbenzene hydrogen-type gel strong acid cation exchange column and pH meter;

2. The conductance electrode is standard equipped with a flow cell that completely isolates air to avoid air interference on high-purity water and steam samples;
3. Complies with GB 12145 *Water and Steam Quality for Thermal Power Generating Units and Steam Power Equipment*, DLT 502.29 *Methods for Water and Steam Analysis in Thermal Power Plants - Part 29: Determination of Hydrogen Conductivity*, and DL/T 912 *Water and Steam Quality Standard for Supercritical Thermal Power Generating Units*;
4. The hydrogen conductivity test mode can measure liquid hydrogen conductivity, automatically adjust the instrument test accuracy according to water quality conditions, and automatically switch the ion exchange column as needed;
5. Supported by professional software with a **simple and clear interface** and easy operation; the detection process is flexible and configurable. Fully automatic operation with one-key detection for conductivity, hydrogen conductivity and pH value;
6. Can draw real-time change curves of hydrogen conductivity, conductivity and pH value based on real-time data;
7. Can store **more than 100,000 test data records** and provide a convenient test data query function;
8. Can share data with computers or update equipment software through the **Type-C interface**.

1.3 Technical Specifications

Item	**Index**	**HC-101**	**HC-102**	**HC-103**
Hydrogen Conductivity	Measuring Range	0~20μs/cm		
	Resolution	0.01/0.001μs/cm		
	Accuracy	±1.0%F.S		
Degassed Hydrogen Conductivity	Measuring Range	\	\	\
	Resolution	\	\	\
	Accuracy	\	\	\
	Degassing Efficiency	\	\	\
pH Value	Measuring Range	\	1~14	
	Resolution	\	0.01	
	Accuracy	\	±0.1	
Conductivity	Measuring Range	\	—	0~2000μs/cm
	Resolution	\	\	0.01/0.001μs/cm
	Accuracy	\	\	±1.5%F.S
	Ion Column Maintenance Cycle	≥6 months		
	pH Meter Calibration Cycle	\	3 months	
	Temperature Compensation	Automatic		

Basic Configuration				
	Working Temperature	0~50℃		
	Relative Humidity	<90%	<90%	<90%
	Calibration Points	6	9	12
	Recording Type	Manual; Automatic		
	Data Storage	10,000 groups	100,000 groups	
	Working Pressure	<0.1MPa		
	Sample Flow Rate	50~500ml/min		
	Equipment Volume	58cm×36cm×24cm		

2. Equipment Appearance

2.1 Equipment Appearance Diagram

Portable Host Case + Accessory Case (Figure 1)

2.2 Function of Each Component

(1) Portable Host Case

Used to measure the hydrogen conductivity, conductivity and pH value of high-purity water and steam water, and can also measure the conductivity of tap water, groundwater and various industrial wastewater at the same time with an extremely wide range coverage. **Open flame is strictly prohibited** to avoid accidents. The portable hydrogen conductivity meter **shall not be used** to measure harmful liquids such as toxic and strongly corrosive liquids, otherwise the user shall bear all consequences!

(2) Mini Accessory Case

Used to store various accessories including: host charger, spare ion column, fuse, clamp, water inlet and outlet connecting pipes, etc.

3. Equipment Installation

3.1 Equipment Working Environment

1. The working space of the equipment shall be free of strong electromagnetic radiation interference.
2. Operators can only perform test operations on the equipment **after reading the manual thoroughly** and mastering the basic operation essentials; tentative operations on the equipment without understanding are strictly prohibited.

3.2 Equipment Installation

(1) Unpacking

Open the outer package of the instrument carefully, check the equipment list, manual and accessories, and verify whether the received goods are consistent with the contents listed in the packing list. Contact the manufacturer in a timely manner if there is any abnormality.

Keep the packing case and accessory case properly for transportation during factory return maintenance.

(2) Water Circuit Connection

Connect the water inlet and outlet pipelines **before turning on the equipment power**. Insert the Φ8mm transparent polyurethane pipe provided in the accessory case into the water inlets and outlets, then connect the sample sampling port of the tested water to the transparent polyurethane pipe with a yellow latex pipe.

