



## **Shenzhen Polinovel Technology Co., Ltd**

### 51.2V 102Ah LiFePO4 Solar Home Battery Specification

Model: \_\_\_\_\_ V5000 \_\_\_\_\_

Customer Name: \_\_\_\_\_

Customer Confirmation: \_\_\_\_\_

Date: \_\_\_\_\_ 2020.11.24 \_\_\_\_\_

| Formulate | Proof | Verify | Authorize |
|-----------|-------|--------|-----------|
|           |       |        |           |

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**1. Scope**

This specification describes the property indexes and technical requirements of the 51.2V 102Ah rechargeable Lifepo4 lithium ion battery manufactured by Shenzhen Polinovel Technology Co., Ltd (hereinafter to be referred as POLINOVEL ).

**2. Product**

2.1 Product Name: LiFePO4 Battery Pack

2.2 Specification: 51.2V/102Ah

2.3 Model: V5000

**3. Product Parameters**

| NO. | Item                                    | General Parameter   |            | Remark                              |
|-----|---|---------------------|------------|-------------------------------------|
| 1   | Cell Model                              | IFR 32700-6Ah       |            | Single cell capacity 6Ah            |
| 2   | Casing Material for Single Cell         | Nickel plated steel |            |                                     |
| 3   | Standard Capacity (0.2C <sub>5</sub> A) | 102Ah               |            | Battery pack capacity               |
| 5   | Rated Voltage                           | 51.2V               |            | Single cell voltage: 3.2V           |
| 6   | Max.Charge Voltage                      | 58.4V               |            | Single Ave. charge Voltage: 3.65V   |
| 7   | Cut-off Voltage                         | 40V                 |            | Single Ave. Discharge Voltage: 2.5V |
| 8   | Constant Charge Current                 | 100A                |            |                                     |
| 9   | Charging Time                           | About1h             |            |                                     |
| 10  | Max Continuous Discharge Current        | 100A                |            |                                     |
| 11  | Peak Discharge Current                  | 150A                |            | 1 second                            |
| 12  | Battery Dimension LxWxH                 | 938x605x147(±5) mm  |            | Including the mounting kit          |
| 13  | Total Weight (Approx.)                  | About 85kg          |            |                                     |
| 14  | Impedance (Max at 1000Hz)               | ≤15mΩ               |            |                                     |
| 15  | Charge Method (CC/CV)                   | Standard            | 0°C~45°C   |                                     |
|     |   | Discharge           | -20°C~45°C |                                     |
|     |   | Storage             | 0°C~45°C   |                                     |

