Liquid Cooling Energy Storage System

TRENE-P79B261L-E / TRENE-P100B261L-E / TRENE-P124B261L-E / TRENE-P125B261L-E

Maintenance Manual

Version 0.0

www.solaxpower.com

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About This Manual

Scope of Validity

This document describes regular maintenance, troubleshooting and parts replacement for TRENE-P125B261L-E 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 device, please carefully read and understand the document, and strictly follow the instructions and safety precautions given herein, as well as symbols affixed on the device. The safety instructions herein are only supplements to local laws and regulations.

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, regulations, standards, guidelines and industry rules in the process of transportation, storage, installation, operation, and maintenance. 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, nor will the company assume any liability to pay compensation for the possible physical and property damage resulting from the installation environment that does not meet the design requirements.

The device is well designed and tested to meet all applicable state 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.

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

- Device damage due to force majeure, such as earthquake, flooding, thunderstorm, lighting, fire hazard, volcanic eruption, war, typhoon, tornado, etc.
- Device damage due to human cause.
- Device damage caused by strong vibrations from external factors before, during and after installation.
- 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 PCSs or devices.

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

1.2 Device Safety

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

1.2.1 Cabinet Safety

DANGER!

- According to the local laws and regulations related to high-altitude work, operators must wear PPE, e.g., a helmet, safety belt, or waist harness, when they work at heights, while the other end of the harness must connect to a secure structure to prevent fall incidents.

WARNING!

- Please prepare tools that meet the requirements before installation, and check the number of tools after installation, to avoid leaving them inside the equipment.
- Please ensure that the cabinet has been thoroughly secured before operating it. Otherwise, it may cause personal injury or equipment damage due to tilting or collapsing the cabinet.
- Please ensure that the cabinet's vents and cooling system are working properly when it is running. If the vents are blocked, it will lead to overheating, and even equipment damage or fire hazard.
- Please ensure that the cabinet's vents and cooling system are kept away from heat sources.
- Do not drill holes in the device to avoid equipment failure.
- If the circumstances that may cause personal injury or equipment failure occur, such as, fluid flowing into the equipment, stop operation and power off immediately. Otherwise, it may cause a short circuit or damage.
- Do not open the cabinet doors on a rainy or high humid day (≥80% humidity). If the doors have to be opened on such days, please take proper protective measures.

CAUTION!

- Do not use a straight ladder. When electrical work is involved, a wooden ladder or an insulated ladder shall be used.
- The equipment shall not be used to provide a backup power source in the following circumstances:
  a. Equipment related to life;
  a. Sensitive precision instruments;
  b. Home appliances will be faulty in the case of a power failure during operation.

NOTICE!

- The signs and messages on the labels and nameplates attached to the device need to be visible and clear.

1.2.2 Battery Safety

DANGER!

- Do not connect the positive and negative poles of a battery together. Otherwise, it may be short-circuited. This will result in an excessive flow of current and large quantities of energy for a short time, and then will cause battery leakage, smoke, the emission of flammable gases, thermal runaway, fire, or even an explosion. Therefore, the battery must be powered off before maintenance.
- If a battery is overheated, it will cause leakage, smoke, release of flammable gases, thermal runaway, fire, or even an explosion. Therefore, please ensure that the installation site shall be well ventilated and kept away from high temperatures.
- Do not dismantle, change, shake, drop, crush, impact, cut, penetrate with a sharp object, or any other ways to damage the battery. Otherwise, it may cause leakage, smoke, emission of flammable gases, thermal runaway, fire, or even an explosion.
- Do not mix different types or makes of the battery. Otherwise, it may cause leakage or rupture, resulting in personal injury or property damage.
- The battery electrolyte is toxic and volatile. Never get in contact with the leaked liquids or inhale gases in the case of the battery leakage or odor, and contact professionals immediately. The professional must wear PPE (including but not limited to safety glasses, safety gloves, gas masks, and protective clothing) before powering off the device, and then contact our company at once after removing the damaged battery.
- Normally, the battery will not release any gases. 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. If the battery needs to exhaust flammable gas, safe emission measures must be taken to prevent fire and device corrosion.
- Do not use damaged batteries, and ensure that the installation site must be well ventilated.

WARNING!

- Please read the document carefully before installation, operation and maintenance.
- Must arrange fire-fighting equipment in advance according to the local laws, regulations, and standards while installing and commissioning the device.
- Please check that there is no damage to the outer packaging before and after unpacking, and in the process of storage and transportation. The battery shall be correctly placed or stacked in accordance with the requirements stipulated on the labels to prevent damaging or scrapping the battery resulting from crushing or falling.

⚠ WARNING!

- Must tighten screws securing cables and on the copper bars according to the torque information specified in the document, and check whether they are tightened periodically. For instance, whether there is any rust, corrosion, or any other foreign object on it, and then clean it up if any. Because the loose screw connections may result in excessive voltage drops and large currents, leading to generating a lot of heat and burning the battery.
- The battery should be charged in time after discharge, to prevent battery damage due to overdischarge. If a battery pack is stored for a long time, please periodically recharge it to protect it from damage according to the storage requirements specified in the document.
- Please charge the battery within the specific temperature range because the low temperature may result in a short circuit. Hence, do not charge it when the temperature is below the low limit of the operating temperature.
- Do not use the battery when you find a bulge, or dents on the battery housing, and contact the installer or professional maintenance personnel to dismantle and replace it. The damaged battery must be kept away from other devices and flammable and explosive articles, and do not contact it except for professionals.
- Before operation, ensure that there are no irritating or burning smells around the battery.
- Do not weld or grind near a battery. Because electric sparks or arcs may cause fires.
- Do not step, lead, stand, or set on the battery.

NOTICE!

Transportation requirements for battery:

- Relevant qualifications for the transport of dangerous goods must be obtained by the forwarding agent engaged in such businesses, and they must strictly abide by the local regulations for the transport of dangerous goods.
- Please check the battery before transportation. If a battery leaks, smells, or is damaged, do refuse to transport it.
- Please handle gently in the process of loading and unloading, transportation, and moving a battery to prevent bumping, and take effective moisture-proof measures to prevent personal injuries and battery damage.
- Unless otherwise specified, do not transport the batteries, which are classified as dangerous goods, together with food, medicine, or other additives on the same means of transport.

If the battery leaks electrolyte or any other chemical materials, the electrolyte leakage can lead to toxic gases. Therefore, do not contact with them 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 at least 15 minutes, and seek medical attention;
- In case of contact with skin: Wash the contact 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 is installed, please do as follows:
- In case a battery is charging when the fire breaks out, provided it is safe to do so, press the emergency stop button and unplug the power cable;
- In case a battery is not on fire yet, use a water-based fire extinguisher or a carbon dioxide extinguisher to extinguish the fire;
- In case a battery catches fire, do not try to put it out, and evacuate immediately;
- A battery may catch fire when it is heated above 150°C/302°F. If the battery catches fire, please evacuate immediately since it will generate noxious and poisonous gases.

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 curbside recycling bins. Otherwise, it may cause environmental pollution or explosions.
- Ensure that the damaged or wasted batteries are not exposed to the following situations: high temperatures, high humidity, direct sunlight, or corrosive environments.
- Contact a battery recycling company to scrap the battery, which leaks electrolytes, or is damaged or expired.
- Please take protective steps to prevent battery short circuits before moving batteries.
- Please keep away from flammable material storage areas, residential areas, and other population centers when transporting and storing the damaged battery.

1.2.3 Safety Instructions of Liquid cooling unit

WARNING!

- When the liquid cooling unit is running, please do not touch the internal components of the liquid cooling unit with your hands at will to avoid electric shock or injury from the fan blades.

CAUTION!

- If severe vibration or abnormal sound occurs during running or debugging of the liquid cooling unit, please stop all operations and immediately cut off the circuit switch for inspection.
- Do not allow liquids such as water to enter the terminal area of the device during installation and maintenance.
- Only when all the circuit switches are turned off and the internal control board no longer flashes the signal light, can you operate the device circuit and electronic devices, and you must wear anti-static gloves.
- The waste is hazardous. Please properly handle it, and avoid contact of the waste with soil or drainage systems.
- Coolant may cause irritation to eyes, skin, and throat. When handling, wear PPE and use only authorized tools.
- Do not heat the liquid cooling unit in an empty container since it may cause an explosion.

NOTICE!

- While injecting the liquid, if the injection process is interrupted manually, restart the process from the beginning when resuming.
- During injection, ensure that the hose in the coolant collection tank is fully submerged and maintains proper coolant flow.
- After completing injection and drainage, thoroughly flush the hoses of the inject machine to remove residual coolant.
- Use a coolant collection tank with a capacity of 20 liters or more, and keep it clean, dry and free from contaminants.

