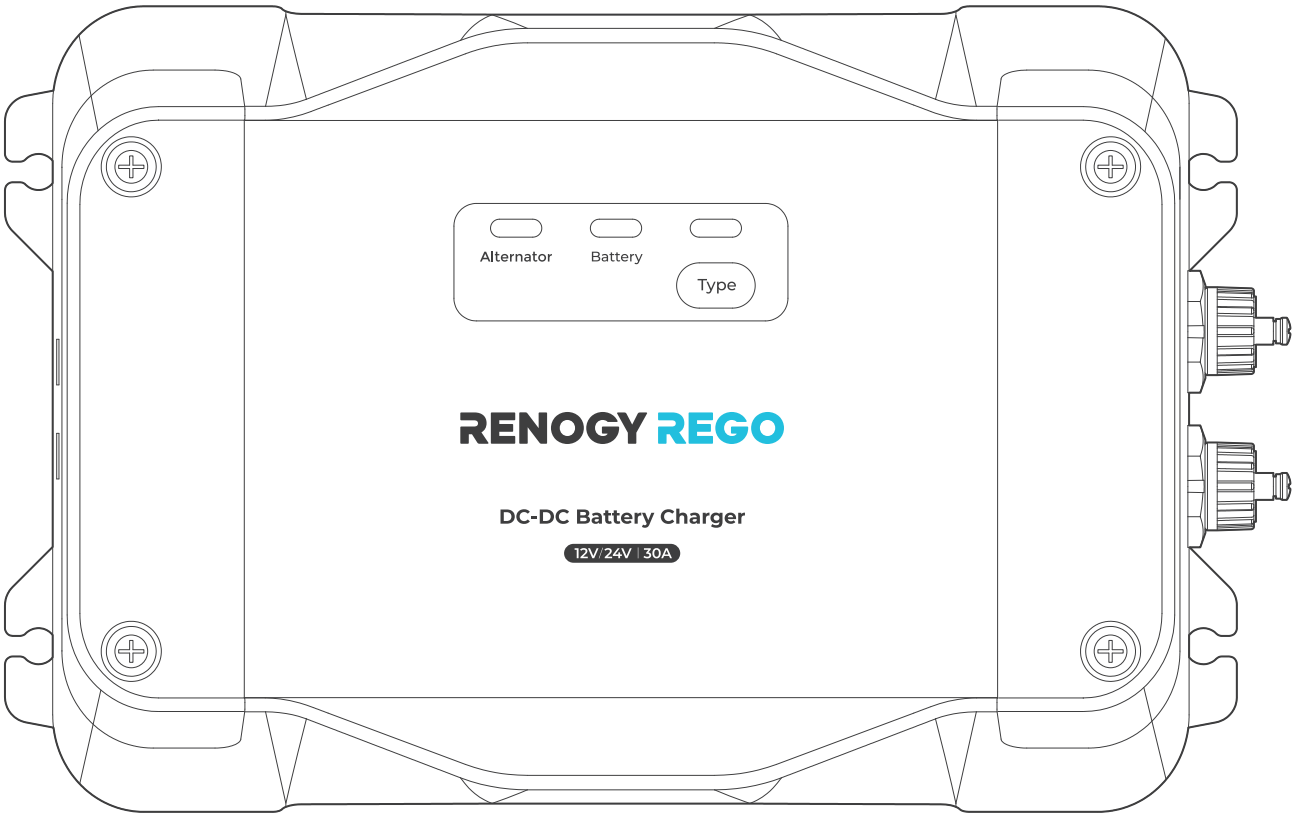
RENOGY REGO

Bidirectional DC-DC Battery Charger

12V/24V | 30A

RBC2115DS-21W-G1

VERSION A1
April 15, 2025



USER MANUAL

Before Getting Started

The user manual provides important operation and maintenance instructions for REGO 12V/24V-12V/24V 30A Bidirectional DC-DC Battery Charger (hereinafter referred to as battery charger).

Read the user manual carefully before operation and save it for future reference. Failure to observe the instructions or precautions in the user manual can result in electrical shock, serious injury, or death, or can damage the battery charger, potentially rendering it inoperable.

- Renogy ensures the accuracy, sufficiency, and the applicability of information in the user manual at the time of printing or release due to continual product improvements that may occur.
- Renogy assumes no responsibility or liability for personal and property losses, whether directly and indirectly, caused by the user's failure to install and use the product in compliance with the user manual.
- Renogy is not responsible or liable for failures, damages, or injuries resulting from repair attempted by unqualified personnel, improper installation, and unsuitable operation.
- The illustrations in the user manual are for demonstration purposes only. Details may appear slightly different depending on product revision and market region.
- Renogy reserves the right to change the information in the user manual without notice. For the latest user manual, visit renogy.com.

Disclaimer

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1. General Information

1.1. Symbols Used

The following symbols are used throughout the user manual to highlight important information.

WARNING: Indicates a potentially hazardous condition that could result in personal injury or death.

CAUTION: Indicates a critical procedure for safe and proper installation and operation.

NOTE: Indicates an important step or tip for optimal performance.

1.2. Introduction

REGO 12V/24V-12V/24V 30A Bidirectional DC-DC Battery Charger allows you to charge your 12V or 24V auxiliary battery from the starter battery in your RV and charge the starter battery from the auxiliary battery when the starter battery voltage drops below a predefined threshold. The supported auxiliary battery types include deep-cycle gel-sealed lead-acid batteries (GEL), flooded lead-acid batteries (FLD), sealed lead-acid batteries (SLD/AGM) or lithium iron phosphate batteries (LI). In addition, the battery charger provides a user-defined battery mode that allows for more battery setting flexibility.

This charger delivers an unparalleled driving charge experience, enhanced by smart control technology. Compatible with both smart and traditional generators, it maximizes energy efficiency while protecting your vehicle's batteries. With advanced electronic protections and up to 94% charging efficiency, this charger ensures reliable performance on the road. The intelligent charging logic optimizes the charging process, and with easy monitoring via the Renogy app (free of charge) and/or Renogy ONE Core (sold separately), you can effortlessly monitor your battery system's status.

1.3. Key Features

- **Advanced High-Temperature Performance**
  Effortlessly converts between 12V and 24V systems with over 92% charging efficiency, offering a dual charging solution adaptable to various DIY configurations.
- **Optimized Battery Health**
  Enables or disables lithium battery activation based on battery status via the Renogy app, extending battery lifespan.
- **Extremely Compact and Lightweight**
  Compact and light enough to be mounted in engine compartment and side storeroom, allowing for a more spacious and comfortable living space.
- **Smart Control for Simplicity and Efficiency**
  The built-in Bluetooth module allows for seamless remote monitoring of the battery charger through the Renogy app (free of charge) on your smartphone and/or Renogy ONE Core (sold separately), providing real-time insights into the charging process and enabling you to track performance over time and make informed decisions for optimal battery management.

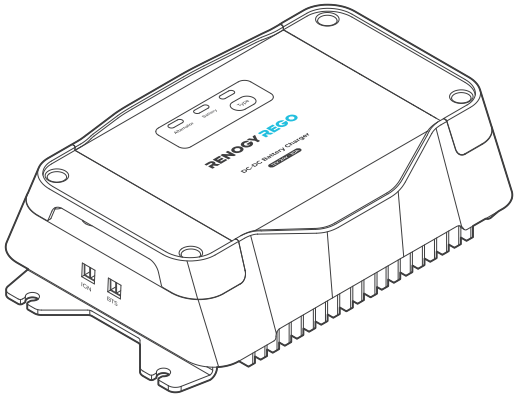
1.4. SKU

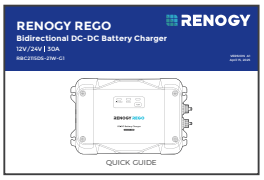
REGO 12V/24V-12V/24V 30A Bidirectional DC-DC Battery Charger	RBC2115DS-21W-G1

2. Get to Know 12V/24V-12V/24V 30A DC-DC Battery Charger

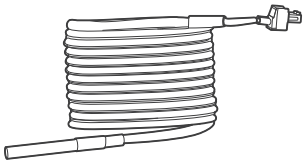
2.1. What's In the Box?

RENOGY REGO 12V/24V-12V/24V 30A Bidirectional DC-DC Battery Charger × 1





Quick Guide × 1



Battery Temperature Sensor (2 m) × 1

ST4*16 mm

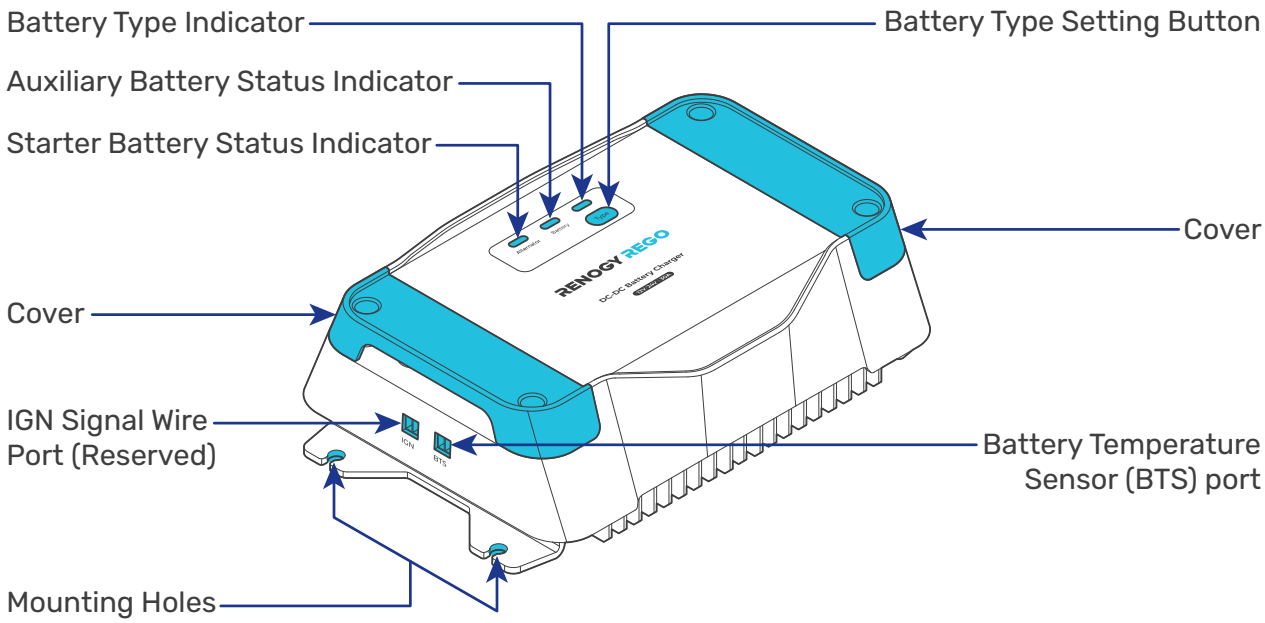
Mounting Screws x 4

Make sure that all accessories are complete and free of any signs of damage.

The accessories and product manual listed are crucial for the installation, excluding warranty information and any additional items. Please note that the package contents may vary depending on the specific product model.

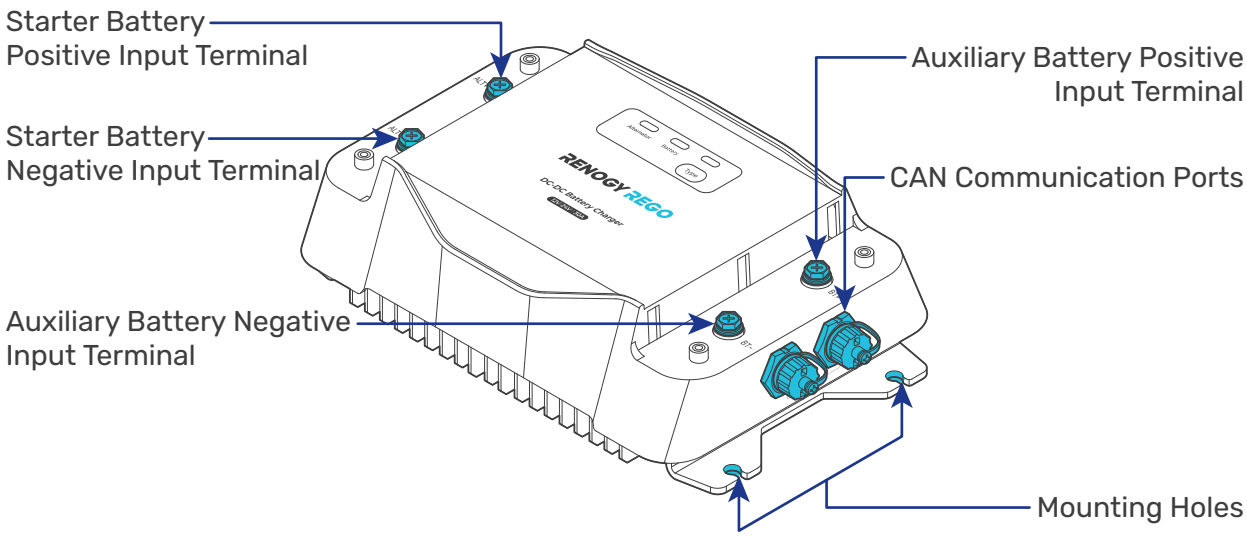
2.2. Product Overview

With Covers

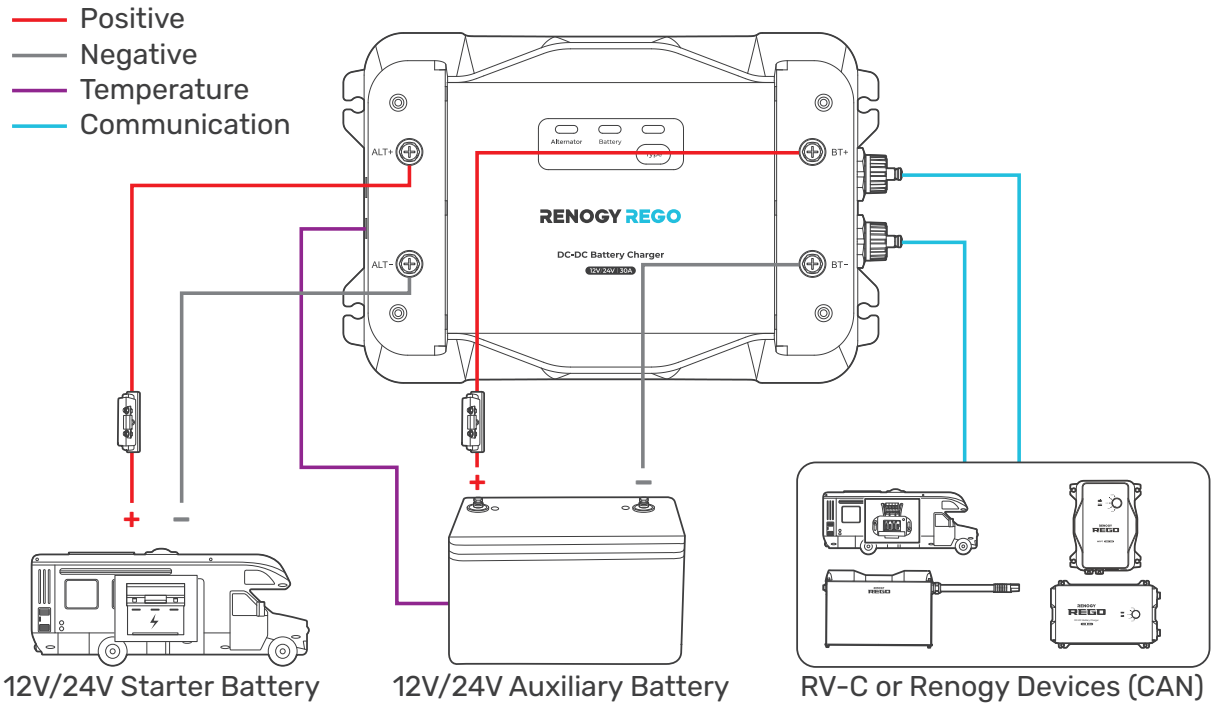


The Battery Temperature Sensor (BTS) port can only be used with lead-acid batteries.

Without Covers



2.3. System Setup

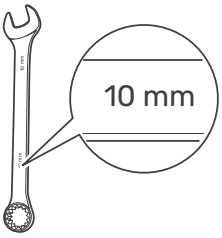


The wiring diagram only shows the key components in a typical DC-coupled off-grid energy storage system for the illustrative purpose. The wiring might be different depending on the system configuration. Additional safety devices, including disconnect switches, emergency stops, and rapid shutdown devices, might be required. Wire the system in accordance with the regulations at the installation site.

