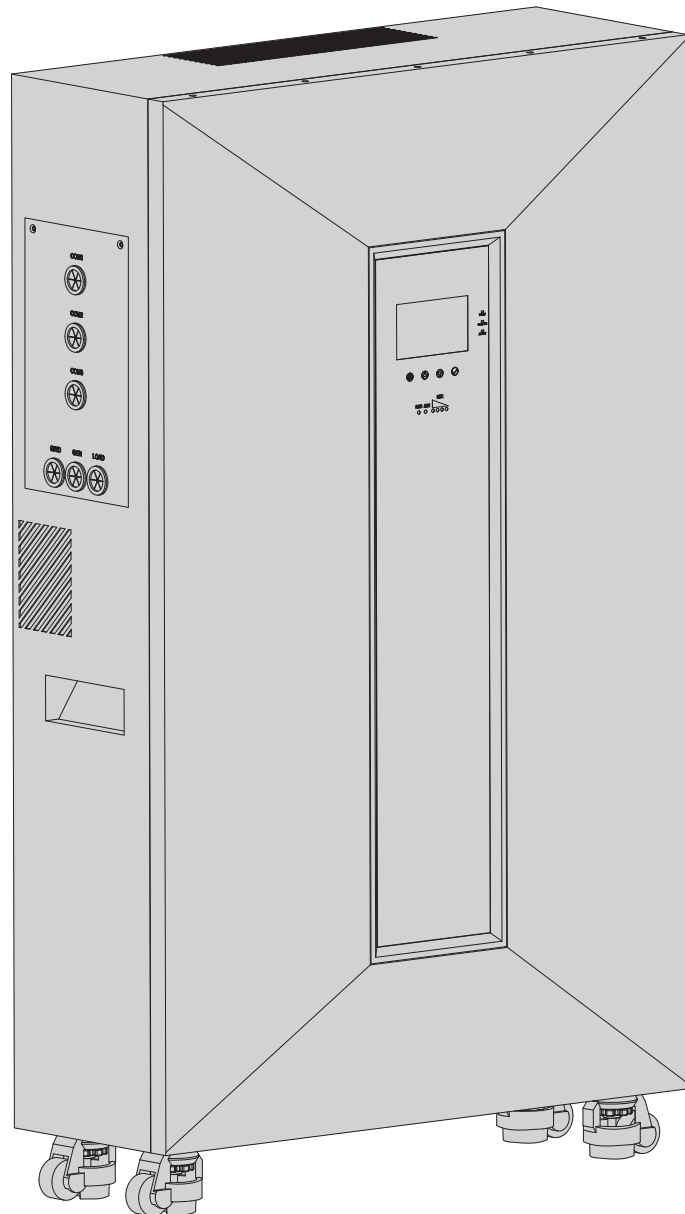


Installation Manual



Document version 01
Release date 2025-09-13

Important safety instructions

Please keep this manual for future use

Please read all instructions and precautions in this manual carefully before installation and use.

- Non-safety voltage exists inside the all-in-one machine. To avoid personal injury, users should not disassemble the equipment themselves. Contact our professional maintenance personnel if you are a need for repair.
 - Do not place this product within the reach of children.
 - Do not install this product in hostile environments such as wet, greasy, flammable and explosive or heavily dusty areas.
 - Utility service input and AC output are high voltage, do not touch the junction.
 - The shell of the product is hot when it is working, do not touch it.
 - Please do not open the terminal protection cover when the equipment is working.
 - It is recommended that a suitable fuse or circuit breaker be installed on the exterior of this product.
 - Be sure to disconnect the fuse or circuit breaker near the PV array, utility and battery terminals before installing and adjusting the wiring for this product.
 - After installation, check that all wiring connections are tight to avoid dangerous heat build-up due to false connections.
 - This product is off-grid. It is necessary to confirm that it is the only input device for load, and it is forbidden to use it in parallel with other input AC power to avoid damage.
-

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1. Basic Information

1.1 Product overview and characteristics

This home energy storage system is a new type of mixed solar energy storage inverting & control all-in-one machine integrating solar energy storage & municipal power charge storage and AC sine wave output. It adopts DSP control and advanced control algorithm to achieve characteristics of high response speed, high reliability and high industrial standard. There are four charge modes namely only solar power, mains power priority, solar power priority, mains power & solar power; and two optional output modes, namely inverting and mains power to meet different application needs.

The solar charge module adopts the latest optimized MPPT tracking technology, which can quickly track the maximum power point of the photovoltaic array in any environment to obtain the maximum energy of the solar panel in real time with wide voltage range of MPPT.

AC-DC charge module adopts advanced control algorithm to realize full digital double closed-loop control of voltage and current, with high control accuracy and small volume. Battery can be charged and protected stably and reliably with wide AC voltage input range, full input/output protection function.

DC-AC inverter module based on full digital intelligent design adopts advanced SPWM technology, outputs pure sine wave, converts DC into AC. It is suitable for AC loads such as household appliances, electric tools, industrial devices, electronic audiovisual, etc. The product adopts the segment LCD display design to display the operation data and state of the system in real time. The comprehensive electronic protection function ensures that safety and stability of the whole system.

Characteristics:

- Anti-reverse current grid-connection function (hybrid photovoltaic utility power supply).
- Insulation impedance and leakage current detection.
- Supports battery-free operation.
- With lithium battery dual activation function, utility/photovoltaic power supply can be triggered by any power access.
- With power saving mode function, it can reduce no-load loss.
- Four optional charge modes: only solar energy, mains priority, solar energy priority and hybrid charge.
- Two output modes, i.e. mains bypass and inverter output to achieve uninterrupted power supply function.
- 360° protection with multiple protection features.
- Support lead-acid battery, lithium battery access.
- The ON/OFF switch controls the inverter AC output.
- PV grid-connected power generation mode can be set.
- Adopt fully digital voltage and current double closed-loop control, cash SPWM technology, output pure sine wave.
- Advanced MPPT technology, with efficiency up to 99.9%.
- LCD screen design and 3 LED indicator lights dynamically display system data and operation states.
- Intelligent adjustable speed fan is adopted for efficient heat dissipation to extend system life.
- Possessing complete short circuit protection, overvoltage and undervoltage protection, overload protection, back filling protection, etc.

1.2 Basic system introduction

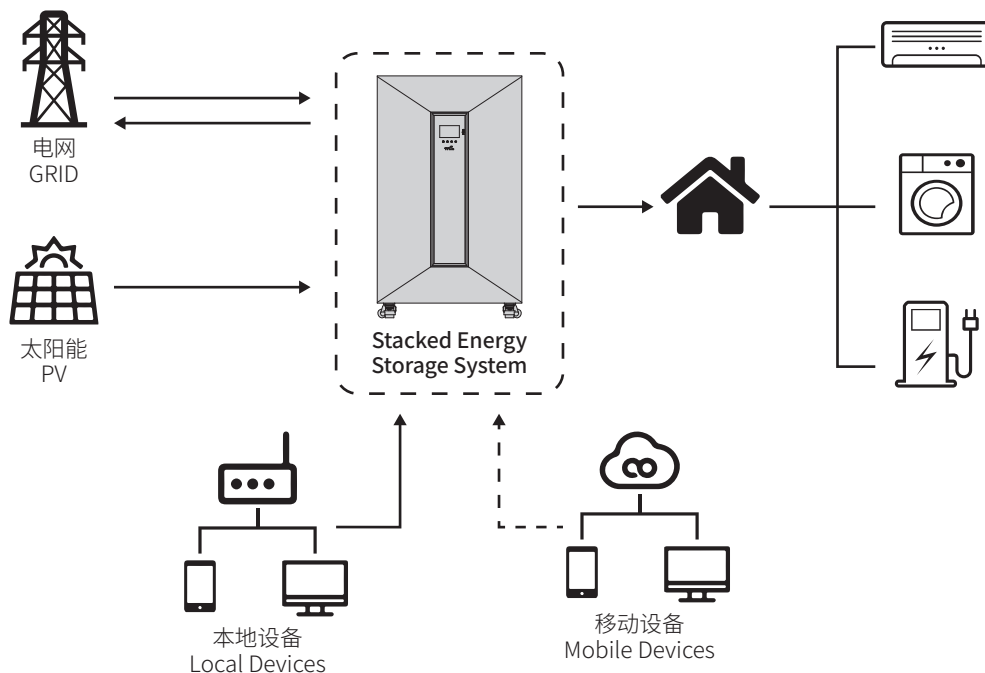
The figure below shows the system application scenario of this product.

A complete system includes the following parts:

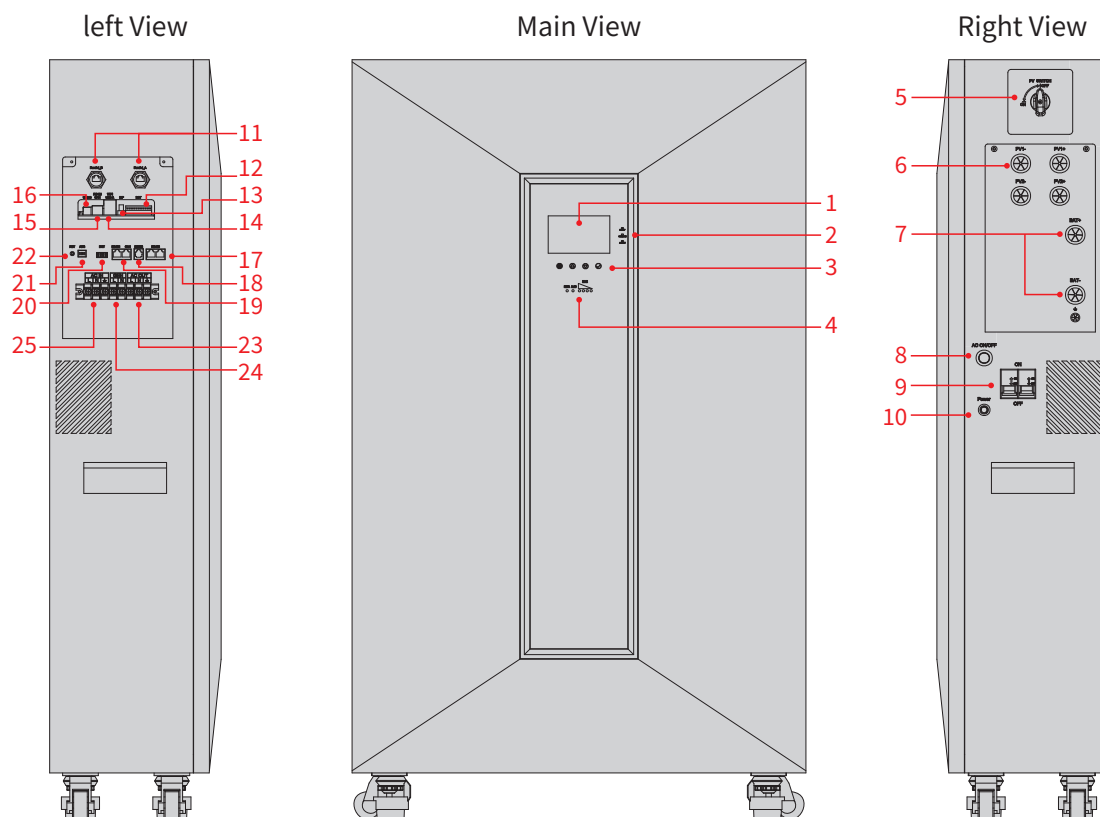
1. Photovoltaic module: convert the solar energy into direct current energy and then charge the battery via the all-in-one machine, or directly invert the light energy into alternating current to supply power to the load.
2. Mains or generator: connected to the AC input, it can supply power to the load and charge the battery at the same time. If no mains power or generator is connected, the system can also operate normally. At this time, the load power is supplied by the battery and photovoltaic modules.
3. Battery: the battery is to ensure the normal power consumption of the system load in case of no sufficient solar energy or mains supply.
4. Household load: it can be connected to various household and office loads, including AC loads such as refrigerators, lamps, televisions, fans, air conditioners, etc.
5. All-in-one machine: the energy conversion device of the whole system. System wiring is based on actual application scenario.

The specific system wiring is determined by the actual application scenario.

