

**Dongguan Hinen New Energy Technology Co., Ltd**

Add: No.24 Dongkang Road, Dalingshan Town,
Dongguang City, Guangdong, China
Email: service@hinen.com
Tel: +86 (769) 89920666 ext 8318
Website: <https://www.hinen.com>

Hinen Australia Pty. Ltd.

Add: Suite 503, Level 5, Tenancy 3, 107 Mount Street, North Sydney
Email: service@hinen.com.au
Tel: +61 2 7258 1272
Website: <https://au.hinen.com>

Europe HL Hinen B.V.

Add: John M.Keynesplein 1, 1066EP Amsterdam
Email: service@hinen.com
Tel: +86 (769) 89920666 ext 8318
Website: <https://nl.hinen.com>

Hinen Energy Eastern Europe

Add: Wąska 95, 05-806 Sokółów Poland
Email: biuro@hinen.com
Tel: +48 606 807 712
Website: <https://pl.hinen.com>

Hinen South Africa (Pty) Ltd

Add: Ground floor, Block B, 100 West Street,
Sandton. Johannesburg 2196, South Africa
Email: SAfrica@hinen.com
Tel: +27 10 449 2306
Website: <https://za.hinen.com>

Hinen Technology East Africa LIMITED

Add: No.6, Kirichwa Lane Court, next to
GreenhouseMall, Ngong Road, Nairobi, Kenya
Email: EAfrica@hinen.com
Tel: +254789688999
Website: <https://ke.hinen.com>

Hinen West Africa LIMITED

Add: 25A-2 Talabi St, Ogba, Lagos 101233, Lagos, Nigeria
Email: WAfrica@hinen.com
Tel: +86 (769) 89920666 ext 8318
Website: <https://ng.hinen.com>



RECHARGEABLE LI-ION BATTERY SYSTEM

8.9-26.9kWh



User Manual

Notice

The contents of this document may be updated from time to time due to product version upgrades or for other reasons. If not otherwise agreed, the contents of this document do not replace the safety precautions on the product labels or in the user manual. All descriptions in this document are intended as a guide to use only.

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1 Forward

This document primarily provides an overview of the battery system, covering aspects such as product details, installation procedures, wiring, configuration, testing, troubleshooting, and maintenance. Please read this manual thoroughly before installing and using the battery system to understand the safety information and to become acquainted with the functions and features of the product. Please note that this document may be revised periodically. For the most current version and additional information about the product, visit the official website.

1.1 Applicable products

This document applies to the following product models:

B8900M-HA / B8900M-HB / B8900M-HC / B8900M-HP
B8900M-HAW / B8900M-HBW / B8900M-HCW / B8900M-HPW

1.2 Applicable personnel

Only for professionals familiar with local codes, standards and electrical systems, who have been professionally trained and are knowledgeable about this product.

1.3 Symbol definition

For better use of this manual, the following symbols are used to highlight important information, so please read the symbols and descriptions carefully.

Danger

Indicates a situation with a high potential for danger which, if not avoided, will result in death or serious injury.

Warning

Indicates a situation of moderate potential hazard that could result in death or serious injury if not avoided.

Caution

Indicates a situation with a low potential hazard that, if not avoided, could result in moderate or minor injury to personnel.

Note

Highlights and additions to the content may also provide tips or tricks for optimal use of the product that can help you solve a problem or save you time.

2 Safety precautions

This document contains information on safety precautions that must be followed when operating the equipment.

Note

The equipment has been designed and tested in accordance with strict safety regulations. However, as with any electrical equipment, it is important to follow the relevant safety instructions before performing any operation on the equipment, for improper operation may result in serious injury or property damage.

2.1 General safety

Note

1. The equipment has been designed and tested in accordance with strict safety regulations. However, as with any electrical equipment, it is necessary to follow the relevant safety instructions before performing any operation on the equipment, for improper operation may result in serious injury or property damage.
2. Please read this document carefully to understand the product and precautions before installing the equipment.
3. All operations of the equipment must be carried out by professional, qualified electrical technicians who are familiar with the relevant standards and safety codes of the project site.
4. When operating the equipment, it is essential to use insulated tools and wear personal protective equipment to ensure personal safety. When handling electronic devices, it is important to wear electrostatic gloves, ESD wrist strap, anti-static clothing and so on to safeguard the equipment from electrostatic damage.
5. Any damage to the equipment or injury to personnel resulting from improper installation, usage, or configuration of the battery, contrary to the provided documentation, will not be the responsibility of the equipment manufacturer. For additional warranty information, please refer to the official website.

System lock:

When the battery exceeds the limit (voltage, current and temperature) protection during use, it will be locked and cannot be recovered by itself. Please contact manufacturer for reset.

2.2 Battery safety

Danger

1. The battery system operates at hazardous voltage. Before operating the equipment in the system, make sure that the equipment is disconnected from the power supply to avoid the risk of electric shock. Strictly observe all safety precautions in this manual and the safety signs on the equipment during operation.
2. Inverters paired with batteries need to be approved by the battery manufacturer. The approved list of inverter and battery is available on the official website.
3. Do not disassemble, modify or repair the battery or BMS control unit without official authorisation from the equipment manufacturer, as this may pose a risk of electric shock or damage the equipment, for which the manufacturer will not assume any liability.
4. Do not hit, pull, drag, crush or step on the equipment, and do not expose the battery to fire as this could result in an explosion.
5. Do not place the battery in a high temperature environment. Avoid direct sunlight and make sure that there is no heat source near the battery. When the ambient temperature exceeds 60 °C, it is possible to fire.
6. Do not use the battery or BMS control unit if it is visibly defective, cracked, damaged or otherwise. Damaged batteries may cause electrolyte leakage.
7. To ensure the safety of the battery pack and its components during transportation, it is essential that transport personnel are professionally trained. Document the transportation process and maintain equipment stability to prevent any accidental drops.
8. Given the heavy weight of battery equipment, please assign personnels based on the weight of the equipment to avoid exceeding safe lifting limits, thereby preventing potential injuries.
9. If the battery fails to start, promptly contact an after-sales service center. Otherwise, it may result in irreversible damage to the battery.
10. Do not move the battery system while the battery is in operation. If you need to replace the battery or add batteries, please contact the after-sales service centre.

Danger

1. Ensure that the battery system is adequately protected during transportation and storage to prevent physical damage or malfunctions.
2. Transportation must be carried out by trained professionals, and the operations during the process must be recorded.
3. Ensure the battery system is securely placed on a stable, flat surface. Any tilting could lead to mechanical damage or potential safety risks.
4. Cables used in high-temperature environments may cause insulation aging or damage. The distance between cables and heating components or hot areas should be at least 30mm.
5. Bundling cables of the same type together is acceptable. However, cables of different types must be placed with a minimum separation of 30mm, and they should not be twisted or laid out in a way that causes physical stress or electrical interference.

Symbol definition

	Potential hazards exist when the equipment is operating. Please take precautions when operating equipment.		The equipment should be kept away from open flames or sources of ignition.
	Hazardous voltage hazard. Hazardous voltage is present when the unit is operating, make sure the unit is de-energized when operating the unit.		The equipment should be kept away from areas accessible to children.
	Please use the equipment rationally. If used under extreme circumstances, the equipment may explode.		Do not lift the unit after the battery system is finished wiring or while the battery system is in operation.
	The equipment contains corrosive electrolytes. Please avoid contact with leaking electrolyte or volatile gases.		When the equipment is working, do not directly disconnect or plug in the DC terminals.
	Batteries contain flammable materials, beware of fire.		Recycling sign.
	Before operating the equipment, please read the product manual in detail.		CE certification mark.
	Personal protective equipment is required during installation, operation and maintenance.		Protective earth wire connection point.
	The equipment cannot be disposed of as domestic waste. Please dispose of the equipment according to local laws and regulations, or send it back to the equipment manufacturer.		

2.3 Emergency measures

Battery electrolyte leakage

If the battery module leaks electrolyte, avoid contact with the leaking liquid or gas. The electrolyte is corrosive and contact may cause skin irritation and chemical burns. If you inadvertently come into contact with the leaked substance, perform the following actions:

- **Inhalation:** Evacuate contaminated area and seek medical help immediately.
- **Eye Contact:** Flush with water for at least 15 minutes and seek medical attention immediately.
- **Skin contact:** Wash affected area thoroughly with soap and water and seek medical attention immediately.
- **Ingestion:** Induce vomiting, seek medical attention immediately.

Fire

- When the battery temperature exceeds 150°C, the battery is at risk of fire, and the battery may release toxic and harmful gases if it catches fire.
- To avoid a fire, make sure there is a carbon dioxide, Novac 1230 or FM-200 fire extinguisher near the unit.
- When extinguishing a fire, do not use ABC dry powder fire extinguishers. Firefighters must wear protective clothing and self-contained breathing apparatus.

3 Product description

3.1 Product introduction

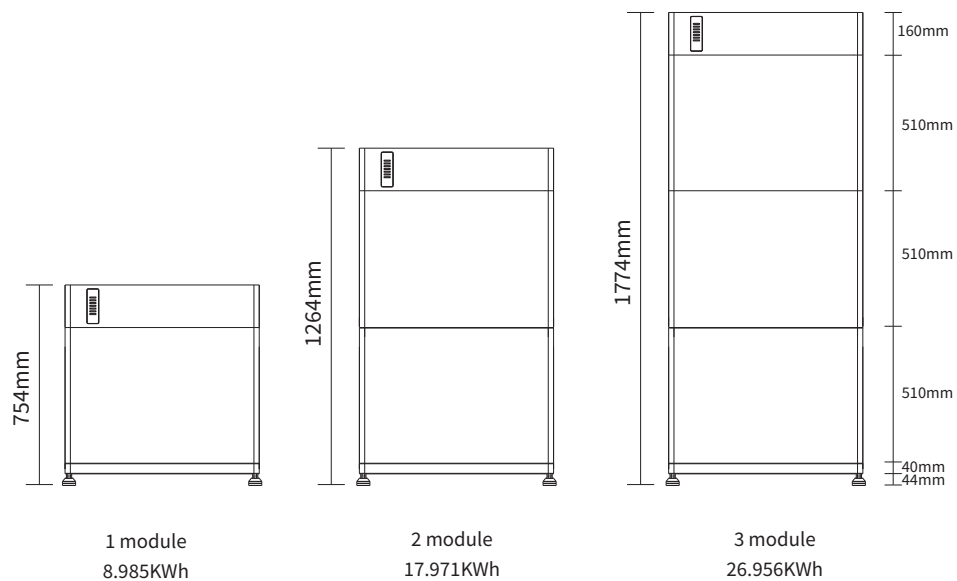
Functional overview

The battery system consists of a battery module and a BMS control unit, which can store and release electricity according to the requirements of the photovoltaic energy storage system. The input and output ports of the energy storage system carry hazardous voltage direct current.

Description of available electricity

Note

1. The battery system supports power expansion, allowing for the addition of up to 3 battery modules to increase available power. Expansion must be carried out according to specific conditions. For more details, please contact your dealer or the equipment manufacturer. Failure to follow the required expansion procedures may result in undervoltage, overvoltage, or voltage imbalance issues in the battery system.
2. The actual installation height may vary slightly. Please refer to the actual installation height for accurate information.

