



**1000 - 2000 Watt**

**Pure Sine Wave Inverter Series**

Owner Manual & Installation Guide



Address: 4120 Valley Blvd, Walnut CA 91789, USA  
Email: [Sales@ACOPower.com](mailto:Sales@ACOPower.com) Phone: +1-(626) 575-7722  
Web: [www.acopower.com](http://www.acopower.com)

## Specifications:

Model	3GR-P10011	3GR-P10012	3GR-P10021	3GR-P10022	3GR-P12011	3GR-P12012	3GR-P12021	3GR-P12022	3GR-P15011	3GR-P15012	3GR-P15021	3GR-P15022	3GR-P20011	3GR-P20012	3GR-P20021	3GR-P20022
Continuous output	1000W				1200W				1500W				2000W			
Surge Power	2000W				2400W				3000W				4000W			
Input Voltage	12V	24V	24V		12V	24V	24V		12V	24V	24V		12V	24V	24V	
AC Voltage	110V	220V	110V	220V	110V	220V	110V	220V	110V	220V	110V	220V	110V	220V	110V	220V
Frequency	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz
Wave Form	Pure Sine Wave															
Total Harmonic Distortion	THD ≤ 3%															
USB Output	DC 5V ± 5% 2400mA AUTO															
Undervoltage protection	10.5V±0.5V	21V ± 1.0V			10.5V±0.5V	21V ± 1.0V			10.5V±0.5V	21V ± 1.0V			10.5V±0.5V	21V ± 1.0V		
Overvoltage protection	15.5V± 0.5V	31V ± 1.0V			15.5V± 0.5V	31V ± 1.0V			15.5V± 0.5V	31V ± 1.0V			15.5V± 0.5V	31V ± 1.0V		
No load current	650mA	350mA			650mA	350mA			650mA	350mA			650mA	350mA		
Efficiency	90%	92%			90%	92%			90%	92%			90%	92%		
Overload Protection	1200W±100W				1400W±100W				1800W±100W				2400W±100W			
Output short circuit protection	Yes															
Anti-reverse protection	Built in fuse															
Display mode	LCD+LED															
Other	Remotely Operated Panel(Optional)															
Cooling Fan	Start up: 45°C ± 5°C															
	Shut down: 38°C ± 5°C															
	Over temperature shutdown: 85°C±5°C Over temperature recovery: 55°C±5°C															
Fuse	8*20A	4*20A			8*25A	4*25A			12*20A	6*20A			12*25A	6*25A		
dimension(mm)	263*34 (D) × 191 (W) × 98(H)								329*34 (D) × 191 (W) × 98(H)							
N.W	2.78KG								3.54KG							

## ▶ Customer Service & Warranty

### ENJOY 18 - MONTHS WARRANTY

Each product is guaranteed against defects in material and workmanship to the original consumer in normal use for 18-months Warranty from the date of original purchase. This warranty does not cover blemishes due to normal wear and tear or damages caused by accidents, abuse alterations or misuse.

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# Safety and Precautions

## ► General Safety Instructions

Before installing and using your new inverter, kindly please read all sections of this guide and any cautionary markings on the inverter, batteries and your appliances.

- 1. CAUTION:** Do not operate the inverter if the carton or unit is seriously damaged by drop or pressure, or received a direct hit of force or is otherwise damaged.
- 2. CAUTION:** Do not dismantle the inverter. Call the factory directly when service or repair is required. Incorrect assembly may result in risk of electrical shock or fire.
- 3. CAUTION:** To reduce the risk of electrical shock, disconnect both AC and DC power from the inverter before any maintenance or cleaning.
- 4. CAUTION:** Protect inverter from rain, snow, and spray water.
- 5. CAUTION:** Internal inverter components remain charged after power is disconnected.
- 6. CAUTION:** As a precaution - Keep Children away from the inverter and its components! The same potentially hazardous or lethal AC power that is found in a normal household 110V/220V AC power outlet can be found in the inverter.
- 7. CAUTION:** Under no circumstances shall the user connect a live AC (household) power supply to the inverter's AC socket, the inverter will be damaged even if it is turned off. This unit can only take 12V DC battery power and invert it to 110V/220V AC household power. This unit is not a battery charger!
- 8. CAUTION:** this Inverter must be installed with an inline fuse in the positive (+) cable on the DC side of the inverter (between the battery and the inverter) at a distance of seven inches from the battery connection.

