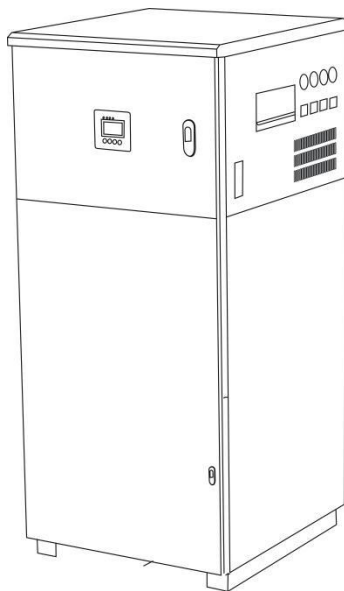




User Manual



Solar Power Station

SPS6K Split Phase Series

Dear Customer,

Thank you very much for purchasing the Hysolis SPS-6KW Series! We designed this product to help grant you energy independence. We have the utmost confidence in this product's performance and quality. Please feel free to contact us at Hysolis.com if you have any questions. Enjoy using your Hysolis Solar Power Station, and may it positively affect your future endeavors!

Sincerely,

The Hysolis Team

Catalogue

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Note: Hysolis reserve the right of modification on this user manual without any notice.

1 Product features

- Double CPU intelligent control technology, excellent performance;
- Dual isolated transformer, higher safety standard.
- 3 working modes for optional. (Utility first, Battery first, Energy saving);
- Smart cooling fan control, safe and reliable;
- Pure sine wave output, protect your loads from dirty power;
- Wide input voltage range, high-precision output with automatic voltage regulator (AVR);
- The LCD display showing the unit working status real time;
- The output overload, short circuit protection, automatic protection and alarm;
- The intelligent solar maximum power point tracking charge controller with overcharge, overdischarge protection, current limiting charging, multiple protection;

2 Installation & storage

2.1 Off packet inspection

2.1.1 Open the package, check the product overall, accessories, user manual.

2.1.2 If the unit is damaged during the shipment transit, please inform the carrier and dealer before you start to use it.

2.2 Installation & storage

2.2.1 Installation should be done by qualified technicians, or assisted by local distributors.

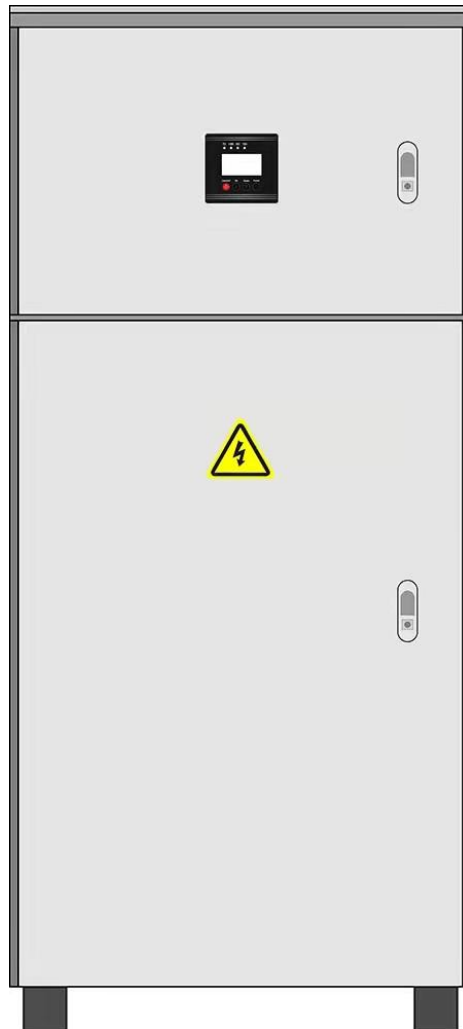
2.2.2 Protection materials are needed for transporting the unit. Move the unit from low temperature to high temperature environment, it may get wet on surface. Please make sure the unit is completely dry before using.

2.2.3 The working environment is supposed to be dry, clean and ventilated. Do not cover or block the vents. In maintain good heat dissipation, 20cm air circulation space is required for peripheral equipment;

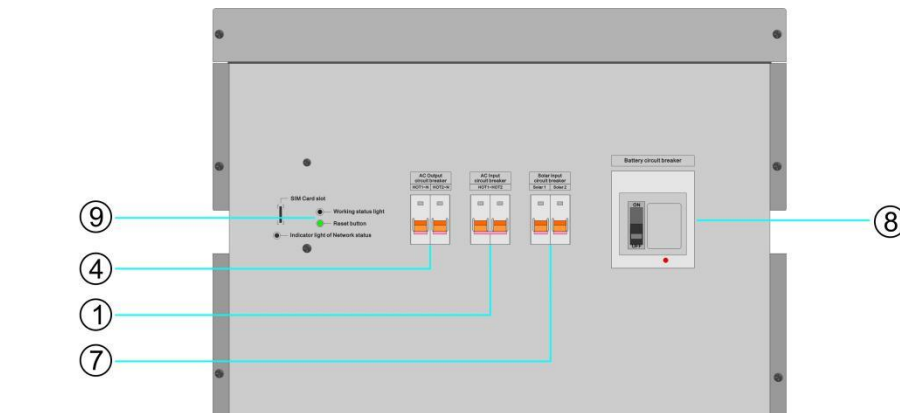
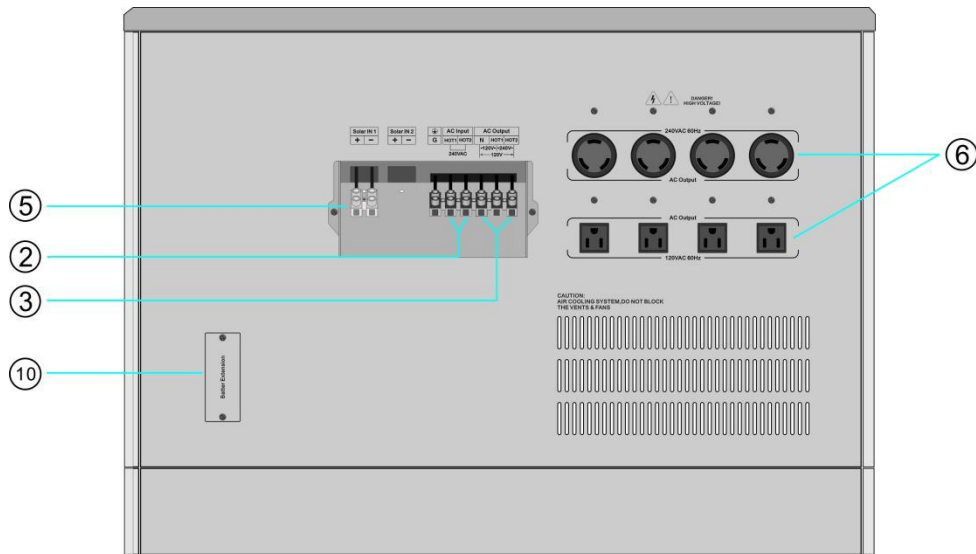
2.2.4 To conserve battery, turn off the Battery Breaker before periods of inactivity (>2 days), unless solar power is connected.

