User Manual

All-in-One Energy Storage System

UE-XX-XXXX-L2-LA1 Series

XXXX: System Energy Capacity (kWh)

XXXX=5/10/15/20/6.6/13.2/19.8

Contents

Foreword

Overview

This document mainly introduces the RESS-1A-XXXX-L2-6K residential all-in-one energy storage system, including the product introduction, installation, adjustment, test, system maintenance and technical indicators of RESS-1P-6K-L02 series energy storage inverter module and RESS-BM-051130-L0/RESS-BM-051100-L0 battery pack module. The relevant models involved in this document are as follows:

Inverter (In hybrid inverter box)

PCS Model No.	Nominal Output Power	Nominal Output Voltage
UE-3.68K-S2-LA1	3680W	230V a.c, L+N+PE
UE-5K-S2-LA1	5000W(4600W for Germany, South Africa)	230V a.c, L+N+PE
UE-6K-S2-LA1	6000W	230V a.c, L+N+PE

Battery Pack (In battery pack box)

Model No.	Name	Function specification
LB1-5KWh	Battery pack, 51.2V, 100Ah, 5KWh	Stores electrical energy
LB1-6.6KWh	Battery pack, 51.2V, 130Ah, 6.6KWh	Stores electrical energy

Power Sensor (Optional)

Model No.	Name	Function specification
YADA YDS70-C16	YADA Single-Phase Smart Meter	Single-Phase CE Certificate digital Energy Meter, RS485 Modbus, LCD display, Din rail mounted, Class 1 accuracy
CHNT DDSU666	CHNT Single-Phase Smart Meter	

Communication module (In hybrid inverter box)

Model No.	Name	Function specification
EESW-A413	WIFI +BLE Stick	Enables communication between inverter and management system from website or mobile phone

Audience

- Sales engineer
- Hardware installation engineer
- Installation, adjustment and test engineer
- Technical support engineer
- Maintenance engineer

Symbol conventions

The following symbols may appear in this document and have the following meanings.

Symbol	Explanation
	A hazard with a high level of risk which, if not avoided, will result in death or serious injury.
	A hazard with a medium level of risk which, if not avoided, may result in death or serious injury.
	A hazard with a low level of risk which, if not avoided, may result in minor or moderate injury.
	Supplementary information to the main text. "Note" is not a safety warning information and does not involve personal injury, equipment or environmental damage information.

1 Safety precautions

1.1 General safety

Statement

Please read this manual first and follow the identifications on the equipment and all safety precautions in the manual when installing, operating and maintaining the equipment.

The "NOTICE", "CAUTION", "WARNING" and "DANGER" in this manual do not represent all safety precautions that shall be observed, but are only used as a supplement to all considerations for safety. The company does not assume any responsibility for any violation of general safety operation requirements or violation of safety standards for design, production and use of equipment.

This equipment shall be used in an environment that meets the design requirements. Otherwise, it may cause equipment failure. The abnormal equipment function, component damage, personal safety accident, property loss, etc. caused thereby are not within the scope of equipment quality assurance.

The installation, operation and maintenance of the equipment shall comply with local laws, regulations and specifications. The safety precautions in the manual are only used as a supplement to local laws, regulations and specifications.

- The Company shall not be liable in any of the following cases.
- Operation not under the conditions of use described in this manual.
- Installation and use environment beyond the requirements specified in the relevant international or national and regional standards.
- Unauthorized disassembly or change of product or change of software code.
- Failure to operate according to the operating instructions and safety warnings in the product and documents.
- Equipment damage caused by abnormal natural environment (force majeure, such as earthquake, fire, storm, etc.).
- Damage due to customer transportation.
- Damage due to storage conditions that do not meet the requirements of product documents.
- Damage to the hardware or data of the equipment due to customer negligence, improper operation or intentional damage.
- System damage due to third party or customer reasons, including handling and installation that do not comply with the requirements of this manual, as well as adjustment, modification or removal of identification marks that do not comply with the requirements of this manual.

General requirements:

Danger

There is a high voltage in the equipment, and improper operation may cause electric shock or fire, resulting in death, serious personal injury or serious property damage. Please standardize the operation:

- It is strictly forbidden to install, use and operate outdoor equipment and cables (including but not limited to handling equipment, operating equipment and cables, plugging and connecting outdoor signal interfaces, working at heights, outdoor installation, etc.) in severe weather such as lightning, rain, snow, and strong winds of level 6 or above.
- Please observe the operating sequence and safety precautions given in this manual and other relevant documents.
- Please observe the warning signs, warnings and protective measures on the equipment.
- Please follow the requirements of this manual, use the correct tools, and master the correct use of tools.
- It is forbidden to carry out installation, wiring, maintenance and replacement with power on.
- It is forbidden to clean the equipment with water.
- Do not open the host panel of the equipment.
- Please check the equipment for damage, such as battery drop, collision, casing dent or other signs of damage.
- Before touching any conductor surface or terminal, please measure the voltage at the contact point to confirm that there is no electric shock hazard.
- Paint scratches occurring during equipment transportation and installation must be repaired in time. It is strictly forbidden to expose the scratched part to the outdoor environment for a long time.
- It is forbidden to affect the battery terminal components during handling, and it is not allowed to lift and handle through the battery terminal bolts.
- In any case, do not change the structure and installation sequence of the equipment without the permission of the manufacturer.
- If a fire breaks out, leave the building or equipment area and press the fire alarm bell, or call the fire emergency number. Do not re-enter a burning building under any circumstances.

Caution

- When carrying out operations such as transportation, turnover, installation, wiring and maintenance, the local laws, regulations and relevant standards of the countries and regions must be met.
- The materials provided by the user and the tools required during the operation must meet the local laws, regulations and relevant standards of the countries and regions.

Note

The reverse engineering, decompilation, disassembly, modification, adaptation, implantation, or any other derivative operations of the device software are strictly prohibited. It is not permissible to investigate the internal workings of the device, acquire the source code of the device software, steal intellectual property, or disclose the results of any performance testing of the device software in any manner.

1.2 Personnel requirements

The personnel responsible for installing and maintaining the equipment must be strictly trained to understand various safety precautions and master the correct operation methods.

Only qualified professionals or trained personnel are allowed to install, operate and maintain the equipment.

- Only qualified professionals are allowed to dismantle safety facilities and maintain the equipment.
- The personnel who operate the equipment, including operators, trained personnel and professionals, shall have the special operation qualifications required by the local countries, such as qualifications of high-voltage operation, climbing operation, and special equipment operation.
- The replacement of equipment or components (including software) must be completed by professionals or authorized personnel.

Note

- Professionals: personnel who have experience in training or operating equipment and are aware of various potential hazard sources and hazard levels during equipment installation, operation and maintenance.
- Trained personnel: personnel who have received appropriate technical training and have the necessary experience, are aware of the dangers that may be brought to them when performing a certain operation, and can take measures to minimize the dangers to themselves or other people.
- Operator: operators who may come into contact with the equipment except trained personnel and professionals.

1.3 Electrical safety

Grounding requirements

- Before installing the equipment to be grounded, the PE cable must be installed first; When removing the equipment, the PE cable must be removed last.
- It is forbidden to damage the grounding conductor.
- It is forbidden to operate the equipment without the grounding conductor installed.
- The equipment shall be permanently grounded for protection. Before operating the equipment, check the electrical connection of the equipment to ensure that the equipment has been grounded reliably

General requirements:

Before the electrical connection, make sure that the equipment is not damaged, otherwise it may cause electric shock or fire.

- All electrical connections must meet the local electrical standards of the countries/regions.
- The user-provided cables shall comply with local laws and regulations.
- The special insulating tools shall be used for high-voltage operation.

DC operation

Danger

It is forbidden to install and remove the power cable with power on. The power cable core will produce electric arcs or sparks at the moment of contact with the conductor, which can cause fire or personal injury.

- Before the electrical connection of the equipment, if there is a possibility of touching live parts, the corresponding disconnection device upstream of the equipment must be disconnected.
- Confirm that the power cable is labeled correctly before connecting it.
- If the equipment has multiple inputs, all inputs of the equipment shall be disconnected, and the equipment can be operated only after power off.

Wiring requirements

- The use of cable in high temperature environment may cause aging and damage of the insulation layer. The distance between the cable and the heating device or the periphery of the heat source area shall be at least 50 mm.
- Similar cables shall be tied together, and different cables shall be placed at least 30 mm apart. It is forbidden to wind or cross them.
- The position where the cable passes through the pipe or the hole must be protected to avoid the cable being damaged by sharp edges, burrs, etc.
- When the temperature is too low, severe impact and vibration may cause the plastic sheath of the cable to crack. In order to ensure the construction safety, the following requirements shall be followed:
- All cables shall be laid and installed above 0°C, and shall be handled with care, especially when the construction is in low temperature environment.
- If the storage ambient temperature of the cable is below 0°C, the cable must be stored at room temperature for more than 24 h before laying.

Caution

Static electricity generated by the human body can damage electrostatic sensitive components on the single board, such as large-scale integrated (LSI) circuits.

- Anti-static gloves must be worn when touching the equipment, and clothing prone to static electricity is prohibited.

1.4 Battery safety

Statement

- The Company shall not be liable for abnormal equipment function, component damage, personal safety accidents, property losses, etc. caused by the following reasons:
- The battery is stored beyond the time limit due to the customer's failure to charge in time, resulting in capacity loss or irreversible damage to the battery.
- The battery damage, falling, leakage, etc. caused by improper operation or failure to connect the battery as required.
- The battery is installed on site and connected to the system. The battery is over discharged due to the customer's failure to power on in time, resulting in damage.

- The user fails to set the battery operation management parameters correctly.
- The customer or a third party changes the battery usage scenario without informing the Company. For example, an additional load is connected to the battery without authorization; The battery provided by the Company is mixed with other batteries, including but not limited to mixed with other brands of batteries, mixed with batteries of different rated capacities, etc.
- The direct damage to the battery due to the operating environment of the on-site equipment or the external power parameters that cannot meet the environmental requirements for normal operation. These include the actual operating temperature of the battery being too high or too low, and the power grid being unstable and causing frequent power outages.
- The customer's improper maintenance causes frequent over-discharge of the battery, the customer's on-site expansion, long-term inability to fully charge the battery, etc.
- The customer does not maintain the battery correctly according to the supporting equipment operation manual, including but not limited to failing to regularly check whether the battery terminals are locked.
- The battery is stolen.
- The battery is beyond the warranty period.

Basic requirements

Danger

- Do not expose the battery to high temperature environment or around hot equipment, such as sunlight, fire source, transformer, heater, etc. Overheating of the battery may cause fire and explosion.
- It is forbidden to disassemble, modify or damage the battery (such as inserting foreign objects, immersing in water or other liquids), so as to avoid battery leakage, overheating, fire or explosion.
- The fire hazard of lithium-ion/sodium-ion battery energy storage system is Class A or Class B. The following safety risks shall be fully considered before battery operation:
- The battery electrolyte is flammable, toxic and volatile.
- The thermal runaway of battery will produce combustible gas, as well as CO, HF and other harmful gases.
- The accumulation of combustible gas generated by thermal runaway of battery has the risk of deflagration and explosion.
- The battery must be stored separately and in the outer packaging to avoid mixing with other items, open storage, and stacking too high.
- The battery beyond the warranty period must not be used.
- The outer package of the battery must not be removed under normal circumstances. If the battery needs to be recharged, the recharge shall be done by professionals as required. The battery shall be repacked after the recharge is completed.
- The battery shall be handled in the direction as required, and it is forbidden to invert or tilt the battery.
- The battery shall be protected from impact.
- Do not perform welding, grinding and other similar work around the battery to avoid fire hazards such as electric sparks and arcs.
- Please use the battery within the operating temperature range specified in this manual.

- Do not use damaged battery (due to drop, collision, casing dent or others). The damaged battery may cause the release of flammable gases. Do not store the damaged battery near undamaged products.
- The storage location of the damaged battery shall not contain flammable materials, and non-professionals shall not approach it.
- The damaged battery shall be monitored during storage to determine that there are no signs of smoke, flame, electrolyte leakage, or heating.

Personal safety

- Appropriate personal protective equipment shall be worn during operation of the equipment. If a fault that may cause personal injury or equipment damage is found, the operation shall be terminated immediately and reported to the person in charge, and effective protection measures shall be taken.
- Before using tools, please master the correct use of tools to avoid injury to people and damage to equipment.
- When the equipment is working, the housing temperature is high and there is a risk of burns, so do not touch it.
- To ensure personal safety and normal use, the grounding shall be reliable before use.
- When the battery fails, the temperature may exceed the burn threshold of the touchable surface, and contact shall be avoided.
- Do not open or damage the battery, and avoid contact with the drained electrolyte, which is harmful to skin and eyes.
- Do not place irrelevant items on the top of the equipment or insert them anywhere in the equipment.
- Do not place flammable materials around the equipment.
- It is strictly forbidden to place the battery in the fire to avoid explosion and endangering personal safety.
- Do not place the battery module in water or other liquids.
- Do not short-circuit the battery terminals, as this will cause combustion.
- The battery may cause danger of electric shock and high short circuit current. When using the battery, pay attention to the following precautions:
  a. Remove metal objects such as watches and rings.
  b. Use tools with insulated handles.
  c. Wear rubber gloves and boots.
  d. Do not place tools or metal parts on the top of the battery.
  e. Disconnect the charging power supply before connecting or disconnecting the battery terminals.
  f. Determine if the battery is accidentally grounded. In case of accidental grounding, remove the power supply from the ground.
- Do not use water or detergent to clean the electrical parts inside and outside the cabinet.
- Do not stand, lean or sit on the equipment.
- Do not damage each module of the equipment.

Battery installation requirements

- Before installing the battery, check whether the packaging is intact. The battery with damaged packaging shall not be used.
- During the installation of the battery, pay attention to the positive and negative, and it is forbidden to short-circuit the positive and negative of the battery.
- During the installation, use a torque wrench to ensure that the screws are tightened without looseness, and check them regularly.
- After installing the equipment, the empty packaging materials in the equipment area, such as cartons, foam, plastic, cable tie, etc., shall be removed.

Hazard and toxicity statements

Danger

- Hazard: Contact of battery terminals with other metals may cause heating or electrolyte leakage. The electrolyte is flammable. If the electrolyte leaks, the battery shall be removed from the fire immediately.
- Toxicity: Vapors from battery combustion may irritate eyes, skin and throat.

Emergency measures for abnormal battery

Danger

- When electrolyte leakage or abnormal odor occurs, avoid contact with the leaked liquid or gas. Do not allow non-professionals to approach. Please contact professionals immediately. The professionals shall wear goggles, rubber gloves, gas masks, protective clothing, etc. to prevent the hazards caused by electrolyte overflow.
- The electrolyte is corrosive and any contact may cause skin irritation and chemical burns. If the battery electrolyte is touched, the following measures are required.
- Inhalation: Leave the contaminated area, get into fresh air immediately, and seek medical help immediately. Eye contact: Immediately flush eyes with plenty of water for at least 15 minutes, do not rub, and seek medical help immediately. Skin contact: Wash contact area immediately with plenty of water and soap, and seek medical help immediately. Ingestion: Seek medical help immediately.

Fire emergency measures

Danger

- In case of fire, the system shall be powered off under the premise of safety.
- Use carbon dioxide, FM-200 or ABC dry powder fire extinguishers to extinguish the fire.
- Firefighters shall avoid contact with high-voltage components during fire fighting, otherwise it may cause electric shock risk.
- When the battery temperature is too high, it may cause deformation, damage, electrolyte overflow, and leakage of toxic gases. Wear respiratory protection equipment and stay away from the battery to avoid skin irritation and chemical burns.

Flood emergency measures

Danger

- Power off the system to ensure personal safety.
- If any part of the battery is flooded, do not touch the battery to avoid electric shock.
- Do not use the flooded battery, and contact the battery recycling company for scrap.

Battery drop emergency measures

Danger

- When installing the battery, if the battery is dropped or strongly impacted, it may cause damage to the inside of the equipment. It is strictly prohibited to continue using it, otherwise there will be a safety risk (cell leakage, electric shock injury, etc.).
- After the battery drop, if there is obvious odor, damage, smoke, fire, etc., immediately evacuate people, call the police in time, and contact professionals. The professionals shall use fire-fighting facilities to extinguish the fire under the condition of ensuring safety.
- After the battery drop, if there is no obvious deformation or damage on the appearance and no obvious odor, smoke or fire, contact professionals to transfer the battery to an open and safe place or contact a recycling company for disposal.

Battery recycling

- Please dispose of the waste battery according to local laws and regulations, and do not dispose of the battery as household waste. Improper disposal of battery may cause environmental pollution.
- If the battery leaks or is damaged, please contact technical support or battery recycling company for scrap.
- When the battery is unusable beyond its service life, please contact the battery recycling company for scrap.
- Avoid exposing waste battery to high temperature or direct sunlight.
- Avoid exposing waste battery to high humidity or corrosive environment.

Battery electrolyte leakage treatment measures

- In case of electrolyte leakage, avoid contact with the leaked liquid or gas. The electrolyte is corrosive and any contact may cause skin irritation and chemical burns. If the battery electrolyte is touched, the following measures are required.
- Inhalation: Leave the contaminated area, get into fresh air immediately, and seek medical help immediately.
- Eye contact: Immediately flush eyes with plenty of water for at least 15 minutes, do not rub, and seek medical help immediately.
- Skin contact: Wash contact area immediately with plenty of water and soap, and seek medical help immediately.
- Ingestion: Seek medical help immediately.

1.5 Storage requirements:

General requirements

Note

- During storage, it is necessary to record the relevant requirements for product storage in this manual, such as temperature, humidity, storage environment, etc.
- Long-term storage of the battery is not recommended. There will be capacity loss in long-term storage of lithium batteries. After 12 months of storage at the recommended storage temperature, the general irreversible capacity loss is 3%~10%.
- The storage environment shall meet the local regulations and standard requirements.
- In case of overdue storage, it shall be inspected and tested by professionals before it can be put into use.
- When the battery is stored, it shall be placed correctly according to the packaging box labels, and shall not be placed upside down or sideways.
- When the battery packaging boxes are stacked, they shall meet the stacking requirements on the outer packaging.
- When handling the battery, it is required to handle it with care, and it is strictly forbidden to damage the battery. Storage environment requirements:
- Ambient temperature: -10°C ~ 55°C, recommended storage temperature: 20°C ~ 30°C.
- Relative humidity: 5%RH ~ 80%RH.
- Store in a dry, clean and ventilated place, and prevent dust and moisture erosion. Do not expose to erosion by rain or ground water.
- Avoid contact with corrosive organic solvents, gases and other substances.
- Avoid direct sunlight.

1.6 Handling and transportation requirements

Caution

This product has passed the certification of UN38.3 (UN38.3: Section 38.3 of the sixth Revised Edition of the Recommendations on the Transport of Dangerous Goods: Manual of Tests and Criteria) and SN/T 0370.2-2009 *Rules for the Inspection of Packaging for Export Dangerous Goods - Part 2 : Performance Test*, and belongs to Class 9 dangerous goods.

Handling requirements:

The energy storage system shall be handled in accordance with the laws and regulations of the region and the industry standards. Rough handling will cause short circuit or damage to the battery in the packaging box, which may lead to battery leakage, rupture, explosion or fire.

Start conditions:

Before start, the battery must be checked to ensure that it is intact and free of obvious odor, smoke, fire, etc. Otherwise, start is prohibited.

Note

The product can be directly shipped to the site, meeting the transportation requirements for vehicles and ships, and the transportation packaging must be sturdy. During the loading, unloading, and transportation process, care should be taken to handle the goods gently and to take proper moisture-proof measures. Affected by the external environment (such as temperature, transportation, storage, etc.), the specifications of the product shall be subject to the date of manufacture.

Transportation requirements:

- The energy storage system does not support railway and air transportation.
- The sea transportation shall comply with the requirements of International Maritime Dangerous Goods Code (IMDG CODE).
- The land transportation shall comply with the ADR or JT T617 transportation requirements.
- The regulatory requirements of the transportation regulatory authorities in the country of departure, the country of passage and the country of destination shall be met.
- The international rules for the transport of dangerous goods and the regulatory requirements of the transportation regulatory authorities in the corresponding countries shall be met. During handling or transportation, the followings are forbidden:
- Direct rain and snow or falling into water.
- Drop or mechanical impact.
- Turning upside down or tipping over.

Note

In case of the above abnormal conditions, please follow the emergency measures.

Installation environment requirements

- The installation and use environment shall comply with the local laws and regulations and the provisions of relevant international, national and regional standards on lithium products.
- The mounting position shall be out of reach of children and away from daily work and living areas, including but not limited to the following areas: studio, bedroom, lounge, living room, music room, kitchen, study, game room, home theater, sun room, bathroom, shower room, laundry room, and attic.
- For installation in the garage, it is necessary to keep away from the direction of vehicle travel. It is recommended to install the energy storage system on the wall above the bumper of the vehicle to avoid accidental collision.
- For installation in the basement, it is necessary to maintain ventilation. Do not place flammable and explosive materials around the equipment. It is recommended to install the energy storage system on the wall to avoid accumulated water.
- Install in a dry and well-ventilated environment, and fix the equipment on a solid and flat supporting surface.
- Please select a sheltered installation site, or build a sunshade to avoid direct sunlight or rain.
- The environment around the mounting position shall be clean, without a large amount of infrared radiation, organic solvents and corrosive gases.
- For areas with frequent natural disasters such as floods, debris flows, earthquakes and typhoons, the corresponding preventive measures shall be taken for installation.

- The mounting position shall be far away from fire and heat sources, and flammable and explosive materials shall not be placed around the equipment.
- Avoid water accumulation in the mounting position, and keep away from water sources such as taps, sewer pipes, sprinklers, etc. to avoid water infiltration.
- When the equipment is running, the temperature of the cabinet and cooling fin will be relatively high. Do not install it in a position that is easy to touch.
- Do not block the vents or heat dissipation system when the equipment is running to prevent fire from high temperatures.
- It is forbidden to place the equipment in an environment of flammable, explosive gases or fumes, and it is forbidden to carry out any operation in this environment.
- It is prohibited to install in mobile scenarios such as ships, trains, and cars.
- In a backup power scenario, do not use the power supply for the following purposes.

  a. Medical equipment directly related to human life.

  b. Control equipment such as trains and elevators, which may cause personal injury.

  c. Computer system of social and public importance.

  d. In the vicinity of medical equipment.

  e. Equipment similar to that described above.
- The energy storage system will be corroded if installed in the salt damage area. Do not install it outdoors in the salt damage area. Salt damage area refers to the area within 500 m from the coast or affected by the sea breeze. The area affected by the sea breeze varies according to meteorological conditions (such as typhoons and seasonal winds) or terrain (with dams or hills).

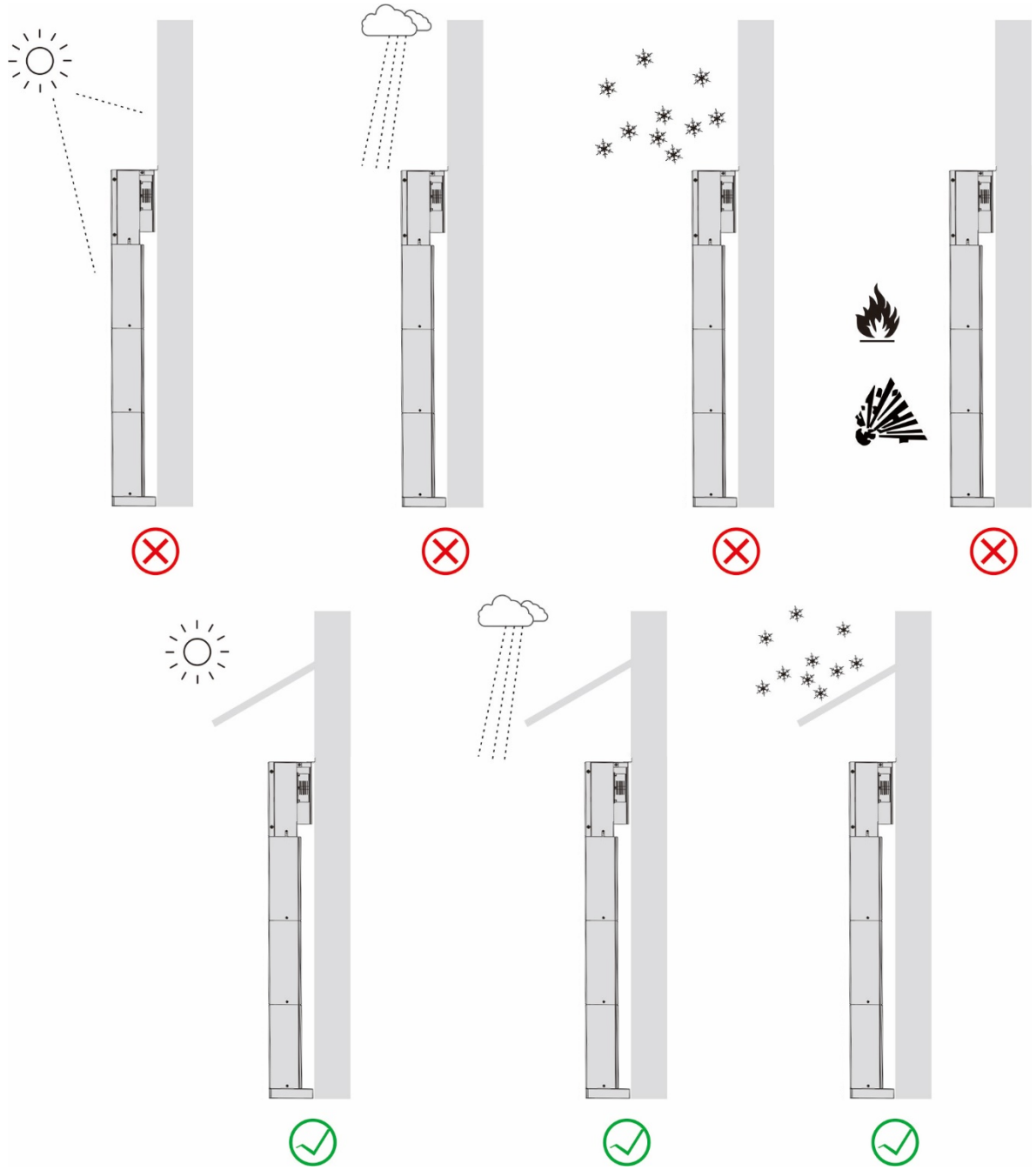


Figure 1 Installation environment

Note

The operation and service life of the energy storage system are related to the operating temperature. Please install the energy storage system at the ambient temperature or above.

1.7 Adjustment and test

When the equipment is powered on for the first time, the professionals shall set the parameters correctly. Incorrect settings may cause the equipment to be inconsistent with the local certification of the country/region, which may affect the normal operation of the equipment.

1.8 Maintenance and replacement

Danger

During the operation of the equipment, there is high voltage, which may cause electric shock, resulting in death, serious personal injury or serious property damage. Therefore, before any maintenance, the equipment must be powered off, and the operation must be carried out in strict accordance with the safety precautions listed in this manual and other relevant documents.

- Please maintain the equipment under the condition that you are familiar with and understand the contents of this manual and have appropriate tools and test devices.
- Before maintenance, please power off the equipment, and then follow the instructions on the delay discharge label and wait for the corresponding time to ensure that the equipment is powered off before operating the equipment.
- During the maintenance, please try to prevent irrelevant personnel from entering the maintenance site, and temporary warning signs or fences must be erected for isolation.
- If the equipment fails, please contact your dealer in time.
- The equipment can be powered on again only after the fault is eliminated, otherwise it may cause the fault to expand or the equipment to be damaged.
- Do not open the cover without authorization, otherwise there will be a risk of electric shock, and the resulting failure is not covered by the warranty.
- Operation and maintenance personnel and professional technicians shall be fully trained in safe use and equipment maintenance, and shall operate with sufficient precautions and personal protective equipment.
- When it is necessary to move or rewire, you must cut off the power supply, wait for 5 minutes to ensure that the internal energy of the machine has been completely discharged. After confirming with a multimeter that there is no dangerous voltage on the DC busbar and the area inside the machine that requires maintenance, you can start the maintenance process.
- The maintenance of the battery shall be performed or supervised by personnel who are familiar with the battery and the precautions required.
- When replacing the battery, replace it with a battery or battery pack of the same model.
- After the maintenance operation is completed, an immediate check should be conducted to ensure that no tools or other parts have been left inside the equipment.
- If the device is not going to be used for a long period, it is necessary to store the battery and perform recharging according to this manual.

