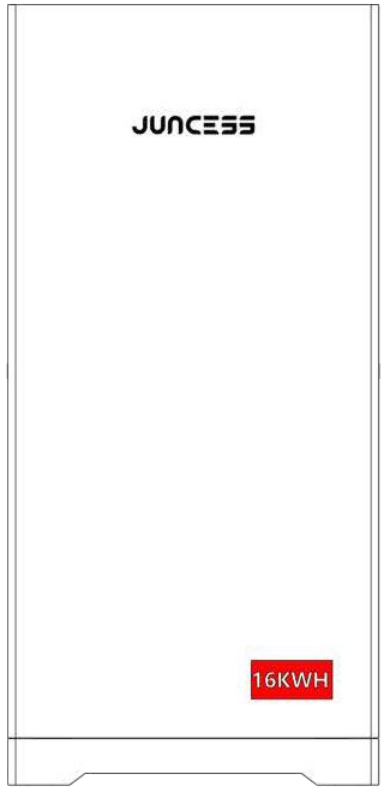
Energy storage battery User's manual

JFL16



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Date: 20260330

How to use this manual

Before performing any operation on the battery, please read this manual and other relevant documents. The document must be properly stored for easy access at any time. Due to the needs of product development, the content may be regularly updated or revised. The information in this manual is subject to change without prior notice.

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Trademark and License

Software License

Disclaimers

In the following circumstances, the manufacturer shall not be liable for personal injury, property damage, product damage, and subsequent losses:

* Damage caused by force majeure, including earthquakes, floods, volcanic eruptions, mudslides, lightning, fires, wars, military conflicts, typhoons, hurricanes, etc.
* Failure to comply with the provisions of this manual.
* The installation, operation, and storage environment do not comply with relevant international, national, or regional standards.
* Incorrect use of this product.
* Unauthorized or unqualified personnel perform maintenance, disassembly of racks, and other operations on the product.
* Using unapproved spare parts.
* Unauthorized modifications or technical changes to products or software.
* Incorrect shipment by yourself or by a third party commissioned by you.
* The materials and tools you provide do not comply with relevant international, national, or regional standards.
* Damage caused by your own or third-party negligence, intent, gross negligence, or improper operation.

catalogue

1 Safety instructions

Warning!

Please read and follow all safety warnings and instructions carefully. Otherwise, it may result in electric shock, fire, serious injury, or death. Please save these instructions for future reference.

1.1 Terminology and Symbols

Terminology/Symbols	Description
Danger	Indicates a high risk level hazard that, if not avoided, may result in death or serious injury.
Warning	Indicates a moderate level of danger, which, if not avoided, could result in death or serious injury.
Caution	Indicates a low risk level hazard that, if not avoided, may result in minor or moderate injury.
Notice	Indicate potential hazardous situations that, if not avoided, may result in equipment damage, data loss, performance degradation, or unexpected outcomes. Notification is used to handle practices unrelated to personal injury.
Note	Supplement important information in the main text. Used to handle information unrelated to personal injury, equipment damage, and environmental degradation.
	Attention, the electric shock hazard symbol represents important safety instructions, and improper adherence may result in electric shock.
	The DC input terminal of the inverter shall not be grounded.
	Surface high temperature, please do not touch the inverter casing.
CE	CE conformity mark
	Please read the instructions carefully before use.
	Indicates that this product is recyclable.
	Do not approach open flames or burn. Do not use near heaters or high- temperature sources.

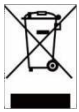
	be careful! There is a risk of explosion.
	Lithium Ion Battery
	No Stepping
	Do not run or chase
	Do not touch with your palm
	Marking symbols for electrical and electronic equipment in accordance with Directive 2002/96/EC. The device, accessories, and packaging must not be treated as unclassified urban waste and must be collected separately at the end of their service life. Please comply with local disposal regulations or laws, or contact the manufacturer's authorized representative for information on equipment retirement.

