

Phosphate-base Lithium-ion Battery Pack

Model : LFP1350-48 48V 1350Ah

Product Specifications

MERITSUN[®]
Lithium Energy Solution

1. Product overview

LFP1350-48 Products are mainly for customized development of high power dc application backup power supply products, to provide emergency standby power. 48V50Ah system consists of 27 modules in parallel to form 48V1350Ah system.

2. Product circuit principle

LFP1350-48 Product management system is made up of 27 independent unit BMS.

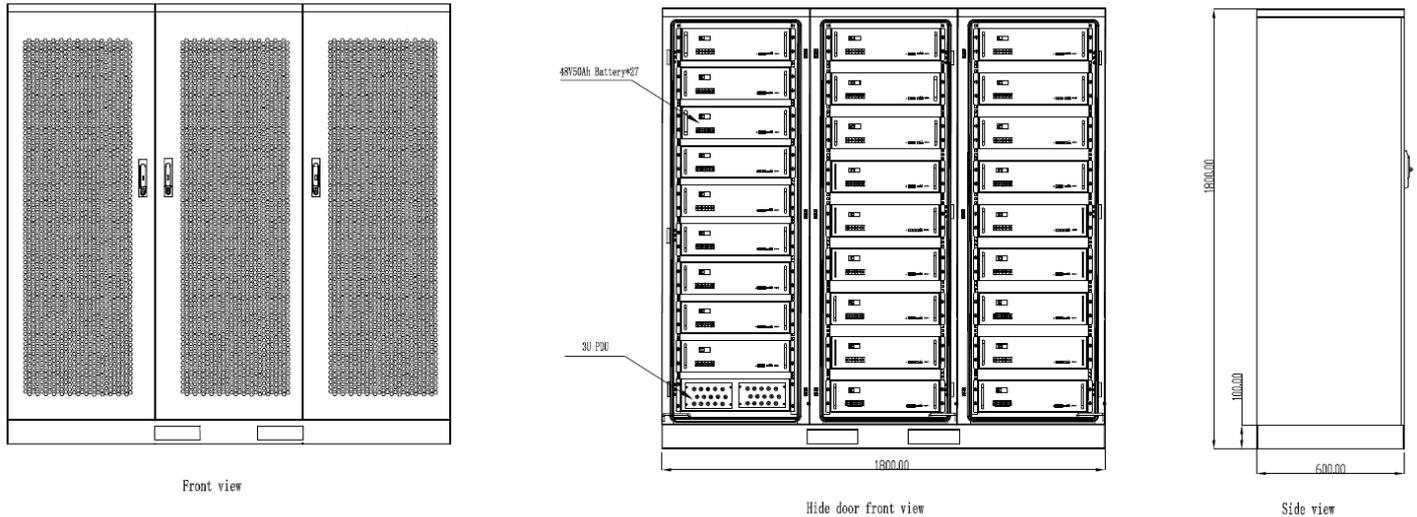
Unit BMS refers to the internal built-in 48V battery module, used for acquisition of monomer battery parameters, such as monomer voltage, total voltage, charge/discharge current, capacity, battery temperature, etc, used for battery charging and discharging process management, and effective protection and alarm function of the circuit system (protection and alarm functions), by collecting and protection circuit, electrical and communication interface and thermal management devices and so on,

3. Specification parameter

3.1 The machine parameters

| Serial number | Item | | Technical parameters |
|---------------|---------------------------|-----------|--|
| 1 | Material system | | Lithium iron phosphate |
| 2 | Nominal voltage | | 48V |
| 3 | Nominal capacity | | 1350AH |
| 4 | Size | | 1.8*0.6*1.8m * |
| 5 | Weight | | 1000kg |
| 6 | Maximum charging current | | 500A |
| 7 | Maximum discharge current | | 500A |
| 8 | Operating environment | Charging | 0°C~+45°C |
| | | Discharge | -10°C~+60°C |
| 9 | Protection function | | Over current protection, short circuit protection, over voltage protection, under-voltage protection, temperature protection |
| 10 | remote control function | | Remote sensing, remote communication, remote |

| | | |
|----|-------------------------|----------------------------|
| | | control, remote regulating |
| 11 | Protection function | IP20 Protection grade |
| 12 | Communication interface | RS232、RS485 |



