



Energy Storage Battery High Voltage Stack Series User Manual BS06-S

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1. Preface

This brochure primarily introduces high-voltage stack series products. The BS06-S high-voltage stack series is a lithium iron phosphate battery storage system. It is primarily suitable for DC-side applications in energy storage systems. If you have any questions, please contact our company for advice and clarification.

1. 1. Applicable Products

This document applies to the following product models:

BS06-15-S
BS06-23-S
BS06-30-S
BS06-38-S
BS06-46-S

1. 2. Applicable personnel

It is only suitable for professionals who are familiar with local regulations and electrical systems, have received professional training, and are familiar with the relevant knowledge of this product. Including but not limited to:

Technical Support Engineer
Installation Engineer

Debugging Engineer
Electrical Engineer
Maintenance Engineer

1. 3. Legal Notice

The copyright of this manual belongs to our company. Without the prior written authorization of our company, no part of this manual may be extracted, duplicated, translated, annotated or copied in any form or manner.

All rights are reserved by our company.

Please note that our company may make modifications to contents of this Manual without prior notice. If any changes are made to its information, we will not notify you separately.

1. 4. Other Statements

Before transporting, storing, installing, operating, using, or/and maintaining the device, please read this manual first, operate strictly in accordance with the manual contents, and observe all safety precautions marked on the device and in this manual. In this manual, "device" refers to the products, software, components, spare parts, and/or services related to this manual; "Company" refers to the manufacturer (producer), seller, or service provider of the device; and "you" refers to the entity that transports, stores, installs, operates, uses, and/or maintains the device.

The "Danger," "Warning," and "Notice" items in this manual do not represent all safety precautions that should be observed. You must also comply with relevant international, national, or regional standards and industry practices. The company assumes no liability for any violation of safe operating requirements or safety standards for the design, production, and use of equipment.

This equipment should be used in an environment that meets the design specifications. Otherwise, the equipment failure, equipment malfunction or component damage that may occur are not covered by the equipment quality assurance scope. Otherwise, the company will not be liable for compensation for personal injury, property loss, etc. that may be caused.

All operations including transportation, storage, installation, operation, use and maintenance must comply with applicable laws, regulations, standards and specifications.

It is prohibited to reverse engineer, decompile, disassemble, adapt, or implant the device. It is also prohibited to study the internal implementation logic of the device, obtain the source code of the device software, or infringe on intellectual property rights in any way. It is also prohibited to disclose the results of any device software performance test.

The Company shall not be liable for any of the following circumstances or their consequences:

- Equipment damage caused by earthquake, flood, volcanic eruption, mudslide, lightning strike, fire, war, armed conflict, typhoon, hurricane, tornado, extreme weather, or force majeure;
- Operation is not within the operating conditions described in this manual;
- The installation and use environment does not comply with relevant international, national or regional standards;
- Unqualified personnel are not allowed to install and use the equipment;
- Failure to follow the operating instructions and safety warnings in the product and documentation;
- Unauthorized disassembly, modification of the product or modification of the software code;
- Damage caused by you or a third party you entrust for transportation;
- Damage caused by storage conditions not meeting the requirements of product documentation;
- The materials and tools you provide do not meet the requirements of local laws, regulations and relevant standards;
- Damage caused by your or a third party's negligence, intentional fault, gross negligence, improper operation, or reasons not attributable to our company.

1. 5. Revision History

The latest version in the revision history contains the updated contents of all previous document versions.

V1.0.0.20250522

First issue

2. Safety

2. 1. Safety Tips

Read all safety instructions carefully before performing any work and follow them when handling batteries.

Incorrect operation may result in:

- Injury or death of the operator or third party
- Damage to system hardware

Skills required of qualified personnel:

- Training in electrical system installation and commissioning, as well as hazard handling
- Understanding this manual and other related documents
- Understand local regulations and directives

The following symbols may appear in this manual to highlight information. Their meanings are as follows:



Indicates a hazardous situation which, if not avoided, will result in death or serious injury.



Indicates a potential for damage or injury, which, if not avoided, could result in death, injury, or damage.



Indicates potential equipment damage or environmental safety warnings. Failure to avoid these warnings may result in equipment damage, data loss, performance degradation, or other unpredictable consequences.

2. 2. Personal safety

It is strictly forbidden to carry out installation, maintenance, inspection and other operations when the equipment is energized! When maintaining or inspecting the equipment, at least two people must be on site.

2. 2. 1. Personnel requirements

- Only professional electricians or personnel with professional qualifications can perform various operations on this product.
- Operators should be fully familiar with the structure and working principle of the entire energy storage system.
- Operators should be fully familiar with this manual.
- Operators should be fully familiar with the relevant standards of the country/region where the project is located.

2. 2. 2. Safety warning operation

When installing, performing routine maintenance, or inspecting the battery pack, please observe the following warnings to prevent unauthorized personnel from approaching and causing misoperation or accidents:

- Place clear markings on the front, back, and switch of the battery pack to prevent accidental closing of the switch.
- Set up warning signs or safety warning tapes near the operating area.

2. 3. Electrical safety

It is strictly forbidden to operate with power on during the installation process. It may cause fire or personal injury.

2. 3. 1. Electrical safety

- Never touch terminals or conductors connected to the mains circuit.
- Observe all instructions or safety documentation regarding connection to the power grid and follow the warning signs on the product.
- Observe the safety precautions listed in this manual and other documentation related to this equipment.
- Perform a preliminary visual inspection of the equipment for damage or other hazards before operating.
- Check whether other external devices or circuit connections are secure.
- Make sure the equipment is in a safe state before operating it.

2. 3. 2. Static Electricity Safety

- Avoid unnecessary contact with the circuit board.
- Observe electrostatic protection regulations, such as wearing an anti-static wrist strap.

2. 3. 3. Battery Pack Precautions

- There is a lethally high voltage between the positive and negative poles of the energy storage battery pack.
- Damaged equipment or system failure may cause electric shock or fire
- When maintaining the equipment, ensure that the connection between the energy storage converter and the energy storage battery pack is completely disconnected.

2. 4. Environmental safety

It is strictly forbidden to place the device in flammable, explosive or smoky environments, otherwise it may cause hazards such as fire or explosion.

2. 4. 1. Escape route requirements

To ensure that personnel can evacuate the scene quickly in the event of an accident, please comply with the following:

- Do not place flammable or explosive items around the battery pack.
- It is strictly prohibited to pile up debris in the escape passage or occupy the escape passage in any form.

2. 4. 2. Moisture protection

- Do not use the product in an environment that is more humid than specified.

2. 5. Machinery Safety

When working at heights, you must wear safety equipment such as a hard hat and fasten it to a solid structural member to prevent falling accidents.

Before installing the equipment, make sure it is securely fixed to avoid problems such as tipping over and injuring people or damaging the equipment.

