ECI Power ECI12400BT

ECI Power 12V 400Ah Lithium LiFePO4 Deep Cycle Rechargeable Battery Instruction Manual

Model: ECI12400BT

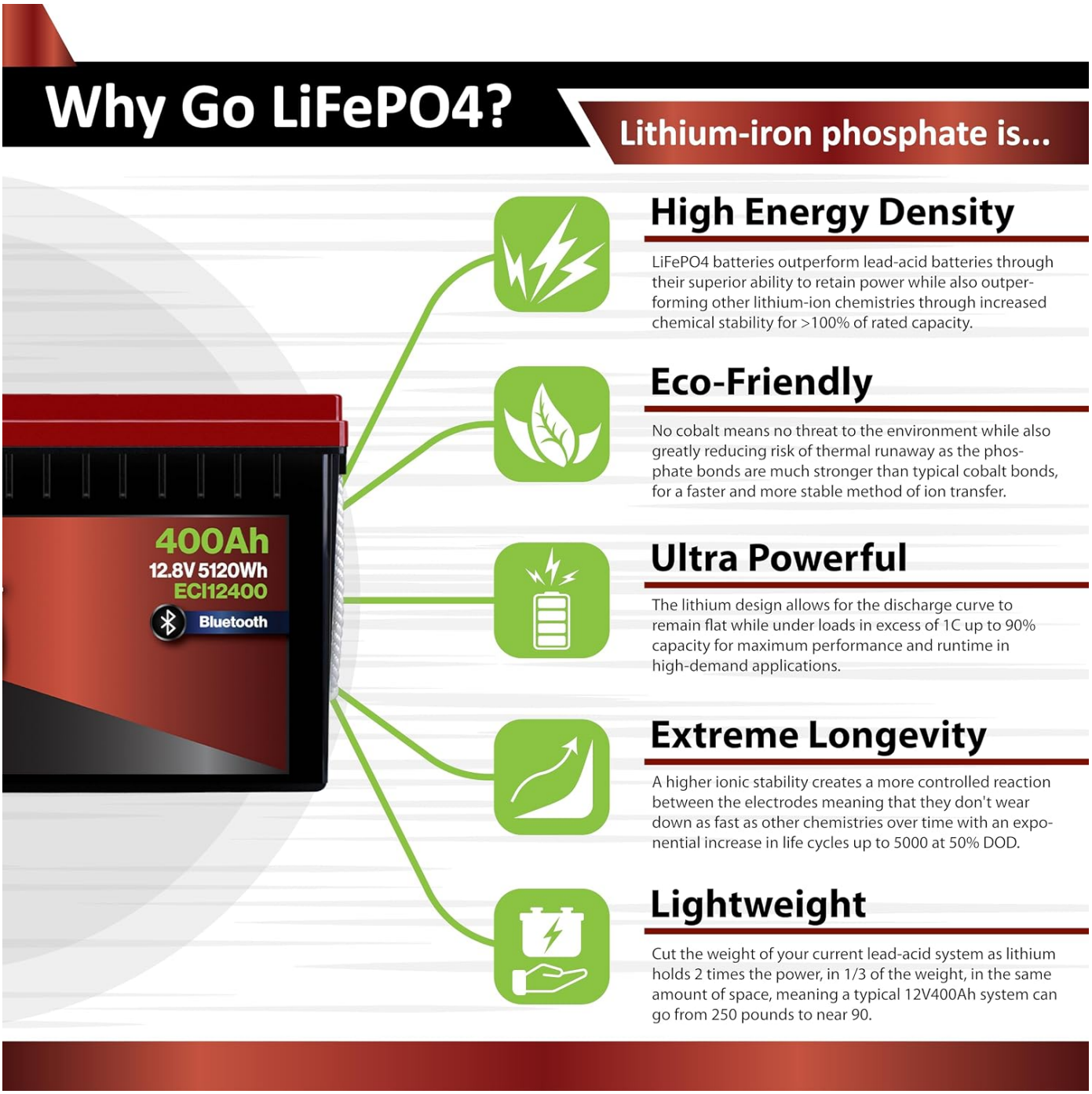
Introduction

This manual provides essential information for the safe and efficient operation of your ECI Power 12V 400Ah Lithium LiFePO4 Deep Cycle Rechargeable Battery. Please read this manual thoroughly before installation or use to ensure optimal performance and longevity of your battery.

Key Features

- Built-in Battery Management System (BMS) for comprehensive protection.
- Integrated Bluetooth for real-time monitoring via a smartphone application.
- Supports expansion up to 4 batteries in series (48V 400Ah) or parallel (12V 4000Ah).
- Utilizes UL1642 listed LiFePO4 Grade-A cells for proven quality.
- Designed for 3500-7000 life cycles, offering a 10-year lifetime.
- Built-in low-temperature cut-off to prevent charging below 23 °F (-5 °C).

Why Choose LiFePO4?



