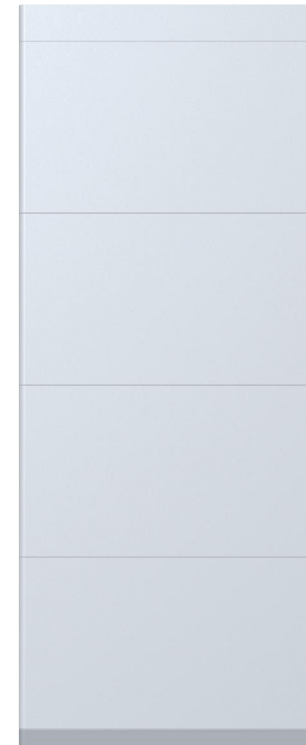




RECHARGEABLE LI-ION BATTERY SYSTEM

(Low-voltage)



User Manual



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About this Document

This document describes the installation, electrical connections, operation, commissioning, maintenance, and troubleshooting of the SAL5-0L and the SAL5-0L Battery System (hereafter referred to as the SAL5-0L). Before installing and operating the SAL5-0L, make sure you are familiar with the product features, functions and safety precautions provided in this document.

Symbol	Description
 WARNING	Indicates a potentially hazardous situation, if not avoided, could result in serious injury or death.

Foreword

- All information in this document is the property of the battery system manufacturer. Any parts of this document shall not be copied or reproduced in any commercial forms. Internal use allowed.
- The manufacturer makes no warranties or guarantees, express or implied, with respect to any device and/or software other than this product that may be described in this document, including, but not limited to, any implied warranties of merchantability, fitness for a particular purpose, accuracy or completeness of responses.
- In no event shall the manufacturer or its distributors or resellers be liable for indirect, incidental or consequential damages arising from non-compliance with the guidelines in this document.
- Specifications in this document are subject to change without notice. Every effort has been made to make this document complete, accurate and up to date. However, the manufacturer may require some improvements under certain circumstances without prior notice. The manufacturer shall not be liable for any damage caused by this document, including but not limited to omissions, typographical errors, arithmetic errors or errors listed in the document.

Disclaimer

The manufacturer shall not be liable for direct or indirect battery system damage or property loss caused under the following circumstances.

- Modify or replace parts without official authorization from the manufacturer.
- Change or clear the serial number by non-manufacturer technical professionals.
- System, assembled with other devices, design and installation fail to meet standards, safety regulations and other relevant requirements.
- Battery system damage caused by failure to comply with the user manual.
- Battery system damage caused by improper use or misuse.
- Battery system damage caused by insufficient ventilation.
- The maintenance procedures do not comply with acceptable standards.
- Battery system damage caused by force majeure, such as earthquake, storm, lightning, overvoltage, fire, etc.
- Battery system damage caused by any external factors.

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01 Safety

Safety information contained in this section must be observed at all times when working on or with batteries. For safety, installers are responsible to familiarize themselves with this manual and all warnings before installation.

1.1 Basic Security

The PACK has been designed and tested to comply with strict international safety certification requirements. Please read all safety instructions carefully before operation and always observe the relevant regulations when operating or making the PACK. The company is not responsible for the consequences of violating 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.
- PACK tamper label is damaged or product with any part missing (except the authorized disassemble parts).
- Operate and use in extreme environments not allowed in this document.
- Repair, disassemble, or change PACKs without authorization and cause failure.
- Damage to shell labels or modifies date of production.
- PACK fail to be charge for more than six months.
- Damages due to force majeure (such as lightning, earthquakes, fire, and storms).
- Warranty expiration.

1.2 Safety Precautions

1.2.1 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 PACK shall not come in contact with liquids.
- The PACK can only be installed indoors. Regarding indoor installation, please do not install it in the bedroom, living room, kitchen, etc.

1.2.2 Operation Precautions

- Do not touch the PACK with wet hands.
- Do not disassemble the PACK without permission.
- Do not crush, drop or puncture the PACK and battery.
- 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 break 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.

1.3 Warning Labels

Symbol Explanation



Caution!
Failure to observe any warnings contained in this manual may result in injury.



Danger-high voltage and electric shock!



Danger-hot surface!



The components of the product can be recycled.



Lithium ion battery can be recycled.



This side up! This package must always be transported, handled and stored in such a way that the arrows always point upwards.



No more than six (6) identical packages being stacked on each other.



Products shall not be disposed as household waste.



Fragile - The package/product should be handled with care and never be tipped over or slung.



Refer to the operation instructions.



Keep dry! The package/product must be protected from excessive humidity and must be stored under cover.



CE mark.



UK certification.



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.



Personal protective equipment is required during installation, operation and maintenance.



Protective earth wire connection point.

1.4 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: Emetic, and seek medical help.
Fire	It's hard for PACK systems ignite spontaneously. If the PACK has caught a fire, do not try to extinguish the fire but evacuate people immediately.
Wet Packs	Do not touch the PACK if it is flooded or submerged. Contact an after-sales service centre or distributor immediately for technical assistance.
Damaged PACKS	Damaged PACKs are dangerous and must be handled with extreme care. They are no longer suitable for use and may pose a danger to people. If the PACK is damaged, stop using it and contact an after-sales service centre or distributor.

02 Product Overview

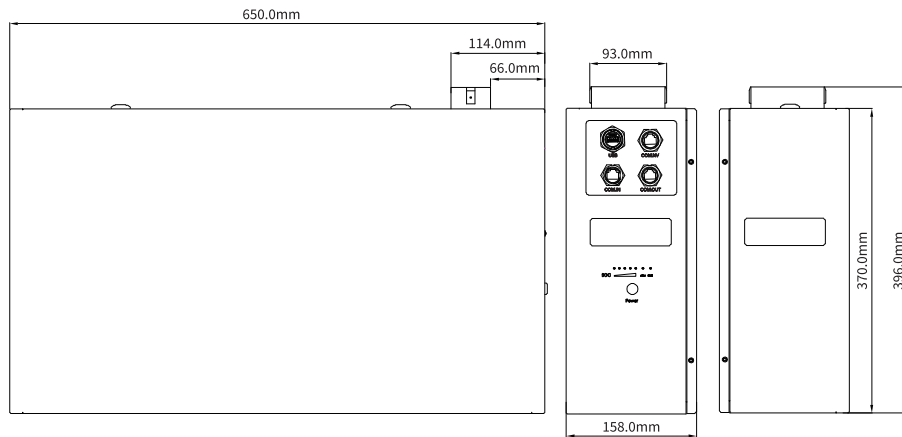
2.1 Intended Use

Each SAL5-0L consists of 100Ah batteries forming a 51.2V battery module and 16 serial connections (1P16S). Up to 4 batteries can be connected in parallel to a single PACK and up to 6 PACKs can be connected in parallel to expand the capacity and power of the energy storage system. PACKs of the same type of battery and the same software version can be used in parallel. Specifically, when there is no solar energy at night, the SAL5-0L Battery System supplies power to the loads through the inverter; when solar energy is available during the day, the solar energy is prioritised to supply power to the loads and the remaining solar energy is stored in the SAL5-0L Battery System.

