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1 Manual Description

1.1 Purpose

This manual mainly describes the equipment from assembly, installation, operation to troubleshooting. To ensure the normal operation of the device, read the user manual carefully before installation and use.

1.2 Scope of Application

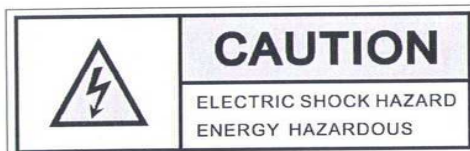
This manual provides you with safe installation instructions and information on the tools and wiring to use.



2. Safety precautions

Warning: This chapter contains important safety and operational instructions. Read and save this manual for future reference.

1. Read the warning labels and battery specifications carefully before installing and using the device.
2. In order to reduce operational risks, it is recommended to use deep-cycle lead-acid rechargeable batteries. Other types of batteries increase the safety risk of operation.
3. Do not disassemble the equipment. If you need to repair and maintain the equipment, please go to the designated maintenance center. Improper operation may lead to electric shock and even fire.
4. To reduce the risk of electric shock, disconnect all electrical circuits before repair and maintenance.
5. Warning: The battery must be installed by professional technicians.
6. Never charge a non-rechargeable battery.
7. In order to maximize the function and efficiency of the product, please configure the cable according to the cable type specified in the product.
8. Please use metal tools with caution when loading and unloading to avoid short circuit and explosion caused by metal conductors.
9. When you want to disconnect the mains and battery for installation, follow the installation instructions.
10. The fuse is to provide overcurrent protection for the battery.
11. Equipment grounding requirements: Please select a place where the ground wire is permanently fixed and connected for product wiring!
12. Do not short circuit AC output and DC input. When the DC input is short-circuited, do not connect the power supply.
13. Warning! Only qualified service personnel can service the equipment. If the error persists after the troubleshooting table, take the device back to your local dealer or repair center for maintenance.



CAUTION:
HIGH LEAKAGE CURRENT,
EARTH CONNECTION
ESSENTIAL BEFORE
CONNECTING SUPPLY

3 Introduction

This is a multi-functional inverter/charger that combines the functions of the inverter, solar charger and battery charger to provide uninterruptible power for electrical equipment, light and easy to transport. Its comprehensive LCD display offers customized and user-friendly push-button operations (e.g., battery charging current, mains/solar charging priority, and acceptable input voltages based on different applications).

3.1 Features

1. Pure sine wave output inverter
2. Select the mains input voltage range on the LCD panel as required by the load (household appliance/personal computer)
3. Set the battery charging current on the LCD screen as required
4. Set the mains/solar priority input mode on the LCD
5. Compatible with mains and generator inputs
6. Automatic restart when the mains is restored
7. Overload, high temperature, short circuit protection.
8. Intelligent battery charging design makes the battery more fully utilized.
9. Cold start function.

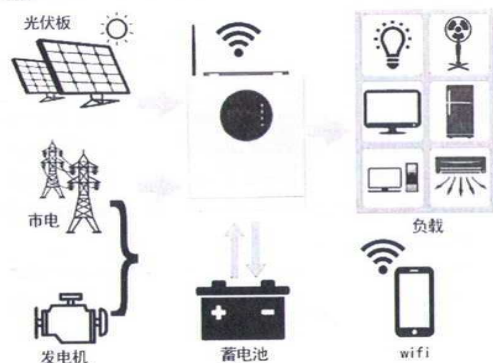
3.2 Basic Structure

The following illustration shows the basic structure of solar inverter operation. A complete operating system with the following devices:

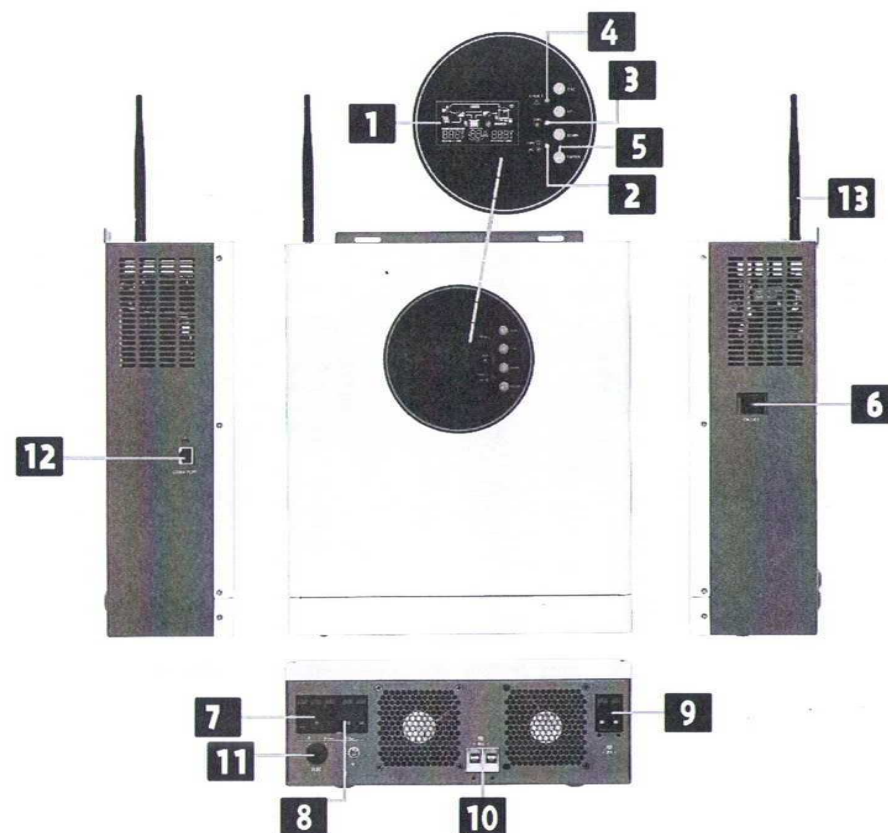
- Generator or mains.
- Solar module.

Depending on your needs, you can consult with the system integrator to configure other feasible system architectures.

This solar inverter can drive a variety of household appliances and office equipment, such as: electric fans, lights, air conditioners, refrigerators, computers and so on.



3.3 Product introduction



1. LCD display
2. Status indication
3. Charging instructions
4. Fault indication
5. Function keys
6. Power on and off
7. Mains input
8. Mains output
9. Solar input
10. Input the battery
11. Circuit Breakers
12. RS-232 communication interface
13. Antenna

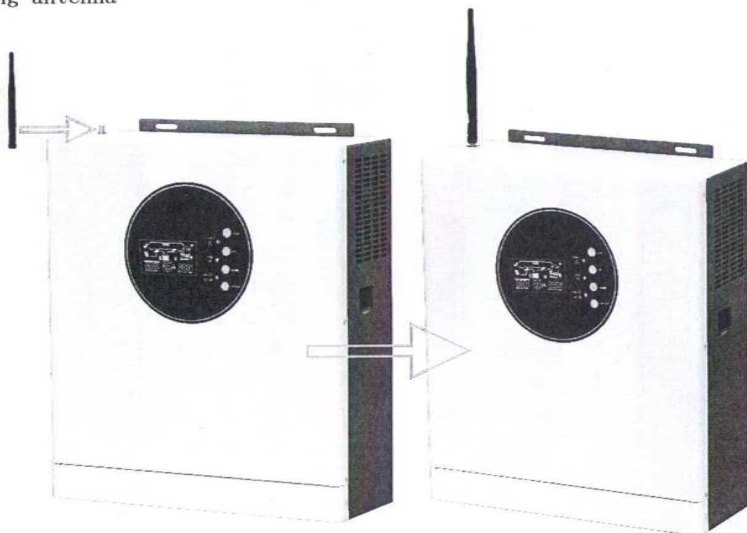
4. Install

4.1 Unpacking Inspection

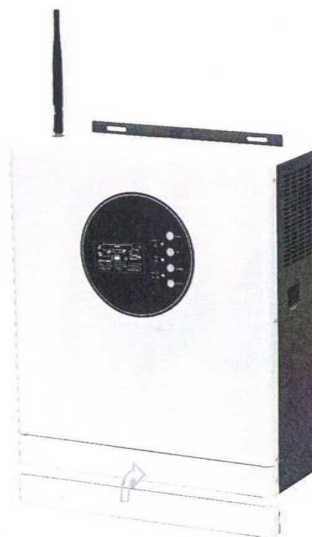
Before installation, please check the packaging carefully for damage to see if the item is complete.

