Before Getting Started

The user manual provides important operation and maintenance instructions for RENOGY REGO 12V/24V 30A MPPT Solar Charge Controller (hereinafter referred to as charge controller).

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 charge controller, potentially rendering it inoperable.

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- The illustrations in the user manual are for demonstration purposes only. Details may appear slightly different depending on product revision and market region.
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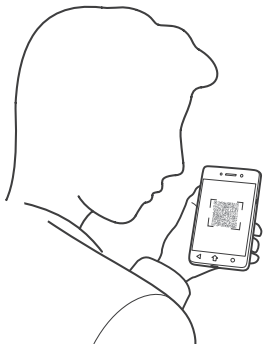
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Online Manual



Quick Guide

User Manual

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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

RENOGY REGO 12V/24V 30A MPPT Solar Charge Controller is an intelligent maximum power point tracking (MPPT) charge controller suitable for 12V and 24V off-grid solar applications.

Featuring a smart tracking algorithm, the charge controller maximizes the energy from the solar module(s) at more than 99% MPPT tracking efficiency and charges the battery at 97% conversion efficiency.

In addition, the built-in Bluetooth module allows you to configure and monitor your solar system by pairing the charge controller with your smartphone via the DC Home app (free of charge) and/or Renogy ONE Core (purchased separately).

The charging process has been optimized for long battery life and improved system performance. The comprehensive self-diagnostics and electronic protection functions can prevent damage from installation mistakes or system faults. The electronic protection functions include solar overvoltage, solar reverse polarity protection, battery overvoltage/undervoltage protection, over-temperature protection, and night charge protection.

1.3. Key Features

- **High Battery Compatibility**
  The charge controller is compatible with 12V and 24V AGM, SLD, flooded, gel, and lithium batteries as well as user-defined battery mode.
- **Auto Battery Voltage Detection**
  The charge controller detects 12V and 24V DC system voltages for non-lithium batteries and programmability for lithium batteries.
- **Supreme Conversion Efficiency**
  The charge controller supports a maximum of 99% MPPT tracking efficiency and up to 97% conversion efficiency, mitigating the affect of cloudy days and damaged solar panels.
- **Full System Protection**
  The charge controller offers reverse polarity protection, overvoltage protection, short circuit protection, and reverse charging protection at night for solar panels.
- **Remote Power Monitoring Anywhere, Anytime**
  The built-in Bluetooth and RV-C communication module makes remote monitoring possible when the charge controller is paired with your smartphone via the DC Home app and Renogy ONE Core.

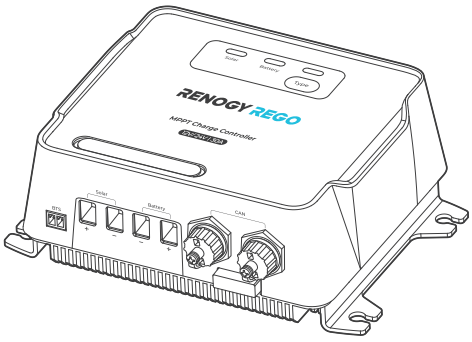
1.4. SKU

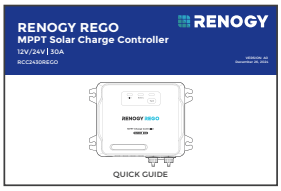
RENOGY REGO 12V/24V 30A MPPT Solar Charge Controller	RCC2430REGO

2. Get to Know Renogy MPPT Solar Charge Controller

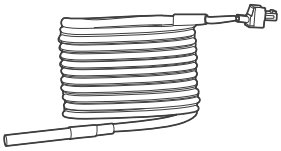
2.1. What's In the Box?

RENOGY REGO 12V/24V 30A
MPPT Solar Charge Controller × 1





Quick Guide × 1



Battery Temperature Sensor (3 m) × 1

ST6.3 mm

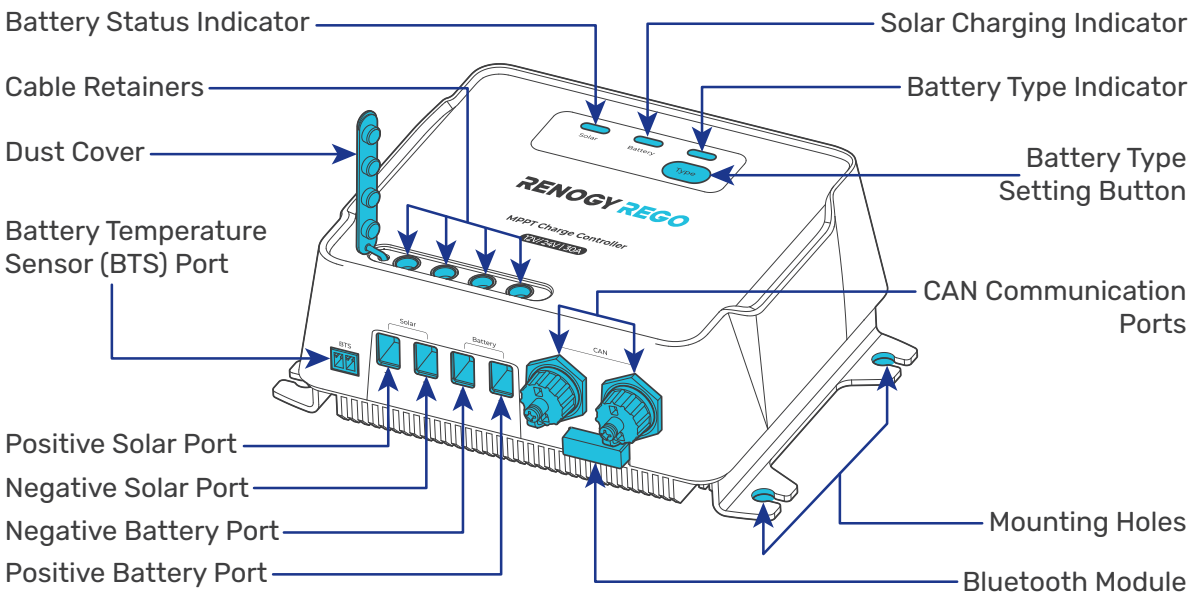


Mounting Screws x 4

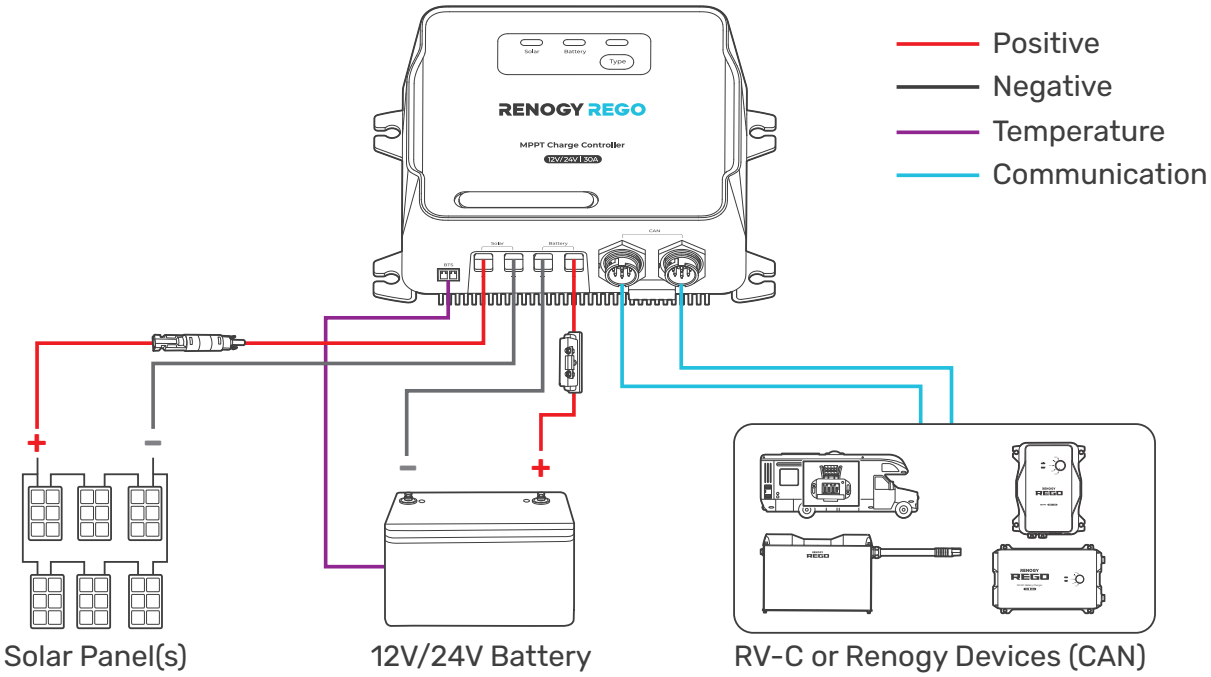
Make sure that all accessories are complete and free of any signs of damage.

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



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.

The Battery Temperature Sensor (BTS) Port cannot be used on lithium iron phosphate batteries which come with battery management systems (BMS).

In this manual, the red cable represents the positive cable, and the gray cable represents the negative cable.

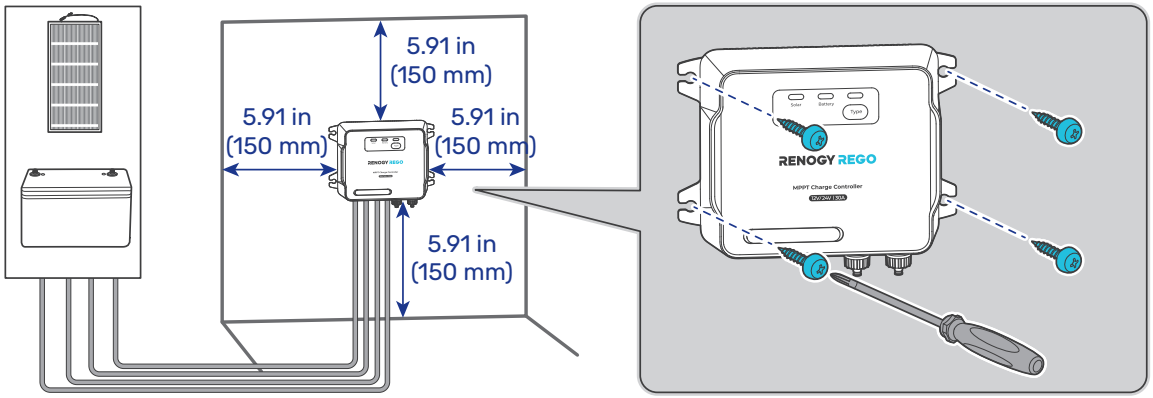
Always connect the battery terminals before the solar panel terminals to the charge controller.

3. Preparation

3.1. Plan a Mounting Site

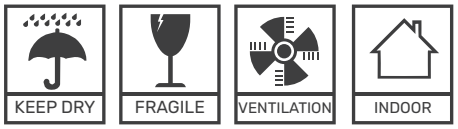
The charge controller requires adequate clearance for installation, wiring and ventilation. The minimum clearance is provided below. Ventilation is highly recommended if it is mounted in an enclosure. Select a proper mounting site to ensure the charge controller can be safely connected to the battery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

To ensure good ventilation and optimal system performance, we recommend mounting the charge controller vertically (terminals down) on a wall or horizontally on the floor.



-22°F to 176°F / -30°C to 80°C
(Power reduction above 113°F / 45°C)

0% to 95%



- Risk of explosion! Never install the charge controller in a sealed enclosure with flooded batteries! Do not install the charge controller in a confined area where battery gases can accumulate.
- The charge controller should be installed on a flat surface protected from direct sunlight.
- Keep the charge controller out of the reach of children and animals.
- Do not expose the charge controller to flammable or harsh chemicals or vapors.
- To ensure optimal working efficiency, make sure that the charge controller is installed in a place at ambient temperature from -22°F to 176°F (-30°C to 80°C).
- Make sure that the charge controller is installed in an environment with relative humidity between 0% and 95% and no condensation.
- If the charge controller is installed improperly on a boat, it may cause damage to components of the boat. Have the charge controller by a qualified electrician.
- The charge controller 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).
- The cable specifications listed in the user manual account for critical, less than 3% voltage drop and may not account for all configurations.
- Keep the charge controller away from EMI receptors such as TVs, radios, and other audio/visual electronics to prevent damage or interference to the equipment.

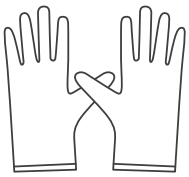
3.2. Recommended Tools



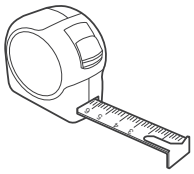
Phillips Screwdriver (#2)



Slotted Screwdriver (5 mm)



Insulating Gloves



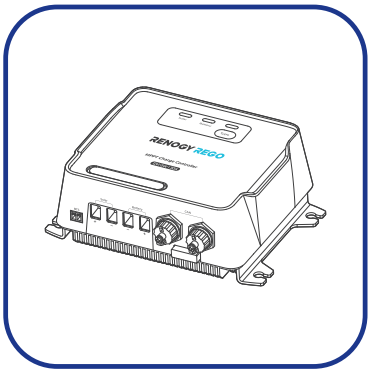
Measuring Tape



Wire Stripper

Prior to installing and configuring the charge controller, prepare the recommended tools, components, and accessories.

3.3. Check the Charge Controller



Inspect the charge controller 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 charge controller if there is any visible damage.

Do not puncture, drop, crush, penetrate, shake, strike, or step on the charge controller.

There are no serviceable parts in the charge controller. Do not open, dismantle, repair, tamper with, or modify the charge controller.

Confirm the polarities of the devices before connection. A reverse polarity contact can result in damage to the charge controller and other connected devices, thus voiding the warranty. Reverse polarity protection does not apply if the solar panel is connected to the charge controller before the battery.

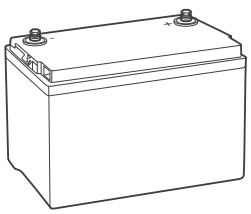
Do not touch the connector contacts while the charge controller is in operation.

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 charge controller.

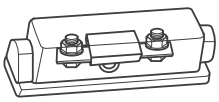
Do not dispose of the charge controller as household waste. Comply with local, state, and federal laws and regulations and use recycling channels as required.

