

Detailed Installation Instructions For wall-mounted products



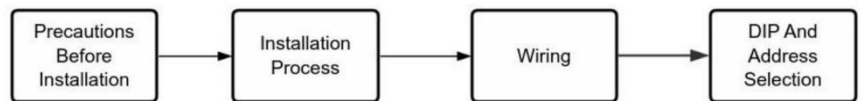
Battery: NP-W525



Inverter: KE-5K5L1EF

CONTENTS

1. NP-W525



2. KE-5K5L1EF



NP-W525

Precautions Before Installation

	Operating when the power is on is strictly prohibited during installation.
	It is strictly prohibited to install, use, and operate any outdoor equipment or cables (including but not limited to transporting equipment, operating equipment and cables, plugging and removing signal ports connected to the outdoor, working at altitude, and outdoor installation) in severe weather, such as thunder, rain, snow, and gale level 6.
	In case of any fire, evacuate the building or equipment area and press the fire alarm bell or dial the fire call. Under any circumstances, re-entry into a burning building is strictly prohibited.
	Under no circumstances should the structure and installation sequence of the device be changed without the manufacturer's permission.
	The battery terminal components shall not be affected during transportation. And, the battery terminal bolts shall not be lifted or transported.
	It is strictly prohibited to alter, damage or block the marks and nameplates on the device.
	The composition and working principle of the entire photovoltaic power generation system, as well as the relevant standards of the country/region where the project is located shall be known fully.
	After the device is installed, the empty packing materials, such as cartons, foam, plastics, and cable ties, shall be removed from the device area.

- This product is for indoor use only, and is strictly prohibited to be used in outdoor environment.
- Do not install or use this product in an environment where the temperature is lower than -10°C or higher than 50°C.
- It should be installed in a dry and well-ventilated environment to ensure good heat dissipation performance.
- The product can be installed at a maximum altitude of 2,000m.
- The installation position should be away from the fire source.
- The product should be installed and used away from children and animals.
- The installation position should be far away from water sources, such as faucets, sewer pipes, and sprinklers, to avoid entering of water.
- The device should be placed on a firm and flat supporting surface.
- Do not place any inflammable or explosive items around the device.

Installation Process

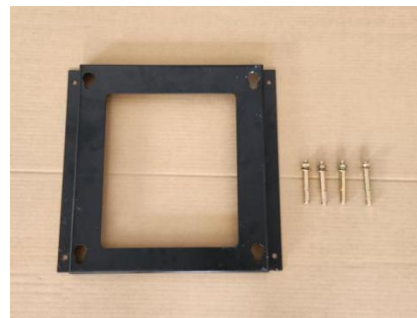
1. Read the product instructions carefully
2. Prepare installation tools

marker pen, measuring tape, impact drill, claw hammer, wrench



3. Take out the accessories in the product box

Back plate, expansion bolts



4. At least 1m above the ground, press the battery back panel against the wall, and use a marker to pass through the four small holes on the outermost side of the back panel and mark the wall
5. Use an impact drill to drill holes in the wall according to the marks. Make sure the depth and width of the holes match the expansion bolts

6. Use a claw hammer to drive the expansion bolt into the hole on the wall, and remove the nut and two washers



7. Fix the back plate to the bolts, install the washers and nuts in sequence, and then tighten the bolts with a wrench



8. Check the firmness of the back pane

9. Finally, snap the battery into the back panel



Wiring

Precautions

	<p>Before electrical connection, please ensure that the switches of the energy storage are in the "OFF" state. Otherwise, the high voltage of the device may cause electric shock.</p>
	<p>The operations related to electrical connections must be carried out by professional electrical technicians. When carrying out electrical connections, the operator must wear personal protective articles.</p>

Cable Materials

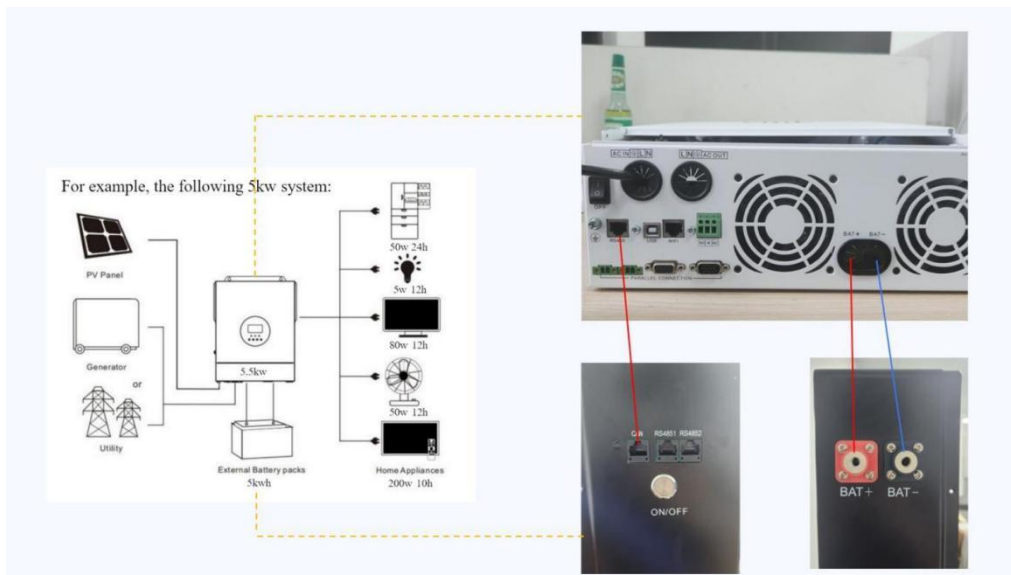
The following installation materials should be prepared by installers.