2 Product introduction

2.1 Appearance of all-in-one inverter

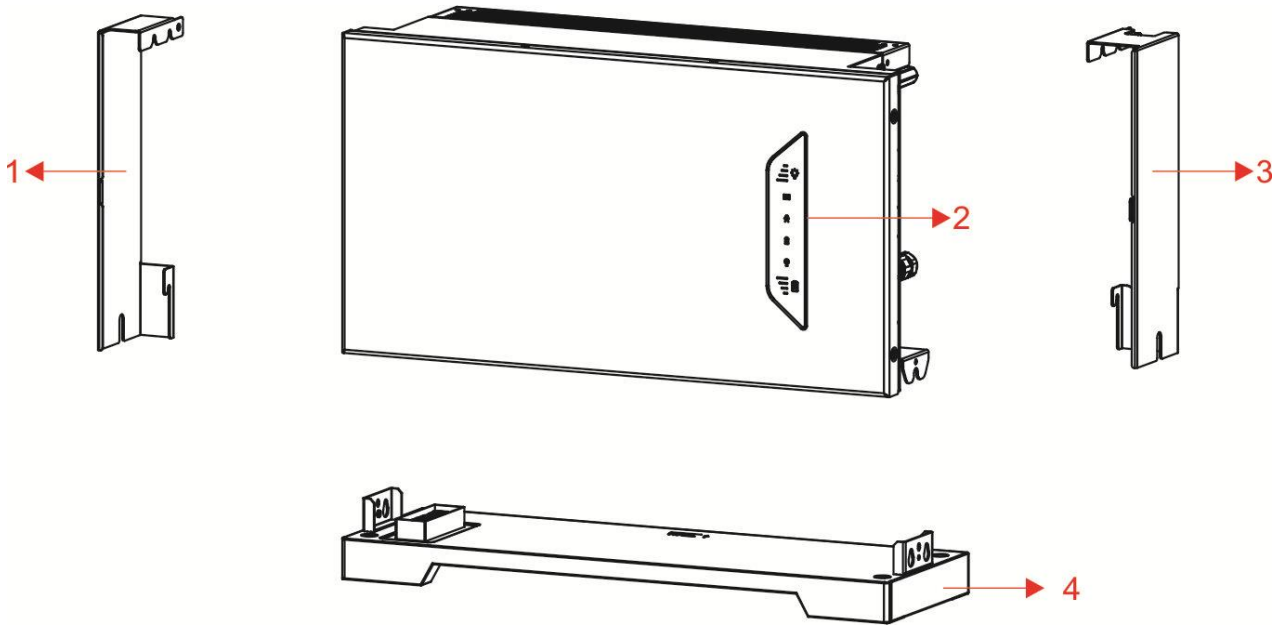
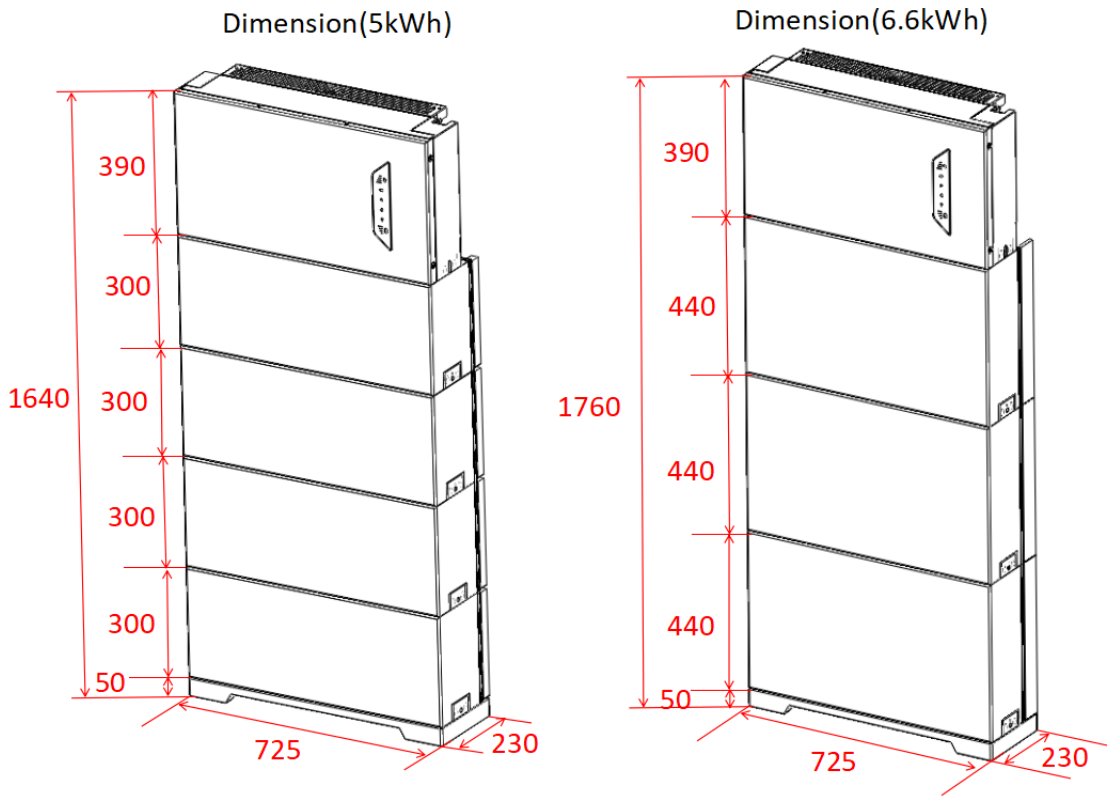


Figure 2-1 Exploded view of main components in inverter packaging box

Item	Explanation	Item	Explanation
1	Left trim baffle	2	LED panel
3	Right trim baffle	4	Pedestal

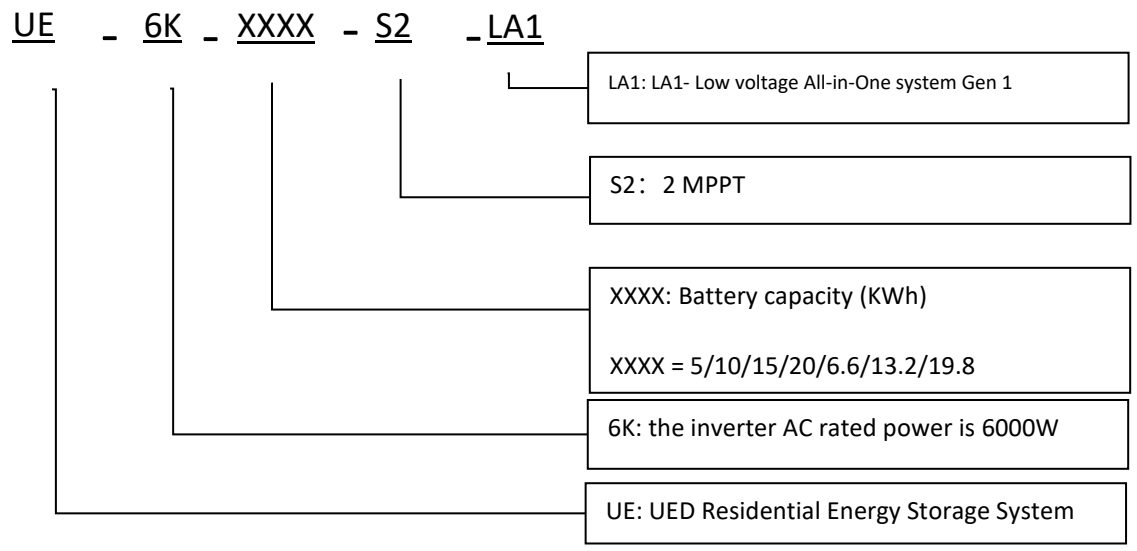


Model

This manual applies to the all-in-one systems listed below:

UE-3.68K-XXXX-S2-LA1, UE-5K-XXXX-S2-LA1,UE-6K-XXXX-S2-LA1

Model description



2.2 External interface of all-in-one inverter

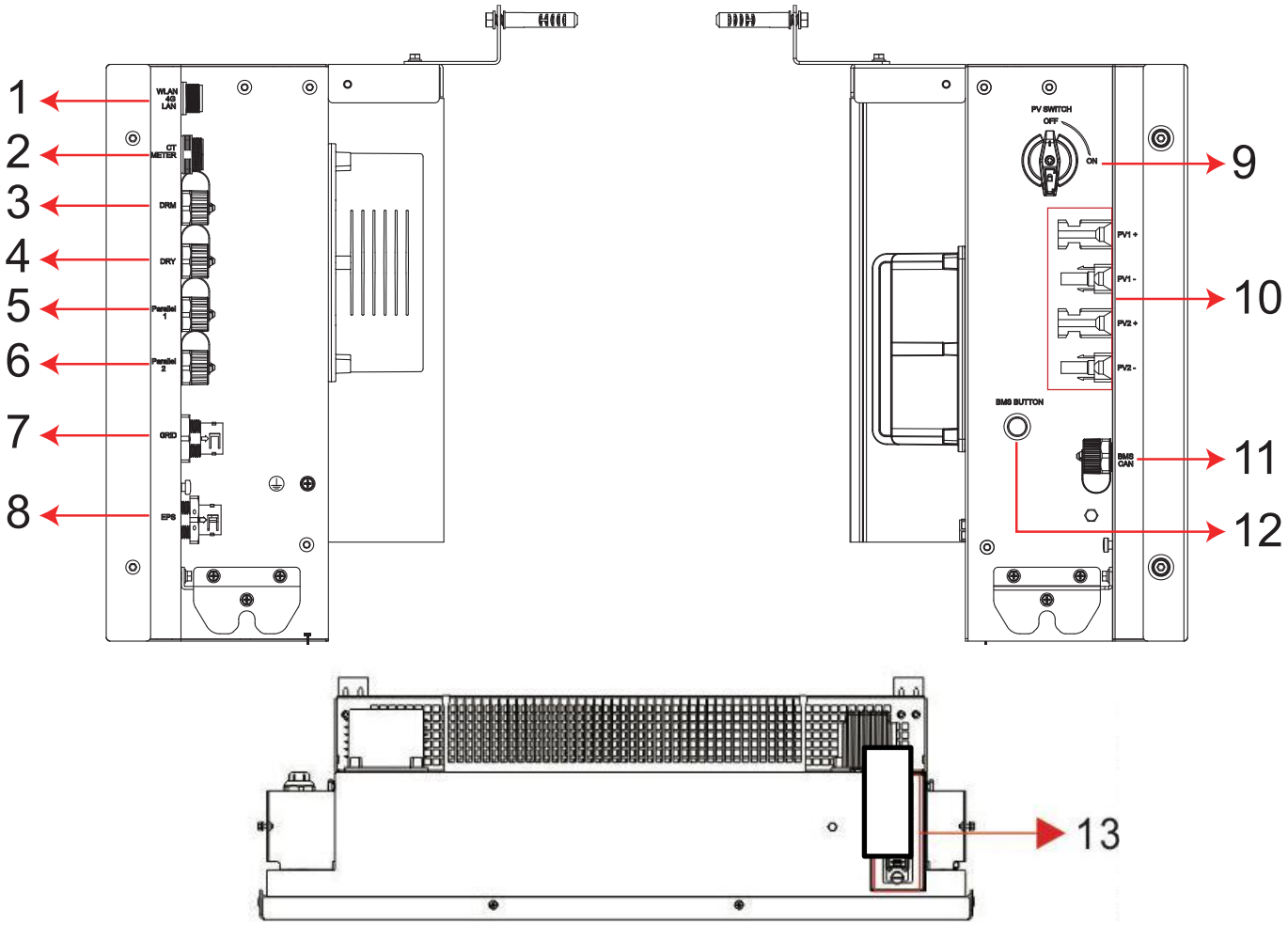
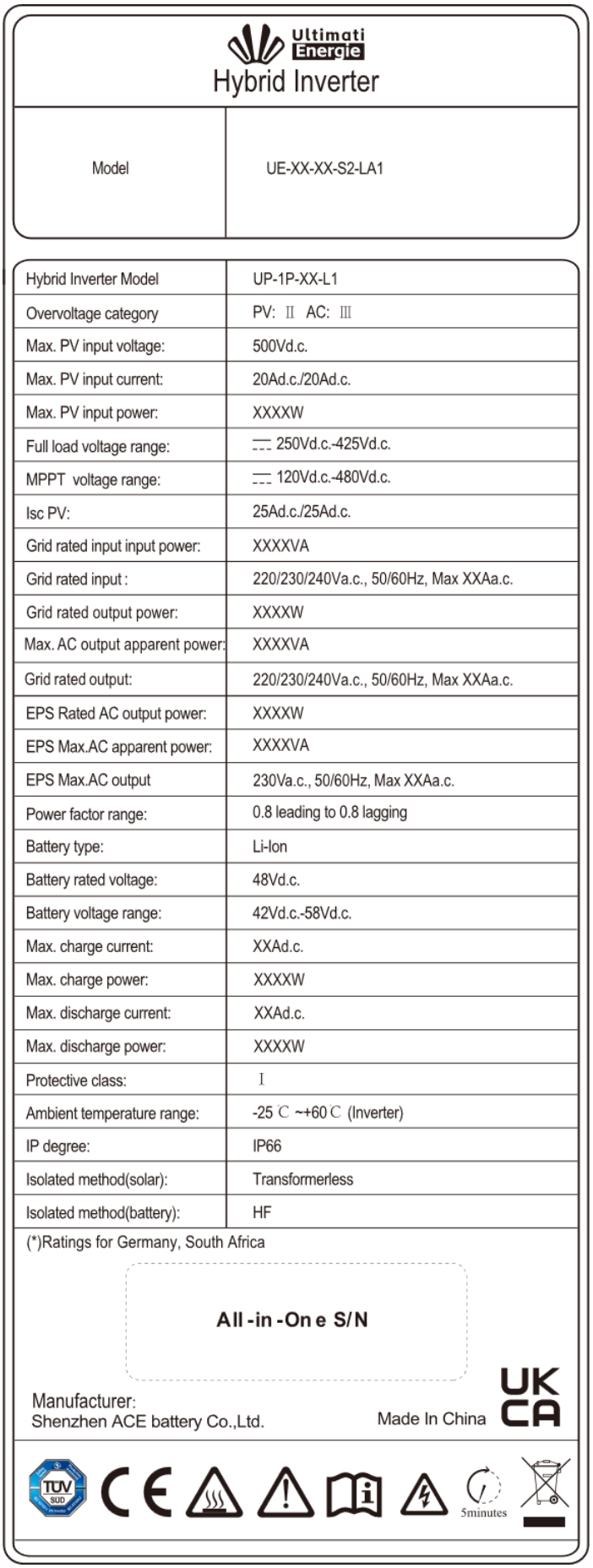


Figure 2-2 External interface

Item	Explanation	Item	Explanation
1	WLAN/4G/LAN	2	CT/METER
3	DRM	4	DRY contact
5	Parallel1	6	Parallel2
7	GRID	8	EPS
9	PV SWITCH	10	PV1/PV2
11	BMS CAN	12	BMS BUTTON
13	BAT connect		

2.3 Nameplate

The nameplate is for reference only.



Ultimati Energie

Hybrid Inverter

Model	UE-XX-XX-S2-LA1

Hybrid Inverter Model	UP-1P-XX-L1
Overvoltage category	PV: Ⅱ AC: Ⅲ
Max. PV input voltage:	500Vd.c.
Max. PV input current:	20Ad.c./20Ad.c.
Max. PV input power:	XXXXW
Full load voltage range:	⎓ 250Vd.c.-425Vd.c.
MPPT voltage range:	⎓ 120Vd.c.-480Vd.c.
Isc PV:	25Ad.c./25Ad.c.
Grid rated input input power:	XXXXVA
Grid rated input :	220/230/240Va.c., 50/60Hz, Max XXAa.c.
Grid rated output power:	XXXXW
Max. AC output apparent power:	XXXXVA
Grid rated output:	220/230/240Va.c., 50/60Hz, Max XXAa.c.
EPS Rated AC output power:	XXXXW
EPS Max.AC apparent power:	XXXXVA
EPS Max.AC output	230Va.c., 50/60Hz, Max XXAa.c.
Power factor range:	0.8 leading to 0.8 lagging
Battery type:	Li-Ion
Battery rated voltage:	48Vd.c.
Battery voltage range:	42Vd.c.-58Vd.c.
Max. charge current:	XXAd.c.
Max. charge power:	XXXXW
Max. discharge current:	XXAd.c.
Max. discharge power:	XXXXW
Protective class:	Ⅰ
Ambient temperature range:	-25℃~+60℃ (Inverter)
IP degree:	IP66
Isolated method(solar):	Transformerless
Isolated method(battery):	HF

(*)Ratings for Germany, South Africa

All-in-One S/N

Manufacturer:
Shenzhen ACE battery Co.,Ltd.

Made In China

UK CA

5minutes

2.4 Display definition

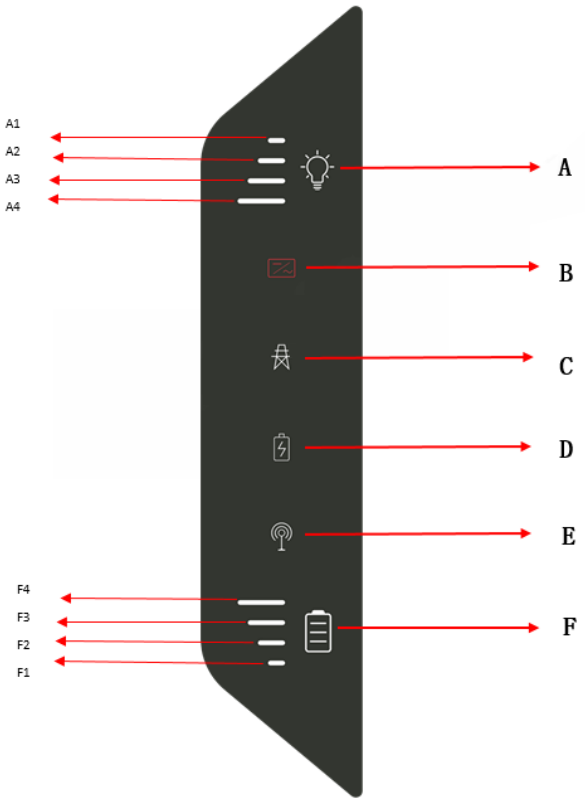


Figure 2-3 Appearance of LED indicator light

Table 2-3 Description of indicator light

Object	Name	Color	Status	Explanation
A	EPS load power indicator light	Stay on after power-on (cool white)	A4:4/4	≥75%
			A3:3/4	≥50%
			A2:2/4	≥25%
			A1:1/4	≥5%
			0	＜5%
B	System status light	Cool white	Breathing	Self-test or standby
			Stay on	Inverter on-grid or off-grid
		Red	Flicker	Alarm
			Stay on	System fault
			Off	System power off
C	Operating mode light	Cool white	Stay on	Normal power grid, inverter on-grid mode
			Flicker	Abnormal power grid, inverter off-grid mode
			Off	Back-up function off
D	Battery light	Cool white	Stay on	Normal battery working
			Breathing	Battery discharge
			Flicker	Abnormal battery (battery fault, battery alarm, abnormal BMS communication)
			Off	Battery shutdown or battery disconnection
E	Communication light	Cool white	Flicker	Monitor background connection failure or communication failure
			Stay on	Normal inverter communication and normal monitor
			Off	Monitor module not connected or other communications not connected
F	Battery SOC	Stay on after power-on (cool white)	F1:4/4	≥75%
			F2:3/4	≥50%
			F3:2/4	≥25%
			F4:1/4	≥5%
			0	＜5%

2.5 System configuration

The system supports capacity expansion and power expansion.

ALL INE ONE system work in parallel for on-grid and off-gird operation

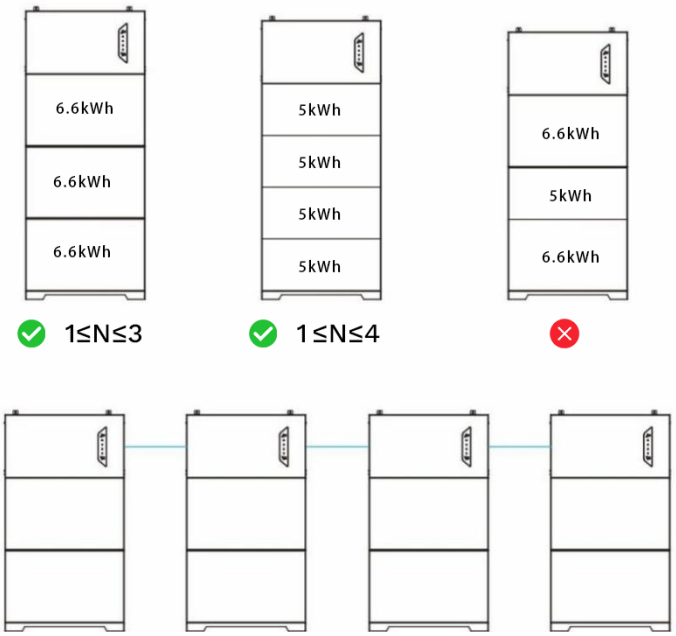


Figure 2-4 System configuration diagram

One to three battery modules(6.6kwh) or One to four battery modules(5kwh) could be installed in one tower. **DIFFERENT BATTERY MODULES CANNOT BE INSTALLED IN ONE TOWER.**

Note

- Maximum capacity configuration:

  1 In single operation scenario, up to 4 battery pack modules can be connected.

  2 In parallel operation scenario, up to 3 battery modules can be connected, and up to 4 battery pack modules can be connected to a single power module.

- The parallel operation scenario supports three-way single-phase closed-loop output, and cannot be used as a three-phase scenario.
- In parallel operation scenario, it is recommended that the number of energy storage modules on the master and slave be the same.
- In parallel operation scenario, if the number of energy storage modules of the master and slave is different (not recommended), overloading may cause the high-capacity energy storage side to be unable to discharge the stored energy.
- 5kWh&6.6kWh battery pack can not be installed in one tower

3 Application scenarios

3.1 System introduction

RESS-1A-XXXX-L2-6K series residential all-in-one energy storage system is applicable to:

DC coupling system: A energy storage power generation system composed of PV, battery, load, power grid and single inverter; AC coupling system: When the customer has installed a grid-connected inverter, the AC side of the energy storage inverter is allowed to be connected in parallel to the AC side of the grid-connected inverter. In the self-generation and self-consumption mode, the battery charging is provided by the PV grid-connected inverter.

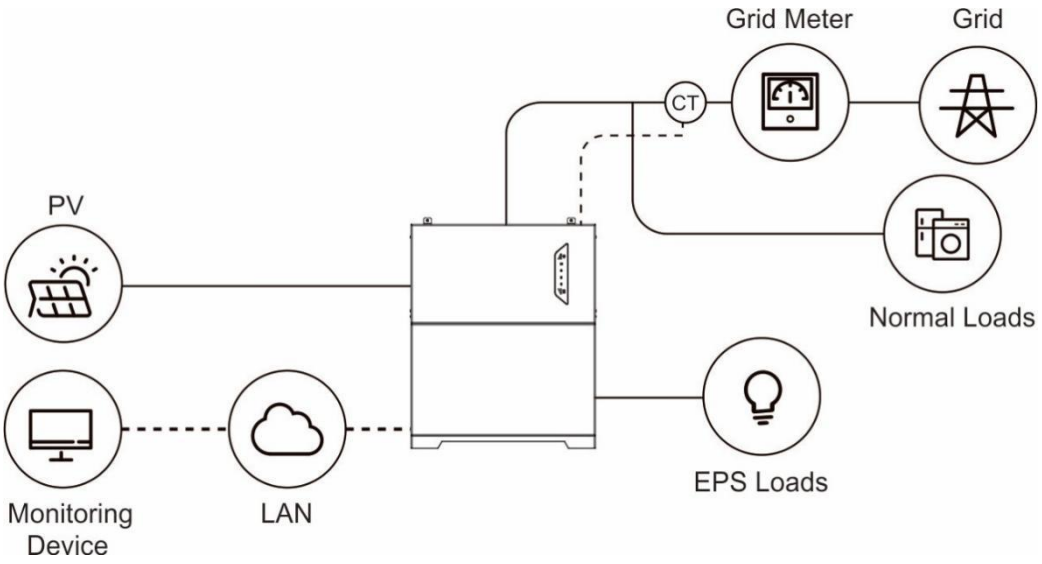


Figure 3-1 DC coupling storage system

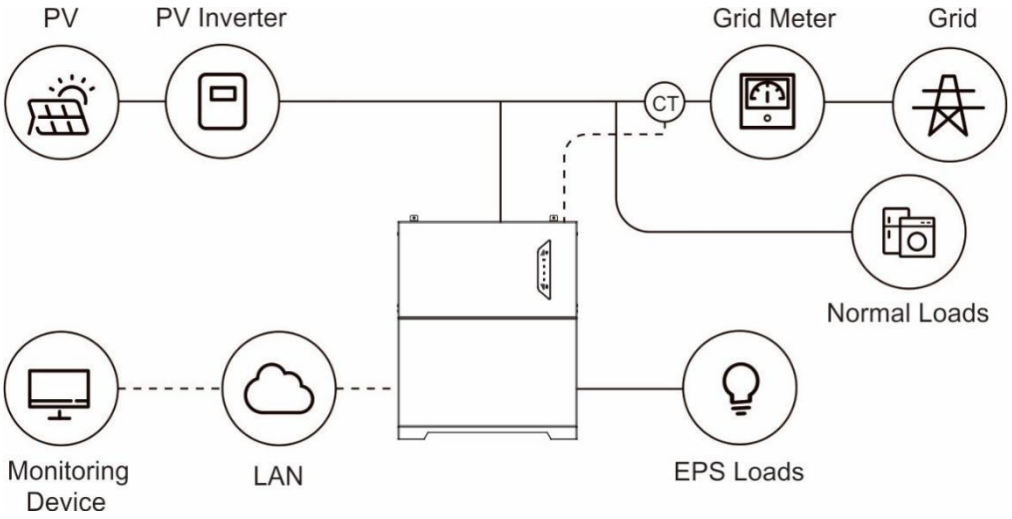


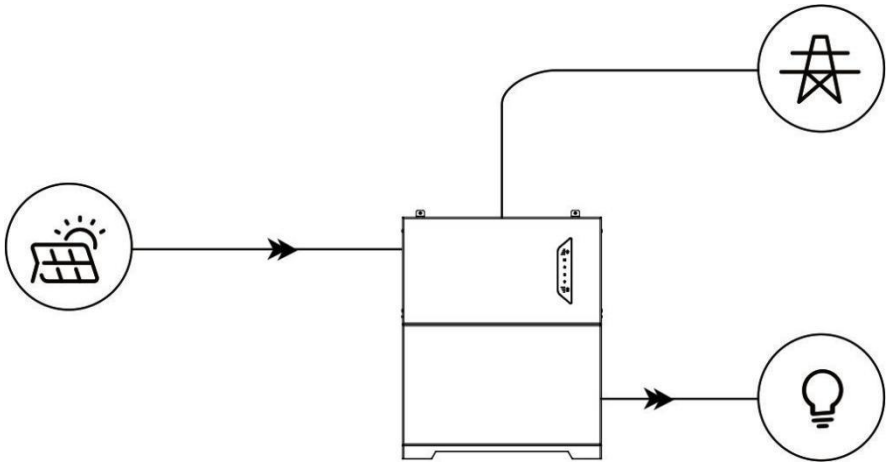
Figure 3-2 AC coupling storage system

3.2 Operating mode

The end user can select three basic modes in the application mode through APP.

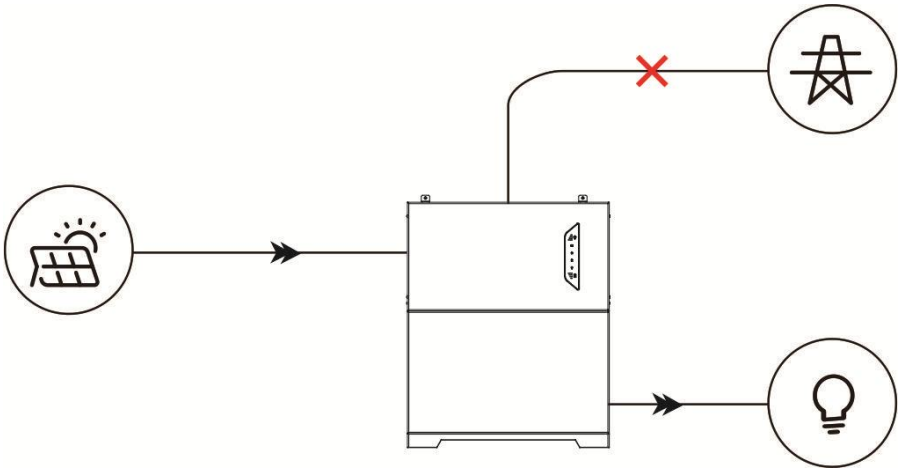
Self-generation and self-consumption:

The energy generated by the solar PV panel will be used in the following order: priority is given to supplying power to household loads, then charging the battery, and finally sending excess energy to the power grid. When the sun sets, clouds block out or other light-poor conditions occur, the load will be supported by battery discharge to enhance self-consumption. If PV and battery power supply is insufficient, the power grid will support the load demand.



Battery priority:

This mode, also known as UPS mode, uses the battery as a backup power source. The battery will only discharge after the power grid goes out, which helps to maximize the lifespan of the battery. If the battery is not fully charged, it will continuously charge, with the charging power being from PV or grid electricity (with priority given to PV when both are available), keeping the battery's charge level always full. When the grid power goes out, it will provide backup power in offline mode.