3.4. Check the Auxiliary Battery

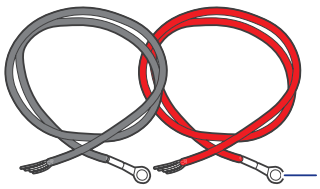
Recommended Components & Accessories



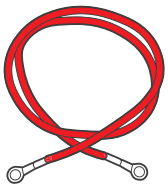
*12V/24V Battery



*ANL Fuse (40A) × 1



Battery Adapter Cables (10 AWG) × 2



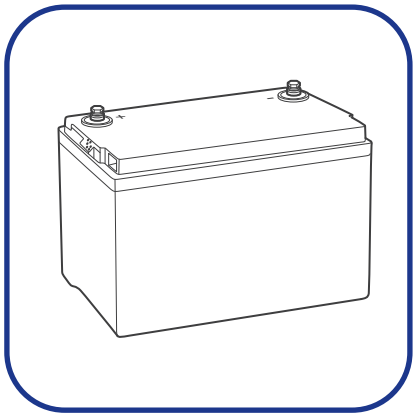
Fuse Cable (10 AWG) × 1

Components and accessories marked with "*" are available on renogy.com.

To ensure optimal system performance, a 10 AWG cable should be no longer than 3 meters. Choose higher gauge cables for longer distances.

Cable Length (ft) / (m)	0 to 10 ft (0 to 3 m)	11 to 20 ft (3 to 6 m)	21 to 30 ft (6 to 9 m)
Recommended Cable Size	10 AWG	8 AWG to 10 AWG	8 AWG

The size of the fuse cable is consistent with that of the corresponding cable connecting to the output terminal of the charge controller.



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

   The charge controller 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 charge controller, 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: $U_1 = U_2 = U_3$

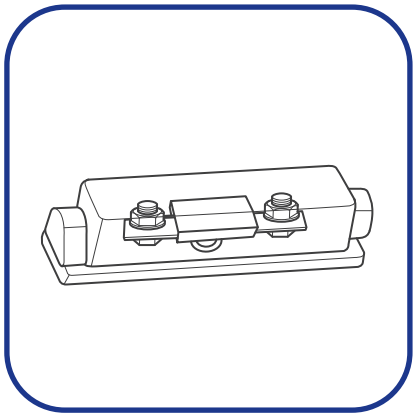
2. Check system voltage for batteries connected in series or parallel.

   This charge controller supports a maximum system voltage of 32V.

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 32V.

Do not connect batteries rating higher than 32V to the charge controller. Doing so will damage the charge controller.

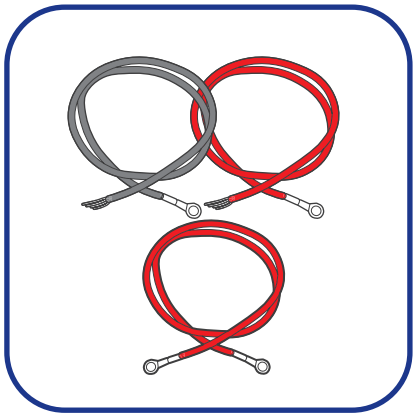
In the formula, U represents the battery voltage, and 1, 2, or 3 represents the battery number respectively.



3. Inspect the ANL Fuse (40A) 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 Fuse if there is any visible damage.

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

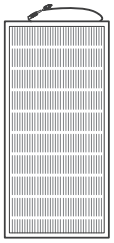


4. Inspect the Battery Adapter Cables and Fuse Cable for any visible damage including cracks, dents, deformation, and other visible abnormalities. All terminals are fastened to the cables.

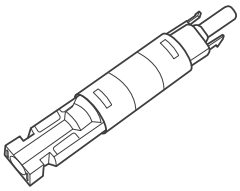
Do not use the battery adapter cables if there is any visible damage.

3.5. Check the Solar Panel(s)

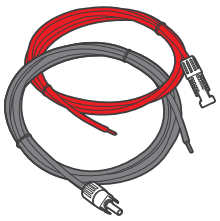
Recommended Components & Accessories



*Solar Panel (s)
(14V to 100V, 30A Max)



*Solar Panel Fuse



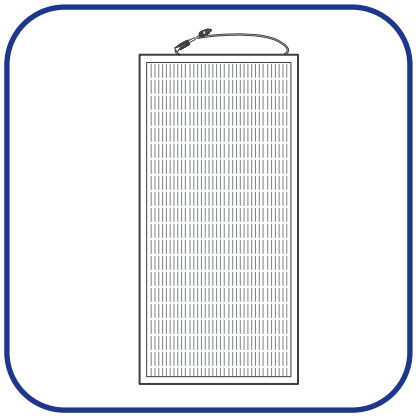
*Solar Panel to Charge Controller Adaptor Ki
(10 AWG, Max power) × 1

Components and accessories marked with "*" are available on renogy.com.

For accessories required for connecting solar panels in series, parallel, or series-parallel, visit "A Guide Between Series and Parallel Connections" at Renogy Learning Center.

To ensure optimal system performance, a 10 AWG cable should be no longer than 3 meters. Choose higher gauge cables for longer distances.

Cable Length (ft) / (m)	0 to 10 ft (0 to 3 m)	11 to 20 ft (3 to 6 m)	21 to 30 ft (6 to 9 m)
Recommended Cable Size	10 AWG	8 AWG to 10 AWG	8 AWG



1. Inspect the solar panel 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 solar panel if there is any visible damage.
- Cover the solar panel prior to connecting it to the charge controller to prevent any electrical current or voltage from being generated or flowing through the system during the installation process. This reduces the risk of electrical shocks or accidents while making connections, ensuring the safety of the installer and the integrity of the equipment.
- Do not install the solar panel on a surface constructed from combustible material.
- Do not expose the solar panel to direct flame or heat sources.
- Keep the solar panel out of the reach of children.
- Keep the solar panel away from explosives and corrosive substances.
- Do not step, walk, stand, or jump on the solar panel. Localized heavy loads may cause damage to the solar cells, which will ultimately compromise the performance of the solar panel.
- Do not bend the solar panel. Bending the solar panel will cause damage to the cells and affect panel performance.
- Do not immerse the solar panel in water.
- Read the user manual of the solar panel carefully before installation.
- The solar panels can be combined in parallel or in series as needed.
- Identify the polarities (positive and negative) on the cables used for solar panels. A reverse polarity contact may damage the unit.

Maximum Output Power	
Maximum Output Power of Solar Panel or Solar Panel Array = Maximum Solar Input Power of the Charge Controller (W)	
Solar Panels in Series	**Solar Panels in Parallel**
Maximum Output Power (W): $W_1 + W_2 + W_3$	Maximum Output Power (W): $W_1 + W_2 + W_3$

2. Read the user manual of the solar panel for the maximum output power, and calculate the maximum output power of solar panel or solar panel array according to the formula.

In the formula, 1, 2, or 3 represents the solar panel number respectively.

Ensure that the maximum output power of the solar panel/solar panel array meets the condition in the table below.

System Voltage	12V	24V
Maximum Output Power	≤ 450W	≤ 900W

The charge controller features solar power limiting protection. When the solar power exceeds 440W (for a 12V system) and 880W (for a 24V system), the charge controller activates the power limiting protection mode. In this mode, it caps the input power to a maximum of 450W (for a 12V system) and 900W (for a 24V system) to charge the battery.

Open Circuit Voltage	
Open Circuit Voltage of Solar Panel or Solar Panel Array = Maximum Solar Input Voltage of the Charge Controller (U or Voc)	
Solar Panels in Series	**Solar Panels in Parallel**
Open Circuit Voltage (U) = $U_1 + U_2 + U_3$	Open Circuit Voltage (U) = $U_1 = U_2 = U_3$

3. Read the user manual of the solar panel for the maximum open circuit voltage, and calculate the maximum open circuit voltage of solar panel or solar panel array according to the formula. Ensure that the open circuit voltage of the solar panel/solar panel array is no higher than 100V.

In the formula, 1, 2, or 3 represents the solar panel number respectively.

Connecting the charge controller to a solar panel exceeding 100V results in damage to the charge controller.

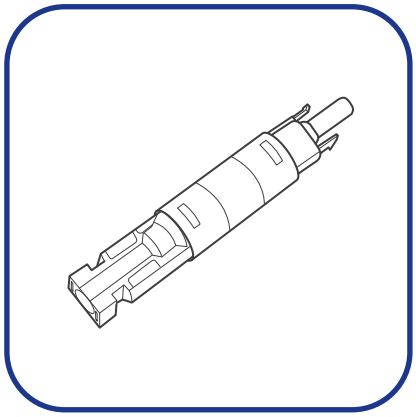
Short Circuit Current	
Short Circuit Current of Solar Panel or Solar Panel Array (Isc) = Maximum Solar Input Current of the Charge Controller	
Solar Panels in Series	**Solar Panels in Parallel**
$Isc = I_1 = I_2 = I_3$	$Isc = I_1 + I_2 + I_3$

4. Read the user manual of the solar panel for the maximum short circuit current, and calculate the maximum short circuit current of solar panel or solar panel array according to the formula. Ensure that the maximum short circuit does not exceed 30A.

In the formula, 1, 2, or 3 represents the solar panel number respectively.

Short circuit current is the abnormal flow of electric current in a power system, occurring between phases or between phase and ground (or neutral) during operation, with values often exceeding the rated current and dependent on the electrical distance from the short-circuit point to the power source. For detailed information, please refer to the specific solar panel manual.

For details about how to connect solar panels in series, parallel, and series-parallel, refer to "A Guide Between Series and Parallel Connections" on Renogy Learning Center.



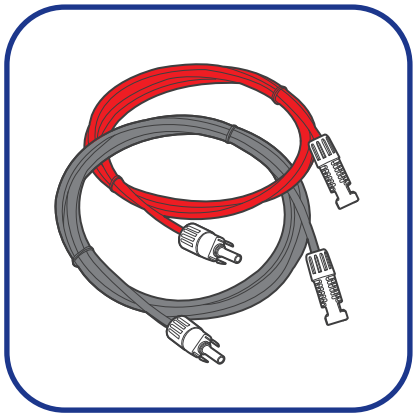
5. The appropriate current rating for the solar panel fuse should be determined by multiplying the total amperage of the solar panel array by 1.56.

   Rated Current of the Solar Panel Fuse = Short Circuit Current (Isc) of Solar Panel x 1.56

   Inspect the solar panel fuse 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 solar panel fuse if there is any visible damage.

For details on how to install and use the solar panel fuse, see its user manual.



6. Inspect the Solar Panel to Charge Controller Adaptor Kit 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 bare wires and Solar Panel to Charge Controller Adaptor Kit if there is any visible damage.

3.6. How to Install Cables on the Charge Controller?

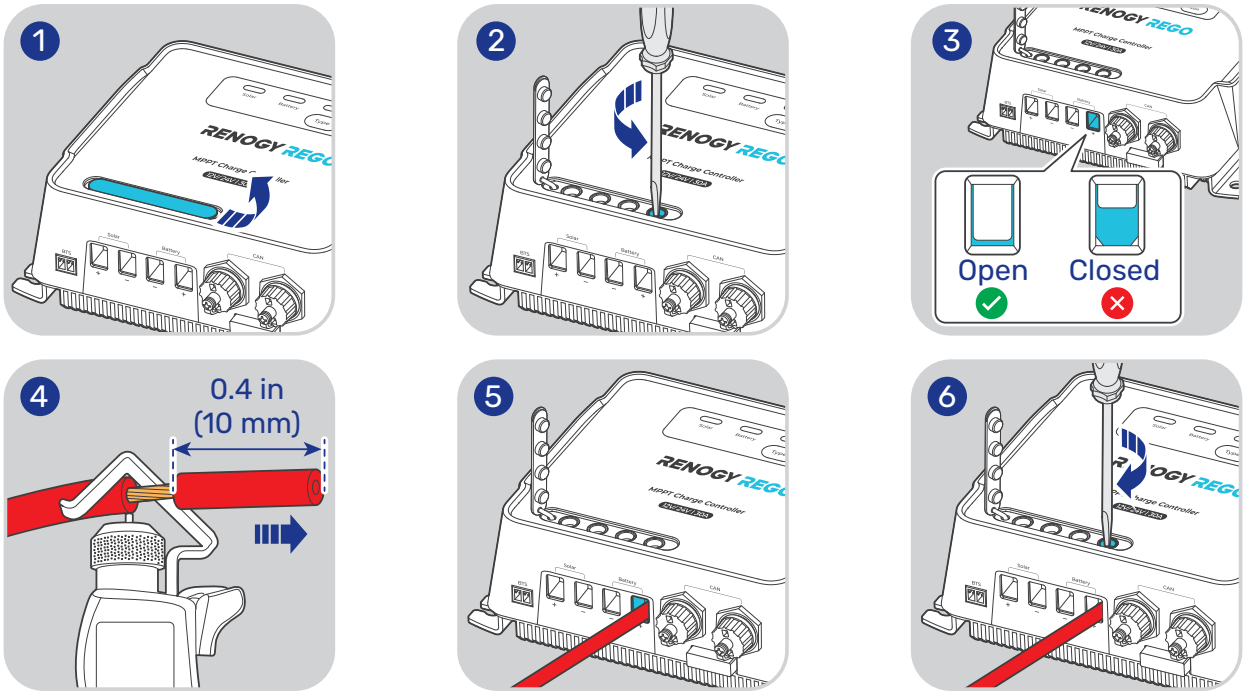
Prior to connecting the charge controller to a battery or a solar panel, you need to get familiar with how to install cables on the charge controller. The illustrations below are based on the Positive Battery Port. The same installation rules apply to the Positive/Negative Solar and Negative Battery ports.

Step 1: Remove the dust cover from the charge controller.

Step 2: Loosen the cable retainer of the Negative Battery Port by turning the screw counterclockwise.

Step 3: Strip 0.4 inches (10 mm) of insulation from the exposed end of the Negative Battery Adapter cable.

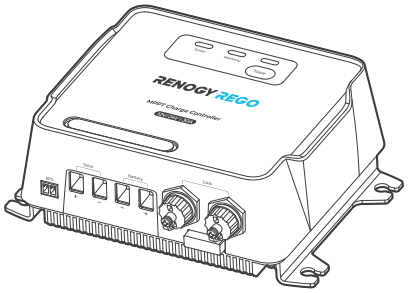
Step 4: Insert the stripped end of the cable into the cable retainer, and tighten the retainer by turning the screw clockwise.

