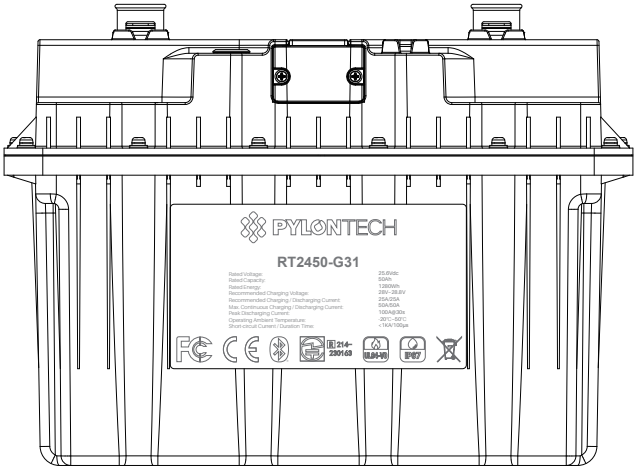

Smart Lithium Iron Battery
RT2450-G31

User Manual

PYLONTECH

Information Version: 1.0
5PMPA08-00202

Legal Information

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Any reproduction or distribution of this manual or any part of this manual, in any form by any means, without the prior written consent of Pylontech is prohibited.

Disclaimer

The Manual contains instructions for the use of the product. All the pictures and charts hereinafter are for description and explanation only. The information in the manual is subject to change, without further notice.

Please read this manual carefully before using the product. Failure to do so may result in serious injury, property damage and may void the warranty. Please keep this manual for further reference.

By using this product, you hereby signify that you have read this manual carefully and that you understand and agree to abide by all terms and conditions of this manual and all relevant documents of this product. You agree that you are solely responsible for your own conduct in using this product, and for any consequences thereof. Pylontech shall not be liable for any damages resulting from the use of this product not in accordance with this manual. In the event of any conflicts between this manual and the applicable law, the latter prevails.

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 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.

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 as soon as possible 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 battery 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 battery 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.

Specifications

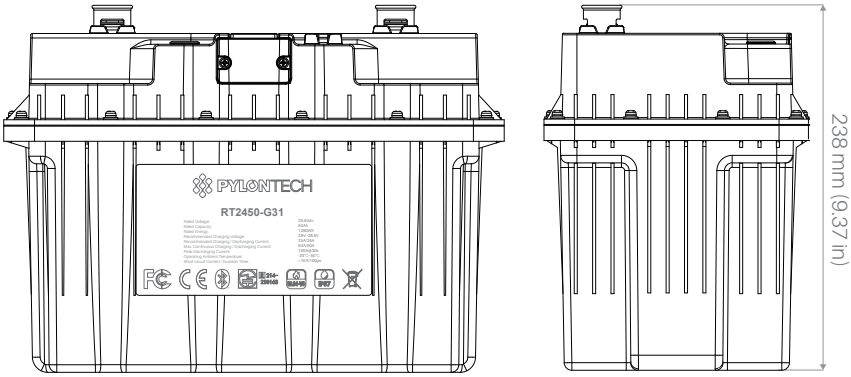
Electrical Specification	
Nominal Voltage	25.6 VDC
Nominal Capacity	50 Ah
Resistance	＜10 mΩ
Self Discharge	≤3% per month
Maximum Modules in Parallel or Series	2S8P or 1S16P
Cycle Life (25°C)	＞4500 (80% DOD, 0.5 C, 25 °C)
Design Life	≥ 10 years
Short Circuit Current Duration	<1 kA/100 us
Discharge Specification	
Max. Continuous Discharging Current	50 A
Peak Discharging Current	100 A @30 s
Under-voltage Disconnect	21.6 V
Reconnect Voltage	24 V
Charge Specification	
Recommended Charging Current	25 A
Max. Continuous Charging Current	50 A
Recommended Charging Voltage	28 V ~ 28.8 V
Over-voltage Disconnect	28.8 V
Reconnect Voltage	27 V
Temperature & Humidity Specification	
Discharging Temperature	-4 °F ~ 158 °F (-20 °C ~ 70 °C)
Charging Temperature	32 °F ~ 158 °F (0 °C ~ 70 °C)
Storage Temperature	-4 °F ~ 140 °F (-20 °C ~ 60 °C)
Working Temperature	-4 °F ~ 122 °F (-20 °C ~ 50 °C)
Relative Humidity	5% ~ 95%
Mechanical Specification	
Dimensions (L*W*H)	325 mm × 173.5 mm × 238 mm (12.8 in × 6.83 in × 9.37 in)

