



Power Inverters

Instruction Manual for models:

G1000INV-8

G1500INV-12

G2000INV-15

G2500INV-20

G3000INV-30

G3500INV-30

From

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Welcome.

This inverter has been carefully engineered and manufactured to give you dependable operation. Please read this manual thoroughly before operating your new inverter, as it contains the information you need to become familiar with its features and obtain the performance that will bring you continued enjoyment for many years. Please keep this manual on file for future reference.

About Gorilla Inverters.

Gorilla's factory is an innovator in portable inverter design, has developed a new line of super-efficient power inverters with the highest surge capability in the industry. These extremely advanced, microprocessor controlled units run cooler and more reliable than any in their class. Their superior surge capability allows them to start even the most difficult loads, including color televisions, TV/VCR combinations, microwaves, refrigeration units, even small air conditioners! They also sport the highest efficiency available (up to 90%), which translates into longer running time and extended battery life. Inverters convert low voltage, direct current (DC) to 110 volt alternating current (AC). Depending on the model and its rated capacity, the inverters draw power either from standard 12 volt automobile and marine batteries or from portable high power 12 volt sources.

Getting Started

When you turn on an appliance or a tool that operates using a motor or tubes, it requires an initial surge of power to start up. This surge of power is referred to as the "starting load" or "peak load."

Once started, the tool or appliance requires less power to continue to operate. This is referred to as the "continuous load" in terms of power requirements.

You will need to determine how much power your tool or appliance requires to start up (starting load) and its continued running power requirements (continuous load).

Power consumption is rated either in wattage (watts), or in amperes (amps), and this information is usually stamped or printed on most appliances and equipment. If this information is not indicated on the appliance or equipment, check the owner's manual or contact the manufacturer to determine if the device you are using is compatible with a modified sine wave.

Multiply: AMPS X110 (AC voltage) = WATTS

This formula yields a close approximation of the continuous load of your appliance.

Multiply: WATTS X2 = Starting Load

This formula yields a close approximation of the starting load of your appliance.

Most often the start up load of the appliance or power tool determines whether your inverter has the capability to power it.

To determine whether your model of inverter will operate a particular piece of equipment or appliance, run a test. All inverters are designed to automatically shut down in the event of a power overload. This protection feature prevents damage to the unit.

If an appliance will not operate properly and LED indicator will turn RED color FROM GREEN, it's likely that the inverter does not have the required capacity to operate the appliance in question.

Important:

- Your inverter is designed to operate from a 12 volt power source only. Do not attempt to connect the inverter to any other power source, including any AC power source.
- Do not attempt to extend or otherwise modify the connector cables provided with your inverter.
- 110 volts of current can be lethal. Improper use of your inverter may result in property damage, personal injury or loss of life.

A. ON/OFF Switch. The current flowing from the power source to the inverter is controlled by this switch. It does not control the current flowing from the inverter to the appliance.

B. Protect LED Indicator Light. When the internal operating temperature exceeds 165F this light will turn RED as the inverter automatically shuts down. Immediately turn off the appliance if this occurs. The High Speed Cooling Fan automatically activates when excessive temperatures are detected.

The inverter may overheat when it is being used in a location that does not allow proper ventilation and therefore prevents required dissipation of heat. This may also occur when the appliance(s)

being operated exceed the wattage rating of the inverter. Under normal operating conditions the protect LED turn green after over 8 minutes. Automatically the inverter will restart, indicating that the inverter has reached a safe operating temperature.

If the continuous power draw of the appliance(s) being operated exceeds the inverter specifications, this light will turn RED and the inverter will automatically Power off. When this occurs turn off the inverter and determine the cause of the overload before turning the inverter and the appliance back on.

C. Battery voltage and inverter output wattage digital meters.

When selection switch at "watt" position, the digital number will show the "wat" reading. If the reading is over the inverter specifications, the inverter may automatically shut down. This is most often caused when the current draw of the appliance being operated is greater than the battery is capable of producing.

