

Smart Lithium Iron Phosphate Battery

Ecox 12200

User Manual

Legal Information

Copyright©2024 All rights reserved.

Any reproduction or distribution of this manual or any part of this manual, or any uploading of this manual to a third party website, in any form by any means is prohibited.

Disclaimer

The Manual contains instructions for the use of the product. All the pictures and charts in this manual are for description and explanation only. Information in the manual may change without further notice.

Please read this manual carefully before using the product and keep this manual for further reference.

Failure to use the product in accordance with the manual may result in serious injuries, property damages and may void the warranty, with which the user acknowledges and accepts full responsibility for any risks associated.

No representations or warranties, either express or implied, are made with respect to the information contained in this manual.

In the event of any conflicts between this manual and the applicable law, the latter prevails.

The final interpretation of this manual rests with the issuing party.

Safety Instructions



Warning

- The device should be used in strict compliance with local laws, electrical safety regulations, and fire prevention regulations of the nation or the region.
- Do not place the device near open fire, heat sources and flammable materials.
- Do not leave the device in an extremely hot environment.
- Do not place the device in damp locations.
- Do not expose the device to high electromagnetic radiation.
- Do not strike, mechanically crush or cut the device.
- Do not puncture the device with sharp objects.
- Do not stack heavy objects on the device.
- Do not place metal objects or wires on the device.



Caution

General

- For safety purposes, please use only the accessory (cable, charger, and etc) supplied or recommended. Damage to the product that caused by using third-party accessories is not covered by warranty.
- Before first use, please check if the device is in good condition. If the device is deformed or has an odor, do not use the device and return it to the distributor.
- Keep the device out of reach of children and pets.
- If the device falls into water during use, please take it out immediately.
- If the battery leaks, avoid contact with the leaking liquid or gas. In case of contact with skin or eyes, flush immediately with plenty of clean water and seek medical advice.

Installation

- Do not install the device in an unstable place. Personal injury or property damage may be caused if the device falls.
- Do not place the device in dusty locations.

Operation

- Please ensure good ventilation while the device is in use.
- If the device has been stored for more than one year, please check it carefully to make sure there is no problem before using it.

Transportation

- Keep the device upright when moving it.
- Handle the device gently.

Safety Instructions

Maintenance

- Charge the device regularly. If you need to store the device for a long time, please charge it to 40% ~ 70% every time before storing it.
- Recharge the device as soon as possible after it has been fully discharged.
- If the device does not work properly, please contact your distributor. DO NOT disassemble the device for repair or maintenance by yourself. The user acknowledges and accepts full responsibility for any risks associated.
- Do not charge the device which is hot, deformed, or leaking.
- It is recommended to check the connection between power cords and screws regularly to ensure that there is no loosening, breakage or corrosion at the connection points.
- It is recommended to regularly check if the device storage environment is normal.

Cleaning

- Please use a soft and dry cloth to clean the exterior surfaces.

Disposal

- Dispose of used batteries according to the laws or the regulations of the nation or the region.

Contents

- 1 Introduction.....1
- 2 Packing List.....2
- 3 Interface.....2
- 4 Battery Installation.....2
 - 4.1 Tools and Accessories Preparation.....2
 - 4.2 Pre-installation Check.....3
 - 4.3 Battery Connection.....3
 - 4.4 Post-Installation Check.....6
- 5 Battery Activation.....6
- 6 Battery Monitoring.....7
 - 6.1 App.....7
 - 6.2 Battery Networking.....7
- 7 Battery Storage.....8
- 8 Battery Management System.....8
- 9 Specifications.....9
- 10 Troubleshooting.....11

1 Introduction

Ecox 12200 is a smart lithium iron phosphate battery module. It is designed to replace deep cycle lead-acid batteries. With a standard BCI 4D size, it is perfect for recreational vehicles (RV), marine (boats), trucks, cabins, and other off-grid deep-cycle applications.

The product has the following advantages.

- High Reliability

Adopting advanced BMS, the battery has comprehensive protection functions.