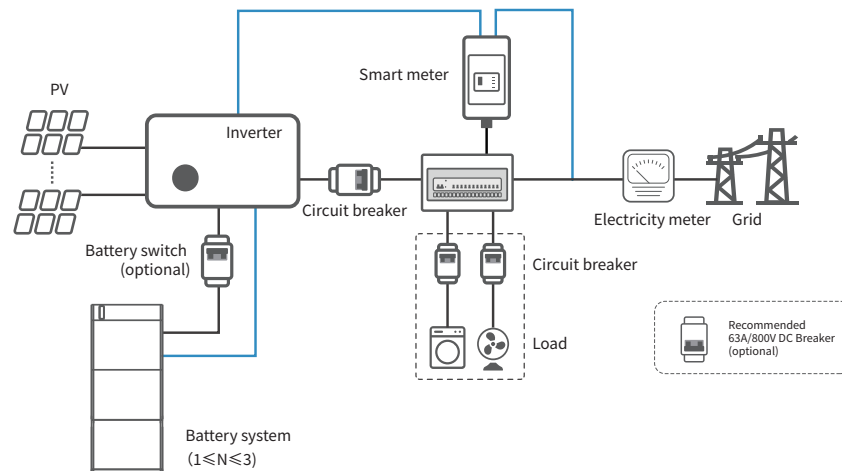


3.2 Application scenarios

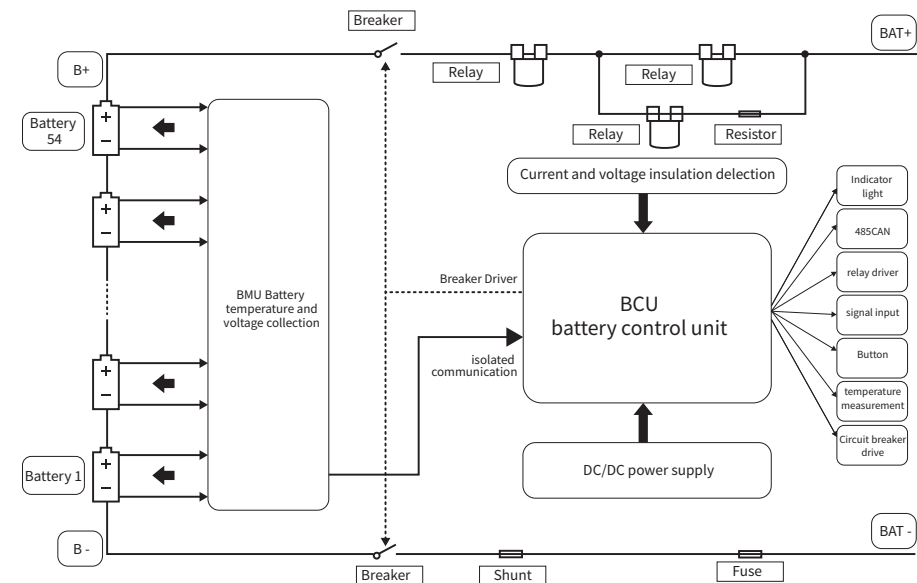
Note

The circuit breaker between the inverter and battery and the circuit breaker between the battery system must be installed in accordance with local laws and regulations. Recommended specifications:

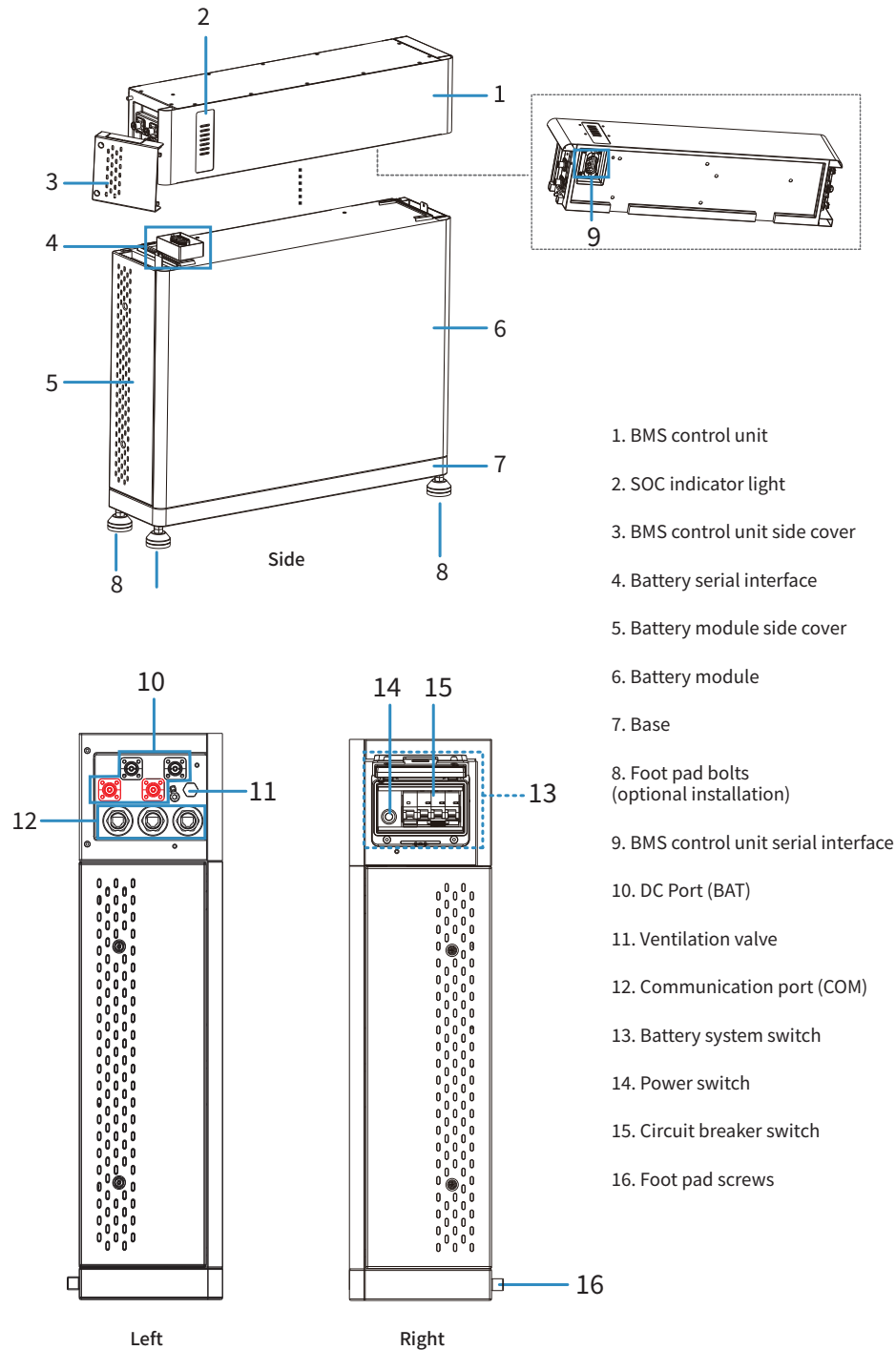
- Rated voltage $\geq 750V$
- When the battery system is used in single clusters: the switching current rating between the inverter and the battery is $\geq 50A$.



The internal wiring diagram for built-in isolator is shown below.



3.3 Appearance description



4 Equipment inspection and storage

4.1 Check before signing

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

1. Inspect the outer packaging for any signs of damage, including deformation, holes, cracks, or other indicators that could potentially harm the equipment inside. If you notice any damage, please refrain from opening the package and contact your dealer.
2. Verify that the equipment model matches your order. If there is any inconsistency, please do not open the package and contact your dealer.
3. Confirm that the type and quantity of the delivered components are correct, and check for any visible damage on the appearance. If you find any damage, please get in touch with your dealer.

4.2 Packing list



4.3 Equipment storage

If the equipment is not put into immediate use, please store it according to the following requirements:

If the equipment is not immediately installed, please ensure the storage environment meets the conditions:

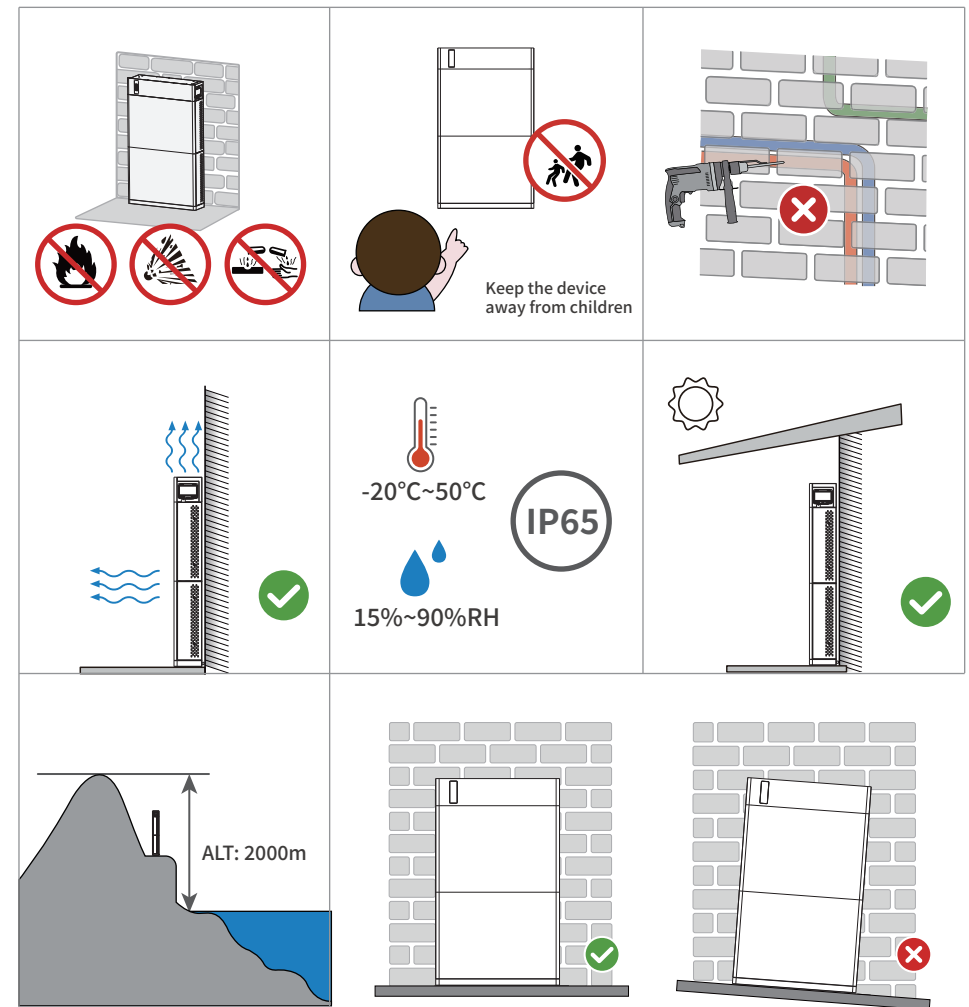
1. The equipment should remain in its original packaging, with a desiccant placed inside the box before sealing.
2. It is recommended to complete the equipment installation within three days after unpacking. If installation is not immediately required, use the original packaging to securely repackage the equipment for future use.
3. Ensure that the equipment is stacked and positioned according to the labeling instructions on the box.
4. Take precautions to prevent any risk of tipping after stacking.
5. Store the equipment away from flammable, explosive, corrosive, and other hazardous materials.
6. Keep the device in a cool location away from direct sunlight.
7. Verify that the storage area is clean, with appropriate temperature and humidity levels, ensuring there is no condensation present.
8. For storage batteries, maintain a state of charge (SOC) between 25% and 50%, and perform a charge and discharge cycle every 6 months during storage.
9. Storage temperature range description:
 - When $-20^{\circ}\text{C} \leq \text{temperature} < 0^{\circ}\text{C}$, the storage time cannot exceed 1 month.
 - When $0^{\circ}\text{C} \leq \text{temperature} \leq 35^{\circ}\text{C}$, the storage time cannot exceed 1 year.
 - When $35^{\circ}\text{C} < \text{temperature} \leq 40^{\circ}\text{C}$, the storage time should not exceed 1 month.
10. Storage humidity range requirements: 15~90%RH without condensation. If moisture and condensation are found on the battery interface, the battery system cannot be installed.

5 System installation

5.1 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 to prevent burns. High temperatures may exist on the surface when the equipment is in operation.
3. The installation must avoid walls containing water pipes, electrical cables, etc. to prevent hazards during drilling.
4. The installation environment should be protected from direct sunlight, rain, snow, and other elements. A sheltered location is recommended, and an awning can be installed if necessary.
5. The installation space must meet the ventilation and heat dissipation requirements of the equipment and the operating space requirements. For indoor installation, install one meter away from the vertical plane of windows or building vents that ventilate habitable rooms to ensure air circulation.
6. The equipment protection level meets indoor and outdoor 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 facilitates easy operation and maintenance, ensuring that indicators and labels are clearly visible and that wiring terminals are easily accessible.
8. The equipment installation altitude should not exceed the maximum working altitude of 2,000 meters.
9. Avoid placing the equipment in areas with strong magnetic fields to prevent electromagnetic interference. If there are radio stations or wireless communication devices operating below 30 MHz nearby, ensure that the distance between the battery and these devices is greater than 30 meters.
10. Maintain a minimum distance of two meters from heat sources, including direct sunlight, fireplaces, thermally uninsulated walls exposed to sunlight, hot water sources, or heaters.
11. Install the equipment on the ground with sufficient bearing capacity and flatness. If not, increase the bearing capacity and flatness of the ground by laying the foundation, adding bearing plates and so on.



