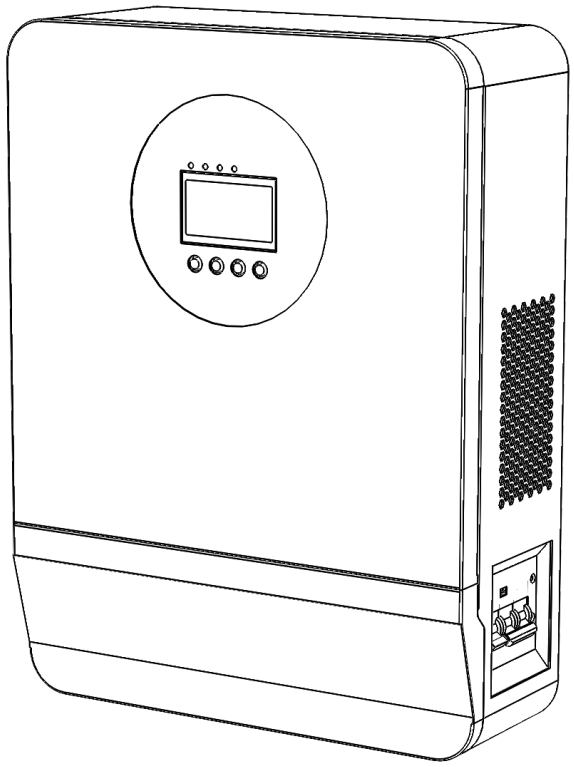
User Manual



MPPT Hybrid solar inverter

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!

Catalogue

1 Product Features

● Double CPU intelligent control technology, excellent performance.
● The grid mode /battery mode could be set, application flexible.
● Smart fan control, safe and reliable.
● The pure sine wave output, can adapt to various types of load.
● Wide input voltage range,high-precision output automatic voltage function.
● The LCD real-time display device parameters, running status at a glance.
● The output overload, short circuit protection, automatic protection and alarm.
●The intelligent MPPT solar controller, overcharge,overdischarge protection, current limiting charging, multiple protection

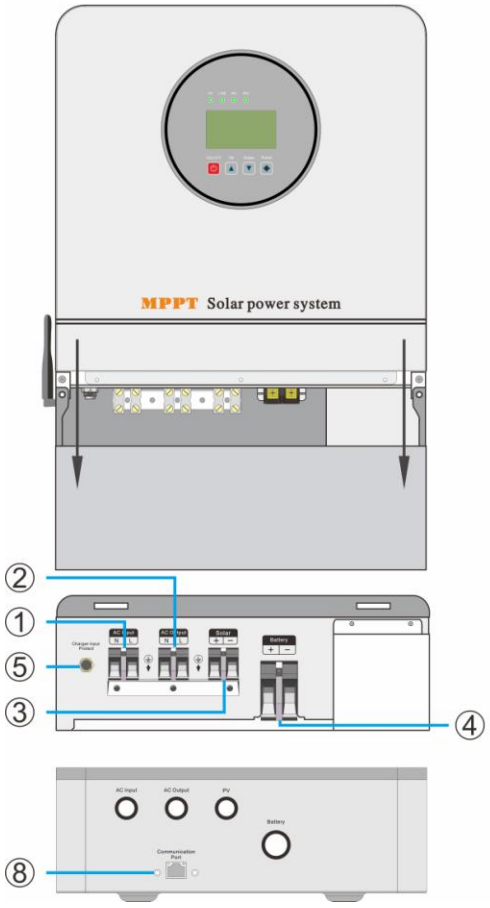
2 Installation and Storage instructions

2.1 Unpacking inspection
2.1.1Open the package, check whether the product accessories is complete, including: a host controller, a user manual.
2.1.2 Check whether the device is damaged in transit, if you find damaged, please do not start machine and inform your shipper and dealer.

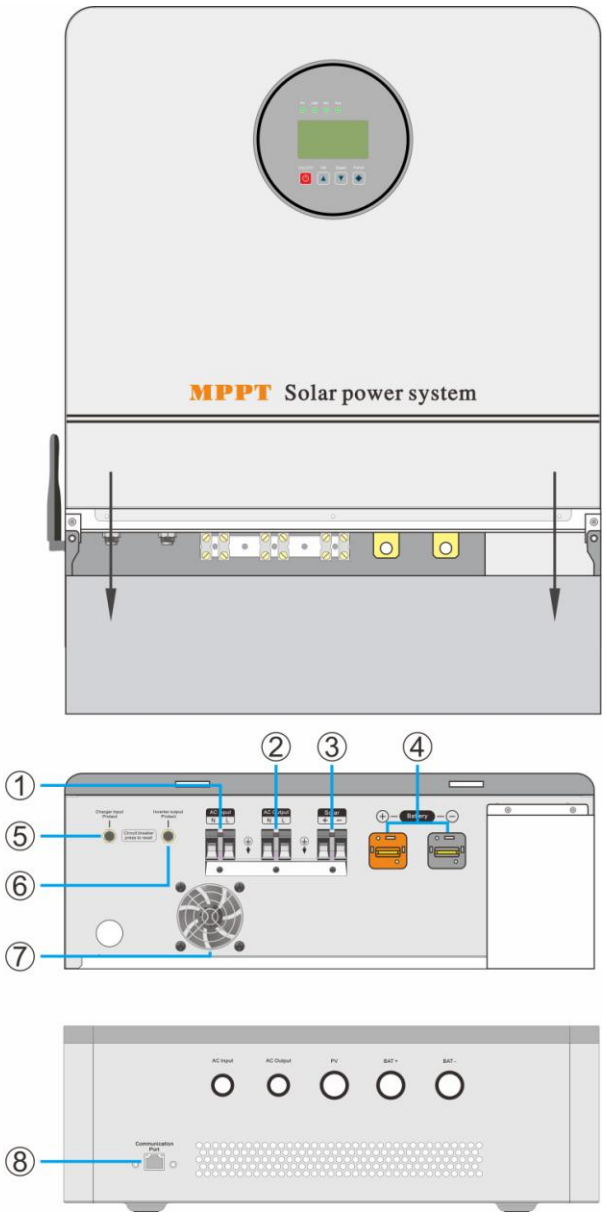
2.2 Installation and Storage matters need attention
2.2.1 Install equipment should be operated by a professional personal, or performed by the local distributor.
2.2.2 During transportation, it need taking appropriate protective measures. When the equipment is moved to high temperature environment from low temperature environment may appear water, in order to ensure safety so it must be completely dry before use.
2.2.3 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.
2.2.4 Battery switch on backboard should be under off state when themachineis not be used for a long time.

