Renogy 24V 100Ah BMS LiFePO4 Self-Heating Deep Cycle Lithium Battery User Manual

Model: 24V 100Ah BMS LiFePO4 Self-Heating

1. Introduction

This manual provides essential information for the safe and efficient operation of your Renogy 24V 100Ah BMS LiFePO4 Self-Heating Deep Cycle Lithium Battery. This battery is designed for reliable backup power in various off-grid systems, including RVs, marine applications, and trolling motors. It features industry-leading self-heating capabilities for cold climates, high energy density, and an extended lifespan.

2. Safety Information

Always adhere to the following safety guidelines to prevent injury or damage to the battery and connected equipment:

- Do not short-circuit the battery terminals.
- Ensure proper ventilation during operation and charging.
- Keep the battery away from open flames, heat sources, and flammable materials.
- Do not disassemble, puncture, or modify the battery.
- Use only compatible chargers and charging methods.
- Wear appropriate personal protective equipment (PPE) such as gloves and eye protection when handling the battery.
- The battery features built-in low-temperature protections. Do not attempt to bypass these safety features.
- In case of fire, use a Class D fire extinguisher. Water can exacerbate lithium battery fires.

3. Product Overview

The Renogy 24V 100Ah LiFePO4 battery is engineered for superior performance and durability. Key features include:

- **Industry-Leading Self-Heating:** Integrated 200W heating elements enable faster warming in cold conditions.
- **Lightweight & High Density:** Utilizes Grade A EV-class LiFePO4 cells, offering over 5000 cycles and a 61% weight reduction compared to lead-acid batteries.
- **Low-Temperature Cut-off:** Built-in protections prevent charging and discharging in extreme cold.
- **Smart Cell Balancing:** A 100A programmable Battery Management System (BMS) ensures balanced voltage and enhanced protection.
- **Ultra-Rugged Design:** Robust frames and IP65-rated design with silicone caps provide protection against bumps, drops, water, and dust.

Figure 3.1: The Renogy 24V 100Ah BMS LiFePO4 Self-Heating Deep Cycle Lithium Battery.

Figure 3.2: Visual comparison highlighting the lighter weight and higher power density of the Renogy LiFePO4 battery compared to traditional lead-acid alternatives.

Figure 3.3: The Renogy LiFePO4 battery shown with protective caps, demonstrating its splash-proof design suitable for marine environments.

4. Setup

Proper setup is crucial for optimal performance and safety. Due to its lightweight design, transportation and installation are simplified.

1. **Unpacking:** Carefully remove the battery from its packaging. Inspect for any visible damage.
2. **Mounting:** The ultra-rugged design allows for secure mounting. Ensure the battery is placed on a stable, flat surface. It can be mounted upright or on its side, depending on your application and space constraints.
3. **Connections:** Connect the battery to your system using appropriate cables and terminals. Ensure all connections are secure and polarity is correct (positive to positive, negative to negative). Refer to your system's wiring diagram for specific instructions.
4. **Initial Charge:** It is recommended to fully charge the battery before its first use.

Figure 4.1: Illustration of the battery's vibrance-resistant design, showing options for upright and side mounting to secure the battery pack.

5. Operating

The Renogy LiFePO4 battery is designed for consistent and reliable power delivery.

- **Charging:** The integrated 200W heating elements activate when the battery temperature drops, allowing for efficient charging even in cold environments. Connect the battery to a compatible LiFePO4 charger. The Smart Cell Balancing feature within the BMS ensures balanced voltage during charging.
- **Discharging:** The battery can be discharged down to 80% Depth of Discharge (DOD) for optimal lifespan. The built-in low-temperature cut-off prevents discharging when the battery cell temperature falls below -4°F (-20°C) to protect the battery.
- **Temperature Range:** For best performance and longevity, operate the battery within its specified temperature ranges for charging and discharging.

