LFP Series User Manual

Version 1.1

NPP Power Europe B.V.

September 22, 2025

Contents

1 Introduction

Dear customer,

Congratulations on your recent battery purchase. We appreciate your choice of our product and are committed to ensuring your satisfaction.

Welcome to the comprehensive User Manual for your LiFePO4 battery. This manual has been carefully prepared to provide you with essential information on the proper use, maintenance, and safety considerations for your battery. Whether you are a first-time user or seeking a refresher, this guide is designed to help you maximize the performance and lifespan of your battery.Inside this manual, you will find detailed instructions, safety guidelines, and valuable tips to ensure your experience with our LiFePO4 battery is both trouble-free and rewarding. Please take the time to read and familiarize yourself with the content provided, as it will empower you to make the most of your investment and use your battery with confidence.

2 Safety Precautions

2.1 General safety guidelines

- Carefully read these instructions and keep them readily accessible near the lithium battery for future reference.
- All work on the lithium battery should be performed exclusively by qualified personnel.
- Ensure that the lithium battery remains out of reach of children at all times.
- When working with the lithium battery, always wear appropriate protective eyewear and clothing.
- Take note of any warning signs or labels affixed to the battery. Do not remove or damage these warning labels.
- Exercise extreme care when handling lithium batteries.
- Before use, verify that the selected battery is suitable for the intended application and meets the power/load requirements.
- Ensure the battery is securely and correctly installed, and always use suitable transport equipment.
- Keep the LiFePO4 battery dry and, if possible, clean.

- Prevent any form of damage, including dropping, impact, drilling, scratching, compression, etc.
- Take note of the positive (+) and negative (-) terminals on the LiFePO4 battery, and always connect it with the correct polarity to avoid irreversible damage.
- Pay attention to the proper connection with the load.
- Never short-circuit the LiFePO4 battery.
- Avoid extremely deep discharges and high-charge currents. Always refer to the battery's datasheet.
- If the battery is equipped with Bluetooth® connectivity, download the app to monitor the battery's status and performance.
- Do not attempt to dismantle the battery, as it may result in overheating, smoking, ignition, or explosion. Always seek guidance from the manufacturer.
- The LiFePO4 battery pack is a non-repairable component. In case of any abnormal situations, please contact the after-sales department for assistance

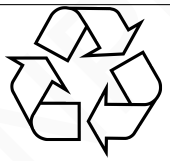
WARNING

- Be aware that the lithium battery terminals carry voltage. Never place any conductive objects or tools on the battery to prevent a short circuit. Always use insulated tools when necessary.
- Keep the battery away from heat sources, open flames, flammable materials, and any areas with explosive gases or liquids.
- If you notice any of the following conditions with the battery - unusual odours, excessive heat, deformation, or any other irregularities - cease using the battery immediately. Contact our after-sales department for further guidance.

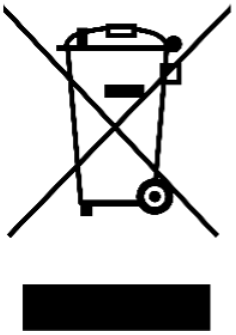
- In the event of a fire involving the battery, employ a type D, foam, or CO2 fire extinguisher to extinguish the flames.

These guidelines are crucial for ensuring the safe and reliable operation of your LiFePO4 battery. Your safety and the optimal performance of the battery depend on strict adherence to these instructions.

2.2 Identification

	Follow the instructions for safe use. Follow the instructions on the battery and in the user manual.
	Work with high attention!
	Electrical equipment, risk of electrical shock!
	Fire, open light and smoking are prohibited! Avoid sparks when handling cables and short circuits
	Misusing or mishandling a lithium-ion battery may cause fire or explosion, which can result in personal INJURY or DEATH and property damage!
	This product or parts of this product may be recycled.
	Certified according to the CE certification of electrical/electronic devices related to electromagnetic compatibility (EMC)

2.3 Recycling



Before sending LiFePo4 batteries for recycling, make sure to cover the terminals with a protective cap or non-conductive tape. Properly dispose of LiFePo4 batteries at a certified lithium recycling facility. After consulting with the manufacturer, you may also return the batteries to them for recycling. Please refrain from disposing of these batteries in household or industrial waste to support responsible and environmentally friendly recycling practices.