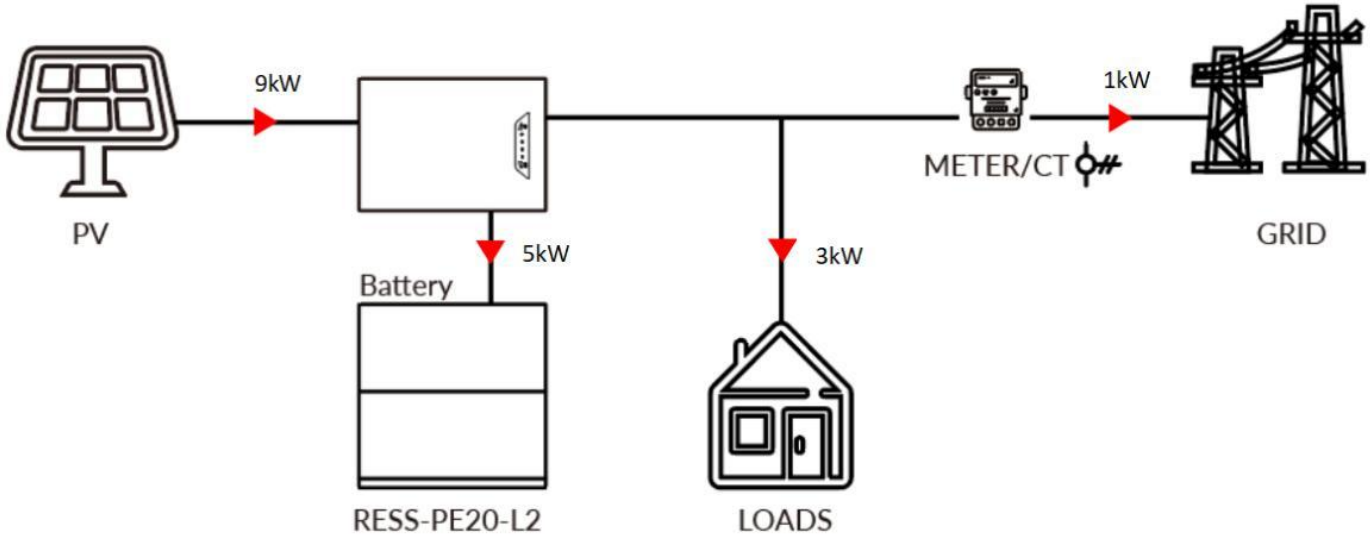
Peak shaving and valley filling:

Set the grid power - peak power and valley power. When the mains power is between the peak and valley values, the load draws electricity from the grid, and PV power is used solely for charging the battery. When there is excess PV power, it is curtailed, and when the battery is fully charged, the excess PV power is also curtailed. When the grid power is less than the valley value, the battery actively draws charge from the grid to maintain the grid power until it reaches the valley power level. When the grid power exceeds the peak power level, the battery actively discharges to maintain the grid power at the peak power level. Application scenarios: To ensure that customers avoid paying high electricity bills due to overload and fully utilize the power capacity contracted with the DNO/DSO.

3.2.1 Self Consumption: Energy priority is load → battery → grid.

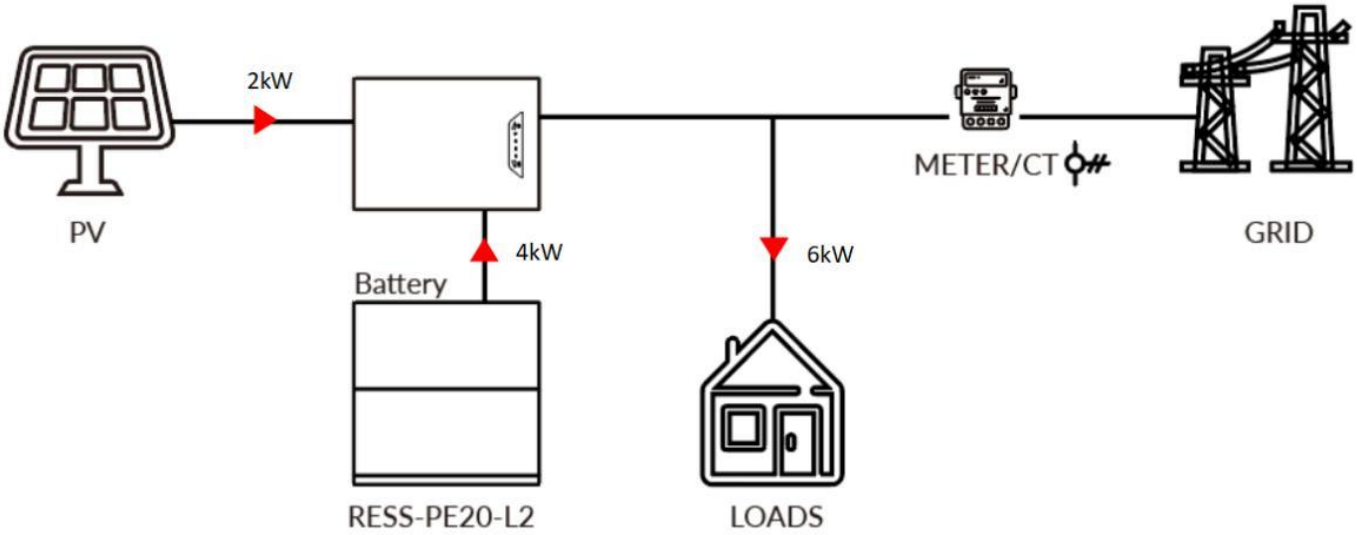
3.2.1.1 The electricity generated by the photovoltaic system is first used to power the loads.

If the generated power exceeds the load demand, the surplus energy is used to charge the battery. Once both the loads and the battery are fully supplied, any remaining power is fed into the grid. The energy priority follows the order: Load > Battery > Grid, as shown in Figure



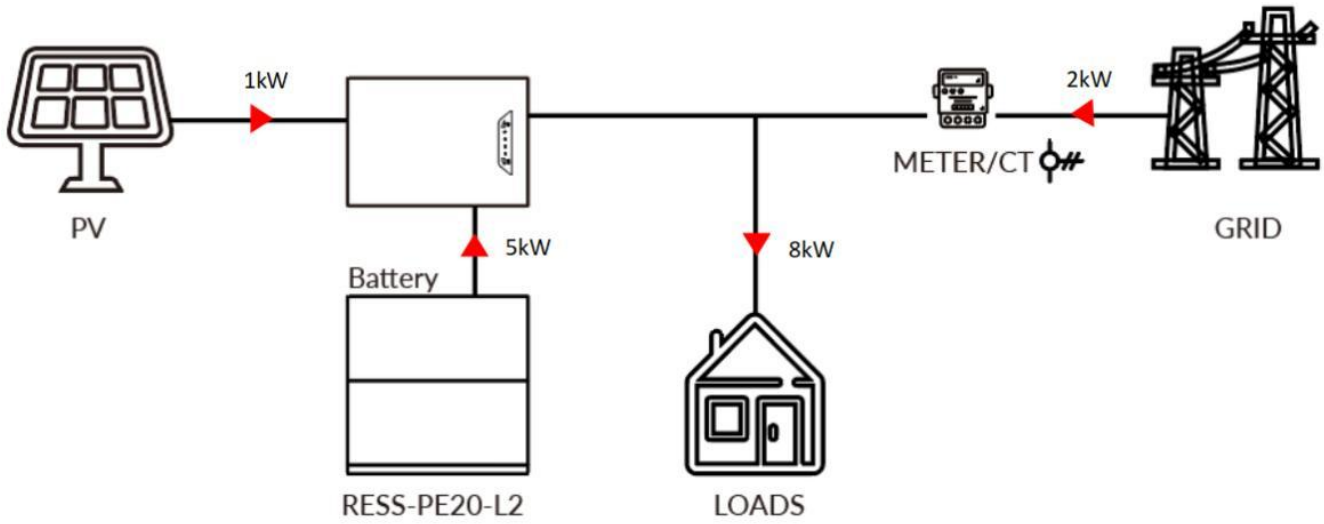
3.2.1.2 Photovoltaic priority power supply load

When the photovoltaic system, grid, and battery are all available, the photovoltaic power is prioritized to supply the loads. If the photovoltaic power alone is insufficient, the battery will supplement it to meet the load demand. As shown in Figure.



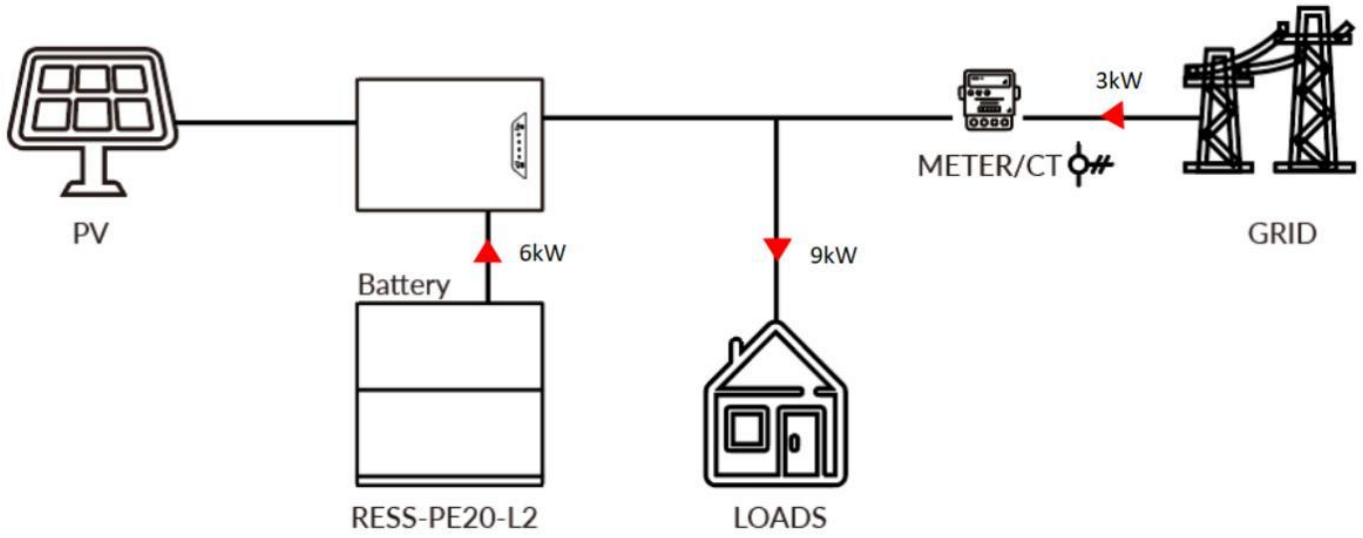
3.2.1.3 Photovoltaic power generation is preferred to power the load

When the photovoltaic system, grid, and battery are all available, the electricity generated by the photovoltaic system is used to power the loads first. If the combined power from the photovoltaic system and the battery is insufficient to meet the load demand, the grid will supplement the power supply. As shown in Figure



3.2.1.4 The grid supplies power to the load

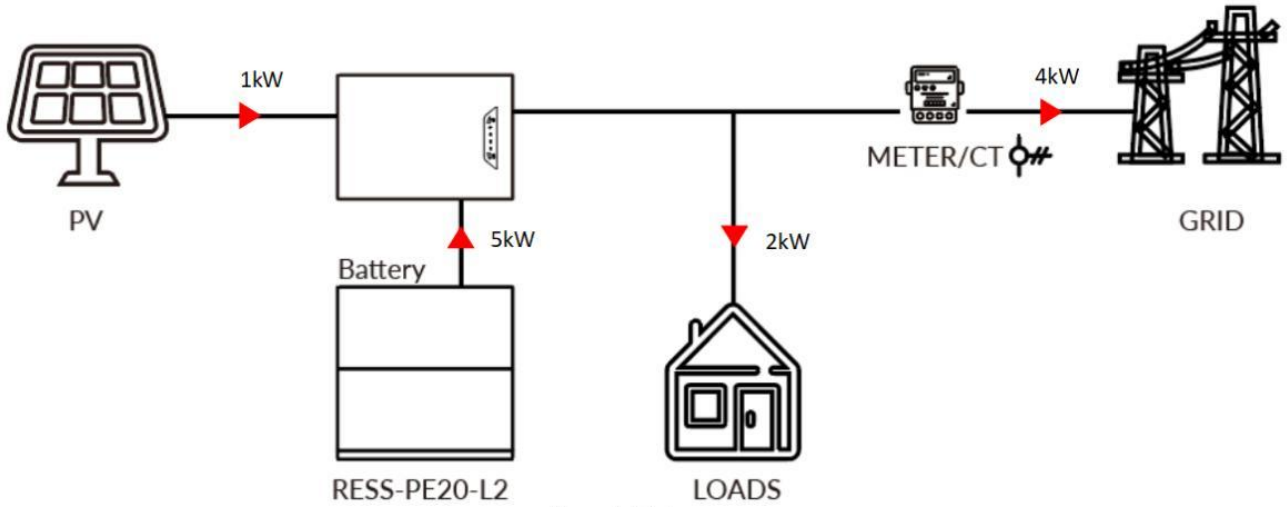
When there is no photovoltaic power supply, the battery will discharge first to meet the load, and when the battery capacity is insufficient, the grid will supply power to the load. This is shown in Figure



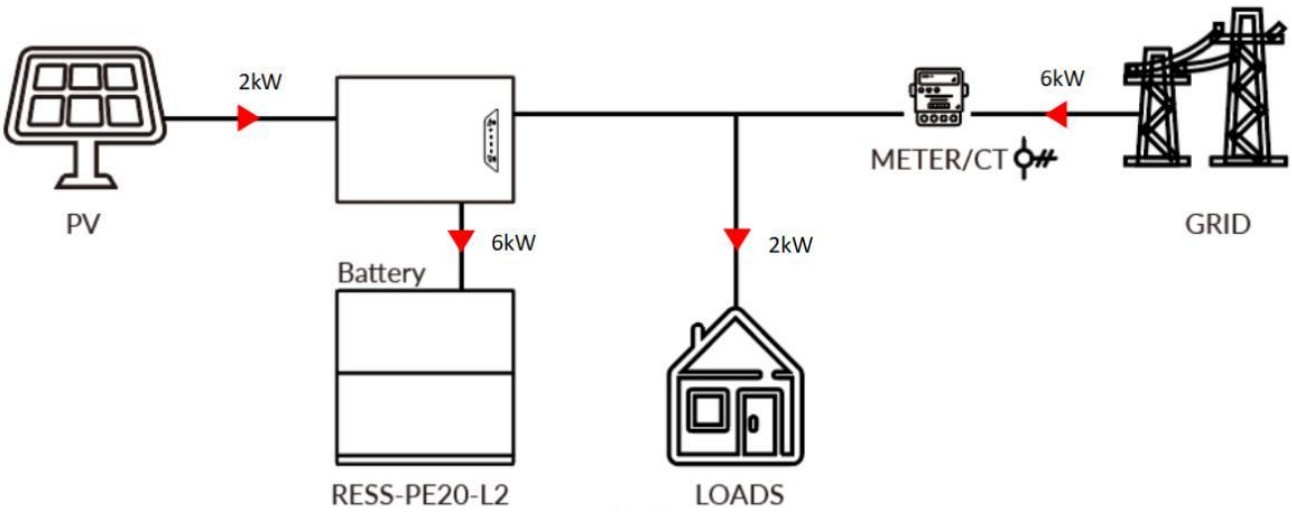
3.2.2 Peak Shift

In this mode, users are able to set the charging and discharging time periods according to local peak-valley electricity prices.

3.2.2.1 Discharging time period: The period prioritizes supplying power to the loads, and any excess energy is delivered to the grid. As shown in Figure

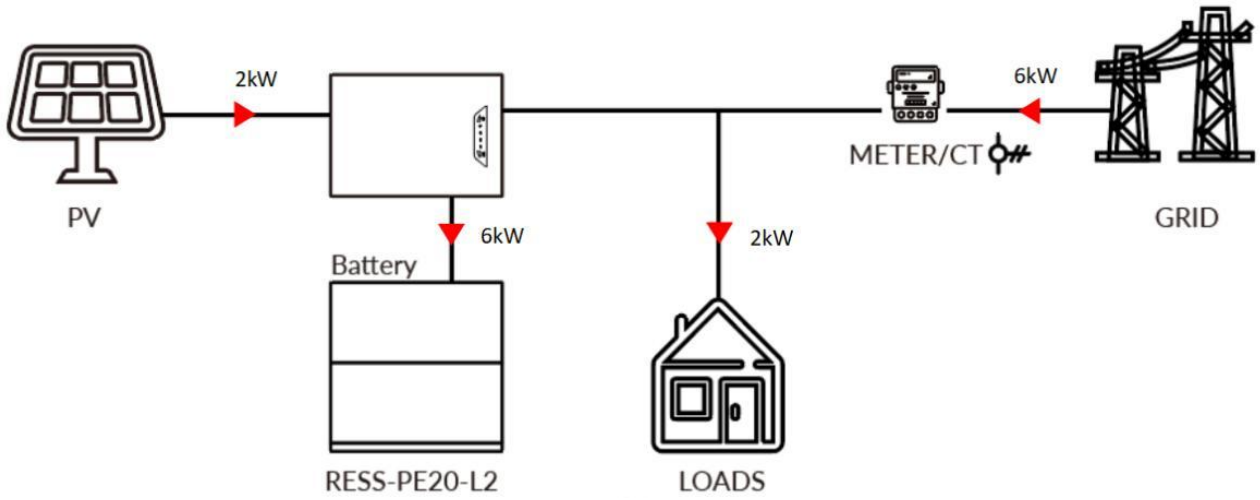


3.2.2.2 Charging time period: First meet the power demand of the load, then charge the battery. As shown in

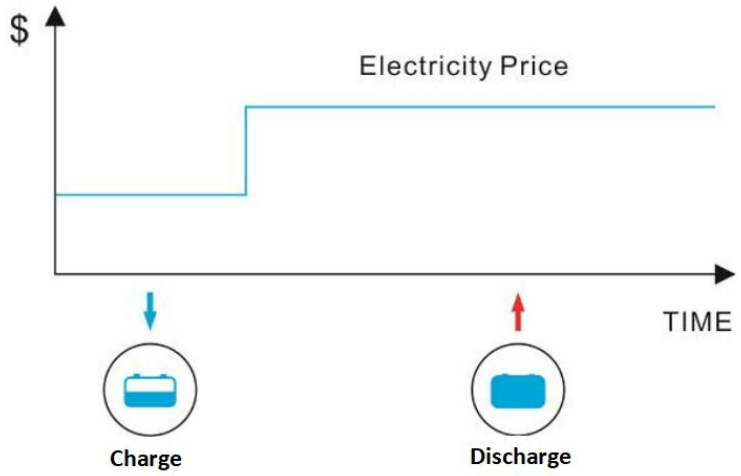


3.2.3 Battery Priority

In this mode, the load's power demand is met first, with any surplus energy used to charge the battery. As shown in Figure



Time-sharing control: Manually force the battery to charge/discharge during the peak and valley periods of the power grid, or set 5 charging/discharging periods within two days. When the mains power is between the peak and valley values, the load draws power from the grid, and PV energy is used exclusively for battery charging. Any surplus PV power is curtailed, and when the battery is fully charged, the excess PV power is also curtailed. Application scenarios: The price difference between peak and valley electricity is large. When the electricity price is cheap, buy electricity to charge battery, and when the electricity price is high, release the electricity and sell it to power grid to make a profit from the price difference.



4 System installation

4.1 Preparation before installation

4.1.1 Pre-installation inspection

Inspection of outer packaging

Before unpacking the product, check the outer packaging for visible damage, such as holes, cracks or other signs of possible internal damage, and check the model. If there is any packaging abnormality or product model discrepancy, do not unpack it and contact your distributor as soon as possible.

Inspection of deliverables

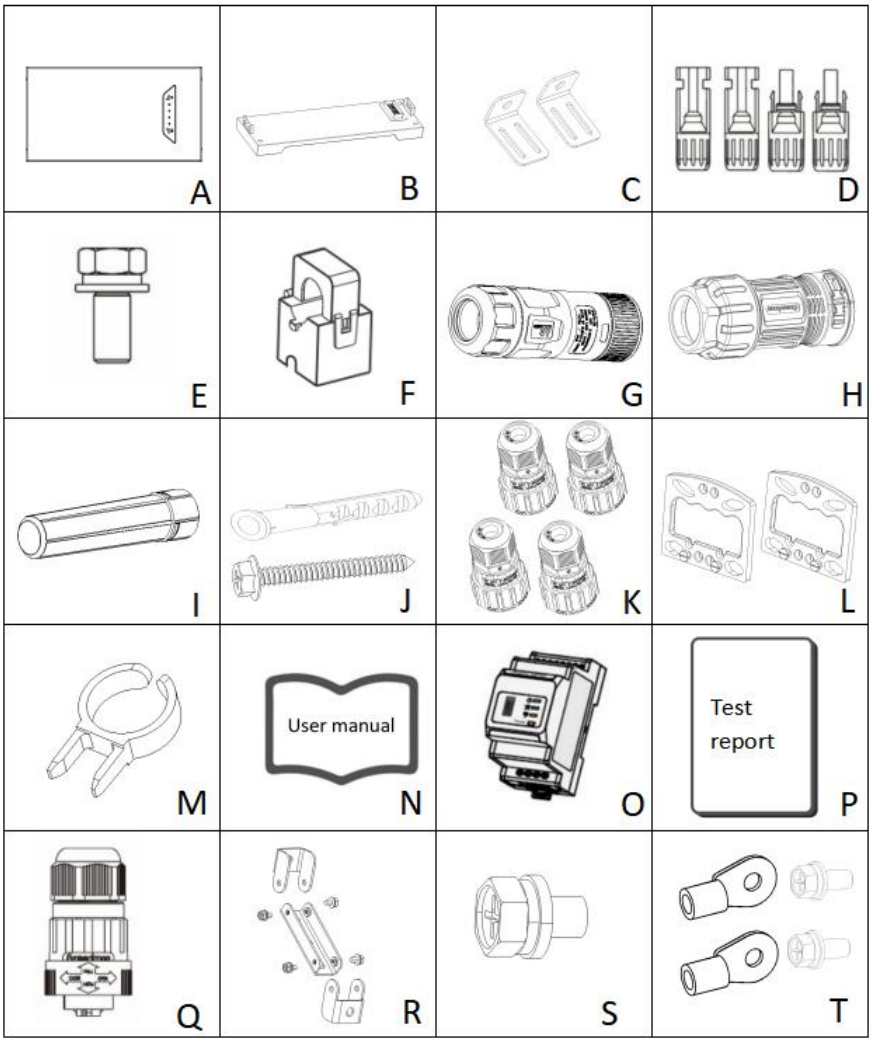
After unpacking the outer packaging of the product, please check whether the deliverables are complete and intact, and whether there is any obvious external damage. If any item is missing or damaged, please contact your dealer.

Note

Please refer to the *Packing List* in the packaging box for the number of deliveries attached with the box.

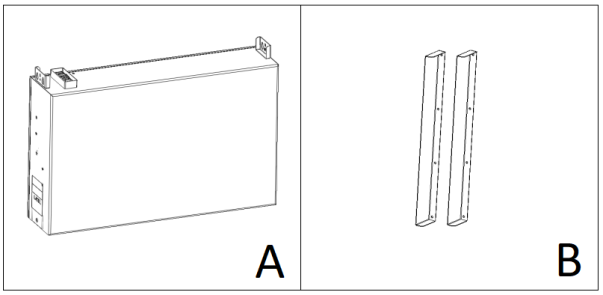
4.1.2 What's in the box?

Inverter box



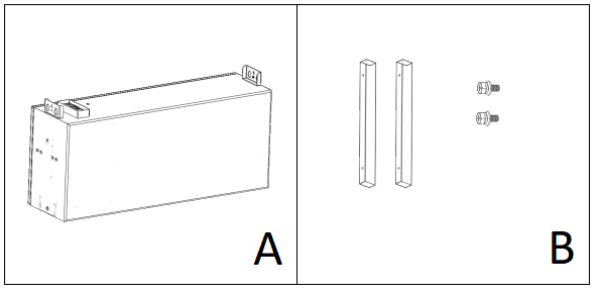
Item	Quantity	Description	Item	Quantity	Description
A	1	Inverter (packed and assembled with base)	B	1	Base (must be removed from inverter bottom immediately after unpacking)
C	2	Mounting bracket	D	2	PV terminals: 2x positive, 2x negative
E	10 sets	M4x12 Bolt	F	1	CT
G	1	AC EPS connector	H	1	AC grid connector
I	1	WIFI+BLE Stick	J	1 set	7 screws, 7 rubber sleeves (base and wall bracket)
K	4	RJ45 Connector	L	2	Handle
M	1	PV connector tool	N	1	User manual, Warranty card, Certificate of quality card
O	1	CHNT DTSU666 or YADA YDS60-C24 Smart Power Meter (optional)	P	1	Test report
Q	1	CT Connector	R	1 set	Brackets to secure the battery
S	1	M6x10 screw	T	2	OT terminals and M5x12 screws

6.6kwh Battery Pack box



Item	Quantity
A Battery Pack	1 unit
B Accessory kit	2 PCS

5kwh Battery Pack box



Item	Quantity
A Battery Pack	1 unit
B Accessory kit	2 PCS

4.1.3 Selection of mounting position

Basic requirements

- When the product is running, the temperature of the cabinet and cooling fin will be relatively high. Do not install it in a position that is easy to touch.
- Do not install in areas where flammable and explosive materials are stored.
- The product will be corroded and may cause fire when installed in the salt damage area. Do not install it outdoors in the salt damage area. Salt damage area refers to the area within 500 m from the coast or affected by the sea breeze. The area affected by the sea breeze varies according to meteorological conditions (such as typhoons and seasonal winds) or terrain (with dams or hills).

Do not install in a location that is accessible to children.

Requirements for installation angle

The product supports ground installation. Requirements for installation angle:

- Do not install the product in a forward, horizontal, inverted, backward or sideways position.

Requirements for wall and floor installation

- Cement walls and brick walls are recommended, and it is forbidden to use them on sandwich panels and wooden walls.
- The ground bearing capacity shall be more than 500 kg/m2.

Requirements for installation space

When installing the product, a certain space shall be reserved around to ensure sufficient installation and heat dissipation space.

