

LiPOWER

User manual



Product Name: Integrated Energy Storage System

Product Model: PH7000

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1. Information in this manual

This manual describes the installation, operation and troubleshooting of this machine. Please read carefully before installation and operation.

Please keep this manual in a safe place for future reference.

1.1 Scope

This manual provides safety and installation instructions as well as tool and wiring information.

1.2 Target Group

This document is intended for qualified personnel and end users, and tasks that do not require any specific qualifications can also be performed by end users.

Qualified individuals must have the following skills :

1. Understand the working principle and operation method of the inverter.
2. Be trained on how to deal with the hazards and risks associated with installing and using electrical equipment and installations.
3. Training on installation and commissioning of electrical equipment.
4. Understand the applicable standards and directives.
5. Understand and comply with this document and all safety information.

1.3 Safety Instructions

1. Before using the machine, please read all instructions and warning marks on the machine manual and all relevant chapters of this manual. The company has the right not to make quality guarantees. If the equipment is damaged due to failure to install according to the instructions in this manual .
2. Do not disassemble the machine. When maintenance or repair is required, please send it to a qualified service center. Improper

reassembly may cause the risk of electric shock or fire. 3. All operations and connections should be performed by professional electrical or mechanical engineers. All electrical installations must comply with local electrical safety standards. 4. To reduce the risk of electric shock, disconnect all wires before performing any maintenance or cleaning. Turning off the power does not reduce the risk of electric shock. 5. For the best operation of the all-in-one machine, please select the appropriate cable size according to the required specifications. It is very important to operate the all-in-one machine correctly.

6. Grounding Instructions - This inverter should be connected to a permanently grounded wiring system. When installing this inverter, be sure to comply with local requirements and regulations.

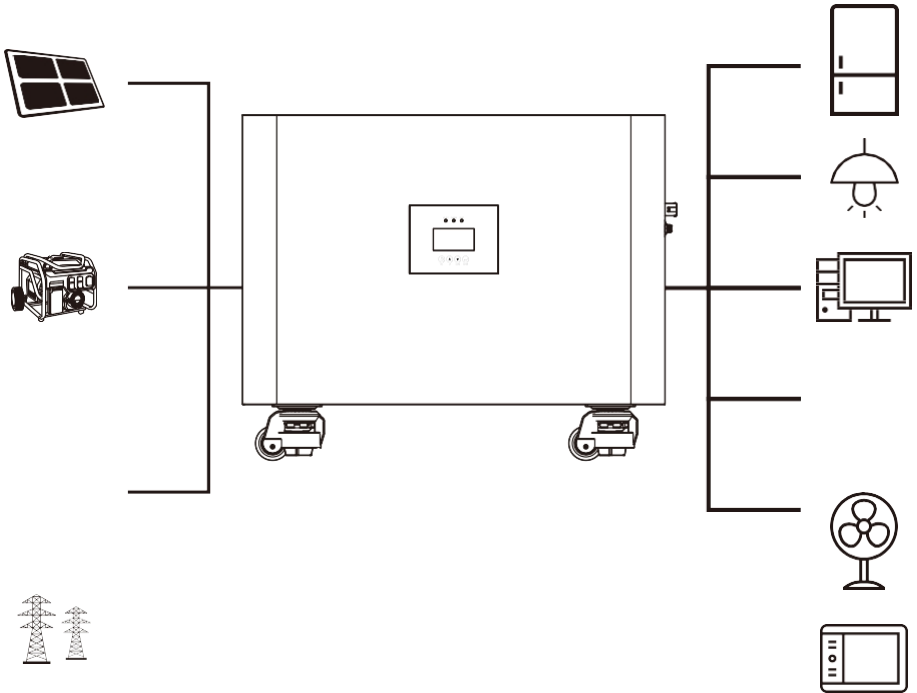
7. It is strictly forbidden to cause short circuit between AC output and DC input. When DC input is short-circuited, it is strictly forbidden to connect to the mains.

8. Please do not install the machine in a damp, greasy, flammable, explosive or dusty environment.

9. Warning!! Only qualified maintenance personnel can repair this device. If the fault still exists after troubleshooting according to the troubleshooting table, please return the all-in-one to the local dealer or service center for repair .

10. Before operation, please make sure the all-in-one machine has been fully assembled.

1.4 Application Introduction



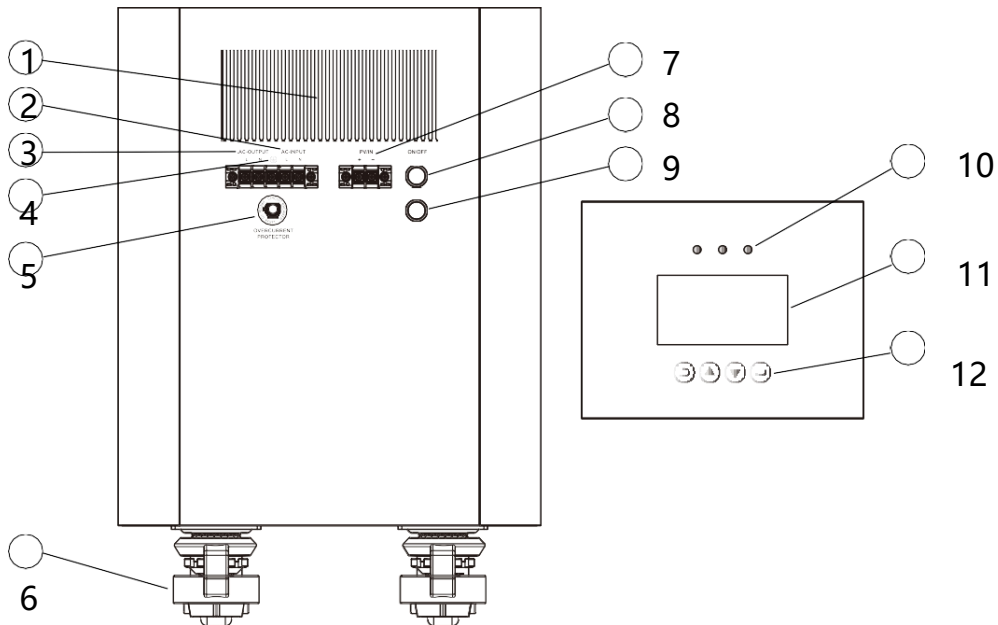
Welcome to use the solar energy storage inverter control all-in-one machine. This product can meet the needs of photovoltaic and energy storage systems at the same time. It can realize off-grid function and two-way control of electric energy. Intelligent control can achieve highly autonomous energy scheduling. It is easy to install and debug, simple to operate and maintain, and is an ideal choice for family residential application scenarios. This product supports off-grid switching (the typical switching time is 10ms), supports input and output overload and short circuit Circuit protection, DC/AC side is equipped with surge protection as standard, so that it can continuously provide safer electricity for the family .

