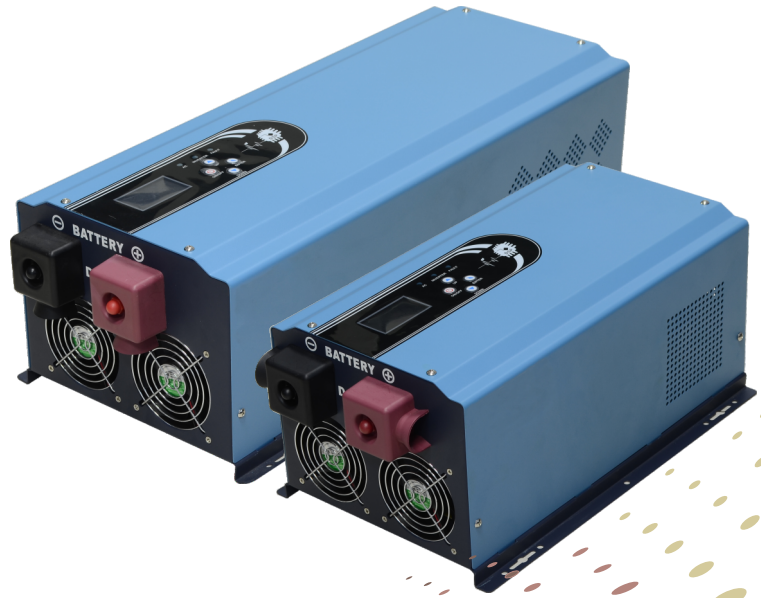
Low Frequency
Pure Sine Wave Inverter

Operational 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.

Protection	Battery lowvoltage alarm	11V (Single battery voltage)
	Battery lowvoltage protection	10.5V (Single battery voltage)
	Battery overvoltage alarm	15V (Single battery voltage)
	Battery overvoltage protection	17V (Single battery voltage)
	Battery overvoltage recovery voltage	14.5V (Single battery voltage)
	Overload power protection	Automatic protection (battery mode), circuit breaker or insurance (AC mode)
	Inverter output short circuit protection	Automatic protection (battery mode), circuit breaker or insurance (AC mode)
	Temperature protection	>90°C(Shut down output)
Alarm	A	Normal working condition, buzzer has no alarm sound
	B	Buzzer sounds 4 times per second when battery failure, voltage abnormality, overload protection
	C	When the machine is turned on for the first time, the buzzer will prompt 5 when the machine is normal
Working Mode		Battery First/AC First/Saving Energy Mode
Transfer Time		≤4ms
Display		LCD
Thermal method		Cooling fan in intelligent control
Environment	Operating temperature	-10°C~40°C
	Storage temperature	-15°C~60°C
	Noise	≤55dB
	Elevation	2000m(More than derating)
	Humidity	0%~95% (No condensation)

Above parameter revision change without notification.

8. Technical specification

Model: DMD		GI-1000VA	GI-1500VA	GI-2000VA	GI-3000VA	GI-4000VA
Rated Power		1000VA	1500VA	2000VA	3000VA	4000VA
Battery Voltage		12/24/48VDC				
Size(L*W*Hmm)		460x265x199		460x265x199		
Package Size(L*W*Hmm)		535x343x265		535x343x265		
N.W.(kg)		8.5	9.7	12.2	14	16
G.W.(kg)		10.5	11.7	14.2	16	18
Installation Method		Wall-Mounted				
Model:DMD		**GI-5000VA**	**GI-6000VA**	**GI-7000VA**	**GI-8000VA**	
Rated Power		5000VA	6000VA	7000VA	8000VA	
Battery Voltage		24/48/96VDC				
Size(L*W*Hmm)		635x279x199				
Package Size(L*W*Hmm)		715x353x265				
N.W.(kg)		24	25	26.5	28	
G.W.(kg)(Carton Packing)		26.5	27.5	29	30.5	
Installation Method		Wall-Mounted				
Input	DC Input Voltage Range	10.5-15VDC(Single battery voltage)				
	AC Input Voltage Range	73VAC~138VAC/83VAC~148VAC/145VAC~275VAC / 155VAC~285VAC /165VAC~295VAC				
	AC Input Frequency Range	45Hz~65Hz				
	Max AC charging current	0~30A(Depending on the model)				
	AC charging method	Three-stage (constant current, constant voltage, floating charge)				
Output	Efficiency(Battery Mode)	≥85%				
	Output Voltage(Battery Mode)	110VAC±2% / 120VAC±2% / 220VAC±2% / 230VAC±2% / 240VAC±2%				
	Output Frequency(Battery Mode)	50/60Hz±1%				
	Output Wave(Battery Mode)	Pure Sine Wave				
	Efficiency(AC Mode)	>99%				
	Output Voltage(AC Mode)	110VAC±10% / 120VAC±10% / 220VAC±10% / 230VAC±10% / 240VAC±10%				
	Output Frequency(AC Mode)	Tracking Automatically				
	Output waveform distortion Battery Mode)	≤3%(Linear load)				
	No load loss(Battery Mode)	≤0.8% rated power				
	No load loss(AC Mode)	≤2% rated power(charger does not work in AC mode)				
	No load loss(Energy saving Mode)	≤10W				