## ► Trouble Shooting

This section is designed to accommodate you in identifying and troubleshooting common problems that may result with an inverter. Review this section before contacting customer service. If you can not resolve the problem, record the data of the instance based on information provided here with in this manual.

This troubleshooting section will aid you in identifying the source of common problems you may encounter. If you are unable to resolve the problem from the troubleshooting reference table, contact customer service.

Possible Cause	Solution
The switch is in the off position	Turn on the switch
No Input Voltage of Inverter	Check whether the dc connection of inverter is loose or damaged
The DC fuse has broken	Check that the user has installed and complies with standard fuses
	Please check and replace the internal fuse by qualified maintenance technician
AC circuit breaker has tripped	Disconnect all appliances to reduce the overload, then turn it off to reset the device, and back to on again
LCD Display screen shows OVP fault code	Overvoltage Protection started, Check the battery voltage whether within the working voltage range, and the output can be restored
LCD Display screen shows UVP fault code	Low-voltage Protection started, Check the battery voltage whether within the working voltage range, and the output can be restored
LCD Display screen shows OTP fault code	Overtemperature Protection started, Check whether the fan turns, and the output can be resumed after the temperature drops
LCD Display screen shows OLP fault code	Overload Protection started, Check whether the load exceeds the rated power, and the output can be resumed after reducing the power
LCD Display screen shows SCP fault code	Output Short Circuit Protection started, Check whether there is short circuit in the load, and the output can be resumed after the short circuit is removed
Internal temperature have not reached the fan's start value	No action, The fan will turns on automatically when the internal temperature reaches the fan's start value
Fan is damaged	Please check and replace the internal fan by qualified maintenance technician

## ► Performing Checking before Operation

**Before starting up your inverter, ensure these conditions are met:**

- \* Verify the On/Off switch is in the Off position.
- \* Verify the Positive (+) battery cable is connected to the positive (+) battery terminal.
- \* Verify the Negative (-) battery cable is connected to the negative (-) battery terminal.
- \* Verify the battery voltage is within the proper range for this unit (roughly 10-15.5 volts DC).
- \* Verify the DC fuse is in tact.

## ► Testing Installation

When you are ready to test your installation and operate the TruePower inverter, close the DC fuse or the DC circuit breaker to supply DC power to the inverter.

### **Display Functions of the LED Light Pattern:**

The ON/OFF switch turns the inverter to ON or to OFF:

- In the On position, the Inverter Power LED/LCD Display light illuminates Green. The unit begins inverting and provides AC power.
- In the Off position, the Inverter draws no current from the battery. None of the front panel LED/LCD Display lights are illuminated.
- A RED light indicates a Fault, at the same time, LCD Display shows a Fault Code, such as: Over temperature, Output overload, Low-voltage / Over-voltage of battery.

### **To test the Inverter:**

1. Turn the On/Off switch to the ON position. The Inverter/Fault LED light illuminates Green.
2. Plug an appliance of equal watts or less into the AC outlet.
3. Turn the appliance ON to verify that it operates.

If the Inverter/Fault light illuminates Red, see the Inverter "Troubleshooting" section.

## ► Personal Safety Precautions

1. Someone should be within the range of your voice or close enough to come to your aid when installing power inverters or working near lead acid batteries.
2. Wear complete eye protection and protective clothing. Avoid touching eyes while working on or with batteries. Keep plenty of soap and water nearby in case of battery acid comes in contact with skin, clothing or eyes.
3. If battery acid comes in contact with skin or clothing, wash immediately with soap and water. If acid enters into the eye (s), flood eye (s) with running water for at least 10 minutes and get medical attention immediately.
4. Never smoke or make a spark or a flame in the vicinity of a battery or engine.
5. Be extra cautious to reduce the risk of dropping a metal tool onto a battery. It may spark or short-circuit the battery or other electrical parts that may cause an explosion.
6. Remove all personal metal items such as rings, bracelets, necklaces, watches and jewelry when working near a battery. A battery can produce a short circuit high enough to weld a ring or any metal, causing serious burns.
7. Never charge or invert power from a frozen battery.

