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Pure Sine Wave Inverter with Transfer Switch

12V | 2000W

RIV1220PU-235

VERSION A0
January 10, 2025

EN **RENOGY 12V 2000W Pure Sine Wave Inverter with Transfer Switch**
User Manual 01

DE **RENOGY 12V 2000W Pure Sine Wave Inverter with Transfer Switch**
Benutzerhandbuch 44

Before Getting Started

The user manual provides important operation and maintenance instructions for RENOGY 12V 2000W Pure Sine Wave Inverter with Transfer Switch (hereinafter referred to as inverter).

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 inverter, potentially rendering it inoperable.

- Renogy ensures the accuracy, sufficiency, and the applicability of information in the user manual at the time of printing due to continual product improvements that may occur.
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- Renogy is not responsible or liable for any failure, damage, or injury resulting from repair attempts by unqualified personnel, improper installation, or inappropriate operation.
- The illustrations in the user manual are for demonstration purposes only. Details may appear slightly different depending on product revision and market region.
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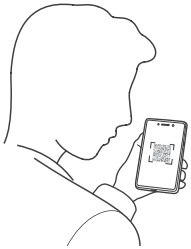
Online Manual



User Manual

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1. General Information

1.1. Symbols Used

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

WARNING: Indicates a potentially 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.

1.2. Introduction

RENOGY 12V 2000W Pure Sine Wave Inverter with Transfer Switch is ideal for a wide range of off-grid applications, including vans, semi-trucks, fifth wheels, cabins, and remote locations that require reliable power sources. The inverter converts DC Power stored in batteries into usable AC Power for appliances. Renogy's advanced pure sine wave technology empowers you to run a wide variety of AC appliances without the risk of damaging even your most sensitive equipment.

1.3. Key Features

- **Powerful DC-AC Conversion**
  Continuous rated output power with a conversion efficiency greater than 91%, and up to 2x surge for start-up loads.
- **Uninterrupted Power Supply (UPS)**
  Utilizing the built-in transfer switch, this inverter seamlessly switches to grid power, bypassing the inverter when it's available, thereby directly supplying the load with grid power.
- **Guaranteed Appliance Protection**
  Our pure sine wave technology ensures appliance longevity by delivering a clean sine wave that's comparable to or even better than grid power. Say goodbye to annoying buzzing sounds and enjoy the smooth operation of all your devices.
- **Easy to Use**
  Offers a built-in 5V/2.1A USB port, AC Outlet, Hardwired AC Output Terminal Block, and a Wired Remote Port.
- **Dependable Quality**
  The inverter complies with RoHS standards and is certified under relevant safety regulations, ensuring reliability and safety for users across different regions.

1.4. SKU

Country	SKU
Australia	RIV1220PU-235-AU
The UK	RIV1220PU-235-UK
Germany	RIV1220PU-235-DE

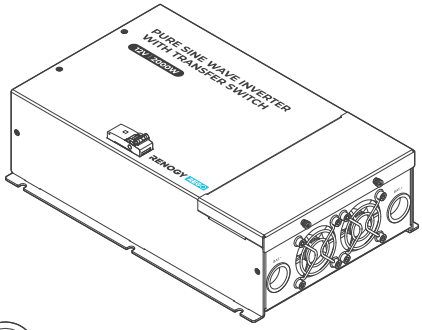
1.5. Model Difference

Model	Built in RCD
RIV1220PU-235-AU	Yes
RIV1220PU-235-UK & RIV1220PU-235-DE	No

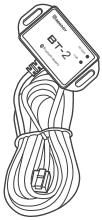
2. Get to Know RENOGY 12V 2000W Inverter

2.1. What's In the Box?

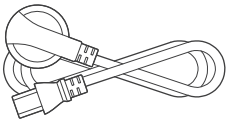
RENOGY 12V 2000W
Pure Sine Wave Inverter with Transfer Switch × 1



User Manual × 1

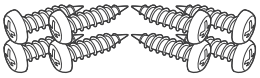


Renogy BT-2
Bluetooth Module × 1



AC Power Cable × 1

ST6.3*1.8*13 mm



Self-tapping Screws × 8
(2 extra)

Wired Remote
Control × 1

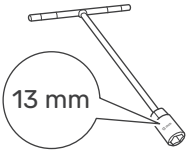
RJ12 Ethernet
Cable (5m) × 1

- Ensure 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.
- This manual utilizes the RIV1220PU-235-AU model as a reference for its illustrations. The product component and functions apply to the RIV1220PU-235-DE and RIV1220PU-235-UK model.

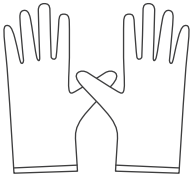
2.2. Required Tools

Prior to installing and configuring the inverter, prepare the recommended tools.

Phillips
Screwdriver (#1)



Socket Wrench
(17/32 in)

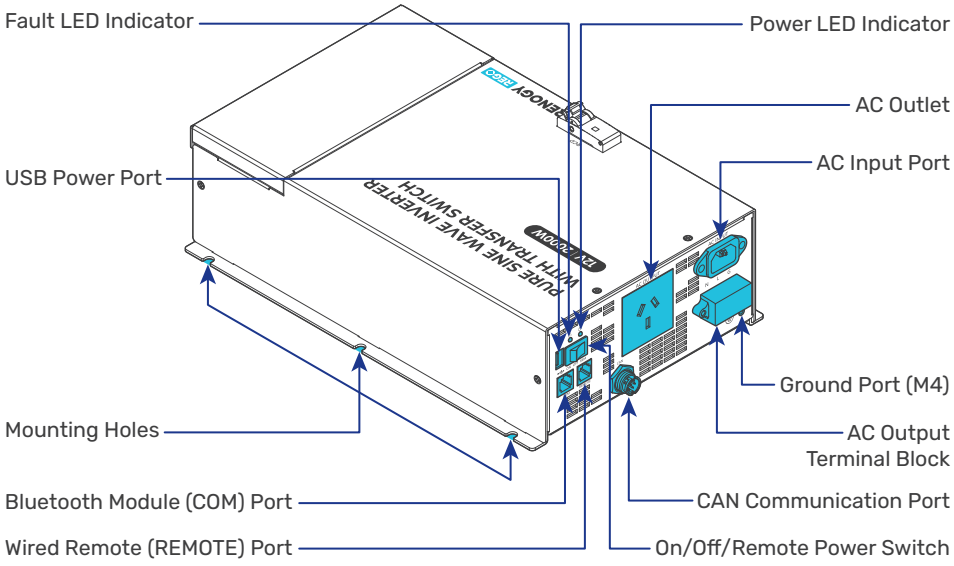


Insulating
Gloves

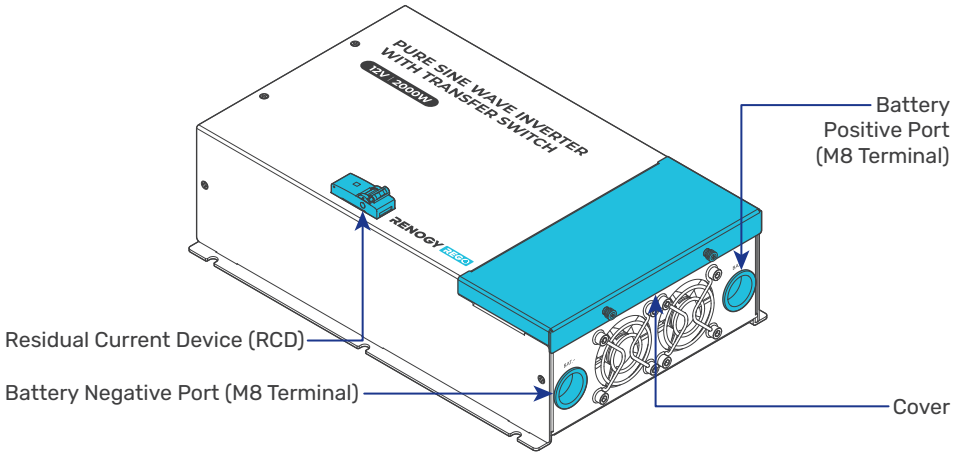
Wire
stripper

2.3. Product Overview

AC Side View

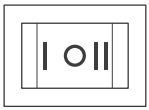
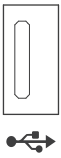
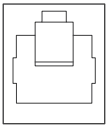
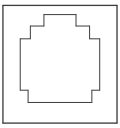


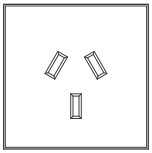
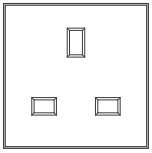
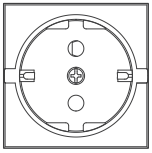
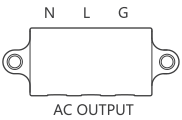
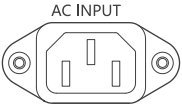
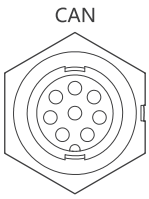
DC Side View



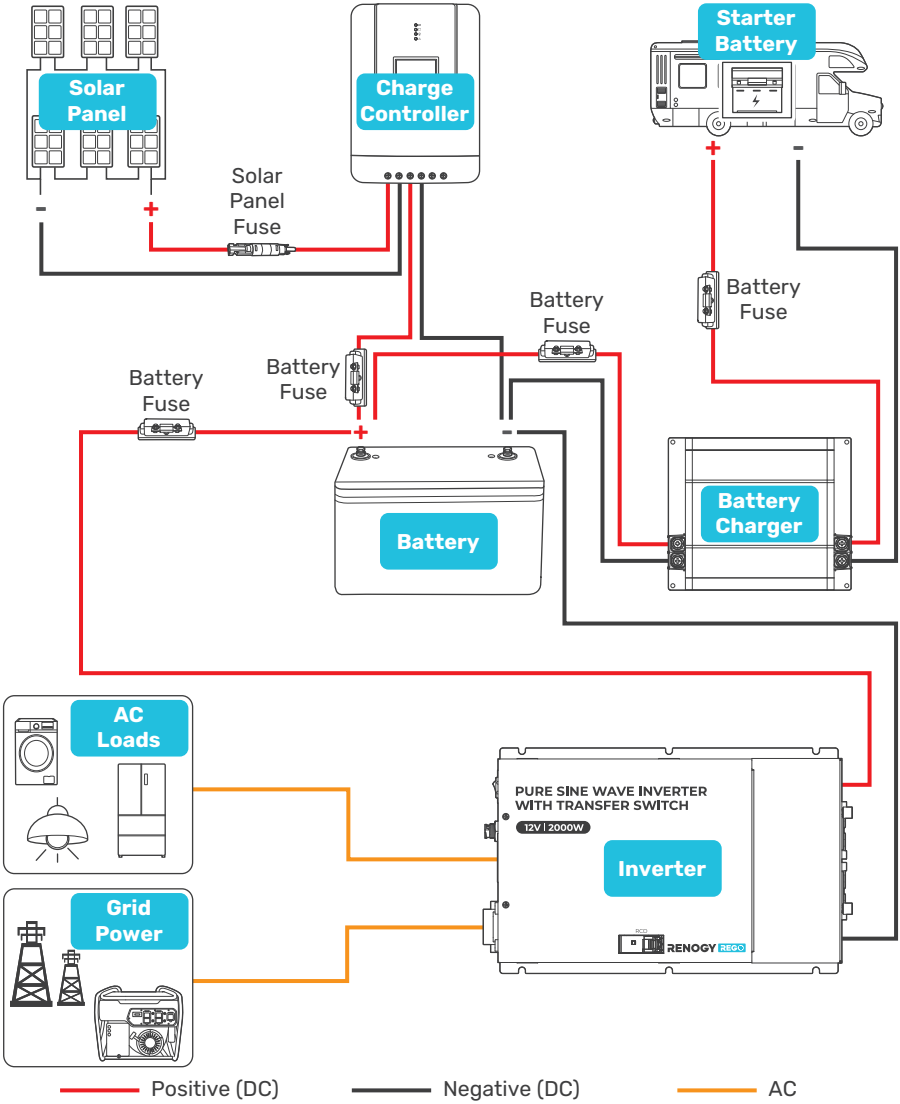
The RIV1220PU-235-DE and RIV1220PU-235-UK model does not have a built-in RCD.