VOLT Reading: If the switch is on "volt" position, The digital number will show input "voltage" reading. These readings are the result of measuring the voltage in both the positive and negative input terminals on the inverter. In a high voltage draw the display will show a low voltage level due to the drop in volts that occurs between the positive and negative input cables.

This inverter will operate with input voltage (see specifications) direct current (DC). If the voltage level falls below specifications, an audible alarm will sound. Should the voltage drop below specifications, the inverter will automatically shut down.

The inverter may be damaged if the input voltage exceeds specifications. It will shut down automatically if this occurs, however despite this safety feature excessive voltage may cause damage to the inverter. Damage caused by excess voltage input is not covered under the warranty.

Connection Cable Gauges.

When connecting the inverter to the power source use the thickest wire available, in the shortest length practical. If the inverter and the battery are positioned within 4 feet of each other, a minimum of specified gauge wire should be used to make to connections. Please check specifications.

Connecting Your inverter.

1. Make sure the ON/OFF switch located on the front panel of the inverter is in the OFF(O) position.
2. Connect the wires to the power input terminals at the rear of the inverter. Make sure to match the negative (black) terminal on the 12 volt power source. Then repeat this procedure with the positive (Red) terminal connecting a wire to the positive terminal of the 12v volt power source. Make sure you have good secure connections.
3. Locate the Ground Lug Terminal at the rear of the inverter. Run a wire from this terminal to a proper grounding point using the shortest practical length wire in specifications. You can connect this wire to the chassis of your vehicle or to the grounding system in your boat. As an alternative when in remote locations the ground wire can be connected to the earth (one way to accomplish this is to attach it to a metal rod driven into the ground). Before connecting the ground, make certain that the inverter is turned off.

Operating the inverter without correctly grounding the unit may result in electrical shock.

4. Turn On (I) the inverter. The Voltage Bar Graph on the front panel should show specification volts depending on the voltage of the power source. If the voltage reading does not fall within this range, check the connections of the wires to the terminals on the power source and the inverter to make sure they are secure. Also check the voltage of the power source.
Make certain the the Over Load LED Indicators are not lit.
5. Turn OFF (O) the inverter. The Over Load and LEDS may briefly "blink". This is normal. The internal audible alarm may also sound a short " chirp." This is also normal.
6. When you have confirmed that the appliance to be operated is turned off, plug the appliance into one of the two 110v AC Outlets on the front panel of the inverter.
7. Turn the inverter on.
8. Turn the appliance on.

Note:

- The audible alarm may make a momentary "chirp" when the inverter is turned OFF. This same alarm may also sound when the inverter is being connected to or disconnected from the 12 volt power source.
- When using an extension cord from the inverter to the appliance the extension cord should be no more than 50 feet long. At this length there should be no measurable decrease in power from the inverter.
- Loose connections can result in a severe decrease in voltage which may cause damage to the wires and insulation.
- Failure to make a proper connection between the inverter and the power source will result in reverse polarity. Reverse polarity will blow the internal fuses in the inverter and may cause permanent damage to the inverter. Damage caused by reverse polarity is not covered under the power bright warranty.
- Making the connection between the Positive terminals may cause a spark as a result of current flowing to charge capacitors within the inverter. This is a normal occurrence. Due to the possibility of sparking, however, it is extremely important that both the inverter and the 12 volt battery be positioned far from any possible source of flammable fumes or gases.
Failure to heed this warning could result in fire or explosion.
- It may be advisable to operate the inverter from a bank of batteries of the same type in a "parallel" configuration. Two such batteries will generate twice the amp/hours of a single battery; three batteries will generate three times the amp/hours and so on.

Selecting A Power Supply.

When you operate the inverter for long periods of time combined with a high continuous load demand, the result will be a large power drain from the battery. With this in mind, check the reserve capacity of the battery you plan to use to power your inverter. To calculate the approximate power drain on your battery you will want to estimate the reserve power ("amp/hour") of the battery and the amps the inverter will require, to meet the continuous load demand of the appliance.

