a WOLONG company

User Manual

Hybrid Inverter

WL EHTS-3000~20000X

Contents

1 Overview

This manual mainly introduces the product information, installation, electrical connection, configuration debugging, troubleshooting and maintenance, technical parameters, and other contents of the three phase hybrid inverter. Please read this manual carefully before installing and using this product to understand the product safety information and familiarize yourself with the functions and features of the product. The Manual may be updated from time to time, please get the latest version of the material from the official website to obtain more information about the product.

1.1 Scope of application

This Manual is applicable to the following inverter models:

Model	Rated output power	Rated output voltage
WL EHTS-3000X	3000W	3L/N/PE,220/380Vac，230/400Vac
WL EHTS-5000X	5000W	
WL EHTS-6000X	6000W	
WL EHTS-8000X	8000W	
WL EHTS-10000X	10000W	
WL EHTS-12000X	12000W	
WL EHTS-15000X	15000W	
WL EHTS-18000X	18000W	
WL EHTS-20000X	20000W	

Note: Due to the overload protection of the product above an ambient temperature of 40 ℃, the high temperature mode test in the Italian power grid specification certification will be conducted at an ambient temperature of 40 ℃.

1.2 Applicable personnel

This Manual is only for professional and technical personnel who are familiar with local regulatory standards and electrical systems and who have been professionally trained and are familiar with the knowledge

related to this product.

1.3 Symbol definition

The Manual provides relevant safety operation information and highlights it with appropriate symbols in order to ensure the safety of the user's person and property when using three phase hybrid inverter and the efficient use of the product. Please first fully understand and absolutely comply with this highlighted information in order to avoid personal injury and property damage. The following is a list of symbols used in this manual.

 Danger
It indicates a high potential hazard that, if not avoided, will result in death or serious injury.
 Warning
It indicates a moderate potential hazard that, if not avoided, will result in death or serious injury.
 Caution
It indicates a low potential hazard that, if not avoided, will result in moderate or minor injury.
 Attention
It indicates a potential risk that, if not avoided, will result in the equipment not operating properly or cause property damage.

2 Safety precautions

The manual on safety precautions contained in this document must always be observed when operating the equipment.

Attention

- The inverter has been designed and tested in strict accordance with safety regulations, but as an electrical equipment, the relevant safety instructions need to be observed before any operation of the equipment, and improper operation may result in serious injury or property damage.

2.1 Operation safety

Attention

- Please read this manual carefully to fully understand the product and precautions before installing the equipment.
- All operations of the equipment must be carried out by professional electrical technicians who are familiar with the relevant standards and safety codes of the project site.
- Insulated tools and personal protective equipment must be used when operating the inverter to ensure personal safety. Static gloves, static hand ring, anti-static clothing, etc. must be worn when contacting electronic devices to prevent the inverter from being broken by static electricity and causing damage.
- Damage to the inverter or injury to personnel caused by not following the requirements of this manual for installation, use and configuration is not covered by the equipment manufacturer's responsibility.

2.2 PV string safety

Danger

- Please use the DC terminal block provided with the box to connect the inverter DC cable. The use of other types of DC terminals may lead to serious consequences, so the damage caused by the

equipment is not covered by the equipment manufacturer's responsibility.

Warning

- Please make sure that both the component frame and the bracket system are well grounded.
- Please make sure the cable is tightly connected and not loose after the DC cable is connected.
- Check that the battery DC terminals are correctly wired and that the voltage is within the allowable range with a multi-meter.
- Please do not connect the same PV string to more than one inverter, otherwise the inverter will be damaged.

2.3 Battery safety

Warning

- Please read the battery safety content introduced in the User manual carefully to understand the product before installing the equipment, and please strictly follow the requirements in the User manual.
- Battery current may be affected by external environment, such as: temperature, humidity, etc., which may lead to battery current limiting and affect loading performance of the battery.
- Please contact the after-sales service center as soon as possible if the battery fails to start. otherwise, the battery may be permanently damaged.
- Check if the battery DC terminals positive and negative are wired properly and the voltage is within the allowable range with a multimeter.
- Please do not connect the same battery set to more than one inverter, as this will cause damage to the inverter.

2.4 Inverter safety

Warning

- Please ensure that the voltage and frequency of the grid connection point comply with the inverter grid connection specifications.
- It is recommended to add protection devices such as circuit breakers or fuses on the AC side of the inverter, and the protection inverter specifications should be greater than 1.25 times the maximum current of the AC output of the inverter.
- The protective ground wire of the inverter must be firmly connected, and when there are multiple inverters, make sure that the protective ground points of all inverter chassis enclosures are connected equipotentially.
- If the battery is not configured in the PV system, the BACK-UP off-grid function is not recommended and the resulting risk of system power usage will not be covered by the equipment manufacturer's warranty.

2.5 Personnel requirements

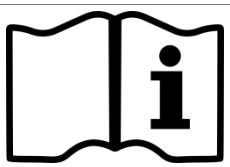
Attention

- Certain parts may become charged or hot when the inverter is in operation. Improper use, incorrect installation or operation may result in serious injury to persons or property. transportation, handling, installation, startup and maintenance operations must be performed by a qualified electrical engineer.

2.6 Description of inverter symbols

The three phase hybrid inverter carries a number of safety-related

labels. please read and fully understand the contents of these labels before installing the product.

Symbol	Symbol name	Symbol meaning
	It indicates the danger of residual voltage in the inverter.	Please wait for 5 minutes until the capacitor is completely discharged after the DC side of the inverter has been disconnected with power for a period of time.
	It indicates the danger of high voltage.	High voltage exists during inverter operation. If you need to operate the inverter, please make sure the inverter is disconnected.
	It indicates to be careful of high temperature surface.	The temperature of inverter housing is high during operation, so do not touch it, otherwise it may cause burns.
	It indicates grounding terminal.	Connect the inverter to ground for grounding protection purpose.
	It indicates reading the manual.	Please read and understand this manual carefully before installing the inverter.

3 Equipment inspection and storage

3.1 Inspection before receipt

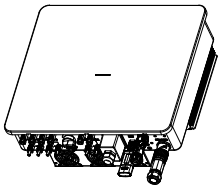
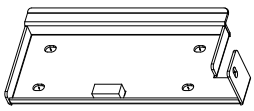
Please check the following in detail before signing for the product:

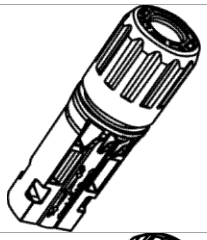
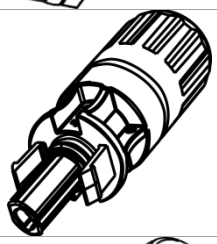
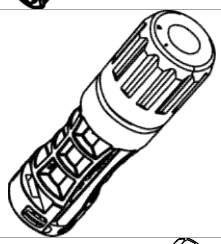
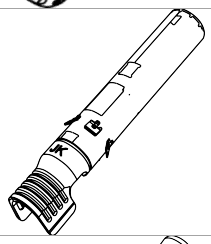
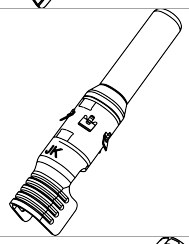
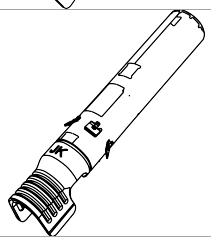
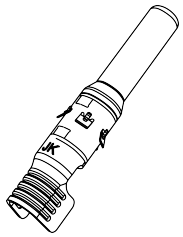
- Check the outer packaging for damage, such as holes, deformation, cracks or other signs that may cause damage to the equipment inside the box; if there is damage, do not open the packaging and contact your dealer.
- Check if the inverter model is correct, if there is any discrepancy, please do not open the package and contact your dealer.
- Check that the type and quantity of the deliverables are correct and that there is no damage to the appearance. please contact your dealer if there is any damage.

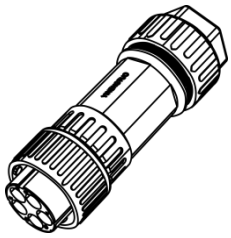
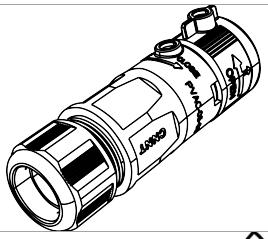
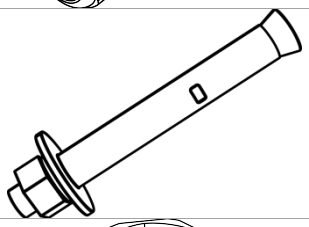
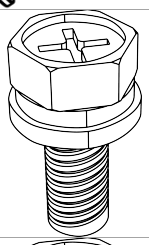
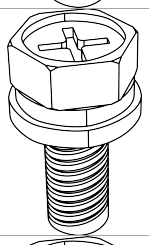
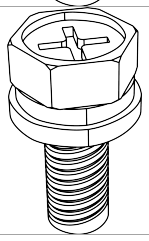
3.2 List of deliverables

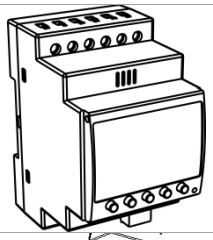
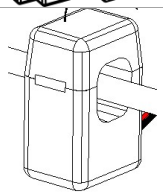
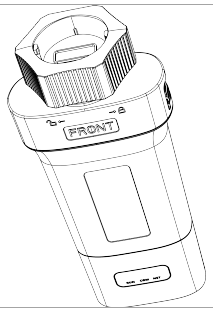
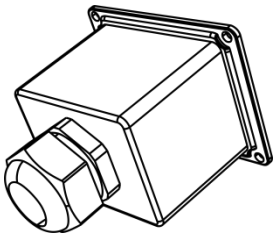
Check the deliverables for completeness after unpacking the inverter and contact your dealer if any components are found to be missing or incomplete.

Table 3-1 Components and mechanical parts to be delivered

Series No.	Picture	Description	Quantity
1		Inverter	1PC
2		Wall-mounted rear cover	1PC
3		PV+ wire end input terminal plastic case	4PCS

4		PV- wire end input terminal plastic case	4PCS
5		BAT+ wire end input terminal plastic case	2PCS
6		BAT- wire end input terminal plastic case	2PCS
7		PV+ wire end input terminal metal core	4PCS
8		PV- wire end input terminal metal core	4PCS
9		BAT+ wire end input terminal metal core	2PCS
10		BAT- wire end input terminal metal core	2PCS

11		AC grid terminal	1PC
12		6mm hex wrench	1PC
13		AC load terminal	1PC
14		M8*80 expansion bolt	4PCS
15		Cross recessed hexagon head combination screw M4*10	4PCS
16		Cross recessed hexagon head combination screw M6*16	2PCS
17		Cross recessed hexagon head combination screw M6*20	1PC

18		Smart meter	1PC
19		CT (Used with the meter)	3PCS
20		BMS communication line	2PCS
21		Meter communication line	1PC
22		Parallel communication line	2PCS
23		WIFI acquisition bar (optional)	1PC
24		Waterproof cover	1PC
25		PV Disassembly wrench	1PC

26		BAT Disassembly wrench	1PC
27		User manual	1PC
28		Warranty card	1PC
29		Test report	1PC
30		Certificate of Inspections	1PC
31		desiccant	1PC

3.3 Equipment storage

Please store the inverter according to the following requirements if it is not to be put into use immediately:

- Ensure that the outer packing box is not removed and the desiccant inside the box is not lost.
- Ensure that the storage environment is clean and the temperature and humidity range is appropriate.
- Ensure that the inverter stacking height and direction are placed in accordance with the label instructions on the box.
- Ensure that there is no risk of tipping of the inverters after stacking.

- The inverter must be checked and confirmed by professional personnel before it can be used again after long-term storage.

4 Product introduction

4.1 Product profile

WL Three phase hybrid inverter is a combination of photovoltaic grid connected inverters and battery energy storage, with multiple bulit-in working modes to meet the diverse user needs. WL Three phase hybrid inverter provides a complete solution in times of rising energy costs such as oil and coal, declining energy subsidies for grid-connected PV systems, mountainous areas or base stations without grid access, uninterrupted power supply, and emergency power needs.

4.2 Application scenarios

Warning
➢ PV systems are not suitable for connection to equipment that depends on a stable power supply, such as life-sustaining medical equipment, etc. Please ensure that no personal injury is caused when the system loses power. ➢ Please avoid using loads with higher starting currents in PV systems as much as possible, otherwise the off-grid output may fail due to excessive instantaneous power. ➢ The inverter can restart automatically when the inverter overload protection occurs in a single time; if it happens several times, the inverter restart time will be extended, and you can restart the inverter immediately through the App if you need to restart the inverter as soon as possible. ➢ If the load capacity exceeds the rated power of the inverter when the grid is down, the off-grid function of the inverter will automatically shut down; if you want to start it, you need to turn off the large load and make sure the load power is less than the rated power of the inverter. ➢ The inverter can be used for normal household loads when it is in

off-grid mode.

- Inductive load: 1.5P non-inverter air conditioners can be supported. access to two or more non-inverter air conditioners may lead to unstable standby mode.
- Capacitive load: total power ≤ 0.7×inverter rated output power.

4.3 Working mode

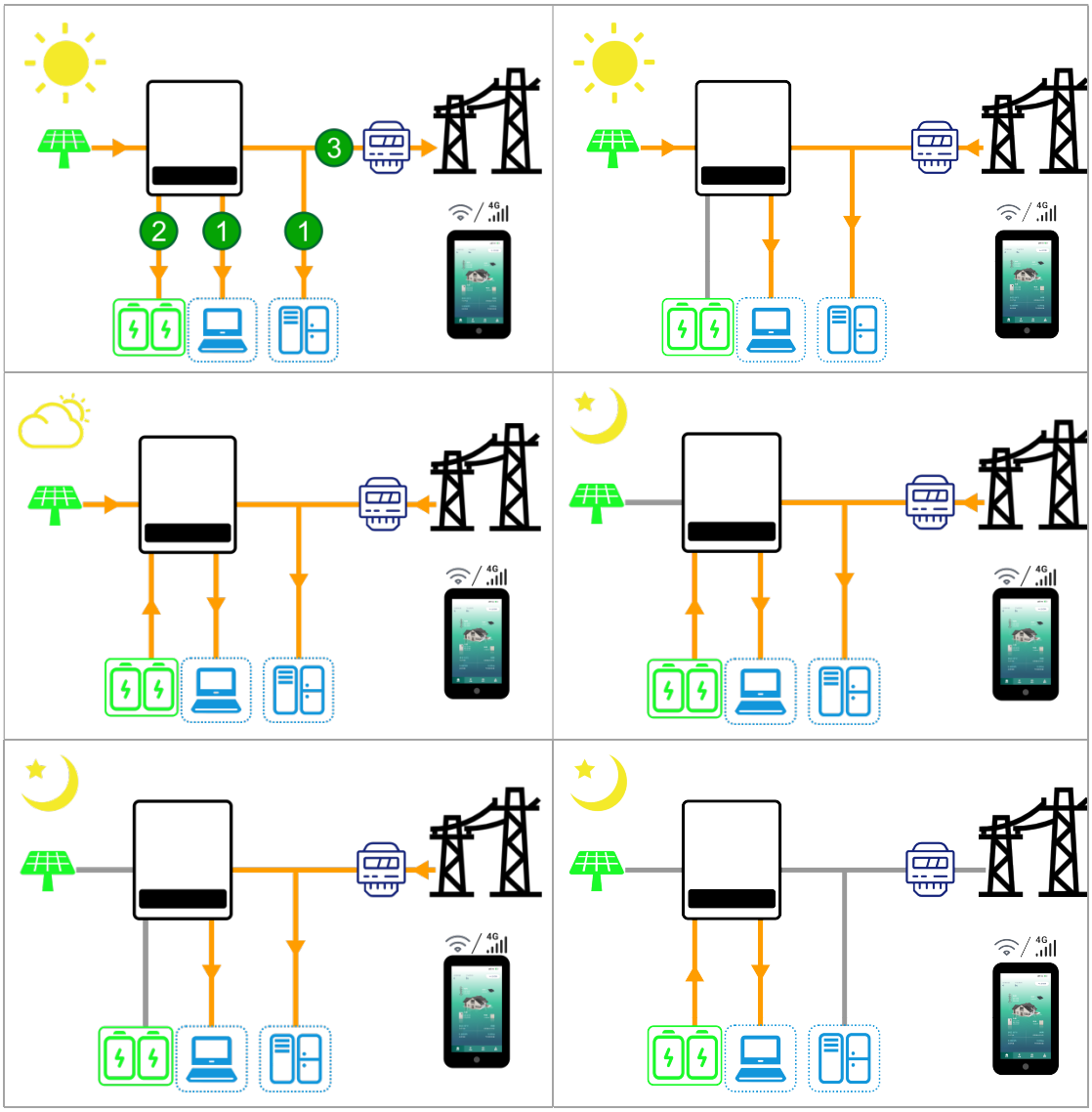
4.3.1 Self-generation and self-use mode

Functions:

Prioritizes the use of PV and battery energy, and does not use energy from the grid as much as possible.

