
PT3580S

energy storage system specification



curriculum VITAC

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catalogue

1. Safety Notice 1	4
1.1 Scope of Application 1	4
1.2 Safety Instructions 1	4
2. Product Introduction 1	4
2.1 Product Description 1	4
2.2 Product Model Naming Rules 1	4
2.3 System Connection Diagram 2	6
2.4 Product Overview 2	6
2.5 Product Parameters 3	7
3. Install 4	8
3.1 Selection of Installation Location and Operation 4	8
3.2 Removal and Installation of Terminal Protective Covers and Dustproof Nets 5	9
4. Wiring 5	9
4.1 Cable and Circuit Breaker Selection 5	9
4.2 AC Input and Output Wiring 6	10
4.3 Photovoltaic Input Wiring 7	11
4.4 Antenna Module Wiring 7	11
4.5 Product Launch 8	12
5. Operation 8	12
5.1 Operation Interface 8	12
5.2 Set 11	15
5.3 COM Communication Port 15	19
5.4 Battery Parameter Table 15	19
6. Working Mode 16	20
6.1 Charging Mode 16	20
6.2 Output Mode 17	21
7. Protection 19	23
7.1 Protective Features 19	23
7.2 Meaning of Fault Codes 19	23
7.3 Partial Troubleshooting Measures 21	25
8.2 Maintenance 22	25

1、 safety instruction

1.1 Scope of Application

- This specification document contains critical product information, guidelines, operation and maintenance instructions, applicable to the following model: PT3580S
- Users must comply with the contents of this specification during installation, use, and maintenance.

1.2 Safety Instructions

- **Batteries pose potential hazards and require appropriate protective measures during operation and maintenance!**
- **Improper operation of the test procedures described in this specification may result in serious personal injury and property damage!**
- **Use the correct tools and protective equipment to handle batteries.**
- **Battery maintenance must be performed by a person with battery expertise and safety training.**
- **Non-compliance with the above warnings may lead to a variety of disasters.**

2、 product presentation

2.1 Product Description

The PT3580S is an integrated energy storage system combining photovoltaic power generation, grid charging, and battery storage. Featuring a compact design with built-in wheels at the base, it enables easy relocation while integrating inverter and battery storage functions.

2.2 Product Model Naming Rules

order number	defined declaration	remarks
1	Product category	ESS stands for Energy Storage System
2	Product voltage level	H: represents high pressure; L represents low pressure
3	Product power	7 representation 7kWh
4	Product temperature control method	F: stands for air cooling; L: stands for liquid cooling
5	product line	01: Represents the 01 series; can distinguish sizes
6	Product feature options	P: PCS (Power Conversion System); M: MPPT (Maximum Power Point Tracking); A: ATS (Automatic Transfer Switch); S: STS (Static Transfer Switch); The number indicates the power parameter of the function.

2.3 System Connection Diagram

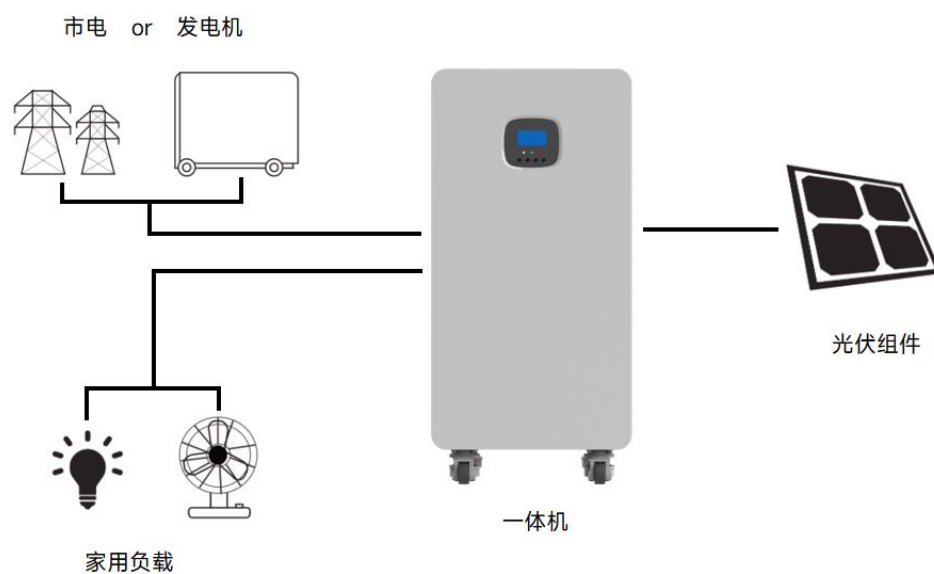
The following figure shows the system application scenarios of the product. A complete system consists of the following components:

- Photovoltaic modules: Convert light energy into DC power for product charging, or directly invert it into AC power to supply loads.
- Grid power or generator: Connected to AC input, it can charge batteries while supplying loads.

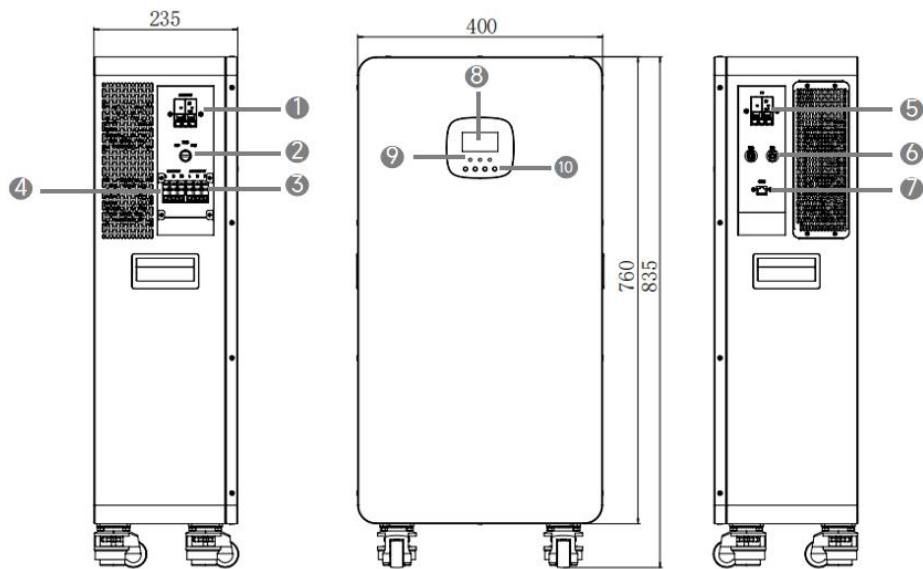
When batteries and photovoltaic modules power the load, the system can typically operate without grid power or a generator.

- Household loads: Supports various home and office appliances, including refrigerators, lighting fixtures, televisions, fans, air conditioners, and other AC-powered devices
- All-in-one machine: The energy conversion unit of the entire system.

The actual application scenario determines the specific system wiring method.