1. When calculating the amp/hour of the battery, find its "reserve minutes" rating. This is typically is marked on the battery label along with the "Cold Cranking Amps" (CCA) rating. If you multiply the reserve minutes rating of the battery by 0.3 it will tell you the battery amp/hour.

2. To estimate the maximum battery power the inverter will require to run a piece of equipment or appliance, divide its continuous load wattage equipment by 10.
3. Conclusion: The reserve power of a battery with a 150 reserve minutes rating is sufficient to satisfy the continuous load demand placed on the inverter for a maximum of about one hour. (45 amps/hour-amp draw = 1 hour).

Note:

- When the inverter will be operating appliances with high continuous load ratings for extended periods, it is not advisable to power the inverter with the same battery used to power your car or truck. If the car or truck battery is utilized for an extended period, it is possible that the battery voltage may be drained to the point where the battery has insufficient reserve power to start the vehicle.
- Deep cycle (marine)batteries generally have the highest reserve ratings. They are capable of with standing repeated complete drains of power and recharging. If you do not have a deep cycle battery we recommend that you run the engine of your vehicle when operating the inverter.

How Power Inverters Work.

There are two stages in while a power inverter changes the 12 volt DC (or battery) power into 110V AC (household Current).

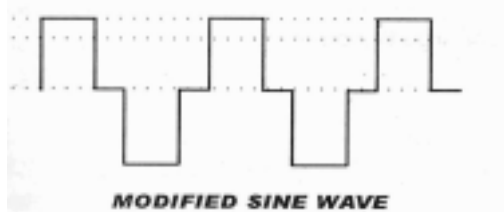
STAGE1:

The inverter uses a DC to DC converter to increase the DC input voltage from the power source to 145 volts DC.

STAGE2:

The inverter then converts the high voltage DC into 110v AC (household current), using advanced MOSFET transistor in a full bridge configuration.

This design provides all Gorilla inverters with the capability to start and run difficult reactive loads, while providing excellent overload capability. The waveform that is generated by this conversion is a "modified sine wave" as shown in the diagram below.



The modified sine wave produced by Gorilla inverters has a root mean square (RMS) voltage of 110 volts. The majority of AC voltmeters are calibrated for RMS voltage and assume that the measured waveform will be a pure sine wave. Consequently, these meters will not read the RMS modified sine wave voltage correctly and, when measuring the inverter output, the meters will read about 20 to 30 volts too low. To accurately measure of the output voltage of the inverter, use a true RMS reading voltmeter such as a Fluke 87, Fluke 8060A, Beckman 4410, Triplet 4200 or any multimeter identified as "True RMS."

In Review.

- Never attempt to operate the inverter from any power source other than a 12 volt battery.
- Always disconnect the inverter when not in use.
- Always ensure the power cable terminal connections run Negative (-) to Negative (-) and Positive (+) to Positive (+). Check these connections frequently to make sure they remain secure. Use the heaviest gauge wire available to connect the inverter to the power source.
- While connecting the inverter to the power source, make certain that the inverter is positioned far away from any potential source of flammable fumes or gases.
- Always ground the inverter before operating it.
- Make certain the power consumption of the appliance or equipment you wish to operate is compatible with the capacity of the inverter. Do not exceed specifications.
- When attempting to operate battery chargers, monitor the temperature of the battery charger for approximately 10 minutes. If the battery charger becomes abnormally warm, disconnect it from the inverter immediately.
- When operating the inverter with a Deep Cycle battery, start the engine every 30 to 60 minutes and let it run for approximately 20 minutes to recharge the battery.
- In the event of a continuous audible alarm or automatic shut down, turn the inverter OFF immediately. Do not restart the inverter until the source of the problem has been identified and corrected.
- To avoid battery drain always disconnect the inverter when not in use.
- Do not expose the inverter to rain or moisture.
- Avoid placing the inverter near sources of heat or in direct sunlight.
- While in use, make sure the inverter is properly ventilated.
- Do not operate the inverter near flammable materials, fumes or gases.

Television and Audio Suggestions.