Table 1-1 Definition

1.2 safety rules

1) After opening the box, please check the product and packing list first. If the product is damaged or parts are missing, please contact the local distributor.
2) Before installation, be sure to cut off the power supply to the grid and ensure that the battery is in off mode.
3) The wiring must be correct. Pay attention to the negative and positive poles of cables and terminals. Ensure that there is no short circuit with external devices.
4) Do not directly connect batteries to AC power sources.
5) Please ensure that the electrical parameters of the battery system are compatible with the relevant equipment.
6) Do not let the terminals come into contact with exposed wires or metal.
7) Please keep the battery out of reach of children or animals.
8) Do not place batteries near fire, heaters, or high-temperature sources. This will reduce the risk of explosion or potential injury.
9) Batteries may explode in the presence of a fire source, such as an open flame. Explosive batteries will spray fragments and chemicals. If this happens, please rinse immediately with water.
10) Do not immerse the battery in water or expose it to humid environments. Do not disassemble or alter the battery in any way.
11) If it is necessary to move or repair the battery system, the power must be cut off and the battery must be completely turned off.
12) Do not connect batteries with different types of batteries.
13) Do not use batteries with faulty or incompatible power conversion systems (PCS).
14) Do not disassemble the battery.
15) In case of a fire, only dry powder fire extinguishers can be used. Do not use liquid fire extinguishers.
16) Please do not open, repair, or disassemble batteries except for qualified personnel. We do not assume any consequences or related responsibilities resulting from violations of safety operations or design, production, and equipment safety standards.
17) The battery needs to be charged within 48 hours after being fully discharged.
18) Do not expose the cable to the outside.
19) Do not expose the battery to flammable or corrosive chemicals or vapors.
20) Do not spray paint any part of the battery, including any internal or external components.
21) Do not directly connect the battery to the photovoltaic solar power line.
22) No foreign objects are allowed to be inserted into any part of the battery.
23) Do not hit, drop, puncture or step on the battery. Damaged batteries are prone to explosion. Please dispose of the damaged battery immediately and correctly.
24) Battery module is a sealed component with no access to cell components. Access to the cell.components cannot be obtained without damaging the enclosure of the cell components orfixing devices of the enclosure of the cell components.
25) Note: The intention is there is no maintenance required at cell component level or any on siterepair or replacement at cell component level - for any of this type of activity the batterymodule is returned to manufacturer/service agent, and so prevent unsafe situations of largeenergy release and arcflash issues.
26) If there is an electrolyte leakage, it should be avoided from coming into contact with eyes or skin. If this happens, immediately rinse with clean water for at least 10 minutes, and then seek medical attention immediately.

2 DESCRIPTION

2.1 Product Features

1) Lithium iron phosphate batteries are one of the new energy storage products that can be used to provide reliable power support for various types of equipment and systems. The entire module is non-toxic, pollution-free, and environmentally friendly.
2) This product has a built-in BMS battery management system that can manage and monitor battery cell information, including voltage, current, and temperature. In addition, BMS can balance the charging and discharging of battery cells to extend their cycle life.
3) The positive electrode material is made of $LiFePO_4$, which has safety performance and long cycle life.
4) Flexible configuration. Multiple batteries can be connected in parallel to expand capacity and power.
5) Adopting self cooling mode can quickly reduce system noise.
6) This module has low self discharge, no memory effect, and excellent shallow charging and discharging performance.
7) The communication address of the battery module is automatically networked, easy to maintain, and supports remote monitoring and firmware upgrades.
8) The current limiting charging module helps to improve battery life.

System lock (or system lock function)

The system has a system lock function, when the battery system has over-voltage, over-current and over-temperature, the system will stop running, and the system cannot be reset automatically. In this case, the customer needs to contact the corresponding installer for processing

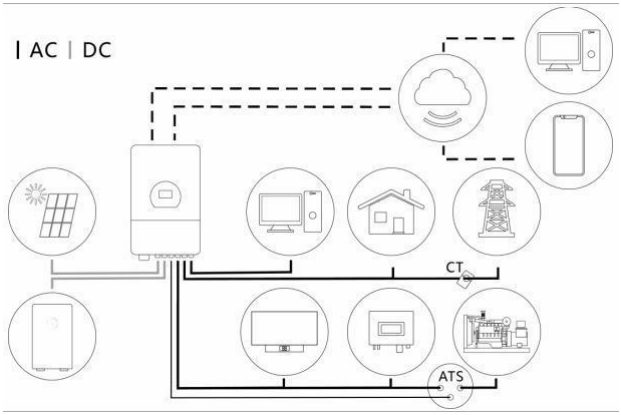
2.2 Application scenarios

The following figure shows the basic application of the battery.

It also includes the following devices to form a complete operating system.

- Generator or utility
- PV module
- Low voltage hybrid PCS (charge discharge)

According to your requirements, you can consult your system integrator for other possible system architectures.



