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*Specifications are subject to change without prior notice.

A0-20260708





W16+ Operation Manual

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TECHNICAL DATA

NOTE

Operating current derating according to cell voltage and battery temperature.



Performance	
Nominal Voltage	51.2Vdc
Nominal Capacity	314Ah
Battery Energy	16077Wh
Charge Voltage	56.16Vdc
Discharge Voltage	44.8Vdc
Nominal Charge/Discharge Current	100A
Nominal Charge/Discharge Power	5120W
Max Charge / Discharge Current	210A
Max Charge / Discharge Power	10752W
Communication	
Display	SOC status indicator, LED indicator
Communication	RS232, RS485, CAN
General Specification	
Dimension(WxDxHmm)	800x500x227mm
Weight (Kg)	128kg
Installation	Floor stand or Wall mounted
Charging Temperature Range	0°C~ 45°C
Discharge Temperature Range	-20~ 45°C
Operating / Storage / humidity	≤95%RH
Max Operating Altitude	≤2000m
IP Rating	IP65
Cell Technology	LiFePO ₄ , Lithium Iron Phosphate
Scalability	Max 20 batteries in parallel
Recommended usage environment	Indoor or outdoor under eaves(avoid direct sunlight).
Standard Compliance	
Certification	UN1973/UL9540A/UL9540/UN38.3

1. Test conditions: 100% depth of discharge (DoD), 0.2C rate charge & discharge at 25°C.
2. Charge/discharge derating occurs when the operating temperature from -10°C to 5°C & 45°C to 55°C.
3. Condition apply. Refer to W16+ Warranty Letter.

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PRODUCT OVERVIEW

2.1 Brief Introduction



PRODUCT OVERVIEW

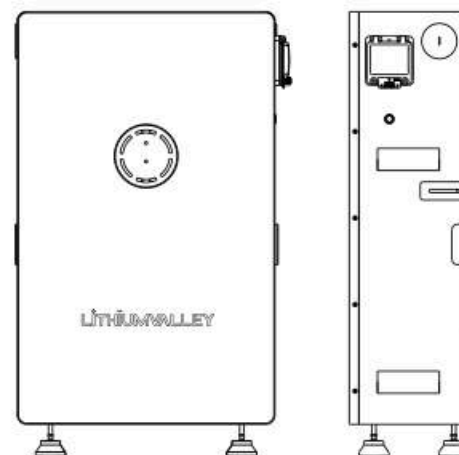
W16+ is a lithium battery with an operating voltage range between 44.8~56.16V. It is designed for residential energy storage applications and works together with a 48V battery hybrid inverter. **W16+ is not suitable for supporting life-sustaining medical devices.**

W16+ has built-in BMS (Battery Management System), which can manage and monitor cells information including voltage, current and temperature.

Besides that, BMS can balance cells charging to extend cycle life. BMS has protection functions including over-discharge, over-charge, over-current and high/low temperature; the system can automatically manage charge state, discharge state and balance state.

Multiple W16+ can be connected in parallel to expand capacity and power, 20 W16+ can be connected in parallel at most.

2.2 Interface Introduction



2.2.1 Switch ON/OFF

STARTUP PROCEDURE

1. Switch on the circuit breaker on the battery side.
2. Press and hold the battery's "POWER" button for 3 seconds, and confirm that the RUN indicator is flashing and the SOC indicator is lit normally.

Startup Status Display Instructions

1. Single Battery Pack Startup: Press and hold the "POWER" button for 3 seconds. The SOC, RUN, and ALM indicators will all light up and flash 3 times. After that, the SOC indicator will remain on, and the RUN indicator will flash, indicating that the startup is complete.
2. Parallel Battery Pack Startup: First, check if the communication connection cables are properly installed. Then, press and hold the "POWER" button on the master unit for 3 seconds. The SOC, RUN, and ALM indicators on both the master and slave units will all light up and flash 3 times. Afterward, the master unit's SOC indicator will remain on, and the RUN indicator will flash. The slave unit will only have the RUN indicator flashing, indicating that the master-slave battery pack startup is complete.

SHUTDOWN PROCEDURE

1. Turn off the circuit breaker on the battery side.
2. Press and hold the battery's "POWER" button for 3 seconds to shut down the battery, and ensure that the SOC, RUN, and ALM indicators are all turned off.

Shutdown Status Display Instructions

1. Single Battery Pack Shutdown: Press and hold the "POWER" button for 3 seconds. The SOC, RUN, and ALM indicators will light up one by one, then all will turn off, indicating that the shutdown is complete.
2. Parallel Battery Pack Shutdown: Press and hold the "POWER" button on the master unit for 3 seconds. The SOC, RUN, and ALM indicators on the master unit will light up one by one, then all will turn off. The RUN indicator on the slave unit will turn off, indicating that the master-slave battery pack shutdown is complete.

