Lithium Battery Charge And Discharge Test System User Manual

HRCDS Series VER: 2022

HRCDS series charge and discharge test system

Installation and operation

Important safety instructions

Please save these instructions

This manual contains important instructions to be followed when installing and maintaining the equipment. Read all instructions before starting operating equipment and keep this manual for future inquiries.

Catalogue

Chapter 1 Preface

Read the user manual and software instructions carefully before you use the equipment. If the equipment cannot work properly, please check whether the cable connection, equipment online and basic software setting are correct according to this instruction. If the fault can not be solved, please do not open the equipment without authorization. You can scan the QR code on the equipment and contact the after-sales department of ACEY in time. The after-sales personnel will provide services for you.

1.1 Use of the manual

This manual describes how to install and use the HRCDS device. Be sure to read and understand the process described in the manual to allow installation and operation smoothly.

1.2 Conventions in this manual

icon	Explain
	Information used to draw attention to important features or instructions.

1.3 Symbol description

The following are symbolic legends of warning critical information appearing on the device:

Electric shock hazard-It indicates the danger of electric shock and should be observed.

Note: Refer to the operating Guide-for details such as important operations, maintenance instructions, etc.

1.4 Get help

For help in one of:

Get the area service points and their phone numbers

Any questions about the information in the manual

Issues not covered in the manual

Chapter 2 Safety Warning

This manual contains important instructions to be followed during the installation and maintenance of the equipment, so please read them through and keep them properly for future reference.

Danger

The device carries a lethal voltage, and all repairs and services can only be performed by authorized maintenance personnel, with no user-accessible parts within the device.

Attention

The device output is connected to the external battery, which may carry a dangerous voltage even when the device is disconnected from the AC power supply.

To reduce the risk of misfire or electric shock, the equipment can be installed in an indoor environment with controllable temperature and humidity, and ensure that the room is free of conductive impurities, and the ambient temperature shall not exceed 45℃ (113 ℉). Do not operate near water or with high humidity (95% of maximum, no moisture condensation). This system is not suitable for the outdoors.

Ensure that all power supply (including the output end) is disconnected before installation or repair.

To add the hardware module to the chassis, be sure to connect the device's communication line before connecting the power supply. If you want to remove the hardware module from the chassis, always disconnect the power cord of the device first, and then disconnect the communication cable.

If the power supply is damaged, do not try to repair it yourself. To avoid danger, it must be done by the manufacturer or its maintenance department or similar dedicated personnel.

The battery may cause electric shock or cause burns due to high short circuit current, the following precautions should be taken: 1) remove the watch, ring or other metal objects; 2) use tools with insulated handle; 3) do not place tools or metal parts on the battery; 4) wear a rubber coat and rubber boots.

Attention

People and the battery test environment should be isolated, to avoid abnormal battery, explosion, combustion caused damage to the human body.

The equipment installation space and the battery test space should be environmentally isolated to ensure a good test environment.

Battery test space environment must meet the fire fighting requirements, and should be equipped with fire fighting equipment, such as smoke alarms, electrical fire extinguishers, sandboxes, asbestos high-temperature gloves, asbestos quilt, flat light protection glasses, etc

Battery installation or repair shall be performed by qualified maintenance personnel with extensive knowledge of batteries and necessary precautions. Any unauthorized person should be kept away from the battery. All warnings, notes and instructions should be carefully considered before installing or replacing the battery.

When installing / unloading batteries, wear protective gloves and use special insulation tools to avoid short circuit in the battery and cause damage to human body.

Develop good security measures, according to the laboratory duty list, to ensure that the battery test is on duty, to prevent accidents.

Special computer for battery test, prohibit other uses, only install the software required for the test, to ensure the working stability of the computer and the stability of the battery test work.

Keep the equipment door closed to protect the operator from dangerous voltages inside the equipment.

Do not operate the equipment near a gas or electric heat source.

The operating environment shall be maintained within the parameters specified in this manual.

The outside environment shall be kept neat, clean and not excessively wet.

Observe all "danger", "attention" and "instructions" warnings attached inside and outside the equipment.

