Renogy

AC-DC LFP Portable Battery Charger

14.6V | 20A

RBC20A1P

VERSION B4
September 1, 2025

USER MANUAL

Before Getting Started

The user manual provides important operation and maintenance instructions for Renogy 14.6V 20A AC to DC LFP Portable 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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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 14.6V 20A AC to DC LFP Portable Battery Charger is a specialized automatic portable charger designed for charging 12.8V LFP batteries. This charger integrates both an AC input line and a DC output line, and comes with two different styles of DC Output Adapter Cables (Alligator Clip and 3/8 in Ring Terminal), significantly reducing installation difficulty and making it easy to charge the battery.

Equipped with an LED status indicator, the charger provides intuitive visual feedback, helping users easily understand its working status. The charger can automatically monitor and maintain the battery in a fully charged state, ensuring a safe and efficient charging experience.

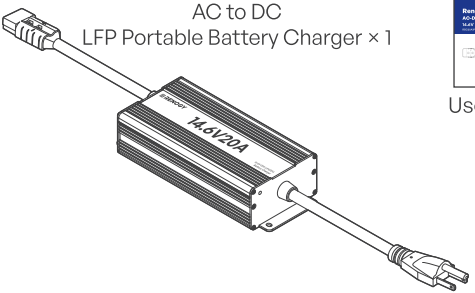
1.3. SKU

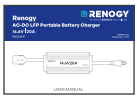
Renogy 14.6V 20A AC to DC LFP Portable Battery Charger	RBC20A1P

2. Get to Know AC-DC Battery Charger

2.1. What's In the Box?

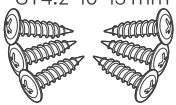
Renogy 14.6V 20A
AC to DC
LFP Portable Battery Charger × 1



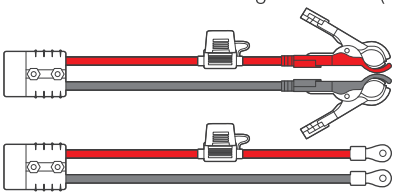


User Manual × 1

ST4.2*10*13 mm



Mounting Screws x 6 (2 extra)



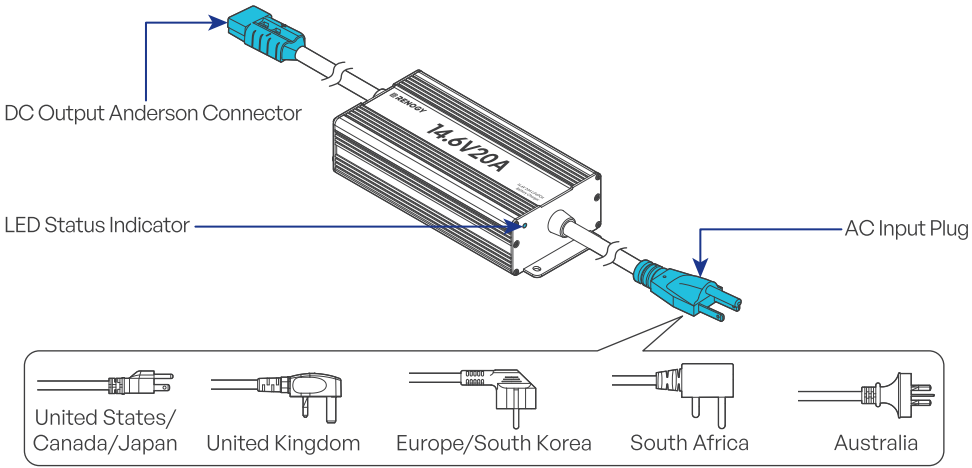
DC Output Adapter Cables (1.97ft / 0.6m) × 2

