



# User Manual

## Solar Inversion Power Supply System

### JLS-ESS2-2kwh



## Dear consumer

Thank you very much for choosing our products! Before using this product, please read this manual carefully, including installation, use and troubleshooting and important information and advice. Please properly keep this manual!

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## 1、 Product Features

- Excellent performance because of double CPU intelligent control technology;
- A wide range of applicable loads because of pure sine wave AC output
- The mains supply mode/energy-saving mode/battery mode can be set for flexible
- Convenient and practical 5VDC-USB output port and 12VDC output port;
- Digital LCD and LEDs for visualization of operation status of the equipment
- Overcharge protection and overdischarge protection for a longer battery life;;
- Safe and reliable with intelligent exhaust fan control
- Overall automatic protection and alarms including AC output overload protection . short circuit protection . etc .

## 2、 Installation and Storage instructions

### (1) Unpacking inspection

1. Open the package, check whether the product accessories is complete, including: a host controller, a user manual

2. Check whether the device is damaged in transit, if you find damaged, please do not start machine and inform your shipper and dealer.

### (2) Installation and Storage matters need attention

1. Install equipment should be operated by a professional personal, or performed by the local distributor.

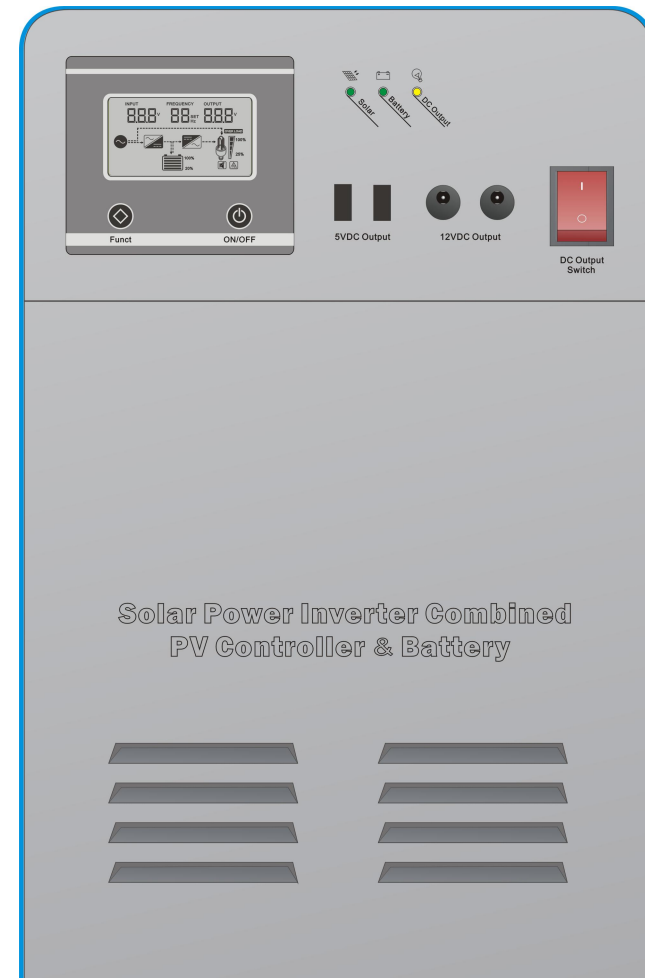
2. During transportation, it need taking appropriate protective measures. When the equipment is moved to high temperature environment from low temperature environment may appear water, in order to ensure safety so it must be completely dry before use.