3 Inverter diagram, operation instructions

3.1 Front panel icon



(0.3KW-1KW inverter)

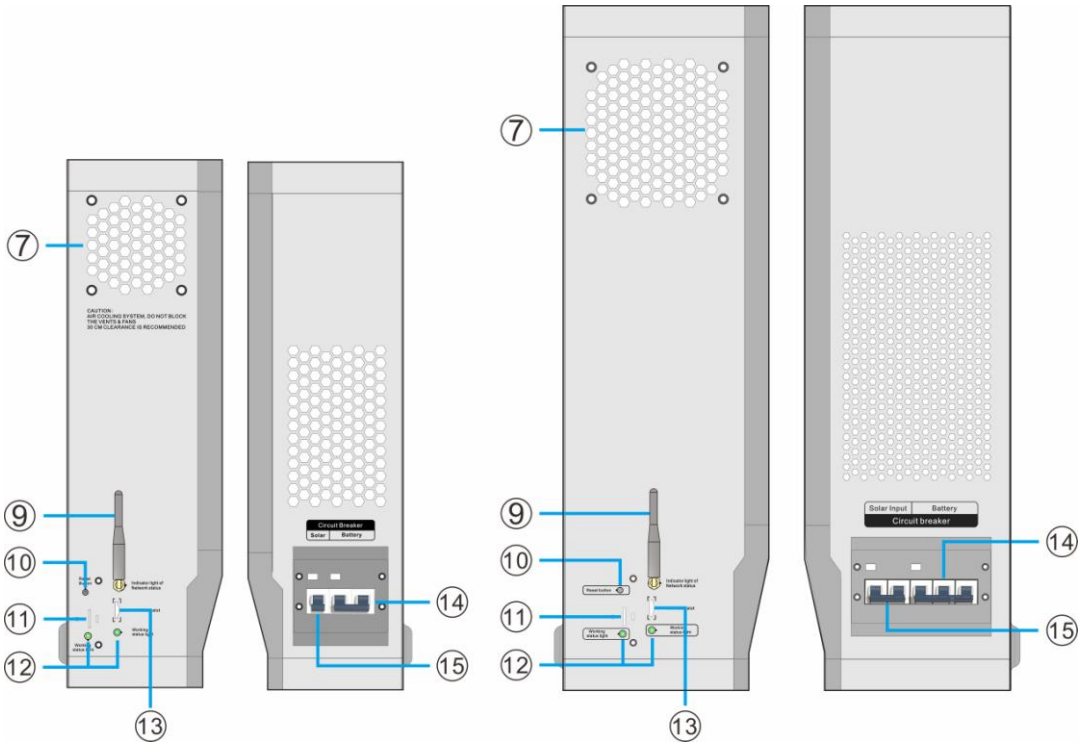


(1.5KW-6KW inverter)

Introduction:

①-- AC input port
②-- AC output port
③-- Solar input port
④-- Battery access port
⑤-- AC input fuse holder
⑥-- AC output fuse holder
⑦-- Fan
⑧-- Rs485

3.2 Side panel icon



(0.3KW-1KW inverter) (1.5KW-6KW inverter)

Introduction：

⑨-- Wi-fi communication instructions(optional function)

⑩-- WIFI reset button

⑪-- 4G communication instructions(optional function)

⑫-- WIFI/4G working status indicator

⑬-- SIM card slot(optional function)

⑭-- Battery input breaker

⑮-- Solar input breaker

3.3Front panel instructions

3.3.1 LCD display and function key operation interface, can display the working status of the equipment, such as: Input / output voltage, frequency, mains mode, the inverter mode, battery capacity, charge current, charge the total load capacity, warning tips.

3.3.2Keys Description

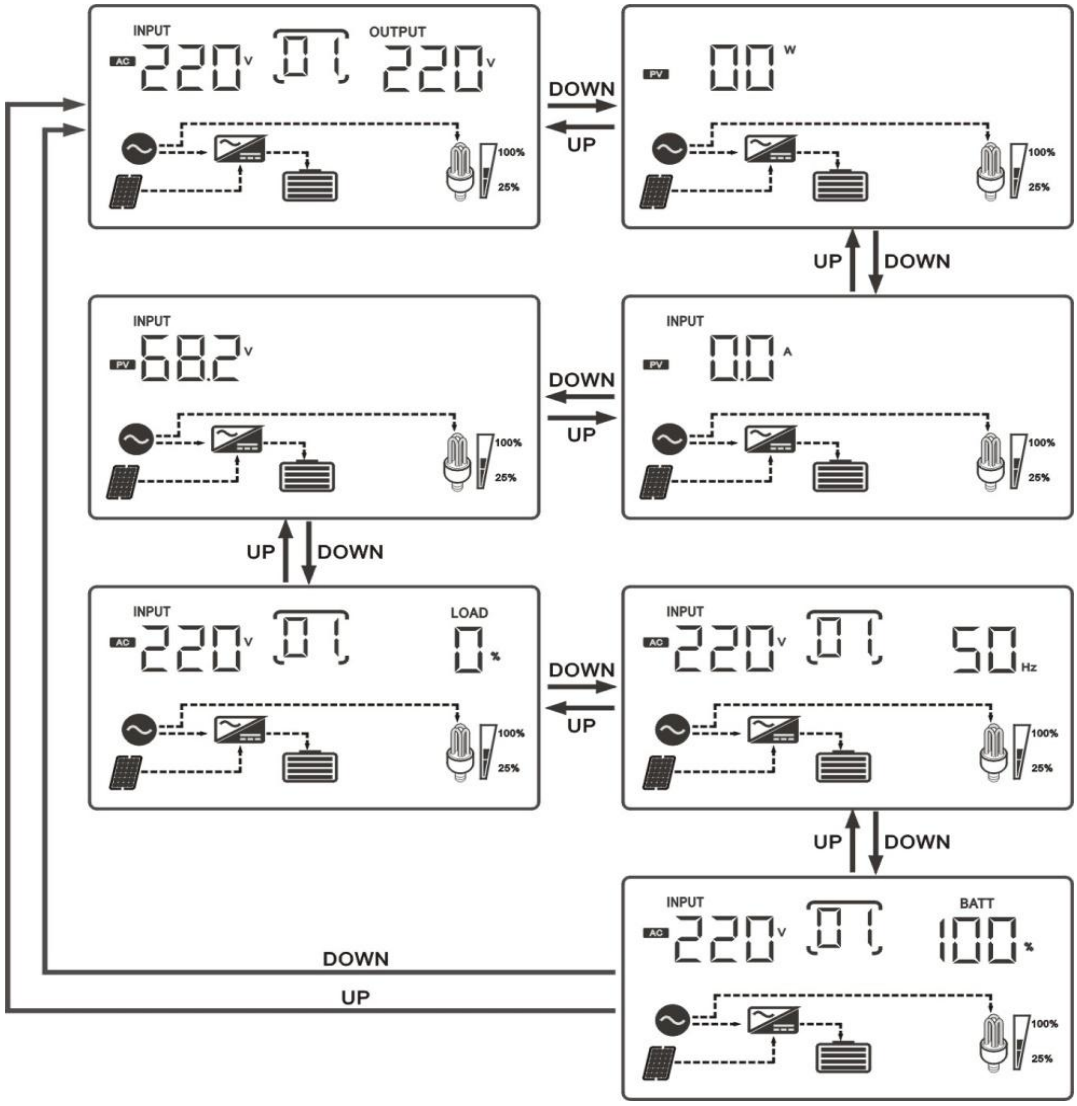
Function keys		Decription
⏻	Power on/ off key	Single on / off control
▲	Page up/set key	Under the main interface, click to view the device parameters and set the increment under the interface
▼	Scroll down/set key	Under the main interface, click to view the device parameters and set the decrement under the interface
◇	Function keys	Long press to enter device mode setting /Under the setting interface, short press the button to confirm the parameters and return to the main interface