3 Diagram & operation instructions

3.1 Front panel



3.2 Side panel

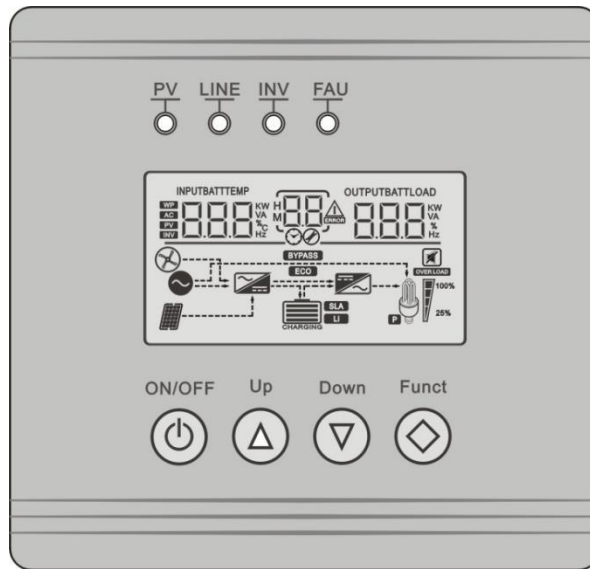


Guide





- ① - AC input breaker
- ② - AC input wiring terminals
- ③ - AC output wiring terminals
- ④ - AC output breaker
- ⑤ - Solar input wiring terminals
- ⑥ - AC output sockets
- ⑦ - Solar input breaker
- ⑧ - Battery breaker
- ⑨ - WIFI Indicator
- ⑩ - Expansion Battery Port

3.3 Display Instructions

3.3.1 LCD display and function key allows user to check the SPS working status and set working modes. Such as: AC Input / AC output voltage, AC frequency, working mode, the battery level, PV input power, PV current, PV voltage, loads percentage of the unit capacity, error codes and etc;



3.3.2 Keys Instructions

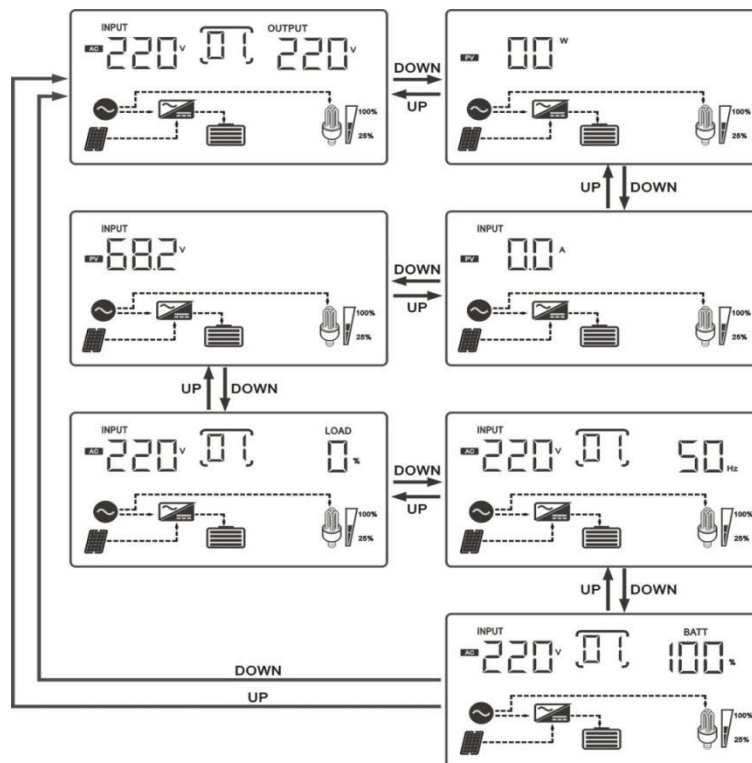
Function keys		Description
	Power ON/OFF	Inverter Power ON/OFF
	Page UP	Click to view the last page. Or set the increment under the setting manual.
	Page DOWN	Click to view the next page. Or set the decrement under the setting manual.
	Function keys	Long press to enter setting mode. Or short press to confirm the settings and return to the main page.

3.3.3 LED indicator instructions

LED indicators			Instructions
PV	Green	ON	PV is charging
		OFF	PV is not charging
LINE	Green	ON	The AC input power is connected and bypassing.
		OFF	The AC input is disconnected.
INV	yellow	ON	The inverter is ON, Powered by the battery.
		OFF	The inverter is OFF.
FAU	red	ON	AC output overload or Inverter fault.
		OFF	The Inverter is working normally.