2.4. Part Description

Part	Description
	**On/Off/Remote Power Switch** Turns the inverter ON, OFF, or REMOTE.
	**Power LED Indicator** Indicates the operational status of the inverter.
	**Fault LED Indicator** Indicates that the inverter shuts down due to overheating, overload, undervoltage, or overvoltage. Solution: 1. Immediately turn off all AC appliances. 2. Power off the inverter. 3. Check all AC appliance connections. 4. Check for overloads or short circuits in the AC appliances. 5. Verify the battery connections and ensure all cables are securely fastened. 6. Confirm that the battery voltage is within the inverter's allowable range. 7. Allow the inverter to cool before continuing. Make sure that the ventilation vents are not blocked. 8. Ensure all cables are of proper sizes and lengths.
	**USB Power Port** Supplies 5V/2.1A for charging tablets, smartphones, and other small appliances.
	**Wired Remote (REMOTE) Port** Connects to the Wired Remote Control.
	Bluetooth Module (COM) Port Connected to the Renogy BT-2 Bluetooth module, the inverter working status can be viewed and set through the DC Home app.

Part	Description
 RIV1220PU-235 -AU  RIV1220PU-235 -UK  RIV1220PU-235 -DE	**AC Outlet** 230V AC, 50 Hz, Up to 8.7A. Note: Combined loads on the AC Outlet and AC Terminal Block must not exceed 2000W, the total output power of the inverter.
	**AC Output Terminal Block** 230V AC, 50 Hz, Up to 8.7A. Remove the two screws on the protective cover to access the terminals. Terminal layout (facing the front panel): ● Left: Neutral (N) ● Middle: Live (L) ● Right: Ground (G) Note: Combined loads on the AC Outlet and AC Terminal Block must not exceed 2000W, the total output power of the inverter.
	**AC Input Port** When the inverter is connected to grid power through the AC Input Port, the grid power can directly supply power to the load through bypass.
	**CAN Communication Port** Can communicate with other Renogy devices supporting CAN communication and monitoring devices through CAN (common area network) bus, also known as RV-C, enabling safe operation, smart control, remote monitoring, and programmable settings.

2.5. System Setup

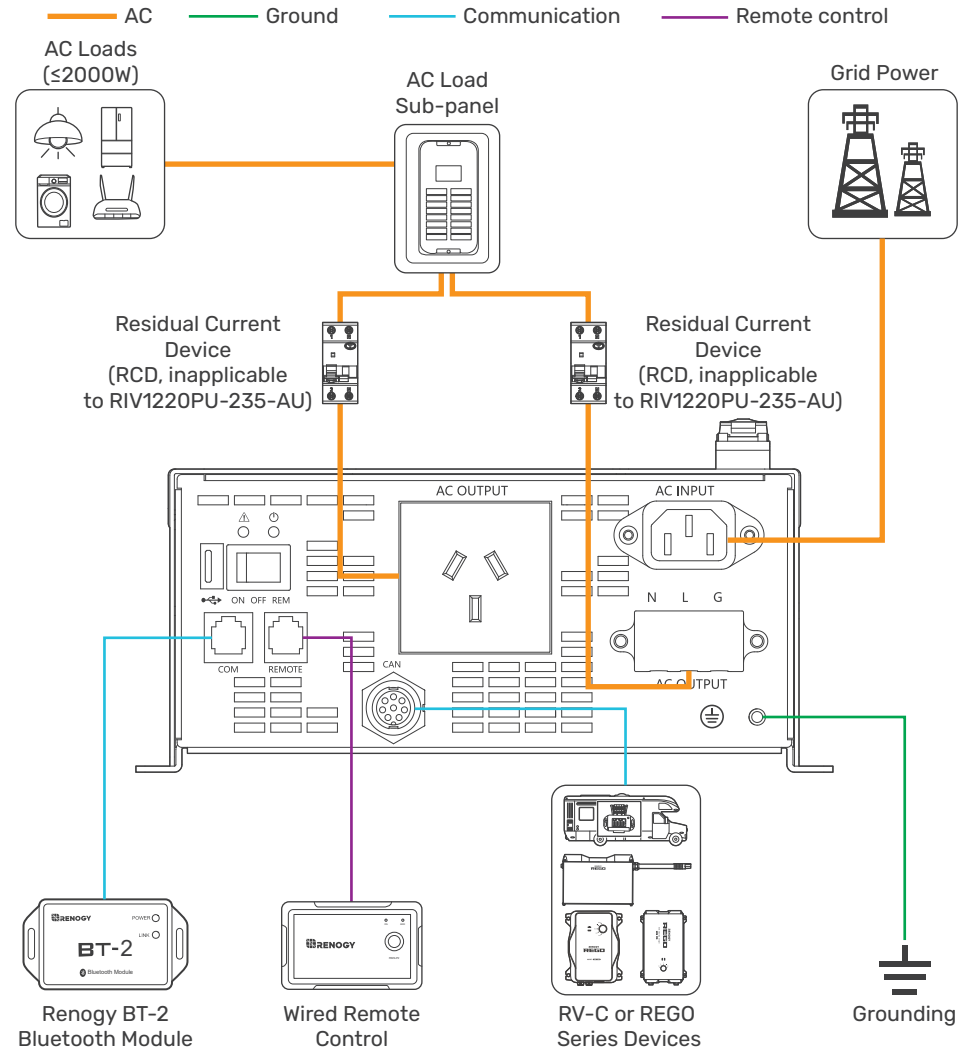


The wiring diagram only shows the key components in a typical DC-coupled off-grid energy storage system for the illustrative purpose. The wiring might be different depending on the system configuration. Additional safety devices, including disconnect switches, emergency stops, and rapid shutdown devices,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

The grid supplies the connected loads only. It does not charge the battery.

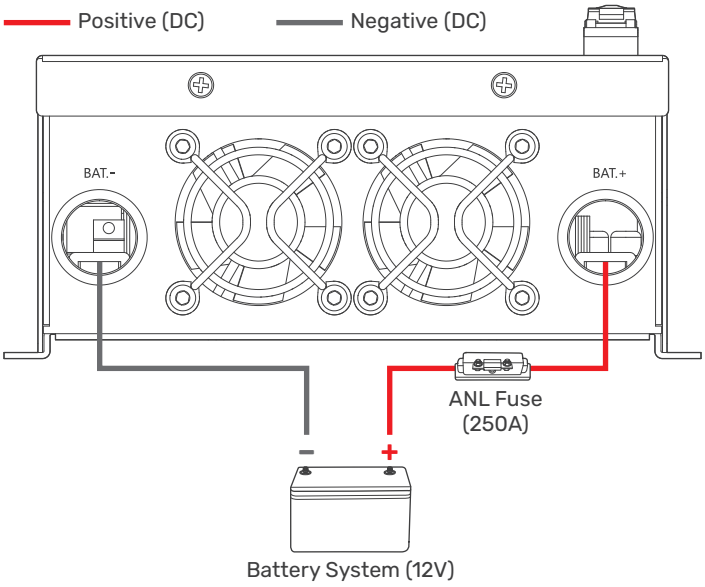
2.6. Inverter Wiring

AC Side View



The RIV1220PU-235-AU model has a built-in RCD and does not require an external RCD.

DC Side View



⚠ The battery fuse must be installed in the circuit from the inverter to the battery.

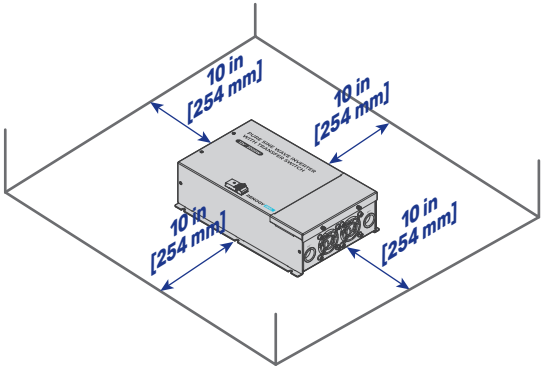
3. Preparation

3.1. Plan a Mounting Site

The inverter 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 inverter can be safely connected to the battery and grid power with the relevant cables.

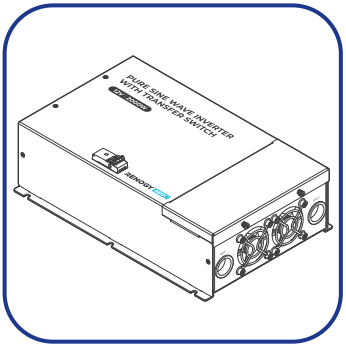
-4°F to 140°F
-20°C to 60°C

0% to 95%



- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Children should be supervised to ensure that they do not play with the appliance. Keep the inverter out of the reach of children and animals.
- Risk of explosion! Never install the inverter in a sealed enclosure with flooded batteries! Do not install the inverter in a confined area where battery gases can accumulate.
- The inverter should be installed on a vertical surface protected from direct sunlight.
- Do not expose the inverter to flammable or harsh chemicals or vapors.
- Ensure that the inverter is installed in a place at ambient temperature from -4°F to 140°F (-20°C to 60°C).
- Ensure that inverter is installed in an environment with relative humidity between 0% and 95% and no condensation.
- If the inverter is installed improperly on a boat, it may cause damage to components of the boat. Have the inverter by a qualified electrician.
- When the inverter temperature exceeds 104°F (40°C), the output power is reduced linearly by 2% per °C, reaching 1200W at 140°F (60°C). In such case, you need to reduce the connected loads manually to adapt to the power reduction.
- The inverter should be as close to the battery as possible to avoid voltage drop due to long cables.
- The cable specifications listed in the user manual account for critical, less than 3% voltage drop and may not account for all configurations.
- It is recommended that all cables (except communication cables) should not exceed 10 meters (32.8 feet) because excessively long cables result in a voltage drop. The communication cables should be shorter than 6 m (19.6 feet).
- Ensure the inverter is firmly grounded to a building, vehicle, or earth grounded. Keep the inverter away from EMI receptors such as TVs, radios, and other audio/visual electronics to prevent damage / interference to the equipment.