3. Do not expose the device to damp, flammable and explosive, dust mass and harsh environments; Do not cover and blocking the air vents, so that having good heat dissipation;

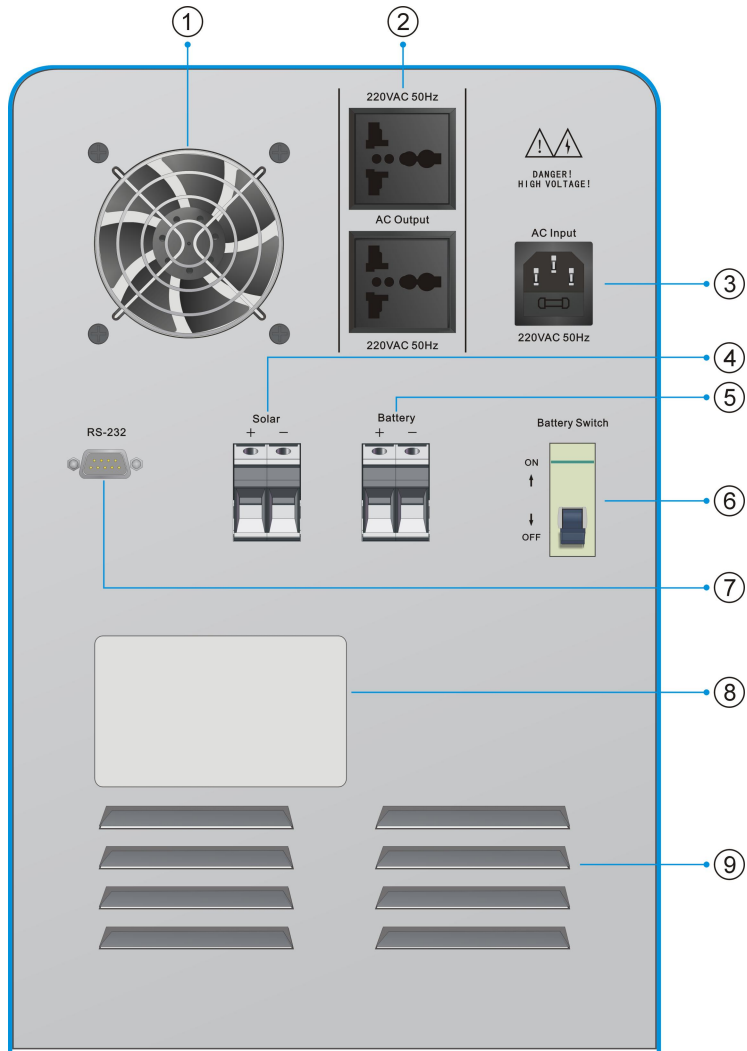
4. Battery switch on backboard should be under off state when the machine is not be used for a long time.

## 3、 Product appearance diagram and introduction

### (1) Front panel diagram



## (2) Backboard diagram introduction



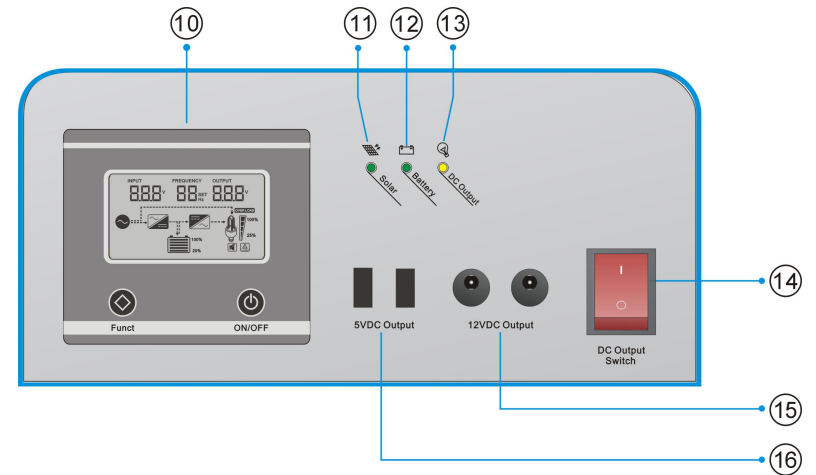
### Introduction:

- ①--Fan:
- ②--AC Output (Max. 10A)
- ③--AC Input:
- ④--Solar:Solar module input terminals

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- ⑤--Battery:External battery input terminals(selectable)
- ⑥--Battery Switch:built-in battery switch
- ⑦--RS232communication port
- ⑧--Model stickers
- ⑨--Heat dissipation window

## (3) Front panel introduction



### Instructions:

- ⑩-- Inverter LCD display / operation interface
- ⑪-- Solar: Solar input state indicator
- ⑫-- Battery: Battery mode indicator
- ⑬-- DC Output: 5VDC-USB、 12VDC output indicator
- ⑭--5VDC-USB,12VDCoutput ON/OFF switch
- ⑮--12VDC Output: 12VDCoutput terminal
- ⑯--5VDC Output: 5VDC-USB output terminal

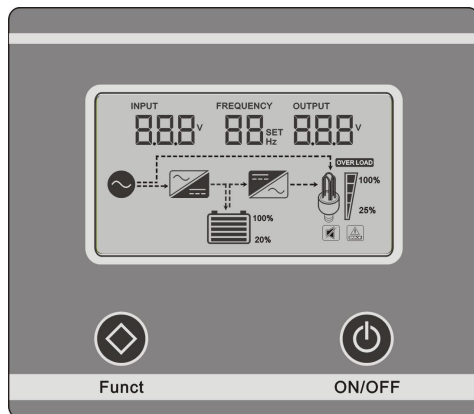
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#### (4) Solar energy charge/discharge LED indicator state introduction

LED display		Introduction	
Solar	Green	Light	Charge controller is in charging...
		Twinkle	Charging controller to prepare...
		Extinguish	Charge controller is in standby...
Battery	Green /Red two tone	Red quick flashing	Battery voltage high voltage reminder; > 16V;
		Green quick flashing	Battery voltage charge protection; > 13.8V;
		Green light	Battery voltage normal
		Orange (Red+green light)	Battery voltage low voltage reminder; < 11.6V
		Red light	Battery voltage under-voltage protection reminder; < 11.1V;
DC Output	Yellow	Quick flashing	DC load current overload or short circuit
		Light	DC output voltage normal
		Twinkle	DC load current overload
		Extinguish	Power off DC output

#### (5) Inverter LCD display/ operation introduction

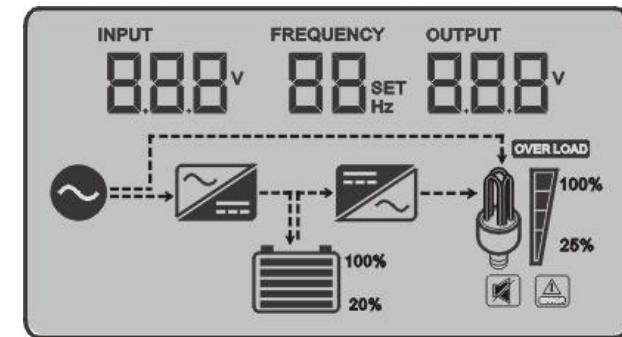
LCD display and function key operation interface can display the equipment working state, such as: input/output voltage, frequency, the mains supply mode, inversion mode, battery capacity, loads capacity, alarming reminder etc.



#### (6) Panel key function/LCD setup introduction

Function key		Operation introduction		
◇	Mute key	Long press for 1 second, buzzer once, stars mute state; Long press 1 second, buzzer twice, close mute state		
	Function key	; Long press 5 seconds, can choose 01, 02, 03 mode cycle, after the selected mode, the machine will restart to take effect;		
⏻	ON/OFF	The mains supply preferred mode	Energy-saving mode	Battery preferred mode
		01 <sub>SET</sub>	02 <sub>SET</sub>	03 <sub>SET</sub>
⏻	ON/OFF	Starting up	Long press for 2 seconds, release after buzzer once, equipment starts output	
		Power off	Long press for 2 seconds, release after internal actuating of relay, equipment close output	