**4. Battery Picture and Drawing**

• Overview •

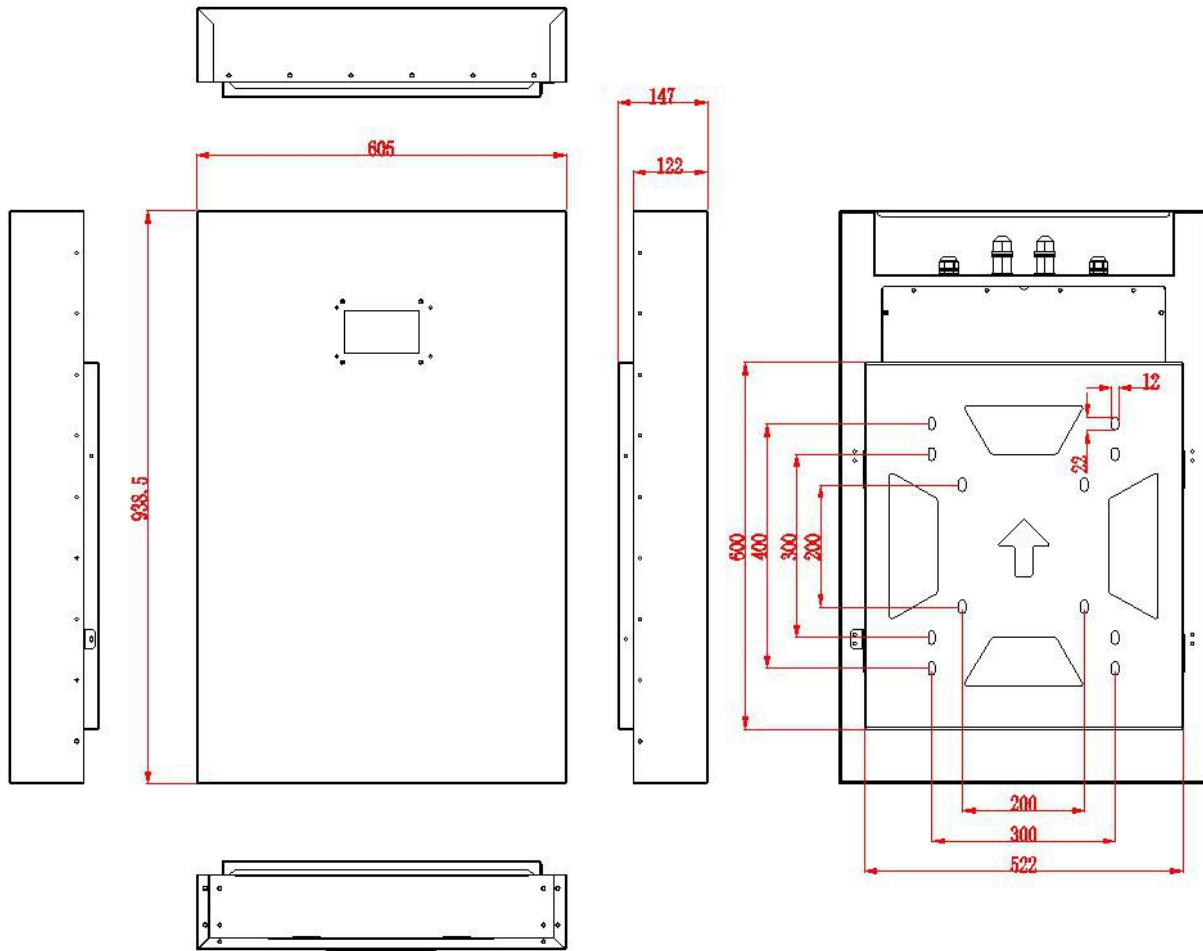


| Item | Description | Dimension  |
|------|-------------|------------|
| L    | Length      | 938mm ±5mm |
| W    | Width       | 605mm±5mm  |
| H    | Height      | 147mm±5mm  |