- ① Copper nose SC25-8
- ② Orange EV wire
- ③ Black EV wire
- ④ Ethernet cable

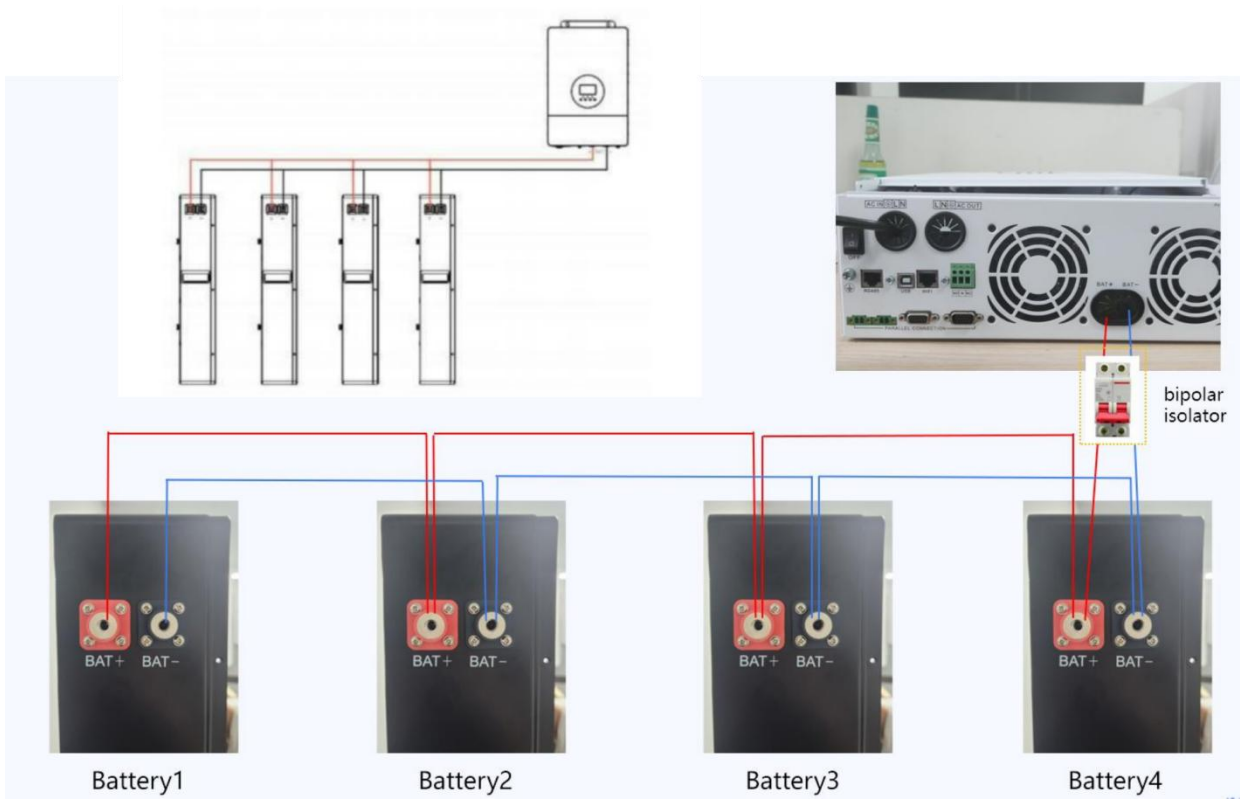
When two or more battery systems in parallel, each of them shall have a bipolar isolator. Meanwhile, the isolator shall have ability to break the full load current.

The battery and the battery are connected using the RS485-485 interface, and the battery and the inverter require the RS485-CAN interface.