4.2 Preparing for Installation

Mounting antenna



Before connecting all wiring, remove the two screws, as shown below, and remove the bottom cover.



4.3 Installing Devices

Consider the following points before choosing a suitable installation location:

1. Do not install the inverter on flammable building materials;
2. Install on a solid surface;
3. The height of the inverter should be fixed at eye level to view the display data above the LED;
4. Leave a gap of 20-50 cm for ventilation and heat dissipation of the equipment;
5. The temperature of the equipment working environment should be 0-55°C;
6. The installation position is best against the wall vertically downwards, leaving a certain space with the ground.

4.4 Battery Connection

Caution: For safe operation and regulatory compliance, it is required to install a separate DC overcurrent protection switch or disconnect the device between the battery and the inverter. Some appliances that may not require a circuit breaker should also be equipped with an overcurrent protection switch. According to the required fuse and.

For switch dimensions, please refer to the general current (A) data in the table below.

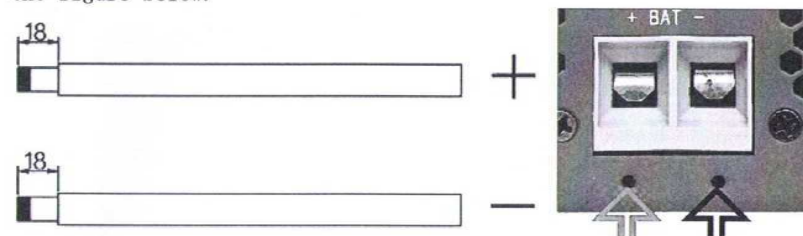
Warning: All wiring work must be operated by specialized technicians.

Warning: The use of appropriate cables to connect the battery is very important for the safe and efficient operation of the system. To reduce the risk of injury, please use the appropriate recommended cables below.

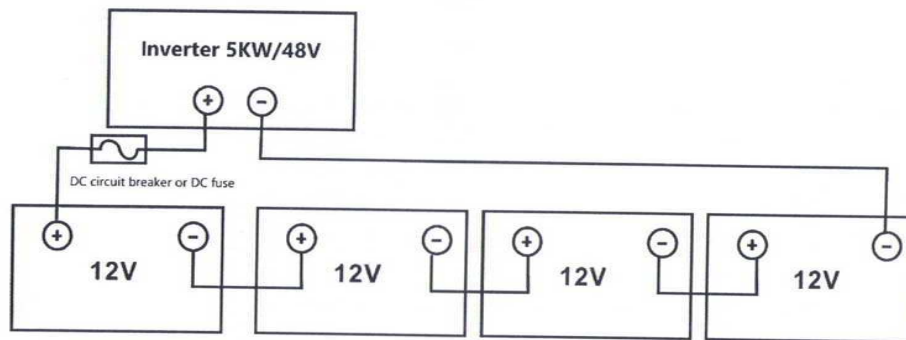
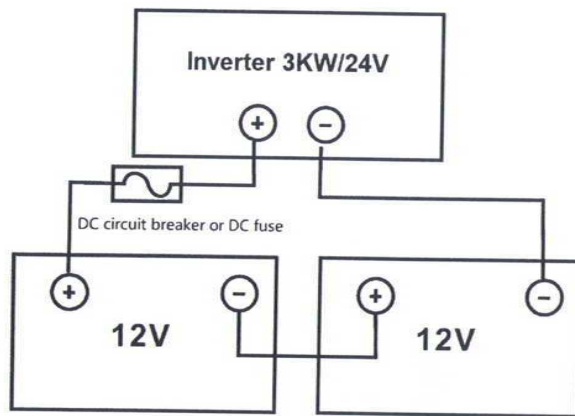
Model number	Wire size	Cable (MM2)	Torque value (max)
2KW/3KW/5KW	1 x 2AWG	35	2 Nm

Follow these steps to achieve battery connection:

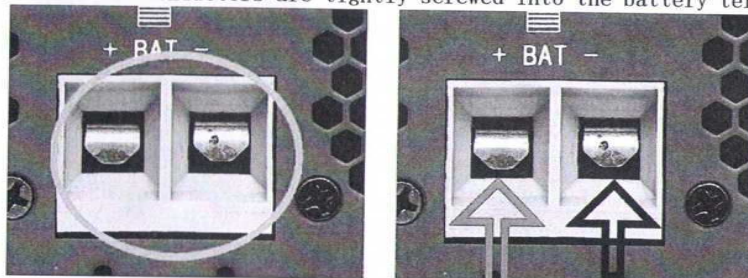
1. Remove 18 mm of the positive and negative conductor insulation tubes.
2. It is recommended to place the cable hoop at the end of the positive and negative wires with the correct crimping tool.
3. Fix the strain relief plate to the inverter with the fixing screws shown in the figure below.



4. Connect all battery packs in the following table:



5. Insert the battery conductor smoothly into the battery connector of the inverter, and ensure that the bolt is tightly tightened. Torque is 2 nanometers clockwise. Make sure the battery and inverter/charge polarity are properly connected and the conductors are tightly screwed into the battery terminals.



To securely connect the wire, you can secure the wire to the cable tie.



Warning: Impact hazard

Due to the high battery voltage, it must be installed carefully.

4.5 Ac input/output connection



Attention! Before making a final DC connection or turning off the DC circuit breaker/isolation switch, ensure that the positive (+) must be connected to the positive (+) and the negative (-) must be connected to the negative (-).

Alert! Install a separate AC circuit breaker between the inverter and the AC input before connecting to the AC input power.

This will ensure that the inverter can be safely disconnected during maintenance and is fully protected from excessive AC input. The recommended AC circuit breaker specifications are 3A for 3kVA and 50A for 5kVA.

Warning! The two terminals are marked with "IN" and "OUT" respectively. Be careful not to misconnect the input and output connectors

Alert! All wiring work must be operated by specialized technical personnel.

