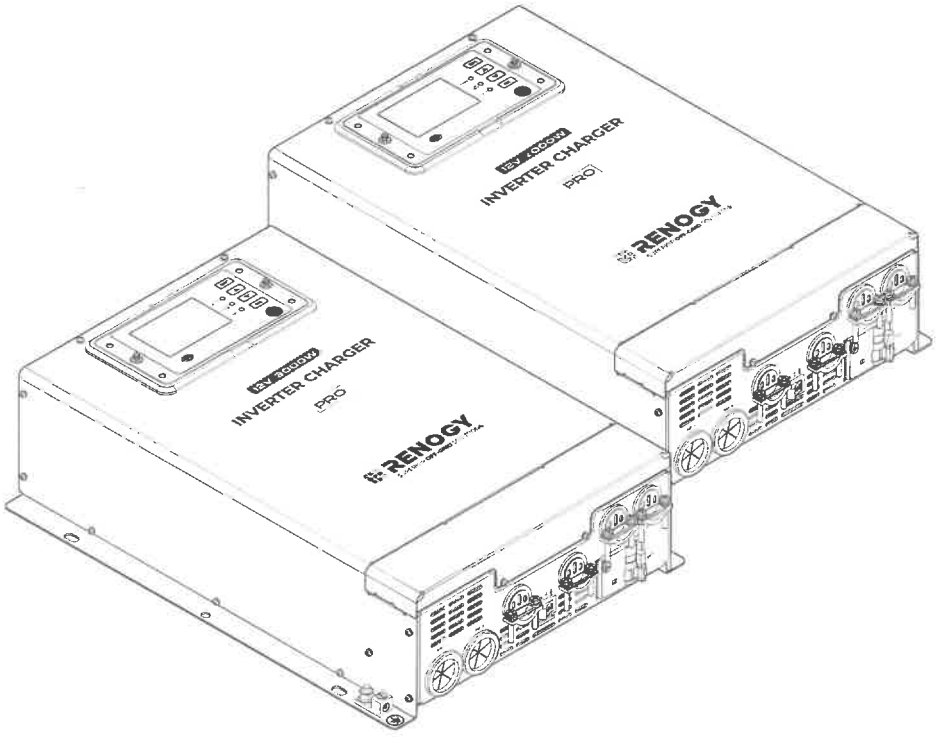
RENOGY

Renogy Pro
HF Inverter Charger
12V | 2000W/3000W

RIV1220PCH-24S/RIV1230PCH-24S/RIV1220PCH-23S/RIV1230PCH-23S

VERSION A0
April 23, 2025



USER MANUAL

Before Getting Started

The user manual provides important operation and maintenance instructions for Renogy Pro 12V 2000W/3000W HF Inverter Charger (hereinafter referred to as inverter 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 inverter charger, potentially rendering it inoperable.

- Renogy ensures the accuracy, sufficiency, and the applicability of information in the user manual at the time of printing or release due to continual product improvements that may occur.
- 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 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.
- Renogy reserves the right to change the information in the user manual without notice. For the latest user manual, visit renogy.com.

Disclaimer

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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. Qualified Personnel

The installation and service of the inverter charger must be carried out by qualified personnel. Qualified personnel refer to trained and licensed electricians or installers with all the following skills and expertise:

- Knowledge of the functional principles and operation of on-grid and off-grid energy storage system.
- Knowledge of the risks and dangers associated with the installation and service of electrical devices and acceptable mitigation methods.
- Knowledge of the installation and service of electrical devices.
- Knowledge of and adherence to the user manual and all safety precautions and best practices.
- Knowledge of local installation regulations.
- Electrical license for the installation and service of energy storage system required by the county or state.

1.3. Introduction

Renogy Pro 12V 2000W/3000W HF Inverter Charger is your off-grid smart living center that revolutionizes comfort when you live in your off-grid home or RV. The inverter charger can invert DC to AC and directly supply power to the load, and charge the battery when it is connected to the utility power.

In addition, it supports different types of batteries such as lithium, GEL, flooded, SLD, and AGM batteries. The inverter charger can switch power supply from the grid power to batteries within 20 milliseconds, ensuring a smooth mode switch without powering off the load. The Clip-on 3-pin connectors make AC IN/OUT connections simply and easy. They simplify installation and shorten the installation time.

The inverter charger can be connected to Renogy devices and smart accessories via Bluetooth (need to purchase Renogy BT-2 Bluetooth Module separately) or RV-C. When the inverter charger works in association with the Renogy app (free of charge) or Renogy ONE Core (sold separately), you will have the same system monitoring wherever you go on your smartphone. With advanced pure sine wave technology, the inverter charger can protect and extend the life of your electronic equipment and loads.

1.4. Key Features

- **Battery versatility and easy-to-configure settings**
  Compatible with four preset battery types and allows custom parameter settings. Provides simple switch setup for battery type, output frequency, and input priority setting.
- **Multi-stage non-lithium batteries charging and customizable charging**
  Offers up to three-stage charging for various types of batteries and supports adjustable charging current (up to 80A/120A) to suit your daily power needs.
- **High-current output**
  For RIV1220PCH-24S model: Provides continuous 8.3A current to AC output when connected to both the grid and a battery.

For RIV1230PCH-24S model: Provides continuous 12.5A current to AC output when connected to both the grid and a battery.
For RIV1220PCH-23S model: Provides continuous 8.7A current to AC output when connected to both the grid and a battery.
For RIV1230PCH-23S model: Provides continuous 13.04A current to AC output when connected to both the grid and a battery.

- **High conversion efficiency thanks to quality pure sine wave**
  Achieves peak conversion efficiency of over 91%, reducing energy loss thanks to the smooth AC power with minimal harmonic distortion, equivalent to grid power quality.
- **Automatic generator start**
  Equipped with dry contacts for automatic generator start and stop function, facilitating battery charging.
- **Multiple protections**
  Provides undervoltage, overvoltage, overcurrent, overload, overtemperature, and short circuit protections for enhanced safety.

1.5. SKU

Product Name	SKU	Applicable Country or Region
Renogy Pro 12V 2000W HF Inverter Charger	RIV1220PCH-24S	Australia
Renogy Pro 12V 3000W HF Inverter Charger	RIV1230PCH-24S	Australia
Renogy Pro 12V 2000W HF Inverter Charger	RIV1220PCH-23S	Europe
Renogy Pro 12V 3000W HF Inverter Charger	RIV1230PCH-23S	Europe

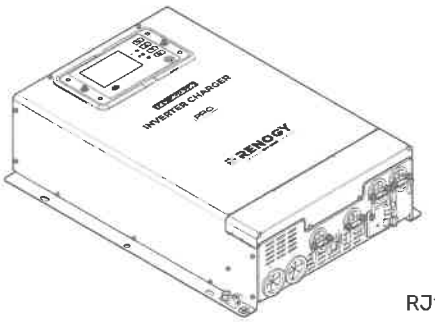
1.6. Model Difference

Model	Power	AC Input/Output Voltage
RIV1220PCH-24S	2000W	240V (AU)
RIV1230PCH-24S	3000W	240V (AU)
RIV1220PCH-23S	2000W	230V (EU)
RIV1230PCH-23S	3000W	230V (EU)

2. Get to Know 12V 2000W/3000W HF Inverter Charger

2.1. What's In the Box?

Renogy Pro 12V 2000W/3000W HF Inverter Charger x 1



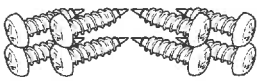


User Manual x 1



RJ12 Ethernet Cable (5m) x 1

ST6.3*16 mm



Self-tapping Screws x 8 (2 extra)

- 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 RIV1230PCH-24S model as a reference for its illustrations. The product component and functions apply to the RIV1220PCH-24S, RIV1220PCH-23S, and RIV1230PCH-23S models.

2.2. Recommended Tools

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



Phillips Screwdriver (#1)



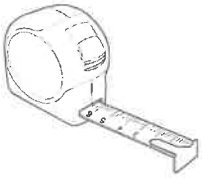
Phillips Screwdriver (#2)



Slotted Screwdriver (4 mm)



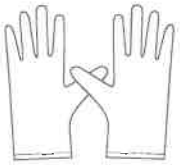
Socket Wrench (17/32 in)



Measuring Tape



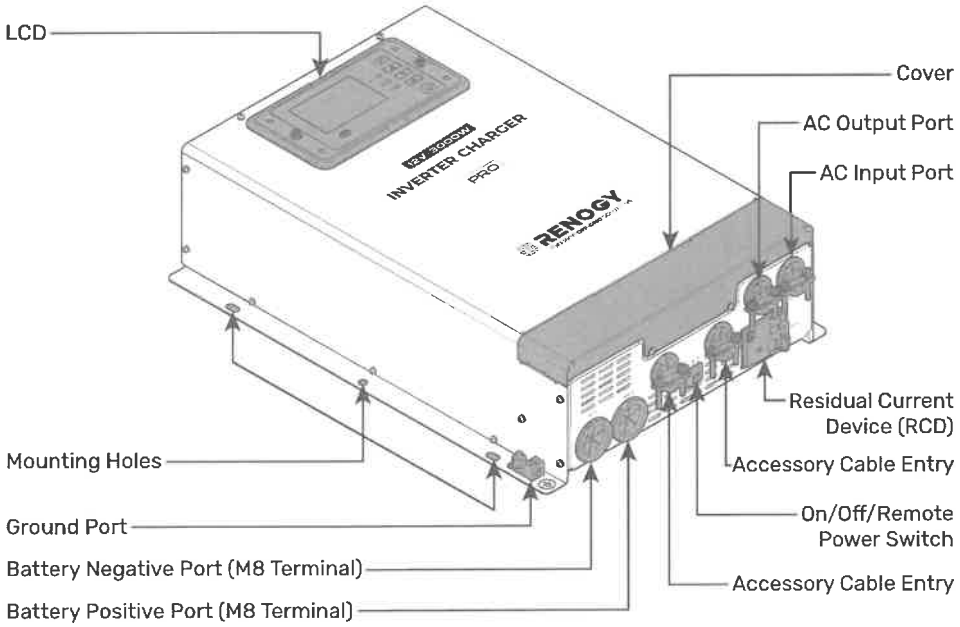
Wire stripper



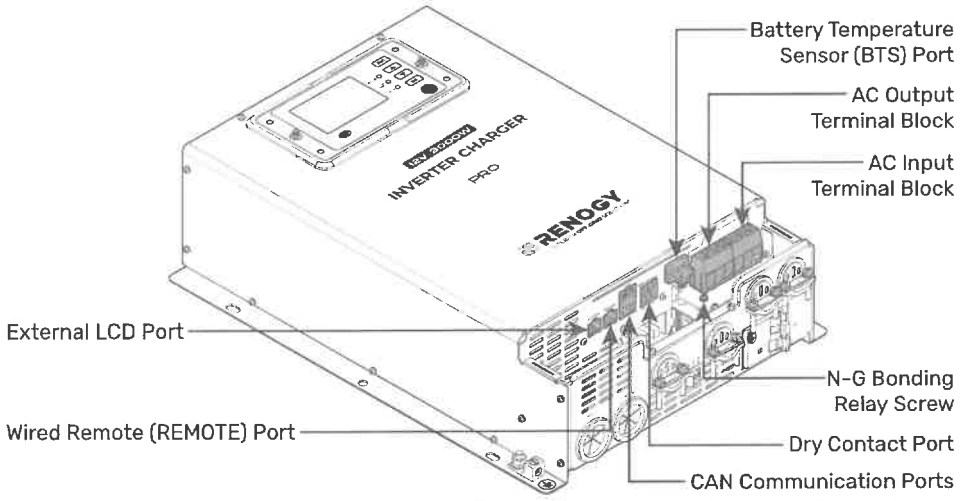
Insulating Gloves

2.3. Product Overview

Exterior

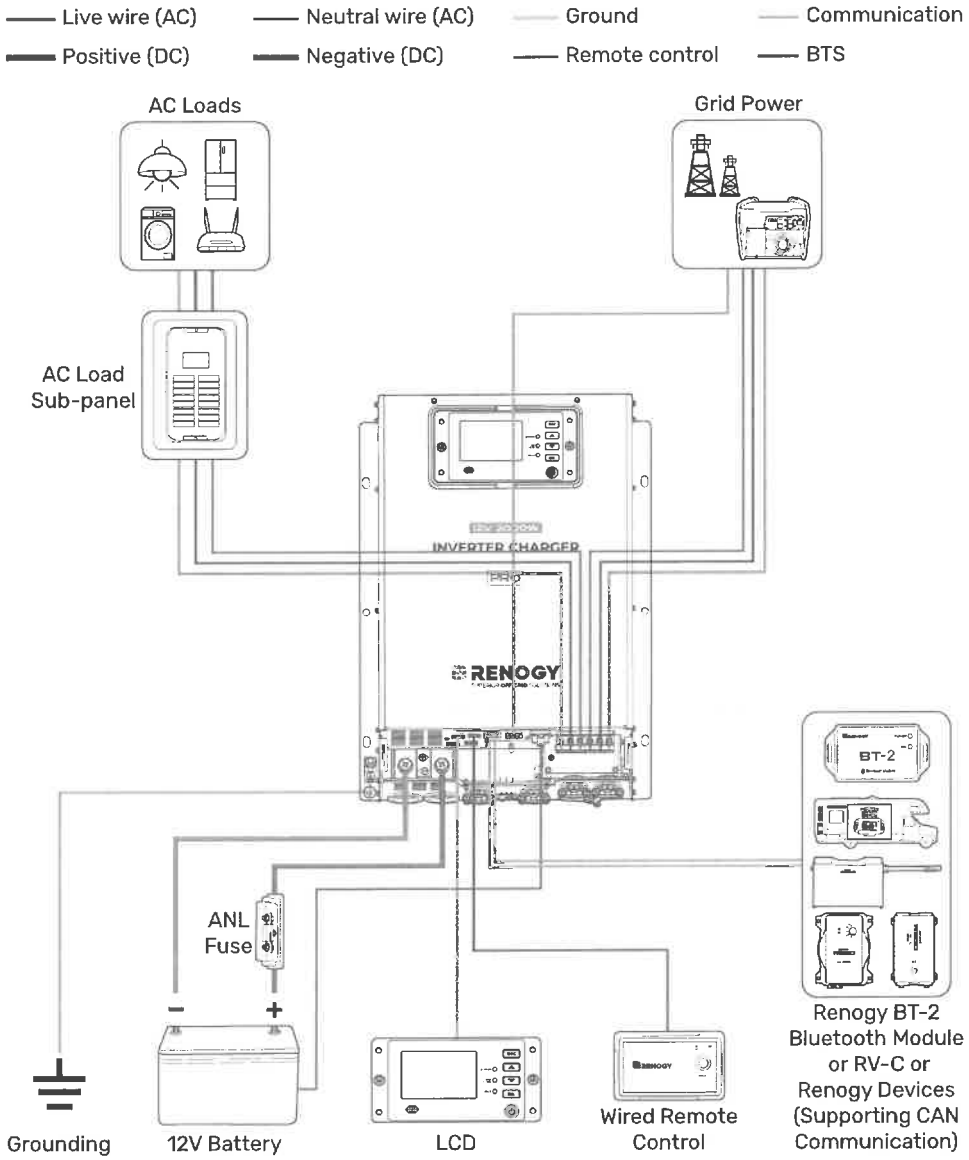


Interior (with the cover removed)



The BTS port can only be used with lead-acid batteries.