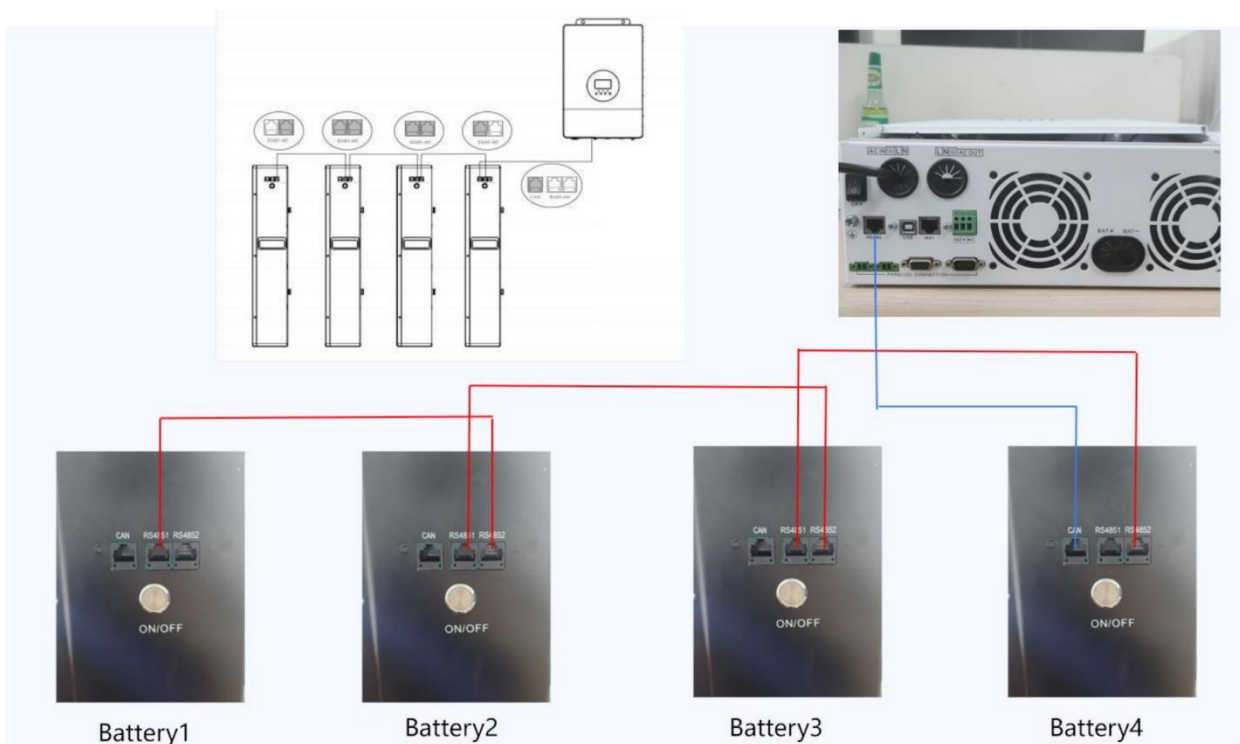
Single battery connected to inverter



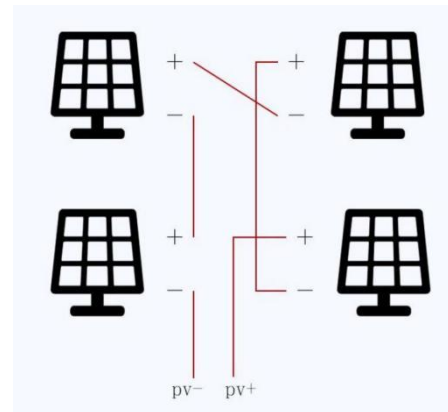
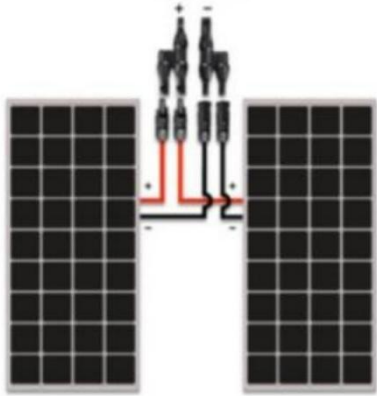
Multiple batteries connected in parallel and then connected to an inverter



Multiple batteries connected in parallel communicate with the inverter



Solar panels series connection



DIP And Address Selection

If the BMS has the automatic DIP switch function turned on and the communication line is connected to the machine, the battery pack will be automatically addressed. To enable the automatic DIP switch function, follow these steps:

- (1) Connect the communication line correctly
- (2) The host computer opens the automatic dip function

Specific operation steps refer to the [document](#)——“Host computer operation guide”

KE-5K5L1EF

Precautions Before Installation

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

- Be very careful when installing the battery. Wear safety goggles when installing a lead-acid liquid battery. Once coming into contact with the battery acid, rinse with clean water timely.
- Do not place metal objects near the battery to prevent short-circuit of the battery.
- Acid gas may be generated when the battery is charged. So, please ensure good ventilation.
- When installing the cabinet, be sure to leave enough space around the solar storage inverter for heat dissipation. Do not install the solar storage inverter and lead-acid battery in the same cabinet to avoid corrosion by acid gas generated during battery operation.
- Only the battery that meets the requirements of the unit can be charged.
- Poorly connected connections and corroded wires may cause great heat which will melt the wire insulation, burn the surrounding materials, and even cause fires. So, make sure the connectors have been tightened, and the wires are secured with ties to avoid looseness of connections caused by shaking of wires during mobile application.
- The system connection wires are selected according to a current density of not more than 5 A/mm².
- Avoid direct sunlight and rainwater infiltration for outdoor installation.
- Even after the power is turned off, there is still high voltage inside the unit. Do not open or touch the internal components, and avoid related operations until the capacitor completely discharges.
- Do not install the solar storage inverter in harsh environments such as moist, oily, flammable or explosive, or heavily dusty areas. Polarity at the battery input end of this product shall not be reversed, otherwise it may damage the device or cause unpredictable danger.
- The mains input and AC output are high voltage, so please do not touch the wiring terminals.
- When the fan is working, do not touch it to prevent injury.
- It is necessary to confirm that the solar storage inverter is the only input device for load equipment, and it is forbidden to use it in parallel with other input AC power to avoid damage.