3.3.4 LCD display instruction

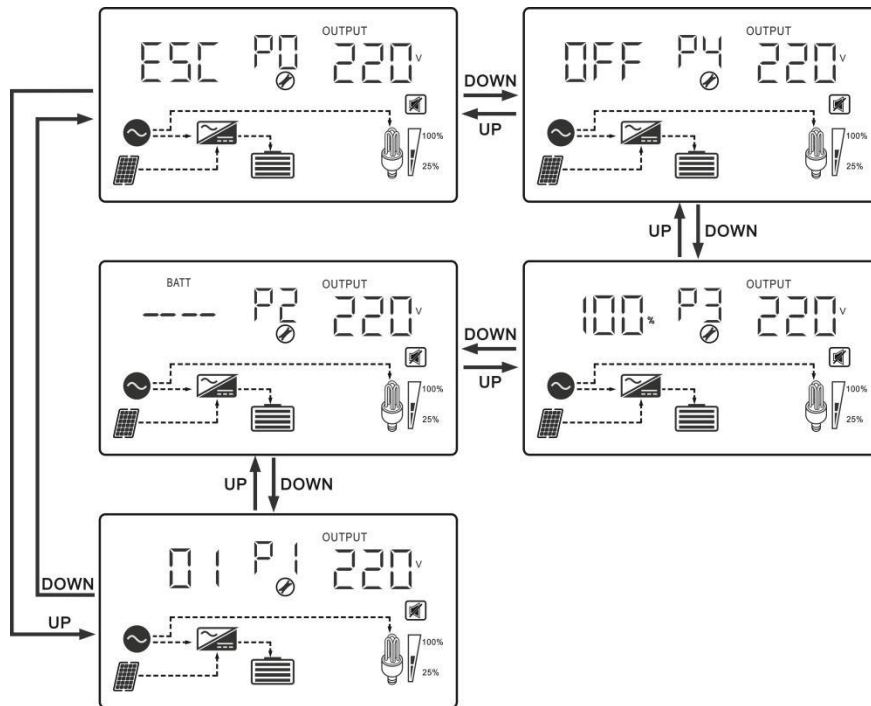
3.3.4.1 On the main page, press DOWN or UP to scroll pages .



3.3.4.2 Settings.

Under the main page, long press Funct key for 5 seconds or to enter the setting menu, and then 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 AC-DC charging current
P2	Inverter AC-DC charging voltage
P1	Inverter working mode
P0	Save & Exit



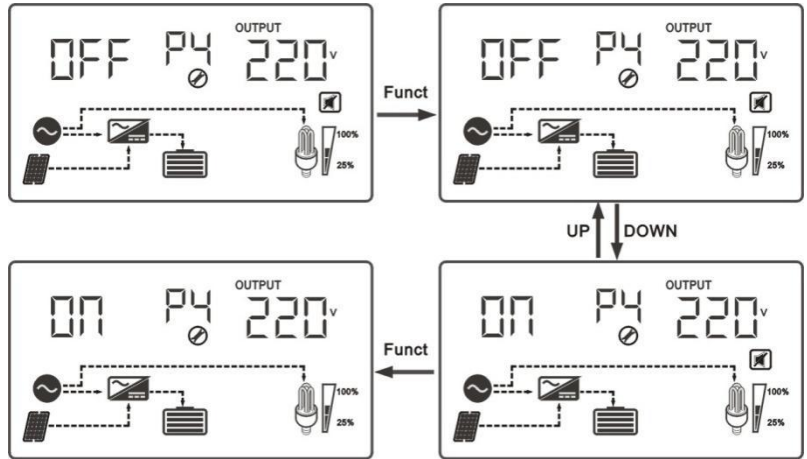
3.3.5 Parameters Setting

3.3.5.1 Buzzer mode Settings

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

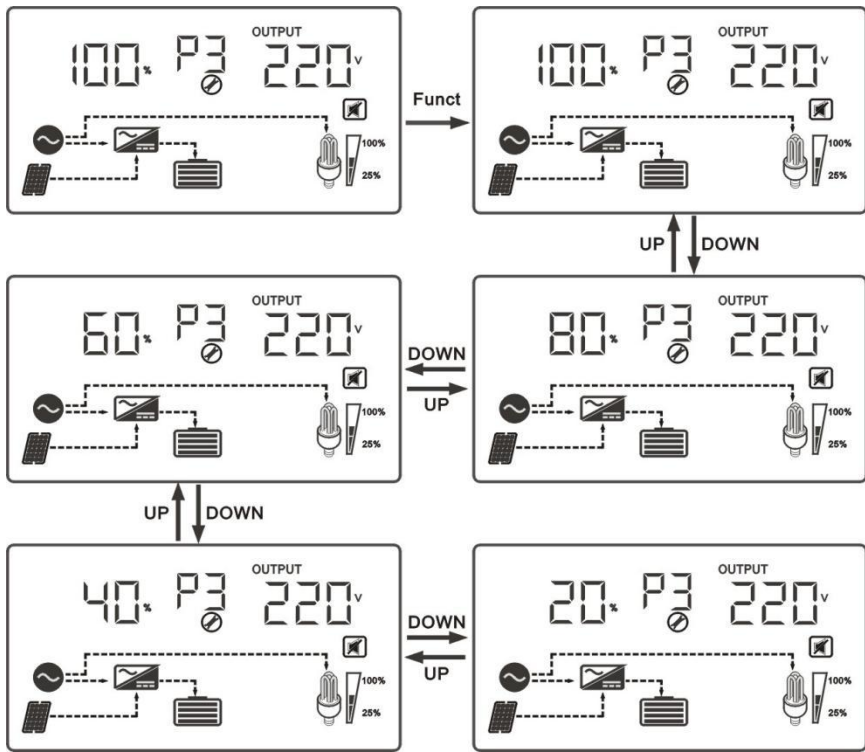
ON Indicates that the buzzer is ON;

OFF Indicates that the buzzer is OFF;