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

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

2.2. Product Overview

Battery Charger

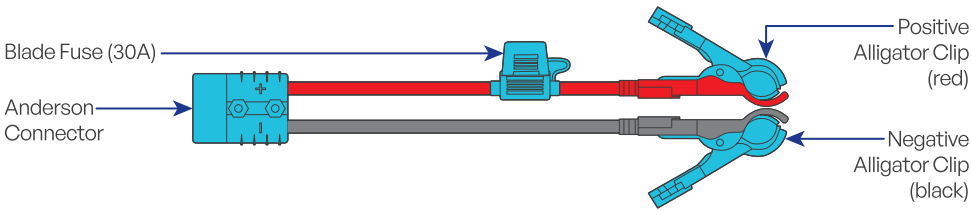


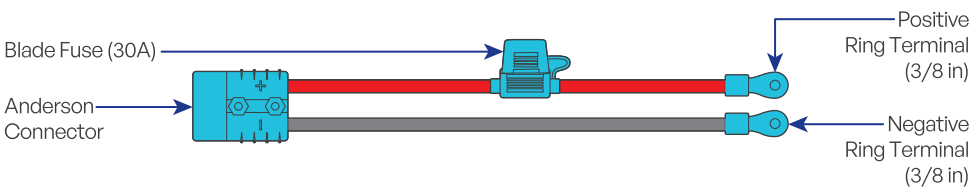
The illustrations in the user manual are for demonstration purposes only. Details may appear slightly different depending on product revision and market region.

DC Output Adapter Cables

The battery charger comes with two DC Output Adapter Cables.

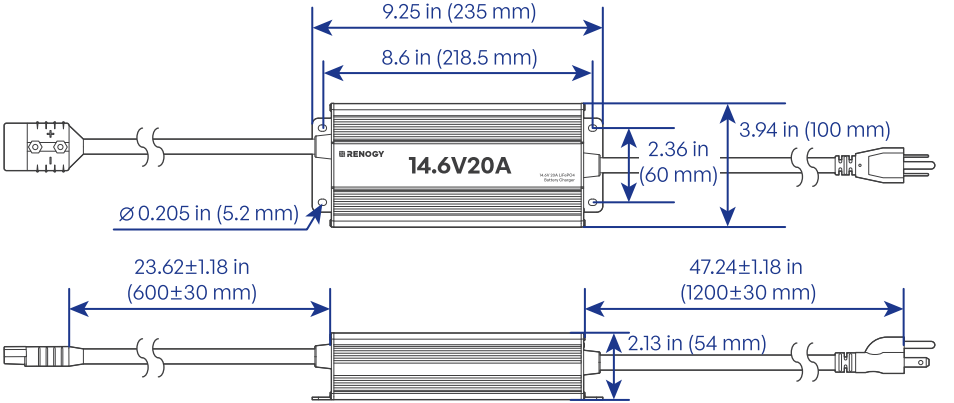
- For temporary charging, the convenient alligator clip can be used.
- For long-term use, it is recommended to use the securely installed ring terminal.





The red line represents the positive cable while the black one represents the negative cable.

2.3. Dimensions



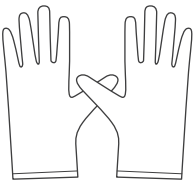
Dimension tolerance: ±0.2 in (1 mm)

3. Installation

3.1. Required Tools

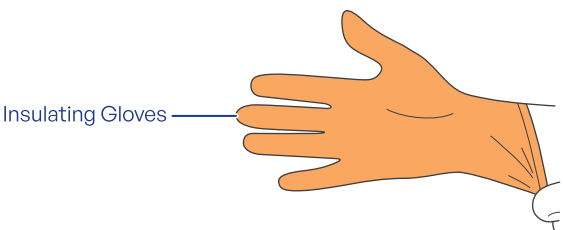
Prior to installing the battery charger, prepare the required tools.

Phillips Screwdriver (#1)



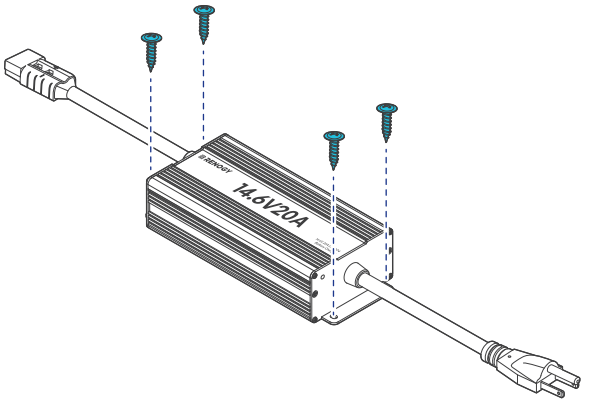
Insulating Gloves

3.2. Wear Isolation Gloves



3.3. Mount the Battery Charger

You can mount the battery charger vertically on a wall or horizontally on the floor. The battery charger should be installed on a flat surface protected from direct sunlight.



