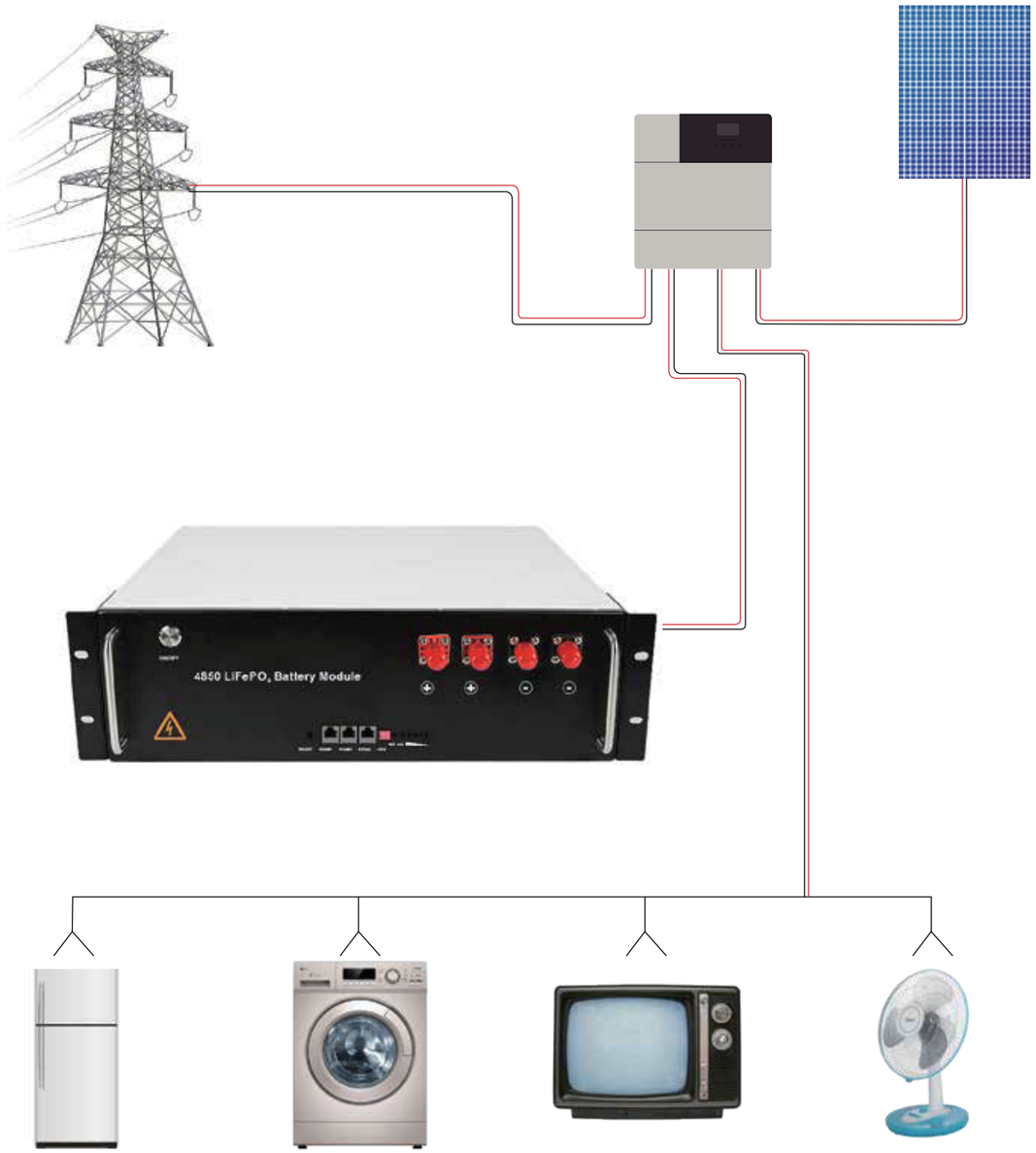



# Rack Type Energy Storage LiFePO4 Battery

User manual

# Important safety instructions

**Important safety instructions**
**Please keep this manual for future reference.**
**This manual contains all the safety. installation and operation instructions of the rack type energy storage $LiFePO_4$ battery.**
**Please read all instructions and precautions in the manual carefully before installation and use.**