Alert! In order to reduce the risk of use, please select the cable specifications specified in the following table:

Model number	gauge	Cable (mm ²)	Torque value
1.2KW	14AWG	2	1.2 Nm
2KW/3KW	12 AWG	4	1.2 Nm
5KW	10 AWG	6	1.2 Nm

Follow these steps for a mains input/output connection:

Follow these steps for a mains input/output connection:

1. Before connecting AC input and output, turn on the DC protector or isolation switch.

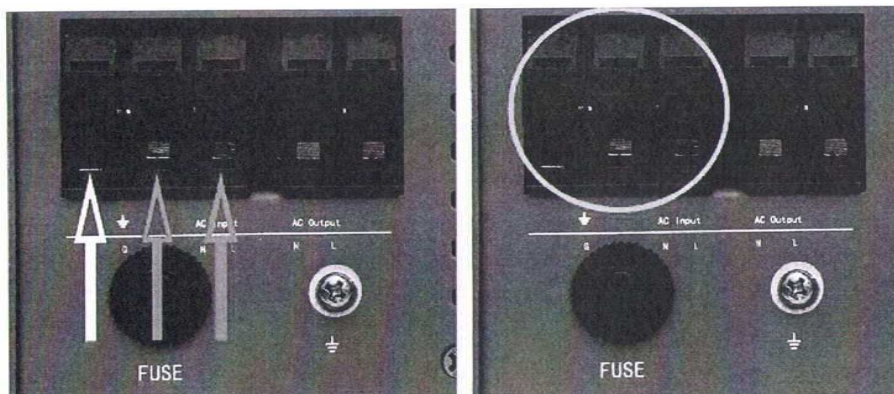
2. Remove 10mm of the insulation bushings of the six conductors. Shorten the L phase and neutral conductor N by 3 mm.

3. Connect the mains input cable according to the polarity of the terminal and tighten it with screws. Install the PE protection cable first.

→E→ Ground wire

L→ Fireline

N→ zero line



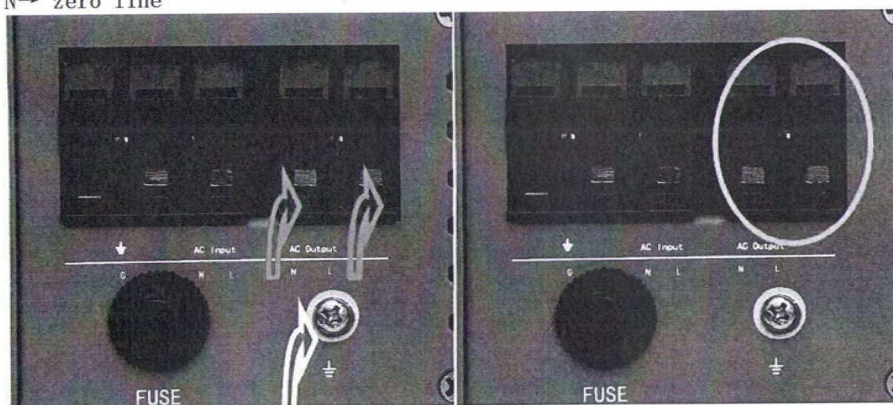
Warning: Make sure the mains is disconnected before connecting the device with a wire.

4. Then, connect the mains output line according to the polarity of the terminal and tighten the screws. First make sure you have a PE protective conductor () installed.

→E→ Ground wire ()

L→ Fireline

N→ zero line



5. Recheck whether the cables are correctly connected.

Warning: Ensure that the polarity of the mains cable is connected correctly. If the live line and the neutral line are incorrectly connected, a short circuit will occur when the inverter is in parallel state. Electrical appliances such as air conditioners need at least 2 to 3 minutes to restart. Because it takes a certain amount of time to balance the cooling gas inside the circuit. If the power short circuit occurs immediately restart will cause damage to the electrical appliance. To prevent such damage, check with the air conditioning

manufacturer whether the appliance has a delay function before installation. Otherwise, the inverter will have an overload failure, and the output will be cut off to protect the electrical input, which will inevitably cause certain damage to the air conditioner

4.6 Solar Connection

Warning: Install a separate protection switch between the inverter and the solar module before connecting the solar module.

Caution: All wiring work must be performed by specialized technicians to ensure safety and efficient operation of the equipment, please use cables that meet specifications to connect the solar module.

Warning: To reduce the risk of operation, please select the cable specifications specified in the following table:

Model number	gauge	Cable (mm ²)	Torque value
2KW/3KW/5KW	1x12AWG	4/6	1.2Nm

Before choosing the right solar module, please refer to the following requirements:

1. The open circuit voltage (Voc) of the solar module does not exceed the maximum open circuit voltage of the inverter.
2. The open circuit voltage (Voc) of the solar module should be higher than the minimum battery voltage.

Model number	2KW	3KW	5KW
Maximum open circuit voltage of photovoltaic	500VDC		
MPPT PV input voltage range	120VDC-450VDC		

The following is an example of the 300Wp solar panel configuration system. After taking the above two parameters into account, the recommended configuration is as follows:

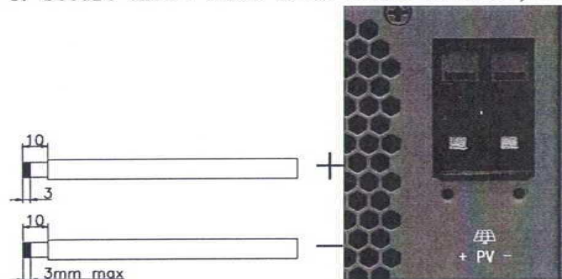
Photovoltaic panel reference specifications - 300Wp - Vmp: 34Vdc - Imp: 8.3A - Voc: 42Vdc - Isc: 8.7A	Photovoltaic input (最小串联数: 6片, 最大串联数: 11片)	quantity	Total input power	Total open circuit voltage
	6 pcs Series connection	6pcs	1800W	252vdc
	7 pcs Series connection	7pcs	2100W	294vdc
	8 pcs Series connection	8pcs	2400W	336vdc
	9 pcs Series connection	9pcs	2700W	378vdc
	10 pcs Series connection	10pcs	3000W	420vdc
	11 pcs Series connection	11pcs	3300W	462vdc
	6 pcs Series connection, 2 parallel groups	12pcs	3600W	252vdc
	7 pcs Series connection, 2 parallel groups	14pcs	4200W	294vdc
	8 pcs Series connection, 2 parallel groups	16pcs	4800W	336vdc
	9 pcs Series connection, 2 parallel groups	18pcs	5400W	378vdc
	10 pcs Series connection, 2 parallel groups	20pcs	6000W	420vdc
	11 pcs Series connection, 2 parallel groups	22pcs	6600W	462vdc

Note: Total solar input voltage = Voc*(total in series) must be ≤ 495Vdc.

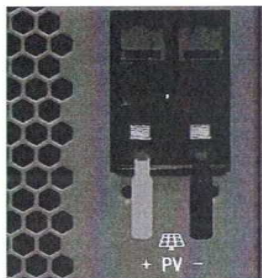
Equipment assembly

Follow these steps to achieve PV module connection:

1. Remove 10 mm of the positive and negative conductor insulation tubes.
2. It is recommended to place the cable hoop at the end of the positive and negative wires with the correct crimping tool.
3. Secure the PV cable cover to the inverter, as shown in the following figure.

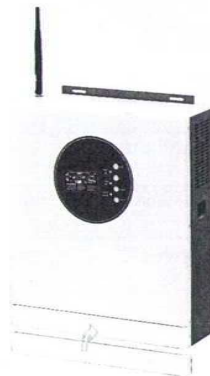


4. Check that the cables to the secondary PV module and the PV input connector are of correct polarity. Then, connect the positive terminal (+) of the connecting wire to the positive terminal (+) of the PV input connector. Connect negative (-) Connect wire to negative (-) PV input connector. Tighten the two lines clockwise.