2. 5. 1. General requirements

- Scratches that occur during transportation and installation must be repaired in a timely manner, and it is strictly forbidden to expose the scratched parts for a long time.
- It is prohibited to perform welding, cutting and other operations on the equipment without permission.
- Proper use of work and the correct use of tools.
- When working at height, wooden ladders or insulated ladders should be used, and straight ladders are prohibited.
- When using a ladder, it must be placed on a stable surface and someone must hold the ladder during operation.

2. 5. 2. Heavy object handling requirements

- When moving heavy objects, you should be prepared to bear the weight in advance.
- When multiple people are carrying something, they should be distributed reasonably to ensure that the weight is evenly distributed.
- When carrying heavy objects, you should wear protective gloves, labor protection shoes and other safety gear.

2. 6. Live test specifications

There is a fatal high voltage between the positive and negative poles of the energy storage battery pack. Two-person operation is required to ensure personal safety.

2. 6. 1. Live measurement

There is high voltage in the device. Accidental contact may result in fatal electric shock. Therefore, when measuring with power on, you should:

- Take protective measures (such as wearing insulating gloves, insulating shoes, etc.).

2. 6. 2. Use of measuring equipment

When performing electrical measurements, connections, or commissioning on equipment:

- Select high-quality measuring equipment whose measuring range and usability conditions meet the on-site requirements.
- Ensure that the connection and use of measuring equipment are correct and standardized to avoid dangers such as arcing

2. 7. Equipment Security

Erect safety warning signs for isolation to prevent unauthorized personnel from entering and operating the equipment incorrectly during operation, which may cause personal injury or property loss.

- The equipment installation layout must meet the installation protection requirements specified by local standards, including but not limited to the requirements of GB 51048-2014 Code for Design of Electrochemical Energy Storage Stations and NFPA 855 Standard for the Installation of Stationary Energy Storage Systems.
- Before installing, operating, or maintaining the battery, please read the relevant instructions and follow the manufacturer's requirements.
- Please use the battery within the specified ambient temperature range.
- If the battery is accidentally exposed to water, do not continue to install it. Please transport it to a safe place and dispose of it promptly.
- Before installing the battery, check that the battery pack casing is not damaged or deformed.

2. 8. Product scrapping

When the product needs to be scrapped and discarded, it cannot be treated as regular waste.

- Our company has priority recycling rights for scrapped batteries
- For scrapped batteries that are not recycled by our company, please contact local authorized professional recycling agencies or manufacturers for scrap recycling.

Note: This manual does not cover all possible situations during operation, maintenance, and repair. If you encounter a situation that is not explained in the manual, please give priority to complying with local regulations and standards and contact our company in a timely manner.

2. 9. Pre-installation preparation

Tools:

- The tools shown in the pictures are for reference only. Please refer to the actual objects.
- Due to different on-site conditions, this tool list does not fully list all the tools that may be needed. On-site installers and users are requested to prepare tools not listed according to actual conditions.

Installation tools:

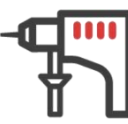
			
Slotted insulated screwdriver	Phillips insulated screwdriver	wire strippers	diagonal pliers
			
wire cutters	utility knife	wrench	rubber hammer
			
electric drill	impact drill	cutting machine	tape measure
			
spirit level	Vernier caliper	steel ruler	brush
			
cable ties	multimeter	heat gun	Vacuum cleaner
			
Lifting cable	Insulated ladder		

Diagram Installation Tool Diagram

Personal protective equipment:

 Insulated gloves	 protective gloves	 reflective vest	 seat belt
 Insulated shoes	 helmet	 goggles	 protective masks

Icon protection tool map

3. System Introduction

3.1. Energy Storage System Introduction

The energy storage system involves the process of storing energy in a medium or device and then releasing it when needed. The energy storage system includes input and output devices of energy and materials, along with energy conversion and storage devices. Energy storage technologies can be classified into several categories, including physical energy storage, electrochemical energy storage, and electromagnetic energy storage.

The electrochemical energy storage system is a system that uses electrochemical batteries as the storage medium and employs power conversion systems (PCS) to store and release electrical energy in a cyclic manner. The essence of an electrochemical energy storage system is to convert electrical energy into chemical energy, which is then stored and later released through the mechanism of chemical battery, ultimately converting back into electrical energy to be fed into the power grid. Compared with other energy storage technology routes, the electrochemical energy storage system is characterized by higher energy density, moderate response speed, and wide range of applications, and is easier to mass-produce, install, and operate and maintain, thus having excellent potential for large-scale promotion.

Electrochemical energy storage includes forms such as lithium-ion, sodium-ion, and liquid flow. Among these, lithium-ion technology is the most mature and is currently the widely recognized route in the market.

In an energy storage system, storage battery serves as a critical device for energy storage and plays a key role in adapting to various usage scenarios.

3.2. System Features

The product is an energy storage DC-side system designed in the form of indoor stack-able boxes. It features low cost, ease of installation and transportation. The system consists of high-energy-density and high-safety lithium iron phosphate battery units connected in a specific series mode, complemented by an advanced battery management system, ensuring stability and reliability. In addition, the system has the following features:

- Comprehensive, multi-level battery warning and protection strategies, ensuring high safety
- Equipped with comprehensive communication and monitoring functions, ensuring continuous and stable operation for a long time
- Modular design, easy to install, and small footprint

3. 3. Product Configuration

The energy storage system configuration includes:

Stacked base: It is the place where the stack-able battery boxes are installed

Lithium batteries: 3.2 V/100 Ah lithium iron phosphate batteries connected in series constitute a battery cluster.

Battery Management System (BMS): BMS is designed for secondary (rechargeable) batteries to improve battery utilization and prevent overcharge and over discharge. This system can control the charging and discharging of the energy storage system and monitor the battery SOC information according to commands.

