XES Stackable HV Battery

User manual

XES61450-5.0S series stacked high voltage energy storage battery system

Foreword

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Limitation of Liability

The equipment manufacturer will not bear any direct or indirect responsibility for any damage to the energy storage battery system or property loss caused by the following circumstances.

• Without the authorization of the equipment manufacturer, the energy storage battery system has been modified, modified or replaced.

• The serial number of the energy storage battery system should be changed or cleared by non-equipment manufacturer technicians.

• The design and installation of the system composed of other equipment does not meet the standards, safety regulations and other relevant requirements.

• Equipment damage caused by failure to comply with the relevant requirements of the energy storage battery system user manual.

• Equipment damage caused by improper use or misuse of the energy storage battery system.

• Equipment damage caused by insufficient ventilation of the energy storage battery system.

• Maintenance procedures regarding energy storage battery systems did not follow acceptable standards.

• Equipment damage caused by force majeure, such as: earthquake, storm, lightning, over voltage, fire, etc.

• Equipment damage caused by any external factors.

Version record

The most recent version in the log contains updates from all previous versions of the document. V1.0 2023-02-02

Table of contents

Technical parameters

General Specifications					
Model	XES20450-W	XES30750-W	XES40950-W	XES51250-W	XES61450-W
Layers	2 Layer	3 Layers	4 Layers	5 Layers	6 Layers
Capacity	10.24 KWh	15.36KWh	20.48KWh	25.6KWh	30.72 KWh
Dimensions (L*W*H)	760*430*570mm	760*430*720mm	760*430*870mm	760*430*1020mm	760*430*1170 mm
Weight	133KG	187 KG	241KG	295 KG	349 KG
Storage temperature	-20°C ~ 45°C				
Relative humidity	5% ~ 95%				
Operating temperature	-10°C ~ 55°C				
Degree of protection	IP21 (indoor)				
Topology	Natural convection and fan cooling				
Show	LCD				
Communication Interface	RS485/WIFI				
Installation method	Floor-standing/Mobile				
Protection Function	Over voltage, under voltage, high temperature, low temperature, over current, short circuit protection				
Battery pack Specifications					
Rated battery voltage	204.8 V	307.2 V	409.6 V	512V	614.4 V
Battery voltage range	160-230.4 V	240-345.6 V	320-460.8V	400-576V	480-700.8V
Max. Discharge current	25A				
Maximum charging current	25A				
Internal impedance	≤ 60 mΩ (each module)				
Battery Type	Lithium Iron Phosphate (LiFePO4)				
Life of cycle	6000 times (25°C , 0.3C , 80%DOD , >60%C25°C)				
Storage temperature	-20℃-45℃				
Storage humidity	5%~ 95%				
Range of working	Maximum 4 batteries in parallel (5.12 KWH per module)				
Monitoring parameters	System voltage, current, battery voltage				

Technical parameters	Rated specifications
Module supply voltage	12-30V
Maximum power supply	< 3W
Overall voltage sampling range	50-1650V
Voltage detection accuracy	+0.3FSR
Current detection range	With in 300A (default shunt) / 300A or more (Hall)
Current detection accuracy	±0.5%FSR
Temperature sensing range	-40~125℃
Temperature detection accuracy	±2 ℃
Insulation resistance detection accuracy	10% above 100K, 15% below 100K, and below the minimum 10K2MΩ are faults
Input insulation resistance	0-10MΩ
Groups soc estimation accuracy	< 5% （Supports shunt and Hall acquisition options）
Group SOH estimation accuracy	< 10%
Data Communication interface	RS485*2 , CAN*3
Communication baud rate	Host computer (9500-115200bps] Default baud rate: 57600 Display (9500-115200bps] Default baud rate: 9600

Maintenance

Maintenance item	Maintenance cycle
Check whether the battery system is installed loosely, if so, fasten the corresponding position.	Every 6 months
Check whether the shell is damaged, if so, please touch up the paint or contact the after-sales specialist.	Every 6 months
Check whether the exposed wires are worn. If so, please replace the corresponding cables or contact the after-sales specialist.	Every 6 months
Check whether there is debris accumulation around the battery, if there is, please clean it, so as not to affect the heat dissipation of the battery.	Every 6 months
Check for water or pests to avoid long-term intrusion into the battery.	Every 6 months

• If you find a problem that may affect the battery module or inverter module, please contact the after-sales specialist, and it is forbidden to disassemble it without permission.

• If you find that the copper wire inside the conductive wire is exposed, it is forbidden to touch it. The high voltage is dangerous, please contact the after-sales specialist, and it is forbidden to disassemble it without permission.

• In case of other emergencies, please contact the after-sales specialist as soon as possible, and operate under the guidance of the after-sales specialist, or wait for the after-sales professional on-site operation.