Installation Process

1. Read the product instructions carefully



2. Prepare installation tools

marker pen, measuring tape, impact drill, claw hammer, wrench



3. At least 1m above the ground, press the inverter against the wall, and use a marker to pass through the two small holes at the top of the inverter and mark the wall

4. Use an impact drill to drill holes in the wall according to the marks. Make sure the depth and width of the holes match the expansion bolts

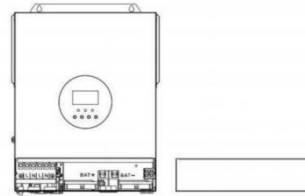
5. Use a claw hammer to drive the expansion bolt into the hole on the wall, and remove the nut and two washers

6. Fix the inverter to the bolts, install the washers and nuts in sequence, and then tighten the bolts with a wrench

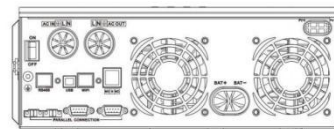


Wiring

Step 1 : Remove the terminal protection cover



Step 2 : Connect AC input and output

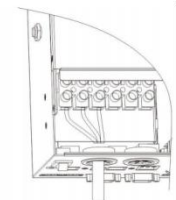


AC input/output wiring method:

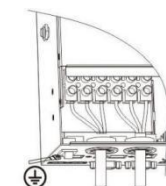
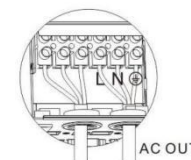
1. Before AC input/output wiring, disconnect the external breaker at first and then confirm whether the cable used is thick enough. Please refer to chapter " 2.2 Wiring Specification and Breaker type"

2. Correctly connect AC input wire in accordance with cable sequence and terminal position shown in the figure below. Please connect ground lead at first, and then live wire and null wire

: **Ground** **L: Live** **N: Neutral**



3. Correctly connect AC output wire in accordance with cable sequence and terminal position shown in the figure below. Please connect the ground wire at first, and then live wire and null wire. The ground wire is connected to the ground screw hold through O-type terminal.



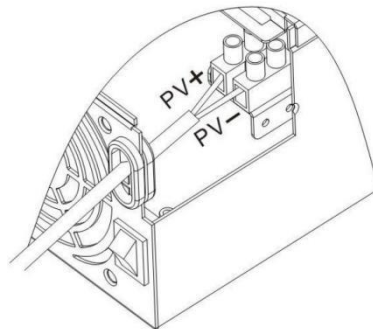
Note: The grounding wire shall be as thick as possible (cross-sectional area is not less than 4mm²). The grounding point shall be as close as possible to the solar storage inverter. The shorter the grounding wire, the better.

Step 3 : Connect PV input

1. Prior to wiring, disconnect the external circuit breaker and confirm that the wire used is thick enough. Please refer to Section 2.2 "Wiring Specifications and Circuit Breaker Selection" ;
2. Properly connect the PV input wire according to the wire sequence and terminal position shown in the figure below.

PV+: PV positive

PV-: PV negative

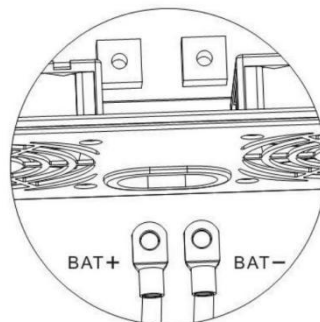


Step 4 : Connect battery terminal

1. Before wiring, disconnect external breaker at first, and then confirm whether the used cable is thick enough. Please refer to chapter " 2.2 Wiring Specification and Breaker Type " . BAT wire shall be connected with the machine via O-shaped terminal. It is recommended to use the O-shaped terminal with 6mm inside diameter. The O-shaped terminal must compress BAT wire firmly to prevent excessive heating caused by great contact resistance;
2. Correctly connect BAT wire in accordance with cable sequence and terminal position shown in the figure below.

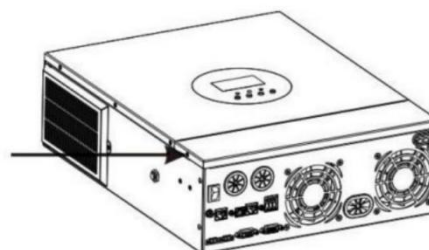
BAT+: Battery positive

BAT-: Battery negative



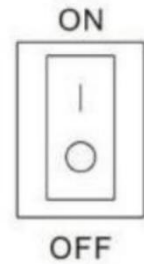
Step 5 : Inspect whether the wires are correctly and firmly connected, especially whether the positive and negative input poles of the battery are correct, whether the positive and negative input poles of PV are correct, whether AC input is inaccurately connected to AC output terminal.

Step 6 : Install protective cap of terminal



Step 7: Start the machine

At first close the breaker at the battery end, and then press the rocker switch at the lower left side of the machine to " ON " state, " AC/INV " indicator light flashes, indicating normal operation of inverter. Afterwards, close breakers of PV array and mains supply. In the end, after AC output is normal, turn on AC load one by one to avoid protection action generated by great instant impact owing to simultaneous turnon of loads. The machine operates normally in accordance with set mode.



Note: if power is supplied to different AC loads, it is suggested to turn on the loads with great impact current, and then turn on the load with little impact current after the load operates stably.

