Kärtel
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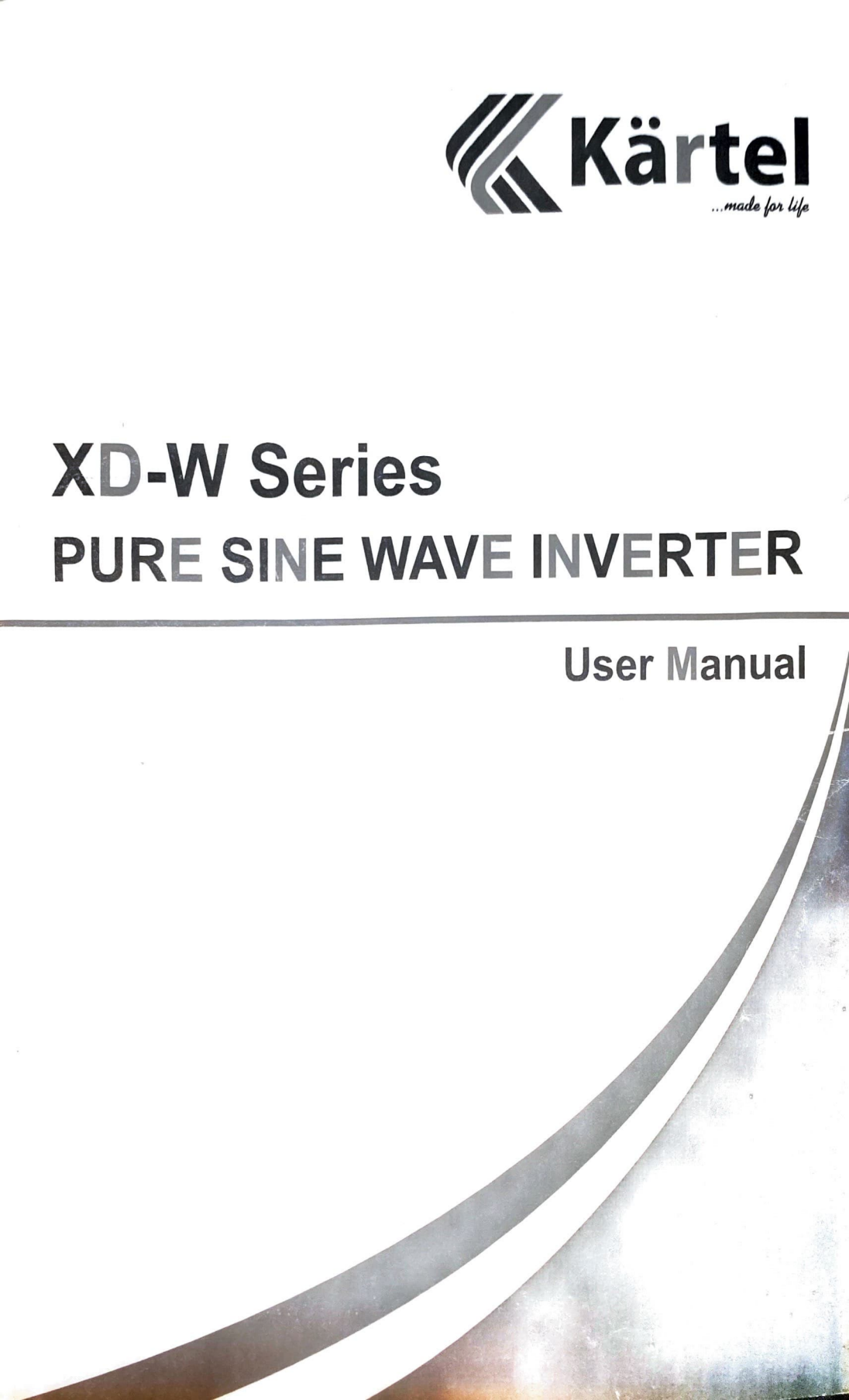
XD-W Series

PURE SINE WAVE INVERTER

User Manual



Content

Warning

This is A class inverter. It might cause slightly radio interference in daily life. And practical measure is required to take under this condition.

Preface

Thank you for the purchase of sine wave inverter. Please read this manual carefully before installing and using the inverter!

Copyright

We have been devoted to technological innovation and aims to meet the demands of its customers with better product and services. And product design and specification would be updated without prior notice. Please in kind prevail!

1.Installation Instructions

1-1: Open-package inspection

After opening the package, please check random accessories, including user manual (contains conformity certificate and warranty card), 2pcs battery cables and accessories for optional functions. And check whether the inverter is still kept well after transportation, if find any broken or component missing, do not turn on the machine, feedback to the carrier and distributor.

Note:

- Please keep the packing box and packing material, can be used for next delivery if needed.
- This series of product is very heavy (check appendix as reference), please handle with care when carrying.

1-2: Installation notice

1) Install in an area of well ventilated, free of water, burning gas and corrodent.

2) Not good to put on the side, better keep good air ventilation from front panel's bottom air intake, or air outlet from back panel's fan, and side face of machine.

3) Around environment temperature should remain 0 to 40 centigrade.

4) If disassembling and operate under low temperature environment, may happen water condense, only can work till thorough dry of machine inside and outside, otherwise will be shock risk.

5) If the machine is placed for a long time, it should be confirmed that the machine is completely dry and no corrosion can be installed and used;

1-3: Installation steps

1) Environmental requirements

Open the package and place the inverter in a reasonable working environment. Refer to the "Installation Precautions" for specific requirements.

