

## 25.6V100AH Lifepo4 Battery Pack

# Datasheet

## Model: PP-E1-2.5KWH



## Catalogue

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# 1. Introduction

## 1.1 Important Safety Instructions

**Danger!**

- Please do not put the battery into water or fire, in case of explosion or any other situation that might endanger your life.
- Please connect wires properly while installation, do not reverse connect. To avoid short circuit, please do not connect positive and negative poles with conductor on the same device.
- Please avoid any form of damage to battery, especially stab, hit, trample or strike.

**Danger!**

- Please shut off the power completely when removing the device or reconnecting wires during the daily use or it could cause the danger of electric shock.
- Please use dry powder extinguisher to put out the flame when encountering a fire hazard, liquid extinguisher could result in the risk of explosion.
- For your safety, please do not arbitrarily dismantle any component in any circumstances. The maintenance must be implemented by authorized technical personnel or our company's technical support. Device breakdown due to unauthorized operation will not be covered under warranty.

**Caution!**

- Our products have been strictly inspected before shipment. Please contact us if you find any abnormal phenomena such as device outer case bulging.
- The product shall be grounded properly before use in order to ensure your safety.
- To assure the proper use please make sure parameters among the relevant device are compatible and matched.
- Please do not mixed-use batteries from different manufacturers, different types and models, as well as old and new together.

**Caution!**

- Ambient and storage method could impact the product life span, please comply with the operation environment instruction to ensure device works in proper condition.
- For long-term storage, the battery should be recharged once every 6 months, and the amount of electric charge shall exceed 80% of the rated capacity.
- Please charge the battery in 18 hours after it fully discharged or over-discharging protection mode is activated.
- Formula of theoretical standby time:  $T=C/I$  (T is standby time, C is battery capacity, I is total current of all loads).

## 1.2 Brief Introduction

lithium iron phosphate battery system is a standard battery system unit, customers can choose a certain number of lithium battery according to their needs, by connecting parallel to form a larger capacity battery pack, to meet the user's long-term power supply needs. The product is especially suitable for energy storage applications with high operating temperatures, limited installation space, long power backup time and long service life.

## 1.3 Product Properties

energy storage product's positive electrode materials are lithium iron phosphate, battery cells are managed effectively by BMS with better performance, the system's features as below:

- The whole module is non-toxic, non-polluting and environmentally friendly;
- Cathode material is made from  $\text{LiFePO}_4$  with safety performance and long cycle life
- Battery management system with better performance, possesses protection function like over-discharge, over-charge, over-current, abnormal temperature.
- Self-management on charging and discharging, Single core balancing function.
- Intelligent design configures integrated inspection module.
- Flexible configuration, multiple battery modules can be in parallel for expanding capacity and power.
- Flexible configurations allow parallel of multi battery for longer standby time.
- Self-ventilation with lower system noise.
- Less battery self-discharge, then recharging period can be up to 10 months during the storage.
- No memory effect so that battery can be charged and discharged shallowly.
- With wide range of temperature for working environment,  $-20^{\circ}\text{C} \sim +55^{\circ}\text{C}$ , circulation span and discharging performance are well under high temperature.
- Small size and light weight, standard of 19-inch embedded designed module is comfortable for installation and maintenance;

