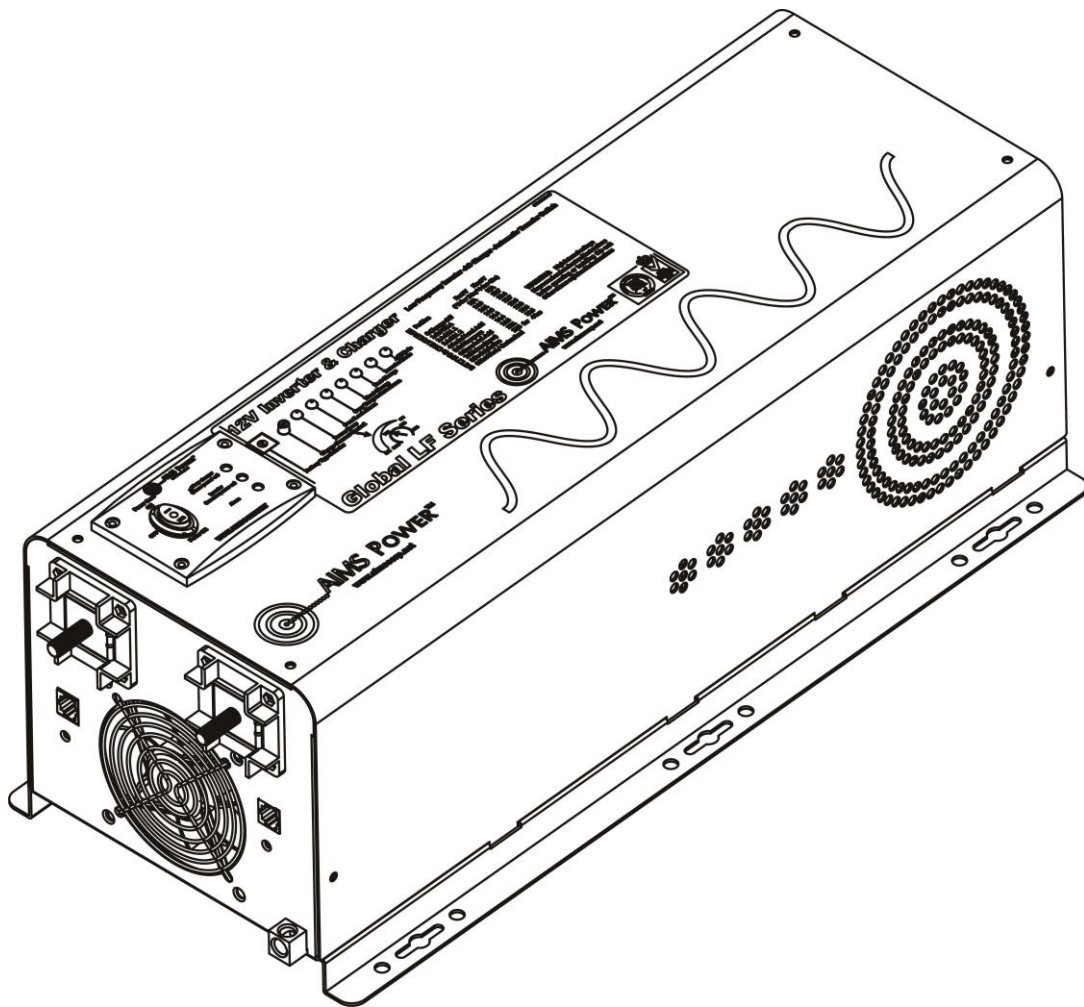




# Global LF Series Pure Sine Wave Inverter Charger User's Manual

PICOGLF12W12V120AL & PICOGLF25W12V120AL





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# 1. Important Safety Information

**NOTE!** Before using the inverter charger, read and save this manual.

## 1-1. General Safety Precautions

1-1-1. Do not expose the inverter to rain, snow, spray, bilge or dust. To reduce risk of hazard, do not cover or obstruct the ventilation openings. Do not install the inverter in a zero-clearance compartment.

Overheating may result. Allow at least 12" of clearance around the inverter for air flow. Make sure that the air can circulate freely around the unit. A minimum air flow of 145CFM is required.

1-1-2. To avoid risk of fire and electronic shock, make sure that existing wiring is in good electrical condition and that the wire is not undersized. Do not operate the inverter with damaged or substandard wiring.

1-1-3. This equipment contains components which may produce arcs and/or sparks. To prevent fire and/or explosion do not install in compartments containing batteries or flammable materials or in a location which require ignition protected equipment. This includes any space containing gasoline-powered machinery, fuel tanks, or joints, fittings, or other connection between components of the fuel system.

See Warranty for instructions on obtaining service.

1-1-4. Do not disassemble the Inverter Charger. It contains no user-serviceable parts. Attempting to service the Inverter Charger yourself may result in electrical shock or fire. Internal capacitors remain charged after all power is disconnected.

1-1-5. To reduce the risk of electrical shock, disconnect both AC and DC power from the Inverter Charger before attempting any maintenance or cleaning. Turning off controls will not reduce this risk

### **CAUTION: Equipment damage**

The output side of the inverter's AC wiring should at no time be connected to public power or a generator.

This condition is far worse than a short circuit. If the unit survives this condition, it will shut down until corrections are made.

Installation should ensure that the inverter's AC output is, at no time, connected to its AC input.

## 1-2. Precautions When Working with Batteries

1-2-1. If battery acid contacts skin or clothing immediately wash with soap and water. If acid enters eyes immediately rinse eyes with running cold water and seek immediate medical attention.

1-2-2. Never smoke or allow a sparks or flames near the battery.

1-2-3. Do not drop a metal tool on the battery. The resulting spark or short-circuit on the battery will cause an explosion.

1-2-4. Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a battery. A battery produces a short-circuit current high enough to weld any metal objects and will cause a severe burn.

1-2-5. To reduce the risk of injury, charge only deep-cycle lead acid, lead antimony, lead calcium gel cell, absorbed mat, LIFEPO4 lithium or NiCad/NiFe type rechargeable batteries. Other types of batteries may swell or burst causing personal injury and damage.

## 2. Introduction

### 2-1. General Information

The Global LF Series Pure Sine Wave Inverter Charger product line is a combination of an inverter, battery charger and auto AC transfer switch in one unit and has a peak conversion efficiency of 88%. It is packed with unique features and is one of the most advanced inverter chargers on the market today. It features power factor correction, sophisticated multi-stage charging and pure sine wave output with unprecedentedly high surge capability to meet demanding power needs of inductive loads without damaging the equipment.

When utility AC power cuts off (or falls out of acceptable range), the transfer relay is de-energized and the load is automatically transferred to Inverter mode. Once the qualified AC power is restored the relay is re-energized and the load is automatically reconnected to AC bypass mode. **NOTE THE BYPASS RATING OF THE INVERTER (page 25) AND DO NOT EXCEED. DAMAGE MAY OCCUR AND VOID THE WARRANTY.** The Global LF Series Inverter is equipped with a powerful four stage smart charger and a high overload capacity of 300% of continuous output for up to 20 seconds to reliably support tools and equipment. This is for inverter mode only. You can NOT bypass the surge rating of the inverter. This may cause permanent damage to the inverter.

The Global LF Series Pure Sine Wave Inverter is suitable for renewable energy systems in work trucks, RV, marine and emergency appliances.