2) Wire diameter selection

Use a cable with a suitable wire diameter, which can not be lower than the national safety standard. The general wire diameter is selected according to the current density of not more than 5A/mm², and the length of the connecting wire is minimized to reduce the loss.

3) Connect the battery

Determine the appropriate number of battery cells according to the rated battery voltage of the inverter. Connect the battery cable to a circuit breaker that meets the breaking capacity, and then connect it to the BATTERY terminal of the inverter. Note that the positive and negative poles cannot be reversed. Otherwise, the product may be damaged.

4) Connecting the load

Turn off all loads firstly, then connect the AC load to the AC output of the inverter (AC OUTPUT), confirming that the load polarity is not reversed, and ensure the load is lower than the standard power of the inverter.

5) Connect to mains

Disconnect the grid voltage first, connect the mains input cable to a circuit breaker that meets the breaking capacity, and then connect it to the AC input terminal of the inverter. Note that the phase and polarity are not reversed.

7) Selection of circuit breaker

a. The circuit breaker on the battery side should be a DC circuit breaker whose working voltage should be greater than the rated voltage of the battery; the circuit breaker on the AC input side should be an AC circuit breaker whose working voltage should be greater than the rated voltage of the mains.

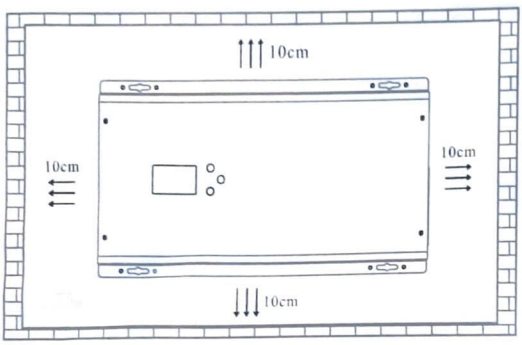
b. The rated current of the circuit breaker should be about 1.5 times of the maximum current inverter during operation . (The maximum current of the inverter during operation is marked on its nameplate)

Note:

- Before connecting the load to the machine, please turn off the loads firstly;
- To ensure the personal safety of the user and ensure the correct use of the product, please confirm that it is properly grounded before starting the machine;
- If user want to load an inductive load such as a motor or a laser printer which operating power is too large, the inverter rated capacity should be selected according to its peak power .The load starting power is generally 2 to 3 times of its rated power.

1-4: Placement

Please leave 10cm of space for each side of inverter to keep good air circulation.