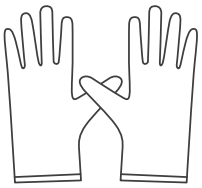
3. Preparation

3.1. Recommended Tools & Accessories

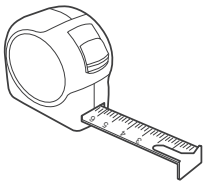
Phillips Screwdriver (#1)



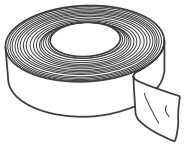
Wrench (7/16 in)



Insulating Gloves



Measuring Tape



Insulation Tape

- Prior to installing and configuring the battery charger, prepare the recommended tools, components, and accessories.
- Choose proper mounting screws specific to your installation site. This manual takes self-tapping screws for wooden walls as an example.
- For how to size bare wires, refer to "3.2. Size Wires" in this manual.
- In this manual, the red cable represents the positive cable, and the gray cable represents the negative cable.

3.2. Size Wires

Select proper bare wires based on the cable length in your power system. Refer to the table below for recommended gauge sizes.

Cable	Fuse Cable	Cable Gauge Size
Auxiliary Battery Side	8 AWG (8.36 mm²)	8 AWG (8.36 mm²)
Starter Battery Side	6 AWG (13.3 mm²)	6 AWG (13.3 mm²)

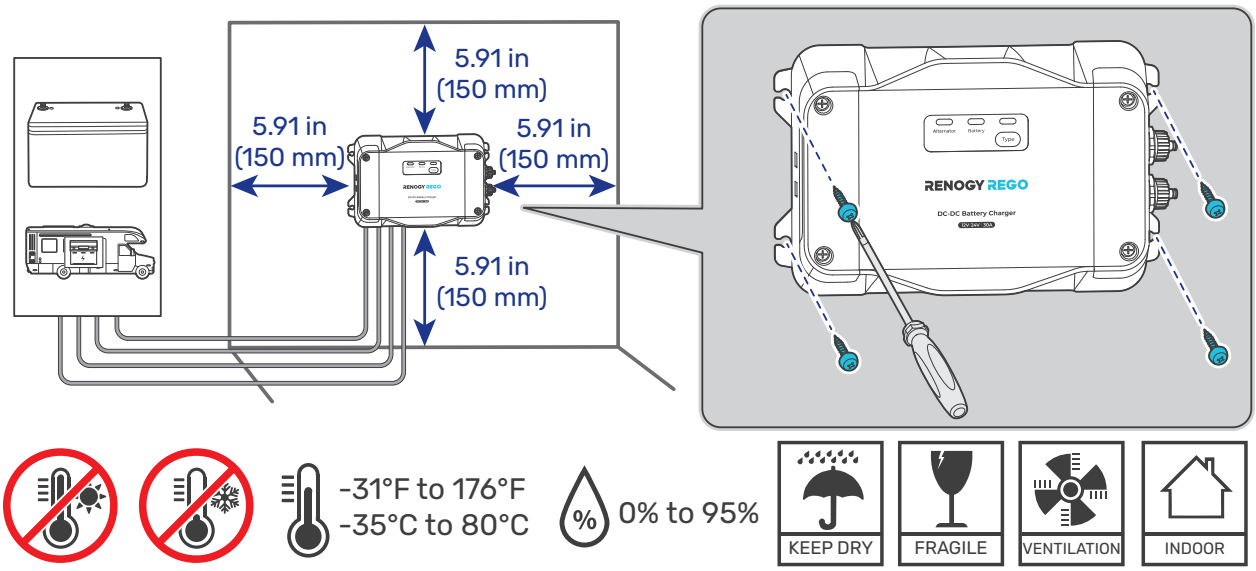
Remember that the lower the gauge number, the less resistance the wire has and therefore the higher current it can handle safely. For details on how to size wires for a system, refer to "Sizing Wires for PV Systems" at Renogy Learning Center.

- The cable specifications listed above account for critical, less than 3% voltage drop and may not account for all configurations.
- The specification of fuse cable is consistent with the input or output terminal of the battery charger.

3.3. Plan a Mounting Site

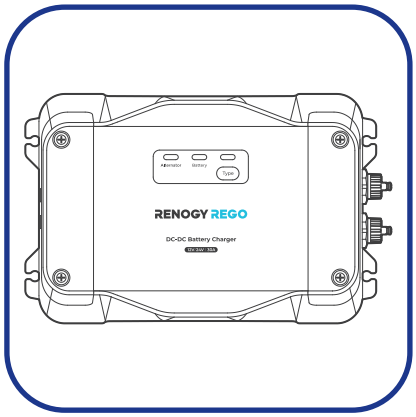
The battery charger requires adequate clearance for installation, wiring and ventilation. The minimum clearance is provided below. Ventilation is highly recommended if it is mounted in an enclosure. Select a proper mounting site to ensure the battery charger can be safely connected to the battery and the other necessary devices with the relevant cables.

You can mount the battery charger vertically on a wall or horizontally on the floor.



- 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.
- The battery charger should be installed on a flat surface protected from direct sunlight.
- Keep the battery charger out of the reach of children and animals.
- Do not expose the battery charger to flammable or harsh chemicals or vapors.
- Make sure that the battery charger is installed in a place at ambient temperature from -31°F to 176°F (-35°C to 80°C).
- Make sure that the battery charger is installed in an environment with relative humidity between 0% and 95% and no condensation.
- If the battery charger is installed improperly on a boat, it may cause damage to components of the boat. Have the battery charger by a qualified electrician.
- The battery charger should be as close to the battery as possible to avoid voltage drop due to long cables.
- It is recommended that all cables (except communication cables) should not exceed 10 meters (32.8 feet) because excessively long cables result in a voltage drop. The communication cables should be shorter than 6 m (19.6 feet).
- Keep the battery charger away from EMI receptors such as TVs, radios, and other audio/visual electronics to prevent damage or interference to the equipment.

3.4. Check the Battery Charger

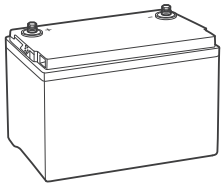


Inspect the battery charger for any visible damage including cracks, dents, deformation, and other visible abnormalities. All connector contacts shall be clean and dry, free of dirt and corrosion.

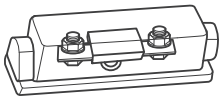
- Do not use the battery charger if there is any visible damage.
- Do not puncture, drop, crush, penetrate, shake, strike, or step on the battery charger.
- There are no serviceable parts in the battery charger. Do not open, dismantle, repair, tamper with, or modify the battery charger.
- Confirm the polarities of the devices before connection. A reverse polarity contact may result in damage to the battery charger and other connected devices, thus voiding the warranty.
- Do not touch the connector contacts while the battery charger is in operation.
- Wear proper protective equipment and use insulated tools during installation and operation. Do not wear jewelry or other metal objects when working on or around the battery charger.
- Do not dispose of the battery charger as household waste. Comply with local, state, and federal laws and regulations and use recycling channels as required.

3.5. Check the Auxiliary Battery

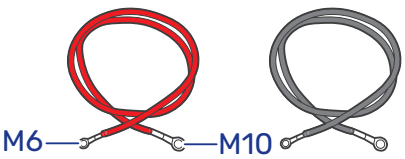
Recommended Components & Accessories



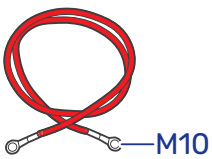
*12V/24V Auxiliary Battery



*ANL Fuse (30A to 40A) × 1

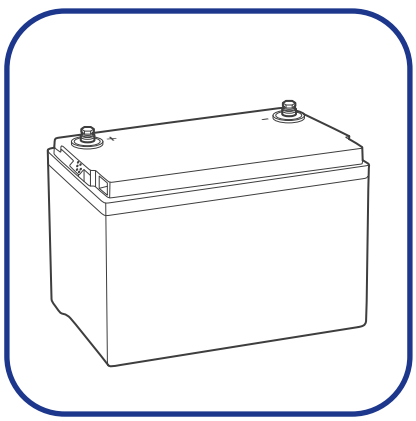


Battery Adapter Cables (8 AWG) × 2



Fuse Cable (8 AWG) × 1

- Components and accessories marked with "*" are available on renogy.com.
- To ensure optimal system performance, a 10 AWG/8 AWG cable should be no longer than 3 meters. Choose higher gauge cables for longer distances. For details, see "3.2. Size Wires" in the user manual.



1. Inspect the battery for any visible damage including cracks, dents, deformation, and other visible abnormalities. All terminals shall be clean and dry, free of dirt and corrosion.

   The battery charger can only be connected to 12V or 24V deep-cycle gel-sealed lead-acid batteries (GEL), flooded lead-acid batteries (FLD), sealed lead-acid batteries (SLD/AGM) or lithium iron phosphate batteries (LI).

Do not use the battery if there is any visible damage. Do not touch the exposed electrolyte or powder if the battery housing is damaged.

When being charged, the battery may give off explosive gas. Make sure there is good ventilation.

Take care to use a high-capacity lead-acid battery. Be sure to wear protective goggles. If carelessly getting electrolyte in your eyes, flush your eyes with clean water immediately.

Combine batteries in parallel or in series as needed. Prior to installing the battery charger, ensure all battery groups are installed properly.

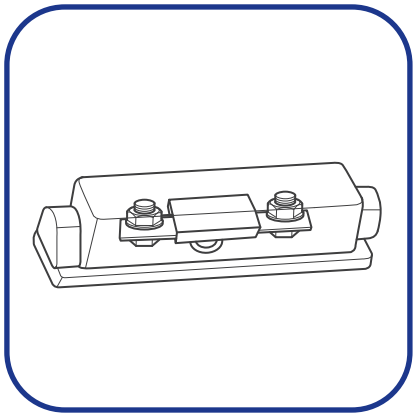
Read the user manual of the battery in use carefully.

Battery or Battery Bank System Voltage	
Battery or Battery Bank System Voltage = System Voltage U	
Batteries in Series	**Batteries in Parallel**
System Voltage U: $U_1 + U_2 + U_3$	System Voltage U: $U_1 = U_2 = U_3$

2. This battery charger works seamlessly with 12V or 24V battery systems. Please consult the battery manual for accurate system voltage information.

Read the battery user manual for battery voltage parameters, and calculate the voltage of the battery or battery pack system according to the formula to ensure that it does not exceed the overvoltage protection limits: 16V for 12V systems or 32V for 24V systems.

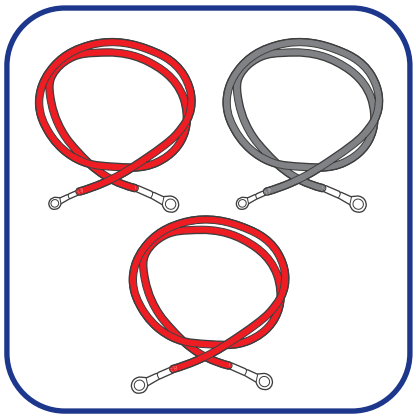
In the formula, U represents the battery voltage, and 1, 2, or 3 represents the battery number respectively.



3. Inspect the ANL Fuses for any visible damage including cracks, dents, deformation, and other visible abnormalities. All terminals shall be clean, free of dirt and corrosion, and dry.

Do not use the ANL Fuses if there is any visible damage.

For details on how to install and use the ANL Fuse, see its user manual.

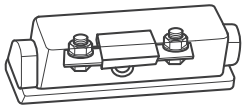


4. Inspect the Battery Adapter Cables and Fuse Cable for any visible damage including cracks, dents, deformation, and other visible abnormalities. All connector contacts shall be clean, dry, and free of dirt and corrosion.

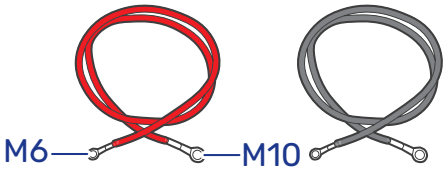
Do not use the cables if there is any visible damage.

3.6. Check the Alternator on Your Automobile

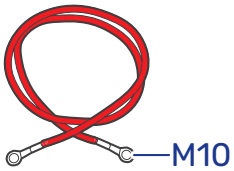
Recommended Components



*ANL Fuse
(60A–80A) × 1



Battery Adapter Cables
(6 AWG) × 2



Fuse Cable
(6 AWG) × 1

Accessories marked with "*" are available on renogy.com.

Do not use the cables if there is any visible damage.

The automobile alternator may be a smart alternator or a traditional alternator. The connection method of a smart alternator or a traditional alternator depends on its parameters. Before installing the battery charger, read the user manual of the vehicle or consult the vehicle supplier to determine the type of alternator and ensure that the alternator power does not exceed 450W with the output current within the range of 45A to 60A.

In addition, you can use a multimeter by yourself to measure the alternator to determine the type of alternator.

1. Locate your main vehicle battery or the starter battery.
2. Start the engine. Ensure all any fans, radio, lights, and others are turned off.
3. Take a voltage reading across the main vehicle battery.
4. Leave the engine run for around 5 or 10 minutes, and repeat Step 3.

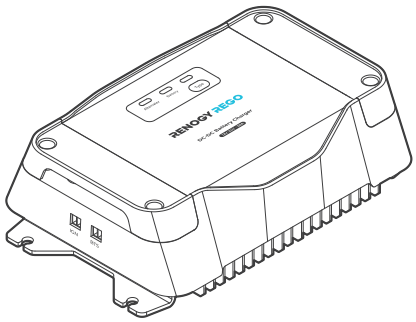
Readings around 14.4V DC indicates you most likely have a traditional alternator. If your readings are around 12.5-13.5V, you most likely have a smart alternator.

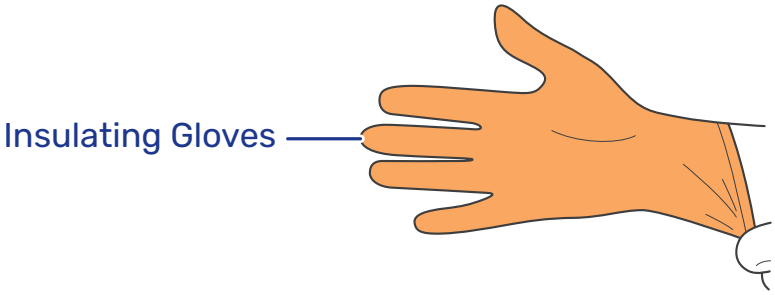
In general, the working voltage of a traditional alternator ranges from 13.2V to 16V, and that of a smart alternator ranges from 12V to 16V. Consult the vehicle supplier for help if necessary.

4. Installation

To ensure safe, efficient operation of the battery charger and to avoid potential damage or hazards, always follow the installation instructions in the sequence described in this manual.

4.1. Wear Insulating Gloves





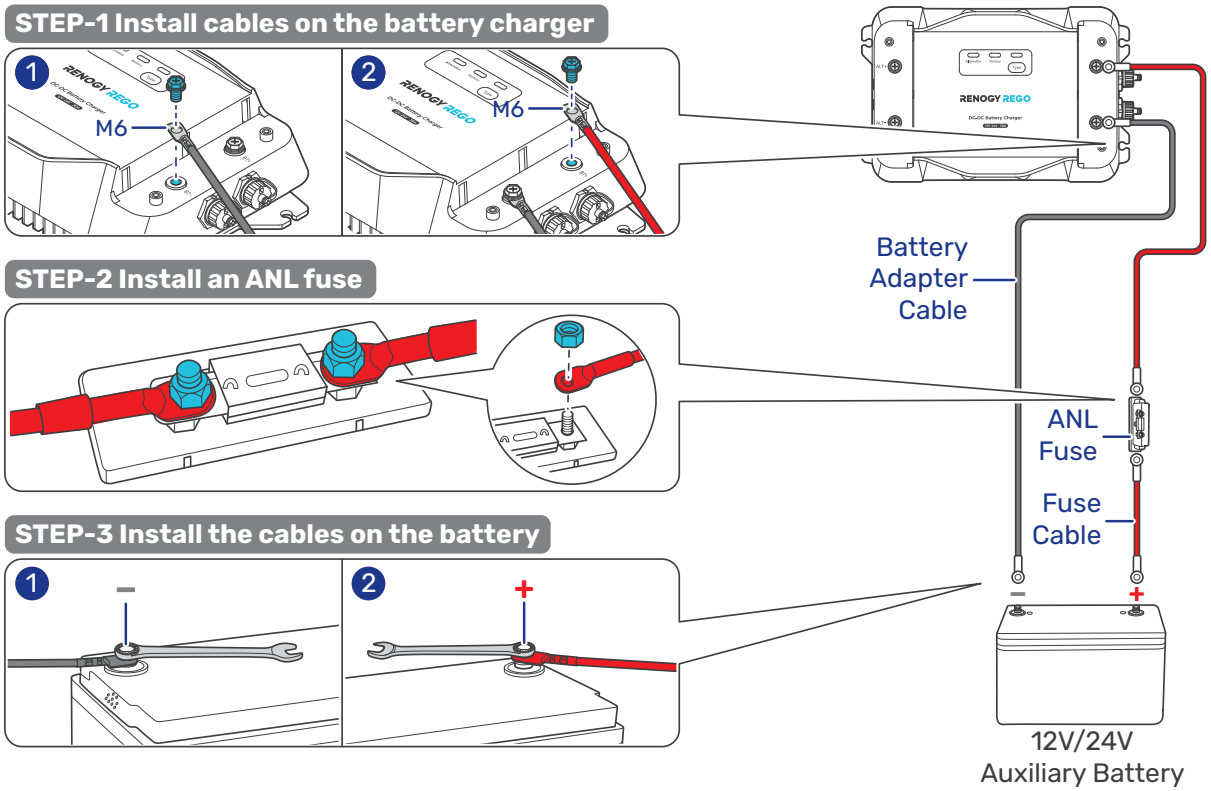
4.2. Connect the Battery Charger to an Auxiliary Battery

The battery charger can be connected to 12V or 24V deep-cycle gel-sealed lead-acid batteries (GEL), flooded lead-acid batteries (FLD), sealed lead-acid batteries (SLD/AGM) or lithium iron phosphate batteries (LI).

