LiFeBlue V3 Battery User Manual v1.1

Lithium Iron Phosphate Battery with Smart Monitoring

Ultimus App QR Code

Contents

1. Safety
1.1 Statement
1.2 Specification
1.3 Critical safety info.
1.4 Battery maintaining
1.5 Waste disposal
2. Installation
2.1 Tools and Equipment
2.2 Battery placement
2.3 Battery supporting materials
3. Introduction to V3 series batteries
3.1 Main features
3.2 Product appearance
3.3 Functional characteristics
3.4 First use
3.5 Heating function
4. Series and parallel connection of batteries
4.1 Introduction
4.2 Parallel usage
4.3 Serial usage
4.4 Simultaneous series and parallel
5. Charging requirements
5.1 AC-DC charger
5.2 Photovoltaic charging
5.3 Charging with an AC generator through a DC-DC charger
5.4 Recommended charging voltage
5.5 Passive balance function
6. Battery recycling
7. Transportation and Storage
8. Warnings and reminders

1. Safety

1.1 Statement

Please read this manual carefully before installation, operation, and maintenance, and pay attention to various warning signs and statements on the equipment. After reading this manual, please keep it properly for future reference.

1.2 Specification

This manual contains the following symbols that should be paid special attention to during operation.

Symbol	Statement
	Attention, caution, warning: Reminder of precautions during operation
	Danger, Reminder that there is a risk of electric shock during operation and protective measures need to be taken
	Explanation or reminder, Matters that require special explanation or reminder

1.3 Critical safety info.

Before installing, operating, or maintaining the battery, the following operating and maintenance instructions must be read.

Before installing

- It is very important and necessary to carefully read the user manual before installing or using the battery. Failure to follow any instructions or warnings in this document may result in electric shock, serious injury, or damage to the battery and the entire system.
- Before connecting the battery pack to your device, check the voltage and ensure that they are within the limits of your device specifications. Failure to comply with these specifications will void your warranty.

During installation:

- Personnel familiar with the electrical specifications of their country or region are required to install battery packs. For optimal safety, please follow the steps described in this manual.

Battery operation:

- Prohibit connecting batteries to different types of batteries；
- Do not use faulty or mismatched chargers to charge the battery；
- The environmental conditions specified in the product specification must be followed;
- If the battery is found to be deformed, abnormally hot, or emitting an odor, please immediately cut off the power and stop using it.

1.4 Battery maintaining

- Professional personnel should take care of the charging operation, ensure good contact between the plug and socket during the charging process, ensure normal operation of the charging equipment, and ensure good contact at all connection points of the battery pack. If there is an abnormality, it needs to be repaired before charging;
- If there is a large amount of dust, metal shavings, or other debris on the upper cover and pole of the battery pack, clean it with Vacuum cleaner in a timely manner and avoid using water or objects soaked in water for cleaning;
- Try to avoid splashing water or other conductive objects onto the battery cover and pole during charging and discharging, such as when exposed to heavy rain for use;
- Estimate the charging and discharging time of the battery or battery pack based on its actual usage status. Pay attention to observing whether there are any abnormalities in the battery or battery pack at the end of charging and discharging, such as voltage difference issues;
- Check whether the conductive strip, voltage collection terminal, and other nodes are loose, detached, rusted, or deformed, ensuring that the batteries used in series or parallel connection are fixed and reliable (once every 3 months);

1.5 Waste disposal

- Please handle packaging and replacement components in accordance with the laws and regulations of the country or region where the battery pack is located. Do not mix batteries with daily life.

