



AELIO-P50B200

AELIO-P60B200

User Manual

Version 0.0

www.solaxpower.com



STATEMENT

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About This Manual

Scope of Validity

This manual is an integral part of AELIO-P50B200 and AELIO-P60B200. It describes the transportation, storage, installation, electrical connection, commissioning, maintenance and troubleshooting of the product. Please read it carefully before operating.

AELIO-P50B200 and AELIO-P60B200 system includes a X3-AELIO series inverter and a AELIO-B200 battery cabinet.

X3-AELIO series inverter model list:

Model	X3-AELIO-50K	X3-AELIO-60K
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Battery cabinet model list:

Model	AELIO-B200
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Model description

AELIO-P50B200



No.	Definition	Description
1	Product name	AELIO: Refer to the name of hybrid energy storage system.
2	Power	P50: Indicate that the rate power of the inverter is 50 kW.
3	Battery capacity	B200: Indicate that the battery capacity is 200 kWh.

Target Group

The installation, maintenance and grid connection setting can only be performed by qualified personnel who

- Are licensed and/or satisfy state and local jurisdiction regulations.
- Have good knowledge of this manual and other related documents.
- A medium-voltage operator is required to obtain any Certifications for High-voltage Electrician.

Conventions

The symbols that may be found in this manual are defined as follows.

Symbol	Description
 DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION!	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
 NOTICE!	Provides tips for the optimal operation of the product.

Change History

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1 Safety

1.1 General Safety

Before transporting, storing, installing, operating, using and/or maintaining the device, please carefully read the document, and strictly follow the instructions and safety precautions given herein, as well as symbols affixed on the device.

The operator should not only abide by all safety precautions provided in the document, including but not limited to the "Danger" sign, "Warning" sign, "Caution" sign, and "Notice" sign, but also comply with relevant international, national and local laws and regulations, and industry rules. **SolaX will not assume any responsibilities for the loss caused by improper operation, or violation of safety standards for design, production and device suitability.**

SolaX will not be liable for maintenance for possible device failure, device malfunction, or parts damage, nor **will the company assume any liability to pay compensation for the possible physical and property damage** resulting from the installation environment that does not meet the design requirements.

The operator should comply with the local laws, regulations, standards and guidelines in the process of transportation, storage, installation, operation, and maintenance.

The device is well designed and tested to meet all applicable states and international safety standards. However, like all electrical and electronic device, safety precautions must be observed and followed during the installation of the device to reduce the risk of personal injury and to ensure a safe installation.

Before installing the device, carefully read, fully understand and strictly follow the detailed instruction of the *User Manual* and other related regulations. And the safety instructions in this document are only supplements to local laws and regulations.

SolaX will not assume any responsibilities if any of the following circumstances occurs, including but not limited to:

- Device damage due to force majeure, such as earthquake, flooding, thunderstorm, lighting, fire hazard, volcanic eruption, war, typhoon, tornado, etc.
- Device damage due to human cause.
- Device used or operated against local policy or regulations.
- Failure to follow the operation instructions and safety precautions on the product and in this document.
- Installation and use under improper environment or electrical condition.
- Unauthorized modifications to the product or software.
- Device damage caused during transportation by the customer or the third party.
- Storage conditions that do not meet the requirements specified in this document

- Use of incompatible inverters or devices.
- Installation and commissioning operated by unauthorized personnel who are not licensed and /or satisfy state and local jurisdiction regulations.

1.2 Personal Safety

DANGER!

- Do not power on while installing the device. If the device is powered on in the process of installation and disassembly of cables, an electric arc, electric spark or fire will occur at the moment that the cable core contacts conductors. It may cause a fire or result in physical and property damage.
- Do not improperly operate while powering on. Any improper operation may cause a fire, electric shock, or explosion, and it will result in physical and property damage.
- Must remove rings, bracelets, watches, and any other metal jewelry from fingers, hands, or wrists before operation, to avoid electrical shock or burn.
- Must use special insulation tools, of which the insulation grade and dielectric strength level must be consistent with local laws, regulations, standards, and guidelines, in the operation process, to avoid electrical shock, burn, or short circuit fault.

WARNING!

- Must wear special personal protective equipment (PPE), such as a coverall, safety boots, safety glasses, safety helmet, safety gloves, etc.

CAUTION!

- Do not stop the safety switch on the device, and neglect the "Danger" sign, "Warning" sign, "Caution" sign, and "Notice" sign on the device, as well as safety precautions in the document.
- Must stop working at once, report to the relevant person in charge, and activate protection schemes in case of possible danger that may cause human injury and damage to device in the installation and operation process.
- Do not power on during the installation process, or before obtaining confirmation from professionals after finishing installation.
- Do not directly contact power supply device, or contact it with other conductors or wet objects.
- Do not touch the running fan with parts, screws, or installation tools, or keep hands clear when the fan is running, to avoid personal injury or property damage.
- Please evacuate and press the fire bell immediately, or call fire department at once in the case of a fire.

1.3 Environment Requirement

DANGER!

The device installation site shall meet the following requirements:

- Keep away from combustibles and explosive materials.
- Keep away from heat or fire sources, such as fireworks, candles, heaters, or any other heat-producing appliances. It may cause damage to device or a fire.
- Keep away from flammable and explosive gases, or smoky environments.

WARNING!

- The device installation site should keep away from liquid areas, such as positions under a water pipe or air outlet where the condensed water is easy to form, or positions under an air-conditioning vent, ventilation opening or device room outlet where there is access to water. The water can seep into the internal components of the device, causing device damage and short circuits.
- Do not cover vents and cooling systems while running. Otherwise, it may cause a fire or device damage due to the high temperature.
- Do not try to open the cabinet doors on a rainy or high humid day (humidity equal to or greater than 80%). If the cabinet doors happen to be opened on a rainy day, a covering must be arranged to protect the modules in it from water. If the cabinet doors have been opened for over 30 minutes on a highly humid day when the cabinet is off-grid or under grid connection, the operator needs to manually dehumidify. Otherwise, it may not work properly or not connect to the network properly.

CAUTION!

- The storage area should be clean, dry, and well ventilated to prevent dust from entering, and condensed water from generating.
- Strictly observe technical specifications while installing and running the device. Or, it may affect the performance and safety of the device.
- Do not install, run or operate outdoor device or cables (including but not limited to carrying device, operating device, connecting cables, plugging or unplugging cables that connect to outdoor signal ports, working at heights, outdoor installation, etc.) in bad weather, such as thunderstorms, rain, snow, etc.
- Keep away from the following environments while installing the device: environments with dust, smoke, volatile gases, corrosive gases, infrared radiation, organic solvents, or a site with high salt.
- Keep away from environments with metal-conductive or magnetic-conductive dust.
- Keep away from areas suitable for fungus, mould, or other microorganism growth.
- Keep away from areas with strong shaking, serious noise pollution, or powerful electromagnetic interference.
- The installation site must conform to local laws and regulations, and relevant standards.

 **CAUTION!**

- The ground at the installation site must be firm and strong instead of having an adverse geological condition, such as soil with high water content, weak soils, or loose soils. And keep away from low-lying areas since they are prone to water or snow accumulation.
- Keep away from areas prone to water accumulation.
- If the device is installed on a grassy plantation, do weed regularly, and harden the ground under the device, such as cementing, gravelling, etc.
- When the operator plans to install, operate or maintain the device, water, snow, or other objects must be cleared on the top of the device before opening doors to keep them from entering into the device.
- Please check the ground is firm and strong enough to meet the load-bearing requirements of the device while it is being installed.
- Must seal the entry holes.
- Must clean the packing materials, such as cartons, foams, plastic bags, ties, etc., on the site after finishing installation.

1.4 Cabinet, Battery and Electric Safety

To prevent personal injury or property damage from improper operation, please carefully read the following installation precautions before installation.

1.4.1 Cabinet Safety

 **DANGER!**

- A safety helmet, belt, or rope must be worn when performing work at height. If the safety rope is adopted, one end must be securely tied to a strong structural part instead of a movable and unsound object or a metal with sharp edges, to prevent fall incidents due to the slip of the rope hook.

 **WARNING!**

- To ensure that a complete set of tools is prepared, are firm and secure. They must pass the verification of professional authorities. DO NOT use any tools that are broken, failed to verify, or are expired.
- To prevent personal injury or device damage from slopping or collapsing of the cabinet because it is unstable, please check if the cabinet has been secured before placing any devices into it.
- To protect relevant people from injury, take care of the unstable or heavy devices in the cabinet when taking them out.

 **WARNING!**

- Do not drill holes in the device. Otherwise, the sealing performance, electromagnetic shielding performance, or internal components or cables of the device will be destroyed, and it can even cause a short circuit on a circuit board if the metal dust generated by drilling enters into the device.

 **CAUTION!****Safety precautions for lifting and handling heavy devices:**

- To prevent injury from oversize loads, assess the device you're about to lift before you start lifting.
- If more than 2 people lift a device, reasonably arrange to have a balanced weight distribution
- Wear personal protective equipment, such as, safety gloves, safety boots, etc., to prevent needless injuries when lifting devices with bare hands.
- Know the right body posture to prevent personal injuries when lifting devices, for instance, bend at your knees, not at your waist or back, and do not twist your back.
- Hold the handles on the device or put your hands underneath the device to move or lift, and do not hold the handles on the parts installed in it.
- To prevent injuries, do not quickly lift the heavy device above the waist.
- To prevent scratches and dents, or damage to components and cables, avoid impact and falling when moving.
- Be aware of workbenches, slopes, steps, and other places where it is easy to slip when moving devices. Ensure that the passageways are smooth, clean, and away from obstacles.
- To prevent tipover, the forklift's forks must be placed under the load. Center the weight of the load between the forks, and adjust the forks to distribute the weight evenly. Firmly attach the loads to the forks before lifting, and arrange for people to watch for when lifting.
- Sea and road (in good condition) transports are an idea for the device instead of rail and air transports. Transport staff should do their best to avoid bumpiness and inclination as much as possible.

 **CAUTION!****Safety precautions for working at heights:**

- Arrange people to protect workers who work at 2 meters in height or higher.
- Workers who work at 2 meters in height or higher are required to be trained and obtain relevant qualifications.
- In the case of one of the following circumstances, workers should immediately stop operation until the device is inspected and confirmed safe by the relevant safety director and technicians.
 1. Wet steel pipe.
 2. Other situations may be dangerous.

 CAUTION!

- Should mark off a dangerous area, put up Danger signs, and keep unauthorized people from entering the area.
- Should install guardrails and put up "Watch Your Step" and Danger signs at the edges of workplace and holes.
- Do not stack scaffoldings, gangplanks, or other sundries, and keep the ground service staff from staying or passing under the area where the work is being carried out.
- Take caution with the apparatus and tools brought to ensure that they do not fall.

 CAUTION!

Safety precautions for working at heights:

- Workers who work at heights should take advantage of crane slings, baskets, elevating transfer vehicles, cranes, or other methods to transfer objects instead of throwing them from the air to the ground or from the ground to the air.
- Should avoid working on the up and down work platform at the same time. Or, a special protective shed should be built or some protective measures should be taken between two work platforms to protect workers. In addition, do not stack tools and materials on the upper work platform.
- The scaffoldings should be removed from top to bottom instead of being removed at the same time after finishing installation. Take caution when dismantling parts of scaffolding.
- Workers who work at heights must abide by the Safety Regulation for Working at Heights. SolaX will not be liable for personal injury or device damage due to violations of the Regulation.
- Do not play and have a break in the area while working at heights.

 CAUTION!

Ladder safety:

- A wood or insulated ladder should be used when working with electricity.
- A platform ladder with handrails is preferred instead of a straight ladder.
- Check that the ladder is in good condition, make sure that the load bearing meets requirements, and strictly prohibit overload.
- Place the ladder on a solid and firm surface, and designate a person to hold it.
- Balance your body to prevent injuries when climbing.
- Make sure that the rope is fastened and secured when using the herringbone ladder to prevent incidents.

 CAUTION!**Crane safety:**

- Crane operators are required to be adequately trained, and certified and licensed to operate said device before starting work.
- Must install guardrails and put up Warning signs at the crane working area.
- The groundwork for the hoisting operation must meet the load bearing requirements of the crane.
- Make sure that the hoisting tools have been secured to an object or wall that meets the load bearing requirements before hoisting.
- Keep the ground service staff from staying or passing under the crane boom or suspended load where the work is being carried out.
- Do not drag steel wire rope, wire rope slings, etc., and hit hoisting device with hard objects, when hoisting work is being carried out.
- Make sure that the angle between two wire ropes do not exceed 90° when hoisting.

 CAUTION!**Drilling safety:**

- Wear personal protective equipment when drilling, such as safety glasses, safety gloves, etc.
- Avoid drilling around pipes, and light switches and sockets, as the electrical wires can go horizontally and vertically around these fixtures.
- Cover the device to protect it from dusts and debris entering when drilling, and clean it at once after finishing drilling.

1.4.2 Battery Safety

 DANGER!

- Do not connect the positive and negative poles of a battery together. Or, the battery may be short-circuited. A short circuit may cause enormous amounts of current and release large quantities of energy for a short time, which may cause the battery to leak, smoke, release flammable gases, or be in thermal runaway, catch fire, or explode. Therefore, power off the battery before maintenance.
- Overheating the battery can lead to significant risks, including leakage, smoke, release of flammable gases, thermal runaway, fire, or explosion. In case of one of the following circumstances, do not install battery:
 - a. Direct sunlight
 - b. Fire source
 - c. Heater
 - d. Others conditions that can cause overheating
- Never damage the device by crushing, deforming, dropping, impacting, cutting or penetrating with a sharp object. Otherwise, it may cause a fire or leakage of electrolytes;

 **DANGER!**

- Never dismantle, change or damage battery, including penetrating with a sharp object, deforming, soaking in water or other liquids, to keep it away from leakage, smoke, release of flammable gases, thermal runaway, fire or explosion.
- Do not touch battery terminals with any other metal objects, which may cause heat or leak.
- Do not mix different types or makes of the battery pack. It may cause leakage or rupture, resulting in personal injury or property damage.
- The battery electrolyte is toxic and volatile. Never get contact with the leaked liquids or inhale gases in the case of the battery leakage or odor. In such a case, keep away from the battery and contact professionals immediately. Those professionals must wear PPE, such as safety glasses, safety gloves, gas masks, protective clothing, etc., power off the device, remove the battery, and contact technical engineers.
- Normally, the battery will not release any gases since it is an enclosed system. However, in the following situations: burnt, needle-pricked, squeezed, struck by lightning, overcharged, or subject to other adverse conditions that may cause battery thermal runaway, the battery may be damaged or an abnormal chemical reaction may occur inside the battery, resulting in electrolyte leakage or production of gases. To prevent fire or device corrosion, ensure that flammable gas is properly exhausted.
- Take steps to protect human beings from the gases released when burning batteries.

 **WARNING!**

- Install batteries in a dry area. Do not install them under areas prone to water leakage, such as air conditioner vents, ventilation vents, feeder windows of the device room, or water pipes. Ensure that no liquid enters the device to prevent faults or short circuits.
- Equip with fire-fighting device, such as dry sand, carbon dioxide fire extinguisher, etc., when installing and commissioning according to construction standards and requirements. Make sure that the above-mentioned fire-fighting device conforms to local laws, regulations and standards.
- Before unpacking, and in the process of storage and transportation, ensure that the packing cabinets are intact and the batteries are correctly placed according to the labels on the packing cabinets. Do not place a battery upside down or vertically, lay it on one side, or tilt it. Stack the batteries according to the stacking requirements on the packing cabinets. Make sure that the batteries do not fall or get damaged. Otherwise, they will need to be scrapped.
- After packing, the batteries must be correctly placed in accordance with the requirements. Do not place a battery upside down or vertically, lay it on one side, or tilt or stack it. Make sure that the batteries do not impact, fall get damaged. Otherwise, they will need to be scrapped.
- Tighten the screws on copper bars or cables to the torque specified in this document. Periodically confirm whether the screws are tightened, check for rust, corrosion, or other foreign objects, and clean them up if any. Loose screw connections will result in excessive voltage drops and batteries may catch fire when the current is high.
- After batteries are discharged, charge them in time to avoid damage due to overdischarge.

 CAUTION!

- Please read the document carefully before installation, operation and maintenance.
- Charge the battery within the specific temperature range because the low temperature may result in short circuit. Hence, do not charge the battery if the temperature is below the low limit of the operating temperature.
- Ensure that the packing cabinets are intact before unpacking. Do not use if package is damaged, and contact forwarder and manufacturer immediately.
- May leak electrolytes or release flammable gases if the battery is damaged, including dropping, crashing, bulging, or housing indentation. Do not use in the case of the above-mentioned circumstances. Please immediately contact the installer or professional operation and maintenance staff to remove or change the battery in the case of leakage of electrolytes or structural distortion. Keep the damaged battery away from other devices or inflammable and explosive materials, and ensure that non-professional personnel do not contact the damaged batteries.
- Ensure that the pungent and burning smells go away before operating.
- Do not place any objects, like tools, metal parts, etc., on top of the battery. Check and clean them up if any.
- Do not install batteries in rain, snow, fog, or other extreme weather, to prevent moisture or corrosion.
- Do not install batteries after moisturizing, transport to an isolation area, and be scrapped.
- Check if the shell of the battery is deformed or damaged before installing. If yes, do not install it.
- Check whether the positive and negative terminals of the battery are accidentally grounded. If yes, disconnect them.
- Do not welt or grind near the battery. Because an electric spark or arc may cause a fire.
- Store or recharge the battery according to the document if it is not used for a long time.
- The devices used to charge or discharge the batteries must meet the requirements of local laws, regulations, and standards.
- Power off the battery when installing and maintaining.
- Inspect the damaged battery to ensure that there is no smoke, fire, leakage of electrolytes, or heat in the period of storage.
- Do not touch the battery when it fails because of the high temperature of the surface.
- Do not step, against, or stand on the battery.
- The batteries are not allowed to be used to provide a backup power source in the following circumstances:
 - a. Medical device that is directly related to human health.
 - b. Device, like trains, elevators, etc., that may cause injuries to human beings.
 - c. Computer systems that play an important role in societies and institutions.
 - d. Nearby area with medical device.
 - e. Other devices that play a similar role, as described above.

NOTICE!

Short-circuit protection

- Use electrical tape to wrap the exposed wire outwards to prevent short circuit when installing and maintaining.
- Prevent any object from entering into batteries.

NOTICE!

In case the battery module leaks electrolyte or any other chemical materials, or gas may be generated due to the leakage of battery module, be sure to avoid contact with the discharge at all times. In case of accidentally coming into contact with them, please do as follows:

- In case of inhalation: Leave the contaminated area immediately, and seek medical attention at once;
- In case of contact with eyes: Rinse eyes with running water for 15 minutes, and seek medical attention;
- In case of contact with skin: Wash the contacted area thoroughly with soap, and seek medical attention;
- In case of ingestion: Induce vomiting, and seek medical attention.

NOTICE!

If a fire breaks out where the battery module is installed, please do as follows:

- In case the battery module is charging when the fire breaks out, provide it is safe to do so, disconnect the battery module circuit break to shut off the power charge;
- In case the device is not on fire yet, use a Class ABC fire extinguisher or a carbon dioxide extinguisher to extinguish the fire;
- If the battery module catches fire, do not try to put out the fire, and evacuate immediately.
- The battery module may catch fire when it is heated above 302°F/60°C; and in case of catching fire, it will produce noxious and poisonous gas, DO not approach and keep away.

NOTICE!

Effective ways to deal with accidents:

- In case of the damaged battery module, place it into a segregated place, and call the local fire department at the place where the user lives or qualified personnel.
- If any part of the battery module, or wiring is submerged, do stay out of the water and do not touch anything; If the battery module gets wet, don't touch it.
- If the battery module is damaged, don't use it. Otherwise, it may result in both personal injury and property damage.
- Don't use the submerged battery module again, and contact the qualified personnel

NOTICE!**Recovery of damaged or wasted battery:**

- Dispose of the damaged or wasted batteries according to local laws and regulations instead of placing them in the household trash or in curbside recycling bins. Otherwise, it may cause environmental pollution or explosions.
- Contact our company or a battery recycling company to scrap the battery, if it leaks electrolytes, or is damaged.
- Contact a battery recycling company to scrap batteries if they are expired.
- Keep the damaged or wasted batteries away from high temperatures and direct sunlight.
- Ensure that the damaged or wasted batteries are not exposed to the following environments: high humidity, corrosion.
- Do not recycle the damaged or wasted batteries for a second use, and immediately contact a battery recycling company to scrap them. Or, it may cause environmental pollution.

1.4.3 Electrical Safety**⚠ DANGER!**

- Before wiring, check that the device is intact to prevent electric shock or a fire.
- Improper operation may cause a fire, electric shock, etc.
- Prevent any objects from entering into the device when operating. Otherwise, the device may be short-circuited or damaged, the load's power supply may be derated or powered off, or personal injuries may occur.

⚠ WARNING!

- A device required to be grounding must be grounded firstly when conducting wiring. The PNGD cable must be disconnected finally after removing any other cables.

⚠ CAUTION!

- Do not install cables near air inlet (or outlet) of the device.

NOTICE!

- Please strictly follow the steps described in the document before installing, operating and maintaining the device. Do not modify or change the device, and adjust the installation procedure.
- Permission shall be obtained from the state or local electrical department before conducting the grid connection.
- Abide by the safety regulations stipulated by the power station.
- Mark off an operation area, install a temporary fencing or rope, and put up "No Entry" signs.
- Power off the device and shut down switches before connecting or disconnecting power cables.
- Power off the device at once and do not use again if there are any liquids entering into it.
- Check and confirm whether the tools meet the requirements described in the document before operating the device, and be registered. Check whether the number of tools is correct after installing and operating it.
- Check that the icons on the cable labels are correct before connecting power cables. Ensure that the terminals are completely covered with insulation.
- Ensure that protective shell or insulation sleeving on the electrical components are correctly installed to protect operators from electric shock.
- In the case of multiple inputs, disconnect them first; do not operate the device until it is completely powered off.
- Turn off the corresponding output switch of the power supply device while maintaining electrical terminal device and power distribution device connected to the power supply device.
- Must put up "Do Not Switch On" signs and warning signs, to prevent power connection. Do not switch on before the fault is repaired.
- Must follow the steps below if the device needs a power cut in the process of fault diagnosis and troubleshooting: power cut > electricity testing > connecting grounding cable > putting up warning signs and installing guardrails.
- Periodically check whether the screws are tightened fully.
- Only professionals can change the damaged cables.
- Do not alter, damage or obscure the logos and labels attached to the devices.
- Do not clean the internal and external parts of the device with solvents, like water, alcohol or oil.

NOTICE!**Grounding requirement:**

- The device grounding impedance shall meet the requirements of the local electrical code.
- The device shall be permanently connected to a grounding wire within the building's electrical system. Check that the device is reliably grounded.
- Do not operate the device before connecting it to the device grounding connector.
- Do not damage the device grounding connector.
- Make sure that the grounding pin in the 3 pin plug is connected to a grounding wire within the building's electrical system in the case of the 3 pin plug.
- In the case of high-current device, it shall be ensured that the protective grounding terminal of the device shell has been grounded.

NOTICE!**Wiring requirement:**

- Must abide by the local laws, regulations and standards to select, install, and route cables.
- Do not circle or twist cables. Change the power cable if the cable length is insufficient instead of joining it.
- Make sure that cables are secured and well-insulated, and meet specifications.
- Cable troughs or holes must be smooth, burr-free working surface to prevent cable damage.
- Suggest to use cable ties to bind cables to ensure that the cables inside the cabinet are tidied, and to prevent cable jacket damage. Do not circle or twist cables.
- Use fireproofing mud immediately to seal the cable holes if you need to leave for a while after finishing wiring or in the process of wiring, to prevent water vapor and small animals.
- If the external conditions (routing method, temperature, etc.) change, the cable type must be verified according to IEC-60364-5-52 or local laws, regulations and standards. For instance, verify whether the cable ampacity meets the requirements.
- The cable insulation layer may be aging, and even damaged in a high temperature environment. Therefore, at least 30 mm of distance shall be kept between the cables and heater or periphery of heat sources.
- Do as follows to prevent cables from brittle cracking due to shocking or shaking in the low temperature environment, and ensure operation safety:
 - a. Handle gently when installing cables in a low temperature environment above 0°C.
 - b. Must move the cables indoors and leave them for more than 24 hours before installing them, if the previous storage temperature is below 0°C.
- Do not throw cables to prevent damage and deteriorate performance, such as current capacity, temperature, etc.

NOTICE!

The static electricity generated by human beings can damage the static-sensitive components on the board, like large scale integrated circuit. Therefore, please follow the steps below to prevent static electricity:

- Operators must wear anti-static clothing, and anti-static gloves or wrist straps before contacting the boards, modules with exposed circuit boards, or application specific integrated circuits (ASIC). If the anti-static wrist strap is used, hook up the metal clip that's on one end to a grounded and unpainted metal surface.
- Hold the circuit board or the modules with exposed circuit board by its edges without components. Do not contact the components.
- Use anti-static materials to pack the removed boards or modules before storage or transportation.

1.5 Safety Instructions of PV, Inverter and Grid

Save these important safety instructions. Failure to do so may result in damage to the inverter and injury or even loss of life.

1.5.1 Safety Instructions of PV

DANGER!

Potential risk of lethal electrical shock associated with the photovoltaic (PV) system

- Exposure to sunlight can result in the generation of high DC voltage by PV modules, which can lead to electric shock causing severe injuries or even death.
- Never touch the positive or negative poles of the PV connecting device, and avoid touching both poles simultaneously.
- Do not ground the positive or negative poles of the PV modules.
- Only qualified personnel can perform the wiring of the PV modules.

WARNING!

- Overvoltage protection with surge arresters should be provided when the PV system is installed. The grid connected inverter is fitted with SPDs on both PV input side and MAINS side.
- Please consult professionals before installing SPDs.

WARNING!

- Make sure that the input DC voltage does not exceed the maximum DC input voltage specified for the inverter. Overvoltage can cause irreversible damage to the inverter, and such damage is not covered by the warranty.

1.5.2 Safety Instructions of Inverter

DANGER!

Potential risk of lethal electrical shock associated with the inverter

- Only operate the inverter if it is in a technically faultless condition. Operating a faulty inverter may lead to electric shock or fire.
- Do not attempt to open the enclosure without authorization from SolaX. Unauthorized opening of the enclosure will void the warranty and can result in lethal danger or serious injury due to electric shock.
- Make sure that the inverter is reliably grounded before any operation to prevent the risk of electric shock causing lethal danger or serious injury.
- Only qualified personnel can perform the installation, wiring, maintenance of the inverter by following this document and the related regulations.

DANGER!

- Prior to any wiring connection, establishing an earth connection is essential.

WARNING!

- During operation, avoid touching any parts of the inverter other than the DC switch and LCD panel.
- Never connect or disconnect the AC and DC connector while the inverter is running.
- Prior to conducting any maintenance, turn off the AC and DC power and disconnect them from the inverter. Wait for 5 minutes to fully discharge the energy.

WARNING!

Potential danger of scalding due to the hot enclosure of the inverter

- Avoid touching the inverter while it is running, as it becomes hot during operation and may cause personal injuries.

WARNING!

- When handling the battery, carefully follow all safety instructions provided in the battery manual. The battery used with the inverter must meet the specified requirements of the series inverter.

CAUTION!

- Make sure that children are supervised to prevent them from playing with the inverter.
- Pay attention to the weight of the inverter and handle it properly to avoid personal injuries.
- Use insulated tools when installing the device, and always wear personal protective equipment during installation and maintenance.

NOTICE!

- If an external Residual Current Device (RCD) is required by local regulations, verify the type of RCD required. It is recommended to use a Type-A RCD with a rating of 300 mA unless a lower value is required by the specific local electric codes. When required by local regulations, the use of an RCD type B is permitted.
- Keep all product labels and the nameplate on the inverter clearly visible and well-maintained.

1.5.3 Safety Instructions of Utility Grid

NOTICE!

- Only connect the inverter to the grid with the permission of the local utility grid company.

2 Product Overview

2.1 System Overview

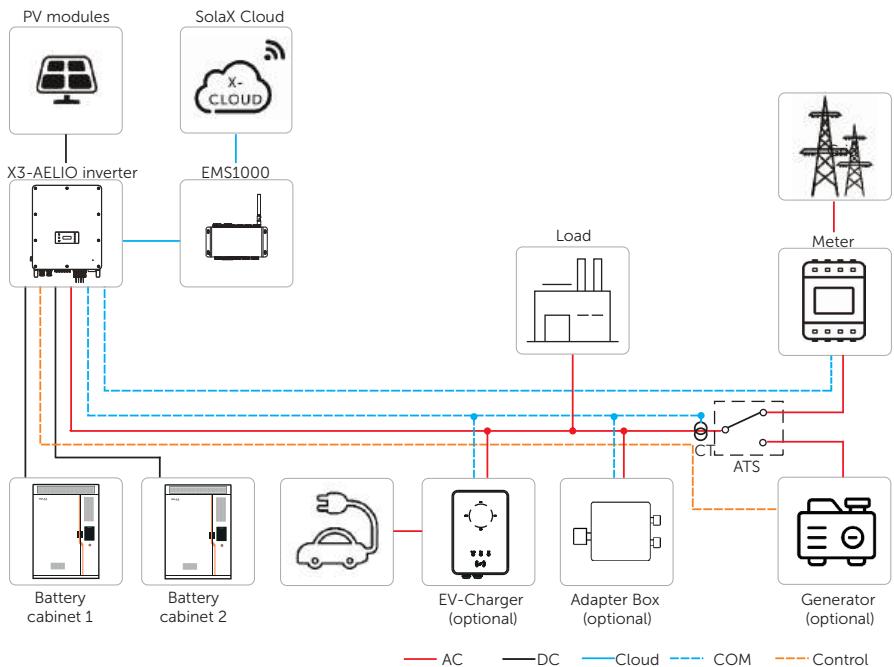


Figure 2-1 System overview diagram

Table 2-1 System item description

Item	Description
X3-AELIO series inverter	The X3-AELIO series inverter manages battery and system energy.
PV modules	PV modules work in MPPT mode. The maximum number of PV MPP tracker is five for 50 kW inverter and six for 60 kW inverter.
Battery cabinet	The AELIO-B200 cabinet integrates high-performance 280Ah LFP battery cells, high voltage box, fire suppression system, air cooling system and optional EMS1000 and screen.
CT/Meter	The CT/meter is used by the inverter for import / export or consumption readings, and manages the battery charge / discharge accordingly for smart energy management applications.
Adapter Box (optional)	With SolaX Adapter Box, you can connect the smart heat pump to the energy storage systems, realizing the control of the heat pump through inverter.
EV-Charger (optional)	The inverter can communicate with SolaX EV-Charger to form an intelligent photovoltaic, storage and EV charging energy system, thus maximizing the utilization of photovoltaic energy.
Generator (optional)	SolaX PV-Genset solution ensures optimum interaction between the photovoltaics and diesel generator, which saves fuel, lowers energy costs and ensures a stable and reliable power supply.
Grid	400 V / 230 V and 380 / 220 V grid are supported. Power grid TT, TN-C, TN-C-S can be supported.
SolaX Cloud	SolaX Cloud is an intelligent, multifunctional monitoring platform that can be accessed either remotely or through a hard wired connection. With the SolaX Cloud, the operators and installers can always view key and up-to-date data. There are two SolaX Cloud platforms. Commercial platform can be connected through EMS1000 connection.

2.2 Product Introduction

The product "AELIO-P50B200" and "AELIO-P60B200", a smart outdoor energy storage system with easy installation and convenient expansion, integrates high-capacity battery packs, a high-performance inverter, smart EMS, high-voltage box, and fire extinguishing system in a cabinet based on the design concept of "ALL-IN-ONE". The industrial and commercial scenarios are designed to be broadly applicable.

The entire system consists of X3-AELIO series inverter, cabinet, battery packs, high-voltage box, distribution box, IO module, EMS, HUB, and UPS.

2.3 Appearance and Dimension

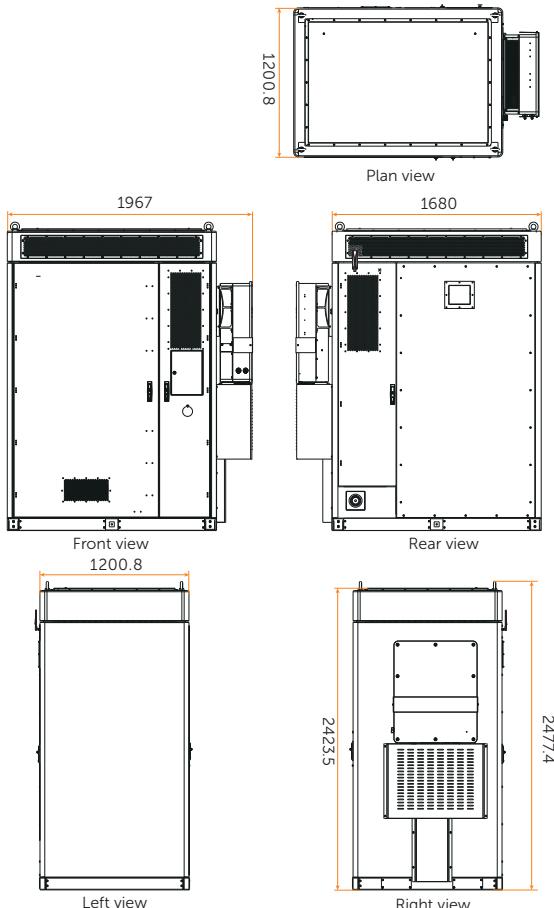


Figure 2-2 Dimension (unit: mm)

2.4 Parts Description

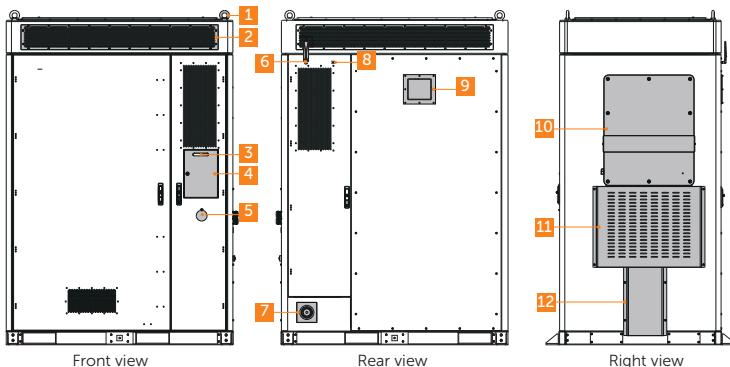


Figure 2-3 Parts description

Table 2-2 Parts description

No.	Item	Description
1	Eye bolt	Material lifting applications.
2	Air conditioner	Energy storage system air conditioner.
3	LED light	To display status information of all processes running on the system.
4	Display screen	To display information of the whole system.
5	Emergency stop button	To shut down the system in emergency circumstances.
6	Antenna	A 4G antenna, to connect EMS.
7	Fire hose nozzle	To connect the water supply sources.
8	A reserved antenna port	To connect wireless meter.
9	Expansion-proof valve	To exhaust the combustible gas out of the cabinet.
10	Inverter	SolaX's X3-AELIO inverter which is not delivered with the cabinet.
11	Large cable cover	To protect and secure cables.
12	Small cable cover	To protect and secure cables.

Inverter

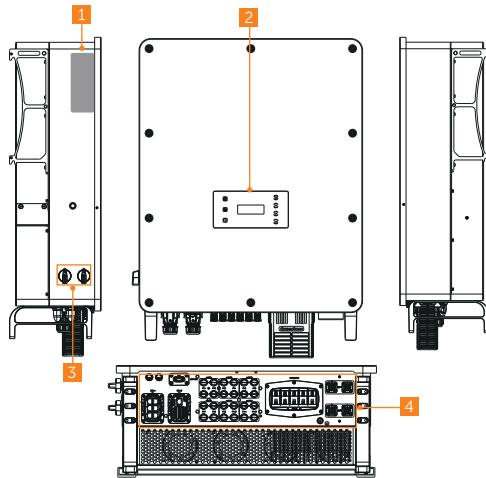


Figure 2-4 Parts description

Table 2-3 Parts description

No.	Item	Description
1	Type label	Type label clearly identifies the device type, serial number, specific DC / AC parameters, certification, etc.
2	LCD panel	Including screen, indicators and keys. Screen displays the information; indicators indicate the status of inverter. Keys are used to perform the parameter setting.
3	DC switch	Disconnect the PV DC input when necessary. DC switch 1 controls MPPT 1, 2 and 3, DC switch 2 controls MPPT 4, 5 and 6.
4	Electrical connection area	Including PV terminals, battery terminals, Grid and EPS terminals, communication terminals, etc.

Battery cabinet

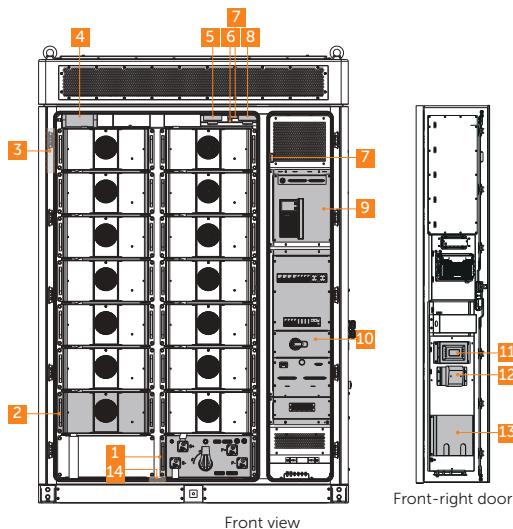


Figure 2-5 Parts description (in the opened state)

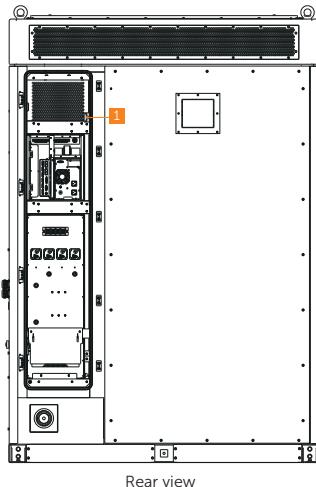
Table 2-4 Parts description

No.	Item	Description
1	High-voltage box	To collect current and voltage information on battery tower, and control the charge and discharge of battery pack.
2	Battery pack	/
3*	Temperature and humidity sensor	To measure temperature and humidity.
4	Automatic fire sprinkler	To control or suppress the spread of fire
5	Temperature sensor	To detect temperature.
6	CO detector	To detect CO gases.
7	Door sensor	To alert you when the door is open.
8	Smoke detector	To detect smoke.
9	Control area	Including IO module, EMS, UPS, etc.
10	Distribution box	To distribute AC power for the energy storage system.
11	Control panel of air conditioner	To monitor the air conditioner and show relevant parameter.

No.	Item	Description
12	Audible and visible alarm	To alter you when the abnormal conditions occur, such as temperature, smoke.
13*	File pocket	To put documents.
14	Water sensor	To detect water level based on the principle of potential difference between the two electrodes.

NOTICE!

- The mark "*" indicates that parts in the front view (Figure 2-7) cannot be fully seen.



Rear view

Figure 2-6 Parts description (in the opened state)

No.	Item	Description
1	Door sensor	To alert you when the door is open.

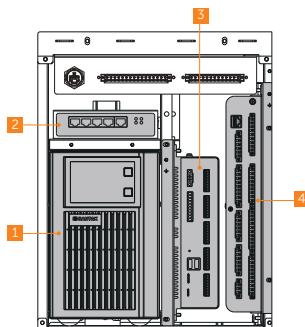


Figure 2-7 Parts description (control area)

Table 2-5 Parts description

No.	Item	Description
1	UPS	To provide backup power to ensure that the device is in a normal operating condition.
2	HUB	/
3	EMS	A energy management system.
4	IO module	To collect signal and control other modules.

High-voltage Box

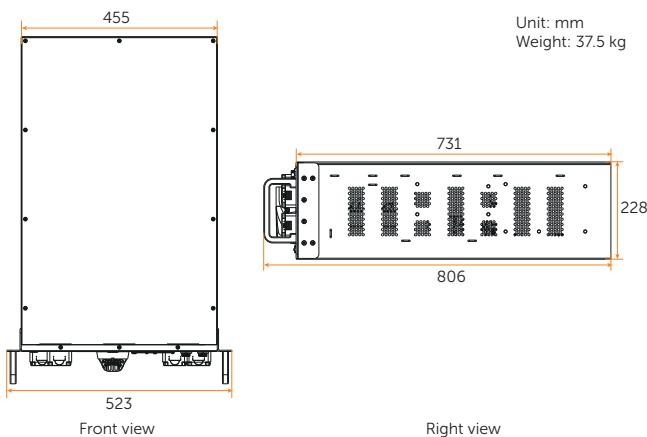


Figure 2-8 Dimension and weight

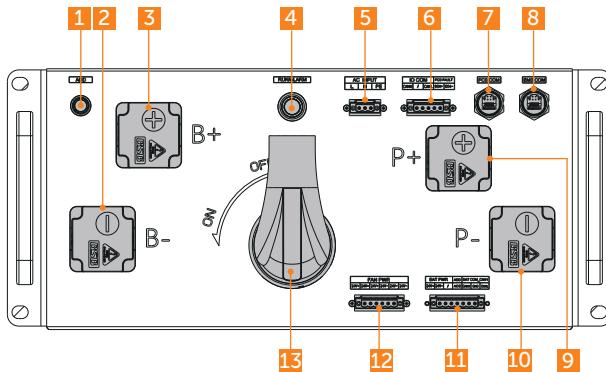


Figure 2-9 Front panel

Table 2-6 Description of front panel

No.	Item	Description
1	ADD button	To assign address.
2	Negative output port	To connect battery pack's negative terminal.
3	Positive output port	To connect battery pack's positive terminal.
4	Power button / status light	To start up or shut down system.
5	AC220V input terminal block	To connect distribution box's CZ1.
6	Communication terminal block (for IO module)	To connect the IO module's CAN port and dry contact of the inverter.
7	Communication port (for inverter)	To connect inverter's communication port.
8	Communication port (for EMS)	To connect EMS's communication port.
9	P+ port	To connect inverter's positive terminal.
10	P- port	To connect inverter's negative terminal.
11	Terminal block (for battery pack)	To connect battery pack's communication cable and power cable.
12	Terminal block (for fan)	To connect fan's power cable.
13	Disconnect switch	To disconnect the device on the DC side.

Battery pack

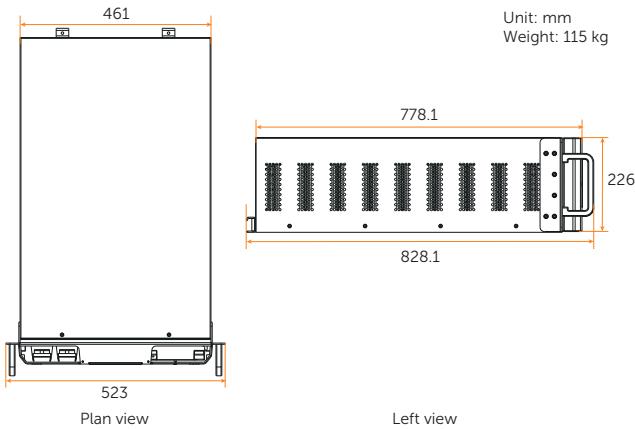


Figure 2-10 Dimension and weight

In the closed state

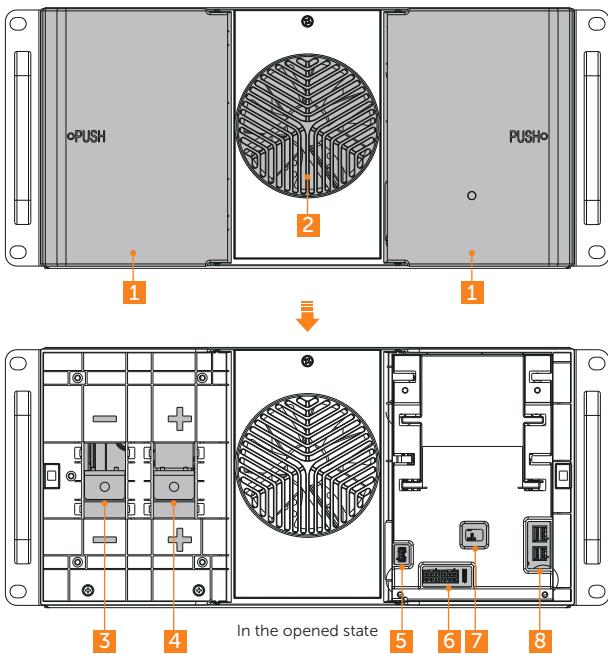


Figure 2-11 Front panel

Table 2-7 Description of front panel

No.	Item	Description
1	Left/right door	Please open the door while wiring.
2	Fan	To keep components cool in the cabinet.
3	Negative terminal	To connect negative terminal of high-voltage box or battery pack.
4	Positive terminal	To connect positive terminal of high-voltage box or battery pack.
5	Connection port (for fan)	To connect the fan.
6	Power connector (for fan)	To provide power to the fan.
7	BMS's status light	To display the running status of BMS.
8	Communication port	To connect communication cable.

Distribution box

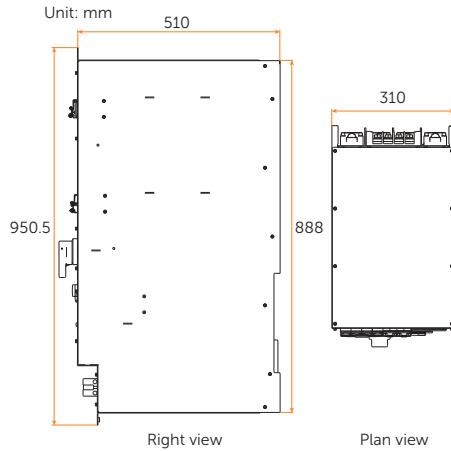


Figure 2-12 Dimension

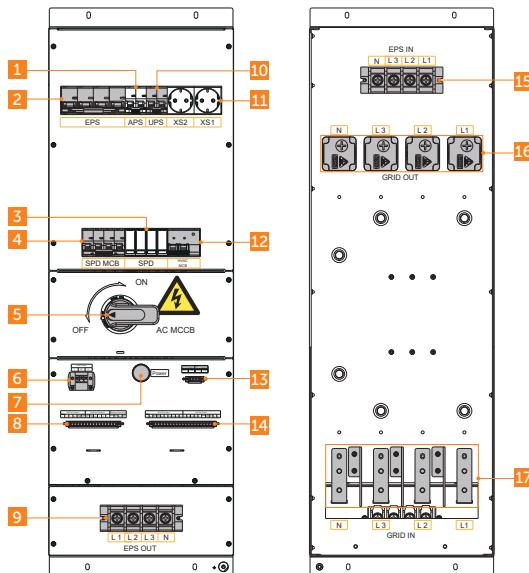


Figure 2-13 Front panel

Table 2-8 Description of front panel

No.	Item	Description
1	EPS breaker	EPS protection breaker.
2	Auxiliary power breaker of high-voltage box	/
3	Current terminal	To connect to the grid.
4	SPD maintenance breaker	/
5	Breaker handle	A switch for AC side.
6	Power supply port for air conditioner	To connect to the air conditioner.
7	LED light	To display the operation state.
8	220 V power supply port for controlling emergency stop switch	Provides 220V power for other devices in the cabinet. To manually turn off AC side for emergency.
9	EPS out	Connect EPS to loads.
10	UPS breaker	To protect UPS breaker.
11	Socket	Power socket.

No.	Item	Description
12	Air conditioner/liquid cooling unit on/off breaker	/
13	Circuit breaker's electrical control signal	To remotely turn off AC power for emergency.
14	24V power supply port	To provide power supply for the devices inside the cabinet.
15	EPS in	/
16	Grid out wire connector	For AC side
17	Grid in wire connector	Port for connecting to power grid.

IO module

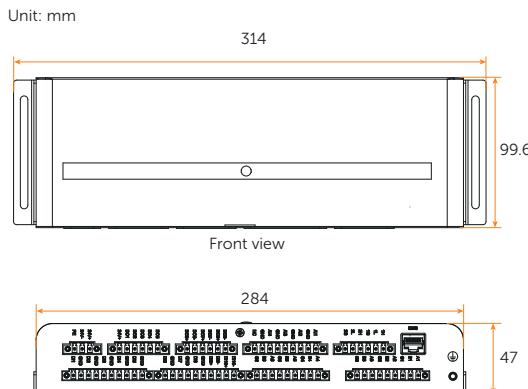


Figure 2-14 Dimension

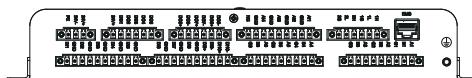


Figure 2-15 Electric panel

Other parts

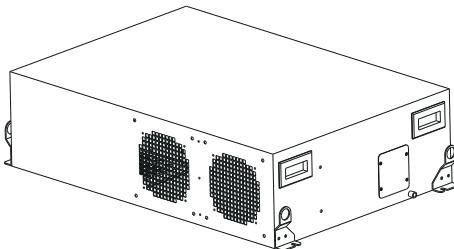


Figure 2-16 Appearance of air conditioner

NOTICE!

- Please refer to when "[11.4.1 Disassembly and Clean of Air Conditioner Filter](#)" it's time to clean or replace the air conditioner filter.

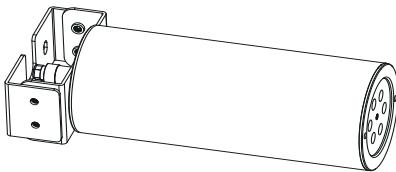


Figure 2-17 Appearance of automatic fire sprinkler

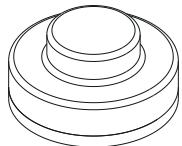


Figure 2-18 Appearance of temperature sensor

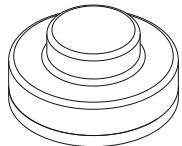


Figure 2-19 Appearance of smoke detector

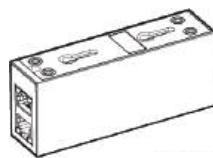


Figure 2-20 Appearance of CO detector

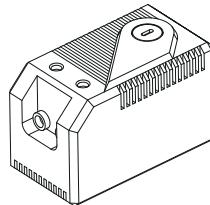


Figure 2-21 Appearance of temperature and humidity sensor

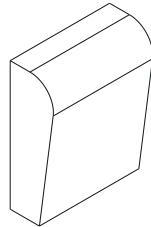


Figure 2-22 Appearance of audible and visible alarm

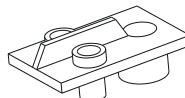


Figure 2-23 Appearance of water sensor



Figure 2-24 Appearance of door sensor

2.5 Indicator

Cabinet's LED light

The cabinet is equipped with a tri-colour indicator (green/yellow/red) to show the system operating status.

