

SunESS Power

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About This Manual

This manual provides the product information, installation, operation, and routine maintenance of the three-phase energy storage system and battery. It does not contain all the information about the three-phase energy storage system.

Manual Using Instruction

In order to ensure the correct installation and operation of photovoltaic energy storage inverter. Please read the user manual carefully before installation, operation and maintenance, and follow the instruction during installation and operation.

Please keep this manual all time available in case of emergency.

Due to the product update caused by the actual deviation from the data, please refer to the actual.

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1 Introduction

1.1 Target Audience

This manual applies to trained and knowledgeable technical personnel who need to install, operate and maintain the inverter.

The public can check the specifications through this manual.

The operator applicable to this product must meet the conditions:

- Receive professional training and familiar with this product related knowledge professional.
- Familiar with regulatory standards and electrical systems, as well as various safety precautions.
- Ability to wear personal protective equipment correctly.
- Only qualified professionals are allowed to perform installation, operation, and maintenance.

1.2 Safety Instructions

Please always obedience to the safety precautions in this product manual during the operation.

This manual is subject to update due to product upgrades or other reasons. Unless additional instructions, the manual cannot replace the safety precautions on the product label. All descriptions here are for guidance only.

- Please read the manual carefully before using the product.

- Please always obedience to the safety precautions in this product manual during the operation.
- Please read the instructions and warning labels carefully before using the inverter and battery.
- Do not disassemble the inverter and battery. Please contact the after-sales service center if need maintenance.
- Please power off to prevent electric shock during installation.
- Only professionals are qualified to power the equipment.
- Please follow the steps in "Remove Inverter" to proceed effectively when disconnecting all AC or DC terminals.
- Inverter cannot connect half wave load and unbalanced load of positive and negative half cycles.

1.3 Operating Precaution

	DANGER High voltage! Do not open the shall of the working or power on inverter, the company does not assume the relevant responsibility.		Warning! If not avoided, mild or moderate injury may result.
	DANGER High temperature! Do not touch the surface when the inverter is running. High temperature may cause burns.		Please read the instructions carefully before installation.
	DANGER High voltage needs to wait! After powering off, the operator should wait 5 minutes to ensure the battery had fully discharged.		Do not be discarded into the garbage basket directly after scrapping.
	Please recycle		Protective Earth (connector)
	No stepping on		No flame
	Do not short circuit (cut off power)		Keep away from children
	Fragile		Do not get wet

1.3.1 Inverter Safety Guidelines

- Ensure that the voltage and frequency of the grid access points conform to the inverter specifications.
- Additional protective devices like circuit breakers or fuses are recommended on the AC side.
- Please ground the PV system according to the local requirements and regulations to achieve the protection for the system and personnel.
- Operation of the inverter, it is forbidden to touch hot parts (such as radiator, etc.). The burns maybe occur even the inverter is shut down. Until the equipment cools, operate the inverter with protective gloves.
- Do not disassemble the inverter casually.
- Do not connect any cable halfway when the inverter is power on.

1.3.2 Battery Safety Guidelines

- Ground the device to prevent electric shock.
- Wear insulation gloves when handling battery.
- Do not power on the device during installation.
- Please check the polarity carefully before switching on the system.
- Do not charge or discharge a defective or damaged battery.
- Do not charge the frozen battery.
- Do not remove the battery casually.
- Do not connect to other devices when the battery is running.
- Be careful when using metal tools around batteries.

2 Product Introduction

2.1 PV grid-tied/off Energy Storage System

The PV grid-tied/off energy storage system is mainly composed of PV module, PV energy storage integrated machine, grid-off load, grid-tied load and utility grid. The system diagram shown below:

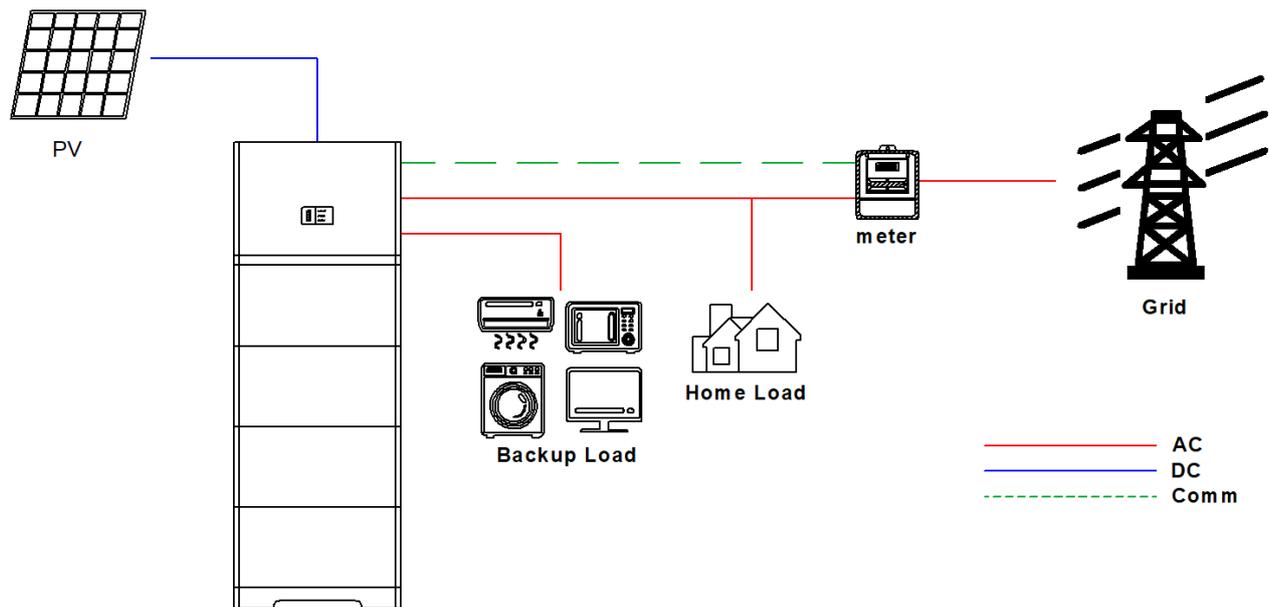


Figure 2.1-1 PV grid-tied/off energy storage system

PV module:

- When exposed to sunlight, it can convert the solar energy into electricity and supply power to the home load or charges the battery through the PV hybrid inverter;

Utility Grid:

- The system switches to the grid-off state and supply power to important loads in backup mode in the event of a power outage;
- The system switches back grid-tied state when the grid restored.

Battery:

- It can store the electricity converted by PV, increasing the proportion of self-use and reducing electricity bills by charging the battery at off-peak time and using peak time;
- It can switch to grid-off operation as backup power when grid power outages.

Application:

PV grid-tied/off energy storage system is suitable for a variety of conditions, such as:

- Constantly power backup loads in an unstable grid;
- PV self-use and not feed into the grid;
- Purchase tariff is much more expensive than feed-in tariff price;
- A large gap between the peak price and the valley price.

Inverter Model Coding:

SW5KH3UT

①

Identifiers	Meaning	Specification
①	Power Grade	<ul style="list-style-type: none"> ● 5K:Rated power is 5kW ● 6K:Rated power is 6kW ● 8K:Rated power is 8kW ● 10K:Rated power is 10kW ● 12K:Rated power is 12kW ● 15K:Rated power is 15kW

Battery Model Coding:

B40012DP03

①

Identifiers	Meaning	Specification
①	Battery module	Operating Voltage:350~450Vd.c. Reted Energy:5kWh

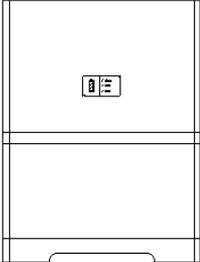
System mode:

SW5KH3UT – H4

①

②

Identifiers	Meaning	Specification
①	Inverter Model	Stacked optical storage all in one machine
②	Battery module quantity	H4 means 4 battery modules, the code from H1 to H8 means the product supports for expansion to two clusters (8 battery module).

				
Model	SW5KH3UT-H1	SW5KH3UT-H2	SW5KH3UT-H3	SW5KH3UT-H4
	SW6KH3UT-H1	SW6KH3UT-H2	SW6KH3UT-H3	SW6KH3UT-H4
	SW8KH3UT-H1	SW8KH3UT-H2	SW8KH3UT-H3	SW8KH3UT-H4
	SW10KH3UT-H1	SW10KH3UT-H2	SW10KH3UT-H3	SW10KH3UT-H4
	SW12KH3UT-H1	SW12KH3UT-H2	SW12KH3UT-H3	SW12KH3UT-H4
	SW15KH3UT-H1	SW15KH3UT-H2	SW15KH3UT-H3	SW15KH3UT-H4

2.2 Description of System Capacity

The energy storage system supports multiple capacity options. With one inverter, the system is compatible with up to 8 battery packs.

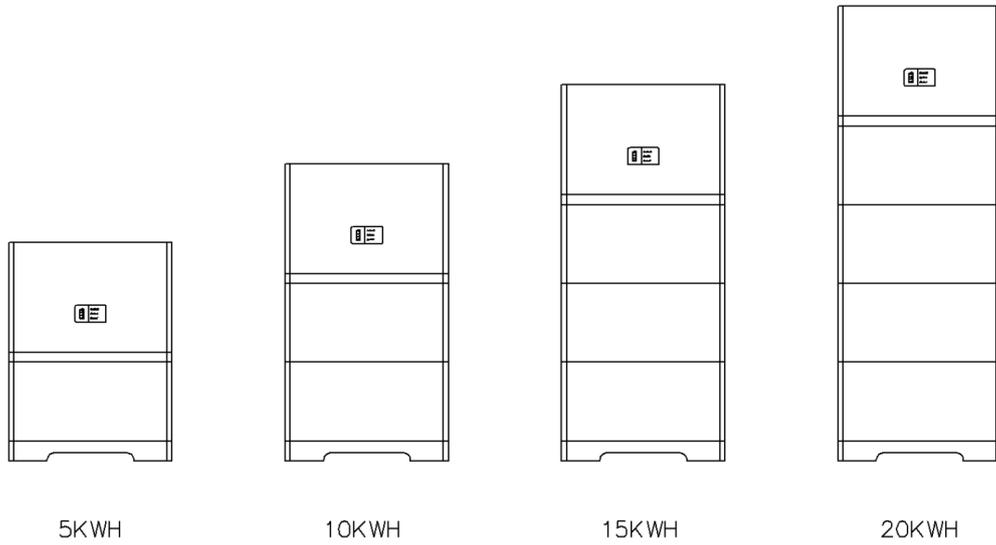


Figure 2.2-1 Description of the system capacity

Table 1 Battery parameter

Battery Pack Number	1	2	3	4
Battery Type	LiFePO4			
Battery Capacity	5 kWh	10 kWh	15 kWh	20 kWh
Available Capacity (90%DOD)	4.5 kWh	9 kWh	13.5 kWh	18 kWh
Battery Voltage Range	350~450V			
Max. Power of Charge/Discharge	2.5kW	5kW	7.5 kW	10 kW

2.3 Appearance Description

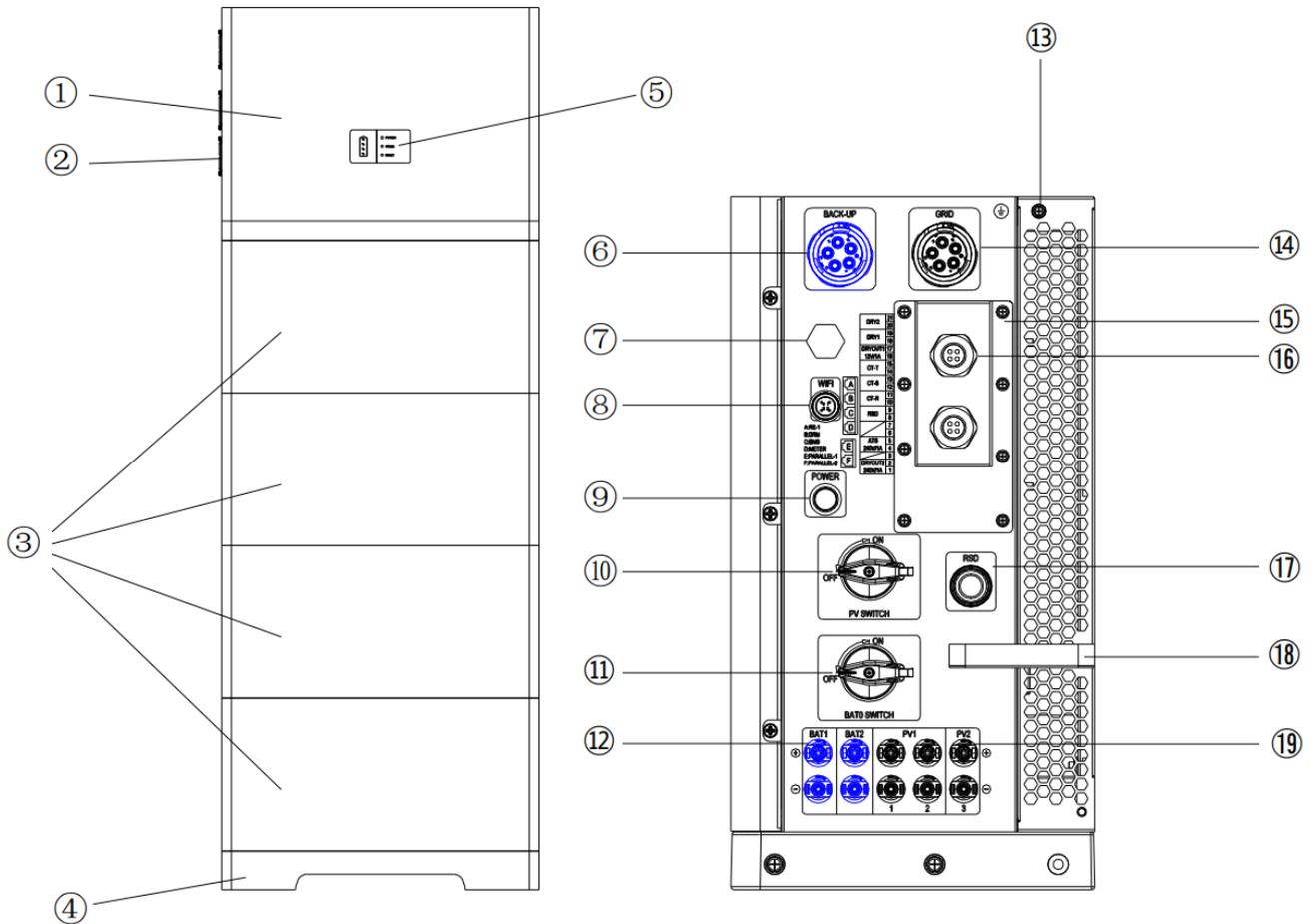


Figure 2.3-1 Appearance description

① Inverter
② External fan
③ Battery pack
④ Base
⑤ Indicator light
⑥ BACK-UP connector
⑦ Waterproof vent valve
⑧ WIFI connector
⑨ POWER switch
⑩ PV DC switch

⑪ BAT DC switch
⑫ BAT1、BAT2 connector
⑬ Protection earth (PE)
⑭ GRID connector
⑮ Communication-port waterproof cover
⑯ Waterproof lock
⑰ RSD switch or Waterproof stopper
⑱ Handrail
⑲ PV1、PV2 connector

2.4 Dimensions and Weight

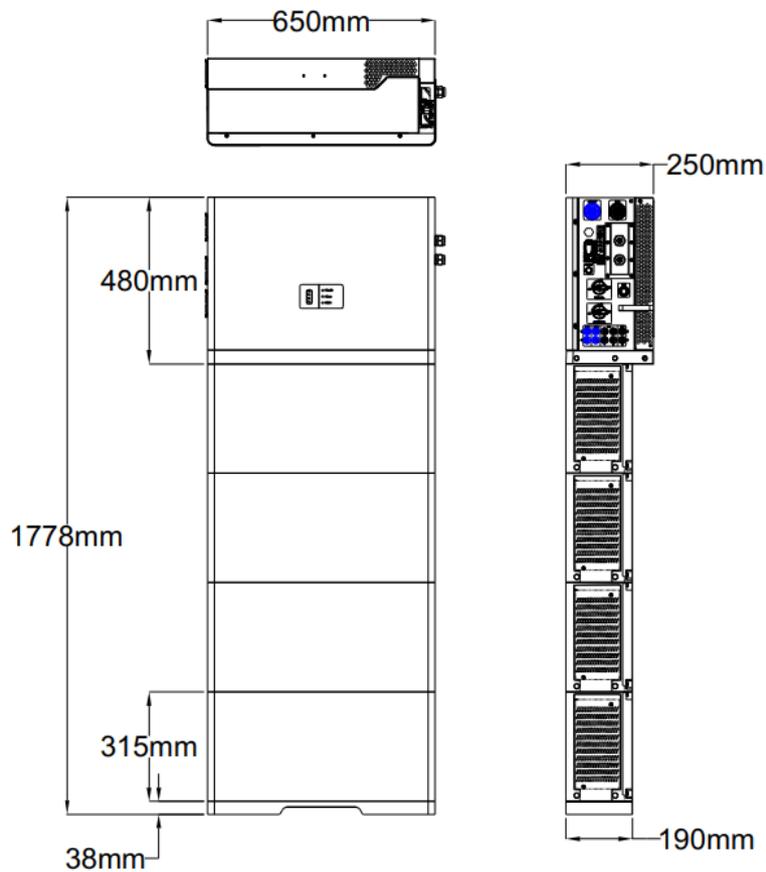


Figure 2.4-1 Dimensions

Table2 Size and weight of models

Model	Height (mm)	Width (mm)	Depth (mm)	Weight (kg)
B40012DP03	347	653	189	52kg

Note: The two battery modules overlap 32mm in height after stacking

Model	Height (mm)	Width (mm)	Depth (mm)	Weight (kg)
SW5KH3UT	480	650	250	41kg
SW6KH3U	480	650	250	41kg
SW8KH3UT	480	650	250	41kg
SW10KH3UT	480	650	250	41kg
SW12KH3UT	480	650	250	41kg
SW15KH3UT	480	650	250	41kg

2.5 Nameplate

2.5.1 Inverter Nameplate (15kW for example)

SUNWODA ENERGY Hybrid Inverter	
Model name:	SW15KH3UT
Max. PV input Vol:	1000 Vdc
MPPT voltage range:	180 - 850 Vdc
Max. PV input current:	15/30 A
Max. PV I _{sc} :	19/38 A
BAT operating Vol range:	350 - 450 Vdc
Max. BAT input/output current:	46 A
Max. Grid output apparent power:	15000 VA
Default grid voltage setting:	230/400 Vac 3W/N/PE
Rated output frequency:	50 Hz
Max. output current:	25 A
Output power factor:	0.99 (0.8i - 0.8c adj)
a.c. Output Rated power:	15000 W
Degree of protection:	IP65
Protective Class:	Class I
Operation ambient temperature:	-30°C - +60°C (de-rating above 45°C)
Conform to EN 62109-1, EN 62109-2, EN 62477-1, EN50549-1, VDE 4105, VDE 0124, EN 61000-6-1, EN 61000-6-3	
WARNING: High voltage, warning electric shock! The capacitors store hazardous energy. Do not touch while working!	
	
	
N	Made in China

2.5.2 Battery Nameplate

SUNWODA ENERGY Rechargeable Lithium Iron Phosphate Battery System	
Model: B40012DP03	Max. Charge/Discharge Current: 6A/6.5A
Nominal Voltage/Operating Voltage: 51.2Vd.c./350-450Vd.c.	
Rated Capacity/Energy/Power: 100Ah/5kWh/2.5kW	Enclosure Type: IP65
Battery Type: IFpP51/161/119[16S]E/-20+50/90	Protective Class: I
Ambient Temperature: -20°C~50°C	Weight: 52±2kg
Critical raw materials: Lithium; Phosphorus; Copper;	
Usable extinguishing agent: Water-based fire extinguisher	
Manufacturer: Sunwoda Energy Technology Co., Ltd. Address: No.18 South Tangjia Road, Fenghuang Street, Guangming District, Shenzhen, 518132, P.R.C	
	
MADE IN CHINA	

3 Installation Guidelines

3.1 Equipment Inspection

The equipment has undergone completed test and strict inspection before leaving factory. The inverter and battery leave factory with normal electrical and mechanical connection property. However, damage may still occur during transportation. Please check the product carefully before signing for it

- Check the packing case for any damage.
- Check that the inverter and battery models match your requirements.
- Check the completeness of the goods according to the packing list.
- Unpack and check all internal equipment is intact and undamaged.

Please contact the dealer as soon and provide photo evidences for service provision if any equipment damaged or uncompleted. Do not discard the original equipment packaging. It is best to store the equipment in the original packaging box after it shut down and remove.

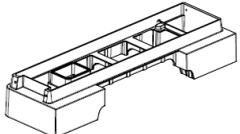
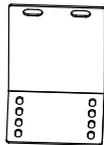
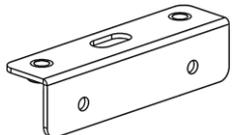
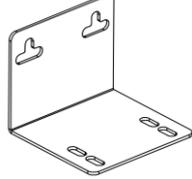
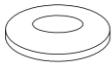
3.2 Accessories List

Please check the appearance of inverter and battery for any damage or accessories lack after opening the packaging.

Please contact the dealer for any damage or accessories lack.

- The list of inverter packaging components shown in Table 3.
- The list of optional accessories for inverters shown in Table 4.
- The list of battery packaging components shown in Table 5.