3. 4. System layout

3. 4. 1. System size

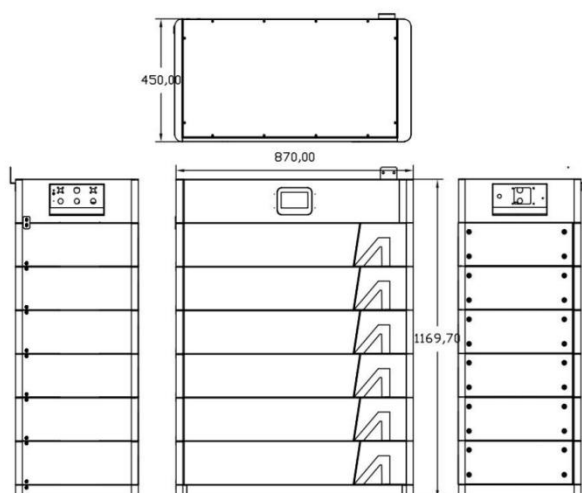


Figure Product Dimensions

* Note: 46 kWh specification is used as an example

3. 4. 2. System layout

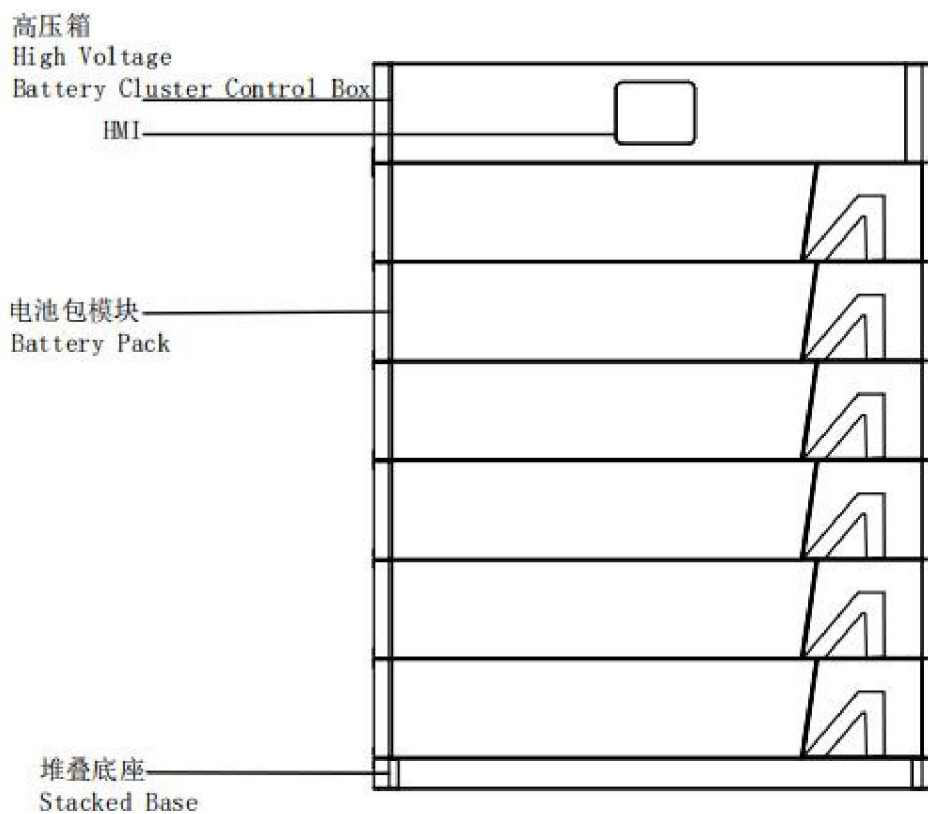
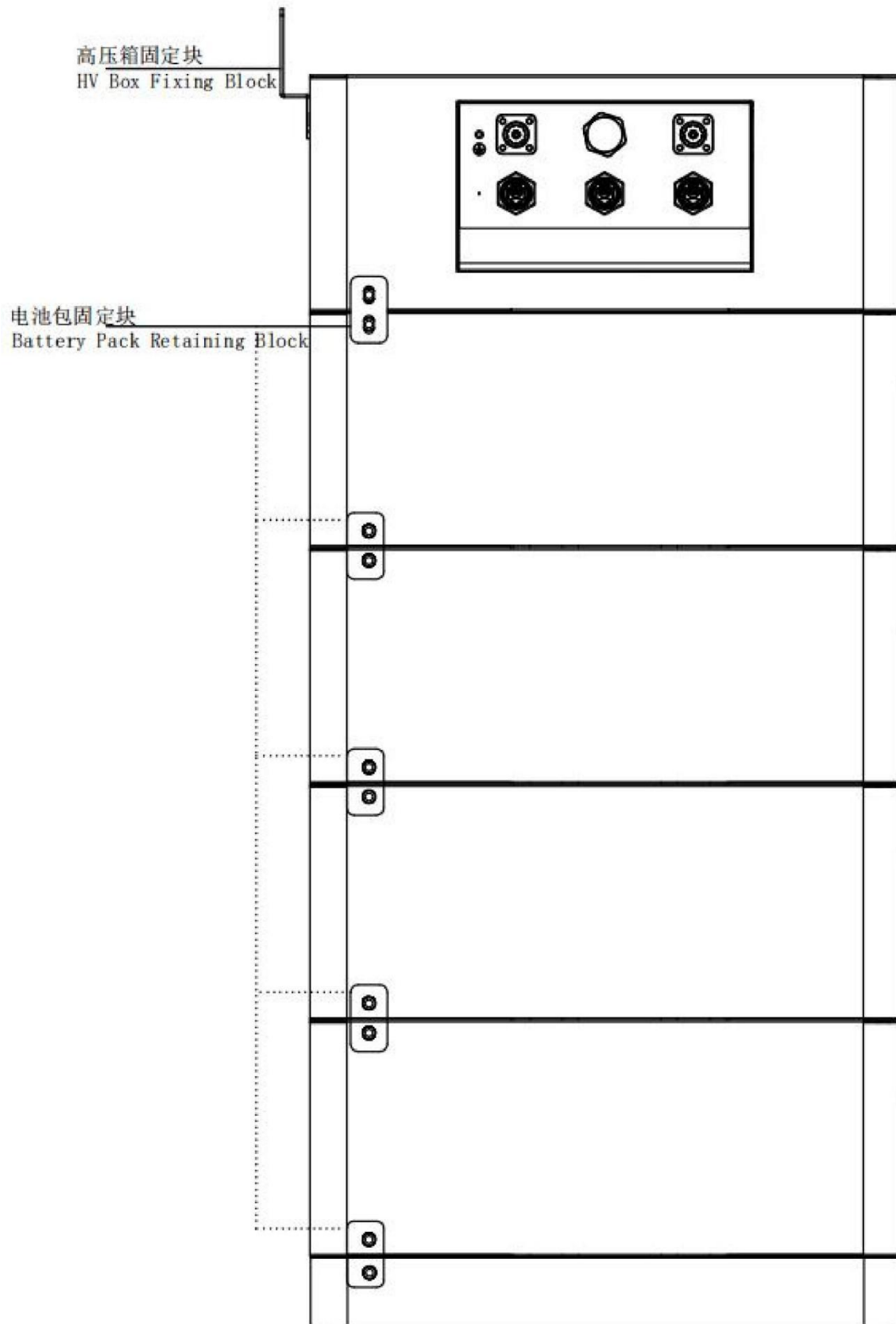
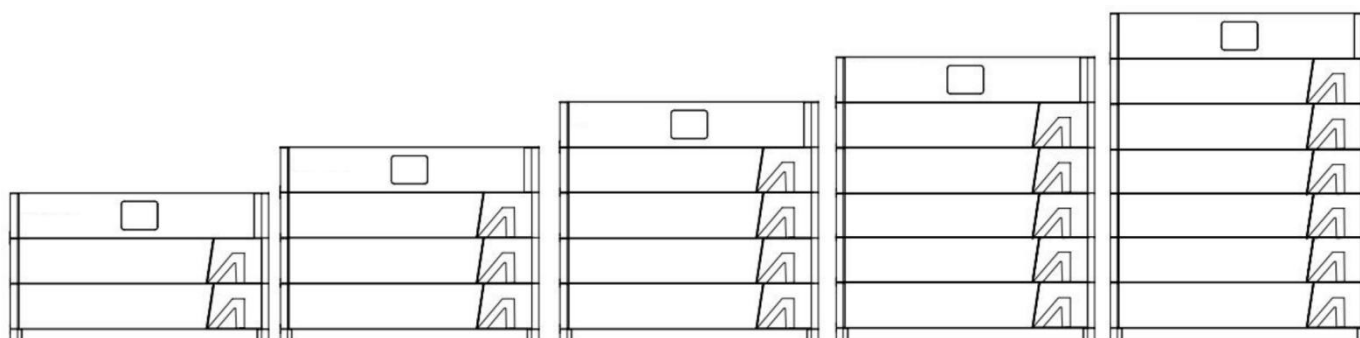


