



Product Description Manual

PS Series



Pure Sine Wave Inverter & Charger

※ Please read this manual carefully before using it, and save for future use!



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We reserve the right of manual final explanations;
We reserve the right of changing products and specifications, and without prior notice;
We reserve the right of correcting errors, if appears any printing error during printing process.

Corporation Profile

Suzhou Maili Electrical Appliance CO., Ltd was established in June 2012, is a high-tech enterprise specialized in manufacturing and sales of power inverter, charger and related products, formed by a team of the inverter industry management, production, research and development. The company is located in the famous Suzhou National Hi-Tech Industrial Park, where is with beautiful scenery, outstanding people; it is backed Shanghai, radiated around the world, which is the superior business environment for the growth of enterprises.

Now we mainly produce: pure sine wave 1000w~6000w all series PASS POWER pure sine wave charging inverter; pure sine wave 300w~8000w all series high frequency inverter; modified sine wave 300w~5000w all series high frequency inverter; 8A-20A-25A intelligent battery charger; 5A~60A common battery charger, five series over 300 type's products.

Our products are widely used in car modification, wind & solar system, industry, home emergence etc, and sold all over the world...the products won universal praise from customers at home and abroad as soon as it is available.

"Maili Manufacturing, dedicated service" is the company purpose. We warmly welcome home and abroad businessman to visit and guide.

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Security Instructions

Please ensure to be qualified to use the user manual before installation to avoid the possibilities of fire, electric shock, and other personal injury happened.

1.1 Please ensure that the inverter has the correct Dc voltage for your machine, if not, the machines could be destroyed. The cables and the method of cables installation which fail to meet the standard could damage the inverter! And the shorter the Dc cables the better. Fit as close to the batteries as possible, and voltage on long cables will fall and affect the unit's efficiency.

1.2 Don't reverse the cables! Connect the red cable to the positive terminal and the black cable to the negative terminal of the battery.

1.3 As much as possible to use the inverter in the environment which is well ventilated, don't cover and wall up the intake because the power will run self- protection or be damaged from overheating; Avoid to be exposed to the direct sunlight, heat source, water, moisture, oil or grease; Away from any highly inflammable substance; Out of reach from Children; Don't touch the machine with your wet hands.

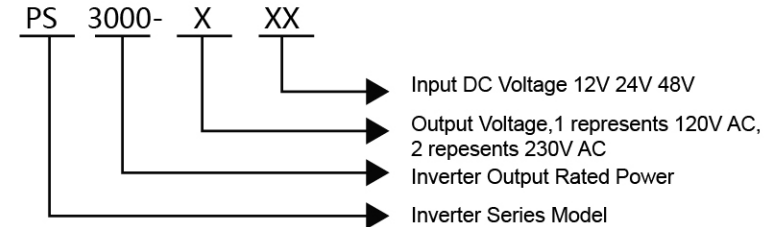
1.4 The output voltage of this unit must never be on your Ac system at the same time as any other Ac source such as the 230V external mains line or a generator. All external power must go through the UPS.

1.5 Please switch off the inverter before plugging in any appliances, and don't install the machines with electric. Please switch on the inverter after plugging in the appliances and then switch on the appliances when the output voltage is stable.

1.6 To avoid the security accident happened, don't freely dismantle the machine. When you need to repair it, please ask the qualified person to do it.

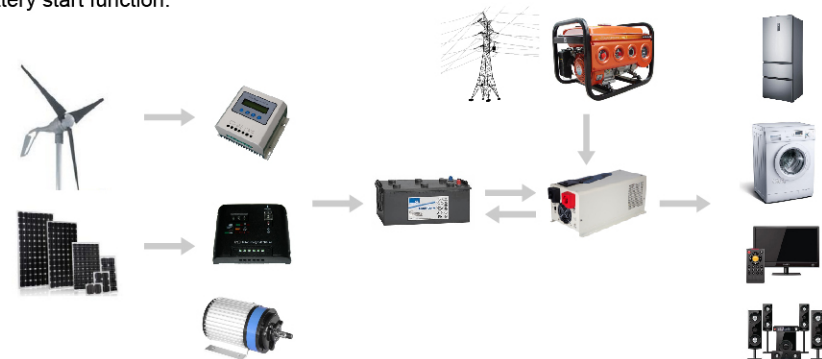
Product Introduction and Characteristics