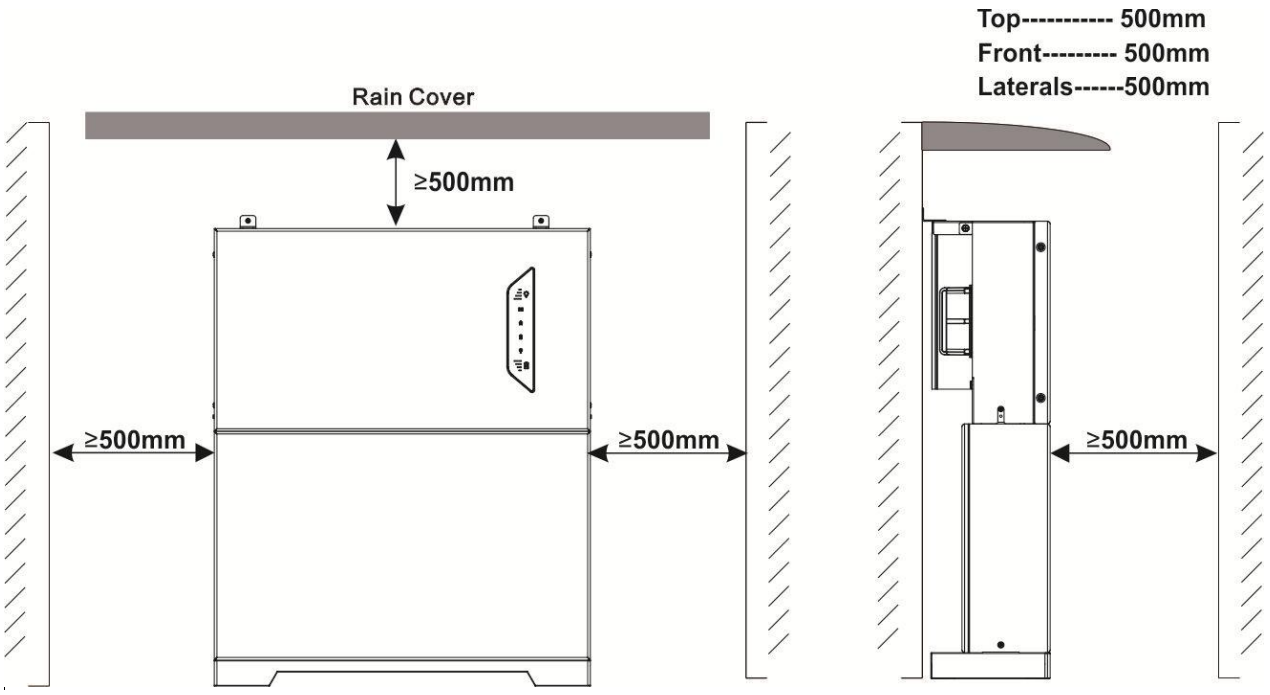


Figure 4-1 Single operation installation space

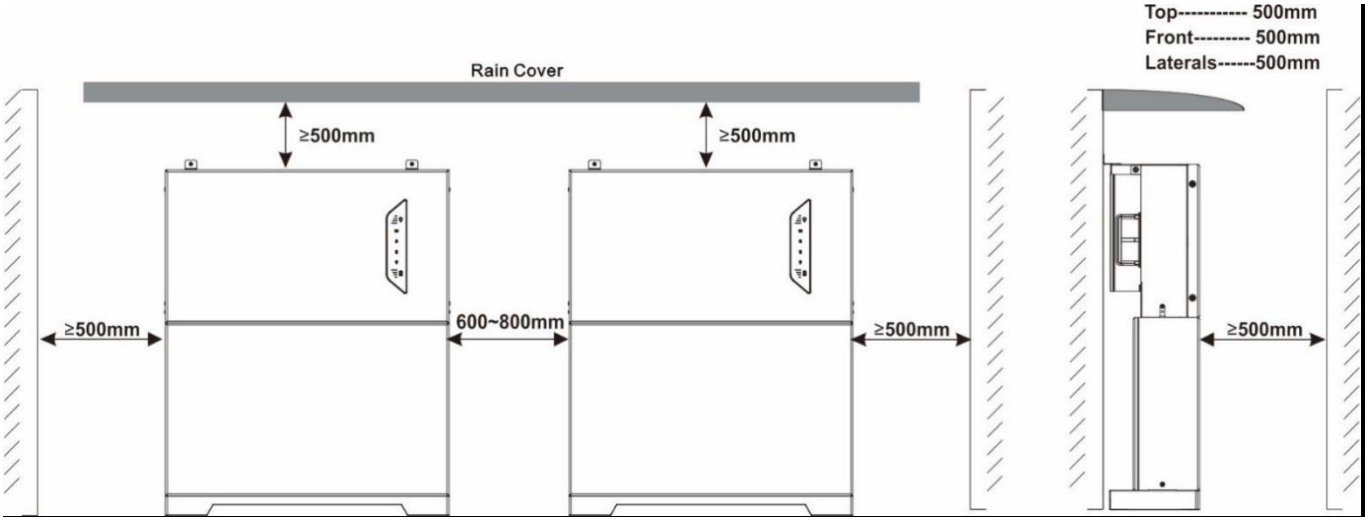


Figure 4-2 Single or parallel operation installation space

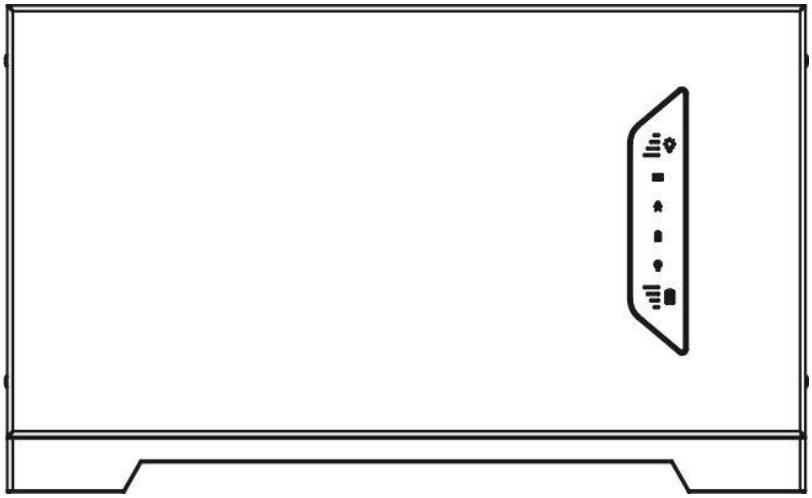
Scan the QR code below to watch the installation video

Installation Tool Requirements

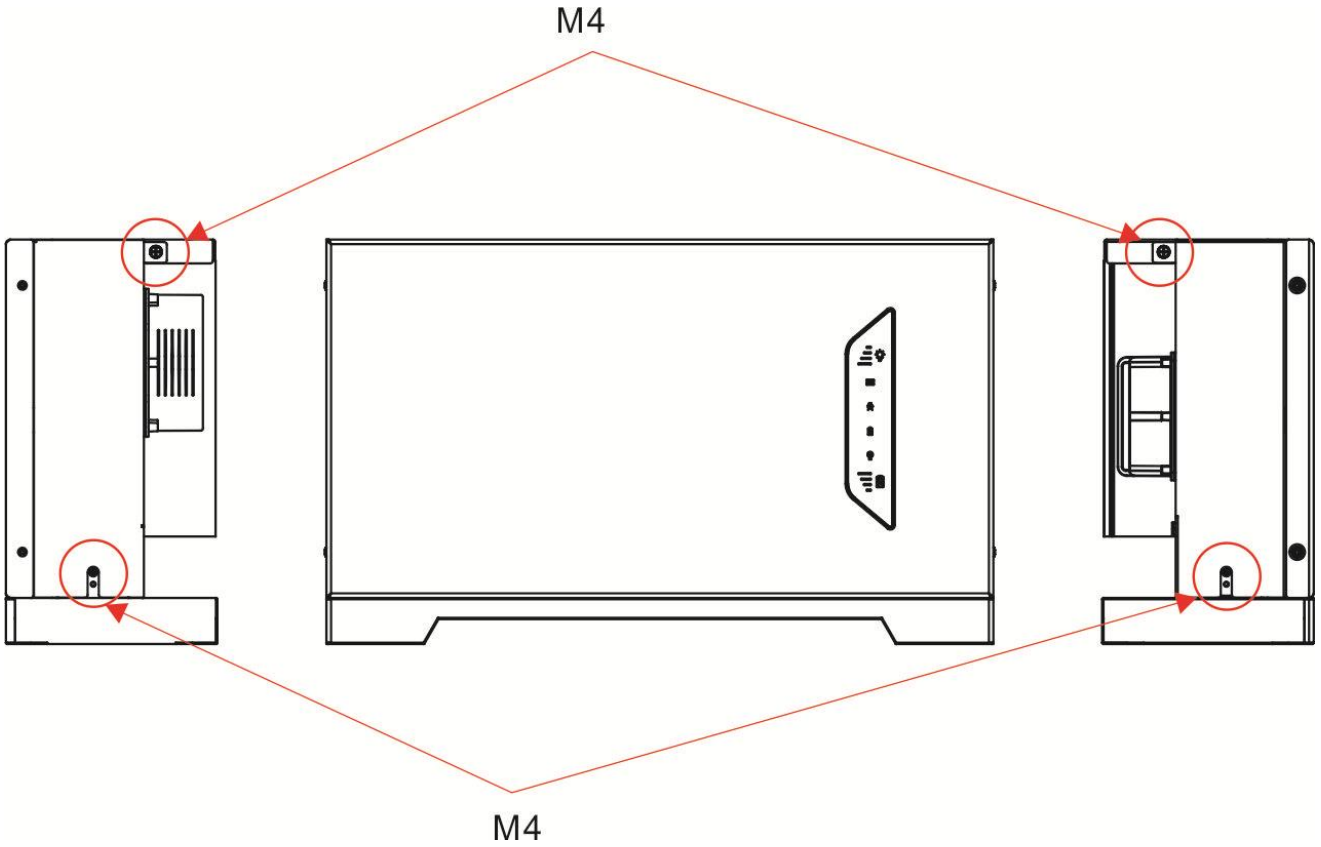
The following tools are recommended when installing the equipment. Use other auxiliary tools on site if necessary

4.2 System installation

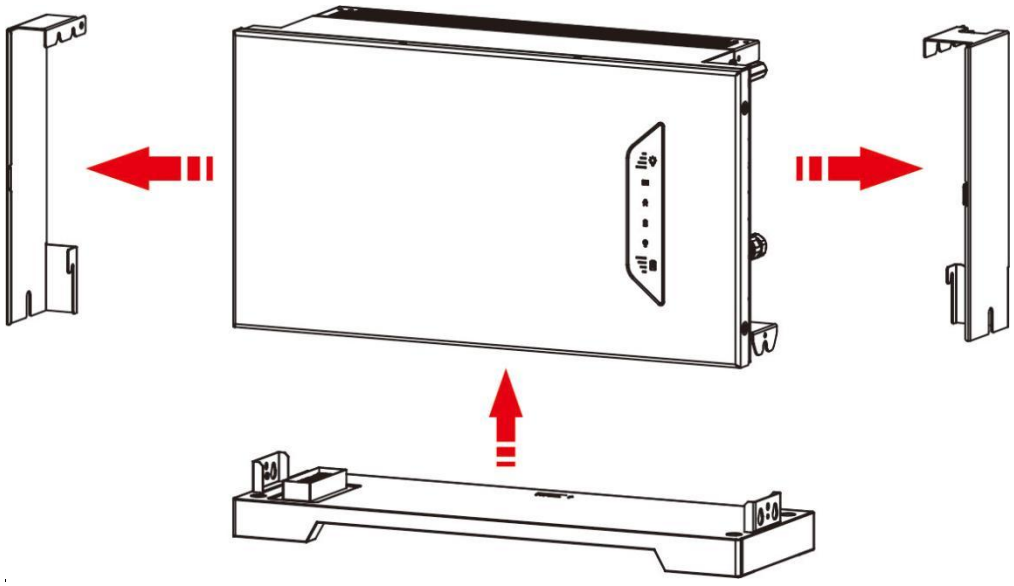
Step 1: Take out the inverter;



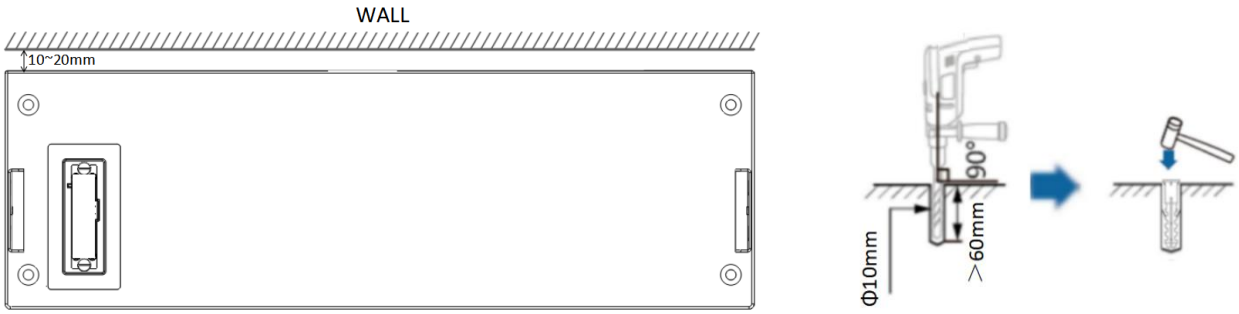
Step 2: Remove the upper and lower fixing screws on both sides (torque: 2 N.m). Note: The upper 2 screws can be tightened by hand;



Step 3: Remove the trim panels on both sides and the pedestal;



Step 4: Install the battery pedestal as shown in the figure;



4-1: Keep a mounting distance of 10~20 mm between the pedestal and the wall.

4-2: Mark the fixing hole position of the pedestal.

4-3: Then use a 10 mm drill bit to drill the holes.

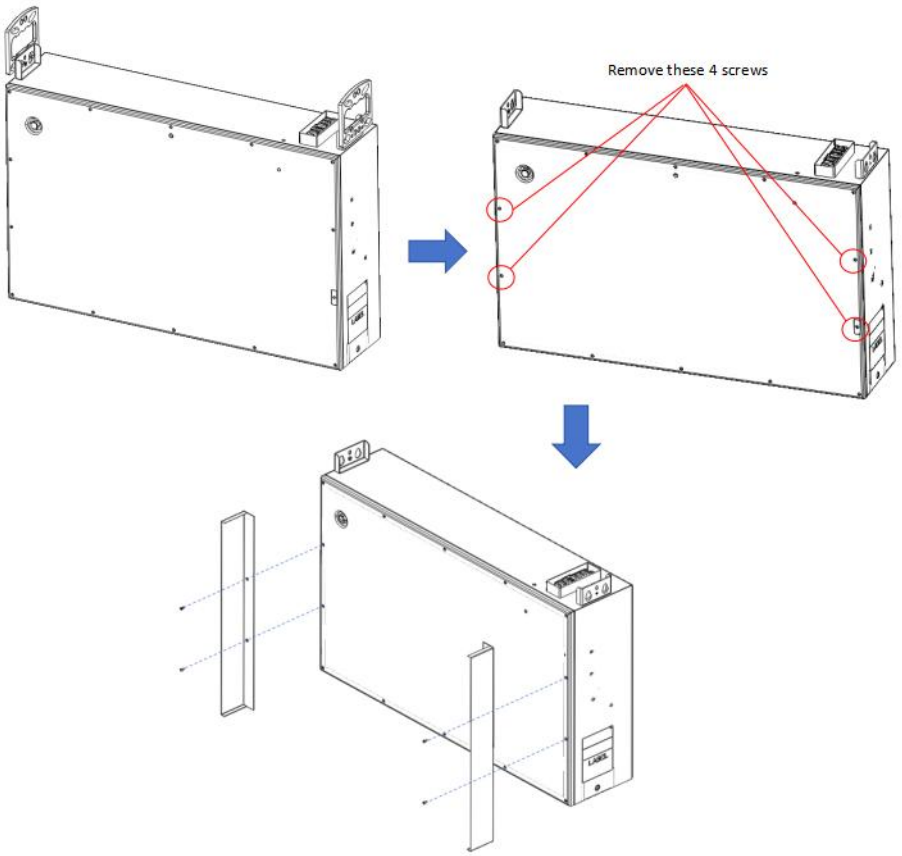
4-4: Drilling depth > 60 mm.

4-5: Place the rubber plug in the hole.

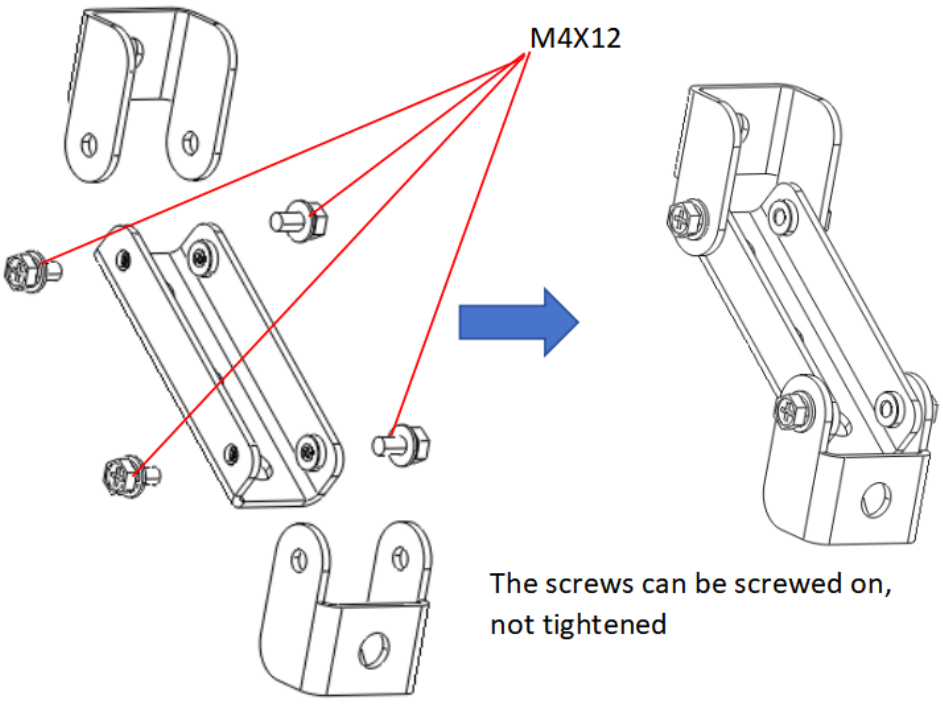
4-6: Use PA6*60 screws to lock the pedestal, with a torque of 3.0 N·m.

The installation steps for the 6.6kWh battery pack are as follows:

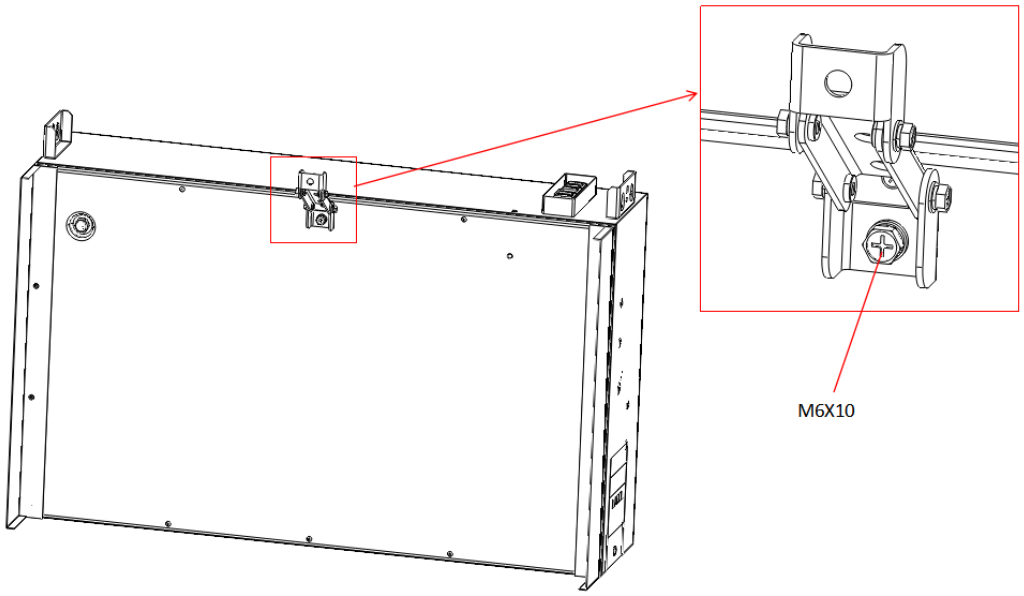
Step 5: Remove the screws of the battery first, and then install the side trim cover, the screw torque is 2N.m (Note: the trim cover is inside the battery compartment fitting). The details are as follows:



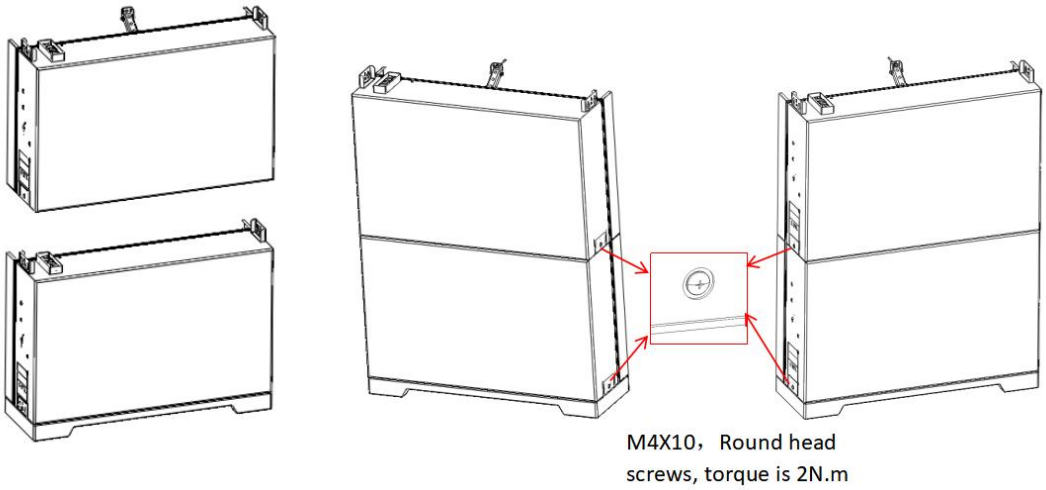
If the number of battery packs exceeds 2, add the following steps before installing the second battery pack:



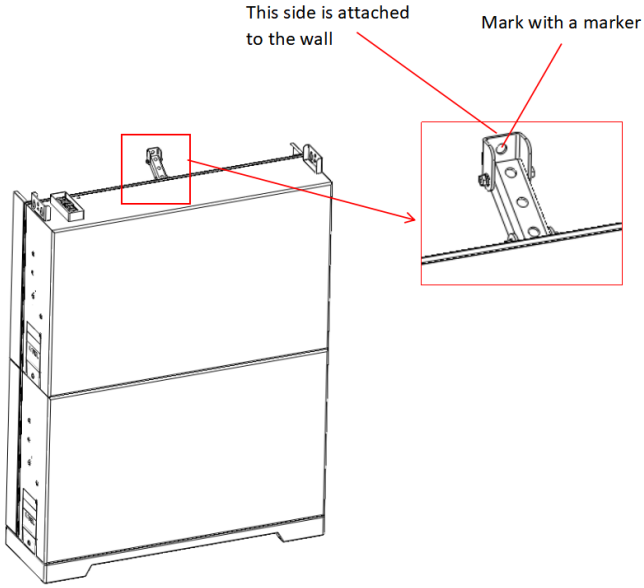
Attach the installed bracket to the battery pack with M6x10 screws, and the torque is 6N.m



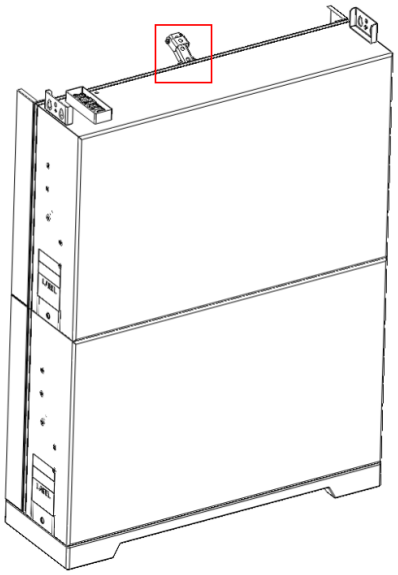
5-1: Install the two battery packs and tighten the screws



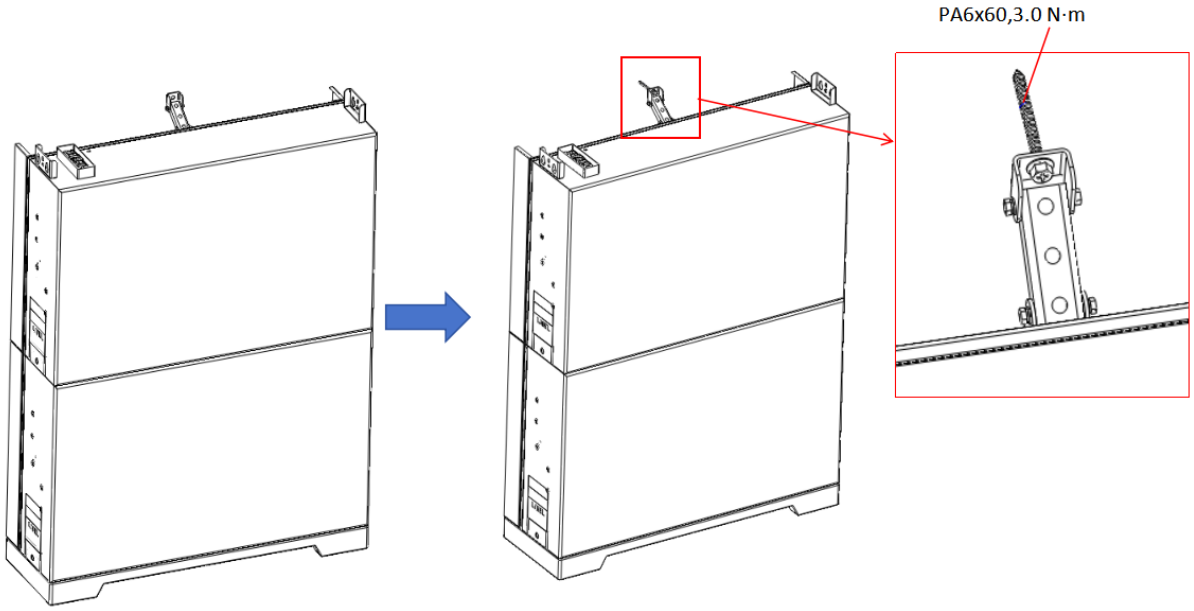
5-2: Place the back of the bracket against the wall, then mark it with a marker



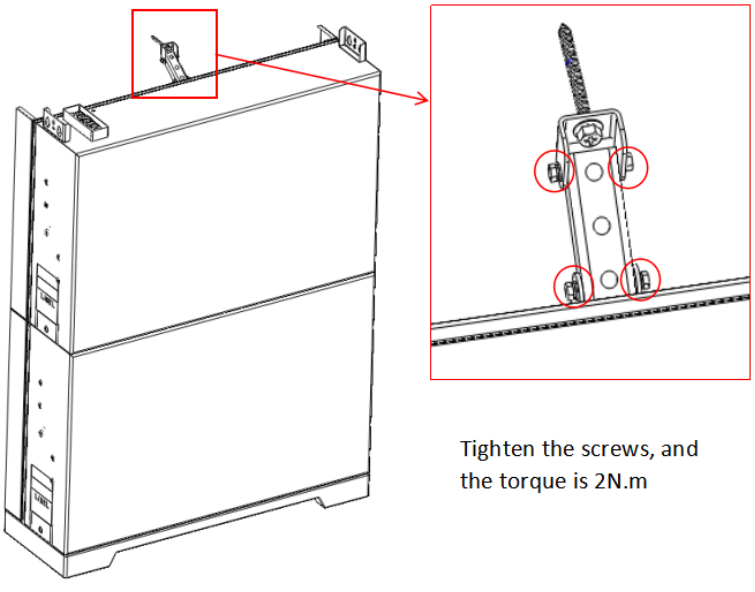
5-3: Rotate to avoid affecting the punch



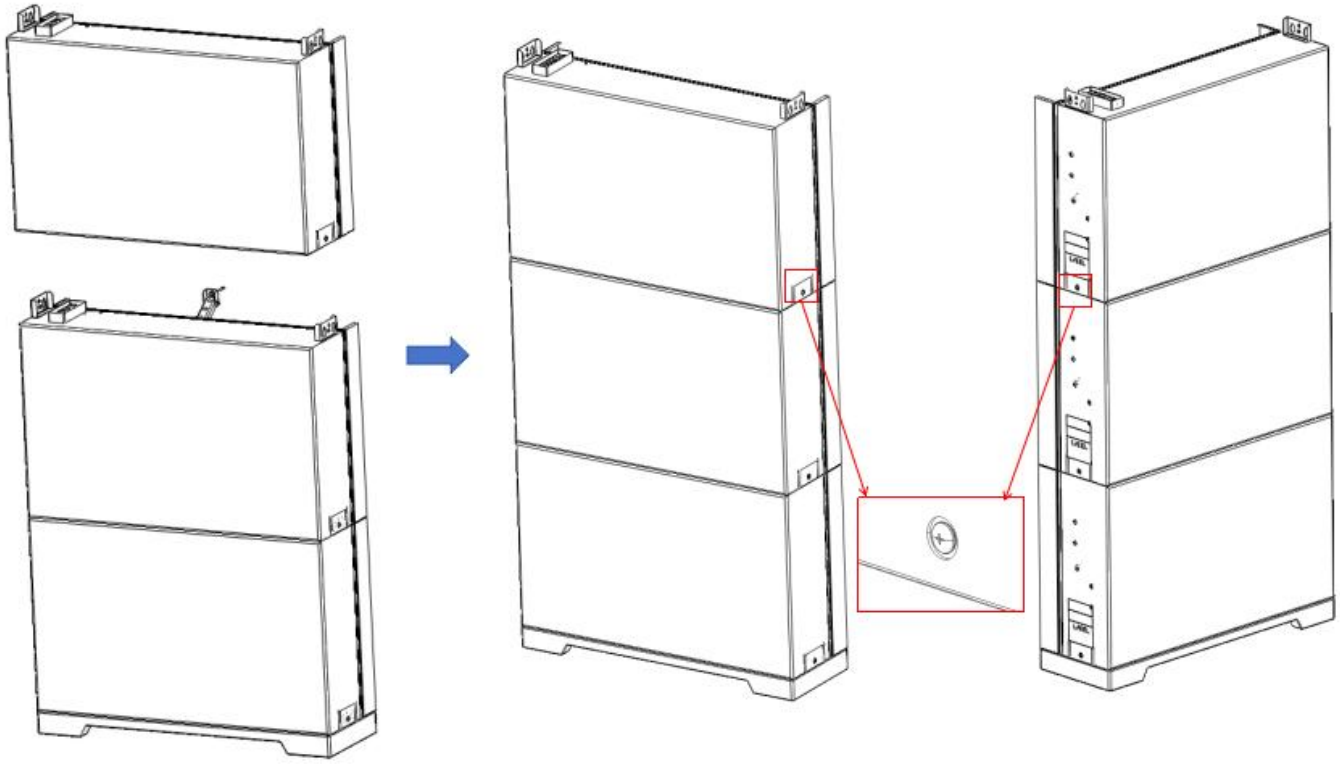
5-4: Refer to step 4 for punching, then attach the bracket to the wall, fix the bracket with PA6x60 screws, and the torque is 3N.m



5-5: Tighten the screws, and the torque is 2N.m

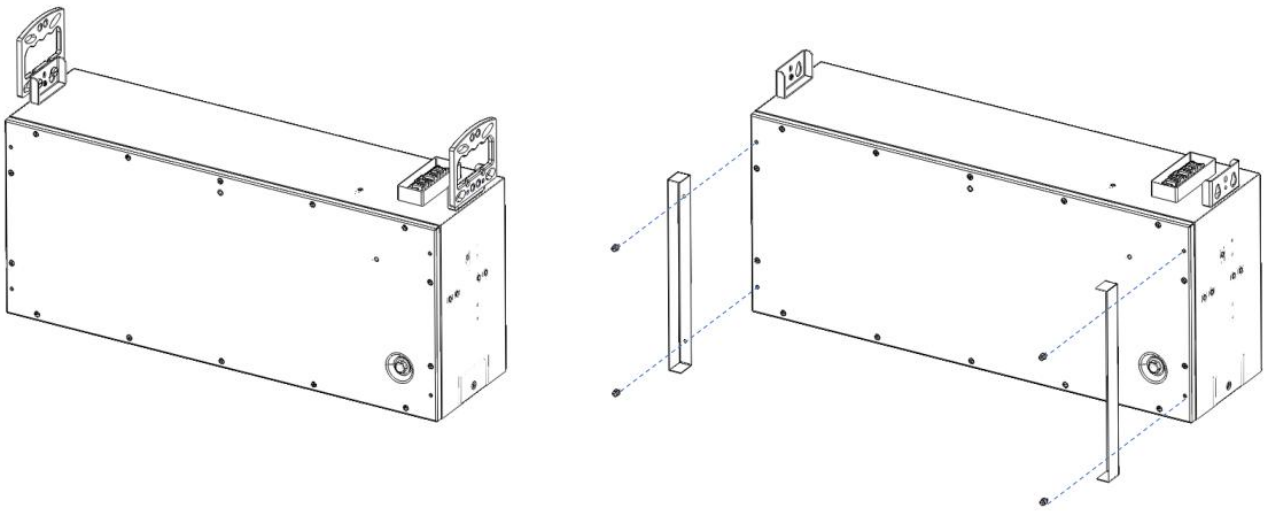


5-6: Lock with M4*10 Round head screws, with a tightening torque of 2.0 N·m.