Start flushing the host to discharge air bubbles inside.

Power Key and Water Inlet/Outlet Schematic (Figure 2)

(3) Turn on the Host

Press the power button after discharging air bubbles from the host to turn on the operating mobile phone.

Wait for 60 seconds until the host beeps twice, then open the **"Hydrogen Conductivity Meter - APP"**; the software will connect to the host automatically.

4. Software Interface and Function Introduction

4.1 Operation Interface and Functions

Main interface of the operation software (Figure 3)

1. **Setting Function**: Manages the Bluetooth connection between the equipment and the control mobile phone.
2. **Device Status**: Displays whether the operating mobile phone is connected to the host and the host battery level.
3. **Hydrogen Conductivity**: Used to test the hydrogen conductivity, conductivity and pH value of water samples. Click to start the test and click **"End Test"** to stop. Real-time curves of hydrogen conductivity and pH value, as well as real-time values of conductivity, hydrogen conductivity and pH value are displayed (Figure 4).

   Clicking **"End Test"** pops up the PDF test report setting interface, which displays the conductivity, hydrogen conductivity, pH value, test time. You can add the unit name, sampling location, tester and remarks. Click **"Save"**

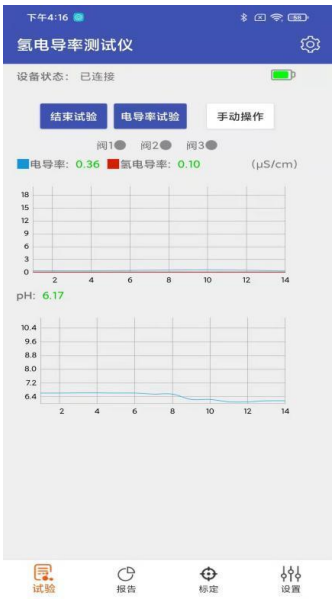
to store the test report on the mobile phone (Figure 5).

4. **Conductivity Test**: Used to test the conductivity and pH value of water samples. Click to start the test and click **"End "** to stop. Real-time conductivity curve, pH value curve and their real-time values are displayed (Figure 6).

   Clicking **"End"** pops up the PDF test report setting interface, which displays the conductivity, pH value and test time. You can add the unit name, sampling location, tester and remarks. Click **"Save"** to store the test report on the mobile phone (Figure 7).

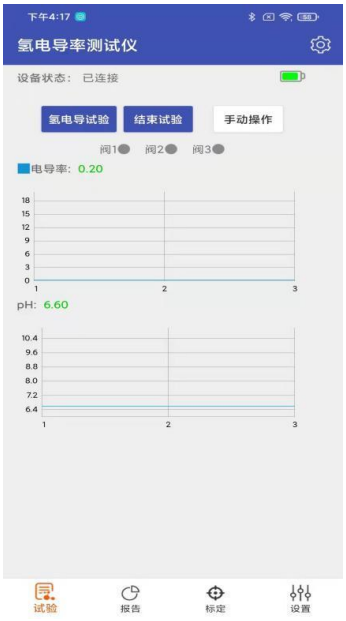
5. **Manual Operation**: Allows manual operation of 3 valves in the host and real-time reading of values from 5 sensors on this page (Figure 8).

(Figure 3)



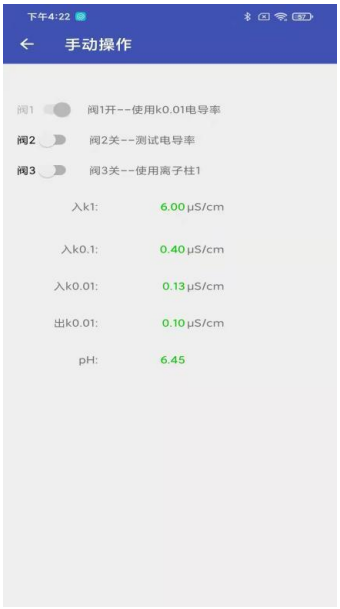
(Figure 4)

(Figure 5)



(Figure 6)

(Figure 7)



(Figure 8)

4.2 Report Interface and Functions

Search Function: Test reports can be searched by **unit name, sampling location and tester** respectively on this page, and experimental reports in PDF format can be exported (Figure 9).