01 Safety Instructions

• There is an unsafe voltage inside the energy storage battery system. Before operating the equipment in the system, please turn off the power to avoid danger, and strictly abide by all safety precautions in this manual and safety signs on the equipment.

• Only professionals are allowed to operate the energy storage battery system. Professionals need to be familiar with local laws and regulations and electrical systems, have undergone professional training, and be familiar with the relevant knowledge of this product.

• Do not use if the battery module or inverter module is visibly defective, damaged or missing.

• Do not disassemble or modify any part of the battery module or inverter module without the official authorization of the equipment manufacturer.

• Damaged battery modules may cause electrolyte leakage. If the electrolyte leaks, do not touch the leaked electrolyte and volatile gas, and contact the after-sales specialist for help immediately.

In case of accidental exposure to spilled material, do the following:

•Inhalation of spilled material: Evacuate from contaminated area and seek medical help immediately.

• Eye contact: Flush with water for at least 15 minutes and seek medical help immediately.

• Skin contact: Wash exposed area thoroughly with soap and water and seek medical attention immediately.

• Ingestion: Induce vomiting and seek immediate medical attention.

• Do not move the energy storage battery system while connecting the external battery expansion module. If you need to replace the battery module or add a battery module, please contact the after-sales specialist.

Transportation:

• Ensure that the energy storage battery system is not damaged during transportation and storage.

• Be careful and consider its weight when lifting the battery module or inverter module.

• Gloves are required when handling.

• Do not hit, pull, drag or step on the device, and do not put extraneous objects into any part of the battery module.

• Transportation must be carried out by trained professionals, and the operations in the process must be documented.

• Make sure that the device is placed firmly and cannot be tilted. The device may be damaged and personal injury may be caused if the device falls over.

• Make sure there is a CO2, Novac1230 or FM-200 fire extinguisher near the equipment.

• When extinguishing the fire, please use the fire extinguisher of the recommended material, and cannot use water or ABC dry powder fire extinguisher to extinguish the fire; firefighters must wear protective clothing and self-contained breathing apparatus.

• When the ambient temperature exceeds 150°C, the battery may explode.

• Use proper tools and protection when installing and maintaining heavy equipment. Improper handling can result in personal injury.

• When working with high voltage, please use special insulated tools.

• Using the cable in a high temperature environment may cause aging and damage to the insulation layer. The distance between the cable and the outer periphery of the heating device or heat source area should be at least 30mm.

• Cables of the same type should be bundled together, and cables of different types should be separated by at least 30mm. Intertwining or crossing is prohibited.

02 Product introduction

2.1 Product description

• This document mainly introduces the product introduction, application scenarios, installation, commissioning, maintenance and technical parameters of the XES51420-5.0S series stacked all -in-one energy storage battery system (hereinafter referred to as: battery system).

• The energy storage battery system is mainly composed of XES-5.4S battery module (hereinafter referred to as: battery module) and XES-5.0S inverter module (hereinafter referred to as: inverter module).

The configuration of each battery system model is as follows:

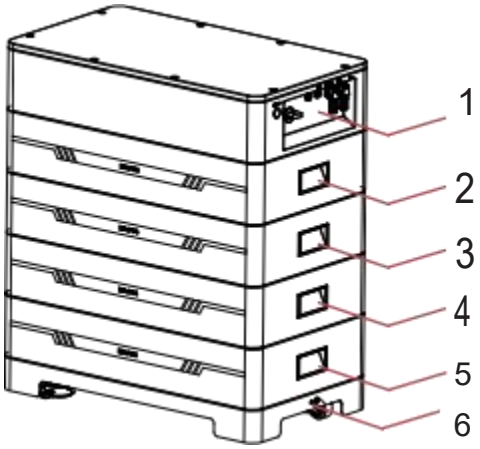
Battery system	Number of battery module	Number of HV box module	Number of base
XES10250-5.0S	1	1	1
XES20450-5.0S	2	1	1
XES30750-5.0S	3	1	1
XES40950-5.0S	4	1	1

2.2 Description of symbols

Sign	Description	Sign	Description
	Potential risks exist when the device is running. Take protective measures when operating the device		Devices should be kept away from open flames or fire sources.
	High voltage danger,high voltage exists when the inverter runs. Ensure that the inverter is powered off before operating it		Keep equipment away from children
	Use the device properly.In extreme cases, the equipment is at possible risk of explosion		Prohibit water extinguishing
	The equipment contains corrosive electrolyte. Avoid contact with leaking electrolyte or volatile gases		The equipment cannot be treated as domestic garbage. Dispose the equipment according to local laws and regulations, or send it back to the equipment manufacturer
	Please read the product manual carefully before operating the equipment.		Equipment should be placed in the correct place and recycled in accordance with local environment regulations.
	Pay attention to personal protection during installation, operation and maintenance.		CE certification mark
	RCM certification mark		The protective grounding mark is used only for the PGND cable connection position.