3.3.3LED Status Description

LED display			Description
PV	Green	Quick Flash	Maximum power tracking mode charge
		Slow Flash	Floating charging mode
		OFF	Stop charging
LINE	Green	Light	The AC is connected and the output is bypassed
		OFF	Do not connect AC power or it is in inversion state
INV	yellow	Light	The device is in inversion state
		OFF	The device is not in inversion state
FAU	red	Light	Device AC output short circuit or severe overload
		OFF	The device work normally

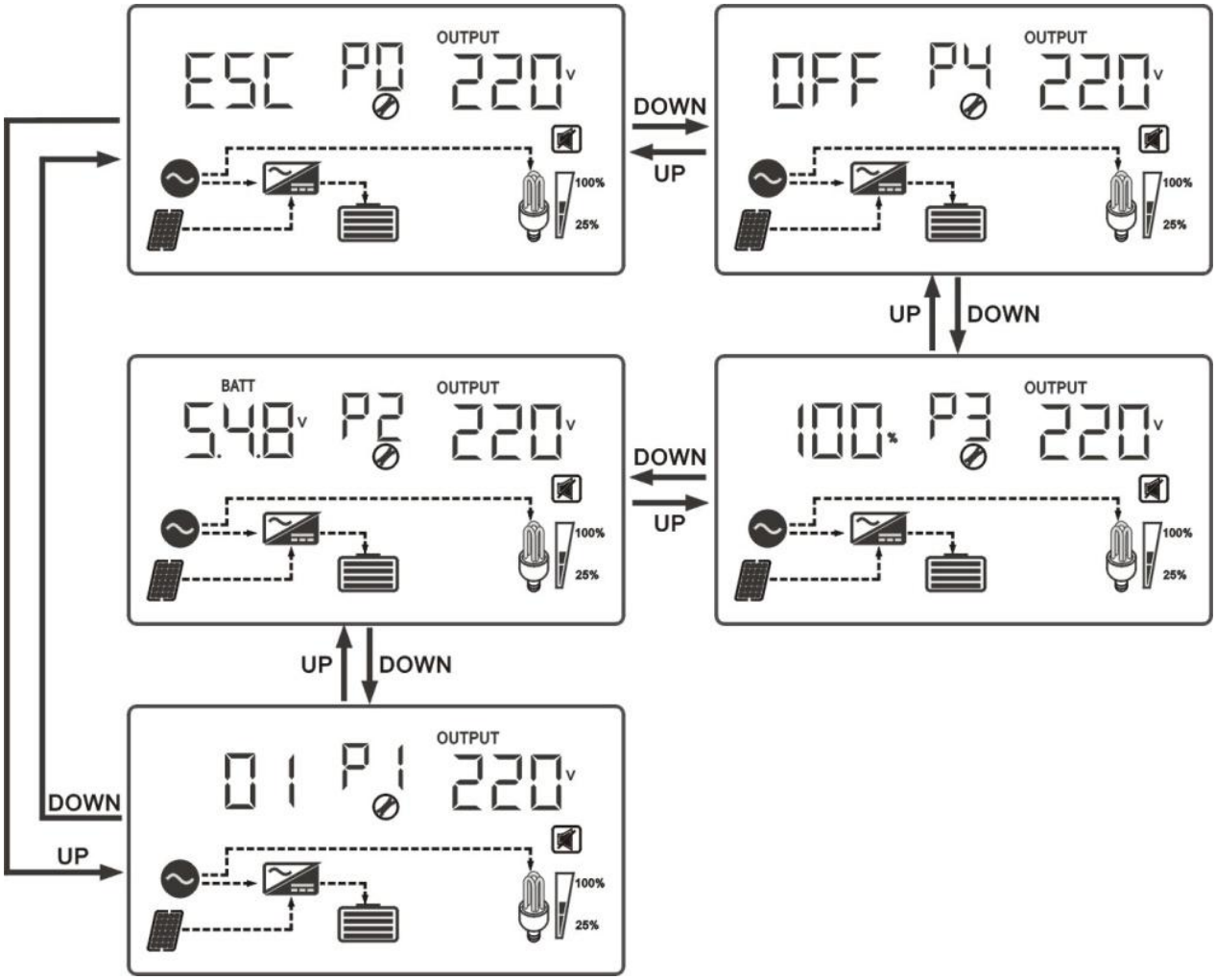
3.3.4LCD display instruction

3.3.4.1View the main interface：In the main interface, press DOWN or UP to scroll through the screen.



3.3.4.2Main menu: in the main interface, long press Funct key for 5 seconds or less to enter the main menu, and press DOWN or UP to view the sub-menu. The function of P0/P1/P2/P3/P4 in the flashing state is as follows：

Main Menu	Functions
P4	Buzzer mode
P3	Inverter charging current
P2	Inverter charging voltage
P1	Inverter operating mode
P0	Save & Exit