Specific working methods:

- When the PV is sufficient, the PV prioritizes supplying power to the load, charging the battery with excess electricity, and the remaining electricity can be fed back to the grid.
- When PV is insufficient, PV and battery jointly supply power to the load.
- When both PV and battery are insufficient, PV, battery, and grid jointly supply power to the load.
- When the PV is not working and the battery is sufficient, the battery supplies power to the load.
- When the PV is not working and the battery is insufficient, the battery and the grid jointly supply power to the load.
- When both PV and battery are not working, the grid supplies power to the load, forming a BYPSS output.
- When the power grid is unable to supply power, the load is powered by both the photovoltaic and battery systems.



4.3.2 Timed charging and discharging mode

Functions:

Set the charging and discharging time period according to the user's own needs. For example, during the day when the electricity price is high, discharge is set up to supply power to the load using the electricity from batteries and photovoltaics. at night when the electricity price is low, charging is set up to charge the battery using the electricity from the grid, in order to achieve peak shaving and valley filling.

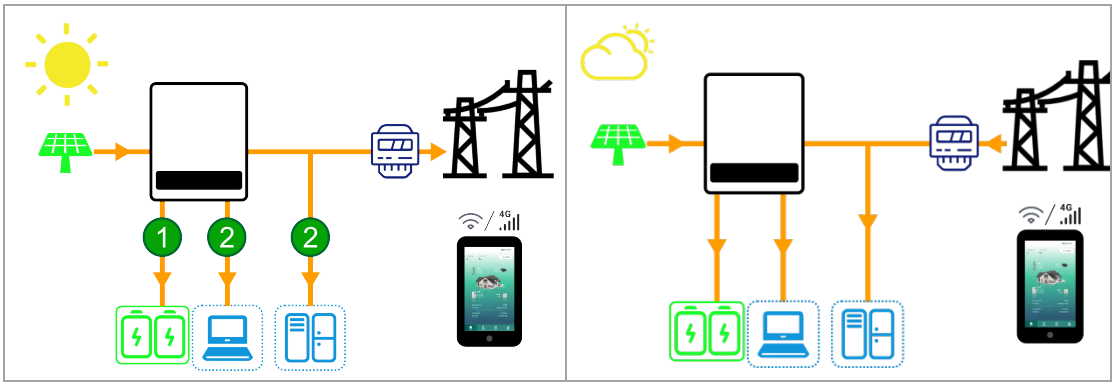
Specific working methods:

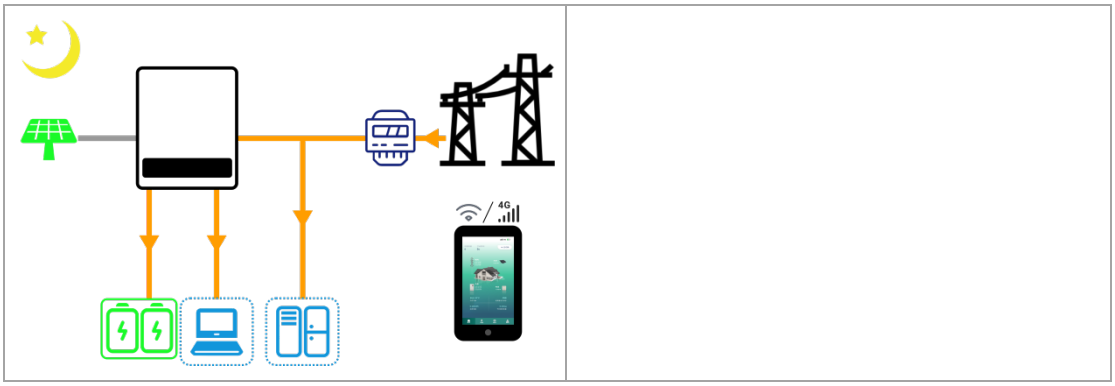
Charging time period:

- When the PV is sufficient, the PV charges the battery, and the remaining electricity supplies power to the load.
- When the PV is insufficient, the photovoltaic and grid work together to charge the battery and supply power to the load.
- When PV is not working, the grid charges the battery and supplies power to the load.
- Discharge time period:
- When PV is sufficient, PV supplies power to the load.
- When the PV is insufficient, the PV and battery supply power to the load.
- When the PV is not working and the battery is sufficient, the battery supplies power to the load.
- PV does not work, and when the battery is insufficient, the battery and grid supply power to the load.
- When the PV is not working and the battery is not working, the grid supplies power to the load.

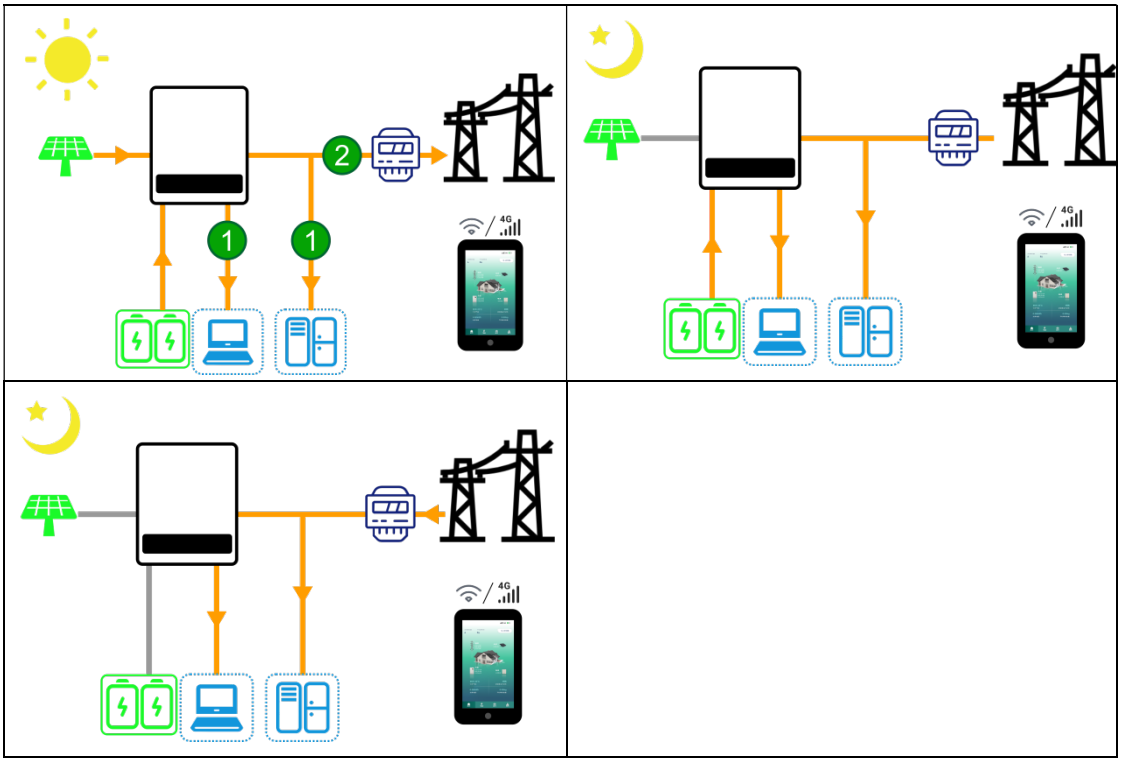
Note: The charging power is defined as the power that the inverter charges the battery, and the discharge power is defined as the power emitted by the inverter.

Charging time period:





Discharge time period:



4.3.3 Time of use electricity price mode

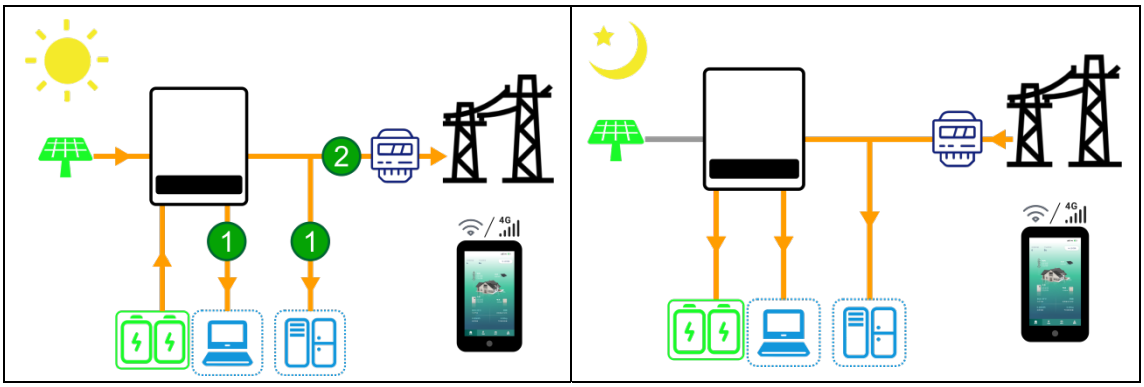
Functions:

It is recommended to use the time of use electricity pricing model in scenarios where there is a significant difference in peak and valley electricity prices.

Specific working methods:

When the power grid is at its peak: PV and batteries supply power to the load, and excess electricity can be fed back to the grid.

When the power grid is in a trough: PV and the grid charge the battery and supply power to the load.



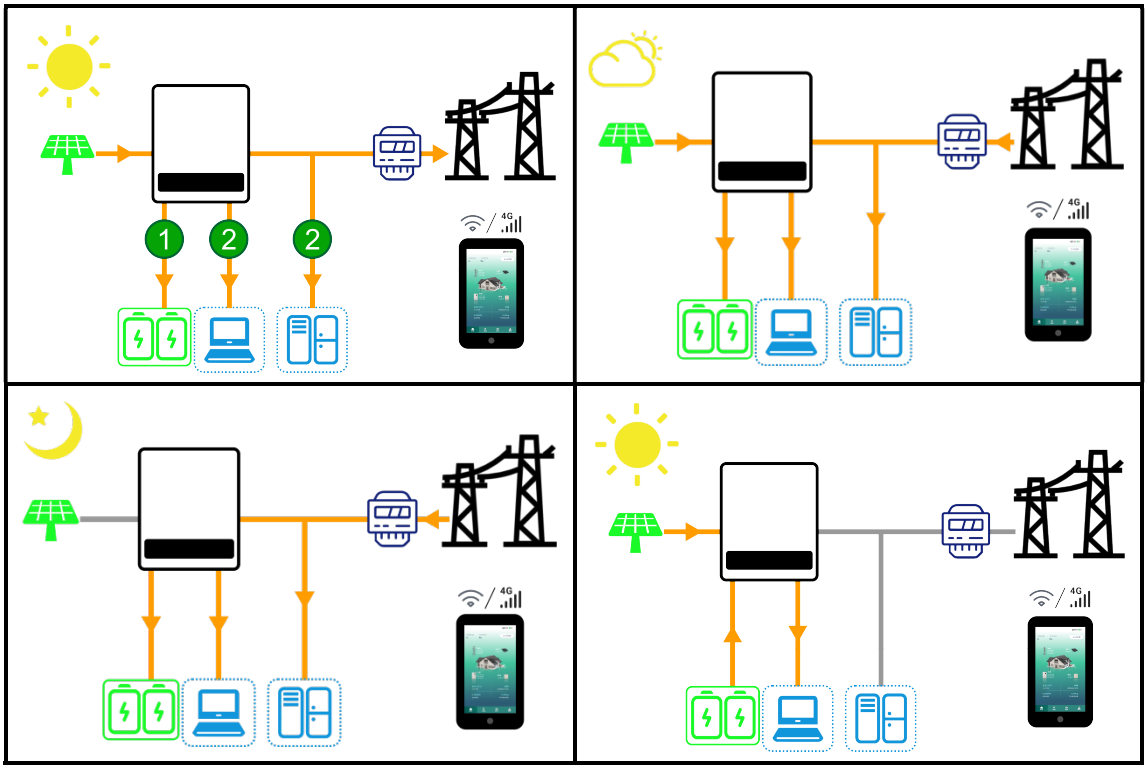
4.3.4 Disaster Recovery Mode

Functions:

Always maintain the battery in a fully charged state to respond to sudden power grid outages or other emergency situations, ensuring that users can also use the battery's energy backup for power supply in the event of an emergency.

Specific working methods:

- When PV is sufficient, PV prioritizes charging the battery before supplying power to the load, and the remaining electricity can be fed back to the grid.
- When the PV is insufficient, the PV and the grid prioritize charging the battery before supplying power to the load.
- When the PV is not working, the power grid charges the battery and supplies power to the load.
- When the power grid is unable to supply power, the PV and battery jointly supply power to the load.


1
2
2

4.4 Inverter operation mode

4.4.1 Operating mode

Table 4-1 Description of Inverter Operation Mode

Series No.	Mode	Description
1	Wait mode	➢ Waiting phase after the inverter is powered on. ➢ Enter self-check mode when conditions are met. ➢ If there is a fault, the inverter enters the fault mode.
2	Self-check mode	➢ The inverter continuously performs self-check, initialization, etc. before starting up. ➢ If the conditions are met, it enters grid-connected mode and the inverter starts grid-connected operation. ➢ If no grid is detected, it enters off-grid mode and the inverter runs off-grid. ➢ If the self-check is not passed, it enters fault mode.

