RENOGY
SUPERIOR **OFF-GRID** SOLUTIONS

RENOGY REGO
AC-DC Battery Charger
12V | 35A

RACC35A1W

VERSION A0
October 10, 2024

USER MANUAL

Before Getting Started

The user manual provides important operation and maintenance instructions for RENOGY REGO 12V 35A AC-DC Battery Charger (hereinafter referred to as battery charger).

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

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

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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 35A AC-DC Battery Charger supports various types of 12V batteries, offering a four-stage intelligent charging curve. It includes essential protections such as over-voltage, over-current, over-temperature, low-temperature, output short-circuit, and output reverse connection protection.

Additionally, when paired with the external Bluetooth BT-2 module, the battery charger allows you to monitor real-time operating status, access operational data, and adjust parameter settings through the DC Home app.

1.3. Key Features

- **Multi-Type Battery Support**
  This charger is versatile, accommodating both lithium, gel batteries, absorbed glass mat (AGM), sealed deep cycle (SLD) battery, flooded (FLD), and user-defined batteries, providing users with flexibility in their choice of battery technology.
- **Four-Stage Battery Charging Algorithm**
  With its advanced four-stage charging process, this charger optimizes battery performance and longevity. It ensures efficient and effective charging by sequentially performing stages such as bulk charge, absorption charge, float charge, and equilization charge.
- **Diverse Protections**
  The battery charger prioritizes safety with a range of built-in protections. From over-current and over-temperature protection to low-temperature, output short-circuit, and output reverse connection protections, this charger safeguards both the battery and the charging system against potential hazards.
- **Intuitive LED Indications**
  Equipped with intuitive LED indicators, this battery charger offers user-friendly feedback on its operating status. The LEDs provide clear and easily

understandable visual cues, indicating the current charging stage, battery status, and any potential issues.

- **Bluetooth Communication**
  By incorporating the optional Bluetooth communication module, users can seamlessly interact with the charger via the DC Home app. This feature enables convenient real-time monitoring of charging status, access to detailed operational data, and the ability to customize charging parameters remotely.

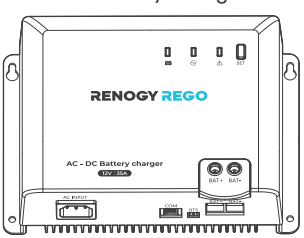
1.4. SKU

RENOGY REGO 12V 35A AC-DC Battery Charger	RACC35A1W

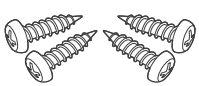
2. Get to Know AC-DC Battery Charger

2.1. What's In the Box?

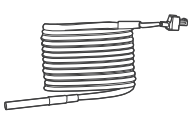
RENOGY REGO 12V 35A AC-DC Battery Charger × 1