2.2 Appearance

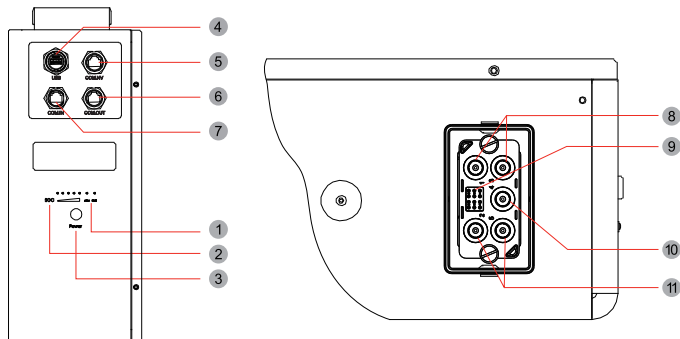
SAL 5·0L consists of battery module (including cell and mechanical parts), battery management system (BMS) as well as power and communication terminals. Product appearance is shown as below.

2.2.1 Dimension

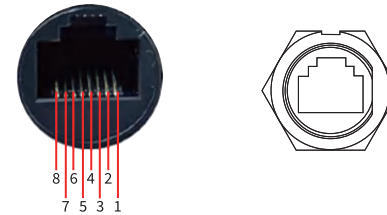


Battery size diagram

2.2.2 Introduction to the Battery Operation Panel



1	Fault light	7	COM.IN for multi-cluster in parallel communication
2	SOC light	8	Negative terminal
3	Power button	9	Communication between battery packs of single cluster
4	USB interface	10	PE terminal
5	COM_INV for INV CAN communication	11	Positive terminal
6	COM.OUT for multi-cluster in parallel communication		



COM_INV Interface Definition	
RJ45 Pin No.	Definition Note
1	WAKE_UP+
2	WAKE_UP-
3	GND_COM
4	INV_CANH
5	INV_CANL
6	GND_COM
7	INV_RS485A
8	INV_RS485B

COM_IN Interface Definition	
RJ45 Pin No.	Definition Note
1	CLUS_CANL
2	CLUS_CANH
3	CLUS_MASTER
4	GND_COM
5	CLUS_POWER
6	GND_COM
7	CLUS_MAS_TX
8	CLUS_MAS_RX

COM_OUT Interface Definition	
RJ45 Pin No.	Definition Note
1	CLUS_CANL
2	CLUS_CANH
3	GND_COM
4	CLUS_SLAVES
5	CLUS_POWER
6	GND_COM
7	CLUS_SLA_RX
8	CLUS_SLA_TX

2.3 Working Principle and Function

The SAL5-0L is an energy storage unit consisting of an electrochemical battery, a switching button, a battery management unit, power and signalling terminals and mechanical components. It offers better charging and discharging performance, more accurate condition monitoring, longer cycle life and less self-discharge losses than other batteries. Very scalable, up to 4 batteries can be paralleled in a single cluster and up to 6 clusters can be paralleled to expand the capacity and power of the energy storage system.

The whole battery system communicates to Power Conversion System (Inverter) via CAN.

Monitoring: voltage, current and temperature detection of both single cells and PACK.

Protection and alarms: Provide protection and alarms in the event of over-voltage, under-voltage, over-current, over-heating or under-temperature. See 7.4 for details.

Report: Report all alarms and status data to the inverter.

Power off triggered by fault: PACK and inverter communication is interrupted for 25 minutes or undervoltage protection for 2 minutes.

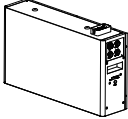
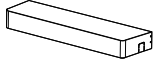

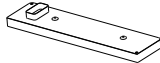



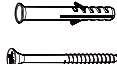


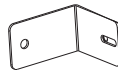

03 Equipment Inspection and Storage

3.1 Check Before Signing

Before signing for the product, please check the following in detail:

1. Check whether the outer packaging is damaged, such as deformation, holes, cracks or other signs that may cause damage to the equipment in the box. If there is any damage, please do not open the packaging and contact your dealer.
2. Check whether the device model is correct. If there is any discrepancy, please do not open the package and contact your dealer.
3. Check whether the type and quantity of the delivered parts are correct, and whether there is any damage to the appearance. If damaged, please contact your dealer.

3.2 Packing List

 Battery module x1	 Wire shade x1	 Accessory for connecting wall x2	 Base x1
 Foot pad bolts x4	 M4 combination screws x4	 M3 combination screws x2	 Expansion bolt x4
 M5 combination screws x2	 User manual x1	 Chassis Locking Wall Bracket x1	 Cable x1

★ annotate: optional.

PACK for Battery Module Abbreviation.

3.3 Storage Requirements

- Place the PACK follow the identification on the packing case during storage.
- Do not put the PACK upside down or sidelong.
- The defective PACK needs to be separated from other PACKS.
- The storage environment requirements are as follows:
 - ① Install the PACK in a dry and clean place with proper ventilation.
 - ② The storage temperature for a short week is between -20°C to 50°C.
 - ③ If you store the PACK over a long period of six months, the storage temperature is between -20°C to 40°C, relative humidity: 10%~85%RH.
 - ④ Place the PACK away from corrosive and organic substances (including gas exposure).
 - ⑤ Free from direct exposure to sunlight and rain.
 - ⑥ At least two meters away from heat sources (such as a radiator).
 - ⑦ Free from exposure to intensive infrared radiation.
- If the PACK has not been used for more than six months, it needs to be charged, The charging procedure is as follows:
 - ① Identify the PACK that needs charging.
 - ② Refer to quick installation guidance, complete the installation and wire connection. Ensure PACK in off status during all the steps.
 - ③ Set the power system as “ $CC \leq 25A$, $CV=55.8V$ ”, activate the PACK and start recharging.
 - ④ Charge until the battery is fully charged.
 - ⑤ Having completed recharge, leave circuit open for five minutes before check voltage. If voltage is not less than 52V, the recharge succe.

3.4 Transportation Requirement

- The PACK shall not be transported with other inflammable, explosive or toxic substances.
- Ensure the original Package and label complete and recognizable.
- Prohibit direct exposure to sunlight, rain, condensing water caused by temperature difference and mechanical damages.
- There will be a drop in capacity during transportation and storage.
- Transportation temperature is between -20°C to 45°C, relative humidity: 10%~85%RH.