3	Grid-connected mode	➢ The inverter operates normally in grid-connected. ➢ If grid non-existence is detected or the grid conditions are detected that do not meet the grid connection requirements, it enters off-grid operation mode. ➢ If a fault is detected, it enters fault mode. ➢ If it is detected that the grid conditions do not meet the grid connection requirements and the off grid output function is not enabled, it enters a waiting state. ➢ If after switching off the grid, it is detected that the grid conditions meet the grid connection requirements and the grid connection function is enabled, it enters the grid connection state.
4	Off-grid mode	➢ When the grid is disconnected or the grid conditions are detected that do not meet the grid connection requirements ,the inverter working mode switches to off-grid mode to continue to supply power to the load. ➢ If the grid conditions are detected to meet the grid connection requirements, it will enter the grid-connected mode. ➢ When the working mode is set to off grid mode before operation, the inverter works off grid. ➢ If a fault is detected, it enters fault mode.
5	Fault mode	➢ If a fault is detected, the inverter enters fault mode, waits for the fault to clear, returns to the previous running mode.

4.4.2 Indicator description

A bar indicator light is located in the middle of the device panel, indicating the inverter status through three colors: red, green, and blue.

Table 4-2 Indicator light status description

Display item	Indicator light status	Corresponding status description	Notes
Green	Constantly on	Grid connection	Indicates that the machine is currently working in a grid connected state and can exchange energy with the power grid. The load can be powered on for operation.
	Flashing 1s/time	Be ready	Indicates that the machine is in the power-on state and needs to wait until the power-on is completed before the load can be powered on and run.
	Flashing 0.1s/time	The machine has just been powered on and the program is initialized/Code online upgrade	Indicates that the machine has just been powered on and the program initialization will flash for 10s; Indicates that the current working status is

			in shutdown state, and it can be turned on and used normally after the code upgrade is completed.
Blue	Constantly on	Off-grid	Indicates that the machine is currently working in an off-grid state and cannot exchange energy with the power grid. the load can be powered on and run.
Red 	Constantly on	System error	Indicates that the machine is currently in shutdown state, a serious alarm occurs on the machine, and the load cannot be powered on and run.
	Flashing for 0.5s/time	System error	Indicates that the machine is currently in shutdown state, a relatively serious alarm has occurred on the machine, and the load cannot be powered on.
	Flashes 2s/time	System error	Indicates that the machine is currently in shutdown state, an

			alarm occurs on the machine, and the load cannot be powered on.

4.5 Description of Appearance

4.5.1 Appearance introduction

Please carefully inspect the packaging and accessories of the product before installation.

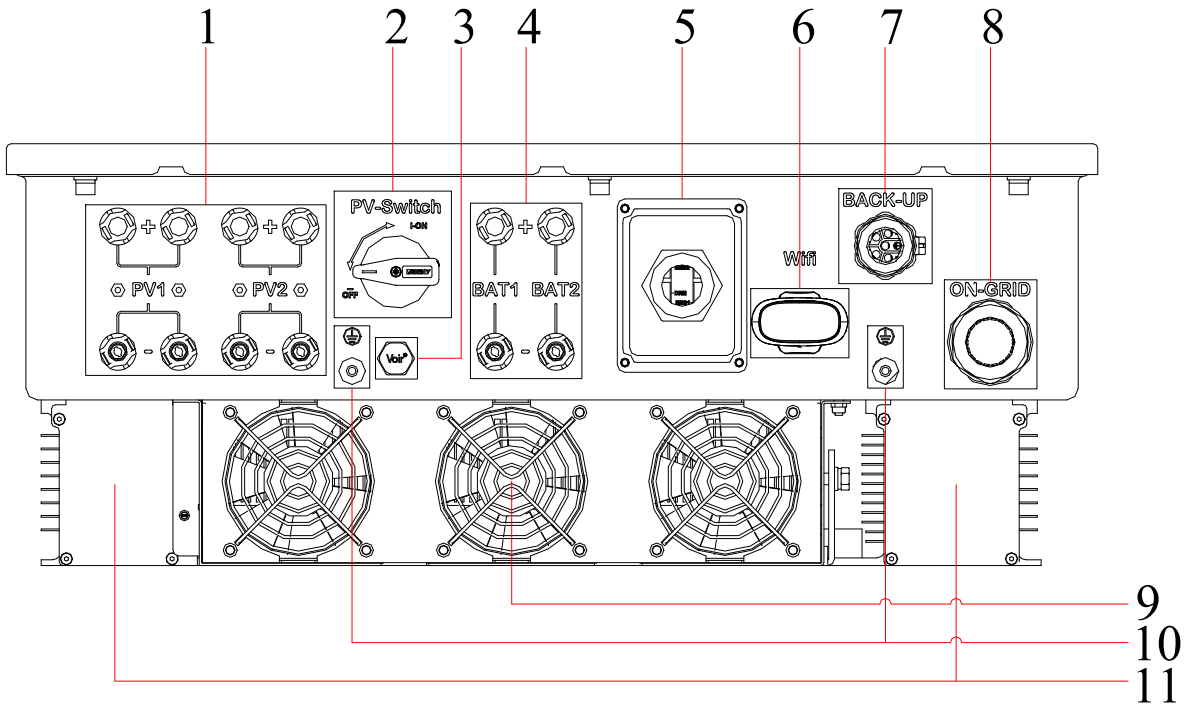


Figure 4.1 Illustration of the appearance of the hybrid inverter

Table 4-2 Appearance of a hybrid inverter

1	PV DC input port (PV+/-)	2	PV DC input switch
3	Waterproof and breathable device	4	Battery DC input port (BAT+/-)
5	Communication module interface	6	WiFi/4G interface
7	Off-grid AC wiring port	8	Grid-connected AC wiring port
9	Fan assembly	10	Protective ground terminal

11	Inductive cooling box		

4.5.2 Dimensional description

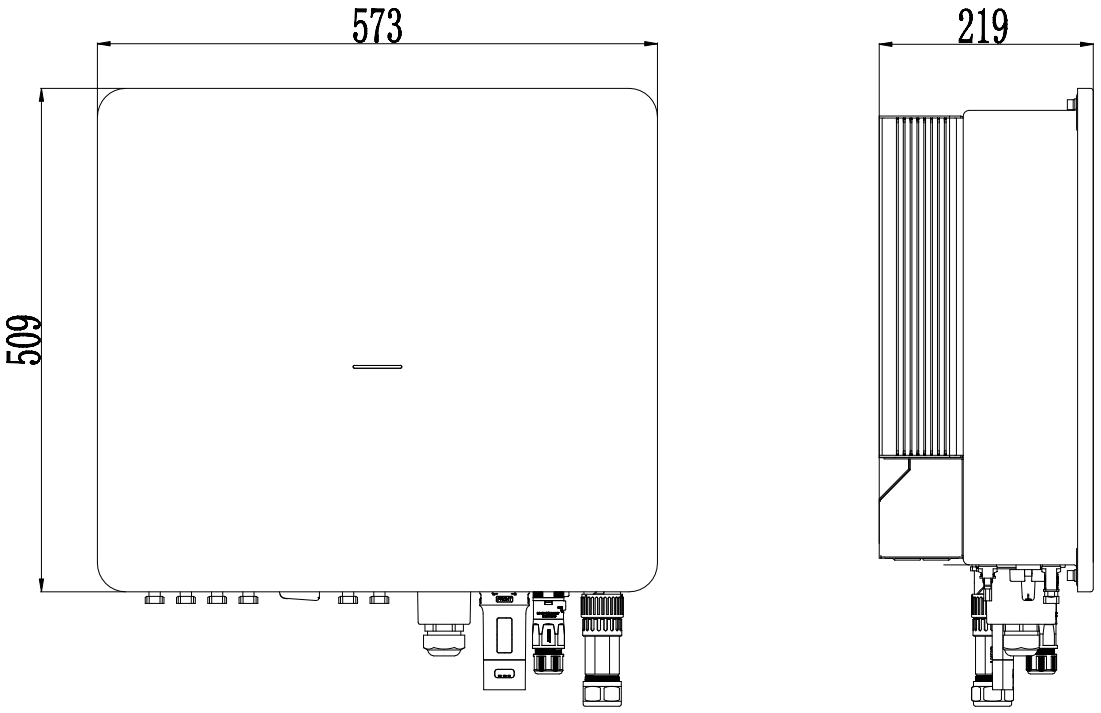


Figure 4.2 Three phase inverter dimensions

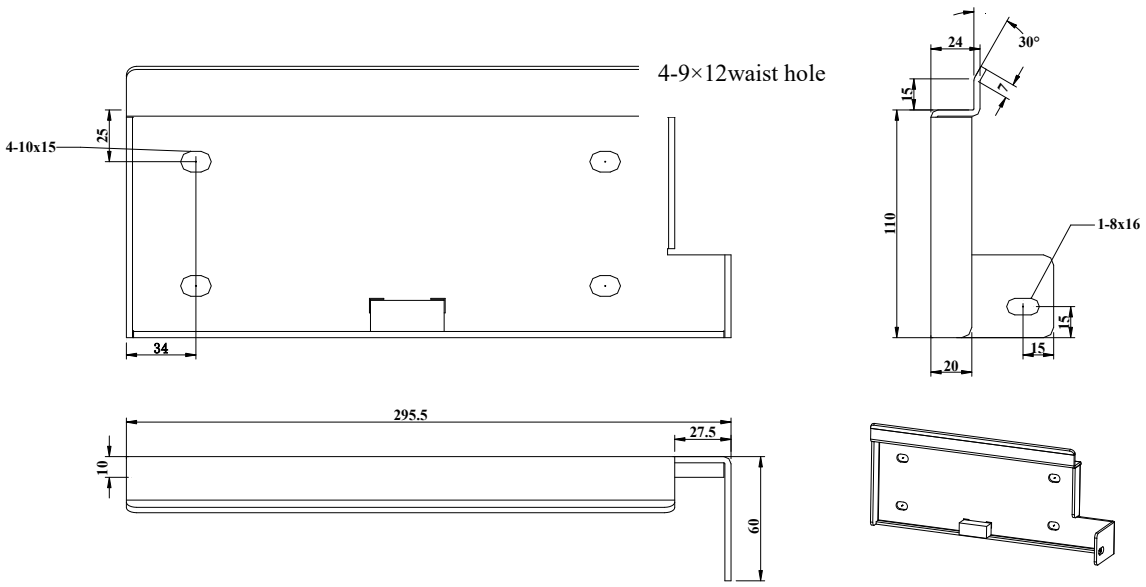
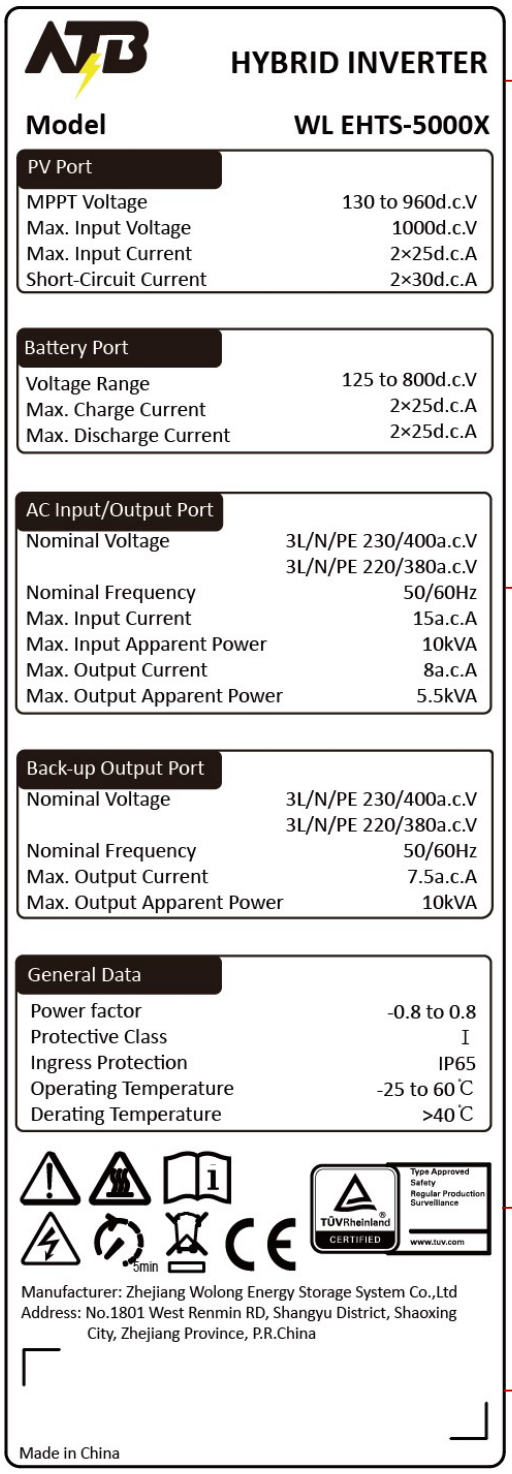


Figure 4.3 Wall mount dimensions

4.6 Nameplate description



Company logo and product type and

Technical parameters of product

Product safety symbol and certification mark

Manufacturer and serial number information

5 Installation

5.1 Installation requirements

5.1.1 Installation environment requirements

1) The equipment shall not be installed in flammable, explosive or corrosive environments.

2) The installation position shall avoid the water pipe and cable in the wall to avoid the danger when drilling.

3) Installation location shall avoid the range of children's access, and avoid installation in the easy-to-touch location. Please note that there may be high temperature on the surface when the equipment is operating, so please be careful of burns.

4) The inverter shall avoid the installation environment of sun, rain and snow, etc. It is recommended to be installed in a sheltered installation position, and if necessary, a sunshade can be built.

5) The installation space shall meet the requirements of equipment ventilation and heat dissipation and operation space.

6) The protection level of the equipment shall meet the indoor and outdoor installation, and the temperature and humidity of the installation environment shall be within the suitable range.

7) Please ensure that the equipment indicator and all labels can be easily viewed and the terminals are easy to operate.

8) The installation altitude of the inverter shall be lower than the maximum working altitude of 4000m.

9) Please keep away from strong magnetic field environment to avoid electromagnetic interference. please install the equipment in accordance with the following requirements if there are radio stations or wireless communication equipment below 30MHz near the installation location:

- Add multi-turn winding ferrite cores at the DC input wire or AC output wire of the inverter, or add low-pass EMI filters.
- The distance between the inverter and the wireless EMI equipment

shall exceed 30m.

5.1.2 Installation carrier requirements

1) The installation carrier shall not be flammable materials, and must have fireproof performance.

