

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.

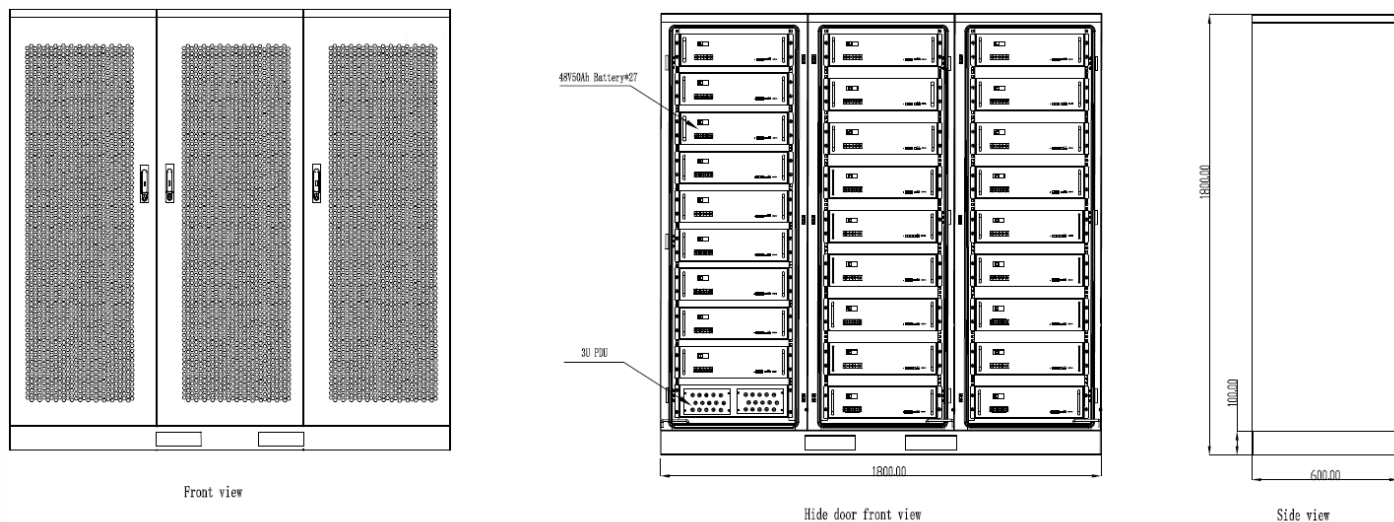
Unit BMS refers to the internal built-in 48V battery module, used for acquisition of monomer battery parameters, such as monomer voltage, total voltage, charge/discharge current, capacity, battery temperature, etc, used for battery charging and discharging process management, and effective protection 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	$\leq 350\mu\text{A}$
Temperature protection	High temperature protection	$65\pm 5^{\circ}\text{C}$
	Charging high temperature recovery	$55\pm 5^{\circ}\text{C}$
	Discharge high temperature protection	$75\pm 5^{\circ}\text{C}$
	Discharge high temperature recovery	$65\pm 5^{\circ}\text{C}$
	Charging low temperature protection	$-10\pm 5^{\circ}\text{C}$
	Charging low temperature recovery	$-1\pm 5^{\circ}\text{C}$
	Discharge low temperature protection	$-25\pm 5^{\circ}\text{C}$
	Discharge low temperature recovery	$-20\pm 5^{\circ}\text{C}$
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 $20\pm 5^{\circ}\text{C}$ 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 $15\sim 30^{\circ}\text{C}$ 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.