Carrier installation requirements

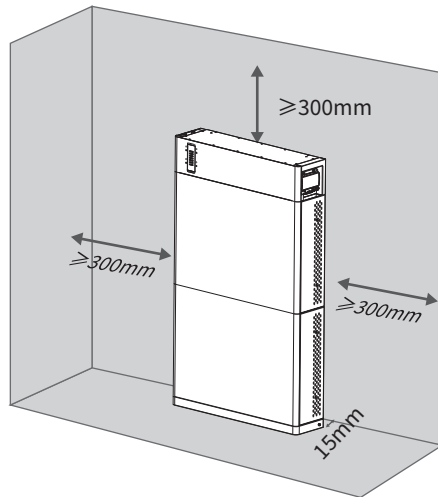
- The mounting carrier should be made of non-flammable materials with fire-retardant properties.
- Ensure that the mounting carrier is robust enough to support the weight of the device.
- The battery system should be installed near a wall, with an anti-tip bracket to prevent the battery from toppling.

Installation angle requirements

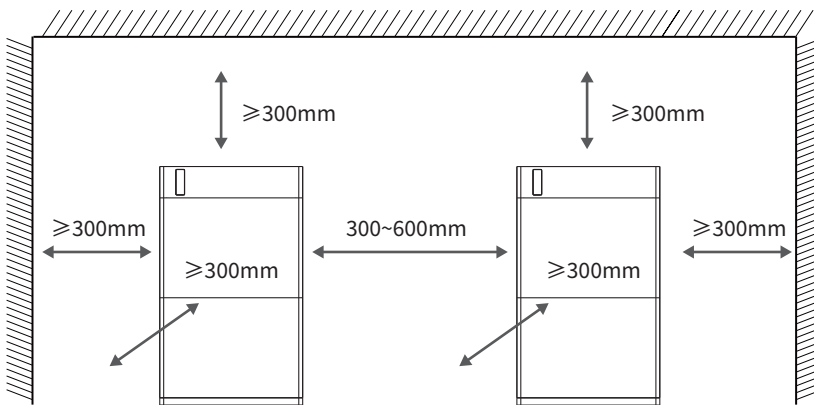
- Ensure that the equipment is installed horizontally, avoiding any tilt or inversion.

5.2 Installation Clearance Requirements

Reserve enough clearance around the battery to ensure sufficient space for airflow and heat dissipation.



In case of multiple batteries, reserve specific clearance between the batteries.



NOTICE

The distance is only the recommended distance, which can be adjusted according to the actual situation.

5.3 Handling equipment

Caution

1. During transportation, handling, installation, and other related operations, it is essential to adhere to the laws, regulations, and applicable standards of the respective country and region.
2. Before installation, the equipment must be delivered to the designated site. To prevent personal injuries or damage to the equipment during transit, please follow these precautions:

- Assign appropriate personnel based on the weight of equipment, as exceeding safe lifting limits may result in injury.
- Wear safety gloves to prevent potential injuries.
- Ensure that the equipment remains balanced during transportation to avoid the risk of it falling.

5.4 Battery system installation

Warning

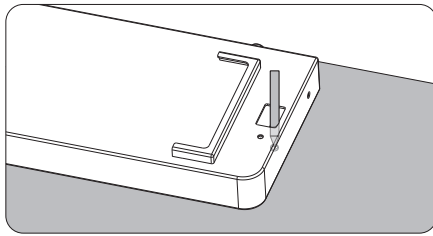
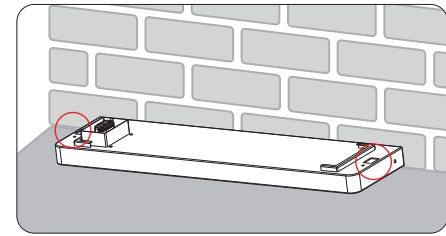
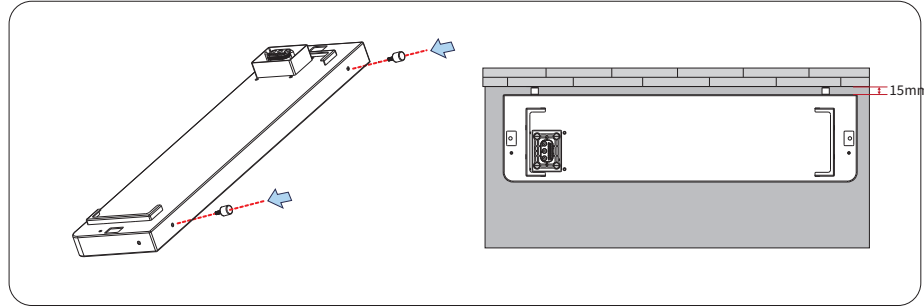
1. Make sure the BMS control unit is installed above the battery. Do not install the battery above the BMS control unit.
2. When installing the battery system, ensure that the installation is level and stable. When placing the battery base, battery, or BMS control unit, verify that the upper and lower holes are properly aligned. The anti-tip bracket should be securely attached vertically to the ground, wall, or the surface of the battery system.
3. When using an impact drill to drill holes, protect the battery system with cardboard or other materials to prevent debris from entering and potentially damaging the equipment.
4. Before installing the battery system, remove the cover of the battery module wiring port.

Base installation (without foot pad bolts)

Step 1: Install two foot pad screws on the back of the base. (The foot pad screws can control the appropriate distance between the product and the wall.)

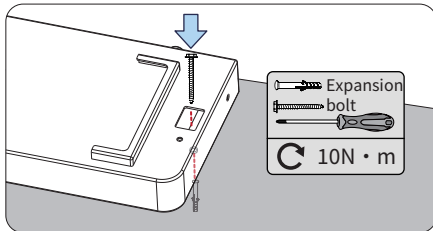
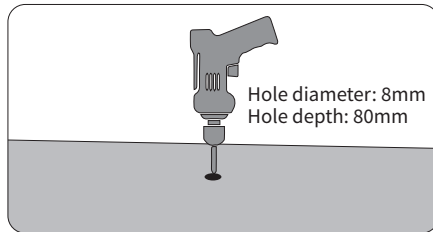
Step 2: Place the base against the wall in a suitable position.

Step 3: Use a marker to mark the holes on the left and right sides, and then remove the base. (Note: The base should be 15mm away from the wall, otherwise it will affect the installation of the integrated machine.)



Step 4: Use an impact drill to drill the holes.

Step 5: After checking that the battery base is installed in the correct direction, use expansion bolts to fix the base.

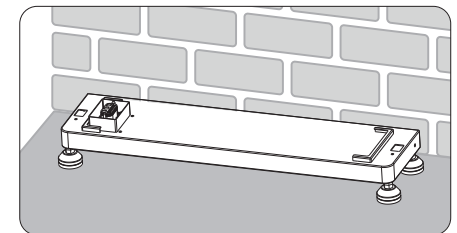
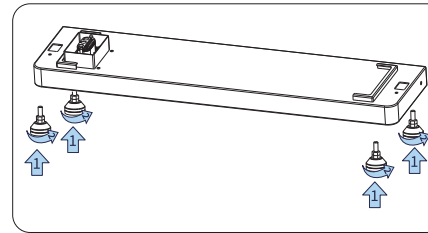
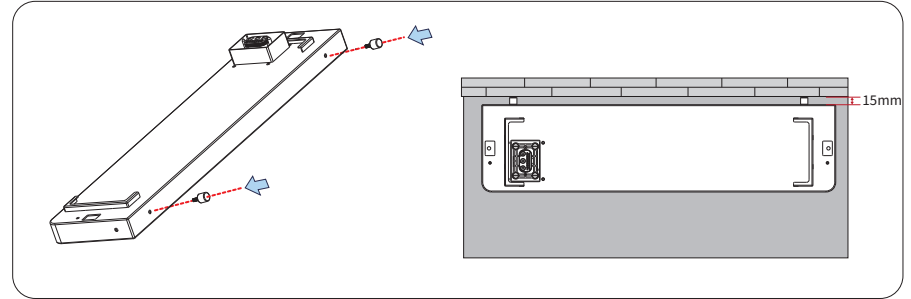


Base installation (with foot pad bolts)

Step 1: Install two foot pad screws on the back of the base. (The foot pad screws can control the appropriate distance between the product and the wall.)

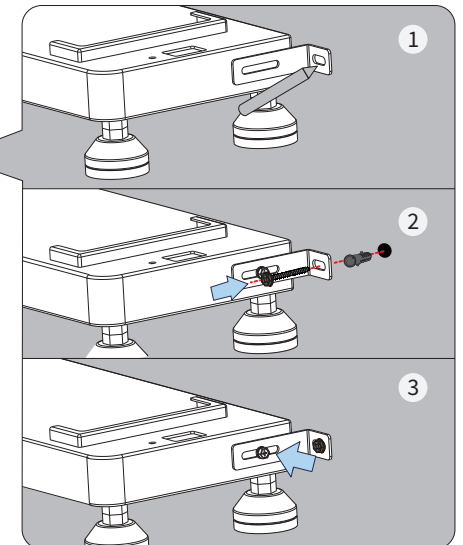
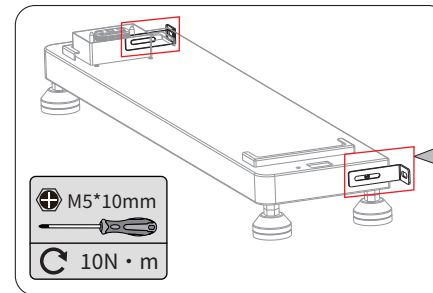
Step 2: Install the adjustable foot pad bolts to the base.

Step 3: Place the base against the wall and place it in a suitable position. (Note: The base should be 15mm away from the wall, otherwise it will affect the installation of the integrated machine.)



Step 4: Use M5 screws to secure the base wall-lock bracket to the base, ensuring both sides are fixed.

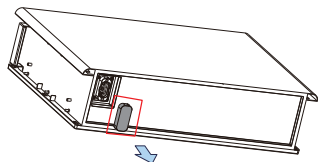
Step 5: Mark the holes on both the left and right sides with a marker, and remove the base. Then, secure the wall-lock bracket on the other side to the wall with 2 expansion screws. (Ensure that both sides are properly fixed).



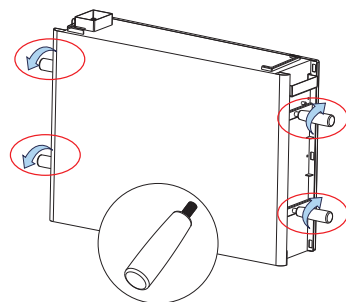
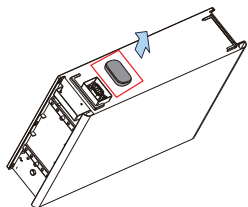
Note

The base wall-locking bracket is not required when the base does not need foot pad bolts.

