



BMS Board Long Life Communication

Stackable Energy Storage System

High Voltage LiFePO₄ Battery Pack

User
Manual

Overview

The entire High Voltage Stackable Energy Storage System includes a High voltage controller and multiple Battery packs.

Each Battery pack consists of 100Ah cells which form 51.2V voltage battery pack via 1 parallel and 16 series connection (1P16S). 3 up to 8 battery packs can be connected in series to extend the capacity and power of energy storage system.

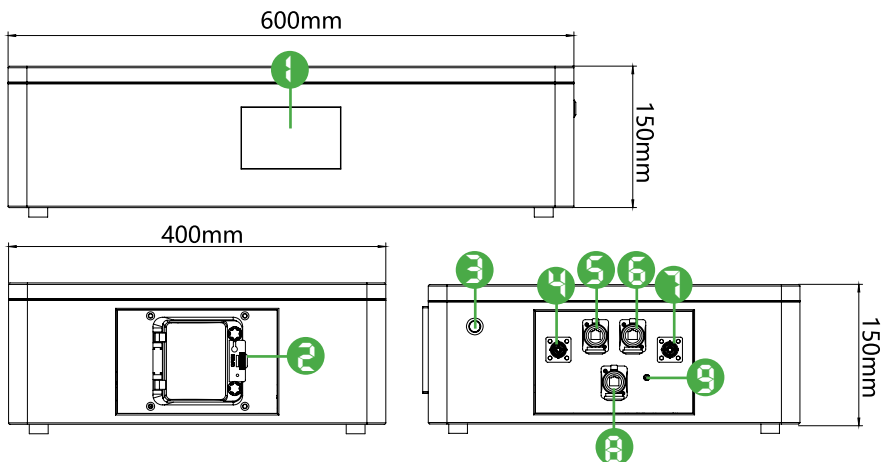
The High Voltage Stackable Energy Storage System powers the loads through PCS at nighttime without solar; when solar becomes available during daytime, solar energy powers the loads as a priority and store excess solar power into the battery system.

1. Technical Specifications


Project	Specification					
Battery Modules	STACK 3.0 LFP BATTERY (51.2V 100Ah 5,120Wh)					
System Demo						
Nominal Voltage	153.6V	204.8V	256.0V	307.2V	358.4V	409.6V
Nominal Energy	15.36kWh	20.48kWh	25.60kWh	30.72kWh	35.84kWh	40.96kWh
Nominal Capacity	100Ah					
Size (W*D*H)	600x400x740 mm	600x400x890 mm	600x400x1040 mm	600x400x1190 mm	600x400x1340 mm	600x400x1490 mm
Weight	165Kg	210Kg	255Kg	300Kg	345Kg	390Kg
Life Cycles	≥6,000 Cycles (80%DOD), at 25°C					
Anode Material	LiFePO4					
Self Discharge Rate	≤3% per month at 25°C					
Charge						
Standard Charge Current	50A					
Max.Charge Current	100A					
Charge Voltage	175.2V	233.6V	292.0V	350.4V	408.8V	467.2V
Discharge						
Max Continuous Discharge Current	100A					
Discharge Cut-off Voltage	134.4V	179.2V	224.0V	268.8V	313.6V	358.4V
Temperature						
Charge	0~50°C					
Discharge	-20~60°C					
Storage	15~35°C					
Communication Mod						
CAN (INV) X1 CAN X1 RS485 X1						

2. Electrical layout

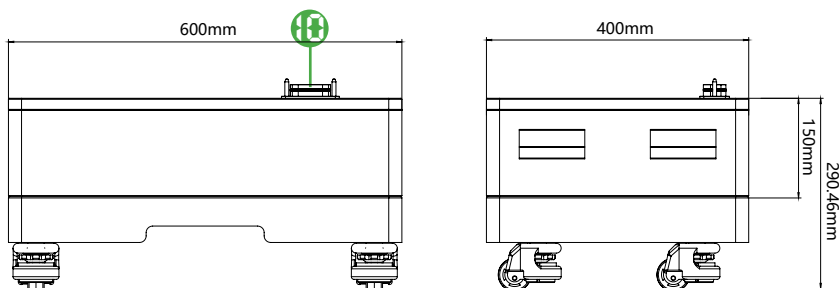
High voltage controller



Note: The picture is for reference only, please refer to the actual product.