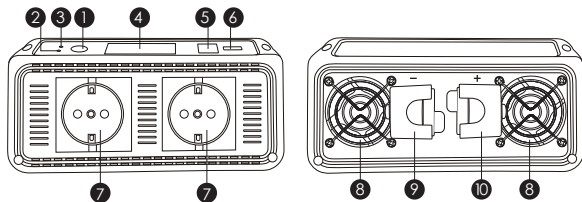
# Overview

## ▶ Product Introduction

This pure sine wave inverter is extraordinarily designed for the area of Household Appliances / Office Equipment / Industrial Equipment / Power Tool Series etc. It can convert DC12V/24V of portable power supply to AC110V/220V/230V and works for almost all the household electrical resistive appliances, such as: MP3/MP4 player, CD/DVD player, cell phone, laptop, emergency light, electric blanket, electric shaver, electric cooker, digital camera/video, bulb, fluorescent light, rice cooker, electric fans, electric iron, hair dryer and so on.

**Note: Only Pure Sine Wave Inverter can run sensitive electric appliances that are including refrigerator, washing machine, microwave oven, induction cooker, air conditioner, mercury lamp, Sodium lamp, electric drill and so on )**

## ▶ Product Diagram



- 1 ON/Off Switch turns the inverter to ON, OFF
- 2 LED(GREEN): Normal working indicator
- 3 LED(RED): Fault indicator
- 4 Exponential display
- 5 Remote control
- 6 USB 5V
- 7 Output socket \* 2( EU / UK / US / AU / Universal Optional )
- 8 FAN \* 2
- 9 Negative electrode
- 10 Positive electrode

# Connecting the DC Cables

**DC connections must be securely fastened and all connections must be tight to avoid risk of fire. Connect the DC cables from the inverter to the battery as noted in the following steps:**

1. Switch the On/Off switch to the Off position.
  2. Route the DC cables from the inverter toward the battery.
  3. connect a customer supplied DC fuse or circuit breaker in the positive side of the circuit within 7 inches of the battery. This protects your battery and wiring in case of an accidental shorting .
  4. Open the DC fuse or turn off the circuit breaker.
  5. Install one connector on the POSITIVE (+) cable to the POSITIVE DC terminal on the inverter.
  6. Install the other connector to the POSITIVE (+) terminal DC fuse or DC circuit breaker. Use a wrench to tighten the connection. Test that the cable is secure and the connection is tight.
  7. Attach a short DC cable from the unconnected end of the DC fuse or DC circuit breaker. Tighten appropriately.
  8. Observing polarity carefully, connect the end of the fused cable to the POSITIVE (+) terminal of the battery. Tighten this connection to the battery manufacturer's recommended torque. You may replace the fuse now or turn the DC circuit breaker on.
  9. Connect one connector on the NEGATIVE (-) cable to the NEGATIVE (-) battery terminal. Tighten the connection and assure the cable is secure.
  10. Check that the polarity of the DC connection is correct: positive (+) on the inverter is connected to the positive (+) on the battery and negative (-) is connected to the negative (-).
- IMPORTANT:** The next step is the last cable connection you will need to make in mounting the inverter. A spark is normal when this.
11. Connect the other connector of the NEGATIVE (-) cable onto the NEGATIVE (-) terminal on the Inverter.
  12. Use a wrench to tighten the nut. Test that all cable connections are tight.

To obtain sufficient battery capacity, you may need to use more than one battery. Two identical batteries can be connected + to + and - to - in a parallel system, doubling capacity. We recommend that you do not connect batteries from different manufacturers, or with different amp-hour ratings in parallel as decreased battery life may result. See below Figure 3.

Figure 3 → Displays 2 x 12volt batteries connected in a parallel system that doubles the capacity and maintains the 12v voltage requirement of your inverter. This battery bank requires a negative battery charging system.

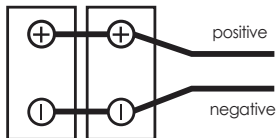


Figure 3

Figure 4 → If you are using different batteries, or need to use more than two batteries, we recommend that you set up two separate battery banks and use them alternately. Battery selector switches are available from Marine and RV Dealers which allow the user to select between two banks of batteries, or use both in parallel, or disconnect both banks from the load. Please see figure 4 below.