2.2.2 LED Indicator Definition

Note:

flash 1 - 0.25s light / 3.75s off

flash 2 - 0.5s light / 0.5s off

flash 3 - 0.5s light / 1.5s off

LED Indicators Instructions

		RUN	ALM	Battery Level Indicator						Descriptions
Status		L8	L7	L6	L5	L4	L3	L2	L1	
Shut down		OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	All OFF
Standby		Flash 1	OFF	According to the battery level						Indicates Standby
Charging	Normal	Light	OFF	According to the battery level						The highest capacity indicator LED flashes(flash 2),others lighting
	Full Charged	Light	OFF	Light	Light	Light	Light	Light	Light	Turn to standby status when charger off
	Protection	OFF	Light	OFF	OFF	OFF	OFF	OFF	OFF	Stop charging
Discharg	Normal	Flash 3	OFF	According to the battery level						
	UVP	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Stop charging
	Protection	OFF	Light	OFF	OFF	OFF	OFF	OFF	OFF	Stop discharging
Fault		OFF	Light	OFF	OFF	OFF	OFF	OFF	OFF	Stop charging and Discharging

Charging Battery Level Indicators Instructions

Status		Charging							
Battery Level Indicator		L8	L7	L6	L5	L4	L3	L2	L1
Battery Level (%)	0 ~ 17%	Light	Red	Light	Light	Light	Light	Light	Flash 2
	18 ~ 33%	Light	Red	Light	Light	Light	Light	Flash 2	Light
	34 ~ 50%	Light	Red	Light	Light	Light	Flash 2	Light	Light
	51 ~ 66%	Light	Red	Light	Light	Flash 2	Light	Light	Light
	67 ~ 83%	Light	Red	Flash 2	Light	Light	Light	Light	Light
	84 ~ 100%	Flash 2	Light	Light	Light	Light	Light	Light	Light
	Full Charged	Light	Light	Light	Light	Light	Light	Light	Light

Discharging Battery Level Indicators Instructions

Status		Discharge							
Battery Level Indicator		L8	L7	L6	L5	L4	L3	L2	L1
Battery Level (%)	0 ~ 17%	Light	Red	Light	Light	Light	Light	Light	Light
	18 ~ 33%	Light	Red	Light	Light	Light	Light	Light	Light
	34 ~ 50%	Light	Red	Light	Light	Light	Light	Light	Light
	51 ~ 66%	Light	Red	Light	Light	Light	Light	Light	Light
	67 ~ 83%	Light	Red	Light	Light	Light	Light	Light	Light
	84 ~ 100%	Light	Red	Light	Light	Light	Light	Light	Light

2.2.3 CAN / RS485 Port

CAN / RS485 Communication Terminal (RJ45 port), connect to inverter, follow CAN / RS485 protocol.

PIN	Definition
Pin 1、Pin 8	RS485-B (to PCS, reserved)
Pin 2、Pin 7	RS485-A (to PCS, reserved)
Pin 3	NC
Pin 4	CANH (to PCS)
Pin 5	CANL (to PCS)
Pin 6	GND

2.2.4 CONSOLE

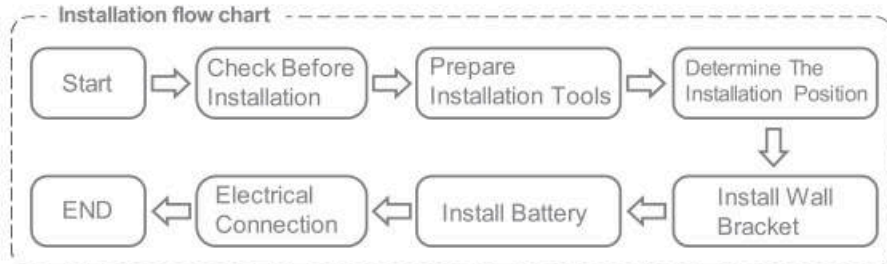
RS232 Communication Terminal (RJ45 port) follow RS232 protocol, for manufacturer or professional engineer to debug or service.

PIN	Definition
Pin 1、Pin 8	GND
Pin 2、Pin 7	RS232_TX
Pin 3、Pin 6	RS232_RX
Pin 4、Pin 5	NC

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INSTALLATION GUIDE

Installation flow chart



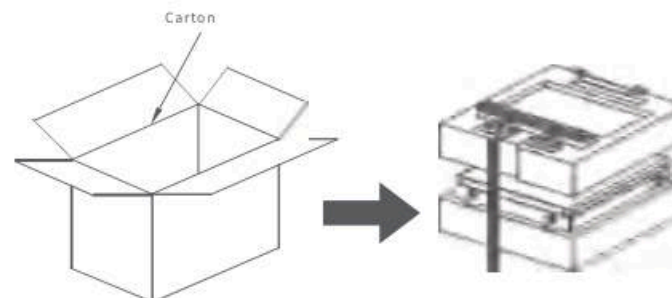
3.1 Checking Before Installation

3.1.1 Checking Outer Packing Materials

Packing materials and components may be damaged during transportation. Therefore, check the outer packing materials before installing the battery. Checking the surface of packing materials for damage, such as holes and cracks. If any damage is found, do not unpack the battery and contact the dealer as soon as possible. You are advised to remove the packing materials within 24 hours before installing the battery.