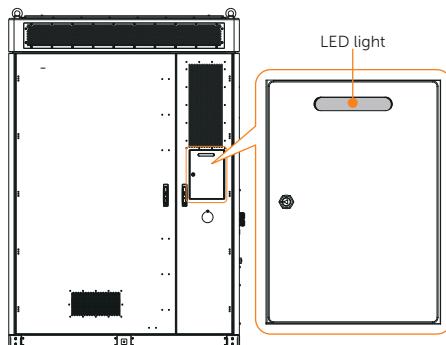


Figure 2-25 LED light

Table 2-9 Description

Status		Description
Solid yellow light		Light on In standby
Solid green light		Light on In operation
Solid red light		Light on System failure

Hight-voltage box's indicator light

The box is equipped with a bi-colour indicator (green/red) to show its operating status.

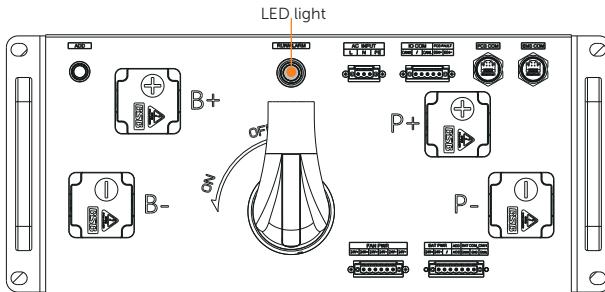


Figure 2-26 LED light

Table 2-10 Description

Status	Description
Flashing green light	Blinking
Solid green light	Light on
Solid red light	Light on
	System failure

Battery pack's LED light

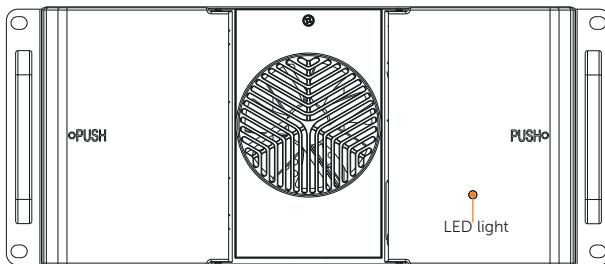


Figure 2-27 LED light

Table 2-11 Description

Status	Description
Flashing green light	Blinking
	In operation

Inverter control panel

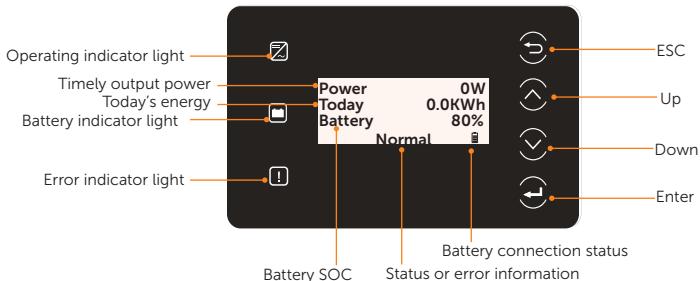


Figure 2-28 Control Panel

Table 2-12 Description

LED indicator	Status	Definition
		Light on The inverter is in a normal state.
		Blinking The inverter is in a waiting or checking state.
		Light on The inverter is in a fault state.
		Light on One of the battery terminal is connected in a normal state at least.
		Blinking Both of the battery terminals are connected are in an idle state.
		Solid display One of the battery terminals is connected normally at least.
		Blinking Both of the battery terminals are disconnected.

2.6 Symbols

Table 2-13 Description of symbols

Symbol	Description
	CE mark of conformity.
	TUV certification.
	RCM mark of conformity
	Protective grounding point.
	Grounding point.
	Caution, hot surface. The enclosure temperature may be high while running. Therefore, do not contact to avoid scalding.
	Danger, electric shock. Do not touch the device after it is powered on. Otherwise, an electric shock may occur.
	Danger. Due to possible risks, do not touch the device after it is powered on.
	Observe enclosed documentation.
	The device cannot be disposed together with the household waste.
	Do not operate the inverter until it is isolated from mains and on-site PV generation suppliers.
	Danger of high voltage. Do not touch live parts for 15 minutes after disconnection from the power sources.
	Danger to life due to high voltage. Residual voltage exists after the inverter is powered off, which needs 5 minutes to fully discharge. Wait 5 minutes before attempting any service.
	The battery system must be disposed of at a proper facility for environmentally-safe recycling.



The battery module may explode.

The rechargeable battery can become hot during operation. Avoid touch during operation.



Keep the device away from children.



Keep the device from open flames or ignition sources.

2.7 Working Mode

Six working modes are available for you to choose in on-grid status, i.e Self use, Feed-in priority, Backup, Peak shaving, Schedule and Manual. You can choose the working modes according to your lifestyle and environment.

When the power supply from the electric power company is stopped due to a power outage, it automatically switches to EPS mode and connects to the distribution board for a specific load, thereby providing power to important electrical appliances.

For how to set the working mode, please refer to the X3-AELIO Series User Manual.

2.7.1 Self-use Mode (Priority: Loads > Battery > Grid)

The self-use mode is suitable for areas with low feed-in subsidies and high electricity prices. The power of PV will supply the loads first, and the surplus power will charge the battery, then the remaining power will feed into the grid.

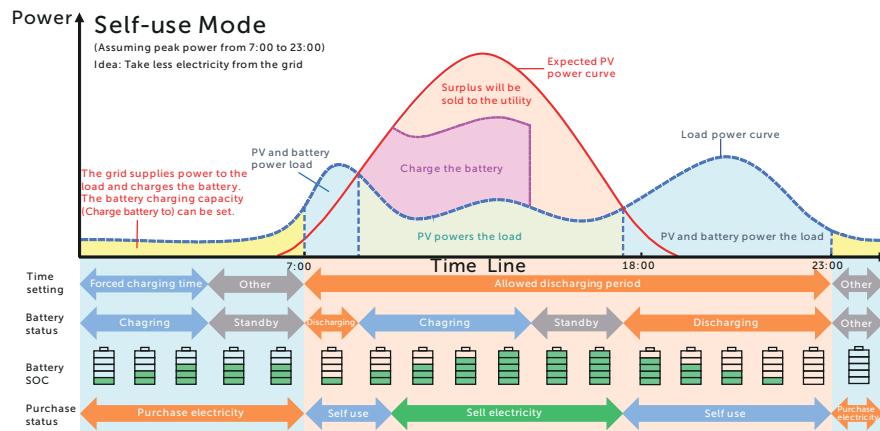


Figure 2-29 Self-use mode

Table 2-14 Description of self-use mode

Time period	Inverter working status
Forced charging period	<ul style="list-style-type: none"> Charge the battery firstly until the battery SOC reaches the specified Charge battery to value. You can configure the inverter to either draw power from the grid or not.
Allowed discharging period	<p>PV is sufficient (PV → load → battery → grid)</p> <ul style="list-style-type: none"> The power generated from PV prioritizes supplying the load. Any excess power is then directed towards charging the battery, and if there is still surplus electricity, it can be sold to the grid. In the event that the local utility restricts the sale of electricity to the grid, the export control value can be set on the inverter. <p>PV is insufficient (PV+battery → load)</p> <ul style="list-style-type: none"> The battery discharges power to the load, and once its capacity reaches Min SOC, it automatically ceases discharging.

Note:

Charge battery to: The battery SOC charged from grid. 10% by default, the settable range is 10%~100%.

Min SOC: Minimum SOC of the battery under grid connection. 10% by default, the settable range is 10%~100%.

Charge & Discharge period

You can set two configurable working periods: forced charging period and allowed discharging period. The interval not in the charging & discharging period belongs to other time periods.

- Forced charging period (Default period: 00:00~00:00, closed by default)

The priority of forced charging period is higher than all working modes. In the forced charging period, the inverter will charge the battery first until the battery SOC reaches the specified **Charge battery to** value set in each working mode. You have the option to configure the inverter to either draw power from the grid or not.

- Allowed discharging period (Default period: 00:00~23:59)

In the allowed discharging period, the inverter will allow the battery to discharge and charge power in accordance with the working mode and load conditions.

- Period not set as forced charging or allowed discharging period

In this period, the inverter will allow the battery to charge but can not discharge power.

NOTICE!

- The charging and discharging period is only applicable for self-use mode, feed-in priority and backup mode.

2.7.2 Feed-in Priority (Priority: Loads > Grid > Battery)

The feed-in priority mode is suitable for areas with high feed-in subsidies, but has feed-in power limitation. The power generated from PV is directed towards supplying the loads. Any excess power beyond the load requirements will be fed into the grid.

Note: If the amount of electricity sold to the grid is limited, the remaining power will be utilized to charge the battery.

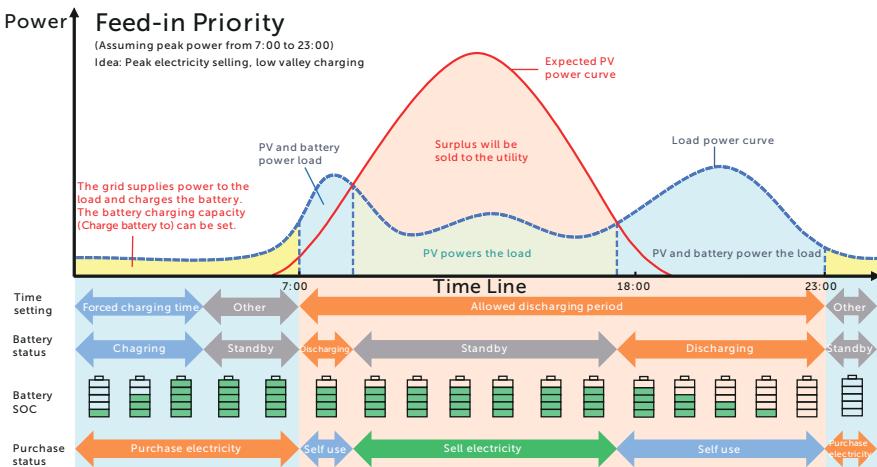


Figure 2-30 Feed-in priority

Table 2-15 Description of feed-in priority

Time period	Inverter working status
Forced charging period	<ul style="list-style-type: none"> Charge the battery firstly until the battery SOC reaches the specified Charge battery to value. You can configure the inverter to either draw power from the grid or not.
Allowed discharging period	<p>PV is sufficient (PV → load → grid)</p> <ul style="list-style-type: none"> The power generated from PV is directed towards supplying the loads. Any excess power beyond the load requirements will be fed into the grid. <p>PV is insufficient (PV+battery → load)</p> <ul style="list-style-type: none"> PV and battery supply power to the load at the same time, and once the battery capacity reaches Min SOC, it automatically ceases discharging.

Note:

Charge battery to: The battery SOC charged from grid. 50% by default, the settable range is 10%~100%.

Min SOC: Minimum SOC of the battery under grid connection. 10% by default, the settable range is 10%~100%.

NOTICE!

- You can set two configurable working periods: forced charging period and allowed discharging period in feed-in priority mode. Please refer to "["Charge & Discharge period"](#) for details.

2.7.3 Backup Mode (Priority: Loads > Battery > Grid)

The backup mode is suitable for areas with frequent power outages.

This mode will maintain the battery capacity at relatively high level to ensure that the emergency loads can be used when grid is off. Same working logic with self-use mode.

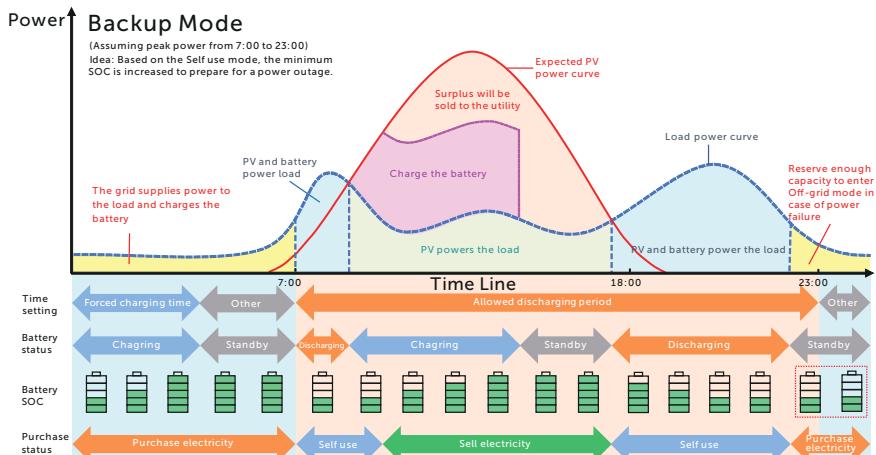


Figure 2-31 Backup mode

Table 2-16 Description of backup mode

Time period	Inverter working status
Forced charging period	<ul style="list-style-type: none"> Charge the battery firstly until the battery SOC reaches the specified Charge battery to value. You can configure the inverter to either draw power from the grid or not.
Allowed discharging period	<ul style="list-style-type: none"> The working logic remains the same as for self-use mode, but it enters a standby state when PV input is not available and the battery SOC reaches Min SOC (on-grid min SOC). In the event of a grid outage, it will switch to EPS mode until the battery discharges to Min SOC (Off-grid min SOC).

Note:

Min SOC (on-grid min SOC): Minimum SOC under grid connection. 30% by default, the settable range is 30%~100%.

Min SOC (off-grid min SOC): Minimum SOC under off-grid conditions. 10% by default, the settable range is 10%~100%.

NOTICE!

- You can set two configurable working periods: forced charging period and allowed discharging period in backup mode. Please refer to "["Charge & Discharge period"](#) for details.

2.7.4 Peak Shaving Mode

Peak shaving mode is set for leveling out peaks in electricity use. The system is intelligently controlled to ensure charging takes place during off-peak hours and discharging occurs during peak hours.

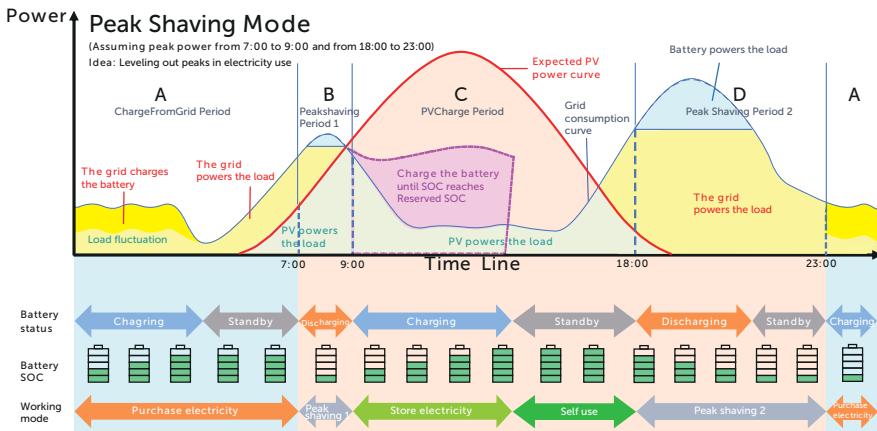


Figure 2-32 Peakshaving mode

Table 2-17 Description of peakshaving mode

Time Period	Inverter working status
Period A	<ul style="list-style-type: none"> The grid can charge the battery to MaxSOC within the set ChargePowerLimits. In this period, the battery will not discharge power.
Period B & D	<p>Grid consumption power < PeakLimits (PV+grid → load)</p> <ul style="list-style-type: none"> The PV and grid will power the load. The battery will not charge or discharge power.
Period C	<p>Grid consumption power > PeakLimits (PV + battery+grid → load)</p> <ul style="list-style-type: none"> The battery will discharge energy for loads and thus reduce the amount of energy purchased from the grid.
Note:	

MaxSOC: The energy taken from grid to charge the battery. 50% by default, the settable range is 10%-100%.

ChargePowerLimits: The charging power from grid. 1000 W by default, the settable range is 0-60000 W

PeakLimits: The load consumption from grid side. 0 W by default, the settable range: 0-60000 W.

Reserved SOC: The lower limit of battery SOC required for later peak shaving period. 50% by default, the settable range is 10~100%.

2.7.5 TOU Mode

In the TOU mode, different working modes, i.e Self-use, Charging, Discharging, Peaking shaving and Battery off can be set for different time periods in accordance with actual needs and environment conditions through SolaX Cloud App or Web.

The day can be divided into up to 24 time slots, and the minimum time slot is 15 minutes, independent working mode can be set for each time slot. Please refer to Web Guide or App Guide for details about how to set the TOU mode.

Time Slot	Working Mode
x:xx~x:xx (e.g 0:00~0:15)	Choose one mode from Self-use / Charging / Discharging / Battery off / Peaking shaving

Note:

Self-use: Same working logic with "Self-use Mode", but it is not limited by the charging and discharging time slots. The priority of PV: Loads > Battery > Grid.

Charging: The power of PV will charge the battery as much as possible to the set SOC of **Charge BAT to (%)**. You can set whether to Charge from grid. The default value of **Charge BAT to (%)** is 100%. When the battery reaches the set SOC, the surplus power will perform "Self-use Mode" or supply to the grid (based on the system setup), at this point, **Charge from grid** is not allowed.

Discharging: If allowed by the battery, the system outputs a specified power from the grid based on the set output percentage, controlling the power at the AC port. You need to set the **RatePower (%)** through Web or App when choosing Discharging mode. When the battery **Discharge to (%)** reaches the set SOC, the inverter performs "Self-use Mode".

Peak Shaving: The working logic is that when the power consumption from the grid exceeds the set **PeakLimit** value, the battery is allowed to discharge power. The excess power beyond the limit is provided by the combination of photovoltaic and battery to ensure that the maximum power purchased from the grid does not exceed the set limit. You need to set the **PeakLimit** value through Web or App when choosing Peak Shaving mode.

Battery off: The battery neither charges nor discharges. The power of PV will supply to loads or the grid. Only when the battery SOC is lower than the system (TOU) **Min SOC**, the battery can be charged.

2.7.6 EPS Mode (Priority: Loads > Battery)

During a power failure, the system will provide uninterrupted power supply to the EPS loads using the power from PV and the battery. It is important to ensure that a battery is installed, and the EPS loads should not exceed the maximum output power of the battery.

The power generated by PV will prioritize supplying power to the loads, while any surplus power will be utilized to charge the battery.

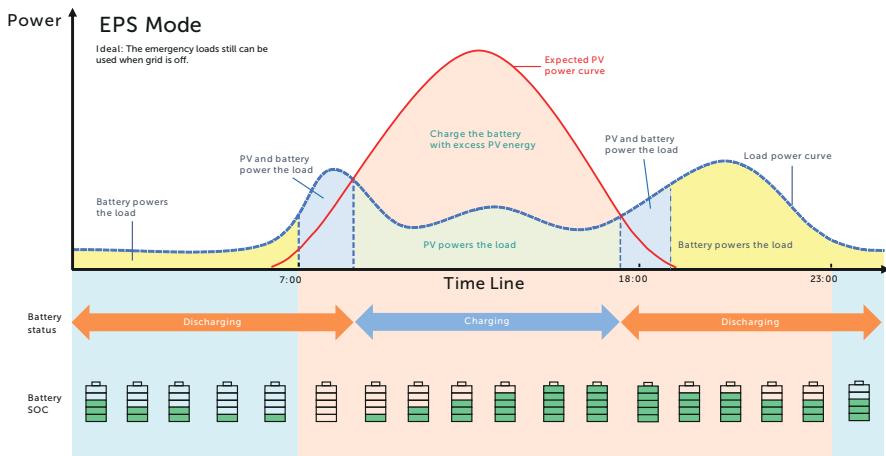


Figure 2-33 EPS mode

Table 2-18 Description of EPS mode

Battery SOC	Inverter working status
Battery SOC >Min SOC (off-grid min SOC)	<p>PV is sufficient (PV → load → battery)</p> <ul style="list-style-type: none"> The PV prioritizes supplying power to the load, with any excess energy being directed towards charging the battery.
Battery SOC ≤Min SOC (off-grid min SOC)	<p>PV is insufficient (PV+battery → load)</p> <ul style="list-style-type: none"> The PV prioritizes supplying power to the load. If the energy is not enough, the battery will discharge power until the battery SOC reaches Min SOC and then error of BatPowerLow will be reported.
Battery SOC ≤Min SOC (off-grid min SOC)	The inverter reports BatPowerLow . When there is PV, it will charge the battery first. After charging to the set Min ESC SOC value, it will be automatically recovered and enter EPS mode again.

Note:

Min SOC: Minimum SOC of the battery under off-grid conditions. 10% by default, the settable range: 10%-100%.

Min ESC SOC: The minimum SOC of the battery to enter EPS mode. 30% by default, the settable range: 15%-100%.

2.7.7 Manual Mode

This working mode is only for the after-sales team to do after-sales maintenance. It includes **Forced Discharge**, **Forced Charge** and **Stop chrg&dischrg**. The system will restore to the original working mode after six hours Manual mode set.

2.7.8 Export Control Function

Solar export control is a limit on the amount of energy that your solar system can export into the grid. You have a set limit on how much energy you can export to the grid.

How export control works

- CT/meter required
- Correct setting of the limit value of **Export Control** through inverter. (For parallel system, set on the master inverter)

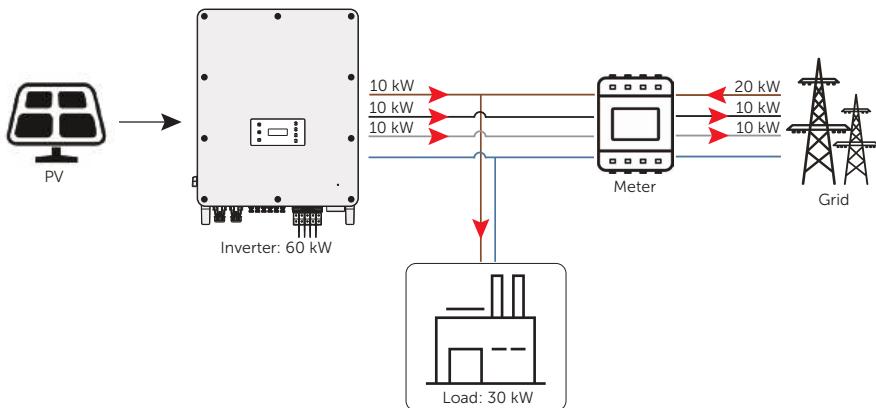


Figure 2-34 Zero export control with **Phase Unbalance** disabled

NOTICE!

- The power taken from the grid is equal to the power fed into the grid.

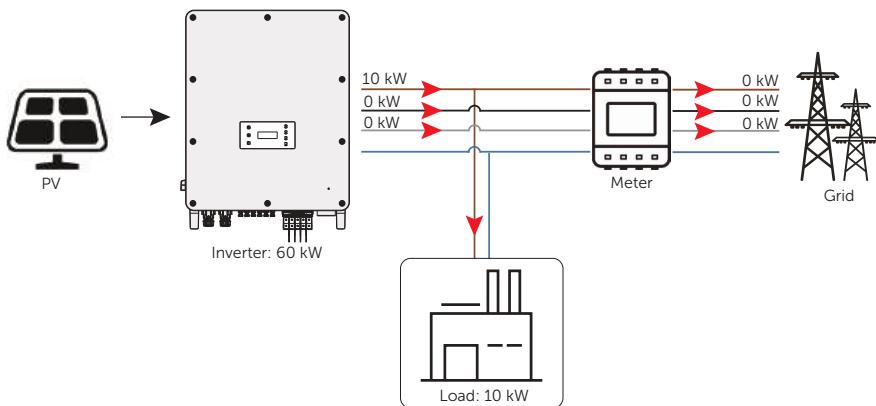


Figure 2-35 Zero export control with **Phase Unbalance** enabled

Note:

Export Control value can be set from 0W to more than the rated output power.

2.8 Application Schemes

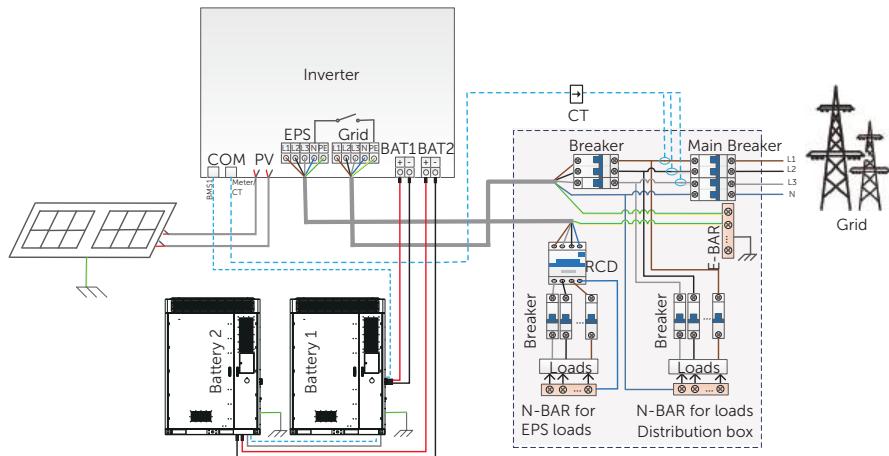


Figure 2-36 Partial load backup for Europe

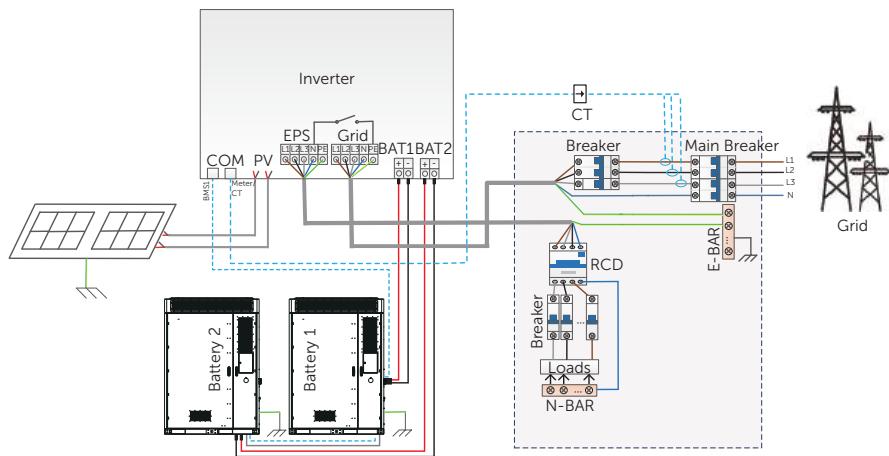


Figure 2-37 Whole load backup for Europe

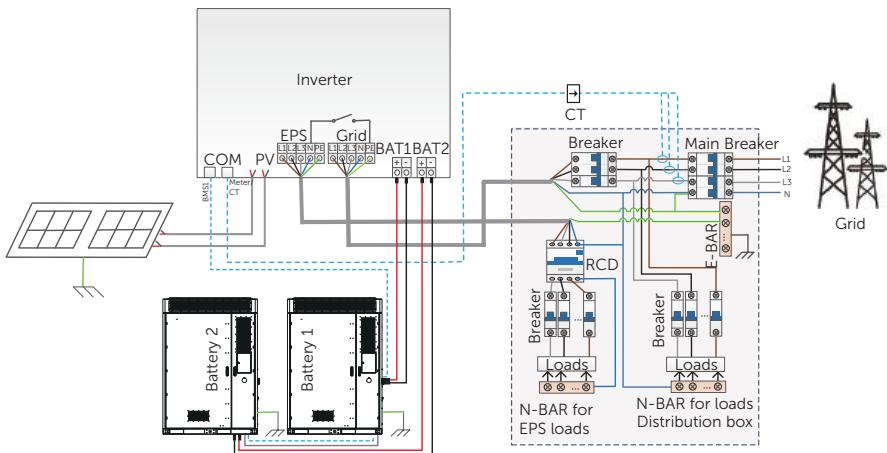


Figure 2-38 Partial load backup for Australia

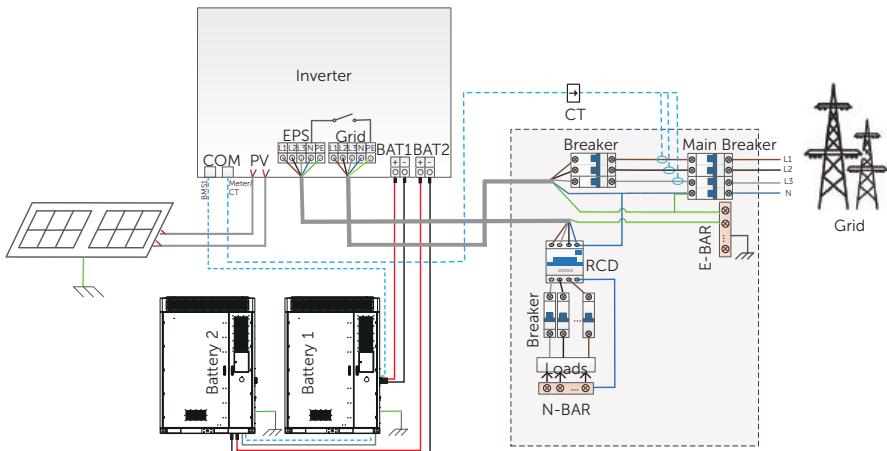


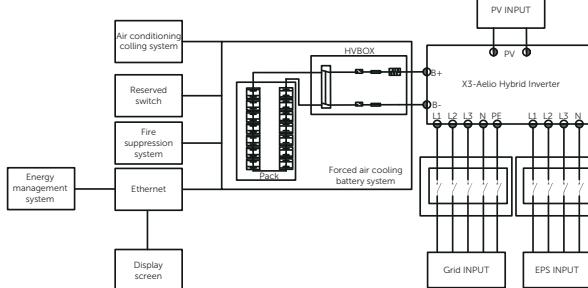
Figure 2-39 Whole load backup for Australia

NOTICE!

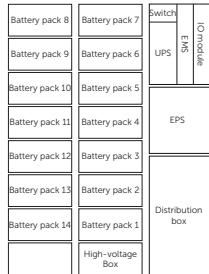
- The BAT 1 and BAT2 terminals of the inverter are positioned vertically, with the positive pole on the left side and the negative pole on the right side. The battery terminals shown in the figure above are for illustrative purposes only, please refer to the actual product for accurate information.

2.9 Operating Principle

System Schematic Diagram



Layout Diagram



AC Auxiliary Power Supply Schematic Diagram

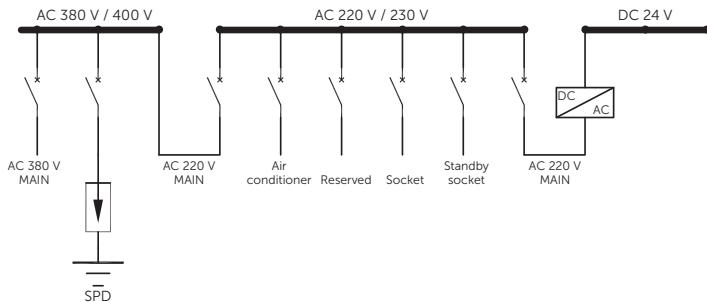


Figure 2-40 Electrical block diagram

NOTICE!

- In an off-grid situation, the current will vary due to the types of electrical loads. The common electrical load can be classified into following types, resistive load, inductive load, capacitive load, half-wave load, etc. Therefore, the types of electrical loads shall be fully considered when designing and configuring a system. In the case of a half-wave load, the load power shall not exceed 1 kW; in the case of an uncertain electrical load, please contact the supplier for evaluation of output supply to special loads.

3 Transportation and Storage

3.1 Transportation

3.1.1 Battery Cabinet Transportation

DANGER!

- Do not disassemble the battery violently. Otherwise, it may lead to battery pack short circuit, damage to the device (leakage, rupture), fire, or explosion.

WARNING!

- Hold the handles on the device or put your hands underneath the device to move or lift, and do not hold the handles on the parts installed in it.
- Strictly follow the document to carry or move the battery pack. Ensure that the device is correctly placed. Do not place a battery upside down or vertically, lay it on one side, or tilt it. And keep away from rain and water.

General requirements are shown as follows:

- Please pay attention to the signs on the package.
- To prevent injury from oversize loads, assess the device you're about to lift before you start lifting.

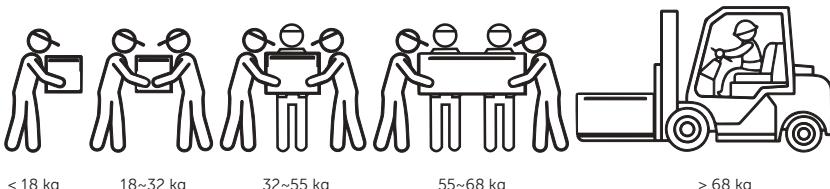


Figure 3-1 Lifting requirement

- If more than 2 people lift a device, reasonably arrange to have a balanced weight distribution
- Wear personal protective equipment, such as, safety gloves, safety boots, etc., to prevent needless injuries when lifting devices with bare hands.
- Know the right body posture to prevent personal injuries when lifting devices, for instance, bend at your knees, not at your waist or back, and do not twist your back.

- Hold the handles on the device or put your hands underneath the device to move or lift, and do not hold the handles on the parts installed in it.
- To prevent injuries, do not quickly lift the heavy device above the waist.
- To prevent scratches and dents, or damage to components and cables, avoid impact and falling when moving.
- Be aware of workbenches, slopes, steps, and other places where it is easy to slip when moving devices. Ensure that the passageways are smooth, clean, and away from obstacles.
- To prevent tipover, the forklift's forks must be placed under the load. Center the weight of the load between the forks, and adjust the forks to distribute the weight evenly. Firmly attach the loads to the forks before lifting, and arrange for people to watch for when lifting.
- Sea and road (in good condition) transports are an idea for the device instead of rail and air transports. Transport staff should do their best to avoid bumpiness and inclination as much as possible.
- The tilt angle of the cabinet must meet the requirement as shown in Figure 3-2. The angle before unpacking: $a \leq 15^\circ$; the angle after unpacking: $a \leq 15^\circ$.

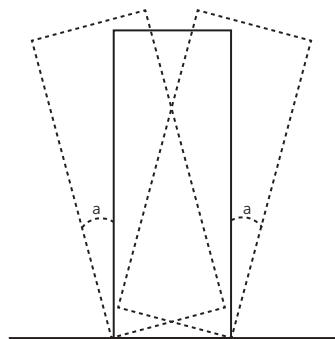


Figure 3-2 Tilt angle

- The battery pack has been certified according to 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--Part 2: Performance Test*. Therefore, the battery pack is classified in Class 9.
- Relevant qualifications for transport of dangerous goods must be obtained by the forwarding agent engaged in such businesses. Do not transport it in an open trailer.
- Strictly abide by the international regulations on the transport of dangerous goods, and meet the supervision requirements stipulated by the transport authority of the departure country, transit country, and country of destination, respectively.

- Before transportation, check that the battery package is intact and that there is no abnormal odor, leakage, smoke, or sign of burning. Otherwise, the batteries cannot be transported.
- The packing case must be secured for transportation. Handle the case with care during loading, unloading, and transportation, and take measures to prevent moisture damage to the device during transportation.
- Handle gently when moving the battery pack to prevent bumping and damage to individuals.
- Unless otherwise specified, dangerous goods shall not be mixed with goods containing food, medicine, animal feed, or their additives in the same vehicle or container.
- Before moving a faulty battery pack (with scorch, leakage, bulge, or water intrusion), insulate its positive and negative terminals, pack it, and place it in an insulated explosion-proof box as soon as possible. Record information such as the site name, address, time, and fault symptom on the box.
- Keep away from flammable material storage areas, residential areas, and other population centers (e.g., public transport, elevators) when transporting the faulty battery pack.

3.1.2 Inverter Transportation

If the inverter is not put into use immediately, the transportation and storage requirements needs to be met:

- Observe the caution signs on the packaging of inverter before transportation.
- Pay attention to the weight of inverter. Be cautious to avoid injury when carrying X3-AELIO (gross weight: 130 kg). Lifting device is recommended.
- The inverter with a package should be transported by forklift to the location where it needs to be placed.

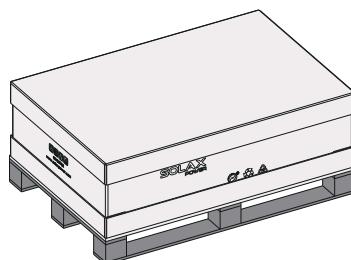


Figure 3-3 Caution signs on the packaging

3.2 Storage

3.2.1 Battery Cabinet Storage

- Do not remove the original packaging material and check the outer packaging material regularly.
- The required storage temperature: -20°C ~ 60°C.
- The relative humidity should be between 5% and 95%.
- Store the device according to the caution signs on the packaging to prevent device damage.

Battery pack storage

DANGER!

- Ensure that batteries are stored in a dry, clean, and ventilated indoor environment that is free from sources of strong infrared or other radiations, organic solvents, corrosive gases, and conductive metal dust. Do not expose batteries to direct sunlight or rain and keep them far away from sources of heat and ignition.
- If a battery is faulty (with scorch, leakage, bulge, or water intrusion), move it to a dangerous goods warehouse for separate storage. And it must be scrapped as soon as possible.
- Store the device according to the caution signs on the packaging to prevent device damage. Do not place a battery upside down or vertically, lay it on one side, or tilt it.
- Store the battery packs in a separate place. Do not store them together with other devices. Do not stack too high. The storage site should be equipped with qualified fire fighting facilities, such as fire sand and fire extinguishers.

NOTICE!

- If a battery pack is stored for a long time, please periodically recharge it to protect from damage. For details, please refer to the table below.

Table 3-1 Maintenance of battery pack

Circumstance	Measure
If the ambient temperature for storage is between 30°C and 50°C	Recharge the battery packs at least once every 6 months
If the ambient temperature for storage is between -20°C and 30°C	Recharge the battery packs at least once every 12 months.
In the first installation	The interval among manufacture dates of battery packs shall not be exceed 3 months.
If a battery module is replaced or added for capacity expansion	Each battery's SOC should be consistent. The max. SOC difference should be $\pm 5\%$.
If users want to increase their battery system capacity	Ensure that the SOC of the existing system capacity is about 40%. The manufacture date of the new battery pack shall not exceed 6 months. If the manufacture date of the new one exceeds 6 months, please charge it to around 40%.

- The required storage temperature, see the following table 3-2.

Table 3-2 Storage temperature and time

Storage Temperature	Storage Time
50°C to 60°C	3 months
30°C to 50°C	6 months
-20°C to 30°C	12 months

- The relative humidity should be between 5% and 95%.
- If the rechargeable battery has been stored for more than 1 year, it must be checked and tested by professionals before use.

3.2.2 Inverter Storage

- The inverter must be stored indoors.
- Do not remove the original packaging material and check the outer packaging material regularly.
- The storage temperature should be between -40°C and +70°C. The humidity should be between 0% and 65%.
- Stack the inverter in accordance with the caution signs on the inverter carton to prevent their falling down and device damage. Do not place it upside down.

4 Preparation before Installation

4.1 Installation Site Selection

Given the importance of the installation site to the security, service life and performance of the device, the site should be selected according to NFPA 855 *Standard for the Installation of Stationary Energy Storage Systems* and local regulations, and based on the principles of wiring, operation and maintenance for convenience.

NOTICE!

- During the installation, commissioning, and operation, fire extinguishers shall be equipped nearby the device according to the fire requirements. The number of fire extinguishers shall be over 2.
- The minimum distance between air exhaust of the device and buildings or other device's heating ports, ventilation opening, air conditioner vent, windows, doors, or hot sources shall be 4.6 m.
- A port for water fire extinguishing system shall be reserved.
- Measures, for instance, setting up water baffles or drainage facilities, or raising the ground, shall be taken in an unavoidable situation, like an installation site where rainwater may accumulate.

The installation site shall meet the following requirements:

- The device is intended only for outdoor use.
- The surface level of the site must be at least 300 mm above the highest water level in the area. Do not install the device in a low-lying area.
- Ensure that no plants have been grown within 3 meters of the site and its surroundings, to avoid wildfires due to the high temperature in the summer which results in device on fire.
- Given safety reasons, the distance between the device and residential housing shall be over 12, as well as at least a distance of 30.5 meters between the device and schools, hospitals, or other population centers. Otherwise, a fire wall must be constructed between the device and buildings.
- The safe distance between the device and industrial buildings shall meet the local fire safety codes and standards.

Table 4-1 Safe distance

	Safe Distance
The safe distance between the device and Class A industrial buildings	≥ 12 m
The safe distance between the device and Class B industrial buildings	≥ 10 m
The safe distance between the device and Class C and D industrial buildings which meet the requirements of Class I and II fire resistance rating	≥ 10 m
The safe distance between the device and industrial buildings which meet the requirements of Class III fire resistance rating	≥ 12 m
If the external wall of the adjacent building with fire-resistant materials, and without windows, doors, and extended eaves, the safe distance shall	(3- 25%*3) m
<ul style="list-style-type: none"> • If the above-mentioned safe distance cannot be met, a fire wall between the device room, storage room, or installation area and Class C, D and E buildings shall have a 3-hour fire-resistance rating. The height and thickness of the fire wall shall be 1 meter over the device. In addition, the factors, such as transportation, installation, and maintenance, should be considered before construction. • Keep away from flammable and combustible. • Convenient transportation and reliable fire suppression systems are required to be equipped at the installation site. • Please reserve enough space for capacity expansion. • The site shall be well ventilated. • Since the salt-damaged and polluted areas may corrode the device, do not install this device in those areas. Please strictly follow the requirements below when installing the device. <ul style="list-style-type: none"> » If the installation site of the device is selected at the coast, the distance from the device to the shore should be over 2000 m. In case the distance from the device to the shore is between 500 m and 2000 m, it is not recommended to install (if the user wants to install here, do not install until gets to an actual approval from the distributor or our company's engineer). Additionally, do not install the device if the distance from it to the shore is less than 500 m. » The distance from the device to the smelters, coal mines, thermal power plants, and other heavy pollution sources should be over 1500 m. » The distance from the device to the chemical plants, rubber plants, electroplate factory, and other moderately polluted sources should be over 1000 m. » The distance from the device to the light pollution sources, such as food processing plants, leather processing plants, heating boiler factory, slaughter houses, dumping sites, and sewage treatment stations, should be over 500 m. 	

Table 4-2 Installation spacing requirements

	Safe Distance
Distance from coastal areas	> 2000 m
Distance from heavy pollution sources, such as smelters, coal mines, thermal power plants	> 1500 m
Distance from moderate pollution sources, such as chemical plants, rubber plants, and electroplate factory	> 1000 m
Distance from light pollution sources, such as food processing plants, leather processing plants, heating boiler factory, slaughter houses, dumping sites, and sewage treatment stations	> 500 m

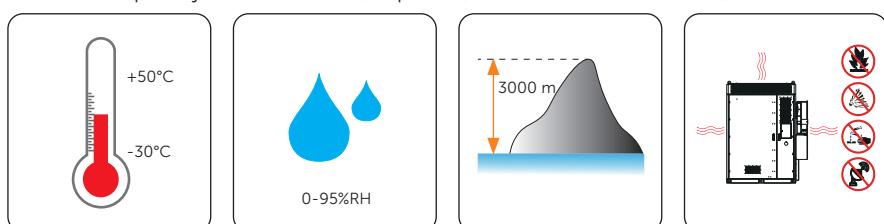
- Keep away from the sand and dust environment.
- Keep away from areas with high vibration, strong noise sources, or strong electromagnetic interference.
- Keep away from places that are easily to generate dust, oil fumes, harmful gases, corrosive gases, etc.
- Keep away from places that store corrosive, flammable and explosive materials.
- Keep away from places where underground facilities have been built.
- Keep away from areas at poor geological conditions (such as rubber soil, weak soil), as well as the waterlogged ground or land subsidence.
- Keep away from places below water reservoirs, water landscapes, and water intake rooms.
- Keep away from seismic zone and earthquake areas of which a seismic fortification intensity is over 9 degrees.
- Keep away from areas where natural disasters (such as debris flow, landslide, quicksand) are likely occur, as well as karst caves.
- Do not install the device within the boundaries of mining subsidence (impact) areas.
- Keep away from an area where there is a risk of explosion.
- Keep away from areas that are likely to be flooded if levees or dams broke.
- Keep away from important water source protection areas.
- Keep away from heritage protected areas.
- Keep away from population centers, high-rise buildings, and underground structures.
- Keep away from intersections of urban main roads and heavily travelled roads.
- Please strictly select the installation site in accordance with the following requirements for flood prevention and rainwater control:

- » The height of the foundation for the large, medium and small electrochemical energy storage systems must be over the highest water level in history.
- » If the installation site cannot meet the above-mentioned requirements, please find another site, or take measures to prevent flooding and waterlogging based on the actual situation.
- » Regarding the energy storage power stations affected by wind and wind-waves from rivers, lakes, and seas, the height of the foundation must be 0.5 m above the highest wave height in history.
- » If a large amount of water flows in or through the foundation, a side ditch or drainage channel is recommended to be built.
- The installation site needs to be equipped with a "Stop" sign:
- » Solid walls or fences around the energy storage device area are recommended to be built. In the case of fences, they have to be lockable, with a height of over 2.2 m. The firewall can be built in place of part or the entire fence based on comprehensive considerations.

4.1.1 Installation Environment Requirements

Installation environment shall meet the following requirements:

- Temperature: -30°C ~ +50°C
- Relative humidity: 0 ~ 95% RH
- Altitude: Below 3000 meters.
- Good ventilation.
- Keep away from flammable, explosive, and corrosive substances, and antennas.



4.1.2 Installation Foundation Requirements

The requirements for foundation are shown as follows:

- The foundation must be made of non-combustible materials, such as solid bricks or concrete. And ensure that the foundation is level, smooth and firm, and has sufficient bearing capacity to withstand the load from the device.
- The bearing capacity of the foundation shall be over 5 t. If the above-mentioned requirement cannot be met, re-inspection is required.

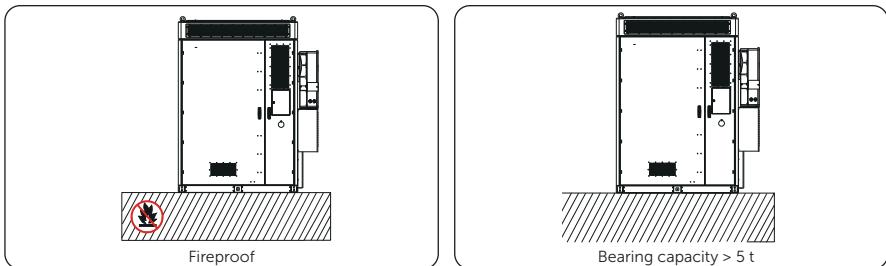


Figure 4-1 Foundation requirement

- The bottom of the foundation pit must be strengthened and filled.
- Do not water or disturb the foundation after starting to dig it. If the foundation is watered or disturbed, continue to dig down and remove the bad soil, and then refill with quality materials.
- The angle of depression between the foundation and cabinet shall be less than 5°, as well as the height of less than 3 mm.
- The foundation is not only higher than the local high-water mark, but also at least 300 mm above the ground.
- Construct drainage facilities based on local geological conditions and municipal drainage standards to ensure that there is no water accumulation at the foundation. The foundation construction should meet the drainage requirements for maximum volume of rainfall in the locality, and the discharged water needs to be treated in accordance with local laws and regulations.
- Dig a trench or reserve a cable entry hole by considering the electrical wiring of the device before construction of the foundation.
- Both the reserved holes on the foundation and the cable entry holes on the device should be sealed.
- The foundation drawing is only for reference, and cannot be regarded as the final construction drawing. Operators shall recheck the basic parameters according to the environment, geological conditions, seismic requirements, etc. of the installation site.
 - » Angle supports installed at front and rear sides;
 - » Angle supports installed at left and right sides.

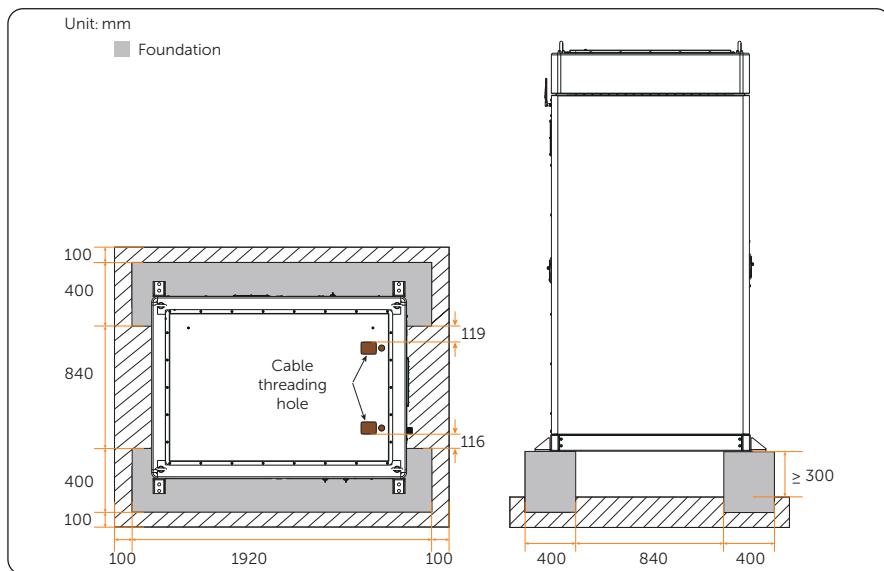


Figure 4-2 Foundation requirements for angle supports installed at front and rear sides

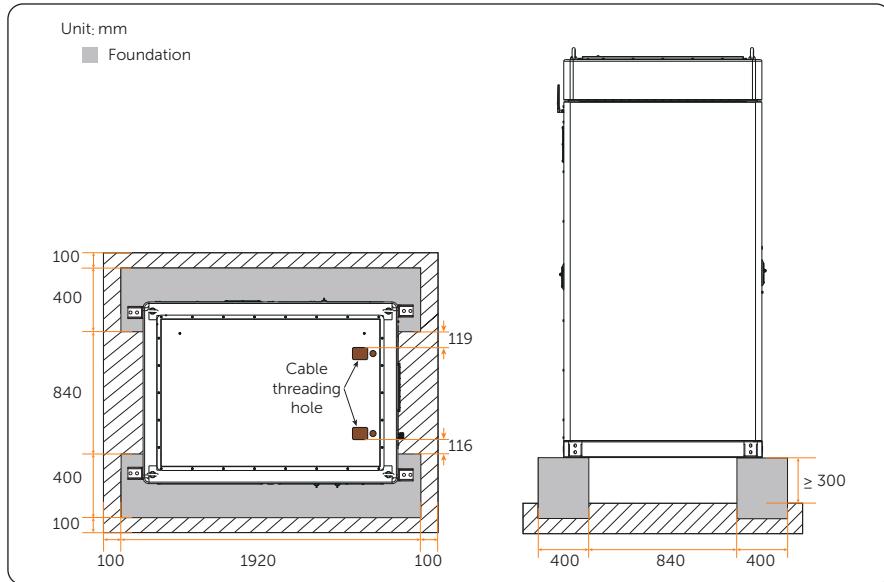


Figure 4-3 Foundation requirements for angle supports installed at left and right sides

4.1.3 Forklift Requirements

- Before using the forklift, ensure that it meets the load requirements: load capacity ≥ 5 t;
- The recommended forklift should meet the following requirements: length of fork blade > 1.2 m, width of fork blade between 80 cm and 160 cm, and thickness of fork shank between 25 cm and 70 cm;

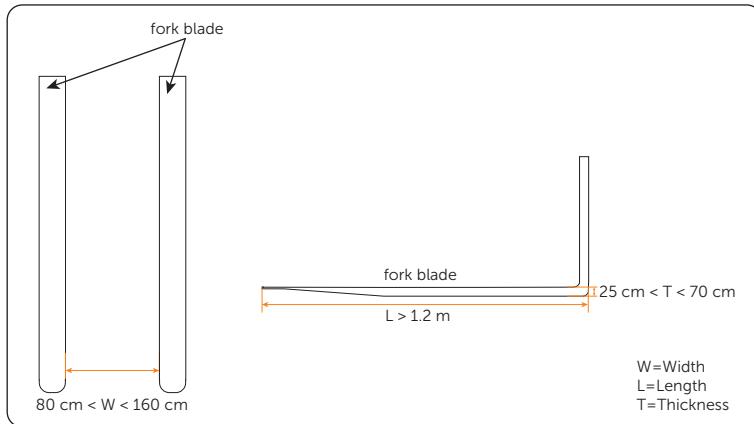


Figure 4-4 Requirements for forklift

4.1.4 Hoisting Requirements

- Ensure that the crane and steel wire rope meet the load-bearing requirements.
- To prevent the cabinet from scratching, do not drag it when installing and removing hoisting device.