High voltage controller		
No.	Port	Function
1	LED Display	Show detailed battery status
2	DC Breaker	Breaker to turn on/off the whole battery system
3	Switch	Activate the battery system
4	-	Negative terminal
5	RS485	RS485 communication
6	CAN	CAN communication
7	+	Positive terminal
8	PCS	Connect to PCS
9		Grounding terminal


Battery



Note: The picture is for reference only, please refer to the actual product.

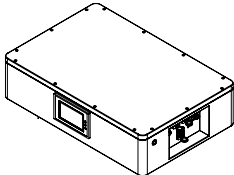
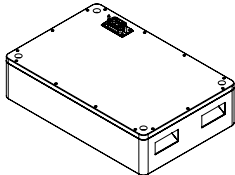
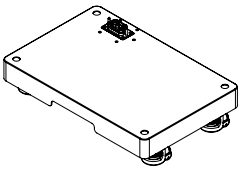

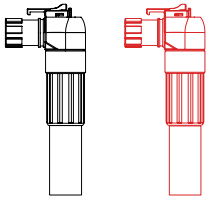

Battery		
No.	Port	Function
10	Plug-in terminal	Battery modules are connected in series


3. Installation

 WARNING	<ul style="list-style-type: none"> ➤ The installation and use of batteries involve a lot of expertise. Therefore, please ensure that technicians have obtained relevant technical certificates before operation. ➤ Ensure to read the Guidance before installation in order to understand product information and safety cautions. ➤ Operators should be well trained technicians and fully understand the whole photovoltaic system, grid network, battery system, working principle and national regional standards. ➤ Installers must use insulating tools and wear safety equipment. ➤ Device damages caused by failure to comply with storage, transportation, installation and use requirements specified in Guidance are not covered by Warranty. ➤ Do not install or use battery near explosive or inflammable substances. Use battery in well-ventilated environment with temperature ranging from -10°C to 50°C. ➤ Maintain a minimum level of dust and dirt in the environment. ➤ Do not install battery in highly humid area such as bathroom. ➤ Please make sure that all battery pack connected in series are from the same batch, the same model and the same manufacturer. Do not mix old batteries with new batteries.
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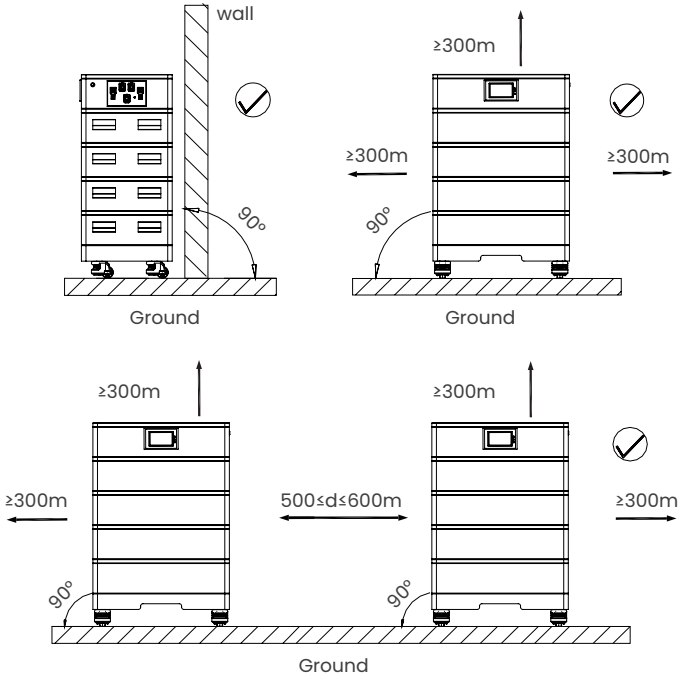
3.1 Shipping Packing List

Check the PACK package before open it. If any abnormality is detected, do not open the Package and contact us. Check the quantity of all parts inside according to the package list. If there is any part missing or damaged, please contact us.

