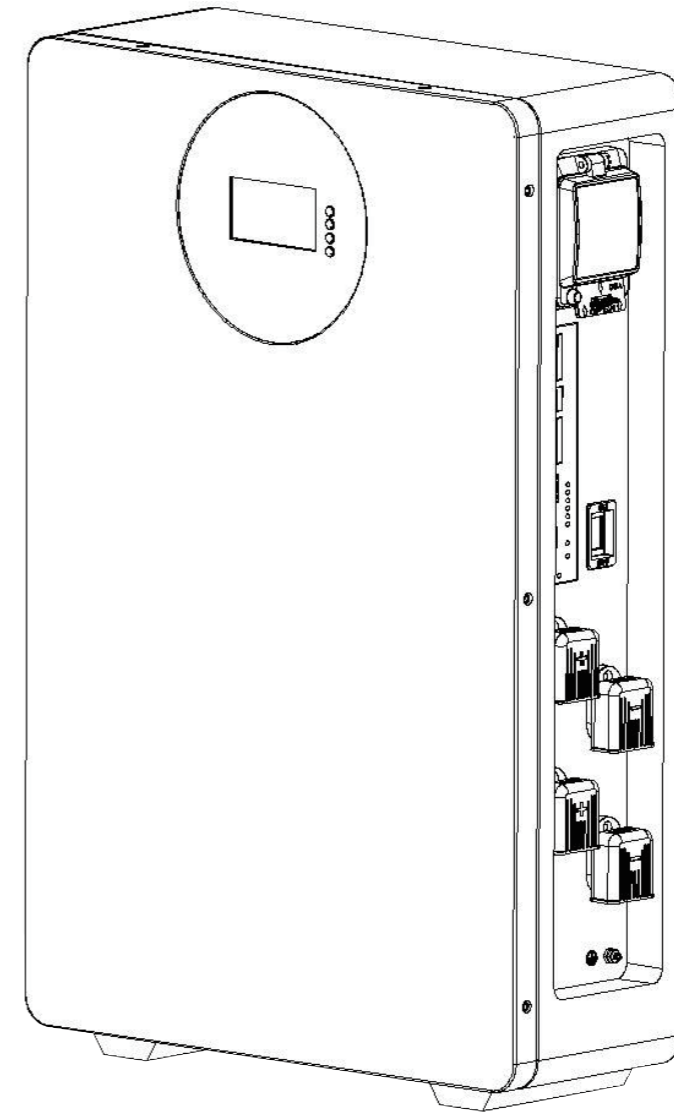# Lithium Battery Power Bank

## Product Manual

## 6. Emergency Situations

### 1) Leaking Battery

If the battery pack leaks electrolyte, avoid contact with the leaking liquid or gas.If one is exposed to the leaked substance, immediately perform the actions described below .

Inhalation: Evacuate the contaminated area, and seek medical attention.

Contact with eyes: Rinse eyes with flowing water for 15 minutes, and seek medical attention.

Contact with skin: Wash the affected area thoroughly with soap and water, and seek medical attention.

Ingestion: Induce vomiting, and seek medical attention.

### 2) Fire

NO WATER! Only dry powder fire extinguisher can be used; if possible, move the battery pack to a safe area before it catches fire.

### 3) Wet battery

If the battery pack is wet or submerged in water, do not let people access it,and then contact an authorized dealer for technical support.

### 4) Damaged Battery

Damaged battery are dangerous and must be handled with the utmost care. They are not fit for use and may pose a danger to people or property. If the battery pack seems to be damaged pack it in its original container, and then return it to an authorized dealer.

This manual introduces 24V/48VDC series energy storage battery,Please read this manual before you to install the battery and follow the instruction carefully during the installation .Any confusion ,please contact manufacturer immediately for advice and clarification .