2.4 Product Overview



1	AC entry switch	2	System switch	3	AC output interface (L+N+PE)
4	AC input interface (L+N+PE)	5	photovoltaic input switch	6	Photovoltaic input interface: PV+ and PV-
7	Communication interface (WIFI module/RS485)	8	LCD display screen	9	LED pilot lamp
10	key				

2.5 Product Parameters

Battery parameters	
Battery type	LFP,3.2V/314AH
serial mode	1P8S
rated power	8.038kWh
rated voltage	25.6V
voltage range	21.6V~29.2V(2.7v~3.65v)
charge-discharge rate	≤0.5C
depth of discharge	85-90%
inverter output	
output rating	3500W
maximum peak power	6000VA

rated output voltage	230Vac (single-phase)
rated frequency	50/60Hz
discharge waveform	pure sine wave
switching period	10ms (typical value)
overload protection	After the overload protection is triggered, the product will resume output after 3 minutes. If the overload occurs five times consecutively, the output will be shut down until the inverter restarts. overload protection (102% <load <125%): Alarm triggered and shutdown after 5 minutes. (125% <load <150%): Alarm and shutdown after 10 seconds. Load> 150%: Alarm and shutdown after 5 seconds.
Photovoltaic input	
MPPT way	1
maximum input power	4000W
maximum input current	13A
maximum open circuit voltage	500Vdc
PPPT operating voltage range	120~450Vdc
City power/generator input	
input voltage range	90~280Vac
Input frequency range	50/60Hz
side current	30A
productiveness	
PTT tracking efficiency	99.9%
maximum efficiency of battery inverter	92%
be in common use	
size	835*400*235mm
weight	80kg
levels of protection	IP20 is for indoor use only
ambient temperature	-10~55°C,>45°C reduction in capacity
noise	<60dB
cooling-down method	Built-in fan
communication	
debugging interface	RS485
External module (optional)	WiFi

3. Installation

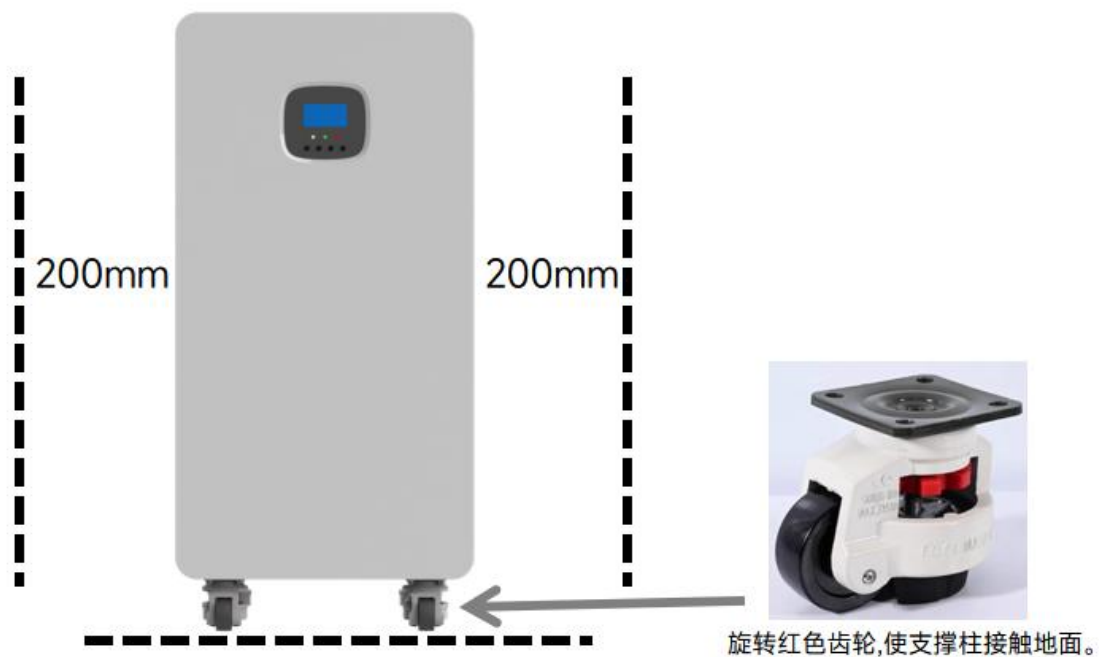
3.1 Selection of Installation Location and Operation

The PT3580S is designed for indoor use (IP20 protection rating). Before selecting the installation location, users should consider the following factors:

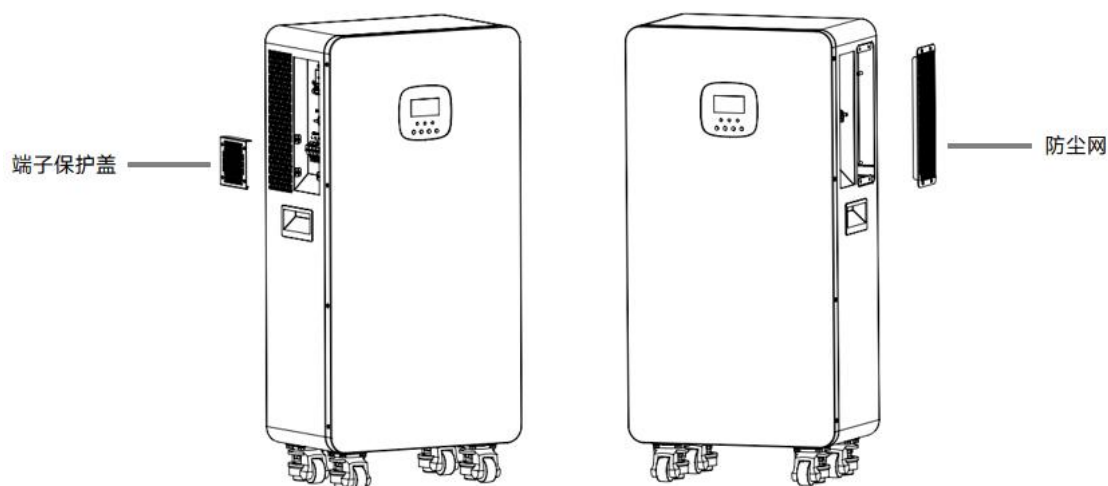
- Choose a flat surface for product installation
- Select a dry and well-ventilated environment for product installation
- Ensure sufficient cooling space for the inverter

The ambient temperature should be maintained between -10°C and 55°C (14°F to 131°F) to ensure optimal operation.

- After selecting the location, adjust the bottom casters.



3.2 Installation and Removal of Terminal Cover and Dust Cover



- In areas with poor air quality, dust filters may become clogged by airborne particles when using the equipment. Regular disassembly and cleaning of the dust filter is required to prevent interference with the inverter's airflow velocity, which could trigger device over-temperature protection (19/20 fault), thereby affecting power supply and product lifespan.

4. Wiring

4.1 Cable and Circuit Breaker Selection

- Photovoltaic input

Wire diameter	maximum input current	circuit breaker specification
3.5mm ² / 12AWG	13A	2P-25A (included in the product)

- AC input

Wire diameter	maximum input current	circuit breaker specification
6mm ² / 10AWG	30A	2P-40A (included in the product)

- AC output

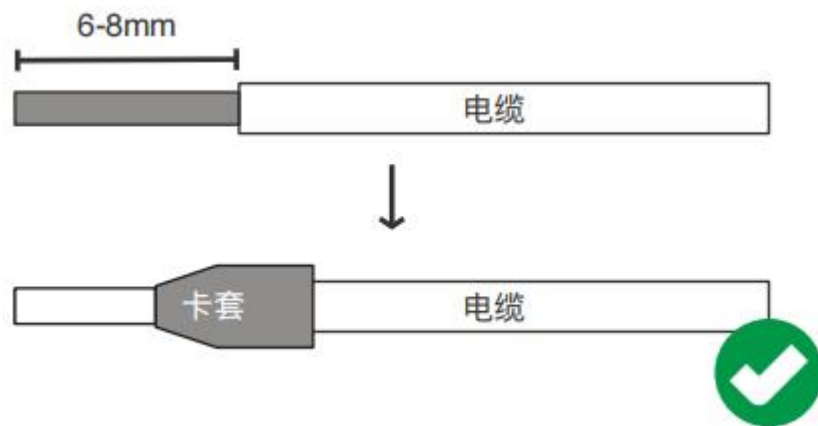
Wire diameter	maximum input current	circuit breaker specification
6mm ² / 10AWG	30A	2P-40A (User-owned)

