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# LiFePO4 Battery Battery Specification

Product: Lithium Ion Batteries 51.2V 100Ah

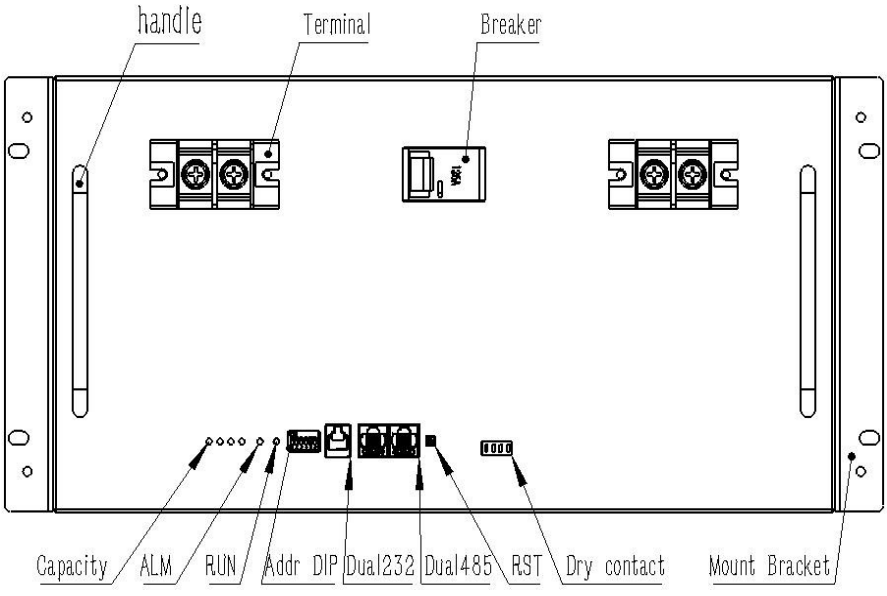
Model: **LFP48V100AH**

## 1. Application

The specification is applicable to basic performance, technical requirement, testing method, warningand caution of the Li- ion rechargeable battery

## 2. Product technical parameters

2.1 Battery size (mm) and panel interface
19 "5U case: 483 × 385 (Insertion depth) ×222±2mm (LxWxH)




2.2 Panel interface

| Item | Name | Description | Remarks |
|---|---|---|---|
| 1 | Handle | Easy to carry, move and install | |

| | | | |
|---|---|---|---|
| 2 | M6 Terminals | For external output and parallel connection of battery | Two sets of parallel outputs are configured by default |
| 3 | Addr | Address allocation for battery in parallel | |
| 4 | Operation | LED indication during normal operation (green light) | |
| 5 | Breaker | Protection battery pack, safety | |
| 6 | RS232 | System communication RS232 interface | |
| 7 | RS485 | System communication RS485 interface | |
| 8 | RST | Emergency system reset to ensure the maintainability of the system | |
| 9 | Alarm | Alarm indication when the system is abnormal | |
| 10 | Power indicator | Battery capacity estimation | Four green lights represent four stages of power |

## 2.3 Battery pack performance

| Features | Parameter | Remarks |
|---|---|---|
| Rated capacity | 100Ah | |
| Rated voltage | 51.2V | |
| Rated energy | 5120Wh | |
| Max charging voltage | 56.8V | Constant current to constant voltage charging voltage （3.55V/cell） |
| Minimum discharge voltage | 40.0V | |
| Standard charging current | 20A | When the charge current limiting function is not opened |
| Standard discharge current | 50A | |
| Maximum continuous charging current | 100A | When the charge current limiting function is not opened/10℃-35℃ |

| | | |
|---|---|---|
| Maximum continuous discharge current | 100A | ≤45℃ |
| Cycle life | >2000 times | (@ 0.5 C, 80% DOD, at 25℃) |
| Weight (approx.) | 53Kg | |
| Parallel Connection Quantity | 2-15 units | |
| Operating temperature | Charge : 0℃ ~ 45℃ | |
| | Discharge: -10℃ ~ 55℃ | |
| Storage temperature | -20 ~ 45℃ | ≤1 month |
| | -20 ~ 35℃ | ≤ 3 months |
| | -20 ~ 25℃ | ≤ 12 months |
| | 0~25℃ | >12 months, ＜ 15 months |

