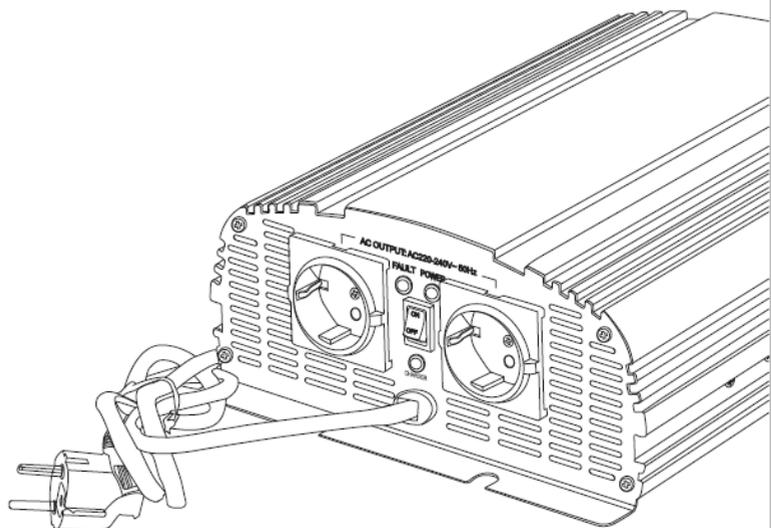


VOLTIMA VSC SERIES

PURE SINE WAVE
INVERTER WITH CHARGER



1. INTRODUCTION

Thank you choosing our VSC series Pure sine wave inverter with charger. It is a perfect combination with a pure sine wave inverter, bypass transfer part and 3 stage battery charger. When the public power failure, it converts the battery's DC to AC to support the electrical appliances' work. When the public power on, it auto. switches to use main AC power and then auto 3 stage charging (constant current, constant voltage, floating charge) for your battery, the transfer time is less than 15 ms no any influence to your AC appliances.

2. FEATURES

- Fully auto. protection functions: earth leakage protection, reverse polarity, overload, over voltage, over temperature, low voltage, short circuit.
- Transfer time between bypass and inverter mode is less than 15ms, no any influence in your appliance's working when public power off.
- Three LED indicators: Power, Fault, Charger
- Pure sine wave output: THD<3%
- AVS protection function: low voltage, over voltage, time delay

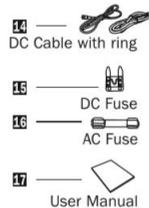
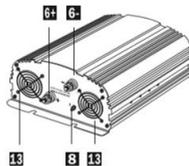
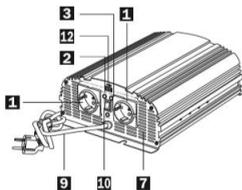
3. OPERATION ENVIRONMENT

For best operating performance, the VSC should be placed on flat surface, such as ground or other solid surface, install the VSC in a location that is:

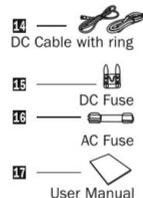
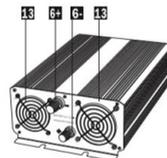
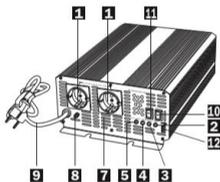
- DRY. Do not allow water and/ or other liquids to come into contact with the VSC. In all marine applications, do not install the VSC below or near the waterline and keep the VSC away from moisture or water.
- COOL. Ambient air temperature should be between -1 °C non-condensing, and 40 °C. Do not place the VSC on or near a heating vent or any pieces of equipment which is generating heat above room temperature. Keep the VSC away from direct sunlight, if at all possible.
- VENTILATED. Keep the area surrounding the VSC clear to ensure free air circulation around the unit, do not place items on or over the VSC during operation. A fan is helpful if the VSC is operating at maximum power outputs for extended periods of time. The units will shut down if the internal temperature exceeds operating temperature and restart after it cools.
- SAFE. Do not use the VSC near flammable materials or in any locations that may accumulate flammable fumes of gasses.

