



# Lithium Iron Phosphate Battery RV12100CH User Manual

## Legal Information

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# Safety Instructions

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## 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 by Pylontech. Pylontech shall not be liable for damage caused by third-party devices.
- 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

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## Maintenance

- Charge the device regularly. If you need to store the device for a long time, please charge it to at least 60% every time before storing it.
- Recharge the device in time after it has been fully discharged.
- If the device does not work properly, please contact your distributor or the nearest service center within 24 hours. DO NOT disassemble the device for repair or maintenance by yourself. Pylontech shall not assume any responsibility for problems caused by unauthorized repair or maintenance.
- 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

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1 Introduction.....	1
2 Packing List.....	1
3 Optional Accessory .....	2
4 Interface & Indicator.....	2
5 Battery Installation.....	3
5.1 Tools Preparation .....	3
5.2 Pre-installation Check .....	3
5.3 Battery Connection .....	3
5.4 Post-installation Check.....	4
6 Battery Use.....	5
7 Battery Storage .....	5
8 Battery Management System.....	6
9 Specifications .....	7
10 Troubleshooting.....	9
11 FAQ.....	11

# 1 Introduction

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RV12100CH is a lithium iron phosphate battery module. It is designed to replace deep-cycle lead-acid batteries. The battery is perfect for recreational vehicles (RV), caravans, marine (boats), trucks, cabins, and other off-grid deep-cycle applications.

The product has the following advantages.

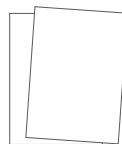
- **High Reliability**  
The built-in advanced BMS manages charging and discharging status, helps in balancing the individual cells, and ensures intelligent automatic protection against over-voltage, under-voltage, over-current, over-temperature, under-temperature and short circuit.
- **Low Self-discharge Loss**  
The battery can be stored for more than 12 months if it has been disconnected from other devices.
- **Energy Expansion**  
The battery supports up to 1 in series and 8 in parallel (Max. 1S8P) to build a 12 V 800 Ah battery system.
- **Heating Film**  
With the heating film, the battery can work in an extremely-cold environment.

# 2 Packing List

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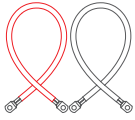


Battery



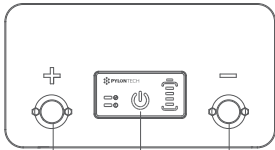
User Manual

# 3 Optional Accessory



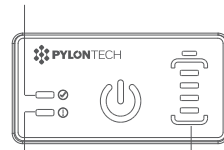
Battery Adapter Cables

# 4 Interface & Indicator






Positive Pole    Power Button    Negative Pole

Running Indicator

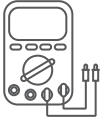


Alarm Indicator    SoC Indicators

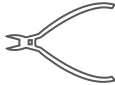
<p>Running Indicator</p> 	<ul style="list-style-type: none"> <li>• Solid blue: Charging mode / Idle mode.</li> <li>• Quick flashing blue: Discharging mode.</li> <li>• Slow flashing blue: Power-saving mode.</li> </ul> <p>*Quick flashing: Light up every 2 s. *Slow flashing: Light up every 4 s.</p>
<p>Alarm Indicator</p> 	<ul style="list-style-type: none"> <li>• Flashing red: Protected mode.</li> <li>• Solid red: System error.</li> </ul> <p>*When the alarm indicator is on, refer to 10 Troubleshooting to solve problems.</p>
<p>SoC Indicators</p> 	<p>Each indicator represents 25% SoC.</p> <ul style="list-style-type: none"> <li>*When the device is being charged, one of the indicators will flash to show the state.</li> <li>*When SoC is less than 5% and the device is not being charged, all power indicators will remain off to save power.</li> <li>*When an exception occurs, all power indicators will remain off.</li> </ul>

# 5 Battery Installation

## 5.1 Tools Preparation



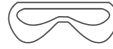
Voltmeter



Wire Cutter



Screwdriver

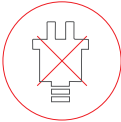


Safety Goggles

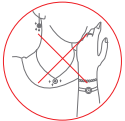


Insulating Gloves

## 5.2 Pre-installation Check



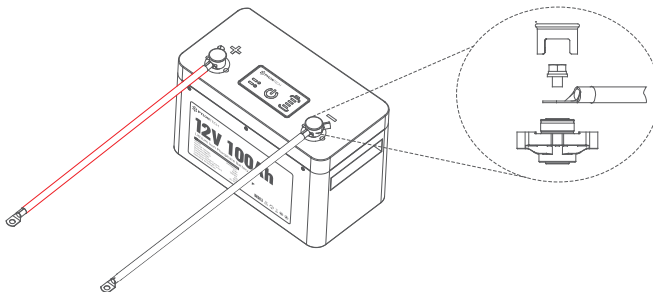
- Cut off the power before wiring, installing or removing the battery.