Table 4-3 Precaution

Precaution	
Before hoisting	The crane's lifting capacity shall equal or exceed 5 t, as well as the working radius of equaling or exceeding 2 m. If the above requirements cannot be met, it is required to be evaluated by professional personnel.
	A trained and qualified lifting personnel is required.
	Check to ensure that the hoisting tools are in good condition and complete.
	Ensure that the hoisting tools are fixed securely to the fixture or wall that meets the load-bearing requirements.
	Do not operate a hoist if severe weather or wind is apparent when conducting hoisting outdoors.
	Ensure that the crane and steel wire ropes meet the requirements.
	Ensure that all the doors of the device are closed and locked.
	Ensure that the knots among steel wire ropes are securely fastened.
	To ensure that the lifting can proceed successfully, it is suggested to conduct it according to the order from left to right or right to left.
	Keep unauthorized people from entering the area and standing under crane boom.
During hoisting	Ensure that the crane is parked in place and avoid long-distance lifting.
	Keep stability, and dutch angle of the cabinet should be less than or equal 5°.
	Ensure that the angle between the two steel wire ropes is less than or equal 90°.
	To avoid impacting the internal components of the device, the lifting device should be lifted and lowered gently, as well as the cabinet.
	Do not dismantle the steel wire ropes until the cabinet lands smoothly, when it contacts the foundation.
	Do not drag steel wire ropes and lifting tools, and crash the device.
	Do not dismantle the steel wire ropes to hoist the next cabinet until the cabinet lands smoothly.

4.1.5 Clearance Requirement

This device has multiple installation methods:

- Single cabinet (see Figure 4-5)
- Multiple cabinets (see Figure 4-6 and Figure 4-7)

In order to ensure the heat dissipation of the inverter and facilitate disassembly, the minimum space to be reserved around the cabinet must meet the following standards.

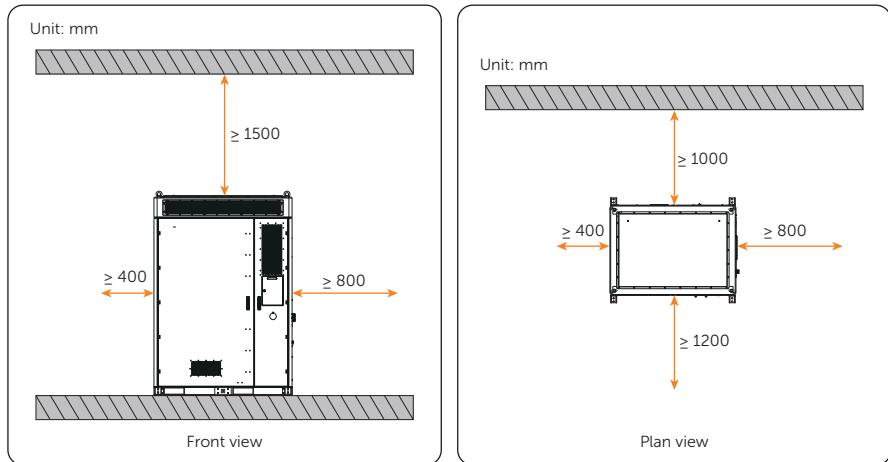


Figure 4-5 Single cabinet

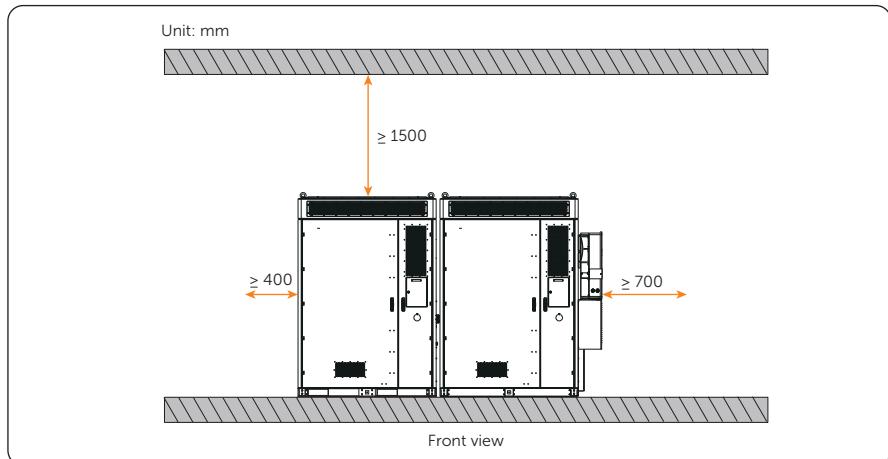


Figure 4-6 2 and more cabinets

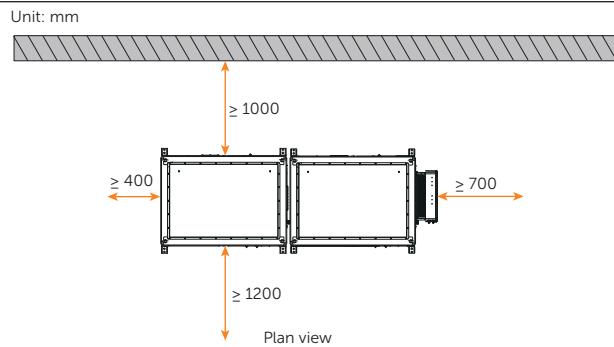
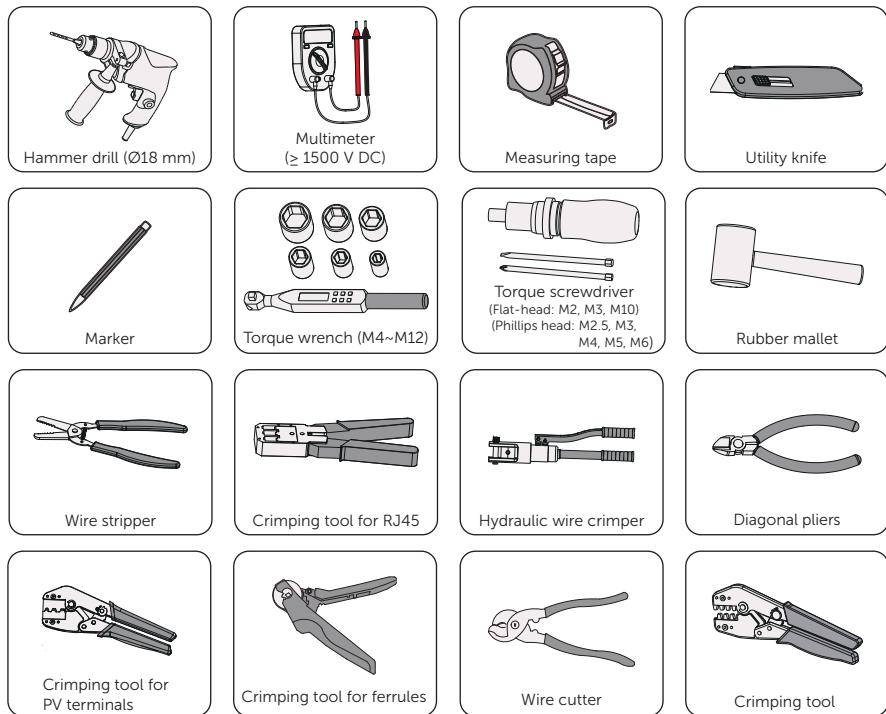


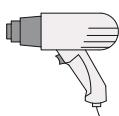
Figure 4-7 2 and more cabinets

4.2 Tools Requirement

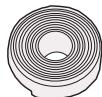
Installation tools include but are not limited to the following recommended ones. If necessary, use other auxiliary tools on site.



Preparation before Installation



Heat gun



Heat shrink tubing
(Ø13, Ø30~60 mm)



Cable tie



Steel pipe
Ø25~30 mm



Insulated ladder



Spirit level



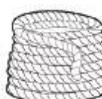
Vacuum cleaner



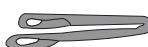
Electric forklift



Crane



Steel wire rope
(Length > 2000 mm)*4



Slings
carrying capacity ≥ 150 kg
length ≥ 0.8 m



Safety belt



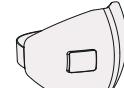
Insulating gloves



Safety boots



Safety goggles



Anti-dust mask



Safety vest



Safety helmet

4.3 Additionally Required Materials

Table 4-4 Additionally required wires

No.	Required Material	Type	Conductor Cross-section
1	PV cable	 Dedicated PV cable with a voltage rating of 1000 V, a temperature resistance of 105 C, a fire resistance grade of VW-1	6 mm ²
2	Communication wire 1	 Network cable CAT5E	/
3	Communication wire 2	 Four-core signal cable	0.25 mm ² -0.3 mm ²
4	Grounding plate	 Galvanized iron plate	Width: 40 mm Depth: 4mm
5	Grid wire	 Five-core copper cable * The conductor cross-section of copper cables connecting to the distribution box (a total of 4 copper cables) is 35 mm ² , as well as 16 mm ² for a copper cable that is connected to the grounding.	35 mm ² * 4 + 16 mm ² * 1
6	EPS wire	 Four-core copper cable * The conductor cross-section of copper cables connecting to the cabinet (a total of 4 copper cables) is 35 mm ² .	35 mm ² * 4
8	Additional PE wire	 Conventional yellow and green wire	> 25 mm ²

Table 4-5 Additionally required materials

No.	Required Material	Type
1	Ring terminal	 TLK16-8 ring terminal

5 Unpacking and Inspection

5.1 Battery Cabinet Unpacking

5.1.1 Unpacking

- The device undergoes 100% testing and inspection before shipping from the manufacturing facility. However, transport damage may still occur. Before unpacking the rechargeable battery, please verify that the model and outer packing materials for damage, such as holes and cracks.
- Due to the cabinet height exceeding 2m, please take necessary precautions for working at heights when removing the outer packaging. The unpacking procedure can be referred to the following Figure.

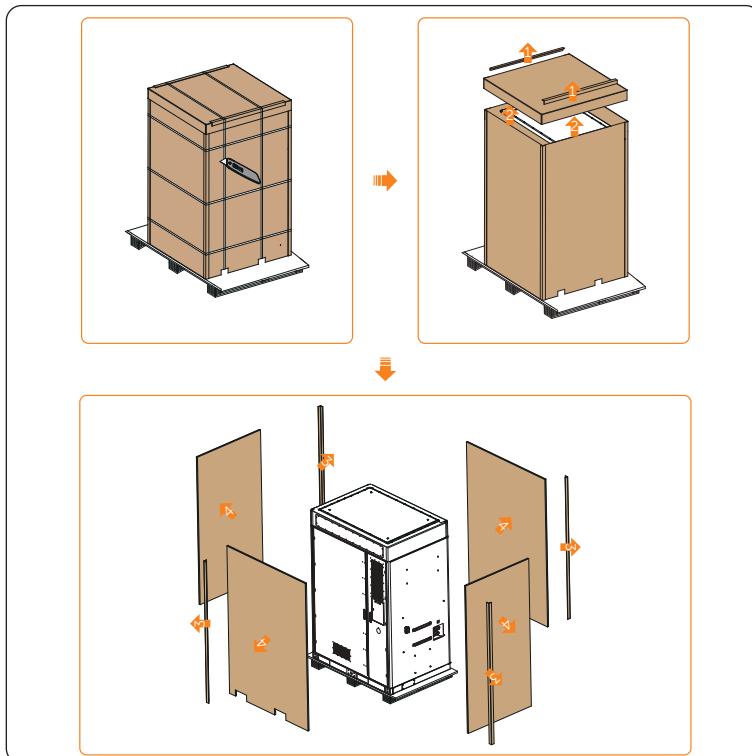


Figure 5-1 Unpacking

- When unpacking, please handle all packaging materials properly for future storage or relocation of this device.
- After unpacking, please check if the device is intact and if all accessories are complete. If there is any damage or missing accessories, please contact your dealer immediately for assistance.

5.1.2 Packing List

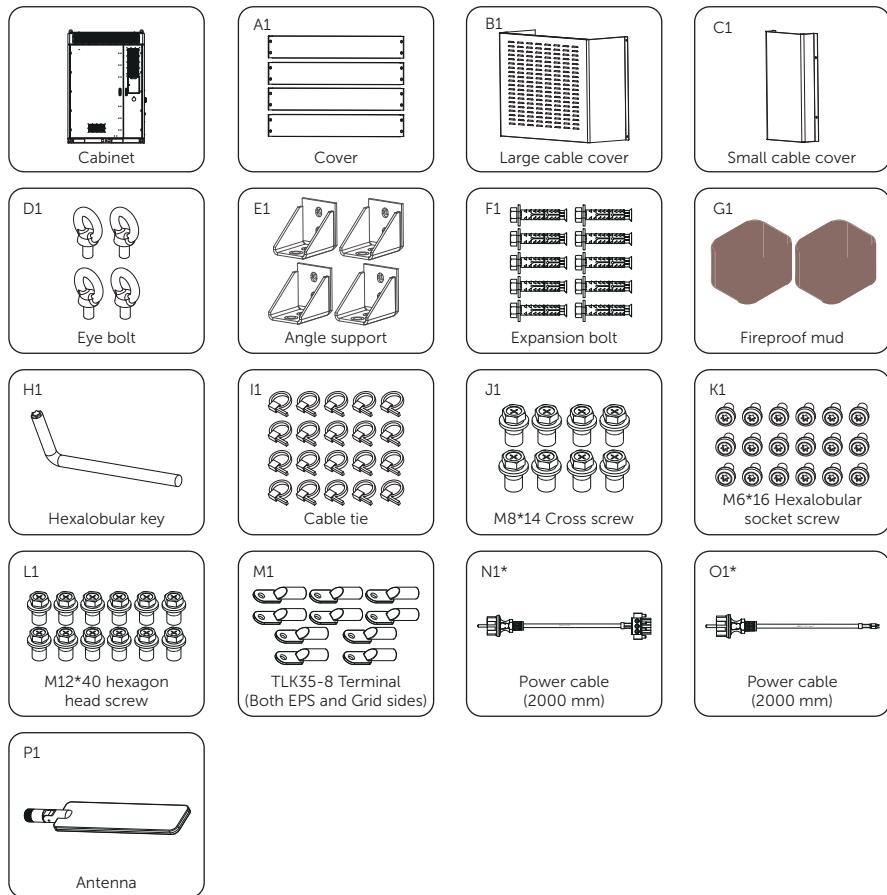


Table 5-1 Packing list

Item	Description	Quantity
/	Cabinet	1 pc
A1	Cover	4 pcs
B1	Large cable cover	1 pc
C1	Small cable cover	1 pc
D1	Eye bolt	4 pcs
E1	Angle support	4 pcs
F1	Expansion bolt	10 pcs
G1	Fireproof mud	2 pcs
H1	Hexalobular key	1 pc
I1	Cable tie	20 pcs
J1	M8*14 Cross screw	8 pcs
K1	M6*16 Hexalobular socket screw	18 pcs
L1	M12*40 hexagon head screw	12 pcs
M1	TLK35-8 Terminal (Both EPS and Grid sides)	10 pcs
N1*	Power cable (2000 mm)	1 pc
O1*	Power cable (2000 mm)	1 pc
P1	Antenna	1 pc

NOTICE!

- The mark "*" indicates that if one of the cables connecting the high-voltage box AC input and AC power is damaged, the N1 power cable (2000 mm) can be used as a replacement cable to connect to the AC input and the O1 power cable (2000 mm) can be used as a replacement cable to connect to the AC power.

5.2 Inverter Unpacking

5.2.1 Unpacking

- The inverter undergoes 100% testing and inspection before shipping from the manufacturing facility. However, transport damage may still occur. Before unpacking the inverter, please check the outer packing materials for damage, such as holes and cracks.
- Unpacking the inverter according to the following figure.

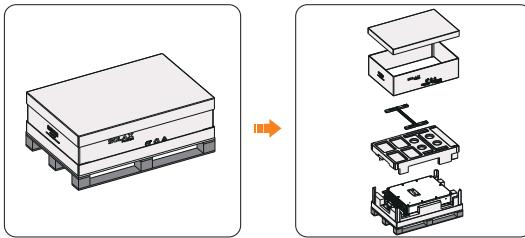


Figure 5-2 Unpacking the inverter

- Be careful when dealing with all package materials which may be reused for storage and relocation of the inverter in the future.
- Upon opening the package, check whether the appearance of the inverter is damaged or lack of accessories. If any damage is found or any parts are missing, contact your dealer immediately.

5.2.2 Packing List



* Refer to the actual delivery for the optional accessories.

Table 5-2 Packing list

Item	Description	Quantity
/	Inverter	1 pc

Item	Description	Quantity
A2	Mounting bracket	1 pc
B2	M5*50 screw	4 pcs
C2	Cable clamp	1 pc
D2	OT terminal	1 pc
E2	RJ45 terminal	7 pcs
F2	8-pin terminal block	2 pcs
G2	Positive battery connector	2 pcs
H2	Negative battery connector	2 pcs
I2	Positive PV connector & pin contact	10 pairs for X3-AELIO-50K 12 pairs for X3-AELIO-60K
J2	Negative PV connector & pin contact	10 pairs for X3-AELIO-50K 12 pairs for X3-AELIO-60K
K2	M10*100 expansion bolt	4 pcs
L2	Eye bolt	2 pcs
M2	Removal tool for PV connectors	1 pc
N2	AC terminal	10 pcs
O2	AC connector	1 pc
P2	Five-hole sealing plug	2 pcs
Q2	M6 screw	10 pcs
R2	M4*12 screw	2 pcs
S2	Negative PV dustproof buckle	12 pcs
T2	Positive PV dustproof buckle	12 pcs
U2	M4*10 screws	2 pcs
V2	Inverter screen cover	1 pc
W2	RJ45 connector	1 pc
X2	CT	1 pc
Y2	Documents	/
/	Meter (optional)	1 pc
/	Dongle (optional)	1 pc

6 Mechanical Installation

After determining the installation site, please take out the underground electrical wiring which is buried beneath the ground.

WARNING!

- This device must be installed by professionals in accordance with local regulations and standards.
- Before drilling, please check and avoid wiring inside the wall to prevent accidents.
- Use insulated tools and wear personal protective equipment (PPE) during installation and maintenance.
- Do not destroy the cabinet's anti-corrosion coating during the process of installation.

CAUTION!

- Pay attention to the weight of the device at all times during transportation and installation, as improper lifting or dropping of the device may cause personal injury.

6.1 Battery Cabinet Installation Dimensions

Angle supports installed at front and rear sides

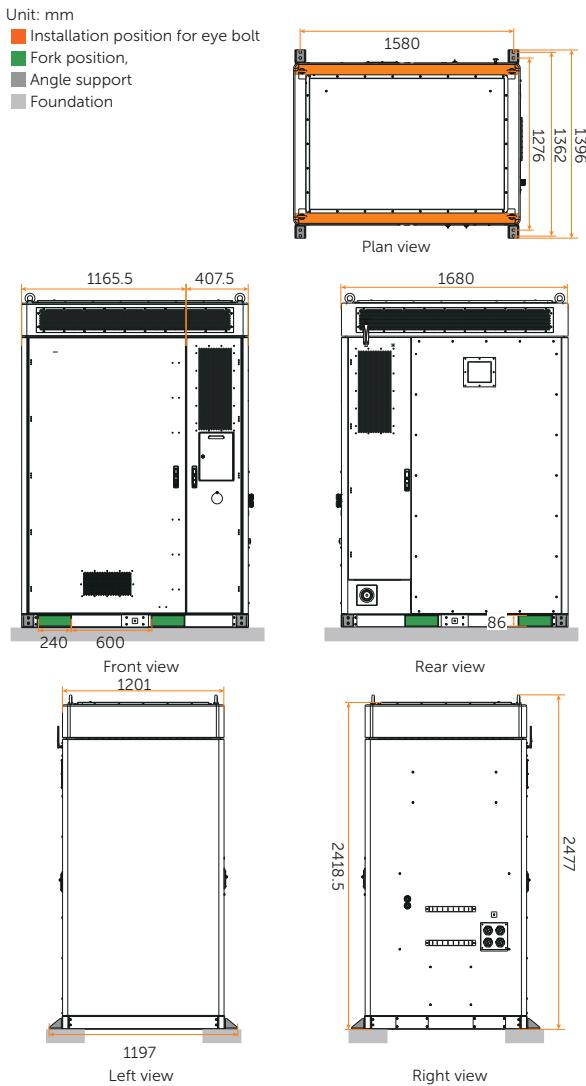


Figure 6-3 Dimension of battery cabinet

Angle supports installed at left and right sides

Unit: mm

- Orange Installation position for eye bolt
- Green Fork position
- Grey Angle support
- Light grey Foundation

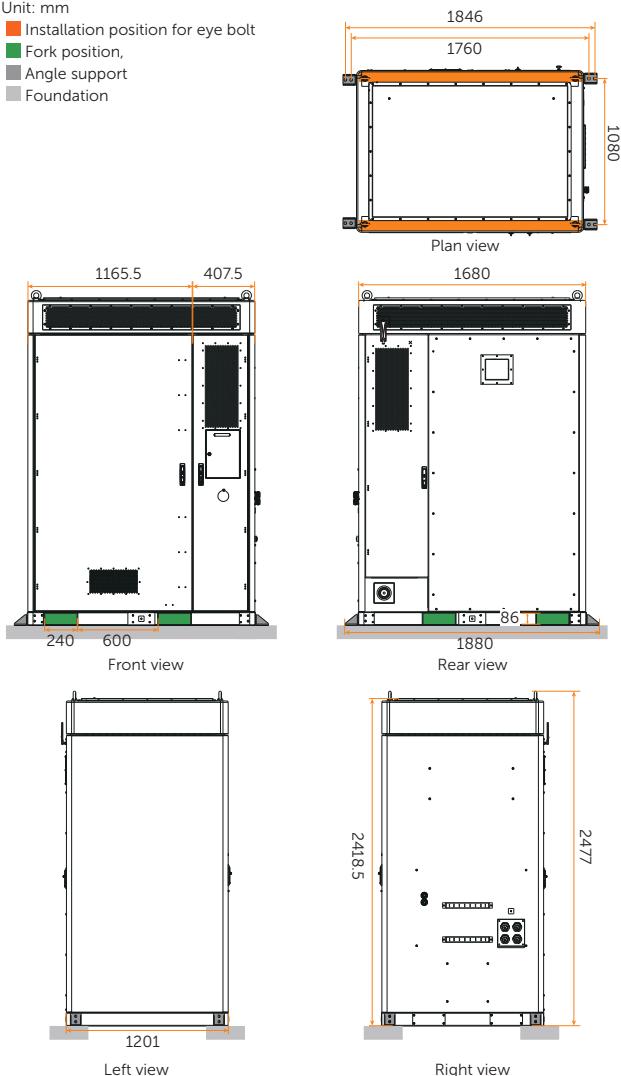


Figure 6-4 Dimension of battery cabinet

Dimensions of angle support

Unit: mm

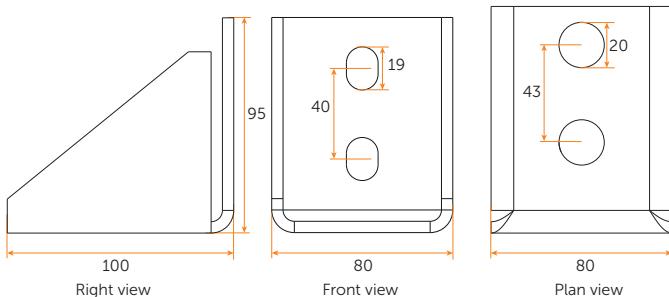


Figure 6-5 Dimensions of angel support

6.2 Battery Cabinet Handling

6.2.1 Hoisting

NOTICE!

- If the eye bolts are required to be installed based on the actual situation, please strictly follow the steps below.

Step 1: Remove the M20 screws (with a total of 4 pieces) inside the top eye bolt holes using a torque wrench.

Step 1: Remove the M20 screws (with a total of 4 pieces) inside the top eye bolt holes using a torque wrench.

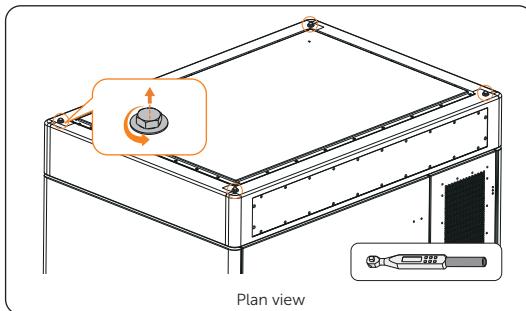


Figure 6-6 Unscrewing M20 screws

Step 2: Insert and clockwise the eye bolts (M20) (Part D1) (with a total of 4 pieces).

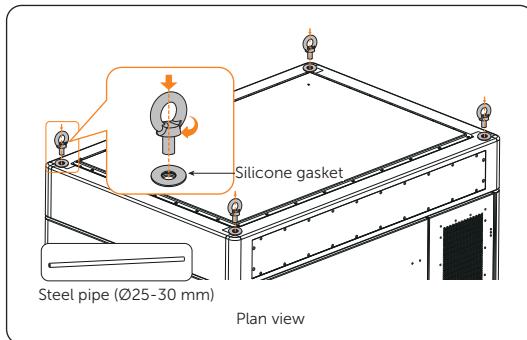


Figure 6-7 Tightening eye bolts

NOTICE!

- Put the silicone gaskets in place before inserting the eye bolts.
- Please ensure that the eye bolt's shoulder makes total contact with the silicone gasket.

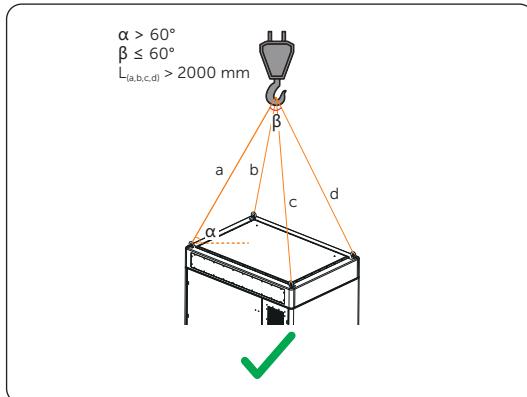


Figure 6-8 Proper way of hoisting

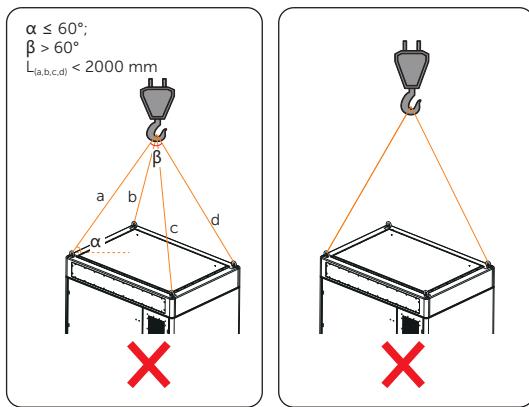


Figure 6-9 Improper way of hoisting

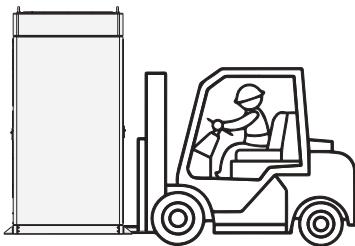
NOTICE!

- Before lifting, please prepare sufficient length of lifting ropes according to the actual situation.
- L =Length

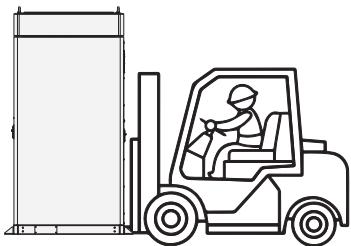
6.2.2 Forklift

NOTICE!

- When using a forklift to move the cabinet, please secure it according to the actual situation to ensure that the cabinet does not pose a risk of tipping over.

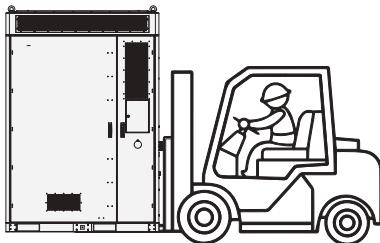


Left view

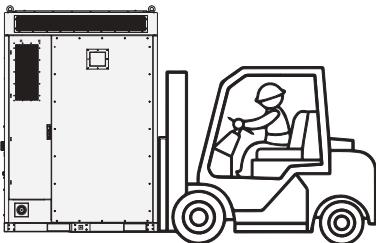


Right view

Figure 6-10 Right positions



Front view



Rear view

Figure 6-11 Wrong positions

NOTICE!

- For installation space requirements, please refer to "[6.1 Battery Cabinet Installation Dimensions](#)".
- For foundation requirements, please refer to "[4.1.2 Installation Foundation Requirements](#)".

6.3 Installation Procedure for Angle Support and Cover

The cabinet allows the angle supports to be installed at the front and-rear sides or at the left and-right sides. Since the installation procedure for the angle support is the same, take the angle support installed at the front and-rear sides, for instance.

Step 1: After determining the installation position of the cabinet, align the holes on the angle support (Part E1) with the holes on the cabinet, and draw a circle on the bottom of the angle support. There are totalling 4 angle supports for a cabinet.

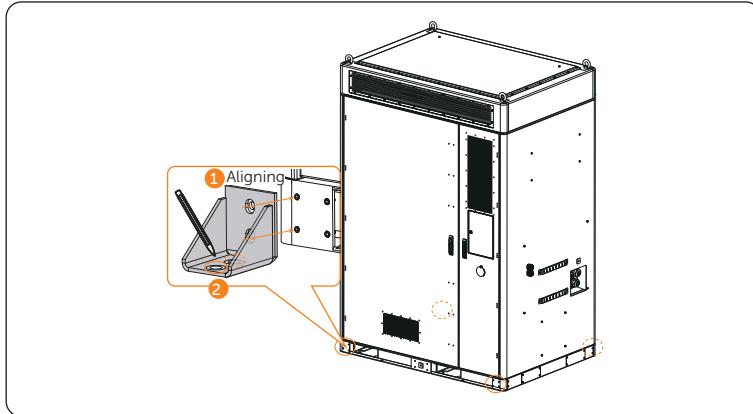


Figure 6-12 Marking hole position

Step 2: Drill holes at the previously marked positions (drill bit: Ø18 mm; hole depth: 95~105 mm). After drilling, clean the foundation surface with a vacuum cleaner.

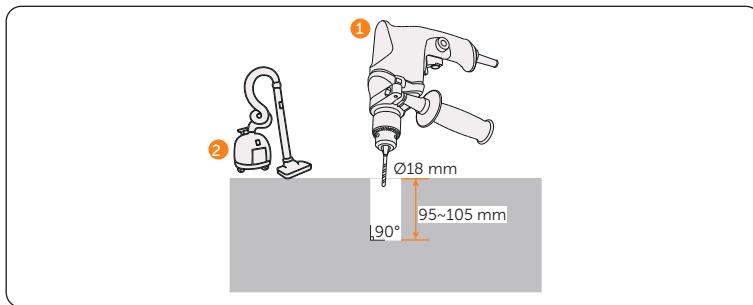


Figure 6-13 Drilling

Step 3: Attach the angle supports to the cabinet and ensure that holes are aligned, and insert M12 screws (Part L1) and tighten them clockwise using a torque wrench (torque: 42 ± 4.2 N·m). Each angle support has two M12 screws, with a total of eight M12 screws.

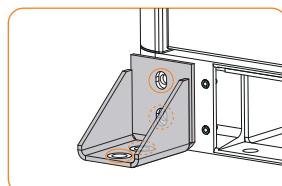


Figure 6-14 Aligning screw holes

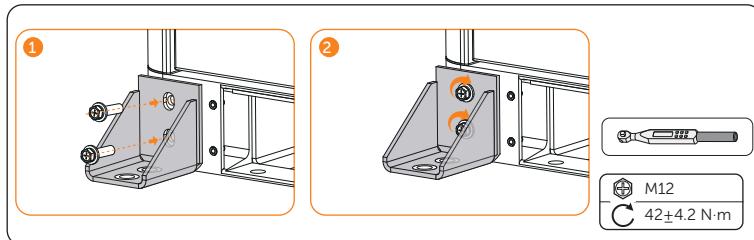


Figure 6-15 Tightening M12 screws

NOTICE!

- Reinstall the angle supports, ensuring that the screw holes on the angle support align with the screw holes on the cabinet and foundation.

Step 4: Use a rubber hammer to drive the expansion bolts (Part F1) into the foundation screw holes, and then tighten them clockwise with a torque wrench (M12) (torque: 42 ± 4.2 N·m). Each angle support has 2 expansion bolts, with a total of 8 expansion bolts.

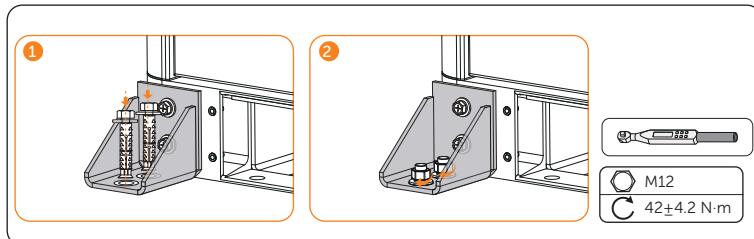


Figure 6-16 Tightening expansion bolts

Step 5: After the angle supports have been installed, take out the covers (Part A1) to seal the forklift hole and tighten the M6 hexalobular screws (Part K1) with the hexalobular key (Part H1). Each cover has 4 screws, with a total of 4 covers.

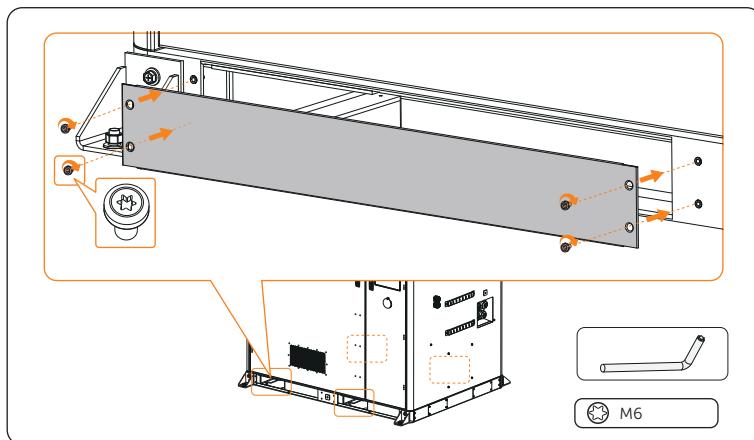


Figure 6-17 Fixed covers

NOTICE!

- The above-mentioned installation steps also apply to the angle supports, which are installed on both the left and right sides.

6.4 Antenna Installation

NOTICE!

- The user can decide whether the reserved port connects an antenna based on the actual situation.
- Regarding the other antenna port, the antenna is delivered with the accessories kit.

There are two antenna ports on the rear side of the cabinet. The left one shall be connected to an antenna, and the right one is a reserved port. Regarding the antenna installation steps, please do as follows.

Step 1: Remove the silicone cap.

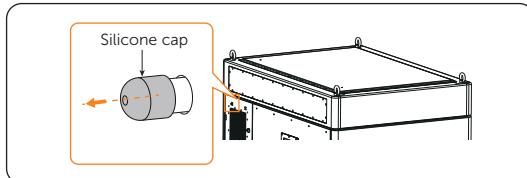


Figure 6-18 Removing silicone cap

Step 2: Correctly insert and tighten the antenna (Part P1) by turning it clockwise.

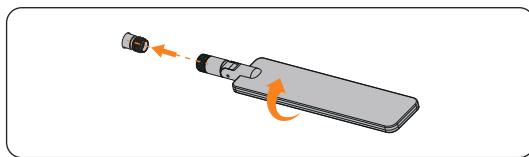


Figure 6-19 Installing antenna

Step 3: Fold the antenna up 90°.

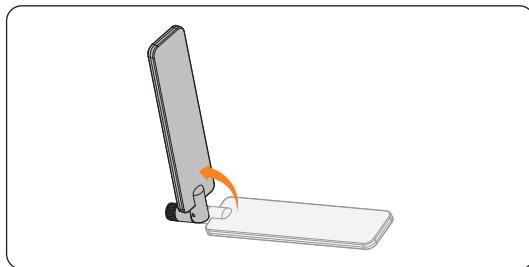


Figure 6-20 Folding the antenna

After installing the antenna, see following figure.

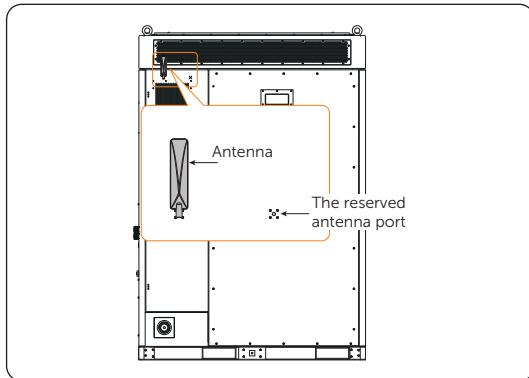


Figure 6-21 Installing an antenna

6.5 Inverter Installation

⚠ WARNING!

- Only the qualified personnel can perform the mechanical installation following the local standards and requirements.

⚠ CAUTION!

- Always be aware of the weight of the inverter. Personal injuries may result if the inverter is lifted improperly or dropped while being transported or mounted.
- Use insulated tools when installing the inverter. Personal protective equipment must be worn during installation and maintenance.

NOTICE!

- Install the inverter at a maximum back tilt of 5 degrees and avoid forward tilted, side tilted, or upside down.

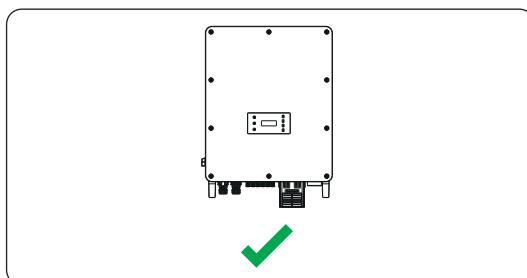


Figure 6-22 Correct installation

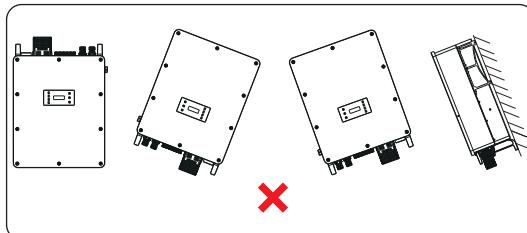


Figure 6-23 Incorrect installation

6.5.1 Inverter Installation Dimensions

Check the dimensions of the wall mounting bracket before mounting and reserve sufficient space for heat dissipation and installation of the whole system.

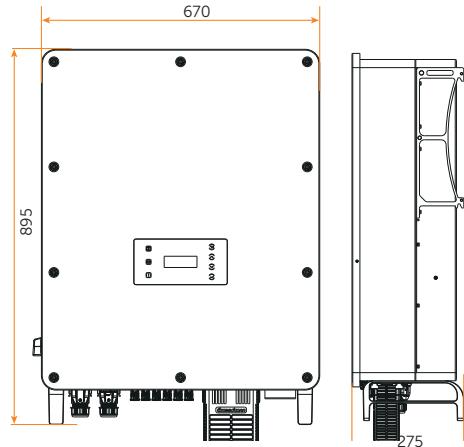


Figure 6-24 Dimensions (Unit: mm)

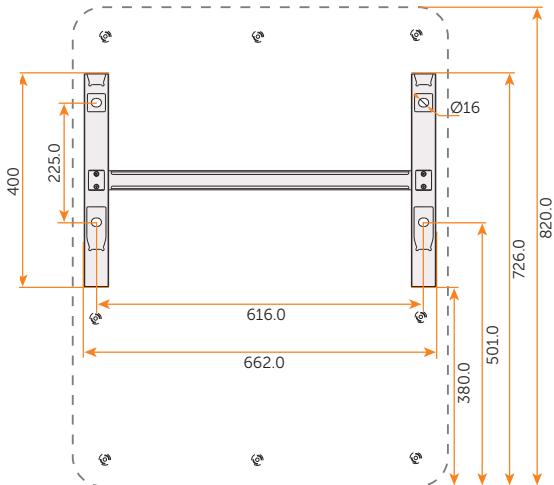


Figure 6-25 Dimensions 2 (Unit: mm)

6.5.2 Installation Procedures

Step 1: Confirm the four holes for the position of the mounting bracket on the battery cabinet.

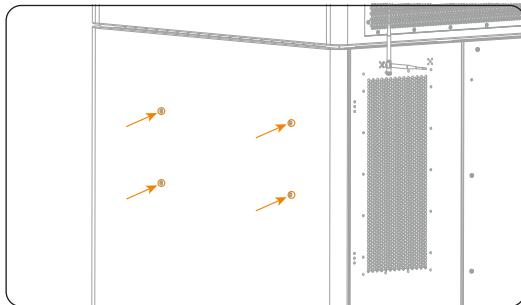


Figure 6-26 Confirming the position of the mounting bracket

Step 2: Take out the mounting bracket (Part A2) from the carton. Attach the mounting bracket on the battery cabinet. Knock the expansion screws (Part E1) into the holes and secure it to the cabinet by torque wrench. (Torque: 24 N·m)

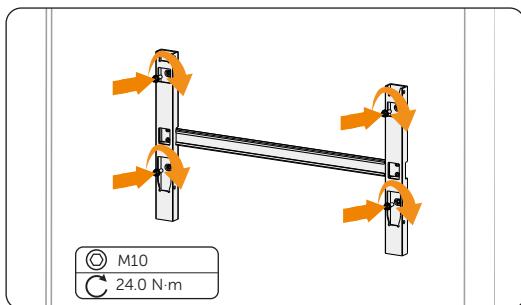


Figure 6-27 Securing the mounting bracket

Step 3: Open the anti-static bag and take out the machine.

NOTICE!

- If the inverter is temporally needed to be placed on the ground, use foam or other protective materials to prevent any damage to the inverter.

Step 4: Remove the carton, loosen and pull out the M10 screws on the sides of the inverter with a flat-head screwdriver. Tighten the two eye bolts (Part L2) on the two sides of the inverter and tie them with a sling. Lift up the inverter with a crane and hang the device on the mounting bracket. The keyways of the inverter must be hooked into the buckles of the mounting bracket.

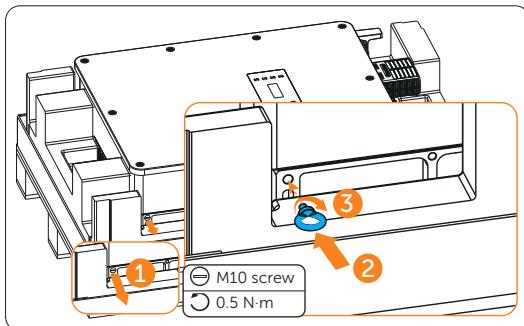


Figure 6-28 Installing the eye bolts

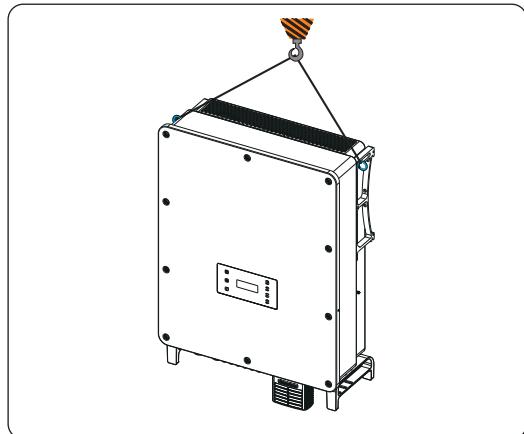


Figure 6-29 Hanging the inverter

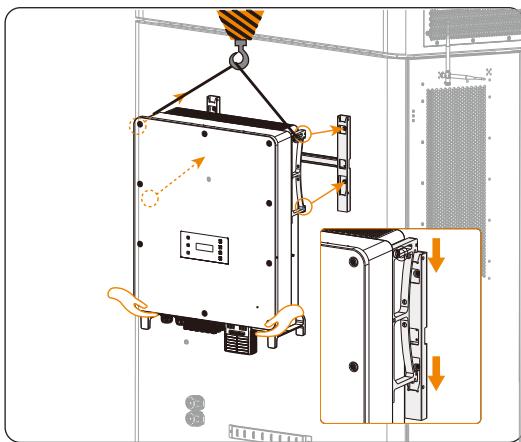


Figure 6-30 Hooking the inverter on the bracket

NOTICE!

- When the inverter is lifted up from the carton or the inverter is close to the mounting bracket, use hands to adjust the inverter position to prevent any damage to the inverter.
- Ladders will be helpful for installers to stand in a proper position and adjust the inverter position.

Step 5: Remove the eye bolts when the inverter is hooked on the mounting bracket and tighten the M10 screws with a flat-head screwdriver.

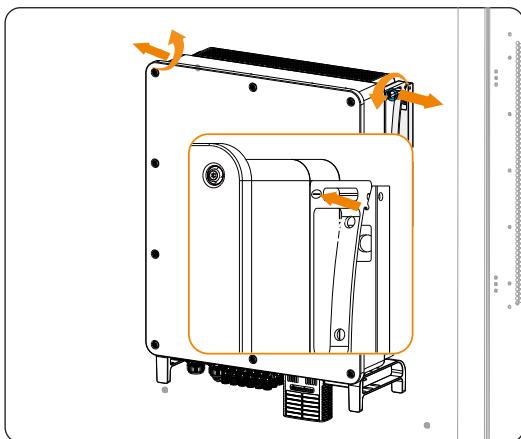


Figure 6-31 Removing the eye bolts

NOTICE!

- After removing the eye bolts from the inverter, keep them in a safe place. They are needed when the inverter is relocated or disassembled.

Step 6: Secure the inverter to the mounting bracket with M5*50 screws (Part B2). (Torque: 2 ± 0.2 N·m)

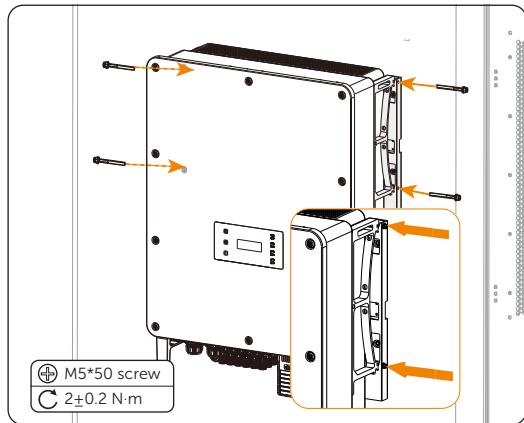


Figure 6-32 Securing the inverter

7 Electrical Connection

NOTICE!

- Before wiring, operators are required to learn which parts need to be conducted wiring. For details, please refer to Figure 7-1.

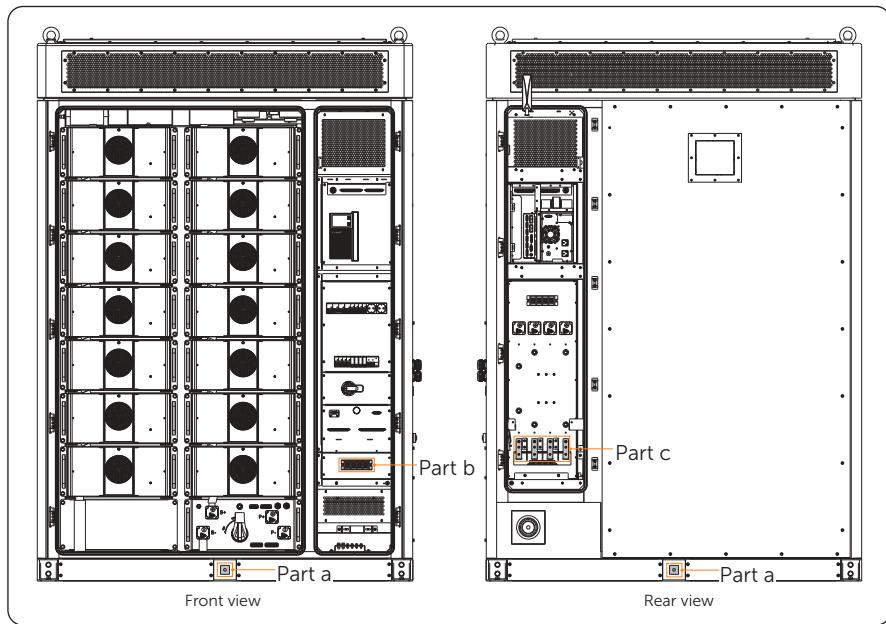


Figure 7-1 Part that needs wiring

7.1 Cabinet Grounding Connection

The device supports grounding plate connection and PE connection. Regarding the wiring area, see **Part a** in ["Figure 7-1 Part that needs wiring"](#), please strictly follow the steps below.

NOTICE!

- There are two GND ports on the cabinet. Either of them can be connected.
- The grounding plate or the PE wire is prepared by the user self. For details, please refer to ["4.3 Additionally Required Materials"](#).

Grounding Plate Connection

Step 1: Insert and tighten M12 screw (Part L1) to secure grounding plate (torque: 42 ± 2 N·m).

