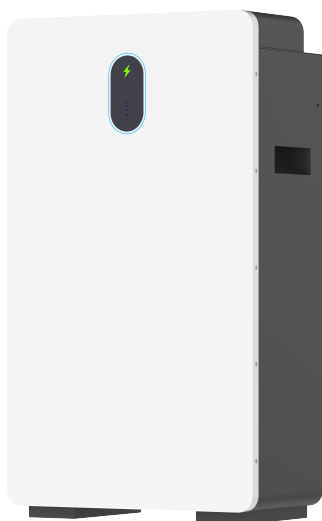


Version: EN-UM-2.0



USER MANUAL

16kWh Battery System

HISTORY

VERSION	ISSUED	COMMENTS
0.0	May 22 nd , 2026	First release
1.0	June 1 st , 2026	Update mounting details; Update bluetooth QR code; Update indicator content.
2.0	June 24 th , 2026	Add parallel notice;optimize details in the manual.

Preface

About This Manual

This manual describes the installation, electrical connection, commissioning, and maintenance of the 16kWh Battery System. Please read the manual and related documents carefully before using the product and store it in a location accessible to installation, operation and maintenance personnel at all times. Illustrations in this user manual are for reference only. This user manual is subject to change without prior notice. (The actual product shall prevail.)

Target Group

The 16kWh Battery System must be installed by qualified electrical engineers who hold relevant qualifications.

Scope

This manual is applicable to the following battery system:

- 16kWh

Conventions

The following safety instructions and general information are used within this user manual.

 DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
 NOTICE	Indicates a situation which, if not avoided, can result in property damage.
 NOTE	Information that is important for a specific topic or goal, however not related to safety.

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1. Detailed Specifications

Item Name	Specification
Rated Capacity	314 Ah
Rated Voltage	51.2 V
Rated Current	157 A
Working Voltage Range	43.2 to 57.6 V
Rated Energy	16.07 kWh
Max. Parallel Quantity ¹	Up to 16 units in parallel (total capacity: 257.12 kWh)
Max Charge Current	160 A
Max Discharge Current	200 A
Standard Charging Method	157 A to 57.6 V;25°C
Dimensions [W*D*H]	800 mm * 235 mm * 450 mm
Weight	~115 kg
Operating Temperature ²	Charge: 0 °C to 55 °C Discharge: -20 °C to 60 °C
Storage Temperature and Humidity ³	Temperature:-15°C to 55°C Humidity: 5%~95% RH,no condensation
Working Humidity	5%~95% RH (non-condensing)
Altitude ⁴	≤ 3000 m
Communication	CAN, RS485, Bluetooth, Wi-Fi (Optional)
Certifications	UN38.3
Designed Cycle Life	6000 cycles@0.5CC/0.5DC , 70%SOH
IP Rating (25°C ± 2°C)	IP54
Cooling	Natural Cooling
Fire Protection	Aerosol fire suppression

1 Parallel Connection Requirements

Dynamic parallelism strategy for static state: Batteries can be connected in parallel when their static voltage difference is within 1 V (corresponding to an SOC difference of 15%–20%).

- If the voltage difference exceeds 1 V during discharge: prioritize connecting higher-capacity batteries. When the voltage difference drops to 0.5 V, connect lower-capacity batteries.
- During charging: prioritize connecting lower-capacity batteries. When the voltage difference narrows to 0.5 V, connect higher-capacity batteries into the system.

Rules for mixed use of new and aged batteries: Batteries with a cycle count difference of less than 300 cycles are permitted for parallel connection. Those with a cycle count difference exceeding 300 cycles are prohibited from parallel connection.

2 Recommended operating temperature: 10 °C to 30 °C.

3 Recommended storage temperature: 10 °C to 30 °C.

4 Recommended operating altitude ≤ 2000 m, maximum operating altitude 3000 m.

2. Safety

2.1 Important Safety Instruction

This product is designed and rigorously tested in compliance with international safety standards. Like all electrical and electronic equipment, residual risks may remain despite meticulous manufacturing. To avoid personal injury and property damage, and ensure stable long-term operation, read and strictly follow all safety instructions in this manual carefully before use.

 DANGER	Electric shock hazard if surge protection is not installed! Without surge protection, voltage surges can enter the building and connected devices through power, network, or other cables. Contact with live parts may cause death or serious injury. • Ensure all devices in the same system are integrated into existing surge protection systems/devices. • Refer to local installation codes and regulations to determine the requirements for the installation of surge protection devices.
 WARNING	Electric shock hazard from damaged measuring devices! Overvoltage may damage measuring devices, leaving hazardous voltage inside the enclosure. Contact with the enclosure may cause death or serious injury. • Only use measuring devices with a voltage rating exceeding the system battery voltage.
 CAUTION	Risk of injury from heavy product! Improper lifting or accidental dropping during transportation or installation may result in personal injury. • Lift and transport the product carefully. • Wear appropriate personal protective equipment (PPE) in accordance with local regulations when handling the product.
 NOTICE	Electrostatic discharge may cause permanent damage to internal components of the battery system. • Ground yourself before touching any internal component.

2.2 Installation Requirement

Personnel must complete training on all safety precautions and proper operating procedures prior to installing, operating, or maintaining the equipment.

- Only qualified and trained personnel are allowed to install, operate, and maintain equipment.
- Only qualified professionals are allowed to remove safety facilities and repair equipment.
- The product must be installed and used in accordance with the specifications described in this manual. Improper use may cause malfunctions. Damage or faults resulting from such misuse are not covered under warranty.

2.3 Grounding Requirement

The following applies only to equipment that requires grounding (excluding energy storage units).