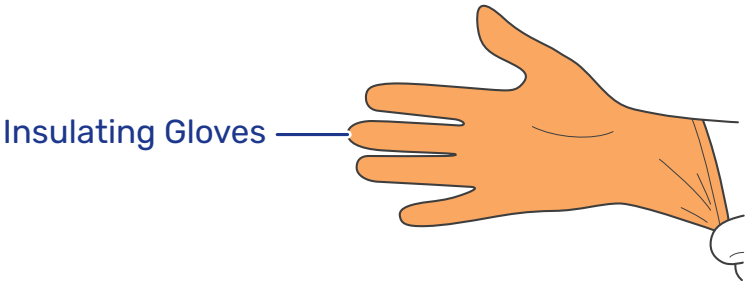


4. Installation

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

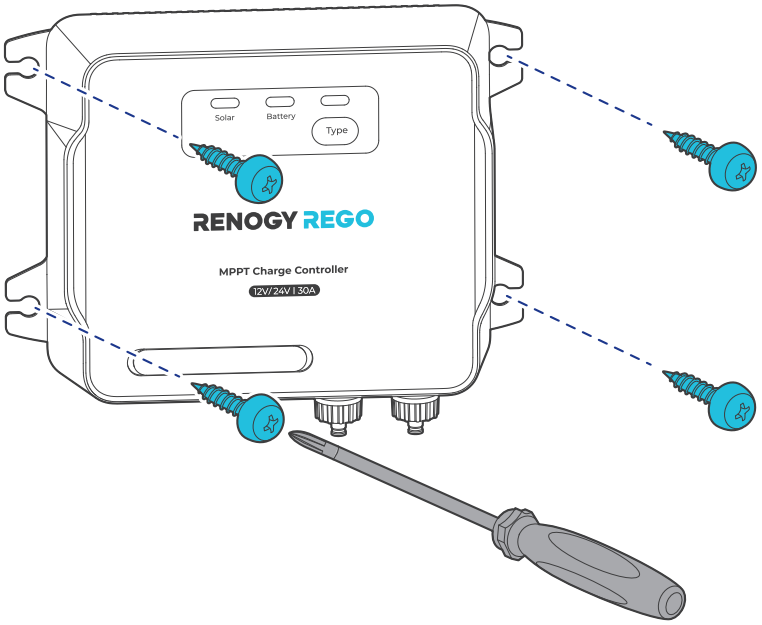
4.1. Wear Insulating Gloves





4.2. Mounting

For details on how to select a proper mounting site, see "3.1. Plan a Mounting Site".



4.3. Connect the Charge Controller to an Auxiliary Battery

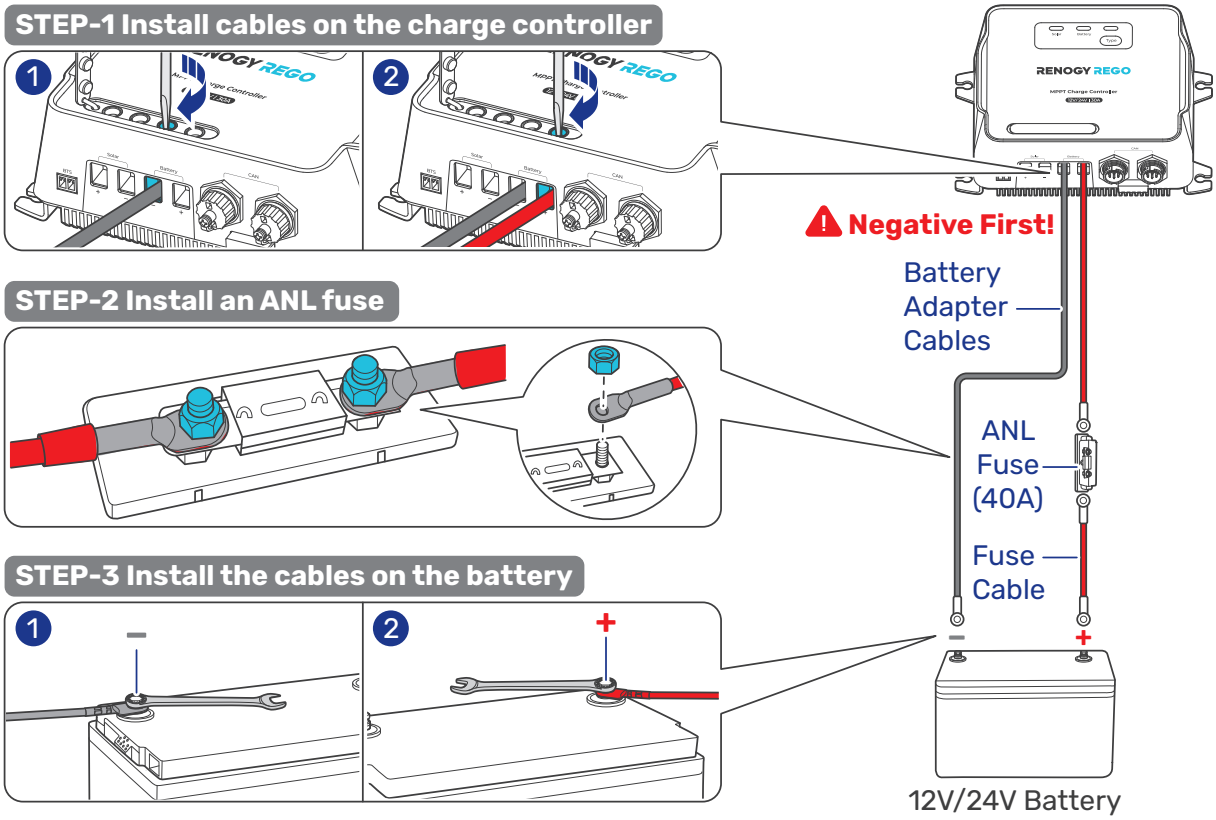
Always connect the battery to the charge controller first, and then connect the solar panels to the charge controller. This helps ensure safe and efficient setup.

Step 1: On the charge controller, connect the exposed end of the Negative Battery Adapter Cable to the Negative Battery Port. Repeat the process for the Positive Battery Adapter Cable, connecting it to the Positive Battery Port.

Step 2: Install an ANL fuse. Connect the ring terminal of the Positive Battery Adapter Cable to an ANL fuse, ensuring the other end of the fuse is securely attached to the fuse cable.

Step 3: On the battery, attach the negative terminal to the ring terminal of the Negative Battery Adapter Cable. Connect the other end of the fuse cable to the positive terminal of the battery.

Identify the polarities (positive and negative) on the cables used for the batteries. A reverse polarity contact may damage the charge controller. Reverse polarity protection does not apply if the solar panel is connected to the charge controller before the battery.

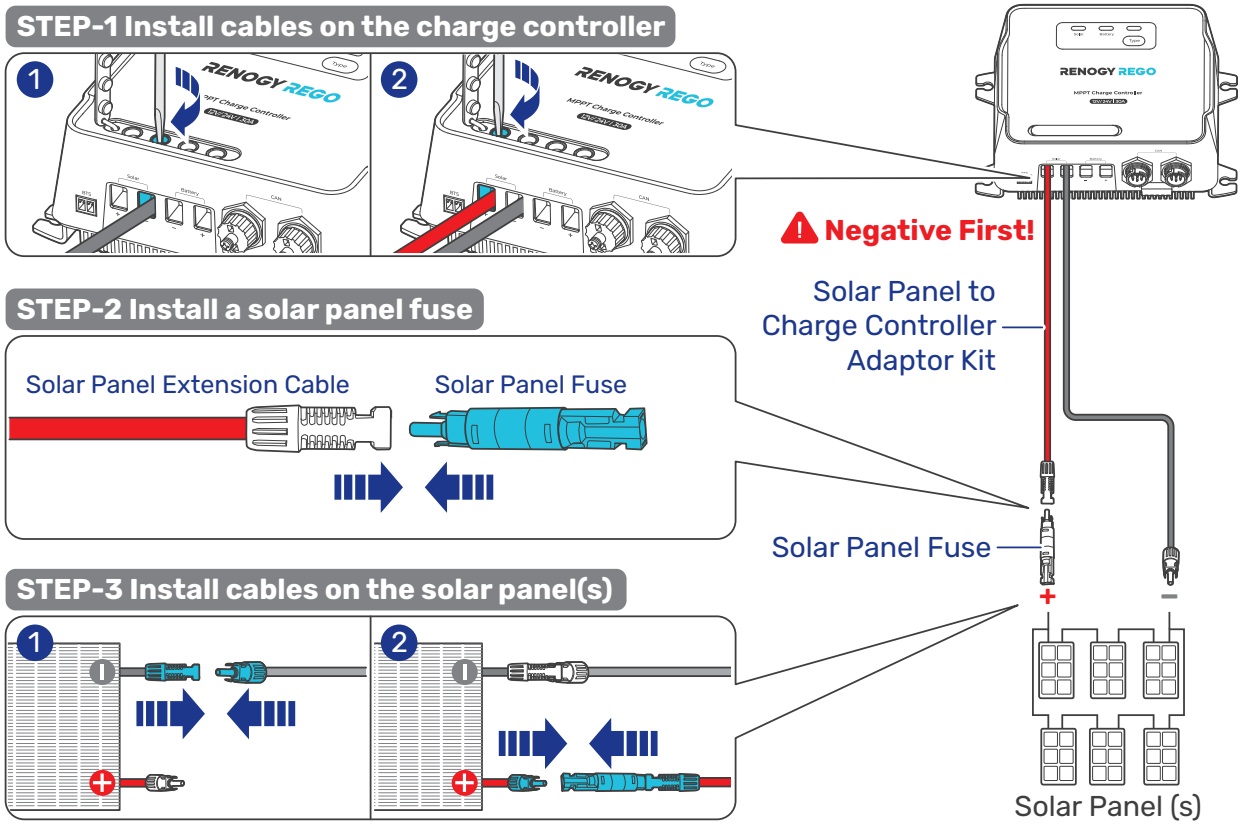


4.4. Connect the Charge Controller to a Solar Panel

Step 1: On the charge controller, connect the exposed end of the Negative Solar Panel to Charge Controller Adaptor Kit to the Negative Solar Port. Repeat the process for the Positive Solar Panel to Charge Controller Adaptor Kit, connecting it to the Positive Solar Port.

Step 2: Install a solar panel fuse. Insert a solar panel fuse to the other end of the Positive Solar Panel to Charge Controller Adaptor Kit.

Step 3: On the solar panel(s), attach the negative MC4 connector to the Negative Solar Panel to Charge Controller Adaptor Kit. Connect the positive MC4 connector to the solar panel fuse.



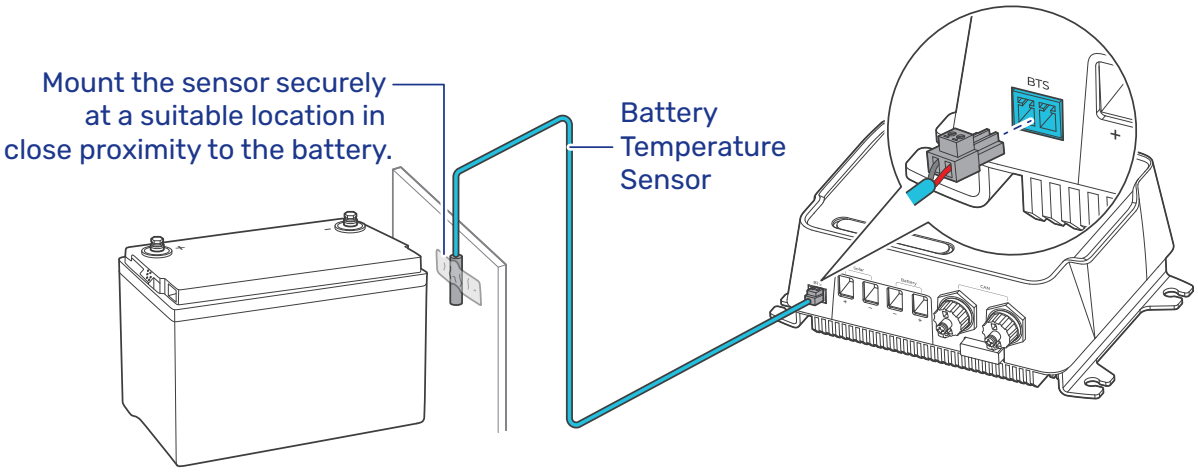
For details on how to connect solar panels in series, parallel, or series-parallel, visit "A Guide Between Series and Parallel Connections" at Renogy Learning Center.

4.5. Install a Battery Temperature Sensor

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

Step 1: Connect the battery temperature sensor to the Battery Temperature Sensor (BTS) Port on the charge controller.

Step 2: Mount the other end of the sensor securely at a suitable location in close proximity to the battery.



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

Battery Overtemperature Protection

The charge controller will stop charging the battery when the battery temperature exceeds 149°F (65°C). Charging will automatically resume once the battery temperature drops below 140°F (60°C).

Battery Undertemperature Protection

The charge controller will stop charging the battery when the battery temperature falls below -31°F (-35°C). Charging will automatically resume once the battery temperature rises above -22°F (-30°C).

4.6. CAN Communication Wiring (Optional)

The RENOGY REGO 12V/24V 30A MPPT Solar Charge Controller 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 charge controller 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 networks.

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

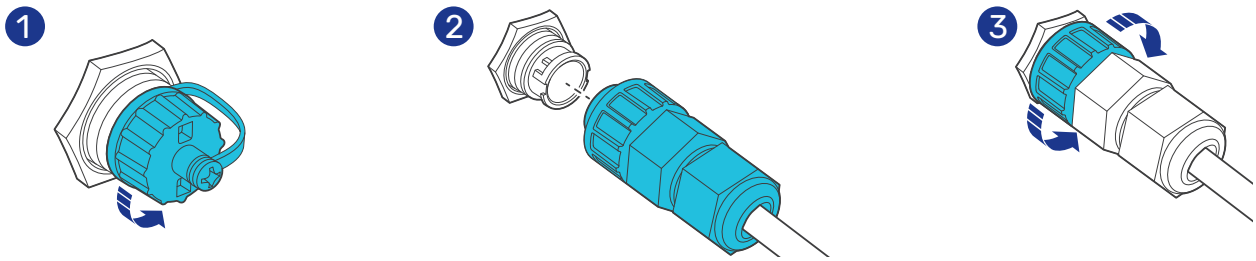
To properly connect or disconnect the 7-Pin CAN Communication Terminal Plug to or from the charge controller, you should

1. Remove the dust cover from the CAN Communication Port on the charge controller.

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.