4.7 Device Assembly

After connecting all the cables, tighten the bottom cover with the following two screws.

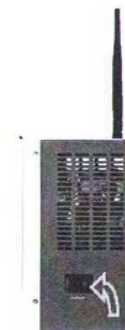


4.8 APP Monitoring

Scan the QR code, download and install the APP from the APP store or website, follow the steps in the manual, set up an Internet connection and register an account. After the connection is successful, the user can view and set the working state of the inverter in the mobile APP.

5 Operation

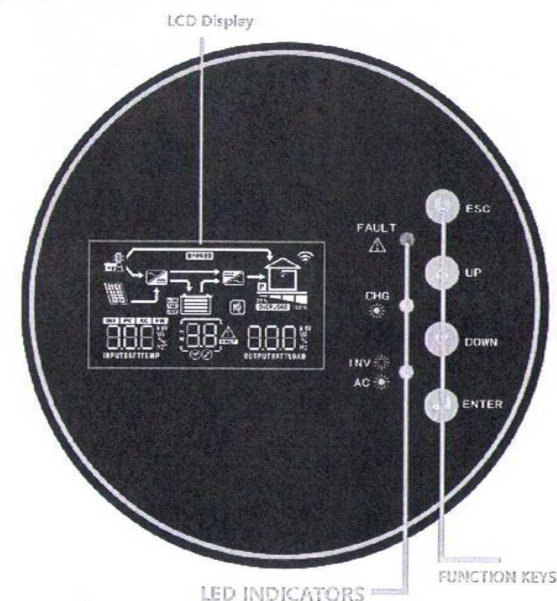
5.1 Power on/off



Once the device is installed and the battery is connected, you can turn the device on by pressing the power switch.

5.2 Running the Display Panel

As shown in the figure, the running display board is located on the front board of the inverter. It contains three indicators, four function keys and an LCD display screen, which is used to display equipment running status indication, input and output power information.



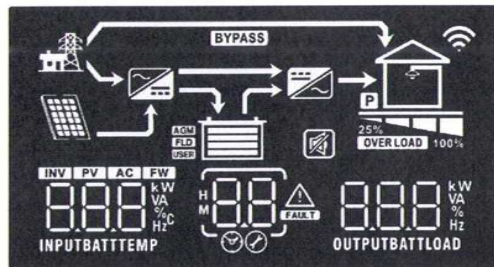
LED indicator sign

LED indicator			Indication information
AC / INV	Green	Solid On	Output is powered by utility in Line mode.
		Flashing	Output is powered by battery or PV in battery mode.
CHG	Green	Solid On	Battery is fully charged.
		Flashing	Battery is charging.
FAULT	Red	Solid On	Fault occurs in the inverter.
		Flashing	Warning condition occurs in the inverter.

Function Keys

Function Key	Description
ESC	To exit setting mode
UP	To go to previous selection
DOWN	To go to next selection
ENTER	To confirm the selection in setting mode or enter setting mode

5.3 LCD Display Icons



Icon	Function description
Input Source Information	
	Indicates the AC input.
	Indicates the PV input
	Indicate input voltage, input frequency, PV voltage, charger current (if PV in charging for 3K models), charger power, battery voltage.
Configuration Program and Fault Information	
	Indicates the setting programs.

	Indicates the warning and fault codes.	
Warning: 	flashing with warning code.	
Fault: 	lighting with fault code	
Output Information		
	Indicate output voltage, output frequency, load percent, load in VA, load in Watt and discharging current.	
Battery Information		
	1. Indicates battery type. 2. Indicates battery level by 0-24%, 25-49%, 50-74% and 75-100% in battery mode and charging status in line mode.	
In AC mode, it will present battery charging status.		
Status	Battery voltage	LCD Display
Constant Current mode / Constant Voltage mode	<2V/cell	4 bars will flash in turns.
	2 ~ 2.083V/cell	Bottom bar will be on and the other three bars will flash in turns.
	2.083 ~ 2.167V/cell	Bottom two bars will be on and the other two bars will flash in turns.
	> 2.167 V/cell	Bottom three bars will be on and the top bar will flash.
Floating mode. Batteries are fully charged.		4 bars will be on.
In battery mode, it will present battery capacity.		
Load Percentage	Battery Voltage	LCD Display
Load >50%	< 1.85V/cell	
	1.85V/cell ~ 1.933V/cell	
	1.933V/cell ~ 2.017V/cell	
	> 2.017V/cell	

Load < 50%	< 1.892V/cell	
	1.892V/cell ~ 1.975V/cell	
	1.975V/cell ~ 2.058V/cell	
	> 2.058V/cell	

Load Information

OVER LOAD	Indicates overload.			
	Indicates the load level by 0-24%, 25-49%, 50-74% and 75-100%.			
	0~24%	25~49%	50~74%	75~100%

Mode Operation Information

	Indicates unit connects to the mains.
	Indicates unit connects to the PV panel.
BYPASS	Indicates load is supplied by utility power.
	Indicates the utility charger circuit is working.
	Indicates the DC/AC inverter circuit is working.

Mute Operation

	Indicates unit alarm is disabled.
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Output Information

	Indicate output voltage, output frequency, load percent, load in VA, load in Watt and discharging current.
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Battery Information

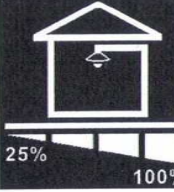
- 3.Indicates battery type.
- 4.Indicates battery level by 0-24%, 25-49%, 50-74% and 75-100% in battery mode and charging status in line mode.

In AC mode, it will present battery charging status.

Status	Battery voltage	LCD Display
Constant Current mode / Constant Voltage mode	<2V/cell	4 bars will flash in turns.
	2 ~ 2.083V/cell	Bottom bar will be on and the other three bars will flash in turns.
	2.083 ~ 2.167V/cell	Bottom two bars will be on and the other two bars will flash in turns.
	> 2.167 V/cell	Bottom three bars will be on and the top bar will flash.
Floating mode. Batteries are fully charged.		4 bars will be on.

In battery mode, it will present battery capacity.

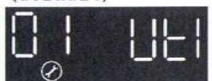
Load Percentage	Battery Voltage	LCD Display
Load >50%	< 1.85V/cell	
	1.85V/cell ~ 1.933V/cell	
	1.933V/cell ~ 2.017V/cell	
	> 2.017V/cell	
Load < 50%	< 1.892V/cell	
	1.892V/cell ~ 1.975V/cell	
	1.975V/cell ~ 2.058V/cell	
	> 2.058V/cell	

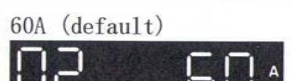
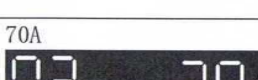
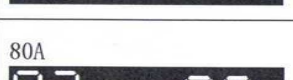
Load Information				
OVER LOAD	Indicates overload.			
	Indicates the load level by 0-24%, 25-49%, 50-74% and 75-100%.			
	0%~24%	25%~49%	50%~74%	75%~100%
				
Mode Operation Information				
	Indicates unit connects to the mains.			
	Indicates unit connects to the PV panel.			