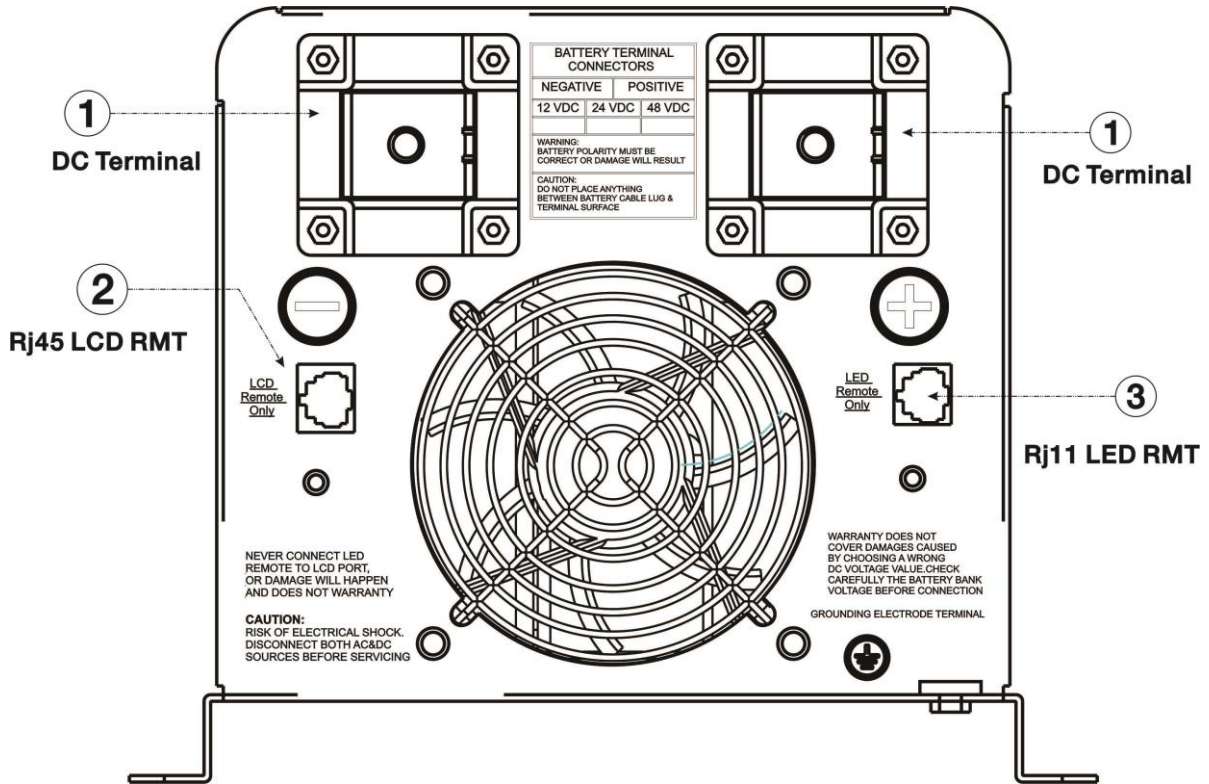
To get the most out of the power inverter, it must be operated and maintained properly. Please read the instructions in this manual before installing and operating.

### 2-2. Application

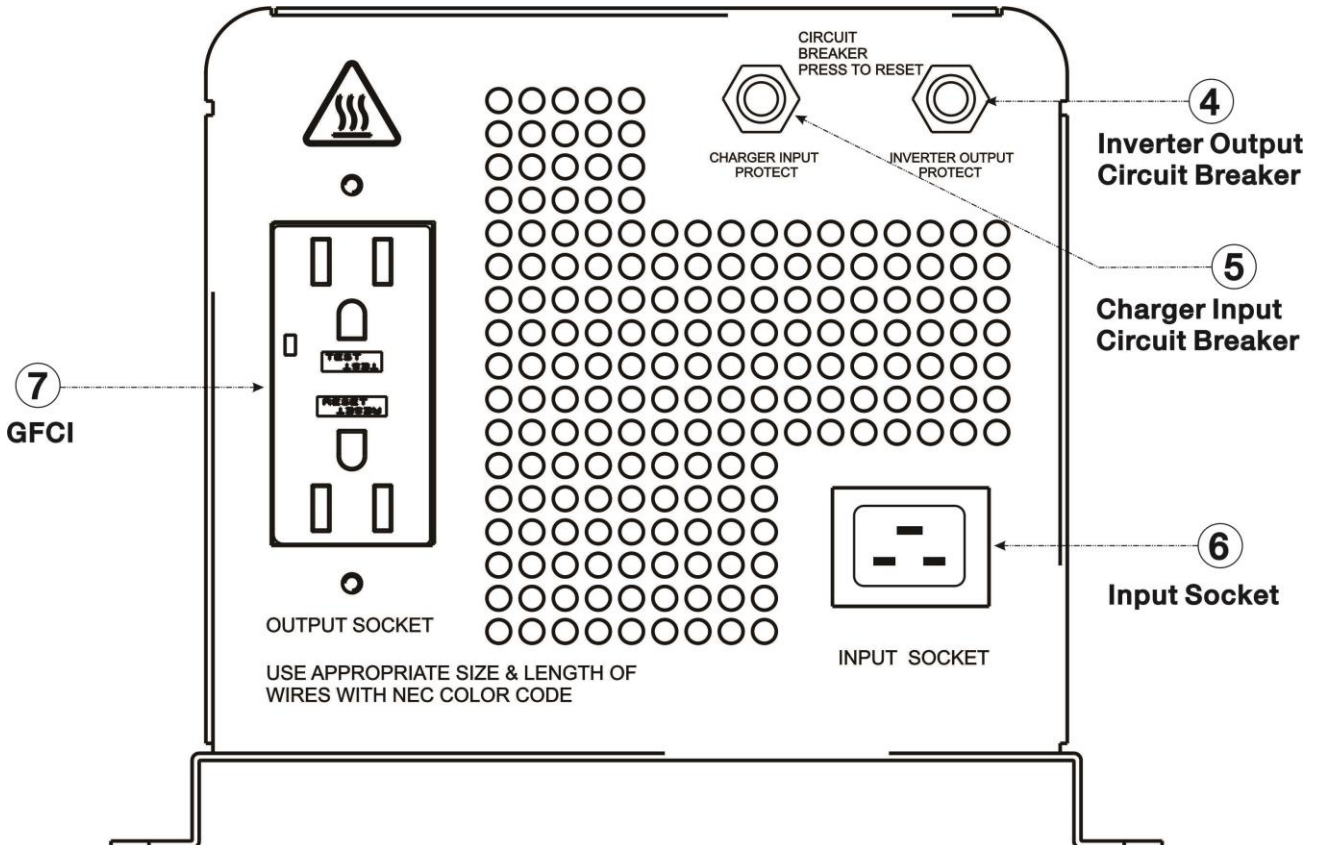
Power tools—circular saws, drills, grinders, sanders, buffers, weed and hedge trimmers, air compressors.  
Office equipment – computers, printers, monitors, facsimile machines, scanners.  
Household items – vacuum cleaners, fans, fluorescent and incandescent lights, shavers, sewing machines.  
Kitchen appliances – coffee makers, blenders, ice makers, toasters.  
Industrial equipment – metal halide lamp, high pressure sodium lamp.  
Home entertainment electronics – television, DVRs, video games, stereos, musical instruments, and satellite equipment.