3.1.2 Checking Deliverables

After unpacking the battery, check whether deliverables are intact and complete. If any damage is found or any component is missed, contact the dealer. The below table shows the components and mechanical parts that should be delivered.



No.	Pictures of accessories	Quantit	Uses
1		1	Battery box
2		1	Wall mounting bracket
3		10	Lock Wall Pendant
4		2	Crossed external hexagonal triple combination screws
5		2	Locking bracket
6		2	L-shaped wall-mounted piece

No.	Pictures of accessories	Quantit	Uses
7		1	User manual
8		4	RJ45 Crystal head
9		2	Communication network cable
10		1	yellow-green two-color grounding cable
11		1	Power line
12		1	Power line

3.2 Ventilation requirements for indoor installation

(1) Normal Operation

Under normal operating conditions, this battery system does not generate toxic or flammable gases. No mechanical forced ventilation is required for normal operation.

(2) Abnormal Conditions (e.g., electrolyte leakage or thermal runaway)

To facilitate safe dispersal of potential toxic gases (such as hydrogen fluoride, HF) under abnormal conditions, the following ventilation provisions apply to indoor installations:

- The room shall have at least natural ventilation to the outdoors.
- Ventilation openings shall discharge directly to the outdoor environment and shall not vent into indoor ductwork or habitable rooms.
- Ventilation openings shall not be positioned in restricted zones.
- If the room has no natural ventilation, an explosion-proof exhaust fan shall be installed prior to commissioning the battery system.
- Lithium-ion battery gases such as HF are heavier than air at lower temperatures; both inlet (low level) and outlet (high level) ventilation should be considered.

(3) Note

These ventilation requirements are intended to ensure that non-hazardous levels of emissions or potential emissions during testing can be properly discharged. They are not intended to meet the test standard requirement of "no hazardous emissions of toxic or flammable gases."

(4) Emergency Response to Electrolyte Leakage

In the event of electrolyte leakage, follow these steps:

- Immediately turn OFF the battery main switch and the bipolar DC isolating switch. Then open (switch OFF) the circuit breaker. Do not disconnect the PE earthing conductor under any circumstances;
- Ventilate the room, and after air exchange is completed, measure the gas concentration to confirm safety before proceeding;
- Avoid contact of battery materials with skin or eyes. If contact occurs, rinse the affected area with plenty of water or seek medical assistance.

3.3 Installation Location Requirements

(1) Distances from Heat Sources

The battery system shall NOT be installed:

- Within 600 mm horizontally of any unrelated heat source, including but not limited to: hot water heaters, air conditioning units, gas heaters, steam pipes, or space heaters.
- Within 900 mm vertically below any of the above heat sources.
- Within 600 mm of any exit or doorway.
- Within 600 mm of the vertical edge of any window or building ventilation opening serving a habitable room.
- Within 600 mm of any flammable or combustible materials.

The flow of heated air from any nearby appliance shall be directed away from the battery system and shall not impinge on the battery enclosure.

(2) Clearance Distances from Vents and Other Equipment

Ventilation openings of the battery system shall not be obstructed and shall not be positioned:

- Within 600 mm of any building exit;
- Within 600 mm of any window or building ventilation opening serving habitable rooms;
- Within 900 mm of any water heating system;
- Facing directly towards the air inlet or outlet of an inverter or other equipment (to prevent hot-air recirculation).

The air outlet of connected inverters shall not be directed at the battery enclosure.

(3) Direct Sunlight and Outdoor Exposure

- The battery system shall be installed in a shaded area, protected from direct solar radiation.
- For outdoor installations, the unit must be shielded from direct sunlight to maintain the operating temperature within the specified range (Recommended ambient temperature 10°C to 30°C).
- This product has an IP rating suitable for outdoor use. However, additional shelter is recommended in areas of high UV exposure or extreme weather.
- Outdoor installations shall not be on a roof surface unless specifically assessed as suitable.

Scenario	Key Requirement
Battery wall is not adjacent to habitable room	Requirements for non-residential rooms: see 3.4.1
Battery wall is adjacent to habitable room	Wall must be non-combustible; barrier must extend 600 mm side + 900 mm above
Battery is within 300 mm of habitable room wall (floor mounted)	Requirements for habitable rooms: see 3.3.1
Top of battery within 900 mm of ceiling	Ceiling must be non-combustible for 600 mm beyond battery edges

WARNING: Failure to implement the required fire barrier may allow fire or toxic gases generated during a thermal runaway event to spread to occupied living spaces. This requirement is mandatory under AS/NZS 5139 and must be verified prior to commissioning by the installing electrical contractor.

3.3.1 Fire Protection Requirements for Habitable Rooms

Installations Adjacent to Habitable Rooms

Where the battery system is mounted on, placed against, or installed near a wall or structure that has a habitable room on the other side (e.g., a bedroom, living room, or kitchen), the following fire barrier requirements apply in accordance with AS/NZS 5139 Clause 5.2.4.2.

