JKS-B51100-GI

User MANUAL

Contents

Statement of Law

This product complies with the design requirements of environmental protection and personal safety. The storage, use and disposal of the products shall be carried out in accordance with the product manual, relevant contract or relevant laws and regulations.

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Revision History

The modification log accumulates the description of each document update. The latest version of the documentation contains updates from all previous documentation versions.

Revision	Date	Reason for revision
1.0	2022.10.24	Initial Release

Symbol

The following symbols may appear in this document, and the meanings they represent are as follows.

Danger

- Only qualified person can wire the batterypack.
- Do not unplug the connector while the system is running !

Warning

- Make sure to de-energize from all power sources and no volts at the power source.

Caution

- Risk of battery system failure or life cycle reduction.

Safety Handling of Lithium Batteries Guide

Danger: Before installation or operation you must read <User manual> carefully.

 **Caution:**

Before Connecting

- Please check product and packing list after unpacking. And if product is damaged or lack of parts, please contact with the local retailer;
- Before installation, be sure to cut off the grid power and make sure the battery is in the turned-off mode;
- Do not mistake the positive and negative cables and ensure there are no short circuit connection to the external device;
- It is prohibited to connect the battery to AC power directly;
- The battery system must be well grounded;
- Please ensure the electrical parameters of battery system are compatible to related equipment;
- Keep the battery away from water and fire.

In Using

- If the battery system needs to be moved or repaired, the power must be cut off and ensure the battery is completely shut down;
- It is forbidden to connect the battery with different types of batteries;
- It is prohibited to put the batteries working with faulty or incompatible inverter;
- It is prohibited to disassemble the battery;

- In case of a fire, only dry powder fire extinguisher can be used and liquid fire extinguishers are prohibited;
- Please do not open, repair or disassemble the battery except by staffs from Jinko or authorized by Jinko. We are not responsible for any consequences or liability arising from violations of safety operation or equipment safety standards.

 **Caution:**

- Please read the user manual carefully (in the accessories);
- If the battery is stored for a long time, it is required to charge them every six months, and the SOC should be no less than 40%;
- Battery needs to be recharged within 12 hours, after fully discharged;
- Do not expose cable outside;
- All the battery terminals must be disconnected during maintenance;
- Please contact the supplier within 24 hours if there is something abnormal;
- No warranty claim would be made if there were a violation of the above clauses

1 Introduction

1.1 Brief Introduction

This product is a low-voltage battery energy storage system based on lithium iron phosphate(LFP) battery, and is one of the newest energy storage products developed and produced by Jinko Solar Co., Ltd. The rated design capacity is 5.12 kWh. It can be used to support reliable power supply of various devices and systems, and is especially suitable for application scenarios with home power supply systems, limited installation space, limited load bearing conditions, and long cycle life. This product adopts IP65 waterproof design and can be installed in outdoor, indoor, corridor and other areas. This product adopts automatic addressing function and adopts quick plug-in terminals, which is plug-and-play and convenient for installation.

1.2 Product Properties

- This pack is non-toxic, non-polluting, environmental-friendly and has inner fireproof function;
- Anode material is made from $LiFePO_4$ with safety performance and long cycle life;
- The battery management system (BMS) is included to protect the battery;
- The system can automatically manage charge and discharge state and balance current and voltage of each cell;
- This pack has protection failure detection and secondary protection functions；
- This pack has cell voltage, overall voltage detection, overcharge, over discharge alarm and protection functions;
- The other functions are SOC estimation function, automatic charging and discharging calibration function, etc.;

