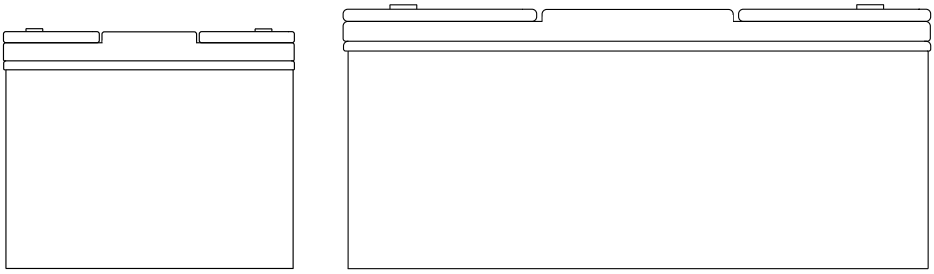
FOXYGEN

LiFePO4 Battery
USER MANUAL



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Contents

Introduction

This manual contains information about the LiFePO4 Batteries and their installation. Please make sure you read and fully understand this manual before purchasing and installing the batteries to ensure that you use them correctly.

Any incorrect usage may result in severe injury to the user or others, damage to the product or loss of property. If you have any questions, please do not hesitate to contact us for further clarification and explanation.

When installing LiFePO4 Batteries, installers should follow all safety precautions specified in this manual and any local regulations. Before installing LiFePO4 Battery systems, installers should be familiar with the mechanical and electrical requirements of such systems.

Battery Inspection

- Upon receiving the battery, inspect the packaging carefully. Ensure that no shock or impact has occurred during transportation.
- Check the battery casing and accessories for any visible damage or leakage. If any issues are found, contact your dealer immediately.
- Verify that the output connector is correct and measure the voltage between the positive and negative terminals to ensure it is within the normal range.

Disclaimer

The use of this manual, as well as the conditions or methods for the installation, operation, use, and maintenance of LiFePO4 Battery products, may fall outside our control. We accept no responsibility for any nonstandard installations or operations and expressly disclaim any liability for loss, damage, or maintenance requirements resulting from or related to such use.

We are not liable for any infringement of third-party patents or other rights arising from the use of installation methods, accessories, or components not provided by our company. The information and installation examples in this manual are based on our own and our partners' knowledge and experience, and are provided in good faith. However, the limitations and recommendations included—such as product specifications—do not constitute any express or implied warranty.

Before using this product, please read both the User Manual and this disclaimer carefully. By using the product, you acknowledge, understand, and accept all the terms contained in this document. The user is solely responsible for their actions and any resulting consequences.

We disclaim all liability for any losses arising from failure to use the product in accordance with the User Manual. The company reserves the right to interpret this document and any related documents, in compliance with applicable laws and regulations.

We may update, revise, or terminate the contents of this document as necessary, without prior notice. For the most current information, please refer to our official website.

Safety Precautions

Please follow these guidelines to avoid battery leakage, heat generation, fire, or other hazards:

- Do not immerse the battery in water or seawater.
- Store in a cool, dry place when not in use.
- Do not expose the battery to high temperatures, fire, or heaters.
- Do not reverse the battery terminals or charging polarity.
- Do not connect battery electrodes directly to a power outlet.
- Avoid short-circuiting the battery.
- Do not store or transport the battery with metal objects (e.g., hairpins, necklaces).
- Do not strike, drop, or shock the battery.
- Do not pierce the battery or solder directly to it.
- Avoid using the battery near static electricity or magnetic fields.
- Do not connect battery packs in series or parallel unless specified.
- Do not overload the battery.
- Use only the recommended charger.
- Charge the battery within 12 hours after use.

If electrolyte contacts eyes, rinse with clean water and seek medical attention immediately.

Stop using the battery immediately if it emits an odor, becomes hot, discolored, deformed, or behaves abnormally.

Clean dirty or oxidized terminals with a dry cloth before use.

Tape the terminals of discarded batteries to insulate them properly.

Installation Procedures and Precautions

- Do not smoke or use open flames during installation to prevent the risk of fire or injury.
- Install the battery in a well-ventilated area, away from direct sunlight and potential flooding.
- Avoid over-tightening the battery terminals as this may cause damage.
- Clean the battery surface with a dry cloth only. Do not use oil or volatile organic solvents.
- Ensure correct polarity when connecting: positive (+) to positive, negative (-) to negative. Incorrect connections can cause fire or damage to the battery and equipment.
- Once installed, test the equipment to confirm proper operation with the battery.