3.3.5.2 Inverter AC charging current setting

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



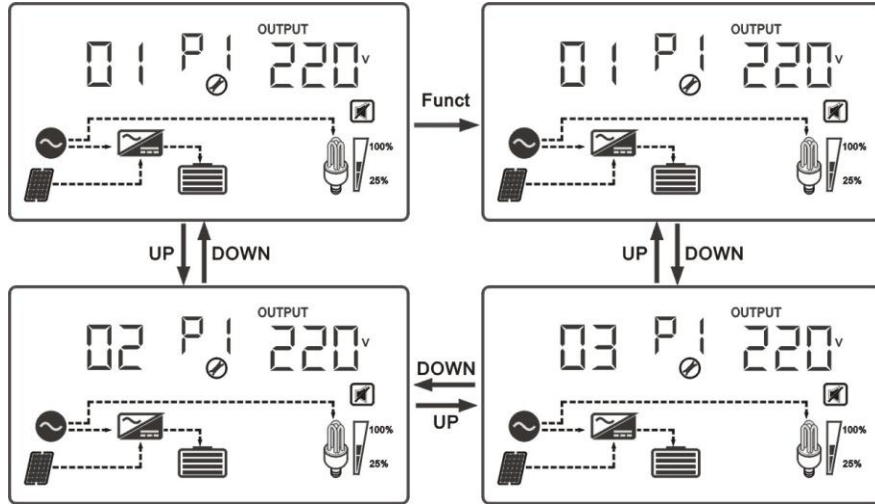
3.3.5.3 Error code and solution

Error code	Fault description	Solution
E01	Overcurrent of MOSFETS board	Contact tech support if still having this issue after restarting
E02	Output short circuit	Loads shortcircuit or extreme overloaded.
E03	Overloaded	Remove some loads or reduce the loads power.
E04	Over-temperature	Check whether cooling fan is working well or vent might be covered
E05	Battery overvoltage	Check the battery voltage & connection
E06	Battery undervoltage	Recharge the battery or replace battery
E07	Reverse connection between transformer and heat-sink on power board	Exchange and reconnect.
E08	Protection when low voltage output	Contact tech support if it's reoccurs after restart.

3.3.5.4 Inverter charging voltage setting

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

Code	Working mode	Description
01	AC Input Power priority mode	In working mode 01, the AC input directly powers the AC output (through a voltage stabilizer), bypassing the battery (a.k.a. "pass-through AC power"). When the grid's AC power is over-voltage, low-voltage, distorted waveform, or cut off, the unit will draw from the battery power supply. When the grid power returns to normal, the unit will re-enable pass-through AC power.
03	Battery Power priority mode	In working mode 03, the AC input does not charge the battery or power the loads. The unit utilizes solar power only; solar charge the batteries and supply power to the loads through the inverter. When the battery meets the low-voltage protection point, i.e. when the battery is 70% empty, the unit will enable pass-through AC power if the grid power is available. When the battery is fully charged again, the unit will again only use solar or DC power.



4 System Wiring Instructions.

4.1 Cable size calculating

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

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

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

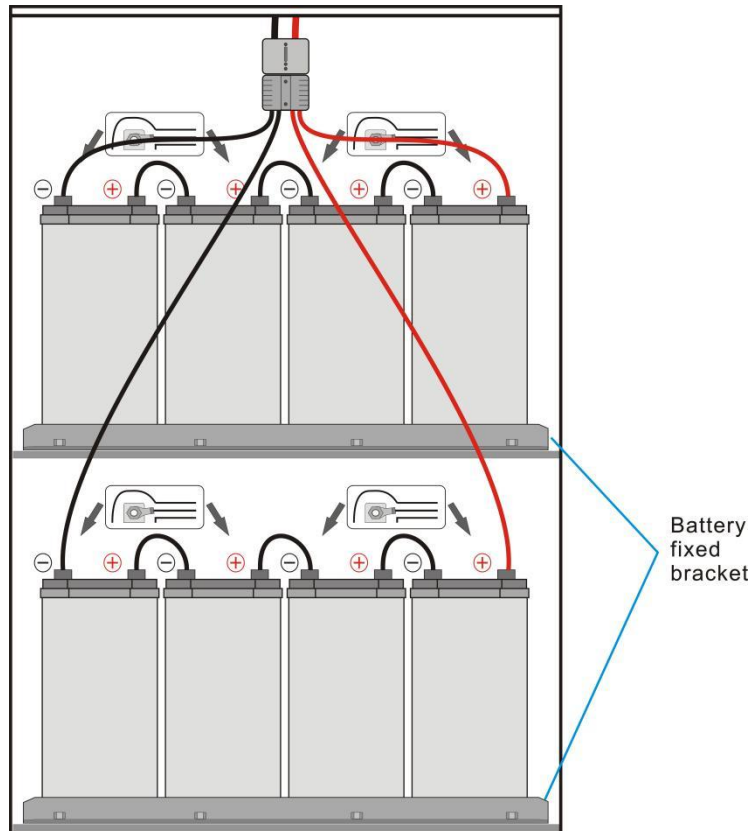
$\text{The battery connecting wire diameter} = \frac{5000\text{W}}{48\text{VDC} \times 5\text{A/mm}^2} \approx 20(\text{mm}^2)$
$\text{AC connection wire diameter} = \frac{\text{Power rating(W)}}{\text{Rated AC voltage} \times 5\text{A/mm}^2} \approx 6(\text{mm}^2)$

4.2 Instructions for batteries wiring.

This instruction is for 12V Lead-acid batteries. Make sure all the batteries are same specification, same voltage level.

Note: Flip OFF the battery breaker before wiring.

BE CAUTIOUS! Wrong wiring may cause damage, battery short circuit may cause fire.



4.2.1 Remove the battery fixed brackets before load the batteries. The battery terminals side to the SPS front.

4.2.2 Put on the battery terminal insulated caps with the cables before wiring. 4 12V-batteries on same level are wired in series which will create 48V battery group. 2 of 48V-battery group are wired in parallel. Refer to above picture for battery wiring.

4.2.3 Well tighten the screws. Loosened screws will cause heating issue.

4.3 Solar Wiring Instructions

4.3.1 All the solar panels in same array are supposed to be same specification. Check the open circuit voltage on the solar panels, calculate quantity for each string. The string voltage range is (VoC=60V-150V). All the strings voltage differences less than 5%.

4.3.2 Flip OFF the breaker in the PV combiner box. Wire the strings to the PV combiner box (“Solar Input +” & “Solar Input -” are separated). 12AWG PV wire is recommended, length <40ft.

4.3.3 Flip OFF the “Solar Input” breaker in the SPS. Wire the PV combiner box output to SPS “Solar Input 1” terminals” ⑤. 8 AWG PV wire is recommended if length no more than 50ft.

4.3.4 Flip ON the breaker in the PV combiner box. Flip ON the “Solar Input” breaker in the SPS.

4.4 AC input wiring instructions

Select correct size wire for AC input power connection (12AWG or bigger). The AC input voltage must be in the range 170VAC-275VAC.