Lithium Iron Phosphate (LiFePO4) batteries offer several advantages over traditional lead-acid batteries:

- **High Energy Density:** Superior performance in retaining power.
- **Eco-Friendly:** Reduced risk of thermal runaway and stable ion transfer.
- **Ultra Powerful:** Flat discharge curve for maximum performance under load.
- **Extreme Longevity:** High ionic stability for extended life cycles (up to 7000 cycles at 50% DOD).
- **Lightweight:** Significantly lighter than comparable lead-acid batteries.

Specifications

Attribute	Value
Brand	ECI Power
Model Number	ECI12400BT

Voltage	12V
Capacity	400Ah
Item Weight	82 pounds
Terminal Type	Button Terminal
Life Cycles	2000-5000 (min 3500 cycles at 80% DOD, max 7000 cycles at 50% DOD)
Lifetime	10 Years
Built-in BMS	Yes (Overcharge, Deep Discharge, Overloading, Overheating, Short Circuit Protection, Low-Temp Cut-off)

Physical Dimensions



The ECI Power 12V 400Ah battery has the following approximate dimensions:

- **Dimensions (L x W x H):** 20.47 x 10.59 x 8.66 inches
- **Weight:** 80 lbs
- **Terminal Type:** M8

Setup and Installation

Important Prerequisites for Battery Connection

Before connecting multiple batteries in series or parallel, ensure the following conditions are met:

- All batteries must have identical specifications (type, capacity, voltage, and BMS).
- All batteries should be from the same brand.
- Batteries should be purchased within one month of each other.
- Fully charge and balance each battery separately before connecting them to maintain a constant voltage across the entire system.
- Ensure the PVC wire thickness meets the requirements of your entire battery system. Refer to the user manual for recommended cable sizing.
- Always wear insulated gloves during installation.

Series and Parallel Connection Overview



The ECI Power LiFePO4 battery supports expansion up to 4 batteries in either series (for higher voltage) or parallel (for higher amperage/capacity).
For detailed visual instructions on series and parallel connections, please refer to the video below:

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Video: Battery Series and Battery Parallel - Guideline Notes. This video demonstrates the correct procedures for connecting LiFePO4 batteries in series and parallel configurations, including necessary tools and safety precautions.

Parallel Connection Steps

1. Use copper bus bars to balance input and output currents and prevent terminal overheating.
2. Connect the negative terminals of all batteries to one copper bus bar.
3. Connect the positive terminals of all batteries to another copper bus bar.
4. Use a torque wrench to tighten all bolts securely, between 12 to 14 Newton-meters.
5. After parallel connection, the voltage remains the same, but the capacity and amperage increase.

Series Connection Steps

1. Connect the negative terminal of one battery to the positive terminal of the next battery in the series.

2. Tighten the bolts securely using a torque wrench (12 to 14 Newton-meters).
3. After series connection, the voltage increases, while the capacity and amperage remain the same.
4. For series connections, it is recommended to use a battery balancer to maintain cell voltage equilibrium.
5. The total voltage of the entire battery system should not exceed 51.2V.

Connecting for Charging

1. Identify the main negative and positive terminals of your series or parallel battery system.
2. Connect the negative output cable from your lithium charger to the main negative terminal of the battery system.
3. Connect the positive output cable from your lithium charger to the main positive terminal of the battery system.
4. Plug the charger into a power source. The charger's indicator light will typically change from green to red when charging is active.

Operating Instructions

Bluetooth Monitoring via Smartphone App



Your ECI Power battery features built-in Bluetooth connectivity, allowing you to easily monitor its status using a dedicated smartphone application. The app provides real-time data on:

- Battery State of Charge (SOC)
- Battery Voltage
- Charging Current
- Discharging Current
- Temperature
- Protection warnings

Download the companion app from your smartphone's app store (e.g., Google Play, Apple App Store) and follow the in-app instructions to connect to your battery.

Maintenance

Built-in Battery Management System (BMS)

The integrated BMS provides comprehensive protection for your battery, ensuring its safety and extending its lifespan. The BMS protects against:

- Overcharge
- Deep discharge
- Overloading
- Overheating
- Short circuit
- Excessive low self-discharge rate (ensuring up to 1 year maintenance-free storage)