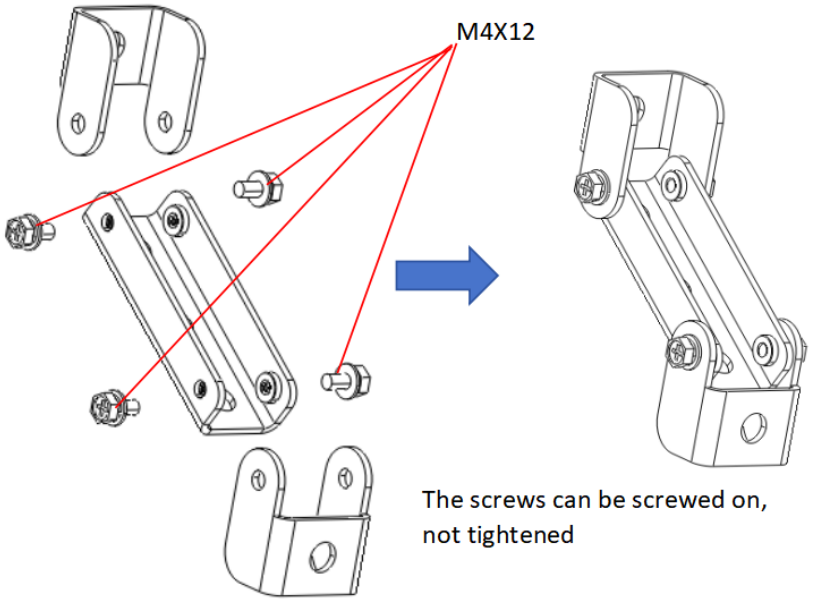


The installation steps for the 5kWh battery pack are as follows:

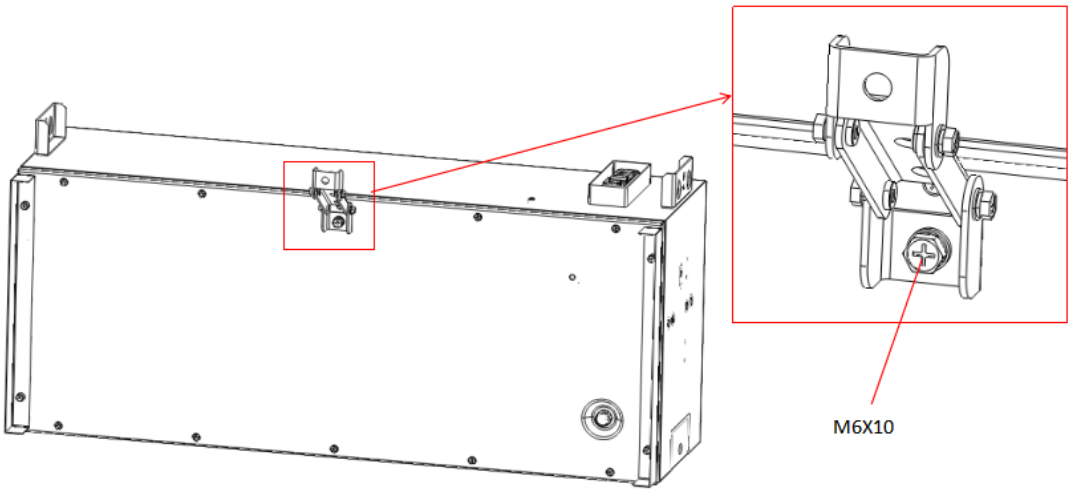
Step 5: Install the side trim cover first, screw torque 2N.m(Note: The trim cover and screws are inside the accessories of the battery box). Then install the battery as shown in the diagram below;



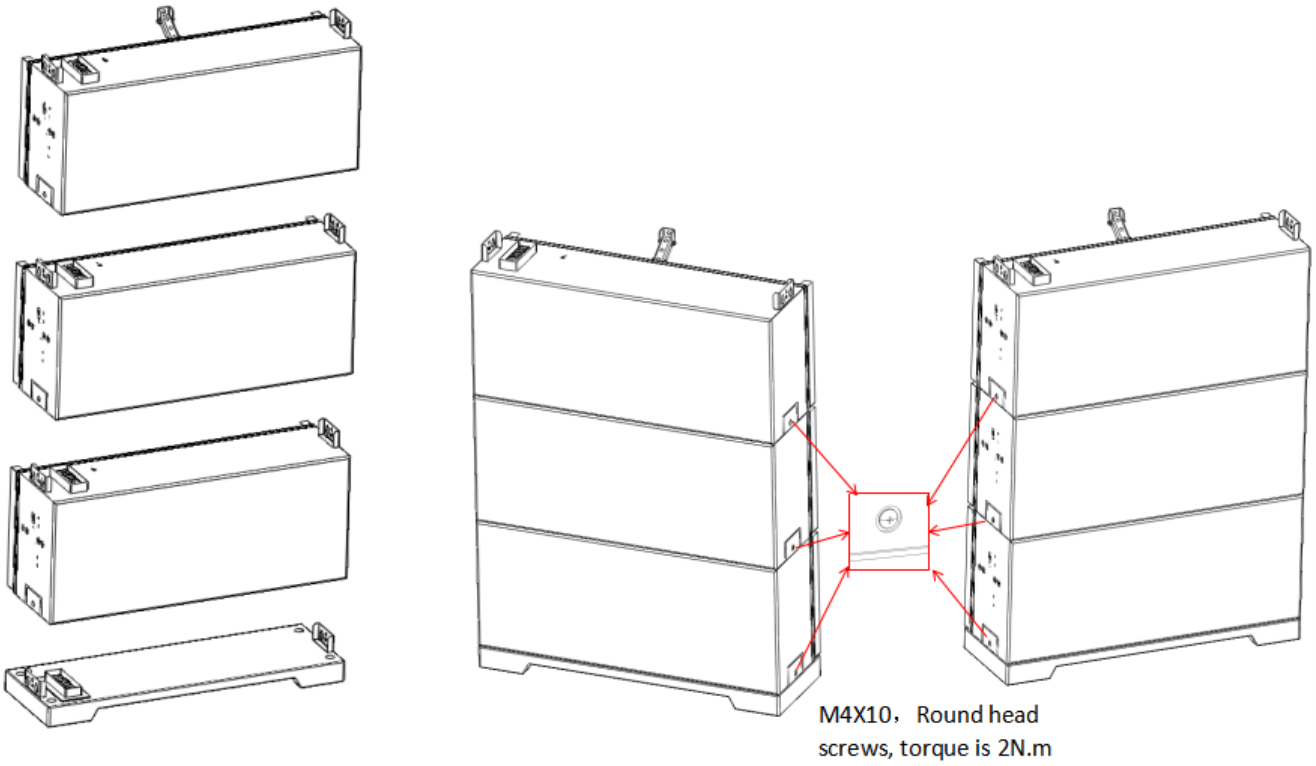
If the number of battery packs exceeds 3, add the following steps before installing the second battery pack:



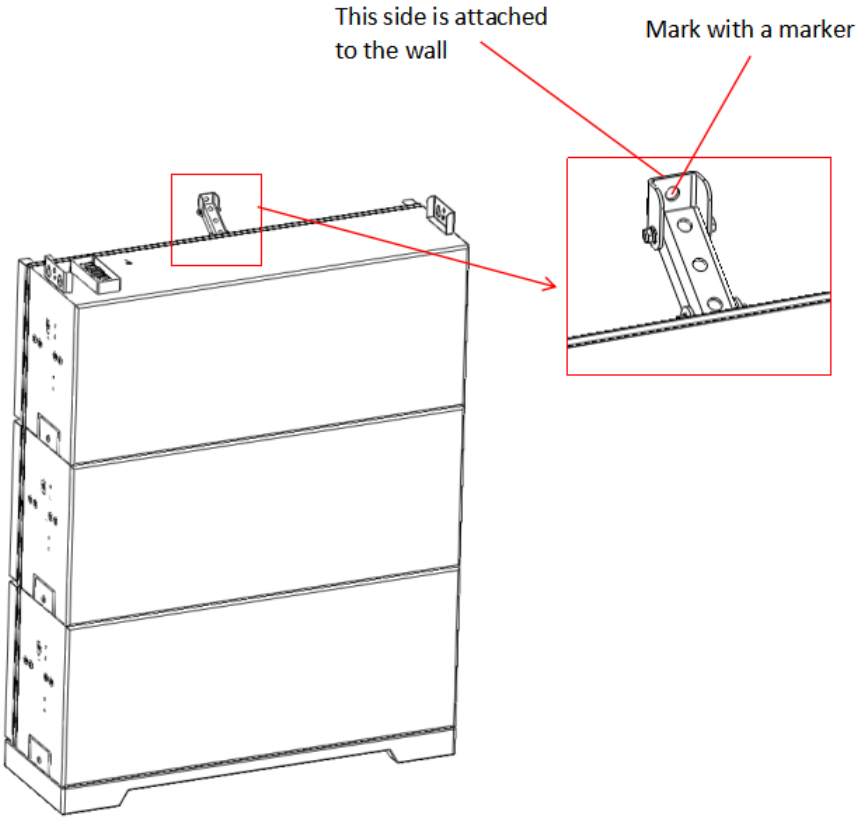
Attach the installed bracket to the battery pack with M6x10 screws, and the torque is 6N.m



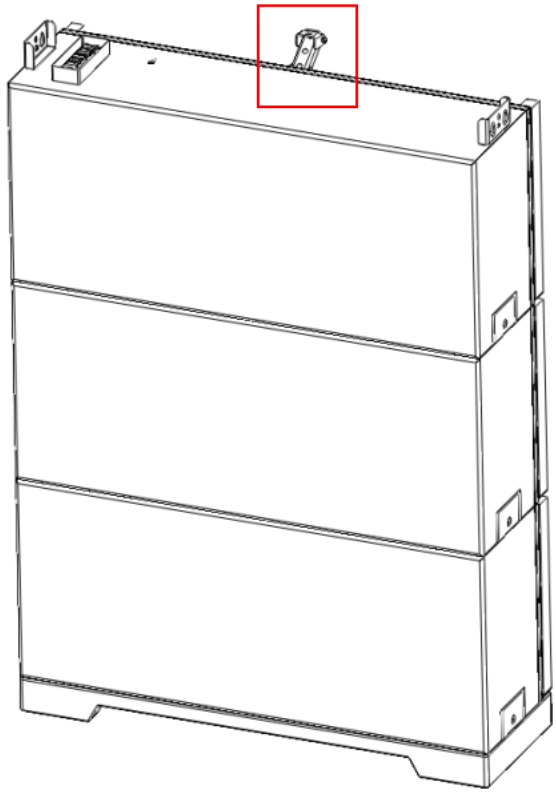
5-1: Install the three battery packs and tighten the screws



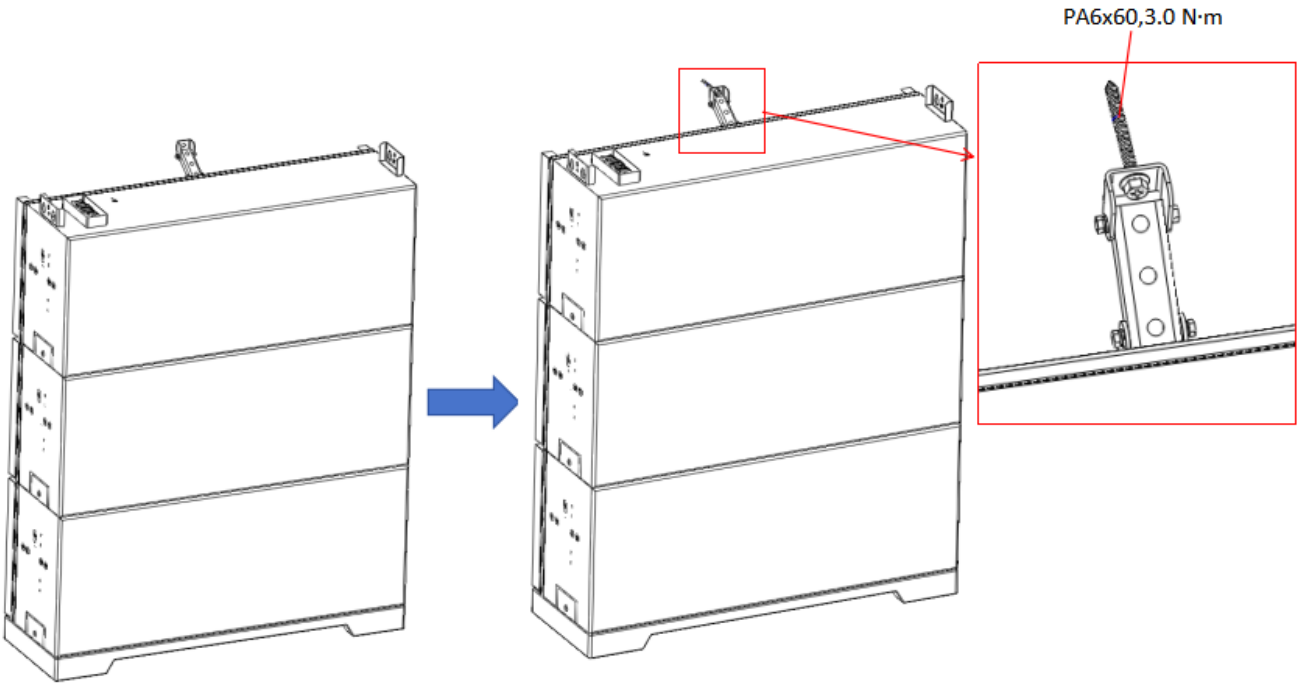
5-2: Place the back of the bracket against the wall, Then mark it with a marker



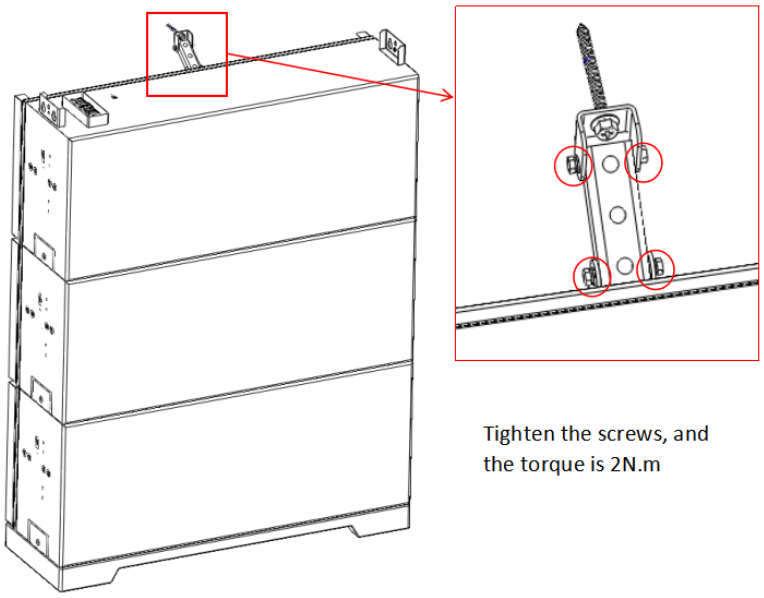
5-3: Rotate to avoid affecting the punch



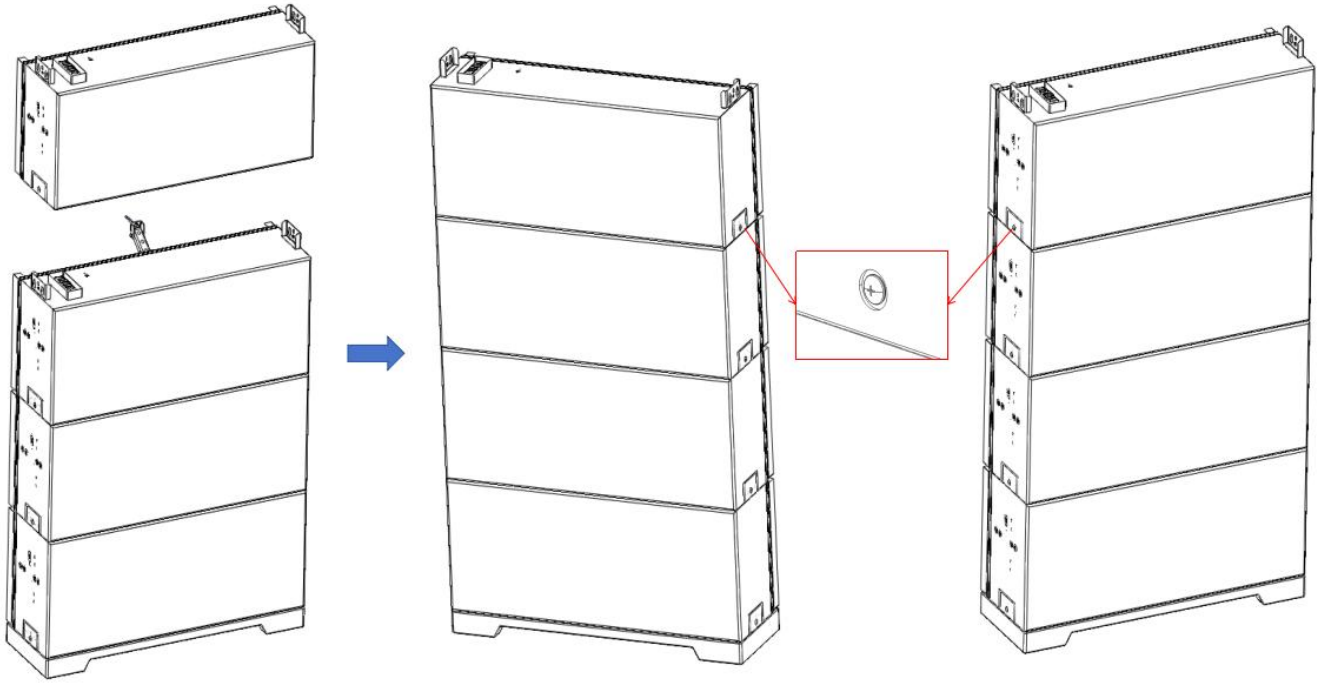
5-4: Refer to step 4 for punching, then attach the bracket to the wall, fix the bracket with PA6x60 screws, and the torque is 3N.m



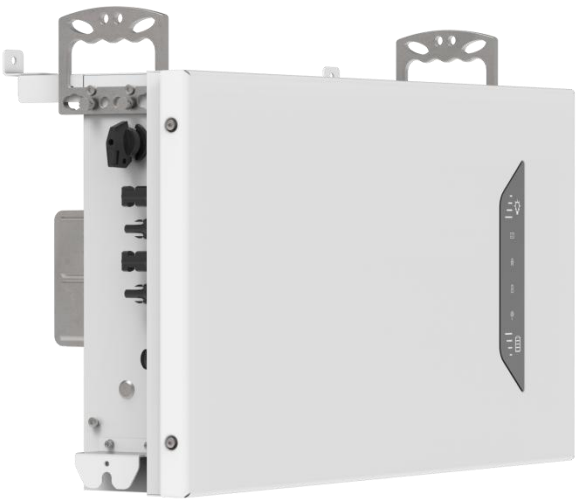
5-5: Tighten the screws, and the torque is 2N.m



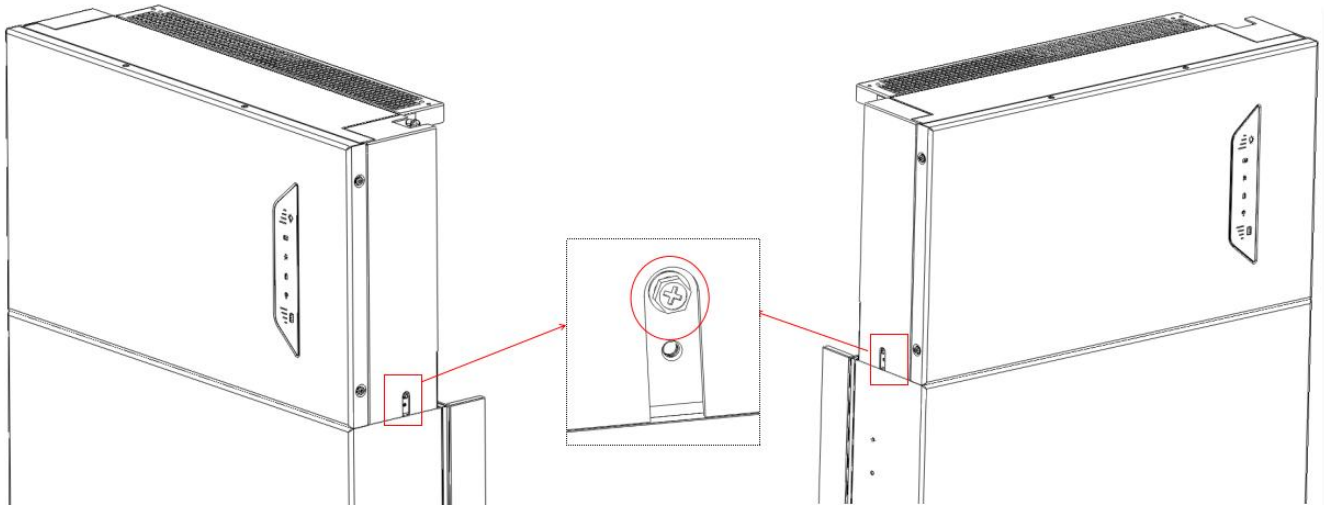
5-6: Lock with M4*10 Round head screws, with a tightening torque of 2.0 N·m.



Step 6: Install the inverter.



6-1: An example of removing the inverter is shown in the figure above (the handle is in the accessory package of the inverter).



6-2: Stack the inverter on the battery pack and lock it with M4*10 screws (locked in the upper screw holes), with a tightening torque of 2.0 N·m.

Step 7: Install the locking wall bracket.

7-1. Pre-install the wall bracket on the inverter (note: the screws can be unscrewed, no need to tighten);

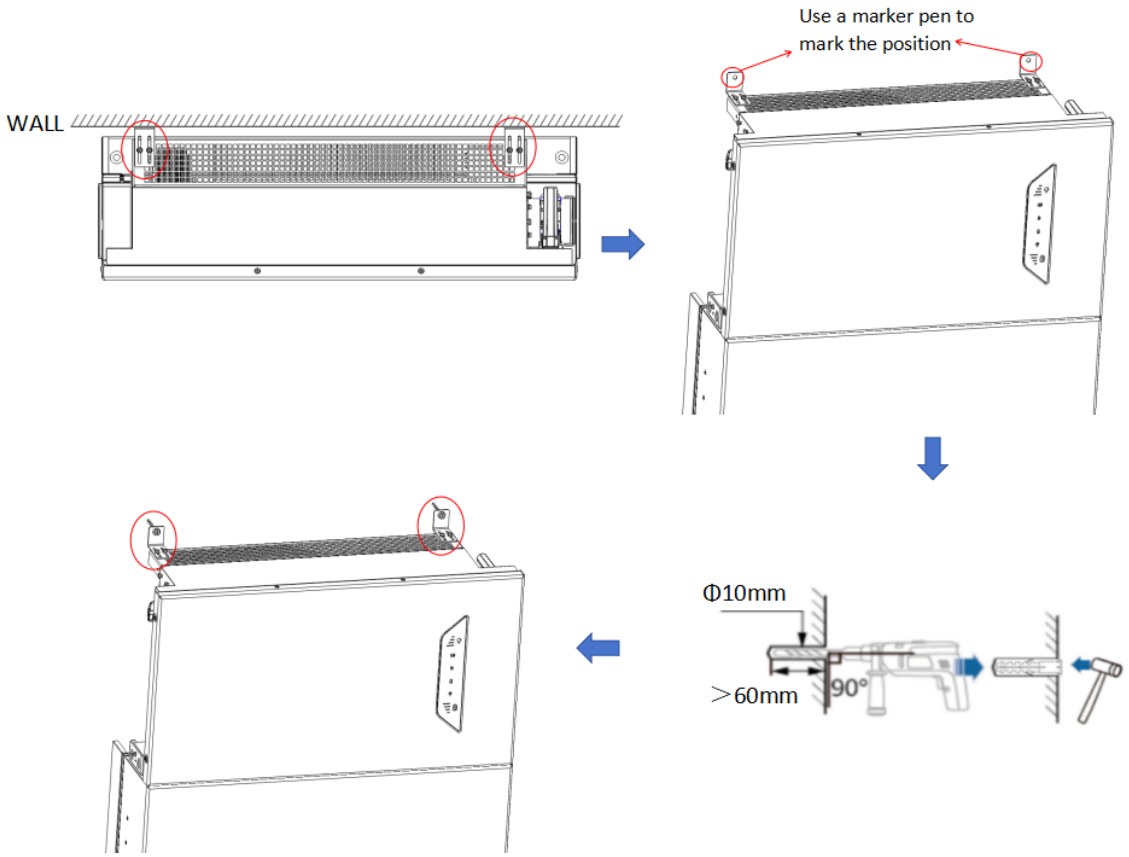
7-2. Attach the wall bracket to the wall;

7-3. Mark with a marker in the position shown;

7-4. Remove the wall bracket and screws, punch holes in the marked position, the hole diameter is Φ10mm, the hole depth is >60mm, and then plug in the rubber stopper;

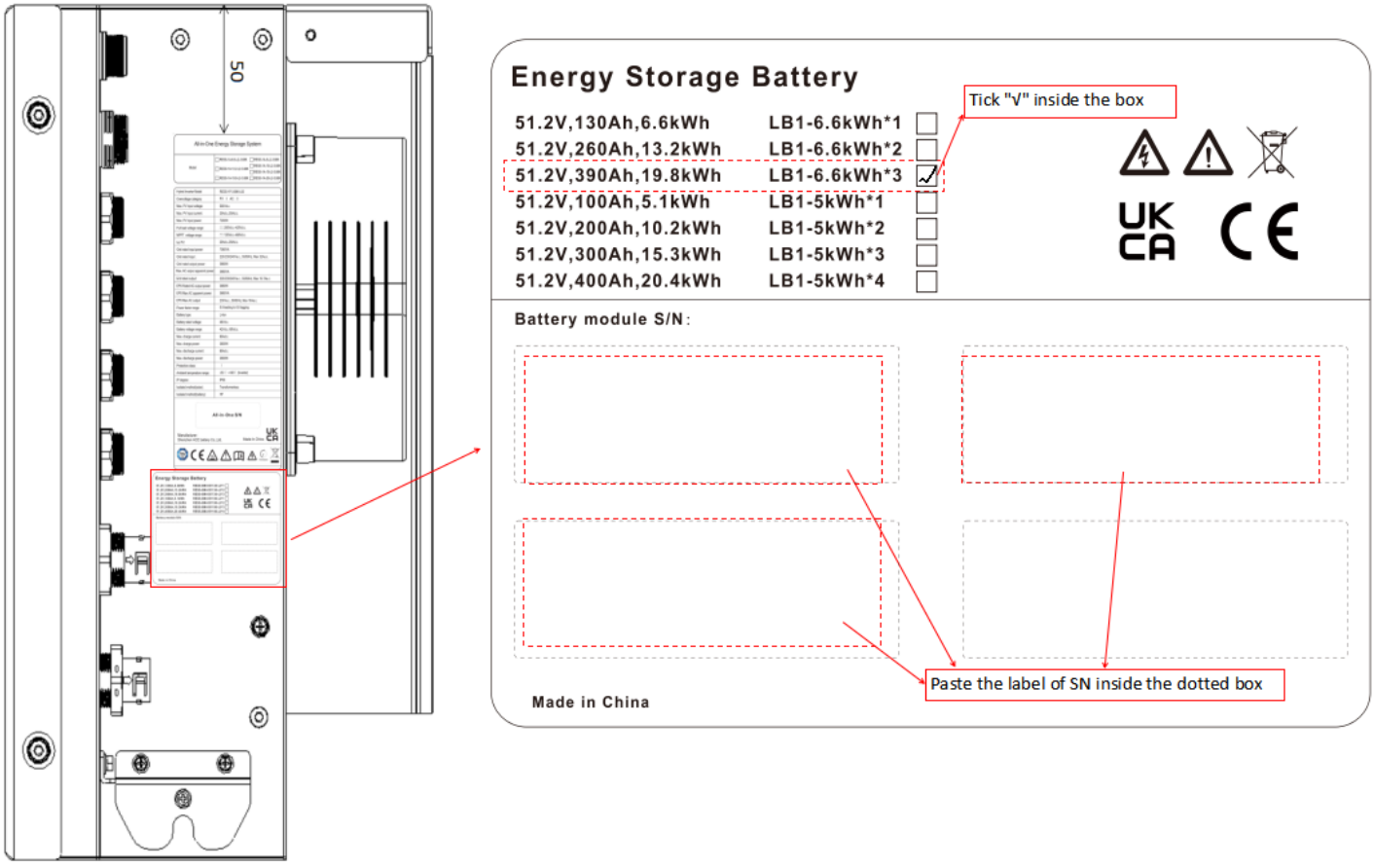
7-5. First, use M4*12 screws to pre-install the wall bracket on the inverter, and then use PA6*60 screws to fix the bracket on the wall, and the fixing torque is 3.0 N • m;

7-6. Finally, tighten the screws (M4*12) with a torque of 2.0 N • m.