3.2. Check the Inverter



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

- Do not use the inverter if there is any visible damage.
- Do not puncture, drop, crush, penetrate, shake, strike, or step on the inverter.

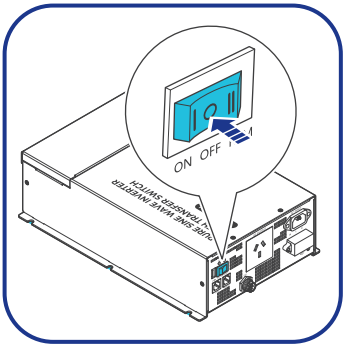
There are no serviceable parts in the inverter. Do not open, dismantle, repair, tamper with, or modify the inverter.

Confirm the polarities of the devices before connection. A reverse polarity contact can result in damage to the inverter and other connected devices, thus voiding the warranty.

Do not touch the connector contacts while the inverter is in operation.

Wear proper protective equipment and use insulated tools during installation and operation. Do not wear jewelry or other metal objects when working on or around the inverter.

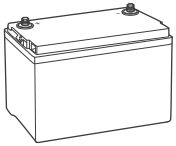
Do not dispose of the inverter as household waste. Comply with local, state, and federal laws and regulations and use recycling channels as required.



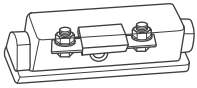
2. Ensure the On/Off/Remote Power Switch is in the OFF position.

3.3. Check the Battery

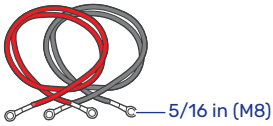
Recommended Components & Accessories



*12V Battery



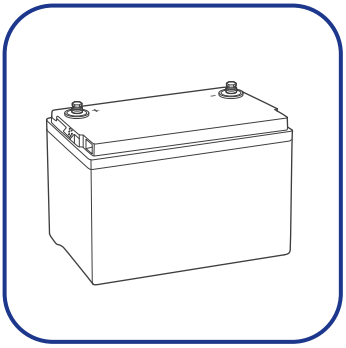
*ANL Fuse



*Battery Adapter Cables × 2

*Fuse Cable × 1

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



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

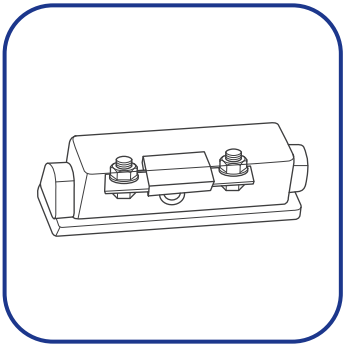
   The inverter can only be connected to 12V deep-cycle gel-sealed lead-acid batteries (GEL), flooded lead-acid batteries (FLD), sealed lead-acid batteries (SLD/AGM) or lithium iron phosphate batteries (LI).

- During the charging process, the battery must be placed in a well-ventilated place.
- Do not use the battery if there is any visible damage. Do not touch the exposed electrolyte or powder if the battery housing is damaged.
- When being charged, the battery may give off explosive gas. Ensure there is good ventilation.
- Take care to use a high-capacity lead-acid battery. Be sure to wear protective goggles. If carelessly getting electrolyte in your eyes, flush your eyes with clean water immediately.
- Combine batteries in parallel or in series as needed. Prior to installing the inverter, ensure all battery groups are installed properly.
- Read the user manual of the battery in use carefully.

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

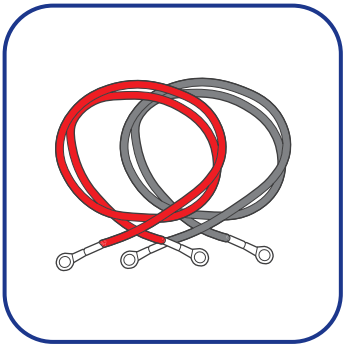
2. Check battery system voltage. This inverter supports a maximum system voltage of 15.5V. Read the user manual of the specific battery for battery voltage parameters, and calculate the voltage of the battery or battery pack system according to the formula to ensure that it does not exceed 15.5V.

- In the formula, U represents the battery voltage, and 1, 2, or 3 represents the battery number respectively. For batteries connected in series-parallel, refer to Series, Parallel, and Series-Parallel Connections of Batteries for the system voltage.
- The inverter operates normally at a range between 11V and 15.5V.
- Do not connect batteries rating higher than 16V to the inverter. Doing so will damage the inverter.



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

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



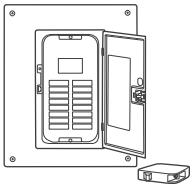
4. Inspect the Battery Adapter Cables for any visible damage including cracks, dents, deformation, and other visible abnormalities. All ring terminals are fastened to the cables.

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

3.4. Check the AC Loads (Appliances)

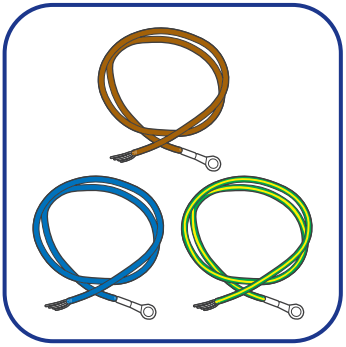
Recommended Components & Accessories

Adapter Cables × 3


AC Load Sub-panel


AC Loads (≤2000W)

ℹ You can connect the AC output of the inverter to an AC load sub-panel or supplementary AC outlets. In this section, we use a brown wire for live, a blue wire for neutral, and a chartreuse wire for ground.



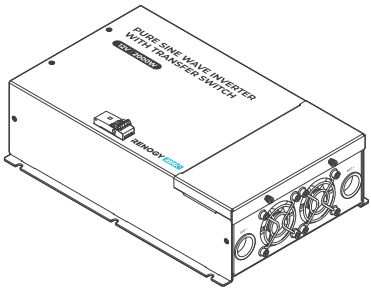
Inspect the Adapter Cables for any visible damage including cracks, dents, deformation, and other visible abnormalities. All ring terminals shall be clean, dry, and free of dirt and corrosion.

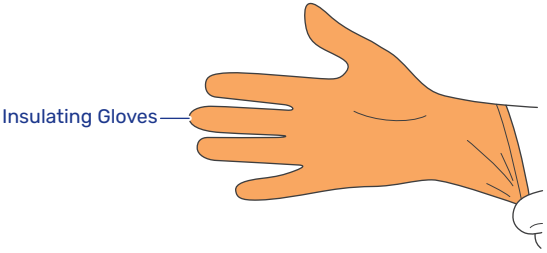
⚠ Do not use the adapter cables if there is any visible damage.

4. Installation

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

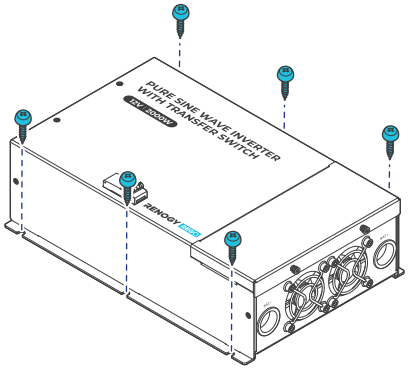
4.1. Wear Insulating Gloves





4.2. Mount the Inverter

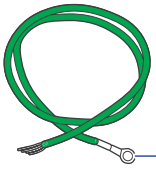
Secure the inverter to the installation site by fixing the included self-tapping screws through the mounting holes.



Ensure that the inverter is installed firmly to prevent it from falling off.

4.3. Ground the Inverter

Recommended Components



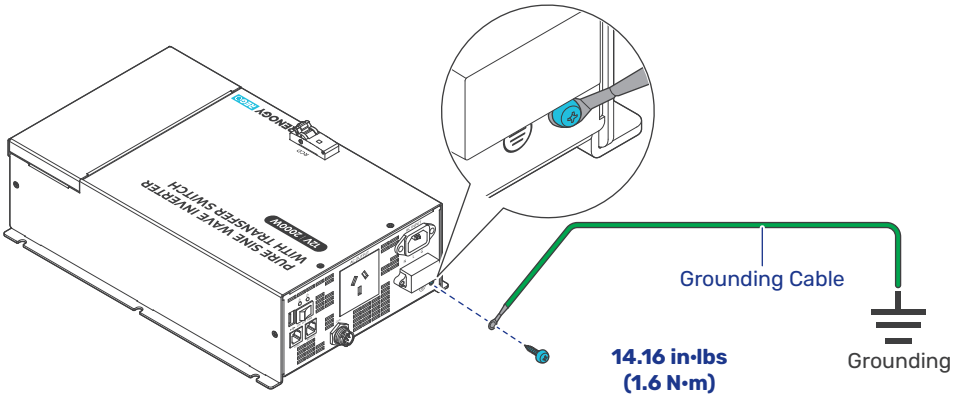
Grounding Cable (14 AWG / 2.1 mm²)

Step 1: Remove the screw on the Ground Port with a Phillips screwdriver (#1).

Step 2: Connect the Grounding Cable Ring Terminal to the grounding port of the inverter with the removed screw by using the Phillips screwdriver (#1).

Step 3: Connect the bare wire end of the grounding cable to a grounding rod (not included), if applicable.

- The screw torque of a cable clamp is 14.16 in•lbs (1.6 N•m). Do not overtighten the screws to prevent damage.
- The DC Grounding system is sometimes referred to as the earth ground or another designated ground. In an RV Setting, the metal frame of the RV could be the designated ground. A common ground should be used to bond the inverter, negative bus bar, and negative battery terminal together, if applicable.

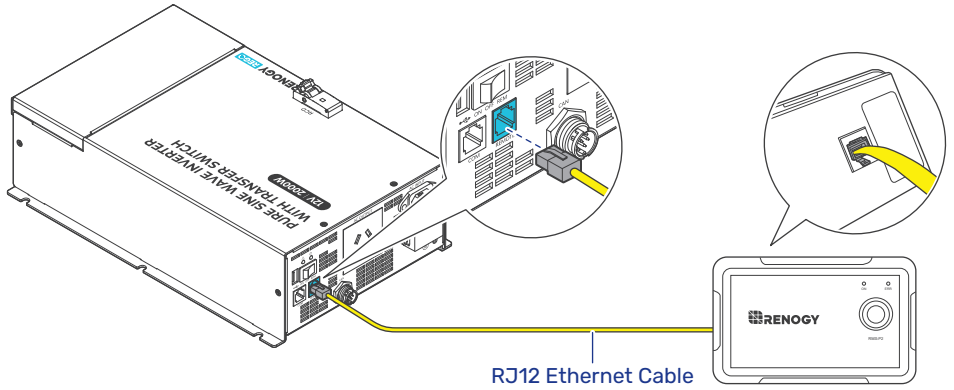


4.4. Install a Wired Remote Control

You can use a Wired Remote Control to power on or off the inverter remotely.

Step 1: Connect the RJ12 connector to the Wired Remote (REMOTE) Port on the inverter.