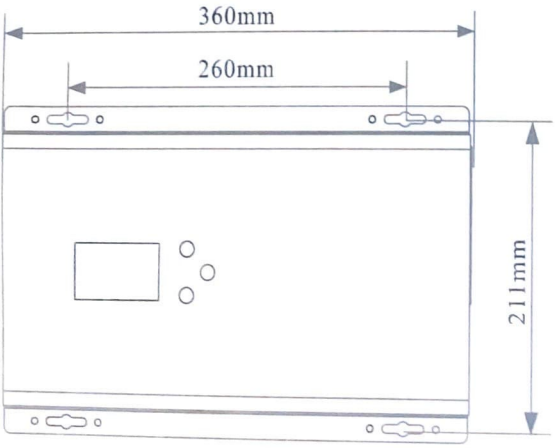
★ Avoid direct sunlight

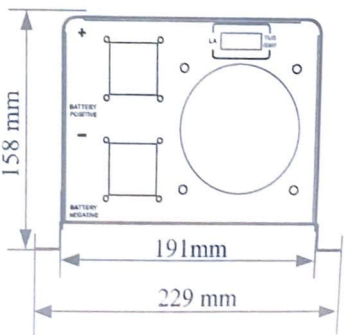
★ Avoid dust

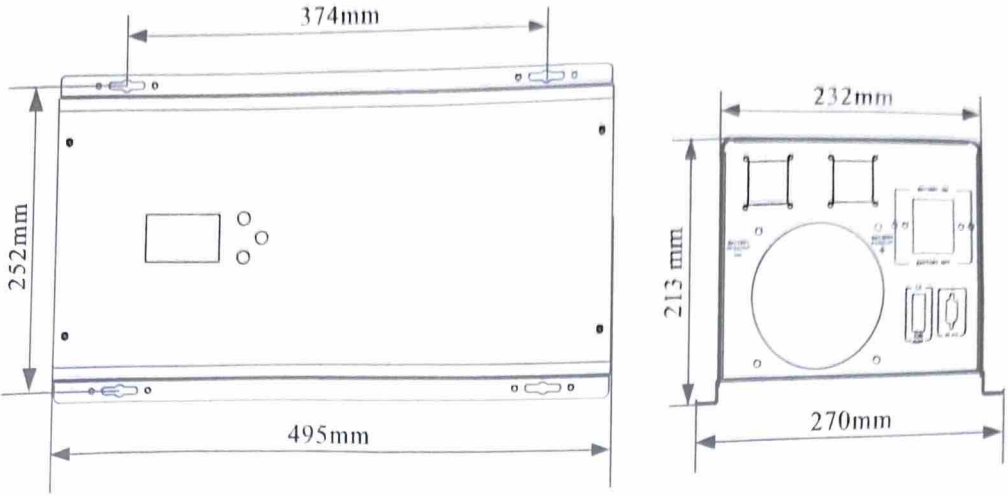
★ Avoid moisture and liquids

★ Avoid over heating

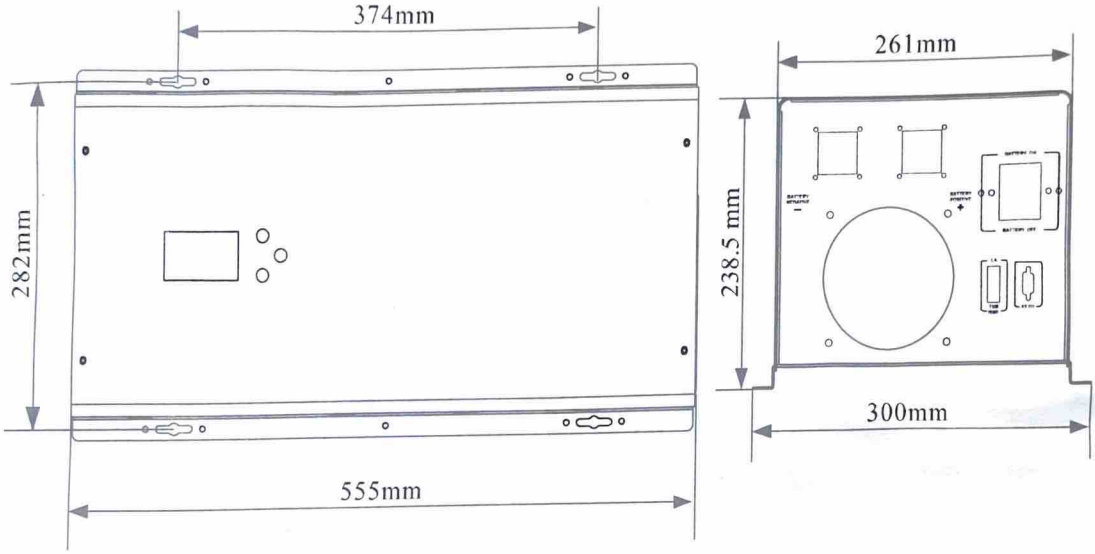
1-5: Installation Size







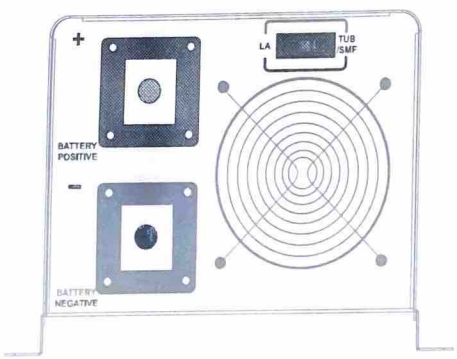
2000VA-5000VA Series

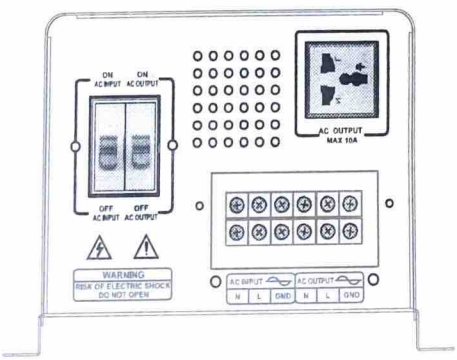


7500VA-10000VA Series

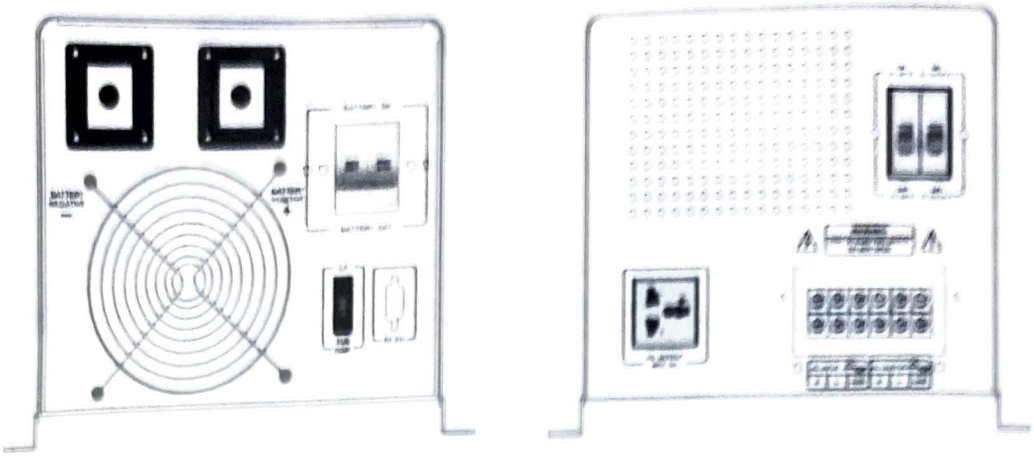
2. Outlook of Inverter

2-1. 1500VA Series

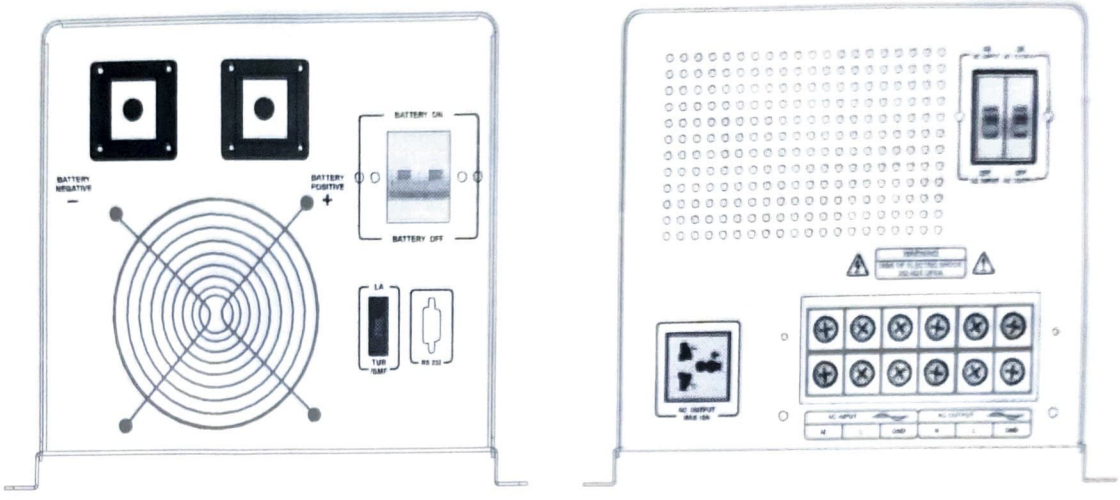


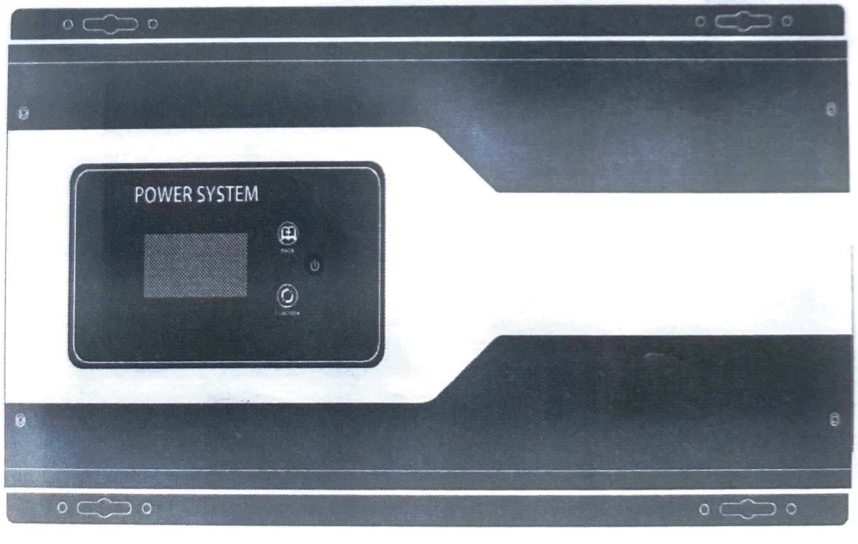


2-2. 2000VA-5000VA Series



2-3. 7500VA-10000VA Series

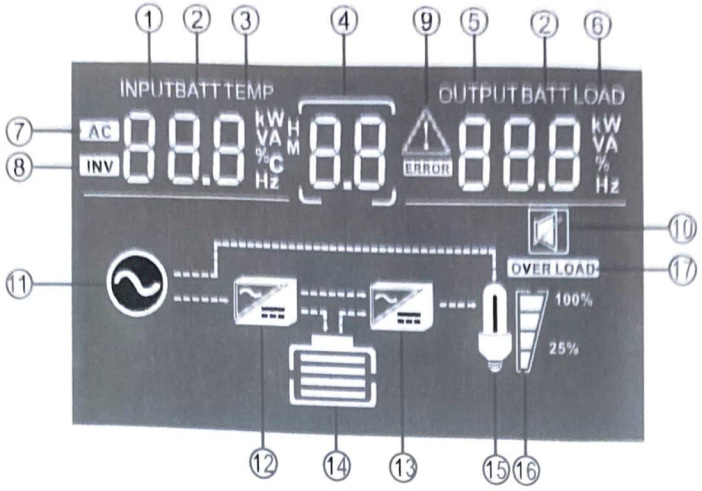




1000VA-10000VA top view

Note: Images may be slightly different from actual product. Please in kind prevail!

3. LCD screen description



Parameter display area