1.5 Product Features

1. It has segmented charging and discharging function.

2. It has built-in lithium battery dual activation function, which can be triggered by connecting to either AC power or photovoltaic power.
3. It has energy-saving mode function to reduce no-load loss.
4. There are 4 charging modes to choose from: solar power only, mains power priority, solar power priority, and hybrid charging.
5. It has two output modes: AC bypass and inverter output, and has uninterrupted power supply function.
6. It has complete short circuit protection, over-voltage protection, under-voltage protection, overload protection, reverse feeding protection, etc., 360° all-round protection.
7. Adopt full digital voltage and current double closed loop control, advanced SPWM technology, and output pure sine wave.
8. Advanced MPPT technology, efficiency up to 99.9%.
9. Adopt intelligent adjustable speed fan to dissipate heat efficiently and extend system life.

2. Product Overview



①	Cooling fan	⑦	PV input
②	AC input port	⑧	Inverter switch
③	AC output port	⑨	Battery switch
④	Ground terminal	⑩	Indicator Lights
⑤	AC input overload	⑪	LCD screen

	protector		
⑥	Universal wheel	⑫	Button

3. Installation

3.1. Unpacking and Inspection

Please check the unit before unpacking to ensure that there is no damage in the package. You should receive the following items in the package: All-in-one machine x1

User

manual x1

Terminal

block x8

3.2.

Preparat

ion

Before making any wiring connections, remove the terminal protection covers.

3.3. Installation precautions

Before selecting an installation location, please consider the following points: 1. Do not install the all-in-one machine in a humid, flammable, explosive, or dusty environment.

2. During installation, leave more than 300MM space on the left and right sides of the all-in-one machine for heat dissipation.

3. The ambient temperature should be between 0°C and 55°C to ensure optimal operation.

4. When installing outdoors, avoid direct sunlight and rain infiltration.

5. Mains input and AC output are high voltage, please do not touch them.

3.4 AC input/output connection

Warning! ! Before connecting the AC input, please install a separate AC circuit breaker between the integrated machine and the AC input. This will


ensure that the integrated machine can be safely disconnected during maintenance and fully protect the AC input from overcurrent. The recommended specification of the AC circuit breaker is 30A.

WARNING!! There are two terminal blocks marked with 'IN' and 'OUT', please do not mistakenly connect the input and output connection blocks. **WARNING!!** All wiring must be done by qualified personnel.

WARNING!! Using the appropriate cables for AC input and output connections is very important for safe and efficient operation of the system. To reduce the risk, please use the correct recommended cable size as shown in the figure below:

Recommended AC input wire diameter		Maximum bypass input current	Recommended air switch or circuit breaker model	Torque value
230V	8mm ² / 8AWG	30A	2P— 30A	1.2- 1.6Nm
110V	10mm ² / 7AWG	40A	2P— 40A	1.2- 1.6Nm

Insert the AC input or output wire according to the polarity indicated on the terminal block and tighten the screws.

-  →Ground wire (yellow-green)
- L→LINE(brown)
- N → Neutral (blue)

WARNING !! Make sure the power cord is disconnected before attempting to connect the AC input to this unit.

WARNING!! Make sure the power cord is connected securely.

3.5 PV connection

Warning!! When connecting PV modules, please install a DC circuit breaker between the integrated machine and the PV modules. **Warning!!** All connections must be made by qualified personnel.

WARNING!! Using appropriate cables to connect PV modules is very important for the safe and efficient operation of the system. To reduce risks, please use the correct recommended cable sizes as shown below:

Recommended PV input wiring diameter		Maximum PV input current	Recommended air switch or circuit breaker model	Torque value
230V	10mm ² / 7AWG	13A	2P—16A	1.2-1.6Nm
110V	10mm ² / 7AWG	13A	2P—16A	1.2-1.6Nm

PV Module Selection:

When choosing a suitable PV module, please be sure to consider the following parameters:

1. The open circuit voltage (V_{oc}) of the PV module does not exceed the maximum value.
2. The open circuit voltage (V_{oc}) of the PV module should be higher than the minimum value.

Max.PV array open circuit	500Vdc
Starting voltage	80Vdc
PV array MPPT voltage range	120Vdc~450Vd c

Check whether the polarity of the connection cable between the PV module and the PV input connector is correct. Then connect the positive (+) of the cable to the positive (+) of the PV input connection terminal, and the negative (-) of the cable to the negative (-) of the PV input connection terminal.

WARNING!! Make sure the wire connections are secure.

4. Operation

4.1. Start the all-in-one machine

Step 1: Press the metal battery switch on the all-in-one machine.

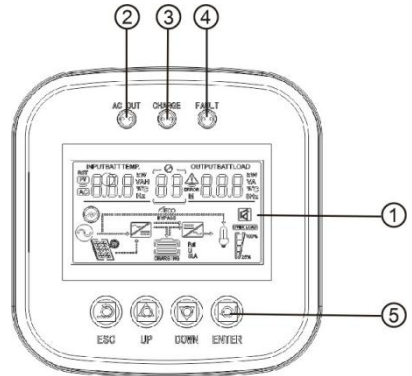
Step 2: Press the metal switch of the inverter on the all-in-one machine, and the screen and indicator light will light up, indicating that the inverter has been activated.

Step 3: Close the PV, AC input and AC output circuit breakers in sequence. Step 4: Start the loads one by one according to the power.