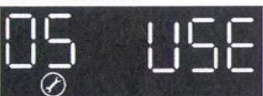
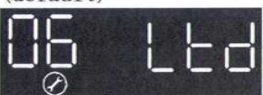
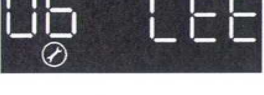
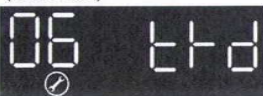
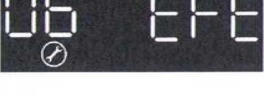
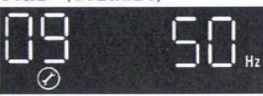
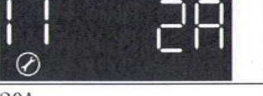
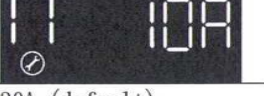
5.4 LCD Setting

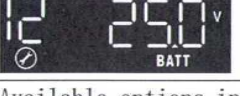
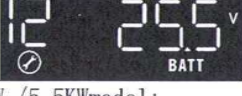
After pressing and holding ENTER button for 3 seconds, the unit will enter setting mode. Press “UP” or “DOWN” button to select setting programs. And then, press “ENTER” button to confirm the selection or ESC button to exit.

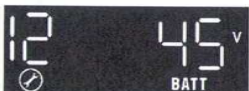
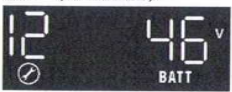
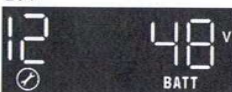
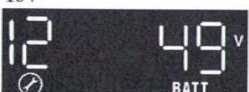
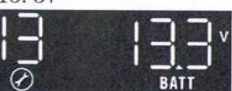
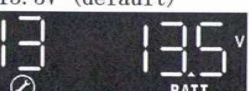
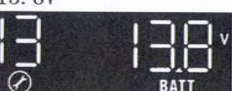
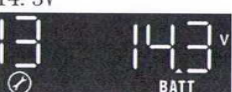
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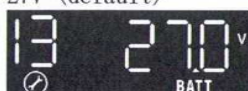
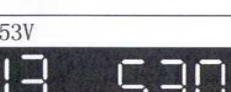
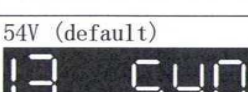
Program	Description	Selectable option	
00	Exit setting mode	Escape 	
01	Output source priority: To configure load power source priority	Utility first (default) 	Utility will provide power to the loads as first priority. Solar and battery energy will provide power to the loads only when utility power is not available.
		Solar first 	Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, battery energy will supply power the loads at the same time. Utility provides power to the loads only when any one

			condition happens: - Solar energy is not available - Battery voltage drops to low-level warning voltage or the setting point in program 12.
		SBU priority 	Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, battery energy will supply power to the loads at the same time. Utility provides power to the loads only when battery voltage drops to either low-level warning voltage or the setting point in program 12.
02	Maximum charging current: To configure total charging current for solar and utility chargers. (Max. charging current = utility charging current + solar charging current)	10A 	20A 
		30A 	40A 
		50A 	60A (default) 
		70A 	80A 
03	AC input voltage range	Appliances (default) 	If selected, acceptable AC input voltage range will be within 90-280VAC.

		UPS 	If selected, acceptable AC input voltage range will be within 170-280VAC.
05	Battery type	AGM (default) 	Flooded 
		User-Defined 	If "User-Defined" is selected, battery charge voltage and low DC cut-off voltage can be set up in program 26, 27 and 29.
06	Auto restart when overload occurs	Restart disable (default) 	Restart enable 
		Restart disable (default) 	Restart enable 
07	Auto restart when over temperature occurs		
09	Output frequency	50Hz (default) 	60Hz 
10	Output voltage	220V 	230V (default) 
		240V 	
11	Maximum utility charging current Note: If setting value in program	2A 	10A 
		20A	30A (default)

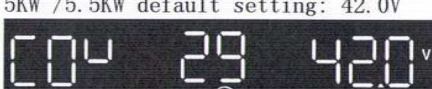
	02 is smaller than that in program in 11, the inverter will apply charging current from program 02 for utility charger.		
		40A 	50A 
		60A 	80A 
12	Setting voltage point back to utility source when selecting "SBU priority" or "Solar first" in program 01.	Available options in 1.2KW model:	
		11.0V 	11.3V 
		11.5V (default) 	11.8V 
		12.0V 	12.3V 
		12.5V 	12.8V 
		Available options in 2.4K/3KW model:	
		22.0V 	22.5V 
		23.0V (default) 	23.5V 
		24.0V 	24.5V 
		25.0V 	25.5V 
		Available options in 5KW /5.5KW model:	

13	Setting voltage point back to battery mode when selecting "SBU priority" or "Solar first" in program 01.	44V 	45V 
		46V (default) 	47V 
		48V 	49V 
		50V 	51V 
		Available options in 1.2KW model:	
		Battery fully charged 	12. 0V 
		12. 3V 	12. 5V 
		12. 8V 	13. 0V 
		13. 3V 	13. 5V (default) 
		13. 8V 	14. 0V 
		14. 3V 	14. 5V 
		Available options in 2.4K/3KW model:	
		Battery fully charged	24V

	
24. 5V 	25V 
25. 5V 	26V 
26. 5V 	27V (default) 
27. 5V 	28V 
28. 5V 	29V 
Available options in 5KW/5.5KW model:	
Battery fully charged 	48V 
49V 	50V 
51V 	52V 
53V 	54V (default) 
55V	56V

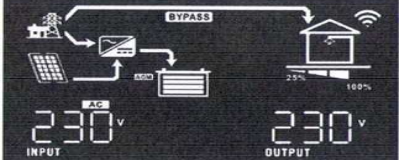
		57V 	58V
16	Charger source priority: To configure charger source priority	If this inverter/charger is working in Line, Standby or Fault mode, charger source can be programmed as below:	
		Utility first 	Utility will charge battery as first priority. Solar energy will charge battery only when utility power is not available.
		Solar first 	Solar energy will charge battery as first priority. Utility will charge battery only when solar energy is not available.
		Solar and Utility (default) 	Solar energy and utility will charge battery at the same time.
		Only Solar 	Solar energy will be the only charger source no matter utility is available or not.
		If this inverter/charger is working in Battery mode or Power saving mode, only solar energy can charge battery. Solar energy will charge battery if it's available and sufficient.	
18	Alarm control	Alarm on (default) 	Alarm off
19	Auto return to default display screen	Return to default display screen (default) 	If selected, no matter how users switch display screen, it will automatically return to default display screen (Input voltage /output voltage) after no button is pressed for 1 minute.