3 Scope of application

The LFP series batteries are versatile and suitable for a wide range of applications, including but not limited to:

- **Recreational Vehicles:** Ideal for motorhomes, caravans, and leisure appliances.
- **Renewable Energy Systems:** Well-suited for photovoltaic, solar, and other renewable energy installations.
- **Marine Applications:** Suitable for use in fishing, electric boat engines, and depth sounders.
- **Emergency Power:** Reliable for emergency power supply situations.
- **Uninterruptible Power Supplies (UPS):** Effective for ensuring uninterrupted power in critical applications.

- **Traction Vehicles:** Compatible with various types of vehicles utilizing traction batteries, including golf carts and warehouse vehicles.

Please ensure that the selected battery matches the specific power demands and load requirements of your intended application!

4 3. Installation of the battery

4.1 Receiving and unpacking

- Inspect the packaging for any signs of damage during transit. If you notice visible damage to the packaging, take photographs for documentation purposes before proceeding.
- Examine the batteries for any visible damage, such as dents, punctures, or leaks. If any damage is detected, do not use the battery, and contact the manufacturer or supplier immediately.
- Dispose of packaging materials in accordance with local regulations or recycling guidelines.
- Before installing the batteries, ensure you have the necessary equipment and tools for a safe and proper installation.

4.2 Location and mounting

- Whenever possible, install LiFePO4 batteries indoors or in a controlled environment to protect them from extreme temperatures, moisture, and direct sunlight.
- Ensure adequate ventilation in the installation area to dissipate any heat generated by the batteries. Proper airflow helps maintain the batteries at an optimal operating temperature.
- Securely mount the batteries on a stable, level, and vibration-resistant surface using appropriate brackets, racks, or mounting hardware. Ensure that the mounting structure can withstand the weight of the batteries.
- Locate the batteries away from sources of excessive vibrations or mechanical shocks to prevent damage.
- Position the batteries in a way that allows easy access for maintenance, inspections, and routine checks.

- Install the batteries in the orientation specified by the manufacturer, typically upright. Avoid installing them on their sides or upside down unless explicitly allowed in the manufacturer's guidelines.
- Ensure that battery terminals are protected against accidental short-circuits using appropriate terminal covers or insulating materials.
- Route cables and wiring neatly and securely to avoid strain, pinching, or damage. Use cable management solutions to organize and secure the wiring.
- Comply with all local regulations and building codes related to battery installation and safety.
- If you are uncertain about the installation process, consider hiring a qualified professional with experience in battery installations!

4.3 Electrical connections

- Select appropriately sized cables and connectors based on the battery's specifications, including current and voltage requirements.
- Double-check and ensure that the polarity of the battery terminals aligns correctly with the system's requirements.

WARNING! Connecting with reversed polarity will irreversibly damage the battery BMS system! Equipment may also be damaged!

- Use a torque wrench to tighten cable connections to the specified torque values in the battery datasheet. Proper torque ensures secure connections and minimizes the risk of overheating.
- Use proper crimping or soldering techniques for cable terminations, following industry best practices and guidelines.
- Install overcurrent protection devices, such as fuses or circuit breakers, in line with the battery to safeguard against excessive current draw.

- Regularly inspect and tighten cable connections to prevent loosening due to vibrations or temperature variations.
- Comply with relevant electrical codes and standards applicable to your installation.

4.4 Series & Parralel Connection Rules

General Balancing Rule

- Before putting batteries into service, make sure the voltage difference between any two batteries does not exceed 50 mV (0.05 V).
- If imbalance occurs (one battery differs by more than 50 mV from another), recharge each battery individually until voltages are equalized and wait for 1 hour before connecting them together.
- When using batteries in a series connection, it is recommended to install a battery equalizer to maintain balanced voltage across all units and ensure consistent performance. For connecting the battery equalizer, please refer to its User Manual.