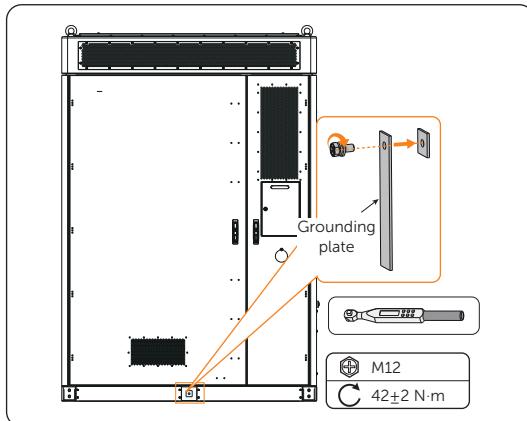


Figure 7-2 Tightening M12 screws

PE Connection

Step 1: Strip the cable jacket about 20 mm from the end.

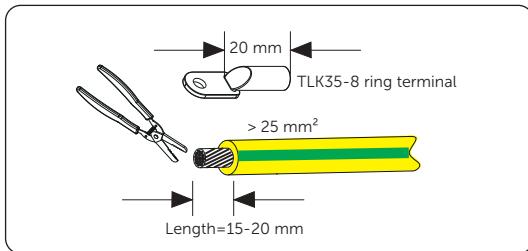


Figure 7-3 Striping cable jacket

Step 2: Cut the heat-shrink tubing ($\varnothing 15-20$ mm) to about a length of 30 mm to 40 mm, carefully slide it onto the end of the cable, and then carefully slip the wires all the way into the grounding terminal.

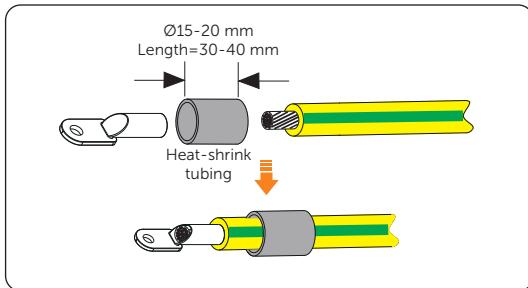


Figure 7-4 Cutting heat-shrink tubing

Step 3: Crimp the terminal, and heat the heat-shrink tubing after it wraps the end of terminal.

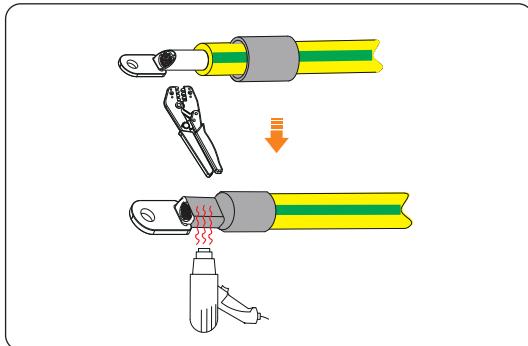


Figure 7-5 Crimping and heating

Step 4: Connect the assembled grounding cable to the grounding port of the cabinet, and then tighten M12 screw (Part L1) (torque: 42 ± 2 N·m).

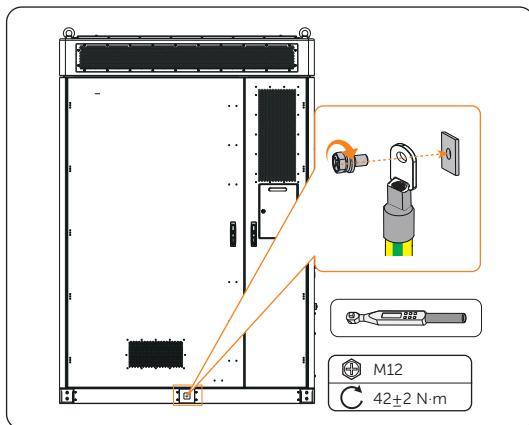


Figure 7-6 Tightening M12 screw

7.2 Inverter Electrical Connection

DANGER!

- Before electrical connection, make sure the DC switches and AC breakers are disconnected. Otherwise, electrical shock may be caused by high voltage, resulting in serious personal injury or death.

WARNING!

- Only the qualified personnel can perform the electrical connection following the local standards and requirements.
- Follow this manual or other related document to wire connection. The inverter damage caused by incorrect cabling is not in the scope of warranty.
- Use insulated tools and wear personal protective equipment throughout the electrical connection process.

NOTICE!

- The PE cable, Grid cable, EPS cable, battery cables, COM1 communication cables of the inverter are prefabricated in the battery cabinet, the cable outlets as shown below:

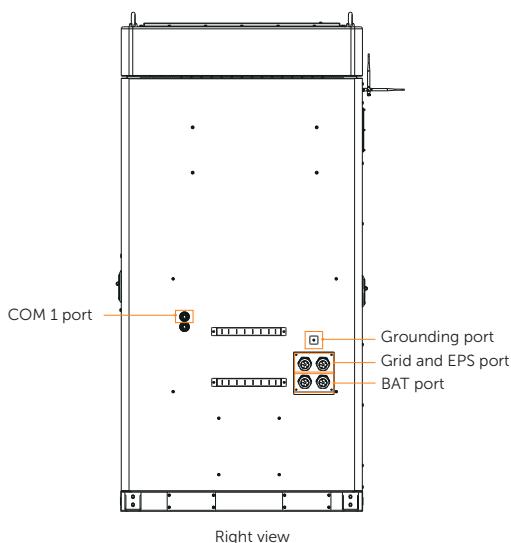


Figure 7-7 Prefabricated inverter cables in battery cabinet

7.2.1 Terminals of Inverter

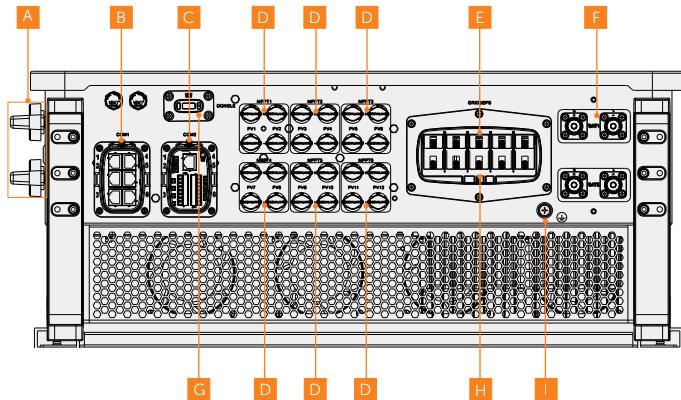


Figure 7-8 Terminals of Inverter

Table 7-1 Description of terminals

Item	Description
A	DC switch (including DC switch 1 and DC switch 2)
B	COM 1 communication terminal (including Parallel-1, Parallel-2, BMS-1, BMS-2, RS485, DRM)
C	COM 2 communication terminal (including Ripple control, DIO, Meter/CT)
D	PV connection terminal (including six MPPT trackers)
E	EPS connection terminal
F	Battery connection terminal (including BAT 1 and BAT 2)
G	Dongle terminal
H	Grid connection terminal
I	Ground connection point

7.2.2 Inverter Grounding Connection

All non-current carrying metal parts of the device and other enclosures in the PV system must be grounded reliably. The PE point at the AC output terminal is used only as a PE equipotential point, not a substitute for the PE point on the enclosure. The connection point has been labeled with the following label: .

CAUTION!

- In compliance with IEC62109-2, X3-AELIO series inverter has the grounding detection function which is used to check whether the inverter is properly grounded before it starts. If the inverter is not connected with earth, the inverter will turn on a red light and report **Earth Relay Fault**.

PE connection procedures

NOTICE!

The PE cable of the inverter outlets from the **Grounding port** in "[Figure 7-7 Prefabricated inverter cables in battery cabinet](#)", please strictly follow the steps below.

Step 1: Loosen the PE screw on the inverter with a cross screwdriver.

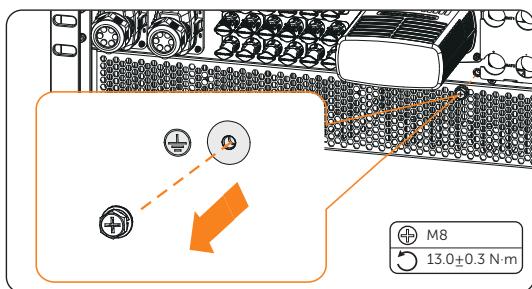


Figure 7-9 Uninstalling the screw

Step 2: Connect the PE cable to the inverter and secure it with the original screw. (Torque: $13.0 \pm 0.3 \text{ N}\cdot\text{m}$)

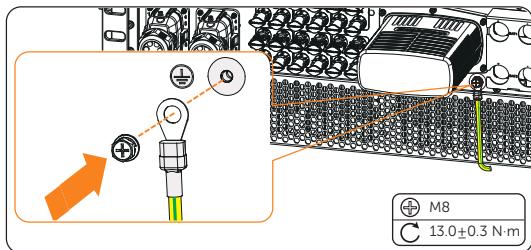


Figure 7-10 Securing the PE cable

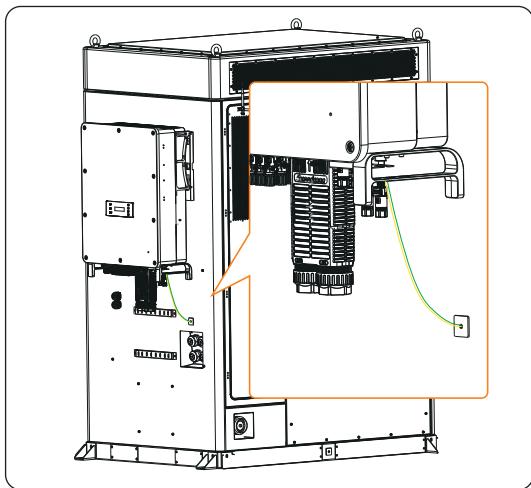


Figure 7-11 Well connected PE cable

7.2.3 AC Connection

NOTICE!

- Before connecting the inverter to the grid, approval must be received by local utility as required by national and state interconnection regulations.

The inverter has an EPS function. When the grid is connected, the inverter outputs go through the Grid terminal, and when the grid is disconnected, the inverter outputs go through the EPS terminal.

Requirements for AC connection

- Grid voltage requirement
 - » The grid voltage must be within the permissible range. The inverter is suitable for rated voltage 400V/230V, 380/220V, frequency 50/60Hz. Other technical requests should comply with the requirement of the local public grid.
- RCD requirement
 - » The inverter does not require an external residual-current device when operating. If an external RCD is required by local regulations, it is recommended to use a Type-A RCD with the value of 300 mA. When required by local regulations, the use of an RCD type B is permitted.
- AC breaker requirement
 - » An AC breaker that matches the power of the inverter must be connected between the inverter output and the power grid, and each inverter must be equipped with an independent breaker or other load disconnection unit to ensure the safe disconnection from the grid. Refer to "[4.3 Additionally Required Materials](#)" for specific data of AC breaker of Grid and EPS.
- Load requirement
 - » It is prohibited to connect any load between inverter and AC switch that directly connects to the inverter.
- EPS load requirement
 - » Do not connect sensitive precision instruments or medical device to the EPS terminal.
 - » Ensure that the EPS load rated power is within the EPS rated output power range. Otherwise, the inverter will report an **Overload Fault** warning. When **Overload Fault** occurs, turn off some loads to make sure it is within the EPS rated output power range, and the inverter will return to normal after **ESC** key on the LCD screen pressed.
 - » For inductive load such as fridge, air conditioner, washing machine, etc., ensure that the start power does not exceed the EPS peak power.

Table 7-2 EPS load information

Type of load	Device	Start power
Resistive load	Lamp	Equal to rated power
	Fan	Equal to rated power
	Hairdryer	Equal to rated power
Inductive load	Fridge	3-5 times rated power
	Air conditioner	3-6 times rated power
	Washing machine	3-5 times rated power
	Microwave oven	3-5 times rated power

* Please refer to the nominal current of the device for the actual start current.

Wiring procedures

NOTICE!

The Grid and EPS cables of the inverter outlet from the **Grid and EPS port** in "Figure 7-7 Prefabricated inverter cables in battery cabinet", please strictly follow the steps below.

Step 1: Anti-clockwise loosen the swivel nut and pull out the sealing plugs to disassemble the AC connector (Part O2) as below. Keep the sealing plugs still in the cable support sleeve if you choose not to connect the cable. Replace the original sealing plugs with the five-hole sealing plugs (Part P2).

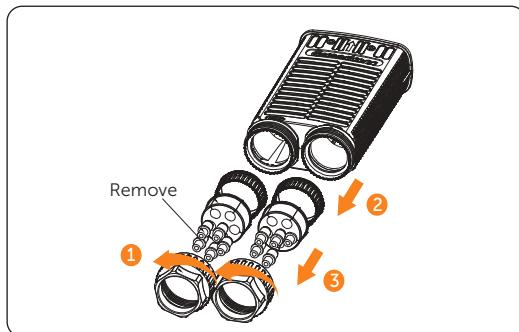


Figure 7-12 Disassembling the AC connector

Step 2: Thread the Grid and EPS cable through the AC connector.

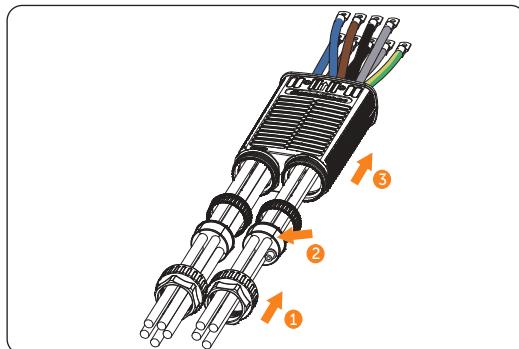


Figure 7-13 Threading cables through the AC connector

Step 3: Secure the L1, L2, L3, N and grounding conductors of the assembled Grid cable with M6 screws. (Torque: 5.0 ± 1 N·m) Make sure the conductors are correctly assigned and firmly seated in the terminals.

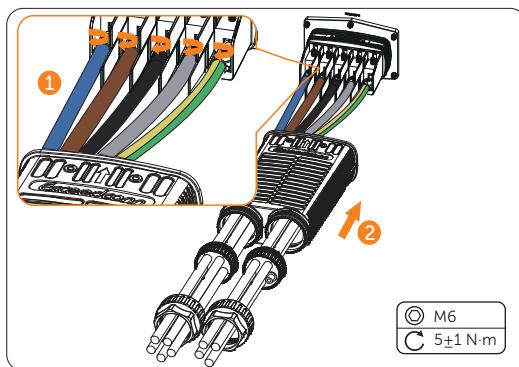


Figure 7-14 Connecting the Grid cable

Step 4: Secure the L1, L2, L3, N conductors of the assembled EPS cable with M6 screws (Part Q2). (Torque: 5.0 ± 1 N·m) Make sure the conductors are correctly assigned and firmly seated in the terminals. Connect the enclosure of the AC connector to the inverter, insert the waterproof seals into the AC connector, and tighten the swivel nuts of the connector.

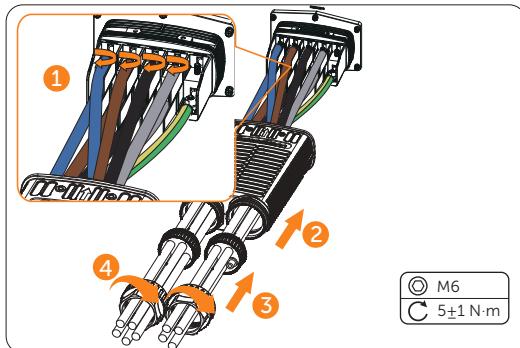


Figure 7-15 Connecting the EPS cable

Step 5: Connect the assembled AC connector to the AC port of the inverter, tighten the two M4*12 screws (Part R2) on the AC connector enclosure (Torque: 1.5 ± 0.3 N·m) and tighten the swivel nuts clockwise.

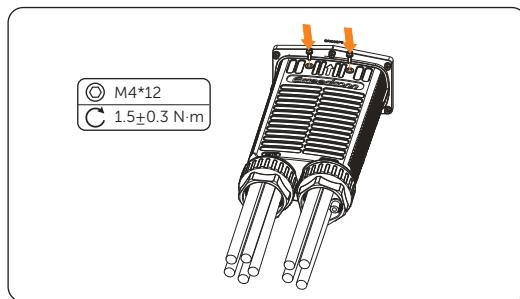


Figure 7-16 Securing the AC connector on the inverter

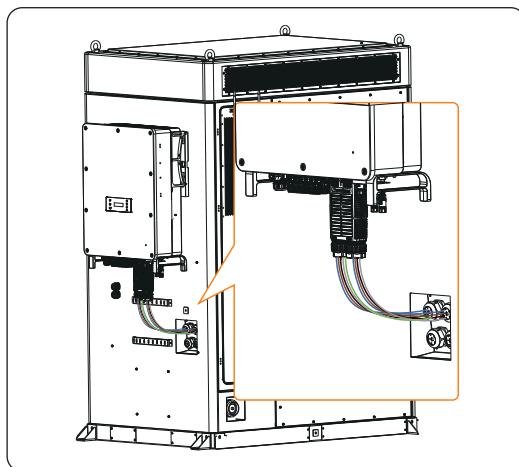


Figure 7-17 Well connected AC connector

 **DANGER!**

- Before powering on the inverter, make sure the AC connector has been installed correctly on the Grid and EPS terminal even if the EPS terminal is not wired. Otherwise, electrical shock may be caused by high voltage, resulting in serious personal injury or death.

 **WARNING!**

- Reinstall AC terminal caps immediately after removing the connectors from terminals.

7.2.4 PV Connection

 **DANGER!**

- High DC voltage will be generated by PV modules when exposed to sunlight. Death or lethal injuries will occur due to electric shock.
- Make sure the DC switch and AC breaker are disconnected from the inverter before connection.
- Make sure that the PV module output is well insulated to ground.

 **CAUTION!**

- Power is fed from more than one source and more than one live circuit.

Requirements for PV connection

- Open circuit voltage and working voltage
 - » The open circuit voltage of the module array should be less than the maximum PV input voltage (1000 V) of the inverter. Otherwise the inverter may be damaged.
 - » The working voltage should be within the MPPT voltage range (160-950 V). Otherwise, the inverter will prompt **PV Volt Fault**. Consider the impact of low temperature on the voltage of the photovoltaic panels, as lower temperatures tend to result in higher voltages.
 - » The working voltage should be within the full load MPPT range (320-800V). Otherwise, the inverter will prompt derating protection.
- PV module
 - » The PV modules within the same MPPT channel are of the same brand. Additionally, the strings within the same channel should have identical quantities, and be aligned and tilted identically.
 - » The positive or negative pole of the PV modules is not grounded.
 - » The positive cables of the PV modules must be connected with positive DC connectors.
 - » The negative cables of the PV modules must be connected with negative DC connectors.

Wiring procedures

Step 1: Strip approx. 7 mm of the cable insulation.

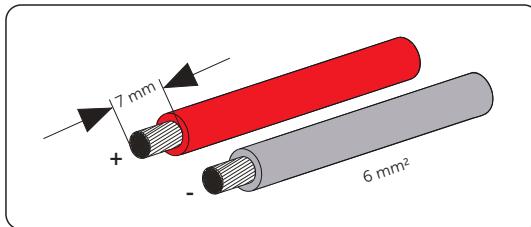


Figure 7-18 Stripping the PV cable

Step 2: Insert the stripped cable into the PV pin contact (Part I2 and Part J2). Ensure that the stripped cable and the PV pin contact are of the same polarity. Crimp it with a crimping tool for PV terminal.

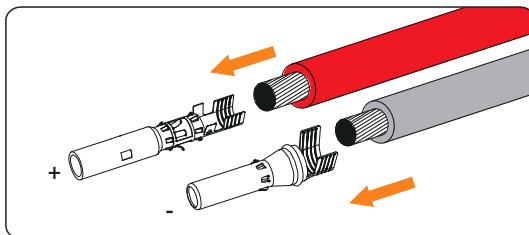


Figure 7-19 Inserting the PV pin contact

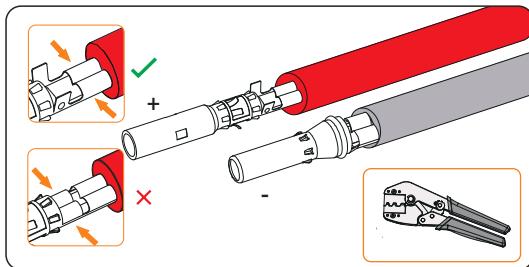


Figure 7-20 Crimping the terminal

⚠️ WARNING!

- To mitigate the risk of fire, it is crucial to utilize a dedicated crimping tool specifically designed for PV installations to ensure secure and reliable connections.

Step 3: Thread the PV cable through the swivel nut and insert the cable into the PV connector until a "Click" is heard. Gently pull the cable backward to ensure a firm connection. Tighten the swivel nut clockwise. Verify that the PV connectors have the correct polarity before connection.

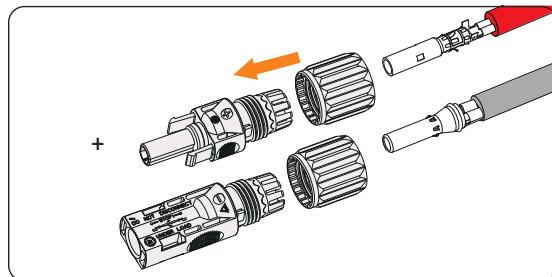


Figure 7-21 Threading the PV cable

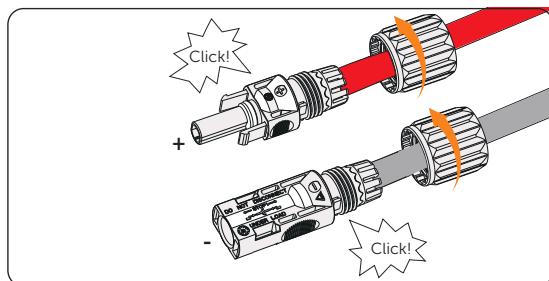


Figure 7-22 Securing the PV cable

Step 4: Use a multimeter to measure the positive and negative voltage of the assembled PV connectors. Make sure the open circuit voltage does not exceed the input limit of 1000 V.

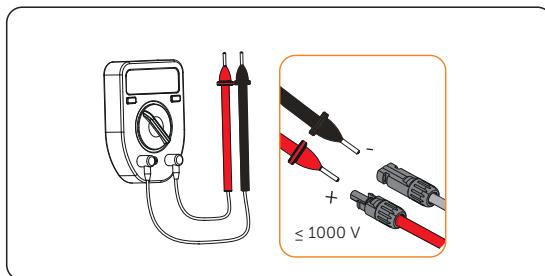


Figure 7-23 Measuring the voltage of PV connectors

NOTICE!

- If the voltage reading is negative, it indicates an incorrect DC input polarity. Please check if the wiring connections on the multimeter is correct or PV connectors are not mistakenly connected.

Step 5: Remove the PV terminal caps and connect the assembled PV connectors to corresponding terminals until there is an audible "Click". The PV+ on the string side must be connected to the PV+ on the inverter side, and the PV- on the string side must be connected to the PV- on the inverter side.

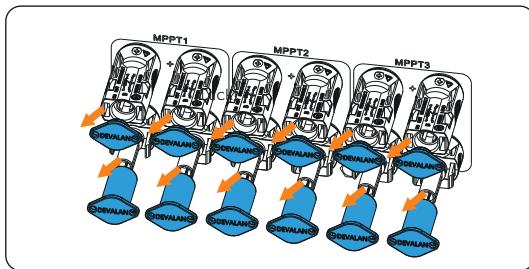


Figure 7-24 Connecting the PV cable

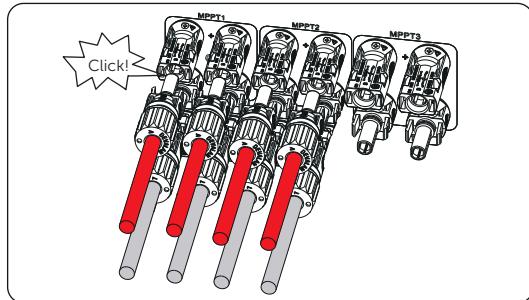


Figure 7-25 Connecting assembled PV cables to the inverter

Step 6: Seal the unused positive and negative PV terminals with corresponding PV dustproof buckles (Part S2 and Part T2). Reinstall them immediately after removing the connectors from terminals.

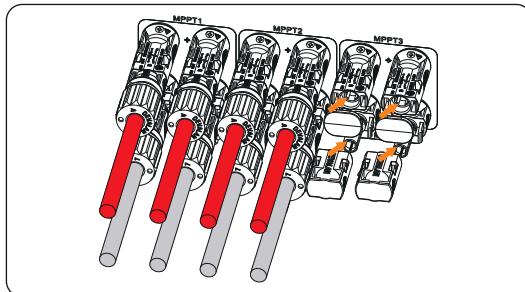


Figure 7-26 Installing PV dustproof buckles

Step 7: Secure the PV cables to the bracket with cable ties.

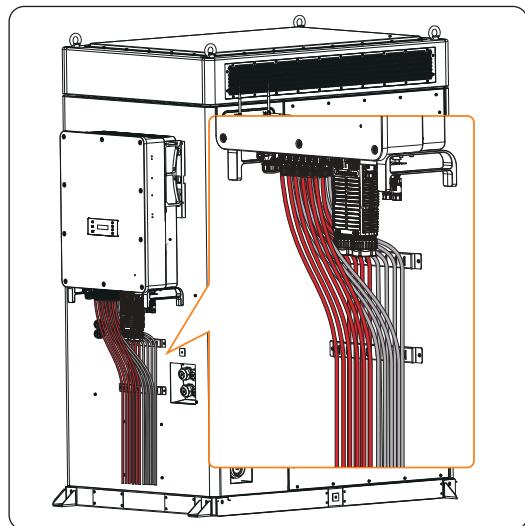


Figure 7-27 Well connected PV cables

7.2.5 Battery Power Cable Connection



- Make sure the breaker of battery is in OFF position.
- Always ensure correct polarity. Never reverse the polarity of the battery cables as this will result in inverter damage.

Requirements for battery connection

- Required battery
 - » The inverter is equipped with two independent battery terminals, allowing for connection to two battery cabinets. Max charge and discharge current is 160 (80*2) A for each BAT terminal.
 - » Make sure the input voltage of each BAT terminal is higher than minimum voltage 180 V and lower than maximum input voltage 820 V.
- Micro circuit breaker (MCB)
 - » If local regulations mandate the use of a DC MCB between the battery and the inverter, install a non-polar DC MCB.
 - » Nominal voltage of DC MCB should be larger than maximum voltage of battery.

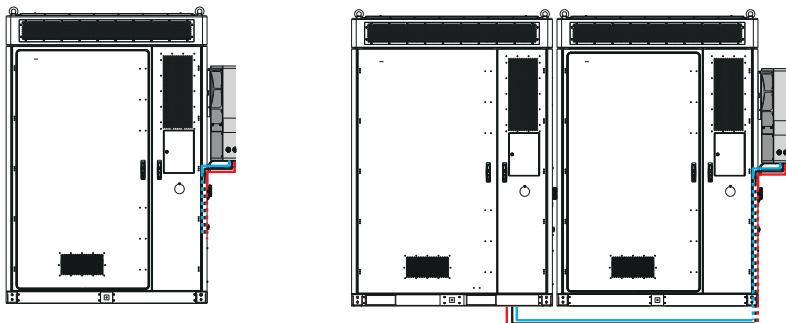


Figure 7-28 Inverter with battery cabinet(s)

Wiring procedures

NOTICE!

- The Grid and EPS cables of the inverter outlet from the Grid and EPS port in ["Figure 7-7 Prefabricated inverter cables in battery cabinet"](#), please strictly follow the steps below.
- When the battery capacity requires expansion, BAT2 can be connected to AEILIO-B100 or AEILIO-B200 battery cabinets with the same wiring method.

Step 1: Disassemble the battery connectors (Part G2 and Part H2).

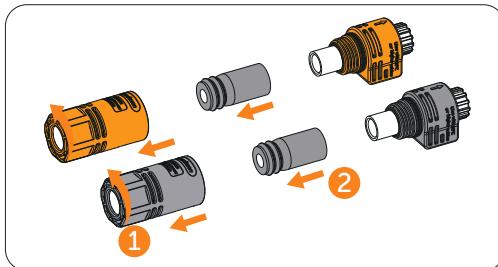


Figure 7-29 Disassembling battery connectors

Step 2: Pull the cable support sleeve over the battery cables and then the swivel nut to the enclosure. Tighten the swivel nut.

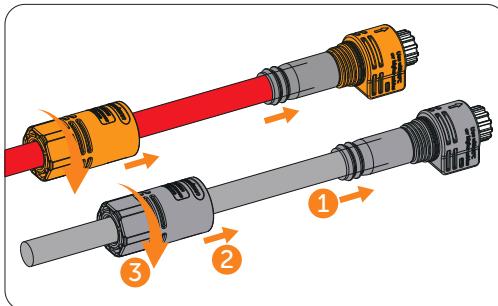


Figure 7-30 Tightening the battery connector

Step 3: Loosen the screws on the battery protective cover and remove the cover. Pull out the battery caps.

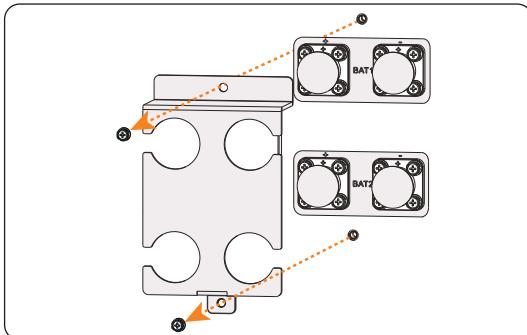


Figure 7-31 Removing the battery protective cover

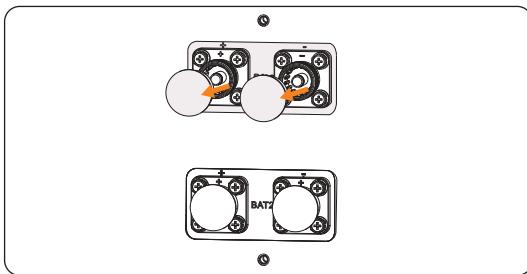


Figure 7-32 Removing battery caps

Step 4: Connect the assembled battery connectors to corresponding terminals until there is an audible "Click". The BAT+ on the string side must be connected to the BAT+ on the inverter side, and the BAT- on the string side must be connected to the BAT- on the inverter side. Gently pull the cable backward to ensure firm connection.

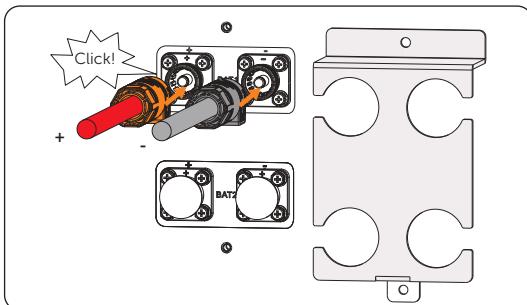


Figure 7-33 Connecting assembled battery cables

Step 5: After the battery cables are connected, install the battery protective cover and secure the cover on the inverter with screws.

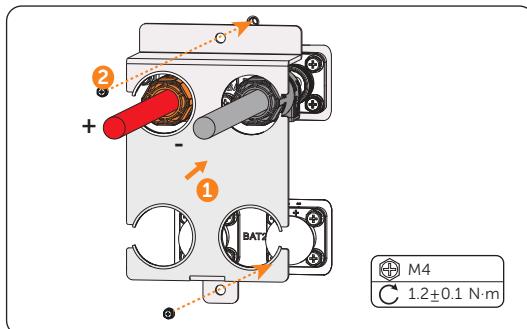


Figure 7-34 Installing the battery protective cover

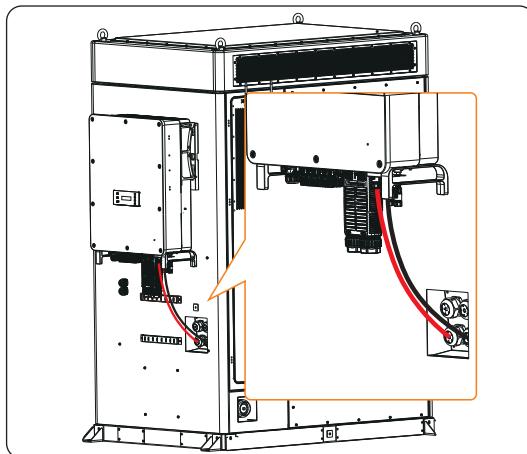


Figure 7-35 Well connected battery cables

WARNING!

- Seal the unused battery terminals with original terminal caps.
- Keep the terminal caps in a safe place if battery cables are connected to the inverter.
- Reinstall it immediately after removing the connectors from terminals.

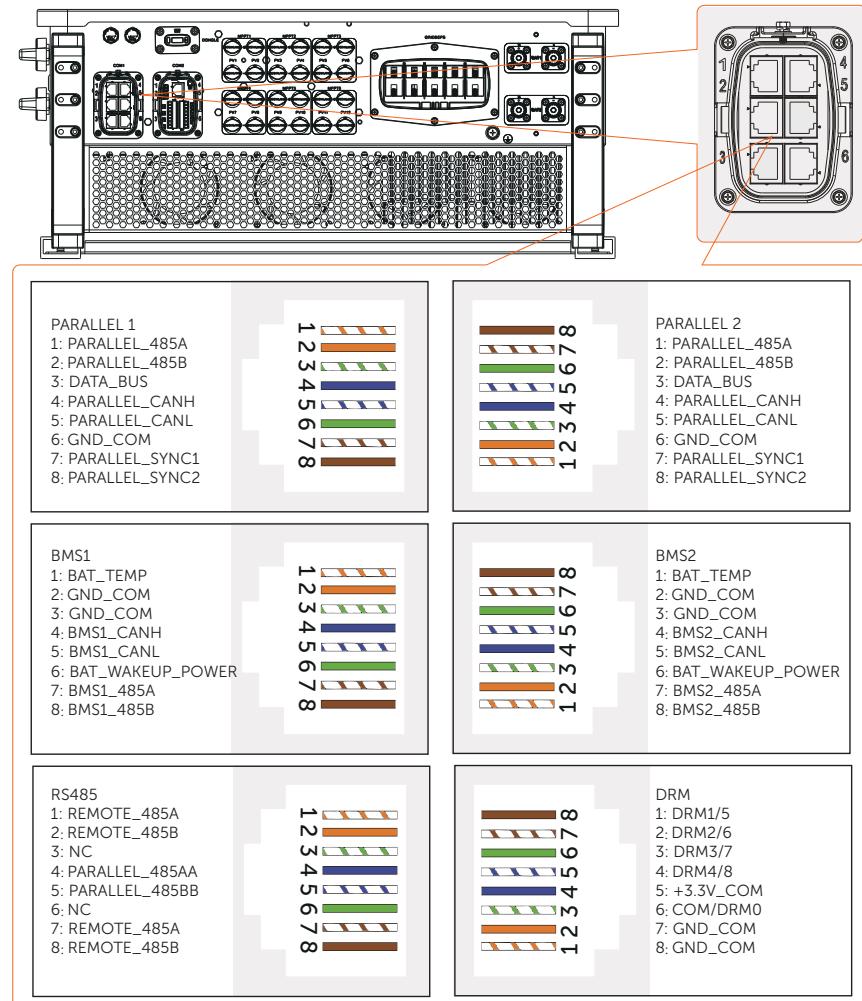
NOTICE!

- Please refer to the battery document for specific wiring procedures on the battery side.

7.2.6 COM 1 Communication Connection

Pin assignment of COM 1 terminal

The COM 1 terminal is used for cabinet and inverter communication via PARALLEL-1 communication terminal, parallel connection and via PARALLEL-1 and PARALLEL-2 communication terminal, battery communication via BMS-1 and BMS-2 terminal, external device communication via RS485 and DRM function.



NOTICE!

The COM 1 cables of the inverter outlet from the **COM 1 port** in ["Figure 7-7 Prefabricated inverter cables in battery cabinet"](#), please strictly follow the steps below.

Cabinet and inverter communication and parallel communication connection

The inverter provides the parallel connection function. One inverter will be set as the "Master inverter" to control the other "Slave inverters" in the system. For details, please refer to ["14.2 Application of Parallel Function"](#).

- Parallel connection wiring procedure

Step 1: Loosen the screws on the COM 1 terminal. Pinch the tabs on the sides of the COM 1 connector enclosure and pull it at the same time to disassemble it.

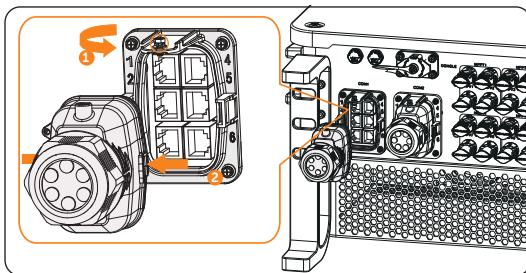


Figure 7-36 Removing the connector enclosure

Step 2: Anti-clockwise loosen the swivel nut and pull out the sealing plugs. Keep the sealing plugs still in the cable support sleeve if you choose not to connect the cable.

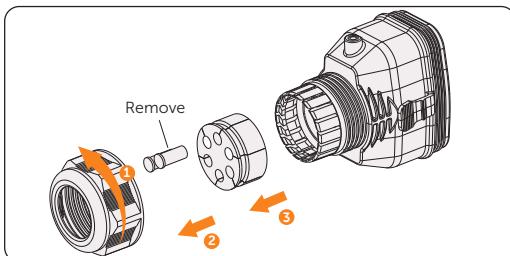


Figure 7-37 Disassembling the connector

Step 3: Thread the network cables.

- » Method 1: If your network cable has already been connected with RJ45 terminal (Part E2), you can directly thread the cable through the swivel nut, cable support sleeve and connector enclosure in sequence.

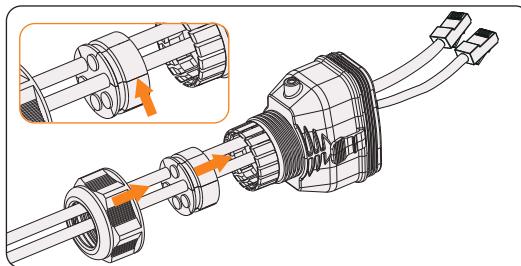


Figure 7-38 Threading the cables with RJ45 terminal

- » Method 2: If your network cable is not connected to an RJ45 terminal, you will need to assemble the cable before proceeding.

Thread the cables without RJ45 terminal through the swivel nut, cable support sleeve, and connector enclosure in sequence. Strip approx. 15 mm of the cable insulation.

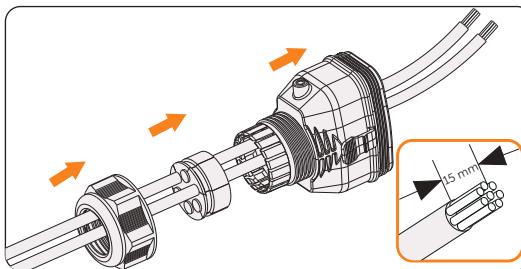


Figure 7-39 Threading the cables and stripping the insulation

Insert the stripped section into the RJ45 terminal. Crimp it tightly with a crimping tool for RJ45. Pay attention to pin order of RJ45 terminal.

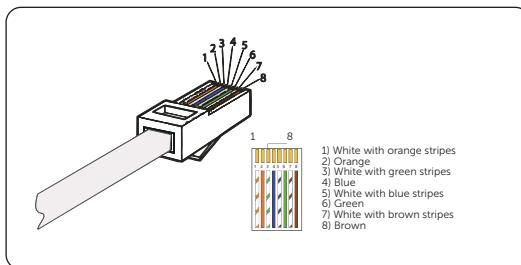


Figure 7-40 Crimping the communication cable

NOTICE!

- Use network cable tester to test the crimped cable before connecting to the inverter.

Step 4: Install the network cables with a crimped RJ45 terminal to Parallel-1 and Parallel-2 of cable clamp (Part C2) according to the labeling.

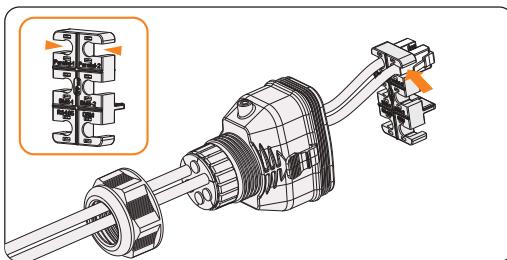


Figure 7-41 Installing the cable to the cable clamp

Step 5: Connect the assembled connector to COM 1 terminal. Ensure the cable clamp tongue is well inserted into the slot of terminal. You will hear an audible "Click" if it is connected securely. Lighly pull the cable for double check its connection.

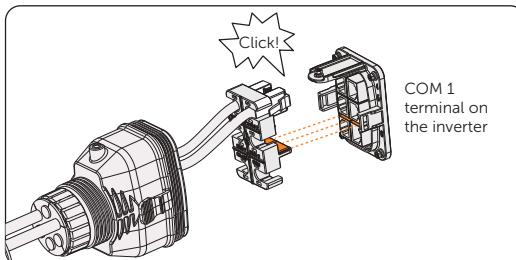


Figure 7-42 Inserting the connector to COM 1

Step 6: Secure the assembled connector on COM 1 terminal.

- Install the connector enclosure back into the COM 1 terminal.
- Install the cable support sleeve into the enclosure.
- Tighten M3 screw to secure it. (Torque: $1.2 \pm 0.1 \text{ N}\cdot\text{m}$)
- Clockwise tighten the swivel nut to finish the COM 1 wiring connection.

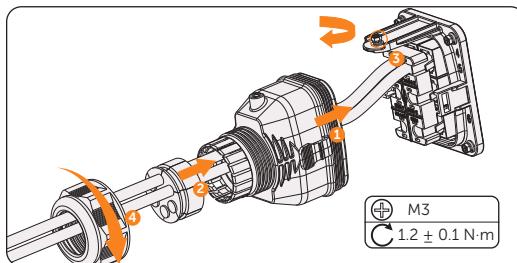


Figure 7-43 Securing the connector

BMS communication connection

Through BMS-1 and BMS-2 communication terminal, the inverter can be connected to two AELIO-B100 battery cabinet.

- BMS connection diagram

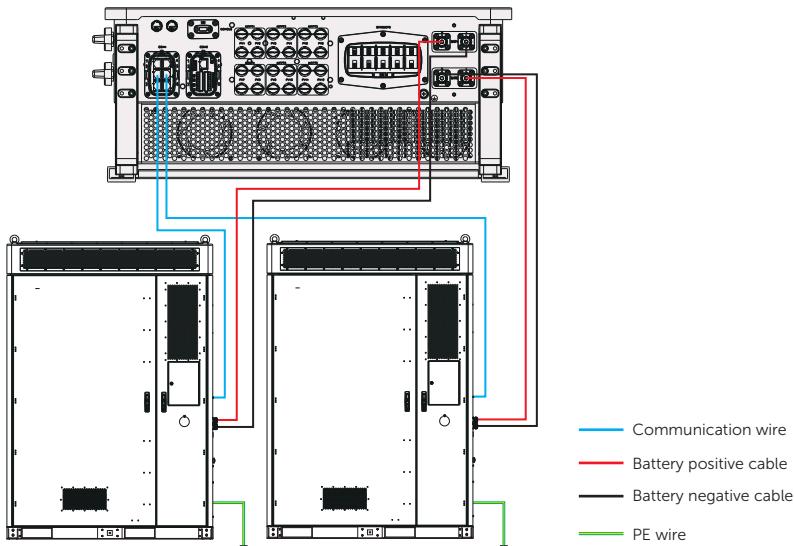


Figure 7-44 BMS connection diagram

- BMS wiring procedure

Step 1: Loosen the screws on the COM 1 terminal. Pinch the tabs on the sides of the COM1 connector enclosure and pull it at the same time to remove it.

Step 2: Anti-clockwise loosen the swivel nut and pull out the sealing plugs. Keep them still in the cable support sleeve if you choose not to connect the cable.

Step 3: Thread the cables through the swivel nut, cable support sleeve, and connector enclosure in sequence.

Step 4: Install the network cables to BMS-1 and BMS -2 of cable clamp according to the labeling.

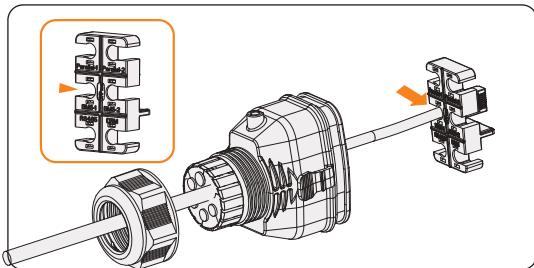


Figure 7-45 Installing RJ45 terminal to the cable clamp

Step 5: Connect the assembled connector to COM 1 terminal. Make sure the cable clamp tongue is well inserted into the slot of terminal. You will hear an audible "Click" if it is connected securely. Lightly pull the cable backward for double check its connection.

Step 6: Secure the assembled connector on COM 1 terminal.

- Install the connector enclosure back into the COM 1 terminal.
- Install the cable support sleeve into the enclosure.
- Tighten M3 screw to secure it. (Torque: $1.2 \pm 0.1 \text{ N}\cdot\text{m}$)
- Clockwise tighten the swivel nut to finish the COM 1 wiring connection.

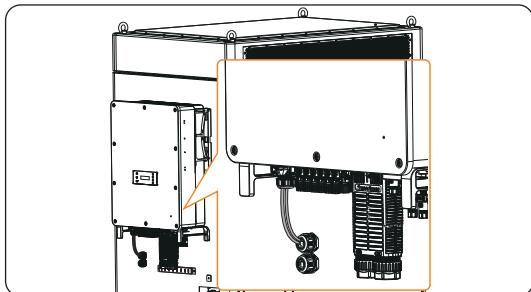


Figure 7-46 Well connected COM 1 cables

RS485 communication connection

For SolaX products, such as the Adapter Box, EV-Charger and etc., they can be connected to pin4 and pin5. As for pin1, pin2, pin7, and pin8 they can be utilized to connect devices other than SolaX products. If you require simultaneous connections of multiple devices, a splitter adapter can be employed.

NOTICE!

- Please refer to corresponding user manual for the specific application of Adapter Box, EV-Charger and Datahub.
- Not all devices are compatible with 8 pin Network cables. In cases where 8 pin Network cables are not supported, it is required to re-crimp the RJ45 terminal according to the pin assignment.

- External device wiring procedure

Step 1: Loosen the screws on the COM 1 terminal. Pinch the tabs on the sides of the COM 1 connector enclosure and pull it at the same time to remove it.

Step 2: Anti-clockwise loosen the swivel nut and pull out the sealing plugs. Keep the sealing plugs still in the cable support sleeve if you choose not to connect the cable.

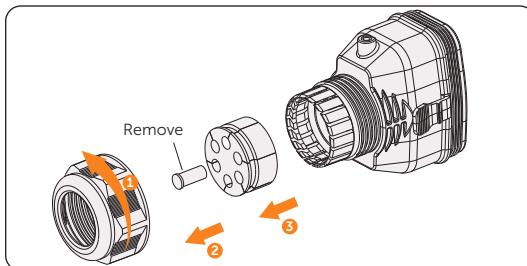


Figure 7-47 Disassembling the connector

Step 3: Thread the cables without RJ45 terminal through the swivel nut, cable support sleeve, and connector enclosure in sequence. Strip approx. 15 mm of the cable insulation.

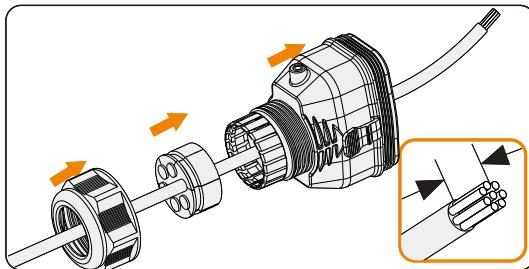


Figure 7-48 Threading the cables and stripping the insulation

Step 4: Insert the stripped section into the RJ45 terminal. Crimp it tightly with a crimping tool for RJ45. Pay attention to pin order of RJ45 terminal.

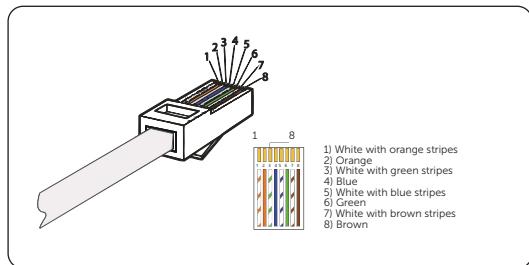


Figure 7-49 Crimping the communication cable

NOTICE!

- Use network cable tester to test the crimped cable before connecting to the inverter.

Step 5: Install the network cable of the crimped RJ45 terminal to RS485 of cable fixture according to the labeling.

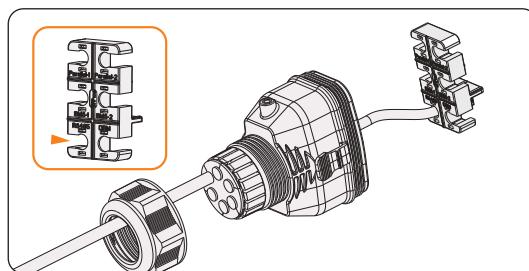


Figure 7-50 Installing RJ45 terminal to the cable fixture

Step 6: Connect the assembled connector to COM 1 terminal. Make sure the cable fixture tongue is well inserted into the slot of terminal. You will hear an audible "Click" if it is connected securely. Lighly pull the cable backward for double check its connection.

Step 7: Secure the assembled connector on COM 1 terminal.

- Install the connector enclosure back into the COM 1 terminal.
- Install the cable support sleeve into the enclosure.
- Tighten M3 screw to secure it. (Torque: $1.2 \pm 0.1 \text{ N}\cdot\text{m}$)
- Clockwise tighten the swivel nut to finish the COM 1 wiring connection.

DRM connection (applicable to AS/NZS 4777)

According to AS/NZS 4777, the inverter needs to support the function of demand response mode (DRM). With the use of an external control box, active or reactive power regulation can be realized in a timely and fast manner, and the inverter can be operated stably during the process of regulation.

DRM 0, DRM 1 and DRM 5 are available now.