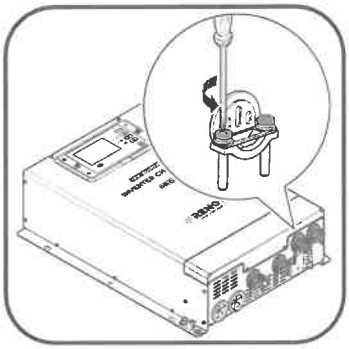
2.4. System Setup



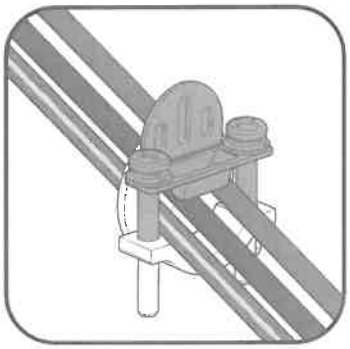
The wiring diagram only shows the key components in a typical DC-coupled off-grid energy storage system for the illustrative purpose. The wiring might be different depending on the system configuration. Additional safety devices, including disconnect switches, emergency stops, and rapid shutdown devices,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

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

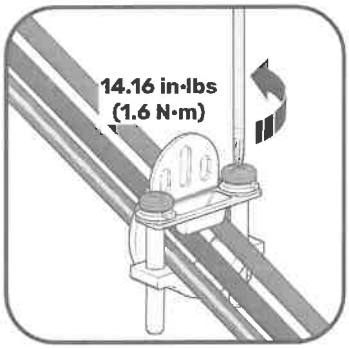
2.5. How to Install Cable Clamps?



1. Loosen the screws on a cable clamp with a Phillips Screwdriver.



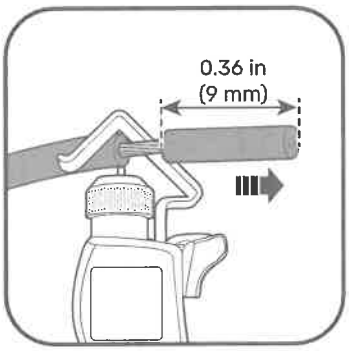
2. Lift the clamp, and run the cables through the clamp.



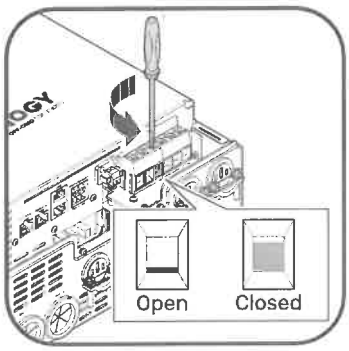
3. After running all required cables through the clamp, secure the clamp by fastening the screws.

2.6. How to Install AC Input and Output Cables?

This section takes a live wire for an AC Output Terminal Block as an example. The same rules apply to other AC input and output terminals.

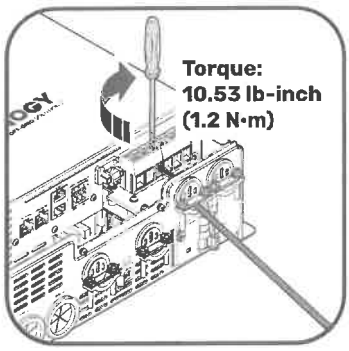


1. Strip approximately 0.36 inches (9 mm) of insulation from the end of an cable using a wire stripper.



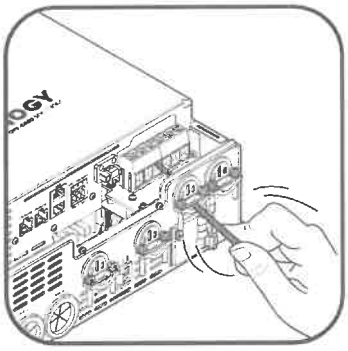
2. Rotate the cable retainer of the AC Output Terminal Block (L) counterclockwise with a slotted screwdriver.

   Make sure the cable retainer is completely open.



3. Insert the bare end of the cable into the corresponding L terminal. Rotate the screws clockwise to clamp the wire down and close the cable retainer.

The torque of the cable retainer is 10.53 lb-inch (1.2 N•m). Do not overtighten the cable retainer screws. Otherwise it will lead to stripped screws or screw bending.



4. Make sure the connection is tight and secure.

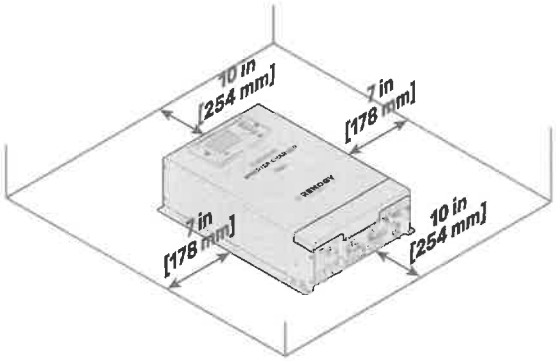
3. Preparation

3.1. Plan a Mounting Site

The inverter 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 inverter charger can be safely connected to the battery and grid/AC generator with the relevant cables.

-4°F to 122°F / -20°C to 50°C (Output power degrading at 86°F/30°C or higher)

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 charger out of the reach of children and animals.

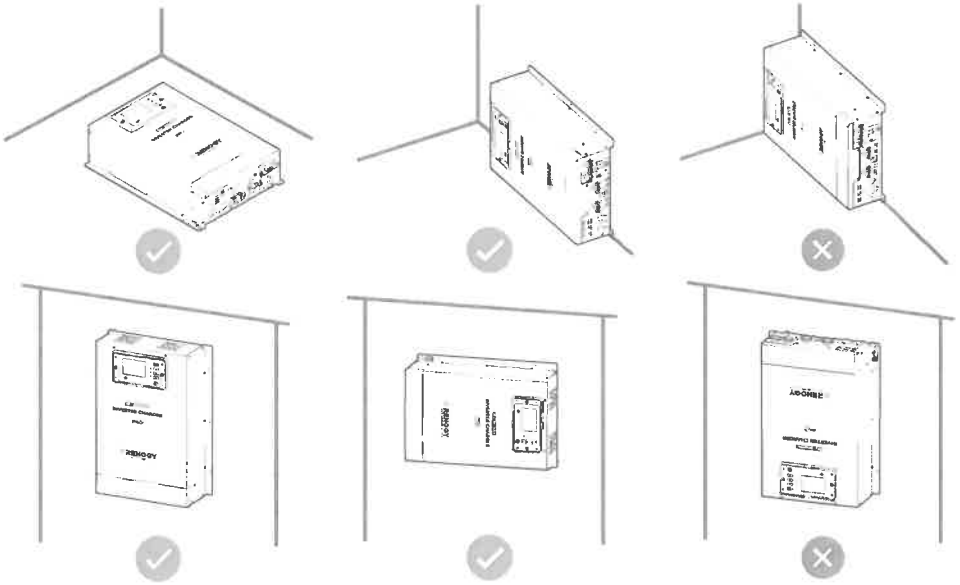
⚠ Risk of explosion! Never install the inverter charger in a sealed enclosure with flooded batteries! Do not install the inverter charger in a confined area where battery gases can accumulate.

⚠ The inverter charger should be installed on a vertical surface protected from direct sunlight.

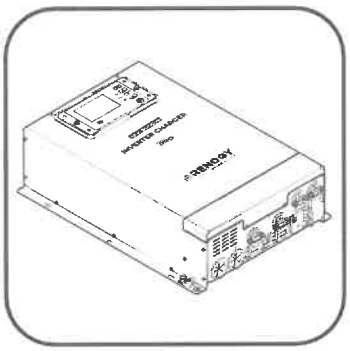
- ⚠ Do not expose the inverter charger to flammable or harsh chemicals or vapors.
- ⚠ Ensure that the inverter charger is installed in a place at ambient temperature from -4°F to 122°F (-20°C to 50°C).
- ⚠ Ensure that inverter charger is installed in an environment with relative humidity between 0% and 95% and no condensation.

  If the inverter charger is installed improperly on a boat, it may cause damage to components of the boat. Have the inverter charger by a qualified electrician.
- The inverter charger cannot operate at full load in ambient temperatures above 86°F (30°C).
- The inverter charger 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 charger is firmly grounded to a building, vehicle, or earth grounded. Keep the inverter charger away from EMI receptors such as TVs, radios, and other audio/ visual electronics to prevent damage / interference to the equipment.

To ensure good ventilation and optimal system performance, It is prohibited to invert (terminals up) the inverter charger and block the cooling fans.



3.2. Check the Inverter Charger



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

⚠ Do not use the inverter charger if there is any visible damage.

⚠ Do not puncture, drop, crush, penetrate, shake, strike, or step on the inverter charger.

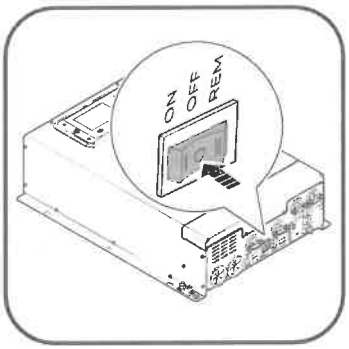
⚠ There are no serviceable parts in the inverter charger. Do not open, dismantle, repair, tamper with, or modify the inverter charger.

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

⚠ Do not touch the connector contacts while the inverter charger 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 charger.

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



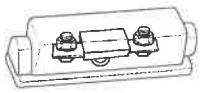
2. Ensure the On/Off/Remote Power Switch is in the OFF position.

3.3. Check the Battery



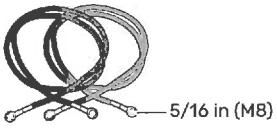
*12V Battery

2000W: 250A
3000W: 400A



*ANL Fuse

2000W: 2/0 AWG / 67 mm²
3000W: 4/0 AWG / 107 mm²



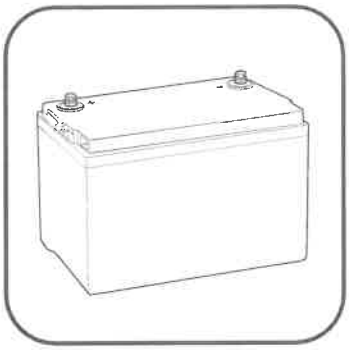
*Battery Adapter Cables × 2

2000W: 2/0 AWG / 67 mm²
3000W: 4/0 AWG / 107 mm²



*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 charger 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).

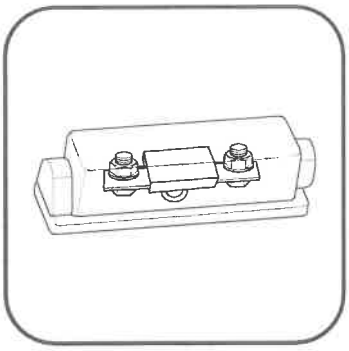
- During the charging process, the battery must be placed in a well-ventilated place.
- Do not use the battery if there is any visible damage. Do not touch the exposed electrolyte or powder if the battery housing is damaged.
- When being charged, the battery may give off explosive gas. Ensure there is 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 charger, 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: $U_1=U_2=U_3$

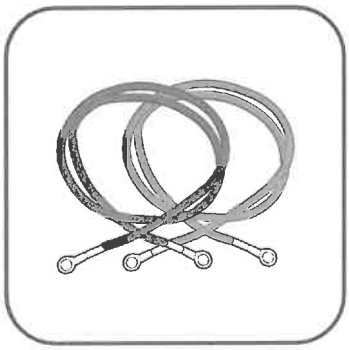
2. Check battery system voltage. This inverter charger supports a maximum system voltage of 16.5V. Read the user manual of the specific battery for battery voltage parameters, and calculate the voltage of the battery or battery pack system according to the formula to ensure that it does not exceed 16.5V.

- 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.
- Do not connect batteries rating higher than 16.5V to the inverter charger. Doing so will damage the inverter charger.



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.

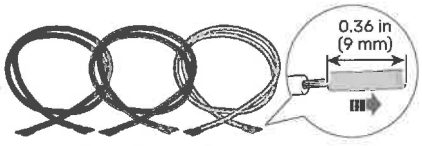
ⓘ Ensure the ring terminals of your Battery Adapter Cables are compatible with the 1.06 in (27 mm) diameter battery terminals (both positive and negative) on the inverter charger.

3.4. Check the AC Loads (Appliances)

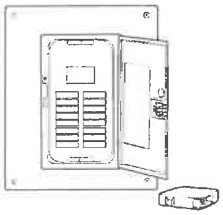
Recommended Components & Accessories

Recommended Cable Size

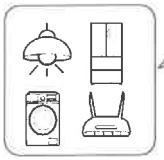
Model	Cable Size
RIV1220PCH-24S	14 AWG (2.1 mm²)
RIV1230PCH-24S	12 AWG (3.3 mm²)
RIV1220PCH-23S	14 AWG (2.1 mm²)
RIV1230PCH-23S	12 AWG (3.3 mm²)



Bare Wires × 3



AC Load Sub-panel



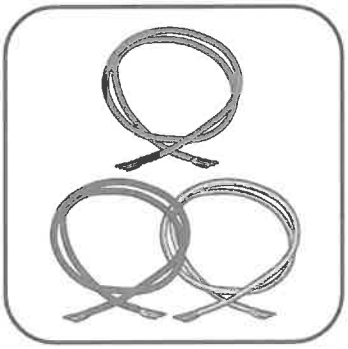
AC Loads

Total Load Power

Model	Ratings
RIV1220PCH-24S	≤2000W
RIV1230PCH-24S	≤3000W
RIV1220PCH-23S	≤2000W
RIV1230PCH-23S	≤3000W

Model	AC Input/Output Voltage	AC Loads Voltage
RIV1220PCH-24S	240V	240V
RIV1230PCH-24S	240V	240V
RIV1220PCH-23S	230V	230V
RIV1230PCH-23S	230V	230V

You can connect the AC output of the inverter charger to a 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 Bare Wires for any visible damage including cracks, dents, deformation, and other visible abnormalities. All connector contacts shall be clean, dry, and free of dirt and corrosion.

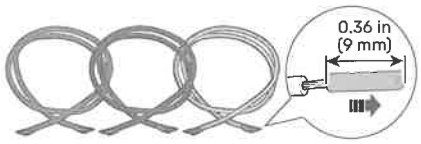
⚠ Do not use the bare wires if there is any visible damage.