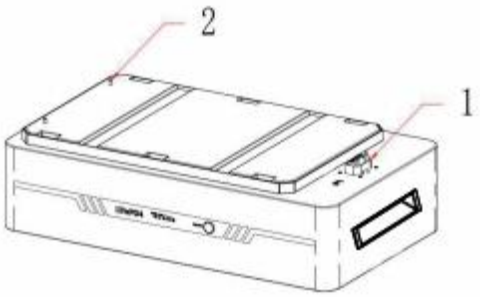
03 Parts introduction

3.1 Introduction of battery system



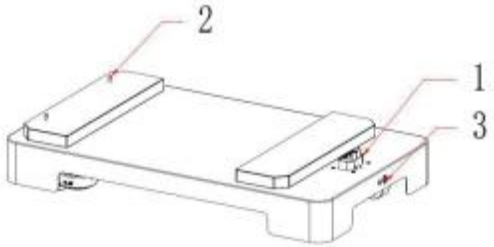
Serial number	Part
1	HV box module
2, 3, 4, 5	Battery module
6	Base

3.2 Introduction of battery module



Notice	
• Make sure the control box is installed above the battery, the battery cannot be installed above the control box. • This article takes the configuration of 4 batteries as an example to introduce the product installation and wiring steps. • The bottom battery should be on the bottom especially, please don't change the sequence.	
Serial number	Part
1	Blind mate connector
2	Positioning pin

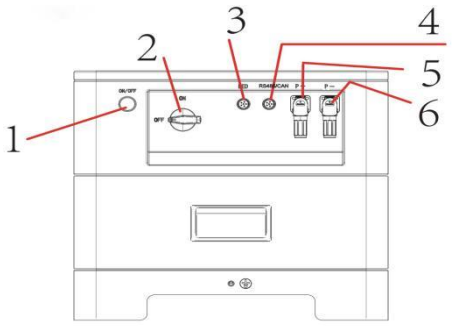
3.3 Base Introduction



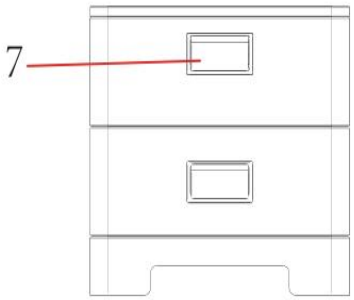
Serial number	Part
1	Blind mate connector
2	Positioning pin
3	Protective earth point

3.4 Introduction of Inverter Module Components

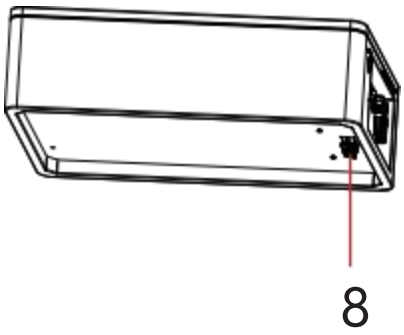
Left view



Right view

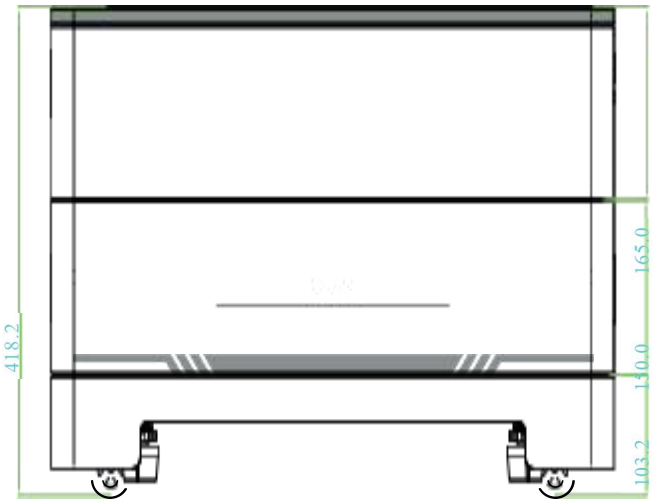


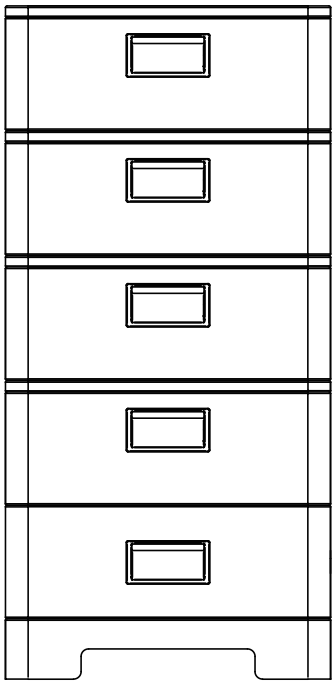
Front view



Serial number	Part
1	Switch1
2	Switch2
3	LCD Port(Optional)
4	RS485/CAN Communication Port
5	P+
6	P-
7	Handrail
8	Blind connector

3.5 Size introduction





04 Storage and packaging

4.1 Storage environment

If the device is not installed and used immediately, please confirm that the storage environment meets the following conditions:

• The equipment should be packed in a packing box, and the packing box should be sealed after placing the desiccant in the packing box.

