

LiFePO4 Battery User Manual

Technical Department

Content

1. Applicable Range
2. Installation
3. Operating
4. Protection and Faults
5. Battery maintenance
6. Precautions for Use
7. Precautions for Transportation
8. Storage
9. Battery Parameter
10. Application Examples
11. After Sale Service

1. Applicable Range

This product specification applies to lithium iron phosphate battery products provided by our company, and the product provided in this manual with the requirements of the IEC62133 standart.

Customer who use the battery manufactured or sold by our company must read this user manual carefully before using, we will not be responsible for accident or damage with incorrect operating.

2. Installation

Do not connect the battery in series. Please contact us for check if you want to connect them.

2.1 Tools

- 2.1.1 Insulated tools sized to match nuts, bolts, and cables in use Voltmeter.
- 2.1.2 Personal protective equipment.
- 2.1.3

2.2 Securing battery

Battery can be strapped into place with non-conductive nylon straps or on the ground.

2.3 Inspection

To check the battery package, type, quantity, appearance and other components.

Check if there is any damage on the battery box.

Check the battery terminals and connections to make sure they are clean, free of dirt, fluids.

All battery cables and their connections should be tight, intact, and NOT broken or frayed.

Replace any damaged batteries.

Replace any damaged cables.

Check torque on terminal bolts.

NOTE!

Please inform us within 7 days after receipt of goods. If any problems, otherwise we deem clients have no objection to the goods.

2.4 Installation

If the battery circuit has a disconnected, open and disconnect to isolate battery.

Clean cable connections. Broken, frayed, brittle, kinked or cut cables should be replaced.

Install and secure new battery. Be careful not to ground the terminals to any metal mounting, fixture, or body part.

Connect battery cables. Connect ground cable last to avoid sparks.

Recommended terminal torque is 7.0 – 7.7Nm (5J – 5.7 ft – lb).

Measure the open circuit voltage, which is to prevent the battery reverse or reverse during manufacturing.

3. Operating

3.1 Charging

Never attempt to charge a battery without first reviewing and understanding the instructions for the charger being used.

Caution!

Always make sure the charging meets the battery's charging requirement; never charge a visibly damaged battery; never charge a frozen battery.

- 3.1.1 Please use special lithium iron phosphate charger when charging the battery. Do not use GEL/lead acid/AGM or other battery charger, it will hurt the battery and effect the battery life.
- 3.1.2 Please check with our company if you use inverter to charge the battery, must make sure the spec of inverter and battery fit each other before connecting, or else it may cause damage on inverter or battery.
- 3.1.3 Never use a charge/inverter/power supply with higher charging voltage than battery charging voltage, it will damage the BMS.
- 3.1.4 Connect the charger leads to the battery, make sure that the charger lead, both at the charger and battery side, connections are tight, then turn the charger on.

3.2 Discharging

Do not discharge battery below operating voltage.

Do not discharge battery at rates greater than maximum continuous current.

Do not operate in conditions that will exceed the internal operating temperatures of the battery.

3.3 Charge/Discharge Parameter Setting

Charge/Discharge setting for LiFePO4 battery	
Bulk voltage:	3.65*N (N=Number of series)
Absorb voltage:	3.65*N

Absorb end up current:	0.01C (C=Capacity)
Suggest charge current:	0.2C
Recommend charge cut off voltage:	3.65*N (N=Number of series)
Recommend discharge cut off voltage:	2.5*N

Regular Nominal Voltage and series number (Just for reference, if you are not sure of the nominal voltage, please check with us.)

Nominal Voltage	Series number	Voltage in market
3.2V	1S	3V
6.4V	2S	6V
9.6V	3S	9V
12.8V	4S	12V
25.6V	8S	24V
38.4V	12S	36V
48V	15S	48V
54.4V	17S	
64V	20S	60V
76.8V	24S	72V

4. Protection And Faults

In the event of a fault the battery protection circuit will open its internal relay/mosfet discharge connecting, and stop the negative battery terminals from working. The battery uses a solid state relay/mosfet and precautions should be taken to reduce voltage spikes and large inductance in the application.

Over Voltage fault	3.9 ± 0.025V
Over Voltage Recovery	3.8 ± 0.050V
Low Voltage Fault	2.0 ± 0.050V
Low Voltage Recovery	2.3 ± 0.100V

Common Failure

LiFePO4 battery failure solution:

Failure	Solutions
Unable to Charge or Discharge	Check the Wire Connection
	Check the Voltage
	Check the connections Between Cells
	Unload First then Connect again
	Replace BMS
Produce heats when Using	Continues Current is too High
	Battery Cell is Not Tightly Connected with each other

5. Battery Maintenance

5.1 When customer receive the battery, should check the basic function first, make sure no damage during the transport. Please test the battery voltage, charging function, discharge function, and display function, if there is any abnormal, please stop installation and notify us first.

After installing the battery according to the installation manual, fully charge the battery before using it for the first time. Fully charged and discharged for 3 to 5 times, the battery can reach its maximum capacity.

5.2 To prolong it's life cycle, charge those batteries in time when the capacity is low. If batteries are not charge in time, leaving the battery in a deficient state for a long time will affect the battery life. If those batteries will not be used for a long time, keep it half capacity and floating charge the battery every two months, 1 hour each time.

5.3 The battery should be installed in ventilation, dry and clean environment, avoiding the ignition source, flammable materials approaching and disconnecting the load (turn off the electrical equipment) during charging.

5.4 The working temperature of the battery is 5 to 40 °C (Optimal working temperature is 15 to 35 °C). Beyond this temperature range, the performance of the battery may change. It is normal if the capacity changed or equipment operating time changed.

