Renogy RBC2125DS-21W-DE

Renogy DC-DC 12V/24V IP67 50A MPPT Battery Charger User Manual

Model: RBC2125DS-21W-DE

1. Introduction

This manual provides essential information for the safe and efficient operation of your Renogy DC-DC 12V/24V IP67 50A MPPT Battery Charger. This device is designed to charge your service battery from both solar panels and your vehicle's alternator, offering versatile power management for various applications, including RVs and marine setups. Please read this manual thoroughly before installation and use.

2. Important Safety Instructions

Please observe all safety precautions to prevent injury or damage to the product and connected systems.

2.1 General Safety

- Always wear proper protective equipment and use insulated tools during installation and operation.
- Avoid wearing jewelry or other metal objects when working on or around the battery charger.
- Keep the battery charger out of the reach of children.
- Do not dispose of the battery charger as household waste. Comply with local, state, and federal laws and regulations for recycling.
- In case of fire, use an FM-200 or CO_2 fire extinguisher.
- Improper installation on a boat can damage boat components. Consult a qualified electrician for marine installations.
- Do not expose the battery charger to flammable or harsh chemicals or vapors.
- Clean the battery charger regularly.

- Do not puncture, drop, crush, penetrate, shake, strike, or step on the battery charger.
- Do not open, disassemble, repair, tamper with, or modify the battery charger.
- When connecting any device, connect the negative terminal prior to the positive terminal.
- It is recommended that all cables do not exceed 10 meters to prevent excessive voltage drop.
- Cable specifications in the quick guide account for a critical voltage drop of less than 3% and may not apply to all configurations.

2.2 Battery Charger Safety

- Install the battery charger on a vertical surface, protected from direct sunlight, high temperatures, and water. Ensure adequate ventilation.
- Keep the battery charger away from heating equipment.
- Do not insert foreign objects into the battery charger.
- Confirm device polarities before connection. Reverse polarity can damage the battery charger and void the warranty.
- Do not touch the connector contacts while the battery charger is in operation.
- Disconnect all connectors from the battery charger before performing maintenance or cleaning.

2.3 Battery Safety

- Do not use batteries if there is any damage.
- Do not touch exposed electrolyte or powder if the battery is damaged.
- **Risk of explosion!** Never install the battery charger in a sealed enclosure with flooded batteries. Do not install the battery charger in a confined area where battery gases can accumulate.
- Before installing the battery charger, ensure all battery groups are properly installed.

3. Product Features

3.1 720W Max Output & Intelligent Boost/Buck Logic

The charger delivers a maximum output of 720W, capable of fully charging a 1.2 kWh battery in approximately 1.8 hours. Its intelligent boost and buck logic supports both 12V and 24V systems, allowing for flexible configurations such as boosting a 24V battery from a 12V input or bucking a 12V battery from a 24V input.

This diagram illustrates the charger's ability to adapt to diverse DIY configurations, boosting voltage without efficiency loss. It shows how a 12V solar panel can charge a 24V battery via the charger's boost function, and how an alternator can charge a service battery.

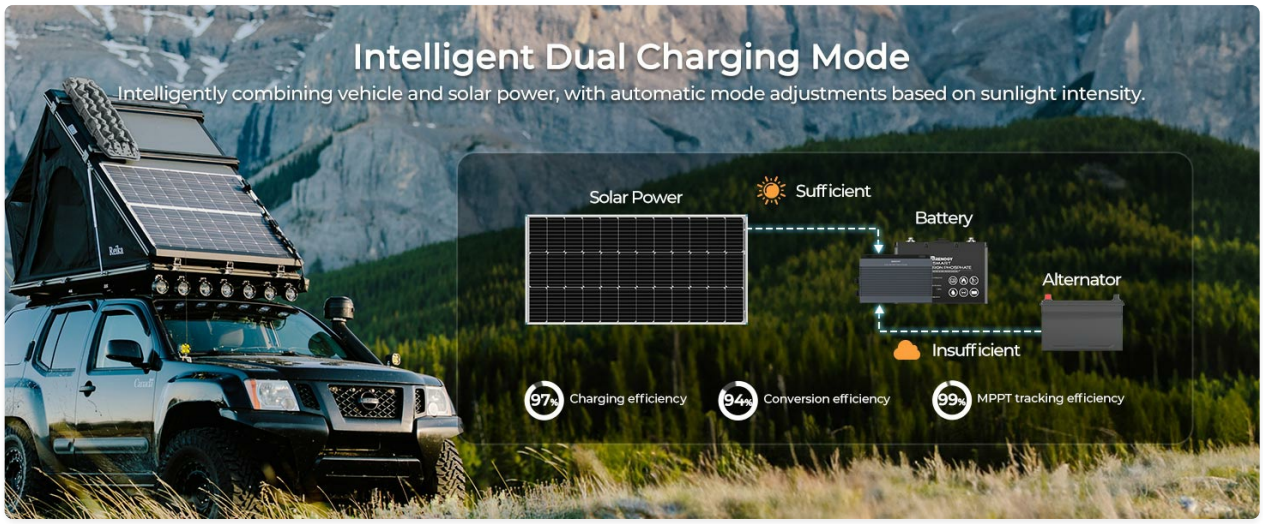
3.2 Robust, Compact, and IP67 Certified Design

