RENOGY

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REGO

MPPT Solar Charge Controller

12V | 60A

VERSION A0

USER MANUAL

Applicability

The user manual applies to the following product:

- REGO 12V 60A MPPT Solar Charge Controller (RCC60REGO)

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Date and Revision

January 2022, Revision A0

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Important Safety Information

The user manual provides important installation, operation, and maintenance instructions for REGO 12V 60A MPPT Solar Charge Controller (hereinafter referred to as charge controller). Read the user manual carefully before installation and 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. The installation and service of the charge controller might require knowledge of electricity and is recommended to be carried out by qualified personnel.

Symbols Used

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

WARNING	Indicates a potentially dangerous condition which could result in 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.
INFO	Indicates that more information is available in other documents relating to the subject.

General Safety Information

WARNING

- Read all instructions and precautions in the user manual before installation.
- Do not puncture, drop, crush, penetrate, shake, strike, or step on the charge controller.
- Do not open, disassemble, repair, tamper with, or modify the components of the charge controller.
- Install the charge controller on a vertical surface indoors protected from direct sunlight, high temperature, and water. Make sure there is good ventilation.
- Keep the charge controller away from heating equipment.
- Do not insert foreign objects into the charge controller.
- Risk of explosion! Never install the charge controller in a sealed enclosure with flooded batteries! Do not install in a confined area where battery gases can accumulate.
- Confirm the polarities of the devices before connection. A reverse polarity contact will result in abnormalities.
- Refer to the Recommended Cable and Fuse Sizing in this user manual, and select the appropriate cables and fuses according to the usage.
- Keep the charge controller out of the reach of children.
- Wear proper protective equipment and use insulated tools during installation and operation.

- Do not touch the connector contacts while the charge controller is in operation.
- Disconnect all connectors from the charge controller before maintenance or cleaning.
- 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.
- In the event of fire, use fire extinguishers suitable for electrical equipment.
- If the charge controller is installed improperly on a boat, it may cause damage to the corrosive agents of the boat. Please have the charge controller by a qualified electrician.

CAUTION

- Do not expose the charge controller to flammable or harsh chemicals or vapors.
- Ensure that there is no water source including downspouts, sprinkles, or faucets above or near the charge controller.
- Ensure that the battery pack is properly connected before installation.

Overview

Introduction

REGO 12V 60A MPPT Solar Charge Controller can serve various off-grid solar systems. It monitors the status of the battery in real time and prevents the battery from overcharge and overdischarge. The newly added Battery Protection Unit (BPU) prevents fire accidents caused by system failures, further guaranteeing the security of the whole off-grid system. In addition, with the adoption of intelligent MPPT tracking algorithm, the charge controller can maximize the energy from the solar panel to charge the battery.

The charge controller supports multi-stage charging to can provide precise charging services for different types of batteries.

Key Features

- **High-power Output**

12V rated DC voltage with the output power up to 800W.

- **MPPT Technology**

Advanced MPPT technology with tracking efficiency up to 99% and peak conversion efficiency of 98%.

- **High Battery Compatibility**

REGO 12V 60A MPPT Solar Charge Controller is compatible with AGM, sealed, flooded, gel, lithium, and user-defined batteries.

- **Diverse Battery Protection Mechanisms**

Overcharge protection, overdischarge protection, reverse polarity protection, and open circuit protection.

- **Multiple Input Protection Features**

Reverse polarity protection, overvoltage protection, short circuit protection, and reverse charging protection at night of the solar panel.

- **Support for RV-C Protocol**

Based on RV-C and Modbus protocols, the charge controller can meet various communication needs.

Charging and Activation Logics

MPPT Technology

Based on MPPT (Maximum Power Point Tracking) technology, the charge controller can extract maximum power from the solar panel. With an automatic tracking algorithm, the MPPT technology can track the voltage of the maximum power point that changes with weather conditions, ensuring the harvest of the maximum power throughout the day.

- **Current Boost**

Generally, the charge controller will “boost” the current in the solar system. 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).

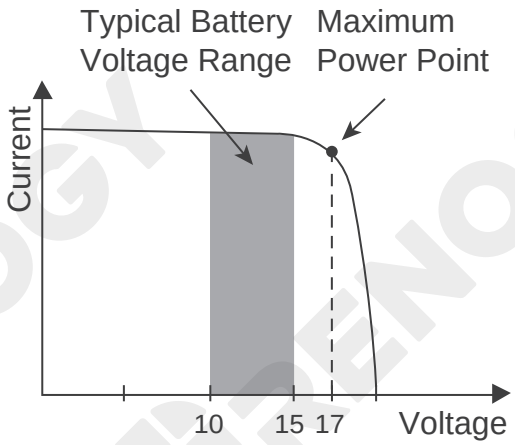
Therefore, assuming 100% efficiency:

Power In = Power Out

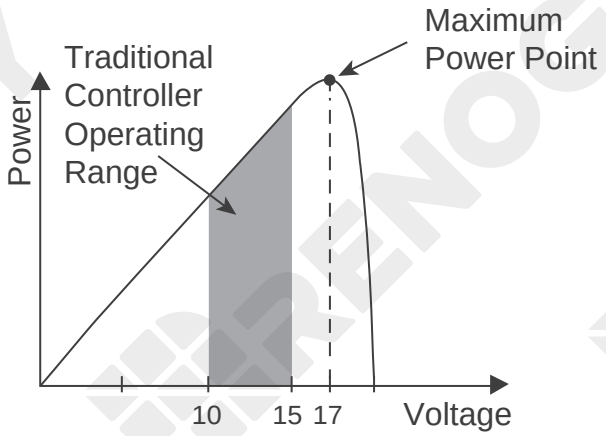
Volts In * Amps In = Volts out * Amps out

The efficiency of the charge controller is about 92% to 95%. As the maximum power point voltage of the solar system is greater than the battery pack 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 charge controller does not waste the stepped down voltage. 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)



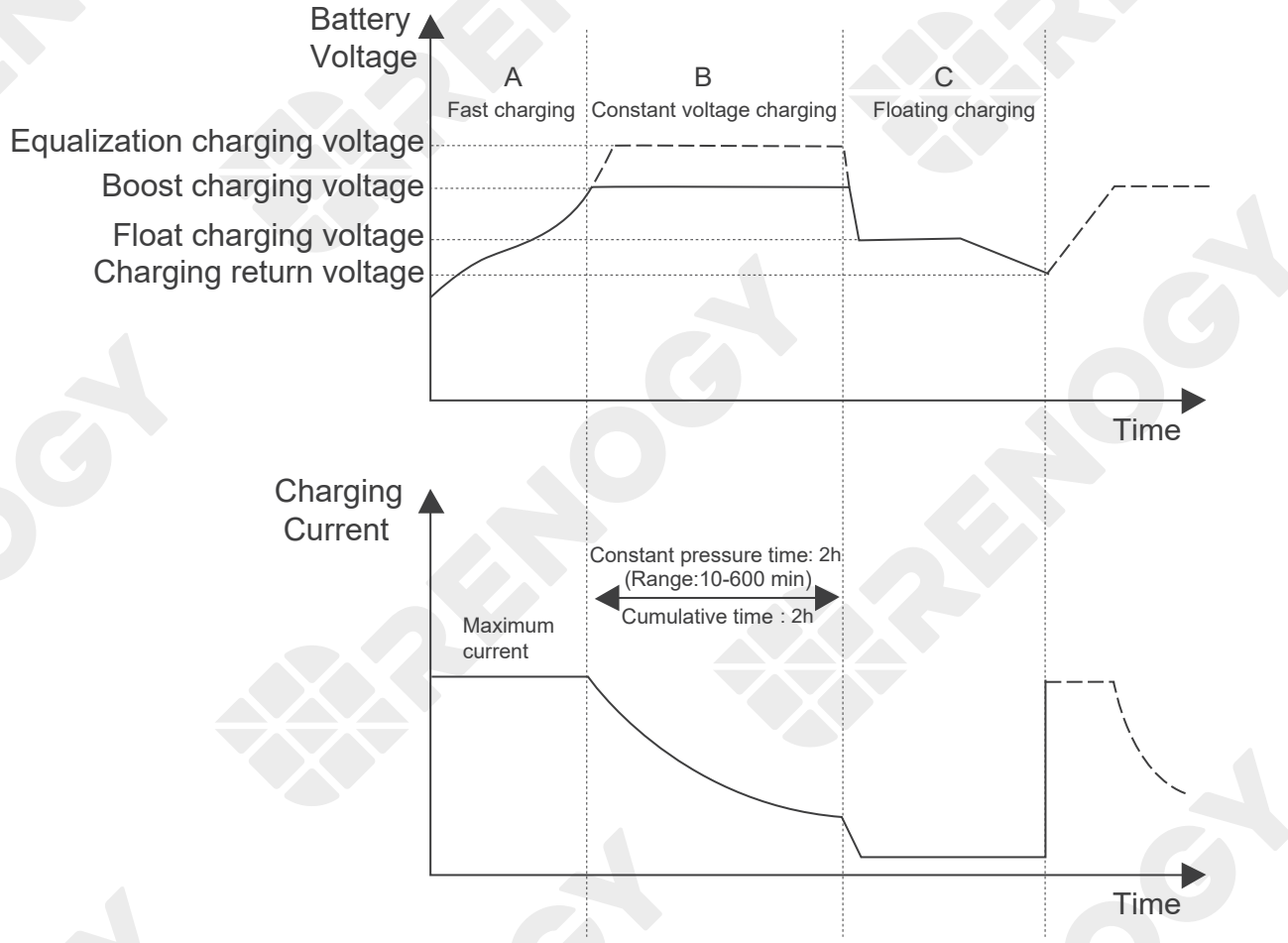
- **Limiting Effectiveness**

High temperature is the natural enemy of solar panels. With the increase of ambient temperature, the operating voltage (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.

Charging and Activation Logics

Four Charging Stages

REGO 12V 60A MPPT Solar Charge Controller has a four-stage battery charging algorithm for a rapid, efficient, and safe battery charging. The stages include: Bulk Charge, Boost Charge, Float Charge, and Equalization.



- **Bulk Charge:**

This algorithm is used for day to day charging. It uses 100% of available solar power to recharge the battery and is equivalent to constant current. In this stage the battery voltage has not yet reached constant voltage (Equalize or Boost), the controller operates in constant current mode, delivering its maximum current to the batteries (MPPT Charging).

- **Constant Charging:**

When the battery reaches the constant voltage set point, the charge controller will start to operate in constant charging mode, where it is no longer MPPT charging. The current will drop gradually. The charge stages (equalization and boost) are not carried out constantly in a full charge process to avoid too much gas precipitation or overheating of the battery.

Boost Charge: Boost stage maintains a charge for 2 hours by default. The user can adjust the constant time and preset value of boost per their demand.

- **Float Charge:**

After the constant voltage stage, the controller will reduce the battery voltage to a float voltage set point. Once the battery is fully charged, there will be no more chemical reactions and all the

charge current would turn into heat or gas. Because of this, the charge controller will reduce the voltage charge to smaller quantity, while lightly charging the battery. The purpose for this is to offset the power consumption while maintaining a full battery storage capacity. In the event that a load drawn from the battery exceeds the charge current, the controller will no longer be able to maintain the battery to a Float set point and the controller will end the float charge stage and refer back to bulk charging.

- **Equalization:**

Equalization is carried out every 30 days of the month. It is intentional overcharging of the battery for a controlled period of time. Certain types of batteries benefit from periodic equalizing charge, which can stir the electrolyte, balance battery voltage and complete chemical reaction. Equalization charging increases the battery voltage, higher than the standard complement voltage, which gasifies the battery electrolyte.

CAUTION

- It is recommended to use only non-sealed/vented/flooded/wet cell lead acid batteries in the Equalization stage.
- Do not equalize VRLA type AGM/gel/lithium cell batteries unless permitted by battery manufacturer.

WARNING

- Once Equalization is active in the battery charging, the charge controller will not exit this stage unless there is a sufficient source of charging current from the solar panel. There should be NO load on the batteries when in equalization charging.
- Overcharging and excessive gas precipitation may damage the battery plates and activate material shedding on them. Too high of an Equalization charging or too long of one may cause damage. Review the specific requirements of the battery used in the system carefully.
- Equalization may increase battery voltage to a level that damages to sensitive DC loads. Ensure that allowable input voltages of all loads are greater than the set voltage during Equalization charging.

Lithium Battery Activation

REGO 12V 60A MPPT Solar Charge Controller has the activation function of lithium battery. 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 Conditions**

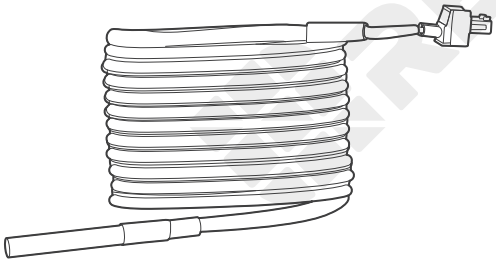
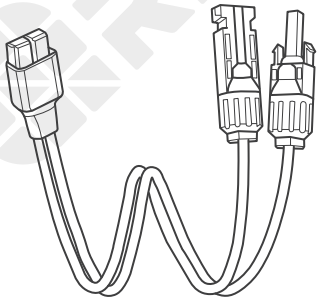
1. Set the battery type of the charge controller to LI. For details, see Setting the Battery Type.
2. Ensure the output voltage of the solar panel should be equal to or greater than 16V.

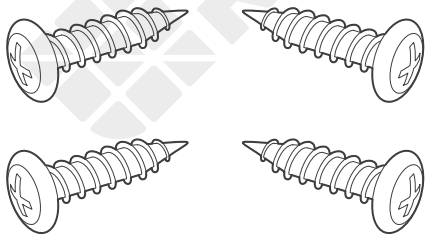
- **Operation Logic**

1. In lithium battery mode, the controller automatically enables the activation function and provides a constant voltage of over 13.6V to activate the lithium battery.
2. After activation for 1 minute, the controller temporarily stops activation and detects the battery voltage again. If the battery voltage is no less than 9V, the controller will automatically turn off the activation mode. Otherwise, it will continue to activate the lithium battery.

Package Contents

REGO 12V 60A MPPT Solar Charge Controller × 1	Quick Guide × 1
	

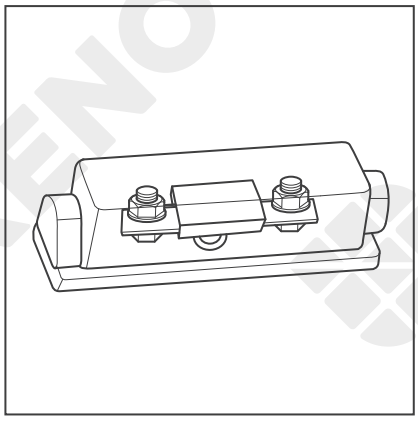
Renogy Temperature Sensor × 1 (Model: RTSCC)	Solar Adapter Cable × 1 (Anderson PP75 to MC4 Adapter Cable)
	

Mounting Screws × 1
ST 6.3 x 1.8 x 13 mm 

Optional Accessories

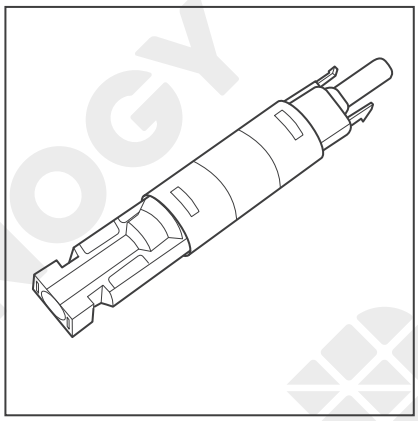
NOTE

- You can buy optional accessories from renogy.com.



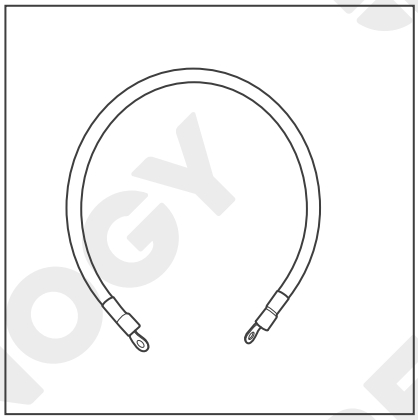
Battery Fuse (80A)

The battery fuse protects the charge controller, cables and batteries from overcurrent.