1. To avoid personal injury, users should disassemble it by professional installer. If need repairs, please contact our company's professional maintenance personnel.
2. Do not install the energy storage $LiFePO_4$ battery in a place where children can touch.
3. Do not install the energy storage $LiFePO_4$ battery in harsh environments such as damp greasy, flammable, explosive, or dust accumulation.
4. When the energy storage $LiFePO_4$ battery is working, please do not open the box.
5. It is recommended to install a suitable fuse or circuit breaker externally.
6. After installation, check whether all line connections are tight to avoid the risk of heat accumulation due to virtual connection.
7. Rack energy storage battery shall be charged with solar power or AC power supply, parallel connection with other AC power supply or different voltage and brand batteries is prohibited.



# Contents

## 1. Basic information

### 1.1 Product overview

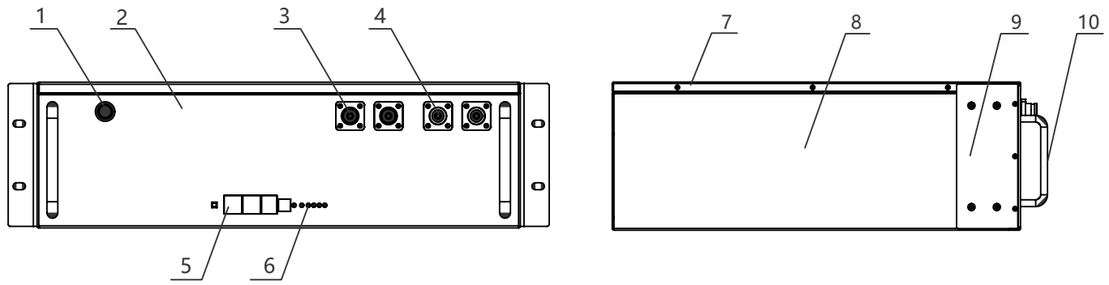
Rack type energy storage battery is mainly used in the field of household power storage. At the same time, it is also suitable for the internal energy storage of RV, household energy storage and temporary buildings. It adopts high-performance and long-life lithium iron phosphate battery as the basic energy storage unit, combined with advanced lithium-ion battery management system industrial design of household products and other technologies. Ensure that products have high reliability and high industrialization standards.
Rack type energy storage battery covers the energy demand of a single machine from the 2.5kwh to 5.0kwh.
Rack type products have wall mounting function and can support external parallel use function, which greatly improves the convenience of use.
Through scientific and reasonable active heat dissipation. Rack type energy storage battery improves the consistency of internal temperature field, prolongs service life, and enables the product to continuously output high current.

### 1.2 Features

- The battery adopts high-performance lithium iron phosphate battery with high safety performance and long service life.
- External weak current switch reduces product power consumption and improves the safety of transportation and storage.
- With RS485/CAN communication function, it can easily communicate with the equipment with communication.
- External wireless module can be connected for remote data monitoring and corresponding control.
- It has multiple protection functions to protect the safety of power supply inan all-round way.
- The output is stable and can be connected to different loads with in the voltage rang.
- Support up to 15 independent modules for parallel use.



### 1.3 Function description




| | | | |
|---|---|---|---|
| 1 | On/Off | 6 | Battery indicator |
| 2 | Interface | 7 | Welding parts of upper cover |
| 3 | Red terminal | 8 | Box |
| 4 | Black terminal | 9 | Box fixings |
| 5 | RS485/CAN communication | 10 | Box handle |

## 2. Installation instructions

### 2.1 Installation notes

Before installation, please read this manual carefully and familiarize the installation steps.

(1) Be sure to leave a certain space around for heat dissipation during installation.

(2) Avoid sunlight direct and rainwater infiltration during outdoor installation to cause battery damage.