## 2. Product Specification

### 2.1 Size and Weight

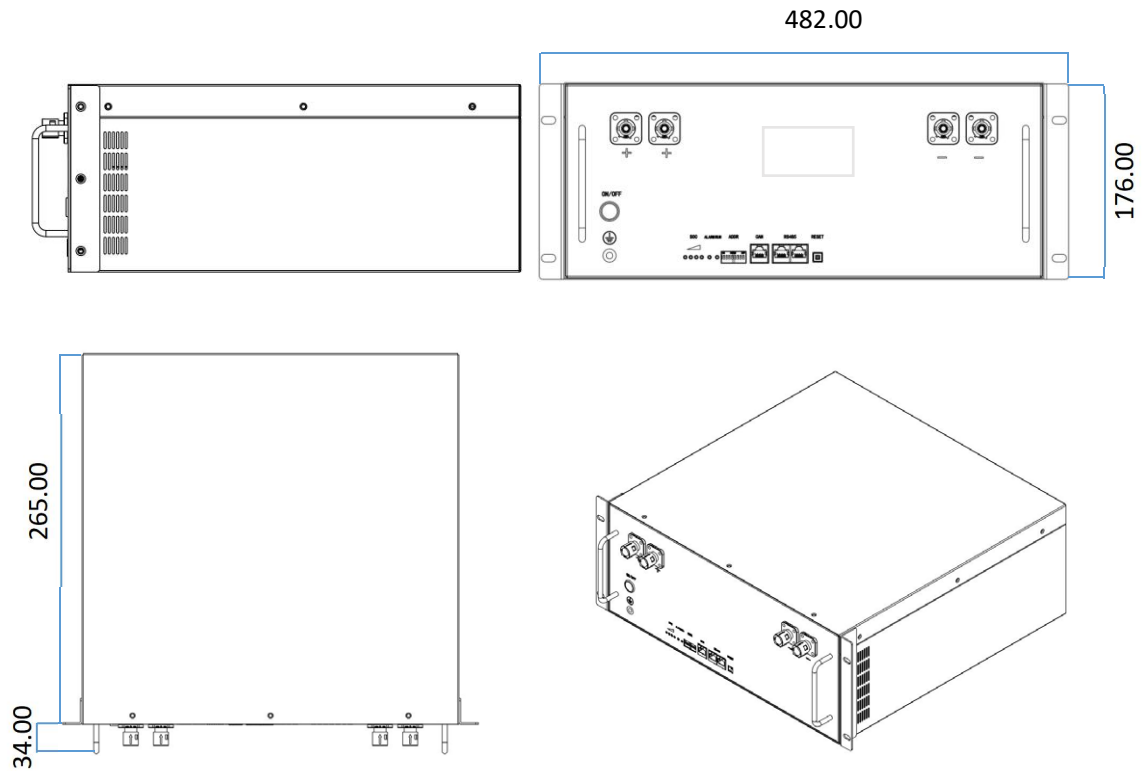


Table 2- 1 Device size

| Product     | Nominal Voltage | Nominal Capacity | Dimension   | Weight |
|-------------|-----------------|------------------|-------------|--------|
| 25.6V/100AH | DC25.6V         | 100AH            | 482*265*176 | 26.6KG |

## 2.2 Performance Parameter

Table 2-2 performance parameter

| Basic Parameters                        | Numerical             |
|-----------------------------------------|-----------------------|
| Nominal Voltage (V)                     | 25.6                  |
| Nominal Capacity (WH)                   | 2560                  |
| Usable Capacity (WH)                    | 2304                  |
| Discharge Voltage (V)                   | 23                    |
| Charge Voltage (V)                      | 28.4                  |
| Recommend Charge/ Discharge Current (A) | 50                    |
| Max. Charge/ Discharge Current(A)       | 100 (3s)              |
| Communicaiton                           | RS485/CAN/Bluetooth   |
| Working Temperature                     | 0-40℃                 |
| Storage Temperature                     | -20-70℃               |
| Humidity                                | 10% - 80%             |
| Certification                           | CE/ IEC/ UN38.3/ MSDS |
| Design Life                             | 10 years+             |
| Cycle Life                              | >6000@90%DOD(25±5℃)   |

## 2.3 Equipment Interface Instruction

This section details the front and back interface functions of the lithium battery

Product Front Interface :