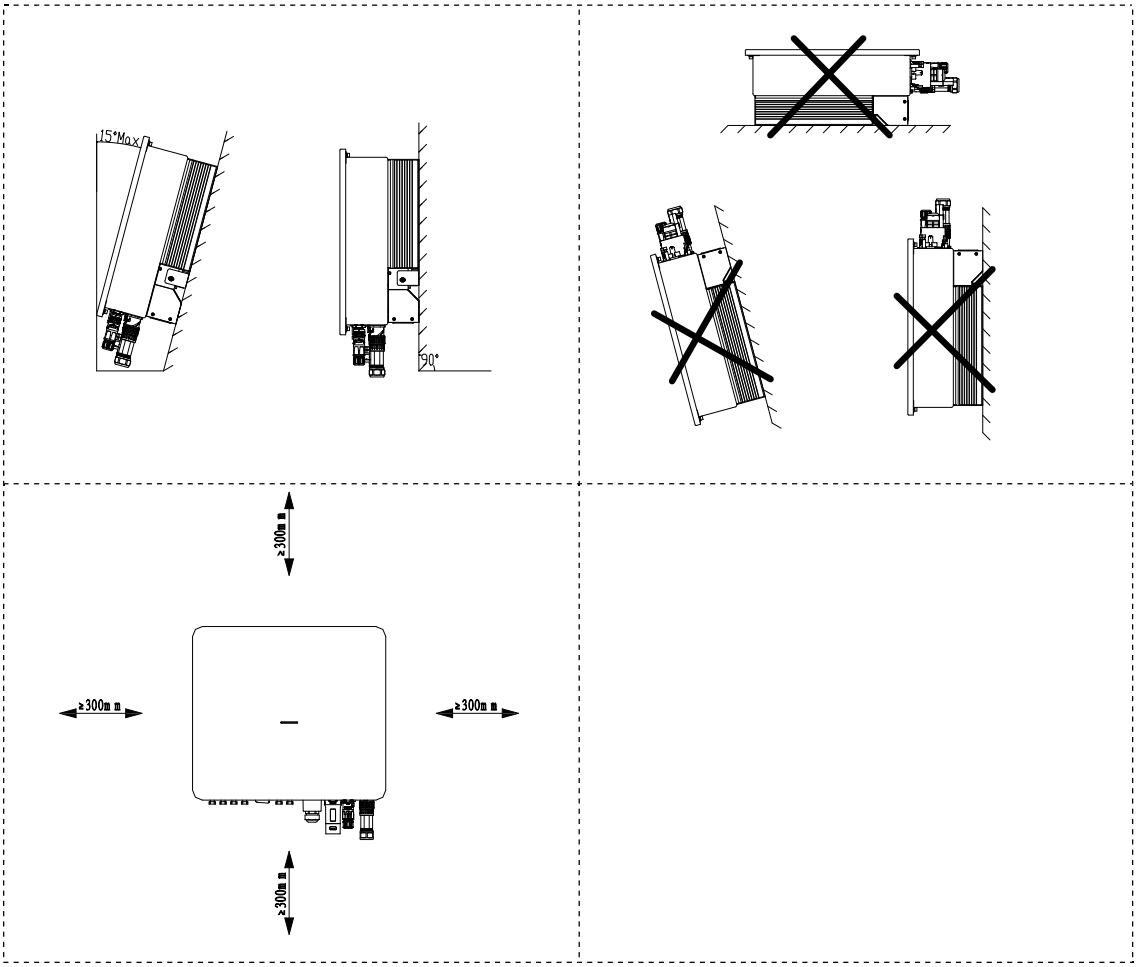
2) Please ensure that the installation carrier is strong and reliable and can carry the weight of the inverter.

3) Please do not install the inverter on a carrier with poor sound insulation, as the noise from the operation of the equipment may cause disturbance to the residents in the living area.

5.1.3 Installation angle requirements

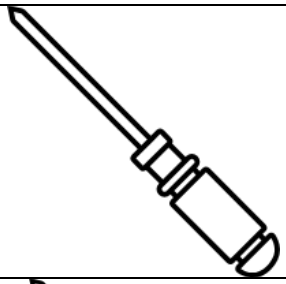
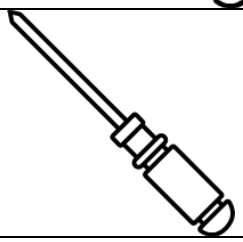
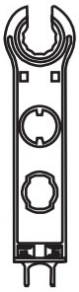
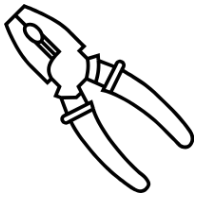
1) .Recommended Installation angle of inverter: vertical or tilted back ≤ 15°.

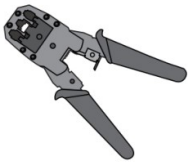
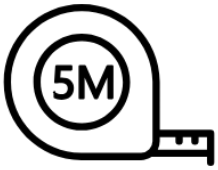
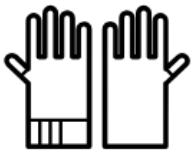
2) The Inverter shall not be installed upside down, tilted forward, tilted back beyond the angle, or horizontal.

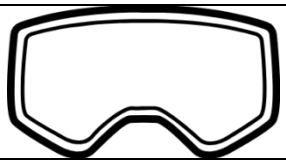
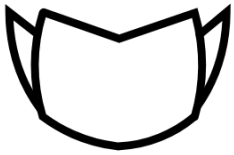


5.2 Installation tools

Table 5-1 List of Installation Tools

Series No.	Tools	Description	Function
1		Percussion drill Recommended 8mm drill	Wall drilling
2		6mm cross-head screwdriver	Removing, installing screws and wiring
3		4mm cross-head screwdriver	Removing and installing load terminal screws
4		Removal tool	Removal of PV, BAT line end terminals
5		Wire strippers	Stripping wire
6		Crimping pliers	Crimping PV and BAT cables

7		Crimping pliers	Pressure welding grid, load end cable
8		6mm hex wrench	Fasten the grid terminal to the cable
9		Multimeter	Check whether the cable wiring is correct, the positive and negative battery terminals are correct and voltage, and grounding is reliable
10		Marking pen	Drilling mark
11		Tape	Measurement distance
12		Protective gloves	Wear when setting up the inverter

13		Goggles	Wear when drilling holes
14		Dust mask	Wear when drilling holes

5.3 Hand the inverter

Remove the inverter from the outer packaging and handle it horizontally to the designated installation location. open the outer packing box, two operators shall each reach under the inverter heat sink, carry the inverter out of the outer packing box and carry it to the designated installation position.

Caution

- The operation of transportation, turnover and installation shall meet the laws and regulations and relevant standards of the country or region where it is located.
- Please pay attention to keep the balance when transporting the inverter as it is heavy, so that the operator will not be injured by the falling of the inverter.
- The power cable interface and signal cable interface at the bottom of the inverter cannot bear weight, please do not put the terminals in direct contact with the ground, please place the inverter horizontally.
- Please put foam or paper s[illegible]n under the inverter when it is placed on the ground to avoid damaging the case.

5.4 Install the inverter

Attention

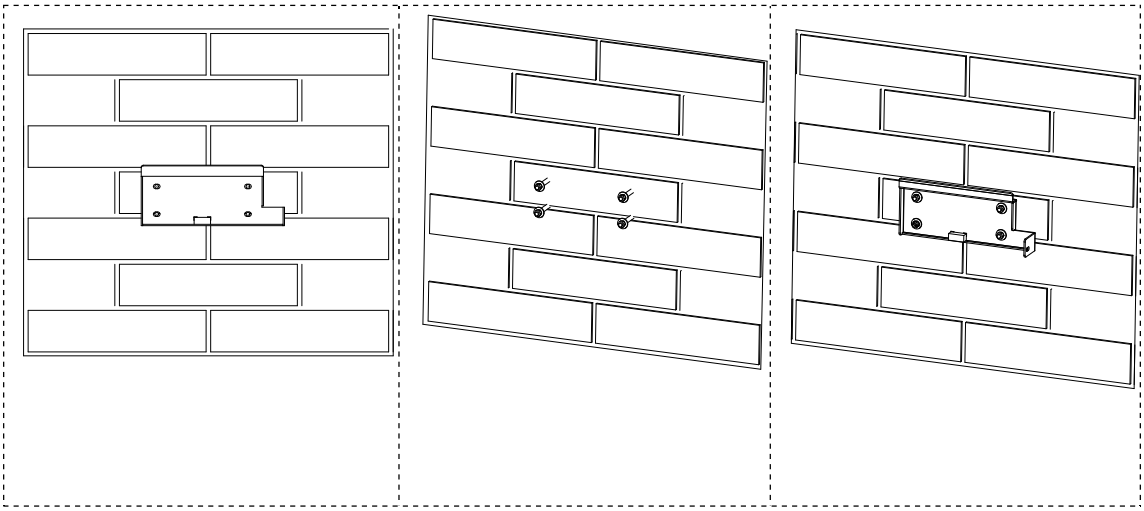
- Please ensure that the drilling position avoids water pipes and cables in the wall when drilling to avoid danger.
- Please wear goggles and a dust mask when drilling to avoid dust being inhaled into the respiratory tract or falling into the eyes.

Step 1: Please choose a wall with sufficient bearing capacity, according to the level on the wall mounting bracket, horizontally attach the bracket to the installation wall, mark the position of the fixed wall mount to be drilled with a marking pen on the wall, then use the percussion drill to drill holes on the wall, keep the percussion drill perpendicular to the wall when drilling, do not shake it to avoid damaging the wall, reposition it if the hole drilling error is large.

Step 2: Insert the M8*80 expansion screw vertically into the hole, pay attention to the depth of the expansion screw shall not be too shallow.

Step 3: Put the wall bracket on the hole, and fix the wall bracket on the wall with nuts.

Step 4: Hang the inverter on the wall bracket, make sure the inverter is correctly inserted into the slot, and then fix the wall bracket to the inverter body case with screws, as shown in Figure 5.1.



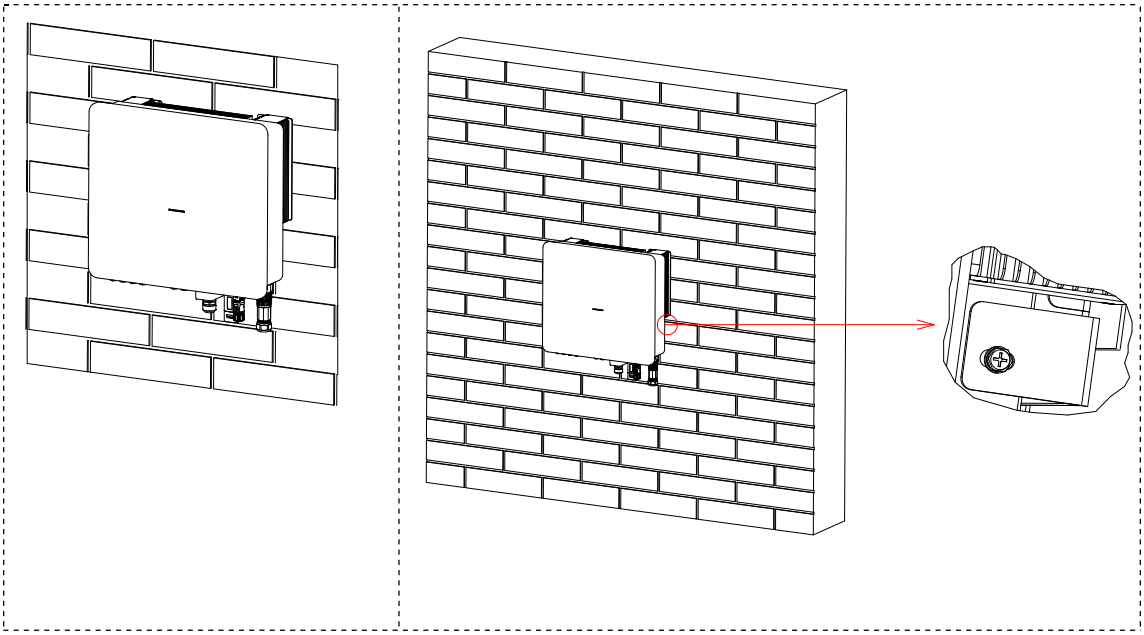


Figure 5.1 Wall-mounted parts installation instructions diagram

6 Electrical connection

Before installation and maintenance, ensure that both the AC and DC sides are not charged. Due to the fact that the capacitor remains charged for a period of time after the inverter is powered off, it is necessary to wait for at least 5 minutes to ensure that the capacitor is fully discharged. three phase inverters are used for battery energy storage photovoltaic systems. If not used as expected, the equipment may be damaged.

6.1 Electrical system connection diagram

⚠ Attention
➢ According to the regulatory requirements of different regions, the N and PE wires of the inverter ON-GRID and BACK-UP ports are wired differently, depending on the local regulatory requirements. ➢ The inverter ON-GRID and BACK-UP AC ports are equipped with built-in relays. When the inverter is in off-grid mode, the built-in ON-GRID relay is open; when the inverter is in grid-tied operation mode, the built-in ON-GRID relay is closed. ➢ When the inverter is powered up, the BACK-UP AC port is charged. please power down the inverter if you need to perform maintenance on the BACK-UP load, otherwise it may cause electric shock.

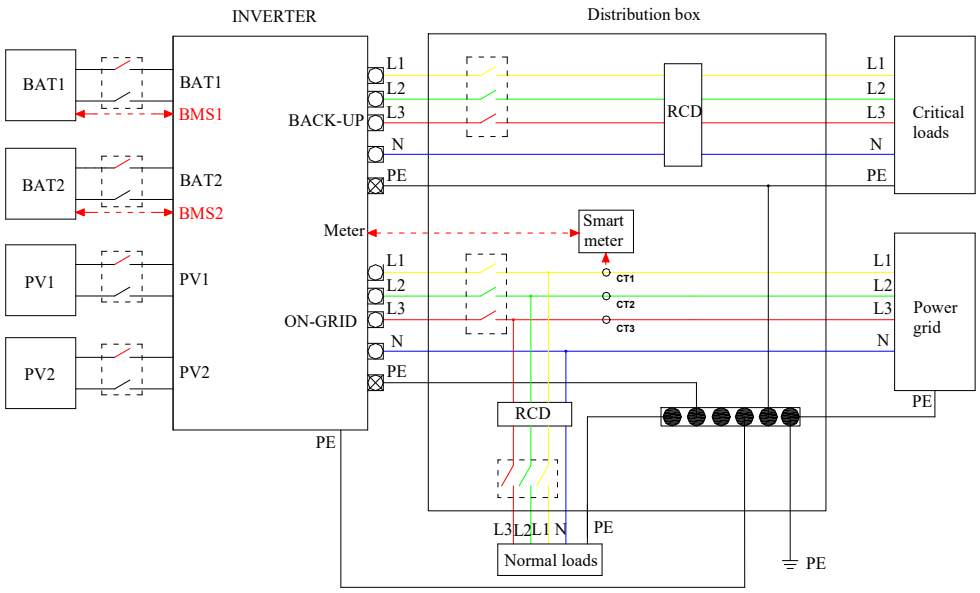
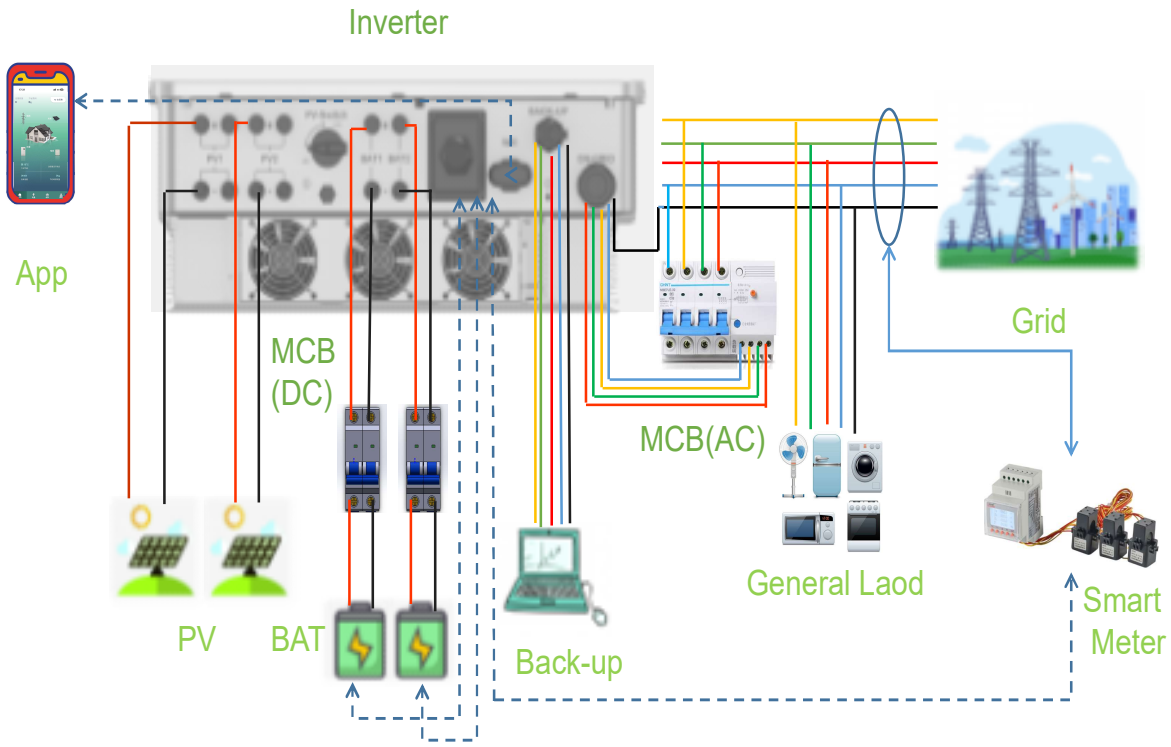