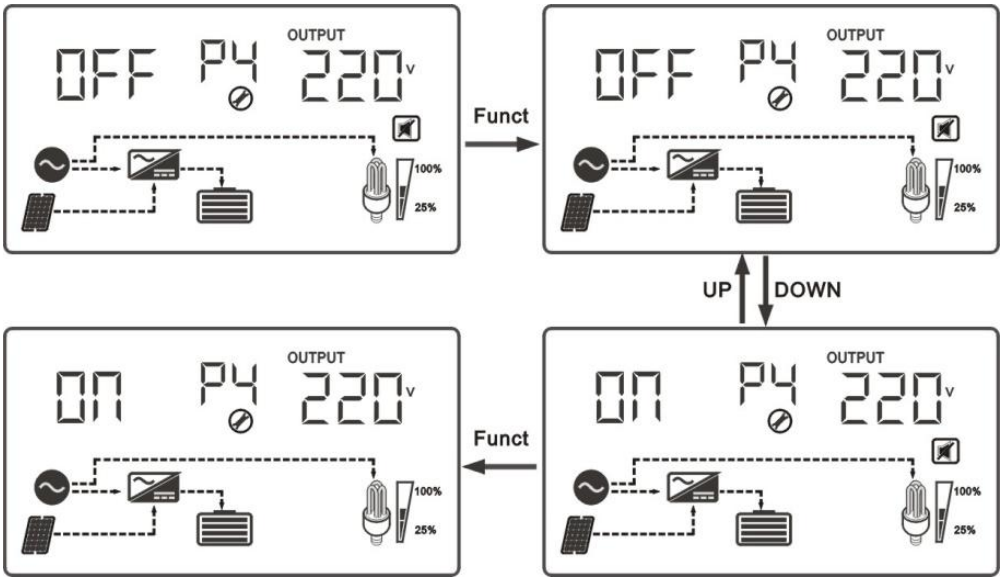
3.3.5ParametersSetting

3.3.5.1Buzzer mode Settings.

Under the main interface, long press the Funct button for 5 seconds or less to enter the main menu, press the DOWN button to select the buzzer information P4, press the Funct button to enter the setting interface, turn on/off the buzzer state through DOWN or UP key, and press the Funct key to save and exit.

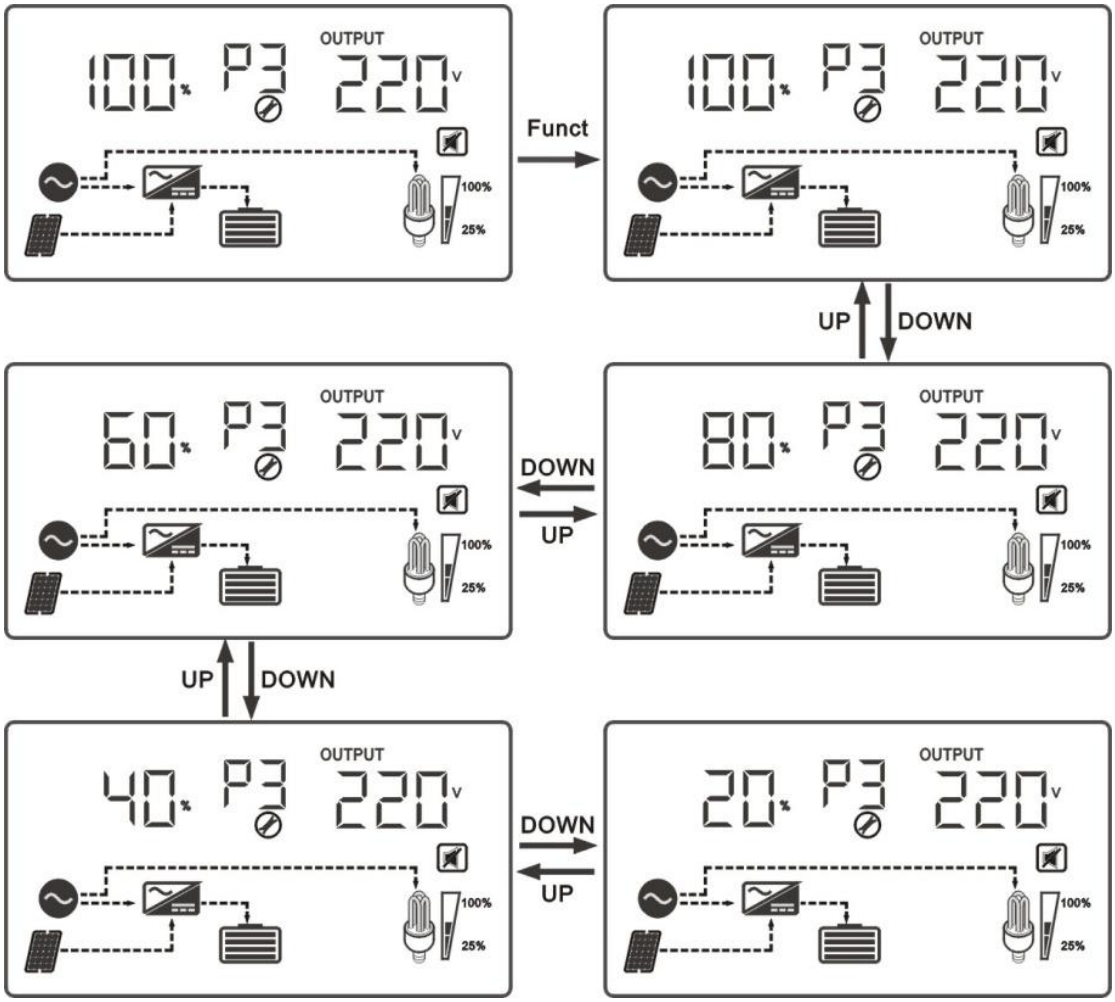
On Indicates that the buzzer is on;

0FF Indicates that the buzzer is off;



3.3.5.2Inverter charging current setting.