2.3 Product overview

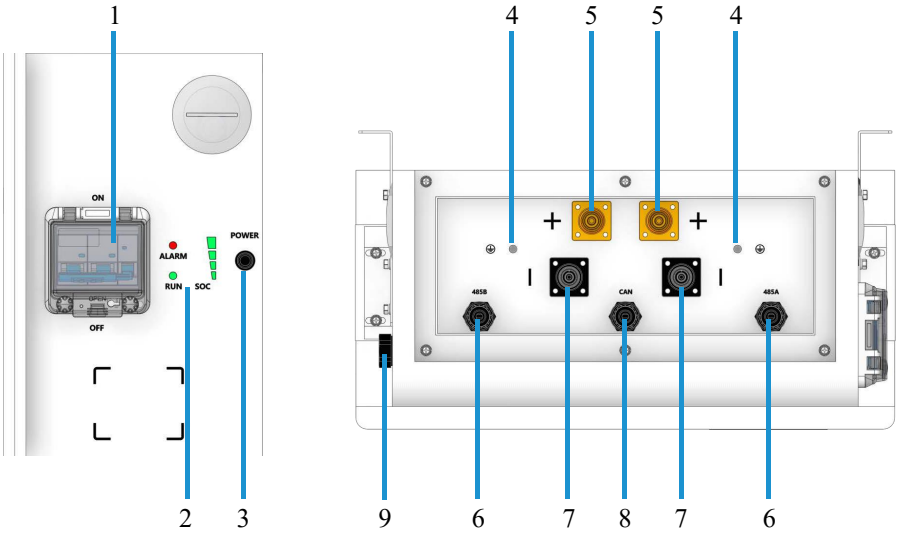
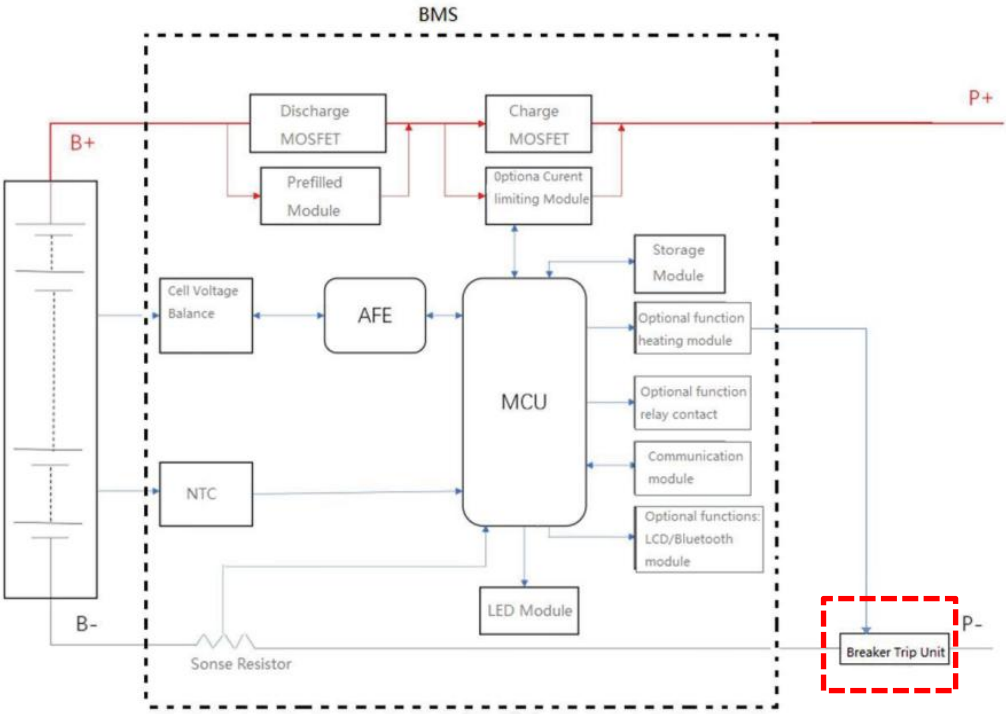


Table 2-1 Product Overview

1. Circuit breaker	6. 485 communication port
2. SOC status indicator light	7. Battery output negative pole
3. Start button	8. CAN communication port
4. Grounding	9. Pressure relief valve
5. Battery output positive pole	

2.4 Block diagram:



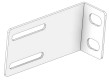
Circuit breakers in energy storage systems are key mechanical switchgear used to detect and protect electrical equipment from overloads, short circuits and other faults. They have short-circuit/overload protection functions and can ensure the safe and stable operation of the system.

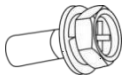
3 Installation preparation

After opening the box, check if the contents of the packaging are intact and undamaged. If any items listed in the unboxing checklist are missing or damaged, please contact your supplier.

3.1 Unboxing list

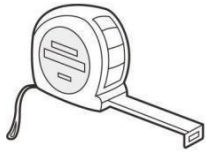
		
Battery pack * 1	PCS communication line * 1	Grounding wire * 1

		
Fixed bracket *2	1m battery positive electrode wire *1	1m battery negative electrode wire *1

		
Expansion bolt * 2 (M6 * 100)	Bolt * 5 (M5)	Power line×2 （BESS→PCS）

3.2 Installation tools

These tools are needed when installing batteries.

		
hammer	electric drill	tape measure
		
CR-V	cross screwdriver	marking pen

⚠Attention!

Use well insulated tools to prevent accidental electric shock or short circuit.

If there is no insulating tool, all exposed metal surfaces of the tool (except for the tip) should be wrapped with insulating tape.

3.1 Safety Equipment

When handling battery packs, it is recommended to wear the following safety equipment.

		
insulating gloves	Safety shoes	goggles

4 Installation instructions

4.1 Installer

Lithium batteries are designed for outdoor use. However, please avoid direct sunlight, rain exposure, and snow accumulation during installation and use.
Please ensure that the installation location meets the following conditions:
The installation area should avoid direct sunlight.

The walls and floors need to be completely waterproof.
The wall should be smooth and level.

There are no flammable or explosive materials around.