- Long Cycle Life

With Energy Storage Grade LiFePO₄ Cells, the battery extends its cycle life to more than 8 times that of lead-acid batteries.

- High Energy Density

With the high energy density lithium cells, the battery is 50% the weight of the lead acid battery of equivalent energy, and 70% the size of the regular lithium battery of equivalent energy. It's easier to carry, faster to charge, and more convenient to use.

- Flexible Connection in Parallel and Series

Available in 12 V, 24 V, 36 V and 48 V, multiple batteries can build a battery system with a max. energy output of 40.96 kWh through flexible connection in parallel and series.

- Strong Environmental Adaptability

With low-temperature smart heating function, the battery can be charged safely in sub-zero temperatures.

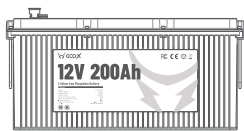
- Real-time Monitoring via App

You can monitor the battery status via App.

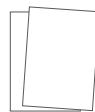
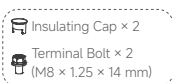
- Low Self-discharge Loss

The battery can be stored for over 2 months if it is turned off after being fully discharged, and can be stored for over 6 months if it is turned off when its level is between 40% and 70%.

2 Packing List

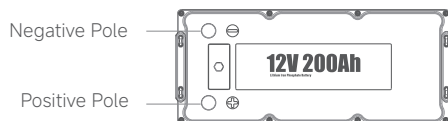


Battery



User Manual

3 Interface



4 Battery Installation

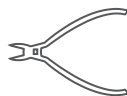
4.1 Tools and Accessories Preparation



Voltmeter



Torque Wrench



Wire Cutter



Screwdriver

4 Battery Installation



Insulating Gloves



Safety Goggles

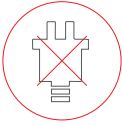


Bus Bar

4.2 Pre-installation Check



- Ensure that the battery is away from open flames, heat sources and flammable materials.



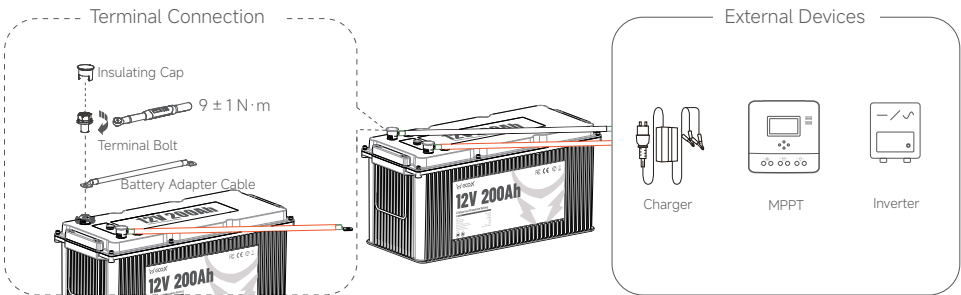
- Cut off the power before wiring, installing or removing the battery.



- To prevent electric shock, please remove watches, bracelets, rings and other conductive items (if any) and wear insulating gloves and safety goggles before installation.

4.3 Battery Connection

4.3.1 Single Battery



4 Battery Installation

4.3.2 Multiple Batteries

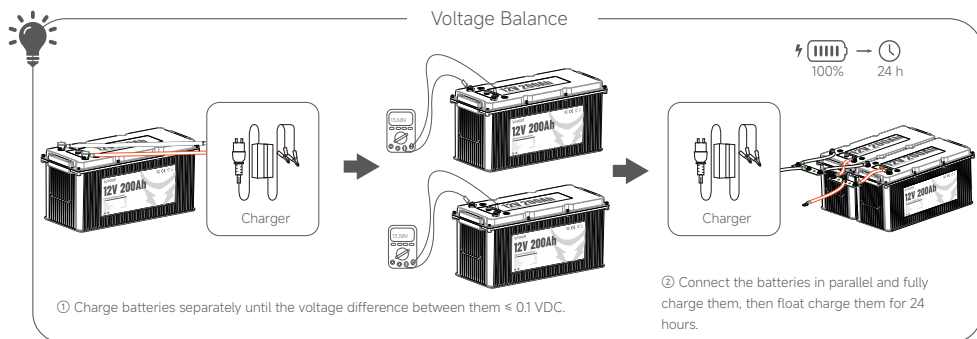
Connect batteries in series and parallel via power adapter cables to increase voltage and capacity.