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

## 5.3 Battery Connection

### Single Battery





# 5 Battery Installation

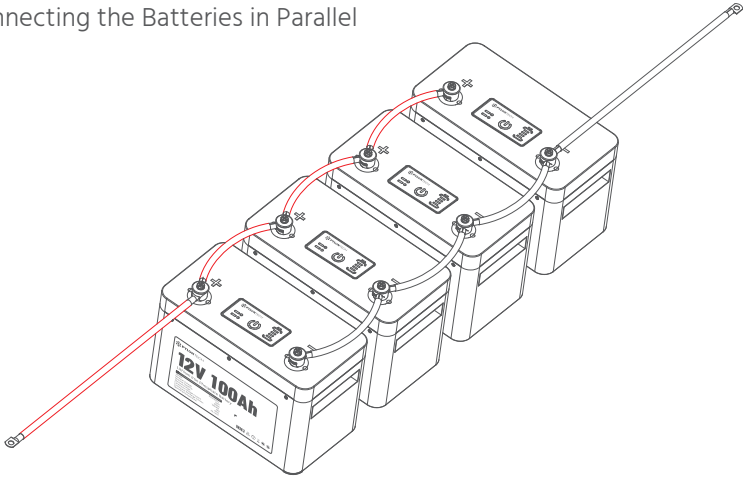
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## Multiple Batteries



- 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.

### Connecting the Batteries in Parallel



### Steps

1. Connect the Positive Terminals of the batteries in sequence.
2. Connect the Negative Terminals of the batteries in sequence.
3. Finally, connect the Positive Terminal of the first battery and the Negative Terminal of the last battery to the corresponding terminals of external devices.



Note

Up to 8 batteries can be connected in one system.

## 5.4 Post-installation Check

Please check if the positive and negative connections are correct.

# 6 Battery Use

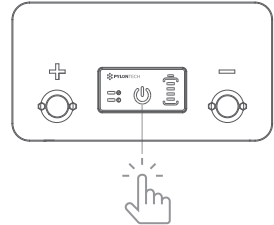
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- Turn on the battery: short press the button for about 1 s.



Note

- When the battery is turned on for the first time, it performs a power-up self-test. After that, all indicators light up for about 2 s and then resume displaying the device status.
- The device will enter idle mode automatically if the battery is turned on but no operation is performed in 30 s, and it will enter power-saving mode automatically if no operation is performed after 30 s.
- You can turn on all batteries in one battery system by turning on any battery in the system.



- Turn off the battery: long press the button for about 3 s.



Note

If you want to turn off any battery in one system, please turn off all the batteries in 1 min.

- Enable Power-saving Mode

Short press the button to enable/disable power-saving mode when the battery is turned on.

# 7 Battery Storage

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Please follow the steps below to store the battery.

1. Make sure the battery level is between 40% and 70%.
2. Disconnect the battery from all loads and the charging device (if present).
3. Turn off the battery.
4. Store the battery in a well-ventilated, clean, dry area with temperatures between 50 °F (10 °C) and 104 °F (40 °C).



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 -4 °F (-20 °C) or as high as 140 °F (60 °C).

# 8 Battery Management System

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## Protection and Warnings

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Under-voltage

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Over-voltage

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Over-current

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Over-temperature/Under-temperature

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Short Circuit

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System Error

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## Management and Monitoring

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Cell Balancing

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Smart Charging Mode

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Heater Control

---

SoC Calculation

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SoC Display

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Operation Log

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# 9 Specifications

## Electrical Specification

Nominal Voltage	12.8 VDC
Nominal Capacity	100 Ah
Resistance	<10 mΩ
Self Discharge	≅ 3% per month
Max. Batteries in Parallel	8
Design Life	≧ 10 years
Short Circuit Current Duration	< 1 kA/100 us

## Discharge Specification

Max. Continuous Discharging Current	100 A
Peak Discharging Current	200 A @10 s

## Charge Specification

Recommended Charging Current	≅ 50 A
Max. Continuous Charging Current	100 A
Recommended Charging Voltage	14 V ~ 14.4 V

## Environment Specification

Recommended Storage Temperature	50 °F ~ 104 °F (10 °C ~ 40 °C)
Operating Temperature	-4 °F ~ 122 °F (-20 °C ~ 50 °C) *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 above 32 °F (0 °C).
Relative Humidity	5% ~ 95%