-4°F to 113°F
-20°C to 45°C

5% to 95%

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

3.4. Connect the Battery Charger to a Battery

This battery charger is only compatible with 12.8V Lithium Iron Phosphate (LFP, LiFePO4) batteries. It is prohibited to connect other types of batteries. The charger has an output current of 20A; please check the battery specifications to ensure that the maximum continuous charging current is greater than 20A. Otherwise, it may trigger overcurrent protection in the battery.

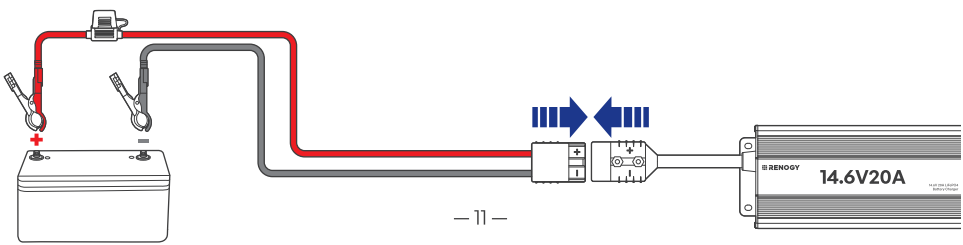
Make sure that the LiFePO4 batteries are equipped with a PCM/BMS when using this battery charger.

DC Output Adapter Cable (Alligator Clips)

Step 1: Connect the DC Output Anderson Connector of the battery charger to the Anderson Connector of the DC Output Adapter Cable.

Step 2: Connect the Negative Alligator Clip (black) of the DC Output Adapter Cable to the battery negative terminal.

Step 3: Connect the Positive Alligator Clip (red) of the DC Output Adapter Cable to the battery positive terminal.

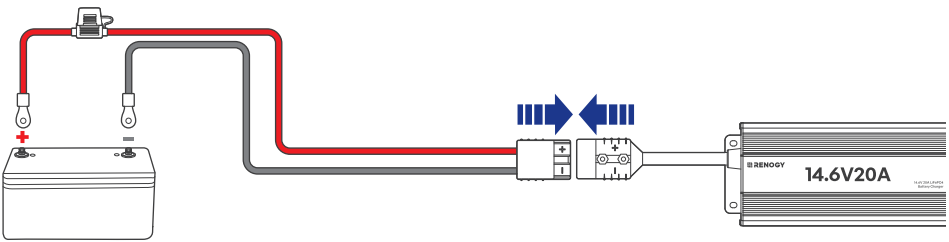


DC Output Adapter Cable (3/8 in Ring Terminals)

Step 1: Connect the DC Output Anderson Connector of the battery charger to the Anderson Connector of the DC Output Adapter Cable.

Step 2: Connect the Negative Ring Terminal (3/8 in) of the DC Output Adapter Cable to the battery negative terminal.

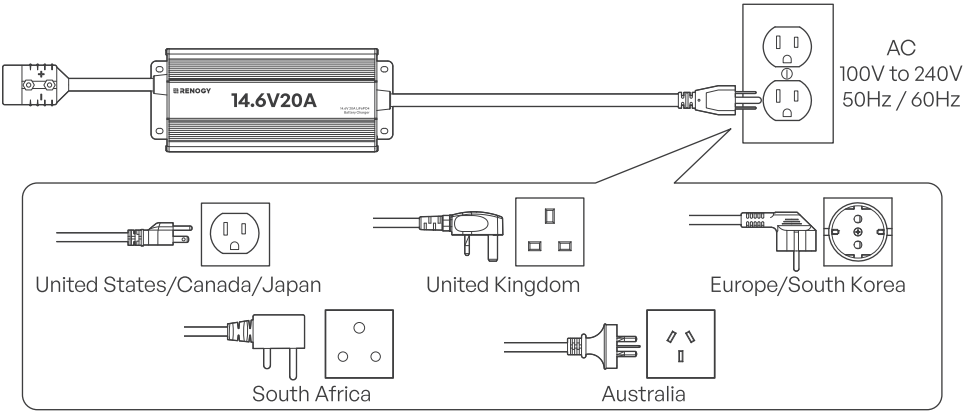
Step 3: Connect the Positive Ring Terminal (3/8 in) of the DC Output Adapter Cable to the battery positive terminal.