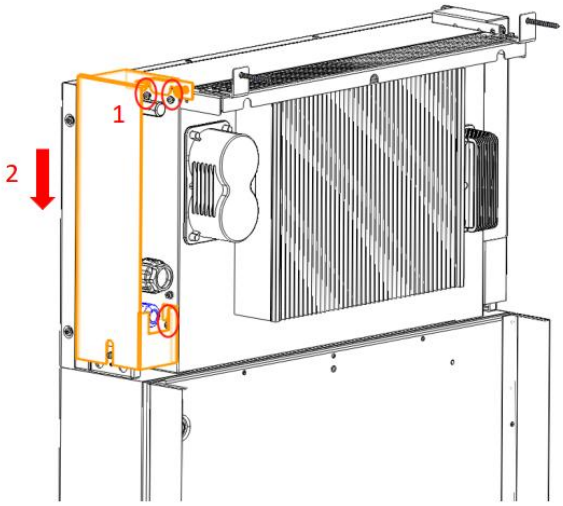
Step 8: refer to chapter 6 for harness installation

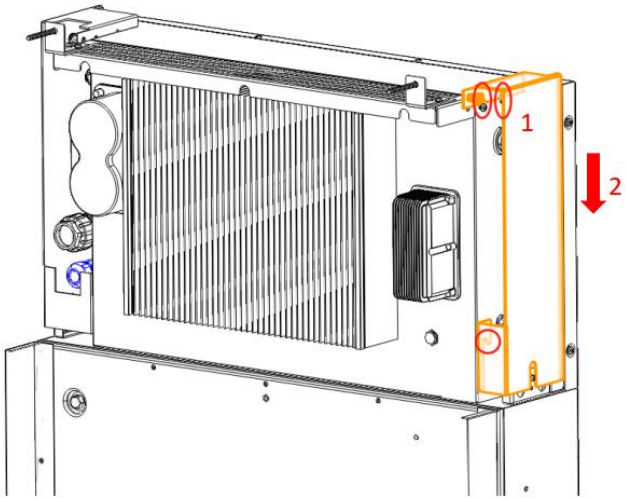
Step 9: Tick "√" inside the box and paste the battery's SN code label inside the dotted box. The following example is a system with three 6.6kWh battery packs installed.



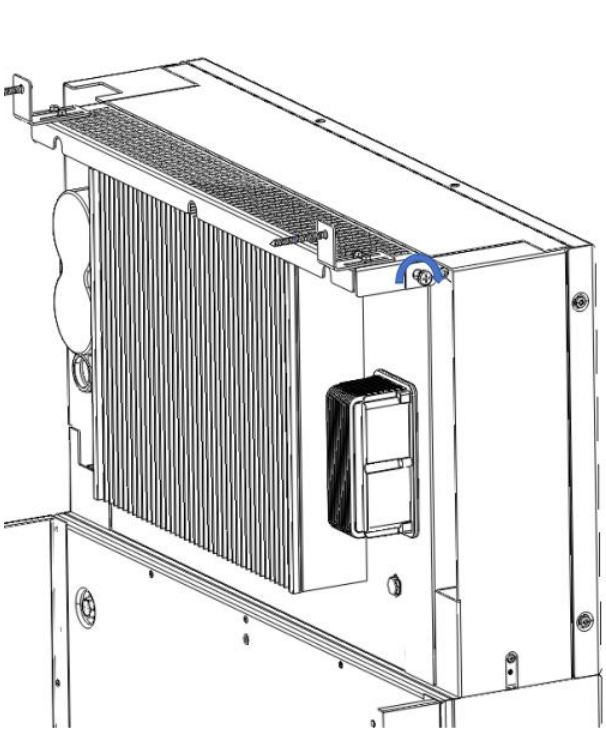
Step 10: Install the side cover

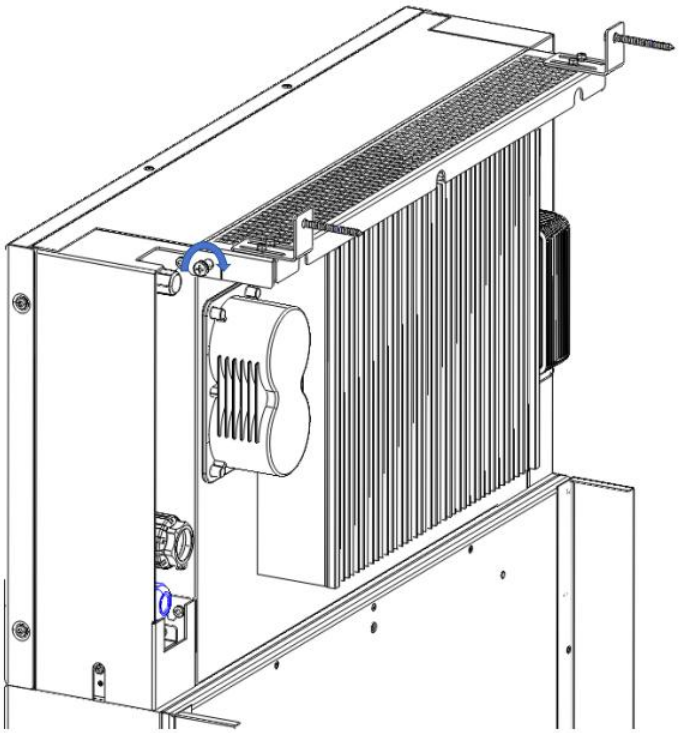
10-1: Align the notch on the side cover with the step screws on the inverter first, then push the side cover down to make sure the notch snaps into the screws





10-2: Install the side covers on both sides of the inverter and tighten the screws by hand.





5 Preparation of cables and electrical diagrams

5.1 Preparation of cables

Caution

- Considering the influence of electrochemical corrosion of copper and aluminum, it is strictly forbidden to use aluminum cable.
- The power cable shall have a temperature resistance of at least 90°C.

Note

- The selection of the minimum diameter of the cable shall comply with the local cable standards.
- The factors that affect the selection of cables include: rated current, cable type, laying method, ambient temperature and maximum expected line loss.

Caution

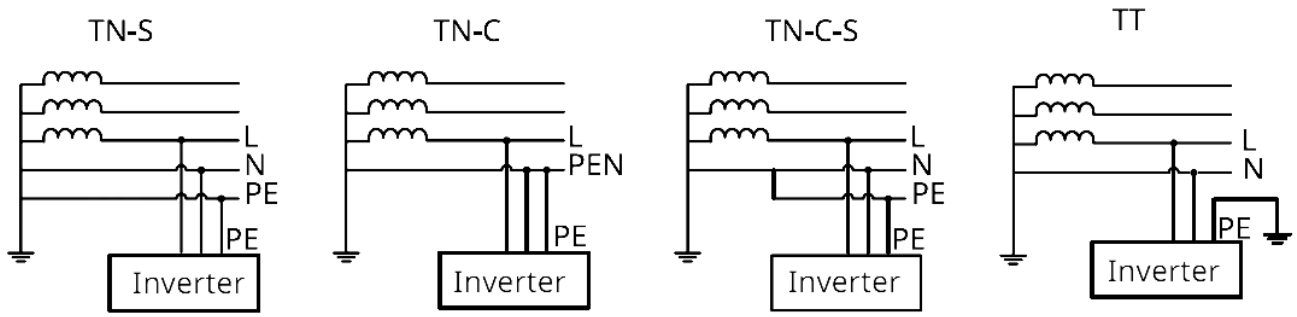
In parallel operation scenario, additional RJ45 2.6 m parallel operation communication line needs to be purchased from our company.

Table 6-1 Cable in single operation scenario

S/N	One end of cable	Other end of cable	Cable type	Recommended specification
1	Solar input Interface	DC switch (customer side)	Industry common outdoor PV cable	● Cross-sectional area of conductor: 2.5 mm2 ~ 4 mm2 ● Cable outer diameter: 5.5 mm ~ 8 mm
2	AC output interface	Distribution box (customer side)	Outdoor multi-strand copper three-core cable (L/N/PE)	● Cross-sectional area of conductor: 4 mm2 ~ 6 mm2 ● Cable outer diameter: 10 mm-13 mm
3	Grounding point	Site grounding bar (customer side)	Outdoor copper single-core cable	Cross-sectional area of conductor: 4 mm2 ~ 6 mm2 (consistent with the diameter of AC input line)

5.2 Applicable power grid type

For power grid structure with N-type cable, the effective value of the voltage across the N and PE cables must be less than 10 V.



5.3 Electrical wiring diagram

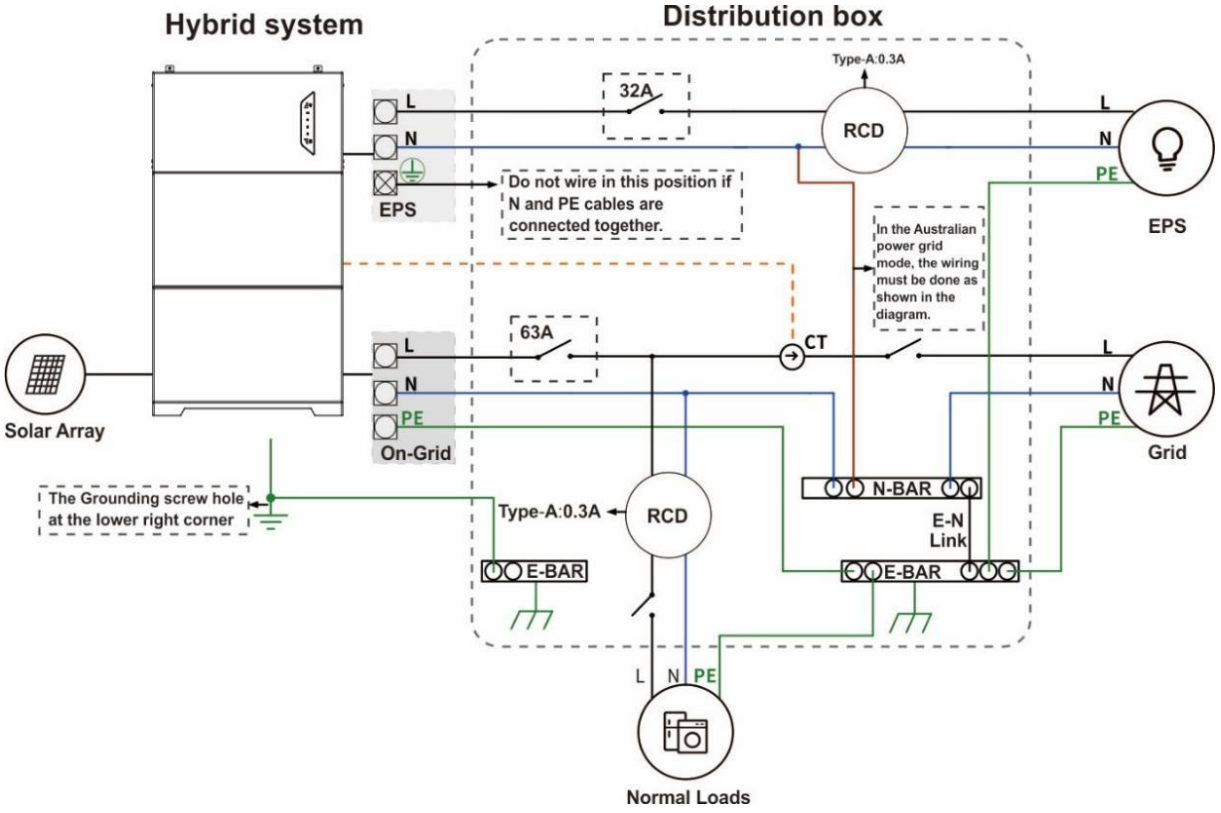
5.3.1 Connection of N and PE cables inside inverter

Caution

If the back-up N and PE cables of the inverter have been internally connected, do not connect the distribution box to the back-up PE cable.

Under the Australia power grid standards, the N line of ON-GRID must be short-circuited to the back-up N line in the external power distribution cabinet.

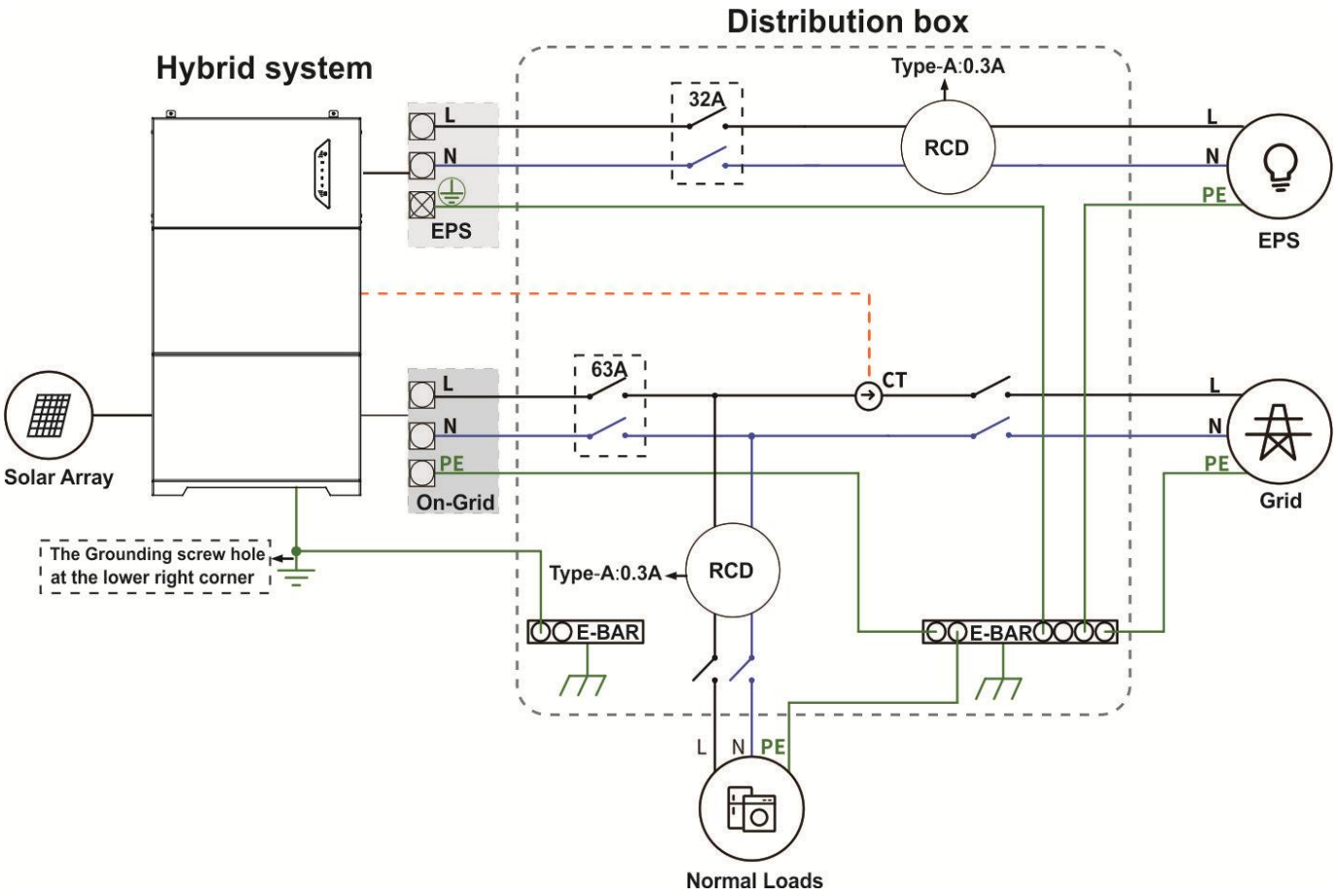
The wiring method shown in the figure below is only applicable to Australia, New Zealand, South Africa and other regions.



5.3.2 The internal N and PE cables of the inverter are independently connected

Caution
Please ensure that the back-up is grounded correctly and firmly, otherwise the back-up function may be abnormal when the power grid fails.

The following wiring methods are applicable except for Australia, New Zealand, South Africa and other regions.



6 Electrical connection

Precautions

Danger

- The electrical connection shall comply with the installation regulations of the country/region where the equipment is located.
- Before the electrical connection, make sure that the "DC SWITCH" of the product and all switches connected to the product are in the "OFF" state, otherwise the high voltage of the product may cause electric shock hazard.
- During the installation of the cable, it is strictly forbidden to touch the manual start/stop switch.

Warning

- The equipment damage caused by incorrect wiring is not covered by the equipment warranty.
- The relevant operations of the electrical connection must be carried out by professional electrical technicians.
- During the electrical connection, the operator must wear personal protective equipment.

Note

- The cable colors in all electrical connection diagrams in this chapter are for reference only. The selection of cables shall comply with local cable standards. (yellow-green cables can only be used for protective earthing).

6.1 Install the earth cable

Precautions

Danger
Please confirm that the PE cable is reliably connected. If it is not connected or loose, it may cause electric shock hazard.

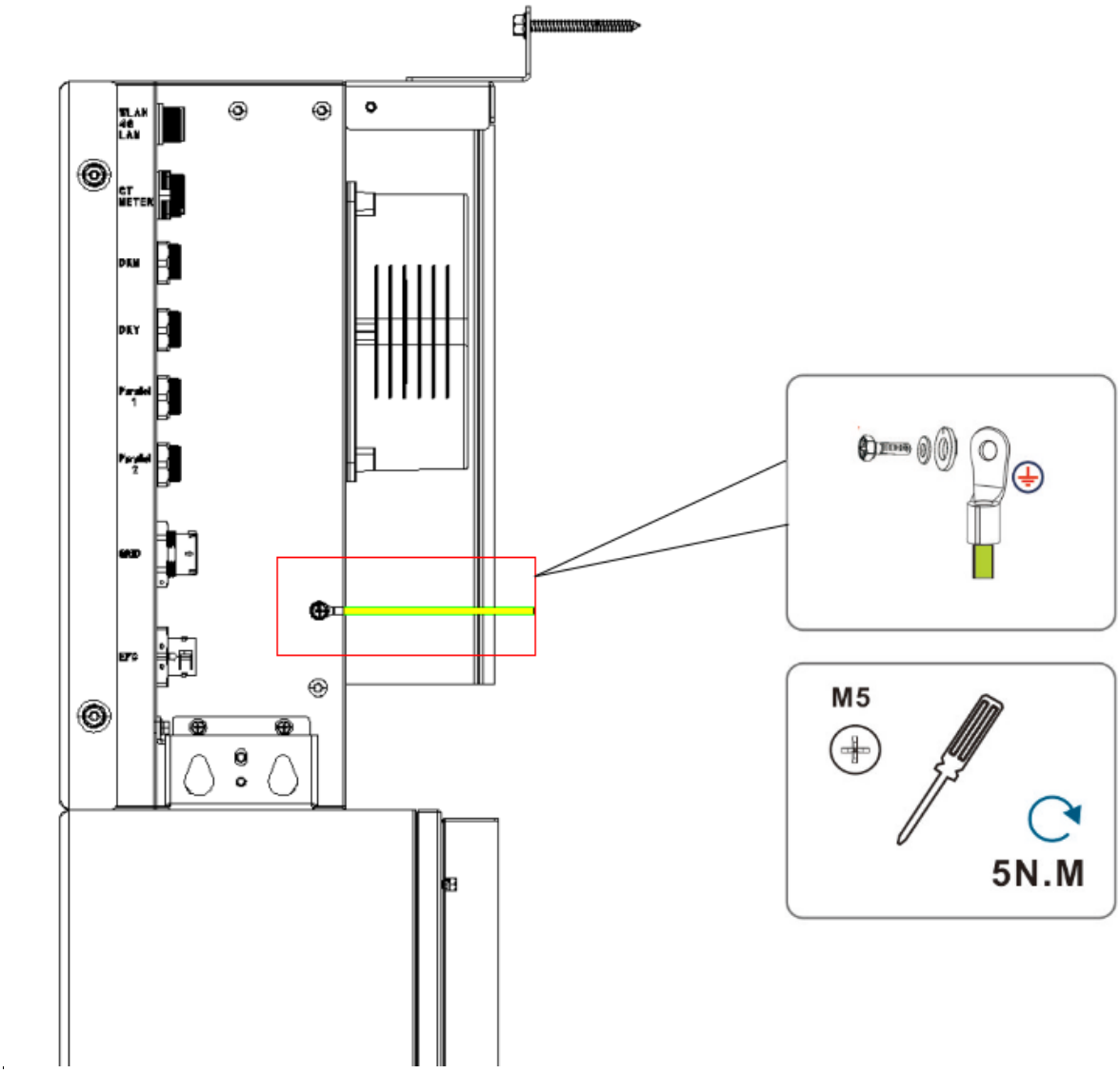
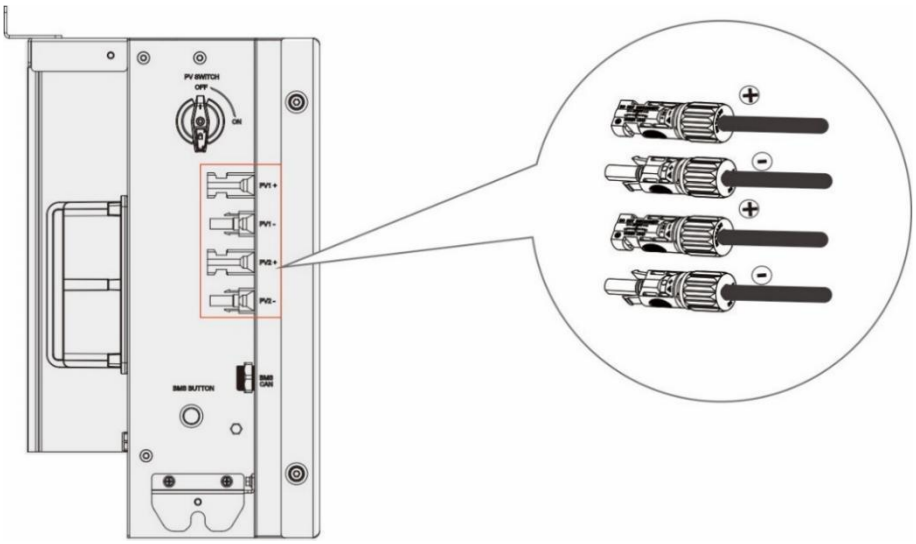


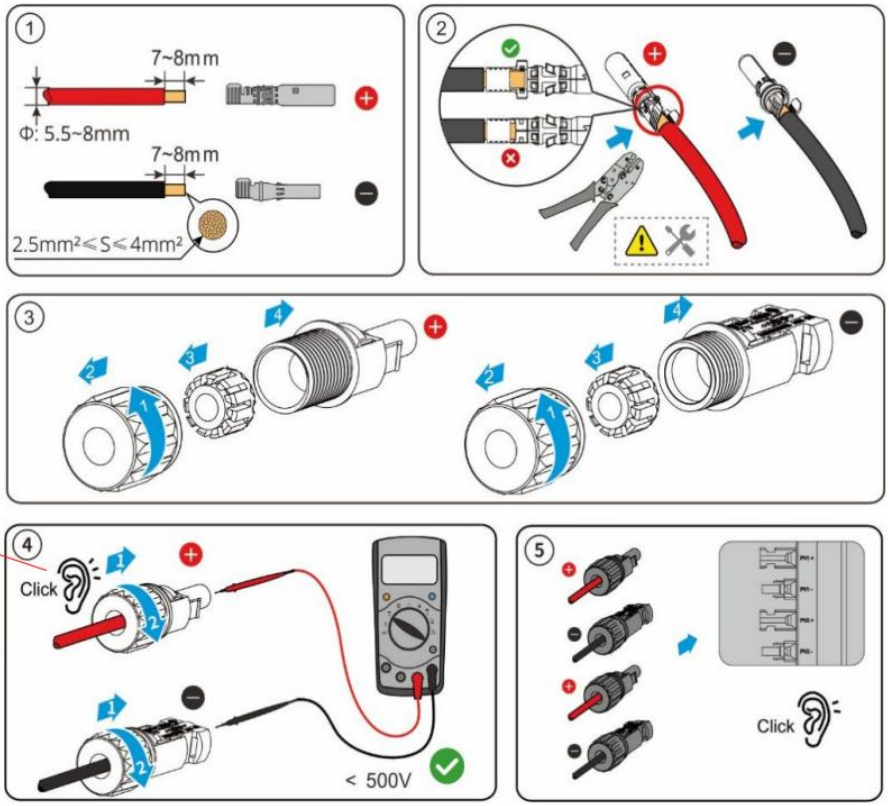
Figure 6-1 Installation of PE cable

6.2 Installation of solar input cable

Caution
When two PV panels are connected to a single power module, the two PV panels must be of the same model and quantity. The PV string shall not be grounded, and the insulation resistance of the equipment shall be the minimum; Before connecting the PV string to the inverter, the minimum insulation resistance of the PV string to ground shall meet (R = maximum input voltage/30 mA). If the insulation resistance value is less than the above requirements, the insulation resistance inverter alarm will be triggered.



Installation steps for PV terminal:



Push the terminal forward first, and then rotate it all the way to the ground when you hear a "click".

Figure 6-2 Installation of PV input cable

6.3 Installation of AC output cable (GRID and EPS)

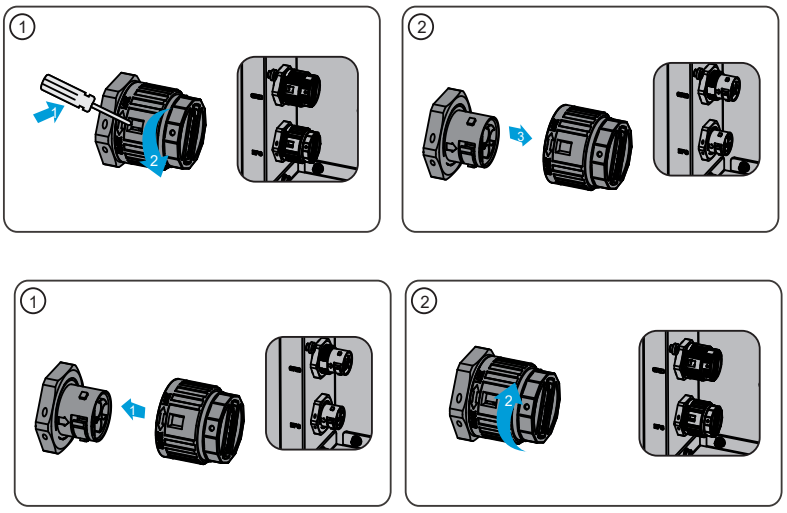
Caution

- The L and N lines of the AC cable shall not be connected reversely or short-circuited.
- The PE cable of the AC cable must be grounded.
- The AC output cable shall not be connected reversely.
- The connector cable only supports multi-strand copper cables and requires riveted tube/pin type terminals. The terminal specifications shall be selected according to the wire gauge.

Caution

- There are three connecting ports marked "L", "N", and "⏚" inside the AC connector. The live wire shall be connected to the "L" terminal, the neutral wire shall be connected to the "N" terminal, and the PE cable shall be connected to the "⏚" terminal.