2. Installation

2.1 Tools and Equipment

Insulating gloves

Safety shoes

Tool

2.2 Battery placement

Gently place the battery pack face up on the support surface, do not lay it on its side or upside down, and do not place any covers above the pack. The schematic diagram of battery pack placement is shown in Figure 3

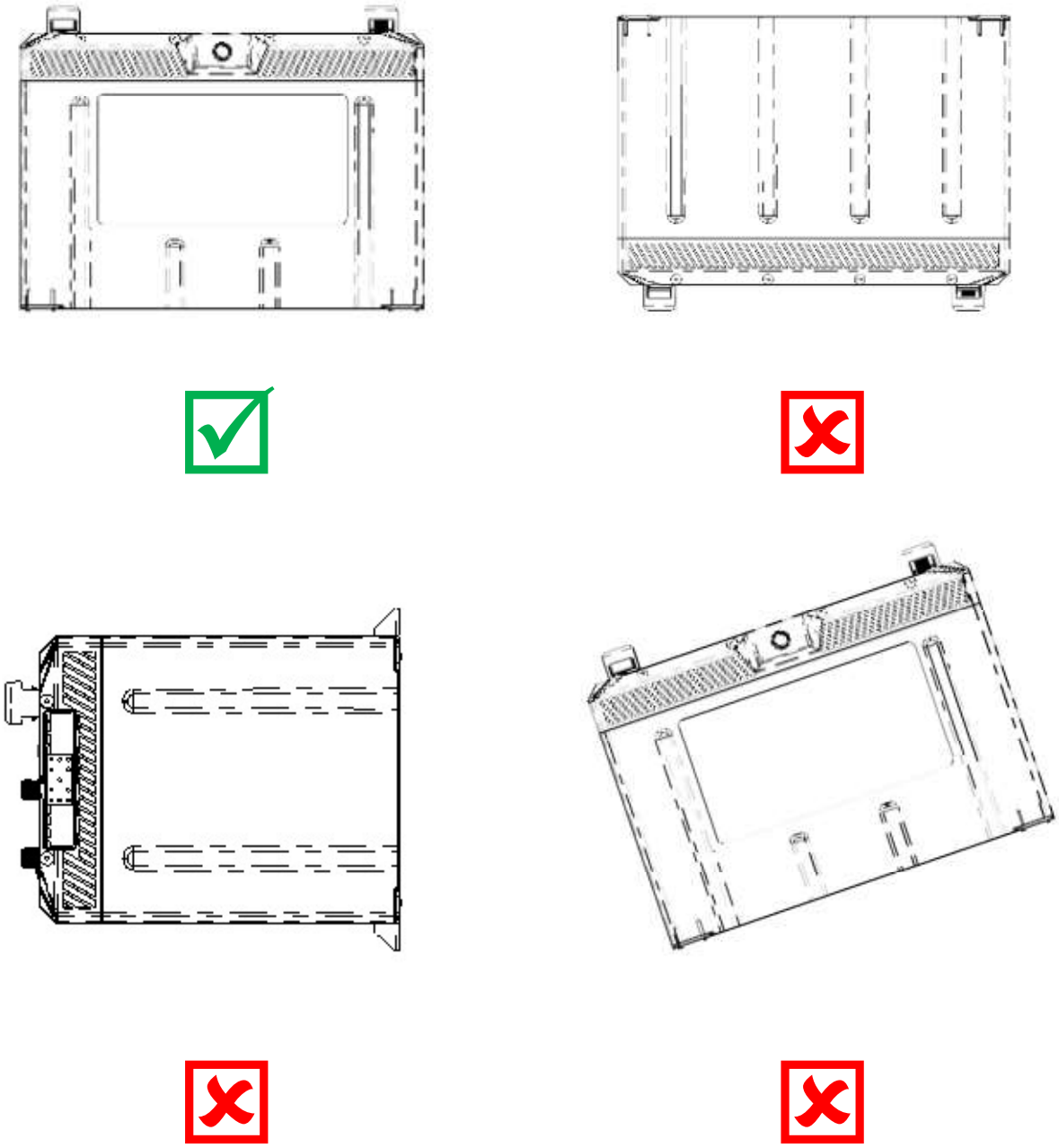


Figure 1 Installation and Placement Diagram

2.3 Battery supporting materials

Table 1: Material List

SN	Material Name	Chart	QTY/ pc	SPEC
1	Battery		1	12.8V100Ah 12.8V200Ah 12.8V300Ah
2	Screw		2	M8 * 12 stainless steel screw

