

TRENE-P100B215

Maintenance Manual

Version 0.0

www.solaxpower.com

STATEMENT

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About This Manual

Scope of Validity

This document describes regular maintenance, troubleshooting and parts replacement for TRENE-P100B215 product. Please read it carefully before operating.

Target Group

This document is intended for:

- Technical support engineers
- Maintenance engineers

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

Version 0.0 (2024-10-28)

Initial release

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1 Safety

1.1 General Safety

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

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 equipment suitability.**

SolaX will not be liable for maintenance for possible device failure**,** device malfunction, or parts damage, or **will not assume any liability to pay compensation for the possible physical and property damage**, caused since the installation environment cannot meet the design requirements of the device.

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 equipment, 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 man-made 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 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 equipment, and neglect the "Danger" sign, "Warning" sign, "Caution" sign, and "Notice" sign on the equipment, 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 equipment 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 equipment, 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 equipment 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 equipment or a fire.
- Keep away from flammable and explosive gases, or smoky environments.

WARNING!

- The equipment 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 equipment 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 equipment 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 equipment. Or, it may affect the performance and safety of the equipment.
- Do not install, run or operate outdoor equipment or cables (including but not limited to carrying equipment, operating equipment, 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 equipment: 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 equipment is installed on a grassy plantation, do weed regularly, and harden the ground under the equipment, such as cementing, gravelling, etc.
- When the operator plans to install, operate or maintain the equipment, 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 equipment 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 equipment 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 equipment. Otherwise, the sealing performance, electromagnetic shielding performance, or internal components or cables of the equipment 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 equipment 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 equipment 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 equipment 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 runnaway, 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 equipment, 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 equipment room, or water pipes. Ensure that no liquid enters the equipment to prevent faults or short circuits.
- Equip with fire-fighting equipment, 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 equipment 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 equipment that is directly related to human health.
  b. Equipment, 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 equipment.
  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. Others conditions that can cause overheating.
- 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 equipment while maintaining electrical terminal equipment and power distribution equipment connected to the power supply equipment.
- 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 equipment grounding impedance shall meet the requirements of the local electrical code.
- The equipment shall be permanently connected to a grounding wire within the building's electrical system. Check that the equipment is reliably grounded.
- Do not operate the equipment before connecting it to the equipment grounding connector.
- Do not damage the equipment 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 equipment, 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.

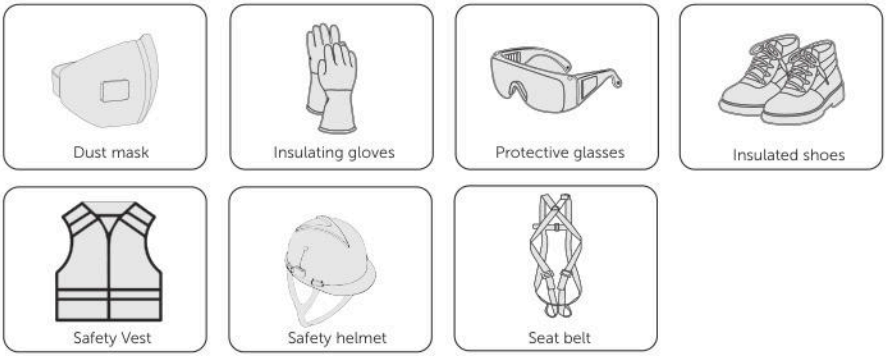
NOTICE!

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.

2 Preparation before Maintenance

2.1 Preparation of protective equipment



NOTICE!

- This section lists only protective equipment, refer to the appropriate chapter for specific tool information.

2.2 Parts Description

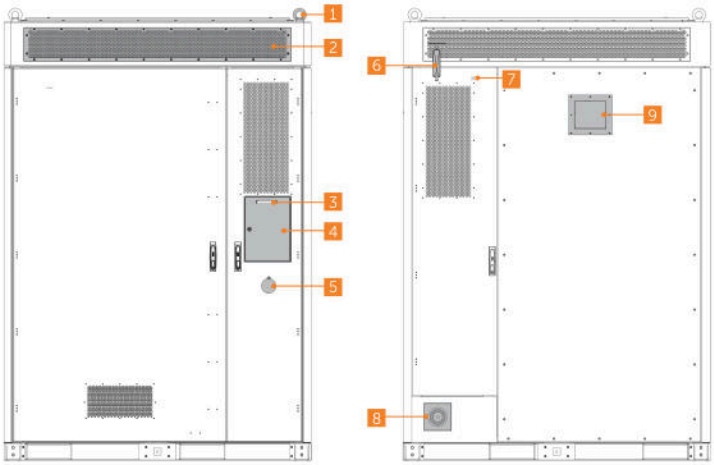


Figure 2-1 Parts description (in the closed state)

Table 2-1 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 processess 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	A reserved antenna port	To connect wireless meter.
8	Fire hose nozzle	To connect the water supply sources.
9	Expansion-proof valve	To exhaust the combustible gas out of the cabinet.

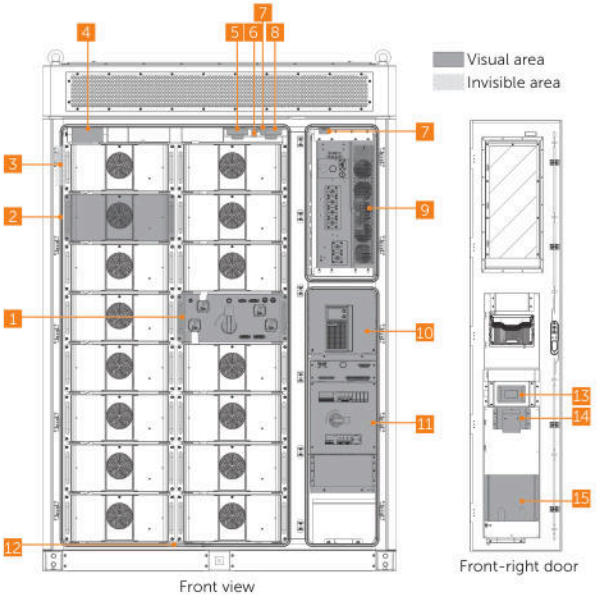


Figure 2-2 Parts description (in the opened state)

Table 2-2 Parts description

No.	Item	Description
1	High-voltage box	To collect current and voltage information on battery tower, ad 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	PCS	/
10*	Control area	Including IO module, EMS, UPS, etc.
11	Distribution box	To distribute AC power for the energy storage system.
12	Water sensor	To detect water level based on the principle of potential difference between the two electrodes.
13	Control panel of air conditioner	To monitor the air conditioner and show relevant parameter.
14	Audible and visible alarm	To alter you when the abnormal conditions occur, such as temperature, smoke.
15	File pocket	To put documents.

NOTICE!

- The mark "*" indicates that parts in the front view (Figure 2-4) cannot be fully seen.

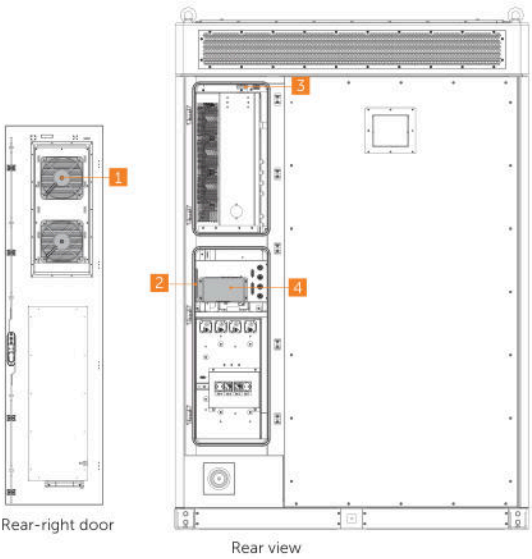


Figure 2-3 Parts description (in the opened state)

Table 2-3 Parts description

No.	Item	Description
1	Fan	To improve air circulation and dissipate heat when the temperature rises.
2	HUB	/
3	Door sensor	To alert you when the door is open.
4	EMS	A energy management system.

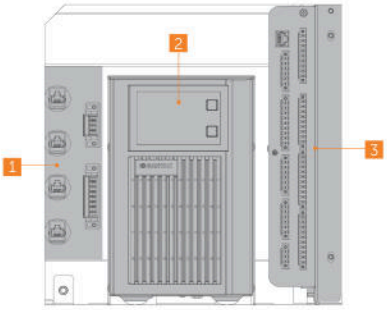


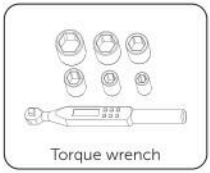
Figure 2-4 Parts description (control area)

Table 2-4 Parts description

No.	Item	Description
1	Ports	To achieve parallel connection.
2	UPS	To provide backup power to ensure that the device is in a normal operating condition.
3	IO module	To collect signal and control other modules.

3 Routine Maintenance

3.1 Preparation before maintenance


Torque wrench


Insulated ladder

3.2 Maintenance steps

Regular maintenance is required for the device. Please follow the instructions below to inspect and maintain the system. 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.

Step:1 Patrol the system round, checking the following items in turn:

Check Item	Description	Interval Time
System Appearance	• Check the outside of the cabinet for obvious deformation, rust or damage.	Every 6 months
Operation Status	• Check the system for abnormal noise while running.	Every 6 months
Antenna	• Check whether the antenna is rusted due to salt spray. If the communication is abnormal (the cloud platform is offline) and the rust is serious, you can try to troubleshoot by replacing the antenna.	Every 6 months
Environment	• Check the surrounding environment whether the humidity is at a normal level, whether the dust and air filter are damaged. It must be ensured that the air inlet ventilation condition is good. Otherwise, the battery pack will overheat and generate a fault.	Every 6 months

Step:2 View alarms on the cabinet screen, for details, see "4 Alarm Reference".

Step:3 Power off the system, refer to"3.3 Power Off" for detailed power off steps.

Step:4 Open the cabinet door and check the following items:

Check Item	Description	Interval Time
Environment	• Clean the inside of the cabinet of obvious foreign matter. • Check whether there is water leakage and water storage in the cabinet.	Every 6 months
Electrical connection	• Check that all cables are securely connected. If the connection is not secure, reconnect or reinforce the cable using the sleeve specified in the instructions. • Check the integrity of the cable to ensure that there are no scratches on the parts in contact with the metal surface. • Check whether the electrical insulation tape is in good condition and no peeling. • Inspect the terminals for oxidation. • Use a thermal imager to detect the temperature of the overcurrent connection part, and timely feedback and maintenance if there is any abnormality.	Check the equipment within one month after the first commissioning and every 6 months thereafter
Connection of terminals and components	• Check whether the screw is tight. If not tightened, Use a torque tool to secure the screw. • Check the screws and copper rods for discoloration. • Check whether the circuit terminal is in good condition and whether the temperature of screw is normal.	Check the equipment within one month after the first commissioning and every 6 months thereafter

Step:5 Power on the system. For details, refer to "3.4 Power On".

Step:6 Check the following items:

Check Item	Description	Interval Time
Operation Status	• Confirm that the system is running without alarm.	Every 6 months
Battery pack	• Check whether the battery appearance is deformed or damaged. • Check for abnormal noise during operation. • Check the battery pack fan for dust.	Every 6 months
PCS	• Check the appearance of the PCS for deformation or damage. • Check for abnormal noise during operation.	Every 6 months
Air conditioning dust net	• Check for abnormal noise, abnormal vibration and blade blockage. • Clean the dustproof net, refer to the instruction manual for specific cleaning steps.	Every 6 months (every 3 months where environmental conditions are poor)
Smoke detector, temperature sensor, CO detector	• Check the appearance for damage or deformation.	Every 6 months

Check Item	Description	Interval Time
Components (distribution box, UPS , EMS , IO module, etc.)	• Whether the appearance is damaged or deformed. • Check for abnormal noise during operation.	Every 6 months
Safety performance	• Check the shutdown signal and communication by simulating the shutdown operation. • Check the warning labels and other labels attached to the equipment for damage. If there is any damage, please replace it in time.	Every 6 months

3.3 Power Off

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, see following figure.

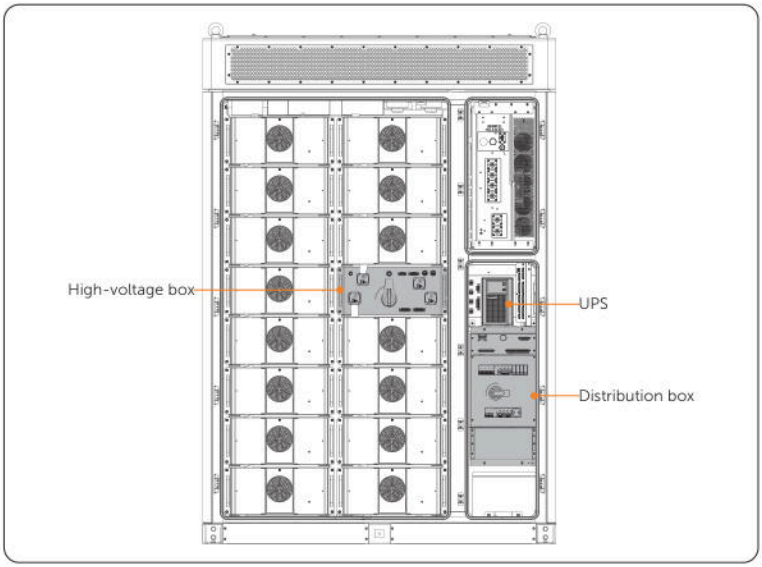


Figure 3-1 Position of modules

Normal Power Off

Step:1 Open the door.

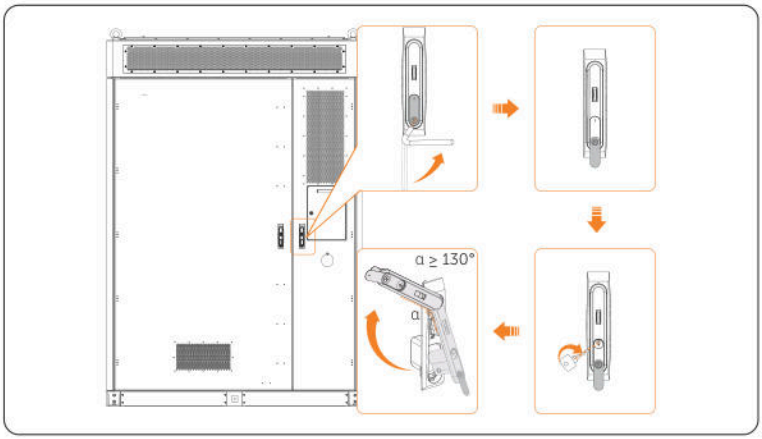


Figure 3-1 Opening the door

Step:2 Gently press the power button, and rotate the disconnector of the high-voltage box to "OFF".

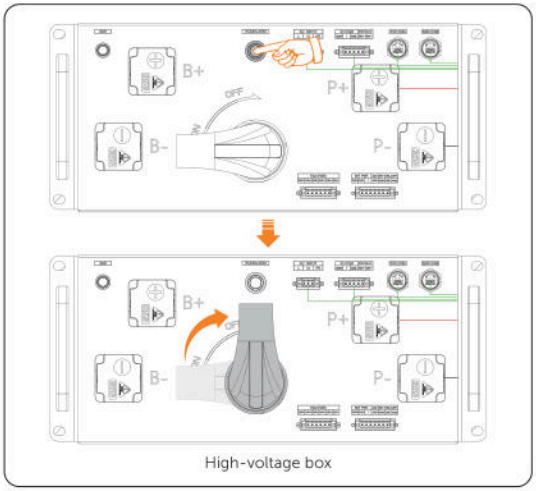
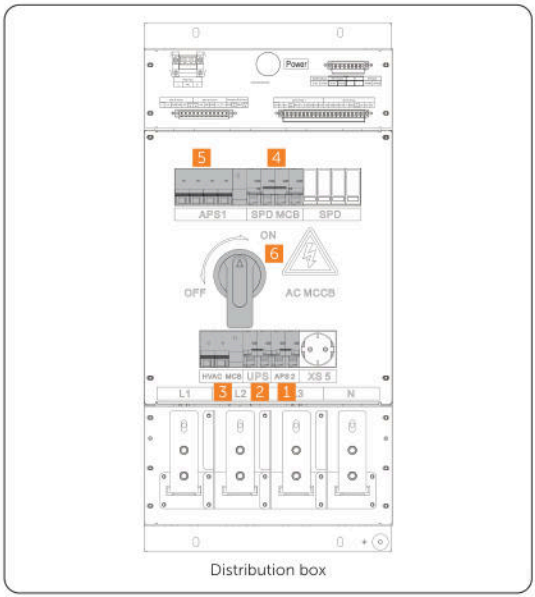


Figure 3-2 Shutting down the high-voltage box

Step:3 Shut down the distribution box.

1. Flip down the "APS2" breaker;
2. Flip down the "UPS" breaker;

3. Flip down the "HVAC MCB" breaker;
4. Flip down the "SPD MCB" breaker;
5. Flip down the "APS1" breaker";
6. Rotate the switch on the distribution box 90° clockwise to "OFF".



Distribution box

Figure 3-3 Shutting down sequence of distribution box

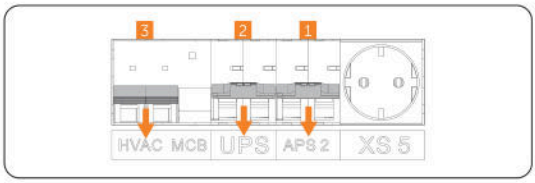


Figure 3-4 Flipping down breakers

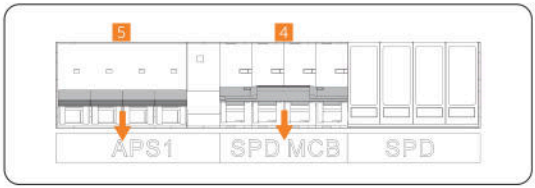


Figure 3-5 Flipping down breakers



Figure 3-6 Rotating switch

Step:1 Hold and press the "Power on/off" button to power off the UPS.

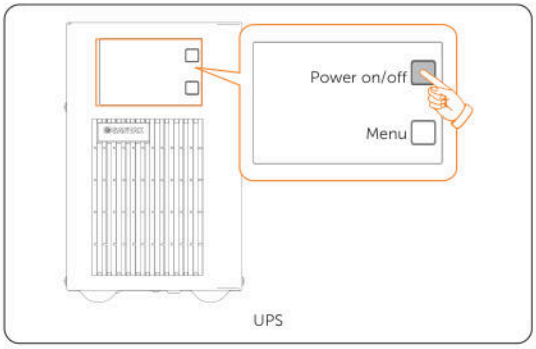


Figure 3-7 Holding and pressing button

⚠ 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 30 minutes and wear PPE before conducting maintenance.

3.4 Power On

Check before power on

Ensure that all cables connected to the EPS and distribution box (grid side) are wired and securely fastened. See Table 3-1 below for details.

Table 3-1 Checklist

No.	Item	Description
1	Equipment appearance	• Check the equipment is in good condition, with a clean, non-peeling paint, and rust-free surface. • Ensure that the labels on the equipment are clear and easy to read. If it is damaged, the label shall be replaced at once.
2	Cable appearance	• Check whether the outer layer of the cable is intact. Check whether the protective tube is in good condition.
3	Cable connection	• 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.
4	Wiring	• Make sure that the wiring steps comply with the principle of strong and weak current separation. • Make sure wiring is neat. • Leave extra length of cable for adjustment. • Keep the cables in the cabinet tidy. • 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 V, L2+L3=380 V, L1+L3=380 V.**
5	Copper bars in the battery pack	• Check to make sure the copper bars are not deformed.
6	Button/Switch	• Check the distribution box's switch is "OFF". • Check the battery packs' switches are "OFF".