System Operation Diagram



1.3 Overall appearance of energy storage system



Number	Defined declaration	Number	Defined declaration
1	LCD Screen	14	WiFi / USB-A
2	Indicator Light	15	RS485/CAN
3	Function Button	16	USB-B
4	Power Indicator Light	17	Parallel Communication Port
5	PV Switch	18	RS232
6	PV Interface	19	RS485/CAN
7	BAT+ / BAT-	20	Reset Switch(DCT)
8	Inverter Switch	21	Dip Switch(ADS)
9	Air Break Switch	22	Dry Contact(RST)
10	Battery Switch	23	AC Output Port(AC OUT)
11	Parallel Operation Port	24	Generator Input Port(GEN)
12	Inverter Dry Contact(DCT)	25	AC Input Port(AC IN)
13	Inverter Dial Switch(DIP)		

2.Installation Instruction

2.1 Notice

Before installation, please read the manual carefully and get familiar with the installation step.

- Don't place any metal object beside the battery to prevent short circuit of the battery.
- During cabinet installation, sufficient space shall be reserved around the all-in-one machine for heat dissipation; do not install the all-in-one machine and lead-acid liquid battery in the same cabinet to avoid the corrosion of the all-in-one machine by acid gas generated during battery operation.
- Charge only the type of battery that matches this all-in-one unit.
- Loose connection points and corroded wires may cause great heat, thereby melting the insulation layer of wires, burning the surrounding materials, or even causing fire. Therefore, all connectors must be tightened, and the wires must be fixed with ties, so as to avoid the looseness of connectors caused by wire shaking during mobile application.
- The current density of connection wiring should not greater than 5A/mm².
- The machine installed outdoors shall be protected against direct sunlight and rain.
- After the power switch is turned off, there is still high voltage inside the all-in-one machine. Please do not open or touch the internal components, and carry out relevant operation after the capacitor is fully discharged.
- Please do not install the all-in-one machine in a humid, greasy, flammable, explosive, dusty or other severe environments.
- The polarity of the battery shall not be reversed, otherwise the device may be damaged easily or there may be some unpredictable dangers.
- AC input and AC output are both high voltage, so please do not touch the wires.
- Do not touch fan while the equipment is working.
- It is required to confirm that the all-in-one machine is the unique input device for the loads. It is forbidden to use the machine with other AC power to avoid damage.
- Do not make a wrong or reverse connection when you connect the battery pack together. If the battery pack couldn't connect to the upper computer or the mainboard, it will get hot obviously, please turn off the equipment quickly. The mainboard may be damaged, you need to replace or repair the board.
- Strictly follow the specification, otherwise the main board may be damaged.
- Pay attention to moisture-proof, water-proof and anti-static.

2.2 Wire specification and breaker type

For wiring and installation, it is required to comply with national and local electrical specification requirements.

Recommended wiring specification and breaker type for photovoltaic array: the output current of the photovoltaic array is affected by the form, connection way and illumination angle of photovoltaic array, therefore the minimum wire diameter of the photovoltaic array is calculated based on the short circuit current of photovoltaic array. Please refer to the short circuit current value in the specification of photovoltaic array (the short circuit current keeps unchanged for the photovoltaic arrays in series connection; the short circuit current of photovoltaic arrays in parallel connection is the sum of short circuit current of all components connected in parallel); the short circuit current of the array cannot exceed maximum input current of PV.

• Photovoltaic input

Wire diameter	Maximum input current	Circuit breaker specifications
5mm ² / 10 AWG	22A	2P-25A

• Battery

Wire diameter	Maximum current	Circuit breaker specifications
42mm ² / 1 AWG	220A	2P-250A

• AC INput

Maximum current	Wire diameter	Circuit breaker specifications
63A(L1/L2) 126A(N)	13mm ² /6AWG(L1/L2) 26mm ² /3AWG(N)	2P-125A

• AC Output

Maximum current	Wire diameter	Circuit breaker specifications
63A(L1/L2) 126A(N)	13mm ² /6AWG(L1/L2) 26mm ² /3AWG(N)	2P-125A

Note: the wire diameter is only for reference. In case of long distance between photovoltaic array and all-in-one machine or between all-in-one machine and battery, use thicker wire to reduce voltage drop and improve system performance.

Note: The above wiring diameters and circuit breakers are only recommendations, please select the appropriate wiring diameters and circuit breakers according to the actual situation.

2.3 Installation requirements

2.3-1 Check before installation

- When opening the product packaging, please check equipment appearance. If the product is damaged, please consult the dealer and not install equipment.
- The appearance defects after product installation (such as scratching, friction, dent, etc.) are not covered by the warranty.

2.3-2 Installation requirements

Installation Angle Requirements

- The energy storage system supports landing installation and by the wall installation.
- Installation angle requirements: the energy storage system should not be tilted forward, horizontal, upside down, backward and rolling when installed.

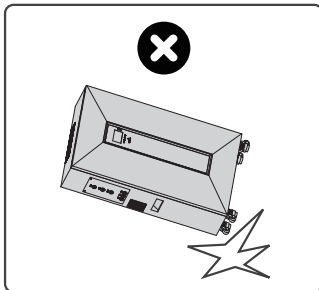


Figure2-1 Dangerous Warning

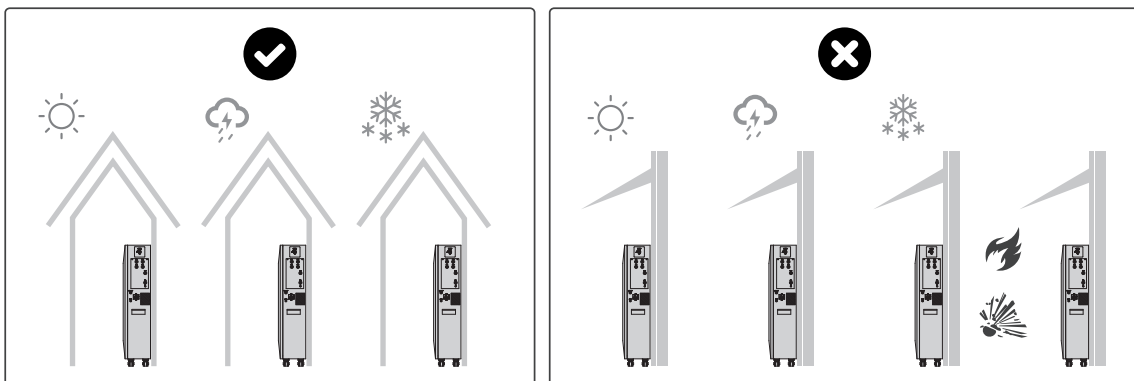
⚠ Danger

If the battery falls or is strongly impacted when installing, it may cause internal damage to the device. It is strictly forbidden to continue using it, otherwise there will be safety risks (cell leakage, electric shock damage, etc.).

Installation Location Requirement

- Please select the solid brick structure, concrete wall and ground of the interior. If you choose other types of walls and grounds, it must be built completed by flame retardant materials, and meet the load bearing demand of equipment.

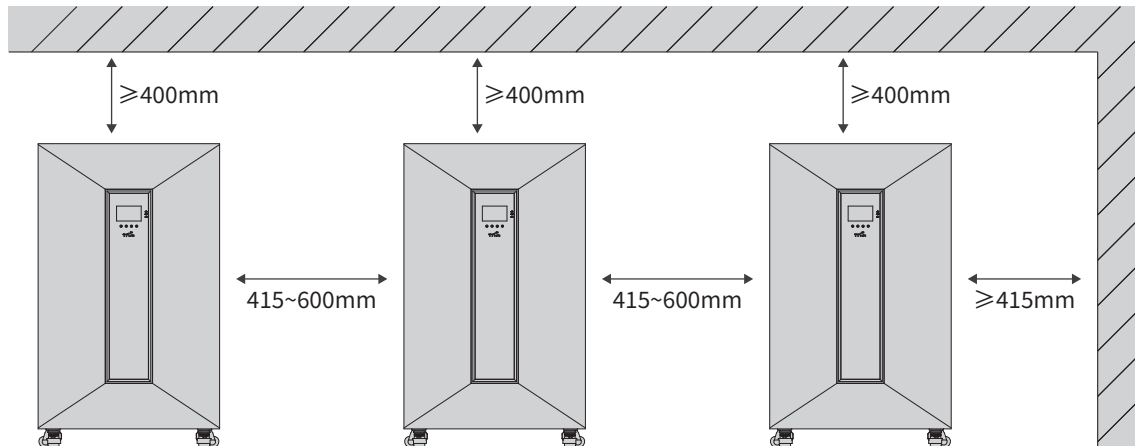
Figure2-2 Installation Location



Installation Space Requirement

- When installing energy storage system, ensure that there are no dangerous items around such as excess temperature devices, flammable or explosive items etc. Sufficient space should be reserved to ensure heat dissipation and safety isolation.
- When installing by the wall, it is not recommended to place any products in front of the energy storage.

Figure2-3 Installation Location



2.4 Environment requirements

- The installation and use environment should meet the requirements of lithium battery products in local laws and regulations.
- The installation location should be not accessible for child, far away from high-temperature and humid areas, including but not limited to the following areas: kitchen, sunlight room, bathroom, shower room, laundry room, attic.
- If installed in the garage, it is necessary to stay away from the direction of the vehicle to avoid accidental.
- If installed in the basement, you need to keep ventilation. Do not place flammable and explosive items around the equipment. It is recommended to install a platform to avoid water accumulation.
- Installed in dry, ventilated environment, and fixed the equipment on a sturdy and flat surface.
- The environment of the installation location should be clean, no significant infrared radiation, organic solvents and corrosive gases etc.
- In frequent occurrence of natural disasters such as floods, mudslides, earthquakes, and typhoons areas, corresponding preventive measures are required for installation.
- The installation location should be far away from the fire and heat sources. Do not place flammable and explosive items around the equipment.
- The installation location should avoid accumulated water, and keep away from water sources such as faucets, water pipes, sprinkler etc. to avoid water penetration.
- When the device is running, the temperature of the case and the cooling fin will be relatively high. Do not install it in a touching position.
- When the device is running, do not cover the air outlet or heat dissipation system to prevent high temperature from causing fire.
- Don't place the equipment in an environment of flammable, explosive gases or smoke, and prohibit any operation in this environment.
- Don't install the equipment in mobile scenarios such as ships, trains, cars.
- When using standby power source, do not use the power supply for the following scenarios.
 - a. For medical equipment directly related to human life.
 - b. Used for control equipment such as trains, elevators, etc., it may cause personal injury.
 - c. For computer systems with social and public significance.
 - d. Used for the location near medical equipment.
 - e. Used to similar devices as described above.
- Energy storage system will be corroded in salt damage areas. Do not install outdoor in the salt damage area. The salt damage area refers to the areas within 500m from the coast or are affected by the sea breeze. The area of the impact of sea breeze is different according to meteorological conditions (such as typhoon, seasonal wind) or terrain (dams, hills).

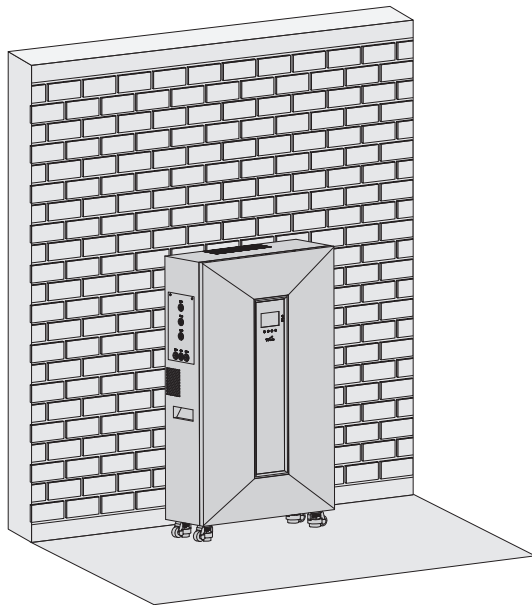
2.5 Steps of installation against the wall (optional)

NOTICE

- This step is optional for your actual needs.
- Use the M4 setscrews distributed with the box to install brackets on the module.

