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 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:
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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 prepaid to AIMS. You have a full 1 year from date of purchase warranty.

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For additional products such as:
 -Modified sine wave inverters
 -Digital pure sine wave inverters
 -Power controllers
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 -Power supplies
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DC to AC
AIMS Power Inverter

Owner's Guide

This manual covers all 12Vdc Pure Sine Wave inverters by AIMS Power from 180-5000 Watts

Contents

Safety First	1
1 Introduction.....	5
2 Installation Guidelines.....	6
3 Using the inverter.....	11
4 Troubleshooting.....	18
5 Specifications.....	22

Safety First ...

Incorrect installation or misuse of the inverter may result in danger to the user or hazardous conditions. We urge you to pay special attention to all CAUTION and WARNING statements. CAUTION statements identify conditions or practices that may result in damage to the inverter or to other equipment. WARNING statements identify conditions that may result in personal injury or loss of life.



WARNING! Shock hazard. Keep away from children.

- The inverter generates the same potentially lethal AC power as a normal household wall outlet. Treat it with the same respect that you would any AC outlet.
- Do not insert foreign objects into the inverter's AC outlets, fan or vent openings.
- Do not expose the inverter to water, rain, snow or spray.
- Do not under any circumstances, connect the inverter to utility power AC distribution wiring.

1



WARNING! Heated surface.

- The inverter's housing may become uncomfortably warm , reaching 117°F (60°C) under extended high power operation. Allow at least 2 inches (5 cm) of air space on all sides of the inverter. During operation, keep away from materials that may be affected by high temperatures.



WARNING! Explosion hazard.

- Do not use the inverter in the presence of flammable fumes or gases, such as in the bilge of a gasoline powered boat, or near propane tanks. Do not use the inverter in an enclosure containing automotive-type, lead-acid batteries. These batteries, unlike sealed batteries, vent explosive hydrogen gas, which can be ignited by sparks from electrical connections.
- When working on electrical equipment always ensure someone is nearby to help you in an emergency.



CAUTION!

- Do not connect live AC power to the inverter's AC outlets. The inverter will be damaged even if it is switched OFF.
- Do not expose the inverter to temperatures exceeding 104°F (40°C).

2



CAUTION!

- Connect inverter only to batteries with a 12V DC nominal output. A battery with 6V nominal output will not supply enough voltage and a battery with 24V nominal output will damage the inverter.

3

Safety Features

These advanced safety features are built into the inverter.

- Electronic overload protection with automatic shutdown.
- Built-in internal backup DC fuse provides added safety.
- Low battery voltage warning followed by automatic shutdown.
- High input voltage protection with automatic shutdown.
- Over temperature protection with automatic shutdown.
- Output short circuit protection.

4

1 Introduction

Thank you for purchasing the AIMS Power Inverter. The inverter is a compact and portable for all mobile application (up to rated wattage), the leader in the field of high frequency inverter design. From the 12V DC outlet in your vehicle or boat, or directly from a dedicated 12V DC battery, the inverter will efficiently and reliably power a wide variety of household AC products, such as TVs, computers, VCRs, and many more. The inverter is designed to provide years of trouble-free operation and includes automatic safety monitoring circuitry to protect the inverter, and your battery, from inadvertent overload conditions.

Read this guide before installing or using the inverter and save it for future reference.

5

2 Installation Guidelines

Selecting a Suitable Location

For safe and optimum performance, install the inverter in a location that is...

- **Dry.** Do not expose to water drip or spray.
- **Cool.** Operate only in ambient temperatures between 32°F(0°C) and 104°F(40°C). Keep away from furnace heating vents or other heat producing equipment.
- **Well ventilated.** Allow at least 2 inches (5cm) of clearance above and on all sides of the unit for proper cooling.
- **Safe.** Do not install inverter in a compartment with non-sealed batteries or flammable liquids, such as gasoline, or explosive vapors.
- **Clean and free of dust and dirt.** This is especially important if the inverter is used in a work environment.