NOTICE!

If the coolant leaks, please avoid contact with it at all times. In case of accidentally coming into contact with it, please do as follows:

- In case of contact with eyes: Rinse eyes with running water for at least 15 minutes, and seek medical attention;
- In case of contact with skin: Wash the contact area thoroughly with soap, and seek medical attention.

1.2.4 PCS Safety

DANGER!

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

WARNING!

- Operators must wear PPE while installation and maintenance of the device.
- During operation, avoid touching any parts of the PCS other than the LED panel.
- Never connect or disconnect the AC and DC connector while the PCS is running.
- Prior to conducting any maintenance, turn off the AC and DC power and disconnect them from the PCS. Wait for 15 minutes to fully discharge the energy.
- Avoid touching the PCS while it is running, as it becomes hot during operation and may cause personal injuries.

CAUTION!

- Make sure that children are supervised to prevent them from playing with the PCS.
- Pay attention to the weight of the PCS and handle it properly to avoid personal injuries.

NOTICE!

- The PCS has an integrated Residual Current Monitoring Unit (RCMU). If an external Residual Current Device (RCD) is required by local regulations, verify the type of RCD required. It is recommended to use a Type-A RCD with a rating of 300 mA unless a lower value is required by the specific local electric codes. When required by local regulations, the use of an RCD type B is permitted.

1.2.5 Utility Grid Safety

NOTICE!

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

1.3 Electrical Safety

DANGER!

- Please make sure that the unit is free from any damage before the electrical connection.
- Do not modify, change, or dismantle the device, do not change the power-on and power-off sequences and the installation procedure written in the document, and please properly and correctly operate it.
- Do not power on the device during installation. Otherwise, it may cause a fire, personal injury, or device damage.
- Must remove earrings, rings, bracelets, watches, and any other metal jewelry before operation, to avoid electrical shock, burns, or even death.
- During operation, special insulated tools must be used to avoid electric shock or short circuit failure. The insulated tools' voltage ratings must exceed the system voltage ratings. Please refer to "12 Technical Data" for system information.

WARNING!

- Please wear PPE, such as, protective clothing, insulating shoes, goggles, safety helmets, insulating gloves, etc., when conducting electrical wiring.
- Do not touch the power supply equipment directly, or through conductors or damp objects.
- Do not touch the parts of the equipment of which warning signs are attached, to avoid personal injury or device damage.

WARNING!

- Please check that there is no damage to the outer packaging before unpacking. If damaged, do not use and contact the transporter and manufacturer immediately.
- Do not place installation tools, metal parts and other sundries on the battery while installing. Items on and around it need to be cleaned up in time after finishing installation.
- Do not install the battery in rain, snow, fog and other weather to avoid battery damage.
- If the battery is damaged or accidentally drenched in water, do not install and use it. Please transport it to a safety isolation point and contact the local fire department or professional technicians for scrapping.
- If the battery cables are submerged in water, do not approach, touch or use them.
- Ensure that the positive and negative terminals of the battery are not accidentally grounded. If accidental grounding occurs, disconnect the battery terminals from the ground immediately.

CAUTION!

- Do not power on the device until it has been installed and confirmed by professionals.
- In the event of a fire, evacuate immediately and call the local fire services.

NOTICE!

- Please operate according to the safety code for power station.
- Before installation, it is necessary to set up temporary safety fences or warning lines and hang warning signs in the operation area, to prohibit non-staff from entering here.
- Please make sure that the equipment and its associated switches are off before connecting and disconnecting power cables.

NOTICE!

- Please check whether the protective housing and insulating sleeve for an electrical component have been installed correctly after finishing installation, to avoid electric shock.
- Must turn off the output switch of the power supply equipment when maintaining its electrical terminal device and power distribution device.
- If the device is required to be powered off during troubleshooting and diagnosis, please do as the following procedure: power off > electricity testing > connecting grounding cable > hanging warning signs and setting up guardrails.
- Must hang up "Do Not Switch On" warning signs on the relevant switches or circuit breakers before completing maintenance, to prevent power connection. Do not switch on before the fault is solved.
- Do not use water, alcohol, oil, or other solvents when cleaning electrical components inside and outside the device.

NOTICE!

Grounding Requirements:

- The device's grounding impedance shall meet the requirements of local electrical safety standards.
- The equipment shall be permanently connected to a grounding wire within the building's electrical system. Please check whether the device is reliably grounded before operation. The grounding cable should be removed last while dismantling and maintaining the device.
- Do not start the device if it is not fitted with a grounding conductor.
- All acts against the grounding conductor are prohibited.
- If the device is equipped with a three-pronged socket, make sure that the ground prong is reliably grounded.
- For the device that may generate large contact currents, please make sure that the grounding terminal on the housing has been grounded before powering on, to avoid electric shock.

Cable Requirements:

- When deciding the wire diameter, and connecting or wiring cables, follow the local laws, regulations, and codes to ensure safety.
- When external conditions (e.g., placement method, ambient temperature, etc.) change, the cable type must be verified according to IEC-60364-5-52 or local laws, regulations and standards. For instance, whether the cable's current-carrying capacity meets the requirements.
- Before connecting power cables, please make sure that the cable labels are correctly labelled and the cable terminals are well insulated.
- Do not loop and twist cables while conducting electrical wiring. If the length of the power cable is not enough, please replace it instead of joining or welding. Ensure that all the cables of the correct type and size are fully connected and well insulated, and the edges of cable slots and crossing holes are smooth.

NOTICE!

- It is recommended to bundle similar cables with cable ties, to ensure that the inside of the device is neat and tidy and to avoid cable jacket damage.
- Please use fireproof mud to seal the threading openings immediately after finishing wiring, to avoid the entry of water vapour or small animals.
- Cables should be kept away from heaters or other heat sources, because a high temperature environment may result in aging and damage to cable insulation.

NOTICE!

- Must turn off the output switch of the power supply equipment when maintaining its electrical terminal device and power distribution device.
- If the device is required to be powered off during troubleshooting and diagnosis, please do as the following procedure: power off > electricity testing > connecting grounding cable > hanging warning signs and setting up guardrails.
- Must hang up "Do Not Switch On" warning signs on the relevant switches or circuit breakers before completing maintenance, to prevent power connection. Do not switch on before the fault is solved.

NOTICE!

Short Circuit Protection:

- Please use electrical tape to wrap the bare conductor cables to prevent short circuits when installing and maintaining the battery.
- Prevent any object from entering into batteries, which may cause a short circuit.
- Regularly check the screws or copper bars on the device, to ensure that they are fully tightened.

Protection of Static-sensitive Components from Static Electricity:

- Please wear anti-static clothing and use anti-static gloves or wrist straps properly before operating sensitive equipment, and ensure that the wrist strap is grounded.
- Do not touch electronic components when picking up single boards or modules with exposed circuit boards.
- Please use anti-static materials to pack disassembled veneer boards or modules before storage or transportation, to avoid damage caused by static electricity.

2 Preparation before Maintenance

2.1 Preparation of Protective Equipment

WARNING!

- Avoid installing, operating and maintaining the device or cables outdoors under severe weather conditions such as lightning, rain or snow.

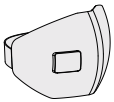
CAUTION!

- Please clear the fallen leaves, dust, water, snow, or other debris on the top of the cabinet before opening its doors, to avoid internal damage to the device.

Handling of replacement parts

- Please choose an appropriate transport method based on site conditions and device weight.
- Please wear PPE (e.g. protective gloves, shoes, belt, etc.) and lift the device with proper postures, to prevent personal injuries and device damage.
- Please reasonably arrange the number of workers, the right mix, and the handling position to achieve distributing weight and balancing load when moving the device.
- Please hold the handles or the bottom of the device when moving, to avoid device damage.
- Please pay attention to the surrounding environment when moving, such as, obstacles, slippery ground, etc., to avoid personal injuries and device damage.

Tools requirement


Dust mask


Insulating gloves


Protective glasses


Insulated shoes


Safety Vest


Safety helmet

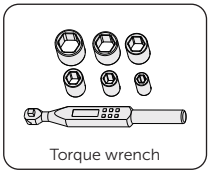

Seat belt

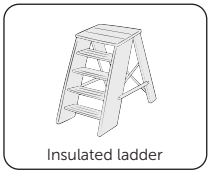
NOTICE!