- Ground the equipment during installation. When removing the equipment, disconnect the ground cable last.
- Do not damage the grounding conductor.
- Do not operate the equipment without a grounding conductor installed. Before operation, verify the electrical connections to ensure the equipment is reliably grounded.

2.4 Personal Safety

- Do not operate devices or work on cables during thunderstorms.
- Before opening a device, wear ESD clothes, ESD gloves, and an ESD wrist strap. Remove conductive items such as jewelry and watches to avoid electric shocks or burns.
- If there is a fire, evacuate the building or operating area and press the fire alarm bell, or call the fire alarm number. DO NOT re-enter a burning building under any circumstances.
- Do not turn on the switch before the installation is complete.

2.5 Equipment Safety

- Before operation, the equipment must be securely fixed to the floor or other stable structures, such as walls or mounting brackets.
- Before powering on the equipment, ensure all internal screws are tightened to prevent loosening during operation.
- After installing the equipment, remove all empty packing materials from the work area.
- Replace illegible or damaged safety signs promptly.
- In any case, DO NOT modify the structure of the equipment, installation sequence, etc., without prior written approval of the manufacturer.
- Never clean internal electrical components or equipment enclosure with water.
- Do not drill holes in the equipment enclosure.

2.6 Symbols on the Label



This symbol indicates that the product must be additionally grounded if additional grounding or equipotential bonding is required at the installationsite.



Beware of high voltage and operating current!
The product operates at a high voltage and current. Work on the product must only be carried out by skilled and authorized personnel.



WEEE Designation
Do not dispose of the product together with household waste. Dispose the product in accordance with local disposal regulations for electronic waste.



The battery is recyclable
The battery can be recycled by a professional recycling organization, please refer to the relevant local regulations.



Observe the documentation
Read and understand all documentation supplied with the product.

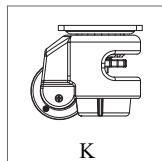
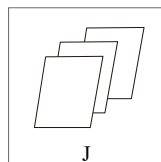
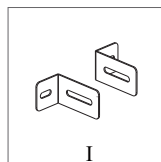
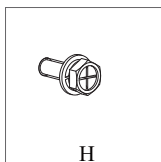
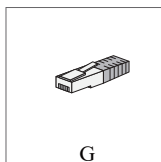
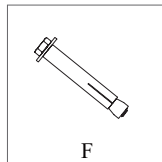
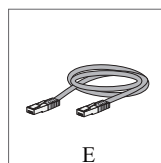
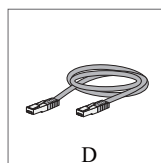
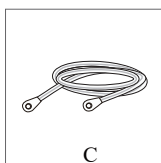
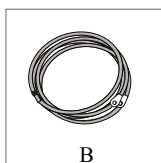
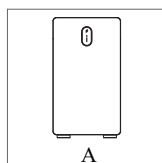
3. Unpacking and Storage

3.1 Unpacking

- Choose an appropriate place to set battery system.
- Take the battery pack from the package.

3.2 Scope of Delivery

Check the scope of delivery for incompleteness and any visible external damage. Contact your supplier if the package is damaged upon delivery or is incomplete.



Object	Item Name	Details	Quantity	Notes
A	Battery Pack		1 PC	
B	Output Cable		2 PCS	
C	Grounding Cable	Ground cable yellow & green, BVR2.5 mm ² , L=2000 mm, double RNB2-6	1 PC	
D	Communication Cable	Black Category 5e unshielded cable sequence: 4 pairs, 4 pairs, 5 pairs, 5 pairs, wire length: 2000 mm-RJ45 crystal plug	1 PC	For inverter
E	Communication Cable	Black Category 5e unshielded T568B color wire sequence, wire length 2000 mm-RJ45 crystal plug	1 PC	For parallel
F	Expansion Bolt	M6 × 60	2 PCS	
G	RJ45 Terminal		4 PCS	Spare parts
H	Screw	M6 × 12	2 PCS	
I	Mounting Lug		2 PCS	
J	File Package	User manual*1 /Packing list*1 Quality certificate*1/Wi-Fi guide *1	1 PC	WiFi guide is optional
K	Caster		4 PCS	Optional

3.3 Storage Recommendations

Long-term battery storage is not recommended. Use batteries promptly after on-site installation and follow handling regulations.

Required Storage Temperature	Actual Storage Temperature	Recharge Interval	Remarks
$-15^{\circ}\text{C} < T \leq 55^{\circ}\text{C}$	$T \leq -15^{\circ}\text{C}$	Not allowed	Not reaching the time for recharge: Use the batteries as soon as possible.
	$-15^{\circ}\text{C} < T \leq -10^{\circ}\text{C}$	6 months	
	$-10^{\circ}\text{C} < T \leq +25^{\circ}\text{C}$	12 months	
	$25^{\circ}\text{C} < T \leq 35^{\circ}\text{C}$	9 months	Reaching the time for recharge: Recharge the batteries.
	$35^{\circ}\text{C} < T \leq 55^{\circ}\text{C}$	6 months	
	$55^{\circ}\text{C} < T$	Not allowed	