Step 1: On the battery charger, connect one negative battery adapter cable (gray) to the Auxiliary Battery Negative Input Terminal, and connect one positive battery adapter cable (red) to the Auxiliary Battery Positive Input Terminal.

Step 2: Connect the other end of the positive battery adapter cable (red) to an ANL fuse which should be then connected to a fuse cable.

Step 3: On the auxiliary battery, connect the negative terminal and positive terminal to the other end of the negative battery adapter cable (gray) and the other end of the fuse cable respectively.



Tug on cable to ensure firm connection.

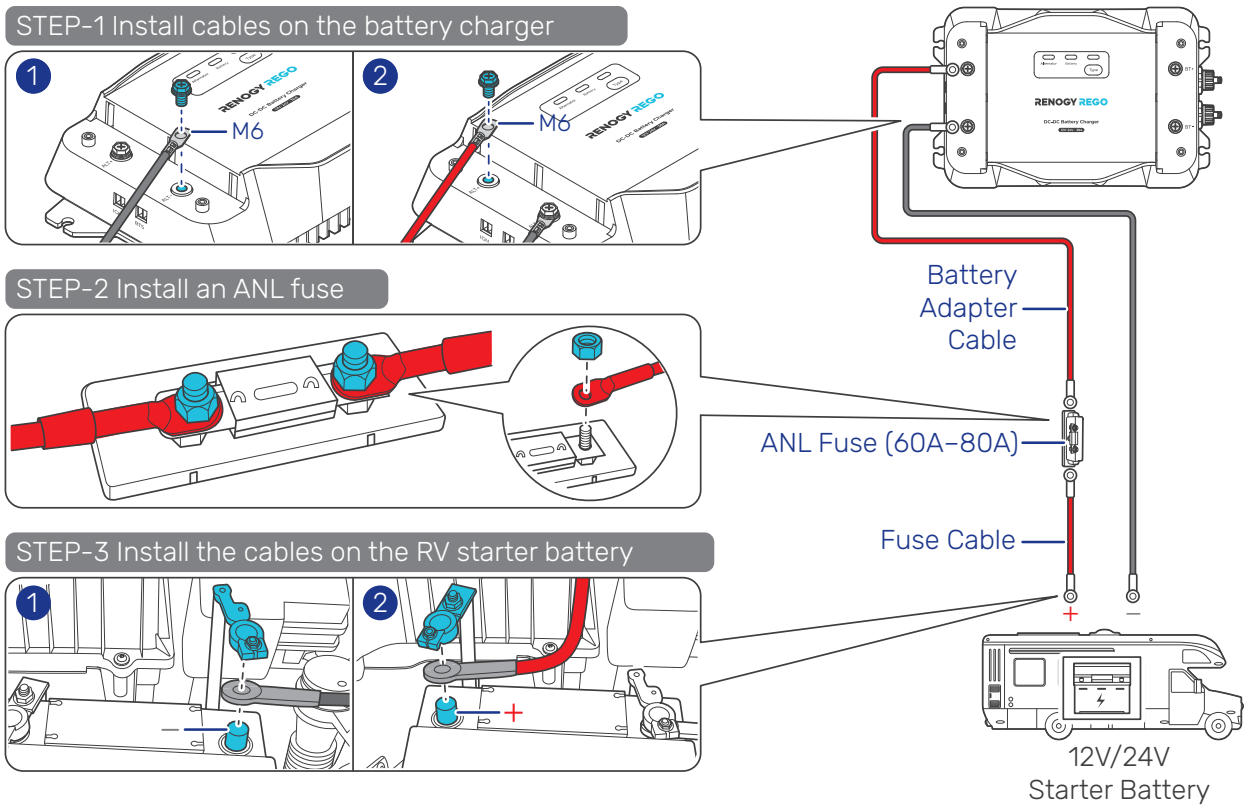
4.3. Connect the Battery Charger to a Starter Battery

Before installing the charger, consult your vehicle's user manual or contact the vehicle manufacturer to ensure that the output current ranges from 45A to 60A.

Step 1: On the battery charger, connect one negative battery adapter cable (gray) to the Starter Battery Negative Input Terminal, and connect the positive battery adapter cable (red) to the Starter Battery Positive Input Terminal.

Step 2: Connect the other end of the positive battery adapter cable (red) to an ANL fuse which should be then connected to a fuse cable.

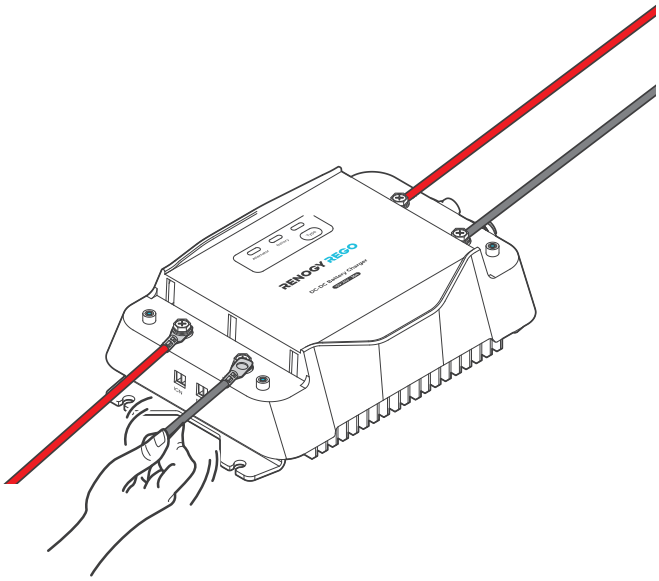
Step 3: On the auxiliary battery, connect the negative terminal and positive terminal to the other end of the negative battery adapter cable (gray) and the other end of the fuse cable respectively.



Tug on all cables to ensure firm connection.

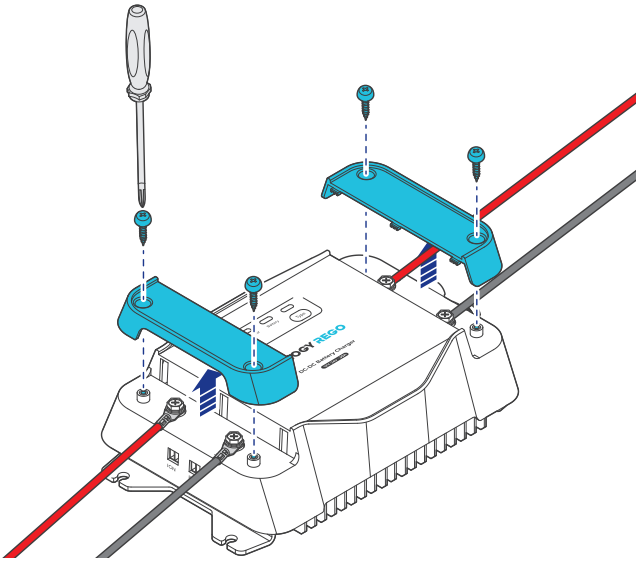
4.4. Wire Inspection

Verify that all cable connections are firmly and securely fastened. This step is essential to prevent any loose or unstable connections that could lead to operational issues or safety concerns.



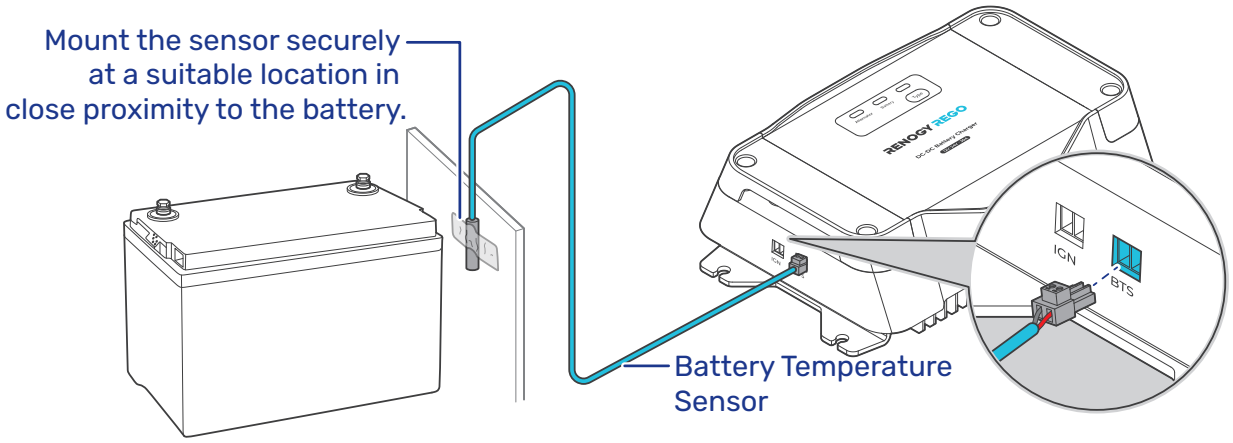
4.5. Reinstall the Covers

Reinstall the covers on the battery charger to prevent dust or water ingress at the terminals, which may cause operational issues.



4.6. Install a Battery Temperature Sensor (Optional)

The temperature sensor measures the surrounding temperature of the battery and compensates the floating charge voltage when the battery temperature is low.



Do not use the temperature sensor on a LiFePO4 (LFP) battery which comes with a battery management system (BMS).

4.7. CAN Communication Wiring (Optional)

REGO 12V/24V-12V/24V 30A Bidirectional DC-DC Battery Charger can communicate with other Renogy devices supporting CAN communication and monitoring devices through CAN (common area network) bus, also known as RV-C, enabling safe operation, smart control, remote monitoring, and programmable settings.

You can connect the battery charger to other Renogy devices supporting CAN communication for real-time inter-device data communication through either of the CAN Communication Ports. 7-Pin CAN Communication Terminal Plugs and 7-Pin CAN Communication Terminal Plug adapter cables are required for the wiring.

The wiring details vary depending on the wiring schemes. This user manual elaborates on inter-device wiring in two schemes: backbone and daisy chain.

For technical support from Renogy, please contact us through renogy.com/contact-us/.

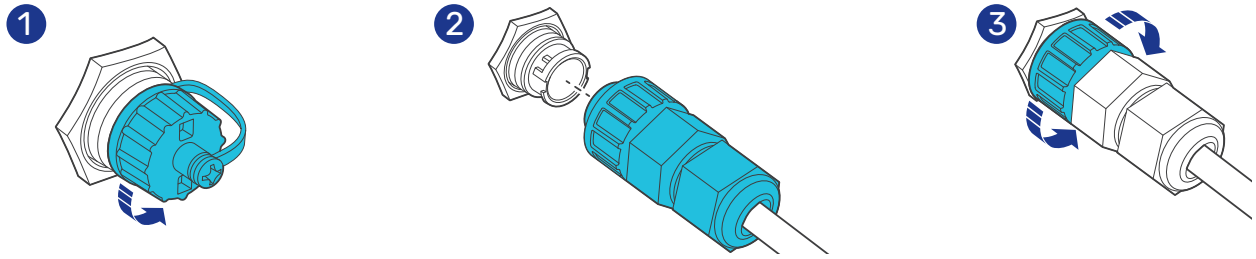
To properly connect or disconnect the 7-Pin CAN Communication Terminal Plug to or from the battery charger, you should

1. Remove the dust cover from the CAN Communication Port on the battery charger.

2. Ensure that the plug is oriented vertically toward the CAN Communication Port.

3. Rotate the terminal fixing nut to loosen or secure the plug.

Shaking the terminal plug while plugging or unplugging it is not allowed.



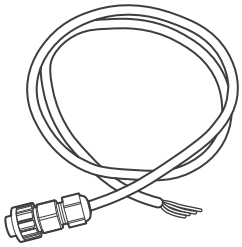
Backbone Network

Ensure 120Ω terminating resistors are installed at both ends of the RV-C bus for successful communication with Renogy devices supporting CAN communication. If the RV user manual does not determine if the RV-C bus has a built-in 120Ω termination resistor, call the RV manufacturer to confirm.

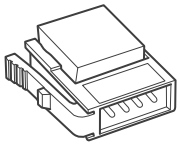
If the RV-C bus does not have a built-in 120Ω termination resistor, the battery charger will not communicate properly with other Renogy devices supporting CAN communication. Please use the Daisy Chain Network for communication connections.

Connect devices to the battery charger according to the wiring diagram provided by the RV manufacturer. Choose proper communication cables according to your specific demands.

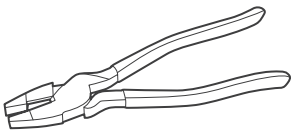
Recommended Tools & Accessories



*7-Pin CAN Communication Terminal Plug to Bare Drop Cable(s)



Drop Plugs



Split Joint Pliers

Accessories marked with "*" are available on renogy.com.

The 7-Pin CAN Communication Terminal Plug to Bare Drop Cable is only for use with the battery charger. Please refer to the user manual of other devices for the communication cable types they require.

The drop cable shall not exceed 19.6 feet (6 m), and the RV-C bus shall not exceed 98.4 feet (30 m).

Choose the appropriate drop plugs that are compatible with the drop sockets used on the RV-C bus. Different RV manufacturers may use different types of drop sockets for inter-device communication connections. If you are unsure about the correct drop plug selection, consult with the RV manufacturer. In this manual, the Mini-Clamp II plug (4-pin) is used as an example.

Different Drop Plugs follow different pinouts. Crimp the Drop Plugs on the Drop Cables following the correct pinout. If you are not sure about the Drop Plug pinout, check with the RV manufacturer.

Step 1: Install the Drop Plugs on the bare end of the 7-Pin CAN Communication Terminal Plug to Bare Drop Cable. The white CAN_H wire goes to pin 2, the blue CAN_L wire goes to pin 3, and the yellow GND wire goes to pin 4. Leave pin 1 empty.

Step 2: Squeeze the crimp areas of the Drop Plugs with the Split Joint Pliers.