Battery module installation



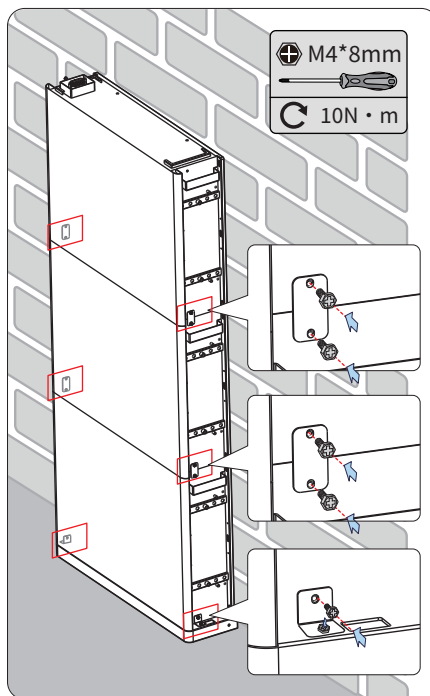
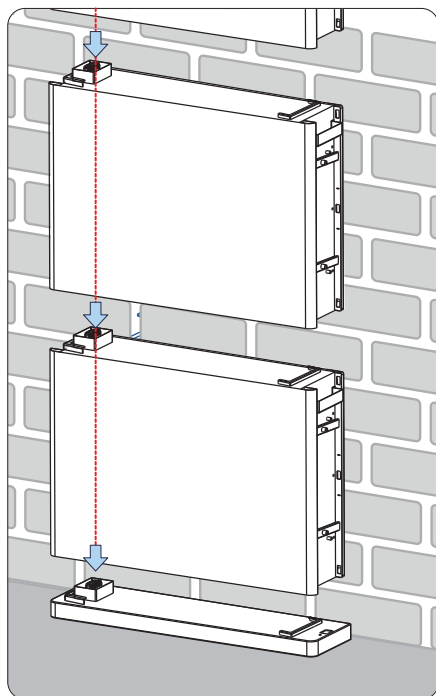
Before stacking the batteries, make sure to remove the protective covers from the top socket and bottom plug of the battery.



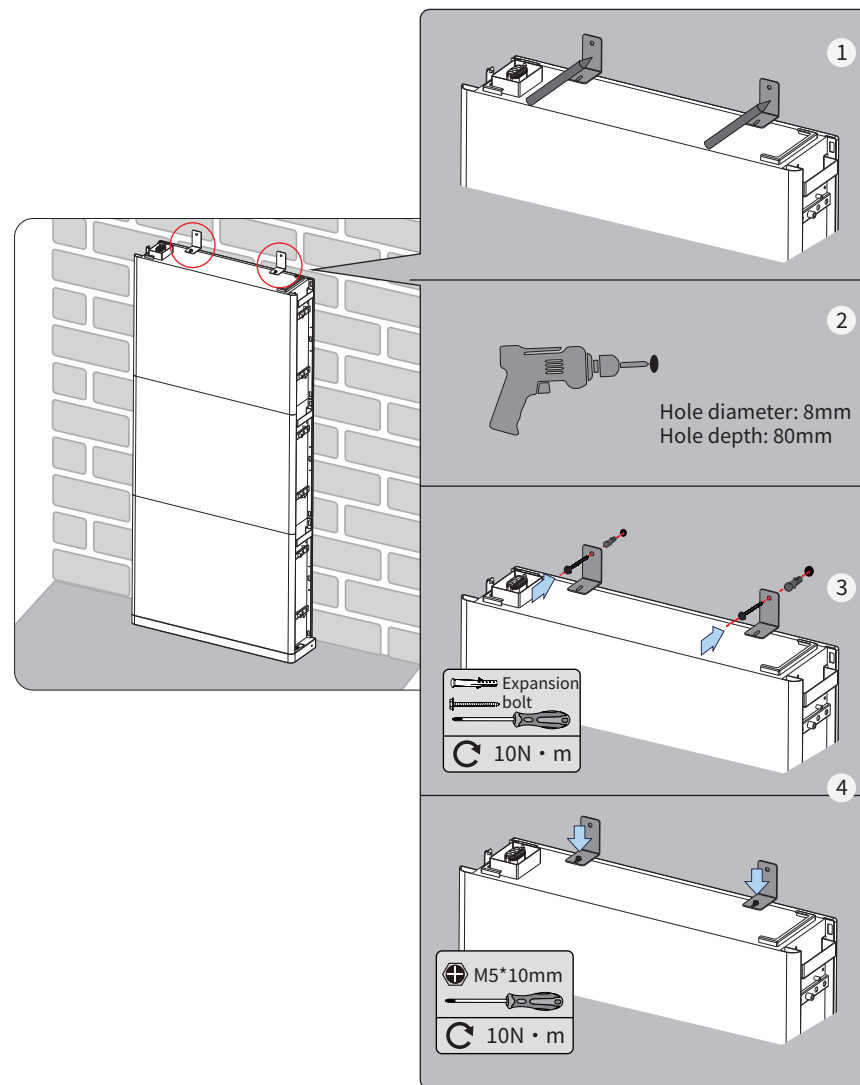
Four carrying handles can be installed on the battery to assist with lifting, as the battery module is quite heavy. Be sure to remove the handles after the battery modules are installed.

Step 1: Install the battery module based on the selected battery system type.

Step 2: Secure the batteries and the base using the shell fixing buckles. (Make sure both sides are properly fixed.)



Step 3: Lock the wall-locking bracket to the battery and the wall with two expansion bolts and two M5*10mm screws.



Warning

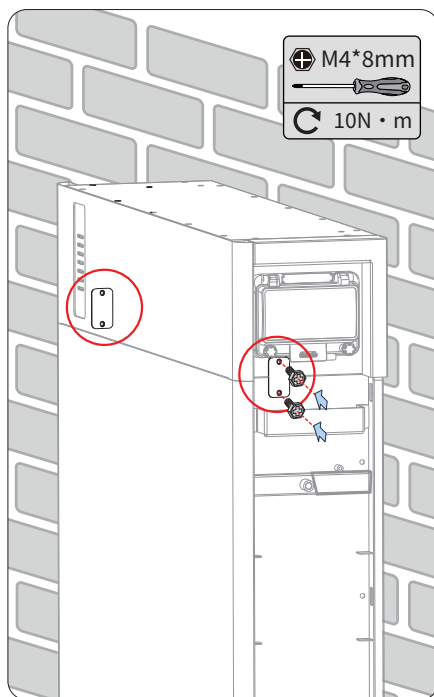
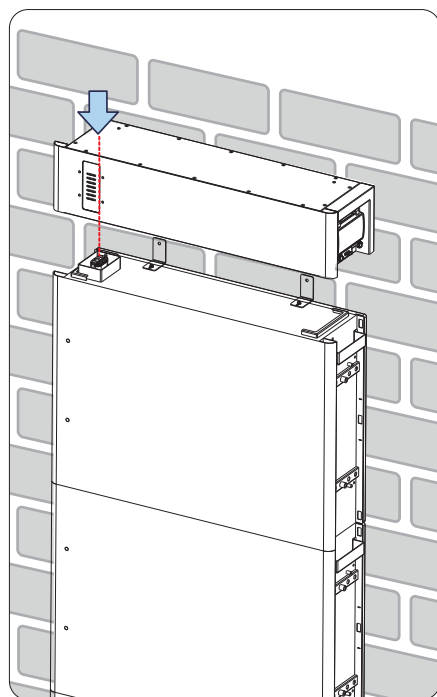
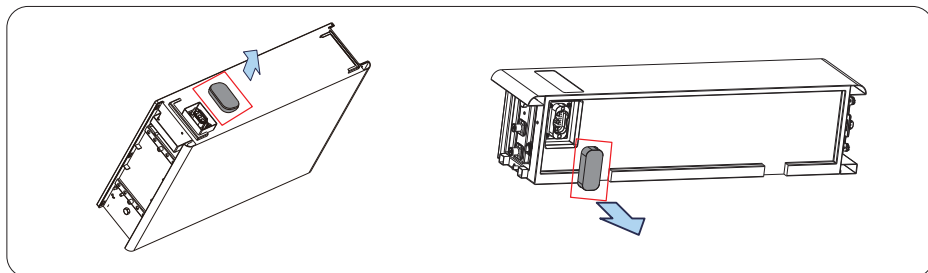
1. After marking the drilling position with a marker, the BMS control unit needs to be removed to prevent damage from the impact drill being too close during drilling.
2. When drilling holes with an impact drill, cover the battery system with cardboard or other materials to prevent debris from entering and damaging the device.

BMS control unit installation

Step 1: Before connection, remove both protective covers from the battery and the BMS control unit.

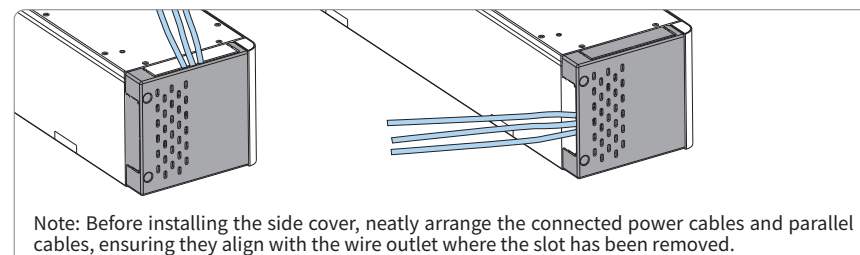
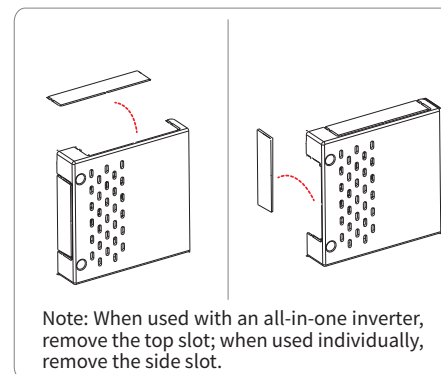
Step 2: Grasp the upper left and right frames of the BMS control unit and lift it, ensuring that the ports are positioned on the left and the circuit breaker switch is on the right. Carefully align the plug at the bottom of the BMS control unit with the battery socket, then gently lower the unit to complete the connection between BMS control unit and the battery.

Step 3: Use the shell fixing buckle to secure the battery and BMS control unit. (Both sides must be fixed.)



Step 4: Remove the slot for wire outlet on the control box side cover. (Note: When used with an all-in-one inverter, remove the top slot; when used individually, remove the side slot.)

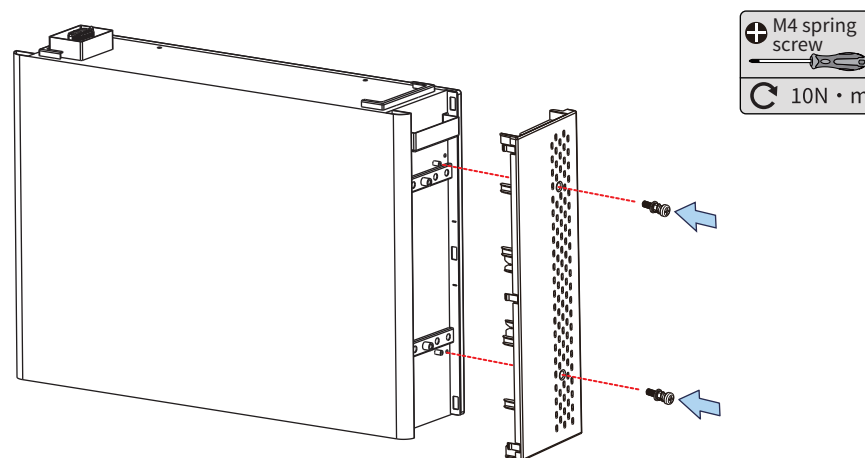
Step 5: After completing the wiring, install the control box side cover. (Refer to the wiring section for details.)



Battery side cover installation

Step 1: Complete the installation of the battery system or all-in-one machine according to the above steps.