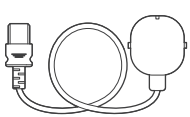
User Manual × 1



Mounting Screws x 4



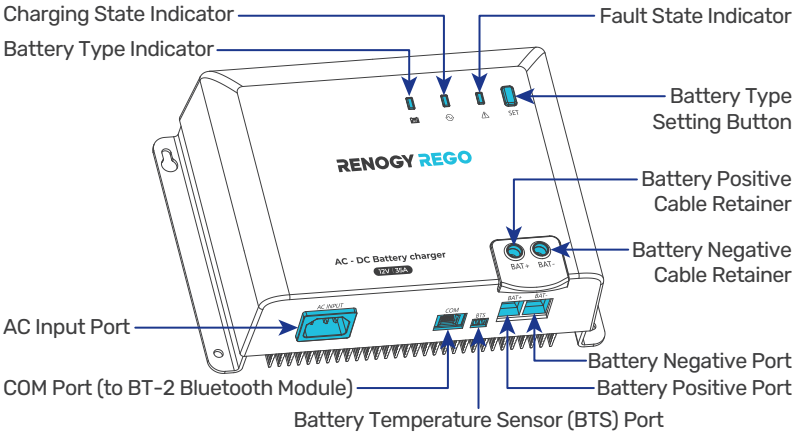
Battery Temperature Sensor (3 m) × 1



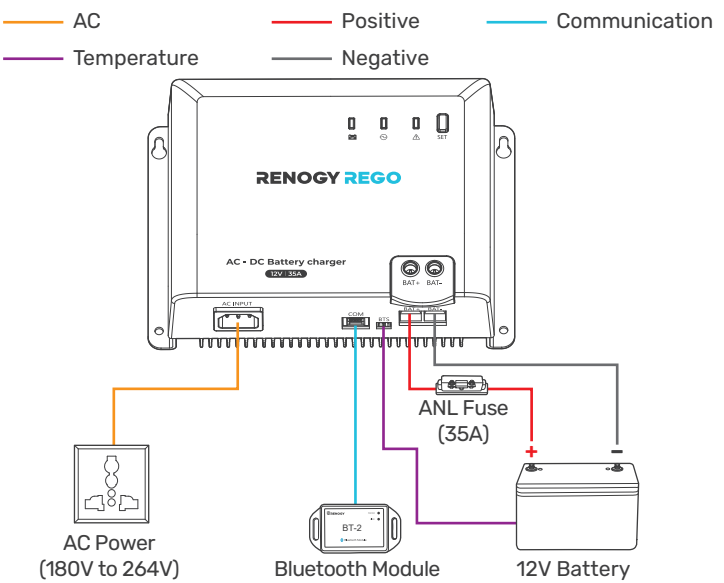
AC Power Cable × 1

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

2.2. Product Overview

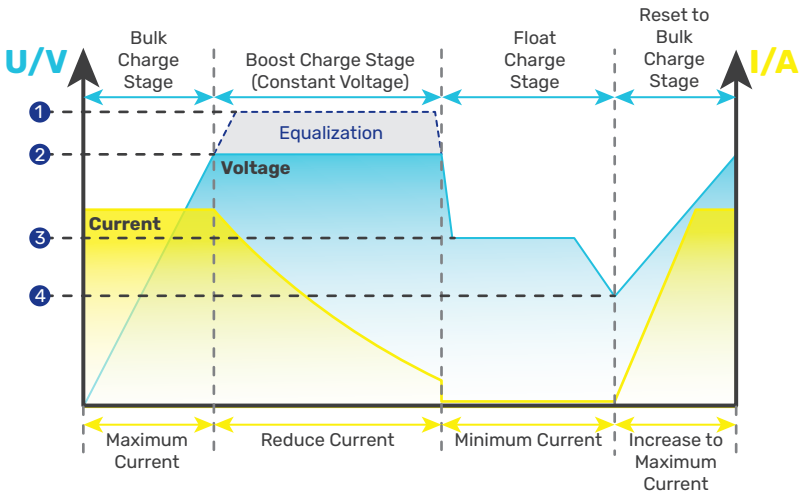


2.3. System Setup



2.4. Adaptive Four-Stage Charging

RENOGY REGO 12V 35A AC-DC Battery Charger 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.



1. Equalization charging voltage
2. Boost charging voltage
3. Float charging voltage
4. Low Voltage Disconnect Recover charging voltage

Bulk Charge

During the high current fast charging phase, if the battery voltage has not yet reached the preset value (Equalization or Boost), the battery charger will perform Bulk charging and output a constant maximum current value continuously and steadily. When the battery voltage reaches the preset value, it will move to the next stage of constant voltage.

Constant Charging

When the battery voltage reaches the preset value, the battery charger enters the constant voltage charging stage, and constant high current charge is no longer used in this process. At the same time, the charge current will gradually drop. Two states exist in the constant voltage charging phase-Equalizing and Boosting, which are not repeated.

Boost Charge: Boost stage maintains a charge for 2 hours by default. The user can adjust the constant time and preset value of Boost according to 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. In this case, the battery charger 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 battery charger will no longer be able to maintain the battery to a Float set point and the battery charger will end the Float charge stage and refer back to Bulk charging.

