



PRODUCT MANUAL

Smart Power Station Pro
Smart Power Station Pro (S)

Instructions

Integrated Charging, Storage and Inversion

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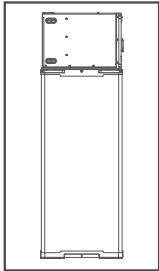
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► Packaging Storage and Transportation

1.1 Storage and Transportation

01. During transportation, the battery packing box must be placed properly and avoid strong vibration, impact and heavy pressure.
02. During loading of battery pack, strictly avoid dropping, overturning and serious stacking.
03. The battery pack is not recommended leaving unused for long-term. For temporary storage (≤ 1 month), store in a dry, clean and ventilated environment at -20°C to 40°C . For long-term storage (≤ 6 months), maintain a temperature of 10°C to 35°C . A battery pack with a storage time of 6 months needs to be recharged in time to reach 50% SOC.
04. During the storage and transportation, pay attention to preventing dust and water vapor from eroding of the battery pack, and the fire source should be isolated.



Fire source should be isolated

05. During storage and transportation, the battery pack should avoid contact with corrosive organic solvents, gases and other substances.
06. When delivering stored battery pack, the first-in-first-out principle should be followed.

Storage Environment Requirements:

Ambient temperature: $-20^{\circ}\text{C}\sim 40^{\circ}\text{C}$, recommended storage temperature: $10^{\circ}\text{C}\sim 35^{\circ}\text{C}$.
Relative humidity: 5%RH $\sim$ 80%RH.
Dry, clean and ventilated.
Avoid direct sunlight.
The distance from the heat source must be more than two meters.

1.2 Open-box Inspection

Products have been strictly tested before leaving the factory, Please inspect and sign for delivery upon receipt. If the product is damaged, please contact the local distributor. Please open the box to check whether the outer packaging is intact or damaged, Whether the internal equipment is damaged.

1.3 Packing List (380V/19.5kW 45kWh)

Name	Legend	Specification	Quantity	Standard/Optional
Battery Pack		51.2V/300Ah	3	Standard
Inverter		19.5KW	1	Standard
Solar Panel		585W	12~42	Standard/Optional
Peep Hole Copper Terminal		16-6	2	Standard
Photovoltaic Connector MC4 Plug		MC4	6	Standard
Red and Black Photovoltaic Wire		4mm ²	100m	Optional
Flat Head Hexagonal Bolt		M6×10	12	Standard
Self-Contained Washer Nut		M5	6	Standard
Battery Bottom Fastener		Sheet Metal	2	Standard
Flat Head Hexagonal Bolt		M8×12	12	Standard
Network Cable		1m×1 0.4m×1	3	Standard
MC4 Connector Wrench		Male & Female	2	Standard
Four-pin Socket (Female)		32A	1	Standard
Copper Bar		Positive Electrode Negative Electrode	2	Standard
Hex key		M3 M4 M5	3	Standard
Specification		120×160mm	1	Standard

1.3 Packing List (220V/13kW 30kWh)

Name	Legend	Specification	Quantity	Standard/Optional
Battery Pack		51.2V/300Ah	2	Standard
Inverter		13KW	1	Standard
Solar Panel		585W	8~28	Standard/Optional
Peep Hole Copper Terminal		16-6	2	Standard
Photovoltaic Connector MC4 Plug		MC4	4	Standard
Red and Black Photovoltaic Wire		4mm ²	100m	Optional
Flat Head Hexagonal Bolt		M6×10	8	Standard
Self-Contained Washer Nut		M5	4	Standard
Battery Bottom Fastener		Sheet Metal	2	Standard
Flat Head Hexagonal Bolt		M8×12	8	Standard
Network Cable		1m×1 0.4m×1	2	Standard
Copper Bar		Positive Electrode Negative Electrode	2	Standard
Hex key		M3 M4 M5	3	Standard
Specification		120×160mm	1	Standard

1.3 Packing List (220V/6.5kW 15kWh)

Name	Legend	Specification	Quantity	Standard/Optional
Battery Pack		51.2V/300Ah	1	Standard
Inverter		6.5KW	1	Standard
Solar Panel		585W	4~14	Standard/Optional
Peep Hole Copper Terminal		16-6	2	Standard
Photovoltaic Connector MC4 Plug		MC4	2	Standard
Red and Black Photovoltaic Wire		4mm ²	100m	Optional
Flat Head Hexagonal Bolt		M6×10	4	Standard
Network Cable		1m×1 0.4m×1	1	Standard
Hex key		M5	1	Standard
Specification		120×160mm	1	Standard

Product Description

2.1 Instructions

This document is intended for qualified persons and end users. Operations requiring no special qualifications may be performed by end users. Qualified persons must have the following skills:

- Knowledge of inverter operating principles and procedures
- Training in hazard and risk management for electrical equipment installation and use
- Professional skills in electrical equipment installation and commissioning
- Understanding of applicable standards and directives
- Full compliance with this manual and all safety requirements

2.1.1 Identification description and identification definition

	Danger: High Voltage! Danger: Electrical Hazard!
	CAUTION Do not disconnect under load!
	Do not short-circuit.
	CAUTION Do not disconnect under load!
	Do not disconnect or disassemble by non-professionals.
	Do not expose batteries to fire.
	Please read the product manual before installation and use.
	Keep out of reach of children, animals or insects.
	Recyclable.
	Do not dispose of this product with domestic waste.
	Warning: High potential danger, if not avoided, may result in death or serious injury to personnel.
	Caution: Potential danger of medium or low level, which, if not avoided, may result in moderate or minor injury to personnel. In some severe situations, death or serious injury may occur.

2.1.2 Operation Safety



WARNING!

**This chapter contains important safety and operating instructions.
Read and keep this manual for future reference.**

01. When operating and maintaining this product, please follow the operation regulations of high voltage DC power supply, and take good personal protection measures.
02. Keep away from children.
03. Avoid touching exposed metal parts before touching the battery pack.
04. In order to prevent the accumulation of static electricity, the maintenance personnel should release the static electricity from the human body before operating the battery pack.
05. Do not place tools or metal parts on the top of the battery pack.
06. Do not step on or sit on the battery pack.
07. Do not short circuit the positive and negative electrodes of the battery pack directly.
08. Unauthorized battery replacement is strictly prohibited.
09. It is for bidden to charge or discharge the battery pack module directly without BMS or other charging and discharging protection measures.
10. Before using the unit, read all instructions and cautionary marking on the unit, the batteries and all appropriate sections of this manual. The company has the right not to apply quality assurance, if not according to the instructions of this manual for installation and cause equipment damage.
11. Only professional electrical or mechanical engineers are permitted to operation and connection.
12. All the electrical installation must comply with the local electrical safety standards.
13. When installing PV modules during daylight hours, cover modules with opaque materials. Uncovered modules generate lethal high voltages under sunlight.
14. CAUTION - To reduce risk of injury, charge only deep-cycle lead-acid type rechargeable batteries and lithium batteries. Other types of batteries may burst, causing personnel injury and damage.
15. Do not disassemble the unit. Take it to a qualified service center when service or repair is required. Incorrect re-assembly may result in a risk of electric shock or fire.
16. To reduce risk of electric shock, disconnect all wirings before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
17. NEVER charge a frozen battery.
18. For optimum operation of this inverter, please follow required spec to select appropriate cable size. It's very important to correctly operate this inverter.
19. Exercise extreme caution when using metal tools on or near batteries. Dropped tools may cause sparks, short circuits or explosions.
20. Strictly follow installation procedures when disconnecting AC or DC terminals. Refer to the "Installation" section for details.
21. GROUNDING INSTRUCTIONS -This inverter should be connected to a permanent grounded wiring system. Be sure to comply with local requirements and regulation to install this inverter.
22. NEVER cause AC output and DC input short circuited. Do NOT connect to the mains when DC input short circuits.
23. Make sure the inverter is completely assembled, before the operation.

2.1.3 Responding to Emergencies

01 Electrolyte Leakage

In case of electrolyte leakage, immediately follow the following instructions.

Inhalation: Evacuate the contaminated area and seek medical advice immediately.

Eye Contact: Rinse eyes with running water for 15 minutes and seek medical advice immediately.

Skin Contact: Wash the affected area thoroughly with soap and water and seek medical advice immediately.

Ingestion: Cause vomiting and seek medical advice immediately.

02 Battery Soaking

If the battery pack is immersed in water, do not continue to use.

03 Battery Damage

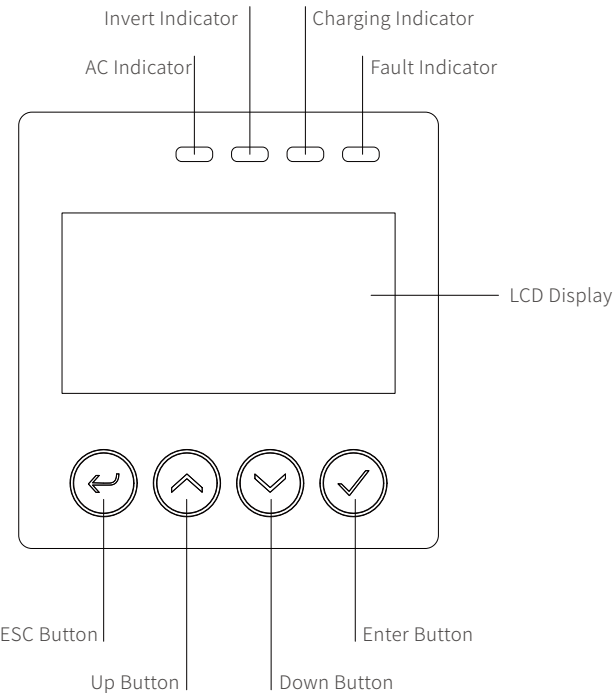
If the battery pack is damaged, please contact us directly.

2.2 Use

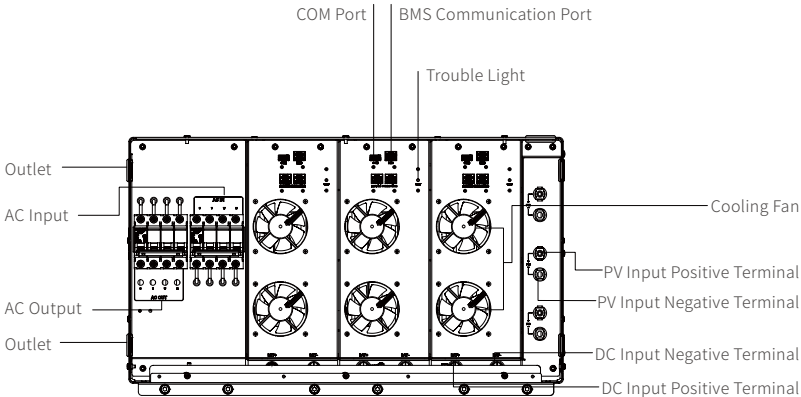
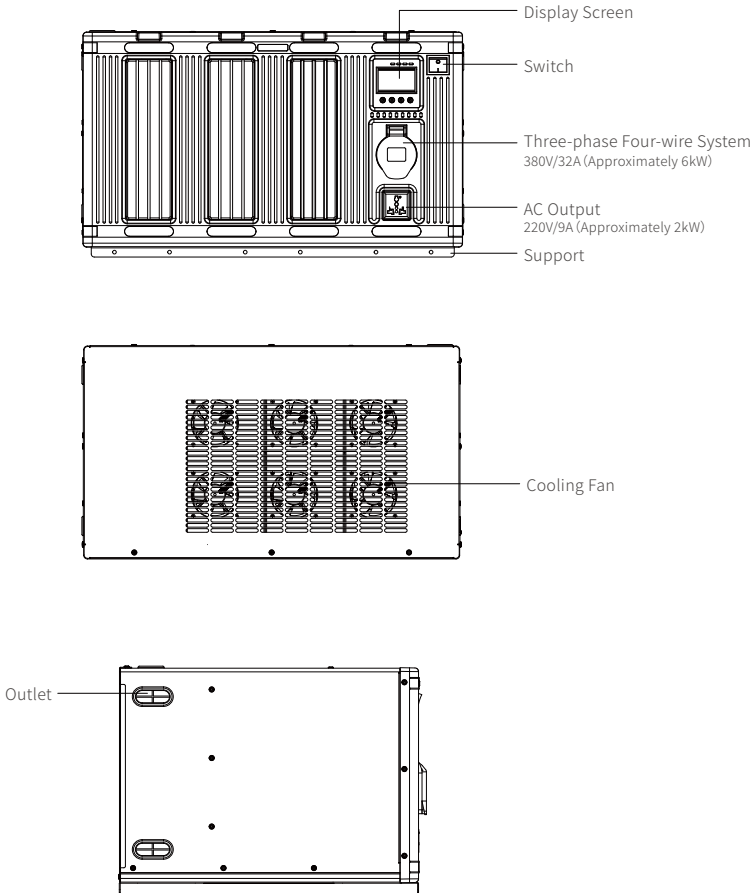
This product is used in areas lack of electricity, frequent power failure, expensive electricity price and peak and off-peak electricity price. It can be charged by panels during the day and used at night. It is suitable for small industrial and commercial entities, household, field operation, tourist camping, breeding farm, plantation, restaurant, farmhouse and other places.

