User s Manual

S-1.3

Catalog

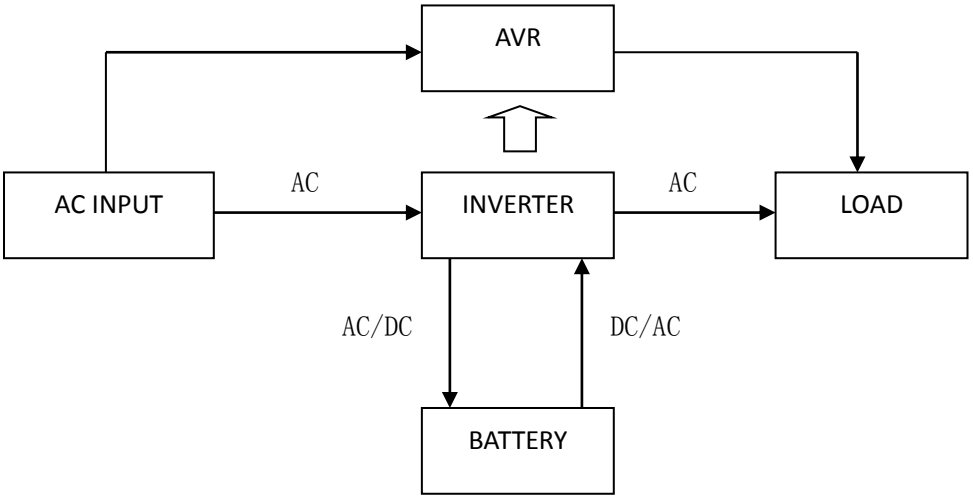
``

1. Product introduction:

The inverter is suitable for mains power unstable or often off, and important equipment that requires backup power. This product adopts high-precision DSP control chip, precise detection circuit、advanced control technology 、 modular design is more convenient for installation and maintenance. Intelligent temperature-regulating fan, efficient heat dissipation, extending system life. The output is stable, clean and pure sine wave output. There are four working modes to choose: mains priority mode, battery priority mode, energy saving mode, and unattended mode. Has short circuit protection, overvoltage and under voltage protection, overload protection，Overheat / short circuit automatic restart (automatic restart three times), wide frequency and wide voltage input, can be used for diesel / gasoline generator input.

1.1.Introduction to working principle

AC220-240V:300W-6000W: with AVR
AC110-120V:300W-3000W: with AVR
AC220-240V:6500W Above： without AVR
AC110-120V:3500W Above： without AVR



1.2. Introduction to working mode

01 Mains priority

When the mains power is available, the mains power supply power to the load, and when the mains power is off, the battery will supply power to the load. You can set the mains power charge the battery or not (PC set).

02 Energy saving mode

``

When the inverter is in battery priority mode and the output load is less than 1%-10% of the power(set by the P7 ,10% default), the AC output will be turn off, The inverter restarts every 1 minute, and checks whether the load is greater than the set power. When the connected load is greater than the minimum setting, the inverter restarts output. This function is to reduce the battery loss and extend the battery backup time.

03 Battery priority mode

The battery supply power to the load. When the battery voltage is lower than the set battery voltage(voltage set by PA item), use mains power supply power to the load. When the battery voltage is restored , the battery will supply power to the load again (When battery power is low or PV power is off inverter use mains power charging for battery or not set by PC）.

04 Mains priority unattended mode

Inverter automatically turn on when connected to mains power or battery voltage is normal (not include inverter first time use) . But when the battery discharge voltage lower than battery voltage by set F4 (F4: set the battery low voltage power is turn off), the power will be turned off. Inverter on only mains power is coming or turn on by hand.(mains is charging is or not set by PC)

05 Battery priority unattended mode

When the battery voltage is normal ,the inverter automatically turn on and battery supply power to the load. When the battery is low voltage ,mains power supply power to the load. When the battery discharge to battery low voltage shutdown (PL setting), the inverter enters standby and waits for the mains power or solar charging to battery .When the battery voltage is restored (PN setting),the inverter automatically turn on .But when the battery
discharge voltage is lower than battery voltage（set by F4), power will be turn off .Inverter on only mains power is coming or turn on by hand,

2.Operation instruction

1.Opening packing inspection:

Check the package is complete before opening. After opening packing please check the accessories, The accessories includes 1PCS user manual and check the inverter is still protected well after transportation.

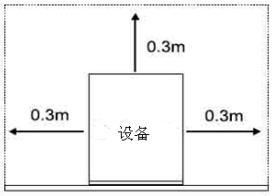
note:

- Read the product manual carefully before using this product.
- If you find damage or missing parts, please do not turn on the machine and contact your dealer.
- Please keep the packing box and materials for can be for next delivery if need.

- This series of products is very heavy, please handle it carefully .

3.Installation notice:

1. The inverter must be more than 30cm away from the wall, well ventilated, free of water, flammable gases and corrosives. As shown in the figure:



2.Not good placed in a corner, side, or upside down, away from heat sources. To avoid direct sunlight, ensure that the front panel, rear panel, and fan inlets have good ventilation.
3.The environment temperature should be between 0 °C and 40 °C.
4.If the machine is disassembled and used in a low temperature environment, may happen water condense ,only can work till through dry of machine inside and outside ,otherwise will be shock risk
5.Please install the inverter near the mains input socket or switch. It is easy to unplug the mains input or cut off the power supply when meet emergency situation..
6.The external battery should not be exposed. It should be installed in the battery cabinet..
7.The DC input between inverter should be short as possible

8.Do not stack goods on the inverter.

note:

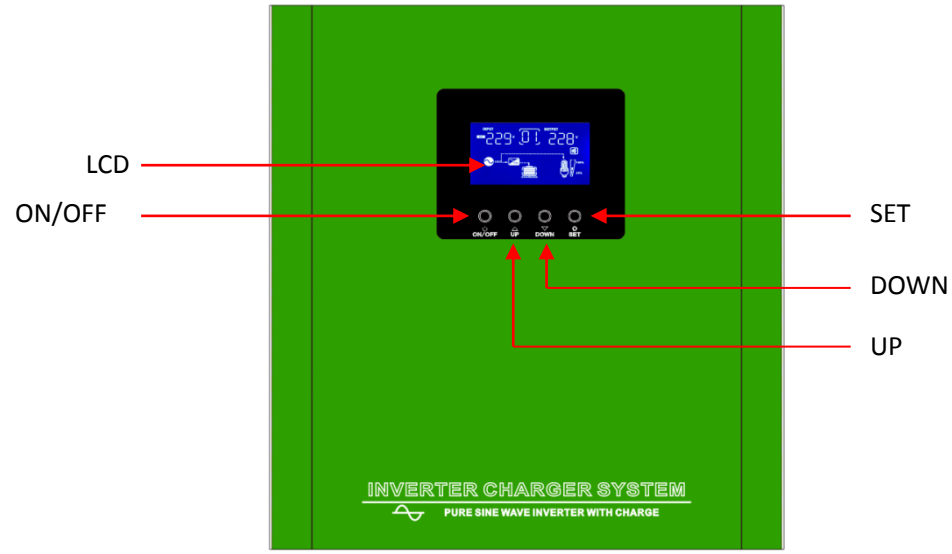
- When the load is connected to the inverter, the load must be turned off before wiring, and then turned on the loads one by one.
- The inverter is connected to a socket with over current protection, and the machine is safely grounded.
- The power outlet should be safely grounded.
- Whether the inverter has input or not, the inverter may have output, turning off the inverter does not ensure that the internal parts are not have power. If need to make the inverter no output, must turn off all switches first, then turn off the mains power supply.
- Need to touch inductive load: when inductive load such as motor, display, laser printer. The inverter capacity is three times of the load equipment starting power .