Equalization

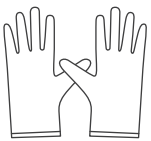
Equalization is carried out every 30 days of the month. It is intentional overcharging of the battery for a controlled period of time. Certain types of batteries benefit from periodic equalizing charge, which can stir the electrolyte, balance battery voltage and complete chemical reaction. Equalizing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

- It is recommended to only use no-sealed / vented / flooded / wet cell lead acid batteries in the Equalization stage, and the battery charger provides Equalization charging for flooded type batteries by default.
- Do not equalize VRLA type AGM / Gel / Lithium cell batteries unless permitted by battery manufacturer.
- Once Equalization is active in the battery charging, the battery charger will not exit this stage unless there is a sufficient source of charging current from the starter battery. 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 charge or too long of one may cause damage. Carefully review the specific requirements of the battery used in the system.
- Equalization may increase battery voltage to a level damaging to sensitive DC loads. Ensure that allowable input voltages of all loads are greater than the set voltage during Equalization charging.

3. Preparation

3.1. Recommended Tools

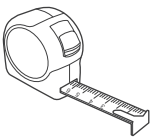
Phillips
Screwdriver (#1)



Insulating Gloves

Wire Stripper

Insulation Tape

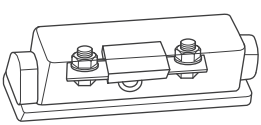


Measuring Tape

Bare Wires
(8 to 6 AWG)

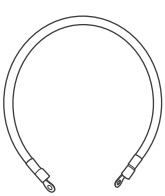
- Prior to installing and configuring the battery charger, prepare the recommended tools.
- It is recommended that all cables (except communication cables) should not exceed 10 meters (32.8 feet) because excessively long cables result in a voltage drop.
- In this manual, the red line represents the positive cable while the gray one represents the negative cable.

3.2. Optional Accessories



ANL Fuse (35A)

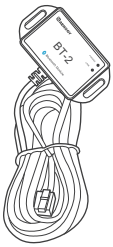
The ANL fuse protects the battery charger, cables and batteries from overcurrent.



Fuse Cable

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

The fuse cable size should be consistent with that of the bare wires.



BT-2 Bluetooth Module (sold separately)

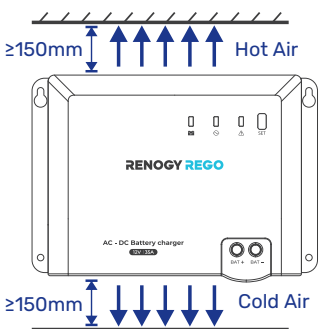
Pair the Bluetooth Module with the DC Home app to monitor and change parameters through a smartphone or tablet.

The BT-2 Bluetooth Module is optional in the setup.

4. Installation

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

4.1. Plan a Mounting Site



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

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

Risk of explosion! Never install the battery charger in a sealed enclosure with flooded batteries! Do not install the battery charger in a confined area where battery gases can accumulate.

The battery charger should be installed on a flat surface protected from direct sunlight.

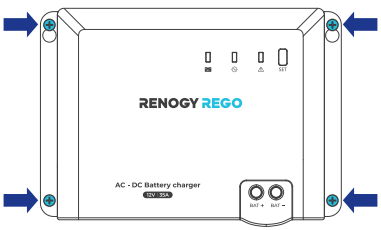
Keep the battery charger out of the reach of children and animals.

Make sure that the battery charger is installed in a place at ambient temperature from -4°F to 140°F (-20°C to 60°C).

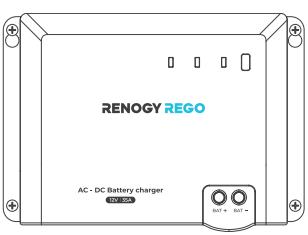
4.2. Mount the Battery Charger

Step 1: Mark the mounting position according to the mounting dimensions of the controller. Drill 4 mounting holes of the appropriate size at the 4 marks. Fix screws into the upper two mounting holes.