2.3 Product Appearance

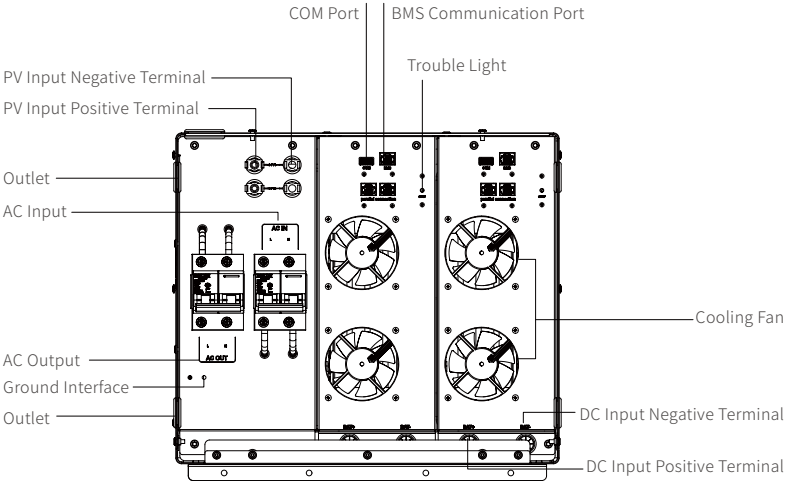
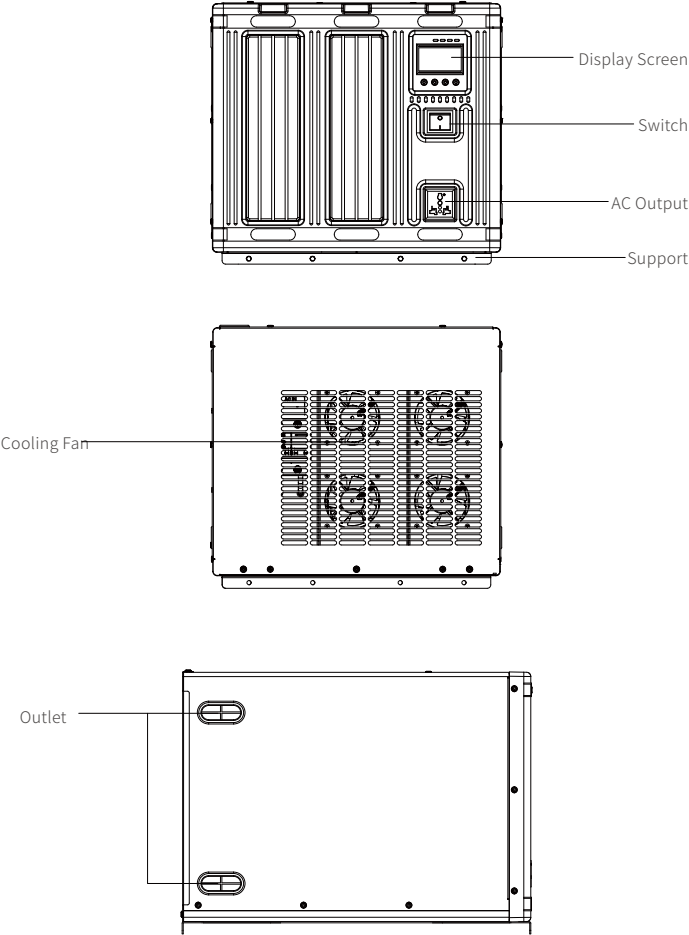
2.3.1 Display Screen



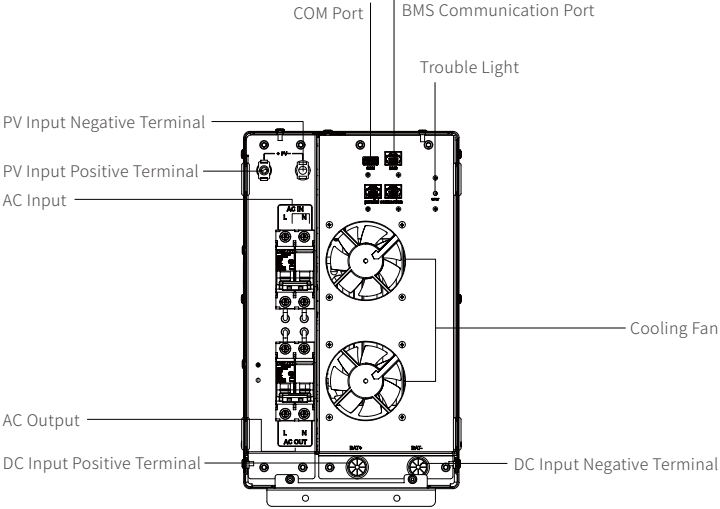
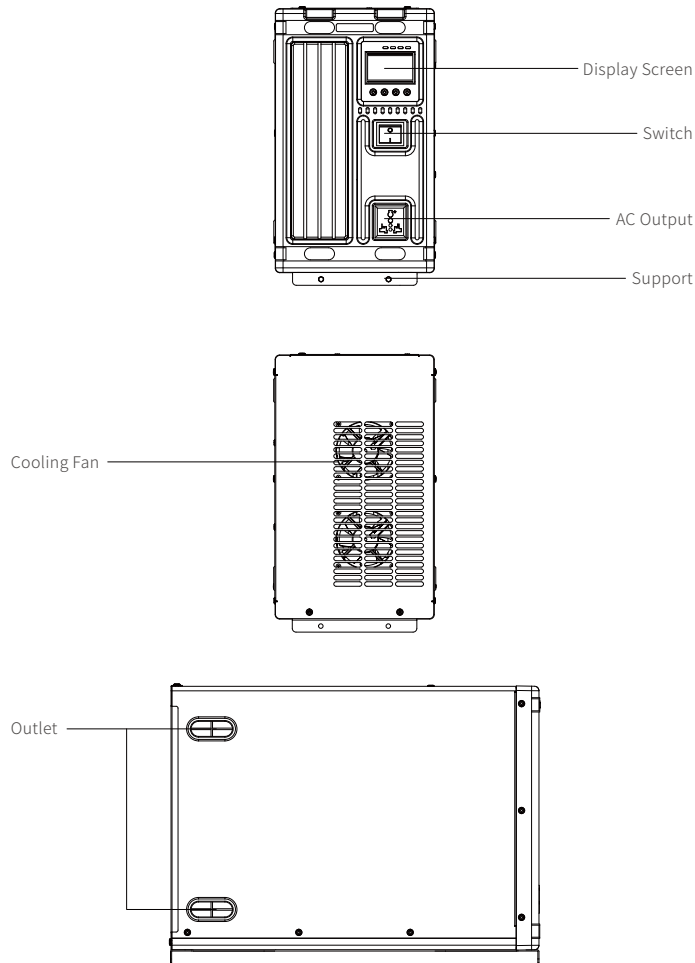
2.3.2 Product Appearance Introduction (380V/19.5kW 45kWh)



2.3.2 Product Appearance Introduction (220V/13kW 30kWh)

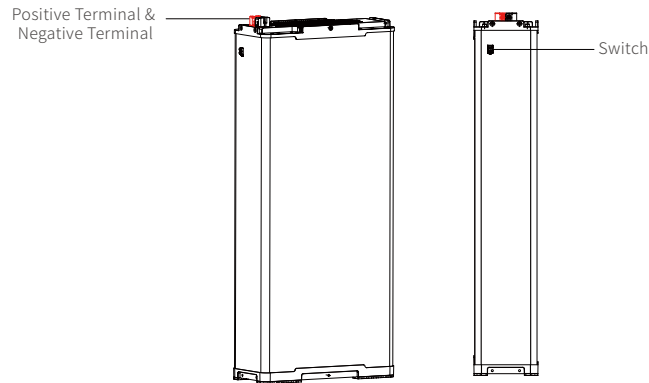


2.3.2 Product Appearance Introduction (220V/6.5kW 15kWh)

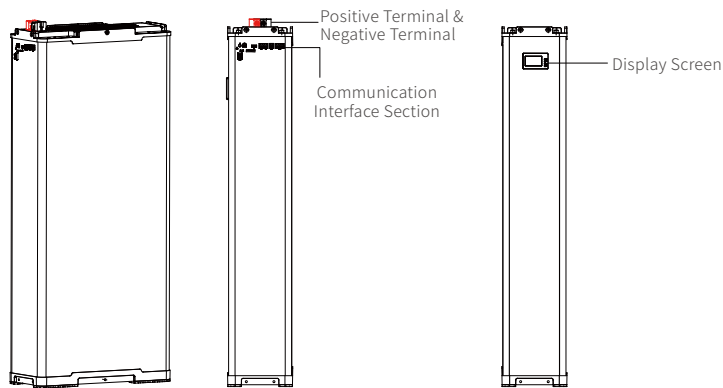


2.3.3 Product Appearance Introduction (Battery)

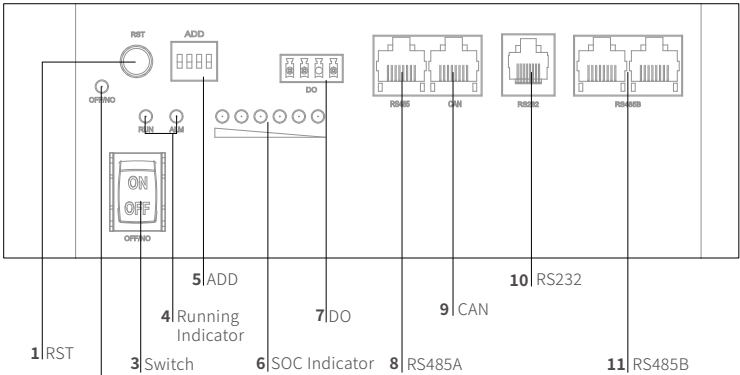
- Battery Pack for Smart Power Station Pro



- Battery Pack for Smart Power Station Pro (S)



2.3.4 Communication Interface Introduction(For Smart Power Station Pro (S) Only)



NO	Label	Name	Function Description
1	RST	Reset Switch	BMS reset parameters
2	Switch Light	Switch Light	Display battery pack ON/OFF status
3	Switch	Switch	Turn on or off battery pack
4	Running Indicator	Running Indicator	Blinks during battery pack charge and discharge
5	ADD	DIP Switch	Battery pack parallel connection address setting
6	SOC Indicator	Battery Capacity Indicator	Remaining battery capacity is displayed
7	DO	Dry Contact Terminal	Output control signals
8	RS485A	Communication Port	Communication with inverter
9	CAN	Communication Port	Communication with inverter
10	RS232	RS232	Connect to the upper computer
11	RS485B	Communication Port	Battery pack cascade communication

Installation

3.1 Installation Tools

Installation Tools	Multi-meter 	Protective gloves 	Insulated anti-smashing shoes 
	Safety glasses 	ESD wrist strap 	Hammer drill 
	Electric screwdriver 	Cross screwdriver 	Rubber mallet 
	Spirit level 	Wire cutter / stripper 	Terminal crimping tool 

3.2 Assembly Connection

3.2.1 Installation Environment

Consider the following points before selecting installation location:

- Do not mount the inverter on flammable construction materials.
- Mount on a solid surface.
- Install this inverter at eye level in order to allow the LCD display to be read at all times.
- The ambient temperature should be between -15°C and 50°C to ensure optimal operation.
- Recommended installation: Vertical wall mounting.
- Reserve sufficient space for heat dissipation and wiring operations.