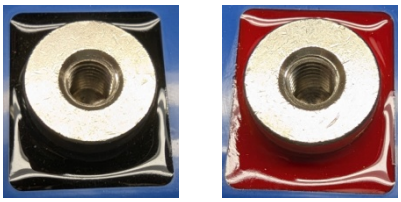
3. Introduction to V3 series batteries

3.1 Main features

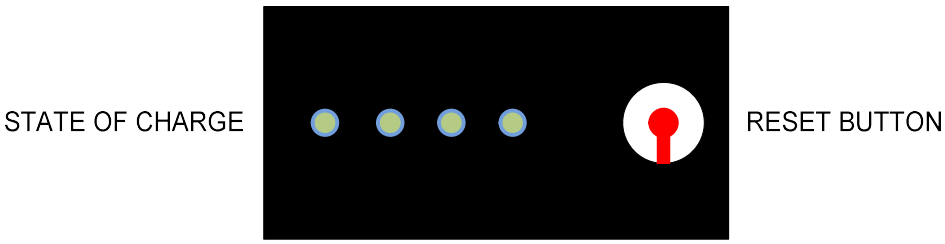
- LiFePO4 chemistry-providing excellent safety and lifespan
- High reliability
- Maintain consistent performance over a wide temperature range
- With higher heat dissipation effect, it can maintain high current charging and discharging of the battery for a longer time

3.2 Product appearance

Figure 2 Battery Appearance

No.	Component Description	Name	Statement
1		Pole	M8 Terminal
2		Panel	Check approx state charge, reset BMS
3		Handles	Included with 200AH and 300AH models
4	 	Label	Carefully read the label and use the battery correctly according to the label content

1. Pole terminal
    - Each battery has a positive terminal and a negative terminal. During use, be sure to identify and avoid reversing the positive and negative poles. After connecting the power line to the pole terminal, cover it with a protective cover to avoid short circuits.
2. Display panel



- Pressing the RESET button for 1 second will briefly display LED's, each LED represents approximately 25% charge.
- Pressing and holding the RESET button for 5 to 6 seconds will restart the BMS.
- The LED closest to the RESET button will briefly light when charge current is applied AND when connecting with the LiFeBlue or Ultimus Battery app.
- If the RESET button is pressed for 10 seconds or more, the battery will enter a state of unable to charge or discharge. To restore normal operation:
    - Press RESET button for 5 seconds.
    - Wait 5 minutes.
    - Press RESET button for 5 seconds.
- Many V3 batteries will go into hibernation mode after 15 days of non-use.
    - Lights, refrigerator, fan, etc… are "use" and will discharge the battery.

3. Handle
    - Handles are used to bear the weight of the battery when moving or lifting the battery.
4. Label
    - Labels include performance parameters and should be adhered to closely. During use, it is important to match the corresponding charger and load according to the label parameters to avoid battery failure.

3.3 Functional characteristics

Item	LB12100	LB12200	LB12300
Nominal voltage	12.8V		
Nominal energy	1280Wh	2560Wh	3840Wh
Nominal capacity	100Ah	200Ah	300Ah
Internal resistance@1khz AC	≤20mΩ		
Allowed MAX. charge current@25°C / 77°F	100A	150A	150A
Allowed MAX. discharge current@25°C / 77°F	150A	200A 30 min.	200A 30 min.
Recommend charge current	1A to 80A	1A to 120A	1A to 120A
Recommend discharge current	100A	150 Amps	150 Amps
Peak/Surge current limit	350A-3s	500A-3s	500A-3s
Short circuit current	500A-500μs	>500A-500μs	>500A-500μs

3.4 First use

1. Inspect the battery to ensure that there are no signs of the battery being disassembled.
2. All batteries should be fully charged prior to installation.
    - Fully charged means SOC=100% and battery is accepting <3A.

3.5 Heating function

- LT (Low Temperature) models are equipped with a built-in heater that is fully automatic. When charge current is applied and the battery temperature is below 0°C / 32°F, the built-in heater will automatically warm up the battery to approximately 5°C / 40°F and then switch to charging mode.
- Non-heated batteries will not accept charge current if the battery is below freezing.
- As noted in the table above, both types of batteries will operate down to -20°C / -4°F.

