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### Renogy RBC50D1S-G2

# Renogy 50 Amp MPPT Charge Controller User Manual

Model: RBC50D1S-G2

## PRODUCT OVERVIEW

The Renogy 50 Amp MPPT Charge Controller with alternator power input is engineered for multi-stage, multi-input charging. This versatile unit can charge a service battery from either a starting battery connected to an alternator or directly from solar panels. It prioritizes the vehicle's starting battery while allowing the solar system to charge the service battery first. With multi-stage charging and multi-chemistry functionality, this 50 Amp MPPT charger supports Flooded, Gel, AGM, and Lithium batteries. It features innovative MPPT technology with a high tracking efficiency of up to 99% and a peak conversion efficiency of 97%.



The Renogy 50 Amp MPPT Charge Controller, model RBC50D1S-G2, is a versatile device designed for charging service batteries from both solar panels and a vehicle's alternator. It features a robust black casing with indicator lights for system status.

## KEY FEATURES

- **Innovative MPPT Design:** Achieves up to 99% tracking efficiency and 97% peak conversion efficiency, maximizing solar power even in cloudy conditions. Can activate a dead battery (0 Volt) with a small current.
- **Extensive Protection:** Features a 3-phase charging profile (Bulk, Boost, Float) for accurate battery charging. Includes protections for battery isolation, over-voltage, battery temperature, over-current, overheat, reverse current, and solar panel/alternator reverse polarity. Equipped with a remote temperature sensor port for accurate temperature compensation.
- **DC to DC Charger Function:** Compatible with both traditional and smart alternators. Charges a service battery from a starting battery. An IGN Port connects to vehicle ignition for auto-trigger with smart alternators. Built-in Voltage Sensitive Relay (VSR) simplifies setup with traditional alternators.
- **Real-time Monitoring & Customization:** RJ45 communication port allows remote control and monitoring via the BT-2 Bluetooth Module and Renogy DC Home App on a smartphone.
- **Silent & Efficient Heat Dissipation:** Integrated heat sink provides 0 dB operation and highly efficient heat dissipation, ensuring maximum charging efficiency and a quiet environment.

## Multiple Smart Protections

Ensure charging safety





Temperature Compensation



Over-voltage Protection



Over-current Protection



Built-in VSR



Reverse Prevention Circuit



Reverse Current Protection

The controller incorporates various safety features including temperature compensation, over-voltage protection, over-current protection, built-in VSR, reverse prevention circuit, and reverse current protection to ensure safe and reliable operation.

## Support Multiple Battery Types



Gel



AGM



Flooded



Lithium



This charge controller is compatible with a wide range of battery chemistries, including Gel, AGM, Flooded, and Lithium batteries, offering flexibility for various power systems.