3.5. Check the Grid (Optional)

Recommended Components & Accessories

Recommended Cable Size

Model	Cable Size
RIV1220PCH-24S	14 AWG (2.1 mm²)
RIV1230PCH-24S	12 AWG (3.3 mm²)
RIV1220PCH-23S	14 AWG (2.1 mm²)
RIV1230PCH-23S	12 AWG (3.3 mm²)



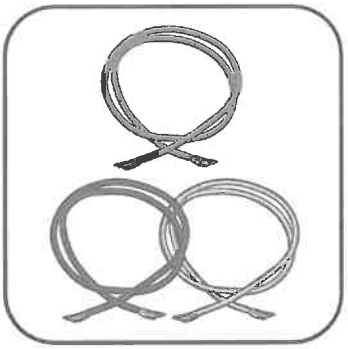
Bare Wires × 3

Model	Voltage
RIV1220PCH-24S	240V
RIV1230PCH-24S	240V
RIV1220PCH-23S	230V
RIV1230PCH-23S	230V



Grid Power

⚠ Risk of electric shock! Ensure the grid is turned off before connecting them to the inverter charger.



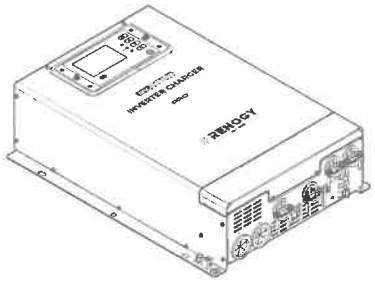
Inspect the Bare Wires for any visible damage including cracks, dents, deformation, and other visible abnormalities. All connector contacts shall be clean, dry, and free of dirt and corrosion.

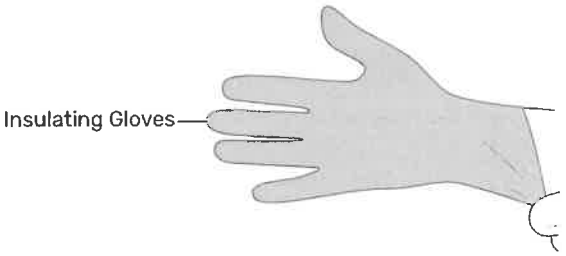
⚠ Do not use the bare wires if there is any visible damage.

4. Installation

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

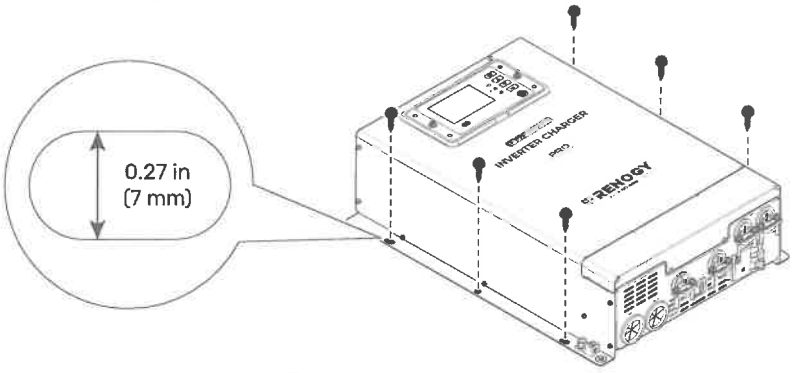
4.1. Wear Insulating Gloves





4.2. Mount the Inverter Charger

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



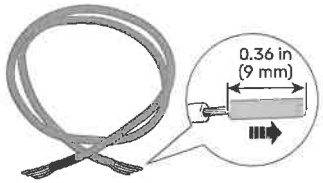
ℹ Ensure that the inverter charger is installed firmly to prevent it from falling off.

4.3. Ground the Inverter Charger

Recommended Components

Recommended Cable Size

Model	Cable Size
RIV1220PCH-24S	14 AWG (2.1 mm²)
RIV1230PCH-24S	12 AWG (3.3 mm²)
RIV1220PCH-23S	14 AWG (2.1 mm²)
RIV1230PCH-23S	12 AWG (3.3 mm²)



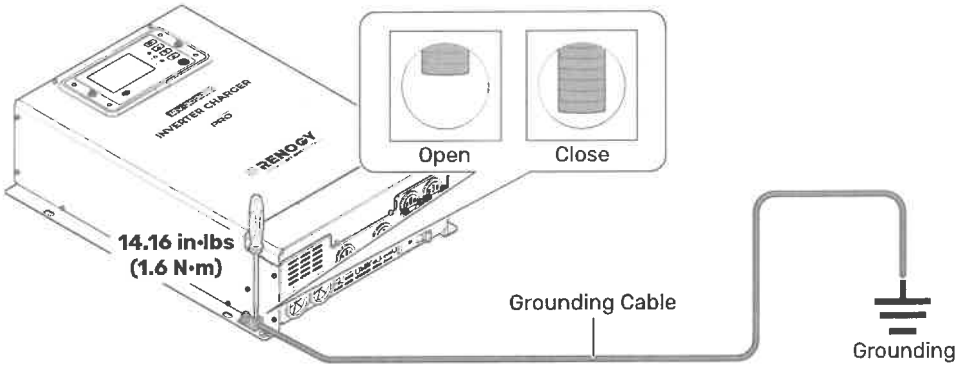
Grounding Cable

Step 1: Rotate the cable retainer of the ground port counterclockwise with a slotted screwdriver (4 mm). Make sure the cable retainer is completely open.

Step 2: Strip approximately 0.36 inches (9 mm) of insulation from one end of the grounding cable using a wire stripper. Run the stripped end into the Ground Port on the inverter charger.

Step 3: Rotate the screws clockwise to clamp the wire down and close the cable retainer.

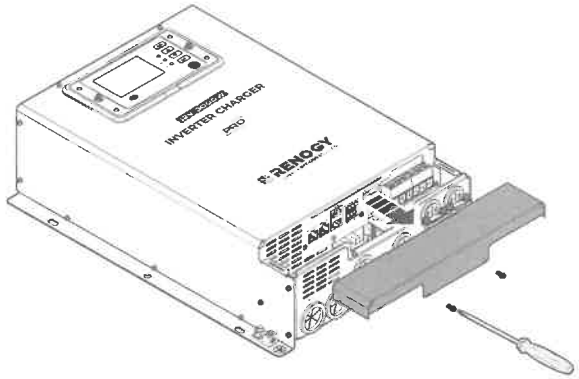
- The cable retainer torque of the ground port is 14.16 in·lbs (1.6 N·m). Do not over-tighten the screws to prevent damage.
- The DC Grounding system is sometimes referred to as the earth ground or another designated ground. In an RV setting, the metal frame of the RV could be the designated ground.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



4.4. Remove the Cover

Step 1: Turn the two Cover Screws counterclockwise either by using a Phillips Screwdriver.

Step 2: Remove the cover.



4.5. Connect the Inverter Charger to a Battery

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

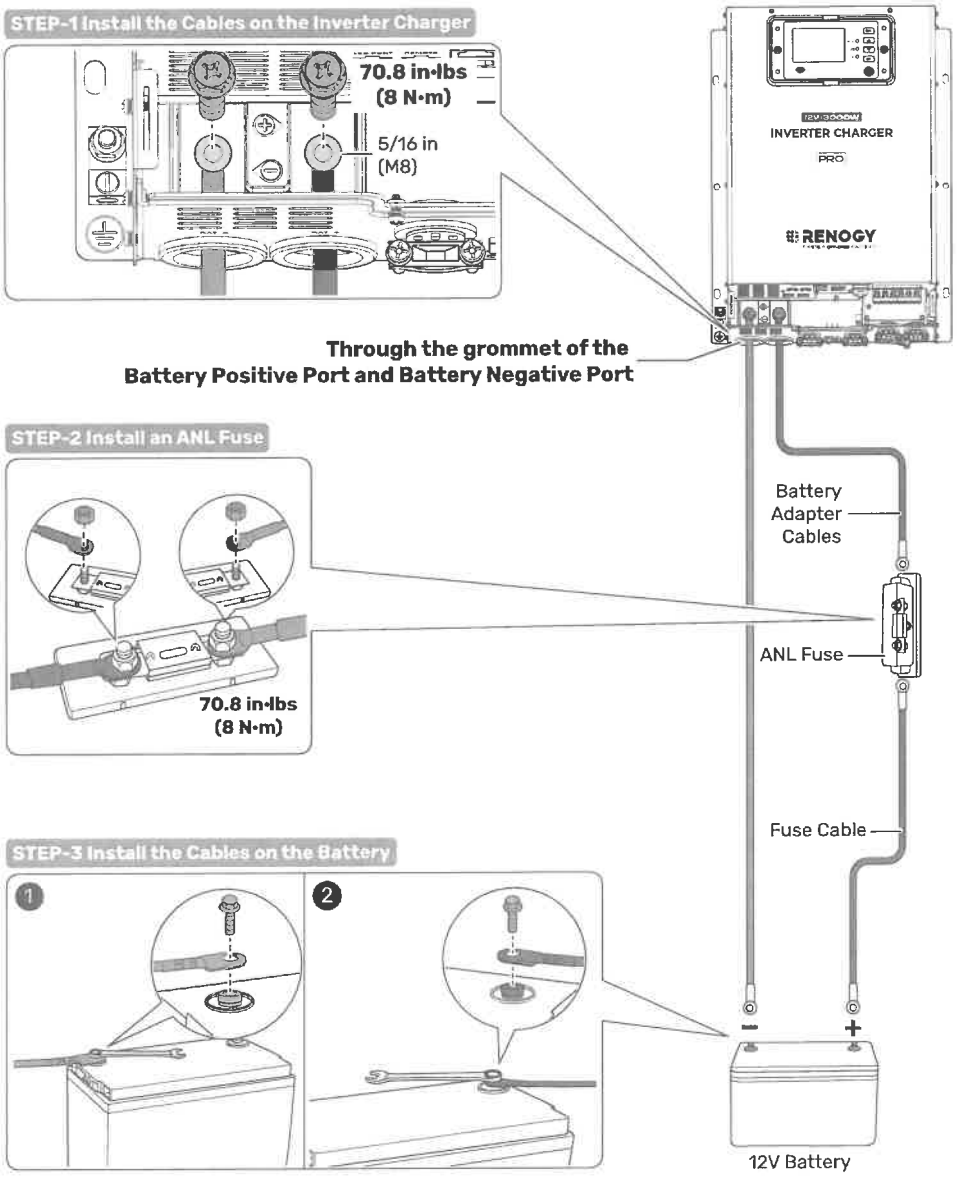
Step 2: Connect the other ring terminal of the Negative Battery Adapter Cable to the negative terminal of the battery.

Step 3: Repeat the actions in Step 1 on the Battery Positive Terminal on the inverter charger 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 other ANL Fuse end 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.

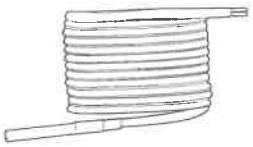
The retaining bolt torque of the Battery Positive/Negative Terminal is 70.8 in·lbs (8 N·m). Do not over-tighten it to prevent damage.


STEP-1 Install the Cables on the Inverter Charger
70.8 in·lbs
(8 N·m)
5/16 in
(M8)
INVERTER CHARGER
PRO
RENOGY
Through the grommet of the
Battery Positive Port and Battery Negative Port
STEP-2 Install an ANL Fuse
70.8 in·lbs
(8 N·m)
Battery
Adapter
Cables
ANL Fuse
Fuse Cable
STEP-3 Install the Cables on the Battery
1
2
12V Battery

4.6. Install a Battery Temperature Sensor (Optional)

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

Recommended Components & Tools



*Battery Temperature Sensor



Slotted Screwdriver (1 mm)

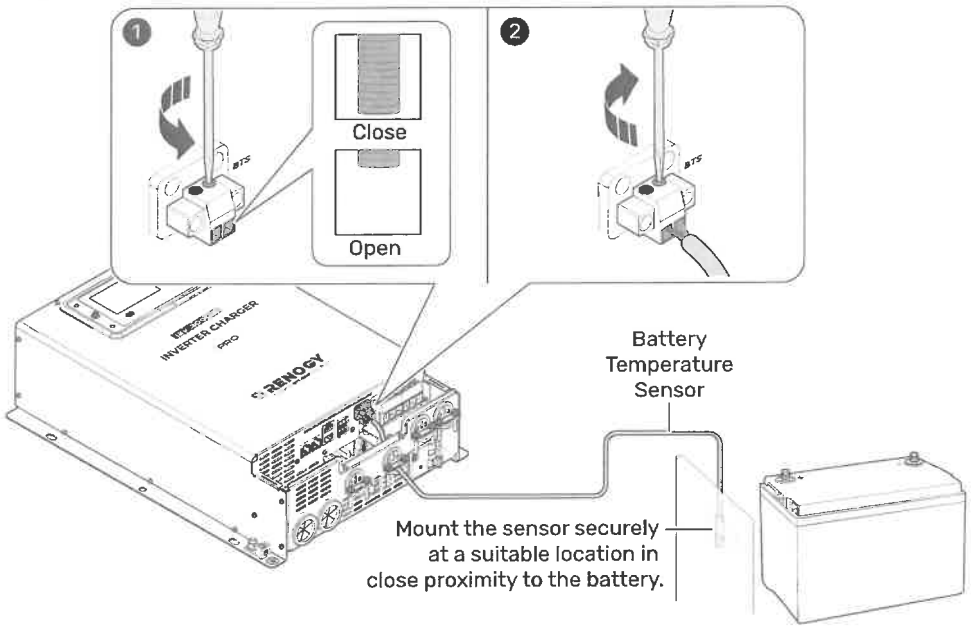
- Components marked with "*" are available on renogy.com.
- Do not use the temperature sensor on a LiFePO4 (LFP) battery which comes with a battery management system (BMS).

Step 1: Run the bare terminal of the temperature sensor through the Accessory Cable Entry.

Step 2: Turn the cable retainer screws on the retainer counterclockwise with a slotted screwdriver to ensure that the cable retainer is open.

Step 3: Strip some insulation off the grounding cable with a wire stripper. Insert the bare terminal of the temperature sensor into the retainer and tighten it with a slotted screwdriver by turning the cable retainer screws clockwise.

Step 4: Mount the sensor securely at a suitable location in close proximity to the battery.



- Never mount the temperature sensor on the battery to prevent false overtemperature alarms.

4.7. Install a Wired Remote Control (Optional)

You can use a Wired Remote Control (sold separately) to power on or off the inverter charger remotely.