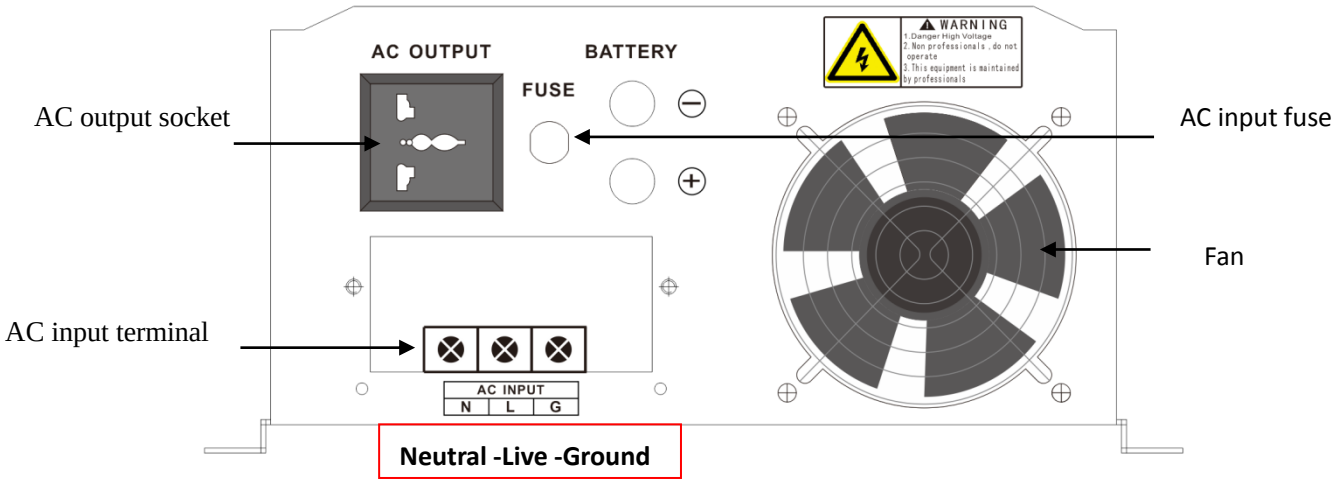
``

4. Outward appearance and wiring

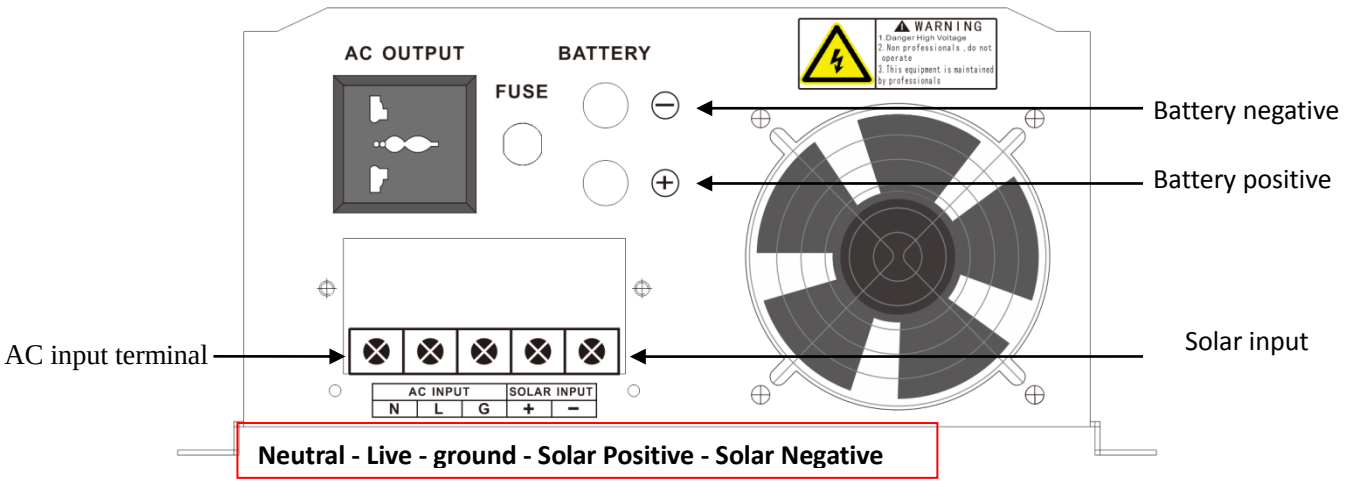
4.1. Outward

0001：



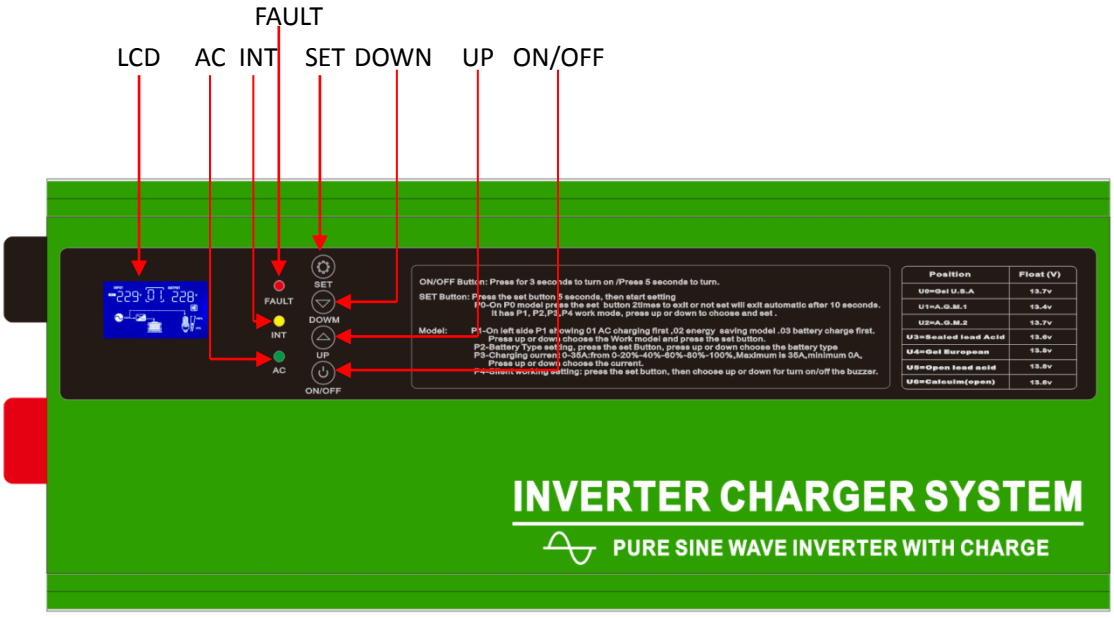


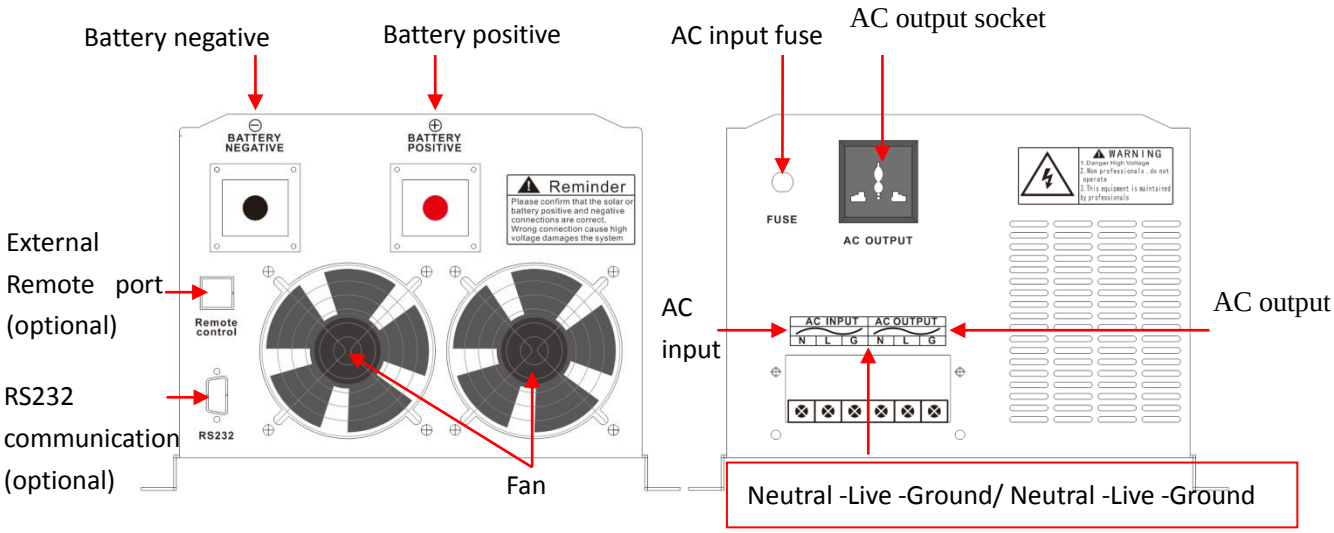
Routine series



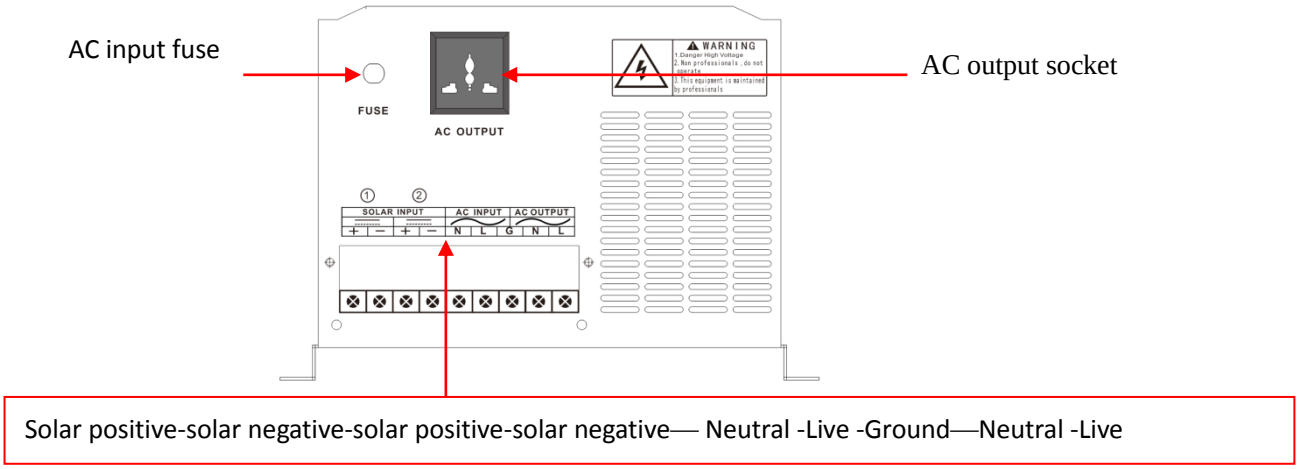
Integrated machine series

0002：

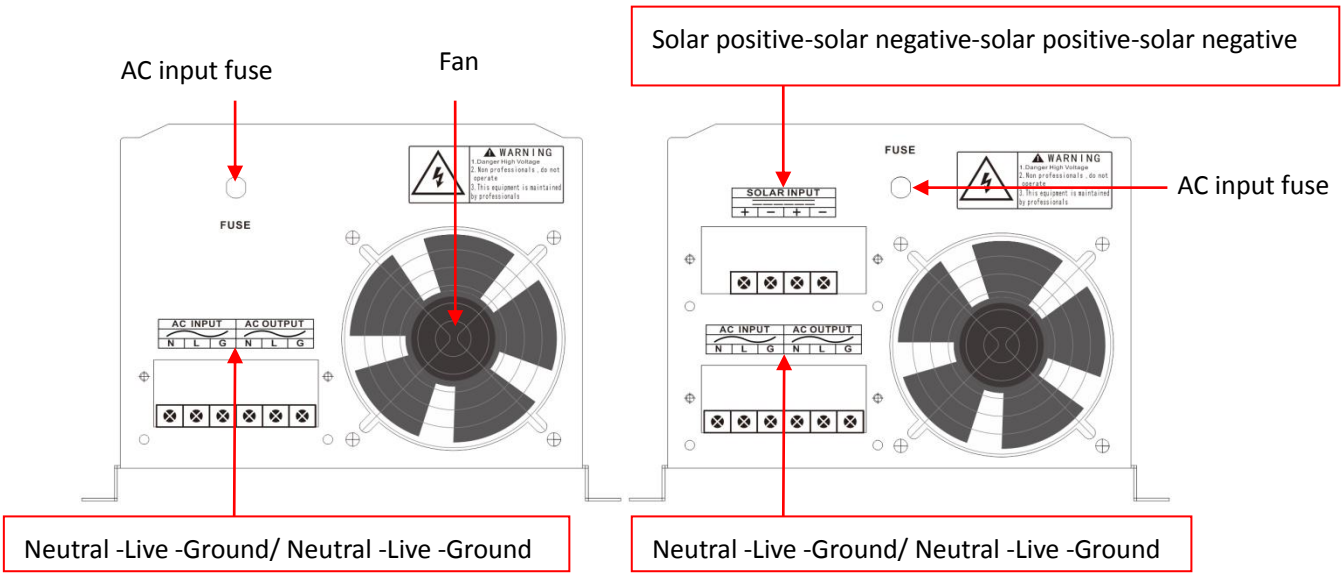