Please ensure that the equipment is installed in a clean, dry, well ventilated area with appropriate temperature, humidity, and altitude range. View more data in the "Technical Specifications" section.
There should be no dust or dirt in this area.
Do not place the device near heat or fire sources, such as smoke, candy, heaters, or other heating devices. Overheating may damage equipment or cause a fire. The distance from the PCS air outlet is greater than 0.5 meters.
Do not place it in a place where children or pets can come into contact.

There is no mandatory ventilation requirement for battery modules, but please avoid installing them in enclosed areas. Do not cover or wrap the battery box or cabinet.

The battery monitoring is achieved by the inverter.

An external double pole isolation device must be installed at the output port of each battery.

⚠Warning!

clean. Before installing and powering on the system, dust and iron filings must be removed to maintain a clean environment. The system cannot be installed in desert areas without a casing to prevent sand.

⚠Warning!

Temperature. When the ambient temperature exceeds the normal operating range, the battery pack will stop working to protect itself. Frequent exposure to harsh temperatures may reduce the performance and lifespan of the battery pack.

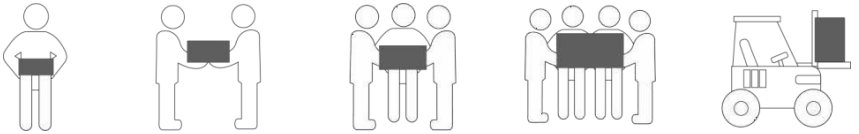
⚠Warning!

Fire extinguisher system. For safety reasons, it is best to have a fire extinguisher system. Regularly inspect the fire protection system to ensure it is in normal condition. For usage and maintenance requirements, please follow the local fire equipment guidelines.

⚠Warning!

Carrying heavy objects. Be careful when carrying heavy objects to avoid injury. Choose the appropriate way to transport heavy objects based on the weight of the product. Refer to Table 4-1.

As the weight of this battery pack has exceeded 120kg, please use a forklift or crane for handling.



weight	way	recommend
<18 kg (40lbs)	manual handling	1 person
18~32 kg (40~70lbs)	manual handling	2 people
32~55 kg (40~70lbs)	manual handling	3 people
55~68 kg (121~150lbs)	manual handling	4 people
> 68 kg (150lbs)	**mobile device**	**forklift truck**

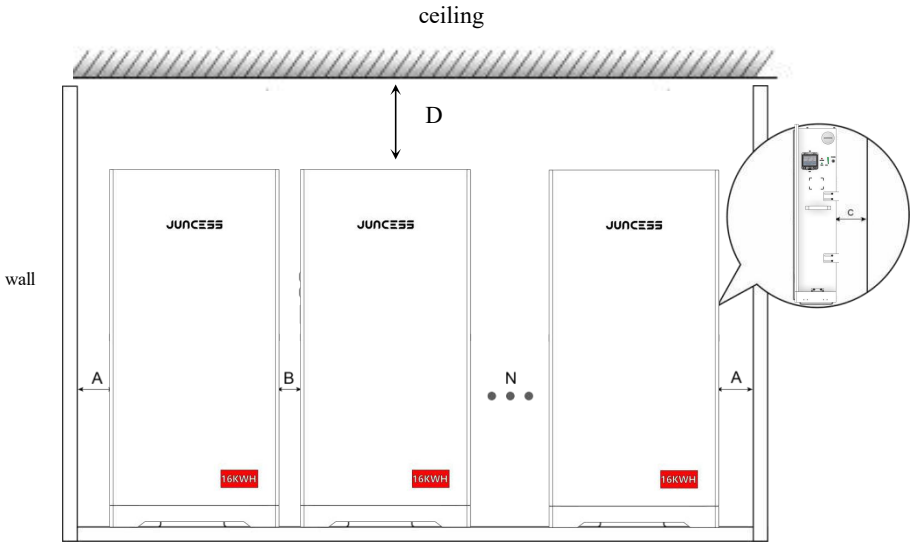
Table 4-1: Moving Heavy Objects

4.2 Selection of installation location

⚠Warning!

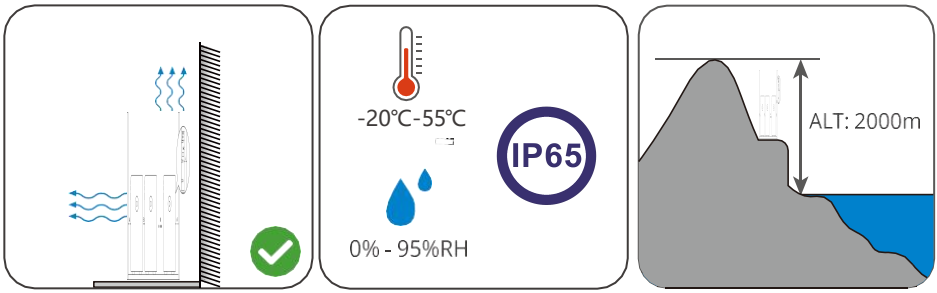
The battery should be installed in a clean and flat place, without direct sunlight, away from water sources, fire sources, and at a suitable temperature. Suggested installation location should meet the size requirements in the following figure: ($0 \leq N \leq 29$)

The equipment should be kept away from heat source at least 1000mm.