Pic 1 Battery cabinet drawing

3.2 48V50AH Battery Module Parameters

| Serial number | Item | Technical parameters | |
|---------------|---|----------------------|-------------|
| 1 | Consist method | 15S | |
| 2 | Nominal capacity | 50AH | |
| 3 | Rated voltage | 48V | |
| 4 | Internal resistance | ≤80mΩ | |
| 5 | Maximum charging current | 50A | |
| 6 | Maximum continuous discharge current | 50A | |
| 7 | Maximum instantaneous discharge current | 65A | |
| 8 | Charging voltage | 54V | |
| 9 | Discharge threshold voltage | 40V | |
| 10 | Working temperature | Charging | 0°C~+45°C |
| | | Discharge | -10°C~+60°C |

| | | | |
|----|---------------------|-------------|-------------|
| 11 | Storage environment | Temperature | -10°C~+60°C |
| | | Humidity | ≤90% |
| 12 | Appearance size | Thickness | 132±0.5mm |
| | | Width | 442±1mm |
| | | Depth | 385±1mm |

3.3 Unit BMS protection parameters

| Item | Detailed content | standard |
|----------------------------|---|---------------------|
| Unit overcharge protection | Over Charging detection voltage | 3.80±0.02V |
| | Over charging detection delay time | Typical values 1.0s |
| | Over Charging release voltage | 3.34±0.02V |
| Unit discharge protection | Over discharge detection voltage | 2.5±0.02V |
| | Over Discharge detection delay time | Typical values 1.0s |
| | Over discharge release voltage | 2.75±0.02V |
| Over current protection | Discharge overcurrent protection current | 65±2A |
| | Discharge over-current detection delay time | ≤1000ms |
| | Discharge overcurrent protection current | 75±2A |
| | Discharge over-current detection delay time | ≤100ms |
| | Charging over-current | 65±2A |
| Short circuit protection | Short circuit protection current | 150±4A |
| | Protect conditions | Load short circuit |
| | Detection of delay time | ≤200us |
| | Protect subsequent condition | Disconnect the load |
| Current consumption | Working circuit internal consumption | ≤500mA |

| | | |
|------------------------|---|--------|
| | Hibernation and internal consumption | ≤350uA |
| Temperature protection | High temperature protection | 65±5℃ |
| | Charging high temperature recovery | 55±5℃ |
| | Discharge high temperature protection | 75±5℃ |
| | Discharge high temperature recovery | 65±5℃ |
| | Charging low temperature protection | -10±5℃ |
| | Charging low temperature recovery | -1±5℃ |
| | Discharge low temperature protection | -25±5℃ |
| | Discharge low temperature recovery | -20±5℃ |
| Balance | Balanced open electrical | 3.5V |
| | Balanced differential voltage | 20mV |
| Communication | Have RS232 and RS485 standard communication interface, real-time monitoring by the upper machine (SOC) of battery capacity, battery/battery voltage, battery/battery current, environment /, battery temperature and battery charge/discharge current | |
| Alarm | With the temperature, overcharge, undervoltage, over current, short circuit, and alarm functions | |

4. Battery performance and test condition

4.1 Standard Test Conditions

Test should be conducted with new batteries within one week after shipment from our factory and the cells shall not be cycled more than five times before the test. Unless otherwise specified, test and measurement shall be done under temperature of 20±5℃ and relative humidity of 45~85%. If it is judged that the test results are not affected by such conditions, the tests may be conducted at temperature 15~30℃ and humidity 25~85%RH.

4.2 Measuring Instrument or Apparatus

4.2.1 Dimension Measuring Instrument

The dimension measurement shall be implemented by instruments with equal or more precision scale of 0.01mm.

4.2.2 Voltmeter

Standard class specified in the national standard or more sensitive class having inner impedance more than 10kΩ/V

4.2.3 Ammeter

Standard class specified in the national standard or more sensitive class. Total External resistance including ammeter and wire is less than 0.01Ω.

4.2.4 Impedance Meter

Impedance shall be measured by a sinusoidal alternating current method(1kHz LCR meter).

4.3 Standard Charge\Discharge

4.3.1 Standard Charge : Test procedure and its criteria are referred as follows:

$0.2C_5A = 120A$

Charging shall consist of charging at a 0.2C₅A constant current rate until the cell reaches 54.75V. The cell shall then be charged at constant voltage of 54volts while tapering the charge current. Charging shall be terminated when the charging current has tapered to 0.01 C₅A . Charge time : Approx 6h, The cell shall demonstrate no permanent degradation when charged between 0°C and 45°C.