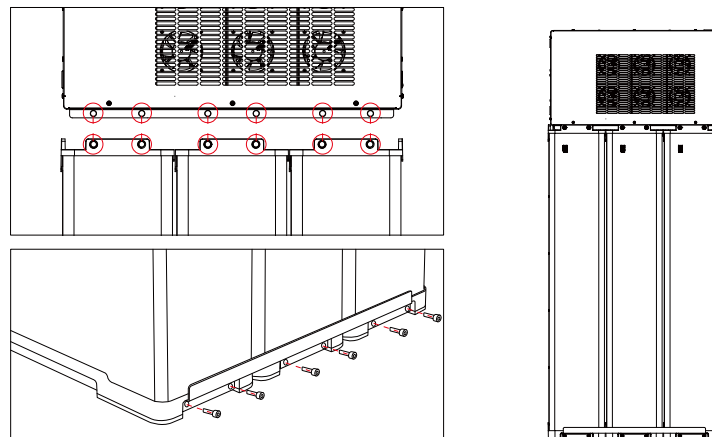


WARNING!

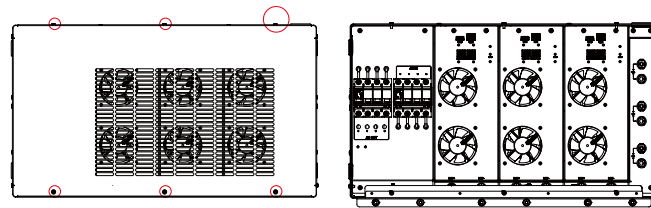
Inverter is suitable for mounting on concrete or other non-combustible surface only.

3.2.2 Product Installation (380V/19.5kW 45kWh)

1. Place the three sets of batteries in order and tightly.
2. Put the inverter on the battery, align the holes on the inverter bracket with the holes on the battery, and fix it with M6×10 flat head hexagon socket screws.
3. Align the battery sheet metal at the bottom with the hole at the bottom of the battery, and secure it using M8x12 flat head hexagon socket screws.

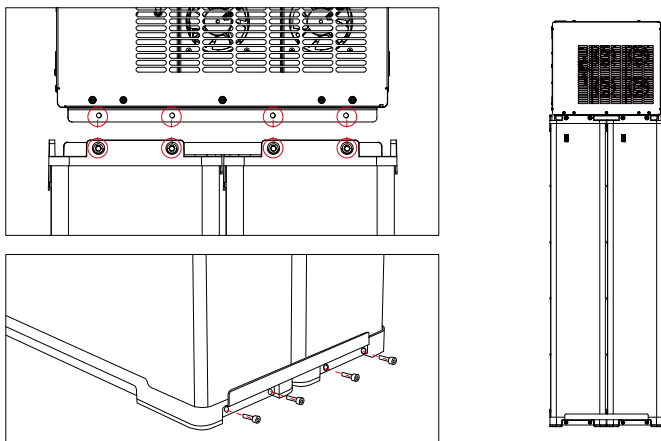


4. Use a screwdriver to remove the bolts on the rear panel one by one.

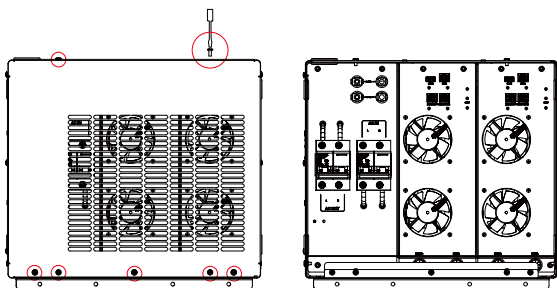


3.2.2 Product Installation (220V/13kW 30kWh)

1. Place the two sets of batteries in order and tightly.
2. Put the inverter on the battery, align the holes on the inverter bracket with the holes on the battery, and fix it with M6×10 flat head hexagon socket screws.
3. Align the battery sheet metal at the bottom with the hole at the bottom of the battery, and secure it using M8x12 flat head hexagon socket screws.

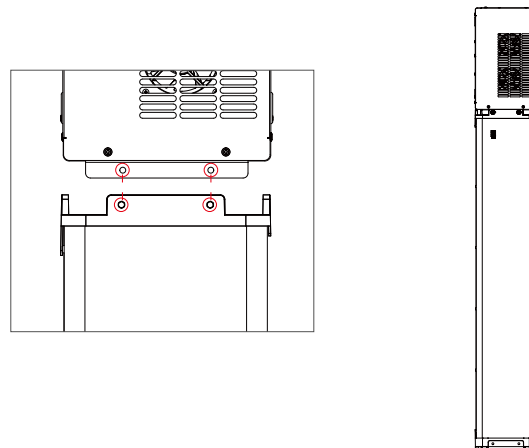


4. Use a screwdriver to remove the bolts on the rear panel one by one.

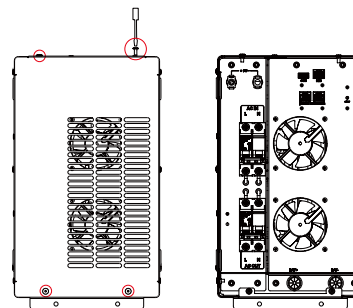


3.2.2 Product Installation (220V/6.5kW 15kWh)

1. Put the inverter on the battery, align the holes on the inverter bracket with the holes on the battery, and fix it with M6×10 flat head hexagon socket screws.



2. Use a screwdriver to remove the bolts on the rear panel one by one.

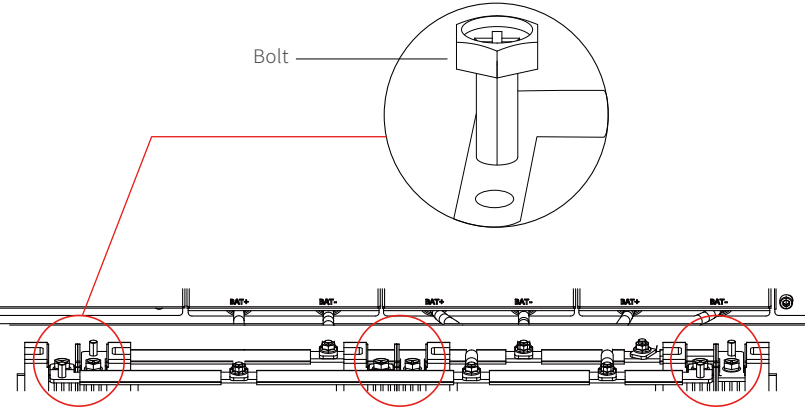


3.3 Connection Diagram

3.3.1 Battery Connection

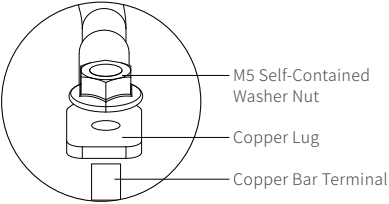
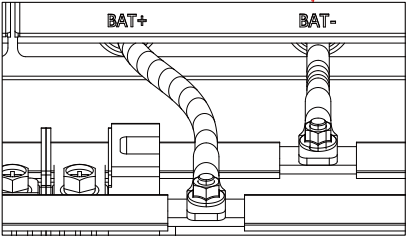
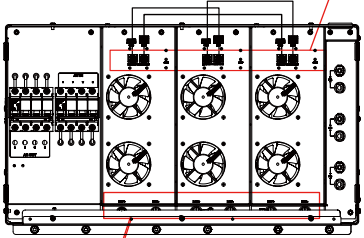
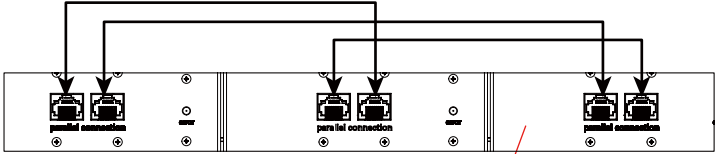
1. For safety and regulatory compliance, install a separate DC overcurrent protector or disconnect device between the battery and inverter. While disconnect devices may not be required in some applications, overcurrent protection is mandatory. Recommended protector/disconnect rating: 150A.
2. All wiring must be performed by a qualified person.
3. Proper cable sizing for battery connections is critical for system safety and efficiency. The cable color mentioned below is for typical reference.
4. Make sure AC power is disconnected before attempting to connect AC power to the unit. All electrical connection operations and cable/component specifications must comply with local laws and regulations. The cable color mentioned below is for typical reference.
5. Installation must be performed with care due to high battery voltage in series.
6. Do not place anything between the flat part of the inverter terminal and the DT terminal. Otherwise, overheating may occur.
7. Do not apply anti-oxidant substance on the terminals before terminals are connected tightly.
8. Before making the final DC connection or closing DC breaker/disconnector be sure positive (+) must be connected to positive (+) and negative (-) must be connected to negative(-).

Fix the positive and negative copper bars to the battery pack with bolts.



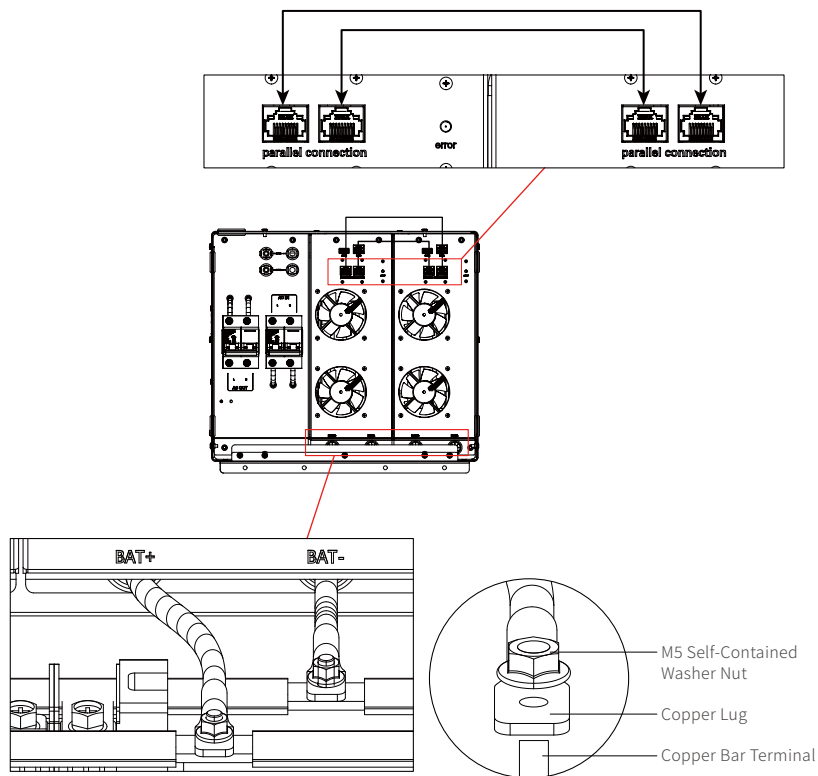
Battery Connection (380V/19.5kW 45kWh)

- ① Take out the connection wires reserved by the inverter and align them with the positive and negative terminals of the battery copper busbar.
- ② Use M5 washer nut to fix the copper nose to the positive and negative terminals of the copper busbar.
- ③ Connect the Network cables as shown below.
- ④ Make sure the cable is securely connected.
- ⑤ Flip the switch on the battery.



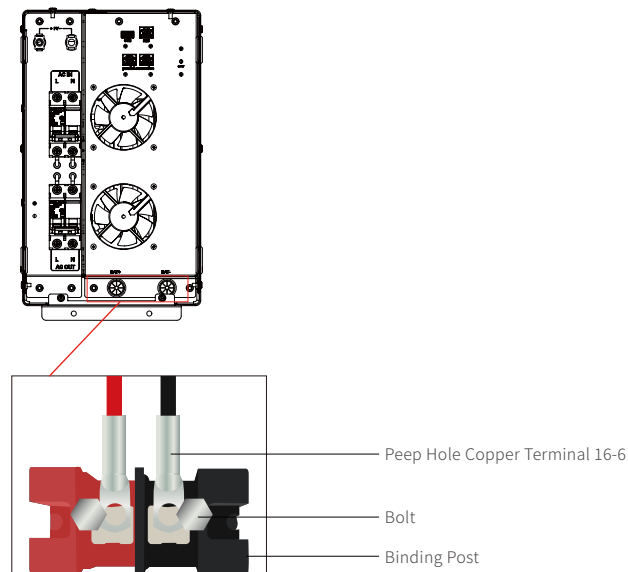
Battery Connection (220V/13kW 30kWh)

- ① Take out the connection wires reserved by the inverter and align them with the positive and negative terminals of the battery copper busbar.
- ② Use M5 washer nut to fix the copper nose to the positive and negative terminals of the copper busbar.
- ③ Connect the Network cables as shown below.
- ④ Make sure the cable is securely connected.
- ⑤ Flip the switch on the battery.