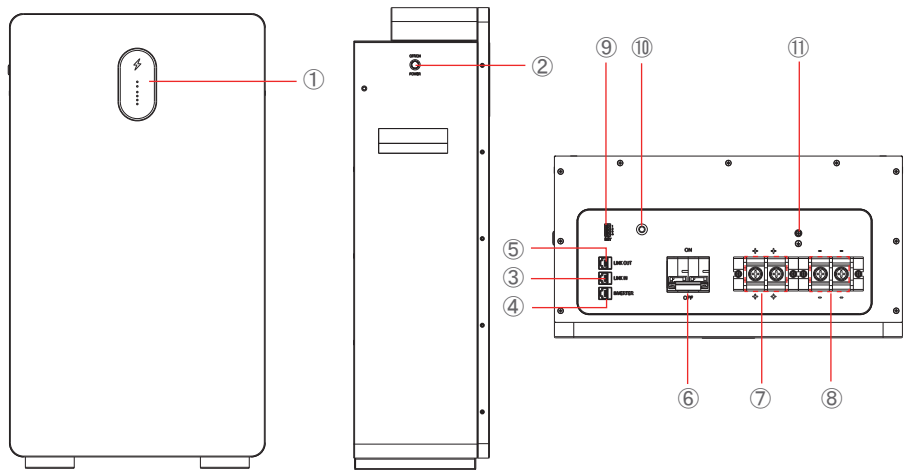


CAUTION

Failure to comply with storage guidelines will significantly reduce battery cycle life.

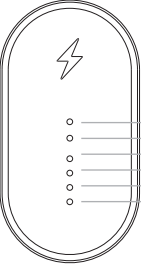
4. Product Overview

4.1 Interfaces and Functions



Number	Item	Details	Notes
1	Indicator Lights		Status indicator, alarm indicator and SOC indicators
2	Power Switch		
3	Link In	RJ45	Internal RS485 communication between batteries
4	Inverter	RJ45	Communication between the battery pack and the inverter
5	Link Out	RJ45	Internal RS485 communication between batteries
6	125A DC Breaker x2		
7	Port Positive	P+	Connected to the positive terminal of the inverter
8	Port Negative	P-	Connected to the negative terminal of the inverter
9	DRY Port		Dry1 Point + Contact Max 600V/Max 80mA Dry1 Point - Contact Max 600V/Max 80mA Dry2 Point + 24V/Max 80mA Dry2 Point - 24V/Max 80mA
10	WiFi Antenna		Optional
11	GND	M4 × 8	Yellow-green, 12 AWG

4.2 LED Indicator Definition

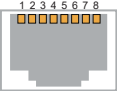
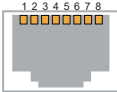
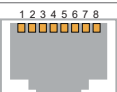


- LED6 (Status indicator)
- LED5 (Alarm indicator)
- LED4 (SOC indicator)
- LED3 (SOC indicator)
- LED2 (SOC indicator)
- LED1 (SOC indicator)

Battery LED Indicator light status description									
Battery Status	Battery Information	RUN	ALA	Battery SOC LED				Remark	Duration
		LED6	LED5	LED4	LED3	LED2	LED1		
Remote		★	● or ●					LED5 depending on the previous status	
Bootload		★		★	★	★	★	2Hz	1~2S
Short press power Switch to display parallel machine address	Master-Slave Definition	●		●	●	●	●	Master	
		●					●	Slave1	
		●				●		Slave2	
		●				●	●	Slave3	
		●			●			Slave4	
		●			●		●	Slave5	
		●			●	●		Slave6	
		●			●	●	●	Slave7	
		●		●				Slave8	
		●		●			●	Slave9	
		●		●		●		Slave10	
		●		●		●	●	Slave11	
		●		●	●			Slave12	
		●		●	●		●	Slave13	
		●		●	●	●		Slave14	
		●					★	Slave15	
Application Mode Checking	Parallel or single application mode checking success	★		Display according to actual SOC				Blink 5 times	2S
	Wait for the power loop to dynamically incorporate Battery	★		Display according to actual SOC				1Hz	

Battery Status	Battery Information	RUN	ALA	Battery SOC LED				Remark	Duration
		LED6	LED5	LED4	LED3	LED2	LED1		
Charge	0~25% SOC	●					■		
	25.1% to 50% SOC	●				■	■		
	50.1% to 75% SOC	●			■	■	■		
	75.1% to 99.9% SOC	●		■	■	■	■		
	100% SOC	●		●	●	●	●		
Discharge& Stanby	100% to 75.1%	●		●	●	●	●		
	75% to 50.1%	●			●	●	●		
	50% to 25.1%	●				●	●		
	25% to 0%	●					●		
Battery Fault	BMS fault(Classification of internal faults such as MOS Adhesion)	●		●or★	●or● or★	●or● or★	●or● or★	LED1~LED4 depending on the previous status	
Shutdown		●or● or★	●or● or★	★	★	★	★	LED5, LED6 depending on the previous status, blink 2times, then shutdown	
Remark: ★: Blue LED Blink , ●: Blue LED On ■: Blue LED flash display(The LEDs are illuminated in the form of a running light at intervals of 500ms according to the current SOC, and are then all extinguished simultaneously upon completion. After the end of one cycle, the LEDs light up again in a cyclic manner) ★: Green LED Blink ●: Green LED On ★: Red LED Blink ●: Red LED on ●: LED off									

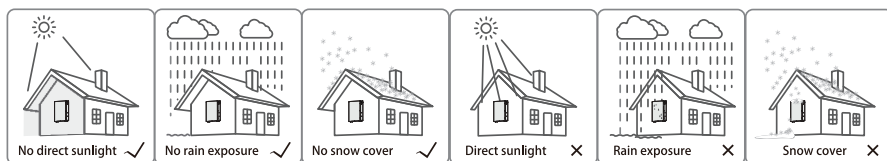
• RJ45 Port Pin Definition

View	Item	Port	1	2	3	4	5	6	7	8
	1	LINK IN	CAN2_H	CAN2_L	GND_ISO	GND_ISO	SS	GND_ISO	E_IN	SOUT
	2	LINK OUT	CAN2_H	CAN2_L	GND_ISO	GND_ISO	MS	GND_ISO	E_OT	SOUT
	3	INVERTER	CAN2_H	CAN2_L	E12-	CAN1_H	CAN1_L	EXT_12V+	RS485_B	RS485_A