## SETUP AND INSTALLATION

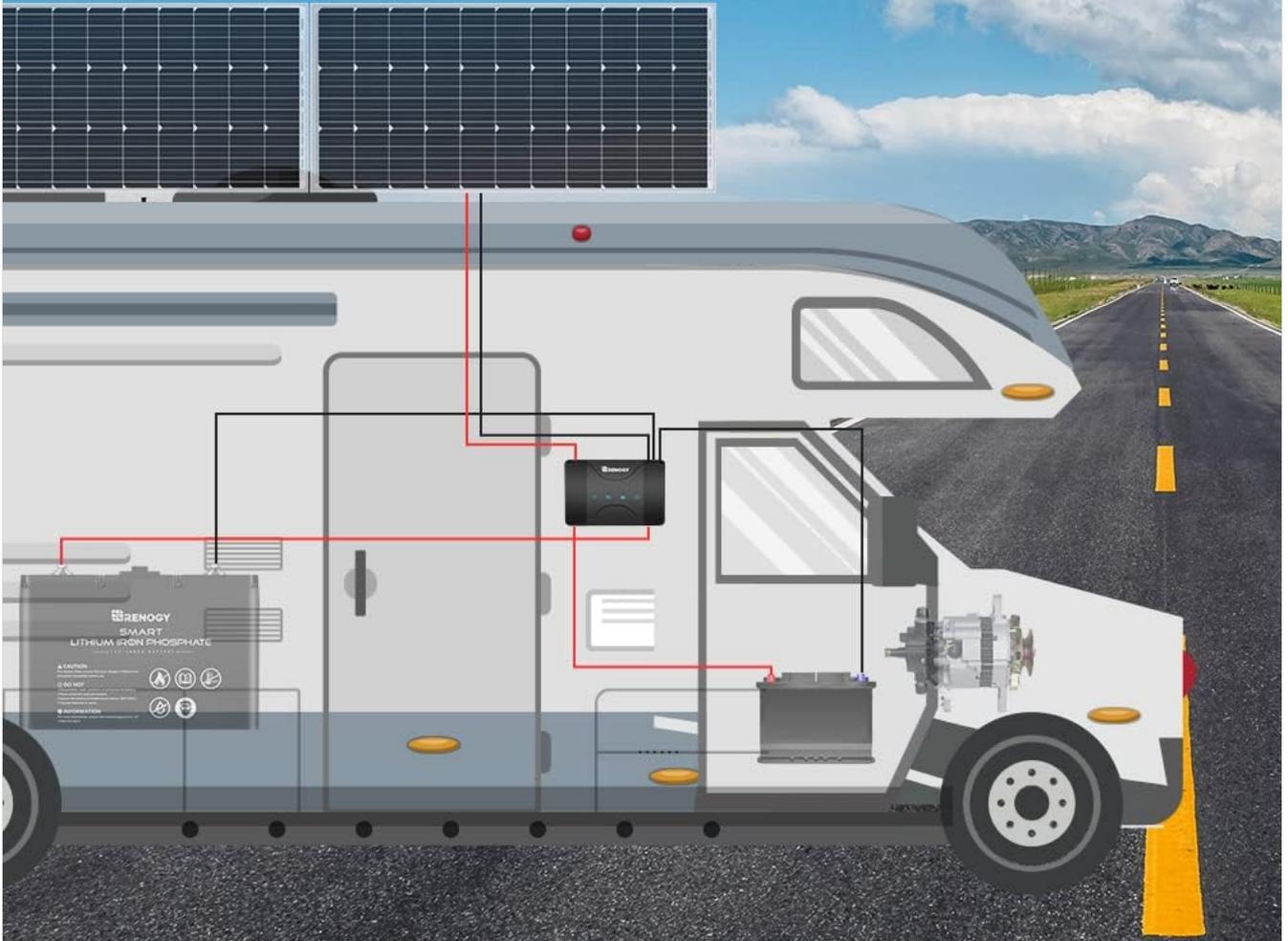
The Renogy 50 Amp MPPT Charge Controller is designed for straightforward installation in various mobile and off-grid applications. It supports dual power input from both solar panels and your vehicle's alternator.