## Mechanical Specification

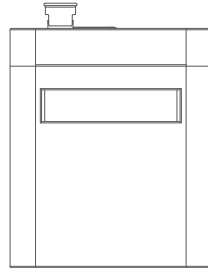
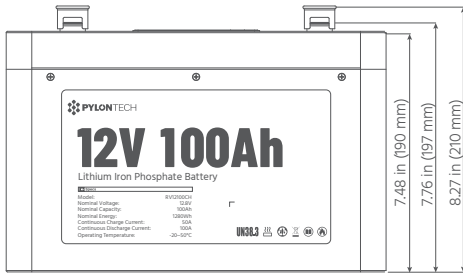
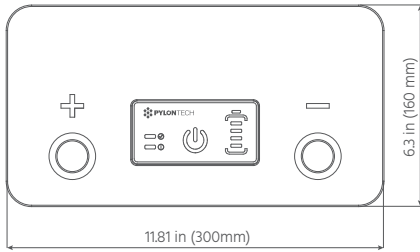
Dimensions (L × W × H)	11.81 in × 6.3 in × 8.27 in (300 mm × 160 mm × 210 mm)
Weight	Approx. 26.46 lbs (12 kg)
Terminal Type	M8 × 1.25 × 14 mm
Terminal Torque	8 ± 1 Nm
Case Material	Metal

# 9 Specifications

Enclosure Protection	IP20
Cell Type-chemistry	LiFePO <sub>4</sub>
Cooling	Natural Cooling
<b>Other</b>	
Certifications	UN38.3, IEC 62619
Max. Altitude	13123 ft (4000 m)

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

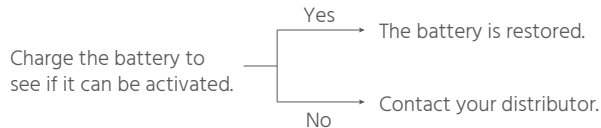
## Dimension



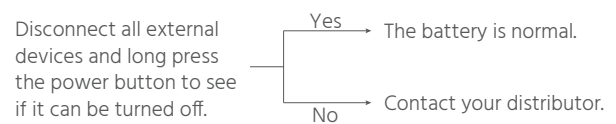
Unit: inch (mm)

# 10 Troubleshooting

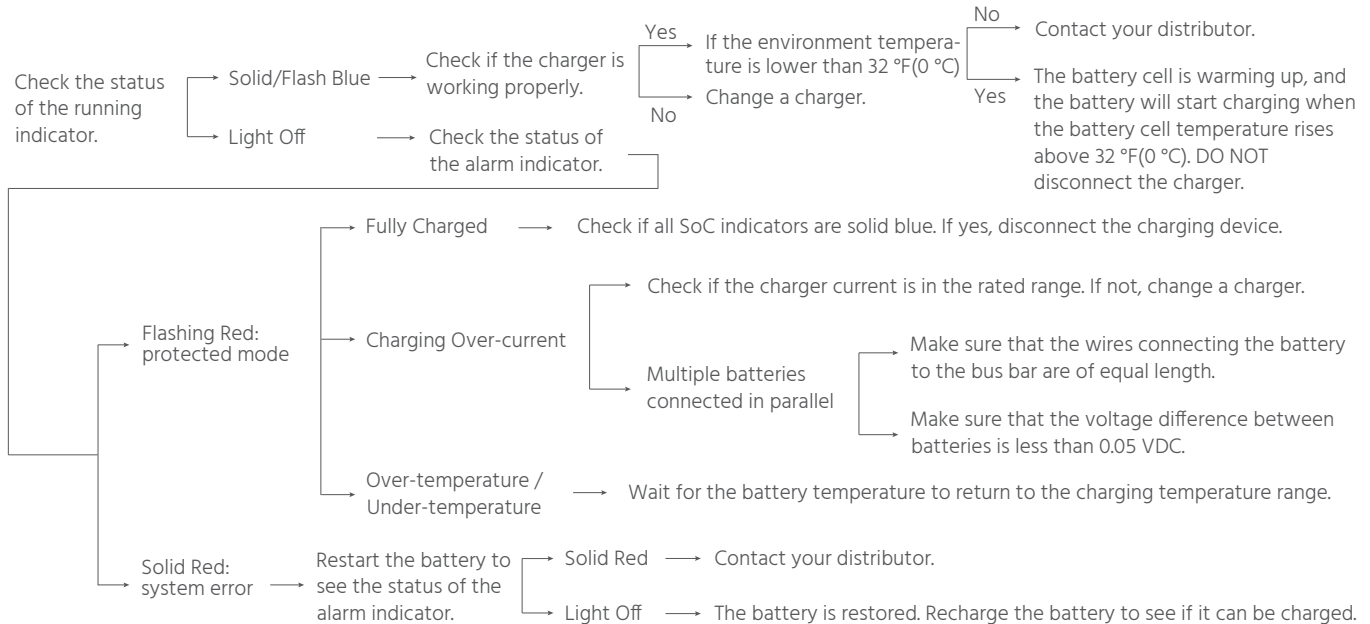
## My battery won't turn on?