Recommended Components



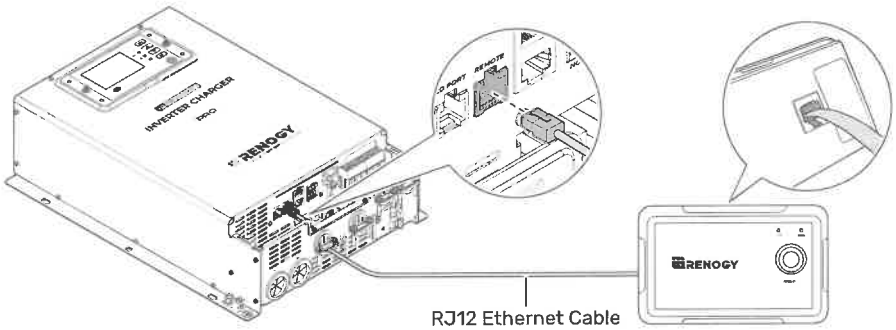
*Wired Remote Control

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

Step 1: Run the RJ12 Ethernet Cable through the Accessory Cable Entry.

Step 2: Connect the RJ12 connector to the Wired Remote (REMOTE) Port on the inverter charger.

Step 3: Connect the other end of the cable to the Wired Remote Control.



RJ12 Ethernet Cable

4.8. Connect the Inverter Charger to AC Loads (Appliances)

This section takes an AC load sub-panel as an example.

Step 1: Strip 0.36 inches (9 mm) of insulation off the three bare wires with a wire stripper. Run three bare wires through the AC Output Port.

Step 2: Rotate the cable retainer of the AC Output Terminal Block counterclockwise with a slotted screwdriver. Make sure the cable retainer is completely open.

Step 3: Connect the live wire to the (L) terminal, the neutral wire to the (N) terminal, and the ground wire to the (PE) terminal. Rotate the screws clockwise to clamp the wire down and close the cable retainer.

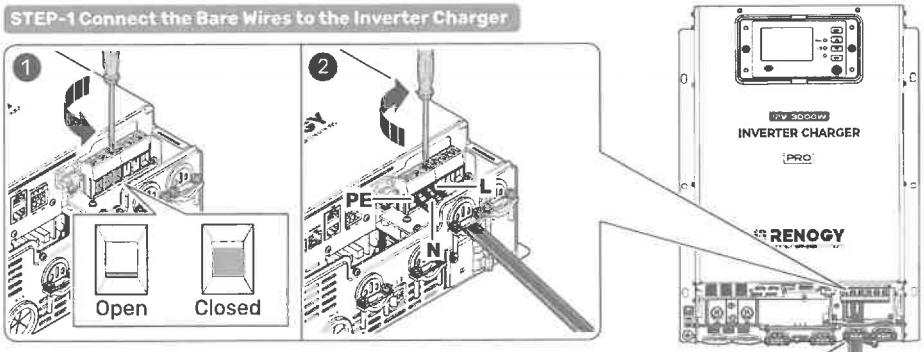
Step 4: Connect the other ends of the three bare wires to a AC load sub-panel. The live wire should be connected to the L terminal of the socket outlet. The same rules apply to the neutral (N) and ground (PE) terminals.

Step 5: 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 a AC load sub-panel, please refer to the user manual of the specific AC load sub-panel.

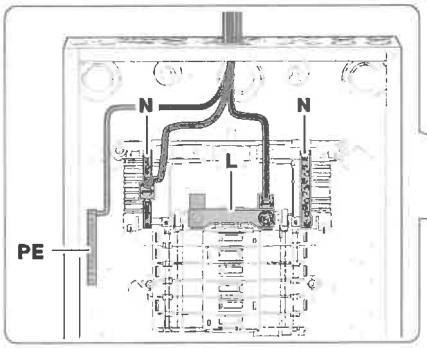
For your safety, it is recommended that qualified electricians familiar with safety codes of electrical systems perform the installation.

STEP-1 Connect the Bare Wires to the Inverter Charger



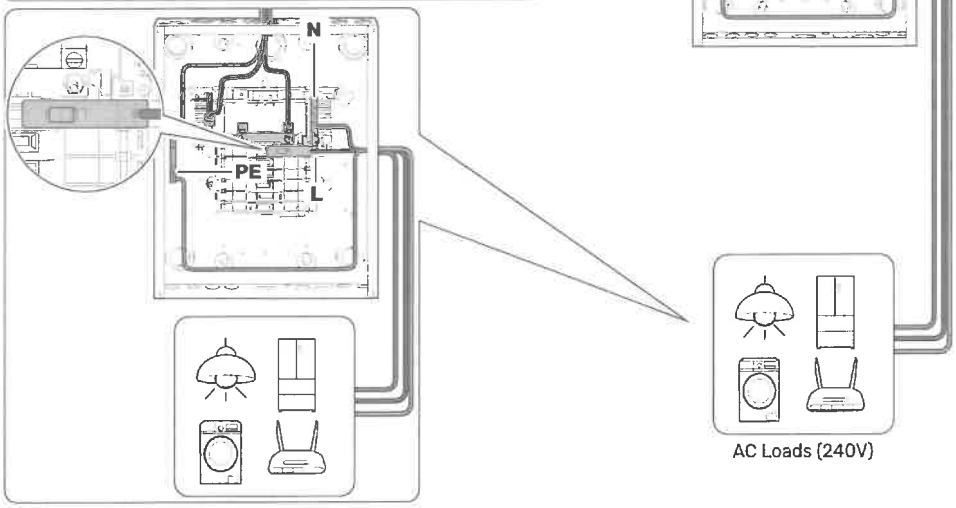
Through the grommet of the AC Output Port

STEP-2 Connect the Bare Wires to an AC Load Sub-panel



Bare Wires

STEP-3 Install Circuit Breakers and AC Loads on Demand



AC Loads (240V)

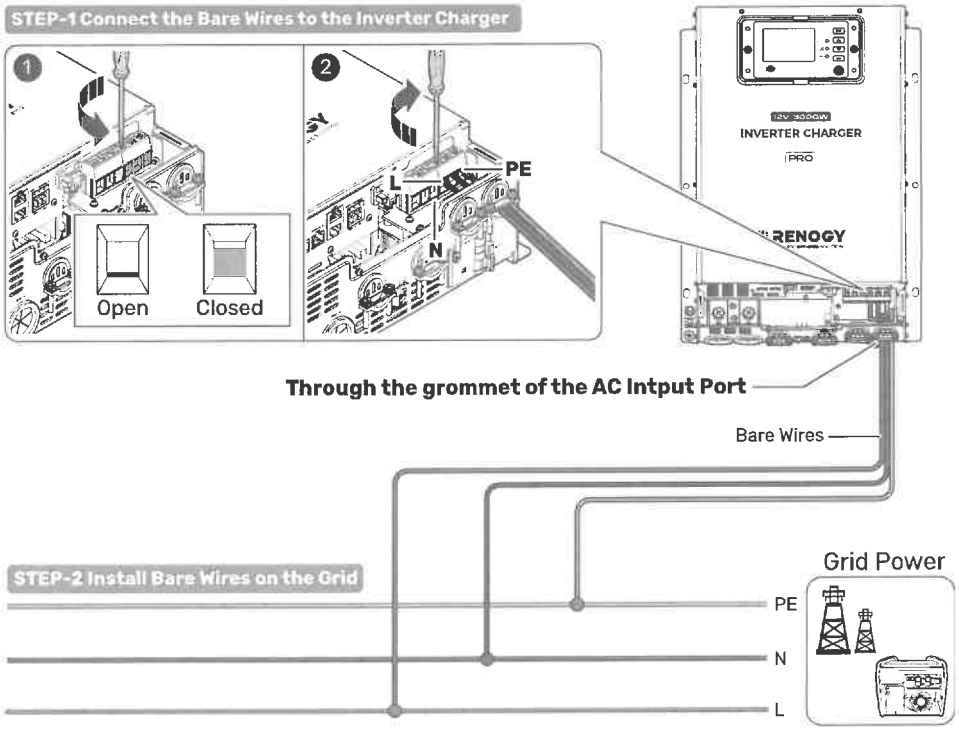
4.9. Connect the Inverter Charger to the Grid (Optional)

Step 1: Strip 0.36 inches (9 mm) of insulation off the three bare wires with a wire stripper. Run three bare wires through the AC Intput Port.

Step 2: Rotate the cable retainer of the AC Input Terminal Block counterclockwise with a slotted screwdriver. Make sure the cable retainer is completely open.

Step 3: Connect the live wire to the (L) terminal, the neutral wire to the (N) terminal, and the ground wire to the (PE) terminal. Rotate the screws clockwise to clamp the wire down and close the cable retainer.

Step 4: Locate the live, neutral, and ground terminals on the grid, and connect the other ends of the bare wires to the respective terminals on the grid. The live wire should be connected to the L terminal of the socket outlet. The same rules apply to the neutral (N) and ground (PE) terminals.



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

When the AC input reaches 16A, the inverter charger automatically shuts down the AC input to prevent damage caused by excessively high current. You can customize the overcurrent protection threshold on the Renogy app. Maximum allowed threshold: 16A.

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

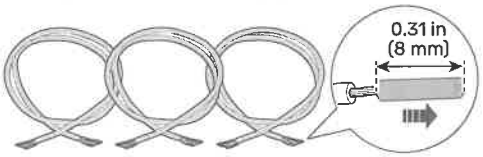
Automatic Generator Start

For AC generators supporting the automatic on/off function, connect the generator to the inverter charger. If the battery voltage reaches or falls below the Low Voltage Reconnect value (when a Battery Voltage Sensor is involved), the inverter charger will send a 5-minute start signal to the generator. Upon receiving the signal, the generator will automatically start and provide power to the battery and loads.

- Read the user manual of the AC Input source carefully before connection.
- Ensure the generator can automatically start or stop. Identify NC (normally closed contact), NO (normally open contact), and C (common static contact) of the generator and ensure signal lines are connected properly. Some generators only have NC and C (common static contact) or NO and C. You can connect them on demand.

  Do not install the inverter charger near any generator supporting automatic generator on/off because these generators exhaust dangerous fumes in operation.

Recommended Accessories & Tools



Bare Wires × 3



Slotted Screwdriver (3 mm)

- There is no polarity requirement for the bare wires.

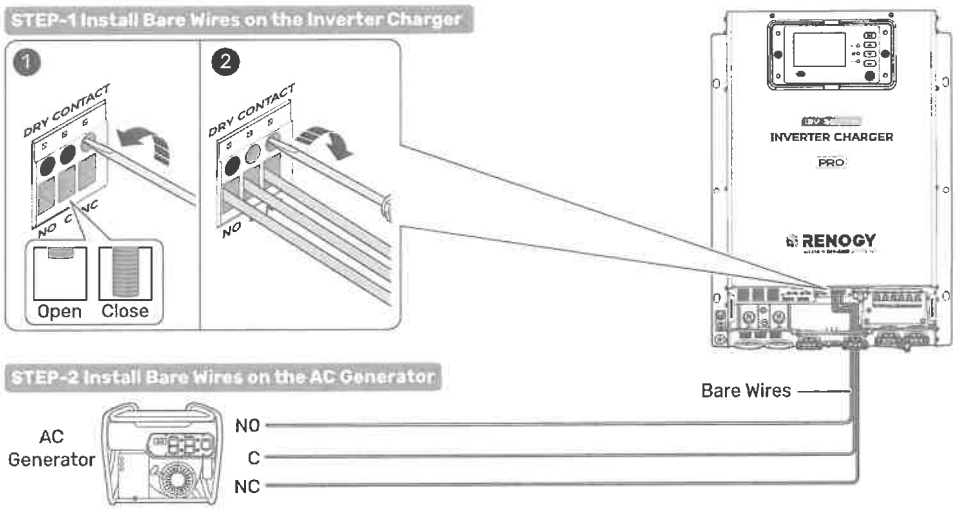
Step 1: Strip some insulation (0.31 in/8 mm) off each of the three bare wires with a wire stripper. Run three bare wires through the Accessory Cable Entry.

Step 2: Turn the cable retainer screws of NC, C and NO of Dry Contact Relay Terminal BLock counterclockwise with a slotted screwdriver to ensure that the cable retainers are open.

Step 3: Connect three bare wires to the corresponding NC, C, and NO wiring holes. Turn the cable retainer screws of NC, C and NO clockwise with a slotted screwdriver to fasten the cable.

Step 4: Connect the bare ends of the three wires to the AC generator.

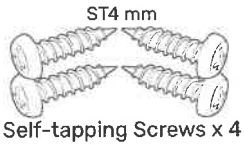
- For details on how to connect the AC Generator to the inverter charger, read the user manual of the specific generator.



4.10. LCD Mounting (Optional)

The LCD is pre-installed on the inverter charger. If the default installation location restricts accessibility, relocate the LCD to an alternative position for improved operation.

Recommended Accessories



Self-tapping Screws x 4

Choose proper mounting screws specific to your installation site. This manual takes selftapping screws for wooden walls as an example.

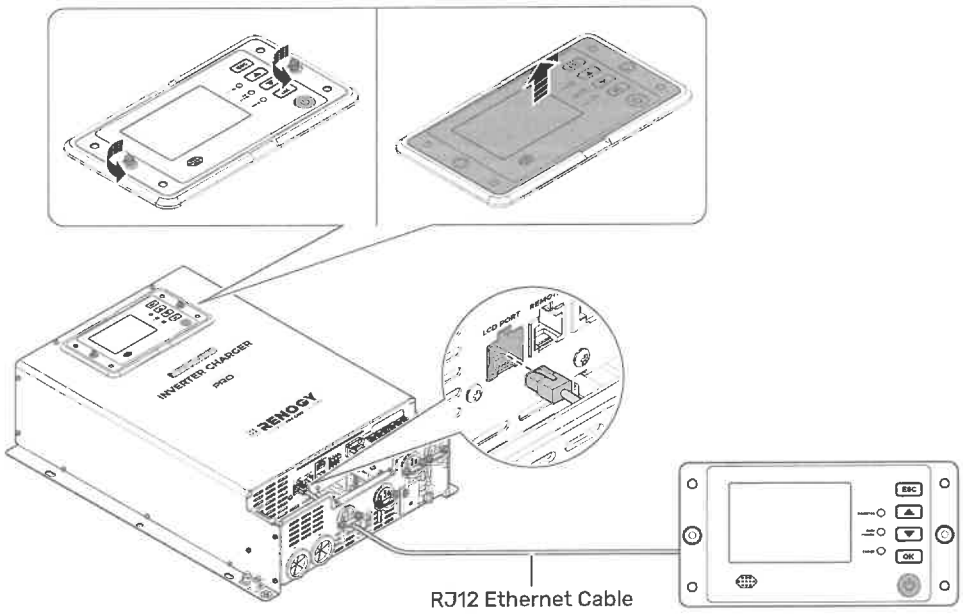
Step 1: Turn the two LCD screws counterclockwise either by hands or by using a slotted screwdriver.

Step 2: Lift the LCD, and replace the existing communication cable with an included RJ12 Ethernet Cable.

Step 3: Run the RJ12 Ethernet Cable through the Accessory Cable Entry, and inset the other end of the cable into the External LCD Port on the inverter charger.

Step 4: Secure the LCD to a required location for easy access.