Step 2: Fasten the Controller
Align fixing holes of the controller with the two pre-fixed screws and hang the controller up. And then fix the lower two screws.



4.3. Wear Isolation Gloves



4.4. Connect the Battery Charger to a Battery

We use batteries with ring terminals and an ANL fuse as an example. For detailed instructions on how to connect the battery charger with the battery and fuses, please refer to the specific user manual of the battery of fuse in use.

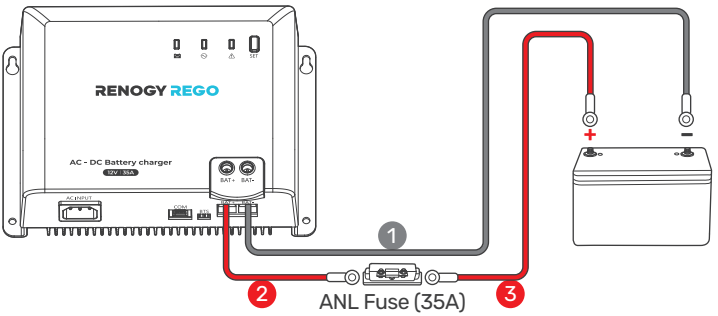
Step 1: Rotate Battery Positive/Negative Cable Retainers counterclockwise with a Phillips Screwdriver (#1) to fully open them.

Step 2: Use wire strippers to remove insulation from Bare Wires based on port depth.

Step 3: Insert negative (gray) wire into the Battery Negative Port, and secure it with the retainer by rotating screw clockwise. Connect the other end to the negative battery terminal.

Step 4: Insert positive (red) wire into the Battery Positive Port, and secure it with the retainer by rotating screw clockwise. Connect other end to an ANL Fuse.

Step 5: Connect the ANL Fuse and the positive battery terminal with the a Fuse Cable.

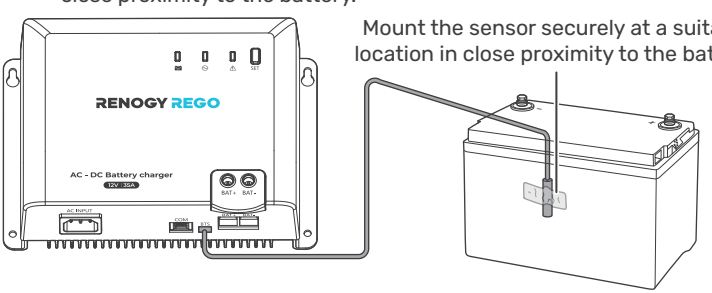


4.5. Install a Battery Temperature Sensor

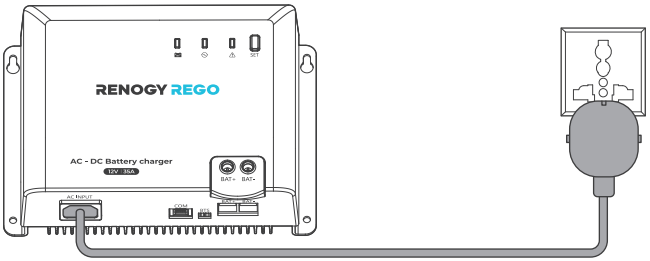
The temperature sensor measures the surrounding temperature of the battery and compensates the floating charge voltage when the battery temperature is low.

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

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



4.6. Connect the Battery Charger to AC Power

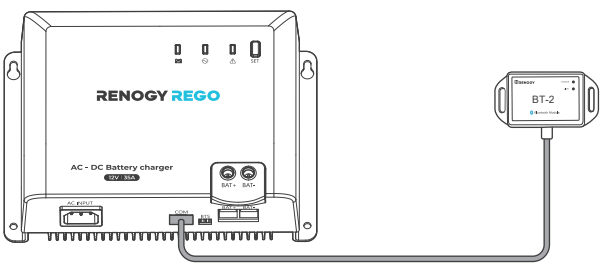


4.7. Install a Bluetooth Module (Optional)

With a BT-2 Bluetooth Module, the battery charger can be connected to the DC Home app for remote device monitoring. You can monitor and modify parameters of the battery charger through the app.