Preface

Thank you for the purchase of pure sine wave inverter or hybrid solar inverter (Hereinafter referred to as inverter). Please read this manual carefully before installing and using the inverter!

Copyright

1.Installation Instructions

1-1: Open-package inspection

1. After opening the package, please check random accessories, including user manual, certificate of conformity, 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

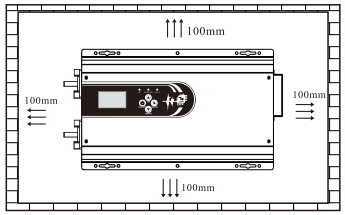
1) Environmental requirements
Open the package and place the inverter in a reasonable working environment. Refer to the "Installation Precautions" for specific requirements.
2) Wire diameter selection
Use a cable with a suitable wire diameter, which can not be lower than the national safety standard. The general wire diameter is selected according to the current density of not less than 5A/mm², and the length of the connecting wire is minimized to reduce the loss.
3) Connecting battery bank
According to the rated battery voltage of the inverter, determine the appropriate number of battery segments. Connecting the negative battery to the BATTERY (-) terminal of the inverter, while the positive battery is connected to the BATTERY (+) terminal of the inverter. Pls do not reverse.
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, and the starting current can not exceed the peak starting power of the inverter (2 to 3 times the rated power).
5) Connecting to the mains
Disconnecting the grid switch firstly, connect the mains input cable to the devices which has over current protection, and then connect it to the AC input of the inverter. Be careful not to reverse the phase and polarity.

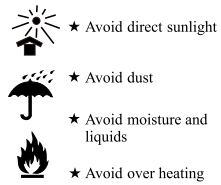
Note:

- 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.