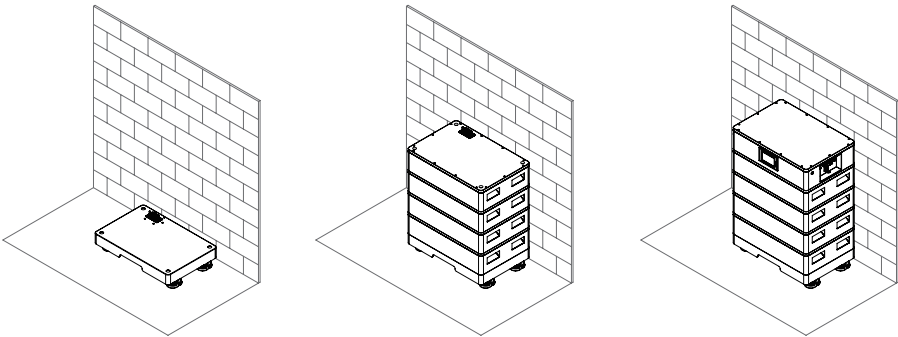
		
High voltage controller	Battery Module	Bottom base
		
Cable X 1	Power cable(to battery)X1	User Manual X 1

 NOTICE	<ul style="list-style-type: none"> ➤ The high voltage controller and the battery pack are standard accessories, please be sure to purchase both, a battery system only needs a high voltage controller, battery pack. You can freely match the number within three to . ➤ The battery base is only used for floor installation.
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3.2 Installation Location Requirements



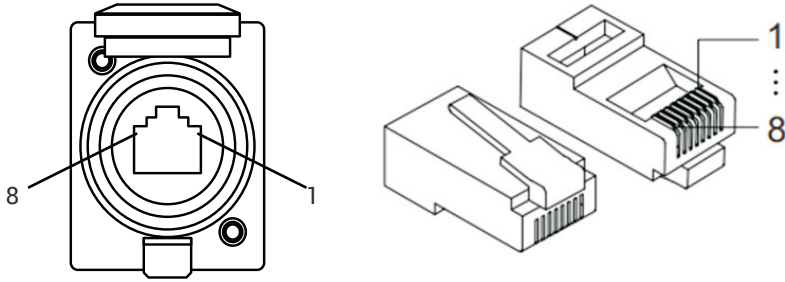
3.3 Floor Standing Installation



NOTICE

➤ When the base is installed on the floor, up to 8 batteries can be stacked.

3.4 Definition of RJ45 communication port pin

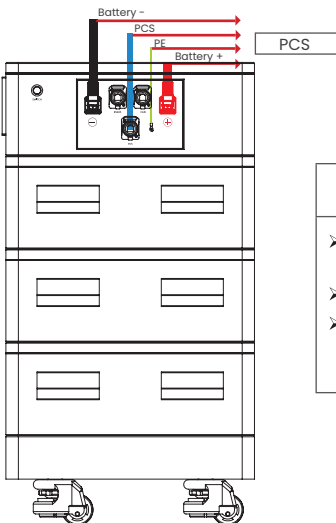


	CAN	RS485	CAN (INV)
PIN	Definition		
1	X	X	X
2	X	X	X
3	X	X	X
4	CAN-H	X	CAN-H
5	CAN-L	X	CAN-L
6	X	GND	X
7	X	RS485-A	X
8	X	RS485-B	X

3.5 System connection diagram

When connecting the three-phase inverter to the battery, please refer to the inverter manual for battery connection and communication interface. The high voltage control box has + / - output quick-connect terminals; "PCS" is the communication port with the inverter, including CAN and RS485 communication.


The connection diagram is as follows:



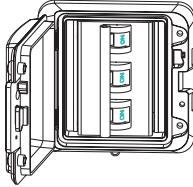
Note

- Do not install the battery or connect the inverter while in operation. Please turn off the system power before installation.
- To ensure system security, do not forget to install ground wire.
- The inverter used must support high-voltage batteries. Otherwise, we do not bear responsibility for any damage to the inverter.