04 Installation



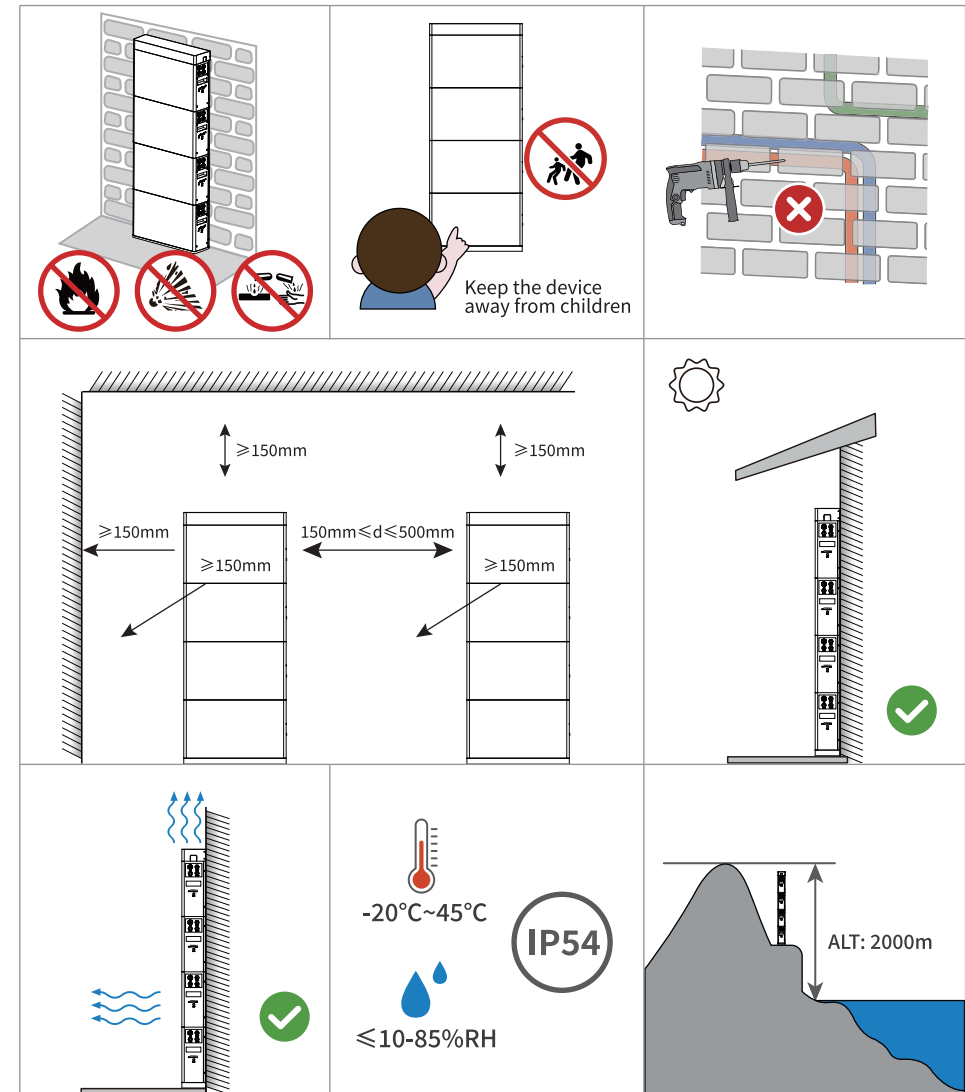
WARNING

- 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, 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.
- The PACK can only be installed indoors. Regarding indoor installation, please do not install it in the bedroom, living room, kitchen, etc.
- Different types of batteries are not recommended to be mixed and used in parallel.
- The battery system cannot be installed, dismantled, and maintained when it has been powered on.

4.1 Installation Requirements

Installation environment requirements

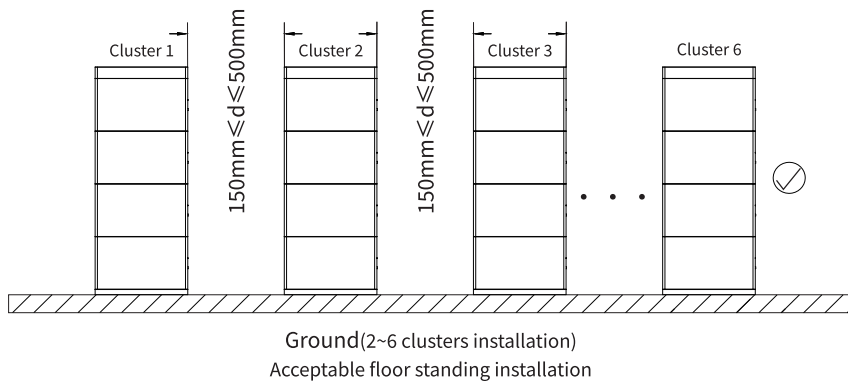
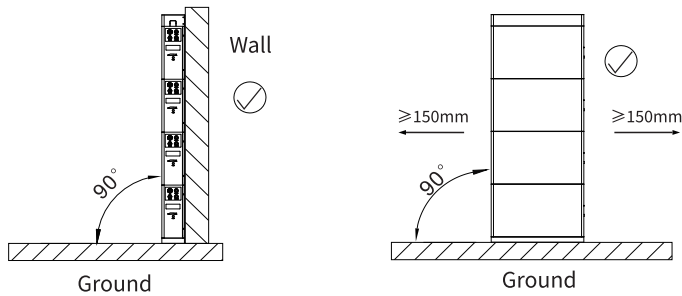
1. The equipment must not be installed in flammable, explosive or corrosive environments.
2. The installation location must be out of the reach of children, and avoid installation in easily accessible locations. High temperatures may exist on the surface when the equipment is in operation, preventing burns.
3. The installation location must avoid water pipes, cables, etc. in the wall to avoid danger when drilling holes.
4. The installation environment needs to be away from the sun, rain, snow, etc. It is recommended to install it in a sheltered installation location. If necessary, an awning can be built.
5. The installation space must meet the ventilation and heat dissipation requirements of the equipment and the operating space requirements.
6. The protection level of the equipment meets the indoor installation, and the temperature and humidity of the installation environment must be within a suitable range.
7. The equipment must be installed at a height that is convenient for operation and maintenance. Make sure that the equipment indicators and all labels are easy to view, and the wiring terminals are easy to operate.
8. The equipment installation altitude is lower than the maximum working altitude of 2000m.
9. Stay away from strong magnetic field environments to avoid electromagnetic interference. If there are radio stations or wireless communication equipment below 30MHz near the installation location, please ensure that the distance between the battery and the wireless electromagnetic interference equipment is greater than 30m.



Installation carrier requirements

- The installation carrier must not be made of flammable materials and must have fire-retardant properties.
- Make sure the mounting carrier is sturdy and can bear the weight of the device.
- The battery system needs to be installed close to the wall and an anti-tip bracket should be installed to prevent Installation carrier requirements the battery from tipping over.

4.2 Installation Basic Requirements



WARNING

Do not turn the PACK upside down, and keep the ground level.

4.3 Handling Equipment

Warning

- When carrying out transportation, turnover, installation and other operations, the laws, regulations and relevant standards of the country and region must be met.
- Before installation, the equipment needs to be transported to the installation site. To avoid personal injury or equipment damage during transportation, please pay attention to the following matters:
 - Please assign corresponding personnel according to the weight of the equipment to prevent the equipment from exceeding the weight range that the human body can carry and injuring people.
 - Wear safety gloves to avoid injury.
 - Please ensure that the device remains balanced during transportation to avoid falling.