Series connection:

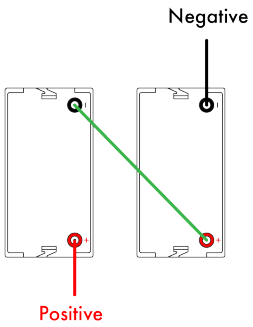
- 12V models: Up to 4 units may be connected in series.
- 24V models: Up to 2 units may be connected in series.
- 36V and 48V models: Designed for standalone use and must not be connected in series.

Parallel Connection:

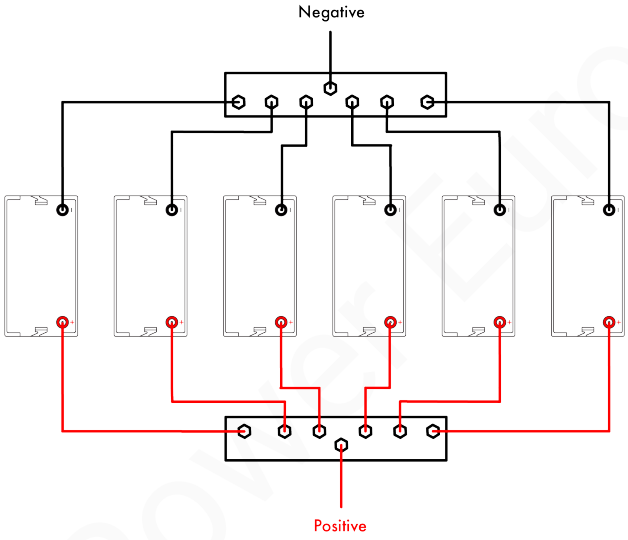
- When connecting batteries in parallel, the capacity (Ah) increases in direct proportion to the number of batteries (2×, 3×, 4×, etc.).
- The charge and discharge current capability, however, only increases by about 75% of the multiple (1.5×, 2.25×, 3×, etc.).

Example: A 12.8V 100Ah LFP battery supports a continuous discharge of 100A. When two are connected in parallel, the maximum continuous discharge increases to approximately 150A.

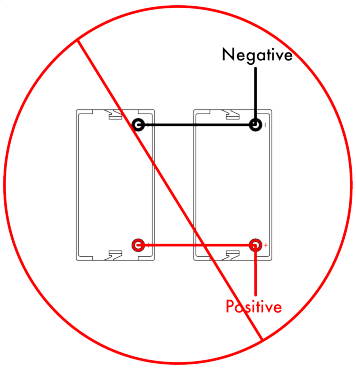
- 12V, 24V, 36V and 48V models: Support up to 6 units in parallel.



Series Connection



Parallel Connection - Always use a busbar for connecting the batteries in parallel!



WARNING! Do not connect both the positive and negative output terminals to the same battery. This incorrect wiring may cause battery damage, overheating, or even fire. Always follow the official connection diagrams when installing.

5 Operation

5.1 Charging

- Please use a special charger for the LiFePO4 battery which matches the specific battery parameters.
- The proper continuous charging current is from 0.2CA to 0.5CA. For best performance, charge as follows: 0.2CA Constant Current to 14.6V, then Constant Voltage of 14.6V, until the current drops to 0.02CA. Rest 30 min before use.
- Please refer to the battery datasheet for more information about charging.
- Charge the battery under the environment temperature range from 0°C to 45°C. Try to keep the temperature close to 25°C for best performance/lifespan ratio. Note that due to internal protection, the battery will not charge under temperatures below 0°C.
- The battery is equipped with overcharge protection which will trigger when the battery reaches 100% charge.
- After the initial charge, perform a capacity check to ensure the battery is functioning within the expected parameters.

5.2 Discharging

- Ensure that the connected load or device is compatible with the battery's voltage and current output specifications.
- Please refer to your battery datasheet for the maximum rate of discharge for your specific battery model.
- LiFePO4 batteries can be discharged up to 100% of their capacity. However, to optimize the performance of your LiFePo4 battery, and to avoid the BMS disconnecting the battery, we recommend limiting the discharge to 80%.
- Set a voltage cutoff threshold to disconnect the load or device from the battery when it reaches a predetermined minimum voltage. This prevents over-discharge.
- Discharge the battery under the environment temperature range from -20°C to 60°C. Try to keep the temperature close to 25°C for best performance/lifespan ratio.
- The battery is equipped with over-discharge protection which will trigger if the voltage of the battery reaches a certain value.