4. Power on/off Battery system

 NOTICE	<ul style="list-style-type: none"> ➤ The installation and use of batteries need to be operated by professional technicians. ➤ Do not contact any positions with potential difference. ➤ Prohibition sign should be hung on the battery: "Non - professionals, do not touch". ➤ If any abnormalities occur during the startup phase, power off the system immediately. Contact us for operation guidance. ➤ Make sure the inverter is turned off before checking the battery system.
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4.1 Power on Battery system

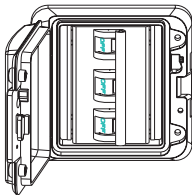


ON ←————→ I OFF

- Before turning on the battery, please check if the cables between your PCS(inverter) and the battery system are properly connected.

Procedures of turning on the battery system		
NO.	Procedures	Acceptation criteria
1	Connect the battery and PCS	Make sure the wiring harnesses are well connected
2	Turn on the breaker of the battery system	Make sure the breaker is ON
3	Press and hold the power switch for 5 seconds.	1. The display is on. 2. Check on the display, main interface-Next-Cell Voltage, to check the voltage of each battery module.

4.2 Power off



ON ←————→ I OFF

- Turn the DC breaker (High Voltage Controller) to "Off" to turn off the entire battery system.

5. Maintenance

The battery is a core component with a backup function. Simultaneously, the battery's lifespan can be influenced by both its usage environment and method. Implementing proper battery maintenance can effectively enhance the battery's service life:

- 5.1 If stored or left unused for an extended period, this product must be placed in a dry, clean environment within the specified temperature range.
- 5.2 Considering the on-site environment, avoid using the battery in excessively high or low-temperature conditions. The ambient temperature should not exceed the specified operating temperature range of the battery (charging: 0°C to +45°C, discharging: -20°C to +55°C). Operating the battery in an environment with a normal temperature of around 25 degrees Celsius can effectively prolong the battery's lifespan.
- 5.3 During each inspection, check the battery's appearance, and measure its voltage. For details, see the parameter table Nominal voltage.
- 5.4 When the battery pack is not in use, it should be turned off or placed into sleep mode to prevent over-discharge.
- 5.5 In order to ensure the service life of the battery, the battery should be properly inspected and maintained. The following maintenance methods are recommended:
 - (1) Seasonal maintenance

Perform the following inspections each month:
 Detect and record battery room temperature.
 Check the cleanliness, appearance, and temperature of the chassis individually.
 Measure and record the total voltage of the battery system.
 - (2) Annual maintenance

Repeat all maintenance and inspections quarterly.
 Check for loose connections every year.
 The battery pack shall be subjected to a check discharge test with actual load once a year.
 If the actual discharge capacity of the battery pack is lower than 80% of the rated capacity, the life of the battery pack is considered to be terminated.
 - (3) Precautions for Use and Maintenance

During installation and maintenance, use insulated tools.
 Do not use any organic solvent to clean the module.
 Do not smoke or use open flames near the battery pack.
 After the battery is discharged, it should be fully charged within 24 hours to prevent capacity degradation.
 The performance of the battery may degrade during storage; recharge the battery after 3 months of storage.
 All maintenance work must be carried out by professionals.

6. Storage and Transportation

6.1 Storage Requirements

- Do not put the product upside down or sidelong.
- The storage environment requirements are as follows:
 - Place the product in a dry, clean and well ventilated place.
The recommended storage temperature is 10°C to 35°C.
 - Place the product away from corrosive and organic substances (including gas exposure).
 - Free from direct exposure to sunlight and rain. At least two meters away from heat sources (such as a radiator). Free from exposure to intensive infrared radiation.
 - If the battery is stored for more than 3 months, the battery pack shall be recharged to 50% SOC every 3 months using a charger.



NOTICE

If not follow the above instructions for long-term storage, the battery cycle life will be reduced or even damaged.