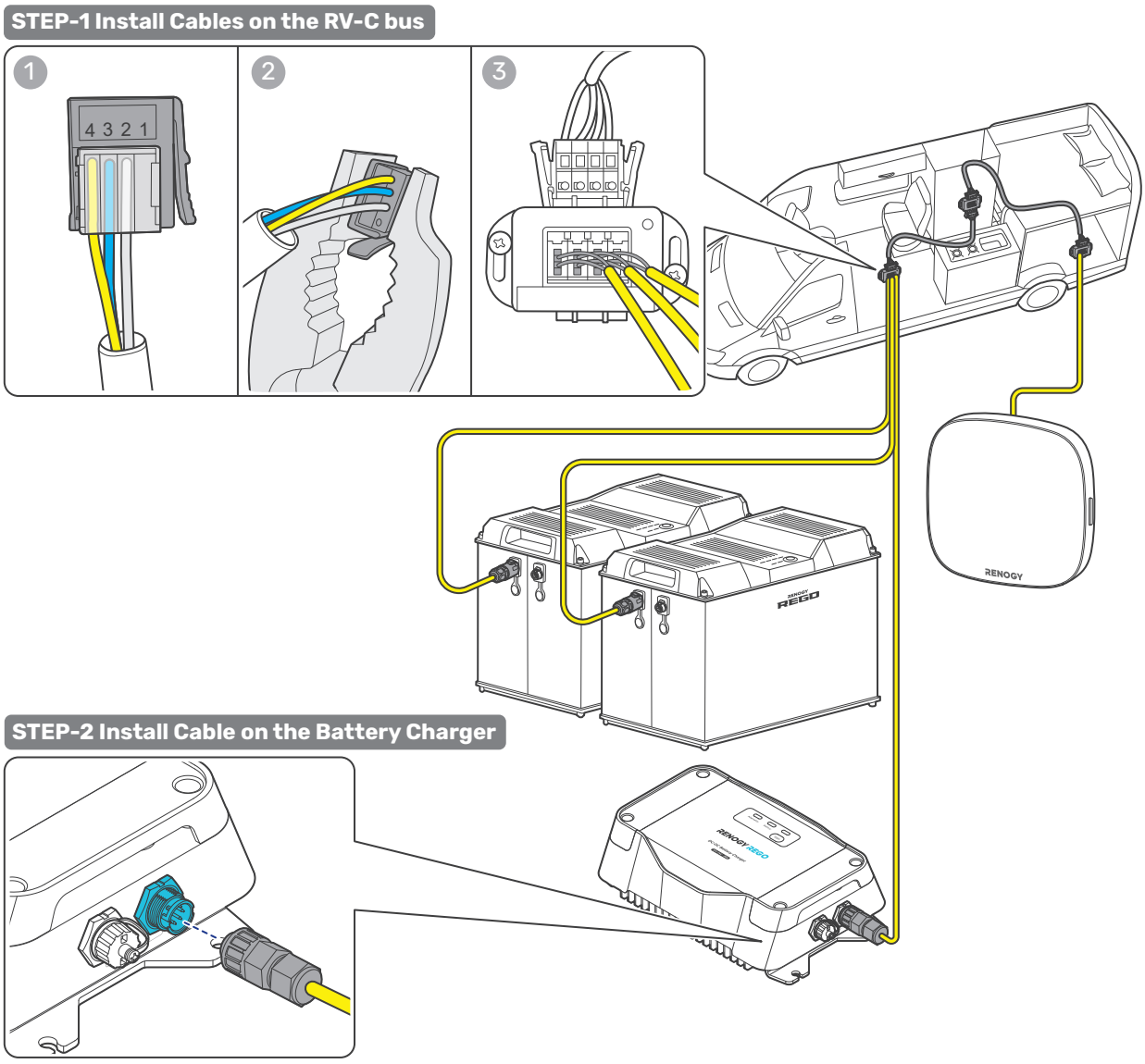
Step 3: Locate the drop tap (not included) on the RV-C bus that is the closest to the installation site of the battery charger. The drop taps are usually located above the entry door, in the bathroom, or under the bed in the RV.

Step 4: Connect the Drop Plugs on the drop cables and other Renogy devices supporting CAN communication to the drop sockets on the drop tap.

Step 5: Insert the 7-Pin CAN Communication Terminal Plug into any of the CAN Communication Ports of the battery charger.

If you fail to locate the drop taps, please contact the RV manufacturer for help.

Different drop taps are used on the RV-C bus by different RV manufacturers. This user manual takes the 4-socket drop tap as an example.



Daisy Chain Network

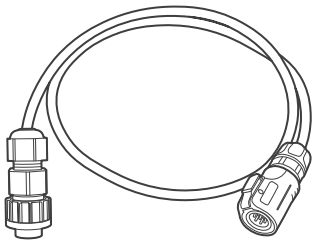
The daisy chain network applies to RVs that are not integrated with RV-C buses.

Please select the appropriate adapter cable based on the type of the CAN Communication Port specific to the device. For example:

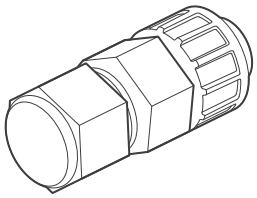
- Battery Charger to Renogy devices with RJ45 Ports: 7-Pin CAN Communication Terminal Plug to RJ45 Communication Adapter Cable
- Battery Charger to Renogy devices with LP16 CAN Communication Ports: 7-Pin CAN Communication Terminal Plug to LP16 Plug (7-Pin) Communication Adapter Cable
- Battery Charger to Renogy devices with 7-Pin CAN Communication Ports: 7-Pin CAN Communication Cable(s)

This section is based on a 7-Pin CAN Communication Terminal Plug to LP16 Plug (7-Pin) Communication Adapter Cable.

Recommended Accessories



*7-Pin CAN Communication Terminal Plug to LP16 Plug (7-Pin) Communication Adapter Cable(s)



*7-Pin CAN Communication Terminal Plug

Accessories marked with "*" are available on renogy.com.

The communication cable should be less than 19.6 feet (6 m).

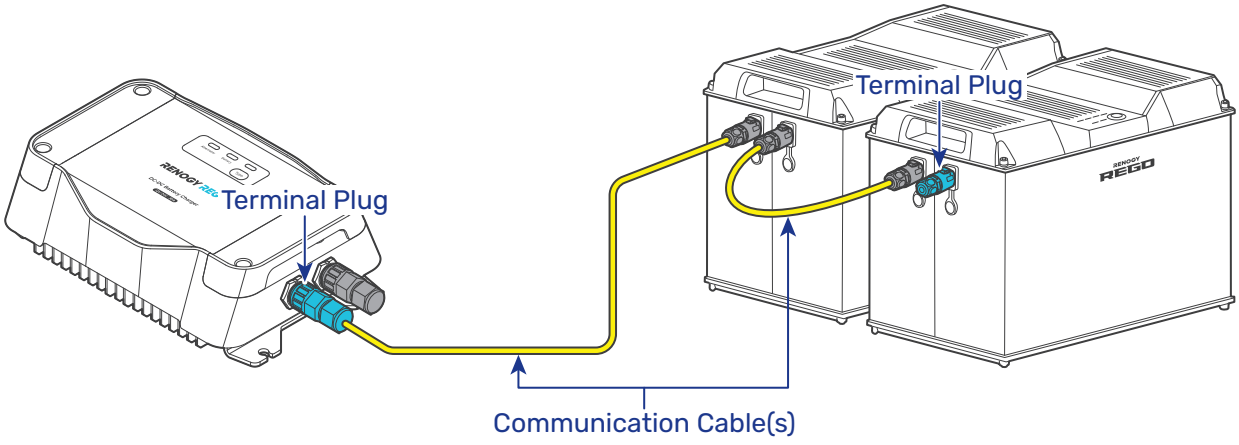
Choose proper terminal plugs based on the specific CAN ports.

The quantity of adapter cables and plugs varies based on the position of the battery charger in the daisy chain network. When the battery charger is positioned at either the first or the last device in the daisy chain network, one 7-Pin CAN Communication Terminal Plug and one adapter cable are required. In scenarios where the battery charger is located in the middle of the daisy chain network, two adapter cables are needed.

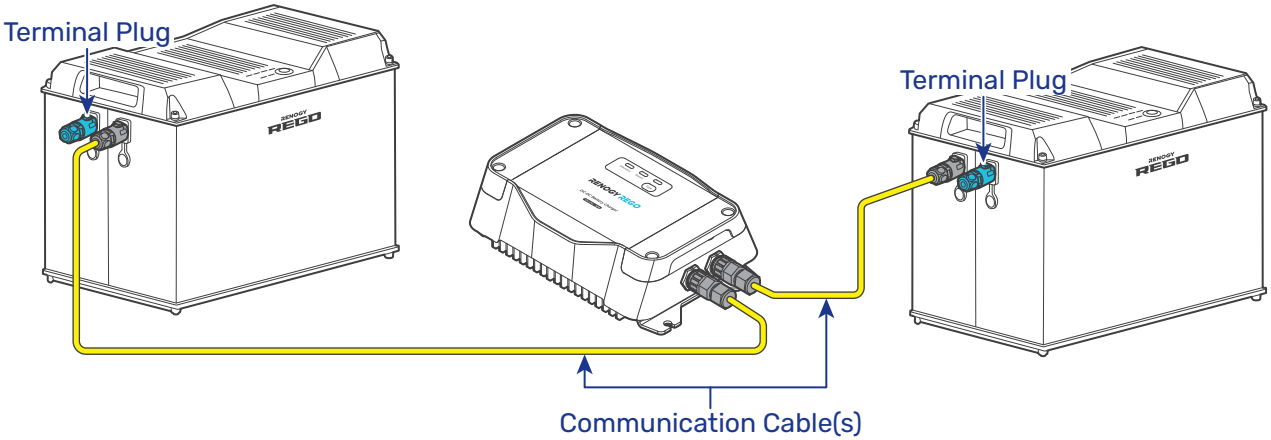
Step 1: Connect devices in series with the battery charger through either of the CAN Communication Ports with the Communication Cable(s) (sold separately).

Step 2: Plug the Terminator Plugs (sold separately) into the vacant CAN Communication Ports on the first and last devices.

Battery Charger is Positioned at the First or Last in the Daisy Chain Network



Battery Charger is in the Middle of the Daisy Chain Network



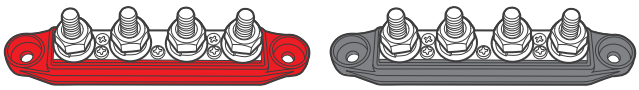
4.8. Parallel Connection for Battery Chargers (Optional)

To provide more charging power, you can connect two REGO 12V/24V-12V/24V 30A Bidirectional DC-DC Battery Chargers in parallel to charge a same group of auxiliary batteries when all of the following are met:

- The alternator output current is higher than 90A.
- The maximum charge current of your auxiliary battery should be no smaller than 60A.
- All to-be-charged auxiliary batteries are identical in size and brand.
- All cables connecting the busbars should be identical in size and length.

For detailed settings for the host and slave battery chargers, please contact our dedicated customer service via renogy.com/contact-us.

Recommended Accessories

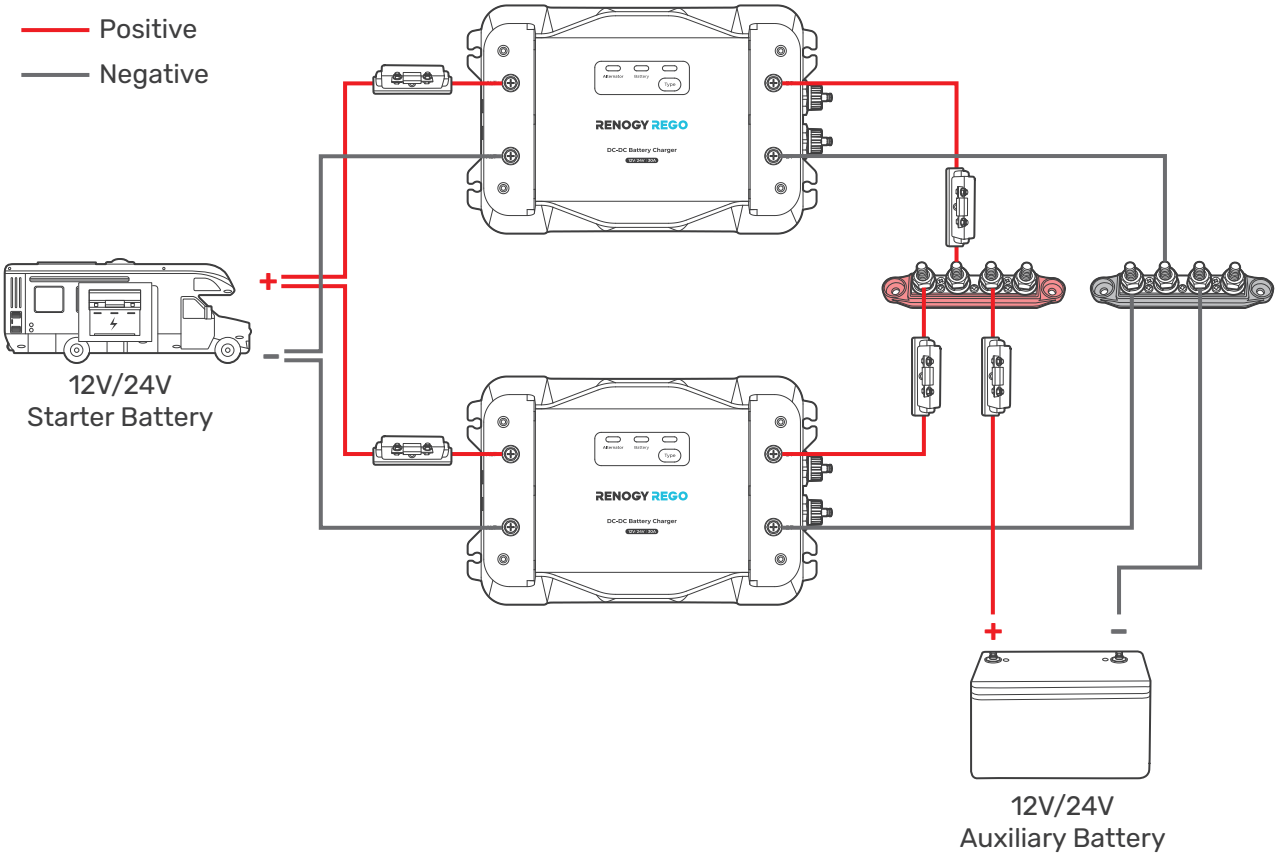


Busbar Pair

Step 1: Connect the Auxiliary Battery Negative Input Ports of the two battery chargers and the negative terminal(s) of the battery or battery groups on a busbar.

Step 2: Connect the Auxiliary Battery Positive Input Ports of the two battery chargers and the positive terminal(s) of the battery or battery groups on a busbar. Install fuses on the positive ends. For detailed fuse ratings, refer to "3.5. Check the Auxiliary Battery".

Step 3: Connect each battery charger to an independent starter battery with fuses installed on the positive ends. For detailed fuse ratings, refer to "3.6. Check the Alternator on Your Automobile".

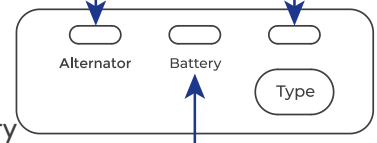


5. LED Indicators

The battery charger turns on automatically after power on with the LED indicators working in accordance with the relative operating status.

Starter Battery Status Indicator

- **Off:** Not charged or discharged
- **Solid:** Charging the auxiliary battery
- **Slow Flash:** Charging the starter battery



Auxiliary Battery Status Indicator

- **Off:** No auxiliary battery detected
- **Solid:** Fully charged
- **Slow Flash:** Charging the auxiliary battery or starter battery
- **Solid:** Auxiliary battery is at normal voltage
- **Solid:** Overdischarge protection on auxiliary battery
- **Slow Flash:** Overvoltage protection on auxiliary battery
- **Fast Flash:** Overtemperature protection on auxiliary battery
- **Jumping Flash:** Overtemperature protection on battery charger

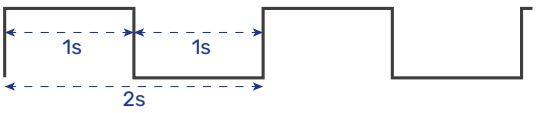
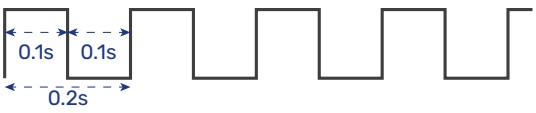
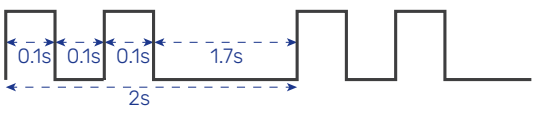
Battery Type Indicator

- **Solid:** SLD/AGM
- **Solid:** GEL
- **Solid:** 12V LI (lithium battery activation enabled)
- **Slow Flash:** 12V LI (lithium battery activation disabled)
- **Solid:** 24V LI (lithium battery activation enabled)
- **Slow Flash:** 24V LI (lithium battery activation disabled)
- **Solid:** User Mode
- **Solid:** FLD

If an error occurs, refer to "9. Troubleshooting" for details, or login to the Renogy app for troubleshooting details.

Check out the graphic indications of ON, OFF, Solid, Slow Flash, Fast Flash, and Jumping Flash of LEDs in the table below:

LED ON		LED OFF	

LED Pattern	Description	Graphic Expression
Solid	The LED remains continuously illuminated without any variation.	
Slow Flash	In this mode, the LED alternates between being on and off at a relatively slow and regular interval of 1s.	
Fast Flash	In this mode, the LED alternates between being on and off at a relatively fast and regular interval of 0.1s.	
Jumping Flash	In this mode, the LED alternates between brief 0.1s on-off cycles followed by a longer 1.7s off period.	