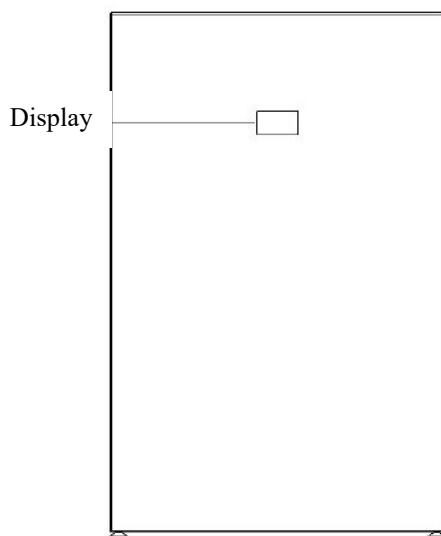
• Main Parts •



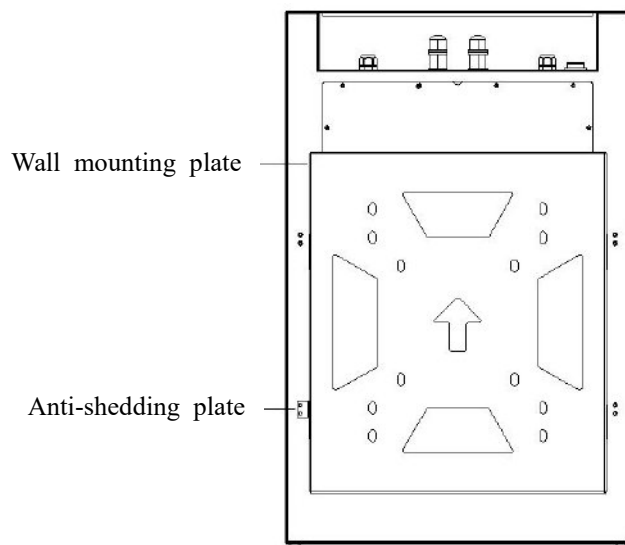
**Dimensional Drawing**

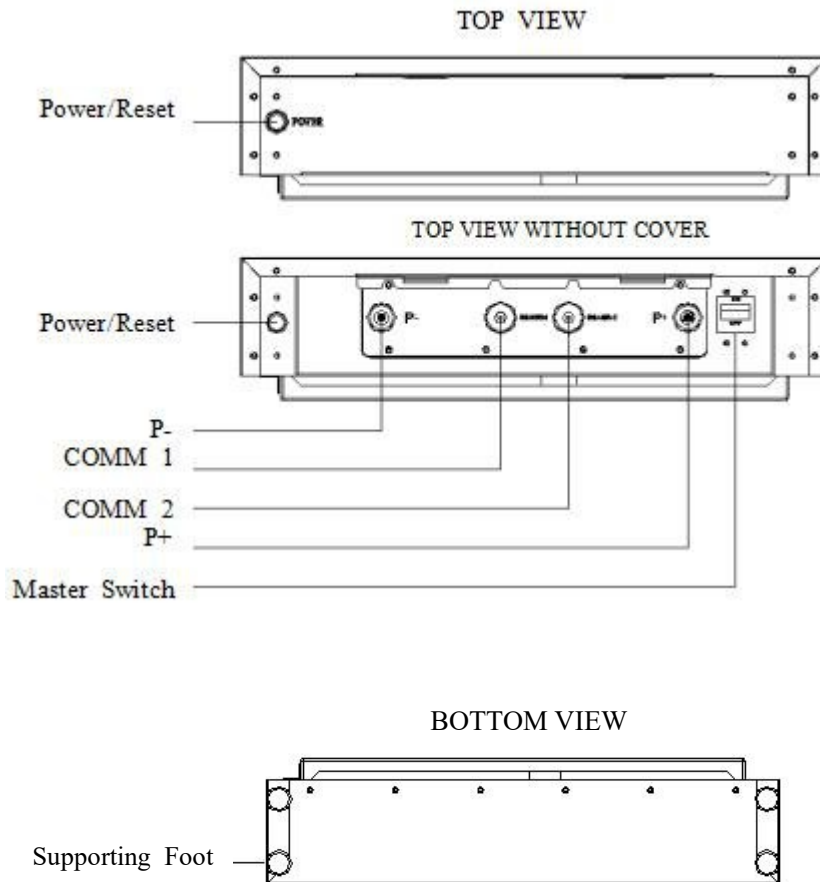


FRONT VIEW



BACK VIEW





## 5. Battery Pack Structure

### 5.1 Battery Modules

272pcs 32700-6Ah cells, 17 parallel and 16 serial, make a battery.

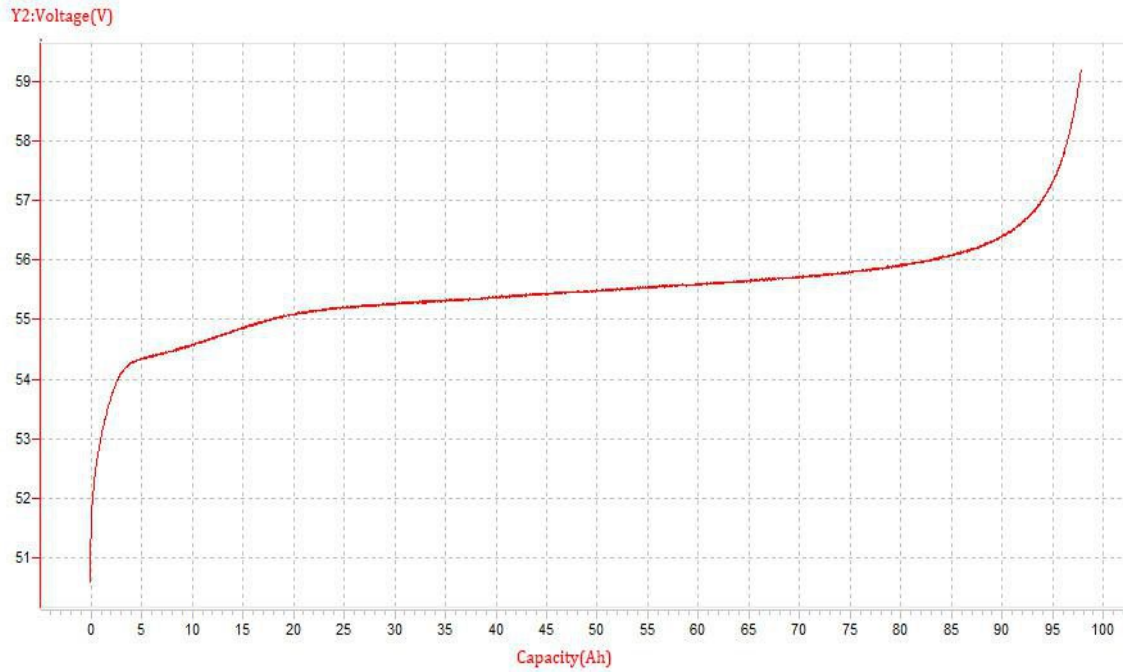
### 5.2 Protection Board

The protection board provides protection against over-charge, over-discharge, over current, and short circuit through monitoring single string of cells. Also it enables every battery pack to obtain independent balancing function.