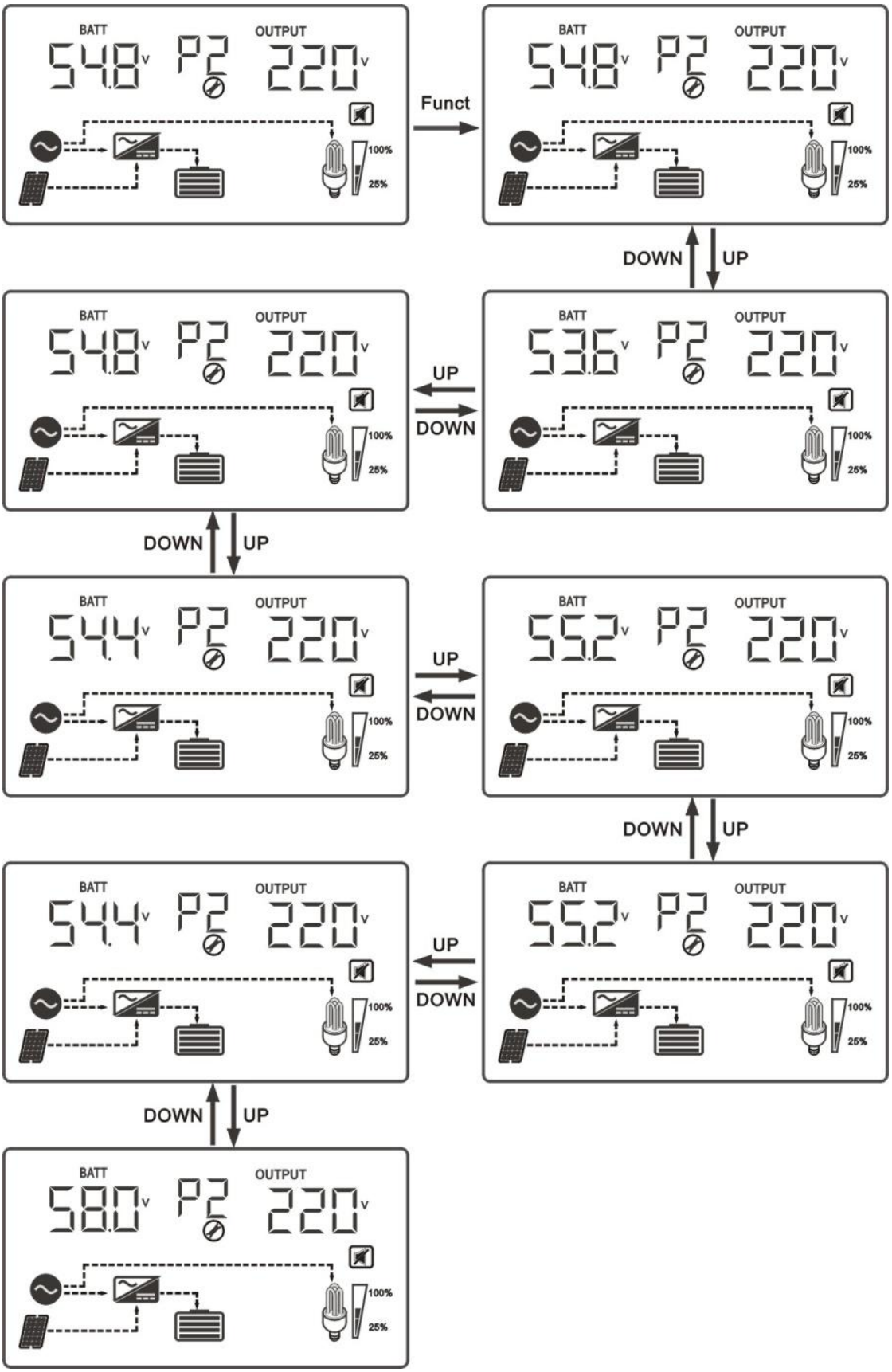
Under the main interface, long press the Funct button for 5 seconds or less to enter the main menu. Press the DOWN button to select the inverter charging current information P3. Press the Funct button to enter the setting interface . Through DOWN or UP keys, increase /decrease The charge current of the inverter (100%-80%-60%-40%-20%). Pressed Funct to save and exit.



3.3.5.3 Inverter charging voltage setting

Under the main interface, long press the Funct button for 5 seconds or less to enter the main menu. Press the DOWN button to select the inverter work mode information P2. Press the Funct button to enter the setting interface，Adjust the charging voltage of the inverter by DOWN or UP key，Pressed Funct to save and exit。

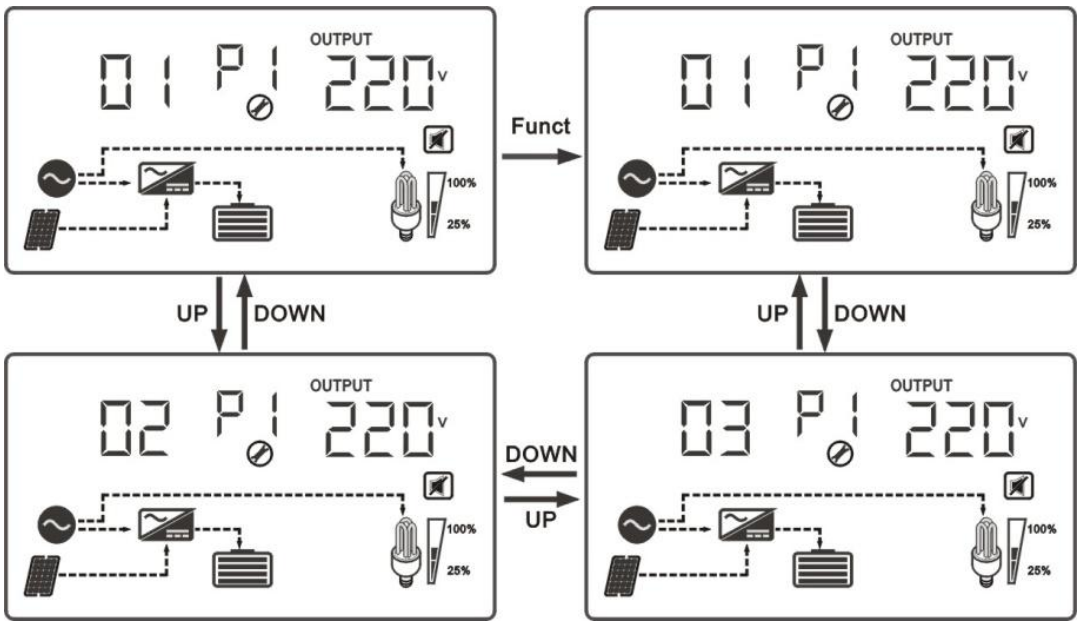
Charging voltage value	Voltage type
54.8	Gel U.S.A
53.6	A.G.M.1
54.8	A.G.M.2
55.2	Gel European
55.2	Open lead acid
54.4	Calcuim(open)
58.0	De sulphation cycle 15.5 for 4 hrs


BATT
OUTPUT
54.8v
P2
220v
Funct
100%
25%
DOWN
UP
53.6v
UP
DOWN
54.4v
55.2v
58.0v

3.3.5.4Inverter charging voltage setting.

Under the main interface, long press the Funct key for 5 seconds or less to enter the main menu, press the DOWN key to select the inverter work mode information P1, press the Funct key to enter the setting interface, adjust the inverter work mode (01-03) through DOWN or UP key, press the Funct key to save and exit.

icon	Working mode	Running state
01	The grid priority mode	Mains priority mode, after the device starts and 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 the grid is having too high/low/serious distortion or other abnormal , equipment will make battery energy through internal module transfer into high quality electricity and supply power to load.
03	Battery priority mode	Battery priority mode, When the battery in the external charging device (such as solar charging system) after adequate power charged, equipment will automatically convert to battery energy through internal module into high quality electricity for load;When the battery power drops to a low voltage threshold, the device supplies power to the load through the mains bypass voltage regulation, but does not add power to the battery pack. This mode is mainly designed for new energy power generation systems (such as wind and solar power generation systems)



4Device connection icon

4.1 Recommended line diameter

Battery, AC input / output connecting wire diameter recommended that: (1 mm2 copper wire is calculated by current 4-5A)

The battery connecting wire diameter $=\frac{\text{Power rating(W)}}{\text{Rated battery voltage(V)*5A/mm}^2}$
AC connection wire diameter $=\frac{\text{Power rating(W)}}{\text{Rated AC voltage*5A/mm}^2}$

