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LIFEPO4
POWERWALL

LFP-24/100

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ENERGY STORAGE SOLUTION

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General Information

This specification defines the performance of rechargeable LiFePO4 battery pack LFP-24/100 manufactured by Lionics India, describes the type, performance, technical characteristics, warning and caution of the Battery pack.

Specification

No	Items	Criteria	Remarks
1	Rated capacity	100 Ah	
2	Minimum capacity	98Ah	
3	Energy	2.56kWh	
4	Nominal Voltage	25.6V	
5	Internal resistance	≤30mΩ	
6	Outgoing Voltage	≥25.6V	
7	Charge voltage	29.2±0.2V	
8	Floating charge voltage	27.6±0.2V	
9	Standard charge current	50A	
10	Maximum charge current	100A	
11	Maximum discharge current	100A	
12	Pulse discharge current	300A/Continuous for 20ms	
13	Discharge cut-off voltage	22.4-24.0V	
14	Dimension	Length- 485±2mm Width- 170±2mm Height -240±2mm	
15	Weight	Approx.- 24.5±0.5Kg	
16	Operating Temperature	Charging- 0~45°C Discharging-20~60°C Recommended operating temperature- 15°C~35°C	
17	Self- discharge rate	Residual capacity- ≤2%/month;≤12%/year	
18	Storage Temperature & Humidity Range	Less than 1 month: -20°C~45°C, 45%RH~75%RH Less than 3 months: -10°C~35°C, 45%RH~75%RH Recommended storage environment: 15°C~35°C, 45%RH ~75%RH	
Long-time storage: If the battery need to be stored for a long time , the voltage should be 26.4(50%SOC), and stored in the condition as storage proposal. It need atleast one charge & discharge cycle every 6 months.			

Test Conditions

3.1 Standard Test Conditions

3.1.1 Unless otherwise specified, all performance tests is required conducted at temperature 25℃±2℃, Humidity less than 45%~75%RH.

3.1.2 Unless otherwise specified, the tested product is required unused within two month after outgoing.

3.2Standard Charge Mode

"Standard Charge" means at 25±2℃ charge to limit voltage with 1.0C constant current, then charge with constant voltage until current less than 0.02C.

3.3 Quick Charge Mode

"Quick Charge" means at 25±2℃ charge to limit voltage with 1.0C constant current, then charge with constant voltage until current less than 0.02C.

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3.4 Quick Discharge Mode
"Quick Discharge" means discharge to the cut-off voltage with 1.0C current

Circuit Protection

No	Items	Criteria	Testing methods
1	Rated Capacity	100Ah	Rest for 1 hour after fully charged, then discharge with 0.33C current until the battery reaches the discharge cutoff voltage. Repeat above process for three times, if the discharge time is not less than 180 minutes, you can stop and define the Discharging current*time value (Ah) as battery capacity.
2	Minimum Capacity	98Ah	Rest for 1 hour after fully charged, then discharge with 0.33C current until the battery reaches the discharge cutoff voltage. Repeat above process for three times, if the discharge time is not less than 180 minutes, you can stop and define the Discharging current*time value (Ah) as battery capacity.
3	Internal resistance	≤30mohm	50% battery SOC state frequency of 1 KHZ ac resistance tester
4	Cycle life(DOD 90%)	≥3000cycle	Discharge with the current of 0.33C until it can't discharge, and then rest it for 1h. Charge the battery following CC (0.33C)/CV (14.4V) mode to full capacity, and then rest it for 1h. Repeat above process until full charged capacity is no more than 80% of normal value. Accumulated times is defined as cycle life
5	Discharge Temperature Characteristics	-20℃ : ≥70% -0℃ : ≥80% 25℃ : ≥100% 55℃ : ≥95%	At 25±5℃ discharge the battery with the current of 0.33C to the cut-off voltage and record charge capacity. Store the battery at various temperatures for 2h and discharge the battery with 0.33C to the cut-off
6	Charge Retention ability	Residual capacity≥80% Recovery capacity≥90%	Charge the battery to full capacity and store it for 28 days and then discharge it with 0.33C to the cut-off voltage.
Optional	Communication Function	Bluetooth	Through APP, user can read the battery system information such as voltage, current, SOC, temperature, etc

Protective circuit specification

The batteries are supplied with a LiFePO4 Battery Management System (BMS) that can monitor and optimized each single prismatic cell during charge & discharge , to protect the battery pack overcharge, over discharge, short circuit . Overall, the BMS helps to ensure safe and accurate running.