## 2-3. Mechanical Drawing

### PICOGLF 1250W Battery Side

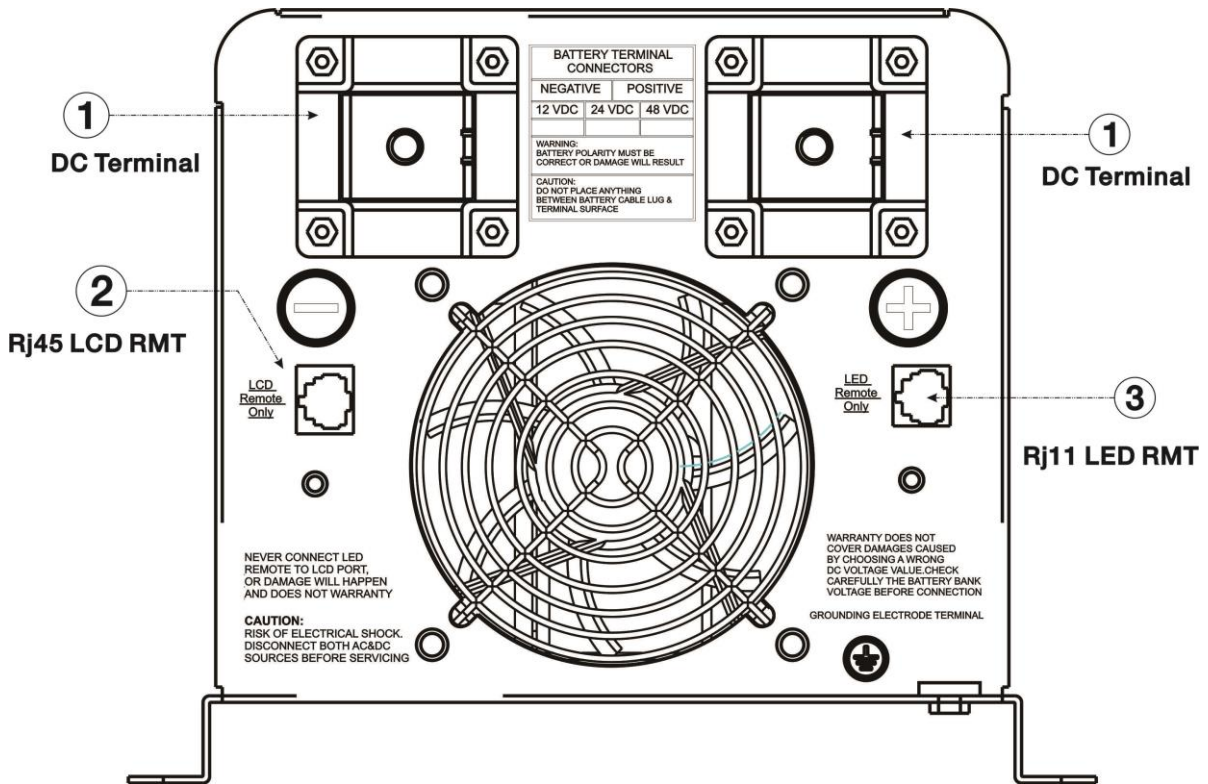


### PICOGLF 1250W AC Side - No hardwire AC terminal

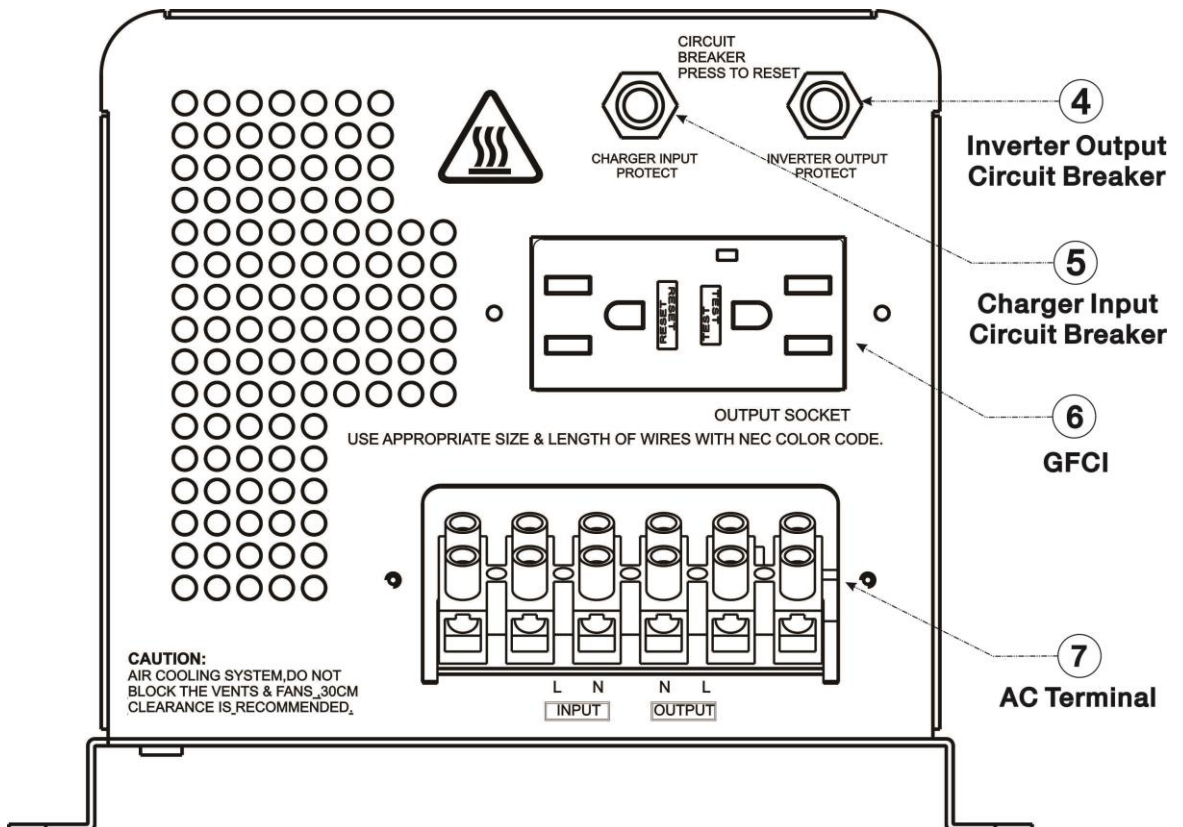




### PICOGLF 2500W Battery Side



### PICOGLF 2500W AC Side with hardwire AC terminal



## 2-4. Features

- **High overload ability up to 300% of rated power (20 sec)**
- **Low quiescent current, low power “Power Saving Mode” to conserve energy**
- **Automatic Generator Start**
- **4-step intelligent battery charger, PFC (Power Factor Correction) for charger**
- **8 pre-set battery type selector switch plus de-sulphation for totally flat batteries**
- **Powerful charger with selectable from 0% 100% (based on model)**
- **10 ms typical transfer time between battery and AC, guarantees power continuity**
- **LCD or LED remote controls (optional)**
- **15s delay before transfer when AC resumes, extra protection for loads when used with generator**
- **Allows start up and throughput power with depleted batteries 15A (1250W)/30A (2500W) (bypass current)**
- **Multiple controlled cooling fans**
- **Extensive protections against various harsh situations**
- **13VDC battery recovery point, dedicated for renewable energy systems**

## 2-5. Electrical Performance

### 2.5.1 Inverter

#### Topology

The Global LF inverter/charger is built according to the following topology.

Invert: Full Bridge Topology.

Charge: Isolated Boost Topology

Because of the high efficiency Mosfets and 16bit, 4.9MHZ microprocessor and heavy transformers, it outputs PURE SINE WAVE AC with an average THD of 15% (min 5%, max 25%) depending of load connected and the battery voltage.

#### Overload Capacity

The Global LF series inverters have high overload capacities, making it ideal to handle demanding loads.

1 For  $110% < \text{Load} < 125% (\pm 10\%)$ , no audible alarm for 14 minutes, beeps 0.5s every 1s in the 15th minute, and Fault(Turn off) after the 15th minute.

2 For  $125% < \text{Load} < 150% (\pm 10\%)$ , beeps 0.5s every 1s and Fault(Turn off) after 1 minute.

3 For  $300% \geq \text{Load} > 150% (\pm 10\%)$ , beeps 0.5s every 1s and Fault(Turn off) after 20s.

#### Caution:

After the inverter is switched on, it takes time for it to self-diagnose and ready to deliver full power. Hence, always switch on the load(s) after a few seconds of switching on the inverter. Avoid switching on the inverter with the load already switched on. This may prematurely trigger the overload protection. When a load is switched on, it may require initial higher power surge to start. Hence, if multiple loads are being powered, they should be switched on one by one so that the inverter is not overloaded by the higher starting surge if all the loads are switched on at once.



## 2.5.2 AC Charger

The Global LF Series inverter charger is equipped with an active PFC (Power Factor Corrected) multistage battery charger. The PFC feature is used to control the amount of power used to charge the batteries in order to obtain a power factor as close as possible to 1. Unlike other inverters whose max charging current decreases according to the input AC voltage, the Global LF series inverter charger is able to output max current as long as the input AC voltage is in the range of 164-243VAC(95-127VAC for 120V model), and AC frequency is in the range of 48-54Hz(58-64Hz for 60Hz model).

The Global LF series inverter charger has a very rapid charge current available, and the max charge current can be adjusted from 0%-100% via a liner switch to the right of the battery type selector. This will be helpful if you are using our powerful charger on a small capacity battery bank. Fortunately, the liner switch can effectively reduce the max charging current to 20% of its peak.

Choosing “0” in the battery type selector will disable the charging function.



### Caution:

**Turn the charge current control switch gently to avoid breakage due to over-turning. Not covered under warranty.**

There are 3 charging stages:

**Bulk Charging:** (*fast charge LED solid*) this is the initial stage of charging. While Bulk Charging, the charger supplies the battery with controlled constant current. The charger will remain in Bulk charge until the Absorption charge voltage (determined by the Battery Type selection) is achieved.

A software timer will measure the time from A/C start until the battery charger reaches 0.3V below the boost voltage, then take this time as  $T_0$  and  $T_0 \times 10 = T_1$ .