Battery Connection (220V/6.5kW 15kWh)

- ① Take out the connection wires reserved by the inverter and align them with the positive and negative terminals of the battery, use the bolts delivered with the terminal to secure it.
- ② Make sure the cable is securely connected.
- ③ Flip the switch on the battery.

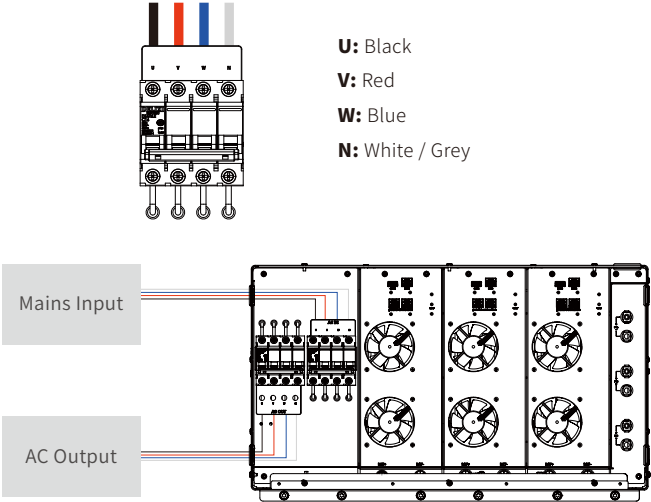


3.3.2 Mains Connection

- 1. Before connecting to AC input power source, please install a separate AC breaker between inverter and AC input power source. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current of AC input. The recommended specification of AC breaker is 40A for 6.5KW inverter.
- 2. The unit has three terminal blocks labeled “AC IN”, “AC OUT 1” “AC OUT 2”markings. Please do NOT mis-connect input and output connectors.
- 3. Make sure to connect the AC cables with the correct polarity. If the L and N wires are connected in reverse, it may cause a utility short circuit when these inverters are working in parallel.
- 4. All wiring must be performed by a qualified personnel
- 5. Proper cable sizing for AC dual output connections is critical for safe and efficient system operation.
- 6. Make sure AC power is disconnected before attempting to connect AC power to the unit. All operations during the electrical connection process, as well as the specifications of cables and components used, must comply with local laws and regulations. The cable color mentioned below is for typical reference.

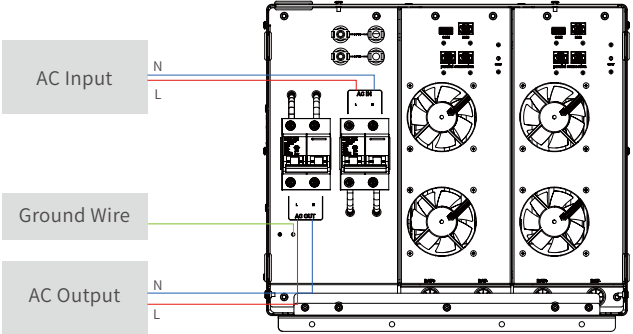
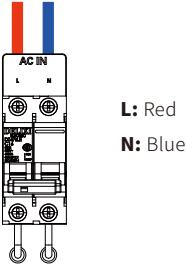
Mains Connection (380V/19.5kW 45kWh)

- ① Connect the cables in sequence according to the cable colors in the figure below.



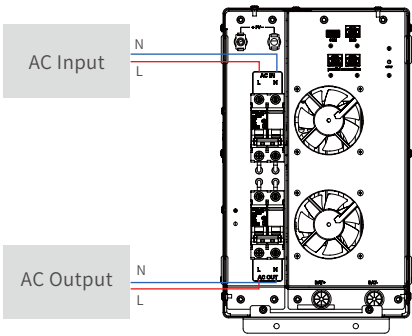
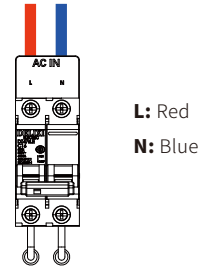
Mains Connection (220V/13kW 30kWh)

- ① Connect the cables in sequence according to the cable colors in the figure below.



Mains Connection (220V/6.5kW 15kWh)

① Connect the cables in sequence according to the cable colors in the figure below.



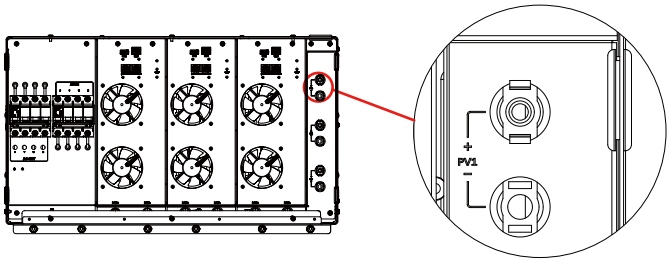
3.3.3 Photovoltaic Connection

1. Before connecting to PV modules, please install a separate DC circuit breaker between inverter and PV modules.
2. Do not ground the positive or negative terminals of the PV modules, as this can severely damage the inverter.
3. Exposure to sunlight can generate lethal high voltages in photovoltaic strings, so strictly adhere to the safety precautions listed in the photovoltaic string and related documents.
4. Make sure to connect the PV terminals to the corresponding ports on the inverter, as reversing the polarity can damage the inverter.
5. All wiring must be performed by a qualified personnel.
6. Proper cable sizing for PV module connections is critical for system safety and efficiency. The cable color mentioned below is for typical reference.
7. Please do not connect any DC switches or AC/DC circuit breakers before completing the electrical connections.

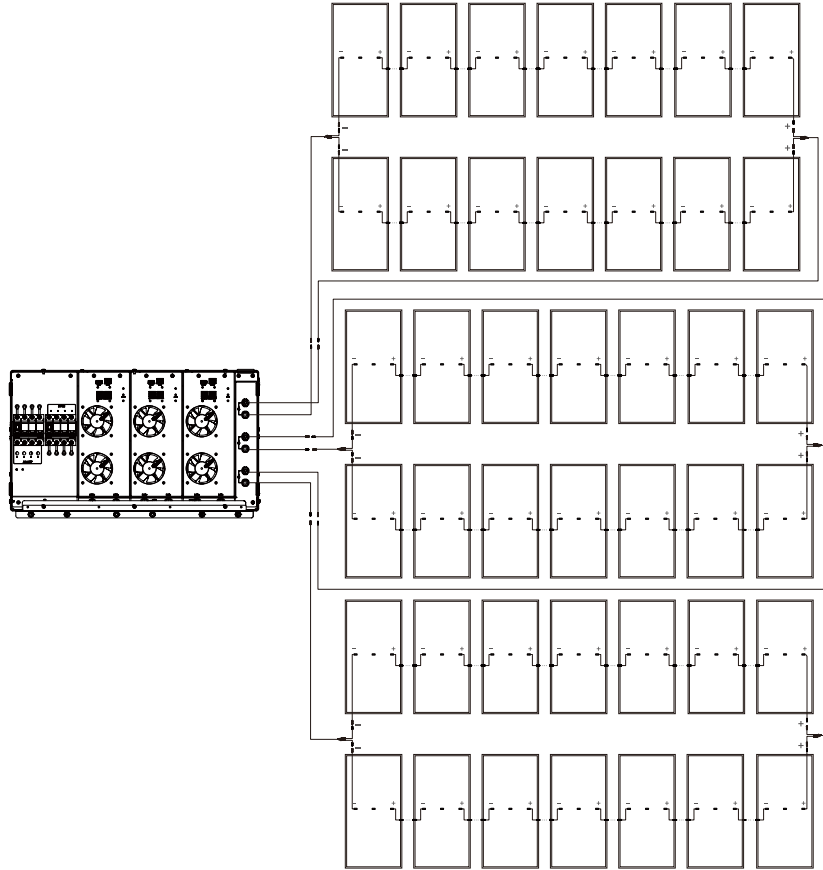
Photovoltaic Connection (380V/19.5kW 45kWh)

- ① Series Connection Limit: A maximum of 8 solar panels are recommended per series string.
- ② Series & Parallel Wiring Rule: If the total number of PV modules exceeds 8, straight full series wiring is strictly prohibited. Modules must first be wired into multiple series strings (each string with no more than 8 panels), then all strings shall be connected in parallel for input.
- ③ Thread the solar panels cables through the outlet holes of the inverter one by one and fix them on the photovoltaic plug.

*** A total of 12 to 42 PV modules is recommended for the complete system.**



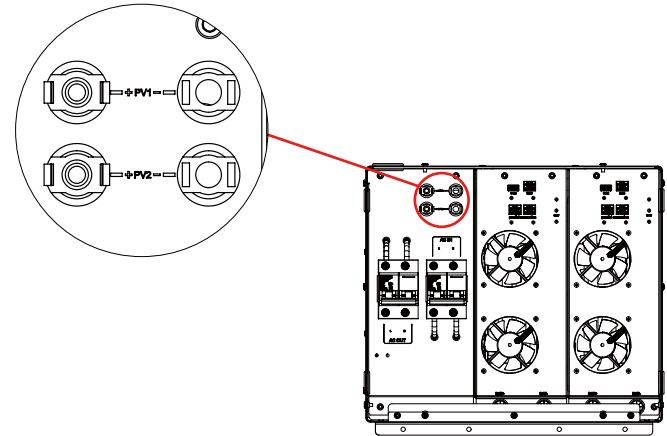
After pressing and holding ENTER button for 2 seconds, the unit will enter setting mode Press “UP” or “DOWN” button to select setting programs. Then press “ENTER” button to confirm the selection or ESC button to exit.

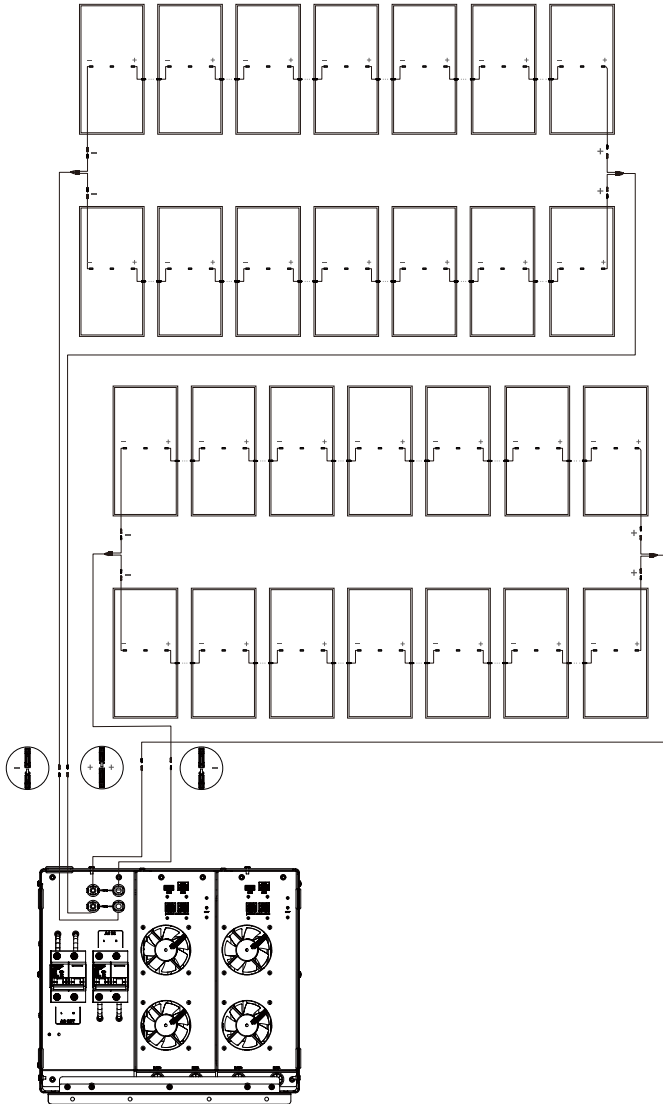


Photovoltaic Connection (220V/13kW 30kWh)

- ① Series Connection Limit: A maximum of 8 solar panels are recommended per series string.
- ② Series & Parallel Wiring Rule: If the total number of PV modules exceeds 8, straight full series wiring is strictly prohibited.
Modules must first be wired into multiple series strings (each string with no more than 8 panels), then all strings shall be connected in parallel for input.
- ③ Thread the solar panels cables through the outlet holes of the inverter one by one and fix them on the photovoltaic plug.