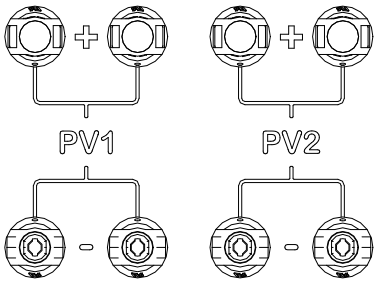
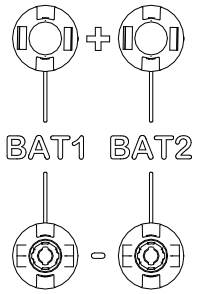
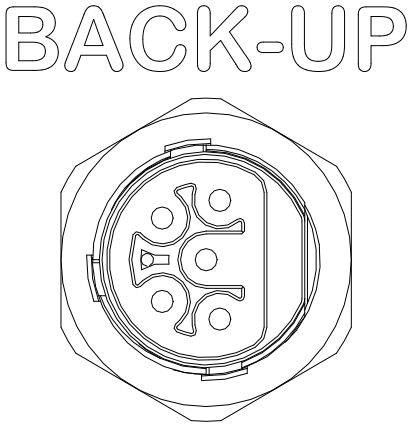
Figure 6.1 Electrical connection diagram

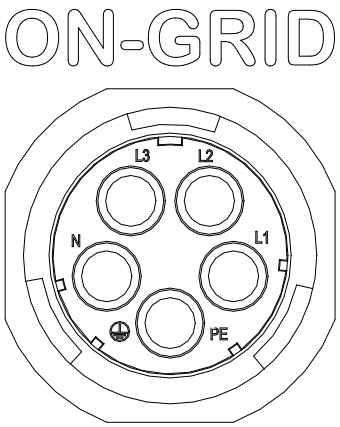


Note: At the time of final installation, circuit breakers for external connections to the machine shall comply with IEC60947-1 and IEC 60947-2 certification requirements.

6.2 Port wiring instruction

Table 6-1 Cable Model and Specification Descriptions

Port	Definition		Cable type	Cable specification
	+: Connect to PV positive pole		Outdoor Multi-Core Copper Cable	Recommended 6mm² cross-sectional area of conductor, maximum current through the wire is 30A
	-: Connect to PV negative pole			
	+: Connect to battery positive pole		Outdoor Multi-Core Copper Cable	Recommended 6mm² cross-sectional area of conductor, the maximum current through the wire shall be 30A
	-: Connect to battery negative pole			
	AC load port	L1	Outdoor Multi-Core Copper Cable	Recommended 6mm² cross-sectional area of conductor, maximum current through the leading wire is 30A, grounding cable specifications are the same as the
		L2		
		L3		
		N		
		PE		

				phase conductor
	AC grid port	L1	Outdoor Multi-Core Copper Cable	Recommended 10mm² cross-sectional area of conductor, maximum current through the wire is 60A, grounding cable specifications are the same as the phase conductor
		L2		
		L3		
		N		
		PE		

6.3 Protective ground wire connection

Attention
➢ Since the inverter is transformerless, it is required that both positive and negative terminals of the PV array shall not be grounded, otherwise it will cause inverter failure. all non-current carrying metal parts (such as bracket, distribution cabinet shell, inverter shell, etc.) shall be connected to the ground in the PV power system.

Step 1: Use 6mm or greater² for yellow green outdoor cables, use wire stripping pliers to strip the insulation layer of the grounding cable to a suitable length.

Step 2: Thread the stripped insulation core into the conductor crimping area of the OT terminal and tighten it with crimping pliers. recommended OT terminal: OTM6.

Step 3: Use M6 screws to fix the OT terminal, and it is recommended to tighten with a torque of 5N·m

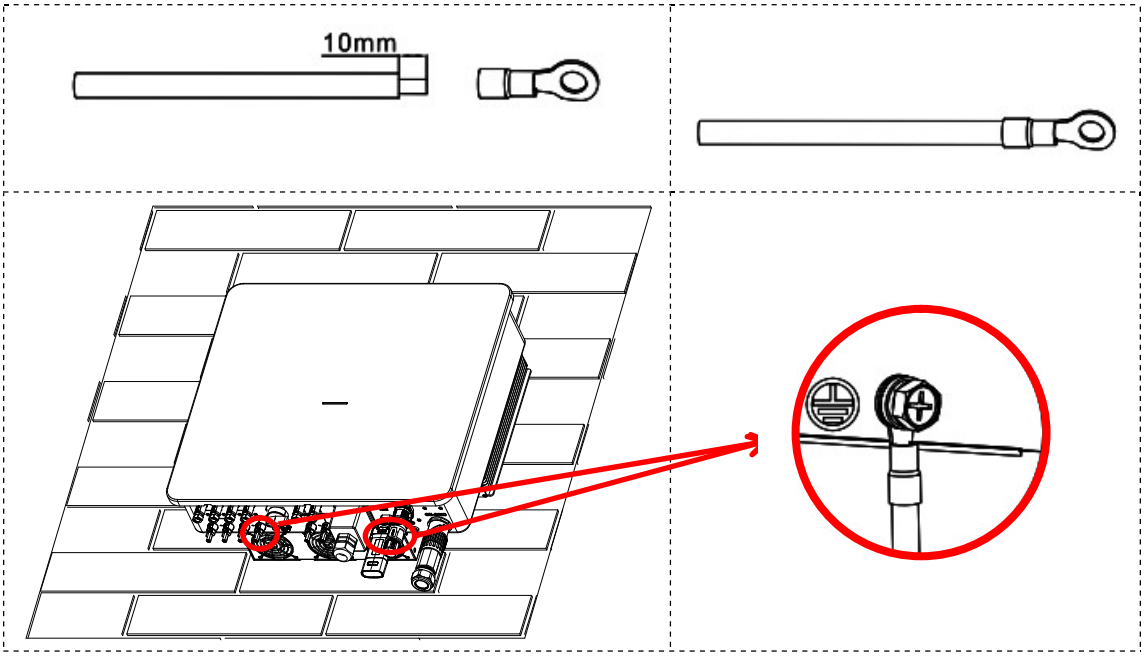


Figure 6.2 Schematic diagram of protective grounding

6.4 Connect the PV string input cable and battery cable

Danger

PV string connection:

- Please do not connect the same PV string to more than one inverter, otherwise the inverter will be damaged.
- Please confirm the following information before connecting the PV string to the inverter, otherwise it may lead to permanent damage to the inverter, and in serious cases, it may cause a fire resulting in damage to people and property.
- Please make sure that the maximum short-circuit current and maximum input voltage of each MPPT are within the allowable range of the inverter.
- Please make sure the positive pole of PV string is connected to PV+ of the inverter, and the negative pole of PV string is connected to PV- of the inverter.

Battery cable connection:

- A short circuit in the battery may cause personal injury, and the instantaneous high current caused by a short circuit can release a

large amount of energy, which may cause a fire.

- Please make sure that the inverter and battery are disconnected and both the front and rear switches of the inverter are disconnected before connecting the battery cable.
- It is forbidden to connect and disconnect the battery cable when the inverter is running, and the irregular operation may lead to the danger of electric shock.
- Please do not connect the same battery set to more than one inverter, as this will cause damage to the inverter.
- It is forbidden to connect loads between the inverter and the battery.
- Please use insulated tools when connecting battery cables to prevent accidental electric shock or short-circuiting of the batteries.
- Please make sure the battery open circuit voltage is within the allowable range of the inverter.

 Warning

PV string connection:

- The PV string output does not support grounding. please ensure that the minimum insulation resistance to ground of the PV string meets the minimum insulation impedance requirement before connecting the PV string to the inverter.

Battery cable connection:

- The battery cable and the "BAT+", "BAT-", and ground port of the battery terminal shall be matched exactly when wiring.
- Please make sure that the cable cores are fully connected to the terminal wiring holes and not exposed.
- Please make sure the cable is connected tightly, otherwise the terminal may overheat when the equipment is running and cause damage to the equipment.

Note: Before crimping the PV and BAT cables, please check and ensure that the PV knob switch is set to the "OFF" position and the

battery is powered off.

Please refer to Figure 6.3 for the specific procedure of wire pressing.

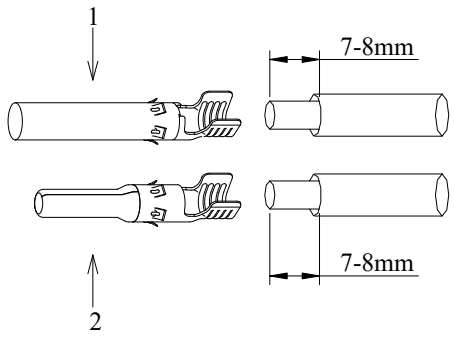
Step 1: Please select the appropriate cable type and specification according to Table 6-1, find the corresponding PV and BAT terminals based on table 3-1,and strip the insulation layer of the positive and negative cables to the appropriate length with wire stripping pliers.

Step 2: Insert the positive and negative cables stripped of insulation into the PV/BAT corresponding positive and negative metal terminals respectively, and crimp the cables with the metal cores of the terminals using crimping pliers to ensure that the cable wires are firmly crimped to the metal cores;

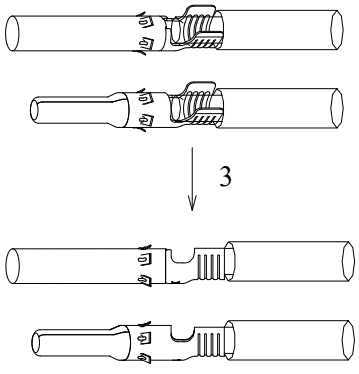
Step 3: Insert the crimped positive and negative cables through the locknuts and into the corresponding plastic housing of the PV/BAT until a click is heard, indicating that the metal core has been snapped into place, after which the locknuts are tightened;

Step 4: Check if the PV/BAT positive and negative terminals are connected incorrectly using a multi-meter, and after confirming that they are correct, they can be inserted into the corresponding PV/BAT input terminals;

Note: Please make sure the PV/BAT positive and negative connectors are disconnected from the top of the inverter if you need to remove them, then use the removal wrench to insert the fixing tabs and press down firmly to remove the connectors.



1. Positive metal core



3. Use crimping pliers to crimp the

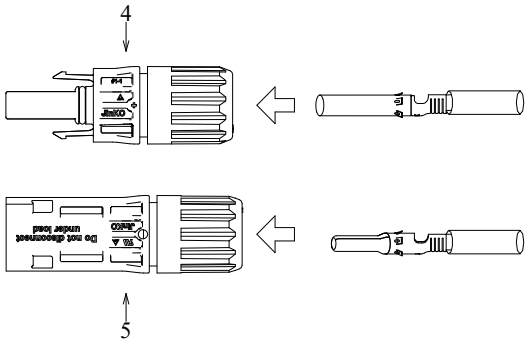
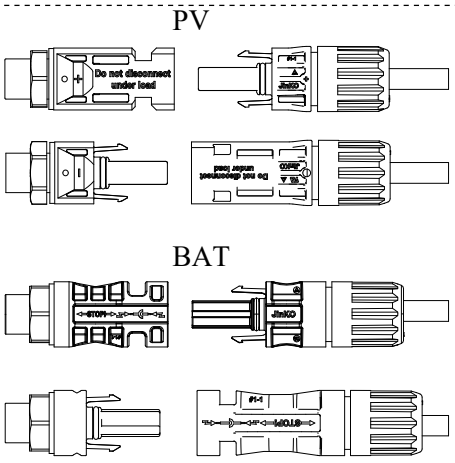
2. Negative metal core	pins and wires together
 4. Positive male terminal 5. Negative male terminal	

Figure 6.3 Connect PV&BAT cables

The PV modules used to connect to this inverter shall meet the requirements of the Class A standard for IEC 61730 certification, and the maximum current allowed through the external circuit breaker for each PV string and battery input shall be greater than or equal to 30A.

6.5 Connect the AC grid connection cable

Warning

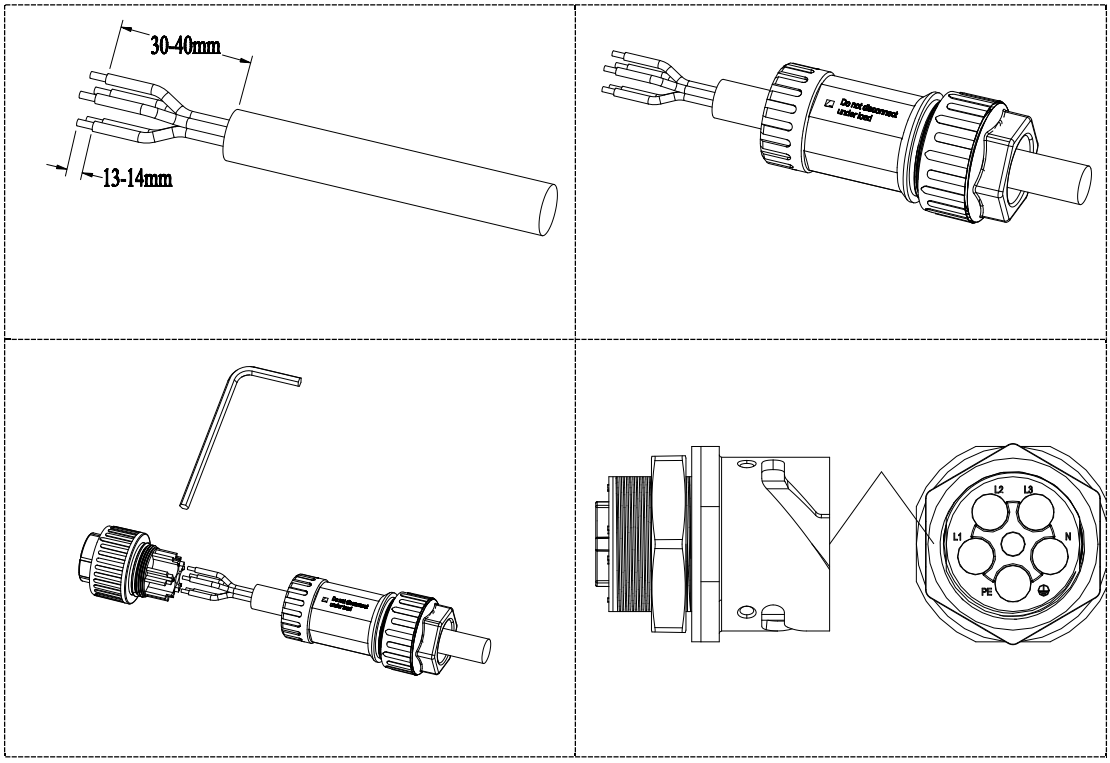
- When wiring, the "L1", "L2", "L3", "N", and grounding ports of the AC line and AC terminal shall be completely matched. If the cable connection is incorrect, it will cause equipment damage.
- Please make sure that the cable cores are fully connected to the terminal wiring holes and not exposed.
- Please make sure the insulation board at the AC terminal is stuck tightly and not loose.
- Please make sure the cable connection is tight, otherwise the terminal may be overheated when the equipment is running causing damage to the equipment.