- Recharge the LiFePO4 battery promptly after discharging to a safe DoD level. Avoid leaving the battery in a deeply discharged state for an extended period.

5.3 Storage

- Store the battery in a clean and dry environment within a temperature range of -10°C to 45°C. Avoid storage in conditions exceeding 50°C, as it can lead to overheating, potential fire hazards, or reduced lifespan. Ideally, maintain the temperature close to 25°C for optimal performance and longevity.
- The recommended state of charge for battery storage is around 50%. Over time, lithium batteries self-discharge, especially if they are equipped with Bluetooth® connectivity! Avoid long-term storage with a remaining capacity below 10% or above 90%, as this can result in irreversible damage.

WARNING! If the battery remains at a 0% state of charge for an extended period, the cell voltage may decline to a level where the Battery Management System (BMS) cannot function. In such cases, the battery will become inoperable. Please be aware that this type of damage is not covered by the warranty! Charge the battery immidiately if it reaches 0% state of charge!

- If an unused battery is connected to an appliance but not in use, limit the storage period to a maximum of 3 months. After this period, the battery may degrade and should be recharged. We recommend always disconnecting the battery from the load during prolonged periods of non-use, if possible.
- For new batteries charged to 50% of their capacity, the maximum recommended storage period is 6 months. After this duration, the battery could experience damage and should be recharged.
- Ensure the battery is kept away from situations where it could fall. Falls can cause internal damage, and potential leakage, and even lead to overheating, smoke, fires, or explosions.
- Avoid using or storing the battery in areas with strong electrostatic or magnetic fields. These environments may disrupt the battery's safety protection devices, posing safety hazards.

- If the battery is stored outside of its original packaging, cover the terminals with insulating materials to prevent accidental short circuits.

6 Transportation

- Always transport the battery in its original packaging or an approved container designed for battery transportation. Secure the battery to prevent movement during transit.
- Avoid exposing the battery to extreme temperatures during transportation. High temperatures can lead to overheating, while extreme cold can affect performance. The maximum temperature during transportation should be below 50°C.
- Handle the battery with care during loading and unloading to prevent physical damage or impact.
- Ensure that you have the necessary documentation for transporting lithium batteries, including compliance with transport regulations and safety standards.
- Be prepared for emergencies. Have suitable fire extinguishing equipment (e.g., type D, foam, or CO2 extinguishers) readily available in case of a battery-related incident.
- Keep all relevant product documentation, including user manuals and safety information, readily accessible during transport.

7 Technical Support

Our commitment to providing excellent technical support is a top priority. Should you encounter any issues or require assistance with your LiFePO4 battery, please refer to the following resources:

- Start by referring to the product documentation provided with your battery, including the datasheet, user manual and safety guidelines. These documents contain valuable information about usage, maintenance, and troubleshooting.
- If your battery is covered under warranty, review the warranty terms and conditions provided with your purchase. Ensure that any potential issues fall within the scope of warranty coverage.

- Our dedicated customer support team is available to assist you with technical inquiries and concerns. You can reach us via phone, email, or our online support portal during regular business hours. Our contact details are available below or on our website.

NPP Power Europe B.V.
Address: Brouwerstraat 30, 2984AR Ridderkerk. The Netherlands
Email: support@npp-power.eu
Website: www.npp-power.eu
Tel.+31 88 888 2999

8 Notes to manual users

- This Operational Manual is intended for the safe and efficient operation of LiFePO4 batteries contained within VRLA battery containers. Please read and understand the contents of this manual thoroughly before installation and use.
- Adherence to the safety precautions and operational guidelines outlined in this manual is essential to ensure the longevity and performance of the batteries and to prevent accidents.
- Any maintenance or service procedures should be carried out by qualified personnel
- For specific product details and compatibility, refer to the product's individual datasheet or specifications.