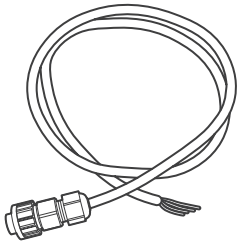
Backbone Network

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.

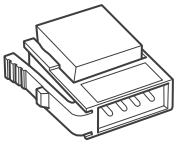
If the RV-C bus does not have a built-in 120Ω termination resistor, the charge controller will not communicate properly with other Renogy devices supporting CAN communication. Please use the Daisy Chain Network for communication connections.

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

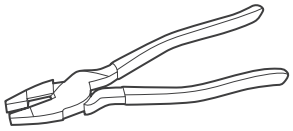
Recommended Tools & Accessories



*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 charge controller. 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. Leave pin 1 and pin 4 empty.

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

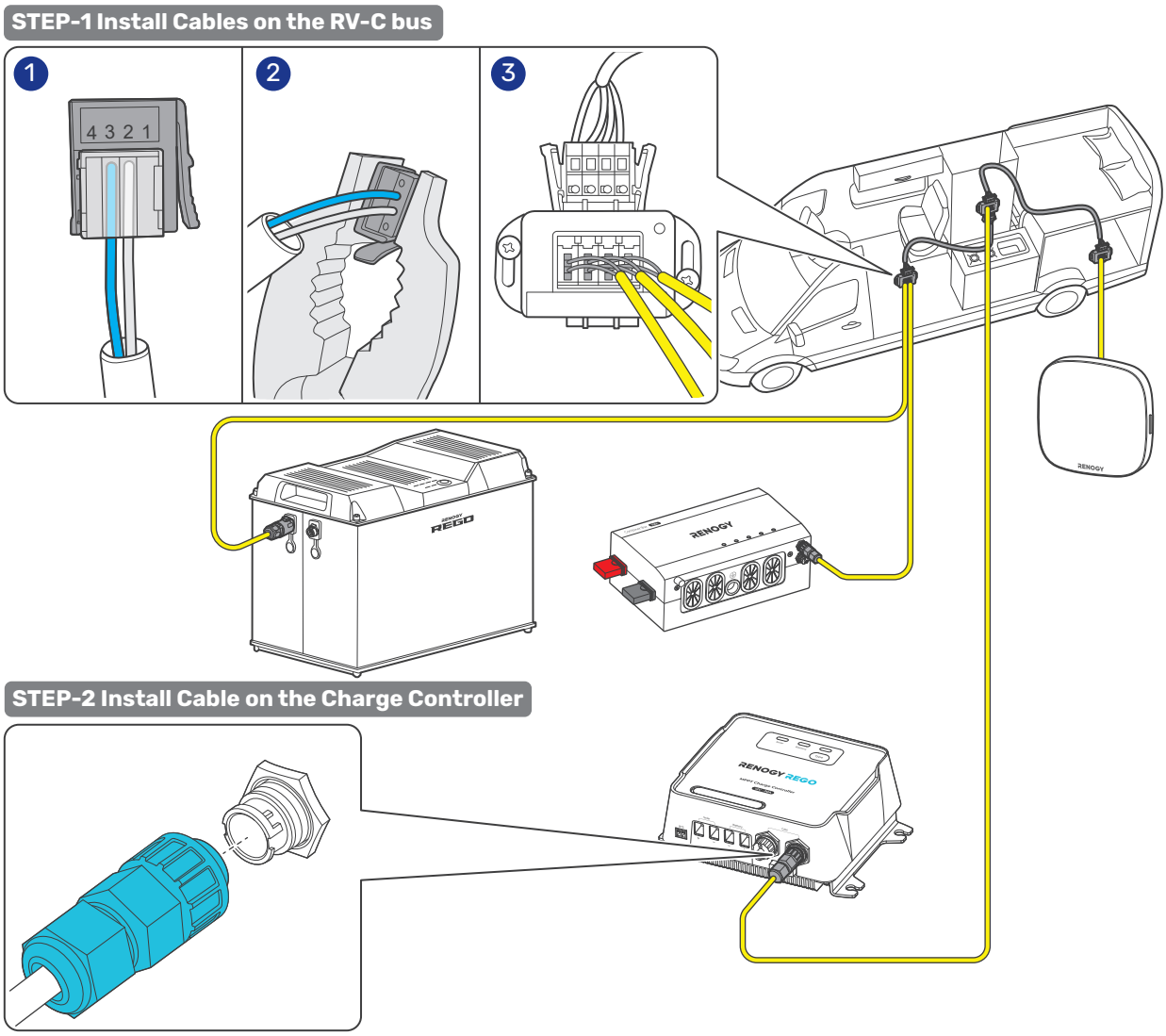
Step 3: Locate the drop tap (not included) on the RV-C bus that is the closest to the installation site of the charge controller. The drop taps are usually located above the entry door, in the bathroom, or under the bed in the RV.

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 either of the CAN Communication Ports of the charge controller.

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

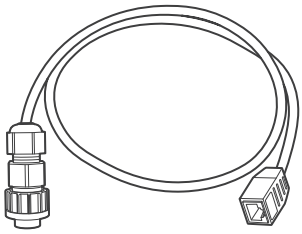
The daisy chain network applies to RVs that are not integrated with RV-C buses.

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

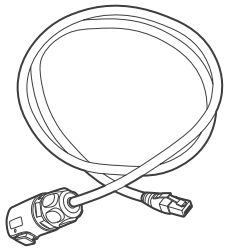
- Charge Controller to Renogy Combiner Box: 7-Pin CAN Communication Cable
- Charge Controller to Renogy ONE Core: 7-Pin CAN Communication Terminal Plug to RJ45 Port Adapter Cable and RJ45 Ethernet Cable (CAT5 or above)
- Charge Controller to REGO Battery: 7-Pin CAN Communication Terminal Plug to RJ45 Port Adapter Cable and LP16 Plug (7-Pin) to RJ45 Communication Cable

This section is based on a 7-Pin CAN Communication Terminal Plug to RJ45 Port Adapter Cable and LP16 Plug (7-Pin) to RJ45 Communication Cable.

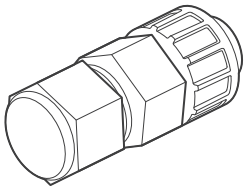
Recommended Accessories



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



*LP16 Plug (7-Pin) to RJ45 Communication Cable(s)



*7-Pin CAN Communication Terminal Plug

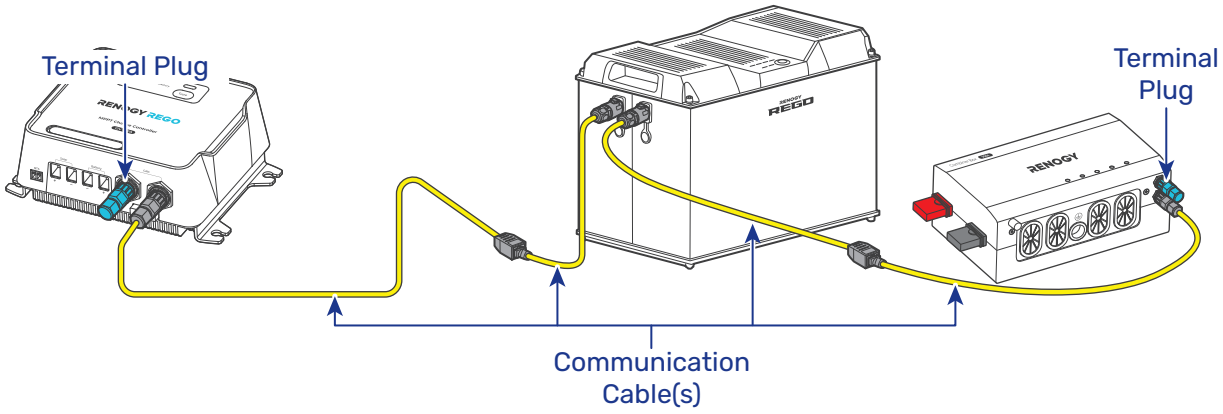
- Accessories marked with "*" are available on renogy.com.
- The communication cable should be less than 19.6 feet (6 m).
- Choose proper terminal plugs based on the specific CAN ports.

The quantity of adapter cables and plugs varies based on the position of the charge controller in the daisy chain network. When the charge controller 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 charge controller is located in the middle of the daisy chain network, two adapter cables are needed.

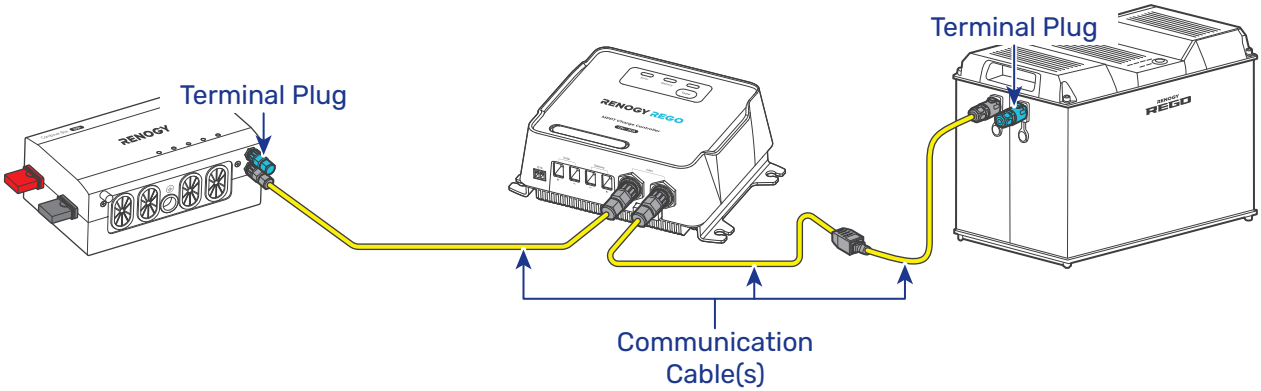
Step 1: Connect devices in series with the charge controller through either of the CAN Communication Ports with the Communication Cable(s) (sold separately).

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

Charge Controller is Positioned at the First or Last in the Daisy Chain Network



Charge Controller is in the Middle of the Daisy Chain Network



4.7. Parallel Connection for Charge Controllers (Optional)

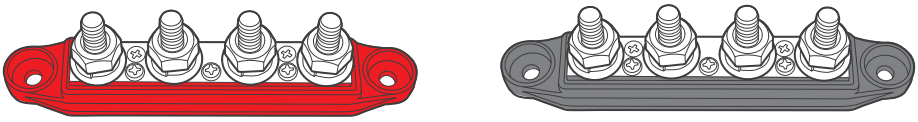
To provide more charging power, you can connect two REGO 12V/24V 30A MPPT Solar Charge Controllers in parallel to provide 60A charge current when all of the following are met:

- All to-be-charged batteries are identical in size and brand.
- Each charge controller is connected to independent solar panels of the same size.
- All cables connecting the busbars should be identical in size and length.

A larger number of charge controllers leads to a higher charging power. The charging capability relates to the number of charge controllers in parallel.

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

Recommended Accessories

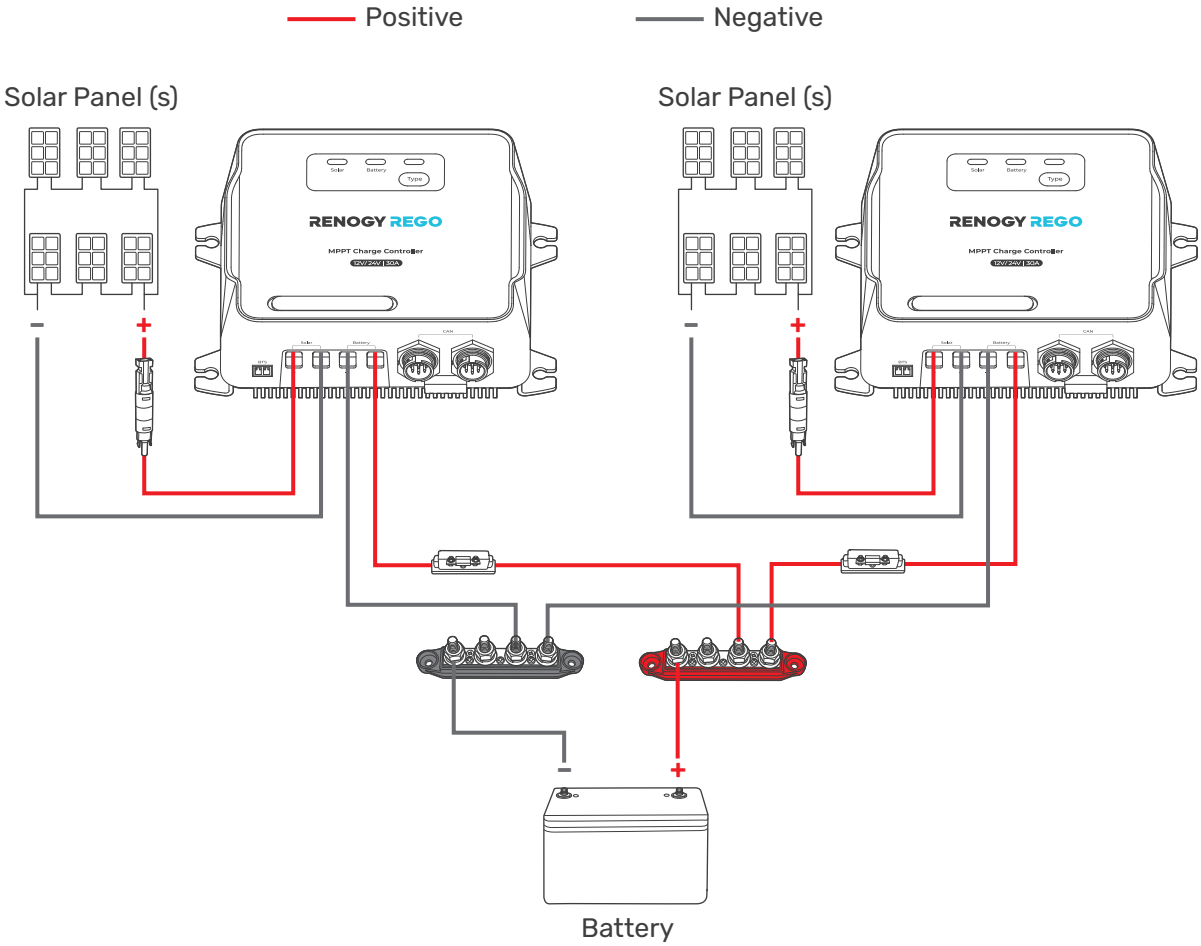


Busbar Pair (≥ 200A) × 1

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

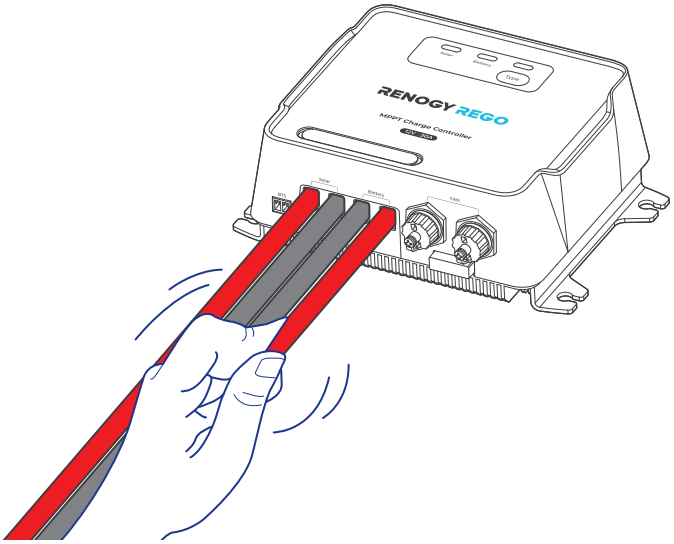
Step 2: Connect the Positive Battery Ports of the two charge controllers and the positive terminal(s) of the battery or battery groups on a busbar.