(Figure 9)

4.3 Calibration Interface and Functions

1. pH Calibration

The real-time pH value is displayed on this page, and calibration can be performed with 4.00, 6.86 and 9.18 calibration standard buffer solutions. The specific operation steps are as follows:

(1). Remove the pH meter and flow cell from the fixator;

Separate the pH meter from the flow cell with the special wrench in the accessory case;

(2). Rinse the pH meter electrode with carbon dioxide-free distilled water first, dry it with filter paper, rinse it with 6.86 standard buffer solution, then immerse it in 6.86 standard buffer solution, let it stand vertically until the value is stable, and click **6.86 Calibration** (the value varies with temperature) (Figure 10);

(3). Take out the electrode, rinse it with carbon dioxide-free distilled water, dry it with filter paper, rinse it with 9.18 standard buffer solution, then immerse it in 9.18 standard buffer solution, let it stand vertically until the value is stable, and click **9.18 Calibration** (the value varies with temperature);

(4). Take out the electrode, rinse it with carbon dioxide-free distilled water, dry it with filter paper, and immerse it in 6.86 standard buffer solution again. A stable value indicates accurate calibration.

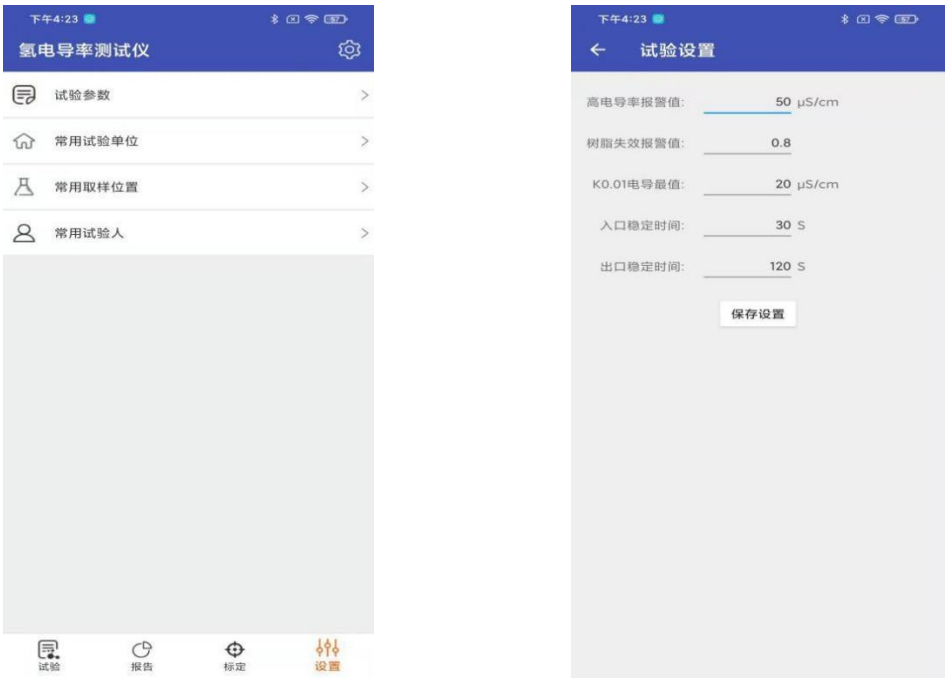
2. Conductivity Calibration

Offset calibration, slope calibration and offset reset (restore) can be performed for 4 conductivity sensors respectively on this page (Figure 11).