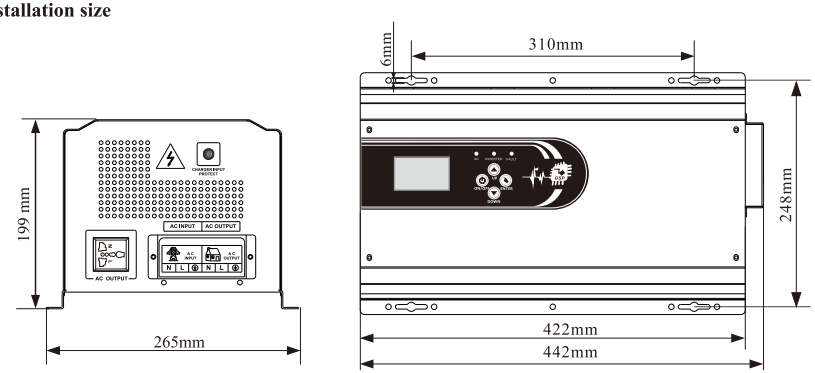
1-4: Placement

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

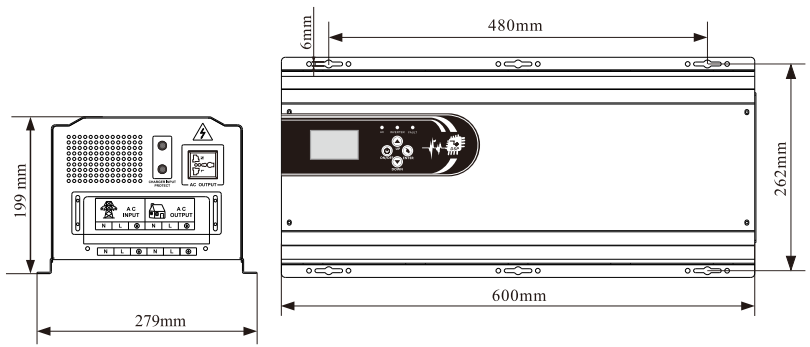




1-5: Installation size



1000VA~4000VA Series



5000VA~8000VA Series

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

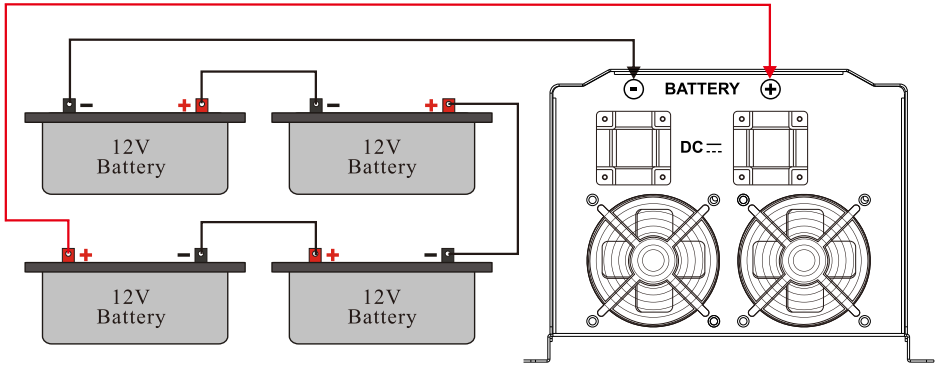
7-1: Regular error

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

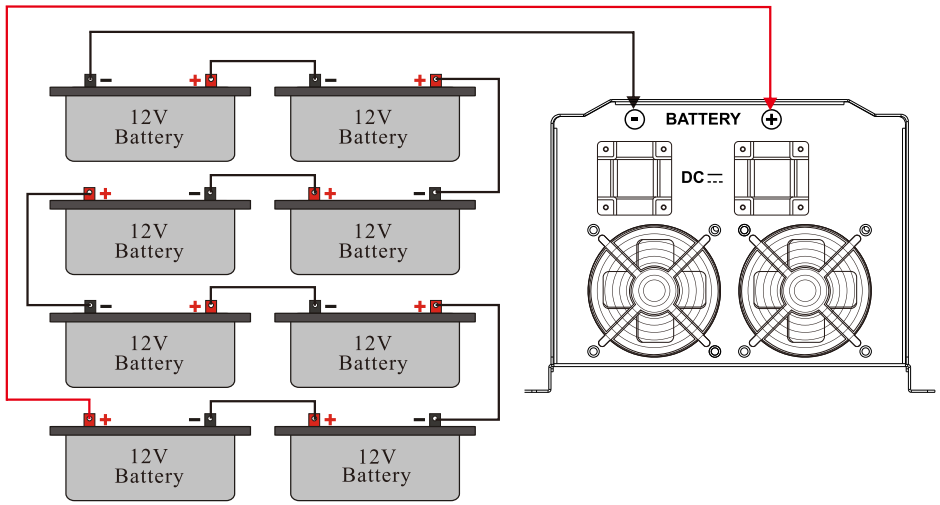
7-2: Code for alarm

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	Please reduce the loads
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 inverte
15	Battery over voltage alarm	Please check the AC input voltage
16	Battery over voltage protection	Please contact the supplier

3) 48V series battery wiring



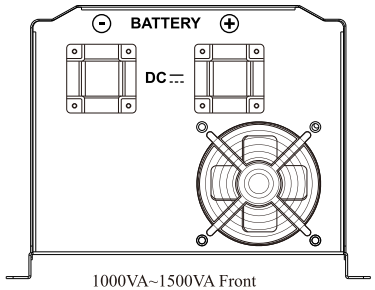
4) 96V series battery wiring



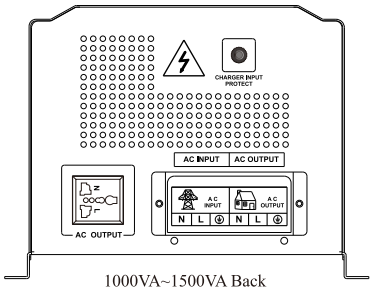
Note:

- 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 inverter starts to work, connect user's equipment to the AC output.
- Capacity of generator≥3 times of the rated capacity of inverte