Power on procedure

NOTICE!

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

Step:1 Start the distribution box.

1. Rotate the switch on the distribution box 90° clockwise to "ON";
2. Flip up the "APS1" breaker";
3. Flip up the "SPD MCB" breaker;
4. Flip up the "HVAC MCB" breaker;
5. Flip up the "UPS" breaker;
6. Flip up the "APS2" breaker.

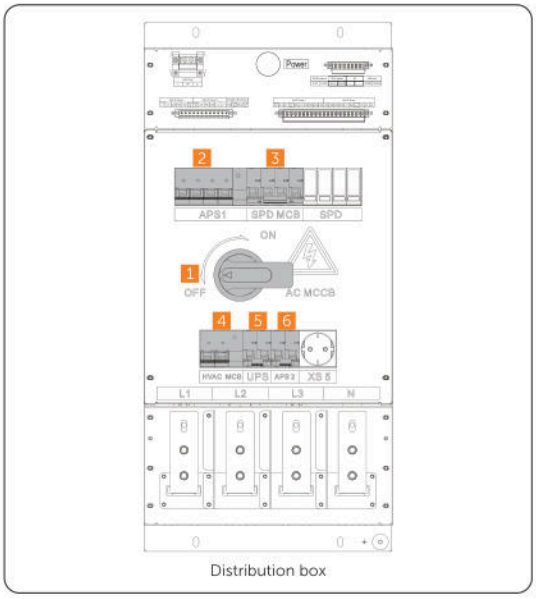


Figure 3-8 Starting sequence of distribution box

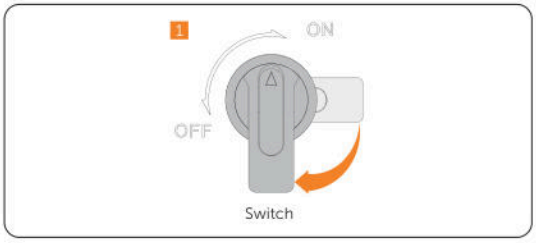


Figure 3-9 Rotating switch

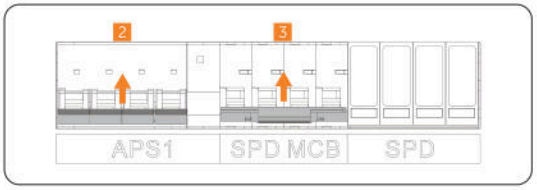


Figure 3-10 Flipping up breakers

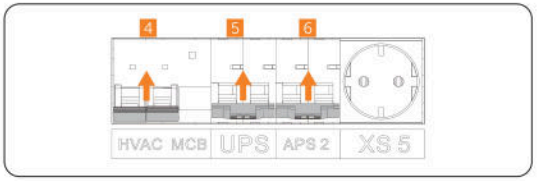


Figure 3-11 Flipping up breakers

Step:1 The startup sound on boot will be heard when holding and pressing the "Power on/off" button to start the UPS.

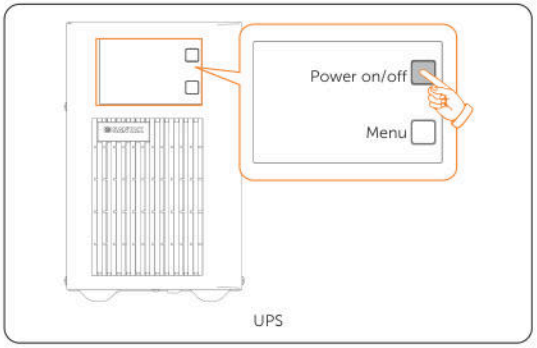


Figure 3-12 Holding and pressing button

Step:2 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.

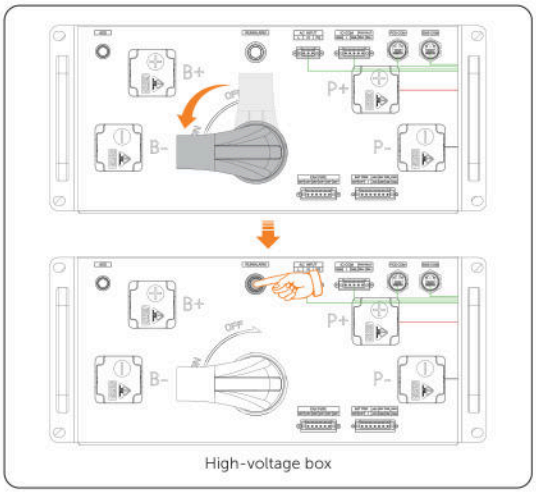


Figure 3-13 Starting the high-voltage box

Step:3 Close the door after the equipment has been started.

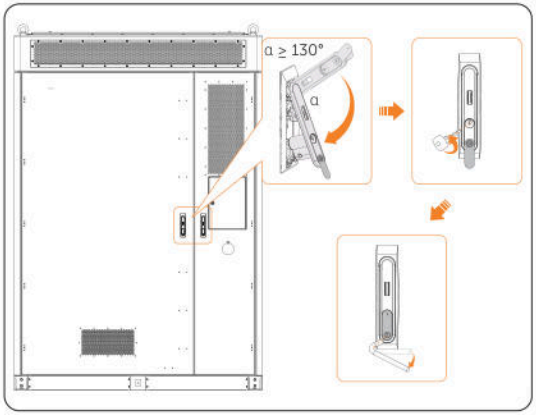


Figure 3-14 Closing the door

Check after power on

Step:1 Check whether the system has any abnormal noise.

Step:2 Check whether the LED indicator reports an error and whether the LCD screen displays an error information.

Step:3 Check the running status of the system through the cabinet screen.

4 Alarm Reference

System alarms can be viewed through the following channels: cabinet screen, ESM1000 webpage, SolaxCloud APP, please handle alarms according to the suggestions. If you are unable to view the alarm information, please check the *TRENE-P100B215 Troubleshooting Manual*.

4.1 Cabinet Screen

Step:1 Gently and correctly guide the key into the keyhole, and then turn it clockwise to unlock the screen door.

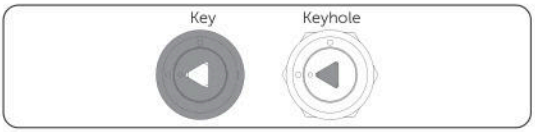


Figure 4-1 Correct position

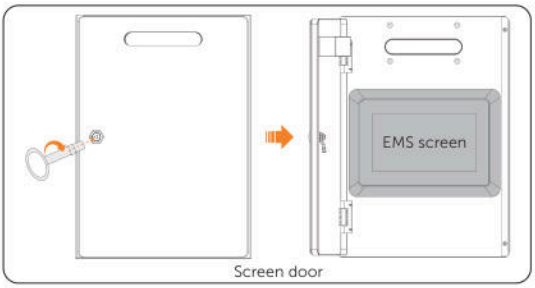


Figure 4-2 Unlocking screen door

Step:2 On the login screen, enter your user name and password, and then click Login.

- Username: user
- Password: 123456

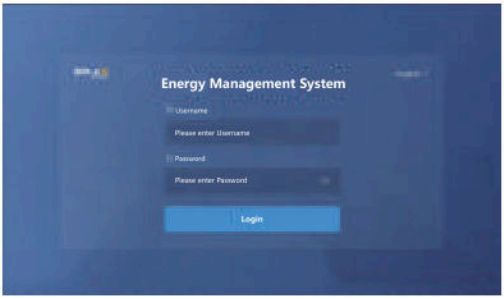


Figure 4-3 Local login

Step:3 After logging in, click Alarm to enter the alarm information page.

The alarm information page includes the device name, device type, error code, alarm name, alarm level, alarm occurrence time, alarm end time, and operation. Click Details under the operation list to view the alarm details, fault causes and solutions.

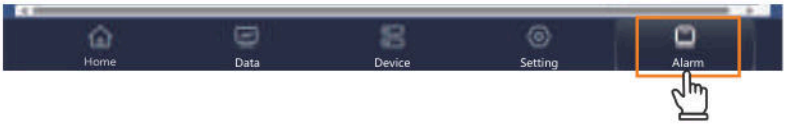


Figure 4-4 Alarm information interface

4.2 EMS1000 Web Page

HINT!

- Screenshot takes V002.05 version as an example, the actual page details may be different.
- IE browser is not supported currently, and we recommend logging in to the webpage through Chrome.

Step:1 Connect the computer to NET2 of EMS1000 with a network cable, or connect the computer to EMS1000 hotspot named WiFi_SN, and then go to the defined IP address based on the connection mode.

» For wired connection: 192.168.11.10

» For hotspot connection: 192.168.10.10

If the Wi-Fi signal is weak, open the cabinet door and try again.

Step:2 On the login page, select the language, enter the username and password, and then click **Login**.

- Username: user
- Password: 123456



Figure 4-5 Login page

Step:3 After logging in, click Alarm Information to enter the alarm information page.

The alarm information page includes the device type, device SN, alarm name, error code, alarm level, alarm occurrence time, alarm end time, alarm status and operation. Click Details to view the possible causes of the alarm and suggestions for the alarm.

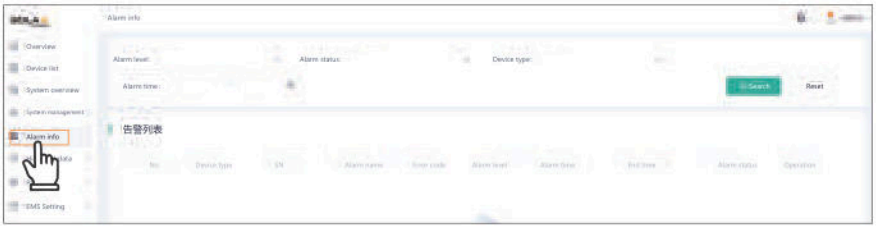


Figure 4-6 Alarm information interface

4.3 SolaXCloud APP

Step: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 button right of the login page of www.solaxcloud.com. In addition, you can search with the key word SolaxCloud in Apple Store or app store to download it.

Figure 4-7 QR code

Step:2 Please watch the video or read the document on the SolaXCloud App for relevant operation.

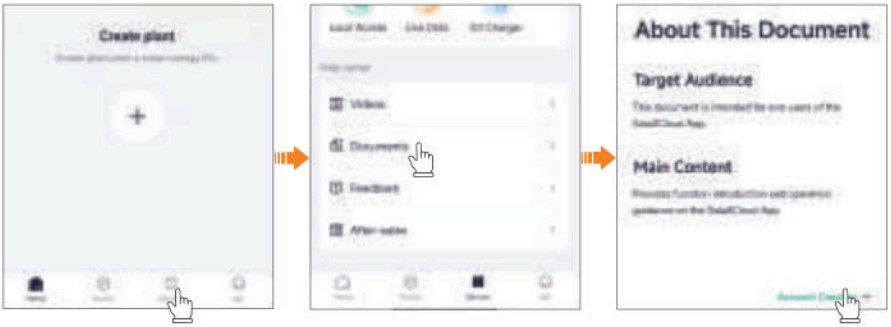


Figure 4-8 App guide on SolaXCloud

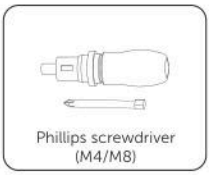
5 Replacement of Battery pack

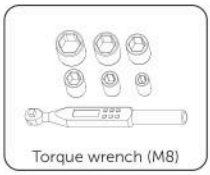
Fault location

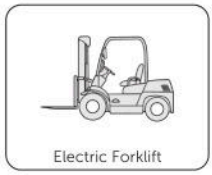
1. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.
2. Refer to the alarm handling suggestions in the alarm details.

Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:

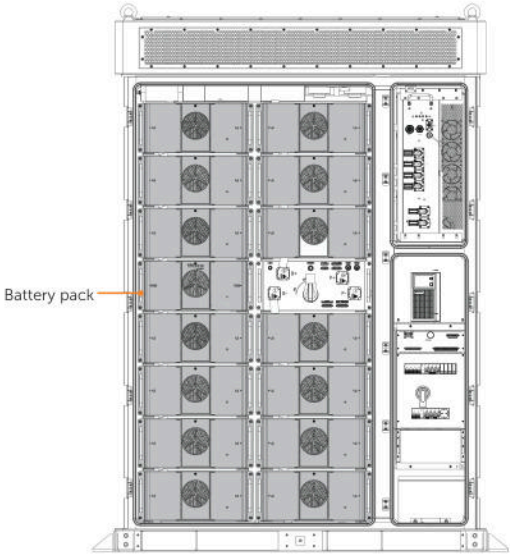

Phillips screwdriver (M4/M8)


Torque wrench (M8)


Electric Forklift


Insulated ladder

- Position of the battery pack in cabinet:



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!

- Before replacing the battery pack, ensure that the system is powered off. Otherwise, electric shocks may occur.
- After the system powers off, there will still be the remaining electricity and heat which may cause electric shocks and body burns. Please wear personal protective equipment (PPE) and begin servicing the system 15 minutes after power off.
- Only qualified person can perform the maintenance for the device.

WARNING!

- 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.
- Handle gently when moving the battery pack to prevent bumping or damage.
- 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 area, residential areas, and other population centers (e.g., public transport, elevators) when transporting the faulty battery pack.

WARNING!

- Before unpacking the battery, check whether the package is intact, batteries with damaged packaging should not be used, please notify the transporter and the manufacturer immediately if it is damaged.
- Before installing the battery pack, inspect the battery pack shell for deformation or damage.
- After removing the package from the battery pack, the installation must be completed within 24 hours, if it cannot be installed in time, the battery needs to be repacked and placed in an indoor, dry, non-corrosive gas environment; after completing the installation of the energy storage system, it must be powered on within 24 hours; the unpacking of the batteries to the powering on of the energy storage system needs to be completed within 72 hours, and the power off time can not be more than 24 hours for the later regular routine maintenance.

NOTICE!

- The expenses for dispose of the wasted or damaged battery packs incurred shall be borne by the user.
- The replaced devices should be sent back to the local Solax warehouse.

NOTICE!

- The SOC value of the cabinet needs to be charged/discharged to 40%~50% before the new battery pack is installed and powered up.

5.1 Replacement of Battery Pack

Procedure

Step:1 As an example, in the picture below. Press "PUSH" on the battery pack to open the cover of the battery to be replaced and the two neighbouring batteries above and below.

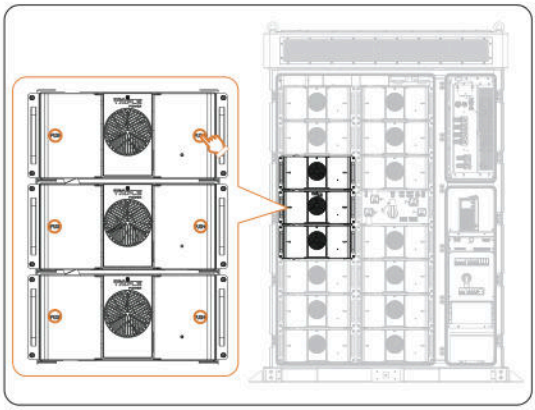


Figure 5-1 Open the battery pack cover

Step:2 Remove copper bars and cables

1. Pinch both sides of the insulating cover and remove the cover bars;
2. Unscrew the screw;
3. Remove the copper bar and cover the insulating cover;
4. Remove the cable from the battery pack.

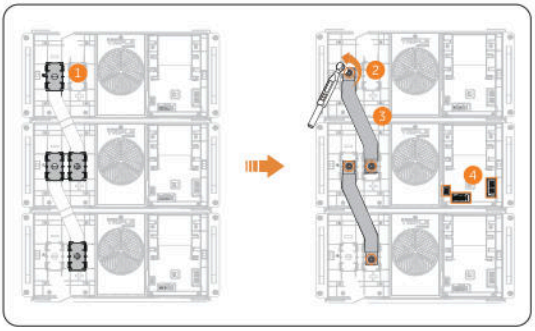


Figure 5-2 Remove the copper bar and cable

DANGER!

- After removing the copper bar, the insulating cover must be installed back on the battery, otherwise it may cause electric shock.

Step:1 Remove the screws that secure the battery and remove the battery that needs to be repaired or replaced.

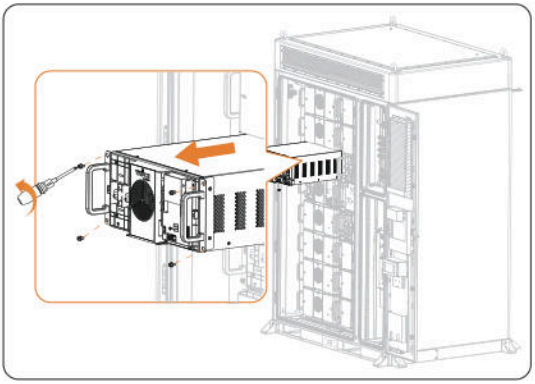


Figure 5-3 Remove the battery

Step:2 Pull the battery pack to the forklift and transport it with the forklift .

Step:3 Use a forklift to transport the new battery pack to the need to be replaced location, and then manually push the battery pack into the cabinet. Fix the battery pack with M8 screws.

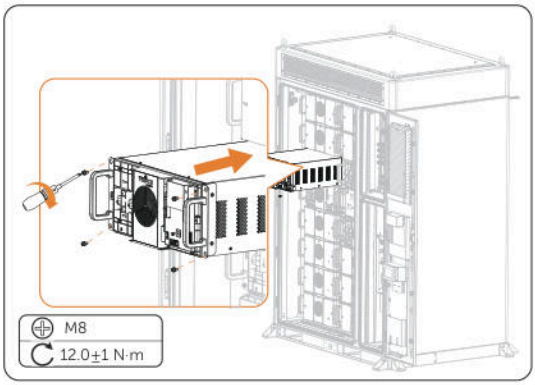


Figure 5-4 Installing the battery pack

Step:4 Install copper bar and cable

1. Install the copper bar and lock it;
2. Install the insulating cover;
3. Connect the cables.

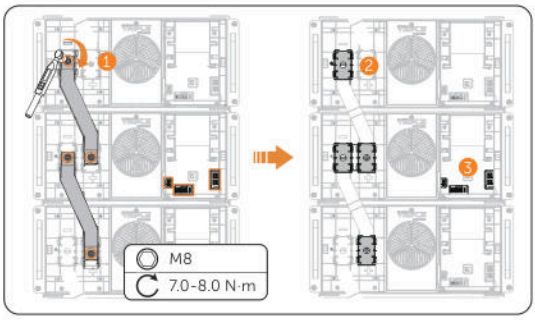


Figure 5-5 Install copper bar and cable

Checking after replacement

Step:1 Power up the system. For details,refer to "3.4 Power On".

Step:2 Press and hold the "ADD" button of the High-voltage Box for 10 seconds to assign the address.

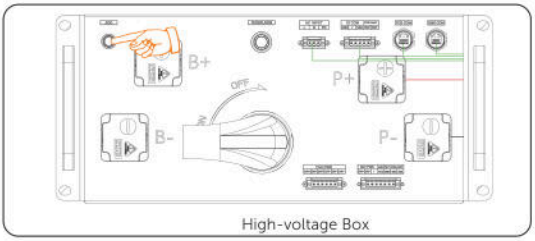


Figure 5-6 Assign the address

Step:3 Check if function Restore

No.	Check Items	Description
1	Alarm message	The alarm status is displayed as resolved and no new alarms are generated
2	Function	The communication and charging/discharging functions are normal.
3	Operating parameters	• Number of battery packs: 15 • Battery pack voltage range: 43.2-58V • Single cell voltage range: 2.5-3.65V • Battery pack temperature range: -20°C to +53°C • Charging cutoff SOC for the ESR: Set it to 90% first, and then adjust it to 100% after the system balancing is complete.
4	Appearance	• There is no obvious damage to the appearance. • There is no obvious paint peeling or rust. • The screws are secured. • The fans rotate properly without abnormal sound. • The front panel vent is clean and free from blockage.