### Wiring Connections

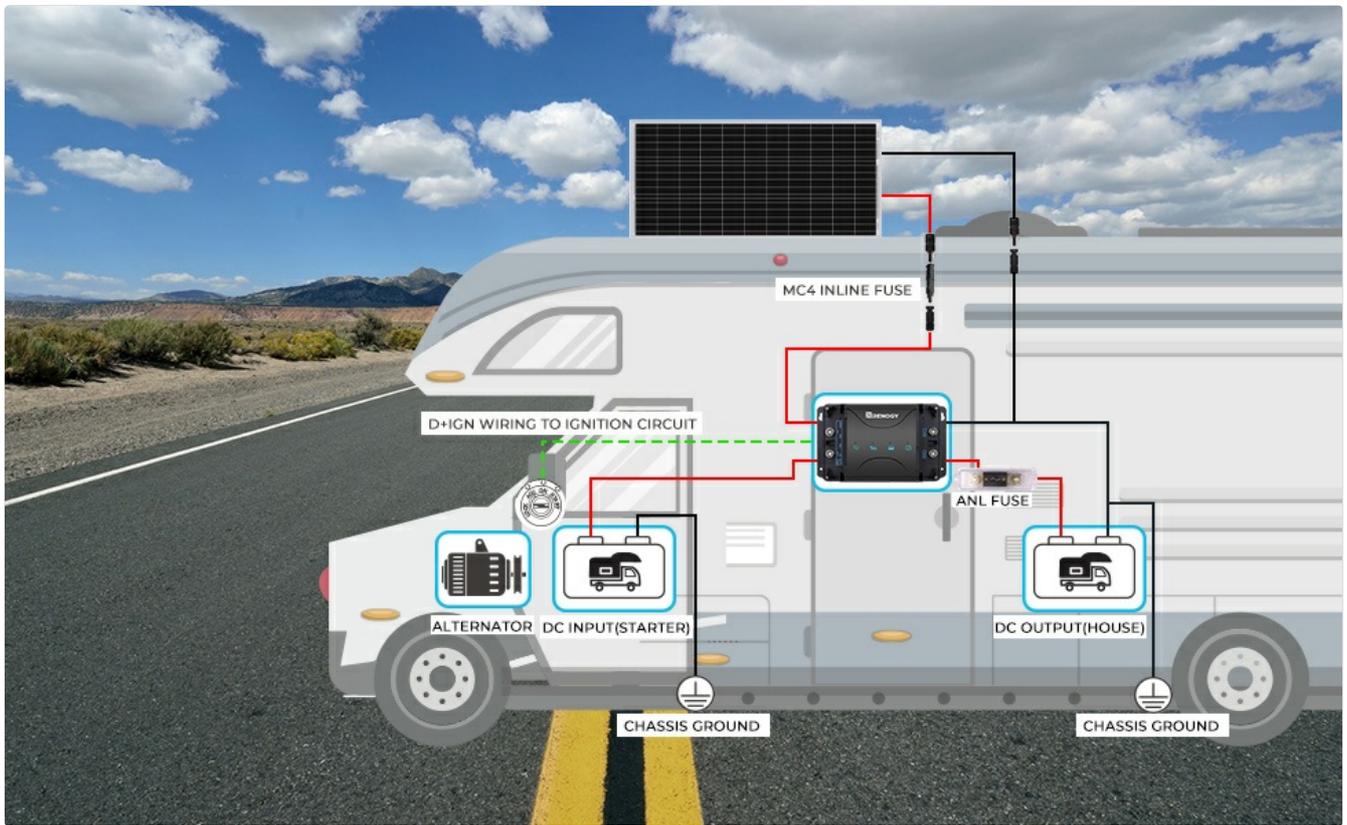
Connect your solar panels to the designated solar input terminals. For alternator charging, connect the unit to your vehicle's starting battery. If your vehicle has a smart alternator, utilize the IGN Port by connecting it to the vehicle's ignition circuit for automatic triggering. For traditional alternators, the built-in Voltage Sensitive Relay (VSR) simplifies the setup by automatically isolating the batteries when the engine is off.

# Multi-input for Battery Charging

Stay fully charged and off-grid longer



The Renogy charge controller supports multi-input charging, allowing it to charge your service battery from both solar panels and the vehicle's alternator, ensuring your batteries stay charged while on the go.



This diagram illustrates the typical wiring setup for the charge controller, connecting solar panels via an MC4 inline fuse, the alternator and starter battery to the DC input, and the house battery to the DC output, all with appropriate fusing and grounding.

## Physical Dimensions

The compact design of the controller allows for flexible installation in various spaces.

## RJ45 Communication Port Featured

Remotely monitor and control your device



The compact design of the controller, measuring 9.60 x 3.0 x 5.75 inches and weighing 3.13 lbs (1.42 kg), allows for flexible installation in various spaces.

### OPERATING INSTRUCTIONS

Once installed, the Renogy MPPT Charge Controller operates automatically to manage your battery charging. It employs an intelligent 3-phase charging profile to ensure optimal battery health and longevity.