4.4 Battery System Installation

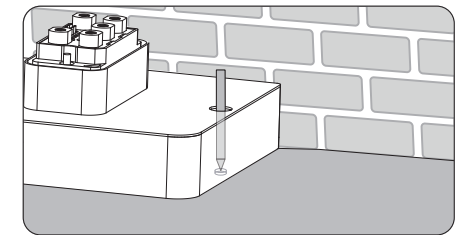
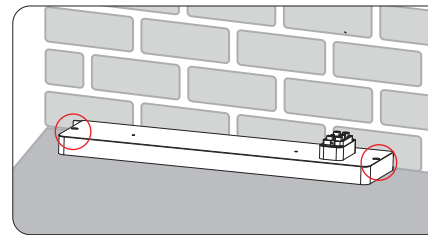
Warning

- Make sure the control box is installed above the battery. Do not install the battery above the control box.
- When installing the battery system, make sure the installation is level and firm. When placing the battery base, battery or control box, make sure that the upper and lower holes are aligned; the anti-tip bracket is vertically attached to the ground, wall or battery system surface.
- When using an impact drill to drill holes, the battery system must be covered with cardboard or other objects to prevent foreign matter from entering the device and causing damage to the device.
- Before installing the battery system, remove the cover of the battery module wiring port.

4.4.1 Installation Base (Without Foot Pads)

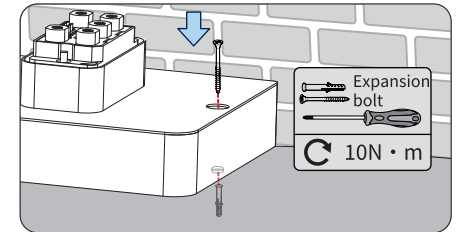
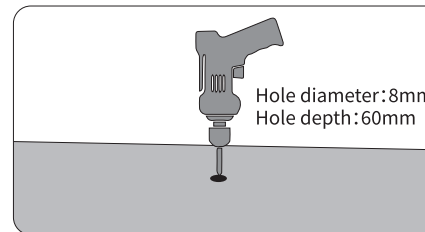
Step 1: Place the base against the wall and place it in a suitable position.

Step 2: Use a marker to mark the holes on the left and right sides, and then remove the base.



Step 3: Use an impact drill to drill the hole.

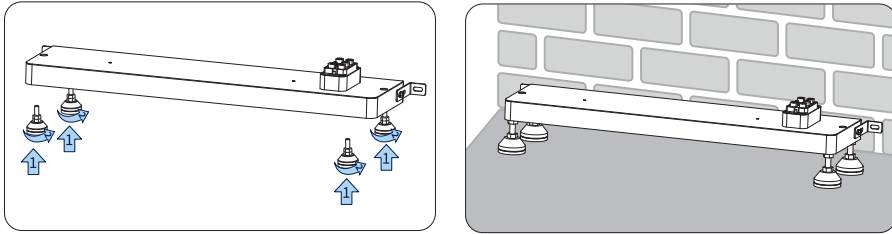
Step 4: After checking that the battery base is installed in the correct direction, use expansion bolts to fix the base.



4.4.2 Installation Base (With Foot Pads)

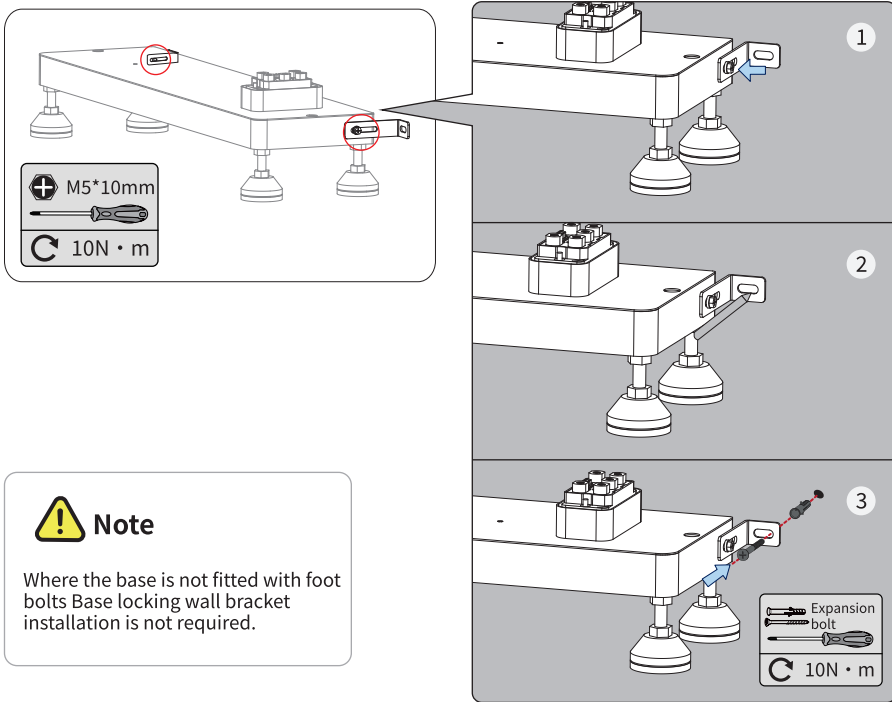
Step 1: Install the adjustable foot pad bolts to the base.

Step 2: Place the base against the wall and place it in a suitable position.



Step 3: Lock the base locking wall bracket to the base with M5 screws. (Both sides need to be fixed)

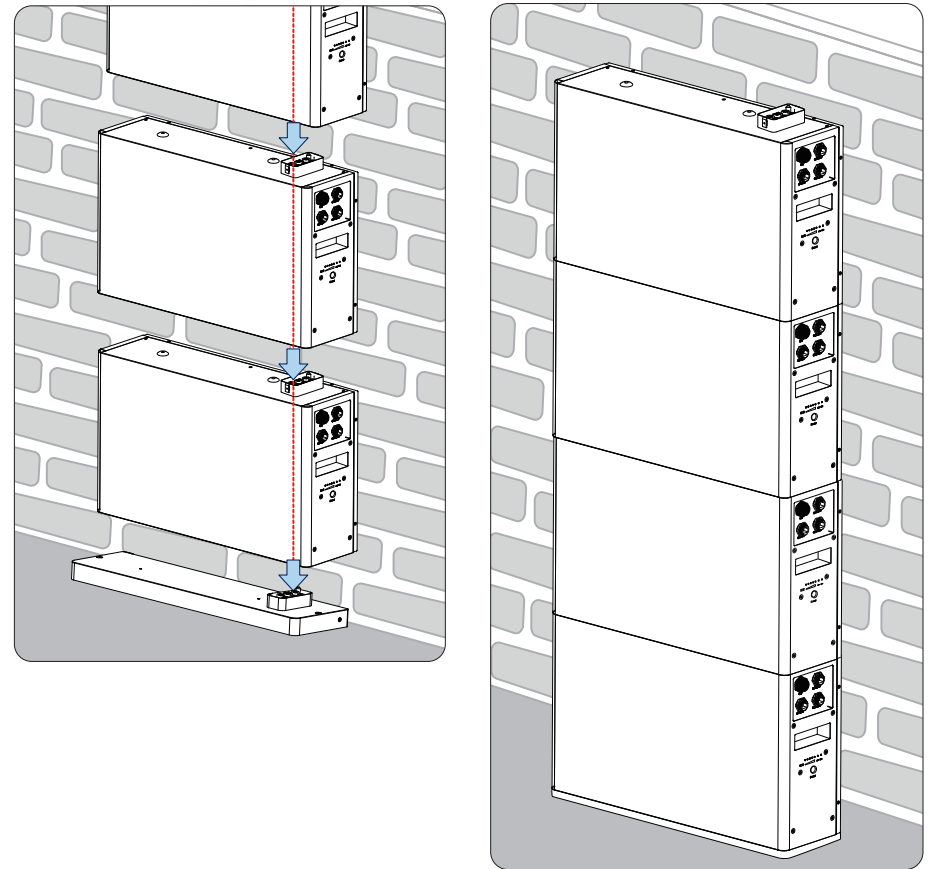
Step 4: Remove the base after marking the left and right side punch locations using a marker pen. Then use 2 expansion screws to complete the base locking wall bracket locking wall fixing. (Both sides need to be fixed)