5.2 Replacement of Battery Pack Fan

Procedure

Step:1 Press to open the cover of the battery pack.

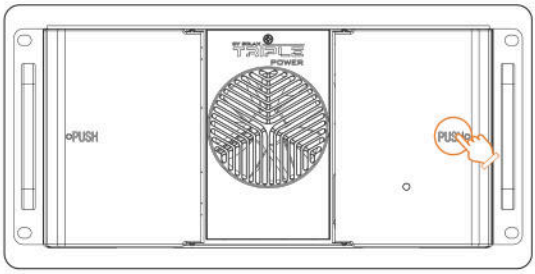


Figure 5-7 Opening the battery panel

Step:2 Remove the cover by pressing down.

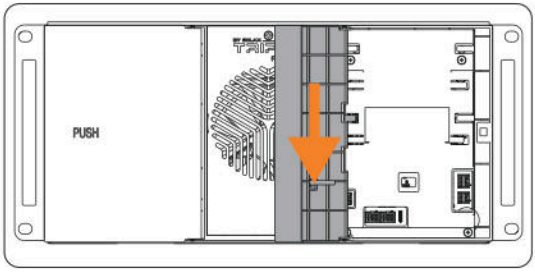


Figure 5-8 Removing the cover

Step:3 Disconnect the cable.

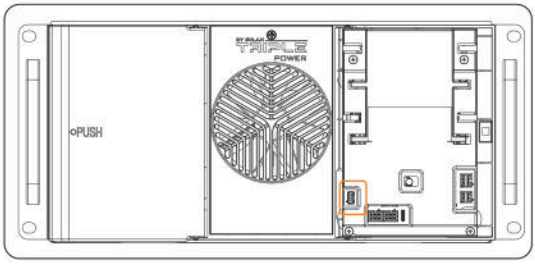


Figure 5-9 Removing the fan line

Step:4 Unscrew the screw on the cover, remove the cover.

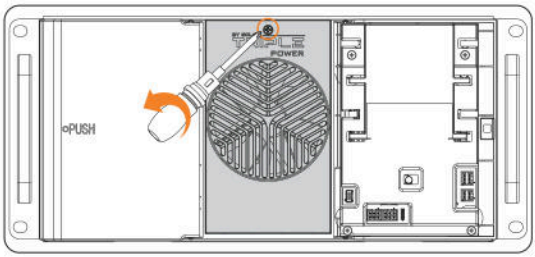


Figure 5-10 Removing fan panel

Step:5 Unscrew the screws and remove the fan.

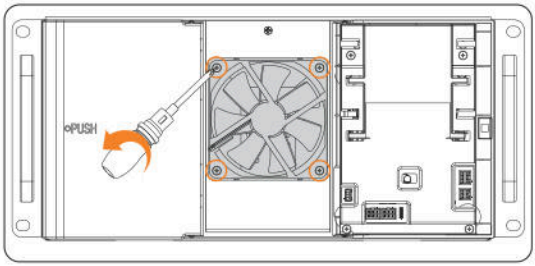


Figure 5-11 Removing the fan to be replaced

Step:6 Install a new fan and connect the cable.

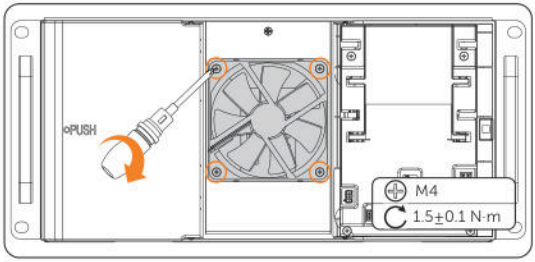


Figure 5-12 Installing a new fan

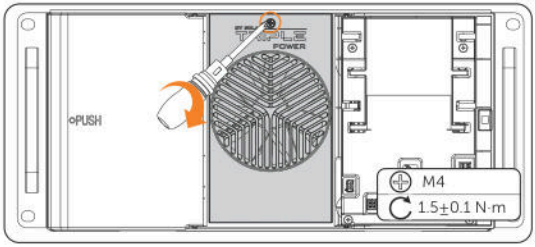


Figure 5-13 Installing the cover

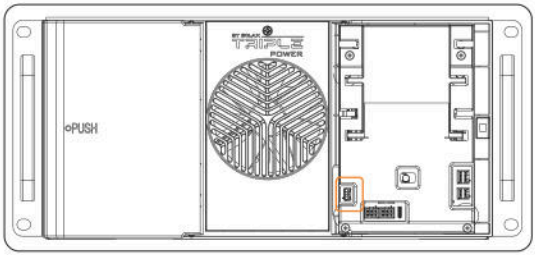


Figure 5-14 Connecting the cable

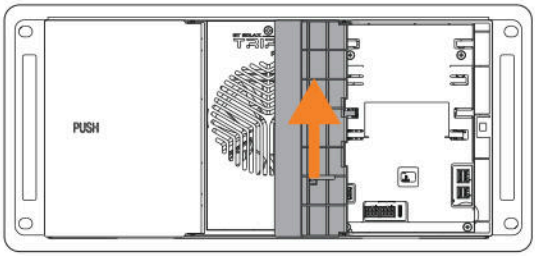


Figure 5-15 Installing the cover

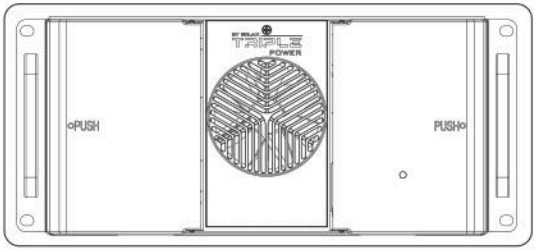


Figure 5-16 Closing the cover

Checking after replacement

For details of checking procedure after replacement, please refer to "20 Checking after replacement".

5.3 Replacement of BMU

Procedure

Step:1 Press to open the cover of the battery pack.

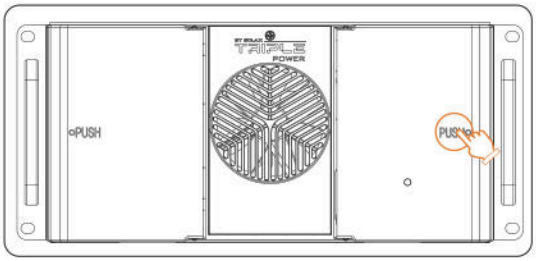


Figure 5-17 Opening the battery panel

Step:2 Remove the cover by pressing down.

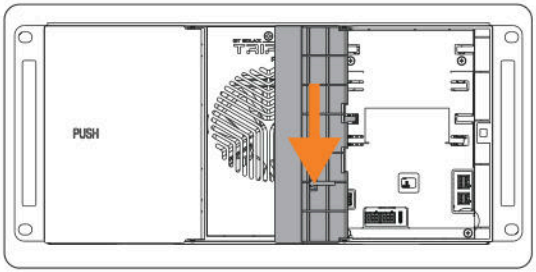


Figure 5-18 Removing the cover

Step:3 Remove the cable of the BMU.

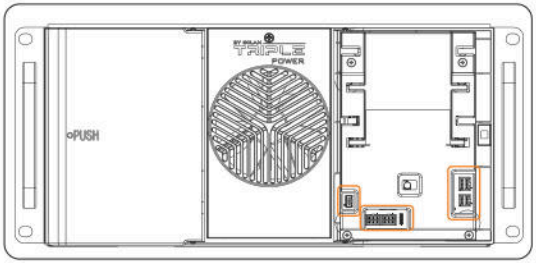


Figure 5-19 Disconnecting the cable

Step:4 Remove the PCBA cover.

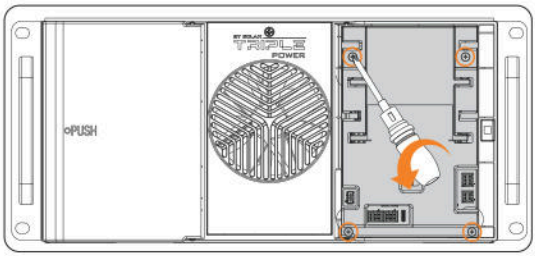


Figure 5-20 Removing the PCBA cover

Step:5 Removing the cables of the BMU.

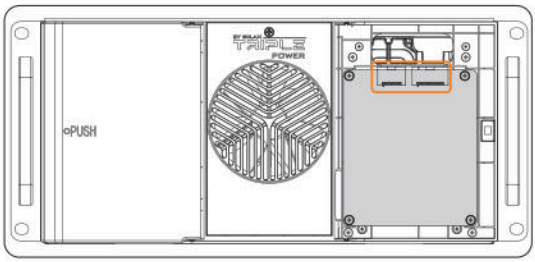


Figure 5-21 Removing BMU cable

Step:6 Remove the BMU.

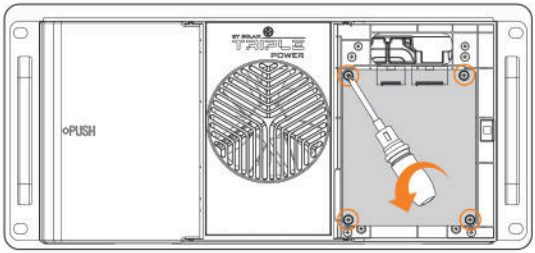


Figure 5-22 Removing the BMU

Step:7 Install the new BMU.

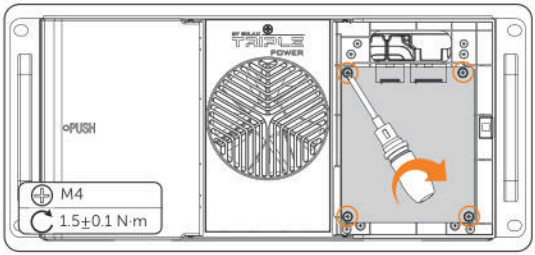


Figure 5-23 Installing a new BMU

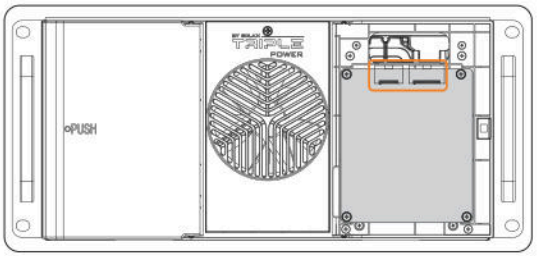


Figure 5-24 Connecting the cables of the BMU

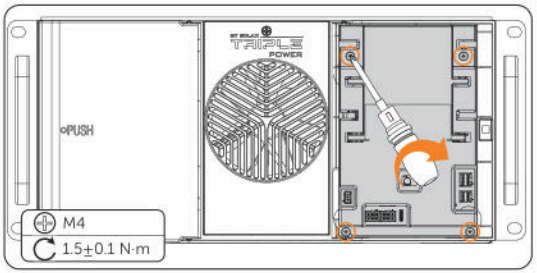


Figure 5-25 Installing the PCBA Panel

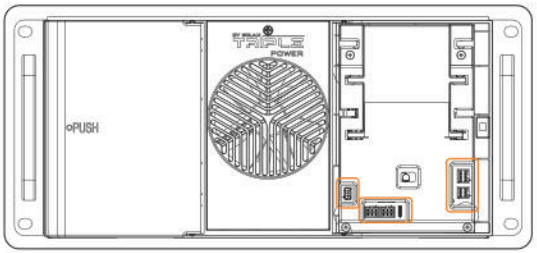


Figure 5-26 Connecting the cables

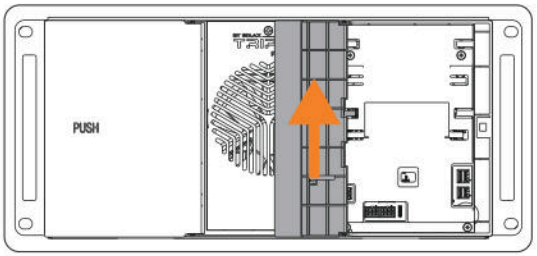


Figure 5-27 Installing the cover

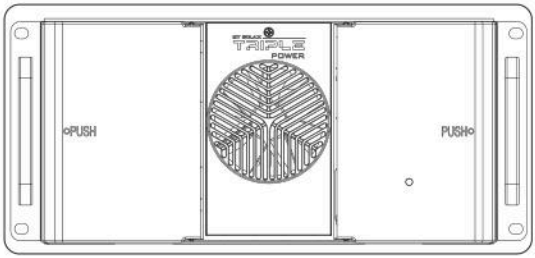


Figure 5-28 Closing the battery cover

Checking after replacement

Step:1 Power on the system. For details, refer to "3.4 Power On".

Step:2 Press and hold the "ADD" button of the High-voltage Box for 10 seconds to assign the address.

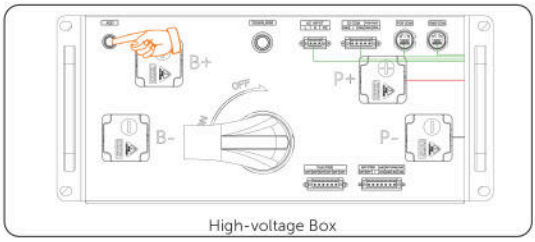


Figure 5-29 Assign the address

Step:3 Check whether the indicator on the battery pack front panel is flashing green light and check whether the battery pack communication is normal via EMS1000 webpage or SolaX Cloud App.

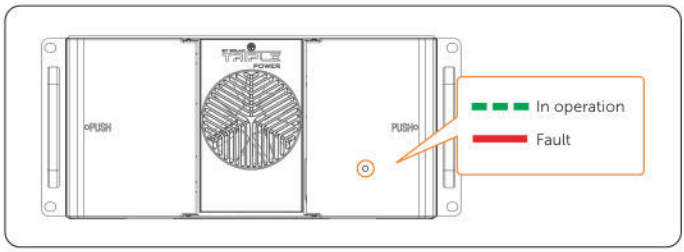


Figure 5-30 Battery indicator light

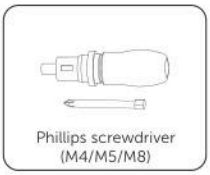
6 Replacement of High-voltage Box

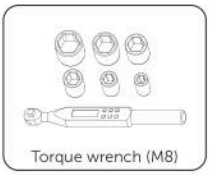
Fault location

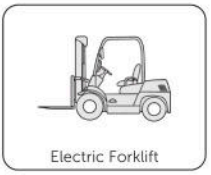
1. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.
2. Refer to the alarm handling suggestions in the alarm details.

Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:

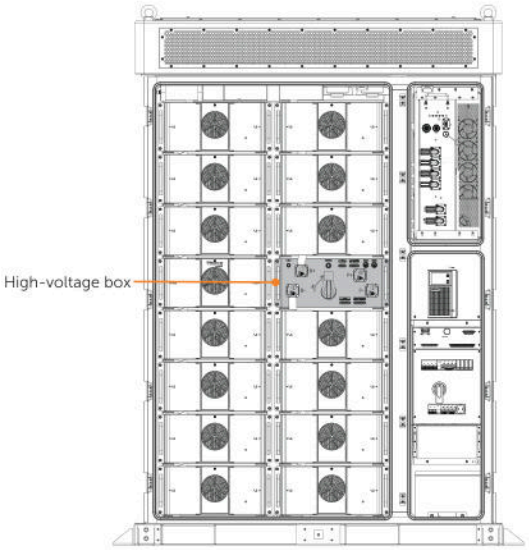

Phillips screwdriver (M4/M5/M8)


Torque wrench (M8)


Electric Forklift


Insulated ladder

- Position of the High-voltage Box in cabinet:



WARNING!

- Before replacing the high-voltage box, make sure that the system power is turned off. Otherwise, there is a risk of electric shock.
- After the system is powered off, there will still be residual power and heat, which may cause electric shock and body burns. Please wear personal protective equipment (PPE) and start maintaining the system at least 30 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

6.1 Replacement of High-voltage Box

Procedure

Step:1 Open the covers of the upper and lower battery packs in the high voltage box.

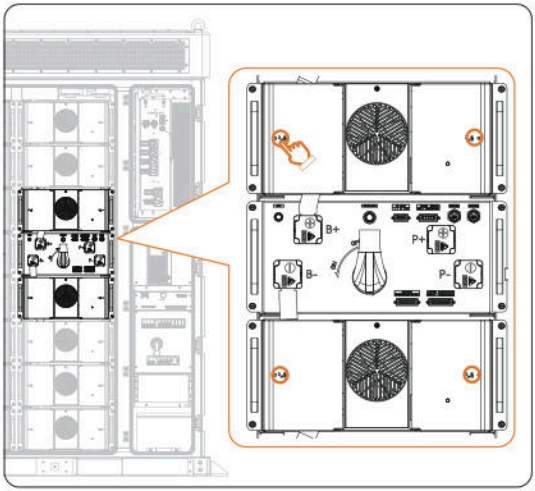


Figure 6-1 Opening the battery pack cover

Step:2 Remove copper bar and cable

1. Pinch both sides of the insulating cover and remove the insulating cover;
2. Unscrew the screws;
3. Remove the copper bar and cover the insulating cover;
4. Unplug the cable from the circled area.

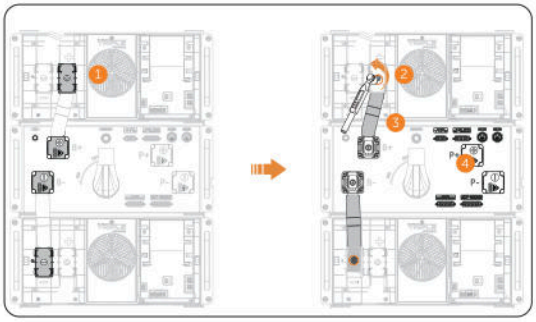


Figure 6-2 Removing copper bars and cables

Step:1 Remove the screws and take out the High-voltage Box.

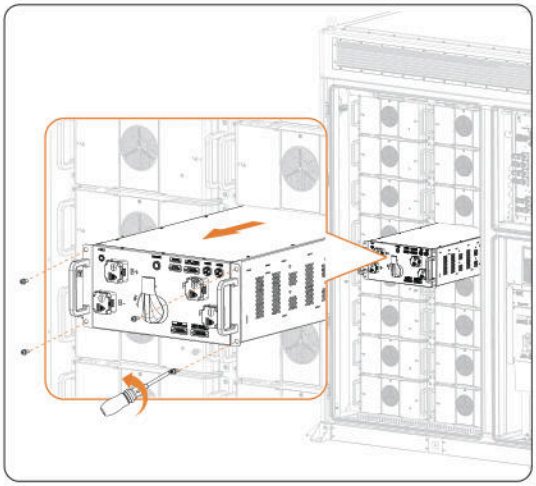


Figure 6-3 Taking out the High-voltage Box

Step:2 Pull the high-voltage box to the forklift and transport it with the forklift.

Step:3 Use a forklift to transport the new high-voltage box to the designated location, and then manually push the high-voltage box into the cabinet. Fix the high-voltage box with M8 screws.

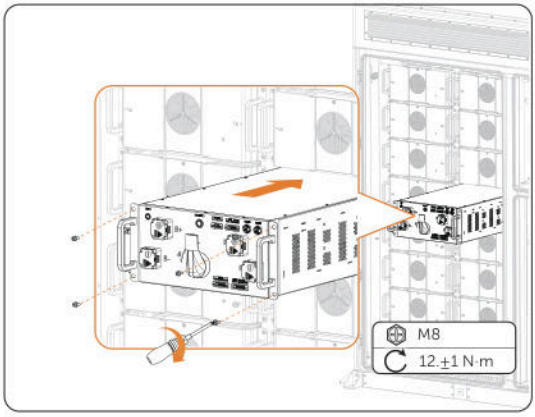


Figure 6-4 Installing a new High-voltage Box

Step:4 Install copper bar and cable

1. Install the copper bar;
2. Tighten the screw (The connection torque between the battery pack pole and the copper bar is 12±1 N · m, and the torque between the high-voltage box pole and the copper bar is 7.0-8.0 N · m);
3. Install the insulating cover;
4. Connect the cable on the high-voltage box.