Figure2-7 Fixed Steps Against The Wall

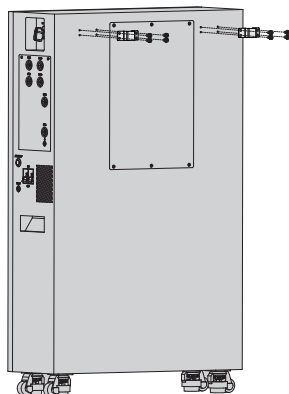
- Completed Installation demonstration



⚠ Danger

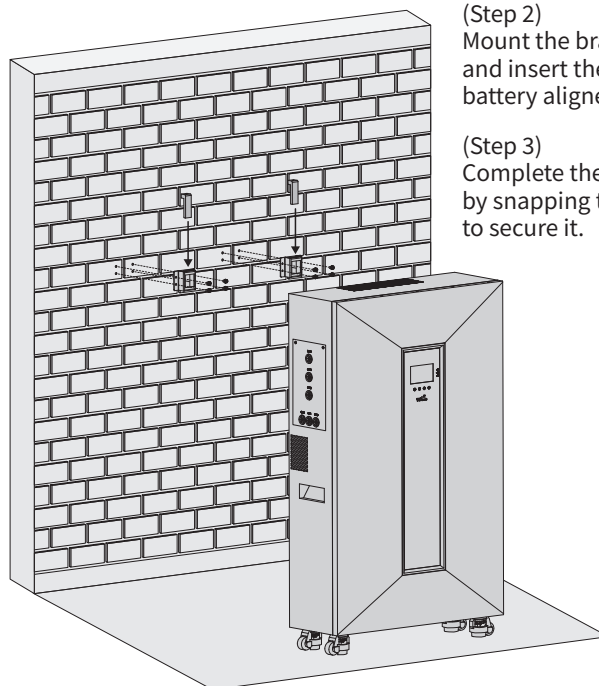
- For wall installation, the M4 setscrews distributed with the box are mainly used for solid brick mixed structure walls. If the installation wall is not this type, you may change screws correspondingly.
- Before drilling holes on the wall, please make sure to keep away from pipes and wires embedded in the wall to avoid danger.
- The installation location should keep away from water sources such as faucets, water pipes, sprinkler etc. to avoid water penetration.

(Step 1)
Attach the bracket to the battery holes and secure with screws.



(Step 2)
Mount the bracket to the wall and insert the bracket on the battery aligned with it.

(Step 3)
Complete the installation by snapping the pins down to secure it.



2.6 External electrical connection

ATTENTION

Danger

- Electrical connection should comply with the installation regulations of the country or region where the equipment is located.
- Before connecting the equipment, please make sure that the "Power" of energy storage system and all switches connected to the energy storage system are in the "OFF" state, otherwise it may cause the risk of electric shock.
- Please confirm that the protective ground wire is reliable. If it is not connected or loose, it may lead to the risk of electric shock.

warning

- The device damaged by incorrect wiring is not covered by the warranty.
- Relevant operations of the electrical connection must be performed by professional electrical technicians.
- When conducting electrical connections, the operator must wear personal protective supplies.

2.6-1 Cable preparation

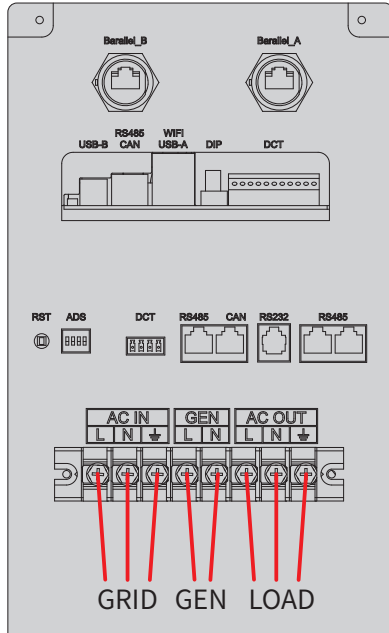
NOTICE

- Electrical connection should comply with the installation regulations of the country or region where the equipment is located.
- The following is the suggestions of using cable, for reference only. Please prepare fitted cable for your actual application scenarios.

NO.	CABLE	TYPE	CONDUCT CROSS-SECTIONAL AREA
1	protective ground wire	Single core copper cable	8mm ²
2	DC-input wire (inverter-battery pack, battery pack- battery pack)	common use PV cable	3.5mm ² ~5.5mm ²
3	AC Input Output Line (Single phase)	Outdoor single core copper wire	13mm ²

2.6-2 GRID & LOAD & GEN connection

Connect the energized conductor, neutral and grounding wires in the cable location and sequence shown in the diagram below.

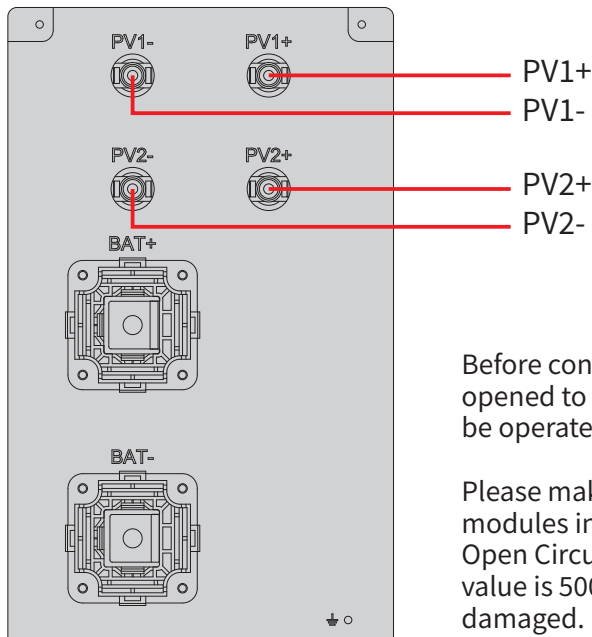


Before connecting AC inputs and outputs, the circuit breaker must be opened to avoid the risk of electric shock and must not be operated with electricity.

Please check that the cable used is sufficient for the requirements, too thin, poor quality cables are a serious safety hazard.

2.6-3 PV connection

Connect the positive and negative wires of the two strings of PV according to the diagram below.

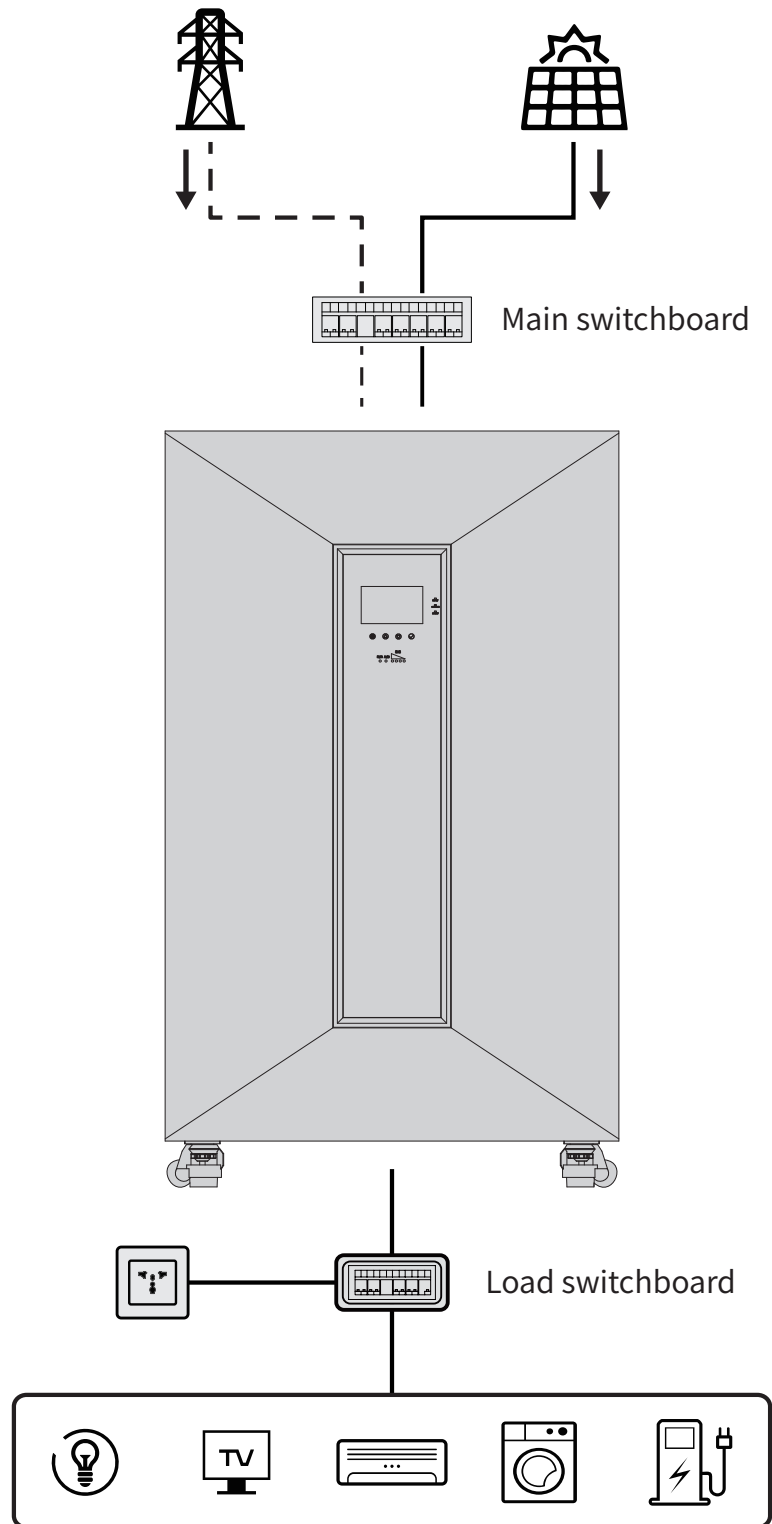


Before connecting PV, the circuit breaker must be opened to avoid the risk of electric shock and must not be operated with electricity.

Please make sure that the open circuit voltage of the PV modules in series does not exceed the Max. Open Circuit Voltage of the all-in-one machine (this value is 500V), otherwise the all-in-one machine may be damaged.

2.7 Energy storage system cable connection

The open circuit voltage of photovoltaic panels connected in series must be lower than 500V. Overvoltage will cause damage to the inverter. Damage caused by improper configuration is not covered by the warranty.



2.8 Check

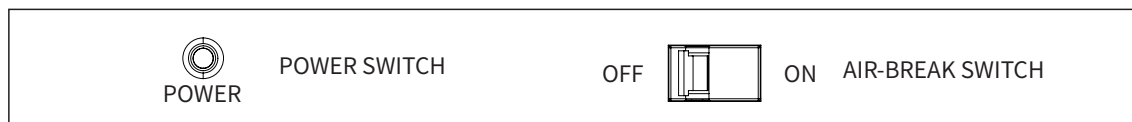
NO.	ACCEPTANCE STANDARD
1	Energy storage system is properly and securely installed.
2	The cable arrangement is reasonable and meets the user's requirements.
3	The ties are evenly spaced and do not leave sharp corners where they are cut.
4	The ground wire is properly and securely connected.
5	The switch and all switches connected to the energy storage system are "OFF".
6	The DC input and signal lines are properly and securely connected.
7	Reasonable installation space, clean and tidy environment, no construction leftovers.

2.9 Power on

NOTICE

• Avoid continuously exposing the equipment to high temperature and humid environment when the equipment run down. It is recommended that the equipment be powered on within 24 hours after opening the package. For maintenance, the down time should not exceed 24 hours, otherwise condensation will be generated causing equipment damage.

Turn on the POWER switch of the battery expansion module. For initial installation, when the equipment power-on, the ON/OFF indicator lights up and you could check the operation status.



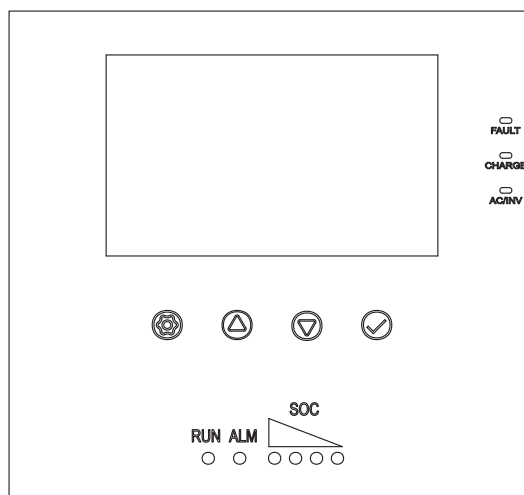
Indicator Lights:: ○Flash ○OFF ●Green ●Red

Classification	State		Instruction Definition
Operating Status Indication	ON/OFF	Green light constant on	Powered ON
	ON/OFF	OFF	Powered OFF
	RUN	Green light constant on	Standby
	RUN	OFF	Sleep
	SOC	Flash	Charging
	SOC	Full Bright	Full Charge
	SOC	Red Light ON	Low Power
	ALM	Red constant light and flashing	Warning (ALM lights up. Please do not operate by yourself, and refer to the User Manual first. If you cannot solve the problem, please contact the after-sales service or dealer immediately)

3.Operation

3.1 Operation and display panel

The operation and display panel below includes 1 LCDscreen, 3 indicators, 4 physical buttons.