4.4.3 Install Battery Module

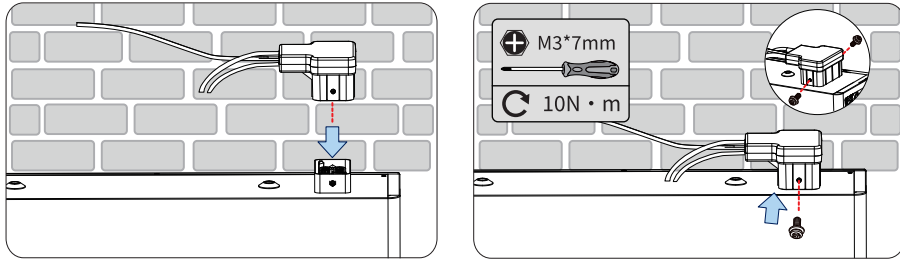
Step 1: Install the battery module according to the actual type of battery system selected.

Step 2: Slowly lower the bottom plug of the battery module against the battery socket to complete the docking of the bottom battery to the top battery.

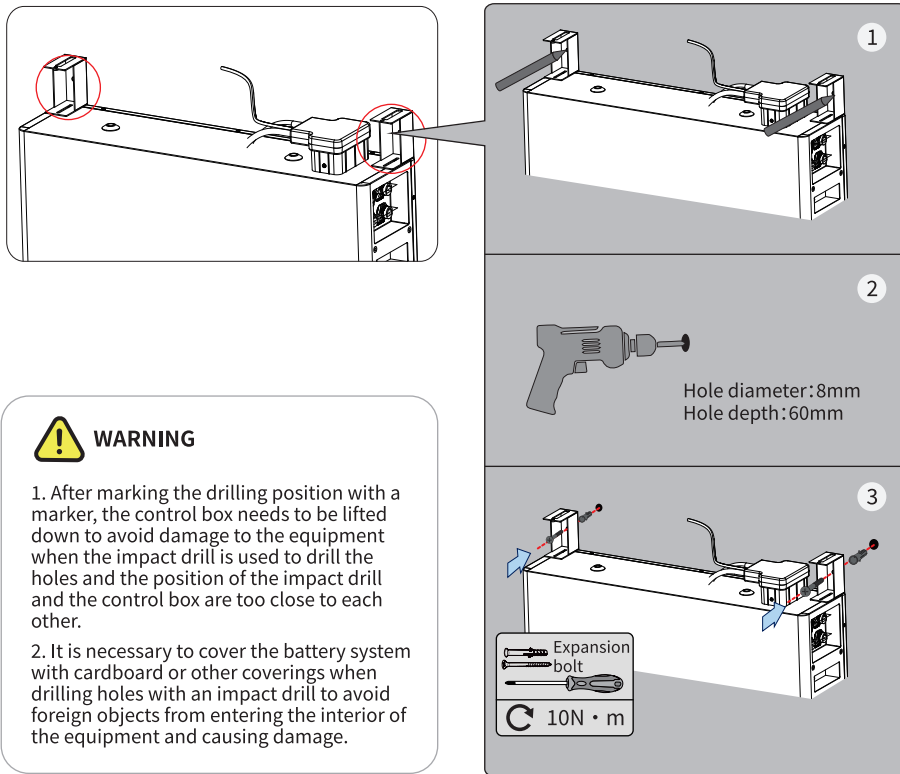


Step 3: Insert the combination plug into the wiring hole.

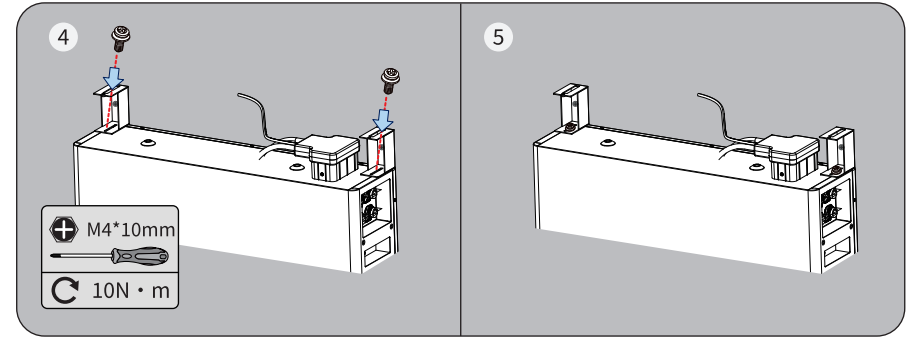
Step 4: Lock the connecting screws on both sides of the plug.



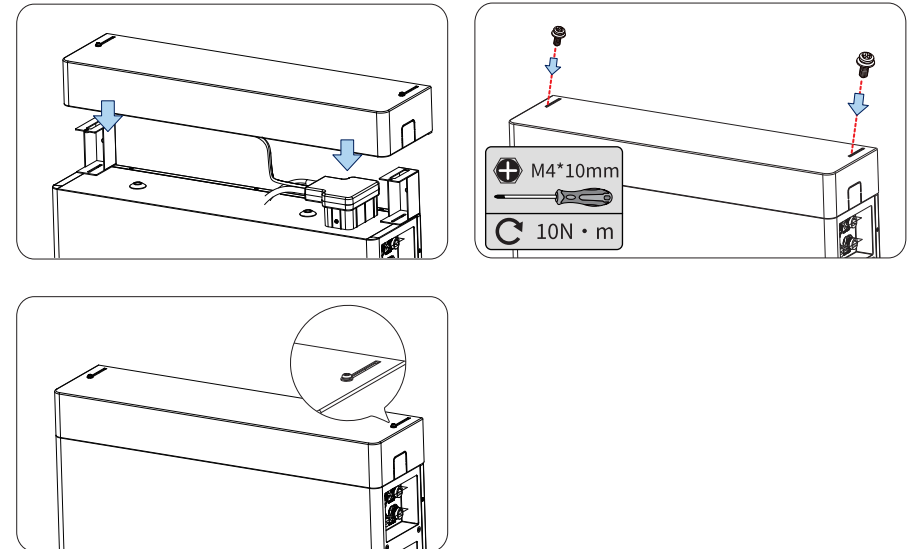
Step 5: Place the wall mount against the wall in a suitable position, use a marker to mark the position of the left and right side holes and then remove the wall mount. Use an impact drill to drill the holes, check that the wall bracket is installed in the correct direction, and then use expansion screws to fix it.



Secure the wall mounts and batteries on both sides with M4 screws.



Step 6: Once the installation is complete, cover the wire shield tightly in the right position and tighten the screws on both sides to secure it.