3.5. Connect the Battery Charger to AC Power

Connect the AC Input Plug of the battery charger to a grid power, and the battery charger will start charging the battery.

If a non-heated LFP battery is charged at temperatures below 32°F (0°C), the Battery Management System (BMS) will automatically stop the charging process.



3.6. Replace the Fuse

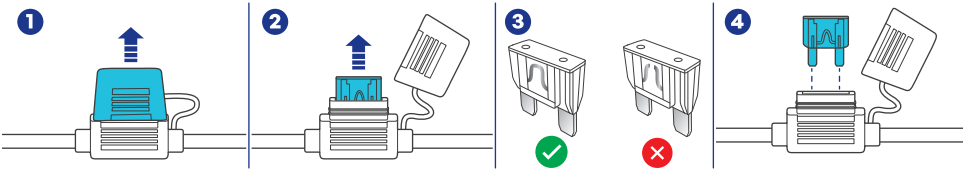
When the DC output current of the battery charger exceeds 30A, the 30A fuse in the DC Output Adapter Cable will blow. Follow the steps below to replace the blown fuse.

Step 1: Disconnect the battery charger from the grid power. Open the fuse dust cover.

Step 2: Pull the fuse straight out.

Step 3: Check if the fuse is damaged.

Step 4: Insert a new 30A fuse straight in and close the dust cover. Reconnect the battery charger to the grid power.



4. LED Indicators

LED Pattern	Description
Solid Green	• **Standby Mode:** The battery charger is connected to the grid power but not connected to the battery, resulting in no DC output. • **Battery Fully Charged:** The output current of the battery charger is less than 2A.
Solid Red	The battery charger is charging the battery.

LED Pattern	Description
Flash Red	The battery charger triggers reverse connection protection, output short circuit protection, output overvoltage protection, output overcurrent protection, or overtemperature protection.

5. Troubleshooting

Fault	Troubleshooting
Reverse Connection Protection	When the positive and negative terminals of the battery are connected in reverse to the battery charger, the charger will automatically shut down. Solution: Disconnect the battery charger from the grid power, rewire with the correct polarity, and then reconnect to the grid power.
Output Short Circuit Protection	If a short circuit occurs at the battery charger output, the charger will automatically shut down. Solution: Disconnect the battery charger from the grid power, check the circuit to eliminate the short circuit, and then reconnect to the grid power.

Fault	Troubleshooting
Output Overvoltage Protection	The battery charger will shut off the DC output when the output voltage is ≥15.33V. Solution: Disconnect the battery charger from the grid power, and then reconnect to the grid power.
Output Overcurrent Protection	The battery charger will shut off the DC output when the output current is ≥22A. Solution: Disconnect the battery charger from the grid power, and then reconnect to the grid power.
Overtemperature Protection	When the internal temperature of the battery charger reaches ≥95°C, the DC output current will drop to 4 (±1) A. If the temperature reaches ≥105°C, the DC output will shut off. Solution: Provide ventilation for the battery charger. The DC output will resume when the internal temperature falls below 75°C.

6. Activate Lithium Batteries

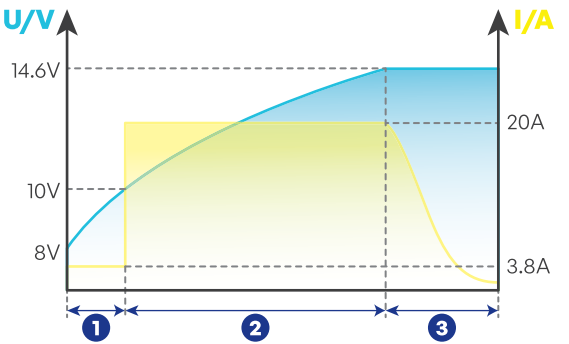
The battery charger can activate connected lithium batteries. Lithium batteries may enter sleep mode when the in-built protection is triggered. In such a case, the battery charger provides a small

current to reactivate the sleeping lithium battery. The lithium battery can be charged normally after successful activation.