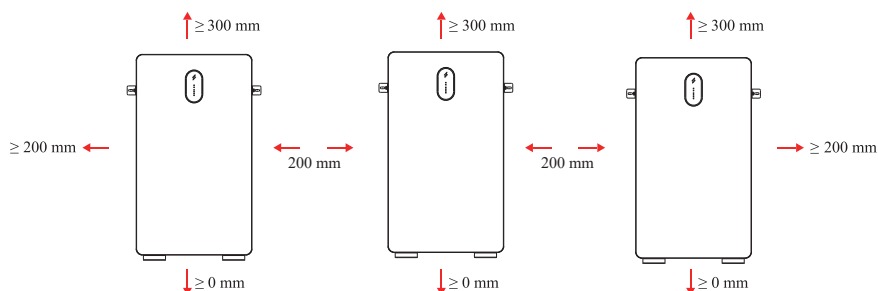
5. Installation

5.1 Installation Environment Requirements

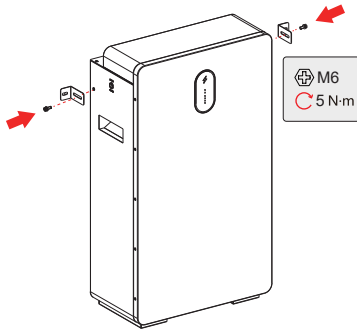
1. Install the battery pack in a dry and well-ventilated location.
2. The installation location must be away from direct sunlight and rain.
3. The installation location must be far away from fire sources.
4. The installation location must be far away from water sources such as taps, sewer pipes, and sprinklers to prevent water ingress.
5. Do not expose the battery pack to flammable or explosive gases or vapors .
6. Ambient conditions:
 - Humidity: 5%RH to 95%RH (non-condensing)
 - Operating temperature: -15°C to +55°C



5.2 Wall Mounting Steps

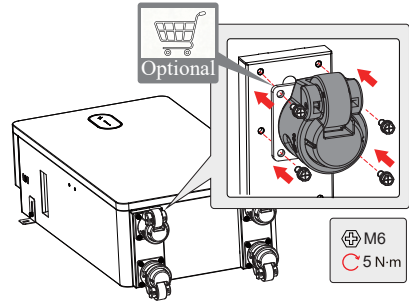


 CAUTION	• Walls may contain electrical cables or pipes (e.g., gas or water lines). Ensure no power cables or pipes are damaged when drilling. • Improper lifting or dropping of the battery pack during transport and installation may cause personal injury. • Wear appropriate personal protective equipment (PPE) in accordance with local regulations during all operations.
 NOTICE	• Expansion bolts are intended for use in solid brick-concrete walls and concrete floors. For other wall/floor types, verify the load-bearing capacity and select suitable fasteners accordingly. • Ensure mounting holes are level with the floor surface.

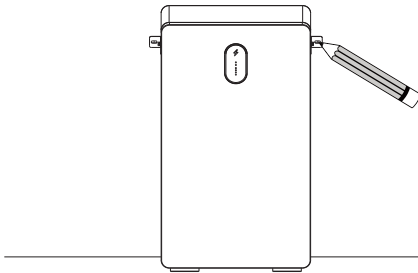


1 Install the mounting lugs.

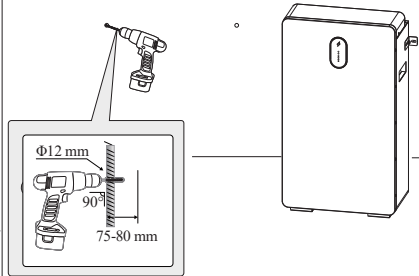
 Risk of tipping when moving with these casters



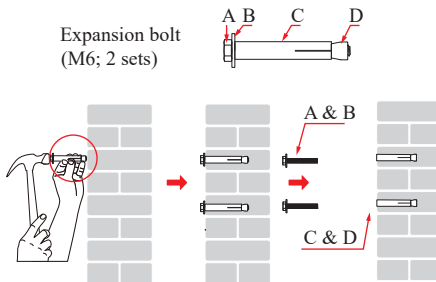
2 Install the casters as needed.



3 Mark the drill holes on the wall.

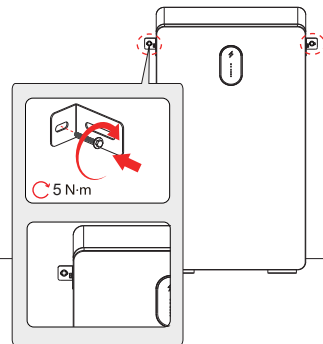


4 Remove the battery pack and drill the holes.



Install the expansion bolts in the wall, then remove the screws.

5



6 Secure the battery pack with mounting screws.

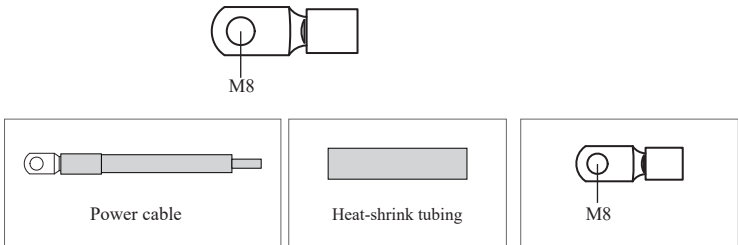
6. Electrical Connection

6.1 Requirements for the Electrical Connection

6.1.1 Power Cable (For parallel connection)

Material List (plug components may be purchased separately from the supplier.)

