

Hlsolar

51.2V 105AH

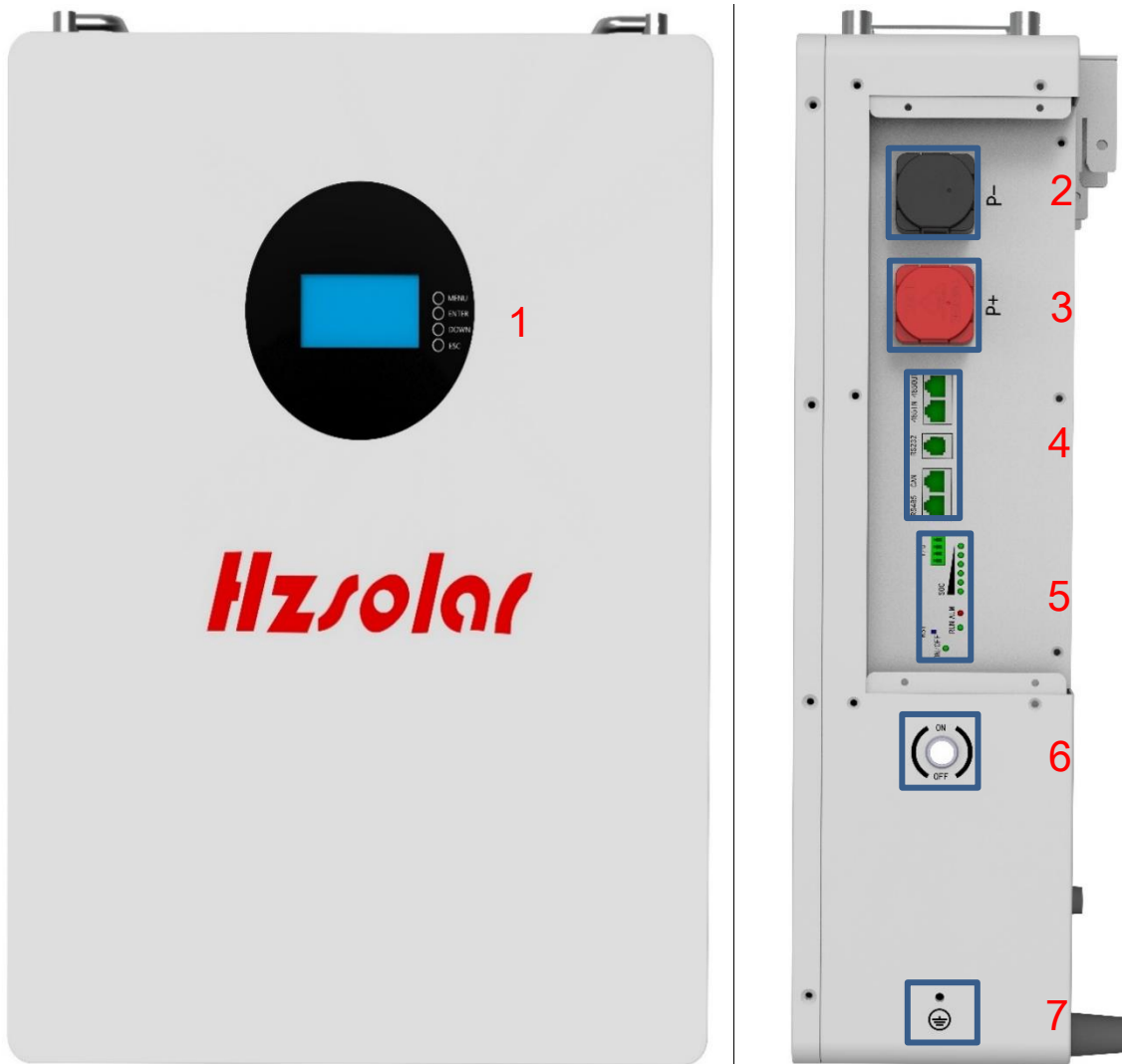
Wall Mounted

Lithium Battery

USER INSTRUCTION

1. Product Description

This wall mounted LiFePO4 lithium battery belongs to one of the series of household energy storage products that are independently designed and developed. It has long cycle life, high safety standard BMS software protection and strong housing, exquisite looks, and easy installation, etc. It is widely used in energy storage system with off-grid inverters, on-off grid inverters and hybrid inverters.