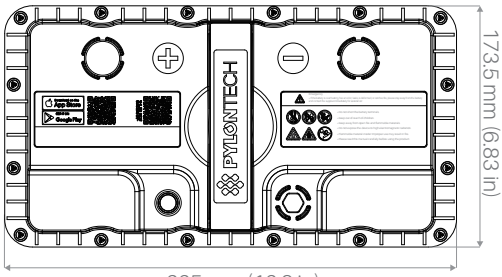
Specifications

Weight	Approx.10.6 kg (23.37 lbs)
Terminal Type	M8 × 14
Terminal Torque	9 ± 1 Nm
Case Material	PC
Enclosure Protection	IP67
Cell Type-chemistry	$LiFePO_4$
Other	
Certifications	UN38.3, TELEC, FCC, CE, Bluetooth SIG
Communication	BLE 5.0
Max. Altitude	4000 m
APP	Support

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

Dimension





Unit: mm (inch)

Introduction

RT2450-G31 is a lithium iron phosphate battery module. With a standard BCI group size, it is designed to replace deep-cycle lead-acid batteries. The battery is perfect for recreational vehicles (RV), marine (boats), trucks, cabins, and other off-grid deep-cycle applications.

The product has the following advantages.

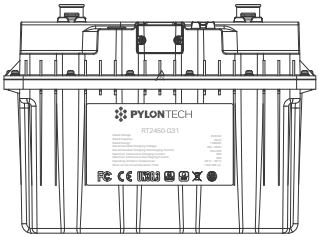
- High Reliability
  The built-in advanced BMS manages charging and discharging status, helps in balancing the individual cells, and ensures intelligent automatic protection against over-voltage, under-voltage, over-current, high temperature, low temperature and short circuit.
- High Energy Density
  With the high energy density lithium cells, our battery is half 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.
- Real-time Monitoring via APP
  The built-in Bluetooth module allows real-time monitoring via mobile devices.
- Long Cycle Life
  More than 4,500 cycles at a depth of discharge of 80%.
- Low Self-discharge Loss
  The battery can be stored for more than 6 months if it has been disconnected from other devices.
- Flexible Connection in Parallel and Series
  Supports both parallel connection and series connection.