1.3 Product Identity Definition

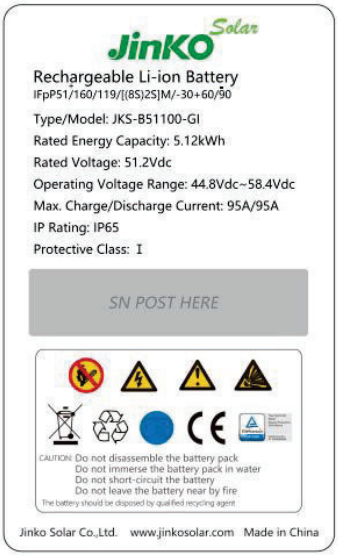


Figure 1-1 Battery energy storage system nameplate

	Do not place near open flame or incinerate.
	The battery voltage is higher than the safe voltage, and direct contact may cause electric shock.
	Be careful of your actions and be aware of the dangers.
	Beware of explosions.
	The scrapped battery cannot be put into the garbage and must be sent to the appropriate institution for recycling.
	Although the Battery should not be discarded at will, after the battery life is terminated, the battery can still be used after it is recycled by the professional recycling organization.
	Please read the manual carefully before using.
	This battery product meets European directive requirements.
	This battery product passed the TUV certification test.

2 Product Specification

2.1 System Appearance and Performance Parameter

Table 2-1 The Parameters of Product

Model Type	JKS-B51100-GI
Physical Properties	
Battery Type	LFP ($LiFePO_4$)
Weight	58 kg±0.5 kg
Dimension （width×height×depth）	660*410*210 mm
Enclosure Rating	IP65
Warranty Period	10 years@25℃
Electrical parameters	
Rated Energy	5.12 kWh
Available Energy	4.60 kWh
Battery Capacity	100 Ah
Maximum Depth of Discharge	90 %
Rated Voltage	51.20 V
Maximum Short Circuit Current （fuse）	200 A
Operating Voltage Range	44.8 V ~ 58.4 V
Internal Resistance	≤20 mΩ
Cycle Life	≥5000
Working Parameters	
Rated Charge and Discharge Current	100 A/100 A
Maximum Charge and Discharge Current	100 A/100 A
Rated DC Power	5 kW
Operating Temperature	-30 ~ 60 ℃
Storage Temperature	-10 ~ 45 ℃
Humidity	0~90 %
Extended Parameters	
Recommended Max. Parallel Number	4
Capacity	100Ah
Own Power Consumption	<5 W
Data Communication	CAN/RS485
Balance Current	30~50 mA
Monitoring Parameters	System voltage, current, battery voltage, battery temperature，PCBA measurement
Compensate	Line Loss Compensation
Others	
Installation Method	Floor/Wall Mount

Certification standards	IEC62619, IEC63056, IEC62477, IEC60730, IEC 61000, UN38.3