| NO | Name | Instructions |
|----|-------------------------|--|
| 1 | LCD screen | Display battery information, including battery quantity, voltage, current, fault record, etc |
| 2 | Negative port | Connect battery negative |
| 3 | Positive port | Connect battery positive |
| 4 | Communication Interface | Communication between batteries or between batteries and inverters |
| 5 | LED indicator | Display battery power and working status |
| 6 | Switch | Control the power-up and power-down of the battery system |
| 7 | Grounding port | Ground cable for battery system protection |

*This interface design is only for reference, it may change according to different demands

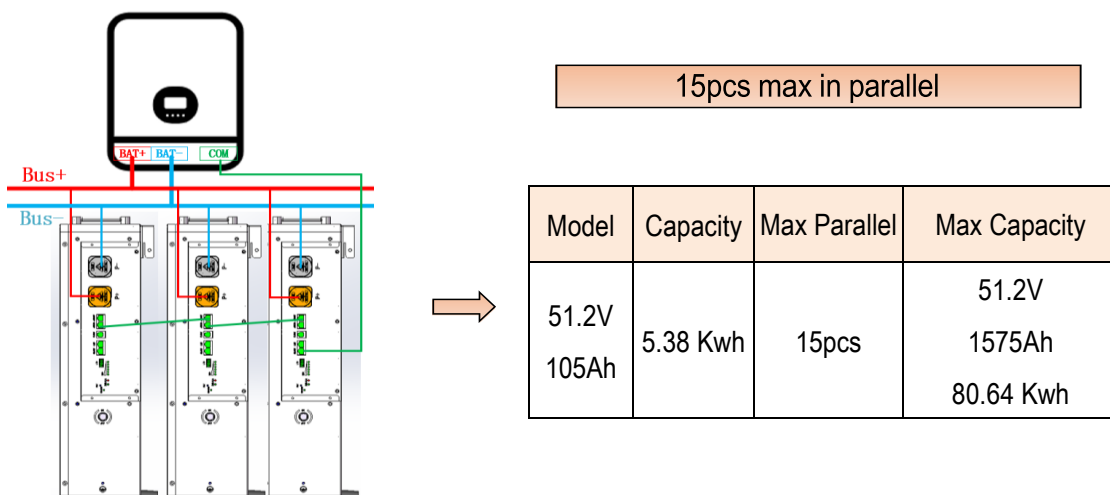
2. Product Function Description

2.1 Product Specifications

| Items | | Condition | Specification |
|-----------------------------------|-----------|--|--------------------------------------|
| Nominal Capacity | | Standard charge / discharge | 105.0Ah |
| Nominal Voltage | | Average | 51.2V |
| Standard Charging Refer to 3.1 | | Constant current Constant voltage End current{Cut off} | 30A 56.0V 5A |
| Charging Voltage | | Constant voltage Floating voltage | 56.0V 54.0V |
| Max. Continuous Charge Current | | 25±2°C | 50.0A |
| Standard Discharging Refer to 3.2 | | Constant current End voltage{Cut off} | 50.0A 45.6V |
| Max Continuous Discharge Current | | 25±2°C | 100.0A |
| Max Output Power | | 25±2°C | 5.38KW |
| Operating Temperature | Charge | / | 0 ~ 55°C |
| | Discharge | / | -20 ~ 60°C |
| Storage Temperature | | 1 month{40%SOC} 3 month{40%SOC} 6 month{40%SOC} | -20 ~ 45°C -10 ~ 40°C 0 ~ 35°C |
| Power Cable Terminal | | / | Ring Terminal |

2.2 Parallel Connection

When Connect the batteries in parallel, connect the positive terminal and positive terminal{red colour} in parallel, and the negative terminal and negative terminal {black colour} in parallel, the max parallel quantity is 15pcs, as shown in the figure Below.



2.3 Communication Function

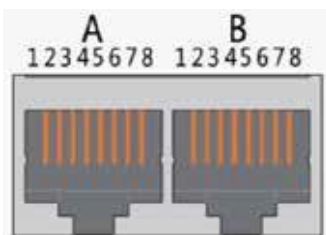
a) RS232 communication



| RS232 Port use 6P6C vertical RJ11 Socket | |
|--|----------------------------|
| RJ11 Pin | Define |
| Pin 1、 2、 6 | NC{empty} |
| Pin 3 | TX{computer receives data} |
| Pin 4 | RX{computer sends data} |
| Pin 5 | GND{ground} |

BMS can communicate with the upper computer through RS232 interface, so that it can monitor all kinds of battery information, including battery voltage, current and temperature, working status etc. The default baud rate is 9600bps.