Multiple inverters in parallel

Precautions:

1. Up to six units connected in parallel.
2. When using the parallel operation function, the following connecting lines (package accessories) shall be firmly and reliably connected:

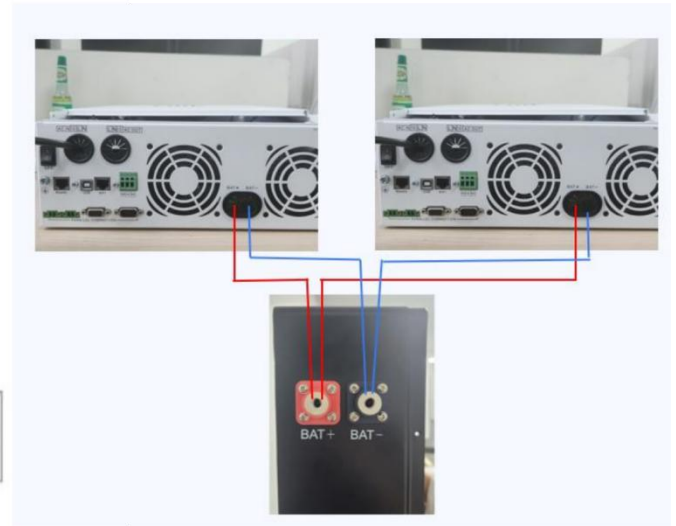
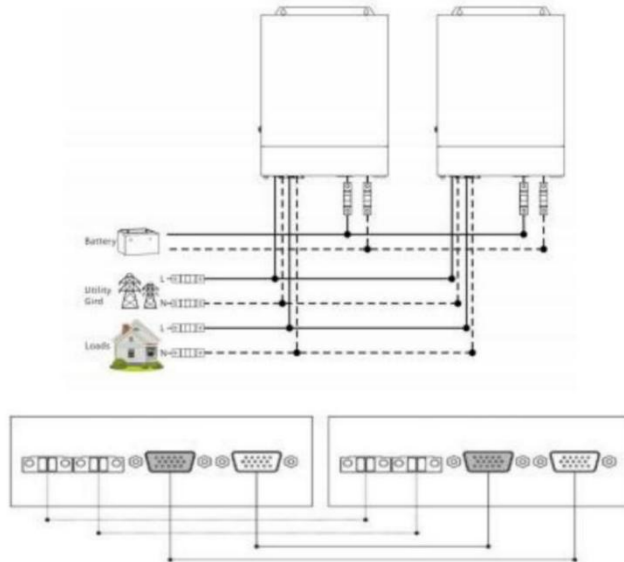
Parallel communication line*1: Current sharing detection line*1:



Parallel connection in single or three phase: Our company's parallel communication line is a DB15 standard computer cable with shielding function. Ensure the "one-in-one-out" rule when connecting each inverter, that is, connect the male connector (out) of this inverter with the female connector (in) of the inverter to be paralleled. Do not connect the male connector of the inverter to its female connector. In addition, make sure to tighten the parallel communication line of each inverter with self-contained end screws of DB15 to avoid the abnormal operation or damage of the system output caused by the falling off or poor contact of the parallel communication line.

Multiple inverters in parallel——Single-phase parallel

a) Two units connected in parallel:



Parallel connection in single phase: Ensure L-to-L, N-to-N and PE-to-PE connection for all solar storage inverters, and that the connection is correct with the same wiring length and line diameter before power on and start-up, so as to

avoid the abnormal operation of parallel system output caused by wrong connection. For specific wiring, please refer to 2.4.3 Wiring Diagram

Parallel connection in single phase: Our company's current sharing detection line is a twisted connection line. Ensure the "one-in-one-out" rule when connecting each inverter, that is, connect the current sharing line of the inverter with the current sharing green port of the inverter to be paralleled (choose one port from the two, and there is no

mandatory sequence requirement). The current sharing ports of the inverter cannot be connected to each other. In addition, make sure that the red and black current sharing connection lines of each inverter are not manually exchanged, and make sure to tighten the lines with self-contained screws to avoid the abnormal operation or damage of the system output caused by abnormal parallel current sharing detection.



AC IN wiring:

Parallel connection in single phase: Ensure L-to-L, N-to-N and

PE-to-PE connection for all solar storage inverters, and that the connection is correct with the same wiring length and line diameter

before power on and start-up, so as to avoid the abnormal operation of parallel system output caused by wrong connection. Meanwhile, it is not allowed to have multiple different AC source inputs to avoid

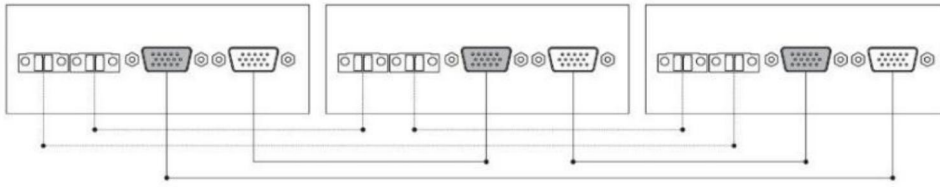
damage to the external equipment of the inverter. The consistency and uniqueness of AC source input shall be ensured. For specific wiring, please refer to 2.4.3 Wiring Diagram.