Designed to withstand extreme temperatures from -35°C to 80°C, the charger maintains full-load operation even at 55°C. Its compact size (17.8 x 12.1 x 3.7 cm) allows for installation in tight spaces like an RV engine compartment. With an IP67 rating, it is protected against dust and water ingress, ensuring reliable operation in challenging environments.

This image highlights the compact and waterproof design of the DC-DC charger, demonstrating its suitability for installation in various vehicle compartments such as the trunk, side space, or engine bay, even in wet conditions.

3.3 Innovative Dual Power Input (Solar & Alternator)

The charger supports simultaneous charging from both solar panels and the vehicle's alternator. It intelligently combines these power sources to maintain a total maximum output of 50A, ensuring consistent performance.



This illustration depicts the dual charging solution, where both vehicle power (alternator) and solar power are combined to charge the service battery simultaneously.

3.4 High Efficiency & Comprehensive Protection

Equipped with MPPT technology, the charger offers exceptional efficiency: 99% tracking efficiency, 97% charging efficiency, and 94% conversion efficiency. It includes comprehensive electrical protections against overvoltage, overcurrent, overheating, reverse current, reverse polarity, and battery isolation, ensuring a safe and reliable charging process.

This image emphasizes the optimized charging efficiency of the Renogy DC-DC charger, capable of delivering 720W of power to fully charge a battery in 1.8 hours.

3.5 Remote Monitoring

The integrated Bluetooth module allows real-time power data monitoring via the DC Home or Renogy One Core app (optional). Wired CAN communication is also supported for continuous connectivity and system control, optimizing energy consumption.

This image demonstrates the easy monitoring capabilities through the Renogy app, showing real-time data for energy generation and consumption, remote control options, and efficiency management.

3.6 Battery Type Compatibility

The charger is compatible with a wide range of battery types, including Lithium (LiFePO4) and various Lead-Acid batteries (GEL, AGM, SLD, FLD), offering flexibility for system upgrades and adaptability to technological changes.

This image illustrates the charger's compatibility with most battery types, including Lithium and various Lead-Acid batteries, providing greater flexibility for system upgrades.

4. Setup and Installation

Proper installation is crucial for the safe and efficient operation of the Renogy DC-DC Battery Charger. Ensure

you have read and understood all safety instructions before proceeding.

4.1 Choosing an Installation Location

- Mount the charger on a vertical surface in a well-ventilated area.
- Protect the unit from direct sunlight, high temperatures, and water exposure.
- Avoid installing near heating equipment or in confined spaces where battery gases might accumulate.

4.2 Wiring Connections

Connect the charger to your starter battery, service battery, and solar panels according to the wiring diagram provided in the full product manual. Always ensure correct polarity before making connections. Connect negative terminals before positive terminals.
Use appropriate cable gauges to minimize voltage drop, especially for longer cable runs. It is recommended that cable lengths do not exceed 10 meters.