6

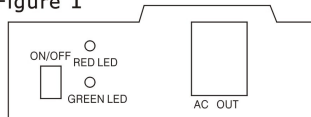
Using the DC Cable-Plug

Due to limitations in the common 12V outlet in a vehicle or boat, the inverter should only be used to supply AC power to products that require 180 Watts or less. If your application requires more than 180 Watts and the inverter has a higher rating, see "Using the DC Cable-clips on page 9".

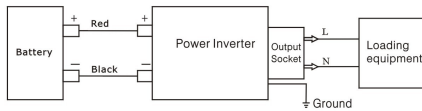
1. Before connecting your new inverter, you should make a visual inspection to ensure no visible damage has been caused by shipping. Then make sure the Main Power Switch of the inverter is Off (O).
 2. Attach the ring type connector marked with red to the positive (+) DC terminal on the inverter and attach the ring connector marked with black to the negative (-) DC terminal.
- CAUTION!** A reverse polarity connection (positive to negative) may damage the inverter. Damage caused by a reverse polarity connection is not covered under warranty.
3. Tighten the nut on each DC terminal by hand until it is snug. Do not over tighten.
 4. Insert the plug of this cable into the 12VDC outlet and switch the unit ON. See Section 4 if the inverter does not operate properly after being connected.
 5. When the inverter is not in use, unplug it from the 12V DC outlet to prevent slight discharge of the battery.

7

Figure 1



Instruction of operation



8

Using the DC Cable Clips or Direct Connect Cables

By directly connecting the inverter to a 12V DC battery with the DC Cable-Clips, you can operate products with power requirements up to the rated continuous output power.

1. Follow steps 1, 2 and 3 above (using the DC Cable-Plug) to attach the ring type connectors. Large inverters may require multiple DC input cables. It is required to connect each DC input terminal to the battery or battery bank.
2. Attach the black negative clip to the negative (-) battery terminal. Attach the red positive to the positive (+) battery terminal. Make sure both clips are securely connected to the battery terminals, as a loose connection will cause excessive Voltage drop and may cause the cables to overheat resulting in equipment Damage or fire.
3. The display will alternate between the battery, Voltage and % of maximum inverter load. This is for inverters 1000W and higher.
4. If your inverter has been shipped with a wireless remote, the receiver is built into your inverter. We include 1 of 4 different wireless remotes matched to the receivers: A, B, C, or D. The remote and receiver must have the same letter to work together. You can see the receivers letter by the S/N on the bottom sticker.

9

If you have multiple inverters using the same remote system, you may operate all inverters with a single remote, if the letters match. For example: if you have 3 inverters and all of the S/N are labeled A, then 1 single remote labeled A will control all 3 inverters as long as Main Power Switch to each inverter is ON. If you like you may have up to 4 different remotes, please ensure each remote and inverter have a unique letter.

5. All inverters may be turned ON and OFF using the main power switch. If a remote was included and you plan on using it, the inverter's Main Power Switch must be ON for the remote to operate. You may always leave the Main ON and control the inverter using the Remote. Lock symbol will turn inverter OFF, unlock will turn it ON.
6. The fan is thermally controlled and will only turn on as needed.
7. Now that you have confirmed the inverter is operating as expected, it is time to connect your equipment to the inverter. You may use the ac outlets or the ac direct connect terminal block (on larger models only).
8. You are now ready to enjoy the use of your new inverter and may turn it on .

10

3 Using the Inverter

The inverter is capable of continuously powering most 120V AC products that use the rated continuous output power or less. Its AC output waveform, called pure sine wave . It is designed to function as the sine wave shape of utility power.

The power, or 'wattage', rating of AC products is average power they use. When many AC products are first switched on, they initially consume more power than their power rating. For loading such as motor rectifier, there is a surge current when starting. Please note the starting current can't exceed the maximum rated current. (The starting current of motor may be 7-12 times the rated current.)

It is normal that the output voltage drops when a heavy load is present . You must take action in case of below conditions.

11

- When the battery DC voltage is reduced below 10.5Volts.
Solution:
 - increase the battery capacity .
 - reduce the load on inverter.
- When output AC voltage drops below acceptable levels(106Vac).
Solution:
 - Increase the inverter capacity,
 - Reduce the load.