4.2. Operation and display panel

Operation and display panel, as shown in the figure below, on the front panel of the all-in-one machine, it includes 3 indicator lights, 4 The function buttons and an LCD display screen show the operating status and input/output information.

1. LCD display
2. Status Indicator
3. Charging Instructions
4. Fault indication
5. Function buttons



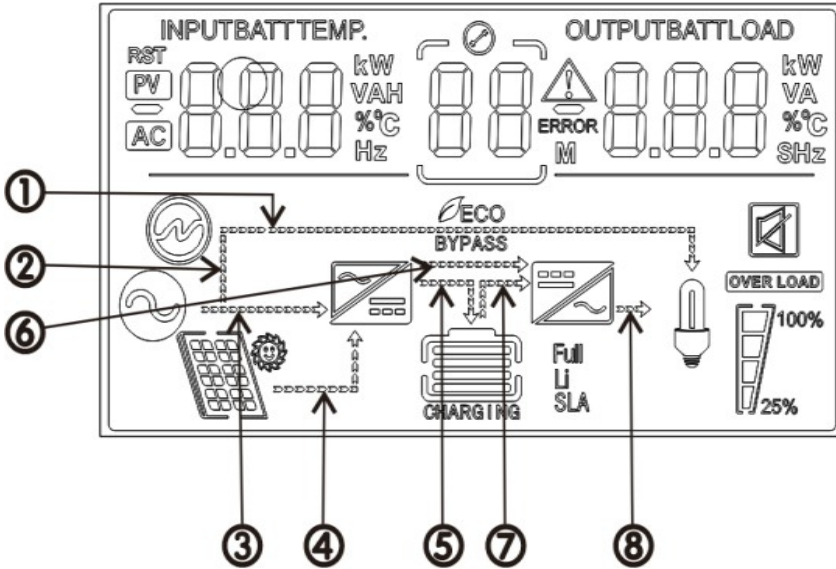
Indicator Light Introduction

Indicator Lights	color	describe
AC OUT	yellow	Steady on: AC power output
		Flashing: Inverter output
CHARGE	green	Flashing: Fast charging
		Steady on: Float charge
FAULT	red	Flashing: Fault status






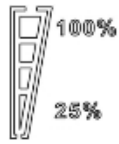



Operation button introduction








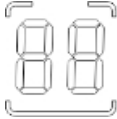



Function keys	describe
ESC	Enter/Exit the settings menu
UP	Previous selection
DOWN	Next option
ENTER	Under the Settings menu, confirm/enter options


LCD screen introduction:



icon	Fuction	icon	Function
	Indicates that the AC input is connected to AC Input Source		Indicates that the inverter discharge circuit is working. do
	This icon indicates wide voltage AC input Input mode (APL mode)	BYPASS	Indicates that the machine is in mains bypass (Bypass) working mode
	Indicates that the PV input is connected to the solar Energy panels	OVER LOAD	Indicates that the AC output is in an overload state

	<p>Indicates that the machine is connected to a battery.</p> <p> Indicates the remaining battery power 0%~24%,</p> <p> Indicates the remaining battery power 25%~49%,</p> <p> Indicates the remaining battery power 50%~74%,</p> <p> Indicates the remaining battery power 75%~100%</p>		<p>Indicates the AC output load percentage, indicating the load percentage</p> <p>0%~24%,  Indicates the load percentage</p> <p>25%~49%,  Indicates the load percentage</p> <p>50%~74%,  Indicates load percentage</p> <p>≥ 75%</p>
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	Indicates that the current battery type of the machine is lithium Battery		Indicates that the buzzer is not enabled
	Indicates that the current battery type of the machine is lead Acid battery		Indicates that the machine has an alarm
CHARGING	Indicates that the battery is being charged	ERROR	Indicates that the machine is in a fault state
	Indicates that the AC/PV charging circuit is Work		Indicates the machine is in setup mode
	Indicates that there is AC voltage output at the AC output terminal		The parameters in the middle of the screen are displayed. 1. In non-setting mode, the alarm or fault code is displayed; 2. In setting mode , the currently set parameters are displayed Item Code
M	When used in parallel, this icon indicates that this machine is the master machine, which is only valid in parallel mode.		
Parameters displayed on the left side of the screen: Input parameters			
	Indicates AC input		
	Indicates PV input		
RST	The icon is not displayed		
	Display battery voltage, total battery charging current, AC charging power, AC input voltage, AC input Frequency, PV input voltage, internal heat sink temperature, software version		

The parameters on the right side of the screen display: Output parameters			
	Indicates output voltage, output current, output active power, output apparent power, battery discharge current, and software version; in setting mode, displays the setting parameters under the currently set parameter item code		
Arrow Display			
①	The arrow is not displayed	⑤	Instructs the charging circuit to charge the battery electricity
②	Indicates that the grid supplies power to the load	⑥	The arrow is not displayed
③	Instructs the grid to supply power to the charging circuit	⑦	Indicates that the battery supplies power to the inverter. road
④	Indicates that PV is supplying power to the charging circuit	⑧	Instructs the inverter circuit to supply power to the load

How to view real-time data:

On the LCD main screen, press the 'UP' and 'DOWN' buttons to turn pages and view the real-time data of the machine.

page number	Parameters on the left side of the screen	Screen middle parameters	Parameters on the right side of the screen
1	battery voltage	Fault code (error code)	The output voltage
2	Battery voltage collected by BMS (The display will be displayed only after BMS communication is normal. Show)		Battery capacity rate obtained by BMS (The display will be displayed only after BMS communication is normal. Show)
3	Battery Current		Battery power
4	AC output current		AC output active power
5	AC output frequency		AC output apparent power
6	AC input current		AC input voltage
7	AC input frequency		AC input apparent power
8	PV input voltage		PV input power
9	PV heat sink temperature		PV input current

10	Inverter heat sink temperature		bus voltage
11	Program version 1		Program Version 2
12	Battery rated voltage		Output rated power
13	PV rated voltage		PV rated charging current
14	Machine ID		Inverter parallel mode