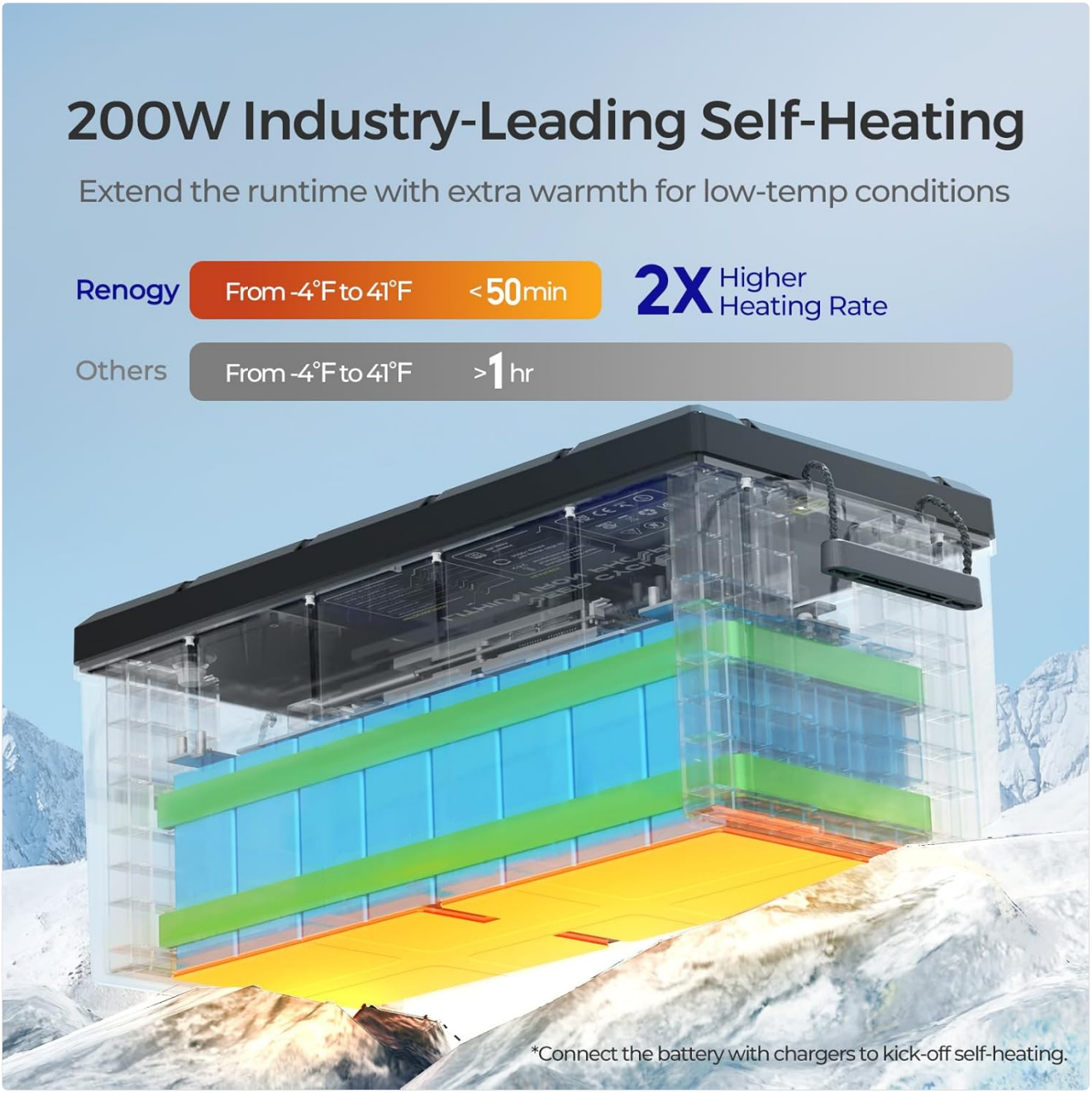

Figure 5.1: Diagram illustrating the 200W industry-leading self-heating elements that allow the battery to warm up quickly in low-temperature conditions.

Figure 5.2: Visual representation of the low-temperature cut-off feature, showing that charging stops below 32°F (0°C) and discharging stops below -4°F (-20°C).

6. Maintenance

LiFePO4 batteries require minimal maintenance compared to traditional lead-acid batteries. Follow these guidelines to maximize battery life:

- **Regular Inspection:** Periodically check the battery terminals for corrosion and ensure connections are tight.
- **Cleaning:** Keep the battery clean and free of dust and debris. The IP65-rated design and silicone caps help shed water and dust.
- **Storage:** If storing the battery for an extended period, ensure it is charged to approximately 50% State of Charge (SOC) and stored in a cool, dry place.
- **Cycle Life:** The battery is rated for over 5000 cycles at 80% Depth of Discharge (DOD), indicating exceptional longevity with proper use.

7. Troubleshooting

If you encounter issues with your Renogy battery, consider the following common troubleshooting steps:

- **Battery Not Charging:**
  - Check all cable connections for tightness and correct polarity.
  - Verify the charger is compatible with LiFePO4 batteries and is functioning correctly.
  - Ensure the ambient temperature is within the charging range (above 32°F / 0°C). The self-heating function should activate if needed.
  - The BMS may have activated a protection mode (e.g., over-voltage, under-voltage, over-current). Disconnect and reconnect the battery to reset the BMS.
- **Low Power Output:**
  - Check the battery's State of Charge (SOC).
  - Ensure the load is not exceeding the battery's continuous discharge current rating.
  - Verify the ambient temperature is within the discharge range (above -4°F / -20°C).
- **Unusual Odor or Heat:** Immediately disconnect the battery from all loads and chargers. Contact Renogy customer support.

For persistent issues or complex problems, please refer to the detailed troubleshooting guide on the Renogy website or contact customer support.

8. Specifications

Detailed specifications for the Renogy 24V 100Ah BMS LiFePO4 Self-Heating Deep Cycle Lithium Battery:

Attribute	Value
Brand	Renogy
Model	24V 100Ah BMS LiFePO4 Self-Heating
Manufacturer Part Number	840315231528
UPC	840315231528
Voltage	24V
Capacity	100Ah
Cycle Life	Over 5000 cycles (80% DOD)
Weight Reduction (vs. Lead-Acid)	61%
Heating Elements	Integrated 200W
BMS	100A Programmable
Ingress Protection (IP) Rating	IP65

9. Warranty and Support

Renogy provides comprehensive support for its products. For warranty information, technical assistance, or service inquiries, please contact Renogy directly.

- **Manufacturer:** Renogy
- **Protection Plans:** Additional protection plans may be available for purchase. Please check the product listing or Renogy's official website for details.
- **Contact Support:** Visit the official Renogy website for contact information, FAQs, and detailed product resources.