Step 3: Connect each charge controller to independent solar panels.



4.8. 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.



5. Operation

5.1. Power On/Off

The charge controller powers up upon connection to a battery and/or to a solar panel. To power it off, disconnect the solar panel from the charge controller, followed by the battery. In scenarios involving a DC breaker, simply switch the DC breaker to the OFF position.

5.2. LED Indicators

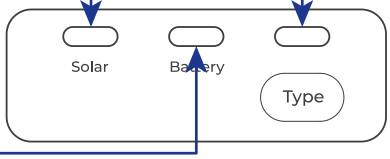
The charge controller turns on automatically after power on with the LED indicators working in accordance with the relative operational status.

Solar Charging Indicator

- **Off:** No solar panel detected
- **Solid:** Charging

Battery Status Indicator

- **Off:** No battery detected
- **Solid:** Fully charged
- **Slow Flash:** Charging
- **Solid:** Not charged and the battery at normal voltage
- **Solid:** Overdischarge protection
- **Slow Flash:** Overvoltage protection
- **Fast Flash:** Overtemperature protection on battery
- **Jumping Flash:** Overtemperature protection on charge controller



Battery Type Indicator

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

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.		

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

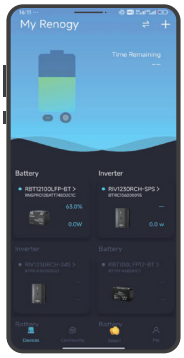
6. Monitoring

Depending on the specific application, the charge controller can establish either short-range or long-range communication connections with monitoring devices. These monitoring devices facilitate real-time data monitoring/programming and complete system management, offering comprehensive control and enhanced flexibility.

You can monitor the performance of the charge controller through the following methods:

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

To ensure the optimal device compatibility, download and log into the latest DC Home app.



DC Home App

GTE IT ON Google Play

Download on the App Store

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

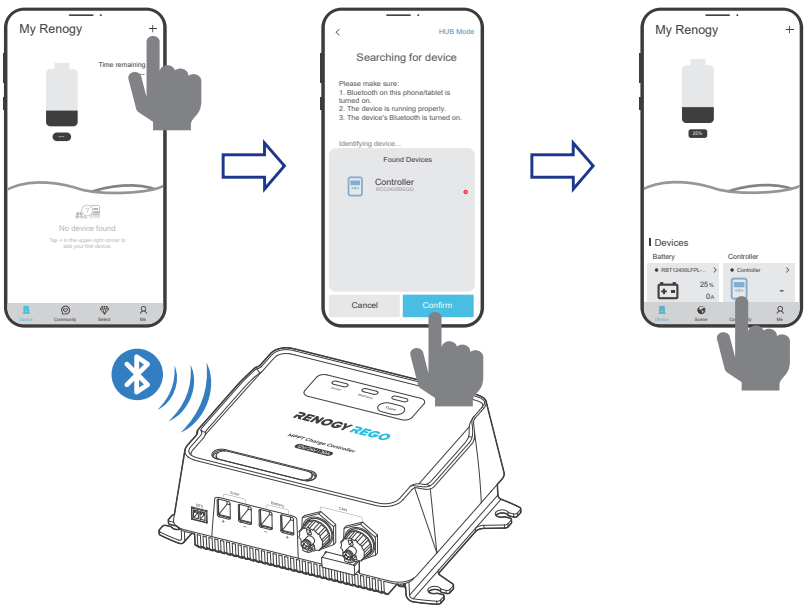
6.1. Short-Range Monitoring via DC Home App

If only short-range monitoring is required, connect the charge controller to the DC Home app directly through the Bluetooth of your phone.

Step 1: Open the DC Home app. Tap **+** to search for new devices.

Step 2: Tap **Confirm** to add the newly found charge controller to the device list.

Step 3: Tap the charge controller widget to check the details.



6.2. Wireless Long-Range Monitoring

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

Recommended Components & Pairing Instructions

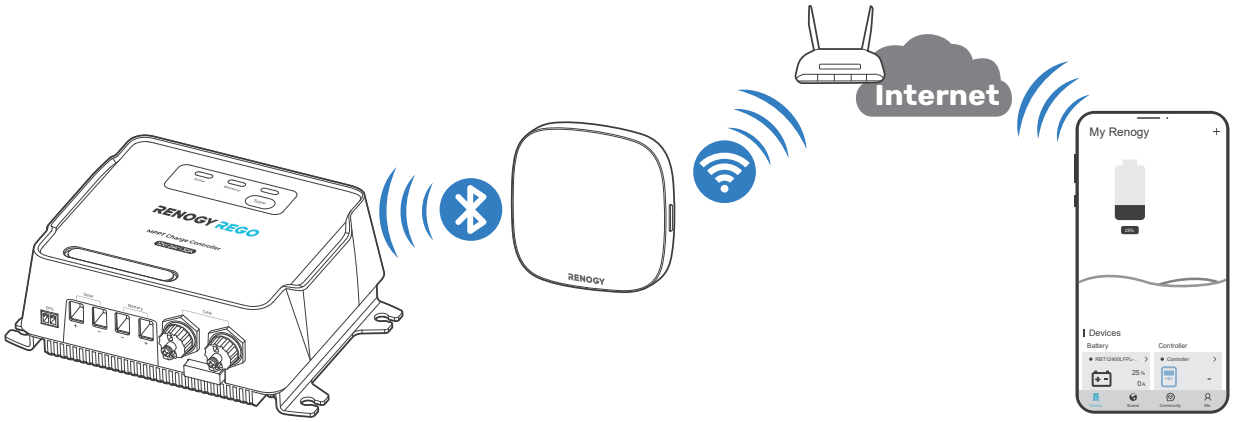


*RENOGY ONE Core

- Components marked with "*" are available on renogy.com.
- Ensure that the Renogy ONE Core is powered on before the connection.
- Ensure the charge controller does not communicate with any other device.

Step 1: Connect the charge controller to Renogy ONE Core through the Bluetooth of your phone.

Step 2: Pair Renogy ONE Core with the DC Home app through Wi-Fi or by scanning the QR code in Renogy ONE Core. On Renogy ONE Core, go to "**Settings** > **System** > **Pair with App**" to get the QR code. For pairing instructions on Renogy ONE Core, see Renogy ONE Core User Manual.



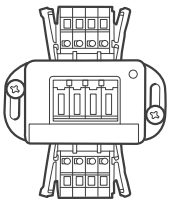
6.3. Wired Long-Range Monitoring (Backbone Network)

If long-range communication and programming are required, connect the charge controller to Renogy ONE Core through wires, and then pair Renogy ONE Core with the DC Home app.

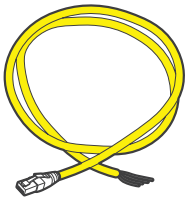
Recommended Components & Accessories



*RENOGY ONE Core



Common Drop Tap



Communication Cable
(RJ45 Plug to Bare Drop Cable)

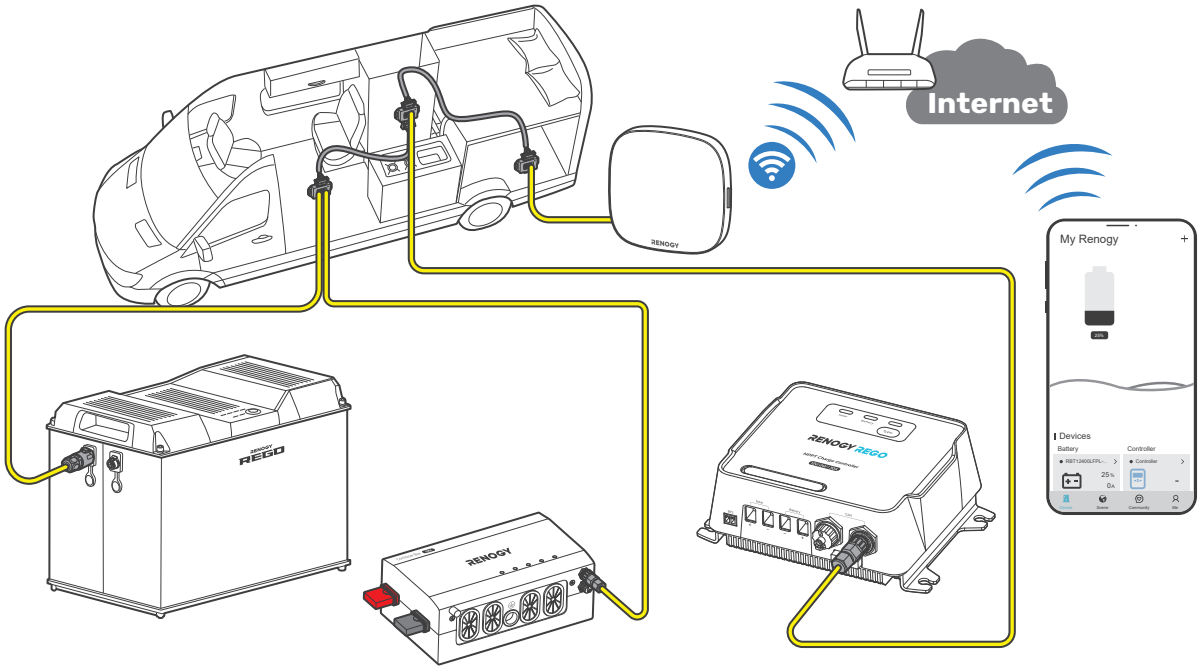
- Components marked with "*" are available on renogy.com.
- Ensure that the Renogy ONE Core is powered on before the connection.
- Ensure the charge controller does not communicate with any other device.

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. 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 2: Monitor and program the complete system on Renogy ONE Core or the DC Home app.



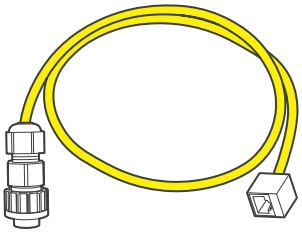
6.4. Wired Long-Range Monitoring (Daisy Chain Network)

If long-range communication and programming are required, connect the charge controller to Renogy ONE Core through wires, and then pair Renogy ONE Core with the DC Home app.

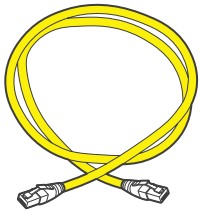
Recommended Components & Accessories



*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.

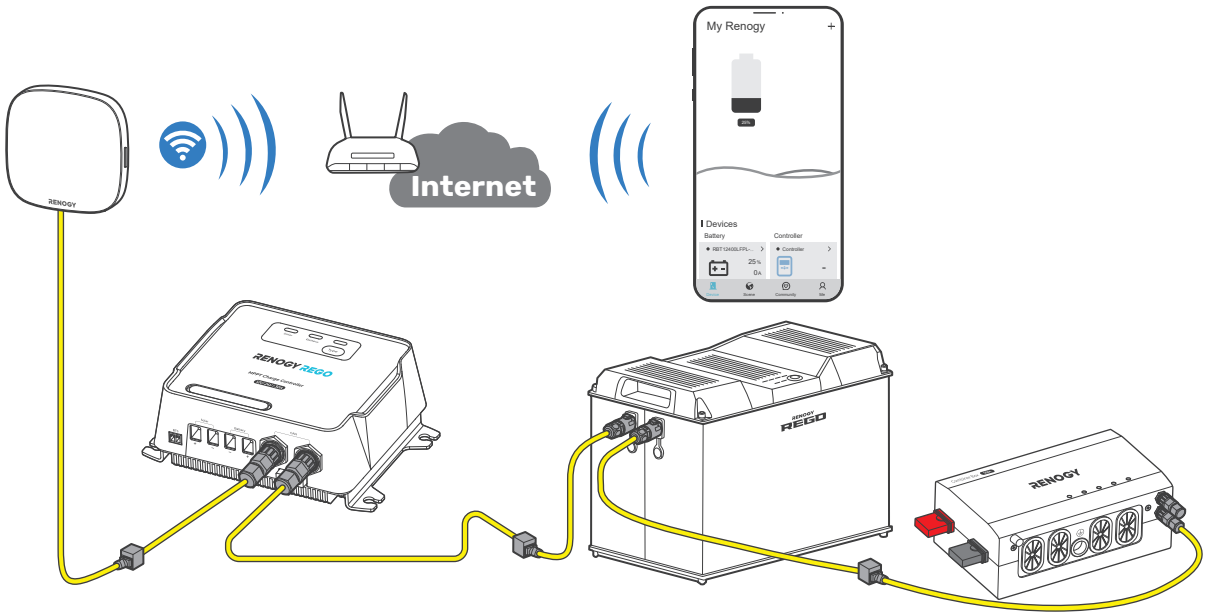
Ensure the charge controller does not communicate with any other device.

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 DC Home app. Monitor and program the complete system on the Renogy ONE Core or the DC Home app.