*** A total of 8 to 28 PV modules is recommended for the complete system.**

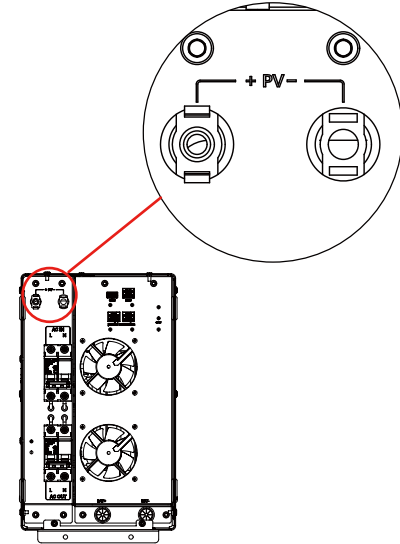


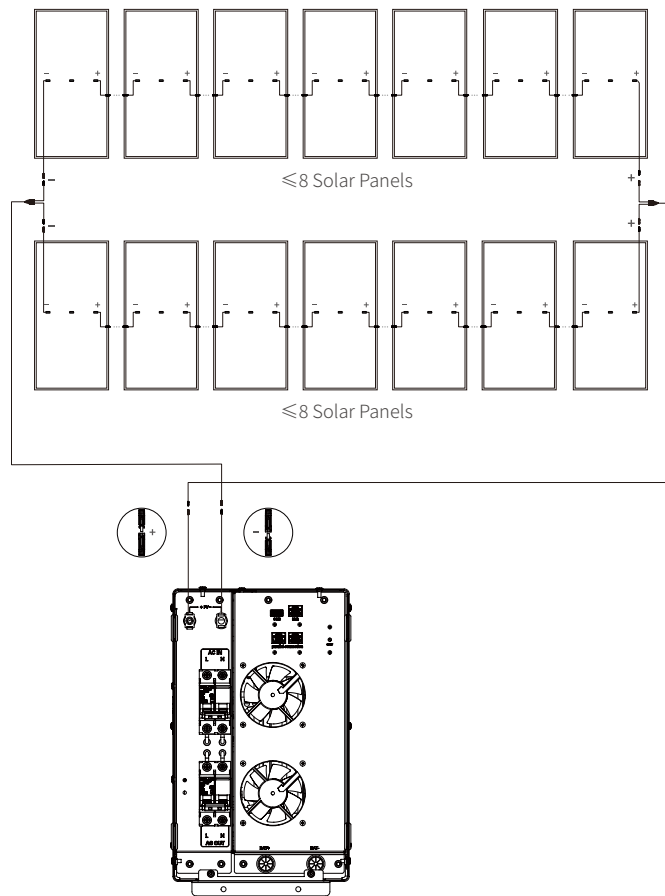


Photovoltaic Connection (220V/6.5kW 15kWh)

- ① Series Connection Limit: A maximum of 8 solar panels are recommended per series string.
- ② Series & Parallel Wiring Rule: If the total number of PV modules exceeds 8, straight full series wiring is strictly prohibited.
Modules must first be wired into multiple series strings (each string with no more than 8 panels), then all strings shall be connected in parallel for input.
- ③ Thread the solar panels cables through the outlet holes of the inverter one by one and fix them on the photovoltaic plug.

*** A total of 4 to 14 PV modules is recommended for the complete system.**



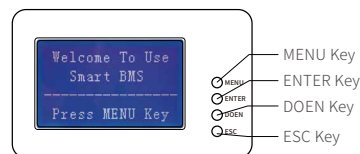


3.4 Debugging

- ① After ensuring that all cables are connected, turn on the external switch first, then turn on the internal air switch.
- ② For Smart Power Station Pro (S) battery pack, refer to the table below for battery display functions.

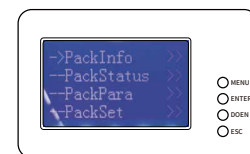
Welcome Surface

After power-on/ reactivation, the welcome screen is displayed, as shown in the below figure.



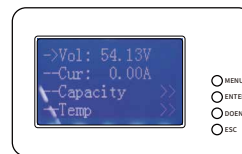
Menu Surface

Press MENU key to enter into the main menu page, as shown in the below figure:



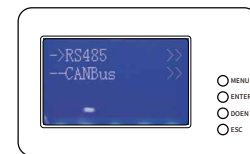
Basic Information Surface

When cursor ">" points to "PackInfo", press ENTER. The "PackInfo" page is displayed, as shown in the following figure:



Protocol Selection Surface

When cursor ">" points to "PackSet", press ENTER. The "PackSet" page is displayed, as shown in the following figure:



Button Description

1. Each item starts with ">" or "--", ">" indicates the position of the current position, press DOWN to move the cursor down. If the item ends with ">", it indicates that the item has no displayed content. Press ENTER to go to the corresponding page.
2. Press the ESC button to return to the previous directory; at any position, press the MENU button to return to the main menu page.
3. In sleep mode, press any button to activate the display.

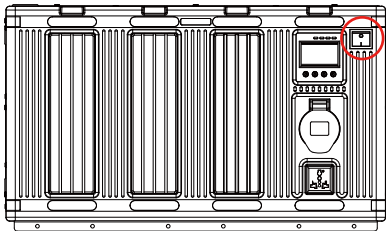
Sleep/Power Off

Under normal operating conditions, the system will enter sleep/shutdown mode after 1 minute of no button operation. In the shutdown/sleep mode, press any button, and the display will be activated.

Operation

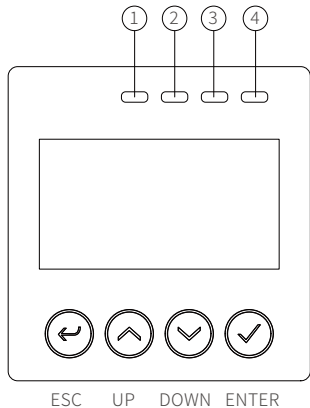
4.1 Power ON/OFF

Once the unit has been properly installed and the batteries are connected well, simply press ON/OFF switch (located on the button of the case) to turn on the unit.



4.2 Operation and Display Panel

The operation and display panel, shown in below chart, is on the front panel of the inverter. It includes four indicators, four function keys and a LCD display, indicating the operating status and input/output power information.



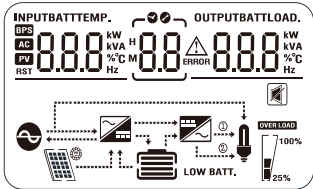
4.2.1 LED Indicator Description

LED Indicator			Messages
① AC	Status indicator (Green)	Solid On	The mains power is normal and enters the mains power operation.
		Flashing	The mains power is normal, but it has not entered mains power operation.
		Off	The mains power is abnormal.
② Inverter	Invert indicator (Yellow)	Solid On	Output is powered by battery or PV in battery mode.
		Off	Other status.
③ Charging	Charging indicator (Yellow)	Solid On	The battery is in float charging.
		Flashing	The battery is in constant voltage charging.
		Off	Other states.
④ Fault	Fault indicator (Red)	Solid On	Fault occurs in the inverter.
		Flashing	Warning condition occurs in the inverter.
		Off	The inverter is working properly.

4.2.2 Function Buttons

Button	Description
ESC	To exit setting mode
UP	To go to previous selection
DOWN	To go to next selection
ENTER	To confirm the selection in setting mode or enter setting mode

4.2.3 LCD Display Icons



Icon	Description
AC Input Information	
	AC input icon.
	Indicate AC input power, AC input voltage, AC input frequency, AC input current.
PV Input Information	
	PV input icon.
	Indicate PV power, PV voltage, PV current, etc.
Output Information	
	Inverter icon.
	Indicate output voltage, output current, output frequency, inverter temperature.
	Dual output (output1 and output2)
Load Information	
	Load icon.
	Indicate power of load, power percentage of load.
	Indicate overload happened.
Battery Information	
	Indicate battery level by 0~24%, 25~49%, 50~74% and 75~100% in battery mode and charging status in line mode.
	Indicate battery voltage, battery percentage, battery current.
Other Information	
	Indicate alarm code or fault code.
	Indicate a fault is happening.
	Indicate the alarm is disabled.

4.2.4 For battery, detailed description of battery icon as following.

In battery mode, battery icon will present Battery Capacity		
Load Percentage	Battery Voltage	Display
Load >50%	< 44.584V	
	44.584V ~ 46.74V	
	46.74V ~ 48.896V	
	> 48.896V	
50%> Load > 20%	< 47.18V	
	47.18V ~ 49.336V	
	49.336V ~ 51.492V	
	> 51.492V	
Load < 20%	< 48.48V	
	48.48V ~ 50.636V	
	50.636V ~ 52.792V	
	> 52.792V	

4.2.5 LCD Setting

After pressing and holding ENTER button for 2 seconds, the unit will enter setting mode.

Press 'UP' or 'DOWN' button to select setting programs. Then press 'ENTER' button to confirm the selection or ESC button to exit.

Notes:

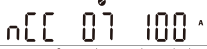
Standby mode: Inverter is not allowed to power the load. (Turn output switch to 'OFF' or inverter is abnormal)

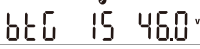
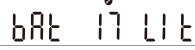
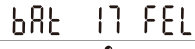
Battery mode: Inverter is allowed to power the load with PV / PV+Battery / Battery, and operates without the grid.

Grid mode: Inverter is allowed to power the load with PV / PV+Grid / Grid, and operates with the grid.

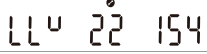
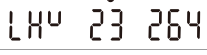
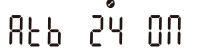
Program	Description	Setting Option	
01	Output voltage	OPV 01 230 ^v	
		230V (default) Adjustable/settable value: 208V, 220V, 230V, 240V	
02	Output frequency	OPF 02 50 ^{Hz}	
		50Hz(default) Adjustable/settable frequency: 50Hz, 60Hz	
03	Output source priority	Grid first (default)	OPP 03 GPB
		Grid provides power to the loads as first priority. Solar power will charge the battery. If solar is not sufficient to charge battery, grid will charge the battery at the same time. If grid is absent and solar is sufficient, solar will power the loads. If grid is absent and solar is not sufficient, solar and battery will power the loads. If grid is absent, solar and battery are not sufficient to power loads at the same time, inverter will go to standby and charge battery.	
		Solar first	OPP 03 PGB
		Solar energy provides power to the loads as first priority. If solar energy is sufficient, battery will be charged with solar energy. If solar energy is not sufficient to power all connected loads, Grid will supply power to the loads at the same time. If grid is absent and solar is not sufficient, solar and battery will power the loads. If grid is absent, solar and battery are not sufficient to power loads at the same time, inverter will go to standby and charge battery.	

03	Output source priority	PBG priority	OPP 03 PGB
		Solar energy provides power to the loads as first priority. If solar energy is sufficient, solar will charge the battery. If solar energy is not sufficient, battery will also supply power. If solar and battery energy are not sufficient, grid will supply power to the loads and solar charges the battery. If battery is charged to be sufficient, solar and battery will power the loads instead of grid. If grid is absent, solar and battery are not sufficient to power loads at the same time, inverter will go to standby and charge battery.	
		MKS	OPP 03 nts
		Generator provides power to loads as first priority. When generator, PV, battery all exist, the work mode is as PBG. When generator and battery exist (no PV), the work mode is as GPB. When generator and PV exist (no battery), the work mode is as GPB.	
04	Input mode	APP: Appliance (default)	nOd 04 APP
		Applied to household appliances Typical switching time is 10ms.	
		UPS	nOd 04 UPS
		Applied to computer and other devices. Typical switching time is 10ms.	
		GEN	nOd 04 GEN
05	Charger source priority	Applied to connect generator from AC IN port. Typically switching time is 20ms.	
		PNG: PV and Grid (default)	CHP 05 PNG
		PV and Grid are charged at the same time.	
		OPV: Only PV	CHP 05 OPV
		Only PV charge.	
		PVF: PV first	CHP 05 PVF
		If both grid and PV are available, PV charge. If only PV is available, PV charge. If only grid is available, grid charge.	