(1) Wall / Structure Material Requirement

The wall or structure separating the battery system from the habitable room shall be made of suitably non-combustible material. Acceptable materials include:

- Brick or masonry block
- Concrete
- Compressed cement sheeting
- Ceramic or terracotta tiles

If the existing wall or structure is not made of a suitably non-combustible material (e.g., timber-framed plasterboard), a non-combustible barrier panel shall be installed between the battery system and the wall surface before the battery is mounted.

☐ A material is considered suitably non-combustible if it passes testing to AS 1530.1. The materials listed above are exempt from testing and are accepted directly.

⚠ Any penetration through the barrier (e.g., cable penetrations) with an internal free space greater than 5 mm diameter shall be sealed with a fire-retardant sealant.

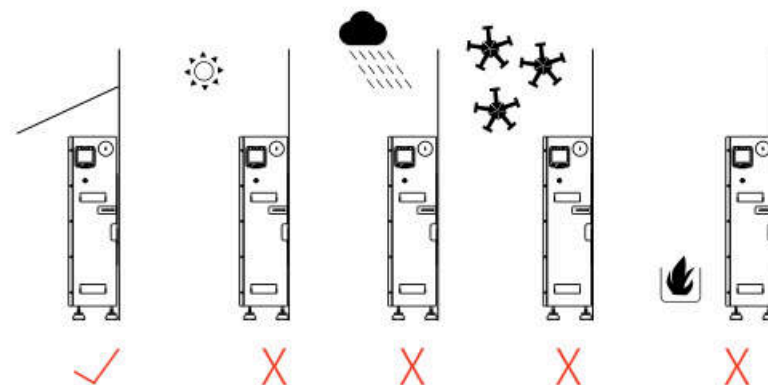
Where the battery system is mounted on the wall, or is floor-mounted within 300 mm of the wall or structure separating it from the habitable room, the non-combustible barrier shall extend to cover the following zones:

Direction	Minimum Barrier Extent
Each vertical side (left and right)	600 mm beyond the outer edge of the battery
Above the battery	900 mm above the top of the battery
Below the battery	Down to the bottom (floor level) of the battery

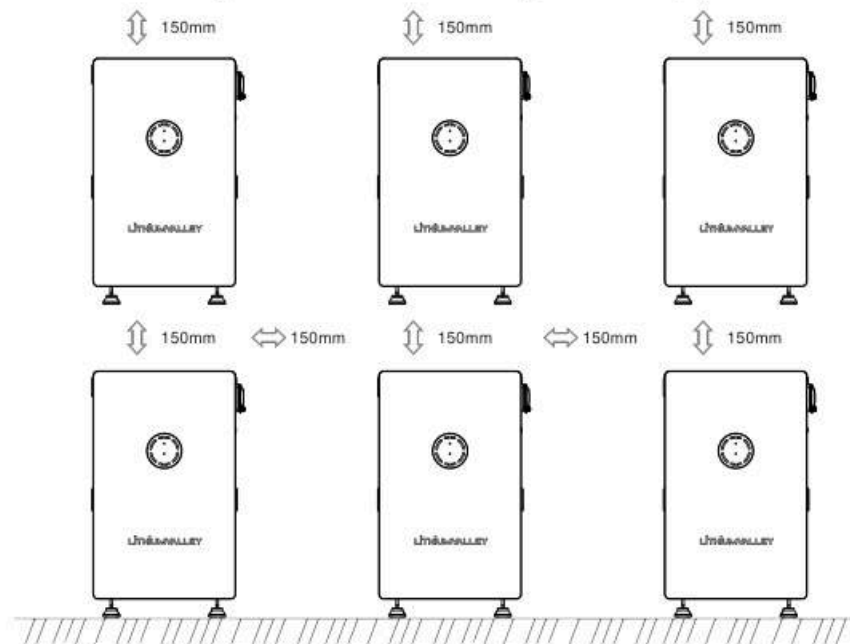
This means the barrier must be significantly larger than the battery footprint — not just directly behind it.