Although all Gorilla inverters are shielded and filtered to minimize signal interference, some interference with your television picture may be unavoidable, especially with weak signals. However, here are some suggestions that may improve reception.

1. First, make sure that the television antenna produces a clear signal under normal operating conditions (i.e., at horn plugged into a standard 110V AC wall outlet). Also, ensure that the antenna cable is properly shielded and of good quality.
2. Change the positions of the inverter, antenna cables and television power cord.
3. Isolate the television, its power cord and antenna cables from the 12 volt power source by running an extension cord from the inverter to the television set.
4. Coil the television power cord and the input cables running from the 12 volt power source to the inverter.

Note:

- Some inexpensive audio systems may discharge a slight "buzzing" sound when operated with the inverter. This is caused by deficient filters in the audio system. The only solution to this problem is using a sound system with a higher quality power supply.

Operating a Microwave oven with Your Power Inverter

The power rating used with microwave ovens is the "cooking power" which qualifies as the power being "delivered" to the food being microwaved. The actual operating power requirement rating is higher than the cooking power rating. This is usually referenced on the back of the microwave. If the operating power requirement cannot be found on the back of the microwave, check the owner's manual or contact the manufacturer.



Safety Precautions.

For best results place the power inverter on a reasonably flat surface.




- Keep the inverter dry. Do not expose it to rain or moisture. DO NOT operate the inverter, if the inverter the device being operated or any other surfaces that may come in contact with any power source are wet. Water and many other liquids can conduct electricity which may lead to serious injury or death.
- Avoid placing the inverter on or near heating vents, radiators or other sources of heat. Do not place the inverter in direct sunlight. Ideal air temperature should be between 50°and 80°F.
- In order to properly disperse heat generated while the inverter is in operation, keep it well ventilated. While in use, maintain several inches of clearance around the top and sides of the inverter.
- Do not use the inverter near flammable materials. Do not place the inverter in areas such as battery compartments where fumes or gases may accumulate.

Troubleshooting

PROBLEM: Low or No Output Voltage

Reason	Solution
 Poor contact with battery terminals.,	Clean terminals thoroughly.
 Using incorrect type of voltmeter to test output voltage.	Use true RMS reading meter.

PROBLEM: Red Bar Graph

Reason	Solution
 Battery voltage below 11 volts. Equipment being operated draws too much power, do not use this equipment.	Recharge or replace battery. Use a higher capacity inverter or
 Inverter is too hot (thermal shut down mode).	Allow inverter to cool. Check for adequate ventilation. Reduce the load on the inverter to rated continuous power output.
 Unit may be defective.	See Warranty and call Customer service.




Troubleshooting

PROBLEM: TV Interference


Reason	Solution
Electrical interference from the inverter, the TV power cord.	Add a ferrite data line filter on to



PROBLEM: Low Battery Alarm On All The Time

Reason	Solution
 Input voltage below 11 volts.	Keep input voltage above 10 volts to maintain regulation.
 Poor or weak battery condition.	Recharge or Replace battery.
 Inadequate power being delivered to the inverter or excessive voltage drop.	Use lower gauge wire Keep wire length as short as possible.

PROBLEM: TV Does Not Work

Reason	Solution
 TV does not turn on.	Contact TV manufacturer for start up surge and/or if the TV is compatible with a modified sine <u>wave</u> . A large inverter may be required.

SPECIFICATIONS: Model G1000INV-8

Continued Power	1000W
Peak Load Power Rate	< 2000W
No Load Current Draw	< 0.9A
Input DC Voltage Range	10-15V
Output Voltage Range	117 +/- 10%
Output Frequency Range	60 +/- 3Hz
Max Outer Temperature	< 65 C
Max Power Efficiency	> 90%
High Voltage Cut Off Level	15.5 +/- 1V
Low Voltage Alarm Level	10.5 +/- 0.5V
Low Voltage Cut Off Level	10 +/- 0.5V
Dimension (LxWxH) in	9.64 x 5.78 x 2.71
Weight	3.30 lbs
Input Voltage	DC 12V
Wiring:	AWG#6 (Black) and (Red) With Battery Clamps