#### (7) LCD display introduction






Equipment parameter introduction			
LCD display	Function introduction		
INPUT 888 <sub>v</sub>	AC input voltage parameter		
FREQUENCY 88 <sub>Hz</sub>	AC Output frequency parameter		
OUTPUT 888 <sub>v</sub>	AC output voltage parameter		
88 <sub>SET</sub>	Working mode selection		
	The mains supply preferred mode	Energy-saving mode	Battery preferred mode
	01 <sub>SET</sub>	02 <sub>SET</sub>	03 <sub>SET</sub>

Battery icon introduction		
LCD icon	State	Battery voltage/12V; *A (pcs)
	Twinkle	< 10.5V; *A
	Light	10.5~11.2V; *A
	Light	11.2~11.6V; *A
	Light	11.6~12.1V; *A
	Light	12.1~12.5V; *A
	Light	> 12.5V; *A

Load icon introduction				
LCD display	Function introduction			
OVER LOAD	Output loads overload reminder			
	0%~25%	25%~50%	50%~75%	75%~100%

Working mode icon introduction		
LCD display	Function introduction	
	The mains supply icon	
	AC-DC icon	
	DC-AC icon	
Buzzing icon introduction		
	Lighten	Prohibit the breezer
	Out	Open the breezer
Fault/abnormal icon reminder		
	Fault/abnormal reminder	

**(8) Working mode introduction**

Icon	Working mode	Running state
	The mains supply preferred mode	Mains supply preferred mode, after the device starts, the grid input under normal operation, the equipment through the grid bypass regulator to supply power to the load, at the same time power battery; When there is having too high/low/serious distortion of the grid, equipment will make battery energy through internal module transfer into high quality electricity for load.
	Energy-saving mode	Energy saving mode, after the device starts, automatically detect load, when the load is greater than 5% rated power equipment open the ac supply power to the load; When detected no load, device automatically back to the search pattern, drop the battery energy consumption to lowest; This mode, equipment detect a load every 10s, so as to achieve the purpose of energy saving.
	Battery preferred mode	Battery priority mode, the device for the first time started, the mains input under normal operation of equipment for mains priority mode, but no battery power. When the battery in the external charging device (such as solar charging system) after adequate electricity, equipment automatically converted to battery energy through internal module into high quality electricity for load; When the battery power down to low voltage threshold, the equipment and the mains shunt voltage to supply power to the load, but no battery power. This pattern is mainly for new energy power generation system design (such as wind power system)

**(9) Alarm warning instruction**

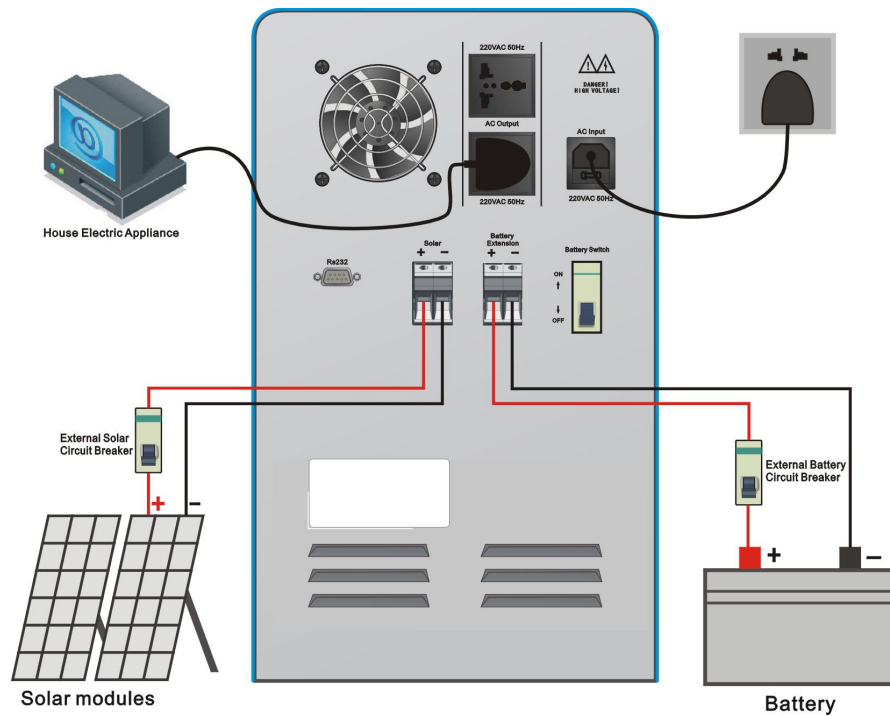
	Buzzing forbid	Default state, no buzzing
Equipment normal operation	Buzzing open	Buzzer alarm 4 time per 15 seconds indicate the equipment under battery pack inverter mode.
Battery pack high voltage alarm		Buzzer alarm 4 times per second, indicate high voltage
Battery pack low voltage alarm		Buzzer alarm 2 times per second, indicate low voltage
Over temperature alarm		Buzzer alarm 2 seconds pause 1 second