Chapter 3. Installation Plan and Unpacking

Install the equipment in the following basic order:

1. Develop an installation plan for the equipment.

2. Select the installation location for the equipment.

3. Check and open the equipment cabinet.

4. Remove and install the cabinet, and lay the circuits for the system.

5. Install important components, accessories, or available options.

6. Fill in the installation list.

7. Authorized service personnel shall conduct preliminary operation inspection and boot up.

3.1 Notes for environment and installation

The installation of the equipment must follow the following instructions:

This device must be installed on a horizontal floor suitable for computers and electronic devices.

This equipment must be installed in a room with suitable temperature and humidity, kept away from contaminants.

The cabinet can be installed in neat arrangement or individual separately.

If not followed, the warranty will expire.

The operating environment of the equipment must meet the weight requirements and dimensions requirements specified in Table 3-1.

Table 3-1 Dimensions and weight of commonly used cabinets

measurement	weight	type
600*800*1980mm（W×D×H）	≤400KG	High cabinet

The module uses forced cooling measures to cool the internal components. The air inlet is in front of the cabinet and the outlet with fan suction at the top. To ensure good air circulation and workspaces, gaps must be gaps in the front and back of each module. The gaps left in the cabinet are listed in Table 3-2.

Table 3-2 Clearance of the equipment

In front of the cabinet	At least a 1,000 mm workspace
Behind the cabinet	At least 1000 mm working space at least 500 mm ventilation space and maintenance space

Basic environment requirements for system operation:

Ambient temperature range: -20-45℃

Recommended operating temperature range: 20-25℃ (68-77 ℉)

Maximum relative humidity: 95%, not condensation

Chapter 4 Equipment Introduction

This series of equipment application scenarios: applications including lithium ion battery, lead acid battery, cadmium nickel or nickel metal hydride battery battery composition capacity, life aging test (Circle Life Testing) and quality control.

Support: battery cycle charge and discharge test, battery capacity test, battery charge and discharge characteristics test, battery charge retention ability test, aging test, battery internal resistance test, etc.

4.2 Basic System Configuration

The following basic configurations are available:

Cabinet: high cabinet

Battery rack: multiple sizes of model battery rack for selection

Grip: square aluminum shell fixture, wire nose, etc

Test line: the length is customized according to the site layout

Switch: 16 ports

Communication line: 8-core super-6 shielding line

MTV'S/MTS: Independent auxiliary single cell voltage / temperature acquisition module