1KW-3KW Routine series

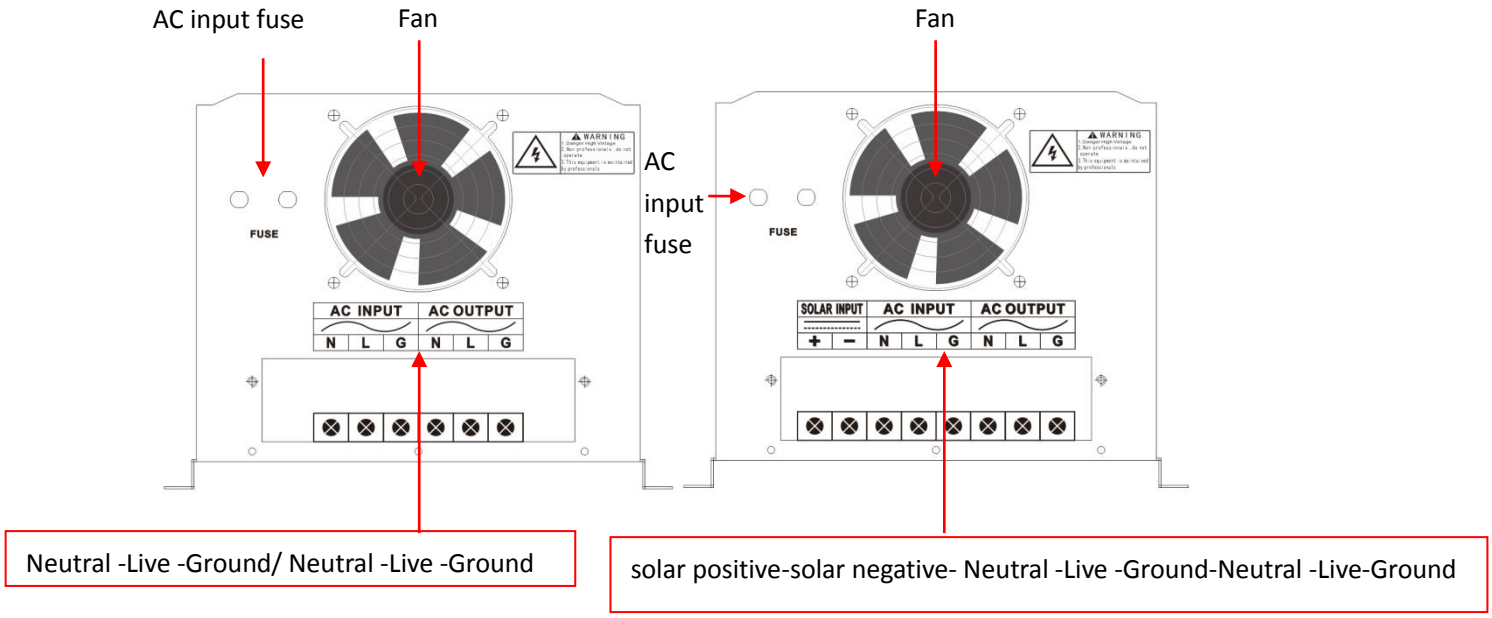


1KW-3KW Integrated machine series



4KW-6KW Routine series

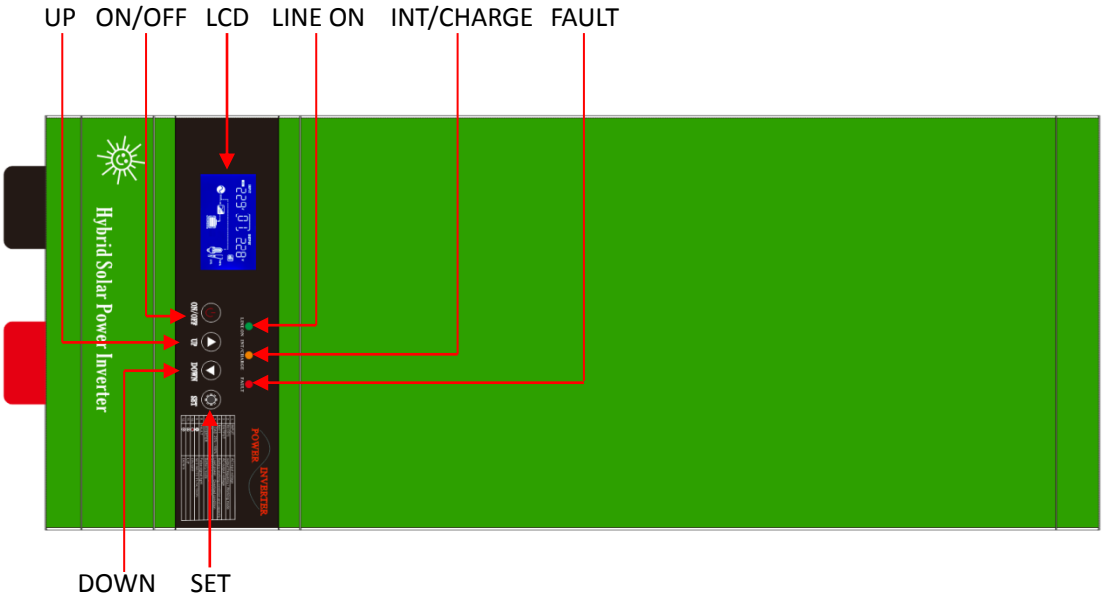
4KW-6KW Integrated machine series

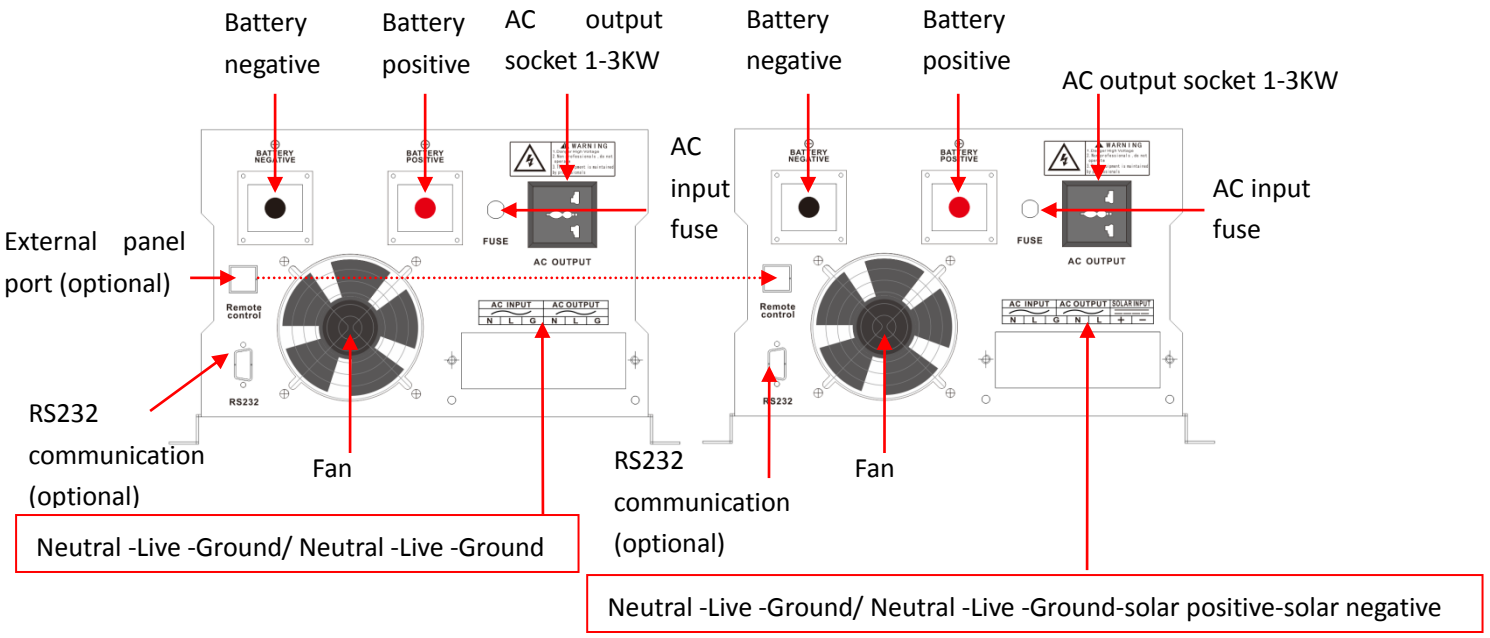


8KW-12KW Routine series **8KW-12KW Integrated machine series**