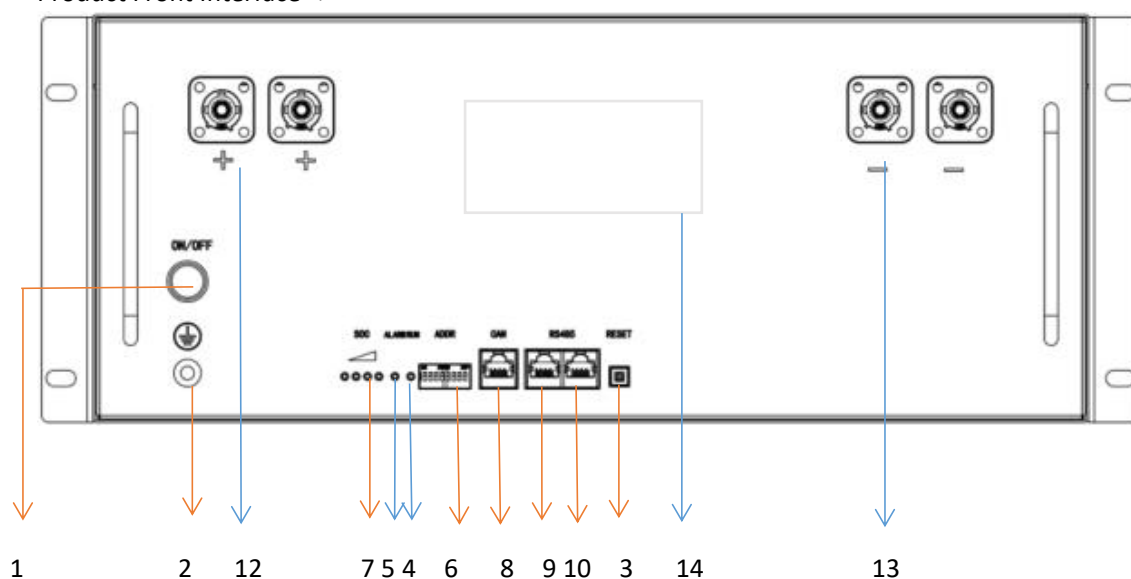


Table 2-3 Inter

| Item | Name            | Definition                                                                                                                                                                   |
|------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Power switch    | ON/ OFF, must be in the "ON" state when in use                                                                                                                               |
| 2    | Ground          | Grounding connection                                                                                                                                                         |
| 3    | RESET           | Keep pressing for more than 3 seconds, the battery will be restarted                                                                                                         |
| 4    | RUN             | Green light flashing during standby and charging mode. Green light always on when discharging.                                                                               |
| 5    | ALM             | Red light flashing when an alarm occurs, red light always on during protection status. After the condition of trigger protection is relieved, it can be automatically closed |
| 6    | ADD             | DIP switch                                                                                                                                                                   |
| 7    | SOC             | The number of green lights shows the remaining power.                                                                                                                        |
| 8    | CAN             | Communication cascade port, support CAN                                                                                                                                      |
| 9/10 | RS485           | Communication cascade port, support RS485                                                                                                                                    |
| 12   | Positive socket | Battery output positive or parallel positive line                                                                                                                            |
| 13   | Negative socket | Battery output negative or parallel negative line                                                                                                                            |
| 14   | Screen          | Battery screen                                                                                                                                                               |

## 2.4 ADD switch definition and description

DIP switch description:

Multi machine communication during parallel connection of battery packs, using DIP switches to distinguish different pack addresses, hardware addresses can be set through the DIP switch on the board.

Definition of DIP switches bit1 to bit8: bit1 to bit4 are used to set host addresses, and bit5 to bit8 are used for the number of slaves.

Host settings: Bit1 to bit4 are 0, and the fixed address of the host is 0. Bit5 to bit8 are set based on the number of parallel slaves (as shown in Table 2).

Slave settings: Bit1 to bit4 are set according to the device order, and the range of slave addresses from 1 to 15. Bit5 to bit8 is fixed to 0 (as shown in Table 1).

DIP switch:

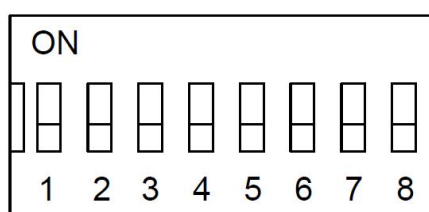


Table 1 Slave Setting

| Address | DIP Switch |     |     |     | Description |
|---------|------------|-----|-----|-----|-------------|
|         | #1         | #2  | #3  | #4  |             |
| 1       | ON         | OFF | OFF | OFF | Pack1       |
| 2       | OFF        | ON  | OFF | OFF | Pack2       |
| 3       | ON         | ON  | OFF | OFF | Pack3       |
| 4       | OFF        | OFF | ON  | OFF | Pack4       |
| 5       | ON         | OFF | ON  | OFF | Pack5       |
| 6       | OFF        | ON  | ON  | OFF | Pack6       |
| 7       | ON         | ON  | ON  | OFF | Pack7       |
| 8       | OFF        | OFF | OFF | ON  | Pack8       |
| 9       | ON         | OFF | OFF | ON  | Pack9       |
| 10      | OFF        | ON  | OFF | ON  | Pack10      |
| 11      | ON         | ON  | OFF | ON  | Pack11      |
| 12      | OFF        | OFF | ON  | ON  | Pack12      |
| 13      | ON         | OFF | ON  | ON  | Pack13      |
| 14      | OFF        | ON  | ON  | ON  | Pack14      |
| 15      | ON         | ON  | ON  | ON  | Pack15      |

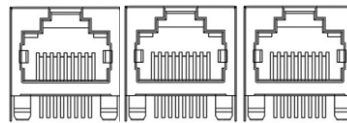
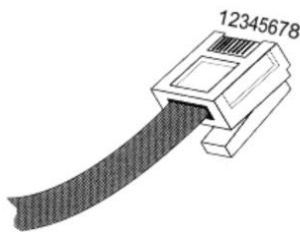
Table 2 Host setting

| Number | DIP Switch |     |     |     | Description  |
|--------|------------|-----|-----|-----|--------------|
|        | #5         | #6  | #7  | #8  |              |
| 2      | ON         | OFF | OFF | OFF | Number of 2  |
| 3      | OFF        | ON  | OFF | OFF | Number of 3  |
| 4      | ON         | ON  | OFF | OFF | Number of 4  |
| 5      | OFF        | OFF | ON  | OFF | Number of 5  |
| 6      | ON         | OFF | ON  | OFF | Number of 6  |
| 7      | OFF        | ON  | ON  | OFF | Number of 7  |
| 8      | ON         | ON  | ON  | OFF | Number of 8  |
| 9      | OFF        | OFF | OFF | ON  | Number of 9  |
| 10     | ON         | OFF | OFF | ON  | Number of 10 |
| 11     | OFF        | OFF | OFF | ON  | Number of 11 |
| 12     | ON         | ON  | OFF | ON  | Number of 12 |
| 13     | OFF        | OFF | ON  | ON  | Number of 13 |
| 14     | ON         | OFF | ON  | ON  | Number of 14 |
| 15     | OFF        | ON  | ON  | ON  | Number of 15 |

For example

| Number | DIP switch |     |     |     |     |     |     |     | Description |
|--------|------------|-----|-----|-----|-----|-----|-----|-----|-------------|
|        | #1         | #2  | #3  | #4  | #5  | #6  | #7  | #8  |             |
| 1      | OFF        | OFF | OFF | OFF | OFF | OFF | OFF | OFF | 1battery    |
| 2      | OFF        | OFF | OFF | OFF | ON  | OFF | OFF | OFF | Host 1      |
|        | ON         | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Slave 2     |
| 3      | OFF        | OFF | OFF | OFF | OFF | ON  | OFF | OFF | Host 1      |
|        | ON         | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Slave 2     |
|        | OFF        | ON  | OFF | OFF | OFF | OFF | OFF | OFF | Slave 3     |

## 2.5 CAN/485 interface definition



|              |                   |       |
|--------------|-------------------|-------|
| CAN          | RS485             | RS485 |
| For Inverter | For pack parallel |       |

|       | PIN position | Color        | Definition |
|-------|--------------|--------------|------------|
| RS485 | PIN1         | Orange/White | 485B1      |
|       | PIN2         | Orange       | 485A1      |
|       | PIN3         | Green/White  | GND        |
|       | PIN4         | Blue         | NC         |
|       | PIN5         | Blue/White   | NC         |
|       | PIN6         | Green        | GND        |
|       | PIN7         | Brown/White  | 485A2      |
|       | PIN8         | Brown        | 485B2      |
| CAN   | PIN1         | Orange/White | NC         |
|       | PIN2         | Orange       | NC         |
|       | PIN3         | Green/White  | NC         |
|       | PIN4         | Blue         | CANH       |
|       | PIN5         | Blue/White   | CANL       |
|       | PIN6         | Green        | NC         |
|       | PIN7         | Brown/White  | GND        |
|       | PIN8         | Brown        | NC         |