4. Series and parallel connection of batteries

4.1 Introduction

- The V3 battery allows multiple batteries to be connected in series or parallel, as well as simultaneously connected in series and parallel. This allows for the assembly of different voltage systems and the expansion of battery system capacity. For example, four 12.8V200Ah batteries can be connected in series and parallel to form a 25.6V400Ah battery system.

Before connecting batteries in series or parallel, please note:

- The batteries must be of the same model. Different models, different capacities, and different voltage platforms, series and parallel connection is not allowed
- Ensure that all parallel wires are the same size and length
- 0.5C charging is recommended, that is, charging current=rated capacity of battery * 0.5C;
- Before connecting the batteries in series and parallel, the voltage of each group of batteries must remain highly consistent. It is recommended that the voltage difference between battery packs be:
    - Voltage difference ＜500mV when battery batteries are connected in series and parallel, it will be charged and discharged as a whole system.
    - An external battery balancer is highly recommended for series systems.

4.2 Parallel usage

- A maximum of 16 batteries can be used in parallel. Before connecting batteries in parallel, a multi meter needs to be used to test the voltage between the positive and negative terminals of the battery. You can also check the battery voltage through the Bluetooth app to ensure that the voltage between the batteries does not exceed 0.5V, which can be connected in parallel. If the voltage between the batteries exceeds 0.5V, each battery needs to be fully charged separately, left for 1 hour, and then used in parallel.