3.1-1 Buttons

Functional button	Description
	To enter/exit the setting menu
	To last selection
	To next selection
	To confirm/enter the selection in setting menu

3.1-2 LED Indicators

Indicator lights	Color	Descriptive
CHARGE	green	Continued: charging complete
		Flash: charging
AC/INV	yellow	Continued: utility grid by-pass output
		Flash: inverter output
FAULT	red	Flash: error occur

3.1-3 LCD screen introduction



Icon	Function	Icon	Function
	Solar panel		Load
	Battery		Grid
	Home page		Inverter is Working
	History data		Setting
	Local time		The buzzer is silent
	Indicates that the machine is currently in energy-saving mode.		The energy direction
	UPS load (connected to inverter load port)		HOME load (connected to grid port)
	Smart Load		Generator port

3.1-4 View real-time data

On the LCD home screen, click the inverter icon, battery icon, mains icon, load icon and photovoltaic icon to view the real-time data of the machine.

System data			
1	Machine state	9	SN code
2	MCU1 version	10	Min version number
3	LCD version	11	Rated power
4	MCU2 version	12	RS485 Address
5	Outside Temperature	13	Transformer temperature
6	PV temperature	14	inverter temperature
7	inverter Voltage	15	inverter Current
8	Customer ID	16	Total busbar voltage

Battery data			
1	SOH	6	Discharge current
2	SOC(Percentageofremainingbatterycapacity)	7	BMS protocol
3	Battery voltage	8	Battery type
4	Charge current	9	Battery Charge Status
5	Battery power(Battery charging and discharging power)		
Grid data			
1	Voltage	5	Current
2	Active power	6	Apparent power
3	Frequency	7	Mains charging current
4	CT power		
Load data			
1	Voltage	4	Current
2	UPS load active power	5	UPS load apparent power
3	Frequency	6	load rate
PV data			
1	PV1 voltage	5	PV2 current
2	PV1 current	6	PV2 power
3	PV1 power	7	PV total power
4	PV2 voltage		

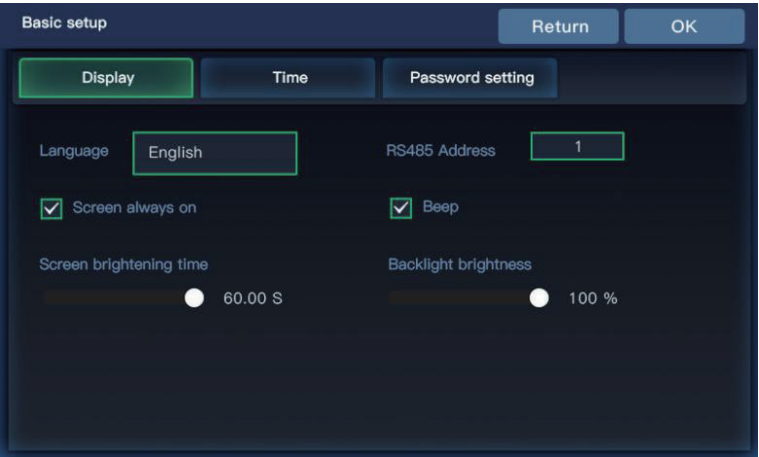
Click on the history button in the menu bar below to access the historical data and view various types of historical data.

Today data			
1	Battery charging energy	6	Load consumption energy from grid
2	Battery discharging energy	7	On grid energy
3	Solar generated energy	8	Gen discharging capacity
4	Load consumption energy	9	Gen charging capacity
5	Grid charging energy	10	Home load consumption energy
History			
1	PV generation last seven days history	4	Mains charge enery for last 7 days
2	Battery charging enery for last 7 days	5	Load consumption enery for last 7 days
3	Battery discharge for last 7 days	6	Load consumption from the grid for last 7 days
Energy Statistics			
1	Total battery charging energy	6	Total on grid energy
2	Total solar generated energy	7	Total load consumption energy from grid
3	Total battery disharging energy	8	Total gen discharging capacity
4	Total load consumption energy	9	Total gen charging capacity
5	Total mains charging energy	10	Total home load consumption energy
Historical faults			

3.2 Setting

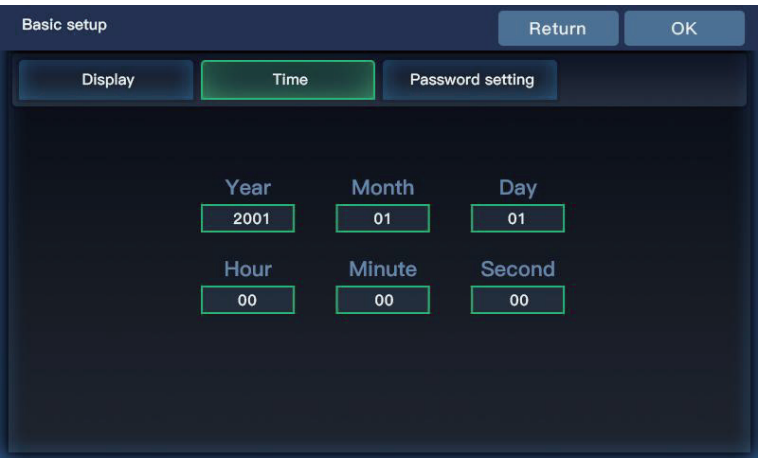
Click "Settings" in the menu bar at the bottom of the screen to enter the settings interface. It includes five categories of settings: Basic Settings, Working Mode Settings, Battery Settings, Grid-connection Settings, and Advanced Settings.

3.2-1 Display Setup



Parameter Meaning	Description
Language	English, Italia, Deutschland, Espana, Chinese, Polski
RS485 Address	This refers to the RS485 address of the inverter. For a single unit, the adjustable range is 1~254, and for parallel units, it is 1~6
Screen always on	Selectable whether the screen is always on or not
Beep	You can choice whether enable the Bee palarm
Screen brightening time	Setting range 0~60 seconds
Backlight brightness	0~100%

Time Setup



Password Setting

(Password is required to access the Grid Settings and Advanced Settings)

The screenshot shows the 'Basic setup' menu with three tabs: 'Display', 'Time', and 'Password setting'. The 'Password setting' tab is selected. It contains two input fields: 'New Password' and 'Confirm Password', both with the value '4321' entered. At the top right are 'Return' and 'OK' buttons.

Default password is "4321". Password setting value range:0~9999.

3.2-2 Work Mode Setup

The screenshot shows the 'Work mode setup' menu with two tabs: 'Work mode' and 'Peak shaving'. The 'Work mode' tab is selected. It contains two columns of settings. The left column has 'Hybrid grid mode' with sub-options: 'On grid' (checked), 'Limit power to ups load' (checked), 'Limit power to home load' (checked), 'AC Coupling' (checked), 'PV energy manage' with sub-options 'First to load' (checked), 'First to charging' (checked), and 'First to grid' (checked). The right column has 'Grid charging enable' (checked), 'Battery energy manage' with sub-options 'Standby' (checked), 'Battery to ups load' (checked), 'Battery to home load' (checked), and 'Battery to grid sell' (checked). A blue arrow points to the right. At the top right are 'Return' and 'OK' buttons.

The screenshot shows the 'Work mode setup' menu with two tabs: 'Work mode' and 'Peak shaving'. The 'Peak shaving' tab is selected. It contains two columns of settings. The left column has 'Parallel mode' with sub-options: 'stand-alone' (unchecked), 'single phase parallel' (unchecked), 'three phase A' (checked), 'three phase B' (unchecked), and 'three phase C' (unchecked). The right column has 'Output phase voltage' with sub-options: '200V' (unchecked), '208V' (unchecked), '220V' (unchecked), '230V' (checked), and '240V' (unchecked). A blue arrow points to the left. At the top right are 'CANCEL' and 'OK' buttons.

Home Load: connected to the GRID port of the machine, requires external CT for monitoring.
UPS Load: connected to the LOAD port of the machine.

Parameter Meaning	Option	Description
Hybrid grid mode	On grid	Grid-connected mode. PV or battery energy can be fed into the grid.
	Limit Power to UPS load	CT-free anti-backflow mode. The inverter outputs zero power to the Grid port, and PV or battery energy is only supplied to the UPS load.
	Limit Power to home load	CT-based anti-backflow mode. The inverter outputs zero power to the household grid inlet, and PV or battery powers the UPS, home load and smart loads.
	AC Coupling	Connect the grid-connected inverter to the grid side or generator port of the hybrid inverter.
PV energy manage	When mixed grid mode is set to "Limit Power to UPS load" or when CT is not connected, the following load refers to the UPS load. When mixed grid mode is set to "Limit Power to home load/On grid" and CT is connected, the following load refers to the UPS load plus the home load.	
	First to Load	PV power supply logic: load-charge-grid connection
	First to charging	PV power supply logic: charge-load-grid connection
	First to grid	PV power supply logic: load-grid connection-charge
Grid charging enable	Selectable grid participation in battery charging	
Battery energy manage	Standby	The battery does not discharge, and the battery is discharged only when the working state is off the grid.
	Battery to UPS load	When the PV power is less than the UPS load power, the battery discharge is added.
	Battery to home load	The battery can supply the power to UPS load, Smart load and Home load.
	Battery to grid sell	The battery can supply the power to grid.
Parallel mode	Stand-alone	
	Single phase Parallel	
	Three Phase A	Three-phase parallel connection setting All machines in phase 1 must be set as【three phase A】 All machines in phase 2 must be set as【three phase B】 All machines in phase 3 must be set as【three phase C】 When the output voltage is 230Vac At present the line voltage between the live wire L1 in phase1 and the live wire L2 in phase 2 is 230*1.732=398Vac, and similarly the line voltage
	Three Phase B	
	Three Phase C	
Output phase voltage	Settable: 200V, 208V, 220V, 230V, 240V	

Peak Shaving

The image displays two screenshots of the 'Work mode setup' interface, specifically the 'Peak shaving' tab.

Top Screenshot: Timed charging and discharging settings

- Timed charging enable:** Three rows (1, 2, 3) for setting charging parameters. Each row includes Start Time, End Time, Stop SOC (100%), Stop Volt (60.0V), Max Power (60W), Grid (checked), and Gen (checked).
- Timed discharging enable:** Three rows (1, 2, 3) for setting discharging parameters. Each row includes Start Time, End Time, Stop SOC (100%), Stop Volt (60.0V), and Max Power (60W).
- Max consumption enable:** A checkbox that is checked.

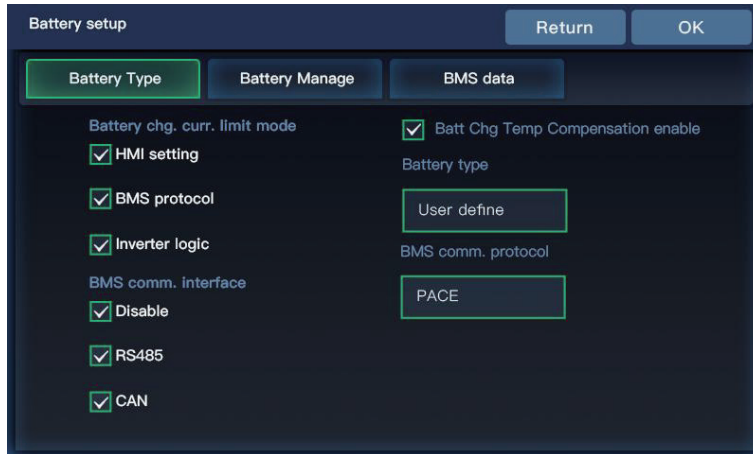
Bottom Screenshot: Week enable settings

- Week enable:** A list of days from Monday to Sunday, each with a checked checkbox.

Parameter Meaning	Description
Time charging/discharging enable	Select whether to turn on timed charging and discharging.
Start/End Time	Setting the time period for timed charging and discharging.
Stop SOC	Setting the battery charging cut-off SOC value and the cut-off SOC value for discharging during the timed charging and discharging time period(during BMS communication).
Stop Volt	Setting the battery charging cut-off voltage value and discharging cut-off voltage value during the timed charging and discharging time period(when the BMS is not communicating).
Max. Power	Setting the battery charging power and discharging power during the timed charging and discharging time period.
Grid	When setting the timed charge, select the grid to charge the battery.
Gen	When setting the timed charge, select the generator to charge the battery.
Week enable	Sets the day of the week for timed charging/discharging (effective only for time-sharing charging/discharging).
Max. consumption enable:	When this option is enabled, the battery operates according to the battery energy management settings during non-scheduled charge and discharge periods.

3.2-3 Battery Type

To enter this setting, you need to enter the password set by the user, the default password is “4321” .