2.4 BMS parameters

| Item | Detail | Parameter |
|---|---|---|
| Charge and Discharge Port | Shared | The reference standard (The value can be set, subject to the actual set value) |
| Communication | CAN or RS485 | |
| Overcharge protection | Cells overcharge alarm voltage | 3.60±0.02V |
| | Overall overcharge alarm voltage | 57.6±0.5V |
| | Cell overcharge protection voltage | 3.65±0.02V |
| | Overall overcharge protection voltage | 58.4±0.5V |
| Over discharge protection | Cell over discharge alarm voltage | 2.70±0.02V |
| | Overall over discharge alarm voltage | 43.2±0.5V |
| | Over discharge protection voltage | 2.5±0.02V |
| | Total over discharge protection voltage | 40±0.5V |
| | Charging overcurrent alarm current | 102A±0.5A |
| | Discharge over current alarm current | 102A±0.5A |
| | Discharge overcurrent protection current | 105A±0.5A |
| | Discharge overcurrent protection delay time 1 | 5S |

| | | |
|---|---|---|
| | Discharge overcurrent protection current | 150A±0.5A |
| | Discharge overcurrent protection delay time 2 | 500ms |
| | Dischargeover current protection release condition | Automatic recovery after 15 minutes or charge |
| | Charge overcurrent protection current | 105A±0.5A |
| | Charge overcurrent protection delay time | 4S |
| | Charge over current protection release condition | Discharge |
| Output short circuit protection | Short circuit protection current | 330A |
| | Detection delay time | 500us |
| | Release condition | Charging release, charge current≥2A |
| Temperature protection | Charge high temperature protection | 55℃±5℃ |
| | Charge low temperature protection | 0℃±5℃ |
| | Discharge high temperature protection | 60℃±5℃ |
| | Discharge low temperature protection | -15℃±5℃ |
| Charge balance | Cell charge balancing | Open condition: status of effective charge current |
| | Balance open voltage | 3.5V±0.02V |
| | Balance open voltage difference | 20mV |
| | Balance current | 68mA±13mA |
| Battery Rated Capacity | 100Ah | |
| Low SOC Alarm | 30% | |
| Charge limit current | Parallel use should be turned on. When charge current is ＞charge Over current protection value, limit current(10A) open, after 2 minutes, limit current end. If it still ＞ charge over current protection value, limit current open and so forth | 10A±1A |
| Power consumption | Circuit consumes current while working | ≤40mA |
| | Sleep mode consumes current | 120-200μA |

2.5 Cell

| No. | Items | Specifications | Test tools | Comments |
|---|---|---|---|---|
| 1 | Max Charge voltage | 3.6±0.05V | Voltage meter | |
| 2 | Min Discharge voltage | 2.5±0.05V | Voltage meter | |
| 3 | Initial capacity | Nominal capacity @ 0.2 C5A | Secondary batteries testing equipment | |
| 4 | AC Impedance | ≤10mΩ | Impedance test equipment | AC impedance 1KHz |
| **5** | Charge standard | 0.2C CC charge to max charge voltage, then CV charge till charging current decline to ≤0.01C | Digital voltage meter Secondary batteries testing equipment | CC=Constant Current CV=Constant Voltage（3.60V） |
| 6 | Charge time | Standard：5 hours | Secondary batteries testing equipment | |
| 7 | Discharge standard | 0.2C CC discharge to discharge ending voltage | Digital voltage meter Secondary batteries test equipment | |
| 8 | Cell Dimension | Height：71.1mm Max ;Diameter：32.3mm Max | Digital Calipers | Accurate sizes to ±0.25mm |

## 3. Appearance inspection

Scratch, flaw, crack, and leakage are not allowed.