(3) Do not place metal products near the place of the energy storage $LiFePO_4$ battery installation to prevent short circuits.

(4) Virtual connection points and corroded wires may generate high heat, and the molten insulation layer will burn surrounding materials and even cause a fire. Therefore, it must be ensured that the connector has been tightened and the wires should be secured with cable ties to avoid loosening of the connector due to shaking during mobile applications.

(5) After the battery switch is turned off,there is still high voltage inside the energy storage case. Please do not open or touch the internal components, and external short circuit is strictly prohibited.

(6) Please do not install it in a harsh environment where a large amount of damp, greasy, flammable and explosive dust gathers.

(7) It is forbidden to reverse the charging and discharging terminals of the battery, other wise it is very easy to damage the battery or cause unpredictable risks.

(10) If an injury occurs during installation or use, please seek medical attention in time.

2.2 Installation and connection

Installation and connection must comply with national and local electrical code requirements. According to the current situation, firstly, choose the corresponding wire or awire with a larger wire diameter to avoid unnecessary troubles during use. Secondly, determine the installation location. Thirdly, when installing, please make sure to leave at least 200 mm of spaceat the air outlets on both sides ofthe energy storage battery to ensure natural convection heat dissipation.

2.3 Recommended external wiring diameter and switch selection.

| Mode1 | Recommended extemal wiring diameter | Battery continuous current circuit breaker | Circuit breaker Model |
|---|---|---|---|
| YLRM-15S-2400 | 25mm² /4AWG | 50A | 2P-125A |
| YLRM-15S-4800 | 25mm² /4AWG | 100A | 2P-125A |
| YLRM-16S-5120 | 25mm² /4AWG | 100A | 2P-125A |

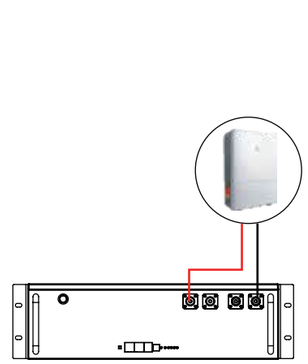
Note: The wiring diameter is for reference only. If the distance between the load and the battery is relatively long,use a larger wire to reduce the voltage and improve the system performance. He above wiring diameter and circuit breaker are only recommendations, please follow the actual choose the appropriate wire diameter andcircuit breaker according to the situation.

2.4 Recommended setting data of inverter:

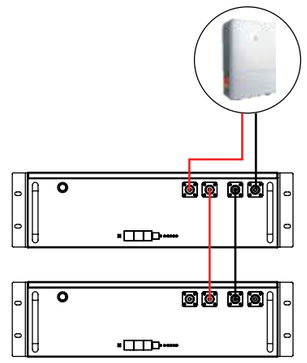
| Battery model | LiFePO4/Lithium battery | | |
|---|---|---|---|
| Model | YLRM-15S-2400 | YLRM-15S-4800 | YLRM-16S-5120 |
| Discharge cut-off voltage | 42 | 42 | 46 |
| Over discharge recovery | 44 | 44 | 48 |
| Normal charging voltage | 58.4 | 58.4 | 58 |
| Surge charging voltage | 58 | 58 | 60 |
| Overvoltage protection | 54.8 | 54.8 | 58.4 |
| Overvoltage recovery | 52 | 52 | 56 |