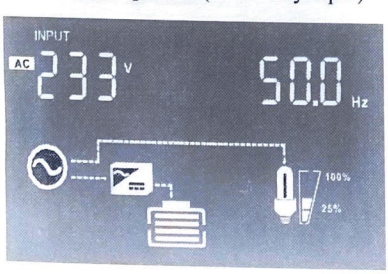
1 INPUT: Mains input data displayed	2 BATT: Battery data displayed	3 TEMP: Temperature displayed
4 AC charging current setting: (C3~C6, C6 is the maximum AC charging current, the maximum current value depends on the actual model); Remark: When emergency come, shows alarm code here.		
5 OUTPUT: AC output data displayed	6 LOAD: Load data displayed	
7 AC: AC data displayed	8 INV: AC data displayed of battery mode	

Icon display area

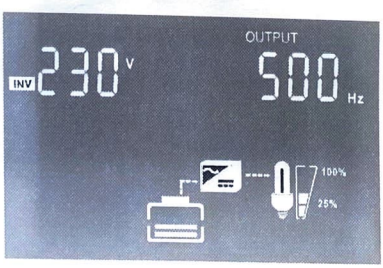
9: ERROR: Error alarm	10: Turn mute on/off	11: Utility	
12: AC charging icons	13: Battery powered icons	14: Battery	15: Load
16:Load capacity(The load is divided into 4 grids, and the single-grid load is 25% of the full load)			
17:Overload alarm			

3-1. Work flow chart icon introduction

1)Mains working mode (Has utility input)