4.3、 Setting parameter description

Key operation instructions: To enter and exit the setup menu, press the "SET" key. After entering the setup menu, the parameter number [00] will flash. At this time, you can press the "UP" and "DOWN" keys to select the parameter item code to be set. Then press the "ENT" key to enter the parameter editing state. At this time, the parameter value is flashing. Use the "UP" and "DOWN" buttons to adjust the parameter value. Finally, press the "ENT" key to complete the parameter editing and return to the parameter selection state.

parameter serial number	parameter name	Setting Options	illustrate
00	quit	[00] ESC	Exit the settings menu
01	Work-first mode	[01] GID Default	In the mains priority mode, the mains will give priority to supplying power to the load. When the mains is input, it will switch to photovoltaic and battery to supply power to the load.
		[01] BAT	In photovoltaic battery priority mode, photovoltaic power will give priority to the load. When photovoltaic energy is insufficient, the battery will also supply power to the load. Only when the battery voltage is under or lower than the setting value of parameter [16], it will switch to AC power supply. Only when the battery is fully charged or higher than the setting value of parameter [17], it will switch to AC power supply. Switch to battery discharge.

		[01] PV	In photovoltaic priority mode, photovoltaic power will give priority to the load. When photovoltaic energy is insufficient, the battery will also supply power to the load. Only when there is no photovoltaic input or the battery power is lower than the setting value of parameter [16], it will switch to the mains electricity.
		[01] HBD	Mixed network mode, you can set the mixed network mode through [33] setting item
02	AC output voltage range setting	[02] 120V	120V model: 100/105/110/120Vac can be set, default 120Vac . AC output power = rated power * (set voltage /120)
		[02] 230V	230V model : 200/208/220/230/240Vac can be set, the default is 230Vac . AC output power = rated power * (setting Voltage/230)
03	Output frequency	[03] 50.0HZ	Bypass adaptive, when there is AC power, it automatically adapts to the frequency when the AC power is first supplied; when there is no AC power, the output frequency can be set through this menu. The default setting for 230V machines is 50HZ, and the default setting for 120V machines is 60HZ.
		[03] 60.0HZ	

04	AC input voltage range	[04] APL	230V model wide range input mains voltage range 90~280V 120V model AC input range: 90~140V Frequency range: 47~ 55Hz (50Hz); 57Hz ~ 65Hz (60Hz);
		[04] UPS Default	230V model narrow range input mains voltage range 170~280V 120V model AC input range: 90~140V Frequency range: 47~ 55Hz (50Hz);57Hz ~ 65Hz (60Hz);
		[04] GEN	When the diesel engine is input, it needs to be set to this mode. At this time: 230V model input AC voltage range 90~280V 120V model input AC voltage range: 90~140V Frequency range: 40~70Hz
05	Energy saving mode	[05] DIS Default	Disable Energy Saving Mode
		[05] ENA	After the energy-saving mode is enabled, if the load is empty or less than 25W, the inverter output will be turned off after a delay; When the power is above 50W, the inverter starts automatically.
06	Charging Mode	[06] SNU Default	Photovoltaic and mains are mixedly charged, with photovoltaic charging being the priority. When photovoltaic energy is insufficient, mains charging is used to supplement. When photovoltaic energy is sufficient, mains charging stops. Note: Photovoltaic and mains can only be charged at the same time when the mains

			bypass output is loaded. When the inverter is working, only photovoltaic can be started. Charge.
		[06] OUO	The mains power is charged first, and the photovoltaic charging is started only when the mains power is invalid. electricity
		[06] OSO	Photovoltaic charging is prioritized, and AC charging is started only when photovoltaic charging is ineffective. electricity
		[06] NUC	Only photovoltaic charging is enabled, and mains charging is not enabled.
07	Maximum total charging current	[07] 80A Default	Maximum total charging current setting. Setting range 0~80A.
08	PV maximum charging current	[08] 80A Default	Maximum current setting for PV to charge the battery: 0-80A
09	AC maximum charging current	[09] Default	M series models, setting range 0~40A, default 40A; V Series models, setting range 0~80A, default 60A.

10	Battery full charge judgment current	[10] 3A Default	When the battery voltage is greater than or equal to the constant voltage charging value and the charging current is less than this set value, the battery is judged to be fully charged and charging is turned off;
11	Battery Type	[11] USE	User-defined, all battery parameters can be set.
		[11] SLd	Sealed lead-acid battery, constant voltage charging voltage 28.8V, floating charge voltage 27.6V.
		[11] FLd	Open lead-acid battery, constant voltage charging voltage 29.2V, floating charge voltage 27.6V.
		[11] GEL Default	Colloidal lead-acid battery, constant voltage charging voltage 28.4V, floating charge voltage 27.6V.
		[11] LF07/LF08/LF09	Lithium iron phosphate battery LF07/LF08/LF09, corresponding to 7, 8 and 9 series of lithium iron phosphate batteries, 7 series default constant voltage charging voltage 24.6V, 8-series default constant voltage charging voltage 28.4V, 9-series default constant voltage charging voltage is 31.6V, adjustable.
		[11] N07/N08	Ternary lithium battery, adjustable. N07 default constant voltage charging voltage 28.8V, N08 string default constant voltage charging voltage is 31.6V.
12	Constant voltage charging voltage	[12] 28.8V Default	Constant voltage charging voltage value setting, setting range 24V~29.2V, step It is valid when the input voltage is 0.2V and the battery type is custom or lithium battery.
13	Float charge voltage	[13] 27.6V Default	Float charge voltage, setting range 24V~29.2V, step 0.2V

14	Maximum constant voltage charging time	[14] 120 Default	<p>The maximum time setting of constant voltage charging. The constant voltage charging voltage reaches the parameter</p> <p>【12】 When setting voltage, maximum charging time and setting range 5min~900min, step by 5 minutes</p>
15	Battery recharge recovery point	[15] 26V Default	<p>After the battery is fully charged, the inverter stops charging.</p> <p>When the voltage reaches this value, charging is resumed.</p>
16	Battery to mains power	[16]21.8V Default	<p>When parameter [01] = BAT, the battery voltage is lower than the set value, and the output switches from inverter to AC power. The setting range is 22V~26V.</p> <p>Cannot be greater than</p>
17	Mains to battery	[17] 28.8V Default	<p>When parameter [01] = BAT, the battery voltage is higher than the set value.</p> <p>The output is switched from AC to inverter, with a setting range of 24V~30V.</p>