**(10) Electric generator connection announcements**

If connect electric generator, it needs operate as below:

- 1, Start up electric generator and after it running stable, make electric generator output power connect into the equipment input terminal, then make sure the equipment output is no-load, then start up the equipment.
- 2, After the equipment starting, then connect load one by one
- 3, We suggest electric generator capacity should be 2~3 times of this equipment

## 4、 System connection diagram



### Instructions:

For external battery pack input switch, please select current of breaker is or above 60A; For solar module input switch, please select current of breaker is or above 30A

## 5、 Wiring steps introduction

**Note: make sure the breaker on backboards is in off position, then operate the following processes;**

### (1)Solar module access introduction:

1.1 Connect the solar component within the rated power with right diameter wire, when sunlight hits the solar module components, with voltmeter testing, on both ends of the open circuit voltage is about 1.5 to 1.7 times of equipment rated voltage;

1.2 On the positive cable of Solar module connect a suitable breaker in series, then connect to the "4 - Solar" Solar module input terminal, pay attention to the process of Solar access its polarity cannot be mistake, so as not to damage the equipment. Check"system connection diagram";

### (2) “15--12VDC Output”、 “16--5VDC Output”Connection introduction

2.1 Confirm DC load working current can't exceed the equipment rated current, the two “ 15 --12VDC Output”DC terminal port on the front panel foreign respectively with 12 VDC, 1 amp current, two "16-5 VDC Output" dc port foreign respectively provide 5 VDC, 1 amp of current;

2.2 When access dc load, note its polarity can't be wrong, it is strictly prohibited the dc port output wiring short circuit, so as not to damage the equipment;

### (3)Then mains supply input connection introduction

3.1 Input AC current to backboard “③--AC Input”input sockets

### (4)External battery access instructions note

**Note: the machine is with built-in battery, if it needs external battery , please operate as following steps:**

4.1 Use external battery with suitable diameter wire connection, then test with voltmeter the ends of the battery voltage is about rated voltage of equipment;

4.2 put out Battery anode connections on a proper circuit breaker series, "5) Connect in series a suitable breaker to external battery pack anode, then access to equipment “⑤—Battery” terminal pay attention to in the process of the Battery access its polarity cannot be mistake, so as not to damage to the equipment, see" system connection diagram"

## 6、 Operating instructions

### Open/Run

( 1 ) Check the solar components which has accessed to the equipment terminal voltage and polarity are correct; Such as external expansion of the battery, battery also needs to check its terminal battery end polarity is correct

( 2 ) Close the built-in battery on backboard breaker“⑥--Battery Switch”, if connect external expansion battery, will also make the circuit breaker connecting in series be closed stat, then the front panel“ ⑩ —Battery”light , “③—DC Output”indicator light state depends on battery voltage/capacity

( 3 ) Make breaker on solar array connecting in series be closed state, where there is sunshine on solar energy components, the "11 - Solar" on the front panel light is lit, the photovoltaic components with built-in controller charge for battery power;

( 4 ) Long press the button “ON/OFF” for 2 seconds, release after buzzer once, the machine starts AC output, then long press the button “ON/OFF” for 2 seconds, release after buzzer once, the machine close AC output.