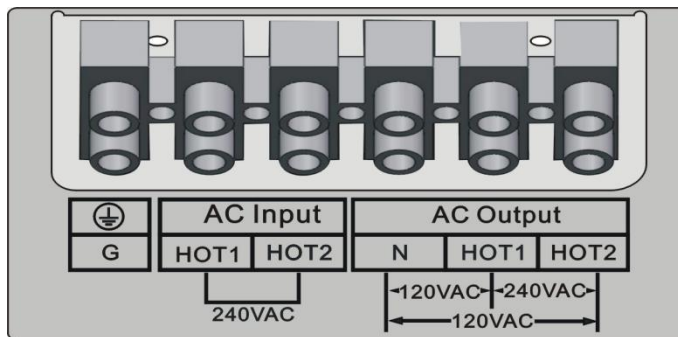
Flip OFF the “AC Input” breaker before wiring.

Connect the L1, L2 & G to the SPS AC Input terminals HOT1, HOT2 & G.

Do NOT connect Neutral.

Flip ON the “AC Input” breaker.

4.5 AC output wiring instructions



4.5.1 For 120VAC output, wiring to phase 1 (N-HOT1) is recommended. Make sure the total loads power no more than the inverter rated power (120V3KW).

Phase 1 is in the inverter protection circuit. The loads power ratio will be shown on the LCD display.

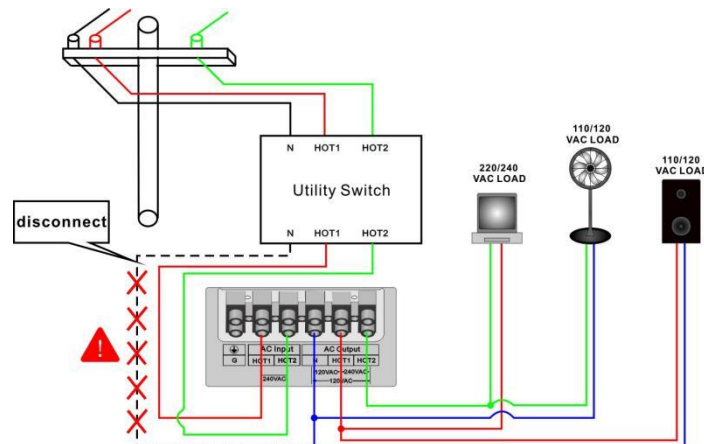
4.5.2 Do not use phase 2 (N-HOT2) for 120V output unless the phase 1 power is not enough. Make sure the total loads power no more than the inverter rated power (120V3KW).

Phase 2 (N-HOT2) is NOT in the inverter protection circuit. The loads power will NOT be shown on the LCD display.

4.5.3 For 240VAC outputs, wire to HOT1:HOT2, N, G. Total loads maximum power is 240V6KW.

The 240VAC output (HOT:HOT2) is in the inverter protection circuit. The loads power ratio will be shown on the LCD display.

4.6 AC Input / AC Output wiring diagram



5 Power ON / OFF

5.1 Power ON

5.1.1 Start with battery

- ① Flip "Battery" breaker ON.
- ② Press and hold "ON/OFF" button for 2 seconds, release when it's beep.
- ③ Flip "AC Output" breaker ON.
- ④ Flip "AC Input" and "Solar" breakers ON as needed.

5.1.2 Start with AC input power

Connect the 240V grid power to the SPS "AC Input" terminals. Flip ON the "AC Input" breaker. The Inverter will be started, the "LINE" indicator will be on.

5.2 Solar Charge Controller

Check the open circuit voltage of the solar array, make sure it's in the range of (60VDC-150VDC). Wire the solar array to the terminal "SOLAR IN 1" (Positive to "+", Negative to "-"), Flip ON the "Solar Input Breaker". The "PV" indicator will be on.

5.3 Power OFF the SPS unit.

Flip OFF the “AC Output” & “AC Input” breakers, then press and hold the "ON/OF" button for 2 seconds, release after the internal relay action, the LCD screen will be off. Flip OFF the “Batter Breaker” if you don’t have solar power to charge the batteries during the unit idle.

Note: To conserve battery, turn off the Battery Breaker before periods of inactivity (>2 days), unless solar power is connected.

5.4 Battery protection voltage parameter & instructions

Battery protection voltage parameter				
Overvoltage protection	Overvoltage recovery	Undervoltage recovery	Undervoltage alarm	Undervoltage protection
67.2V	64.0V	54.0V	43.2V	42.0V
Shut off AC output	Restore AC output	Restore AC output	Maintain AC output	Utility bypassing maintain charge

5.5 Audio alarm instructions

Normal	Buzzer Mute	(Default setting) No beeps unless error code show up.
	Buzzer Unmute	4 beeps every 15s when the AC input power is disconnected.
Battery high voltage alarm	4 beeps per second continuously.	
Battery low voltage alarm	2 beeps per second continuously.	
Over temperature alarm	Beeps intermittently for every 2 seconds .	

5.6 Connect with a generator:

If connect with a generator, please follow the steps below:

5.6.1 Make sure the generator is 220VAC-240VAC 60Hz.

5.6.2 Flip OFF the “AC Input” & “AC Output” breaks. Wire the generator L1, L2 & G to the

SPS AC Input terminals HOT1, HOT2 &G. Start up generator and wait for a few second to make sure it's running stable.

5.6.3 Press and hold "ON/OFF" button for 3 seconds to start the inverter. The inverter will be ready after 4 beeps. Set the work mode on [01].

5.6.4 Flip ON the "AC Input" breaker. Check the AC input voltage on the screen. The "LINE" indicator should be ON when the AC Input is ready.

5.6.5 Flip ON the "AC Output" breaker. Plug into your loads one by one. Make sure the load percentage is no more than 100%.

5.6.6 2-3 times bigger capacity generator is recommended.

6 Maintenance

6.1 The SPS unit needs very little maintenance. Just keep the battery charged regularly to maintain 50% or more to obtain expected lifespan.