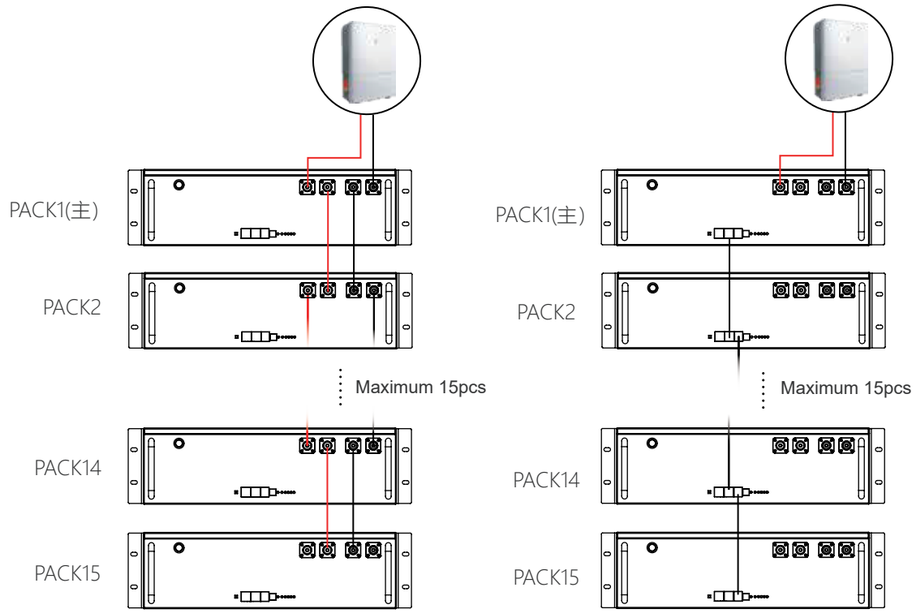
## 3. Parallel structure diagram



① One unit product



② Two units products




③ Batteries are connected in communication

Note: 1. When the battery pack is used in parallel, it is necessary to distinguish different packs by hardware address, and the hardware address of each pack in the whole battery pack is unique.

2. It must set up a park for the host park. The inverter communicate with host pack via PRS485/CAN. The hardwareaddress can be set successively through the dial switch on the board.

## 4. LED instructions

Table1 LED working status indication

| state | normal/warning/ protect | RUN | ALM | Battery indicator LED | | | | illustrate |
|---|---|---|---|---|---|---|---|---|
| | | ● | ● | ● | ● | ● | ● | |
| shutdown | hibernate | extinguish | extinguish | extinguish | extinguish | extinguish | extinguish | annihilate |
| Standby | normal | flash 1 | extinguish | According to the battery indicator | | | | standby mode |
| | alert | flash 1 | flash 3 | | | | | Module low voltage |
| Charge | normal | Always bright | extinguish | According to the battery indicator (battery indication maximum LED flashes 2) | | | | Maximum battery LED flashes Move (flashing 2), overcharge warning ALM does not flash during alarm |
| | alert | Always bright | flash 3 | | | | | |
| | Overcharge protection | Always bright | extinguish | Always bright | Always bright | Always bright | Always bright | If there is no utility power, indicate Light goes to standby |
| | temperature, overcurrent, Failsafe | extinguish | Always bright | extinguish | extinguish | extinguish | extinguish | stop charging |
| discharge | normal | flash 3 | extinguish | According to the battery indicator | | | | stop charging |
| | alert | flash 3 | flash 3 | | | | | |
| | Undervoltage protection | extinguish | extinguish | extinguish | extinguish | extinguish | extinguish | stop charging |
| | temperature, overcurrent, short circuit, Reverse connection, failsafe | extinguish | Always bright | extinguish | extinguish | extinguish | extinguish | stop charging |
| invalid | | extinguish | Always bright | extinguish | extinguish | extinguish | extinguish | Stop charging and discharging |

Table2 Description of capacity indication

| state | | Charge | | | | discharge | | | |
|---|---|---|---|---|---|---|---|---|---|
| capacity indicator | | L4 ● | L3 ● | L2 ● | L1 ● | L4 ● | L3 ● | L2 ● | L1 ● |
| Battery (%) | 0~25% | extinguish | extinguish | extinguish | extinguish | extinguish | extinguish | extinguish | constant |
| | 25~50% | extinguish | flash 2 | flash 2 | constant | extinguish | extinguish | constant | constant |
| | 50~75% | flash 2 | flash 2 | constant | constant | extinguish | constant | constant | constant |
| | 75~100% | flash 2 | constant | constant | constant | constant | constant | constant | constant |
| Running lights ● | | constant | | | | Blink (blink 3) | | | |



Table 3 LED flashing description

| flashing method | Bright | extinguish |
|---|---|---|
| flash 1 | 0.25S | 3.75S |
| flash 2 | 0.5S | 0.5S |
| flash 3 | 0.5S | 1.5S |

Remarks: The LED indicator alarm can be enabled or disabled through the host computer, and the factory default is enabled.