## 4. Test battery pack performance

| NO. | Items | Test method and Condition | Test tools | Criteria |
|---|---|---|---|---|
| 1 | Battery capacity | A. (standard charging) use the standard charging current, constant current charging to the charging termination voltage, and switch up to this constant voltage charging. When the current drops to 0.01C, | Secondary battery testing equipment | Battery capacity ≥ rated capacity 95% |

| | | | | |
|---|---|---|---|---|
| | | stop charging.<br>B. Rest 30 mins<br>C. Discharge with standard discharge current to discharge termination voltage.<br>D. Measure battery capacity | | |
| 2 | Cycle life | A. Use the standard charging current constant current charging to the charging termination voltage, and then switch to this constant voltage charging. When the current drops to 0.01C, stop charging.<br>B. Rest 30 mins<br>C. Discharge with standard discharge current to discharge termination voltage<br>D. Rest 30 mins<br>E. Record discharge capacity and so forth | Secondary battery testing equipment | 2000 cycles ≥ 80% of initial capacity |
| 3 | Self-discharge | A. After standard charging, store at 25±5℃ for 28 days, and then discharge with standard discharge current to BMS protection<br>B. Record discharge capacity | Secondary battery testing equipment | Measuring capacity ≥ 90% of rated capacity |
| 4 | Temperature characteristic | A. After standard charging at 25±5℃, discharge the battery at the following temperature conditions to measure and record the battery capacity: 25±5℃, -10℃ and 60℃<br>B. Calculate the percentage based on the discharge capacity at 25℃ | Secondary battery testing equipment | 25±5℃, 100%<br>-10℃ ≥ 60%<br>60℃ ≥ 85% |

## 5. Mechanical characteristics

| No. | Items | Test Method and Condition | Test tools | Criteria |
|---|---|---|---|---|
| 1 | Vibration Test | After standard charge, vibrate cell in 1.6mm amplitude and frequency varied at 1 Hz/min. Between 10 to 55 Hz and return in within 30 minutes | Secondary batteries test equipment, Vibration | No fire<br>No smoke<br>No explosion |
| 2 | Altitude simulation | Batteries shall be stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature (20 ± 5 ℃). | Digital voltage meter<br>vacuum box | No fire<br>No venting<br>No leakage |
| 3 | High temperature and high humidity test | Keep battery under condition as 40℃ ± 2℃ & 90%-95% RH for 2hours | Thermometer<br>Hygrometer | Discharge time ⩾36 mins,<br>No distortion<br>No explosion |
| 4 | Fall | Under the condition of 25 ± 5℃, after standard charging, the battery is dropped from a height of 100cm to the hardwood, and the X, Y and Z planes are dropped once each. | | No fire<br>No explosion |

## 6. Standard test conditions

Unless otherwise specified, all tests should be conducted within one month of delivery under the following conditions:

Temperature：20±5℃ Humidity: 60±15% RH Barometric: 86kPa-106kPa

## 7. Cautions in use

Please read the manual carefully before using it to ensure properly use.

7.1 Do not make the battery exposure or thrown into fire.

7.2 Never reverse charge the battery.

7.3 Never short circuit the battery.

7.4 Avoid excessive physical shock or vibration.

7.5 Do not disassemble or deform the battery.

7.6 Never allow the battery to get wet or be immersed in water.

7.7 Do not use different types together.

7.8 Keep away from children.

7.9 Charge at the appropriate conditions.

7.10 Never use the faulty charger to charging.

## 8. Storage

8.1 Store the battery in cool, dry and well-ventilated conditions.

8.2 Store the battery in a individual room, separate from the other goods.

8.3 Discarded batteries should be covered with insulating paper and sent to a professional recycling station for recycling.

**8.4 The battery should be stored in 50% SOC. If the battery is stored for a long time, the battery should be conducted a cycle of charge and discharge every 3 months, then charge to 50%SOC.**

## 9. Battery operating instruction

9.1 Charge

Charge current: Never out of the max charge current as mentioned in specification.

Charge voltage： Never out of the max charge voltage as mentioned in specification.

Charge temperature： Please refer to the temperature range as specification.

Charge as constant current before constant voltage, Never reverse charge the battery.

9.2 Discharge current

The discharge current is not allowed to out of max current as specification. Otherwise, the battery will be over heat and capacity fading.

9.3 Discharge temperature

Please refer to the temperature range as specification.

9.4 Over-discharge

It's workable if over charge and discharge for a short while but not allow to do it for a long time. Over discharge may result in self-energy disappear. Please keep a certain electric quantity to prevent over discharge.

## 10. Warranty period

The warranty period of the battery is stipulated in the contract,but we are not responsible for the damage caused by inadequate and improper use. The information ( subject to change without prior notice ) contained in this document is for reference only and should not be used as a basis for product guarantee or warranty. For applications other than those described here, please contact our office. Manufacturer reserves the right to alter, amend the design, model and specification without prior notice.

## 11. Note:

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