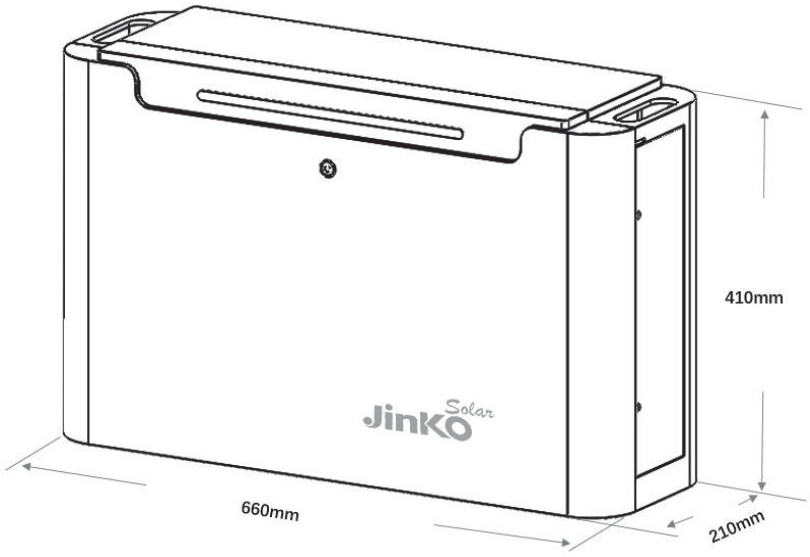


Figure 2-1 Product Appearance

2.2 External Interface Description

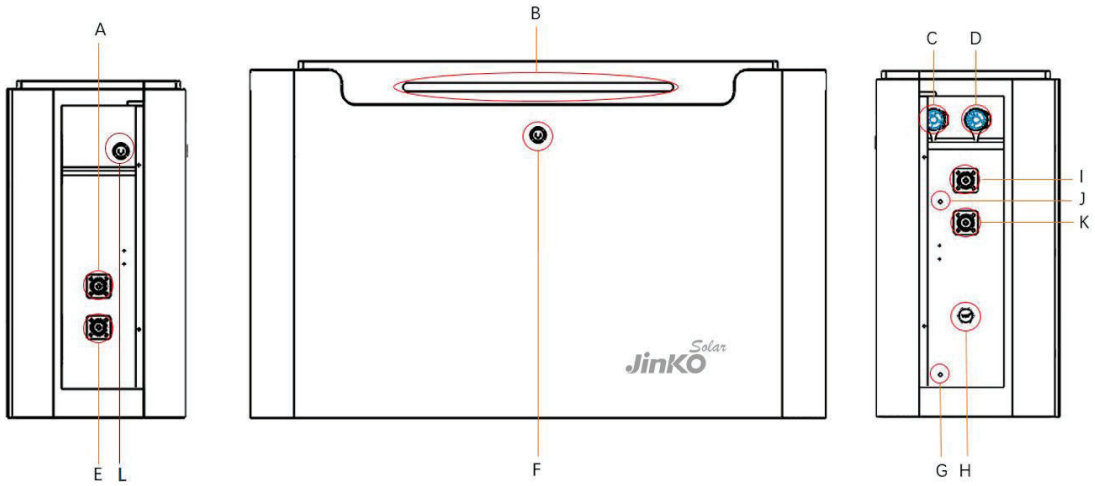


Figure 2-2 Product External Interface

Table 2-2 Interface Definition

Interface	Name	Function Description
A	Battery +	Positive upward parallel port
B	Indicator Light	Run, alarm & SOC
C	Communication port 1	8 pin 8 cell RJ45 communication

D	Communication port 2	8 pin 8 cell RJ45 communication
E	Battery +	Positive downward parallel port
F	SOC button	Self-resetting button, click to show SOC
G	GND	Downward ground terminal
H	Pressure relief valve	Air tightness test hole/pressure relief port
I	Battery -	Negative upward parallel port
J	GND	Upward ground terminal
K	Battery -	Negative downward parallel port
L	Switch	Power button

2.3 Communication Interface Definition

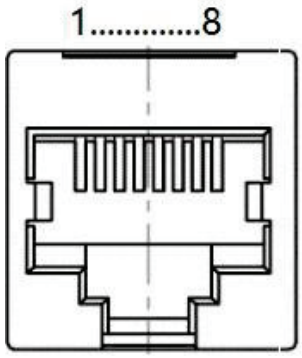


Figure 2-3 RJ45 interface

Table 2-3 Table of Interface Pin Definition

RJ45 pin	RS485-Using 8 Pin 8 Cell Vertical Socket
	Definition Description
1	RS485-B
2	RS485-A
3	CAN0-GND
4	CAN0-H
5	CAN0-L
6	Rev.
7	Rev.
8	Rev.