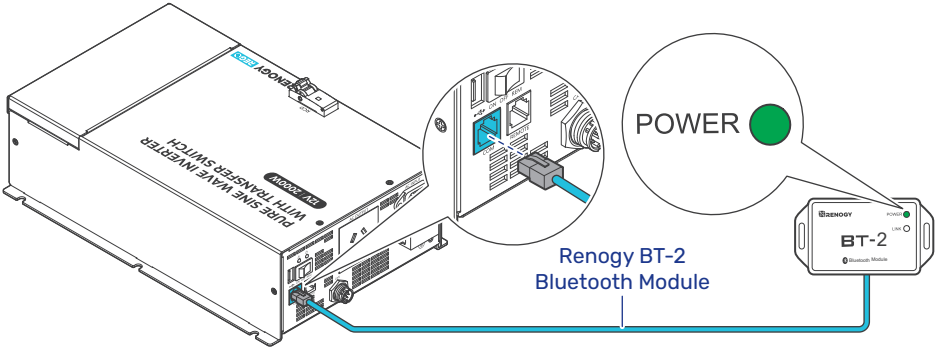
Step 2: Connect the other end of the cable to the Wired Remote Control.



4.5. Install a Bluetooth Module

Step 1: Connect the Renogy BT-2 Bluetooth Module to the Bluetooth Module (COM) Port on the inverter. After the inverter is powered on, the Bluetooth Module POWER indicator light will remain solid green.

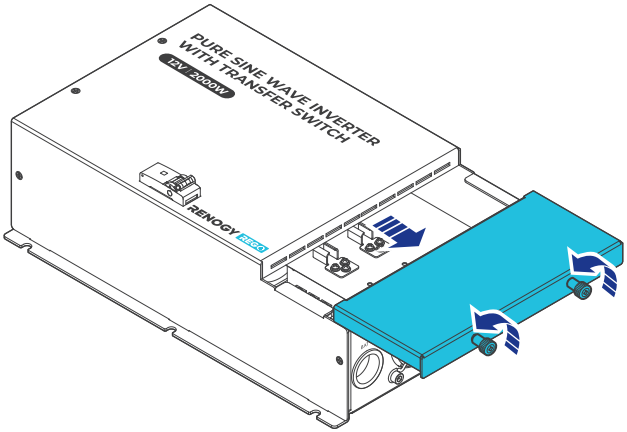
Step 2: Place the Bluetooth module in a suitable site.



4.6. Remove the Cover

Step 1: Turn the two Cover Screws counterclockwise either by hands or by using a Phillips screwdriver.

Step 2: Remove the Cover.



4.7. Connect the Inverter to a Battery

Step 1: Remove the retaining bolt from the Battery Negative Terminal on the inverter by using a Socket Wrench. Run the Negative Battery Adapter Cable through the grommet of the Battery Negative Port of the inverter, and connect the ring terminal of the Negative Battery Adapter Cable to the Battery Negative Terminal with the retaining bolt.

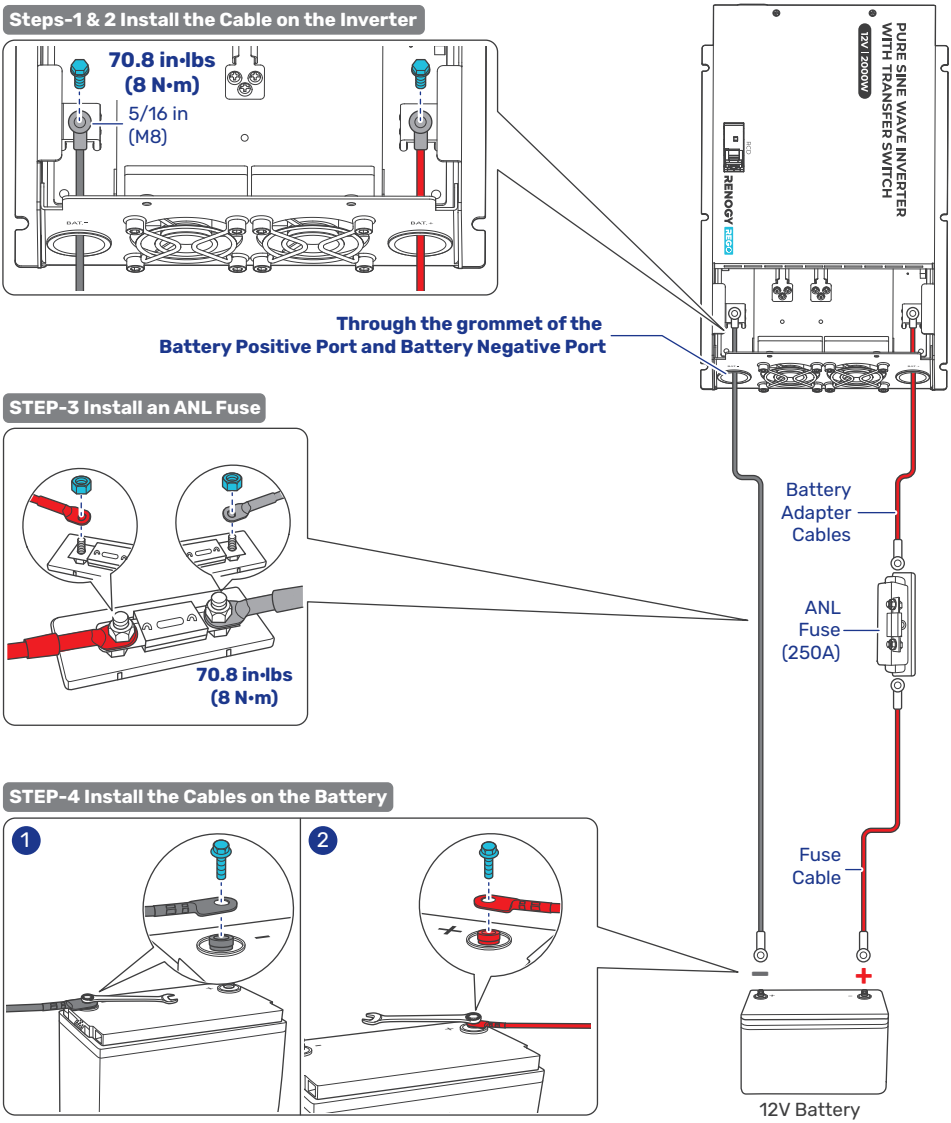
Step 2: Connect the other ring terminal of Negative Battery Adapter Cable to the negative terminal of the battery.

Step 3: Repeat the actions in Step 1 on the Battery Positive Terminal on the inverter to finish connection on the positive end.

Step 4: Remove the retaining nuts from the ANL Fuse, connect the Positive Battery Adapter Cable to one end of the ANL Fuse, and fix them with one retaining nut.

Step 5: Connect the ANL Fuse to the positive terminal of the battery via the Fuse Cable, and fix the fuse cable on the ANL Fuse with the other retaining nut.

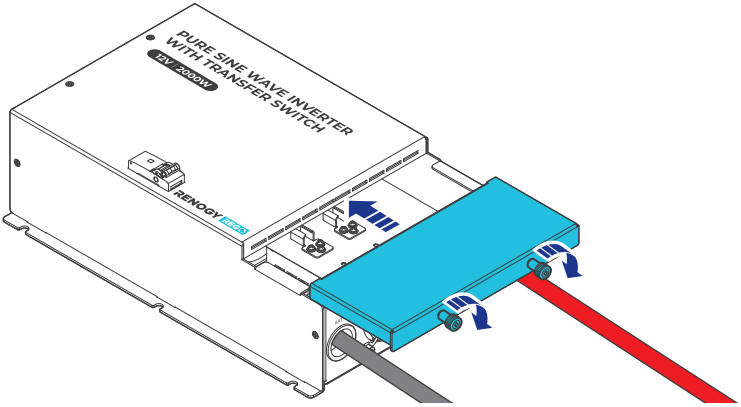
The retaining nut torque of the Battery Positive/Negative Terminal is 70.8 in•lbs (8 N•m). Do not overtighten it to prevent damage.



4.8. Install the Cover

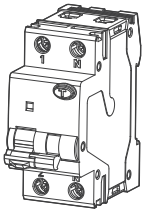
Step 1: Install the cover to the inverter.

Step 2: Install the two cover screws clockwise either by hands or by using a Phillips screwdriver.



4.9. Connect the Inverter to AC Loads (Appliances)

You can establish a permanent connection from the AC output by linking it through the AC Outlet and AC Output Terminal Block to an RCD, a load sub-panel, or supplementary AC outlets that receive power from the inverter. This section takes a load sub-panel and a Residual Current Device (RCD) for RIV1220PU-235-UK model as an example. The residual current device (RCD) effectively protects the inverter and connected devices. In the event of a leakage fault, the RCD immediately cuts off power, preventing circuit damage, fires, and electric shock accidents.



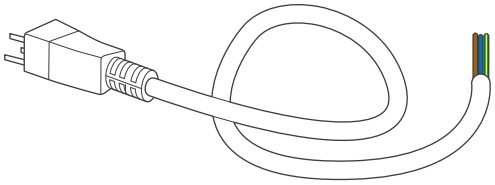
Residual Current Device (RCD)

Recommended RCDs	
Protection	Overcurrent Protection
Rated Residual Current	30mA
Rated Current	10A
Rated OperatingVoltage	230V/240V
Type	Type A

Installing an external RCD is not required for the RIV1220PU-235-AU model because it has a built-in RCD. Therefore, ignore steps related to RCDs below, and connect the AC Outlet and AC Output Terminal Block to an AC load sub-panel directly.

AC Outlet

Recommended Components



AC Power Cable w/ Bare End

Step 1: Insert the AC Power Cable connector into the AC Outlet on the inverter.

Step 2: Connect the live wire (L terminal) and the neutral wire (N terminal) to a RCD (Residual Current Device).

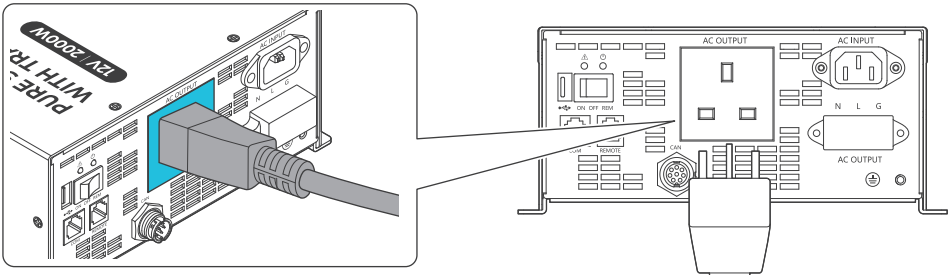
Step 3: Connect the RCD to an AC load sub-panel. The live wire should be connected to the L terminal of the sub-panel. The same rules apply to the neutral (N) and ground (PE) terminals.

Step 4: Select an appropriate circuit breaker according to the operating load current, and connect the load to the AC load sub-panel. Connect the live wire to the (L) terminal, the neutral wire to the (N) terminal, and the ground wire to the (PE) terminal. Install the front cover of the AC load sub-panel and turn on all the circuit breakers in the AC load sub-panel.