- Plug Components (A)



- Positive Negative DC Cable (B)
* These cables are included in the accessory kit.



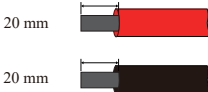
Positive DC Cable



Negative DC Cable

6.1.2 Assembly Parallel Cable

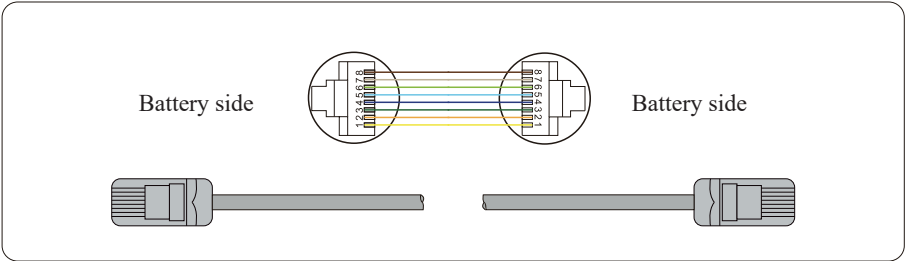
- Crimping Procedure for Plug Components (A)

 1 Slide the heat-shrink tubing onto the cable.	 2 Strip 20 mm (± 0.5 mm) of insulation from the end of the cable.
 3 Attach the red lug to the positive cable and the black lug to the negative cable. Crimp the cable ends securely to the terminals using crimping pliers.	 4 Slide the heat-shrink tubing over the insulated wire and terminal. Use a heat gun to apply heat and shrink the tubing tightly into place.

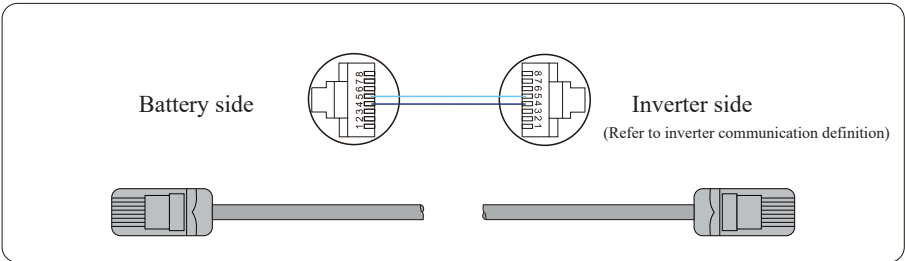
6.1.3 Communication Cable

Battery to Battery Communication Cable.

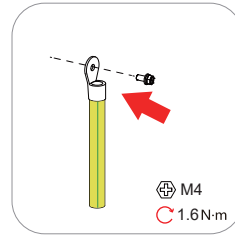
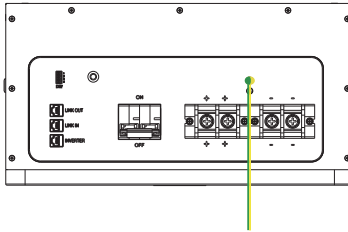
Pin definition as below, alternatively a standard straight CAT5 Ethernet cable can be used.



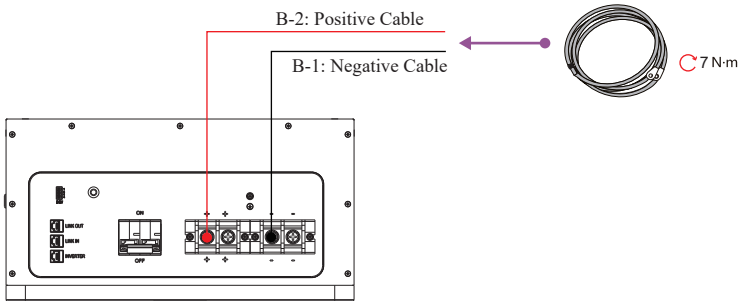
Battery to Inverter Communication Cable



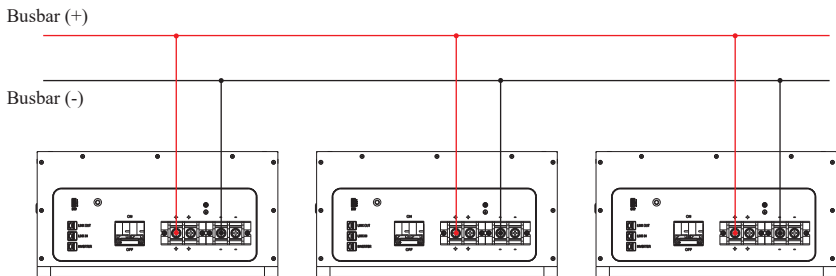
6.2 Electrical Connection Steps



- 1 Connect ground cable.