18	Battery undervoltage alarm point	[18] 22V Default	Battery undervoltage alarm point. When the battery voltage is lower than this judgment point, an undervoltage alarm (01 fault) and the output does not shut down. The setting range is 20V~26V, step 0.2V.
19	Over discharge delay protection voltage	[19] 21V Default	Over discharge voltage, battery voltage is lower than this judgment point, delay parameter 【 22】 Turn off the inverter output after the set time. Setting range 20V~24V, step 0.2V
20	Over discharge immediate protection voltage (Battery EOD)	[20] 21V Default	Battery discharge limit voltage, if the battery voltage is lower than this judgment point, the output will be immediately shut down (report 02 fault). Setting range 20V~26V, Step 0.2V, effective when battery type is custom and lithium battery
21	Battery voltage recovery point after over-discharge protection (02 fault clearing Except point)	[21] 26V Default	When the battery over-discharge protection disconnects the inverter output, the battery voltage needs to be greater than this set value to restore the battery inverter AC output.
22	Over discharge delay protection time	[22] 5S Default	Over discharge delay protection time, when the battery voltage is lower than parameter [19], the inverter output will be turned off after the delay time set by this parameter. 5S~50S, step 5S
23	RS485-2 /CAN communication Communication function	[23] DIS default	RS485-2 turns off the BMS communication function. However, our PC and remote The process monitoring protocol can continue to be used.
		[23] RS485	RS485-2 BMS communication function
24	BMS protocol settings	When [23] setting item = BMS, you need to select the corresponding lithium battery manufacturer brand for communication	
		PLN=Paineng, PCE=Peicheng, GXU=Guoxuan, DAQ=Daqin, AOG=Aoguan, OLT=Ouyang LiTe, XWD=Xinwanda, CFE=Changfeng, MIT=Maitian	

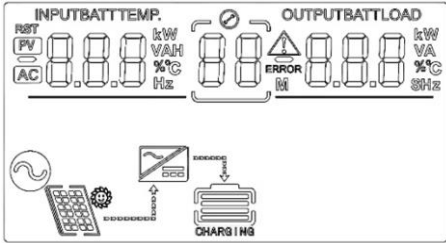
25	Discharge alarm SOC (Can be set when BMS is enabled)		<p>【23】 The setting item BMS is enabled and becomes effective. If the battery capacity rate is lower than this value, the machine will alarm 07. If the battery capacity rate is higher than this value, the machine will alarm 07. The alarm can be cleared after 5%.</p>
26	Switch to AC SOC (Can be set when BMS is enabled)		<p>【23】 The setting item BMS is enabled and becomes effective. The battery capacity rate is low. When the value exceeds this value and AC power is available, the machine switches to AC power operation.</p>
27	Switching inverter SOC (Can be set when BMS is enabled)		<p>【23】 The setting item BMS is enabled and becomes effective. In battery priority mode, if the battery capacity rate is higher than this value, the machine will switch back to inverter mode from AC power. Mode.</p>
28	Discharge cut-off SOC (Can be set when BMS is enabled)		<p>【23】 The setting item BMS is enabled and becomes effective. If the battery capacity rate is lower than this value, the machine will report 08 fault and cut off the mains power or disconnect the power supply. Output.</p>

29	Charging cut-off SOC (Can be set when BMS is enabled)		<p>【23】 The setting item is effective after BMS is enabled. When the battery capacity rate is higher than this value, the inverter considers that the battery is fully charged.</p> <p>In battery priority mode, the machine will switch from AC power to battery power.</p>
30	Buzzer alarm	[30] DIS Default	Disable alarm
		[30] ENA	Enable alarm
32	RS485 ID Setting	[32] 1 Default	<p>Parallel mode, setting range 1-6, ID cannot be repeated, parallel start</p> <p>The machine will automatically assign addresses; the single machine mode setting range is 1-254;</p>
33	-	-	-
34	N-PE connection switching function enabled	[34] DIS Default	It is forbidden to automatically connect the N line and the PE line under any working conditions.
		[34] ENA	<p>When off-grid and without mains input, the N line is automatically connected to the PE; bypass</p> <p>When AC power is input, the N line is automatically disconnected from the PE.</p>
35	Automatic battery activation	[34] DIS	When the battery is in sleep mode or not connected, PV or AC IN will not automatically Battery activation turns on the battery output.
		[34] ENA Default	<p>When the battery is in sleep mode or not connected, PV or AC IN will automatically power on.</p> <p>Battery activation turns on the battery output.</p>

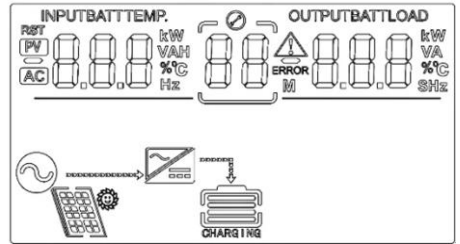
5. Working mode

5.1 Charging Mode

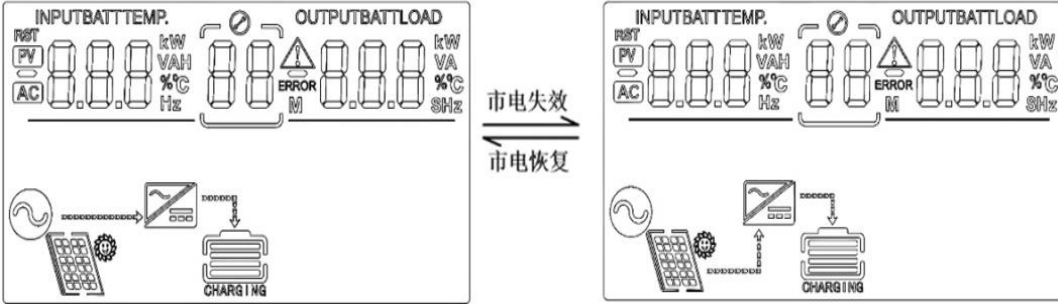
1) Photovoltaic priority: Photovoltaic priority charging, only when the photovoltaic power fails will the mains charging be started. Make full use of solar power generation during the day and switch to mains charging at night to maintain the battery power. It is used in areas with relatively stable power grids and relatively expensive electricity prices.