⚠ Caution

- Check if the voltage difference between the batteries is less than 0.1 VDC before using them in series connection, or 0.5 VDC in parallel connection. If not, please balance the voltage first. Otherwise, over-current protection may be triggered due to the large voltage difference.
- Do not mix batteries of different brands, types, models or life spans.
- In order to prolong the life span of the batteries, please make sure the length, diameter and internal resistance of the power cables are the same when using multiple batteries.

📄 Note

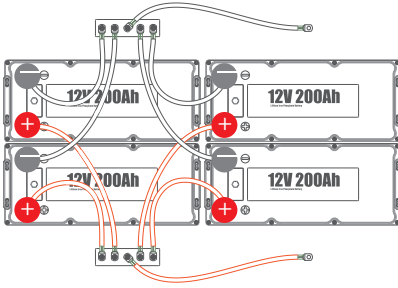
- Please refer to Section 5.3.1 for terminal connection and external devices connection.
- When batteries are used in series and parallel connection, it is recommended to use with a busbar to distribute power effectively.
- The power cable connection methods provided in the manual are for reference only. The actual optimal connection method varies depending on the cable size, equipment devices connected and environmental conditions.



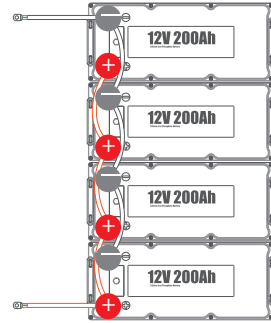
4 Battery Installation

① Connecting the Batteries in Parallel

+ to +
- to -



Method 1 (Optimal)



Method 2

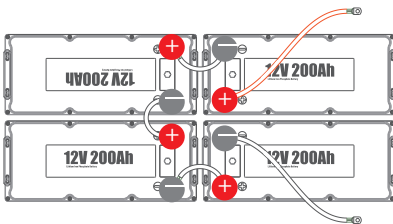
Voltage of Battery Pack (VDC)	Current of Battery Pack (A)
12.8	Total Current of All Batteries

Note

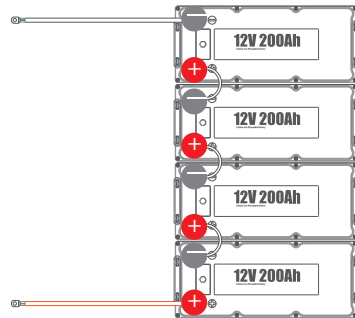
Up to 8 batteries can be connected in parallel. The pictures above shows 4 batteries in parallel as an example.

② Connecting the Batteries in Series

+ to -



Method 1



Method 2

4 Battery Installation

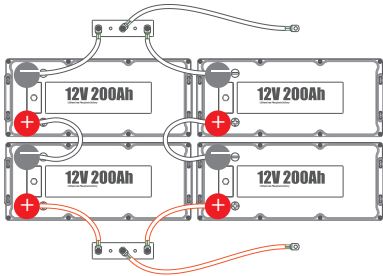
Series Configuration	Recommended Charging Voltage Value (VDC)
1S	14 ~ 14.6
2S	28 ~ 29.2
3S	42 ~ 43.8
4S	56 ~ 58.4

Voltage of Battery Pack (VDC)	Current of Battery Pack (A)
12.8 ~ 51.2	Current of Single Battery

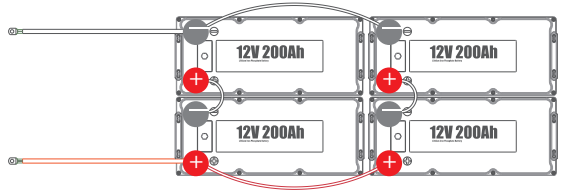
Note

- Up to 4 batteries can be connected in series.
- Using batteries in a series connection for a long time may lead to imbalances. It is recommended to regularly connect the batteries in parallel, and float charge them for 24 hours after a full charge.