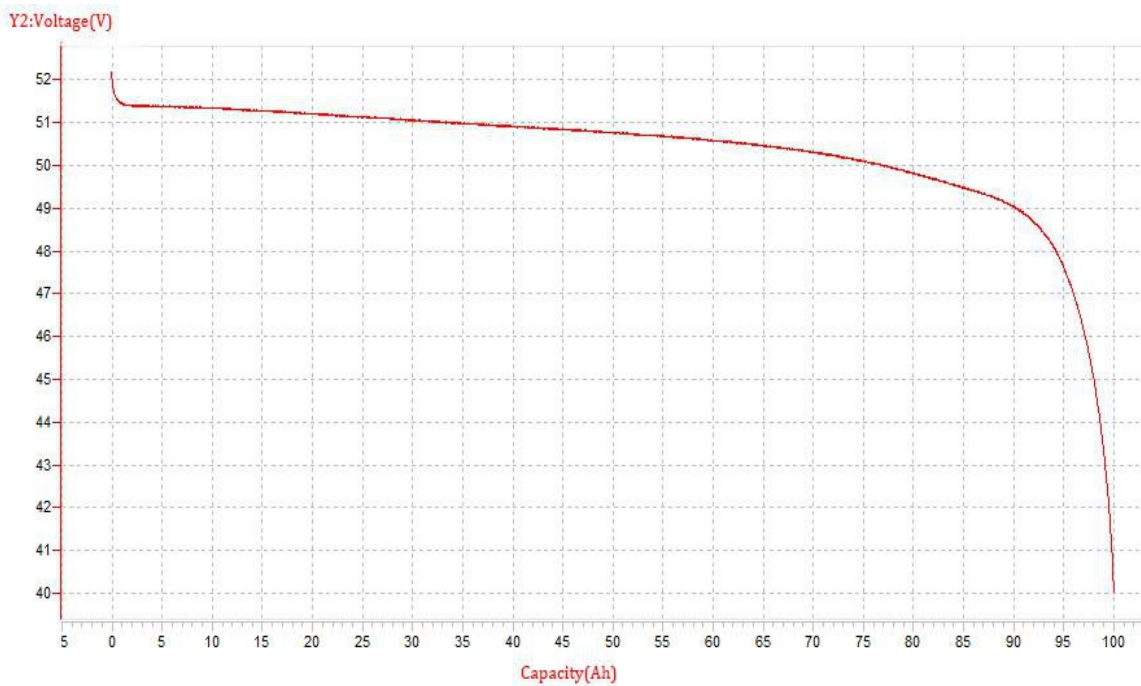
### 5.3 Charge/ Discharge Standards

- Cell adopted: 32700-6Ah
- Constant charge current: 0.2 C<sub>5</sub>A -1C<sub>3</sub>A is the best. Cell max voltage < 3.65V.
- Constant discharge current: cell min voltage > 2.0V
- Rapid charge capability: Max. charge current 1C<sub>3</sub>A; temperature increase falls within 15 °C is normal while over 15 °C will affect the service life of cell.

### 5.4 Charge Curve



### 5.5 Discharge Curve



**6. Battery Performance**

| No. | Project                                     | Standard   | Testing Method   |
|-----|---|--|--|
| 1   | Discharge performance in normal temperature | Discharge capacity/standard capacityx100%<br>(A)0.2C <sub>5</sub> A ≥100%<br>(B)1C <sub>5</sub> A ≥90% | Charge with 0.2C <sub>5</sub> A standard charge in the condition of temperature 25°C±5°C, relative humidity 45%~80% (if there is no especial statement, the charging way is same as this), rest for 10min, separated discharge with 0.2C <sub>5</sub> A, 1C <sub>5</sub> A to cut-off voltage 10V, cycles for three times, One cycle capacity arrive standard, that's to say it is qualified.(The below as the same) |
| 2   | Charging keep ability in normal temperature | Remain capacity≥standard capacity x90%   | After standard charging, store at 25°C±5°C for a month, and then discharge to cut-off voltage10V by 0.2C <sub>5</sub> A. Then measure the remain capacity of cell.   |
| 3   | Cycle life                                  | Capacity≥Standard capacity x80%  | After 0.2 C <sub>5</sub> A standard charged, discharge with 0.2 C <sub>5</sub> A to 10V, then leave it for 10mins. Repeat this cycle test for 2000 times.  |
| 4   | Storage performance                         | Remain Capacity≥80% Storage for 12months   | After standard charged, leave it on shelf for 12 months under open circuit, then discharge it until 10V by 0.2C <sub>5</sub> A current, and then measure the remain capacity. Measure its recovery capacity by 0.2C <sub>5</sub> A/0.2C <sub>5</sub> A. Undertake 3 cycles, it passes when one cycle meets the standard.   |

**7. Transportation**

Based on the character of cell, proper environment for transportation of LiFePO<sub>4</sub> battery pack need to be created to protect the battery.

