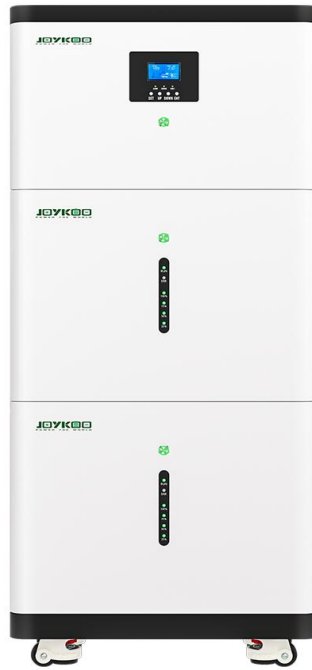# Product Specification

Product Name：   ENERGY STORAGE SYSTEM

Model No：   EPS10000

Issued by：   He Jia

Issued date：   2022-10-5

S/N	Version	Revised content	Confirmed by	Verified by
1	V1.0		Jiang Deping	Zhang xiaohua

Product Summary

1. Application environment and value

The system application scenario of the product is shown in the following figure. A complete system consists of the following parts:

1) Photovoltaic modules: convert the light energy into direct current, charge the battery through the reverse control all-in-one machine, or directly reverse into an AC drive load.

2) Mains or generator: connected to the AC input to charge the battery while supplying power to the load. If the power supply or generator is not connected, the system can also operate properly, and the load is powered by the battery and the solar module.

3) Battery: used to ensure the normal power supply of the system load when the solar energy is insufficient and the mains power is not connected.

4) Home load: can connect a variety of home and office loads, including refrigerators, lamps, TV, fans and air conditioning.

5) Inverse control all-in-one machine: the energy conversion equipment of the whole system.
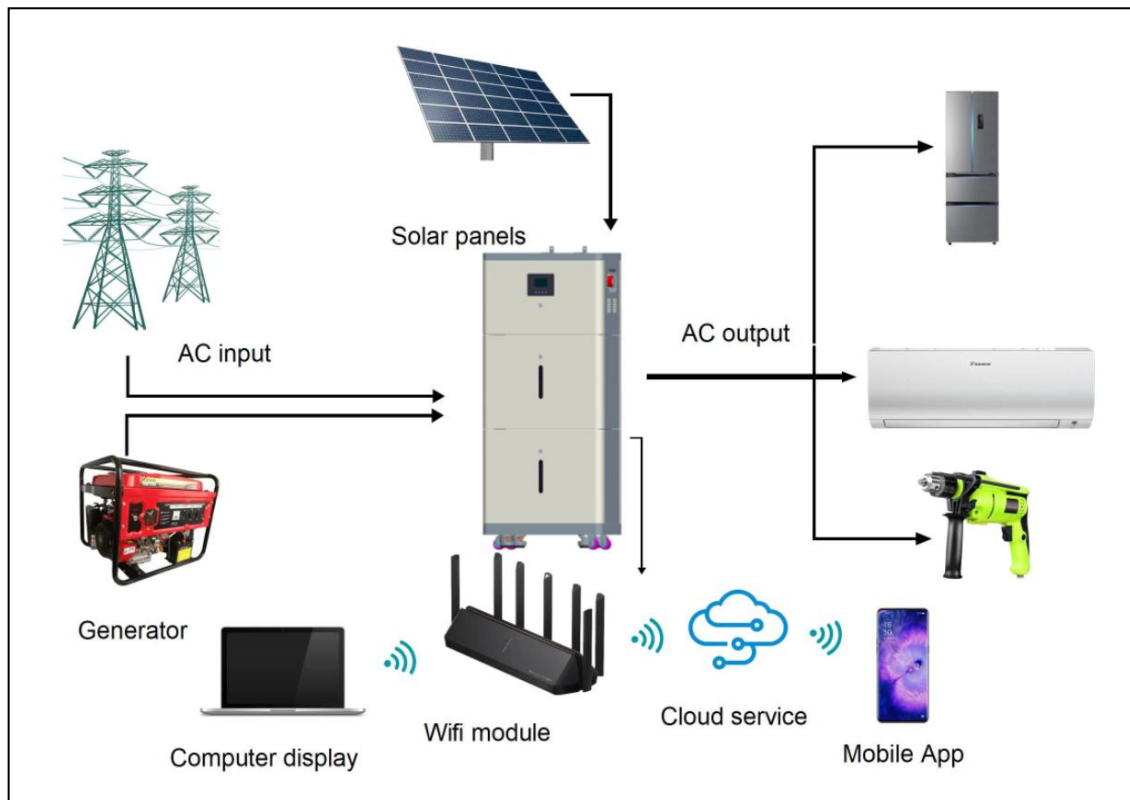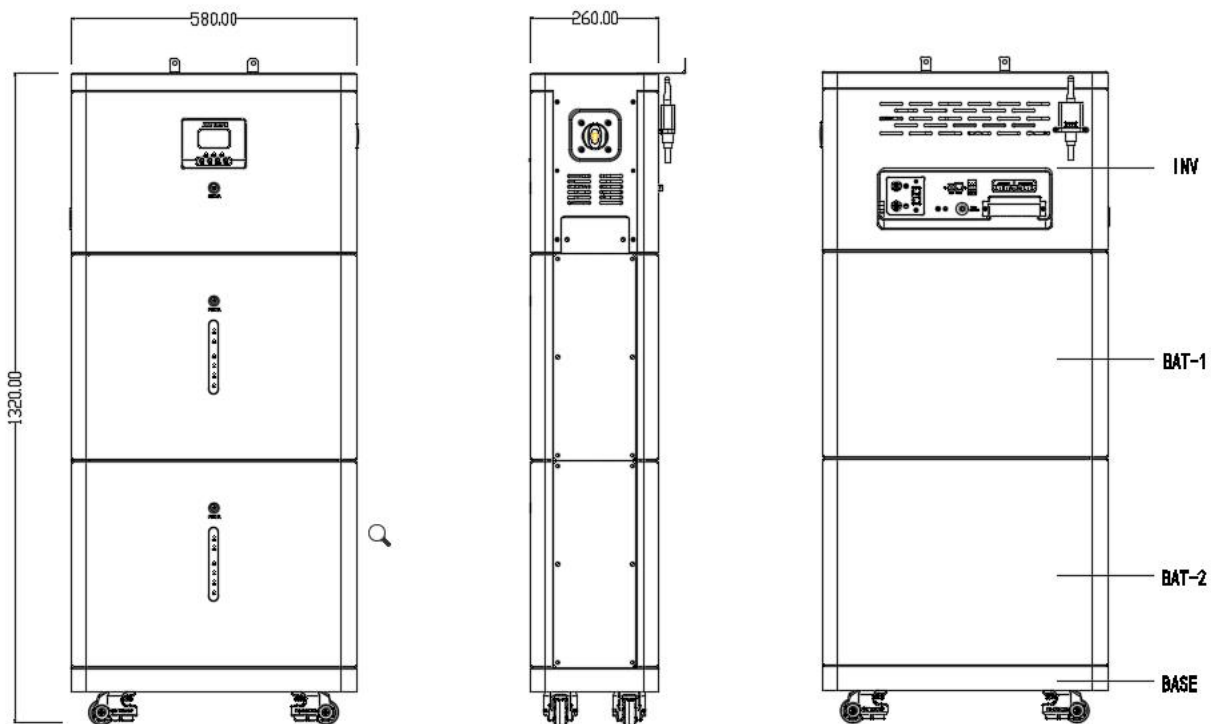

2. Functional characteristics

1). Fully digital voltage and current double closed-loop control, advanced sinusoidal pulse width modulation technology, output pure sinusoidal wave.

2). Two output modes: mains power bypass and inverter output, uninterrupted function.

3). Four charging modes are available: hybrid charging with only solar energy, mains power priority,