Table 3 List of inverter packaging components

 <p>Inverter *1PCS</p>	 <p>Battery Base *1PCS</p>	 <p>Screw Cover *4PCS</p>	 <p>WIFI Collector *1PCS</p>
 <p>L-shaped bracket *4PCS</p>	 <p>Battery Angle Bracket *4PCS</p>	 <p>PCS Anti Tipping Plate *1PCS</p>	 <p>M6 Large Flat Gasket *10PCS</p>

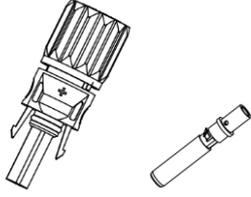
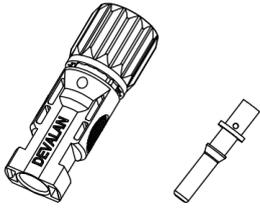
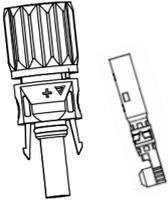
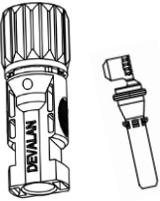
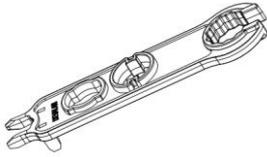
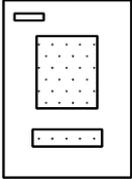
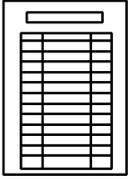
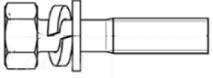
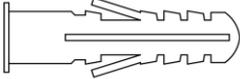
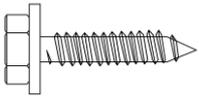
 <p>Small Five Core Plug *1PCS</p>	 <p>Five Core Plug *1PCS</p>	 <p>BAT Connection Terminal (Blue Female) *2PCS</p>	 <p>BAT Connection Terminal (Blue Male) *2PCS</p>
 <p>Connection Terminal (Black Female) *3PCS</p>	 <p>Connection Terminal (Black Male) *3PCS</p>	 <p>Remover *1PCS</p>	 <p>Cross Hexagonal Combination Screw M5*12 *10PCS</p>
 <p>User Manual *1PCS</p>	 <p>Quality Assurance Card *1PCS</p>	 <p>Delivery Inspection Report *1PCS</p>	 <p>Certificate of Conformity *1PCS</p>
 <p>Software application manual *1PCS</p>	 <p>Cross Hexagonal Combination Screw M6*14 *8PCS</p>	 <p>Expansion Tube φ6X40 *10PCS</p>	 <p>Self-Tapping Screw ST6.0X40 *10PCS</p>
 <p>Electric meter communication cable *1PCS</p>	 <p>OT Terminal *1PCS</p>		

Table 4 List of optional accessories

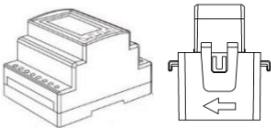
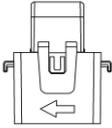
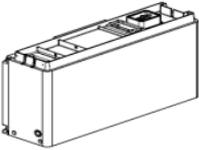
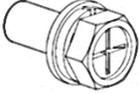
 <p>Meter + CT *1PCS+3PCS</p>	 <p>CT *3PCS</p>	 <p>Leveling foot (Optional) *4PCS</p>	
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Table 5 List of battery packaging Components

 <p>Battery Module *1PCS</p>	 <p>Product Packing List *1PCS</p>	 <p>Product Qualification Certificate *1PCS</p>	 <p>Screw Cover *4PCS</p>
 <p>Fix Screw (M5*12) *4PCS</p>			

3.3 Installation Environment

- The installation location must meet the installation requirements of the all-in-one machine.
- Ambient humidity: 10% ~ 95%RH.
- Ambient temperature: -25°C~+50°C.
- Altitude <4000m.
- Install the all-in-one machine in shaded, rainproof, or other sheltered and protected location.
- The installing wall should withstand the long-term machine load with sturdy construction.
- Avoid installing the equipment in flammable, explosive, or corrosive environments.
- Avoid directly sunlight to prevent overheating and power reduction.
- Avoid installing the inverter on buildings made of flammable or heat-resistant materials.

- Avoid children playing near the all-in-one machine to avoid unnecessary injury.

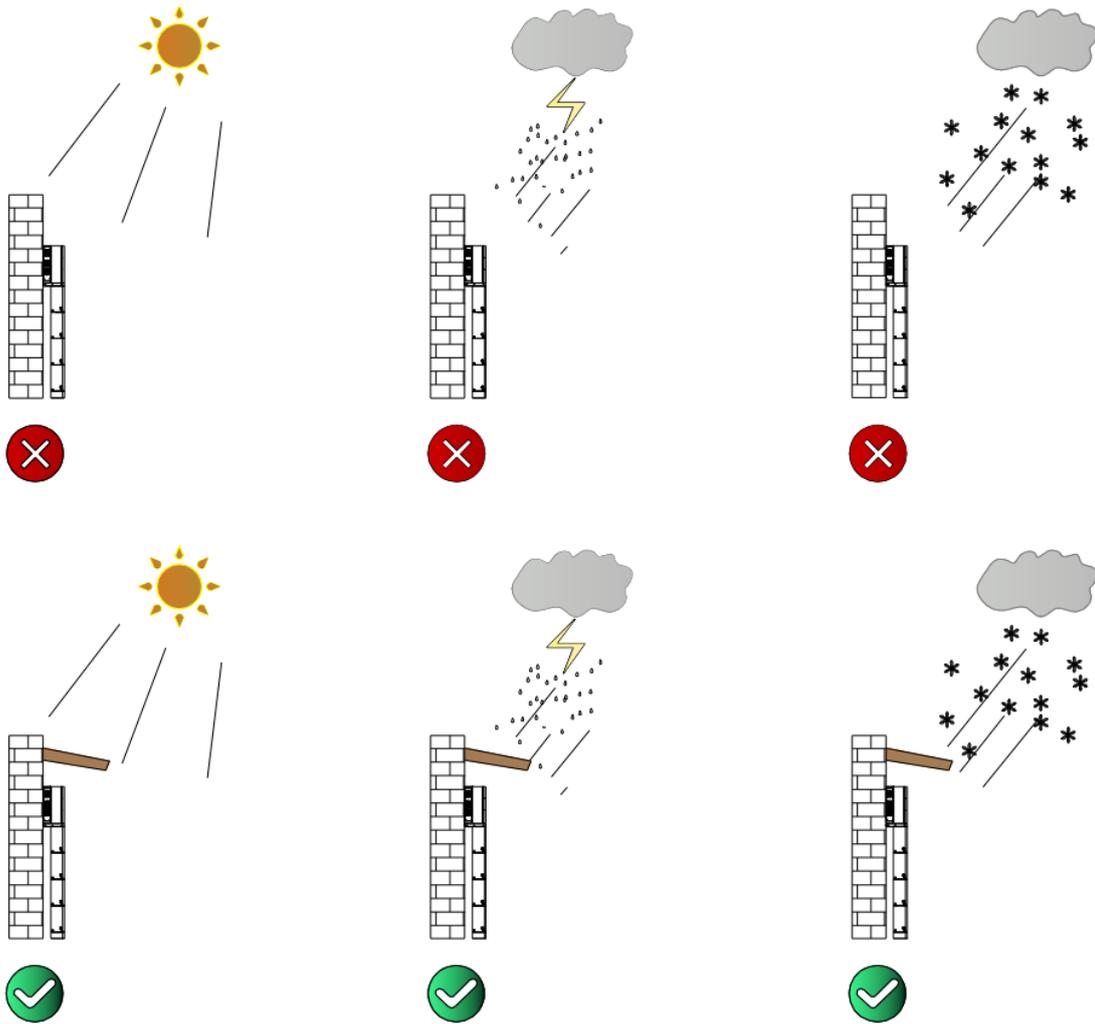


Figure 3.3-1 Installation Environment Diagram

- The equipment must be installed vertically.
- Do not install the inverter forward ($\leq 3^\circ$), backward ($\leq 3^\circ$), upside down, horizontally, or laterally.

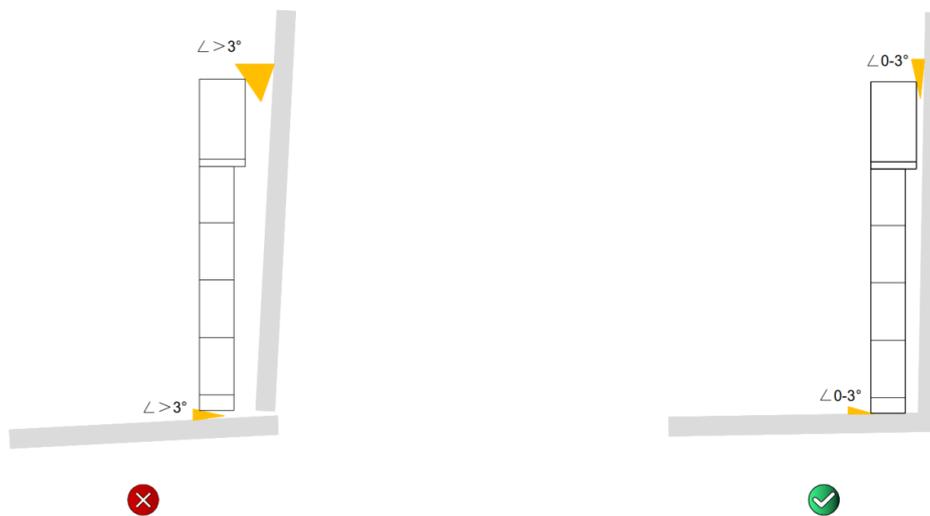


Figure 3.3-2 Installation precautions

- Reserve adequate clearance for the equipment: ensure the normal ventilation of the equipment and the convenient operation of technical personnel. The install clearance reservation diagram and table are as follows:

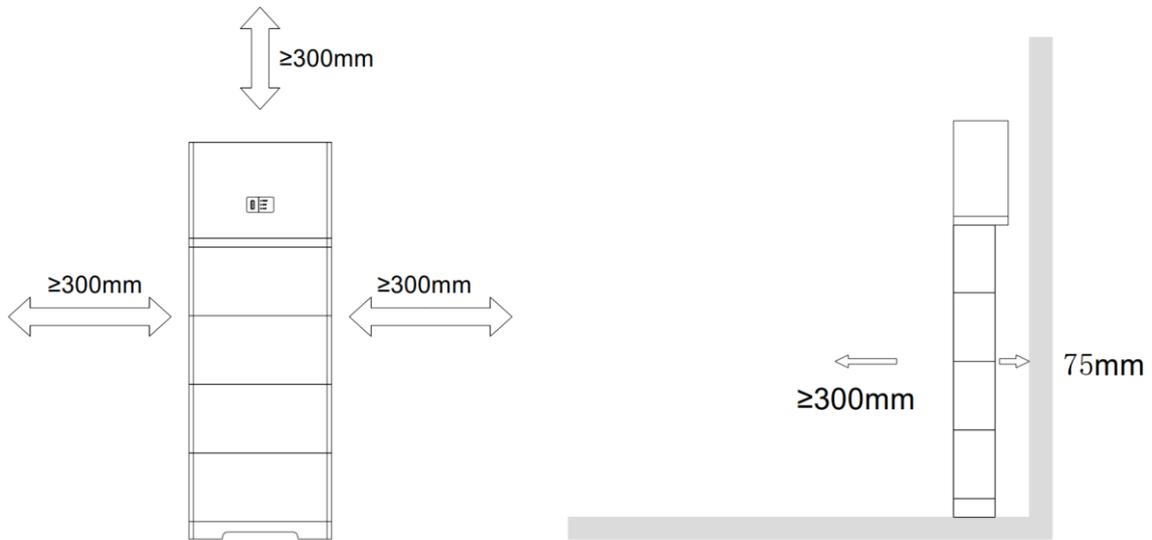


Figure 3.3-3 Install clearance reservation diagram

Table 6 Clearance reservation

Direction	Minimum Clearance (mm)
Upper side	300
Both sides	300-600
Front side	300
Rear side	75

- Reserve 300~600 millimeter between each battery cluster when install multiple parallel machine.

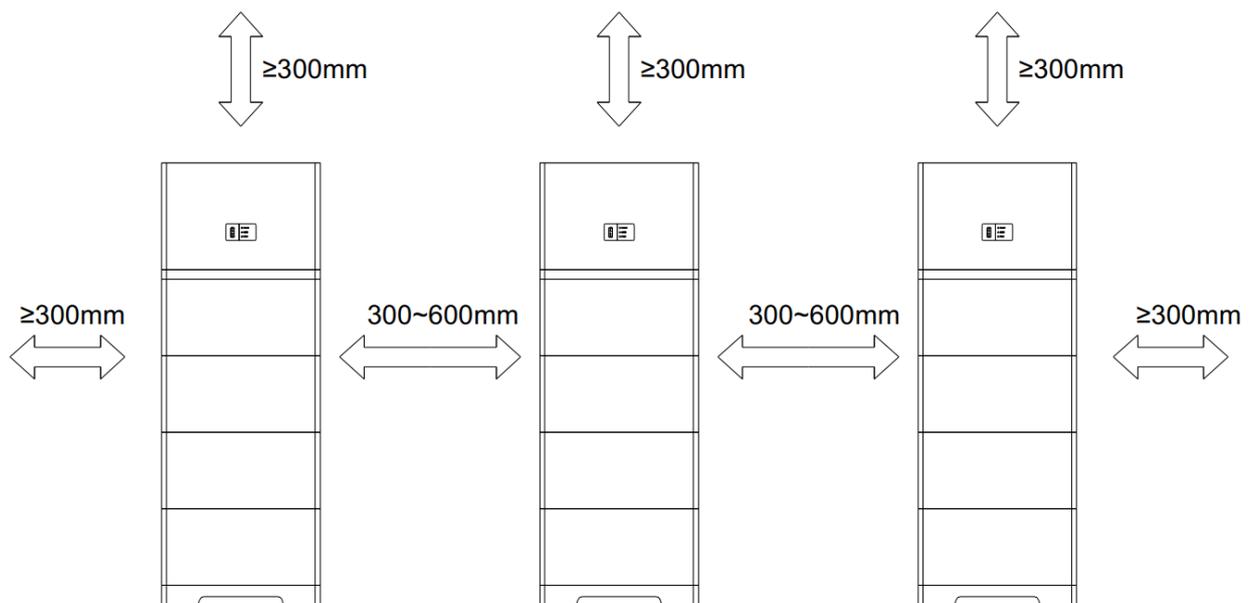


Figure 3.3-4 Multiple parallel machine installation

3.4 Preparation before installation

3.4.1 Installation precautions

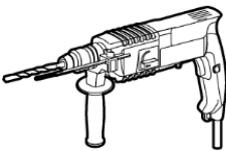
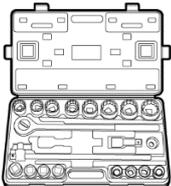
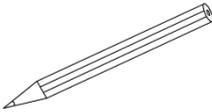
Installation location should be professional. It is very critical to ensure the machine safe operation, life cycle and performance, etc.

	<ul style="list-style-type: none"> • Ensure that the inverter has no electrical connection before installing the inverter and batteries. • Ensure to avoid the water and electricity lines in the wall before drilling.
	<ul style="list-style-type: none"> • Please read the instructions carefully before operating the equipment.

- Protection class of inverter and battery: IP65. Suitable for indoor or installation.
- The installation position should be convenient for electrical connection, operation, and maintenance.
- Two installation personnel at least. When multiple people carry heavy objects, they should consider individual physical conditions and do a reasonable division of labor to ensure balanced weight distribution.
- Wear protective tools such as protective gloves and shoes to avoid injury when handling devices manually.

3.4.2 Installation Tools

Table 7 List of Installation tools

 <p>Impact drill 10mm (25/64 in)</p>	 <p>Torque wrench 8mm & 10mm (12/64 in & 13/32 in)</p>	 <p>Marker pen</p>	 <p>Electric batch</p>
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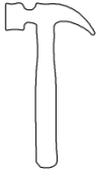
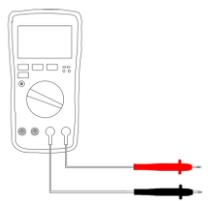
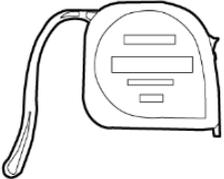
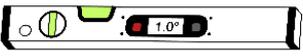
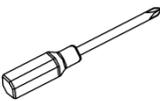
 <p>Hammer</p>	 <p>Multimeter</p>	 <p>Messmittel</p>	 <p>Level ruler</p>
 <p>Cross screwdriver</p>	 <p>Crimping pliers</p>	 <p>Wire stripper</p>	 <p>Flathead screwdriver</p>

Table 8 Personal protective equipment

 <p>Safety gloves</p>	 <p>Safety goggles</p>	 <p>Dust mask</p>	 <p>Safety shoes</p>
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3.5 Installation steps

Step 1: Place the base.

(1) Take the inverter module and base module out of the carton and put them side by side

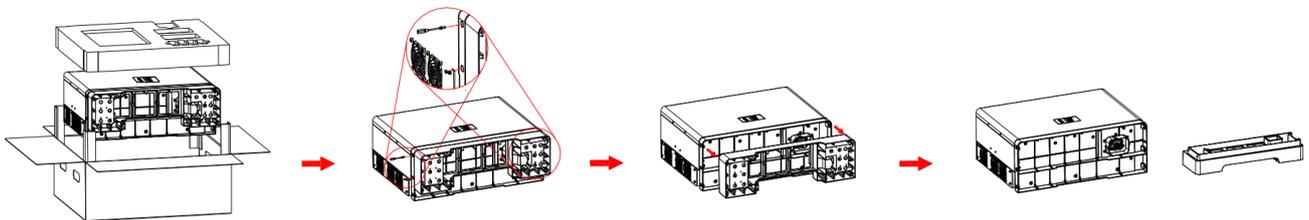


Figure3.5-1 Take out the inverter and base

(2) Check the inverter version

If there is a label on the inverter, it is the labeled version, otherwise it is the unlabeled version.

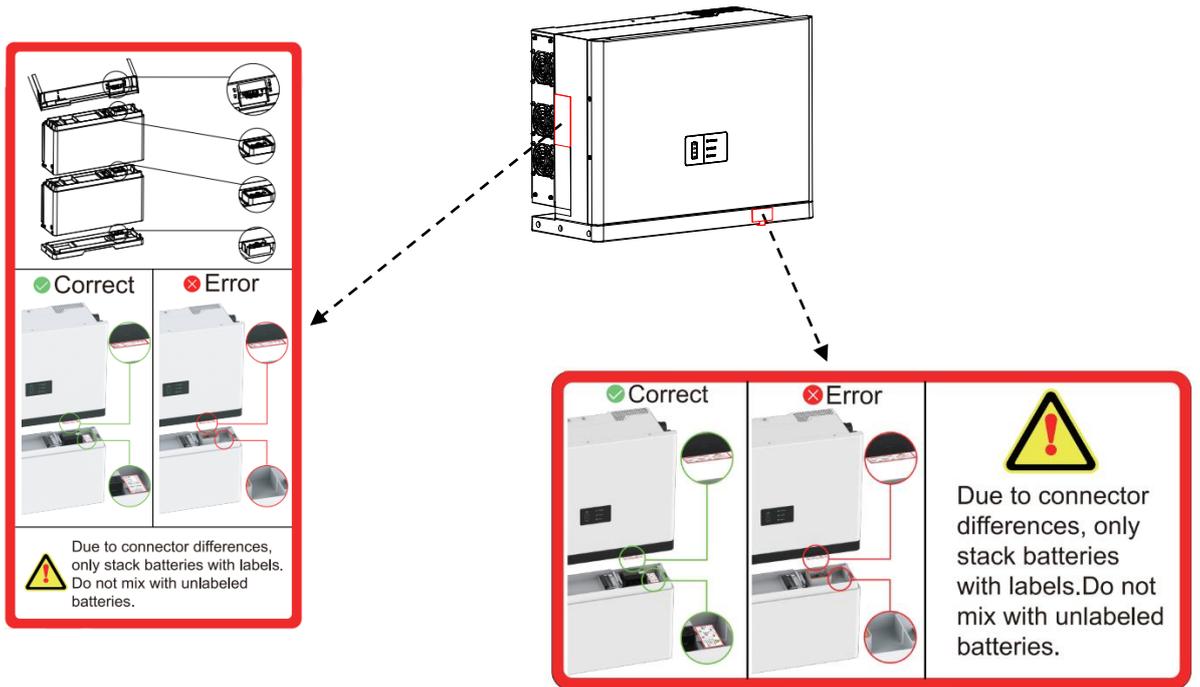


Figure3.5-2 Check the inverter version

If it's a labeled version, tear the label along the dotted line in the middle

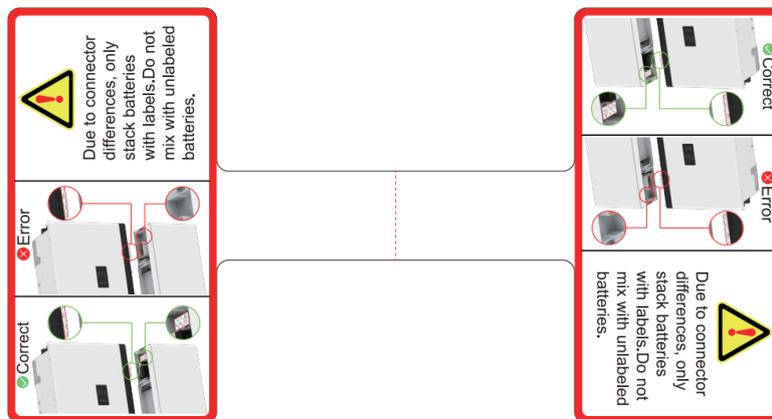


Figure3.5-3 Tear off the label on the bottom of the inverter

(3) Installation of the leveling feet (If it is a standard version, please ignore this step)

Assemble the leveling feet to the base, ensuring the locking nut of feet is flush with the bottom surface of the base.

Note: Before installing the feet, adjust feet's nut until it seats against the fixed nut.

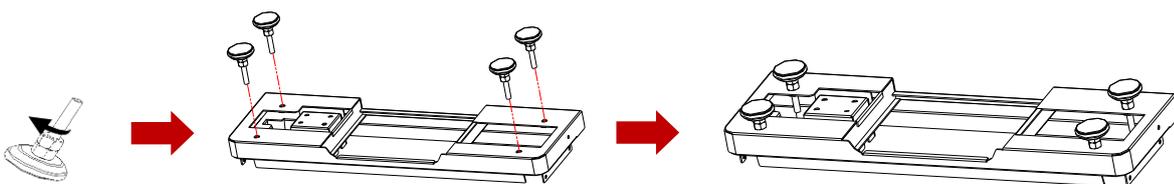


Figure3.5-4 Installation of the leveling feet

(4) The base module should be placed on a level ground, parallel to the wall. The clearance to the wall should be 75mm.

* (base module Cannot be installed in a water-wading area)

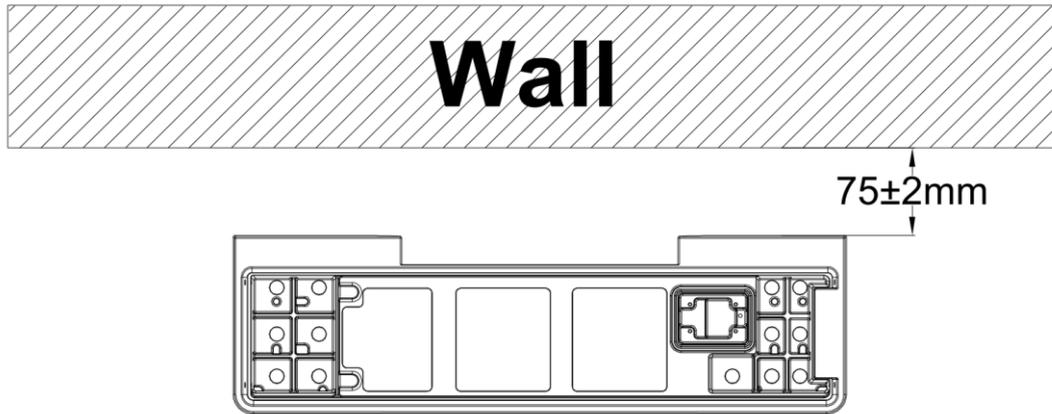


Figure3.5-5 Top view of base mounting

(5) Rotate the locking nuts of feet with a wrench, until the leveling bubble of level ruler is centered. Then tighten adjusting nuts of feet upward until they fully contact the base, and securely lock it in position. (If it is a standard version, please ignore this step)



Install the leveling feet must installed wall-against bracket (angle bracket + L-bracket)

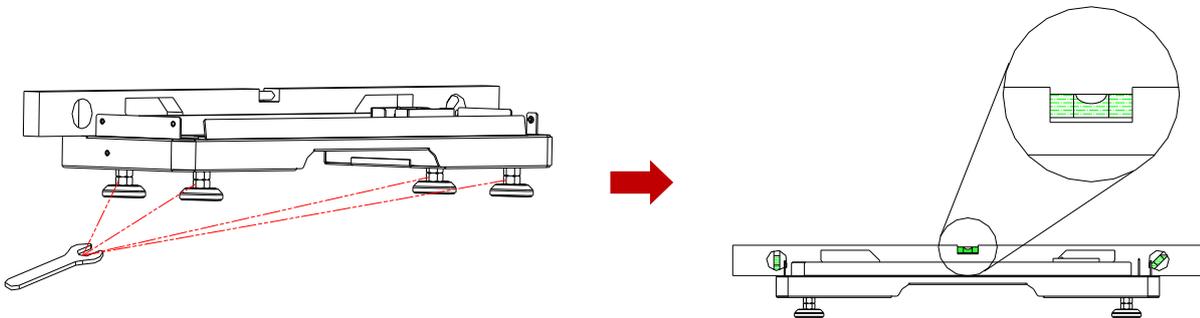


Figure3.5-6 Fixed leveling foot

Step 2: Check the battery module version

If there are waterproof cover with label on battery module connector, it is the labeled version. Otherwise, it is the unlabeled version.