-
- PV input terminal selection: MC4-pin PV connector (male/female, user-supplied)



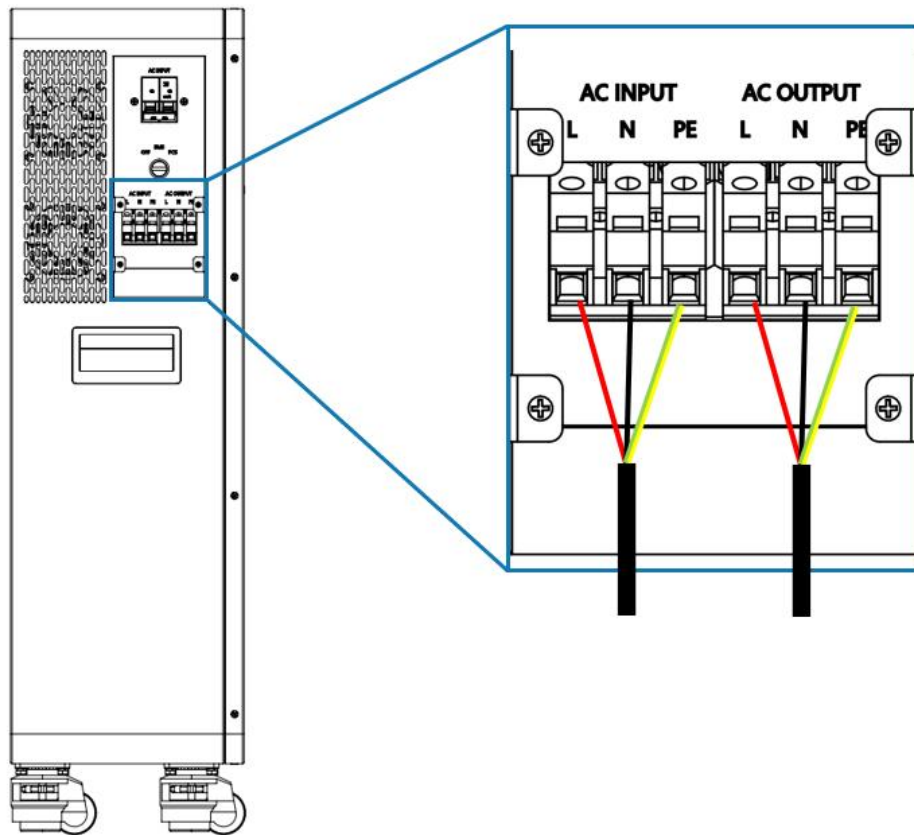
- AC input and AC output terminals

1. Use a wire stripper to remove the 6-8mm insulation layer from the cable (the user must provide the tool).
2. Install a cable clamp at the cable's end (the clamp must be provided by the user)



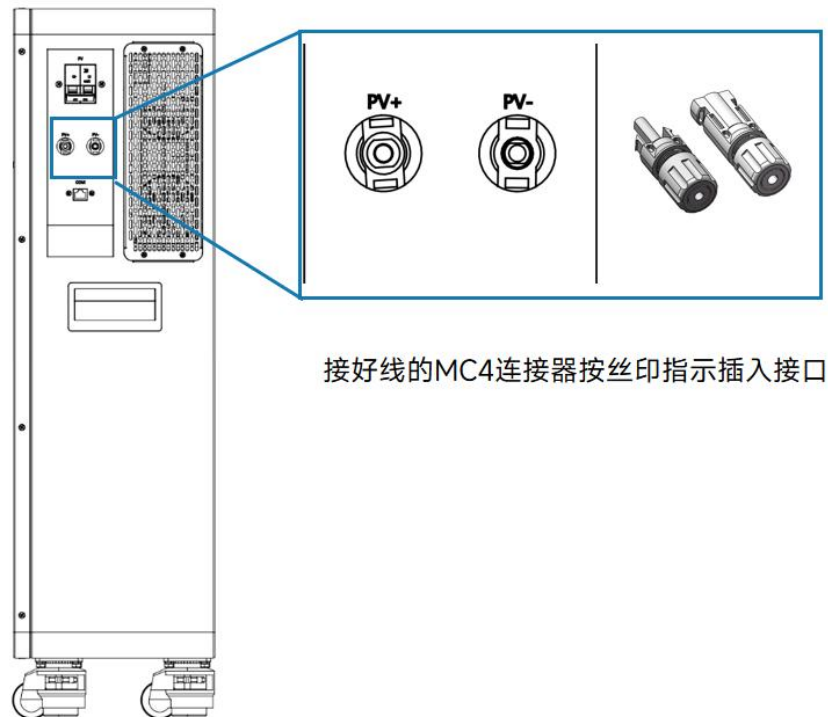
The wire diameter is provided for reference only. When the distance between the photovoltaic array and the product is long, using thicker wires can reduce voltage drop and improve system performance.

4.2 AC Input and Output Wiring



- Before connecting AC inputs and outputs, disconnect the circuit breaker to avoid electric shock hazards. Do not operate under live conditions.
- Ensure the cables used meet the required specifications, as those that are too thin or of poor quality may pose serious safety risks.

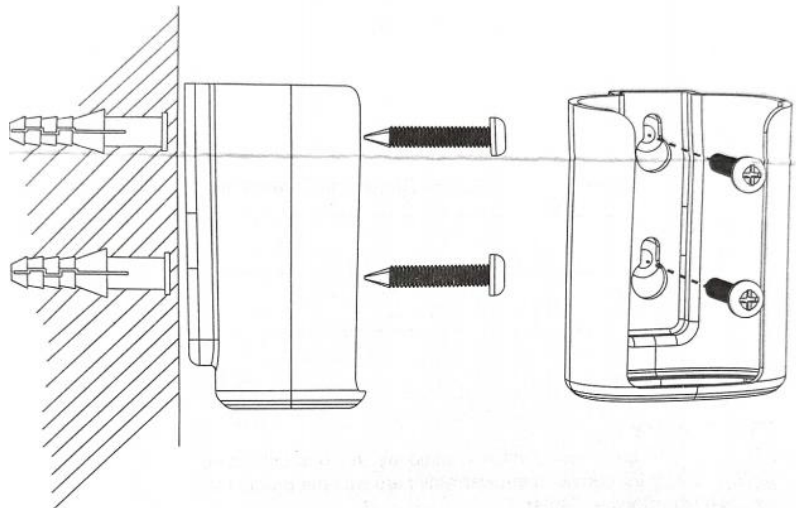
4.3 Photovoltaic Input Wiring



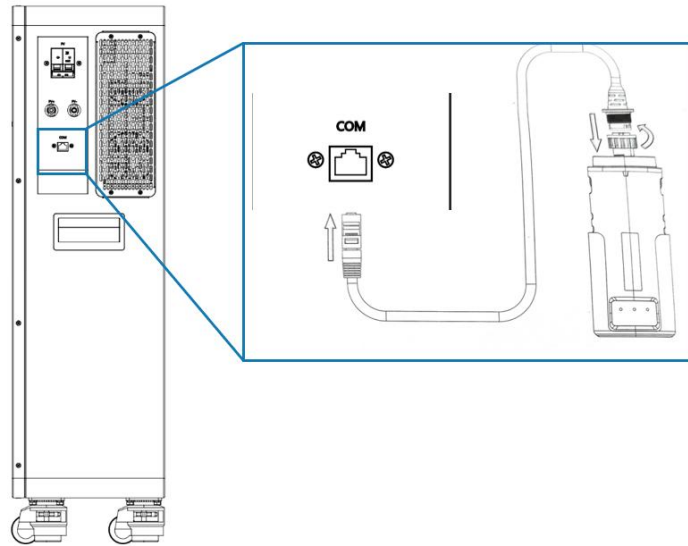
- Before connecting the photovoltaic system, disconnect the circuit breaker to prevent electric shock. Do not operate under live conditions.
- Ensure the open-circuit voltage of the connected PV modules does not exceed the inverter's maximum open-circuit voltage of 500V, otherwise the product may be damaged.