5.1 Safety Precautions

! Danger

1. This battery system is a high-voltage system, and high voltage exists when the equipment is running. Before operating the equipment in the system, make sure the equipment is powered off to avoid the risk of electric shock. When operating the equipment, you must strictly abide by all safety precautions in this manual and the safety signs on the equipment.
2. All operations, cables and component specifications used during the electrical connection process must comply with local laws and regulations.
3. Cables of the same type should be bundled together and arranged separately from cables of different types. It is prohibited to entangle or cross each other.
4. When crimping the terminal block, please ensure that the conductor part of the cable is in full contact with the terminal block. Do not crimp the cable insulation and the terminal block together. Otherwise, the equipment may not be able to operate, or the device may generate heat due to unreliable connection after operation. This may lead to damage to the inverter terminal block.

! Note

1. When making electrical connections, please wear safety shoes, protective gloves, insulating gloves and other personal protective equipment as required.
2. Only professionals are allowed to perform electrical connection related operations.
3. The cable colors in the graphics in this article are for reference only, and the specific cable specifications must comply with local regulations.

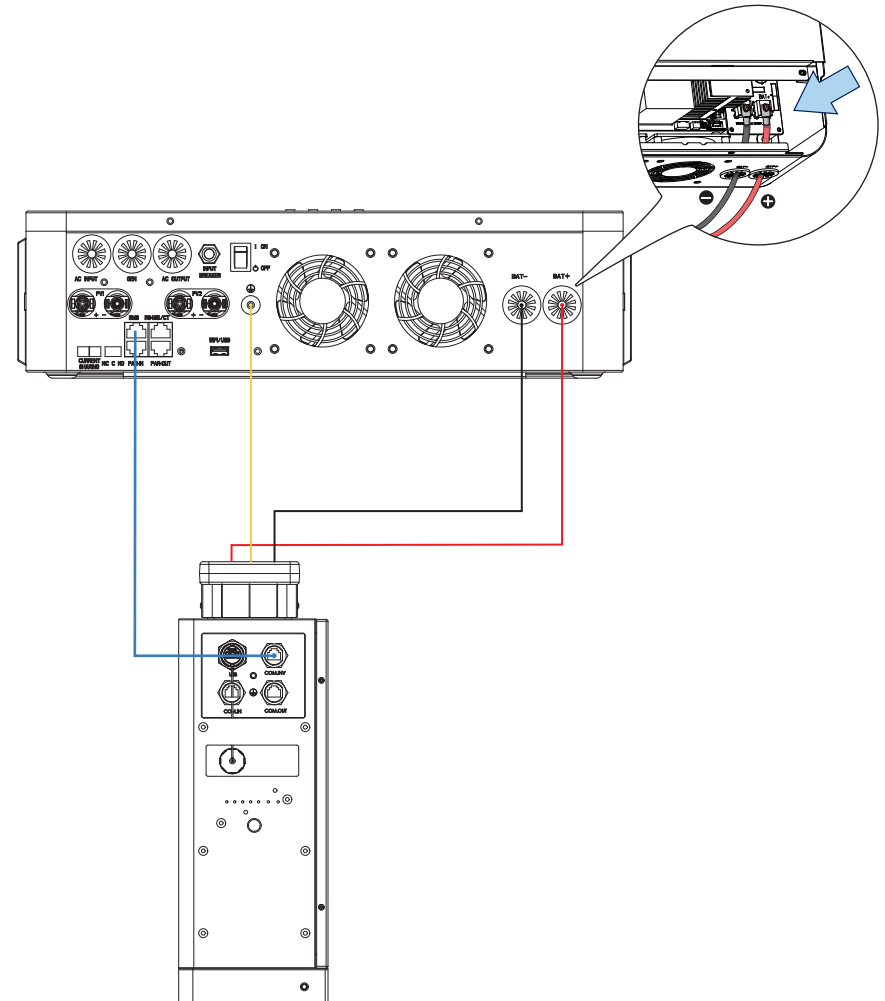
5.2 Electrical Connection

Insert the combination charger head into the top battery pack wiring hole, first install the protective ground wire, then connect the positive battery terminal BAT+ to the inverter BAT+, and the negative battery terminal BAT- to the inverter BAT-. Be careful not to connect the wrong wires.

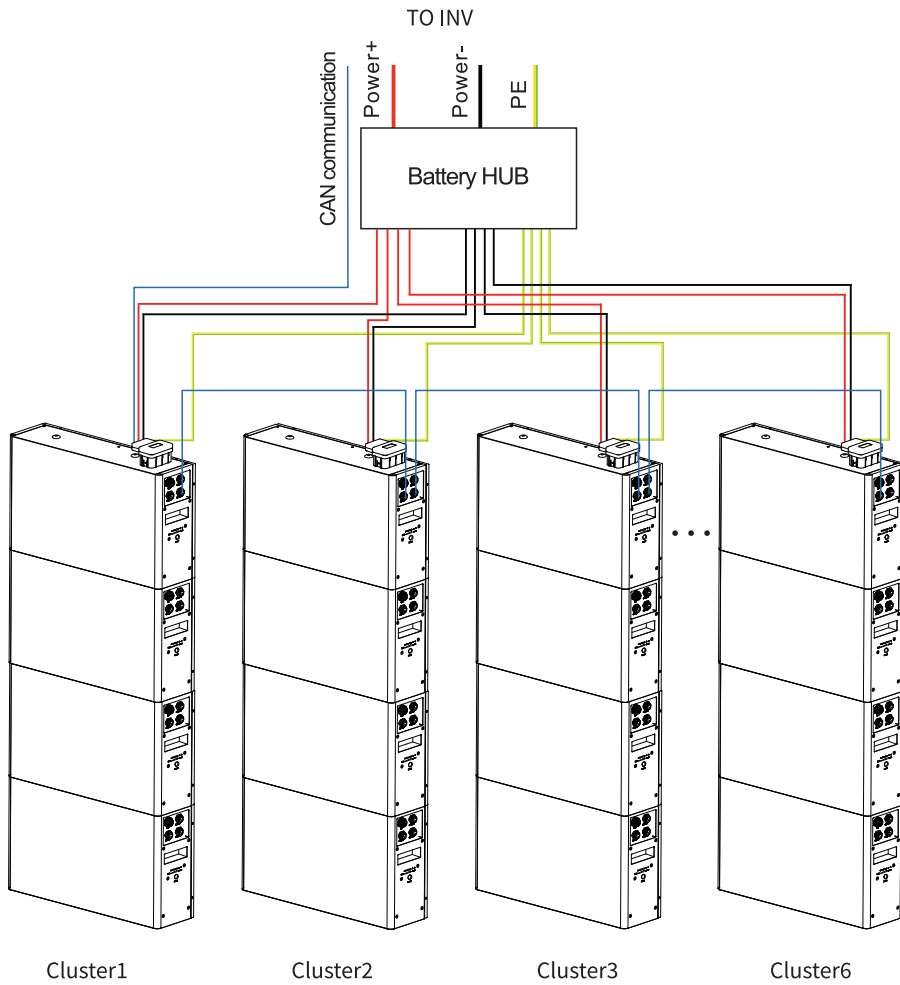
Connect the battery COM.INV communication port to the inverter BMS communication port using an RJ45 cable.