For details about cable connections, see figure 6.4

Step 1: Please select the appropriate cable type and specification according to Table 6-1, and strip the cable insulation with wire stripping pliers to the appropriate length, after which the cable will be passed through each part of the terminal.

Step 2: Lock the stripped insulation layer of the cable in the lock hole on the terminal according to the L1, L2, L3, N, PE markings on the terminal, and tighten the lock nut clockwise with an Allen wrench to ensure that the cable is firmly connected.

Step 3: Connect the AC grid connection terminal to the grid connection board port on the inverter, rotate the terminal clockwise and check the tight connection between them.



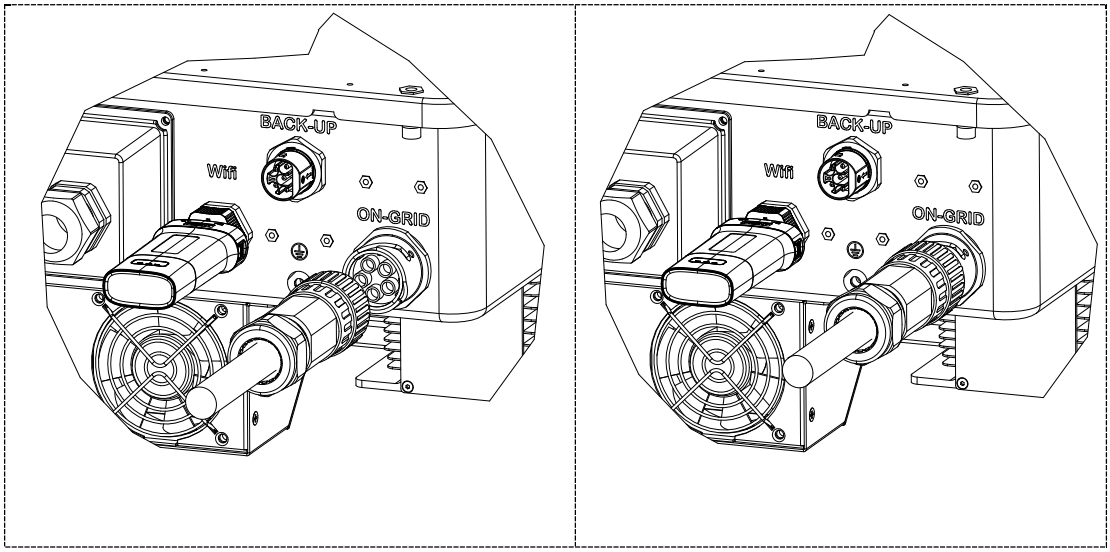


Figure 6.4 AC Parallel Cable Connection

The maximum current allowed to pass through the circuit breaker used for grid over connection shall be greater than or equal to 60A.

6.6 Connect the AC load cable

For details about cable connections, see figure 6.5

Step 1: Please find the corresponding AC load terminals according to Table 3-1.

Please select the appropriate cable type and specification according to Table 6-1, and strip the cable insulation with wire stripping pliers to the appropriate length, after which the cable will be passed through each part of the terminal.

Step 2: Lock the stripped insulation layer of the cable in the lock hole on the terminal according to the L1, L2, L3, N, PE markings on the terminal, and tighten the lock nut clockwise with a 4mm cross-head screwdriver to ensure that the cable is firmly connected.

Step 3: Connect the various parts of the terminal,use a 4mm Phillips screwdriver to loosen the screws near the terminal cable counterclockwise to tighten each part of the terminal, insert the AC off grid terminal into the inverter off grid port and push it all the way forward. Rotate the front end of the terminal clockwise, Check if the

terminal connections are secure.

The maximum current allowed to pass through the circuit breaker used for off-grid load over the external one shall be greater than or equal to 30A.

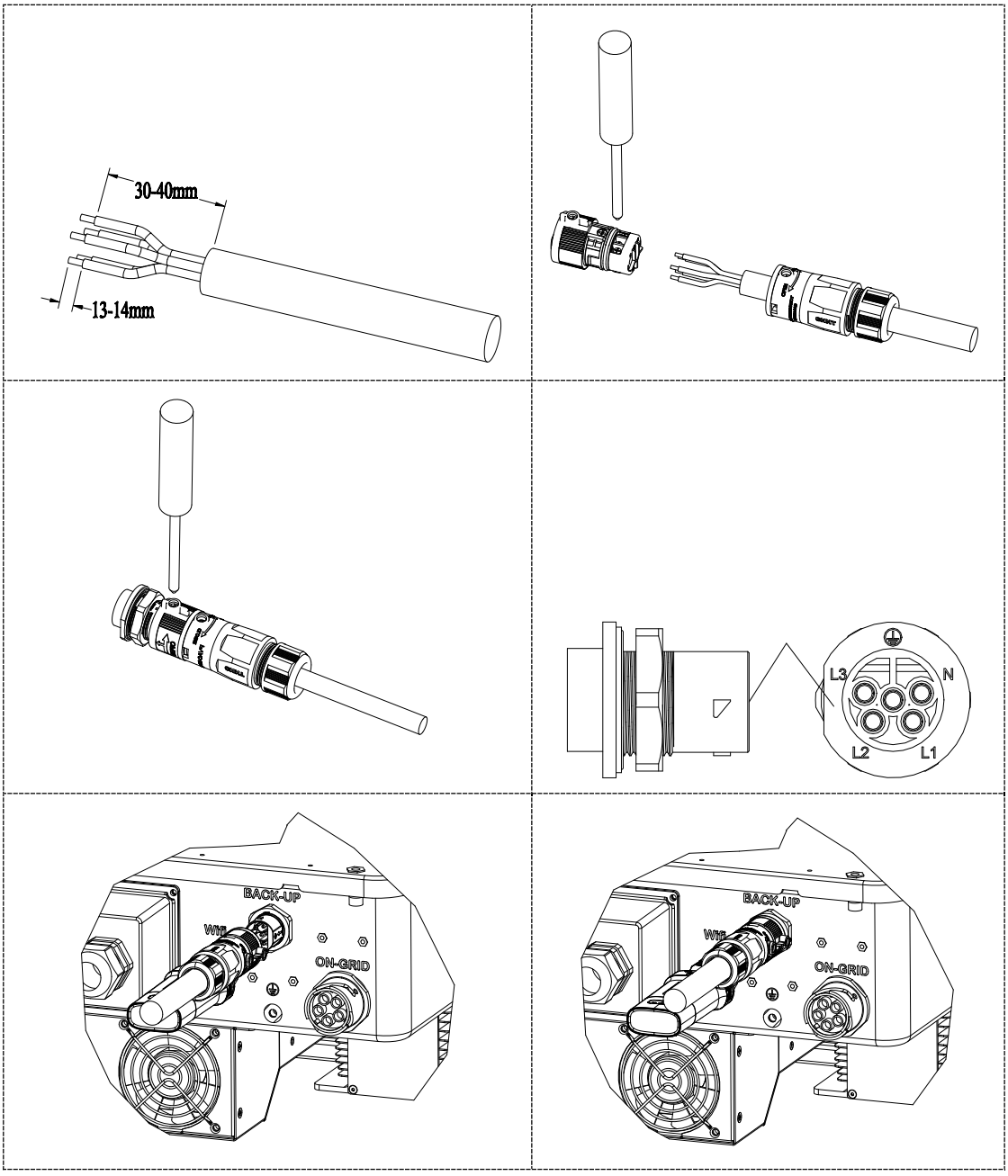


Figure 6.5 AC load cable connection

6.7 Install WIFI/Bluetooth/4G module(Optional)

The communication collector is an external accessory that needs to be selected by the user.

The collector is connected with a default WIFI/Bluetooth module for remote monitoring and control of the inverter.

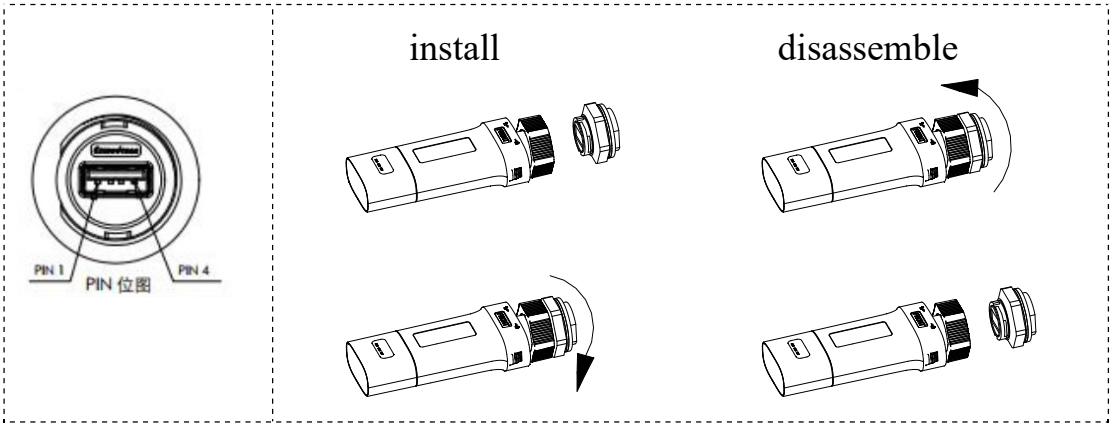


Figure 6.6 WIFI interface, Connection and Disconnection

Table 6-2 Meaning of AGN8 WIFI Dongle indicator light

LED	state	Specific meanings
RUN&COM&NET	Alternating flashing (cycle 1500ms, each light flashes for 500ms in sequence)	Self test mode
	Flashing together (cycle 1 second, off 900ms, on 100ms)	Dongle is currently upgrading (including Bluetooth App upgrade)
	Illuminate together for 5 seconds	Dongle upgrade failed
RUN	Slow flashing (on for 1 second and off for 1 second)	Dongle is running normally
	Constant extinction	Dongle running abnormally
	Twice flashing (on (off) 100ms, off (on) 100ms, twice)	Dongle sends Bluetooth data to the app

COM	Flash (on for 200ms, off for 200ms)	Dongle time not synchronized (scanning will not start)
	Constant extinction	Abnormal southbound communication
	Flashing once (on (off) 100ms, off (on) 100ms, once)	Normal southbound communication
NET	flash	Connecting to WiFi
	Constant extinction	Connecting to MQTT
	Slow flashing	Connecting to platform
	Light	Successfully connected to the platform
	Twice flashing	Dongle sends platform data

Table 6-3 Meaning of AGN9 4G Dongle indicator light

LED	state	Specific meanings
RUN&COM&NET	/	/
RUN	Light	The process from power on to initialization
	Flash (with an interval of 100ms)	Gateway initialization completed, flashing for 5 seconds
	Twice flashing (on (off)	Slow flashing (with an

	100ms, off (on) 100ms, twice)	interval of 1 second)
COM	/	/
NET	Light	Looking for the internet or on a call
	Flash (interval 200ms)	Data connection established or network registered
	Slow flashing (with an interval of 800ms)	2G/3G network registered
	Long extinction	Shutdown or module sleep

6.8 Connect communication terminal

Multifunctional communication port, including meter communication, BMS communication, DRMS, parallel communication, and external dry contact signal

Step 1: Pass the cables through the waterproof cover of the signal interface and their waterproof plugs, and crimp the RJ45 terminals in the sequence of pins.

Step 2: Insert the cable into the inverter communication interface.

Step 3: Tighten the waterproof cover plate with screws.

Step 4: Tighten the waterproof nut.

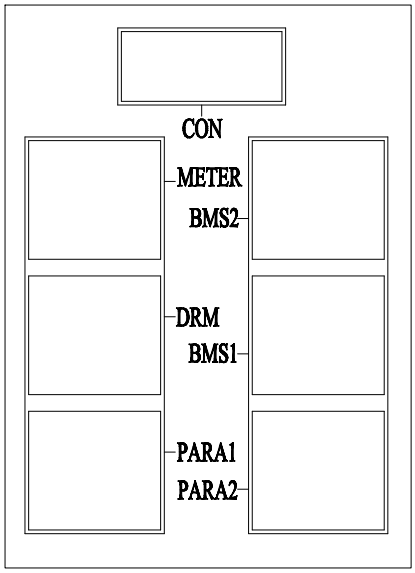


Figure 6.7 X1 board interface diagram

The RJ45 pins of the communications cables are as below:

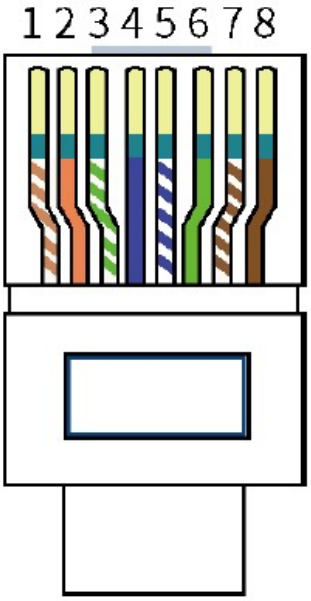


Figure 6.8 RJ45 crystal terminal wire sequence diagram

6.8.1 Smart meter connection

1, 2, 3 and 4 on the smart meter are connected to L1, L2, L3 and N of the grid respectively.

Current measurement needs to be connected with current transformers. 5 and 6 on the smart meter are connected to the positive and negative leads of the current transformers, and then the current

transformers are fastened as the L1 phase of the grid, and similarly, 7 and 8 are connected to the L2 phase and 9 and 10 are connected to the L3 phase. 12 and 13 on the meter are connected to any one phase of AC and N line.(Figure 6.9 is connected to phase A).