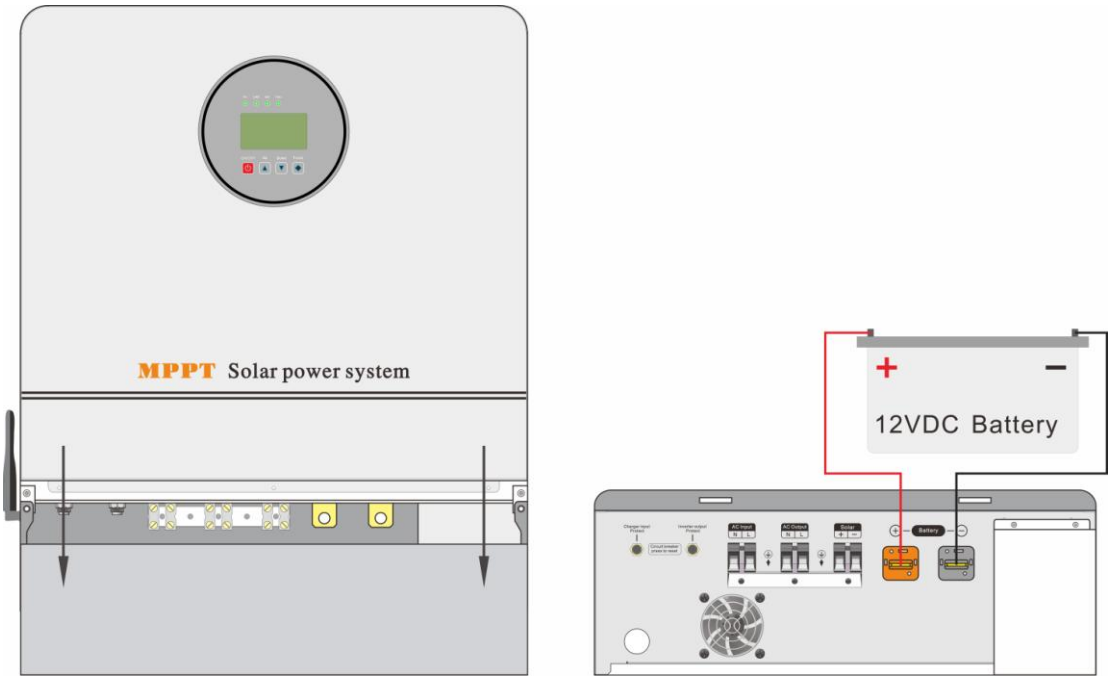
For example: 5000W/48VDC/220VAC equipment connecting wire diameter are as follows

The battery connecting wire diameter $=\frac{5000W}{48VDC*5A/mm^2}\approx 20(mm^2)$
AC connection wire diameter $=\frac{\text{Power rating(W)}}{\text{Rated AC voltage*5A/mm}^2}\approx 6(mm^2)$

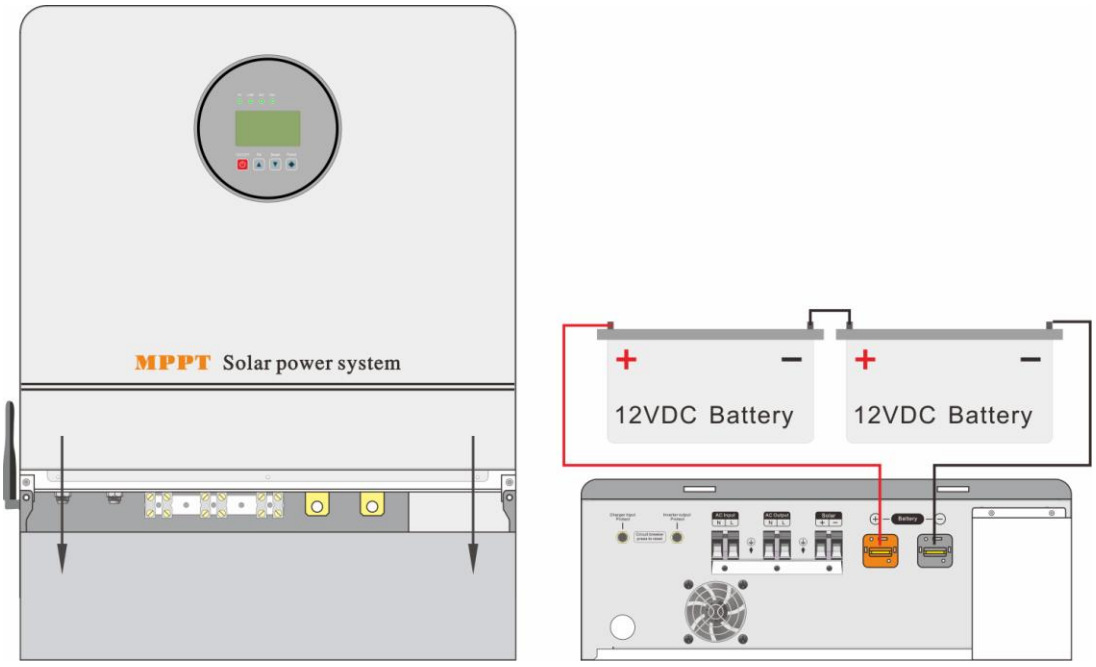
4.2Battery installation

Note: make sure the circuit breaker on the side board is in the disconnected state, Wrong connection will cause equipment failure.

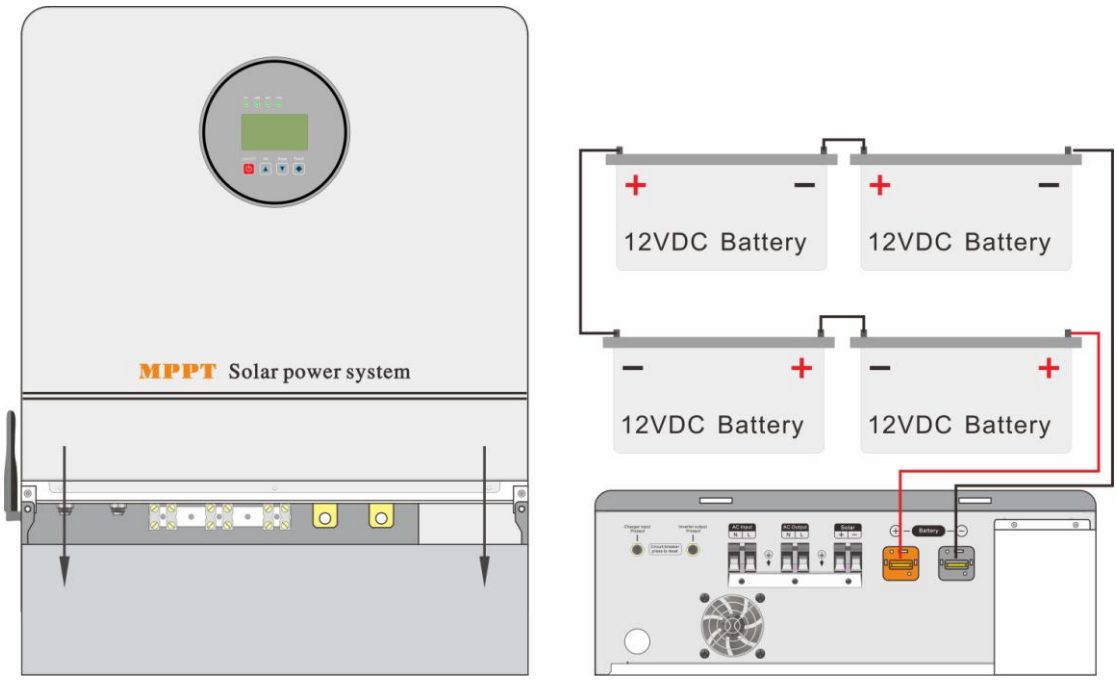
4.2.1 12VDC series battery wiring graphical representation