Contents

# 1. Safety Precautions

⚠️ Reminding

1) It is very important and necessary to read the user manual carefully (in the accessories) before installing or using battery .Failure to do so or to follow any of the instructions or warnings in this document can result in electrical shock ,serious injury ,or death,or can damage battery ,potential rendering it inoperable .
2) If the battery is stored for long time ,it is required to charge them every six months ,and the soc should be no less than 90% .
3) Battery needs to be recharged within 12 hours ,after fully discharged .
4) Do not expose cable outside .
5) All the battery terminals must be disconnected for maintenance .
6) Please contact the supplier within 24 hours if there is something abnormal .
7) Do not use cleaning solvents to clean battery .
8) Do not expose battery to flammable or harsh chemicals or vapors .
9) Do not paint any part of battery ,include any internal or external components .
10) Do not connect battery with PV solar wiring directly .
11) The warranty claims are excluded for direct or indirect damage due to items above .
12) Any foreign object is prohibited to insert into any part of battery .

⚠️ Warning

## 1.1 Before Connecting

1) After unpacking ,please check product and packing list first ,if products is damaged or lack of parts ,please contact with the local retailer .
2) Before installation ,be sure to cut off the grid power and make sure the battery is in the turned-off mode .
3) Wiring must be correct ,do not mistake the positive and negative cables ,and ensure no short circuit with the external device .
4) It is prohibited to connect the battery and AC power directly .
5) The embedded BMS in the battery .The wall mounted case are not allowed to be used in series ,in the communication state, a maximum of 16 parallel connections are allowed .
6) Battery system must be well grounded and the resistance must be less than 1Ω .
7) Please ensured the electrical parameters of battery system are compatible to related equipment .
8) Keep the battery away from water and fire .

## 1.2 In Using

1) If the battery system needs to be moved or repaired ,the power must be cut off and the battery is completely shutdown .
2) It is prohibited to connect the battery with different type of battery .
3) It is prohibited to put the battery working with faulty or incompatible inverter .
4) It is prohibited to disassemble the battery (QC tab removed or damaged) .
5) In case of fire ,only dry powder fire extinguisher can be used ,liquid fire extinguishers are prohibited .
6) Please do not open ,repair or disassemble the battery except staffs from manufacturer .We do not undertake any consequences or related responsibility which because of violation of safety operation or violating of design ,production and equipment safety standards .

⚠️ CAUTION

If the ambient temperature is outside the operation range, the battery pack stops operation to protect itself. The optimal temperature range for the battery pack to operate is 0℃ to 50℃ .
Frequent exposure to harsh temperature may deteriorate the performance and life of the battery pack .

# 5. Trouble Shooting Steps

### 5.1 Problem determination based on:

1) Whether the battery can be turned on or not.

2) If battery is turned on, check the LED light is off, flashing or lighting.

3) If the LED light is off, check whether the battery can be charge/discharge or not.

### 5.2 Preliminary determination steps:

1) Battery cannot turn on, switch on the lights are all no lighting or flashing.
   If the battery external switch is on, the LED light is flashing, and the external power supply voltage is 48V or more, the battery still unable to turn on, please contact distributor.

2) The battery can be turned on, but red light is lighting, and cannot charge or discharge. If the red light is lighting, that means system is abnormal, please check values as following:

a) Temperature: Above 50℃ or under -10℃, the battery could not work.
Solution: to move battery to the normal operation temperature range between -10℃ and 50℃.

b) Current: If current is greater than 150A, battery protection will turn on .
Solution: Check whether current is too large or not, if it is, to change the setting on power supply side.

c) High Voltage: If charging voltage above 58.4Vdc(48V system), battery protection will turn on.
Solution: Check whether voltage is too high or not, if it is, to change the setting on power supply side.

d) Low Voltage: When the battery discharges to 44.8Vdc(48V system) or less, battery protection will turn on.
Solution: Charge the battery for some time, the LED light turn off.

### 5.3 The battery cannot be charged or discharged

1) Cannot be charged:
Disconnect the power cables, measure voltage on power side, if the voltage is 51.2~54.0Vdc(48V system) ,restart the battery,
connect the power cable and try again, if still not work, turn off battery and contact distributor.

2) Unable to discharge:
Disconnect the power cables and measure voltage on battery side, if it is under 44.5V, please charge the battery. If voltage is above 48V and still cannot discharge, turn off battery and contact distributor.