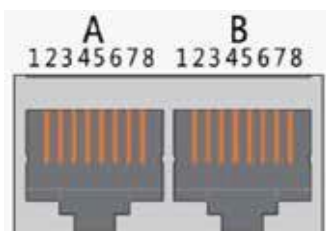
b) RS485 & CAN PCS communication



The product adopts isolated communication design, supports RS485 / CAN communication mode, RS485 communication default baud rate is 9600 bps; The default baud rate of CAN communication is 500Kbps; When the battery is the master, the interface can summarize the slave data and communicate with the inverter.

| RS485 & CAN use 8P8C vertical RJ45 socket | | | |
|---|----------|---------------|--------|
| RS485 PIN | Define | CAN PIN | Define |
| 1、 8 | RS485-B1 | 1、 3、 6、 7、 8 | NC |
| 2、 7 | RS485-A1 | 4 | CAN-H |
| 3、 6 | GND | 5 | CAN-L |
| 4、 5 | NC | 2 | GND |

c) RS485 communication for parallel connection



It has two RS485 ports and the default baud rate is 9600bps. If you need to communicate the battery in parallel with the monitoring device or inverter, you need to connect the 485-IN port of the master to the 485-OUT port of the slave so that the master battery can read the information of each battery.

| RS485-A & RS485-B use 8P8C vertical RJ45 socket | | | |
|---|---------|---------------|---------|
| RS485-IN PIN | Define | RS485-OUT PIN | Define |
| 1、 8 | RS485-B | 1、 8 | RS485-B |
| 2、 7 | RS485-A | 2、 7 | RS485-A |
| 3、 6 | GND | 3、 6 | GND |
| 4 | GND | 4 | GND |
| 5 | UP_IN | 5 | DN_OP+ |

2.4 LED Indication Function

The current power consumption and operating status of the product are displayed through the LED indicator, details are shown in the following table.

| Status | Normal / alarm / protection | ON/ OFF | RUN | ALM | Battery capacity LED (17% SOC bright one) | | | | | | Specification | |
|-----------|--|------------|-------|-------|--|-----|-----|-----|-----|-----|---|------------------|
| | | ● | ● | ● | ● | ● | ● | ● | ● | ● | | |
| Power off | Sleep | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | ALL NO |
| Standby | Normal | YES | Flash | NO | Indicate according to the battery capacity | | | | | | Standby status | |
| | Warning | YES | Flash | Flash | | | | | | | Module Low Voltage | |
| Charging | Normal | YES | YES | NO | Indicate according to the battery capacity | | | | | | The maximum power LED flashes, the overcharge alarm is ALM does not flicker | |
| | Warning | YES | YES | Flash | | | | | | | | |
| | Overcharge protection | YES | YES | NO | YES | YES | YES | YES | YES | YES | If there is no mains, the indicator light turns to standby | |
| | Temperature, overcurrent, failure protection | YES | NO | YES | NO | NO | NO | NO | NO | NO | NO | Stop charging |
| Discharge | Normal | YES | Flash | NO | Indicate according to the battery capacity | | | | | | | |
| | Warning | YES | Flash | Flash | | | | | | | | |
| | Undervoltage protection | YES | NO | NO | NO | NO | NO | NO | NO | NO | NO | Stop discharging |

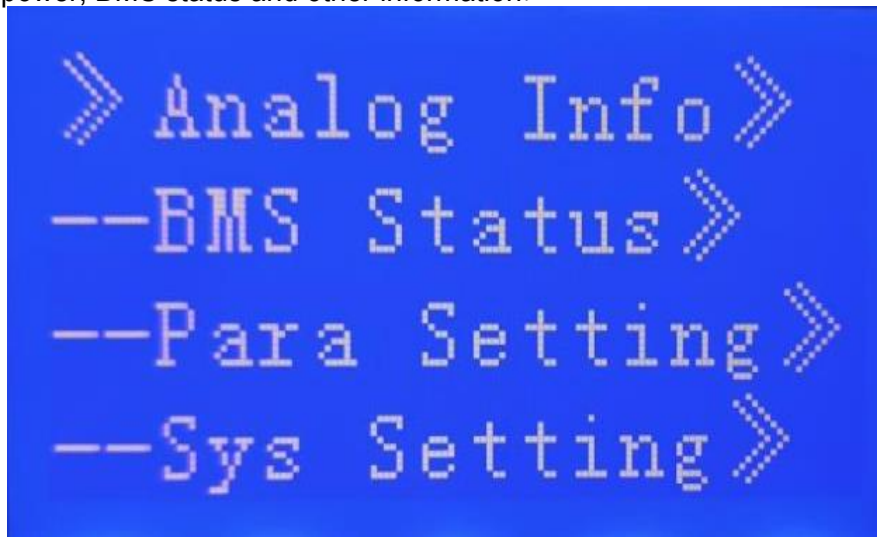
| | | | | | | | | | | | | |
|---------|--|-----|----|-----|----|----|----|----|----|----|----|-------------------------------|
| | Temperature, overcurrent, failure protection | YES | NO | YES | NO | NO | NO | NO | NO | NO | NO | Stop discharging |
| Failure | | NO | NO | YES | NO | NO | NO | NO | NO | NO | NO | Stop charging and discharging |