• If the device is not installed within 3 days after unpacking , it is recommended to store the device in the packing box.

• Storage SOC : 25% ~ 50% SOC , a charge-discharge cycle is required every 3 months of storage.

• Storage temperature range: -20 ℃ ~ 45 ℃ for no more than 1 month; 0 ~ 35 ℃ for no more than 1 year.

• Humidity range: 0 ~ 95% non-condensing. It cannot be installed when there is moisture condensation on the battery interface.

• The device should be stored in a cool place out of direct sunlight.

• Equipment storage should be away from flammable, explosive, corrosive and other items.

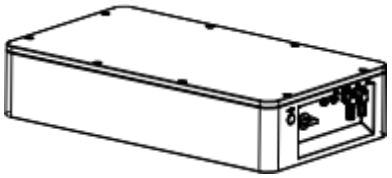
• The device must not be exposed to rain.

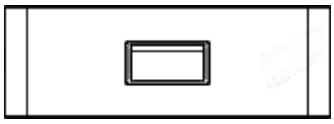
4.2 Packaging information

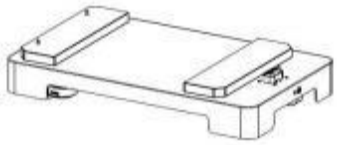
• The battery system consists of three parts: battery module, inverter module and base.

• Before unpacking the battery system, check whether the outer package is damaged and check the model of the battery system. If there is any abnormality,Do not open the packing box, and contact the after-sales specialist as soon as possible.

• After unpacking the battery system, please check whether the product delivery is complete according to the packaging information. If there is any abnormality, please contact the sales post commissioner.

HV box module

HV box module × 1

Battery module

Battery module × 1

base

Base × 1

05 System installation

5.1 Installation environment

• The battery system must be installed on a ground with sufficient load-bearing capacity and flatness; if the ground does not have sufficient support and flatness, other

Measures to ensure (such as making foundations, adding load-bearing boards, etc.).

• The battery system works best in a temperature environment of 20-40 ℃ .

• Avoid installing in direct heat, rain environment.

• Avoid installing near high-temperature heat sources or low-temperature cold sources.

• Avoid installation in areas with extreme changes in ambient temperature.

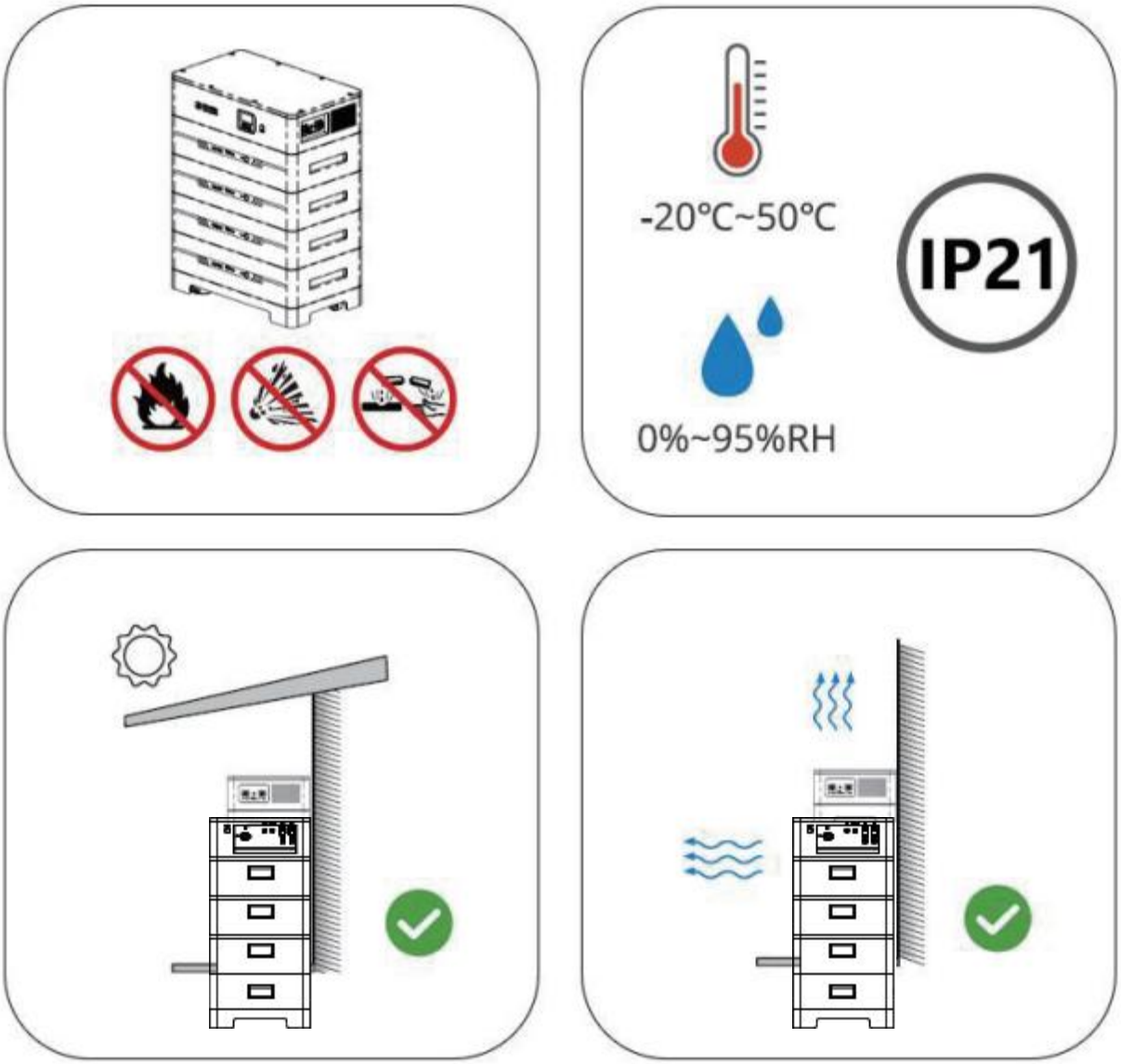
• Avoid installing in strong interference environment.