4.3 Product View

4.4.1 Module appearance

4.4.2 Cabinet appearance

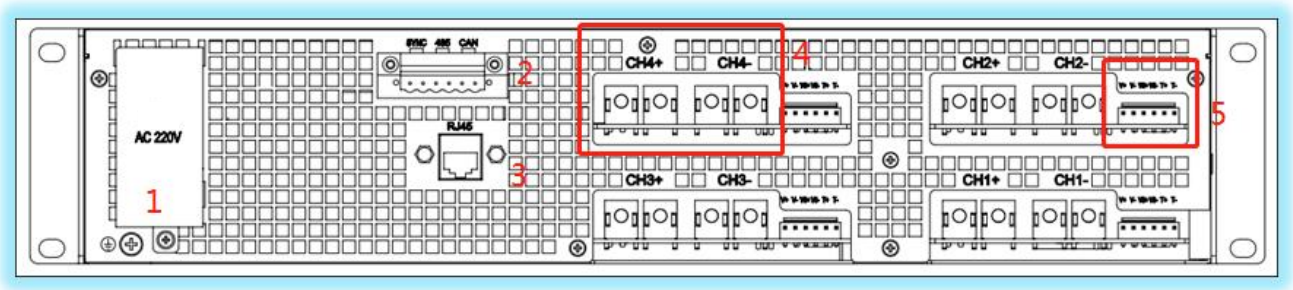
4.5 Equipment introduction

4.5.1 Positive introduction of the module

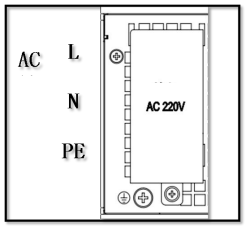
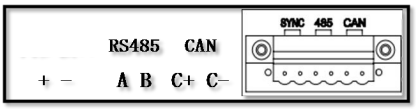
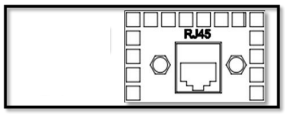
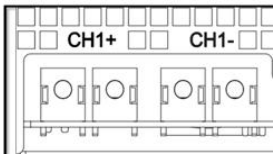
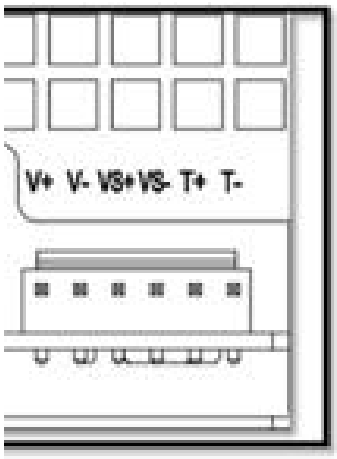
No	Name	Explain
1	Pilot lamp	"RUN": Run the indicator light, and flash the green light when the device is running normally; "FAULT": fault indicator, red light except for normal operation of the device;
2	OLED display screen	Under the normal state, display the DPU software version number and IP address; Press the confirmation button in the lower right corner to check 1, channel operation information 2, channel parallel information 3, channel program burning; Select "Channel Operation Information", press the lower right corner confirmation key, to display the equipment box number, the DSP program version, the current first voltage, the second voltage, the current, the temperature, and the error code; Up and down keys press simultaneously to change the IP address
3	Operational key	The key operation can switch between the display content

4.5.2 Introduction to the back side of the module

The device connection port is located on the back of the device, including the AC power connection terminals, battery power connection terminals, and battery voltage and temperature sampling terminals.



The port details are as follows:

No	Name	Picture	Explain
1	AC input port		Single-module power input port, 220V (380V cabinet, three-phase five-wire input)
2	signal interface		Synchronization interface: "SYNC": two parallel "RS485", "CAN": reserved interface, no this function
3	Module communication port		Network port where chassis equipment communicates with upper computer
4	Power output interface		Connect power interface line and equipment "CH1 +": Current line (red) "CH1-": Current line anode (black)
5	Voltage and temperature sampling interface		The voltage and temperature sampling channel of the battery "V +": Battery voltage positive electrode "V-": Battery voltage negative electrode "VS +": the reference voltage positive electrode "VS-": Reference voltage negative electrode "T +": Temperature probe positive pole "T-": negative temperature probe The reference voltage is mainly to detect the clamture impedance