If the battery voltage drops below 8V, the battery charger automatically activates the activation function and continues to charge the battery using constant voltage until the battery voltage reaches 14.6V. The battery charger cannot activate batteries with a voltage below 4 (±1) V.

7. Charging Logic

The battery charger utilizes a three-stage charging algorithm to achieve fast, efficient, and safe charging. The stages include: Precharge Stage, Fast Charge Stage, and Constant Voltage Charge Stage.



1. Precharge Stage
2. Fast Charge Stage
3. Constant Voltage Charge Stage

Precharge Stage

The battery charger provides a continuous current of 3.8A to charge the battery until the voltage reaches 10V, at which point the charger automatically switches to the Fast Charge Stage.

> If the battery voltage is below 8V, the battery charger will automatically activate the lithium battery until the voltage reaches 8V before entering the Precharge Stage.

Fast Charge Stage

This stage is the main charging phase, where the battery charger rapidly charges the battery with a constant current of up to 20A. When the battery voltage reaches 13.6V, the battery charger automatically switches to the Constant Voltage Charge Stage.

Constant Voltage Charge Stage

The charging current gradually decreases, providing a trickle charge to the battery. When the LED indicators are solid green, it indicates that the battery charging is complete.

8. Specifications

Model	RBC20A1P
Input Voltage Range	100V to 240V (50Hz / 60Hz)
Input Current	5A Max
No-Load Input Power Dissipation	≤3W
Maximum Output Voltage	14.6V (±0.2V)
Output Current	20A
Efficiency	≥89%
Operating Temperature Range	-4°F to 113°F / -20°C to 45°C
Storage Temperature Range	-40°F to 158°F / -40°C to 70°C
Relative Humidity	5% to 95%
Protection Rating	IP65
Dimensions	9.25 x 3.94 x 2.13 in / 235 × 100 × 54 mm
Weight	3.97 lbs / 1.8 kg

Certification	FCC, CE, RCM, UKCA, and RoHS
Warranty	2 years

9. Important Safety Information

9.1. 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 an 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.

9.2. 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.

9.3. 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.

10. Maintenance

10.1. Inspection

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

- Check the appearance of the battery charger to make sure it is clean and dry.
- Ensure the battery charger is installed in a clean, dry and ventilated area.
- Ensure the firmness of all cables and check if there are any loose, damaged or burnt connections.
- Make sure that all indicators are in normal state.
- Ensure there is no corrosion, insulation damage, or discoloration marks of overheating or burning.

> In some applications, corrosion may exist around the contacts. 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.

10.2. Cleaning

Follow the steps below to clean the battery charger regularly.

- Disconnect all cables that are connected to the battery charger.
- Wipe the housing of the battery charger and connector contacts with a dry cloth or non-metallic brush. If it is still dirty, you can use household cleaners.

- Dry the battery charger with a clean cloth and keep the area around the charger clean and dry.
- Make sure the battery charger is completely dry before reconnection.
- When reconnecting, follow the steps in the user manual.

10.3. Storage

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

- Disconnect all cables that are connected to the battery charger.
- By applying dielectric grease to each connector contact, the dielectric grease repels moisture and protects the connector contacts from corrosion.
- Store the battery charger in a well-ventilated, dry and clean environment with a temperature between -40°F to 158°F or -40°C to 70°C.

11. Emergency Responses

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

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

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

11.1. Fire

Disconnect all cables connected to the battery charger. Put out the fire with a fire extinguisher. Acceptable fire extinguishers include water, CO_2, and ABC.

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

11.2. Flooding

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

11.3. Smell

Disconnect all cables connected to the battery charger. Make sure nothing is in contact with the battery charger. Ventilate the room.

11.4. Noise

Disconnect all cables connected to the battery charger. Make sure no foreign objects are stuck in the battery charger ports.

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Questionnaire Investigation

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1(909)2877111

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FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and
(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 20cm between the radiator & your body.

Renogy Power PLUS

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