4. PRODUCT MATERIALS LIST AND INDICATION

4.1. VSC600 - VSC1000



4.2. VSC1500-VSC2000



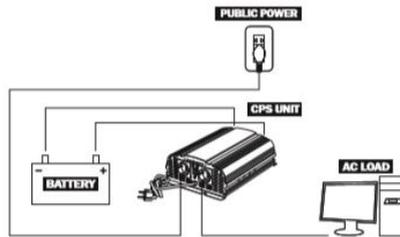
Indication:

- | | | |
|---|----------------------------|------------------------|
| 1. AC Outlet | 7. Ventilation Hole | 13. Cooling Fan |
| 2. Fault LED | 8. Grounding Terminal | 14. DC Cable with Ring |
| 3. Power LED | 9. AC Power Cord | 15. DC Fuse |
| 4. Charger LED Switch | 10. ON/OFF Switch | 16. AC Fuse |
| 5. Fully Charged | 11. Charger Switch | 17. User Manual |
| 6. DC Input Terminal (Red-Positive)
DC Input Terminal (Black-Negative) | 12. USB 5V 2.1A (optional) | |

5. AVS PROTECTION FUNCTION

- Lower voltage protection: when the public power is lower than 70V/170VAC, the VSC shall be shut down to protect it. Once voltage increases to normal range, The VSC restarts automatically.
- High voltage protection: When the public power is too high, the VSC shut down and auto. restart once the voltage is down to the normal range.
- Time delay: The restart after protection delay 17 seconds, the time delay function avoids the unit's damage even AC grid power failure frequently.

5. INSTALLATION



NOTE:

- You can use one or more batteries. Be best to use 100 Ah or larger battery for long back-up time.
- If grid power available, AC bypass the inverter & power-for the electrical appliances ("Inverter" mode ON by switch ON the **4**). Also charge the battery / batteries.
- If grid power failure, it converts the battery DC power to AC power-for the electrical appliances. (must switch on the "inverter" mode **4**).

6.1. There are cables inside of packaging, use the cable connect the unit directly to the battery.

The input terminals on the rear side of the unit are Red-Positive **6+** and Black-Negative **6-**. Connect the red cable to the red terminal and to the positive pole of the battery. Connect the black cable to the black terminal and to the negative pole of the battery. Make sure all connections are solid and secured. Poor connections may cause overheat the cable and also shorten the battery backup time. (Ensure that the inverter and charger mode are all OFF before connect to battery).

WARNING!

- The reverse polarity will burn the fuse or may cause the damage of the VSC. So please pay more attention to it. The damage caused by wrong connection is not cover by our warranty.
- The VSC must be connected only to batteries with a normal output voltage of 12 volts. The power source can be a 12V battery or several 12V batteries connected in parallel / in series to increase the backup time. The unit will not operate from a 6 volt battery, and will sustain permanent damage if connected to a 24 volt battery.
- Keep ventilation when using batteries. Batteries may generate flammable gas during charging or discharging.
- Sparking may occur when connect the unit to the battery, make sure no flammable fumes present before making any connections.
- Please use the DC cables **12** which inside the packing to ensure best performance.

6.2. Connect the grounding terminal 7 to earth. If you can, please do it to ensure safety.

WARNING!

Before use the VSC, please provide a grounding cable. There is a terminal fitted with a nut in the VSC's output panel. Please choose heavy duty, green insulated cable and driven into the ground at a depth of 1-2m or more.

6.3. Plug into the public power, the charger part effect, and charger LED on. It can charge for your battery.

6.4. Plug your AC appliance into the VSC's outlet.

Make sure your appliance is turned off before connecting to the unit. Please turn your appliance on one by one. Now your appliance are functioning. If overload, the red LED 8 and the inverter shut down. To reset, reduce the load and if your appliance required power within VSC's rated power inverter shall restart automatically.

WARNING!

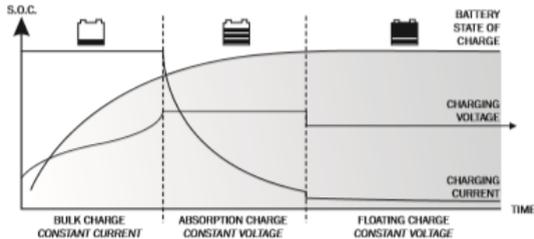
We advise that do not use the appliance whose power is more than 90% of the VSC's rated power. Although there is an overload protection in VSC, it may damage the unit.

7. PROTECTION FUNCTION

It is designed with a universal protection circuit that provide added safety features not only for your AC appliances, batteries but also for itself.

