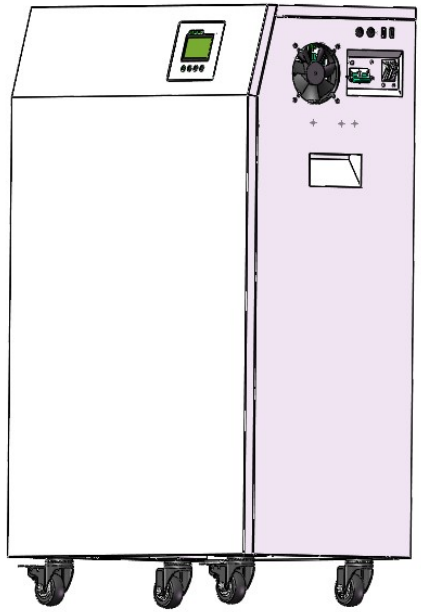
User Manual



SHS-4800

9 Specifications table

Model :		SHS-4800
power rating		4000W
Battery	rated voltage	48Vdc
	Charge Current	30A (C0-C6 Can be set)
	Battery Capacity	100AH
Input	Voltage Range	170-275Vac
	frequency	45-65Hz
Output	voltage range	220Vac；±5%(Inverter mode)
	frequency	50/60Hz±1%(Inverter mode)
	Output wave	Pure Sine Wave
	Change time	＜10ms(Typical load)
	frequency	＞85%（80% Resistive load）
	overcharge	110-120%/30S；＞160%/300ms；
	Protection function	Battery over-voltage and low-voltage protection, overload protection, short circuit protection, over-temperature protection
Solar Controller	Battery voltage	48Vdc
	PV max Voltage	≤100 Vdc
	Charge Voltage	40-100 Vdc
	Rated charge current MPPT	60A Max
	Max Power	2880W
	Overcharge Voltage	56.8 Vdc
	Overcharge recovery voltage	56 Vdc
	Floating charge voltage	54.4 Vdc
Operating ambient temperature		0-40℃
Storage ambient temperature		-15 - +50℃
Operating / storage environment		0-90% No Condensation
Dimensions: L * W * H (mm)		500*390*725
Packing size: L * W * H (mm)		585*490*945

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

Dear Customers：

It’s very grateful to you for trusting our company and selecting our products! Before using this product, please read carefully this user manual, including installation, using, failure investigation and other important information and suggestion, we also suggest you keep this manual well!

Catalog

1 Product features

● Double CPU intelligent control technology, performance excellence;
● The power mode / energy saving mode / battery mode can be set up, Flexible application;
● 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 alltomatic 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 solar controller, overcharge, overdischarge protection, current limiting charging, multiple protection;
● Automatic operation of the inverter, the use of the process does not require human values;

2 Installation, storage instructions

（1）Off packet inspection

1.1 open the packaging of the equipment, please check the product parts, including: a mainframe, the use of a manual.

1.2 check whether the equipment is damaged in transit, such as damage or missing parts, do not boot, inform the carrier and dealer.

（2）Installation, storage precautions

2.1 Installation equipment should be operated by professionals, or assisted by local distributors.

2.2 Transport equipment, the need to take appropriate protective measures; equipment from low temperature to high temperature environment, may appear drops, before using, need to be completely dry, to ensure safety.

2.3 Don't expose the device in the wet, inflammable, explosive or a lot of dust accumulation in the bad environment; do not cover and block the vents, 10cm above the air circulation space reserved for peripheral equipment; in order to have good heat dissipation;

2.4 When the equipment is not in use,it should close all switches；

8 Simple fault diagnosis and treatment

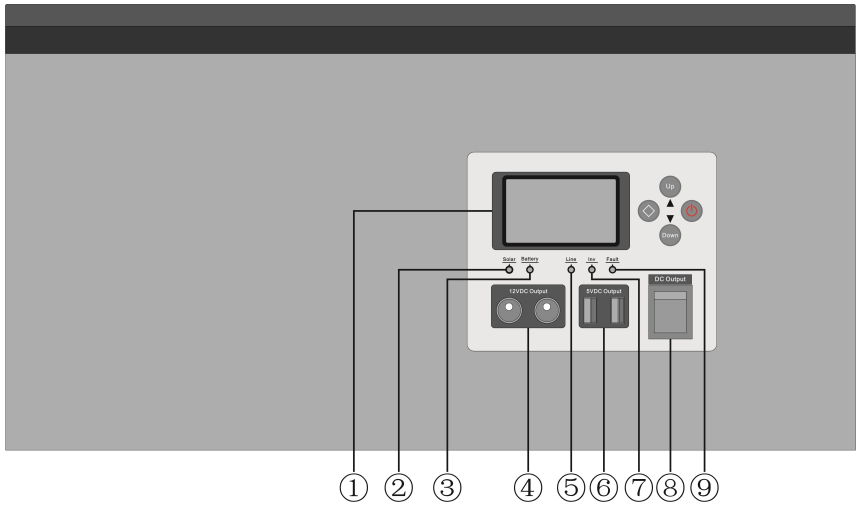
WARNING: There is high pressure inside the machine! Do not open and try to repair or maintenance, so as not to cause electric shock hazard!