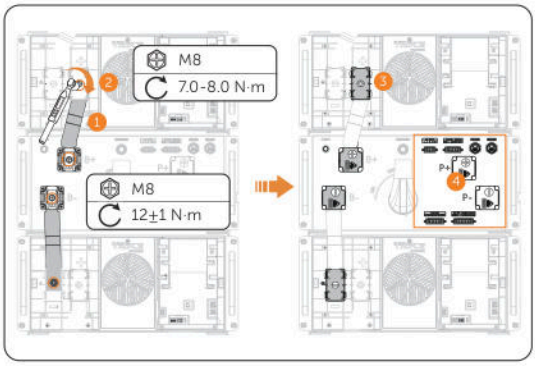


Figure 6-5 Installation of copper bars and wiring

Checking after replacement

Step:1 Power on the system. For details, refer to "3.4 Power On".

Step:2 Press and hold the "ADD" button of the High-voltage Box for 10 seconds to assign the address.

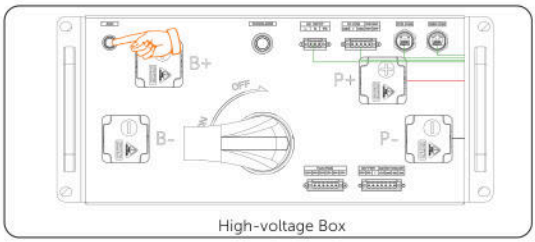


Figure 6-6 Assign the address

Step:3 For details of checking procedure after replacement, please refer to "20 Checking after replacement".

6.2 Replacement of HVU and SBMU

Procedure

Step:1 Remove the High-voltage Box from the cabinet. For details, refer to "6.1 Replacement of High-voltage Box".

Step:2 Unscrew the screws of the upper cover of the High-voltage Box and remove the upper cover.

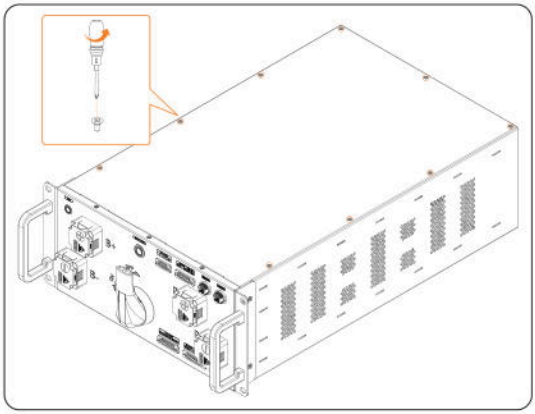


Figure 6-7 Opening the upper cover

Step:3 Unplug the cables of HVU or SBMU. Unscrew the screws.

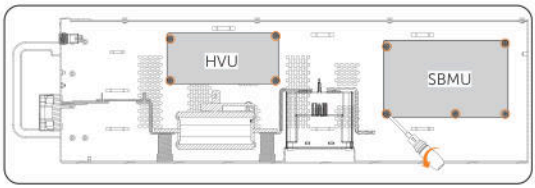


Figure 6-8 Removing the HVU or SBMU (right view)

Step:4 Install the new HVU or SBMU and fix it with screws. Insert the cable according to the line mark.

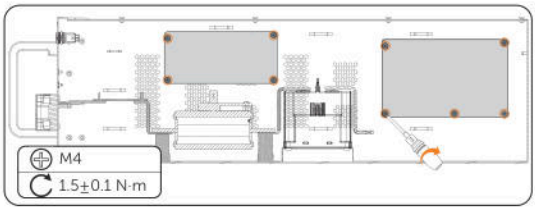


Figure 6-9 Installing (right side view)

Step:5 Install the upper cover of the High-voltage Box and tighten it with screws.

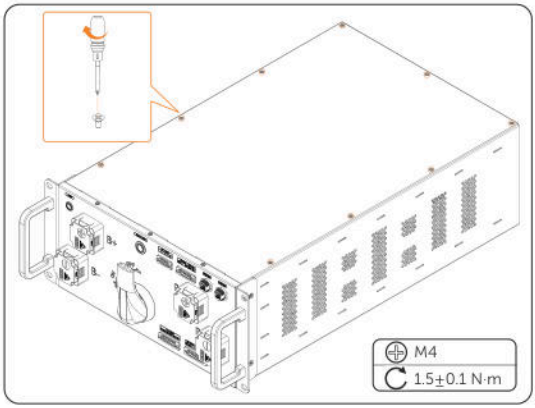


Figure 6-10 Installing upper cover

Step:6 Install the High-voltage Box back into the cabinet as "6.1 Replacement of High-voltage Box".

Checking after replacement

Step:1 Power on the system. For details, refer to "3.4 Power On".

Step:2 Press and hold the "ADD" button of the High-voltage Box for 10 seconds to assign

the address.

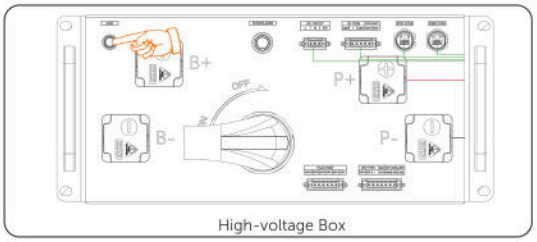


Figure 6-11 Assign the address

Step:3 Reference "20 Checking after replacement" .

6.3 Replacement of High Voltage Box Fuse

Procedure

Step:1 Remove the High-voltage Box from the cabinet. For details, refer to "6.1 Replacement of High-voltage Box".

Step:2 Unscrew the screws of the upper cover of the high-voltage box and remove the upper cover of the high-voltage box.

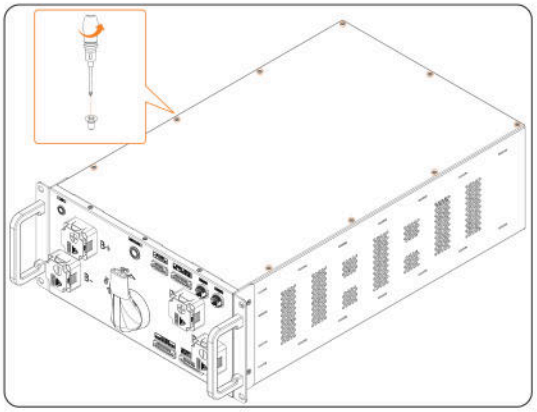


Figure 6-12 Removing upper cover

Step:3 Use a multimeter to measure the fuse ON-OFF status (ON for normal, OFF for abnormal).

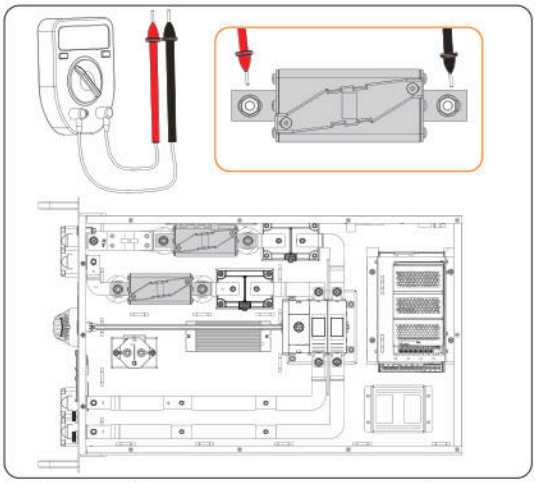


Figure 6-13 Measuring the on-off state of the fuse

Step:4 Remove the cables of the fuse. Loosen the M8 nuts from the fuses and remove the fuses.

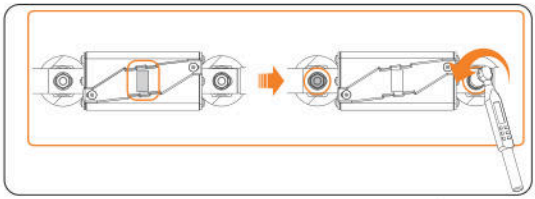


Figure 6-14 Removing fuse to be replaced (top view)

Step:5 Install new fuses and secure with nuts. Connect the cables of the fuse.

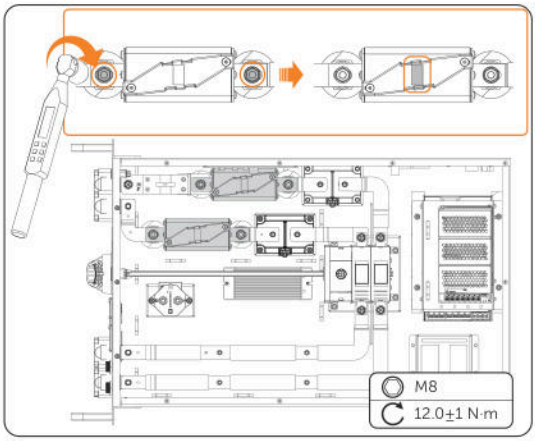


Figure 6-15 Installing fuse (top view)

Step:6 Use a multimeter to measure the replaced fuse ON-OFF status (ON for normal, OFF for abnormal).

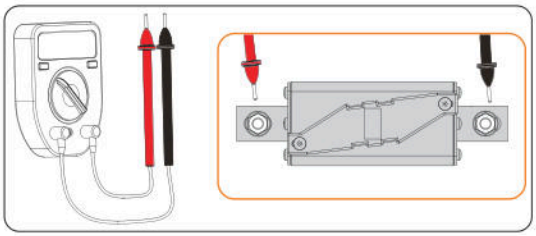


Figure 6-16 Measuring the on-off state

Step:7 Install the top cover of the high-voltage and secure with screws.

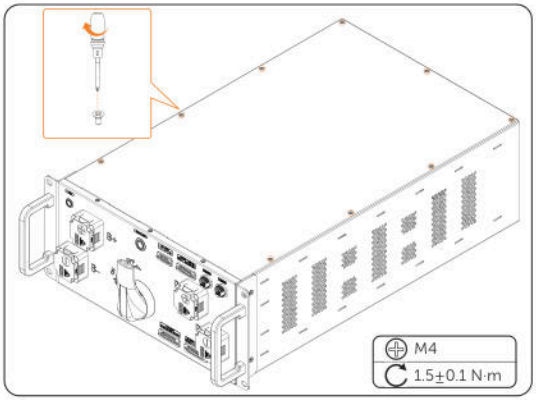


Figure 6-17 Installing upper cover

Step:8 Install the High-voltage Box back into the cabinet as "6.1 Replacement of High-voltage Box".

Checking after replacement

Step:1 Power on the system. For details, refer to "3.4 Power On".

Step:2 Press and hold the "ADD" button of the High-voltage Box for 10 seconds to assign the address.

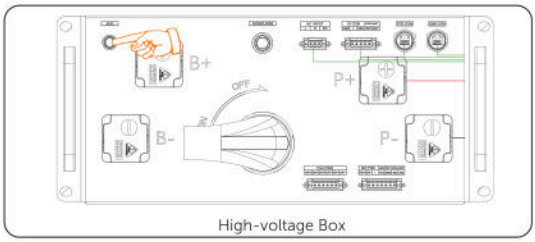


Figure 6-18 Assign the address

Step:3 For details of checking procedure after replacement, please refer to "20 Checking after replacement".

6.4 Replacement of High-voltage Box Contactor

Procedure

Step:1 Remove the High-voltage Box from the cabinet. For details, refer to "6.1 Replacement of High-voltage Box"

Step:2 Unscrew the screws and remove the upper cover

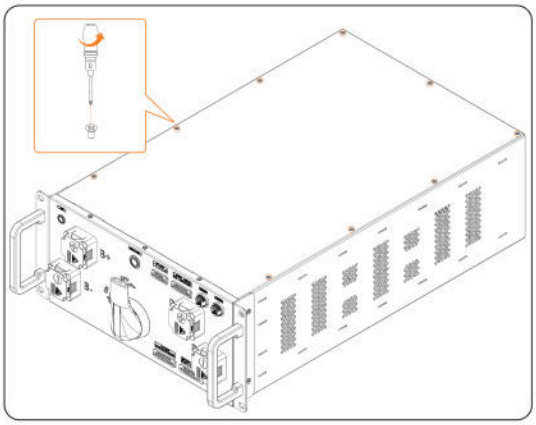


Figure 6-19 Removing upper cover

Step:3 Use a multimeter to measure the ON-OFF status of the contactor (ON for abnormal, OFF for normal).

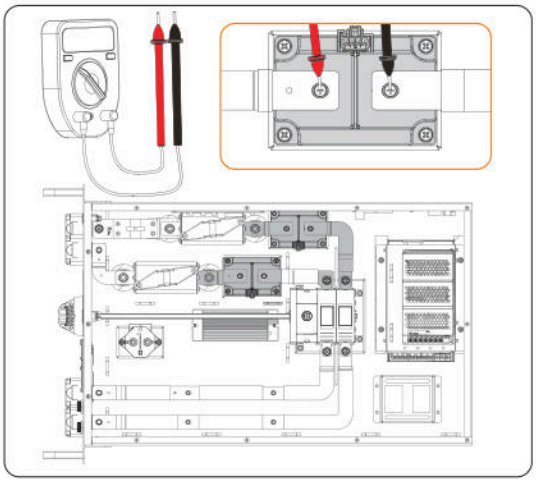


Figure 6-20 Measuring contactor status

Step:4 Remove the cable from the contactor. Unscrew the copper bar on the contactor, remove the copper bar and remove the contactor.

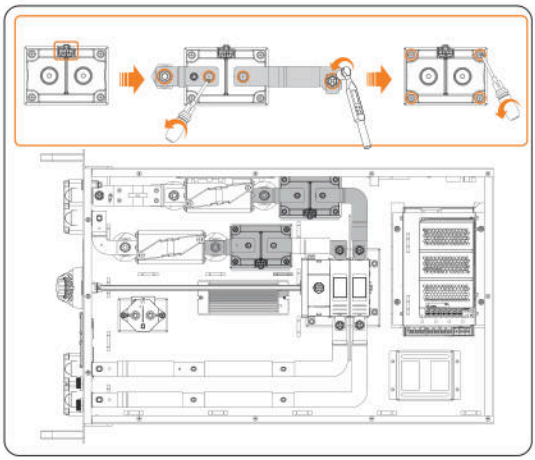


Figure 6-21 Removing contactor (top view)

Step:5 Install a new contactor and secure with screws. Install the copper rod and connect the cable .

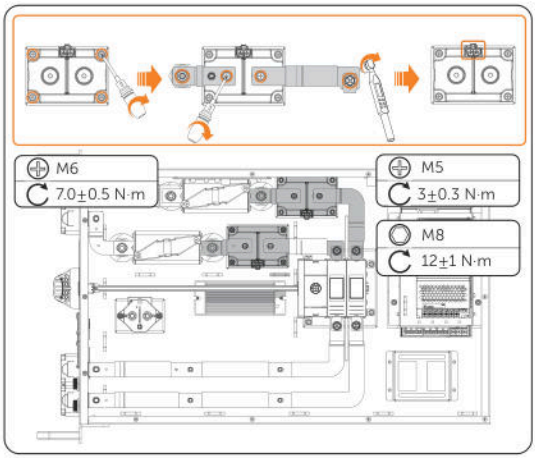


Figure 6-22 Installing contactor (top view)

Step:6 Use a multimeter to measure the ON-OFF status of the replaced contactor (ON for abnormal, OFF for normal).

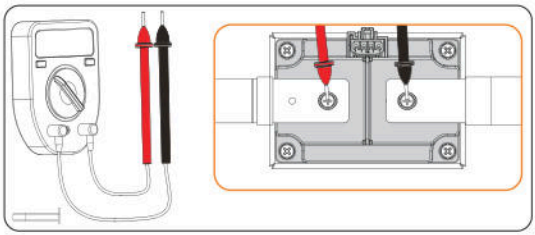


Figure 6-23 Measure contactor on-off

Step:7 Install the high-voltage power supply upper cover and fix it with screws.

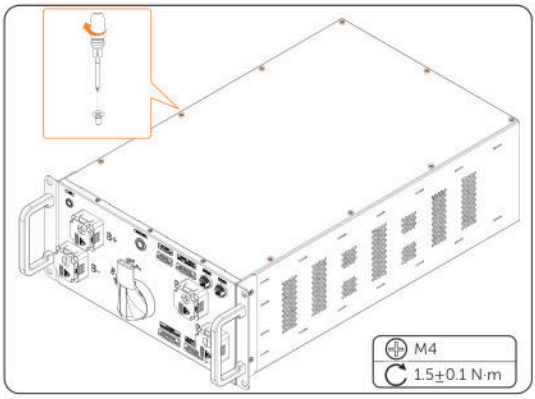


Figure 6-24 Installing upper cover

Step:8 Install the High-voltage Box back into the cabinet as "6.1 Replacement of High-voltage Box".

Checking after replacement

Step:1 Power on the system. For details, refer to "3.4 Power On".

Step:2 Press and hold the "ADD" button of the High-voltage Box for 10 seconds to assign the address.

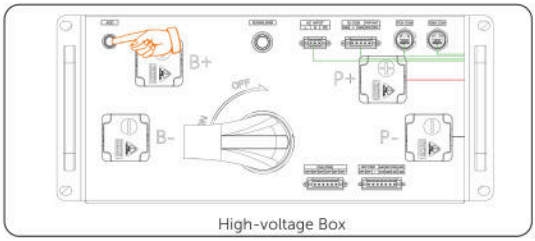


Figure 6-25 Assign the address

Step:3 Reference "20 Checking after replacement".

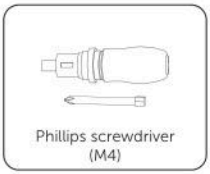
7 Replacement of EMS

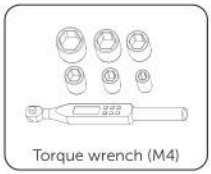
Fault location

1. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.
2. Refer to the alarm handling suggestions in the alarm details.

Preparation before replacement

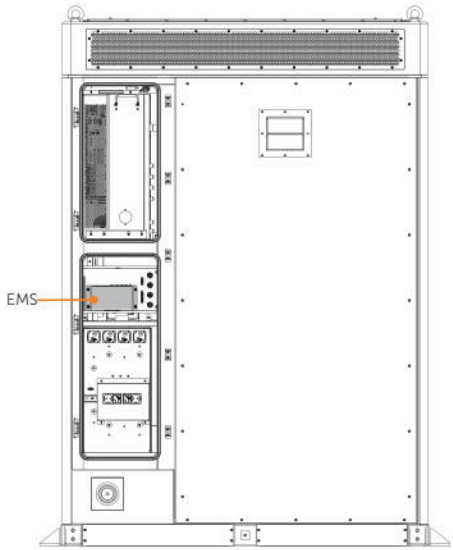
- Contact SolaX and order replacement parts.
- Tools:


Phillips screwdriver (M4)


Torque wrench (M4)


Insulated ladder

- Position of the EMS in cabinet:



WARNING!

- Before replacing the EMS, make sure the system is powered off. Otherwise, there is a risk of electric shock.
- After the system is powered off, there will still be residual power and heat, which may cause electric shock and body burns. Please wear personal protective equipment (PPE) and start maintaining the system at least 30 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

Procedure

Step:1 Remove cables from EMS.