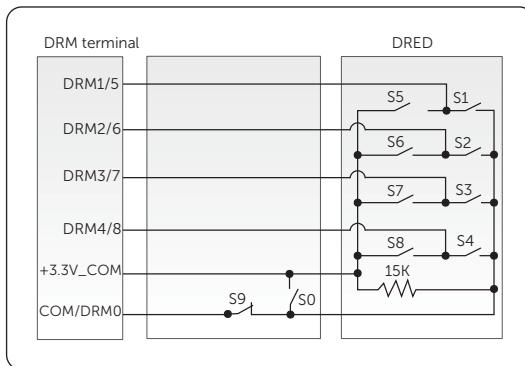


Figure 7-51 DRED connection diagram

Table 7-3 Descriptions of DRM

Mode	Pin	Requirement
DRM 0	Pin 6	<ul style="list-style-type: none"> When S0 is turned on, the inverters shut down. When S0 is turned off, the inverters restore grid connection.
DRM 1	Pin 1	<ul style="list-style-type: none"> When S1 is turned on, the inverters do not input active power.
DRM 5	Pin 1	<ul style="list-style-type: none"> When S5 is turned on, the inverters do not output active power.

- DRM connection wiring procedure

Step 1: Loosen the screws on the COM 1 terminal. Pinch the tabs on the sides of the COM 1 connector enclosure and pull it at the same time to remove it.

Step 2: Anti-clockwise loosen the swivel nut and pull out the sealing plugs. Keep them still in the cable support sleeve if you choose not to connect the cable.

Step 3: Thread the cable through the swivel nut, cable support sleeve, and connector enclosure in sequence.

Step 4: Install the network cable of the crimped RJ45 terminal to RS485 of cable fixture according to the labeling.

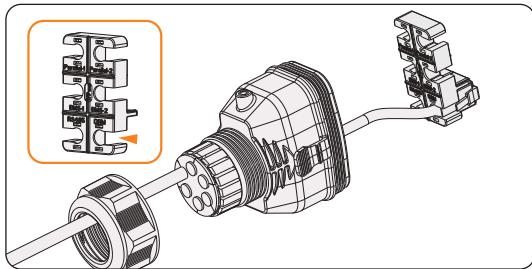


Figure 7-52 Installing RJ45 terminal to the cable fixture

Step 5: Connect the assembled connector to COM 1 terminal. Make sure the cable fixture tongue is well inserted into the slot of terminal. You will hear an audible "Click" if it is connected securely. Lightly pull the cable backward for double check its connection.

Step 6: Secure the assembled connector on COM 1 terminal.

- Install the connector enclosure back into the COM 1 terminal.
- Install the cable support sleeve into the enclosure.
- Tighten M3 screw to secure it. (Torque: $1.2 \pm 0.1 \text{ N}\cdot\text{m}$)
- Clockwise tighten the swivel nut to finish the COM 1 wiring connection.

7.2.7 COM 2 Communication Connection

Pin assignment of COM 2 terminal

The COM 2 terminal is used for Meter/CT connection, ripple control and DIO function.

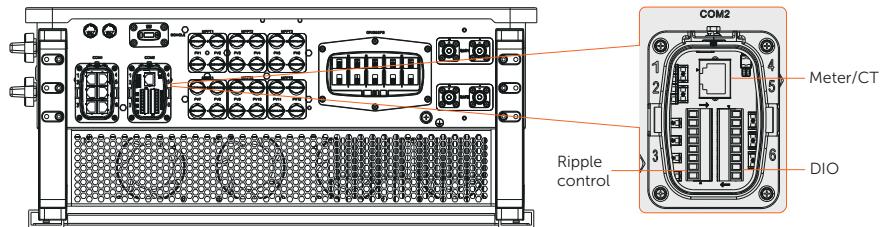


Table 7-4 Pin assignment of COM 2 terminal

Pin	Pin assignment
Meter/CT	
1	CT_R1_CON
2	CT_S1_CON
3	CT_T1_CON
4	METER_485A
5	METER_485B
6	CT_T2_CON
7	CT_S2_CON
8	CT_R2_CON
Ripple control	
1	RP_K4
2	GND_COM
3	RP_K3
4	GND_COM
5	RP_K2
6	GND_COM
7	RP_K1
8	GND_COM

Electrical Connection

Pin	Pin assignment
DIO port	
1	DO_1
2	DO_2
3	DI_1+
4	DI_1-
5	DI_2+
6	DI_2-
7	GND_COM
8	EPSBOX_RELAY_VCC

CT/Meter connection

The inverter should work with an electric meter or current transformer (CT for short) to monitor household electricity usage. The electricity meter or CT can transmit the relevant electricity data to the inverter or platform.

This section only introduces the wiring of the CT/Meter port of the inverter. For wiring procedures of the CT and meter side, see ["14.3 CT/Meter Connection Scenarios"](#).



CAUTION!

- Compatible meters and CTs must be properly connected to the inverter, otherwise, the inverter will shut down and prompt a **Meter Fault** alarm.
- Meters and CTs that will be connected to the inverter must be authorized by SolaX. Unauthorized meters and CTs might be incompatible and cause damages to the inverter. SolaX will not be responsible for the impact caused by the use of other appliances.

Table 7-5 CT/Meter pin definition

	Pin	Pin assignment
For CT connection	1	CT_R1_CON
	2	CT_S1_CON
	3	CT_T1_CON
For Meter connection	4	METER_485A
	5	METER_485B

For CT connection	6	CT_T2_CON
	7	CT_S2_CON
	8	CT_R2_CON

- CT/Meter wiring procedure

Step 1: Loosen the screws on the COM 2 terminal. Pinch the tabs on the sides of the COM 2 connector enclosure and pull it at the same time to remove it.

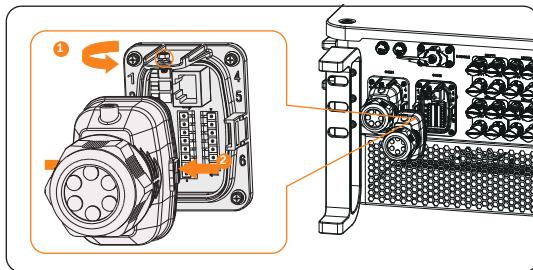


Figure 7-53 Disassembling the COM 2 terminal

Step 2: Loosen the swivel nut and pull out the sealing plugs. Keep them still in the cable support sleeve if you choose not to connect the cable.

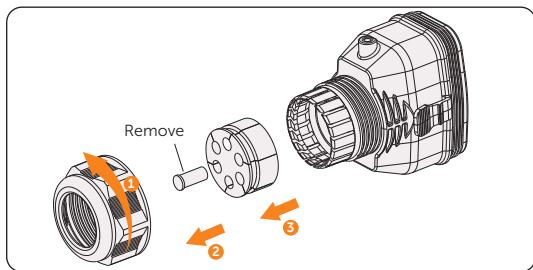


Figure 7-54 Disassembling the connector

Step 3: Directly thread the cable through the swivel nut, cable support sleeve and connector enclosure in sequence.

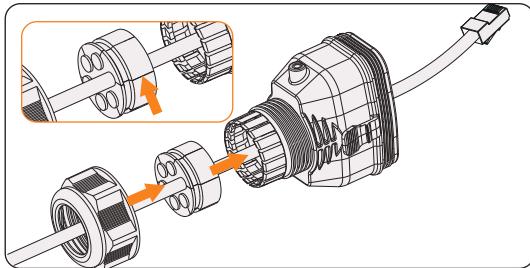


Figure 7-55 Threading the cable with RJ45 terminal

NOTICE!

- Use network cable tester to test the crimped cable before connection.

Step 4: Connect the assembled communication cable into the COM 2 terminal. Secure the assembled connector on COM 2 terminal.

- » Install the connector enclosure back into the COM 2 terminal.
- » Install the cable support sleeve into the enclosure.
- » Tighten M3 screw to secure it. (Torque: $1.2 \pm 0.1 \text{ N}\cdot\text{m}$)
- » Clockwise tighten the swivel nut to finish the COM 2 wiring connection.

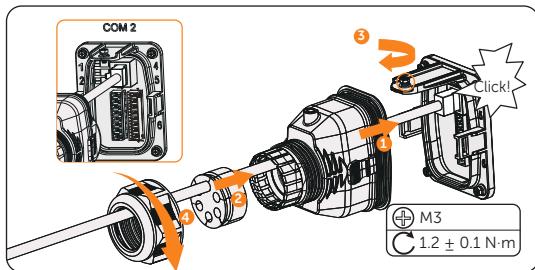


Figure 7-56 Connecting to COM 2

Ripple control communication connection

Ripple Control is a common form of grid management. Its communication is based on superimposing a very high frequency signal onto the 50 / 60 Hz mains power. The inverter supports to connect a digital signal source (e.g. ripple control receiver) to the digital input.

- Requirements for Ripple control
 - » The signal source must be technically suitable for connection to the digital inputs. (see technical data)
 - » The connected digital signal source has a safe separation to the grid potential.
- Connection diagram for ripple control

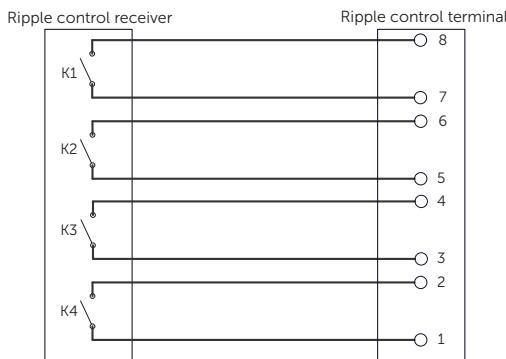


Figure 7-57 Connection diagram for ripple control

- Ripple control wiring procedure

Step 1: Loosen the screws on the COM 2 terminal. Pinch the tabs on the sides of the COM 2 connector enclosure and pull it at the same time to remove it.

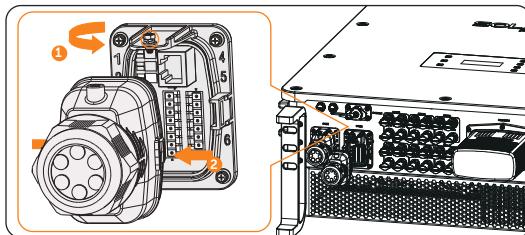


Figure 7-58 Disassembling the COM 2 terminal

Step 2: Loosen the swivel nut and pull out the sealing plugs. Keep them still in the cable support sleeve if you choose not to connect the cable.

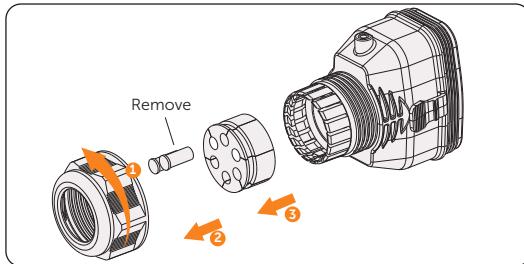


Figure 7-59 Disassembling the connector

Step 3: Prepare two four-core signal cables. Thread the cables through the swivel nut, cable support sleeve, and connector enclosure in sequence.

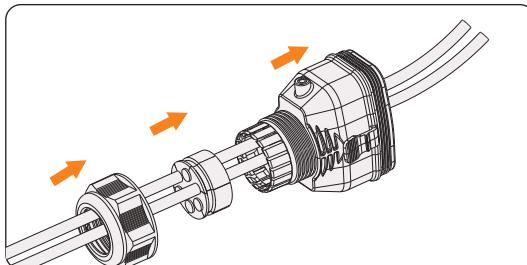


Figure 7-60 Threading the cables

Step 4: Strip approx. 6 mm of the cable insulation. Insert the conductors into the 8-pin terminal block (Part F2) and tighten the terminal block screws. (torque: 0.4 ± 0.1 N·m) Ensure that the conductors are firmly seated in the terminal.

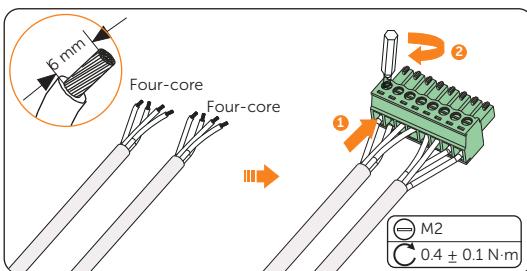


Figure 7-61 Connecting to 8-pin terminal block

Step 5: Connect the assembled communication cable into the COM 2 terminal. Lightly pull the cable backward to confirm tight insertion and then install the connector back.

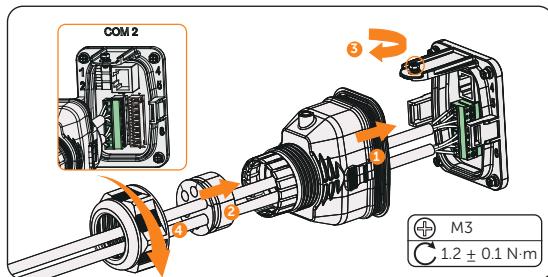


Figure 7-62 Connecting to the inverter

DIO communication connection

DIO terminal is designed to support generator and system switch connection through dry contact.

To enhance safety and reduce the risk of injury, you can install the system switch in a readily accessible location through dry contact connection. In the event of an emergency, the system switch can be easily reached and pressed to promptly switch off the entire system, ensuring a swift response and preventing further harm.

For generator, please refer to corresponding user manual for specific application.

Table 7-6 DIO pin definition

	Pin	Pin assignment
For generator dry contact output	1	DO_1
	2	DO_2
For system switch dry contact input	3	DI_1+
	4	DI_1-
Reserved	5	DI_2+
	6	DI_2-
Reserved	7	GND_COM
For power supply	8	EPSBOX_RELAY_VCC

NOTICE!

- If there is strong interference in the surroundings, it is recommended to use shielding cables and ground the shielding layer of the cables through Pin 7.
- System switch connection diagram

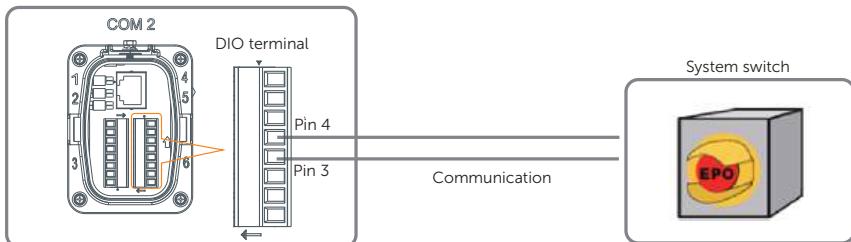


Figure 7-63 System switch connection diagram

Choose a self-locking switch for the system. When system switch is pressed, **OFF MODE (DIO SW)** will be displayed on the LCD screen and the system will be powered off. To release the switch, press it again.

- DIO wiring procedure

Step 1: Loosen the screws on the COM 2 terminal. Pinch the tabs on the sides of the COM 2 connector enclosure and pull it at the same time to remove it.

Step 2: Loosen the swivel nut and pull out the sealing plugs. Keep them still in the cable support sleeve if you choose not to connect the cable.

Step 3: Prepare two four-core signal cable. Thread the cables through the swivel nut, cable support sleeve, and connector enclosure in sequence.

Step 4: Strip approx. 6 mm of the cable insulation. Insert the conductors into the 8-pin terminal block and tighten the terminal block screws. (torque: $0.4 \pm 0.1 \text{ N}\cdot\text{m}$) Ensure that the conductors are firmly seated in the terminal.

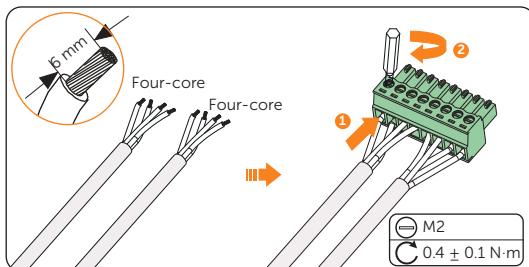


Figure 7-64 Connecting to 8-pin terminal block

Step 5: Connect the assembled communication cable into the COM 2 terminal. Lightly pull the cable backward to confirm tight insertion and then install the connector back.

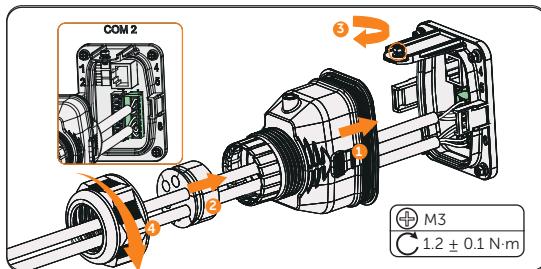


Figure 7-65 Connecting to the inverter

7.3 EPS Connection

Regarding the grid connection, see **Part b** in “Figure 7-1 Part that needs wiring”, please strictly follow the steps below.

NOTICE!

- Take out the underground electrical wiring which is buried beneath the ground.
- Regarding the terminal requirements, please refer to “14.4 Requirements for OT/DT/OT Terminal”.

Step 1: Use keys to open the front doors.

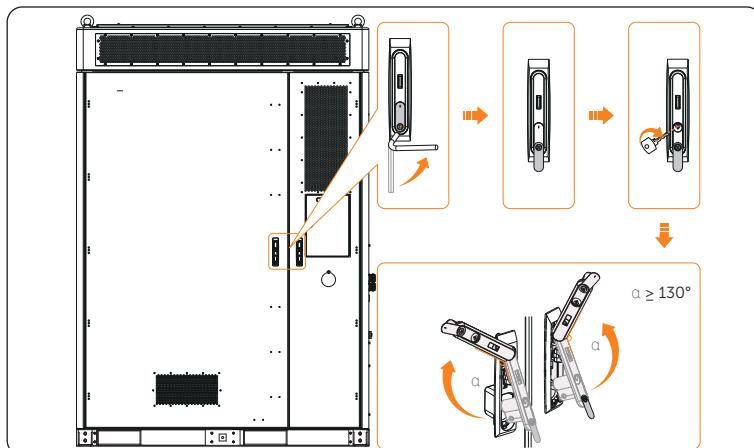


Figure 7-66 Opening front doors

NOTICE!

- Please keep the keys properly.

Step 2: Unscrew screws to open the cable hole cover.

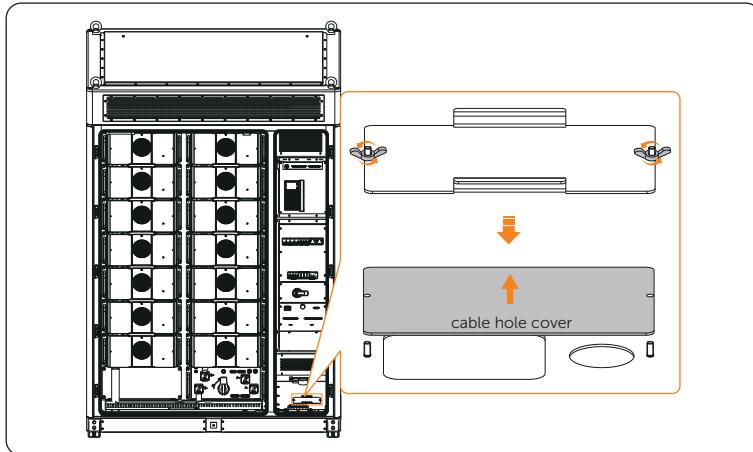


Figure 7-67 Opening cable hole cover

Step 3: Strip the four-core cable about 250 mm to 270 mm.
Strip the cable jacket (for L1/L2/L3/N) about 20 mm.

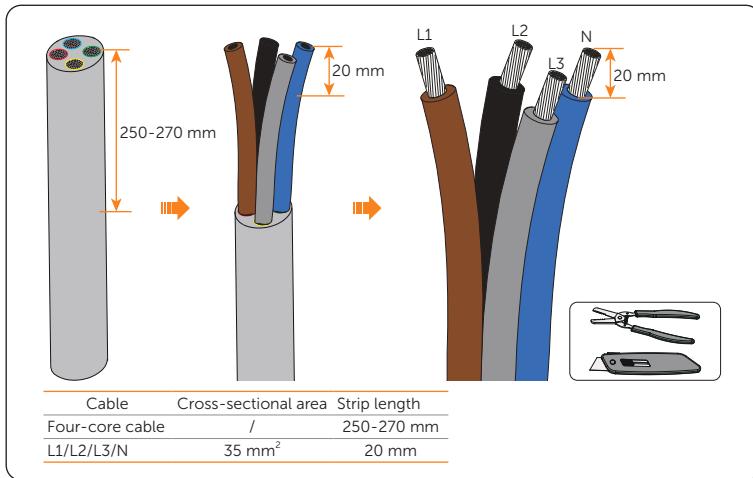


Figure 7-68 Stripping cable jacket

NOTICE!

- It's important to give the power cable a health check before stripping it.
- It's necessary to use controlled motion to strip the insulation down the wire, to prevent damage to the wires.
- Make sure that the insulation layer has been stripped to a sufficient length so that the center conductor is fully exposed without any damage or nicks. In addition, make sure that no extra insulation remains beyond the connector once it's crimped on.

Step 4: Cut the heat-shrink tubing ($\varnothing 15-20$ mm) to about 50 mm to 60 mm length for L1/L2/L3/N wires;

Carefully slide it onto the end of the cable, and then carefully slip the wires all the way into the copper terminals (Part M1).

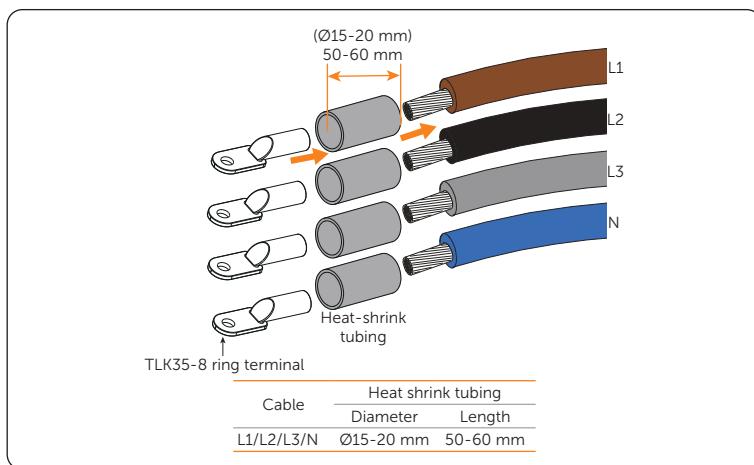


Figure 7-69 Slipping wires

Step 5: Crimp the terminal using hydraulic wire crimper. Since the procedure for installing a terminal is same, take the L1 wire, for instance.

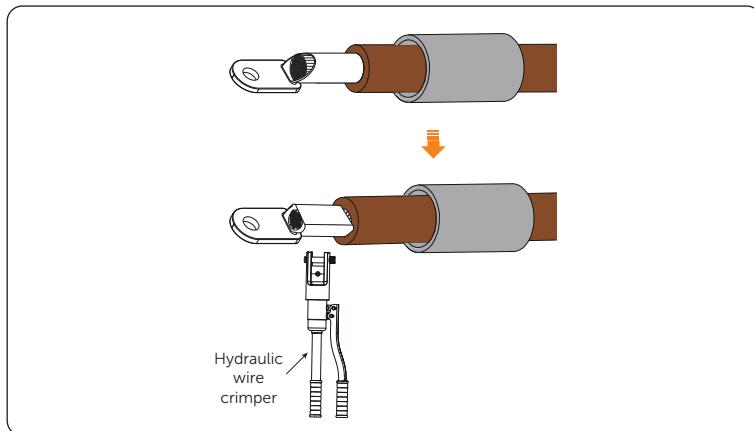


Figure 7-70 Crimping

NOTICE!

- Do not damage the conductor insulation while crimping.
- Do not place the conductor insulation into the terminal.

Step 6: Heat the heat-shrink tubing after it wraps the end of terminal.

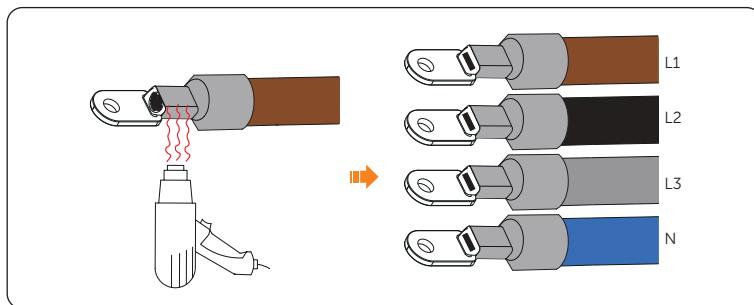


Figure 7-71 Heating

NOTICE!

- Move the heat gun back and forth slowly to distribute the heat evenly across the surface of heat shrink tubing.

Step 7: There are two options (a and b) for pulling through the EPS wires. Therefore, thread it through option a or b from the outside to the inside.

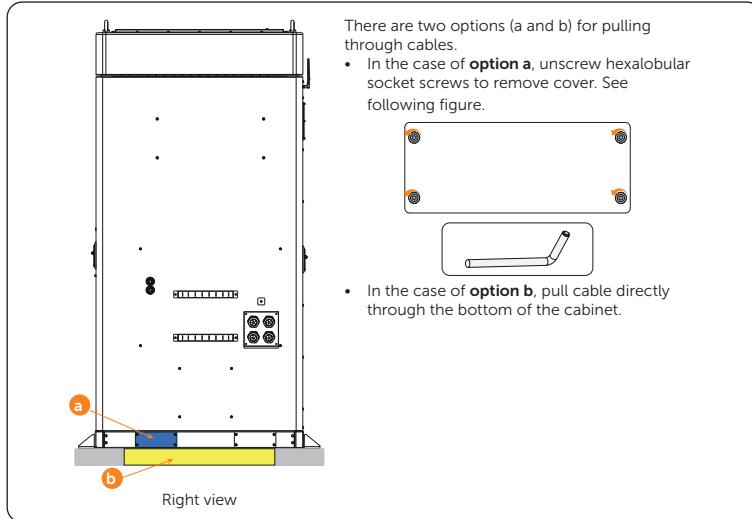


Figure 7-72 Threading EPS wires

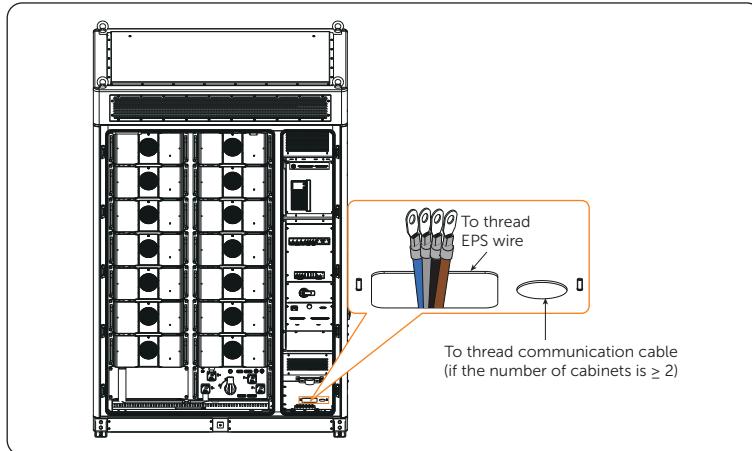


Figure 7-73 Threading EPS wires

Step 8: Unscrew M5 screws to open clamp.

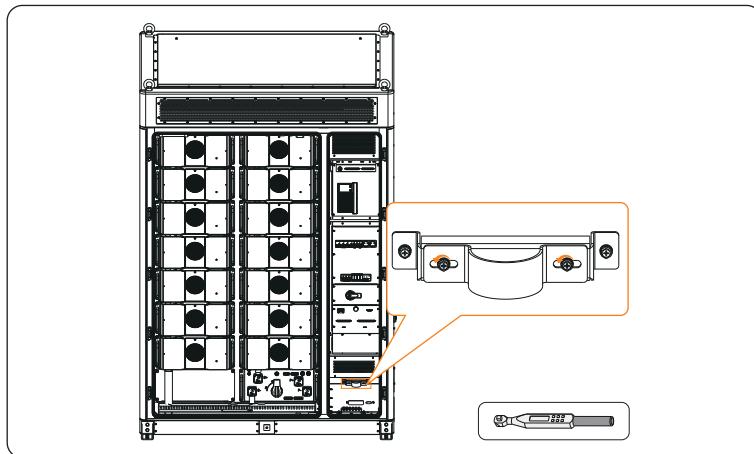


Figure 7-74 Opening clamp

Step 9: Run the EPS wires through the clamp, and then insert and tighten M5 screws (torque: 2.0 ± 0.2 N·m).

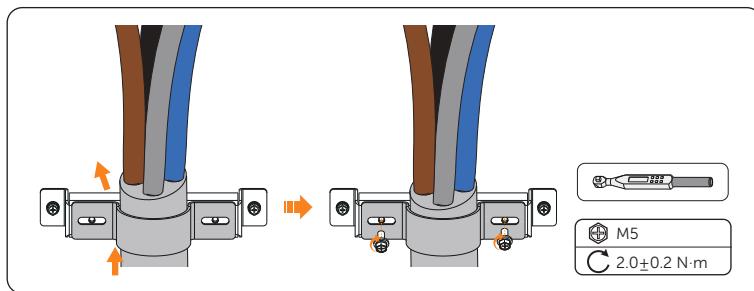


Figure 7-75 Threading EPS wires

Step 10: Unscrew M4 screws to remove the cover.

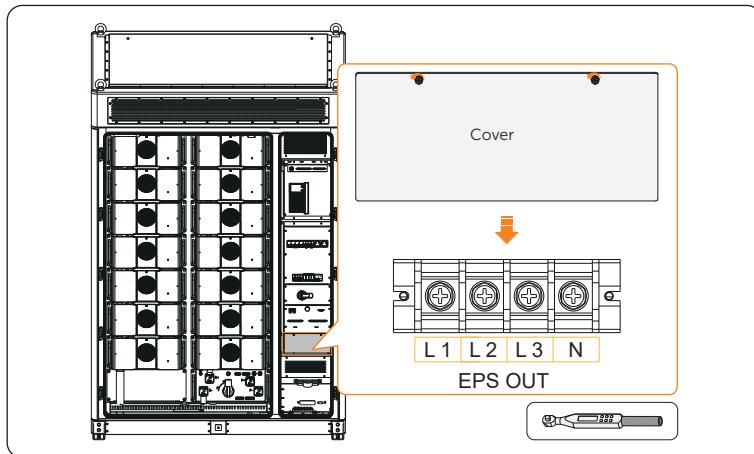


Figure 7-76 Removing cover

NOTICE!

- Please keep the M4 screws and cover properly.

Step 11: Unscrew the M8 screws using torque wrench, connect the assembled L1/L2/L3/N wires to the wire interface, and then tighten them (torque: 12 ± 1 N·m). There are a total of 4 pieces of M8 screws.

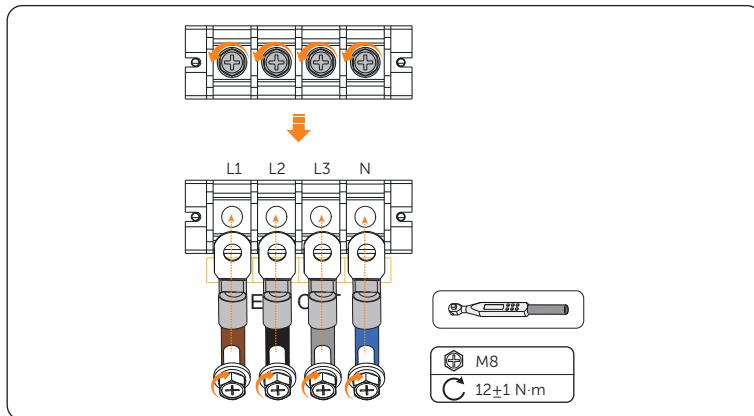


Figure 7-77 Connecting L1/L2/L3/N wires

Step 12: Attach the cover, and insert and tighten the M4 screws (torque: $1.2\pm0.1\text{ N}\cdot\text{m}$).

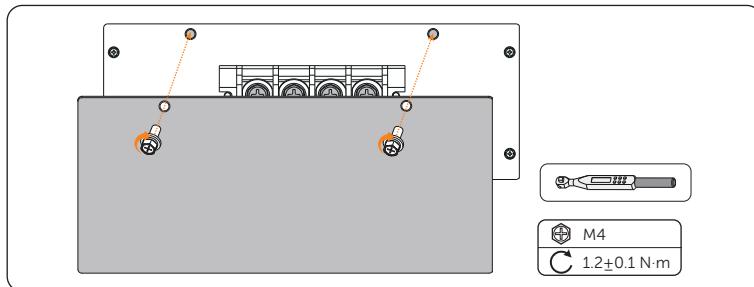


Figure 7-78 Securing cover

7.4 Grid Connection

Regarding the grid connection, see **Part c** in "Figure 7-1 Part that needs wiring", please strictly follow the steps below.

NOTICE!

- Take out the underground electrical wiring which is buried beneath the ground.
- Regarding the terminal requirements, please refer to "[14.4 Requirements for OT/DT/OT Terminal](#)".

Step 1: Use keys to open the rear door.

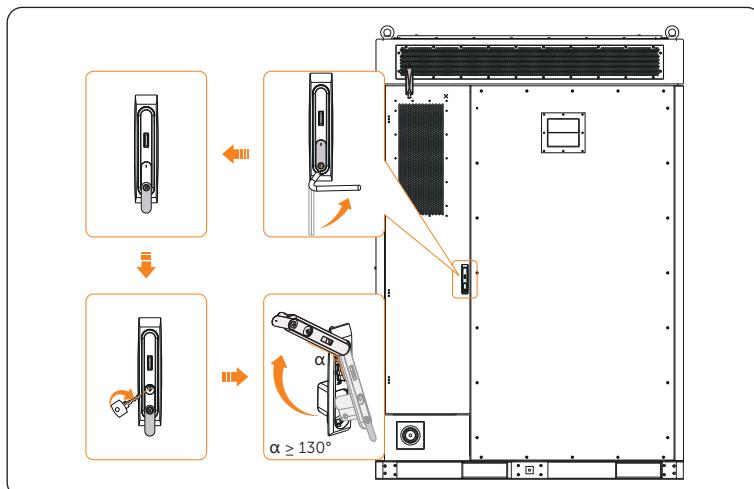


Figure 7-79 Opening rear door

Step 2: Unscrew screws to open the cable hole cover.

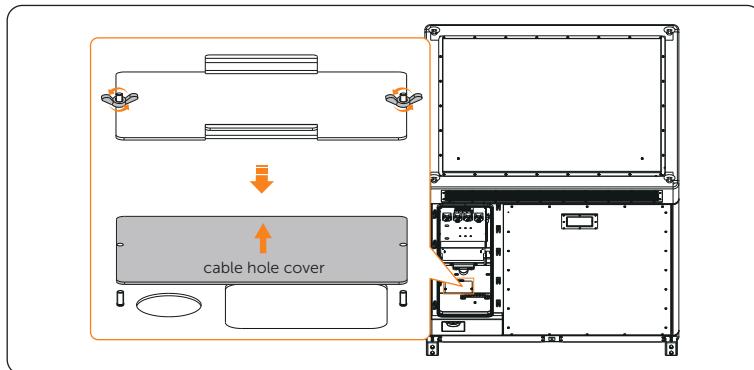


Figure 7-80 Opening cable hole cover

Step 3: Strip the five-core cable about 160 mm to 180 mm;
 Strip the cable jacket (for L1/L2/L3/N) about 20 mm;
 Strip the PE cable jacket about 15 mm to 20 mm.

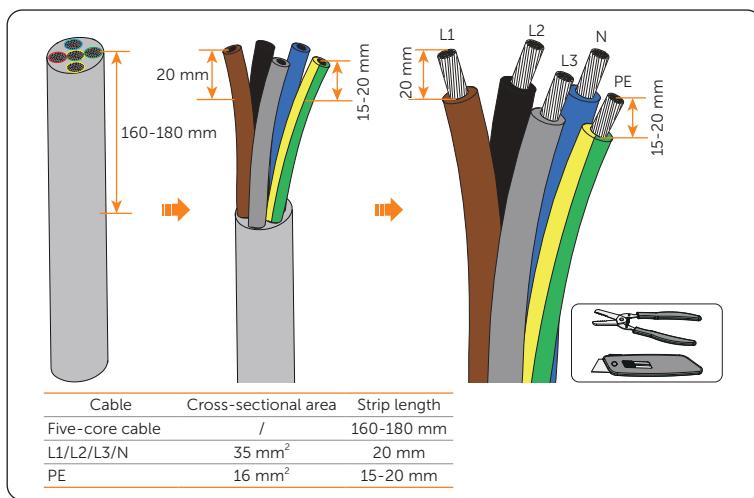


Figure 7-81 Striping cable jacket

NOTICE!

- It's important to give the power cable a health check before stripping it.
- It's necessary to use controlled motion to strip the insulation down the wire, to prevent damage to the wires.
- Make sure that the insulation layer has been stripped to a sufficient length so that the center conductor is fully exposed without any damage or nicks. In addition, make sure that no extra insulation remains beyond the connector once it's crimped on.

Step 4: Cut the heat-shrink tubing ($\varnothing 17\sim25$ mm) to about 50 to 60 mm length for L1/L2/L3/N wires;

Cut the heat-shrink tubing ($\varnothing 10\sim15$ mm) to about 30 to 40 mm length for PE wire;

Carefully slide it onto the end of the cable, and then carefully slip the wires all the way into the copper terminals (Part M1).

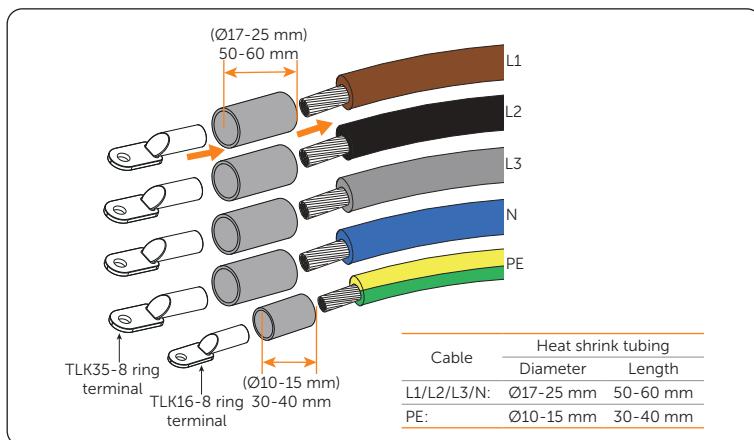


Figure 7-82 Cutting heat-shrink tubing

Step 5: Crimp the terminal using hydraulic wire crimper. Since the procedure for installing a terminal is same, take the L1 wire, for instance.

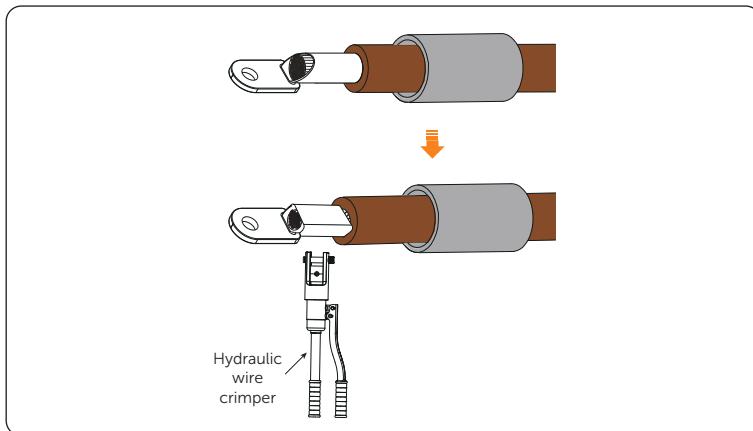


Figure 7-83 Crimping

NOTICE!

- Do not damage the conductor insulation while crimping.
- Do not place the conductor insulation into the terminal.

Step 6: Heat the heat-shrink tubing after it wraps the end of terminal.

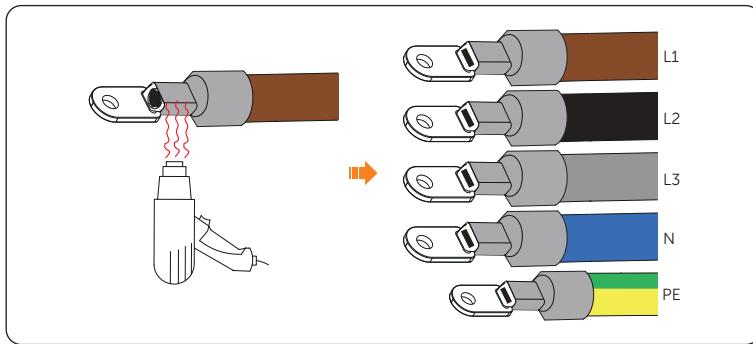


Figure 7-84 Heating heat-shrink tubing

NOTICE!

- Move the heat gun back and forth slowly to distribute the heat evenly across the surface of heat shrink tubing.

Step 7: There are two options (a and b) for pulling through the grid wires. Therefore, thread it through option a or b from the outside to the inside.

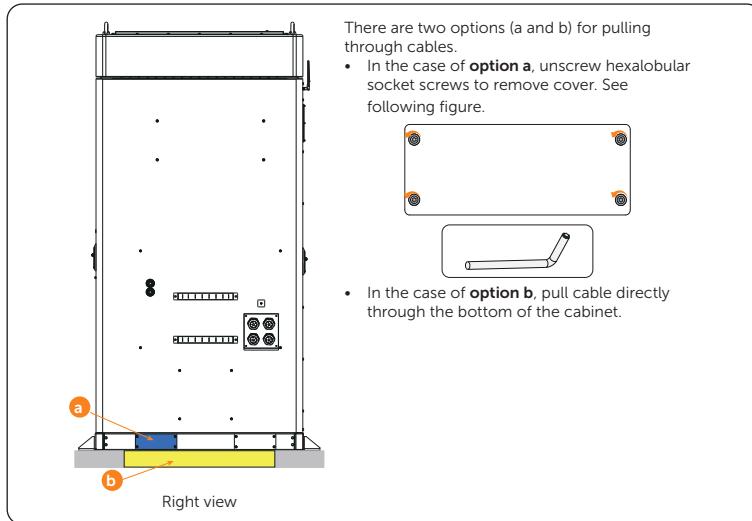


Figure 7-85 Threading grid wires

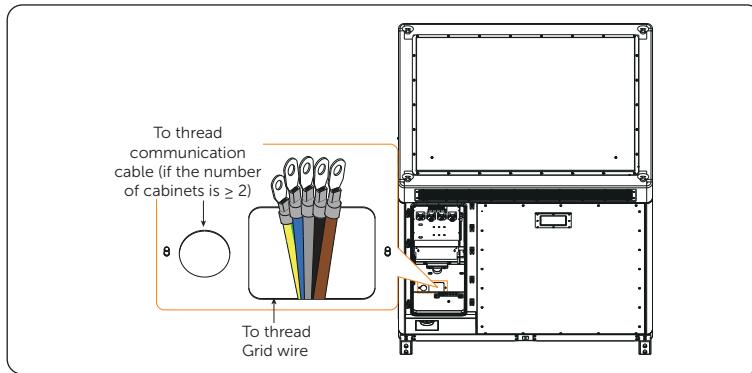


Figure 7-86 Threading grid wires

Step 8: Unscrew M5 screws to open clamp.

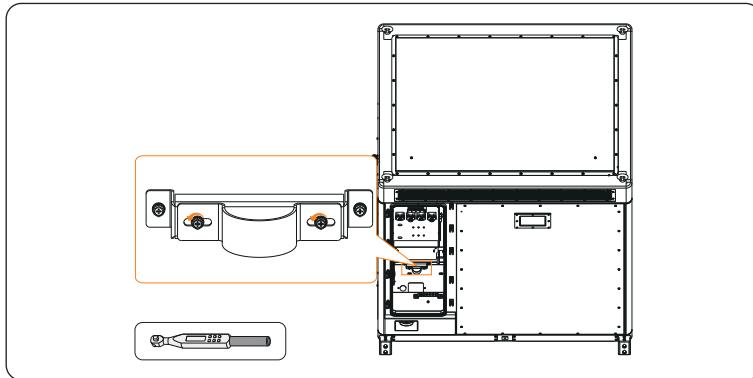


Figure 7-87 Opening clamp

Step 9: Run the grid wires through the clamp, and then insert and tighten M5 screws (torque: 2.0 ± 0.2 N·m).

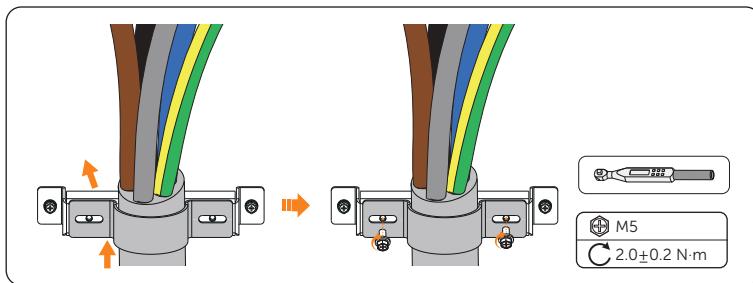


Figure 7-88 Threading grid wires

Step 10: Unscrew M5 screws and remove the cover from the hooks.

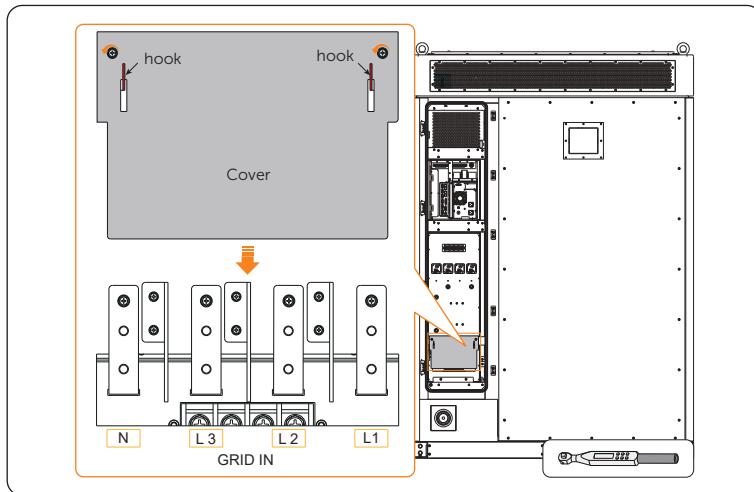


Figure 7-89 Removing cover

NOTICE!

- Please keep the M5 screws and cover properly.

Step 11: Unscrew the M8 screws using torque wrench, connect the assembled L1/L2/L3/N wires to the wire interface, and then tighten them (torque: 12 ± 1 N·m). There are two options. **Option b** is recommended to connect. The ports of **option a** are regarded as reserved ports.

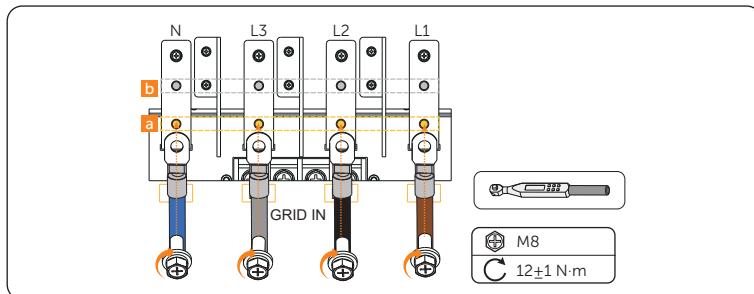


Figure 7-90 Connecting L1/L2/L3/N wires

Step 12: There are two M8 screws (a and b), and either of them can be connected to the PE wire. Hence, unscrew a M8 screw using a torque wrench, connect the assembled PE wire to the copper bar, and then tighten it (torque: 12 ± 1 N·m).

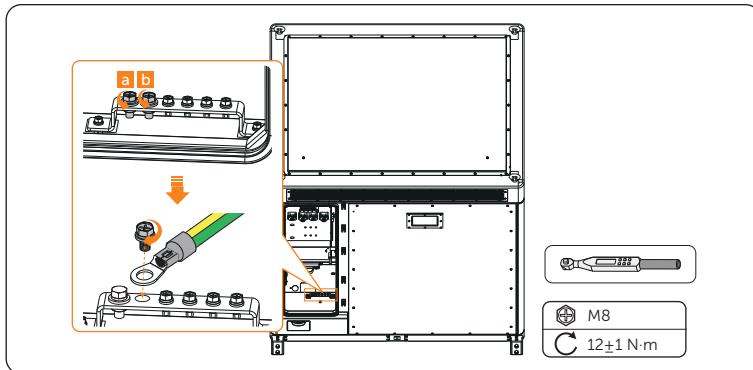


Figure 7-91 Connecting PE wire

Step 13: Reattach the cover over the hooks, and then correctly insert and tighten M5 screws (torque: 2.0 ± 0.2 N·m).

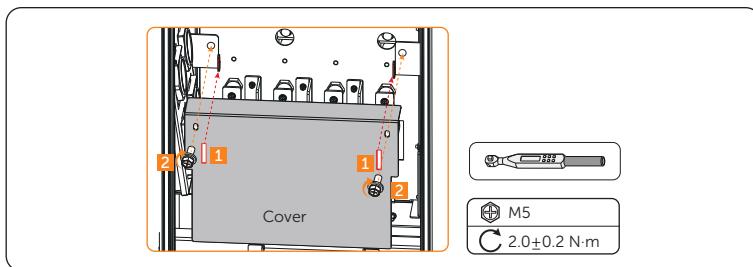


Figure 7-92 Reattaching cover

7.5 Fireproof Mud

After finishing wiring, the cable threading holes must be laid with fireproof mud.

Step 1: Lay the fireproof mud (Part G1) to plug the cable threading holes on both front and rear sides of the cabinet.

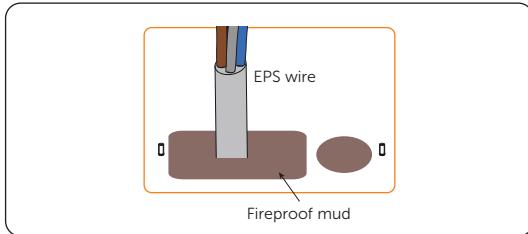


Figure 7-93 Plugging the cable threading hole on the front side

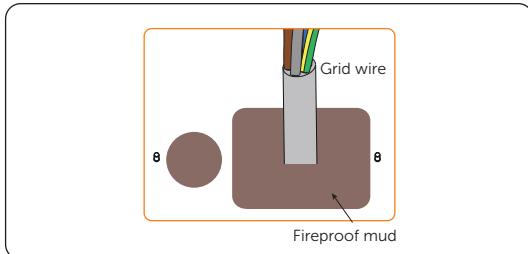


Figure 7-94 Plugging the cable threading hole on the rear side

NOTICE!

Notice for fireproofing mud:

- Take out the fireproof mud delivered with the cabinet and knead it into a ball shape. In the case of the low temperature, place it into warm water, of which the temperature range is between 40°C and 70 °C, with its package until it is soft.
- Clean the area around the cable threading hole before sealing it.
- The fireproof mud should be evenly spread, embedded, or filled in the cable threading hole. If such a hole is too large, a fireproofing board can be placed to enhance fire protection before using the mud.
- The fireproof mud needs to be cured after sealing the cable threading hole. Prevent water from entering and colliding during curing.

7.6 Installation Procedure for Cable Cover

NOTICE!

- Do not install the cable cover until the all the cables are wired.