2.1 Instructions of Inverter Type



2.2 Main Functions

1. Pure sine wave combined inverter, automatic charger and commercial power battery automatic switch;
2. Output pure sine wave form, input and output totally separated design, high efficiency 88%--90%, inverter power saving mode;
3. 4-step progressive charging 7 battery type selector;
4. Microprocessor control guarantees high reliability;
5. Multiple protection functions, equipped with Ac and Dc input high & low voltage protection, over-current protection, overload protection, temperature protection, output short circuit protection and so on;
6. Suitable for capacitive, inductive load, excellent load and overload ability;
7. Built-in Ac bypass replay (< 10ms), the actual realization of Ac power output;
8. Ultra-wide commercial power input voltage;
9. LED display and the RJ11 standard interface;
10. Load and temperature control fan start;
11. Hybrid power working(solar, battery, commercial power and generator switch freely);
12. Options: Remote viewing LCD digital control panel / RJ45 interface; Priority inverter mode; No battery start function.



2.3 Electric Parameters

2.3.1 Commercial power mode specifications


Input wave form	Pure sine wave (Utility or generator)	
Rated input voltage	230VAC	120VAC
Low voltage trip	180VAC±4%	90VAC±4%
Low voltage re-engage	194VAC±4%	100VAC±4%
High voltage trip	253VAC±4%	140VAC±4%
High voltage re-engage	243VAC±4%	135VAC±4%
Max input Ac voltage	270VAC	150VAC
Rated input frequency	50HZ/60HZ(Auto detect)	
Utility low freq re-engage	58±0.3HZ 60HZ 48±0.3HZ 50HZ	
Utility low freq transfer	57±0.3HZ 60HZ 47±0.3HZ 50HZ	
Utility high freq re-engage	64±0.3HZ 60HZ 54±0.3HZ 50HZ	
Utility high freq transfer	65±0.3HZ 60HZ 55±0.3HZ 50HZ	
Output wave form	same as input	
Overload protection	Circuit breaker	
Short circuit protection	Circuit breaker	
Power supply efficiency	>95% (Bypass mode)	
Transfer current	30A	
Transfer time(Ac to Dc)	8ms	
Transfer time(Dc to Ac)	10ms	
Bypass over load current	30A	

2.3.2 Inverter mode specifications

Output waveform	Pure sine wave (THD < 3%)							
DC Input voltage Dc	12VDC/24VDC/48VDC							
Rated output voltage (W)	1000	1500	2000	3000	4000	5000	6000	7000
Surge ratings (W)	3000	4500	6000	9000	12000	15000	18000	21000
Load power factor	0.1—1							
Rated output voltage	230VAC/120VAC							
Rated output frequency	50HZ±0.5%/60HZ±0.3%							
Output voltage regulation	< ±5%							
Transfer efficiency	Max efficiency 90%							
Overload protection	(110%< load <125%)±10% : Turn off the output after 15 minutes, restart the machine after reducing the load.							
	(125%<load<150%)±10% : Turn off the output after 60 seconds, restart the machine after reducing the load							
	(Load>150%)±10% : Turn off the output after 2 seconds, restart the machine after reducing the load							
Output short circuit protection alarm	Shutdown the output when short circuit, restart the machine after disposing the troubles.							
Dc low voltage protection	10.5±0.3VDC(12V battery) 21.0±0.6VDC(24V battery) 41.0±1.2VDC(48V battery)							
Dc high voltage alarm	16.0±0.3VDC(12V battery) 32.0±0.6VDC(24V battery) 64.0±1.2VDC(48V battery)							
Power saving mode	load ≤30W							
Work temperature	-20~50°C							
Weight (KG)	17	20	21	23	35	44	44	47
Size (mm) (L*W*H)	490*220*180			670*220*180				