③ Connecting the Batteries in Series & Parallel



Method 1 (Optimal)



Method 2

Note

- To avoid triggering battery protection due to the large voltage difference, it is recommended to connect the batteries in parallel, float charge them for 24 hours after a full charge, and then use them in series and parallel connection.
- When connecting the batteries in series and parallel, please connect them in series first and then in parallel.
- Up to 16 identical batteries are supported in series and parallel connection (Max 4S4P). The pictures above shows 4 batteries in 2S2P connection as an example.

4.4 Post-Installation Check

Please check if the positive and negative connections are correct.

5 Battery Activation

Before first use, use a charger with a current greater than 1 A to activate the battery, and verify if the battery is activated successfully by measuring its voltage.

6 Battery Monitoring

6.1 App

You can finish battery networking, check battery information, complete remote upgrades and more through RE+ App.



ios

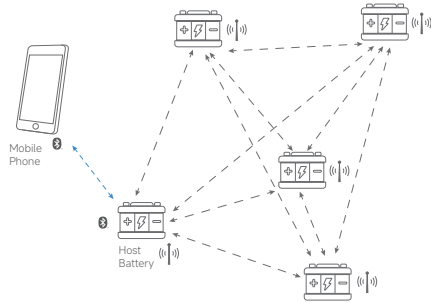


Google play

6.2 Battery Networking

- Basic Mode

Before first use, follow "Connect" section in the App Quick Guide to finish battery networking.



Note

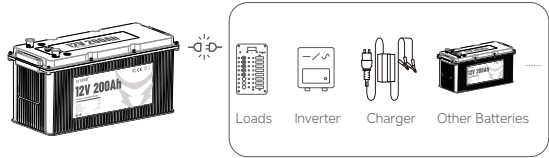
In this mode, make sure that there is no obstruction between the devices, and that the distance between the mobile phone and the host battery is less than 10 m, and the distance between the batteries is less than 5 m.

7 Battery Storage

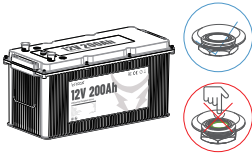
1. Make sure the battery level is above 40% (Optimal 70%).



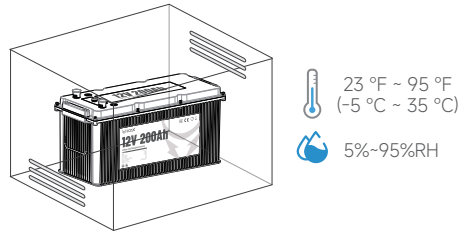
2. Disconnect the battery from all external devices (if present).



3. Turn off the battery.



4. Store the battery in a well-ventilated, clean, dry area.



Note

- Charge the battery at least once every 6 months to prevent over-discharge.
- In extreme conditions, the battery can be stored for up to 1 month at temperatures as low as -40 °F (-40 °C) or as high as 140 °F (60 °C).

8 Battery Management System

Protection and Warnings

Under-voltage

Over-voltage

Over-current

Over-temperature/Under-temperature

Short Circuit

System Error

Management and Monitoring

Cell Balancing

Smart Heating Mode

SoC Calculation

Wireless Internal Communication

Wired Extended Communication

Operation Log

9 Specifications

Electrical Specification

Nominal Voltage	12.8 VDC
Nominal Capacity	200 Ah
Resistance	< 10 mΩ
Efficiency	99%
Self Discharge	≤ 3% per month
Max. Batteries in Parallel or Series	4S4P
Cycle Life (25°C)	> 4000 (80% DOD, 0.5 C, 25 °C)
Design Life	≥ 10 years

