Renogy Rover 100 Amp 12/24/36/48V

Renogy Rover 100A MPPT Solar Charge Controller User Manual

Brand: Renogy | Model: Rover 100 Amp 12/24/36/48V

1. INTRODUCTION

The Renogy Rover 100A MPPT Charge Controller is designed for large-scale off-grid solar systems, supporting up to 1300 watts on 12 volts, 2600 watts on 24 volts, 3900 watts on 36V, and 5200 watts on 48V. This controller features advanced Maximum Power Point Tracking (MPPT) technology for optimal energy harvesting and comprehensive system protection. It is compatible with various battery types including Gel, Sealed, Flooded, and Lithium batteries, and offers convenient remote monitoring capabilities via the Renogy BT app.

2. KEY FEATURES

- **Innovative MPPT Design:** Die-cast aluminum design for excellent heat dissipation and up to 99% tracking efficiency, 98% peak conversion efficiency. Ideal for varying light conditions.

- **Automatic Voltage Detection:** Automatically detects 12V, 24V, 36V, or 48V DC system voltages (for non-lithium batteries), suitable for various off-grid applications.

- **Full System Protection:** Self-diagnostic capabilities protect against reverse polarity, battery overcharging/over-discharging, overload, short-circuiting, and reverse current.

- **User-Friendly LCD:** LCD screen and multiple LED indicators display system operation information, customizable parameters, and error codes.

- **4-Stage Safe Charging:** Features Bulk, Absorption, Float, and Equalization for Lead Acid Batteries, and Bulk and Absorption for Lithium batteries, including Lithium Reactivation.

- **Multiple Battery Adaptation:** Compatible with AGM, Sealed, Gel, Flooded, and Lithium Deep Cycle battery options.

- **Renogy ONE Integration:** Add Renogy ONE M1 for smart energy monitoring and real-time data via the DC Home app.

3. WHAT'S IN THE BOX

The Renogy Rover 100A MPPT Solar Charge Controller package includes:

- Rover 100 Amp MPPT Solar Charge Controller

Additional accessories such as the Renogy BT-1 Bluetooth Module (for app connectivity) and specific cables (temperature sensor, battery remote) may be sold separately.

Figure 3.1: Included cables, such as the temperature sensor and battery remote cables, for the Renogy Rover 100A MPPT Solar Charge Controller.

4. SETUP AND INSTALLATION

Proper installation is crucial for the safe and efficient operation of your Renogy Rover 100A MPPT Solar Charge Controller. Always ensure the system is disconnected from power sources before installation.

4.1 Component Overview

Figure 4.1: Front view of the Renogy Rover 100A MPPT Solar Charge Controller, showing the LCD display and control buttons.

Figure 4.2: Detailed view of the Renogy Rover 100A MPPT Solar Charge Controller's connection ports, including Solar Panel Terminals, Battery Terminals, RS485 Ports, RS232 Port, Temperature Sensor, Battery Remote, and Parallel Ports.

4.2 Wiring Connections

1. Connect the battery to the charge controller first. Ensure correct polarity (positive to positive, negative to negative).

2. Connect the solar panels to the charge controller. Verify correct polarity.

3. (Optional) Connect the load to the charge controller's load terminals.

4. (Optional) Connect the RS232 port to a Renogy BT-1 Bluetooth Module for remote monitoring via the Renogy BT app.

5. (Optional) Connect the temperature sensor and battery remote cables to their respective ports for optimized charging.

Figure 4.3: The RS232 Port, allowing communication with the optional Renogy BT-1 Bluetooth Module for remote monitoring.

4.3 Parallel Connection (100A Model Specific)

The 100A Rover controller supports connecting two 100A Rover controllers in parallel for a total capacity of 200 amps. Refer to the detailed wiring diagram in the full user manual (link provided in Section 9) for proper parallel setup.

5. OPERATION

5.1 LCD Display and Indicators

The LCD display provides real-time system information, while LED indicators show the status of solar charging, battery, and load.

Figure 5.1: The LCD screen and multiple LED indicators for displaying system operation information.

5.2 Battery Charging Stages

The controller employs a multi-stage charging algorithm to optimize battery life and performance:

- **Bulk Charge:** Charges the battery at maximum current until voltage reaches the Absorption voltage.

- **Absorption Charge:** Charges at constant voltage, gradually reducing current until the battery is fully charged.

- **Float Charge:** Maintains battery at a constant voltage, providing a trickle charge to compensate for self-discharge. (For Lead Acid Batteries)

- **Equalization:** Periodically overcharges flooded batteries to balance cell voltages and prevent sulfation. (For Flooded Batteries)

- **Lithium Reactivation:** Special mode for deeply discharged lithium batteries to bring them back to a safe charging voltage.

5.3 Remote Monitoring (Optional)

With the optional Renogy BT-1 Bluetooth Module and the Renogy BT app, you can monitor and adjust your solar system parameters directly from your smartphone or tablet. This includes viewing real-time data on voltage, current,

and energy production, as well as customizing charging settings.

6. MAINTENANCE

Regular maintenance ensures the longevity and optimal performance of your charge controller.

- **Cleanliness:** Keep the controller clean and free from dust and debris. Use a dry cloth for cleaning.
- **Connections:** Periodically check all wiring connections for tightness and corrosion. Loose connections can lead to overheating and poor performance.
- **Ventilation:** Ensure adequate airflow around the controller, especially around the heat sink, to prevent overheating. The die-cast aluminum design aids in heat dissipation.

Die-cast Aluminum Design for Heat Dissipation

Figure 6.1: The back of the Renogy Rover 100A MPPT Solar Charge Controller, featuring a die-cast aluminum design with fins for efficient heat dissipation.

- **Firmware Updates:** Check the Renogy website or app for any available firmware updates to ensure your controller has the latest features and bug fixes.

7. TROUBLESHOOTING

The Rover 100A MPPT Charge Controller has self-diagnostic capabilities. Refer to the LCD display for error codes

and consult the full user manual for detailed troubleshooting steps.

Common Issues and Solutions

Problem	Possible Cause	Solution
No Power to Controller	Loose battery connection, blown fuse, or incorrect wiring.	Check battery connections and polarity. Inspect fuses. Ensure wiring matches the diagram.
No Solar Charging	Insufficient sunlight, incorrect solar panel wiring, or panel issues.	Verify solar panel connections and polarity. Check for shading or panel damage. Ensure sufficient sunlight.
Battery Not Fully Charging	Incorrect battery type setting, undersized solar array, or battery degradation.	Confirm battery type setting on the controller. Evaluate solar array size relative to load. Test battery health.
Error Code Displayed	Specific system fault (e.g., over-voltage, short circuit).	Note the error code and refer to the comprehensive user manual for specific diagnostic and resolution steps.

8. TECHNICAL SPECIFICATIONS

Model Number: Rover 100 Amp 12/24/36/48V

Brand: Renogy

Voltage: 12 Volts (DC) (Auto-detects 12V/24V/36V/48V)

Material: Aluminum

Color: Black

Product Dimensions: 12 x 17.44 x 4.35 inches

Item Weight: 22 Pounds

Manufacturer: Renogy

Date First Available: November 13, 2018

ASIN: B07KG7PD7V

Country of Origin: China

9. WARRANTY AND SUPPORT

For detailed warranty information and technical support, please refer to the official Renogy website or the comprehensive user manual.
Official User Manual (PDF): Download Here
Renogy Store: Visit the Renogy Store on Amazon
For any issues not covered in this manual or the PDF, please contact Renogy customer service for assistance.