4.4 Antenna Module Wiring

Step 1: Mount the mounting bracket on the wall adjacent to the product PT3580S.



Step 2: Connect the WIFI module to the COM port of the PT3580S device by securing the cable.



4.5 Product Launch

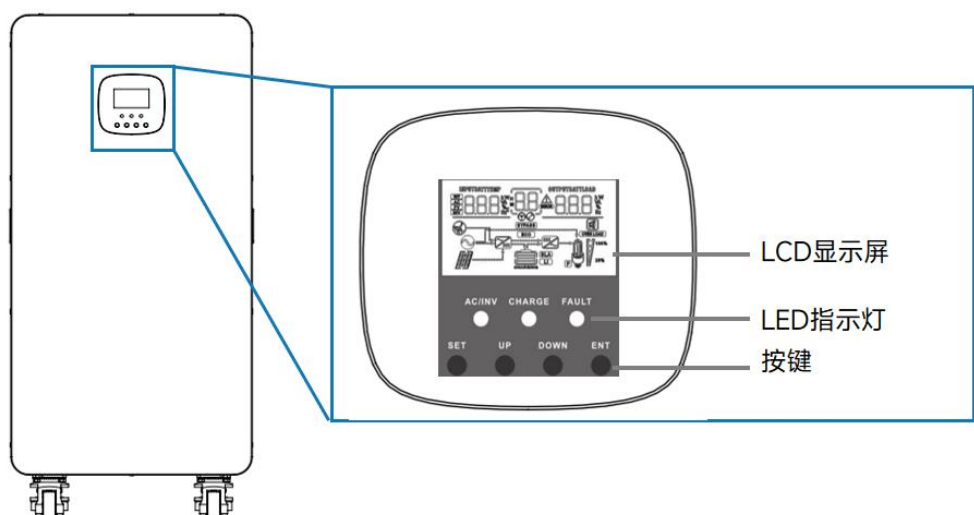
After confirming reliable wiring and correct sequence, reposition the terminal cover to its original position.

- Step 1: Turn the power switch clockwise to the PCS position
- Step 2: Close the circuit breakers for photovoltaic, AC input, and AC output in sequence
- Step 3: Start the loads in ascending order of power

5. Operation

5.1 Operation Interface

The product's operation and display interface includes 1 LCD screen, 3 indicator lights, and 4 buttons.



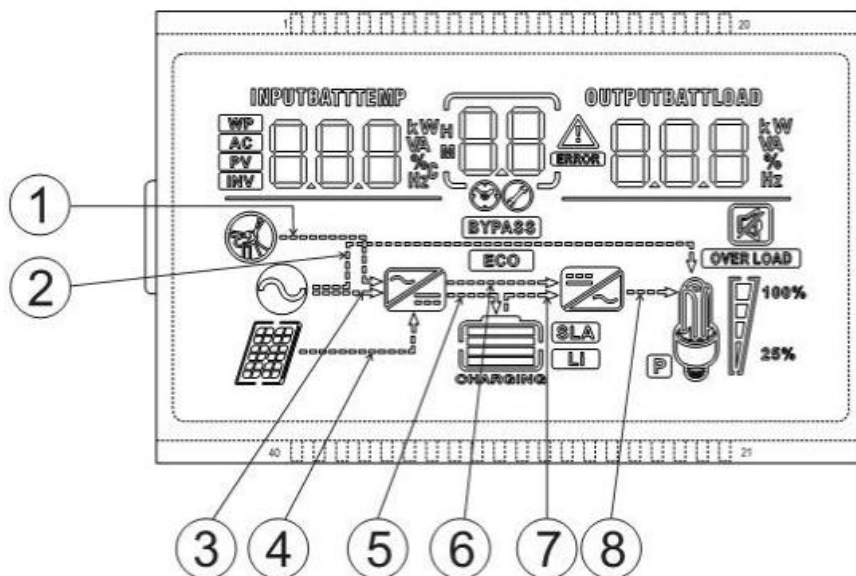
• key

key	description
SET	Go to/Exit Settings Menu
UP	Previous selection
DOWN	Next option
ENT	Under the settings menu, select or enter the option

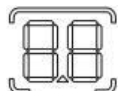
•LED pilot lamp

pilot lamp	pigment	description
AC/INV	yellow	Always On: mains output Flicker: Inverter Output
CHARGE	green	Chang Liang: Charging complete Flicker: The battery is charging
FAULT	red	Flash: Flash failure occurred

Display interface



icon	description	icon	description
	The AC input terminal is connected to an AC power source.		The inverter discharge circuit is operational.
	This icon indicates the wide voltage AC input mode (APL mode)		Set the machine to bypass mode (Bypass)
	The PV input terminal is connected to the solar panel.		The AC output is overloaded.
	The instruction machine is connected to the battery.		Indicates the percentage of the AC output load.
	indicates  the battery level from 0% to 24%		 Displays the load percentage from 0% to 24%.
	indicates  the battery has 25% to 49% remaining charge		 indicates a load percentage of 25% to 49%
	indicates  the battery has 50% to 74% remaining charge		 indicates a load percentage of 50% to 74%
	indicates  battery level between 75% and 100%		indicates  a load percentage of $\geq 75\%$
	The machine indicates the current battery type as lithium battery.		The indicator buzzer is not enabled.

	The machine indicates that the current battery type is a lead-acid battery.		The machine is instructed to trigger an alarm
	The indicator shows the battery is charging.		The machine is in a fault state.
	The AC/PV charging circuit is active.		Set the machine to setup mode
	The AC output terminal indicates the presence of alternating current voltage.		Display the middle parameter in the screen 1. In non-setting mode, display alarm or fault codes; 2. In setting mode, display the currently set parameter item codes
The left parameter display on the screen shows: Enter parameters			
	Indicate AC input		Indicate PV input
	indication inverter circuit		This icon is not displayed
	Display battery voltage, total charging current, mains charging power, AC input voltage, AC input frequency, PV input voltage, internal heat sink temperature, and software version		
The right parameter on the screen shows: output parameters			
	Indicates output voltage, output current, output active power, output apparent power, battery discharge current, and software version. In the settings mode, displays the parameters under the current parameter code.		
Arrow display			
①	The arrow is not displayed	⑤	Indicates charging the circuit to the battery
②	Indicates the power supply from the grid to the load	⑥	The arrow is not displayed
③	Indicates the power supply from the grid to the charging circuit	⑦	Indicates the power supply from the battery terminal to the inverter circuit
④	Indicates that PV power is supplied to the charging circuit	⑧	Direct the inverter circuit to supply power to the load