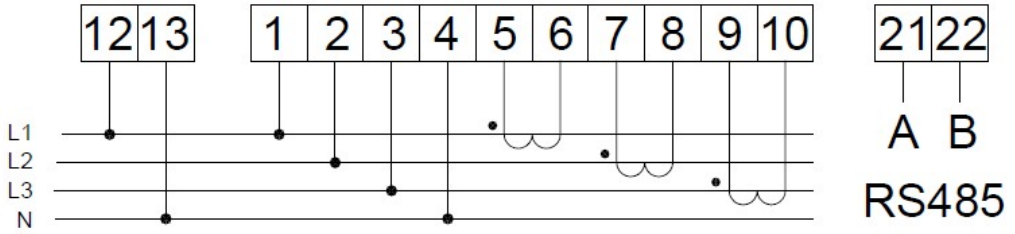


Figure 6.9 Smart meter terminal wiring description diagram

The current transformer is oriented as shown in Figure 6.10 with the arrow pointing to the grid.

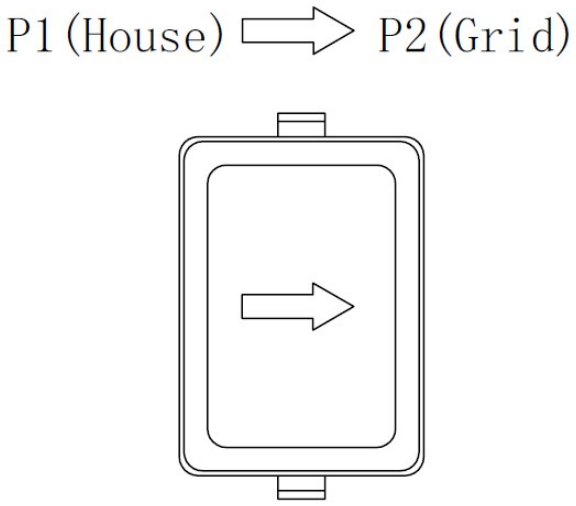


Figure 6.10 Wiring direction of current transformer

According to table 6-4, 21 corresponding to RS485-A and 22 corresponding to RS485-B on the smart meter are connected to the 8 and 7 ports of the network terminal, then connect the communication line to the corresponding meter port shown in Figure 6.7.

Table 6-4 Description of smart meter ports

PIN	Color	Definition	Function	Note
1-6	/	/	/	/
7	White &Brown	RS485_B_EEM	RS485 differential signal B	Smart meter communicatio n
8	Brown	RS485_A_EEM	RS485 differential signal A	

6.8.2 BMS communication line connection

Table 6-5 Description of the BMS1 interface

PIN	Color	Definition	Function	Note
1	White&Orang e	RS485-A1-BMS	RS485 differential signal A1	Communicatio n with lithium battery BMS, the inverter can be adaptive to BMS to provide CAN and RS485 communicatio
2	Orange	RS485-B1-BMS	RS485 differential signal B2	
3	/	/	/	
4	Blue	CANA-H1-BMS	CAN high level data	
5	White&Blue	CANA-L1-BMS	CAN low level	

			data	n
6-8	/	/	/	/

Table 6-6 Description of the BMS2 interface

PIN	Color	Definition	Function	Note
1	White&Orange	RS485-A2-BMS	RS485 differential signal A2	Communication with lithium battery BMS, the inverter can be adaptive to BMS to provide CAN and RS485 communication
2	Orange	RS485-B2-BMS	RS485 differential signal B2	
3	/	/	/	
4	Blue	CANA-H2-BMS	CAN high level data	
5	White&Blue	CANA-L2-BMS	CAN low level data	
6-8	/	/	/	/

Note: When communicating with lithium batteries, attention should be paid to the communication port sequence and pin definition of the battery.

6.8.3 DRMS logic interface connection

Table 6-7 Description of DRMS ports

PIN	Color	Definition	Function	Note
1	White&Orange	DRM1/5	The DRMS interface is applicable to the Australian AS-NZS-4777.2 (some European	DRMS logical interface
2	Orange	DRM2/6		
3	White&Green	DRM3/7		

4	Blue	DRM4/8	requirements) safety standard	
5	White&Blue	REF GEN		
6	Green	COM LOAD		
7-8	/	/	/	/

6.8.4 Parallel communication line and parallel standard wiring

If there are multiple inverters in use and need to use parallel inverter for communication, you need to use the network cable terminal to connect to Pa1 of the first inverter, the other end to Pa2 of the second inverter, and so on, Table 6-8 describes the signals of the communication cables. Figure 6.11 shows the connections.

Table 6-8 Description of parallel ports

PIN	Color	PARA 1	PARA 2	Note
1	White&Orange	CON1_AO	CON2_AO	Parallel signal
2	Orange	CON1_AO	CON2_BO	
3	White&Green	CON1_AI	CON2_AI	
4	Blue	CON1_BI	CON2_BI	
5-6	/	/	/	/
7	White&Brown	CON_SyncH	CON_SyncH	Parallel synchronization signal
8	Brown	CON_SyncL	CON_SyncL	

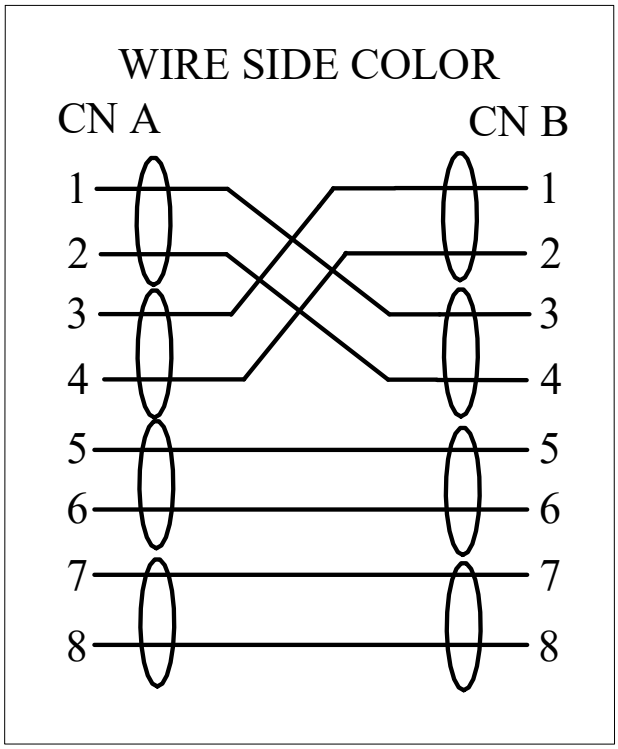
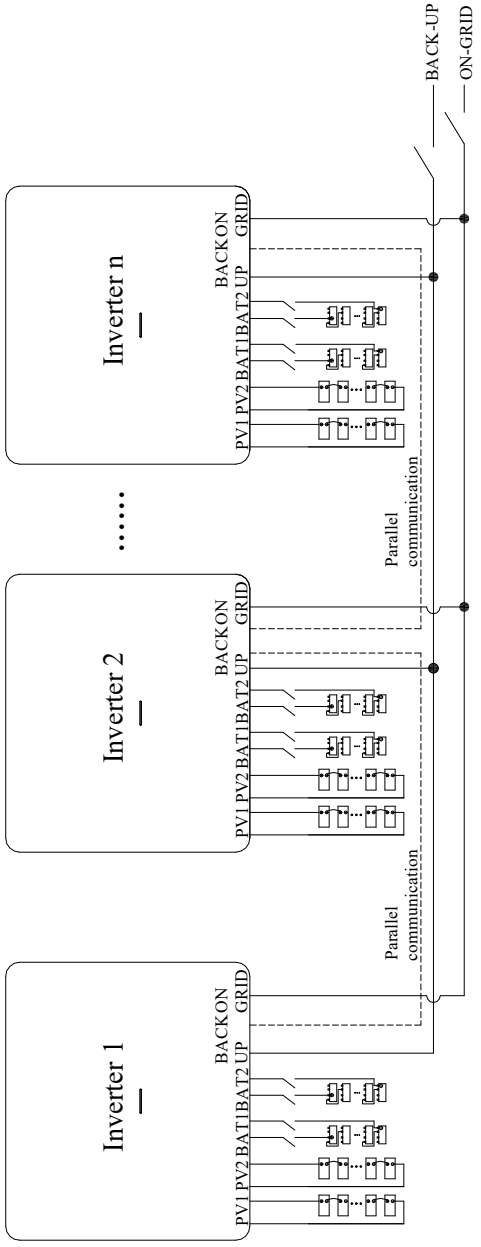


Figure 6.11 Parallel communication line sequence diagram

Application precautions:

- Support maximum of 6 three phase hybrid inverter parallel.
- Ensure that the inverter is connected to the link port cable.
- Ensure that the load power is less than the maximum power of parallel inverter.

The parallel wiring is shown in the following figure:



6.8.5 Introduction to dry contact points

Figure 6.9 shows the locations of dry contact ports.

Table 6-9 Description of dry contacts

	PIN	Definition	Note
Dry contact 1	2	OP1_NO	External dry contact port
	4	OP1_COM	
Dry contact 1	1	OP2_NO	
	3	OP2_COM	

/	5-6	/	/

7 Equipment commissioning

7.1 Inspection before power-on

Number	Item
1	Whether the inverter is firmly fixed on the wall mounting bracket.
2	Whether the cable ties meet the alignment requirements, are reasonably distributed, and are not broken.
3	Whether the PV+/PV- and BAT+/BAT- wires are firmly connected, the polarity is correct, and the voltage is in accordance with the accessible range.
4	Whether the DC switch is properly connected between the battery and inverter, and whether the DC switch is disconnected.
5	Whether the AC circuit breaker is properly connected between the inverter grid port and the grid, and the circuit breaker is disconnected.
6	Whether the AC circuit breaker is properly connected between the inverter load port and the grid, and the circuit breaker is disconnected.
7	Please make sure the communication cable is properly connected for batteries.

7.2 Initial power-on of equipment

Please be sure to follow the steps below to turn on the inverter.

1) Ensure that the inverter is not working;

2) Close the AC circuit breaker between the inverter grid port and the grid;

3) Turn on the PV switch (when connected to the PV);

4) Turn on the battery and close the DC switch between the battery and the inverter;

5) Start operation after successful self-check of the inverter;

6) Close the AC circuit breaker between the inverter load port and the load.

8 System maintenance

During powering on, powering off, removal, scrapping or maintenance of the inverter, please observe the following warnings and precautions.

Danger

- During the operation of the equipment, there is high voltage, which may cause electric shock, death, serious personal injury or serious property loss. Therefore, before any maintenance, the equipment must be powered off and operated in strict accordance with the safety precautions listed in this manual and other relevant document. Electrically operated equipment may cause damage to the inverters or the risk of electric shock.
- After the inverter system is powered off, the chassis still has residual power and residual heat, which may cause electric shock or burns. Therefore, after the inverter system is powered off for 5 minutes, please operate the inverter with protective gloves.

Attention

- Before maintenance, please power off the equipment, then follow the instructions of the delay discharge label and wait for the appropriate time to ensure that the device is powered off before operating the device.
- During the maintenance, please try to avoid irrelevant personnel entering the maintenance site, and temporary warning signs or fences must be shown for isolation.
- The AC/DC switch of the inverter needs to be disconnected when maintaining the power equipment or distribution equipment behind the inverter.
- In case of any equipment failure, please contact your dealer for treatment.
- Only after the failure has been dealt with can the equipment be powered on again, otherwise the failure may become more serious

or the equipment is damaged.

8.1 Power off of the inverter

Step 1: Disconnect the AC circuit breaker of inverter ON-GRID.

Step 2: Disconnect the AC circuit breaker of inverter BACK-UP.

Step 3: Disconnect the energy storage circuit breaker between the inverter and the battery.

Step 4: Disconnect the DC switch of the inverter.

8.2 Dismantlement of the inverter

Warning

- Ensure that the inverter is powered off and the maintenance personal have worn personal protective equipment.

Step 1: Make the system power off, and disconnect all electrical connections of the inverter, including all electrical cables such as DC lines, AC lines, communications lines, communication modules and protective ground wires.

Step 2: Remove the inverter from the back hanging panel.

Step 3: Dismantle the back hanging panel.

Step 4: If you still have the original package of the inverter, please use the original package for packaging and then seal the package securely with adhesive tape. If the original package of the inverter is not available, please use a hard carton suitable for the weight and size of the inverter to seal it securely.

Step 5: Property keep the inverter. If the inverter needs to be put into use later, please ensure its storage conditions meet the requirements.

8.3 Inverter scrapping

If the inverter has reached its service life and needs to be scrapped,

please dispose of the inverter according to the electrical waste disposal requirements give in the regulations of the country/region where the inverter is located.

8.4 App alarm display and solution

This section will find the cause of any issues in inverter.

Table 8-1 Fault Message List and Solution

sequence number	Fault name	Note	Solutions
1	Grid voltage abnormality	Alarm	➢ If the alarm occurs occasionally, it may be caused by a short-term abnormality in the power grid. The inverter will resume normal operation after detecting that the power grid is

2	Power grid frequency abnormality	Alarm	normal, without manual intervention. ➢ If there are frequent alarms, check whether the grid voltage frequency is within the allowed range. If so, please check whether the AC circuit breaker and AC wiring of the inverter are correct, whether the grid is powered off, etc. ➢ When the machine is connected to photovoltaics or batteries and is powered on after a power outage from the grid, in order to meet the requirements of grid connection certification in various countries, this alarm will appear and will be automatically cleared within 1 minutes.
3	Grid voltage reverse sequence	Alarm	➢ Check whether the phase sequence, voltage and wiring of the power grid are correct.
4	Grid voltage phase loss	Alarm	
5	Zero-line abnormality	Alarm	
6	Output voltage abnormality	Fault	➢ The App sends a fault clearing command or waits for 10 minutes to automatically clear the fault.

			➢ If the fault persists, please check whether the connected load power is greater than the inverter power or whether more capacitive loads are connected. ➢ If the connected load power is lower than the inverter power and this fault is still reported, please contact your dealer or after-sales service center.
7	Radiator temperature is too high	Fault	➢ Please ensure that the inverter is installed in a place away from direct sunlight. the fault will be cleared automatically after the radiator cools down to below 60°C for 5 minutes. ➢ If the fault persists, please contact your dealer or after-sales service center.
8	Insulation fault	Fault	➢ Please check if there is any problem with the machine or wiring. If not, the App will send a fault clearing command. If the fault still exists, please contact your dealer or after-sales service center. ➢ There is an internal fault in the inverter. Power off the inverter and wait 5 minutes before powering on the inverter. If the fault persists, please contact your dealer or after-sales
9	Leakage protection fault	Fault	

			service center.
10	Auxiliary power failure	Fault	➢ There is an internal fault in the inverter. Power off the inverter and wait 5 minutes before powering on the inverter. if the fault persists, please contact your dealer or after-sales service center.
11	Fan failure	Fault	➢ Check whether the external fan is blocked after powering on. If not, it is an internal fault of the inverter. power off the inverter and wait for 5 minutes before powering on the inverter. If the fault still exists, please contact your dealer or Service center.
12	Lightning protector abnormality	Fault	➢ There is an internal fault in the inverter. Turn off the inverter and wait for 5 minutes before turning on the inverter. If the fault persists, please contact your dealer or after-sales service center.
13	Island protection	Alarm	➢ Turn off the AC circuit breaker on the grid side and check whether the grid quality is too poor or the grid is abnormal. ➢ The App sends a fault clearing command, and then closes the AC circuit breaker of the power grid after the power grid is stable.