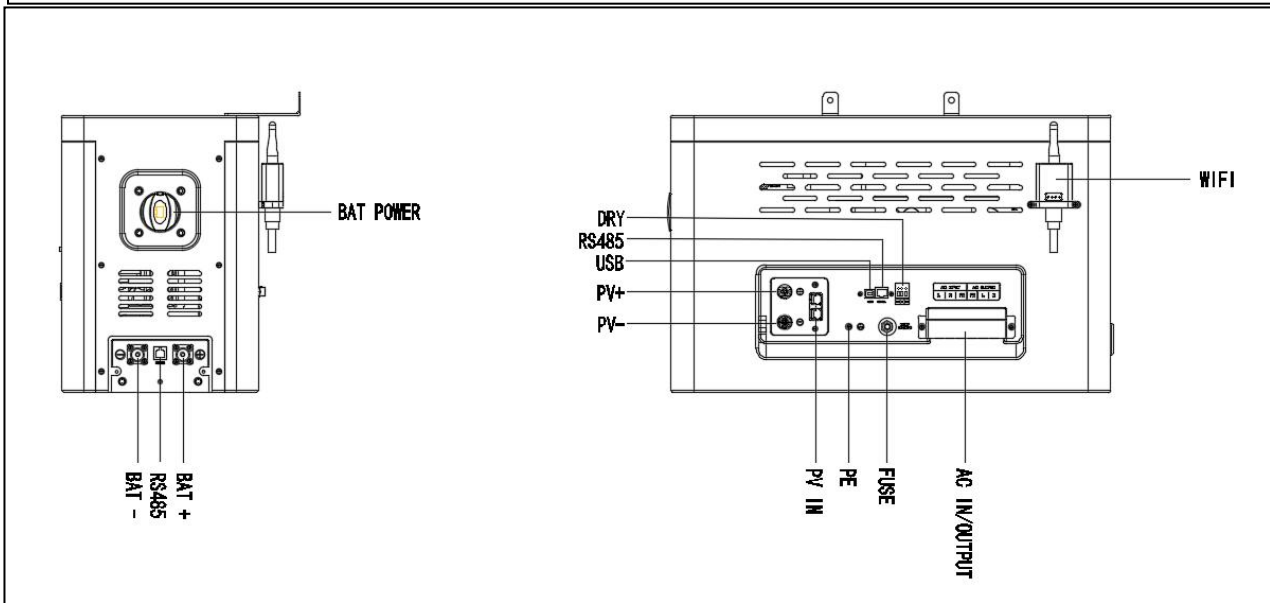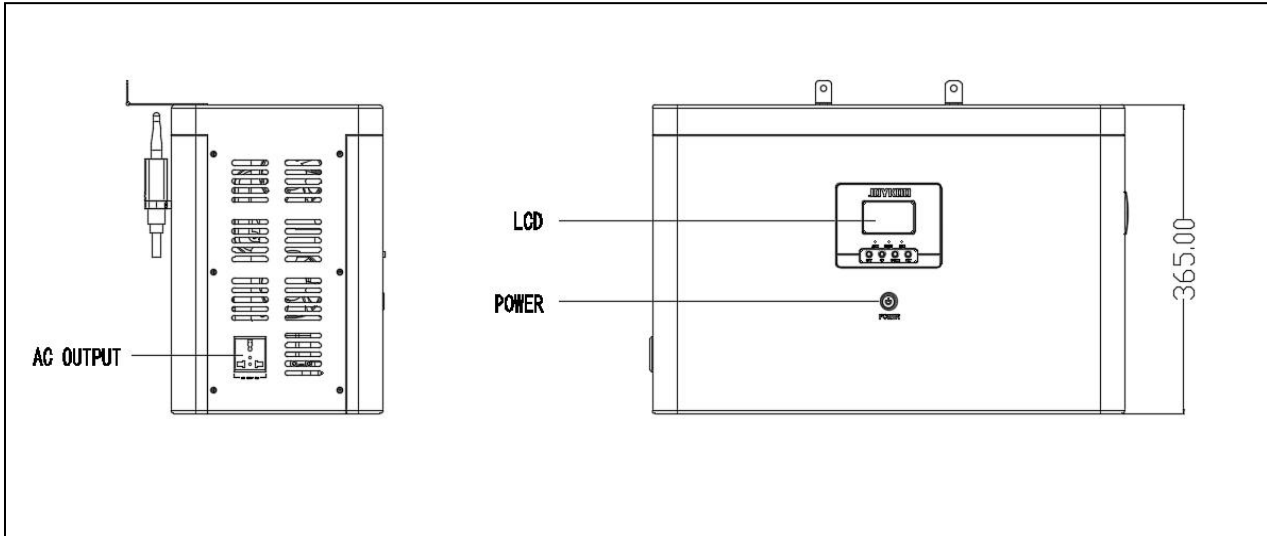solar energy priority and mains power solar energy.

4). Advanced maximum power point tracking technology, with an efficiency of 99.9%.

5). Have an LCD screen and 3 indicators design to dynamically display the system data and running status.

6). With the lamp self-lock type switch control AC output.

7). The power-saving mode can be used to reduce the power loss.

8). Intelligent variable speed fan efficient heat dissipation, prolong the system life.

9). Lithium battery is activated by photovoltaic solar energy or mains power, and charge the lithium battery in two ways.

10). 360° comprehensive protection, a number of protection functions, including short circuit protection, over voltage, under voltage protection, overload protection, reverse connection protection, etc

11). Lithium iron phosphate battery, high energy density and power density, good safety performance.

12). The battery pack is separated from the inverter, which can use multiple battery packs in parallel to facilitate capacity expansion.
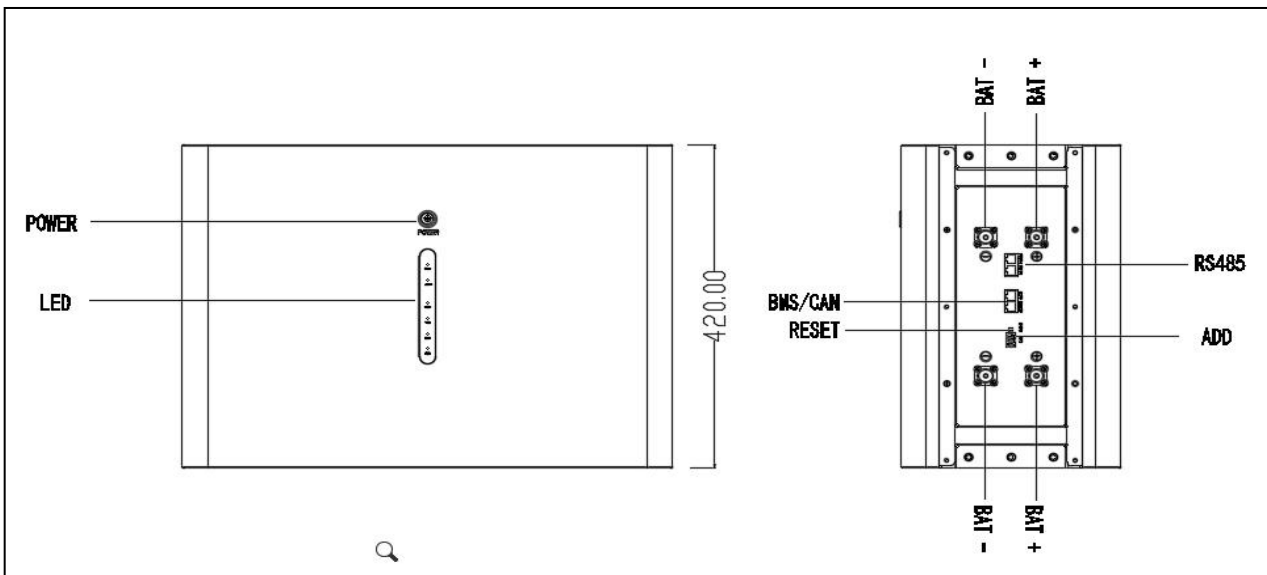
3. Product features

3.1. Appearance dimensions (1320 * 580 * 260mm)

3.2. Inverter master case (580 * 365 * 260mm)

LCD

POWER

AC OUTPUT

365.00

BAT POWER

BAT −
RS485
BAT +

DRY
RS485
USB
PV+
PV−

WIFI

PV IN
PE
FUSE
AC IN/OUTPUT

3.3. Battery box (580 * 420 * 260mm)

POWER

LED

420.00

BAT −
BAT +

RS485

BMS/CAN

RESET

ADD

BAT −
BAT +

4. Electrical performance and parameters

Electrical Parameters

Rated Capacity		10000Wh		
Model		EPS10000		
AC input	Municipal electricity input system	L+N+PE		
	Rated input voltage	220/230VAC		
AC output	Output system	L+N+PE		
	Output voltage	220/230VAC±5%		
	Output frequency	50/60Hz±0.1%		
	Wave form	Pure sine wave		
	Switching period	10ms		
	Transfer efficiency	≥95%		
	Power rating	5.5KVA	6.2KVA	8.0KVA
	Peak power	10KVA	12KVA	16KVA
Battery	Battery pack specifications	48V100Ah		
	Rated operational voltage	48VDC		
	Charging cut-off voltage	54.8VDC		
	Discharge cut-off voltage	41.2VDC		
	Maximum battery number allowed	15PCS		
	Rated operational current	200A		
	Peak discharge current	250A		
Charge	PV charging method	MPPT		
	PV maximum input power	5500Wp	6200Wp	8000Wp
	MPPT tracking range	120~450VDC		
	Maximum PV input voltage	500VDC		
	Maximum PV charging current	80A	120A	80A
	Maximum mains charging current	60A		
Display	LCD joggle	4.0-inch LCD / 4 button		
Joggle	Communicating protocol	RS485/CAN		
	DC output	/		
	AC import	AC230V		

	AC output	AC230V
Environmental parameter	Operating ambient temperature	0~40℃
	Operating environment humidity	20%~95% (no condensation)
	Storage temperature	-15~60℃
	Above sea level	The altitude shall not exceed 1000m, over 1000m, output less, altitude maximum 4000m
	Noise	≤50db
Physical parameters	Length*Width*Height (mm)	580×260×1320
	Weight (for the reference)	120kg
	CERTIFICATION	CE/ROHS/UN38.3/MSDS