Parameter Meaning	Option	Description
Battery chg. curr. limit mode	HMI setting	Maximum battery charging current is limited according to the inverter battery charging current setting value.
	BMS protocol	Maximum battery charging current is limited by the current limit value of the BMS.
	Inverter logic	Maximum battery charging current is limited by the machine's derating logic.
BMS comm. interface	Disable	BMS does not communicate.
	RS485	BMS RS485 communication function.
	CAN	BMS CAN communication function.
Batt Chg Temp Compensation enable	Select whether to turn on temperature compensation.	
Battery Type	USER define	User customizable to set all battery parameters.
	SLd	Sealed Lead Acid Battery.
	FLd	Open-ended lead-acid batteries.
	GEL	GEL lead-acid battery.
	LFP14/15/16	
	N13/N14	Ternary lithium batteries, N13/N14, corresponding to ternary lithium batteries 13 string, 14 string.
	No battery	Without battery.
Output phase voltage	When the BMS port selection setting item=485 or CAN, you need to select the corresponding lithium battery manufacturer brand for communication: 485 protocol: 1: PACE-PACEEX 2: RUDA-Ritar 3: AOGUAN-ALLGRAND BATTERY 4: OULITE-OLITER 5: CEF-CHANGFENG TECHNOLOGY 6: XINWANGDA-SUNWODA 7: DAQIN-DAKING 8: WOW-SRNE 9: PYL-PYLONTECH 10: MIT-FOXESS 11: XIX-XYE 12: POL-POWERM 13: GUOX-Gotion 14: SMK-SMK 15: VOL-WEILAN CAN protocol: 16: UZE-YUZE	

Battery Manage

Battery setup Return OK

Battery Type **Battery Manage** **BMS data**

Maximum chg. voltage 12.0V Maximum chg. current 1.0A

Batt. Recharging voltage 12.0V Max. chg. curr. by Grid 12.0A

Battery curr. stop chg. 1.0A Bat. SOC stop chg. 12%

Battery setup Return OK

Battery Type **Battery Manage** **BMS data**

Batt. volt. stop dischg. 12.0V Batt. SOC stop dischg. 10%

Batt. volt. restart dischg. 12.0V Batt. SOC restart dischg. 15%

Battery under volt. alarm 12.0V Batt. under capacity alarm 12%

Batt. volt. low recovery 12.0V Batt. SOC low fault 10%

Batt. voltage low fault 12.0V Batt. volt. low fault delay 5S

Battery max. curr. dischg. 10.0A

Parameter Meaning	Description
Maximum chg. voltage	When the battery is charging, the voltage reaches the value to enter the float state or stop charging.
Batt. Recharging voltage	When the battery is fully charged, the inverter stops charging and resumes charging when the battery voltage falls below this voltage value.
Battery curr. stop chg.	When the charging current falls below this setting, the battery will stop charge.
Maximum chg. current	Set the current magnitude for battery charging. When BMS communication is normal, this charging current parameter will be associated with the charging current limit value uploaded by the BMS. In this case, the set value must not exceed the current limit value; otherwise, the setting will fail.
Max. chg. curr. by Grid	When using mains charging, set the size of the battery mains charging current (the value is the battery current)
Bat. SOC stop chg.	Charging will stop when the SOC value reaches this set point (effective when BMS communication is normal).
Batt volt. stop dischg.	The battery will stop discharging when it reaches this setting value in the mixed grid state (when there is grid access).
Batt volt. restart dischg.	When the battery voltage is too low to discharge, the battery voltage needs to reach this setting to discharge again.

Parameter Meaning	Description
Battery under volt. alarm	Battery under-voltage alarm point, when the battery voltage is lower than the judgment point, the under-voltage alarm will be reported and the output will not be turned off.
Batt volt low recovery	When the battery report voltage low fault, the battery voltage reach this setting, the fault will be cleared.
Batt voltage low fault	When in the off-grid state, the inverter will shut down due to the low voltage of the battery; when in the hybrid grid state, the battery will stop outputting due to low voltage.
Battery max. curr. dischg.	Set the current magnitude for battery discharge. When BMS communication is normal, this discharge current parameter will be associated with the discharge current limit value uploaded by the BMS. In this case, the set value must not exceed the current limit value; otherwise, the setting will fail.
Batt. SOC stop dischg.	In the hybrid gridstate, the battery will stop discharging when the State of Charge(SOC) is lower than this set value. In the off-grid state, the battery will continue to discharge when the SOC is lower than this set value.
Batt. SOC restart dischg.	When the battery report SOC low fault, the battery SOC reach this setting, it can restart discharge(valid when BMS communication is normal).
Batt under capacity alarm	SOC value up to this setting will alarm. The inverter output will not shut down and the fault disappears if the SOC value exceeds 5% of the set value.(Valid when BMS communication is normal)
Batt. SOC low fault	When the State of Charge (SOC) of the battery reaches this set value, the inverter will report a low battery SOC fault and stop discharging (this is valid when the Battery Management System (BMS) communication is normal).
Batt. Volt. low fault delay	When the battery voltage reaches the "Batt voltage low fault" setting, the battery will stop diacharging with a delay.

BMS data (When the battery communicate with inverter)

Check the data that battery BMS upload to inverter.

Battery setup				Return	OK
Battery Type		Battery Manage		BMS data	
Battery Voltage:	33.3V	Battery charge voltage:	33.3V		
Battery Current:	33.3A	Charge current limit:	33.3A		
Battery Temp.:	33.3°C	Discharge current limit:	33.3A		
SOH:	33%	Battery rated capacity:	33AH		
Number of battery cycles:	4444	Battery remain capacity:	33AH		
Alarms 1:	50000	Protection 1:	50000		
Alarms 2:	50000	Protection 2:	50000		

3.2-4 On grid setup

To enter this setting, you need to enter the password set by the user, the default password is "4321".

Parameter Meaning	Description
Grid Standard	Italy: CEI 021
	Germany: VDE-ARN-4105
	Europel: EN50549-1
	Spain: UNE217002
	Great Britain: G99
	South Africa: NRS-097
	Other regions: GNL
	Australia: AS4777.2 Australia A
	Australia: AS4777.2 Australia Newzealand
	Poland: EN 50549-1
	Northern Ireland: G98/NI
	Great Britain: G98
	Northern Ireland: G99/NI
	Ireland: EN50549-IE
	MYANMAR
	Thailand: PEA-MEA
Grid Frequency	Selection of local grid frequency, 50Hz/60Hz
Sell Power Max	Setting the maximum grid-connected power
External CT ratio	When connecting an external CT, enter the ratio on the CT specification.
Buy power Max	Maximum power drawn from the grid. If the grid charging power+load power exceeds this setting, the machine reduces the charging power.(Setting range: 0 to rated power)
Zero-export power	Error calibration power in the case of backflow prevention, recommended setting 20~100W
On-Grid Reactive Power	Setting range of reactive power percentage: 0% to 100%
Reactive power over /under excited	Over indicates 0%~100% / Under indicates -100%~0%
On Grid PF	Setting range 0.8~1
Power factor over / under excited	Over indicates 0.8~1 / Under indicates -0.8~-1

Enter Service(This setting is not recommended to be changed by the customer, the value depend on the grid standard)

On grid setup

Return OK

Basic Enter Service Grid Protection Other

Connect Voltage Low 234.5V Connect Frequency Low 50.00Hz

Connect Voltage High 234.5V Connect Frequency High 50.00Hz

Normal connect delay time 50S Normal Connect Power Ramp Rate 50S

Reconnect delay time 50S Reconnect Power Ramp Rate 50S

Parameter Meaning	Description
Connect Voltage Low	Grid-connected low voltage protection voltage
Connect Voltage High	Grid-connected high voltage protection voltage
Normal connect delay time	Grid normal connection, grid connection delay time
Reconnect delay time	Grid down reconnection, grid connection delay time
Connect Frequency Low	Grid-connected low-frequency protection points
Connect Frequency High	Grid-connected high-frequency protection points
Normal connect Power Ramp Rate	Normal grid connection, rate of rise of grid-connected power
Reconnect Power Ramp Rate	Grid disconnection and reconnection, rate of rise of grid-connected power

Grid Protection (This setting is not recommended to be changed by the customer, the value depend on the grid standard)

On grid setup

Return OK

Basic Enter Service Grid Protection Other

LV1 234.5V Time 2ms LF1 100HZ Time 2ms

LV2 234.5V Time 2ms LF2 100HZ Time 2ms

HV1 234.5V Time 2ms HF1 100HZ Time 2ms

HV2 234.5V Time 2ms HF2 100HZ Time 2ms

Parameter Meaning	Description
LV1	Class 1 undervoltage protection point
LF1	Class 1 underfrequency protection point
LV2	Class 2 undervoltage protection point
LF2	Class 2 underfrequency protection point
HV1	Class 1 overvoltage protection point
HF1	Class 1 overfrequency protection point
HV2	Class 2 overvoltage protection point
HF2	Class 2 overfrequency protection point
Time	Protection Response Time

other

On grid setup

Return OK

Basic Enter Service Grid Protection **Other**

☒ Watt-PF (P-PF) curve enable

☒ LVRT/HVRT enable

Parameter	Description
Watt-PF (P-PF) curve enable	Adjustment of the power factor of the inverter according to the set active power.
LVRT/HVRT enable	Adjustment of grid HV ride-through / LV ride-through values.

3.2-5 Advance Setup

To enter this setting, you need to enter the password set by the user, the default password is "4321".

Advance setup

Return OK

Generator Other Restart Inverter

Generator work mode

☐ Generator input

☒ Smart load

☒ Grid always to smart load enable

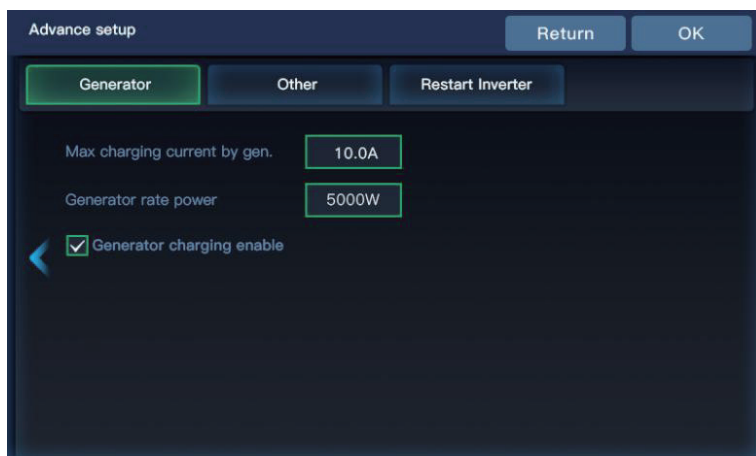
☒ Off-grid disconnect smart load

Turn off the smart load SOC 0%

Turn on the smart load SOC 0%

Turn off the smart load voltage 10.0V

Turn on the smart load voltage 10.0V



Parameter Meaning	Description	
Generator work mode	Generator Input	When the generator is connected to the “Gen port”, select the generator input.
	Smart load	When a load is connected to the “Gen port”, select the load output.
	Grid always to smart load enable	Whether to enable continuous power supply to the smart load.
	Off-grid disconnect smart load	Whether or not to enable the Off-grid Disconnect Smart Load function.
Turn off / on the smart load SOC	Set the State of Charge (SOC) of the battery to turn the intelligent load on or off.	
Turn off / on the smart load voltage	Set the battery voltage to turn the intelligent load on or off.	
Max charging current by gen.	Maximum battery charging current during generator charging.	
Generator rate power	Setting the power of the generator up to the rated power of the inverter.	
Generator charging enable	Setting whether the generator is charged or not.	

Other

To enter this setting, you need to enter the password set by the user, the default password is "4321".





Parameter Meaning	Description
PE-N connect enable	Enable automatic switching of Neutral connections.
PV Riso check enable	Enable PV insulation impedance detection.
Leakage curr. protection enable	Enable leakage current protection.
Power saveing mode	After turning on the energy-saving mode, if the load is empty or less than 25W, the inverter output will be shut down after a delay of 5 min; when the load is more than 40W, the inverter will start automatically.
BMS comm. error stop	Inverter stops output when BMS communication error occurs.
CT manual setting	Select the direction of the CT according to the installation of the CT.
Electric meter options	Whether to enable single-phase meter.
Smart meter connection point	Select on-grid inverter side or grid side according to meter installation location.