3.4 Installation Instructions

3.4.1 Installation



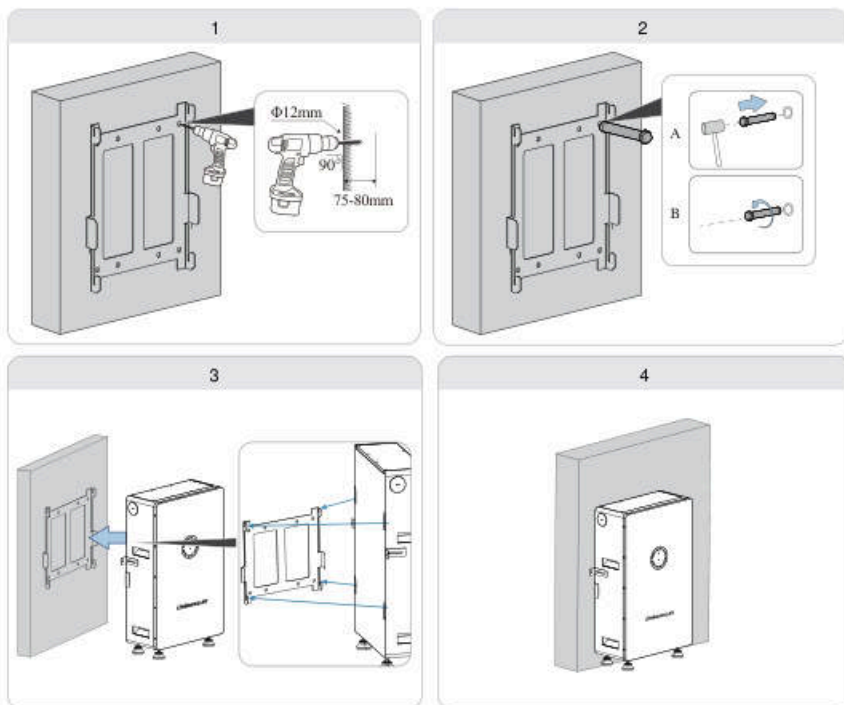
Minimum mounting distance between battery pack and equipment:



3.5 Tools

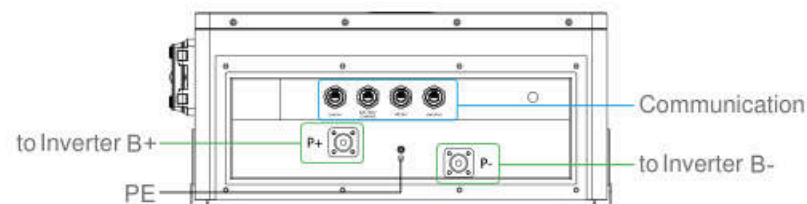
Installation	Knife 	Measuring tape 	Socket wrench 
	Rubber mallet 	Cross Screwdriver 	Hammer drill (12mm) 
Protection	ESD gloves 	Safety goggles 	Anti-dust respirator 
	Safety shoes 		

3.5.1 Installation Procedure



3.5.2 Electrical connection steps

Connect the power cord, communication cable and grounding wire.



Grounding and Earthing Requirements

This battery system must be earthed in accordance with the manufacturer's instructions and AS/NZS 5139 Section 5.3.1.6.

(1) Protective Earth (PE) Connection

- Locate the PE terminal (identified by the PE earth symbol on the battery enclosure).
- Connect a green/yellow insulated earth conductor from the PE terminal to the installation earthing system (main earth bar or earth electrode).
- Minimum earth conductor size: 6 mm² copper (or as calculated by the installer in accordance with AS/NZS 3000:2018 Cl. 5.3.3.1.2 and AS/NZS 5139 Cl. 5.3.1.6.7).
- The earth conductor shall be rated to withstand the prospective earth fault current of the battery system for the operating time of the associated overcurrent protective device.

(2) Metallic Enclosure Bonding

- All metallic components and enclosures associated with the battery installation (including the wall mounting bracket) shall be bonded together and connected to the installation earthing system.
- This bonding prevents shock hazards in the event of a fault condition.

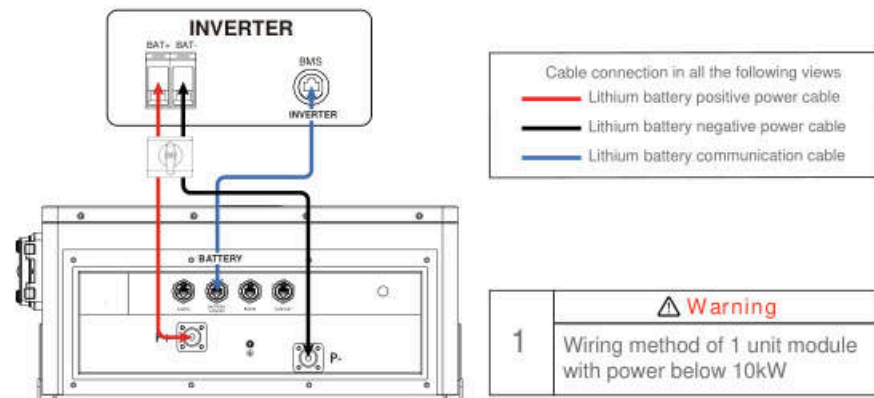
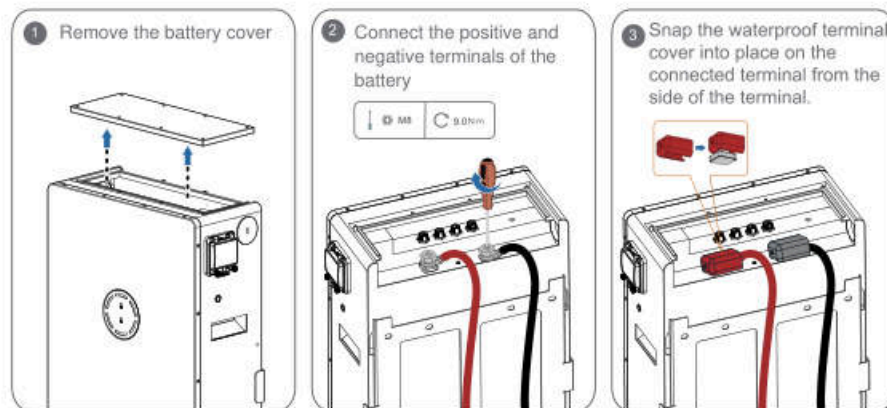
(3) Earthing Verification