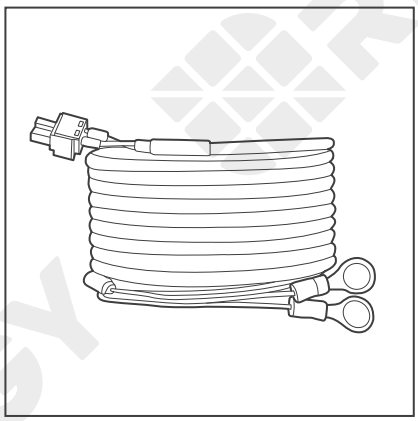
Solar Panel Fuse

Solar panel fuse provides single circuit protection for solar panels, preventing damage from high currents.



Fuse Cable

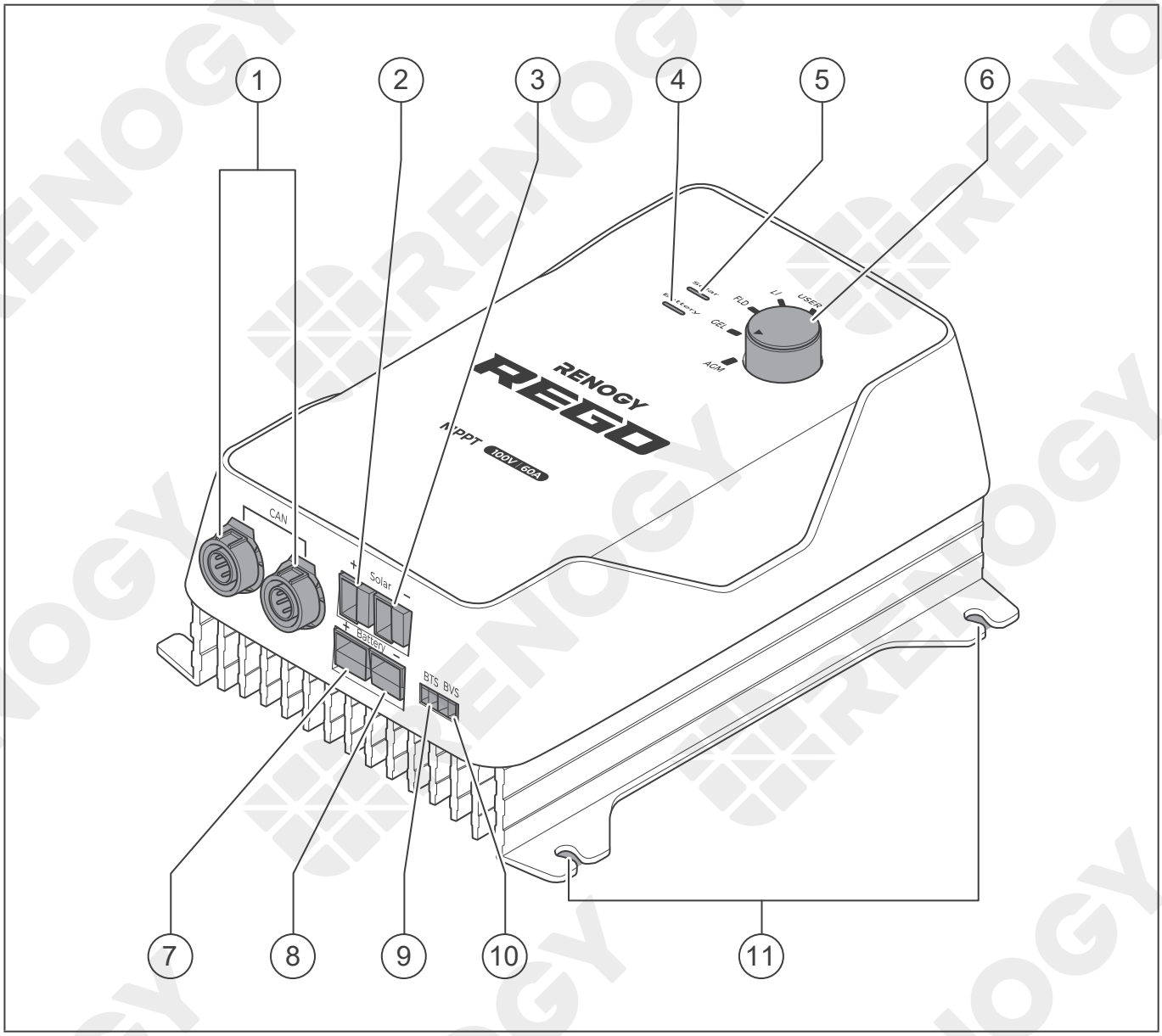
The cable is integrated with copper rings at both ends, enabling the controller to be connected with an external fuse.



Battery Voltage Sensor (Model: RVSCC)

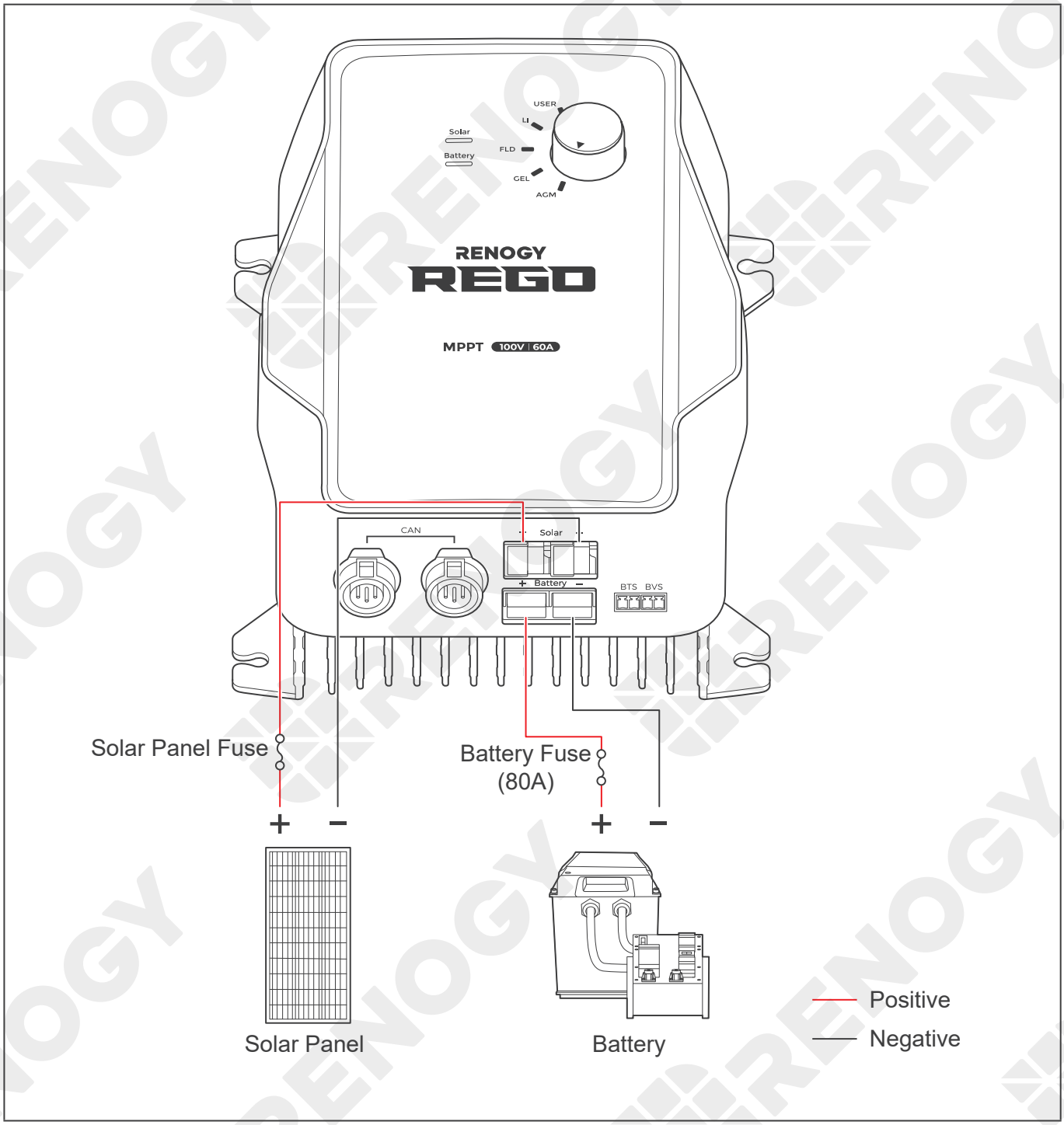
The charging voltage of the controller is affected by the length and size of the cable. The voltage sensor can calibrate the charging voltage error caused by the cable to ensure the charge controller works properly.

Product Overview



No.	Part	No.	Part
1	CAN Communication Ports	7	Positive Battery Terminal
2	Positive Solar Terminal	8	Negative Battery Terminal
3	Negative Solar Terminal	9	Battery Temperature Sensor Port (BTS)
4	Battery Status Indicator	10	Battery Voltage Sensor Port (BVS)
5	Solar Status Indicator	11	Mounting Holes
6	Battery Type Setting Knob		

Wiring Diagram



Recommended Cable and Fuse Sizing

Recommended Cable Sizing

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

NOTE

- The cable specifications listed above account for critical, less than 3% voltage drop and may not account for all configurations.
- The size of the fuse cable is consistent with that of the corresponding cable connecting to the output terminal of the charge controller.

Recommended Fuse Sizing

For your safety, it is recommended to install fuses at both the input and output ends of the charge controller to ensure safe operations.

NOTE

- Choose appropriate fuses according to the specifications of the solar panel and charge controller.

Fuse from Solar Panel to Charge Controller	
Solar Panel to Charge Controller Fuse = Solar Panel / Solar Panel Array Total Amps *1.56	
Solar Panels in Series	**Solar Panels in Parallel**
Total Amps I: $I_1=I_2=I_3$ Fuse = I_1*1.56	Total Amps I: $I_1+I_2+I_3$ Fuse = $(I_1+I_2+I_3)$ *1.56

NOTE

- In the formula, I represents the maximum output current of the solar panel, and 1, 2 or 3 represents the solar panel number, respectively.

Recommended Cable and Fuse Sizing

INFO

- Read the user manual of the solar panel to obtain working voltage parameters, and calculate the corresponding fuse specifications according to the formula.

Fuse from Charge Controller to Battery	
REGO 12V 60A MPPT Solar Charge Controller	Battery Fuse (80A)

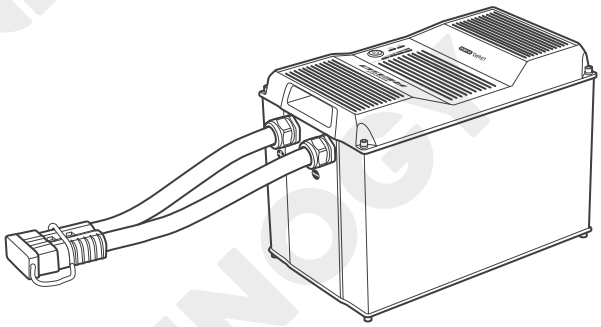
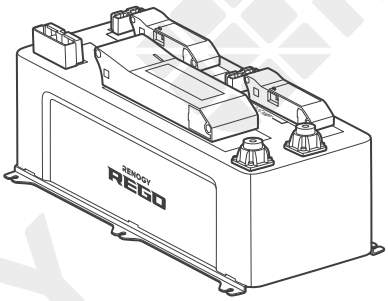
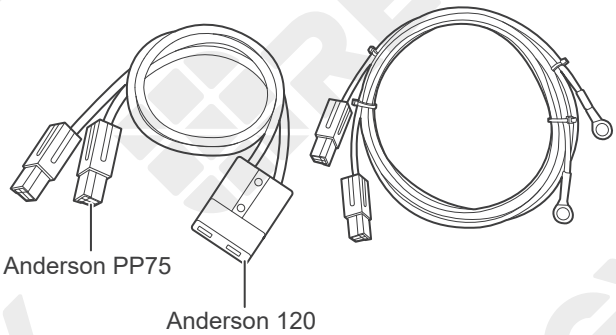
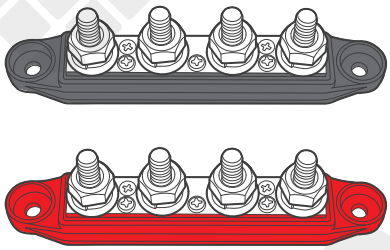
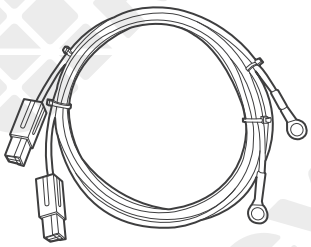
Components & Tools

NOTE

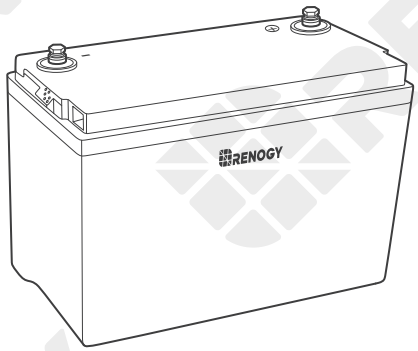
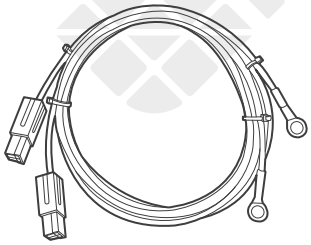
- The adapter cable used in this manual can be made by yourself or purchased from renogy.com according to the names in Recommended Components.

Recommended Components

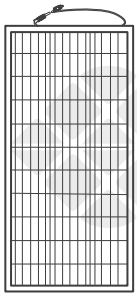
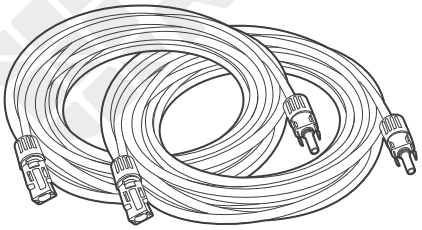
Battery Scenario A: REGO Battery Kit

REGO 12V 400Ah Lithium Iron Phosphate Battery	
	
System Combiner Box Accesory Set	**Positive/Negative Busbars Accessory Set**
REGO 4 Ports 400A System Combiner Box  Battery Adapter Cable (output) (Anderson PP75 to Anderson 120 Adapter Cable or Anderson PP75 to Ring Terminal Adapter Cable)  	Positive/Negative Busbars  Battery Adapter Cables (output) (Anderson PP75 to Ring Terminal Adapter Cable) 

Battery Scenario B: Normal Battery Kit

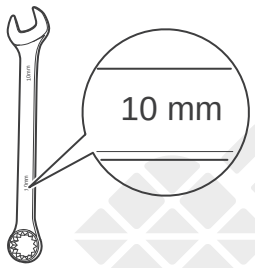
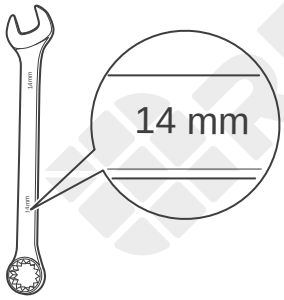
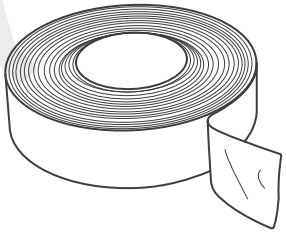
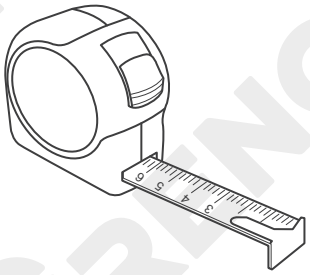
Normal Battery with +/- Bolts	Battery Adapter Cables (output) (Anderson PP75 to Ring Terminal Adapter Cable)
	

Solar Panel Kit

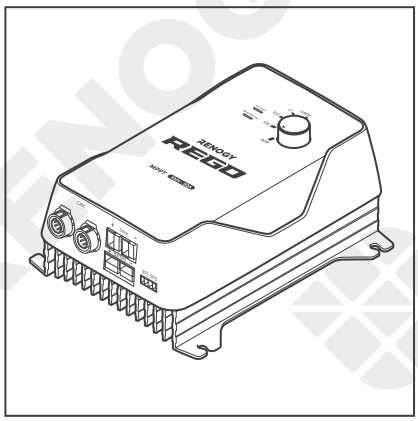
Solar Panel	Solar Panel Extension Cables
	

Preparation

Required Tools

Wrench (10 mm)	Wrench (14 mm)
	
Insulation Tape	**Measuring Tape**
	

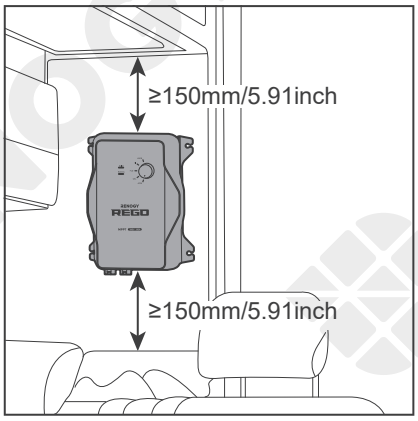
Checking the Charge Controller



1. Inspect the charge controller 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.

WARNING

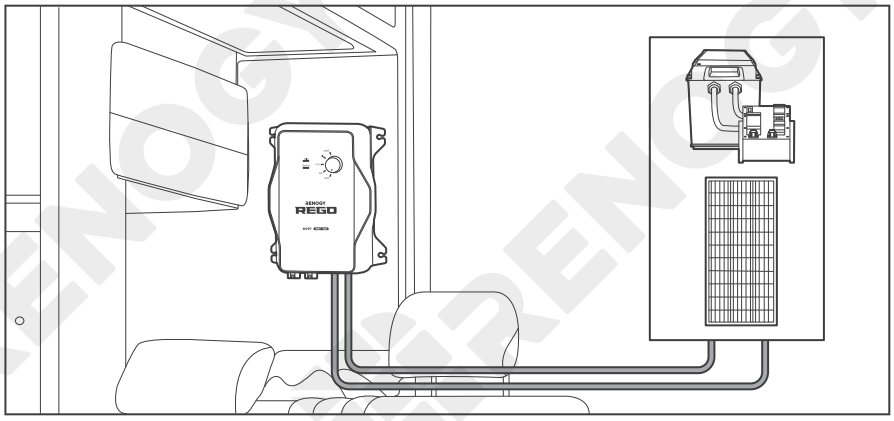
- Do not use the charge controller if it has any visible damage.