7. Configuration

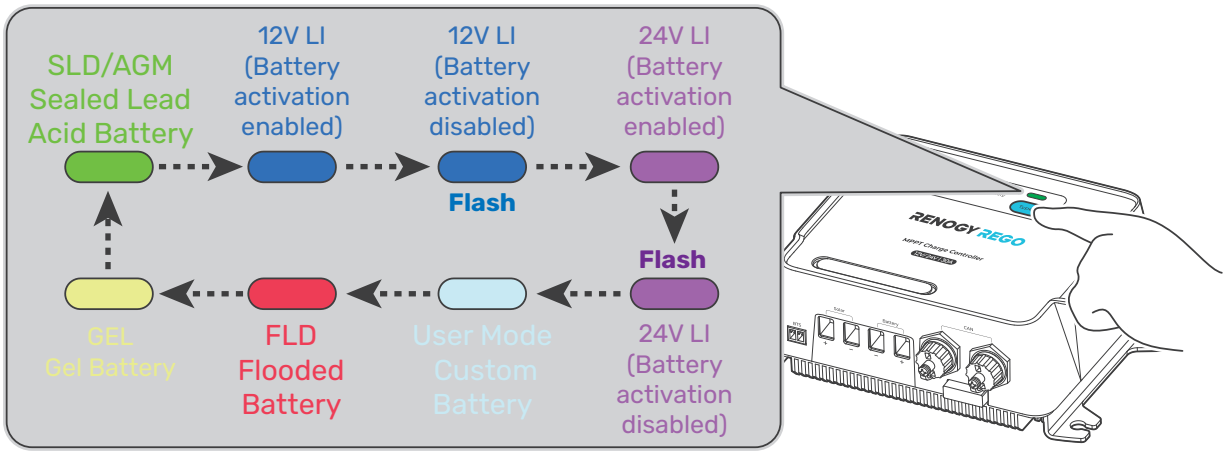
7.1. Set Battery Type and Nominal Voltage

REGO 12V/24V 30A MPPT Solar Charge Controller provides one easy-to-use button for setting the battery type in your solar system.

Upon installing the charge controller, set a correct battery type for the connected auxiliary battery either by using the Battery Type Setting Button or in the DC Home app. The battery type settings on the charge controller will automatically synchronize with the DC Home app, and changes made in the app will also reflect on the charge controller. For how to pair the charge controller with the DC Home 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.

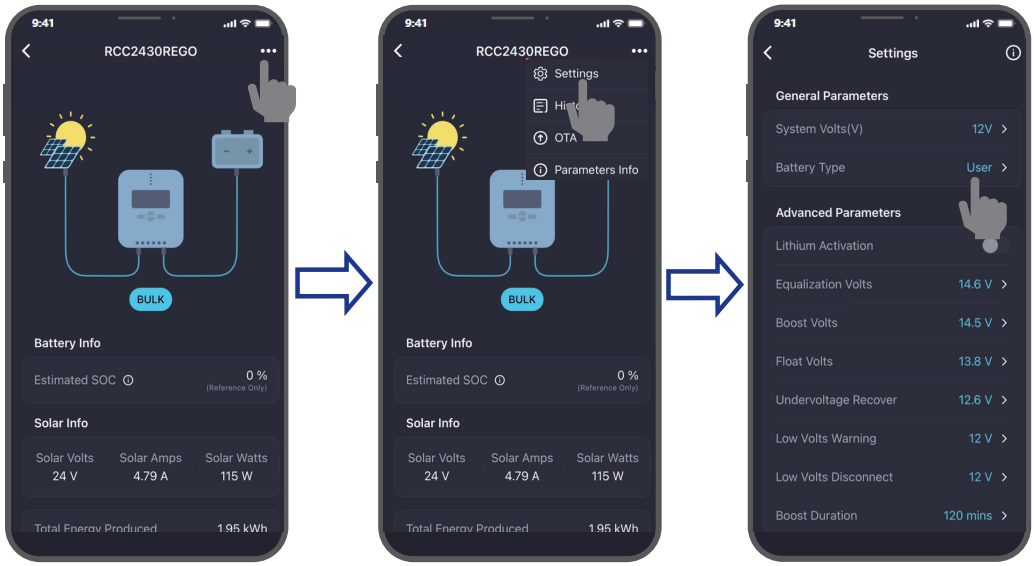


Step 2: Set the nominal battery voltage.

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

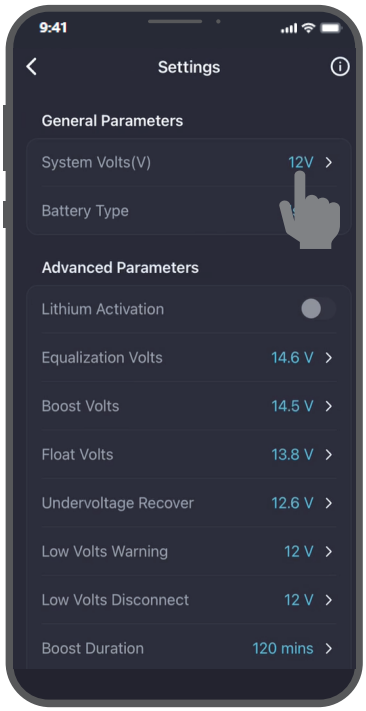
Configuration via the DC Home App

Step 1: On the home screen in the DC Home app, tap the charge controller 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 charge controller can automatically detect their voltage (12V/24V). No further configuration is required.
- For lithium batteries, the charge controller defaults to a voltage of 12V. For 24V lithium batteries, you can set the nominal battery voltage by tapping "... > **Settings** > **Battery Volts(V)**".

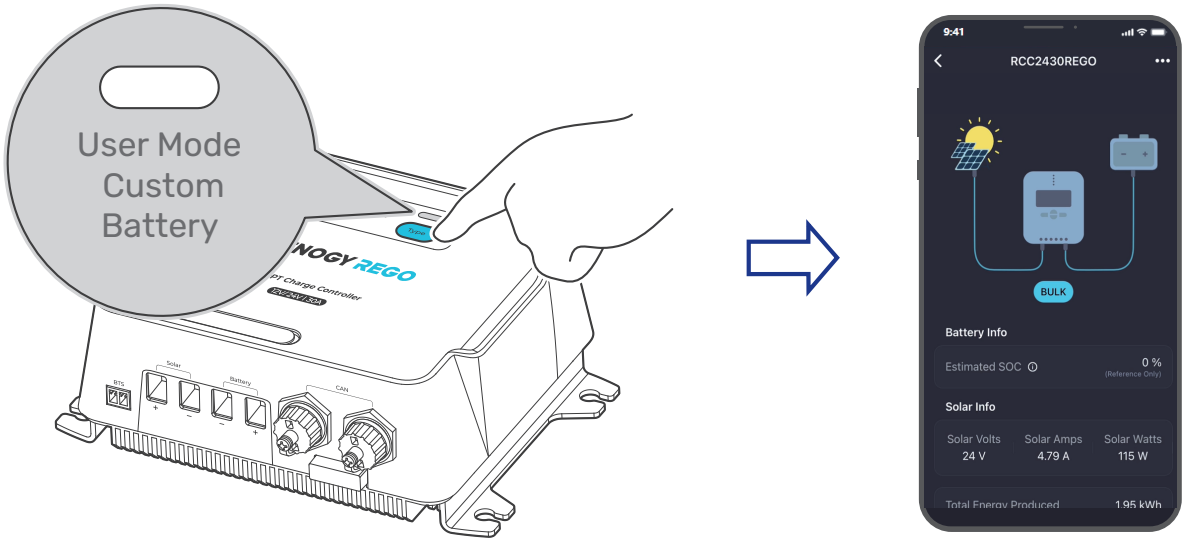


It is essential to ensure that the battery type is set correctly to avoid any potential damage to the charge controller because any damage to the charge controller resulting from an incorrect battery type setting voids the warranty.

The version of the DC Home 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, maximizing the charge controller. You can modify the battery parameters in the DC Home app.



Before modifying battery parameters in User Mode, check the table below and consult the battery manufacturer to check whether modification is allowed. Incorrect parameter setting will damage the charge controller 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.

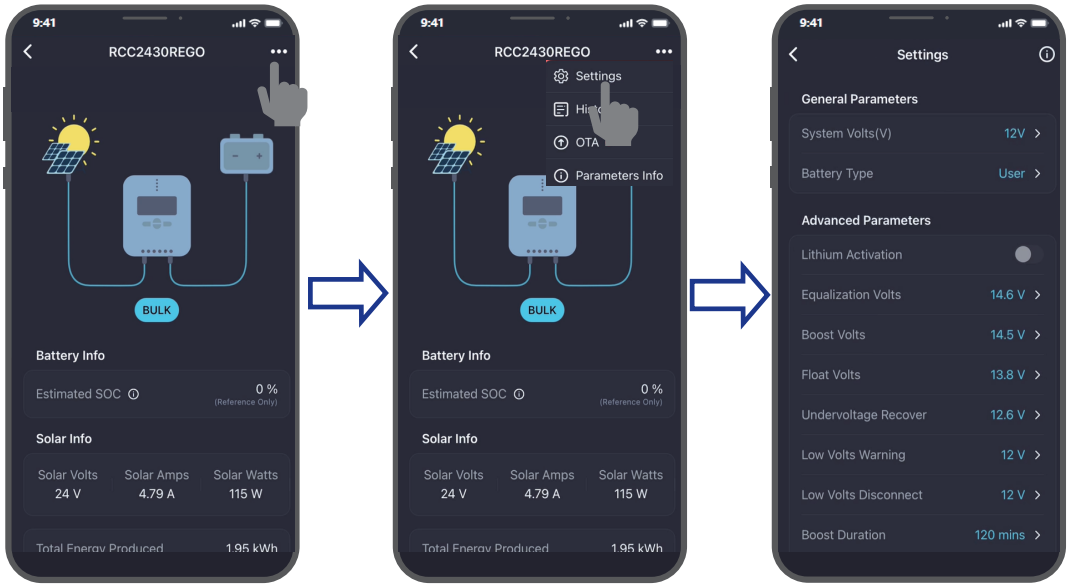
Parameters	Description
Overvoltage Shutdown	The default protection voltage is 16V for 12V systems and 32V for 24V systems. Improper setting may affect safe use of the battery. Please consult the battery manufacturer and check if this voltage value needs to be modified.
Equalization Voltage	1. For lead-acid batteries, please consult your battery manufacturer to obtain the voltage value and then complete the settings according to the feedback. 2. If no equalization is required, set it to the same voltage as Boost.
Boost Voltage	This value affects whether the battery can be fully charged. Please consult the battery manufacturer and set the value properly.
Float Voltage	
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.
Low Voltage Shutdown	
Low Voltage Reconnect	
Boost Duration	Please consult the battery manufacturer if it is necessary to set these values.
Equalization Duration	
Equalization Interval	

When customizing settings, consult the user manual of the specific battery. If necessary, contact the manufacturer for further assistance.

7.3. Configure Charging Parameters

You can set the charging voltage for the charge controller in the DC Home app. For how to connect the charge controller to your phone via the DC Home app, refer to "6. Monitoring".

On the home screen in the DC Home app, tap the charge controller widget to enter the device details page. Tap "... > **Settings**" to configure charging parameters such as equalization voltage, boost voltage, float voltage, and undervoltage recover threshold.



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 charge controller and voids the warranty.

The table below illustrates the default and recommended parameters for 12V batteries that can be connected to the charge controller. For 24V batteries, double the parameter values.

Battery Type / Parameters	SLD/ AGM	Gel	FLD	Lithium	User Mode	
					Default	Adjustable
Overvoltage Shutdown*	16.0V	16.0V	16.0V	16.0V	16.0V	9V–17V
Compensation Voltage Limit	15.5V	15.5V	15.5V	15.5V	15.5V	9V–17V
Equalization Volts	14.6V	–	14.8V	–	14.6V	9V–17V
Boost Volts	14.4V	14.2V	14.6V	14.4V	14.4V	9V–17V
Boost Return Voltage	14.1V	13.9V	14.3V	14.1V	14.1V	Boost Voltage – 0.3V (cannot be modified separately)
Float Volts	13.8V	13.8V	13.8V	–	13.8V	9V–17V
Float Return Voltage	13.2V	13.2V	13.2V	13.6V	13.2V	9V–17V
Undervoltage Warning	12.0V	12.0V	12.0V	12.0V	12.0V	9V–17V
Undervoltage Recover**	12.2V	12.2V	12.2V	12.2V	12.2V	Undervoltage Warning + 0.2V (cannot be modified separately)
Low Volts Disconnect	11.0V	11.0V	11.0V	11.0V	11.0V	9V–17V
Low Voltage Reconnect	12.6V	12.6V	12.6V	12.6V	12.6V	9V–17V
Boost Return Delay	5s	5s	5s	5s	5s	5s (non-adjustable)
Float Return Delay	5s	5s	5s	5s	5s	5s (non-adjustable)
Equalization Interval	30 days	–	30 days	–	30 days	0–250 days Setting this parameter to "0" means to disable equalizing charge.
Equalization Duration	120 min	—	120 min	—	—	10–600 min
Boost Duration	120 min	120 min	120 min	–	120 min	10–600 min
Temperature Compensation Factor (mV/°C/2V)	-3	-3	-3	–	-3	0, 1, 2, 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 charge controller - Default Boost Voltage in User Mode).

**In User Mode, set the Undervoltage Recover to Undervoltage Warning plus 1V after the thrid time when the undervoltage protection is triggered.

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.

Overcharging and excessive gas precipitation may damage the battery plates and activate material shedding on them. Too high of an equalization charging voltage or too long of equalization charging may damage the battery. Review the specific requirements of the battery used in the system carefully.

It is recommended to use only non-sealed, vented, flooded, and wet cell lead acid batteries in the equalization stage.

Do not equalize VRLA type AGM, gel, and lithium cell batteries unless permitted by battery manufacturers.

If no equalization is required, set Equalization Volts to the same value as Boost Volts.

7.4. Activate Lithium Batteries

REGO 12V/24V 30A MPPT Solar Charge Controller can activate connected lithium batteries. Lithium batteries may enter sleep mode when the in-built protection is triggered. In such case, the charge controller provides a small current to reactivate the sleeping lithium battery. The lithium battery can be charged normally after successful activation.

Operation Condition

By default, the lithium battery activation function on the charge controller is disabled before delivery from factory. You can enable or disable the function manually in the DC Home app.