- After connection, measure the earthing resistance of the PE conductor using a grounding resistance tester.
- Confirm the reading complies with AS/NZS 3000 safety limits before energising the system.
- **WARNING:** Failure to correctly earth this equipment may result in electric shock hazard. Earthing connections shall only be made by a licensed electrical contractor.

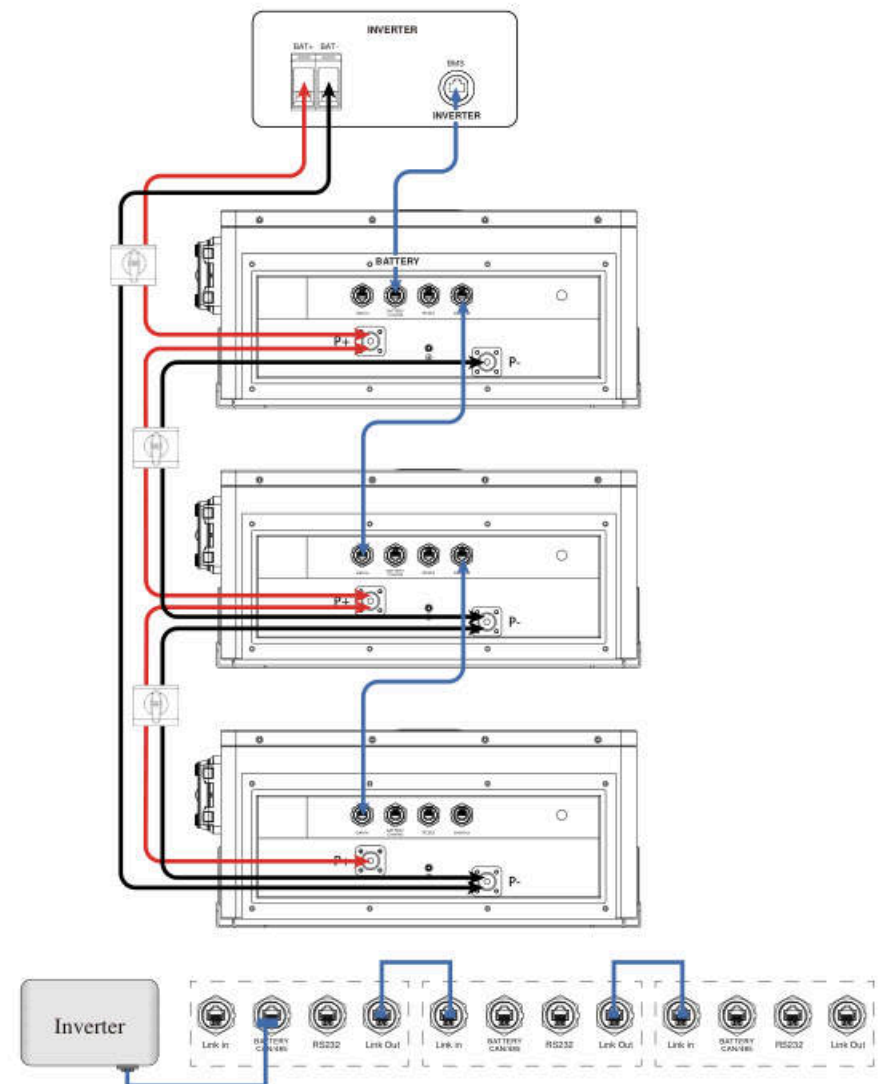
1. Load power exceeding 10kW requires at least 2 units Parallel operation.
2. The maximum number of Number of parallel machines is 20. The power of the inverter selected for the battery module must be less than the maximum output power of the battery module.
3. It is suggested to fit a circuit breaker on the power wiring harness between the battery pack and the inverter for overcurrent protection.
4. A 2-pole isolator must be installed between each battery.

Parallel operation	Load power	Connection mode
1unit	Below 10kW	1
2-20units	Below 10kW	2
2-20units	Over 10kW	3

Power Cable Connection



	Warning
2	For 2 units -20 units is-layer module with power below 10kW. (The number of units in the middle of the diagram is omitted, the length of the two positive and negative poles connecting lines must be the same.)