Before stack battery modules, please remove the waterproof cover and break the connection between cover and label.



Please stack and install the labeled products. Do not stack labeled and unlabeled products together. Unlabeled products can only stack with unlabeled ones.

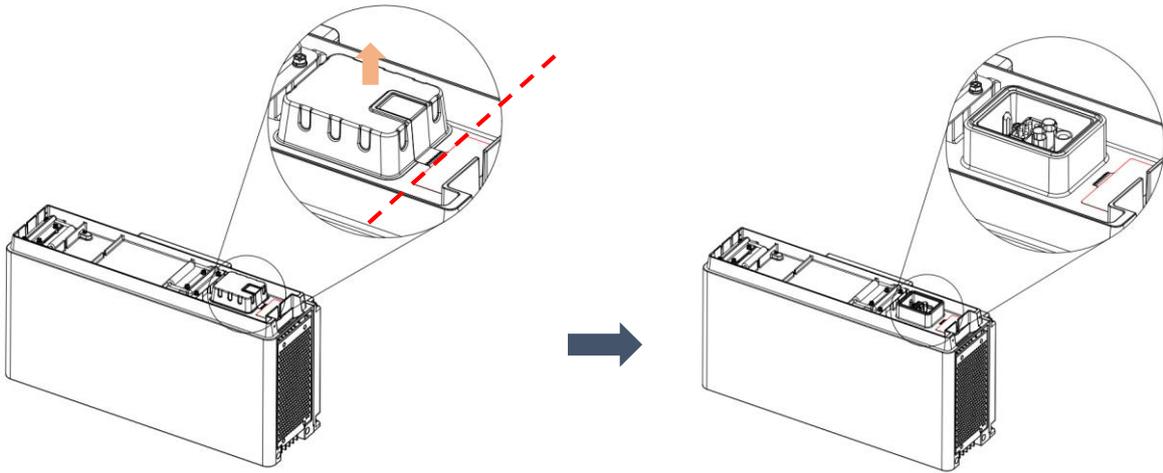
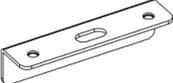


Figure3.5-7 Remove the waterproof cover

Step 3: Install battery fixing bracket

Battery Angle bracket	-	2PCS	
Fixing screw M5*12	M5*12	4PCS	

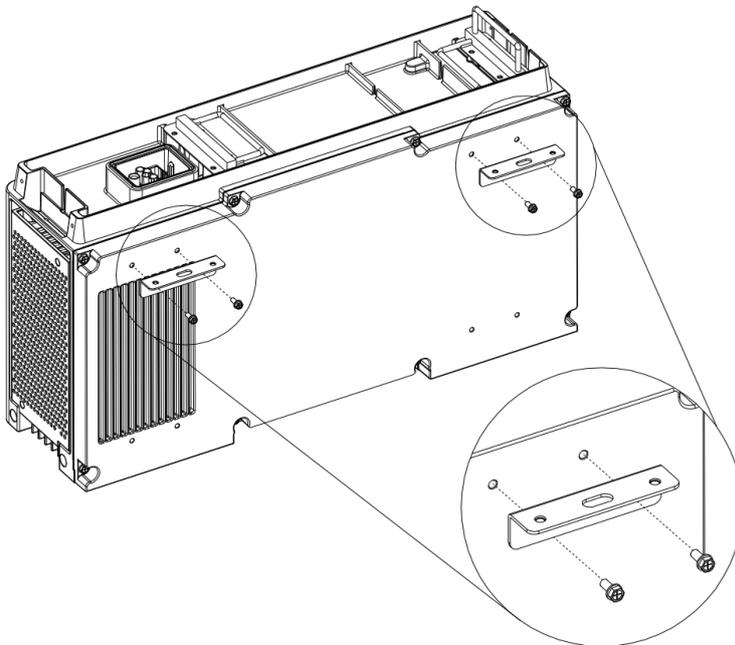
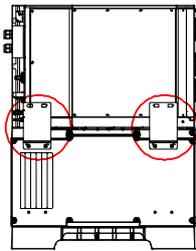
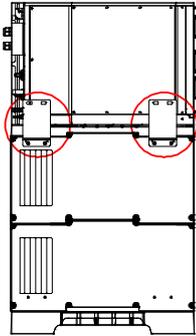
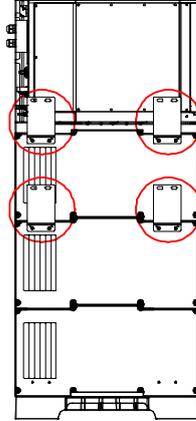
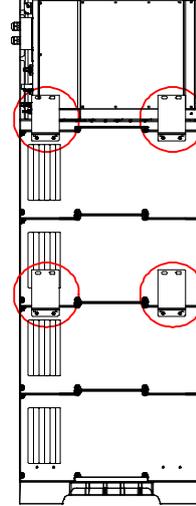


Figure3.5-8 Install fixing screws

Refer to the following for the recommended the wall mounting assembly (angle bracket + L-bracket) installation:

			
1 pcs mounting assembly on Batt. No.1	1 pcs mounting assembly on Batt. No.2	2 pcs mounting assembly on Batt. No.2 Batt. No.3	2 pcs mounting assembly on Batt. No.2 Batt. No.4

Step 4: Stack battery module

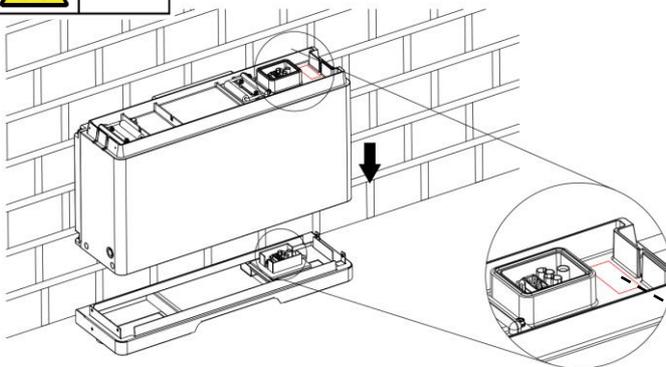
(1) Before stack battery module, please check the battery module version and remove the waterproof cover.



Please stack and install the labeled products. Do not stack labeled and unlabeled products together. Unlabeled products can only stack with unlabeled ones.



Unit weights 50kg (110.2lbs). Two or more people are necessary. Align the connector side first, then stack gently to avoid damaging the connector!



Pay attention to check the module is labeled or not.

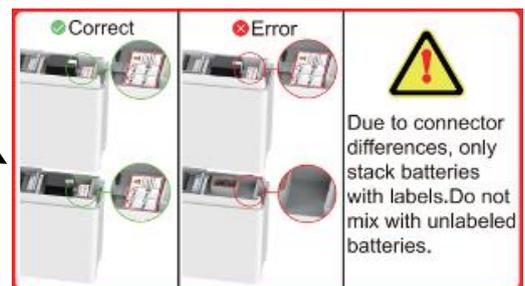


Figure3.5-9 Stack battery packs

(2) Fasten the installed battery module

Fixing screw M5*12	M5*12	4PCS	
Screw cover	-	4PCS	

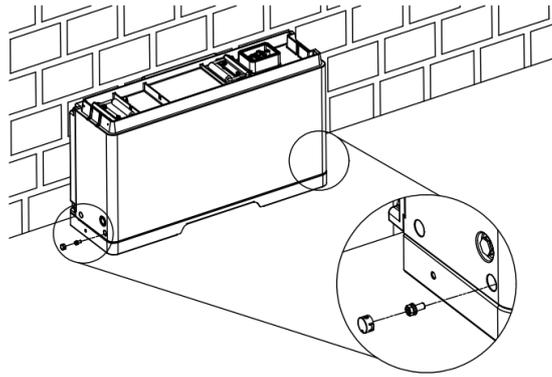


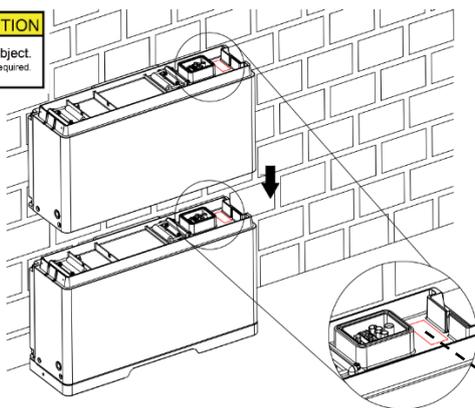
Figure3.5-10 Fasten the installed battery module

(3) Adding additional battery module. Before stacking the battery packs, please carefully inspect each battery terminal seal to ensure it is securely fixed.

Fixing screw M5*12	M5*12	4PCS	
Screw cover	-	4PCS	



Please stack and install the labeled products. Do not stack labeled and unlabeled products together. Unlabeled products can only stack with unlabeled ones.



Pay attention to check the module is labeled or not.

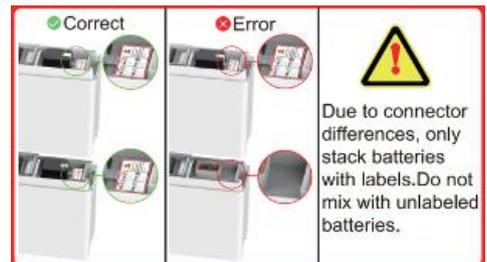


Figure3.5-11 Adding additional battery module

Fixing screw M5*12	M5*12	4PCS	
Screw cover	-	4PCS	

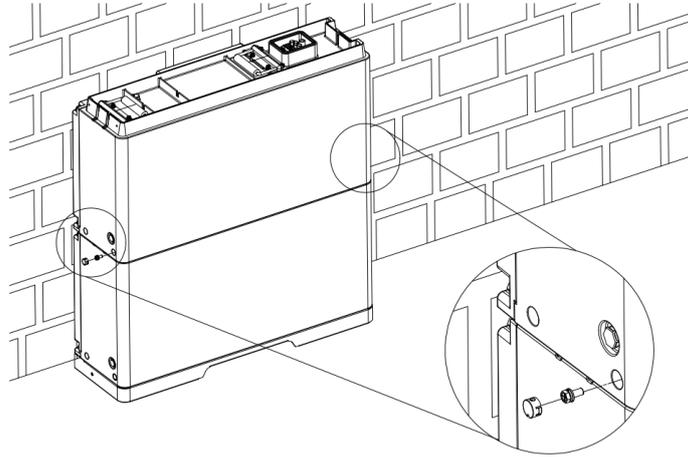
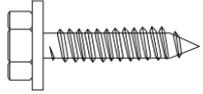
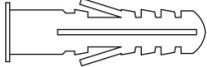
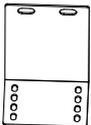
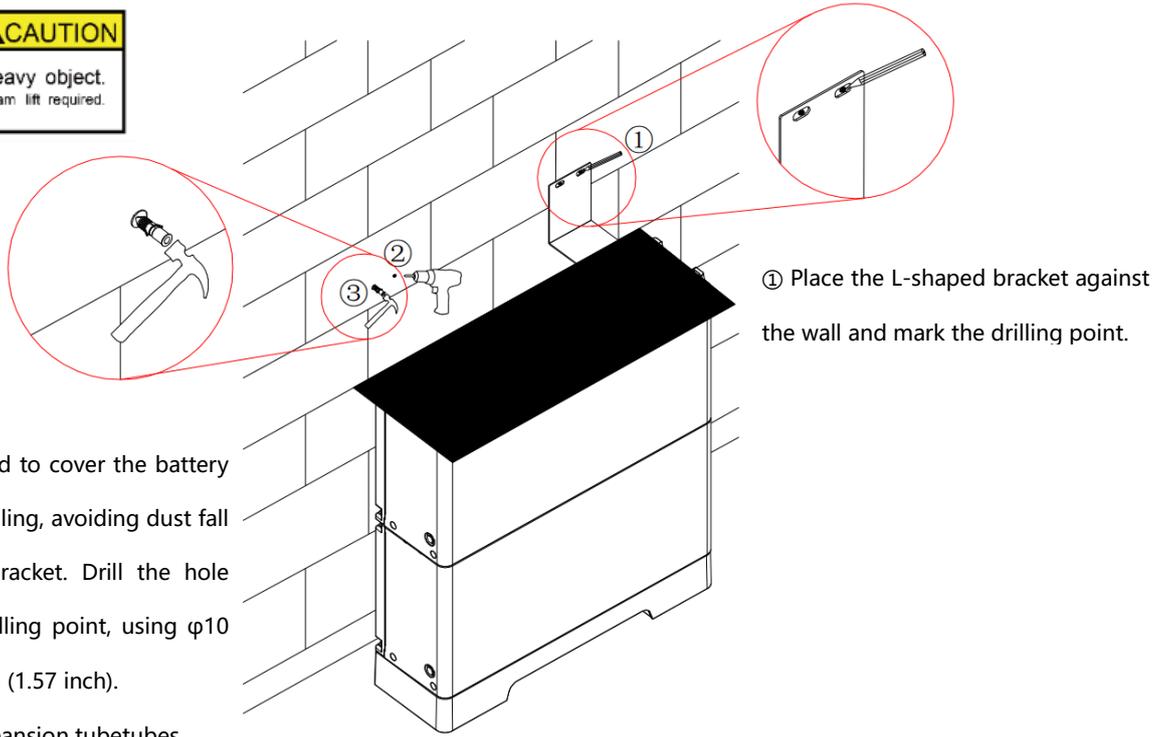


Figure3.5-12 Fasten the installed battery module

(4) Install L-bracket

Self-tapping screws	ST6.0x40	8PCS	
Fixing screw M6*14	M6*14	8PCS	
Screw cover	-	4PCS	
Expansion tube	φ6x40	8PCS	
Large Flat Gasket	-	8PCS	
L-shaped bracket	-	4PCS	

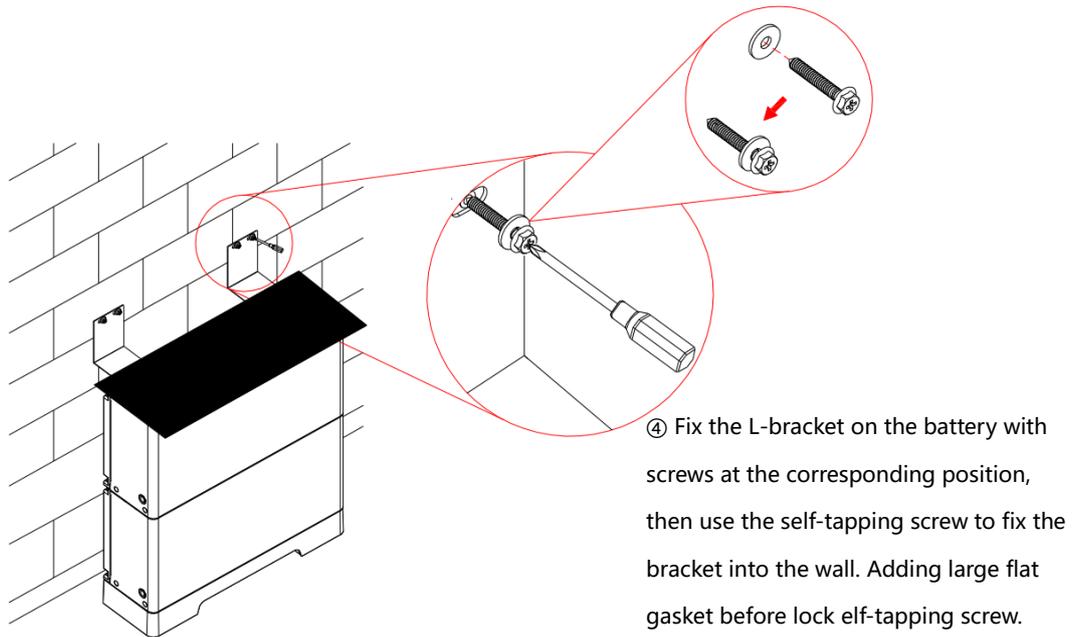


① Place the L-shaped bracket against the wall and mark the drilling point.

② Please use a shield to cover the battery connector before drilling, avoiding dust fall into. Remove the bracket. Drill the hole according to the drilling point, using $\phi 10$ drill bit, depth 40mm (1.57 inch).

③ Knock into the expansion tubetubes.

Figure3.5-13 Install L-shaped bracket 1



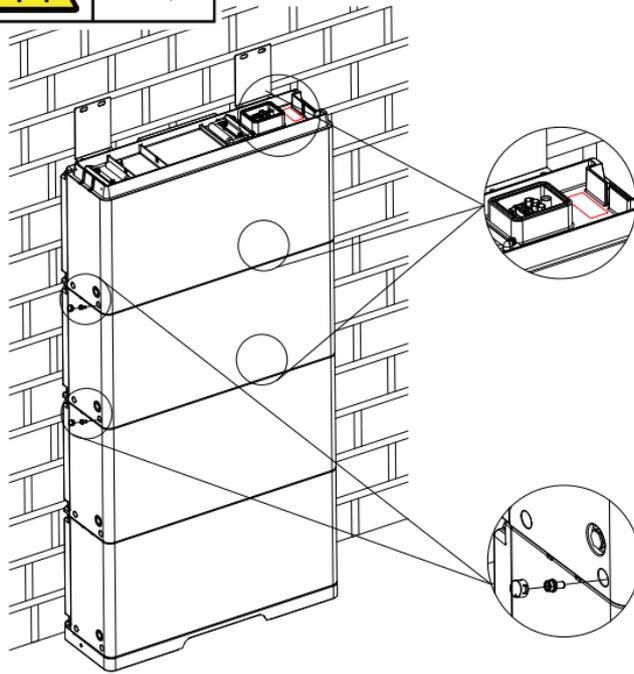
④ Fix the L-bracket on the battery with screws at the corresponding position, then use the self-tapping screw to fix the bracket into the wall. Adding large flat gasket before lock elf-tapping screw.

Figure3.5-14 Install L-shaped bracket 2

(5) Repeat the above steps to stack all battery modules, as shown.



Please stack and install the labeled products. Do not stack labeled and unlabeled products together. Unlabeled products can only stack with unlabeled ones.



⚠ Pay attention to check the module is labeled or not.

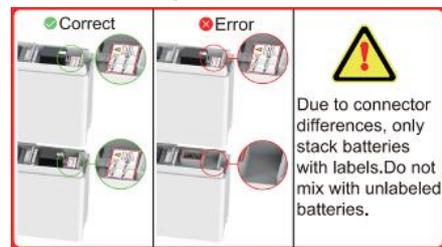
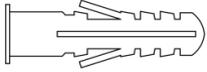


Figure3.5-15 Stack all battery modules

Step 5: Install inverter

PCS Anti tipping plate	-	1PCS	
self-tapping	ST6.0x40	2PCS	
Expansion tube	φ6x40	2PCS	
Large flat gasket	-	2PCS	
Fixing screw M5*12	M5*12	12PCS	
Screw cover	-	4PCS	

(1) The inverter is stacked on the battery as shown. Place vertically on the top of the battery module, and fix the anti-dumping bracket with screws.