• Avoid installing in places where children can touch.

• Avoid installing in areas prone to water accumulation.

• Do not place flammable, explosive, or corrosive items around the device.

5.2 Location requirements



5.3 Installing the battery system

• Before installation, check that the ground is flat and not inclined.

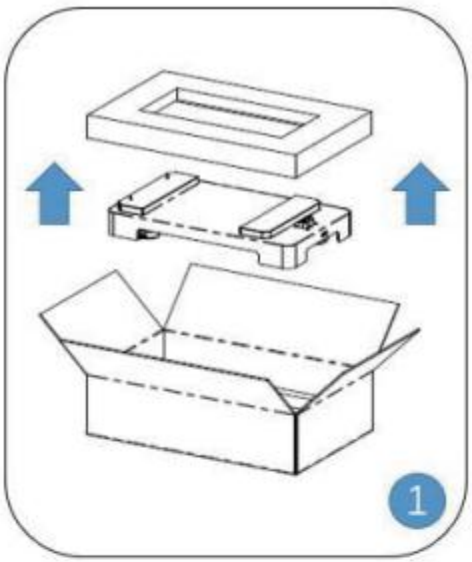
• Make sure that the base rollers are vertical to the ground and lock the rollers so that they cannot slide.

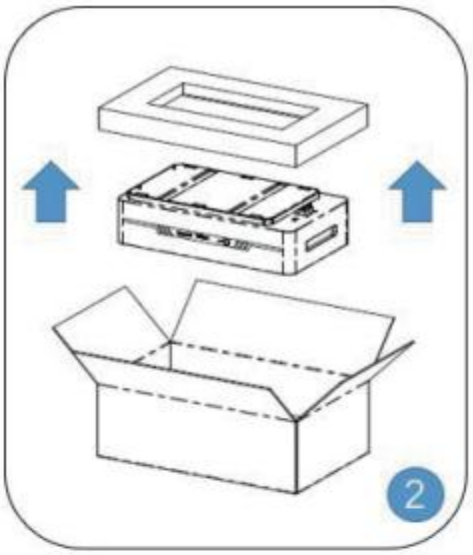
• Make sure the base is against a wall and positioned with the blind-mate connector on the base on the right.

• Make sure that all battery modules are placed against the wall and that the blind-mating connectors on the batteries correspond to the blind-mating connectors on the base when placed.

• When placing the upper battery module, make sure that the upper and lower positioning pins are aligned with the blind mating connectors.

• Be careful not to drop the battery module.