5. Installation method and use instructions

5.1 Installation steps:

1. Install the base for universal casters
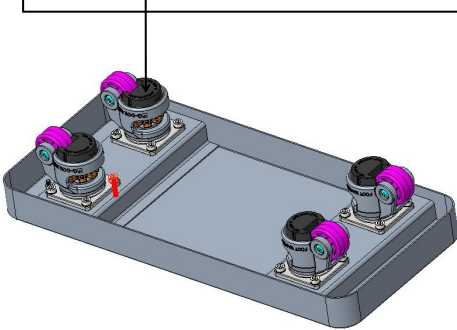
2. Install the right-angle fixed holder of the base
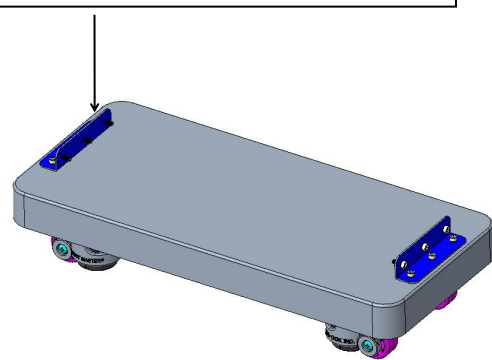
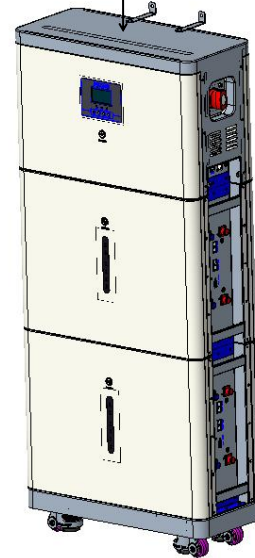3. Install the main box straight fixing
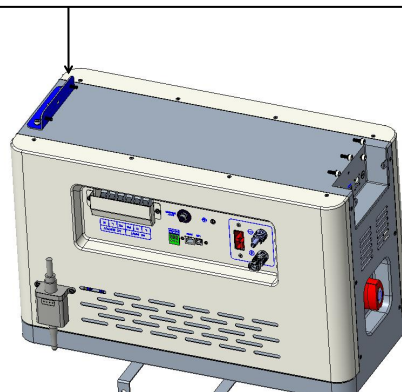
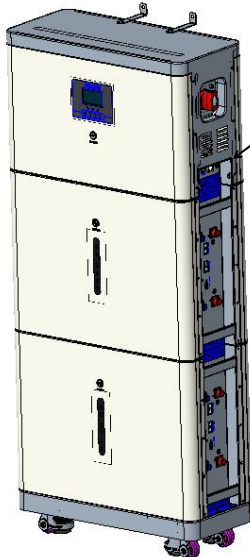4. Install the battery box (2)
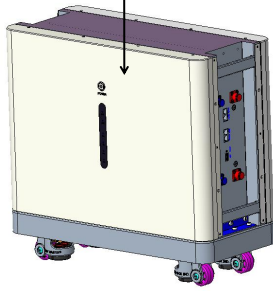
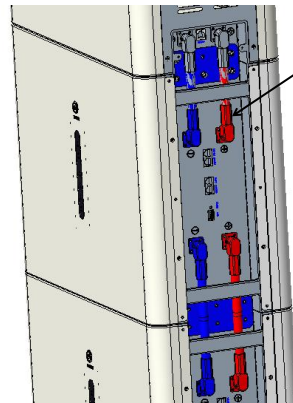5. Install the battery box (1)
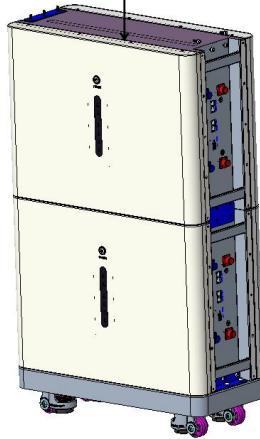
6. Install the main machine box
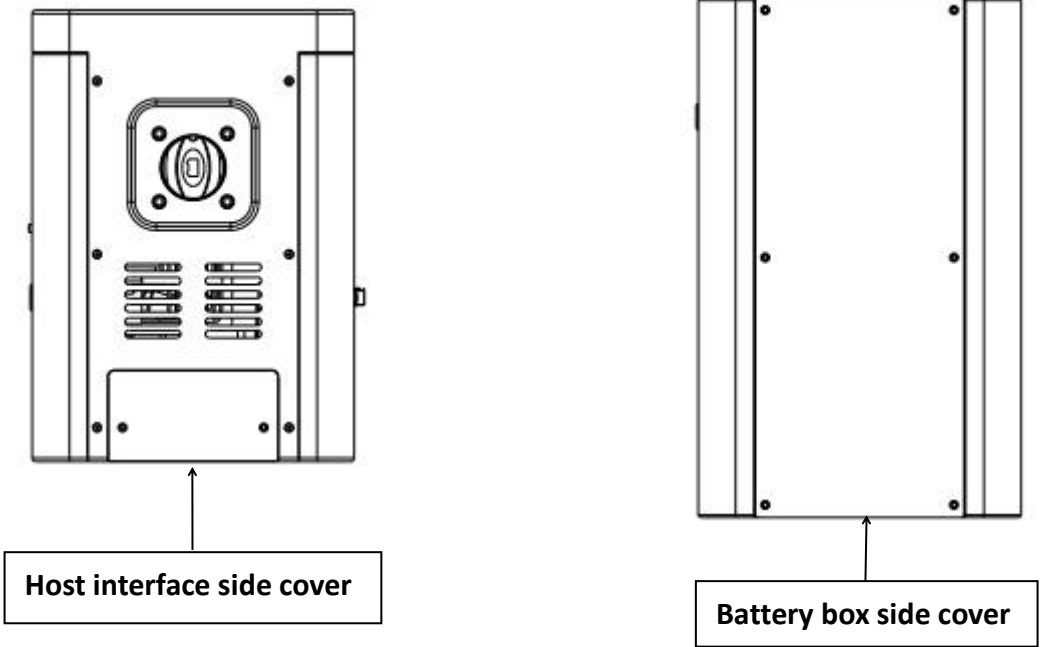
7. Screw to secure the upper and lower machine box

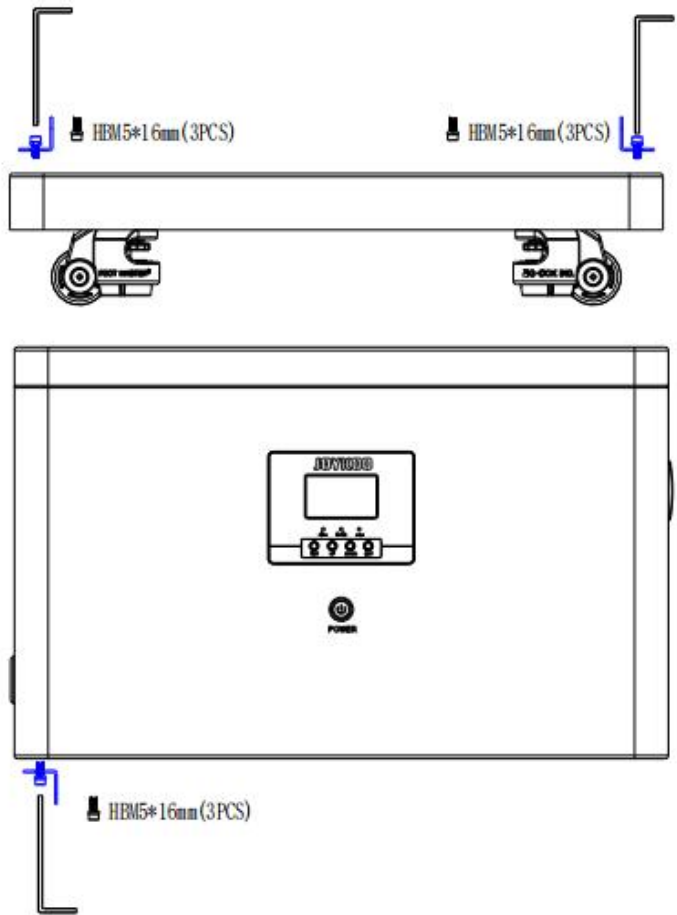8. Plug in the wires and communication lines for the corresponding polarity
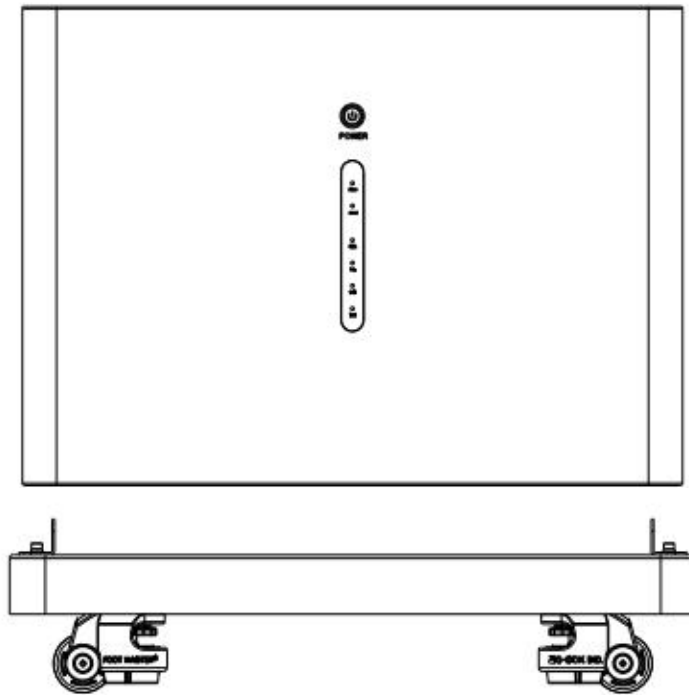
5.2 Installation manual:

1.Use a screwdriver to remove the side covers on both sides of the main unit and the battery box
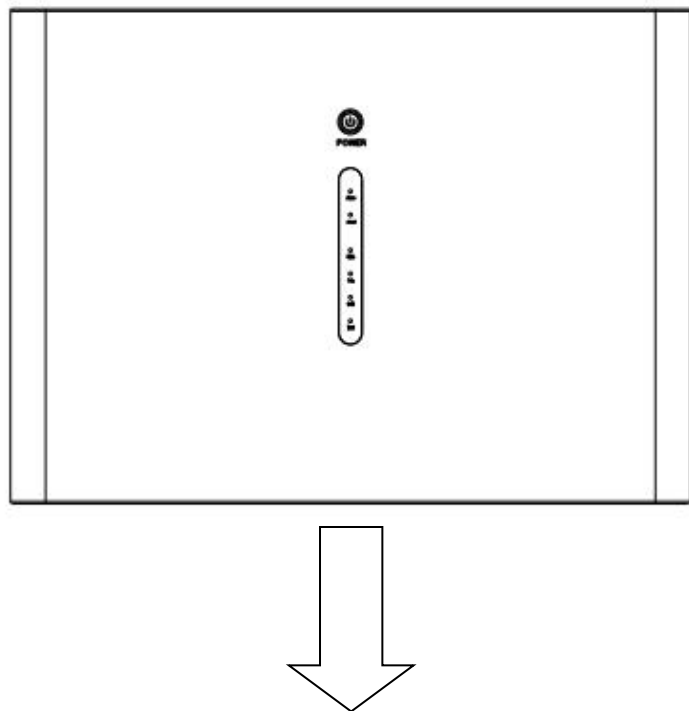

Host interface side cover

Battery box side cover

2.Install the main chassis and the right-angle fixing bracket on the base

HBM5*16mm(3PCS)   HBM5*16mm(3PCS)
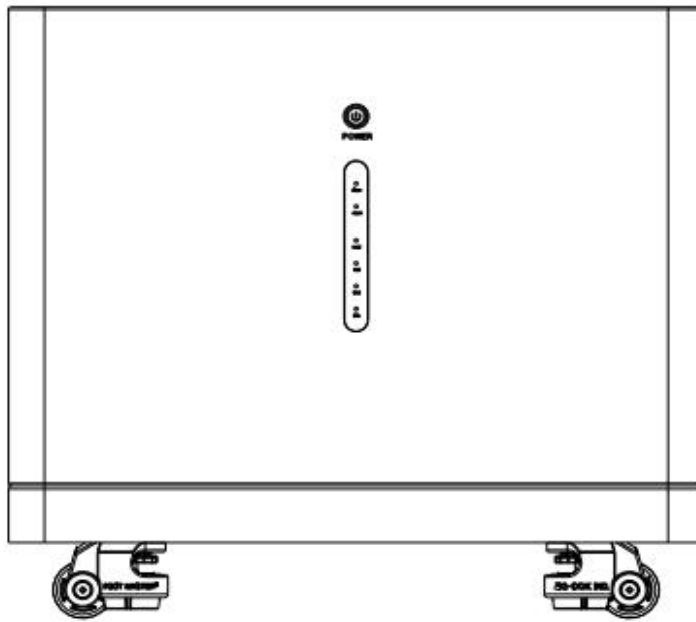
HBM5*16mm(3PCS)

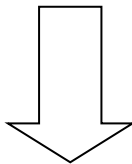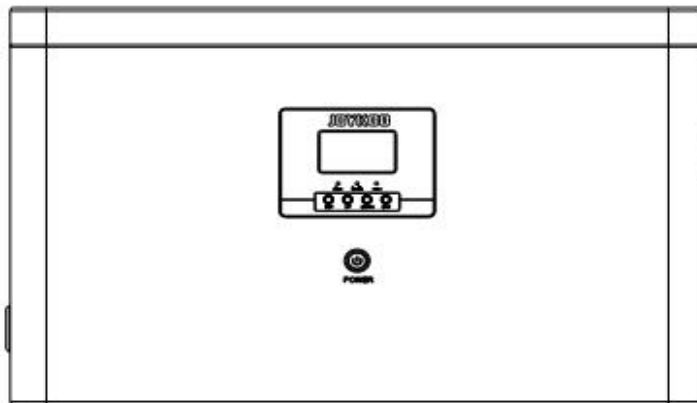**3.Install the battery box downwards in the direction of the arrow (1)**
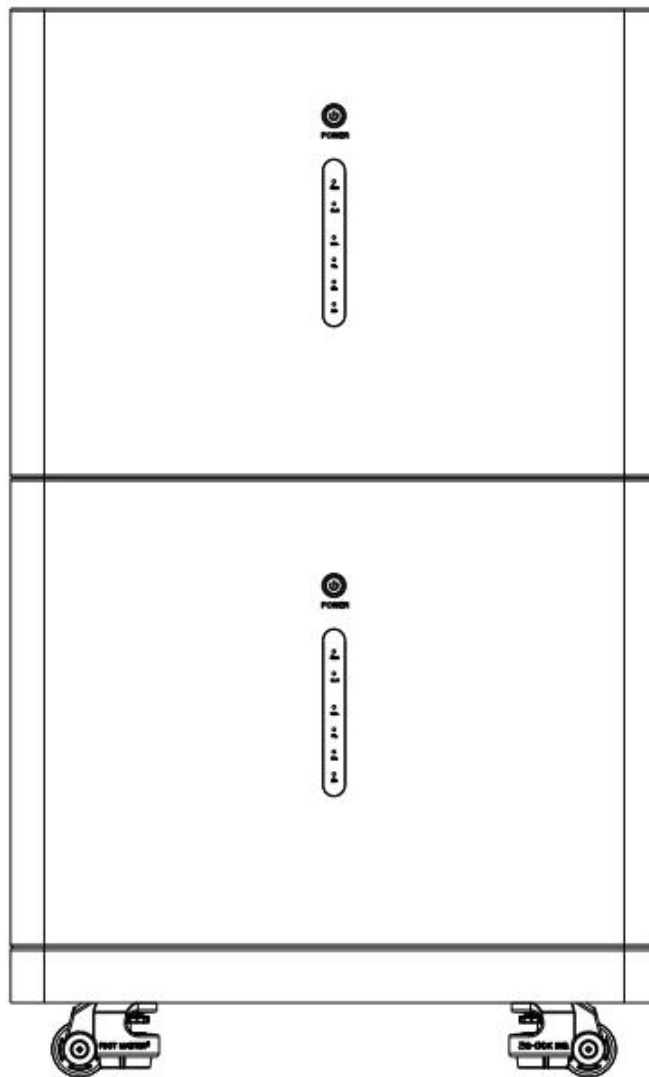