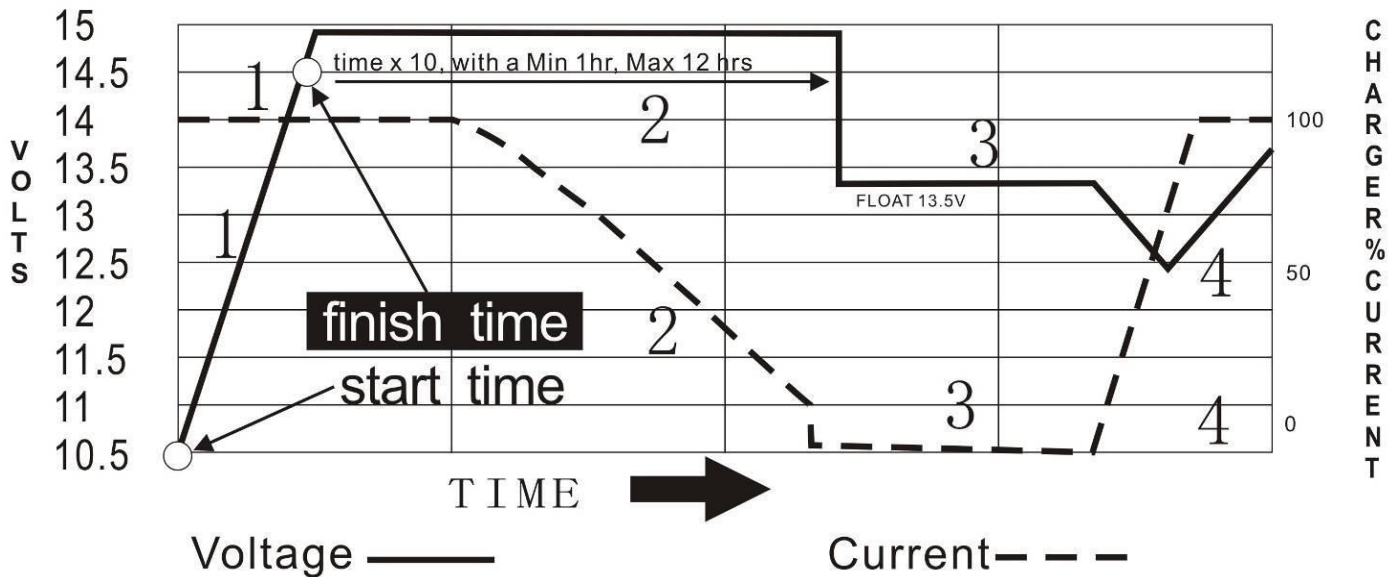
**Absorb Charging:** (*fast charge LED blinking*) This is the second charging stage when the fast charge LED is flashing and begins after the absorb voltage has been reached. Absorb Charging provides the batteries with a constant voltage and reduces the DC charging current in order to maintain the absorb voltage setting. In this period, the inverter will start a  $T_1$  timer; the charger will keep the boost voltage in Boost CV mode until the  $T_1$  timer has run out. Then drop the voltage down to the float voltage. The timer has a minimum time of 1 hour and a maximum time of 12 hours.

**Float Charging:** (*float charge LED solid*) The third charging stage occurs at the end of the Absorb Charging time. While Float charging, the charge voltage is reduced to the float charge voltage (determined by the Battery Type selection\*). In this stage, the batteries are kept fully charged and ready if needed by the inverter.

If the AC is reconnected or the battery voltage drops below 12Vdc/24Vdc, the charger will restart the above cycle.

If the charge maintains the float state for 10 days, the charger will deliberately reset the cycle to protect the battery.

# Battery Charging Processes



THE NEW BATTERY CHARGERS AND BOOSTERS OFFER THE FASTEST CHARGE RATE CURRENTLY AVAILABLE

STEP 1= Bulk Charge (Constant Current)  
STEP 3= Float Voltage

STEP 2 = Absorption (Constant Voltage)  
STEP 4 = RESET TO STEP 1

\*2 FOR 24 VOLTS  
\*4 FOR 48 VOLTS

ADJUSTABLE TIME DEPENDING ON BATTERY BANK CAPACITY

## Battery type selector

Switch setting	Description	Boost / Vdc	Float / Vdc
0	Charger Off		
1	Gel USA	14.0	13.7
2	AGM 1	14.1	13.4
3	AGM 2	14.6	13.7
4	Sealed lead acid / LIFEP04 lithium	14.4	13.6
5	Gel EURO	14.4	13.8
6	Open lead acid	14.8	13.3
7	Calcium	15.1	13.6
8	De-sulphation	15.5 (4 Hours then Off)	
9	Not used		

**\*Check the required charging specifications with the battery manufacturer. The chart above is just a guide.**

## De-sulphation

The de-sulphation cycle (*switch position 8*) is a very dangerous setting if you do not know what you are doing. Before attempting to use this cycle you must clearly understand what it does and when and how you would use it.

What causes sulphation? This can occur with infrequent use of the batteries or if the batteries have been discharged low enough that they will not accept a charge. This cycle is a very high voltage charge cycle designed to try to break down the sulphated crust that is preventing the plates from taking a charge and allowing the plates to clean up and accept a charge once again.

### Charging depleted batteries

The Global LF series inverter allows start up and through power (bypass) after batteries are depleted. See page

For 12VDC models: after the battery voltage goes below 10V and the power switch is kept in the "ON" position and the inverter stays connected to the battery and the battery voltage doesn't drop below 2V, the inverter will be able to charge the battery once qualified AC inputs are present.

Before the battery voltage goes below 9VDC, the charging can be activated when the switch is turned to "Off", then to "ON".

When the voltage goes below 9VDC, and you accidentally turn the switch to OFF or disconnect the inverter from the battery, the inverter will not be able to charge the battery once again, because the CPU loses memory during this process.

### Charging current for each model

Model	Current
PICOGLF12W12V120AL	35+/-5A
PICOGLF25W12V120AL	85+/-5A

The charging capacity will peak charge rate in about 3 seconds. This may cause a generator to drop frequency, making the inverter transfer to battery mode.

It is recommended to gradually put the charging load on the generator by switching the charging switch from min to max. Together with the 15s switch delay our inverter gives the generator enough time to spin up. This will depend on the size of the generator and rate of charge.

As a general rule, the Bulk Charging Current should be limited to 20% of the capacity of the battery bank. Higher charging current may be used if permitted by the battery manufacturer.



**Warning: Items to note and are not covered under warranty.**

**To set the charge current control switch, use a small jeweler's style flat-head screwdriver and gently turn to avoid breakage due to over-turning.**

**To guarantee the best performance of the built in AC charger, when the AC input is from a generator, the standby generator should be of at least 150% higher capacity than the inverter. Example, if you are using a 2500 watt inverter, the generator must be 3750 watts or larger. If using a 1250 watt inverter, the generator must be 1875 watts or larger, and so on. Warning! Operating with an under-rated generator or generator with unqualified wave form may cause premature failure and is not covered under warranty.**

## 2.5.3 Transfer

### Swift Power Transfer

While in the Standby Mode, the AC input is continually monitored. Whenever AC power falls below the VAC Trip voltage (140 VAC, default setting for 230VAC, 90VAC for 120VAC), the inverter automatically transfers back to the Invert Mode with minimum interruption to your appliances - as long as the inverter is turned on. The transfer from Standby mode to Inverter mode occurs in approximately 10 milliseconds. It is the same time from Inverter mode to Standby mode.

### Synchronized Power Transfer

When a load is transferred from inverter AC output to another backup AC source of power through the transfer switch, there will be a finite interruption of power to the load for the transfer to take place. A mismatch of phase and frequency of the inverter AC output and the backup AC source in transfer is likely to damage the backup AC source / a reactive load. With sophisticated circuitry design, our inverter will first lock on the frequency and phase of the input shore power/generator power and make a smooth and safe transfer at the zero voltage point to minimize the impact on the power modules. Though it is not designed as a computer UPS system, this transfer time is usually fast enough to keep your equipment powered up.

### Transfer Delay

There is a 15-second delay from the time the inverter senses that continuously qualified AC is present at the input terminals to when the transfer is made. This delay is built in to provide sufficient time for a generator to spin-up to a stable voltage and frequency and avoid relay chattering. The inverter will not transfer to generator until it has locked onto the generator's output. This delay is also designed to avoid frequent switching when input utility is unstable.

## 2.5.4 Auto Frequency Adjust

The factory default configuration for inverters sold in American market is 60Hz.

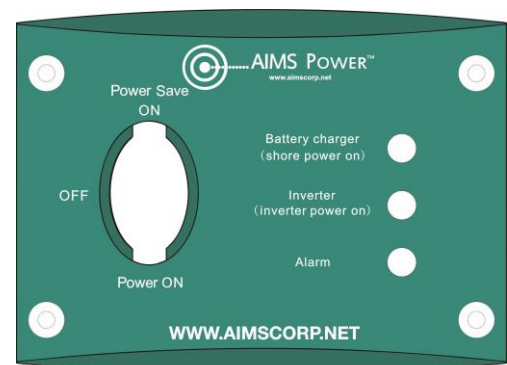
If the output frequency needs to be changed this is done by putting in a valid input Power Source to the inverter's input lines. Once the inverter validates the input, the output will automatically change.

## 2.5.5 Power Saver

There are 2 different working statuses for our Global LF inverter: "Power On" and "Off".

When the power switch is in "Off" position, the inverter is powered off.

When the power switch is turned to either of "Power Save ON" or "Power ON", the inverter is powered on.



The Power Saver function is designed to conserve battery power when AC power is not normally required by the loads.

In this mode, the inverter pulses the AC output looking for an AC load (IE. electrical device). Whenever an AC load (greater than 100 watts) is turned on, the inverter recognizes the need for power and automatically starts inverting and output goes to full voltage. When there is no load (or less than 100 watts) detected, the inverter automatically goes back into search mode to minimize energy consumption from the battery bank.

In “Power save ON” mode, the inverter will draw power mainly in sensing moments, thus the idle consumption is significantly reduced. The inverter will detect a load for 250ms every 3 seconds.