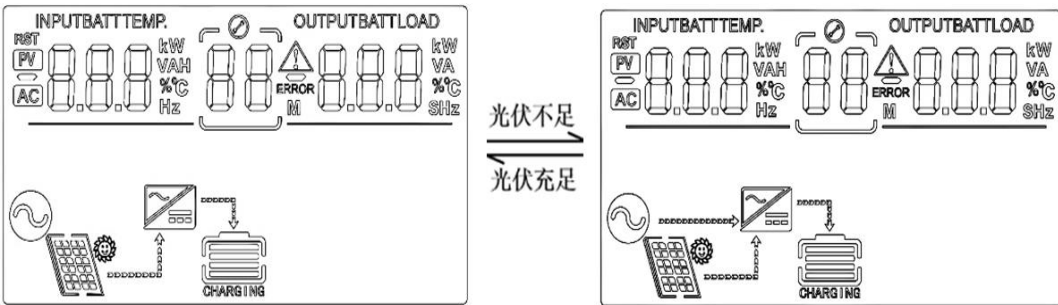
光伏失效
光伏恢复



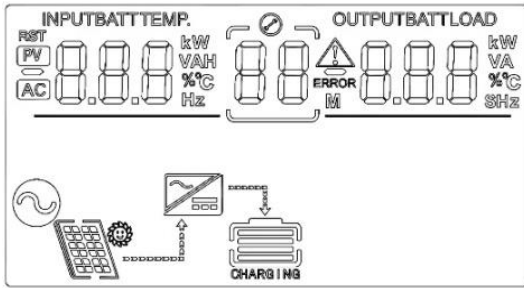
2) Mains power priority: Mains power gives priority to charging the battery, and photovoltaic charging is only started when the mains power is invalid .



3) Hybrid charging: PV and mains are mixed and charged, with PV MPPT charging being the priority. When PV energy is insufficient, mains will be used to supplement. When PV energy is sufficient, mains will stop charging. This method is the fastest and is suitable for areas with unstable power grids , which can provide sufficient backup power supply at any time.



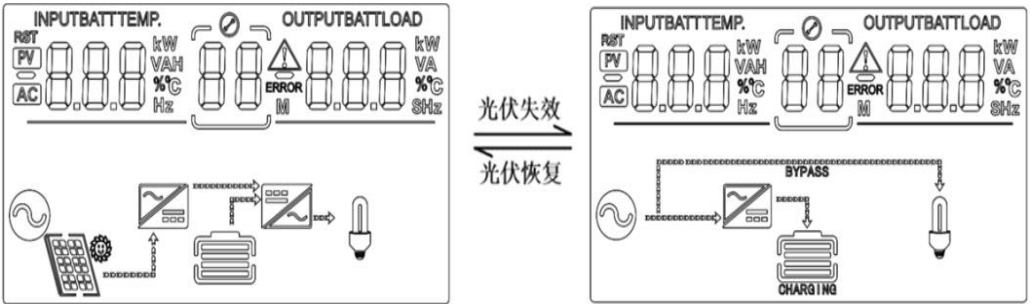
4) Photovoltaic charging only: Only photovoltaic charging, not AC charging. This method is the most energy-saving method. The battery power comes from solar energy and is usually used in areas with good lighting conditions.



5.2 Power supply mode

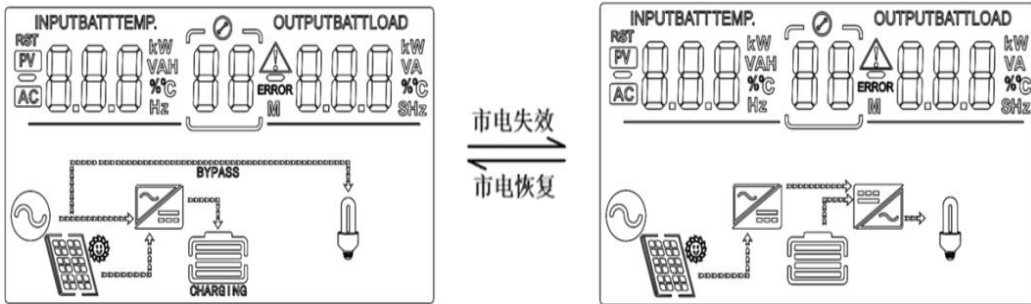
1) Photovoltaic priority mode: When photovoltaic power is ineffective, it switches to AC power supply and charging. This mode maximizes the use of solar energy while maintaining battery power. It is suitable for areas with relatively stable power grids.

The power supply sequence achieved is: photovoltaic-mains-battery

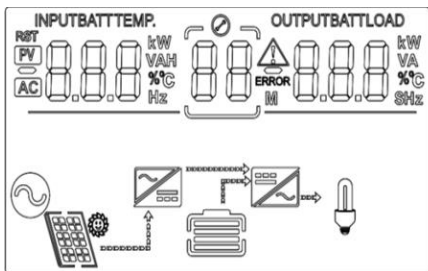


2) Mains priority mode: Switch to battery power only when there is no mains power. Switch to mains power and charging when there is mains power. The device is equivalent to UPS and is used in areas with unstable power grids. Switching does not affect photovoltaic charging.