- Real-time data viewing method

page number	Left screen parameters	Screen Center Parameter	Right screen parameter
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1	INPUT BATT V Battery input voltage	Fault code (Fault code)	OUTPUT LOAD V (AC output voltage)
2	PV TEMP °C Temperature of solar charging radiator		PV OUTPUT KW (Solar charging output power)
3	PV INPUT V (Solar input voltage)		PV OUTPUT A Solar charging output current
4	INPUT BATT A Enter battery current		OUTPUT BATT A Battery output current
5	INPUT BATT KW Enter battery power		OUTPUT BATT KW Battery output power
6	AC INPUT Hz Input frequency		AC OUTPUT LOAD Hz (communication output frequency)
7	AC INPUT V (AC input voltage)		AC OUTPUT LOAD A Exchange output load current
8	INPUT V Inverter maintenance parameters display		OUTPUT LOAD KVA apparent power of load
9	INV TEMP °C (temperature of the radiator during AC charging or battery discharge)		INV OUTPUT LOAD KW (Active power load)
10	APP software release		Bootloader software version
11	Model battery voltage level		model output power class
12	PV voltage level of the model		PV charging current level for the model

On the LCD main screen, press the UP or DOWN button to scroll through and view the machine's real-time data.

5.2 Settings

Key Instructions: Press the "SET" key to enter or exit the settings menu. When in the menu, the parameter code [00] will flash. Use the "UP" and "DOWN" keys to select the parameter code. Press "ENTER" to edit the parameter. The value will then flash, allowing you to adjust it using the "UP" and "DOWN" buttons. Press "ENTER" again to complete the edit and return to the parameter selection state.

parameter number	Parameter name	Settings	explain
00	withdraw from	[00] ESC	Exit the settings menu.
01	Work First Mode	[01] SOL	The PV priority mode automatically switches to mains power when solar energy is unavailable or battery levels fall below the [04] parameter threshold.
		[01] UTI Default	The mains power priority mode only switches to inverter when mains power is invalid.
		[01] SBU	The inverter priority mode activates only when the battery voltage drops below the set value of parameter [04], switching to mains power.
02	output frequency	[02] 50.0 Default	The bypass mode adapts automatically to the mains frequency when powered on, and allows setting the output frequency through this menu when no mains power is available. 230V machines default to 50Hz, while 120V machines default to 60Hz.
		[02] 60.0	
03	AC input voltage range	[03] APL	The 230V machine supports a wide input voltage range of 90 to 280V. The 120V machine operates within a mains voltage range of 90 to 140V.
		[03] UPS default	The 230V machine operates within a narrow mains voltage range of 170 to 280V. The 120V machine operates within a mains voltage range of 90 to 140V.
04	Switch battery to mains power	[04] 23V Default	When parameter [01] = SOL/SBU, the battery voltage is below the set value, and the output switches from inverter to mains power. The set range is 20V to 27V. Do not set beyond [14] settings.
05	city power transfer battery	[05] 28V Default	When parameter [01] = SOL/SBU, the battery voltage exceeds this setting value, and the output switches from mains power to inverter. The setting range is 24V to 32V. Do not set below the values in [04] and [35].
06	Charging mode	[06] CSO	Solar power takes priority in charging, with mains power only activated when solar power is unavailable.
		[06] CUB	The system prioritizes grid power for charging, with photovoltaic charging activated only when grid power becomes unavailable.
		[06] SNU Default	The system supports hybrid charging with solar and grid power. Solar charging takes priority, and grid power supplements when solar energy is insufficient. Grid power stops charging when solar energy is sufficient. Note: Solar and grid charging can only occur simultaneously when the

			grid power bypass output is under load. During inverter operation, solar charging can only be initiated.
		[06] OSO	Only solar charging is available, and the mains power charging is not activated.
07	maximum charging current	[07] 80A Default	Set the range from 0 to 80A.
08	Battery type	[08] USE	Customizable by users, all battery parameters can be set.
		[08] SLd	Sealed lead-acid battery, constant voltage charging at 28.8V, float voltage at 27.6V.
		[08] FLd	Open lead-acid battery, constant voltage charging voltage 29.2V, float voltage 27.6V.
		[08] GEL Default	The voltage of the lead-acid battery is 28.4V for constant voltage charging and 27.6V for float charging.
		[08] LF07/LF08/LF09	The lithium iron phosphate battery models LF07/LF08/LF09 are compatible with 7-cell, 8-cell, and 9-cell configurations respectively. The 7-cell configuration defaults to a constant voltage charging voltage of 24.8V, while the 8-cell configuration uses 28.4V and the 9-cell configuration 31.8V, all of which are adjustable.
		[08] NCA	The ternary lithium battery has a default constant voltage charging voltage of 28.4V, which is adjustable.
09	Increase the charging voltage	[09] 28.4V default	Adjust the charging voltage settings to a range of 24V to 31.6V with 0.2V increments. This option applies when using custom or lithium battery types.
10	Increase maximum charging time	[10] 120 Default	Adjust the maximum charging duration setting, which defines the maximum charging time when the voltage reaches the parameter [09] set voltage during constant voltage charging. The range is 5 minutes to 900 minutes, with increments of 5 minutes. This setting applies to both custom and lithium battery types.
11	floating charge voltage	[11] 27.6V default	Floating voltage, set range 24V~29.2V with 0.2V step, valid when battery type is custom.
12	overvoltage	[12] 21V default	Overvoltage: When the battery voltage drops below the threshold, the inverter output is turned off after the delay parameter [13] sets the time. The voltage range is 20V to 28V with a step of 0.2V. This function is valid for both custom and lithium battery types.
13	overextended delay time	[13] 5S Default	When the battery voltage drops below parameter [12] after the overcharge delay time, the inverter output will be turned off after the preset delay time. The delay range is 5S to 50S with 5S increments. This setting applies to both custom and lithium battery types.

14	battery under-voltage alarm point	[14] 22V default	The battery under-voltage alarm activates when the voltage drops below the preset threshold, with the output remaining on. The adjustable range spans 20V to 28V, with 0.2V increments. This function applies to both custom and lithium battery types.
15	battery discharge limit voltage	[15] 23.2V default	The battery discharge limit voltage. If the battery voltage drops below this threshold, the output will shut down immediately. Set the range to 20V~27.2V with a step of 0.2V. This setting applies to custom and lithium battery types.
16	equalizing charge	[16] DIS Default	Even charging is not allowed.
		[16] ENA	Enable balanced charging, only open lead-acid batteries and sealed lead-acid batteries are effective.
17	balanced charging voltage	[17] 29.6V default	The charger maintains a stable voltage range of 24V to 31.6V with 0.2V increments, compatible with both open-cell and sealed lead-acid batteries.
18	equilibrium charging time	[18] 120 Default	The charging time is evenly distributed, with a range of 5 to 900 minutes and increments of 5 minutes. Both open and sealed lead-acid batteries are compatible.
19	equilibrium charging delay	[19] 240 Default	The equalization charging delay is adjustable within a range of 5 minutes to 900 minutes, with increments of 5 minutes. This setting applies to both open and sealed lead-acid batteries.
20	equilibrium charge reduction time	[20] 30 Default	The equalization charging and discharge duration ranges from 0 to 30 days, with a step increment of 1 day, applicable to both open and sealed lead-acid batteries.
21	equilibrium charging enablement	[21] DIS Default	Stop the balanced charging immediately.
		[21] ENA	Start balanced charging now.
22	Energy-saving mode	[22] DIS Default	Energy-saving mode is disabled.
		[22] ENA	When the energy-saving mode is enabled, the inverter will delay output and turn it off if the load is zero or under 50W. It will automatically start when the load exceeds 50W.
23	automatic reboot on overload	[23] DIS	Overload automatic restart is disabled. If the output is shut down due to overload, the machine will not restart.
		[23] ENA default	Enable automatic reboot on overload. If the output is shut down due to overload, the machine will restart the output after a 3-minute delay. After 5 cumulative occurrences, the system will not resume startup.
24	overheat automatic restart	[24] DIS	Overheat automatic restart is prohibited. If overheating occurs, the output machine will shut down and will not restart.