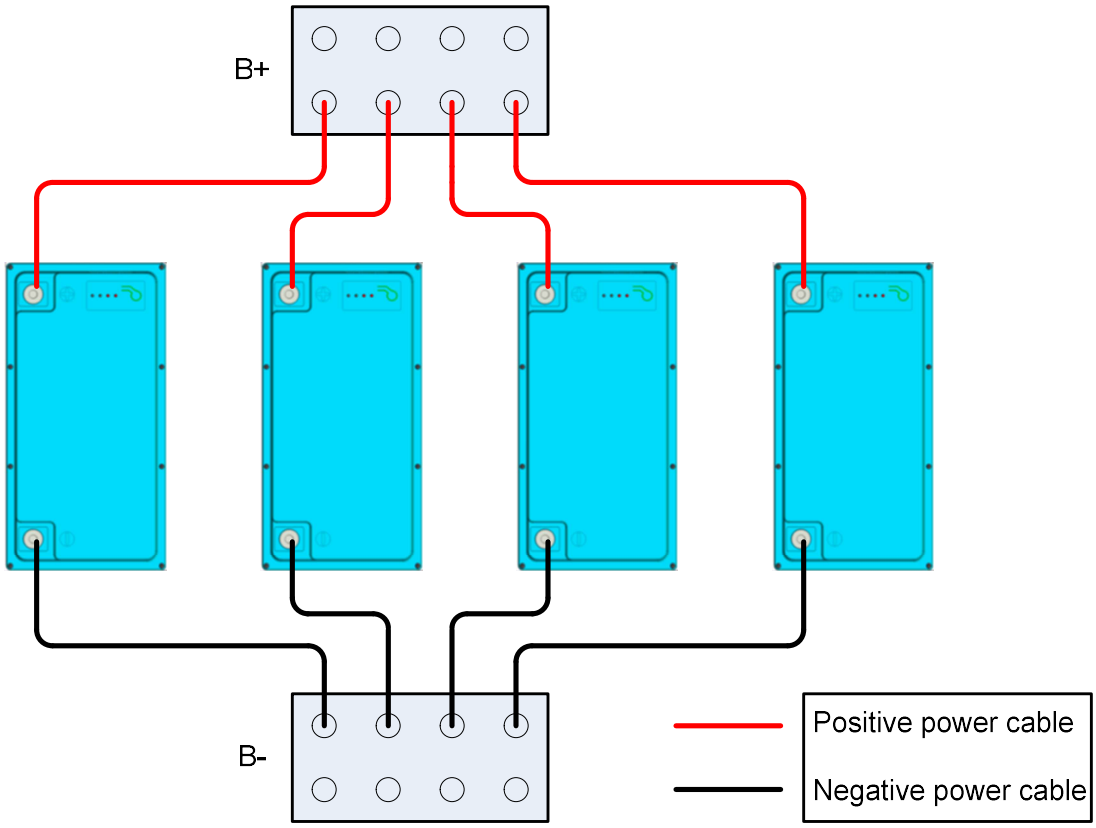
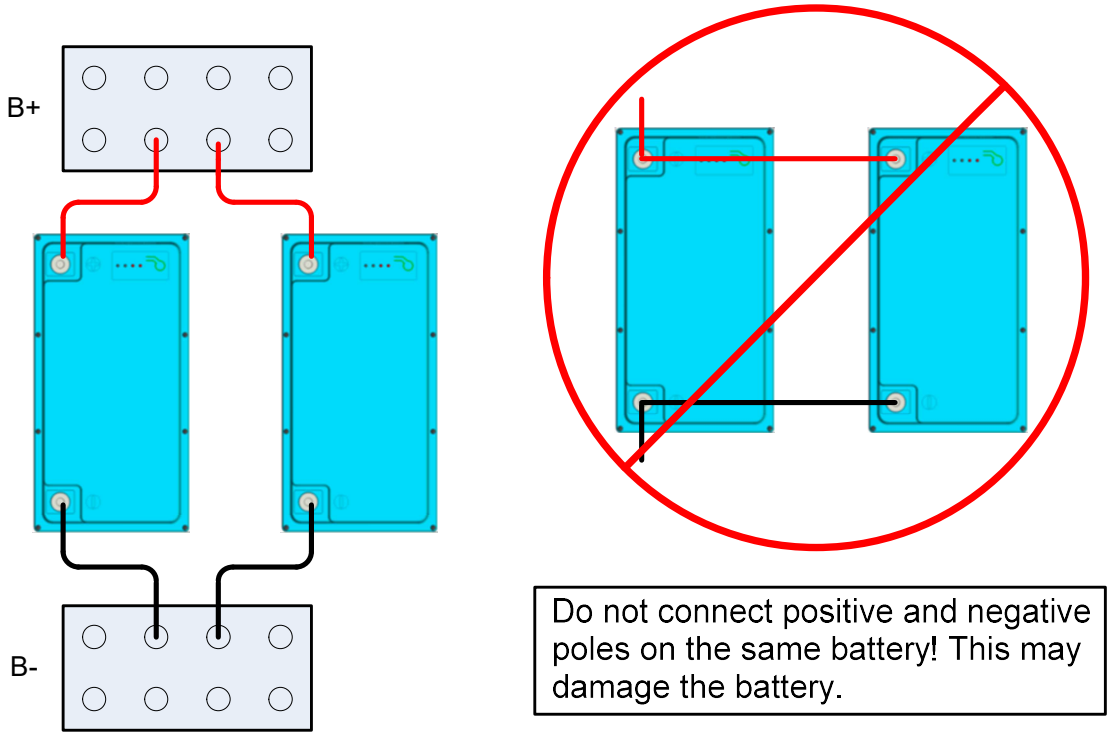


Chart 3：Wire chart
For example, two 12.8V100Ah are used in parallel



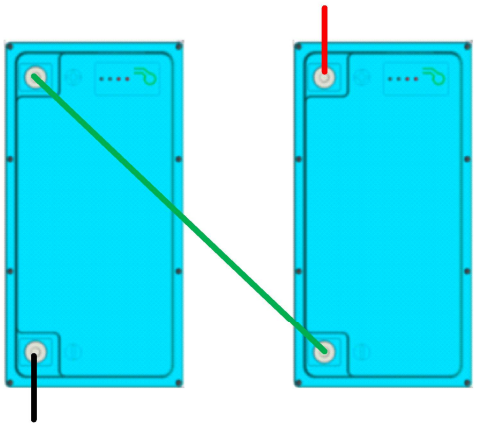
System voltage: 12.8V
System capacity:100Ah + 100Ah = 200Ah

4.3 Serial usage

- A maximum of 4 batteries can be used in series. Before connecting the batteries in series, confirm all batteries are within 500mV of each other. This confirmation can be with either a multi meter or the Ultimus Battery app. If the voltage difference exceeds 500mV, each battery needs to be fully charged separately, then left for 1 hour, and then used in series. Series connection method: Connect the positive pole of the battery to the negative pole of the next battery, and so on.