## 4. Installation

### 4.1 One set Lithium battery product connects to Inverter



Address 1
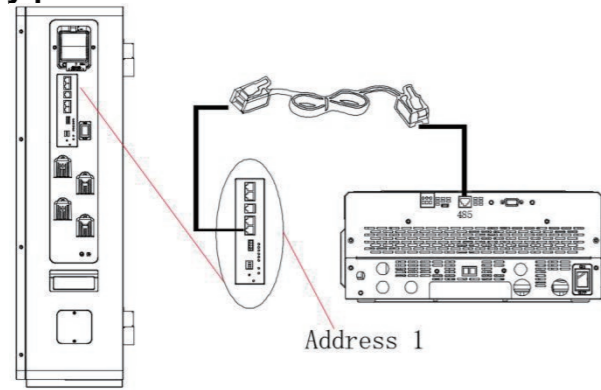
### 4.2 Multiple sets of Lithium battery product connects to Inverter



Address 2    Address 1
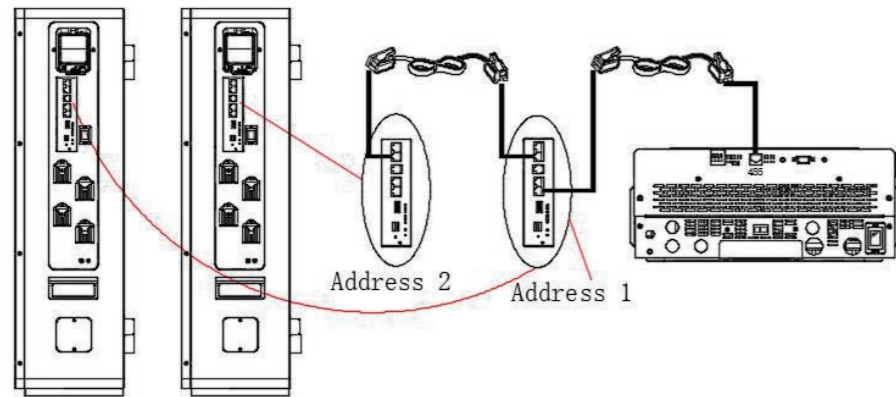
### 4.3 Installation Location
Make sure that the installation location meets the following conditions.

◆The area is completely water proof.

◆The floor is flat and level.

◆There are no flammable or explosive materials.

◆The ambient temperature is within the range from 0℃ to 50℃.

◆The temperature and humidity is maintained at a constant level.

◆There is minimal dust and dirt in the area.

◆Use fitting screws to fix the box on the wall.
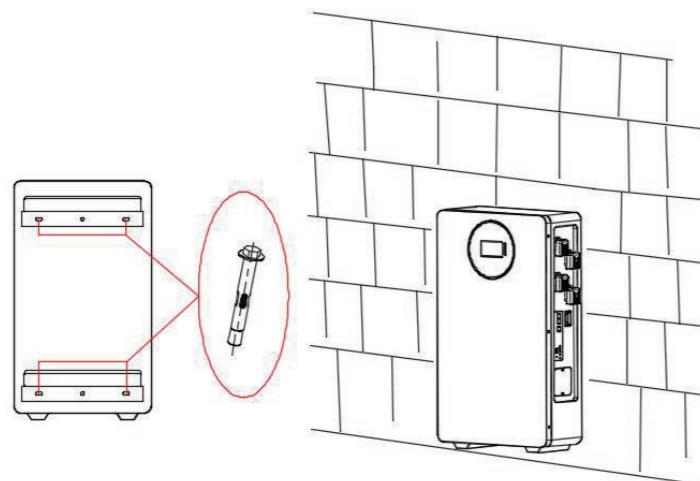
## 2. Introduction

24/48VDC series Lithium  battery power bank is one of new energy storage products developed ,it can be used to support reliable power for various types of equipment and systems .Is especially suitable for application scene of high power ,limited installation space ,restricted load-bearing and long cycle life .

24/48VDC series has built-in BMS battery management system ,which can manage and monitor cells information including voltage ,current and temperature .What's more ,BMS can balance cells charging and discharging to extend cycle life .

Multiple batteries can connected in parallel to expand capacity and power in parallel for larger capacity and longer power supporting duration requirements .

The capacity of Lithium battery should be higher than the Solar Inverter which you will connect with .

### 2.1 features:

◆ The whole module is non-toxic ,non-polluting and environmentally friendly .

◆ Cathode material is made from LiFePO4 with safety performance and long cycle life .

