

# Specification Approval Sheet

## LiFePO4 24V 80Ah

### Model: OSN-30135220-2480

Prepared by	Approved by R&D	Approved by SALES	Approved by QA
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<b>Customer Approval</b>	<b>Signature</b>	<b>Date</b>
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**1. Scope**

This document describes the Product Specification of the Lithium iron phosphate battery supplied by OSN (**OSN Power Tech Limited**).

**2. Model: OSN-30135220-2480****3. Specification**

No.	Items	Specifications
1	Nominal Voltage	25.6V
2	Nominal Capacity	80Ah
3	Cell Inside	LiFePO4 3.2V 80Ah
4	Configuration	8S1P
5	Standard Charge Current	16A (0.2C)
6	Max. Charge Current	120A
7	Battery management System (BMS)	BMS-SM8S100100-C49 (230*140*35mm) Smart BMS with Bluetooth 4.0 (Read Voltage, Current, Temperature, cycles etc)
8	Continuous Discharge Current	100A
9	Peak Discharge Current	200A
10	Full Charged Voltage	29.2V(3.65V per cell)
11	Charge Cut-off Voltage	27.5V (3.9V any single cell)
12	Discharge Cut-off Voltage	16V (2.0V per cell)
13	Net Weight	19.3kg
14	Dimensions	376*256*171mm(158mm)
15	Connector	Anderson connector
16	Operating Temperature	Charging: 0°C ~ 45°C Discharging: -20°C ~ 55°C
17	Storage Temperature	(Recommended to store 20 ± 5°C for long term storage)
18	Cycle Life	2000 times (80% of initial capacity at 0.2C rate, IEC Standard)

## 4. Technical Specifications

### 4.1 Test Condition:

- (1) Standard Charge: Charge the battery pack with constant current (CC) at  $0.2C_5A$  and when the battery reaches 3.65V per series, charge the battery pack with constant voltage (CV) at 3.65V per series till the charge current declines to  $0.05C$ .
- (2) Standard Discharge: Discharge the battery with constant current  $0.2 C_5A$  to the cut-off voltage at  $20\pm5^{\circ}C$ .
- (3) Standard Test Environment:  
 Temperature:  $25\pm2^{\circ}C$   
 Relative Humidity:  $65\pm20\%RH$   
 Atmospheric Pressure:  $86kPa\sim106kPa$ .

### 4.2 Electrical Performance:

NO	Item	Testing Procedure	Requirements
1	Nominal Capacity	0.5~1hr after standard charge, measure the capacity by discharging at constant current of $0.2C_5A$ to the cut-off voltage of 16v at $20\pm5^{\circ}C$ .	80Ah
2	Capacity at High Discharging Current	0.5~1hr after standard charge, measure the capacity by discharging at constant current of $1C_5A$ .	Discharge time is no less than 51 minutes. no explosion.
3	Low Temperature Discharging	After standard charge, put the battery in a cooling box of $-10\pm2^{\circ}C$ for 16~24hr ,and then discharge the battery with constant current of $0.2C_5A$ and keep record of the discharging time. After 2hr of standby at $20\pm5^{\circ}C$ , check the performance of the battery pack.	Discharge time is no less than 3.5 hours. no explosion.
4	High Temperature Discharging	After standard charge, put the battery in a heating box of $55\pm2^{\circ}C$ for 2hr, and then discharge the battery with constant current $1C_5A$ and keep record of the discharging time. After 2hr of standby at $20\pm5^{\circ}C$ , check the performance of the battery pack.	Discharge time is not less than 51 minutes. no explosion.
5	Shelf Life	After standard charge, shelve the battery pack for 28 days at $20\pm5^{\circ}C$ ,and then discharge it with constant current of $0.2C_5A$ ,recording the discharging time.	Discharge time is not less than 4.25 hours.

6	Cycle Life	Fully discharge the battery before this test ,then charge it with constant current $1C_5A$ ,when the voltage of the battery reaches the charge limited voltage , charge the battery with constant voltage until the charging current below 20mA,then have a 0.5h~1h rest period, next ,discharge with current $1C_5A$ to the cut-off voltage .After a 0.5h~1h rest period ,begin next charge and discharge cycle. when two times over discharge time is less than 36min, life of the battery is end.	Cycle life is not less than 2000 cycles. No liquid leakage during the test.
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## 4.3 Environment Adaptability:

NO	Item	Test Procedure	Requirements
1	Constant Humidity and Temperature	1. After standard charge, keep the battery for 48 hr in an insulated box at constant relative humidity of 90~95% and constant temperature of $40\pm 2^{\circ}C$ ; 2. Take out the battery pack from the box and standby for 2hr at room temperature and check the battery; 3. Finally discharge the battery with constant current $0.1C_5A$ to the cut-off voltage and keep record of the discharging time.	No visible distortion, no rust, no smoke, no explosion. Discharging time is not less than 36min.
2	Vibration Test	1. After standard charge, fix the battery to an oscillatory board; 2. Cycle scan in three dimensions of X/Y/Z axis with a frequency from 10Hz to 55Hz for 30min, scan velocity of 1oct/min; 3. Check the appearance and measure the voltage of the battery. Frequency: 10Hz~30Hz; Displacement Amplitude/Single Amplitude: 0.38mm, Frequency: 30Hz~55Hz; Displacement Amplitude/Single Amplitude: 0.19mm.	No visible damage, no liquid leakage, no smoke, no explosion.
3	Impact Test	After the vibration test, fix the battery to the board in X/Y/Z axis three directions. Pulse peak acceleration: $100m/s^2$ ; Impact times /sec: 40~80; Pulse duration: 16ms; Impact times: $1000\pm 10$ . Check the appearance and measure the voltage of the battery.	No visible damage, no liquid leakage, no smoke, no explosion.