06	Grid charging current			Set charging current for grid chargers. The default setting is 60A. Available options: 2/10/20/30/40/50/60/70/80/90/100/110/120A
07	Maximum charging current			Set total charging current for solar and grid chargers. The default setting is 100A. Available options: 2/10/20/30/40/50/60/70/80/90/100/110/120A
08	Menu Default			During setting: Set to ON. If the current page is not on the first page and no operation with 1 minute, the system will return to display the first page. Set to OFF. If the current page is not on the first page and no operation with 1 minute, the system will stay on the current page.
09	Auto restart when overload occurs	ON(default)		
10	Auto restart when over temperature occurs	ON(default)		
11	Main input cut warning			Enable/Disable Grid or PV loss alarm. The default setting is ON. If the grid/PV input detected lost, the buzzer will sound for 5 seconds. when set to OFF, after the grid/PV input is lost, the buzzer will not sound.
12	Energy-saving mode			The default setting is OFF. When set to ON, in battery mode, if the load is lower than 25W, the system will stop output for a period then resume. If the load is still lower than 25W, the system will do the loop stop then resume. If the load is higher than 35W, the system will resume continuous normal output.
13	Overload transfer to bypass			The default setting is OFF. When set to ON, in the case of PBG (PV priority) or MKS (generator priority) mode, if there is an overload, the system will immediately transfer to bypass mode (grid power output, also known as bypass mode).

14	Silent mode setting			Enable/disable buzzer sound. The default setting is OFF. When set to ON, in any situation such as alarms or faults, the buzzer will not sound. This setting can be applied to all modes. Button sound is not effected.
15	Battery return to grid voltage point			When the battery is set to the AGM (Lead Acid Battery Type) or FLD (Flooded Battery Type) mode. The default setting is 46V, and it can be adjusted within a range of [44, 52V]. When the battery is set to LIT (Ternary lithium battery). The default setting is 47.6V. It can be adjusted within a range of [40, 50V]. When the battery is set to FEL (Lithium iron battery), the default setting is 49.6V. It can be adjusted within a range of [40, 50V]. When the battery is set to the CUS (Customer Setting Type) mode. The adjustable range is [40, 50V]. The default setting is 47.6V, and it can be adjusted within a range of [40, 50V].
16	Switching back to battery mode voltage points			After the battery shuts down due to low voltage, it needs to reach a certain voltage level to restart in battery mode. The value can be set to FUL or batery voltage. If set to FUL, the battery will only recharge to full capacity before it can restart in battery mode. When the battery is set to AGM (Absorbent Glass Mat) or FLD (Flooded) mode,The default setting is 52V. It can be adjusted within a range of [48, 58V]. When the battery is set to LIT (Ternary lithium battery) or CUS (Customer Set Type) mode. The default setting is 54.4V. It can be adjusted within a range of [46, 58V]. When the battery is set to FEL (Lithium iron battery), the default setting is 53.2V. It can be adjusted within a range of [46, 58V].
17	Battery type	AGM(default)		
		Flooded		
		Lithium (Ternary Lithium Battery)		
		FEL (Lithium iron)		
		User-Defined		

18	Battery low voltage point	
		Battery low voltage alarm setting. When the battery type is set to LIT, the default setting is 47.6V. The adjustable range for the voltage is [41.2, 50V]. Initial settings for CUS are the same as for LIT. When the battery type is set to FEL, the default setting is 48V. The adjustable range for the voltage is [41.2, 50V].
		The voltage cannot be set if the battery mode is AGM or FLD. The default setting is 44V.
19	Battery shutdown voltage point	
		The battery low voltage shutdown point setting function cannot be adjusted when the battery is defined as AGM or FLD mode. The default setting is 42V.
		When the battery type is set to LIT, the battery shutdown point can be modified. The default setting is 46V, and the adjustable range is [40, 48V]. Initial settings for CUS are the same as for LIT. When the battery type is set to FEL, the battery shutdown point can be modified. The default setting is 42V, and the adjustable range is [40, 48V].
20	Constant voltage mode voltage point setting	
		When the battery is defined in AGM or FLD mode, the voltage set point cannot be configured. The default setting for AGM mode is 56.4V, for FLD mode is 58V. When the battery type is CUS, It can be set within the range of [48, 60V] for the constant voltage charging set point. The default setting is 56.4V. It is important to note that the constant voltage set point voltage needs to be higher than the float charge set point voltage.
		When the battery type is set to LIT, the default setting is 56.4V, and it can be adjusted within the range of [48, 60V]. When the battery type is set to FEL, the default setting is 55.2V, and it can be adjusted within the range of [48, 60V]. It is important to ensure that the constant voltage set point voltage is higher than the float charge set point voltage.

21	Floating charge mode voltage point setting	
		If battery type is AGM or FLD mode, the voltage set point cannot be configured. The default setting is 54V. If the battery type is CUS, the default setting is 55.2V. The setting range is [50, 58V]. If the battery type is LIT, the default setting is 55.2V. The setting range is [50, 58V]. If the battery type is FEL, the default setting is 54.4V. The setting range is [50, 58V]. It is important to note that the constant voltage point voltage should always be set higher than the floating charge point voltage.
22	Grid low voltage point setting	
		If input mode is APP/GEN, Grid low voltage point can be set within a range of 90V to 154V. The default setting is 154V. If input mode is UPS, Grid low voltage point can be set within a range of 170V to 200V. The default setting is 185V.
23	Grid high voltage point setting	
		If input mode is APP/GEN, Grid high voltage point can be set within a range of 264V to 280V. The default setting is 264V. If input mode is UPS, Grid high voltage point is set as 264V.
24	Automatic turn off backlight	
		The default setting is ON. If ON, the backlight will turn off after 1minutes of no button operation.
25	Inverter soft start setting	
		The default setting is OFF. If ON, the inverter output gradually increases from 0 to the target voltage value. If OFF, the inverter output directly increases from 0 to the target voltage value. Setting Condition: It can be set in single-machine operation mode.

26	Reset factory setting	5td 26 OFF
		Restore all settings to factory default values. Before the setting, this interface is displayed as OFF. When set to ON, the system will restore to default settings. After the setting is completed, this interface will display OFF again. The setting can be applied immediately in mains and standby modes, but cannot be set in battery mode.
27	Parallel mode setting	PAR 27 SIG
		Set the parallel operation mode. It can be set in grid mode and standby mode, cannot set in battery mode. The default setting is SIG (single mode). When set to PAR (parallel mode), it is single-phase parallel working mode. When set to 3P1 (R phase), 3P2 (S phase) or 3P3 (T phase), it works as one phase of 3 phases system. Before using parallel system, system should be connected correctly then set the parallel mode of each unit. If some inverter in parallel system set as SIG, fault 24 will occur. If using as 3 phases system, all units should be set as one of 3P1, 3P2 or 3P3. For each phase (3P1, 3P2 or 3P3), there is at least one inverter set as. Otherwise, fault 24 will occur.
28	Parallel identity code	PI d 28 Ato
		The default setting is ATO (auto mode). Besides ATO, it also can be set as 1-9 number. If set as 1-9, each inverter in one parallel system must have a unique ID from 1-9. If ID repeat, fault 19 will occur.
29	Battery Disconnection Alarm	5bA 29 OFF
		Enable/Disable battery disconnection alarm. OFF(default). When set to OFF, there will be no battery disconnection alarm when the battery is disconnected.
30	Parallel PV only operation mode	POP 30 OFF
		Set if inverter can work during parallel operation without battery. The default setting is OFF. When the system is in parallel mode and without a battery, the PV (photovoltaic) and battery cannot operate; it can only run when connected to the grid.

31	Equalization Voltage Point Setting	E9V 31 58.4V
		The default setting for FEL battery type is 56V, setting range is [48, 60V]. The default setting for AGM/FLD/LIT/CUS battery type is 58.4V, with a configurable range of [48, 60V].
32	Equalization Charging Time Setting	E9t 32 OFF
		The function can be set as 'OFF' or active. During the equalization stage, the controller will charge the battery as much as possible until the battery voltage rises to the battery equalization voltage. Then, it will adopt constant voltage regulation to maintain the battery voltage. The battery will remain in the equalization stage until the set battery equalization time is reached. The setting range is [5, 900] with 5 minutes for every step. The default setting is OFF.
33	Equalization Delay Time Setting	E90 33 120
		The function can be set as 'OFF' or active. During the equalization stage, if the battery equalization time expires and the battery voltage has not risen to the battery equalization voltage point, the charging controller will extend the battery equalization time until the battery voltage reaches the battery equalization voltage. When the battery equalization delay setting is completed and the battery voltage is still below the battery equalization voltage, the charging controller will stop equalization and return to the floating stage. The default setting is 120 minutes, with a configurable range of [5, 900], and an increment of 5 minutes for each setting.
34	Equalization Interval Time Setting	E9I 34 30
		When the battery connection is detected during the float phase with the equalization mode turned on, the controller will start to enter the equalization phase when the set equalization interval (cell equalization period) is reached. The default setting is 30 days, the settable range is [1, 90], and the increment of each setting is 1 day.

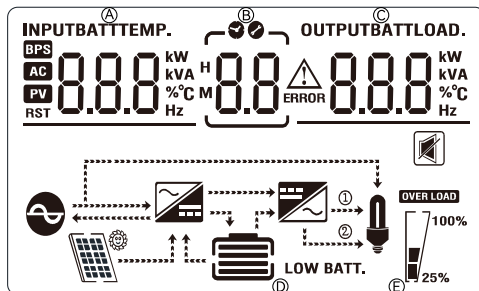
35	Enable Equalization Immediately	EQN 35 OFF
		The default setting is OFF, and the function is not turned on. If it is set to ON, in the float charging stage when the equalization mode is turned on and the battery connection is detected. The equalization charging is activated immediately, and the controller will start to enter the equalization stage.
36	Grid-tie inverter function	GtI 36 OFF
		Set whether the inverter can feed to grid or not. If the value is 'INT', the inverter can feed to grid according to different output source priority. In PGB mode when battery level is sufficient, as long as grid is connected, PV can feed energy to grid as much as possible and surplus energy of PV charges the battery. In PGB mode when battery level is NOT sufficient, PV charges battery as much as possible and surplus energy of PV feeds to grid. In GPB mode and PBG mode, as long as grid is connected, PV charges battery as much as possible and surplus energy of PV feeds to grid. In MKS mode, inverter does not feed to grid.
37	Max Grid Tie Power	GtP 37 6.5 ^{kW}
		Setting the output power value to grid. The default setting is 6.5kW. The setting range is [0, 6.5]kW. Every setting step is 0.5kW.
38	Battery dual output low voltage shutdown point	dbV 38 48.0 ^V
		When enabled, the secondary output of the inverter is enabled by default. In battery mode, when the battery voltage drops below the set point, the secondary output is turned off. When the battery voltage rises above the set value plus 1V per additional battery cell, the secondary output is turned on. The default setting is 48V, with a configurable range of [44, 60]V. When the set point is higher than the constant voltage charging (CV) point - 1V per cell, the recovery voltage is set to the constant voltage charging point.