14	Battery 1 is not connected	Tips	➢ Please check whether the battery 1/2 wiring is correct, measure the battery 1/2 voltage, and whether the battery 1/2 switch is closed.
15	Battery 2 is not connected	Tips	
16	Battery 1 overvoltage	Alarm	➢ Please check whether the 1/2 rated voltage of the battery in the battery settings of the App is set to the charging voltage limit value on the battery cabinet page. after the parameters are set correctly, the alarm is automatically cleared.
17	Battery 2 overvoltage	Alarm	
18	Battery 1 undervoltage	Tips	➢ Please check whether the battery 1/2 undervoltage value in the battery settings of the App is set to the discharge voltage limit value on the battery cabinet page. After the parameters are set correctly, the alarm is automatically cleared.
19	Battery 2 undervoltage	Tips	
20	Battery 1 discharge terminated	Alarm	➢ Please check whether the discharge depth of 1/2 of the battery in the battery settings of the App is set too high. If the value is higher than the SOC value of the battery cabinet on the battery cabinet page, it means that the battery energy is insufficient and the discharge is terminated and needs to be recharged.
21	Battery 2 discharge terminated	Alarm	
22	Battery 1 has insufficient power	Alarm	
23	Battery 2 has	Alarm	

	insufficient power		
24	Battery 1 reversely connected	Alarm	➢ Check the battery 1/2 voltage and whether the wiring is correct. ➢ It will report when the battery is 1/2 powered off, ignore it.
25	Battery 2 reversely connected	Alarm	
26	Photovoltaic 1 is not connected	Tips	➢ Please check whether the PV 1/2 wiring is correct and whether the PV DC circuit breaker of the inverter is closed.
27	Photovoltaic 2 is not connected	Tips	
28	Photovoltaic 1 overvoltage	Fault	➢ Please check whether the voltage of photovoltaic 1/2 is higher than 960V, and then power on again after confirming it is correct.
29	Photovoltaic 2 overvoltage	Fault	
30	Photovoltaic 1 current sharing abnormality	Alarm	➢ The current of the photovoltaic branch is unevenly distributed, please check whether the wiring is correct. ➢ There is an internal fault in the inverter. Power off the inverter and then power on the inverter after waiting for 5 minutes. If the alarm still exists, please contact your dealer or after-sales service center.
31	Photovoltaic 2 current sharing abnormality	Alarm	
32	DC bus overvoltage	Fault	➢ There is an internal fault in the inverter. Power off the inverter

			and wait 5 minutes before powering on the inverter. If the fault persists, please contact your dealer or after-sales service center.
33	DC bus undervoltage	Alarm	➢ Please check whether the battery is exhausted or the load power connected to the inverter's off-grid output is too high. ➢ There is an internal fault in the inverter. Power off the inverter and then power on the inverter after waiting for 5 minutes. if the alarm still exists, please contact your dealer or after-sales service center.
34	DC bus voltage unbalance	Fault	➢ There is an internal fault in the inverter. Power off the inverter and wait 5 minutes before powering on the inverter. if the fault persists, please contact your dealer or after-sales service center.
35	Photovoltaic 1 power tube failure	Fault	
36	Photovoltaic 2 power tube failure	Fault	
37	Battery 1 power tube failure	Fault	

38	Battery 2 power tube failure	Fault	
39	System output overload	Fault	➢ Please check whether the load power connected to the inverter is greater than the inverter output power.
40	Inverter overload	Alarm	
41	inverter overload timeout	Alarm	
42	Battery 1 overload timeout	Alarm	➢ Please check whether the maximum battery charging current and the maximum battery discharging current in the App battery settings are set too high, and reduce the values appropriately.
43	Battery 2 overload timeout	Alarm	
44	inverter soft start failed	Fault	➢ There is an internal fault in the inverter. Power off the inverter and wait 5 minutes before powering on the inverter. If the fault persists, please contact your dealer or after-sales service center.
45	Battery 1 soft start failed	Fault	
46	Battery 2 soft start failed	Fault	
47	DSP1 parameter setting failure	Fault	
48	DSP2 parameter	Fault	

	setting failure		
49	DSP version compatibility failure	Fault	
50	CPLD version compatibility failure	Fault	
51	CPLD communication failure	Fault	
52	DSP communication failure	Fault	
53	Relay self-test failed	Fault	
54	Inverter abnormality	Fault	
55	Photovoltaic 1 soft start failed	Fault	
56	Photovoltaic 2 soft start failed	Fault	
57	Balance circuit overload timeout	Fault	➢ The fault will be automatically cleared after 10 minutes or fault clearing will be sent. ➢ If the fault persists, please contact your dealer or after-sales service center.
58	PV 1 overload timeout	Alarm	➢ Check whether the photovoltaic panel access parameters are

59	PV 2 overload timeout	Alarm	within the allowable range of the inverter. ➢ There is an internal fault in the inverter. Power off the inverter and then power on the inverter after waiting for 5 minutes. If the alarm still exists, please contact your dealer or after-sales service center.
60	Photovoltaic 1 reverse connection	Fault	➢ Check whether the positive and negative poles of photovoltaic 1/2 are connected reversely, and then power on again after confirming it is correct.
61	Photovoltaic 2 reverse connection	Fault	
62	Battery 1 is prohibited from charging	Alarm	➢ Please check whether the battery type and battery access method in the App battery settings are set correctly. ➢ Whether the battery is 1/2 full or discharged. ➢ If the alarm still exists, please contact your dealer or after-sales service center.
63	Battery 2 is prohibited from charging	Alarm	
64	Battery 1 is prohibited from discharging	Alarm	
65	Battery 2 is prohibited from discharging	Alarm	
66	Battery 1 is fully charged	Tips	➢ Please check that the SOC of battery 1/2 is close to 100%. If

67	Battery 2 is fully charged	Tips	not, check whether the rated voltage of battery 1/2 in the battery parameters of the App is set to the charging voltage limit on the battery cabinet page.
68	Parallel communication alarm	Alarm	➢ It is only displayed in parallel mode. Check whether the parallel communication cable is connected correctly
69	System derating operation	Alarm	➢ Check whether the external fan of the inverter is blocked. ➢ Is the ambient temperature too high?
70	Relay open	Fault	➢ There is an internal fault in the inverter. Power off the inverter and wait 5 minutes before powering on the inverter. If the fault persists, please contact your dealer or after-sales service center.
71	Relay short circuit	Fault	
72	Parallel module is missing	Alarm	➢ It is only displayed in parallel mode. Check whether the parameters related to parallel settings in the App are set correctly.
73	The parallel module number is duplicated	Alarm	
74	Parallel module parameter conflict	Fault	
75	Inverter sealing pulse	Fault	➢ There is an internal fault in the inverter. Power off the inverter

			and wait 5 minutes before powering on the inverter. If the fault persists, please contact your dealer or after-sales service center.
76	Wrong battery connection method	Alarm	➢ Check whether the battery access method in the APP host settings is consistent with the actual battery wiring method.
77	Meter reverse connection	Fault	➢ Check whether the meter is connected correctly.

8.5 Regular maintenance

Warning

- Make sure that the inverter is disconnected from power.
- Wear personal protective equipment when operating the inverter.

Table 8-2 Maintenance Instructions

Maintenance content	Maintenance methods	Maintenance period
System cleaning	Check the heat sink, air inlet/outlet for foreign objects and dust.	1 time/half year~1 time/year
DC Switch	Turn the DC switch on and off 10 times continuously to ensure proper DC switch function.	1 time/year
Electrical connection	Check whether the electrical connection is loose, whether the cable appearance is broken, and whether	1 time/half year~1 time/year

	there is copper leakage.	

9 Technical parameters

Table 9-1 Technical Parameters Description

Product model	WL EHTS-3000X	WL EHTS-5000X	WL EHTS-6000X	WL EHTS-8000X
Battery parameter				
Number of battery input channels	2			
Battery type	Lithium battery/Lead-acid battery			
Battery voltage range	125~800V			
Full load battery voltage range	125V~800V	125V~800V	125~800V	160V~800V
Maximum charge and discharge current	25A/25A			
Peak charge/ discharge current&duration	35A/35A（60s）			
Nominal charge/ discharge power	3000W	5000W	6000W	8000W
Communication Interface	RS485/CAN			
PV input parameters				
Number of PV input channels	2			

Maximum input power	4500WP (2250WP/ 2250WP)	7500WP (3750WP/3750 WP)	9000WP (4500WP/4500 WP)	12000WP (6000WP/6000 WP)
Maximum input voltage	1000V			
MPPT voltage range	130~960V			
MPPT full load voltage range	130V~850V	130V~850V	130V~850V	210V~850V
Starting voltage	130V			
Rated input voltage	600V			
Maximum input current per MPPT	25A/25A			
Maximum short-circuit current per MPPT	30A/30A			
MPPT quantity	2			
Maximum input strings per MPPT	2			
Backfeed current	0A			
Parallel input and output parameters				
Nominal output power	3000W	5000W	6000W	8000W
Maximum output power	3.3kVA~60s	5.5kVA~60s	6.6kVA~60s	8.8kVA~60s
Maximum grid input power	6kVA	10kVA	12kVA	16kVA
Maximum grid	9A	15A	18A	24A

input current				
Nominal output current	4.5/4.3A	7.5/7.2A	9/8.7A	12/11.6A
Nominal voltage	3L/N/PE,220V/380Vac,230V/400Vac			
Grid voltage range	184~276V			
Rated grid frequency	50/60Hz			
Nominal Grid frequency	45Hz~55Hz/55Hz~65Hz			
Power factor	-0.8~0.8			
THdI(@ Nominal power)	<3%			
Off-grid output parameters				
Nominal output power	3000W	5000W	6000W	8000W
Maximum output power	6kVA~60s	10kVA~60s	10kVA~60s	10kVA~60s
Nominal output current	4.5/4.3A	7.5/7.2A	9/8.7A	12/11.5A
Nominal output voltage	3L/N/PE,220V/380Vac,230V/400Vac			
Nominal output frequency	50/60Hz			
Thdu(@ linear load)	<3%			
On/off-grid switch-over time	<10ms			
Efficiency				
European efficiency	97.70%			

Maximum efficiency	98.20%
Maximum battery charge/discharge efficiency	97.80%
Protection	
DC Switch	Available
Input reverse	Available
Output overvoltage, overcurrent, short circuit	Available
Anti-islanding	Available
Residual current detection	Available
Insulation resistance detection	Available
Overvoltage Category	DC:II ; AC:Ⅲ
Surge protection level	DC:II ; AC:Ⅲ
Battery input reverse connection protection	Available
Routine parameters	
Weight	35kg
Noise	<45dB
Topology	No isolation

Working altitude	<4000m
Derating Temperature	>40℃
Ambient Temperature	-25℃~+60℃
Ambient Humidity	5%~95%
Cooling method	Air cooling
IP Degrees	IP65
Dimensions	573*509*219mm
Standby loss	<15W
Features	
DC terminal	MC4
AC output terminal	5P connector
interface	RS485/CAN/DRED/DO/Parallel port
Human-computer interaction mode	H5/LED/APP/WIFI/4G/Bluetooth
Scalability in Parallel function	Support
Certification	
Grid	VDE 4105, EN 50549
Safety regulations	IEC62109-1,IEC62109-2,IEC62477-1
Electromagnetic Compatibility (EMC)	EN61000-6-1, EN61000-6-2, EN61000-6-3, EN61000-6-4

Product model	WL EHTS-10000X	WL EHTS-12000X	WL EHTS-15000X	WL EHTS-18000X	WL EHTS-20000X
Battery parameter					
Number of battery input channels	2				
Battery type	Lithium battery/Lead-acid battery				
Battery voltage range	125~800V				
Full load battery voltage range	200V~800V	240V~800V	300V~800V	360V~800V	400V~800V
Maximum charge and discharge current	25A/25A				
Peak charge/ discharge current&duration	35A/35A（60s）				
Nominal charge/ discharge power	10000W	12000W	15000W	18000W	20000W
Communication Interface	RS485/CAN				

PV input parameters					
Number of PV input channels	2				
Maximum input power	15000WP (7500WP/ 7500WP)	18000WP (9000WP/ 9000WP)	22500WP (11250WP/ 11250WP)	27000WP (13500WP/ 13500WP)	30000WP (15000WP/ 15000WP)
Maximum input voltage	1000V				
MPPT voltage range	130~960V				
MPPT full load voltage range	250V~850V	290V~850V	350V~850V	410V~850V	450~850V
Starting voltage	130V				
Rated input voltage	600V				
Maximum input current per MPPT	25A/25A				
Maximum short-circuits current per MPPT	30A/30A				
MPPT quantity	2				
Maximum input strings per MPPT	2				

Backfeed current	0A				
Parallel input and output parameters					
Nominal output power	10000W	12000W	15000W	18000W	20000W
Maximum output power	11kVA~60s	13.2kVA~60s	16.5kVA~60s	19.8kVA~60s	22kVA~60s
Maximum grid input power	20kVA	24kVA	30kVA	36kVA	40kVA
Maximum grid input current	29A	35A	44A	52A	58A
Nominal output current	15/14.5A	18/17.4A	22.7/21.7A	27/26A	30/29A
Nominal voltage	3L/N/PE,220V/380Vac,230V/400Vac				
Grid voltage range	184~276V				
Rated grid frequency	50/60Hz				
Nominal Grid frequency	45Hz~55Hz/55Hz~65Hz				
Power factor	-0.8~0.8				
THdI(@ Nominal power)	<3%				
Off-grid output parameters					
Nominal	10000W	12000W	15000W	18000W	20000W

output power					
Maximum output power	11kVA~60s	13.2kVA~60s	16.5kVA~60s	19.8kVA~60s	22kVA~60s
Nominal output current	15/14.5A	18/17.4A	22.7/21.7A	27/26A	30/29A
Nominal output voltage	3L/N/PE,220V/380Vac,230V/400Vac				
Nominal output frequency	50/60Hz				
Thdu(@ linear load)	<3%				
On/off-grid switch-over time	<10ms				
Efficiency					
European efficiency	97.70%				
Maximum efficiency	98.20%				
Maximum battery charge/discharge efficiency	97.80%				
Protection					
DC Switch	Available				

Input reverse	Available
Output overvoltage, overcurrent, short circuit	Available
Anti-islanding	Available
Residual current detection	Available
Insulation resistance detection	Available
Overvoltage Category	DC:II ; AC:Ⅲ
Surge protection level	DC:II ; AC:Ⅲ
Battery input reverse connection protection	Available
Routine parameters	
Weight	35kg
Noise	<45dB
Topology	No isolation
Working altitude	<4000m
Derating Temperature	>40℃

Ambient Temperature	-25℃~60℃
Ambient Humidity	5%~95%
Cooling method	Air cooling
IP Degrees	IP65
Dimensions	573*509*219mm
Standby loss	<15W
Features	
DC terminal	MC4
AC output terminal	5P connector
interface	RS485/CAN/DRED/DO/Parallel port
Human-computer interaction mode	H5/LED/APP/WIFI/4G/Bluetooth
Scalability in Parallel function	Support
Certification	
Grid	VDE 4105, EN 50549
Safety regulations	IEC62109-1, IEC62109-2, IEC62477-1
EMC	EN61000-6-1, EN61000-6-2, EN61000-6-3, EN61000-6-4

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