2.4 Indicator Light Description

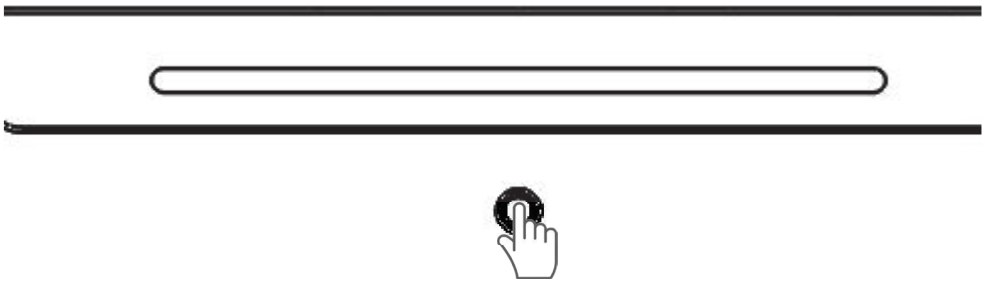
The indicator light control is integrated inside the BMS, which can easily indicate the status of the system.

Table 2-4 The Table of LED Working Status Indication

System Status	Abnormal Event	RUN ●	ALM ●	Description
Shutdown	Hibernate	Lights off	Lights off	All lights off
Standby	Normal	Flashing 1	Lights off	Standby mode
	Alarm	Flashing 1	Flashing 3	Reference Notes
Charging	Normal	Lights on	Lights off	/
	Alarm	Lights on	Flashing 3	Reference Notes
	Single overvoltage protection, overall overvoltage protection	Lights on	Lights off	/
	Overcurrent protection	Flashing 1	Lights off	/
Discharging	Normal	Flashing 3	Lights off	/
	Alert	Flashing 3	Flashing 3	Reference Notes
	Undervoltage protection	Lights off	Flashing 3	Stop discharge
	Overcurrent protection	Lights off	Lights on	Stop discharge
Temperature	Protection	Lights off	Lights on	Stop charging includes three types of temperature protection for battery cell / MOS / environment
Invalid	Battery failure, NTC failure	Lights off	Lights on	Stop charge/discharge
	Reverse connection, short circuit protection			
	Voltage sensor failure			
	Current sensor failure			
	Charge and discharge MOS failure			

LED strip SOC display:

Push the SOC button, the battery will show current SOC



SOC	Lights show
＜10%	
10%~25%	
25 %~50 %	
50 %~75 %	
75 %~100%	

2.5 Sleep and Wake Up Function Description

1） Wake up

When the system is in low power consumption mode and any of the following conditions are met, the system will exit the low power consumption mode and enter the normal operation mode: When the charger is connected, the output voltage of the charger must be higher than 48 V.

- Operate the power switch button to restart the battery.
- Connect to the communication line and open the software of the upper computer (It enters the sleep state due to over-discharge protection, and this method cannot wake up the protection board).

2） Hibernate

When any of the following conditions is met, the system enters low power consumption mode:

- The individual or overall over-discharge protection has not been released within 3 minutes.
- The minimum cell voltage is lower than the sleep voltage, and the duration reaches the sleep delay time (At the same time, no communication and no current are satisfied).

- Standby time more than 1 hour (configurable) (no communication, no charge and discharge, no charger access).
- Forced shutdown through the host computer software.

Before entering the sleep mode, make sure that the input terminal is not connected to external voltage or external communication, otherwise it will not be able to enter the low-power sleep mode.

3 Installation and Configuration

3.1 Environmental Requirement

3.1.1 Working Temperature

Operating temperature range of this product: -30℃ ~ 60℃; optimum temperature: 18℃ ~ 30℃; **Note:** Exceeding the operating temperature range will cause over/low temperature alarm or protection of the battery system, which may reduce cycle life.

3.1.2 Heating System

This product has a heating function which is automatically controlled by the battery. **Note:** Exceeding the operating temperature range will cause battery system over/low temperature alarm or protection, possibly resulting in reduced cycle life.

3.1.3 Fire-extinguisher System

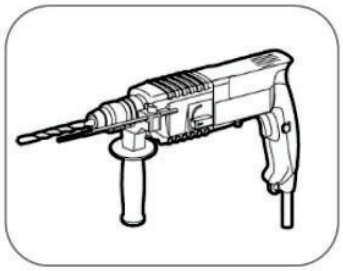
For safety, the room must be equipped with a fire extinguishing system. The fire protection system needs to be checked regularly to see if it is in normal condition. Refer to use and maintenance requirements and follow local fire protection equipment guidelines.