### ◆ Key Description

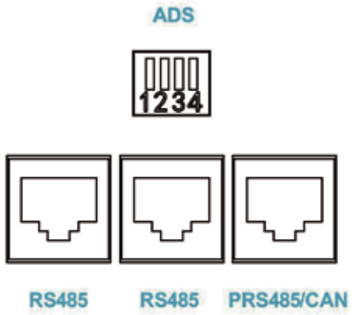
1. When the BMS is in sleep state, press the button (3~6S) and release it, the protection board will be activated, and the LED indicators will light up sequentially from "RUN" for 0.5 seconds.
2. When the BMS is active, press the button (3~6S) and release it, the protection board will be put to sleep, and the LED indicators will light up sequentially for 0.5 seconds from the lowest battery indicator.
3. When the BMS is active, press the button (6~10S) and release it, the protection board will be reset, and all the LED lights will light up at the same time for 1.5 seconds.
4. After the BMS is reset, the parameters and functions set by the host computer are still retained. If it is necessary to restore the initial parameters, it can be achieved through the " restore default value" of the host computer, but the relevant operation records and stored data remain unchanged (such as power, cycle times, etc.).

## 5.BMS communication settings

### 5.1 BMS communication and setting

When the load (such as inverter) needs to communicate with the battery, in order to establish normal communication with the load, BMS needs to set the following settings for each brand. The RS485 communication protocols of inverters are different, but there are several RS485 communication protocols inside the inverter to match the battery. When using, you can directly select the communication protocol code in the inverter for matching. If you have other problems,please consult the supplier.

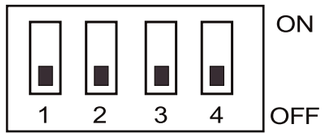
Battery BMS interface pin foot definition as shown in the following figure




“ADS” is used for parallel use of battery packs.
PACK can be distinguished by hardware address.
The definition of ADS master-slavead dress refers to communication address selection specification.
“PRS485/CAN” battery pack can communicate with the upper computer or inverter and the reverse control integrated machine through the interface.
“RS485” is used in parallel for battery pack,and the main ack communicates with pack from the interface.


| The battery communication interface adopts 8P8C RJ45 socket. | | | |
|---|---|---|---|
| RS485 | | PRS485/CAN | |
| PIN | Definition | PIN | Definition |
| 1、8 | RS485-B | 1、8 | RS485-B |
| 2、7 | RS485-A | 2、7 | RS485-A |
| | | 4 | CAN-H |
| | | 5 | CAN-L |

## 5.2 Communication address selection specification




| address | Code switch position | | | | Illustrate |
|---|---|---|---|---|---|
| | 1# | 2# | 3# | 4# | |
| 0 | OFF | OFF | OFF | OFF | Stand-alone use, no cascade |
| 1 | ON | OFF | OFF | OFF | Set to Pack 1 (Host) |
| 2 | OFF | ON | OFF | OFF | Set to Pack 2 |
| 3 | ON | ON | OFF | OFF | Set to Pack 3 |
| 4 | OFF | OFF | ON | OFF | Set to Pack 4 |
| 5 | ON | OFF | ON | OFF | Set to Pack 5 |
| 6 | OFF | ON | ON | OFF | Set to Pack 6 |
| 7 | ON | ON | ON | OFF | Set to Pack 7 |
| 8 | OFF | OFF | OFF | ON | Set to Pack 8 |
| 9 | ON | OFF | OFF | ON | Set to Pack 9 |
| 10 | OFF | ON | OFF | ON | Set to Pack 10 |
| 11 | ON | ON | OFF | ON | Set to Pack 11 |
| 12 | OFF | OFF | ON | ON | Set to Pack 12 |
| 13 | ON | OFF | ON | ON | Set to Pack 13 |
| 14 | OFF | ON | ON | ON | Set to Pack 14 |
| 15 | ON | ON | ON | ON | Set to Pack 15 |