## 4.4 Safety Performance:

NO	Item	Test Procedure	Requirements
1	Thermal-Shock Test (Heating Test)	1. 24hr standby after standard charge, the battery is put in a heater, with a temperature rising at a rate of $5 \pm 2^{\circ}\text{C}/\text{min}$ to $150 \pm 2^{\circ}\text{C}$ ; 2. Keep the battery at $150 \pm 2^{\circ}\text{C}$ for 30 minutes; 3. Check the appearance of the battery.	No explosion, no fire
2	Short Circuit Test	1. 24hr standby after standard charge, the positive and negative terminals of the battery is short-circuited with copper wire(maximum resistance $\leq 50\text{m}\Omega$ ); 2. Keep close watch of the change in temperature of the battery. When the temperature of the battery is $10^{\circ}\text{C}$ lower than that of the peak value ,end the test ; 3. Check the appearance and the temperature of the battery.	No explosion, no fire. The temperature of the exterior cell casing shall not exceed $150^{\circ}\text{C}$ .

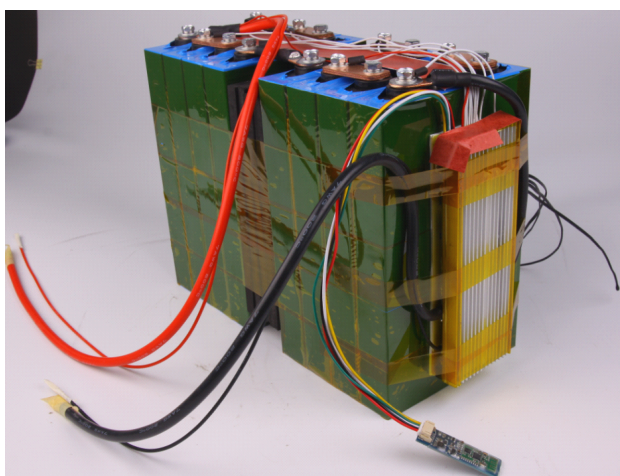
## 5. Storage

The storage temperature range for the battery is  $-20^{\circ}\text{C} \sim 45^{\circ}\text{C}$ . If it is to be stored for a long time (more than three months) , the battery should be stored at temperature of  $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$  and humidity of  $65\% \pm 20\%\text{RH}$  in a dry and cool place.

## 6. Others

Any matters that this specification does not cover should be conferred between the customer and OSN

## 7. Battery Photos



## **Handling Precautions and Guideline For Lithium Iron Phosphate Battery**

### **Preface**

This document of 'Handling Precautions and Guideline' shall be applied to the battery pack manufactured by OSN (**OSN Power Tech Limited**).

### **Note (1):**

It's a must for the customer to contact OSN in advance when the customer uses the battery pack for applications or under operating conditions other than those described in this document. Additional experiments may be required to verify performance and safety under such conditions.

### **Note (2):**

OSN takes no responsibility for any accident when the battery is used under other conditions than those described in this document.

### **Note (3):**

OSN will inform, in a written form, the customer of improvement(s) regarding proper use and handling of the battery if it is necessary.

### **Warning And Matters Need Attention In Using Battery**

Please pay attention to followings in case of battery had leakage, heat or explosion.

#### **Warning !**

- Do not immerse the battery in water or seawater, and keep the battery in a cool dry surrounding if it stands by.

Does not use or keep the battery near a heat source as fire or a heater.

- Use the original chargers specially designed for the batteries please. .
- Do not reverse the positive and negative terminals.
- Do not connect the battery electrodes to an electrical outlet.
- Do not discard the battery in fire or a heater.
- Do not short-circuit the battery by directly connecting the positive and negative terminals with metal objects.
- Do not transport or store the battery together with metal objects such as hairpins, necklaces, etc.
- Do not strike, trample or throw the battery.
- Do not directly solder the battery and pierce the battery with a nail or other sharp objects.

#### **Please handle the batteries with care.**

- Do not use or leave the battery at high temperature (for example, at strong direct sunlight or in a vehicle in extremely hot weather). Otherwise, there are dangers of overheat, inflammation, or deterioration of the performance.
- Do not use the battery in a location where static electricity and magnetic field is strong; otherwise, the safety devices may be damaged, inflicting hazardous outcomes.
- In case the electrolyte has contact with skin or eyes, flush the electrolyte away immediately with fresh water and seek medical care.
- If the battery gives off strange odor, generates heat, becomes discolored or deformed, or in any other way abnormal during usage, charging or storage, immediately remove it from the device or battery charger and stop using it.

- In case the battery terminals are dirty, clean the terminals with a dry cloth before use. Otherwise poor performance may occur due to the poor connection with the instrument.
- Never incinerate or dispose the cell in fire. These actions may cause inflammation of the cells, which is very dangerous and is prohibited.