Diagram system layout

3. 4. 3. System connection fixed



3. 5. Product Parameters



Serial number	BS06-S				
Model	BS06-15-S	BS06-23-S	BS06-30-S	BS06-38-S	BS06-46-S
Battery cell type	LiFePO ₄	LiFePO ₄	LiFePO ₄	LiFePO ₄	LiFePO ₄
Stack Quantity	2	3	4	5	6
Rated power (kWh)	15.36	23.04	30.72	38.40	46.08
Rated capacity (Ah)	100	100	100	100	100
Rated voltage (VDC)	153.6	230.4	307.2	384.00	460.80
Operating voltage (VDC)	134.4~172.8	201.6~259.2	268.8~345.6	336~432	403.2~518.4
Charge and discharge rate (C)	0.5				
Standard charge and discharge current (A)	50				
Maximum charge and discharge current (A)	50				
Dimensions (mm) (W*D*H)	870x450x530	870x450x690	870x450x850	870x450x1010	870x450x1170
Weight (kg)	184	259	334	409	484
Protection level	IP 65				
Charging temperature range (°C)	0~55				
Discharge temperature range (°C)	0~55				
Cycle life	≥6000 times 25±2°C 80%DOD 0.5C 70% SOH				
Communication methods	CAN/RS485				

Product Specifications

3. 6. Nameplate information

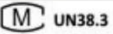
Energy Storage Battery Pack	
Model: BS06-P	Cell Type: LiFePo4
Rated voltage: DC76.8V	Voltage range: 67.2V-86.4V
Energy: 7.680kW-h	Capacity: 100Ah
Recharging current: <50A	Discharge current: <50A
Working humidity: 0~90% (non-condensing)	
Working temperature: -10°C~+55°C	
Protection Level: IP65	
Date of manufacture: 2025.XX.XX	
Manufacturer: Jiangxi Hertz New Energy Technology Co.,Ltd	
 UN38.3 	
Made in China	

Figure battery pack nameplate

High Voltage Battery Cluster Control Box	
Model: BS06-PDU-S	
Max Working Voltage: 1000VDC	
Max Working Current: 100A	
Protection Level: IP65	
Working Temperature: -10°C~55°C	
Working Humidity: 0~90%RH (non-condensing)	
Altitude: ≤2000m	
Date of manufacture: 2025.XX.XX	
Manufacturer: Jiangxi Hertz New Energy Technology Co.,Ltd	
	
Made in China	

Figure High-voltage box nameplate

Energy Storage Battery Cluster	
Model: BS06-46-S	Cell Type: LiFePo4
Rated voltage: DC460.8V	Voltage range: 403.2V-518.4V
Energy: 46.08kW-h	Capacity: 100Ah
Recharging current: <50A	Discharge current: <50A
Working humidity: 0~90% (non-condensing)	
Working temperature: -10°C~+55°C	
Protection Level: IP65	
Date of manufacture: 2025.XX.XX	
Manufacturer: Jiangxi Hertz New Energy Technology Co.,Ltd	
 UN38.3 	
Made in China	

Figure battery cluster nameplate

* Note: 46 kWh specification is used as an example

4. Product Introduction

This product series offers a total battery energy range of 15 kWh to 46kWh. In this product, individual 3.2 V/100 Ah lithium iron phosphate cells arranged in a 1P24S configuration constitutes a battery pack module and 2 to 6 battery packs are then connected in series to form a DC-side battery cluster. The rated charge-discharge rate is 0.5 C.

4. 1. Product configuration parameters

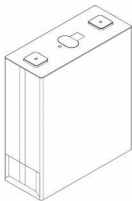
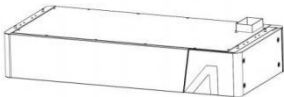
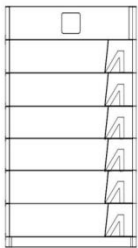
No.	Description	Unit	Rated voltage	Rated capacity	Rated energy	Quantity
1	Battery		3.2V	100Ah	320Wh	144
2	battery pack		76.8 V	100Ah	7680 Wh	6
3	Battery Cluster		460.8 V	100Ah	46080 Wh	1

Table configuration parameters

* Note: 46 kWh specification is used as an example

4. 2. Battery cell parameters

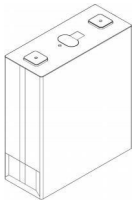
Unit	Model / Description	100Ah
	Chemical system	LFP/C
	Rated capacity (Ah)	100
	Charge and discharge rate	≤ 0.5C/0.5C
	Application Areas	ESS
	Dimensions (length * width * height mm)	173.9 * 47.8 * 132.7 ± 0.8

Table battery parameters

4. 3. Battery pack parameters

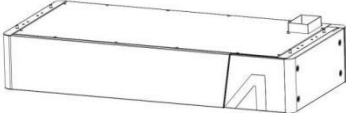
Unit	Model / Description	BS06-S
	Battery cell type	LFP 100Ah
	Maximum charging rate	$\leq 0.5C$
	Rated charge and discharge rate	0.5C
	Maximum discharge rate	$\leq 0.5C$
	Monomer combination	1P 24S
	Nominal capacity	100Ah
	Nominal energy	7.68 kWh
	Nominal voltage	76.8 V
	Operating voltage range	67.2 to 86.4 V
	Operating temperature range	Discharge: 0 °C ~55 °C Charging: 0 °C ~55 °C