2. Confirm the installation location.

WARNING

- Install the charge controller indoors and prevent its components from being exposed to direct sunlight. Prevent water from entering the charge controller.
- The charge controller requires at least 6 inches (150 mm) of clearance above and below for proper ventilation.
- Make sure that the charge controller is installed with ambient temperature range from -4°F to 140°F or -20°C to 60°C. To ensure the working efficiency, it is recommended to keep the ambient temperature range from -4°F to 113°F or -20°C to 45°C.
- Make sure that the charge controller is installed in an environment with relative humidity between 0% and 95% and no condensation.



3. Measure the length of the cables connecting to the battery and solar panel so they can be connected to the charge controller.

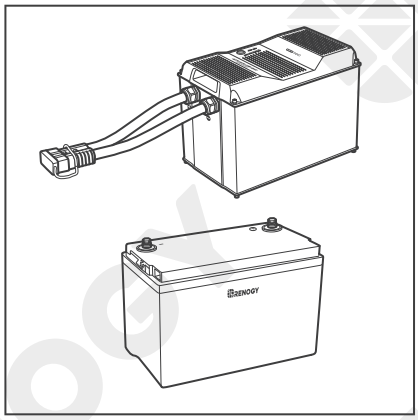
NOTE

- If the Battery Adapter Cable or Solar Panel Extension Cable is not long enough, you can use more extension cables or reselect the position where the charge controller needs to be secured.

WARNING

- Read the "Recommended Cable and Fuse Sizing" in this manual, and select the appropriate cables according to the actual demands.

Checking Battery



1. Inspect the battery 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.

INFO

- Read the user manual of the battery carefully before installation.

NOTE

- Make sure the battery is working normally.
- The charge controller can only be applied to a deep-cycle sealed lead-acid battery, a flooded battery, an AGM battery, a gel battery or a lithium iron phosphate battery.
- 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.

WARNING

- Do not use the battery if it has any visible damage.
- Do not touch the exposed electrolyte or powder if the battery housing is damaged.
- The battery may produce explosive gases when being charged. Make sure there is good ventilation.

System Voltage	
Battery or Battery Pack 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. The batteries can be combined in parallel or in series as needed. This charge controller supports a maximum system voltage of 16V. Read the user manual for battery voltage parameters, and calculate the battery or battery pack system voltage according to the formula to ensure that it does not exceed 16V.

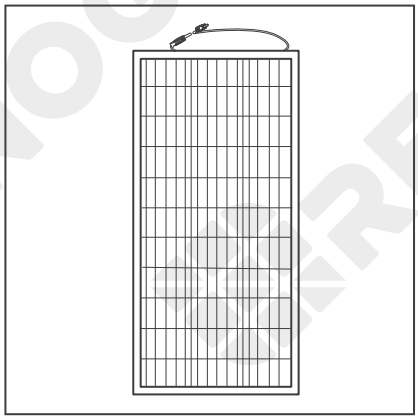
NOTE

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

WARNING

- Do not use the charge controller if the battery or battery pack system voltage exceeds 16V. Doing so will cause damage to the charge controller.

Checking Solar Panel



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.

INFO

- Read the user manual of the solar panel carefully before installation.

NOTE

- 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.

WARNING

- Do not use the solar panel if it has any visible damage.

Maximum Output Power	
Maximum Output Power of Solar Panel / Solar Panel Array = Maximum Output Power 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.

NOTE

- In the formula, W represents the maximum output power of the solar panel, and 1, 2 or 3 represents the solar panel number, respectively.

WARNING

- Ensure that the maximum output power of the solar panel/solar panel array does not exceed 800W.

Working Voltage	
Working Voltage of Solar Panel / Solar Panel Array = Working voltage U	
Solar Panels in Series	**Solar Panels in Parallel**
Working Voltage U: $U_1+U_2+U_3$	Working Voltage U: $U_1=U_2=U_3$

3. Read the user manual of the solar panel for the working voltage, and calculate the working voltage of solar panel/solar panel array according to the formula.

NOTE

- In the formula, U represents the working voltage of the solar panel, and 1, 2 or 3 represents the solar panel number, respectively.

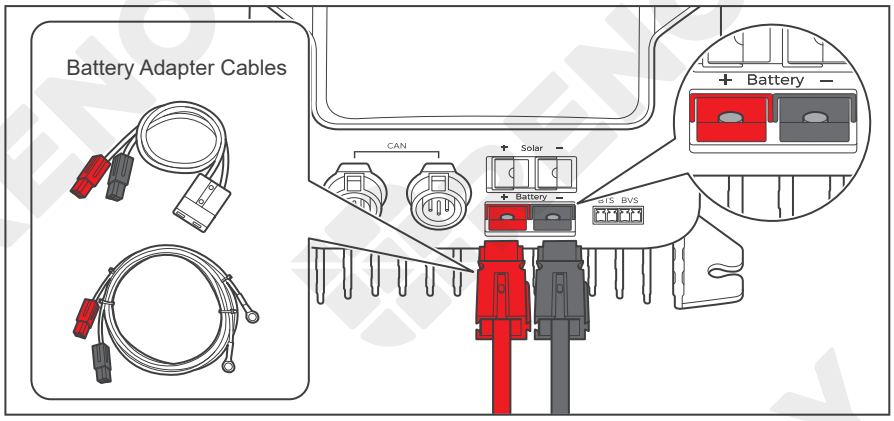
WARNING

- Ensure that the working voltage of the solar panel/solar panel array does not exceed 100V.

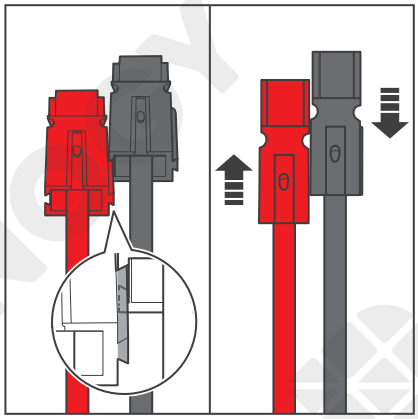
Charge Controller Wiring

NOTE

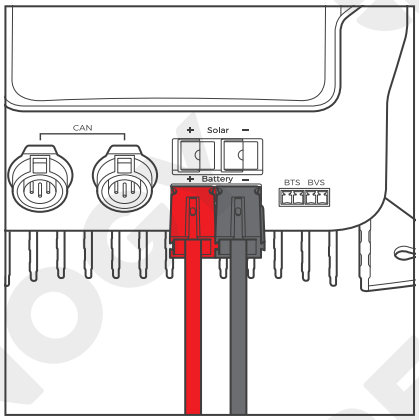
- Make sure that the connections of the Anderson connectors are tight and secure.



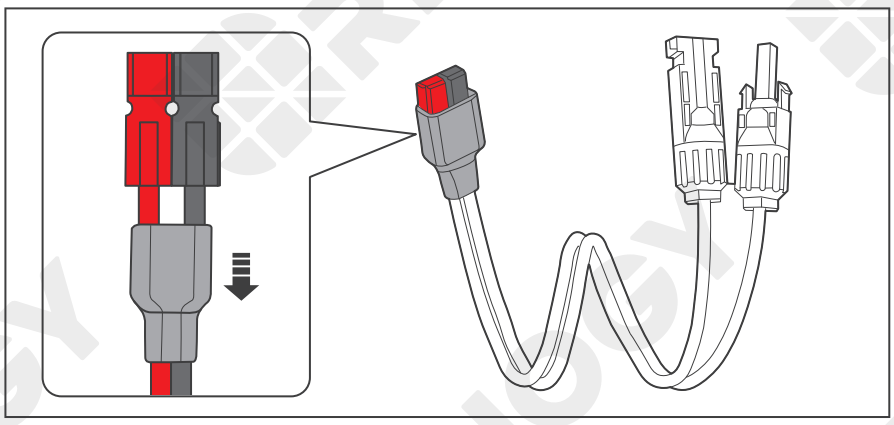
1. For the Battery terminal, align the Battery Adapter Cable's Anderson PP75 connectors to the correct orientation and polarity.



2. Bind the Anderson connectors by sliding the side grooves.

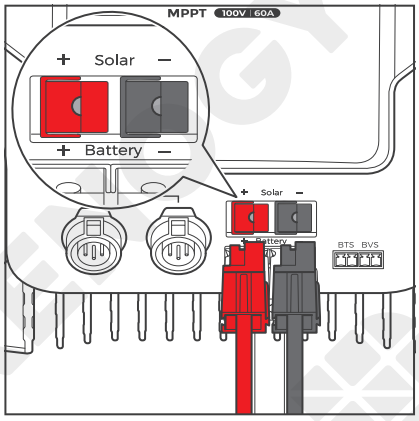


3. Insert the Anderson connectors into the Battery terminals.

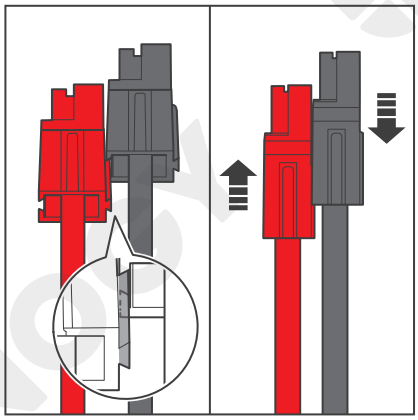


4. Remove the protective cover of the Solar Adapter Cable by sliding it downwards.

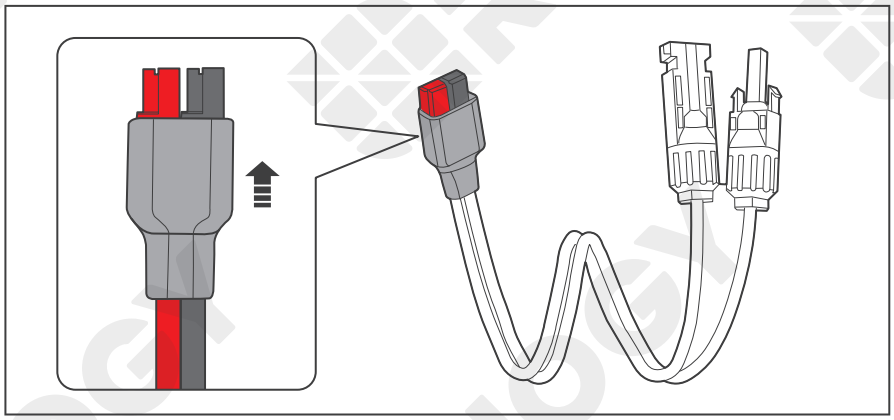
Charge Controller Wiring



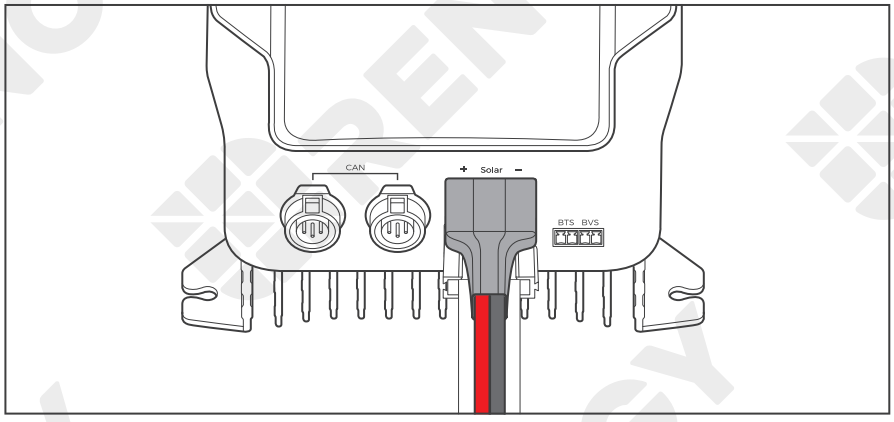
5. For the Solar terminal, align Anderson PP75 connectors of the Solar Adapter Cable to the correct orientation and polarity.



6. Pair the Anderson connectors by sliding the side grooves.



7. Push the protective cover upwards.



8. Insert the Anderson connectors into the Solar terminals.

NOTE

- Identify the polarities (positive and negative) on the cables used for the batteries. A reverse polarity contact may damage the unit.
- Ensure that the Anderson connectors are fully seated and/or the ring terminals are securely connected.

WARNING

- Do not touch the positive and negative terminals of the battery directly with your hands at the same time.
- Do not allow the positive (+) and negative (-) terminals of the battery to contact with each other.

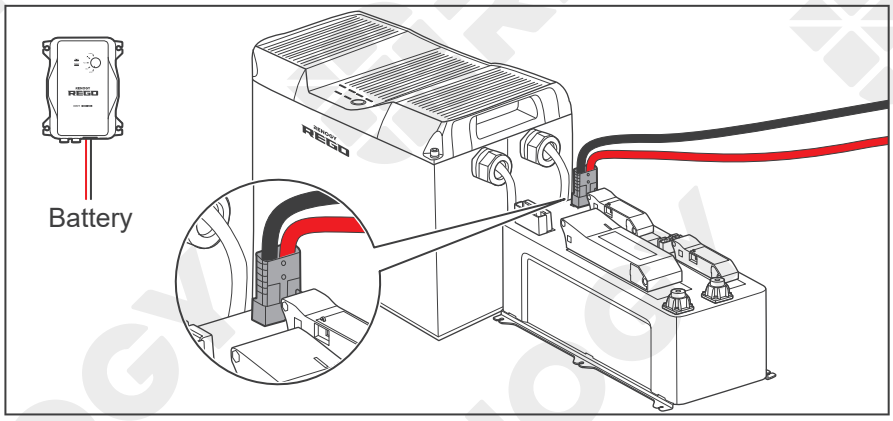
Battery Scenario A: REGO Battery Kit

Using the System Combiner Box Accessory Set

INFO

- Read the user manual of REGO 4 Ports 400A System Combiner Box carefully before wiring.