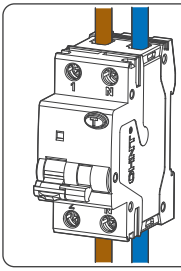
For detailed instructions on how to wire an AC load sub-panel, please refer to the user manual of the specific AC load sub-panel.

For your safety, it is recommended that qualified electricians familiar with safety codes of electrical systems perform the installation.

STEP-1 Install the Cables on the Inverter



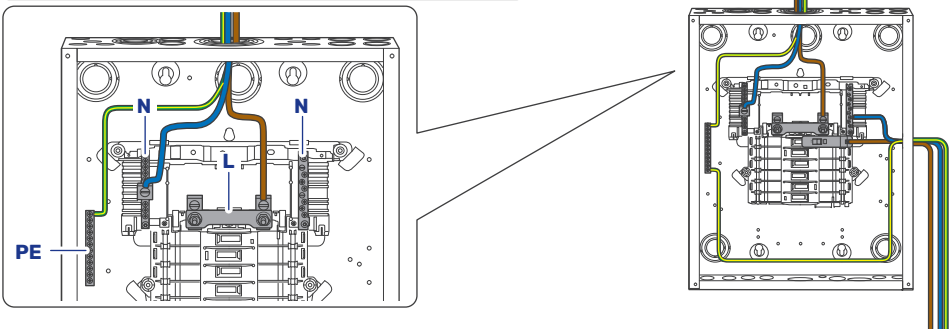
STEP-2 Install a Residual Current Device (RCD)



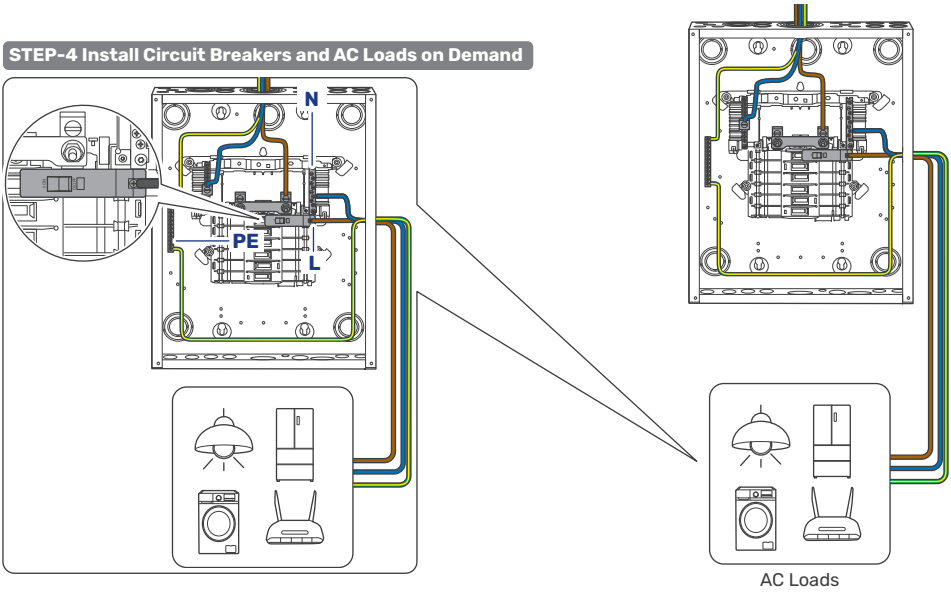
(inapplicable to RIV1220PU-235-AU)

Residual Current Device (RCD)

STEP-3 Connect the Bare Ends to an AC Load Sub-panel



STEP-4 Install Circuit Breakers and AC Loads on Demand



AC Output Terminal Block

Step 1: Remove the two screws on the protective cover to access the terminals.

Step 2: Remove the fixed bolts and square washers from the terminals.

Step 3: Use the fixed bolts and square washers to secure the 3/16 in (M4) ring terminals of the Adapter Cables to the corresponding terminals. Connect the live wire to the L terminal, the neutral wire to the N terminal, and the ground wire to the G terminal.

Step 4: Connect the live wire (L terminal) and the neutral wire (N terminal) to a RCD (Residual Current Device).

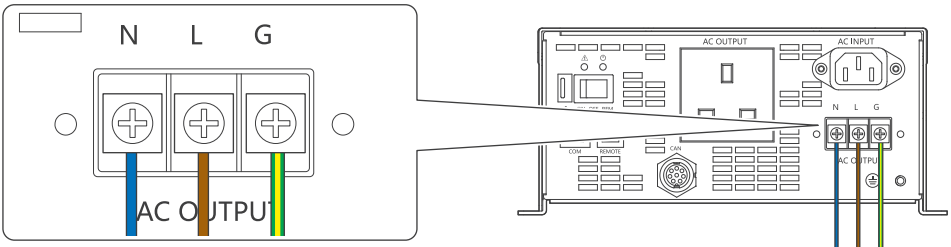
Step 5: Connect the RCD to an AC load sub-panel. The live wire should be connected to the L terminal of the sub-panel. The same rules apply to the neutral (N) and ground (PE) terminals.

Step 6: Select an appropriate circuit breaker according to the operating load current, and connect the load to the AC load sub-panel. Connect the live wire to the (L) terminal, the neutral wire to the (N) terminal, and the ground wire to the (PE) terminal. Install the front cover of the AC load sub-panel and turn on all the circuit breakers in the AC load sub-panel.

Step 7: Install the protective cover and secure it using two screws.

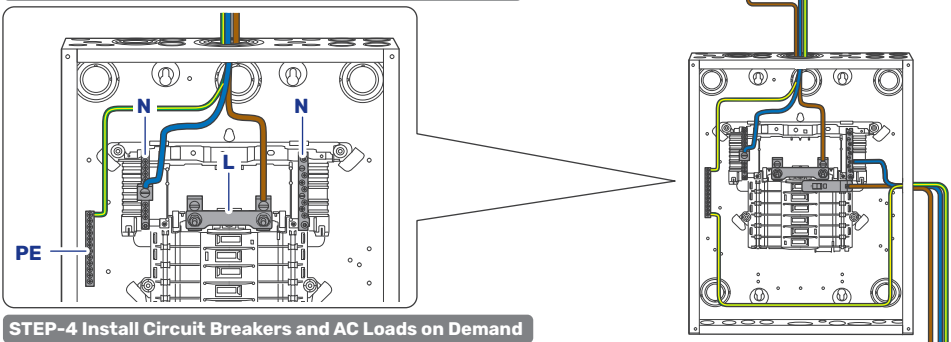
- For detailed instructions on how to wire an AC load sub-panel, please refer to the user manual of the specific AC load sub-panel.
- For your safety, it is recommended that qualified electricians familiar with safety codes of electrical systems perform the installation.

STEP-1 Install the Cables on the Inverter

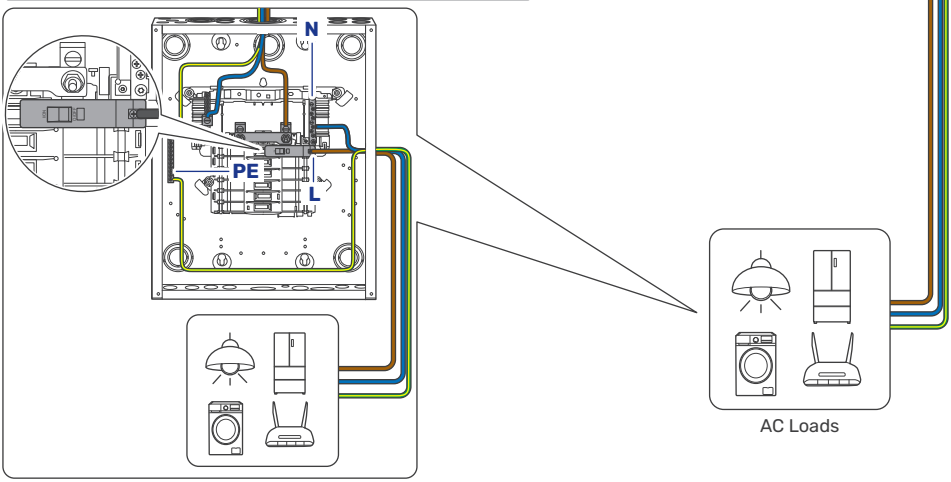


STEP-2 Install a Residual Current Device (RCD)

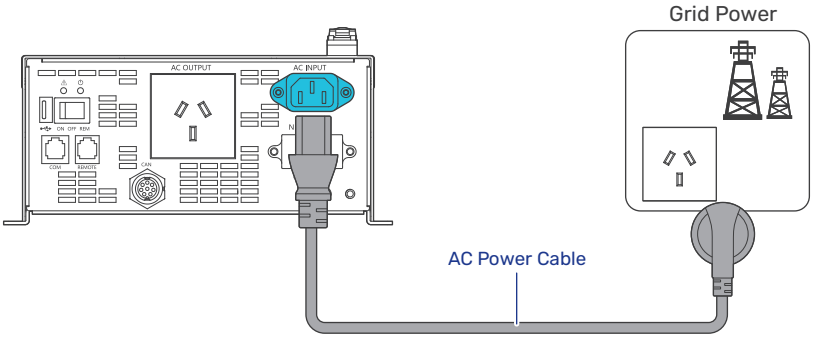
STEP-3 Connect the Bare Ends to an AC Load Sub-panel



STEP-4 Install Circuit Breakers and AC Loads on Demand



4.10. Connect the Inverter to the Grid (Optional)



The inverter provides overcurrent protection by detecting the AC input current from the grid in real time.

When the AC input exceeds 10A, the inverter may automatically shuts down the AC input to prevent damage caused by excessively high current.

⚠ Do not parallel the inverter with other AC input sources to avoid damage.

4.11. CAN Communication Wiring (Optional)

RENOGY 12V 2000W Pure Sine Wave Inverter with Transfer Switch can communicate with other Renogy devices supporting CAN communication and monitoring devices through CAN (common area network) bus, also known as RV-C, enabling safe operation, smart control, remote monitoring, and programmable settings.

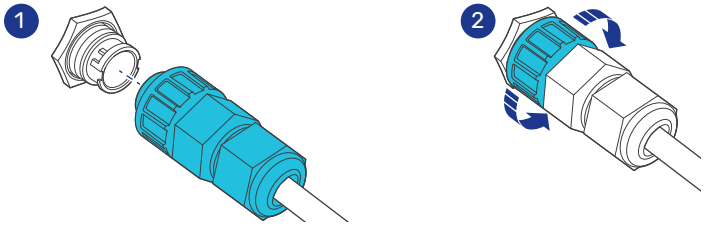
ℹ For technical support from Renogy, please contact us through renogy.com/contact-us/.

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

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

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

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

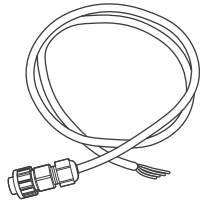


Ensure 120Ω terminating resistors are installed at both ends of the RV-C bus for successful communication with Renogy devices supporting CAN communication. If the RV user manual does not determine if the RV-C bus has a built-in 120Ω termination resistor, call the RV manufacturer to confirm.