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

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.	1 year
	• Check the system for abnormal noise while running.	1 year
Operation Status	The current, voltage, inlet and outlet coolant temperature / pressure and other data during liquid cooling unit operation meet the following range: • Current: less than the maximum operating current marked on the nameplate of the liquid cooling unit • Voltage: 230V±10% • Coolant operating temperature range: -30°C~55°C	1 year
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.	1 year

Check Item	Description	Interval Time
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.	1 year

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.	1 year
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 1 month after the first commissioning and Every 1 year 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 1 month after the first commissioning and Every 1 year thereafter
Pipe	• Appearance without damage, deformation, or corrosion. • The pipeline is fixed and the connection joints are not loose. • No failure or damage to valve components. • No coolant leaks.	1 year

Check Item	Description	Interval Time
Coolant	• Concentration meets range requirements. • The PH value and the concentration of each electrolyte meet the requirements of "Table 25-2 Coolant specifications" • No dirt, precipitation, algae, etc.	1 year

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.	1 year
Battery pack	• Check whether the battery appearance is deformed or damaged. • Check for abnormal noise during operation. • No coolant leaks.	1 year
PCS	• Check the appearance of the PCS for deformation or damage. • Check for abnormal noise during operation.	1 year
Liquid Cooling Unit	• The refrigeration system has no refrigerant leakage. • The coolant circulation system has no leakage. • Check the appearance for damage or deformation. • Check for abnormal noise during operation.	1 year
Smoke detector, temperature sensor, CO detector	• Check the appearance for damage or deformation.	1 year
Components (distribution box, UPS , EMS , IO module, etc.)	• Whether the appearance is damaged or deformed. • Check for abnormal noise during operation.	1 year
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.	1 year

3.3 Power Off

WARNING!

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

There are two methods to power off the system: normal power-off and emergency power-off. The latter is used only in emergencies.

Normal Power Off

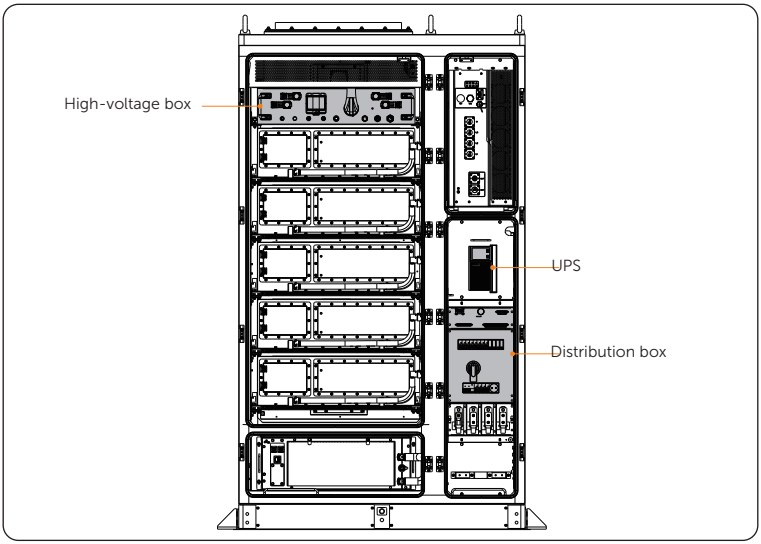


Figure 3-1 Position of modules for normally powering off system

Step 1 Open the front doors.

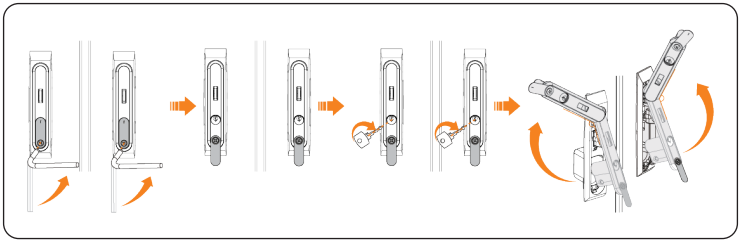


Figure 3-2 Opening the front doors

Step 2 Shut down the distribution box.

1. Flip down the "Cooling System MCB" breaker;
2. Flip down the "UPS" breaker;
3. Flip down the "APS2" breaker.

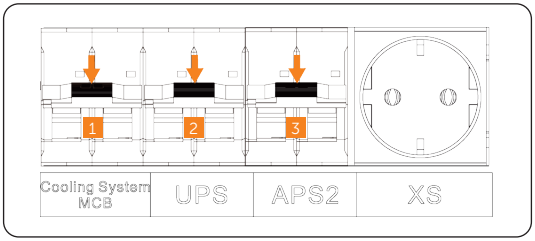


Figure 3-3 Flipping down breakers on distribution box (1)

1. Flip down the "APS1" breaker";
2. Flip down the "SPD MCB" breaker;

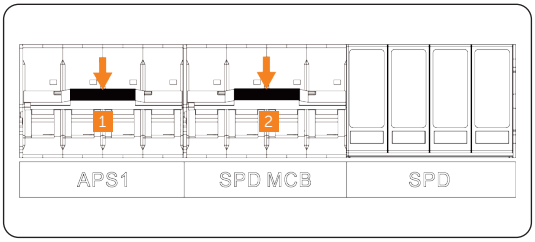


Figure 3-4 Shutting down breakers on distribution box (2)

1. Rotate the switch on the distribution box to "OFF" position;

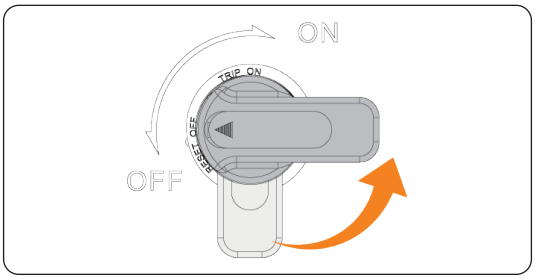


Figure 3-5 Switching off the distribution box

Step 3 Shut down the high-voltage box.

WARNING!

- Before switching off the high voltage box, check the LED indicator light status of the high voltage box. If it is flashing green, do not operate it in case of load breaking.

1. Rotate the switch on the high-voltage box to "OFF" position.

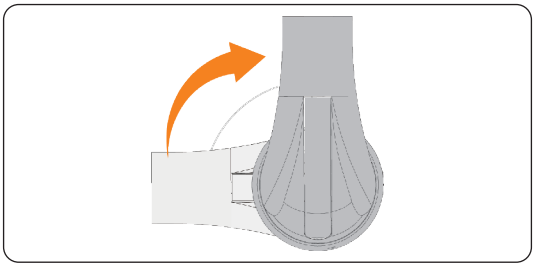


Figure 3-6 Switching off the high-voltage box

1. Flip down the breakers on the high-voltage box.

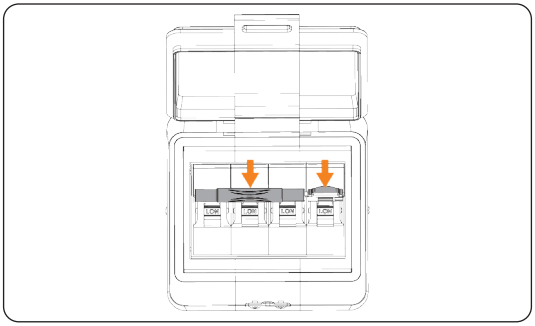


Figure 3-7 Flipping down high-voltage box breakers

Step 4 Press and hold the power button of the UPS for 3 seconds to shut down it.

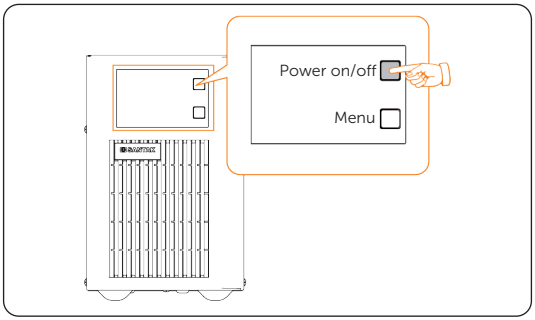


Figure 3-8 Shutting down the UPS

Emergency Power Off

WARNING!

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

Step 1 Flip up the cover.

Step 2 Press the emergency stop button.