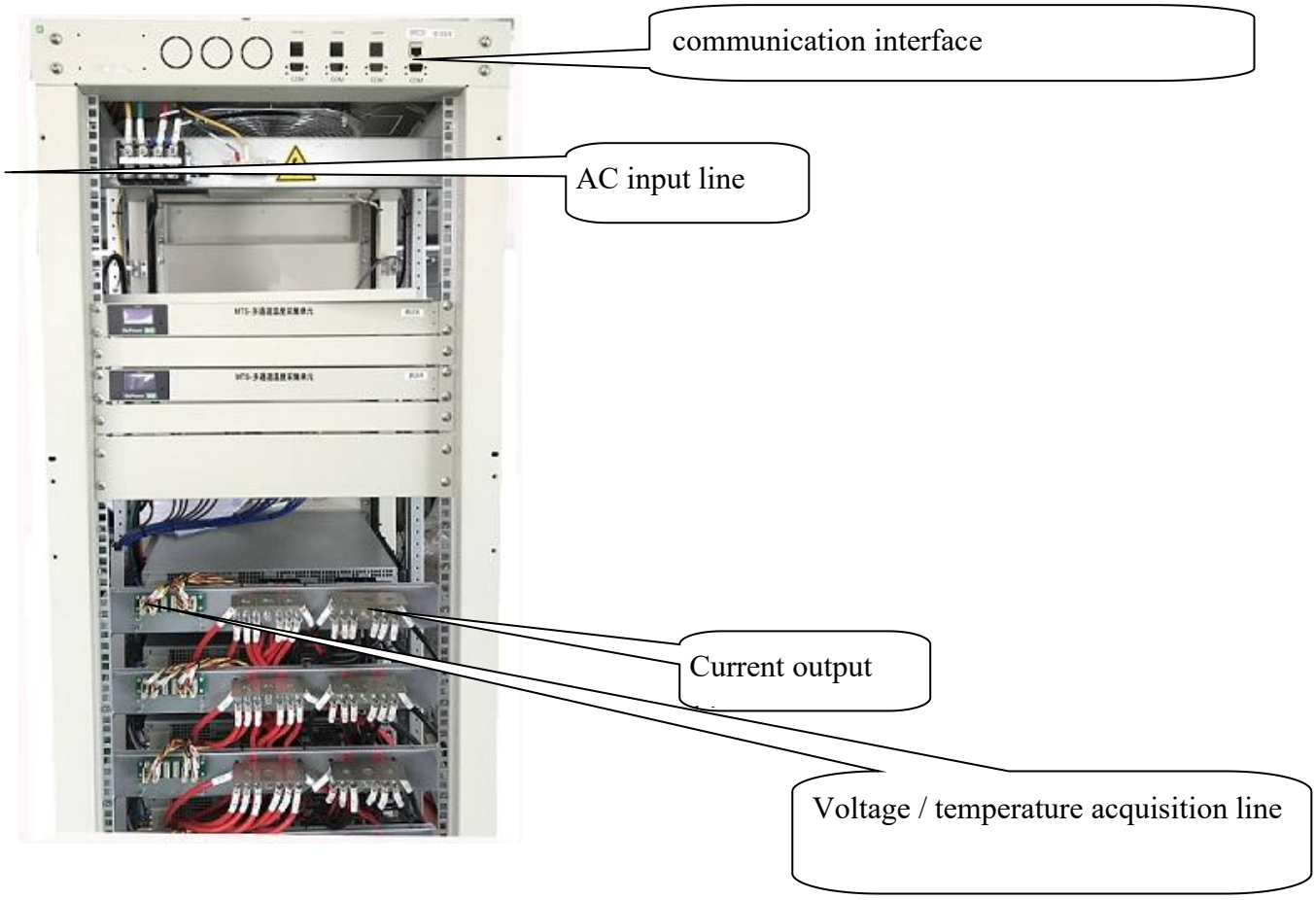
Note: The number of ports of different models of HRCDS devices may be different, with the ports of the actual device model prevail.

4.5.3 Front introduction of the cabinet

Take the high-level cabinet as an example:

No	Name	Explain
1	Nameplate equipment	Identify the equipment model and other information
2	Module switch	Control the start and stop of a single chassis
3	Emergency stop switch	Take the system power in an emergency
4	The cabinet is open	Corresponding to the control inside each chassis power
5	Trundle	Easy for cabinet movement, with a foot brake

4.5.4 Introduction of the cabinet back



Chapter 5 Related ire Connections

5.1 AC power supply input line

AC input of equipment cabinet is three-phase five-wire system (380V 50HZ)

Input power of equipment = maximum voltage of main channel * maximum current of main channel * number of channels / charging efficiency. For example: if the user buys HRCDS-5V300A-16CH / cabinet, the input power required of equipment is: 5V * 120A * 40CH / 70%=34.28KW

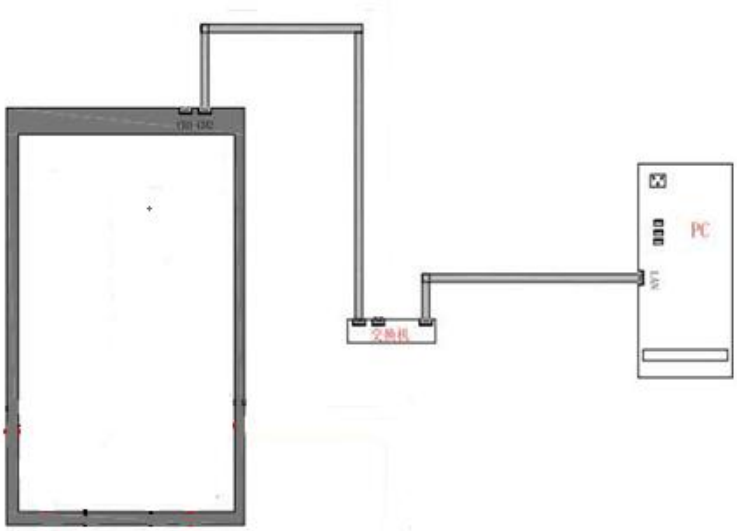
View the identification on the device nameplate.