You can flush mount the LCD on demand. LCD dimension 5.89 x 3.05 x 0.65 in (149.5 x 77.5 x 16.5 mm).



RJ12 Ethernet Cable

4.11. CAN Communication Wiring (Optional)

The Pro 12V 2000W/3000W HF Inverter Charger can communicate with other Renogy devices supporting CAN communication and monitoring devices through CAN (common area network) bus, also known as RV-C, enabling safe operation, smart control, remote monitoring, and programmable settings.

You can connect the inverter charger to other Renogy devices supporting CAN communication for real-time inter-device data communication through either of the CAN Communication Ports.

The wiring details vary depending on the wiring schemes. This user manual elaborates on inter-device wiring in two schemes: backbone and daisy chain networks.

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

Backbone Network

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

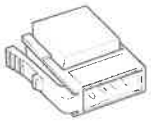
If the RV-C bus does not have a built-in 120Ω termination resistor, the inverter charger will not communicate properly with other Renogy devices supporting CAN communication. Please use the Daisy Chain Network for communication connections.

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

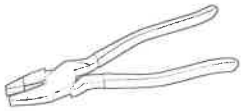
Recommended Tools & Accessories



Communication Cable
(RJ45 Plug to Bare Drop Cable)



Drop Plugs



Split Joint Pliers

- Accessories marked with "*" are available on renogy.com.
- The Communication Cable is only for use with the inverter charger. Please refer to the user manual of other devices for the communication cable types they require.
- The communication 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 Communication Cable. The white green CAN_H wire goes to pin 2, the white orange CAN_L wire goes to pin 3. Leave pin 1 and pin 4 empty.

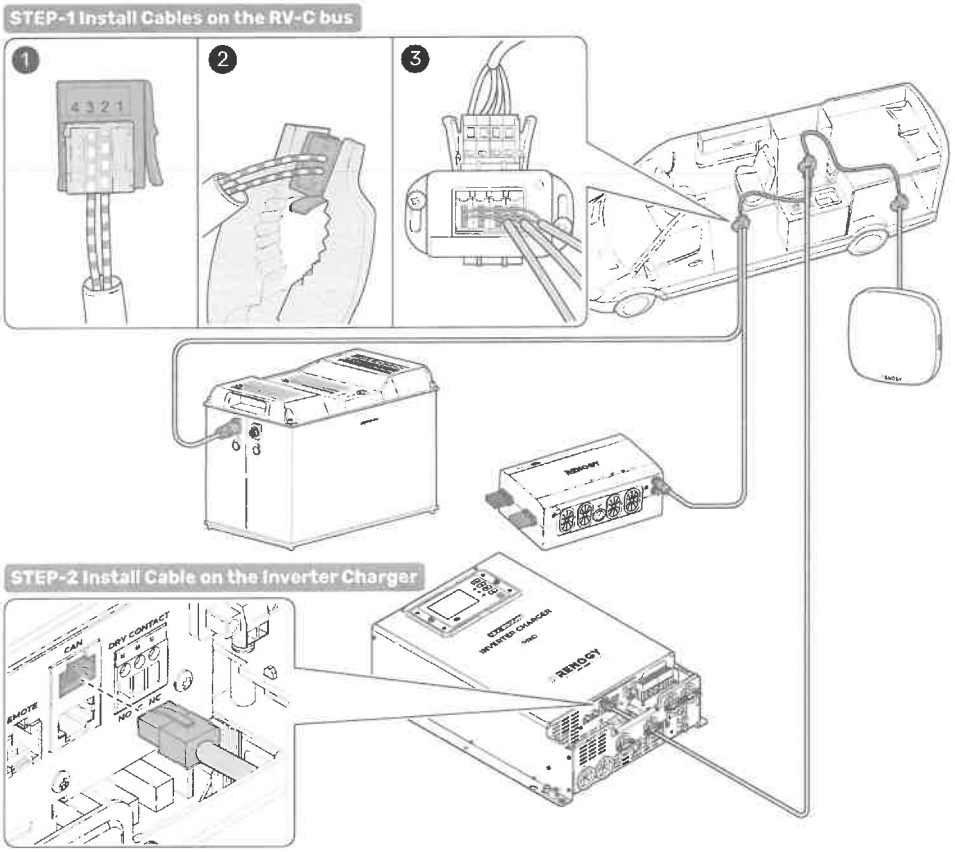
Step 2: Squeeze the crimp areas of the Drop Plugs with the Split Joint Pliers.

Step 3: Locate the drop tap (not included) on the RV-C bus that is the closest to the installation site of the inverter charger. 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 RJ45 Plug into any of the CAN Communication Ports of the inverter charger.

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



Daisy Chain Network

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

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

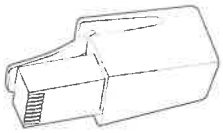
- Inverter Charger to Renogy devices with RJ45 Ports: RJ45 Ethernet Cable (CAT5 or above)
- Inverter Charger to Renogy devices with 7-Pin CAN Communication Ports: RJ45 to 7-Pin CAN Communication Terminal Plug Adapter Cable
- Inverter Charger to Renogy devices with LP16 CAN Communication Ports: RJ45 to LP16 Plug Adapter Cable

This section is based on an RJ45 to LP16 Plug Adapter Cable.

Recommended Accessories



*RJ45 to LP16 Plug Adapter Cable(s)



*RJ45 CAN Termination Resistor

Accessories marked with "*" are available on renogy.com.

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

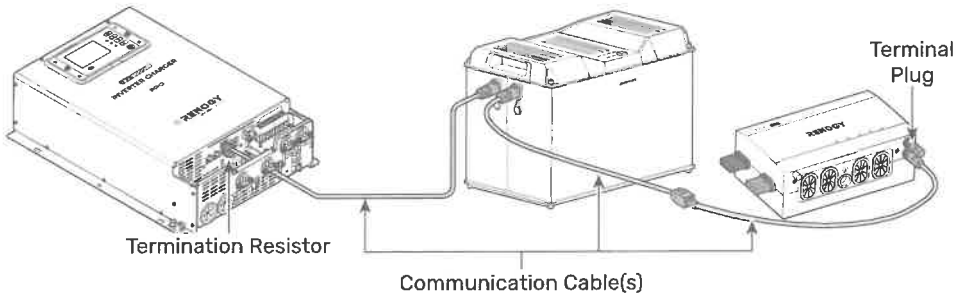
Choose proper termination resistors based on the specific CAN ports.

The quantity of adapter cables and plugs varies based on the position of the inverter charger in the daisy chain network. When the inverter charger is positioned at either the first or the last device in the daisy chain network, one RJ45 CAN Termination Resistor and one adapter cable are required. In scenarios where the inverter charger is located in the middle of the daisy chain network, two adapter cables are needed.

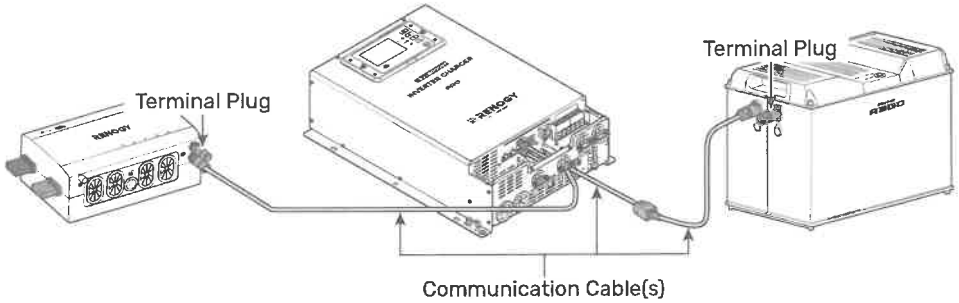
Step 1: Connect devices in series with the inverter charger through either of the CAN Communication Ports with the Communication Cable(s) (sold separately).

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

Inverter Charger is Positioned at the First or Last in the Daisy Chain Network

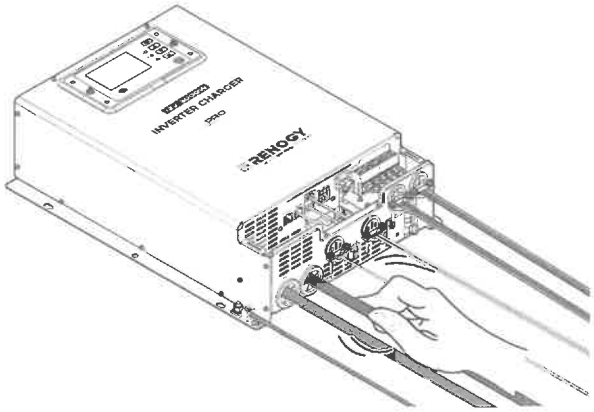


Inverter Charger is in the Middle of the Daisy Chain Network



4.12. Inspection

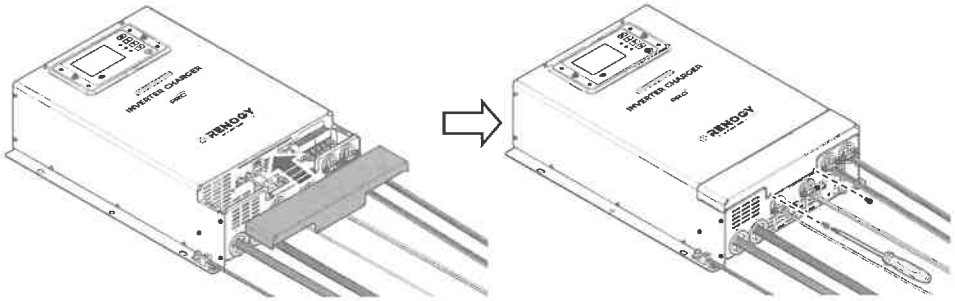
Check and confirm all wires are firmly fastened to the inverter charger.



4.13. Install the Cover

Step 1: Place the cover back on the inverter charger.

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



5. Power On/Off

- In scenarios involving available AC input, the AC input current can bypass the inverter charger to power loads and charge the battery, even if the inverter charger is turned off.
- Set the battery type immediately after powering on the inverter charger. For details, refer to "8.4. Set a Battery Type" in this manual.

Method 1: Through the On/Off/Remote Power Switch



OFF: The inverter charger is off.

The inverter charger uses grid power to directly power AC loads without drawing power from the batteries. The grid charges the connected battery at the same time.

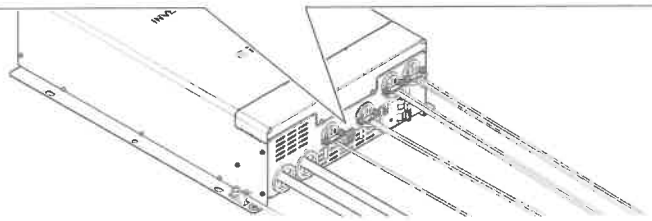


ON: The inverter charger is on.

The inverter charger powers AC loads either by the grid or batteries in accordance with your settings. The grid charges the connected battery at the same time.



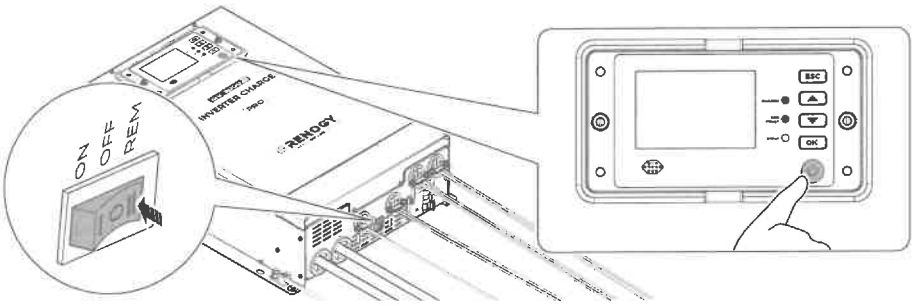
REM: Turn on or off the inverter charger via the Wired Remote Control and LCD.



Method 2: Through the Included LCD Screen

You can press the Power button on the LCD to power the inverter charger on or off when all of the following are met:

1. The On/Off/Remote Power Switch on the inverter charger is toggled to the REM position.
2. The inverter charger is powered on.



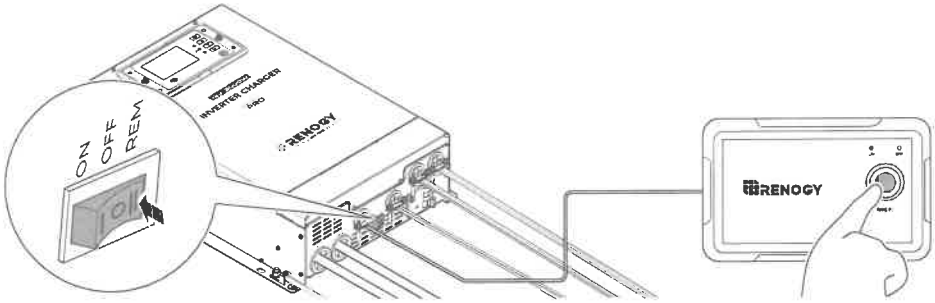
Method 3: Through the Wired Remote Control (Optional)

An external Wired Remote Control is required. For detailed installation instructions, see Section "4.7. Install a Wired Remote Control (Optional)" in this manual.

Press the RMS-P button on the Wired Remote Control to power the inverter charger on or off remotely when all of the following are met:

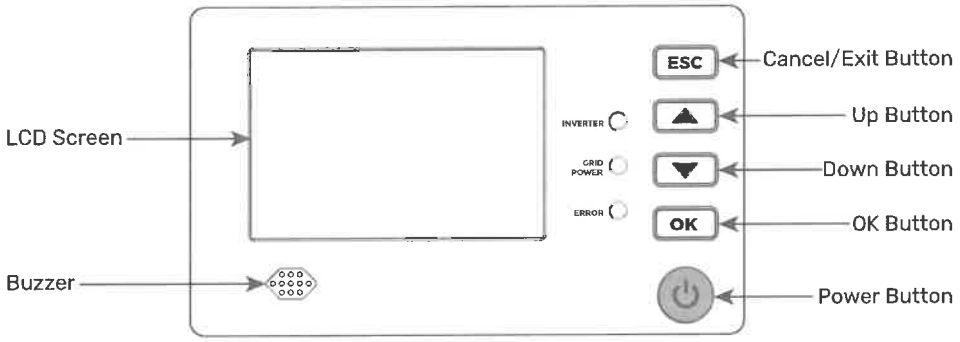
1. The On/Off/Remote Power Switch on the inverter charger is toggled to the REM position.
2. The inverter charger is powered on.
3. The ON LED on the Wired Remote Control flashes in green.

The ON LED flashes in green once the inverter charger is powered on and the On/Off/Remote Switch is in the REM position.