6.2 If you do not use the SPS for a long period, to conserve battery, turn off the Battery Breaker before periods of inactivity (>2 days), unless solar power is connected. The batteries are supposed to be recharged every 4 months even they are not in use at all. To replace the batteries, it must be done by qualified technician. All the replacement batteries have to be same specifications and same voltage level. The overall replacement should follow the battery supplier's instructions.

6.3 Before replacing the battery, turn off the SPS unit, flip off the battery breaker and all other breakers on the unit. Take off metal objects such as rings and watches. Use insulated handle screwdriver, do not put tools or other metal objects on the top of batteries..

6.4 Make sure all the series connection, parallel connection and polarity are correct. Wrong connection may cause damage or fire or even more serious consequences.

6.5 All the wiring with the battery terminal screws must be well tighten.

7 Common faults and troubleshooting guide

**WARNING: There's high voltage inside! It may cause electric shock hazard or death!
Do not open the cover unless you are the qualified electrician.**

Failures	Possible reason	Solutions
The unit backup time becomes short	The battery is not fully charged	Make sure that the battery is fully charged
	More loads are connected	Disconnect the noncritical loads
	Battery aging, can not hold the power.	Replace the batteries.
The unit can not be started	The AC input connection or the battery connection loosened.	Check the connection.
Boot alarm	The battery voltage is low.	Recharge the battery.
	Overload	Disconnect the noncritical loads
The buzzer beeps every 2 seconds	Over-temperature	Check the cooling fan and vent.
The cooling fan is running intermittently	The fan's running speed is intelligent controlled by temperature.	Normal.
The "PV" indicator does ON.	PV module array connection loosened.	Check the PV connection.

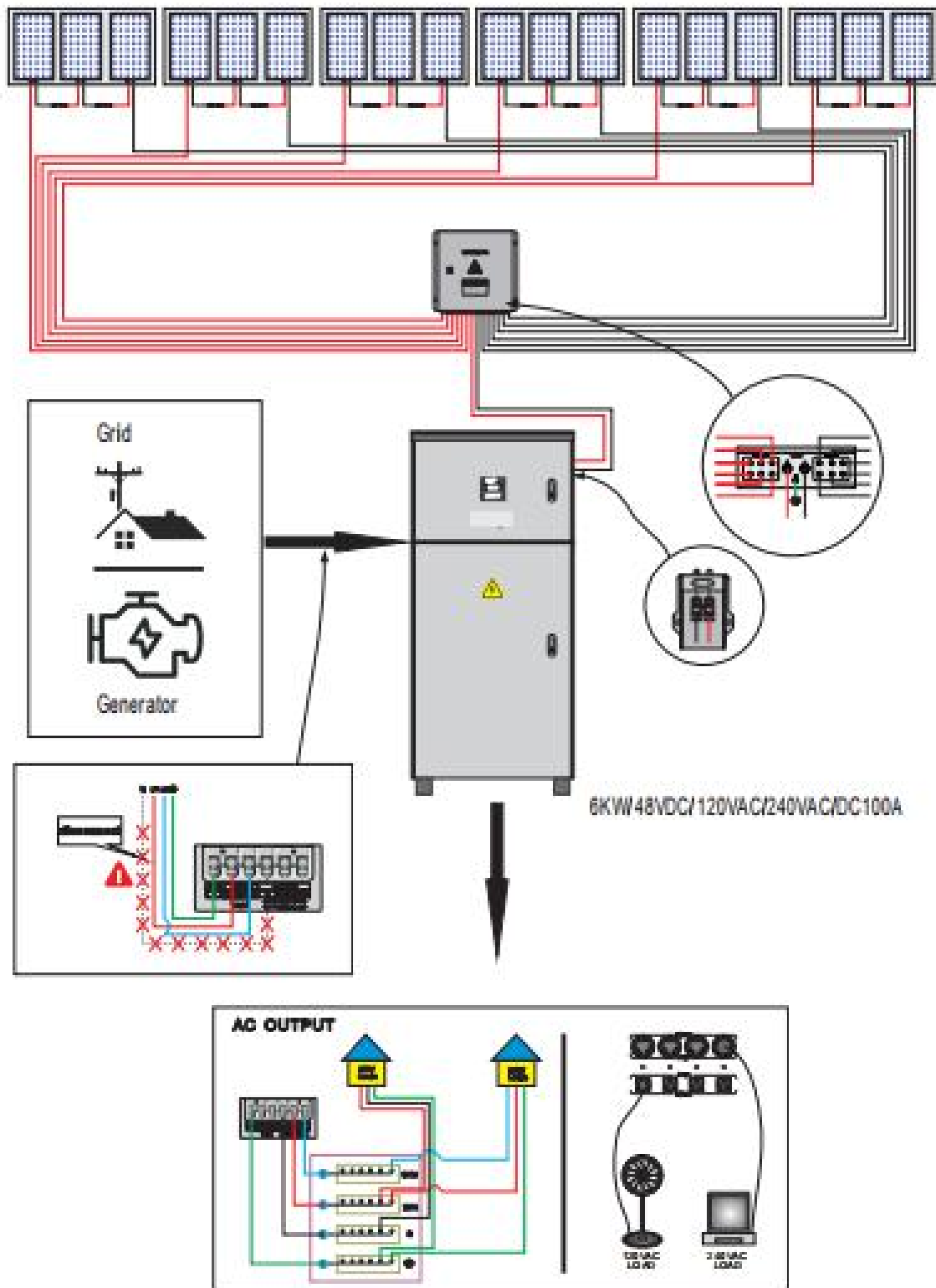
When you contact the technical support, please provide the following information: Product model number, order date, solar panels specs and quantity, complete description of the problem (including the relevant indicator display status, battery configuration, loads information and etc.).