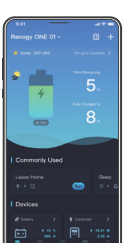
Step 1: Connect the Bluetooth Module to the COM port on the battery charger.

Step 2: Place the Bluetooth module in a suitable site.



Step 3: Laden Sie die DC Home App herunter und melden Sie sich an.

Step 4: Open the app. Tap “+” to search for new devices, tap “Confirm” to add the newly found battery charger to the device list. To ensure optimal system performance, keep the phone within 10 feet (3 m) of the bluetooth module.



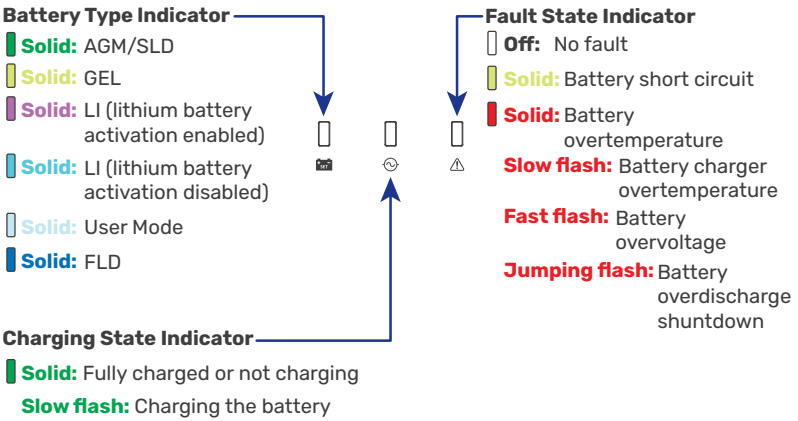
DC Home App

GTE IT ON Google Play

Download on the App Store

5. LED Indicators

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



Prior to see the indications of LEDs, you need to know the graphic expression of ON and OFF of LEDs for RENOGY REGO 12V 35A AC-DC Battery Charger.

LED ON		LED OFF	

The table below shows the graphic expression of Solid, Slow Flash, Fast Flash, and Jumping Flash.

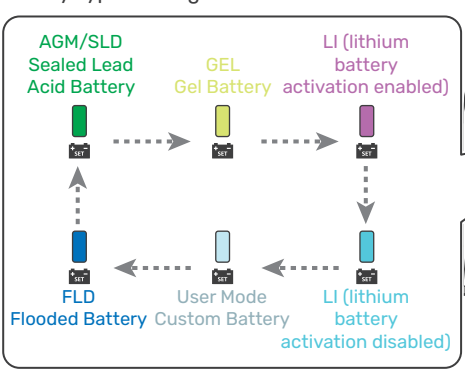
LED Pattern	Description	Graphic Expression
Solid	The LED remains continuously illuminated without any variation.	
Slow Flash	In this mode, the LED alternates between being on and off at a relatively slow and regular interval of 1s.	1s 1s 2s

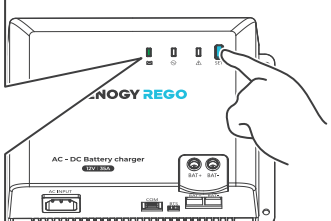
LED Pattern	Description	Graphic Expression
Fast Flash	In this mode, the LED alternates between being on and off at a relatively fast and regular interval of 0.1s.	
Jumping Flash	In this mode, the LED alternates between brief 0.5s on-off cycles followed by a longer 2.5s off period.	

6. Configuration

6.1. Set a Battery Type

Upon installing the battery charger, set a correct battery type by using the Battery Type Setting Button.