LED Flashing Instructions

| Flash way | Bright | Extinguish |
|-----------|--------|------------|
| Flash 1 | 0.25S | 3.75S |
| Flash 2 | 0.5S | 0.5S |
| Flash 3 | 0.5S | 1.5S |

2.5 LCD Display

Battery information can be viewed through the LCD display, including voltage, current, temperature, power, BMS status and other information.



2.6 Sleep Mode

When the battery has no communication, no current, no button, enter the hibernation mode after 24 hours to save power and reduce self-consumption.

2.7 Awake Mode

When the system is in sleep mode, if any of the following requirements, the system will quit the sleep mode and enter into the normal operation mode.

- 1) Automatic wake-up after charged with voltage higher than 48V;
- 2) Press the key button for 3~6 second, release the key button and activate it;
- 3) Access communication line {RS232}, activate it with upper computer software.

2.8 This product is designed with reset button function.

In the normal operation process, long press this button once {>6s}, then release the button and the product will be reset and restarted.

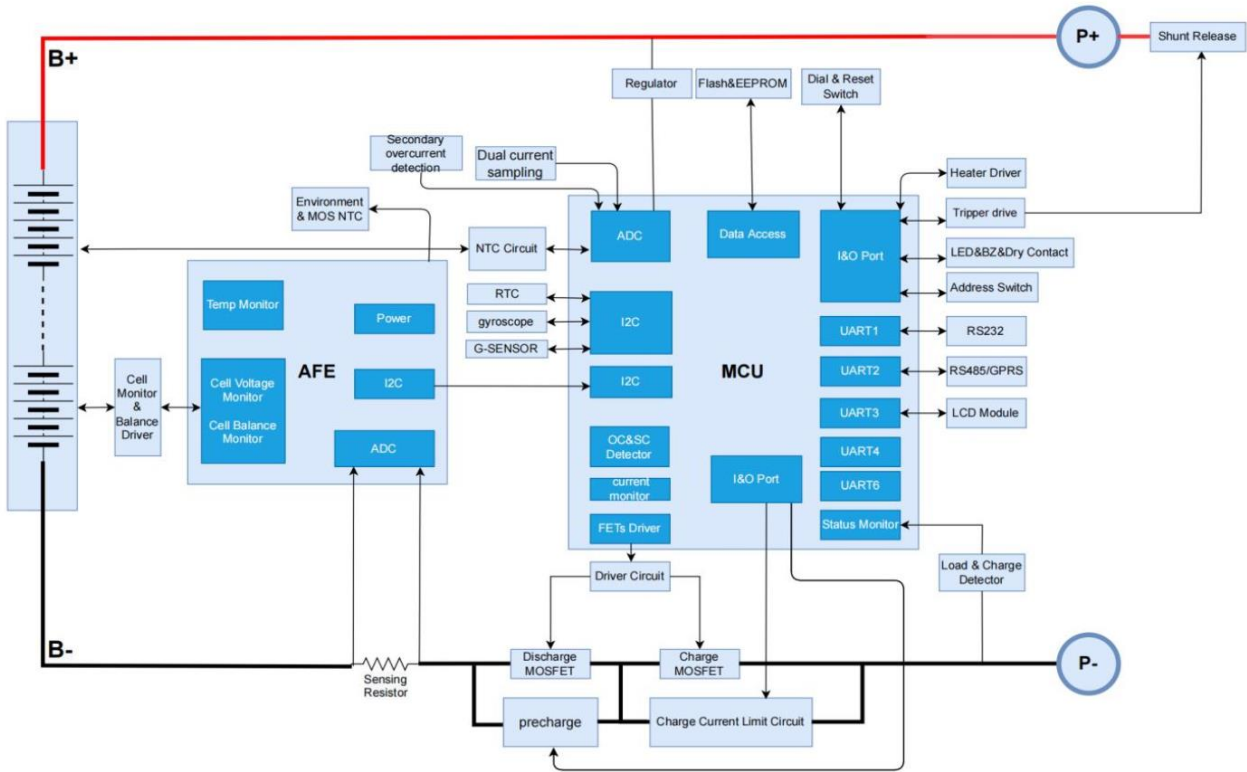
3. Electrical Specification

(Unless there is special requirement, the test shall be done under temperature of $25\pm 2^{\circ}\text{C}$ and with relative humidity of 45~85%)