8 Technical Specifications Sheet

Model		SPS6K
AC Output Rated Power		240VAC 6000W / 120VAC 3000W
Battery	Rated voltage (Lead-acid battery)	48VDC
	AC-DC Charge Current	48V30A Max (Adjustable)
	Battery Type	Lead-Acid
Input	Voltage Range	170-275VAC (HOT1-HOT2)
	Frequency	45-65Hz
Output	Voltage/Power(HOT1-HOT2)	240VAC/6KW
	Voltage/Power(N-HOT1)	120VAC/3KW
	Voltage/Power(N-HOT2)	120VAC/3KW
	Frequency	50/60Hz±1%(Inverter mode)
	Output wave	Pure Sine Wave
	Transfer time	< 10ms(Typical load)
	Efficiency	>85% (80% Resistive load)
	Max. Overload Time	110-120%/30S; > 160%/300ms;
	Protection Features	Battery over-voltage & low-voltage, AC overload & short circuit, over-temperature protections.
Solar Controller	MPPT Voltage Range	65-150VDC
	Max. PV Power	5400Wp(Max)
	Rated charge current	100A (Max)
	PV Power Efficiency	≥99%
	Average charging voltage (lead acid battery)	55.2VDC
Operating ambient temperature		0-40℃
Storage ambient temperature		-15 - +50℃
Operating / Storage humidity		0-90% (no moisture condensation)
Dimensions:W * D * H (mm)		640*690*1440
Package: W * D * H (mm)		790*730*1590

Note: Our company reserve the right of modification on this user manual without any notice.

9 System Wiring Diagram



10 WIFI Configuration & APP setup

10.1 Power on WiFi module

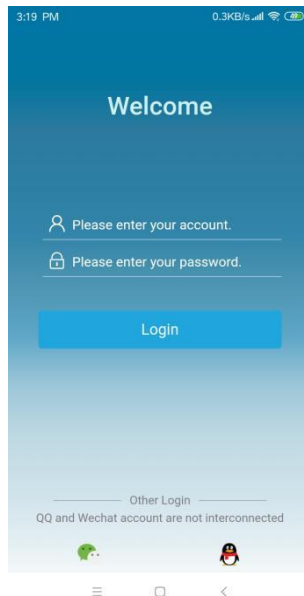
Power on the SPS unit, the wifi indicator light turns on red for the first 15 seconds, then turns on green and quick flash.

(Above instruction for the first time connection. For resetting the network connection, press and hold the reset button. When the LED is turns on green and quick flash,it's ready for resetting.)

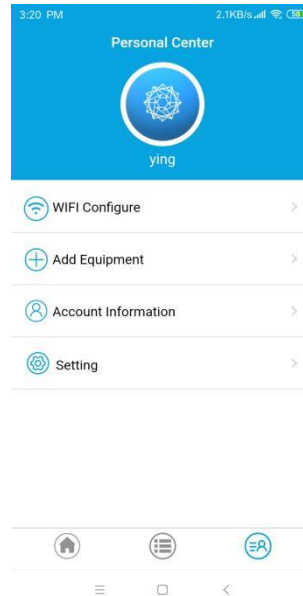
10.2 Network connection setup

Step 1: Scan the QR code, download and install the APP.

Step 2: Open the app, input the account password to log in.

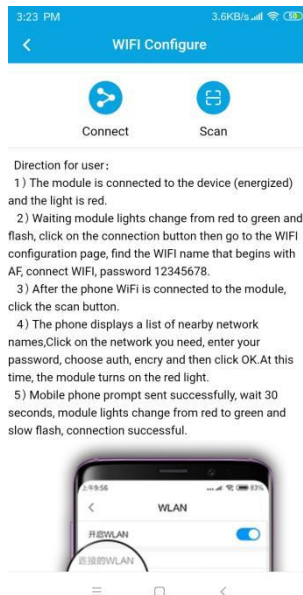


Screenshot 1- login interface



Screenshot 2 - personal center interface

Step 3: Enter “WiFi configure”

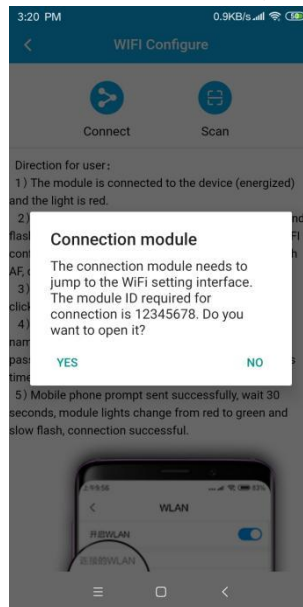


Screenshot 3 - WiFi configuration interface

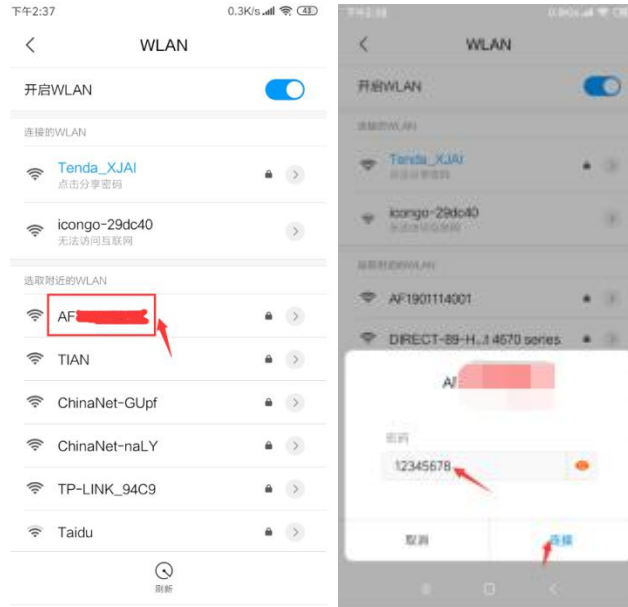
Please make sure the LED indicator light is on green and quick flash. If not, press and hold the reset button to reset.

Step 4: Configure WiFi.

1) Click “Connect”, find the WiFi name starting with AF (Screenshot 5). (Android app will automatically jump to WiFi screen, IOS app needs to enter the WiFi connection page manually.) Enter the password 12345678 to connect your app to the WiFi module.