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

6.2. User Mode

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

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

6.3. Recommended Charging Parameters

The table below illustrates the default and recommended parameters for batteries that can be connected to the charge controller. The parameters may vary depending on the specific battery you use. Read the user manual of the specific battery or contact the battery manufacturer for help if necessary.

Before modifying battery parameters, check the table below first. Incorrect parameter setting wil 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.

Battery Type: Sealed Lead Acid Battery (AGM/SLD)

Overvoltage Shutdowm	16.0V
Overvoltage Disconnect Recover	15.0V
Equalizing Charging Volts	N/A
Boost Charging Volts	14.5V
Float Charging Volts	13.8V
Boost Recover	13.2V
Over-discharge Recover	12.6V
Undervoltage Recover	12.2V
Undervoltage Warning	12.0V
Over-discharge Warning	11.1V
Boost Duration	120min
Equalization Duration	N/A
Equalization Interval	0 days
Temperature Compensation	-3 mV/°C/2V

Battery Type: Gel Battery (GEL)

Overvoltage Shutdowm	16.0V
Overvoltage Disconnect Recover	15.0V
Equalizing Charging Volts	N/A
Boost Charging Volts	14.2V
Float Charging Volts	13.8V
Boost Recover	13.2V
Over-discharge Recover	12.6V
Undervoltage Recover	12.2V
Undervoltage Warning	12.0V
Over-discharge Warning	11.1V
Boost Duration	120min
Equalization Duration	N/A
Equalization Interval	0 days
Temperature Compensation	-3 mV/°C/2V

Battery Type: Flooded Battery (FLD)

Overvoltage Shutdowm	16.0V
Overvoltage Disconnect Recover	15.0V
Equalizing Charging Volts	14.8V
Boost Charging Volts	14.6V
Float Charging Volts	13.8V
Boost Recover	13.2V
Over-discharge Recover	12.6V
Undervoltage Recover	12.2V
Undervoltage Warning	12.0V
Over-discharge Warning	11.1V

Boost Duration	120min
Equalization Duration	120min
Equalization Interval	7 days
Temperature Compensation	-3 mV/°C/2V

■ **Battery Type: Lithium Battery (LI)**

Overvoltage Shutdowm	15.0V
Overvoltage Disconnect Recover	14.0V
Equalizing Charging Volts	N/A
Boost Charging Volts	14.2V (range: 12V–16V)
Float Charging Volts	13.5V
Boost Recover	13.3V
Over-discharge Recover	12.2V
Undervoltage Recover	11.9V
Undervoltage Warning	11.5V
Over-discharge Warning	11.1V
Boost Duration	60min
Equalization Duration	N/A
Equalization Interval	N/A
Temperature Compensation	N/A

■ **Battery Type: User Mode**

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

Actual Overvoltage Shutdown = Default Overvoltage Shutdown + (Boost Charging Volts - Allowed Boost Charging Voltage in the battery user manual). The maximum Overvoltage Shutdown value for lithium batteries can be set to 17V.

Overvoltage Shutdowm	Default: 16.0V Range: 7V–17V

Overvoltage Disconnect Recover	Default: 15.0V Range: 7V–17V
Equalizing Charging Volts	Default: 14.8V Range: 7V–17V
Boost Charging Volts	Default: 14.6V Range: 7V–17V
Float Charging Volts	Default: 13.8V Range: 7V–17V
Boost Recover	Default: 13.2V Range: 7V–17V
Over-discharge Recover	Default: 12.6V Range: 7V–17V
Undervoltage Recover	Default: 12.2V Range: 7V–17V
Undervoltage Warning	Default: 12.0V Range: 7V–17V
Over-discharge Warning	Default: 11.1V Range: 7V–17V
Boost Duration	Default: 120 min Range: 0–600 min
Equalization Duration	Default: 120 min Range: 0–600 min
Equalization Interval	Default: 7 days Range: 0–7 days
Temperature Compensation	Default: -3 mV/°C/2V Range: 0, 3, 4, and 5 mV/°C/2V