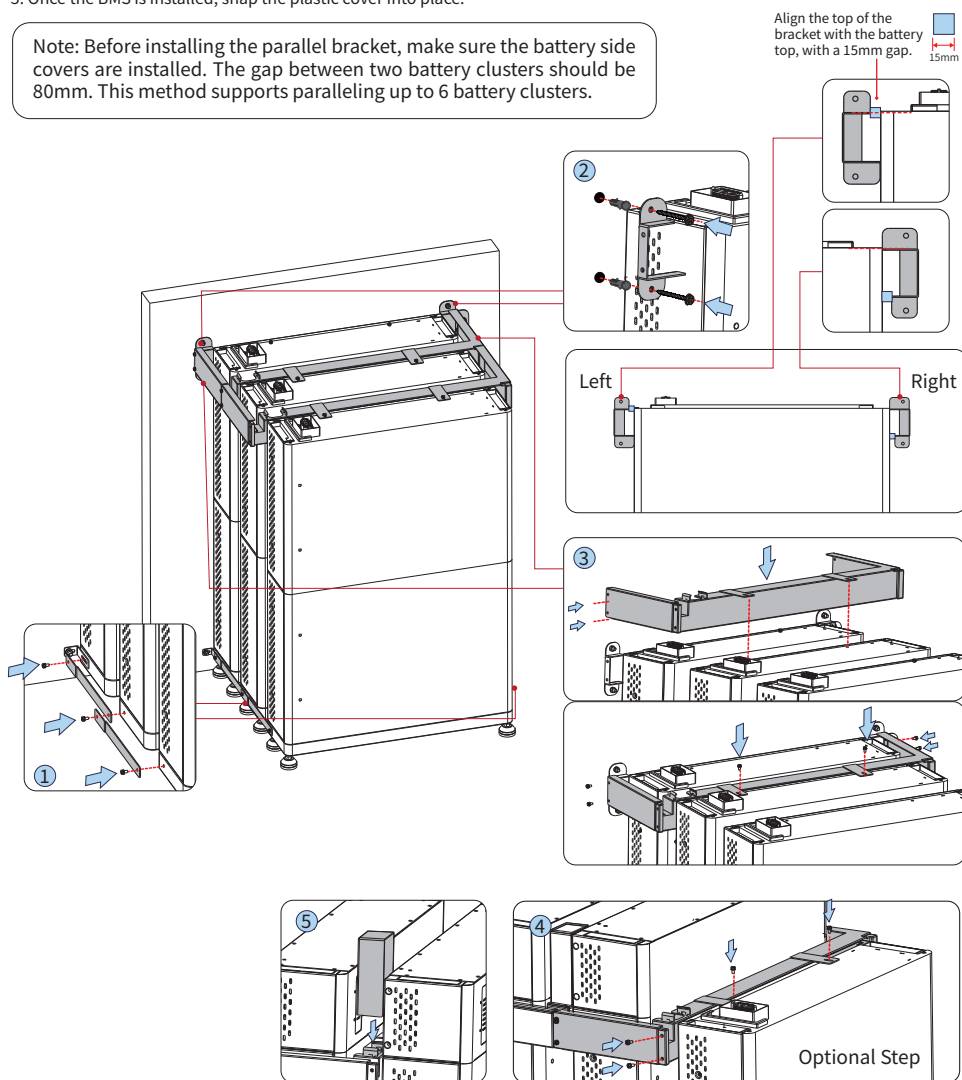
Step 2: Align the screw holes of the battery side cover with the two holes on the side of the battery, and use a screwdriver to tighten the side cover spring screws. (Side covers need to be installed on both sides)



Parallel Connection Bracket Installation (If the battery cluster needs to be connected in parallel, refer to this step to install the parallel connection bracket.)

1. Set the base first. Ensure the base and its height are aligned and consistent. Secure both sides of the base and the base parallel bracket with M5 screws. Use 4 screws for two battery clusters, 6 screws for three, and so on.
2. Install the parallel bracket 2. Secure the parallel bracket 2 on both sides of the battery with expansion screws. (Note: The top opening of the parallel bracket 2 must be level with the top of the battery pack. The long side of the bracket should fit tightly against the battery pack's plastic cover, with a 15 mm gap from the short side to allow for the cable exit. You can use the EVA pad in the accessory to help position it.. The installation on both sides should be the same.)
3. Stack the battery packs. Install the BMS box later. Starting from the top, place the parallel bracket 1. First, use 4 M5 screws to secure the sides of the bracket 1, then use 2 M5 screws to fasten the bracket to the top screw holes of the second battery cluster.
4. (Optional) If adding a third battery cluster, Repeat Step 1 for the third cluster. Stack the battery packs and place the parallel bracket 1 from top to bottom. First, secure the sides with 4 M5 screws, then fasten the bracket 1 to the top screw holes of the third battery cluster using 2 M5 screws. Once the BMS is installed, connect the parallel cables and route them through the cable slots on the side of the bracket. Any excess cable can be stored in the cable channel at the back of the bracket. (Repeat for installations with the 4th, 5th, or 6th battery cluster.)
5. Once the BMS is installed, snap the plastic cover into place.

Note: Before installing the parallel bracket, make sure the battery side covers are installed. The gap between two battery clusters should be 80mm. This method supports paralleling up to 6 battery clusters.



6 Electrical connection

6.1 Safety precautions

⚠ Danger

1. This battery system operates at hazardous voltage. Before operating the equipment in the system, ensure that the equipment is powered off. Failing to do so may expose you to dangerous voltage levels, which can lead to electric shock. Strictly comply with all safety rules in this manual and heed safety signs on the equipment while using it.
2. Ensure that all operations, cables, and component specifications comply with local laws and regulations during electrical connections.
3. Group cables of the same type together and keep them separate from different types. Do not mix or cross them.
4. When crimping the terminal, please ensure that the cable's conductor is fully touching the terminal. Avoid crimping the cable insulation with the terminal, as this may cause the device to malfunction or overheat during use, causing damage to the inverter ports.

Note

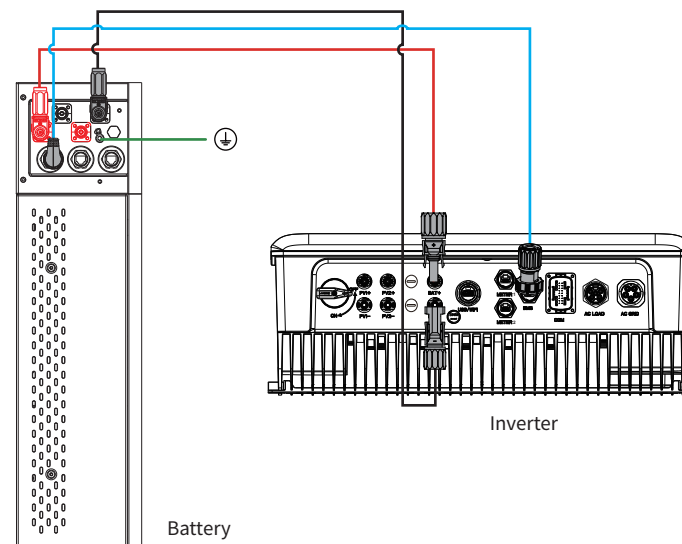
1. When making electrical connections, please wear safety shoes, protective goggles, insulating gloves and other personal protective equipment as required.
2. Only professionals are allowed to perform operations related to electrical connections.
3. The cable colors in this manual are for reference only.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

6.2 Electrical connection

Single battery system

Note

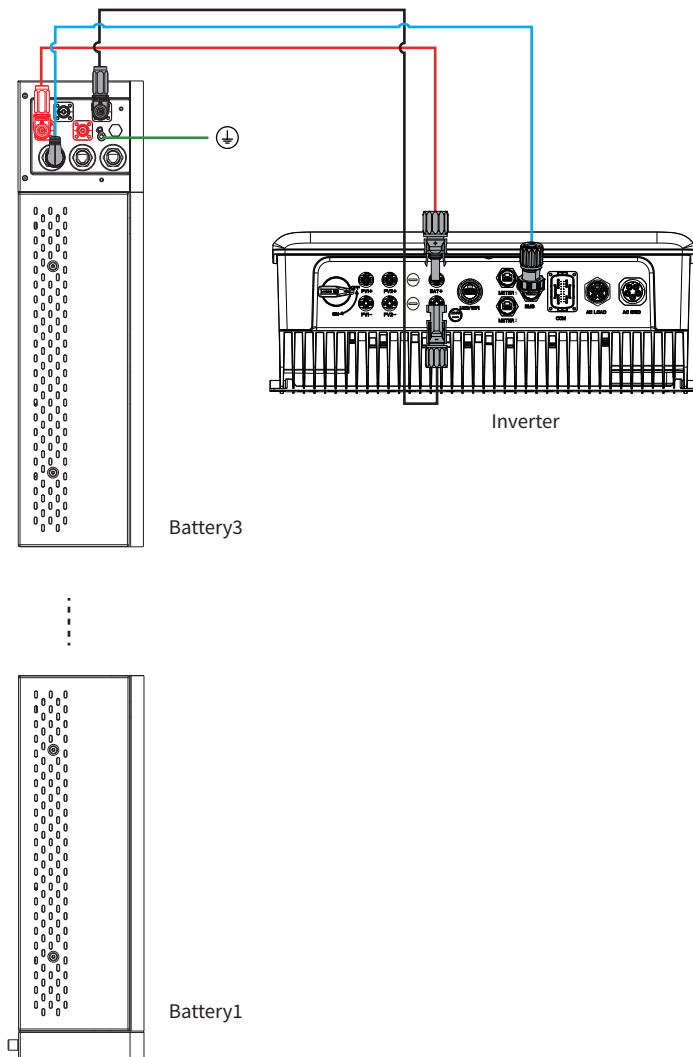
1. The positive terminal of the battery, labeled BAT+, should be connected to the inverter's BAT+ terminal, while the negative terminal, labeled BAT-, must be connected to the inverter's BAT- terminal. Ensure that these connections are correct.
2. Connect the battery's COM.INV communication port to the inverter's communication port using a network cable.



Single Cluster Battery System

Note

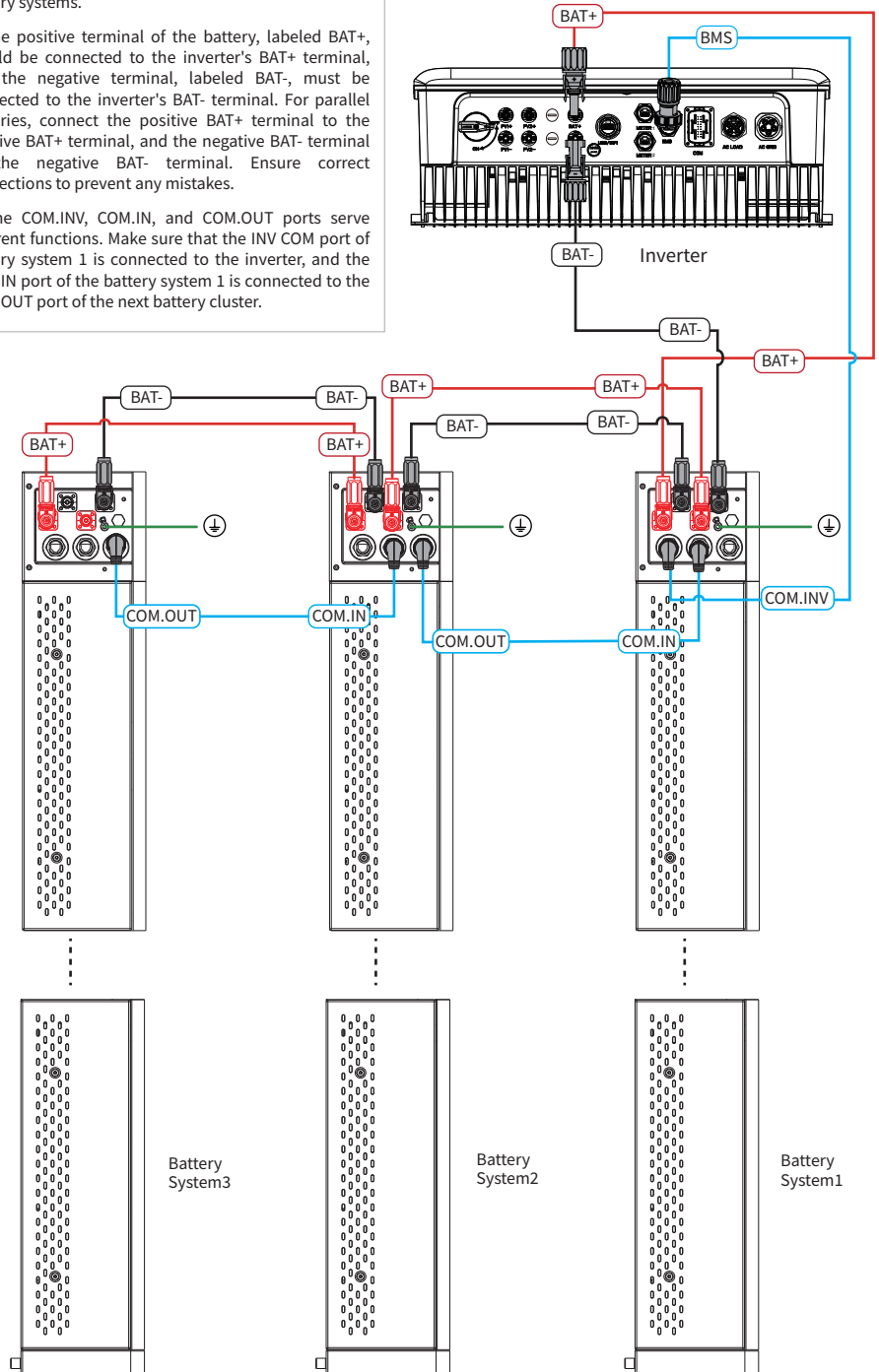
1. For a single-cluster battery system, no more than three batteries can be stacked.
2. The positive terminal of the battery, labeled BAT+, should be connected to the inverter's BAT+ terminal, while the negative terminal, labeled BAT-, must be connected to the inverter's BAT- terminal. Make sure the connections are correct.
3. Use a network cable to connect the battery's COM. INV communication port to the inverter's communication port.