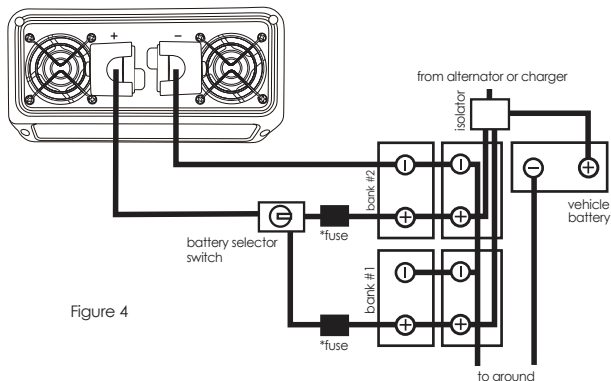


Figure 4

## ► Inverter Features

- \* Soft Start, Noise Filtered Technology - progressively increases the output voltage to start heavy loads, with minimal or no interference.
- \* Remote Wire Control Function Optional: operated by a separate wire control panel
- \* Low Power Consumption Standby, Longer Battery Storage Time
- \* True Rated Continuous Power
- \* Hi-Surge Ratings for Demanding Loads
- \* Constructed to UL 458
- \* LCD Highly Visible Status Indication, LCD & LED & Buzzer, 3 kinds of Fault Alarm
- \* Pure Sine Wave output, high-frequency power inverter, no matter coffee machine, microwave, TV, printer or other heavy-duty devices.
- \* Gives the perfect performance of running loads, from the household appliances to office devices.
- \* Carry main power supply with AC electricity, better compatibility than the modified sine wave.
- \* With LCD display, clearly know the operation of the device;
- \* System controlled by smart cooling fan, it can be auto matically adjusted by temperature to reduce the device's noise.
- \* Equipped with mounting bracket kit for convenient installation
- \* Input Polarity Protection
- \* Low Battery Shutdown
- \* Over Voltage Protection
- \* Overload Protection
- \* Overtemperature Protection
- \* Output Short Circuit Protection

# Before Mounting Your Inverter

## ► Preparing for Installation

Read this entire installation section if you plan a hardwire installation from beginning to end.

**IMPORTANT: ALWAYS PLACE THE INVERTER IN AN ENVIRONMENT WHICH IS:**

- \* WELL VENTILATED
- \* NOT EXPOSED TO DIRECT SUNLIGHT OR HEAT SOURCE
- \* OUT OF REACH FROM CHILDREN
- \* AWAY FROM WATER / MOISTURE, OIL OR GREASE
- \* AWAY FROM ANY FLAMMABLE SUBSTANCE

**DO NOT INSTALL DIRECTLY ABOVE OR BELOW BATTERIES**

Fuses: As stated in this manual, this Inverter must be installed with an inline fuse in the positive (+) cable on the DC side of the inverter (between the battery and the inverter) at a distance of seven inches from the battery connection.

If this external fuse blows, or if the breaker trips on the larger models, there is a short or overload in the DC wiring. Find and fix the problem before replacing the fuses or resetting the breaker. After replacing the fuse, reconnect the inverter.

**⚠ WARNING:** This device does not provide Ignition Protection. Avoid serious injury or death or explosion. Do not install in compartments containing gasoline fueled engines or gasoline tank, or in areas where ignition protected equipment is required.

**⚠ WARNING:** Do not mount the inverter above or below your batteries.

Figure 1 → This wiring setup displays an inverter connected directly to the engine battery for light-duty applications.

customer supplied fuse, 7" from battery

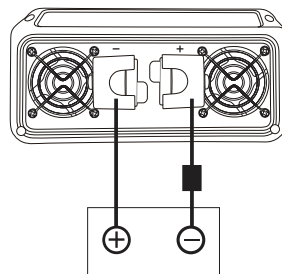


Figure 1

Figure 2 → This wiring diagram displays a battery configuration for Medium-Duty applications. This configuration allows the inverter to only draw power from the auxiliary battery and keeps the vehicle start battery from being drawn upon.

customer supplied fuse, 7" from battery

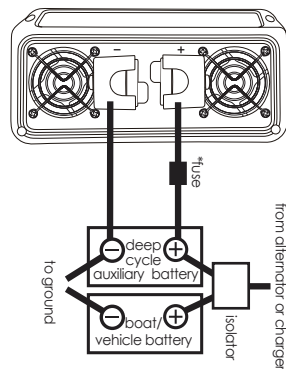


Figure 2

## ▶ Battery Operating Time

Operating time of your inverter is determined by the size and type of battery you use, but more specifically it is determined by how much power you will draw. Follow the below steps to calculate roughly the battery ampere-hour capacity you may require.