For example, two 12.8V100Ah batteries connected in series

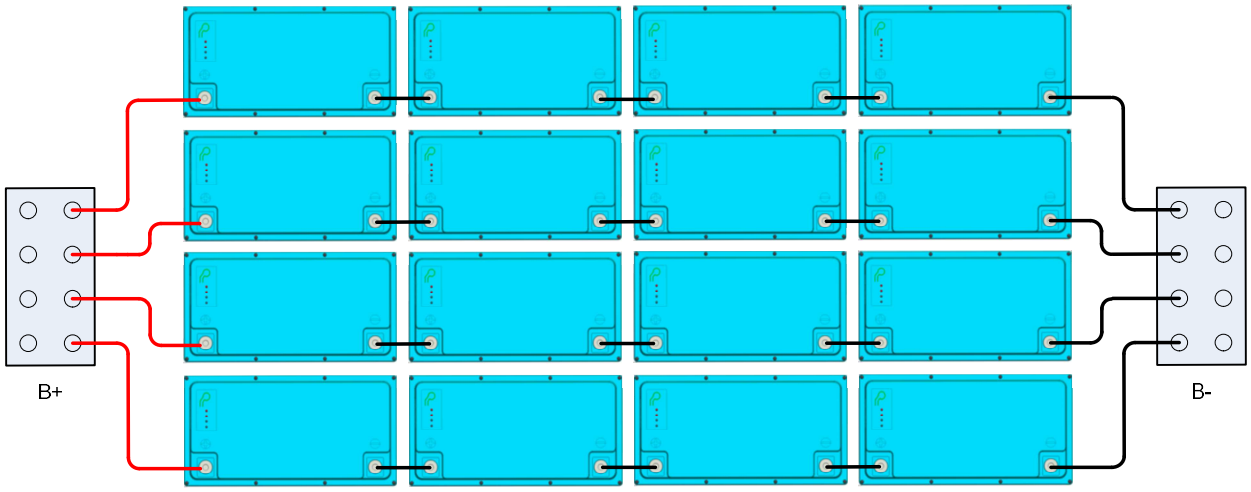
System voltage：12.8*2=25.6V
System capacity：100Ah



4.4 Simultaneous series and parallel

- V3 batteries allow simultaneous use of batteries in series and parallel, with a maximum support of 4 series and 4 parallel applications. The connection method is: **first in series, then in parallel**, which means that the batteries are connected in series to form a high voltage, and then in parallel to form a high capacity.

Series number	Allowed parallel number
1	16
2	4
3	4
4	4



- For example: 16 12.8V100Ah batteries, 4 in series&4 in parallel
- System voltage:12.8V * 4=51.2V
- System capacity: 100Ah * 4=400Ah

5. Charging requirements

- A charging source with specific lithium charging settings is often most convenient, although any charge source meeting the following charging requirements will achieve optimal performance and lifespan of LiFeBlue series batteries.

Model	Recommended Charge Voltage	Recommended float voltage	Max. Charge Current	Recommended Charge Current	Operation Temperature
48V	56.8V	55.2V	1C	0.5C	Charge:0~60°C Discharge:-20~65°C
36V	42.6V	41.4V			
24V	28.4V	27.6V			
12V	14.2V	13.8V			

Note: When necessary, heated batteries will heat before switching to charging mode.

5.1 AC-DC charger

- Check if the AC-DC battery charger you plan to use has a dedicated lithium charging setting that meets the above charging requirements. Many battery chargers are only designed to charge Lead–acid battery and may not have appropriate lithium charging settings.