Note

1. This wiring method is suitable for 1-3 cluster parallel battery systems.
2. The positive terminal of the battery, labeled BAT+, should be connected to the inverter's BAT+ terminal, and the negative terminal, labeled BAT-, must be connected to the inverter's BAT- terminal. For parallel batteries, connect the positive BAT+ terminal to the positive BAT+ terminal, and the negative BAT- terminal to the negative BAT- terminal. Ensure correct connections to prevent any mistakes.
3. The COM.INV, COM.IN, and COM.OUT ports serve different functions. Make sure that the INV COM port of battery system 1 is connected to the inverter, and the COM.IN port of the battery system 1 is connected to the COM.OUT port of the next battery cluster.

1-3 parallel cluster battery system



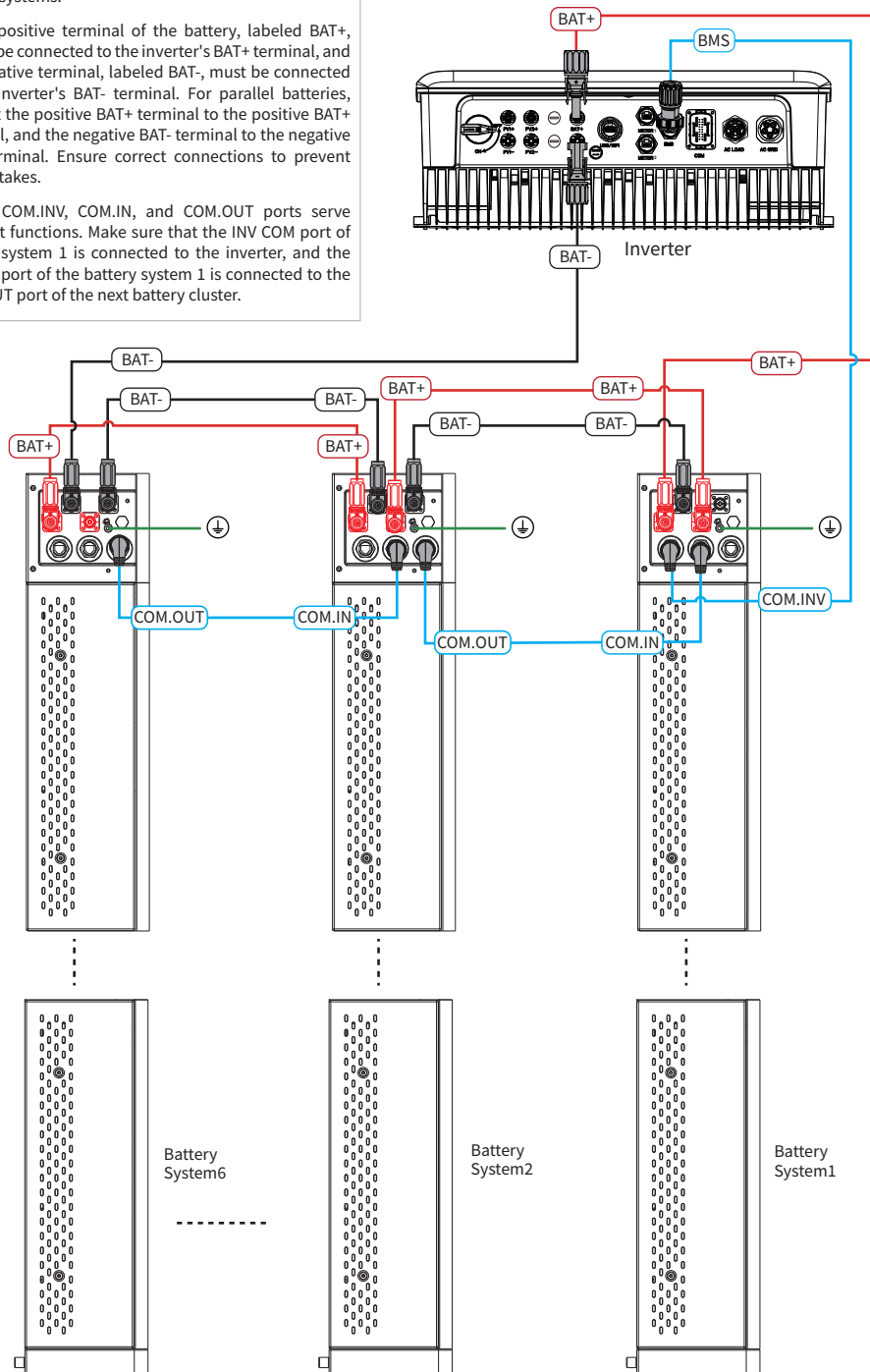
Note

1. This wiring method is suitable for 4-6 cluster parallel battery systems.

2. The positive terminal of the battery, labeled BAT+, should be connected to the inverter's BAT+ terminal, and the negative terminal, labeled BAT-, must be connected to the inverter's BAT- terminal. For parallel batteries, connect the positive BAT+ terminal to the positive BAT+ terminal, and the negative BAT- terminal to the negative BAT- terminal. Ensure correct connections to prevent any mistakes.

3. The COM.INV, COM.IN, and COM.OUT ports serve different functions. Make sure that the INV COM port of battery system 1 is connected to the inverter, and the COM.IN port of the battery system 1 is connected to the COM.OUT port of the next battery cluster.

4-6 parallel cluster battery system



6.3 Protective ground wire connection

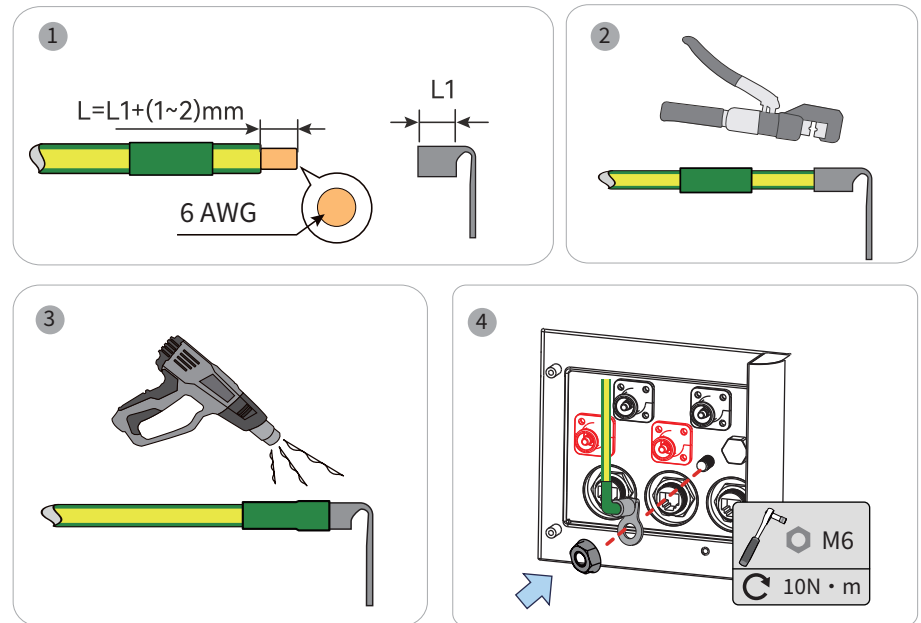
Note

1. When installing equipment, the protective ground wire must be installed first; when disassembling the equipment, the PE line must be removed last.

2. The pull-out force after crimping should exceed 400N.

3. Please prepare your own PE line. Recommended specifications:

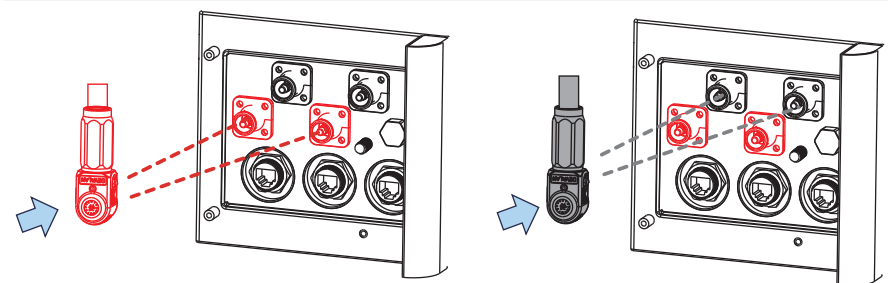
- Type: Outdoor single-core copper wire
- Wire gauge: 6 AWG



6.4 Power cable connection

Warning

According to the diagram below, the positive red power cable is connected to the BAT+ terminal, and the negative black power cable is connected to the BAT- terminal.



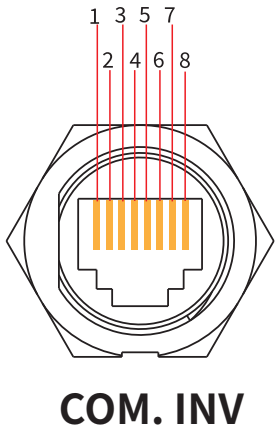
6.5 Communication cable connection



Warning

1. If the inverter model you have comes with a communication cable connecting the inverter to the battery, you can decide whether to use the provided cable based on specific circumstances. For detailed cable specifications, please refer to the user manual for the relevant inverter model.
2. If you need to prepare your own communication cable, the recommended specifications include a standard network cable and an RJ45 connector.

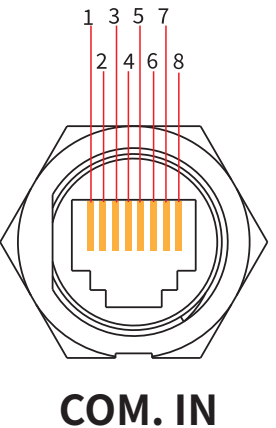
RJ45 communication port



COM. INV interface definition

RJ45 PIN	Definition	Remark
1	WAKE UP	
2	GND	
3	24V	
4	CAN0H	
5	CAN0L	
6	NC	
7	RS485-A	
8	RS485-B	
RJ45 PIN definition for inverter & BMS communication		

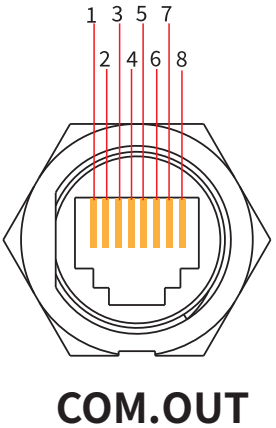
RJ45 communication port



COM. IN interface definition

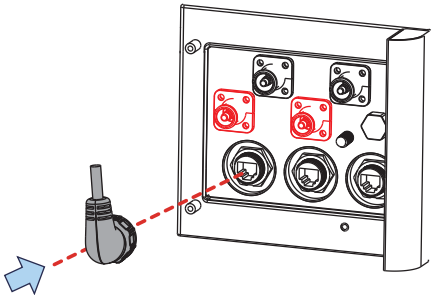
RJ45 PIN	Definition	Remark
1	WAKE UP	
2	GND	
3	24V	
4	CAN1H	
5	CAN1L	
6	IP1	
7	RS485-A1	
8	RS485-B1	
RJ45 pin number definition for cluster communication		

RJ45 communication port



COM. OUT interface definition

RJ45 PIN	Definition	Remark
1	WAKE UP	
2	GND	
3	24V	
4	CAN2H	
5	CAN2L	
6	IP2	
7	RS485-A2	
8	RS485-B2	
RJ45 pin number definition for cluster communication		



Warning

1. For the requirements regarding the communication cable connections of the battery system, please refer to the system wiring diagram. This chapter focuses only on the methods for communication cable connections and the definition of ports.
2. If you need to prepare your own communication cable, recommended specifications: standard network cable and RJ45 crystal connector.