6. LCD Screen and LED Indicators

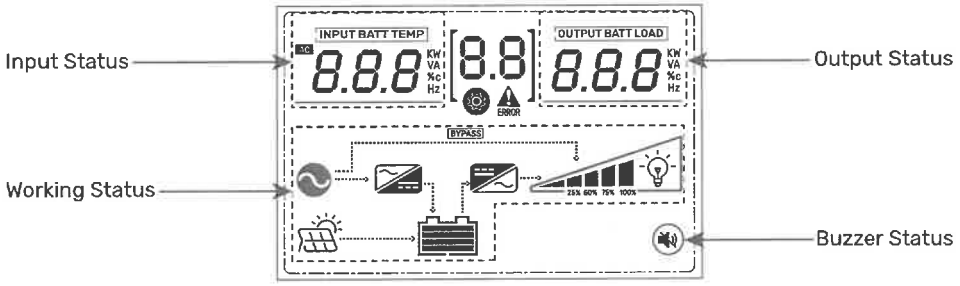
6.1. LCD Screen

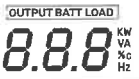
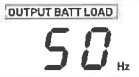
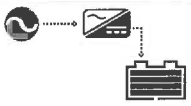
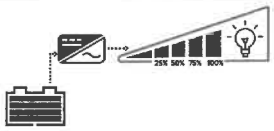


The table below introduces the buttons and their functions.

Button	Function
Cancel/Exit Button	Press this button to cancel the setting or exit the setting interface.
Up Button	Press this button to navigate to the previous parameter.
Down Button	Press this button to navigate to the next parameter.
OK Button	Press this button to enter a parameter setting page or confirm your parameter settings.
Power Button	Press this button to power on or off the inverter charger.

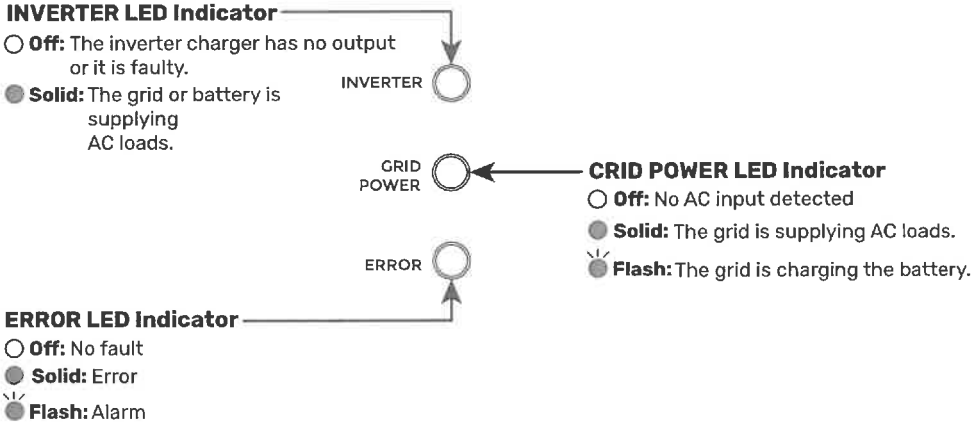
The LCD screen presents an overview of your inverter charger's operating status.



Status Area	Icon	Description
Input Status		AC input available: Displays AC input voltage and frequency.
		No AC input: Displays battery voltage.
Output Status		AC input available: Displays battery charge current. Displayed as FUL when the battery is fully charged.
		No AC input: Displays output frequency of the inverter charger.
Working Status		The grid is supplying AC loads.
		The grid is charging the battery.
		The battery is supplying AC loads.
		Indicates battery level (SOC) by 0-24%, 25-49%, 50-74%, and 75-100%.
		The battery is charged by a battery charger.
Buzzer Status		Buzzer disabled. This icon will disappear automatically when the buzzer is enabled.

Status Area	Icon	Description
Fault and Setting		Displays error code and program code.

6.2. LED Indicators



- A solid red LED indicates that the inverter charger is faulty. Please login to the LCD or Renogy app for troubleshooting details.
- By default, the buzzer will beep intermittently when an alarm is triggered on the inverter charger. If a fault occurs, the buzzer will emit a continuous beep. In such cases, check the fault or alarm details using the included LCD or the Renogy app. For further information, refer to "10. Troubleshooting".

7. Monitoring

Depending on the specific application, the inverter charger can establish either short-range or long-range communication connections with monitoring devices.

You can monitor this inverter charger through any or all of the following devices:

- Included LCD Screen (for details, see "6.1. LCD Screen")
- Renogy app
- Renogy ONE Core

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 Renogy 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 charger is properly installed and powered on before it is paired with the Renogy app.
- To ensure optimal system performance, keep the phone within 10 feet (3 m) of the inverter charger.

To ensure the optimal performance, download and log in to the latest Renogy app.







7.1. Short-Range Monitoring via Renogy App

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

Recommended Components

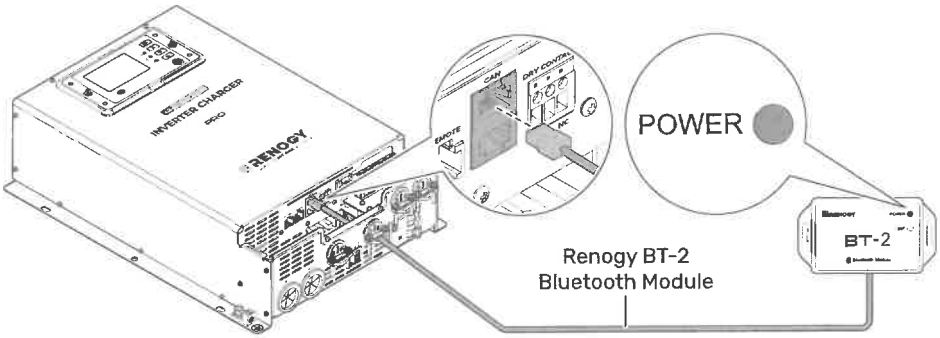


*Renogy BT-2 Bluetooth Module

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

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

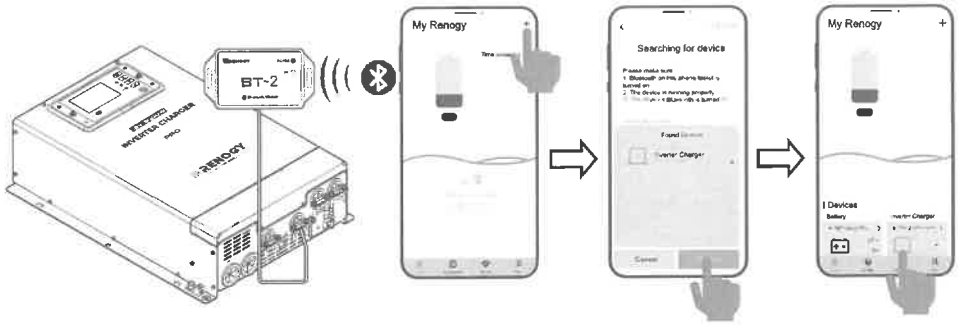
Step 2: Place the Bluetooth module in a suitable site.



Step 3: Open the Renogy app. Tap + to search for new devices.

Step 4: Tap **Confirm** to add the newly found device to the device list.

Step 5: Tap the inverter charger icon to enter the device information interface.



7.2. Wireless Long-Range Monitoring

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

Recommended Components

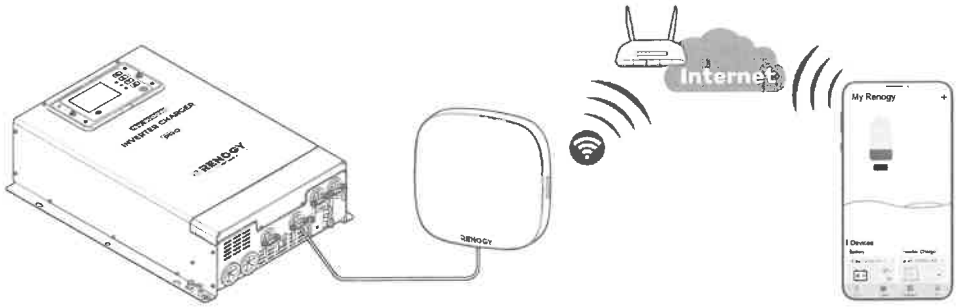


*RENOGY ONE Core

- 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 charger does not communicate with any other device.

Step 1: Connect the RENOGY ONE Core to the CAN Communication Port on the inverter charger.

Step 4: Pair the Renogy ONE Core with the Renogy app through Wi-Fi or by scanning the QR code in the Renogy ONE Core. On Renogy ONE Core, go to "**Settings** > **System** > **Pair with App**" to get the QR code.



7.3. Wired Long-Range Monitoring (Backbone Network)

If long-range communication and programming are required, connect the inverter charger to Renogy ONE Core through wires, and then pair the Renogy ONE Core with the Renogy app through WLAN.

Recommended Components & Accessories



*RENOGY ONE Core



Common Drop Tap

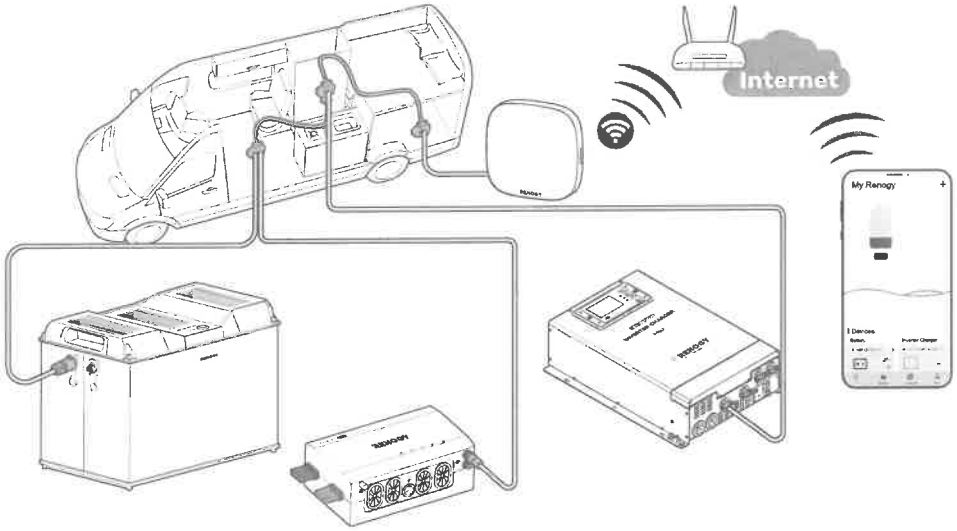


Communication Cable
(RJ45 Plug to Bare Drop Cable)

- 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 charger 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 Renogy app.



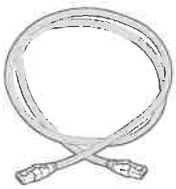
7.4. Wired Long-Range Monitoring (Daisy Chain Network)

If long-range communication and programming are required, connect the inverter charger to Renogy ONE Core through wires, and the Renogy ONE Core to the Renogy app through Wi-Fi.

Recommended Components & Accessories



*RENOGY ONE Core



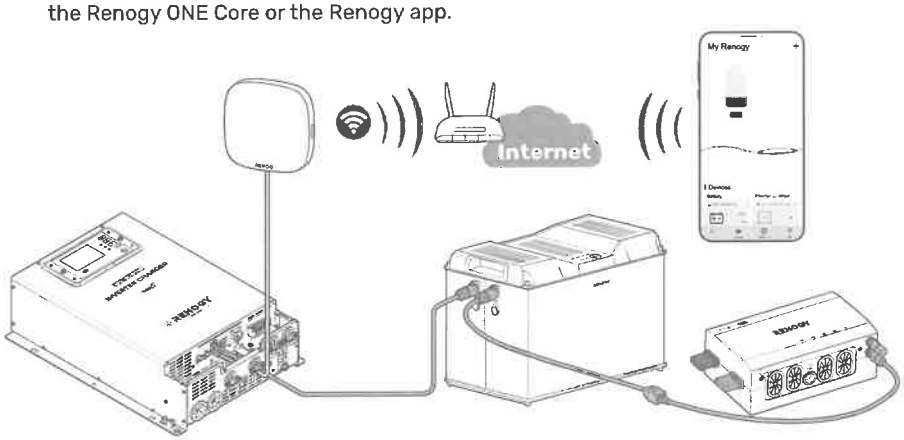
RJ45 Ethernet Cable (CAT5 or above)

- Components and accessoriesmarked 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 charger does not communicate with any other device.
- Select the appropriate communication cable (sold separately) according to the distance between devices. The communication cable should be less than 19.6 feet (6 m).

Step 1: Remove the Termination Resistor or Terminator Plug from the Renogy device at either end of the daisy chain.

Step 2: Connect the Renogy ONE Core to the free CAN Communication Port on the Renogy device with the Communication Adapter Cable (sold separately) and RJ45 Ethernet Cable.

Step 3: Pair Renogy ONE Core with the Renogy app. Monitor and program the complete system on the Renogy ONE Core or the Renogy app.



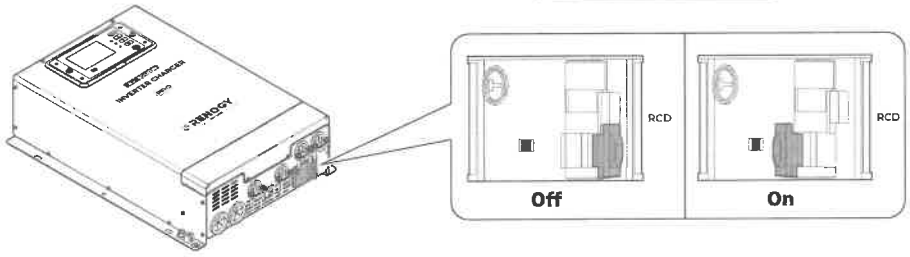
8. Configuration

8.1. Residual Current Device (RCD)

The built-in residual current device (RCD) of either effectively protects the inverter charger and connected devices, enhancing system safety. In the event of a leakage fault, the RCD immediately cuts off power, 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.

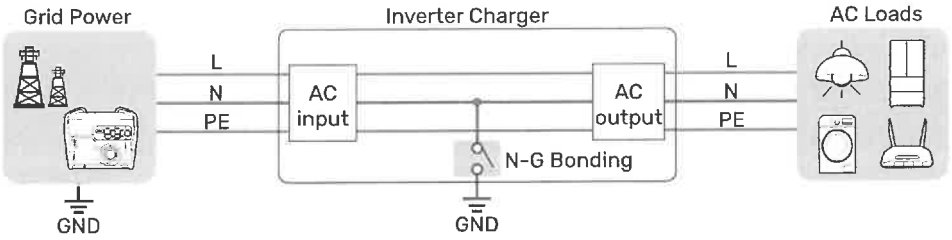
When the RCD triggers protection, it automatically trips, causing the inverter charger to stop working. In such case, check all wires and connections to ensure there is no damage or loose connections. Simply flip the switch upward to restore operation of the inverter charger. For technical support, contact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



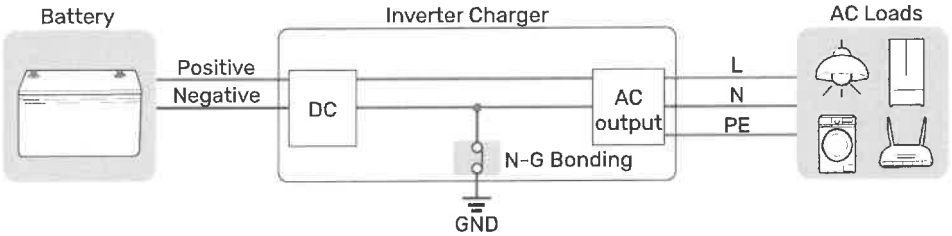
8.2. N-G Bonding Relay

The inverter charger 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 charger faults. Additionally, the N-G bonding relay ensures the proper operation of any additional RCDs.