Low-Temperature Cut-off Protection

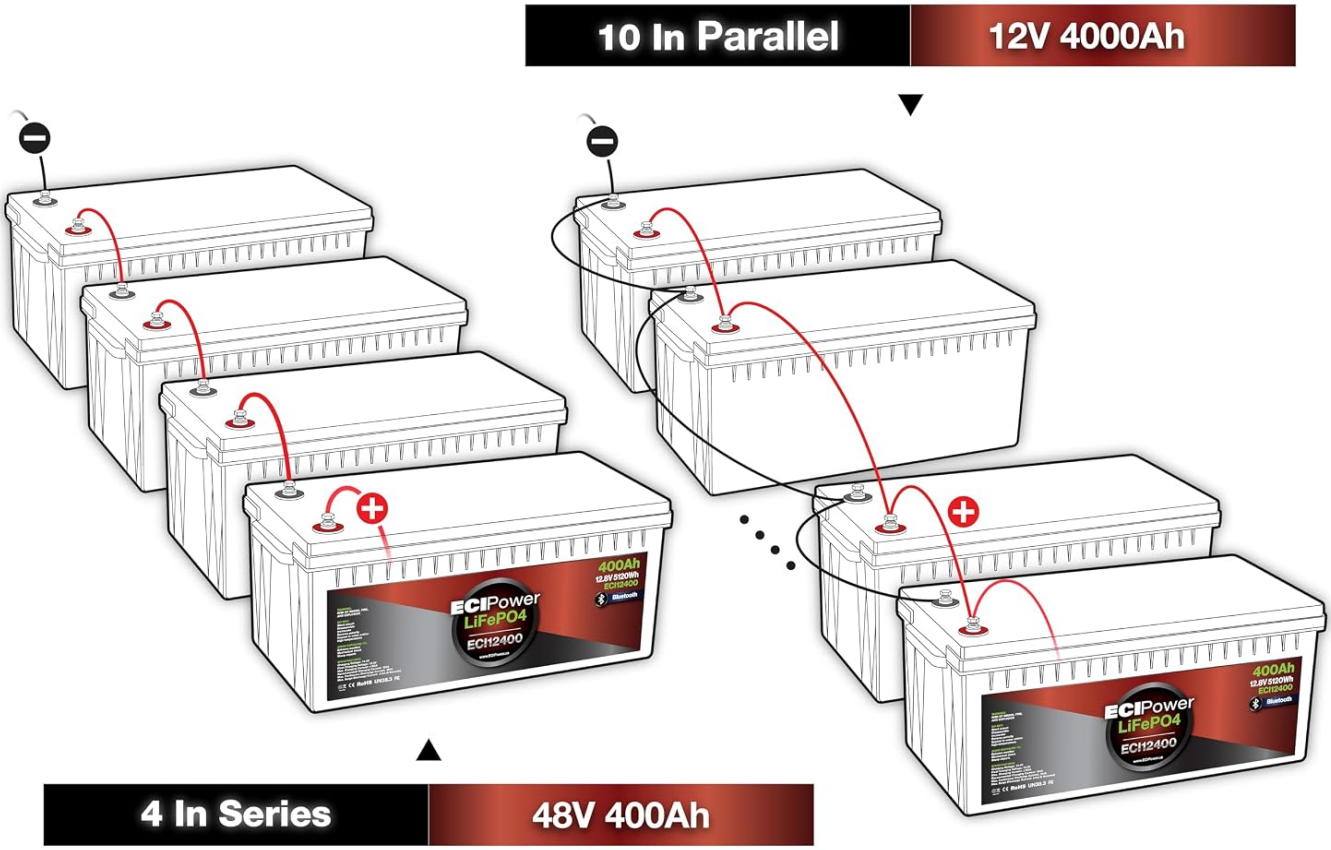
The battery features a built-in low-temperature cut-off mechanism that prevents charging when the battery temperature drops below 23 °F (-5 °C). This protects the battery cells from damage that can occur during low-temperature charging. For a demonstration of the low-temperature cut-off functionality, please watch the video below:

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Video: Low temp cut-off test. This video illustrates how the battery's low-temperature cut-off feature activates to prevent charging in freezing conditions, safeguarding the battery's integrity.

Anti-Swelling Fixture

Series & Parallel Connection



Supports expansion up to 4 batteries sequenced in either series at 48V 400Ah, or in parallel at 12V 4000Ah.

The battery incorporates an anti-swelling fixture inside. This fixture provides a stable, inward force that prevents the battery cells from expanding due to gas accumulation, which can occur from overcharging, aging, or high temperatures. This design greatly improves the battery's performance, cycle life, and overall safety.

Troubleshooting

If you encounter any issues with your ECI Power battery, please refer to the following general troubleshooting steps:

- **No Power Output:** Check all cable connections for tightness and proper polarity. Ensure the battery is adequately charged.
- **Charging Issues:** Verify that the charger is compatible with LiFePO4 batteries and is functioning correctly. Check the battery temperature to ensure it is within the allowable charging range (above 23 °F / -5 °C).
- **App Connectivity Problems:** Ensure Bluetooth is enabled on your smartphone and the battery is within range. Try restarting the app or your phone.
- **Unusual Behavior:** If the battery exhibits any unusual behavior (e.g., excessive heat, strange odors), immediately disconnect it from all loads and charging sources.

For further assistance, please contact ECI Power customer support.

Warranty and Support

ECI Power is committed to providing high-quality products and excellent customer service. This battery is backed by our industry-leading engineering and after-sale teams, with a focus on longevity and performance.
For any questions, technical support, or warranty claims, please contact ECI Power customer service. Our team is available to assist you with your product needs.