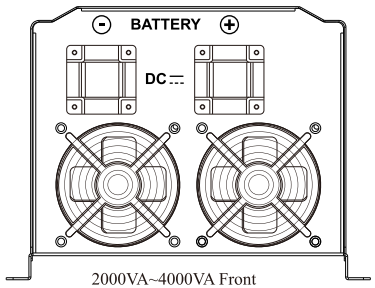
2. Outlook of Inverter



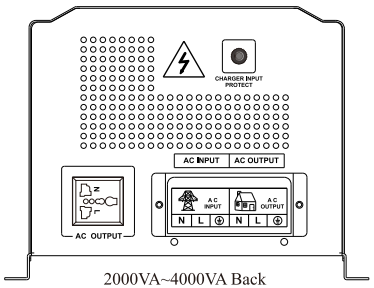
1000VA~1500VA Front



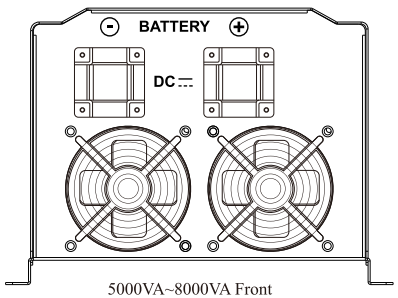
1000VA~1500VA Back



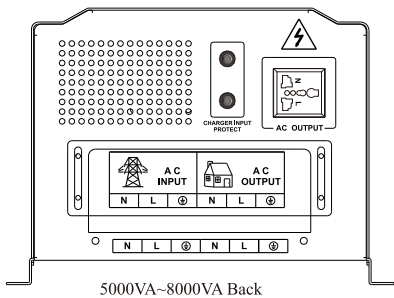
2000VA~4000VA Front



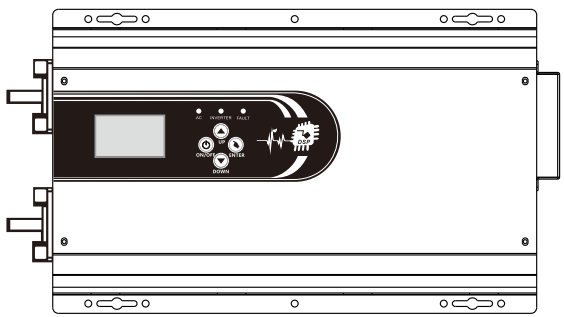
2000VA~4000VA Back



5000VA~8000VA Front



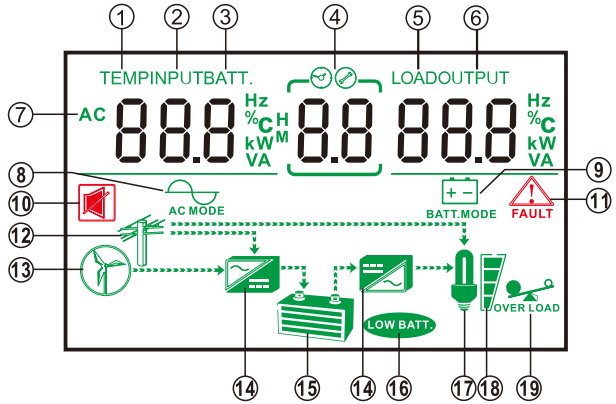
5000VA~8000VA Back



Top View

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

3. LCD screen description



Parameter display area

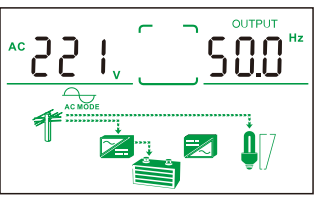
1 TEMP: Temperature displayed	2 INPUT: Mains input data displayed	
3 BATT: Battery data displayed		
4 1) Working mode setting: d1:Mains priority mode, d2: Energy saving mode, d3:Battery priority mode; 2) Battery type setting(U0~U7) 3) AC charging current setting: (C0~C6, C0=0A, C6 is the maximum AC charging current); Remark: When emergency come, shows alarm code here.		
5 LOAD: Load data displayed	6 OUTPUT: AC output data displayed	7 AC: AC data displayed