5.2 Photovoltaic charging

- Check if the solar regulator you plan to use has a dedicated lithium charging setting that meets the above charging requirements. The LiFeBlue V3 batteries can be charged using a solar regulator without lithium charging settings. However, it must be set to charge no more than 58.4V (4 batteries in series, with a maximum charging voltage of no more than 14.6Vfor a single battery). After the battery is fully charged, please turn to the recommended floating voltage.

5.3 Charging with an AC generator through a DC-DC charger

- Check if the DC-DC charger you plan to use has a dedicated lithium charging setting that meets the above charging requirements. You can use a DC-DC charger without lithium charging settings to charge LiFeBlue batteries. However, it must be set to charge no more than 58.4V (4 batteries in series, with a maximum charging voltage of no more than 14.6V for a single battery), and then it must be turned off after the battery is fully charged. After the battery is fully charged, please turn to the recommended floating voltage.

5.4 Recommended charging voltage

- We strongly recommend a dedicated charger for lithium-ion batteries to better fully charge the battery. At the same time, according to the actual situation, AGM chargers can also be used to charge the battery, which can achieve varying degrees of effect.

5.5 Passive balance function

- When the battery is charged close to SOC 100%, due to the chemical characteristics of lithium batteries, the voltage difference between the cells will gradually expand. In order to ensure that each cell has the same capacity, slightly higher capacity cells will be consumed, which can allow the remaining cells to catch up.

6. Battery recycling

- LiFeBlue lithium iron phosphate batteries are recyclable and should not be treated as household waste or landfill waste. If you need assistance in recycling batteries, please contact your dealer or LiFeBlue Battery.

7. Transportation and Storage

- During transportation, there should be no severe vibration, impact, or compression, and it should be protected from sunlight and rain.
- Handle with care during loading and unloading, and strictly prevent falling, rolling, and heavy pressure.
- For long term storage, the battery should be stored in a dry, clean, dark and well ventilated indoor environment. The recommended storage temperature is 15~35 ℃.
- The storage area should be free of harmful gases, flammable and explosive materials, and corrosive chemicals.
- Batteries should be stored and transported at close to 50% SOC.
- If not used for a long time, the battery needs to be charged every 6 months according to the specifications.
- It is strictly prohibited to collapse, and the stacking should not exceed 6 layers, with the surface facing upwards.

8. Warnings and reminders

- Please carefully read the battery specifications or instructions before use. Improper use may cause the battery to heat up, catch fire, rupture, damage, or decrease capacity. LiFeBlue Battery shall not be responsible for any accidents caused by not following our operating instructions.

Warning!

- The battery must be kept away from heat sources, high voltage, and directly exposed to sunlight.
- Do not throw the battery into water or fire.
- Do not invert the two terminals when using the battery.
- Do not connect the positive and negative poles of the battery to the conductors.
- Do not strike, throw, or step on the battery.
- Do not disassemble the battery without the manufacturer's permission and guidance.
- Do not mix batteries of different capacities and brands;

Reminder:

- It is recommended to fully charge the battery every week to calibrate the battery SOC meter.
- When the battery is over discharged, please charge the battery in a timely manner (≤ 2 days).
- Please use a dedicated lithium battery charger to charge the battery.
- Please stop using the battery when it emits odor, heat, deformation, or any abnormalities occur
- Please place the battery away from children or pets.
- If the battery pack electrolyte leaks, please take the following steps immediately:
  1. Avoid contact with liquids or leaked gases.

2. Inhalation of gas: Evacuate personnel from the contaminated area and seek medical attention as soon as possible.
3. Eye contact: Rinse eyes with water for 15 minutes and seek medical attention as soon as possible.
4. Skin contact: Thoroughly rinse the exposed area with soap and water to ensure there are no chemicals or soap residues on it, and seek medical assistance as soon as possible.
5. Swallowing: Try to induce vomiting and seek medical attention as soon as possible.
6. Fire: Please use carbon dioxide fire extinguishers instead of liquid fire extinguishers to extinguish the fire.