Pre-Installation Requirements

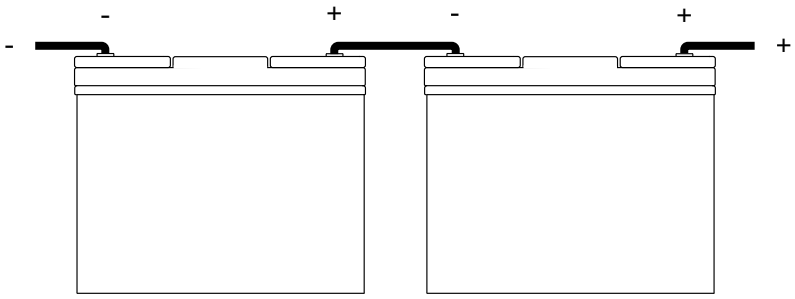
Ensure that the LiFePO4 Battery complies with general system technical requirements and that other system components do not damage the LiFePO4 Batteries mechanically or electrically.

LiFePO4 Batteries can be connected in series to increase voltage or in parallel to increase capacity (Amps).

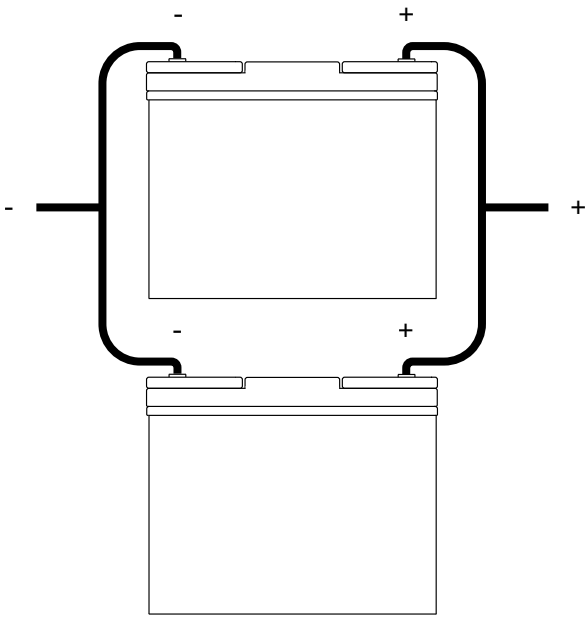
In a series connection, the positive terminal of one battery is connected to the negative terminal of the second battery. The Voltage doubles and the Capacity (Amps) stays the same.

In a parallel connection, the positive terminal of one battery is connected to the positive terminal of the second battery. The negative terminal of one battery is connected to the negative terminal of the second battery. The Capacity (Amps) doubles and the Voltage stays the same.

A series connection is shown in the diagram:



A parallel connection is shown in the diagram:



Battery Usage and Maintenance

Charging:

- The charging current must not exceed the maximum specified in the Product Specification. Overcharging may damage the battery.
- Charging temperature range: -20°C to +60°C. Relative humidity: ⩽85%. Ensure ventilation above 45°C and protection above 85% humidity.

Discharging:

- Discharging current must remain below the maximum specified in the Product Specification.
- Discharge temperature range: -20°C to +60°C. Relative humidity: ⩽85%. Ventilation and protection are needed as above.

Storage:

- Store within -5°C to +45°C (recommended: 15°C to 25°C, in a dry environment).
- Charge the battery promptly when power is low to prolong cycle life. Continuous under-voltage can reduce battery life.

General Maintenance:

- Shallow charge/discharge cycles help to extend cycle life. Discharge to about 80% of nominal capacity is recommended.
- Due to self-discharge, long-term unused batteries may over-discharge. To prevent this, charge every 2 months (maintain 13.2V–13.6V). For batteries with communication functions, charge once per month.
- Do not use organic solvents to clean the battery.
- In the event of a fire, use a dry powder extinguisher or sand.
- Battery performance will degrade over time. If capacity drops below requirements, recharge promptly to avoid reduced cycle life.