#### Operational considerations:

When start the equipment, please operate breaker as following sequence, first close the battery circuit breaker, and then close solar module input circuit breaker; Closing device, first disconnect the solar component input circuit breaker, and then disconnect the battery circuit breaker;

#### Using considerations:

When solar module is under disconnection and not be used for long time, it should be under close state for built-in battery circuit breaker on backboard :”⑥-Battery Switch”, it also should be disconnect its anode connection wiring circuit breaker if it have external battery pack, in order to avoid batter deep discharge loss( built-in controller has power loss when standby):

## 7、 Simple fault judgment and processing

Warning: Internal of the machine has high pressure! Don't open it own, and try to do the repair or maintenance, so as not to risk electric shock!

Fault	possible reasons	solution
When the machine have enough light point-blank photovoltaic modules, "Solar" indicator light is not lit	Photovoltaic component array cable open circuit	Please check on whether both ends of the pv array wiring is correct, the contact is reliable or not.
“DC output”indicator light flash, DC no output	DC loads overload or short circuit	Check loads and connection and restart equipment
The mains supply from time to time	Input fuse damaged	Change the same fuse
Machine load time reduced	Not enough for battery charging	Make sure battery full of charge normally
The machine can't be started	Machine overload	Removal of critical load
	Battery burn-in, and can't be charged full	Please connect with CSR so that getting battery changing module
	The mains input line or the battery cables poor contact	Check and connect again
Starting up alarm	Battery power is not enough	Make sure battery full of power normally
	Overload	Removal of critical load
Buzzer is 2 seconds but stop 1 second	Internal over temperature alarm	Check whether the fan and cooling hole is blocked
Fan working sometimes quickly, sometimes slow	Internal temperature is higher than 45 degrees turn fast, slow turning less than 42 degrees	Normal

When you contact with maintenance personal, please provide the following information: machine model/problem happening date/complete instructions (including relative indicator light display status, equipped battery power, photovoltaic modules power, connection and other information).



## 8、 Technical specification sheet

Model		JLS-ESS2-2KWH
Battery rated voltage (VDC)		24
Inverter	Rated power (W)	1000
	Input voltage range (VAC)	160-275VAC
	Input frequency (Hz)	45-65
	Output voltage (VAC)	220
	Output frequency (Hz)	50/60
	Output wave	Pure Sine Wave
	Specification of built-in battery	25.6V 78Ah
Solar input	Max. PV voltage (VDC)	≤50
	Range of charging voltage (VDC)	20-50
	Rated charge current (A)	30
	Voltage for overcharge protection (VDC)	28.4
	Voltage for overcharge recovery (VDC)	28.0
	Voltage for floating charge (VDC)	27.4
DC output	Voltage for high voltage protection (VDC)	32V
	High voltage recovery voltage (VDC)	30.4
	Low voltage recovery voltage (VDC)	25.2
	Low voltage protection voltage (VDC)	22
	5VDC USB output	2pcs/MAX 2A
	12VDC output ports	2pcs /MAX 2A
Heat dissipation/Cooling		Temperature control by intelligent exhaust fan
Operating ambient temperature		-20 - +50℃
Storage ambient temperature		-25 - +55℃
Operating/Storage ambient		0-90% No condensation
External size: W*D*H (mm)		423×260×453
Package size: W*D*H (mm)		505×355×485
N.W/ G.W. (kg)		33KG/35KG