



Craft Autoworks Battery Manual v1.0

1. Introduction

Welcome to the Craft Autoworks LiFePO4 Battery Manual. This guide is designed to help you understand, safely operate, and maintain Craft Autoworks' LiFePO4 batteries.

2. Understanding LiFePO4 Batteries

LiFePO4 Chemistry

LiFePO4 (Lithium Iron Phosphate) is a type of lithium-ion battery chemistry known for its safety, long cycle life, and stable performance.

Battery Monitoring System

The Battery Monitoring System (BMS) is a device inside each battery that monitors and protects the LiFePO4 Cells from any voltages, loads, charging or temperatures that could damage it. It has the ability to deactivate the battery if it detects any potentially harmful condition.

Advantages of LiFePO4 Batteries

- High energy density
- Long service life
- Fast charging capabilities
- Enhanced safety features

Key Features and Specifications

- Nominal Voltage: 12.8V

CA12100 100ah Battery

- Nominal Amp Hours: 100AH
- Recommend Charge Current: 50A
- Maximum Charge Current: 100A
- Maximum Continuous Discharge Current: 100A
- Peak Discharge Current: 150A (3 seconds)
- Terminal Type: M8 bolts
- Weight: 26.8 lbs.
- Metric Dims: 278 x 175 x 180 mm (L x W x H)
- Imperial Dims: 10.9 x 6.9 x 7.1 inches (L x W x H)



CA12230 230ah Battery

- Nominal Amp Hours: 230AH
- Recommend Charge Current: 100A
- Maximum Charge Current: 150A
- Maximum Continuous Discharge Current: 150A
- Peak Discharge Current: 200A (3 seconds)
- Terminal Type: M8 bolts
- Weight: 50.2 lbs.
- Metric Dims: 250 x 200 x 277 mm (L x W x H)
- Imperial Dims: 9.8 x 7.9 x 10.9 inches (L x W x H)

General Features

- Case Size: 30% smaller than leading competitors
- Low SOC Wake Up System: Allows for reactivation of low state-of-charge batteries
- Built-in Smart Battery Management System (BMS): Provides advanced safety and performance management
- Low Temperature Charging Protection: Safeguards battery during charging in low temperatures
- Self-Heating System: Enables charging below 0°C (32°F) for enhanced versatility
- High Temperature Charging or Discharging Cut-off: Protects battery from extreme temperature conditions
- Over Charging and Discharging Protection: Prevents overcharging and excessive discharging
- Over Current and Short Circuit Protection: Safeguards against current spikes and short circuits
- Battery Cells Auto Balance: Ensures uniform cell voltage and longevity
- 8 Year Warranty (See end of manual for details)



Charge and Discharge Specs

- Recommend Charge Voltage: 14.6V for optimal performance (14.4v minimum)
- Maximum Batteries in Parallel: Up to 10 batteries
- Recommended for 12V Applications ONLY due to self-heating system
- Recommend Low Voltage Disconnect: 11.2V to protect battery health
- BMS Discharge Cut-off Voltage: Approximately 10.2V to prevent over discharge
- Reconnect Voltage: Greater than 11.5V to resume normal operation
- Discharge Temperature Range: -4°F to 140°F
- Charge Temperature Range: 0°F to 113°F
- Recommend Storage Temperature: 32°F to 95°F for optimal battery life

3. Warning: Risk of Explosion or Combustion

Important Safety Precautions

- Do Not Short Circuit: Short-circuiting the battery terminals can result in overheating, electrocution, explosion, or fire. Always ensure proper insulation and prevent contact with metal objects.
- Do Not Disassemble: Disassembling the battery can expose internal components and may result in chemical exposure, electrical shock, or injury. Opening the battery voids the warranty and may cause irreparable damage.
- Do Not Incinerate: Do not dispose of the battery in a fire. LiFePO4 batteries can release toxic gasses and hazardous materials when incinerated, posing a risk to health and the environment.
- Avoid High Temperatures: Exposing the battery to temperatures above 60 degrees Celsius (140 degrees Fahrenheit) can cause thermal runaway, leading to explosion or combustion. Store and operate the battery in a cool environment.
- Proper Charging: Follow recommended charging voltage and current specifications to prevent overcharging. Overcharging can lead to battery swelling, leakage, or hazardous conditions.
- Avoid Over Discharging: Do not discharge the battery beyond the recommended nominal voltage. Over Discharging can damage the battery's capacity, performance, and safety.
- Ventilation: Ensure proper ventilation during charging, discharging, and storage to prevent heat buildup and thermal issues.
- Children and Pets: Keep batteries out of reach of children and pets. Mishandling batteries can result in serious injury.

Temperature Exposure:

- Storage: Store batteries in a dry and cool environment, away from direct sunlight and extreme temperatures during use.



4. Installation

- Ensure batteries are securely fastened and cannot move or vibrate while the vehicle is in motion.
- Ensure the batteries have some amount of passive ventilation if installed in an enclosure. The batteries will produce some heat during charging or high amperage discharging.
- Use the provided battery terminal hardware and ensure all connectors are secure.
- Cover all battery terminals once installation is complete to prevent any possible shorts or accidental connections.