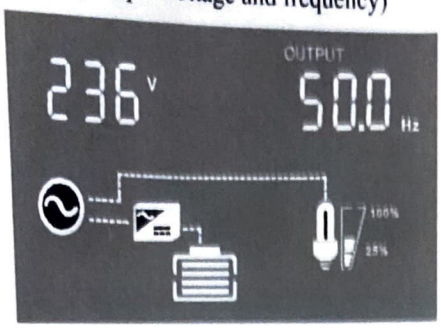


2)Battery working mode (No utility input)

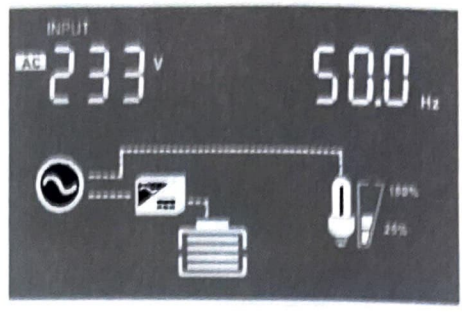


3-2. Introduction to the work interface

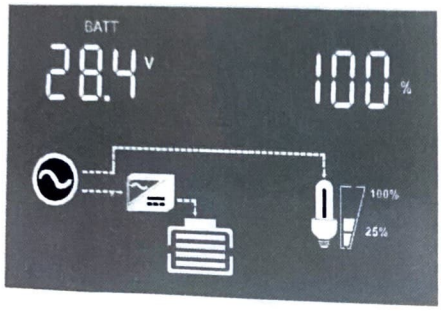
1) Output interface in mains working mode
(Display output voltage and frequency)



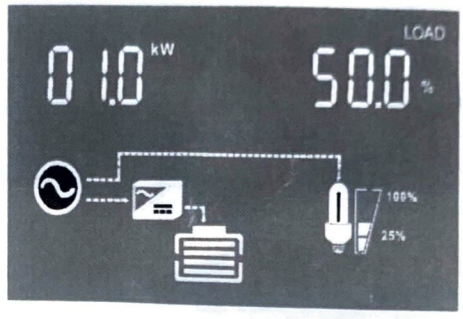
2) AC input interface in mains working mode
(Display AC input voltage and frequency)



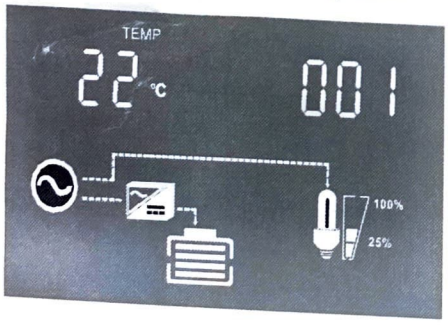
3) Battery interface in mains working mode
(Display battery voltage and percentage)



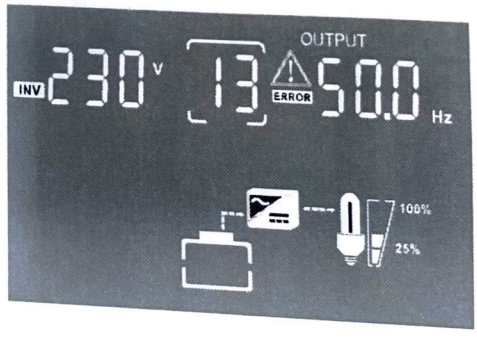
4) Loads interface in mains working mode
(Display load power and load percentage)



5) Internal temperature & Communication address interface in mains working mode



6) Alarm interface in battery working mode
(Display the fault code and icon)



Note:

1. **Model of 1500VA does not display the loads interface;**
2. **The actual display parameters are subject to the specific model, and the picture display contents are only used as examples.**

4. Operation

Function and setting of button on board

4-1 ⏻ Button

◆ When only battery connected to inverter while the AC input is not connected to inverter. this button for the inverter's boot and shutdown;

◆ No press "⏻" button, when the mains and battery input is normal, the inverter still has bypass output and charging function, When the mains lost, the inverter will be powered off;

◆ press "⏻" button, when the mains and battery input is normal, the inverter still has bypass output and charging function, When the mains lost, the inverter can be powered by battery

4-2: PAGE button

◆ Page scroll: in the main interface, short press the PAGE button for 1 second to view various parameter interfaces, such as output interface, input interface, battery interface, and etc.;

◆ Parameters setting: in the parameters setting interface, short press the PAGE button for 1 second to adjust the parameter value.

4-3: FUNCTION button

◆ Mute function: In the main interface, press the FUNCTION button for 1 second to turn on/off alarm.

◆ Function setting button: First time long press FUNCTION button for 3 seconds, the icon 4 area of the display screen flashes, At this time, you can set the AC charging current , short press PAGE button to set charging current (C3~C6, C6 is the maximum AC charging current, the maximum current value depends on the actual model); second time long press FUNCTION button for 3 seconds to save data and exit setting interface.

Note: Value of AC charging current take effect immediately after setting.

4-4 Steps of start up

1) Set the battery circuit breaker to "ON" position(1500VA model without battery circuit breaker);

2) Press "⏻" button to turn on the inverter;

3) If you need utility to be as complementary power or to charge the battery, set AC input circuit breaker switch to the "ON" position;

4) Set the AC output circuit breaker to "ON" position;

5) After 30s when the output voltage is stable, start loads in turn.