Table Battery Pack Parameters

4. 4. Battery cluster parameters

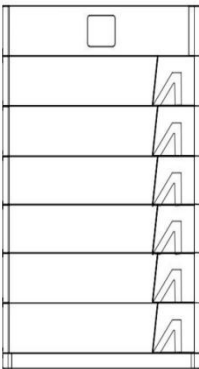
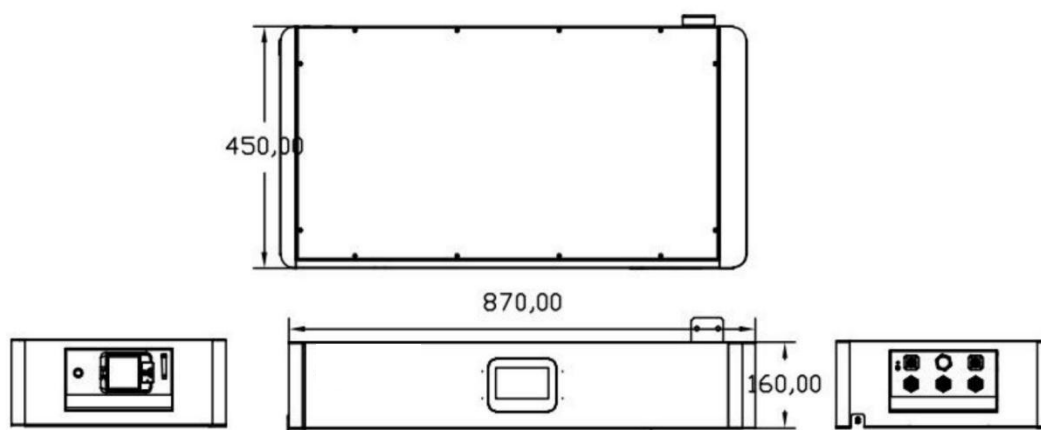
Unit	Model / Description	BS06-46-S
	Model / Description	1P 144 S-100Ah
	Maximum charging rate	$\leq 0.5C$
	Rated charge and discharge rate	0.5C
	Maximum discharge rate	$\leq 0.5C$
	System combination	1P 144 S
	Nominal capacity	100Ah
	Nominal energy	46.08 kWh
	Nominal voltage	460.8 V
	Operating voltage range	403.2 ~ 518.4 V
	Operating temperature range	Discharge: 0 °C ~55 °C Charging: 0 °C ~55 °C

Table Battery Cluster Parameters

4. 5. High voltage cluster control box parameters

4. 5. 1. High voltage cluster control box parameters



Appearance of cluster control box

4. 5. 2. Control Panel

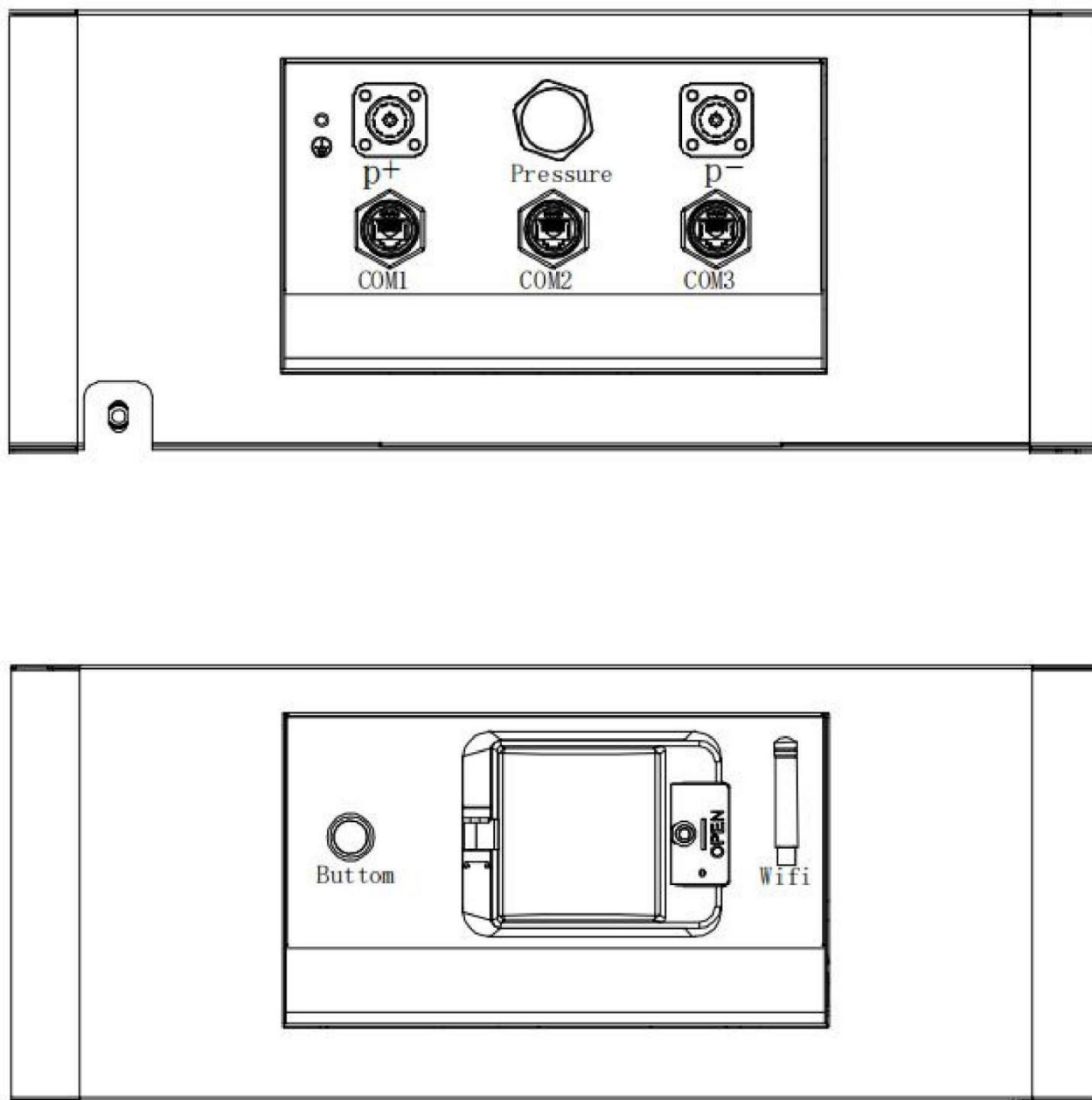


Figure Control Panel

Power input / output port definition:

Interface Definition	Functional Description	Remark
P+	PCS Positive input	connect PCS Positive terminal
P-	PCS Input negative terminal	connect PCS Negative terminal

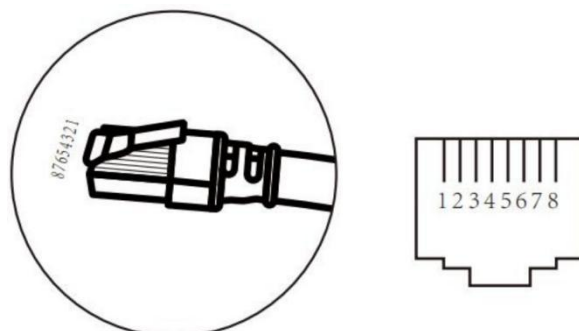
Explanation of the power interface of the meter cluster control box

Signal port definition:

No.	COM port	Definition	Functional Description
1	COM1 (RJ45)	CAN1H	CAN (Connect to PCS or external devices)
2		CAN1L	
3		4851A	485 (Connect to PCS or external devices)
4		4851B	
1	COM2 (RJ45)	CAN0H	Debugging CAN
2		CAN0L	
3		NC	/
4		NC	/
1	COM3 (RJ45)	CAN1H	CAN testing (Connect to PCS or external devices)
2		CAN1L	
3		4851A	485 test (Connect to PCS or external devices)
4		4851B	

Table cluster control box port definition

RJ45 port definition:



No.	RS485 PIN	Color
1	485_B	Orange/white
2	485_A	orange color
3	GND 485	
4	CAN-H1	blue
5	CAN-L1	blue/white
6	GND 485	
7	485_A	Brown/white
8	485_B	Brown

5. Battery Management System (BMS)

5. 1. BMS Overview

The battery management system is a real-time monitoring system composed of electronic circuit equipment. It effectively monitors battery voltage, battery current, battery cluster insulation status, electrical SOC , battery module and single cell status (voltage, current, temperature, SOC, etc.) , safely manages the charging and discharging process of the battery cluster, alarms and emergency protection for possible faults, and performs safe and optimized control of the operation of battery modules and battery clusters to ensure safe, reliable and stable operation of the battery.

5. 2. BMS Features

- Slave control + master control
- Daisy chain communication is stable and reliable
- Support Wi-Fi/ Bluetooth communication to stay online
- Automatic address allocation
- Remote monitoring, early warning / alarm / diagnosis / positioning, OTA Over-the-air program upgrades

5. 3. BMS parameters

Project		Main parameters
Operating temperature		-40°C~85°C
Operating humidity		5~95%
Cell voltage detection accuracy		±5mV
Box temperature detection accuracy		±1°C
Balance control		Support, maximum 100mA
High voltage detection accuracy		±0.5% or 0.5V
Current detection accuracy		±0.5%FSR
Insulation detection accuracy		+10% or 10KQ
SOC estimation accuracy		<5%
System power supply		Voltage range 6~36V (typical values 12V, 24V)
Power consumption	run	200mA@12V
	Shutdown	100uA@12V
Acquisition unit	High voltage detection	6-channel, BAT+/HV1/HV2/HV3/HV4; PACK- (total negative adhesion detection)
	Current detection	Shunt, support (measurement period < 250mS); HALL, Support single range 5VHALL; preferred shunt
	Insulation testing	Support (battery pack B+/B-, range 0-6MQ), Measurement accuracy: 10% or 10KΩ
	Temperature detection	5 channels (temperature sensor model default is NTC103), measurement accuracy ±1C
Data storage	Onboard storage	128MB SLC NAND FLASH
RTC		Time synchronization function, can accept IRIG-B (DC) code time synchronization or network time synchronization

Table BMS parameters

5. 4. Power-on and power-off procedures

Process	Description	
Low pressure Power-on process	① Self-locking switch: When the low-voltage power supply is valid and the switch is closed, the wake-up pin has a continuous high level, and the low-voltage power is turned on;	
Low pressure Power-off process	① Self-locking switch: When the switch is disconnected, the low-voltage power supply is disconnected or the high level of the wake-up pin is invalid, the low voltage power is turned off;	
Precharge strategy	Precharge success flag	The voltage difference between the two ends of the pre-charge circuit is $\leq 10V$
	Precharge time limit	The pre-charge time is $\leq 3S$
	Pre-charge retry mechanism	Precharge times: 3; interval time: 1S;
High pressure Power-on process	Closed total negative, closed pre-charge, pre-charge successful, closed total positive, delayed disconnection pre-charge;	
High pressure Power-off process	High voltage process under non-undervoltage fault, recorded as "normal power off" ① Situation 1: Power supply lost. At this time, the BMS loses power supply, the relay is directly disconnected, and the BMS cannot be controlled; ② Situation 2: Normal power-off: Power is always on, and the switch is pressed to power off (wake-up signal). The BMS first requests that all power (current) be reduced to 0, sends a power-off command to the PCS (with a charge and discharge prohibited flag), waits for the circuit current to be $\leq 5A$, and then disconnects all relays. The maximum time from detecting the power-off signal to disconnecting the relays is 5 seconds. ③ Situation 3: Fault Power-Off: A serious fault is detected that requires relay disconnection. The BMS first requests that all power (current) be reduced to 0, sends a power-off command to the PCS (with a charge and discharge disabled flag), waits for the circuit current to be $\leq 5A$, and then disconnects all relays. The maximum time from detecting the power-off signal to disconnecting the relays is 5 seconds.	
Precautions	1. The disconnection relay action includes the total positive relay and the total negative relay, which can perform the disconnection action at the same time; 2. Execute power reduction: The content in this column indicates that the power is reduced to the value. For example, 50% means the current is reduced to 50% of the previous current, and 50A means the current is reduced to 50A. 3. Execute high voltage: execute the corresponding high voltage process, see the charge and discharge high voltage process for details. 4. Charge and discharge enable: "-" means the corresponding charge and discharge flag is enabled, "disable" means the corresponding charge and discharge flag is disabled;	

5. 5. Battery failure threshold and response method

Power off situation	Strategy Description
High voltage process under undervoltage fault Recorded as "undervoltage power off"	If there is an undervoltage relay fault (single-unit low voltage fault, total low voltage fault): The following strategies do not distinguish between charge and discharge states ① If the current is detected to be $\leq -2A$ and lasts for 10S, the total positive and total negative relays will be disconnected immediately; ② If the current is detected to be $\leq -10A$ and lasts for 3S, the total positive and total negative relays will be disconnected immediately; ③ If the current is detected to be less than 2A, the total positive and negative relays will be disconnected after a maximum delay of 5 minutes; ④ When the current detected is $\geq 2A$, the relay is kept closed and sleep is prohibited; ⑤ The above ①②③④ are always judged when the undervoltage fault is not released;

5. 6. Warning thresholds and response methods

No	Fault name	BMS fault level	Unit	Fault value	Delay	Release Value	Delay	Discharge current limiting to	discharge Enable	Charging current limit to	Charge Enable	implement Lower high pressure
1	Total pressure low pressure	Level 1	V	3.0*number of strings	2S	3.3*number of strings	2S	50%	Enable	/	Enable	/
		Level 2	V	2.8*number of strings	2S	3.3*number of strings	2S	0%	Disable	Strong Charge Logo	Enable	/
		Level 3	V	2.5*number of strings	2S	≥ 3.3 *number of strings and SOC $\geq 50\%$	2S	0%	Disable	Strong Charge Logo	Enable	Undervoltage Power off
		Level 4	V	/	/	/	/	/	/	/	/	/
2	Single low pressure	Level 1	V	3.0	2S	3.3	2S	50%	Enable	/	Enable	/
		Level 2	V	2.8	2S	3.3	2S	0%	Disable	Strong Charge Logo	Enable	/
		Level 3	V	2.5	2S	≥ 3.3 and SOC $\geq 50\%$	2S	0%	Disable	Strong Charge Logo	Enable	Undervoltage Power off
		Level 4	V	/	/	/	/	/	/	/	/	/
3	Total pressure high pressure	Level 1	V	3.60*number of strings	2S	3.35*number of strings And SOC $< 98\%$	2S	100%	Enable	0%	Disable	/
		Level 2	V	3.65*number of strings	2S	3.35*number of strings And SOC $< 98\%$	60S	100%	Enable	0%	Disable	normal Power off
		Level 3	V	3.7*number of strings	2S	3.35*number of strings And SOC $< 98\%$	60S	100%	Enable	0%	Disable	normal Power off
		Level 4	V	/	/	/	/	/	/	/	/	/