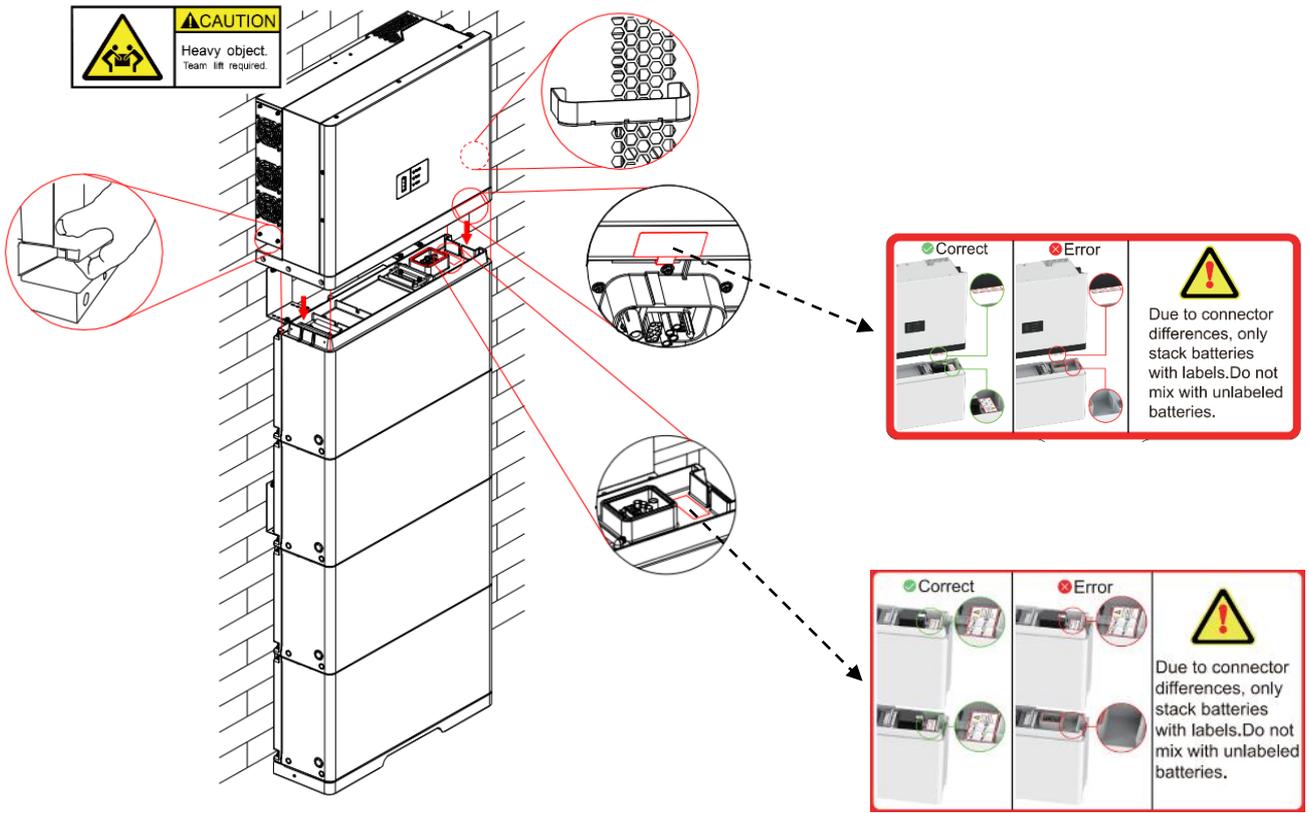


Figure3.5-16 Install inverter 1

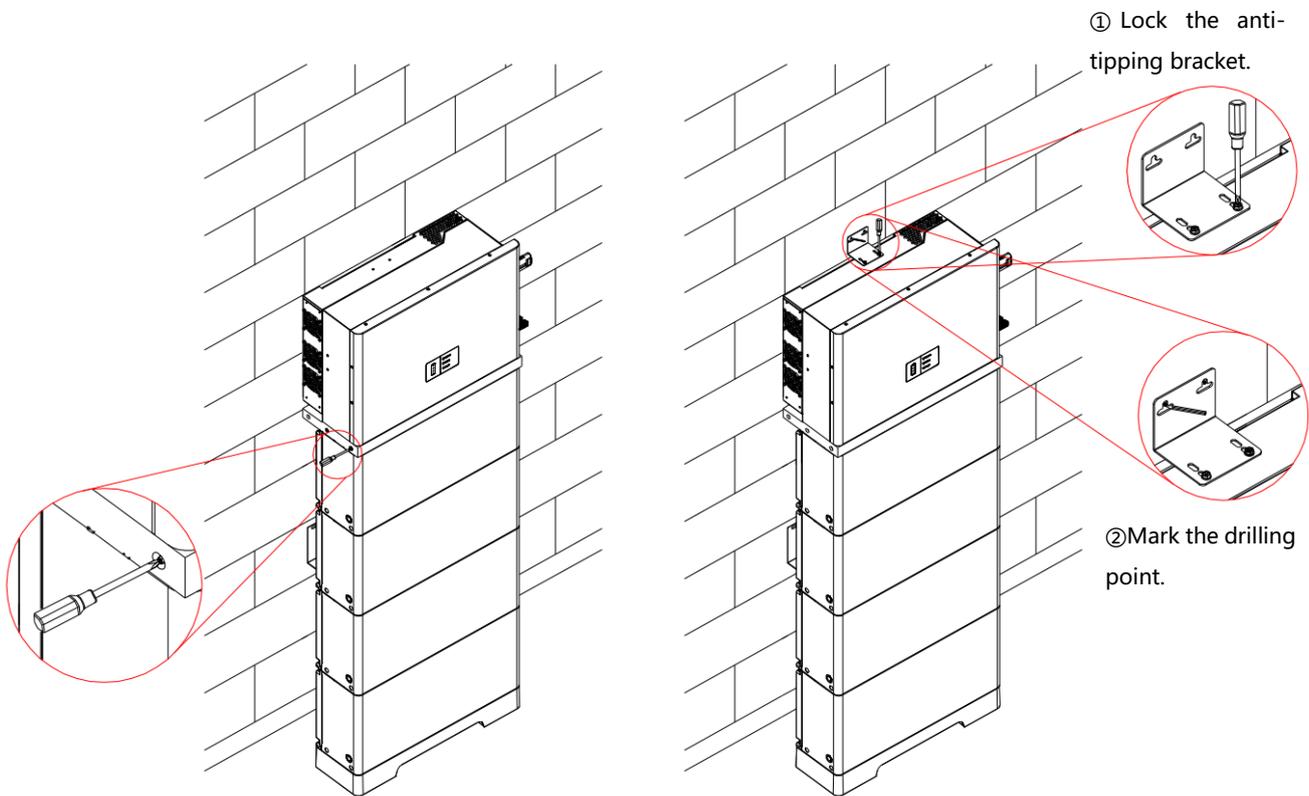


Figure3.5-17 Install inverter 2

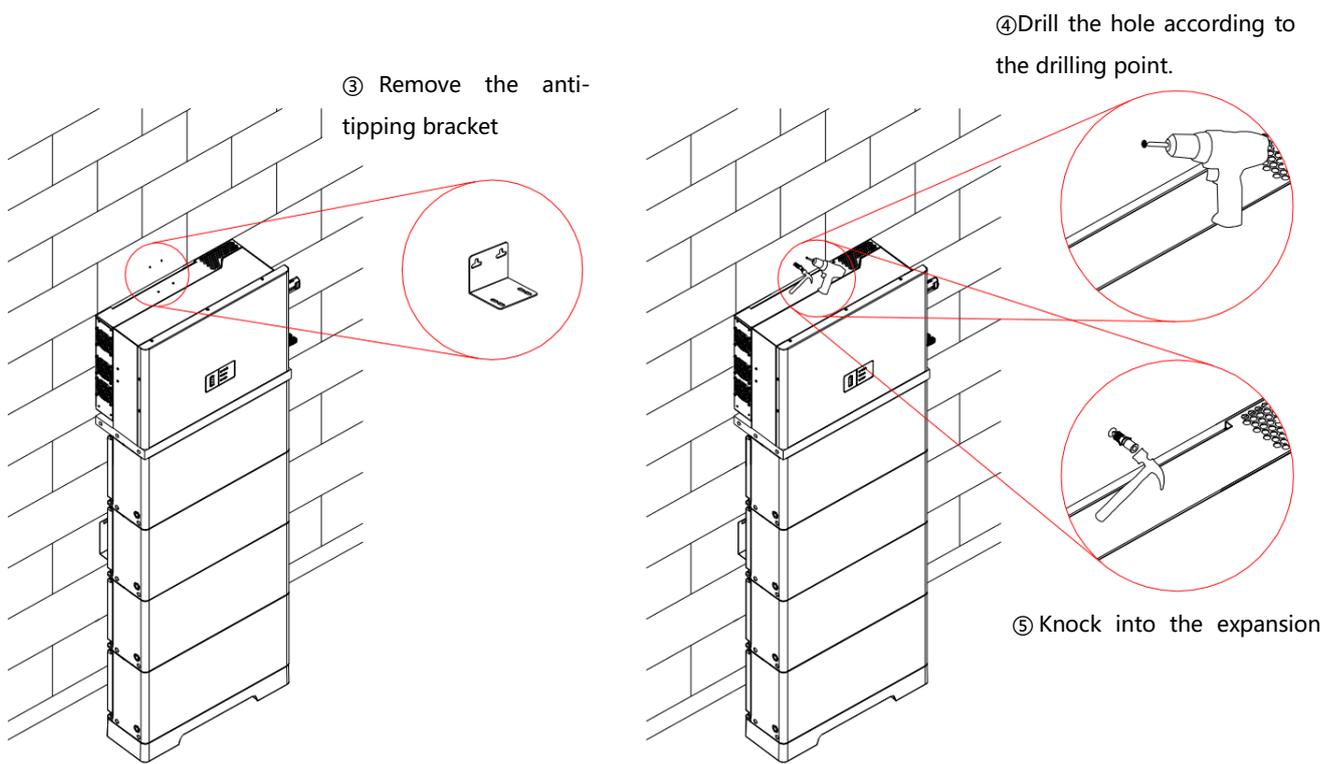


Figure3.5-18 Install inverter 3

⑥ Fix the anti-tipping with screws, then use the self-tapping screw to fix the bracket into the wall. Adding large flat gasket before lock self-tapping screw. (1.5N.m – 2.0 N.m)

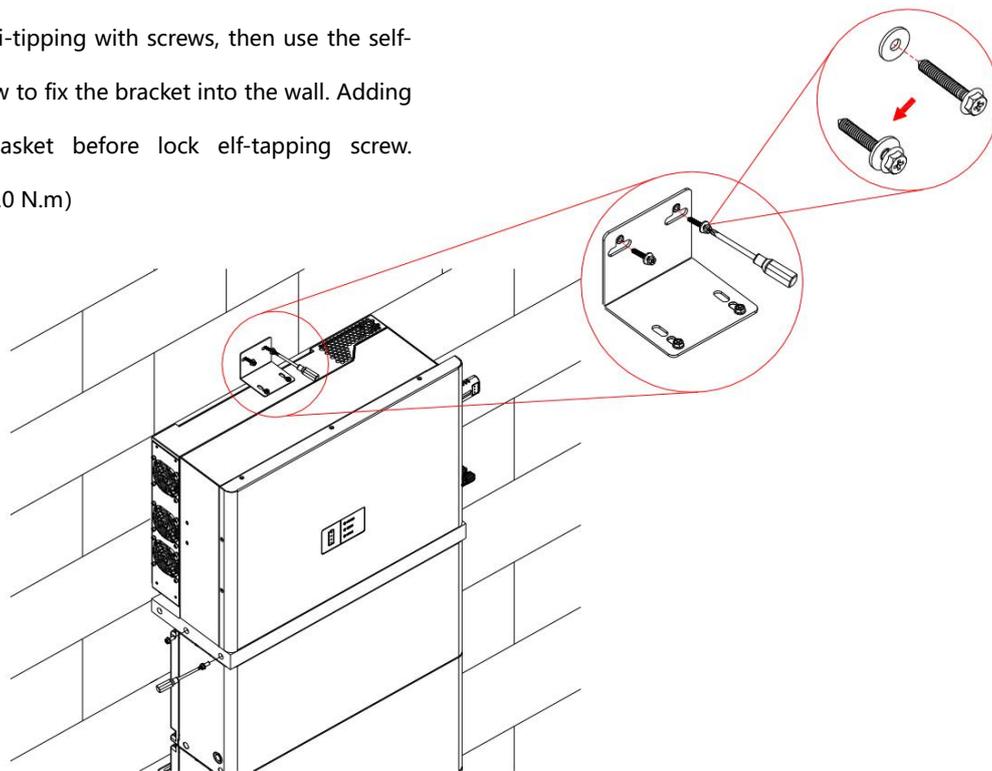


Figure3.5-19 Install inverter 4

(2) Installation is complete as shown.

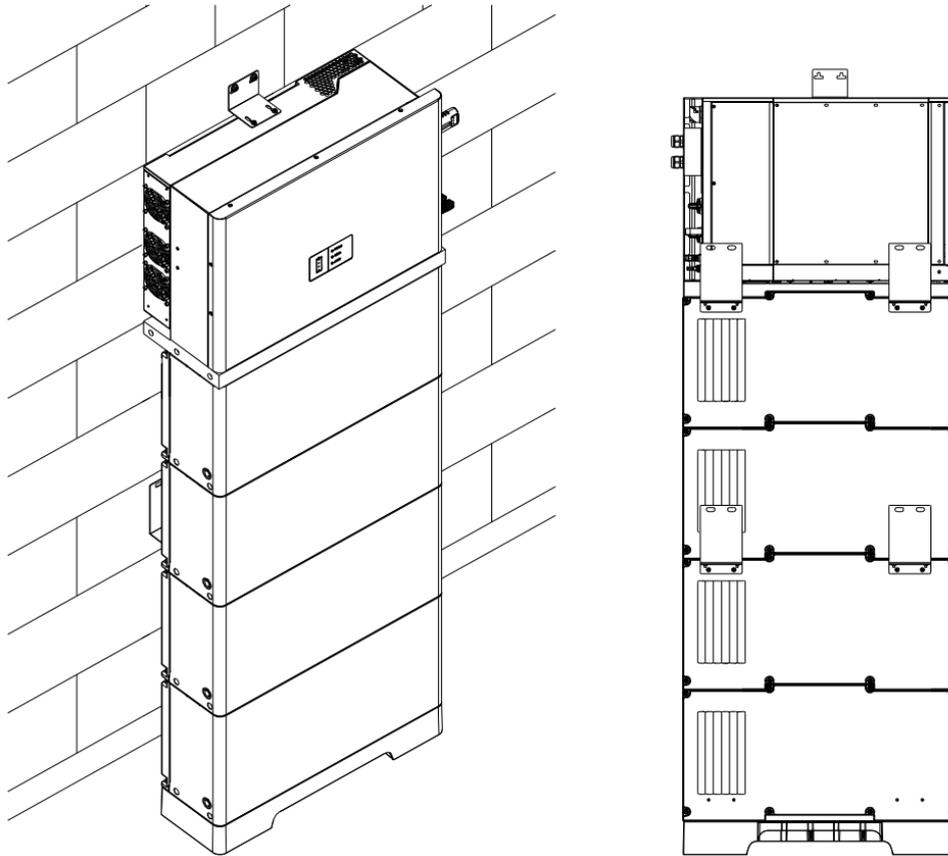


Figure3.5-20 Installation completed

4 Electrical connections

4.1 Notice

	<ul style="list-style-type: none"> ● Do not power on the system during electrical connection. High voltage in the conducting part of inverter or battery may cause electric shock accidents. ● Ensure that the waterproof lock of the cable is tightened. Improperly installed cable connectors may damage the inverter due to moisture and dust infiltration. All warranty claim clause will be invalid for this reason. ● Using the insulation tools during the process of replacing or installing the inverter. ● Do not connect the same PV series to multiple inverters. Otherwise, the inverters may be damaged. ● Do not connect the same battery pack to multiple inverters. Otherwise, the inverters may be damaged.
	<ul style="list-style-type: none"> ● Before the electrical connection, ensure that the inverter DC switch is "OFF" and the AC side air switch is disconnected. Otherwise, the high voltage of the inverter may cause life danger.
	<ul style="list-style-type: none"> ● Please read the instructions carefully before operating the equipment

4.2 Preparation before Connection

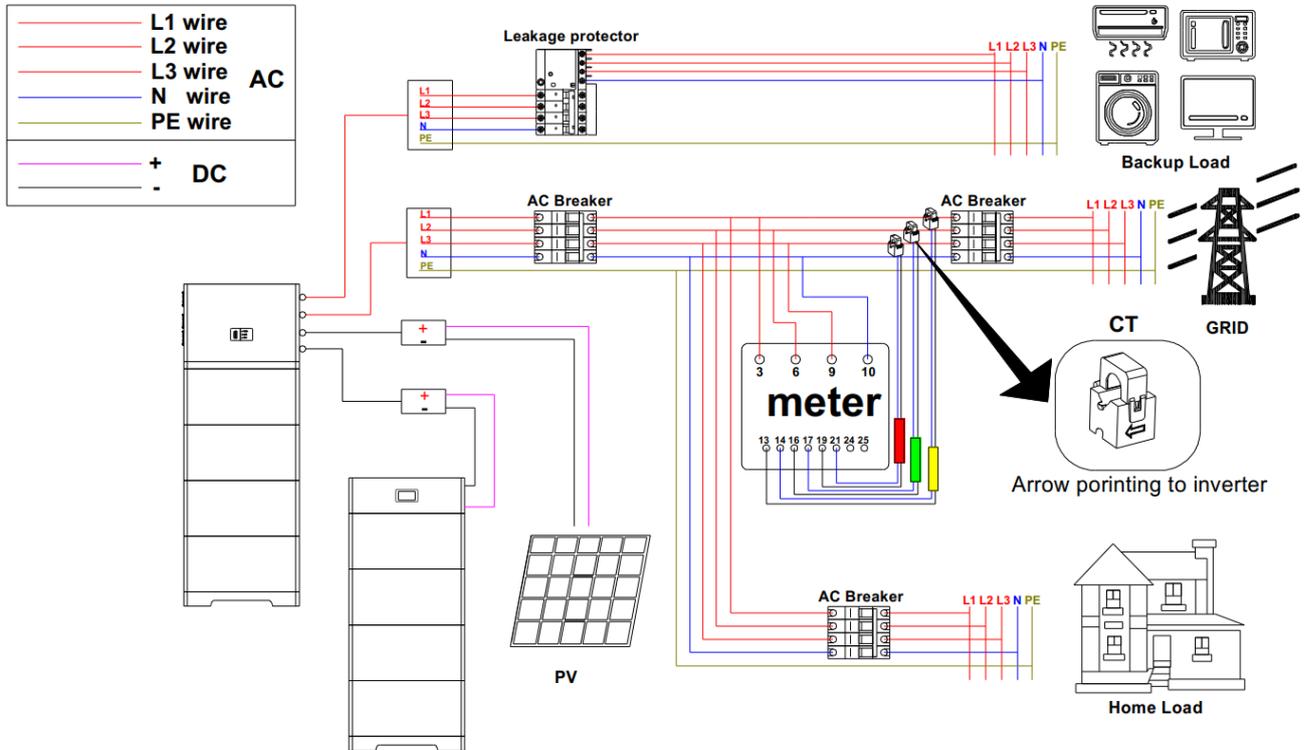


Figure 4.2-1 System circuit diagram

The recommended cables are prepared as shown in the table below:

Table9 Recommended cable specification

NO.	Cable	specification
1	PV connect cable	12AWG(3.332mm ²)
2	GRID connect cable	8AWG(8.37mm ²)
3	BACK-UP connect cable	10AWG(5.26mm ²)
4	DC connect cable	8AWG(8.37mm ²)

4.2.1 WIFI collector access

The WIFI collector access method shown in below.

Note: Only turn the WIFI collector head end.

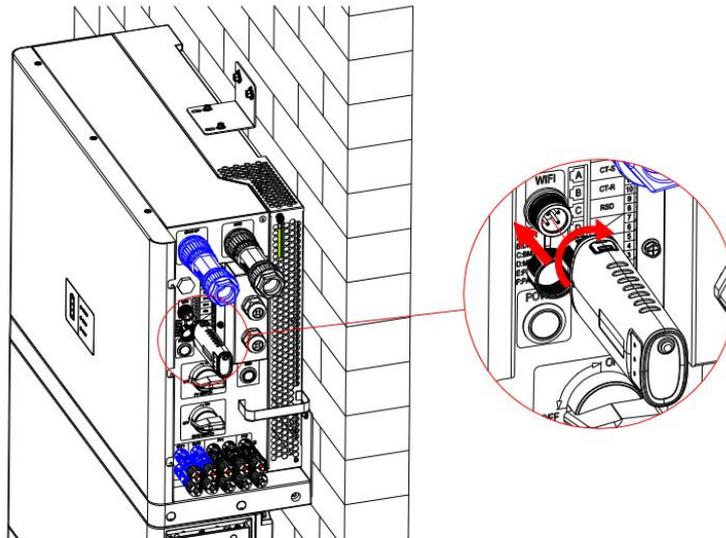


Figure 4.2-2 WIFI collector access method

Indicator light status after successful WIFI access:



Figure 4.2-3 WIFI collector diagram

Table 10 Indicator Light meaning

Indicator light sign	Normal operation state	Indicator Light meaning
NET	constant-bright	Server connection successful
COM	constant-bright	Collector work normally
PEADY	flashing	Collector connected to inverter successfully

Collector Abnormal States and Handling:

If the data platform shows abnormalities while the collector stick is in working condition, please refer to the table below and troubleshoot the issue based on the LED light's status. If the issue persists or if the LED fault status is not reflected in the table below, please contact after-sales support for further assistance.

(Note: Please power on the collector stick for 2 minutes before using the table below for reference.)

LED Indicator Legend:			
-----------------------	--	--	--

READY			Fault Description	Fault Reason	Solution
NET	COM	READY			
Any State	Off	Slow Flash	Communication abnormality between collector stick and inverter	<ol style="list-style-type: none"> Loose connection between collector stick and inverter. Communication rate mismatch between inverter and collector stick. 	<ol style="list-style-type: none"> Check for any abnormal connection between collector stick and inverter, then re-plug the collector stick. Verify if the communication settings of the inverter match those of the collector stick.
Off	Steady On	Slow Flash	Communication abnormality between collector stick and router	<ol style="list-style-type: none"> Collector stick not networked. Weak Wi-Fi signal. 	<ol style="list-style-type: none"> Check if wireless network is configured. Improve router signal strength if signal is weak.
Slow Flash	Steady On	Slow Flash	Connection between collector stick, router normal, but abnormal connection to remote server	<ol style="list-style-type: none"> Router internet connection abnormality. Collector stick server pointer modified. Network restricts server connection. 	<ol style="list-style-type: none"> Verify router internet connectivity. Check router settings for any restrictions on connections. Contact after-sales support for assistance.
Off	Off	Off	Power supply abnormality	<ol style="list-style-type: none"> Abnormal connection between collector stick and inverter, loose connection. Inverter power insufficient. Collector stick abnormality. 	<ol style="list-style-type: none"> Check connection status, re-plug if necessary. Verify if inverter output power meets requirements. Contact after-sales support for assistance.
Fast Flash	Any State	Any State	Bluetooth network status	Normal	<ol style="list-style-type: none"> Will automatically exit after 5 minutes. Long-press reset button for 5 seconds to restart the collector stick. Long-press reset button for 10 seconds to reset the collector stick (restore to factory settings).
Any State	Any State	Fast Flash	Factory reset	Normal	<ol style="list-style-type: none"> Will automatically exit after 1 minutes. Long-press reset button for 5 seconds to restart the collector stick.

					3. Long-press reset button for 10 seconds to reset the collector stick (restore to factory settings).
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4.2.2 Dial switch

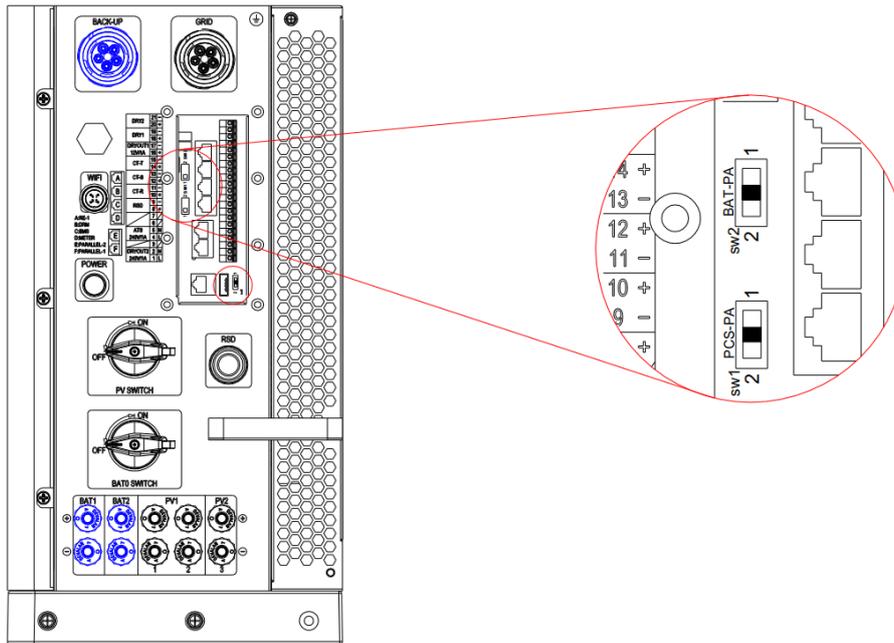


Figure 4.2-3 Dial switch diagram

Table 11 Dial switch meaning

Dial switch	Default state	Dial switch meaning
SW1 (PCS-PA)	1	When operating the inverter in standalone mode, set the switch to position 1; when operating in parallel mode, set the switch to position 2.
SW2 (BAT-PA)	2	When the battery is in single cell mode, set the switch to position 1; when in cluster mode, set the switch to position 2.