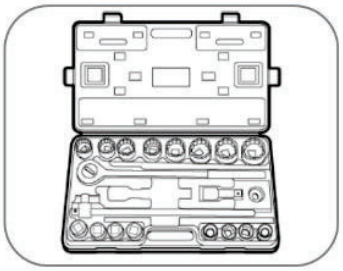
3.1.4 Grounding System

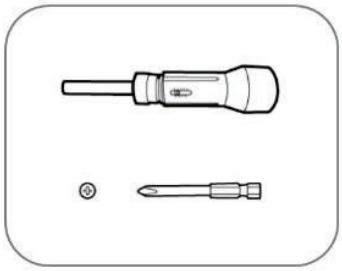
Before installing the battery, make sure that the grounding point of the battery system is stable and reliable. If the battery system is installed in a separate equipment compartment (such as a container), it must be ensured that the grounding in the compartment is stable and reliable.

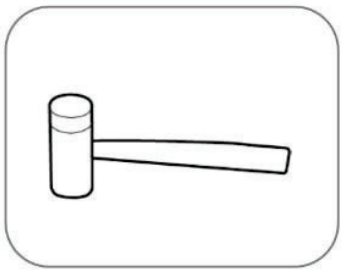
3.2 Tools

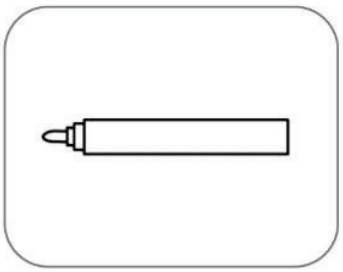
The following tools are required for the installation of the battery packs:

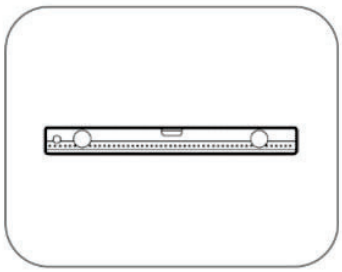

Percussion drill


Socket wrench


Cross screwdriver


Rubber hammer


Maker pen


Horizontal ruler

Caution: Using properly insulated tools to prevent accidental electric shock or short circuit. If no insulating tool is available, cover the entire exposed metal surface with an available insulating substitute.

3.3 Safety Gear

It is recommended to wear the following safety equipment when installing the pack:


Insulated gloves


Goggles


Work shoes

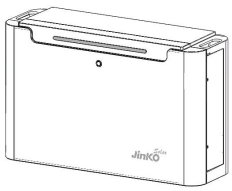
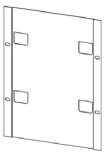
3.4 Unpacking Inspection

- After the equipment arrives at the installation site, it should be loaded and unloaded according to regulations to avoid long-term sunlight exposure.
- Before unpacking, the total number of packages should be indicated according to the shipping note attached to each package, and the boxes should be checked for integrity.
- During the unpacking process, handle carefully to protect the surface coating of

the item.

- The technical documentation should be read carefully before opening the package and the installer. Checklist to ensure items are complete and in good condition according to configuration sheet and packing list. If the inner packing is damaged, it should be checked in detail and recorded.

The list of accessories is as follows:

Name	Feature	Number	Picture
JKS-B51100-GI	Battery pack	1	
Wall-mounted backboard	Wall-mounted back plate	1	
Expansion screw	Screws for fixing the wall-mounted back plate	4	
Parallel positive wire	Positive parallel cable between batteries	1	
Parallel negative wire	Negative parallel cable between batteries	1	
Parallel communication line	Communication cable between batteries	1	
Ground wire	GND cable between batteries	1	
User manual	User manual	1	

3.5 Equipment Installation

Table 3-1 Installation Steps

Number	Installation Steps	Description
1	Unboxing inspection	Unpack the product and check whether the accessories are complete.