Although the inverter can supply momentary surge power , occasionally some products rated less than the rated continuous output power may exceed its surge capabilities and trigger its safety overload shut down feature. If this problem occurs when attempting to operate several AC products at the same time, try first switching on the inverter with all AC products switched off. Then one by one switch each on, starting with the high surge product first.

12

Indicators and Controls (see Figure 1)

- The AC outlets are provided on one end of the inverter. Any combination of 120V AC products with a total continuous power consumption of the continuous power or less may be plugged in.
- The ON/OFF switch enables output AC power at the AC outlets when switched ON. The green POWER light indicated AC power is present at the AC outlets and the inverter is operating normally.
- The red FAULT light indicates inverter shutdown caused by low or high voltage, overload or excessive temperature.

Inverter Operation

1. When properly connected to a 12V DC outlet or battery, turning the ON/OFF switch ON, will illuminate the green POWER light, and deliver AC power to the Outlets.
2. Plug the AC product(s) you wish to operate into the AC outlet(s) and switch them on, one at a time.

13

- As the battery charge is used up, battery voltage begins to fall. When the inverter senses that the voltage at its DC input has dropped to 10~10.5V, an audible alarm sounds. This allows time for computers or other sensitive devices to be shut down.
- If the audible alarm is ignored the inverter will automatically shut down when the battery voltage drops to 9.8~10.2V. This prevents battery damage from excessive discharge. After auto shut down, the red FAULT light illuminates.



IMPORTANT: Vehicle batteries are designed to provide brief periods of very high current needed for engine starting. They are not intended for constant deep discharge. Regularly operating the inverter from a vehicle battery until the low voltage alarm sounds will shorten the life of the battery. Consider connecting the inverter to a separate deep discharge type battery if you will be frequently running electrical products for extended period of time.

- If an AC product rated higher than the rated continuous power (or which draws excessive surge power) is connected, the inverter will shut down. The red FAULT light will turn on.

14

- If the inverter exceeds a safe operating temperature, due to insufficient ventilation or a high temperature environment, it will automatically shut down. The red FAULT light will turn on and the audio warning will sound.
- Should a defective battery charging system causes the battery voltage to rise to dangerously high levels, the inverter automatically shuts down.



CAUTION! Although the inverter incorporates protection against over-voltage, it may still be damaged if the input voltage exceeds 16.2 Volt DC.

- The cooling fan is designed to operate only when the temperature is higher than 104°F (40°C).
- In the event of an overload, low battery voltage or overheating, the inverter will automatically shut down (See Section 4 Troubleshooting).
- The inverter will need to be manually reset when shut down by overload or high voltage.

15

Battery Operating Time

Operating time will vary depending on the charge level of the battery, its capacity and the power lever drawn by the particular AC load.

When using a vehicle as a power source, it is strongly recommended to start the vehicle every hour or two to charge the battery before its capacity drops too low. The inverter can operate while the engine is running, but the normal voltage drop that occurs during starting may trigger the inverter's low voltage shutdown feature.

Because the inverter draws less than the no load current draw with the ON/OFF switch in ON position and with no AC products connected, it has minimal impact on battery operating times.

16

Interference with Electronic Equipment

Generally, most AC products operate with the inverter just as they would with household AC power. Below is information concerning two possible exceptions.

Buzzing Sound in Audio Systems and Radios - some inexpensive stereo systems, boom boxes, and AM-FM radios have inadequate internal power supply filtering and "buzz" slightly when powered by the inverter. Generally, the only solution is audio product with a higher quality filter.

Television Interference - The inverter is shielded to minimize its interference with TV signals. However, with weak TV signals interference may be visible in the form of lines scrolling across the screen. The following should minimize or eliminate the problem:

- Use an extension cord to increase the distance between the inverter and the TV, antenna and cables.
- Adjust the orientation of the inverter, television, antenna and cables. Maximize TV signal strength by using a better antenna and use shielded antenna cable where possible.
- Try a different TV. Different models of televisions vary considerably in their susceptibility to interference.

17

4 Troubleshooting

PROBLEM: AC product will not operate, no inverter lights are ON.

Possible Cause

- Battery is defective.
- Inverter has been connected with reverse DC input polarity.
- Loose cable connections

Suggested Remedy

- Check battery and replace if required.
- Check connection to battery. Probable inverter damage has occurred. Have unit repaired (not covered by warranty).
- Check cables and connections. Tighten as required.