## 2.6 LED status indicator

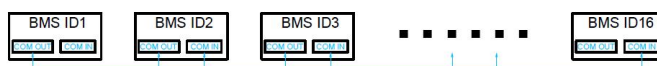
| Battery Status | Running Status                         | RUN                                                                               | ALM                                                                               | SOC                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     | Remark                 |
|----------------|----------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------|
|                |                                        |  |  |  |  |  |  |  |  |                        |
| Shutdown       | Sleep                                  | OFF                                                                               | OFF                                                                               | OFF                                                                               | OFF                                                                               | OFF                                                                               | OFF                                                                                 | OFF                                                                                 | OFF                                                                                 | All off                |
| Standby        | Normal                                 | Flash1                                                                            | OFF                                                                               | OFF                                                                               | OFF                                                                               | OFF                                                                               | OFF                                                                                 | OFF                                                                                 | OFF                                                                                 | Standy                 |
| Charge         | Normal                                 | ON                                                                                | OFF                                                                               | According to the remaining battery indicator                                      |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     | Maximum LED flashing 2 |
|                | Overcurrent ALM                        | ON                                                                                | FLASH2                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                        |
|                | Overvoltage Protection                 | Flash1                                                                            | OFF                                                                               | OFF                                                                               | OFF                                                                               | OFF                                                                               | OFF                                                                                 | OFF                                                                                 | OFF                                                                                 |                        |
|                | Temperature and Overcurrent Protection | Flash1                                                                            | Flash1                                                                            | OFF                                                                               | OFF                                                                               | OFF                                                                               | OFF                                                                                 | OFF                                                                                 | OFF                                                                                 |                        |
| Discharge      | Normal                                 | FLASH3                                                                            | OFF                                                                               | According to the remaining battery indicator                                      |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                        |
|                | ALM                                    | FLASH3                                                                            | FLASH3                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                        |
|                | Protection                             | OFF                                                                               | ON                                                                                | OFF                                                                               | OFF                                                                               | OFF                                                                               | OFF                                                                                 | OFF                                                                                 | OFF                                                                                 |                        |
|                | Undervoltage Protection                | OFF                                                                               | OFF                                                                               | OFF                                                                               | OFF                                                                               | OFF                                                                               | OFF                                                                                 | OFF                                                                                 | OFF                                                                                 |                        |

### Flash Description

| Flashing mode | ON    | OFF   |
|---------------|-------|-------|
| Flash 1       | 0.25s | 3.75s |
| Flash 2       | 0.5s  | 0.5s  |
| Flash 3       | 0.5s  | 1.5s  |

## 2.7 Automatic dialing method

The schematic diagram of automatic dialing connection is as follows:



## 2.8 Battery Management System(BMS)

### BMS Protection and Alarm

#### Over Voltage Alarm/Protection in Charging:

When total voltage or any battery cell voltage reaches the rated alarm value during charging stage, the alarm light will flash. When reaches the rated protection value, the alarm light will on, battery will stop charge. After total voltage or all cell voltage back to rated range, the protection is over

#### Low Voltage Protection in Discharging:

Battery system will stop supply power to the outside, when any battery cell voltage or total voltage is lower than the rated protection value during discharging, the over-discharging protection is activated. When the voltage of each cell back to rated return range, the protection is over.

#### Over Current Protection in Charging:

When the charge current  $> 110A$ , current limit protection mode is activated, current will be limited to 10A, protection is removed after rated time delaying 5 min. Circulate like this until the current is lower than 110A.

#### Over Current Protection in Discharging:

When the discharge current is lower than -110A, the system stops discharging after 10s. After protection, the discharging will restore in 60s delay or immediately when there is charging current.

#### Low/Over temperature protection in charging:

When battery's temperature is beyond range of  $-10^{\circ}C \sim +55^{\circ}C$  during charging, temperature protection is activated, device stops charging.