4-5 Steps of power off

1) Turn off all loads;

2) Set the AC input circuit breaker and AC output circuit breaker to "OFF" position;

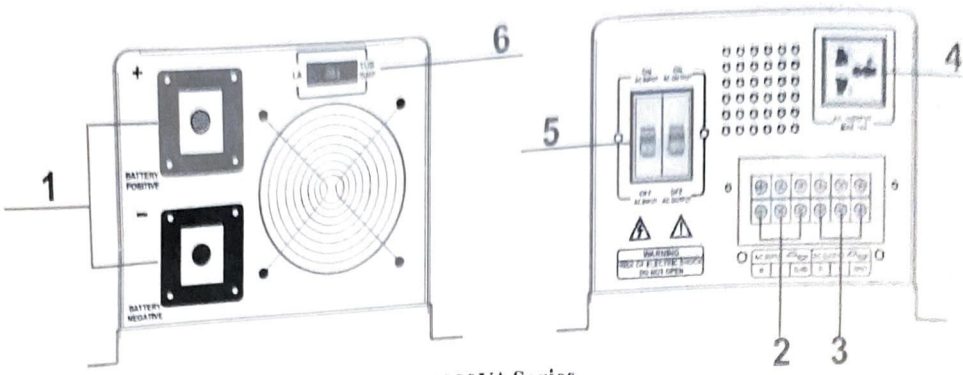
3) Press the "⏻" button on the front panel to turn off the inverter;

4) Set the battery circuit breaker to "OFF" position(1500VA model without battery circuit breaker);

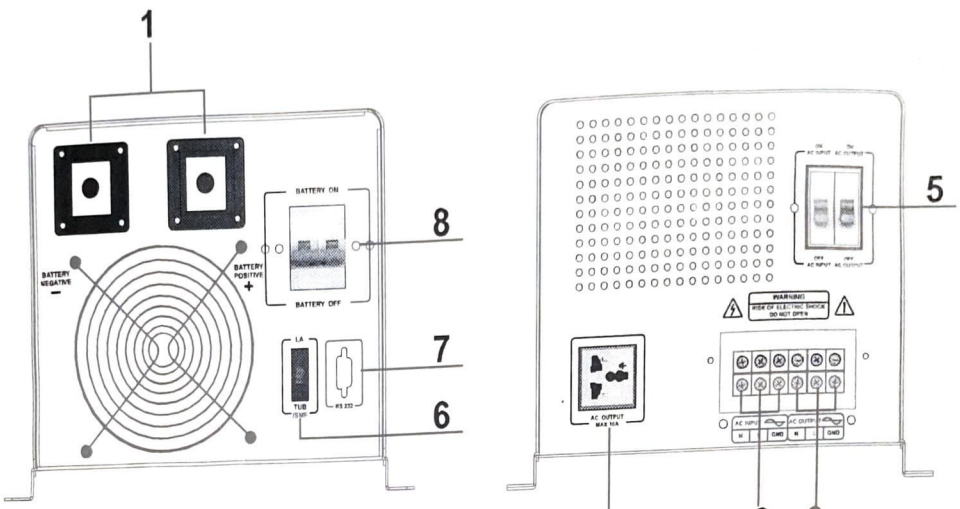
5) Make sure all switches and circuit breakers of the devices has been disconnected;

6) Make sure all indicators are off and the device is completely powered off.