PROBLEM: Inverter will run some small loads, but not larger ones.

Possible Cause

- Voltage drop across DC cables.

Suggested Remedy

- Shorten cables or use heavier cables.

18

PROBLEM: Measured inverter output is too low.

PROBLEM: Alarm is sounding.

Suggested Remedy

Standard "average-reading" AC voltmeter used to measure output voltage, resulting in an apparent reading 5 to 15 volts too low.

Inverter's 'pure sine wave' Output Requires 'true RMS' voltmeter, such as Fluke 87 series multimeter, for accurate measurement.

Battery voltage is too low.

Recharge battery.

Possible Cause

- Low voltage shutdown or thermal shutdown has occurred.

Suggested Remedy

Shorten cables or use heavier cables. Recharge battery. Allow unit to cool. Improve air circulation around unit. Locate unit to a cooler environment. Reduce load if continuous operation is required.

19

PROBLEM: Battery run time is less than expected.

Possible Cause

- AC product power consumption is higher than rated.
- Battery is old or defective.
- Battery is not being properly charged.
- Power dissipation in DC cables.

Suggested Remedy

- Use a larger battery to make up for increased power requirement.
- Replace battery.
- Many simple chargers are unable to charge a battery fully. Replace charger with better model such as a TRUECHARGE smart charger.
- Use shorter/heavier DC cables.

20

PROBLEM: AC product will not operate, red FAULT light ON.

Possible Cause

- AC product(s) connected are rated at more than the rated continuous output power; overload shutdown has occurred.
- AC Product is rated less than the rated continuous output power; high starting surge has caused overload shutdown.
- Battery is discharged (alarm is sounding).
- Inverter has overheated due to poor ventilation and has caused over temperature shutdown.
- Input voltage is greater than 17.0V

Suggested Remedy

- Use product with a power rating less than the rated continuous output power.
- Product exceeds inverter's surge capability. Use a product with starting surge power within the inverter's capability.
- Recharge battery.
- Switch inverter OFF and allow to cool for 15 minutes. Clear blocked fan or remove objects covering unit. Locate unit to a cooler environment. Reduce load if continuous operation is required, restart.
- Verify charging system is properly regulated and battery is 12V DC nominal.

21

5. Specifications

DC input voltage range	10~16.2VDC
AC output voltage (nominal)	120VAC
AC output frequency	60±0.5HZ
Output	USA outlets & USB port
AC output waveform	pure sine wave
Ambient operating temperature range	32 °F-104 °F 0°C --40°C
Low battery alarm trigger range (nominal)	10~10.4VDC
Low battery shut down range (nominal)	9.7~10VDC
High battery shut down range (nominal)	17V DC

22

Aims Part No	CP	SP	efficiency	THD	NL	Dimension (LxWxH)	Weight	Cable
PWR118012S	180W	360W	>90%	<3%	<0.18A	5.9*3.2*1.5inches	0.85lbs	
PWR130012S	300W	600W	>90%	<3%	<0.3A	6.7*5.9*2.1inches	2.53lbs	10AWG
PWR160012S	600W	1200W	>90%	<3%	<0.6A	11.4*5.9*2.8inches	5.28lbs	8AWG
PWR1100012S	1000W	2000W	>85%	<3%	<0.8A	13.4*5.9*2.8inches	7.70lbs	4AWG
PWR1150012S	1500W	3000W	>85%	<3%	<1.0A	14.9*5.9*3.5inches	9.35lbs	4AWG
PWR1200012S	2000W	4000W	>85%	<3%	<1.8A	17.4*8.3*4.1inches	17.6lbs	1AWG
PWR1300012S	3000W	6000W	>85%	<3%	<2.5A	21.5*8.3*5.0inches	26.5lbs	4AWG(2 sets)
PWR1500012S	5000W	10000W	>80%	<3%	<2.1A	24.0*8.3*6.3inches	41.9lbs	1/0(2 sets)

CP=Continuous Power
SP=Surge Power
THD=Total Harmonic Distortion
NL=No load Current Draw
Specifications subject to change without notice.

23