2.3.3 Charger mode specification

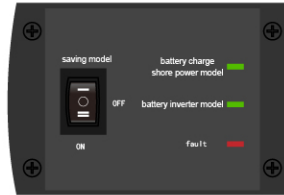
Theory input voltage	230VAC						120VAC						
Input voltage range	197-253VAC						90-135VAC						
Output voltage	Depends on battery type												
Charger current (±5A)	1000W		2000W		3000w		4000W		5000W		6000W		
	12V	24V	12V	24V	12V	24V	48V	24V	48V	24V	48V	24V	48V
	35A	30A	65A	35A	75A	45A	30A	65A	35A	70A	40A	75A	50A
Charger short circuit	Circuit breaker												
Breaker current	1KW10A 1.5LKW/2KW20A 3KW30A 4KW40A 5KW/6KW50A												
Over charge protection	When V≥15.7V/31.4V/62.8VDC, beep for 0.5 second after per second, failure after 60 seconds.												
Charge rules	4 steps												
	Pre-charge mode → constant current mode → constant voltage mode → float charge mode												
Charge step transfer	Constant current stage: If the utility is working, the charger will charge the battery with the max constant current until the battery voltage catches the specifications of the constant voltage.												
	Constant voltage stage: The charger working time in the constant voltage stage is 10 times as the working time in the constant current stage. Then the charger will automatically adjust the charge voltage to the specifications of the float charge stage.												
	Float charge stage: In the float charge state, the voltage remains the float charge voltage. If the electricity is connected again to the AC after it goes off, the voltage will fall to 12V.												
	Within 12VDC/24VDC/48VDC, the charger will start the cycle above again.												
If the charger keeps float condition for 10 days , it will start the cycle.													

The meaning of battery knob selections				
Knob gear	Work mode	Battery type	Fast charge voltage (V)	Float charge voltage (V)
0	Utility priority	Switch off charge function		
1		Gel U.S.A	14	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 euro	14.4	13.8
6		Open lead acid	14.8	13.8
7		Calcium	15.1	13.6
8		De-sulphation	15.5 for 4 hrs	
9	No			
 <p>Note: Section "4" for domestic, Please fit the battery type to related knob. "0" means charge function canceled, but Bypass function is still available. "7.8.9" means you can choose transfer priority function (inform before purchase). Voltage parameter * 2 means 24v battery; Voltage parameter * 4 means 48v battery;</p>				
Knob gear	Work mode	Utility can't charge the battery, but external charger can charge the battery	Battery low voltage to utility mode	Battery high voltage to transfer mode
7	Transfer priority (Selected mating)		11V	14V
8			10.5V	13.5V
9			10V	13V
Note: please select "1" before battery type confirmed; voltage parameter *2 for 24V battery,*4 for 48V battery				

Function Instructions of Each Part

Switch button: The top one gear for power saving mode, when the load is less than 30W, the machine will enter into hibernation; Middle for shutdown; The below one gear for working.

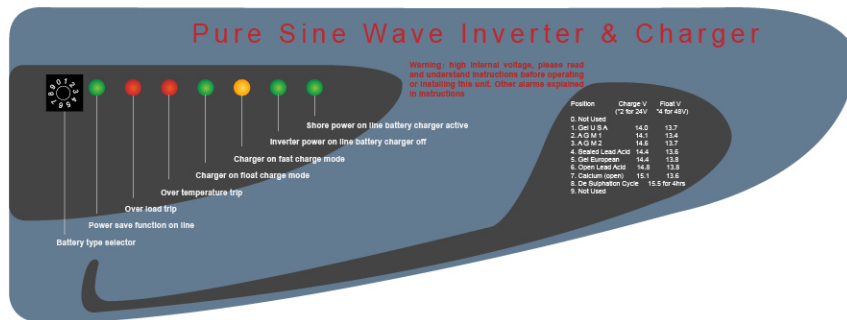
Switch panel lights: The top one for utility mode, battery charge; Middle: inverter mode; The below one for machine failure which needs to be checked and dispose the trouble.