Icon display area

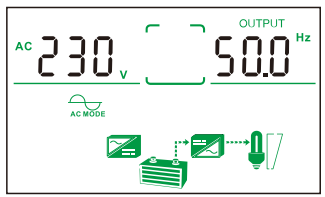
8 AC MODE:AC mode(means the inverter is already on d1 or d2 (Based on the real setting value)	
9 BATT.MODE: BATT.MODE means the inverter is already on d3:battery mode	
10: Turn mute on/off	11: FAULT: fault alarm
12: Utility	13: Wind turbine: display in the wind system
14: AC/DC circuit or DC/AC circuit	15: Battery
16:Low battery alarm	17：Load
18:Load capacity(The load is divided into 4 grids, and the single-grid load is 25% of the full load)	
19:Overload alarm	

3-1. Work flow chart icon introduction

1)Manis working mode



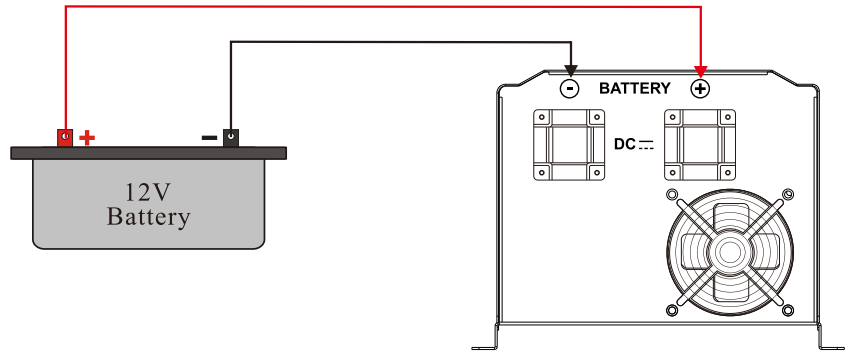
2)Battery working mode



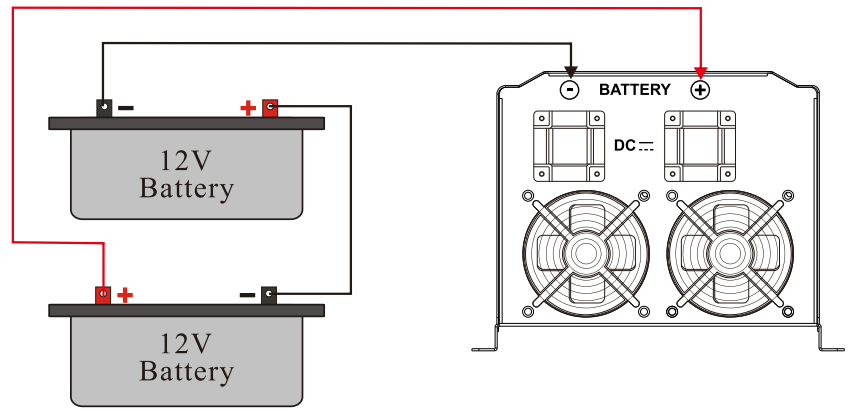
5-3. Battery wiring diagram

(Remarks: please refer to the technical parameter table for specific battery voltage parameters, this figure is only a wiring schematic diagram.)