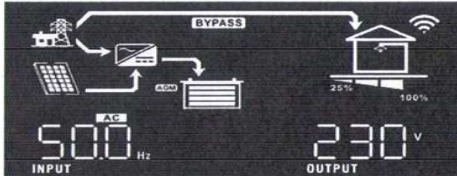
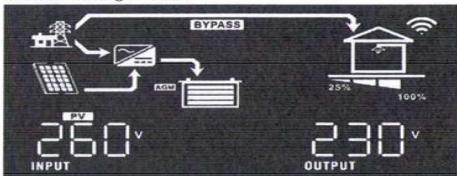
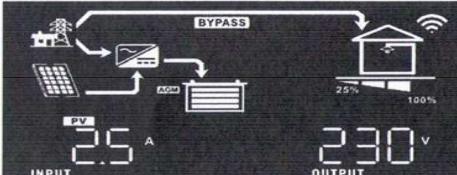
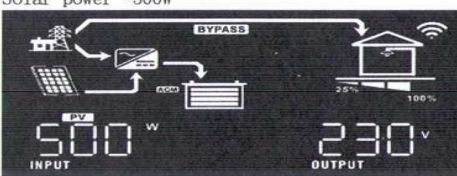
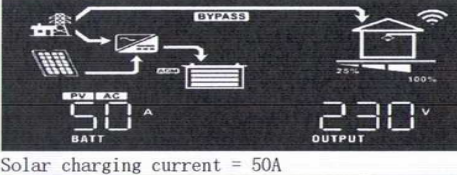
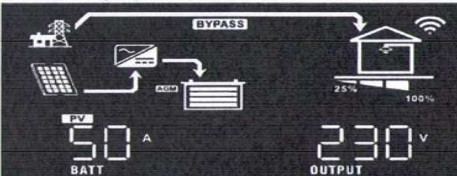
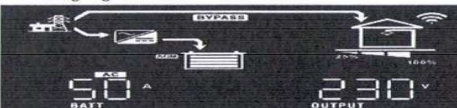
		Stay at latest screen 	If selected, the display screen will stay at latest screen user finally switches.
20	Backlight control	Backlight on (default) 	Backlight off
22	Beeps while primary source is interrupted	Alarm on (default) 	Alarm off
23	Overload bypass: When enabled, the unit will transfer to line mode if overload occurs in battery mode.	Bypass disable (default) 	Bypass enable
25	Record Fault code	Record enable (default) 	Record disable
26	Bulk charging voltage (C.V voltage)	1.2KW default setting: 14.1V 	
		2.4KW/3KW default setting: 28.2V 	
		5KW/5.5KW default setting: 56.4V 	
27	Floating charging	If self-defined is selected in program 5, this program can be set up. Setting range is from 12.0V to 15.5V for 1.2KW model, 25.0V to 31.5V for 2.4KW/3KW model and 48.0V to 61.0V for 5KW /5.5KW model. Increment of each click is 0.1V. 1.2KW default setting: 13.5V	

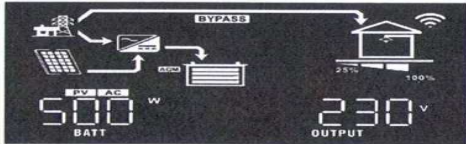
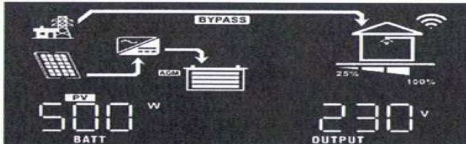
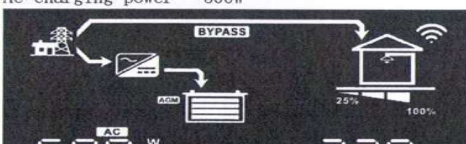
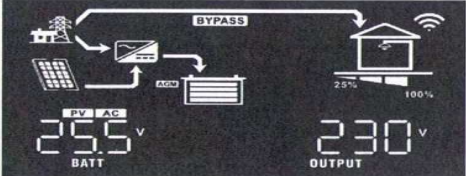
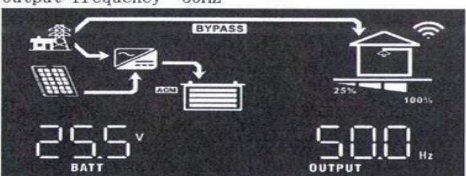
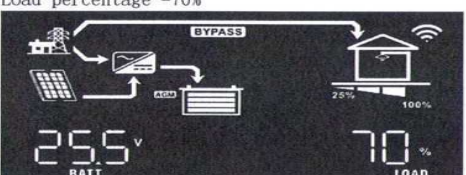
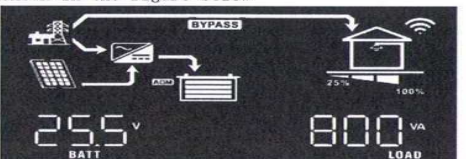
	voltage	
		2.4K/3KW default setting: 27.0V
		
		5KW /5.5KW default setting: 54.0V
29	Low DC cut-off voltage	
		If self-defined is selected in program 5, this program can be set up. Setting range is from 12.0V to 15.5V for 1.2KW model, 25.0V to 31.5V for 2.4KW/3KW model and 48.0V to 61.0V for 5KW /5.5KW model. Increment of each click is 0.1V.
		1.2KW default setting: 10.5V
		
	Low DC cut-off voltage	2.4KW/3KW default setting: 21.0V
		
		5KW /5.5KW default setting: 42.0V
	Low DC cut-off voltage	

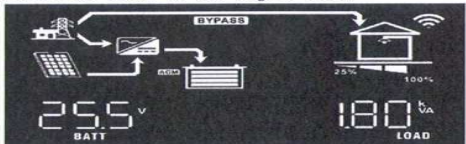
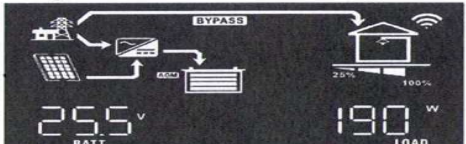
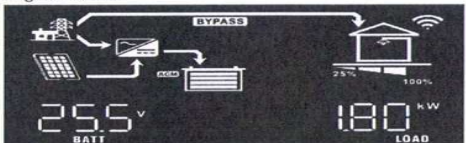
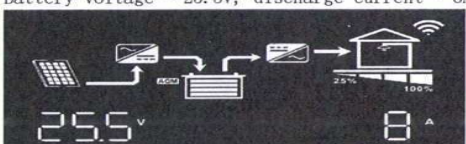
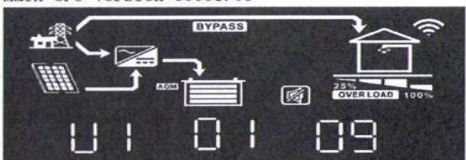
5.5 Display Setting

The LCD display information will be switched in turns by pressing “UP” or “DOWN” key. The selectable information is switched as below order: input voltage, input frequency, PV voltage, charging current, charging power, battery voltage, output voltage, output frequency, load percentage, load in Watt, load in VA, load in Watt, DC discharging current, main CPU Version.

Optional information	LCD display
Input/output voltage (default display)	Input voltage =230V, output voltage =230V 

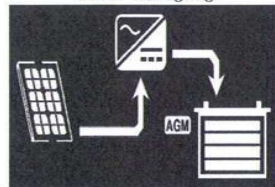
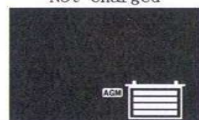
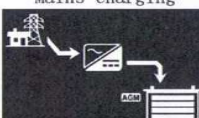
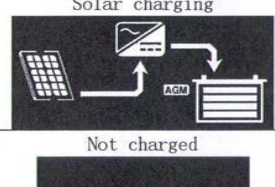
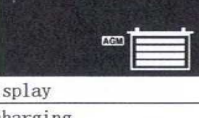
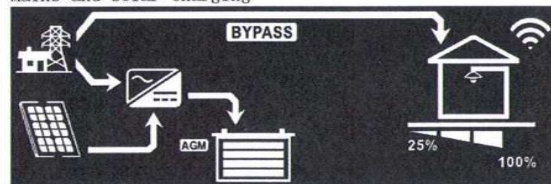
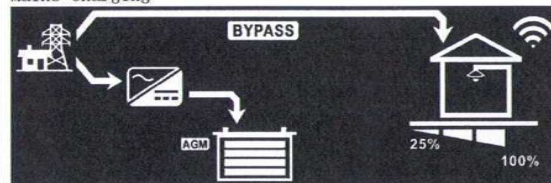
Input frequency	Input frequency =50HZ 
Solar voltage	Solar voltage =260V 
Solar current	Solar current =2.5A 
Solar power	Solar power =500W 
Charging current	Ac and solar charging current = 50A 
	Solar charging current = 50A 
	Ac charging current = 50A 