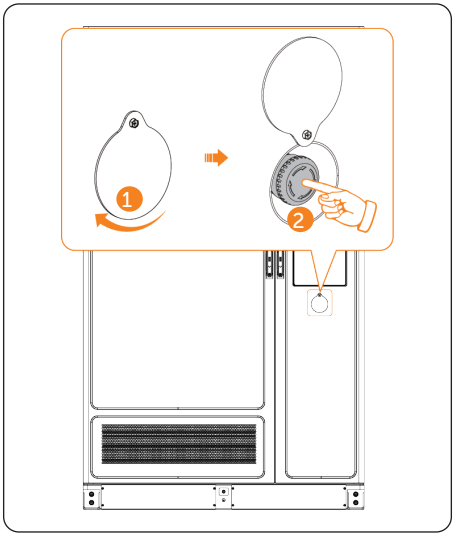


Figure 3-9 Pressing emergency stop button

NOTICE!

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

a. Rotate the cover;

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

3.4 Power On

Check before power on

Ensure that all cables connected to the 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

The position of components for powering on the system are as follows.

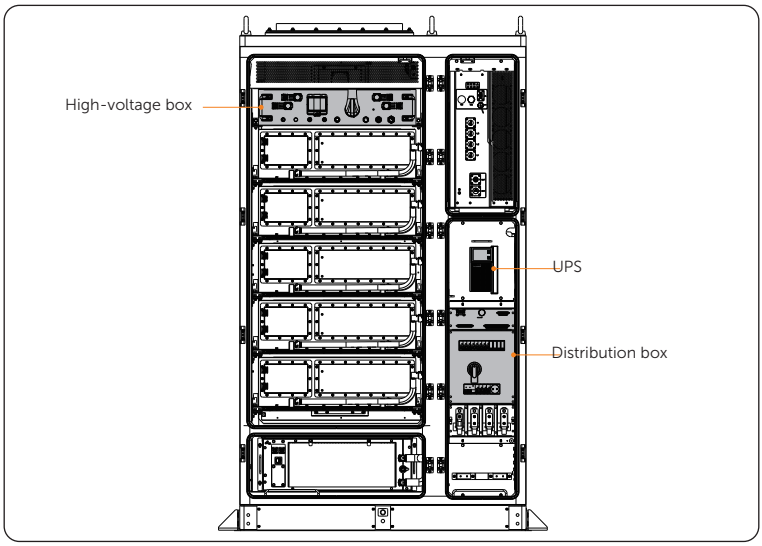


Figure 3-10 Position of modules for powering on system

Step 1 Start the distribution box.

1. Rotate the switch on the distribution box to the "ON" position;

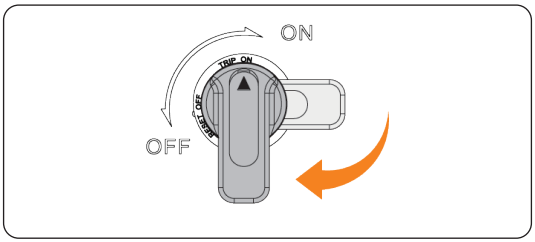


Figure 3-11 Switching on the distribution box

1. Flip up the "APS1" breaker";
2. Flip up the "SPD MCB" breaker;

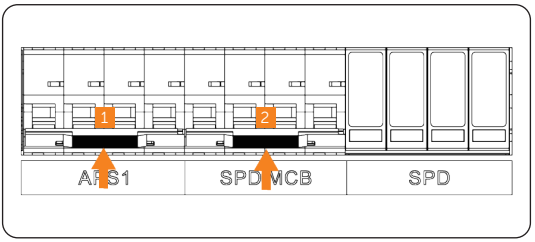


Figure 3-12 Flipping up breakers on distribution box (1)

1. Flip up the "Cooling System MCB" breaker;
2. Flip up the "UPS" breaker;
3. Flip up the "APS2" breaker.

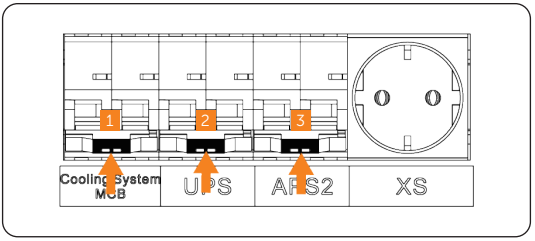


Figure 3-13 Flipping up breakers on distribution box (2)

Step 2 Press and hold the power button of the UPS for 3 seconds to turn on it.

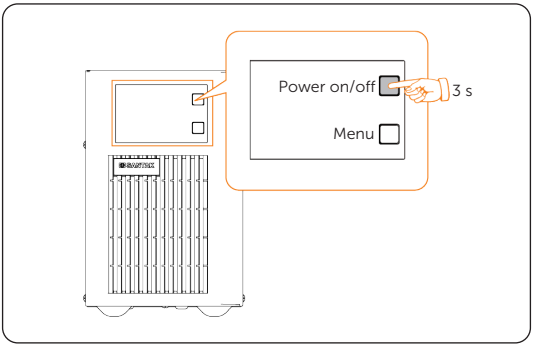


Figure 3-14 Holding and pressing button

Step 3 Start the high-voltage box.

1. Flip up the breakers of the high-voltage box.

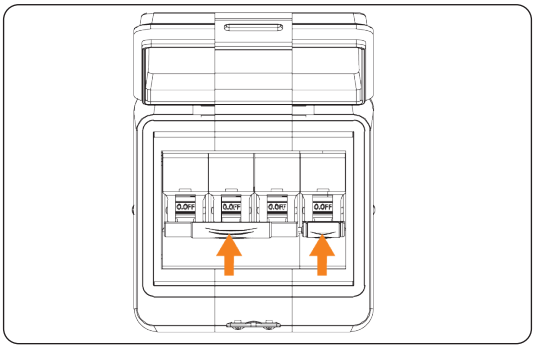


Figure 3-15 Flip up breakers on high-voltage box

1. Rotate the switch to the "ON" position.

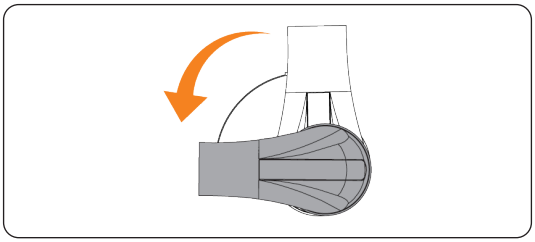


Figure 3-16 Switching on the high-voltage box

Step 4 Close the front doors, and remove and properly keep the keys.

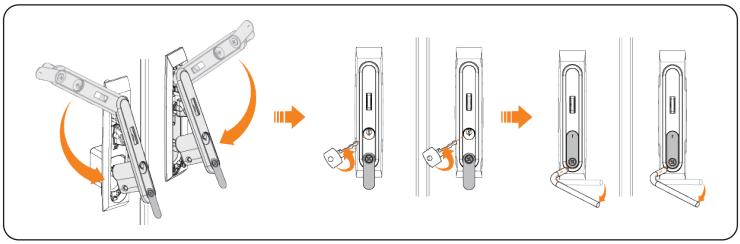


Figure 3-17 Closing the front doors

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, EMS1000 webpage, SolaxCloud APP, please handle alarms according to the suggestions. If you are unable to view the alarm information, please check the *TRENE-P125B261L-E Troubleshooting Manual*.