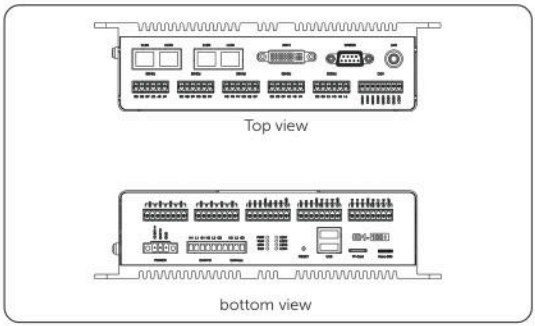


Figure 7-1 EMS Wiring Area

Step:2 Remove the cables on the front of the sheet metal and on the HUB.

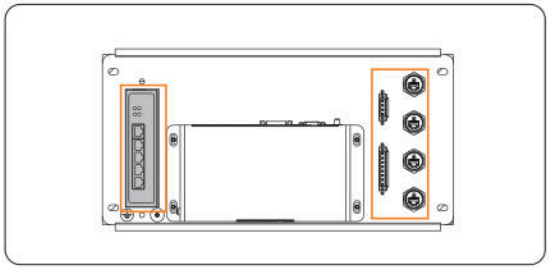


Figure 7-2 Sheet metal (front view)

Step:3 Unscrew the screws on the metal plate, remove the cables on the back of the metal plate, and then remove the EMS and the metal plate together.

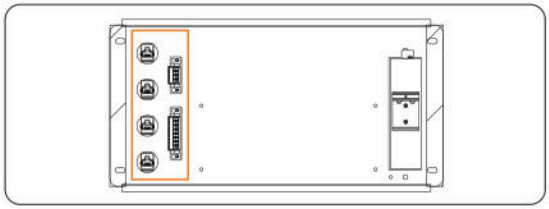


Figure 7-3 Sheet metal wiring area (rear view)

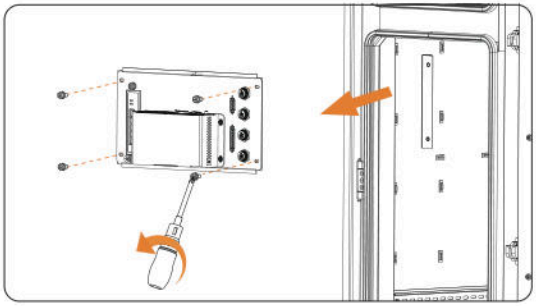


Figure 7-4 Removing sheet metal

Step:4 Remove the EMS from the sheet metal.

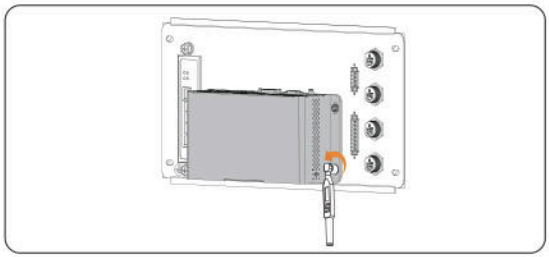


Figure 7-5 Removing the EMS

Step:5 Install a new EMS to the sheet metal.

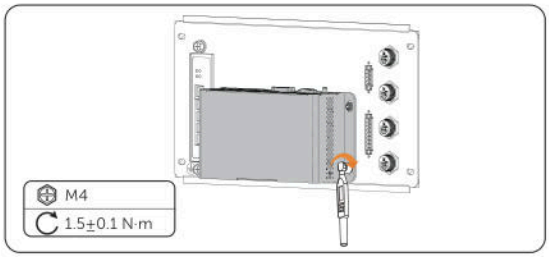


Figure 7-6 Installing a new EMS

Step:6 Install the metal plate and EMS to the cabinet by inserting the cables on the back of the metal plate.

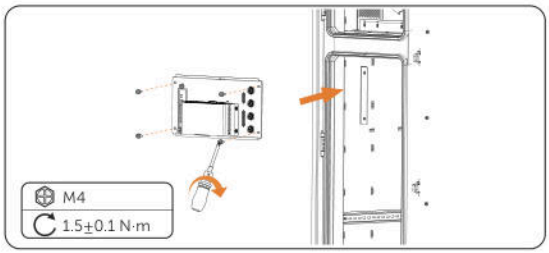


Figure 7-7 Installation

Step:7 Connect the EMS , HUB and sheet metal front cables according to silk screen and cable markings.

Checking after replacement

Step:8 For details of checking procedure after replacement, please refer to "20 Checking after replacement".

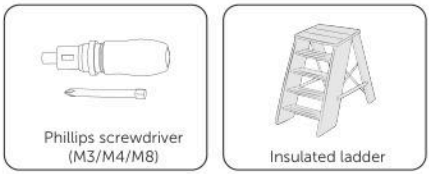
8 Replacement of HUB

Fault location

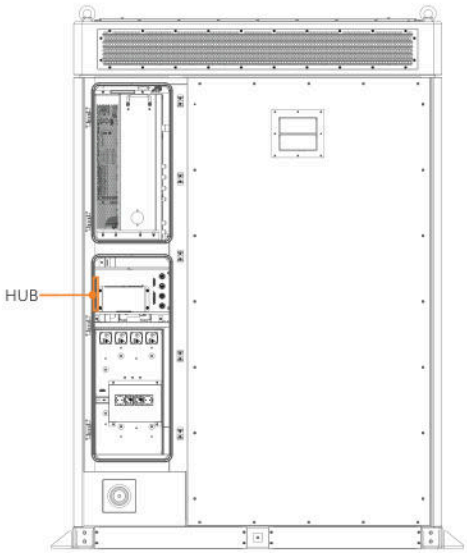
1. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.
2. Refer to the alarm handling suggestions in the alarm details.

Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:



- Position of the HUB in cabinet:



WARNING!

- Before replacing the HUB, make sure the system is powered off. Otherwise, there is a risk of electric shock.
- After the system is powered off, there will still be residual power and heat, which may cause electric shock and body burns. Please wear personal protective equipment (PPE) and start maintaining the system at least 30 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

Procedure

Step:1 Remove the HUB, EMS and the cables on the metal plate.

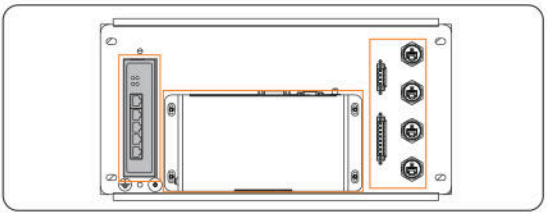


Figure 8-1 Wiring connection area

Step:2 Unscrew the screws on the metal plate, remove the cables on the back of the metal plate, and then remove the EMS and the metal plate together.

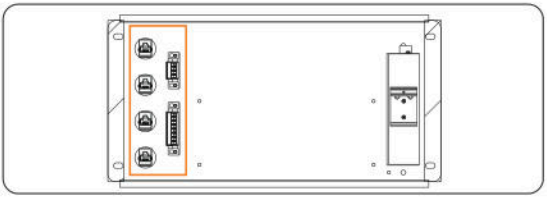


Figure 8-2 Sheet metal wiring area (rear view)

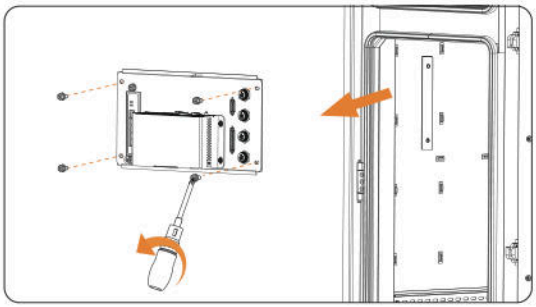


Figure 8-3 Removing the sheet metal

Step:3 Remove the HUB from the sheetmetal.

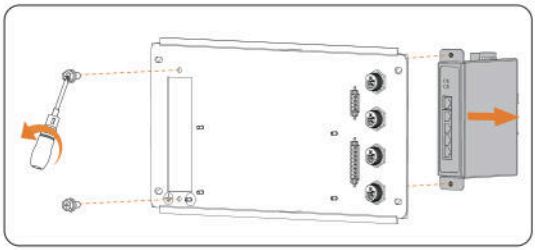


Figure 8-4 Removing the HUB from the sheet metal

Step:4 Remove the HUB from the holder.

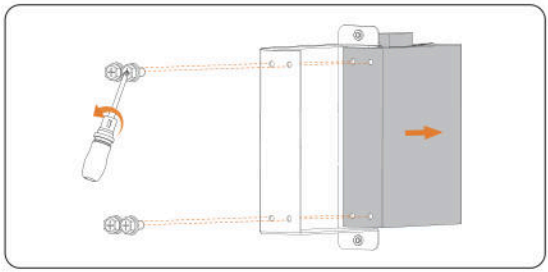


Figure 8-5 Removing the HUB

Step:5 Assemble the new or repaired HUB with the bracket.

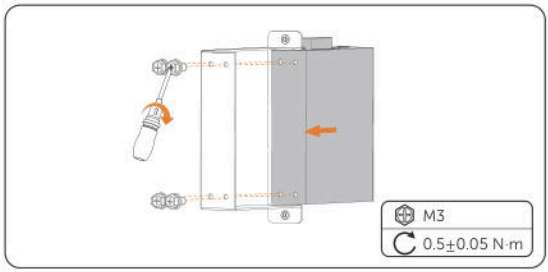


Figure 8-6 Installing the new HUB

Step:6 Install the HUB with the bracket on the metal plate.

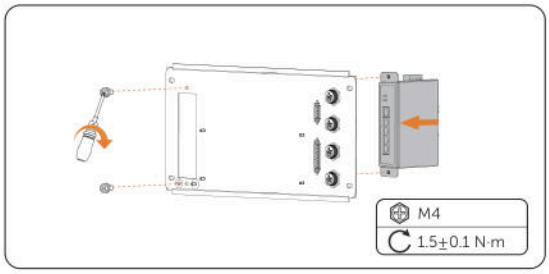


Figure 8-7 Installing the HUB

Step:7 Install the cables on the back of the sheet metal and install the HUB back into the cabinet.

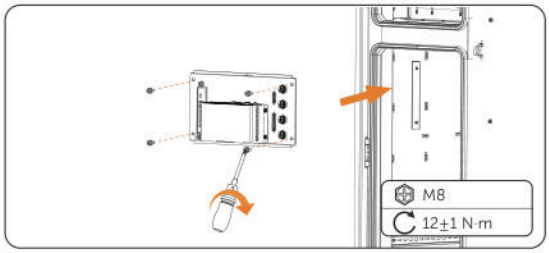


Figure 8-8 Installing the HUB

Step:8 Connect all cables according to silk screen and cable marking.

Checking after replacement

Step:1 Power on the system. For details, refer to "3.4 Power On".

Step:2 Check if the wiring port indicator on the HUB is flashing yellow.

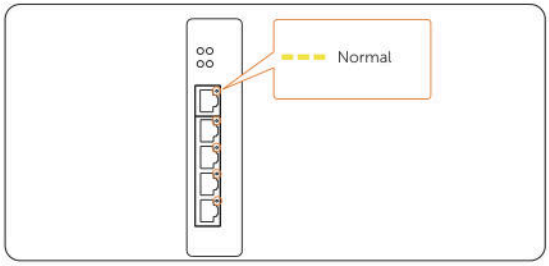


Figure 8-9 HUB Normal Operation Indicator

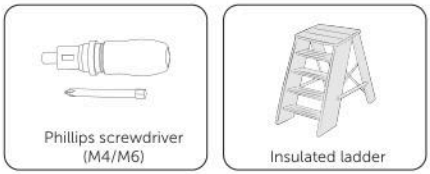
9 Replacement of UPS

Fault location

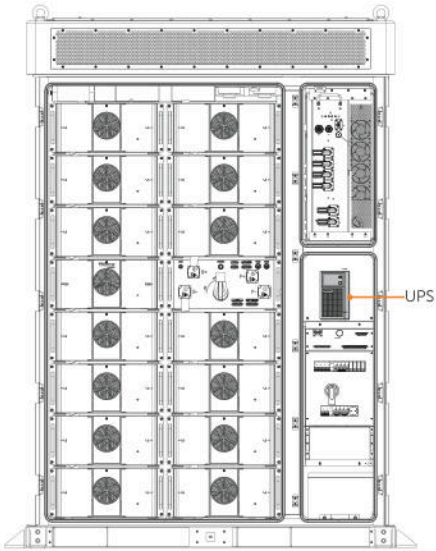
1. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.
2. Refer to the alarm handling suggestions in the alarm details.

Prepare before replacement

- Contact SolaX and order replacement parts
- Tools:



- Position of the UPS in cabinet:



WARNING!

- Before replacing the UPS, make sure the system is powered off. Otherwise, there is a risk of electric shock.
- After the system is powered off, there will still be residual power and heat, which may cause electric shock and body burns. Please wear personal protective equipment (PPE) and start maintaining the system at least 30 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

Procedure

Step:1 Remove the panel.

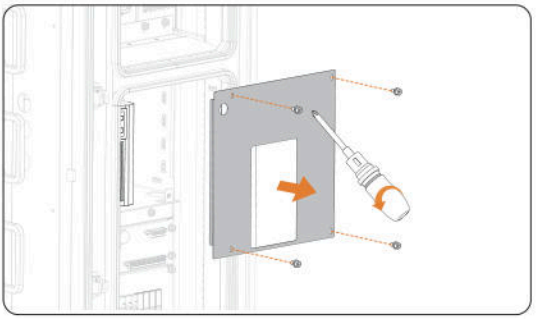


Figure 9-1 Removing the panel

Step:2 Unplug the UPS cables.

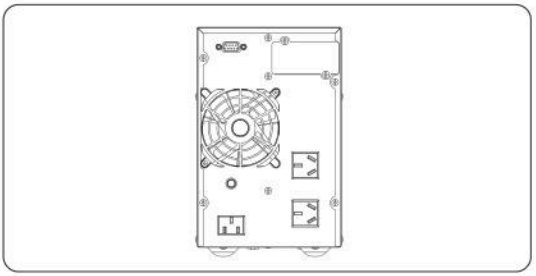


Figure 9-2 UPS Wiring Panel

Step:3 Unscrew the screws that fix the UPS and take out the UPS.

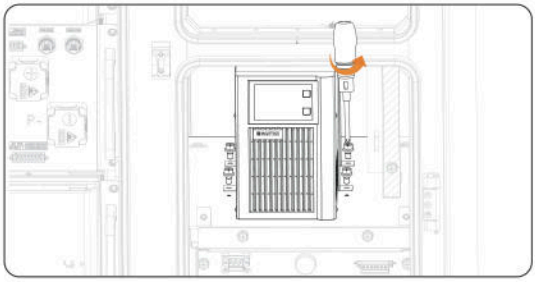


Figure 9-3 Removing the UPS

Step:4 Place the new or maintained UPS in the cabinet and screw on the screws.

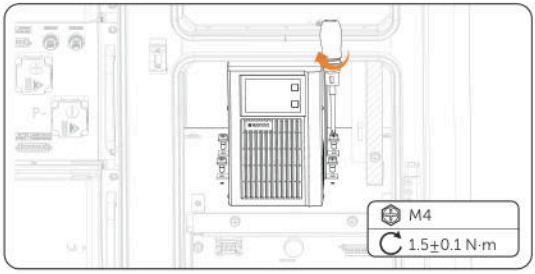


Figure 9-4 Installing the UPS

Step:5 UPS wiring.

Step:6 Install the panel.

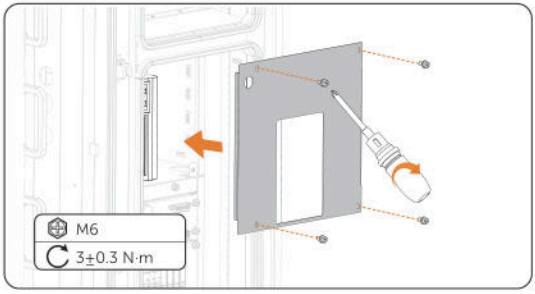


Figure 9-5 Mounting the panel

Checking after replacement

Step:1 Power on the system. For details, refer to "3.4 Power On".

Step:2 Check whether the UPS can be started normally, whether the function keys can be used, and whether the screen can be displayed normally.

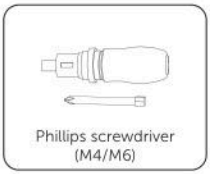
10 Replacement of IO Module

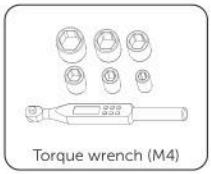
Fault location

1. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.
2. Refer to the alarm handling suggestions in the alarm details.

Preparation before replacement

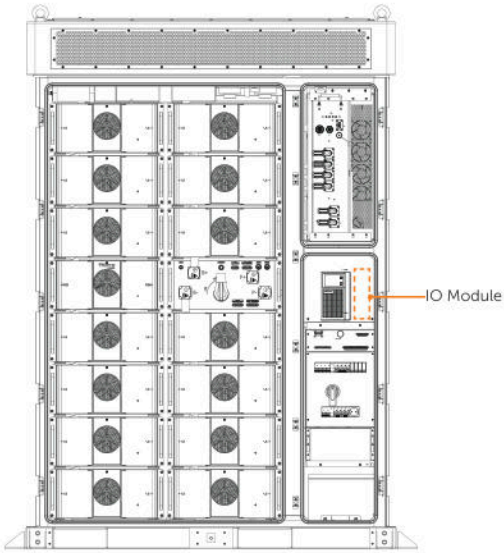
- Contact SolaX and order replacement parts.
- Tools:







- Position of the IO modules in cabinet:



WARNING!

- Before replacing an IO module, ensure that the system is powered off. Otherwise, there is a risk of electric shock.
- After the system is powered off, there will still be residual power and heat, which may cause electric shock and body burns. Please wear personal protective equipment (PPE) and start maintaining the system at least 30 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

Procedure

Step:1 Remove the panel.

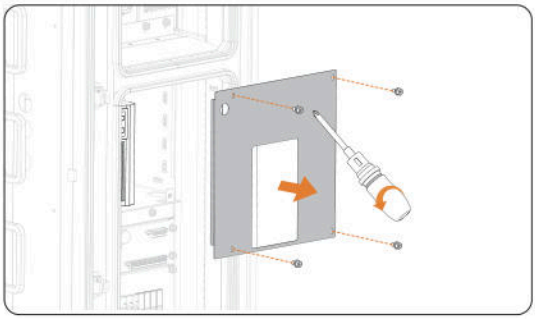


Figure 10-1 Removing panel

Step:2 Remove the cables from the IO module.

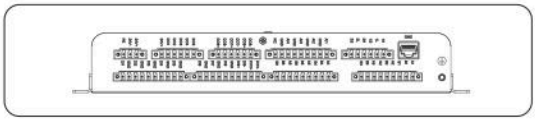


Figure 10-2 IO Module wiring panel

Step:3 Remove the IO module from the cabinet.

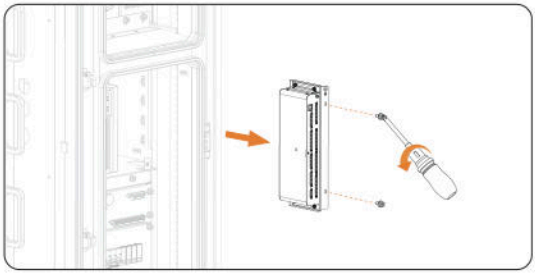


Figure 10-3 Removing the IO module

Step:4 Disconnect the IO module from the bracket.