Bypass and Inverter Mode Protection	Earth Fault Protection	The VSC will shut down when the load has electric leakage
	Low Voltage Alarm	Alarm will activate when battery discharge to 10.6 V
	Low Voltage Protection	The VSC will shut down when battery discharge to 10 V (prevent damage to battery)
	Over Voltage Protection	The VSC will shut down when battery voltage is up to 15.5 V
	Over Temperature Protection	The VSC will shut down when overheat.
	Overload Protection	The VSC will shut down when the loading power exceeds its rating power
	Short Circuit Protection	The VSC shut down when output short circuit happened
Soft Start Circuit	Reverse Polarity Protection	By fuse open.
	Gradual voltage ramp-up during inverter start-up	This eliminates failed cold start under load.
	Output that momentarily dips in voltage and quickly recovers.	This eliminates most shutdown from momentary overload.
	Automatically Restart	The inverter part automatically re-start when overload remove.
Charger Mode Protection	Auto 3 stage battery charging	Stage 1. Constant Current- Rapid charge for the battery with constant high current. Fit for heavy-loaded condition.
		Stage 2. Constant Voltage-Moderate charge for the battery with constant voltage, this allows the battery to well absorb the charge and maximum battery's life.
		Stage 3. Floating Charge-After the battery charged to around 99% full. The charger automatically switches to "floating mode" that keeping the battery in well condition.

IV Auto 3 stage charge



8. OPERATING TIPS

8.1. Rated Versus Actual Current Draw of Equipment

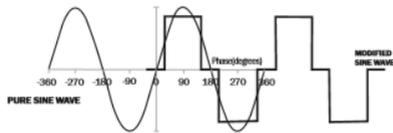
Most electrical tools, appliances and audio/video equipments have labels that indicate the power consumption in amps or watts. Be sure that the power consumption of the item you wish to operate is rated within VSC wattage or less. (if the power consumption is rated in amps AC, simply multiply by the AC volts to determine the wattage). The VSC (inverter mode) will shut down if it is overloaded. The overload must be removed before the VSC restarts. Resistive loads are the easiest for the VSC to run. However, larger resistive loads, such as electric stoves or heaters, usually require more wattage than the inverter can deliver. Inductive loads, such as TV's and stereos, require more current to operate than do resistive loads of the same wattage rating. Induction motors, as well as some televisions, may require 2 to 6 times their wattage rating to start up. The most demanding in the category are those that start under load, such as compressors and pumps. Testing is the only definitive way to determine whether a specific load it can run. To restart the unit after shutdown due to overloading, remove the overload if necessary, turn the power switch OFF then ON.

8.2. Power Tools and Microwave Ovens Won't Start

Read the information panel on each power tool carefully to accurately determine the tool's input wattage. The output wattage is sufficient to operate most power tools and microwave ovens but remember that the power needed to start the power tool may be as much as 2 to 6 times of its continuous wattage required.

8.3. The AC output waveform of the VSC (inverter mode) is known as the "pure sine wave".

Figure 1: Modified Sine Wave and Pure Sine Wave Comparison



8.4. Battery's Back up time depends on the appliances which you will be used.

The batteries must provide between 10.5 and 15.5 volts DC and must be able to supply the necessary current to operate the load. The power source should be a well condition deep-cycle Lead-acid battery. To obtain a rough estimate of the current (in amperes) the power source must deliver, simply divide the power consumption of the load (in watts AC) by 10. Example: if a load is rated at 100 watts AC, the power source must be able to deliver: $100/10=10A$ on larger applications the power source may be several batteries connected in parallel. It is important to make sure the cables have enough size. This manual does not describe all of the possible types of battery configurations, battery charging configurations and battery isolation configurations.

8.5. Battery Charger

We recommend you use deep cycle batteries. If you hear the alarm of low voltage protection, please stopping to use it, when it is fully charged, you can use it again. Please plug into the public power to charge for the battery. The battery operation time depends on the battery capacity (Ah) and the loading power (Watt) The method to calculate the operation time is: Battery capacity (Ah) x input voltage(V)/ loading power(W)

Example:

Battery capacity=	150Ah
Input voltage=	12V
Loading power=	600W
(150Ah x 12V)/600W=	3H