Term	Distance (mm)
A	⩾200
B	⩾400
C	0~40
D	⩾300

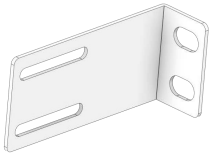
Table 4-2 Spacing

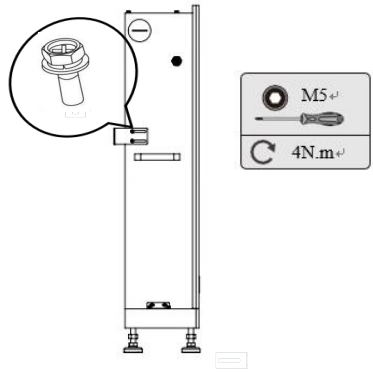


4.3 Install battery

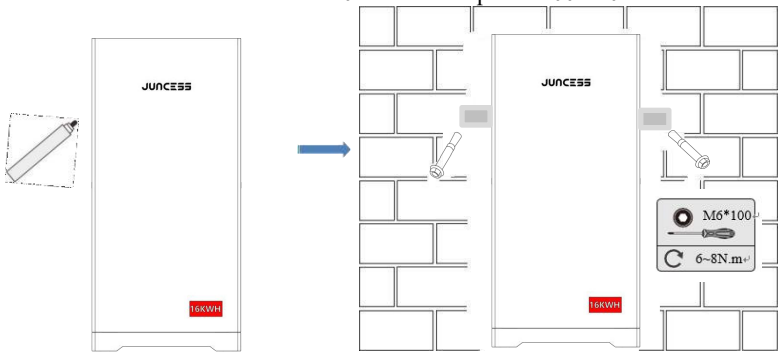
4.3.1 Floor standing installation

1) Use 4 M5screws to secure the two fixing brackets on the left and right sides of the battery.





2) Stick the back of the battery tightly against the wall and mark the positions of the two assembly holes. Drill two holes with a diameter of 10mm and a depth of 100-110mm.



3) Adjust the left and right screws to the appropriate position to ensure that the battery is perpendicular to the ground. Fix the energy storage cabinet to the wall with two M6*100 expansion bolts.

5 Electrical connection

5.1 Parallel connection method 1

⚠Attention!

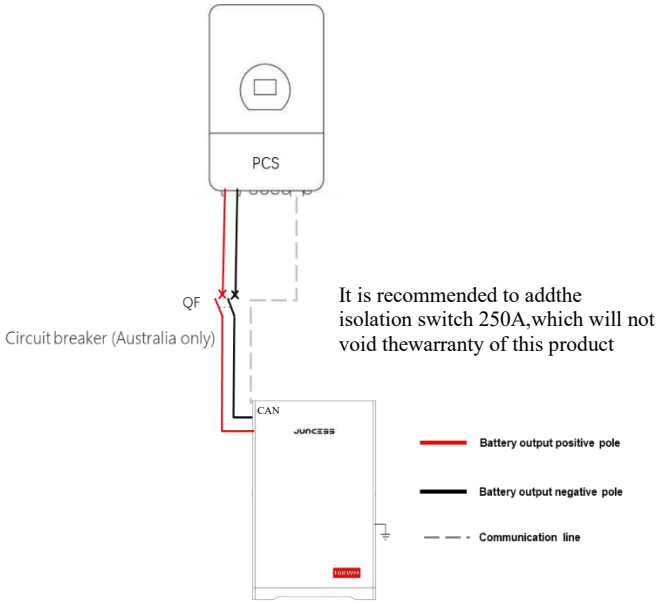
When connecting the battery to PCS, allow the battery wires to be connected to both ports separately or simultaneously to one port. However, for orderly wiring, it is recommended to use the latter.

⚠Warning!

It should be noted that the maximum current of a single battery system for the16 kWh products is 200A (the power of the PCS cannot exceed 10 kw). Exceeding this limit can cause the connectors and cables to heat up, and in severe cases, it may lead to fire accidents.

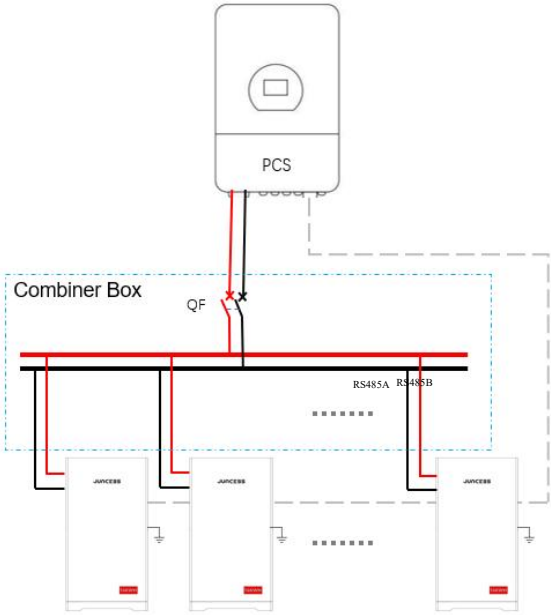
If the PCS power of the 16 kWh products exceeds 10 kW, the connection mode must be parallel mode 2!