Restart

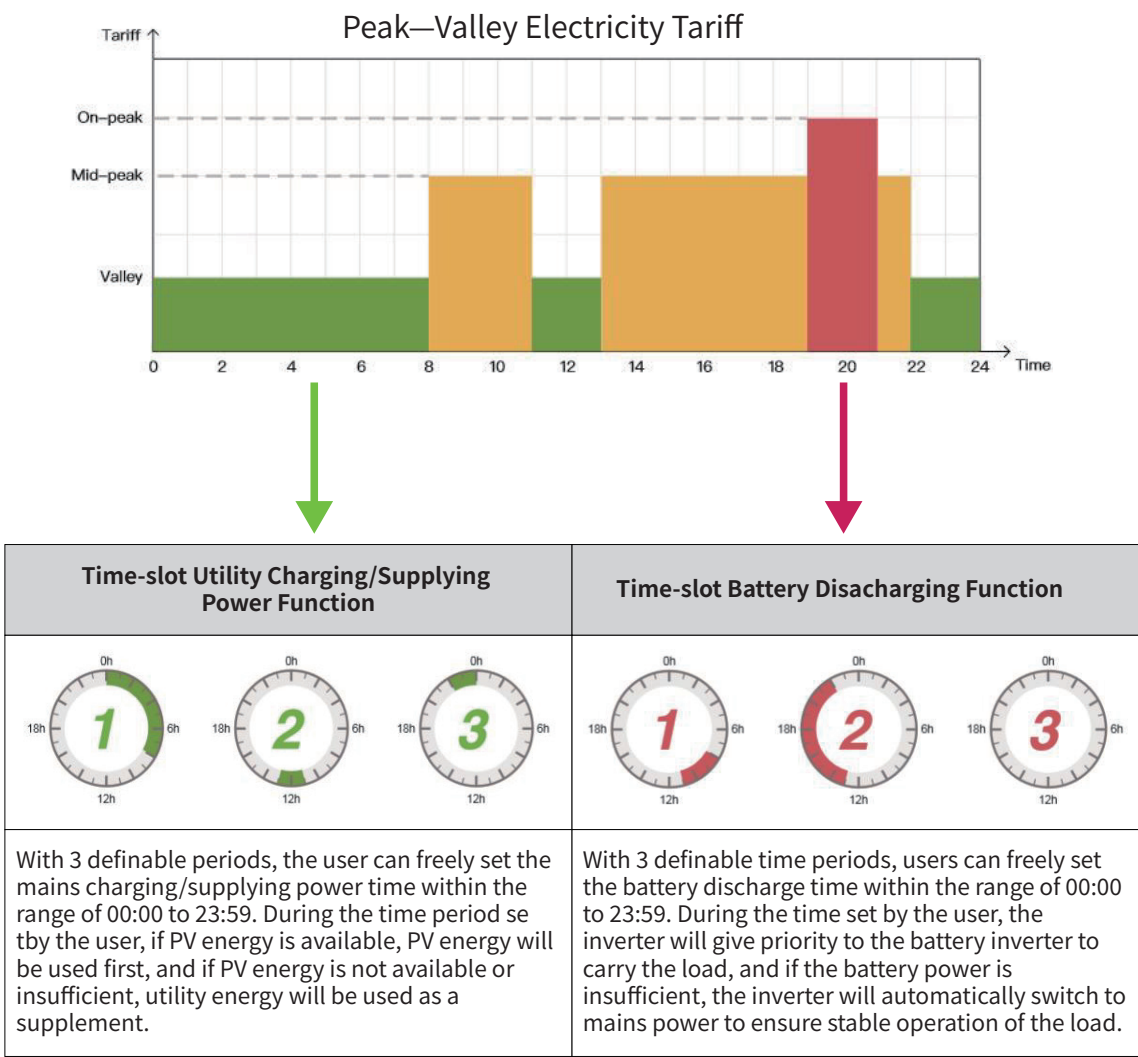
To enter this setting, you need to enter the password set by the user, the default password is "4321".



Restore to factory setting: Reset all inverter settings
Restart inverter: Restart the inverter

3.3 Time-slot charging/discharging function

The SEI series is equipped with a time-slot charging and discharging function, which allows users to set different charging and discharging periods according to the local peak and valley tariffs, so that the utility power and PV energy can be used rationally. When mains electricity is expensive, the battery inverter is used to carry the load; when the mains electricity is cheap, the mains electricity is used to carry the load and charge, which can help customers to save electricity costs to the greatest extent. Below are examples for users to understand the function.



3.4 Battery type parameters

For Lead-acid Battery :

Battery type Parameters	Sealed lead acid battery (SLD)	Gel lead acid battery (GEL)	Flooded lead acid battery (FLD)	User-defined (USE)	Adjustable
Overvoltage disconnection voltage	60V	60V	60V	60V	
Battery fully charged recovery point	52V	52V	52V	52V	√
Boost charge voltage	57.6V	56.8V	57.6V	40V~60V	√
Undervoltage alarm voltage([01] fault)	44V	44V	44V	40V~60V	√
Undervoltage alarm voltage recovery point([01] fault)	Undervoltage alarm voltage+0.8V				
Low voltage disconnection voltage([04] fault)	42V	42V	42V	40V~60V	√
Low voltage disconnection voltage recovery point ([04] fault)(setup item [35])	52V	52V	52V	52V	√
Discharge limit voltage	—	—	—	40V~60V	√
Over-discharge delay time	5s	5s	5s	1~30s	√
Boost charge duration	—	—	—	10~600 minutes	√

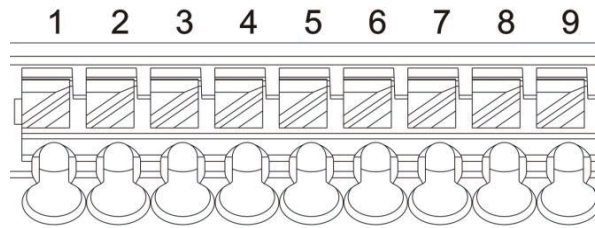
For Lithium Battery :

Battery type Parameters	Ternary (N13)	Ternary (N14)	LFP (L16)	LFP (L15)	LFP (L14)	Adjustable
Overvoltage disconnection voltage	60V	60V	60V	60V	60V	
Battery fully charged recovery point	50.4V	54.8V	53.6V	50.4V	47.6V	√
Equalizing charge voltage	—	—	—	—	—	√
Boost charge voltage	53.2V	57.6V	56.8V	53.2V	49.2V	√
Undervoltage alarm voltage ([01] fault)	43.6V	46.8V	49.6V	46.4V	43.2V	√
Undervoltage alarm voltage recovery point([01] fault)	Undervoltage alarm voltage+0.8V					
Low voltage disconnection voltage ([04] fault)	38.8V	42V	48.8V	45.6V	42V	√
Low voltage disconnection voltage recovery point ([04] fault)(setup item [35])	46V	49.6V	52.8V	49.6V	46V	√
Discharge limit voltage	36.4V	39.2V	46.4V	43.6V	40.8V	√
Over-discharge delay time	30s	30s	30s	30s	30s	√
Boost charge duration	120 minutes	120 minutes	120 minutes	120 minutes	120 minutes	√

4.Communication

4.1 Dry contact

1. RSD power supply
2. Temperature sampling (reserved)
3. Generator remote start/stop
4. CT connection

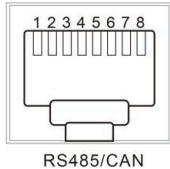


Parameter Meaning	Description
RSD power supply	PIN 1 is GND, PIN 3 is RSD 12V+
Temperature sampling (reserved)	Pin 1 & Pin 2 can be used for battery temperature sampling compensation.
Generator remote start/stop	4-5: NC; 4-6: NO Remote generator shutdown: Pins 4 to 5 are normally closed, and pins 4 to 6 are normally open. (Pin 4/5/6 output 125Vac/1A, 230Vac/1A, 30Vdc/1A)
CT connection	PIN 8: CT-; PIN 9: CT+

If you need to use the remote start/stop function of a dry contact generator, please ensure that the generator is equipped with an automatic transmitter and supports remote start/stop functions.

4.2 RS485/CAN communication port

RS485/CAN communication port for RS485 and CAN communication with lithium battery BMS.



RJ45	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
Description	RS485-B	RS485-A	GND	CANH	CANL	GND	RS485-A	RS485-B

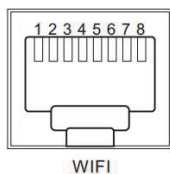
4.3 DIP switch



The single inverter need to press down DIP 1,2.
When the all-in-one machine are in parallel,
press down DIP 1,2 of the first and last iall-in-one machine.

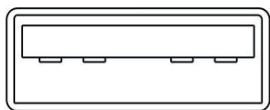
4.4 WiFi port

The WIFI port is used to connect to the Wi-Fi/GPRS data acquisition module, which allows the user to view the operating status and parameters of the inverter via the mobile.



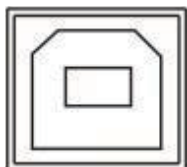
RJ45	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
Description	5V	GND	/	/	/	/	RS485-A	RS485-B

4.5 USB-A port



It is used to updated the screen firmware.

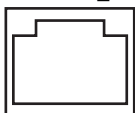
4.6 USB-B port



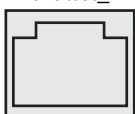
This port is a USB communication port, which can be used for USB communication with the selected upper computer software of our company (Need to apply for). To use this port, the corresponding "USB to serial port chip CH340T driver" should be installed in the computer.

4.7 Parallel port

Parallel_A

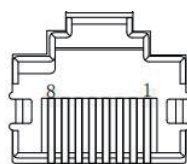


Parallel_B



1. This port is used for parallel communication, through which the parallel modules can communicate with each other.
2. Each machine has two 8Pin ports, one for the parallel_A and one for the parallel_B.
3. When connecting, make sure to connect the local Parallel_A to the parallelized machine Parallel_B, or the local Parallel_B should be connected to the parallelized machine Parallel_A.
4. Do not connect local parallel_A to local parallel_B.

4.8 DRMS port(only Australia)



RJ45	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
Description	DRM5	DRM6	DRM7	DRM8	RefGen	COM/DRMO	V+	V-

MODE	RJ45 socket asserted by shorting pins		Requirement
DRM0	5	6	Operate the disconnection device
DRM5	1	5	Do not generate power to grid
DRM6	2	5	Do not generate at more than 50% of rated power
DRM7	3	5	Do not generate at more than 50% of rated power AND Sink reactive power if capable
DRM8	4	5	Increase power generation (subject to constraints from other active DRMS)

5. Fault and Remedy

5.1 Fault code

Fault code	Fault name	Affecting output or not	Description
【01】	BatVoltLow	No	Battery undervoltage alarm.
【02】	BatOverCurrSw	Yes	Battery discharge average current overcurrent (software protection).
【03】	BatOpen	Yes	Battery not-connected alarm.
【04】	BatLowEod	Yes	Battery undervoltage stop discharge alarm.
【05】	BatOverCurrHw	Yes	Battery overcurrent (hardware protection).
【06】	BatOverVolt	Yes	Charging overvoltage protection.
【07】	BusOverVoltHw	Yes	Bus overvoltage (hardware protection).
【08】	BusOverVoltSw	Yes	Bus overvoltage (software protection).
【09】	PvVoltHigh	No	PV overvoltage protection.
【10】	PvOCSw	No	Boost overcurrent (software protection).
【11】	PvOCHw	No	Boost overcurrent (hardware protection).
【13】	OverloadBypass	Yes	Bypass overload protection.
【14】	OverloadInverter	Yes	Inverter overload protection.
【15】	AcOverCurrHw	Yes	Inverter overcurrent (hardware protection).
【17】	InvShort	Yes	Inverter short-circuit protection.
【19】	OverTemperMppt	No	Buck heat sink over temperature protection.
【20】	OverTemperInv	Yes	Inverter AC output with load or AC charging radiator over-temperature protection.
【21】	FanFail	Yes	Fan blockage or failure fault.
【22】	EEPROM	Yes	Memory failure.
【23】	ModelNumErr	Yes	Model setting error.
【26】	RlyShort	Yes	Inverted AC Output Backfills to Bypass AC Input.
【29】	BusVoltLow	Yes	Internal battery boost circuit failure.
【30】	BatCapacityLow1	No	Inverter AC output with load or AC charging radiator over-temperature protection.
【31】	BatCapacityLow2	No	Alarm given when battery capacity rate is lower than 5% (setting BMS to enable validity).
【32】	BatCapacityLowStop	Yes	Inverter stops whe nbattery capacity is low (setting BMS to enable validity).
【34】	CanCommFault	Yes	CAN communication fault in parallel operation.
【35】	ParaAddrErr	Yes	Parallel ID (communication address) setting error.
【37】	ParaShareCurrErr	Yes	Parallel current sharing fault.
【38】	ParaBattVoltDiff	Yes	Large battery voltage difference in parallel mode.