1) 12V series battery wiring

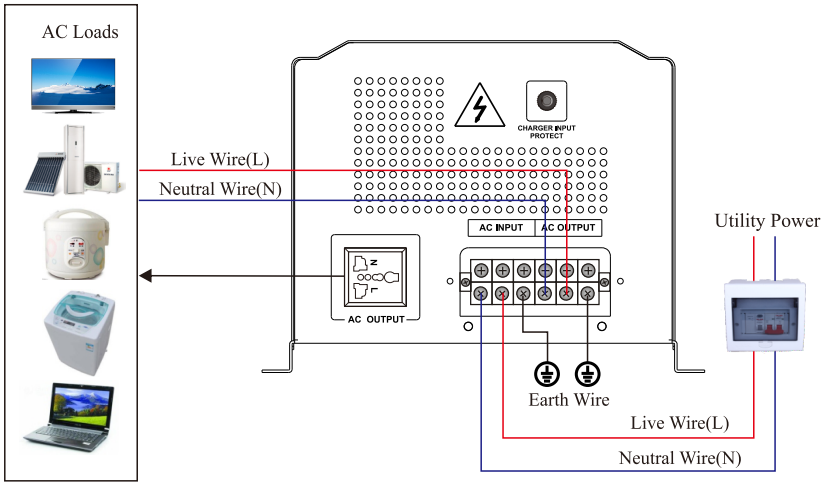


2) 24V series battery wiring

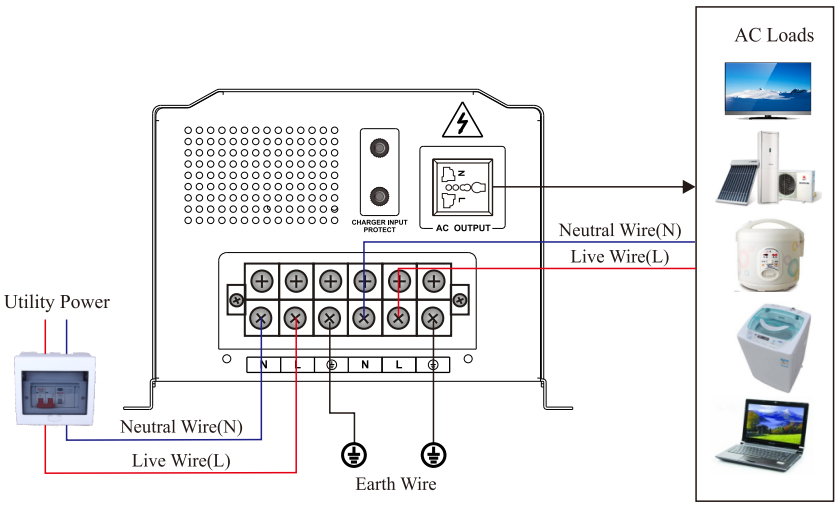


5. Wiring

5-1. 1000VA~4000VA Series

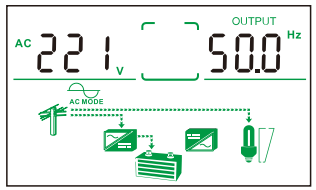


5-2. 5000VA~8000VA Series

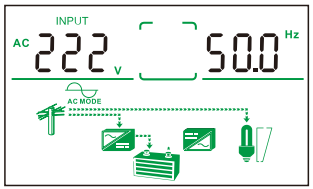


3-2. Introduction to the work interface

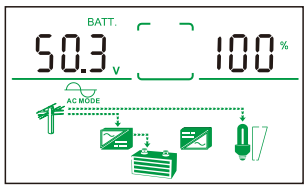
1) Output interface(Display output voltage and frequency)



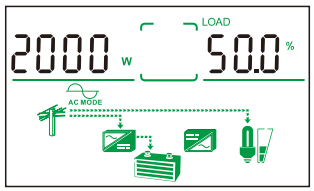
2) AC input interface(Display AC input voltage and frequency)



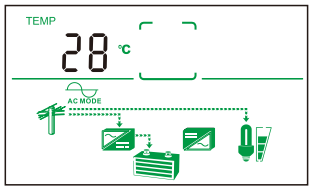
3) Battery interface(Display battery voltage and percentage)



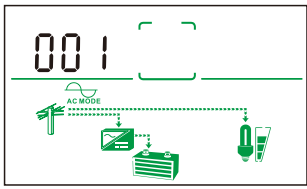
4) Loads interface(Display load power and load percentage)



5) Internal temperature interface

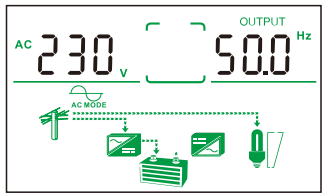


6) Communication address interface

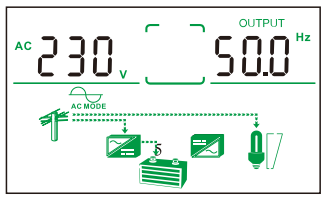


3-3. Three working modes

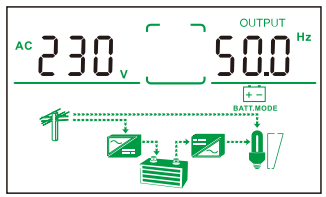
1) Mains priority mode (Display AC MODE icon, the working mode depends on the setting value)



2) Energy saving mode (Display AC MODE , the working mode depends on the setting value)



3) Battery priority mode (Display BATT.MODE icon)



Note:

The actual display parameters are subject to the specific model, and the picture display contents are only used as examples.