1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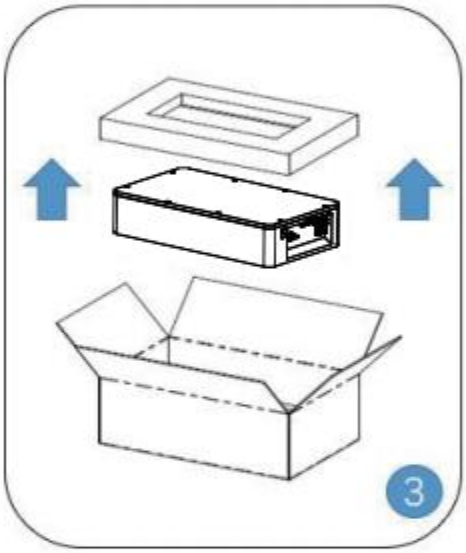
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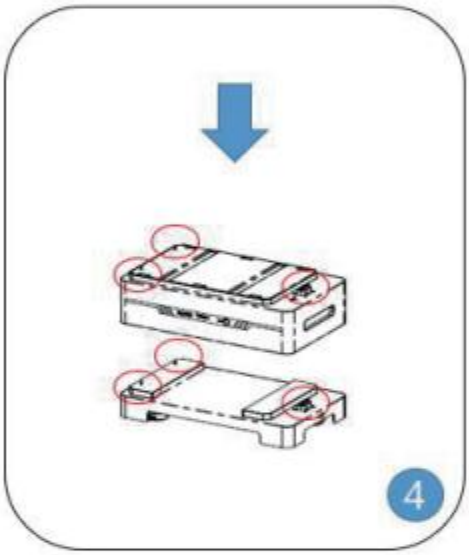
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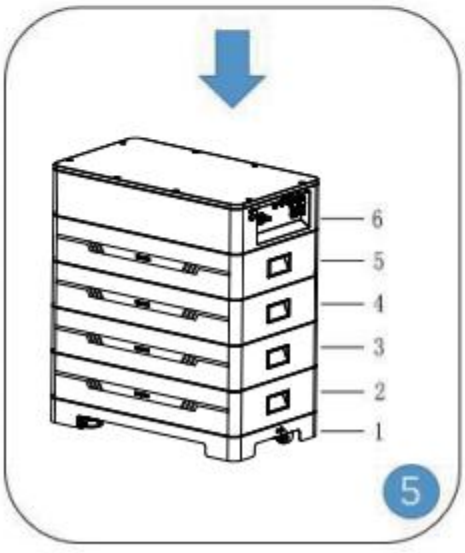
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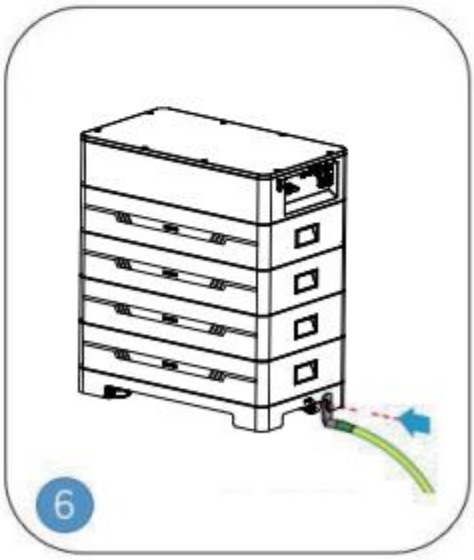
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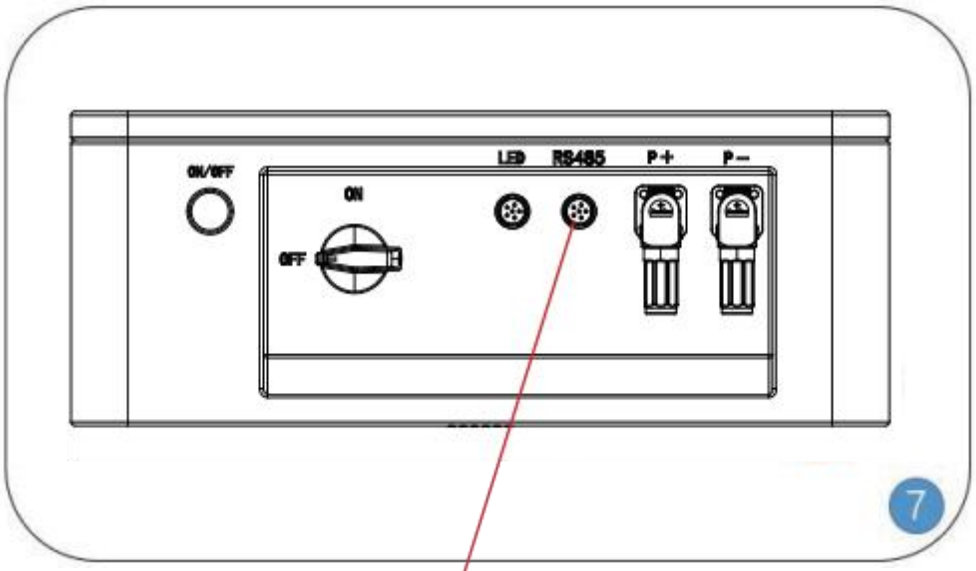
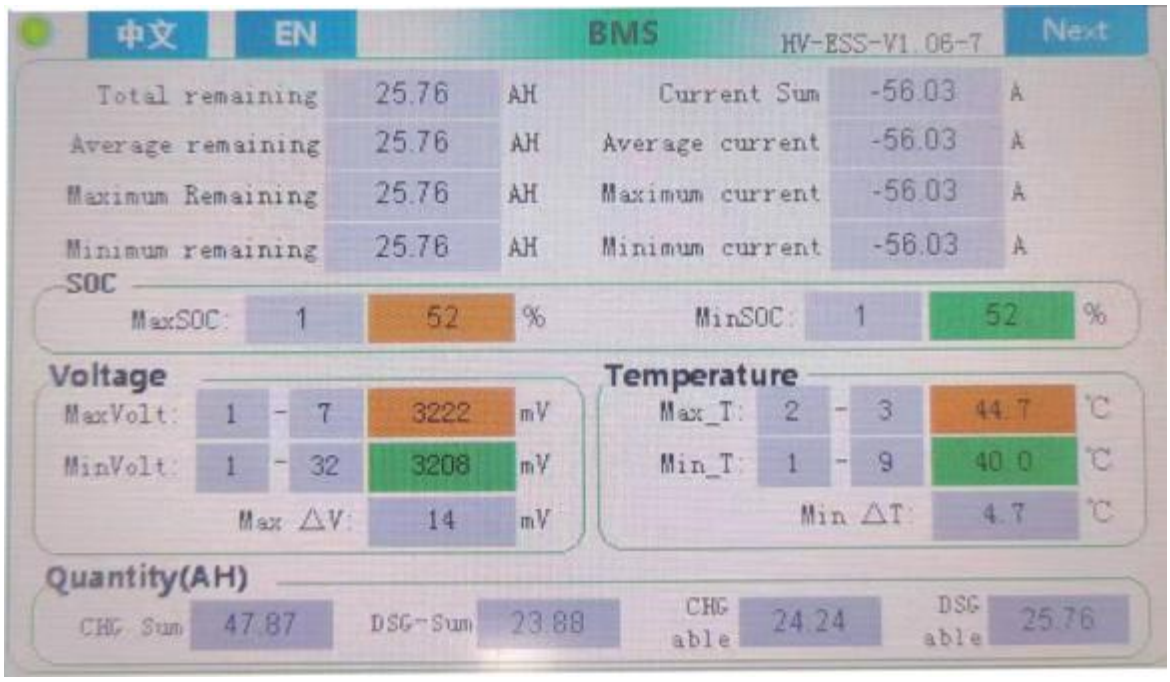