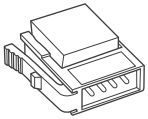
ℹ If the RV-C bus does not have a built-in 120Ω termination resistor, the inverter will not communicate properly with other Renogy devices supporting CAN communication.

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

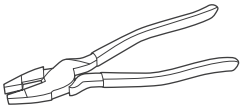
Recommended Tools & Accessories



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



Drop Plugs



Split Joint Pliers

- Accessories marked with "*" are available on renogy.com.
- The 7-Pin CAN Communication Terminal Plug to Bare Drop Cable is only for use with the inverter. Please refer to the user manual of other devices for the communication cable types they require.
- The drop cable shall not exceed 19.6 feet (6 m), and the RV-C bus shall not exceed 98.4 feet (30 m).
- Choose the appropriate drop plugs that are compatible with the drop sockets used on the RV-C bus. Different RV manufacturers may use different types of drop sockets for inter-device communication connections. If you are unsure about the correct drop plug selection, consult with the RV manufacturer. In this manual, the Mini-Clamp II plug (4-pin) is used as an example.
- Different Drop Plugs follow different pinouts. Crimp the Drop Plugs on the Drop Cables following the correct pinout. If you are not sure about the Drop Plug pinout, check with the RV manufacturer.

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

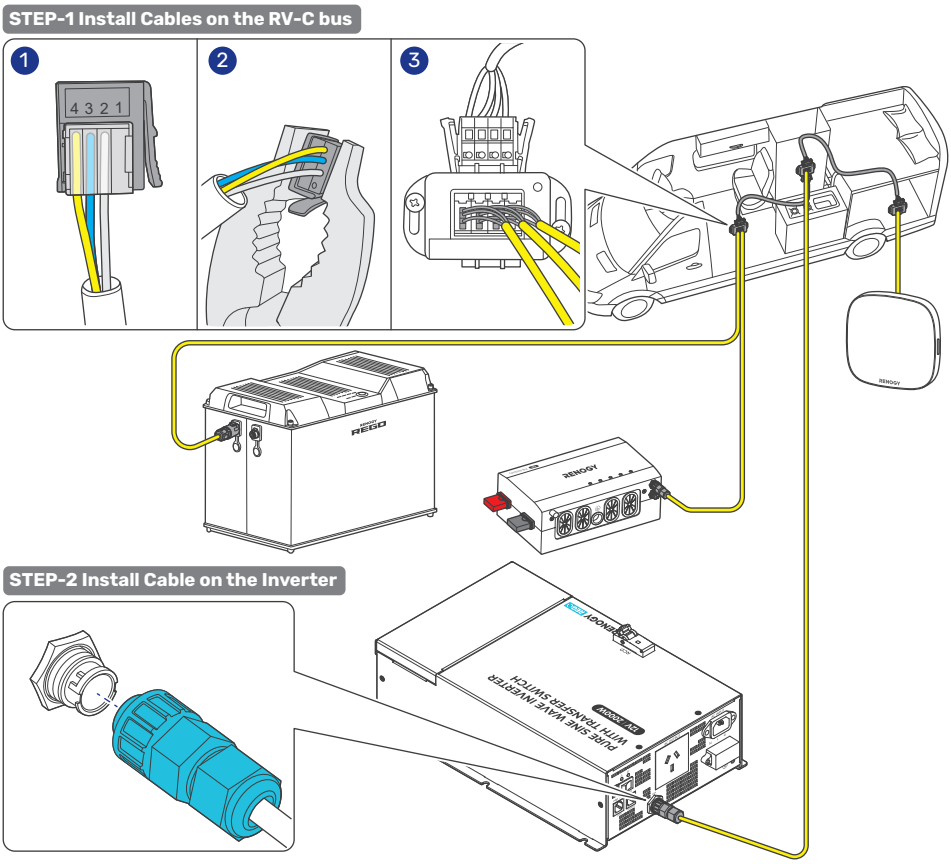
Step 2: Squeeze the crimp areas of the Drop Plugs with the Split Joint Pliers.

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

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

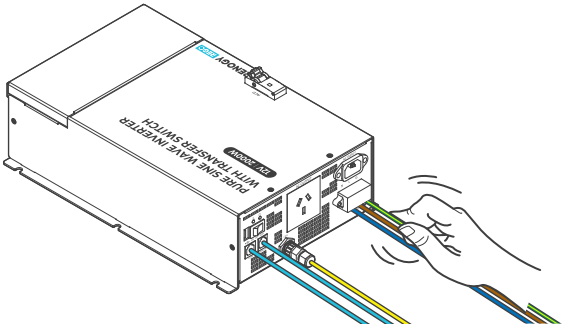
Step 5: Insert the 7-Pin CAN Communication Terminal Plug into the CAN Communication Port of the inverter.

- If you fail to locate the drop taps, please contact the RV manufacturer for help.
- Different drop taps are used on the RV-C bus by different RV manufacturers. This user manual takes the 4-socket drop tap as an example.



4.12. Inspection

Check and confirm all wires are firmly fastened to the inverter.

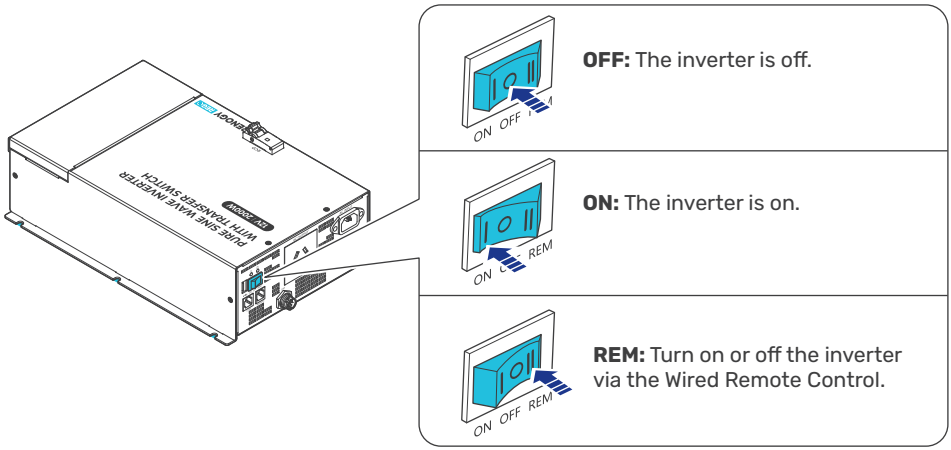


5. Power On/Off and LED Indicators

5.1. Power On/Off

Avoid powering on the inverter with the load (electronic devices) already switched on. This may trigger an overload since some electronic devices have an initial high power surge to start.

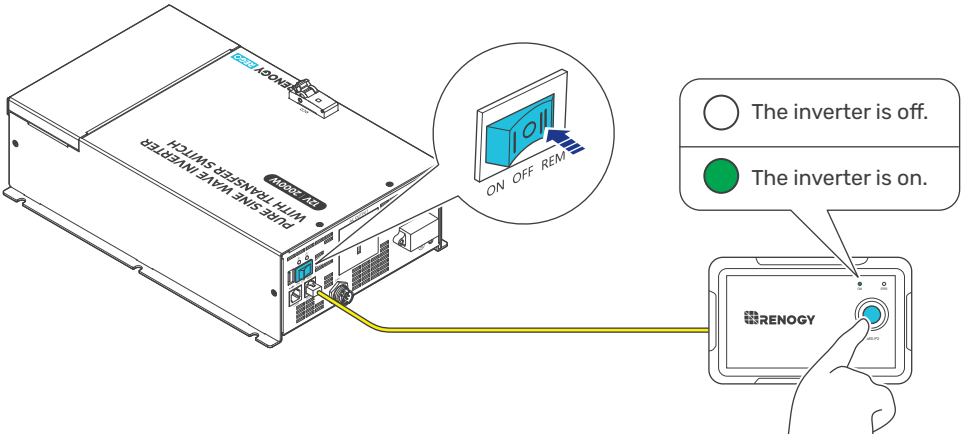
Method 1: Through On/Off/Remote Power Switch



When the inverter is connected to the grid, utility power can bypass the inverter to supply the load(s), regardless of the switch position.

Method 2: Through Wired Remote Control

Rock the ON/OFF Switch to the REM position, and you can power on/off the inverter via the Wired Remote Control.

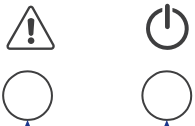


When the inverter is connected to the grid, utility power can bypass the inverter to supply the load(s), regardless of the switch position.

5.2. LED Indicators

A solid red LED indicates that the inverter is faulty. Please login to the DC Home app for troubleshooting details.

Indicator of the Inverter



Fault LED Indicator

- **Off:** No fault
- **Solid:** System fault
  - Inverter overtemperature protection
  - Battery overvoltage protection
  - Battery undervoltage protection
  - Inverter output voltage protection
  - Inverter overload protection
  - Inverter short circuit protection

Power LED Indicator

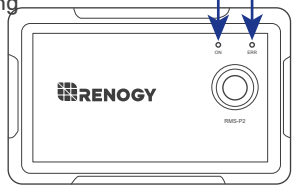
- **Off:** The inverter is off
- **Solid:** The inverter is working
- **Fast flash (0.5s):** Battery undervoltage warning

Indicator of the Wired Remote Control

You can also check the operating status of the inverter on the Wired Remote Control.

ON LED Indicator

- **Off:** The inverter is off
- **Solid:** The inverter is working
- **Fast flash (0.5s):** Battery undervoltage warning



ERR LED Indicator

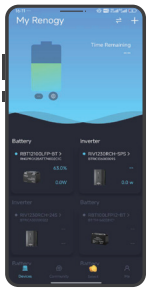
- **Off:** No fault
- **Solid:** System fault
  - Inverter overtemperature protection
  - Battery overvoltage protection
  - Battery undervoltage protection
  - Inverter output voltage protection
  - Inverter overload protection
  - Inverter short circuit protection

6. Monitor the Inverter

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

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

Download the DC Home app. Login to the app with your account.



DC Home App

GTE IT ON Google Play

Download on the App Store

6.1. Short-Range Monitoring via DC Home App

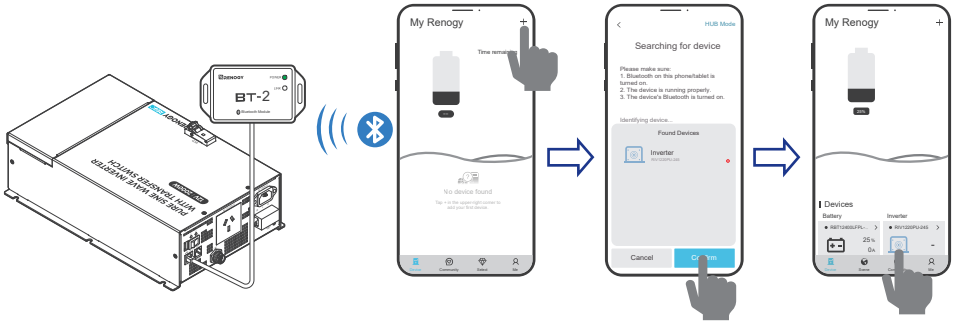
If only short-range monitoring is required, connect the inverter to the DC Home app directly through the Bluetooth of your phone.