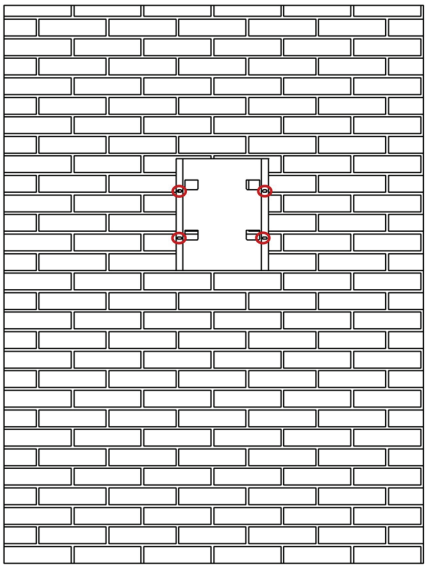
2	Calibration hole	Use the mounting back plate to mark the drilling position of the expansion screw on the wall.
3	Fixed backplane	Use expansion screws to fix the wall-mounted back plate to the wall.
4	Stackable battery packs	Hang the battery pack on the back panel.
5	Connection harness	Connecting the battery parallel power line, the parallel communication line, and the power line between the battery and the inverter. And connecting the communication wire and ground wire between the battery and the inverter.
6	Power-on and check	Power on and check the working status.

3.5.1 Unpacking Inspection

Please be sure to check that the pack and accessories are complete and undamaged immediately after unpacking. If there is any shortage or damage, please contact the supplier or manufacturer in time.

3.5.2 Calibration Hole

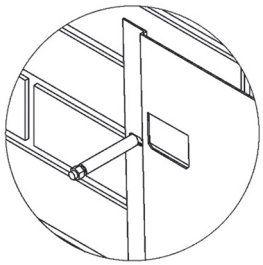
Firstly, please select a suitable installation location and reserve enough installation space. According to the vacant space for installing the back panel, mark the hole position on the wall. The battery can be put on the ground or mounted to the wall. As shown below:



Position and drill holes

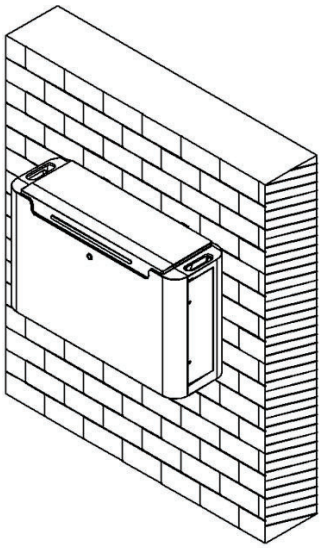
3.5.3 Fixed Back Plate

Fix firmly the back plate with expansion screws with the rubber hammer.

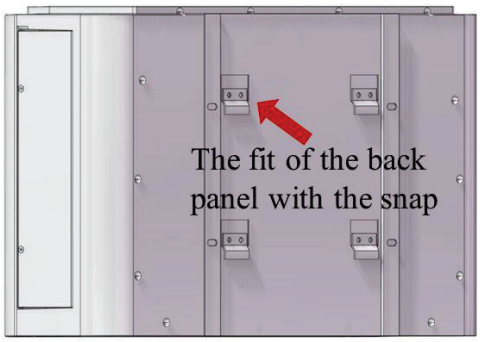


3.5.4 Stackable Battery Packs

It is best to hang the battery pack on the back panel with two people, as shown in the following figure:



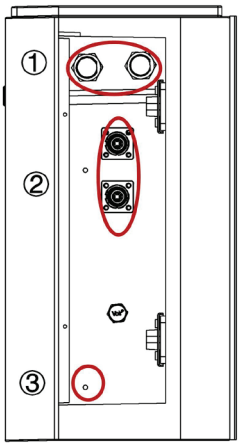
On the front



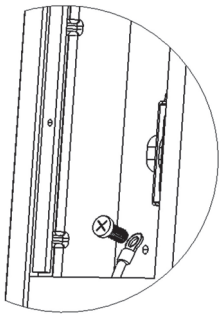
On the back

3.5.5 Connect the cables

Please open the left and right side panels of the pack, we can see the following interface. ① are communication terminals. ② are parallel line terminals and ③ is GND terminal.

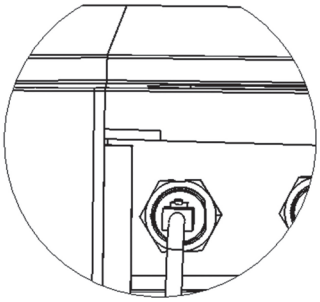


3.5.5.1 Connect GND wire



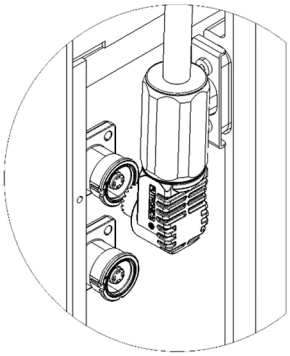
3.5.5.2 Connect communication wire

If you only have one pack, you only need to connect the communication cable to the inverter. If you are stacking multiple packs, you need to connect communication cables with other packs.

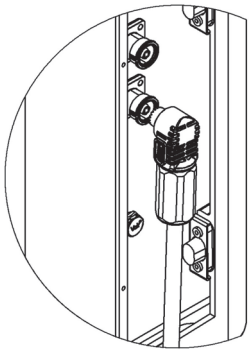


3.5.5.3 Connecting cables.

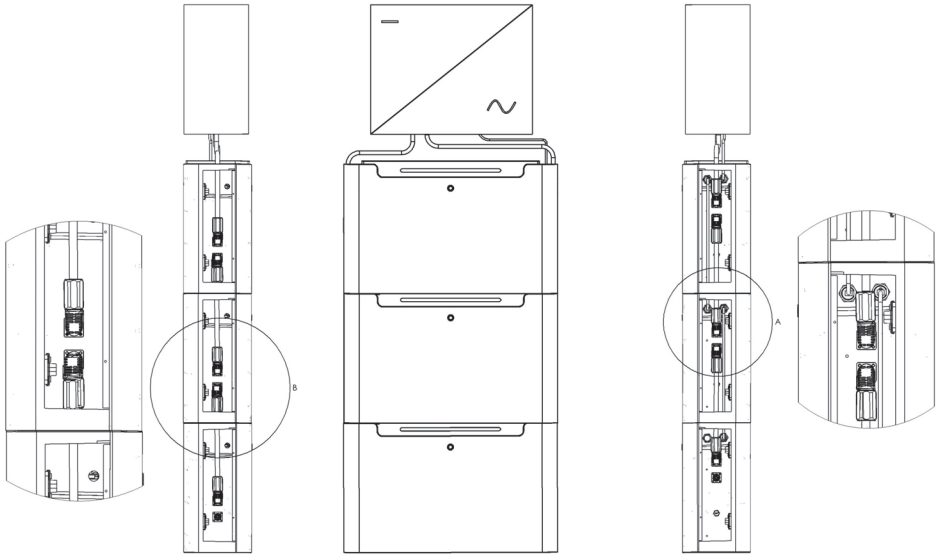
(1) If you only have one pack, just connect up and parallel with the inverter.



(2) If you are stacking multiple packs, you also need to parallel with other packs down.



Taking three pack stacking as an example, the following figure is a schematic diagram of cable connection.