4.2.2 24VDC series battery wiring graphical representation

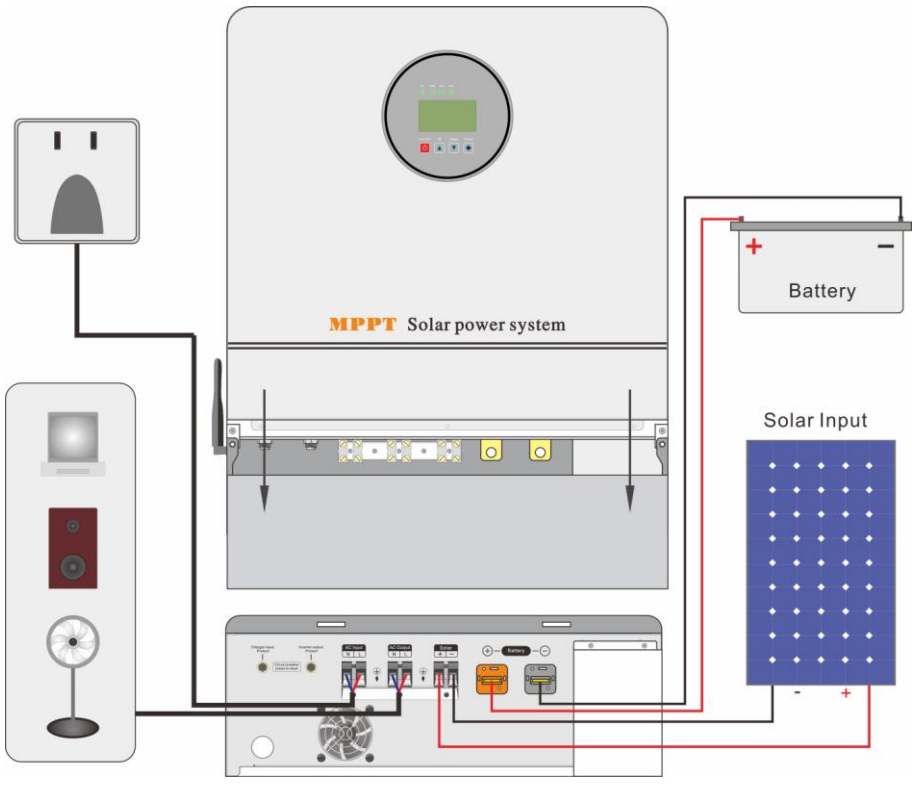


4.2.3 48VDC series battery wiring graphical representation(It is 8 pieces 12VDC battery connected in series of 96VDC series battery connection)



Remarks:0.3KW~1KW device does not support 48VDC and 96VDC voltage levels.

4.2.4 Input/Output wiring diagram



4.3Photovoltaic module access instructions

After connecting the photovoltaic module with a suitable wire diameter, make sure that the voltage and power are within the rated range, and connect it to the "③-- Solar input port " on the side panel of the equipment. Pay attention to the polarity error in the connection process of the photovoltaic module, so as not to damage the equipment.

4.4Mains access instructions

Select the right diameter of the wire to connect the power supply to the side board of the equipment on the "①-- AC input port";Note that the input ac voltage should be within the input range of the equipment to avoid damage the equipment.

4.5Notes of output load

The load of 220VAC is connected to the "②-- AC output port". The load power is the rated power of inverter with load detection function and load percentage display.

5Power ON/RUN

Note: Check it the voltage of battery psckand polarity of the solar module are connected to the equipment correctly.

5.1Inverter Power ON/RUN

5.1.1 Battery starting

pull the battery breaker on the side panel to the closed state. Long press the "ON / OFF" button on the front panel for 2 seconds, release it after the buzzer beeps once .The "INV" indicator light, automatically open the inverter output.

5.1.2 Mains Input Power-on

enter appropriate mains power, the front board "LINE" indicator light, the device automatically output.

5.2 Photovoltaic controller Charger-Disable

Connect to the photovoltaic module, unplug the solar energy input circuit breaker on the side panel of the equipment to the closed state. When the solar module is exposed to sunlight, the "PV" indicator light on the front panel will light up. At this time, the controller is already in the charging state, and the photovoltaic module will supplement the battery power through the controller.

5.3 Equipment shutdown

Shutdown: Turn off the load one by one, disconnect the mains input, and then press the "power on / off button" for 2 seconds, release after the internal relay action, the device off the AC output, LCD screen goes out, pull the side panel of the circuit breaker to disconnect the state.

OPERATION PRECAUTIONS: When opening the device, follow the following sequence: first close the circuit breaker of the battery, and then close the circuit breaker of the solar module input. When the device is turned off, disconnect the circuit breaker of the solar module input, then disconnect the battery of a circuit breaker;

Caution: When disconnecting the solar module, please leave the battery breaker on the side panel to the off state to avoid the deep discharge of the battery when the device is not used for a long time. The internal controller in the standby power loss);

5.4 Audible alarm reminder instruction

Equipment running normal	Buzzing prohibit	Buzzer is no tweet under default state
	Buzzer starts	Buzzer tweet 4 times every 15s, indicate the equipment operated under battery inverter state
Battery high voltage alarm	Buzzer tweets 4 times per second, alarms high voltage	
Battery low voltage alarm	Buzzer tweets 2 times per second, alarms low voltage	
Over temperature alarm	Buzzer alarm 2 seconds pause 1 second	

5.5Electric generator connection announcements:

If connect electric generator, it needs operate as below.

5.5.1 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.