39	Battery dual output duration	dbt 39 OFF
		When enabled, the secondary output of the inverter is enabled by default. In battery mode, when the battery discharge time reaches the set point, the secondary output is turned off. Default setting is OFF, the function is not enabled. The configurable range is [5,900] in minutes. When set to FUL, the secondary output has unlimited output time.
40	Dual output battery mode cut-off SOC	dbS 40 20 [%]
		When enabled, the secondary output of the inverter is enabled by default. In battery mode, when the battery SOC is lower than the set value, the secondary output is turned off. After the battery voltage is 5% higher than set value, the secondary output will turn on. The default setting is 20. The setting range is [5, 90] and OFF.
44	BMS Communication Function	bns 44 OFF
		The default setting is OFF, and the function is not enabled. When set to a specific BMS protocol, the inverter communicates with the lithium battery BMS through the centralized control board and obtains battery information. If the communication is abnormal after the function is enabled, alarm 56 is generated, and the inverter does not determine the running logic based on the BMS information. CVT: CVTE protocol (485) PYL: PYLON protocol (485 and CAN) GRO: GROWATT protocol (485 and CAN) VOL: VOLTRONIC protocol (485) IRF: China Tower protocol (485) PAC: PACE RTU protocol (485)
45	BMS ID	bni 45 AtO
		Setting BMS ID number to communication with. The setting value is AtO or numerical value [0, 15]. Among them, A-F represents 10-15 respectively. The default value is auto (AtO). When set to auto (AtO), system will automatically poll the BMS ID from small to large. When system poll for the first ID with a correct response, it locks the ID and only asks the BMS with that ID.

46	Low SOC Shutdown	650 46 20%
		Set the inverter to shut down when the State of Charge (SOC) of the battery is low. The default setting is 20, with a configurable range of [5, 50]. When the lithium battery SOC reaches the set value in battery mode, the inverter shuts down and generates alarm 68. The alarm 68 is cleared when the SOC returns to the set value + 5%. In standby mode, the inverter can switch to battery mode only when the SOC reaches the set value + 10%. If it does not reach this threshold, alarm 69 is generated. Once the function is enabled, alarm 69 is triggered when the lithium battery SOC reaches the set value + 5%, and it is cleared when it returns to the set value + 10%. It can be set to OFF, in which case the inverter no longer performs shutdown, startup, or alarm operations based on the SOC condition. Once the function is enabled, if a communication abnormality occurs, the inverter no longer operates based on the SOC information and clears the related alarms.
47	High SOC to Battery	566 47 90%
		Set the SOC value for the inverter to switch to battery mode. The default setting is 90, with a configurable range of [10, 100]. In PBG priority mode, when the lithium battery SOC reaches the set value in normal grid mode, the inverter switches to battery mode. Once enabled, the inverter will only switch to battery mode when the SOC is above the set point and the battery voltage is higher than the voltage point to switch back to battery mode. It can be set to OFF, in which case the inverter no longer switches from grid mode to battery mode based on the SOC condition. Once the function is enabled, if a communication abnormality occurs, the inverter no longer operates based on the SOC information and clears the related alarms.

48	Low SOC to Grid	566 48 50%
		Set the SOC value for the inverter to switch to grid mode. The default setting is 50, with a configurable range of [10, 90]. In PBG priority mode, when the lithium battery SOC reaches the set value in battery mode, the inverter switches to grid mode. Once enabled, the inverter will switch to grid mode when the SOC is below the set point or the battery voltage is lower than the voltage point to switch back to grid mode. It can be set to OFF, in which case the inverter no longer switches from battery mode to grid mode based on the SOC condition. Once the function is enabled, if a communication abnormality occurs, the inverter no longer operates based on the SOC information and clears the related alarms. When this setting is higher than the STB point, STB and STG will no longer take effect after the next activation.
61	Battery Max. Discharge Current	ndC 61 OFF
		The default setting is OFF. If the current is higher than 140A and the over-current time reaches 1 min, fault 14 will occur and inverter goes into fault mode. When set to a numerical value, it indicates the limitation current value. The setting range is [10, 140A] with a setting step of 5A. If the discharging current is over the limitation, alarm 60 will occur. If the continuous over-current time reaches 5 seconds, fault 14 will occur and inverter goes into fault mode.
63	Enable battery disconnection detection	66E 63 ON
		The default setting is ON with automatic battery disconnection detection/lithium battery activation. When it is set to OFF, the inverter maintains the battery disconnected state and no longer performs detection/lithium battery activation during operation.
64	Immediate battery detection/lithium battery activation	66E 64 OFF
		The default setting is OFF. When it is set to ON, the inverter will immediately perform battery disconnection detection/lithium battery activation when the execution conditions are met, then the settings will return to OFF.

The LCD display information will be switched in turns by pressing 'UP' or 'DOWN' key. The selectable information is switched as below order: voltage, frequency, current, power, firmware version.



- (A) See table
 (B) Page number
 (C) See table
 (D) Battery capacity
 (E) Load percentage

After enabling BMS, Page 12/13/14/15/16/17 will be available.

The selectable information is switched as below.

LCD display		Information	
INPUT AC 219 V P1 219 V	OUTPUT	Ⓐ AC input voltage	Ⓒ Output voltage
INPUT AC 500 Hz P2 500 Hz	OUTPUT	Ⓐ AC input frequency	Ⓒ Output frequency
BATT 496 V P3 280 A	BATT	Ⓐ Battery voltage	Ⓒ Charge current
PV 0 V P4 0 A	BATT	Ⓐ PV voltage	Ⓒ PV charging current
PV 0 V P5 0 W	BATT	Ⓐ PV voltage	Ⓒ PV power
OUTPUT 220 V P6 11 kW	LOAD.	Ⓐ Output voltage	Ⓒ Active power output
OUTPUT 220 V P7 12 kVA	LOAD.	Ⓐ Output voltage	Ⓒ Apparent power output
OUTPUT 220 V P8 81 %	LOAD.	Ⓐ Output voltage	Ⓒ Load percentage
P1 P9 1		Display software version	

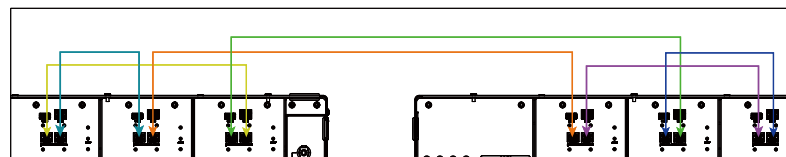
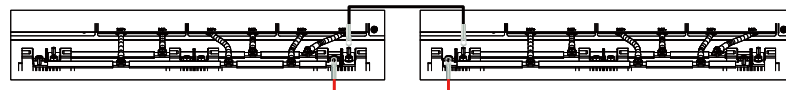
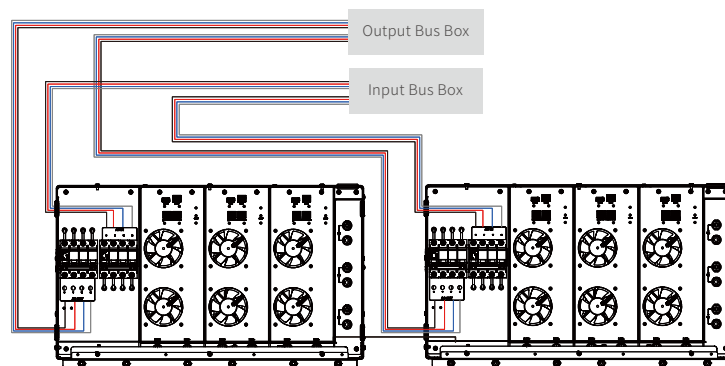
150 ^{kW} 10 22 ^{kW}	Ⓐ Total power generation Ⓒ Daily power generation
516 11 516	Parallel operation status
n0d 12 516	Ⓐ Mode Ⓒ SIG(constant): battery pack is operating as a single group; PAR(constant): battery pack is operating in multiple groups in series and parallel; PAR(Flash): battery pack is establishing a state of multiple groups in series and parallel battery
BATT 50.0 ^v 13 BATT 0.0 ^A	Ⓐ Display battery voltage from BMS Ⓒ Display battery current from BMS. When BMS communication fails, both the upper left and upper right displays will flash ERR.
27.0 ^{°C} 14 BATT 57 [%]	Ⓐ Display battery temperature from BMS Ⓒ Display battery SOC from BMS. When BMS communication fails, both the upper left and upper right displays will flash ERR.
BATT 100 15 BATT 57.7	Ⓐ Display battery rated capacity Ⓒ Display battery current capacity. When BMS communication fails, both the upper left and upper right displays will flash ERR.
C ^U 16 BATT 60.0 ^v	Ⓐ Display the fixed letter CV Ⓒ Display the BMS constant voltage charging point. When BMS communication fails, the upper right display will flash ERR.
0 17 0	Ⓐ Display BMS alarm information Ⓒ Display BMS fault information. When BMS communication fails, both the upper left and upper right displays will flash ERR.

Parallel Installation Guide

1. All inverters must be connected to the same batteries and ensure each group of cables from the inverters to the batteries in the same length.
2. Do not connect the same PV string to multiple inverters, as this may cause damage to the inverters. Each inverter is separately connected to PV.
3. To avoid overload, it is best to run the whole system properly before closing the circuit breaker on the load side.
4. Conversion time exists in the power supply system. Power supply interruption may occur for key equipment with high power supply requirements.

5.1 Two-group Parallel

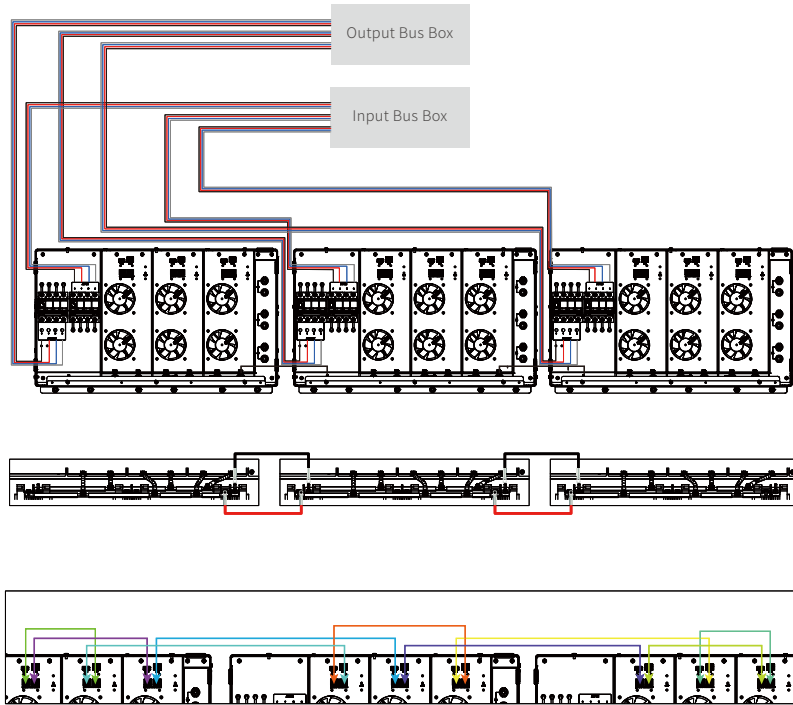
- ① Connect the battery first according to 3.2 and 3.3.1.
- ② Connect two batteries in parallel.
- ③ The mains input and output are connected to the combiner box respectively.
- ④ Connect the photovoltaic lines according to 3.3.3.
- ⑤ Establish communication as shown below.



(Wire color is only indicative.)

5.2 Three-group Parallel

- ① Connect the battery first according to 3.2 and 3.3.1.
- ② Connect three batteries in parallel.
- ③ The mains input and output are connected to the combiner box respectively.
- ④ Connect the photovoltaic lines according to 3.3.3.
- ⑤ Establish communication as shown below.



5.3 System Setting for Parallel

5.3.1 Single Phase Setting



CAUTION!

If there is a machine set to SIG in the parallel system, it will report a fault 24. If there are machines set to 3P1, 3P2, and 3P3 in the parallel system, all machines must be set to one of these three modes, and at least one machine must be set for each mode. Otherwise, all machines set to these three modes will report a fault 24.

- Step 1:** Before setting, please check if the wiring is correct. Ensure that all circuit breakers(PV, AC input, AC output battery breaker) are disconnected and that each neutral line of the inverter is connected together.
- Step 2:** Switch 'ON/OFF' switch to OFF and make sure all inverters switched to OFF. Connect battery breaker to power the inverters.
- Step 3:** If there is grid in parallel system, skip directly to step 4.
If there is no grid in parallel system, switch 'ON/OFF' switch to ON on inverter, wait until the LCD display is on. Then switch 'ON/OFF' switch to OFF and LCD display will last for a while.
- Step 4:** Set "PAR" in program 27 on the LCD.
- Step 5:** Follow step 3&4 to set all the parallel inverter.
- Step 6:** Switch 'ON/OFF' switch to ON on inverter, then connect all the breakers.