6.2 Transportation Requirement

- Battery pack is classified as category 9 dangerous goods.
- The battery pack shall not be transported with other inflammable, explosive or toxic substances.
- Ensure the original Package and label complete and recognizable.
- During transportation, it should be handled with care, it should be placed in strict accordance with the direction marked on the packing box, and violent vibration should be prevented.
- There will be a drop in capacity during transportation and storage..
- Transportation temperature is between 10°C to 35°C

7. Safety

When installing or using a battery system, the safety information contained in this section must always be followed. For safety reasons, it is the installer's responsibility to be familiar with this manual and all warnings before installation.

7.1 Basic security

The battery system has been designed and tested in accordance with strict rules with international safety certification requirements. Before any installation or use of the battery system, please read all safety instructions carefully and always follow the relevant rules. The battery manufacturer is not responsible for any consequences resulting from violation of the following regulations:

- Damage occurred during transportation.
- Incorrect transportation, storage, installation and use, or customer fails to convey the correct information about transportation, storage, installation and use to terminal customers.
- Non-professional installation.
- Failure to obey the rules of this operation instructions and safety precautions in this document.
- Unauthorized modifications or removal of the software package.
- The product's tamper label is damaged or the product lacks any parts (except authorized disassembly parts).
- Operation in extreme environments which are not allowed in this document .
- Repair, disassemble, or change packs without authorization and cause failure.
- Damage to shell labels or modifies date of production.
- Packs fail to be charge for more than six months.
- Damages due to force majeure (such as lightning, earthquakes, fire, and storms).
- Warranty expiration.

7.2 Safety Precautions

7.2.1 Environment requirements

- Do not expose the battery to temperature above 50°C or heat sources.
- Do not install or use the battery in wet locations, moisture, corrosive gases or liquids, such as bathroom.
- Do not expose the battery to direct sunlight for extended periods of time.
- Place battery in safe place away from children and animals.
- Battery power terminals shall not touch conductive objects such as wires.
- Do not dispose the batteries in fire, which may cause an explosion.
- The battery system shall not come in contact with liquids.

7.2.2 Operation Precaution

- Do not touch the battery system with wet hands.
- Do not disassemble the battery system without permission.
- Do not crush, drop or pierce the battery pack and high voltage controller.
- Dispose the batteries according to local safety regulations.
- Store and recharge battery in accordance with this manual.
- Ensure the connection of ground wire reliable.
- Remove all metal objects such as watches and rings that could cause a short-circuit before installation, replacement and maintenance.
- The pack shall be repaired, replaced or maintained by skilled personal that has been recognized.
- When storing or handling batteries ,do not stack batteries without package.
- Do not broke the battery, the released electrolyte may be toxic and is harmful to skin and eyes.
- Packaged batteries should not be stacked more than specified number stipulated on the packing case.
- Do not use damaged, failed or deformed batteries, which may lead to high temperature or even dangerous accidents. Continued operation of damaged battery may result in electrical shock, fire or even worse.

7.3 Emergency Responses

Manufacturer takes foreseeable risk scenarios into consideration and is designed to reduce hazards and dangers. However, if the following situation occurs, do as below:

Situation Occurs	Description and action need
Leakage	Avoid touch of leaking liquid or gas. If you touch the leaking electrolyte, do as below immediately. Inhalation: Evacuate the contaminated area, and seek medical help. Eye contact: Rinse eyes with flowing water for 15 minutes, and seek medical help. Skin contact: Rinse contacted area thoroughly with soap and water, and seek medical help. Ingestion: Vomiting, and seek medical help.
On fire	It's hard for battery system ignite spontaneously. If the battery has caught a fire, do not try to extinguish the fire but evacuate people immediately.
Wet Packs	If the battery system is soaked or submerged in water, do not access it. Contact distributors immediately for technical assistance.
Damaged shell	Damage to the shell is very dangerous, so special attention must be paid. They are no longer suitable for use and may be dangerous to personnel. If the battery case is damaged, please stop using it and contact a distributor.

Symbols	Description
	Do not dispose in trash
	Lithium ion battery can be recycled
	Certification in European union area
	Electric shock hazard
	Explosive gas
	May leak corrosive electrolyte
	Heavy enough to cause severe injury
	Keep the Pack away from children
	Make sure the battery polarity well connected
	Do not expose to fire
	Operate as the Manual