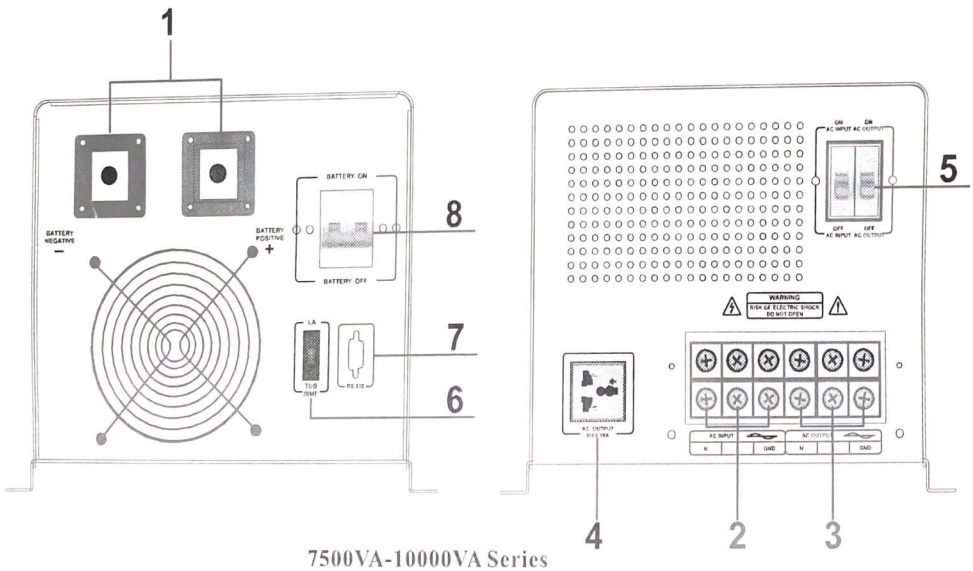
5. Back plane and wiring description



1000VA Series



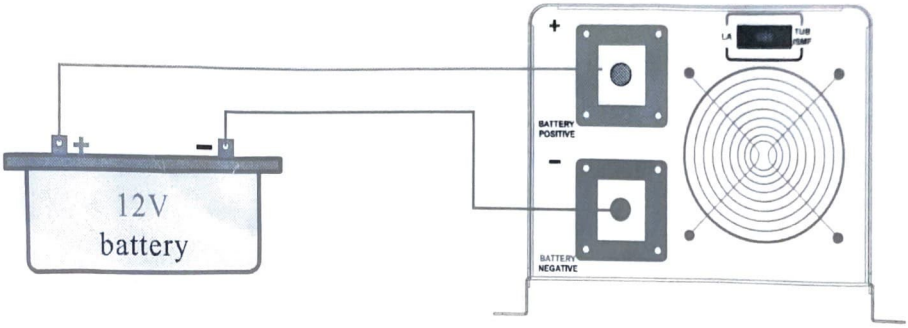
2000VA-5000VA Series



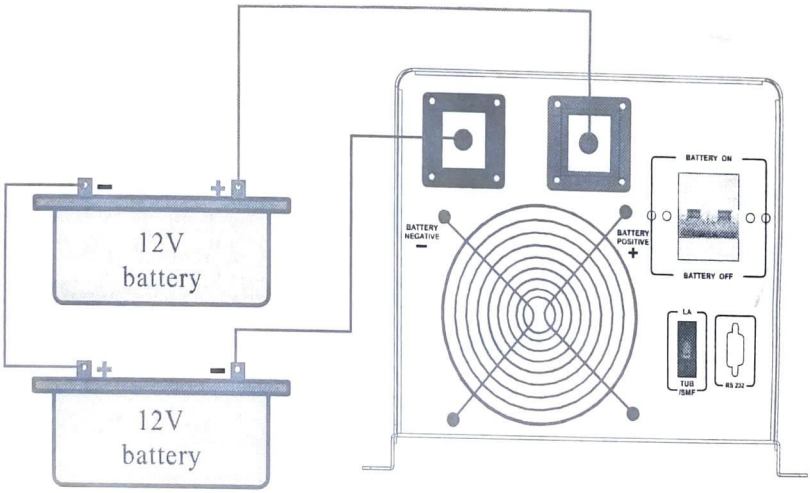
7500VA-10000VA Series

1. Battery terminal: Positive(Red), Negative(Black);
2. AC input terminal: "N" is the "Neutral Wire", "L" is the "Live Wire", " GND " is "Earth Wire";
3. AC output terminal : "N" is the "Neutral Wire", "L" is the "Live Wire", "GND" is "Earth Wire";
4. Universal AC outlet : Loads for each universal AC outlet should not exceed 1kW;
5. AC input and AC output circuit breaker;
6. Battery type selection: "LA" gear: Charging boost voltage of each battery is 14V±0.2V, "TUB/SMF" gear: Charging boost voltage of each battery is 14.5V±0.2V
7. RS232 communication port(Optional);
8. Battery circuit breaker.

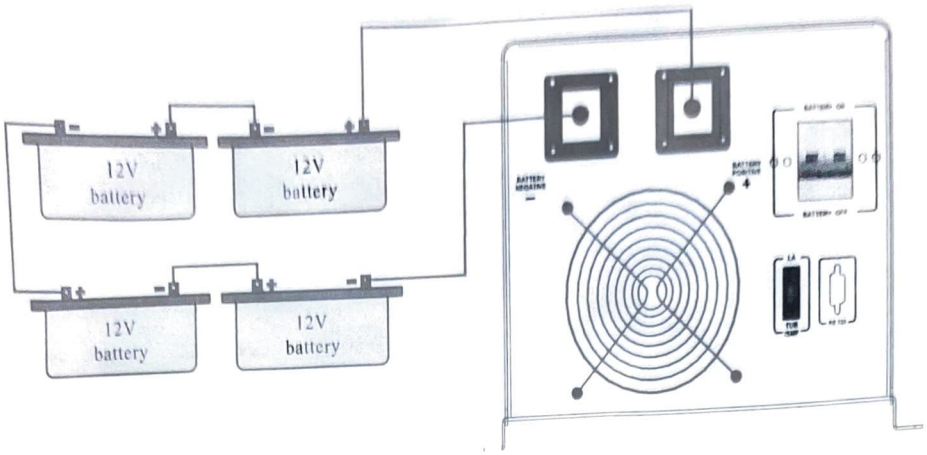
12V series battery wiring diagram



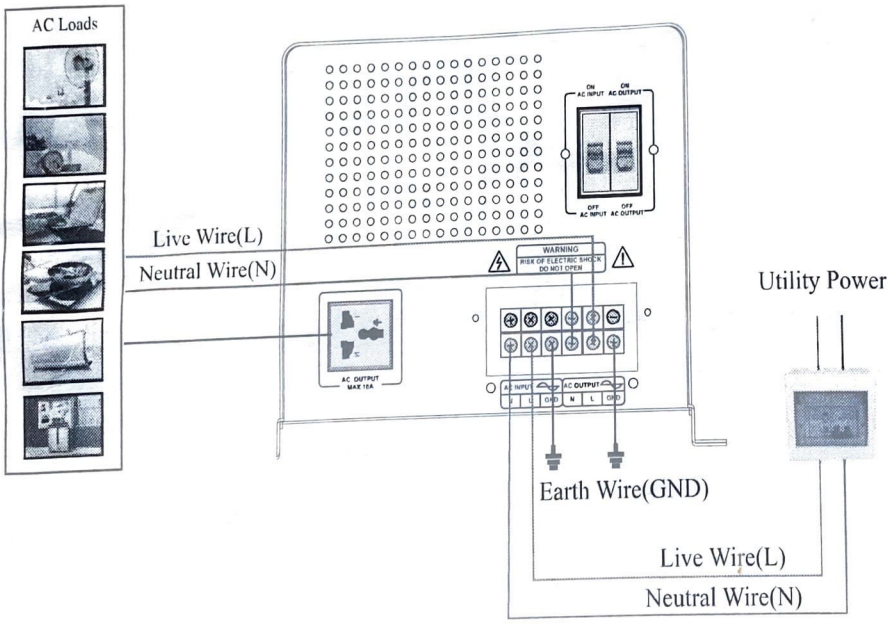
24V series battery wiring diagram



8V series battery wiring diagram



Input & Output wiring diagram



Note:

- Please avoid reverse connection while connecting batteries to the inverter.
- Loads for each universal AC outlet should not exceed 1kW.
- If a generator is used as input power, the operation is as follow: start up the generator, after it runs steadily, connect and turn on inverter. When the inverterstarts to work, connect user's equipment to the AC output.
- Capacity of generator≥3 times of the rated capacity of inverter.