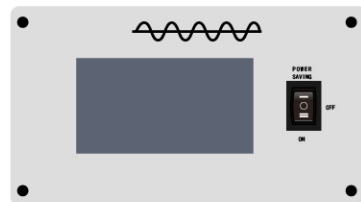
Machine front knob and indicator light (from left to right) functions as follows:

Knob: Battery type selection.

- Indicator:**
1. Power-saving mode (green light);
 2. Machine full loaded with inverter mode (red light);
 3. Inverter's internal temperature is too high (red light);
 4. In utility mode, the battery is in the float charging state (green light);
 5. In utility mode, the battery is in the fast charging state (yellow light);
 6. Battery inverter mode (green light);
 7. In utility mode, start the charging state (green light).



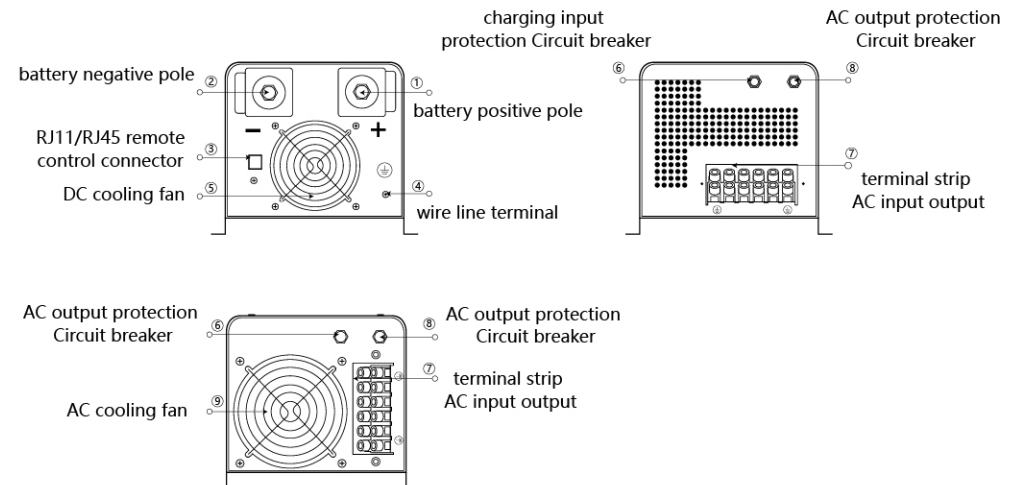
LCD display panel (optional)



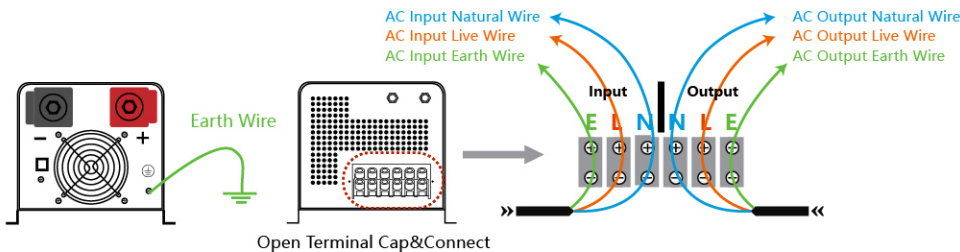
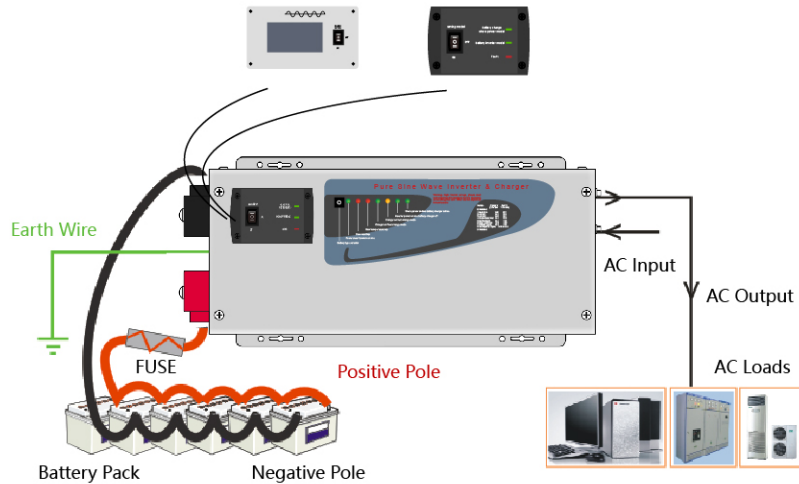
Function Instructions of Each Part