Step 1: Unscrew M6 hexalobular screws, with a total of 8 screws (a1, a2, a3 and a4 for large cable cover, and b1, b2,b3 and b4 for small cable cover).

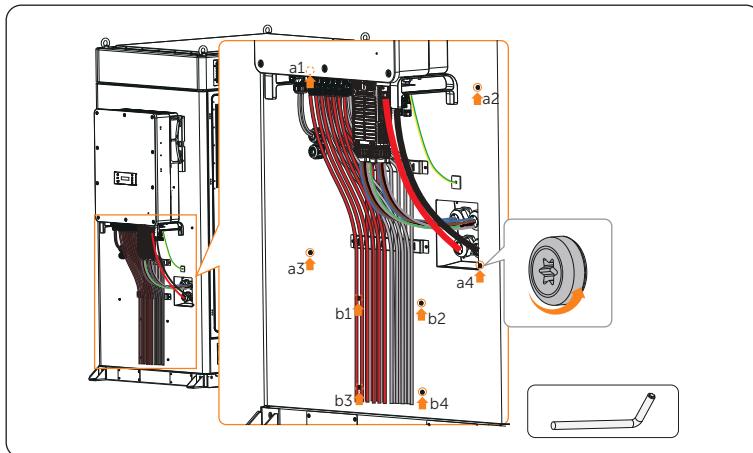


Figure 7-95 Unscrew M6 screws

NOTICE!

- Keep these M6 screws properly.

Step 2: Attach the large cable cover (Part B1) to the cabinet, and insert and tighten the M6 hexalobular screws by using a hexalobular key.

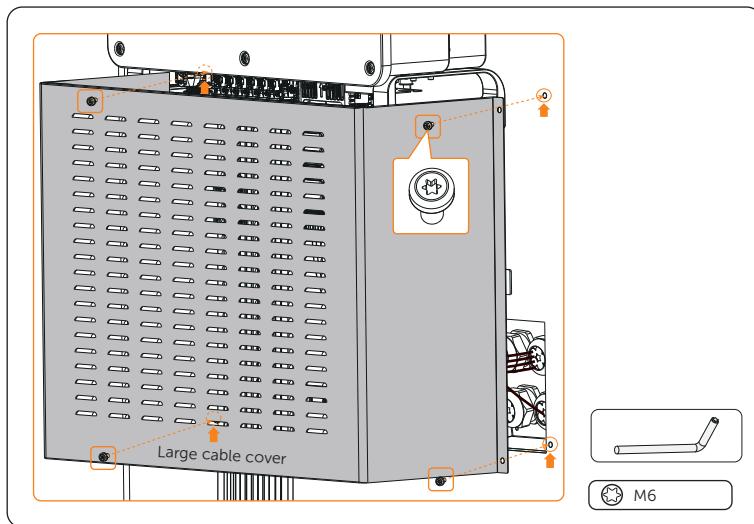


Figure 7-96 Attaching large cable cover

Step 3: Attach the small cable cover (Part C1) to the cabinet, and insert and tighten the M6 hexalobular screws by using a hexalobular key.

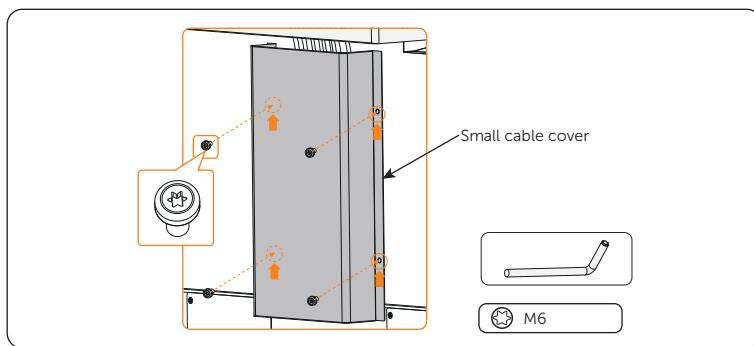


Figure 7-97 Attaching small cable cover

NOTICE!

- Must clean the materials, such as metal parts, screws, etc., in the cabinet after finishing wiring.
- It is recommended to seal off the gap between foundations after finishing wiring.

8 System Commissioning

8.1 Checking before Power-on

Ensure that all the cables connecting to the EPS and distribution box (grid side) are wired and securely fastened. For details, please refer to the following Table 8-1.

Table 8-1 Checklist

No.	Item	Description
1	Device appearance	<ul style="list-style-type: none">Check the device is in good condition, with a clean, non-peeling paint, and rust-free surface.Ensure that the labels on the device are clear and easy to read. If it is damaged, the label shall be replaced at once.
2	Installation	<ul style="list-style-type: none">The battery cabinet, inverter and other device (if any) are installed correctly and securely.All the screws are tightened.
3	Cable appearance	<ul style="list-style-type: none">Check that the cable jacket is in good condition.Check that the protective pipes are in good condition.
4	Cable connection	<ul style="list-style-type: none">Check that the cable connection position is consistent with the design principles.Ensure that the procedure for crimping terminals strictly observe the requirements, and the terminals are securely fastened.Check that the labels on the both sides of cables are clear, and the direction of both labels is the same.Check that all DC, AC cables, ground cable, communication cables and meter/CT of the inverter are connected correctly and securely.Check that the external AC and DC connectors are connected; The connectors on the Grid and EPS terminal are connected correctly and securely.Check the unused terminals and ports of the inverter are locked by waterproof caps.Check that all photovoltaic panels are connected correctly and securely.

No.	Item	Description
5	Wiring	<ul style="list-style-type: none"> Ensure that the wiring procedure is consistent with the principle of separation of strong and weak electricity. Ensure that the cables are neatly places. Leave a little extra length for adjustments. Keep cables tidy in the cabinet. Check if the grid connection voltage meets: L1+N=220/230 V, L2+N=220/230 V, L3+N=220/230 V, L1+L2=380/400 V, L2+L3=380/400 V, L1+L3=380/400 V.
6	Copper bars in the battery pack	<ul style="list-style-type: none"> Check to make sure the copper bars are not deformed.
7	Button/Switch	<ul style="list-style-type: none"> Check the distribution box's switch is "OFF". Check the battery packs' switches are "OFF". All the DC breakers and AC breakers are "OFF"

8.2 Power ON

NOTICE!

- Please check that the emergency stop button remains in the closed position before powering on.

Regarding the detailed location of the modules in the cabinet, see following figure.

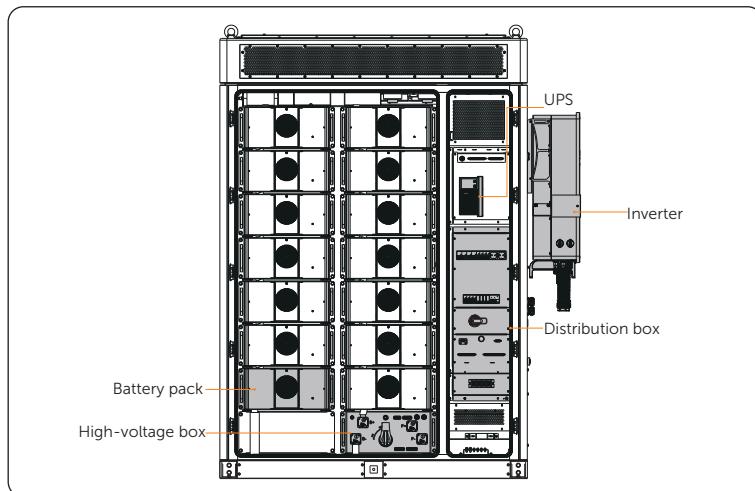


Figure 8-1 Location of modules

Step 1: Start the distribution box.

- » Rotate the switch on the distribution box 90° clockwise to "ON";
- » Flip up the "SPD MCB" breaker;
- » Flip up the "HVAC MCB" breaker;
- » Flip up the "EPS" breaker;
- » Flip up the "APS" breaker;
- » Flip up the "UPS" breaker.

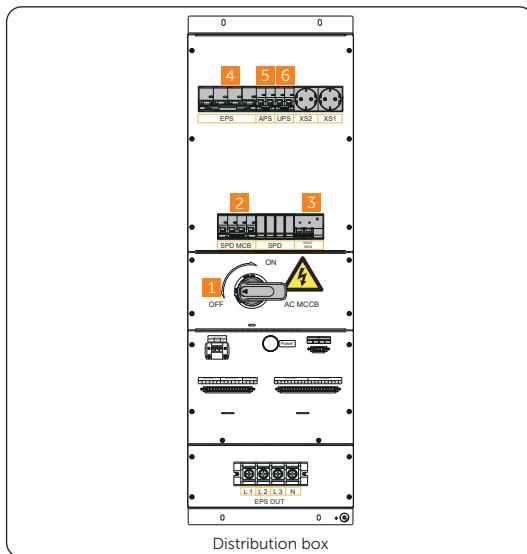


Figure 8-2 Starting sequence of distribution box

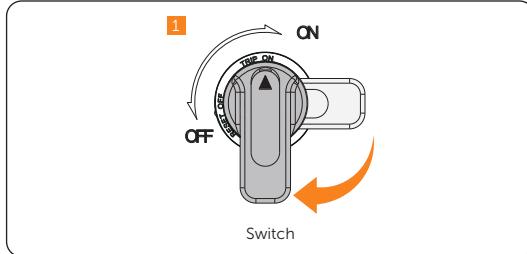


Figure 8-3 Rotating switch

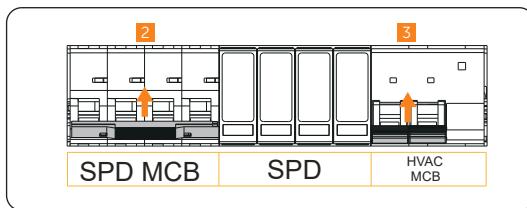


Figure 8-4 Flipping up breakers

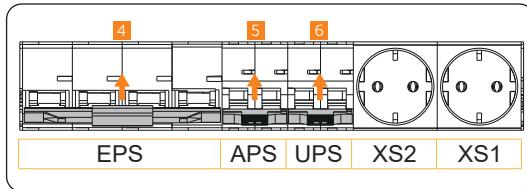


Figure 8-5 Flipping up breakers

Step 2: The startup sound on boot will be heard when holding and pressing the "Power on/off" button to start the UPS.

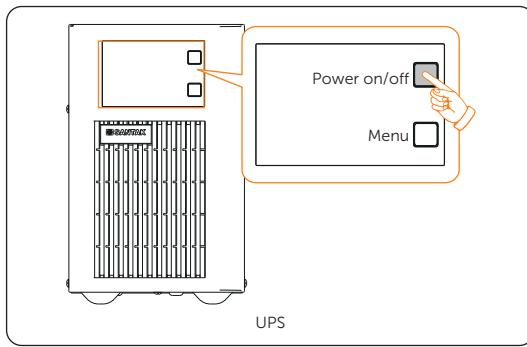


Figure 8-6 Holding and pressing button

Step 3: Rotate the disconnector of the high-voltage box to "ON", and then gently press the power button. At the point, the LED light will come on green.

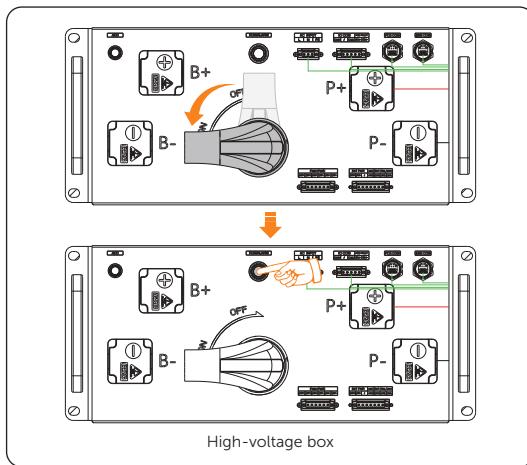


Figure 8-7 Starting the high-voltage box

Step 4: Close the door after the device has been started.

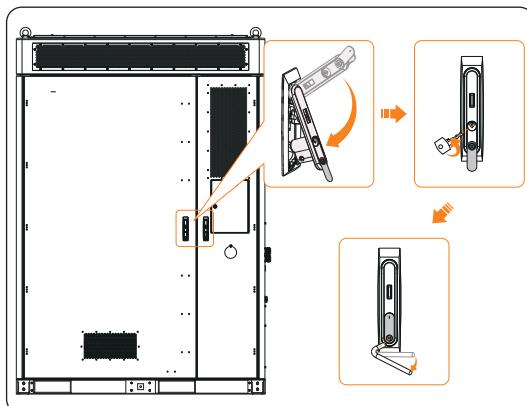


Figure 8-8 Closing the door

NOTICE!

- Please properly keep the key.

Step 5: Start the inverter.

- a. Turn on the AC breakers and check whether the LCD screen lights on.
 - » If the LCD screen is not on, turn off the AC breakers and check whether the Grid cable is connected correctly and securely.
- b. Switch on the inverter DC switch and check the LCD screen, check the PV voltage.
 - » If the PV voltage is 0, turn off the DC switch, pull out the PV connectors and then measure the voltage of the positive and negative PV port (in MPPT voltage range 160-950 V) or check whether the positive and negative poles of PV cables are reversed.
- c. Press and turn on the inverter system button.

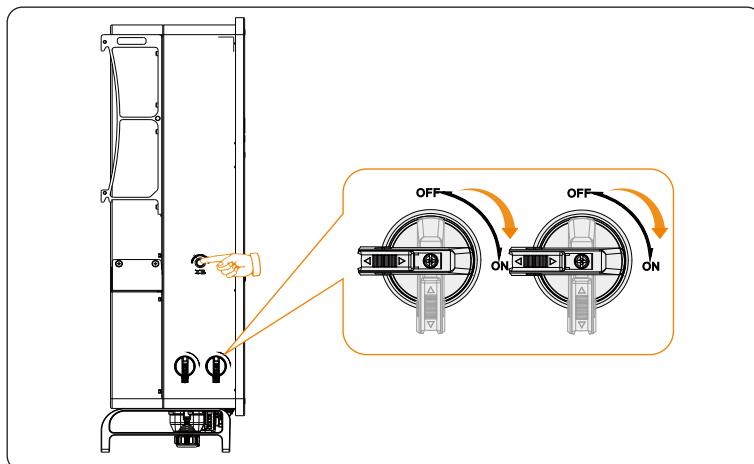


Figure 8-9 Starting the inverter

- d. Set **System ON/OFF** as ON status on the inverter screen, and the LCD displays waiting status.
- e. When the photovoltaic panels generate enough power or the battery supplies power, the inverter will start automatically. The inverter will go Waiting, Checking and Normal status in sequence.
- f. Check whether the meter/CT is correctly connected.
 - » If CT is connected, please perform the Meter/CT Check to check the correct connection through the setting path: **Menu>Setting>Advance Setting>Meter/CT Settings>Meter/CT Check**
 - » If meter is connected, please set the connection of Meter through the setting path: **Menu>Setting>Advance Setting>Meter/CT Settings**.

NOTICE!

- When the meter or CT is correctly connected, the meter/CT power displays on the METER/CT check interface; when the connection method is wrong, **Meter Fault** displays on this interface.

8.3 Checking after Power-on

- Check whether the system has any abnormal noise.
- Check whether the indicator lights report an error and check the system for alarm through the cabinet screen
- Check the running status of the system through the cabinet screen.

9 System Configuration

9.1 Operation on Inverter LCD

9.1.1 Introduction of Control Panel

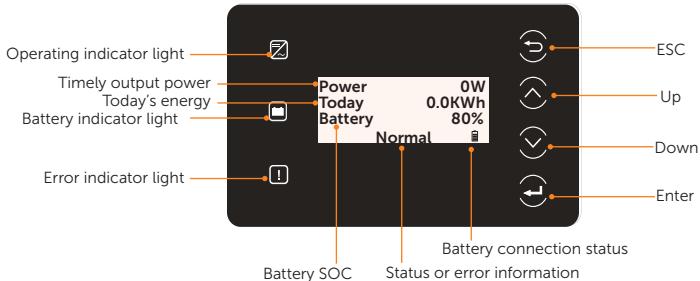


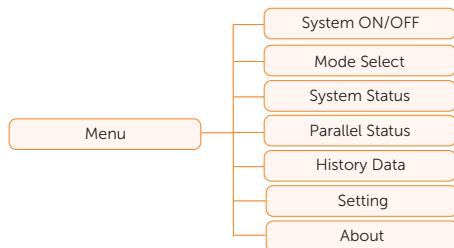
Figure 9-1 Control Panel

- In a normal state, the "Power", "Today" and "Battery" information will be displayed. You can press the keys to switch information.
- In an error state, the fault message and error code will be displayed, please refer to ["11.3 Troubleshooting"](#) for corresponding solutions.

Table 9-1 Definition of keys

Key	Definition
 ESC key	Exit from the current interface or function
 Up key	Move the cursor to the upper part or increase the value
 Down key	Move the cursor to the lower part or decrease the value
 Enter key	Confirm the selection

9.1.2 Introduction of Menu Interface



NOTICE!

This section only introduces the necessary inverter related LCD operations after the system is powered on, for the complete operations on inverter LCD, please refer to the *X3-AELIO Series User Manual*.

9.1.3 Setting

Settings includes User Settings and Advanced Settings.

User setting

Setting path: **Menu>Setting ("0 0 0 0")>User Setting**

NOTICE!

The default password for **User Setting** is "0 0 0 0".

- Setting Date & Time

You can set the current date and time of the installation site.

The display format is "2023-06-16 14:00", in which the first four numbers represent the year (e.g. 2000~2099); the fifth and sixth numbers represent the month (e.g. 01~12); the seventh and the eighth numbers represent the date (e.g. 01~31). The remaining numbers represent the time.



- Setting Language

This inverter provides multiple languages for customers to choose, such as English, Deutsch, Francais, Polskie, Espanol, Português. The default language is English.



Advance setting

Setting path: **Menu>Setting>Advance Setting**

NOTICE!

Property losses or system damage due to unauthorized access to adjustable parameters.

- All the adjustable parameters including safety code, grid parameter, export control, etc can be modified under the permissions of installer password. Unauthorized use of the installer password by unauthorized persons can lead to incorrect parameters being input, resulting in power generation loss or violation of local regulation. Get the installer password from the dealer and never open the password to unauthorized person.

- Setting Safety Code

NOTICE!

- The inverter cannot be connected to the grid before the safety code is correctly set. If there is any doubt about your safety code where the inverter installed, please consult your dealer or SolaX service for details.
- The setup will vary from different safety codes.

Here you can set safety code according to different countries and grid-tied standards.

There are several standards to choose from, please refer to the LCD screen on the inverter. (May be changed or added without notice)

- » When you select safety code **CEI 0-21**, there will be additional **Self Test** option for setting under the path of **Menu>Setting>Advance Setting**.
- » When you select safety code **AS4777**, there will be additional **AS4777 Setting** option for **General Control** and **Export Control** under the path of **Menu>Setting>Advance Setting**.

- Setting Export Control

This function allows the inverter to control the amount of electricity output to the grid. The **User Value** set here must be less than the maximum value. If the user does not want to supply power to the grid, set **User Value** to "0".

NOTICE!

- Under Safety Code AS4777, **Export Control** is in the path of **Advance Setting> AS4777 Setting**. You can set the **Soft Limit** and **Hard Limit** of **Export Control** to control the power output to grid. Please refer to X3-AELIO Series User Manual for details.

====Export Control====
User Value
300000W

9.2 Inverter Screen Cover Installation

After the inverter is well installed on the wall or on the cabinet, all cables are wired on the inverter, the process of powering on and powering off is checked and all necessary Settings are set on the inverter LCD screen, the inverter screen cover should be installed. Here below the inverter installed on the cabinet is taken for an example. Wall-mounting inverter shares the same screen cover installation method.

Step 1: Put the inverter screen cover (Part V2) on the inverter and secure the cover on the two sides of the inverter with M4*10 screws (Part U2) (Torque: 1.5 ± 0.3 N·m).

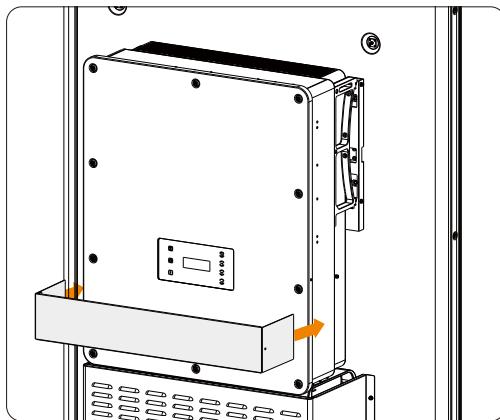


Figure 9-2 Putting the screen cover on the inverter

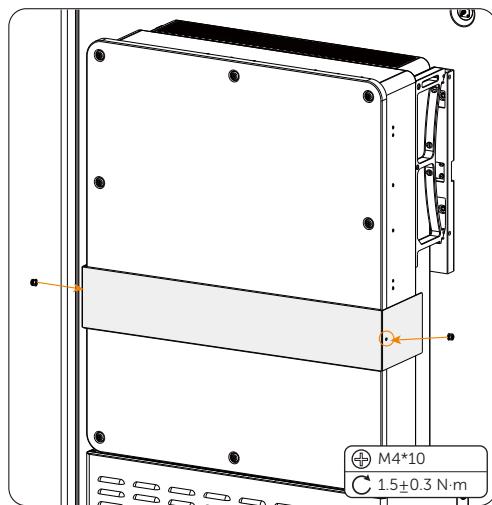


Figure 9-3 Securing the cover with the inverter

Step 2: Here is the well installed inverter screen cover.

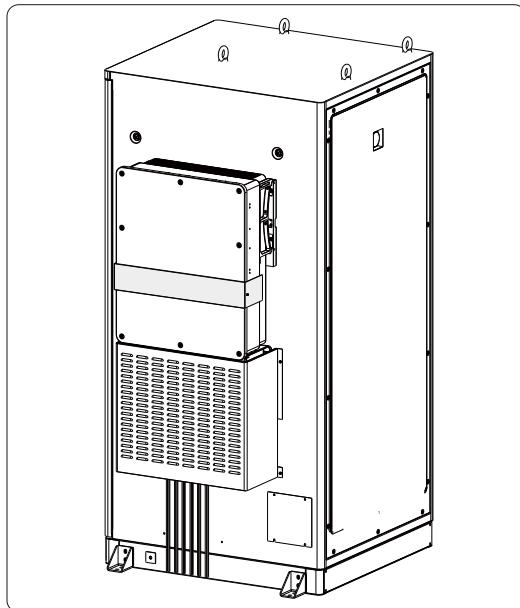


Figure 9-4 Well installed screen cover

9.3 Operation on Cabinet Screen

Gently and correctly guide the key (Part R) into the keyhole, and then turn it clockwise to unlock the screen door.

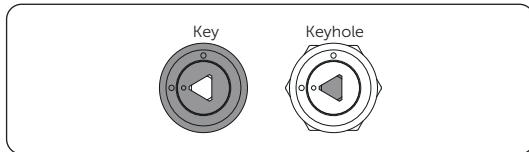


Figure 9-5 Correct position

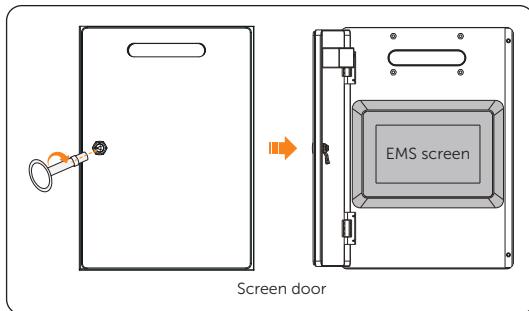


Figure 9-6 Unlocking screen door

9.3.1 Logging in

On the login screen, enter the username and password, and then tap **Login**.

Admin and user accounts are supported.

Table 9-2 Account information

Username	Password	Remarks
Admin	EMS SN	The password cannot be modified
User	123456 by default	The password can be modified on EMS1000 webpage.



Figure 9-7 Logging in to the screen

9.3.2 Adding Inverter

NOTICE!

- This function is only available for Admin account.

Add the inverter to EMS1000 for unified system management.

Step 1: Log in to the screen, and then tap **Device**.



Figure 9-8 Adding inverter

Step 2: Tap **Add device**, set **Device type** to **Inverter** and **COM method** to **MODBUS TRU**, set the remaining parameters, and then tap **Confirm**.

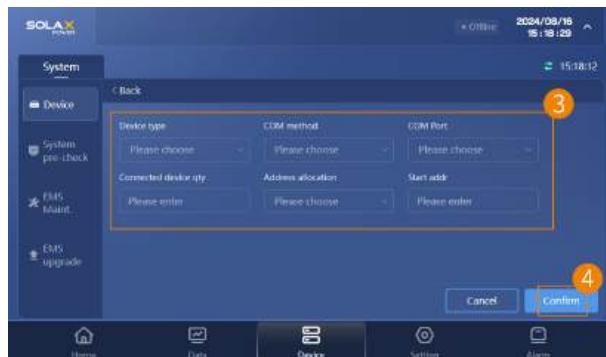


Figure 9-9 Setting parameters

Table 9-3 Parameter description

Parameter	Value Range	Description
COM Port	1-8	Number of RS485 terminal of EMS1000 that the inverter is connected to. For example, if the inverter is connected to the 8th RS485 terminal of the Device, the Serial Num is 8.
Connected device qty	1-20	Number of inverters that EMS1000 will be connected to. Up to 20 inverters can be connected.
Address allocation	<ul style="list-style-type: none"> Manual Auto 	<ul style="list-style-type: none"> Auto: In this mode, EMS1000 will automatically assign and recognize an RTU address for your inverter. Manual: In this mode, you will need to manually modify the Modbus address.
Start addr	/	The minimal Modbus address For manual address allocation, enter the minimal address that is configured for the inverter; For auto address allocation, enter 1.

After the inverter is successfully added, the inverter and the meter that it is bound to will be displayed on the device list. If EMS1000 identifies other devices in the cabinet such as battery and IO module, these devices will also be displayed on the screen.

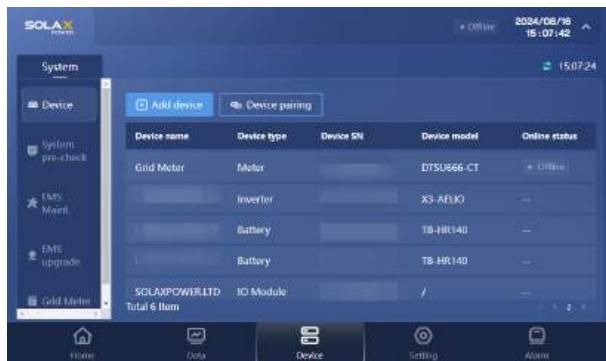


Figure 9-10 Adding inverter successfully

9.3.3 Pairing Inverter and Cabinet

NOTICE!

- This function is only available for Admin account.

You can pair the inverter and the cabinet for easier organization and management.

Step 1: Log in to the screen, and then tap **Device Pairing**.

The inverter, cabinet and related devices will pair automatically, and the pairing result will be displayed.

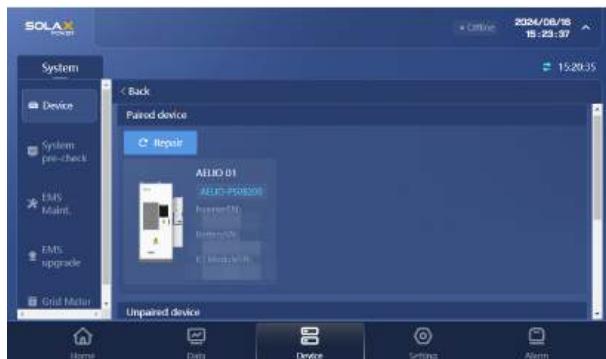


Figure 9-11 Pairing devices successfully

Step 2: Tap **Save and Pre-check** to save the pairing results.

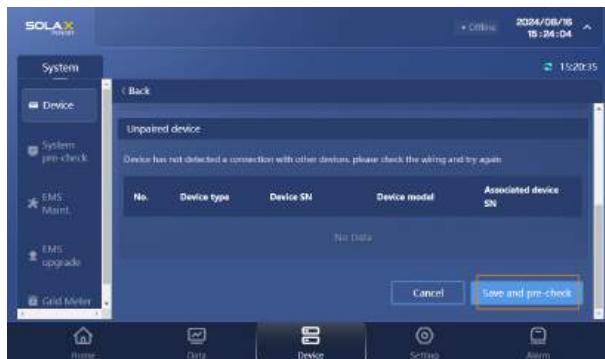


Figure 9-12 Save pairing

Step 3: On the pairing confirmation pop-up, tap **OK**.

The device list will be refreshed and displayed in architecture.

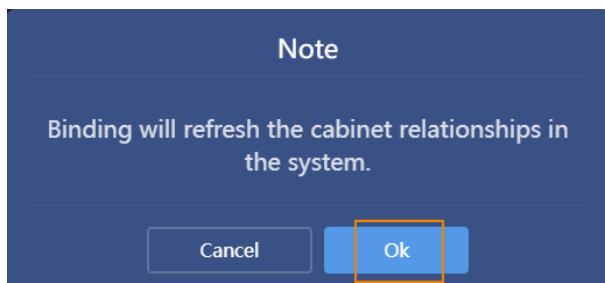


Figure 9-13 Confirming pairing

10 SolaX Cloud App

10.3.1 Downloading and Installing App

Select and scan the QR code below to download SolaxCloud APP. You can also find the QR codes at the top left of the login page of www.solaxcloud.com or on the user manual of Pocket series communication module. In addition, you can search with the key word SolaxCloud in Apple Store or Google Play to download it.



Figure 10-1 QR code

Please watch the video or read the document on the SolaXCloud App for relevant operation.

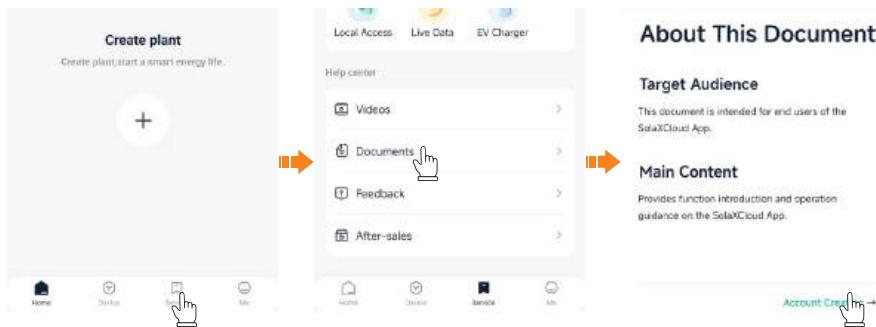


Figure 10-2 App guide on SolaXCloud

NOTICE!

- The screenshots in this chapter correspond to the SolaX Cloud App V6.1.0 .

11 Troubleshooting and Maintenance

11.1 Power Off

WARNING!

- Check whether the system is still running before power off. Do not power off if the device is "under load".

Regarding the detailed location of the modules in the cabinet, please refer to "[Figure 8-1 Location of modules](#)".

There are two circumstances: 1. Normal power off; 2. Emergency power off.

Normal Power Off

Step 1: Inverter power off.

- a. Set **OFF** in the **System ON/OFF** on the inverter LCD screen.
- b. Turn off the inverter system button.
- c. Set the DC switch1 and DC switch2 to "OFF".

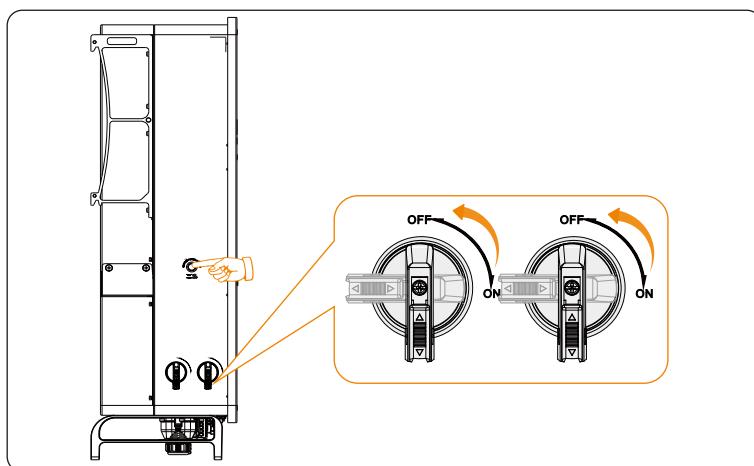


Figure 11-3 Shutting down the inverter

Step 2: Open the front doors.

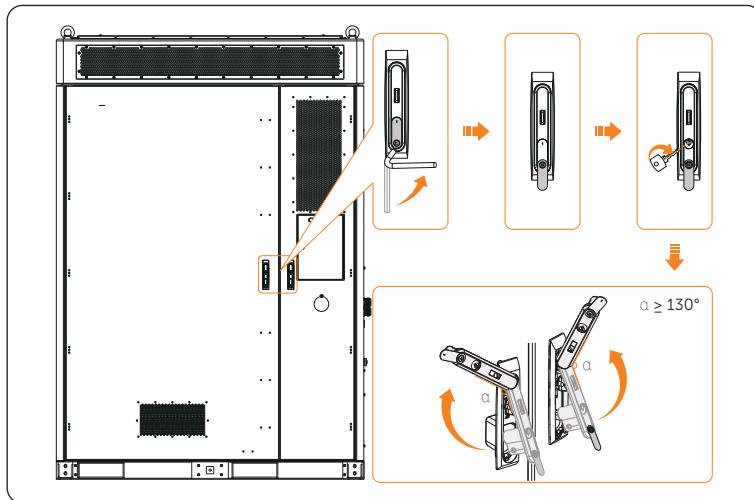


Figure 11-1 Opening front doors

Step 3: Shut down the distribution box.

- » Flip down the "lightning protection breaker (SPD MCB)";
- » Flip down the "air conditioner/liquid cooling unit on/off breaker (HVAC MCB)";
- » Flip down the "auxiliary power breaker of high-voltage box (APS)";
- » Flip down the UPS breaker;
- » Rotate the switch on the distribution box 90° counter-clockwise to "OFF".

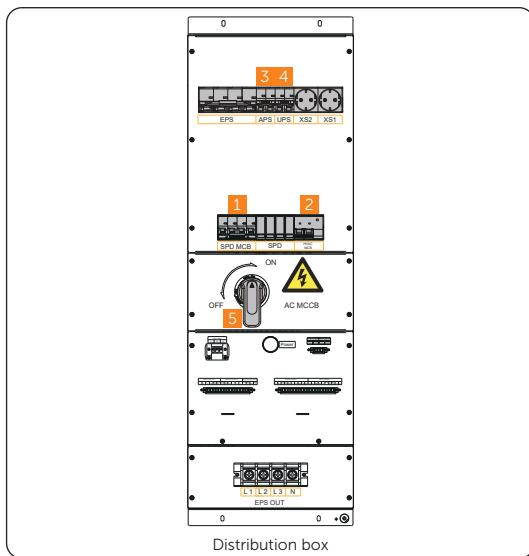


Figure 11-2 Shutting down sequence of distribution box

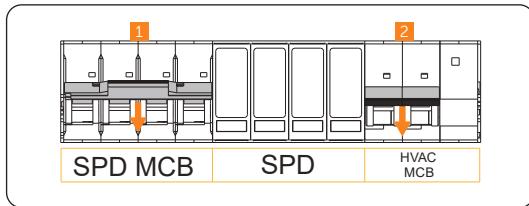


Figure 11-3 Flipping down breakers

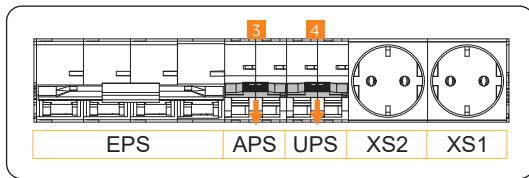


Figure 11-4 Flipping down breakers

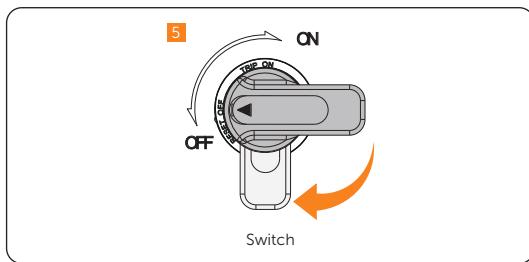


Figure 11-5 Rotating switch

Step 4: Gently press the power button, and rotate the disconnector of the high-voltage box to "OFF".

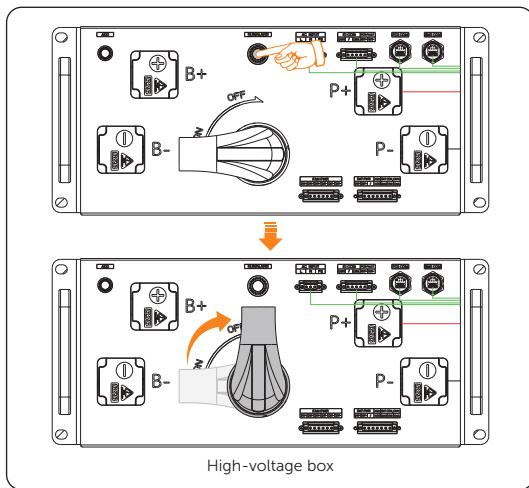


Figure 11-6 Shutting down the high-voltage box

Step 5: Hold and press the "Power on/off" button to power off the UPS.

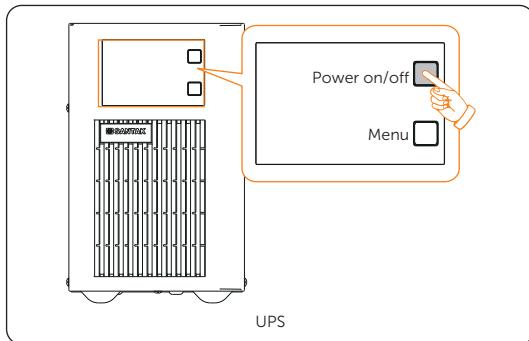


Figure 11-7 Holding and pressing button

 **WARNING!**

- The device may still have power and heat after turning off, which may cause electric shock and personal injuries. Therefore, please allow it to cool for at least 5 minutes and wear PPE before conducting maintenance.

Emergency Power Off

⚠ WARNING!

- Do not press the emergency stop button except for emergencies.
- Some modules inside the cabinet may still have power after pressing the emergency stop button, therefore, non-professionals are not allowed to operate them.

Step 1: Rotate the cover

Step 2: Press the emergency stop button.

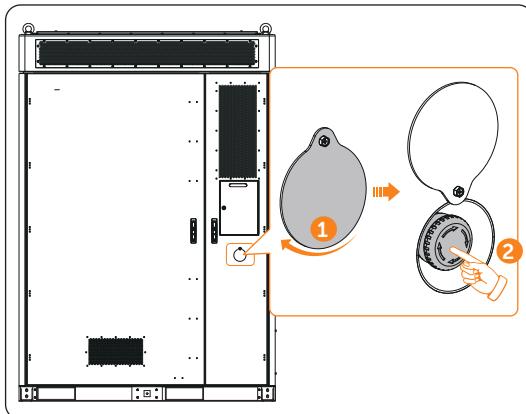


Figure 11-8 Pressing emergency stop button

NOTICE!

If it has been pressed, the emergency stop button must be reset before starting the device. The reset steps are shown as follows:

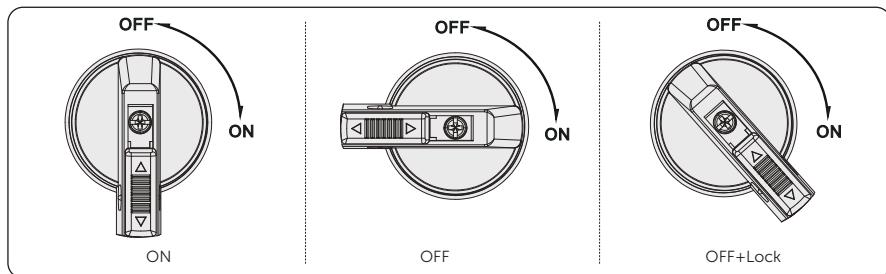
- a. Rotate the cover;
- b. Rotate the button according to the arrow direction shown on the button. Then the button will spring back to its original position.

11.2 Operation of Lockable DC Switch (for Australia Version Only)

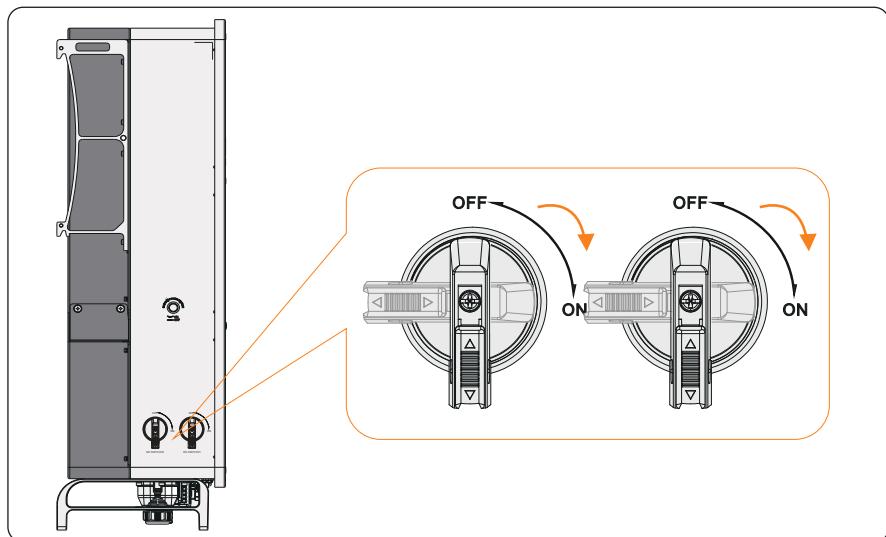
NOTICE!

- The Australian version DC switch is a lockable DC switch to prevent accidental switching on during maintenance, the lock needs to be prepared by the user.

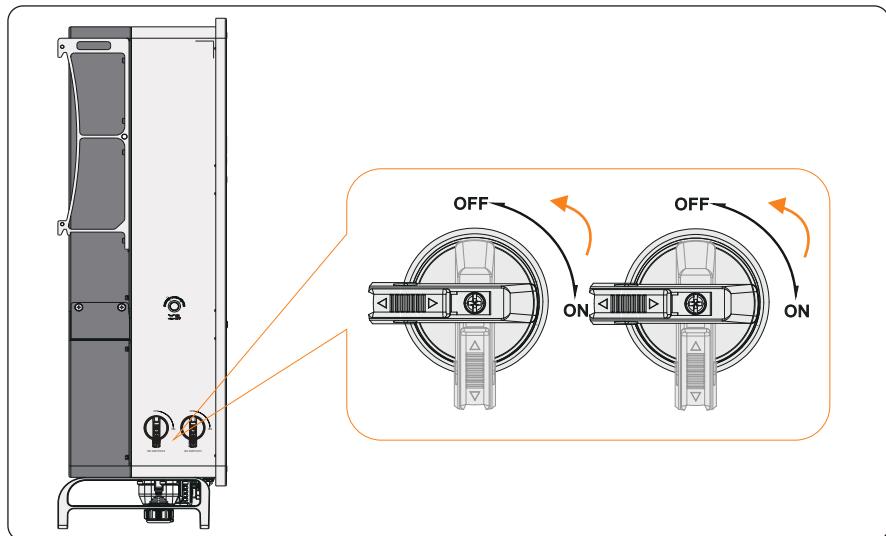
The lockable DC switch includes 3 states: ON, OFF, and OFF+Lock. The DC switch is in the OFF state by default.



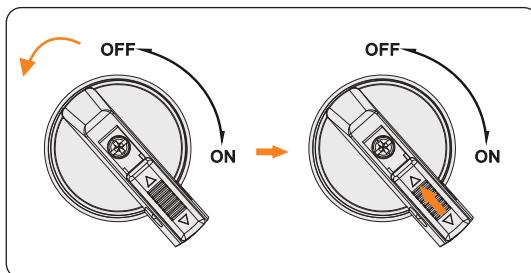
- Turn on the DC switch: rotate the DC switch from OFF state to ON state.



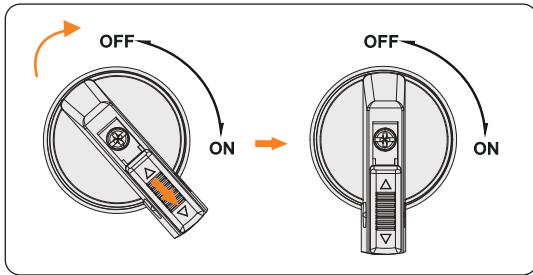
- Turn off the DC switch: rotate the DC switch from ON state to OFF state.



- Lock the DC switch
 - a. Rotate the DC switch to OFF state, then rotate the DC switch to the left side;
 - b. Push the position indicated by the arrow upward (as shown in the diagram below).
 - c. (Optional) After pushing the position upward, choose to lock the DC switch with a lock.



- Unlock the DC switch
 - a. Remove the lock. (If any);
 - b. Push the position indicated by the arrow down (as shown in the diagram below);
 - c. Wait for it to return to OFF state.



11.3 Troubleshooting

11.3.1 Battery Cabinet Troubleshooting

This section lists the possible problems with the device, and provides information and procedures for identifying and resolving them. In case of any errors, check for the warnings or error messages on the system control panel or App, and then refer to the suggestions below. For further assistance, contact SolaX Customer Service. Please provide the model and SN of the cabinet, and be prepared to describe the system installation details.

Table 11-1 Troubleshooting list

Fault	Description and Diagnosis
UCellHi_4	<p>Single Cell Overvoltage Category IV</p> <ul style="list-style-type: none"> • Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. • Or contact SolaX for help.
UCellHi_5	<p>Single Cell Overvoltage Category V</p> <ul style="list-style-type: none"> • Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. • Or contact SolaX for help.
UCellLow_4	<p>Single Cell Undervoltage Category IV</p> <ul style="list-style-type: none"> • Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. • Or contact SolaX for help.

Fault	Description and Diagnosis
UCellLow_5	<p>Single Cell Undervoltage Category V</p> <ul style="list-style-type: none"> Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. Or contact SolaX for help.
UCellDiff	<p>Voltage difference fault</p> <ul style="list-style-type: none"> Or contact SolaX for help.
HVBOver_4	<p>Overvoltage category IV of total voltage</p> <ul style="list-style-type: none"> The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. Or contact SolaX for help.
HVBOver_5	<p>Overvoltage category V of total voltage</p> <ul style="list-style-type: none"> The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. Or contact SolaX for help.
HVBLow	<p>Undervoltage category IV of total voltage</p> <ul style="list-style-type: none"> The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. Or contact SolaX for help.
HVBLow	<p>Undervoltage category V of total voltage</p> <ul style="list-style-type: none"> The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. Or contact SolaX for help.
PosRlyAdh	<p>Sticking contacts of main positive relay</p> <ul style="list-style-type: none"> The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. Or contact SolaX for help.
PosRlyOpen	<p>Open circuit of main positive relay</p> <ul style="list-style-type: none"> The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. Or contact SolaX for help.

Fault	Description and Diagnosis
TempHigh	<p>Overtemperature fault</p> <ul style="list-style-type: none"> The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. Or contact SolaX for help.
TLineFlt_1	<p>Temperature sampling fault level 1</p> <ul style="list-style-type: none"> Check if the temperature sensor is short-circuited. Or contact SolaX for help.
TLineFlt_4	<p>Temperature sampling fault level 4</p> <ul style="list-style-type: none"> The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. Or contact SolaX for help.
TempLow	<p>Low-temperature fault</p> <ul style="list-style-type: none"> The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. Or contact SolaX for help.
DsgOver_4	<p>Discharge overcurrent fault level 4</p> <ul style="list-style-type: none"> The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. Or contact SolaX for help.
DsgOver_5	<p>Discharge overcurrent fault level 5</p> <ul style="list-style-type: none"> The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. Or contact SolaX for help.
ChgOver_4	<p>Charge overcurrent fault level 4</p> <ul style="list-style-type: none"> The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. Or contact SolaX for help.
ChgOver_5	<p>Charge overcurrent fault level 5</p> <ul style="list-style-type: none"> The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. Or contact SolaX for help.

Fault	Description and Diagnosis
ICOMFault	<p>Internal communication fault</p> <ul style="list-style-type: none"> Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. Or contact SolaX for help.
OCOMFault	<p>External communication fault</p> <ul style="list-style-type: none"> Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. Or contact SolaX for help.
MCOMFault	<p>Intermediate network communication fault</p> <ul style="list-style-type: none"> Do not power on, and the charging current is limited to 0 A. Or contact SolaX for help.
UCellLineOpenFlt	<p>Voltage sampling fault</p> <ul style="list-style-type: none"> The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. Or contact SolaX for help.
VoltSensorFlt	<p>Voltage sensor fault</p> <ul style="list-style-type: none"> The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. Or contact SolaX for help.
CurrSensorFlt	<p>Current sensor fault</p> <ul style="list-style-type: none"> Contact SolaX for help.
NegRlyAdh	<p>Sticking contacts of main negative relay</p> <ul style="list-style-type: none"> Restart the device. Or contact SolaX for help.
NegRlyOpen	<p>Open circuit of main negative relay</p> <ul style="list-style-type: none"> Restart the device. Or contact SolaX for help.
FlashFlt	<p>Flash fault</p> <ul style="list-style-type: none"> Check if the external Flash communication is normal. Or contact SolaX for help.
ChgReqFlt	<p>Charging request fault</p> <ul style="list-style-type: none"> Check the device is properly charged. Or contact SolaX for help.

Fault	Description and Diagnosis
InsFlt	<p>Insulation fault</p> <ul style="list-style-type: none"> The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. Or contact SolaX for help.
SOCLowFlt	<p>Low SOC</p> <ul style="list-style-type: none"> Check if the device is running out of power. Or contact SolaX for help.
PreChgFailFlt	<p>External short-circuit fault</p> <ul style="list-style-type: none"> The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. Or contact SolaX for help.
AFeProtectFlt	<p>Battery's hardware protection fault</p> <ul style="list-style-type: none"> The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. Or contact SolaX for help.
SelfCheckFlt	<p>Self-test fault</p> <ul style="list-style-type: none"> The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. Or contact SolaX for help.
LinkerTempHilFlt_3	<p>Fault on overtemperature of high-voltage connector</p> <ul style="list-style-type: none"> Check whether the charge/discharge current is over 50% of rated charge/discharge current. Or contact SolaX for help.
LinkerTempHilFlt_5	<p>Fault on overtemperature of high-voltage connector</p> <ul style="list-style-type: none"> Check whether the charge/discharge current is over 50% of rated charge/discharge current. Or contact SolaX for help.
BatLinkerTempHi_5	<p>High-temperature fault of pole</p> <ul style="list-style-type: none"> The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. Or contact SolaX for help.
FanFault	<p>Fan fault</p> <ul style="list-style-type: none"> Check whether any foreign objects stick to the fan. Contact SolaX for help.