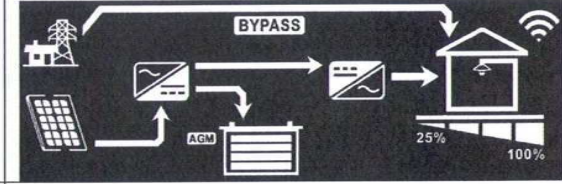
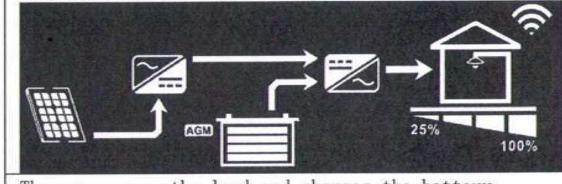
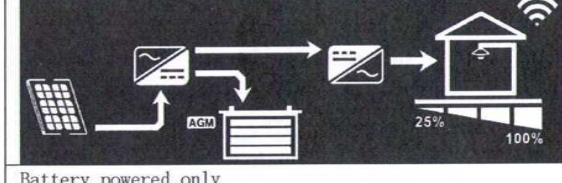
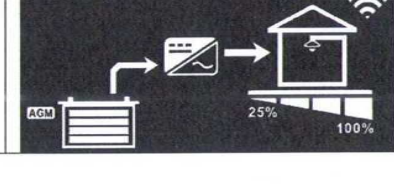
Charging power	Ac and solar charging power = 500W  Solar charging power = 500W  Ac charging power = 500W 
Battery voltage and output voltage	Battery voltage = 25.5V, output voltage = 230V 
Output frequency	Output frequency = 50Hz 
Percentage of load	Load percentage = 70% 
	When the connected load is less than 1kVA, the voltage and current of the load will appear as shown in the figure below 

Load apparent power display (unit: VA)	When the load is greater than or equal to 1kVA, the voltage and current of the load will present X.XKVA as shown in the figure below 
Load active power display (unit: W)	When the load is less than 1kW, the load wattage will present xxxW as shown in the figure below  When the load is greater than or equal to 1kW, the load wattage will appear X.XKW as shown in the figure below 
Battery voltage/DC discharge current	Battery voltage = 25.5V, discharge current = 8A 
Indicates the CPU version of the mainboard	Main CPU version 00001.09 

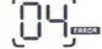
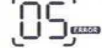
5.6 Operation mode description

Mode of operation	Description	Liquid crystal display
Standby mode/Power Saving mode Note: * Standby mode: The inverter is not turned on, but at this time, the inverter can	The inverter provides no	Mains and solar charging
		Mains charging

charge the battery without AC output. * Power Saving mode: If enabled, the inverter output will turn off when the connected load is very low or not detected	output, but can still charge the battery.	Solar charging  Not charged 
Fault Mode Note: * Fault mode: The error is caused by an internal circuit error or	Solar and mains electricity can power rechargeable batteries	市电和太阳能充电 
External causes, such as overheating, output short circuit, etc.		Mains charging 
		Solar charging 
		Not charged 
Mode of operation	Description	Liquid crystal display
Bypass mode	The mains supplies power to the load and charges the battery.	Mains and solar charging 
		Mains charging 
f "Solar priority" is selected as the output source		

		priority, and the solar energy is not enough to provide the load, the solar energy and the mains will supply power to the load and charge the battery at the same time. 
Inverter mode	The inverter will provide the output power of the battery and photovoltaic power supply.	Batteries and solar power supply the load  The sun powers the load and charges the battery.  Battery powered only 

5.7 Fault reference code

Fault code	Fault event	icon
01	When the inverter is disconnected, the fan is locked	
02	overtemperature	
03	High battery voltage	
04	The battery voltage is too low. Procedure	
05	The internal converter detects an output short-circuit or overtemperature	

06	Output overvoltage	
07	Overload timeout	
08	The bus voltage is too high	
09	The soft start of the bus fails. Procedure	
51	High current or power surge	
52	The bus voltage is too low	
53	The soft startup of the inverter fails. Procedure	
55	The DC voltage in the AC output is too large	
57	Current sensor failure	
58	The output voltage is too low	
59	Solar PV voltage exceeds the limit	

5.8 Alarm indicator

Warning code	Warning event	Audible alarm	icon
01	When the inverter starts, the fan is locked	The beep goes off three times per second	
03	Battery overcharge	The beep goes off once a second	
04	The battery is low. Procedure	The beep goes off once a second	
07	Over duty	The beep goes off every 0.5 seconds	
10	Output power derates	The beep goes off twice every three seconds	
15	Solar energy voltage is low	The beep goes off twice every three seconds	
EQ	Battery equalization	No buzz	

6. Operation mode description

Table 1 Mains mode specification

Model number	2KW	3KW	5KW
Input voltage waveform	Sine wave (mains/generator)		
Nominal Input Voltage	230Vac		
Low Loss Voltage	170Vac $\pm$ 7V (UPS); 90Vac $\pm$ 7V (Appliances)		
Low Loss Return Voltage	180Vac $\pm$ 7V (UPS); 100Vac $\pm$ 7V (Appliances)		
High Loss Voltage	280Vac $\pm$ 7V		
High Loss Return Voltage	270Vac $\pm$ 7V		
Max AC Input Voltage	300Vac		
Nominal Input Frequency	50Hz / 60Hz (Auto detection)		
Low Loss Frequency	40 $\pm$ 1Hz		
Low Loss Return Frequency	42 $\pm$ 1Hz		
High Loss Frequency	65 $\pm$ 1Hz		
High Loss Return Frequency	63 $\pm$ 1Hz		
Output Short Circuit Protection	Circuit Breaker		
Efficiency (Line Mode)	>95% (Rated R load, battery full charged)		
Transfer Time	10ms typical (UPS); 20ms typical (Appliances)		

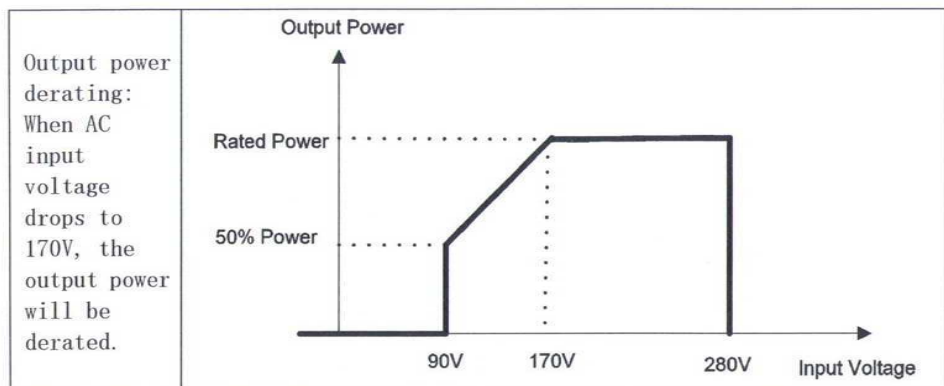


Table 2 Inverter mode specifications

Model number	2KW	3KW	5KW
Rated Output Power	2KW	3KW	5KW
Output Voltage Waveform	正弦波		
Output Voltage Regulation	230Vac $\pm$ 5%		
Output Frequency	50Hz		
Peak Efficiency	94%		
Overload Protection	5s@ $\geq$ 150% load; 10s@110%~150% load		
Surge Capacity	2* rated power for 5 seconds		
Nominal DC Input Voltage	24Vdc	48Vdc	
Cold Start Voltage	23.0Vdc	46.0Vdc	
Low DC Warning Voltage	23.0Vdc	46.0Vdc	
	22.0Vdc	44.0Vdc	
@ load < 50%	23.5Vdc	47.0Vdc	
	23.0Vdc	46.0Vdc	
@ load $\geq$ 50%	21.5Vdc	43.0Vdc	
	21.0Vdc	42.0Vdc	
Low DC Warning Return Voltage	32Vdc	62Vdc	
@ load < 50%	33Vdc	63Vdc	
@ load $\geq$ 50%	<30W	<40W	