**Note:** The minimum power of a load to take inverter out of sleep mode (Power Saver On) is 100 Watts.

The Global LF Series is designed with extraordinarily low idle power consumption, only a mere 0.8-1.8% of its rated power.

When in the search sense mode, the green power LED will blink and the inverter will make a ticking sound. At full output voltage, the green power LED will light steadily and the inverter will make a steady humming sound. When the inverter is used as an “uninterruptible” power supply the search sense mode or “Power Saver On” function should be defeated.

## Exceptions

Some devices when scanned by the load sensor cannot be detected. Small fluorescent lights are the most common example. (Try altering the plug polarity by turning the plug over.) Some computers and sophisticated electronics have power supplies that do not present a load until line voltage is available. When this occurs, each unit waits for the other to begin. To drive these loads either a small companion load must be used to bring the inverter out of its search mode, or the inverter may be programmed to remain at full output voltage (Power On mode).

## 2.5.6 Protections

The Global LF series inverter is equipped with extensive protections against various harsh situations/faults.

- ❖ AC Input over voltage protection/AC Input low voltage protection
- ❖ Low battery alarm/High battery alarm
- ❖ Over temperature protection/Over load protection
- ❖ Short Circuit protection (1s after fault)
- ❖ Back feeding protection

When over temperature /overload occur, after the fault is cleared, the master switch needs to be reset to restart the inverter.

The inverter will go to over temp protection when the heat sink temp.  $\geq 105^{\circ}\text{C}$ (221 $^{\circ}\text{F}$ ), and go to Fault (shutdown Output) after 30 seconds. The switch has to be reset to activate the inverter.

The Global LF series inverter has back feeding protection which avoids presenting an AC voltage on the AC input terminal in inverter mode.

When the fault is cleared, the inverter will need to be reset to start working.

**\*We don't recommend connecting AC input to a GFCI circuit as it will cause the supply GFCI to pop intermittently and fail to supply power to the charger and bypass power through inverter.**

### 2.5.7 Remote Control

In addition to the switch panel on the front (or top) of the inverter, there are two optional remotes. An LCD remote panel that provides more detailed info or an LED remote that provides on/off with a few LED indicators. The LCD remote panel connects to the RJ45 port on the DC side of the inverter displays several statuses of the inverter (sold separately Part # REMOTELF). Use with port labeled LCD remote. If you want a more simple on/off remote, consider the LED remote (sold separately Part # REMOTELFLED). Use with port labeled LED remote.

If an extra switch panel is connected to the inverter via “remote control port”, together with the panel on the inverter case, the two panels will be connected and operated in parallel.

Whichever first switches from “Off” to “Power saver off” or “Power saver on”, it will power the inverter on.

If the commands from the two panels conflict, the inverter will operate according to the following priority: Power saver on > Power saver off > Power off

Only when both panels are turned to the “Unit Off” position, will the inverter be powered off. The max length of the cable is 60 feet.

#### Remote LED - REMOTELFLED

The remote LED has on/off and power save switch. There are also 3 indicator LEDs for the battery charger, inverter mode and faults.

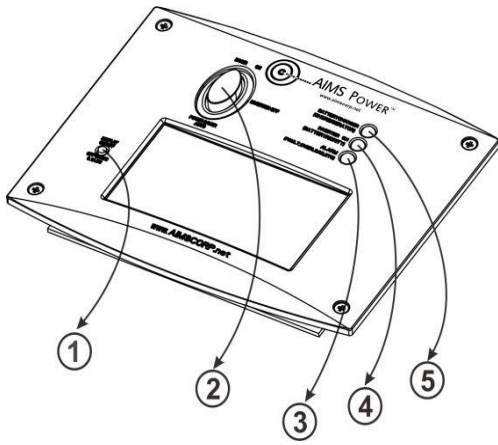


#### Remote LCD - REMOTELF

The remote LCD displays detailed information of the inverter.





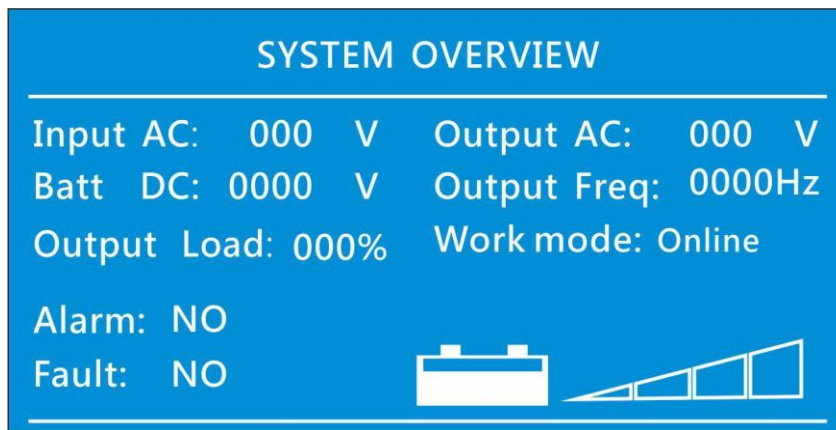


- ① Display ON&OFF
- ② Power Switch ON&OFF
- ③ Alarm LED
- ④ Inverter LED
- ⑤ Battery Charger LED

Display screen provides the following info:

- ❖ Input AC Voltage
- ❖ Output AC
- ❖ Voltage Battery
- ❖ Voltage Output
- ❖ Frequency
- ❖ Output Load
- ❖ Work Mode
- ❖ Alarm Fault
- ❖ Battery Capacity

\*A push button on the left of the panel can be used to turn off the LCD screen and save 0.1A current draw on the battery (#1 on image above).



- (1) Shore/ Generator voltage
- (2) DC voltage on inverter
- (3) Load when inverting
- (4) Low/high voltage, over temp, overload
- (5) Fault condition

- (6) Output voltage
- (7) Output frequency
- (8) Bypass/ inverter mode
- (9) Battery state of charge graph  
NOTE: The battery icon is just an image and does not represent battery capacity. The bar graph will change based on battery voltage (2). If using lithium, you will could an instant drop on the graph.

### 2.5.8 LED Indicator Lights/Status

## 12V Inverter & Charger

Low Frequency Inverter -AC Charger -Automatic Transfer Switch

BATTTYPE & CHG. VOLTAGE	Position	Fast V	Float V
0.Charge Off		N/A	N/A
1.Gel U.S.A		14.0	13.7
2.A.G.M. 1		14.1	13.4
3.A.G.M. 2		14.6	13.7
4.Sealed Lead Acid		14.4	13.6
5.Gel European		14.4	13.8
6.Open Lead Acid		14.8	13.8
7.Calcium (Open)		15.1	13.6
8.De Sulphation		15.5 for 4 hrs	
9.Not Used / Customized			

WARNING: High internal voltage  
Please read and understand instructions before operating or installing this unit  
Other alarms explained in instructions

Global LF Series

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LED INDICATOR	STATUS
AC Mode	Green = shore or generator power
Inverter Mode	Green = inverter on
Fast Charge	Yellow = fast charging mode
Float Charge	Green = float charging mode
Over Temp Alarm	Red = over temp
Overload	Red = overload
Power Saver	Green = in power saver mode (must sense a load > 100 watts)

\* see next page for detailed fault and status

### Status Center

BATTERY TYPE	POWER SAVER	OVER LOAD	OVER TEMP	UNIT ALARM	FLOAT CHG	FAST CHG	INVERTER MODE	LINE MODE

### LED STATUS AND FAULT

Status	L.E.D.s Function	L.E.D.s on main unit								L.E.D.s on remote Alarm				
		①	②	③	④	⑤	⑥	⑦	⑧	①	②	③		
Charge function	Constant current charge							on		on		on		
	Constant voltage charge							flash		on		on		
	Float					on				on		on		
	Standby									on				
Inverter mode	Inverter on								on				on	
	Power saver on	on												
Alarms	Battery low voltage					on			on		beep 0.5 s every 5 s		on	on
	Battery high voltage					on			on		beep 0.5 s every 5 s		on	on
	Over load (inverter mode)		on			on			on		beep 0.5 s every 5 s		on	on
	Over temp (inverter mode)			on	on				on		beep 0.5 s every 5 s		on	on
	Over temp (line mode)			on	on	on			on		beep 0.5 s every 5 s		on	on
	Over charge				on	on			on		beep 0.5 s every 5 s		on	on
Fault mode	Fan lock										beep continuous			
	Battery high voltage								on		beep continuous		on	
	Inverter mode overload		on								beep continuous			
	Over temperature			on							beep continuous			