6. Monitoring

Depending on the specific application, the battery charger can establish either short-range or long-range communication connections with Renogy ONE Core or/and Renogy via the built-in Bluetooth.

- Renogy app (free of charge)
- Renogy ONE Core (sold separately)

Renogy ONE Core

Renogy app

These monitoring devices facilitate real-time monitoring, programming, and complete system management, offering comprehensive control and enhanced flexibility.

Before adding this battery charger to the Renogy app or Renogy ONE, please ensure that both the app version and the firmware version of Renogy ONE have been updated to the latest version.

The software version of the Renogy app and Renogy ONE Core might have been updated. Illustrations in the user manual are for reference only. Follow the instructions based on the current app version.

You can monitor the following parameters of the battery charger in the Renogy app or Renogy ONE Core as listed below.

Table 6-1 Monitoring Parameters

Parameter	Description
Starter Battery Volts	The actual voltage of your starter battery.
Starter Battery Amps	The actual current of your starter battery
Auxiliary Battery Charge Watts	The wattage charged into the auxiliary battery
Auxiliary Battery Volts	The actual voltage of your auxiliary battery
Auxiliary Battery Charging Amps	The current charged into the auxiliary battery
Auxiliary Battery Temperature	The temperature of your auxiliary battery
DC-DC MPPT Temperature	The internal temperature of the battery charger
Total kWh Generated	The total power generated, as recorded by the battery charger within the same day.
Battery Type	The type of your auxiliary battery
Overvoltage Shutdown	The safety voltage threshold at which the battery charger stops charging the auxiliary battery.

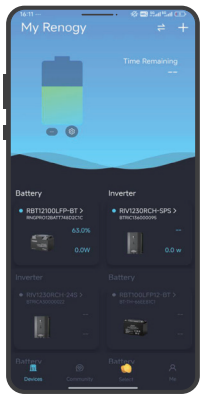
Parameter	Description
Equalization Volts	The equalization voltage delivered to the auxiliary battery. It is a controlled overcharge voltage during the equalization phase to balance the voltage of individual cells, break down sulfation, and optimize battery performance
Boost Volts	The boost voltage or constant voltage delivered to the auxiliary battery during the boost charge stage to ensure full charge of the battery
Float Volts	The float voltage delivered to the auxiliary battery
Boost Return Volts	The voltage at which the battery charger returns to the boost charge stage
Undervoltage Warning	The low voltage warning provided by the battery charger for the auxiliary battery. This warning does not interfere with the normal charging process.
Undervoltage Recover	The undervoltage protection threshold provided by the battery charger for the auxiliary battery. The voltage threshold at which an auxiliary battery, after being disconnected due to low voltage, is reconnected to the load once the voltage rises above a safe level.
Low Voltage Disconnect	The low voltage disconnect protection threshold provided by the battery charger for the auxiliary battery. The voltage threshold at which an auxiliary battery is disconnected from the load due to low voltage.
Boost Duration	The duration during which the auxiliary battery remains at its boost voltage
Equalization Duration	The duration during which the auxiliary battery remains at its equalization voltage
Equalization Interval	The interval for periodic equalization charge at the charger output. For example, if this parameter is set to 28 days, the charger will perform an equalization charge once every 28 days

The parameter names may vary between Renogy and Renogy ONE Core. Refer to the actual parameter names displayed in the respective interfaces.

6.1. Short-Range Monitoring

If only short-range monitoring is required, connect the battery charger to the Renogy app directly through Bluetooth on your phone.

Step 1: Download and log in to the latest Renogy app.



Renogy App

GTE IT ON Google Play

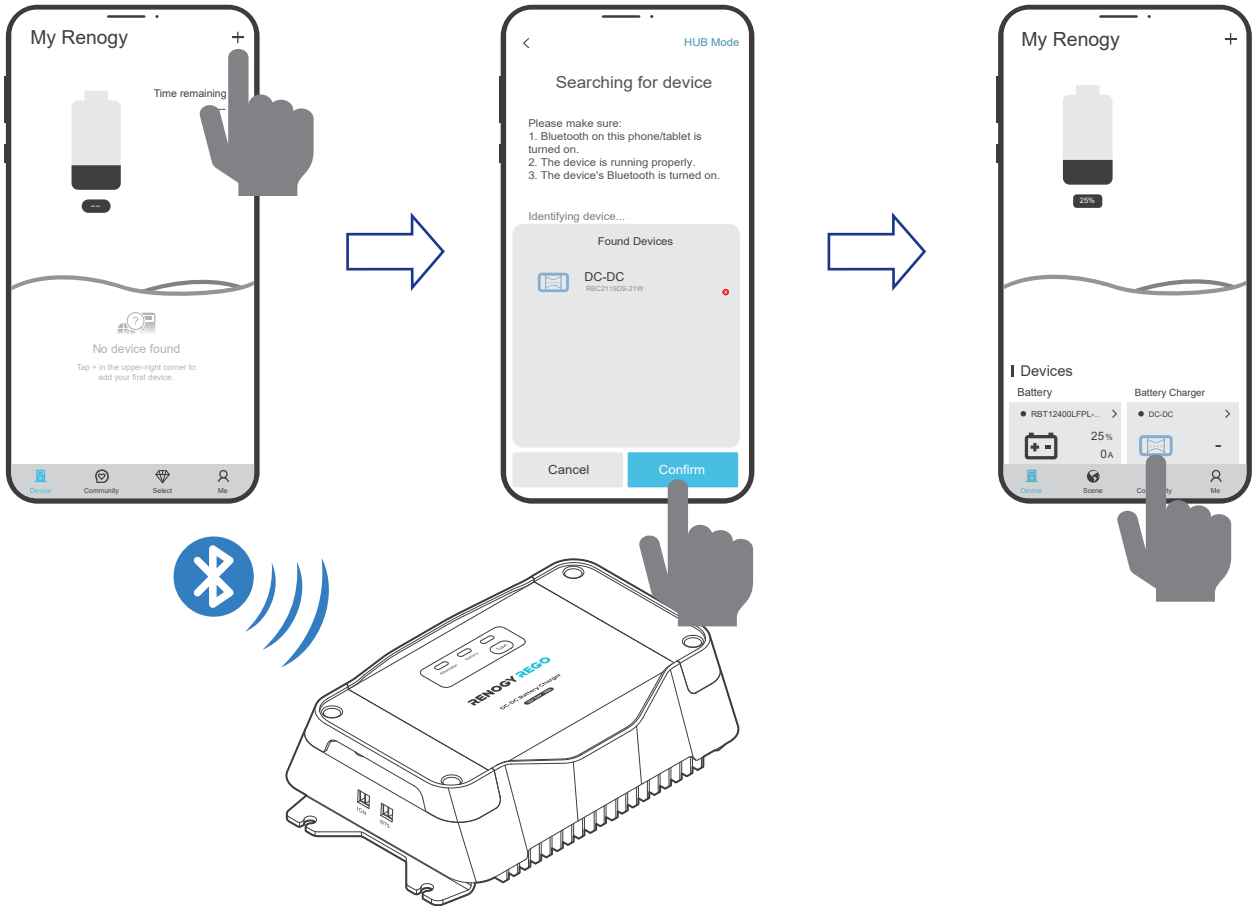
Download on the App Store

- Make sure the Bluetooth of your phone is turned on.
- The version of the Renogy app might have been updated. Illustrations in the user manual are for reference only. Follow the instructions based on the current app version.
- Make sure that the battery charger is properly installed and powered on before it is paired with the Renogy app.
- To ensure optimal system performance, keep the phone within 10 feet (3 m) of the battery charger.

Step 2: Open the Renogy app. Tap **+** to search for new devices.

Step 3: Tap **Confirm** to add the newly found device to the device list.

Step 4: Tap the battery charger icon to enter the device information interface. For detailed parameter explanation, refer to "Table 6-1 Monitoring Parameters".



6.2. Wireless Long-Range Monitoring

If long-range communication and programming are required, connect the battery charger to Renogy ONE Core (sold separately) through Bluetooth, and then pair Renogy ONE Core with the Renogy app.

Required Components and Installation Instructions

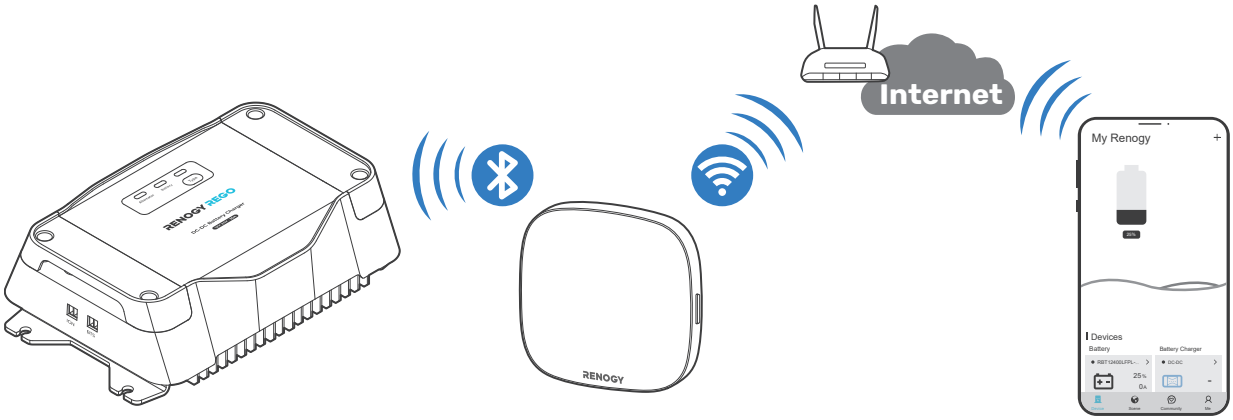
*RENOGY ONE Core

- Components marked with "*" are available on renogy.com.
- Make sure that the Renogy ONE Core is powered on before the connection.
- For pairing instructions for Renogy ONE Core, see Renogy ONE Core User Manual.
- Make sure the battery charger does not communicate with any other device.

Step 1: Connect the battery charger to Renogy ONE Core through the Bluetooth of your phone.

Step 2: Pair the Renogy ONE Core with the Renogy app through WLAN or by scanning the QR code in the Renogy ONE Core. On Renogy ONE Core, go to "**Settings** > **System** > **Pair with App**" to get the QR code.

Step 3: Monitor and program the complete system on Renogy ONE Core or the Renogy app. For detailed parameter explanation, refer to "Table 6-1 Monitoring Parameters".

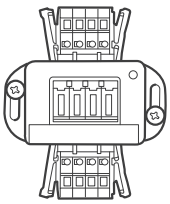


6.3. Wired Long-Range Monitoring (Backbone Network)

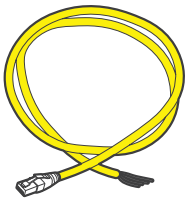
If long-range communication and programming are required, connect the battery charger to Renogy ONE Core through wires, and then pair Renogy ONE Core with the Renogy app.

Recommended Components & Accessories

*RENOGY ONE Core



Common Drop Tap



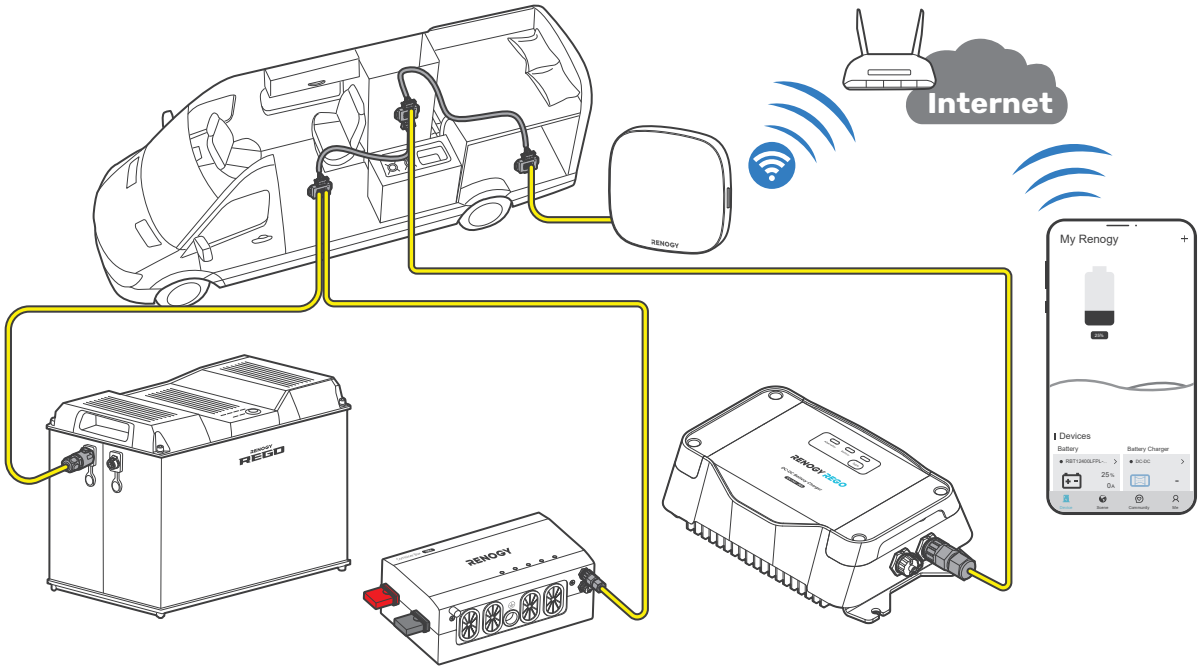
Communication Cable
(RJ45 Plug to Bare Drop Cable)

- Components marked with "*" are available on renogy.com.
- Ensure that the Renogy ONE Core is powered on before the connection.
- Ensure the battery charger does not communicate with any other device.
- Select the appropriate communication cable (sold separately) according to the distance between devices. The communication cable should be less than 19.6 feet (6 m).
- Different terminal block plugs are used on different Common Drop Taps and follow different pinouts. If you are unsure about the pinout of the terminal block plug, contact the RV manufacturer.

Step 1: Replace the terminated drop tap at either end of the RV-C bus with the Common Drop Tap (not included). Secure the bare wires of the Drop Cable (not included) onto the terminal block plug of the Common Drop Tap following the terminal block plug pinout.

Step 2: Plug the Drop Cable to the RJ45 port of Renogy ONE Core. For wiring instructions on Renogy ONE Core, see Renogy ONE Core User Manual.

Step 3: Monitor and program the complete system on Renogy ONE Core or the Renogy app. For detailed parameter explanation, refer to "Table 6-1 Monitoring Parameters".

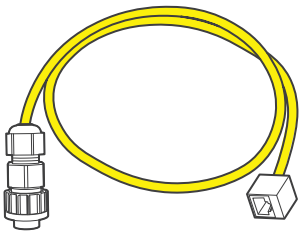


6.4. Wired Long-Range Monitoring (Daisy Chain Network)

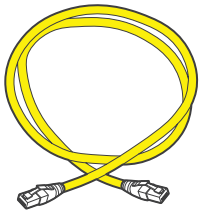
If long-range communication and programming are required, connect the battery charger to Renogy ONE Core through wires, and then pair Renogy ONE Core with the Renogy app.

Recommended Components & Accessories

*RENOGY ONE Core



*7-Pin CAN Communication Terminal Plug to RJ45 Port Adapter Cable



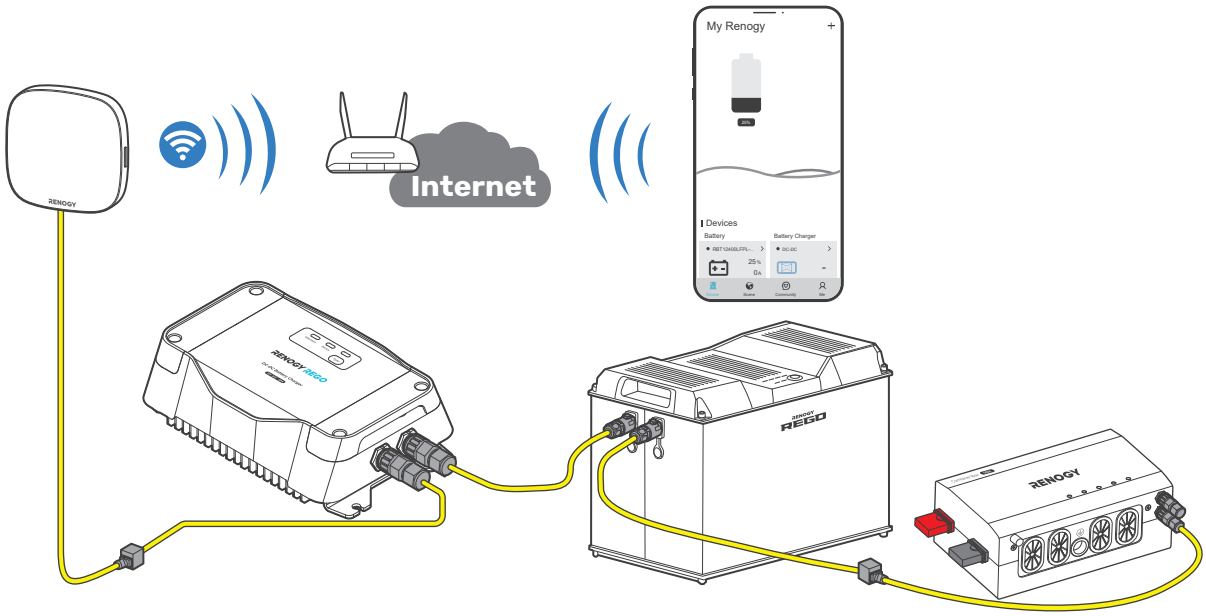
RJ45 Ethernet Cable (CAT5 or above)

- Components and accessories marked with "*" are available on renogy.com.
- Ensure that the Renogy ONE Core is powered on before the connection.
- Ensure the battery charger does not communicate with any other device.
- Select the appropriate communication cable (sold separately) according to the distance between devices. The communication cable should be less than 19.6 feet (6 m).