■ **Using Battery Adapter Cable (Anderson PP75 to Anderson 120 Adapter Cable)**



1. Insert the Anderson 120 connector of the Battery Adapter Cable to the System Combiner Box.

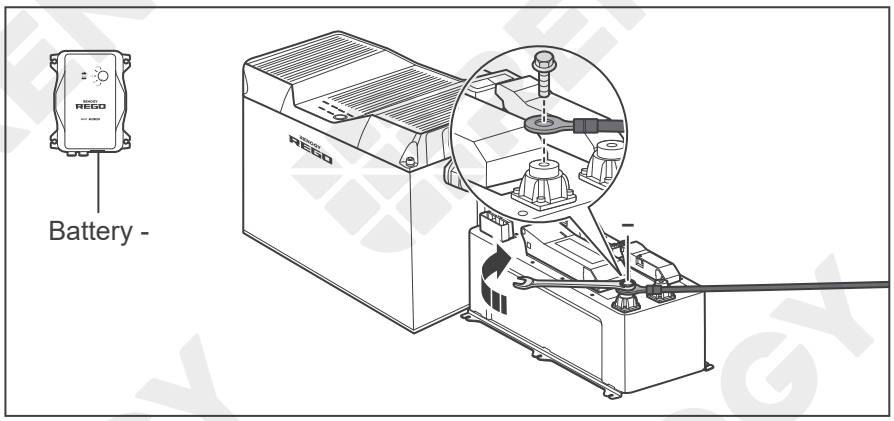
NOTE

- If the devices are connected to the Anderson connectors of the System Combiner Box, install a 80A NH fuse in the top NH fuse disconnect switch.

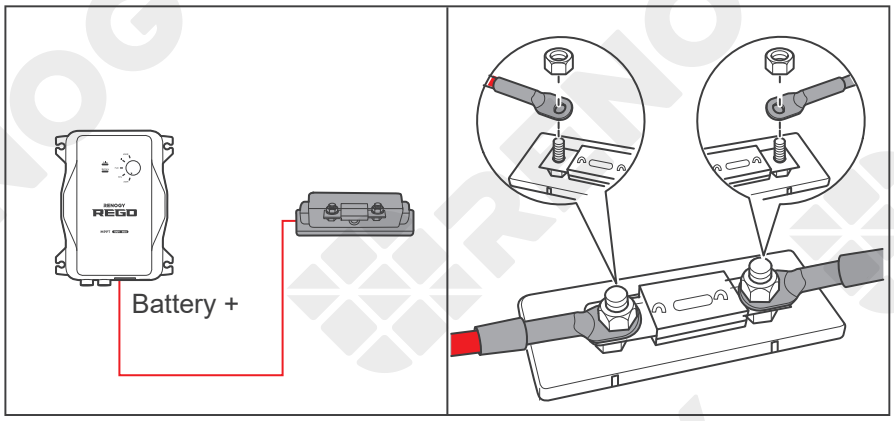
Using Battery Adapter Cable (Anderson PP75 to Ring Terminal Adapter Cable)

NOTE

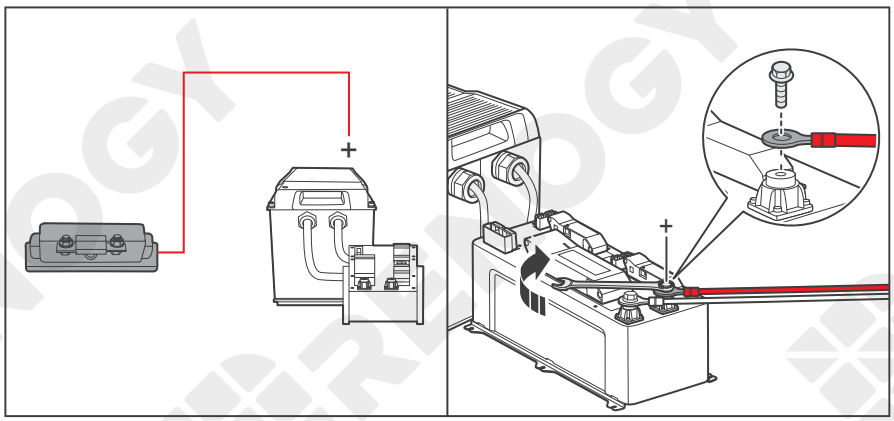
- Select the appropriate wrench according to positive/negative wire fixing bolt specifications of the system hub.



1. Attach the ring terminal of the negative Battery Adapter Cable (output) to the negative battery bolt and tighten with a wrench.



2. For your safety, it is recommended to use a battery fuse (80A). Connect the positive Battery Adapter Cable (output) to one end of the battery fuse, and then connect the other end to the positive bolt of the battery.



3. Attach the ring terminal of the positive Battery Adapter Cable (output) to the positive bolt of the battery and tighten with a wrench.

Using Positive/Negative Busbars Accessory Set

NOTE

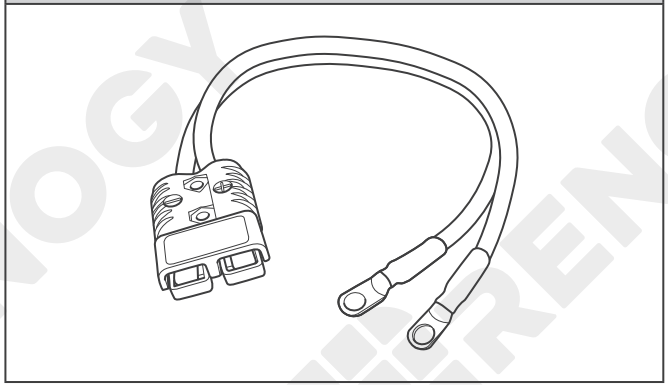
- Select the applicable wrench according to wire fixing bolt specifications of Positive/Negative Busbars.

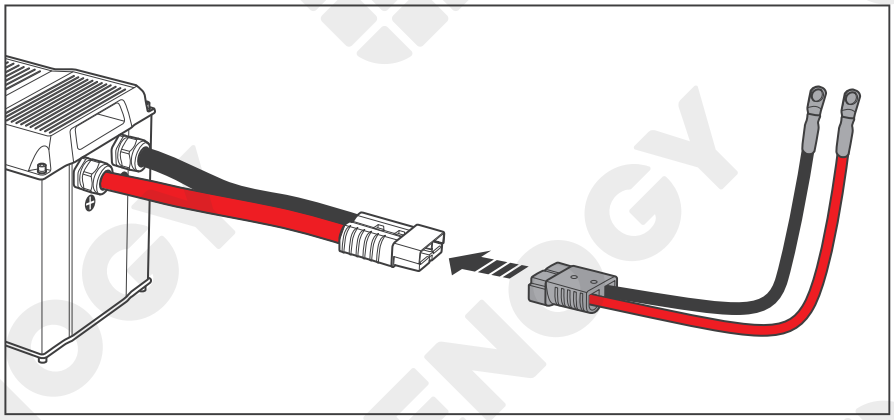
WARNING

- Select the right size of positive/negative sink according to the maximum continuous charging/discharging current of the battery operation.

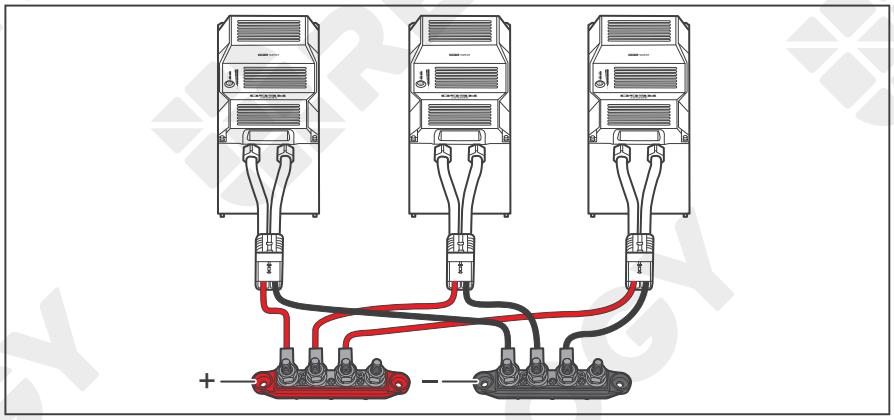
Essential Accessories

Gray Anderson 350 Connector to Ring Terminal Adapter Cable



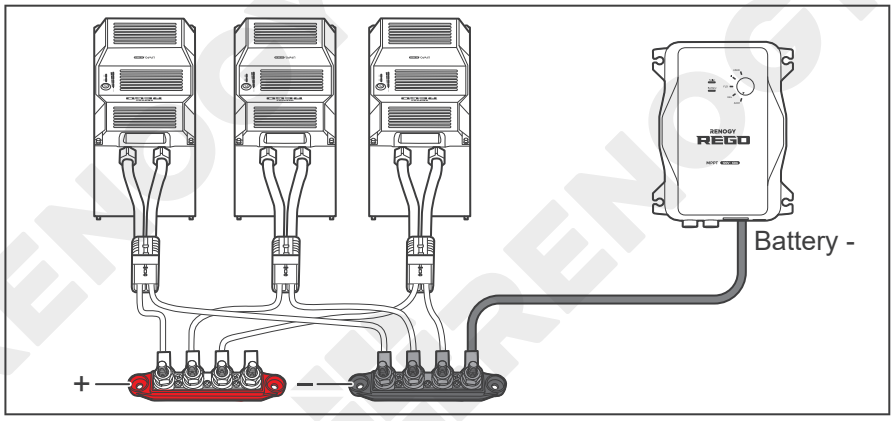


1. Connect the Anderson Connectors of the batteries to the Adapter Cables (sold separately).

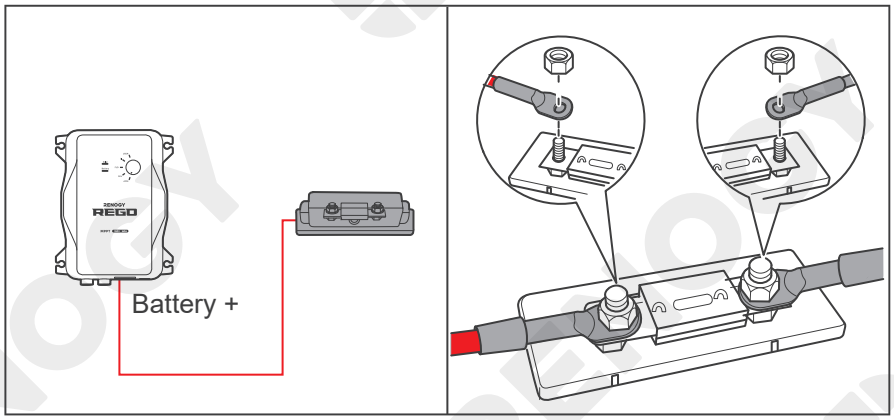


2. Connect the positive and negative ring terminals of the Adapter Cables to the Positive and Negative Busbars (not included) respectively.

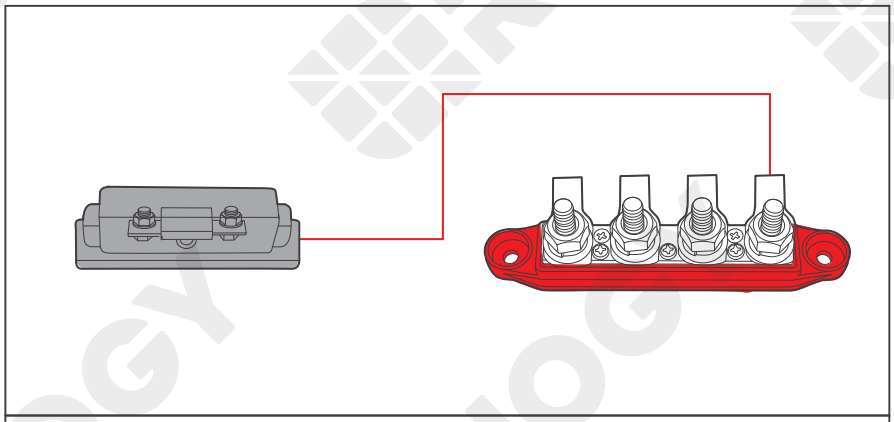
Battery Wiring



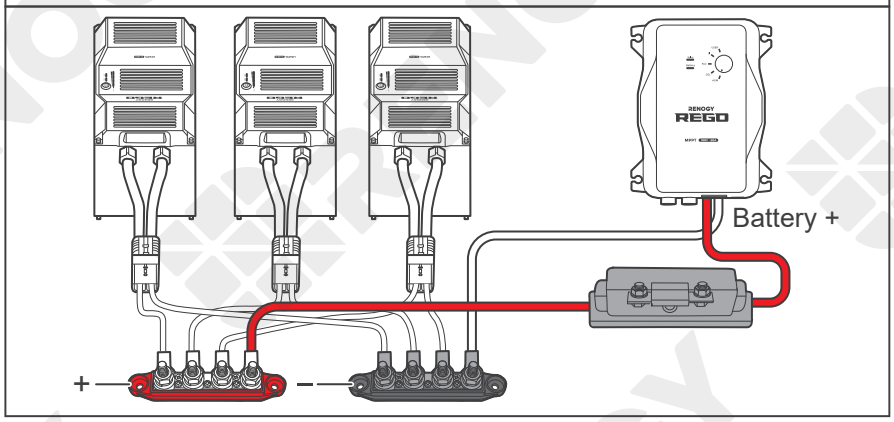
3. Connect the negative ring terminal of the Battery Adapter Cable to the Negative Busbars and tighten the wire retaining bolt with a wrench.



4. For your safety, it is recommended to use a battery fuse (80A). Connect the positive Battery Adapter Cable to one end of the battery fuse, and then connect the other end to the fuse cable.



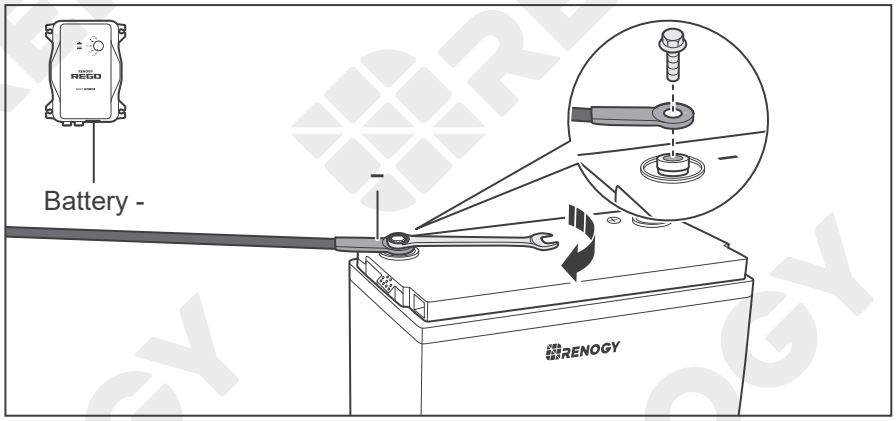
5. Attach the ring terminal of the other end of fuse cable to the Positive Busbar and tighten the wire retaining bolt with a wrench.



