

# OPERATING MANUAL

## LiFePO<sub>4</sub> Battery

**Additional information concerning important procedures and features of the battery.**

**Read all the instructions in this manual before installation, operation, transportation, storage and maintenance.**

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## 1. SAFETY

Do not throw in the garbage. Do not dispose in fire.

Use personal protective equipment when working with batteries.

Use special charger for LiFePO<sub>4</sub> Battery.

This 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 exposed contents.

#### 1.1 Do's

- ✓ Do note about all 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 battery carefully and secure battery safety

#### 1.2 Don'ts

- ✗ Do not operate or store battery outside of operating limits
- ✗ Do not short circuit battery
- ✗ Do not wear rings, watches, bracelets or necklaces when handling or working near battery
- ✗ Do not knock, drop, puncture or crush battery
- ✗ Do not expose battery to flames, incinerate or direct sunlight
- ✗ Do not open battery case or disassemble battery
- ✗ Do not lift battery by the terminal cables
- ✗ Do not vibrate battery
- ✗ Do not expose battery to water or other fluids
- ✗ Do not connect with other types of batteries
- ✗ Do not expose battery to high temperatures

## 2. INSTALLATION

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

## 2.1 Tools

- 1) Insulated tools sized to match nuts, bolts, and cables in use Voltmeter
- 2) Personal protective equipment

## 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 and corrosion
- 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 not objection to the goods.

## 2.4 Installation

- If the battery circuit has a disconnect, 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 – 7.7 Nm (5.1 – 5.7 ft-lb)
- Measure the open circuit voltage, which is to prevent the battery reverse or reverse during manufacturing

### NOTE!

Without exception, product experiencing terminal burn out will not be warranted.



## 3. OPERATING

### 3.1 Operating Environment

Charge Temperature(Min./Max.)	0 °C -45 °C
Discharge Temperature(Min./Max.)	-20 °C -60 °C
Humidity	10%-90%RH

### 3.2 Storage

Systems should be stored out of direct sunlight under the following temperature conditions.

Storage Temperature(Min./Max.)	-20 °C -45 °C
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Systems should be put into storage at 60% SOC and checked monthly to ensure the system SOC does not fall below 20%. At 20% SOC the battery will self discharge in approximately 2 months. Also check the voltage every 3 months and recycle every 6 months if the battery is not use for long time.

### 3.3 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 curve meets the battery's charging requirement; never charge a visibly damaged battery; never charge a frozen battery.

- 1) Connect the charger leads to the battery
- 2) Make sure that the charger lead, both at the charger and the battery side, connections are tight
- 3) Turn the charger on

### 3.4 Charge Curve

- 1) Charge at constant current(CC) to 3.65VDC every string (Bulk)
- 2) Maintain constant voltage(CV) 3.4VDC every string (Absorption)
- 3) Terminate when charge current drops below 0.05C
- 4) Max. charge voltage is 3.65VDC every string(over charge protection)



## CAUTION!

Recommended charging current is 0.5C, Max. 1.0C  
(should follow as the spec. sheet)

### 3.5 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

## 4. PROTECTION AND FAULTS

In the event of a fault the battery protection circuit will open its internal relay/mosfet disconnecting the negative battery terminals from the internal cells. 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	2.300±0.10V

## 5. SERVICE AND MAINTENANCE

Batteries should be carefully inspected on a regular basis in order to detect and correct potential problems. This routine should be started when the batteries are first received.