9. TROUBLESHOOTING

9.1. When public power failure and Inverter switch ON, the problem happened in the inverter mode.

TROUBLE		POSSIBLE CAUSE	SUGGESTED REMEDY
No AC output	Red LED lit, green LED not lit or beep sound alarm	Battery over discharged, low battery protection.	Change the battery or charging for it
		Over temperature protection	Remove or reduce load or wait for VSC to cool
		Overload protection	Remove or reduce load or use more big power VSC
		Short circuit protection	Reduce load or remove short circuit
No AC output	Red and green LED not lit	Fuse burned	Change fuse or contact technician for support
		PCB Broken	Contact Seller for repair or change
		Battery's defective or poor connection	Change battery or re-connect the battery
		Earth fault protection	Unplug the fault load
Battery run time is less than expected		Strong collision causes the circuit lossen	Contact seller for repair or change
		AC loads power consumptions	Use a larger battery or connect more batteries in parallel to increase the backup time
		Battery is old or defective	Replace the battery
		Battery over discharge	Charge for the battery
		Power dissipation caused by the too long or thin cable	Use more shorter /heavier DC cables

9.2. When public power on, the problem happened in bypass and charger mode.

TROUBLE	POSSIBLE CAUSE	SUGGESTED REMEDY
When the public power is available, inverter mode can't be switch to charge mode	Poor AC wire connection	Tighten connection or re-connect the AC power
	Built in fuse burned	Change fuse or contact technician for support
VSC beeps long time but still on working	Battery will be fully charged soon	It will be auto. stop the charge or you switch off charger mode
	AC input voltage under 170V/70V	Stop to use it or switch off the charger mode or adjust AC voltage
	Using time too long, high temperature	Switch off 10 minutes to cool down

9.3. Other problems.

TROUBLE	POSSIBLE CAUSE	SUGGESTED REMEDY
Cooling fan not working	It will be working when in charge mode, fully charged it will auto stop	It is normal
Cooling fan not working	When AC main power failure, it should work in inverter mode, but it is not working	Contact seller for repair or replace
VSC output shows low voltage	Reading voltmeters and can't get accurate data	Use a true RMS reading voltmeters

10. CLEANING, CARE AND MAINTENANCE

Always disconnect the power inverter from the 12V power source and the external appliances from the socket before starting any cleaning or maintenance. Keep all air inlets and vents free of dirt and dust. Clean the power inverter with a moistened cloth. Do not use abrasive utensils for cleaning. Store the power inverter in a dry place, well ventilated and in a temperature range between 0°C and 40°C. Do not store in direct sunlight, near heater, radiators or under moist and wet environment conditions.

11. DISPOSAL



Old electrical appliances are recyclable. Do not dispose them in the domestic waste! Separately deliver these in a valuable material collection point. Dispose the packing material environmentally friendly. Please give cardboard and paper to the waste paper, foils to a valuable material collection point.

12. SPECIFICATION

Output	Model	VSC600	VSC1000	VSC1500	VSC2000
	Rated power	600W	1000W	1500W	2000W
	Surge power	1200W	2000W	3000W	4000W
	AC Output	220±10% 50Hz			
	Wave form	Pure Sine Wave			
Input	DC input	12V(10-15V)			
	AC input range	170-250V(220V)			
Charger	Max. Current	12V 24V	10A 5A	15A 7A	
	Charge way	Constant Current, Constant Voltage, Floating Charge (Auto.3 Stage)			
	Transfer time	<15ms		<25ms	
Protection Function	Overload	6300-700W	1100-1200W	1600-1700W	2100-2200W
	Over temperature	>60°C auto. shutdown			
	Other	earth leakage, polarity reverse, over voltage, low voltage, overload, overheat, short circuit			
	AVS protection	low voltage, over voltage, time delay			

WARRANTY CARD

13. Warranty and service agreements

This warranty covers only manufacturing defects. The appliance must not be modified or altered in any way with regards to both form and function. This warranty does not apply in case of improper usage that falls beyond normal use as indicated in the user's manual or if there is damage caused by force majeure (e.g. natural disaster). Only clean and intact appliances will be accepted for warranty and non-warranty repair. The standard warranty period is 24 months starting from the purchase date. In order to make a warranty claim, this warranty card must be submitted along with proof of purchase, including the model number, purchase date and a dealer's stamp.

Model number:

Purchase date:

Dealer's stamp and signature:

Date of warranty claim:

Defect(s) noted:

14. ICON INDICATION



Standards Organization of Nigeria
Conformity Assessment Programme

RoHS

The Restriction of the use of certain
hazardous substances in electrical and
electronic equipment



Conform to European
standards



Layer
Limited



Read the instruction before using your product.



For indoor
use only



Handle
with Care