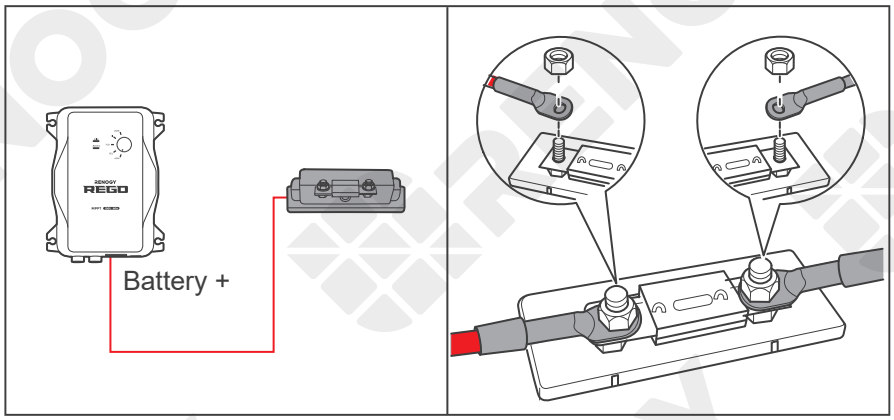
Battery Scenario B: Normal Battery Kit

NOTE

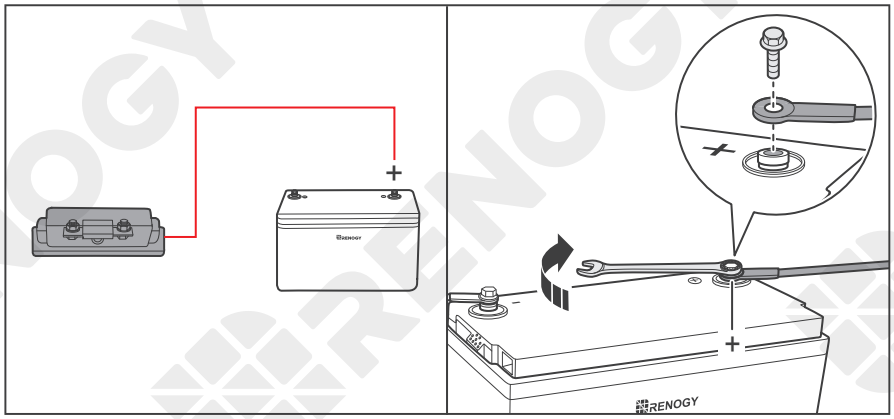
- Select the appropriate wrench according to the battery positive/negative wire fixing bolt specifications.



1. Attach the ring terminal of the negative Battery Adapter Cable to the negative terminal of Normal Battery and tighten the wire retaining bolt with a wrench.

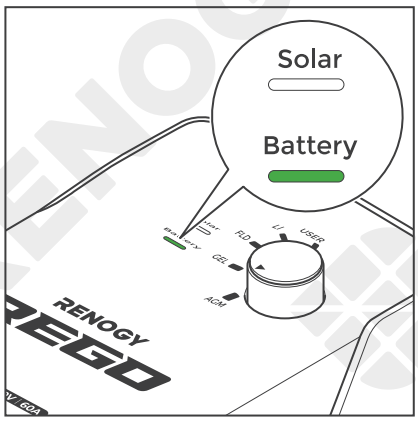


2. For your safety, it is recommended to use a battery fuse (80A). Connect the positive Battery Adapter Cable to one end of the battery fuse, and then connect the other end to the fuse cable.



3. Attach the other end of the ring terminal of the fuse cable to the positive terminal of Normal Battery and tighten the wire retaining bolt with a wrench.

Battery Indicator



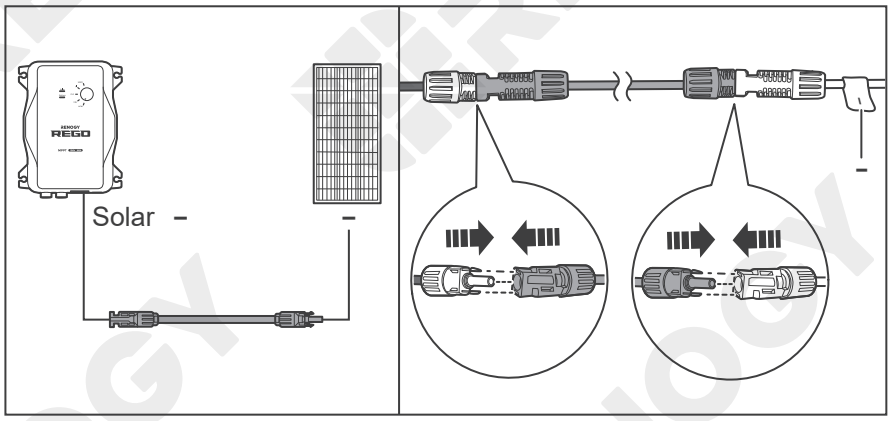
Once the battery wiring is completed correctly and the battery is turned on, the Battery indicator of the charger controller lights up green.

When the Battery indicator does not light up, it means the charge controller needs troubleshooting. Read “Troubleshooting” in the user manual. For more instructions, contact our customer service through renogy.com/contact-us/.

Solar Panel Wiring

NOTE

- Identify the polarities (positive and negative) on the cables used for solar panels. A reverse polarity contact may damage the unit.
- Make sure all connections are tight and secure.
- Read the "Recommended Cable and Fuse Sizing" in this manual, and select the appropriate cables according to the usage.



1. Connect the negative Solar Adapter Cable to the Solar Panel Extension Cable, and then connect the Extension Cable to the negative terminal of the solar panel.

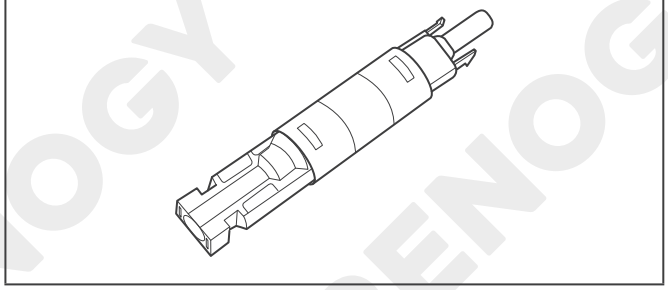
For your safety, it is recommended to use an in-line fuse on the solar panel.

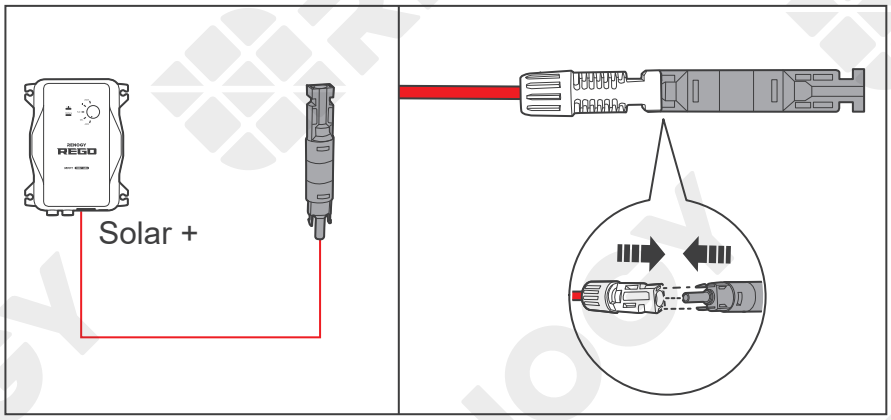
NOTE

- Read the "Recommended Cable and Fuse Sizing" in this manual, and select appropriate cables and fuses according to the usage.

Optional Accessories

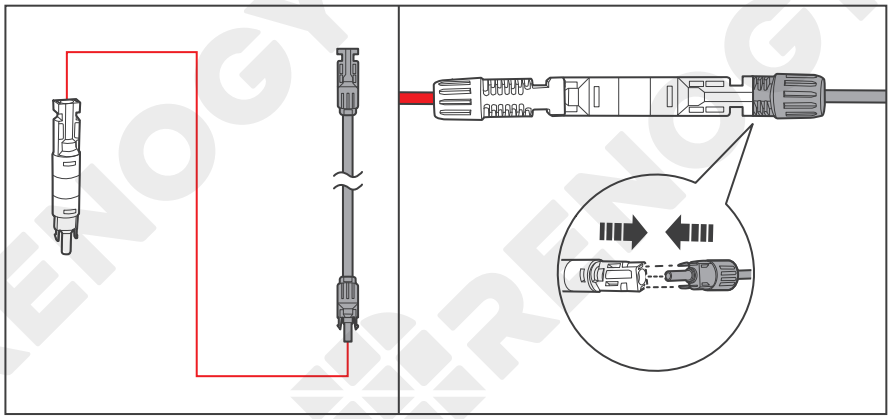
Solar Panel Fuse



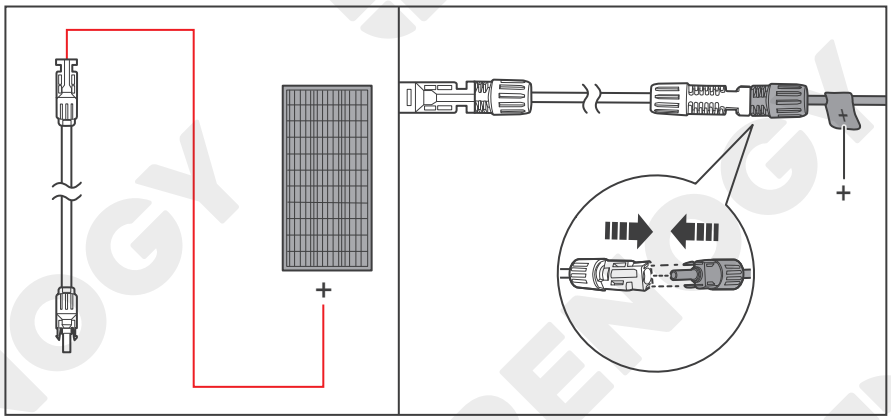


2. Connect the positive Solar Adapter Cable to the Solar Panel Fuse.

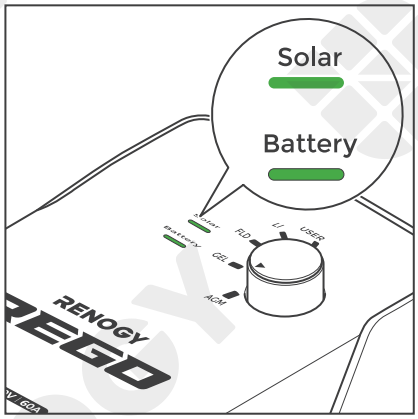
Solar Panel Wiring



3. Connect the other end of the fuse cable to the Solar Panel Extension Cable.



4. Connect the other end of the Solar Panel Extension Cable to the positive terminal of the solar panel.



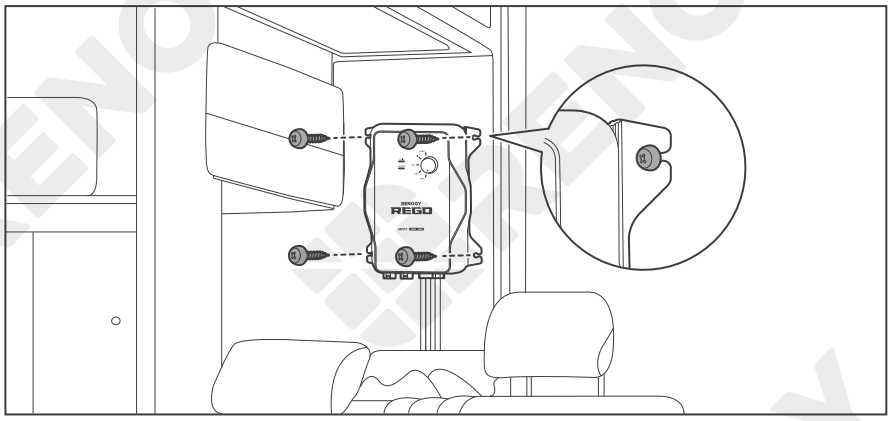
5. Once the solar panel wiring is completed correctly, the Solar indicator of the charger controller lights up green.

   When the Solar indicator does not light up, it means the charge controller needs troubleshooting. Read "Troubleshooting" in the user manual. For more instructions, contact our customer service through renogy.com/contact-us/.

Mounting

NOTE

- Make sure that the charge controller is installed firmly to prevent it from falling off.



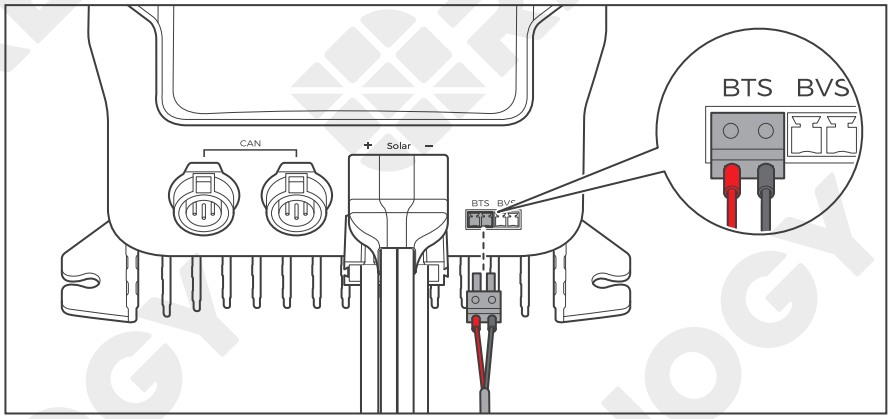
Place the charge controller against a flat surface and secure it with included screws.

Temperature Sensor

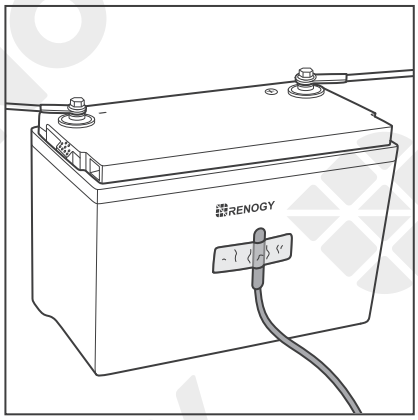
The temperature sensor can detect the battery temperature and update it to the charge controller for charging voltage calibration. This ensures the charger controller (with operating temperature range from -4°F to 140°F or -20°C to 60°C) can charge the battery normally.

CAUTION

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



1. Insert the temperature sensor terminal block into the BTS port of the charge controller.

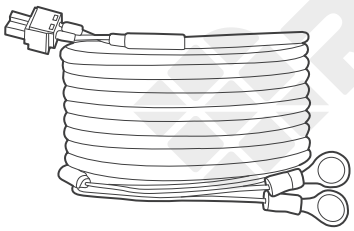


2. Adhere the sensor on the top or side of the battery with insulation tape.

Voltage Sensor (Optional)

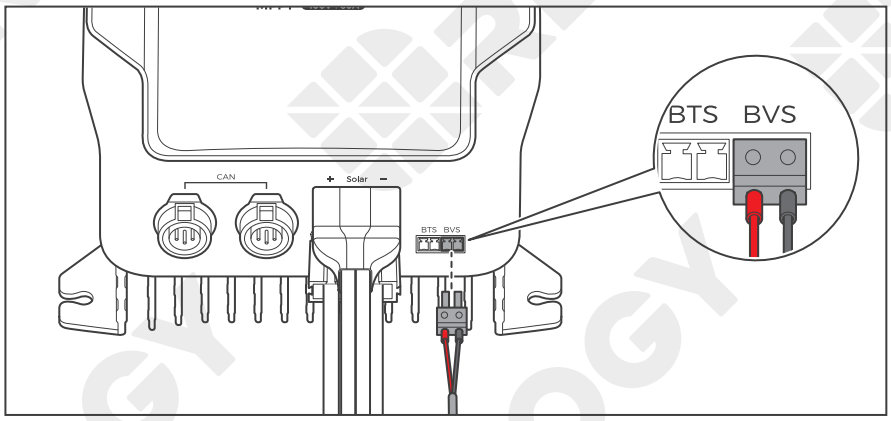
The Battery Voltage Sensor is a perfect solution by providing an accurate battery voltage to the charge controller and allowing it to adjust the charging stage precisely resulting in overall extension of your battery life.