Step 1: Ensure the included BT-2 Bluetooth module is properly installed on the inverter.

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

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

Step 4: Tap the inverter icon to enter the device information interface.



6.2. Wireless Long-Range Monitoring

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

Recommended Components

*RENOGY ONE Core

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

Step 1: Ensure the included BT-2 Bluetooth module is properly installed on the inverter.

Step 2: Connect the inverter to the Renogy ONE Core through the Bluetooth of your phone.

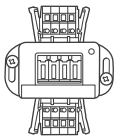
Step 3: Pair Renogy ONE Core with the DC Home app through Wi-Fi or by scanning the QR code in Renogy ONE Core. On Renogy ONE Core, go to "**Settings** > **System** > **Pair with App**" to get the QR code. For pairing instructions on Renogy ONE Core, see Renogy ONE Core User Manual.

6.3. Wired Long-Range Monitoring

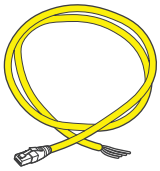
If long-range communication and programming are required, wire the inverter to Renogy ONE Core, and pair the Renogy ONE Core with the DC Home app through Wi-Fi.

Recommended Components & Accessories

*RENOGY ONE Core



Common Drop Tap

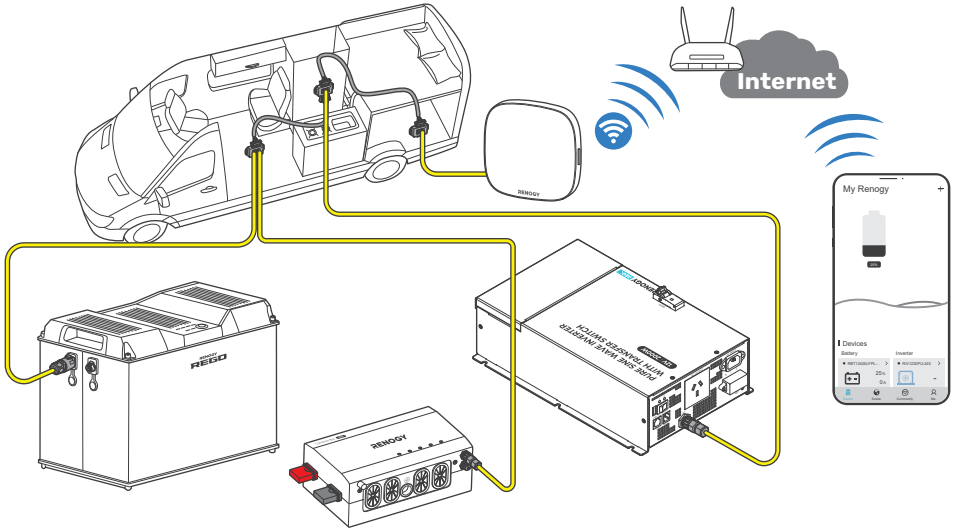


Communication Cable
(RJ45 Plug to Bare Drop Cable)

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

Step 1: Replace the terminated drop tap at either end of the RV-C bus with the Common Drop Tap (not included). Secure the bare wires of the Drop Cable (not included) onto the terminal block plug of the Common Drop Tap following the terminal block plug pinout. Plug the Drop Cable to the RJ45 port of Renogy ONE Core.

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



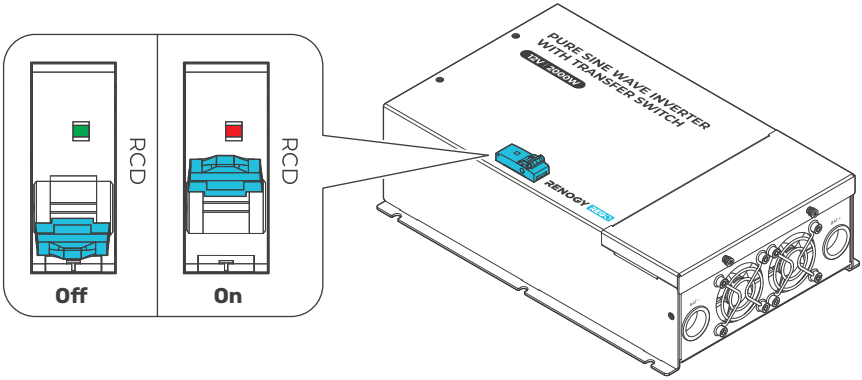
7. Configuration

7.1. Residual Current Device (RCD) (If Equipped)

The built-in residual current device (RCD) of either RIV1220PU-235-AU effectively protects the inverter and connected devices, enhancing system safety. In the event of a leakage fault, the RCD immediately cuts off AC output, preventing circuit damage, fires, and electric shock accidents.

By default, the RCD is set to OFF (with the lever pushed down). Push up the RCD lever to the ON position, and the inverter starts to work.

When the RCD triggers protection, it automatically trips, causing the inverter to stop working. In such case, check all wires and connections to ensure there is no damage or loose connections. Simply flip the switch upward to restore operation of the inverter. For technical support, contact our technical service through renogy.com/contact-us.

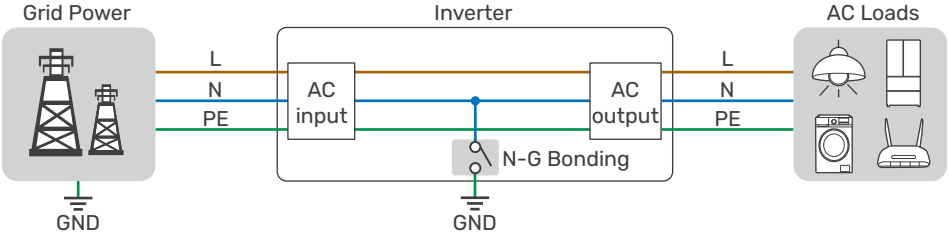


7.2. N-G Bonding Relay

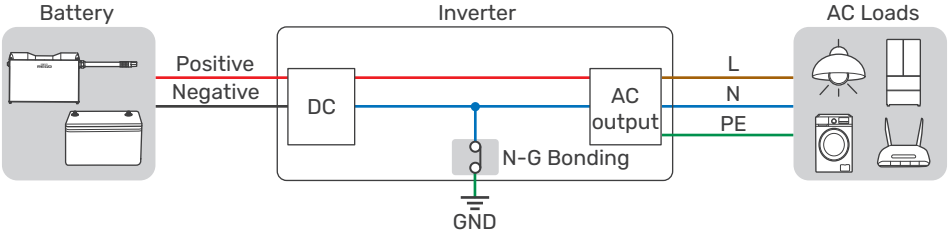
The inverter features a Neutral to Ground (N-G) bonding relay that provides a single grounding point to prevent ground loops and electric shock, minimizing the risk of inverter faults. Additionally, the N-G bonding relay ensures the proper operation of any additional RCDs.

By default, the N-G bonding relay is enabled when the inverter is shipped from the factory.

When there is AC input, the N-G bonding relay automatically opens the neutral-to-ground connection as shown in the figure below, and the system connects to the grid ground contact.

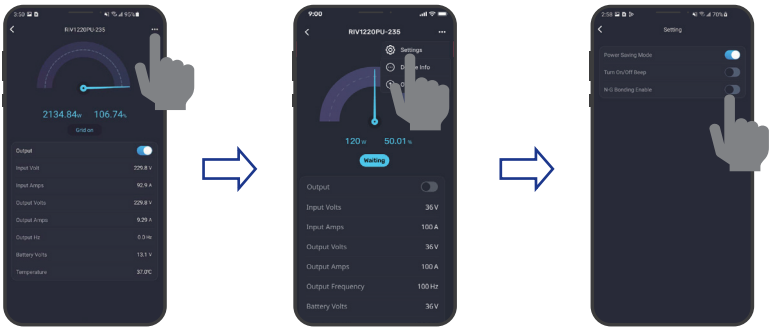


When there is no AC input, the N-G bonding relay automatically closes and connects to the ground contact of the inverter. In this case, the inverter supplies loads with the connected battery.



When the N-G bonding relay is disabled, the output N and PE of the inverter will not be shorted.

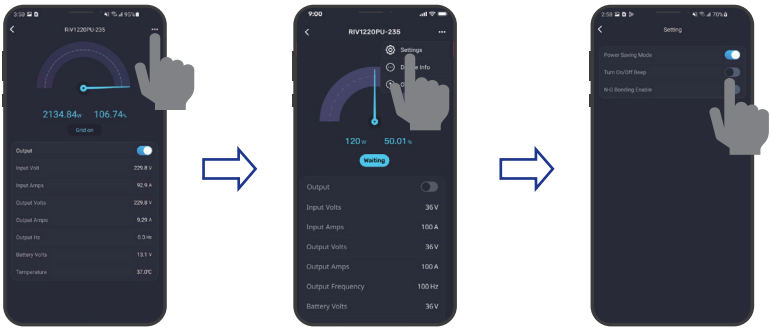
To disable the relay function, go to "**... > Settings > N-G Bonding Enable**" in the DC Home app.



Grounding the inverter is required to ensure your safety.

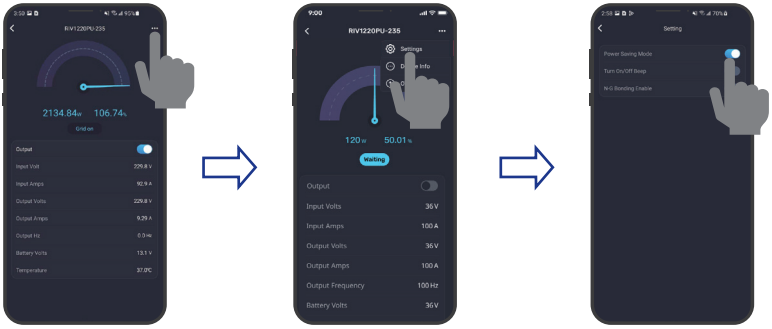
7.3. Enable/Disable the Buzzer

You can enable the built-in buzzer to warn you in case of a device error.



7.4. Enable/Disable the ECO

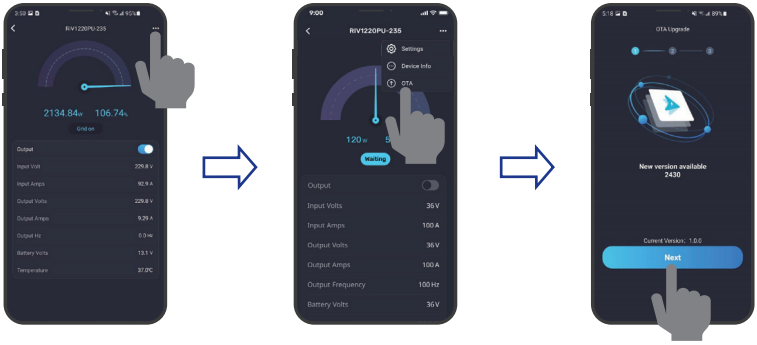
When ECO Mode (Power Saving Mode) is enabled via the DC Home app, the inverter enters power-saving mode if the battery is supplying power to a load and the load power is less than 45W. The inverter automatically exits this mode when connected to grid power or when the load power exceeds 50W.