Table 3 Charge Mode Specifications

Mains charging mode			
Model number	2KW	3KW	5KW
Charging mode	3 段式		
Maximum AC charging current (Max)	80Amp (@VI/P=230Vac)		60Amp (@VI/P=230Vac)
Maximum charging	Flooded batteries	29.2	58.4
	AGM		

voltage	separator lead-acid battery /Gel silica sol lead-acid battery	28.2	56.4
Floating charge voltage		27Vdc	54Vdc
Charging curve	Battery Voltage, per cell 2.43Vdc (2.35Vdc) 2.25Vdc <		

Table 4 General parameters

Model number	2KW	3KW	5KW
Operating temperature range	-10°C to 50°C		
Storage temperature	-15°C ~ 60°C		
humidness	5%~95% relative humidity (no condensation)		
Size: Length, width and height mm	260*111.2*368	309*116.2*366.8	309*116.2*427.8

7. Troubleshooting

breakdown	LCD/LED/ Buzzer	reason	solution
The device automatically shuts down during startup	LCD/LED and buzzer will sound for 3 seconds Back off	Low battery voltage ($< 1.91V/kWh$)	1. Recharge the battery 2. Replace the battery
No response after startup	No indication	1. Battery voltage is too low ($< 1.4V/kWh$) 2. The fuse is blown	1. Contact the maintenance center to replace the insurance wire 2. Charge the battery 3. Replace the battery
Mains supply is normal, but the device is operating in battery mode	The input voltage on the LCD is 0 and the green LED is blinking	The input protection device is triggered	1. Check whether the AC circuit breaker is triggered. 2. Check whether the AC cable is properly connected
	Green LED lights flashing	Ac power quality is not good (Shore/generator)	1. Check whether the AC wire is too thin or too long 2. If there is a generator, check whether the generator works normally, or check whether the input voltage range is set correctly (UPS $\rightarrow$ electrical appliances).
	Green LED lights flashing	Set Solar Priority as the output source	First, change the output source priority to mains priority
	LCD display, LED light flashing	The battery connection is disconnected	Check whether battery cables are properly connected
When the device is turned on, the internal relay is constantly turned on or off, switching repeatedly			

The buzzer went off and the LED turned red	Fault code 07	The overload fault occurs. The inverter is overloaded by 110% and the overload time reaches the limit	Reduce the connected load and turn off some electrical equipment
	Fault code 05	Output short circuit	Check that the wires are properly connected and remove abnormal loads
		The temperature of the internal converter is higher than $120^{\circ}C$	Check whether the environment around the device is properly ventilated
	Fault code 02	The internal component temperature is higher than $100^{\circ}C$	
	Fault code 03	Battery overcharge	Go to the maintenance center for repair
		High battery voltage	Check whether the battery specifications and quantity meet requirements
	Fault code 01	Fan fault	Replacement fan
	Fault code 06/58	Abnormal output (inverter voltage below 190VAC or above 260VAC)	1. Reduce load connections 2. Go to the maintenance center for repair
	Fault code 08/09/53/57	Internal component failure	Go to the maintenance center for repair
	Fault code 51	Overcurrent or surge	Restart the device. If the fault occurs again, go to the maintenance center for repair
	Fault code 52	The bus voltage is too low	
	Fault code 55	The output voltage is unbalanced	

8. Wi-Fi Quick Installation Guideline (Android APP)

1. Download APP, Scan the QR Code as below and download the APP.



2. Open the APP, tap the Register button to enter next page. According to the prompts, type in the information to create an account.

3. Type in the user name and password, tap the Log in button to enter the main interface.

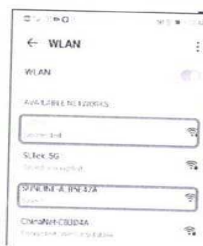
4. Wireless Router Connection

4.1 Confirm the WLAN is 2.4 G network connection by mobile phones (5G network cannot be used), and check inverter Wi-Fi AP "SUNLINE-XXXXXX" is existed". (Fig. 1)

4.2 Open the APP, tap the "+" button to add new device, type in the router password, tap Start button to finish the network setting. (Fig. 2)

4.3 If auto configure device fail, it needs to be configured by manual. According to app tips, connect to the Wi-Fi "SUNLINE-XXXXXX" of the inverter directly. (Fig. 3)

4.4 Then return to the APP interface and follow the prompts step by step. (Fig. 4)



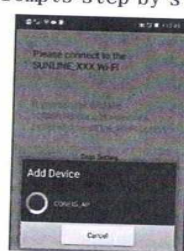
(Fig. 1)



(Fig. 2)



(Fig. 3)



(Fig. 4)

5. If the routing connection failure, we can reset the inverter Wi-Fi module by LCD interface and try again. Inverter Wi-Fi reset process as below.

Press "ENTER" button 3s to enter setting mode → Press "DOWN"

button to find program 37 → Press "ENTER" button to enter

program 37 → Press "DOWN" button to find reset option →

Press "ENTER" button to confirm reset option →

Press "ESC" button to finished the setting.



9. Wi-Fi Quick Installation Guideline (iOS APP)

1. Download and install the "sunline" APP from App Store or scan the QR Code as below.



2. Open the APP, tap the Register button to enter next page. According to the prompts, type in the information to create an account.

3. Type in the user name and password, tap the Log in button to enter the main interface.

4. Wireless Router Connection

4.1 Confirm the WLAN is 2.4 G network connection by mobile phones (5G network cannot be used), and check inverter Wi-Fi AP "SUNLINE-XXXXXX" is existed". (Fig. 1)

4.2 Open the APP, tap the "+" button to add new device, type in the router password, tap Next button to continue network setting. (Fig. 2)

4.3 According to APP tips, connect to the Wi-Fi "SUNLINE-XXXXXX" of the inverter directly. (Fig. 3)

4.4 Then return to the APP interface and follow the prompts step by step. (Fig. 4)



(Fig. 1)



(Fig. 2)



(Fig. 3)



(Fig. 4)

5. If the routing connection failure, we can reset the inverter Wi-Fi module by LCD interface and try again. Inverter Wi-Fi reset process as below.

Press "ENTER" button 3s to enter setting mode → Press "DOWN"

button to find program 37 → Press "ENTER" button to enter

program 37 → Press "DOWN" button to find reset option →

Press "ENTER" button to confirm reset option →

Press "ESC" button to finished the setting.