4.3 Electrical Connector

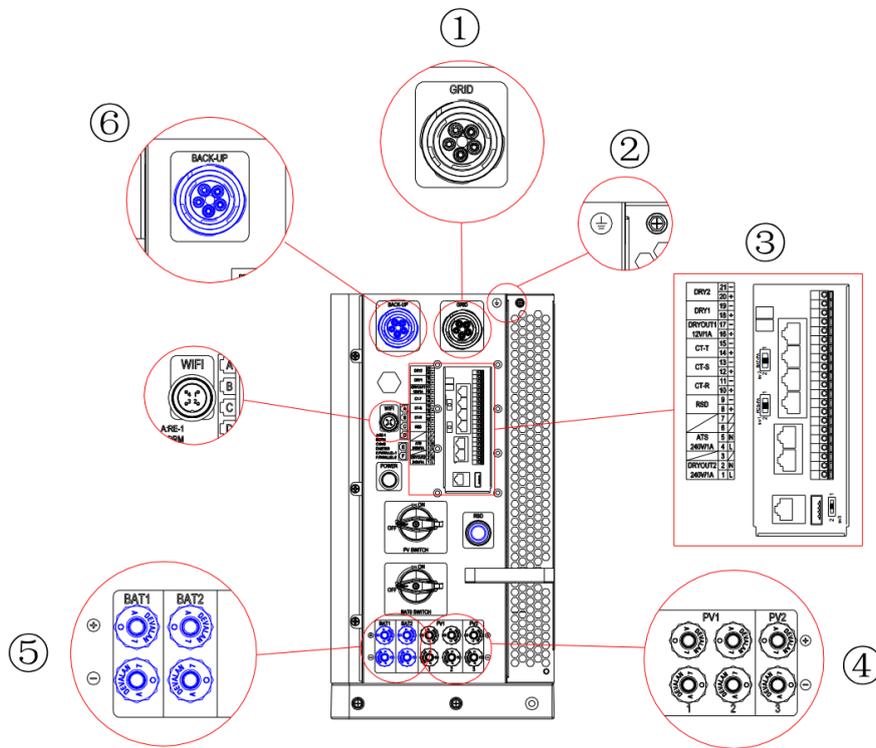


Figure 4.3-1 Inverter connector diagram

Table 12 Port description

NO.	Connector	Port	Port description
①	Utility grid	GRID	Grid cable interface
②	Ground	PE	Ground protection
③	External function	RE、 DRM、 BMS、 METER、 PARALLEL-2、 PARALLEL-1	Reservation, Dry contact, Battery, Meter, Parallel slave machine, Parallel mainframe
③		1.DRYOUT2+; 2. DRYOUT2 -; 3. /; 4. ATS+; 5. ATS-; 6./; 7./; 8. RSD+; 9. RSD-; 10. CT-R+; 11. CT-R-; 12. CT-S+; 13. CT-S-; 14. CT-T+; 15. CT-T-; 16. DRYOUT+; 17. DRYOUT-; 18. DRY1+; 19. DRY1-; 20. DRY2+ ; 21. DRY2-;	1-2.Heat Pump、 4-5.ATS、 8-9.RSD power、 10-15.CT connector、 16-17.Output dry contact、 18-21.Input dry contact
④	PV	PV1-1+、 PV1-1-、 PV1-2+、 PV1-2-、 PV2+、 PV2-	PV series connection port
⑤	BAT	BAT1+、 BAT1-、 BAT2+、 BAT2-	External battery input interface
⑥	grid-off	BACK-UP	Load cable interface

4.3.1 Communication Connection

1) RJ45、LAN Connect port

Ensure that the communication port definition matches the device before connecting. Communication cables should keep away from interference sources or power lines to avoid signal interference,

The meanings of RE、DRM、BMS、METER、PARALLEL-2、PARALLEL-1 is as follows:

Note: Before connecting the cable, please check whether the DIP switch is set to 1 for PCS-PA and 2 for BAT-PA.

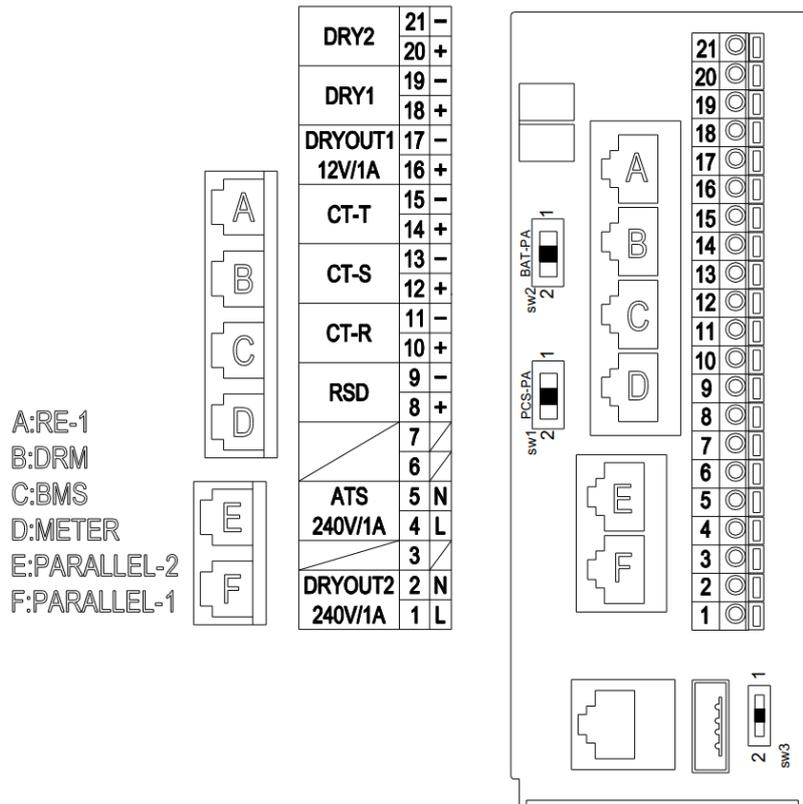


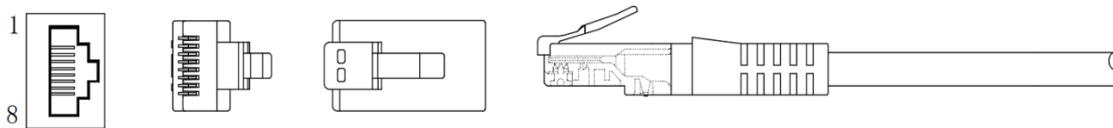
Figure 4.3.1-1 Communication port diagram

Table 13 Interface definition

Internet access	Interface	Definition	Pin description
A	RE-1	Reservation	1. Reserved Battery Communication CAN High 2. Reserved Battery Communication CAN Low 4. Reserved 12V 5. Reserved GND
B	RCR(DRM)	Dry contact	1. Dry Contact 1/5 2. Dry Contact 2/6 3. Dry Contact 3/7 4. Dry Contact 4/8 5. REF.GEN 6. Common Terminal/Dry Contact 0
C	BMS	Battery CAN, 485, Wake-up function	

D	METER	Meter	<p>1. The electricity meter communication 485A connects to the electricity meter.</p> <p>2. The electricity meter communication 485B connects to the electricity meter.</p> <p>4. Reserved Communication 485A</p> <p>5. Reserved Communication 485B</p>
E	PARALLEL-1	Parallel mainframe	
F	PARALLEL-2	Parallel slave machine	

Connect the communication cable to a suitable terminal to complete the cable connection



The communication cable adopts the standard T568B, and the color classification of the pins in follow table.

Table 14 Communication cable pin color

Pin	Color
1	Orange white
2	Orange
3	Green white
4	Blue
5	Blue white
6	Green
7	Brown white
8	Brown

4.4 Ground Protection Connection

This section describes the connect steps of connector ②.

- OT terminal and ground screw in accessories package
- Recommended cable specification: 12AWG(3.332mm²)

Crimp the OT terminal of cable as follows:

Step 1: Strip the cable. Be careful not to scratch the cable core.

Crimp the OT terminal onto the cable to cover the conductor core wires completely. Then cover the junction between OT terminal and cable with heat shrink tubing or insulation tape.

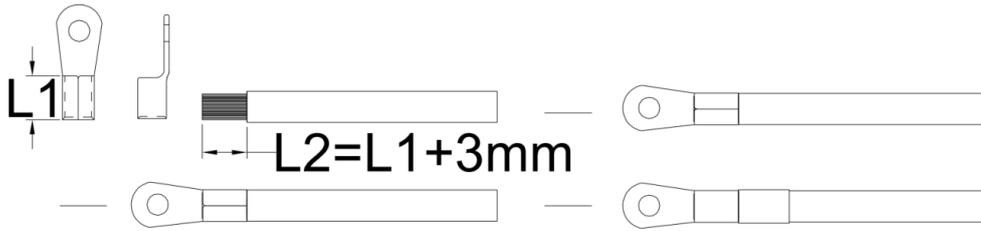


Figure 4.4-1 Strip the cable

Step 2: Place the cable on cable port and tighten with screw.

Ground screw	M5X12	1PCS	
OT terminal	RNB8-5S	1PCS	

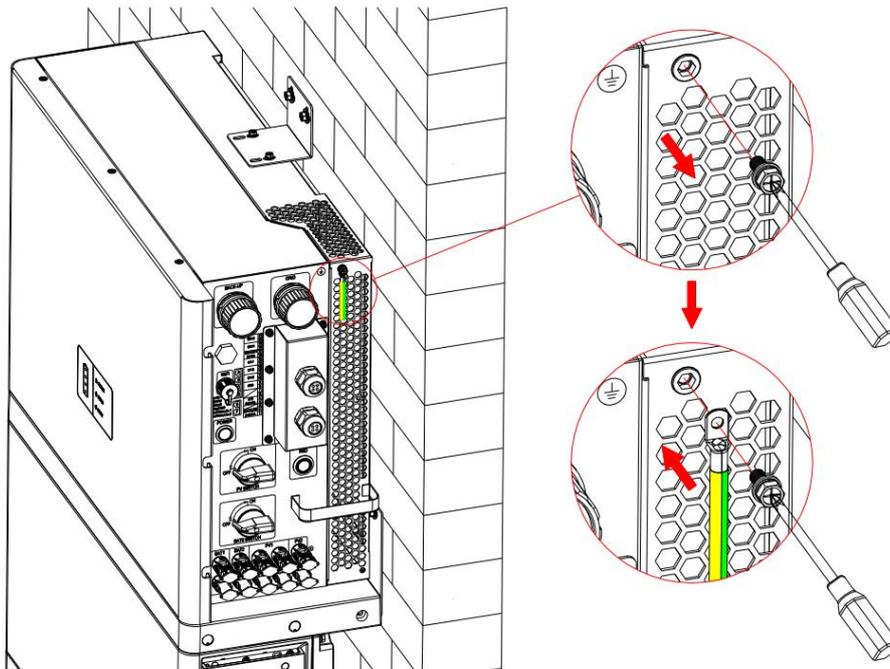


Figure 4.4-2 Inverter ground protection (1.5N.m – 2.0 N.m)

4.5 GRID and BACK-UP Connection

This section describes the connect steps for GRID port and BACK-UP port.

Before connecting the wires, it is necessary to remove the dust cap, as shown in the diagram below.

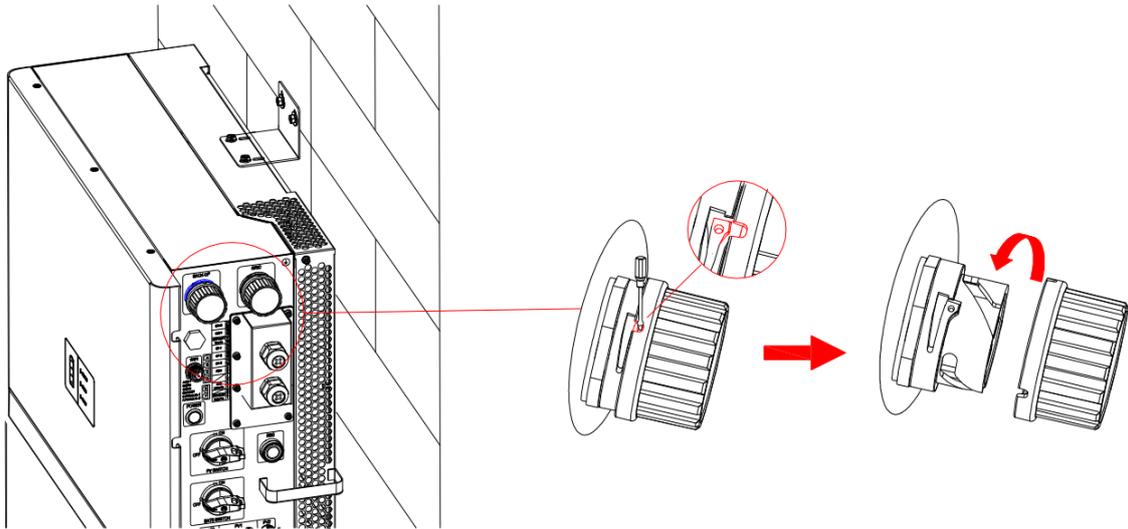


Figure 4.5-1 Remove the dust cap

1) Connect the GIRD port

- Ensure the socket and plug wire matched properly before connecting the GRID cable.
- The GRID plug is black, matched with the black connector.
- Use single-stranded multi-core wire or cable.
- Recommended cable specification: 8AWG(8.37mm²)

Steps of connection as follows:

Step 1: Disassemble the five-pin plug and lock wires into the plug follow the silk screen instructions.

- a. Loosen the nut, sleeve and plug along the thread into three parts
- b. Thread the wire harness through the locking nut and sleeve
- c. Insert the wires into the corresponding plug port and lock it with a hex wrench
- d. Align the plug and socket positions and insert them until you hear two 'clicks', then tighten the locking nut to secure the socket.

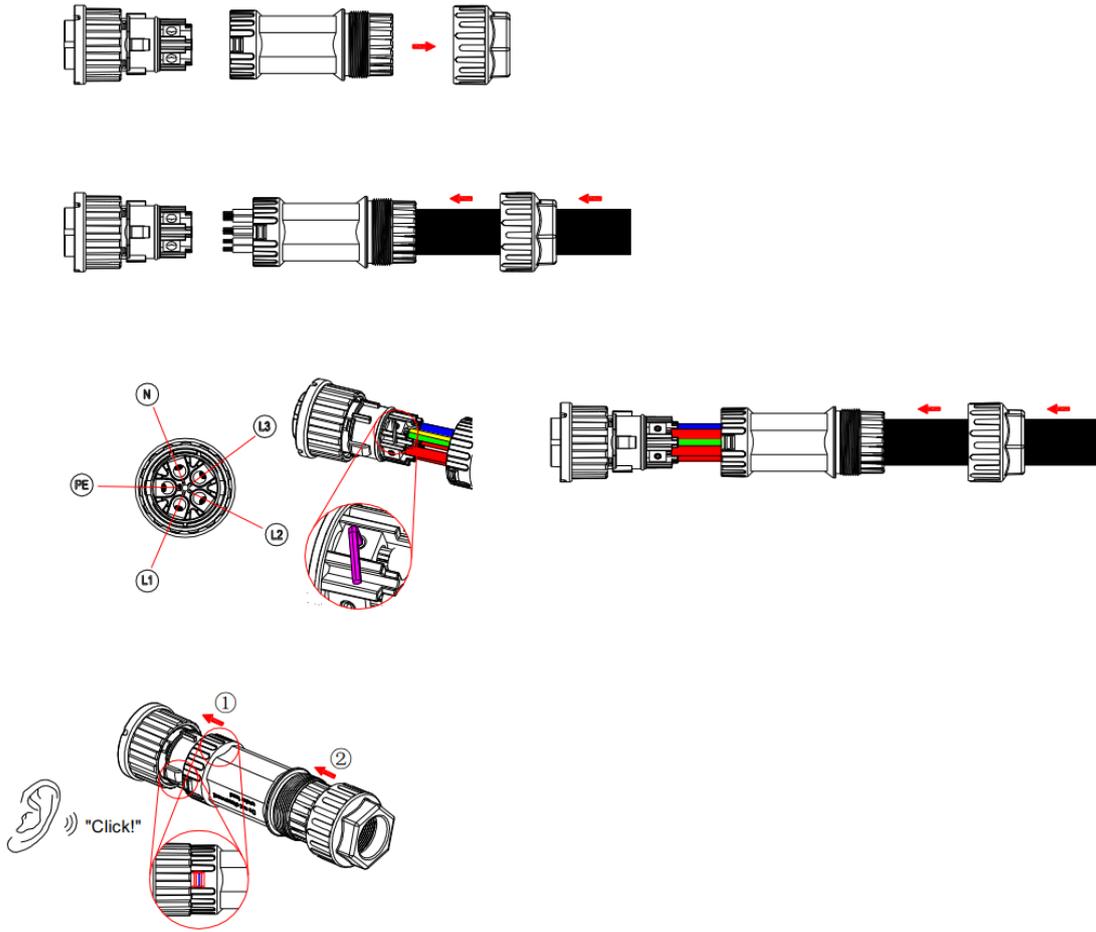


Figure 4.5-2 Prepare GIRD cable

Step 2: Connect the prepared GRID cable to the inverter follow below ① ②.

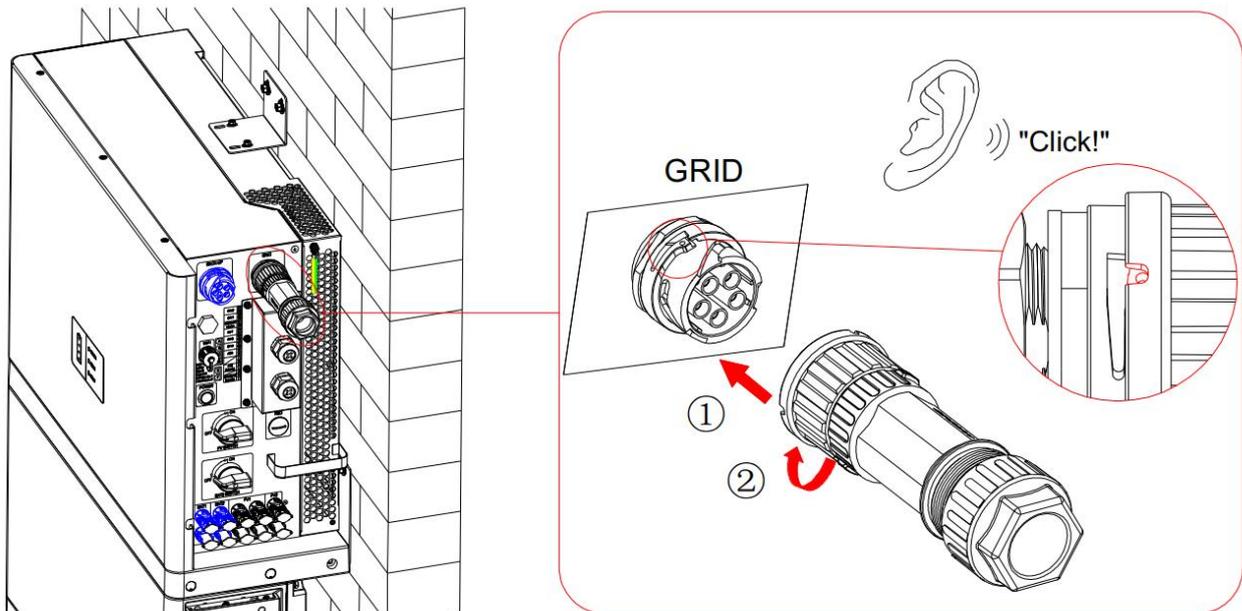


Figure 4.5-3 Connect the inverter

2) Connect the BACK-UP port

- Ensure the socket and plug wire matched properly before connecting the BACK-UP cable.
- The BACK-UP plug is blue, matched with the blue connector.
- Use single-stranded multi-core wire or cable
- Support maximum 1.1 times overload
- Recommended cable specification: 10AWG(5.26mm²)

Steps of connection as follows:

Step 1: Disassemble the five-pin plug and lock wires into the plug follow the silk screen instructions.

- a. Loosen the nut, sleeve and plug along the thread into three parts
- b. Thread the wire harness through the locking nut and sleeve
- c. Insert the wires into the corresponding plug port and lock it with a hex wrench
- d. Align the plug and socket positions and insert them until you hear two 'clicks', then tighten the locking nut to secure the socket.

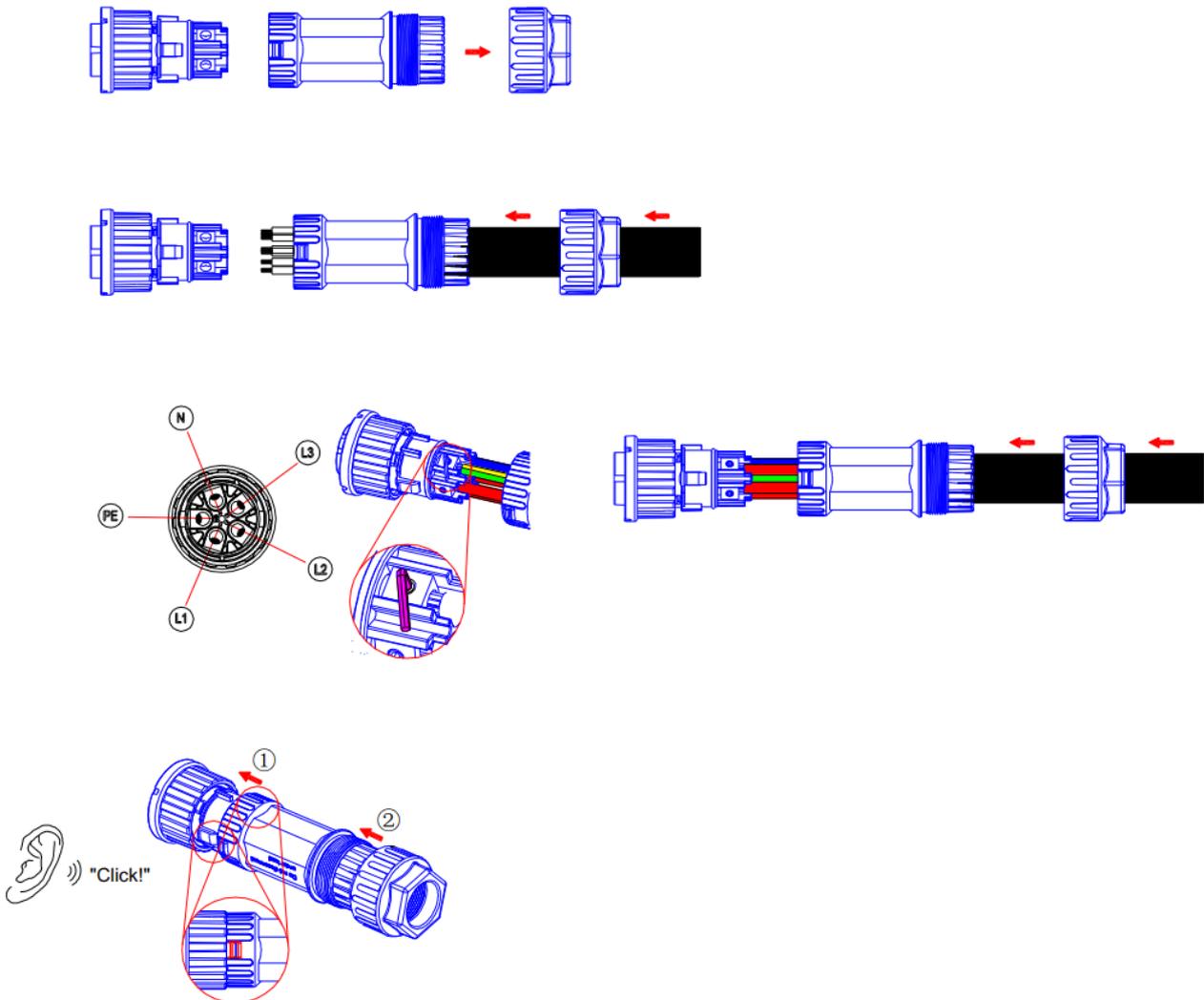


Figure 4.5-4 Prepare BACK-UP cable

Step 2: Connect the prepared BACK-UP cable to the inverter follow below ① ②.