5.2 Output test connection method

The battery is installed by the customer, and ACEY provides the battery type.

5.3 Installation of the communication line

HRCDS series equipment is network communication, communication accessories need network cable, switch. The communication lines of the cabinet chassis are all collected in the switch, and then connected through the switch and computer before the equipment can be controlled online. In order to ensure that the equipment communication sampling is not disturbed, the communication line should be separated from the equipment AC power input line.



Chapter 6: Maintenance

The maintenance of the equipment is directly related to the use safety, service life and energy consumption of the equipment. Compliance with the maintenance system is the premise to ensure the long-term normal operation of the equipment. Please be sure to abide by the following maintenance system, otherwise the warranty clause will be invalid.

Attention

The disassembly and maintenance of the equipment must be completed by the professional personnel.

Before repairing the equipment, cut off the main power supply: power distribution cabinet, DC voltage power line, and hang safety warning signs and lock the corresponding power distribution cabinet door, to prevent the sudden rotation of the equipment in the maintenance process;

After the completion of all maintenance, the maintenance person in charge leads the maintenance personnel to comprehensively check whether the maintenance situation meets the requirements, count the tools, materials, confirm everything, remove the safety warning signs, by the maintenance person in charge of unified command, power transmission operation.

This product is a precision testing equipment. It is recommended that customers do precision calibration every a year to ensure that the accuracy of the equipment meets the requirements.

Maintenance content and maintenance cycle

Check the content every day	Whether the equipment is running normally, have no different sound, and have no peculiar smell
	Whether the equipment shell temperature (0-50℃), ambient temperature (0-45℃), humidity (10%~90%, RH non-condensation) are normal
	Does the fan operate normally
	Whether the equipment indicator lamp works normally
	The test line and the equipment output terminal and the terminal connecting the battery have loose or high temperature burning, aging state
Check the content every month	Check the surface oxidation of all clamp joints and equipment output terminals, remove oxide layer and replace if necessary
	Check whether the chassis power cord is loose
	Check whether the control circuit terminals and each connector (fixture) are loose
	Check whether the outside of the cabinet and chassis is damaged and damp
	When the instrument is not in use for a long time (more than one month), it is necessary to regularly check whether the instrument can be used normally
Maintenance every year	Voltage and current accuracy detection, regular recalibration
	Check the wiring holes and clean the dust with cotton swabs and high alcohol as necessary. The whole maintenance process should be turned off
	Check the aging condition of all test lines and replace them if necessary
	Check the oxidation surface of all clamp joints and equipment output terminals to remove the oxide layer
	Check the pressure drop of the fixture, re-polish and spray it or replace it directly for the excessive impedance caused by the corrosion and oxidation of the electrolyte

Equipment dust cleaning cycle: half a year

Attention should be paid to the dust cleaning cycle needs to change according to the actual situation. When the equipment use environment is poor, and the fan and fan cover have a lot of dust, which affects the air inlet and heat dissipation, it should be cleaned in time.

Dust removal steps:

(1) Disassemble the equipment and open the chassis cover plate (pay attention to the equipment wiring when unpacking the lower equipment)

(2) Cleaning method: (choose either one)

Move the equipment outside and use an air gun to remove dust from every corner of the equipment. Can use hair brush, with use.

This method is recommended, but during the cleaning process, note whether the internal wiring of the equipment is loose.

Use a powerful vacuum cleaner and brush: When using the brush cleaning equipment, the vacuum cleaner sucks the dust away.

Chapter 7. Basic fault judgment and handling methods

1. No communication fails

(1) Whether the communication line is connected to the equipment and the computer is smooth: check whether the communication line is aging or damaged;

(2) Whether the software setting is correct;

(3) Whether the performance of the switch is stable and damaged;

(4) Check whether the local ip of the upper computer computer is consistent with the network segment of the device;

(5) Can ping the device ip, check whether there is a connected device