4.1 EMS Screen Login

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

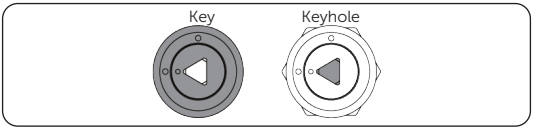


Figure 4-1 Correct position

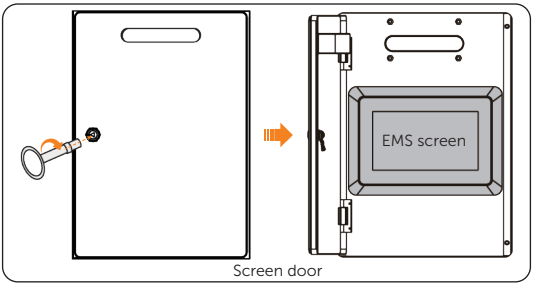


Figure 4-2 Unlocking screen door

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

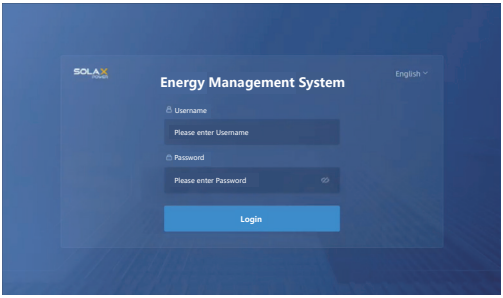


Figure 4-3 Local login

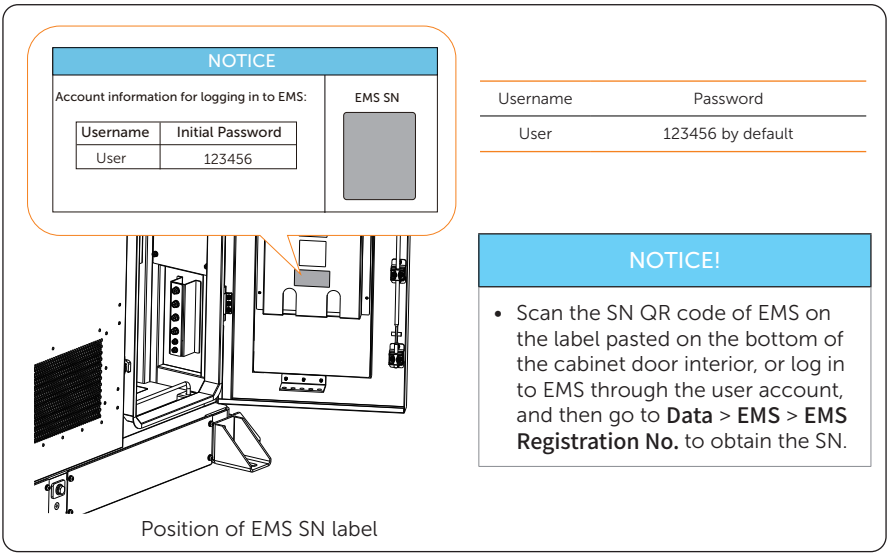


Figure 4-4 Position of EMS login information label

Step 3 After login, 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 4-5 Alarm information interface

4.2 EMS Setup

Step 1 Sign in an admin account from the login page.

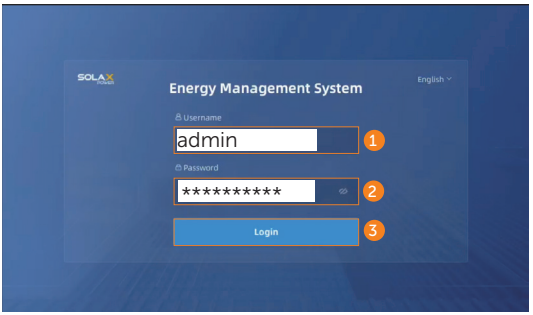


Figure 4-6 Signing in an admin account

NOTICE!

- Please pay attention to the case when entering your password.

Step 2 Tap Device Pairing. The inverter, cabinet and related devices will pair automatically, and the pairing result will be displayed.

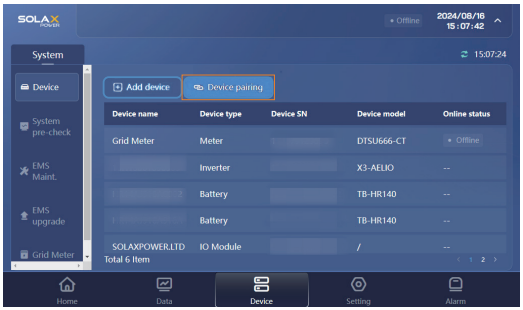


Figure 4-7 Pairing device

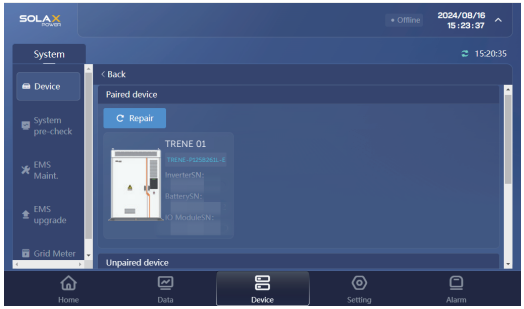


Figure 4-8 Pairing devices successfully

Step 3 Tap **Save and Pre-check** to save the pairing results.
On the pairing confirmation pop-up, tap **Confirm**.
The device list will be refreshed and displayed in architecture.

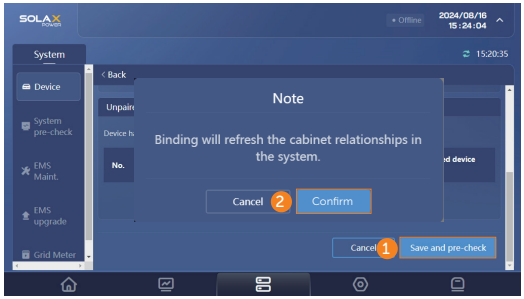


Figure 4-9 Saving and confirming pairing

4.3 EMS1000 Web Page Login

NOTICE!

- 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

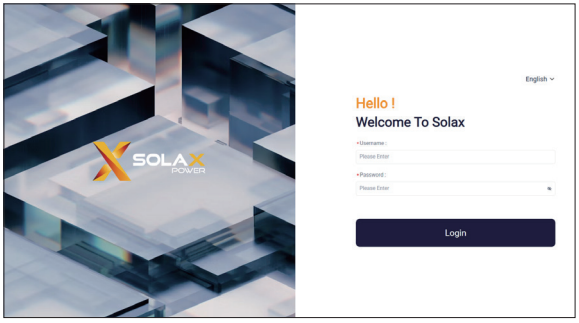


Figure 4-10 Login page

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.

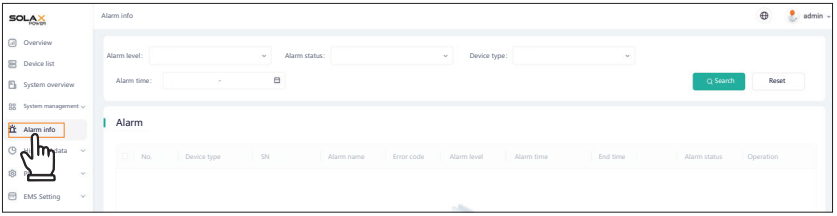


Figure 4-11 Alarm information interface

4.4 SolaXCloud APP Login

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 4-12 QR code

Step 2 On the login page, enter your username and password. Check the boxes to agree to the privacy policy and terms of use. Click on **Login** to complete the app login. You can directly contact the SolaX to obtain your login credentials.

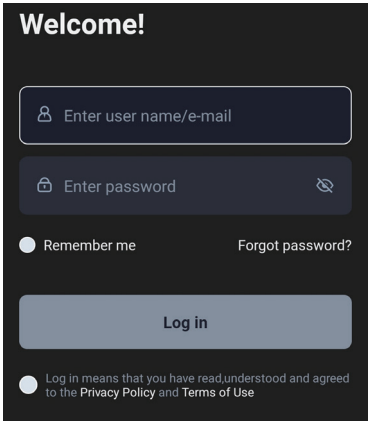


Figure 4-13 Login page

Step 3 After logging in, you can click Alarm at the bottom of the APP to view the alarm information.

The alarm information page includes error code, device type, device serial number, alarm time and so on. Tap Details to view the possible reasons for the alarm and the advice provided for the alarm.

Figure 4-14 Alarm page

5 Replacement of Battery Pack

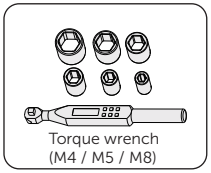
Fault location

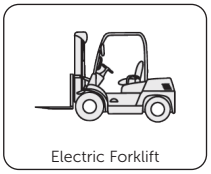
a. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.

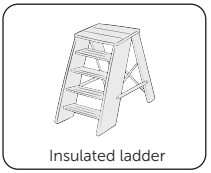
b. Refer to the alarm handling suggestions in the alarm details.

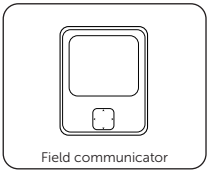
Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:

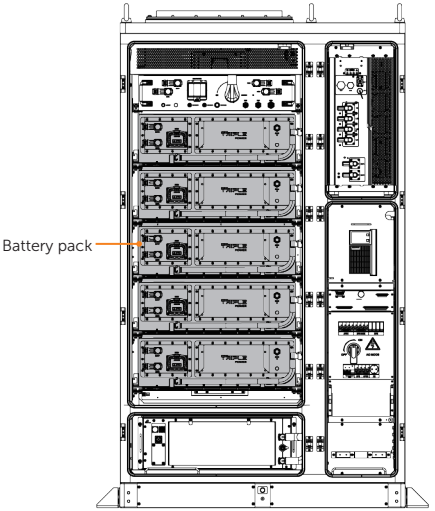

Torque wrench
(M4 / M5 / M8)


Electric Forklift


Insulated ladder


Field communicator

- 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 and the battery pack MSD has been removed. 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.
- 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.
- 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.
- The battery pack needs to be removed sequentially from the bottom to the top.