### Charging Process

The controller utilizes a Bulk, Boost, and Float charging cycle. During the Bulk phase, the maximum current is delivered to rapidly charge the battery. The Boost phase then applies a higher voltage to ensure the battery reaches full charge. Finally, the Float phase maintains a lower voltage to keep the battery fully charged without overcharging.

# 3-Phase MPPT Charging

Efficiently and safely charge your battery to 100%



Bulk Charge

Boost Charge

Float Charge

The controller utilizes a 3-phase charging profile (Bulk, Boost, and Float) to efficiently and safely charge your battery to 100%, optimizing battery health and lifespan.

## Monitoring and Customization

The controller features an RJ45 communication port, allowing you to connect the Renogy BT-2 Bluetooth Module (sold separately). Once connected, you can monitor the system's performance and customize parameters in real-time using the Renogy DC Home App on your smartphone.

## Tiny in Size & Light in Weight

Ready to adapt into small installation space



Equipped with an RJ45 communication port, the controller allows for remote monitoring and parameter customization via the Renogy BT-2 Bluetooth Module and the Renogy DC Home App on your smartphone.

## MAINTENANCE

The Renogy 50 Amp MPPT Charge Controller is designed for minimal maintenance. To ensure optimal performance and longevity, consider the following:

- **Regular Inspection:** Periodically inspect all wiring connections to ensure they are secure and free from corrosion. Loose connections can lead to performance issues or safety hazards.
- **Cleanliness:** Keep the unit clean and free of dust, dirt, and debris. A clean surface helps maintain optimal heat dissipation, especially around the integrated heat sink.
- **Ventilation:** Ensure the installation area provides adequate airflow around the controller to facilitate efficient heat dissipation.
- **Integrated Heat Sink:** The controller features an integrated heat sink, which eliminates the need for a cooling fan, reducing moving parts and minimizing maintenance requirements.

## TROUBLESHOOTING

This section provides guidance for common issues you might encounter with your Renogy 50 Amp MPPT Charge Controller.

- **No Charging from Solar:** Ensure solar panels are receiving adequate sunlight and are connected with correct polarity. Check all fuses in the solar circuit. Verify that the solar input voltage is within the controller's specified range.
- **No Charging from Alternator:** Confirm the alternator is functioning correctly and the vehicle engine is running. Check connections to the starting battery and the IGN port (if applicable for smart alternators). Verify all fuses in the alternator charging circuit.
- **Battery Not Charging Fully:** Ensure the correct battery type is selected in the controller settings (if adjustable via app). Check for proper temperature compensation if a remote temperature sensor is used. Verify battery health and capacity.
- **Controller Not Powering On:** Check all power connections and fuses. Ensure the battery voltage is within the operational range. The controller can activate a completely discharged battery (0 Volt) with a small current to bring it back to life.
- **Error Indicators:** Refer to the indicator lights on the controller. Consult the Renogy DC Home App for detailed error codes or status messages if using the Bluetooth module. The controller's built-in protections (over-voltage, over-current, reverse polarity, etc.) will prevent damage in fault conditions.

If issues persist after following these steps, please refer to the detailed troubleshooting guide available on the official Renogy support website or contact their customer service department for further assistance.

## SPECIFICATIONS

Attribute	Value
Model Number	RBC50D1S-G2
Brand	Renogy
Display Type	LCD
Voltage	12 Volts (DC)
Product Dimensions	9.62 x 5.81 x 3.02 inches (244 x 148 x 77 mm)
Item Weight	4.74 pounds (2.15 Kilograms)
Color	Black
Included Components	1*50 Amp MPPT charge controller with Alternator Power Input and Cables needed
Batteries Required	No
UPC	840315211780

## WARRANTY INFORMATION

The Renogy 50 Amp MPPT Charge Controller (Model: RBC50D1S-G2) comes with a material and workmanship warranty.

- **Warranty Period:** 2 Years

For detailed terms and conditions of the warranty, including coverage and claims procedures, please refer to the official Renogy warranty policy document or contact Renogy customer support.