Fault	Description and Diagnosis
FuseSt	<p>Fuse fault</p> <ul style="list-style-type: none"> • Contact SolaX for help.
DCSwitch	<p>DC switch fault</p> <ul style="list-style-type: none"> • Contact SolaX for help.

11.3.2 Inverter Troubleshooting

This section contains information and procedures for resolving possible problems with the inverter, and provides the troubleshooting tips to identify and solve most problems that may occur. Please check the warning or fault information on the system control panel or on the App and read the suggested solutions below when error occurs. Contact SolaX Customer Service for further assistance. Please be prepared to describe the details of your system installation and provide the model and serial number of the inverter.

Table 11-1 Troubleshooting list

Error Code	Fault	Descriptions and Diagnosis
IE 01	TZ Protect Fault	<p>Overcurrent fault.</p> <ul style="list-style-type: none"> • Wait for a while to check if it returns to normal. • Disconnect PV+ PV- and batteries, reconnect. • If the system is in off-grid state, check if the power of EPS loads exceeds the maximum limit of the system or exceeds the current power supply of battery. • If the system fails to restore to its normal state, please contact SolaX for help.
IE 02	Grid Lost Fault	<p>Grid Lost Fault</p> <ul style="list-style-type: none"> • Check the grid connection status • Or contact SolaX for help.
IE 03	Grid Volt Fault	<p>Power grid voltage overrun</p> <ul style="list-style-type: none"> • Wait a moment, if the utility returns to normal, the system will reconnect. • Please check if the grid voltage is within normal range. • Or contact SolaX for help.
IE 04	Grid Freq Fault	<p>Grid overfrequency</p> <ul style="list-style-type: none"> • Wait a moment, If the utility returns to normal, the system reconnects. • Or contact SolaX for help.

Error Code	Fault	Descriptions and Diagnosis
IE 05	PV Volt Fault	<p>PV overvoltage</p> <ul style="list-style-type: none"> Check the output voltage of the PV panel. Check if the DC switch is OFF. Or contact SolaX for help.
IE 06	Bus Volt Fault	<ul style="list-style-type: none"> Press the ESC key to restart the inverter. Check if the PV input open circuit voltage is in the normal range. Check if the power of half-wave load exceeds the system limit. Or contact SolaX for help.
IE 07	Bat Volt Fault	<p>Battery voltage fault</p> <ul style="list-style-type: none"> Check if the battery input voltage is within normal range Or contact SolaX for help.
IE 08	AC10mins Volt	<p>Grid voltage out of range in the last 10 minutes.</p> <ul style="list-style-type: none"> The system will return to normal if the grid returns to normal. Or contact SolaX for help.
IE 09	DCI OCP Fault	<p>DCI overcurrent protection fault.</p> <ul style="list-style-type: none"> Wait for a while to check if it's back to normal. Or contact SolaX for help.
IE 10	DCV OVP Fault	<p>DCV EPS(Off-grid) overvoltage protection fault.</p> <ul style="list-style-type: none"> Wait for a while to check if it's back to normal. Or contact SolaX for help.
IE 11	SW OCP Fault	<p>Software detection of overcurrent Fault.</p> <ul style="list-style-type: none"> Wait for a while to check if it's back to normal. Shut down photovoltaic, battery and grid connections. Or contact SolaX for help.
IE 12	RC OCP Fault	<p>Overcurrent protection fault.</p> <ul style="list-style-type: none"> Check the impedance of DC input and AC output. Wait for a while to check if it's back to normal. Or contact SolaX for help.
IE 13	Isolation Fault	<p>Insulation fault</p> <ul style="list-style-type: none"> Please check the wire insulation for damage. Wait for a while to check if it's back to normal. Or contact SolaX for help.
IE 14	Temp Over Fault	<p>Temperature out of range</p> <ul style="list-style-type: none"> Check if the ambient temperature exceeds the limit. Or contact SolaX for help.

Error Code	Fault	Descriptions and Diagnosis
IE 15	Bat Con Dir Fault	<ul style="list-style-type: none"> • Battery direction fault • Check if the battery lines are connected in the opposite direction. • Or ask for help from the installer if it can not return to normal.
IE 16	EPS Overload	<p>EPS(Off-grid) overload fault</p> <ul style="list-style-type: none"> • Shutdown the high-power device and press the ESC key to restart the inverter. • Or contact SolaX for help if it can not return to normal.
IE 17	Overload Fault	<p>On-grid mode overload fault</p> <ul style="list-style-type: none"> • Shutdown the high-power device and press the ESC key to restart the inverter. • Or contact SolaX for help if it can not return to normal.
IE 18	BatPowerLow	<p>Bat Power Low</p> <ul style="list-style-type: none"> • Shutdown the high-power device and press the ESC key to restart the inverter. • Please charge the battery to a level higher than the protection capacity or protection voltage.
IE 19	BMS Lost	<p>Battery communication lost</p> <ul style="list-style-type: none"> • Check that the communication cable between the battery and the inverter are properly connected. • Or contact SolaX for help if it can not return to normal.
IE 20	Fan Fault	<p>Fan Fault</p> <ul style="list-style-type: none"> • Check for any foreign matter that may have caused the fan not to function properly. • Or contact SolaX for help if it can not return to normal.
IE 21	Low TempFault	<p>Low temperature fault.</p> <ul style="list-style-type: none"> • Check if the ambient temperature is too low. • Or contact SolaX for help if it can not return to normal.
IE 25	InterComFault	<p>Inter_Com_Fault</p> <ul style="list-style-type: none"> • Restart the inverter. • Or contact SolaX for help if it can not return to normal.
IE 26	INV EEPROM	<p>Inverter EEPROM Fault.</p> <ul style="list-style-type: none"> • Shut down photovoltaic, battery and grid, reconnect. • Or contact SolaX for help if it can not return to normal.

Error Code	Fault	Descriptions and Diagnosis
IE 27	RCD Fault	<p>Residual Current Device fault</p> <ul style="list-style-type: none"> • Check the impedance of DC input and AC output. • Disconnect PV + PV - and batteries, reconnect. • Or contact SolaX for help if it can not return to normal.
IE 28	Grid Relay Fault	<p>Electrical relay fault</p> <ul style="list-style-type: none"> • Disconnect PV+ PV- grid and batteries and reconnect. • Or contact SolaX for help if it can not return to normal.
IE 29	EPS Relay	<p>EPS(Off-grid) relay fault</p> <ul style="list-style-type: none"> • Disconnect PV+ ,PV-, grid and batteries and reconnect. • Or contact SolaX for help if it can not return to normal.
IE 30	PV ConnDirFault	<p>PV direction fault</p> <ul style="list-style-type: none"> • Check if the PV input lines are connected in the opposite direction. • Or contact SolaX for help if it can not return to normal.
IE 31	Battery Relay	<p>Charge relay fault</p> <ul style="list-style-type: none"> • Press the ESC key to restart the inverter. • Or contact SolaX for help if it can not return to normal.
IE 32	Earth Relay	<p>EPS(Off-grid) earth relay fault</p> <ul style="list-style-type: none"> • Press the ESC key to restart the inverter. • Or contact SolaX for help if it can not return to normal.
IE 100	PowerTypeFault	<p>Power type fault</p> <ul style="list-style-type: none"> • Upgrade the software and press the ESC key to restart the inverter. • Or contact SolaX for help if it can not return to normal.
IE 102	Mgr EEPROM Fault	<p>Mgr E2prom Error.</p> <ul style="list-style-type: none"> • Shut down photovoltaic ,battery and grid, and then reconnect. • Or contact SolaX for help if it can not return to normal.
IE 103	Fan4 Fault	<p>FAN4 Fault</p> <ul style="list-style-type: none"> • Check if the foreign objects stuck in the fan. • Or contact SolaX for help.

Error Code	Fault	Descriptions and Diagnosis
IE 104	NTC Sample Invalid	<p>NTC Sample Fault</p> <ul style="list-style-type: none"> • Make sure the NTC is properly connected and the NTC is in good condition. • Please confirm that the installation environment is normal • Or contact SolaX for help if it can not return to normal.
IE 107	CT Fault	<p>CT Fault</p> <ul style="list-style-type: none"> • Check if the CT is working properly • Or contact SolaX for help if it can not return to normal.
IE 109	Meter Fault	<p>Meter Fault</p> <ul style="list-style-type: none"> • Check if the meter is working properly • Or contact SolaX for help if it can not return to normal.
IE 110	BypassRelayFlt	<p>Bypass Relay Fault</p> <ul style="list-style-type: none"> • Press the ESC key to restart the inverter. • Or contact SolaX for help if it can not return to normal.
IE 111	FAN3 Fault	<p>FAN3 Fault</p> <ul style="list-style-type: none"> • Check if the foreign objects stuck in the fan. • Or contact SolaX for help.
IE 112	ARMParaComFlt	<p>ARM Parameter Communication fault</p> <ul style="list-style-type: none"> • Check that the communication cables of inverters are well connected and the baud rate of COMM setting of inverters are the same. • Or contact SolaX for help if it can not return to normal.
IE 113	FAN1 Fault	<p>FAN1 Fault</p> <ul style="list-style-type: none"> • Check if the foreign objects stuck in the fan. • Or contact SolaX for help.
IE 114	FAN2 Fault	<p>FAN2 Fault</p> <ul style="list-style-type: none"> • Check if the foreign objects stuck in the fan. • Or contact SolaX for help.
IE 115	20305Com Fault	<p>Com Fault</p> <ul style="list-style-type: none"> • Check the connection of the monitoring module, reinsert the module. • Please contact SolaX for help.
BE 01	BMS1_UCellOver BMS2_UCellOver	<p>Battery Error - Cell Overvoltage Fault</p> <ul style="list-style-type: none"> • Please contact SolaX for help.

Error Code	Fault	Descriptions and Diagnosis
BE 02	BMS1_UCellLow	Battery Error - Cell Undervoltage Fault
	BMS2_UCellLow	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 03	BMS1_UCellDiff	Battery Error - Large Cell Differential Pressure Fault
	BMS2_UCellDiff	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 04	BMS1_HVBOver	Battery Error - Total Voltage Ovvoltage Fault
	BMS2_HVBOver	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 05	BMS1_HVBLow	Battery Error - Total Voltage Undervoltage Fault
	BMS2_HVBLow	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 06	BMS1_TempOver	Over temperature in battery system
	BMS2_TempOver	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 07	BMS1_SelfCheck	Self check fault in battery system
	BMS2_SelfCheck	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 08	BMS1_PoRlyAdh	Battery Error - Main Positive Relay Adhesion Fault
	BMS2_PoRlyAdh	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 09	BMS1_PoRlyOpen	Battery Error - Main Positive Open Relay Fault
	BMS2_PoRlyOpen	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 10	BMS1_NeRlyAdh	Battery Error - Main Negative Relay Adhesion Fault
	BMS2_NeRlyAdh	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 11	BMS1_NeRlyOpen	Battery Error - Main Negative Open Relay Fault
	BMS2_NeRlyOpen	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 12	BMS1_PreChgFail	Battery Error - Battery Precharge Fault
	BMS2_PreChgFail	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 13	BMS1_CellSample	Battery Error - Battery Cell Sampling Fault
	BMS2_CellSample	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 14	BMS1_TempSample	Battery Error - Battery Temperature Sampling Fault
	BMS2_TempSample	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 15	BMS1_Sys	Battery Error - Battery System Fault
	BMS2_Sys	<ul style="list-style-type: none"> • Please contact SolaX for help.

Error Code	Fault	Descriptions and Diagnosis
BE 16	BMS1_DsgOver	Battery Error - Battery Discharge Overcurrent Fault
	BMS2_DsgOver	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 17	BMS1_ChgOver	Battery Error - Battery Charge Overcurrent Fault
	BMS2_ChgOver	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 18	BMS1_AFECom	Battery Error - Battery AFE communication Fault
	BMS2_AFECom	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 19	BMS1_InvCom	Battery Error - Extranet Communication Fault
	BMS2_InvCom	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 20	BMS1_MidCom	Battery Error - Intermediate Network Communication Fault
	BMS2_MidCom	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 21	BMS1_VoltSensor	Battery Error - Voltage Sensor Fault
	BMS2_VoltSensor	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 22	BMS1_IDRepet	Battery Error - Repetitive ID Fault
	BMS2_IDRepet	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 23	BMS1_TempLow	Battery Error - Low Temperature Fault
	BMS2_TempLow	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 24	BMS1_CurrSensor	Battery Error - Current Sensor Fault
	BMS2_CurrSensor	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 25	BMS1_Line	Battery Error - Open Power Cable Fault
	BMS2_Line	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 26	BMS1_Flash	Battery Error - Flash Fault
	BMS2_Flash	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 27	BMS1_AFEProtect	Battery Error - AFE Self-protection Fault
	BMS2_AFEProtect	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 28	BMS1_ChgReq	Battery Error - Charge Request Fault
	BMS2_ChgReq	<ul style="list-style-type: none"> • Please contact SolaX for help.
BE 29	BMS1_Ins	Battery Error - Battery Insulation Fault
	BMS2_Ins	<ul style="list-style-type: none"> • Check that the battery is properly grounded and restart the battery. • Please contact SolaX for help.

Error Code	Fault	Descriptions and Diagnosis
BE 30	BMS1_MCB	Battery Error - Micro Circuit Breaker Fault
	BMS2_MCB	<ul style="list-style-type: none">• Please contact SolaX for help.
BE 31	BMS1_LinkTemp	Battery Error - Contactor Over Temperature Fault
	BMS2_LinkTemp	<ul style="list-style-type: none">• Please contact SolaX for help.
BE 32	BMS1_BatLinker	Battery Error - Internal contact point Abnormally high in the battery
	BMS2_BatLinker	<ul style="list-style-type: none">• Please contact SolaX for help.
BE 33	BMS1_Fan	Battery Error - Fan Fault
	BMS2_Fan	<ul style="list-style-type: none">• Check if the foreign objects stuck in the fan.• Or contact SolaX for help.

11.4 Maintenance

Regular maintenance is required for the device. The table below lists the operational maintenance for expressing the optimum device performance. More frequent maintenance service is needed in the worse work environment. Please make records of the maintenance.

 **WARNING!**

- Only qualified person can perform the maintenance for the device.
- Only use the spare parts and accessories approved by SolaX for maintenance.

Maintenance routine of battery cabinet

Table 11-2 Power on routine maintenance list

Check Item	Description	Interval Time
The operating status and environment of the system	<ul style="list-style-type: none"> • Check whether there is any damage to the distributed energy system, and the device is deformed. • Check whether there is any abnormal noise in the running system. • Check whether the temperature of the device shell is normal. Meanwhile, it is suggested to use a thermal imager or any other monitoring systems to identify signs of heat. • Check whether the surrounding is at normal humidity level, and there is any damage to the dust and air filters. <ul style="list-style-type: none"> a. Must ensure that the air intake is well ventilated. Otherwise, the battery pack failure will be caused due to overheating. b. Please gently open the door to prevent raising dust from the filter cotton. Otherwise, the smoke detector will alarm and give a command to the automatic fire sprinkler to spray gas. 	Every 6 months
Cabinet screen	<ul style="list-style-type: none"> • Check whether the screen displays normally. • Check Alarm info on the screen. 	Every 6 months
Battery pack	<ul style="list-style-type: none"> • Check whether the fan of the battery pack is running normally • Check the appearance of the battery pack for damage or deformation. • Check whether there is any abnormal noise during operation. 	Every 6 months

Check Item	Description	Interval Time
Inverter	<ul style="list-style-type: none"> Check whether the fan of the inverter is running normally Check the appearance of the inverter for damage or deformation. Check whether there is any abnormal noise during operation. 	Every 6 months
Air conditioner and cabinet fan	<ul style="list-style-type: none"> Check that there are no potential hazards and contaminants around the device, and that there is no rubbish in the vicinity. Check whether there is any abnormal noise, abnormal vibration and blade jamming in the running outdoor unit fan. 	Every 6 months
Smoke detector, temperature sensor, toxic gases detector	<ul style="list-style-type: none"> Check the appearance and patrol lights visually. Use special testing device to add smoke or heat on smoke detectors and temperature detectors to test the action of the detectors. 	Every 6 months
Aerosol	<ul style="list-style-type: none"> Check the appearance of the aerosol: no deformation and nozzle integrity, confirm no agent leakage 	Every 6 months
Distribution box, UPS	<ul style="list-style-type: none"> Check the appearance for damage or deformation. Check whether there is any abnormal noise during operation. 	Every 6 months
EMS, I/O module	<ul style="list-style-type: none"> Check whether the indicator lights normally. 	Every 6 months
Antennae	<ul style="list-style-type: none"> Check whether the antenna is rusty due to salt spray, if so, the antenna needs to be replaced. 	Every 6 months
Safety function	<ul style="list-style-type: none"> Check whether the emergency stop button and LED is in good working condition. Check the stopping signal and communication by simulating the shutdown operation. Check whether there are any damages to warning signs and other labels pasted on the device. If so, please replace them in time. 	Every 6 months

NOTICE!

The system must be shut down before perform the following maintenance.

Table 11-3 Power off routine maintenance list

Check Item	Description	Interval Time
Electrical connection	<ul style="list-style-type: none"> Check whether the power cables are fastened securely. If not, please tighten them again according to the torque written in the document. Check the electrical connection of battery packs, inverter, distribution box, UPS and other major devices for looseness and cable jacket damage, especially the cable jacket connecting with the metal parts. Check whether the inverter, distribution box and UPS are reliably grounded. Verify that the sealing caps on idle terminals of inverter are and not falling off. Check whether the electrical insulation tape is in good condition and no peeling. 	The check shall be scheduled within one month after the first commissioning, and then can be scheduled every 6 months
Terminal and block connection	<ul style="list-style-type: none"> Check whether there is any fading to the screws and copper bars. Check whether the screws are fastened securely. If not, please tighten them again according to the torque written in the document. 	The check shall be scheduled within one month after the first commissioning, and then can be scheduled every 6 months
System cleaning	<ul style="list-style-type: none"> Check whether the circuit boards and components are clean. Check whether the heat sink of the inverter is covered with foreign objects. Check and clean the filter to ensure that there is no dirty blockage of air conditioner and cabinet fan. Clean the inverter cooling fans with a soft dry cloth or brush or replace it if necessary. If necessary, clean the modules by air compressor. <p>The maintenance period shall be shortened if the cabinet is installed in heavily polluted environments.</p>	Every 6 months

11.4.1 Disassembly and Clean of Air Conditioner Filter

WARNING!

- The air conditioner must be powered off before disassembly and clean of air conditioner.
- The device may still have power and heat after turning off, which may cause electric shock and personal injuries. Therefore, please allow it to cool for at least 5 minutes and wear PPE before conducting maintenance.

Step 1: Unscrew M6 screws, and orderly dismantle aluminum mesh plate, stainless steel gauze, and black filter.

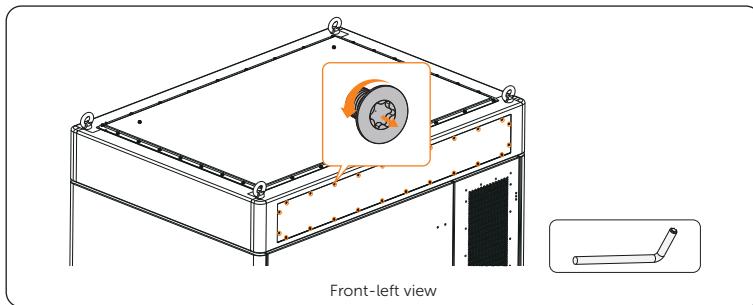


Figure 11-9 Unscrewing M5 screws

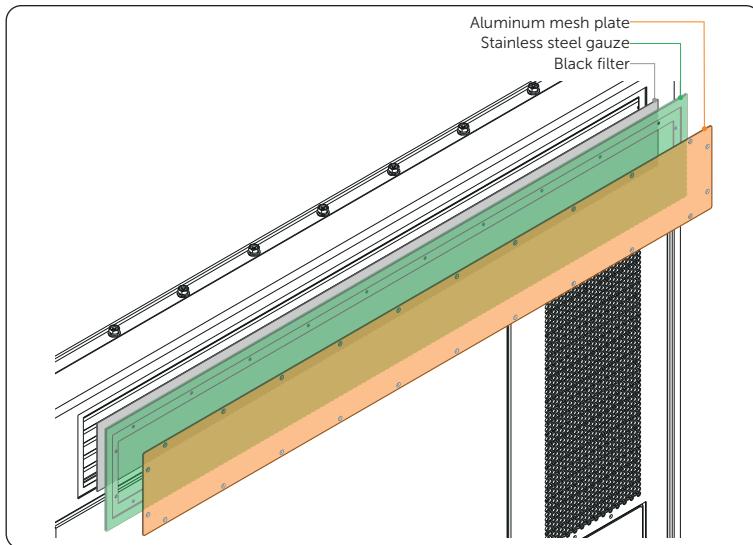


Figure 11-10 Dismantling aluminum mesh plate, stainless steel gauze, black filter

Step 2: Clean aluminum mesh plate and stainless steel gauze, and replace the black filter.

Step 3: Orderly reinstall the black filter, stainless steel gauze, and aluminum mesh plate.

Step 4: Insert and tighten M6 screws (x 24).

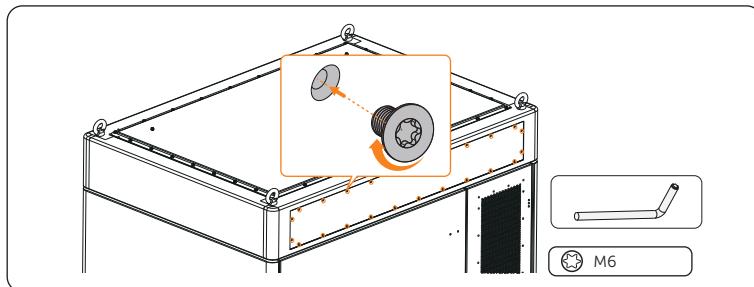


Figure 11-11 Tightening M6 screws

11.4.2 Inverter Maintenance

Replacement of fans

When the fan is not rotating and the feedback speed of the fan is 0, the LCD screen will display FAN1FAULT / FAN2FAULT / FAN3FAULT / FAN4FAULT error. Refer to the following steps for replacement.

Step 1: Loosen the screws on the right side of the inverter with a cross screwdriver, and the nuts on the left side of the inverter.



Figure 11-12 Dismantling screws

Step 2: Pull out the fan bracket, stop at the position about 150 mm, then press the protruding block with a screwdriver to release the fan waterproof connectors, then pull the fan bracket again to pull out the whole bracket.

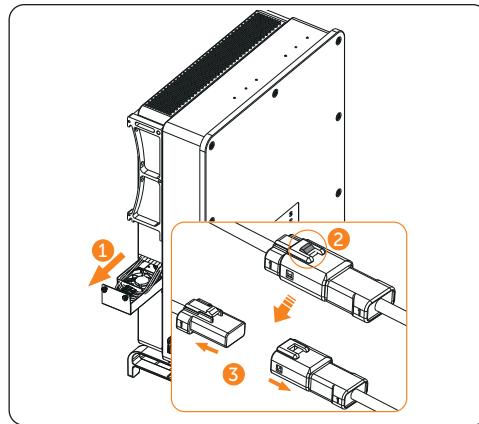


Figure 11-13 Releasing the fan waterproof connectors

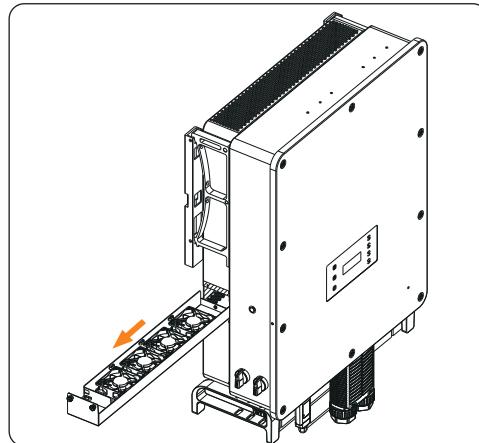


Figure 11-14 Pulling out the whole fan bracket

Step 3: Clean, repair, or replace the fan.

- a. Identify the fan to be replaced by cable markings.

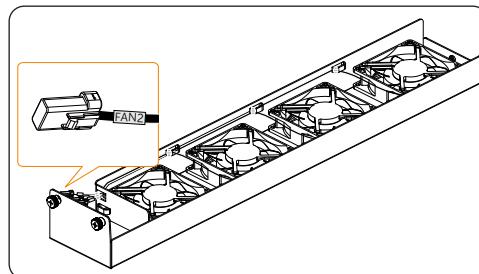


Figure 11-15 Identify the fan to be replaced

- b. Cut the cable ties with diagonal plier.

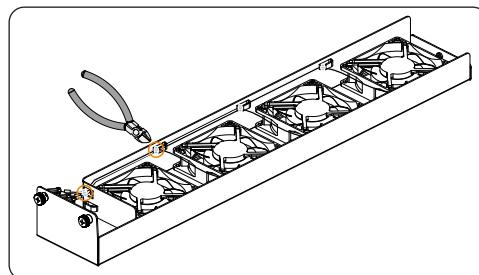


Figure 11-16 Cut the cable ties

- c. Unscrew the fan screws on the bottom of the bracket.

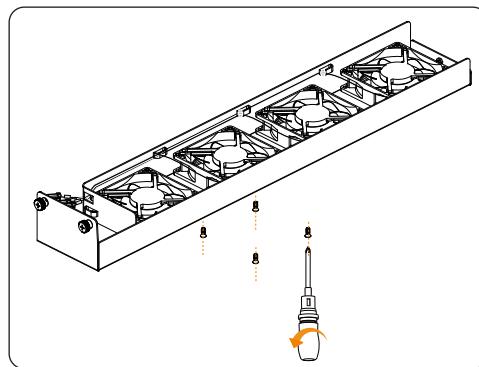


Figure 11-17 Unscrew the fan screws

d. Remove the damaged fan, replace a new fan.

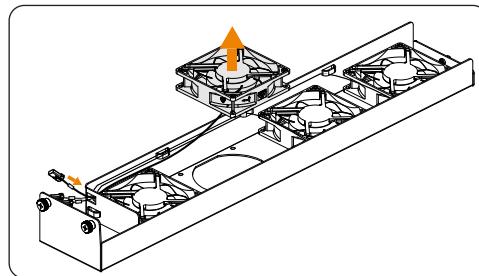


Figure 11-18 Remove the damaged fan

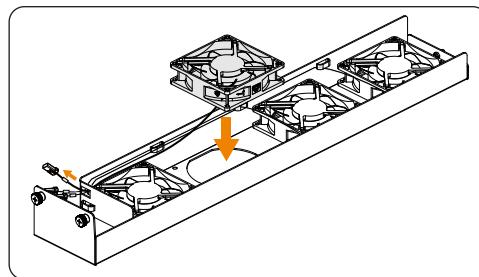


Figure 11-19 Replace a new fan

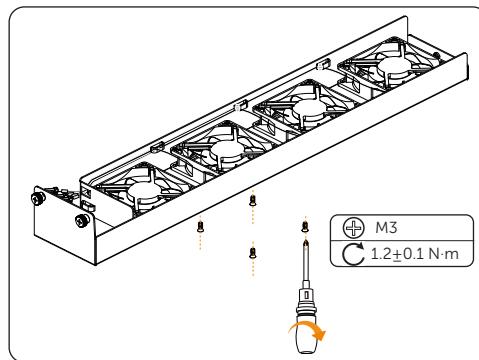


Figure 11-20 Lock the screws

e. Secure the cable with the cable ties.

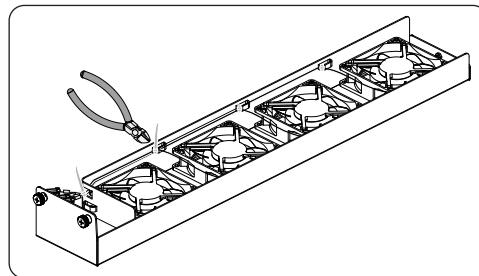


Figure 11-21 Unscrew the fan screws

f. Slide the fan bracket into the inverter, connect fan waterproof connectors.

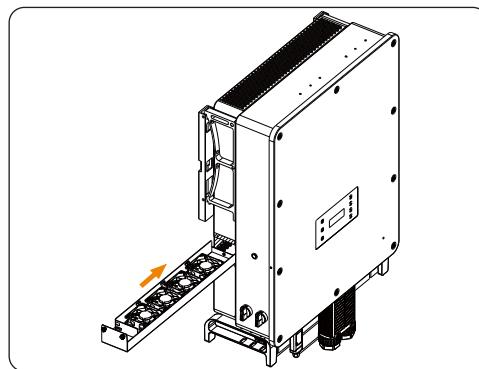


Figure 11-22 Slide the fan bracket

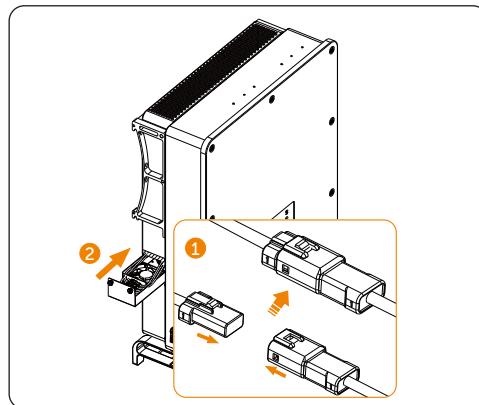


Figure 11-23 Connect fan waterproof connectors

Step 4: Lock the fixing screws.

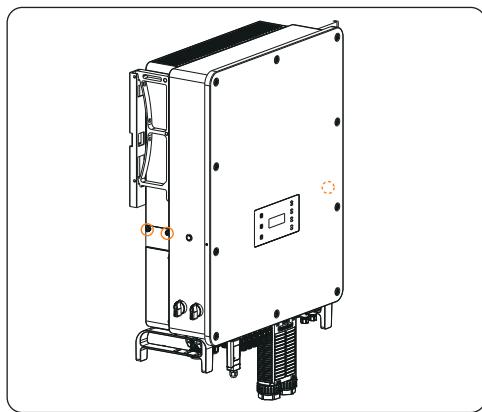


Figure 11-24 Lock the screws

Upgrading firmware

- Upgrade precautions

WARNING!

- Please make sure that the category format is correct. Do not modify the firmware file name. Otherwise, the inverter may not work!
- Do not modify the folder name and file path where the firmware files are located, as this may cause the upgrade to fail.

WARNING!

- Before proceeding with the upgrade process, ensure that the PV input voltage is above 180 V (preferably on sunny days), or that the battery (SOC) is above 20%, or the battery input voltage is above 180 V. Failure to meet these conditions may result in upgrade process failure.

- Upgrade preparation

- Prepare a USB drive (USB 2.0/3.0, \leq 32 GB, FAT 16/32).
- Check for the current firmware version of the inverter.
- Contact our service support for the update firmware file, and save it to the USB drive.
 - » For ARM file: XXX.XXXX.XX_AELIO_3P_ARM_VXXX.XX_XXXX.usb
 - » For DSP file: XXX.XXXX.XX_AELIO_3P_DSP_VXXX.XX_XXXX.usb
- Check the folder name and file path:

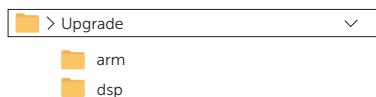


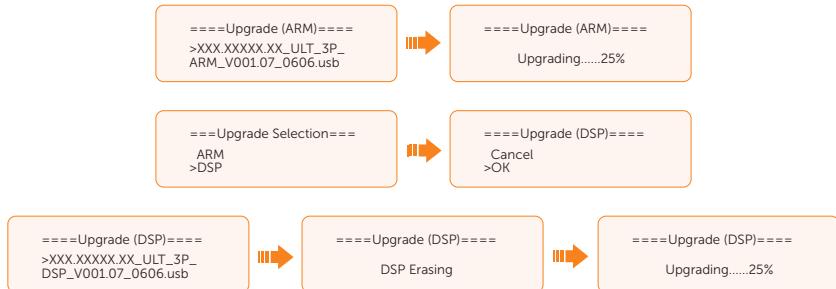
Figure 11-25 Folder name and path

- Upgrade steps

- Press and hold the **Enter** key on the inverter LCD for 5 seconds to enter the **OFF** mode.
- Remove the dongle (if configured) from the Dongle terminal of the inverter by hand, and then insert the USB drive. The inverter will automatically display the **Upgrade Selection** interface.
- On the **Upgrade Selection** interface, select **ARM** or **DSP** based on the file type, and then tap **OK**.



d. Select and confirm the firmware version, and then tap the **Enter** key to start updating. ARM update takes about 20 seconds, and DSP update takes about 2 minutes.



e. After the upgrade is completed, the LCD screen displays **Upgrade Successful**. If the upgrades fail, the LCD screen displays **Upgrade failed**.

====Upgrade (DSP)====
Upgrade Successful

CAUTION!

- If the ARM firmware upgrade fails or stops, do not unplug the U disk. Please power off the inverter and restart it. Then repeat the upgrade steps.

CAUTION!

If the DSP firmware upgrade fails or stops, please follow these steps:

- Check if the DC switch is turned off. If it is off, turn it on.
- If the DC switch is already on, check if the battery and PV parameters in **Menu>System Status** meets the upgrade requirements (PV or battery input voltage is larger than 180V, or battery SOC is above 20%)
- (Not recommended) Alternatively, you can try charging the battery by navigating to **Menu > Mode Select > Manual > Forced Charge**. This process can help wake up the battery for DSP upgrade.

NOTICE!

- If the display screen is stuck after the upgrade, please turn off the DC switch and restart, and the inverter will restart and return to normal. If not, please contact us for help.

12 Decommissioning

12.1 Disassembling the Inverter

WARNING!

- When disassembling the inverter, strictly follow the steps as below.
- Only use measuring devices with a DC input voltage range of 1000 V or higher.

Step 1: Disconnect the external AC breaker of the inverter.

Step 2: Turn the DC switch 1 and DC switch 2 to "OFF" position. Turn off the inverter system button.

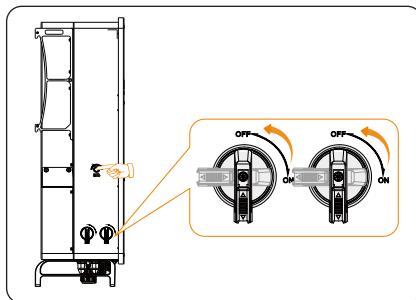


Figure 12-1 Turning off inverter

Step 3: Turn off the battery switch / button / breaker (if any). (See documents of battery)

Step 4: Wait until the LCD screen turns off.

Step 5: Disconnect the PV connectors: Insert the removal tool (Part M2) into the notch of PV connectors and slight pull out the connectors.

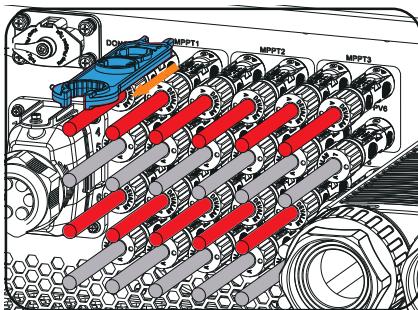


Figure 12-2 Releasing the PV connector

Step 6: Disconnect the battery connectors.

Step 7: Disconnect the AC connector: Loosen the M4 screws on the AC connector. Pull out the AC enclosure and release the screws securing the AC terminals.

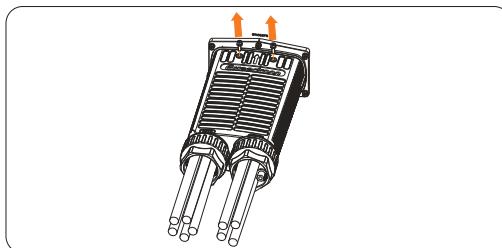


Figure 12-3 Removing AC connector

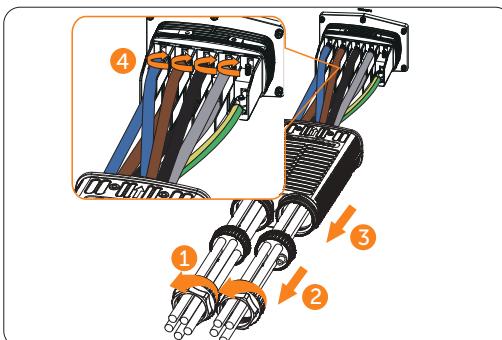


Figure 12-4 Removing AC terminals

Step 8: Disconnect the COM 1 connector and COM 2 connector: Please loosen the swivel nut of the COM connector and anti-clockwise loosen M3 screw of the communication connector by cross screwdriver. Pinch the tabs on the sides of the connector and pull the connector at the same time to remove it.

Step 9: Put the original terminal cap on the terminals.

Step 10: Unscrew the grounding screw by crosshead screw and remove the grounding cable.

Step 11: Unscrew the M5*50 screws on the sides of inverter. (The inverter installed on the wall is taken for an example.)

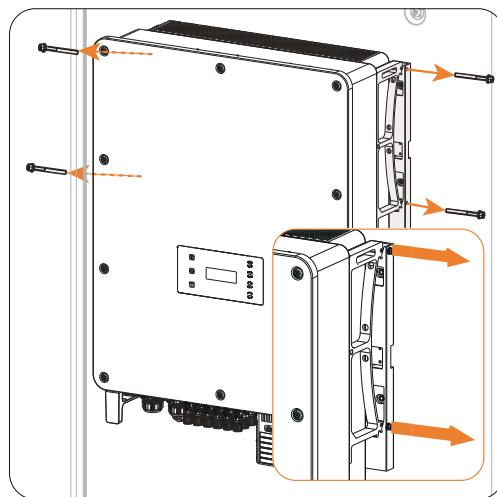


Figure 12-5 Unscrewing screws on the inverter

Step 12: Reinstall the eye bolts on the top of the inverter, use a crane to lift down the inverter. (The inverter installed on the wall is taken for an example.)

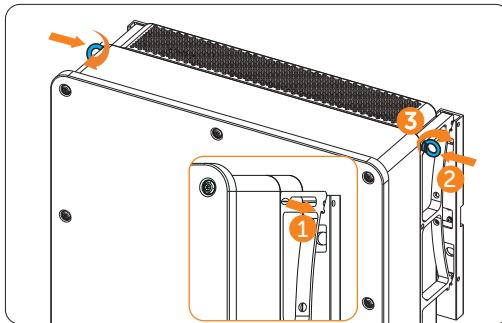


Figure 12-6 Reinstalling the eye bolt

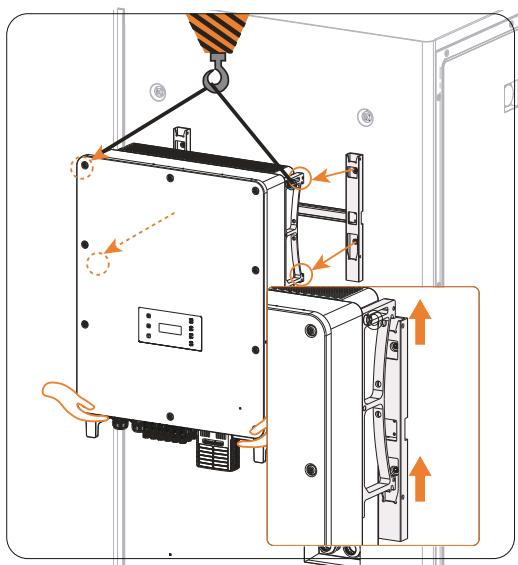


Figure 12-7 Lifting down the inverter

NOTICE!

- In case of personal injury or device damage, ladders will be helpful for installers to stand high and to adjust the inverter position when the inverter is lifted down from the wall mounting bracket.

Step 13: Unscrew the screws for fastening the wall mounting bracket and remove the wall mounting bracket.

12.2 Packing the Inverter

- Load the inverter into the original packing material if possible.

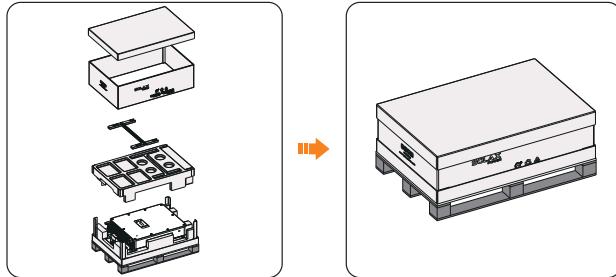


Figure 12-8 Packing the inverter

- If the original packing material is not available, use the packing material which meets the following requirements:
 - » Suitable for the weight of product
 - » Easy to carry
 - » Be capable of being closed completely

12.3 Disposing of the Wasted and Damaged Battery Pack and Inverter

Please dispose of the inverters, rechargeable battery or accessories in accordance with the disposal regulations for electronic waste which is applied at the installation site.

NOTICE!

- The expenses for dispose of the wasted or damaged battery packs incurred shall be borne by the user.

13 Technical Data

Inverter technical data

- DC input

Model	X3-AELIO-50K	X3-AELIO-60K
Max. recommended PV array power [kWp]	100	120
Max. PV input power per MPPT [kW]	30	
Max. PV input voltage [V] ^①	1000	
Nominal PV input voltage [V]	650	
MPPT voltage range [V]	160-950	
Full load MPPT voltage range [V] ^②	320-800	
Start-up voltage [V]	200	
No. of MPP trackers	5	
Strings per MPP tracker	2	
Max. input current per MPPT [A] ^③	40	
Max. input short circuit current per MPPT [A] ^③	50	
Max. inverter backfeed current to the array [A]	0	
DC disconnection switch	YES	

Note:

- ① The maximum input voltage represents the highest DC voltage threshold for the inverter, approaching which power derating occurs and any further increase might lead to potential damage to the inverter.
- ② PV voltage out of the full load MPPT range will trigger the inverter derating protection or possibly cause damage to the inverter if it exceeds the Max. input voltage.
- ③ Max. current for each PV input string is 35A

Technical Data

- AC output

Model	X3-AELIO-50K	X3-AELIO-60K
Rated AC power [kW]	50	60
Max. apparent AC power [kVA]	55	66
Rated grid voltage [V] (AC voltage range)	3/N/PE,400V/230V, 380V/220V	
Rated grid frequency [Hz]	50/60, ±5Hz	
Rated AC current [A]	72.2	86.6
Max. AC current [A]	83.6	100.3
Current (inrush) (at 50µs) [A] (AC 280V, 90°)	104.0	
Adjustable power factor range	1 (-0.8~0.8)	
Total harmonic distortion (THDi, rated power)	<3%	
Maximum output fault current [A]	195	240
Maximum output overcurrent protection [A]	225	260
Feedin phases	3	
Parallel operation	Yes	
Unbalanced output	Yes	

- Battery

Model	X3-AELIO-50K	X3-AELIO-60K
Battery voltage range [V]	180-820	
Recommended battery voltage [V]	650	
Max.charge/discharge power [kW]	50/50	60/60
Max.charge/discharge current [A]	160 (80*2)	
Battery connection	2	

- EPS output (with battery)

Model	X3-AELIO-50K	X3-AELIO-60K
Rated EPS voltage [V], Frequency [Hz]	400/230V, 50/60Hz	
Rated EPS output power [kW]	50	60
Peak EPS output power [kW]	55/ 75kVA for 10s	66/ 90kVA for 10s
Switch time [s]	<10ms	
Total harmonic distortion (THDi)	<3%	
Parallel operation	Yes	

- Efficiency

Model	X3-AELIO-50K	X3-AELIO-60K
Euro-efficiency	97.20%	
Max. efficiency	98.00%	
Rated battery charge/discharge efficiency	98.5%/97.00%	

- Power consumption

Model	X3-AELIO-50K	X3-AELIO-60K
Internal consumption (night) [W]	<25	

- Environment limit

Model	X3-AELIO-50K	X3-AELIO-60K
Protection class	IP66	
Operating temperature range [°C]	-35~60	
Relative Humidity (condensing) [%]	0~100	
Altitude [m]	< 3000	
Storage temperature [°C]	-40°C~+70°C	
Noise emission (Typical) [dB]	< 65	
Over voltage category	PV:II + Main:III	

Technical Data

- General data

Model	X3-AELIO-50K	X3-AELIO-60K
Demensions (WxHxD) [mm]	820x670x257	
Weight [kg]	<100	<105
Cooling concept	Smart air cooling	
Topology	Non-isolated	
Communication	RS485, CAN-BMS,CAN-Parallel,USB,DI,DO, DRM	
LCD display	Optional	
SPD	PV Type II+AC Type II	
AFCI	Optional	

Note:

* The specific gross weight is subject to the actual situation of the whole machine.

- Standard

Model	X3-AELIO-50K	X3-AELIO-60K
Safety	EN/IEC 62109-1/-2	
EMC	EN/IEC 61000-6-1/-2/-3/-4; EN/IEC 61000-3-2/-3/-11/-12; EN 55011; IEC 62920	
Cetification	VDE4105, G99, AS4777, EN50549, CEI 0-21, IEC 61727, PEA/MEA, NRS-097-2-1, RD1699, TOR	

Battery cabinet technical data

Model	AELIO-B200
Battery type	LiFePO4
Battery capacity [kWh]	200
Rated battery voltage [V]	716.8
Battery voltage range [V]	560 ~ 817.6
Rated charge/discharge current [A]	140
Max. charge/discharge current [A]	160 (80 × 2)
Dimensions (without Inverter) (WxHxD) [mm]	1680 × 2420 × 1200
Weight (without Inverter) [kg]	2700
Operating ambient temperature range [°C]	-30 ~ 50
Relative humidity(Non-condensing) [%]	0 ~ 95
Max. operating altitude [m]	3000
Cooling concept	Smart air cooling
Ingress protection	Cabinet: IP55
Fire protection	Aerosol / Water
Standard	IEC62619, IEC63056:2000, IEC61000, IEC62477-1, UN38.3

14 Appendix

14.1 Micro-grid Application

14.1.1 Introduction of Micro-grid Application

Due to Islanding Effect, on-grid inverter is unable to work during off-grid. This characteristic makes user losing the on-grid inverter PV energy when off-grid. Micro-grid is the function that making hybrid inverter simulate the grid to active on-grid inverter during off-grid by connecting on-grid inverter to hybrid inverter's EPS terminal.

14.1.2 Wiring Connection Diagram

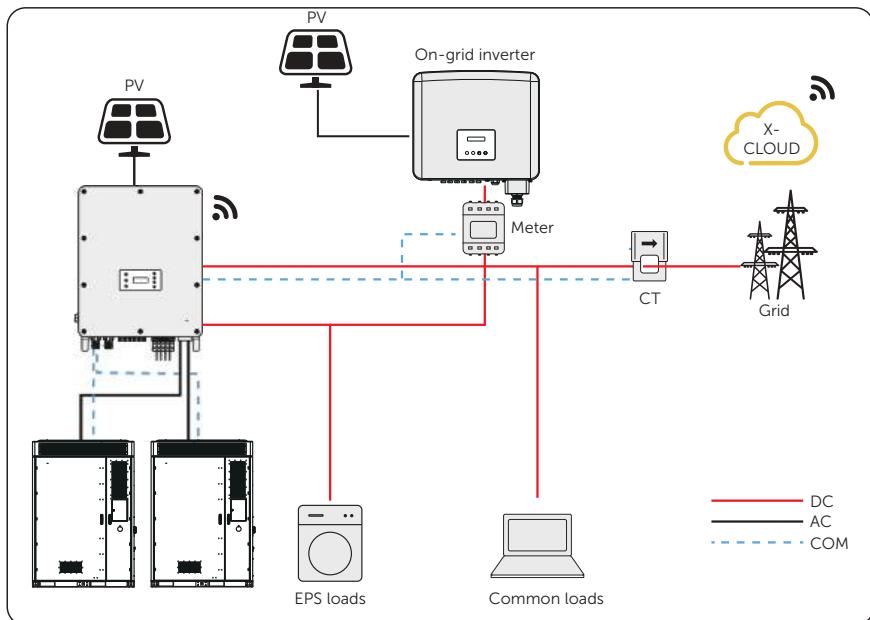


Figure 14-1 Micro-grid wiring connection

14.1.3 Working Modes

Grid on

- When PV is sufficient, the hybrid and on-grid inverters power the general and critical loads together. When there is surplus energy on the on-grid inverter, it will also charge the battery connected to the hybrid inverter.
- When PV is insufficient, the hybrid, on-grid inverter and grid power all the loads.

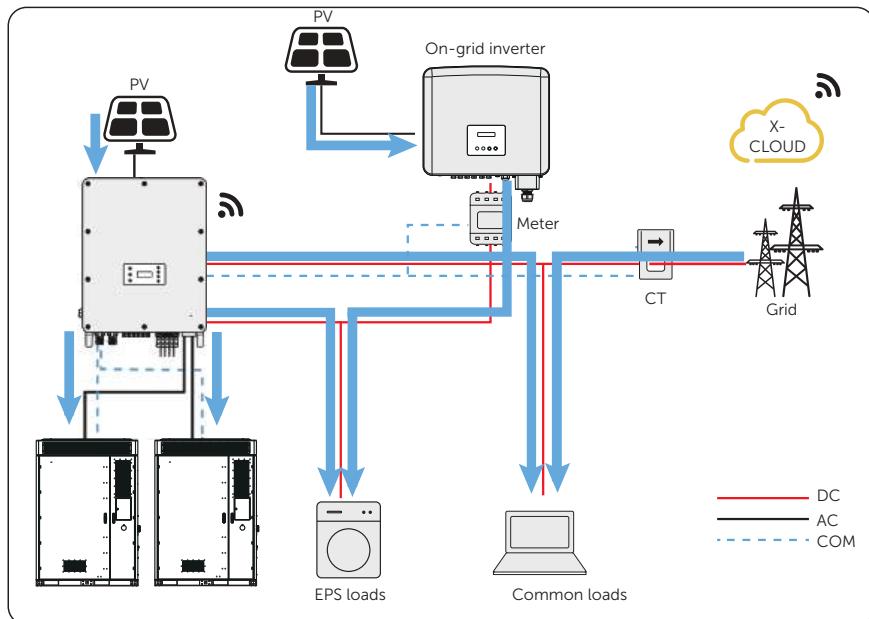


Figure 14-2 Power flowing when grid on and PV sufficient

Grid off

In this case, the hybrid inverter will simulate the grid so as to make the on-grid inverter can still work. Hybrid and on-grid inverter will power the EPS loads together. If there is surplus energy, it will charge the battery.