7 System operation

7.1 Check before powering on

When powering up the battery system, be sure to check the following to prevent system damage.

No.	Check items
1	The equipment is installed firmly. The installation location is convenient for operation and maintenance. The installation space is convenient for ventilation and heat dissipation, and the installation environment is clean and tidy.
2	The protective ground wire, power wire, communication wire, and terminal resistor are connected correctly and firmly.
3	The cable binding meets the wiring requirements. It is reasonably distributed and not damaged.
4	Unused ports are blocked.

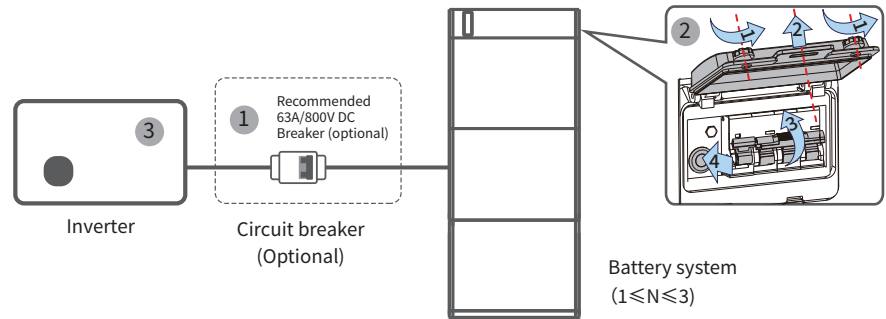
7.2 Battery system power-up

**Warning**

1. The dotted box is an optional configuration.
2. The circuit breaker between the inverter and the battery, as well as the circuit breaker within the battery system, must be installed in accordance with local laws and regulations
3. When shutting down the battery system, please strictly follow the battery system's power-off requirements to prevent damage to the system.
4. To ensure effective protection of the battery system, the cover of the battery system switch will remain closed and the protective cover can be closed automatically after opening. If the switch of the battery system will not be used for a long time, it needs to be tightened with screws.

Method:

- Step 1:** Turn on the circuit breaker between the inverter and the battery system.
- Step 2:** Turn on the circuit breakers inside the battery system switch box. Then, press and hold the button until the blue running indicator comes on.
- Step 3:** Power on the inverter in the system. For detailed operations, please refer to the user manual of the specific inverter model.
- Step 4:** Power on the inverter in the system. For detailed operation, please refer to the user manual of the inverter.



Note

Release the power switch within 2s when the blue indicator is on. Otherwise, the battery will turn off.

After powering on the system, ensure that communication between the inverter and the battery system is established within 15 minutes. If normal communication is not established, the battery system will automatically disconnect and shut down.

7.3 Viewing and Configuring Battery Parameters

After connecting the battery and inverter, use the Hinen App to select the appropriate options for parameter viewing and configuration.

• APP Installation and Connection:

Method 1:

Download and install the Hinen App.



Method 2:

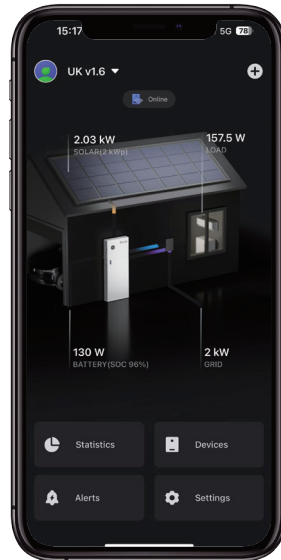
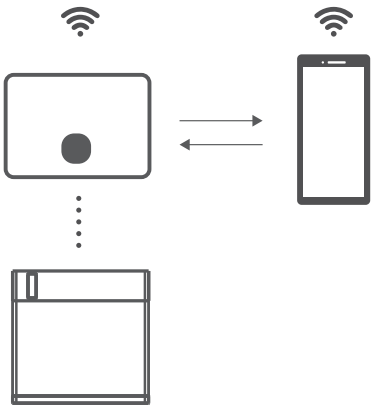


Hinen INSTALL



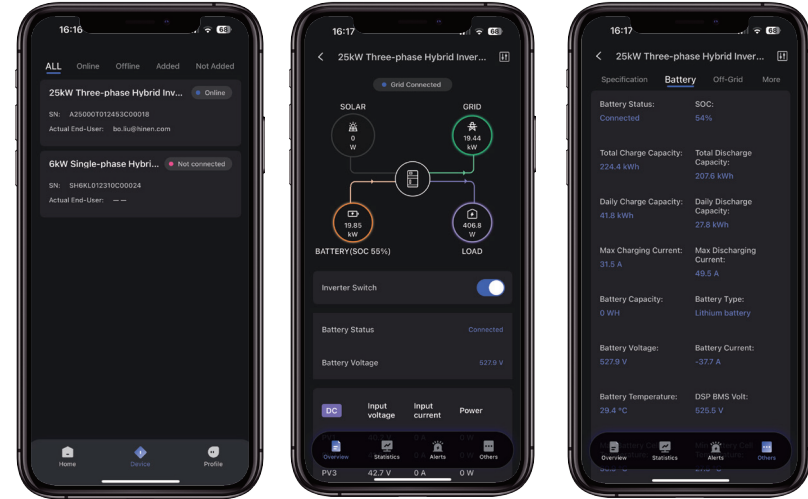
Hinen SOLAR

Connect the Smart phone to the inverter.



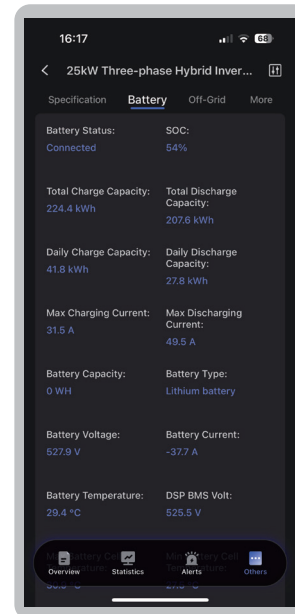
• Viewing Battery Parameter

Tap the inverter connected with battery to enter the corresponding interface and check the battery parameter.

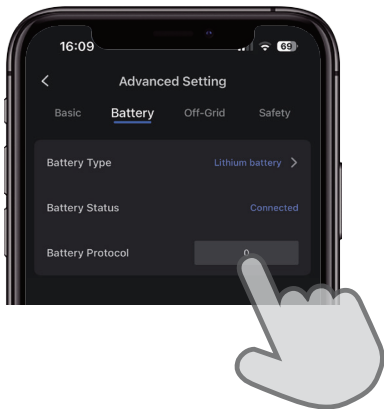


Battery

Here is the battery information: battery status, battery type, main battery voltage, slave battery voltage, battery capacity, battery charging power, battery discharging power, battery SOC, battery SOH, total charge capacity, total discharge capacity, daily charge capacity, daily discharge capacity, and so on.



• Select battery protocol



The battery is compatible with A5000S, A15000S, A25000T and H12000T series. Please choose HINEN protocol and click “Save”.

Battery Protocol		
	Single-phase Inverter	Three-phase Inverter
0	PYLON Protocol	
1	HINEN Protocol	
2	Growatt Protocol	
3	Growcol Protocol	
4	SHOTO Protocol	
5	GoodWE Protocol	
6	YUZEI Protocol	
7-20	Battery 7~20	

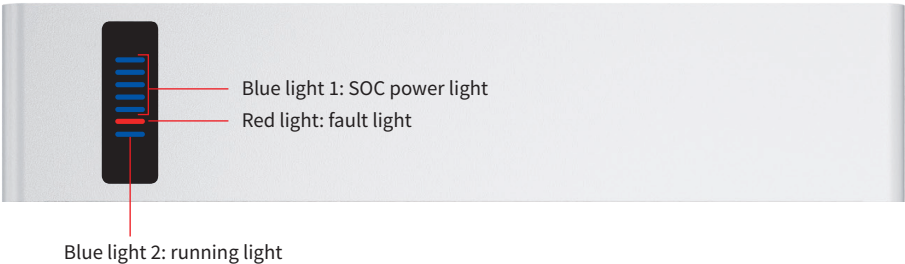
Warning: Please choose the correct battery protocol. Otherwise the battery system will not work normally.

You can check and configure parameters by Solarman Smart.



<https://www.hinen.com/pages/smart-energy-management-system>

7.4 Indicator status



Indicator light	Condition
Blue light 1	The battery SOC indicator light displays the current battery capacity.
Red light	It remains off during normal operation and illuminates continuously in the event of a fault.
Blue light 2	It remains on during normal operation and remains off when a fault occurs.

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

8 Maintenance

8.1 Battery system power-down

Danger

1. When operating and maintaining the battery system, ensure that the system is powered off. Operating the equipment while it is powered on may cause potential damage or electric shock hazards.
2. When shutting down the battery system, strictly follow the specified power-off procedures to prevent any damage to the system.

Note

1. The dotted box is an optional configuration.
2. The circuit breaker between the inverter and the battery and the circuit breaker between the battery system must be installed in accordance with local laws and regulations.
3. To ensure effective protection of the battery system, the cover of the battery system switch should remain closed. The protective cover can be closed automatically after being opened. If the battery system switch is not used for a long time, it needs to be tightened with screws.

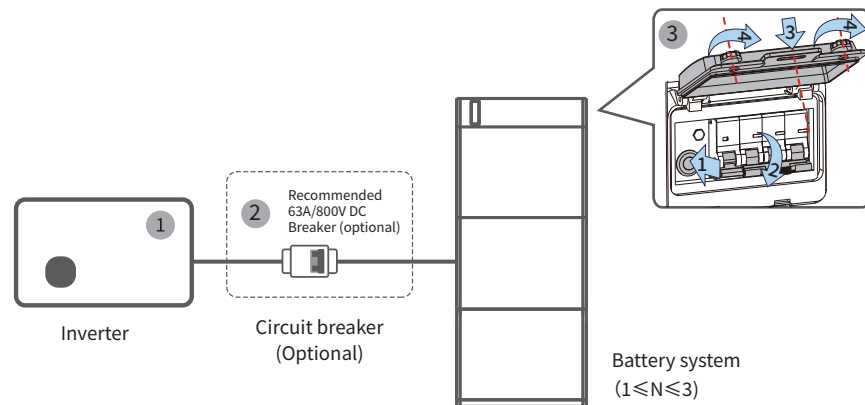
Method:

Step 1: Power off the inverter in the system. For detailed operations, please refer to the user manual of the specific inverter model.

Step 2: Turn off the circuit breaker between the inverter and the battery system.

Step 3: Press and hold the button for 10 seconds until all indicators turn off. At this point, the battery enters the power-off state, and a clicking sound may be heard from inside the control box. This is a normal occurrence as the contactors disconnect.

Step 4: Turn off the built-in breakers of the battery system and close the protective cover.



Note

If the red fault indicator remains on after releasing the power switch, it indicates that the battery is in standby mode.

8.2 Regular maintenance

Warning

1. If you encounter any issues that could impact the battery or energy storage inverter system, please contact the after-sales team. Unauthorized disassembly is prohibited.
2. If you notice any exposed copper wiring in the conductive wire, do not touch it due to hazardous voltage risks. Contact the after-sales team immediately. It is forbidden to disassemble it privately.
3. In the event of any other emergencies, please contact the after-sales team promptly and follow their guidance for operations, or wait for them to arrive on-site for assistance.