6. Maintenance

1) The inverter just needs the minimum maintenance. And life of Pb(battery) can be preserved by frequent charge.
2) Batteries should be charged for every three months if the inverter is long-term unused.
3) Lifespan of battery normally lasts for three to five years. It should be replaced in advance if any battery is found in poor state. And the replacement shall be operated by the professional.
4) Batteries should be wholly replaced by the instruction of the supplier.
5) For every three months, batteries should be discharged (until the inverter shuts down) and recharged. Every charge (by standard inverter) should last at least for 12 hours.
6) Among high temperature area, batteries should be discharged and recharged forevery two months. Every charge (by standard inverter) should last at least for 12 hours.

Note:

- Please shut down the inverter and disconnect AC input before replacing batteries.
- Please do not wear metal jewelry such as ring or watch.
- Please use screwdriver with insulated handle and avoid to place tools or metal objects on batteries.
- Please avoid short circuit or reverse connection.

Warning:

1) Battery must not be put in the fire, which may cause explosion.
2) Shall not open or damage the battery. Electrolyte released will cause harm to eyes and skin and even intoxication.

7. Error and Solution

7-1: Regular error

Error	Reason	Solution
Unable to boot	Low voltage in battery or overload	Charging the battery or reduce the loads
Shut down with load	Low voltage in battery or overload	Charging the battery or reduce the loads
Alarm for boot	Low voltage in battery or overload	Charging the battery or reduce the loads
Heat of connector	Poor contact	Check and fasten the screws

7-2: Code for alarm

Code for alarm	Reason	Solution
01	Over temperature protection	Check and reduce some loads
02	Reversion of transformer	Please contact the supplier
03	Data-saving error	Please contact the supplier
04	Internal reference voltage error	Please contact the supplier
05	Output short circuit protection	Please check if user's equipment is short circuit.
06	Battery over voltage protection	Please contact the supplier
07	NTC error	Please contact the supplier
08	Communication failure of controller	Please contact the supplier
11	Overload alarm/protection	1. Overload in the mains mode, you need to reduce the loads, disconnect the mains and restart the inverter. 2. Overload in the battery mode, you need to reduce the loads and restart the inverter.
12	Contra variant error	Please contact the supplier
13	Battery low voltage alarm	AC output is going to stop, please set as AC first with charging mode, and restart the inverter
14	Battery low voltage protection	Please turn into AC first with charging mode, and restart the inverter
15	AC over voltage alarm	Please check the AC input voltage
16	Battery over voltage protection	Please contact the supplier

8. Technical specification

Model:XD-W		15212/24	20212/24	25212/24	35224	50224/48	75248	10348
Rated Capacity		1000W	1500W	2000W	2500W	3500W	5000W	7000W
		1500VA	2000VA	2500VA	3500VA	5000VA	7500VA	10KVA
Nominal Battery Voltage		12/24VDC	12/24VDC		24VDC	24/48VDC	48VDC	
Machine Size(L*W*Hmm)		400*229*158	530*270*215mm				590*300*240mm	
Package Size(L*W*Hmm)		440*278*225	585*290*285mm				645*320*310mm	
N.W(Kg)		13.5	20.5	25.5	27.5	31.5	48.5	52
G.W(Kg)		14.5	25.5	30	32.5	36.5	54.5	58.5
Input	DC Voltage	10.5-15VDC(single battery voltage)						
	AC Voltage	140VAC-275VAC						
	AC Frequency	45Hz-55Hz						
Output/ Inverter	Efficiency	≥85%						
	Voltage	230VAC±2%						
	Frequency	50Hz±1%						
	Wave Form	Pure Sine Wave						
Output/AC	Voltage	140VAC-275VAC						
	Frequency	Auto tracking						
Battery type	LA gear	Charging boost voltage of each battery is 14V±0.2V						
	FLB/SMF gear	Charging boost voltage of each battery is 14.5V±0.2V						
AC charging current		0A-(30A) is the maximum AC charging current, the maximum current value depends on the actual model)						
Transfer Time		≤4ms						
Display		LCD						
Thermal Methods		Forced Air Cooling						
Protection		Overload, over-current, short circuit, over temperature						
Communication		RS232(optional)						
Environment	Temperature	0℃~+40℃						
	Noise	≤55db						
	Humidity	<95%						

Above parameter revision change without notification

Overload protection instruction:

1. Overload in mains mode: loads ≥110%, report fault code 11, after 30 seconds, the inverter will turn off the output, and there is no mains charging, you need to reduce the loads, disconnect the mains input, and restart the inverter.

2. Overload in battery mode: loads ≥110%, report fault code 11, after 30 seconds, the inverter will shut down, loads ≥130%, report fault code 11, after 2 seconds, the inverter will shut down, you need to reduce the loads and restart inverter.