Step 1: Remove the Terminator Plug from the Renogy device at either end of the daisy chain.

Step 2: Connect the Renogy ONE Core to the free CAN Communication Port on the Renogy device with the Communication Adapter Cable (sold separately) and RJ45 Ethernet Cable. For wiring instructions on Renogy ONE Core, see Renogy ONE Core User Manual.

Step 3: Pair Renogy ONE Core with the Renogy app. Monitor and program the complete system on the Renogy ONE Core or the Renogy app. For detailed parameter explanation, refer to "Table 6-1 Monitoring Parameters".



7. Configuration

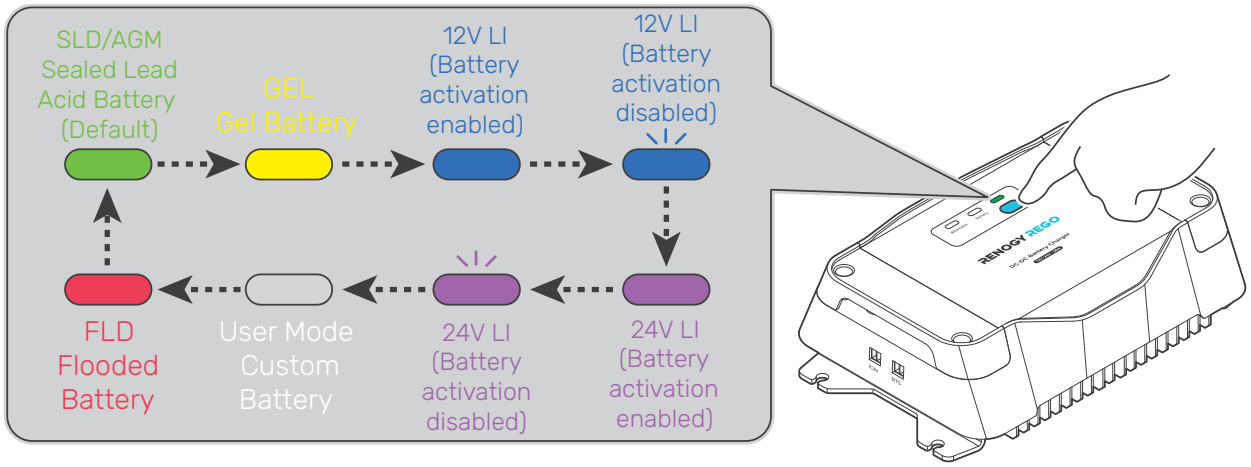
7.1. Set a Battery Type and Nominal Voltage

REGO 12V/24V-12V/24V 30A Bidirectional DC-DC Battery Charger provides one easy-to-use button for setting the auxiliary battery type in your system.

Upon installing the battery charger, set a correct battery type for the connected auxiliary battery either by using the Battery Type Setting Button or in the Renogy app. The battery type settings on the battery charger will automatically synchronize with the Renogy app, and changes made in the app will also reflect on the charger. For how to pair the battery charger with the Renogy app, see "6. Monitoring".

Configuration via the Battery Type Setting Button

Step 1: Press the Battery Type Setting Button to switch between different battery types. The LED indicates the battery type by displaying in different colors.

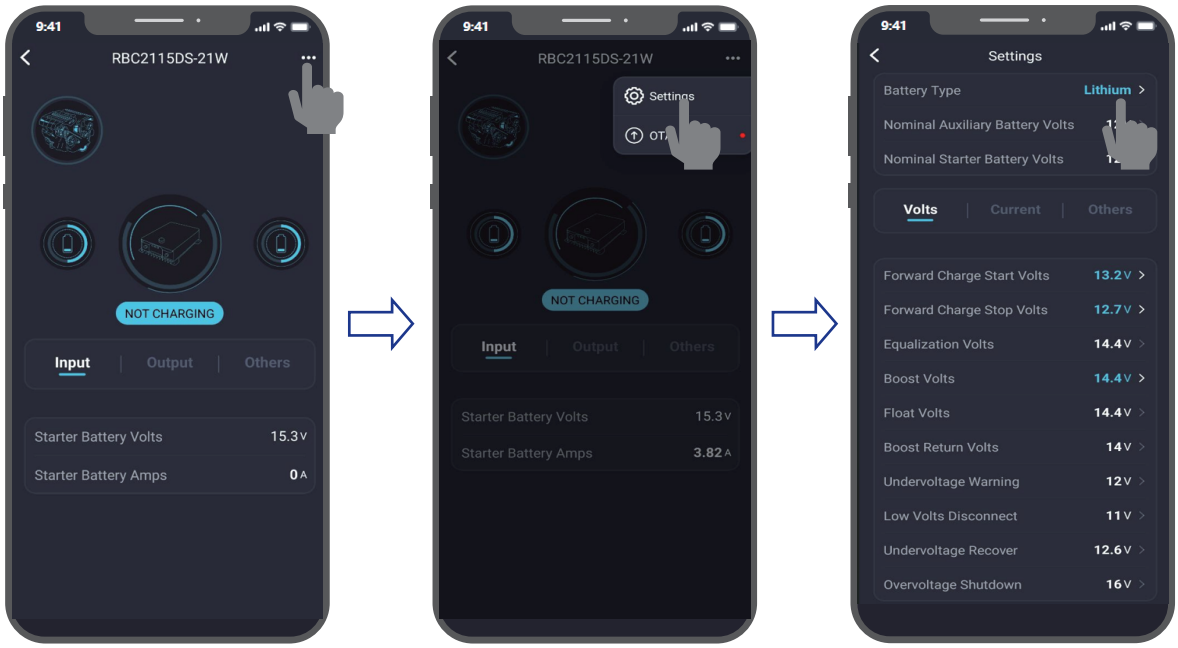


Step 2: Set the nominal battery voltage.

- For non-lithium batteries, the battery charger can automatically detect their voltage (12V/24V). No further configuration is required.
- For lithium batteries, the battery charger defaults to a voltage of 12V. For 24V lithium batteries, you can set the nominal battery voltage through the Battery Type Setting Button.

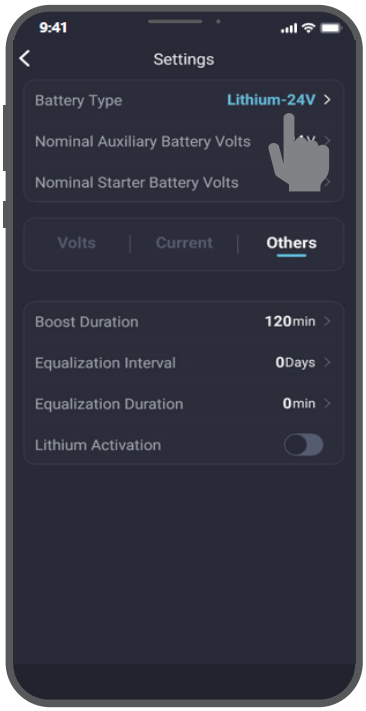
Configuration via the Renogy App

Step 1: On the home screen in the Renogy app, tap the battery charger widget to enter the device details page. Tap "... > **Settings** > **Battery Type**" to choose the battery type in use.



Step 2: Set the nominal battery voltage.

- For non-lithium batteries, the battery charger can automatically detect their voltage (12V/24V). No further configuration is required.
- For lithium batteries, the battery charger defaults to a voltage of 12V. For 24V lithium batteries, you can set the **Battery Type** to "Lithium-24V".

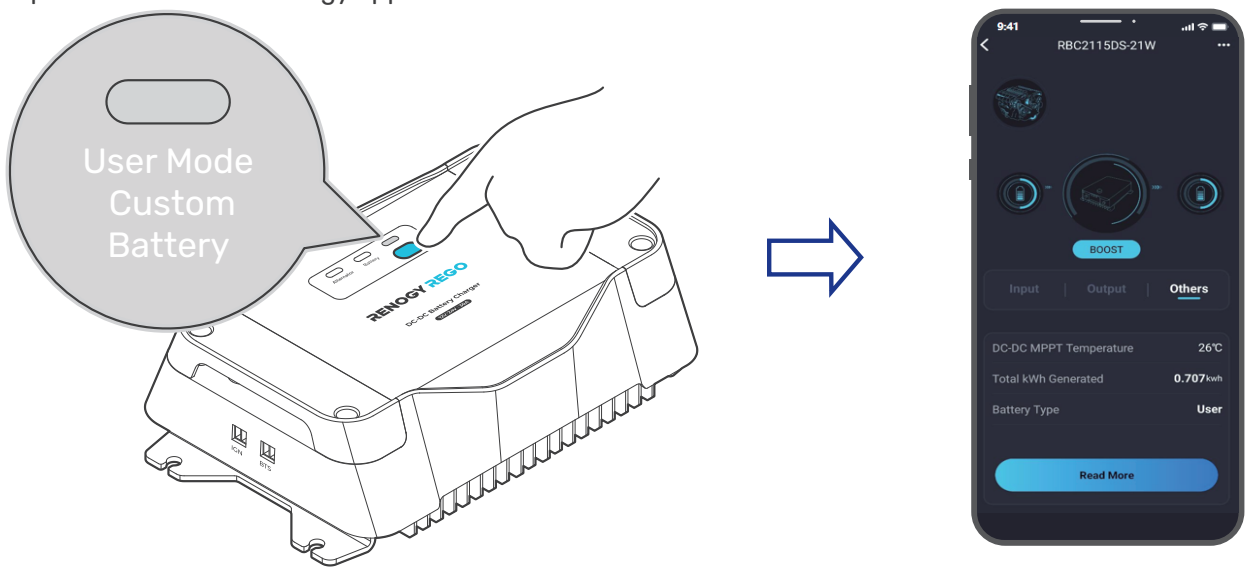


It is essential to ensure that the battery type is set correctly to avoid any potential damage to the battery charger because any damage to the battery charger resulting from an incorrect battery type setting voids the warranty.

The version of the Renogy app might have been updated. Illustrations in the user manual are for reference only. Follow the instructions based on the current app version.

7.2. User Mode

Setting the battery type to User Mode allows you to customize your battery parameters. You can modify the parameters in the Renogy app.



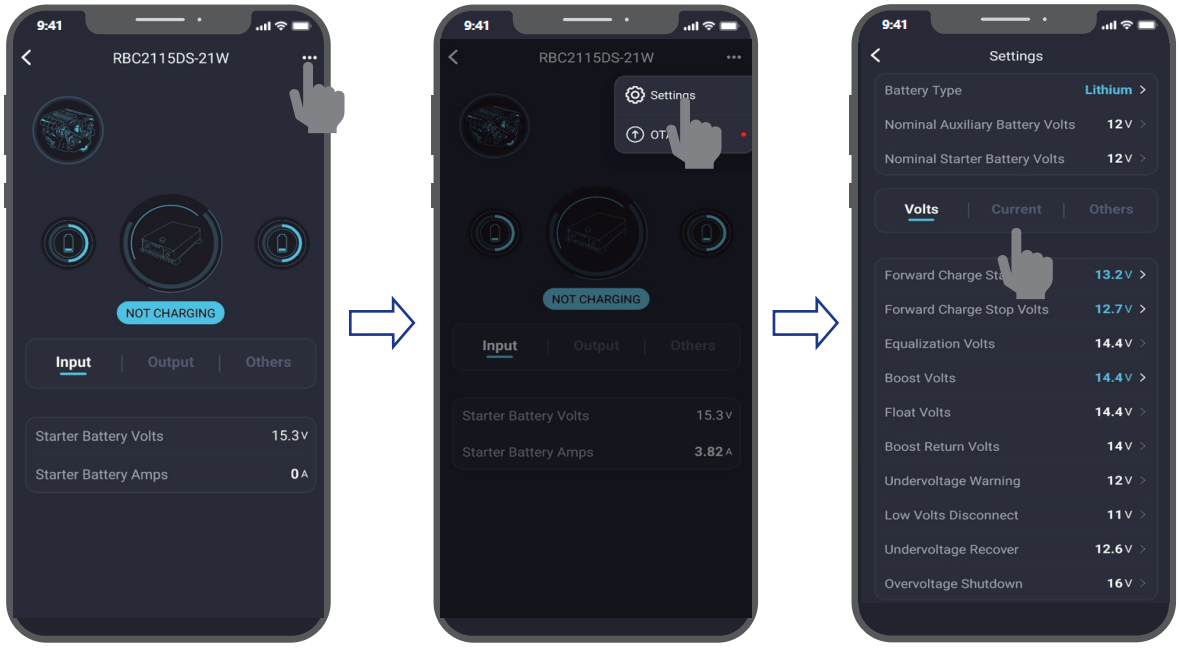
Before modifying battery parameters in User Mode, check the table below and consult the battery manufacturer to check whether your modification is allowed. Incorrect parameter settings will damage the device and void the warranty. For how to adjust charging parameters for batteries in User Mode, refer to "7.3. Configure Charging Parameters" in this manual for details.

Item	12V System	24V System
Maximum Combined Charging Current	Maximum at 30A. Adjustable at 20A and 10A.	Maximum at 15A. Adjustable at 5A and 10A.
Equalization Voltage	1. For lead-acid batteries, please consult your battery manufacturer to obtain the voltage value and then complete the settings according to the feedback. 2. If equalization charging is not required, set the voltage to boost voltage.	
Boost Voltage	This value affects whether the battery can be fully charged. Please consult the battery manufacturer and set the value properly.	
Float Voltage	This value affects whether the battery can be fully charged. Please consult the battery manufacturer and set the value properly.	
Undervoltage Warning	This voltage value affects the life of the battery. Consult the battery manufacturer and check if this voltage value needs to be set.	
Overvoltage Shutdown		
Boost Duration	Please consult the battery manufacturer if it is necessary to set this parameter value.	
Equalization Duration		
Equalization Interval		

7.3. Configure Charging Parameters

By default, the battery charger is configured for 12V systems and begins charging the auxiliary battery 15 seconds after the starter battery voltage remains consistently above 13.2V. For 24V systems, you can customize the "Forward Charge Start Volts" and "Forward Charge Stop Volts" settings via the Renogy app. For details, see "6. Monitoring" in this manual.

You can set the charging voltage and current for the battery charger in the Renogy app. For how to connect the battery charger to your phone via the Renogy app, refer to "6. Monitoring".



The version of the Renogy app might have been updated. Illustrations in the user manual are for reference only. Follow the instructions based on the current app version.

Set Charging Voltage

The table below illustrates the default and recommended voltage parameters for 12V batteries that can be connected to the battery charger. For 24V systems, double the values. The parameters may vary depending on the specific battery you use. Read the user manual of the specific battery or contact the battery manufacturer for help if necessary.

⚠ Before modifying battery parameters, check the table below first. Incorrect parameter setting will damage the device and void the warranty.

⚠ Read the user manual of the battery when customizing a preset battery. Incorrect battery type selection damages the battery charger and voids the warranty.