Optional Accessories

Voltage Sensor


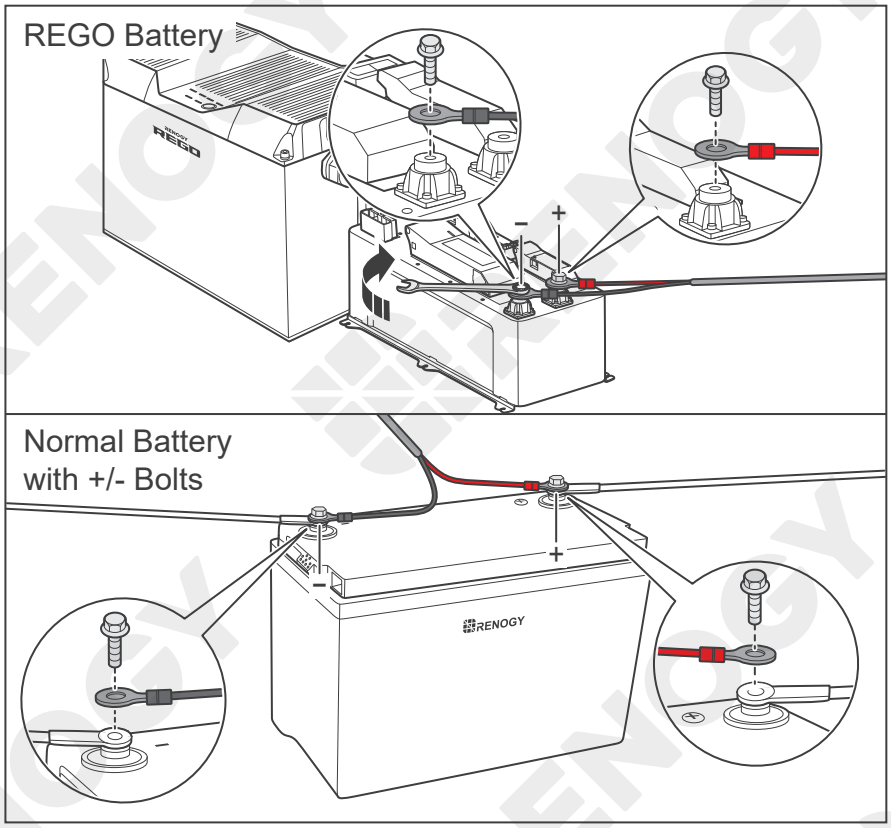
NOTE

- Identify the polarities (positive and negative) on the cables used for the batteries. A reverse polarity contact may damage the unit.
- The voltage sensor ring terminal is M8 (Approx. 5/16 inch). If the battery bolt size is small, use a gasket to fix it to prevent it from falling off.



1. Insert the voltage sensor terminal block to the BVS port.

Voltage Sensor (Optional)



2. Connect the voltage sensor ring terminals to the positive and negative poles of the battery system.

Communication

The REGO 12V 60A MPPT Solar Charge Controller can communicate with other REGO devices and monitoring devices, enabling safe operation, smart control, remote monitoring, and programmable settings.

Inter-Device Communication

Depending on the installation condition, the RV-C communication connections between the charge controller and other REGO devices can be established with backbone or daisy chain topology. The inter-device communication allows the charge controller to dynamically adjust the charging profile for an optimal and safe charge.

Backbone Topology

The backbone topology applies to RVs that are integrated with RV-C buses with built-in 120Ω resistors on both ends. Check the RV user manual for details or contact the RV manufacturer if necessary.

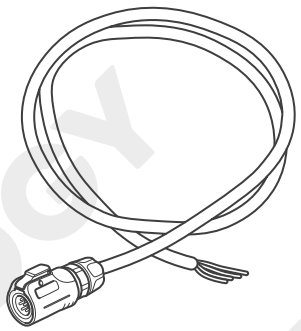
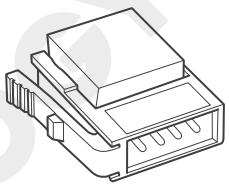
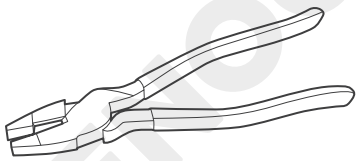
For technical support from Renogy, please contact us through renogy.com/contact-us/.

INFO

- 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.

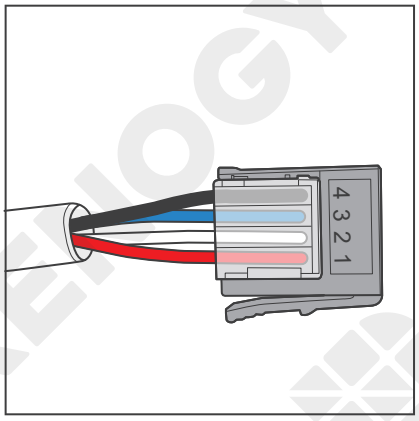
Recommended Accessories

LP16 Plug (7-Pin) to Bare Drop Cables	Drop Plugs	Split Joint Pliers
		

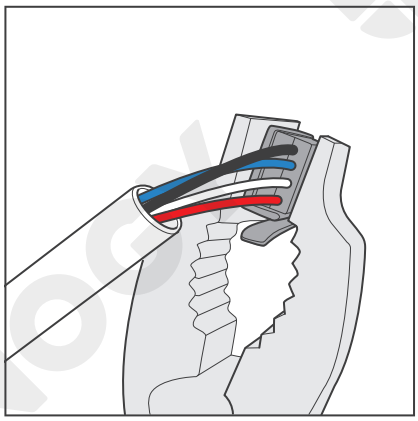
NOTE

- The drop cable shall not exceed 19.6 feet (6 m), and the RV-C bus shall not exceed 98.4 feet (30 m).
- Different drop sockets are used on the RV-C bus by different RV manufacturers. Select the Drop Plugs that match the drop sockets for the inter-device communication connections. If you are not sure about the Drop Plug selection, check with the RV manufacturer. This user manual takes the Mini-Clamp II plug (4-pin) 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. This user manual takes the pinout of the Mini-Clamp II plug (4-pin) as an example.

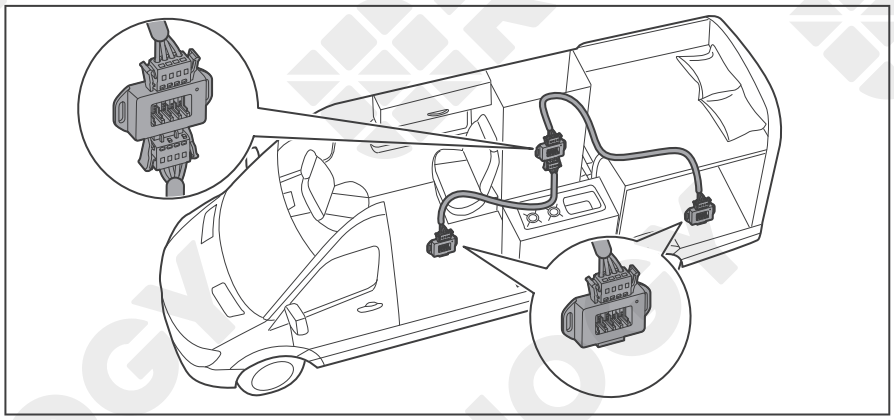
Communication



1. Insert the bare wires of the Drop Cables (sold separately) all the way into the wire ports of the Drop Plugs (not included) following the Drop Plug pinout. The red PS+ wires go to pin 1, the white CAN_H wires go to pin 2, the blue CAN_L wires go to pin 3, and the black PS- wires go to pin 4.



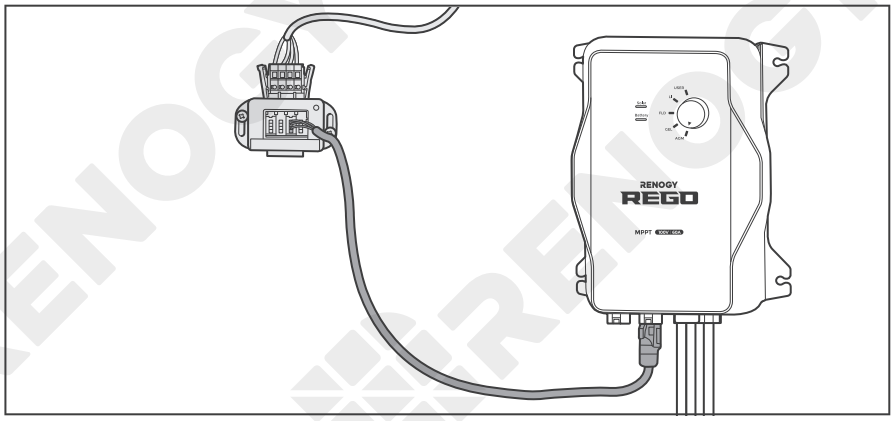
2. Squeeze the crimp areas of the Drop Plugs with the Split Joint Pliers.



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

NOTE

- If unable to locate the drop taps, please contact the RV manufacturer for help.



4. Connect either of the CAN Communication Ports of the charge controller and other REGO devices to the drop sockets on the drop tap with the Drop Cables.

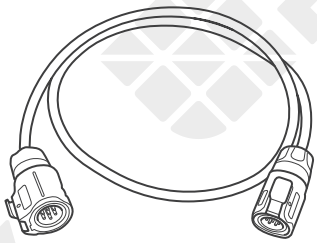
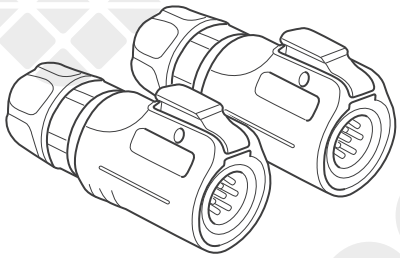
NOTE

- 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 topology

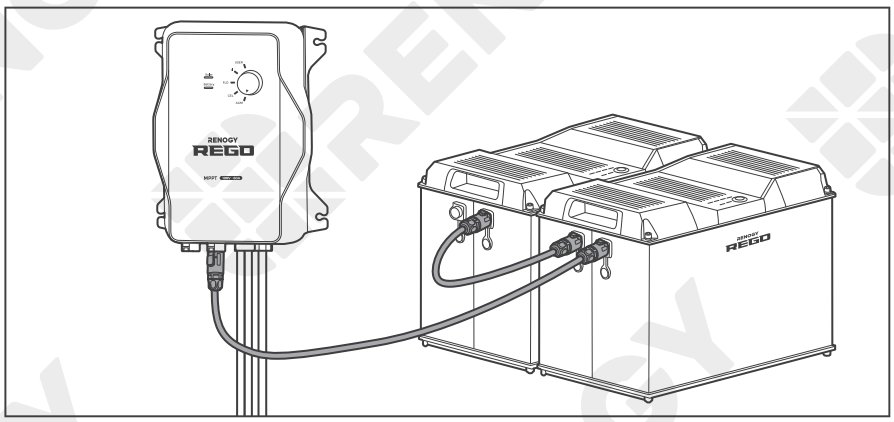
The daisy chain topology applies to RVs that are not integrated with RV-C buses.

Recommended Accessories

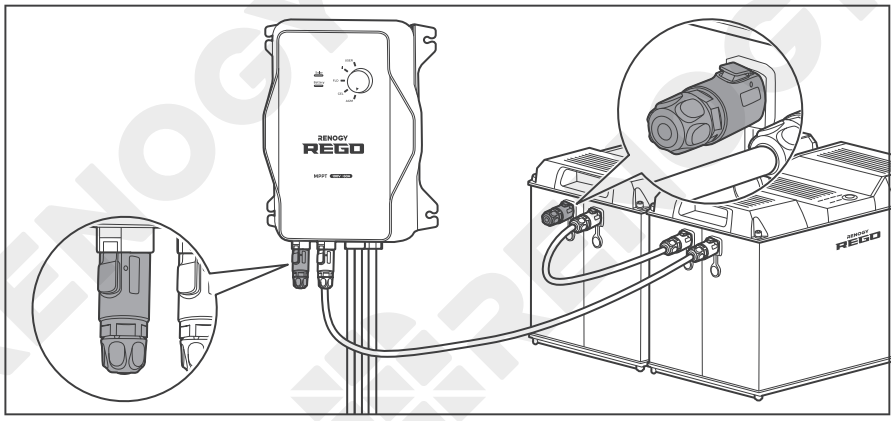
LP16 Plug (7-Pin) Communication Cable(s)	LP16 Terminator Plugs (7-Pin)
	

NOTE

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



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



2. Plug the Termionator Plugs (sold separately) into the free CAN Communication Ports on the first and last REGO devices.

Monitoring Device Communication

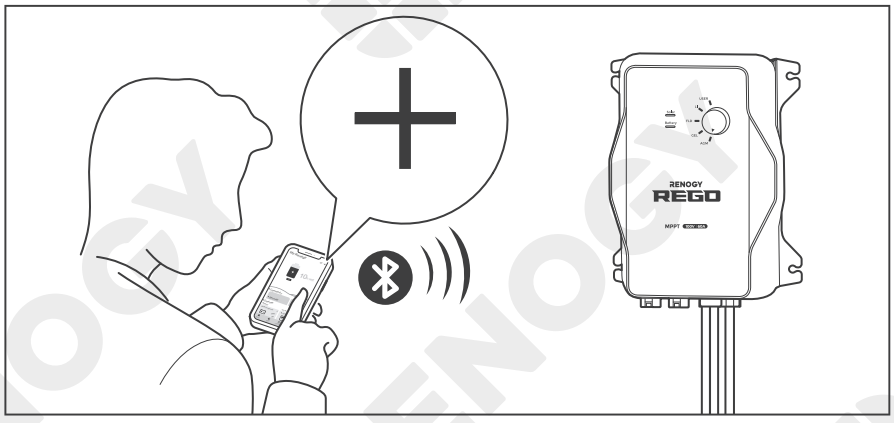
Depending on the application, the short-range or long-range communication connections can be established between the charger controller and monitoring devices.

NOTE

- Scan the QR code on the last page of the user manual to download the DC Home app.
- Make sure that the charge controller is turned on before the connection.

Short-Range Monitoring

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



Tap **+** to search for new devices. Add the newly found charge controller to the device list. Monitor the charge controller on the device page.

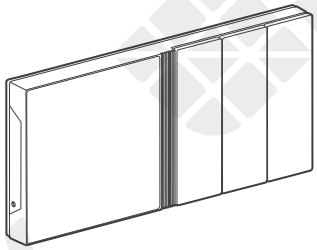
NOTE

- Keep the phone within 10 feet (3 m) of the charge controller.

Long-Range Monitoring

If long-range communication and programming are required, connect the charge controller to Renogy ONE through Bluetooth or wires, and the Renogy ONE to the DC Home app through Wi-Fi.

Recommended Accessories

Renogy ONE


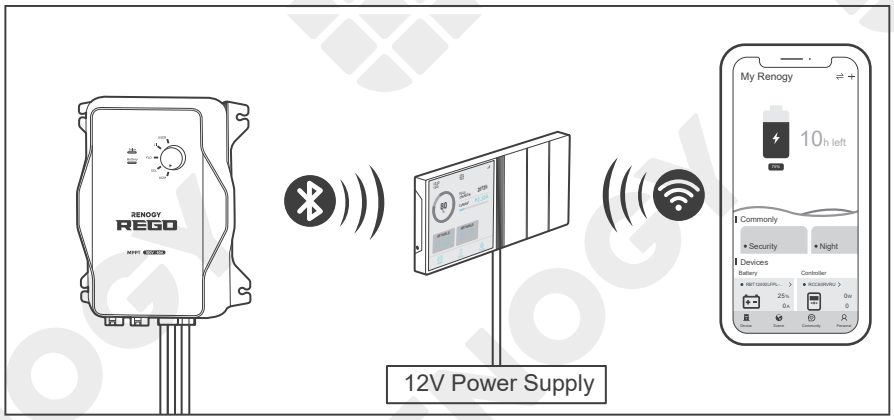
NOTE

- Make sure that the Renogy ONE is powered on before the connection.

INFO

- Read the user manual of Renogy ONE at renogy.com before the connection.

Wireless connection



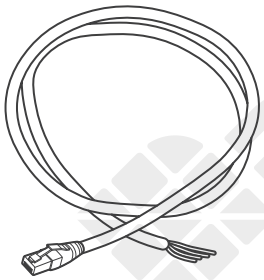
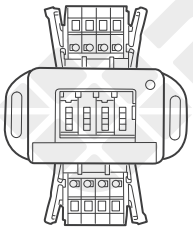
Connect the charge controller to the Renogy ONE (sold separately) through Bluetooth, and pair the Renogy ONE with the DC Home app through Wi-Fi. Monitor the charge controller on the Renogy ONE or the DC Home app.

NOTE

- Ensure the charge controller does not communicate with any other device.
- Keep the phone within 10 feet (3 m) of the charge controller.