(Figure 11)

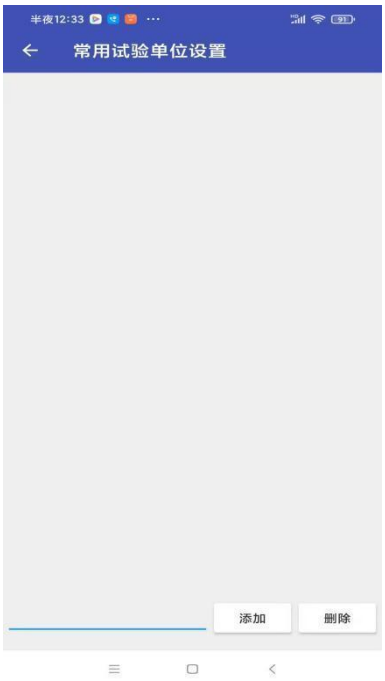
4.4 Setting Interface and Functions

1. **Test Parameters**: The high conductivity alarm value, resin failure alarm value, K0.01 conductivity limit value, inlet stabilization time and outlet stabilization time can be set on this page (Figure 12).



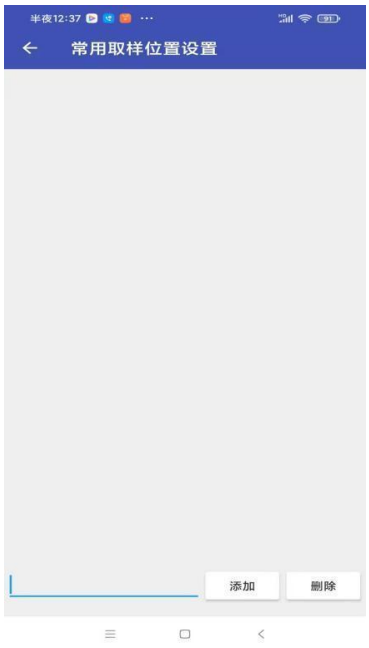
(Figure 12)

2. **Common Test Units**: Common test units can be added and deleted on this page (Figure 13), and can be quickly added by clicking on the test report save page.



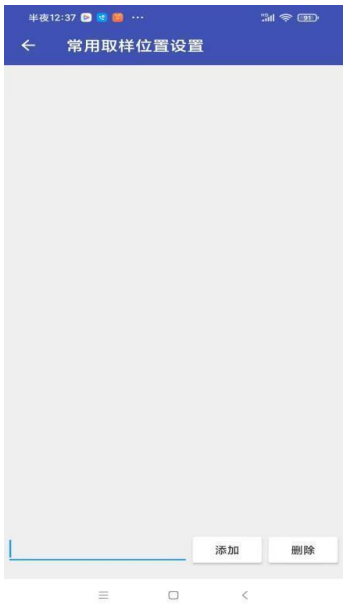
(Figure 13)

3. **Common Sampling Locations**: Common sampling locations can be added and deleted on this page (Figure 14), and can be quickly added by clicking on the test report save page.



(Figure 14)

4. **Common Testers**: Common testers can be added and deleted on this page (Figure 15), and can be quickly added by clicking on the test report save page.



(Figure 15)

5 Shutdown

1. After the test is completed, the final test results will be displayed in the corresponding test report (see 4.1 for details).
2. Turn off the power button, pull out the pipelines by pressing the inlet and outlet connections, block the inlets and outlets with pipe plugs, and sort the polyurethane pipes and latex pipes into the accessory case.
3. Wipe the equipment, store it and cover it with a dust cloth.

6 Charging

1. The host battery level is displayed on the operating mobile phone. Please charge the host in a timely manner with the **dedicated host charger** when the battery level bar turns red.
2. The **first charge** requires 4-6 hours.

7 Query

Historical data can be viewed through the software. For the specific operation instructions of software historical data viewing, see the software operation instructions section.

8 Troubleshooting

Due to the patented technology of the equipment, **contact the manufacturer or the after-sales personnel** directly if a fault occurs.

After-sales Service

1. One-year warranty for the instrument, free software upgrade service and **lifetime free technical support**;
2. Instrument "trade-in" policy, and a spare instrument is provided for use when the instrument is faulty;
3. A testing center is set up to provide customers with sample testing and sample data comparison services.

About Us

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 **industry-leading level**.

Our products cover a variety of water quality analysis equipment, including hydrogen conductivity meters, dissolved oxygen meters, acidimeters, conductivity meters, multi-parameter water quality analyzers, 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, provide customers with suitable water quality analysis equipment and solutions, and make greater contributions to the development of the water quality analysis industry.

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