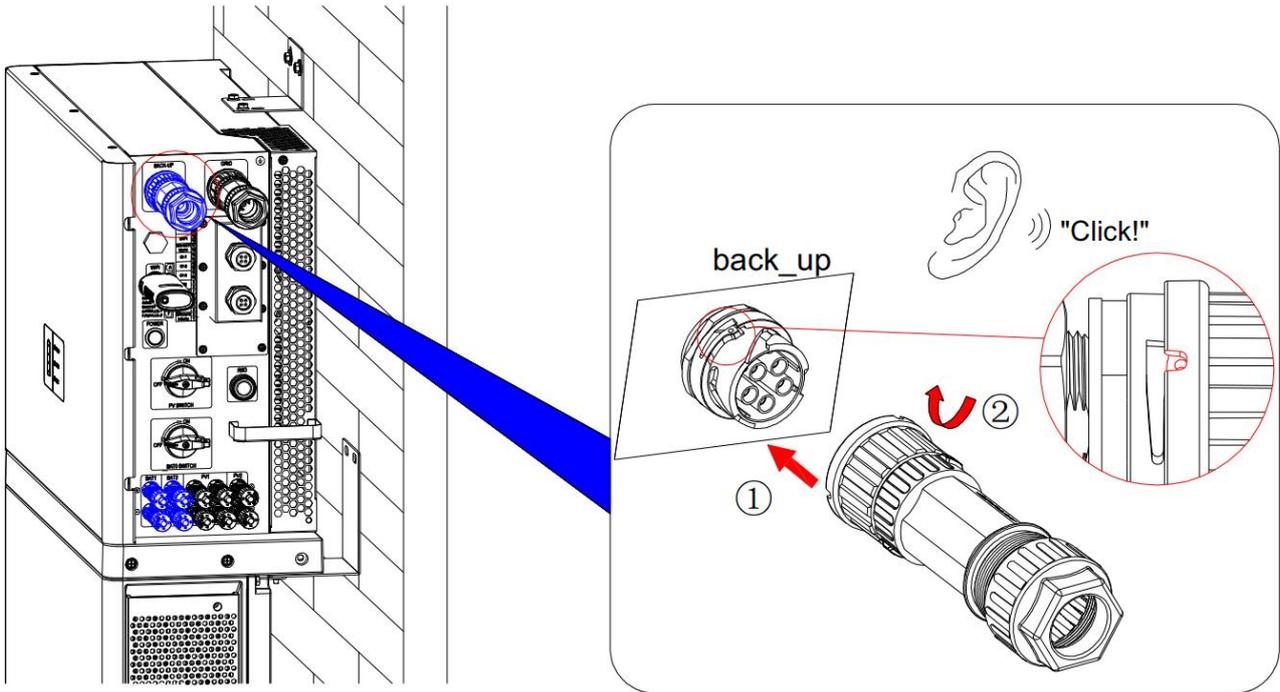


Figure 4.5-5 Connect the inverter

4.6 PV and BAT Connection

This section describes the connect steps of BAT and PV connector.

1) Connect PV

- Please operate with the inverter and battery power down.
- Ensure that the positive and negative terminals are correctly connected before connecting the PV cable
- Recommended cable specification: 12AWG(3.332mm²)

Steps of connection as follows:

Step 1: PV Positive and negative cables connect to the terminal core

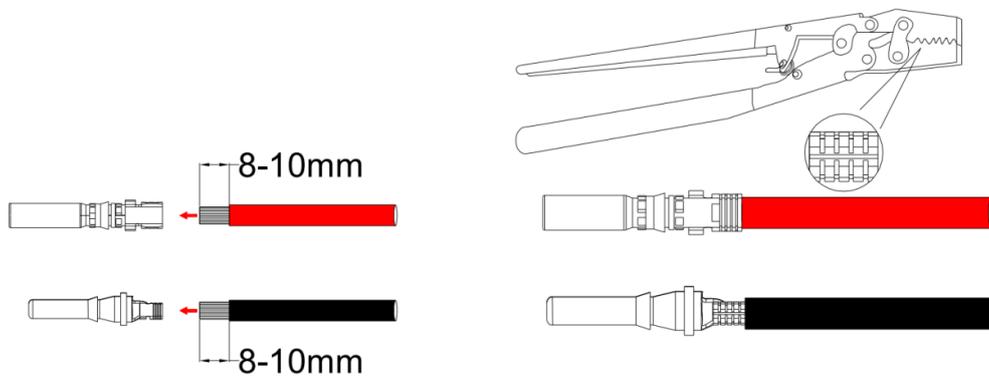


Figure 4.6-1 Prepare PV cables

Notice: Do not press the point of cable. Otherwise, the terminal cannot properly installed.

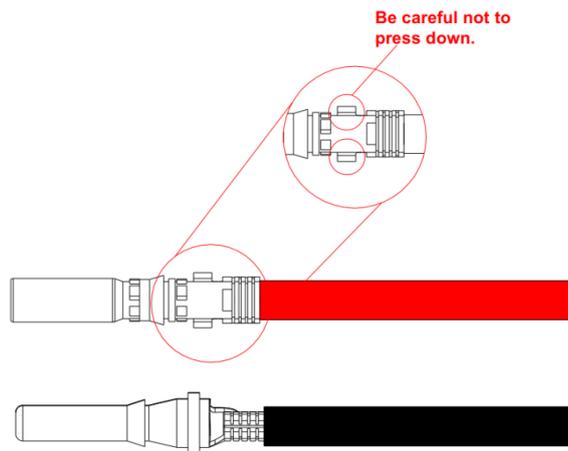


Figure 4.6-2 Precautions for preparation

Step 2: After finished the cable with terminals, insert the PV cables into the connector plastic shell until you hear the "click", as shown in the figure. If it need to tighten, please use the disassembly tool to operate as shown below:

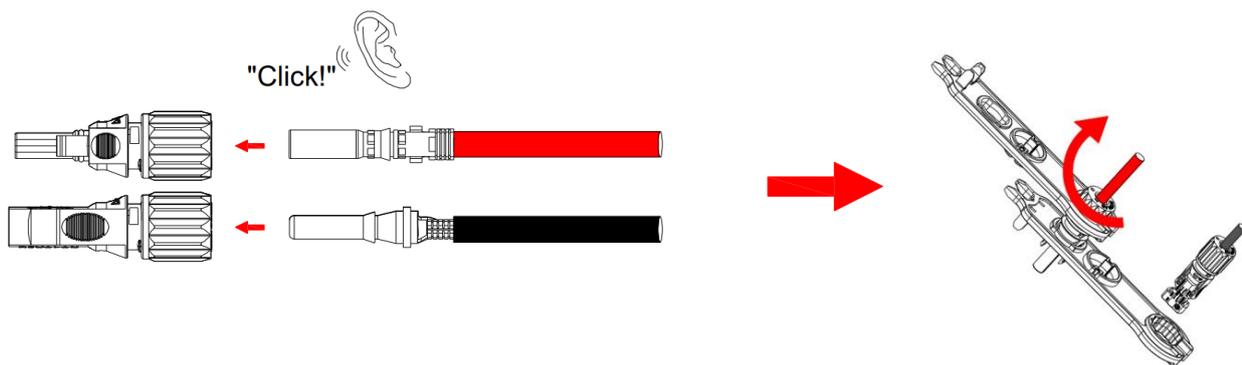


Figure 4.6-3 Connect the positive and negative connectors

Step 3: Ensure the correct polarity of the pV cable. Measure the DC voltage by multimeter to ensure that each PV string ranges is 200-1000V.

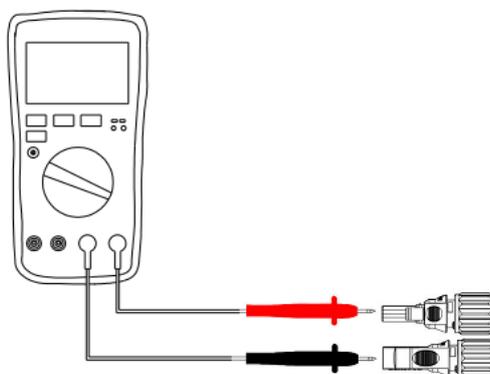


Figure 4.6-4 Measure the DC voltage of PV string

Step 4: Connect the prepared PV cables to the inverter. Please determine the polarity before inserting, and connect until you hear the "click", the connection is complete.

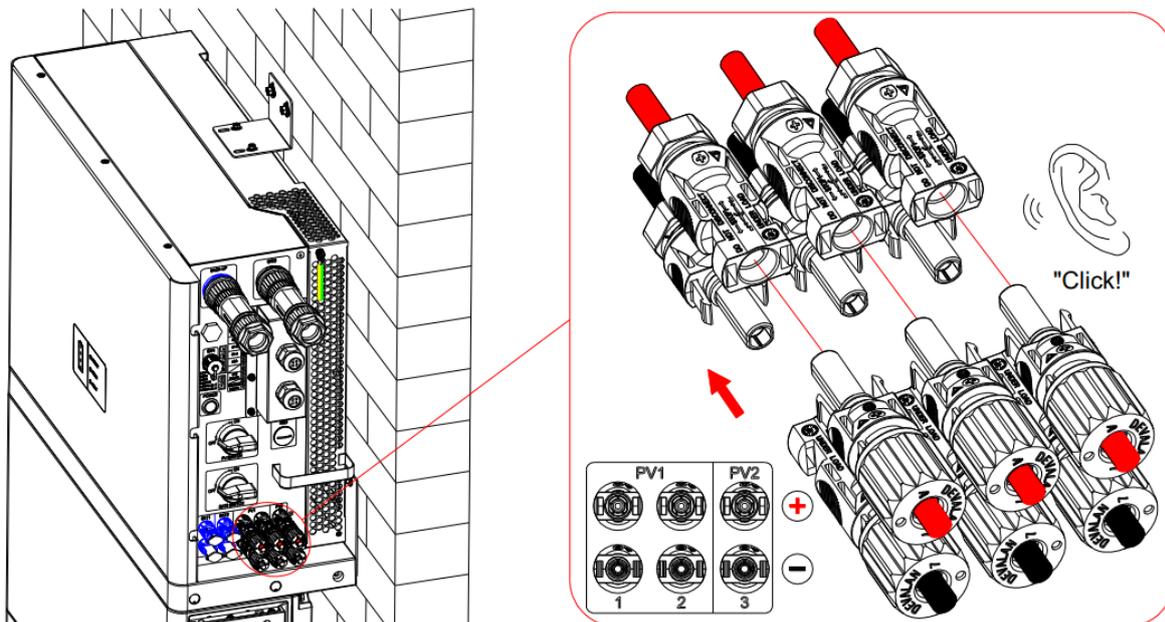


Figure 4.6-5 Connect with inverter

2) Connect BAT

- Power off before operating the all-in-one.
- Battery short circuit may cause injury to person or property. The instantaneous high current caused by the short circuit can release a lot energy and cause fire
- Before connecting the battery cable, ensure that the inverter and battery are power off, and the front and rear switches of the inverter are off.
- Do not connect or disconnect battery cables during the inverter running. Improper operation can lead to electric shock hazard
- Using insulation tools to prevent accidental electric shock or battery short circuit during connecting battery cables.
- Recommended cable specification: 8AWG(8.37mm²)

Steps of connection as follows:

Step 1: BAT Positive and negative cables connect to the terminal core.



Figure 4.6-6 Prepare BAT-inverter cables

Step 2: After finished the cable with terminals, insert the BAT cables into the connector plastic shell until you hear the "click", as shown in the figure. If it need to tighten, please use the disassembly tool to operate as shown below:

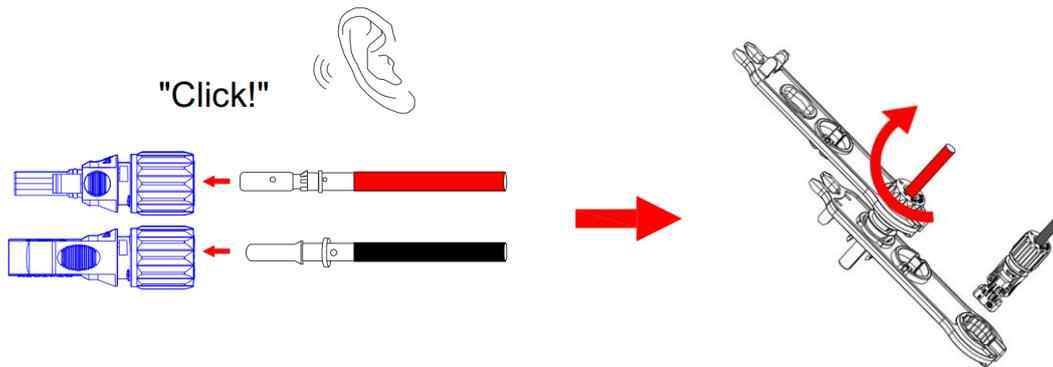


Figure 4.6-7 Connect the positive and negative connectors

Step 3: Connect the prepared BAT cables to the inverter. Please determine the polarity before inserting, and connect until you hear the "click", the connection is complete.

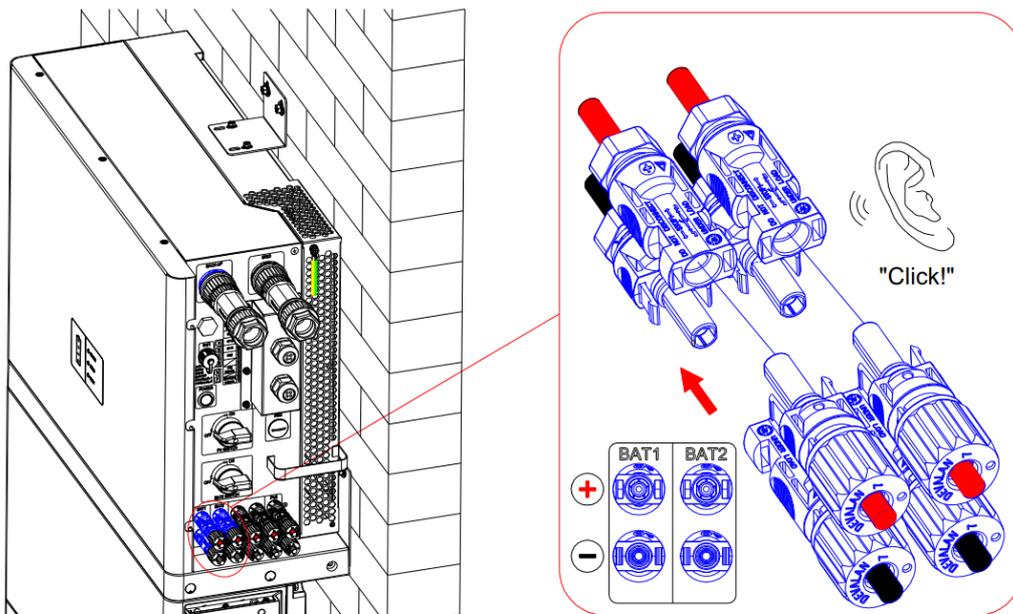


Figure 4.6-8 Connect with inverter

Step 4: Connect the other end of prepared BAT cables to DC+ and DC- of battery. Please determine the polarity before connecting.

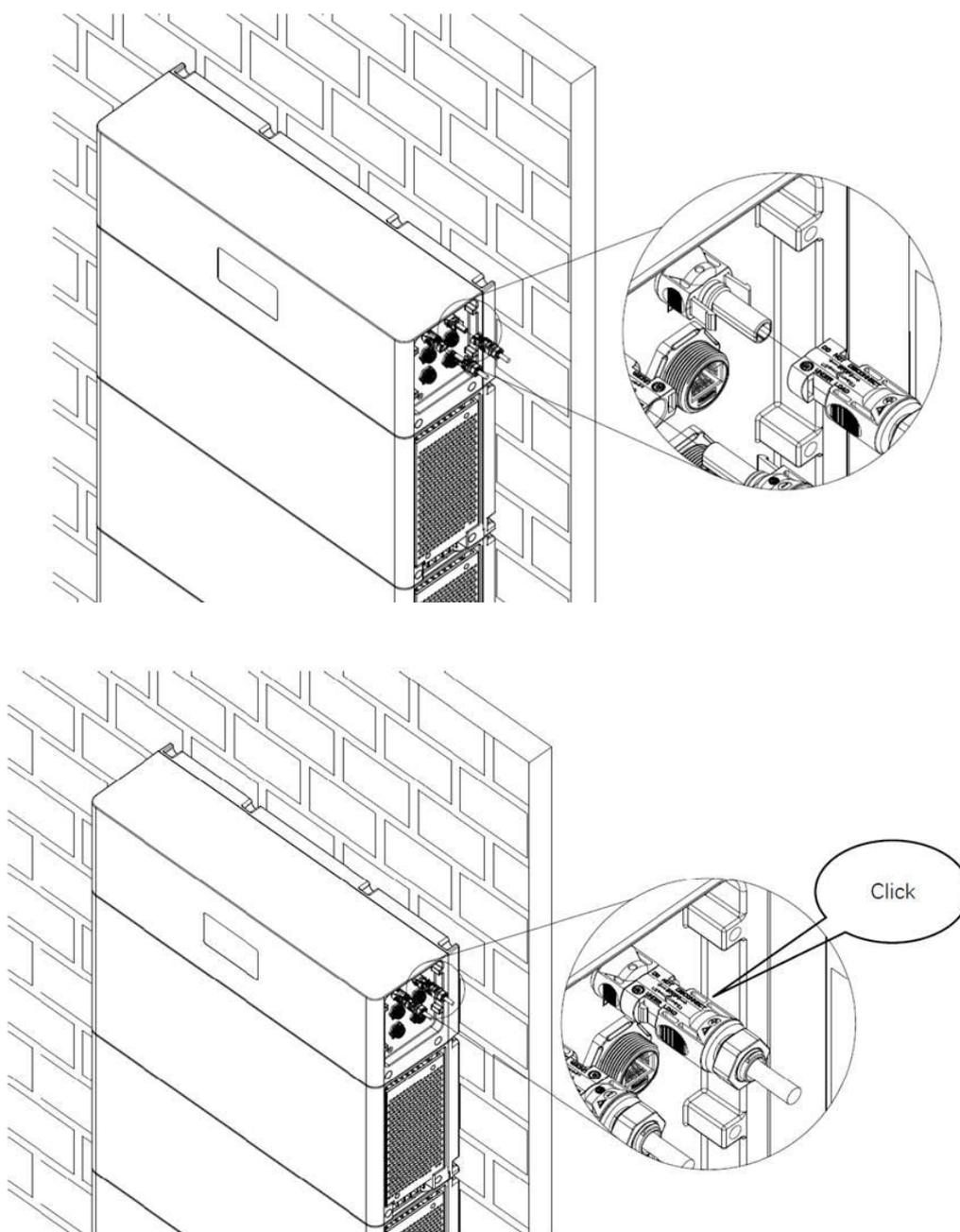


Figure 4.6-9 Battery packs in parallel

Step five: Connect the communication cable.

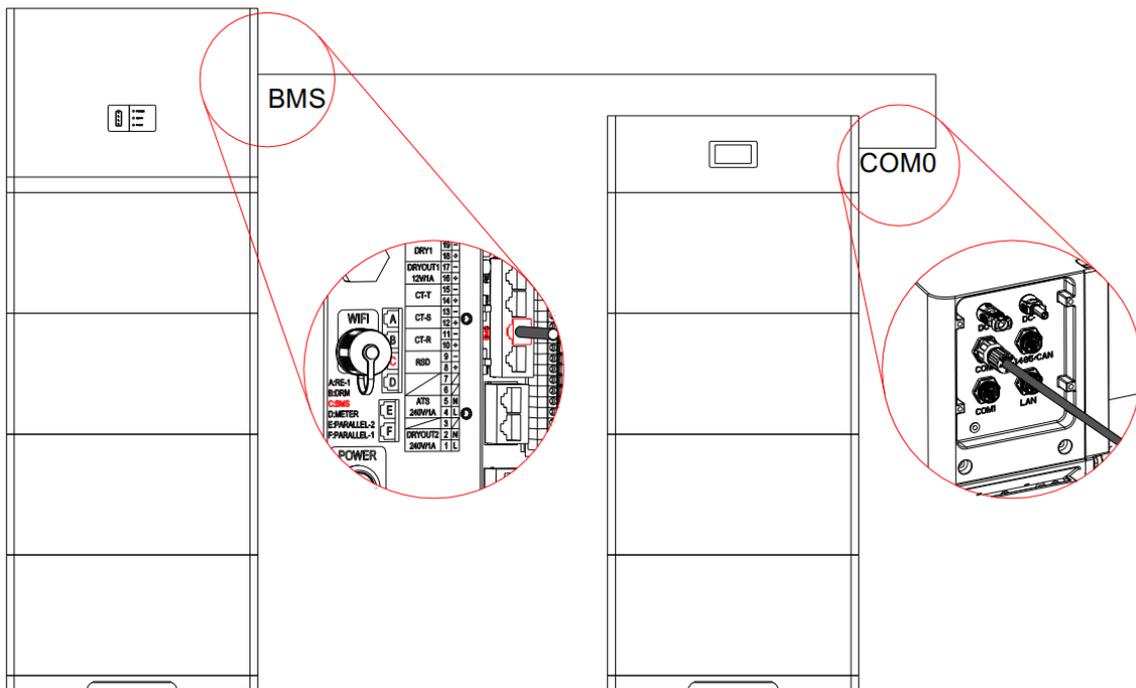


Figure 4.6-10 Connect the communication cable

3) Remove terminal

Remove the terminal according to the following.