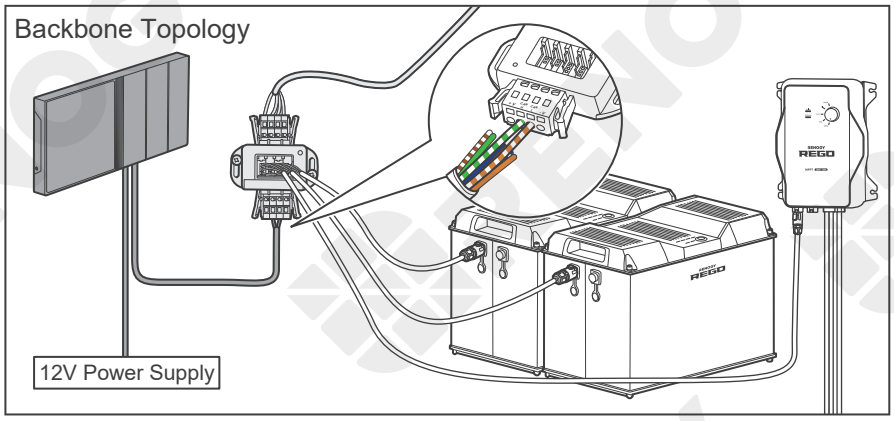
Wired connection

Recommended Accessories (Backbone Topology)

RJ45 Plug to Bare Drop Cable	Common Drop Tap
	

NOTE

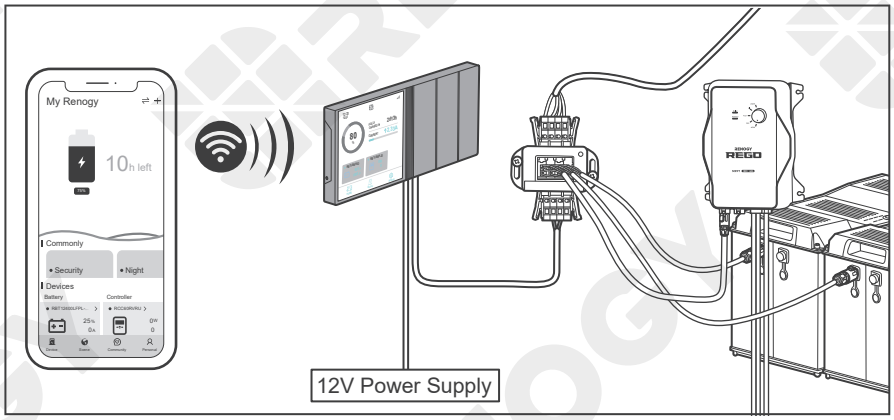
- Select the appropriate communication cable (sold separately) according to the distance between devices. The communication cable should be less than 19.6 feet (6 m).



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.

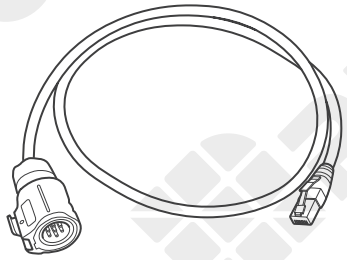
NOTE

- 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.
- Refer to the "Backbone Topology" section for more instructions.



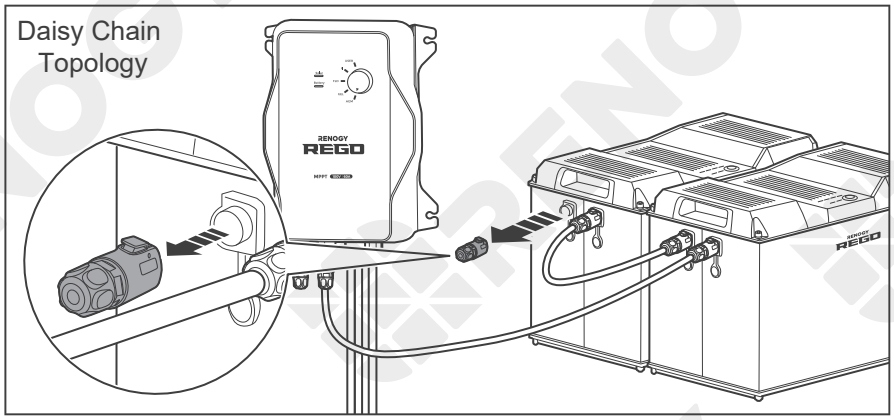
2. Monitor and program the complete system on Renogy ONE or the DC Home app.

Recommended Accessories (Daisy Chain Topology)

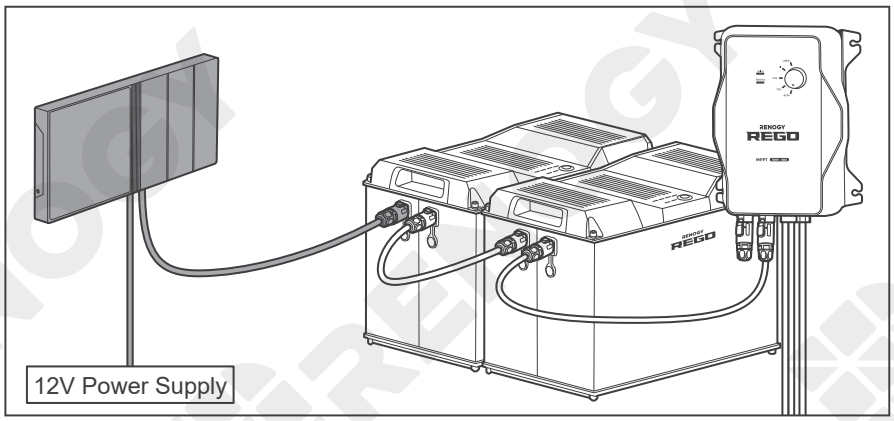
LP16 Plug (7-Pin) to RJ45 Communication Adapter Cable


NOTE

- 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).

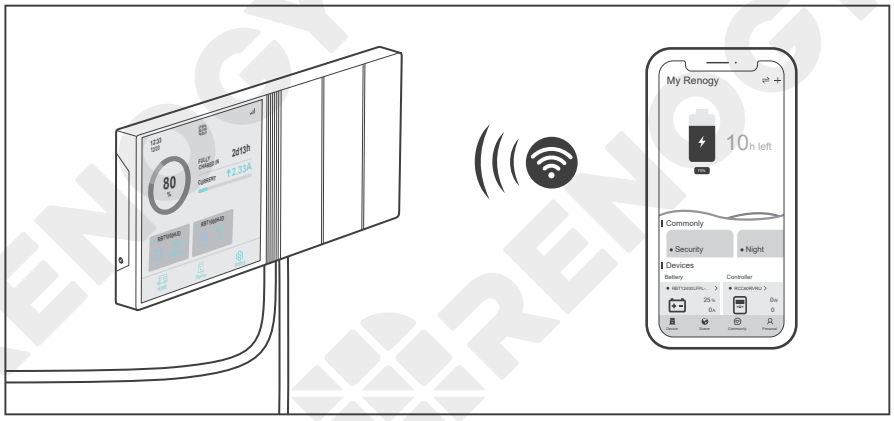


1. Remove the Terminator Plug from the REGO device at either end of the daisy chain.



2. Connect the Renogy ONE to the free CAN Communication Port on the REGO device with the Communication Adapter Cable (sold separately).

Communication



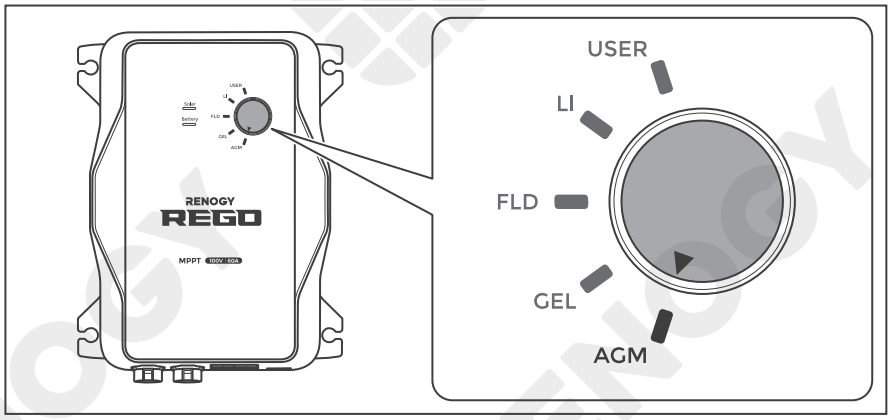
3. Pair Renogy ONE with the DC Home app. Monitor and program the complete system on the Renogy ONE or the DC Home app.

Setting the Battery Type

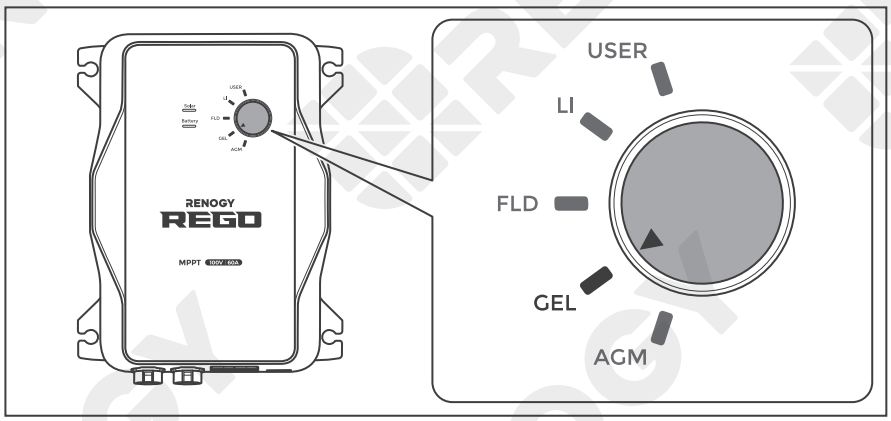
The knob with 5 gears makes the selection of battery type more convenient. Manually set the battery type according to needs.

WARNING

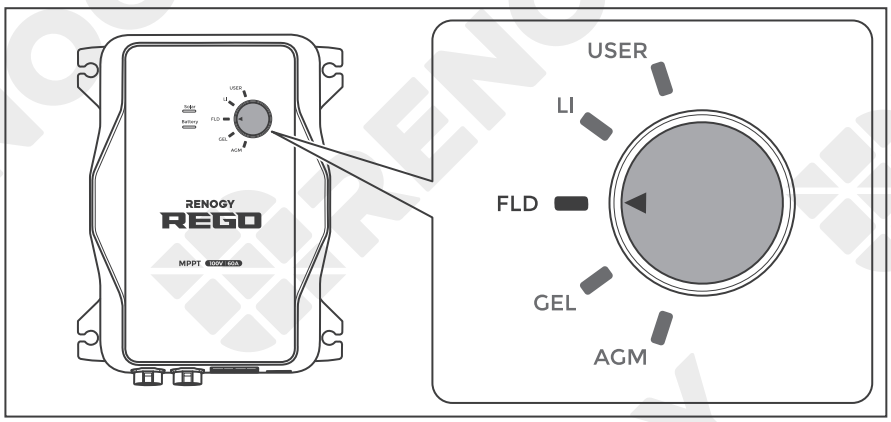
- Refer to technical specifications of the battery provided by the manufacturer when choosing a preset battery. Incorrect battery type selection resulting in damage will not be covered by warranty.



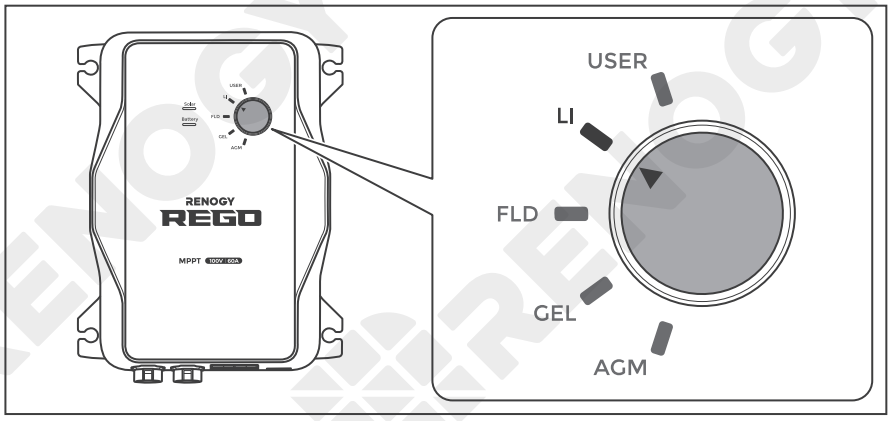
1. If the battery is AGM Battery, turn the knob to AGM.



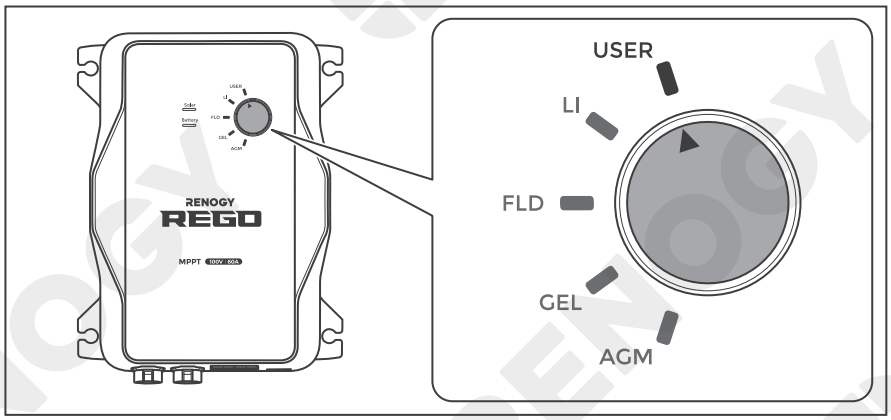
2. If the battery is Gel Battery, turn the knob to GEL.



3. If the battery is Flooded Battery, turn the knob to FLD.



4. If the battery is Lithium Battery, turn the knob to LI.



5. If multiple parameters of the battery need to be programmed, turn the knob to USER to enter the user mode.

NOTE

- After entering the user mode, you need to use the DC Home app to program the battery parameters. Refer to the "User Mode" of this chapter for details.

Battery Charging Parameters

WARNING

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

Battery Type / Parameters	AGM/ SLD	GEL	FLOODED	LI (LFP)	USER (Default)	USER (Recommended)
Overvoltage Shutdowm	16.0V	16.0V	16.0V	16.0V	16.0V	7.0-17.0V
Overvoltage Warning	15.5V	15.5V	15.5V	14.8V	[15.5V]	—
Equalization Volatge	—	—	14.8V	—	14.8V	7.0-17.0V
Boost Voltage	14.6V	14.2V	14.6V	14.4V	14.2V	7.0-17.0V
Float Voltage	13.8V	13.8V	13.8V	—	13.8V	7.0-17.0V
Boost Return Voltage	13.2V	13.2V	13.2V	13.6V	[13.2V]	—
Low Voltage Reconnect	—	—	—	—	—	—
Undervoltage Warning	12.0V	12.0V	12.0V	12.2V	[12.0V]	7.0-17.0V
Undervoltage Shutdown Warning	11.1V	11.1V	11.1V	12.0V	11.1V	7.0-17.0V
Boost Duration	120 min*	120 min*	120 min*	—	120 min*	0-300min
Equalization Duration	—	—	120 min	—	120 min	0-300min
Equalization Interval	0 day**	0 day**	30 days	—	30 days	0-255days

NOTE

- * if the battery type is lead-acid battery and the charging current is less than 3A, the charge controller will automatically switch to float charging after 30 seconds.
- ** no Equalization Charging.
- Parameters in gray cannot be set manually.
- Parameters in square brackets ([ ]) are automatically adjusted according to the relevant settings, and cannot be set directly.

- When the battery voltage reaches the Undervoltage Shutdown Warning value, the Battery Status Indicator slow flashes red. Please disconnect all loads from the battery, and charge it immediately.

User Mode

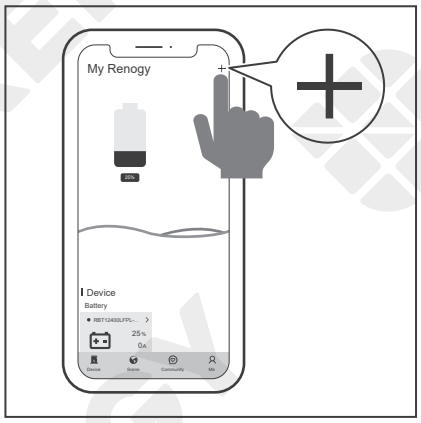
WARNING

- 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 device and void the warranty.