The protection is over when temperature back to rated working range.

#### Low/Over temperature protection in discharging:

When battery's temperature is beyond range of  $-15^{\circ}C \sim +55^{\circ}C$  during discharging, temperature protection is activated, device stops supplying power to the outside.

The protection is over when temperature back to rated working range.

#### Short Circuit Protection:

When the battery is activated from the shutdown state, if a short circuit occurs, the system starts short-circuit protection for 60 seconds.

#### Self-Shutdown:

When device connects no external loads and power supply and no external communication for over 48 hours, device will dormant standby automatically.

## 3.Installation and Configuration

### 3.1 Performance Parameter

#### 3.1.1 Safety Requirement

This system can only be installed by personnel who have been trained in the power supply system and have sufficient knowledge of the power system.

The safety regulations and local safety regulations listed below should always be followed during the installation.

- All circuits connected to this power system with an external voltage of less than 48V must meet the SELV requirements defined in the IEC60950 standard.
- If operating within the power system cabinet, make sure the power system is not charged. Battery devices should also be switched off.
- Distribution cable wiring should be reasonable and has the protective measures to avoid touching these cables while operating power equipment.
- when installing the battery system, must wear the protective items below:

|                                                                                     |                                                                                     |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |
| he isolation gloves                                                                 | Safety goggles                                                                      | Safety shoes                                                                          |

#### 3.1.2 Environmental requirements

Working temperature: 0℃ ~ +40℃

Charging temperature range is 0℃~+40℃,

Discharging temperature range is 0℃ ~+40℃

Storage temperature: -20℃~ +70℃

Relative humidity: 10% ~ 80%RH

Elevation: no more than 3000m

Operating environment: Indoor installation, sites avoid the sun and no wind, no conductive

dust and corrosive gas.

And the following conditions are met:

Installation location should be away from the sea to avoid brine and high humidity environment.

The ground for product arrangement shall be flat and level.

No flammable explosive materials near the installation site.

The optimal ambient temperature is 20℃~ 30℃

Keep away from dust and messy zones

### 3.1.3 Tools and data

Tools and meters that may be used are shown in table 3-1.

Table 3-1 Tool instrument

| NAME                           |                      |
|--------------------------------|----------------------|
| Screwdriver (Slotted、Phillips) | Multimeter           |
| Torque wrench                  | Clamp current meter  |
| Diagonal pliers                | Insulation tape      |
| Pointed nose pliers            | Temperature meter    |
| Pliers to hold the wire        | Anti-static bracelet |
| Stripping pliers               | Cable tie            |
| Electric drill                 | Tape measure         |

### 3.1.4 Technical preparation

#### Electrical interface check

Devices that can be connected directly to the battery can be user equipment, power supplies, or other power supplies.

- Confirm whether the user's PV power generation equipment, power supply or other power supply equipment has a DC output interface, and measure whether the DC power output voltage meets the voltage range requirements in Table 2-2.
- Confirm that the maximum discharge current capability of the DC power interface of the user's photovoltaic power generation equipment, power supply or other power supply equipment should be higher than the maximum charging current of the products used in Table 2-2.

If the maximum discharge capacity of the DC power interface of the user's photovoltaic power generation equipment is less than the maximum charging current of the products used in Table 2-2, the DC power interface of the user's photovoltaic power generation equipment shall have a current limiting function to ensure the normal operation of the user's equipment.

- Verify that the maximum operating current of the battery-powered user equipment (inverter DC input) should be less than the maximum discharge current of the products

used in Table 2-2.

### **The security check**

- Firefighting equipment should be provided near the product, such as portable dry powder fire extinguisher.
- Automatic fire fighting system shall be provided for the case where necessary.
- No flammable, explosive and other dangerous materials are placed beside the battery.

## **3.1.5 Unpacking inspection**

- When the equipment arrives at the installation site, loading and unloading should be carried out according to the rules and regulations, to prevent from being exposed to sun and rain.
- Before unpacking, the total number of packages shall be indicated according to the shipping list attached to each package, and the case shall be checked for good condition.
- In the process of unpacking, handle with care and protect the surface coating of the object.
- Open the package, the installation personnel should read the technical documents, verify the list, according to the configuration table and packing list, ensure objects are complete and intact, if the internal packing is damaged, should be examined and recorded in detail.