SPECIFICATIONS: G1500INV-12

Continued Power	1500W
Peak Load Power Rate	< 3000W
No Load Current Draw	< 1.0A

Input DC Voltage Range 10-15V
Output Voltage Range 117 +/- 10%
Output Frequency Range 60 +/- 3Hz
Max Outer Temperature < 65 C
Max Power Efficiency > 90%
High Voltage Cut Off Level 15.5 +/- 1V
Low Voltage Alarm Level 10.5 +/- 0.5V
Low Voltage Cut Off Level 10 +/- 0.5V
Dimension (LxWxH) in 10.7 x 8.4 x 2.7in
Weight 7.71 lbs
Input Voltage DC 12V
Wiring: AWG#4 (Black) and (Red)

SPECIFICATIONS: G2000INV-15

Continued Power 2000W
Peak Load Power Rate < 4000W
No Load Current Draw < 1.1A
Input DC Voltage Range 10-15V
Output Voltage Range 117 +/- 10%
Output Frequency Range 60 +/- 3Hz
Max Outer Temperature < 65 C
Max Power Efficiency > 90%
High Voltage Cut Off Level 15.5 +/- 1V
Low Voltage Alarm Level 10.5 +/- 0.5V
Low Voltage Cut Off Level 10 +/- 0.5V
Dimension (LxWxH) in 13.9 x 10.2 x 3.1
Weight 11.68 lbs
Input Voltage DC 12V

SPECIFICATIONS: G2500INV-20

Continued Power 2500W
Peak Load Power Rate < 5000W
No Load Current Draw < 1.3A
Input DC Voltage Range 10-15V
Output Voltage Range 117 +/- 10%
Output Frequency Range 60 +/- 3Hz
Max Outer Temperature < 65 C
Max Power Efficiency > 90%
High Voltage Cut Off Level 15.5 +/- 1V
Low Voltage Alarm Level 10.5 +/- 0.5V
Low Voltage Cut Off Level 10 +/- 0.5V
Dimension (LxWxH) in 13.9 x 10.2 x 3.1
Weight 11.68 lbs
Input Voltage DC 12V

SPECIFICATION: Model G3000INV-30

Continued Power	3000W
Peak Load Power Rate	< 6000W
No Load Current Draw	< 2.0A
Input DC Voltage Range	11-15V
Output Voltage Range	117 +/- 10%
Output Frequency Range	60 +/- 3Hz
Max Outer Temperature	< 65 C
Max Power Efficiency	> 90%
High Voltage Cut Off Level	15.5 +/- 1V
Low Voltage Alarm Level	10.5 +/- 0.5V
Low Voltage Cut Off Level	10 +/- 0.5V
Dimension (LxWxH) in	18.3 x 8.8 x 5.9
Weight	20.94 lbs
Input Voltage	DC 12V

SPECIFICATION: Model G3500INV-30

Continued Power	3500W
Peak Load Power Rate	< 7000W
No Load Current Draw	< 2.0A
Input DC Voltage Range	11-15V
Output Voltage Range	117 +/- 10%
Output Frequency Range	60 +/- 3Hz
Max Outer Temperature	< 65 C
Max Power Efficiency	> 90%
High Voltage Cut Off Level	15.5 +/- 1V
Low Voltage Alarm Level	10.5 +/- 0.5V
Low Voltage Cut Off Level	10 +/- 0.5V
Dimension (LxWxH) in	18.3 x 8.8 x 5.9
Weight	20.94 lbs
Input Voltage	DC 12V

Service Warranty

- This product is guaranteed against manufacturing defects for one full year from date of purchase.
- This warranty card is issued only at the time of original purchase. It is NOT transferable.
- All warranty requests must include the original purchase confirmation.
- Damage caused by accident, misuse, do-it-yourself repairs, sand or water is not covered by this warranty.
- All mail or transportation costs including insurance are at the expense of the owner. All other claims of any nature are not covered.
- This warranty is only valid in the USA and Canada