Commissioning and Troubleshooting

A. Battery Voltage is Low After Full Charge

Possible Causes & Solutions:

Long-Term Storage Without Proper Maintenance

Solution: Recharge the battery to restore operational voltage. Extended storage without periodic maintenance charging can lead to deep discharge and reduced performance. Regular maintenance charging is recommended to preserve battery health.

Internal Fault

Solution: If an internal fault is suspected within the battery, contact an authorised dealer to schedule diagnostic testing. Do not attempt to disassemble or open the battery, as doing so will void the manufacturer's warranty and may pose safety risks.

Malfunctioning Protection Circuit

Solution: Verify that all cable connections are secure. Measure the voltage between B+ and B−, and between P+ and P−. A significant voltage discrepancy between these points may indicate a fault in the protection circuit. If confirmed, replace the protection board.

Physical Damage or Leakage

Solution: This condition typically falls outside the scope of standard maintenance. Visually inspect the battery casing for signs of physical damage or leakage. If the casing is pierced or otherwise irreparably compromised, discontinue use immediately and follow proper disposal procedures. Note that such damage will void the manufacturer's warranty.

B. Capacity Below Expected

Solution: Perform 3 to 5 complete charge–discharge cycles to recalibrate the battery's state-of-charge (SOC) estimation and restore optimal performance.

C. Battery Charges but Cannot Discharge (or Vice Versa)

Cause: Failure of the protection circuit, such as a blown fuse or faulty switching component.

Solution: Replace the protection circuit or fuse as required. Ensure proper diagnostics are performed to confirm the root cause before replacement.

D. Battery Voltage Instability or Charging/Discharging Failure

Possible Causes & Solutions:

Poor Connections or Crimping

Solution: Measure internal resistance using a milliohm meter. If resistance exceeds acceptable limits, verify torque settings and re-torque as necessary. If the issue persists, re-crimp suspect connections and ensure proper reconnection.

Defective Protection Circuit

Solution: Replace the protection circuit or associated fuse components. Perform diagnostic checks to confirm circuit failure prior to replacement.

Poor Connector or Terminal Contact

Solution: Inspect for corrosion, wear, or looseness. Replace connectors or terminals as needed to ensure reliable electrical contact.

Product Specification

105Ah LiFePO4 Battery

Electrical Specifications:
- Nominal Voltage: 12.8V
- Nominal Capacity: 105Ah
- Parallel Connection: Max 6 Units
- Series Connection: Max 4 Units
- BMS: 4S100A
- Bluetooth: Android/iOS
- Heat: Yes (Switchable)
- Circuit Protection: Overcharge, Overdischarge, Overcurrent, Over Temperature, Short Balance, Low temp
- Cycle Life: 6000 times @80% DOD
- Self Discharge: Less than 3% per month
- Charge Efficiency: 100% @0.2C
- Discharge Efficiency: 98-100% @1C

Charge Specifications:
- Charge Voltage: 14.4 ± 0.2V
- Standard Current: 21A
- Fast Current: 62.5A

Discharge Specifications:
- Standard Current: 21A
- Max Continuous Current: 100A
- Cut-Off Voltage: 10V

Mechanical Specifications:
- Dimensions: 260mm x 170mm x 208mm
- Approx. Weight: 10.5 kg
- Terminal Type: M8
- Case Colour/Material: Black Plastic Case (ABS)
- IP Rating: IP65
- Cell Type: 3.2V 105Ah Prismatic Cell
- Cell Configuration: 4S1P

Temperature Specifications:
- Charge Temp: -20°C to 55°C (-4°F to 140°F)
- Discharge Temp: -20°C to 60°C (-4°F to 140°F)
- Storage Temp: -5°C to 45°C (23°F to 113°F)

230Ah LiFePO4 Battery

Electrical Specifications:

- Nominal Voltage: 12.8V
- Nominal Capacity: 230Ah
- Parallel Connection: Max 6 Units
- Series Connection: Max 4 Units
- BMS: 4S250A
- Bluetooth: Android/iOS
- Heat: Yes (Switchable)
- Circuit Protection: Overcharge, Overdischarge, Overcurrent, Over Temperature, Short Balance, Low temp
- Cycle Life: 6000 times @80% DOD
- Self Discharge: Less than 3% per month
- Charge Efficiency: 100% @0.2C
- Discharge Efficiency: 98-100% @1C

Charge Specifications:

- Charge Voltage: 14.4 ± 0.2V
- Standard Current: 46A
- Fast Current: 115A

Discharge Specifications:

- Standard Current: 46A
- Max Continuous Current: 250A
- Cut-Off Voltage: 10V

Mechanical Specifications:

- Dimensions: 367mm x 190mm x 245mm
- Approx. Weight: 20 kg
- Terminal Type: M8
- Case Colour/Material: Black Plastic Case (ABS)
- IP Rating: IP65
- Cell Type: 3.2V 230Ah Prismatic Cell
- Cell Configuration: 4S1P

Temperature Specifications:

- Charge Temp: -20°C to 55°C (-4°F to 140°F)
- Discharge Temp: -20°C to 60°C (-4°F to 140°F)
- Storage Temp: -5°C to 45°C (23°F to 113°F)

300Ah LiFePO4 Battery

Electrical Specifications:

- Nominal Voltage: 12.8V
- Nominal Capacity: 300Ah
- Parallel Connection: Max 6 Units
- Series Connection: Max 4 Units
- BMS: 4S250A
- Bluetooth: Android/iOS
- Heat: Yes (Switchable)
- Circuit Protection: Overcharge, Overdischarge, Overcurrent, Over Temperature, Short Balance, Low temp
- Cycle Life: 6000 times @80% DOD
- Self Discharge: Less than 3% per month
- Charge Efficiency: 100% @0.2C
- Discharge Efficiency: 98-100% @1C

Charge Specifications:

- Charge Voltage: 14.4 ± 0.2V
- Standard Current: 60A
- Fast Current: 150A

Discharge Specifications:

- Standard Current: 60A
- Max Continuous Current: 250A
- Cut-Off Voltage: 10V

Mechanical Specifications:

- Dimensions: 367mm x 190mm x 245mm
- Approx. Weight: 25.5 kg
- Terminal Type: M8
- Case Colour/Material: Black Plastic Case (ABS)
- IP Rating: IP65
- Cell Type: 3.2V 304Ah Prismatic Cell
- Cell Configuration: 4S1P

Temperature Specifications:

- Charge Temp: -20°C to 55°C (-4°F to 140°F)
- Discharge Temp: -20°C to 60°C (-4°F to 140°F)
- Storage Temp: -5°C to 45°C (23°F to 113°F)

460Ah LiFePO4 Battery

Electrical Specifications:

- Nominal Voltage: 12.8V
- Nominal Capacity: 460Ah
- Parallel Connection: Max 6 Units
- Series Connection: Max 4 Units
- BMS: 4S250A
- Bluetooth: Android/iOS
- Heat: Yes (Switchable)
- Circuit Protection: Overcharge, Overdischarge, Overcurrent, Over Temperature, Short Balance, Low temp
- Cycle Life: 6000 times @80% DOD
- Self Discharge: Less than 3% per month
- Charge Efficiency: 100% @0.2C
- Discharge Efficiency: 98-100% @1C

Charge Specifications:

- Charge Voltage: 14.4 ± 0.2V
- Standard Current: 92A
- Fast Current: 230A

Discharge Specifications:

- Standard Current: 92A
- Max Continuous Current: 250A
- Cut-Off Voltage: 10V

Mechanical Specifications:

- Dimensions: 521mm x 238mm x 218mm
- Approx. Weight: 38 kg
- Terminal Type: M8
- Case Colour/Material: Black Plastic Case (ABS)
- IP Rating: IP65
- Cell Type: 3.2V 230Ah Prismatic Cell
- Cell Configuration: 4S2P

Temperature Specifications:

- Charge Temp: -20°C to 55°C (-4°F to 140°F)
- Discharge Temp: -20°C to 60°C (-4°F to 140°F)
- Storage Temp: -5°C to 45°C (23°F to 113°F)

The Foxygen App

Connecting to the App

Step 1 - Download the App
Scan the QR code to visit our website.
Select your phone's operating system (iOS or Android).
Simply download and install the Foxygen App.

Step 2 - Connect to your battery
Ensure your phone's Bluetooth and Location Services are turned on.
Open the Foxygen App – it will begin scanning for nearby devices.
Once your battery appears, select your Foxygen Battery from the list.
Wait a few moments while your phone and battery establish a connection.

For more information visit our website: www.foxygen.co.uk/app-download