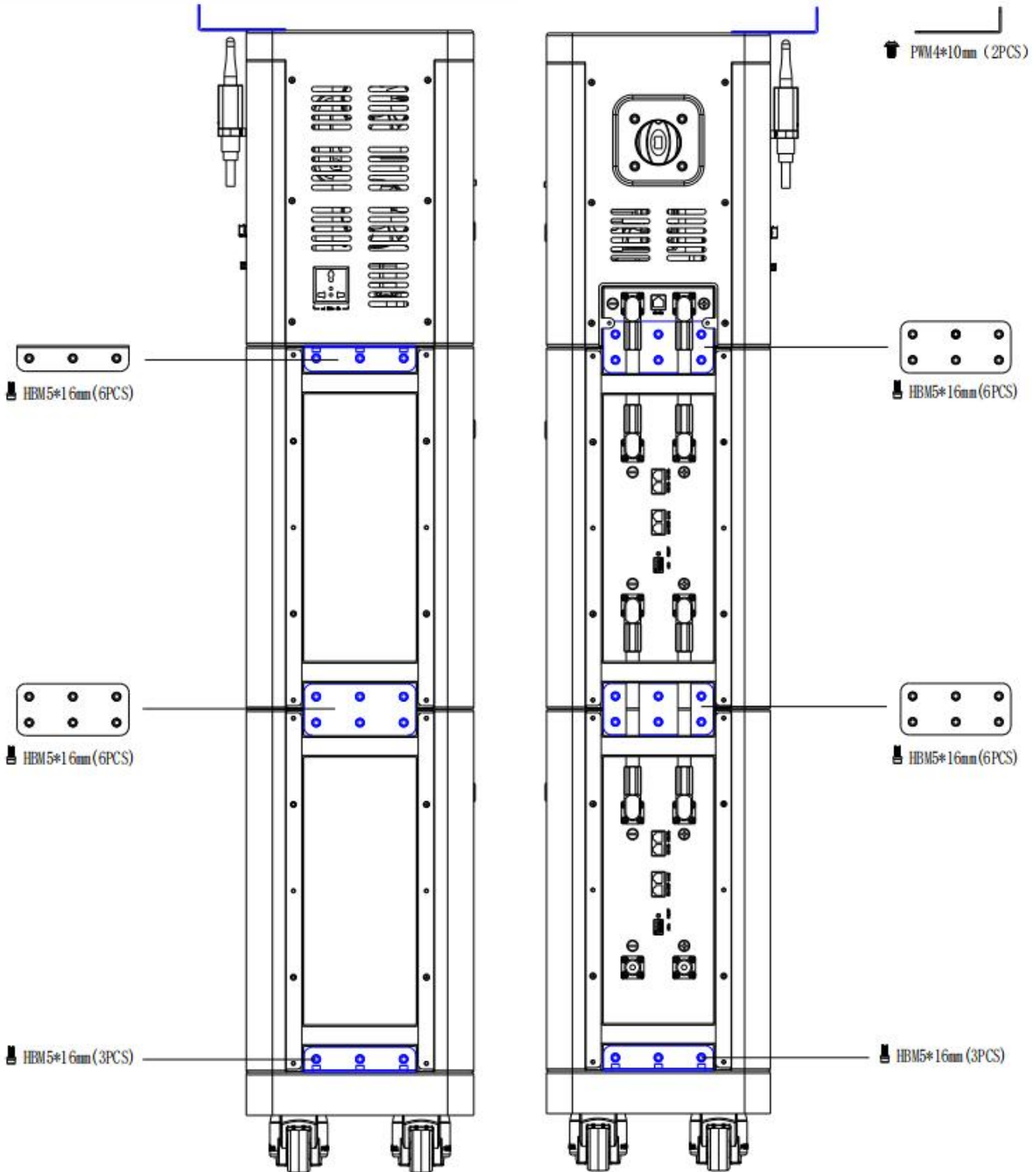**4.Install the battery box downwards in the direction of the arrow (2)**

**5.Install the main chassis downwards in the direction of the arrow**

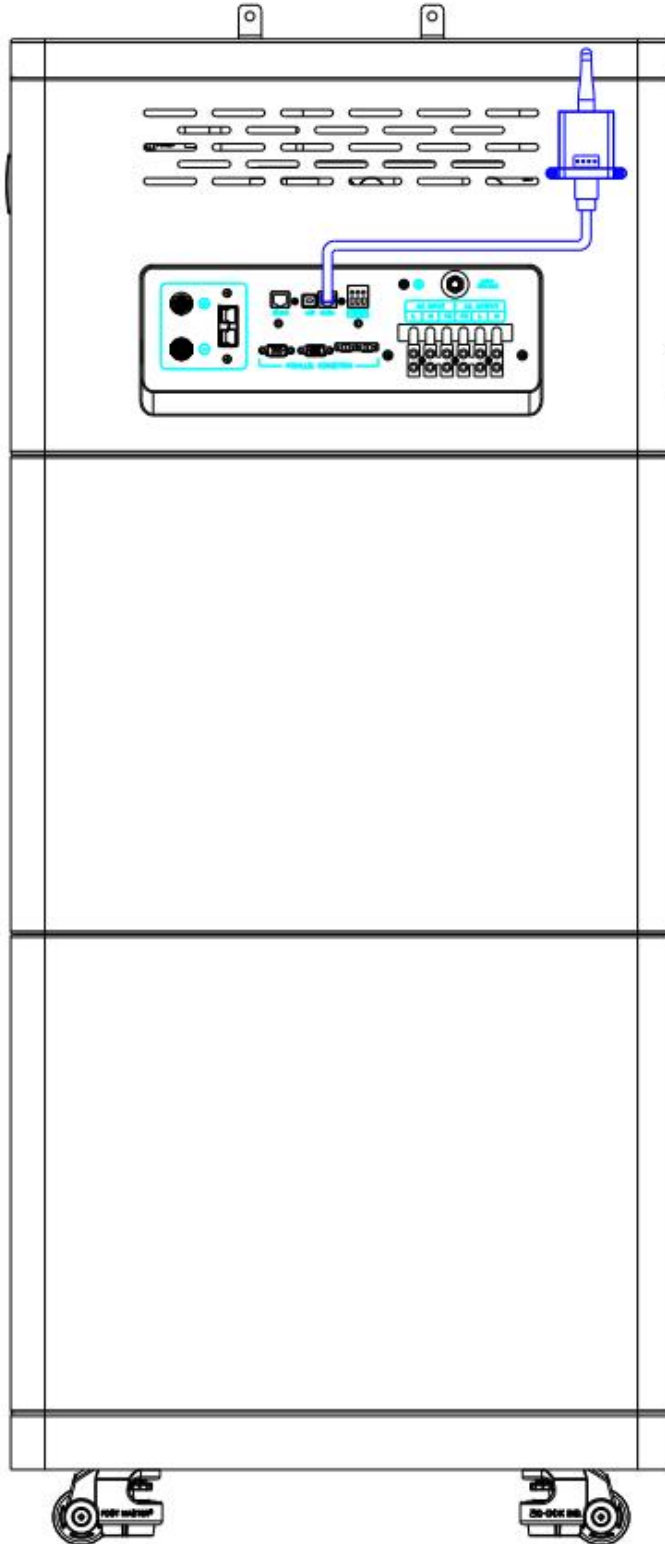**6.Refer to the instructions in the figure to fix the connecting plates on both sides and the top wall bracket with screws**

PWM4*10mm（2PCS）

HBM5*16mm(6PCS)

HBM5*16mm(6PCS)

HBM5*16mm(6PCS)

HBM5*16mm(6PCS)

HBM5*16mm(3PCS)

HBM5*16mm(3PCS)

6.Refer to the instructions in the figure to fix the connecting plates on both sides Insert the positive and negative connecting wires and communication wires into the corresponding interfaces according to the instructions in the figure. (Note that the color of the plug and the socket must be the same. After alignment, press firmly until the "click" sound indicates that the installation is in place. When taking it out, first press the side button of the plug and then pull it out forcefully. It is strictly forbidden to cross-insert plugs and sockets of different colors, otherwise will cause a short circuit in the battery and cause a fire)

BLACK_L=180mm   RED_L=180mm

BAT_INV_L=300mm

BAT1_BAT2_L=460mm

BLACK_L=250mm

RED_L=250mm
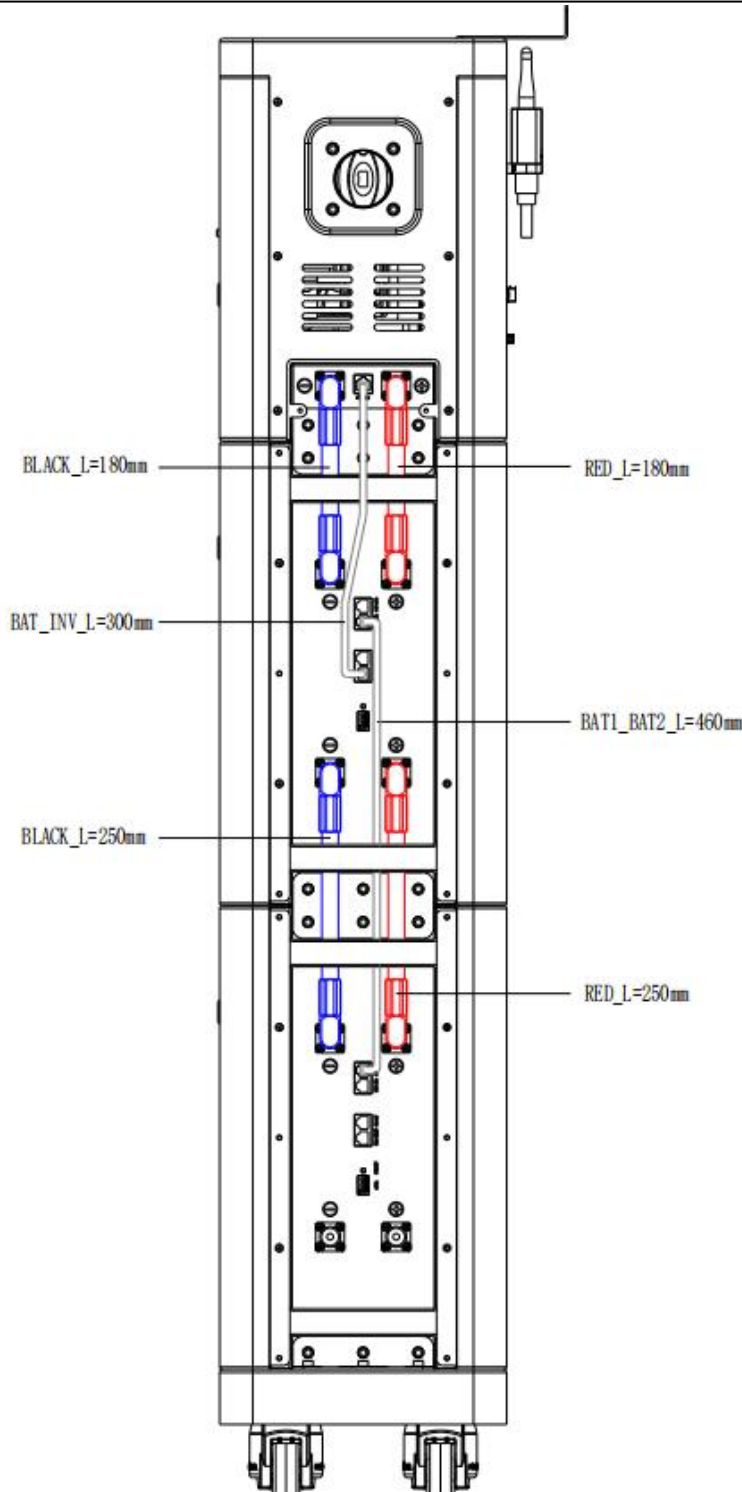
7.Connect the WIFI module with reference to the instructions in the figure, and insert the communication line into the corresponding interface.