Battery Type / Parameters	SLD/AGM	FLD	GEL	LI	USER Mode	
					Default	Adjustable Range
Overvoltage Shutdown*	16.0V	16.0V	16.0V	16.0V	16.0V	9V – 17V
Overvoltage Disconnect Recover	15.5V	15.5V	15.5V	15.5V	15.5V	9V – 17V
Equalization Voltage	14.6V	14.8V	–	–	–	9V – 17V
Boost Voltage	14.4V	14.6V	14.2V	14.4V	14.2V	9V – 17V
Float Voltage	13.8V	13.8V	13.8V	–	13.8V	9V – 17V
Boost Recover Voltage	14.1V	14.3V	13.9V	14.1V	13.9V	9V – 17V
Float Recover Voltage	13.2V	13.2V	13.2V	13.6V	13.2V	9V – 17V
Overdischarge Recover	12.6V	12.6V	12.6V	12.6V	12.6V	9V – 17V
Undervoltage Recover	12.2V	12.2V	12.2V	12.2V	12.2V	9V – 17V
Undervoltage Warning	12.0V	12.0V	12.0V	12.0V	12.0V	9V – 17V
Overdischarge Warning	11.0V	11.0V	11.0V	11.0V	11.0V	9V – 17V
Boost Duration	120 min	120 min	120 min	–	120 min	10 – 600 min
Equalization Duration	120min	120min	–	–	–	10 – 600 min
Equalization Interval	30 days	30 days	–	–	–	0 – 250 days
Temperature Compensation (mV/°C/2V)"	-3	-3	-3	–	-3	0, 3, 4, and 5

*For lithium batteries, set the Overvoltage Shutdown value by following the formula below:

Actual Overvoltage Shutdown = Default Overvoltage Shutdown + (Boost Voltage you have set for the battery charger - Default Boost Voltage in User Mode).

The maximum Overvoltage Shutdown value is 17V or 34V for 12V and 24V systems respectively.

Set Charging Current

Setting the charging current for the battery charger is allowed in the Renogy app. Tap the battery charger icon on the home screen to enter the details interface, go to "**...** > **Settings** > **Current** > **Maximum Charge Amps**".

Item	12V System	24V System
Charging Current	Maximum at 30A. Adjustable at 20A and 10A.	Maximum at 15A. Adjustable at 5A and 10A.

7.4. Activate Lithium Batteries

The battery charger can activate connected auxiliary lithium batteries. Lithium batteries may enter sleep mode when the built-in protection is triggered. In such case, the battery charger provides a small current to reactivate the sleeping lithium battery. The lithium battery can be charged normally after successful activation.

Operation Condition

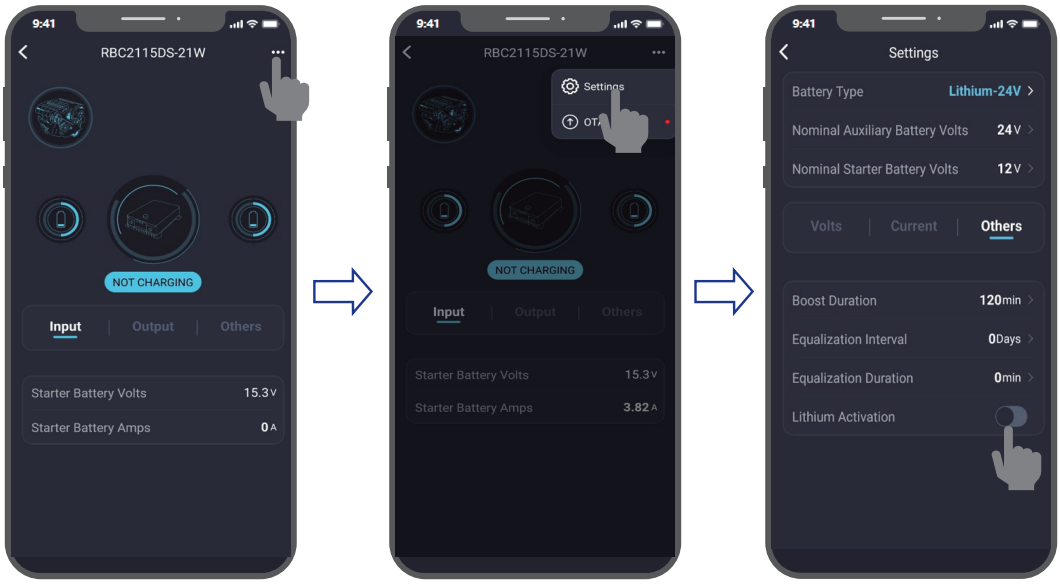
- Set the battery type of the battery charger to LI. For details, see "7.1. Set a Battery Type and Nominal Voltage".
- Both the auxiliary battery and starter battery terminals on the battery charger are properly connected.

Operation Logic

- For 12V Lithium Batteries
  If the auxiliary battery voltage drops below 4V and the starter battery voltage is above 13.2V, the battery charger automatically activates the activation function (on the premise that the activation function is enabled in the Renogy app) and continues to charge the battery using constant voltage until the battery voltage reaches 9V.
- For 24V Lithium Batteries
  If the auxiliary battery voltage drops below 8V and the starter battery voltage is above 26.4V, the battery charger automatically activates the activation function (on the premise that the activation function is enabled in the Renogy app) and continues to charge the battery using constant voltage until the battery voltage reaches 18V.

Enable/Disable Operations

By default, the lithium activation function is disabled in the battery charger. You can manually enable it in the Renogy app. Tap the battery charger icon on the home screen to enter the details interface, go to "**...** > **Settings** > **Others** > **Lithium Activation**". For details, see "6. Monitoring".



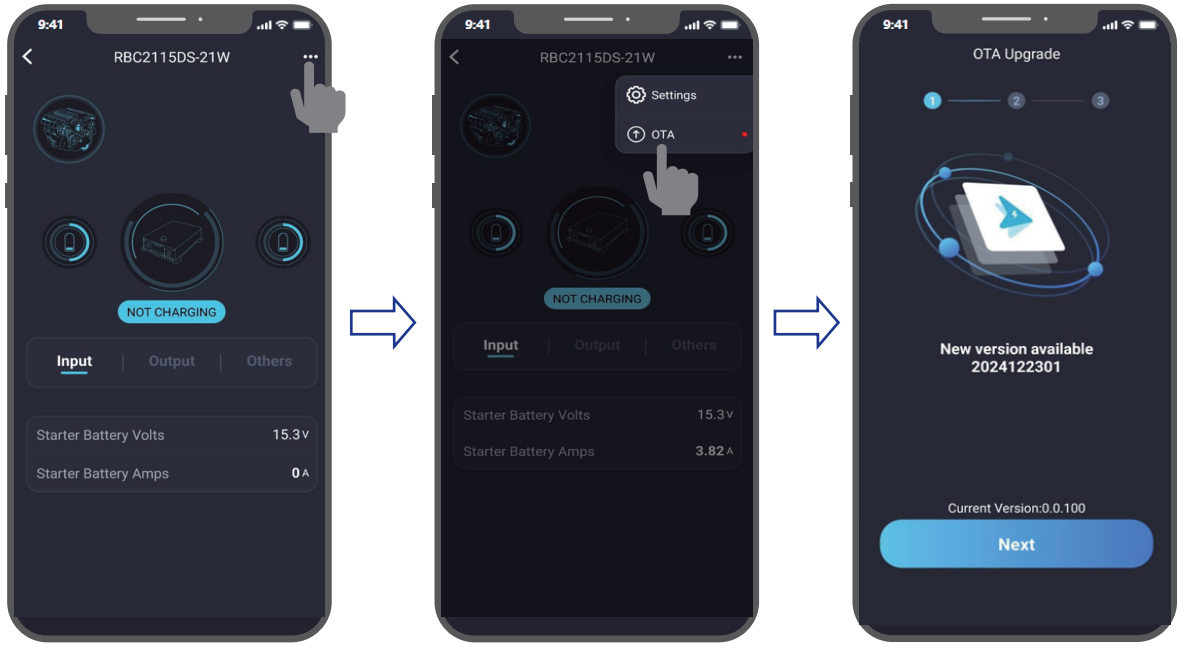
The version of the Renogy app might have been updated. Illustrations in the user manual are for reference only. Follow the instructions based on the current app version.

7.5. OTA Upgrade

REGO 12V/24V-12V/24V 30A Bidirectional DC-DC Battery Charger supports OTA firmware upgrades via the Renogy app, ensuring that you can easily access the latest features and performance enhancements without the need for additional tools or equipment.

On the home screen in the Renogy app, tap the battery charger widget to enter the device details page. Tap "**...** > **OTA**" to check available upgrade packages. Follow the upgrade wizard to update your battery charger.

In addition, you can roll back to the previous version in case of abnormalities after an OTA upgrade. This ensures that your system remains stable and functional.



The version of the Renogy app might have been updated. Illustrations in the user manual are for reference only. Follow the instructions based on the current app version.

8. Working & Charging Logic

8.1. Working Logic

The battery charger functions in either of the following modes:

- Forward charging mode — where the auxiliary battery is charged from the starter battery connected to an alternator
- Backward charging mode — where the starter battery is charged from the auxiliary battery.

The charging process is governed by predefined voltage thresholds, ensuring efficient and reliable power transfer while preventing overcharging or undervoltage conditions in both batteries. This intelligent regulation optimizes system performance and enhances battery longevity.

By default, the battery charger is configured for 12V systems and begins charging the auxiliary battery 15 seconds after the starter battery voltage remains consistently above 13.2V. For 24V systems, you can customize related parameters via the Renogy app. For details, see "8.2. Automatic Voltage Matching Function" in this manual.

Forward Charge: Charging the Auxiliary Battery

When the starter battery voltage exceeds a predefined activation threshold, the charger initiates power charging to the auxiliary battery after a 15-second delay. Charging continues until the starter battery voltage drops below the designated cutoff threshold, at which point the charger ceases operation to prevent excessive discharge of the starter battery.

Nominal Voltage		Working Condition	Stop Condition
Auxiliary Battery	Starter Battery		
12V	12V	Starter battery voltage > 13.2V. After a delay of 15 seconds, the battery charger will charge the auxiliary battery from your starter battery.	Starter battery voltage < 12.7V
	24V	Starter battery voltage > 26.4V After a delay of 15 seconds, the battery charger will charge the auxiliary battery from your starter battery.	Starter battery voltage < 25.4V
24V	12V	Starter battery voltage > 13.2V After a delay of 15 seconds, the battery charger will charge the auxiliary battery from your starter battery.	Starter battery voltage < 12.7V
	24V	Starter battery voltage > 26.4V After a delay of 15 seconds, the battery charger will charge the auxiliary battery from your starter battery.	Starter battery voltage < 25.4V

Backward Charge: Charging the Starter Battery

The battery charger regulates power transfer from the auxiliary battery to the starter battery based on predefined voltage thresholds. When the starter battery voltage falls within the specified operating range and the auxiliary battery voltage remains within safe limits, charging is initiated after a 30-second delay once the alternator ceases operation.

Charging continues until the starter battery voltage exceeds the designated stop threshold, ensuring controlled energy distribution. The charger automatically halts operation in cases of abnormal voltage conditions, such as auxiliary battery undervoltage or overvoltage protection being triggered, or if the starter battery voltage falls outside the acceptable range.

Nominal Voltage		Working Condition (All of the Conditions Shall Be Met)	Stop Condition	
Starter Battery	Auxiliary Battery		Normal Stop	Abnormal Stop
12V	12V	● 6V ≤ Starter battery voltage ≤ 12V ● 12.7V ≤ Auxiliary battery voltage ≤ 15V ● The alternator stops working.	Starter battery voltage > 12.8V After a delay of 30 seconds, the battery charger will charge the starter battery from your auxiliary battery.	● Abnormal voltage of your auxiliary battery (undervoltage or overvoltage protection triggered) ● Abnormal voltage of your starter battery (< 5V or > 16V)
	24V	● 6V ≤ Starter battery voltage ≤ 12V ● 25.4V ≤ Auxiliary battery voltage ≤ 30V ● The alternator stops working.	Starter battery voltage > 12.8V After a delay of 30 seconds, the battery charger will charge the starter battery from your auxiliary battery.	● Abnormal voltage of your auxiliary battery (undervoltage or overvoltage protection triggered) ● Abnormal voltage of your starter battery (< 5V or > 16V)
24V	12V	● 12V ≤ Starter battery voltage < 24V ● 12.7V ≤ Auxiliary battery voltage ≤ 15V ● The alternator stops working.	Starter battery voltage > 25.6V After a delay of 30 seconds, the battery charger will charge the starter battery from your auxiliary battery.	● Abnormal voltage of your auxiliary battery (undervoltage or overvoltage protection triggered) ● Abnormal voltage of your starter battery (< 10V or > 32V)
	24V	● 12V ≤ Starter battery voltage ≤ 24V ● 25.4V ≤ Auxiliary battery voltage ≤ 30V ● The alternator stops working.	Starter battery voltage > 25.6V After a delay of 30 seconds, the battery charger will charge the starter battery from your auxiliary battery.	● Abnormal voltage of your auxiliary battery (undervoltage or overvoltage protection triggered) ● Abnormal voltage of your starter battery (< 10V or > 32V)

8.2. Automatic Voltage Matching Function

Whether you are connecting a 12V or 24V starter battery or auxiliary battery, this battery charger will automatically adjust the working mode and allows you to customize the following parameters based on the rated voltage of the battery being charged in the Renogy app:

- Maximum charging current: The maximum current charged into your auxiliary or starter battery
- Forward charge start volts: The specified voltage at which the starter battery, through the battery charger, begins charging your auxiliary battery.
- Forward charge stop volts: The specified voltage at which the starter battery, through the battery charger, stops charging your auxiliary battery.

On the home screen of the Renogy app, tap the battery charger widget and go to "**...** > **Settings**" to customize the parameters above. For details, see "7.3. Configure Charging Parameters" in this manual.

Forward Charge: Charging the Auxiliary Battery

Nominal Voltage		Battery Charger Status	Maximum Charge Current	Forward Charge Start Volts*	Forward Charge Stop Volts*
Auxiliary Battery	Starter Battery				
12V	12V	-	30A Adjustable at 10A, 20A, and 30A	12V-15V	11.5V-14.5V
	24V	Steps down	30A Adjustable at 10A, 20A, and 30A	24V-30V	23V-29V
24V	12V	Boost	15A Adjustable at 15A, 10A, and 5A	12V-15V	11.5V-14.5V
	24V	-	15A Adjustable at 15A, 10A, and 5A	24V-30V	23V-29V

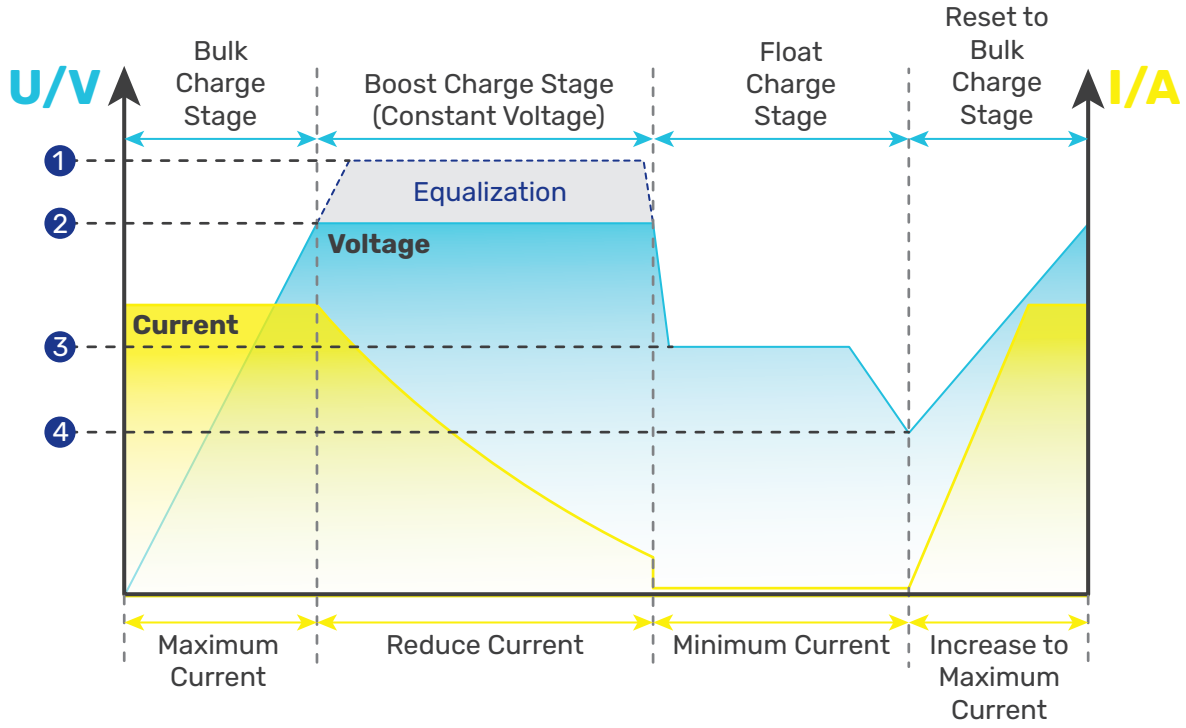
Set the two values in accordance with the formula: Forward Charge Start Volts ≥ Forward Charge Stop Volts + 0.5V. This ensures proper operation of the battery charger.