Fault code	Fault name	Affecting output or not	Description
【39】	ParaAcSrcDiff	Yes	Inconsistent AC input source in parallel mode.
【40】	ParaHwSynErr	Yes	Hardware synchronization signal error in parallel mode.
【41】	InvDcVoltErr	Yes	Inverter DC voltage error.
【42】	SysFwVersionDiff	Yes	
【43】	ParaLineContErr	Yes	Parallel line connection error in parallel mode.
【44】	Serial number error	Yes	No serial number set at factory.
【45】	Error setting of split-phase mode	Yes	Item “Parallel” setting error.
【46】	Meter communication error	Yes	Abnormal wiring, check whether the meter communication line is connected correctly, and check whether the meter communication address is set correctly.
【49】	Grid over voltage	Yes	selects the local corresponding grid standard.
【50】	Grid under voltage	Yes	
【51】	Grid over frequency	Yes	
【52】	Grid under frequency	Yes	
【53】	Grid loss	Yes	
【54】	Grid DC current over	Yes	
【55】	Grid standard un init	Yes	
【56】	Low insulation resistance fault	No	PV1+, PV2+ and PV-abnormally low impedance to ground.
【57】	Leakage current overload fault	Yes	System leakage current exceeds limit.
【58】	BMS communication error	No	Check whether the communication line is connected correctly and whether BMS is set to the corresponding lithium battery communication protocol.
【60】	BMS battery low temperature alarm	No	BMS alarm battery low temperature.
【61】	BMS battery over temperature alarm	No	BMS alarm battery over temperature.
【62】	BMS battery over current alarm	No	BMS alarm battery over current.
【63】	BMS battery undervoltage alarm	No	BMS alarm low battery.

5.2 Maintenance

Fault code	Faults	Remedy
Display	No display on the screen	Check if the battery switch or PV switch is closed; whether the switch is in the "ON" state; press any button on the screen to exit the screen sleep mode.
【06】	Battery overvoltage protection	Check that the battery voltage does not exceed the protection value. If it does, discharge the battery until the voltage falls below the battery over-voltage recovery point.
【01】 【04】	Battery undervoltage protection	Charge the battery until it returns to the low voltage disconnection recovery voltage.
【21】	Fan failure	Check if the fan is not turning or blocked by foreign object.
【19】 【20】	Heat sink over temperature protection	When the temperature of the device is cooled below the recovery temperature, normal charge and discharge control is resumed.
【13】 【14】	Bypass overload protection, inverter overload protection	1.Reduce the use of power equipment. 2.Restart the unit to resume load output.
【17】	Inverter short-circuit protection	1.Check the load connection carefully and clear the shortcircuit fault points. 2.Re-power up to resume load output.
【09】	PV overvoltage	Use a multimeter to check if the PV input voltage exceeds the maximum allowable input voltage rated.
【03】	Battery disconnected alarm	Check if the battery is not connected or if the battery circuit breaker is not closed.
【40】 【43】	Parallel connection fault	Check if the parallel line is not connected well, such as loose or wrong connection.
【35】	Parallel ID setting error	Check whether the setting of parallel ID number is repeated.
【37】	Parallel current sharing fault	Check if the parallel current sharing line is not connected well, such as loose or wrong connection.
【39】	Inconsistent AC input source in parallel mode	Check whether the parallel AC inputs are from the same input interface.
【42】	Inconsistent system firmware version in parallel mode	Check whether the software version of each inverter is consistent.
【44】	Serial number error	Incorrect device serial number setting.
【45】	Parallel mode error	There is a device in the parallel system with the wrong parallel mode setting.
【49】	High grid voltage	Check that the grid voltage is with in the normal range, if the grid voltage is abnormal, wait until the grid voltage is restored.
【50】	Low grid voltage	Check that the grid voltage is with in the normal range, if the grid voltage is abnormal, wait until the grid voltage is restored.

Fault code	Faults	Remedy
【51】	High grid frequency	Check that the grid frequency is with in the normal range, if the grid frequency is abnormal, wait until the grid frequency is restored.
【52】	Low grid frequency	Check that the grid frequency is with in the normal range, if the grid frequency is abnormal, wait until the grid frequency is restored.
【53】	Grid unconnected	Check if the grid is correctly connected, e.g. if the switch is closed and if the grid is disconnected.
【54】	Grid-connected current with DC component over	Power down and restart the device, if it continues to report faults, contact the manufacturer after sales.
【56】	Low insulation resistance fault	Check that the system is well grounded and that the PV modules and cables are not worn.
【57】	Leakage current overload fault	Check that the system is well grounded and that the loads are not operating abnormally.

In case of product failures that cannot be resolved using the methods in the above table, please contact our after-sales service department for technical support. Do not disassemble the equipment without authorization.

6. Protection and Maintenance

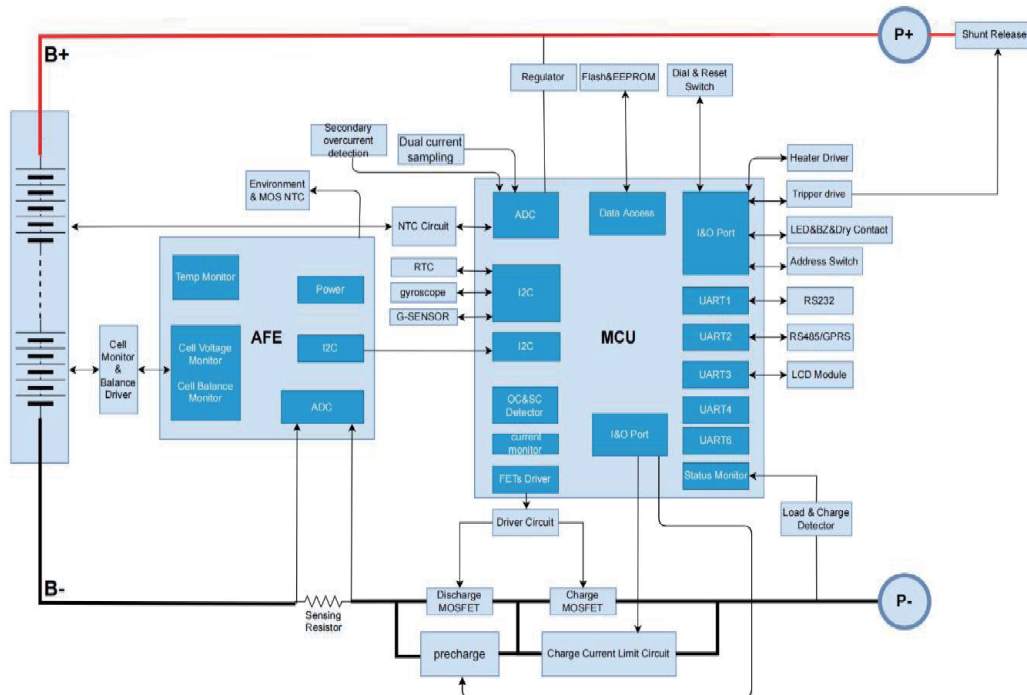
No.	Protection Feature	Instuction
1	PV input current/power limiting protection	When the charging current or power of the PV array configured exceeds the PV input rated value, the inverter will limit the input power and charge at the rated.
2	PV input over-voltage	If the PV voltage exceeds the maximum value allowed by the hardware, the machine will report a fault and stop the PV boost to output a sinusoidal AC wave.
3	PV night reverse current protection	At night, the battery is prevented from discharging through the PV module because the battery voltage is greater than the voltage of PV module.
4	AC input over-voltage protection	When the AC input voltage of each phase exceeds 280V, the mains charging will be stopped and switched to the inverter mode.
5	AC input under-voltage protection	When the AC input voltage of each phase below 170V, the utility charging will be stopped and switched to the inverter mode.
6	Battery over-voltage protection	When the battery voltage reaches the over-voltage cut-off point, the PV and the utility will automatically stop charging to prevent the battery from being overcharged and damaged.
7	Battery under-voltage protection	When the battery voltage reaches the under-voltage cut-off point, the inverter will automatically stop the battery discharge to prevent damage from over-discharging the battery.
8	Battery over-current protection	After a period when the battery current exceeds that allowed by the hardware, the machine will switch off the output and stop discharging the battery.

No.	Protection Feature	Instuction
9	AC output short-circuit protection	When a short-circuit fault occurs at the load output terminal, the AC output is immediately turned off and turned on after 1 second. If the output load terminal is still short-circuited after 3 attempts, the inverter must be manually restarted after first removing the short-circuit fault from the load before the normal output can be restored.
10	Heat sink over-temperature protection	When the internal temperature of the inverter is too high, the inverter will stop charging and discharging; when the temperature returns to normal, the inverter will resume charging and discharging.
11	Inverter over-load protection	After triggering the overload protection the inverter will resume output after 3 minutes, 5 consecutive overloads will switch off the output until the inverter is restarted. (102%<load<125%): alarm and output shutdown after 5min. (125%<load<150%): alarm and output shutdown after 10s. Load > 150%: alarm reported and output switched off after 5s.
12	AC output reverse	Prevents AC back flow from the battery inverter to the bypass AC input.
13	Bypass over-current protection	Built-in AC input over-current protection circuit breaker.
14	Bypass phase inconsistency protection	When the phase of the bypass input and the phase of the inverter split do not match, the inverter disables switching to the bypass output to prevent the load from dropping out or short-circuiting when switching to the bypass.
15	Charging short-circuit protection	When the external battery port is short-circuited in the PV or AC charging state, the inverter will protect and stop the output current.
16	Parallel connection error protection	In parallel operation, the equipment will be protected when the parallel line is lost.
17	Parallel battery voltage difference protection	In parallel operation, the equipment will be protected when the battery connection is inconsistent and the battery voltage is greatly different from that detected by the host.
18	Parallel AC voltage difference protection	In parallel operation, the equipment will be protected when the AC IN input connection is inconsistent.
18	Synchronization signal fault protection	The equipment will be protected when there is a fault in the guidance signal between parallel buses, causing inconsistent behavior of each inverter.

7. Basic configuration of battery pack

7.1 Overview

With the wide application of lithium iron phosphate batteries in the household energy storage industry, requirements such as high performance, high reliability and high cost performance have been put forward for battery management systems. This product is a BMS specifically designed for household energy storage batteries and can be widely applied in household energy storage.



7.2 Functional features

High-integration analog front-end	Adjustable overcurrent protection
Isolated power supply circuit	It has multiple sleep and wake-up modes
Integrated serial port IC	Low power consumption
High voltage accuracy ($\leq 10\text{mV}$)	Dual-channel RS485 communication
High current accuracy ($\leq 2\%@\text{FS}$)	Adjustable parameter Settings
4-channel battery temperature detection ($\leq 2^\circ\text{C}$)	Buzzer alarm function
SOC estimation function	LED status indication function
SOH estimation function	It has the function of charging balance
Short-circuit protection function	

7.3 Overview

Basic Parameter Settings (Note: Unless otherwise specified, the following parameters shall be tested at an ambient temperature of 25°C.)