PV+

PV−

AC_230V

AC_IN

AC_OUT

LOAD
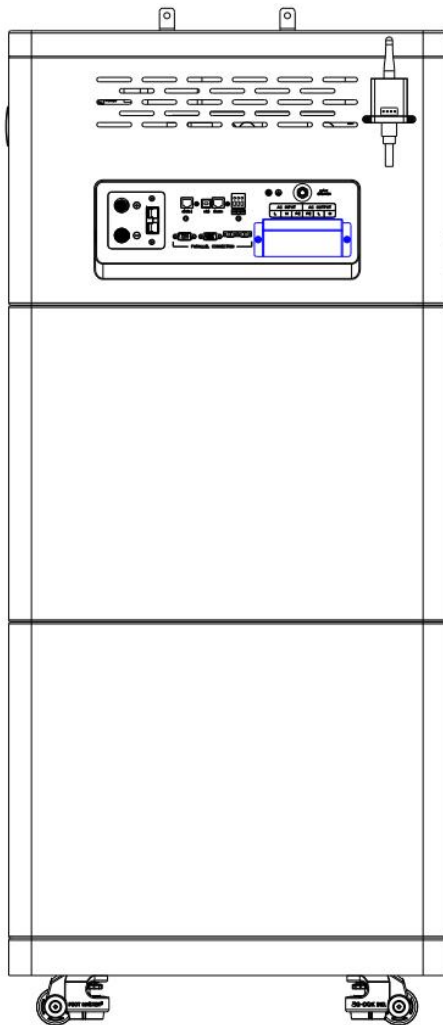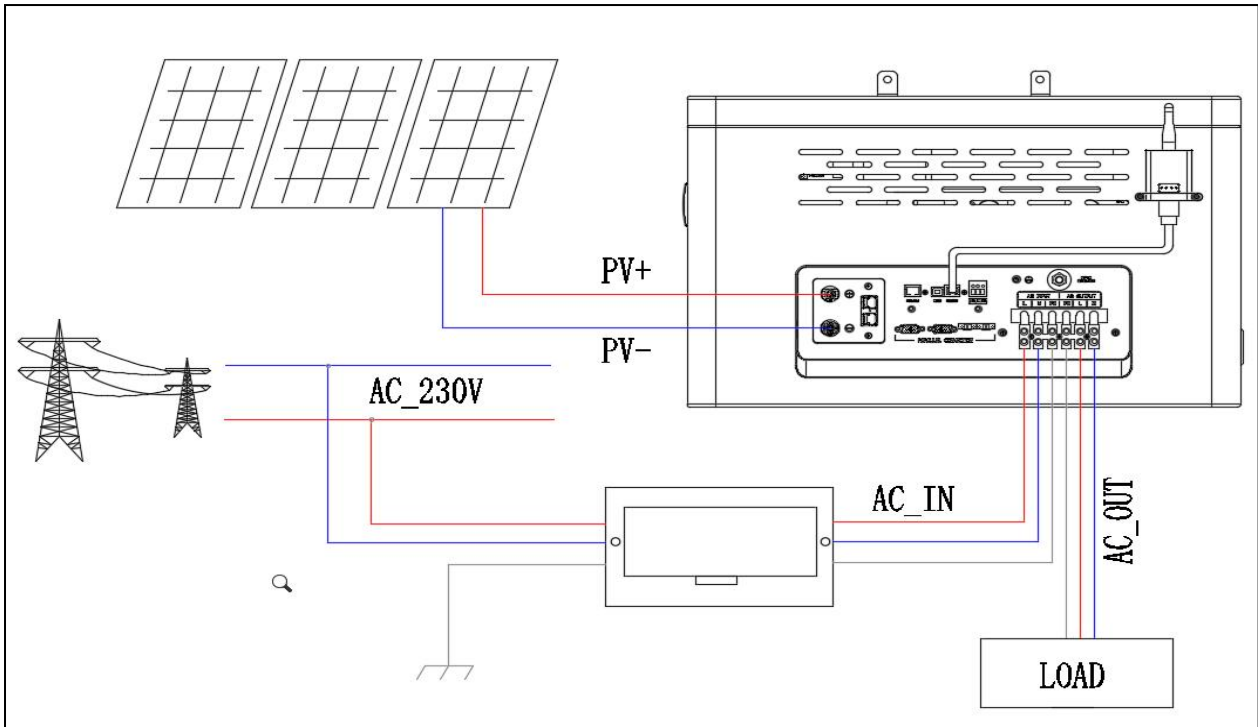
8.Connect the photovoltaic input terminal and the mains output and output wires according to the instructions in the figure. After the installation is complete, please cover the AC protective cover and the side cover of the battery.

9.After the line connection is completed and the test machine is successful, please connect the top two brackets to the wall firmly to prevent rollover and accidents.

Notice:
The output of the machine is high voltage, and non-professionals should not install it privately to avoid safety accidents

5.2 Boot up steps:

1.   First, check the closing state of the red battery main switch on the side of the main engine. (the horizontal side is closed)
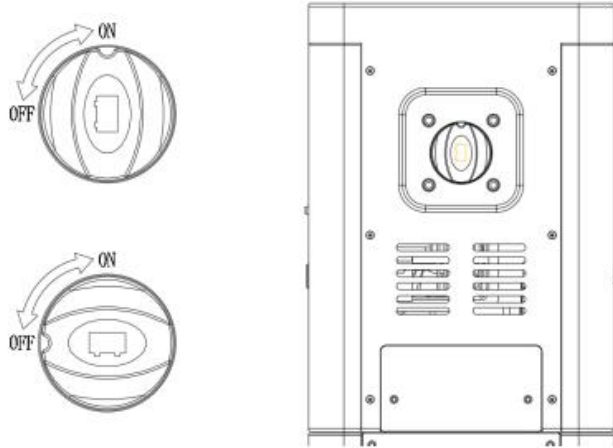
2.Turn on the power switch of the battery box (1), the switch indicator light and the power indicator light are on, and the red light is flashing at this time, wait for about 3 seconds, wait for the red light to stop, and the green light of the operation and power display is always on, at this time The battery system has completed the self-inspection and can work normally; open the next battery box (2) in the same way to complete the self-inspection of the battery system;
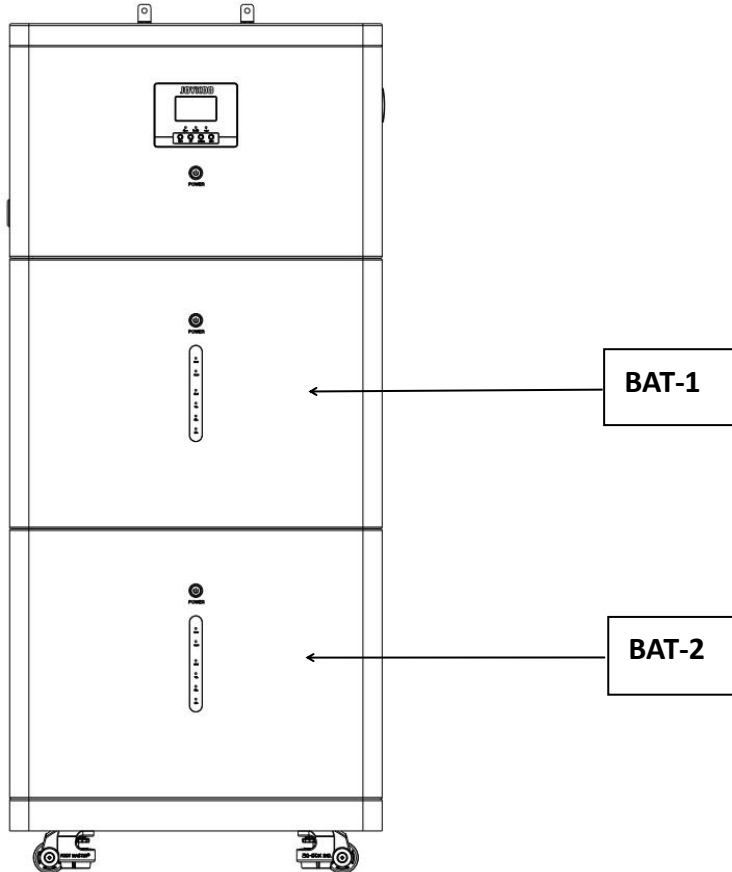
3. After the self-inspection of all battery box systems is completed, turn on the main switch of the battery ⬤ (vertical is on), turn on the power switch of the host, the indicator light is on, wait for about 30 seconds, the AC indicator light flashes, and the display shows AC-230V Output, at this time, the host self-test is completed and the load can be started normally.