		[24] ENA default	Enable automatic restart upon overheating. If the output is shut down due to overheating, it will restart and resume output once the temperature drops.
25	buzzer warning	[25] DIS	Do not report an alarm.
		[25] ENA default	Enable alarm.
26	Mode change notification	[26] DIS	Alarm prompts are disabled when the status of the main input source changes.
		[26] ENA default	Enable alarm prompt when the status of the main input source changes.
27	inverter overload bypass	[27] DIS	The automatic switching off of mains power is forbidden when inverter overload.
		[27] ENA default	When inverter overload, it automatically switches to mains power.
28	maximum charging current for AC	[28] 80A Default	The S-series models support AC charging with a maximum current range of 0 to 80A.
		[28] 40A Default	The maximum charging current for AC charging of U-series models ranges from 0 to 40A.
29	output phase separation function	[29] DIS Default	Disable this feature.
		[29] ENA	Enable the output power frequency transformer.
30	Machine address settings	[30] 1	Range 1-254.
32	RS485/CAN communication function	[32] SLA Default	The RS485 port is used for PC and remote monitoring protocol.
		[32] BMS	The RS485 port is used for BMS communication.
		[32] CAN	The CAN port is used for BMS CAN communication.
33	BMS protocol	When the [32] setting is 485 or CAN, select the corresponding lithium battery manufacturer brand for communication.	
		When [32]=485, the protocol includes: PAC=Peicheng, RDA=Ruida, AOG=Oguan, OLT=Oulite, XWD=Xinwangda, DAQ=Daqin, WOW=Shuori, PYL=Paianeng, SHO=Maotian, POW=Hehejin	
		When [32]=CAN, the protocol includes WST, and UZE=昱泽.	
34	mixed load setting	[34] DIS Default	Disable this feature.
		[34] Lod	In hybrid mode, the PV system charges only the load during mains power supply, with surplus energy not fed into the grid.
35	recovery point of under-voltage	[35] 26V default	When the battery voltage drops below the threshold, the system will restore the inverter's AC output by raising the voltage above the preset level.
36	Maximum PV charging current	[36] 80A Default	Maximum solar charging current: 0~80A.

37	Recharge the battery to restore the charging point	[37] 26V default	When the battery is fully charged, the inverter stops charging. If the battery voltage drops below this threshold, it resumes charging.
38	AC output voltage level (settable only in standby mode)	[38]230Vac default S-series models: 200/208/220/230/240Vac adjustable, default 230Vac. AC output power = rated power × (set voltage / 230)	
39	Charging current limiting method (when BMS is enabled)	The maximum charging current of the [SET] battery is limited according to the setting value in [07].	
		The maximum charging current of the battery is limited by the BMS's current limit value.	
		[INV] The maximum charging current of the battery is limited by the machine's derating logic.	
58	SOC setting for discharge alarm	[58] 15% by default	When the capacity is below the set value, an SOC alarm is triggered. (Valid when BMS communication is normal)
59	Discharge until SOC setting	[59] 5% by default	Stop discharging when the capacity is below the set value. (Valid when BMS communication is normal)
60	SOC setting for charging	[60]100% Default	Stop charging when the capacity exceeds the set value. (Valid when BMS communication is normal)
61	Switch mains SOC settings	[61] 10% default	Switch to mains power when capacity is below the set value. (Valid when BMS communication is normal)
62	Change the inverter output SOC setting	[62] 100% Default	Switch to inverter output mode when the capacity exceeds the set value. (Valid when BMS communication is normal)

5.3 COM Communication Port

COM has two functions:

- ① The COM communication port enables RS485 communication with the lithium battery BMS host computer;
- ② The COM communication port can be connected to the accessory WIFI module. With this module installed, the operation parameters and status of the inverter can be monitored via the mobile app.

Note: The PT3580S features only one COM communication port, limiting the simultaneous operation of either the WIFI module or the BMS host connection. For dual functionality, an additional communication expansion port is required.

COM communication port	
------------------------	--

RJ45	definition	remarks	
Pin1	5V	WIFI module	
Pin2	GND		
Pin3	RS485-A	BMS upper monitor	
Pin4	RS485-B		
Pin5			
Pin6			
Pin7	RS485-A1	WIFI module	
Pin8	RS485-B1		

5.4 Battery Parameter Table

Battery type parameter	ternary lithium (N07)	ternary lithium (N08)	lithium iron phosphate (LF07)	lithium iron phosphate (LF08)	lithium iron phosphate (LF09)	adjustable
overvoltage breaking voltage	31.6V	33.0V	30V	30V	33V	
Recharge after full charge Restore voltage (Setting 37)	27.4V	30.4V	23.2V	26.8V	29.8V	√
balanced charging voltage	-	-	-	-	-	
Increase the charging voltage	28.8V	31.6V	24.6V	28.4V	31.6V	√
floating charge voltage	28.8V	31.6V	24.6V	28.4V	31.6V	√
undervoltage alarm Voltage (01 Fault)	23.4V	26.8V	21.6V	24.8V	27.8V	√
Undervoltage alarm recovery voltage (01 fault)	Undervoltage alarm voltage +0.4V					
Low-voltage open circuit (04 fault)	21.0V	24.0V	21.0V	24.4V	27.0V	√
Low-voltage disconnection and voltage restoration (04 Fault Recovery) (35 Settings)	26.0V	29.6V	23.8V	27.2V	30.6V	√
discharge limiting voltage	19.6V	22.4V	20.4V	23.2V	26.2V	√
overextended delay time	30s	30s	30s	30s	30s	√

equilibrium duration	-	-	-	-	-	√
equilibrium charging interval	-	-	-	-	-	√
Increase the duration of the boost	120 minutes	120 minutes	120 minutes	120 minutes	120 minutes	√

6. Working Mode

6.1 Charging Mode

1) Photovoltaic Priority: Photovoltaic charging is prioritized, with mains power charging activated only when photovoltaic systems fail. Solar energy is fully utilized during daytime for power generation, while switching to mains power charging at night helps maintain battery capacity, particularly in regions with relatively stable power grids and higher electricity prices.



2) Municipal power priority: The system first charges the battery using mains power, with photovoltaic charging activated only when mains power is unavailable.

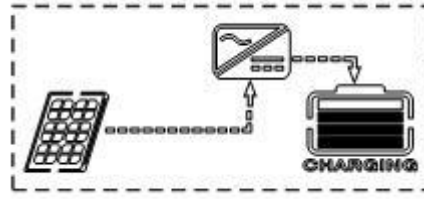


3) Hybrid Charging: This method combines photovoltaic (PV) and grid power. PV MPPT charging takes priority, with grid power supplementing when PV output is insufficient. Grid power stops charging when PV output is sufficient. This approach



rs the fastest charging speed, making it ideal for regions with unstable power grids, providing reliable backup power supply at any time.