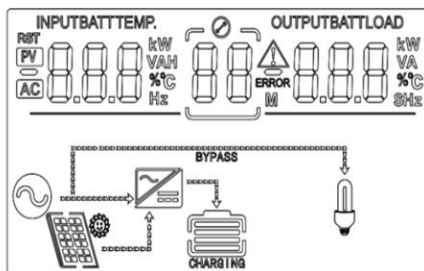
The power supply sequence is: mains-photovoltaic-battery



3) Inverter priority mode: Switch to mains power supply only when the battery voltage is lower than the set point (04 setting item), and switch to battery power supply mode when the mains charging battery voltage is higher than the set point (05 setting item)



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6. Fault codes and countermeasures

6.1 Fault Code

error code	Fault name	Does it affect the output?	illustrate
【01】	Battery voltage low voltage reminder	no	The battery voltage is lower than the setting item 【18】 . Reminds that the battery is in low voltage state.
【02】	Battery voltage low voltage protection	yes	The battery voltage is low, the output is turned off and the Stop battery discharge protection.
【03】	Battery discharge average current overcurrent protection	yes	If the average battery discharge current is greater than the maximum input battery current for 1 minute, the input Stop battery discharge protection.
【04】	Battery discharge instantaneous value overcurrent protection	yes	When the instantaneous value of the battery discharge current is greater than the maximum instantaneous value of the device, the output is turned off to stop the battery Discharge protection.
【05】	Battery not connected	yes	Battery disconnected warning.
【06】	Battery overvoltage	yes	If the selected battery type or the set battery voltage is exceeded, the output is turned

			off to stop battery charging. Electric protection.
【07】	BMS battery capacity rate is low Call the police	no	Lithium battery BMS battery capacity rate low Wake up. (Set BMS enable to be effective)
【08】	BMS battery capacity rate low protection	yes	Lithium battery BMS battery capacity rate is low, turn off the output to stop battery discharge protection. (Set Set BMS enable to be valid)
【09】	Bypass overload protection	yes	The AC power is overloaded and the AC output is turned off. And stop mains charging.
【10】	Battery inverter overload protection	yes	Battery discharge inverter overload, shut down current output and stop battery discharge protection.
【11】	Battery inverter AC output short circuit	yes	Battery discharge inverter AC output short circuit, turn off AC output and stop battery discharge protection Protection.
【12】	Battery inverter AC output overcurrent	yes	The battery discharge inverter AC output overcurrent will shut down the AC output and stop the battery discharge protection.

【13】	The DC component of the battery inverter voltage is abnormal	yes	The DC component of the battery inverter voltage is abnormally regulated , shutting down the AC output and stopping battery discharge. Electric protection.
【14】	Bus overvoltage software sampling protection	yes	Internal battery boost, boost bus voltage overvoltage software protection, shut down AC output and charging electricity.
【15】	Bus overvoltage hardware sampling protection	yes	Internal battery boost, boost bus voltage overvoltage hardware protection, shut down AC output and charging.
【16】	Bus undervoltage protection	yes	Internal battery boost, boost bus voltage undervoltage protection, shut down AC output and charging electricity.
【17】	Busbar short circuit protection	yes	Internal battery boost, boost bus voltage short circuit protection, shut down AC output and charging electricity.
【18】	PV input voltage overvoltage	yes	The solar input voltage exceeds the maximum allowable Input voltage protection.
【19】	-	-	-
【20】	PV overcurrent protection	no	Solar charging overcurrent hardware protection, shut down Solar charging.

【twenty one】	-	-	-
【twenty two】	PV heat sink over temperature	no	The temperature of the solar charging radiator is too high. Close solar charging.
【twenty three】	AC radiator over temperature	yes	The AC charging or battery inverter discharge radiator temperature is too high. Turn off the AC charging or battery inverter discharge. Battery inverter discharge.
【twenty four】	Main transformer over temperature	yes	the internal main transformer of AC charging or battery inverter discharge is too high. Turn off the AC charging. Power or battery inverter discharge.
【25】	AC input relay short circuit	yes	AC input relay short circuit protection to prevent inverter AC output from backflowing to bypass AC enter

【26】	-	-	-
【27】	Fan failure	yes	The fan is blocked or fails, shut down the inverter Output and various charging functions.
【28】	-	-	-
【29】	-	-	-
【30】	Model detection error	yes	The model was not set at the factory, and the model was identified incorrectly. error.
【31】	-	-	-
【32】	-	-	-
【33】	Parallel control CAN communication Fault	yes	In parallel mode, CAN communication is lost. Fault, turn off AC output and charging.
【34】	-	-	-
【49】	BMS communication error	no	Check whether the communication line is connected correctly and 【11】 Is it set to the corresponding lithium battery? Pool Communication Protocol
【50】	BMS other fault alarms	no	After checking the lithium battery BMS fault type, Clearing Lithium Battery Faults
【51】	BMS battery over temperature alarm	no	Lithium battery BMS over temperature alarm

【52】	BMS battery overcurrent alarm	no	Lithium battery BMS battery overcurrent alarm
【53】	BMS battery overvoltage alarm police	no	Lithium battery BMS battery overvoltage alarm
【54】	BMS battery undervoltage alarm	no	Lithium battery BMS battery undervoltage alarm
【55】	BMS battery low temperature alarm	no	Lithium battery BMS low temperature alarm

6.2 Troubleshooting

Fault Code	Fault	solution
/	No display on the screen	Check whether the battery circuit breaker or PV circuit breaker is closed; whether the switch is in the "ON" state; press any button on the screen Exit screen sleep mode.
【06】	Rechargeable battery overvoltage protection	Check whether the battery voltage exceeds the protection value. If it exceeds, the battery needs to be discharged until the voltage is lower than the battery overvoltage recovery point. under.
【01】 【02】	Battery undervoltage protection	Wait until the battery charge is restored to above the low voltage disconnect recovery voltage.
【27】	Fan failure	Check if the fan is not turning or is blocked by something. .
【22】 【23】	Radiator over temperature protection	When the device temperature cools down to below the over-temperature recovery temperature, the Normal charge and discharge control.
【09】 【10】	Bypass overload protection, inverter overload protection	①Reduce the use of electrical equipment; ① Restart the machine and the load will resume output.
【11】	Inverter short circuit protection	① Carefully check the load connection and remove the short circuit fault point; ② Re-energize the load and the load will resume output.
【18】	PV overvoltage	Use a multimeter to check if the PV input voltage exceeds the maximum allowable

		voltage. Allowable input voltage.
【05】	Battery disconnection warning	Check if the battery is disconnected or if the circuit breaker on the battery side is disconnected. There is a closure.
【40】 【42】	Parallel wiring fault	Check if the parallel cable is not properly connected, for example, it is loose or connection error
【49】	BMS communication error	Check whether the BMS communication line and inverter communication port are connected correct

Note: If you encounter a product failure that cannot be solved by the methods in the table above, please contact our after-sales service department for technical support and do not disassemble the device yourself.