Schematic diagram of single battery system connection:



5.2 Parallel connection method 2

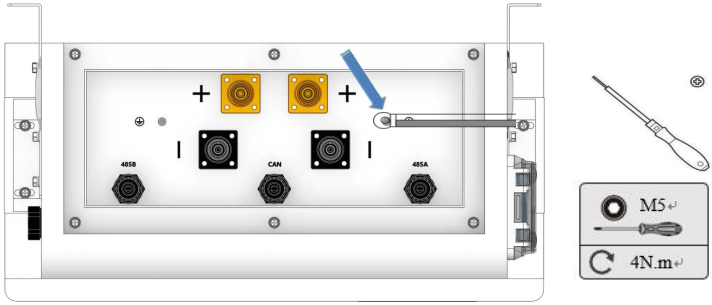
Schematic diagram of multi battery system connection:



It is recommended to add the isolation switch 250A,which will not void thewarranty of this product

5.3 Grounding

Your battery system must be well grounded. The steps are as follows (If the earth cable in the packing list is not long enough. Please prepare your own protective earth wire, which is ≥2.5㎜²):



5.4 Connection

- Pay attention to the positive and negative poles of the cable.
- Be careful to avoid misusing the communication lines between PCS and batteries, as well as between batteries. Once the PCS communication line is connected to the "+" or "-" port, it may form inappropriate gaps and fail to achieve waterproof effect.
- When connecting batteries, the negative and positive wires of the battery should be connected to the "-" and "+" ports on one side of the battery at the same time, rather than being connected to both sides of the battery separately.
- The battery wire passing through the left port of the battery should be connected to the left column of the positive copper bar and the left column of the negative copper bar. The line on the right is also. From left to left, from right to right, try to avoid cross connections as much as possible.

5.5 Communication line connection

RJ45 connector

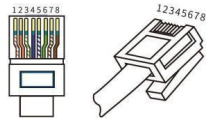


Table 5-1 Pin Definition

Items	Pins	Line color	Interface definition	Remarks
485A/B communication port RJ45 connector definition	1	Orange/white	485-B3	Connecting the battery parallel communication port
	2	Orange	485-A3	
	3	Green/white	GND	Grounding
	4	Blue	/	Reserved

	5	Blue/white	/	Reserved
	6	Green	GND	Grounding
	7	Brown/white	485-A3	Connecting the battery parallel communication port
	8	Brown	485-B3	

Items	Pins	Line color	Interface definition	Remarks
CAN/485 communication port（BMS→PCS） RJ45 connector definition	1	Orange/white	485-B	Connecting the battery parallel communication port
	2	Orange	485-A	
	3	Green/white	GND	Grounding
	4	Blue	CANH	Connecting the inverter communication port or battery parallel communication port
	5	Blue/white	CANL	
	6	Green	GND	Grounding
	7	Brown/white	485-A	Connecting the battery parallel communication port
	8	Brown	485-B	

6 system operation

6.1 Check before powering on

Before operating this product, please ensure that:

- All cables are connected correctly and securely.
- All fasteners, including bolts and screws, are tightened.
- Unauthorized individuals or animals are prohibited from entering the work area.
- Stay away from foreign objects around the battery, especially metals.
- Unused ports are blocked.

6.2 System power on/off

Installation personnel should comply with local installation standards and regulations when installing battery systems.When shutting on/down the battery system, please follow the sequence of the following steps to prevent damage to the system:

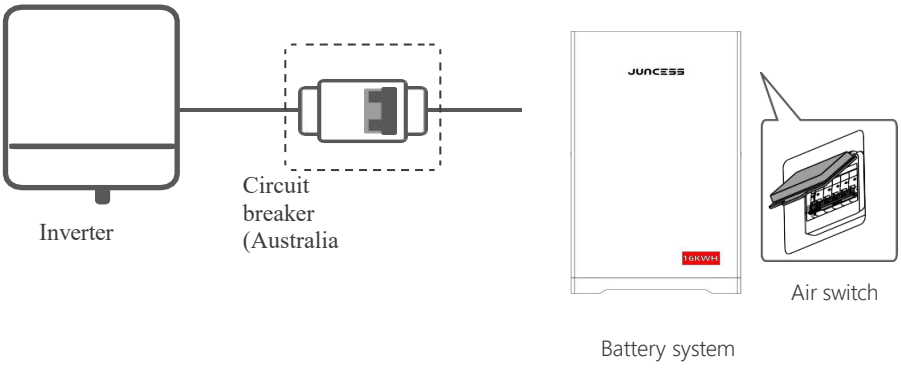
Power On

Step 1: Turn on the breaker between the inverter and the battery system.