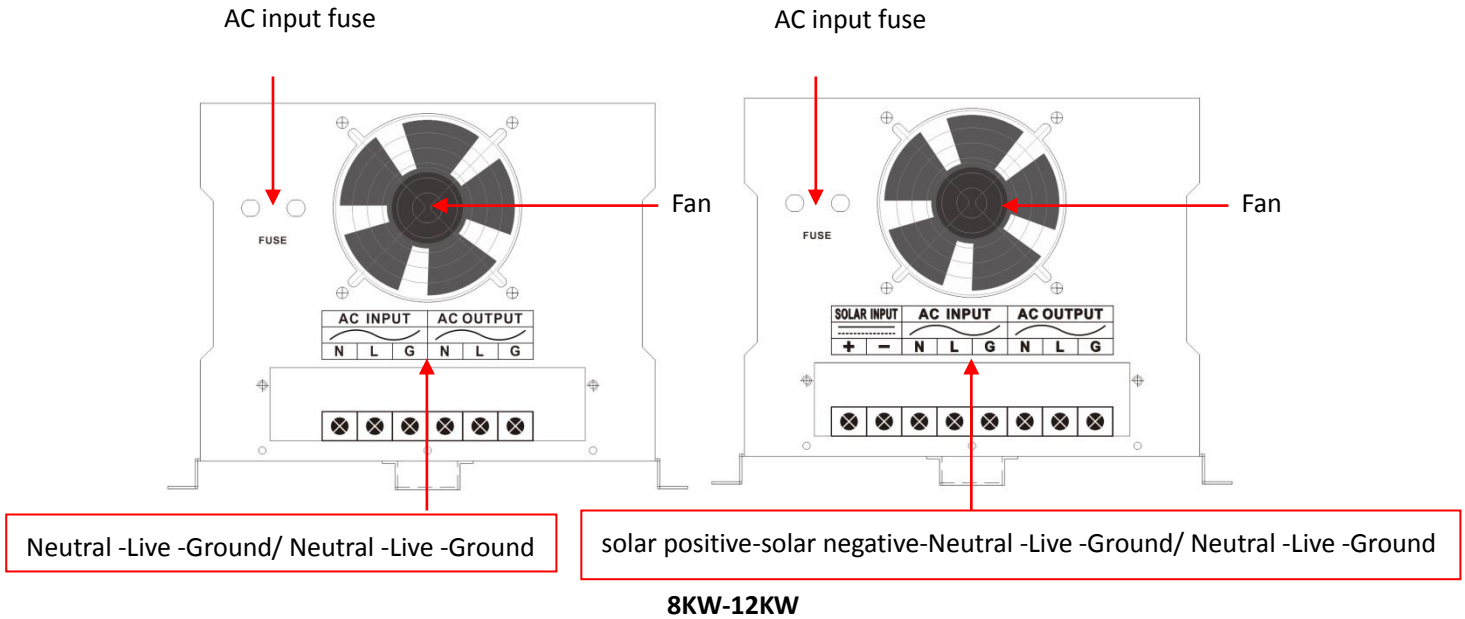
0003：

3



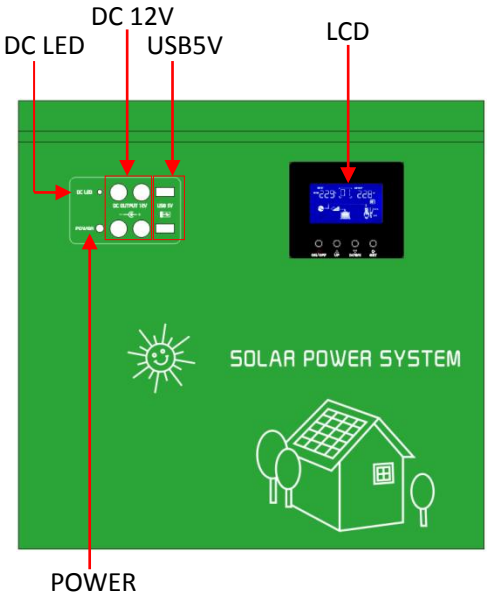


1KW-6KW

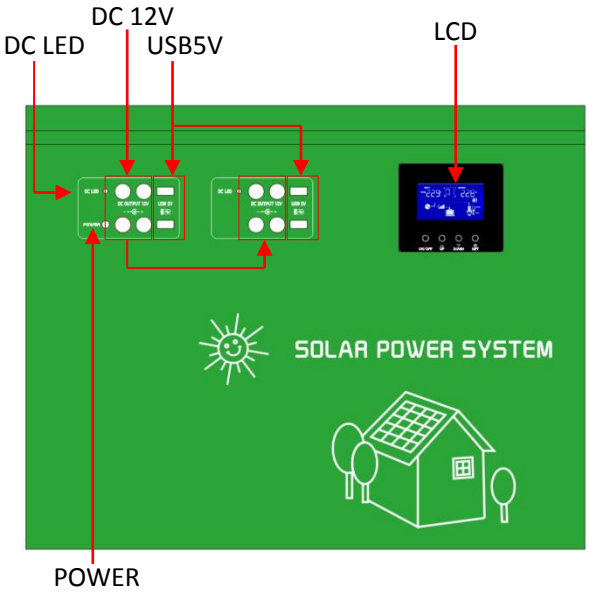


8KW-12KW

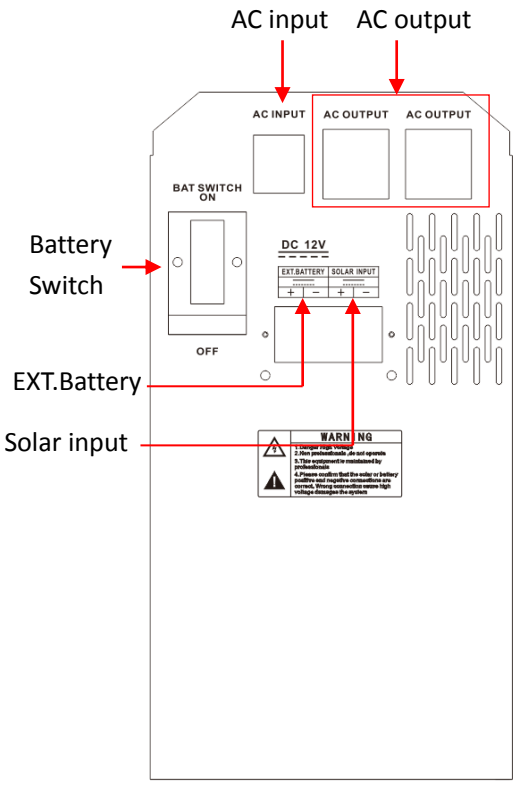
0004:



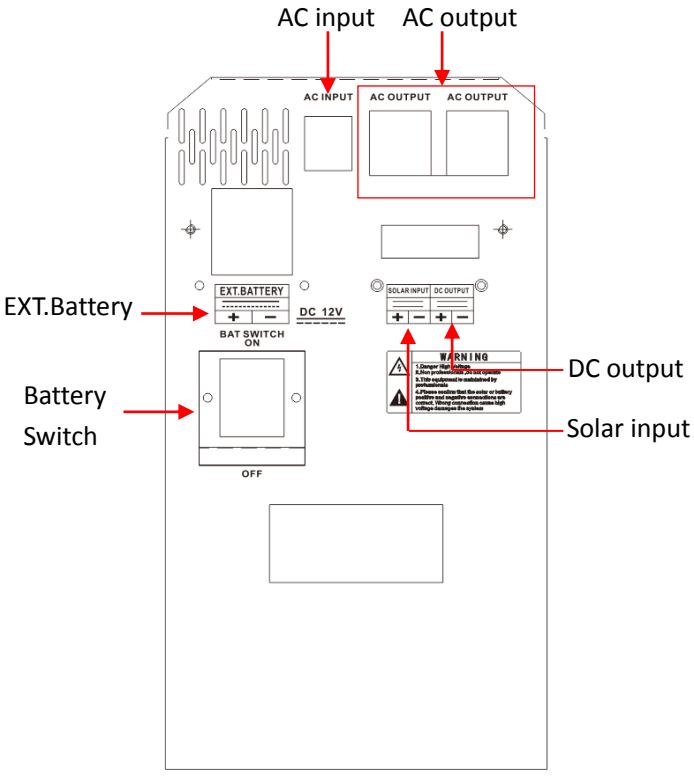
65AH System



100AH System

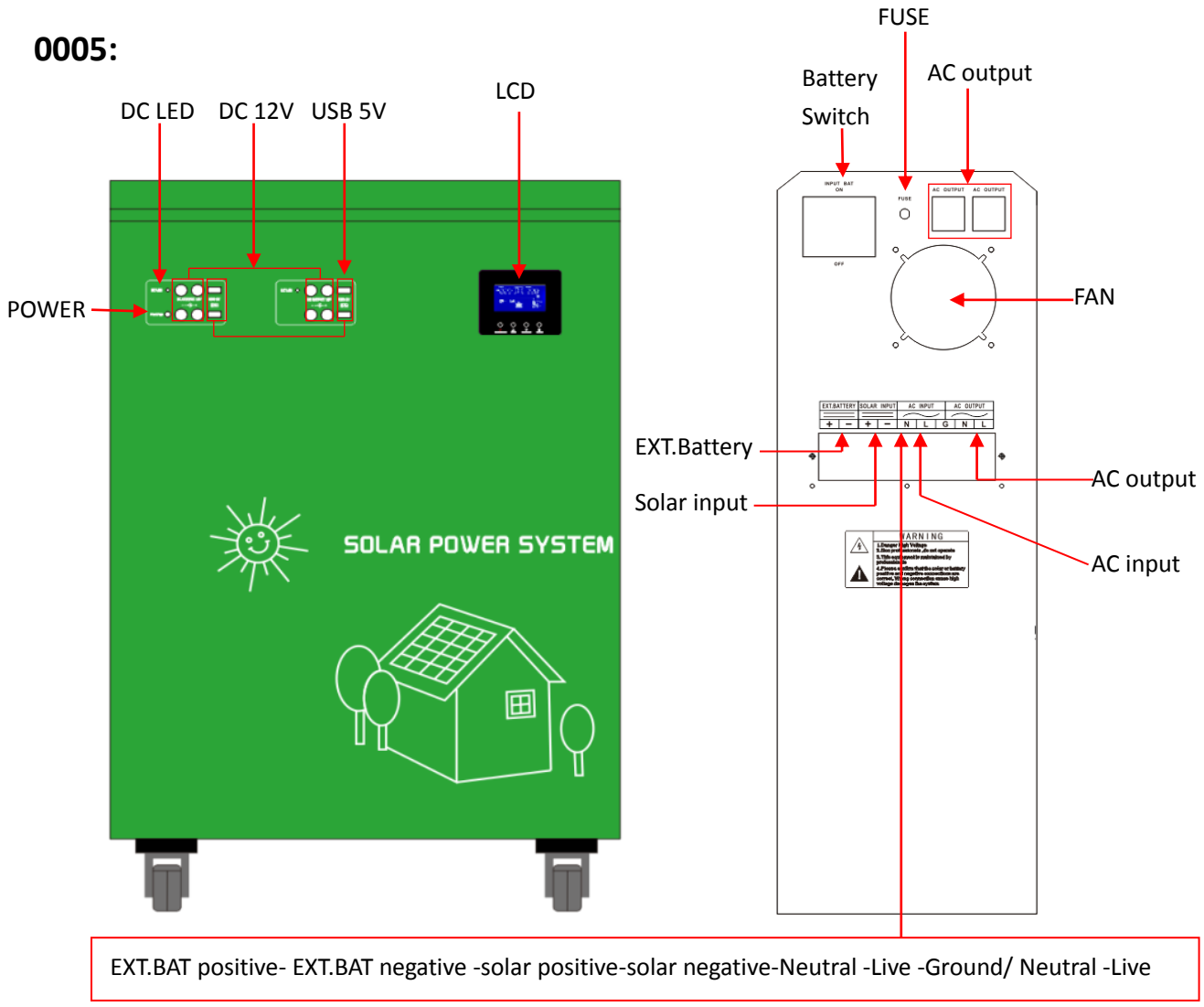


65AH System



100AH System

0005:

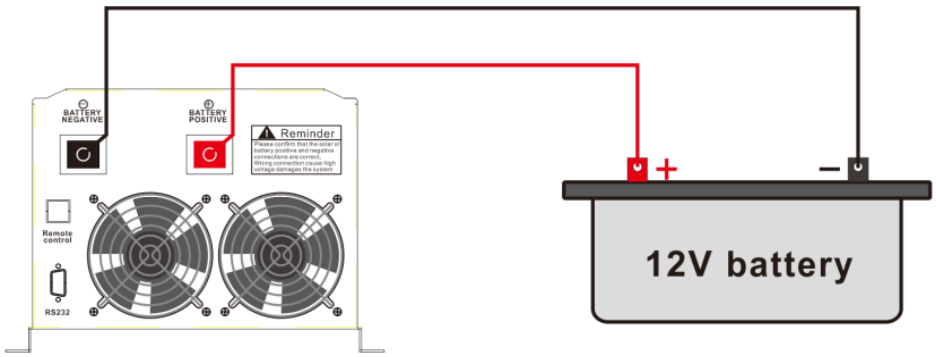


200AH System

4.2wiring

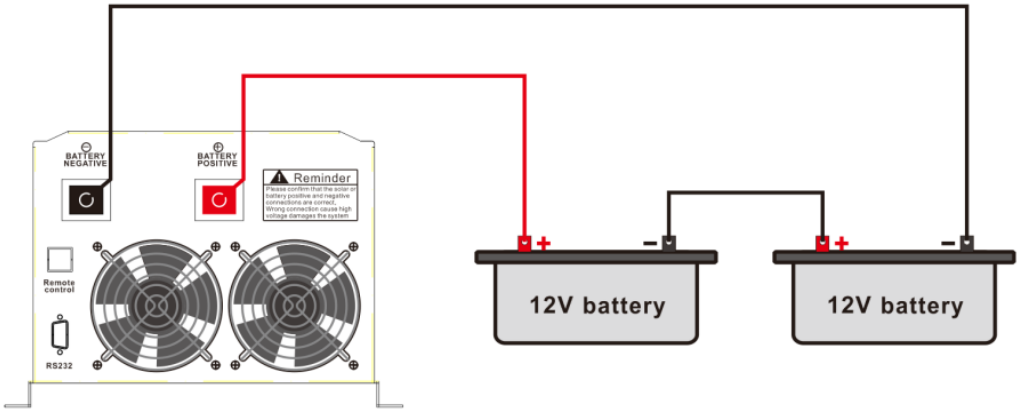
1. Battery wiring example:

1.1. 12V connection diagram:

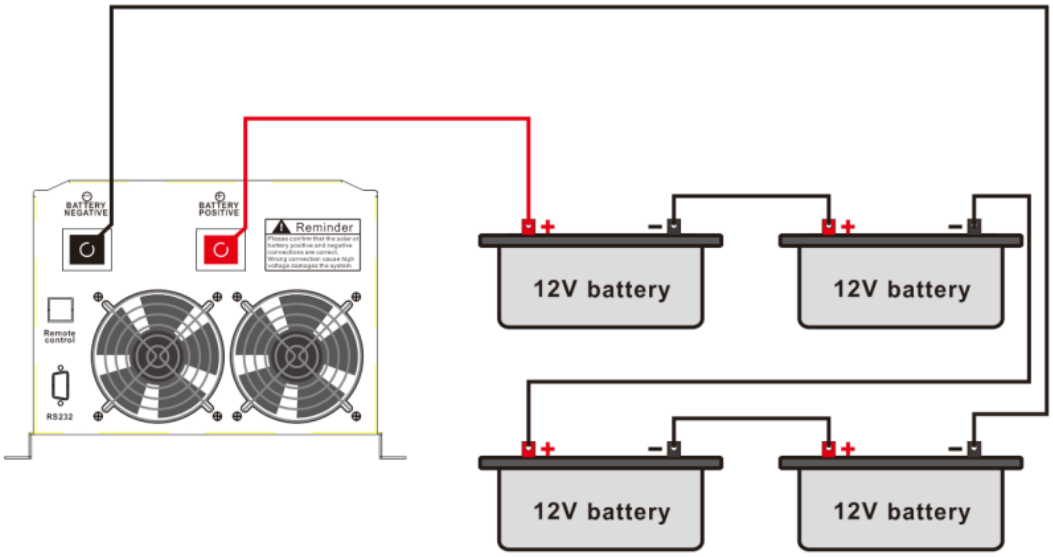


``

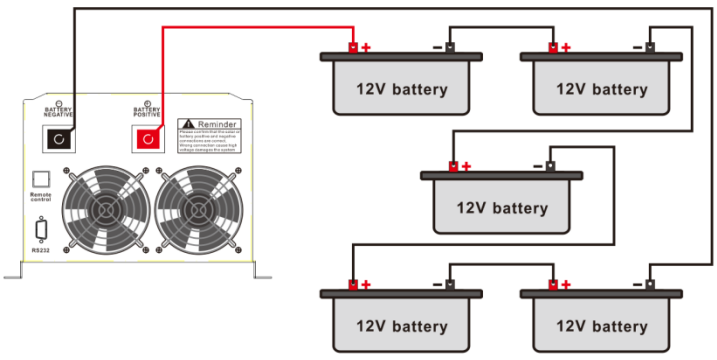
1.2. 24V connection diagram:



1.3. 48V connection diagram:

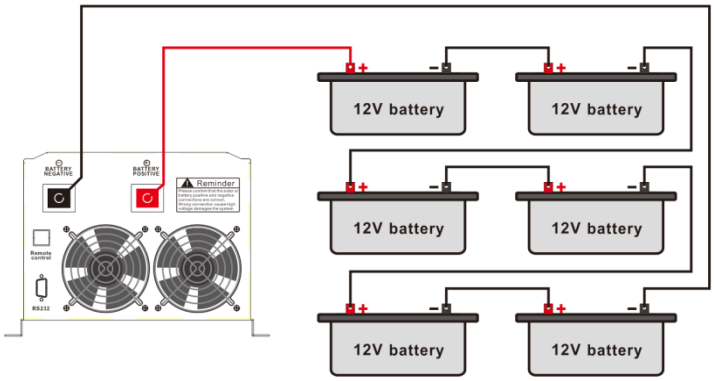


1.4. 60V connection diagram:

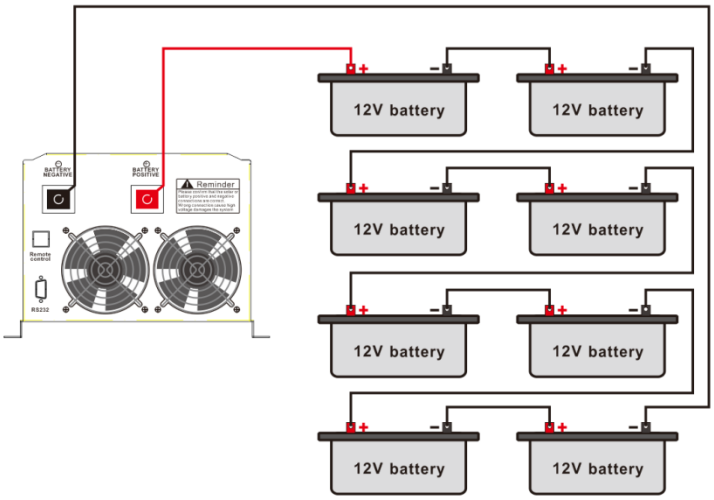


``

1.5. 72V connection diagram:



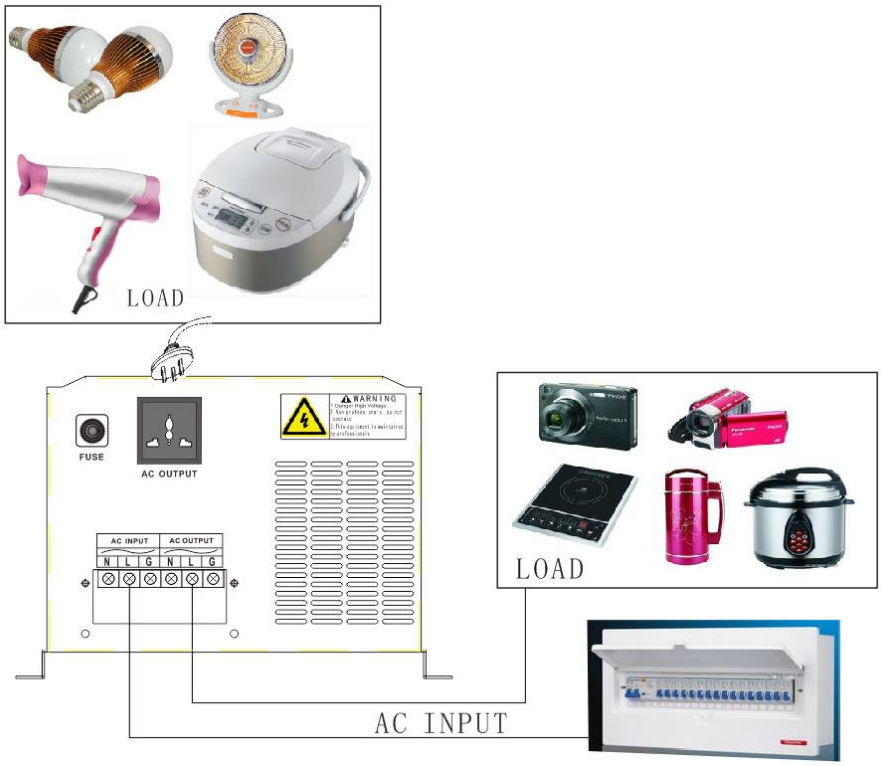
1.6. 96V connection diagram:



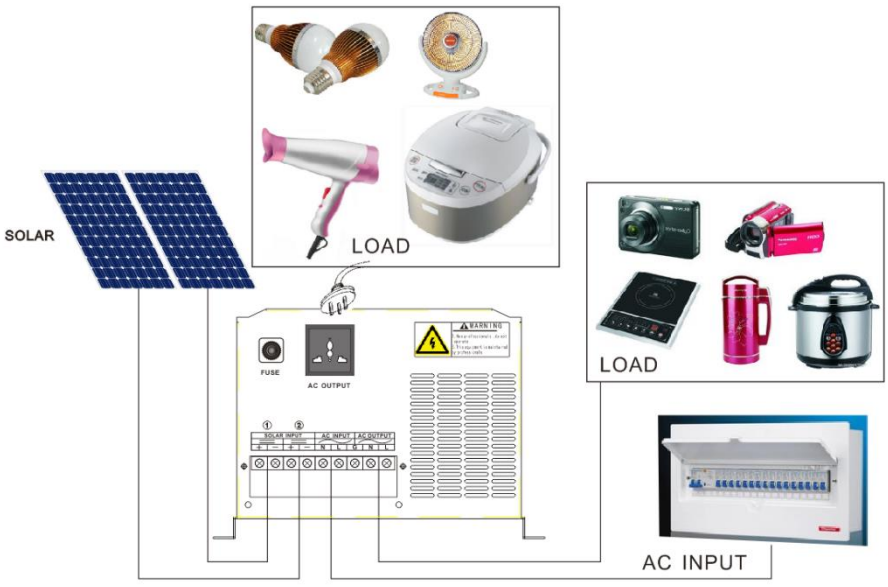
``

2. Solar and AC wiring examples:

2.1. Inverter connection diagram:

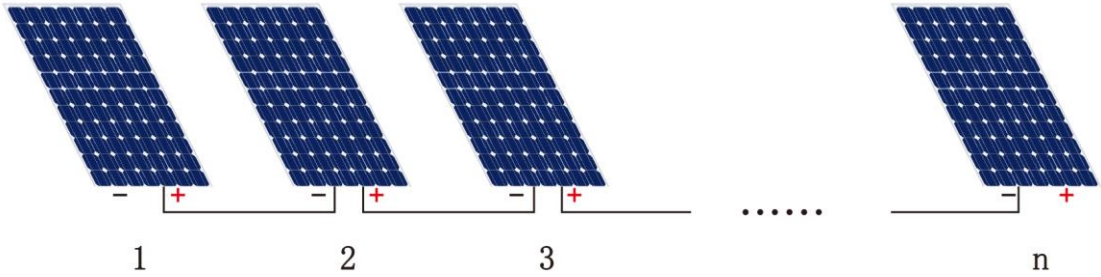


2.2. Solar inverter connection diagram:

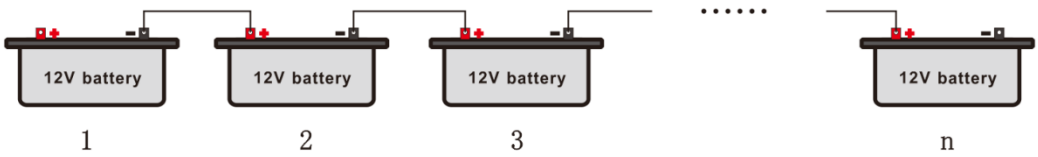


3. Solar panel and battery connection instructions:

3.1. Solar panels or batteries in series:

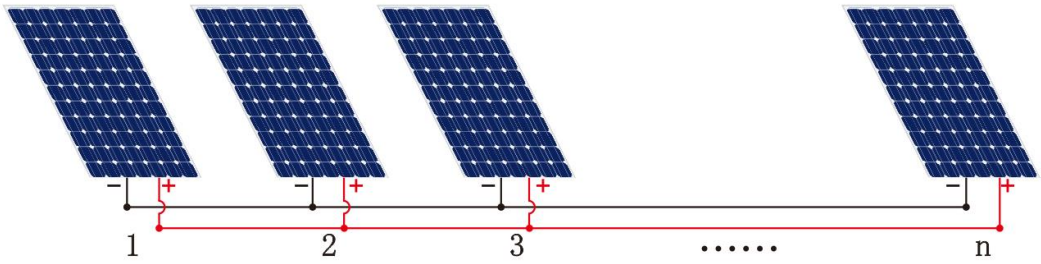


Solar panel voltage = 1 + 2 + 3 + ... n, the voltages of each solar panel are added together.

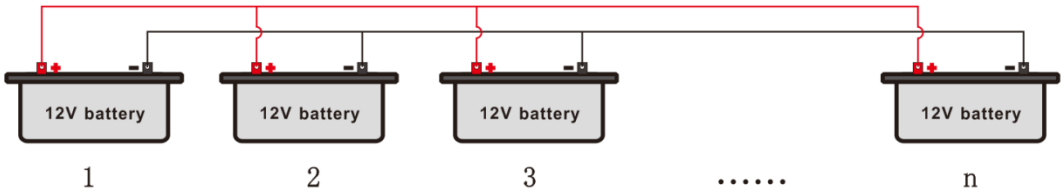


Battery voltage = 1 + 2 + 3 + ... n, the voltages of each battery are added together.

3.2. Solar panel or battery in parallel:



Solar panel voltage = 1 = 2 = 3 = ... n, the voltage of 1PCS solar panel (the voltage of each panel must be the same to be connected in parallel).



Battery voltage = 1 = 2 = 3 = ... n, the voltage of 1PCS battery (the voltage of each battery must be the same to be connected in parallel).

``

note:

*If you want to connect the inverter to diesel generator or gasoline generator, please follow these steps:

1.Turn on the generator, after it works stably, connect generator output to the inverter input(Confirm the inverter is no-load), then turn on the inverter as normal. After the inverter starts working, connect the load.

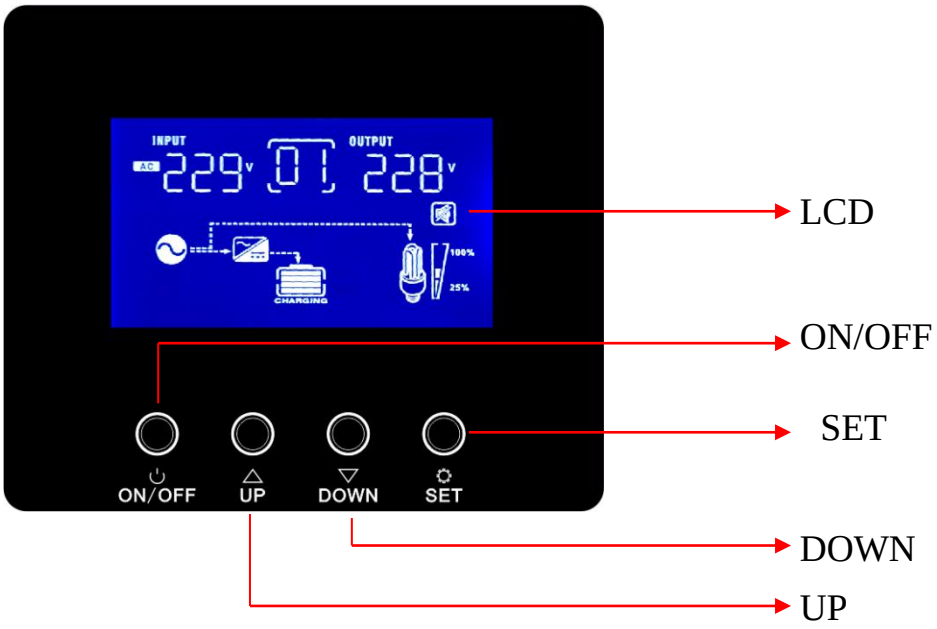
2.Recommended generator capacity is 2-3 times larger than the inverter.

5. Specification :

5.1.0001/0004/0005（Appendix 1）

5.2.0002-0003/0005：（Appendix 2）

6. Indicators、buttons and display description:



``

1. Indicator:

Green light :

In the mains working mode, the LED light is on when the mains is working, the green light off when the inverter is inverting.

Yellow light:

Inverter working mode indicator and mains charging indicator. When the inverter is working it always lighting and the mains charging for battery it flashes. It will off when charging is completed. In the 03 battery priority mode, the PC menu determines the light is on or off during charging.

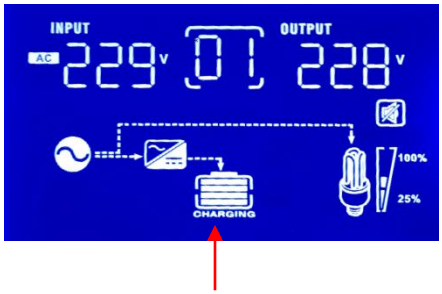
Red indicator:

Lights flashing when the overload is more than 105%, lighting when the overload is more than 110%, lighting when the inverter fails, lights flashing when the battery is low.

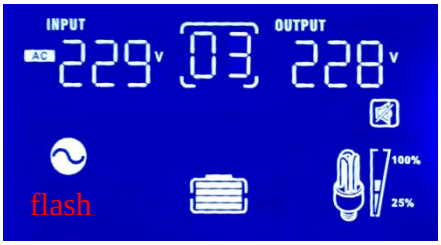
2. When the inverter is off, press(ON / OFF) button and hold 3 seconds to turn on the inverter and buzzer will sound. When inverter is on press(ON / OFF) button and hold 3 seconds to turn off the inverter

3.When the inverter works, you can press UP or DOWN to check display parameters:

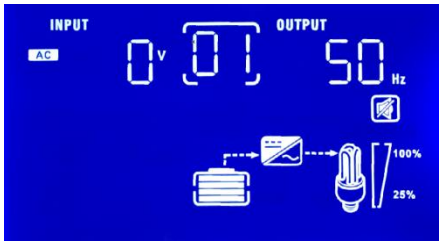
Inverter mode



Mains mode (battery capacity icon flashing when charging, when no charging or complete it will stop flashing)

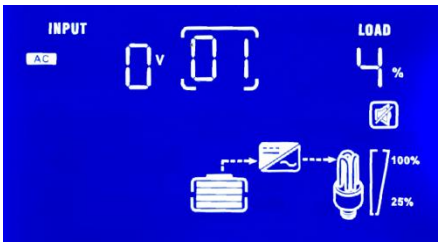


Battery priority mode, mains status (mains icon will flash)

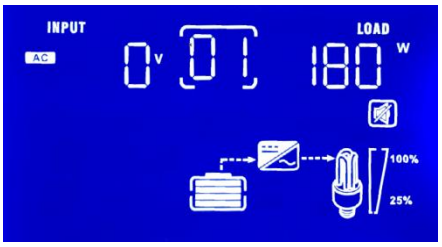


Frequency display

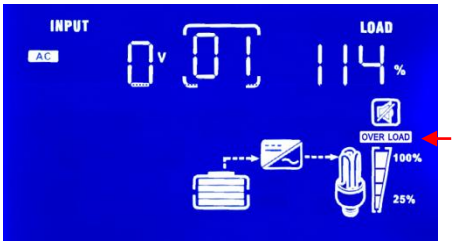
``



Load % display

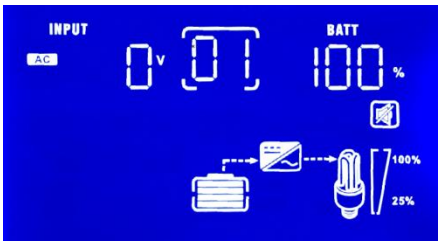


Load power display

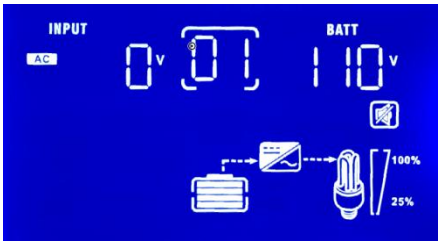


flash

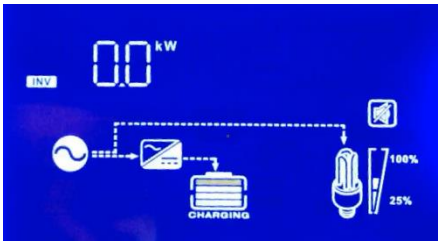
Overload display (when icon will flashes)