4	Single high pressure	Level 1	V	3.60	2S	3.35 And SOC <98%	2S	100 %	Enab le	0%	Disa ble	/
		Level 2	V	3.65	2S	3.45	60S	100 %	Enab le	0%	Disa ble	nor mal Pow er off
		Level 3	V	3.7	2S	3.45	60S	100 %	Enab le	0%	Disa ble	nor mal Pow er off
		Level 4	V	/	/	/	/	/	/	/	/	/
		Level 1	m V	/	/	/	/	/	/	/	/	/
5	Single pressure difference	Level 2	m V	500	2S	250	2S	50%	Enab le	50%	Enab le	/
		Level 3	m V	/	/	/	/	/	/	/	/	/
		Level 4	m V	/	/	/	/	/	/	/	/	/
		Level 1	°C	48	2S	45	2S	100 %	Enab le	100 %	Enab le	/
6	Monomer high temperature	Level 2	°C	56	2S	52	2S	100 %	Enab le	0%	Disa ble	/
		Level 3	°C	60	2S	50	2S	0%	Disa ble	0%	Disa ble	nor mal Pow er off
		Level 4	°C	/	/	/	/	/	/	/	/	/
		Level 1	°C	0	2S	3	2S	100 %	Enab le	0%	Disa ble	
7	Single low temperature	Level 2	°C	-11	2S	-7	2S	100 %	Enab le	0%	Disa ble	/
		Level 3	°C	-20	2S	-15	2S	0%	Disa ble	0%	Disa ble	nor mal Pow er off
		Level 4	°C	/	/	/	/	/	/	/	/	/
		Level 1	°C	15	2S	10	2S	50%	Enab le	50%	Enab le	/
8	temperature difference	Level 2	°C	25	2S	20	2S	20%	Enab le	20%	Enab le	/
		Level 3	°C	/	/	/	/	/	/	/	/	/
		Level 4	°C	/	/	/	/	/	/	/	/	/
		Level 1	A	50	1 0S	45	30S	100 %	Enab le	100 %	Enab le	/
9	continued Discharge overcurrent	Level 2	A	55	10 S	50	300 S	50%	Enab le	100 %	Enab le	/
		Level 3	A	60	5S	5	600 S	0%	Disa ble	100 %	Enab le	nor mal Pow

												er off
		Level 4	A	If this fault occurs 3 times within 1 hour, the system can only be released by restarting;								
10	continued Charging overcurrent	Level 1	A	50	1 0S	45	30S	100 %	Enab le	80%	Enab le	/
		Level 2	A	55	10 S	50	300 S	100 %	Enab le	50%	Enab le	/
		Level 3	A	60	5S	5	600 S	100 %	Enab le	0%	Disa ble	nor mal Pow er off
		Level 4	A	If this fault occurs 3 times within 1 hour, the system can only be released by restarting.								
11	Voltage cable Falling off	Level 1	/	/	/	/	/	/	/	/	/	/
		Level 2	/	Fault	5S	recover	30S	50%	Enab le	50%	Enab le	/
		Level 3	/	Fault	30S	/	/	0%	Disa ble	0%	Disa ble	nor mal Pow er off
		Level 4	/	/	/	/	/	/	/	/	/	/
12	Battery cell temperature sensor cable Falling off (≥2) The temperature sensing cable needs to be calculated according to the temperature of the entire battery pack	Level 1	/	/	/	/	/	/	/	/	/	/
		Level 2	/	Falling off	5S	recover	30S	100 %	Enab le	100 %	Enab le	/
		Level 3	/	Falling off	30 S	/	/	0%	Disa ble	0%	Disa ble	nor mal Pow er off
		Level 4	/	/	/	/	/	/	/	/	/	/
13	Intranet communicati on	Level 1	/	/	/	/	/	/	/	/	/	/
		Level 2	/	Fault	5S	recover	30S	50%	Enab le	50%	Enab le	/
		Level 3	/	Fault	30S	recover	30S	0%	Disa ble	0%	Disa ble	nor mal Pow er off
		Level 4	/	/	/	/	/	/	/	/	/	/
14	Fast plug-in temperature high temperature (due to high pole temperature)	Level 1	°C	70	5S	60	/	80%	Enab le	80%	Enab le	/
		Level 2	°C	80	5S	70	/	50%	Enab le	50%	Enab le	/
		Level 3	°C	90	5S	80	/	20%	Enab le	20%	Enab le	No pow er off

		Level 4	°C	/	/	/	/	/	/	/	/	/
15	Abnormal temperature of the fast plug-in (due to abnormal pole temperature)	Level 1	°C	/	/	/	/	/	/	/	/	/
		Level 2	°C	Falling off	5S	recover	30S	100 %	Enab le	100 %	Enab le	/
		Level 3	°C	Falling off	30 S	/	/	100 %	Enab le	100 %	Enab le	No pow er off
		Level 4	°C	/	/	/	/	/	/	/	/	/
16	Inverter communication failure	Level 1	/	/	/	/	/	/	/	/	/	/
		Level 2	/	/	/	/	/	/	/	/	/	/
		Level 3	/	Fault	60 S	recover	1S	20%	Enab le	20%	Enab le	No pow er off
		Level 4	/	/	/	/	/	/	/	/	/	/
17	Precharge failed	Level 1	/	/	/	/	/	/	/	/	/	/
		Level 2	/	/	/	/	/	/	/	/	/	/
		Level 3	/	Fault	3S	/	/	0%	Disa ble	0%	Disa ble	nor mal Pow er off
		Level 4	/	/	/	/	/	/	/	/	/	/
18	Abnormal current	Level 1	/	/	/	/	/	/	/	/	/	/
		Level 2	/	/	/	/	/	/	/	/	/	/
		Level 3	/	Fault	3S	recover	30S	0%	Disa ble	0%	Disa ble	nor mal Pow er off
		Level 4	/	/	/	/	/	/	/	/	/	/
19	BMS initialization Fault	Level 1	/	/	/	/	/	/	/	/	/	/
		Level 2	/	/	/	/	/	/	/	/	/	/
		Level 3	/	Fault	5S	/	/	0%	Disa ble	0%	Disa ble	nor mal Pow er off
		Level 4	/	/	/	/	/	/	/	/	/	/
20	relay Fault	Level 1	/	/	/	/	/	/	/	/	/	/
		Level 2	/	/	/	/	/	/	/	/	/	/
		Level 3	/	Adhesion Fault	1S	/	/	0%	Disa ble	0%	Disa ble	nor mal Pow er off
		Level 4	/	open circuit Fault	1S	/	/	0%	Disa ble	0%	Disa ble	nor mal Pow er off
21	Insulation leakage Fault	Level 1	Ω/V	500	3S	1000	3S	100 %	Enab le	100 %	Enab le	/
		Level 2	Ω/	300	3S	500	3S	100	Enab	100	Enab	/