1.RS485-A
2.RS485-B
3.GND
4.CAN-H
5.CAN-L

6.Screen interface

6.1 Main interface



This interface is the main interface, which summarizes most of the main data, extreme values, protection (fault) warnings and other displays:

1.The communication light in the upper left corner will be gray when there is no communication, and green when communication is normal.

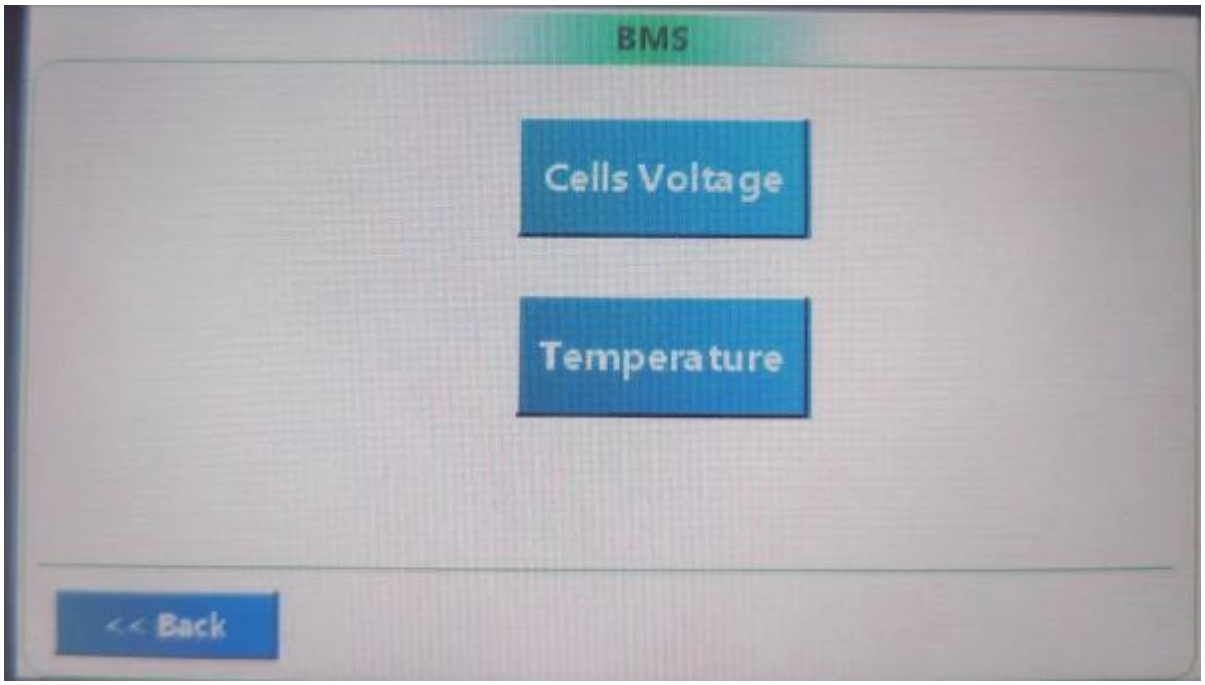
2.The system time in the upper right corner can be set. Click the system time in the upper right corner to enter the time setting interface.