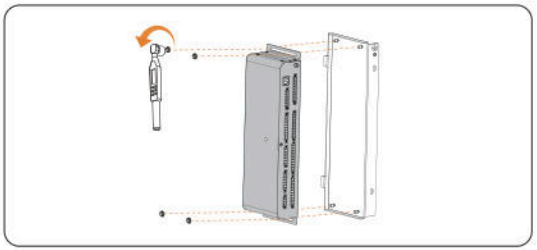


Figure 10-4 Dismantling the IO module

Step:5 Replace the new IO module and assemble the new IO module with the bracket.

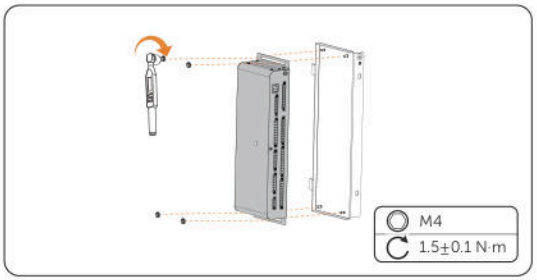


Figure 10-5 Assembling IO modules and brackets

Step:6 Install the IO module into the cabinet.

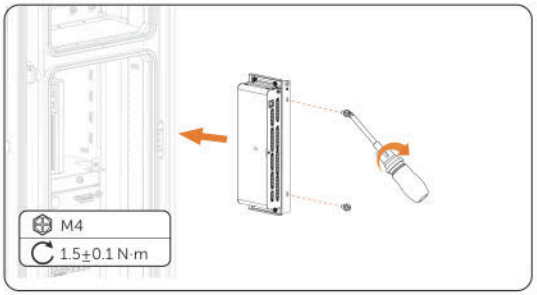


Figure 10-6 Installing IO modules

Step:7 Connect the cables according to the line label and screen printing.

Step:8 Mounting the panel

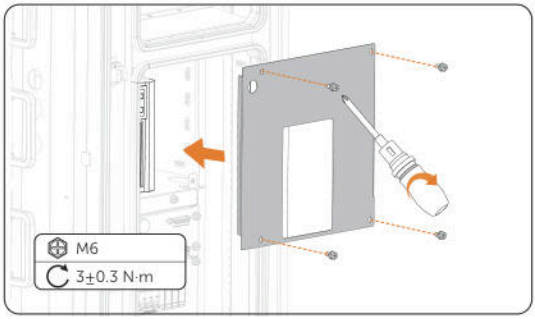


Figure 10-7 Mounting the panel

Checking after replacement

For details of checking procedure after replacement, please refer to "20 Checking after replacement".

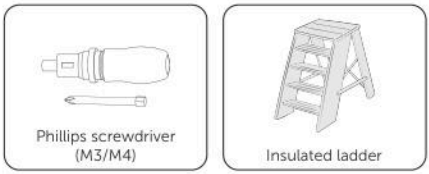
11 Replacement of CO Detector

Fault location

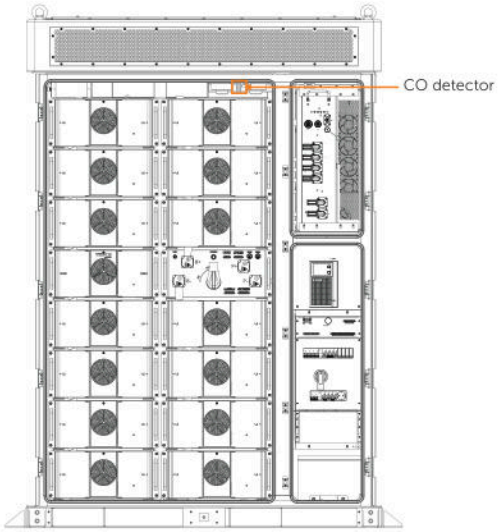
1. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.
2. Refer to the alarm handling suggestions in the alarm details.

Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:



- Location of the CO detector in the cabinet:



WARNING!

- Before replacing the CO detector, ensure that the system is powered off. Otherwise, there is a risk of electric shock.
- After the system is powered off, there will still be residual power and heat, which may cause electric shock and body burns. Please wear personal protective equipment (PPE) and start maintaining the system at least 30 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

Procedure

Step:1 Remove the wiring cables on the CO detector.

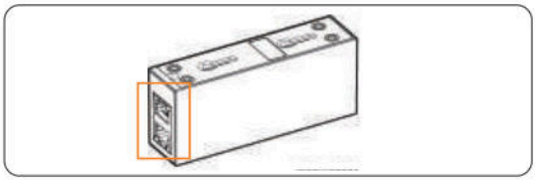


Figure 11-1 Removing wiring cables

Step:2 Remove the CO detector.

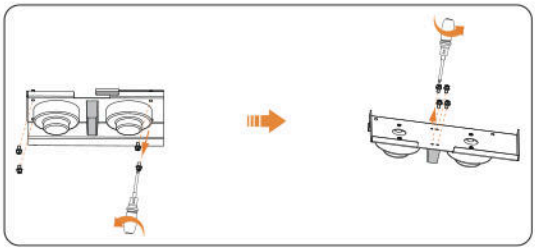


Figure 11-2 Remove CO detector

Step:3 Install a new CO detector. Connect cables.

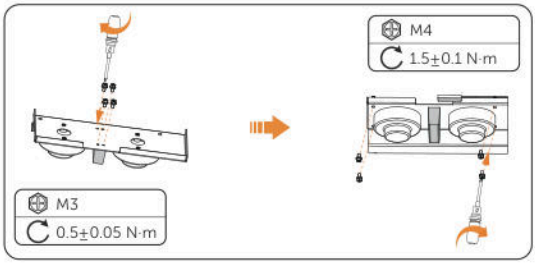


Figure 11-3 Installing a new CO detector

Checking after replacement

For details of checking procedure after replacement, please refer to "20 Checking after replacement".

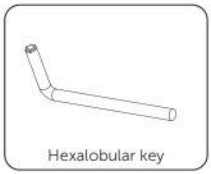
12 Replacement of Air conditioner

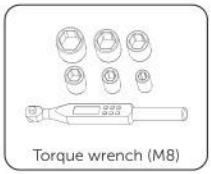
Fault location

1. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.
2. Refer to the alarm handling suggestions in the alarm details.

Preparation before replacement

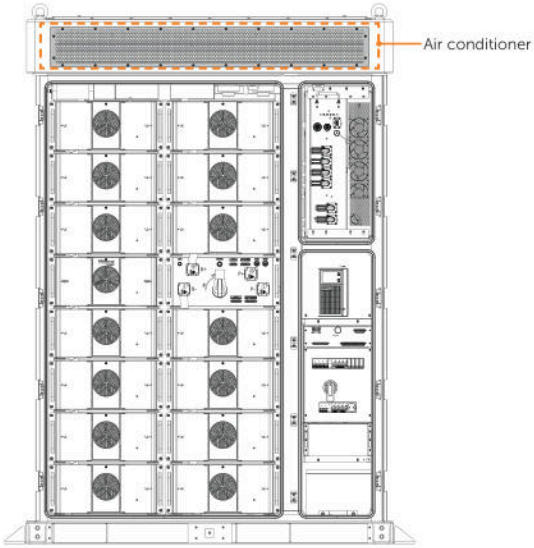
- Contact SolaX and order replacement parts.
- Tools:


Hexalobular key


Torque wrench (M8)


Insulated ladder

- Position of the air conditioner in cabinet:



WARNING!

- Before replacing the air conditioner, make sure that the system is powered off. Otherwise, there is a risk of electric shock.
- After the system is powered off, there will still be residual power and heat, which may cause electric shock and body burns. Please wear personal protective equipment (PPE) and start maintaining the system at least 30 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

Procedure

Step:1 Remove the cabinet cover.

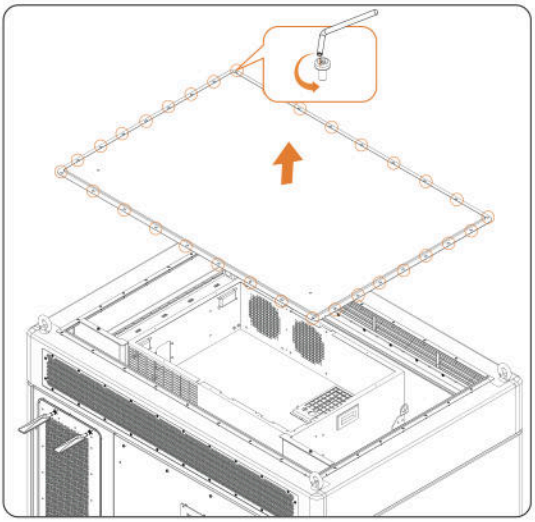


Figure 12-1 Remove the upper cover of the cabinet

Step:2 Remove the connected cables on the air conditioner.

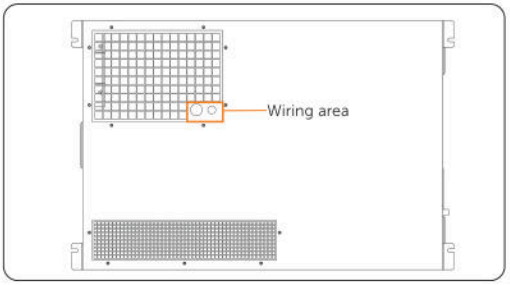


Figure 12-2 Removing cables (top view)

Step:3 Unscrew the screws that fix the air conditioner and take out the air conditioner.

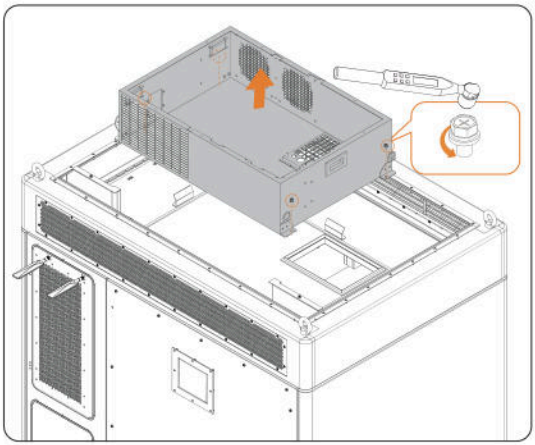


Figure 12-3 Removing air conditioner

Step:4 Install new air conditioner, fix air conditioner.

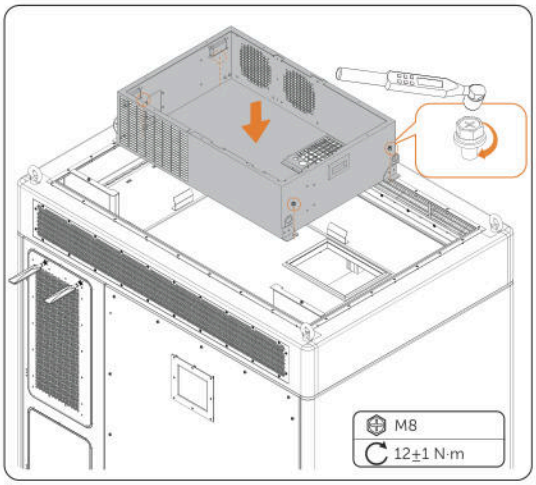


Figure 12-4 Installing the new air conditioner

Step:5 Install the upper cover of cabinet.

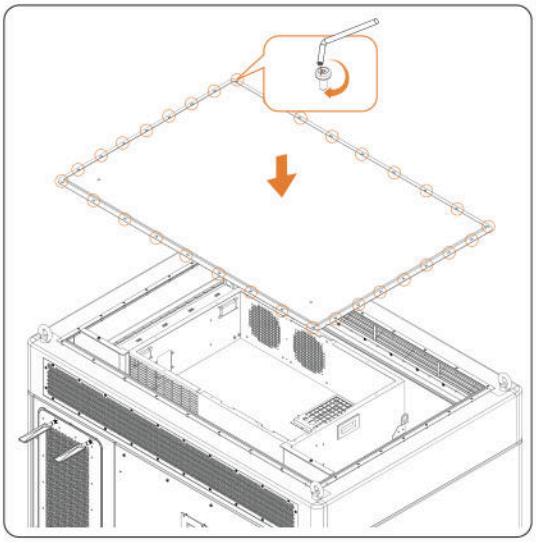


Figure 12-5 Installing top cover

Checking after replacement

For details of checking procedure after replacement, please refer to "20 Checking after replacement".

13 Replacement of Smoke detector and Temperature sensor

Fault location

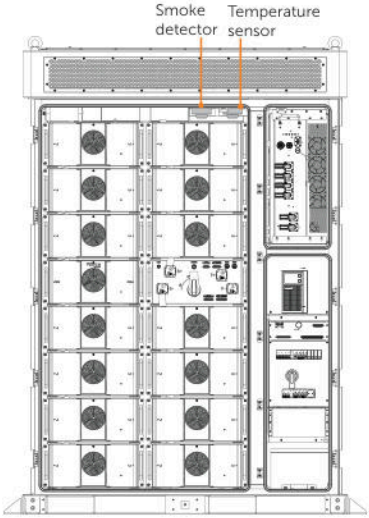
1. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.
2. Refer to the alarm handling suggestions in the alarm details.

Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:



- Position of the Smoke detector and Temperature sensor in cabinet:



WARNING!

- Before replacing the smoke detector and temperature sensor, make sure the system is powered off. Otherwise, there is a risk of electric shock.
- After the system is powered off, there will still be residual power and heat, which may cause electric shock and body burns. Please wear personal protective equipment (PPE) and start maintaining the system at least 30 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

Procedure

Step:1 Loosen the cover of the smoke detector and temperature sensor counterclockwise.

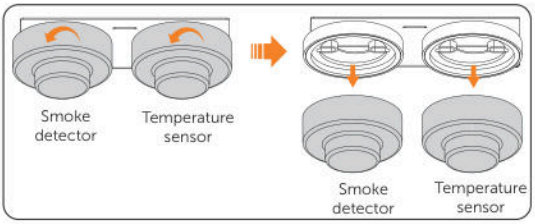


Figure 13-1 Remove the smoke detector and temperature sensor

Step:2 Install a new smoke detector and temperature sensor on the base.

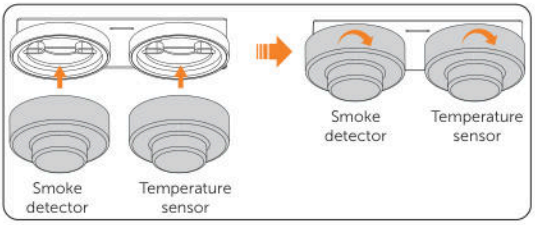


Figure 13-2 Installing smoke detector and temperature sensor

Checking after replacement

For details of checking procedure after replacement, please refer to "20 Checking after replacement".

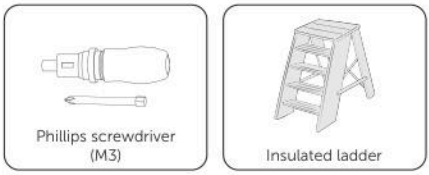
14 Replacement of Door Sensor

Fault location

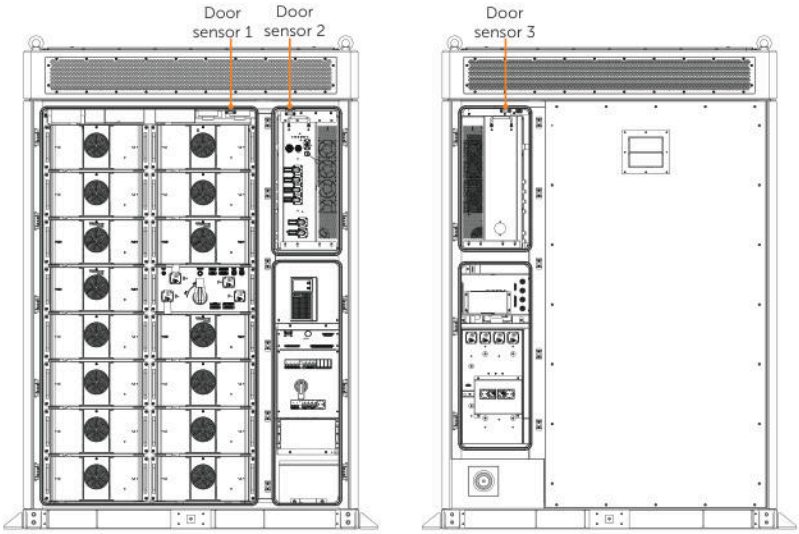
1. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.
2. Refer to the alarm handling suggestions in the alarm details.

Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:



- Position of the door sensor in cabinet:



Front view

Rear view

WARNING!

- Before replacing the door sensor, make sure that the system power is turned off. Otherwise, there is a risk of electric shock.
- After the system is powered off, there will still be residual power and heat, which may cause electric shock and body burns. Please wear personal protective equipment (PPE) and start maintaining the system at least 30 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

Procedure

Step:1 After removing the wiring on the door sensor, loosen the screw on the door sensor and remove the door sensor.

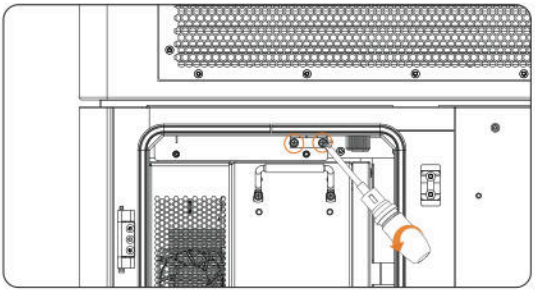


Figure 14-1 Removing the door sensor

Step:2 Connect the cable and install a new door sensor.

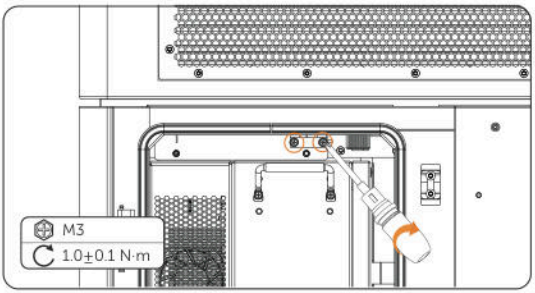


Figure 14-2 Installing a new door sensor.

Checking after replacement

For details of checking procedure after replacement, please refer to "20 Checking after replacement".

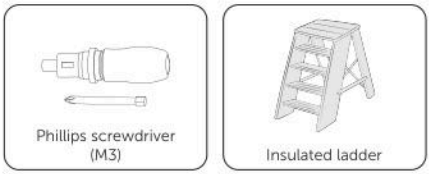
15 Replacement of Temperature and Humidity Sensor

Fault location

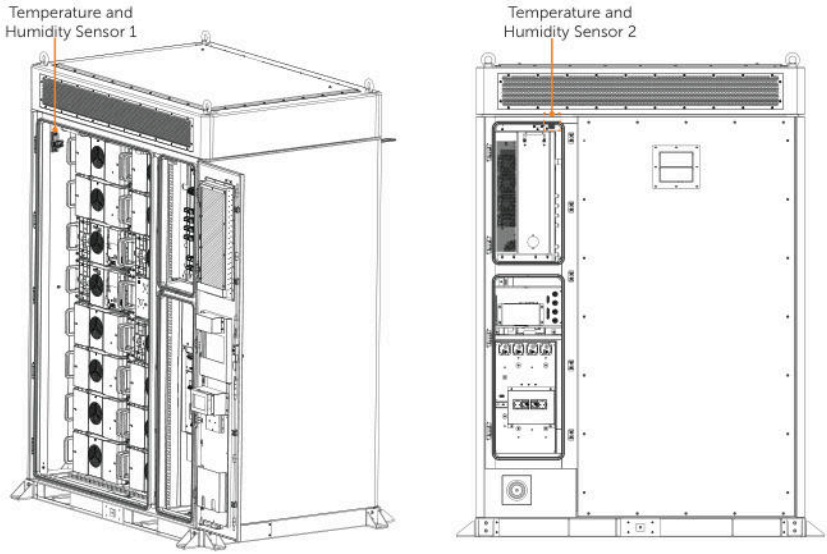
1. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.
2. Refer to the alarm handling suggestions in the alarm details.

Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:



- Position of the temperature and humidity sensor in cabinet:



⚠ WARNING!

- Before replacing the temperature and humidity sensor, make sure that the system is powered off. Otherwise, there is a risk of electric shock.
- After the system is powered off, there will still be residual power and heat, which may cause electric shock and body burns. Please wear personal protective equipment (PPE) and start maintaining the system at least 30 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

Procedure

Step:1 Use a flat-blade screwdriver to unscrew the port that fastens the cables, and remove the cables from the temperature and humidity sensor. (Take temperature and humidity sensor 1 as an example)

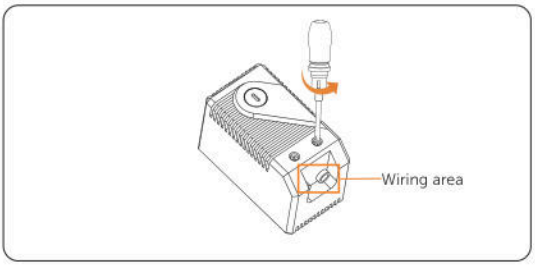


Figure 15-1 Removing cables

Step:2 Unscrew and remove the fixture outward along the guide, and then remove the temperature and humidity sensor.

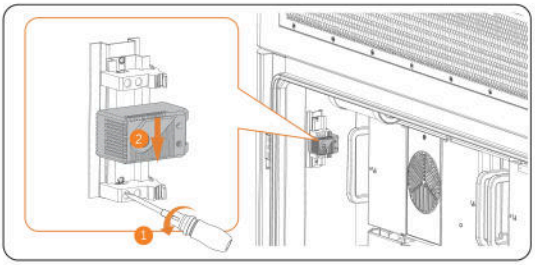


Figure 15-2 Removing temperature and humidity sensor

Step:3 Install the temperature and humidity sensor along the slide rail and lock the screw.

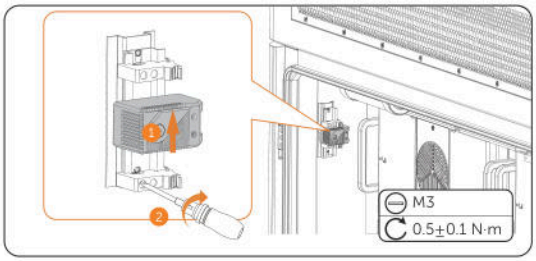


Figure 15-3 Installing temperature and humidity sensor

Step:4 Connect cables.

Checking after replacement

For details of checking procedure after replacement, please refer to ""20 Checking after replacement".

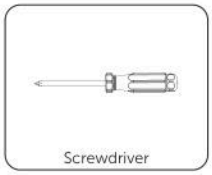
16 Replacement of Distribution box

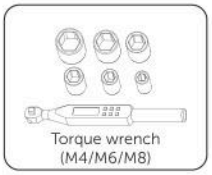
Fault location

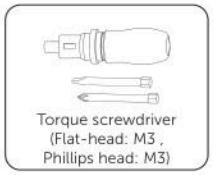
1. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.
2. Refer to the alarm handling suggestions in the alarm details.

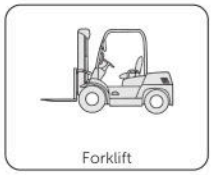
Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:

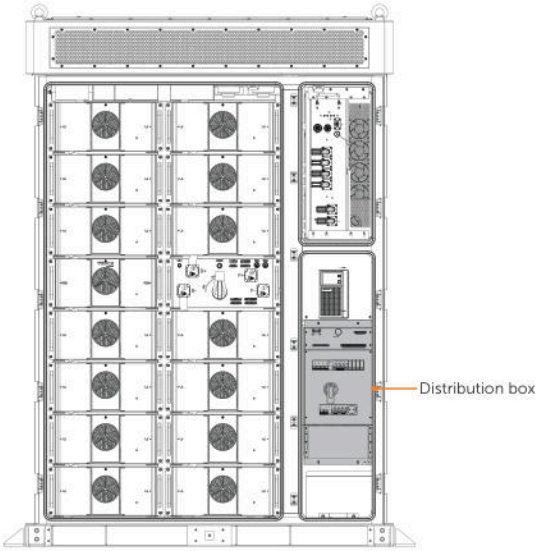








- Position of the distribution box in cabinet:



WARNING!

- Before replacing the distribution box and accessories, make sure that the system power is turned off. Otherwise, there is a risk of electric shock.
- After the system is powered off, there will still be residual power and heat, which may cause electric shock and body burns. Please wear personal protective equipment (PPE) and start maintaining the system at least 30 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

16.1 Replacement of Distribution box

Procedure

Step:1 Remove the cable cover of the distribution box.

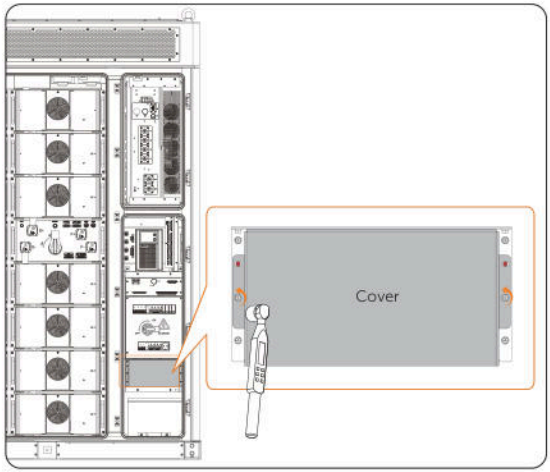


Figure 16-1 Removing the cable cover

Step:2 Loosen the screw and remove the cables.

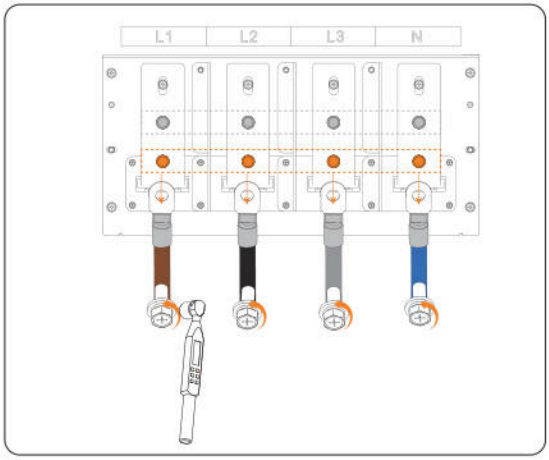


Figure 16-2 Removing the cables

Step:3 Remove the terminal.

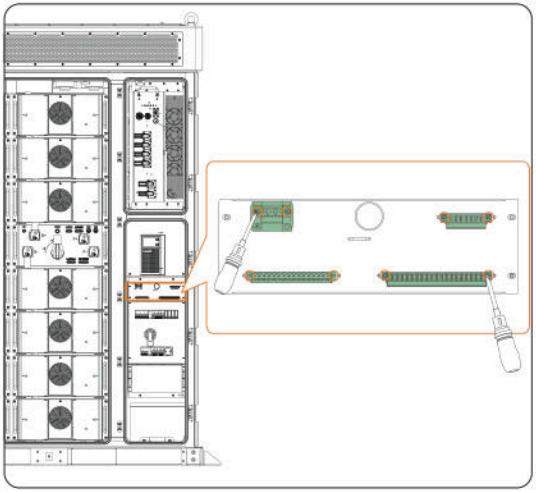


Figure 16-3 Removing the terminal

Step:4 Open the rear cabinet door and remove the cover by pinching both sides of the cover.

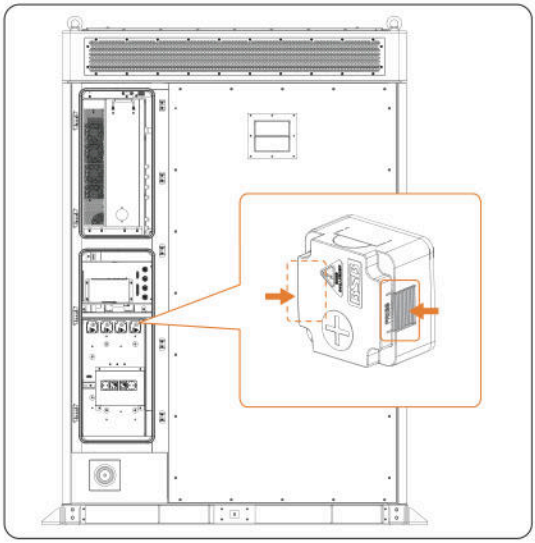


Figure 16-4 Removing the cover

Step:5 Loosen the screw and remove the cables.

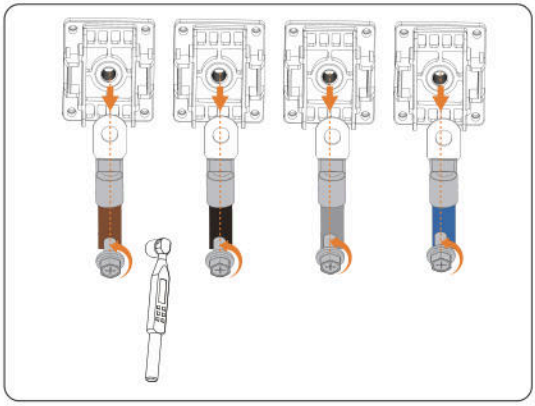


Figure 16-5 Removing the cables

Step:6 Unscrew the screw on the distribution box and take out the distribution box.

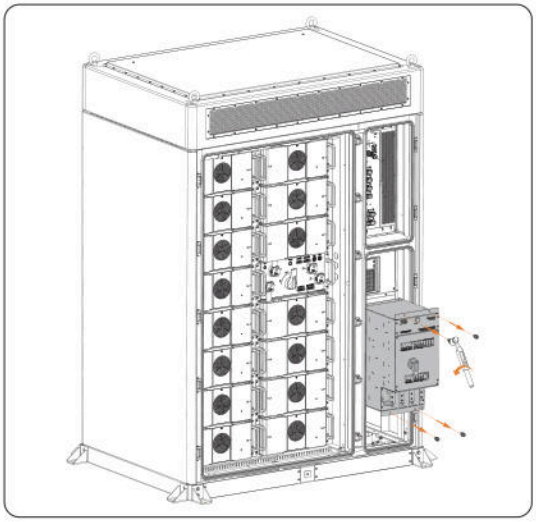


Figure 16-6 Removing distribution box

Step:7 Install new distribution box.

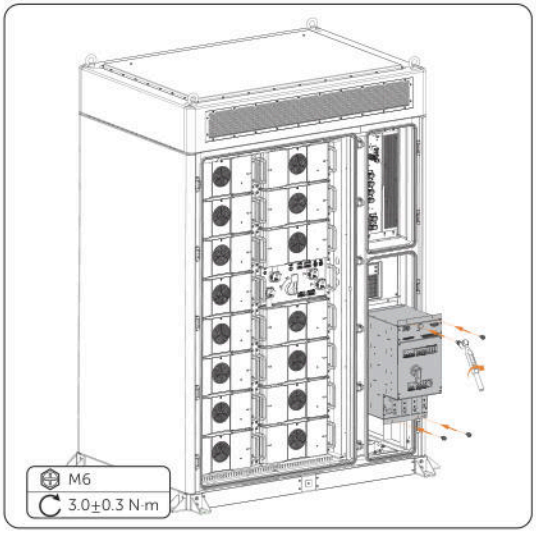


Figure 16-7 Installation of distribution box

Step:8 Insert the M8 screw to secure and connect the assembled L1/L2/L3/N cable to the wiring interface, and tighten the screw. There are two options. recommend connect using option B. The port of option a is considered a reserved port.

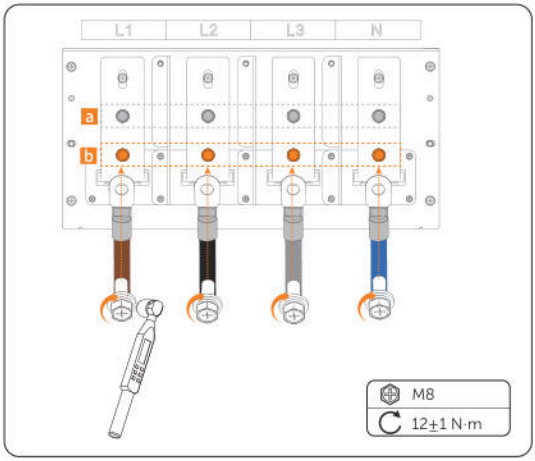


Figure 16-8 Wiring

Step:9 Fix the wire shield to the distribution box again, and tighten the screws (torque: 1.2±0.12 N·m).

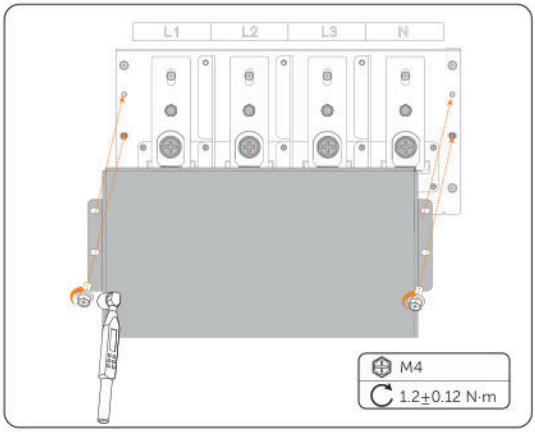


Figure 16-9 Installing cable cover

Step 10: Insert the Terminal Block into the port and tighten the set screw.

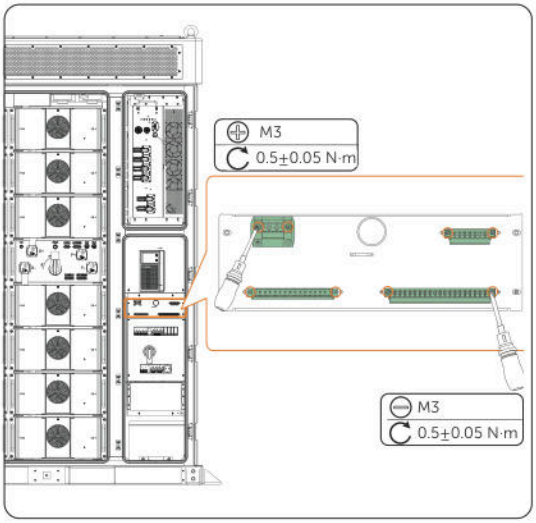


Figure 16-10 Connecting the terminal

Step 110: Remove the terminal cover by pressing the buttons on both sides of the cover. Connect the L1/L2/L3/N cable to the wire interface and secure with the M8 screw. Pin cover back into position.

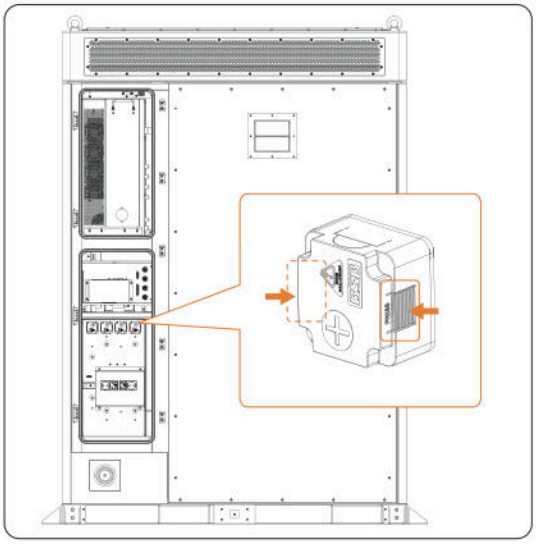


Figure 16-11 Removing the cover

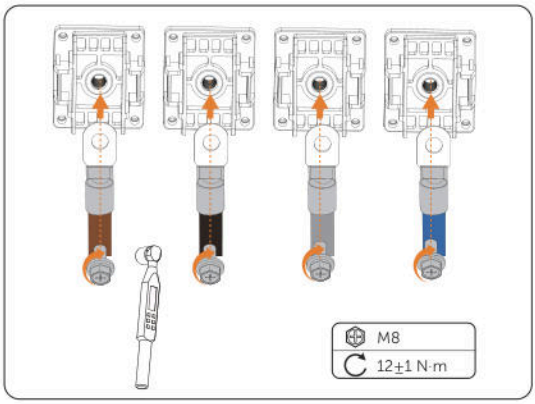


Figure 16-12 Wiring

Checking after replacement

Step:1 Power on the system. For details, refer to "3.4 Power On".

Step:2 Check whether the system is back to normal by EMS1000 a web page or SolaXCloud.

16.2 Replacement of SPD Module

Procedure

Step:1 Unscrew the screws on the front panel of the distribution box and remove the panel (No need to remove the distribution box from the cabinet).

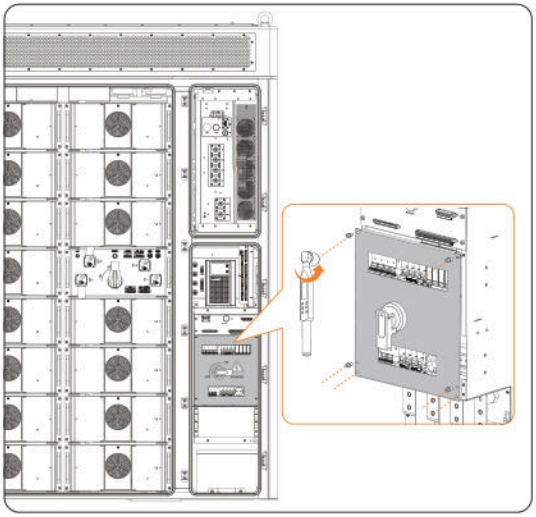


Figure 16-13 Removing the front panel

Step:2 Remove the cable from the SPD module.

Step:3 Use a screwdriver to pry up the clip on the SPD and pull the SPD module out upwards.

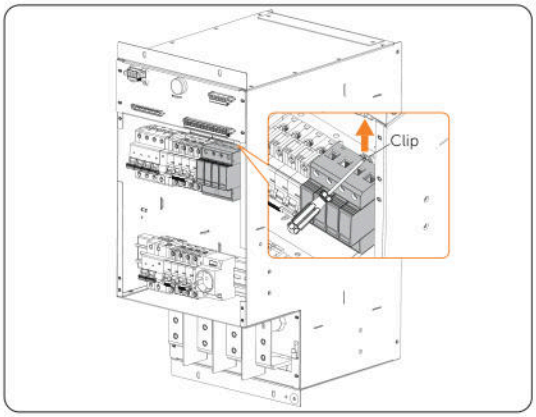


Figure 16-14 Removing the SPD module

Step:4 Pry the clip, install a new SPD module and wire it.