The Machine Side Panel

- ① The battery positive terminal (red);
- ② Battery negative terminal (black);
- ③ RJ11 port: Used to connect the remote control panel;
- ④ Machine shell terminal: To be connected from the machine shell to the earth wire;
- ⑤ DC cooling fan, no plug vent;
- ⑥ Charging input protection circuit breaker: When the battery is over charged and disconnected, restart the machine after disposing the troubles and restarting the breaker;
- ⑦ Terminals: INPUT means AC input; OUTPUT means AC output;
- ⑧ AC output protection circuit breaker: Disconnected when the machine is overload, and restart the machine after disposing load and restarting the breaker;
- ⑨ AC cooling fan: Due to the over heat, 4-6 KW machine has the AC cooling fan in AC output port. Once there is AC output power, the AC cooling fan can start to work.



Installation Guide



4.1 AC wiring instructions

INPUT: This interface only allows access to the utility

OUTPUT: This interface is for the AC output of the inverter, and then connects to your AC appliances

E/L/N: Representing the earth wire, the fire wire and the zero wire

4.2 DC wiring instructions

- 1.The red "+" means the battery positive electrode, the black "-" means the battery negative electrode.
- 2.Before connecting, please confirm that the inverter voltage matches the battery voltage. If the 12V inverter is connected to the 24V battery or higher, that will damage the inverter.



Please remember not to connect the utility or AC generator to the "OUTPUT" port, so as to avoid burning the inverter. Don't reverse polarity to avoid burning the inverter. Don't connect the 12V inverter to the 24V battery or higher, so as to avoid the inverter is burnt. Initial battery access and the instant sparkle happened are in the capacitor charge state, which is normal.

Installation Guide

4.3 Some models' connector specifications

Models	12VDC	24VDC	48VDC	220VAC	110VAC
PS1000	26mm ²	13mm ²	—	1.3mm ²	2.6 mm ²
	105A(3AWG)	50A(6AWG)		5A(16AWG)	10A(13AWG)
PS2000	53 mm ²	26 mm ²	13 mm ²	2.6 mm ²	5.2 mm ²
	210A(0AWG)	105A(3AWG)	50A(6AWG)	10A(13AWG)	20A(10AWG)
PS3000	85 mm ²	42 mm ²	21 mm ²	3.3 mm ²	6.6 mm ²
	330A(000AWG)	167A(1AWG)	83A(4AWG)	14A(12AWG)	28A(9AWG)
PS4000	—	53 mm ²	26 mm ²	5.2 mm ²	10.5 mm ²
		210A(0AWG)	105A(3AWG)	20A(10AWG)	41A(7AWG)
PS5000	—	60 mm ²	26 mm ²	5.5 mm ²	10.5 mm ²
		260A(00AWG)	130A(2AWG)	24A(10AWG)	47A(7AWG)
PS6000	—	85 mm ²	42 mm ²	6.6 mm ²	13.3 mm ²
		330A(000AWG)	167A(1AWG)	28A(9AWG)	55A(6AWG)
PS7000	—	90 mm ²	45 mm ²	8 mm ²	—
		350A(000AWG)	175A(1AWG)	31A(8AWG)	—