AC OUT wiring:

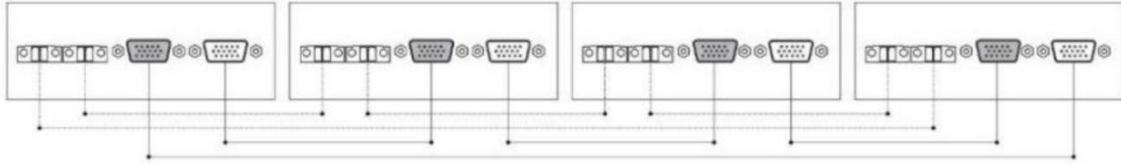
Parallel connection in single phase: Ensure L-to-L, N-to-N and PE- to-PE connection for all solar storage inverters, and that the connection is correct with the same wiring length and line diameter before power on and start-up, so as to avoid the abnormal operation of parallel system output caused by wrong connection. For specific wiring, please refer to 2.4.3 Wiring Diagram

Communication line connection

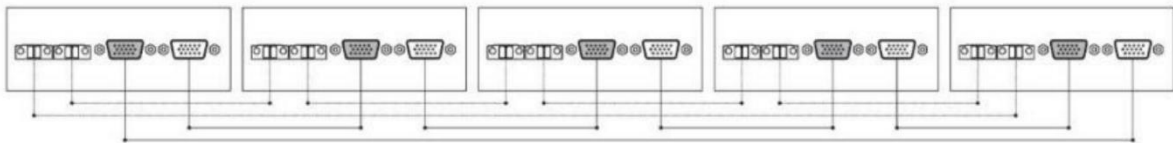
Three units connected in parallel:



Four units connected in parallel:

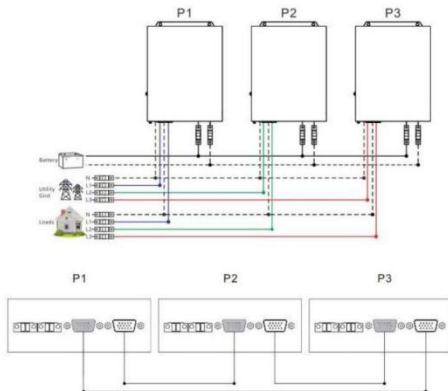


Five units connected in parallel:

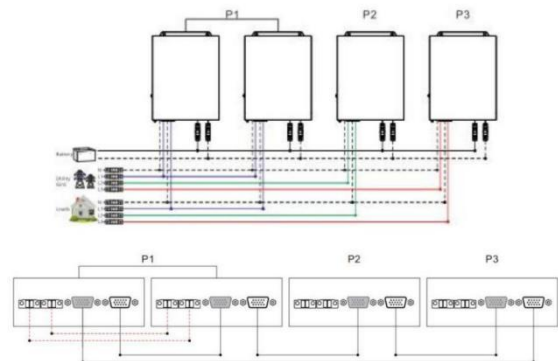


Multiple inverters in parallel — Three-phase parallel

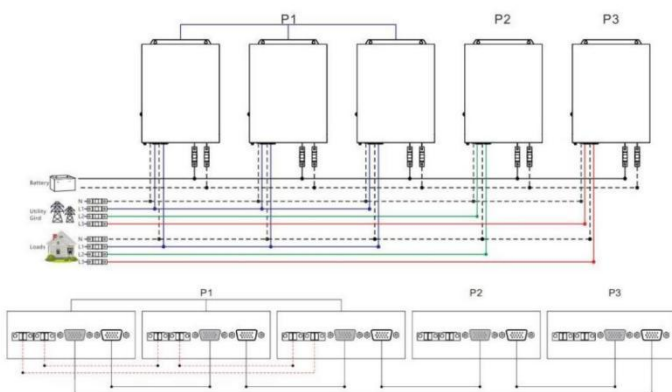
a) Three units connected in three phase:
1+1+1 system:



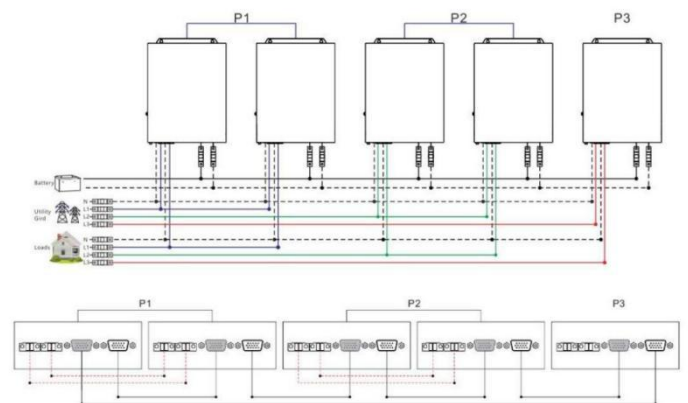
b) Four units connected in three phase:
2+1+1 system:



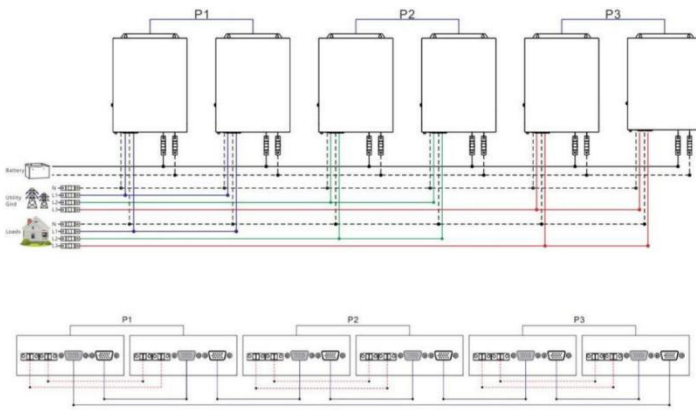
c) Five units connected in three phase:
3+1+1 system:



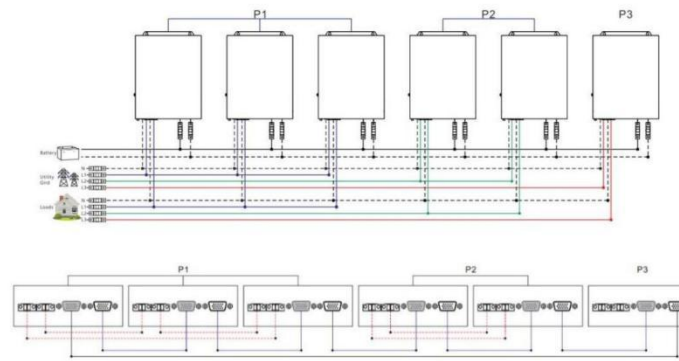
2+2+1 system:



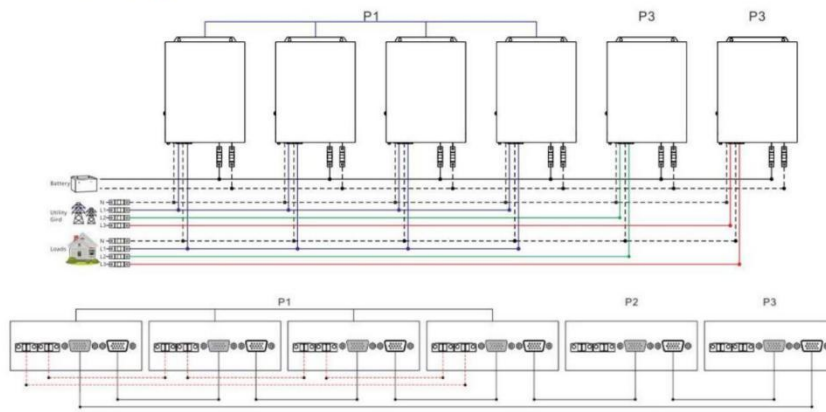
d) Six units connected in three phase:
2+2+2 system:



3+2+1 system:



4+1+1 system:



Note:

- 1) Before starting up and running, please check whether the connection was correct to avoid any abnormalities in the system.
- 2) All wiring must be fixed and reliable to avoid wire drop during use.
- 3) When the AC output is wired to the load, it shall be properly wired according to the requirements of the electrical load equipment to avoid damage to the load equipment.
- 4) Settings [38] need to be set consistently or only for the host. When the machine is running, the voltage set by the host shall prevail, and the master will force the rewrite of the other slave machines to keep the same set. Only can be set in the standby mode.
- 5) Machine factory default for single machine mode, if you use parallel or three-phase function, you need to set the [31] item parameters through the screen. The setting method is: power on one machine at a time, the rest of the machine off, and then set the [31] item parameters according to the site system operation mode. After this machine is set successfully, turn off the machine switch and wait for the machine to be powered down, then set the rest of the machines in turn until all machines are set, and then all machines are powered up again at the same time and enter the working state.

The [31] setting item:

When in single phase parallel connection : setting [31] should be set as " PAL " .

When in three phase parallel connection, setting [31] should be set as follows:

all machines in phase 1 must be set as "3P1" , all machines in phase 2 must be set as "3P2" , all machines in phase 3 must be set as "3P3" . At present, the voltage phase difference between P1-P2, P1-P3 and P2-P3 is 120 degrees. When the output voltage set in the setting [38] is 230Vac (S model), the line voltage between the live wire L1 in phase 1 and the live wire L2 in phase 2 is $230 \times 1.732 = 398\text{Vac}$, and similarly the line voltage between L1-L3, L2-L3 is 398Vac; the single phase voltage between L1-N, L2-N, L3-N is 230Vac.

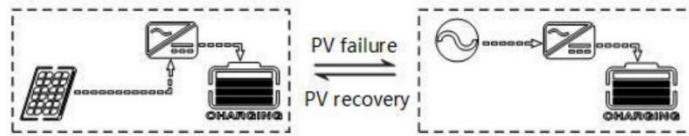
- 6) Finally, power off and start up again. After the system runs, the output voltage is measured correctly, and then the load setting is connected.

Select Mode

Charge mode

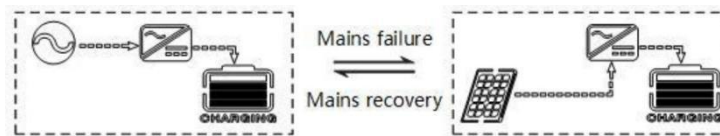
PV priority:

PV module will charge the battery preferentially, and the battery is charged by the Mains only when the PV system fails. During the day, solar energy is fully used to charge, while at night, it converts to the Mains. This can maintain battery level, and is ideal for areas where the grid is relatively stable and electricity price is relatively high.



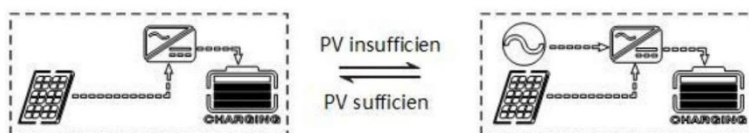
Mains priority:

The Mains supply is preferentially used to charge the battery. Only when the Mains fails, the PV charging



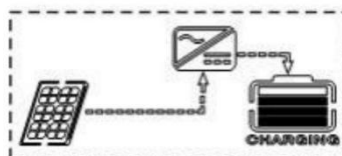
Hybrid charging:

PV and mains hybrid charging. PV MPPT charging is a priority, and when PV energy is insufficient, the mains supply supplements. When the PV energy is sufficient again, the mains stops charging. This is the fastest charging mode, suitable for the areas where power grid is unstable, providing sufficient backup power supply at any time.