◆ Battery management system (BMS) has protection functions including over-discharge ,over-charge ,over-current and high/low temperature .

◆ The system can automatically manage charge and discharge state and balance current and voltage of each cell .

◆ Flexible configuration ,multiple battery modules can be in parallel for expanding capacity and Power .

◆ Adopted self-cooling mode rapidly reduced system entire noise.
The module has less self-discharge ,up to 6 months without charging it on shelf ,no memory effect ,excellent performance of shallow charge and discharge .

◆ Working temperature range is from -10℃ to 50℃ ,(charge 0℃~ 50℃ ,discharge -10℃~ 50℃) with excellent discharge performance and cycle life .

### 2.2 Specifications:

| Basic parameters | 25.6V 100Ah | 25.6V 200Ah | 25.6V 300Ah | 51.2V 100Ah | 51.2V 200Ah | 51.2V 300Ah | 51.2V 350Ah |
|---|---|---|---|---|---|---|---|
| Nominal capacity | 2560Wh | 5120Wh | 7680Wh | 5120Wh | 10240Wh | 15360Wh | 17920Wh |
| Fast charge voltage | 28.8Vdc | | | 57.6Vdc | | | |
| Float charge voltage | 28.0Vdc | | | 56.0Vdc | | | |
| Low DC cut-off voltage | 23.4Vdc | | | 46.8Vdc | | | |
| Max. CHG. current | 50A | 100A | 150A | 50A | 100A | 150A | 175A |
| Max. DISC. current | 100A | 150A | 200A | 100A | 150A | 200A | 200A |
| Peak DISC. current | 150A (1 sec.) | 225A (1 sec.) | 300A (1 sec.) | 150A (1 sec.) | 225A (1 sec.) | 300A (1 sec.) | 300A (1 sec.) |
| Display | LED status indicator , LCD display | | | | | | |
| communication | RS485 , CAN | | | | | | |
| Working temperature | charge 0℃ ~ +50℃ ,discharge -10℃ ~ +50℃ | | | | | | |
| Shelf temperature | -10℃ ~ +50℃ | | | | | | |
| certification | UN38.3 , MSDS | | | | | | |

## 2.3 Equipment Interface Instruction
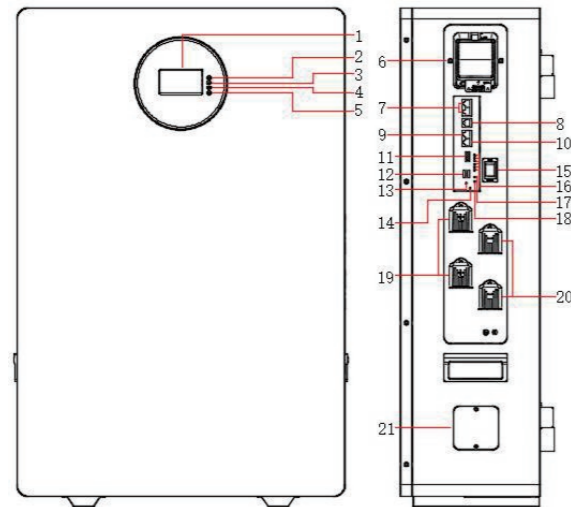


**1. LCD Display**
Display page of working status data .

**2. MENU Operation buttons**
Display page of working status data .

**3. ENTER Operation buttons**
This key allows you to enter the setting page .

**4. Down Operation buttons**
Select down page of working status data .

**5. ESC Operation buttons**
Return to the previous display page .

**6. Circuit Breaker**
The battery output circuit breaker .

**7. Battery RS485 interfaces**
Follow RS485 protocol, for communication between multiple parallel battery .

**8. RS485 interfaces**
Follow RS485 protocol, for communication between BMS controller and Upper-computer software .

**9. CAN interfaces**
Follow CAN protocol, between BMS controller and Inverter,for output battery information .

**10. RS485 interfaces**
Follow RS485 protocol, between BMS controller and Inverter,for output battery information .

**11. Dry point**
Dry point 1: Pin1 to Pin2 normal operation is open circuit, over-charge protection is short circuit .
Dry point 2: Pin3 to Pin4 normal operation is open circuit, over-discharge protection is short circuit .