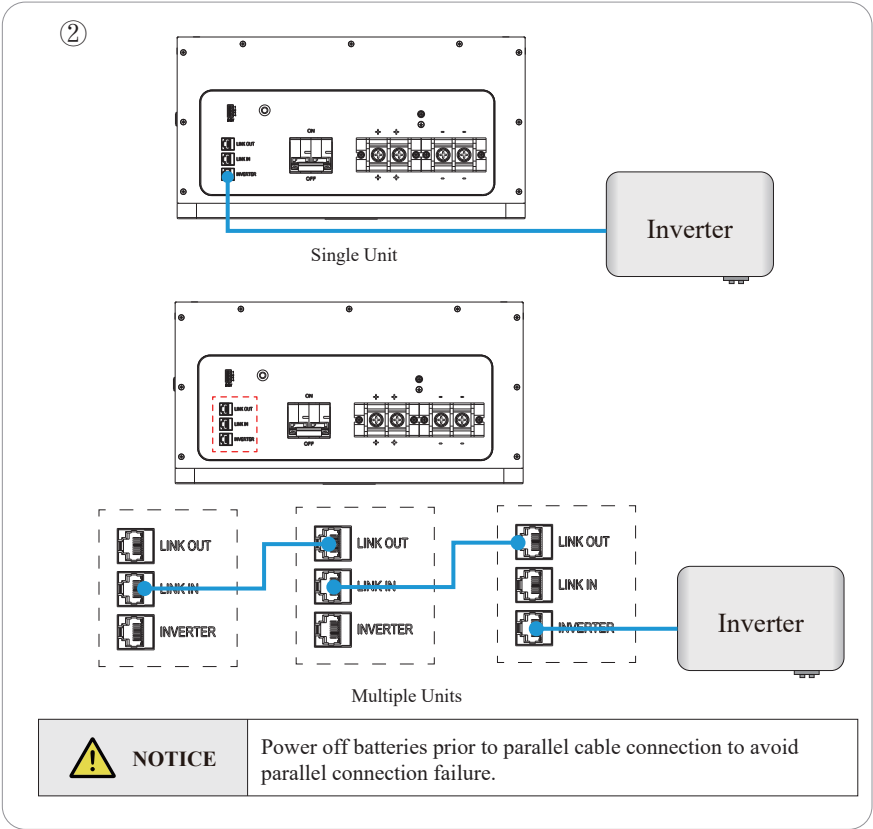
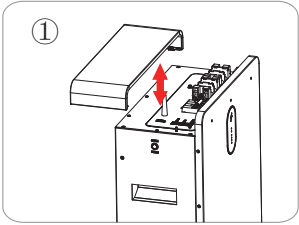


Single Unit



Parallel Connection with Busbar

- 2 Connect power cable.



3 Connect communication cable.

6.3 Battery Activation

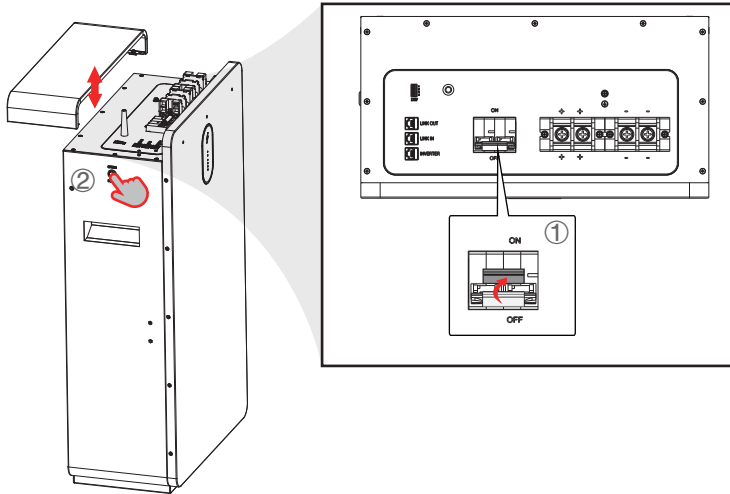


NOTICE

Failing to turn on all circuit breakers between the battery and inverter before turning on the battery power switch will disable the pre-charge/soft-start function. This would cause very high currents to flow between the inverter and battery for a short duration, potentially damaging the battery, inverter or wiring.



Refit the top cover after turning on the circuit breaker.



STARTUP PROCEDURE

Battery Side:

1. Switch on the circuit breaker on the battery pack.
2. Press and hold the battery pack's "POWER" switch for 3 seconds, and confirm that the status indicator and SOC indicators light up normally.

Startup Status Display Instructions:

For Single Battery Pack

Press and hold the "POWER" switch for 3 seconds. The status indicator will light up, and the SOC indicators will flash before remaining lit to show the actual charge level. startup completed.

For Parallel Battery Packs

1. Verify that all communication cables are properly installed.
2. Press and hold the "POWER" switch on the master battery pack for 3 seconds.
 - The status indicators on all battery packs in the parallel system will remain on.
 - The slave addresses will display for 3 seconds, then automatically switch to real-time SOC status.

SHUTDOWN PROCEDURE

Battery Side:

- 1. Turn off the circuit breaker on the battery pack.
- 2. Press and hold the battery's "POWER" switch for 3 seconds to shut down the battery system.
Verify that all indicators have turned off.

Shutdown Status Indicator Instructions:

Shutdown for Single Battery Pack

Press and hold the "POWER" switch for 3 seconds. The SOC indicators flash several times, then turn off along with the status indicator. The shutdown process is complete.

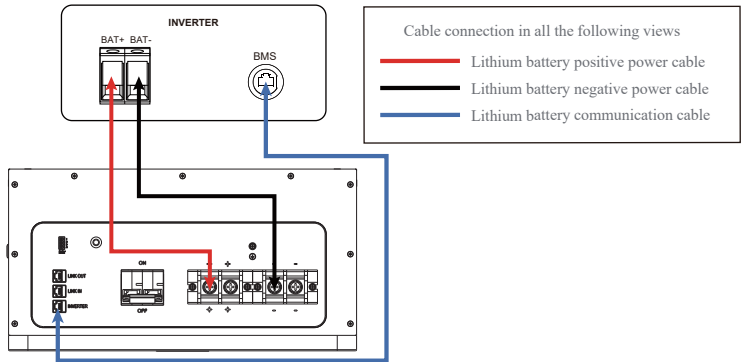
Shutdown for Parallel Battery Packs

Press and hold the "POWER" switch on the master battery pack for 3 seconds. The SOC indicators will flash several times, then turn off together with the status indicator. The parallel system shutdown process is complete.