Checklist	Maintenance cycle
Check if the anti-tipping bracket is securely installed; if it is loose, please tighten it at the corresponding location.	Once every 6 months
Inspect the battery pack casing for scratches; if any are found, please repaint it or contact the after-sales service center.	Once every 6 months
Check whether the exposed wires show signs of wear; if they are worn, replace the affected cables or contact the after-sales service center for assistance.	Once every 6 months
Ensure there is no debris around the battery; if present, please clean it to prevent any impact on the battery's heat dissipation.	Once every 6 months
Check for the presence of water or pests to prevent long-term damage to the battery.	Once every 6 months

8.3 Troubleshooting

In the event of a battery system failure, the system may automatically shut down or experience abnormal functions. To address this issue, please follow the troubleshooting methods outlined below. If the issue persists after following these steps, contact the after-sales service center. When reaching out, please provide the following information to ensure a quick and efficient resolution:

1. Battery details: serial number, software version, installation date, time of fault occurrence, and fault frequency.
2. Installation environment specifics: weather conditions and any relevant photos, videos, or files that may assist in diagnosing the issue.

**The fault code is displayed through the inverter app.
The meaning of the color displayed on the light is as follows:**

— Solid Off — Solid ON — Blue LED Flashing — Flashing

Alarm

Solutions:

- ① Discharge the battery. If the fault message persists, contact the manufacturer.
- ② Charge the battery. If the fault message persists, contact the manufacturer.
- ③ Restore normal temperature before use. If the fault message persists, contact the manufacturer.
- ④ Check if the battery parallel system wiring connections and communication lines are well connected. Restart the battery. If the fault message persists, contact the manufacturer.
- ⑤ Sync the version when the network is stable to keep the machine version consistent.
- ⑥ Restart the battery. If the fault message persists, contact the manufacturer.
- ⑦ Check and remove the input source. If the fault message persists, contact the manufacturer.

Error Code	LED Status	Description	Solution
2501		Cell overvoltage	①
2503		Cell undervoltage	②
2504		Battery undervoltage	②
2505		Battery overvoltage	①
2506		Battery over temperature	③
2507		Low battery temperature	③
2514		Pre-charge over temperature	③
2518		Parallel process timeout	④

Error Code	LED Status	Description	Solution
2520		Parallel versions differ a lot	⑤
2521		Mixed use of standard version and heating version	⑥
2532		Input overvoltage	⑦
2533		Reverse input	⑦
2534		BMU backup timeout	⑥
2535		BMU SOC extraction timeout	⑥
2592		Parallel Versions not aligned	⑤

Fault

Solutions:

- A. Restart the battery. If the fault message persists, contact the manufacturer.
- B. Check the battery and INV communication line to ensure good contact. Restart the battery. If the fault message persists, contact the manufacturer.
- C. Check if the battery system wiring connections and the communication lines are well connected. Restart the battery. If the fault message persists, contact the manufacturer.
- D. Restore normal temperature before use. If the fault message persists, contact the manufacturer.
- E. Discharge the battery. If the fault message persists, contact the manufacturer.
- F. Remove the overcurrent source. If the fault message persists, contact the manufacturer.
- G. Charge the battery. If the fault message persists, contact the manufacturer.
- H. Check the battery power line connection. Restart the battery. If the fault message persists, contact the manufacturer.
- I. Check the system communication lines connection. Restart the battery. If the fault message persists, contact the manufacturer.
- J. Check if the number in each parallel-connected battery stack is inconsistent. Restart the battery. If the fault message persists, contact the manufacturer.

Error Code	LED Status	Description	Solution
2001		Cell Voltage sampling line disconnection	A
2003		AFE COMM abnormal	A
2005		Volatge Sensor abnormal	A
2007		Main circuit abnormal	A
2008		Pre-charge timeout	A
2009		Current Sensor Malfunction	A
2010		Dead Battery	A
2011		INV communication error	B
2012		Internal CAN BUS Line error	C
2014		Parallel address recognition abnormal	C
2016		Temperature sampling line broken	A

Error Code	LED Status	Description	Solution
2021		Heating Versions not aligned	A
2032		Balancer resistor temperature too high	D
2033		SPI-flash abnormal	A
2034		Insulation Fault	A
2035		BMU address assignment timeout	A
2036		AUX communication timeout	A
2037		BAU communication timeout	A
2038		Pre-charge contactor sticking	A
2039		Discharge contactor sticking	A
2040		Charge contactor sticking	A
2041		Ferroelectric memory failure	A

Error Code	LED Status	Description	Solution
2042		Disconnect switch failure	A
2043		High-side driver 1 failure	A
2044		High-side driver 2 failure	A
2045		BMU communication timeout	A
2046		AFE temperature too high	D
2047		AFE power supply temperature high	D
2048		Cell overvoltage	E
2049		System overvoltage	E
2050		System undervoltage	G
2051		Charging overcurrent	F
2052		Discharge overcurrent	F
2053		Charging low temperature	D
2054		Charging over temperature	D
2055		Discharge low temperature	D
2056		Discharge over temperature	D
2057		Cell undervoltage	G
2058		BMU Fault	A

Error Code	LED Status	Description	Solution
2059		Pre-charge relay failure	A
2060		Relay failure	A
2061		Relay Sticking	A
2062		Tripping Fault	A
2063		NVRAM Fault	A
2064		SD-NAND Fault	A
2065		Batt sensor fault	A
2066		Pack sensor fault	A
2067		Pre-charge short circuit	H
2068		Shunt reverse connection	A
2069		Shutdown timeout	A
2070		Pre-charge open circuit	H
2071		Excessive cell voltage difference	A
2072		Excessive temperature difference	D
2073		AUX software total voltage too high	E
2074		AUX software total voltage undervoltage	G
2075		AUX discharge overcurrent	F

Error Code	LED Status	Description	Solution
2076		AUX charge overcurrent	F
2077		AUX ADC communication timeout	A
2078		AUX ADC chip overheat	D
2079		AUX cell overvoltage	E
2080		AUX cell undervoltage	G
2081		AUX over-temperature	D
2082		AUX low temperature	D
2083		AUX and BMU communication fault	A
2084		AUX hardware overcurrent	F
2086		BMU address allocation fault	A
2087		eMMC fault	A
2089		Pre-charge sampling line disconnection	A
2090		Fuse blown	A
2091		Parallel system fault detection timeout	I
2092		Self-test failure	A
2094		Excessive battery consumption during heating	G
2095		Heating Over-temperature	D

Error Code	LED Status	Description	Solution
2096		AUX heating fault	A
2097		AUX zero drift too large	A
2098		Heating film MOS breakdown	A
2099		Parallel system networking timeout	I
2100		Tripping switch abnormal	A
2101		Parallel system voltage platform abnormal	J

9 Technical Specification

9.1 Standard Battery System

Product name	Rechargeable Li-ion Battery System		
Battery system model	B8900M-HA	B8900M-HB	B8900M-HC
Number of battery modules	1 module	2 modules	3 modules
BMS control unit model	B8900M-HP		
System Data			
Rated capacity *	8.985KWh	17.971KWh	26.956KWh
Depth of Discharge (DOD)	90%		
Available energy*	8.087KWh	16.173KWh	24.260KWh
Battery module	172.8V, 52Ah, 8.985KWh		
Cell type	LFP(LiFePO ₄)		
Cycle life*	8000 cycles		
Battery configuration	54S1P	108S1P	162S1P
Rated voltage	172.8 VDC	345.6 VDC	518.4 VDC
Operating voltage	135~194.4 VDC	270~388.8 VDC	405~583.2 VDC
Maximum charge/ discharge current*	52A		
Maximum charge/ discharge power*	8.985KW	17.971KW	26.956KW
Battery clustering function	Yes, 6 clusters per inverter		
Maximum battery expansion capacity	160.2kWh		
Operating temperature	charge: 0°C<T<55°C / Discharge: -20°C<T<60°C		
Storage temperature and SOC	-20~45°C (≦3 Months) / 0~35°C (≦1 Year) @SOC60%		
Running logs	4G-Byte		
Protection			
Overvoltage/ Undervoltage protection	Yes		

Overcurrent protection	Yes		
Overtemperature/under-temperature protection	Yes		
DC circuit breaker	Yes		
Shutdown current	Yes		
General Data			
Communication	CAN		
Humidity	10% to 85% no condensing		
Operating Altitude	≤3000m		
IP rating	IP65		
Cooling method	Natural convection		
Weight	101KG	185KG	269KG
Dimensions (without foot pad)	730*710*180mm	730*1220*180mm	730*1730*180mm
Dimensions (with foot pad)	730*754*180mm	730*1264*180mm	730*1774*180mm
Installation location	Indoor / Outdoor		
Installation method	Floor stand		
Certification	CB, CE, UKCA, LOA, SONCAR, RCM, EMC, ROHS, S-Mark,KBIA, UL		
	IEC 62619:2022, IEC 60730-1 Appendix H,IEC/EN 62368-1, EN IEC61000-6-1/3, IEC 60529, IEC 60068-2-52		
	UN 38.3, MSDS		
Warranty*	10 years Warranty, 10 Years Performance Life		
Country of manufacture	Made in China		
Rated capacity *: Test conditions: 100% DOD, 0.33C charge and discharge at +25±2°C. Available energy*: Test conditions: 90% DOD, 0.33C charge and discharge at +25±2°C. Cycle life*: Test conditions: 90% DOD, 0.2C charge and 0.2C discharge at +25±2°C. Maximum Charge and Discharge Current*/Power *: Maximum continuous charge and discharge current and power derating will be temperature and SOC dependent. Warranty*: Refer to the product warranty terms for details.			

9.2 Battery System With Heating Function

Product name	Rechargeable Li-ion Battery System		
Battery system model	B8900M-HAW	B8900M-HBW	B8900M-HCW
Number of battery modules	1 module	2 modules	3 modules
BMS control unit model	B8900M-HPW		
System Data			
Rated capacity *	8.985KWh	17.971KWh	26.956KWh
Depth of Discharge (DOD)	90%		
Available energy*	8.087KWh	16.173KWh	24.260KWh
Battery module	172.8V, 52Ah, 8.985KWh		
Cell type	LFP(LiFePO ₄)		
Cycle life*	8000 cycles		
Battery configuration	54S1P	108S1P	162S1P
Rated voltage	172.8 VDC	345.6 VDC	518.4 VDC
Operating voltage	135~194.4 VDC	270~388.8 VDC	405~583.2 VDC
Maximum charge/discharge current*	52A		
Maximum charge/discharge power*	8.985KW	17.971KW	26.956KW
Battery clustering function	Yes, 6 clusters per inverter		
Maximum battery expansion capacity	160.2kWh		
Operating temperature	charge: -20°C<T<55°C / Discharge: -20°C<T<60°C		
Storage temperature and SOC	-20~45°C (≦3 Months) / 0~35°C (≦1 Year) @SOC60%		
Running logs	4G-Byte		
Protection			
Overvoltage/Undervoltage protection	Yes		

Overcurrent protection	Yes		
Overtemperature/under-temperature protection	Yes		
DC circuit breaker	Yes		
Shutdown current	Yes		
General Data			
Communication	CAN		
Humidity	10% to 85% no condensing		
Operating Altitude	≤3000m		
IP rating	IP65		
Cooling method	Natural convection		
Weight	101KG	185KG	269KG
Dimensions (without foot pad)	730*710*180mm	730*1220*180mm	730*1730*180mm
Dimensions (with foot pad)	730*754*180mm	730*1264*180mm	730*1774*180mm
Installation location	Indoor / Outdoor		
Installation method	Floor stand		
Certification	CB, CE, UKCA, LOA, SONCAR, RCM, EMC, ROHS, S-Mark,KBIA, UL		
	IEC 62619:2022, IEC 60730-1 Appendix H,IEC/EN 62368-1, EN IEC61000-6-1/3, IEC 60529, IEC 60068-2-52		
	UN 38.3, MSDS		
Warranty*	10 years Warranty, 10 Years Performance Life		
Country of manufacture	Made in China		
Rated capacity *: Test conditions: 100% DOD, 0.33C charge and discharge at +25±2°C. Available energy*: Test conditions: 90% DOD, 0.33C charge and discharge at +25±2°C. Cycle life*: Test conditions: 90% DOD, 0.2C charge and 0.2C discharge at +25±2°C. Maximum Charge and Discharge Current*/Power *: Maximum continuous charge and discharge current and power derating will be temperature and SOC dependent. Warranty*: Refer to the product warranty terms for details.			