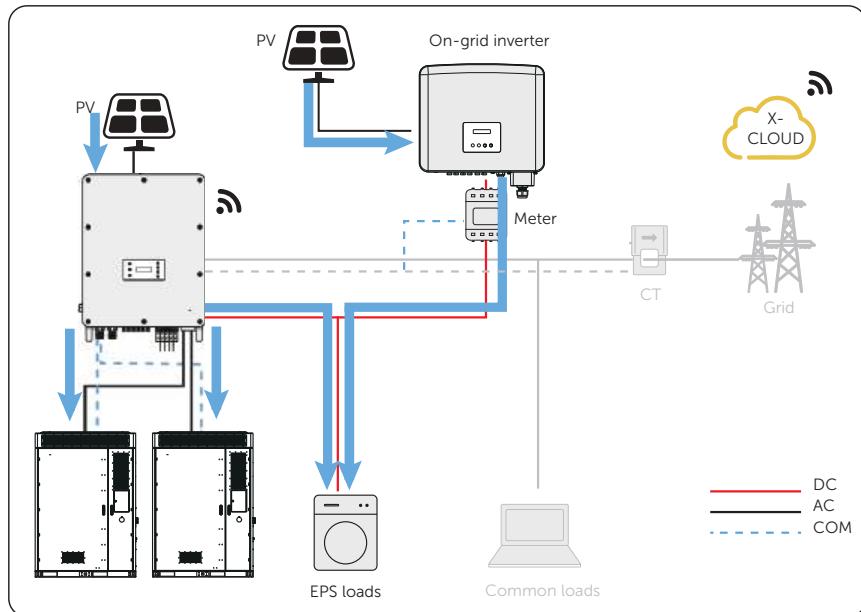


Figure 14-3 Power flowing when grid off

Notice for Micro-grid application

- Any brand of on-grid inverter that supports "frequency adaptation"
- On-grid inverter output power \leq Max hybrid inverter EPS output power
- On-grid inverter output power \leq Max battery charging power, refer to the table below:

NOTICE!

- Since X3-AELIO series inverter is unable to control the output power of on-grid inverter in grid connection mode, therefore X3-AELIO series inverter can not achieve zero export when loads power + battery charging power $<$ on-grid inverter output power.

14.1.4 Cable Connection (Hybrid inverter)

Please refer to ["7.2.3 AC Connection"](#) for Grid and EPS connection on X3-AELIO series inverter.

14.1.5 Cable Connection (On-grid Inverter)

Please connect the AC cable of on-grid inverter to the EPS terminal of X3-AELIO series inverter through a circuit breaker. Please refer to the user manual of specific on-grid inverter.

14.1.6 Cable Connection (Meter)

To detect and monitor the power data generated from the on-grid inverter, you can install a meter on the on-grid inverter side. Otherwise, the relevant power data of on-grid inverter can not be monitored.

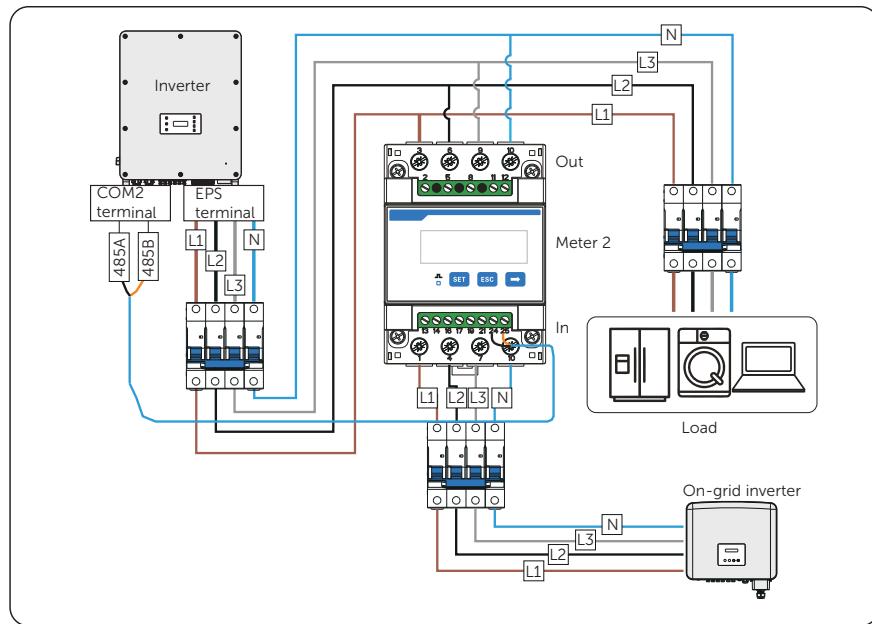


Figure 14-4 Connection diagram of Meter on EPS terminal

NOTICE!

- If one-to-two adapter for RJ45 terminal is used, it should be placed in a waterproof enclosure.

- Pin definition

Table 14-1 Pin definition for meter and CT

Application	For CT1			For meter		For CT2		
Pin	1	2	3	4	5	6	7	8
Assignment	CT_ R1_ CON	CT_ S1_ CON	CT_ T1_ CON	METER -485A	METER -485B	CT_ T2_ CON	CT_ S2_ CON	CT_ R2_ CON

- Meter/CT connection steps

Please refer to **"14.3 CT/Meter Connection Scenarios"** and meter/CT user manual for specific connection steps.

- Setting on the LCD

Setting path: **Menu>Setting>Advance Setting>Meter/CT Setting**

① For meter 1 and meter 2 solution (Meter 1 for grid connection, Meter 2 for EPS connection)

- Select and enter the **Meter/CT Setting** according the setting path.
- Set the address and direction of Meter 1: You can check the connection status in **Meter/CT Check**.



- Set the address and direction of Meter 2: You can check the connection status in **Meter/CT Check**.



- After connection succeeded, check the feed-in power of Meter 1 in the path of **Menu>System Status>Meter/CT** and check the output power (**Output Today** and **Output Total**) of Meter 2 in the path of **Menu>History Data>E_USERDEF**.

② For CT and meter 2 solution (CT for grid connection, Meter 2 for EPS connection)

- a. Select and enter the **Meter/CT Setting** according the setting path.
- b. The default device is CT and the status is enable by default. You can check the connection status in **Meter/CT Check**.
- c. Set the address and direction of Meter 2: You can check the connection status in **Meter/CT Check**.



- d. After connection succeeded, check the feed-in power of Meter 1 in the path of **Menu>System Status>Meter/CT** and check the output power (**Output Today** and **Output Total**) of Meter 2 in the path of **Menu>History Data>E_USERDEF**.

14.2 Application of Parallel Function

14.2.1 Introduction of Parallel Application

The series inverters supports parallel operation in both Grid and EPS modes. It supports up to 3 units in the parallel system when not equipped with a parallel cabinet.

Table 14-2 Maximum inverter number in parallel system

Model	X3-AELIO-50K	X3-AELIO-60K
Maximum inverter number in parallel system		3

14.2.2 Notice for Parallel Application

- All inverters should be of the same software version.
- For optimal efficiency, it is recommended that all inverters have the same model, and are connected to batteries of the same model and quantity.
- In parallel system, there are three status: **Free**, **Slave** and **Master**.

Table 14-3 Three status

Free	Only if no one inverter is set as a Master , all inverters are in Free mode in the system.
Slave	Once one inverter is set as a Master , all other inverters will enter Slave mode automatically. Slave mode can not be changed from other modes by LCD setting.
Master	When one inverter is set as a Master , this inverter enters Master mode. Master mode can be changed to Free mode.

- Master inverter has an absolute lead in the parallel system to control all slave inverter's energy management and dispatch control. Once master inverter has some error and stop working, all slave inverters will be stop simultaneously. But master inverter is independent of all slave inverters to work and will not be affected by slave inverter's fault.
- Overall system will be running according to master inverter's setting parameters, and most setting parameters of slave inverter will be kept but not be cancelled.
- Once slave inverter exits from the system and be running as an independent unit (the network cable is disconnected simultaneously), its all setting will be re-activated.
- The parallel system is extremely complex and requires a large number of cables to be connected. Therefore, the cables must be connected in the correct wire sequence. Otherwise, any small mistake can lead to system failure.
- The communication cable length should not exceed 40 m.

14.2.3 System Wiring Diagram

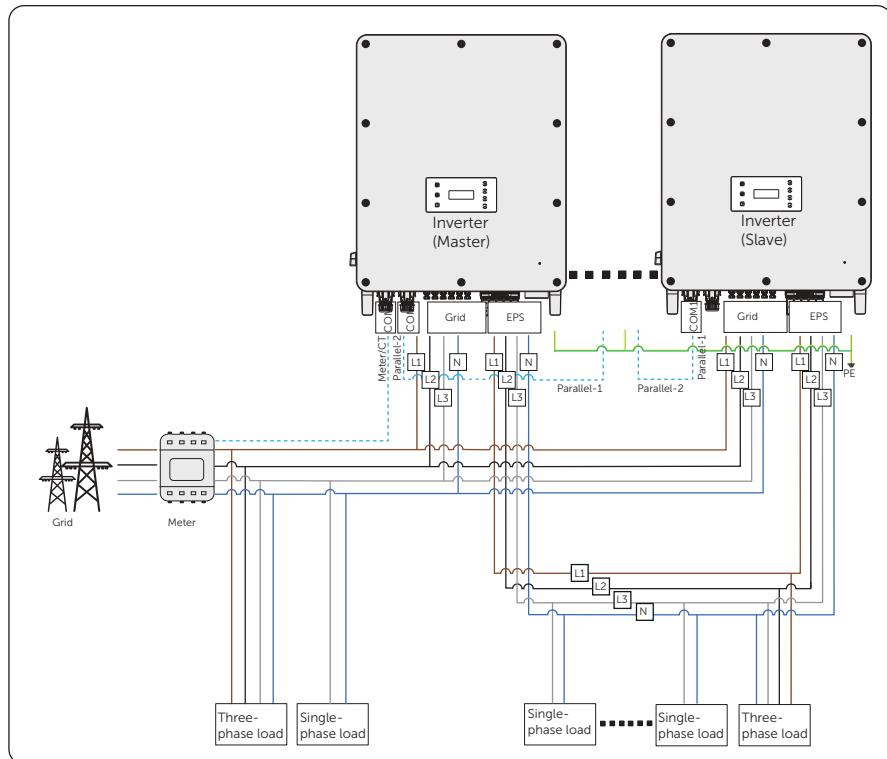


Figure 14-5 System wiring diagram

14.2.4 System Wiring Procedure

Power cable wiring-Grid and EPS terminal

- a. User five-core copper cable to connect Master-Slave inverter.
- b. Grid terminal of Master and Slave inverter: L1 connects to L1, L2 connects to L2, L3 connects to L3 and N connects to N,
- c. EPS terminal of Master and Slave inverter: L1 connects to L1, L2 connects to L2, L3 connects to L3 and N connects to N,
- d. All PE cable connects to the same E-BAR nearby.

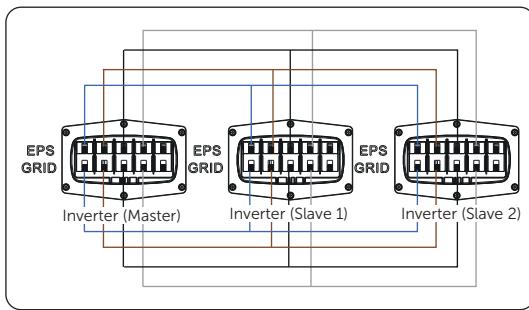


Figure 14-6 Power cable wiring without X3-PBOX-300kW

Communication cable wiring-COM1 terminal and COM2 terminal

- a. Use standard network cables for Master-Slave inverter connection.
- b. Master inverter Parallel-2 connects to Slave 1 inverter Parallel-1.
- c. Slave 1 inverter Parallel-2 connects to Slave 2 inverter Parallel-1.
- d. Meter connects to Meter/CT terminal of the Master inverter. Please refer to "["CT/Meter connection"](#)".

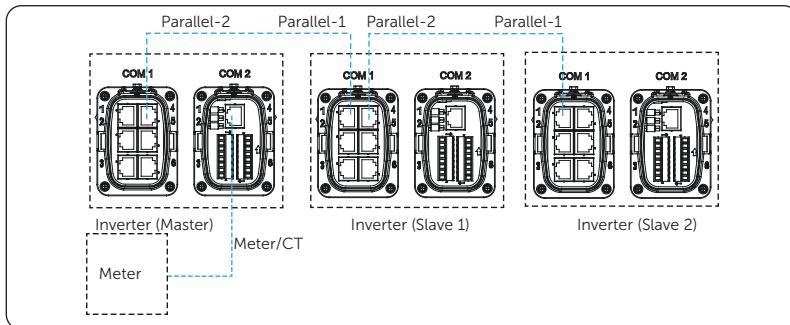


Figure 14-7 Communication wiring without X3-PBOX-300kW

NOTICE!

- For details on the specific wiring of the inverter, see “[7.2.3 AC Connection](#)” and “[7.2.6 COM 1 Communication Connection](#)”

14.2.5 Settings for Parallel Connection

Meter/CT setting

Setting path: **Menu>Setting>Advance Setting>Meter/CT Setting**.

Parallel setting

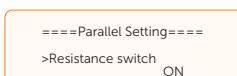
Setting path: **Menu>Setting>Advance Setting>Parallel Setting**.

How to build the parallel connection

- Turn on the power of the entire system, find the inverter which needs to be set as Master and connect the meter to Master inverter, enter the setting page of the Master inverter LCD screen, select the **Parallel Setting**, and select **Master**; then enter the **Resistance Switch** and set it to **ON**;



- Find the last slave in the parallel system and enter the setting page of the inverter LCD screen and set the **Resistance Switch** to **ON**.



How to remove the parallel connection

- a. Find the inverter which needs to be set as Free. Select the **Parallel Settings** and select **Free** for the inverter.

```
=====Parallel Setting=====  
>Setting  
Free
```

- b. Disconnect all the network cables on the Parallel-1 and Parallel-2 port.

NOTICE!

- If a slave inverter is set to **Free** mode but not disconnect the network cable, this inverter will return to **Slave** mode automatically.
- If a slave inverter is disconnected with master inverter but not be set to **Free** mode, this slave inverter will stop working and prompt **ParallelFault**.

External ATS setting

Setting path: **Menu>Setting>Advance Setting>External ATS**.

When the X3-PBOX-300K is connected in the parallel system, enable the function.

```
=====External ATS=====  
Function Control  
> Disable <
```

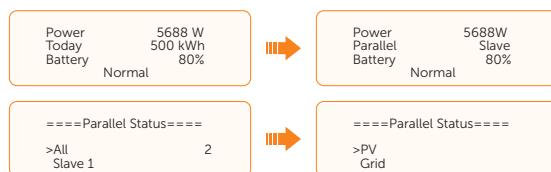
Parallel display

Displaying path: **Menu>Parallel Status**

NOTICE!

- Once inverter enters parallel system, the **Today** yield will be replaced by **Parallel**.

In **Parallel Status** interface, the whole system power and individual slave inverter power can be obtained in **Parallel Status** interface of master inverter. The number displayed in the **Parallel Status** interface refers to the total number of online inverters, for example two inverters in parallel in the below figure.



14.3 CT/Meter Connection Scenarios

X3-AELIO inverter series can be connected to a single batch of CTs, a direct-connected meter, or a CT-connected meter, and also supports a Meter 2 function for you to monitor another power generation device at home.

Followings are the detailed wiring and setting procedures of these scenarios. For wiring procedure of the inverter CT/Meter port, see "[CT/Meter connection](#)".

14.3.1 Connection of CT

NOTICE!

- Do not place the CT on the N wire or ground wire.
- Do not put CT on the N line and L line at the same time.
- Do not place the CT on the side where the arrow points to the inverter.
- Do not place the CT on non-insulated wires.
- The cable length between CT and inverter should not exceed 10 meters.
- It is recommended to wrap the CT clip around in circles with insulating tape.

NOTICE!

- The CTs referred to in this section are the CT batch delivered with the inverter.

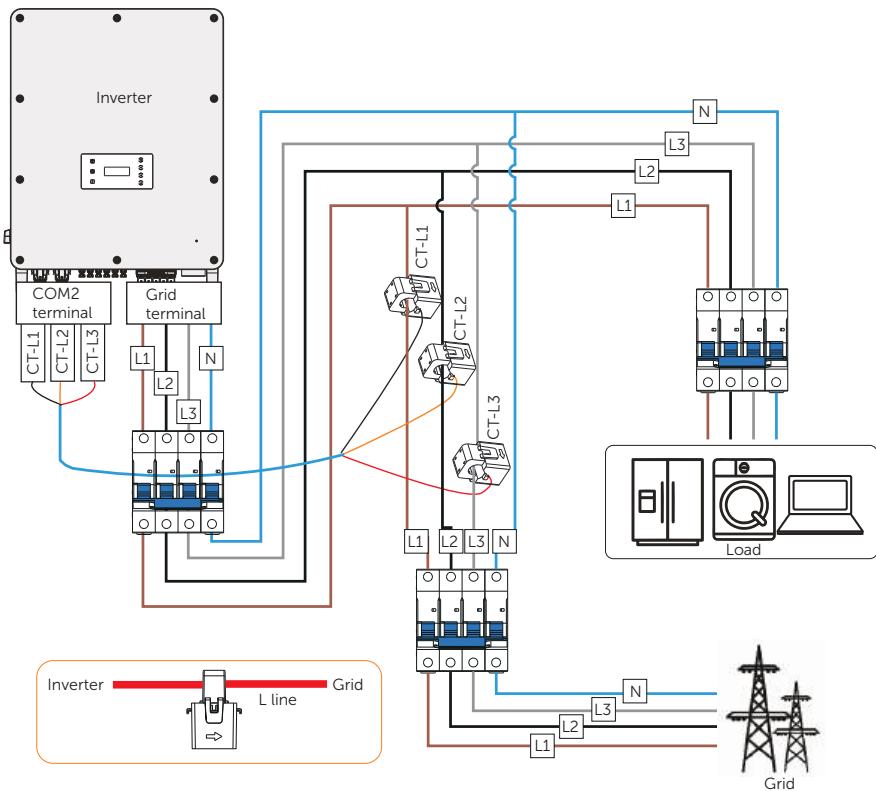


Figure 14-8 System wiring with CT

NOTICE!

- The arrow on the CT must point at the public grid.
- Markings on the CTs might be R, S and T or L1, L2 and L3. Make sure to clip CT-R/CT-L1 to the L1 wire, CT-S/CT-L2 to the L2 wire, and CT-T/CT-L3 to the L3 wire.
- The emergency load is connected to the EPS terminal of the inverter, which is not shown in the diagram.

Wiring procedure

Step 1: Clip CT_L1, CT_L2 and CT_L3 respectively onto the L1, L2 and L3 cables of the grid.

Make sure the arrow on the CTs is pointing to the grid side from the inverter.

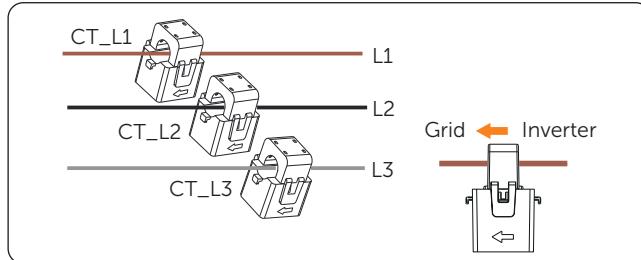


Figure 14-9 Clipping CTs to grid cables

Step 2: Use the RJ45 coupler to connect the extension communication cable and the batch of CTs.

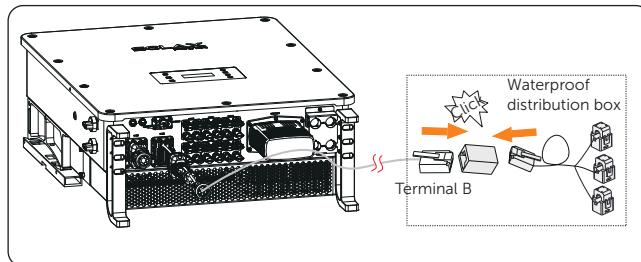


Figure 14-10 Connecting to CT

Setting procedure

After connecting CT to the inverter, set parameters for them on the inverter.

Step 1: Select **Advance Settings > Meter/CT Setting**.

Step 2: Enable CT, and then select the supported CT type.

You can check the connection status in **Meter/CT Check**. For details, see "Setting Meter/CT Check".

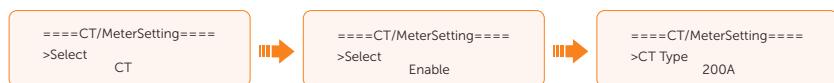


Figure 14-11 Setting CT for the inverter

14.3.2 Connection of Direct-connected Meter

NOTICE!

- The following figures take inverter with Meter DTSU666 as an example.
- Please make PE connection for Meter if the meter has ground terminal.

- Meter connection diagram

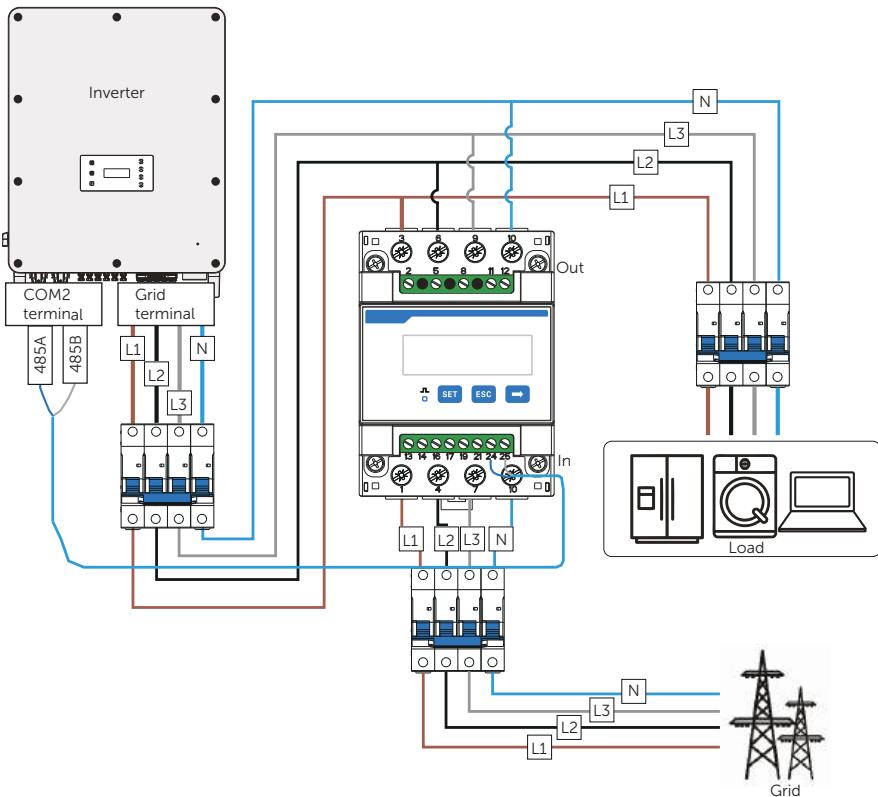


Figure 14-12 System wiring with direct-connected meter

NOTICE!

- For direct-connected meter, the current flow direction should be from grid to the inverter.
- Terminal 1, 4 and 7 of the meter must be connected to the grid side, and terminal 3, 6 and 9 be connected to the inverter side of the system. Otherwise, the system power data might be misread.

Meter terminal definition

Table 14-4 Terminal definition of SolaX direct-connected meter

Terminal No.	Definition	Description
1, 4, 7	UL*	Voltage input terminal of the three phases (the grid side), respectively connected to L1, L2 and L3
3, 6, 9	UL	Voltage output terminal of the three phases (the inverter side), respectively connected to L1, L2 and L3
10	UN	Phase N voltage input and output terminal, connected to the N wire
24	RS485A	RS485 terminal A
25	RS485B	RS485 terminal B

Wiring procedure

Step 1: Strip around 10 mm wire insulation off the grid voltage cables, and then connect L1, L2 and L3 wires respectively to terminal 1 and 3, 4 and 6, 7 and 9, and N wire to terminal 10 of the meter.

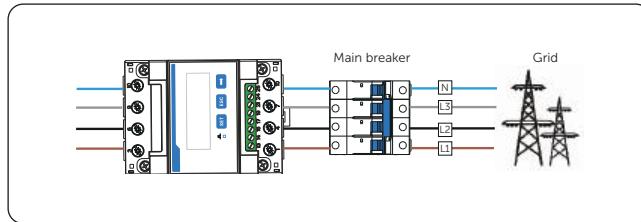


Figure 14-13 Connecting direct-connected meter to the grid

Step 2: Strip 15 mm wire insulation off the other end of the communication cable.

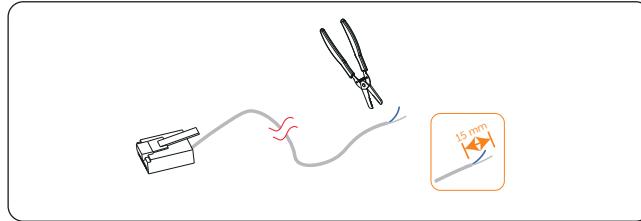


Figure 14-14 Stripping communication cable for meter

Step 3: Connect the conductors to terminal 24 and 25 of the meter.

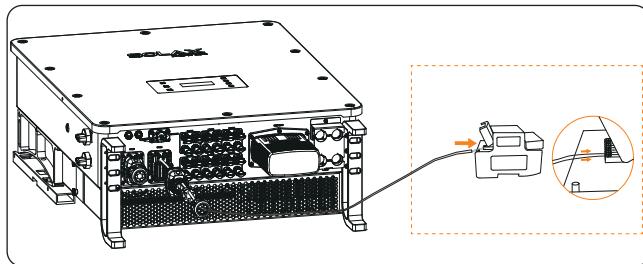


Figure 14-15 Connecting inverter to meter

Setting procedure

After connecting meter to the inverter, set parameters of the meter on the inverter.

Step 1: Select **Advance Settings > Meter/CT Setting**.

Step 2: Enable **Meter**, and then set **Meter1Addr** to **1** and **Meter1 Direction** to **Positive**.

You can check the connection status in **Meter/CT Check**. For details, see "["Setting Meter/CT Check"](#)".



Figure 14-16 Setting meter for the inverter

14.3.3 Connection of CT-connected Meter

NOTICE!

- The following figures take inverter with Meter DTSU666-CT as an example.
- Please make PE connection for Meter if the meter has ground terminal.
- The CTs referred to in this section are CTs that are delivered with the CT-connected meter.

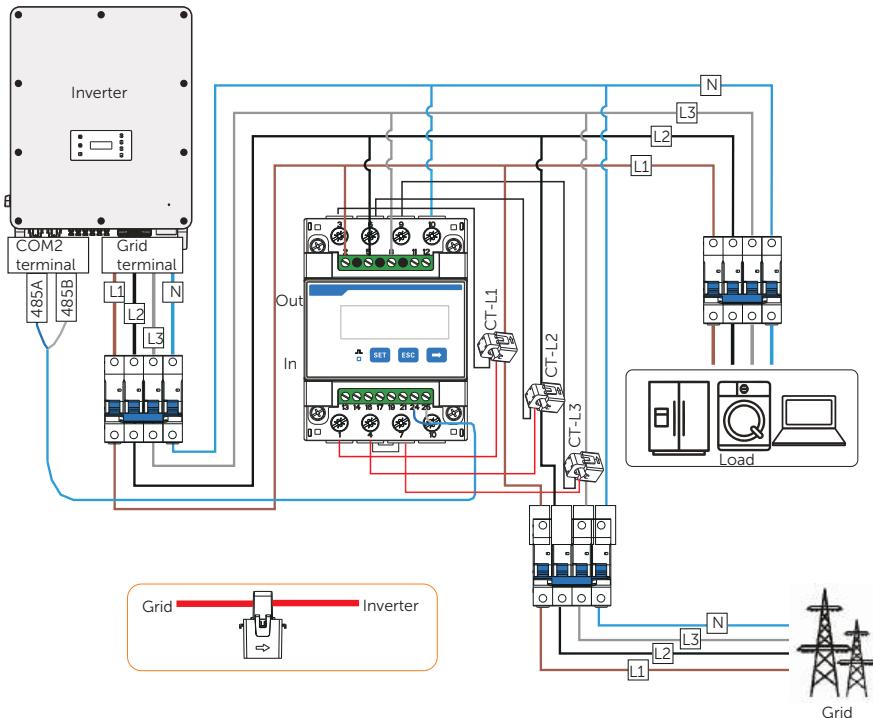


Figure 14-17 System wiring with CT-connected meter

NOTICE!

- Terminal 2, 5 and 8 of the meter must be connected to the grid side. Terminal 1, 4 and 7 must be connected to the S1 wire of the CTs, and terminal 3, 6 and 9 be connected to the S2 wire of the CTs. Otherwise, the system power data might be misread.
- The arrow on the CT must point at the inverter.
- Markings on the CTs might be R, S and T or L1, L2 and L3. Make sure to clip CT-R/CT-L1 to the L1 wire, CT-S/CT-L2 to the L2 wire, and CT-T/CT-L3 to the L3 wire.

Meter terminal definition

Table 14-5 Terminal definition of SolaX CT-connected meter

Terminal No.	Definition	Description
2, 5, 8	UL	Voltage input terminal of the three phases, respectively connected to L1, L2 and L3
10	UN	Phase N voltage input terminal, connected to the N wire
1, 4, 7	IA*, IB*, IC*	Current input terminal of the three phases, connected to the S1 wire of CT
3, 6, 9	IA, IB, IC	Current input terminal of the three phases, connected to the S2 wire of CT
24	RS485A	RS485 terminal A
25	RS485B	RS485 terminal B

Wiring procedure

Step 1: Strip around 10 mm wire insulation off the voltage cables, and then connect L1, L2 and L3 wires respectively to terminal 2, 5 and 8, and the N wire to terminal 10 of the meter.

Step 2: Clip the CTs onto the L1, L2 and L3 wires in the direction from grid to inverter.

Step 3: Connect the S1 wire of the three included CTs respectively to terminal 1, terminal 4 and terminal 7, and S2 wire of the CTs respectively to terminal 3, 6 and 9 of the meter.

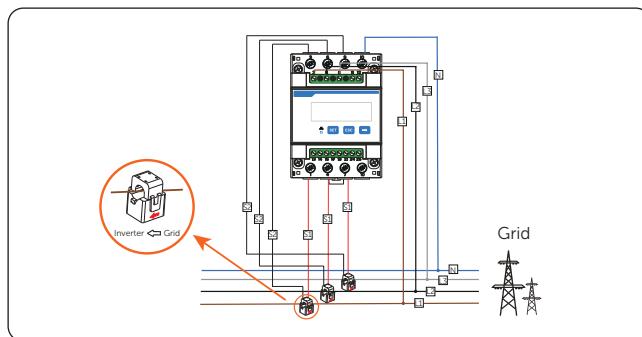


Figure 14-18 Connecting CT-connected meter to the grid

Step 4: Strip 15 mm wire insulation off the other end of the communication cable.

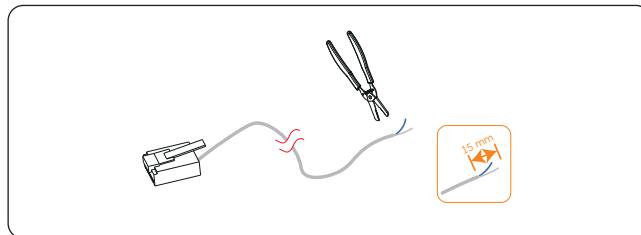


Figure 14-19 Stripping communication cable for meter

Step 5: Connect the conductors to terminal 24 and 25 of the meter.

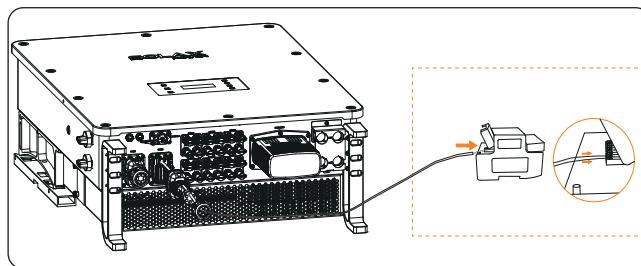


Figure 14-20 Connecting inverter to meter

Setting procedure

After connecting CT to the inverter, set parameters for them on the inverter.

Step 1: Select **Advance Settings > Meter/CT Setting**.

Step 2: Enable **Meter**, and then set **Meter1Addr** to **1** and **Meter1 Direction** to **Positive**.

You can check the connection status in **Meter/CT Check**. For details, see "[Setting Meter/CT Check](#)".



Figure 14-21 Setting meter for the inverter

14.3.4 Connection of Two Meters

If you have another power generation device (such as an inverter) at home and wants to monitor both device, our inverter provides a Meter 2 Communication function to monitor the other power generation device.

NOTICE!

- For connecting CT and meter, or connecting two meters, prepare an RJ45 splitter adapter and a proper waterproof enclosure for it in advance.
- The device for monitoring the system (device at Meter 1 position) can be CT, direct-connected meter and CT-connected meter, but the device for monitoring the other power generation device (device at Meter 2 position) can only be meters, either direct-connected meter or CT-connected meter. The following diagrams use the connection of CT and direct-connected meter for example.

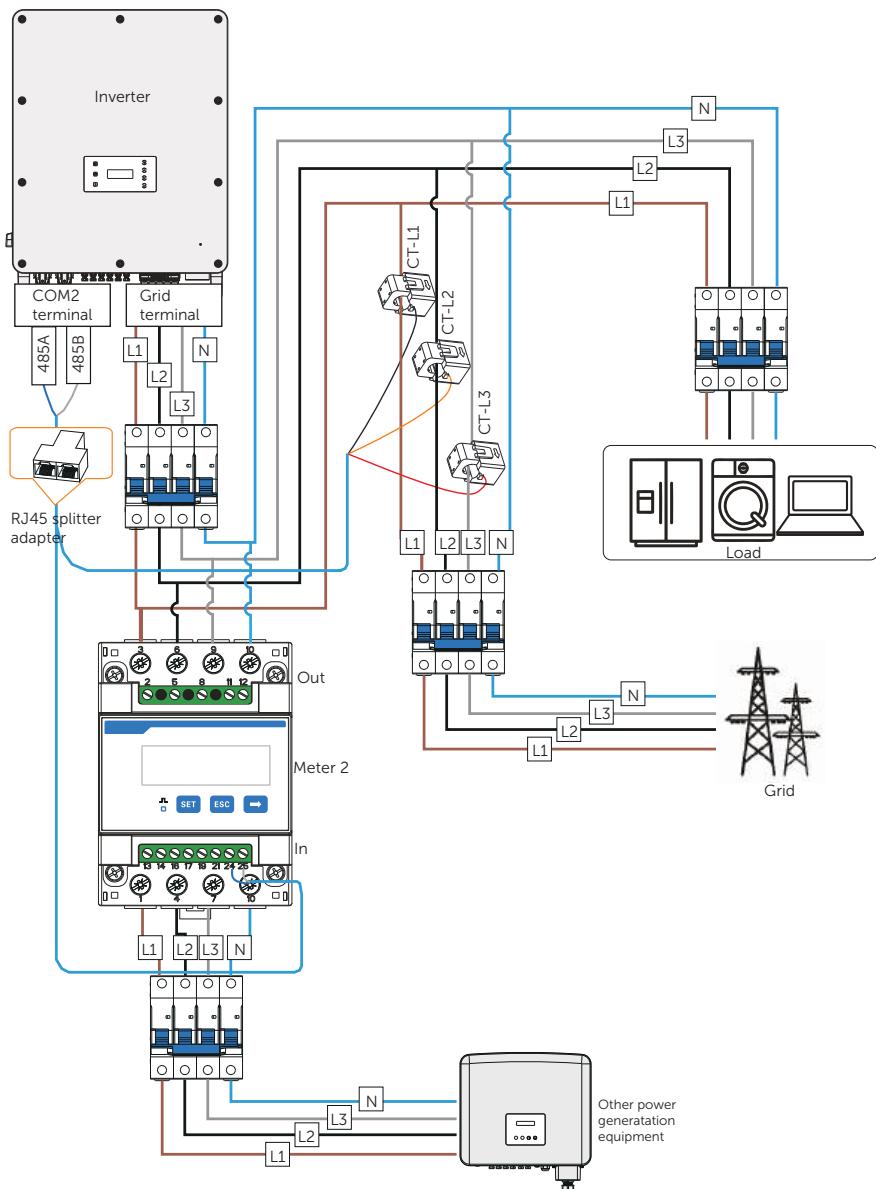


Figure 14-22 Connection diagram of CT and direct-connected meter

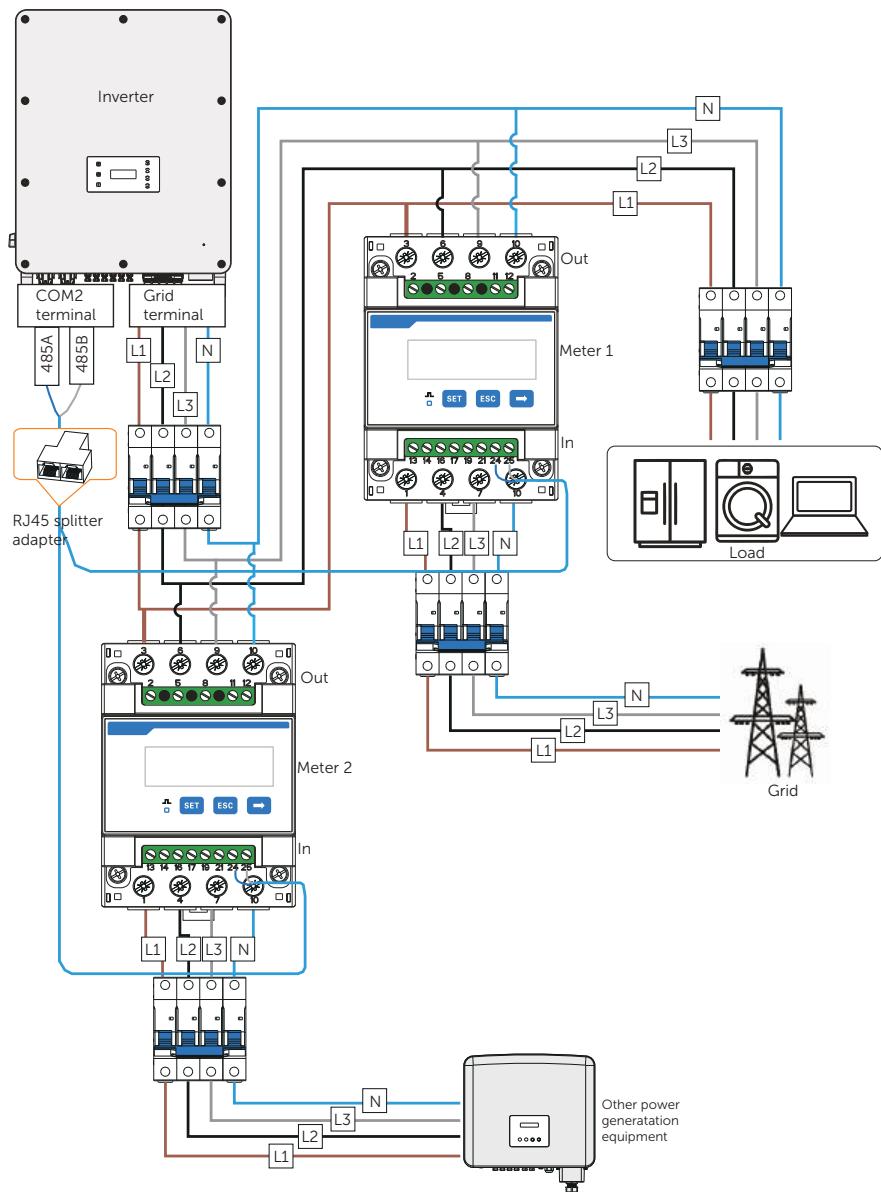


Figure 14-23 Connection diagram of two direct-connected meters

Wiring procedure

Step 1: Follow the above steps to connect the meter, CT and inverter.

Step 2: Connect the RJ45 terminals to the RJ45 splitter adapter.

Setting procedure

After connecting the CT and meter to the inverter, you need to set parameters on the inverter LCD before they can work normally for the system.

Step 1: Select **Advance Settings > Meter/CT Setting**.

Step 2: Set the Meter/CT:

- » Case 1: CT and Meter 2 are connected (CT for SolaX inverter, Meter 2 for another power generation device). CT is set by default. Check whether the address and direction of Meter2 are set based on actual connection.



Figure 14-24 Selecting CT and set Meter2 data

- » Case 2: Meter 1 and Meter 2 are connected (Meter 1 for SolaX inverter, Meter 2 for another power generation device). Select **Meter** and enable the Meter function. Check whether the address and direction of Meter 1 and Meter 2 are set based on actual connection.

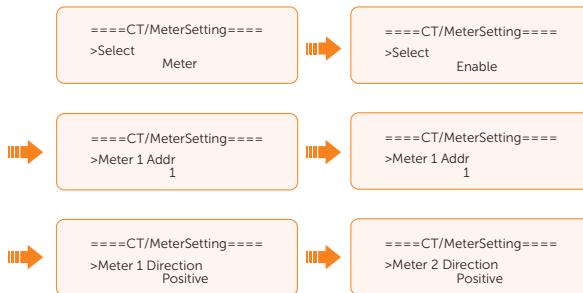


Figure 14-25 Selecting meter and set Meter 1 and Meter 2 data

Step 3: Set the CT type.

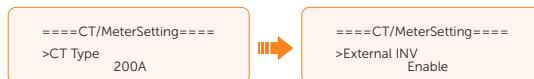


Figure 14-26 Setting the limits

Related operation

Setting Meter/CT Check

- **Installation Check:** It is for checking whether the Meter/CT has been correctly connected. It is vital to the normal function of the whole system. Therefore, we recommend performing installation check after connecting the Meter/CT.

Select **Meter/CT Setting > Meter/CT Check**, and then enable **Installation Check**.

The system will perform Meter/CT check immediately after you enable it, and then automatically restores to the disabled status after the check completes.



- **Cyclic Check:** It is for periodically checking whether the Meter/CT is in good condition when the inverter is running.

Select **Meter/CT Setting > Meter/CT Check**, and then enable **Cyclic Check**.

Once Cyclic Check is enabled, the system will check the Meter/CT status periodically based on the defined cycle.



Figure 14-27 Checking Meter/CT status

14.4 Requirements for OT/DT/OT Terminal

- In the case of a copper cable, please use a copper wiring terminal.
- In the case of a copper-clad aluminum cable, please use a copper wiring terminal.
- In the case of an aluminum alloy cable, please use a copper-to-aluminum wiring terminal or an aluminum wiring terminal with a copper-to-aluminum washer.
 - » Do not connect the aluminum wiring terminal to the terminal block. Otherwise, electrochemical corrosion may occur, compromising the reliability of the cable connection.
 - » The copper-to-aluminum wiring terminal or the aluminum wiring terminal with a copper-to-aluminum washer used must meet the IEC61238-1 requirements.
 - » When using the copper-to-aluminum washer, you must confirm that the aluminum side of the washer contacts the aluminum wiring terminal, as well as the copper side of the washer contacting the terminal block.

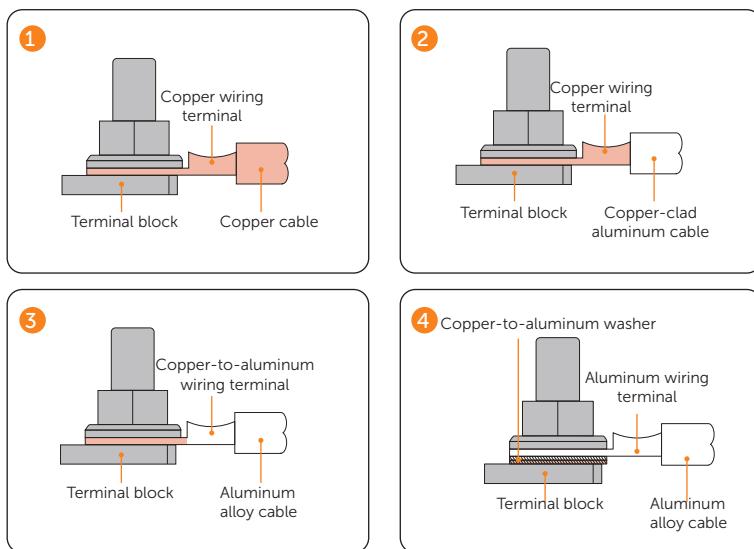


Figure 14-28 Requirement for OT/DT/OT terminal

14.5 How to Repaint the Cabinet

In bad weather conditions, such as rain, snow, gales, sandstorms, etc., stop carrying out repainting even if the device is installed outside.

Strictly comply with the pantone color described in the document while repainting.

Repainting description

To keep the device appearance intact, please repaint it immediately in the case of flaking and peeling paint.

NOTICE!

- Prepare tools and sufficient materials according to the On-site Assessment Report of the Extent of the Paint Damage.

Table 14-6 Repainting description

Extent of the paint damage	Tools and materials	Procedure	Description
Light scratches on device (without reaching the steel substrate)	Spray paint or oil paint, hairbrush (for small scratched area), fine sandpaper, absolute alcohol, cotton cloth, paint sprayer (for large scratched area).	Steps 1, 2, 4, and 5	<ol style="list-style-type: none"> 1. Regarding the painting, the pantone color (Pantone 11-4800TCX) is for reference.
Stubborn stains on device			<ol style="list-style-type: none"> 2. Regarding the light scratches or small area of stubborn stains, it is suggested to use spray paint and hairbrush.
Deep scratches on device (the damaged primer, reaching the steel substrate)	Spray paint or oil paint, zinc-rich primer, hairbrush (for small scratched area), fine sandpaper, absolute alcohol, cotton cloth, paint sprayer (for large scratched area).	Steps 1, 2, 3, 4, and 5	<ol style="list-style-type: none"> 3. Regarding the deep scratches or the large area of stubborn stains, it is suggested to use oil paint and paint sprayer.
The damaged logo or pattern, dents and dings	<p>If the logo or any other patterns are damaged, contact your local spraying company to customize a repainting plan in accordance with the size, color, and extent of the damage to the logo or patterns.</p> <ol style="list-style-type: none"> 1. If the damaged area is < 100 mm² and the depth is < 3 mm, it is recommended to use a poly-putty base to fix the dents and dings first and then deal with them according to the Procedure for Deep Scratches. 2. If the damaged area is > 100 mm² or the depth is > 3 mm, contact your local supplier to make a repair plan based on the actual situation. 		<ol style="list-style-type: none"> 4. Make sure that the damaged area with even coverage and thin, to create a consistent and even appearance. 5. Allow the paint to dry for at least 30 minutes before conducting the next step.

Procedure

Step 1: Gently sand the scratched surface with a fine sandpaper to remove rust or stains.

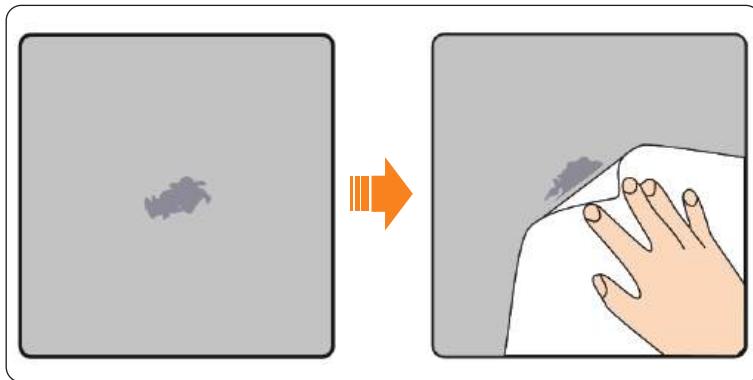


Figure 2-29 Sanding the scratched surface

Step 2: Clean the scratched area properly with a wet cotton cloth to remove dirt, and then wipe it with a dry cotton cloth.

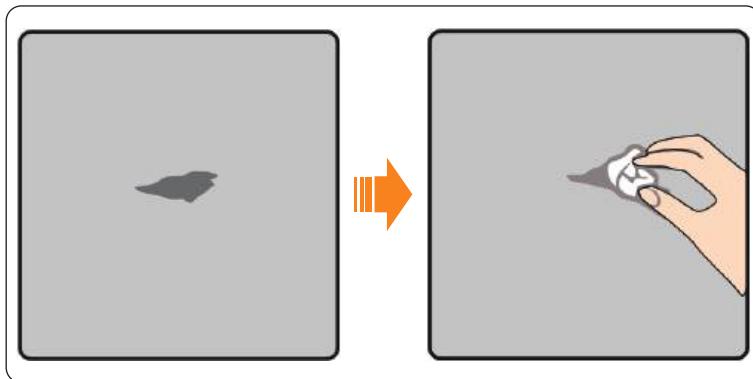


Figure 2-30 Cleaning the scratched area

Step 3: Apply the zinc-rich primer to the scratched area through a hairbrush or paint sprayer.

NOTICE!

- If the bare metal underneath can be seen,
 - » Firstly, the epoxy zinc-rich primer must be applied;
 - » Secondly, apply the acrylic top coat until the primer is dry and the bare metal cannot be seen.
- The epoxy zinc-rich primer and the acrylic top coat shall be decided according to the surface coating of the device.

Step 4: Given the damage degree, one of the following methods, self painting, brush painting, or paint sprayer can be chosen to evenly paint the damaged area.

NOTICE!

- Make sure that the damaged area with even coverage, smooth and thin, to create a consistent and even appearance.
- If there are any other colors on the device, carefully position the tape or paper over the undamaged area before painting, to avoid staining these colors.

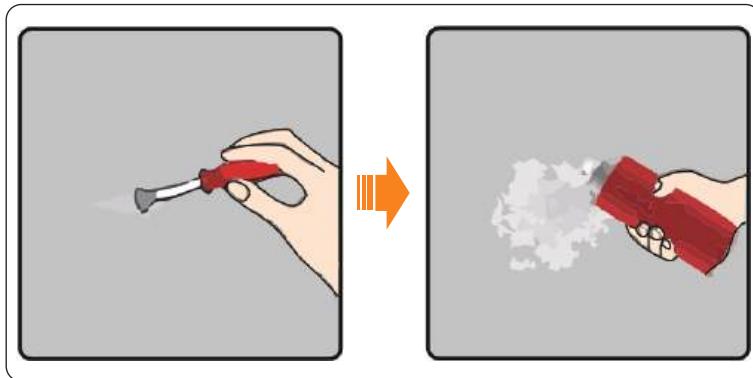


Figure 2-31 Painting the damaged area

Step 5: Allow the paint to dry for at least 30 minutes, and then check whether the repaired area meets requirements.

NOTICE!

- The color of the repaired area shall be consistent with the surrounding area. Use a colorimeter to measure the color difference, of which Delta E shall be ≤ 3 . If the color cannot be measured by a colorimeter, please confirm that there is no obvious color difference at the edges between the repaired area and the surrounding area, as well as no bumps, scratches, flakings, or breaks.
- In the case of spray painting, it is suggested to paint 3 times first before checking whether it meets the requirements. If not, please repeat spray painting until it meets the requirements.

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