Only Solar:

Only PV charging, without Mains charging. This is the most energy-efficient way in which battery is charged only by solar panels, and is usually used in areas with good lighting conditions

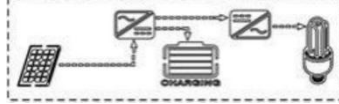


Output mode

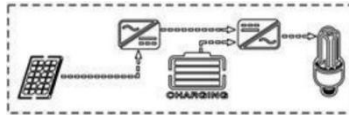
PV priority mode & Inverter priority mode:

Use PV and battery energy to power loads, with PV taking priority.

When the PV energy is greater than the load, the excess energy charges the battery:



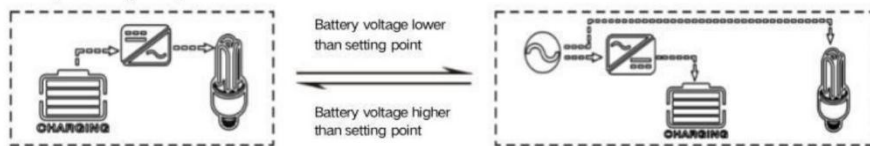
When the PV energy is less than the load, the battery replenishes the power supply



When PV is invalid, determine how to supply power based on whether or not there is BMS communication

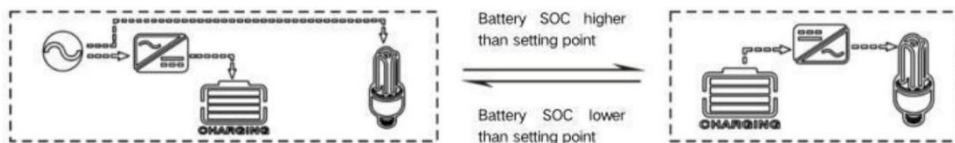
No BMS communication:

When the battery voltage is lower than [04] setting item, switch to mains power supply and charging. When the battery voltage is higher than [05] setting item, switch to PV, battery to power the load.



With BMS communication:

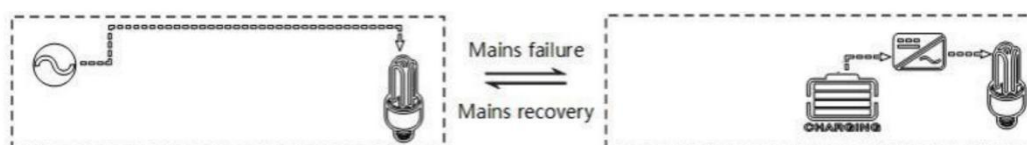
When the battery SOC is lower than the [61] setting item, switch to utility power supply and charging; when the battery SOC is higher than the [62] setting item, switch to PV, battery to power the load.



This mode maximizes the use of DC energy and is used in grid stable areas. Does not affect PV charging.

Mains priority mode:

Switch to inverter power supply only when there is no utility power, and switch to utility power charging and supply when utility power recovery. The equipment is as a backup UPS, used in areas with unstable power grid. Switching does not affect the PV charging.



NO Hybrid power supply to loads

04	Battery to mains	[04] 43.6V default	Parameter [01] = SBU, the battery voltage is lower than this setting value, the output is switched from inverter to mains, the setting range is 40V~52V. cannot be set more than [14] setting item.
05	Mains to battery	[05] 57.6V default	Parameter [01] = SBU, the battery voltage is higher than this setting value, the output is switched from mains to inverter, the setting range is 48V~60V. It cannot be set lower than [04] and [35] setting items.

14	Battery under-voltage alarm point	[14] 44V default	When the battery voltage is lower than the judgement point, an undervoltage alarm is given out and no turnoff is output. 40V~52V setting range at 0.4V step.
-----------	-----------------------------------	------------------	--

35	Low-voltage disconnect battery voltage recovery point (fault 04)	[35] 52V default	When the battery low voltage disconnects the inverter output, the battery voltage needs to be greater than this setting to restore the battery inverter AC output.
-----------	--	------------------	--

61	Switching to mains SOC setting	[61] 10% default	When the capacity is less than this setting value, switch to mains power. (Valid when BMS communication is normal)
62	Switch to inverter output SOC setting	[62] 100% default	When the capacity is greater than this setting, switch to inverter output mode. (Valid when BMS communication is normal)

Parameter settings for charging mode:

06	Charging mode	[06] CSO	PV priority charging. Only when the PV charging fails, the mains charging is started.
		[06] CUB	Mains priority charging. Only when the mains charging fails, the PV charging is started.
		[06] SNU default	PV and Mains hybrid charging. PV charging is a priority, and when the PV energy is insufficient, the mains charging supplements. When the PV energy is sufficient, the mains charging stops. Note: Only when the Mains bypass output is loaded, the PV charging and the mains charging can work at the same time. When the inverter works, only the PV charging can be started.
		[06] OSO	Only PV charging, with the mains charging not activated.

Parameter settings for output mode:

01	Work priority mode	[01] SOL	PV priority mode, when PV is invalid or battery value is lower than the parameter [04] setting value, it shall switch to AC power.
		[01] UTI default	AC priority mode, it switches to inverter only when the AC power is invalid.
		[01] SBU	Inverter priority mode, switching to mains only when the battery is under-voltage or below the value set in parameter [04]; switching to battery discharge only when the battery is fully charged or above the value set in parameter [05].