No	Items	Content	Specification
1	Over charge	Over-charge protection for each cell Over-charge release for each cell Over-charge release method	3.80±0.05V 3.60±0.05V Under the release voltage
2	Over discharge	Over-discharge protection for each cell Over-discharge release for each cell Over-discharge release method	2.50±0.05V 2.80±0.05V Charging recovery
3	Over current	Discharge over current protection 1 Discharge over current protection 2 Over current release method	115±10A, delay15~25s 210±30A, delay 3~5s 10s after cutoff the load

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4	Short	Do not short-circuit the electrodes short-circuit release method	Designed For 540A /200-500us 5s after cutoff the load.
5	Battery temperature	Charge over temperature	Protection @65±5℃ Release @50±5℃
		Discharge over temperature	Protection @65±5℃ Release @50±5℃
6	Static power	≤300uA	

Capacitive Balancer

The capacitive balancer is an impetus which we provide within the battery pack that helps increase battery life.

Capacitive equalization is the energy transfer between neighbouring batteries through capacitors. First, the high voltage battery is discharged to charge the capacitor, and then the capacitor discharge is used to charge the adjacent low voltage battery to achieve the purpose of equalization.

Balanced Starting Voltage	3.0 V - 4.2 V
Balanced Accuracy	≤5mV
Sleeping Current	≤1mA
Maximum Balance Current	The whole group error is 0.1V 1A/0.5V 3.5A/1.0V 5.5 A(18awg 30cm cable test)
Working environmental temperature	0-60ºC

Transportation

Based on the character of cell, proper environment for transportation of LiFePO4 battery pack need to be created to protect the battery.

Battery should be stayed in the warehouse 15℃〜35℃ where it’s dry, clean, shade, and well-ventilated.

The battery should be stored in 50% SOC during transportation.

The battery need to be charged every 6 months if out of use

Keep the battery against dropping, turning over and serious stacking during loading.

Warning & Tips

Please read and follow the specification and caution remarks on battery surface before use the battery. Improper use may cause heat, fire, rupture, and damage or capacity deterioration of the battery. Lionics India is not responsible for any accidents caused by the usage without following our specification.

The battery must be far away from heat source, high voltage, and avoid to be exposed in sunshine for long time.

Never throw the battery into water.

Do not put the battery in a charger or equipment with wrong terminals connected.

Never connect the positive and negative of battery with metal.

Avoid excessive physical shock or vibration. Don't hit, fall or stamp on the battery

Without the permission of the manufacturer and guidance, it is forbidden to remove or to assemble the battery

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Do not use the battery with other different manufactured , type or model batteries.

Keep the battery against high temperature. Otherwise it will cause battery heat, get into fire or lose some function and reduce the life.

When battery run out of power, please charge your battery timely (≤15day).

Please use the matched or suggested charger for this battery.

If battery emits peculiar smell, heating, distortion or projects any abnormity during working or storage, please stop using and take it out from device.

If the battery leaks and get into the eyes or skin, do not wipe, instead, rinse it with clean water and see doctor immediately.

Please keep the battery far away from children or pets.

Do not put battery into a fire or water.

If user needs to parallel several battery packs, please charge them to full capacity with same type of matched charger, and set it aside for 8 hours, professionals only. This battery pack supports application no more than 4 group parallel. If user needs to apply this product to more groups parallel, please reconfirm details with us.

It is strictly prohibited any series between the battery packs. Any requirements on serial connection, please contact **Lionics India**for details.

Battery operation instruction

Charge and discharge

1. Charging current：Do not surpass the largest charging current that specification stipulated.
2. Charging voltage：Do not surpass the highest limited voltage that specification stipulated.
3. Charging temperature：Within temperature scope that specification stipulated.
4. Charge with constant current, then with the constant voltage, no reverse charge, which is dangerous
5. Special note: Short time doesn't affect the use of the battery overcharge too, but for a long period of time over discharge or over charge can affect the function of the battery failure, or the battery can't use permanent, appear serious safety hazards, and need long time floating please use the recommended floating model specification. Battery when not in use for a long time, because of its own self-discharge characteristics can also cause discharge, to prevent the occurrence of a discharge, battery should maintain a certain capacity; maintain the voltage at 50% state of SOC.

Other 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 discharge time is much shorter than the normal after full charged, even battery is charged correctly, and this may indicate it is time to change the battery.