Note:

1. When setting the LCD program, the ON/OFF switch must be OFF. Otherwise, it cannot be set up.
2. The primary and slave devices are generated by competition within the system.
3. After parallel setting, when the parameters of one inverter (unrelated to parallel operation) are changed, other inverters will automatically synchronize the parameters.

PAR 27 SIG	The default setting for the inverter is SIG: single machine mode.
PAR 27 PAR	The default setting for the inverter is PAR: single-phase parallel mode
PID 28 ATO	PID: Parallel identity code. The default setting is ATO (auto mode), system will automatically assign a parallel ID.
PID 28 9	Parallel identity code can be set to 1-9, the same identical ID cannot be set for two inverters.

5.3.2 Three phase Setting

Follow the steps of Single phase setting. Most of the steps are the same except 2 points:
The first difference is when set in Program 27, it should be 3P1 for first phase, 3P2 for second phase and 3P3 for third phase.

First-phase LCD is shown	Second-phase LCD is shown	Third-phase LCD is shown
PA _n 27 3P1	PA _n 27 3P2	PA _n 27 3P3

The second difference is to verify whether the three-phase input has the correct phase sequence.

The inverter needs to be set to UPS mode. If the screen displays that the power grid cannot be connected to the system, the AC phase sequence of the system input needs to be adjusted. After the power grid is connected normally, the APP or UPS mode can be set according to actual needs.

Fault Reference Code

Fault Display



Function description: If alarm occurs, Fault indicator flashes and buzzer sounds every one second for 1 minute, then stop. If fault occurs, the fault indicator is always on, the buzzer sounds 10 seconds then stops. System will try restart automatically. If the machine does not work after six times' restart, the machine and LCD display will always in the fault status. You need to completely power off (off the screen) or wait for 30 minutes to restart the machine.

The fault LCD display is shown in the figure above. In fault mode fault icon is bright, in alarm state alarm icon is flashing, and contact the manufacturer to troubleshoot the abnormal situation according to the fault information.

Fault: The inverter enters fault mode, with a constant red LED light and LCD displaying a fault code.

Fault code sheet

Fault code	Meaning	Relevant action	Trigger conditions	Resume conditions
1	Bus boost fail	Turn fault mode	Grid soft start process starts but bus voltage does not reach set value	Restore after reaching the set voltage for 15 seconds
2	Bus over voltage	Turn fault mode	Bus voltage is higher than set value	Restore after reaching the set voltage for 15 seconds
3	Bus below voltage	Turn fault mode	Bus voltage is lower than set value	Cannot restore
4	Battery over current	Turn fault mode	Battery current is higher than set value	Cannot restore
5	System over temperature	Turn fault mode	PFC temperature is higher than set value or fan is not connected	Restore after temperature lower than set value and fan connected for 15 minutes
6	Battery over voltage	Turn fault mode	Battery voltage is higher than set value	Restore after reaching the set voltage for 15 seconds

Fault code	Meaning	Relevant action	Trigger conditions	Resume conditions
7	Bus soft start failed	Turn fault mode	Battery soft start process starts but the bus voltage has not reached set value	Restore after reaching the set voltage for 15 seconds
8	Bus short circuit	Turn fault mode	Bus voltage is lower than set value	Cannot restore
9	Inverter soft start failed	Turn fault mode	Inverter soft start process starts but the inverter voltage has not reached set value	Restore after reaching the set voltage for 15 seconds
11	Inverter under voltage	Turn fault mode	The inverter voltage is lower than the set value in battery mode	Restore after reaching the set voltage for 15 seconds
12	Inverter short circuit	Turn fault mode	Inverter voltage is less than the set value and current is higher than the set value	Restore after reaching the set value for 15 seconds
14	Over load	Turn fault mode	The load current is higher than the set value	Restore after reaching the set value for 15 seconds
17	Programming	Turn fault mode	Inverter updating or OTA	Restore after updating
18	Panel Reverse	Turn fault mode	PV reverse connection	Restore after connecting correctly for 15 seconds
19	Parallel Same ID	Turn fault mode	Same parallel ID in system	Restore when there is no identical ID.
20	Parallel Communication Fault	Turn fault mode	When communication abnormalities occur, the number of parallel devices decrease to 1	Restore after re-establishing parallel mode or adjusting to single machine mode

Fault code	Meaning	Relevant action	Trigger conditions	Resume conditions
21	Parallel Battery Differ	Turn fault mode	In parallel mode, the battery voltage difference between different machines is too large	Restore after the battery voltage of each inverter under parallel operation is consistent
22	Parallel Grid Voltage Differ	Turn fault mode	In parallel mode, the input voltage difference between different machines is too large	Restore after the grid voltage of each inverter under parallel operation is consistent
23	Parallel Grid Frequency Differ	Turn fault mode	In parallel mode, the input frequency difference between different machines is too large	Restore after the grid frequency of each inverter under parallel operation is consistent
24	Parallel Configuration Differ	Turn fault mode	In three-phase parallel mode, different machine parallel mode settings may have phase loss, or both three-phase and single-phase parallel modes may exist, or there may be single machine mode.	Restore after set to single machine operation and disconnect parallel communication, or parallel operation condition recover.
25	Parallel Sync Loss	Turn fault mode	In parallel mode, the output voltage detection loses synchronization.	Cannot restore in parallel mode or restore after change to single mode.
26	BMS Fault	Turn fault mode	Error code in BMS message.	Restore after BMS fault resolved

Alarm Reference Code

Alarm: the inverter does not enter the fault mode, LED red light flashing, LCD displays Alarm code.

ALA 51

Alarm code sheet

Alarm code	Meaning	Relevant action	Trigger conditions	Resume conditions
50	Battery open	Alarm	Battery disconnected for no more than 10 minutes	Restore after battery connected and charging for 2 minutes
51	Battery under voltage	Alarm, battery low voltage shutdown or cannot power on	Battery voltage is lower than BAU set value	Restore after the battery voltage exceeding the BAU set value by 2V
52	Battery low voltage	Alarm	Battery voltage is lower than BAL set value	Restore after the battery voltage exceeding the BAL set value by 2V
53	Battery charge short circuit	Alarm, battery does not charge	Battery voltage is less than 24V and the charging current exists.	Restore after a maximum of 1 minute when the short circuit is eliminated.
56	BMS loss	Alarm	Communication failure after BMS communication function is enabled	Restore after communication function disabled or communication success
58	Fan error	Alarm, fan operation in full speed	No fan speed signal detected	Restore after fan speed signal detected
59	EEPROM error	Alarm	EEPROM read/write exception	Can not restore

Alarm code	Meaning	Relevant action	Trigger conditions	Resume conditions
60	Overload	Alarm	The mains current/ battery discharge current/ load power is higher than the rated value.	Restore after the mains current/battery discharge current/load power is less than the rated value.
62	PV energy weak	Alarm, Turn off the PV output to the load, but keep the PV charging the battery	When the battery is not connected, the bus voltage is lower than the set value	Restore after battery connected or grid connected, or 10 minutes later.
64	Parallel Configuration Differ	Alarm, turn to standby mode	In standby mode, there is an incompatible mode setting while parallel operation	Restore after setting the parallel operation mode correctly
68	Battery under SOC shutdown	Alarm, turn to standby mode	BMS reports SOC lower than BSU set value	Restore after meeting one of the following three conditions: 1. Disable low SOC shutdown function 2. Disable BMS communication function 3. SOC is higher than the set value by 5%
69	Battery below SOC warning	Alarm, if it is in standby mode, it will remain in standby mode.	Lithium battery SOC is lower than set value+5% (grid mode or battery mode), lower than set value+10% (standby mode)	Restore after meeting one of the following three conditions: 1. Disable low SOC shutdown function 2. Disable BMS communication function 3. SOC is higher than the set value by 10%
72	Battery can not startup	Alarm	During standby, battery voltage is lower than the allowed startup voltage	Restore after the battery voltage is higher than the allowed startup voltage
77	Grid power is unstable	Alarm	Lost of grid power three times within 5 minutes	Restore after 5 mins

Trouble Shooting

Problem	Fault Event	Trigger conditions	What to do
LED screen display fault code 2	Bus voltage high	1. Check whether the total rated voltage of PV string exceeds the Max. PV open circuit voltage of inverter.	If it exceeds, reduce the PV module number.
		2. In case of parallel operation, check whether the output voltage settings of the two inverters are consistent.	If inconsistent, reset.
LED screen display fault code 3	Bus voltage low	1. Disconnect the load from inverter and restart again to observe if it recovers.	If it recovers, it indicates that there are too many impact loads and part of them should be removed from inverter.
LED screen display fault code 5	Over temperature	1. After the temperature is low, start the inverter output and check whether the fan rotates.	If the fan is not rotating, there may be a fault with the fan or its wiring.
		2. Check if the dust filter is too dirty.	If there is excessive dust accumulation, it needs to be cleaned.
		3. Check if there is a clearance space of more than 30cm around the machine.	If there is insufficient space, please refer to the user manual for reinstalling.
		4. Check if the ambient temperature is too high (above 45°C).	For example, avoid direct sunlight.
		5. Check if the air duct paper is loose.	Install the plastic nail provided by the manufacturer at the loose position
LED screen display fault code 26	BMS fault	1. Check the BMS fault information through the battery background controller.	Handle battery problems according to fault information.

LED screen display fault code 56	BMS loss	1. Check whether the communication cable is plugged into the correct port of the lithium battery.	The lithium battery may have multiple communication interfaces, which need to be plugged into the correct position.
		2. Check whether the battery dial switch setting is consistent with the protocol used.	The battery supports a variety of BMS protocols, and different protocols can be selected through the dial switch on the battery.
		3. Confirm whether the definition of battery port pin of BMS communication cable is consistent with that of inverter.	If not, replace the correct cable.
		4. Confirm whether the BMS protocol matches the inverter.	If it is not within the matching range of inverter, the Protocol shall be replaced.
		5. Replace the battery or inverter for test.	If it is normal after replacement, the communication hardware fails.
LED screen display fault code 58	Fan abnormal alarm	1. Confirm if the fan rotation is abnormal and if there is any foreign object causing obstruction.	Remove any foreign objects.
		2. Check if the fan is not connected or if the wiring is loose.	Ensure proper connection of the fan.
		3. Replace the fan to check if the fan is damaged.	Confirm damage and replace the fan.
LED screen display fault code 62	PV Energy Weak	1. Check if PV power is normal.	If abnormal, repair PV.
		2. Check if PV power is lower than load demand.	Remove part of the load.

The maintenance provision is as follows:

01. The product can be repaired free of charge if using according to the manual within the warranty period.
02. If the product is within the warranty period but one of the following occurs, the warranty is void:
 - (1) No letter of guarantee and valid proof of purchase.
 - (2) Usage mistake and/or improper repairs resulting in breakdown and damage.
 - (3) After purchasing, damage caused during transportation, moving and dropping.
 - (4) Other unavoidable external influences result in breakdown and damage.
 - (5) Using beyond the specified power and voltage.
03. Guaranteed 24 hours customer service response will be given.

Technical problems can be solved by telephone, fax, email or other online solutions. Customer service will provide professional technical guidance to help customers deal with all issues.
04. Only the above warranty, without any other express or implied warranty (including the merchantability, the specific and implied guarantee of rationality and adaptation of application), whether in contract, civil negligence or other aspects, the company shall not be liable for any special, incidental or indirect damages.

The illustrations of products, accessories, user interface, etc. in the manual are schematic diagrams and are for reference only. Due to the update and upgrade of the product, the actual product may be slightly different from the schematic diagram, please refer to the actual product.

Statement

01. The manufacturer will not undertake any loss caused by earthquake, flood, thunder or any other natural disasters, fires not caused by the product itself and theft and damage caused by accidents.
02. The manufacturer will not undertake any loss if customers connect the product with other unmatched devices.

* The below damage is not within warranty:

1. The appearance is badly broken (because of human damaging, scraping, falling down, assembling the products).
2. Water ingress (because of putting in rain or any other ways that result in products getting wet).
3. Damages caused by using other accessories which aren't standard ones with products (such as lights, equipments of other brands, and etc).