5.5 Avoid cleaning battery case with organic solvents. When an accident happens, do not use carbon dioxide to extinguish the fire.

5.6 The battery is a consumable item and the life cycle is limited. So please replace the battery when the battery capacity is lower than 50% of the rated capacity.

6. Precautions For Use

To avoid battery leakage, abnormal heat, fire, performance degradation, explosion and other accidents, please follow specifications to properly use the battery. Our company will not responsible for accidents caused by failure to operate in accordance with this manual.

Safety: Do not throw in the garbage. Do not dispose in fire. Use personal protective equipment when working with batteries. Use special charger for LiFePO4. The product must be recycled and is made of recycled materials.

Caution! Do not disassemble or modify the battery. If the battery housing is damaged, do not touch the exposed contents.

Do's

Do note about the warning labels on the battery.

Do protect terminals from short circuit before, during and after installation.

Do wear electrically insulated gloves and use electrically insulated tools.

Do wear eye protection and safety toe boots/shoes.

Do handle the battery carefully and secure battery safety.

Don'ts

Do not operate or store battery outside of the operating limits.

Do not short circuit battery. Avoid shorting the positive and negative output terminals of the battery pack.

Do not wear rings, watches, bracelets or necklaces when handling or working near battery,

Do not expose battery to flames, incinerate or direct sunlight.

Do not lift battery by the terminals cables.

Do not vibrate the battery.

Do not expose battery and its accessories to water or other fluids. And pay attention to moisture proof.

Do not connect with other type of batteries.

Do not expose battery to high temperature.

Do not disassemble the battery. Removing the battery may cause an internal short circuit, causing decomposition of internal substances, fire, explosion, etc. in addition, dismantling the battery may leak the electrolyte of the battery; if electrolyte is splashed on the skin, eyes or other parts of the body, rinse immediately with clean water and immediately go to a doctor.

Do not put waste batteries into the fire, otherwise there will be explosions and other dangerous accidents happen.

In the event of battery damage, deformation, electrolyte and smell like leakage, and other abnormalities, do not use the battery anymore. Please send it to the authorized office of the manufacturer or the appropriate agency for proper disposal. In addition, the batter leaking electrolyte should be kept away from fire to avoid explosion.

Battery replacement. The battery should be replaced by the battery supplier. And users cannot replace the battery without permission.

Self-demolition is prohibited. Users are not allowed to dismantle battery packs and chargers. Otherwise, we will not be responsible for the losses caused by this reason.

Batteries can be used in parallel, but not in series (Unless you confirmed with us the BMS of your battery is customized and support series connection). The voltage of batteries must be tested before being used in parallel and ensure the voltage tolerance within $\pm 0.1V$.

7. Precautions for Transportation

7.1 the battery pack is suitable for transportation methods such as automobiles, trains, and airplanes. However, during the transportation process, the sun, rain, and severe vibrations should be avoided.

7.2 The battery pack should be packaged with insulating and shockproof material, and label with fragile characters so as to avoid damage caused by bumps during transportation.

7.3 The battery pack pole should be upward, and mark the upward label. Do not put it upside down, place it sideways, etc.

- 7.4 The battery pack must be handled gently during transportation and handling. Do not throw at random and avoid collisions.
- 7.5 Do not place heavy objects on the battery pack during transport to avoid damage to the battery pack.
- 7.6 Do not mix transport with flammable, explosive and sharp metal objects.

8. Storage

The battery should be stored at a temperature of 5°C ~ 40°C, relative humidity ≤ 90% (40°C ± 2°C) cleaning, dry and ventilated environment. Avoid contact with corrosive substances and keep away from fire and heat sources. The battery is in a half – power state of about 50% to 60%. To prevent the battery from over – discharging, it is recommended to charge the battery every 2 months, 1 hours each time.

9. After Sale Service

OUR COMPANY OFFER 2 YEARS FACTORY BACKED WARRANTY THAT COVERS MANUFACTURER DEFECTS. WITHIN THE WARRANTY TIMEFRAME, WE WILL REPAIR OR REPLACE THE BATTERY WITH A NEW OR REMANUFACTURED BATTERY.

COVERED CONDITION:

1. BMS DAMAGE WITHIN 2 YEARS, WE CAN SEND FREE REPLACEMENT BMS AND TRAIN YOU HOW TO REPLACE IT, AFTER 2 YEARS, BMS REPLACEMENT UNITS CAN BE SEND ONLY AFTER PAYING.
2. FOR PROBLEMS CUSTOMER CAN NOT HANDLE, WE CAN SEND ENGINEER OR LOCAL COOPERATE AGENT TO FIX THE PROBLEM.
3. FOR CELL DEFECT (VERY FEW PERCENTAGE) OR BIG PROBLEM, WE CAN SEND REPLACEMENT BATTERY CELL OR NEW BATTERY DIRECTLY.

NOT COVERED BY WARRANTY:

1. DAMAGED CAUSED BY ACCIDENTS OR ACTS OF GOD.
2. LOSE TERMINAL BOLTS AND CORROSION.
3. FAILURE TO PROPERLY INSTALL THE BATTERY, MAINTAIN, & CHARGE.
4. FIRE, INTENSE HEAT, &FREEZING.
5. WATER DAMAGE AND MOISTURE.
6. TAMPERING OF THE BATTERY PACK.

ADDITIONAL

THANKS FOR CHOOSING OUR PRODUCTS. OUR COMPANY MAKES EVERY ATTEMPT TO VERIFY THAT ITS PRODUCTS ARE USED AND DESIGNED FOR YOUR APPLICATION.

FOR ADDITIONAL QUESTIONS OR CONCERNS PLEASE FEEL FREE TO CONTACT US AT OUR COMPANY.