## 4. Packing list is as follows

| Item                             | Specification                    | Quantity               | Figure                                                                               |
|----------------------------------|----------------------------------|------------------------|--------------------------------------------------------------------------------------|
| Battery                          | 25.6V/100AH                      | 1                      |    |
| Positive Cable to inverter       | Red/25mm <sup>2</sup> /L2000mm   | 1                      |    |
| Negative Cable to inverter       | Black/25mm <sup>2</sup> /L2000mm | 1                      |  |
| Positive Cable for parallel      | Red/25mm <sup>2</sup> /L250mm    | Optional configuration |  |
| Negative Cable for parallel      | Black/25mm <sup>2</sup> /L250mm  | Optional configuration |  |
| Communication Cable for parallel | L250mm                           | Optional configuration |  |
| Communication Cable to inverter  | L2000mm                          | 1                      |  |
| User Manual                      |                                  | 1                      |                                                                                      |

## 5. Battery parameter settings on the inverter

If your inverter do not have communication function with 25.6V100AH battery pack, please set inverter follow next data.

Max Charging(Bulk) Voltage: 28.4V

Float Voltage: 28V

Shut Down(cut off) Voltage: 23V

Shut Down(cut off) SOC: 5%

Recommend Charge/ Discharge Current :50A

Max Charge Current : 100A(3s)

Max Discharge Current : 100A(3s)

## 6. Display screen operation manual

### 6.1 Key

- 1) ENTER — enter \ confirm, RETURN — exit, GOOD — upper key, DOWN — down key.
- 2) Each item begins with a number, where "number flashing" indicates the position of the current cursor. Press GOOD or DOWN to move the cursor position up and down; press ENTER to enter the corresponding page.
- 3) Press RETURN to return to the previous directory.
- 4) In the dormant state, the display backlight is extinguished. Press any button to light up the display backlight.



ENTER: Confirm / enter (press and hold the confirmation key to switch the Chinese display)

RETURN: exit

GOOD: upper key

DOWN: down key



Press the confirmation key to enter the data interface

## 6.2 Home page introduction

After the activation, the battery management interface will be displayed, and press the ENTER key to enter the home page. As shown in the figure below:



PackV: Total battery pressure

Current: Current

SOC: Remaining capacity

Warn: Alert

## 6.3 Battery parameters interface

Press the GOOD or DOWN key to enter the battery parameter details



CellV: Cell voltage query

Temperaure: Temperature query

Warn: Alarm query

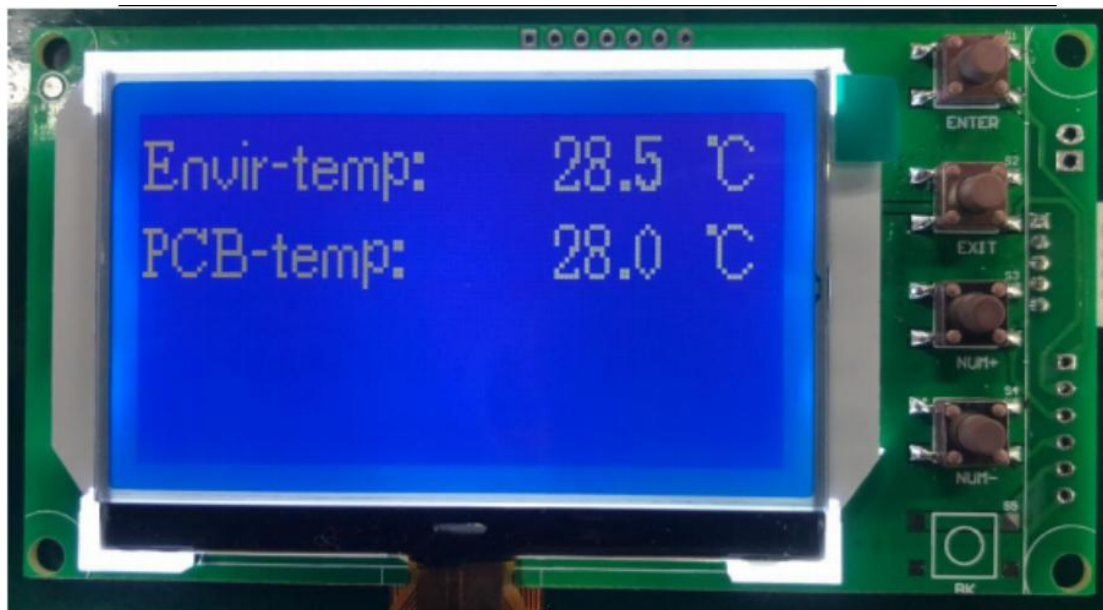
Capacity: Capacity query



CellV01-CellV16: Cell voltage value



Temp 1-Temp 4: Cell temperature value



Envir-temp: Ambient temperature

PCB-temp: Power temperature

## 6.4 State alarm

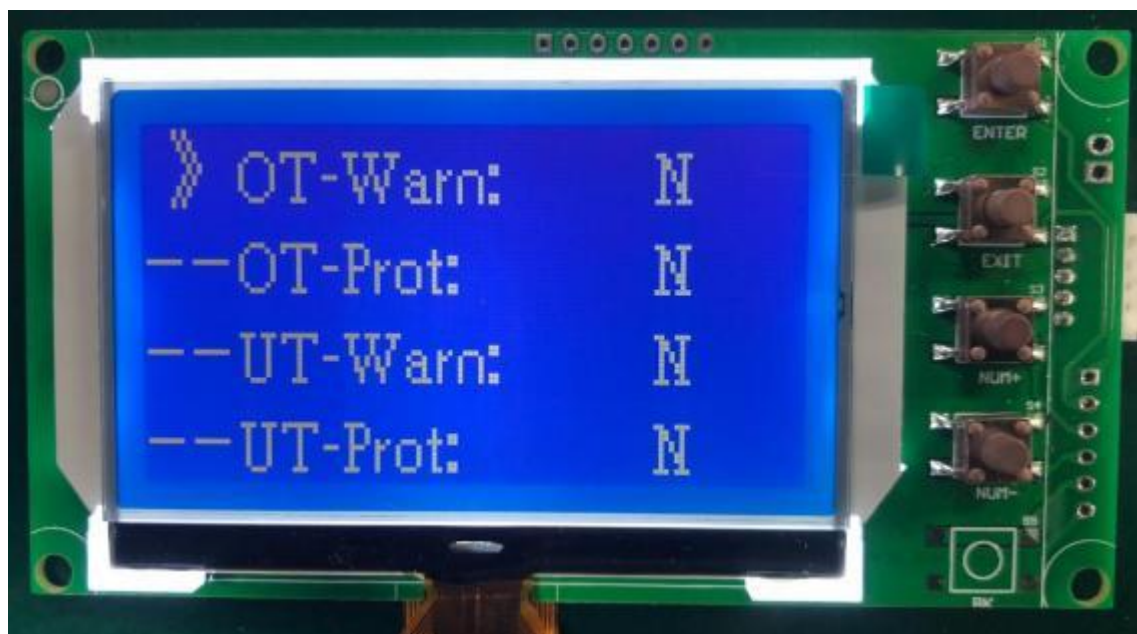


OV-Warn: High voltage warning

OV-Prot: Overvoltage Protection

UV-Warn: Low-voltage warning

UV-Prot: Undervoltage Protection



OT-Warn: High temperature warning

OT-Prot: Over temperature Protection

UT-Warn: Low-temperature warning

UT-Prot: Under-temperature protection



OC-Warn: Overflow warning  
 OC-Prot: Overcurrent protection  
 CAPA-Warn: Remaining Capacity warning  
 OFF-USE: Failure warning



SCP: Short-circuit protection



FCC: Battery capacity  
 Rm: remaining capacity  
 Cycle Time:Cycles

## 6.5 Protocol Conversion



Press page to enter "Protocol Selection"



Choose CAN or 485 protocol



Select the required protocol, long press Enter to successfully set it up