4.4 Some models of recommended battery capacity

Models	12VDC	24VDC	48VDC
PS1000	100AH	50AH	—
PS2000	200AH	100AH	50AH
PS3000	250AH	130AH	70AH
PS4000	400AH	200AH	100AH
PS5000	500AH	250AH	120AH
PS6000	600AH	300AH	150AH
PS7000	—	350AH	200AH



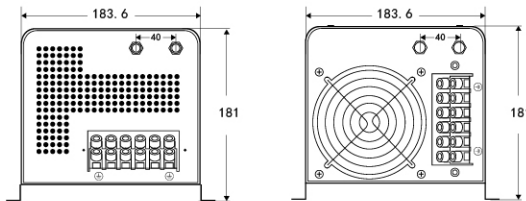
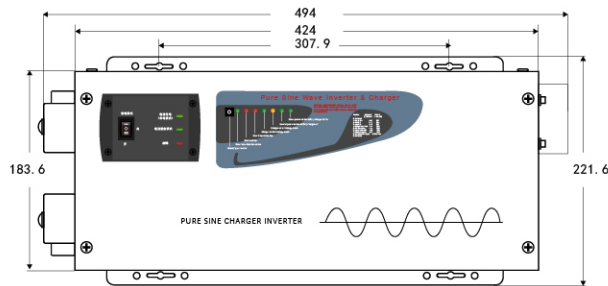
For the safe operation of the inverter in the best condition, please follow the wire diameter above to get the connection setup. The DC input line's length < 1m, the AC output line's length < 5m(the thickness and length of the wire directly affects the conversion efficiency of the inverter and load capacity), and the battery capacity that is too low will cause to be unable to start the high power load appliances.

Mechanical Parameters

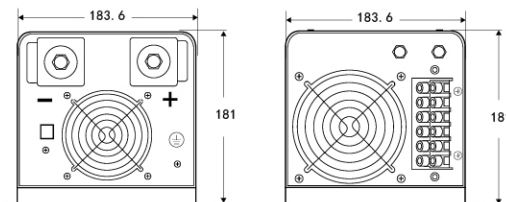
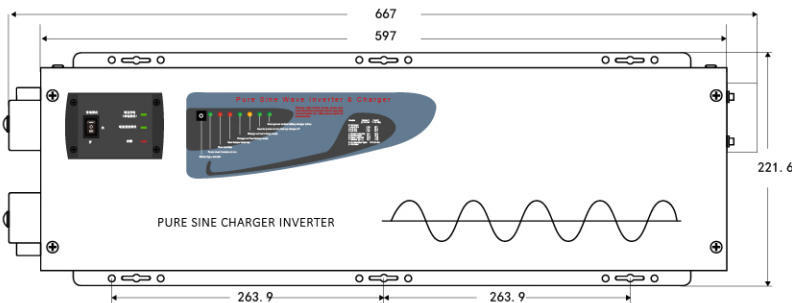
Installation and Method of Use

Unit: mm

Model PS 1-3KW



Model PS 4-6KW



Please carefully read the user manual contents safety instructions before installing this machine. Following is the main installation procedure.

- 1 Please open the machine packaging, you can see: a. machine; b. user manual; c. DC side protective cover; d. AC side protective cover; e. 12 screws . (Choose a LCD remote control panel)
- 2 Depending on where you want to place the inverters, first consider the inverter fan cooling wind direction while the fan vent convection space, then screwed to the inverter installation locations.
- 3 Please switch off the power, then connect AC and DC input part, DC arcing can occur while access, that is a normal phenomenon. You would better to wear insulating gloves for installation
- 4 When you access DC, please lock the terminal, or not, there may be some arcing caused by not locking the Terminal, or it can damage the power supply due to the poor contact. Note: Please pay attention to the polarity of DC not connected reversely.
- 5 Please connect the AC load to the output terminals of the power supply. Please note: AC input and AC output is not reversed.
- 6 Power supply is fully grounded; please ensure that the power and other ground wires are not in conflict.
- 7 Please check that the wiring is completely correct or not after finishing above steps, then open the inverter.
- 8 Finally please consult the manual LED light information, understand the inverter is working properly or not.