7. System Diagram

- 1. Before electrical connection, ensure that the DC breaker / power switch of the battery and all switches connected to the energy storage equipment are in the OFF state. Otherwise, electric shock may occur.
- 2. Parallel cables require additional purchase.

7.1 Single Unit

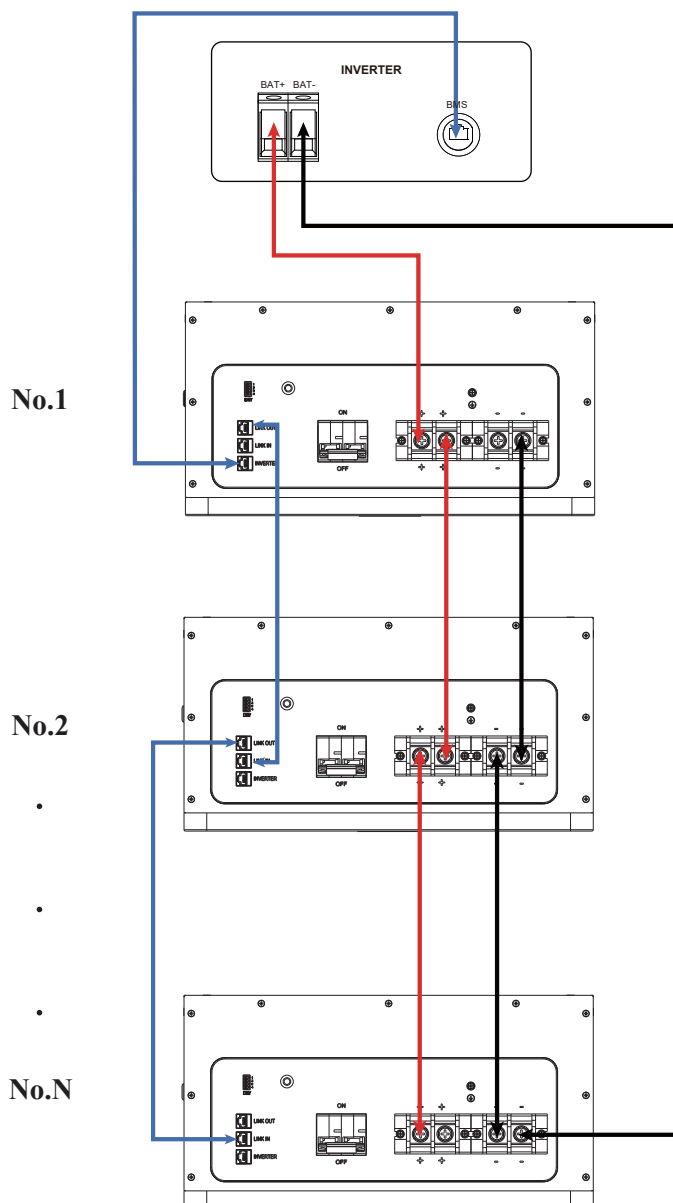


 DANGER	Ensure power cables are installed with the correct polarity. A dangerous situation may arise if the polarities are reversed.
 DANGER	Do not create a short circuit between the positive and negative terminals of the battery. Ensure the polarity is correct during installation.
 WARNING	Incorrect communication cable connection will cause the may lead battery system to operate in unexpected ways which to system failure.

7.2 Multiple Units

7.2.1 Wiring Diagram ($2 \leq N \leq 16$, total system capacity ≤ 10 kW)

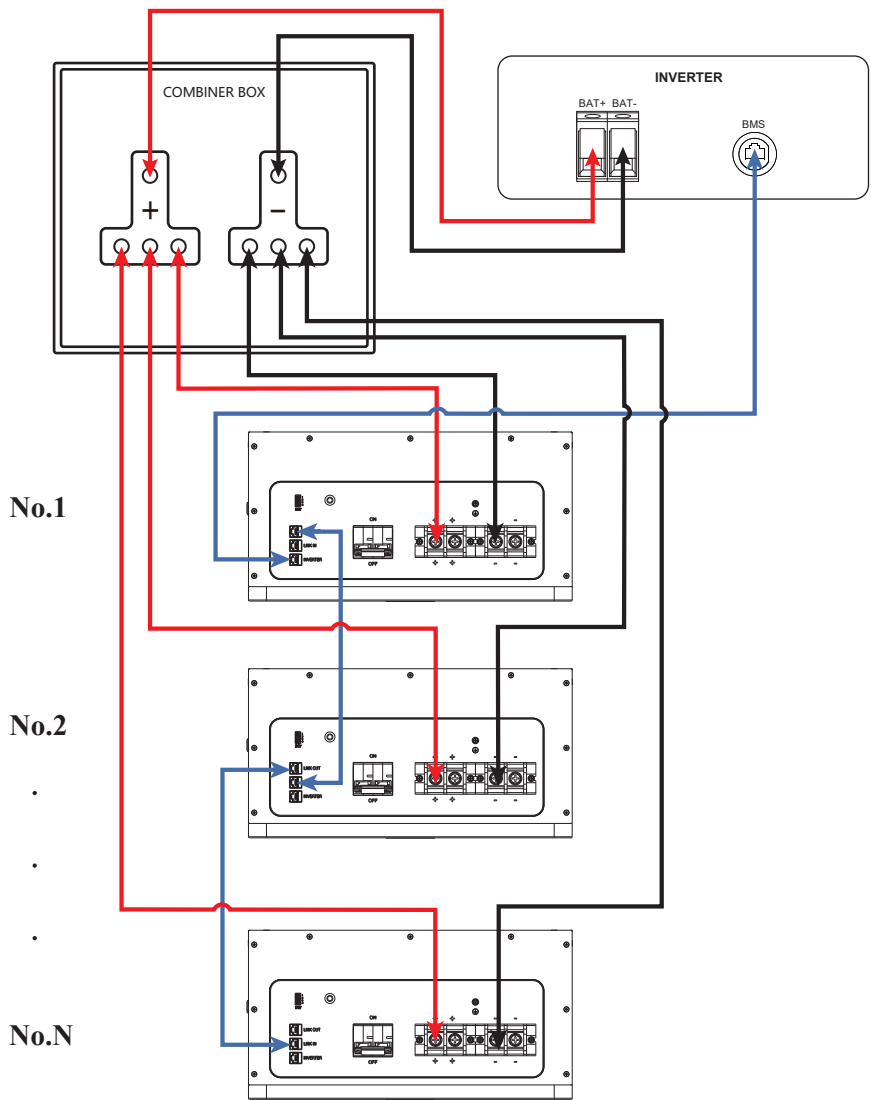
(Intermediate units in the diagram are omitted.)