! Note

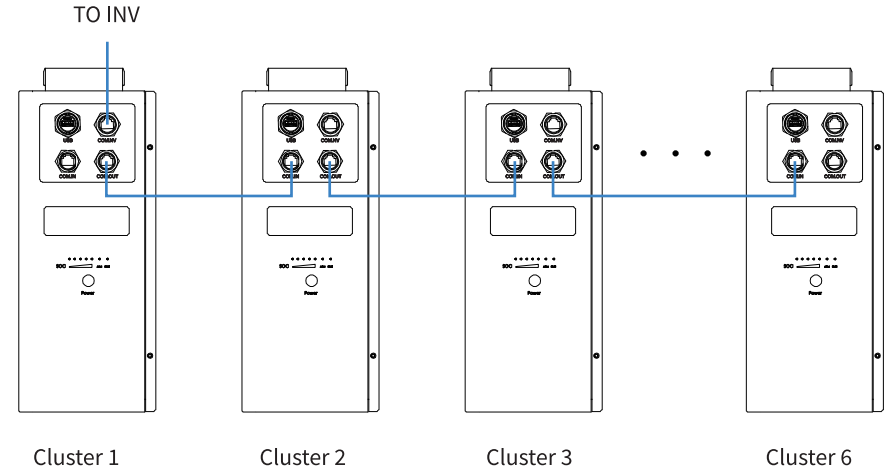
When installing the equipment, the protective earth wire must be installed first; when dismantling the equipment, the protective earth wire must be removed last.



5.3 Multi-Cluster Wiring



Block diagram of multi-cluster system




Multi-cluster communication wiring

Note:

- (1) See 5.2 for power cord wiring.
- (2) The power combiner box needs to be prepared by the user.
- (3) Please install the communication line first, then plug the unused communication port and USB port with a dust cover, and finally install the power line.
- (4) We recommend installing a circuit breaker between the inverter and each cluster. Regarding the specification of the circuit breaker, we recommend the use of a moulded case circuit breaker with a rated operating voltage greater than 80Vdc and a rated operating current greater than 200A.

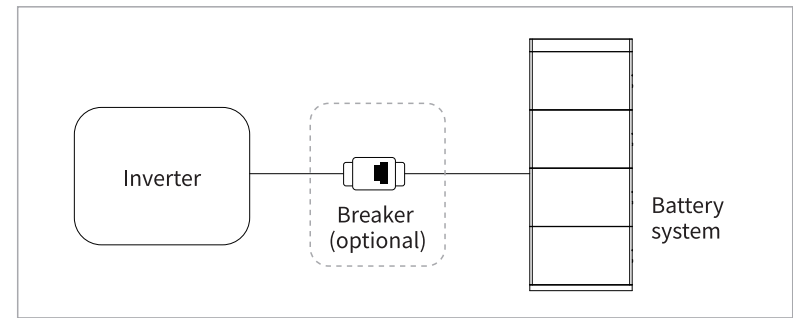
06 Power On And Off the Battery



WARNING

- The installation and use of batteries involve much specialized knowledge. Therefore, technicians should be given appropriate technical training and obtain operational certificates in compliance with local laws and regulations. Please ensure technicians have obtained training certificate before operation.
- Please stand on dry insulating objects and do not wear conductive material such as watches and necklace during operation. Insulated tools should be used.
- 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 PACK immediately. After problem confirmed, proceed again
- Make sure the inverter is turned off before checking the PACK

Power on the PACK by inverter		
1	Connecting the battery and inverter	Make sure the wiring harnesses are well connected
2	Close the breaker of the PACK	Make sure the breaker is ON
3	Turn on the inverter power. The inverter outputs a 5V wake-up signal or output 46-58V main circuit voltage signal.	<ol style="list-style-type: none"> 1. If both RUN/ALM and SOC lights turn on normal, PACK powers on successfully. 2. If ALM light turns red, there is a failure and should solve it before power on again.

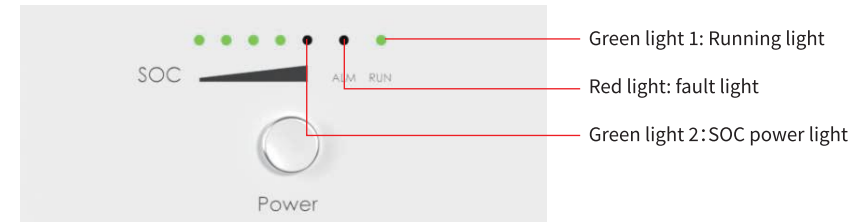


6.1 Power On

When multiple batteries are connected in parallel or multiple clusters of batteries are connected in parallel, press one of the battery power buttons and all the batteries connected in parallel can be turned on.

Power on the PACK by pressing power button		
Serial	Procedures	Acceptation criteria
1	Connecting the battery and inverter	Make sure the wiring harnesses are well connected
2	Close the breaker of the PACK	Make sure the breaker is ON
3	Press the power button. Observe the LEDs on the panel.	<ol style="list-style-type: none"> 1. If both RUN/ALM and SOC lights turn on normally, PACK is powered on successfully. 2. If ALM light turns red, there is a failure and should solve it before power on again.

6.2 Indicator Status



Indicator light	Condition
Green 1	When the PACK starts, the Running light starts blinking.
Green 2	SOC battery indicator light shows the current battery capacity.
Red	It does not light up during normal operation and is always on when a fault occurs.

SOC indicator light			
Describe	SOC=0%	0%≤SOC<20%	20%≤SOC<40%
SOC indicator light			
Describe	40%≤SOC<60%	60%<SOC<80%	80%≤SOC≤100%

6.3 Power Off

Press and hold the power button for three seconds to switch off the battery pack. If only one of the battery packs is switched off when more than one is connected in parallel, the whole battery system will be switched off.

Press the power button for about 5 seconds to turn off the PACK power.		
Serial	Procedures	Acceptation criteria
1	Disconnect the battery and inverter	Ensure wiring is disconnected
2	Turning on the PACK's Circuit Breaker	Make sure the circuit breaker is disconnected
3	Press the power button for about five seconds. Observe the LEDs on the panel.	If both the RUN and SOC lamps are off, the PACK power supply has been successfully disconnected. The PACK power supply has been successfully disconnected.

NOTE: If only one of the battery packs is switched off when multiple packs are connected in parallel, the entire battery system will be switched off.

07 Maintain

Danger

- When operating and maintaining the battery system, please power off the battery system. Operating the device with power on may cause damage to the device or risk of electric shock.
- When shutting down the battery system, please strictly comply with the battery system power-off requirements to prevent damage to the battery system.

7.1 Preparation

Tools like safety gloves, cross head driver and socket wrench should be prepared.

Turn off and turn on new PACK.

- If the PACK is power-off. Press the power button to switch it on.
- If the PACK is energised. Before servicing the battery, make sure the PACK is powered off by turning off the circuit breaker and pressing the power button for about 5 seconds. Install and wire as described above. Before turning on the circuit breaker, make sure the wires are connected properly. Then, turn on the circuit breaker and press the power button on any PACK to check that the system is working properly.
- When installing or maintaining, it is recommended that the battery SOC be at 35%~45% percent.