Backward Charge: Charging the Starter Battery

Nominal Voltage		Battery Charger Status	Maximum Charge Current	Backward Charge Start Volts	Backward Charge Stop Volts
Starter Battery	Auxiliary Battery				
12V	12V	-	15A	6V-12V	12.2V-13V
	24V	Steps down	7.5A	6V-12V	12.2V-13V
24V	12V	Boost	15A	12V-24V	24.4V-26V
	24V	-	7.5A	12V-24V	24.4V-26V

8.3. Battery Charging Stages

The battery charger utilizes a four-stage battery charging algorithm for a rapid, efficient, and safe battery charging. The stages include: Bulk Charging, Boost Charging, Float Charging, and Equalization.



1 Equalization Voltage
2 Boost Voltage
3 Float Voltage
4 Undervoltage Recover Voltage

Adjust the time depending on the specific battery bank size.

Bulk Charge Stage

The battery charger will supply constant current until the battery voltage reaches the boost voltage.

Boost Charge Stage

The battery charger will supply constant voltage and reduce the current slowly through this stage.

Default boost duration: 2 hours. After this time, the charger will enter the float stage.

Boost Duration is not applicable to lithium batteries.

The stage is determined by internal software in the battery charger.

Float Charge Stage

During this stage the battery charger will supply a constant voltage which is determined by the battery selected and will keep current at a minimum level. This stage acts as a trickle charger.

After reaching a constant voltage in the charging process, the battery charger reduces the voltage to a float level. At this point, the battery is fully charged, and any excess current is converted to heat or gas. The charger then maintains a lower voltage to offset power consumption, ensuring a full battery capacity. If a load exceeds the charge current, the charger exits float mode and returns to bulk charging.

Float charging is not applicable to lithium batteries.

Equalization

This stage is only available for batteries with equalization, such as non-sealed, vented, flooded, and wet cell lead acid batteries. During this stage the batteries are charged at a higher voltage than normal and for most batteries this could cause damage. Refer to the user manual of the battery or contact the battery manufacturer to see if this stage is needed.

- During Equalization charging, the battery charger remains in this stage until sufficient charging current is sourced from the starter battery. Note that there should be no load on the batteries during Equalization charging.
- Overcharging and excessive gas precipitation can harm battery plates, leading to material shedding. Carefully review the battery's specific requirements to avoid damage from prolonged or excessively high Equalization charging.
- Equalization may elevate battery voltage to levels that could damage sensitive DC loads. Ensure that the allowable input voltages of all loads exceed the set voltage during Equalization charging.

9. Troubleshooting

When an error or alarm occurs, you can receive notifications in the Renogy app. For how to pair your battery charger with the app, see “6. Monitoring” in this manual.

This chapter discusses general troubleshooting tips specific to the expressions of the Auxiliary Battery Status Indicator as well as built-in protection mechanisms of the battery charger. You can refer to the recommended solutions in the chapter.

9.1. Indicator Errors

Auxiliary Battery Status Indicator	Fault	Solution
Solid red	Overdischarge shutdown protection for auxiliary battery	● Allow the auxiliary battery to be recharged to the Overdischarge Recover voltage as specified in "7.3. Configure Charging Parameters" in this manual. ● Ensure the battery is not deeply discharged frequently.
Slow flash in red	Overvoltage protection for auxiliary battery	1. Disconnect the auxiliary battery and check the battery voltage. 2. Ensure the battery voltage is within the specified Overvoltage Shutdown range in "7.3. Configure Charging Parameters" in this manual.
Fast flash in red	Overtemperature protection for auxiliary battery	1. Let the battery cool down to be lower than 140°F (60°C). 2. Ensure the battery is not exposed to high ambient temperatures.
Jumping flash in red	Overtemperature protection for battery charger	1. Turn off the battery charger and let it cool down. 2. Ensure proper ventilation around the charger at ambient temperature of lower than 176°F or 80°C.

For technical support, contact our technical service through renogy.com/contact-us.

9.2. Built-in Protection/Alarm Mechanisms

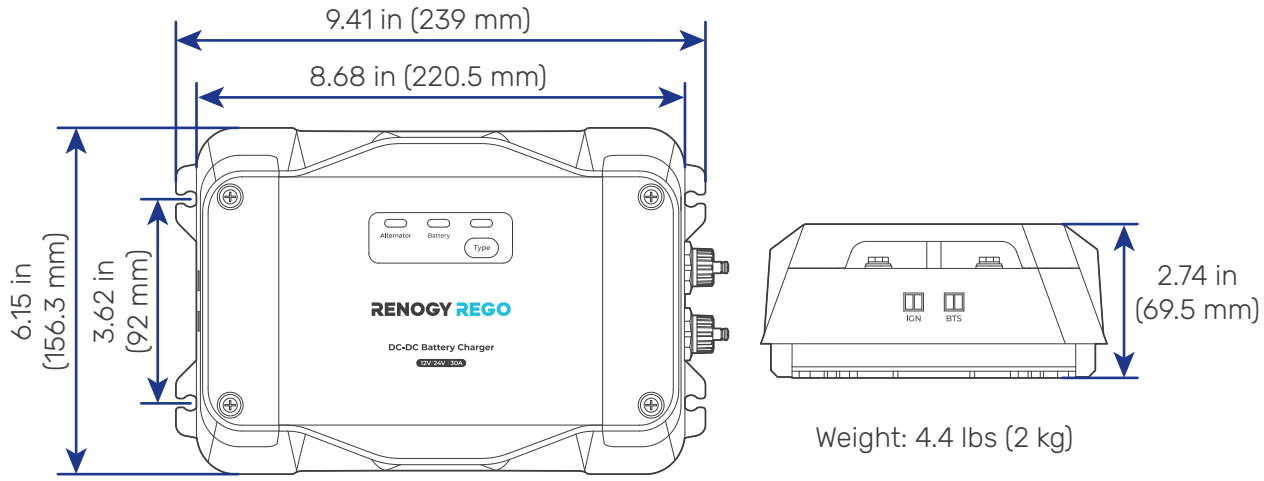
In addition to errors listed in "9.1. Indicator Errors", the battery charger provides multiple protection mechanisms and alarms at the starter battery, auxiliary battery, and battery charger sides. The battery charger may not work when these protections are activated.

Protected Device	Protection Mechanism	Description
Battery Charger	Output current limit protection	● For 12V output systems: The maximum charge current is 30A. ● For 24V systems: The maximum charge current is 15A.
Starter Battery	Reverse contact protection	The battery charger will not work or be damaged when there is a reverse polarity contact between the Starter Battery Negative Input and Starter Battery Positive Input Terminals.
	Short-circuit protection	The battery charger will not work or be damaged when there is a short circuit on the Starter Battery Negative Input and Starter Battery Positive Input Terminals.
	Input current limit protection	● For 12V input systems: This protection is activated when the input current reaches 30A. ● For 24V input systems: This protection is activated when the input current reaches 15A.
	Input overvoltage protection	● For 12V input systems: This protection is activated when the starter battery voltage rises to and above 16V. Upon activation, the battery charger stops operating to prevent potential damage. This protection is deactivated when the starter battery voltage drops to or below 15V. ● For 24V input systems: This protection is activated when the starter battery voltage rises to and above 32V. Upon activation, the battery charger stops operating to prevent potential damage. This protection is deactivated when the starter battery voltage drops to or below 30V.
	Input low voltage protection	● For 12V input systems: This protection is activated when the starter battery voltage drops to and below 12.7V. Upon activation, the battery charger stops operating to prevent potential damage. This protection is deactivated when the starter battery voltage rises above 13.2V. ● For 24V input systems: This protection is activated when the starter battery voltage drops to and below 25.4V. Upon activation, the battery charger stops operating to prevent potential damage. This protection is deactivated when the starter battery voltage rises above 26.4V.
Auxiliary Battery	Reverse contact protection	The battery charger will not work or be damaged when there is a reverse polarity contact between the Auxiliary Battery Negative Input and Auxiliary Battery Positive Input Terminals.
	Short-circuit protection	The battery charger will not work or be damaged when there is a short circuit on the Auxiliary Battery Negative Input and Auxiliary Battery Positive Input Terminals.

Protected Device	Protection Mechanism	Description
Auxiliary Battery	Overvoltage protection	● For 12V output systems: This protection is activated when the auxiliary battery voltage exceeds 16V. Upon activation, the battery charger stops operating to prevent potential damage. This protection is deactivated when the auxiliary battery voltage drops to or below 15V. ● For 24V output systems: This protection is activated when the auxiliary battery voltage exceeds 32V. Upon activation, the battery charger stops operating to prevent potential damage. This protection is deactivated when the auxiliary battery voltage drops to or below 30V.
	Undervoltage alarm	The activation of this alarm does not affect the normal operation of the battery charger.
	Undervoltage protection	The activation of this protection does not affect the normal operation of the battery charger.
	Under-temperature protection	● Application scenario: When the included temperature sensor is installed on your auxiliary battery. ● Protected batteries: SLD/FLD/GEL/AGM batteries ● Protection logic: The battery charger stops charging the battery when the battery temperature drops below -31°F (-35°C) and will resume charging once the temperature rises above -22°F (-30°C).
	Overtemperature protection on auxiliary battery	● Application scenario: When the included temperature sensor is installed on your auxiliary battery. ● Protected batteries: SLD/FLD/GEL/AGM batteries ● Protection logic: The battery charger stops charging when the battery temperature exceeds 149°F (65°C) and resumes charging once the temperature drops below 140°F (60°C).

10. Dimensions & Specifications

10.1. Dimensions



Dimension tolerance: ±0.2 in (0.5 mm)

10.2. Technical Specifications

System Voltage	12V–12V, 12V-24V, 24V-12V, and 24V-24V
Rated Charge Power	450W
Rated Charge Current	30A@12V systems 15A@24V systems
Maximum Input Voltage from Alternator	50V
Input Voltage Range	9V to 32V DC
Output Voltage Range	9V to 32V DC
Supported Battery Type	Auxiliary battery: SLD, AGM, flooded, lithium, and gel; User Mode
Charge Conversion Efficiency	For 12V auxiliary batteries: ≥ 94% For 24V auxiliary batteries: ≥ 92%
No-Load Current Consumption	< 100 mA (When only starter battery input terminals are installed.)
Standby Current	< 50 mA (When only auxiliary battery input terminals are installed.)
Operating Temperature	-31°F to 176°F (-35°C to 80°C)
Storage Temperature	-40°F to 176°F (-40°C to 80°C)
Derating	Internal battery charger temperature < 113°F/45°C: Full load; > 149°F/65°C: Non-full load; > 176°F/80°C: Stop charging"
Temperature Compensation	-3 mV/°C/2V
Grounding	Common negative

Operating Humidity	0% to 95% RH, no condensation
Mounting Method	Surface mounting
Parallel Connection	Supported
Communication	RV-C Built-in Bluetooth RS-485
Noise	< 30 dB
Maximum Altitude	3500m
Cooling	Natural cooling
Dimensions (L x W x H)	9.41 x 6.15 x 2.74 in (239 x 156.3 x 69.5 mm)
Weight	< 4.41 lbs (2 kg)
IP Rating	IP43
Certifactions	FCC, RoHS, CE, and UKCA
Warranty	5 years

11. Maintenance

11.1. Inspection

For optimum performance, it is recommended to perform these tasks regularly.

- Ensure the battery charger is installed in a clean, dry, and ventilated area.
- Ensure there is no damage or wear on the cables.
- Ensure the firmness of the connectors and check if there are any loose, damaged or burnt connections.
- Make sure the indicators are in proper condition.
- Ensure there is no corrosion, insulation damage, or discoloration marks of overheating or burning.
- If the battery charger is dirty, use a damp cloth to clean the outside of the device to prevent dust and dirt from accumulating. Before the battery charger is powered on, make sure it is completely dry after cleaning.
- Make sure the ventilation holes are not blocked.

In some applications, corrosion may exist around the terminals. Corrosion can loosen springs and increase resistance, leading to premature connection failure. Apply dielectric grease to each terminals contact periodically. Dielectric grease repels moisture and protects the terminals contacts from corrosion.

Risk of electric shock! Make sure that all power supplies are turned off before touching terminals on the battery charger.

11.2. Cleaning

Follow the steps below to clean the battery charger regularly.

- Disconnect all cables connected to the battery charger.
- Wear proper protective equipment and use insulated tools during operation. Be careful when touching bare terminals of capacitors as they may retain high lethal voltages even after power is removed.
- Wipe the housing of the battery charger and connector contacts with a dry cloth or nonmetallic brush. If it is still dirty, you can use household cleaners.
- Make sure the ventilation holes are not blocked.
- Dry the battery charger with a clean cloth and keep the area around the battery charger clean and dry.
- Make sure the battery charger is completely dry before reconnecting it to the battery and AC input.

11.3. Storage

Follow the tips below to ensure that the battery charger is stored well.

- Disconnect all cables connected to the battery charger.
- By applying dielectric grease to each terminals, the dielectric grease repels moisture and protects the connector contacts from corrosion.
- Store the battery charger in a well-ventilated, dry, and clean environment with the temperature from -40°F to 176°F (-40°C to 80°C).

12. Emergency Responses

In the event of any threat to health or safety, always begin with the steps below before addressing other suggestions.

- Immediately contact the fire department or other relevant emergency response team.
- Notify all people who might be affected and ensure that they can evacuate the area.

Only perform the suggested actions below if it is safe to do so.

12.1. Fire

1. Disconnect all cables connected to the battery charger.
2. Put out the fire with a fire extinguisher. Preferable fire extinguishers include CO_2 and ABC. Alternatively, you can use water to put out the fire if there is no preferable fire extinguishers.

Do not use type D (flammable metal) fire extinguishers.

12.2. Flooding

1. If the battery charger is submerged in water, stay away from the water.
2. Disconnect all cables connected to the battery charger.

12.3. Smell

1. Ventilate the room. Disconnect all cables connected to the battery charger.
2. Ensure that nothing is in contact with the battery charger.

12.4. Noise

1. Disconnect all cables connected to the battery charger.
2. Make sure no foreign objects are stuck in the fan of the battery charger or the ring terminal.

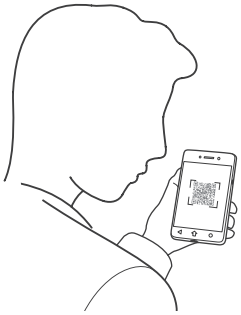
The normal noise value of the battery charger is less than 30 dB during operation. If the noise is abnormal, contact our technical service through renogy.com/contact-us.

Renogy Support

To discuss inaccuracies or omissions in this quick guide or user manual, visit or contact us at:

renogy.com/support/downloads

contentservice@renogy.com



Questionnaire Investigation

To explore more possibilities of solar systems, visit Renogy Learning Center at:

renogy.com/learning-center

For technical questions about your product in the U.S., contact the Renogy technical support team through:

renogy.com/contact-us

1(909)2877111

For technical support outside the U.S., visit the local website below:

Canada | ca.renogy.com	China | www.renogy.cn
Australia | au.renogy.com	Japan | jp.renogy.com
Other Europe | eu.renogy.com	Germany | de.renogy.com
United Kingdom | uk.renogy.com	

FCC Statement

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.

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

Any Changes or modifications not expressly approved by the party responsible for compliance 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:

(1) Reorient or relocate the receiving antenna.

(2) Increase the separation between the equipment and receiver.

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

(4) Consult the dealer or an experienced radio / TV technician for help.

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator & your body.

Renogy Empowered

Renogy aims to empower people around the world through education and distribution of DIY-friendly renewable energy solutions.

We intend to be a driving force for sustainable living and energy independence.

In support of this effort, our range of solar products makes it possible for you to minimize your carbon footprint by reducing the need for grid power.

Live Sustainably with Renogy

Did you know? In a given month, a 1kW solar energy system will...

- Save 170 pounds of coal from being burned
- Save 300 pounds of CO_2 from being released into the atmosphere
- Save 105 gallons of water from being consumed

Renogy Power PLUS

Renogy Power Plus allows you to stay in the loop with upcoming solar energy innovations, share your experiences with your solar energy journey, and connect with like-minded people who are changing the world in the Renogy Power Plus community.

YouTube @Renogy Solar @renogyofficial @Renogy

Renogy reserves the right to change the contents of this manual without notice.

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