Battery % display

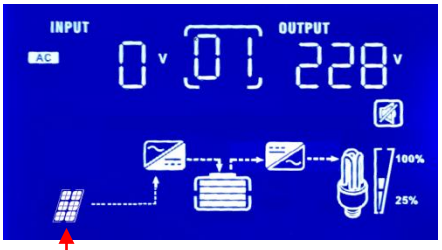


Battery voltage display

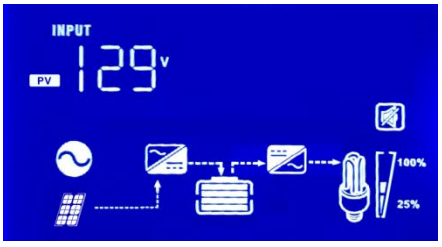


Inverter total output power display

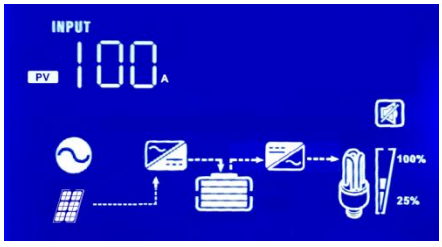
Solar input with mains



Solar input without mains



Solar input voltage display



Solar input current display

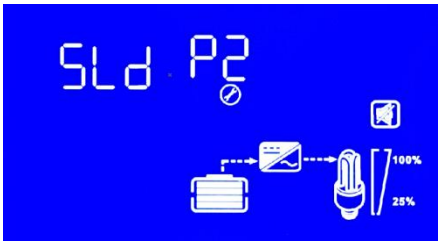
``

7.parameter setting:

1. When the inverter in the normal working , press the **SET** button for 5S to enter the setting menu. Enter the setting menu, LCD shows the working mode icon is flashing. At this time, press the **UP** button or the **DOWN** button to operate the menu options. The working mode icon will change depending on the operation. When in the right menu option, press the setting button **SET** 3S to enter the setting parameters,(At this time, the working mode icon is not flashing, in the left parameter item is flashing.) Press the up or down button to select the setting parameter, press the STE button 3S to exit the setting.(At this time, the working mode icon flashes, and the parameter icon does not flash.) To exit the mode **(ESC)**, press the **SET** button 3S to enter the set parameters and then press the **SET** button 3S to exit the setting menu and save the settings, You need to press the shutdown key to set the parameters to save normally.

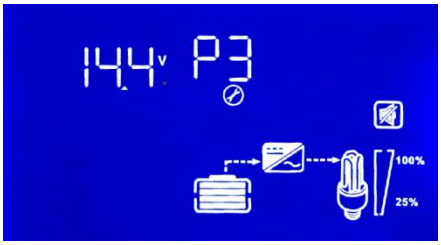
P0:Set work mode menu:
Press the SET button 3S to enter the setting menu, the menu selection icon is flashing. If need save and exit, press the SET button 3S to save and exit

P1: work mode setting:
01: Mains priority mode
02: Energy saving mode
03: Battery priority mode
04: Mains priority Unattended mode
05：Battery priority Unattended mode



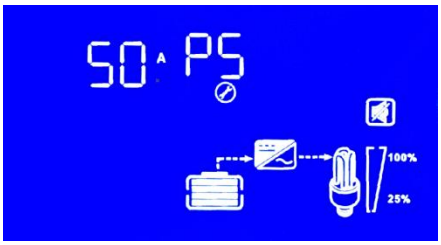
P2: Battery type and charging voltage setting:
SLD: lead-acid battery (default), GEL: gel battery, LI: lithium battery, USE: user mode. Select USE user mode to adjust battery voltage in P3 and P4 menus. If you do not select the USE user mode, the P3 and P4 menus will not appear.

``

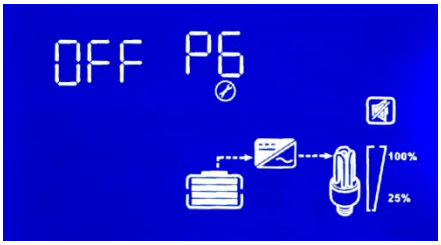


P3: Battery voltage uniform charge setting:
12.5V ～ 15.5V (single) can be set

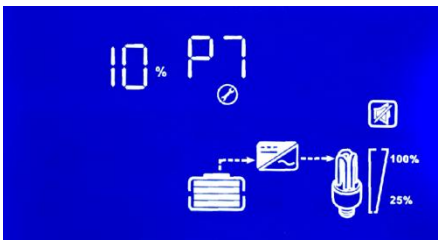
P4: Battery voltage floating charge setting:
12.5 ～ 13.9 (single) can be set



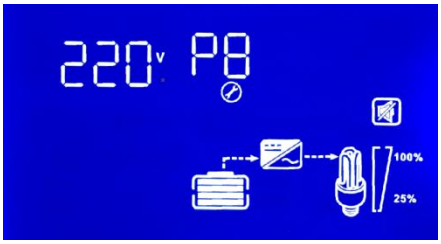
P5: Maximum mains charging current setting:
(Default **300W:10A 、 500W-1500W:15A 、 2000W：20A、3000W-12000W:50A**) 5A, 10A, 20A, 30A, 40A, 50A,



P6: Buzzer sound setting:
ON: Turn on the buzzer, OFF: Turn off the buzzer (overvoltage, under voltage, overload, over temperature, except faults)



P7: Energy saving mode AC output setting:
(10% default), in (USE) user mode， can be adjusted up and down 1.0-10% / 1%

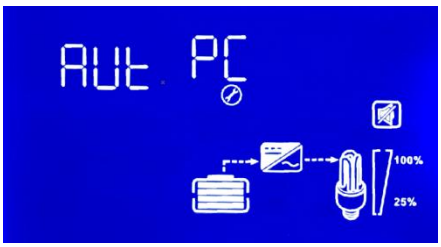


P8: Inverter output voltage setting:
220V default, (208V, 210V, 220V, 230V, 240V)

P9: AC Output frequency setting:
50Hz default, (50Hz, 60Hz)

PA: battery priority mode battery under voltage to mains voltage setting:
10.5V default, (single section: 10.5V, 10.6V, 10.7V, 10.8V, 10.9V, 11.0V, 11.1V, 11.2V, 11.3V, 11.5V)

PB: battery priority mode, when battery voltage is restored inverter from city power conversion inverter voltage:
13.2V default, (single battery: 13.2V, 13.3V, 13.4V, 13.5V, 13.7V, 13.9V, 14.1V, 14.4V)

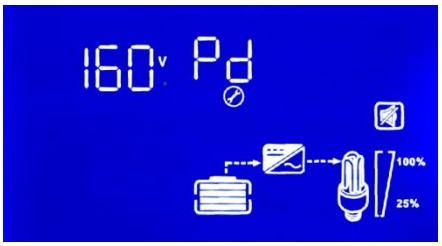


PC: battery priority mode, mains is charged or not:
AUOT default, ON (battery priority with AC charging), OFF (battery priority without AC charging), Automatic detection solar priority or city power priority, select solar charging, the mains will charge when the solar charging current is small) The specific charging method is as follows:

The relationship between solar charging and mains charging:	
Solar charging current	Mains charging current (* maximum set charging current)
40A	0%
30A	20%

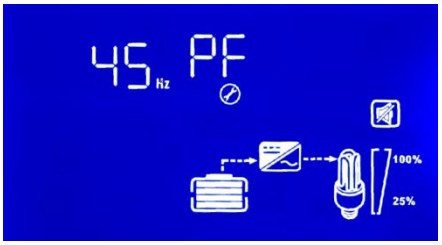
``

20A	40%
10A	60%
5A	80%
0	100%



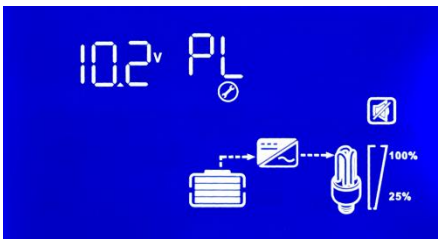
Pd: AC input lowest voltage setting:
Default 160VAC, (140V, 150V, 160V, 170V, 180V)

PE: AC input highest voltage setting:
Default 275V, (260V, 265V, 270V, 275V, 280V , 285V, 290V)



PF: AC input minimum frequency setting:
Default 45Hz, (40Hz, 41Hz, 42Hz, 43Hz, 44Hz, 45Hz

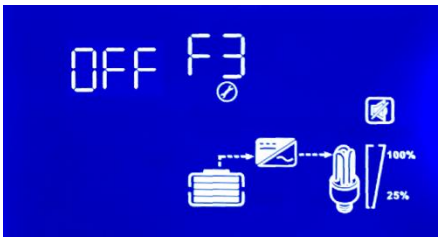
PH: AC input maximum frequency setting:
Default 63Hz, (63Hz, 64Hz, 65Hz)



PL: Battery low voltage shutdown setting:
(must : Pn>PL>F4)
10.2V default,9.5V ～ 12.0V (single) can be set

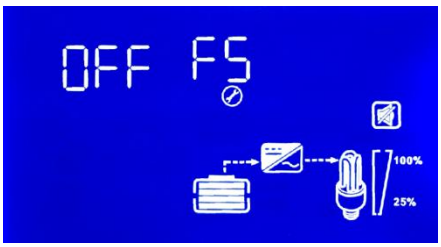
``

Pn: unattended mode, battery under voltage restores the startup voltage setting:**(must : Pn>PL>F4)**
12.4V default,11.0V ～ 13.0V (single) can be set

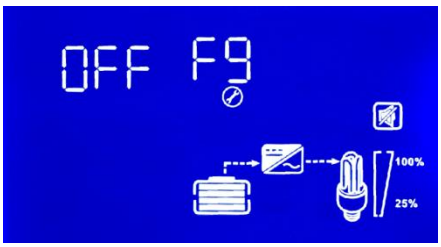


F3: Generator mode setting:
Default OFF (ON \ OFF)

F4: Unattended mode battery voltage low power off power point setting: **(must : Pn>PL>F4)**
Default single section 10.0V (9.0V-12.0V can be set)



F5: Fan failure detection settings:
Default single block OFF (ON, OFF)



F9: Negative temperature detection setting:
The default OFF, (ON, OFF) When the temperature is below -15 ℃ use the machine, please turn on this setting (ON)

8.Product care and maintenance

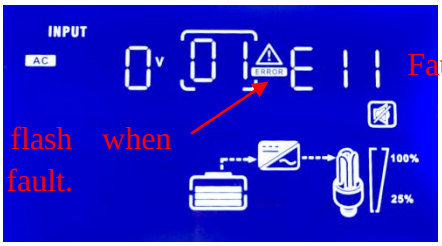
8.1. This series of inverters just need less maintenance. The standard battery type is valve-regulated lead-acid battery, Need to keep charging often to extend battery life. When the inverter is connected to the mains, whether it is on or off, it still keep charging the battery, and provides overcharge and over discharge protection.