5.1 Replacement of Battery Pack

Procedure

Step 1 Check the ambient temperature

» If the temperature is above -15°C, perform the **Step2**;

» If the temperature is lower than -15°C, perform **a** in **Step2**, remove the MSD of the battery pack, and then refer to the liquid drain procedure in the "25.2 System Drain Operation" and perform the drain.

Step 2 Remove cables and pipes of battery pack

a. Remove the MSD: Rotate the handle to vertical, press the position shown in the following figure with one hand, pull the handle with the other hand, and pull out the MSD;

b. Remove the power cables: Press down on both sides of the connector and pull out;

c. Remove the communication cable: Turn the terminal counterclockwise to remove;

d. Remove the liquid cooling pipe inlet and outlet: Press the position shown in the figure and pull out the pipe.

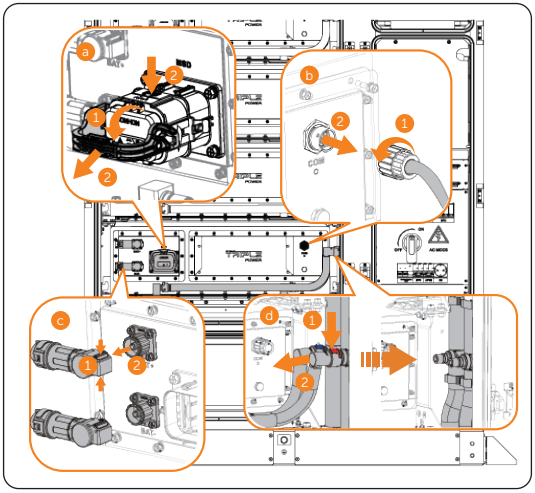


Figure 5-1 Removing cables and pipes of battery pack

Step 3 Remove the screws securing the battery pack to the cabinet, and take out the battery pack with a forklift.

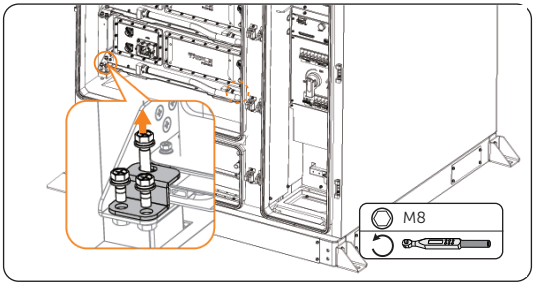


Figure 5-2 Taking out the battery pack

Step 4 Place the new battery pack on the forklift with a sling and push the pack into the cabinet.

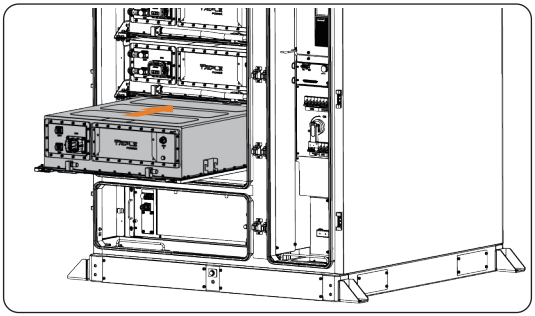


Figure 5-3 Installing the new battery pack

Step 5 Tighten the screws on both sides of the battery pack with a socket (Screw size M8, torque 12.0±1.0 N·m).

Step 6 Connect cables and pipes of battery pack.

NOTICE!
• You will hear a "Click" when the power cable installation is complete.

Step 8 Depending on the fluid drained before replacement:

» If there is no drain, end the operation.

» If the machine is drained, refill the machine according to "25.1 Coolant Filling Operation".

Step 9 Install the MSD of battery pack.

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 for 15 seconds and then release it, the high voltage box performs address assignment and the LEDs flash green rapidly. Until the assignment is complete, normal operation, the indicator light flashes green routinely.

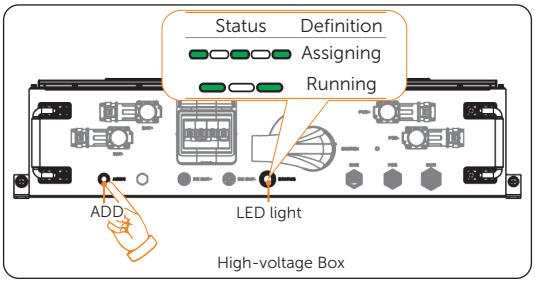


Figure 5-4 Assigning the address

Step 3 Connect the filed communicator to the DEBUG port of liquid cooler unit, open it.

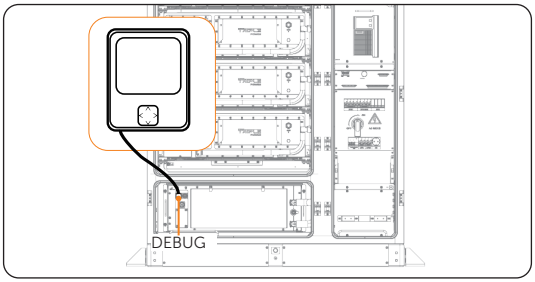


Figure 5-5 Connecting the filed communicator

NOTICE!

- If the Outlet Water Pressure < 1.5 Bar, it is necessary to perform coolant replenishment operations, refer to "25.3 Coolant Replenishment Operation" for details.

Step 4 Check whether the battery pack communication is normal via EMS1000 webpage or SolaXCloud App.

5.2 Replacement of BMU

Procedure

Step 1 Remove cables and pipes of battery pack

a. Remove the MSD: Rotate the handle to vertical, press the position shown in the following figure with one hand, pull the handle with the other hand, and pull out the MSD;

b. Remove the power cables: Press down on both sides of the connector and pull out;

c. Remove the communication cable: Turn the terminal counterclockwise to remove;

d. Remove the liquid cooling pipe inlet and outlet: Press the position shown in the figure and pull out the pipe.

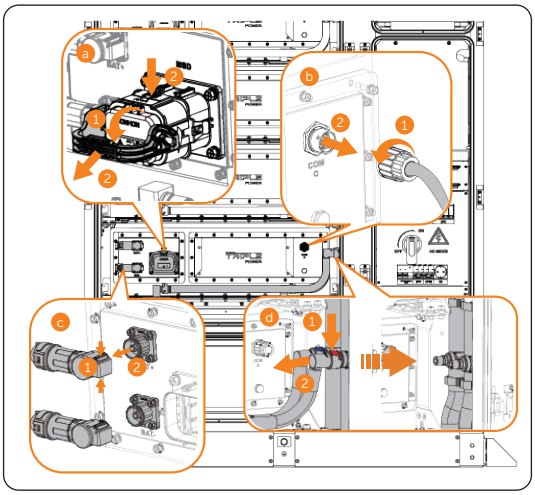


Figure 5-6 Removing cables and pipes

Step 2 Remove the faulty BMU.

a. Remove the panel fixing screws;

b. Remove the wires from the panel and slowly remove the front panel;

c. Remove the BMU fixing screws, and then remove the faulty BMU.

NOTICE!

- After removing the screws from the panel, do not remove the panel directly! You must first unplug the cables from the internal side of the panel near the battery pack!

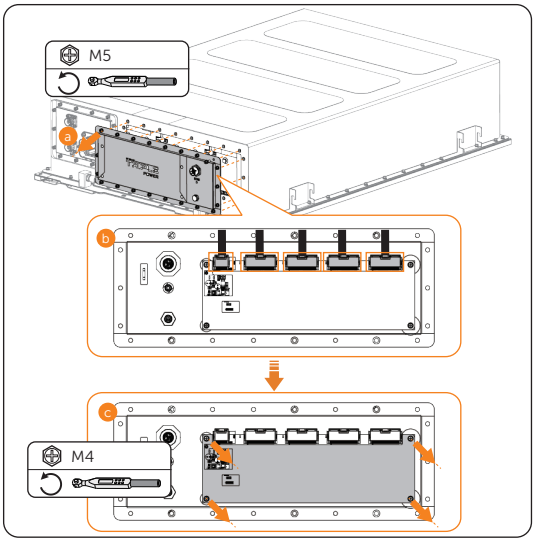


Figure 5-7 Removing the PCBA

Step 3 Refer to the reverse operation of **step 2**, install the new BMU (Screw size M4, torque 1.6±0.2 N·m), connect the cables;

Step 4 Install the front panel (Screw size M5, torque 3.0±0.3 N·m).

Step 5 Connect cables and pipes and finally install the MSD of battery pack.