Remarks:Introduction to three working modes

1) Mains priority mode

● When the mains is normal(in ine with the mains input voltage range of the inverter), the mains charge battery; on the other hand, the mains supplies stable power to the loads after stabilization. (the loads do not consume battery energy);

● When the mains is abnormal(the mains exceeds the working range of the inverter or the mains supply is interrupted), the loads will be powered by the battery.

2) Battery priority mode

● When the battery is fully charged(like single-cell battery voltage is up to 13.2VDC),even the mains is normal, the loads will be powered by the battery;

● When the battery is in low voltage(the voltage of regular single-cell battery is 11VDC) and the mains is normal, the inverter will switch to mains priority mode. The mains supplies power to the load after stabilization,and the mains charges battery simultaneously .

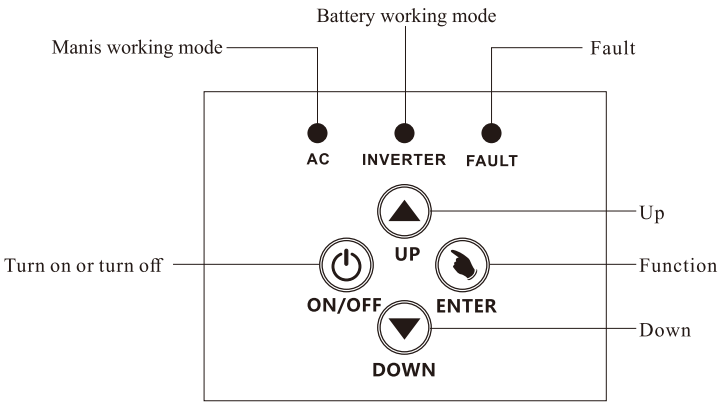
Remarks: Under Mains Priority Mode, when the mains charging current is not set as 0A, the mains charge battery; when the mains charging current is set to 0A, the mains does not charge battery.

3) Energy saving mode

● Inverter works under the battery mode, once the load capacity is less than 10% of the inverter rated power, the inverter will start and stop regularly to achieve energy saving effect (ie: the machine will intermittently interrupt the inverter output); When the load is greater than 10% of the inverter rated power, the inverter will out of this energy saving mode.

4. Operation

4-1. Meaning of indicate lamp &button



4.2. Function and setting of the button

1) ON/OFF button

◆ Battery supply state: Power on, press ON/OFF button for 1 second, the equipment start output; Power off, press ON/OFF button for 1 second, the equipment shutdown.

◆ AC supply state: Power on, the equipment will auto start when AC supply input; Power off, press ON/OFF button for 1 second, the equipment turn off output, the equipment shutdown after cut off AC supply.

2) UP/DOWN button

◆ Page scroll: in the main interface, short press the UP or DOWN 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..

3) ENTER button

◆ Mute function: short press FUNCTUON button, turn on/off alarm.

◆ Function setting: in the default main interface, first long press FUNCTION button for 3 seconds to enter work mode setting interface, short press UP or DOWN button to set work mode(d1:AC priority, d2: Energy saving mode,d3:Battery (Solar) priority); second long press FUNCTION button for 3 seconds to enter charging current setting interface, short press UP or DOWN button to set AC charging current (C0~C6, C0=0A, C6 is the maximum AC charging current); third long press FUNCTION button for 3 seconds to enter battery type setting interface, short press UP or DOWN button to set battery tpye(U0~U7.), Fourth time long press FUNCTION button for 3 seconds to save data and exit setting interface.

Battery Type:

Position	Float(V) (Single battery voltage)	Position	Float(V) (Single battery voltage)
U0(Gel.U.S.A)	13.7V	U4(Gel European)	13.8V
U1(A.G.M.1)	13.4V	U5(Open lead acid)	13.8V
U2(A.G.M.2)	13.7V	U6(Calcuim(open))	13.6V
U3(Sealed lead acid)	13.6V	U7(De sulphation cycle)	14.5V

Note: Value of AC charging current, battery type and working mode takes effect immediately.

Steps of start up

1) Connect loads to the AC output of inverter.

2) Connect mains power and batteries, please notice the negative andpositive side during wiring(refer to chapter 5 for wiring).

3) Press ON/OFF button to start the inverter(start automatically under the state of mains power).

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

Steps of power off

1) Disconnect loads.

2) Press ON/OFF button to disconnect AC output.

3) Disconnect mains power and inverter shut down.