Pylontech Auto APP

PylontechAuto App

APP Quick Guide

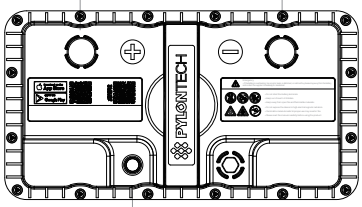
Packing List



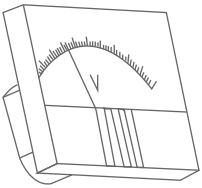
Battery

User Manual

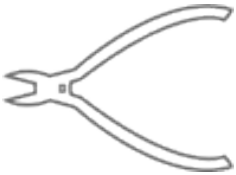
Interface



Tools

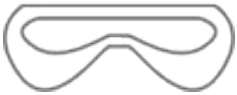


Voltmeter

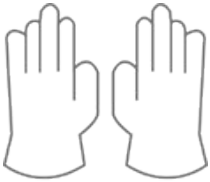


Wire Cutter

Screwdriver



Safety Goggles



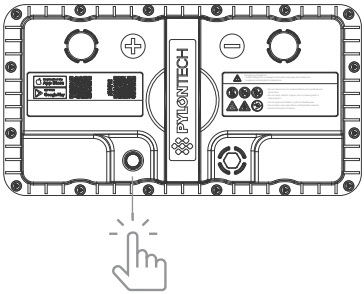
Insulating Gloves

Indicator

Status	Meaning
Light up for 0.5 s every other 1.5 s	Working Mode
Light up for 1 s every other 1 s	Networking Mode
Light up for 1.5 s every other 0.5 s	Protection Mode
Light Off	Sleep/Power Off/System Error

Activation

Before first use, press the on/off button to activate the device.



Installation

1. 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 insulated gloves and protective goggles before installation.

2. Place the battery in the designated area.

   The area where the battery is installed needs to be kept dry and stable, away from water and fire sources, and the temperature and humidity of the area shall be suitable for battery use.

3. Fix the battery modules tight.

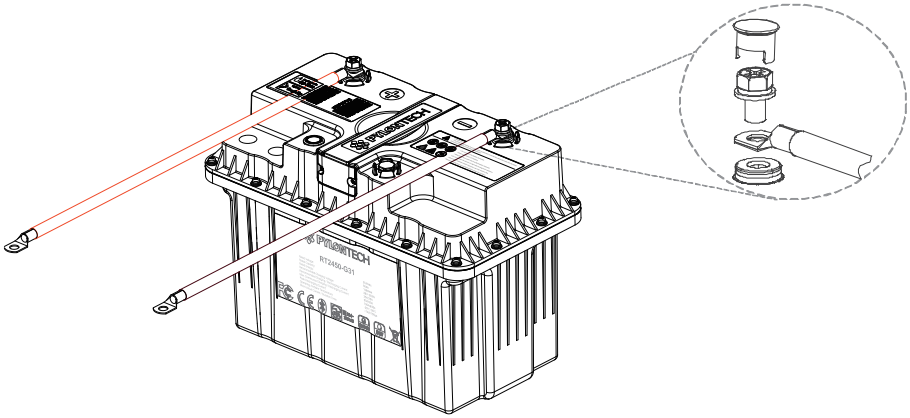
   If the battery is placed on a moving object (eg. car), make sure the battery is securely mounted.

4. Connect the cables.

Note

When installing the battery, the tiny sparks generated during the connection do not harm humans or damage the device.

Single Battery

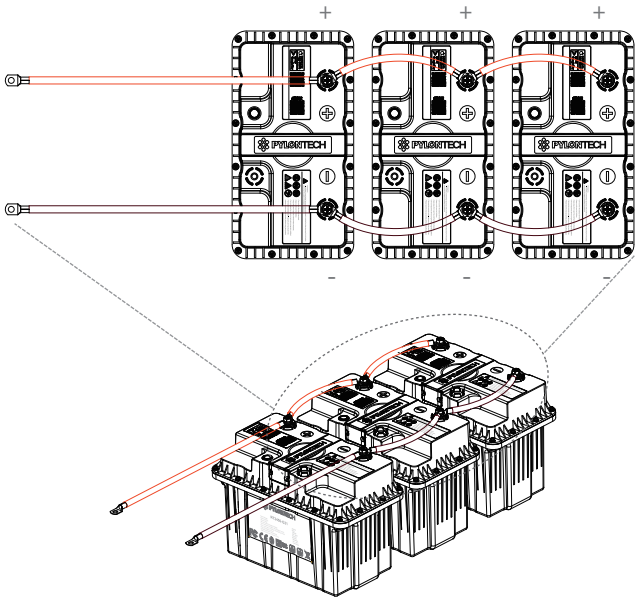


Multiple Batteries

Note

- Before use, 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, connect the batteries in parallel, and float charge them for 24 hours after a full charge. 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.