4.3.2 Standard Discharge

$0.2C_5A = 120A$

Cells shall be discharged at a constant current of 0.2C₅A to 30volts @ 20° ± 5C

4.3.3 If no otherwise specified, the rest time between Chare and Discharge amount to 30min.

4.4 Appearance

There shall be no such defect as flaw, crack, rust, leakage, which may adversely affect commercial value of battery.

Table 4

| Item | Test Method and Condition | Requirements |
|----------------------------|---|------------------------------|
| (1) Open-Circuit Voltage | The open-circuit voltage shall be measured within 24 hours after standard charge. | ≥50V |
| (2) Internal impedance | Internal resistance measured at AC 1KHz after 50% charge. | ≤50mΩ |
| (3) Minimal Rated Capacity | The capacity on 0.2C ₅ A discharge till the voltage tapered to 40 V hall be measured after rested for 30min then finish standard charge. | Discharge Capacity ≥600AH |

4.6 Temperature Dependence of discharge capacity

Cells shall be charged per 4.3.1 and discharged @ 0.2C₅A to 30 volts cept to be discharged at temperatures per Table 5. Cells shall be stored for 3 hours at the test temperature prior to discharging and then shall be discharged at the test temperature. The capacity of a cell at each temperature shall be compared to the capacity achieved at 23°C and the percentage shall be calculated. Each cell shall meet or exceed the requirements of Table 5.

Table5

| | | | | |
|---|-------|-----|------|------|
| Discharge Temperature | -10°C | 0°C | 23°C | 60°C |
| Discharge Capacity (0.2 C ₅ A) | 70% | 85% | 100% | 95% |

5. CAUTIONS IN USE

To ensure proper use of the battery please read the manual carefully before using it.

. Handling

- Do not expose to, dispose of the battery in fire.
- Do not put the battery in a charger or equipment with wrong terminals connected.
- Avoid shorting the battery
- Avoid excessive physical shock or vibration.
- Do not disassemble or deform the battery.
- Do not immerse in water.
- Do not use the battery mixed with other different make, type, or model batteries.
- Keep out of the reach of children.

. Charge and discharge

- Battery must be charged in appropriate charger only.
- Never use a modified or damaged charger.
- Do not leave battery in charger over 24 hours.

. Storage

- Store the battery in a cool, dry and well-ventilated area.

. Disposal

- Regulations vary for different countries. Dispose of in accordance with local regulations.

6. Battery operation instruction

6.1 Charging

Charging current: Cannot surpass the biggest charging current which in this specification book stipulated.

Charging voltage: Does not have to surpass the highest amount which in this specification book stipulated to decide the voltage.

Charge temperature: The battery must carry on the charge in the ambient temperature scope which this specification book stipulated.

Uses the constant electric current and the constant voltage way charge, the prohibition reverse charges. If the battery positive electrode and the cathode meet instead, can damage the battery.

6.2 Discharging current

The discharging current does not have to surpass this specification book stipulation the biggest discharging current, the oversized electric current electric discharge can cause the battery capacity play to reduce and to cause the battery heat.

6.3 Electric discharge temperature

The battery discharge must carry on in the ambient temperature scope which this specification book stipulated.

6.4 Over-discharges

After the short time excessively discharges charges immediately cannot affect the use, but the long time excessively discharges can cause the battery the performance, battery function losing. The battery long-term has not used, has the possibility to be able to be at because of its automatic flashover characteristic certain excessively discharges the condition, for prevented excessively discharges the occurrence, the battery should maintain the certain electric quantity.

6.5 Storing the Batteries

The battery should store in the product specification book stipulation temperature range. If has surpasses above for six months the long time storage, suggested you should carry on additional charge to the battery.

6.6 Period of Warranty

The period of warranty is one year from the date of shipment. Company guarantees to give a replacement in case of cells with defects proven due to manufacturing process instead of the customers abuse and misuse.

6.7 Other The Chemical Reaction

Because batteries utilize a chemical reaction, battery performance will deteriorate over time even if stored for a long period of time without being used. In addition, if the various usage conditions such as charge, discharge, ambient temperature, etc. are not maintained within the specified ranges the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage. If the batteries cannot maintain a charge for long periods of time, even when they are charged correctly, this may indicate it is time to change the battery.

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