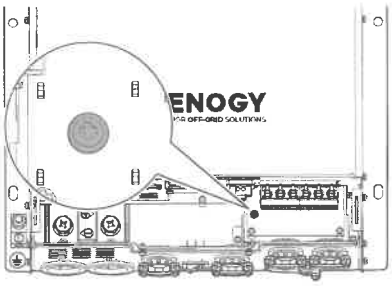
When there is AC input, the N-G bonding relay automatically opens the neutral-to-ground connection as shown in the figure below, and the system connects to the grid ground contact.



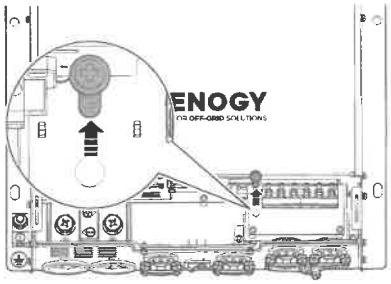
When there is no AC input, the N-G bonding relay automatically closes and connects to the ground contact of the inverter charger. In this case, the inverter charger supplies loads with the connected battery.



To disable the relay function, remove the N-G bonding relay screw. Note that disabling the relay function disables the built-in RCD.



Enabled



Disabled

⚠ Grounding the inverter charger is required to ensure your safety.

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

8.3. Set Charging Parameters

The table below illustrates the default and recommended parameters for batteries that can be connected to the inverter charger. 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 will damage the device and void the warranty.

⚠ Read the user manual of the battery when customizing a preset battery. Incorrect battery type selection damages the inverter charger and voids the warranty.

Battery Type / Parameters	SLD/AGM	GEL	FLOODED	LI (LFP)	USER (Default)	USER (Recommended)
Overvoltage Shutdowm	15.8V	15.8V	15.8V	15.8V	15.8V	9.0–16.0V
Overvoltage Limt	15.5V	15.5V	15.5V	14.8V	15.5V	9.0–16.0V
Equalization Volatge	–	–	14.8V	–	14.8V	9.0–15.5V
Boost Voltage	14.6V	14.2V	14.6V	14.4V	14.2V	9.0–15.5V
Float Voltage	13.8V	13.8V	13.8V	–	13.8V	9.0–15.5V
Boost Return Voltage	13.2V	13.2V	13.2V	13.6V	13.2V	9.0–15.5V
Low Voltage Reconnect	12.6V	12.6V	12.6V	12.8V	12.6V	9.0–16.0V

Under Voltage Warning	12.0V	12.0V	12.0V	12.0V	12.0V	9.0–15.5V
Low Voltage Shutdown	11.1V	11.1V	11.1V	11.5V	11.1V	9.0–15.5V
Boost Duration	120 min*	120 min*	120 min*	–	120 min*	10–600 min
Equalization Duration	–	–	120 min	–	120 min	0–600 min
Equalization Interval	–	–	30 days	–	30 days	0–255 days

- *For SLD/AGM, GEL, and Flooded batteries, the inverter charger automatically switches to float charging when the charging current drops below the tail current of the battery for 30 seconds.
- Parameters in grey cannot be configured manually.

You can set charging parameters for the inverter charger on the included LCD screen or in the Renogy app. For how to connect the inverter charger to your phone via the Renogy app, refer to "7. Monitoring".

Method 1: Set Charging Parameters via the LCD screen

- **Operational Instructions**

Step 1: Press the **OK** Button to enter the parameter setting page, and the program code F0 flashes.

Step 2: Press the **Up** and **Down** Buttons to navigate to the parameter that you want to configure.

Step 3: Press the **OK** Button to enter the setting page of the parameter. The related program code flashes.

Step 4: Press the **Up** or **Down** Button to switch between different parameter values.

Step 5: Press the **OK** Button to confirm your setting and return to the parameter selection state.

Step 6: Press the **Cancel/Exit** button to exit the parameter setting mode.

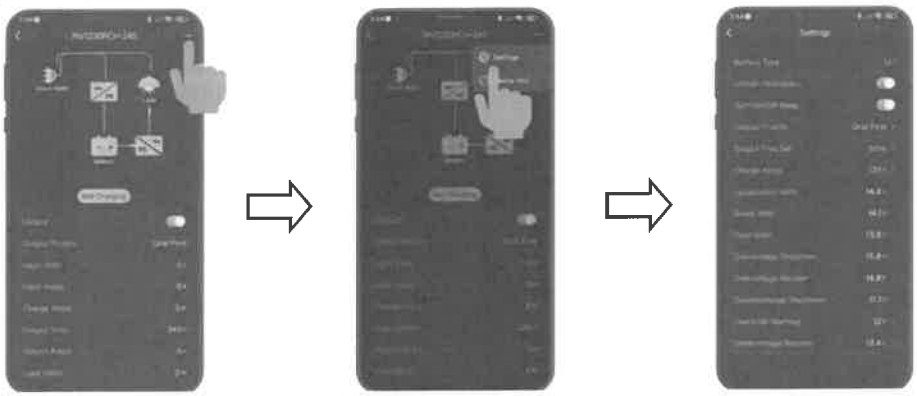
- **Program Code**

The table below provides the configurable charging parameters specific to program code on the LCD screen.

Program Code	Parameter	Value Range
F0	Power supply priority	• 1: AC first • 2: Battery First
F1	Low Voltage Shutdown in USER mode	9V to 15.5V
F2	Overvoltage Shutdown in USER mode	9V to 16V
F3	Charging current	• 3000W: 5A to 120A • 2000W: 5A to 80A
F4	Buzzer status	• 0: Buzzer disabled • 1: Buzzer enabled
F5	Factory restoration	• 0: Cancel • 1: Restore to factory mode

Program Code	Parameter	Value Range
F6	Battery type	• 0: SLD/AGM (Sealed LeadAcid Battery) • 1: GEL (Gel Battery) • 2: FLD (Flooded Battery) • 3: LI (Lithium Battery) • 4: User Mode (Custom mode)
F7	Overvoltage Limt in USER mode	9V to 16V
F8	Equalization Voltage in USER mode	9V to 15.5V
F9	Boost Voltage in USER mode	9V to 15.5V
10	Float Voltage in USER mode	9V to 15.5V
11	Boost Return Voltage in USER mode	9V to 15.5V
12	Low Voltage Reconnect in USER mode	9V to 16V
13	Under Voltage Warning in USER mode	9V to 15.5V
14	Boost Duration in USER mode	10 to 600 min
15	Equalization Duration in USER mode	0 to 600 min
16	Equalization Interval in USER mode	0 to 255 days
17	Boost Voltage in LI Mode	9V to 15.5V
19	Output frequency of inverter charger	• 50: 50HZ • 60: 60HZ
20	Over voltage Reconnect in USER mode	9 to 15.5V
21	Lithium battery activation function	• 0: Disable • 1: Enable

Method 2: Set Charging Parameters via the Renogy app



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

8.4. Set a Battery Type

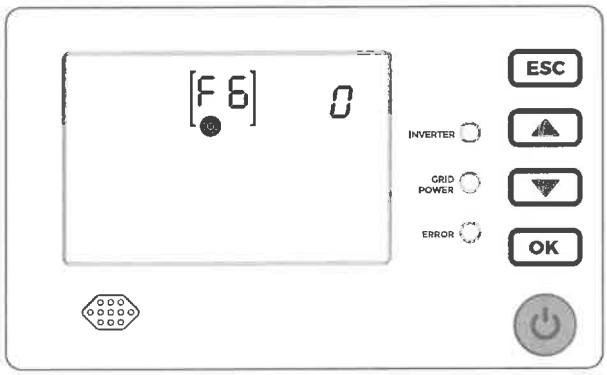
Upon installing the inverter charger, set a correct battery type by using relative buttons on the LCD screen or in the Renogy app. The battery type settings on the LCD screen will automatically synchronize with the Renogy app, and changes made in the app will also reflect on the LCD screen.

Method 1: Set a Battery Type Via the LCD screen

Step 1: Press the **OK** Button to enter the parameter setting page, and the program code F0 flashes.

Step 2: Press the **Up** Button to navigate to the program code F6, and press the OK Button to enter the setting page of battery types.

Step 3: Press the **Up** or **Down** Button to switch between different battery types.



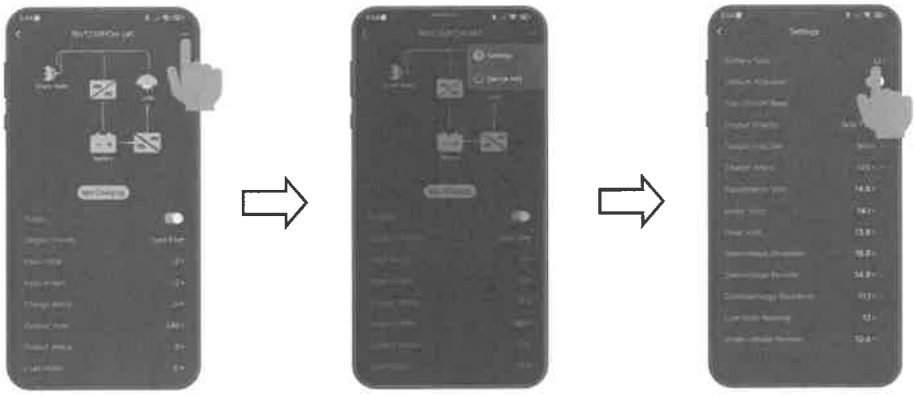
Program Code	Parameter
0	SLD/AGM (Sealed LeadAcid Battery)
1	GEL (Gel Battery)
2	FLD (Flooded Battery)
3	LI (Lithium Battery)
4	User Mode (Custom Battery)

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

After entering the USER mode, you need to use the Renogy app to program the battery parameters. Refer to the "8.5. USER Mode" for details.

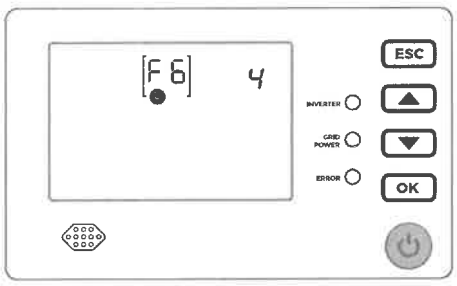
Method 2: Set a Battery Type in the Renogy App

On the home screen in the Renogy app, tap the inverter charger icon to enter the device details page. Tap "**...** > **Settings** > **Battery Type**" to choose the battery type in use.



8.5. USER Mode

Setting the battery type to USER allows you to customize your battery parameters. You can modify the parameters on the included LCD screen or in the Renogy app.



Or



Before modifying battery parameters in USER mode, check the table below and consult the battery manufacturer to check whether modification is allowed. Incorrect parameter setting will damage the device and void the warranty. For how to adjust charging parameters for batteries in USER Mode, refer to "8.3. Set Charging Parameters" in this manual for details.

- In USER mode, when the Equalization Voltage matches the Boost Voltage and Float Voltage, the activation mechanism for the lithium battery is initiated.
- In USER mode, make sure the settings comply with the formula: Overvoltage Shutdown > Boost Voltage > Low Voltage Shutdown.

Overvoltage Shutdown	The default protection voltage is 15.8V. Improper setting may affect the safety of the battery. Please consult the battery manufacturer and check if this voltage value needs to be reset.

Equalization Voltage	1. For lead-acid batteries, please consult your battery manufacturer to obtain the voltage value and then complete the settings according to the feedback. 2. If equalization charging is not required, set the voltage to boost voltage.
Boost Voltage	This value affects whether the battery can be fully charged. Please consult the battery manufacturer and set the value properly.
Float Voltage	This value affects whether the battery can be fully charged. Please consult the battery manufacturer and set the value properly.
Under Voltage Warning	This voltage value affects the life of the battery. Consult the battery manufacturer and check if this voltage value needs to be set.
Low Voltage Shutdown	
Boost Duration	Please consult the battery manufacturer if it is necessary to set this parameter value.
Equalization Duration	
Equalization Interval	

9. Working Logic

Pro 12V 2000W/3000W HF Inverter Charger combines an inverter charger with an automatic transfer switch into one complete system.

Featuring a three-stage battery charging mode when connected to the AC grid input, the inverter charger is capable of producing cleaner, smoother, and more reliable electricity to address your diverse needs.

9.1. Power Supply Logic

Supply by AC First



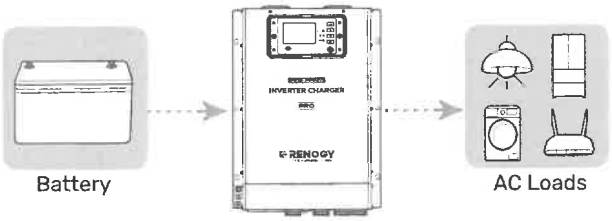
The inverter charger works in AC First mode when all of the following conditions are met:

- The Output Priority of the inverter charger is set to Grid First on the Renogy app.
- Grid power is available.
- The grid power is sufficient to supply all loads.

When none of the designated working conditions are met, the inverter charger transitions to battery power supply. In instances where the battery voltage is lower than the Low Voltage Shutdown value, the inverter charger ceases its operation.

If the grid fails to supply all loads, the battery seamlessly joins in to provide the necessary power.

Supply by Battery First



The inverter charger works in Battery First mode when all of the following conditions are met:

- The Output Priority of the inverter charger is set to Battery First in the Renogy app.
- The battery voltage is no lower than the Low Voltage Shutdown value.
- The battery current is sufficient to power the connected loads.

When none of the designated working conditions are met, the inverter charger utilizes the grid power to supply the battery and loads. In instances where grid power is unavailable, the inverter charger ceases its operation.