NOTICE!

- You will hear a “Click” when the power cable installation is complete.

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 for 15 seconds and then release it, the high voltage box performs address assignment and the LEDs flash green rapidly. Until the assignment is complete, normal operation, the indicator light flashes green routinely.

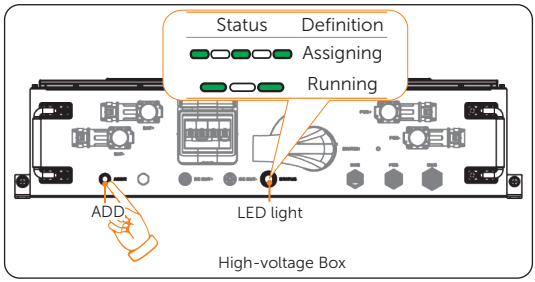


Figure 5-8 Assigning the address

Step 3 Check whether the battery pack communication is normal via EMS1000 webpage or SolaXCloud App.

6 Replacement of High-voltage Box

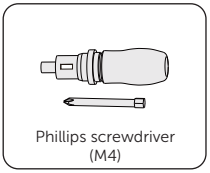
Fault location

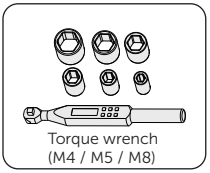
a. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.

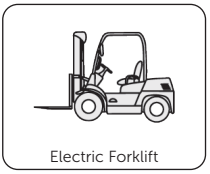
b. Refer to the alarm handling suggestions in the alarm details.

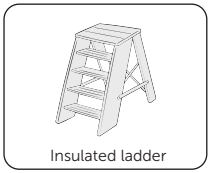
Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:

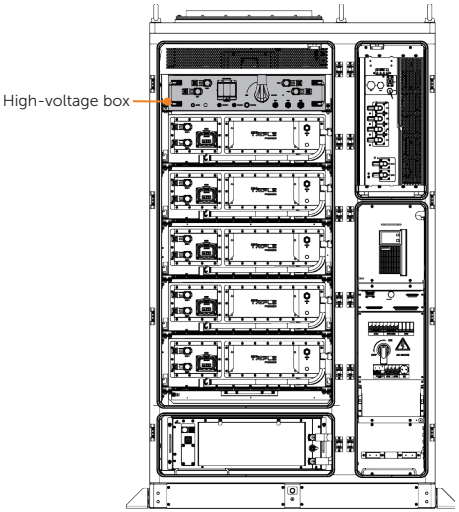

Phillips screwdriver (M4)


Torque wrench (M4 / M5 / M8)


Electric Forklift


Insulated ladder

- Position of the High-voltage Box in cabinet:



WARNING!

- Before replacing the high-voltage box, ensure that the system is powered off and the battery pack MSD has been removed. 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 15 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

6.1 Replacement of High-voltage Box

Procedure

Step 1 Remove the MSD of 5 battery packs: Rotate the handle to vertical, press the position shown in the following figure with one hand, pull the handle with the other hand, and pull out the MSD. See **a** in "Figure 5-1 Removing cables and pipes of battery pack".

Step 2 Remove the cable connected to the faulty high-voltage box.

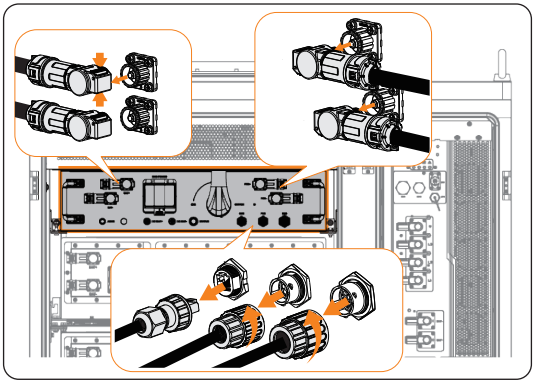


Figure 6-1 Removing the cables

Step 3 Remove the screws securing the high-voltage box to the cabinet, then remove the high-voltage box.

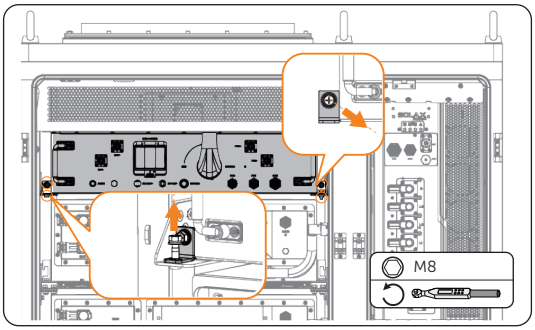


Figure 6-2 Removing the faulty high-voltage box

Step 4 Install the new high-voltage box, fix screws to the cabinet (Screw size M8, torque 12.0±1.0 N·m), and connect the cables.

Step 5 Connect cables and finally install the MSD of battery pack.

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 for 15 seconds and then release it, the high voltage box performs address assignment and the LEDs flash green rapidly. Until the assignment is complete, normal operation, the indicator light flashes green routinely.

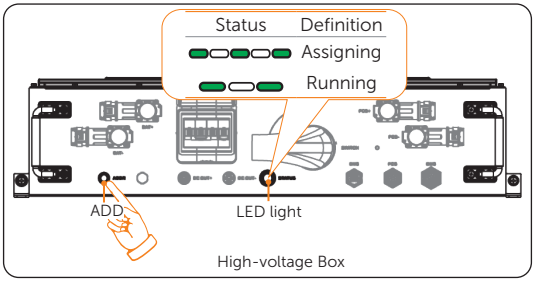


Figure 6-3 Assigning the address

Step 3 See "4.2 EMS Setup" to pair the high-voltage box.

Step 4 Check whether the high-voltage box communication is normal via EMS1000 webpage or SolaXCloud App.

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.

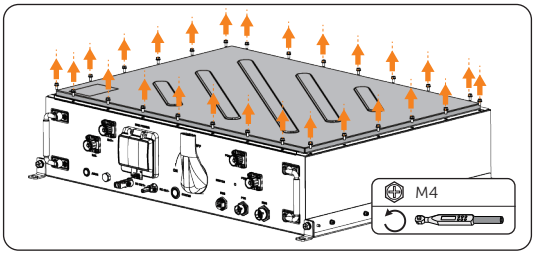


Figure 6-4 Removing the upper cover

Step 3 Unplug the cables of HVU or SBMU.

a. Remove the cables from the board;

b. Remove the screws securing the board;

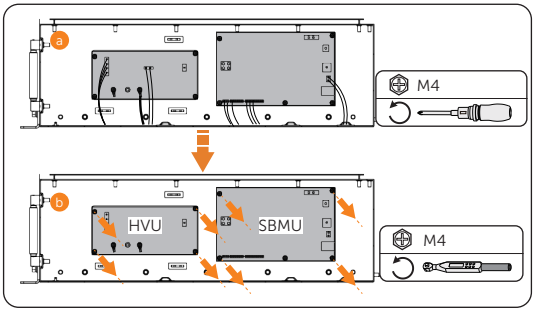


Figure 6-5 Removing the HVU or SBMU (Left view)

Step 4 Install the new HVU or SBMU and fix it with screws (Screw size M4, torque 1.6±0.2 N·m). Insert the cable according to the line mark.

Step 5 Install the upper cover of the High-voltage Box and tighten it with screws (Screw size M4, torque 1.6±0.2 N·m).

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 for 15 seconds and then release it, the high voltage box performs address assignment and the LEDs flash green rapidly. Until the assignment is complete, normal operation, the indicator light flashes green routinely.

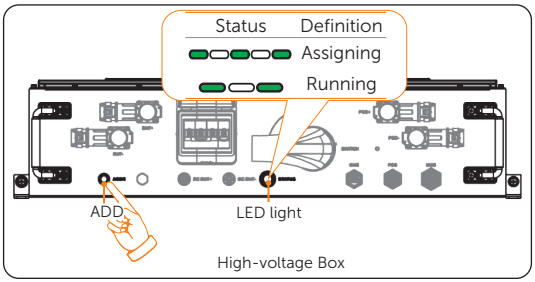


Figure 6-6 Assigning the address

Step 3 See "4.2 EMS Setup" to pair the high-voltage box.

Step 4 Check whether the high-voltage box communication is normal via EMS1000 webpage or SolaXCloud App.

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.