## 6. Technical parameter list

| Product number | YLRM-15S-2400 | YLRM-15S-4800 | YLRM-16S-5120 |
|---|---|---|---|
| Array Mode | 15S | 15S | 16S |
| Nominal Energy（KWh） | 2.4 | 4.8 | 5.0 |
| Minimum Energy (KWh） | ≥4.92 | ≥10.0 | ≥10.0 |
| Nominal Voltage（V） | 48 | 48 | 51.2 |
| Charge Voltage (V) | 54.7 | 54.7 | 58.4 |
| Discharge Cut-off Voltage (V) | 42 | 42 | 45 |
| Standard Charging Current | 10 | 20 | 20 |
| Max.Continuous Charging Current | 50 | 100 | 100 |
| Max.Continuous discharging Current | 50 | 100 | 100 |
| Communication Mode | ≥6000次@80%DOD, 25℃ | | |
| Cycle Life | RS485/232 | RS485/CAN | RS485/CAN |
| Operating Temp | Charging: 0~60°C; Discharging: -10°C~65°C | | |
| Size（L×W×H）mm | 453×493×133 | 515×493×180 | 515×493×180 |
| Weight（Kg） | 27.5 | 41.5 | 45 |
| Package dimensions (L×W×H）mm | 587×537×344 | 587×537×344 | 587×537×344 |
| Gross weight（Kg） | 45.4 | 51.5 | 55.5 |

Note: The dimensions in the datasheet are the product appearance dimensions. If any change for the products, will adjusted by the manufacture.

## 7. Maintenance and conservation

| Item | Problem description | Description/possible causes | Solution |
|---|---|---|---|
| 1 | Unable to boot properly, BMS will immediately enter the protect ion state after press the switch | The external load does not match,and the instantaneous current of load startup is too large | 1. Press the on key to restart<br>2. Reduce load power |
| 2 | Automatically disconnect the output during use | 1. The battery voltage is too low<br>2. Output or load short circuit | 1. Charge the battery<br>2. Disconnect the load and restart the battery |
| 3 | The Communication fault occurs when the load is inverter | 1. Communication line connection error (connecting pinimproper connectionor oxidation)<br>2. The internal protocol code of inverter is not properly chosen<br>3. Communication insert loose orimproper connection | 1. Check the connection between BMS and inverter<br>2. Choose the corresponding communication protocol in the inverter's internal program<br>3. Reconnect the communication cables. If the problem still-exists' please contact the manufacturer |
| 4 | | | |
| 5 | | | |
| 6 | | | |

In order to maintain the best and long-term performance, the following items are recommended to be inspected twice a year.

1. Confirm that the surrounding air flow will not be blocked, and remove any dirts and debris on the cooling hole.
2. Check all exposed wires, shabby and damage, please place or repair them if necessary.
3. If it is not be used for a long time, it is recommended to charge it every three months.

⚠ Danger of electric shock! Make sure that the power supply has been disconnected during the above operations,and then carry out corresponding inspection and operation.

## 8. Warranty record card

Dear Customers:

Hello! Thank you very much for purchasing our products.In order to serve you better, please read and fill in and keep this warranty card after purchasing the product. In order to avoid your worries, our company here by makes a warranty service commitment and provides standardized after sales service accordingly.

Exemption of warranty liability scope:

1. Damage caused by man-made or other natural disasters.
2. Failure caused by incorrect operation and installation or use in an environment other than the product's prescribed use.
3. Damage caused by unauthorized disassembly and modification.

Contact: _____ Number: _____

Tel: _____ Email: _____

Purchase date: _____

Address: _____

| Maintenance records | | | |
|---|---|---|---|
| Repair Date | Repair content | Repair Person | |
| | | | |
| | | | |
| | | | |
| | | | |