3

Warning

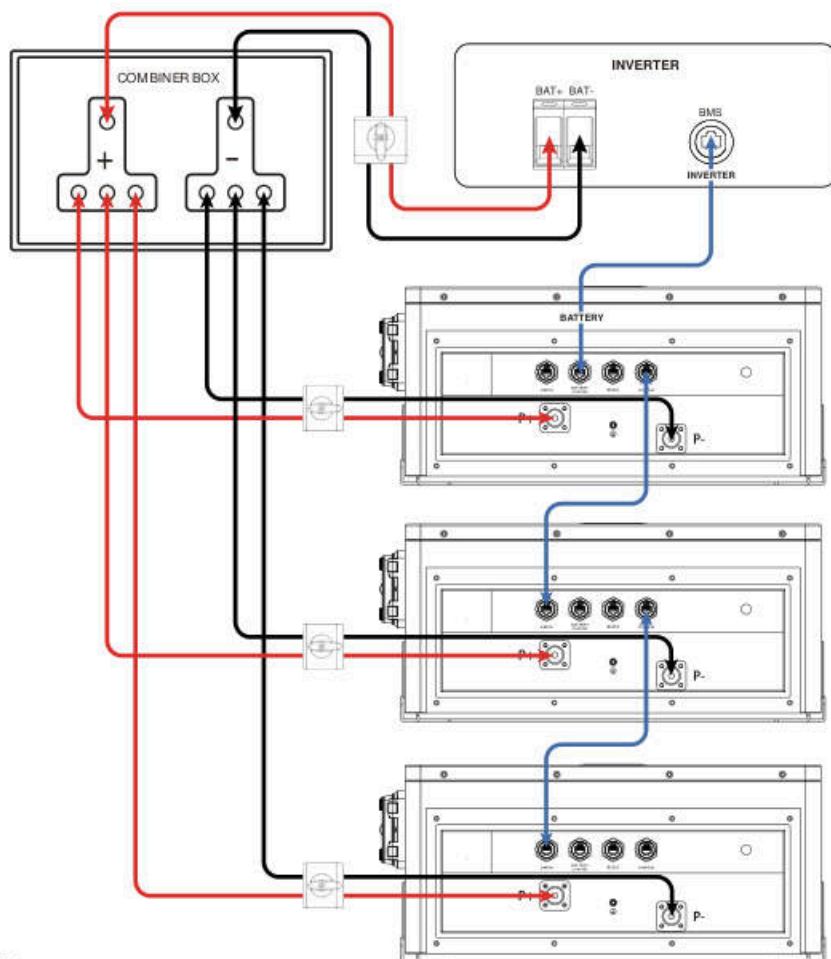
When using an inverter of 10kW or above, the positive and negative ports of each battery must be connected to the combiner cabinet in the wiring method shown in the figure below.

10kW inverter: 0AWG conductor with a cross-sectional area of 50mm²

15kW inverter: 2/0 (00) AWG conductor with a cross-sectional area of 67mm²

For 2 units -20 units is Over 10kW.

(The number of units in the middle of the diagram is omitted. In order to ensure equal current flow, the length of the positive and negative poles connecting lines must be the same.)



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Battery safety instructions**4.1 Safe Handling Instructions**

The W16+ is a high-energy lithium iron phosphate (LiFePO₄) battery system. All persons handling, installing, or servicing this unit must read and follow the instructions below before proceeding.

Physical Handling:

• This battery system is heavy (128kg±3kg). DO NOT lift manually. Use appropriate lifting equipment or a minimum of 2 persons when moving or positioning the unit.



- Wear appropriate personal protective equipment (PPE) during handling and installation: safety gloves, safety glasses/goggles, and safety footwear.
- Do not drop, tilt excessively, or apply mechanical shock to the battery. If the unit is dropped onto a hard surface, do not install or energise it — contact the service centre for inspection first.
- Do not step on the battery unit or use it as a step or support platform.

Electrical Safety:

- The battery operates at up to 56.16VDC with a maximum discharge current of 200 A. This represents a severe electric shock and arc flash hazard.
- Ensure the battery main switch, the bipolar DC isolating switch, and the circuit breaker are in the OFF position before making or disconnecting any electrical connections.
- Use insulated tools rated for DC voltage when working near terminals.
- Never allow metal objects, tools, or conductors to bridge or contact both DC terminals simultaneously — this will cause a short circuit, which may result in fire, explosion, or burns.
- Always observe correct polarity (1+ (positive), 1- (negative)) when making connections.

Chemical Safety:

- The battery contains lithium iron phosphate cells and electrolyte. In the event of electrolyte leakage:
 - » Do not touch the leaked material with bare skin or allow contact with eyes.
 - » If contact occurs, rinse immediately with large amounts of clean water and seek medical attention.
 - » Ventilate the area immediately.
 - » Contact the service centre and do not attempt to use the unit.
- Do not incinerate, puncture, crush, or disassemble the battery unit or individual cells.
- Do not immerse the unit in water or any liquid.
- Do not expose the battery to open flame, sparks, or ignition sources.