6.4. Activate Lithium Batteries

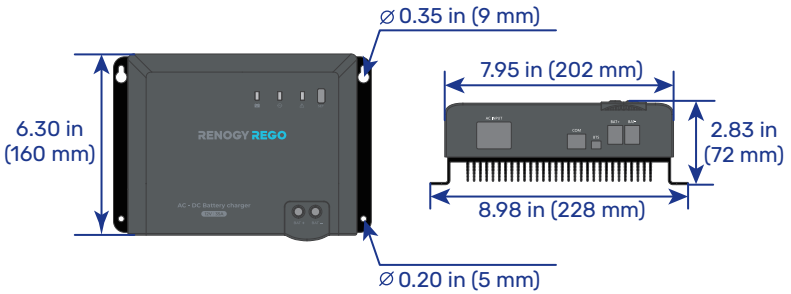
The battery charger can activate connected lithium batteries. Lithium batteries may enter sleep mode when the in-built protection is triggered. In such case, the battery charger provides a small current to reactivate the sleeping lithium battery. The lithium battery can be charged normally after successful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

Set the battery type of the battery charger to LI (lithium battery activation enabled) or User Mode.

If the battery voltage drops below 9V, the battery charger automatically activates the activation function and continues to charge the battery using constant voltage until the battery voltage reaches 14.4V.

7. Dimensions & Specifications

7.1. Dimensions



Dimension tolerance: ±0.2 in (0.5 mm)

7.2. Technical Specifications

Model	RACC35A1W
Maximum Output Current Rating	35A
Charging Algorithm	Adaptive Four-Stage Charging
Idle Power Consumption	< 5W
System Voltage	12V
Output Voltage	9V to 17V DC
Input Voltage	180V to 264V AC (45Hz to 65Hz)
Activate Lithium Batteries	Yes
Communication	External Bluetooth
Protections	Over-current, over-temperature, low-temperature, output short-circuit, and output reverse connection protections
Operating Temperature Range	-4°F to 140°F / -20°C to 60°C

Storage Temperature Range	-22°F to 176°F / -30°C to 80°C
IP Rating	IP32
Operating Altitude	Less than 6,561 ft (2000m)
Weight	< 6.61 lbs (3 kg)
Dimensions	8.98 x 6.3 x 2.83 in / 228 x 160 x 72 mm

8. Important Safety Information

8.1. General

- Wear proper protective equipment and use insulated tools during installation and operation. Do not wear jewellery or other metal objects when working on or around the battery charger.
- Keep the battery charger out of the reach of children.
- Do not dispose of the battery charger as household waste. Comply with local, state, and federal laws and regulations and use recycling channels as required.
- In case of fire, put out the fire with a FM-200 or CO_2 fire extinguisher.
- If installing this battery charger in a marine application or boat, please consult your qualified marine electrician prior to installation.
- Do not expose the battery charger to flammable or harsh chemicals or vapors.
- Clean the battery charger regularly.
- Do not puncture, drop, crush, penetrate, shake, strike, or step on the battery charger.
- Do not open, disassemble, repair, tamper with, or modify the battery charger.
- Connect the negative prior to the positive terminal when connecting any device.
- It is recommended that all cables should not exceed 10 meters because excessively long cables result in a voltage drop.
- The cable specifications listed in the user manual account for critical, less than 3% voltage drop and may not account for all configurations.

8.2. Battery Charger Safety

- Install the battery charger on a vertical surface - protected from direct sunlight, high temperatures, and water. Make sure there is good ventilation.
- Keep the battery charger away from heating equipment.
- Do not insert foreign objects into the battery charger.

- Confirm the polarities of the devices before connection. A reverse polarity contact can result in damage to the battery charger, thus voiding the warranty.
- Do not touch the connector contacts while the battery charger is in operation.
- Disconnect all connectors from the battery charger before maintenance or cleaning.

8.3. Battery Safety

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

Renogy Empowered

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

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

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

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

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