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 "Solar" 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
“Solar”the charge indicator is flashing	System over-voltage battery open	Check battery is connected or charging circuit fault

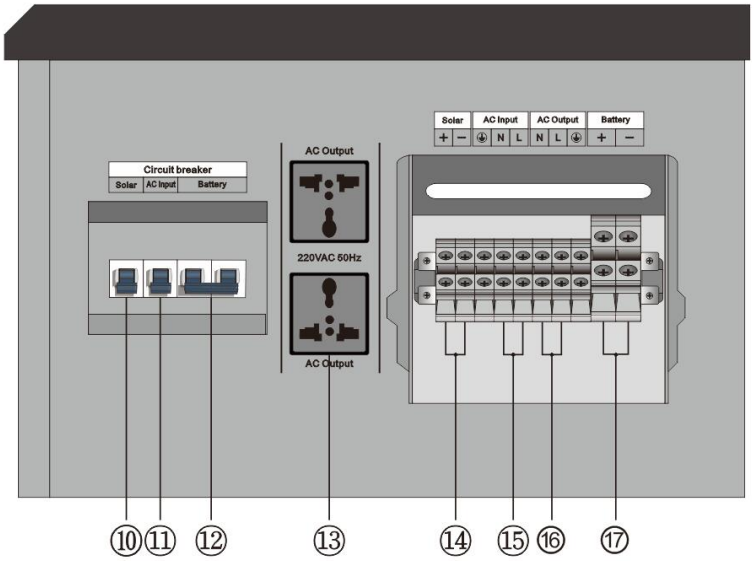
When you contact the service personnel, please provide the following information: Type of machine / date of issue / complete description of the problem (including the relevant indicator display status, battery configuration, connection and other information).

3 Equipment diagram, operation instructions

(1) Front panel icon



(2) Side panel icon



7 Maintenance and maintenance

(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.

(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.

(3) Normal use, the battery every 4 to 6 months to be charged, discharge time, discharge to the shutdown charge, and the standard machine charging time of not less than 12 hours. In the high temperature region, the battery charge every two months, discharge time, the standard charge of each machine shall not be less than 12 hours.

(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.

(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.

Explain：

①--LCD display screen
②--Solar pilot lamp
③--Battery pilot lamp
④--12VDC Output Port
⑤--LINE pilot lamp
⑥--5VDC Output Port(USB)
⑦--INV pilot lamp
⑧--DC Output Switch
⑨--Fault pilot lamp
⑩--Solar Input Switch
⑪--AC Input Switch
⑫--Battery Input Switch
⑬--AC Output With a million
⑭--Solar Input Port
⑮--AC Input Port
⑯--AC Output Port
⑰--Battery Input Port

（5）Battery protection voltage of the inverter Introduction / Parameter table

When the AC output is turned on, the relevant protection or indication will be executed when the battery voltage reaches the value in the table below.

Inverter battery protection voltage parameter table-48V;				
Overvoltage protection	Overvoltage recovery	Undervoltage recovery	Undervoltage alarm	Undervoltage protection
67.2V	64V	54V	42V	41.2V
Close the AC output	Restore AC output	Restore the inverter AC output	Maintain AC output	Utility bypass Mains charge

（6）DC output protection output parameter sheet

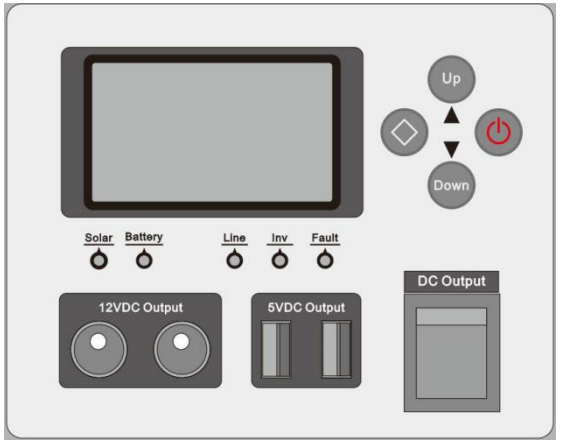
Note:When need DC output, close on the "⑧-DC output switch", and the equipment will start DC output；