| Items | Test Condition | | | | Standard |
|----------------------------|---|-----------------------|---------------------|---|--|
| 3.1 Standard Charge | Standard charging means that the charging temperature of the battery is lower than $25\pm 3^{\circ}\text{C}$, the initial charging current is 30A, the constant voltage is 56V, the floating voltage is 54V, the floating current is gradually reduced to 5A cut off (the lithium battery charger, the accuracy is $\pm 0.05\text{V}$), and the charging time is 4 hours. | | | | 30A |
| 3.2 Standard Discharge | After the battery is fully charged according to the standard, the discharge voltage is 45.6V and the discharge current is 50A. The interval between charging and discharging is at least 30 minutes. | | | | Minimum Capacity $\geq 95\%$ |
| 3.3 Cycle Life | After the completion of standard charge and 30 minutes' rest, discharge with 80% DOD with constant current of 0.3C in the ($25\pm 2^{\circ}\text{C}$) environment. | | | | ≥ 6000 Cycles |
| 3.4 Discharge Character | Discharge current | Discharge Temperature | | | At -10°C : Discharge Capacity $\geq 50\%$ At 0°C : Discharge Capacity $\geq 80\%$ At 25°C : Discharge Capacity $\geq 100\%$ At 40°C : Discharge Capacity $\geq 100\%$ |
| | 0.5C | -10°C | 0°C | 25°C 40°C | |
| | Batteries shall be charged according to 3.1 and discharged in accordance with the above-mentioned temperature. The discharge capacity shall meet the standard. Batteries shall be stored for 6~8 hours at the test temperature. | | | | |

4. BMS

4.1 BMS System Schematic Diagram



4.2 BMS Parameter

| No. | Item | 51.2V105Ah |
|-----|---------------------------|---|
| 1 | Power Consumption | Low power consumption mode $\leq 200\mu\text{A}$ |
| 2 | Over charge Protection | Over charge protection voltage 3.65V |
| | | Over charge release voltage 3.38V |
| 3 | Over discharge protection | Over discharge protection voltage 2.75V |
| | | Over discharge release voltage 2.88V |
| 4 | Over current protection | Charging over current protection current {detection time} 110A{1S} |
| | | Discharging over current protection current 1 {detection time} 120A {5S} |
| | | Discharging over current protection current 2{detection time} $\geq 150\text{A}$ 2s |

| | | | |
|---|------------------|---|-------|
| 5 | Temp. Protection | Charging over temperature protection temperature | 55°C |
| | | Detection temperature | 50°C |
| | | Discharging over temperature protection temperature | 60°C |
| | | Detection temperature | 55°C |
| 6 | Balance | Balance voltage | 3.5V |
| 7 | dormancy | Sleep voltage | 3.15V |

5. Product Life

The design life of this product is 10 years.

6. Transportation

During transportation, please keep the battery from acutely vibration, impacting, over-exposure to the sun and drenching.

7. Storage

7.1 Storage environment requirement

Under temperature of $25 \pm 2^\circ\text{C}$ and relative humidity of 10~85%.

7.2 Storage term

The lithium battery must be charged every six months, and a complete charging and discharging period is required in every nine months.

8. Cautions

- ※The installation and debugging should be operated by professional electric personnel.
- ※Please do not stick your hands or other objects deep into the interior of the product.
- ※Please do not open the product without a professional around.
- ※Please do not mechanically damage the battery module of the energy storage cabinet {perforation, deformation, peeling, etc.}.
- ※Please use dry powder extinguisher as extinguishing agent.
- ※Please do not let the storage cabinet battery module contact abnormal metals or conductors.
- ※Please do not use the product after short circuit occurs.
- ※Please do not expose the energy storage cabinet to flammable or hazardous chemicals or vapors.

Maintenance Record

Dear user.thank you for selecting our product,Please fill in and keep the warranty card for better services.

Attn:_____Product No.:_____

Tel:_____ E-mail:_____

Purchase Date:_____

Address:_____

| Maintenance Record | | | |
|--------------------|---------|-----------------------|------|
| Date of repair | Content | Maintenance Personnel | Note |
| | | | |
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Dear user.thank you for selecting our product,Please fill in and keep the warranty card for better services.