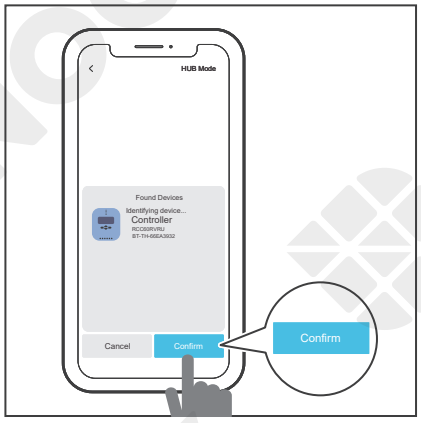
REGO 12V 60A MPPT Solar Charge Controller	
Overvoltage Shutdown	The default protection voltage is 16V. Improper setting may affect the safety of the battery. Please consult the battery manufacturer and check if this voltage value needs to be reset.
Boost Voltage	This value affects whether the battery 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.
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.
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.
Undervoltage Shutdown Warning	
Boost Duration	Please consult the battery manufacturer if it is necessary to set this parameter value.
Equalization Duration	
Equalization Interval	

NOTE

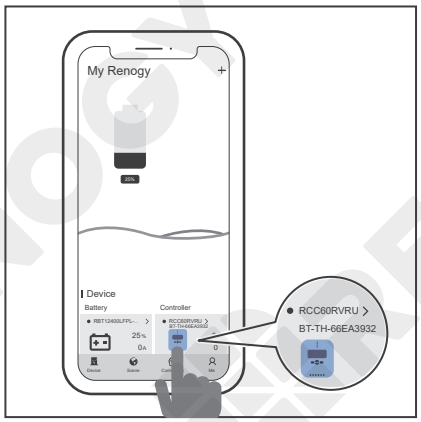
- Make sure Bluetooth is turned On.
- Scan the QR Code on the last page of the user manual to download the DC Home app.
- The version of the DC Home app might have been updated. Illustrations in the user manual are for reference only. Follow the instructions based on the current app version.



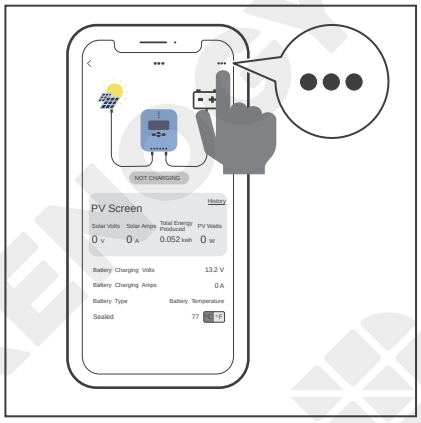
1. Open the DC Home app. Tap **+** to search for new devices.



2. Tap **Confirm** to add the newly found device to the device list.



3. Tap the charge controller area to enter the device information interface.



4. Tap ••• in the upper right corner.

5. Tap **Settings** to enter the mode selection interface.

6. In this interface, you can customize multiple parameters of the battery. When the parameters are modified, **Setting Success** appears on the interface, indicating that the parameter setting is completed.

LED Indicators

Indicator	Color	Status	Description
Solar Status Solar	Green	ON	Solar panel detected
	/	OFF	No solar panel detected or the solar panel voltage is too low. For details, see “Troubleshooting”.
Battery Status Battery	Green	ON	Full
	Green	Flashing	Charging
	Yellow	ON	Limiting power charging
	Yellow	Flashing	Equalization charging
	Red	ON	Fault
	Red	Flashing	Overvoltage / Undervoltage
	/	OFF	No Battery Detected / Reverse Polarity

Troubleshooting

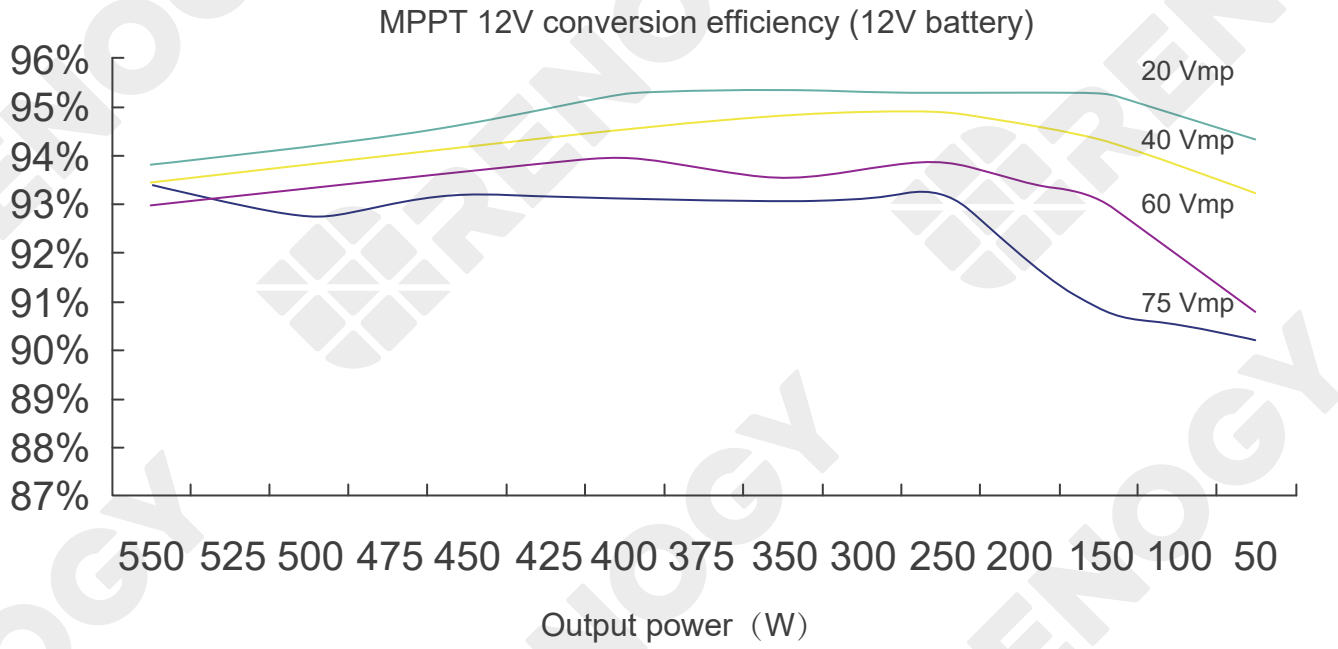
Fault	Description	Troubleshooting
Off Solar 	No solar panel is detected. / The solar panel voltage is too low.	1. Check the wiring from the solar panel to the charge controller. a. Make sure there is no reverse polarity contact. b. Make sure the fuse or circuit breaker in the circuit does not trigger a protective break. 2. Check the solar panel. a. Make sure it is not covered by shadows. b. Make sure it is not operating at excessively high temperature. c. Make sure that the input voltage is at least 2V higher than the battery voltage.
Off Battery 	No battery is detected / The battery polarity contact is reversed.	1. Check the wiring from the battery to the charge controller. Make sure no reverse polarity contact occurs. 2. Check the battery voltage. Measure the battery voltage with a multimeter. Ensure that the battery voltage ranges from 11 and 15V.
Fast flashing red for every 0.5s Battery 	Battery overvoltage	1. Measure the battery voltage with a multimeter. The fault is only triggered when the battery voltage is close to 16V. 2. Disconnect all external chargers and leave the battery in idle state.
Slow flashing red for every 1s Battery 	Battery undervoltage	1. Measure the battery voltage with a multimeter. 2. If the battery is low, disconnect all loads from the battery and charge the battery with the solar panel.
Solid red Battery 	The charge controller is abnormal.	Contact our customer service through renogy.com/contact-us/.

Technical Specifications

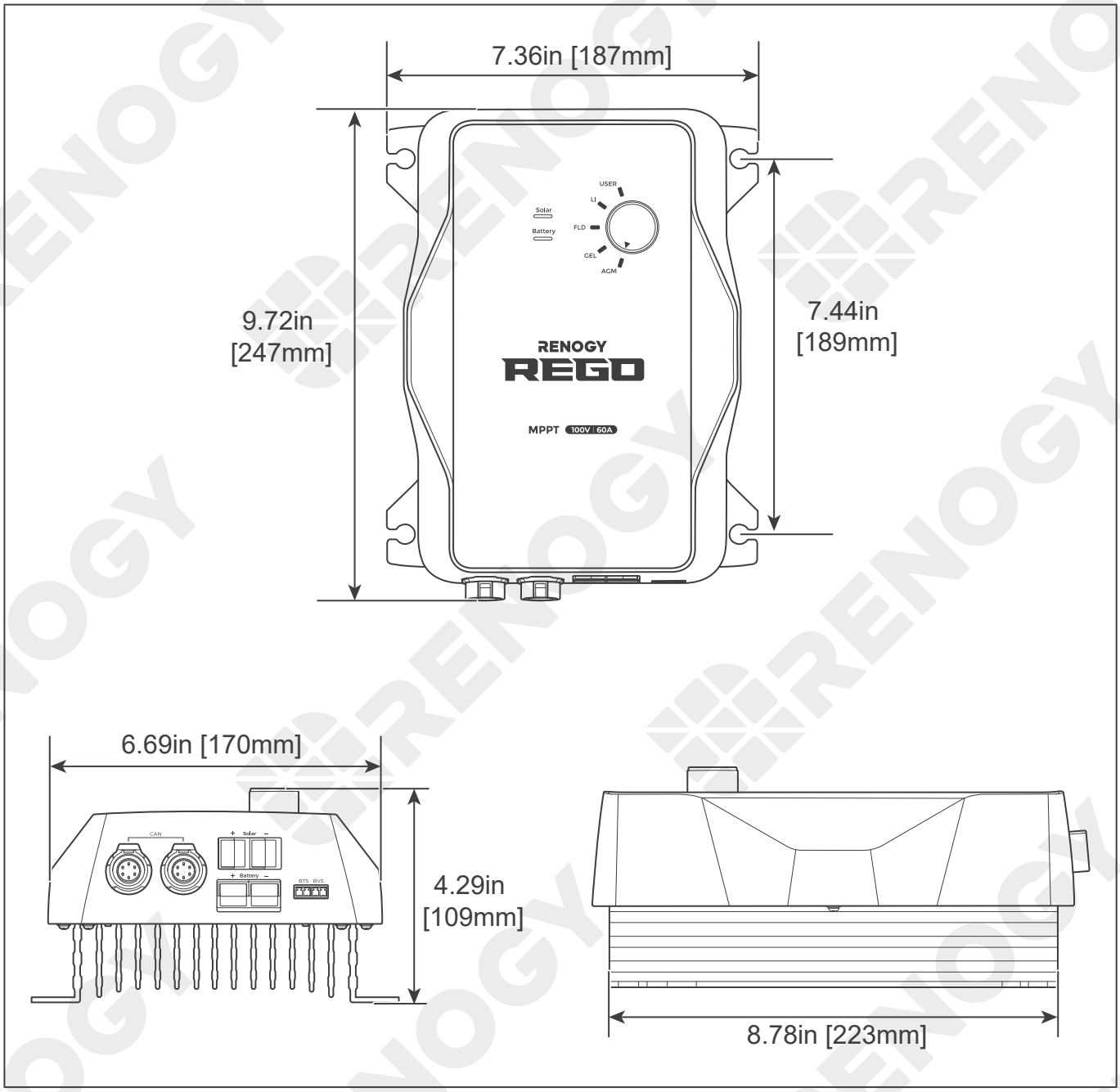
Parameter	Value
Model	RCC60REGO
Terminal Size	Anderson PP75
Terminal Range	6 AWG to 8 AWG
Grounding	Common Negative
Communication	CAN Bus
Operating Temperature	-4°F to 140°F / -20°C to 60°C
Storage Temperature	-13°F to 149°F / -25°C to 65°C
Humidity	0%-90%, RH
Cooling	Heat Sink
Dimensions (L x W x H)	9.72 x 7.36 x 4.29 in / 247 x 187 x 109 mm
Weight	4.7 lbs / 2.7 kg
Rated Battery Input Voltage	12V DC
Battery Input Voltage Range	10V to 16V DC
Rated Charge Current	60A
Rated Solar Input Power	800W (12V Battery)
Maximum Solar Input Voltage (Voc)	100V DC
Solar Input Voltage Range (Voc)	16V to 100V DC
Maximum Solar Input Current (Isc)	50A
Power Consumption	≤0.5 W
MPPT Tracking Efficiency	>99%
Conversion Efficiency	≤98%
Charger Efficiency	>95%
MPPT Operating Voltage Range	16V to 100V DC
Temperature Compensation	Non-lithium: -3mV / °C / 2V Lithium: 0mV / °C / 2V; no compensation
Charger Algorithm	3-stage Lead Acid, Bulk, Boost, Float, Equalize 2-stage Lithium, Bulk, Boost
Charger Preset	AGM, Gel, Flooded, Lithium-iron Phosphate, User Custo

MPPT 12V Conversion Efficiency

Light Intensity: 1000W/m^2 **Temperature: 25°C**



Dimensions



NOTE

- Dimension tolerance: ±0.2 in (0.5 mm)

Maintenance

Inspection

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

- Check the appearance of the charge controller to make sure it is clean and dry.
- Ensure the charge controller is mounted in a clean, dry, and ventilated area.
- Ensure there is no damage or wear on the cables.
- Ensure the firmness of the Anderson connectors and check if there are any loose, damaged or burnt connections.
- Make sure that the Battery indicator and Solar indicator are in normal state.
- Ensure there is no corrosion, insulation damage, or discoloration marks of overheating or burning.

NOTE

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

WARNING

- Risk of electric shock! Make sure that all power is turned off before touching the terminals on the charge controller.

Cleaning

Follow the steps below to clean the charge controller regularly.

- Disconnect all Anderson connectors that are connected to the charge controller.
- Wipe the charger housing and connector contacts with a dry cloth or non-metallic brush. If it is still dirty, you can use household cleaners.
- Dry the charge controller with a clean cloth and keep the area around the charger clean and dry.
- Make sure the charge controller is completely dry before reconnecting it to the solar panel and the battery.
- When reconnecting, the battery must be connected first, then the solar panel.

Storage

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

- Disconnect all Anderson connectors that are connected to the charge controller.
- By applying dielectric grease to each connector contact, 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 a temperature between -13°F and 149°F.

Emergency Responses

Fire | Flooding | Smell | Noise

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.

WARNING

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

Fire

1. Disconnect all cables connected to the charge controller.
2. Put out the fire with a fire extinguisher. Acceptable fire extinguishers include water, CO_2, and ABC.

WARNING

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

Flooding

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

Smell

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

Noise

1. Disconnect all cables connected to the charge controller.
2. Make sure no foreign objects are stuck in the controller Anderson connector.

NOTE

- The normal noise value of the charge controller is less than or equal to 40dB during operation.

Technical Support

For additional support, contact the Renogy technical support team through renogy.com/contact-us. Have the following information available when contacting Renogy.

- Owner name
- Contact information
- Order number
- Purchase channel
- Serial number
- Brief description of the issue

Renogy offers premium services worldwide:

North America	US	www.renogy.com	CN	www.renogy.cn
Asia/Pacific	UK	uk.renogy.com	CA	ca.renogy.com
	AU	au.renogy.com	JP	renogy.jp
Europe	FR	fr.renogy.com	DE	de.renogy.com
	ES	es.renogy.com	KR	kr.renogy.com

FCC Statement

This device complies with Part 15 of the FCC Rules. FCC ID: 2ANPBRSMLP4-G2. 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.

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) Orient 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.

Visit renogy.com to find relevant documentation or get more support via "Contact Us".
Renogy reserves the right to change the contents of this manual without notice.

Manufacturer: RENOGY New Energy Co.,Ltd
Address: No.66, East Ningbo Road Room 624-625
Taicang German Overseas Students Pioneer Park
JiangSu 215000 CN

EC REP
eVatmaster Consulting GmbH
Battinastr.30
60325 Frankfurt am Main, Germany
contact@ evatmaster. com

Manufacturer: RENOGY New Energy Co.,Ltd
Address: No.66, East Ningbo Road Room 624-625
Taicang German Overseas Students Pioneer Park
JiangSu 215000 CN

UK REP
EVATOST CONSULTING LTD
Suite 11, First Floor, Moy Road Business
Centre, Taffs Well, Cardiff, Wales, CF15 7QR
contact@evatmaster.com

Join the Renogy Power Plus Community
by downloading the DC Home App.
Find your e-warranty here, and more.