Step 2: Turn on the air switch of each battery module.

Step 3: Press the power button 10s of each battery module.

Step 4: Turn on the inverter in the system following the instructions in the user manual of the inverter



Power OFF

Step 1: Turn off the inverter in the system following the instructions in the user manual of the inverter.
Step 2: Turn off the circuit breaker between the inverter and the battery system.
Step 3: Turn off the air switch of each battery system switch.

6.3 Indicator light status

Table 6-1 Status Indication

Items		Test criteria
LED indicators	RUN indicator	1. Standby state, RUN indicator flashes 1 (on for 0.25s, off for 3.75s); 2. During the charging process (charging current greater than 1A), RUN indicator is constantly on; 3. During the discharge process (discharge current greater than 1.6A), the RUN indicator flashes 3 (on for 0.5s, off for 1.5s).
	ALM indicator	1. After the alarm is activated, the ALM indicator flashes (on for 0.5s, off for 0.5s) 2. After protection is activated (except cell undervoltage protection, total-voltage undervoltage protection, cell overvoltage protection and total-voltage overvoltage protection), the ALM indicator is constantly on; 3. When there is no alarm and no protection, the ALM indicator turns off.

	Electric quantity indicator	1. Under standby mode, all electric quantity indicators turn off; 2. During the charging process, electric quantity indicators flash sequentially according to the state of charge: SOC 0~25, LED1 flashes; SOC 25~50, LED2 flashes; SOC 50~75, LED3 flashes; SOC ≥ 75, LED4 flashes; 3. During the discharge process, the electric quantity indicators turn off sequentially according to the state of charge: SOC less than 75, LED4 turns off SOC less than 50, LED3 turns off; SOC less than 25, LED2 turns off. To undervoltage protection, LED1 turns off.

7 Inspection, cleaning, and maintenance

7.1 general information

- The battery product is not fully charged. It is recommended to complete the installation within 3 months after the arrival of the goods;
- Do not reinstall the battery into the battery product during maintenance. Otherwise, it will reduce the performance of the battery;
- It is prohibited to disassemble any battery in the battery product and to dissect the battery;
- After overdischarging the battery product, it is recommended to charge the battery within 48 hours. Battery products can also be charged in parallel. After parallel connection of battery products, the charger only needs to be connected to the output port of any product battery.
- Do not attempt to open or remove the battery! The battery does not contain repairable components inside.
- Before conducting cleaning and maintenance activities, please disconnect all lithium-ion batteries from loads and charging devices.
- Before performing cleaning and maintenance operations, please cover the enclosed protective cap on the terminal to avoid the danger of contact with the terminal.
- All battery terminals must be disconnected during maintenance.
- If there are any abnormalities, please contact the supplier within 24 hours.
- Do not use cleaning solvents to clean the battery.

7.2 inspect

- Check for loose and/or damaged wires and contacts, cracks, deformations, leaks, or any other type of damage. If the battery is found to be damaged, it must be replaced. Do not attempt to charge or use damaged batteries. Do not touch the liquid in the ruptured battery.
- Regularly check the charging status of the battery. Lithium iron phosphate batteries will slowly self discharge when not in use or stored.
- If you notice any of the following situations, please consider replacing the battery with a new one:

-The battery running time has decreased to less than 70% of its original running time.

-The battery charging time has significantly increased.

7.3 clean

If necessary, clean the lithium-ion battery with a soft, dry cloth. Do not use liquids, solvents, or abrasives to clean lithium-ion batteries.

7.4 maintenance

Lithium ion batteries are maintenance free. At least once a year, the battery should be charged to about 80% of its capacity to maintain its capacity.

8 storage

- Battery products should be stored in a dry, cool, and shady environment;
- If the battery is stored for a long time, it is required to be charged every six months, and the SOC should not be lower than 50%.
- The longest storage period at room temperature is generally 6 months. When the battery has been stored for more than 6 months, it is recommended to check the battery voltage. If the voltage is higher than 51.2V, the battery can continue to be stored. Additionally, check the voltage at least once a month until it drops below 51.2V. When the battery voltage is below 51.2V, it must be charged according to the charging strategy.
- The charging strategy is to discharge the battery to the cut-off voltage with a current of 0.2C (62.8A), and then charge it for about 3 hours with a current of 0.2C (62.8A). Keep the SOC of the battery between 40% and 60% during storage;
- When storing battery products, they should be kept away from sources of fire or high temperatures, and kept away from explosive and flammable areas.

9 Troubleshooting

To determine the status of the battery system, users must check the whole system, please refer to the solutions in the following sections.