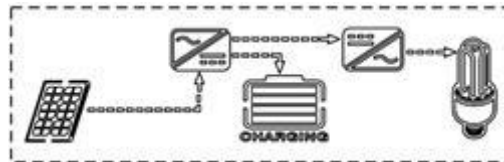
4) Solar-only charging (Only Solar): This mode exclusively uses solar power for charging without switching to mains electricity. As the most energy-efficient option, it relies entirely on solar energy for battery charging and is typically deployed in regions with abundant sunlight.



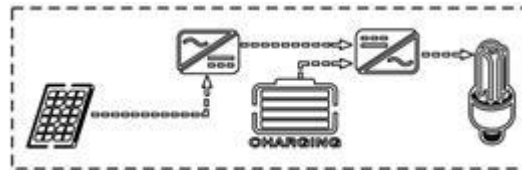
6.2 Output Mode

1) PV Priority Mode: The system uses solar power and battery energy to supply loads, with PV taking priority for load operation.

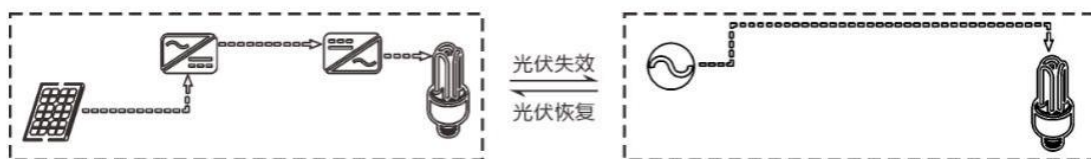
When the photovoltaic energy exceeds the load, the surplus energy is used to charge the battery.



When the photovoltaic energy is lower than the load, the battery supplements the energy deficit.



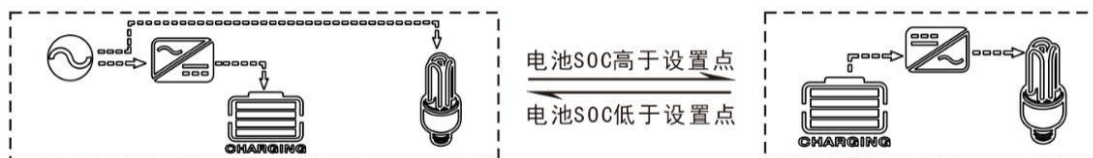
When the PV system is inactive, switch to mains power for charging; when PV resumes operation, switch to PV and battery mode with load.



No BMS communication: When the battery voltage drops below the 04 setting, switch to mains power for charging; when the battery voltage exceeds the 05 setting, switch to photovoltaic or battery load operation.

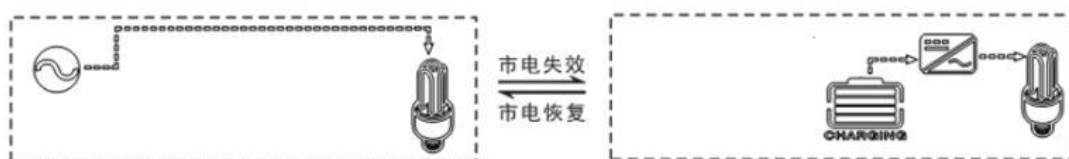


BMS communication: When the battery SOC drops below the 61 threshold, switch to mains power for charging; when the SOC exceeds the 62 threshold, switch to solar power with battery load.



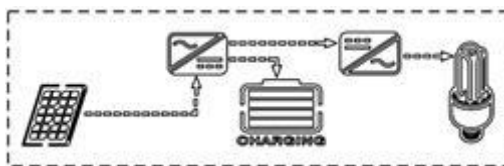
This model maximizes solar energy utilization while maintaining battery capacity, making it ideal for regions with stable power grids.

2) Grid Priority Mode: The system only switches to inverter power supply when no grid electricity is available, and switches to grid charging and power supply when grid electricity is available. This mode functions as a backup UPS for unstable grid regions. The switching process does not affect photovoltaic charging.

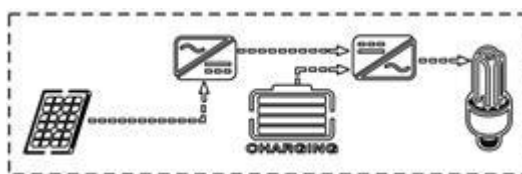


3) Inverter Priority Mode: The system uses photovoltaic and battery energy to power the load, with photovoltaic generation taking precedence.

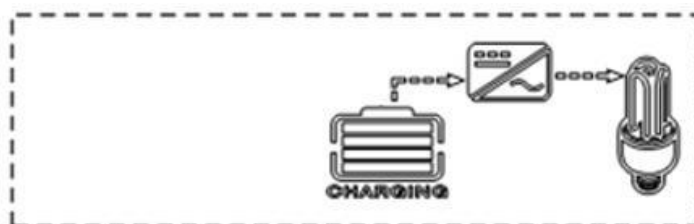
When the photovoltaic energy exceeds the load, the surplus energy is used to charge the battery.



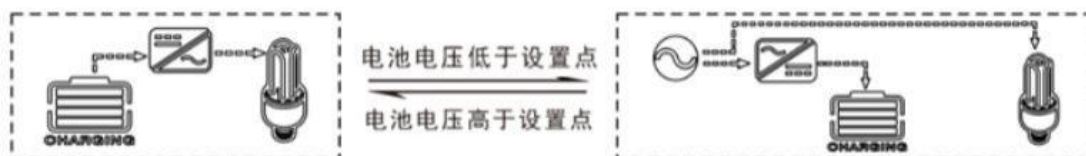
When the photovoltaic energy is less than the load, the battery supplements the energy deficiency.



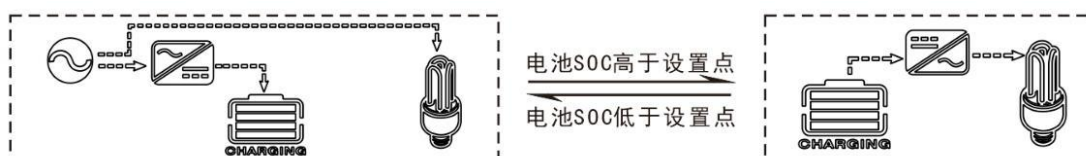
When photovoltaic power is unavailable, the battery operates under load while cycling through charge-discharge cycles.



No BMS communication: When the battery voltage drops below the 04 setting, switch to mains power for charging; when the battery voltage exceeds the 05 setting, switch to photovoltaic or battery load operation.

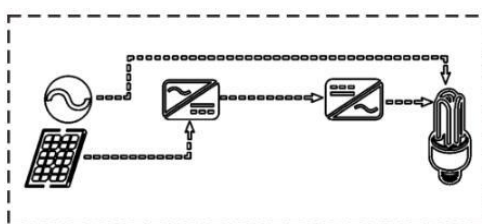


BMS communication: When the battery SOC drops below the 61 threshold, switch to mains power for charging; when the SOC exceeds the 62 threshold, switch to solar power with battery load.



This mode maximizes DC power utilization for grid-stable regions, with no impact on PV charging during switching.

4) Hybrid load mode: When no battery is connected or the battery is fully charged, the system operates in hybrid mode with both PV and mains power, with PV delivering maximum output power.