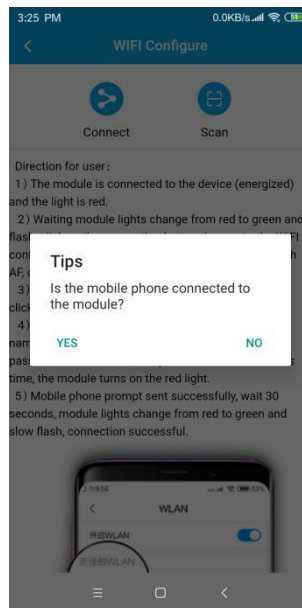


Screenshot 4 - select connection button



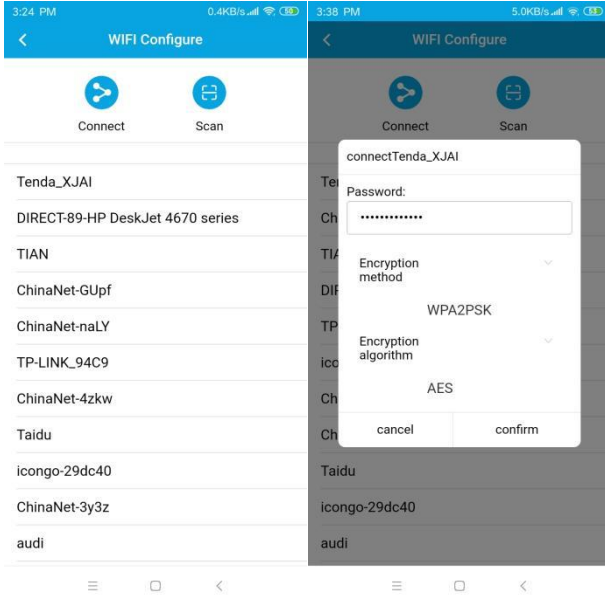
Screenshot 5 - select WiFi name start with AF

2) Return to app and click "Scan" after the wifi has been connected. Select "YES" on the Tips.



Screenshot 6 - scanning diagram

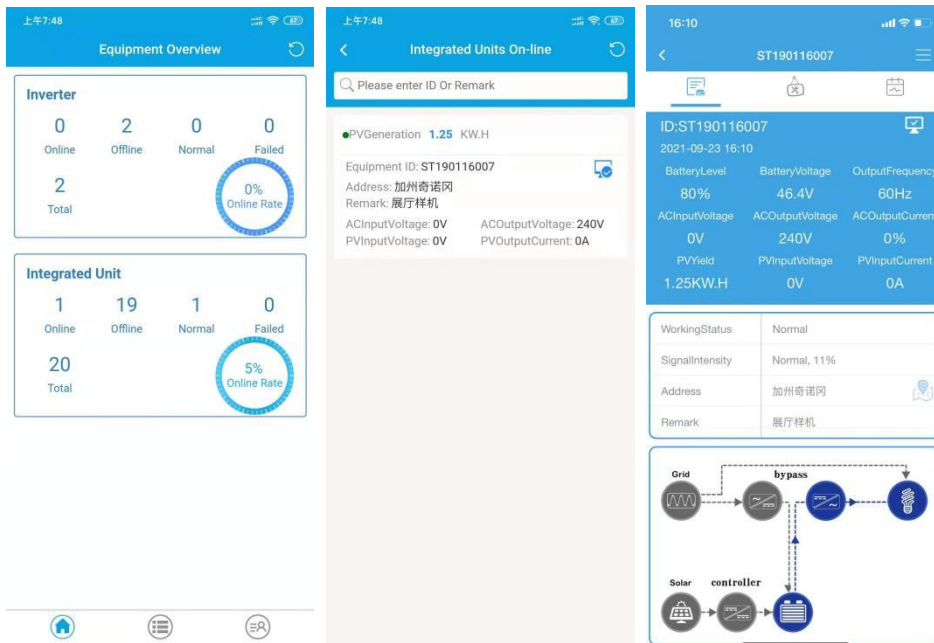
3) The nearby Wifi hot-spot will be listed out. Select your WiFi which has access to the internet, enter the password (Note: please enter the correct password to avoid the failure of wifi connection. If the connection fails, reset to start over), click “Confirm”, the Wifi indicator light will turn on red. Wait for 30s, the indicator light turns on green and slow flash. Connection completed.



Screenshot 7 - WIFI connection

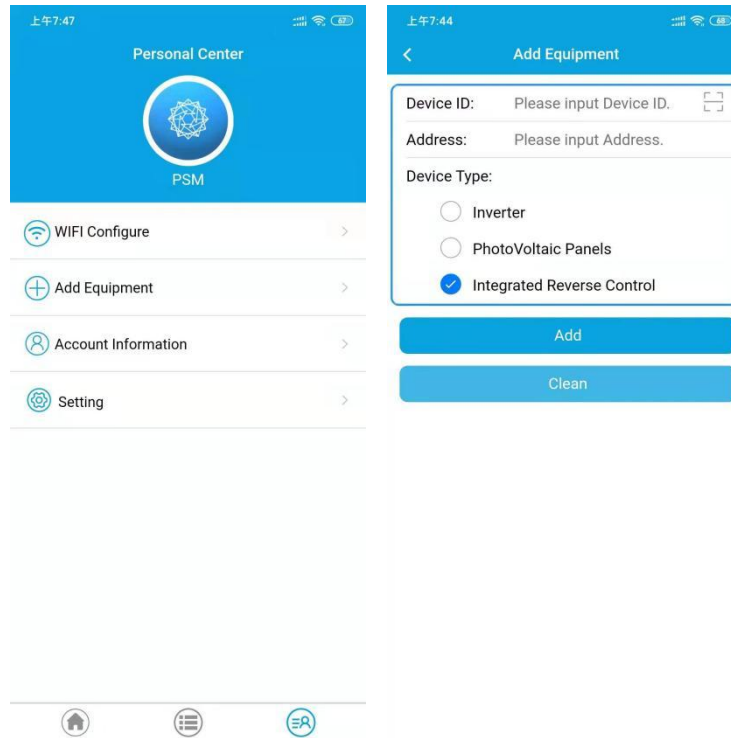
10.3 Monitoring on the APP

Click “Home” icon to enter Equipment Overview. Find and click your equipment to check the working status. (Screenshot 8)



Screenshot 8

If the equipment not shown on the App, enter “Personal Center”, select “Add Equipment”, scan the equipment ID QR code or input the Equipment ID (ST*****).Click “Add”.



Screenshot 9

If failed to add equipment, please contact local dealer for support.