Transport and Storage:

- Store the battery in a dry, cool, ventilated location at ambient temperatures between 10°C and 30°C.
- Do not store with flammable materials.
- Before initial commissioning, or after returning from long-term storage, ensure the battery is charged to an appropriate State of Charge via the connected inverter before restoring normal operation.

Only qualified technical personnel are permitted to open the enclosure or service any internal functional module.

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Battery & BMS Maintenance

5.1 Trouble Shooting

The BMS (Battery Management System) is intended to safeguard the battery and battery cells against a variety of situations that could damage or destroy system components. This protection also aids in keeping the battery and battery cells operational for a greater number of life cycles. Each battery is specifically configured to ensure peak performance and operation with any inverter system.

5.2 BMS PROTECTION

1. PCB temperature protection

The BMS will ensure that the Printed Circuit Board (PCB) does not overheat. This is the component that houses most of the “brains” of the battery. This feature will turn off the battery if it begins to overheat.

2. Cell balance protection

Cell balance ensures that each cell is within a specific voltage range of each other. Cell balance is crucial for ensuring that the battery is operating properly for its lifespan. This is always done Automatically.

3. Environmental temperature protection

It may be dangerous to attempt using the battery in extreme heat or cold. Continued operation in these conditions may result in permanent damage to the battery module and its components. To prevent this, the BMS is designed to measure the temperature while charging/discharging and will shut down the battery to prevent damage.

4. Voltage protection

The BMS is designed to continuously monitor the voltage of each individual cell and ensure that they are not over/undercharged.

5. Current protection

The BMS is designed to constantly monitor the charge/discharge amperage and has built-in safeguards against exceeding specific parameters. These include built-in timers that shut off quickly in the event of short circuits, extremely high amperage and delayed shut down for amperage that is only slightly above the maximum capacity.

NOTE: If any fault from the table below persists, please contact the distributor or for additional troubleshooting.

FAULT	ANALYSIS
Overvoltage Protection	RUN light is constantly on.
Undervoltage Protection	5-minute delay before entering sleep mode.
Overtemperature Protection	ALM light is constantly on.
Low-Temperature Protection	ALM light is constantly on.
MOS Overtemperature Protection	ALM light is constantly on.
Ambient High Temperature	ALM light is constantly on.
Ambient Low Temperature	ALM light is constantly on.
Short Circuit Protection	ALM light is constantly on.
Charging	RUN light is constantly on, SOC light is flashing.
Discharging	RUN light is flashing, SOC light is constantly on.
Standby	RUN light is flashing, SOC light is constantly on.

5.3 Routine maintenance

To ensure the long-term running of the energy storage system, you are advised to maintain batteries regularly.

the battery cover can only be removed with the use of a tool (e.g. screwdriver)

Check Item	Frequency	Action if Fault Found
Visual inspection of enclosure for physical damage, deformation, or swelling	Monthly	Contact authorised service centre immediately
Check all DC cables and connectors for signs of overheating, discolouration, or looseness	Monthly	Contact authorised service centre
Inspect ventilation openings for blockage or debris	Monthly	Clear debris; ensure minimum clearances are maintained
Check LED status indicators (see Section 4)	Monthly	Refer to LED indicator table; contact service if fault codes persist
Verify battery SOC, charge/discharge performance via inverter monitoring app	Monthly	Contact service if SOC readings are abnormal or communication is lost
Verify all labels and warning signs are legible and intact	6 Monthly	Replace any damaged or missing labels immediately

Check the DC disconnect switch for signs of overheating, contact discoloration, mechanical damage, or operational difficulty	6 Monthly	Contact authorised electrician; do not operate the battery system if the isolating switch is damaged or fails to open/close cleanly
Inspect wall mounting brackets and fixing bolts for any signs of looseness or structural movement	6 Monthly	Re-torque or replace hardware as required; contact service if wall damage is observed
Inspect grounding/earthing conductor for continuity and secure connection	Annually	Contact authorised electrician if earthing conductor is damaged or disconnected

5.4 Recharge Requirements During Normal Storage

Battery should be stored in an environment with temperature range between -10°C ~+45°C, and maintained regularly according to following table with 0.5C current till 40% SOC after long storage time.

Recharge Conditions When In Storage

Storage Environment Temperature	Relative Humidity of Storage Environment	Storage Time	SOC
Below -10°C	/	prohibit	/
-10~25°C	5%~70%	≤12 months	30%≤SOC≤60%
25~35°C	5%~70%	≤6 months	30%≤SOC≤60%
35~45°C	5%~70%	≤3 months	30%≤SOC≤60%
Above 45°C	/	prohibit	/

5.5 Recharge Requirements When Over Discharged

Over discharged (90% DOD) battery should be recharged according to following table; otherwise over discharged battery will be damaged.

Recharge conditions when battery is over discharged

Storage Environment Temperature	Storage Time	Note
-10~25°C	≤15 days	Battery Pack disconnected from to Inverter
25~35°C	≤7 days	
35~45°C	<12 hours	Battery Pack connected to Inverter