Over discharge protection	Over discharge recovery	Over discharge current
44.4V	50.8V	1.25 times rated current of 60 seconds. Overload protection operation at 1.5 times the current rating of 5 seconds. Larger than 3 times rated current short-circuit protection action

12VDC OUTPUT CURRENT	5VDC OUTPUT CURRENT
2A*2 unit	2A*2 unit

(3) The front panel is illustration

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;



3.2 Keys Description

Function keys		Decription
◇	Mute / Function keys	Short press silencer; long press to enter device mode settings
▲	Function / switching / up key	Click switching between control parameter and the inverter parameter page; long press enter into the charging current setting
▼	Function / Shift / down key	Click switching between control parameter and the inverter parameter page; long press enter into the charging current setting; short press increments
⏻	Power on / off key	Single on / off control

（3）Starting on solar power charge

After follow steps “6.1.1 or 6.1.2”step,if the step“6.1.2”to start, it needs closing on the battery switch “⑫-- Battery Input Switch” on the side panel. When the battery of the front side panel indicator light on, close on the battery breaker “⑩--Solar Input Switch” on the side panel. The indicator light “Solar” to the front side of the panel will light on when the sun shines the solar module. And then the built-in controller are under charging, the PV module supplies electric through the built-in controller.

（4）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 "⑫ - Battery Input Switch " 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);

3.3 Solar charge / discharge indicator LED Status Description

LED display			Description
Solar	Green	Light	The charging controller is in charging...
		Flash	Charge controller ready to charging...
		Extin guish	The charging controller is in standby mode...
Battery	Green	Light	Battery voltage is normal； >46V;
		Slow flash	Battery low voltage tips；<46.4V;
		flash	Battery low voltage tips；<43.2V; Battery high voltage tips；>64.8V;

3.4 State of the inverter status LED indicator display

LED display			Description
LINE	Green	Light	The AC is connected and the output is bypassed
		Flash	low-voltage state shows that it do not connect AC power
		Extin guish	Do not connect AC power or it is in inversion state
INV	yellow	Light	The device is in inversion state
		Extin guish	The device is not in inversion state
Fault	red	Light	Device AC output short circuit or severe overload
		Flash	AC output overload
		Extin guish	The device work normally

2.3 Connect the solar module to the "⑭- Solar Input Port " terminal block on the rear panel of the device. Note that the polarity of solar modules can not be wrong in the process of access, so as not to damage the equipment.

（3）AC charging access instructions:

Select the appropriate wire diameter in the AC power to the device "⑮ - AC Input" terminal block L interface in series with a suitable circuit breaker, connect the AC power to the "⑮ - AC Input" AC input of the side panel. Note the input AC voltage in the input AC voltage range of the device to avoid damage to the equipment;

First use of equipment are charging time up to 12 hours.

6 Start/running

Attention :Check the terminal voltage and polarity of the solar modules and battery components of the access device, make sure they are correct.

（1）Starting /startover

1.1 Starting battery

Close the battery breaker "⑫-- Battery Input Switch" on the side panel to be closed,Long press "on/off" button on the front panel for 2 seconds long until the buzzer sounded. Indicator "battery "and the "INV "on the front panel are lit as well as the "LCD display screen" Equipment starts on inverter condition, and start on AC output automatically.

1.2 Starting on of the electricity input

Switch off the battery breaker "⑫-- Battery Input Switch" on the side panel ,input the electricity, and close on the AC input breaker"11--AC Input" on the side panel .The "LCD display screen"indicator lights on as well as the "LINE" indicator .The equipment start on AC output automatically.

（2）Starting on city electric charge

Follow the "6.1.2"step,close on the battery breaker "⑫-- Battery Input Switch" from the tandem breaker to the equipment connection line and the battery on the side panel,the city electric bypass output and charge the battery.(if the equipment lies on the battery prior condition,city electric won't

charge the battery)

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

5 Description of wiring procedure

Note: Make sure the switch on the side panel of the circuit breaker is in the closed position, then operate the following process;

（1）Battery Access Description:

1.1 The battery with the appropriate diameter wire is connected correctly, with a voltmeter to measure the battery two Terminal voltage is about the rated voltage of the device;

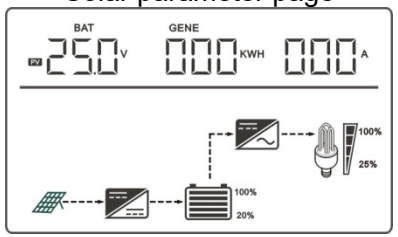
1.2 Connect the correctly connected battery pack to the "⑰ --Battery Input Port" terminal block, pay attention to the polarity of the battery access could not be wrong, so as not to damage the device.