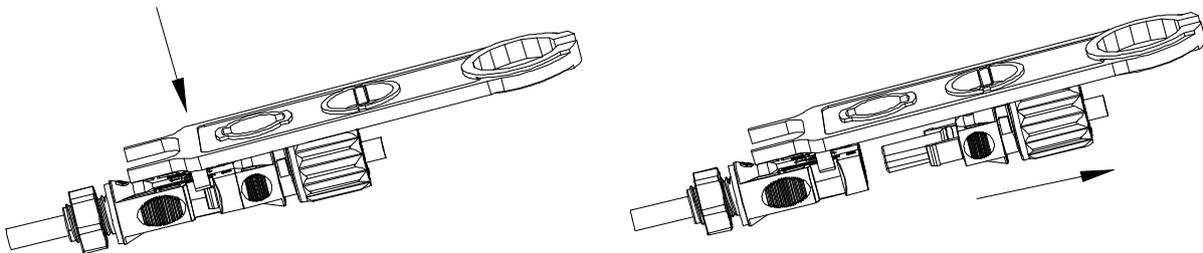


Figure 4.6-11 Remove terminal

4.8 Meter and CT Connection

If the selected accessories include 1 meter and CT, the system electrical connection diagram of Australia and New Zealand is as follows:

NOTE: For Australian safety country, the neutral cable of On-GRID side and BACK-UP side must be connected together, otherwise BACK-UP function will not work.

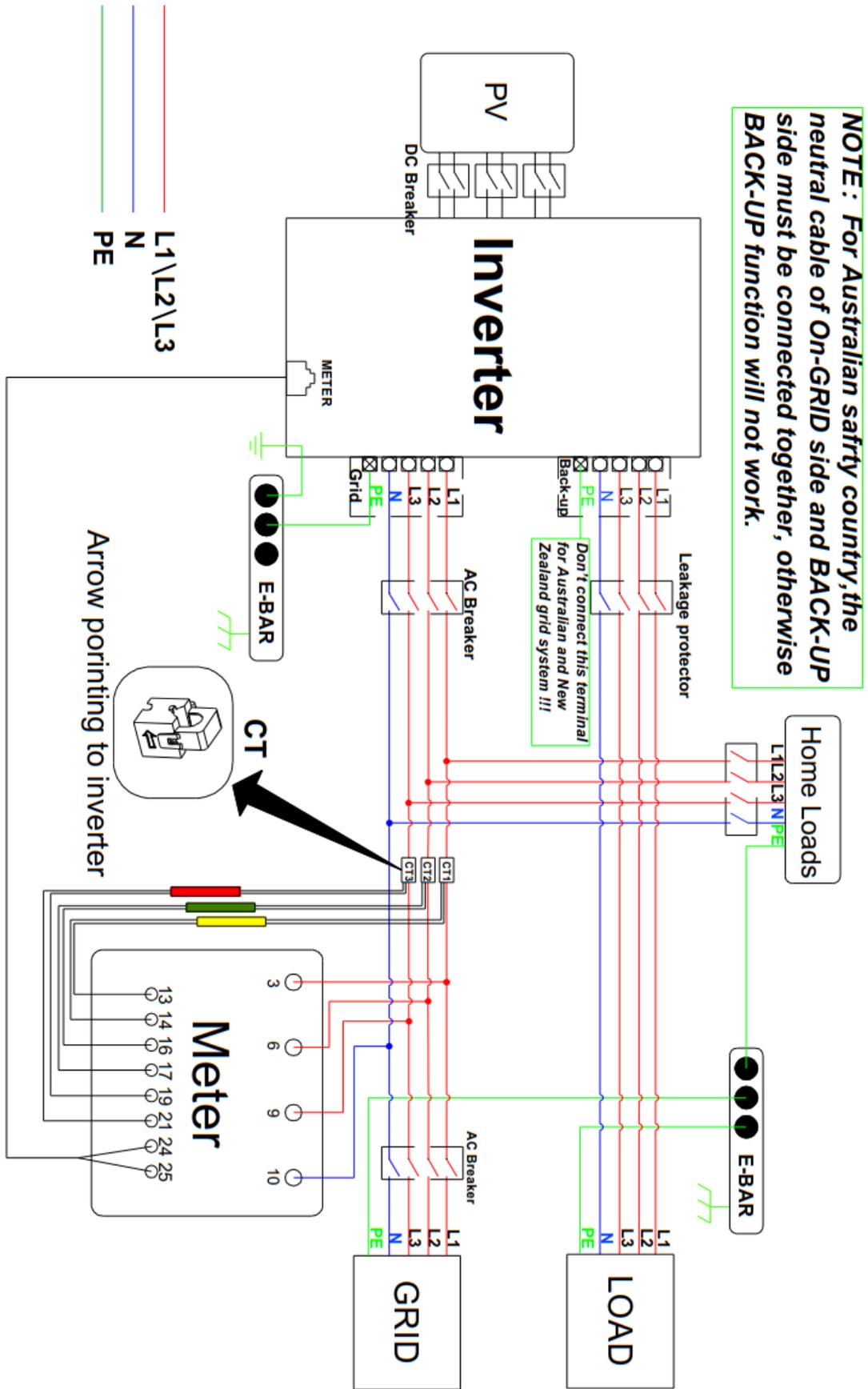


Figure 4.8-1 System electrical connection diagram of Australia and New Zealand

The system electrical connection diagram for generally applicable is as follows:

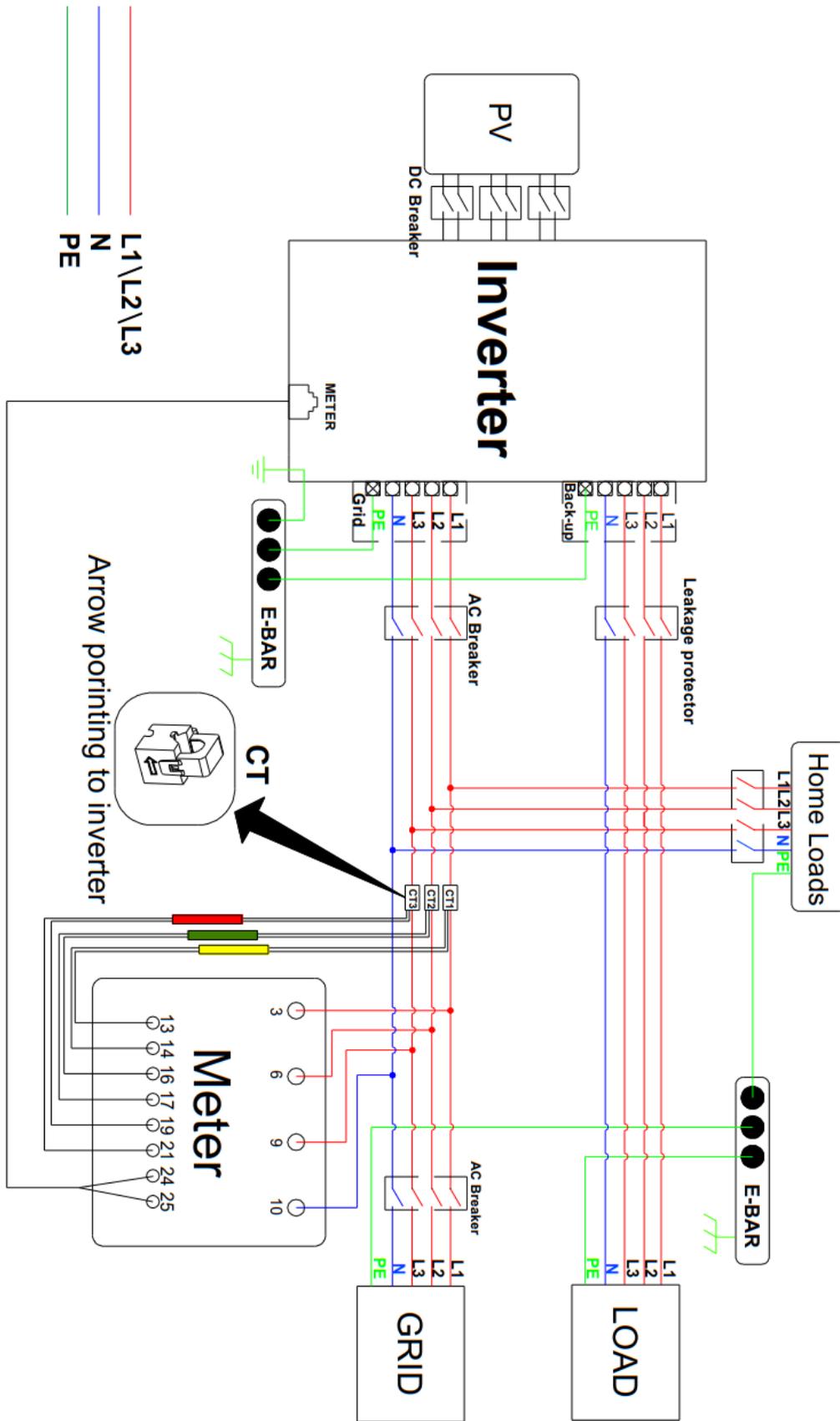


Figure 4.8-2 System electrical connection diagram

5 Equipment Commissioning

5.1 Check Before Power on



- Please read the instructions carefully before operating the equipment.

Before turning on the inverter for the first time, the following inspection work needs to do.

- Check and confirm that all equipment have been installed securely.
- Check the PV DC switch is "OFF".
- Check the BAT DC switch is "OFF".
- If there is an RSD switch, it should be in the unpressed state.
- Check the POWER switch is unpressed.
- Check the ground protection/ AC cable/ DC cable/ communication cable is correct polarity and firmly connected.
- Check the empty terminals are sealed.
- Check the CT cable is correct polarity, and the arrow on CT points towards the inverter.
- Check the meter wiring is correct.
- All safety labels and warning labels attached firmly and visible clearly.

5.2 Power on

Please power on the equipment according to the following steps:

1. Turn the BAT0 switch of inverter to "ON".
2. Turn the PV switch of inverter to "ON".
3. Press and hold the POWER button for 5s. Release the button and then the blue light hold on. It means the battery work normally.
4. If there is an RSD switch, press it first to enable the RSD module to function properly. If there is no RSD, proceed to the next step.
5. Close the AC switch between inverter and utility grid, then the grid power-on.
6. If a DC switch exists between inverter and PV string, close the switch.
7. After the machine is running, close the switch between BUCK-UP and load.

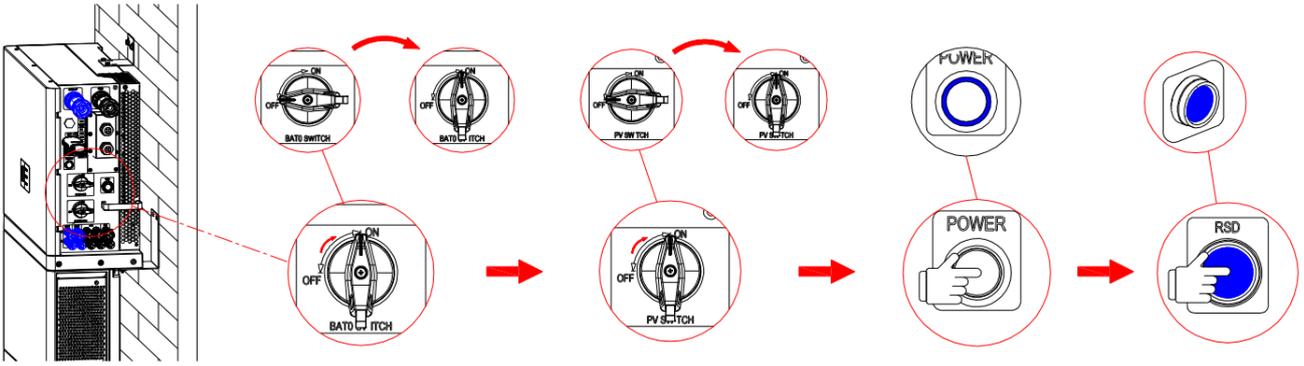


Figure 5.2-1 Power-on procedure for the equipment (with RSD)

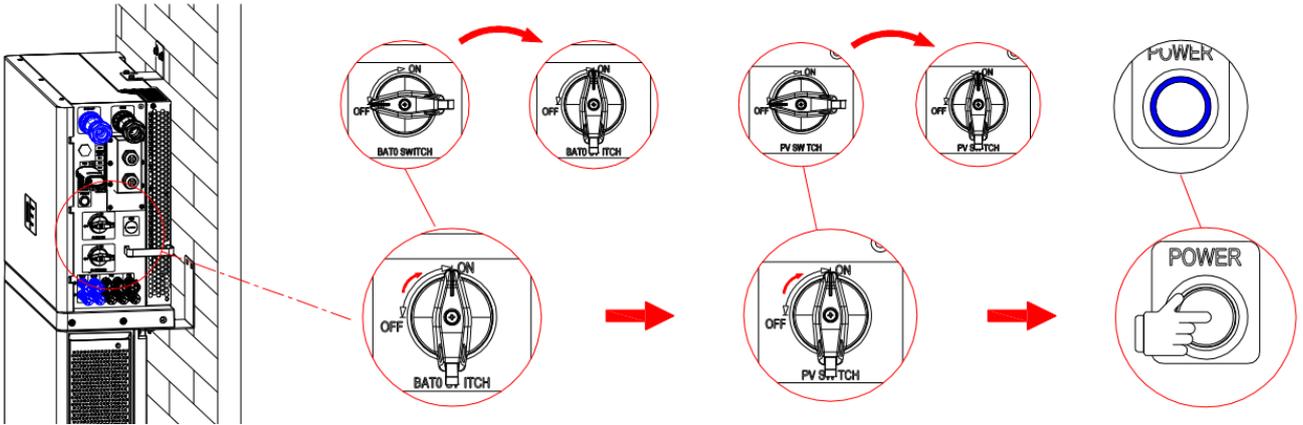
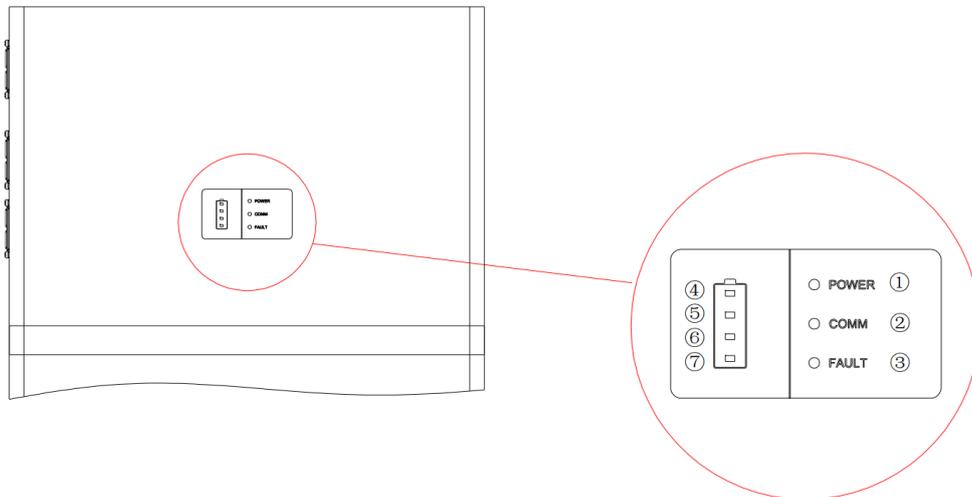


Figure 5.2-2 Power-on procedure for the equipment (without RSD)

5.3 Indicator Description

The LED indicator on the panel of the PV-energy storage inverter can indicate the current working state of the inverter. The indicator status descriptions as follows:



Indicator	Color	Statue	Frequency	Description
① POWER	Green	on	constant on	work normally
	Green	slow flashing	light on 2s light off 2s	standby
	Green	fast flashing	light on 0.5s light off 0.5s	Warning or INV without fault status and DC or PV fault status
②COMM	Green	light off	light off	no WIFI collector
	Green	on	constant on	WIFI collector successful connected
	Green	slow flashing	light on 2s light off 2s	WIFI collector failed connected
	Green	Flashing rapidly	0.5S on 0.5S off	Upgrade status
③FAULT	Red	on	constant on	fault status
	Red	Flashing slowly	2S on 2S off	fault status

BAT energy indicator Lights meanings	Lamp④	Lamp⑤	Lamp⑥	Lamp⑦
Battery fault status	4 Lamp flashing slowly 2s On 2s Off			
NO Battery or SOC=0%	Not illuminated	Not illuminated	Not illuminated	Not illuminated
0% < SOC ≤ 25% (Not charging)	Not illuminated	Not illuminated	Not illuminated	Constantly illuminated
25% < SOC ≤ 50% (Not charging)	Not illuminated	Not illuminated	Constantly illuminated	Constantly illuminated
50% < SOC ≤ 75% (Not charging)	Not illuminated	Constantly illuminated	Constantly illuminated	Constantly illuminated
75% < SOC ≤ 100% (Not charging)	Constantly illuminated	Constantly illuminated	Constantly illuminated	Constantly illuminated
0% ≤ SOC < 25% (charging)	Not illuminated	Not illuminated	Not illuminated	flashing slowly 2s On 2s Off
25% ≤ SOC < 50% (charging)	Not illuminated	Not illuminated	flashing slowly 2s On 2s Off	Constantly illuminated
50% ≤ SOC < 75% (charging)	Not illuminated	flashing slowly 2s On 2s Off	Constantly illuminated	Constantly illuminated

75%≤SOC < 100% (charging)	flashing slowly 2s On 2s Off	Constantly illuminated	Constantly illuminated	Constantly illuminated
SOC=100% (charging)	Constantly illuminated	Constantly illuminated	Constantly illuminated	Constantly illuminated

Description	Statue
Upgrade (PCS)	Two green lights (Power/COMM) flashing slowly together, 2S on, 2 S off
Transfer the battery upgrade file	BAT green light is flashing rapidly 0.5S on 0.5S off

6 Software Application

Detailed steps in the attached **Software Application Manual**.

7 Fault description

This section describes the fault alarms and codes used to find inverter faults quickly. Please contact after-sales service center if you meet the following problems.

fault code	Fault Information	Explanation	Fault Analysis
W101	AmmeterOffLine	Meter off-line	The meter disconnect or abnormal communicate.
W102	BMSOffLine	BMS off-line	The battery disconnect or abnormal communicate.
W103	WIFIOffLine	WIFI off-line	The collector disconnect or abnormal communicate.
W200	InterFanWarn	Internal fan warning	The internal fan disconnect or abnormal speed.
W201	ExterFan1Warn	External fan 1 warning	The external fan 1 disconnect or abnormal speed.
W202	ExterFan2Warn	External fan 2 warning	The external fan 2 disconnect or abnormal speed.
W203	ExterFan3Warn	External fan 3 warning	The external fan 3 disconnect or abnormal speed.

F180	AFCIFault	AFCI fault	The protection threshold of the AFCI module is exceeded.
F181	OverTempFault	Over temperature fault	The temperature of the radiator exceeds the overtemperature protection threshold
F193	OverLoadFault	Overload fault	The BACK-UP load exceeded the threshold.
F196	PassByOverCurrFault	Bypass overcurrent fault	The BACK-UP load current exceeded the threshold.
F197	PassByOverLoadFault	Bypass overload fault	The BACK-UP load power exceeded the threshold.
F198	GridVoltOverFault	Grid voltage overvoltage fault	The mains voltage exceeds the local regulatory voltage limit.
F199	GridVoltLowFault	Grid voltage undervoltage fault	The mains voltage input is below the local regulatory voltage limit.
F200	GridFreqOverFault	Grid frequency overfrequency fault	The mains frequency exceeds local regulatory frequency limit.
F201	GridFreqLowFault	Grid frequency underfrequency fault	The mains frequency is below the local regulatory frequency limit.
F262	PV1OverVolt	PV1 overvoltage	The PV1 voltage exceed the PV overvoltage protection threshold.
F263	PV2OverVolt	PV2 overvoltage	The PV2 voltage exceed the PV overvoltage protection threshold.
F264	PV1OverCurr	PV1 overcurrent	The PV1 current exceed the PV overcurrent protection threshold.
F265	PV2OverCurr	PV2 overcurrent	The PV2 current exceed the PV overcurrent protection threshold.
F266	PV1ReverseConnectFail	PV1 reverse connection fault	PV1 input positive and negative reverse connection
F267	PV2ReverseConnectFail	PV2 reverse connection fault	PV2 input positive and negative reverse connection
F274	OverTempFault	Radiator overtemperature fault	PV INV radiator overtemperature
F277	PVIsoFail	Insulation detection fault	The PV ground resistance value is lower than the insulation impedance protection threshold

F380	PackOverVolt	Pack overvoltage	The output voltage of the LLC module exceeds the battery protection threshold.
F381	PackUnderVolt	Pack undervoltage	The output voltage of the LLC module lower than the battery protection threshold.
F382	BATOverVolt	Battery pack overvoltage	The battery output voltage is higher than the battery protection threshold
F383	BATUnderVolt	Battery pack undervoltage	The battery output voltage is lower than the battery protection threshold
F384	OutputOverCur	Pack output overcurrent	Battery BM-D output overcurrent.
F385	DCDCOvertemp	DC-DC overtemperature	The radiator of the BDC module is overheated
F386	OverloadTimeout	Continuous overload timeout	Battery BM-D output overload times out
F387	ComFail	Abnormal communication	The CAN communication abnormal
F440	Monomer undervoltage protection	Monomer undervoltage protection	The battery voltage is lower than the protection threshold
F441	Monomer overvoltage protection	Monomer overvoltage protection	The battery voltage is higher than the protection threshold
F443	Discharge low temperature protection	Discharge low temperature protection	The battery module will protect itself under discharging at a low temperature.
F444	Charging low temperature protection	Charging low temperature protection	The battery module will protect itself under charging at a low temperature.
F445	Discharge high temperature protection	Discharge high temperature protection	The battery module will protect itself under discharging at a high temperature.
F446	Charging high temperature protection	Charge high temperature protection	The battery module will protect itself under charging at a high temperature.

8 System Maintenance

Managed by PV energy stored connected - off grid system, the inverter can automatically complete grid-connected and power generation, start or stop operations with the change of day and night and the change of seasons

In order to ensure and extend the service life of the inverter, in addition to using the inverter in strict accordance with the contents of this manual, it is necessary to carry out necessary daily maintenance and overhaul of the inverter.

8.1 Machine Cleaning

Recommended to clean the battery and inverter regularly. If the shell is dirty, use a soft dry brush or dust removal device to remove the dust. Cleaning fluid materials include solvents, abrasives, etc. Avoid using corrosive liquids.

8.2 Shutdown procedure

Shutdown procedure for the equipment is as shown in the diagram below.

Step 1: If there is an RSD switch, release the RSD switch first, RSD light goes off, and the inverter shuts down. If there is no RSD switch, proceed to the next step directly.

Step 2: Press and hold the POWER button for more than 8 seconds, wait for 1 second, POWER light goes off, and the battery shuts down.

Step 3: Disconnect the LOAD circuit breaker, GRID circuit breaker, battery DC circuit breaker, and PV DC isolation switch.

Step 4: Wait for 5-10 minutes to ensure complete discharge and check if the inverter is completely shut down.

8.3 Fan replacement

Please replace it if the fan makes any abnormal noise or not fan operation.

Only professional personnel should perform this operation.