7.2.2 Wiring Diagram ($2 \leq N \leq 16$, total system capacity > 10 kW)

When using an inverter of 10 kW or higher, positive and negative terminals of each battery pack must be connected to the combiner cabinet as shown in the diagram below.

(Intermediate units in the diagram are omitted.)



8. Bluetooth Configuration

The built-in Bluetooth module allows users to connect to the APP for real-time monitoring and management of the battery system.

Scan the QR code below to download and install the APP.



iOS



Android

9. Maintenance

9.1 Routine maintenance

To ensure the long-term reliable operation of the energy storage system, perform regular maintenance on all battery packs.

Check content	Inspection method	Maintenance cycle
System appearance	Check whether the appearance of the system is damaged or deformed.	Every 6 to 12 months
System running state	1. Check whether the battery pack produces abnormal noise during operation. 2. Check whether the battery pack parameters are correctly set when the battery is running.	Every 6 months
Electrical connection	1. Check whether cables are secured. 2. Check whether cables are intact, pay special attention to sections contacting metal surfaces to ensure no abrasion/scratches.	Every 6 months
Ground reliability	Check whether all grounding cables are securely fastened.	Initial inspection shall be conducted 6 months after commissioning. Subsequent inspections shall be conducted every 6 to 12 months.

9.2 Troubleshooting

Items	Solution	Measure
Unable to start	1. When the Power Switch is set to the ON position, the LED indicators may fail to respond, or all LEDs may turn off after 1 second if the DC circuit breaker remains off. 2. Charge the battery via a charger or inverter that supplies a voltage of 54 V to 57.6 V, and verify that the battery pack can start normally.	If the fault persists after carrying out all above steps, contact your supplier.
Unable to charge	1. Verify the cable connection between the battery and the inverter / charger is correct. 2. Check whether the inverter / charger setting is correct. 3. Check whether the battery pack is in charge protection mode, if so, try to discharge the battery pack.	
Unable to discharge	1. Check whether the cable connection between the battery and the inverter / charger is correct. 2. Inspect the battery pack for short circuit, reverse connection, or pre-charge failure when connecting it to the inverter. 3. Check whether the battery is in discharge protection mode, if yes, try to charge the battery pack.	For any fault conditions not listed in this table: fully power off the battery system, then contact your supplier.
High / Low temperature	1. Power off the battery system for a while, check whether the temperature at installation location meet the requirement. 2. Avoid continuous full charging and discharging of the battery pack.	
High current	Check whether the configuration and parameters setting on the inverter / charger is correct.	
ALM always on	Power off all battery packs, then remove the faulty unit from the parallel system.	
Communication fail	1. Check whether the communication cable type is correct and the cable connection is secure. 2. Verify the inverter communication pin definition follows the 4H5L standard. If not, rewire the communication cable per the inverter's official requirements. 3. Check whether the inverter protocol setting is correct. 4. Check whether both the battery pack and inverter are operating normally.	

Note: Please restart after software upgrade.

10. Decommissioning and Disposal

10.1 Decommissioning

Before decommissioning the battery system, all operations shall be performed by qualified personnel in accordance with local regulations and applicable safety standards.

1. Switch off the system using the Power Switch and confirm that all indicators (LEDs) are off.
2. Disconnect the system from all external power sources, including the inverter, grid, and loads, and switch off all related DC and AC circuit breakers.
3. After shutdown, wait at least 5 minutes to allow internal capacitors to fully discharge.
4. Disconnect all power and communication cables in the reverse order of installation, and protect all connectors against short circuits.
5. If the battery shows signs of damage (such as deformation, leakage, overheating, smoke, or abnormal odor), immediately stop operation and isolate the battery. Do not open, disassemble, or attempt to repair the battery. Contact the installer, distributor, or manufacturer for further instructions.
6. Store decommissioned batteries in a dry, well-ventilated location, protected from moisture, direct sunlight, high temperatures, and mechanical impact.

10.2 Disposal

This section specifies mandatory legal and environmental requirements for the disposal of used or decommissioned batteries.

- Batteries, including rechargeable batteries, must not be disposed of in household or general waste.
- Used or damaged batteries shall be delivered to authorized collection or recycling facilities in accordance with applicable local regulations.
- Batteries may contain hazardous substances as well as valuable recyclable materials; improper disposal may harm human health and the environment.
- During storage and transportation, batteries shall be protected against short circuits, leakage, and mechanical damage.