**12. Device address**
Used to set the address of each BMS protection board .

**13. Program reset button**
After pressing with the thimble, the program forces a reset and restart .

**14. Power Supply indicator**
Green LED to show the battery has on/off status .

**15. Power switch**
ON~Battery is turn on and the battery has output voltage .
OFF~Battery is turn off and the battery has no output voltage .

**16. SOC status indicator**
Green LEDS to show the battery's current capacity 100% 83% 66.4% 49.8% 33.2% 16.6% .

**17. Alarm status indicator**
Red LED flashing to show the battery has alarm .

**18. Run status indicator**
Yellow LED lighting to show the battery is charging ,and fast flashing to show the battery is discharging , and slow flashing to show the battery is standby status .

**19. +Battery terminal**
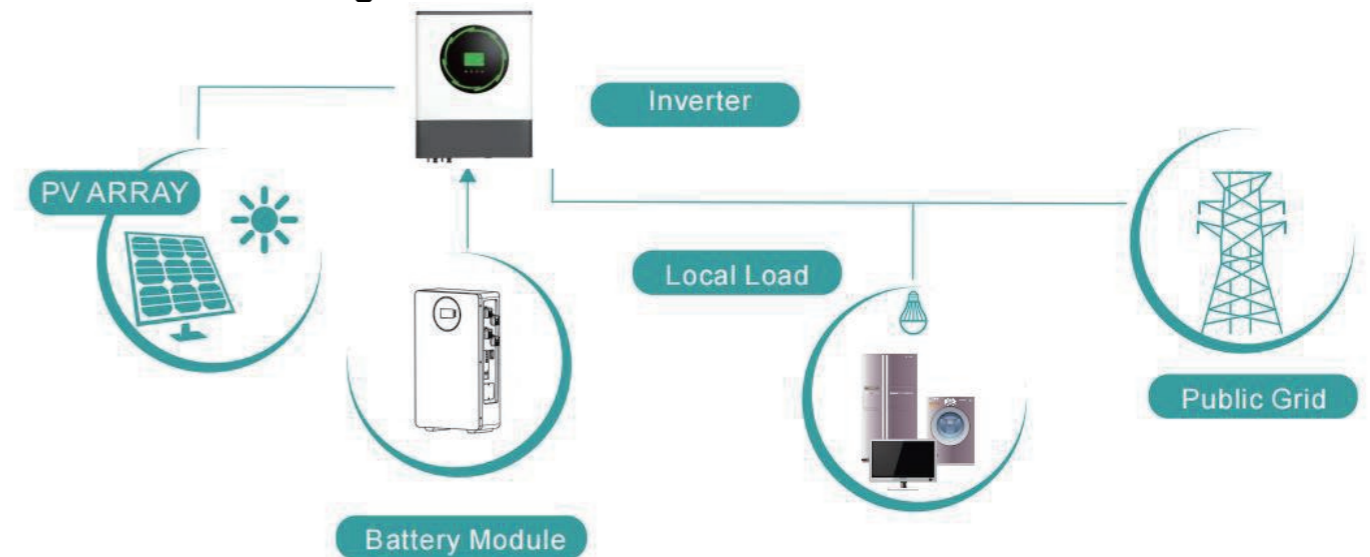There are one pair of terminals, Red is battery positive pole .

**20. -Battery terminal**
There are one pair of terminals, Black is battery negative pole .

**21. Active balancing external interfaces**

## 3. Safe handing of lithium battery guide
### 3.1 Schematic Diagram of solution



### 3.2 Tools
**The following tools are required to install the battery pack**



Wire cutter          Crimping Modular Plier          Screw Driver

**NOTE**
Use properly insulated tools to prevent accidental electric shock or short circuits. If insulated tools are not available,cover the entire exposed metal surfaces of the available tools, except their tips, with electrical tape.