① Connecting the Batteries in Parallel



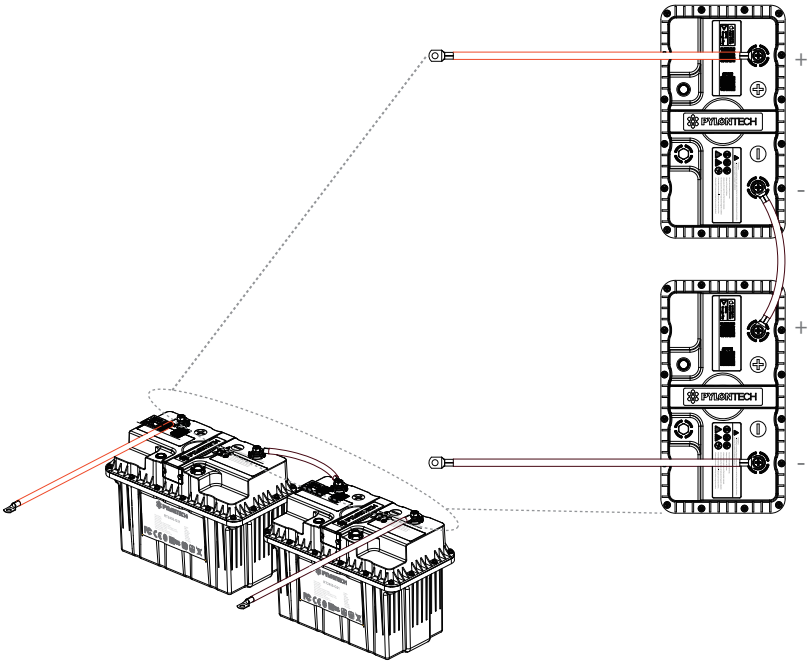
Connection Steps:

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 system.

Note

If you do not need to read the battery system information via APP, you can connect the batteries in parallel as much as you want.

② Connecting the Batteries in Series



Connection Steps:

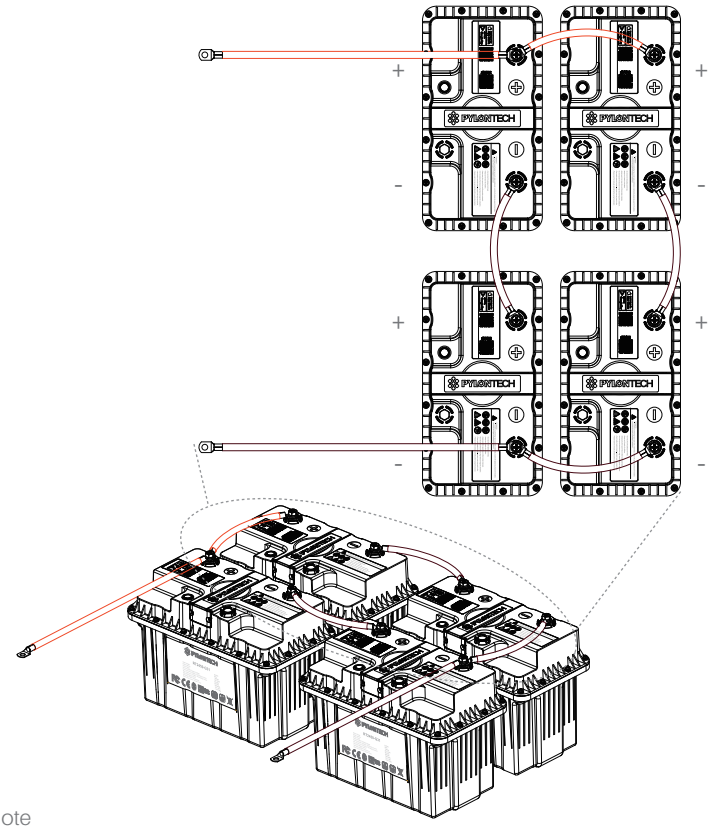
1. Connect the Negative Terminal of the first battery to the Positive Terminal of the second battery.
2. Connect the Positive Terminal of the first battery and the Negative Terminal of the second battery to the system.