	<ul style="list-style-type: none">● Power off the inverter and battery before the replacement.● Only professional electricians can perform fan maintenance and replacement
	<ul style="list-style-type: none">● Wait 5 minutes or more until the capacitor is discharged.

The fan replacement steps are as follows:

Step 1: Ensure that the all in one is shut down and powered off.

Step 2: If the product is connected, please power off and wait at least 5 minutes before the following operations.

Step 3: Not need to remove the inverter and battery when replacing the fan.

Step 4: Pay attention to replace the fan according to the line mark.

Step 5: Remove the damaged fan and install the new to the original position as shown below.

Step 6: Unscrew the 4 fixing screws and remove the fan box, as shown in Figure

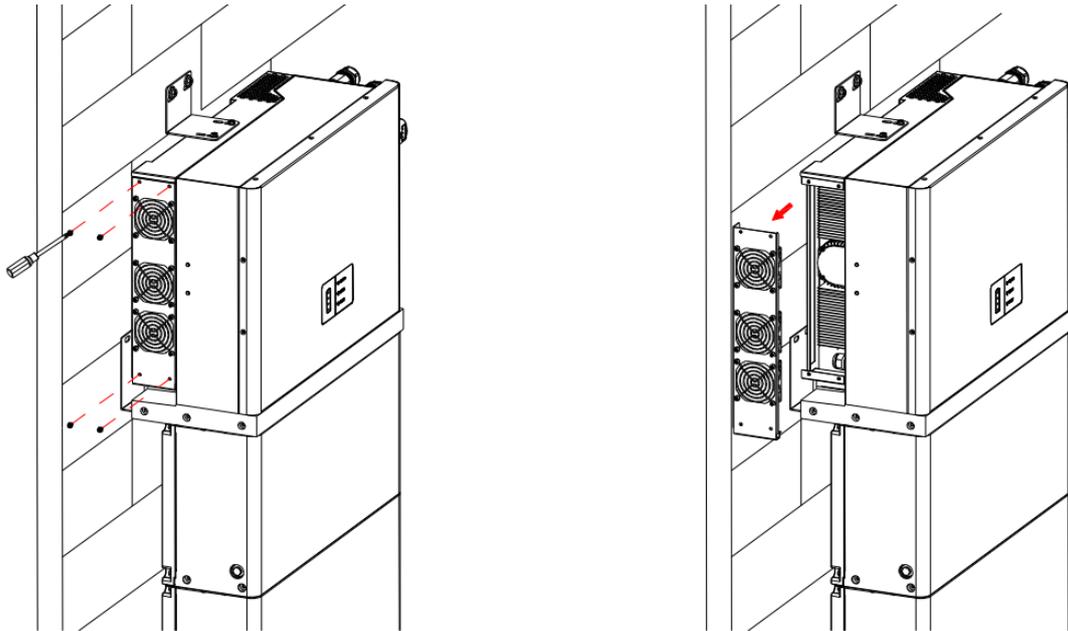


Figure 8.2-1 Remove the fan assembly

Step 7: Remove the fan assembly by separating the cable connecting the fan to the inverter with a screwdriver as shown in Figure.

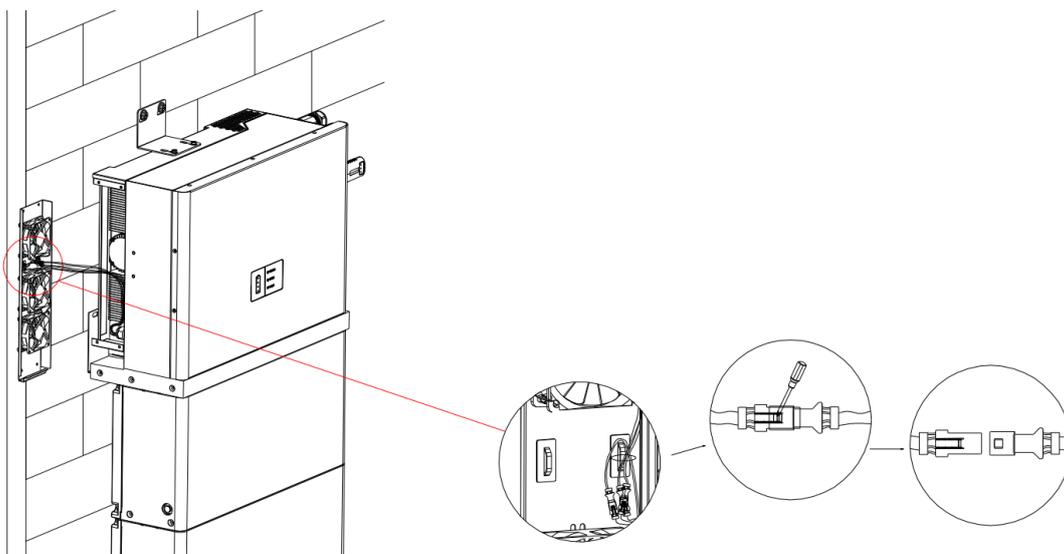


Figure 8.2-2 Remove fan cables

Step 8: Unscrew the damaged fan and replace them, as shown in Figure

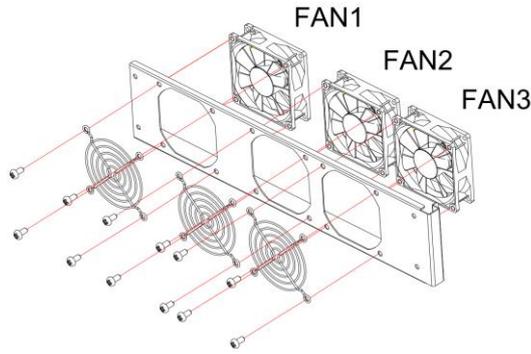


Figure 8.2-3 Remove the damaged fan

Step 9: Reconnect the cables between the fan and inverter, and install the screws and cover of the fan box to their original positions. Finally, install the inverter to the original position and restart

8.4 Inverter Removal

The inverter removal steps are as follows:

Step1: If there is an RSD switch, release the RSD switch first, RSD light goes off, and the inverter shuts down. If there is no RSD switch, you can proceed to the next step directly.

Step 2: Press the POWER button for more than 8 seconds, and then wait 1s. The POWER indicator is off, and the battery is off.

Step 3: Turn off LOAD circuit breaker, GRID circuit breaker, BAT DC circuit breaker, PV DC isolator .

Step 4: Wait 5-10 minutes to ensure the discharge is complete and check to ensure that the inverter turned off. Disconnect all electrical connections of the inverter, including the PV cables, battery cables, and communication cables.

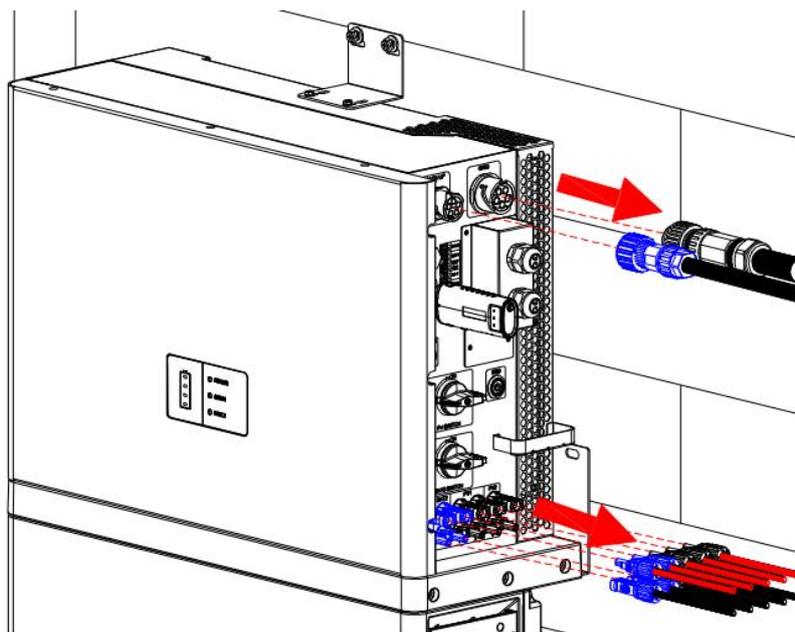


Figure 8.3-1 Remove all inverter electrical connections

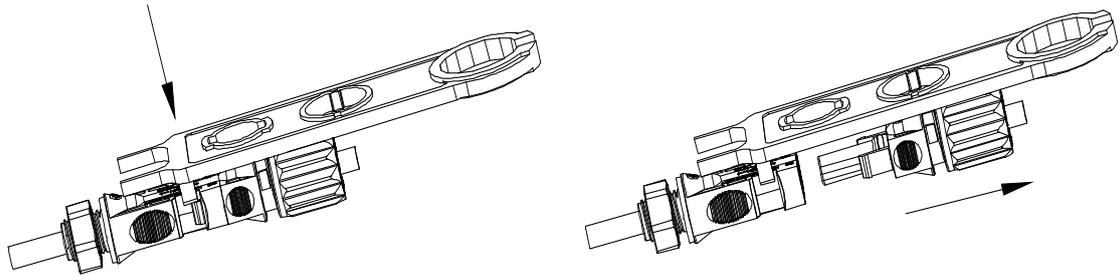


Figure 8.3-2 Remove PV、BAT terminal

Step 5: Remove the self-tapping screws and remove the inverter.

Note: The inverter is heavy, and at least two people to remove it.

Note: Waste inverters should be treated in accordance with local regulations on the disposal of e-waste and used batteries.

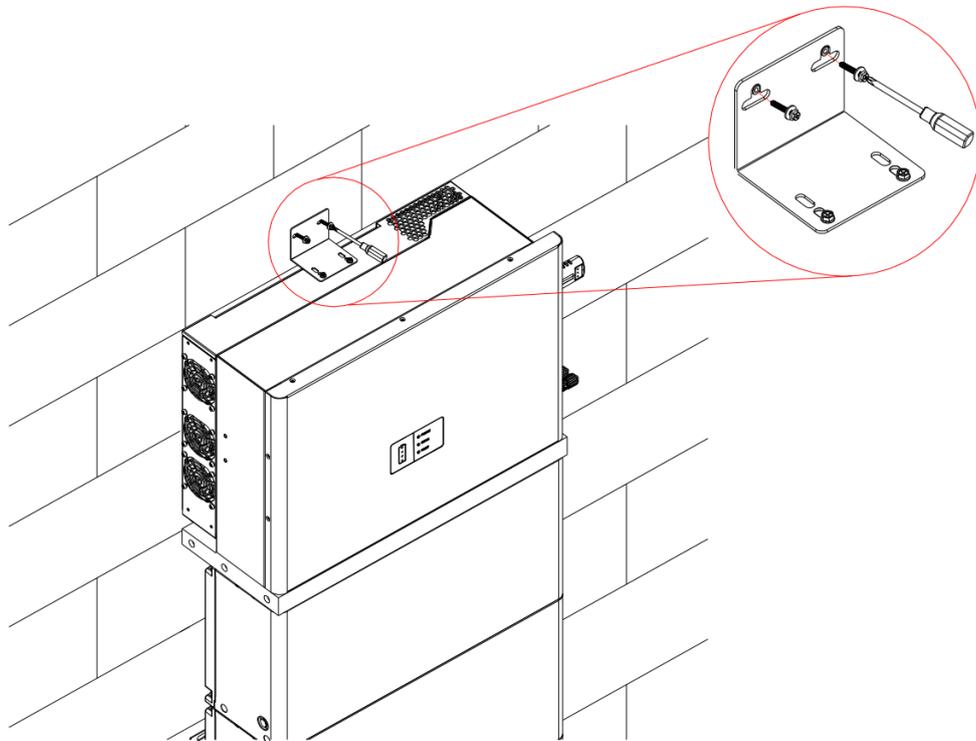


Figure 8.3-3 Remove the self-tapping screw of inverter

8.5 Battery Removal

The battery removal steps are as follows:

Step 1: Remove the inverter by referring to 8.4 Removing an Inverter

Step 2: Remove the self-tapping screws on the battery wall bracket, as shown in the picture

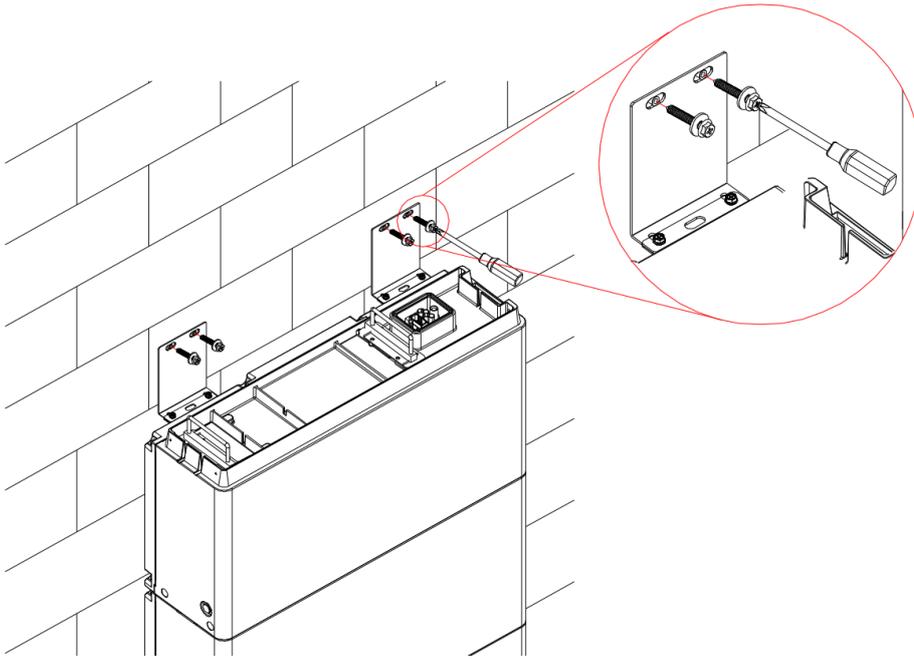


Figure 8.4-1 Remove the battery self-tapping screw

Step 3: Remove the battery pack as shown in the picture.

Note: Waste batteries should be treated in accordance with local regulations on the disposal of e-waste and used batteries.

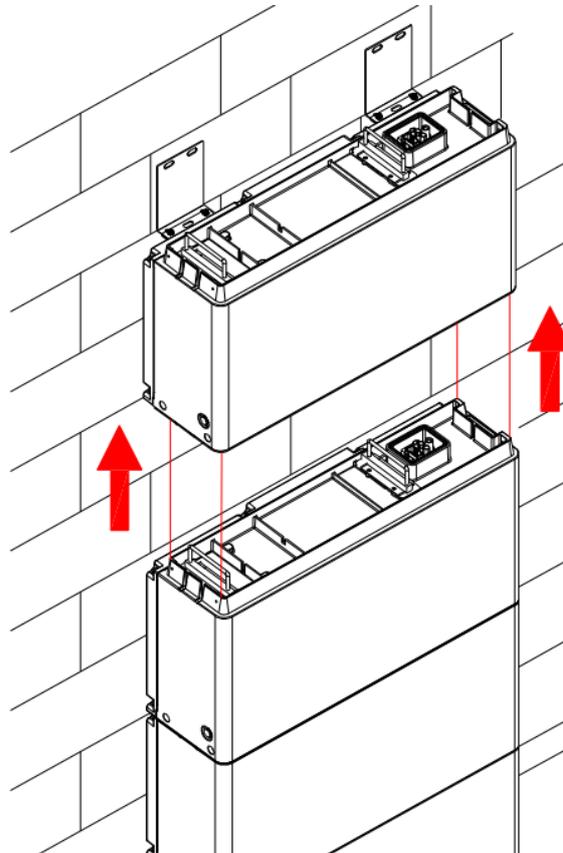


Figure 8.4-2 Remove battery pack

9 Warehouse storage guidelines

9.1 Packaging guidelines

Lithium-ion batteries is recognized as dangerous goods. The packaging requirements for battery products are as follows:

- a. The packaging manufacturer with the packaging qualification for dangerous goods is responsible for providing product packaging, and the packaging manufacturer has a record in the local Commodity Inspection Bureau;
- b. After the packaging manufacturer completes the packaging, the supplier needs to apply to the Commodity Inspection Bureau, and the Commodity Inspection Bureau will provide the 'Dangerous Package Product Use Inspection Sheet' and 'Dangerous package product performance inspection sheet', and complete the dangerous package commodity inspection;
- c. All battery packs should be packaged with product instruction manuals. The packaged product should be placed in a dry, dust-proof and moisture-proof packing box;
- d. The product name, model, quantity, gross weight, manufacturer, and ex-factory date should be marked on the outside of the packing box.
- e. The necessary signs such as "upward" and "fear of fire" shall meet the requirements of GB/T 191;
- f. The packing method is: packing in a carton with molded foam buffer material in the carton;
- g. Accessories packaging: single accessories are first fastened with cardboard or plastic film or braided straps, neatly placed in the carton, and filled with regular fillers (foam pads, cardboard, etc.) to prevent the accessories from shifting in the box. The following documents should be included with the product when leaving the factory:
 - 1) Product certificate (both in Chinese and English);
 - 2) Product use (installation) manual (both in Chinese and English);
 - 3) Product packing list (both in Chinese and English);
 - 4) Factory inspection report (both in Chinese and English).
- h. Clean battery

Regular cleaning of the battery system is recommended. If the case is dirty, use a soft dry brush or dust collector to remove the dust. Cleaning liquid materials include solvents, abrasives, etc. Corrosive liquids should not be used to clean the housing.

9.2 Battery Storage

The battery pack is stored in a clean, dry and ventilated room with an ambient temperature of $25^{\circ}\text{C}\pm 5^{\circ}\text{C}$ and a relative humidity of not more than 75%. The battery pack has a state of charge of 45% to 55%. Avoid contact with corrosive substances and keep away from fire and heat sources.

10 Dispose of used batteries

- Comply with applicable local regulations for the disposal of electronic waste and used batteries.
- Do not mix with your household waste.
- Do expose the battery to high temperatures or direct sunlight.
- Do not expose batteries to high humidity or corrosive environments.
- Do not expose batteries to high humidity or corrosive environments.

11 Detailed specifications

11.1 Inverter Detailed specifications

Model	SW5KH3UT	SW6KH3UT	SW8KH3UT	SW10KH3UT	SW12KH3UT	SW15KH3UT
PV input parameter						
Max. input power (W)	8000	9000	12000	15000	22500	22500
Max. DC input voltage (V)	1000					
MPPT voltage range(V)	180~850					
Starting voltage (V)	180V					
Max. input current per MPPT (A)	A: 15		A: 15 / B: 30			
Max. short-circuit current per MPPT (A)	A: 19		A: 19 / B: 38			
No. of MPPT Tracker	1		2			
NO. of MPPT input strings per channel	A: 1	A: 1	A: 1 / B: 2	A: 1 / B: 2	A: 1 / B: 2	A: 1 / B: 2
Battery input parameter						
Battery capacity (kWh)	5~20(Support union clustering)					
Rated Voltage (V)	400					
voltage range (V)	350~450					
Max. continuous charging current (A)	23			46		
Max. continuous discharge current (A)	23			46		
Max. discharge power (W)	5000	6000	8000	10000	12000	15000
Max. charge power (W)	5000	6000	8000	10000	12000	15000
Grid-tied parameters						
Rated grid-tied output power (W)	5000	6000	8000	10000	12000	15000
Max. grid-tied output apparent power (VA)	5000	6000	8000	10000	12000	15000

Max. grid-tied input apparent power (VA)	8000	9000	12000	15000	18000	22500
Rated output voltage (V)	230/400 3W/N/PE					
Output voltage frequency (Hz)	50					
Max. grid-tied output current (A)	8.4	10	13.4	16.7	20	25
Max. input current (A)	12.2	13.7	18.2	22.8	27.4	34.2
Power factor	0.8 leading to 0.8 lagging					
Total current waveform distortion rate	<3%					
Output parameters(Off-grid)						
Grid-off rated apparent power (VA)	5000	6000	8000	10000	12000	15000
Max. output apparent power (VA)	5500	6600	8800	11000	13200	16500
Max. output current (A)	7.6	10	13.4	16.7	20	25
Rated output voltage (V)	230/400 3W/N/PE					
Rated output voltage frequency (Hz)	50					
Total voltage waveform distortion (@ linear load)	<3%					
Efficiency						
Max. efficiency	97.4%	97.4%	97.8%	97.8%	97.8%	97.8%
Eur efficiency	96.5%	96.5%	96.8%	96.8%	97%	97%
Protection						
Input DC switch	Integrated					
Insulation impedance detection	Integrated					
Residual current monitoring	Integrated					
Input reverse protection	Yes					
Anti-island protection	Yes					
Ac overcurrent protection	Yes					
Ac short circuit protection	Yes					
Ac overvoltage protection	Yes					
AFCI Dc arc protection	Optional					
Dry contact remote scheduling	Yes					
DC surge protection	Type II					

AC surge protection	Type II
PCS general parameters	
Ambient temperature (°C)	-30 ~ +60 (> 45°C derating)
Ambient humidity	0 ~ 95%
Working altitude (m)	<4000 (> 3000m derating)
Cooling	Air Cooling (≤47dB)
Display	LED&APP
BMS Communication	CAN
Meter Communication	RS485
Monitoring mode	4G/Wifi
Weight (Kg)	41
Dimensions (W*H*D, mm)	650*480*250
Topological structure	Transformerless
Enclosure Type	IP65
Type classification	All in One Unit
Installation	Stacked/Stacked in one piece

11.2 Battery Detailed specifications

Battery parameter				
Model of module	B40012DP03			
Battery module Configuration	H1	H2	H3	H4
Rated energy (KWh)	5	10	15	20
Rated capacity (Ah)	100	200	300	400
Nominal voltage (V dc)	400	400	400	400
Rated charging & discharge current (A dc)	6	12	18	24
Max. charging & discharge current (A dc)	6.5	13	19.5	26
Rated charge and discharge power (kW)	2.5	5	7.5	10
Max. charge and discharge power	3.5kW,10s	7kW,10s	10.5 kW ,10s	14 kW ,10s
Dimensions (W*H*D, mm)	653*397*189	653*712*189	653*1027*189	653*1342*189
Total weight(kg)	52	104	156	208
Environment Temperature	-10~50°C(for charging); -20~50°C(for discharging) , Heater will work when the cell temperature is below 5°C.			
IP class	IP65			

12 Statement without Responsibility

The company shall not be liable for the following situations occur.

- Failure or damage caused by accident or abnormal natural environment (force majeure, such as typhoon, earthquake, fire, etc.).
- The environment of installation and operation beyond the international or local national standards.
- Operating equipment is not according to the operation instructions and safety warnings in the product manual, resulting in equipment damage due to incorrect installation, operation and other human factors.
- The product code has been altered or lost.
- Disassemble, change product structure or modify software code without authorization.
- Damage caused by water or other substances infiltrating into the machine due to human reasons.
- Damage caused by storage conditions that do not meet product specifications.
- Transportation damage caused by the customer's own transportation.
- Damage outside the warranty period.



Contact

If you have any technical questions about our products, please contact **Sunwoda Energy Technology Co., LTD.**

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Version: V1.1

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