Discharge Specification

Max. Continuous Discharging Current	100 A
Peak Discharging Current	200 A @5 s

Charge Specification

Recommended Charging Current	50 A
Max. Continuous Charging Current	100 A
Recommended Charging Voltage	14 V ~ 14.6 V

Environment Specification

Discharging Temperature	-4 °F ~ 140 °F (-20 °C ~ 60 °C)
Charging Temperature	32 °F ~ 131 °F (0 °C ~ 55 °C)
Storage Temperature	-40 °F ~ 140 °F (-40 °C ~ 60 °C)
Operating Temperature	-4 °F ~ 122 °F (-20 °C ~ 50 °C) <small>*If charging is required when the temperature is below 32 °F (0 °C), please connect the charger to enable the heating film. The battery starts charging when the cell temperature is heated to a certain temperature.</small>
Max. Altitude	13123 ft (4000 m)
Relative Humidity	5% ~ 95% (non-condensing)

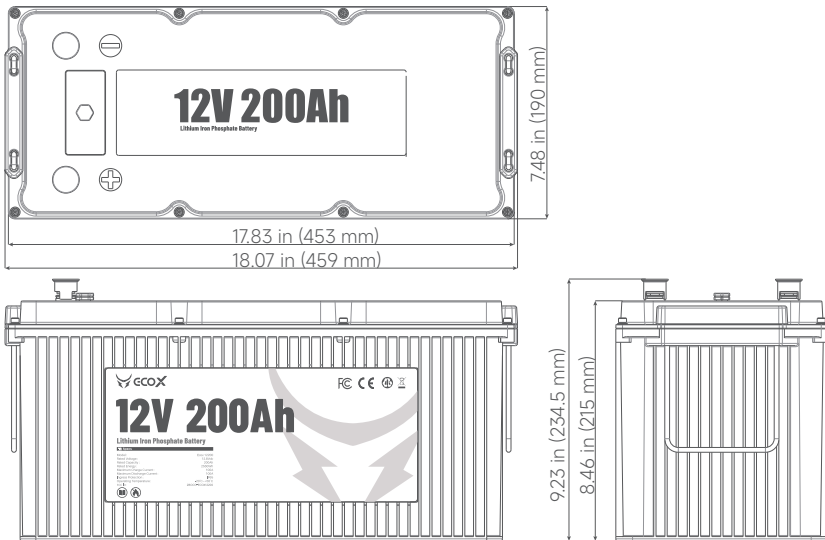
9 Specifications

Mechanical Specification

Dimensions (L × W × H)	18.07 in × 7.48 in × 9.23 in (459 mm × 190 mm × 234.5 mm)
Weight	Approx. 46.08 lbs (20.9 kg)
Terminal Type	M8
Terminal Torque	9 ± 1 N·m
Case Material	PC
IP Rating	IP65
Other	
Certifications	UN38.3, IEC 62619, FCC, CE
Communication	BLE 5.0

*Product performance is based on testing in a controlled environment. Your results may vary due to several external and environmental factors.

Dimension

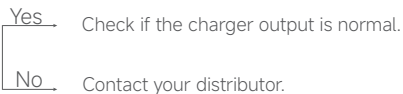


Unit: inch (mm)

10 Troubleshooting

My battery won't turn on?

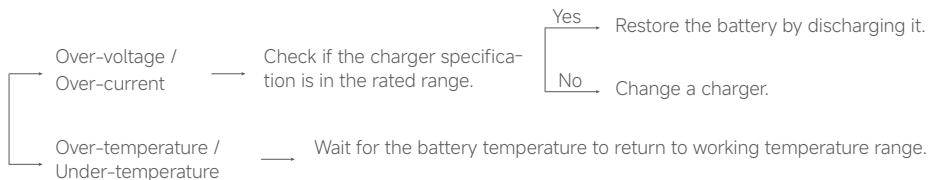
Check if the charger is connected properly.



My battery won't turn off?

Disconnect all external devices, and the battery will turn off after 24 hours of inactivity.

My battery won't charge?



My battery won't discharge?