Steps before AC cable installation :



The installation steps of AC terminal are as follows:

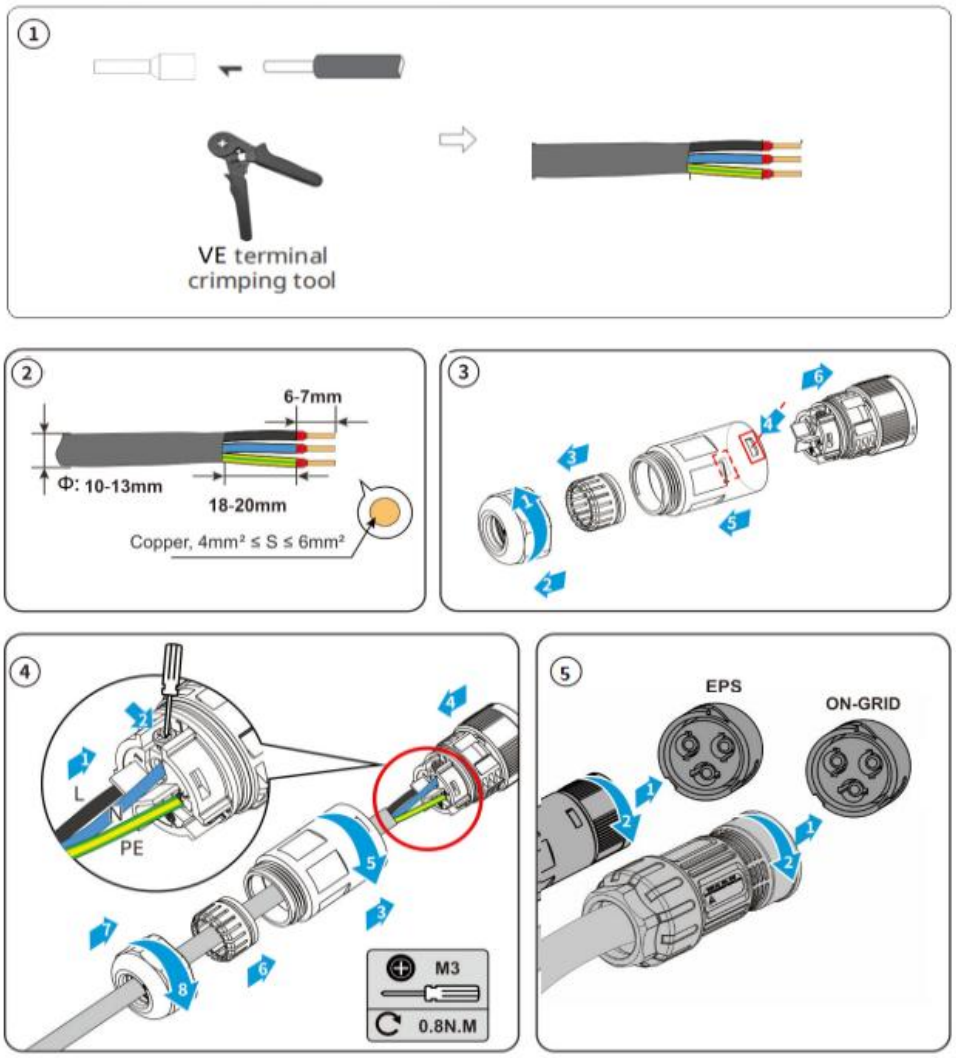
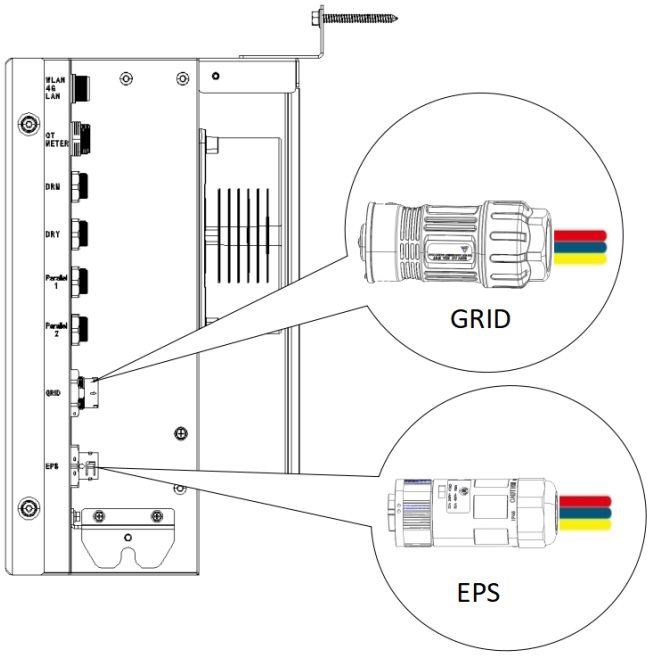


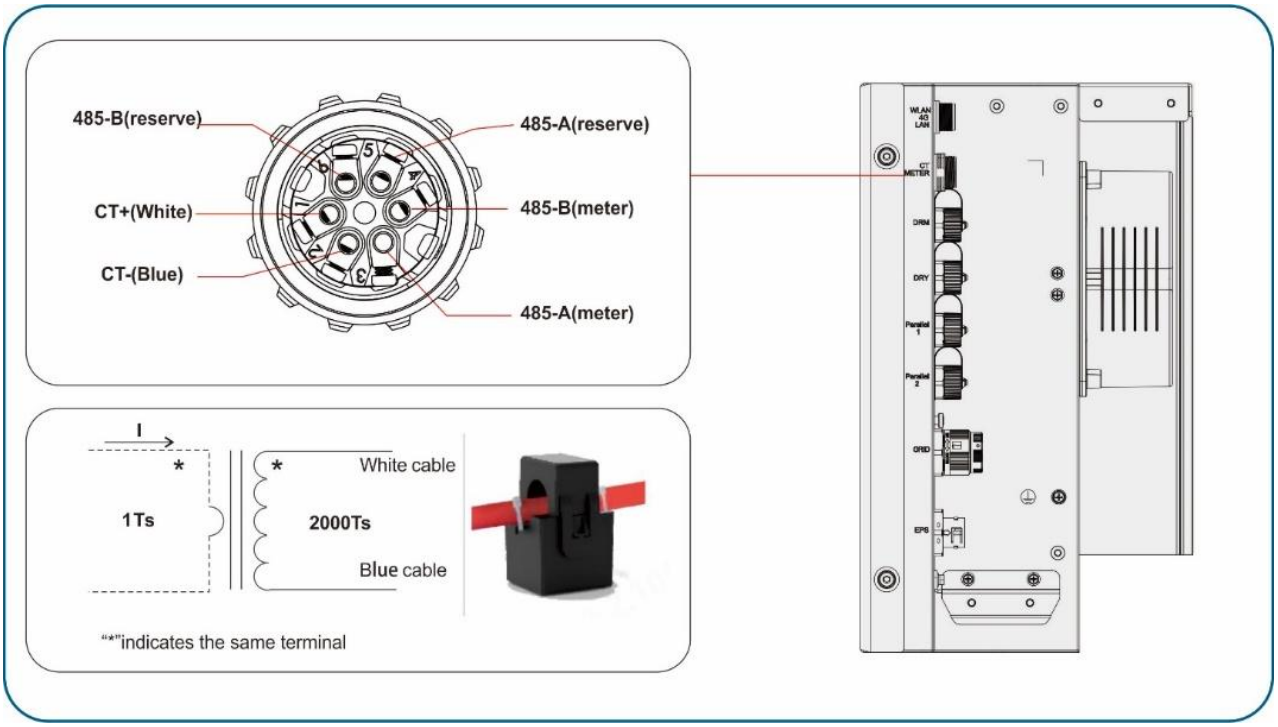
Figure 6-3.1 Installation of AC cable



6.4 External CT/electric meter connection

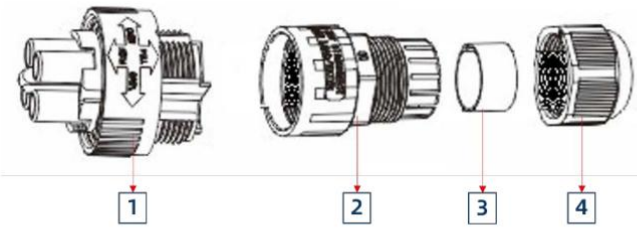
The inverter must be connected to an external CT or smart electric meter to measure the grid current and grid power. The external CT must be installed on the side close to the power grid. If the CT test is passed, but the output power of the inverter remains unchanged, for example, the output power is always 0 or the output power is unstable, please check the mounting position of the CT. The CT self-inspection can also be performed in the settings. For more information, please refer to the section of CT self-inspection.

Applicable smart electric meters: YaDa or Chint. It is recommended to use YaDa YDS70-C16 single-phase electric meter. The electric meter has been configured with CT. Do not change any settings on the smart electric meter. Please refer to the quick installation manual of the electric meter for specific installation.



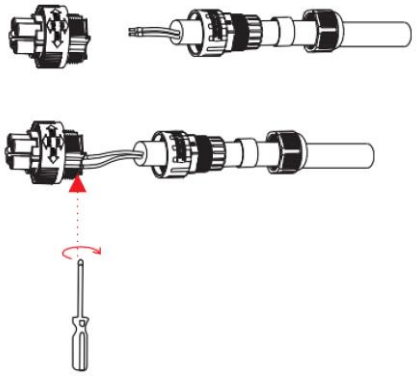
6.4.1 External CT

Step 1. Unscrew the nut, sealing, body, and housing of the CT connector.



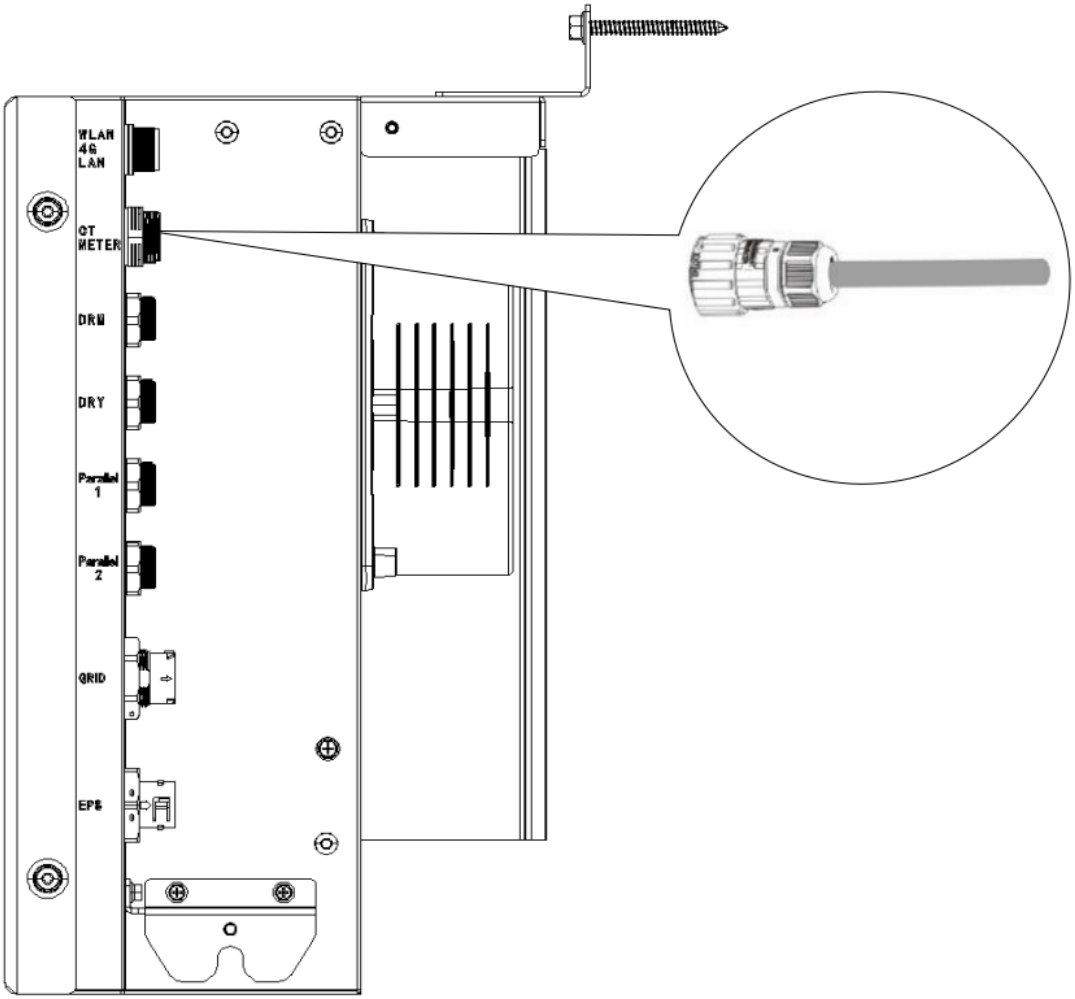
1 Housing 2 Body 3 Sealing 4 Nut

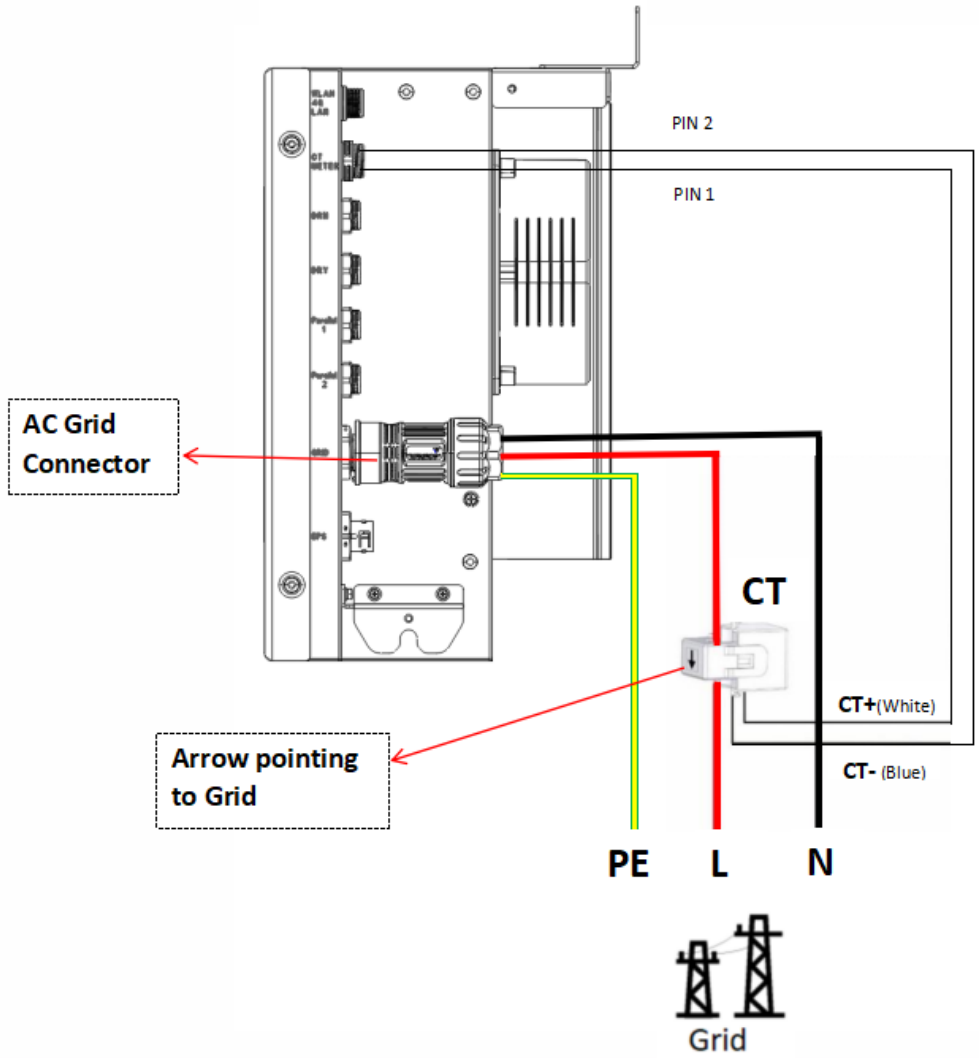
Step 2. Thread the wires of the CTs through the nut, sealing, and the body, insert them into the pins of the CT& Meter connector, and then tighten the screws.



Step 3. Tighten the nut, sealing, body, and housing of the CT& Meter connector.

Step 4. Plug the CT& Meter connector into the CT port inside the inverter and tighten it.





NOTE

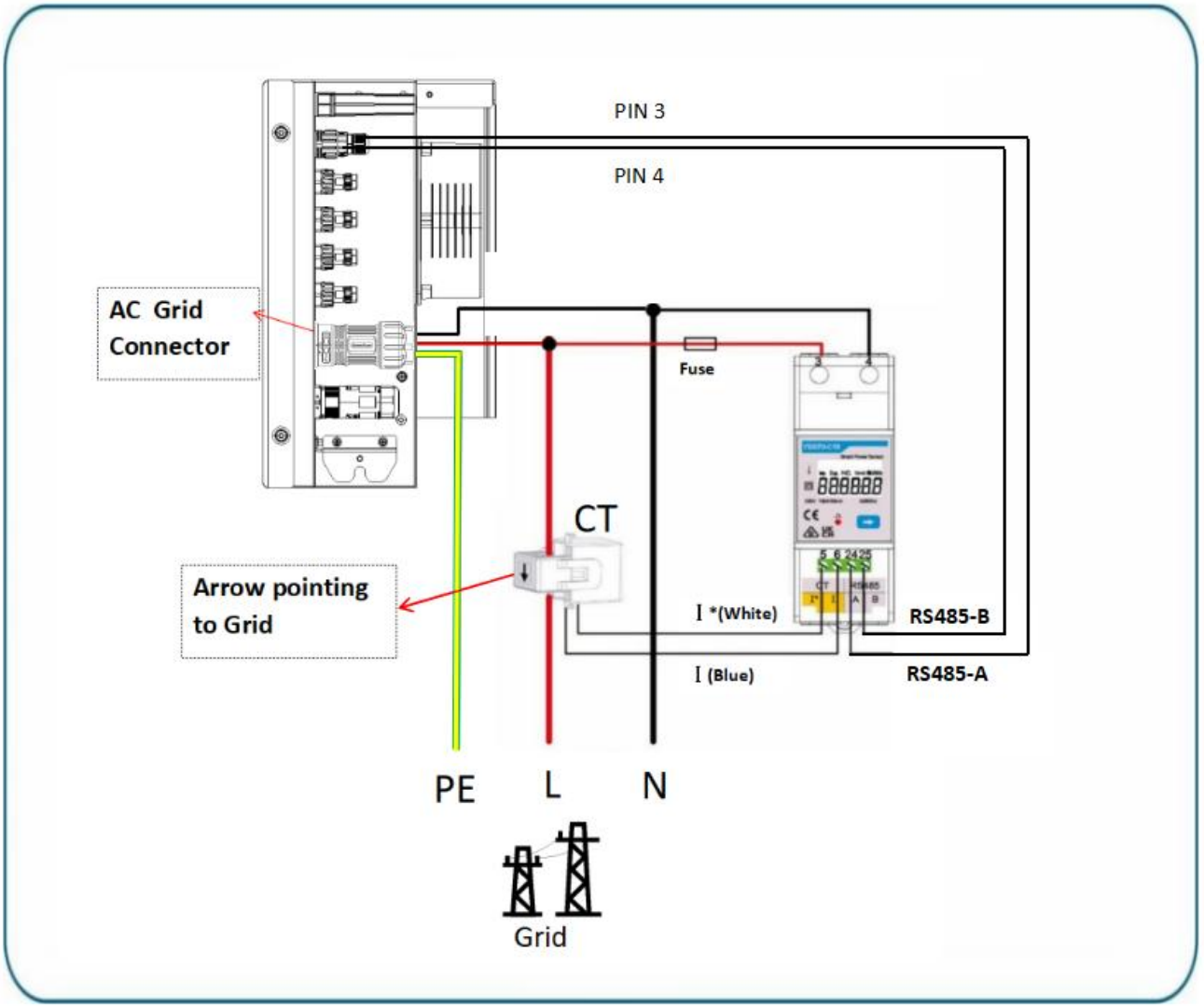
The arrow on the CT must point toward the power grid.

6.4.2 Electric meter connection

Step 1. Prepare the communication wires, power cable, and tools for the meter connection.

Step 2. Follow the meter installation manual to install the meter.

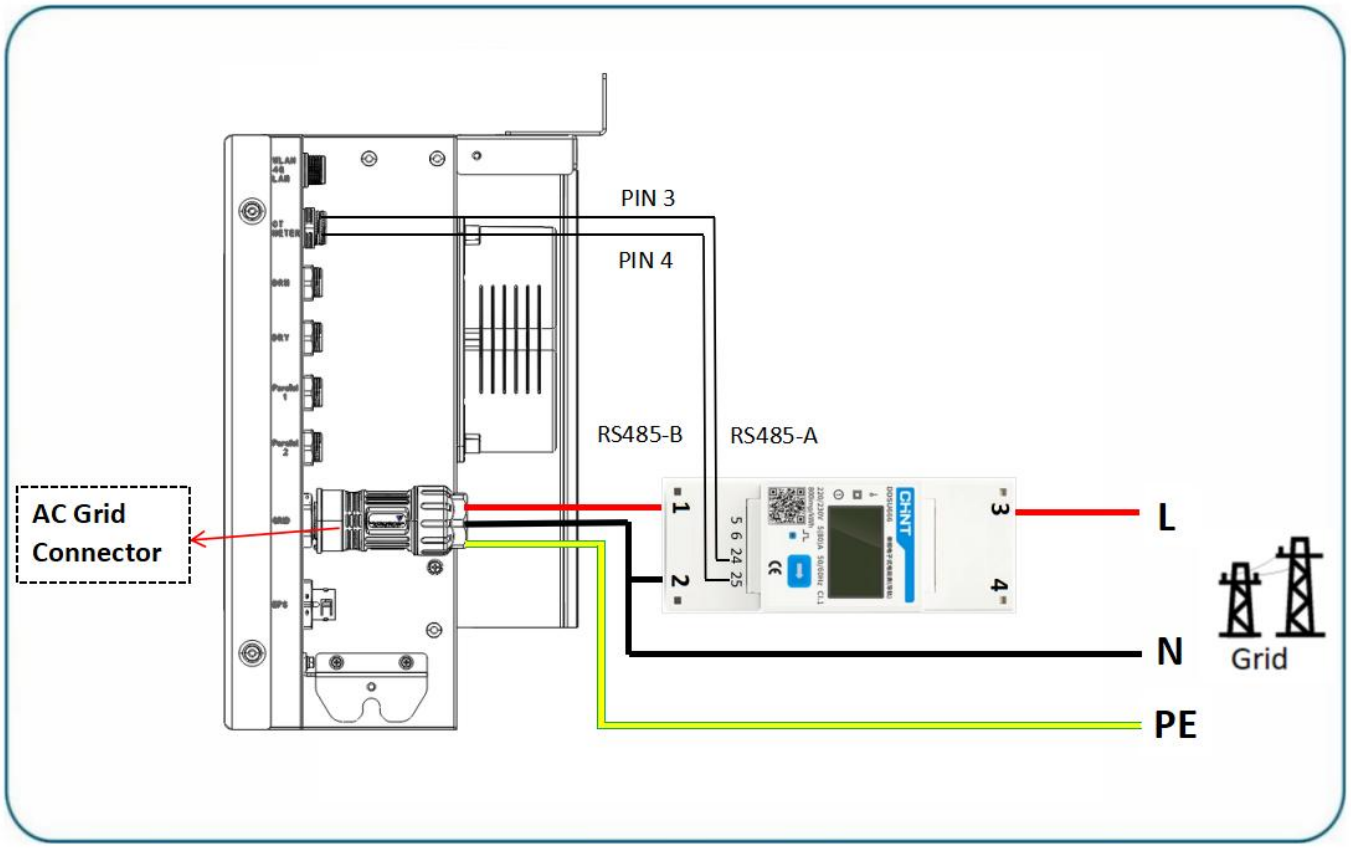
Yada Meter：



NOTE

The arrow on the CT must point toward the power grid.

Chint Meter：



Step 3. Connect the communication line A/B of the meter to pin 3/4 of the CT& Meter connector， and then tighten it.

6.5 DRED/RRCR port connection (optional)

DRED refers to demand response enabling device. RESS-1A-XXXX-L2-6K series residential all-in-one energy storage system meets the requirements of AS/NZS 4777.2:2015. Under national standards such as Australia or New Zealand, the inverter can support the DRED function.

Caution
When the Australia or New Zealand grid standard is selected, the DRM port can be enabled to connect to DRED. When the German grid standard is selected, the port can be enabled to connect to RRCR. For the settings of the power grid standard, please refer to "Power Grid Standard Settings".

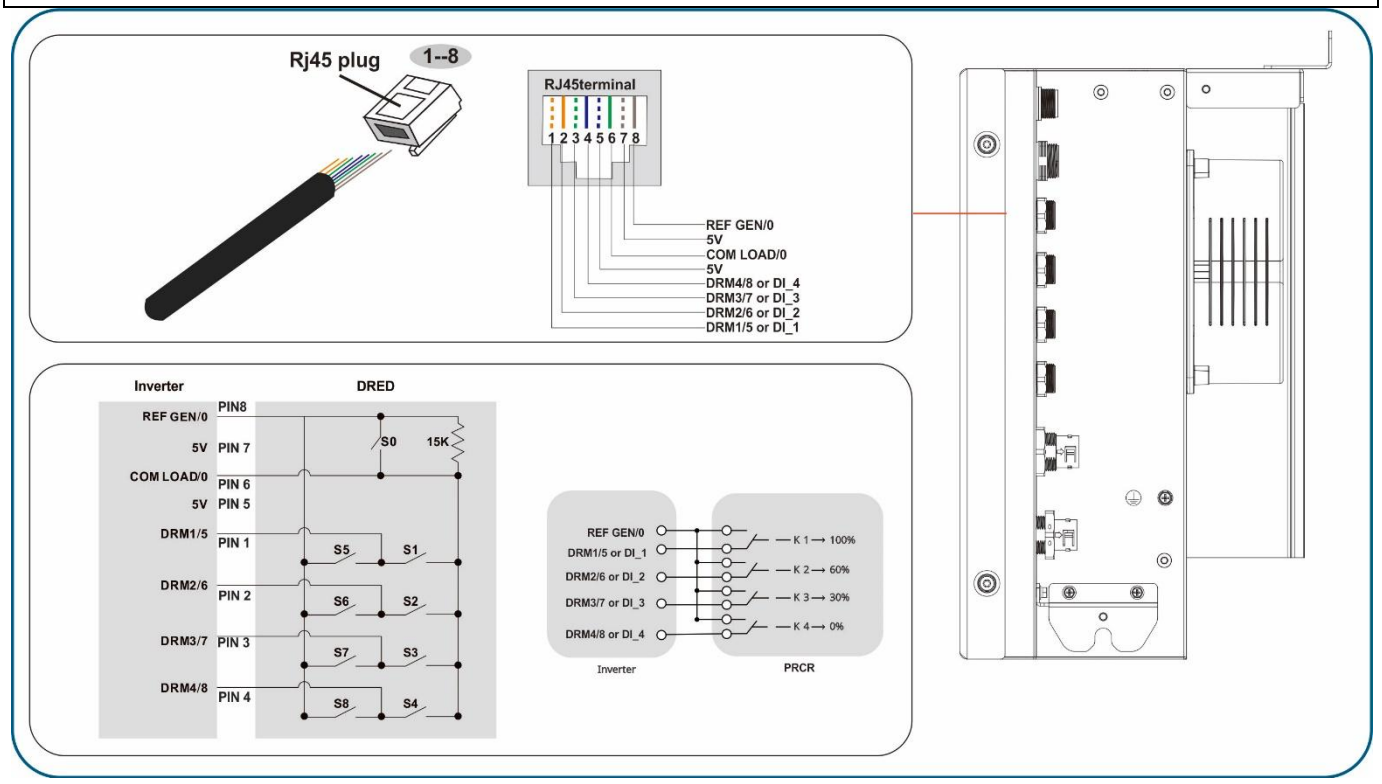


Figure 6-5 Schematic diagram of DRED or PRCR connection

6.6 Parallel operation connection

Caution
The lengths of the three branch cables from the AC output air circuit breaker to the power module must be consistent.