### 2.5.9 Audible Alarm

<b>Battery Voltage Low</b>	Inverter green LED lit, and the buzzer beeps 0.5s every 5s.
<b>Battery Voltage High</b>	Inverter green LED lit, and the buzzer beeps 0.5s every 1s and Fault after 60s.
<b>Invert Mode Overload</b>	(1)110%<load<125%(±10%), No audible alarm in 14 minutes, Beeps 0.5s every 1s in 15 <sup>th</sup> minute and Fault after 15 minutes; (2)125% <load<150%(±10%), Beeps 0.5s every 1s and Fault after 60s; (3)Load>150%(±10%), Beeps 0.5s every 1s and Fault after 20s;
<b>Over Temperature</b>	Heat sink temp. ≥105°C(221°F), Over temp red LED Lighting, beeps 0.5s every 1s;

## 2.5.10 FAN Operation

The Operation of the DC fan at the DC terminal side is controlled by the following logic:

Condition	Enter Condition	Leave condition	Speed
<b>HEAT SINK</b>	$T \leq 140^{\circ}\text{F}$	$T > 149^{\circ}\text{F}$	OFF
<b>TEMPERATURE</b>	$149^{\circ}\text{F} \leq T < 185^{\circ}\text{F}$	$T \leq 140^{\circ}\text{F}$ or $T \geq 185^{\circ}\text{F}$	50%
	$T > 185^{\circ}\text{F}$	$T \leq 176^{\circ}\text{F}$	100%
<b>CHARGER CURRENT</b>	$I \leq 15\%$	$I \geq 20\%$	OFF
	$20\% < I \leq 50\% \text{Max}$	$I \leq 15\%$ or $I > 50\% \text{Max}$	50%
	$I > 50\% \text{Max}$	$I \leq 40\% \text{Max}$	100%
<b>LOAD Percentage (INV MODE)</b>	Load $< 30\%$	Load $\geq 30\%$	OFF
	$30\% \leq \text{Load} < 50\%$	Load $\leq 20\%$ or Load $\geq 50\%$	50%
	Load $\geq 50\%$	Load $\leq 40\%$	100%

Allow at least 6 inches of clearance around the inverter for air flow. Make sure that the air can circulate freely around the unit.

Fan noise level  $< 60\text{db}$  at a distance of 3 feet.

## 2.5.11 Other Features

### Battery voltage recovery start

After low battery voltage shut off (10V for 12V model), the inverter is able to restore operation after the battery voltage recovers to 13V (with power switch still in the “On” position). This function helps users and saves time and extra labor to reactivate the inverter when the low battery voltage returns to an acceptable range in renewable energy systems. The built in battery charger will automatically reactivate as soon as city/generator AC has been stable for 15 seconds.



### WARNING

Never leave the loads unattended, some loads (like a heater) may cause accidents in such cases. It is better to shut everything off after low voltage trip than to leave your load on, due to the risk of fire.

### Conformal Coating

AIMS Power entire line of Global LF inverters have been processed with a conformal coating on the PCB, making it water, rust, and dust resistant as well as corrosion resistant.

While these units are designed to withstand corrosion from the salty air, they are not splash proof.

### 3. Installation

#### 3.1 Unpacking and Inspection

Carefully remove the inverter charger from its shipping package and inspect all contents. Verify the following items are included:

- The PICOGLF Inverter Charger
- Red and black DC terminal covers
- AC terminal block cover with two Phillips screws (2500 watt model)
- Two Flange nuts and 4 Phillips screws (installed on the DC terminals).
- PICOGLF Series Owner’s Manual

If items appear to be missing or damaged, contact AIMS Power. If at all possible, keep your shipping box and all packaging. It will help protect your inverter from damage if it ever needs to be returned for service. Save your proof-of-purchase as a record of ownership; it will also be needed if the unit should require warranty work. The serial number is on the side of the inverter and does NOT start with an 8.

#### 3-2. Location

Follow all the local regulations to install the inverter.

Install the equipment in an INDOOR location that is dry, clean, free from dust, cool and with good ventilation.

Working temperature: -14°F to 122°F | Storage temperature: 40°F to 158°F | Relative Humidity: 0% to 95, non-condensing | Cooling: forced air

**Do not install upside down (top side facing down).**

CAUTION: Some models are heavy. Use proper lifting techniques during installation to prevent personal injury.



**WARNING!**

The inverter should not be installed in an area that allows dust, fumes, insects or rodents to enter or block the inverter’s ventilation openings. This area must also be free from any risk of condensation, water or any other liquid that can enter or fall on the inverter.

All inverters have been processed with a conformal coating on the PCB, making them humid, rust, and dust resistant but not completely protected.

While these units are designed to withstand corrosion from the salty air, they are not splash proof. **DO NOT GET WET.**

The inverter’s life is uncertain if used in these types of environments, and inverter failures under these conditions are not covered under warranty.

#### 3-3. DC Wiring

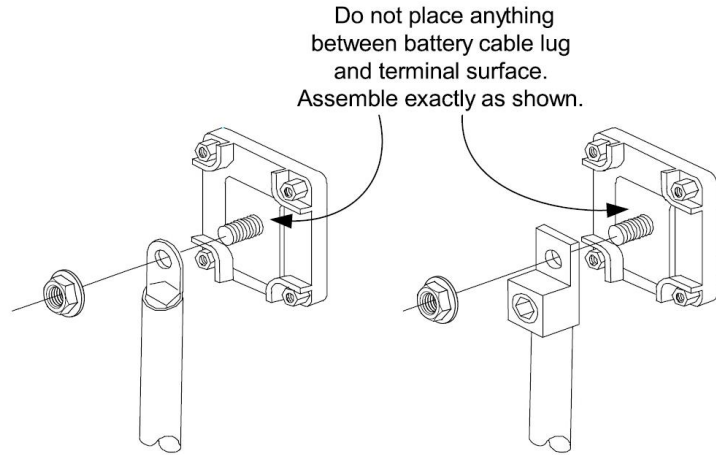
It is recommended that the battery bank be kept as close as possible to the inverter. The following is a suggested wiring option for 12 feet of DC cable. Follow the minimum wire size. If the DC cable is longer than 12 feet, increase the size of cable to reduce voltage drop.

**WARNING! The inverter charger must be connected to a battery bank in order to turn on and transfer AC power.**

Power	DC Input voltage	Wire Gage
1250 Watt	12V	4 AWG
2500 Watt	12V	1/0 AWG

Battery cables must be crimped (or preferably, soldered and crimped) copper compression lugs unless aluminum mechanical lugs are used. Soldered connections alone are not acceptable. High quality, UL-listed battery cables are available. These cables are color-coded with pressure crimped, sealed ring terminals.

Battery terminal must be clean to reduce the resistance between the DC terminal and cable connection. A buildup of dirt or oxidation may eventually lead to the cable terminal overheating during periods of high current draw. Use a stiff wire brush and remove all dirt and corrosion from the battery terminals and cables.



Copper Compression Lug

Aluminum Mechanical Lug



**CAUTION**

The torque rating range for DC terminal is 12.5NM-20.5NM (9.25-15.19 pound-foot), and the suggested torque rating is 17NM (12.6 pound-foot). Over torquing may break the bolt.

**Equipment Damage**

The inverter is not reverse polarity protected. Reversing the battery polarity on the DC input connections will cause permanent damage to the inverter which is not covered under warranty. Always check polarity before making connections to the inverter.

The inverter contains capacitors that may produce a spark when first connected to battery. Do not mount in a confined compartment with vented battery or gases.

Ensure the inverter is off before disconnecting the battery cables, and that AC power is disconnected from the inverter input.

**Reducing RF interference**

To reduce the effect of radiated interference, twist the DC cables. To further reduce RF interference, shield the cables with sheathing /copper foil / braiding.

**Taping battery cables together to reduce inductance**

Do not keep the battery cables far apart. In case it is not convenient to twist the cables, keep them taped together to reduce their inductance. Reduced inductance of the battery cables helps to reduce induced voltages. This reduces ripple in the battery cables and improves performance and efficiency.

### 3-4. AC Wiring

We recommend using 10 AWG wire to connect to the AC terminal block (2500 Watt model only).

When in AC mode the AC input power will supply both the loads and AC charger, a thicker wire gauge for AC Input is required. Please consult a qualified electrician about the specific wire gauge required in terms of wire material and inverter power.