7.2 PACK Replacement

- Wear safety gloves.
- Open the breaker and power off the PACK.
- Remove your safety screw under the power supply, and disconnect the power cord and CAN communication line of the PACK.
- Remove the safety part at the left end of the battery and lift the PACK upward.
- Put the PACK into the packing box according to the repair procedure and transport the PACK to the designated repair site.
- Install new PACK based on procedure specified in Section 4.

7.3 Maintenance

Warning

1. If you find any problems that may affect the battery or energy storage inverter system, please contact after-sales personnel. Private disassembly is prohibited.
2. If you find that the internal copper wire of the conductive wire is exposed, it is forbidden to touch it, high-voltage danger, please contact the after-sales personnel, and it is forbidden to dismantle it privately.
3. If other emergencies occur, please contact after-sales personnel as soon as possible and perform operations under the guidance of after-sales personnel, or wait for on-site operation by after-sales personnel.

Maintain content	Maintenance cycle
Check whether the anti-tipping bracket is loosely installed, if so, please tighten the corresponding position.	Once every 6 months
Check whether the casing is damaged. If so, please repaint it or contact the after-sales service center.	Once every 6 months
Check whether the exposed wires are worn. If so, please replace the corresponding cables or contact the after-sales service center.	Once every 6 months
Check whether there is any debris accumulated around the battery. If so, please clean it to avoid affecting the heat dissipation of the battery.	Once every 6 months
Check for water or pests to avoid long-term intrusion into the battery.	Once every 6 months

7.4 Troubleshooting

When the battery system fails, it may cause the battery system to automatically shut down or some functions to become abnormal. Please troubleshoot according to the following methods. If the troubleshooting methods cannot help you, please contact the after-sales service center. When contacting the after-sales service center, please collect the following information to facilitate quick resolution of the problem.

1. Battery information, such as: serial number, software version, equipment installation time, fault occurrence time, fault occurrence frequency, etc.
2. Equipment installation environment, such as weather conditions, etc. Installation environment recommendations can provide photos, videos and other files to assist in analyzing problems.

Warning Code

Red light is blinking, RUN light is blinking.

SOC indicator	Fault category	Solution
	Cell overvoltage	Restart the battery, if the problem is not solved, please contact the after-sales service centre.
	Cell excessive differential voltage	In case of charging, charge the battery and wait for the voltage to rise and return to normal, if the problem is not solved, please contact the after-sales service centre.
	Cell undervoltage	In case of charging, charge the battery and wait for the voltage to rise and return to normal, if the problem is not solved, please contact the after-sales service centre.





SOC indicator	Fault category	Solution
	Battery undervoltage	In case of charging, charge the battery and wait for the voltage to rise and return to normal, if the problem is not solved, please contact the after-sales service centre.
	Battery overvoltage	Restart the battery, if the problem is not solved, please contact the after-sales service centre.
	Battery over-temperature (the changing and discharging over-temperature)	Turn off the machine and wait for 2 hours, if the problem is not solved, please contact the after-sales service centre.
	Battery under-temperature (the changing and discharging under-temperature)	Turn off the machine, wait for the temperature to rise, restart the battery, if the problem is not solved, please contact the after-sales service centre.
	Charging overcurrent	Restart the battery, if the problem is not solved, please contact the after-sales service centre.
	Discharging Overcurrent 1	Restart the battery, if the problem is not solved, please contact the after-sales service centre.
	Discharging Overcurrent 2	Restart the battery, if the problem is not solved, please contact the after-sales service centre.
	Discharging short circuit	Turn off the machine, unplug the checking device, restart the battery, if the problem is not solved, please contact the after-sales service centre.
	Charging short circuit	Turn off the machine, unplug the checking device, restart the battery, if the problem is not solved, please contact the after-sales service centre.
	PCB over-temperature	Turn off the machine and wait for 2 hours, if the problem is not solved, please contact the after-sales service centre.
	Precharge resistance over-temperature	Turn off the machine and wait for 2 hours, if the problem is not solved, please contact the after-sales service centre.
	MOS over-temperature	Turn off the machine and wait for 2 hours, if the problem is not solved, please contact the after-sales service centre.
	IUIP signal failure	Turn off the machine, check the parallel communication connection cable, restart the battery, if the problem is not solved, please contact the after-sales service centre.
	I_WORK signal failure	Turn off the machine, check the parallel communication connection cable, restart the battery, if the problem is not solved, please contact the after-sales service centre.

Error Code

Red light is always on, RUN light is blinking.

SOC indicator	Fault category	Solution
●○○○○●●	Battery voltage sampling wire broken	Restart the battery, if the problem is not solved, please contact the after-sales service centre.
●●○○○○●●	AFE communication failure	Restart the battery, if the problem is not solved, please contact the after-sales service centre.
○○●○○●●	EEPROM failure	Restart the battery, if the problem is not solved, please contact the after-sales service centre.
●●●○○●●	Voltage sensor failure	Restart the battery, if the problem is not solved, please contact the after-sales service centre.
○○●●○○●●	Extremely high battery voltage fault	Please contact the after-sales service centre.
●●●○○●●	Main circuit anomaly	Please contact the after-sales service centre.
○○●○○●●	Pre-charge over time	Restart the battery, if the problem is not solved, please contact the after-sales service centre.
○○○○○○●●	Dead battery	Restart the battery, if the problem is not solved, please contact the after-sales service centre.
●●○○○○●●	Inverter communication failure	Switch off the machine, check the communication cable with the inverter, if the problem is not solved, please contact the after-sales service centre.
●●●○○●●	Extremely high cell voltage fault	Restart the battery, if the problem is not solved, please contact the after-sales service centre.

08 Technical Parameter

	SAL5.0	SAL10.0	SAL15.0	SAL20.0
System Demo				
Rated Energy ¹	5.12kWh	10.24kWh	15.36kWh	20.48kWh
Usable Energy	4.6kWh	9.21kWh	13.82kWh	18.43kWh
Battery Type	LFP(LiFePO4)			
Number of Modules	1	2	3	4
Battery Configuration	16S1P	16S2P	16S3P	16S4P
Cycle life ²	4000 cycles			
Rated Voltage	51.2V			
Operating Voltage Range	40-58.4V			
Peak Current	150A 180S			
Depth of Discharge (DOD)	90%	90%	90%	90%
Max Continuous Charge/Discharge Current*	100A	120A	120A	120A
Rated Power*	5.12KW	6.14KW	6.14KW	6.14KW
Run Log Recording	32MByte			
Communication	CAN/RS485			
Weight	45KG	90KG	135KG	180KG
Dimensions(W*H*D mm)	650*158*370mm	650*158*740mm	650*158*1110mm	650*158*1480mm
Operating Temperature	Charge: 0°C < T < 55°C / Discharge: -20 < T < 60°C			

Storage Temperature	-20~45°C (≤3 Months) /-0~35°C (≤1 Years)
Humidity	≤10-85%
Altitude	≤2000m
Ingress Protection Rating	IP54
Installation Location	Floor Stand installation
Warranty ³	5 Years Warranty, 10 Years Performance Life
Country of manufacture	Made in China

- 1 . Test conditions: 25°C,100% DOD,0.33C charge & discharge.
2. Test conditions: 25°C,90% DOD,0.5C charge & 1.0C discharge.
- 3 . Refer to battery warranty letter for conditional application.