（2）Solar Module Access Description:

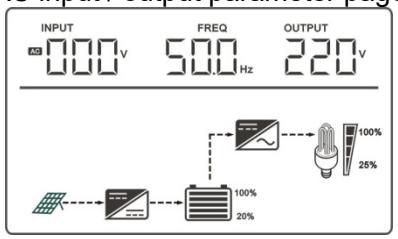
2.1 Connect the solar modules within the rated power to the appropriate diameter wires. When the solar module is illuminated, using a voltmeter to measure the open circuit voltage across the assembly at approximately the device rated voltage of 1.5-1.7 times;

3.5 LCD display instructions

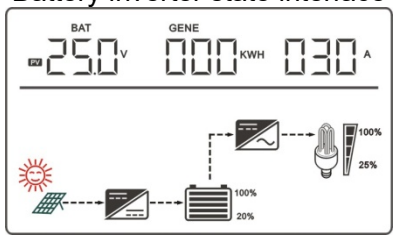
Solar parameter page



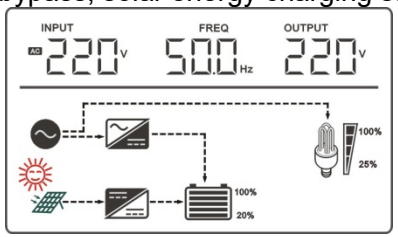
AC input / output parameter page



Battery inverter state interface



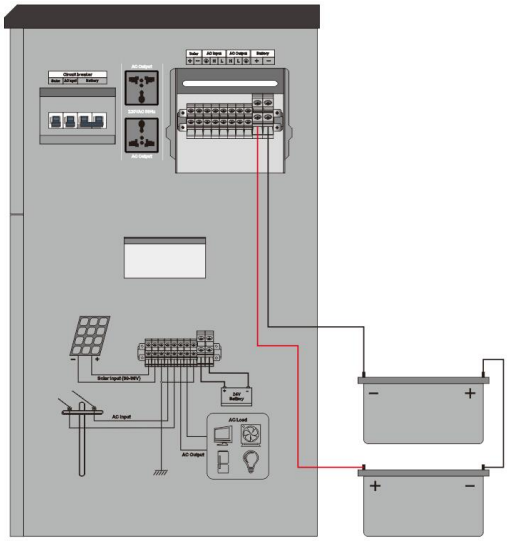
City Electric bypass, solar energy charging state interface



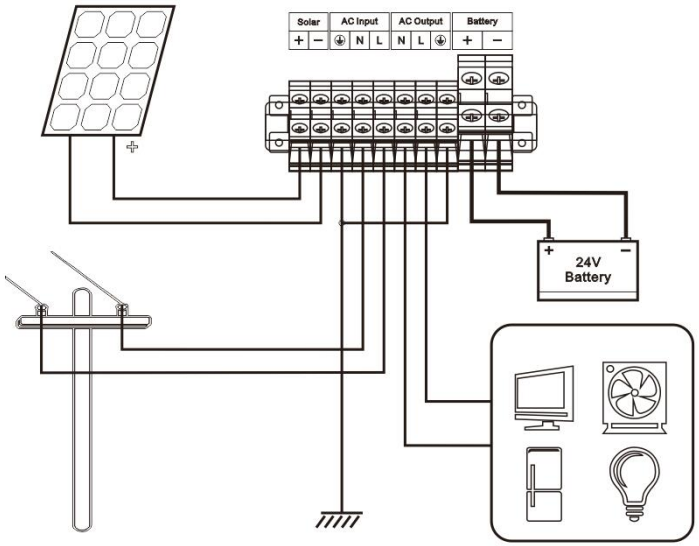
GENE 888 KWH	Charging parameters		
LCD display	Function instruction		
Parameter instruction			
INPUT AC 888 V	AC input voltage parameter		
FREQ 888 Hz	AC output frequency parameter		
OUTPUT 888 V	AC output voltage parameter		
BAT PV 888 V	Battery voltage parameters		
888 A	Charging current parameter		
88 SET	Equipment working mode selection		
	City Electric priority mode	Energy saving mode	Battery priority mode
	01 SET	02 SET	03 SET
Battery icon description			
LCDIcon	state	Battery voltage/48V；	
	flash	＜42V；	
	light	42～44.8V；	
	light	44.8～46.4V；	
	light	46.4～48.4V；	
	light	48.4～50V；	
	light	＞50V；	