## My battery won't turn off?

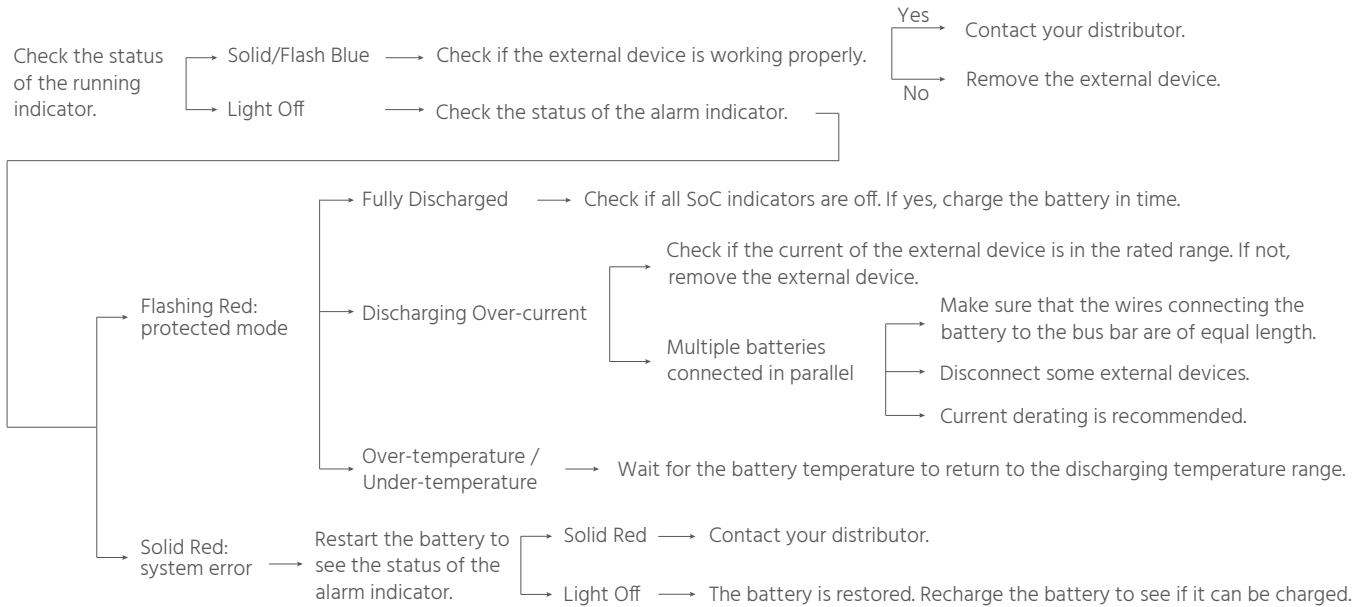


## My battery won't charge?



# Troubleshooting

## My battery won't discharge?



## Why won't my battery turn on sometimes when it is just turned off?

Please wait at least 3 s if you need to turn on a battery after it has just been turned off.

## Why won't my batteries turn off when they are connected in parallel?

- Please turn off all the batteries in 1 min.
- Please make sure that there is no power supply on the power bus, and no energy storage device like large capacitors in the devices connected to the bus bar.

## Why won't my battery system in parallel connection turn on with one-click?

If the voltage of some batteries is low, turning on the whole system by turning on one battery in the system may fail. In this case, please turn on all the batteries manually one by one.

## Why is derating recommended when multiple batteries are used in parallel?

When multiple batteries are connected in parallel, the internal resistance from the bus bar to each battery may differ, and there may be a voltage difference between the batteries. Therefore, the current may be unevenly distributed. In order to avoid the battery triggering protection, derating is strongly recommended.

## Why do some batteries charge at low temperatures and others don't?

Batteries can be charged when the cell temperature is within the charging temperature range, but the cell temperature of different batteries may vary even at the same environment temperature.

## Does the heating film automatically heat the battery at low temperatures?

The battery can only be heated if external electricity is detected.

## Why can a voltage value of 2 V to 7 V be measured by a multimeter at the power terminals of a battery when it is turned off?

Generally, there is leakage current on the BMS board when the battery is turned off, resulting in floating voltage on both sides of power terminals. It's a normal phenomenon. The floating voltage becomes 0 V once a load is connected.

## Why does my battery sometimes over-discharge?


When the battery is discharged, please disconnect the load and charge the battery in time. If the bus bar is connected, the battery may be activated repeatedly by float currents or external devices, which may result in over-discharge.




## With multiple batteries connected in parallel, why do some of them enter protected mode due to over-current at the moment of turning on?

If the voltage difference between the batteries is too large, the battery with a higher voltage will charge the battery with a lower voltage, which may result in charging/discharging over-current.

\*If you're still unable to resolve your issue via the above instructions, please contact your local distributor or send an email to [service@pylon-tech.com.cn](mailto:service@pylon-tech.com.cn).



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