The left side

The right side

4 Maintenance

4.1 Trouble Shooting

Note: This product should only be operated by professionals or authorized personnel.

Note: All cable connections must be checked before checking for faults. Whether the switch is correct, and the battery system can wake up normally.

Table 4-1 Troubleshooting Worksheet

Failure situation	Cause of issue	Solution
Power button not responding	The start wire is damaged or has poor contact	Please contact the supplier or manufacturer.
Short discharge time	Low battery SOC	Connect the inverter for charging until fully charge the battery.

Short discharge time/ charge and discharge failure	Battery overload	Check the load status and exclude non-critical loads.
	Battery aging leads to capacity loss	Please contact the factory to replace the battery pack and its parts。
	Internal failure	Please contact the manufacturer.
Charge and discharge failure/pack communication exception	Temperature of pack is too high	Stop charging and discharging. Let the battery pack be static at room temperature for more than 3 hours.
	The communication line is damaged or has poor contact	Check whether the battery pack communication is normal.
No response light after power on	Total voltage too low	Check the output voltage.
	Damaged indicator light	Please contact the supplier or manufacturer.
Battery cannot fully charged	Charging voltage is too low	Adjust the charging voltage to 58.4 V, or connect the inverter to perform charging.
Battery overvoltage	Battery DC voltage is too high	Stop charging and put it on hold for more than 30 minutes. If it does not recover, please contact the supplier or manufacturer.
Battery undervoltage (EOD)	The battery DC voltage is lower than the lower limit	Charge the battery
Pack temperature sensor failure	Temperature sensor failure	Please contact the supplier or manufacturer.
Temperature of pack is too high	There is a heat source around, causing the ambient temperature to be too high	Keep away from heat sources and reduce ambient temperature. If it still cannot be recovered after cooling down, please contact the supplier.

Note: If the fault still persists, please contact the manufacturer as soon as possible.

Note: Do not disassemble this product by yourself!

When you need to report a fault, please record and communicate the following

information:

a) Product model;

b) Serial number;

c) Date of failure, complete description of the problem (including LED display, working status before failure, etc.).

4.2 Replacements of Battery

Note: Maintenance of the battery should only be performed by professional authorized personnel.

Note: The battery system needs to be shut down first when performing some maintenance items.

4.2.1 Voltage Check：

【Regular maintenance】Check the battery system voltage through the host computer. Check if the system voltage is normal. For example: Check whether the voltage of a single cell is out of the rated range.

4.2.2 Battery check

【Regular maintenance】Check the SOC of the battery system through the host computer. Check whether the SOC of the battery pack is normal.

4.2.3 Consistency Check

【Regular Maintenance】If it is not fully charged for a long time, the battery system will become unbalanced. Solution: Balance maintenance (full charge) every 3 months.

5 Storage Recommendations

- The battery module should be placed in a dry, clean and well-ventilated environment at -10~45℃(Temperature) and 5%~85%(Humidity). The battery should be charged to 50~55% before long-term storage.
- It is recommended to activate the battery system (charge and discharge) every 3 months, and the longest storage time without charge and discharge does not exceed 6 months.
- When the battery is stored, it should be placed correctly according to the box identification, not upside down or sideways.
- When the battery box is stacked, it should meet the stacking requirements on the outer packaging.
- When the battery is handled, it is required to be gently handled, and it is strictly forbidden to damage the battery.

Warning: If the battery is stored for extended periods of time without following the above instructions, the cycling life of the battery will be relatively significantly reduced.

6 Shipment

Battery modules will be pre-charged to 50 % before shipment or as per customer request. The remaining capacity of the battery cell is determined by the storage time and condition after leaving the factory.

- The battery module meets the UN 38.3 certification standard.
- In particular, special rules for the carriage of goods on the road and the current dangerous goods law, specifically ADR (European Convention on the International Carriage of Dangerous Goods by Road), as amended, must be observed.

No.1, Yingbin Road,
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