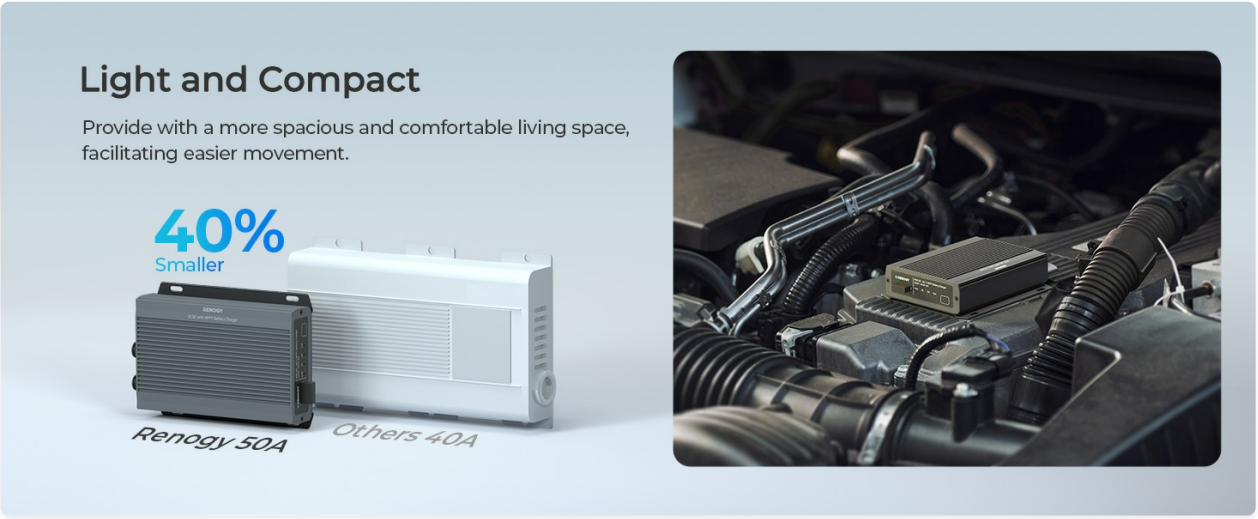
4.3 Professional Installation

For complex installations, particularly in marine environments, it is highly recommended to consult a qualified electrician to prevent damage to your vehicle or vessel components.

5. Operating Instructions

5.1 Automatic Charging Mode Switching

The charger features automatic switching between solar and alternator charging modes. It prioritizes solar power when sufficient sunlight is available and seamlessly switches to alternator charging when solar input is insufficient or when the engine is running.



This image illustrates the automatic charging mode switching, where the charger intelligently selects between solar modules and the alternator based on the intensity of solar energy to ensure continuous charging.

5.2 Monitoring with the Renogy App

Utilize the Renogy DC Home or Renogy One Core app (if applicable) to monitor the charger's performance in real-time. The app provides data on energy generation, consumption, and allows for remote control of system settings. Ensure your device's Bluetooth is enabled and paired with the charger.

6. Maintenance

Regular maintenance ensures the longevity and optimal performance of your Renogy DC-DC Battery Charger.

- **Cleaning:** Regularly clean the exterior of the charger to remove dust and debris. Ensure all connectors are disconnected before cleaning. Use a dry, soft cloth. Do not use harsh chemicals or solvents.
- **Connections:** Periodically check all wiring connections to ensure they are secure and free from corrosion.
- **Ventilation:** Ensure that the installation area remains well-ventilated and free from obstructions to allow for proper heat dissipation.

7. Troubleshooting

If you encounter issues with your Renogy DC-DC Battery Charger, refer to the following common troubleshooting steps:

- **No Charging:**
  - Check all cable connections for tightness and correct polarity.
  - Verify that the input voltage from the alternator or solar panels is within the specified range.
  - Ensure the service battery is properly connected and not severely discharged.
- **Bluetooth Connection Issues:**
  - Ensure your mobile device's Bluetooth is enabled and within range of the charger.
  - Restart the Renogy app and try reconnecting.
  - Check if the charger's indicator lights show any error codes.
- **Overheating:**
  - Ensure the charger is installed in a well-ventilated area and not exposed to direct heat sources.
  - Check for any obstructions around the cooling fins.

For persistent issues, please contact Renogy customer support.

8. Specifications

Feature	Specification
Brand	Renogy
Model Number	RBC2125DS-21W-DE
Input Voltage	12 Volts (DC)
Output Voltage	24 Volts (DC)
Current Rating	50 A
Charging Power	720 W
Charging Time (1.2 kWh battery)	1.8 hours

Feature	Specification
IP Rating	IP67
Operating Temperature Range	-35 °C to 80 °C
Dimensions (L x W x H)	17.8 x 12.1 x 3.7 cm (approximate, inferred from feature bullet)
Connector Type	Anderson PowerPole
Certifications	CE, IP67, ECE R10 (EMC)
UPC	840315219359

9. Warranty and Support

Renogy products are designed for reliability and performance. For specific warranty details regarding your DC-DC Battery Charger, please refer to the warranty card included with your product or visit the official Renogy website.

If you require technical assistance, have questions about installation, or need support for troubleshooting, please contact Renogy customer service through their official channels. Provide your product model number (RBC2125DS-21W-DE) and purchase information when seeking support.

You can find contact information and additional resources on theRenogy Brand Store or the official Renogy website.