1. Establish how many watts each piece of equipment you will use consumes. This usually can be found on the label of your power products. If only current draw is given, you can estimate the watt consumption by multiplying current draw by 115.
2. Estimate the time in hours you will be running each power product between charging your battery source.
3. Calculate the total watt hours of energy consumption (power x operating time) using the average power consumption and the total estimated running hours. (Power x Operating hours = Watt Hours)
4. Now Divide the Watt Hours by 10 to determine how many 12volt ampere-hours will be used. You need to have a battery or a bank of batteries with same ampere-hours you demand.

If the user has running off the start battery of your vehicle, we recommend the user to start the vehicles engine every 30 minutes to recharge the battery. This will help prevent any automatic shutdown of the inverter due to low battery voltage and help ensure enough battery capacity to start the vehicle's engine. The inverter's low battery alarm will sound when the battery drops to 10.5 volts and shut down at 10v.

The inverter can be used with or without the vehicle's engine running. The inverter may not be able to operate while the engine is starting as battery voltage drops substantially during engine cranking. The best battery setup we can recommend for providing sufficient inverter capacity while protecting the engine start battery from being overdrawn is to have a separate battery for starting the vehicle and to have a deep discharge type battery or several batteries in parallel for powering the inverter if you plan on running electrical products for extended periods of time on a frequent basis.

### **⚠ WARNING:** Electrical shock and fire hazards.

We recommends all wiring be done by qualified personnel. Disconnect all AC and DC power sources to prevent accidental shock. Disable and secure all AC and DC disconnect devices and automatic generator starting devices. It is the installer's responsibility to ensure compliance with all the applicable installation codes and regulations.

### **⚠ WARNING:** Installation Precaution.

The inverter should be mounted on a flat horizontal surface or a vertical surface with the front panel and label facing the user. In no case should the front or rear endcaps be facing in an upward or downward position. This allows proper ventilation and product safety of the unit as intended by design.

### **⚠ WARNING:** Fire Hazard.

Do not cover or obstruct the ventilation openings. Do not install this equipment in a compartment with limited airflow; Overheating may result.

### **⚠ WARNING:** Risk of Fire or Explosion.

This equipment contains components that could produce arcs or sparks. To reduce the risk of fire or explosion, do not install this equipment in compartments containing batteries, flammable materials or fumes, or in a location containing gasoline-powered machinery, or joints, fittings, or other connections between components of the fuel system.

### **⚠ WARNING:** Keep Children away from the inverter and its components!

The same potentially hazardous or lethal AC power that is found in a normal household 110V/220V AC power outlet can be found in the inverter.

### **⚠ WARNING:** Low Voltage - Electrical burn and spark hazard.

Disconnect battery power before servicing.

### **⚠ WARNING:** Restrictions on Use.

The inverter shall not be used in connection with life support systems or other medical equipment or devices.



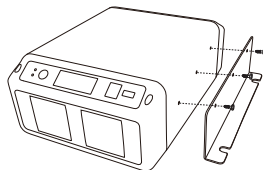
## To Mount the Inverter:

1. Turn the On/Off switch on the front panel of the inverter to Off position.
2. Select an appropriate mounting location and orientation, and then fix the mounting bracket on the both side of the inverter unit with 3\*5mm screws accessories ( 3pcs of each side )  
[ NOTE: Do not install with screws longer than 5mm ].
3. Hold the inverter against the mounting surface, mark the position of the mounting screws, and then remove the inverter.
4. Drill pilot holes for the four mounting fasteners ( Use caution prior to drilling or cutting to ensure proper clearance from existing wiring and hardware).
5. Fix the inverter on the installation surface with 6\*35mm screws accessories [6PCS].

**NOTE :** For the best load starting performance, the DC cables should be short and large as possible. A solid, low resistance connection to the DC power source is important for proper operation of the Inverter. Using a smaller cable may cause the inverter to shut down under a heavy load.

Please refer to the detailed installation steps of inverter on the right diagram →

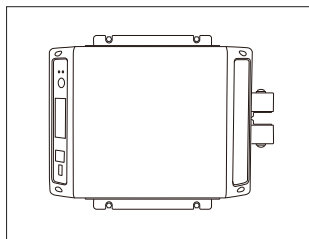
## ► Installation Steps



**STEP 1:** Use 6pcs screws to install the metal bracket onto both side of the inverter

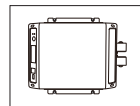


**STEP 2:**  
Use 4pcs screws to fix the inverter with metal bracket to the wall

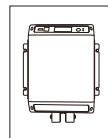


**STEP 3:** Installation Finished

### NOTE :



✓ Level to the ground



✗ Perpendicular to the ground