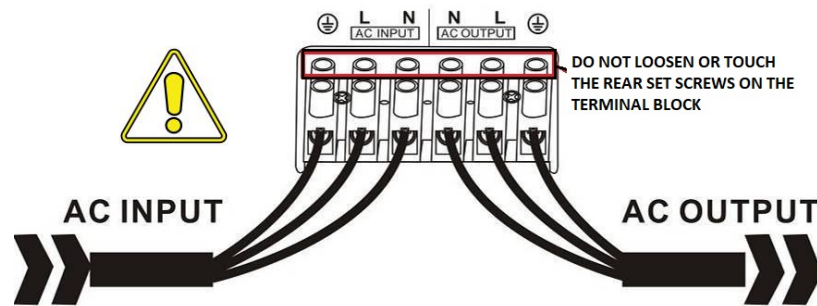


#### WARNINGS

**The output voltage of this unit must never be connected in its input AC terminal, overload or damage may result.**

**Always switch on the inverter before plugging in any appliance.**

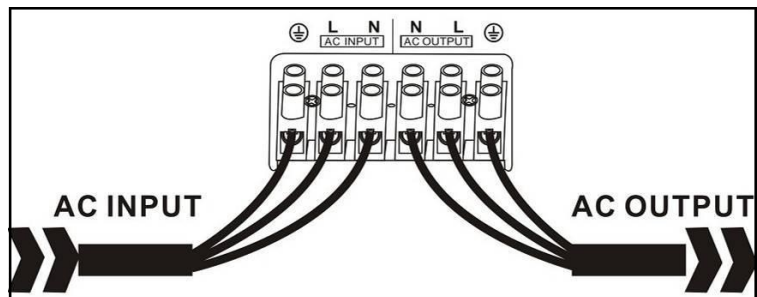
**\*We don't recommend connecting AC input to a GFCI circuit as it will cause the supplied GFCI to pop intermittently and fail to supply power to the charger and bypass power through inverter.**



**Do not loosen or touch the rear set screws on the terminal block.**

#### Wiring

120V single phase Input: Ground + Hot line  
 + Neutral Output: Neutral + Hot line +  
 Ground



### 3-5. Grounding

Connect an 8 AWG or bigger copper wire between the grounding terminal on the inverter and the earth grounding system or the vehicle chassis.

#### USING A GENERATOR FOR AC

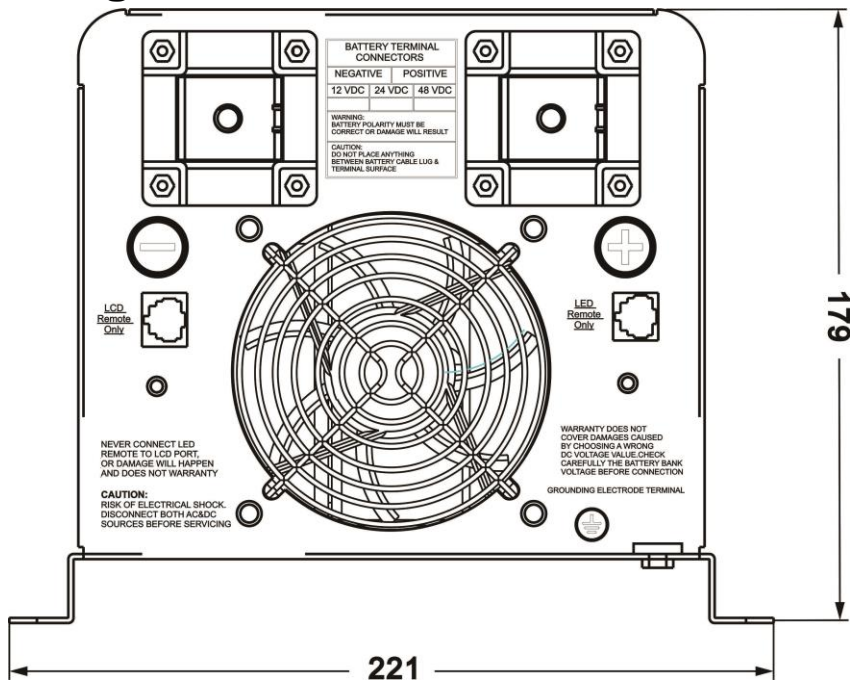
##### BEFORE YOU USE A GENERATOR, MAKE SURE IT IS SIZED TO

**HANDLE THE INVERTER.** To guarantee the best performance of the built in AC charger and when the AC input is from a generator, the standby generator should be at least 150% higher capacity than the inverter.

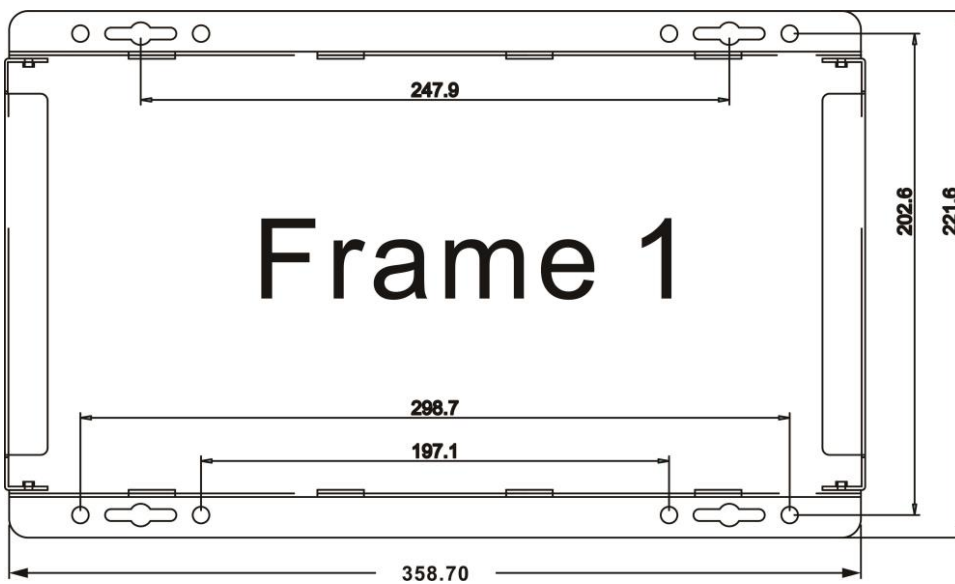
Operating with an under-rated generator or generator with unqualified wave form may cause premature failure which is not covered under warranty. Example: If you are using a 2500 watt inverter charger, your generator must be 3750 watts or larger. If you are using a 1250 watt inverter charger, your generator must be 1875 watt or larger, and so on.



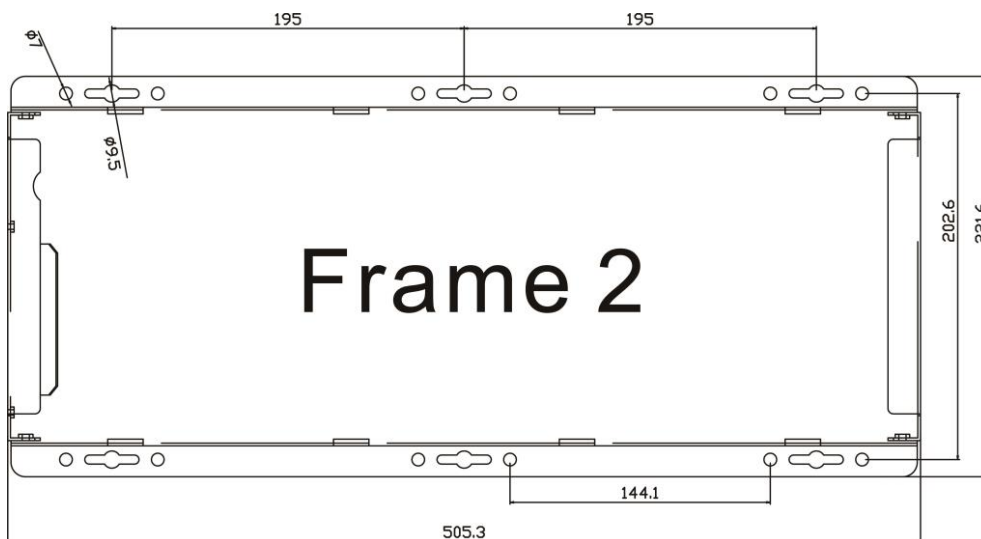
### 3-6. Install Flange



DC Side



1250W



2500W

## 4. Troubleshooting Guide

Troubleshooting contains information about how to troubleshoot possible error conditions while using the Global LF Inverter & Charger.

The following chart is designed to help you quickly pinpoint the most common inverter failures.