7.1 The battery should be packed in boxes for delivery, and well prevented from vibration, shock, extrusion, sun-scorched and rain-drenched.

7.2 The battery should be delivered under the state of half charged (50% SOC).



7.3 During the transportation, the battery should be well prevented from short circuit.

7.4 During loading of the battery, handle lightly, do not drop, throw, turn over the battery, or stack heavy goods on the battery.

## **8. Storage**

The battery should be stored (more than 1 month) in clear, dry and ventilated room under ambient temperature of -20°C~45°C, and it should be kept away from caustic material, combustion source and heat source. Charging and discharging the battery every six months, and make sure the storage voltage should be 12.8~13.4V.

## **9. Battery Operation Instruction**

### **9.1 Charging**

#### 9.1.1 Charging Current

The charging current should not be higher than the maximum current indicated in this specification.

#### 9.1.2 Charging Voltage

The charging voltage should not be higher than the maximum voltage indicated in this specification.

#### 9.1.3 Charging Temperature

The battery should be charged under the ambient temperature range of 0°C~45°C..

#### 9.1.4 Reverse Charging is Forbidden

Properly assemble the cathode and anode of the batteries. Charge the battery in constant current and constant voltage way. Reverse charge is forbidden which will cause damage to the battery.

### **9.2 Discharging**

#### 9.2.1 Discharging Current

The discharging current should not be higher than the maximum current indicated in this specification. Over high discharge current may incur the problem of intensely drooping of the capacity and over heat.

#### 9.2.2 Discharging Temperature

The battery should be discharged under the ambient temperature range of -20°C~60°C.

#### 9.2.3 Over Discharging Is Forbidden

In the course of normal use, the battery management system should be applied to avoid to over discharging. If the battery is over discharged, it may be damaged or safety problem may be occurred.

Please pay attention that the battery can be in the state of over discharged because of self-discharge during the process of storage of the batteries which haven't be used for a long time. To avoid this, the battery should be charged according to a fixed schedule, and the voltage should be maintained above 51.2V.

## 10. Cautions in Use

10.1 Please read the instruction carefully and pay attention to the marks on the surface of battery before using it.

10.2 Please use the battery under normal indoor environment, temperature:  $-20^{\circ}\text{C}\sim 55^{\circ}\text{C}$ ; humidity:  $(65\pm 20)\%$ .

10.3 In the procedure of using the battery, please isolate it from heat source, fire source, and keep the children away from play with it, never beat, drop or shock it.

10.4 This battery only can be used with configured charger.

10.5 Short circuit is forbidden at any time, which may leads to the damage of battery, or even incur danger.

10.6 If you do not use it for a long time, please make sure it is well stored, keep it on the state of being half charged, do not fully charge or discharge it.

10.7 Discarded battery should be well disposed, do not throw it in the fire or under the water.

## 11. Warnings

- Do not immerse the battery under water, store it in the cool and dry environment when not use it.
- Keep it away from heat source like fire, heater when use or store it.
- Please use lithium-ion special charger when charging it.
- Please make sure the polarity is not reversed during the usage.
- Do not dispose battery into the fire or heater
- Do not connect the cathode with the anode directly by metals which could cause short circuit.
- Do not transport or store the battery with metals like hairpin, necklace.
- Do not strike, throw, tread or bend the battery
- Do not solder directly to the battery or penetrate it by using nails or other edge tools.
- Do not use or place the battery where has high temperature(under the hot sun) , otherwise the phenomenon of overheat, improper function, the shorten life span may occur.
- Do not use the battery in the high electrostatic field and high magnetic one, otherwise it leads to the damage of the safety device which causes unsafe issue.



- If the leakage of electrolyte happens, and the electrolyte enters into eyes, instead of rubbing your eyes, you should rinse it out with clear water, and get a treatment in the hospital immediately, or it may hurt the eyes
- If the battery gives out peculiar smell, has a fever, changes color and becomes deformed, or any abnormal phenomenon occurs during the usage, storage, charging process, you should stop and remove it immediately from the device or charger.

**Notes:** Any other items which are not covered in this specification shall be agreed by both parties.

**Technical Support**

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