5.3 Shutdown steps:

1. First, turn off the electrical equipment in use;
2. Turn off the host voltage switch;
3. Close the side battery main switch; ⬤
4. Finally, turn off the battery box power switch in turn.

Pay attention to:

1.   When opening the battery box, you must wait for the previous battery system to complete the self-test before opening the next battery box. Otherwise, the system self-test will fail and need to be reopened.

2.   When the equipment is not in use for a long time, the power supply of the host and the battery main switch must be turned off to avoid safety accidents.

3.   When the battery is low power alarm, please make up the power in time to avoid the damage caused by the battery loss and the failure to charge.

6. Display and operation instructions

6.1 Operation and display panel

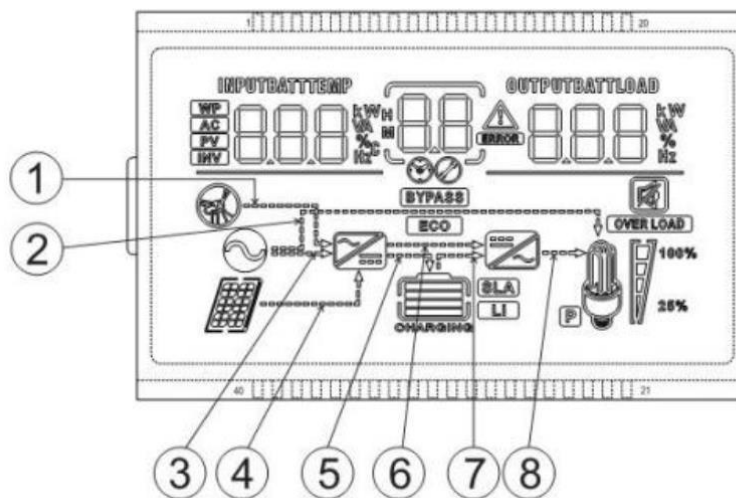The operation and display panel is shown in the figure below, including 1 LCD screen, 3 signal lights and 4 operation keys
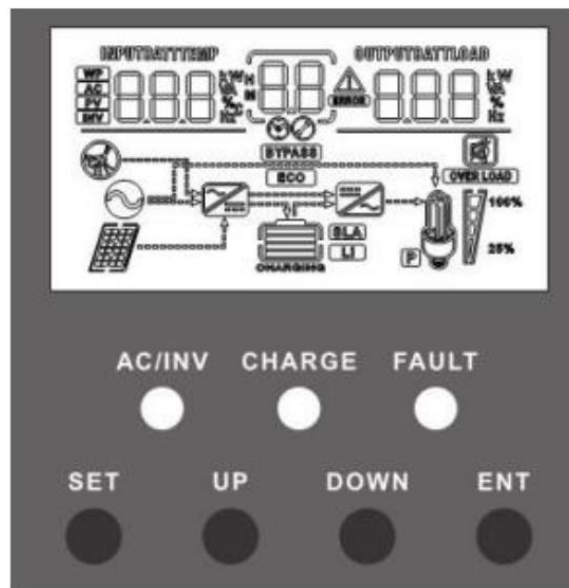
6.2 Key-press operation instructions

Function key	Explain
Set up (UP)	Switch to the previous option
Upward (DOWN)	Switch to the next option
Down (BACK)	Exit the options menu settings
Enter (ENTER)	Confirm / enter the next item in the Settings menu

6.3 Signal light description

Signal lamp	Color	Explain
AC/inverter (AC/INV)	Yellow	Often bright: the mains electricity output
		Blink: Inverter output
Charging (CHARGE)	Green	Flashing: Fast charging
		Often bright: floating charge
Fault (FAULT)	Red	Blink: Fault status

6.4 LCD display description

Icon	Function	Icon	Function
	Indicates that the AC input port is connected to the mains power		Indicates that the inverter circuit is running
	In the AC input mode is APL mode (wide voltage range)	BYPASS	It means that the equipment is on the mains power bypass
	Indicates that the PV input port is connected to the solar panel	OVER LOAD	Indicates that the AC output is in an overloaded state
	Indicates that the device is connected to the battery:		Represents the percentage of the AC output load
	Indicates that the battery remaining power is 0% to 24%		Represents a percent load ranging from 0% to 24%
	Represents the remaining battery power From 25% to 49%		Indicate load percentage of 25%~49%
	Represents the battery surplus is 50%~75%		Indicates the load percentage ranging from 50% to 75%
	Represents the battery is remaining 75%~100%		Represents a load percentage ranging from 75% to 100%
LI	The battery type of the indicated device is a lithium battery		Indicates that the alarm device is not enabled
SLA	The battery type of the indicated device is a lead-acid battery	⚠	Indicates an alert for the device
CHARGING	Indicates that the battery is in a charging state	ERROR	Indicates the device is in a faulty state
	Represents that the AC / solar charging circuit is running	⊘	Indicates that the device is in the setup mode
	Indicates that an AC voltage output exists at the AC output port	88	Parameters displayed in the center of the screen; 1. In unset mode Report or fault code 2. In the setting mode, display the current situation Set the parameter code for the item

P	In parallel operation, the icon indicates that the inverter is the only valid host in parallel mode
Parameters displayed on the left side of the screen: Input parameters	
AC	Indicates the communication input
PV	PV input
INV	Represents the inverter circuit
WP	The icon is not shown
(display)	Display battery voltage, battery total charging current, mains charging power, AC input voltage, AC input frequency, photovoltaic input voltage, internal radiator temperature, software version
Parameters displayed on the right side of the screen: Output parameters	
888	Represents the output voltage, output current, output active power, output dependent power, battery discharge current, Software version; in the setting mode, when the current setting parameter item code, display the setting parameter
Arrows are shown	

①	Arrows are not shown	⑤	Indicates the charging circuit toward the battery port charge
②	Represents the mains power supply to the load	⑥	Arrows are not shown
③	It means that the mains power supplies power to the charging circuit	⑦	Indicates that the battery port is charged to the inverter Road energy supply
④	It means that the solar module provides power to the long point circuit	⑧	Indicates that the inverter circuit supplies power to the load

7. Description of the operation mode

7.1.1 Solar priority: solar components will give priority to charge battery, and battery only in photovoltaic system, through the mains charge, during the day, to charge the solar energy, night, charging power source for city electricity, this can maintain the battery level, and the grid is

relatively stable, relatively high price in the area of the ideal choice
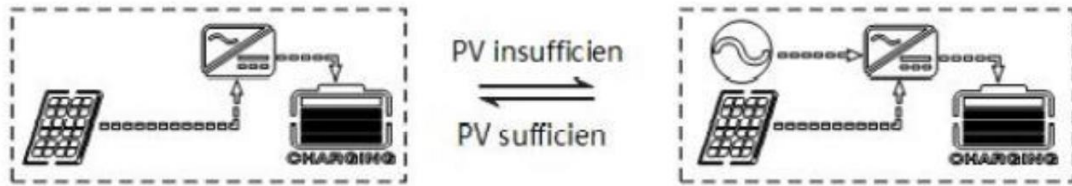
7.1.2 Mains power priority: The mains power will give priority to charging the batteries, and only the photovoltaic charging is activated when the mains power is weakened.
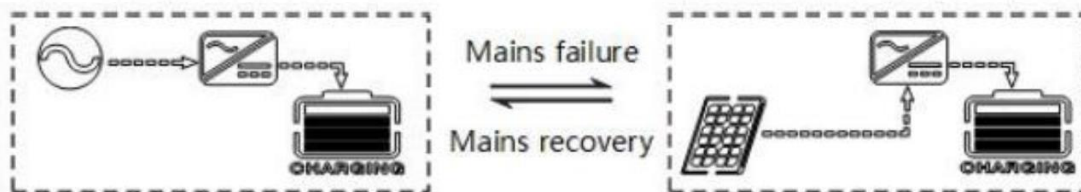
7.1.3 Hybrid charging: photovoltaic and city hybrid charge, photovoltaic maximum power point tracking charge as a priority, at the same time when solar energy, city as the mains supply, when the solar energy, city to stop charging, the mode for the fastest charging mode, suitable for city electricity unstable areas, provide sufficient backup power for the region.
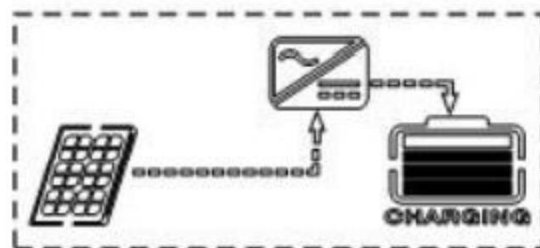
7.1.4 With solar energy only: only solar charging, and not suitable for mains charging. This mode is the most energy efficient method when the battery is charged only by solar panels, and is often used in areas with excellent light conditions.
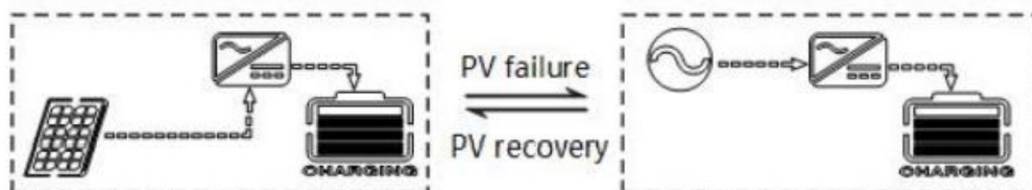
7.2 Output mode