Fault Guide

Undesirable phenomena	Reason	Handling method
Inverter without any lights	No input voltage	Check the DC-side has been connected, the DC circuit breaker is in a disconnected state.
	Dead Battery	Charging immediately.
	Inverter or LED light damage	Please contact the vendors or service department.
Battery voltage alarm (Fault indicator lights bright , buzzer alarm.)	Battery voltage < 10.5V	When the battery voltage is restored buzzer alarm will be lifted.
Battery low voltage protection (light not bright, buzzer stop)	Battery voltage < 10V , Auto Power -Off	After the mains recovery, it will be automatically switched on. Or replace the battery.
Battery high voltage alarm (Fault indicator lights bright , buzzer alarm.)	Battery voltage > 16V,60 seconds to cut off output	When the voltage reduced ,restarting.
Mains model overload protection (Fault indicator lights bright , buzzer alarm.)	Output over-current, circuit breaker disconnects, no output	Reduce the load, reset circuit breaker or restarting.
Inverter model overload protection (Fault indicator lights bright , buzzer alarm.	(110%<Load<125%) ±10% : Display fault , 15 minutes after buzzer alarm buzzer alarm once 0.5 seconds ,then close the output.	Reduce the load, reset circuit breaker or restarting.
	(125%<Load<150%) ±10% : Display fault , 15 minutes after buzzer alarm buzzer alarm once 0.5 seconds , 60 seconds after closing the output.	
	Load>150%±10% : Display fault , buzzer alarm , 2 seconds after closing the output	
Battery is not charging (Do not include no battery to start model)	Inverter no input voltage from the mains.	Check if have AC input to the inverter.
	Battery not power can't start charging function.	Use a separate charger to recharge the battery first, and then start inverter to recharge the battery.
	Battery knob in "0" .	Knob will be dispatched to 1 ~ 4
Battery charger over-current protection	Charger breaker OFF, Auto OFF	troubleshoot , reset circuit breaker or restarting.
Over-temperature protection (LED lights bright , , buzzer alarm 0.5 seconds / seconds)	Heat sink temperature ≥ 105°C , 30 seconds after close the output.	Temperature came back to room temperature restarting.
	Cooling fan is damaged.	Check if the fan is normal work.
	Overload, the inverter not automatically power off.	Reduce the load
Abnormal noise	Half-bridge load.	Change more bigger watt inverter/reduce the load
Other failure can't restart, please contact the seller or after-sales agencies.		
Notice : 1-6KW Inverter ,When the temperature reaches 50 ° C ~ 60 ° C, DC cooling fan start . , 4-6KW When have AC out, the AC cooling fan start.		

QA Card

Dear users:

Thank you for choosing PASS POWER products, if you want to get better service, please read this user manual carefully and keep the warranty card. Welcome to visit our company's website: <http://www.inverter.so>.

In order to ensure the best quality, the products have passed strict inspection before leaving the factory, to ensure the quality. Suzhou Maili Electrical Appliance CO., Ltd guarantees to all users: the products have a good performance, assure all users: this product has a good performance, all components intact, and provides one year free warranty service.

The warranty as follows:

1. During the one year warranty period, if the machine malfunction of component damaged, must go through our technicians test and verification. If the machine malfunction in normal use. We will provide free repair and replacement parts, damaged parts owned by our company.

2. Occur the following situations are out of warranty:

- 1) Change the company logo.
- 2) Human error, Damage or loss caused by external causes due to irresistible.
- 3) Disassemble or modify without authorization.
- 4) Violation machine operation/terms of use.

3. Please keep this card, if necessary, please show your warranty card or purchase invoice to our company.

Please fill in the user forms

User forms

Product information	Product model		Product number	
Purchase information	Company name			
	Address		Phone number	
	Fax		E-mail	
Dealer information	Distribution unit names		Date of purchase	

Repair record

Repair date	Repair content	Repair technician	Remarks