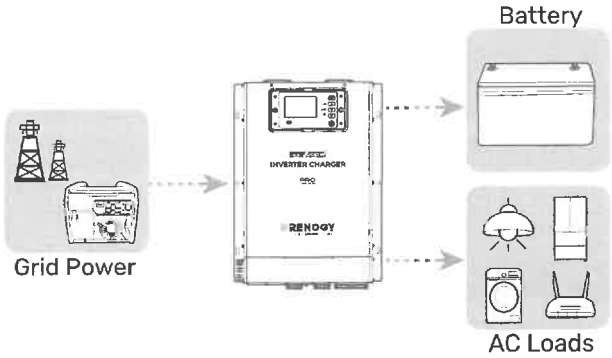
If the battery fails to supply all loads, the grid seamlessly joins in to provide the necessary power.

9.2. Charging Logic

In AC First mode where the grid power is the only supply source, the inverter charger automatically recognizes the battery voltage and charges the battery.

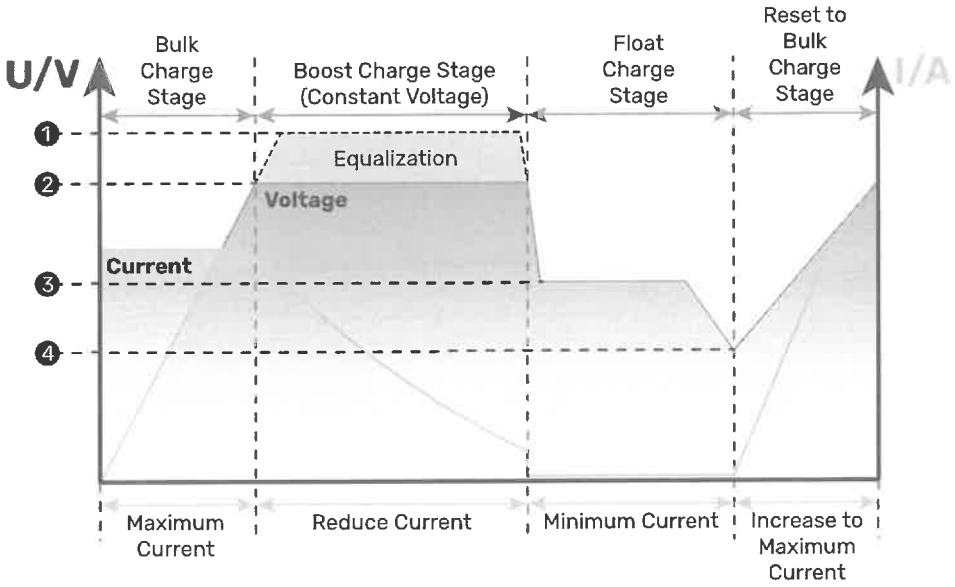
By default, the inverter charger charges the battery at 80A for RIV1220PCH-24S, RIV1220PCH-23S, and RIV1230PCH-24S models. For RIV1230PCH-23S models, the charging current is at 120A.

You can customize the charging current to a value from 5A to 80A for RIV1220PCH-24S and RIV1220PCH-23S models and 5A to 120A for RIV1230PCH-24S and RIV1230PCH-23S models on the Renogy app. For the recommended charging current, refer to the user manual of the specific battery.



Battery Voltage	Charging Status
Drops to the Overvoltage Limt value: ● For lithium batteries: 14.8V (default) ● For non-lithium batteries: 15.5V (default)	Start charging
Rises to Overvoltage Shutdown value: 15.8V (default)	Stop charging

9.3. Battery Charging Stages



1 Equalization charging voltage
2 Boost charging voltage
3 Float charging voltage
4 Low voltage reconnect charging voltage

Adjust the time depending on the specific battery bank size.

Bulk Charge Stage

The inverter charger will supply constant current until the battery voltage reaches the boost voltage.

Boost Charge Stage

The inverter charger will supply constant voltage and reduce the current slowly through this stage. By default, the Boost Duration is set to 2 hours. After this time the charger will enter the float stage. You can set the Boost Duration on the LCD Screen or in the Renogy app.

For details on Boost Duration, see "8.5. USER Mode" in this user manual.

Boost Duration is not required for lithium batteries.

The stage is determined by internal software in the inverter charger.

Float Charge Stage

During this stage the inverter charger will supply a constant voltage which is determined by the battery selected and will keep current at a minimum level. This stage acts as a trickle charger.

The float charge stage is not applicable to lithium batteries.

Equalization

This stage is only available for batteries with equalization, such as flooded. During this stage the batteries are charged at a higher voltage than normal and for most batteries this could cause damage. Refer to the user manual of the battery or contact the battery manufacturer to see if this stage is needed.

9.4. Heat Dissipation Logic

The inverter charger uses fans for heat dissipation. The working logic of the fans is as follows:

Inverter Charger	Inverter Charger Power	Fan
Ambient Temperature ≥95°F (35°C)	–	ON
–	≥ 500W	ON

For 2000W inverter chargers (RIV1220PCH-24S/RIV1220PCH-23S), the fans start working when the output reaches 500W or higher, with the fan speed increasing as the output power rises. The fans operate at full speed when the output power reaches 2000W.

For 3000W inverter chargers (RIV1230PCH-24S/RIV1230PCH-23S), the fans start working when the output reaches 500W or higher, with the fan speed increasing as the output power rises. The fans operate at full speed when the output power reaches 3000W.

The fans start working when any of the above condition is met.

9.5. Activation Logic for Lithium Batteries

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

Operation Conditions

1. Set the battery type of the inverter charger to LI or USER. For details, see "8.4. Set a Battery Type".
2. Ensure the inverter charger is connected to the grid and the grid power is accessible.

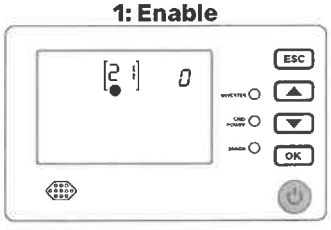
Operation Logic

1. In lithium battery mode, the inverter charger automatically enables the activation function and provides a constant voltage of over 14.0V to 14.4V to activate the lithium battery.
2. After a three-second activation, the inverter charger temporarily stops activation and detects the battery voltage again. If the battery voltage is no less than 9V, the inverter charger will automatically turn off the activation mode. Otherwise, it transitions to normal charging.

Setting Operations

You can enable or disable the activation function either on the LCD screen or in the Renogy app.

0: Disable
1: Enable



Or



10. Troubleshooting

The buzzer will beep in case of a fault. This section provides general troubleshooting tips and error codes specific to faults. You can log in to the Renogy app for troubleshooting details.



10.1. General Faults

Problem	Possible Causes	Solution
LCD screen not displaying	N/A	1. Ensure the battery is properly connected and charged to enable the inverter charger to recognize the battery. 2. Press any LCD button to exit the LCD sleep mode.
Battery overvoltage protection triggered	N/A	Measure whether the battery voltage exceeds 15.5V.
Battery undervoltage protection triggered	N/A	Wait until the battery is charged to return to a voltage above the Low Voltage Reconnect voltage.
Fan failure	N/A	Check if the fans are blocked.
Overtemperature protection triggered	N/A	Wait until the inverter charger cools down, and normal charge and discharge will automatically be restored.
Overload protection triggered	N/A	1. Disconnect or reduce loads from the inverter charger. 2. Shut down the inverter charger, and power it on again.
Inverter charger short circuit protection triggered	N/A	1. Disconnect or reduce loads from the inverter charger. 2. Shut down the inverter charger, and power it on again.

Problem	Possible Causes	Solution
No battery alert	N/A	Ensure the battery is properly connected and the circuit breaker on the battery side is closed.
No battery is detected.	1. The cables between the battery and the inverter charger are loose. 2. Abnormal battery voltage	1. Check the cable wiring between the battery and the inverter charger, and ensure the cables are correctly and firmly installed. 2. Measure the battery voltage with a multimeter. A normal battery voltage should range from 10.5V to 15.8V. The inverter charger may fail to detect the battery when the battery voltage is lower than 10.5V. In such case, charge the battery, and reconnect it to the inverter charger.
The Renogy app fails to discover the inverter charger.	1. Your phone's Bluetooth is off. 2. The inverter charger is off. 3. The inverter charger is far away from the phone of tablet where the Renogy app runs.	1. Turn on Bluetooth on your phone or tablet. 2. Turn on the inverter charger. 3. Keep the phone or tablet within 10 feet (3 m) of the inverter charger.

10.2. Error Codes

When the inverter charger is faulty, the FAULT indicator flashes with relative error code displayed on the LCD.

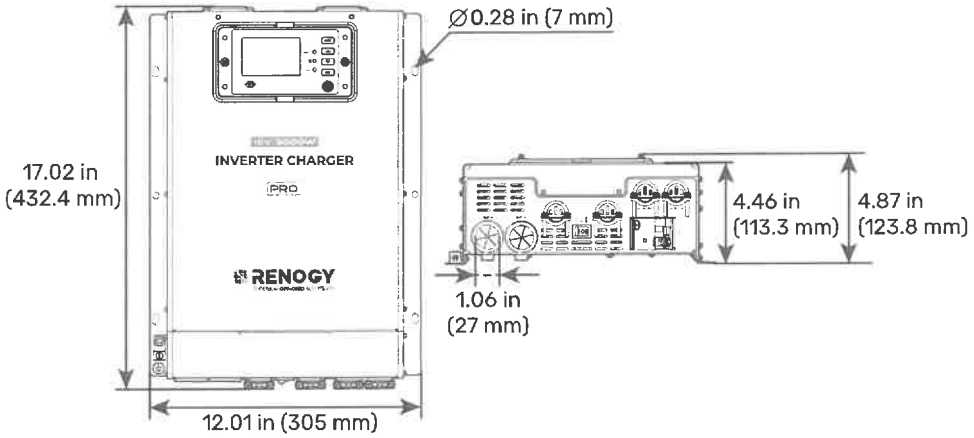
Error Code	Description	Error Code	Description
E01	Battery UnderVolt Protection	**E03**	No battery connected
E06	Battery: Charge Overvoltage Protection	**E08**	Hardware fault*
E14	AC overload protection	**E15**	Battery: Inverter overcurrent protection
E17	AC Output Short-Circuit Protection	**E18**	Battery: Charge overcurrent protection
E20	**Overtemperature within the inverter charger**	**E21**	Fan failure
E27	TC3 battery overtemperature protection	**E29**	Hardware fault*
E33	**Battery overvoltage warning**	**E34**	Battery undervoltage warning
E50	Battery Overvoltage Protection	**E63**	Wrong AC input frequency
E64	Temperature detector fault	**E70**	DC/DC power source error

Error Code	Description	Error Code	Description
E71	AC/DC power source error	**E73**	Three times of triggering of battery undervoltage protection within 1 minute. The inverter output shuts down.
E74	Battery: Charge no current protection	**E75**	Hardware fault*
E76	AC overvoltage > 260V	**E77**	Hardware fault*
E78	TC1 AC overtemperature protection	**E79**	TC2 AC overtemperature protection
E80	AC input voltage < 185V AC or overload protector disconnection		

*For hardware faults and additional technical support, contact our technical service through renogy.com/contact-us.

11. Dimensions & Specifications

11.1. Dimensions



The figure above is based on RIV1230PCH-24S. The other models share the same dimensions.

Dimension tolerance: ±0.2 in (2 mm)

11.2. Technical Specifications

Inverter Specifications				
Model	RIV1220PCH-24S	RIV1230PCH-24S	RIV1220PCH-23S	RIV1230PCH-23S
Rated Output Power @86°F (30°C)	2000W	3000W	2000W	3000W
Surge Power (100 ms)	4000W	6000W	4000W	6000W
Surge Power (3 seconds)	3000W	4500W	3000W	4500W
Surge Power (35 seconds)	2400W	3600W	2400W	3600W
Nominal Output Voltage RMS	240(±3%)V AC		230(±3%)V AC	
Output Frequency	50Hz (±0.1Hz) (Default) / 60Hz (±0.1Hz)			
Output Wave Form	Pure Sine Wave			
Nominal Input Voltage	12V DC			
Input Voltage Range	9V to 16.5V DC (±0.3V) (Full load 10.5V to 15.5V DC)			
Short Circuit Protection	Software Protection & RCD			
Total Harmonics Distortion (THD)	< 4% (Resistance load)			
Nominal Efficiency	> 91% peak			
No load power Consumption	< 10W			
Charger Specifications				
Nominal Input Voltage	187V to 265V AC			
Input Frequency Range	40Hz to 70Hz			
Maximum Charging Efficiency	> 85% Peak			
Charger Current	5A to 80A adjustable, 5A intervals	5A to 120A adjustable, 5A intervals	5A to 80A adjustable, 5A intervals	5A to 120A adjustable, 5A intervals

Transfer Switch Specifications				
Transfer Time	Max. 20 ms			
Transfer Relay Rating	16A			
General Specifications				
Battery Types	SLD, AGM, GEL, FLD, LI and USER			
Operating Temperature Range	-4°F to 122°F / -20°C to 50°C (Output power degrading at 86°F/30°C or higher)			
Storage Temperature	-22°F to 158°F / -30°C to 70°C			
Humidity	0% to 95%, RH			
Dimensions	17.02 x 12.01 x 4.87 in (432.4 x 305 x 123.8 mm)			
Weight	16.5 lbs / 7.5 kg	17.9 lbs / 8.1 kg	16.1 lbs / 7.3 kg	17.4 lbs / 7.9 kg
Warranty	3 Years			
LCD				
Dimensions	5.89 × 3.05 × 0.65 in / 149.5 × 77.5 × 16.5 mm			
EMC & Safety				
Model	RIV1220PCH-24S	RIV1230PCH-24S	RIV1220PCH-23S	RIV1230PCH-23S
EMC certification	AS/NZS 61000-6-1, AS/NZS 61000-6-3		EN/BS 61000-6-1, EN/BS 61000-6-3	
Safety	AS/NZS 60335-2-29, AS/NZS 4763		EN/BS 60335-2-29, EN/BS 61558-2-16	

12. Maintenance

12.1. Inspection

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

- Ensure the inverter charger 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 charger is dirty, use a damp cloth to clean the outside of the device to prevent dust and dirt from accumulating. Before the inverter charger 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 charger.

12.2. Cleaning

Follow the steps below to clean the inverter charger regularly.

- Disconnect all cables connected to the inverter charger.
- 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 charger 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 charger with a clean cloth and keep the area around the inverter charger clean and dry.
- Ensure the inverter charger is completely dry before reconnecting it to the battery and AC input.

12.3. Storage

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

- Disconnect all cables connected to the inverter charger.
- Applying dielectric grease to each terminals to repel moisture and protect the connector contacts from corrosion.
- Store the inverter charger in a well-ventilated, dry, and clean environment with the temperature between -22°F to 158°F (-30°C to 70°C).

13. 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.

13.1. Fire

1. Disconnect all cables connected to the inverter charger.
2. Put out the fire with a fire extinguisher. Preferable fire extinguishers include CO_2 and ABC. Altervatively, 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.

13.2. Flooding

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

13.3. Smell

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

13.4. Noise

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

Renogy Support

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

renogy.com/support/downloads

contentservice@renogy.com



Questionnaire Investigation

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

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

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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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