7. Protection function

No	Protective function	Des cription
1	PV current limiting/power limiting protection Protection	When the configured PV array charging current exceeds the PV rated current, Rated current for charging.
2	PV nighttime anti-reverse charging protection Protection	At night, the battery voltage is greater than the PV panel voltage, preventing the battery from Discharge through PV panels.
3	Mains input overvoltage protection	When the mains voltage exceeds 280V (230V model) or 140V (120V model) When the AC power is turned on, the charging will stop and the inverter output will be switched.
4	Mains input undervoltage protection	When the mains voltage is lower than 170V (230V model/UPS mode) or 90V (120V model or APL mode), the AC power charging will stop and the reverse Change output.
5	Battery overvoltage protection	When the battery voltage reaches the overvoltage disconnect voltage point, the PV and AC power will be automatically stopped. Charge the battery to prevent damage from overcharging.
6	Battery undervoltage protection	When the battery voltage reaches the low voltage disconnection voltage point, the battery discharge will stop automatically. Prevent the battery from being damaged by excessive discharge.
7	Load output	When a short circuit occurs at the load output for more than 200MS, the output will be shut down

	short circuit protection	immediately. Output AC voltage.
8	Radiator over temperature protection	When the internal temperature of the all-in-one machine is too high, the all-in-one machine will stop charging and discharging. When it returns to normal, the all-in-one machine will resume charging and discharging.
9	Overload protection	The output will resume 3 minutes after overload protection. If the overload occurs 5 times in a row, the output will be shut off until the machine is powered on again. For specific overload levels and durations, please refer to the technical documentation at the end of the manual. Parameters Table.
10	PV anti-reverse protection	The machine will not be damaged when the PV polarity is reversed.
11	AC reverse feeding protection	Prevent battery inverter AC power from backflowing to bypass AC input.
12	Bypass overcurrent protection	Built-in AC input overcurrent protection circuit breaker.
13	Battery input overcurrent protection	When the battery discharge output current is greater than the maximum value and lasts for 1 minute, it switches to AC output. Enter the load.
14	Battery input protection	When the battery is reversed or the inverter is short-circuited, the inverter internal battery input The fuse will blow, preventing battery damage or fire.
15	Charging short circuit protection	When the external battery port is short-circuited during PV or AC charging, the inverter will protect and stop output current.

8. Specifications

model	PH7000	
Battery parameters		
Battery Type	LiFePO4	
Rated Capacity	280AH	
Q	25.6V	
Rated energy	7168Wh	
Mains mode		
Rated input voltage	220/230Vac	110/120Vac
Input voltage range	(170Vac~280Vac) \pm 2% (90Vac~280Vac) \pm 2%	(90Vac-140Vac) \pm 2%
frequency	50Hz/ 60Hz (auto detection)	
Frequency Range	47 \pm 0.3Hz~55 \pm 0.3Hz (50Hz); 57 \pm 0.3Hz~65 \pm 0.3Hz (60Hz);	
Overload/short circuit protection	breaker	
Maximum efficiency	>95%	
Conversion time	10ms (typical)	
(Bypass and Inversion)		
AC reverse feeding protection	have	
Maximum bypass overload flow	30A	
Inverter mode		
Output voltage waveform	Pure sine wave	
Rated output power (VA)	3600	

Rated output power(W)	3600	
Power Factor	1	
Rated output voltage (Vac)	230Vac	120Vac
Output voltage error	±5%	
Output frequency range (Hz)	50Hz±0.3Hz/60Hz±0.3Hz	

Maximum efficiency	>92%
Overload protection	<p>230V Model (102% < load < 125%)±10%: Report an error and shut down the output after 5 minutes; (125% < load < 150%)±10%: error is reported and the output is turned off after 10 seconds; Load > 150%±10%: error is reported and the output is turned off after 5 seconds;</p> <p>110V Model (102% < load < 110%)±10%: Report an error and shut down the output after 5 minutes; (110% < load < 125%)±10%: error is reported and the output is turned off after 10 seconds; Load > 125%±10%: error is reported and the output is turned off after 5 seconds;</p>
Peak Power	7200VA
Motor load capacity	2HP
Output short circuit protection	breaker
Bypass circuit breaker specifications	30A
Rated battery input Pressure	24V (minimum starting voltage 22V)
Battery voltage range	20.0Vdc~33Vdc ± 0.3Vdc (undervoltage alarm/ shutdown voltage/ overvoltage alarm/ overvoltage Restore... LCD screen can be set)
Power saving mode	Load ≤ 25W Enter power saving mode
Mains charging	
Battery Type	lithium battery
Maximum charging current (can set up)	80A

Charging current error	±5A _{dc}
Charging voltage range	20–33V _{dc}
Short circuit protection	Circuit Breakers and Fuses
Circuit breaker specifications	30A
Overcharge protection	Alarm and shut down charging after 1 minute
Solar Charging	
Maximum PV open circuit voltage	500V _{dc}
PV operating voltage range	80-500V _{dc}
MPPT voltage range	120-450V _{dc}
Battery voltage range	20-33V _{dc}

Maximum PV input power	2500W
Maximum PV input current	13A
Maximum PV charging power	2200W
Solar charging current Range (configurable)	0-80A
Charging short circuit protection	Blown fuse
Wiring protection	Reverse polarity protection
Maximum hybrid charging current (PV+AC)	
Maximum hybrid charging Flow (configurable)	0-80A
Certification Specifications	
Specification Certification	CE(IEC62109-1,2)
EMC certification level	EN61000, C2
range of working temperature	-15°C to 55°C
Storage temperature range	-25°C ~ 60°C
Humidity range	5% to 95% (three-conformal coating protection)
noise	≤60dB
Heat dissipation	Forced air cooling, adjustable wind speed
Dimensions (L*W*D)	620*345*510MM

Net weight (kg)	83KG
Gross weight (kg)	93KG