### Indicator and Buzzer

Status	Item	Indicator on top cover							LED on Remote Switch			Buzzer
		SHORE POWER ON	INVERTER ON	FAST CHG	FLOAT CHG	OVER TEMP TRIP	OVER LOAD TRIP	POWER SAVER ON	BATT CHG	INVERTER	Alarm	
Line Mode	CC	√	×	√	×	×	×	×	√	×	×	×
	CV	√	×	√, blink	×	×	×	×	√	×	×	×
	Float	√	×	×	√	×	×	×	√	×	×	×
	Standby	√	×	×	×	×	×	×	×	×	×	×
Inverter Mode	Inverter On	×	√	×	×	×	×	×	×	√	×	×
	Power Saver	×	×	×	×	×	×	√	×	×	×	×
Inverter Mode	Battery Low	×	√	×	×	×	×	×	×	√	√	Beep 0.5s every 5s
	Battery High	×	√	×	×	×	×	×	×	√	√	Beep 0.5s every 1s
	Overload On Invert Mode	×	√	×	×	×	√	×	×	√	√	Refer to “Audible alarm”
	Over-Temp On Invert Mode	×	√	×	×	√	×	×	×	√	√	Beep 0.5s every 1s
	Over-Temp On Line Mode	√	×	√	×	√	×	×	√	×	√	Beep 0.5s every 1s
	Over Charge	√	×	√	×	×	×	×	√	×	√	Beep 0.5s every 1s
Fault Mode	Fan Lock	×	×	×	×	×	×	×	×	×	×	Beep continuous
	Battery High	×	√	×	×	×	×	×	×	√	×	Beep continuous
	Inverter Mode Overload	×	×	×	×	×	√	×	×	×	×	Beep continuous
	Output Short	×	×	×	×	×	√	×	×	×	√	Beep continuous
	Over-Temp	×	×	×	×	√	×	×	×	×	×	Beep continuous
	Over Charge	×	×	√	×	×	×	×	√	×	×	Beep continuous
	Back Feed Short	×	×	×	×	×	×	×	×	×	×	Beep continuous



Symptom	Possible Cause	Recommended Solution
Inverter will not turn on during initial power up.	Batteries are not connected, loose battery-side connections.  Low battery voltage.	Check the batteries and cable connections. Check DC fuse and breaker.  Charge the battery.
No AC output voltage and no indicator lights ON.	Inverter has been manually transitioned to OFF mode.	Press the switch to Power saver on or Power saver off position.
AC output voltage is low and the inverter turns loads OFF in a short time.	Low battery.	Check the condition of the batteries and recharge if possible.
Charger is inoperative and unit will not accept AC.	AC voltage has dropped out-of-tolerance	Check the AC voltage for proper voltage and frequency.
Charger is supplying a lower charge rate.	Charger controls are improperly set.  Low AC input voltage.  Loose battery or AC input connections.	Refer to the section on adjusting the "Charger Rate".  Source qualified AC power.  Check all DC /AC connections.
Charger turns OFF while charging from a generator.	High AC input voltages from the generator.	Load the generator down with a heavy load. Turn the generator output voltage down.
Sensitive loads turn off temporarily when transferring between grid and inverting.	Inverter's Low voltage trip voltage may be too low to sustain certain loads.	Choose narrow AC voltage in the DIP switch, or Install a UPS if possible.
Noise from Transformer/case*	Applying specific loads such as hair drier	Remove the loads

### The reason for the noise from transformer and/or case...

When in inverter mode sometimes the transformer and/or case of the inverter may vibrate and make noise. If the noise comes from transformer:

According to the characteristics of our inverter, there is one type of load which most likely may cause the transformer to rattle.

That is a half wave load. A load that uses only half a cycle of the power. This tends to cause an imbalance of the magnetic field of the transformer, reducing its rated working frequency from 20KHz to, say, maybe 15KHz (it varies according to different loads). In such a case the frequency of noise falls exactly into the range (200Hz-20KHz) that human ears can hear. The most common load is a hair drier.

If the noise comes from the case:

Normally when loaded with inductive loads, the magnetic field generated by the transformer keeps attracting or releasing the steel case at a specific frequency. This may also cause noise.

Reducing the load power or using an inverter with bigger capacity will normally solve this problem. The noise will not do any harm to the inverter or the loads.

## 5. Warranty

1. DC reverse polarity. The inverter is NOT designed with DC reverse polarity protection. A reverse polarity may severely damage the inverter.
2. Wrong or loose AC wiring.
3. Operation in a moist or unsanitary environment.
4. Water damage, lightning strikes, short circuit from dirt/dust build-up
5. Operating with an undersized generator or generator with unqualified wave form.

### AIMS Power Warranty Instructions:

This product is designed using the most modern digital technology and under very strict quality control and testing guide lines. If, however you feel this product is not performing as it should, please contact us: [techsupport@aimscorp.net](mailto:techsupport@aimscorp.net) or (775)359-6703.

We will do our best to resolve your concerns. If the product needs repair or replacement, make sure to keep your receipt/invoice, as that will need to be sent back along with the package and RA# prepaid to AIMS. You have a full 1 year from date of purchase warranty.

This warranty is valid world-wide with the exception that freight and duty charges incurred outside the contiguous 48 United States will be prepaid by customer.

Except as provided above, AIMS makes no warranty of any kind, express or implied, including without limitation the implied warranties of merchantability and fitness for a particular purpose. In no event shall AIMS be liable for indirect, special or consequential damages. This warranty only applies to AIMS Power branded products. All other name brand products are warranted by and according to their respective manufacturer. Please do not attempt to return non-AIMS Power branded products to AIMS Power.

For additional products such as:

- Modified Sine Wave Inverters
- Pure Sine Wave Inverters
- Solar Charge Controllers
- Inverter Chargers
- Custom Cut Cables
- Batteries
- Solar Panels
- Generators

Please visit our web site: [www.aimscorp.net](http://www.aimscorp.net)

To find out where to buy any of our products, you may also e-mail: [sales@aimscorp.net](mailto:sales@aimscorp.net) or call (775)359-6703.

## Appendix 1

<h1>Global Low Freq Series Inverter &amp; AC Charger</h1>			
Electrical Specifications			
	Model	PICOGLF12W12V120AL	PICOGLF25W12V120AL
Inverter Output	Continuous Output Power	1250W	2500W
	Surge Rating(20s)	3750W	7500W
	Output Waveform	Pure Sine wave/Same as input (Bypass mode)	
	Nominal Efficiency	>88%(Peak)	
	Line Mode Efficiency	>95%	
	Power Factor	0.9-1.0	
	Nominal Output Voltage rms	100-110-120Vac	
	Output Voltage Regulation	±10% RMS	
	Output Frequency	60Hz ±0.3Hz	
	Short Circuit Protection	Yes, Current Limit Function (Fault after 1sec)	
	Typical transfer Time	6-8ms 10ms(Max)	
	THD	< 10%	
DC Input	Nominal Input Voltage	12.0Vdc (*2 for 24Vdc, *4 for 48Vdc)	
	Minimum Start Voltage	10.0Vdc	
	Low Battery Alarm	10.5Vdc	
	Low Battery Trip	10.0Vdc	
	High Voltage Alarm & Fault	16.0Vdc	
	High DC Input Recovery	15.5Vdc	
	Low Battery voltage recover	13.0Vdc	
	Idle Consumption-Search Mode	< 100 W when Power Saver On	
Charge	Input Voltage Range	Narrow: 90~135VAC	
	Input Frequency Range	Narrow: 57-65±0.3Hz	
	Output Voltage	Depends on battery type	
	Charger Breaker Rating(120Vac)	15A	30A
	Max Charge Rate	See specific charge rates in “2.5.2 AC Charger” section	
	Over Charge Protection	15.7V for 12Vdc (*2 for 24Vdc, *4 for 48Vdc)	
	Shutdown		
	Battery type	Fast Vdc	Float Vdc
	Gel U.S.A	14.0	13.7
	A.G.M 1	14.1	13.4
	A.G.M 2	14.6	13.7

	Sealed Lead Acid	14.4	13.6
	Gel Euro	14.4	13.8
	Open Lead Acid	14.8	13.3
	Calcium	15.1	13.6
	De-sulphation	15.5 for 4hrs	
	Remote Control	Yes. Optional	
Bypass & Protection	Input Voltage Waveform	Sine wave (Grid or Generator)	
	Nominal Voltage	120Vac	
	Low Voltage Trip	85V±4%	
	Low Voltage re engage	90V±4%	
	High Voltage Trip	135V±4%	
	High Voltage re engage	130V±4%	
	Max Input AC Voltage	150VAC	
	Nominal Input Frequency	60Hz (Auto detect)	
	Low Frequency Trip	Narrow:57±0.3Hz	
	Low Frequency re engage	Narrow: 58±0.3Hz	
	High Frequency Trip	Narrow: 65±0.3Hz	
	High Frequency re engage	Narrow: 64±0.3Hz	
	Output Short circuit protection	Circuit breaker	
Mechanical Specification	Bypass breaker rating (120Vac)	15A	30A
	Mounting	Wall/Ground Mount - Do not install upside down (top facing down)	
	Inverter Dimensions(L*W*H)	14.25"x 8.7" x 7"	19.88" x 8.7" x 7.04"
	Inverter Weight	38 lb	46 lb
	Shipping Dimensions(L*W*H)	20.47" x 12.6" x 12.2"	26.4" x 12.6" x 12.2"
	Shipping Weight	42 lb	50 lb
	Display	Status LEDs	
Standard Warranty	1 Year		

※Specifications in this manual are subject to change without prior notice

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