### 3.3 Safety Gear
It is recommended to wear the following safety gear when dealing with the battery back.



Insulated gloves          Safety goggles          Safety shoes

## 2.4 LCD display instruction

2.4.1 First screen after turn on the battery ,use the UP and DOWN buttons to turn pages .

```
->PackInfo      >>
--PackStatus  >>
--PackPara     >>
--PackSet      >>
```

```
->Vol: 51.28V  >>
--Cur: 52.15A  >>
--Capacity     >>
--Temp         >>
```

```
RSOC:100.00%
ReMain:0.00AH
FCC:   200.0AH
Cvc:   0000
```

```
NTC1:  30.8 °C
NTC2:  30.8 °C
NTC3:  30.8 °C
NTC4:  30.8 °C
```

2.4.2 After use the MENU buttons to enter the pack status page .

```
--PackInfo      >>
->PackStatus  >>
--PackPara     >>
--PackSet      >>
```

```
->Status:Protect
--Pro_Count    >>
--Pro_Status   >>
```

2.4.3 After use the MENU buttons to enter the select BMS protocol page .

```
--PackInfo      >>
--PackStatus  >>
--PackPara     >>
->PackSet      >>
```

```
->RS485        >>
--CANBUS       >>
```

Select RS485 communication protocol .

```
RS485-PYLON
RS485-GROWATT
RS485-Voltronic
RS485-LXP
```

Select CAN communication protocol .

```
Can-Pylon
Can-VicTron
Can-Goodwe
Can-Growatt
```
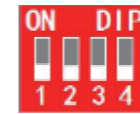
| Dial code switch position | | | | Address | Instruction |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | | |
| 0 | 0 | 0 | 0 | 0 | Set to Pack0 |
| 1 | 0 | 0 | 0 | 1 | Set to Pack1 |
| 0 | 1 | 0 | 0 | 2 | Set to Pack2 |
| 1 | 1 | 0 | 0 | 3 | Set to Pack3 |
| 0 | 0 | 1 | 0 | 4 | Set to Pack4 |
| 1 | 0 | 1 | 0 | 5 | Set to Pack5 |
| 0 | 1 | 1 | 0 | 6 | Set to Pack6 |
| 1 | 1 | 1 | 0 | 7 | Set to Pack7 |
| 0 | 0 | 0 | 1 | 8 | Set to Pack8 |
| ... | ... | ... | ... | ... | ... |
| 0 | 1 | 1 | 1 | 14 | Set to Pack14 |
| 1 | 1 | 1 | 1 | 15 | Set to Pack15 |

**LED INDICATORS INSTRUCTIONS**

| State | Nominal/Warning Protection | Run ● | Alarm ● | Capacity Indicators LED ● ● ● ● ● ● | Instruction |
|---|---|---|---|---|---|
| Shut down | Dormancy | OFF | OFF | OFF | All OFF |
| Standby | Nominal | flash | OFF | Follow battery capacity | Standby |
| Standby | Warning | flash | flash | Follow battery capacity | Battery at low voltage |
| Charge | Nominal | ON | OFF | Follow battery capacity | The LED Light of the highest capacity flashing |
| Charge | Warning | ON | flash | Follow battery capacity | The LED Light of the highest capacity flashing |
| Charge | Over charge | ON | OFF | ON | Stop charging |
| Charge | Over current,Over temperature | OFF | ON | OFF | Stop charging |
| Discharge | Nominal | Fast flash | OFF | Follow battery capacity | |
| Discharge | Warning | Fast flash | flash | Follow battery capacity | |
| Discharge | Over discharge | OFF | OFF | OFF | Stop discharging |
| Discharge | Over current,Over temperature | OFF | ON | OFF | Stop discharging |
| Disable | | OFF | ON | OFF | Stop charging and discharging |



87654321
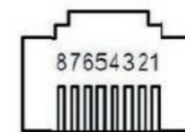
| Inverter RS485-A | | Inverter CAN | | Battery parallel-RS485B interfaces | | | |
|---|---|---|---|---|---|---|---|
| RJ45 pin | define | RJ45 pin | define | RJ45 pin | define | RJ45 pin | define |
| 1,8 | RS485-B1 | 1.3.6.7.8 | NC | 1,8 | RS485-B | 1,8 | RS485-B |
| 2,7 | RS485-A1 | 5 | CANL | 2,7 | RS485-A | 2,7 | RS485-A |
| 3,6 | GND | 4 | CANH | 3,6 | GND | 3,6 | GND |
| 4,5 | NC | 2 | GND | 4,5 | NC | 4,5 | NC |