NO.	Indicator project		Factory default parameters	Configurable	Remarks
1	Single-cell overcharge protection	Single-cell overcharge alarm voltage	3600mV	Yes	
		Overcharge protection voltage for individual cells	3650mV	Yes	
		Single-cell overcharge protection delay	1.0s	Yes	
	The single-cell overvoltage protection is lifted	Single-cell overcharge protection release voltage	3380mV	Yes	
		Capacity removed	SOC<96%	Yes	
		Discharge release	Discharge current > 2A		
2	Single-cell overdischarge protection	Single-cell overdischarge alarm voltage	2800mV	Yes	
		Single-cell overdischarge protection voltage	2700mV	Yes	
		Single-cell overdischarge protection delay	1.0s	Yes	
	Single-cell over-discharge protection is lifted	Cell overdischarge protection release voltage	2950mV	Yes	
		Release when there is charging	It can be activated by connecting to a charger		
3	Overall overcharge protection	Overall overcharge alarm voltage	57.6V	Yes	
		Overall overcharge protection voltage	58.4V	Yes	
		Overall overcharge protection delay	1.0S	Yes	
	Overall overvoltage protection is lifted	Overall overcharge protection release voltage	54.0V	Yes	
		Capacity removed	SOC<96%	Yes	
		Discharge release	Discharge current > 2A		
4	Overall over-discharge protection	Overall overdischarge alarm voltage	44.8V	Yes	
		Overall overdischarge protection voltage	43.2V	Yes	
		Overall overdischarge protection delay	1.0s	Yes	
	Overall over-discharge protection is lifted	Overall overdischarge protection release voltage	47.2V	Yes	
		Release when there is charging	It can be activated by connecting to a charger		
5	Overcurrent protection during charging	Charging overcurrent alarm current	155A	Yes	If it appears 10 times consecutively, the status will be locked and will not be automatically lifted
		Overcurrent protection current during charging	160A	Yes	
		Charging overcurrent protection delay	1.0s	Yes	
	The overcurrent protection during charging is lifted	Automatically lifted	It will be automatically removed after 1 minute		
		Discharge release	Discharge current > 1A		

NO.	Indicator project		Factory default parameters	Configurable	Remarks
6	Discharge overcurrent 1 protection	Discharge overcurrent 1 alarm current	155A	Yes	If it appears 10 times consecutively, the status will be locked and will not be automatically lifted
		Discharge overcurrent 1 protection current	160A	Yes	
		Discharge overcurrent 1 protection delay	1.0s	Yes	
	Discharge overcurrent 1 protection is lifted	Automatically lifted	It will be automatically removed after 1 minute		
		Charging discharged	Charging current > 1A		
7	Discharge overcurrent 2	Discharge overcurrent 2 protection current	≥200A	Yes	If it appears 10 times consecutively, the status will be locked and will not be automatically lifted
		Discharge overcurrent 2 protection delay	500mS	Yes	
	Discharge overcurrent 2 protection is lifted	Automatically lifted	It will be automatically removed after 1 minute		
		Charging discharged	Charging current > 1A		
8	Short-circuit protection	Short-circuit protection current	≥350A		
		Short-circuit protection delay	≤300μS		
		Short-circuit protection lifted	When there is charging, the short-circuit protection is lifted		
			It will be automatically released after the load is removed		
9	MOS high-temperature protection	MOS over-temperature alarm temperature	90℃	Yes	
		MOS over-temperature protection temperature	115℃	Yes	
		MOS protection release temperature	85℃	Yes	
10	Cell temperature protection	Low-temperature alarm temperature for charging	5℃	Yes	
		Low-temperature protection temperature for charging	0℃	Yes	
		The temperature at which the low-temperature protection for charging is released	5℃	Yes	
		Charging high-temperature alarm temperature	55℃	Yes	
		Charging high-temperature protection temperature	60℃	Yes	
		The temperature at which the high-temperature protection during charging is released	55℃	Yes	
		Discharge low-temperature alarm temperature	-15℃	Yes	
		Discharge low-temperature protection temperature	-20℃	Yes	
		Discharge low-temperature protection release temperature	-15℃	Yes	
		Discharge high-temperature alarm temperature	55℃	Yes	
		Discharge high-temperature protection temperature	60℃	Yes	
		Discharge high-temperature protection release temperature	55℃	Yes	

NO.	Indicator project		Factory default parameters	Configurable	Remarks
11	Environmental temperature alarm	Environmental low-temperature alarm temperature	-15°C	Yes	
		Environmental low-temperature protection temperature	-20°C	Yes	
		The temperature at which the environmental low-temperature protection is lifted	-15°C	Yes	
		Environmental high-temperature alarm temperature	65°C	Yes	
		Environmental high-temperature protection temperature	75°C	Yes	
		The temperature at which the environmental high-temperature protection is lifted	65°C	Yes	
12	Current consumption	Self-consumed current during operation	≤75mA (With display screen)		
			≤75mA(Without a display screen)		
		Low-power mode current	≤200μA		
13	Balanced function	Balanced opening voltage	3400mV	Yes	
		Opening pressure difference	30mV	Yes	
14	Low battery alarm	Low battery alarm threshold	SOC<5%	Yes	No alarm during charging
15	Sleep function	Sleep voltage	3150mV	Yes	
		Delay time	5 min	Yes	
16	Cell failure protection	Single unit pressure difference	Pressure difference > 1V	No	Charging and discharging are not allowed
17	Full charge judgment	Full charging voltage	>56V	Yes	When both conditions are met, stop charging and update the SOC to 100%
		Cut-off current	<2A	Yes	

7.4 LED Indicator Definition

System state	Abnormal state	RUN	ALM	Power LED				Explain
Shutdown status	Sleep state	OFF	OFF	Total extinction				
Standby	Normal	Flashing 1	OFF	According to electric quantity indication				Position in readiness
	Alarm	Flashing 1	Flashing 3					Module low voltage
Charging	Normal	Ever Bright	OFF	According to electric quantity indication (the maximum indication LED flashes 2)				The maximum battery level LED flashes 2. The overcharge alarm ALM does not flash
	Alarm	Ever Bright	Flashing 3					
	Overcharge protection	Ever Bright	OFF	Total extinction				
	Temperature, overcurrent, and failure protection	OFF	Ever Bright	Total extinction				Stop charging
Discharge	Normal	Flashing 3	OFF	According to electric quantity indication				
	Alarm	Flashing 3	Flashing 3					
	low-voltage protection	OFF	OFF	Total extinction				Stop discharging
	Temperature, overcurrent, short circuit, reverse connection, and failure protection	OFF	Ever Bright	Total extinction				Stop discharging
Failure		OFF	Ever Bright	Total extinction				Stop charging and discharging

State		Charging				Discharge			
Capacity indicator		L1	L2	L3	L4	L1	L2	L3	L4
Electric quantity	0~25%	OFF	OFF	OFF	Flashing 2	OFF	OFF	OFF	Ever Bright
	25~50%	OFF	OFF	Flashing 2	Ever Bright	OFF	OFF	Ever Bright	Ever Bright
	50~75%	OFF	Flashing 2	Ever Bright	Ever Bright	OFF	Ever Bright	Ever Bright	Ever Bright
	75~100%	Flashing 2	Ever Bright	Ever Bright	Ever Bright	Ever Bright	Ever Bright	Ever Bright	Ever Bright
Operation indicator		Ever Bright				Flashing 3			

Flash mode	on	off
mode 1	0.25 S	3.75 S
mode 2	0.5 S	0.5 S
mode 3	0.5 S	1.5 S

7.5 Operating mode

7.5-1 Buzzer Description

Beeping in case of malfunction.

- When a fault occurs, it will sound for 0.25s every 1s.
- During protection, it will sound for 0.25s every 2s (except for overvoltage protection).
- When an alarm is triggered, it will sound for 0.25s every 3s (except for overvoltage alarms).

Buzzer function can be allowed or disabled by the host computer, the fresh-unused device defaults disabled.

7.5-2 Reset button description

In a non-power-down state, i.e. with the weak switch closed (if the weak switch function is not enabled, it defaults the BMS already being in a non-power-down situation):

When the BMS is in sleep mode, press the button (3 to 6 seconds) and then release it. The protection board will be activated, and the LED indicator lights will light up successively for 0.5 seconds starting from "RUN".

When the BMS is activated, press the button (3 to 6 seconds) and then release it. The protection board will enter sleep mode, and the LED indicator lights will light up successively from the lowest battery level for 0.5 seconds.

When the BMS is activated, press the button (6 to 10 seconds) and then release it. The protection board will be reset and all LED lights will light up simultaneously for 1.5 seconds.

After the BMS is reset, it still retains the parameters and functions set by the upper computer. If it is necessary to restore to the initial parameters, it can be achieved through the "Restore Default Values" function of the upper computer, but the relevant operation records and stored data remain unchanged (such as battery level, cycle times, protection records, etc.).

7.5-2 Hibernation and awakening

Hibernation

When any of the following conditions is met, the system enters low-power mode:

- The over-discharge protection for individual or overall units has not been released within 30 seconds.
- Press the button (3 to 6 seconds), then release it.
- The minimum cell voltage is lower than the sleep voltage, and the duration reaches the sleep delay time (simultaneously meeting the conditions of no communication, no protection, no equalization, and no current).
- Standby time exceeds 24 hours (no communication, no charging or discharging, no mains power).
- Force a shutdown through the upper computer software.

Awakening

When the system is in low-power mode, it will exit the low-power mode and enter the normal operation mode if any of the following conditions is met:

- Connect to the charger. The output voltage of the charger should be greater than 48V.
- Press the button (3 to 6 seconds), then release it.
- It has RS232 activation.

7.6 Communication

7.6-1 RS232 Communication

The BMS can communicate with the host computer via the RS232 interface, thereby enabling the host computer to monitor various information about the battery, including battery voltage, current, temperature, status, and battery production information, etc. The default baud rate is 9600bps.

7.6-2 CAN communication

The default baud rate is 500K. This interface is used for communication with the inverter. When this battery is the master machine, it can summarize the data from the slave machine and communicate with the inverter.

7.6-3 Parallel RS485 communication

You can view the information of the PACK. The default baud rate is 9600bps. If communication with the monitoring device is required via RS485, the monitoring device will act as the host and poll the data based on the address. The address setting range is 2 to 15.

7.6-4 Independent RS485 communication

The default baud rate is 9600bps. This interface is used for communication with the inverter. When this battery is the master machine, it can summarize the slave machine data and communicate with the inverter.

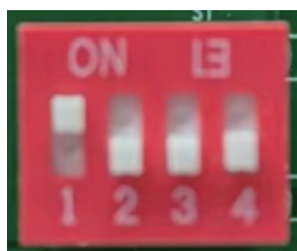
7.6-5 Address dip switch

1. For parallel communication of multiple machines, it is necessary to configure the dialling code address of each PACK first. The dialling code adopts BCD code format, and the address 0 is defined as (Black dot is OFF state, blank is ON state, the same as below),



address 1 , address 2 , and so on.

2. The master needs to be dialled as 0 and the slave as 1-15



Above picture shows a 4-position dip switch

Address	Position of dip switch			
Battery quantity connected in parallel	#1	#2	#3	#4
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

8.Maintenance

- In order to maintain the optimum and permanent operation performance, it is suggested to check the following items semiannually.

1. Confirm that the air flow around the all-in-one machine will not be blocked. In addition, remove any dirt or debris from the radiator.
2. Check whether the insulation of all exposed wires is damaged due to sun exposure, friction with other objects around, dry rot, insect or rat damage, etc. If necessary, it is required to repair or replace the wires.
3. Verify that the indication and display are consistent with the operation of the device. Please pay attention to any fault or error display and take corrective measures if necessary.
4. Check all terminals for corrosion,insulation damage,high temperature or burning/discoloration sign, and tighten the terminal screws.
5. Check for dirt, nesting insects and corrosion phenomenon and clean as required.
6. If the arrester has failed, replace the failed arrester in time to protect the all-in-one machine and other user device against lightning damage.

Warning: Danger of electric shock! To perform above operations, make sure that all the power supplies of the all-in-one machine have been broken and all the capacitor electricity has been discharged. Afterwards, corresponding inspection or operation can be performed!

- We are not responsible for any following damage:
 1. Damage caused by improper use or use in inappropriate place.
 2. Open-circuit voltage of photovoltaic module exceeds maximum allowable voltage.
 3. The damage caused by the operation ambient temperature beyond the limited operation temperature range.
 4. Personally take apart and maintain the all-in-one machine.
 5. Damage caused by force majeure: damage caused by transportation and handling of the all-in-one machine.

9. Declaration

1. Due to product version upgrade or other reasons, the contents of this document will be updated from time to time. Unless otherwise agreed, this document is only used as a guide, and all statements, information and suggestions in the document do not constitute any express or implied warranty.
2. Please read the "Installation Manual" carefully before installing the equipment to understand the product information and safety precautions.
3. All installation operations of the equipment must be carried out by professionally trained electrical technicians. Relevant personnel must wear personal protective equipment and use safe and reliable installation tools.
4. Before installing the equipment, please check whether the delivered parts are complete and free of any obvious external damage according to the packing list. If any items are missing or damaged, please contact your dealer.
5. After installation, please follow the instructions in this guide to ensure the correct use of this product. Equipment damage caused by failure to operate in accordance with the document is not within the scope of equipment warranty.
6. The cable colors involved in this article are for reference only, and the selection of cables should comply with local cable standards.
7. After reading, please keep the "Installation Manual" properly for future reference.
8. If you do not operate this product correctly, you may cause serious injury to yourself or others, or cause product damage and property loss.
9. Once you use this product, you are deemed to have understood, approved and accepted all the terms and contents of this document. Users promise to be responsible for their actions and all consequences arising therefrom. The company will not bear all losses caused by users' failure to use the product in accordance with the "operation manual".
10. In compliance with laws and regulations, the company has the final right to interpret this document and all related documents of this product.
11. Shall not be liable for personal injury, property loss, product damage and subsequent losses under the following circumstances:
 - Failure to comply with the provisions of this manual.
 - Incorrect use of this product.
 - Unauthorized or unqualified personnel repair the product, disassembly the rack and perform other operations.
 - Use of unapproved spare parts.
 - Unauthorized modifications or technical changes to the product.

Installation Manual

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