4 Device connection icon

(1)Battery connection diagram



(2)System connected icon



(6) 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	

(7) Electric generator connection announcements:

If connect electric generator, it needs operating as below:

1, Start up electric generator and after it running stable, make electric generator output power supply be connected 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

Load icon instruction				
OVER LOAD	Output load overload prompt			
100% 25%	0%～25%	25%～50%	50%～75%	75%～100%
				

LCD display	Function instruction	
Work mode icon instruction		
	Mains supply input icon	
	AC-DC icon	
	DC-AC icon	
	DC-DC icon	
Solar panel module icon instruction		
	Device to detect solar input	
	Device is in the state of solar charging	
	Solar photovoltaic panel icon	
Buzzing icon instruction		
	Light up	Buzzer prohibited
	Go out	Buzzer opened
Fault/anomaly icon instruction		
	Fault/anomaly prompt	

(4) Panel key/LCD setting instruction

<table>
<tr><td colspan="2">Function key</td><td colspan="8">Instruction</td></tr>
<tr><td rowspan="4"></td><td>Mute</td><td colspan="8">long press for 1s, buzzing 1, open mute state; long press again, buzzing 2 times, close mute state;</td></tr>
<tr><td rowspan="3">Function keys</td><td colspan="8">Long press for 5s, Press the "Up/Down" key to select the mode,after selected mode, the machine work after restart</td></tr>
<tr><td colspan="3">The grid priority mode</td><td colspan="3">Energy-saving mode</td><td colspan="2">Battery priority mode</td></tr>
<tr><td colspan="3">01 SET</td><td colspan="3">02 SET</td><td colspan="2">03 SET</td></tr>
<tr><td rowspan="3">▲</td><td rowspan="3">Function keys</td><td colspan="8">Under the condition of the main interface, the parameters of the single button switch controller Inverter parameter page</td></tr>
<tr><td colspan="8">Long press for 5s, LCD panel 88 SET display relative charge current adjust C+, press ▲ increase charge current, press ▼ reduce charge current;</td></tr>
<tr><td>Mode</td><td>C0</td><td>C1</td><td>C2</td><td>C3</td><td>C4</td><td>C5</td><td>C6</td></tr>
<tr><td>1-5KW</td><td>0A</td><td>5A</td><td>10A</td><td>15A</td><td>20A</td><td>25A</td><td>30A</td></tr>
<tr><td rowspan="11">▼</td><td rowspan="11">Function keys</td><td colspan="8">Under the condition of the main interface, the parameters of the single button switch controller Inverter parameter page</td></tr>
<tr><td colspan="8">Long press for 5s, LCD panel 88 SET display relative charge voltage adjust U+, press ▲ increase charge voltage, press ▼ reduce charge voltage;</td></tr>
<tr><td>U0</td><td colspan="5">Gel U.S.A</td><td colspan="2">54.8V；</td></tr>
<tr><td>U1</td><td colspan="5">A.G.M.1</td><td colspan="2">53.6V；</td></tr>
<tr><td>U2</td><td colspan="5">A.G.M.2</td><td colspan="2">54.8V；</td></tr>
<tr><td>U3</td><td colspan="5">Sealed lead Acid</td><td colspan="2">54.4V；</td></tr>
<tr><td>U4</td><td colspan="5">Gel European</td><td colspan="2">55.2V；</td></tr>
<tr><td>U5</td><td colspan="5">Open lead acid</td><td colspan="2">55.2V；</td></tr>
<tr><td>U6</td><td colspan="5">Calcuim(open)</td><td colspan="2">54.4V；</td></tr>
<tr><td>U7</td><td colspan="7">De sulphation cycle 60 ·····for 4 hrs</td></tr>
</table>

⏻	ON/OFF key	Starting up	Long press for 2s, buzzer 1 time, then the equipment start output
		Power off	Long press for 2,after internal relay energized power off output

(5) Working mode

Icon	Working mode	Running state
01 SET	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.
02 SET	Energy-saving mode	Under energy-saving mode, after the device starts, it will automatically detect load, when the load is greater than 5% rated power, the equipment starts AC output and power to the load; When detects no load, the device will automatically back to the search pattern, drop the battery energy consumption to lowest; This mode, equipment detects load every 10s, so as to achieve the purpose of energy saving.
03 SET	Battery priority mode	Battery priority mode, the device started for the first time and the mains input under normal , equipment operation for mains priority mode, but no battery be powered. 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