7.2.1 Solar Energy Priority Mode:

When the solar energy weakens, switch to supply power to the city. This model maximizes the use

of solar energy while maintaining the battery power, and is suitable for areas where mains is relatively stable. Power supply priority: Solar mains battery
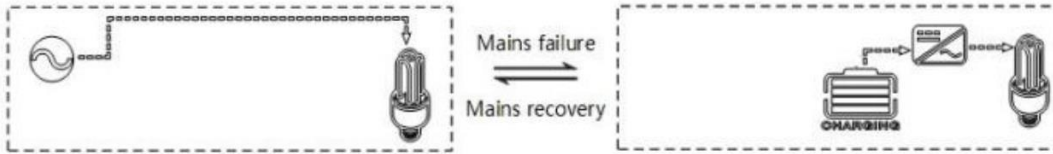
7.2.2 Mains Priority Mode:

Only switch the inverter when the mains power is weakened (when the mains power supply units are available, the mains power supply supports charging and energy supply), and then the equipment is equivalent In a standby UPS to apply to unstable areas, switching to municipal electricity, do not affect solar charging.

Supply Power priority: mains power solar cells
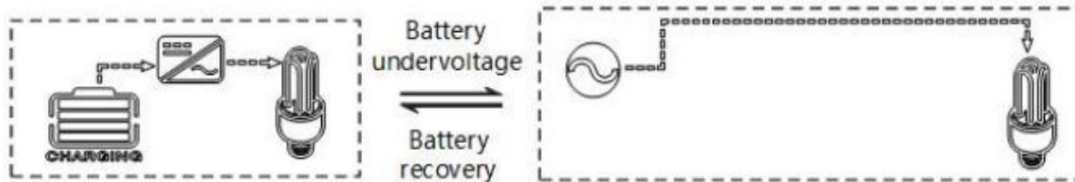
7.2.3 Battery Priority Mode:

Only in the battery discharge low voltage below the set point (04 set), switch for city power, when charging battery than set point (05 set) high, switch to battery discharge mode, which can cycle for battery charge and discharge, the mode to maximize the use of the DC can, and suitable for the mains electricity stable area, switch does not affect the solar charging, power supply priority: solar cell mains
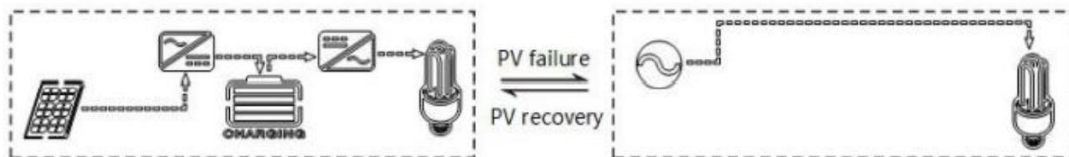
8. Parameter setting

Battery operation instructions: press the "Settings" key to enter or exit the Settings menu. After entering the Settings menu, the parameter number [00] will flash, at this point, press the "up" and "down" keys, select the parameter item code to be set, and then, press the "Enter" key to enter the parameter set series mode, flashing the parameter values, adjust the parameter value through the "Up" and "Down" keys, and finally press the "Enter" key to complete the parameter editing, and returns to the parameter selection state.

| Parameter number	Function	Set up	Explain
00	Exit Setup Menu	[00] ESC (exit)	Exit Setup Menu
01	Output power supply is preferred	[01] SOL (Solar Energy)	Solar priority mode, switching to the mains when the solar energy weakens, or the battery is below the parameter value set by the program [04]
		[01] UTI (Mains)	mains priority mode only switches to the inverter when the mains weakens
		【01】SBU	Battery priority mode switches only only when the battery voltage is insufficient or below the [04] parameter set point, and only switches to the battery discharge when the battery is full or above the [05] parameter set point
02	Output frequency	【02】50.0HZ	Bypass adaptation: the device automatically adapts to the mains frequency; when the mains is disconnected, the output frequency can be set by this setting item. The default output frequency of the 230V device is 50Hz, and the 120V device is 60Hz
		【02】60.0HZ	
03	The AC-input voltage range	[03]APL (household appliances) 230V	The wide mains input voltage range of the equipment is: 90~280V
		[03]UPS (uninterruptible power supply) 230V	Narrow mains power input voltage range of the equipment; 170~280V
04	Battery switch to the voltage setting point of the electricity	[04]43.6V When parameter (default)	When the parameter [01] = SBU, the battery voltage is lower than the set value, and the output is switched from the inverter to the city, the setting range: 48V~52V
05	The mains power switches to the battery Voltage setting point	[05]56.0V (Default)	When the parameter [01] = SBU, the battery voltage is higher than the set value, and the output is switched from mains to inverter, and the setting range is 48V~60V

06	Charging power supply is preferred	【06】CSO	Solar charging first: start mains charging only when solar charging weakens

9. Other functional description

9.1. dry contact

How it works: The dry contact can control the diesel engine on / off to charge the battery.

① Usually the port of the NC-N point is closed state, and the NO-N point is open state.

② When the battery voltage reaches the low voltage disconnection point, the relay coil is energized, and the port is converted, NO-N point is closed state, and NC-N point is open state. At this point, the NO-N point can drive the resistance load: 125 Vac/1A, 230Vac/1A, and 30Vdc/1A.
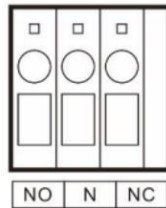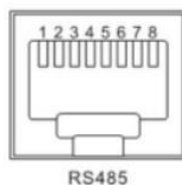

9.2 RS485 communication interface

This interface is a RS485 communication interface and has two functions:

① RS485-2 can communicate directly with the optional host developed by the company through this port, which can monitor the device running status and set some parameters on the host.

② RS485-1 / RS485-2 can also communicate directly with the optional WIFI / GPRS. With this mode, you can connect to the reverse all-in-one machine through the mobile phone APP to browse running parameters and device status.

as shown in the figure:

RS485-1: pin 1 is 5V power supply, pin 2 is ground, pin 7 is RS485-A1, and pin 8 is RS485-B1
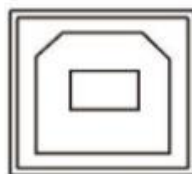
RS485-2: pin 1 is 5V power supply, pin 2 is ground, pin 7 is RS485-A2, and pin 8 is RS485-B2

9.3 USB communication interface

The legend shows the USB communication interface, which can communicate with the optional PC host software. Use the connection

When speaking, you need to install the corresponding "USB to series chip CH340T driver" in the computer.

9.4 Remote monitoring

➢ Google browser, scan the QR code to download the APP.

➢ Search for "SmartESS" in Google Play Store, download it, and install it.

9.5 Packing List

Item Description	Quantity	Remarks
Inverter main chassis	1	5.5KW
battery box	2	48V100Ah
Base	1	
WIFI module	1	
Right Angle connection frame	3	
Plane connection bracket	3	
Screw HB 5 * 16mm	36	
Screw for PWM 4 * 10mm	5	
Top-wall retaining bracket	2	
Inside hexagon screwdriver	1	
Phillips screwdriver	1	
Positive electrode battery cable (L=180mm)	1	Red
Negative electrode battery connector (L=180mm)	1	Black
Positive electrode battery cable (L=250mm)	1	Red
Negative electrode battery connector (L=250mm)	1	Black
Communication line (L=300mm)	1	Battery-connected inverter host
Communication line (L=460mm)	1	Parallel operation
Dry contact connection line	1	Generator communication
AGV communication line	1	Dilatation
product specification	1	
Photovoltaic plug-in terminals	2	

10. Precautions

(1) Do not put in high temperature environment or the fire, or in the sun;

(2) Do not put it in the water or outside in the rain;

(3) Do not use it in environments outside the scope of the use environment;

(4) When applying the inverter, ask consumers to use the certified electrical and electronic equipment;

(5) Do not puncture the power supply shell with nails or other sharp objects, or hammer or pedal power supply;

(6) Do not break down the power supply in any way;

(7) If the power supply emits odor, heat, deformation, discoloration or any other abnormal phenomenon shall not use;

(8) If the power supply leaks or smells off, it should be immediately removed from close to the open flame;

(9) If the equipment is not used for a long time, place the power supply in a cool and dry place and charge and discharge it every 3~6 months, otherwise, it will affect the performance of the power supply and shorten the service life of the power supply;