3.The charging and discharging, pre-charging and negative electrode appliances in the middle display the switch control status of the BM5. Full charging displays the true status of the sensor, and discharging displays the special status.

4. The serial number on the right side of the highest/lowest/voltage/temperature indicates: BMU serial number, battery cell serial number.

5. The function list on the right is the interface selection list. Click to enter the function list below.

6.2 Function bar interface

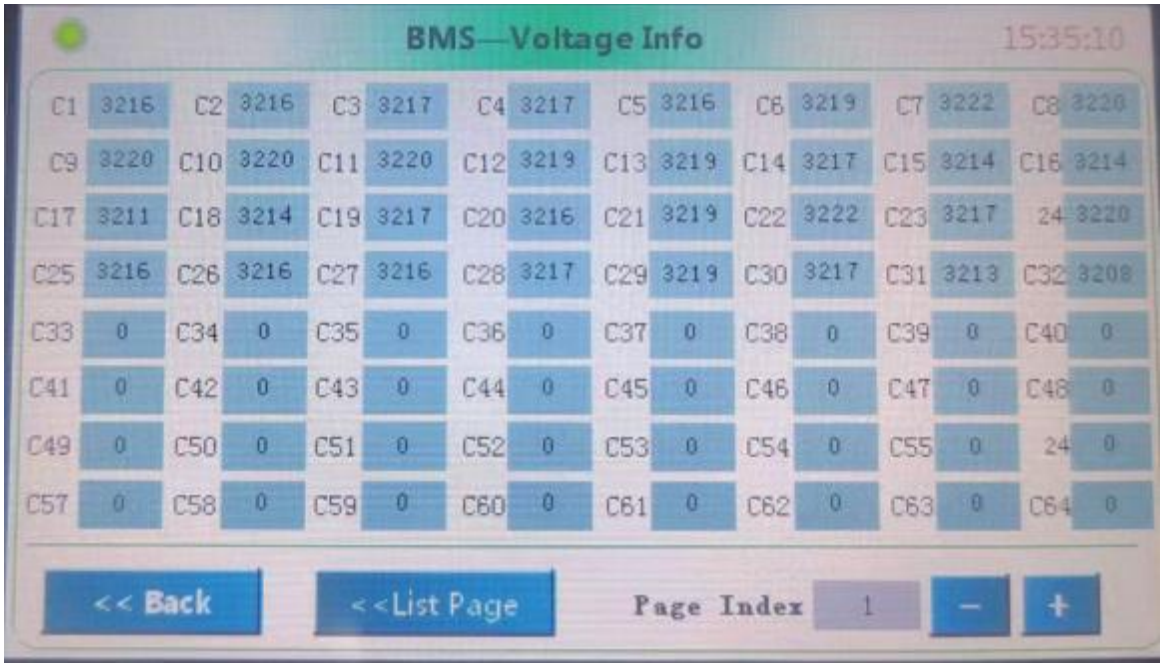


This interface is a menu for function selection:

1. Click the voltage, temperature and other jump controls to jump to the voltage information, temperature information and other interfaces.

2. Click the main interface control in the lower left corner to return to the main interface.

6.3 Cell voltage interface



This interface shows detailed battery cell voltage information, which is divided into two pages:

1. A single BMU supports querying up to 64 battery voltage information, and a single page displays 32 battery voltage information. Click the next page to monitor the remaining battery voltage information.

2. Click the “+” “-” on the right side of the BMU serial number to switch the current BMU serial number.

3. Click the lower left corner to return to the main interface, click the lower right corner to enter the function list menu.

6.4 Temperature information interface

This interface displays detailed battery cell temperature information, which is divided into two pages:

1. A single BMU supports querying up to 64 battery voltage information, and a single page displays 32 battery voltage information. Click the next page to monitor the remaining battery voltage information.
2. Click the “+” “-” on the right side of the BMU serial number to switch the current BMU serial number.
3. Click the lower left corner to return to the main interface, click the lower right corner to enter the function list menu.