5. Low State Of Charge (SOC) Activation System

Understanding Low SOC Protection Mode

- This mode can be used to help wake up the batteries if they have become over discharged (below 10.2v).
- When held down, the button on the top of the battery will display the internal cell voltage of the battery at the terminals. This will allow a battery charger to recognize the battery voltage and begin the charging process.
- Once the battery charger starts its charging cycle, this will cause the BMS to turn back on and the battery will operate normally

Activation Procedure for Deactivated Batteries

1. Disconnect any loads or devices that may be trying to use power from the batteries (turn off breakers, pull fuses, turn off appliances etc.)
2. Connect a charger to your batteries and activate it, a shore power AC to DC charger or a vehicle based DC to DC charger is best (solar tends not to be ideal unless it is a very large array)
3. Press and hold the button on top of the battery, this will display the internal cell voltage at the terminals.
4. Continue holding the button until the charger being used activates and begins charging the batteries. This will usually take between 15 and 60 seconds depending on the charger being used.
5. Once you see that the charger is active, or you see the battery bank voltage jump up (indicating the charger is working) release the button on top of the battery
6. Allow the batteries to charge for at least one hour, and ideally let them charge as long as necessary to reach full charge

Caution

- The Low SOC Activation system should ONLY be used when the battery has been over discharged and the BMS in the battery has shut off.



6. Disposal and Recycling

Proper Disposal Guidelines

- Adhere to local regulations.
- Prevent environmental contamination.
- Utilize recycling centers for proper disposal.

7. Customer Support and Resources

Contact Information for Technical Support

- Craft Autoworks LLC
- Address: 680 Montello St, Reno, NV 89512
- Phone: 775-235-8885
- Email: info@craftautoworks.com



8. Warranty

Thank you for your purchase of a Craft Autoworks Battery.

This Limited Warranty applies to Lithium Iron Phosphate Batteries, and only Lithium Iron Phosphate Batteries, purchased from Craft Autoworks (the “Physical Goods”).

What does this limited warranty cover?

This Limited Warranty covers any defects in material or workmanship under normal use during the Warranty Period.

During the Warranty Period, Craft Autoworks will repair or replace, at no charge (but NOT including any shipping fees during warranty time), products or parts of a product that prove defective because of improper material or workmanship, under normal use and maintenance.

This Limited Warranty is transferable.

What will we do to correct a problem?

Craft Autoworks will replace or repair the Product at no charge, using new or refurbished replacement parts.

How long does the coverage last?

The Warranty Period for Physical Goods purchased from Craft Autoworks is 8 Years from the date of purchase. This Applies to both the **CA12100** and **CA12230** batteries.

What is the Warranty Timeline After Repair or Replacement?

A replacement Physical Good or part assumes the remaining warranty of the original Physical Good or 1 Year from the date of replacement or repair, whichever is longer.



What does this limited warranty not cover?

This Limited Warranty does not cover any problem that is caused by:

- Conditions, malfunctions or damage not resulting from defects in material or workmanship.
- Conditions, malfunctions or damage resulting from negligence, improper maintenance or modification - Damaged or destroyed by natural causes including but not limited to lightning, flood, or other natural disaster- Theft or loss of the Physical Goods
- This Limited Warranty does not cover any shipping charges, handling charges, gift wrap fees or taxes. You are responsible for and must prepay all shipping charges.
- Damage due to improper installation; loose terminal connections, under-sized cabling, incorrect connections (series and parallel) for desired voltage and AH requirements, or reverse polarity connections.
- Environmental damage; inappropriate storage conditions as defined by the Manufacturer; exposure to extreme hot or cold temperatures, fire or freezing, or water damage .
- Damage caused by collision.
- Damage due to improper maintenance; under- or over-charging the Product, dirty terminal connections.
- Product that has been opened, modified or tampered with.
- Product that was used for applications other than which it was designed and intended for, including engine starting.
- Product that was used on an oversized amperage load causing repeated overload of the Battery Monitoring System
- Damage due to improper use of the Low State of Charge Wake Up Circuit including but not limited to, attempting to charge the cells using only the wake up circuit, applying a voltage greater than 14.6v or amperage greater than 5 amps.
- Product not stored in adherence to the Manufacturer's storage guidelines, including storage of the Product at low state-of-charge.

You shall assume all risk of loss or damage to the Physical Good while in transit to Craft Autoworks.

How do I start a warranty claim?

To obtain warranty service, you must obtain a Return Merchant Authorization (RMA) number and instructions on how to return a product by contacting us.

Deliver the Physical Goods, in either its original packaging, including any accessories or documents that shipped with the Physical Goods to the address specified by Craft Autoworks. To obtain the Return Merchant Authorization (RMA) number, you can contact us by any of the following contact methods:

- By email: info@craftautoworks.com
- Contact form on our website: www.craftautoworks.com/contact