7.5. OTA Upgrade

RENOGY 12V 2000W Pure Sine Wave Inverter with Transfer Switch supports OTA firmware upgrades via the DC Home app, ensuring that you can easily access the latest features and performance enhancements without the need for additional tools or equipment.

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

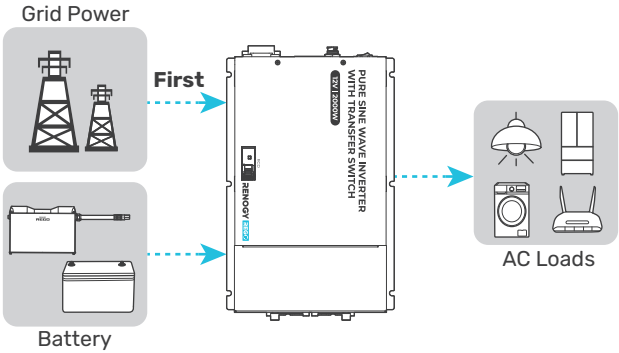


The version of the DC Home app might have been updated. Illustrations in the user manual are for reference only. Follow the instructions based on the current app version.

8. Working Logic

8.1. Power Supply Logic

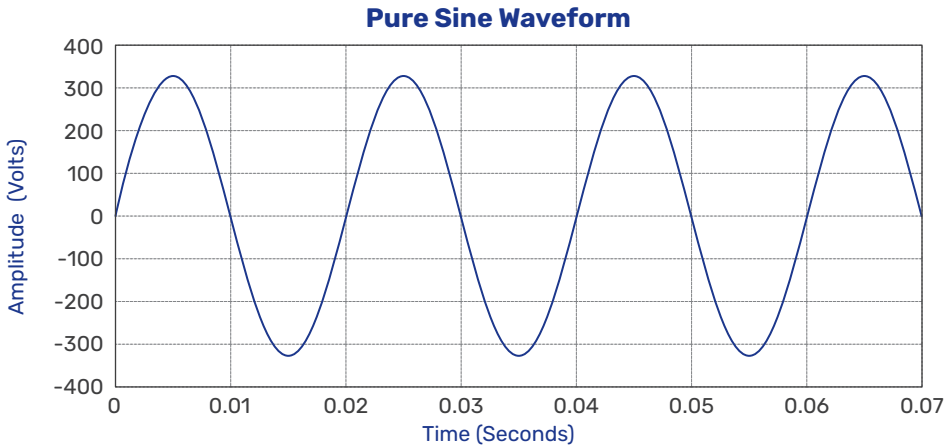
When the inverter is connected to grid power, it prioritizes supplying power to the load from the grid. If the grid power is disconnected, the battery takes over to power the load.



When the battery voltage drops to 10.5V (±0.3V), the inverter triggers undervoltage protection and shuts down automatically.

8.2. Pure Sine Wave

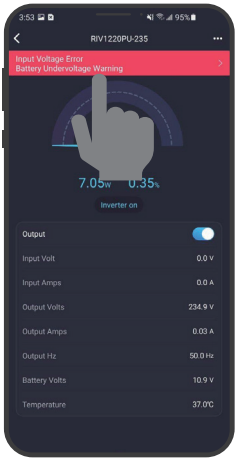
The inverter outputs a pure sine wave similar to the waveform of the grid power. In a pure sine wave, the voltage rises and falls in a smooth fashion with very low harmonic distortion and cleaner utility-like power.



This technology allows the inverter to supply electronic devices that require a high quality waveform with little harmonic distortion. In addition, the technology enables the inverter to be more efficient than traditional ones, allowing you to use less energy to supply more devices. The inverter can provide sufficient, stable power for tools, fans, lights, computers, and other electronics without any interference.

9. Troubleshooting

A solid red LED indicates that the inverter is faulty. Please login to the DC Home app for troubleshooting details.



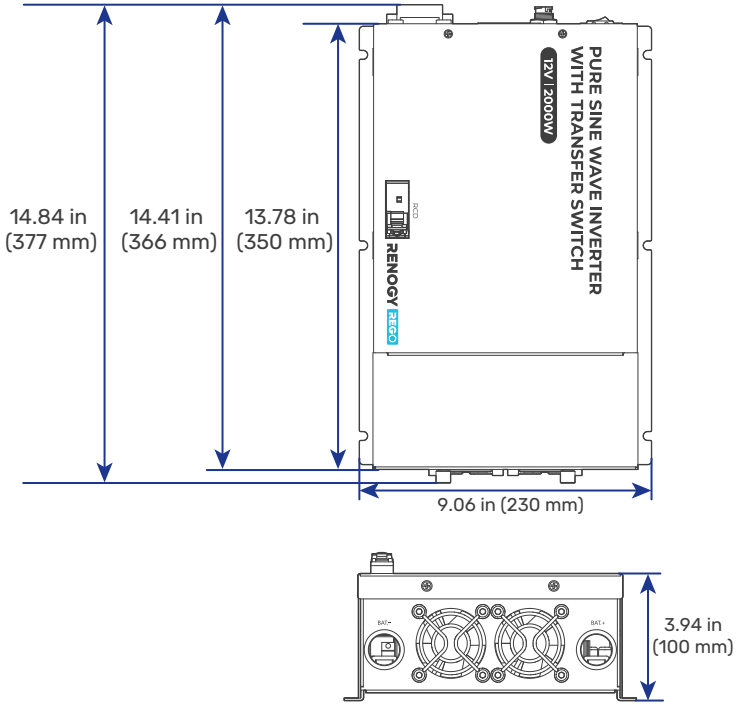
LED Status	Alarm	Protection & Alarm	Inverter Status/Troubleshooting Tips
Power LED in flicker green	Alarm beeps	Battery undervoltage warning	Normal output from the inverter. Keep the battery voltage above 11(±0.3)V. The undervoltage warning is automatically cleared when the battery voltage rises to 12(±0.3)V.
Fault LED in solid red	Long steady beeping sound	Inverter overtemperature protection	1. No output from the inverter. 2. Allow the inverter to cool down. 3. Check for adequate ventilation. 4. Reduce the load on the inverter.
		Battery undervoltage protection	No output from the inverter. This protection is triggered when the battery voltage reaches 10.5(±0.3)V. Charge the battery immediately and ensure the battery voltage is no smaller than 12.6(±0.3)V.
		Battery overvoltage protection	The inverter automatically shunts down. The protection is triggered when the battery voltage is higher than 15.5(±0.3)V. 1. Discharge the battery immediately and ensure the battery voltage is no greater than 14.8(±0.3)V. 2. Manually turn on the inverter.

LED Status	Alarm	Protection & Alarm	Inverter Status/Troubleshooting Tips
Fault LED in solid red 	Long steady beeping sound	Inverter output voltage protection	The inverter automatically shunts down. Solution: Manually turn on the inverter.
		Inverter overload protection	
		Inverter short circuit protection	

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

10. Dimensions & Specifications

10.1. Dimensions



Dimension tolerance: ±0.2 in (0.5 mm)

10.2. Technical Specifications

Inverter Specifications			
Model	RIV1220PU-235 -DE	RIV1220PU-235 -UK	RIV1220PU-235 -AU
Continuous Output Power	2000W		
Surge Power (0.1 seconds)	4000W		
Surge Power (5 seconds)	3000W		
Surge Power (60 seconds)	2400W		
Nominal Output Voltage RMS	230V AC		
Continuous Output Current	8.7A AC		
Output Frequency	50Hz (±0.1Hz)		
Output Wave Form	Pure Sine Wave		
Inverter Efficiency	91%, MAX		
Full Load Efficiency	87%		
Nominal Input Voltage	12V DC		
DC Input Voltage Range	Operating Voltage: 10.5V to 15.5V Full load voltage: 11V to 15.5V		
AC Input Voltage Range	187V to 264V (40Hz to 70Hz)		
Short Circuit Protection	Software Protection		Software Protection & RCD
Total Harmonics Distortion (THD)	< 3% (Resistance load)		
No load power Consumption	< 12W (Normal)		
ECO Mode Power Loss	9W		
Transfer Switch Specifications			
Transfer Time	Max. 20 ms		
Transfer Relay Rating	16A Maximum		
AC Bypass Power	2000W Maximum		
General Specifications			
Battery Types	SLD, AGM, GEL, FLD and LI		
Operating Temperature Range	-4°F to 140°F / -20°C to 60°C When the inverter temperature exceeds 104°F (40°C), the output power is reduced linearly by 2% per °C, reaching 1200W at 140°F (60°C). In such case, you need to reduce the connected loads manually to adapt to the power reduction.		

Storage Temperature	-40°F to 158°F / -40°C to 70°C		
Humidity	0% to 95%, RH		
Protection Rating	IP20		
Noise	< 50dB		
Dimensions	14.84 x 9.06 x 3.94 in / 377 x 230 x 100 mm		
Weight	8.82 lbs / 4 kg		
Warranty	3 years		
Wired Remote Control			
Dimensions	2.8 x 4.3 x 1.3 in / 70 x 110 x 31.8 mm		
Wire length	Approx 16.4ft		
EMC & Safety			
Model	RIV1220PU-235 -DE	RIV1220PU-235 -UK	RIV1220PU-235 -AU
EMC	EN 61000-6-1, EN 61000-6-3, BS EN 61000-6-1, BS EN 61000-6-3		AS/NZS CISPR 32
Safety	EN 62477-1, BSEN62477-1		AS/NZS 4763

11. Maintenance

11.1. Inspection

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

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

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

Risk of electric shock! Ensure that all power supplies are turned off before touching terminals on the inverter.

11.2. Cleaning

Follow the steps below to clean the inverter regularly.

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

11.3. Storage

Please follow the steps below to ensure that the inverter emerges from storage in a good condition:

- Disconnect all cables connected to the inverter.
- Applying dielectric grease to each terminals to repel moisture and protect the connector contacts from corrosion.
- Store the inverter in a well-ventilated, dry, and clean environment with the temperature between -40°F to 158°F (-40°C to 70°C).

Please follow the steps above to store the inverter. Otherwise, the warranty will be void.

12. Emergency Responses

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

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

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

12.1. Fire

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

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

12.2. Flooding

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

12.3. Smell

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

12.4. Noise

1. Disconnect all cables connected to the inverter.
2. Ensure sure no foreign objects are stuck in the fan of the inverter or the terminals.

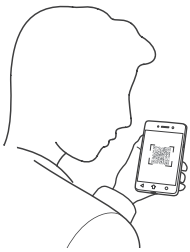
> The normal noise value of the inverter is less than 50dB during operation. If the noise is abnormal, contact our technical service through renogy.com/contact-us.

Renogy Support

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

renogy.com/support/downloads

contentservice@renogy.com



Questionnaire Investigation

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

renogy.com/learning-center

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

renogy.com/contact-us

1(909)2877111

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

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

Renogy Empowered

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

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

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

Live Sustainably with Renogy

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

Save 170 pounds of coal from being burned

Save 300 pounds of CO_2 from being released into the atmosphere

Save 105 gallons of water from being consumed

Renogy Power PLUS

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

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

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