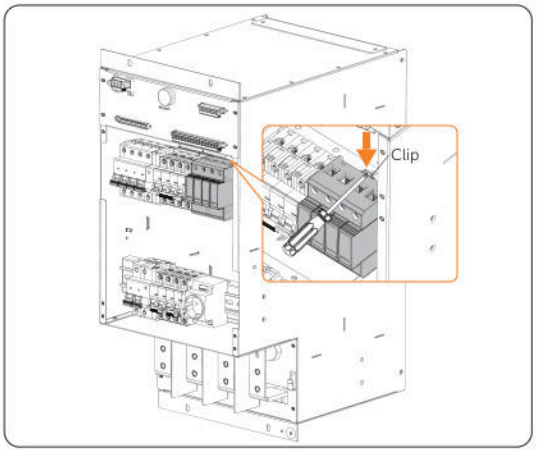


Figure 16-15 Installing the SPD Module

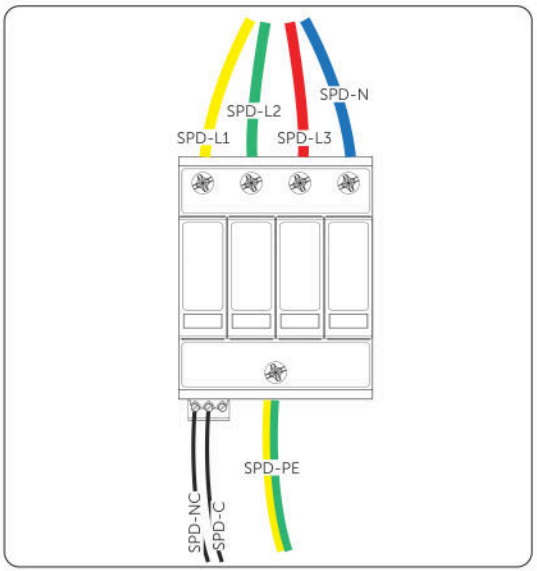


Figure 16-16 SPD Wiring

Step:5 Install the panel.

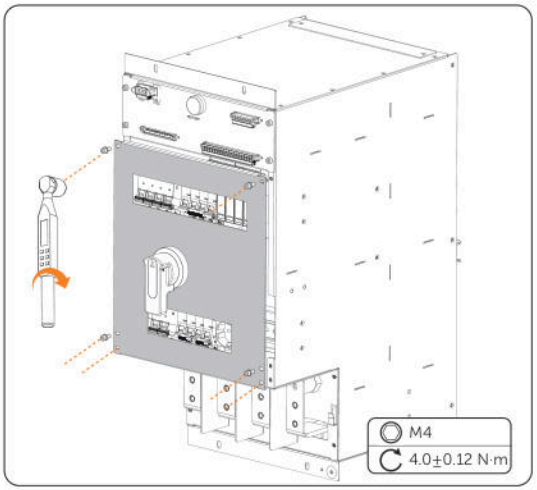


Figure 16-17 Mounting the panel

Checking after replacement

Step:1 Power on the system. For details, refer to "3.4 Power On".

Step:2 Check if the SPD module indicator is green.

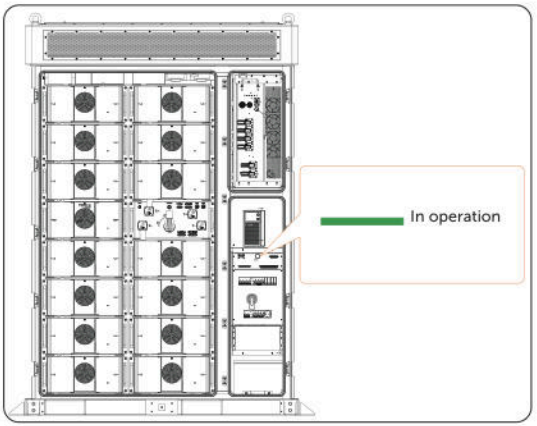


Figure 16-18 SPD Module Indicator

Step:3 Check whether the status of the SPD module is normal via EMS1000 webpage or SolaX Cloud App.

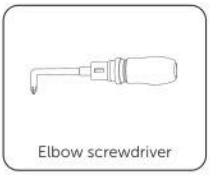
17 Replacement of Water Sensor

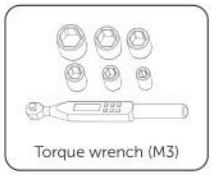
Fault location

1. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.
2. Refer to the alarm handling suggestions in the alarm details.

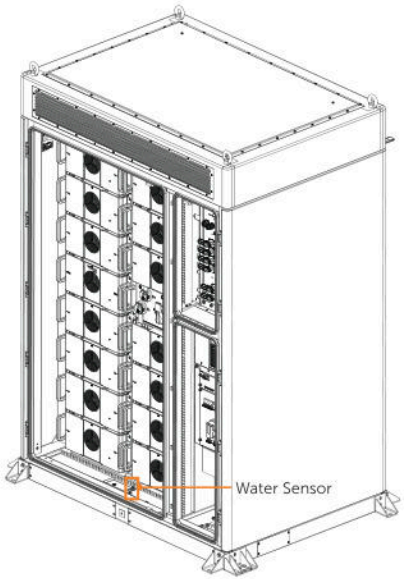
Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:


Elbow screwdriver


Torque wrench (M3)

- Position of the water sensor in cabinet:



WARNING!

- Before replacing the water sensor, ensure that the system is powered off. Otherwise, there is a risk of electric shock.
- After the system is powered off, there will still be residual power and heat, which may cause electric shock and body burns. Please wear personal protective equipment (PPE) and start maintaining the system at least 30 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

Procedure

Step:1 Unscrew the M3 screws on the water sensor and remove the water sensor.

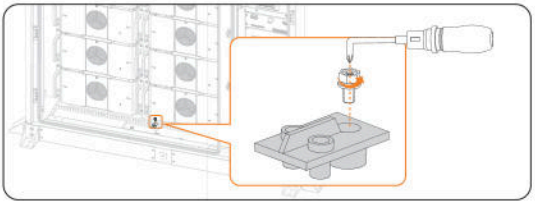


Figure 17-1 A removal of the water sensor

Step:2 Unscrew the M3 nut counterclockwise to remove the water sensor cable.

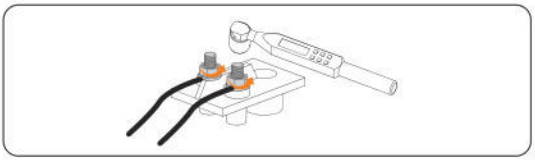


Figure 17-2 Removing the cable

Step:3 Install a new water sensor and connect the cable.

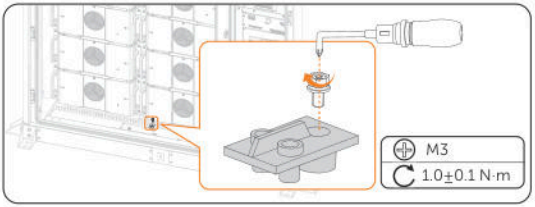


Figure 17-3 Installing the water sensor

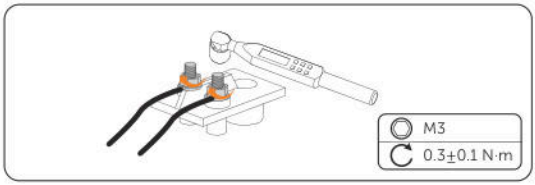


Figure 17-4 Connecting the cable

Checking after replacement

Step:1 Power on the system. For details, refer to "3.4 Power On".

Step:2 Check whether the system is back to normal by EMS1000 a web page or SolaXCloud.

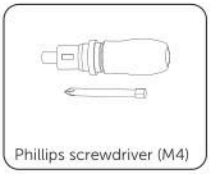
18 Replacement of Audible and Visual Alarm

Fault location

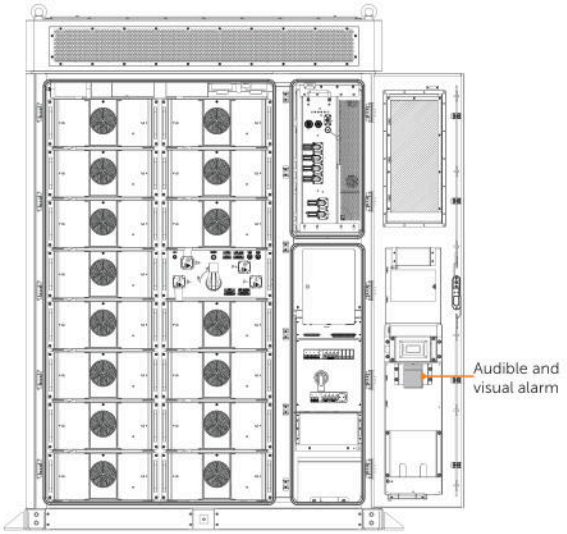
1. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.
2. Refer to the alarm handling suggestions in the alarm details.

Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools: Refer to specific sections.



- Position of the audible and visual alarm in cabinet:



WARNING!

- Before replacing the audible and visual alarm, make sure that the system power is turned off. Otherwise, there is a risk of electric shock.
- After the system is powered off, there will still be residual power and heat, which may cause electric shock and body burns. Please wear personal protective equipment (PPE) and start maintaining the system at least 30 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

Procedure

Step:1 Remove the outer cover of the audible and visual alarm.

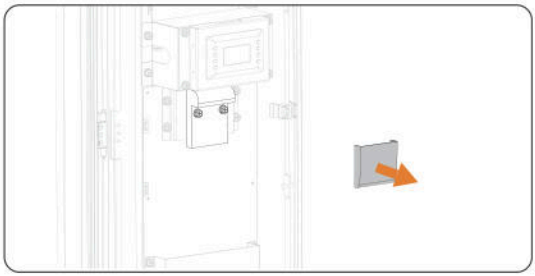


Figure 18-1 Removing the cover

Step:2 Unscrew the screw and remove the audible and visual alarm.

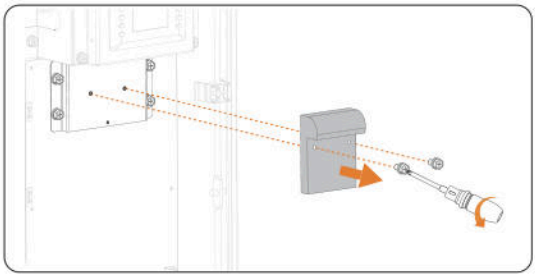


Figure 18-2 Removing audible and visual alarm

Step:3 Install new audible and visual alarms.

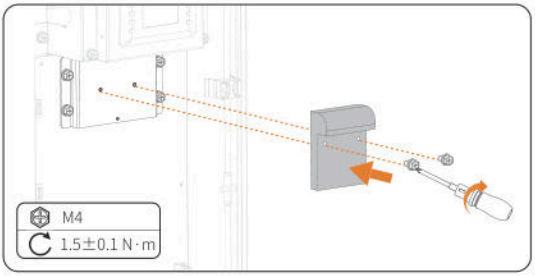


Figure 18-3 Installation of audible and visual alarm

Step:4 Install cover for audible and visual alarm.

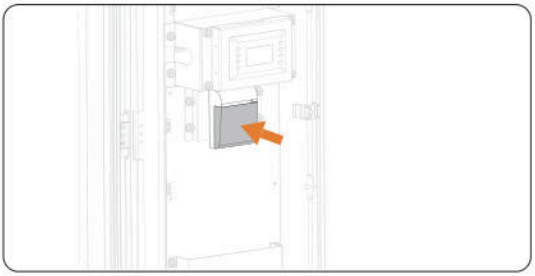


Figure 18-4 Installing cover

Checking after replacement

Step:1 Power on the system. For details, refer to "3.4 Power On".

Step:2 Check whether the system is back to normal through the EMS1000 web page or Arroway.

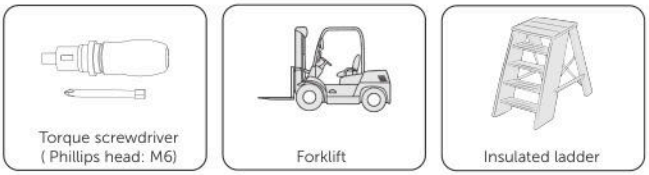
19 Replacement of PCS

Fault location

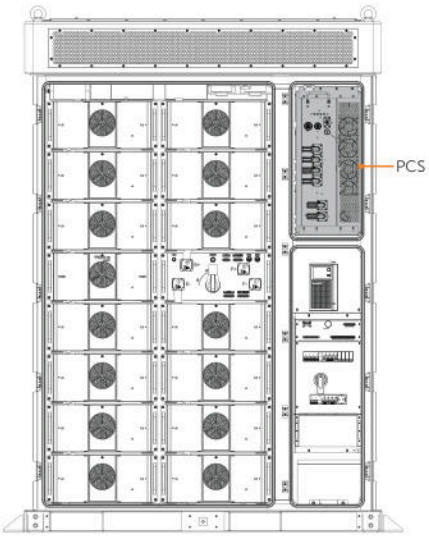
1. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.
2. Refer to the alarm handling suggestions in the alarm details.

Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:



- Position of the PCS in cabinet:



WARNING!

- Before replacing the energy storage converter, make sure that the system power is turned off. Otherwise, there is a risk of electric shock.
- After the system is powered off, there will still be residual power and heat, which may cause electric shock and body burns. Please wear personal protective equipment (PPE) and start maintaining the system at least 30 minutes after the power outage.
- Equipment maintenance must be carried out by professional personnel.

19.1 Replacement of PCS

Procedure

Step:1 Remove the PCS cables.

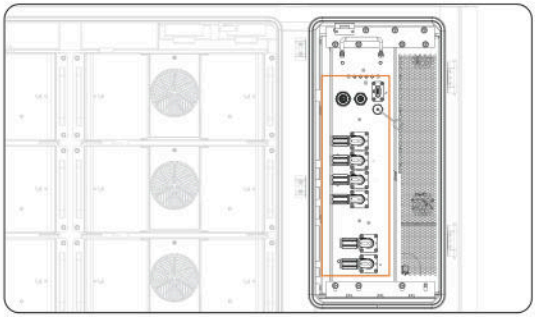


Figure 19-1 Wring area

Step:2 Unscrew the screws and remove the bracket that secures the PCS.

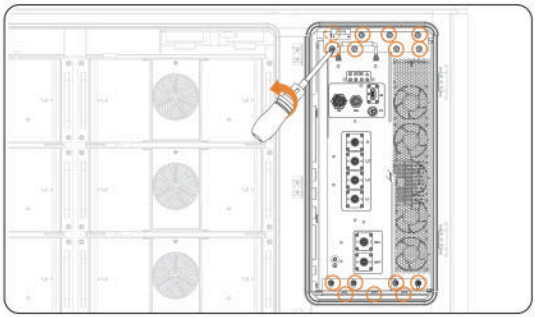


Figure 19-2 Removing brackets (front view)

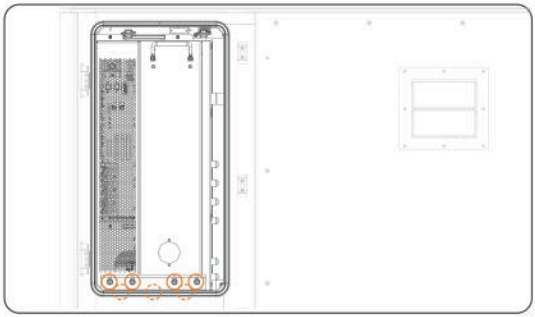


Figure 19-3 Removing bracket (rear view)

Step:3 Take out the PCS for maintenance or replace it with a new one.

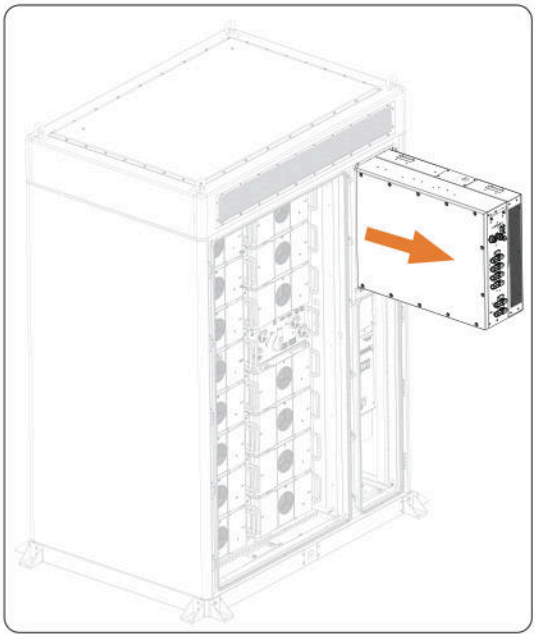


Figure 19-4 Taking out the PCS

Step:4 Place a serviced or new PCS into the cabinet.

Step:5 Install the bracket that secures the PCS to the cabinet.

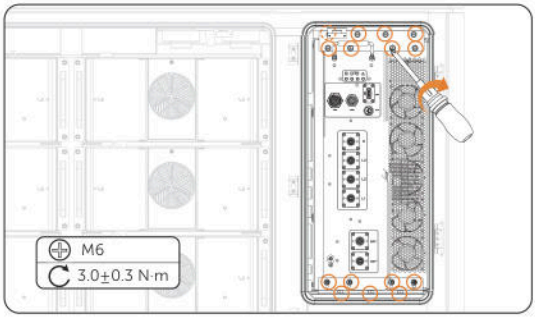


Figure 19-5 Installing the brackets(Front view)

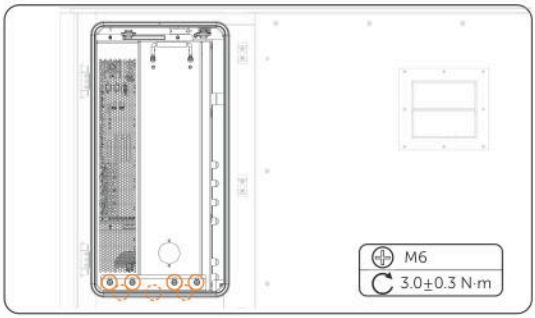


Figure 19-6 Installing the bracket (rear view)

Step:6 Wiring the PCS.

Checking after replacement

Step:1 Power on the system. For details, refer to "3.4 Power On".

Step:2 Check whether the system is back to normal by EMS1000 a web page or SolaXCloud.

19.2 Replacement of External Fan

Procedure

Step:1 Remove the PCS. For details, refer to "19.1 Replacement of PCS".

Step:2 Use a Phillips screwdriver to loosen the screw on the PCS, pull out the fan assembly, and then disconnect the terminal connected to the fan.

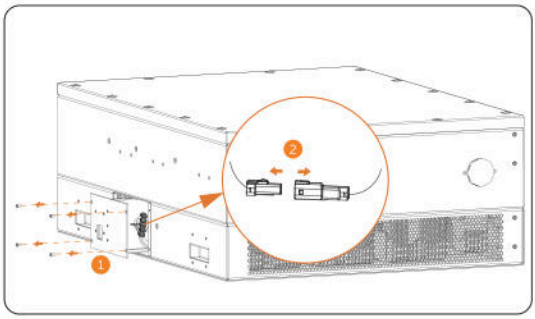


Figure 19-7 Disconnecting the fan

Step:3 Loosen the screw on the fan that needs to be replaced and remove the fan.

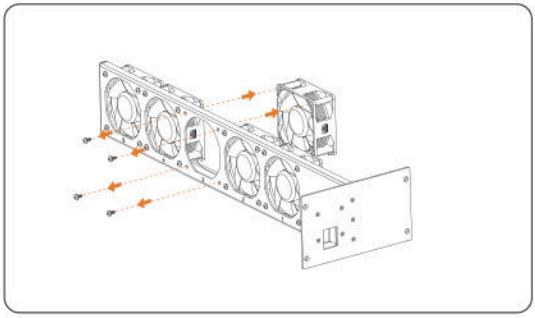


Figure 19-8 Fan remove

Step:4 After replacing the fan, follow the sequence install a new fan.

Step:5 Install the PCS into the cabinet, reference "19.1 Replacement of PCS".

20 Checking after replacement

Step:1 Check that the replacement parts are installed and connected correctly and securely.

Step:2 Check the cable jacket for damage, especially the cable jacket connecting with the metal parts.

Step:3 Power on the system. For details, refer to "3.4 Power On".

Step:4 Check the running status of the system and ensure that the functions are restored.

Step:5 Check whether the alarm status is displayed as resolved and no new alarms are generated via the cabinet screen, EMS1000 webpage or SolaX Cloud App.

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