The activation function works when both the following conditions are met:

- The activation function applies only when the battery type is set to "LI" or "User Mode" on the charge controller or in the DC Home app. For details, see "7.1. Set Battery Type and Nominal Voltage".
- You need to manually enable the activation function in the DC Home app.

Operation Logic

Step 1: The charge controller provides a constant voltage to activate the lithium battery.

Step 2: After a period of charging, the charge controller temporarily stops activation and detects the battery voltage.

Step 3: The charge controller determines the stopping or continuing of the activation based on the detected voltage.

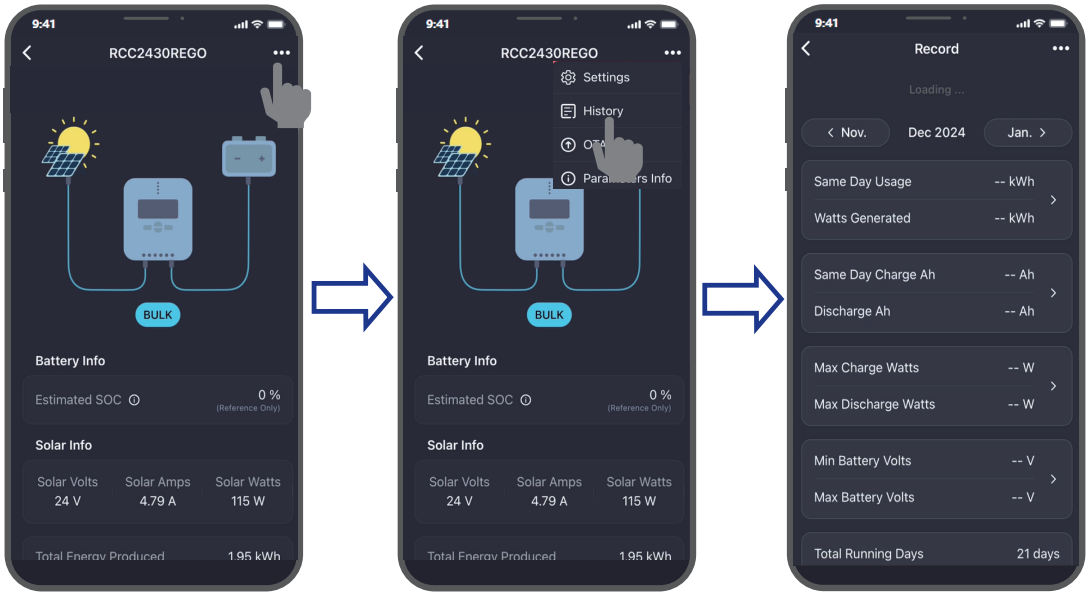
The detailed charging voltage and duration vary specific to the nominal battery voltage as depicted in the table below.

Nominal Battery Voltage	Charging Voltage	Charging Duration	Detected Battery Voltage	Activation
12V	> 13.6V	A period	< 9V	Continue
			> 12V	Stop
24V	> 27.2V	1 min	< 18V	Continue
			> 24V	Stop

7.5. Check Solar History

REGO 12V/24V 30A MPPT Solar Charge Controller allows you to check your solar power history in the DC Home app.

On the home screen in the DC Home app, tap the charge controller widget to enter the device details page. Tap "... > **History**" to check the solar history.



You can check the following parameters recorded by the charge controller in the DC Home app.

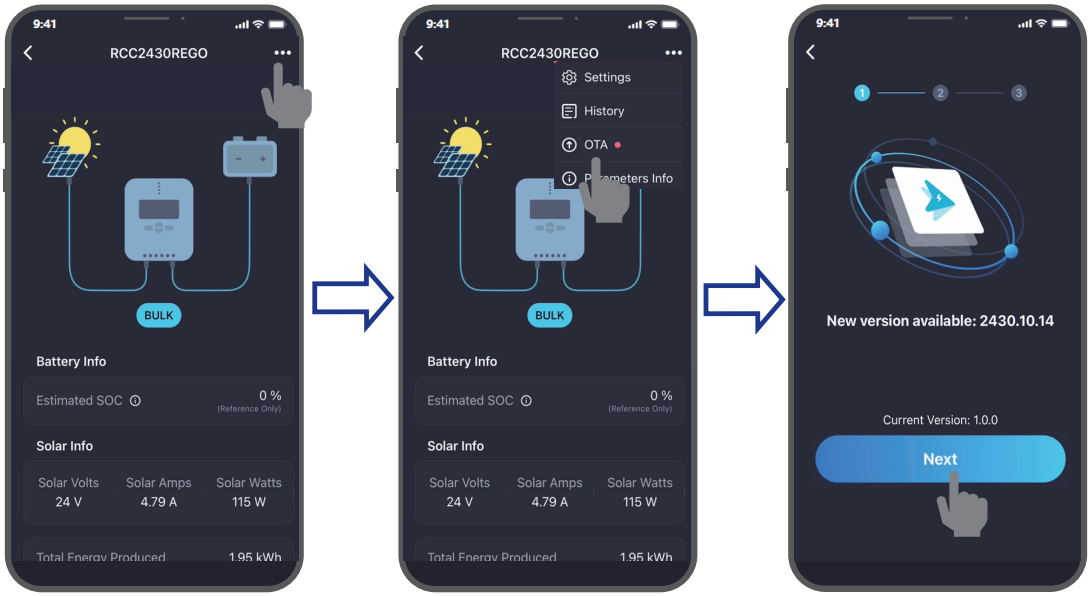
Parameter	Description
Same Day Usage	The total measured energy consumed by the loads connected to the charge controller's load terminals within the same day.
Watts Generated	The power produced by the solar panels recorded by the charge controller within the same day.
Same Day Charge Ah	The total ampere-hours supplied to the battery within the same day recorded by the charge controller.
Discharge Ah	The total ampere-hours consumed by the loads connected to the charge controller, recorded within the same day.
Max Charge Watts(PMAXC)	The maximum power, in watts, supplied to the battery during charging within the same day.
Max Discharge Watts(PMAXC)	The maximum power consumed by the loads connected to the charge controller, recorded within the same day.
Min Battery Volts(VMax)	The minimum voltage supplied to the battery during charging within the same day.
Max Battery Volts(VMin)	The maximum voltage supplied to the battery during charging within the same day.
Total Running Days	The number of days the charge controller has been on up to this point.
Battery Overdischarge Time(s)	The number of times the battery has been overdischarged, or the battery level has dropped below the specified discharge threshold up to this point.
Battery Full Charge Time(s)	The number of times the battery has been fully charged up to this point.
Total Battery Charge Ah	The total ampere-hours supplied to the battery up to this point.
Total Battery Discharge Ah	The total ampere-hours discharged from the battery up to this point.
Generation Amount	The total amount of power generated by the connected solar panels since the initial use of the charge controller.
Consumption Amount	The total amount of consumed power since the initial use of the charge controller.

The parameters listed above are for reference only. The actual parameters in the DC Home app shall prevail.

7.6. OTA Upgrade

REGO 12V/24V 30A MPPT Solar Charge Controller supports OTA firmware upgrades via the DC Home 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 DC Home app, tap the charge controller widget to enter the device details page. Tap "... > **OTA**" to check available upgrade packages. Follow the upgrade wizard to update your charge controller.



The version of the DC Home 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 Logic

8.1. Charging Algorithm

RENOGY REGO 12V/24V 30A MPPT Solar Charge Controller adopts the Maximum Power Point Tracking (MPPT) technology to extract the maximum power from connected solar panels. With an automatic tracking algorithm, the charge controller can track the voltage of the maximum power point that changes with weather conditions, ensuring the harvest of the maximum power throughout the day.

Ideally, the power generated in the solar panel is the same as the power delivered to the battery pack. Power is the product of voltage (V) x amperage (A). Therefore, assuming 100% efficiency, the power into the charge controller equals that into the battery as shown below:

Power In = Power Out

Volts In * Amps In = Volts Out * Amps Out

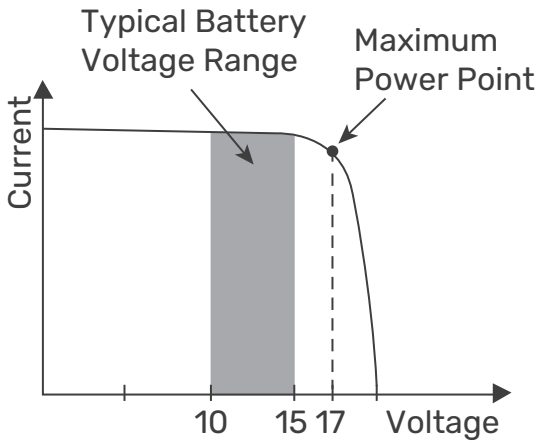
However, the voltage of the maximum power point, also known as peak power voltage (Vmp), varies with sunlight intensity and with solar cell temperature. In scenarios where the solar panel Vmp drops due to weather conditions, an MPPT charge controller adjusts the output current to get the most power from the solar panels.

Current Boost

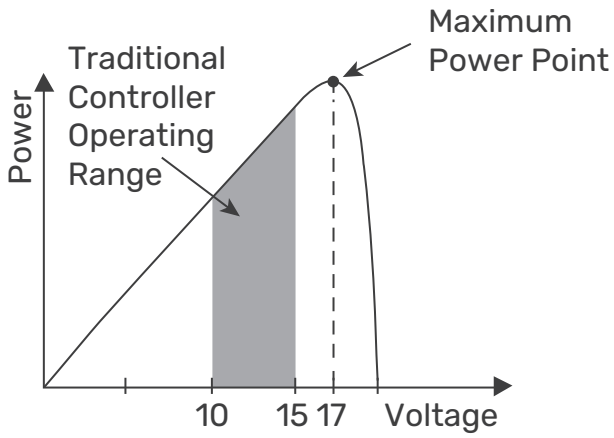
As the maximum power point voltage (Vmp) of the solar system is greater than the battery voltage, the potential difference is proportional to the current boost. The voltage of the solar panel needs to be stepped down to a rate at which the battery can be charged in a stable manner. Compared with traditional charge controllers, the Rover charge controller does not waste the stepped down voltage.

It will “boost” the current in the solar system at a conversion efficiency of up to 97%. It is entirely possible to have the solar module input 8 amps of current into the charge controller, and have the charge controller output 10 amps of current to the battery pack. The following shows a graphic point about the output of MPPT technology.

Current vs.Voltage (12V System)



Output Power (12V System)

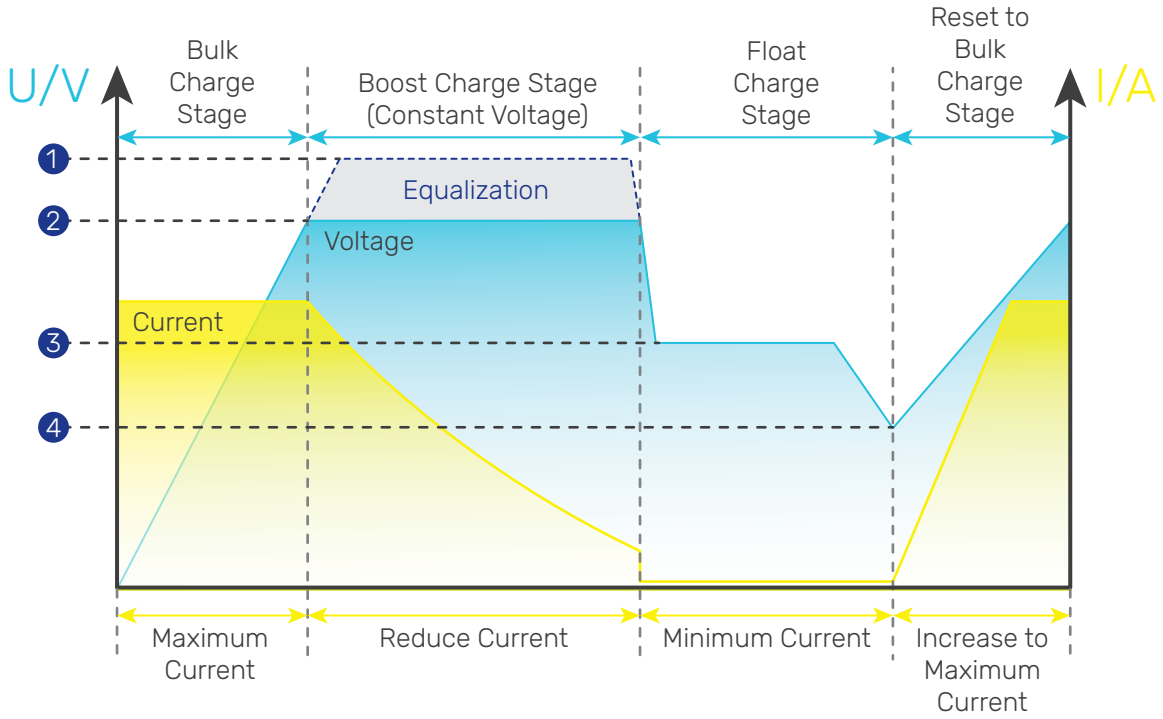


Limiting Effectiveness

High temperature is the natural enemy of solar panels. With the increase of ambient temperature, the Vmp of the solar panel decreases, which limits the power generation of the solar panel. The charge controller encounters an inevitably decrease in charging performance even with the MPPT technology. In this case, it is better to use solar panels with higher nominal voltage, so that the battery can still get current boost even if the voltage drops proportionally.

8.2. Adaptive Four-Stage Charging

RENOGY REGO 12V/24V 30A MPPT Solar Charge Controller has 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 Low Voltage Reconnect

Adjust the time depending on the specific battery bank size.

Bulk Charge Stage

The charge controller will supply constant current until the battery voltage reaches the boost voltage. It uses 100% of available solar power to recharge the battery.

Boost Charge Stage

The charge controller will supply constant voltage and reduce the current slowly through this stage.

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

Boost Duration is not applicable to lithium batteries.

The stage is determined by internal software in the charge controller.

Float Charge Stage

During this stage the charge controller 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 charge controller 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 charge controller then maintains a lower voltage to offset power consumption, ensuring a full battery capacity. If a load exceeds the charge current, the charge controller 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.