5.5.2 After the equipment starting, then connect load one by one.

5.5.3 We suggest electric generator capacity should be 2~3 times of this equipment.

6 Maintenance and maintenance

6.1.This series of products with little maintenance, battery only need to constantly maintain the charge to obtain life expectancy. In the same city electricity connection.

6.2 If you do not use the equipment for a long period of time, it is recommended to charge it every 4-6 months. Under normal circumstances, the battery's life will be 3-5 years, if found in poor condition, you must replace the battery early. When replacing the battery, it must be carried out by qualified personnel. Battery should not be individually replaced, the overall replacement should follow the battery supplier's instructions.

6.3 Normal use, the battery every 4 to 6 months to be charged, discharge time, discharge to the shutdown charge, In the high temperature region, the battery charge every two months, discharge time.

6.4 Before replacing the battery, turn off the device and disconnect it from the mains, and close the battery switch. Take off metal objects such as rings and watches. Use insulated handle and screwdriver, do not put tools or other metal objects on the battery pack.

6.5 When connecting the battery cable, it is normal for small sparks to appear in the joint, which will not cause any harm to the personal safety and the equipment. Do not charge the battery positive and negative, very short or reverse connection.

7Simple fault diagnosis and treatment

WARNING: There is high pressure inside the machine! Do not open and try to repair or maintenance, so as not to cause electric shock hazard!

Failure phenomenon	Possible reason	solution
The machine load time is reduced	The battery is not fully charged	Make sure that the battery is fully charged
	The machine connection is overloaded	Removal of noncritical loads
	Battery aging, can not be sufficient power	Contact your customer service representative to obtain a battery replacement kit
The device can not be turned on	The mains input cable or the battery cable is poorly connected	Check and reconnect
Boot alarm	The battery is low	Make sure that the battery is fully charged
	Load overload	Removal of noncritical loads
The buzzer is called 2 seconds and 1 second	The internal temperature is too high alarm	Check the fan and cooling holes are blocked
The fan is spinning slowly	The fan adjusts according to the temperature	normal phenomenon
The "PV" indicator does not light when there is a sun-lit PV module	PV module array cable open	Please check whether the wiring of the PV array is correct and the contact is reliable

When you contact the service personnel, please provide the following information: Type of machine / date of issue / complete description of the problem (including the relevant indicator display status, battery configuration, connection and other information).

8Technology parameter sheet

<table>
<tr><td colspan="2">Model: NKM-</td><td colspan="2">0.3-1KW</td><td colspan="3">1.5-6KW</td></tr>
<tr><td colspan="2" rowspan="2">power rating(w)</td><td>300</td><td>700</td><td>1500</td><td>3000</td><td>5000</td></tr>
<tr><td>500</td><td>1000</td><td>2000</td><td>4000</td><td>6000</td></tr>
<tr><td rowspan="3">Battery</td><td>rated voltage(Vdc)</td><td colspan="2">12/24</td><td>12/24/48</td><td>24/48</td><td>24/48/96</td></tr>
<tr><td>Charge Current</td><td colspan="2">10A MAX</td><td colspan="3">30A MAX</td></tr>
<tr><td>Battery Type</td><td colspan="5">Can be set</td></tr>
<tr><td rowspan="2">Input</td><td>Voltage Range</td><td colspan="5">85-138VAC/170-275VAC</td></tr>
<tr><td>frequency</td><td colspan="5">45-65Hz</td></tr>
<tr><td rowspan="7">Output</td><td>Voltage Range</td><td colspan="5">110VAC/220VAC; ±5%(Inverter mode)</td></tr>
<tr><td>frequency</td><td colspan="5">50/60Hz ±1%(Inverter mode)</td></tr>
<tr><td>Output wave</td><td colspan="5">Pure Sine Wave</td></tr>
<tr><td>Change time</td><td colspan="5">＜10ms(Typical load)</td></tr>
<tr><td>Efficiency</td><td colspan="5">＞85%（80% Resistive load）</td></tr>
<tr><td>overload</td><td colspan="5">110-120%/30S；＞160%/300ms；</td></tr>
<tr><td>Protection function</td><td colspan="5">Battery over-voltage and low-voltage protection, overload protection, short circuit protection, over-temperature protection</td></tr>
<tr><td rowspan="6">Solar Controller</td><td>MPPT Voltage Range</td><td colspan="5">12VDC:15~150VDC;24VDC:30~150VDC;
48VDC:60~150VDC;96VDC:120~150VDC</td></tr>
<tr><td>PV Power</td><td colspan="2">12VDC-30A(400W);
24VDC-30A(800W)</td><td colspan="3">12VDC-60A(800W);
24VDC-60A(1600W);
48VDC-60A(3200W);
96VDC-60A(6400W)</td></tr>
<tr><td>Rated charge current</td><td colspan="2">30A(Max)</td><td colspan="3">60A(Max)</td></tr>
<tr><td>MPPT efficiency</td><td colspan="5">≥99%</td></tr>
<tr><td>Average charging voltage(lead acid battery)</td><td colspan="5">14.2VDC * A (Battery segment)</td></tr>
<tr><td>Floating charge voltage</td><td colspan="5">13.75VDC * A (Battery segment)</td></tr>
<tr><td colspan="2">Operating ambient temperature</td><td colspan="5">-15-+50℃</td></tr>
<tr><td colspan="2">Storage ambient temperature</td><td colspan="5">-20 - +50℃</td></tr>
<tr><td colspan="2">Operating / storage environment</td><td colspan="5">0-90% No Condensation</td></tr>
<tr><td colspan="2">Dimensions: W * D * H (mm)</td><td colspan="2">315*132*420</td><td colspan="3">455*177*545</td></tr>
<tr><td colspan="2">Packing size: W * D * H (mm)</td><td colspan="2">515*205*410</td><td colspan="3">645*260*555</td></tr>
</table>

Note: Our company has the right of changing this user manual without any information

Error code and solution

Error code	Faulty	Solution
E01	Overcurrent of MOSFETS board	Kindly contact sales if still having this issue after restarting
E02	Output short circuit	Check whether it's overloaded seriously or shortcircuit inside applicances loaded
E03	Applicance Overloaded	Check whether it's overloaded, and remove some loads not important
E04	Inner Over-temperature	Check whether fan is working well or the air dust for cooling be blocked
E05	Overvoltage of battery	Check whether battery connection and configuration correct
E06	Battery's voltage is lower than shutdown voltage	Make sure battery be fully charged, or replace new battery
E07	Reverse connected cables between transformer with heatsink on power board	Fix the two cables after they are interchanged
E08	Start Protection when low output voltage	Kindly contact sales if still having this issue after restarting
E09	Reserved	----------
E 10	Undervoltage of battery	Check the system voltage of inverter and use same data for the battery pack.