			V					%	le	%	le	
		Level 3	Ω/V	100	3S	Restart	/	0%	Disa ble	0%	Disa ble	nor mal Pow er off
		Level 4	Ω/V	/	/	/	/	/	/	/	/	/
22	Low SOC	Level 1	%	15	5S	20	3S	100 %	Enab le	100 %	Enab le	/
		Level 2	%	10	5S	15	3S	100 %	Enab le	Stron g charg ing sign	Enab le	/
		Level 3	%	5	5S	10	3S	100 %	Enab le	Stron g charg ing sign	Enab le	No pow er off
		Level 4	%	Only the host computer alarms, and the fault is handled normally and sent to PCS								
23	Heating failure	Level 1	/	/	/	/	/	/	/	/	/	/
		Level 2	/	/	/	/	/	/	/	/	/	/
		Level 3	/	/	/	/	/	/	/	/	/	/
		Level 4	/	/	/	/	/	/	/	/	/	/
24	Thermal runaway failure	Level 1	/	/	/	/	/	/	/	/	/	/
		Level 2	/	/	/	/	/	/	/	/	/	/
		Level 3	/	Fault	/	Restart	/	0%	Disa ble	0%	Disa ble	Trip Pow er off
		Level 4	/	/	/	/	/	/	/	/	/	/
25	Total pressure differential fault	Level 1	V	/	/	/	/	/	/	/	/	/
		Level 2	V	/	/	/	/	/	/	/	/	/
		Level 3	V	Fault	10S	Restart	/	0%	Disa ble	0%	Disa ble	nor mal Pow er off
		Level 4	V	/								
26	Low voltage power supply abnormality (24V power supply)	Level 1	V	/	/	/	/	/	/	/	/	/
		Level 2	V	≤ 18	5S	> 22	3S	0%	Disa ble	0%	Disa ble	/
		Level 3	V	> 31	5S	< 26	3S	0%	Disa ble	0%	Disa ble	nor mal Pow er off
		Level 4	V	/	/	/	/	/	/	/	/	/

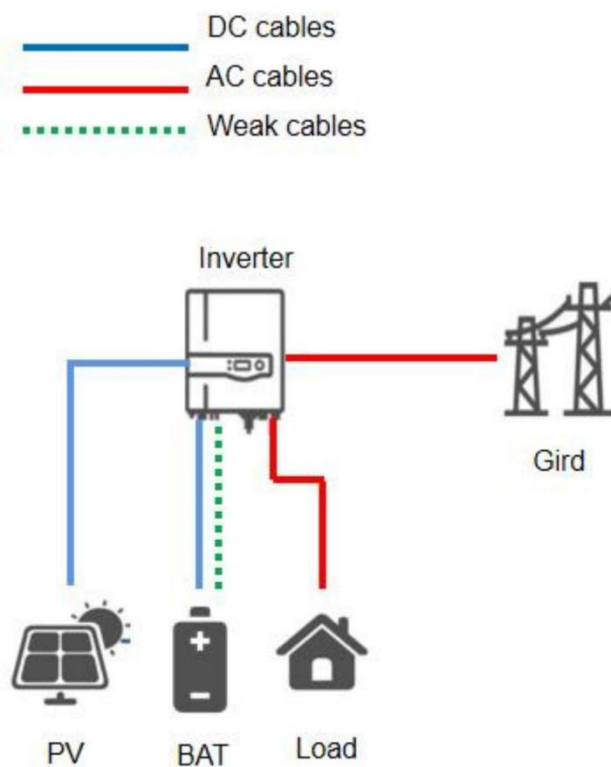
Table BMS warning thresholds and response methods

5. 7. Electromagnetic compatibility

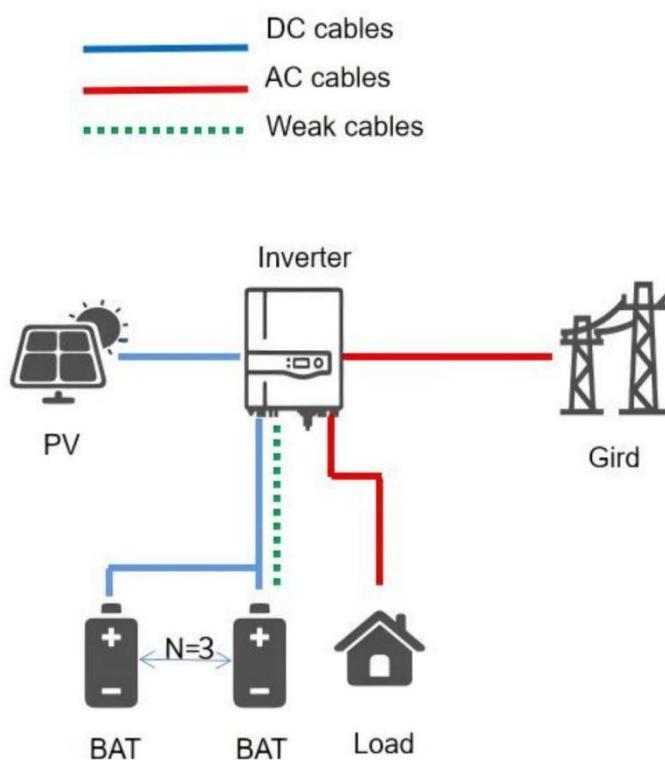
BMS conducts EMC (Electromagnetic Compatibility) and ESD (Electrostatic Discharge) tests in accordance with GB/T 38661-2020.

5. 8. System operation topology

Single battery system:



Supports 5 units in parallel:



6. List of main equipment

No.	Name	Content	Quantity	Unit	Remark
1	DC side energy storage system	High voltage stack DC side	1	set	Each set contains the following items
1.1	Battery pack	76.8 V/ 7.68 kWh	2 ~ 6	set	1P 24S ; 100Ah battery cell
1.2	High voltage cluster control box	1 0 0A	1	set	
1.3	Stacking base	7.68 kwh stacking base	1	set	
1.4	BMS	Battery Management System	1	set	P 720-W
1.5	External electrical harness	4AWG /3m; one red and one black	1	set	Cluster-PCS electrical wiring harness
1.6	External communication harness	3m, single piece customized	1	set	BMS-PCS communication harness



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※ The product information and parameters are subject to change without prior notice