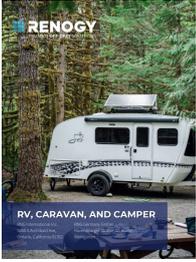
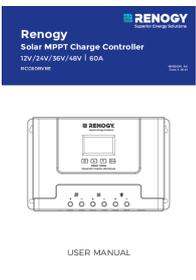
## CUSTOMER SUPPORT

For any questions, technical assistance, or support regarding your Renogy 50 Amp MPPT Charge Controller, please utilize the following resources:

- **Official Website:** Visit the [Renogy Store on Amazon](#) or the main Renogy website for product documentation, FAQs, and support articles.
- **Contact Support:** Reach out to Renogy's customer service team for personalized assistance. Contact information can typically be found on their official website.

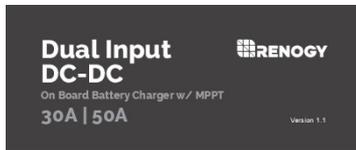
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## Related Documents

	<p><a href="#">Renogy Off-Grid Solutions for RVs, Caravans, and Campers   Product Catalog</a></p> <p>Explore Renogy's comprehensive range of trusted off-grid power solutions, including solar panels, batteries, charge controllers, and inverters, designed for RVs, caravans, campers, and homes. Discover innovative technology for energy independence.</p>
	<p><a href="#">Renogy Rover 100A MPPT Solar Charge Controller Specifications</a></p> <p>Detailed specifications for the Renogy Rover 100A MPPT Solar Charge Controller, including features, technical data, and battery charging parameters for various battery types.</p>
	<p><a href="#">Renogy RCC60RVRE Solar MPPT Charge Controller User Manual</a></p> <p>This user manual provides comprehensive instructions for the Renogy RCC60RVRE Solar MPPT Charge Controller, covering its features, installation, operation, monitoring, specifications, maintenance, and safety guidelines for 12V/24V/36V/48V systems.</p>

	<p><a href="#">Renogy BT-2 Bluetooth Module User Manual and Specifications</a></p> <p>Comprehensive guide to the Renogy BT-2 Bluetooth Module, covering general information, key features, identification of parts, app connection, technical specifications, and FCC compliance. Compatible with various Renogy solar charge controllers and power products.</p>
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Documents - Renogy – RBC50D1S-G2

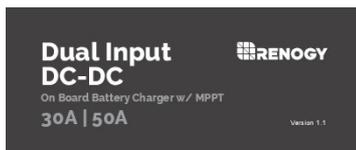


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Dual Input DC-DC On Board Battery Charger w/ MPPT 30A 50A Version 1.1 Important Safety Instructions Please save these instructions. This manual contains important safety, installation, and operating instructions for the DCDC Battery Charger. Do not operate the Battery Charger unless you have r... lang:en score:30 filesize: 909.71 K page\_count: 24 document date: 2020-09-22



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Dual Input DC-DC On Board Battery Charger w/ MPPT 30A 50A Version 1.1 Important Safety Instructions Please save these instructions. This manual contains important safety, installation, and operating instructions for the DCDC Battery Charger. Do not operate the Battery Charger unless you have r... lang:en score:28 filesize: 909.71 K page\_count: 24 document date: 2020-09-22



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RNG 200922 DC EN Dual Input DC Caravan RV CampingDC On Board Battery Charger w MPPT is designed to charge your service battery 100% from two inputs solar and alternator Featuring multi batteryRBC30D1S G1 RBC50D1S G2 Manualcaravanrvcamping au assets files RBC30D1S Manual srsltid AfmBOo06e TQKf4DUEF2 8CKLt3sPioYDNEVUHugMOrcFYdhBGxDWp61 |||



Dual Input DC-DC On Board Battery Charger w/ MPPT 30A 50A Version 1.1 Important Safety Instructions Please save these instructions. This manual contains important safety, installation, and operating instructions for the DCDC Battery Charger. Do not operate the Battery Charger unless you have r... lang:en score:20 filesize: 909.72 K page\_count: 24 document date: 2020-09-22