Note

- Up to 2 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.

Series Configuration	Recommended Charge Voltage Value (VDC)	Recommended Discharge Voltage Value (VDC)
1S	28 ~ 28.8	22.4 ~ 28.8
2S	56 ~ 57.6	44.8 ~ 57.6

③ Connecting the Batteries in Series & Parallel



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.
- If you want to read the battery system information via APP, the maximum number of batteries connected in the system shall be no more than 16 (Max 1S16P or 2S8P) .

Post-Installation Check

Please check if the positive and negative connections are correct.

Charging

Please charge the battery with a battery charger or charge controller that is compatible with the lithium iron phosphate battery.

Note

- A charger with the power of more than 100 W is recommended.
- Charger Voltage Range: 28 V ~ 28.8 V.

Caution

When the battery shuts down due to under-voltage, charge the battery immediately with a LiFePO4 battery charger (voltage should be 28.8 V) to wake up the BMS. DO NOT use a lead acid charger in this case.

Recommended Charging Temperature

50 °F ~ 95 °F (10 °C ~ 35 °C)

Note

- The battery is supported to be charged at a temperature between -32 °F and 158 °F (0 °C ~ 70 °C), but long-term exposure to high/low temperatures may reduce the battery life.
- If the ambient temperature is out of the charging temperature range, the battery stops operating to protect itself, and it cannot be charged.

Charging Time

It takes about 2 hours to fully charge a battery with a current of 25 A.

Max. Continuous Charging Current 50 A

Discharging

The battery discharges at a constant current of 50 A(Max) until the battery voltage reaches 21.6 V.

Note

- The battery can be discharged to 100% of its capacity, and it will enter sleep mode when fully discharged. However, in order to optimize battery performance and avoid BMS disconnecting the battery, it is recommended to limit the discharge to 80%.
- When the battery is fully discharged, remember to disconnect it from other devices or charge it in time.

Caution

In off-grid PV applications, please charge the battery promptly after it has been fully discharged if the temperature is below 32°F(0°C). Otherwise, the PV panel may activate the battery repeatedly, leading to battery damage due to overdischarge.

Recommended Discharging Temperature

50 °F ~ 95 °F (10 °C ~ 35 °C)

Note

The battery is supported to be discharged at a temperature between -4 °F and 158 °F (-20 °C ~ 70 °C), but long-term exposure to high/low temperatures may reduce the battery life.

Max. Continuous Discharging Current 50 A

Battery Storage

Please follow the steps below to store the battery.

1. Charge the battery to 40% ~ 70%.
2. Disconnect the battery from the system.
3. Store the battery in a well ventilated, clean, dry area with temperatures between 41 °F and 104 °F (5 °C ~ 40 °C).

Note

Charge the battery at least once every 6 months to prevent overdischarge.

Storage Temperature

Recommended storage temperature: 23 °F~ 95 °F (-5 °C ~ 35 °C)
Storage up to 1 month: 4 °F~ 140 °F (-20 °C ~ 60 °C)
Storage up to 3 months: 14 °F~ 95 °F (-10 °C ~ 35 °C)
Extended storage time: 59 °F~ 95 °F (15 °C ~ 35 °C)

Protection and Warnings	Over-voltage
	Under-voltage
	Over-current
	High/Low Temperature
	Short Circuit
Management and Monitoring	Cell Balancing
	SOC Calculation
	Operation Log
	APP Real-time Monitoring

FCC Regulations

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

FCC Conditions

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

FCC RF Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. To comply with FCC RF Exposure compliance requirements, this grant is applicable to only Mobile Configurations. The antennas used for the transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

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