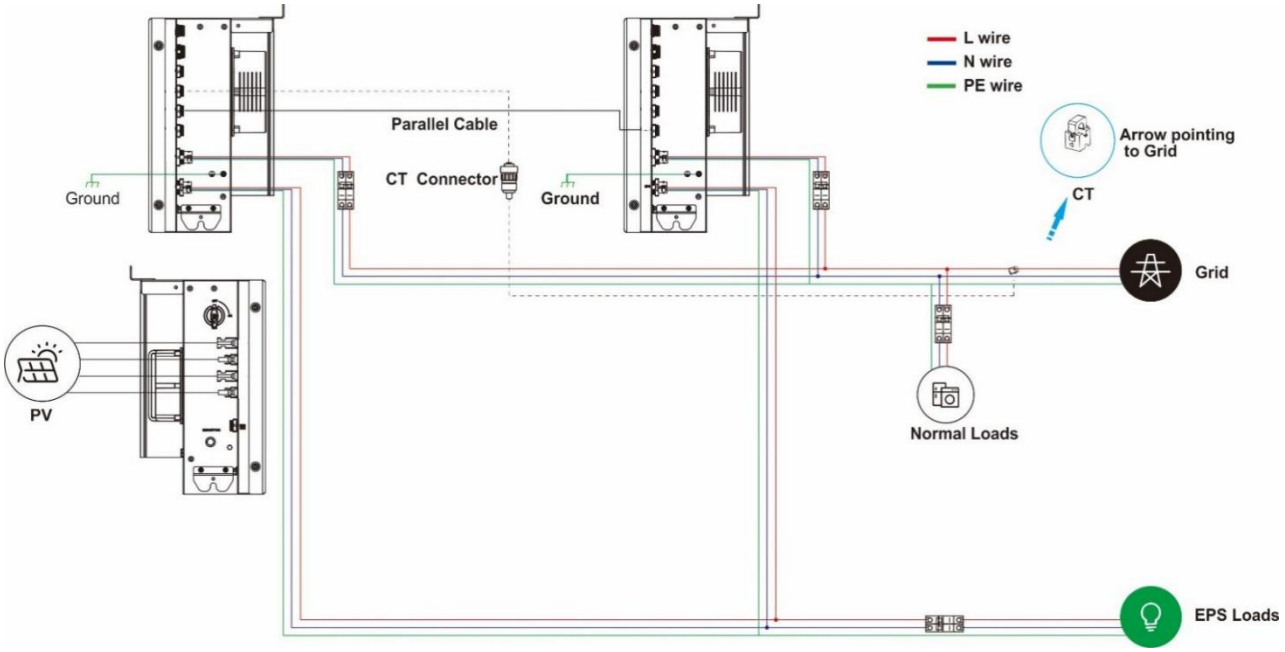


Figure 6-6 Schematic diagram of parallel operation wiring

6.7 Post-installation inspection

6.7.1 Post-installation inspection

Table 6-1 Inspection items and acceptance criteria

S/N	Inspection items	Acceptance criteria
1	The product is installed in place	The installation shall be correct, firm and reliable.
2	The cable layout is reasonable	The cable layout shall be reasonable and meet the requirements of users.
3	The cable ties are tied neatly	The distance between the cable ties shall be uniform, and no sharp corners shall be left at the cuts.
4	The grounding is reliable	The power cable, signal cable and earth cable shall be connected correctly, firmly and reliably.
5	The switch is disconnected	The "DC SWITCH" and all switches connected to the product shall be in the "OFF" state.
6	Whether AC input and output ports are short-circuited	The L and N lines of the AC cable shall not be connected reversely or short-circuited.
7	The unused terminals and interfaces are sealed	The unused terminals and interfaces shall be fitted with waterproof covers.
8	Whether the removal wrench is put back	The removal wrench is put back to its original position .
9	The installation environment meets the requirements	The installation space shall be reasonable, the environment shall be clean and tidy, and there shall be no construction residues.

7 System adjustment and test

7.1 System power-on

Caution
• **The product must be powered on within 24 hours after unpacking; For later maintenance, the power off time shall not exceed 24 hours.** • **In scenarios where there is no PV input, the battery is fully discharged, and the equipment fails to be turned on, the alarm shall be cleared manually through the APP.** • **In scenarios where there is no AC input and no PV input, the power supply must be turned on through the manual start/stop switch.** • **First turn on the power grid switch and inverter PV switch, and then turn on the battery switch**

Operation steps

Step : Turn on the corresponding switch according to different scenarios.

- Press and hold the battery button on the left side of the inverter for more than 5 s, until the LED display light on the panel comes on.
- Connect the APP to check whether the battery parameters are normal.
- In the case of PV input, set the "PV SWITCH" of the product to "ON".
- After the initial installation and power-on, observe the product LED indicator light and check the running status.

7.2 Adjustment and test of energy storage system

Caution
• In the case of no AC input, upgrading the product will cause power off. It is recommended to upgrade the product in the case of AC.

7.2.1 App Installation

To download for Android phones, please use Google Play to search for UltiHome or scan the QR code to download.

- The app only supports Android 10.0 and above mobile devices.
- The app does not support tablet/folding/landscape end devices.
- Installers download the UltiHome Business version.
- End users download the UltiHome version.

For Apple phones, please use the APP Store to search for UltiHome or scan the QR code to download.

- The app only supports mobile devices with IOS 13.0 and above.
- The app does not support tablet/folding/landscape end devices.
- Installers download the UltiHome Business version.
- End users download the UltiHome version.

Web site address

https://ultimati.inteless.com/

7.2.2 Wi-Fi & BLE stick Connection

Follow these installation steps to stall WiFi & BLE Stick.

1. Remove the waterproof cover	2. Align with grooves
3. Plug in WiFi stick	4. Spin to lock the WiFi module

The Wi-Fi connection diagram for the Wi-Fi & BLE stick is shown in the figure below. To configure the network connection, download the app and follow the operation guide provided within the app.

If the Wi-Fi & BLE stick is working normally, both the red LED and green LED will be continuously glowing. If they are not, refer to next section "LED Indication and Troubleshooting," for corrective actions.

7.2.3 LED indication and troubleshooting

LED	State	Indication
	Red LED: Inverter communication indication	 Green LED: Network communication indication
	Cycle for 2s: flashes once quickly, then glows	Cycle for 2s: flashes once quickly, then glows
	No LED glow for more than 20s	The power supply to the Wi-Fi & BLE stick is abnormal or damaged： 1. Check whether the power supply of the Aerial Plug Interface on the inverter is normal. 2. If the Wi-Fi & BLE stick is abnormal, contact the dealer.
	Cycle for 2S: flashes once quickly, then shuts off	Communication failure: Check whether the connection between the Wi-Fi & BLE stick and the inverter is loose or has poor contact
	When powered on, continuously glows for 3s, then shuts off	Power-on indication
	Glows for more than 5s	Communication is normal
	Occasional flashes during long glow	Network is transmitting data
	Cycle for 20s: flashes once quickly, then shuts off	The router is not connected: 1.Check whether the password is right 2.Check the strength of the router
	Cycle for 20s: flashes 3 times continuously, then shuts off	Connecting to the router,but can’t connect to the cloud server: 1. Check whether the router has internet access permission 2. Check the firewall settings
	Cycle for 20s: flashes 4 times continuously, then shuts off	Wi-Fi & BLE stick information error: Please contact the dealer

8 System maintenance

8.1 System power-off

Precautions

- After the system is powered off, the cabinet still has residual electricity and heat, which may cause electric shock or burns. Therefore, after the system is powered off for 5 min, please wear protective gloves to operate the product. Ensure that all indicator lights of the product are off before maintenance.
- During system operation, only the PV SWITCH of the product is disconnected, and the system cannot be completely powered off. At this time, the product cannot be maintained.

System power off operation steps

Step 1: Set the system front-stage AC input circuit breaker to "OFF".

Step 2: Set the "PV SWITCH" of the inverter module to "OFF".

Step 3: Press and hold the battery button switch on the left side of the inverter for 5 s to turn off the battery pack module.

8.2 Routine maintenance

In order to ensure the long-term good operation of the system, it is recommended to perform routine maintenance as described in this section.

⚠ Caution
Before performing maintenance such as system cleaning, electrical connection, and grounding reliability, power off the system.

Table 8-1 Maintenance list

Inspection content	Inspection methods	Maintenance intervals
System cleaning	Regularly check whether the cooling fin is blocked and dusty.	Once every six months to one year.

Inspection content	Inspection methods	Maintenance intervals
System operating status	● Observe the appearance of the product for damage or deformation. ● Listen to the product for abnormal sound during operation.	Once every six months.
Electrical connection	● Check whether the cable is detached or loose. ● Check the cables for damage, especially the cuts where the cables come into contact with the metal surface. ● Check whether the unused solar input terminal,	Half a year after the first adjustment and test, and then once every six months to one year.
Grounding reliability	Check whether the earth cable is reliably grounded.	Half a year after the first adjustment and test, and then once every six months to one

8.3 Troubleshooting

8.3.1 Error code

Code	Explanation
W00	Low power grid voltage
W01	High power grid voltage
W02	Low power grid frequency
W03	High power grid frequency
W04	PV not connected
W05	Battery not connected
W06	Battery undervoltage
W07	Low battery SOC
W08	High battery voltage
W09	Overload alarm
W10	High leakage current
W12	Low fan speed
W13	Shutdown due to low battery SOC
W14	BMS discharge overcurrent
W15	BMS charge overcurrent
W16	High BMS total voltage
W17	BMS overtemperature
W18	BMS discharge low temperature
W19	BMS cell imbalance
W20	Abnormal BMS communication
W21	BMS undervoltage
W22	BMS charge low temperature
W23	BMS high voltage
W24	BMS high temperature
W25	BMS updating
W26	BMS program version error
W27	BMS program update failure
W28	CT reverse polarity
W30	PV low energy
W31	Mode reset

Error code

Code	Explanation
F00	Soft start timeout
F01	Inverter output short circuit
F02	Abnormal GFCI sensor
F03	System fault
F04	Low bus voltage
F05	High bus voltage
F06	Bus short circuit
F07	Low PV insulation impedance
F08	PV input short circuit
F09	Bypass relay fault
F10	Inverter overcurrent
F11	High inverter DC component
F12	High inside temperature
F13	Radiator overtemperature
F14	Abnormal AC relay
F15	Battery discharge overcurrent
F16	Battery charge overcurrent
F17	Current sensor error
F18	Abnormal inverter output
F19	Backup relay error
F20	Overload fault
F22	Parallel operation communication failure
F23	Parallel operation power grid connection
F24	Parallel operation air circuit breaker not closed
F25	Parallel operation inverter power unbalance
F32	Master-slave communication error

8.3.2 Fault diagnosis and solution

The inverter is easy to maintain. When you encounter the following problems, please refer to the following solutions. If the problem is not solved, please contact your local dealer. The following table lists some basic problems that may occur in practice and their corresponding basic solutions.

Fault diagnosis table

Type	Code	Solution
Bus/inverter soft start timeout	F00	(1) Restart the equipment and wait for it to return to normal; (2) If the fault is not eliminated, contact the distributor.
Inverter short circuit	F01	(1) Cut off all power supplies, restart the equipment and wait for it to return to normal. Please confirm whether the load has short circuit; (2) If the fault is not eliminated, contact the distributor.
Abnormal GFCI sensor	F02	(1) Cut off all power supplies, restart the equipment and wait for it to return to normal; (2) If the fault is not eliminated, contact the distributor.
Low/high bus voltage	F04 F05	(1) Check whether the input mode is correct (2) Restart the equipment and observe whether the equipment can return to normal. (3) If the fault is not eliminated, contact the distributor.
Bus short circuit	F06	(1) Restart the equipment and wait for it to return to normal; (2) If the fault is not eliminated, contact the distributor.
Insulation impedance error	F07	(1) Check whether the earth cable is well connected; (2) Check whether the resistance of PV+ and PV- to ground is greater than 2MΩ; (3) If it is less than 2MΩ, check whether the PV string is grounded; If it is higher than 2MΩ and the fault is not eliminated, please contact your local inverter distributor.
PV input short circuit	F08	(1) Check whether the input mode is correct; (2) Disconnect the PV input, restart the equipment and observe whether the equipment can return to normal; (3) If the fault is not eliminated, contact the distributor.
Relay fault	F09 F14 F19	(1) Disconnect the PV input, restart the equipment and observe whether the equipment can return to normal; (2) If the fault is not eliminated, contact the distributor.
Inverter overcurrent	F10	(1) Wait for 5 min, and the inverter is restarted automatically; (2) Check whether the load meets the specification;

		(3) If the fault is not eliminated, contact the distributor.
High inverter DC component	F11	(1) Restart the inverter and observe whether the equipment can return to normal; (2) If the fault is not eliminated, contact the distributor.
NTC/radiator Overtemperature	F12 F13	(1) Restart the inverter, wait for a few minutes until the equipment cools down, then restart the equipment and observe whether the equipment can return to normal. (2) Check whether the ambient temperature exceeds the normal operating temperature range of the equipment; (3) If the fault is not eliminated, contact the distributor. (4) Check whether the fan rotates
Battery discharge overcurrent	F15	(1) Wait for 1 min, and the inverter is restarted automatically; (2) Check whether the load meets the specification; (3) If the fault is not eliminated, contact the distributor.
Battery charge overcurrent	F16	(1) Check whether the battery terminal is short-circuited; (2) Check whether the charge current exceeds the set requirements; (3) If the fault is not eliminated, contact the distributor.
Current sensor error	F17	(1) Restart the inverter and observe whether the equipment can return to normal; (2) If the fault is not eliminated, contact the distributor.
Abnormal inverter output	F18	(1) Please contact the dealer.
Backup relay error	F19	(1) The off-grid relay fails; (2) If the fault is not eliminated, contact the distributor.
Always overloaded	F20	(1) The system load always exceeds the rated value; (2) If the fault is not eliminated, contact the distributor.
Parallel operation communication failure	F22	(1) Check whether the parallel port communication line is properly connected (2) If the fault is not eliminated, contact the distributor.
Parallel operation power grid fault	F23	(1) Check whether the power grid is normal (2) If the fault is not eliminated, contact the distributor.
Parallel operation air circuit breaker not closed	F24	(1) The off-grid relay is abnormal (2) If the fault is not eliminated, contact the distributor.

Parallel operation inverter power unbalance	F25	(1) Parallel operation power unbalance (2) If the fault is not eliminated, contact the distributor.
Master-slave communication error	F32	(1) Restart the inverter and observe whether the equipment can return to normal; (2) If the fault is not eliminated, contact the distributor.
Abnormal mains supply	W00 W01 W02 W03	(1) Check whether the local voltage and frequency meet the specifications of the equipment; (2) If the voltage and frequency are within the allowable range, wait for 2 min for the inverter to return to normal; If the inverter is not restored or the fault recurs, please contact the local inverter customer service personnel; (3) If the voltage and frequency are not within the allowable range or unstable, please contact the local power company.
PV not connected	W04	(1) PV is not connected; (2) Check the connection of the access power grid; (3) Check the PV availability.
Battery not connected	W05	(1) The battery is not connected; (2) Check whether the battery terminal is short-circuited; (3) If the fault is not eliminated, contact the distributor.
Battery undervoltage	W06 W07	(1) Check the battery availability; (2) If the fault is not eliminated, contact the distributor.
Battery high voltage	W08	(1) Check whether the battery used is consistent with the settings; (2) If the settings are consistent, power off and restart; (3) If the fault is not eliminated, contact the distributor.
Overload alarm	W09	(1) Wait for 1 min, and the inverter is restarted automatically; (2) Confirm whether the load is consistent with the specification;
Leakage current error	W10	(1) Check whether the PV strings are directly or indirectly grounded (2) Check the peripheral facilities of the equipment for leakage current; (3) If the fault is still not eliminated, please contact the distributor.
Low fan speed	W12	(1) Restart the inverter and observe whether the equipment can return to normal; (2) If the fault is not eliminated, contact the distributor.
BMS alarm	W14~W27	(1) Please contact the distributor.
CT reverse polarity	W28	(1) Conduct the CT self-inspection; (2) If the fault is not eliminated, contact the distributor.

PV low energy	W30	(1) Restart the inverter and observe whether the equipment can return to normal; (2) If the fault is not eliminated, contact the distributor.
Mode reset	W31	(1) Wait for the equipment to work and observe whether the equipment can return to normal; (2) If the fault is not eliminated, contact the distributor.

8.4 Battery storage

Incoming inspection of battery

The battery recharging label must be on the outer packaging box of the battery. The recharging label shall have the latest charging time.

Battery storage requirements

1. When the battery is stored, it shall be placed correctly according to the packaging box labels, and shall not be placed upside down or sideways.
2. When the battery packaging boxes are stacked, they shall meet the stacking requirements on the outer packaging.
3. When handling the battery, it is required to handle it with care, and it is strictly forbidden to damage the battery.
4. Storage environment requirements:

- - Ambient temperature: -20°C ~ 55°C, recommended storage temperature: 15°C ~ 25°C.
- - Relative humidity: 5%RH ~ 80%RH.
- - Dry, ventilated and clean.
- - Avoid contact with corrosive organic solvents, gases and other substances.
- - Avoid direct sunlight.
- - The distance from the heat source shall not be less than 2 m.

5. The external connection must be disconnected during battery storage.
6. AC mains input voltage at the recharging site: single-phase power grid 200/208/220/230/240 V AC.
7. The warehouse keeper shall make statistics on the battery storage every month, and regularly report the battery inventory to the planning link. For batteries with storage time of nearly 12 months (-10°C~25°C), 3 months (25℃~45℃) or 1 months (45℃~55℃), the recharging shall be arranged in time.
8. When the stored battery is shipped, the first-in-first-out principle shall be followed.
9. After the battery production test is completed, the SOC shall be supplemented to at least 50% before storage.

Conditions for judging overdue storage

In principle, it is not recommended to store the battery for a long time, and it should be used in time. The stored battery shall be handled as follows.

Table 8-3 Lithium battery recharging cycle

Storage	6.6kWh	5kWh	Recharging cycle	Remarks
-10℃＜T≤55℃	T≤-10℃	T≤-10℃	Not allowed	During the recharging cycle: no treatment is required, and the battery shall be used as soon as possible to reach the recharging time: the total storage time required for the recharging shall not exceed the maintenance period
	-20℃~25℃	-20℃~25℃	12 months	
	25℃~45℃	25℃~45℃	3 months	
	45℃~55℃	45℃~55℃	1 months	
	55℃＜T	55℃＜T	Not allowed	

1 If the battery is deformed, damaged or leaking, it shall be directly scrapped without considering the storage time.

2 The storage time is calculated from the last charging time marked on the recharging label on the outer packaging of the battery. After the battery is fully recharged, refresh the latest charging time on the recharging label (next charging time = latest charging time + recharging cycle).

3 The maximum allowable period and times of recharging for storage are 3 years or 3 times, for example, recharging once every 8 months, with a maximum of 3 times allowed; recharging once every 12 months, with a maximum of 3 times allowed; It is recommended to scrap the battery if the maximum allowable period and times are exceeded.

4 There will be capacity loss in long-term storage of lithium batteries. After 12 months of storage at the recommended storage temperature, the general irreversible capacity loss is 3%~10%. If the customer conducts the discharge test and acceptance according to the specification, there is a risk of failure in the test for the battery with a capacity of less than 100% of the rated capacity after storage.

8.5 Storage of battery with low SOC

After the battery is powered off, there is static power consumption of the battery module and self-discharge loss. Avoid storing the battery with low SOC and recharge the battery in time. Otherwise, the battery may be damaged due to over-discharge and the battery module needs to be replaced.

Scenarios that may trigger the storage of battery with low SOC include but are not limited to:

- The DC SWITCH on the power control module is not turned on.
- The battery power line or signal line is not connected.
- After the energy storage system is discharged, it fails to enter the charging state due to system failure.
- The battery fails to enter the charging state due to the incorrect installation or configuration of the energy storage system.
- The battery fails to enter the charging state due to the absence of PV input and the long-term power failure of the power grid.

Regardless of the low SOC storage scenario, the battery must be charged at the longest interval allowed by the SOC when the battery is completely powered off. If the battery is not recharged for more than the maximum interval, the battery may be damaged due to over-discharge.

SOC at power off before storage	Maximum charging interval
SOC>5%	30 days
0 ≤ SOC ≤ 5%	7 days

Note

When the battery SOC drops to 0%, it is necessary to charge the battery in time within 7 days. The Company will not provide corresponding warranty services for the permanent battery failure caused by overdue recharge due to customer reasons.

9 Technical indicators

Model of residential all-in-one energy storage system	UE-3.68K-XXXX-S2-LA1	UE-5K-XXXX-S2-LA1	UE-6K-XXXX-S2-LA1
Model of inverter	UE-3.68K-S2-LA1	UE-5K-S2-LA1	UE-6K-S2-LA1
Grid AC input and AC output			
Rated output apparent power	3680VA	5000VA[1]	6000VA
Rated output active power	3680W	5000W[1]	6000W
MAX output apparent power	3680VA	5000VA	6600VA
Rated input apparent power	7360VA	9200VA	9200VA
Rated output current	16.0 A ac	21.7 A ac	26.1 A ac
Rated input current	16.0 A ac	21.7 A ac	26.1 A ac
MAX output current	16.7 A ac	22.7 A ac	27.3 A ac
MAX input current	32.0 A ac	40.0A ac	40.0A ac
Rated AC voltage	220/230/240 a.c,		
Output Voltage Range (V)	170~270 a.c,		
AC rated frequency	50 Hz/60Hz		
Wiring	L+N+PE		
Power factor (cosΦ)	0.8 leading – 0.8 lagging		
THDI	<3%		
Backup (EPS)			
Rated output apparent power	3680VA	5000VA	6000VA
MAX. output current	16.0 A ac	21.7 A ac	26.1 A ac
Rated output active power	3680W	5000W	6000W
Rated output voltage	230 Vac		
Rated output frequency	50/60Hz		
THDV(@Linear Load)	<3%		
Switch time	<20ms		
PV String Input			
Recommended max. PV input power	7200W	10000W	10000W
MAX.PV input voltage	500Vdc		
Startup voltage	120Vdc		
Nominal Input Voltage (V)	360Vdc		
MPPT voltage range	120-480Vdc		
MPPT Voltage Range at Nominal Power (V)	200-425Vdc	250-425Vdc	
Number of MPPTs	2		
Max. number of PV strings per MPPT	1		
Max. input current per MPPT	20A		
Max. short-circuit current per MPPT	25A		
Reverse Connect Protection	Yes		
Efficiency			
MPPT Efficiency	>99%	>99%	>99%
Euro Efficiency	96.30%	96.30%	96.30%
MAX. Efficiency	97.00%	97.00%	97.00%

[1]4600 for VDE-AR-N4105 & NRS 097-2-1.

XXXX: System Energy Capacity (kWh) XXXX=6.6/13.2/19.8									
Battery									
Battery type	Lithium-ion battery								
System Energy	6.6KWH	13.2KWH	19.8KWH	6.6KWH	13.2KWH	19.8KWH	6.6KWH	13.2KWH	19.8KWH
Usable Energy [2]	6.27KWH	13.49KWH	18.81KWH	6.27KWH	13.49KWH	18.81KWH	6.27KWH	13.49KWH	18.81KWH
Battery Module Model	LB1-6.6KWh								
Rated battery voltage	51.2V								
Recommend charging/discharging current	65A/module								
Number of Battery Modules	1	2	3	1	2	3	1	2	3
Max charging/discharging current	80A	80A	80A	120A	120A	120A	125A	125A	125A
Max charging power	3680W		5000W			6000W			
Max discharging power	3900W		5400W			6400W			
Cycle Life	>=7000 cycles [3]								
Battery auto wakeup	Yes								
Function									
CT/ Meter (optional)	Yes								
OTA	Yes								
Safety protection									
PV String reverse polarity protection	Yes								
DC short circuit current protection	Yes								
DC over current protection	Yes								
DC over voltage protection	Yes								
AC output short circuit current protection	Yes								
AC output over current protection	Yes								
AC over voltage protection	Yes								
Anti-island protection	Yes								
Leakage current detection	Yes								
Ground connection detection	Yes								
AFCI	Optional								
Rapid DC voltage cut off	Optional								
Overvoltage category	AC III ; DC II								
General									
Dimensions W*H*D	725*880*230	725*1320*230	725*1760*230	725*880*230	725*1320*230	725*1760*230	725*880*230	725*1320*230	725*1760*230
Net weight	88	146	204	88	146	204	88	146	204
Installation	Floor-mounted								
Operating temperature range	Charge :-10°C~50°C Discharge:-10°C~55°C								
Max. operating altitude	< 4000m(> 2000m power Derating)								
Relative humidity range	0~95% (No Condensation)								
Ingress Protection Rating	IP66								
Climatic category	4K4H								
Cooling	Natural convection								
Noise	<40dB								
Communication	RS485/WLAN/Bluetooth/DRY/DRM/Meter, LAN/4G(Optional)								
Display	LED indicators / APP/ Web								
Standard									
Safety	IEC/EN 62109-1&-2 IEC62619/CE/UN38.3								
EMC	IEC/EN 61000-6-1/-2; IEC/EN 61000-6-3/-4; IEC/EN 61000-3-2/-12; IEC/EN 61000-3-3/-11; IEC/EN 62920								
Grid	EN 50549-1:2019/AC:2019/RfG:2016; CEI 0-21:2022; Arret du 9 juin 2020; G98/G99/G100; UNE 217001/217001/NTS V2.1/RD 244; VDE-AR-N 4105:2018-11(VDE V 0124-100:2020-06);								

XXXX: System Energy Capacity (kWh) XXXX=5/10/15/20			
Battery			
Battery type	Lithium-ion battery		
System Energy	5.1KWH/10.2KWH/15.3KWH/20.4KWH		
Usable Energy [2]	4.86KWH/9.72KWH/14.59KWH/19.45KWH		
Battery Module Model	LB1-5KWh		
Rated battery voltage	51.2V		
Recommend charging/discharging current	50A/module		
Number of Battery Modules	1/2/3/4	1/2/3/4	1/2/3/4
Max charging/discharging current	80A/80A/80A/80A	100A/120A/120A/120A	100A/125A/125A/125A
Max charging power	3680W	5000W	6000W
Max discharging power	3900W	5400W	6400W
Cycle Life	>=6000 cycles [3]		
Battery auto wakeup	Yes		
Function			
CT/ Meter (option)	Yes		
OTA	Yes		
Safety protection			
PV String reverse polarity protection	Yes		
DC short circuit current protection	Yes		
DC over current protection	Yes		
DC over voltage protection	Yes		
AC output short circuit current protection	Yes		
AC output over current protection	Yes		
AC over voltage protection	Yes		
Anti-island protection	Yes		
Leakage current detection	Yes		
Ground connection detection	Yes		
AFCI	Optional		
Rapid DC voltage cut off	Optional		
Overvoltage category	AC III ; DC II		
General			
Dimensions W*H*D	725mm*(740/1040/1340/1640)mm*230mm		
Net weight	75kg/121kg/167kg/213kg		
Installation	Floor-mounted		
Operating temperature range	Charge :0°C~50°C Discharge:-20°C~50°C		
Operating temperature range(With integrated heating module)	Charge :-25°C~50°C Discharge:-25°C~50°C		
Max. operating altitude	< 4000m(> 2000m power Derating)		
Relative humidity range	0~95% (No Condensation)		
Ingress Protection Rating	IP66		
Climatic category	4K4H		
Cooling	Natural convection		
Noise	<35dB		
Communication	RS485/WLAN/Bluetooth/DRY/DRM/Meter, LAN/4G(Optional)		

Display	LED indicators / APP/ Web
Standard	
Safety	IEC/EN 62109-1&-2 IEC62619/CE/UN38.3
EMC	IEC/EN 61000-6-1/-2 IEC/EN 61000-6-3/-4 IEC/EN 61000-3-2/-12 IEC/EN 61000-3-3/-11 IEC/EN 62920
Grid	EN 50549-1:2019/AC:2019/RfG:2016; CEI 0-21:2022; Arret du 9 juin 2020; G98/G99/G100; UNE 217001/217001/NTS V2.1/RD 244; VDE-AR-N 4105:2018-11(VDE V 0124-100:2020-06);

[2] Test Conditions - Temperature 25°C, at the beginning of life, cell charge voltage between 2.8~3.5V, 0.5C.
[3] 25°C ambient temperature, recommended charging/discharging current.

Table 9.1 Power grid standards (single-phase)

National standards	Output voltage range(Vac)	Output frequency range (Hz)	Start wait time
China	187-252	49.5-50.2	30
Germany	184-264	47.5-51.5	60
Australia	180-265	47-52	60
AUS_B	180-265	47-52	60
AUS_C	180-265	45-55	60
Italy	195-264	49.8-50.2	60
Spain	196-253	48-50.5	180
U.K.(UK_G98)	184-262	47.5-52	180
UK_G99	184-262	47.5-52	180

UK_NI_G98	195.5-253	48-52	180
UK_NI_G99	195.5-253	48-52	180
Hungary	196-253	49-51	300
Belgium	184-264	47.5-51.5	60
New Zealand	180-260	45-52	60
Greece	184-264	49.5-50.5	180
France	184-264	47.5-50.4	60
Bangkok	198-242	49-51	60
Thailand	198-242	47-52	60
South Africa	180-260	47-52	60
50549	184-264	47.5-51.5	60
Brazil	184-264	59.5-60.5	60
0126	184-264	47.5-51.5	60
Ireland	191-269	47-52	180
Israel	195-253	47-51.5	60
Poland	195-253	49-50.0	60
Chile (CHILE_BT)	176-242	47.5-51.5	60
CHILE_HD	198-242	49-51	300
CHILE_LD	198-242	49-51	300
Local	170-270	45-55	30
60Hz	184-264	59.5-60.5	60
Denmark	195-253	47.5-51.5	60
Cyprus	184~253	47-51.5	180

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