Fault Type	phenomenon	Possible reasons	solution
Information collection failed	The battery voltage sampling circuit is faulty. Fault in battery temperature sampling circuit	The welding point for battery voltage sampling is loose or disconnected. The voltage sampling terminal is disconnected. The battery temperature sensor is malfunctioning.	Replace the collection cable
Electrochemical performance error of battery	The battery voltage is too low or unbalanced.	Due to its large self discharge capacity, the battery may over discharge to below 2.0V after long-term storage. The battery is damaged by external factors, such as short circuit, needle puncture, or crushing.	Replacing the battery
Overvoltage protection failure	The voltage of the battery cell is greater than 3.65 V when charging. The battery voltage is greater than 58.4 V.	The input voltage of the busbar exceeds the normal value. The battery cells are inconsistent. The capacity of some battery cells deteriorates too quickly or the internal resistance of some battery cells is too high.	If it cannot be restored due to abnormal protection, please contact the local engineer to troubleshoot.
Under voltage protection failure	The battery voltage is less than 44.8V。 The battery voltage does not exceed 2.8V	The power outage has been going on for a long time. The battery cells are inconsistent. The capacity of some battery cells deteriorates too quickly or the internal resistance is too high.	ditto
Failure of high-temperature protection during charging and discharging	The maximum temperature of the battery is greater than 60 ℃	The ambient temperature of the battery is too high. There are abnormal heat sources around	ditto

Low temperature charging protection failure	The minimum temperature of the battery is below 0 ℃	The ambient temperature of the battery is too low.	ditto
Low temperature discharge protection failure	The minimum temperature of the battery is ≤ -20 ℃	The ambient temperature of the battery is too low.	ditto

Table 9-1: Troubleshooting

By verifying the above data and sending it to our company's service personnel, they will respond with corresponding solutions upon receiving the data.

10 Technical specifications

Table 10-1 Parameters

Product parameters	
Model	JFL16
Battery Type	LFP
Rated Capacity	314Ah
Rated Voltage	51.2V
Rated Enery	16.07kWh
Available Enery	16.07kWh
Minimum Voltage	44.8V
Maximum Voltage	57.6V
Rated Charge/Discharge Current	150A/150A
Rated DC Power	7680W
Max Charge/Discharge Current	200A/200A
Max Charge/Discharge Power	10240W
Recommended Charge/ Discharge C Rate	0.5C
Depth Of Discharge	100%
Weight	126kg
Dimensions(W*H*D)	480*1009*230±3㎜
Protection level	IP65
Communication method	CAN, RS485
Cycle Life	6000
Design Life	10years

Case Material	SPCC
Operation Temperature	Charging temperature range: 1-50 ℃, discharging temperature range: -20-55 ℃
Cooling Mode	Natural Cooling
Fire Protection System	Perfluoro-2-methyl-3-pentanone
Warranty Period	10 years

Note

1) Optimal operating temperature range: 10~35°C charging temperature range: 0~55°C: discharging temperature range: -20~55°C.
2) Test condition : Based on the production date above, discharge current is 150A at 25℃±5℃with100% DOD .
3) Battery module weight includes upper cover and is net weight, allowable tolerance ± 3%.
4) Please follow user manual for proper installation, use, and maintenance.
5) Battery modules capable of high-rate operation can be shipped with base trays.
6) Quantity matches system/device requirements.
7) The installation of energy storage systems is related to ensuring product quality and safe and stable operation. Please follow the requirements of the user manual for standardized installation, use, and daily maintenance.
8) The energy storage system is ordered and shipped in the form of independent battery modules and pallets, with quantities corresponding to the required systems and equipment.
9) Recommended charging method: Charge with a constant current of 150A to 57.6V.

11 Environmental Protection Treatment

Used batteries cannot be disposed of as household waste. You have an obligation to dispose of waste batteries, such as removing privacy from the product, and returning them to designated or authorized recycling points in accordance with relevant regulations and standards for waste battery disposal.

be careful:

1. Do not dispose of batteries and rechargeable batteries as household waste! You have a legal obligation to recycle used batteries and rechargeable batteries.
2. Waste batteries may contain pollutants, and if stored or handled improperly, they may harm the environment or your health.
3. Batteries also contain important raw materials such as iron and lithium, which can be recycled and reused.

For more information, please visit http://www.juncess.com . Do not dispose of batteries as household waste!

12 Transportation requirements

1. Battery products should be transported after packaging. During transportation, measures should be taken to prevent severe vibration, impact, or compression, as well as exposure to sunlight and rain. It can be transported by vehicles such as cars, trains, and ships.
2. Before transporting lithium iron phosphate batteries, please make sure to check all applicable local, national, and international regulations.
3. In some cases, the transportation of scrapped, damaged, or recalled batteries may be subject to special restrictions or prohibitions.
4. The transportation of lithium-ion batteries belongs to the hazard level UN3480, Class 9. For water, air, and land transportation, batteries belong to Packaging Group PI965 Section 1. Transport Class 9 lithium-ion batteries using Class 9 miscellaneous dangerous goods and UN identification labels. Please refer to the relevant transportation documents.

Class 9 Miscellaneous Dangerous Goods and UN Identification Labels