8.2. If the inverter is not used for a long time, need to charge it every four to six months. Charge the battery for 4-6 hours before use.
8.3. Normally , the battery life is three to five years. If there is a problem with the battery, it must be replaced early. When replacing the battery, it must be operated by professionals.
8.4. It is not recommended to replace the battery individually. When replacing, should follow the battery supplier's operating instructions.
8.5.Normally, the battery is charged and discharged every four to six months, and start charged after discharging off, the charging time of the standard machines should not be less than 12 hours.
8.6. In high temperature areas, the battery is charged and discharged every two months, the standard machine charge should not be less than 12 hours.
note:
*Before replacing the battery, you must cut off all power connected to the machine: mains switch, battery switch, etc.
*Take off metal objects such as rings and watches.
*Use tool as handles and screwdrivers. Do not put tools or other metal objects on the battery.
* It is normal for a small spark when connecting the battery cable, but will not harm human safety and inverter.
Note: Do not short the battery positive and negative, can't connection reverse battery.

9. Fault code and repair

◆ This icon 

will flash when there is a fault.



Fault code display

it will flash when there is a fault.

``

9.1. Fault codes and maintenance

Cause of fault	Buzzer or indicator	Fault cause	Solution
E01		Battery low voltage	Check the battery is broken or not
E02	1 long 2 short B-BB shout, red light is off	Battery overvoltage	Check the battery is broken or not
E03	Buzzer urgent shouting, the red light lighting	Battery low voltage	Check the battery is broken or not
E04	Intermittent ringing, red light is off	Transformer secondary line reverse connection	Restart or contact the supplier
E05	Keep shouting, red light keep lighting	Inverter startup failure	Check output have short circuit、overload or not
E06	Keep shouting, red light keep lighting	Output for short circuit	Check output have short circuit、overload or no
E07	Keep shouting, red light keep lighting	Output voltage is too low or overloaded	Check output voltage and load
E08	Keep shouting, red light keep lighting	Temperature is too high	Check the fan is working
E09	Output Low voltage		
E10			
E11	Keep shouting, red light keep lighting	Low temperature or temperature control failure	Check the temperature control lines are not open circuit , dropped
E12			
E13			
E14	Keep shouting, red light off	Fan open circuit	Check the fan are not open circuit , dropped
E15		Input relay short circuit	Tap the input relay to check it broken or not
ES0	Displayed when press the controller display page	Controller work well	Controller work well
ES3	Displayed when press the controller display page	Controller over current	Internal fault
ES4	Displayed when press the controller display page	Controller temperature high	Internal fault

``

ES5	Displayed when press the controller display page	Solar input overvoltage	Check Solar input voltage and correct number of solar panels
ES6	Displayed when press the controller display page	Solar input low voltage	Check Solar input voltage and solar panels not have damaged

9.2. buzzer alert

Buzzer sound:
1) Inverter: A beep sounds every 10 seconds. 10S --- 10S ---
2) When the battery voltage is low, one sound per second. --1S--1S--
3) When the battery is high voltage: three sound every four seconds, one long and two short. 4S ------
4) Overload:
> 110% long sound. ----
> 105% sound every two seconds. 2S --- 2S ---
5) Temperature control failure: 2 sound every 4 seconds 4S-- --4S---
6) The temperature is too high: sound every two seconds. 2 --- 2 ---
7) Fan abnormality: long sound ---

10. External communication

Support RS232, USB, SNMP communication

Appendix1.0001/0004/0005:

Mode		300W	500W	600W	700W	1000W	1200W	1500W(24V)
Rated power		300W	500W	600W	700W	1000W	1200W	1500W(24V)
Input	voltage	145VAC-275VAC						
	Frequency	45-65Hz(Mains mode)			50/60Hz±1%(Battery Mode)			
Output	Voltage	AC 110/120/220/230/240V±15%(Mains mode)			AC 110/120/220/230/240V±2%(Battery Mode)			
Output waveform		Pure sine wave						
Efficiency		>85%						
Type of battery		Optional						
Battery rated voltage		12V/24V						
AC charging current （MAX）		300W:10A（MAX）can be set 5-10A			500W-1500W15A（MAX）can be set 5-10-15A			
Protection		Overload, short circuit, battery high and low voltage, AC input high and low voltage protection						
Conversion method		Interactive						
Overload capacity		Overload 110-120%, the output will turned off after 30S.Overload 160%, the output will turned off after 30ms.						
Solar charger controller	Type	PWM solar charger controller			MPPT solar charger controller			
	Current	10A～30A			20A～30A			
	PV input（max)	12V:22V/24:45V(MAX)			12V/24:80V(MAX)			
	Input power(max)	12V:10A:120W/20A:240W/30A:360W(MAX)			12V:20A:240W/30A:360W(MAX)			
		24V:10A:240W/20A:480W/30A:720W(MAX)			24V:20A:480W/30A:720W(MAX)			
Communication port		RS232/USB/SNMP(Optional)						
working environment	temperature	-15℃～+50℃						
	Humidity	10%～90%						

Mode		500VA	700VA	800VA	1000VA	1200VA	1500VA	2000VA(24V)
Rated power		500VA	700VA	800VA	1000VA	1200VA	1500VA	2000VA
Input	voltage	145VAC-275VAC						
	Frequency	45-65Hz(Mains mode)				50/60Hz ±1%(Battery Mode)		
Output	Voltage	AC 110/120/220/230/240V ±15%(Mains mode)				AC 110/120/220/230/240V ±2%(Battery Mode)		
Output waveform		Pure sine wave						
Efficiency		>85%						
Type of battery		Optional						
Battery rated voltage		12V/24V						
AC charging current （MAX）		300W:10A（MAX）can be set 5-10A				500W-1500W15A（MAX）can be set 5-10-15A		
Protection		Overload, short circuit, battery high and low voltage, AC input high and low voltage protection						
Conversion method		Interactive						
Overload capacity		Overload 110-120%, the output will turned off after 30S.Overload 160%, the output will turned off after 30ms.						
Solar charger controller	Type	PWM solar charger controller				MPPT solar charger controller		
	Current	10A～30A				20A～30A		
	PV input（max)	12V:22V/24:45V(MAX)				12V/24:80V(MAX)		
	Input power(max)	12V:10A:120W/20A:240W/30A:360W(MAX)				12V:20A:240W/30A:360W(MAX)		
		24V:10A:240W/20A:480W/30A:720W(MAX)				24V:20A:480W/30A:720W(MAX)		
Communication port		RS232/USB/SNMP(Optional)						
working environment	temperature	-15℃～+50℃						
	Humidity	10%～90%						

Appendix1.0002-0003/0005：

Mode		1000W	1500W	2000W	3000W	4000W	5000W	6000W	7000W	8000W	10000W	12000W
Rated power		1000W	1500W	2000W	3000W	4000W	5000W	6000W	7000W	8000W	10000W	12000W
Input	voltage	170VAC-275VAC										
	Frequency	45-63Hz(Mains mode)					50/60Hz ±1%(Battery mode)					
Output	Voltage	AC 110/120/220/230/240V ±2%(Battery mode)			AC 110/120/220/230/240V ±15%(Mains mode)				AC 170-275V(Mains mode)			
Output waveform		**Pure sine wave**										
Efficiency		>85%										
Type of battery		Optional										
Battery rated voltage		12/24/48VDC			24/48/96VDC				48/96VDC			
AC charging current（MAX）		20A（MAX）can be set 5-10-20A					50A（MAX）can be set 5-10-20-30-40-50A					
Protection		Overload, short circuit, battery high and low voltage, AC input high and low voltage protection										
Conversion method		Interactive										
Overload capacity		Overload 110-120%, the output will turned off after 30S.Overload 160%, the output will turned off after 30ms.										
Solar charger controller	Type	PWM solar controller					MPPT solar controller					
	Current	10A～60A					10A～120A					
	PV input（max)	12V:22V/24:45V/48:75V/96V:145V(MAX)					12V/24:80V/48:150V/96V:280V (MAX)					
	Input power(max)	12V:10A:120W/20A:240W/30A:360W/50A:600W/60A:720W/80A:960W/100A:1200W/120A:1440W (MAX)										
		24V:10A:240W/20A:480W/30A:720W/50A:1200W/60A:1440W/80A:1920W/100A:2400W/120A:2880W (MAX)										
		48V:10A:480W/20A:960W/30A:1440W/50A:2400W/60A:2880W/80A:3840W/100A:4800W/120A:5760W (MAX)										
		96V:40A:3600W/50A:4000W/60A:5400W/80A:7200W/100A:9600W/120A:11520W (MAX)										
Communication port		RS232/USB/SNMP(Optional)										
working environment	temperature	-15℃～+50℃										
	Humidity	10%～90%										

Mode		1000VA	1500VA	2000VA	3000VA	4000VA	5000VA	7000VA	8000VA	10000VA	12000VA	15000VA
Rated power		1000VA	1500VA	2000VA	3000VA	4000VA	5000VA	7000VA	8000VA	10000VA	12000VA	15000VA
Input	voltage	170VAC-275VAC										
	Frequency	45-63Hz(Mains mode)						50/60Hz ±1%(Battery mode)				
Output	Voltage	AC 110/120/220/230/240V ±2%(Battery mode)				AC 110/120/220/230/240V ±15%(Mains mode)			AC 170-275V(Mains mode)			
Output waveform		**Pure sine wave**										
Efficiency		>85%										
Type of battery		Optional										
Battery rated voltage		12/24/48VDC				24/48/96VDC			48/96VDC			
AC charging current（MAX）		20A（MAX）can be set 5-10-20A						50A（MAX）can be set 5-10-20-30-40-50A				
Protection		Overload, short circuit, battery high and low voltage, AC input high and low voltage protection										
Conversion method		Interactive										
Overload capacity		Overload 110-120%, the output will turned off after 30S.Overload 160%, the output will turned off after 30ms.										
Solar charger controller	Type	PWM solar controller						MPPT solar controller				
	Current	10A～60A						10A～120A				
	PV input（max)	12V:22V/24:45V/48:75V/96V:145V(MAX)						12V/24:80V/48:150V/96V:280V (MAX)				
	Input power(max)	12V:10A:120W/20A:240W/30A:360W/50A:600W/60A:720W/80A:960W/100A:1200W/120A:1440W (MAX)										
		24V:10A:240W/20A:480W/30A:720W/50A:1200W/60A:1440W/80A:1920W/100A:2400W/120A:2880W (MAX)										
		48V:10A:480W/20A:960W/30A:1440W/50A:2400W/60A:2880W/80A:3840W/100A:4800W/120A:5760W (MAX)										
		96V:40A:3600W/50A:4000W/60A:5400W/80A:7200W/100A:9600W/120A:11520W (MAX)										
Communication port		RS232/USB/SNMP(Optional)										
working environment	temperature	-15℃～+50℃										
	Humidity	10%～90%										