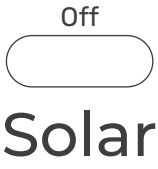
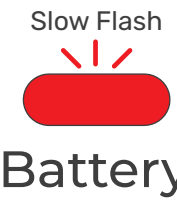
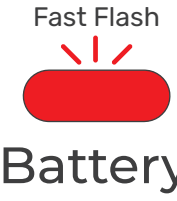
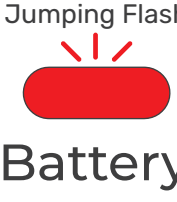
- During Equalization charging, the charge controller remains in this stage until sufficient charging current is sourced from the solar panel. Note that there should be no load on the batteries during Equalization charging.
- Overcharging and excessive gas precipitation can harm battery plates, leading 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

You can get error status from the integrated LED indicators or receive fault alarms on DC Home when the charge controller is faulty. Please log in to the DC Home app for troubleshooting details.

9.1. Fault Indicator Errors

This section discusses general troubleshooting tips specific to the expressions of the Solar Charging Indicator and Battery Status Indicator.

Indicator	Fault	Solution
	Solar input error (overvoltage/reverse contact/short circuit)	Check for overvoltage, reverse polarity, or short circuit in the solar panel connection. 1. Measure the output voltage on the solar panel(s) through a multimeter. A reading of more than 101V indicates an overvoltage error. Adjust the solar panel connection method to ensure the solar output voltage drops below 96V at which the charge controller automatically exits the overvoltage protection mechanism. 2. If no overvoltage error is detected, check for the positive and negative polarities in the solar panel connection. Ensure there is no reverse polarity contact. 3. Check for short circuit in the solar panel connection. Use a multimeter to measure the resistance or voltage between the positive and negative terminals of the solar panel(s); if the resistance is close to zero or the voltage is abnormal, a short circuit may be present.
	Battery overdischarge protection triggered	1. Disconnect loads from the battery. 2. Charge the battery immediately until the actual battery voltage rises to 12.6 V and higher for 12V systems or 25.2V and higher for 24V systems.
	Battery overvoltage protection triggered	Wait until the actual battery voltage drops below the Overvoltage Shutdown value. ● For 12V systems: 16V ● For 24V systems: 32V
	Battery overtemperature protection triggered	Let the battery cool down. Ensure the ambient environment temperature and internal temperature of the battery are below 140°F (60°C).
	Controller overtemperature protection triggered	The charge controller provides a deducted charge current during high temperatures. When this protection is triggered, ensure the charge controller temperature is below 167°F (75°C).

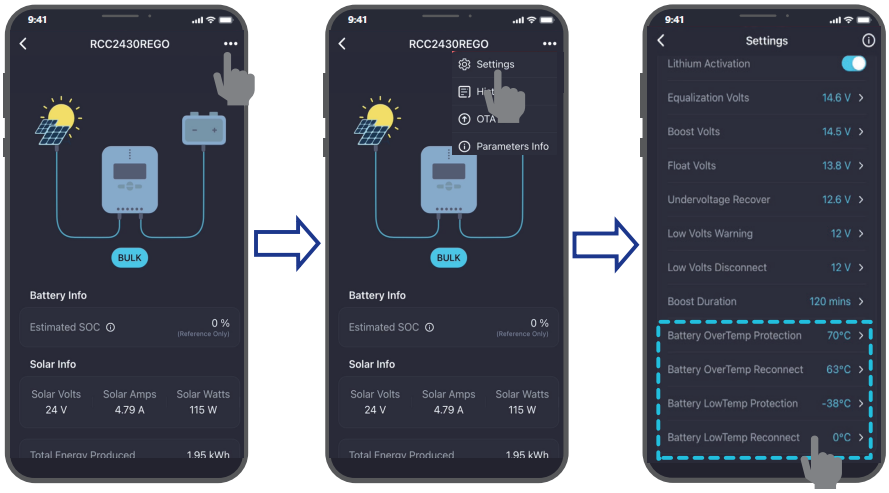
For technical support, contact our technical service through renogy.com/contact-us.

9.2. Built-in Protection Mechanisms

REGO 12V/24V 30AMPPT Solar Charge Controller includes multiple protection mechanisms at the input and output terminals to safeguard the system. Certain protection triggers may temporarily interrupt normal operation, but these are intentional safety features and not faults in the device.

Battery Temperature Protection

When the Battery Type is set to "User", you can customize battery temperature protections in the DC Home app. On the home screen in the DC Home app, tap the charge controller widget to enter the device details page, and tap "... > **Settings**". Swipe down to the bottom of the settings page.



Protection Mechanism	Description	DC Home Settings
Battery OverTemp Protection	This protection is valid when a battery temperature sensor is connected from the charge controller to a non-lithium battery. The charge controller stops charging when the battery temperature exceeds 149°F (65°C) and resumes charging once the temperature drops below 140°F (60°C).	Range: Integer within 50°C–70°C or 122°F–158°F. Minimum Battery OverTemp Protection = Battery OverTemp Reconnect + 5°C (41°F).
Battery OverTemp Reconnect	Battery OverTemp Reconnect is the temperature threshold at which battery charging resumes after the Batttery OverTemp Protection has been triggered.	Range: Integer within 50°C–70°C or 122°F–158°F. Maximum Battery OverTemp Reconnect = Battery OverTemp Protection - 5°C(41°F).
Battery LowTemp Protection	This protection is valid when a battery temperature sensor is connected from the charge controller to a non-lithium battery. The charge controller stops charging the battery when its temperature drops below -31°F (-35°C) and will resume charging once the temperature rises above -22°F (-30°C).	Range: Integer within -39°C–0°C or -38°F–32°F. Maximum Battery LowTemp Protection = Battery LowTemp Reconnect - 5°C(41°F).
Battery LowTemp Reconnect	Battery LowTemp Reconnect refers to the temperature threshold at which the charging process resumes after the battery has been disconnected due to Battery LowTemp Protection being triggered.	Range: Integer within -40°C–0°C or -40°F–32°F. Minimum Battery LowTemp Reconnect = Battery LowTemp Protection + 5°C (41°F).

The following settings rules must be obeyed:

- Battery OverTemp Protection ≥ Battery OverTemp Reconnect + 5°C (41°F).
- Battery LowTemp Protection ≤ Battery LowTemp Reconnect - 5°C (41°F).

For example, when the Battery OverTemp Protection is set to 55°C, the maximum selectable range for the Battery OverTemp Reconnect is 50°C. Conversely, when the Battery OverTemp Reconnect is set to 55°C, the minimum selectable temperature for the Battery OverTemp Protection is 60°C.

Other Protections

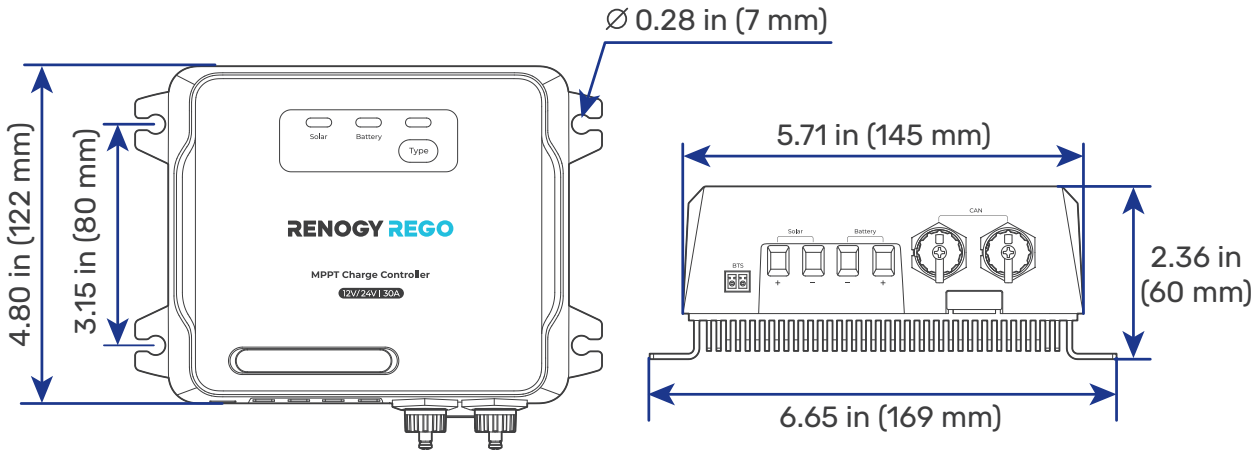
In addition to the battery temperature protections, the charge controller protects the solar input and battery voltage, as depicted in the table below:

Protection Mechanism	Description
Solar overvoltage protection	This protection is activated when the solar input voltage exceeds 101V, causing the charge controller to shut down immediately to prevent damage. ● When the solar input voltage falls below 96V, the charge controller resumes normal operation. ● The charge controller ensures no damage with solar input voltage up to 105V.
Solar reverse polarity protection	If the positive terminal of the solar panel is connected to the Negative Solar Port on the charge controller and vice versa, the charge controller may not function properly or could be damaged.
Solar short circuit protection	The charge controller will not work or be damaged when there is a short circuit on the Negative and Positive Solar Ports.
Solar output limit protection	When the solar power exceeds 440W (for a 12V system) or 880W (for a 24V system), the charge controller activates the power limiting protection mode. In this mode, it caps the input power to a maximum of 450W (for a 12V system) or 900W (for a 24V system) to charge the battery.
Battery overvoltage protection	If the battery voltage exceeds the Overvoltage Shutdown value set in the DC Home app for 2 seconds, the charge controller halts charging to safeguard the system and remains undamaged. For details, see "7.3. Configure Charging Parameters".
Battery undervoltage protection	This protection is triggered when the battery voltage reaches the Low Volts Disconnect value set in the DC Home app. For details, see "7.3. Configure Charging Parameters".
Anti-reverse battery connection protection*	If the positive terminal of the battery is connected to the Negative Battery Port on the charge controller and vice versa, the charge controller may not function properly or could be damaged.
Battery short-circuit protection	The charge controller will not work or be damaged when there is a short circuit on the Negative and Positive Battery Ports.
Controller overtemperature protection	This protection is valid when no battery temperature sensor is connected to the charge controller. ● When the charge controller temperature exceeds 154°F (68°C), it enters power limiting mode. It resumes normal mode once the temperature drops below 153°F (67°C). ● When the charge controller temperature exceeds 185°F (85°C), it halts charging to prevent overheating. Charging automatically resumes once the temperature drops below 167°F (75°C), ensuring reliable and safe operation.
Reverse current at night protection	Prevents charging from the battery to the solar panel(s) if the battery voltage is higher than the solar output voltage.
Battery protection unit (BPU)	Battery fuse protection at the battery output terminals.

*The anti-reverse battery connection protection does not apply when the charge controller is connected to solar panels prior to a battery.

10. Dimensions & Specifications

10.1. Dimensions



Dimension tolerance: ±0.2 in (0.5 mm)

10.2. Technical Specifications

Mechanical & Charge Parameters	
Nominal System Voltage	12V/24V (auto detect for non-lithium batteries)
Supported Battery Type	AGM/Gel/SLD/FLD/LI (four cell series groups) and User Mode
Rated Charge Power	450W@12V 900W@24V
Rated Charge Current	30A
Battery Operating Voltage Range	8V–32V
Maximum Solar Input Power	450W@12V 900W@24V
Maximum Solar Input Voltage (Voc)	100V
Minimum Solar Input Voltage	14V–16V
Maximum Solar Input Current	30A
Peak MPPT Tracking Efficiency	99%
Maximum Charge Conversion Efficiency	97%
Standby Current Draw	80 mA
Operating Temperature	-22°F to 176°F (-30°C to 80°C) (Power reduction at > 113°F/45°C environment temperature; Stop working at > 176°F/80°C environment temperature)
Parallel Connection	Supported (Up to 2)
Lithium Battery Activation	Supported
Storage Temperature	-31°F to 176°F (-35°C to 80°C)
Temperature Compensation	-3 mV/°C/2V

Mechanical & Charge Parameters	
Grounding	Common negative
Installation Method	Surface mounting
Communication	RV-C & Bluetooth
Operating Humidity	0% to 95% RH, no condensation
Dimensions (L x W x H)	6.65 x 4,80 x 2.36 in (169 x 122 x 60 mm)
Weight	< 7.93 lbs (3.6 kg)
Noise	< 30 dB
Maximum Altitude	3500m (Full rated output at < 3000m; Deducted output at > 3000m)
Bluetooth Signal Strength	< 5m with blocks < 20m without blocks
Cooling	Natural cooling
IP Rating	IP43
Warranty	5 years
Safety Certification	FCC, RoHS, SAA, CE-RED, and CE-EMC

Protection Functions		
● Solar overvoltage protection ● Solar reverse polarity protection ● Solar short circuit protection ● Solar output limit protection	● Battery overvoltage protection ● Battery undervoltage protection ● Anti-reverse battery connection protection ● Battery short circuit protection ● Battery overtemperature protection ● Battery undertemperature protection ● Battery protection unit (BPU) protection	● Controller overtemperature protection ● Reverse current at night protection

11. Maintenance

11.1.Inspection

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

- Ensure the charge controller 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 charge controller is dirty, use a damp cloth to clean the outside of the device to prevent dust and dirt from accumulating. Before the charge controller is powered on, make sure it is completely dry after cleaning.

In some applications, corrosion may exist around the terminals. Corrosion can loosen screws 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 charge controller.

11.2. Cleaning

Follow the steps below to clean the charge controller regularly.

- Disconnect all cables connected to the charge controller.
- 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 charge controller 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 charge controller with a clean cloth and keep the area around the charge controller clean and dry.
- Make sure the charge controller is completely dry before reconnecting it to the solar panel and battery.

11.3. Storage

Follow the tips below to ensure that the charge controller is stored well.

- Disconnect all cables connected to the charge controller.
- By applying dielectric grease to each terminals, the dielectric grease repels moisture and protects the connector contacts from corrosion.
- Store the charge controller in a well-ventilated, dry, and clean environment with the temperature between -31°F to 176°F (-35°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 charge controller.
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 charge controller is submerged in water, stay away from the water.
2. Disconnect all cables connected to the charge controller.

12.3. Smell

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

12.4. Noise

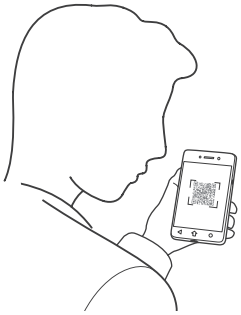
1. Disconnect all cables connected to the charge controller.
2. Ensure sure no foreign objects are stuck in the charge controller terminals.

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:

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

renogy.com/contact-us

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United Kingdom | uk.renogy.com	Other Europe | eu.renogy.com
China | www.renogy.cn	

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.