7. Protection

7.1 Protective Features

order number	defensive function	explain
1	PV current limit/power limit protection	When the configured PV array's charging current exceeds the rated current, it will charge at the rated current.
2	PV Night Anti-Recharge Protection	At night, when the battery voltage exceeds that of the PV modules, the system prevents the battery from discharging through the PV modules.
3	overvoltage protection of mains power input	When the mains voltage exceeds 280V (for 230V models), the system will stop mains charging and switch to inverter output.
4	city power input under voltage protection	When the mains voltage drops below 170V (for 230V models or UPS mode), the system will stop mains charging and switch to inverter output.

5	battery overvoltage protection	When the battery voltage exceeds the overvoltage cutoff threshold, it automatically stops charging from both PV and mains power to prevent damage from overcharging.
6	battery under-voltage protection	When the battery voltage reaches the low-voltage cutoff point, it automatically stops discharging to prevent damage from over-discharge.
7	load output short circuit protection	If a short-circuit fault occurs at the load output for over 1 second, the AC output voltage will be immediately cut off.
8	over temperature protection of radiator	When the inverter's internal temperature becomes excessively high, it will suspend charging and discharging operations. Once the temperature returns to normal, the inverter will resume these functions.
9	overload protection	After 3 minutes following overload protection, the output will be reactivated. The system will shut down output after 5 consecutive overloads until the machine is powered on again. Refer to the technical parameters table in the manual for specific overload levels and durations.
10	PV anti-protective	The machine will not be damaged if the PV polarity is reversed.
11	AC reverse flow protection	Prevent the battery inverter from reverse AC backflowing to the bypass AC input.
12	bypass flow protection	Built-in AC overcurrent protection circuit breaker.
13	battery overcurrent protection	When the discharge output current exceeds the maximum value and persists for one minute, the system switches to AC input with load.
14	battery input protection	When the battery is connected in reverse or an internal short circuit occurs in the inverter, the internal battery input fuse will blow to prevent battery damage or fire.
15	short circuit protection during charging	When a short circuit occurs at the external battery port during PV or AC charging, the inverter will automatically protect itself and cut off the output current.

7.2 Fault Code Meaning

fault code	Fault name	Affects output	explain
【01】	BatVoltLow	yes	low battery voltage alarm
【02】	BatOverCurrSw	yes	Software protection of average current overcurrent in battery discharge
【03】	BatOpen	yes	Battery not connected
【04】	BatLowEod	yes	Battery low voltage stop discharge alarm
【05】	BatOverCurrHw	yes	hardware protection of battery over current
【06】	BatOverVolt	yes	overcharge protection
【07】	BusOverVoltHw	yes	Overvoltage Protection of Internal Battery Boosting Circuit
【08】	BusOverVoltSw	yes	Overvoltage Software Protection of Internal Battery Boosting Circuit
【09】	PvVoltHigh	deny	overvoltage protection of solar energy input voltage
【10】	PvBuckOCSw	deny	Software protection of solar charging

			overcurrent
【11】	PvBuckOCHw	deny	Hardware Protection of Solar Charging Overcurrent
【12】	bLineLoss	deny	Power outage
【13】	OverloadBypass	yes	bypass AC output overload protection
【14】	OverloadInverter	yes	AC output overload protection of inverter
【15】	AcOverCurrHw	yes	Hardware Protection of Inverter AC Output Overcurrent
【16】	-	-	-
【17】	InvShort	yes	short circuit protection of inverter AC output
【18】	-	-	-
【19】	OverTemperMppt	deny	Overtemperature Protection of Solar Charging Radiator
【20】	OverTemperInv	yes	Overtemperature Protection of Inverter AC Output with Load or AC Charging Radiator
【21】	FanFail	yes	Fan stall or failure
【22】	EEPROM	yes	memory fault
【23】	ModelNumErr	yes	Incorrect device configuration
【24】	-	-	-
【25】	-	-	-
【26】	RlyShort	yes	Invert AC output backflow to bypass AC input
【27】	-	-	-
【28】	-	-	-
【29】	BusShort	yes	Internal battery boost circuit failure
【30】	BatCapacityLow1	deny	Battery capacity rate below 10% triggers an alert (enable BMS settings for effective protection)
【31】	BatCapacityLow2	deny	Battery capacity rate below 5% triggers an alert (enable BMS settings for effective protection)
【32】	BatCapacityLowStop	yes	Battery low capacity shutdown (enable BMS settings for effective operation)
【58】	BMS communication error	deny	Check whether the communication cable is properly connected and whether [33] is configured with the corresponding lithium battery communication protocol.

【60】	BMS battery low temperature alarm	deny	Low Temperature Alarm of Lithium Battery BMS
【61】	BMS battery over temperature alarm	deny	Overtemperature Alarm of Lithium Battery BMS
【62】	BMS battery overcurrent alarm	deny	Overcurrent Alarm of Lithium Battery BMS Battery
【63】	BMS battery under-voltage alarm	deny	Lithium Battery BMS Battery Under Voltage Alarm
【64】	BMS battery overvoltage alarm	deny	Overvoltage Alarm of Lithium Battery BMS

7.3 Partial troubleshooting measures

fault code	hitch	countermeasure
Display	No display on screen	Check if the battery or PV circuit breaker is closed; verify the switch is in the "ON" position; press any button on the screen to exit sleep mode.
【06】	overvoltage protection of rechargeable battery	Check if the battery voltage exceeds the protection threshold. If it does, discharge the battery until the voltage drops below the overvoltage recovery point.
【01】 【04】	battery under-voltage protection	The battery should be charged to the voltage above the low-voltage disconnection recovery voltage.
【21】	Fan malfunction	Check whether the fan is not rotating or blocked by other objects.
【19】 【20】	over temperature protection of radiator	When the device temperature cools below the over-temperature recovery threshold, the normal charge and discharge control resumes.
【13】 【14】	side path overload protection, inverter overload protection	① Reduce the number of electrical appliances; ② Restart the inverter to restore load output.
【17】	inverter short circuit protection	① Check the load connection carefully and eliminate the short-circuit fault point; ② Re-power on, the load resumes output.
【09】	PV overvoltage	Use a multimeter to check if the PV input voltage exceeds the maximum allowable input voltage.
【03】	Battery not detected	Check if the battery is disconnected or if the battery-side circuit breaker is not closed.
【26】	AC input relay short circuit	Disconnect the AC power and solar cell input. Wait until the screen turns off, then power only the battery. If the 26 fault still occurs, it indicates the AC input relay is short-circuited. Contact the manufacturer for replacement.

8.2 Maintenance

To maintain optimal long-term performance, it is recommended to perform the following items twice a year;

1. Ensure the airflow around the product is not obstructed;
2. Inspect all exposed wires for insulation damage caused by sun exposure, friction with surrounding objects, decay, or damage from insects or rodents. Repair or replace the wires if necessary.
3. Verify that the instructions and displays align with the device operation. Monitor for any malfunctions or error messages, and take corrective actions when necessary.
4. Inspect all terminal blocks for corrosion, insulation damage, or signs of high-temperature exposure, burning, or discoloration, and tighten the terminal screws.
5. Inspect for dirt, nesting insects, and corrosion, and clean the dust screen regularly as required.
6. If the product remains unused for an extended period, it should be charged at least once a month.

- Before performing any inspection or operation, ensure the inverter is disconnected from all power sources and that the capacitors are fully discharged to avoid the risk of electric shock.

The company shall not be liable for damages caused by the following reasons:

1. Damage caused by improper use or application at the wrong location.
2. The open-circuit voltage of the photovoltaic module exceeds the maximum allowable voltage.
3. Damage caused by exceeding the specified operating temperature range
4. Unauthorized personnel disassembling or repairing the inverter.
5. Damage due to force majeure: Damage occurring during the transportation or handling of inverters.