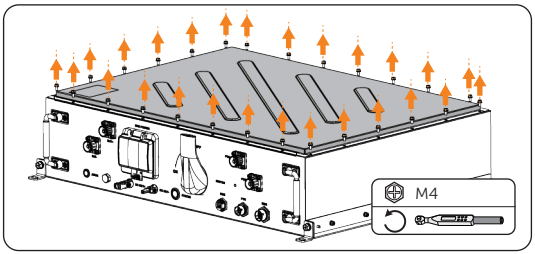


Figure 6-7 Removing the upper cover

Step 3 Remove the faulty Fuse.

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

b. Remove the cables of the fuse;

c. Loosen the screws from the fuses and remove the fuses.

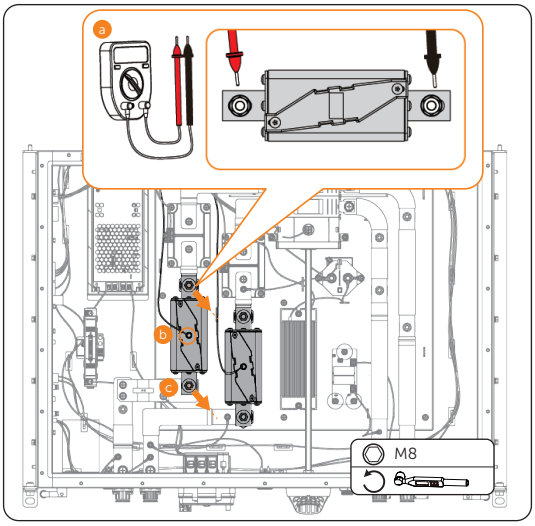


Figure 6-8 Removing the faulty fuse (Top view)

Step 4 Install new fuses and secure with screws (Screw size M8, torque 12.0±1.0 N·m). Connect the cables of the fuse.

Step 5 Use a multimeter to measure the new fuse ON-OFF status (ON for normal, OFF for abnormal).

Step 6 Install the upper cover of the high-voltage and secure with screws (Screw size M4, torque 1.6±0.2 N·m).

Step 7 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 for 15 seconds and then release it, the high voltage box performs address assignment and the LEDs flash green rapidly. Until the assignment is complete, normal operation, the indicator light flashes green routinely.

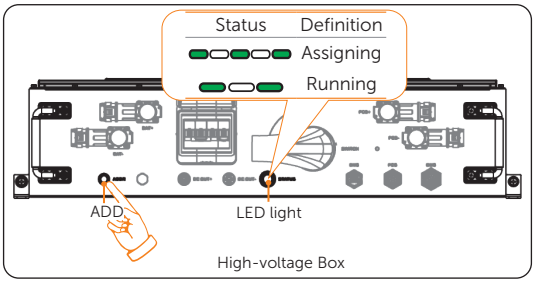


Figure 6-9 Assigning the address

Step 3 Check whether the high-voltage box communication is normal via EMS1000 webpage or SolaXCloud App.

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 of the upper cover of the high-voltage box and remove the upper cover.

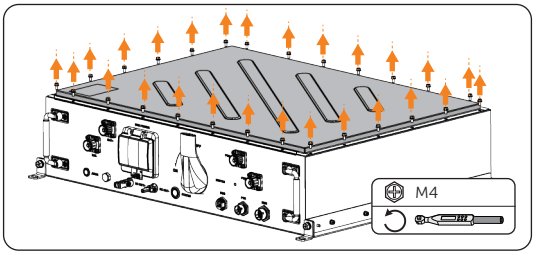


Figure 6-10 Removing the upper cover

Step 3 Remove the cables of faulty contactor (There are two contactors in the high pressure box, the following disassembly procedure, one of them as an example).

a. Use a multimeter to measure the contactor ON-OFF status (ON for abnormal, OFF for normal);

b. Remove the cables of the contactor;

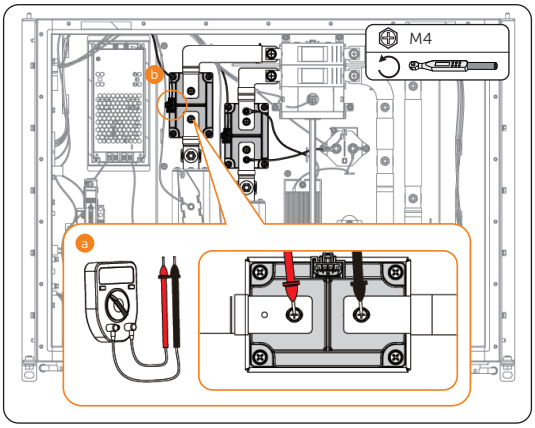


Figure 6-11 Removing the cables

Step 4 Remove the screws securing the contactor

a. Remove the screws (Screw size M6, torque 5.0±0.5 N·m);

b. Remove the screws (Screw size M8, torque 12.0±1.0 N·m);

c. Remove the screws (Screw size M8, torque 12.0±1.0 N·m);

d. Remove the screws (Screw size M5, torque 3.0±0.3 N·m);

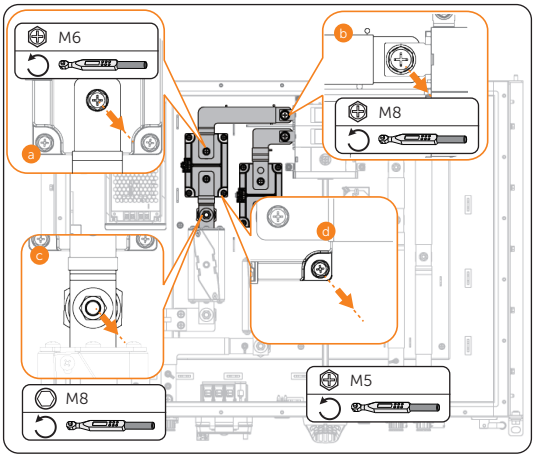


Figure 6-12 Removing contactor (top view)

Step 5 Install a new contactor and secure with screws, following the reverse order of **step4.**

Step 6 Connect the cables of new contactor (Screw size M4, torque 1.6±0.2 N·m).

Step 7 Use a multimeter to measure the ON-OFF status of the new contactor (ON for abnormal, OFF for normal).

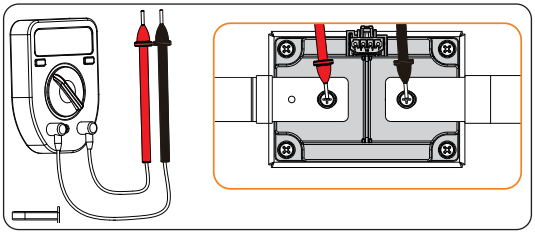


Figure 6-13 Measure contactor on-off

Step 8 Install the upper cover of high-voltage box and fix it with screws (Screw size M4, torque 1.6±0.2 N·m).

Step 9 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 for 15 seconds and then release it, the high voltage box performs address assignment and the LEDs flash green rapidly. Until the assignment is complete, normal operation, the indicator light flashes green routinely.

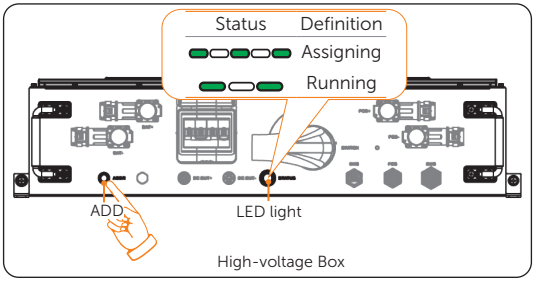


Figure 6-14 Assigning the address

Step 3 Check whether the high-voltage box communication is normal via EMS1000 webpage or SolaXCloud App.

7 Replacement of EMS

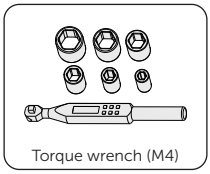
Fault location

a. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.

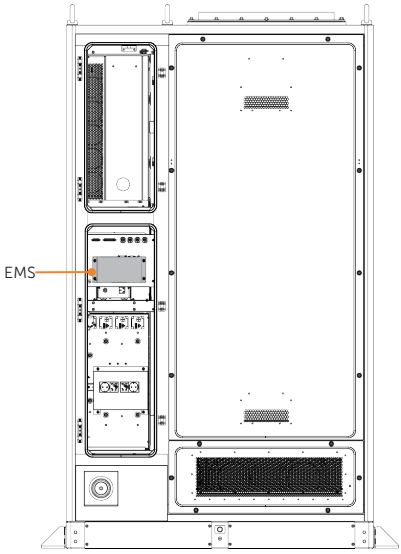
b. Refer to the alarm handling suggestions in the alarm details.

Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:


Torque wrench (M4)

- 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 15 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

Procedure

Step 1 Remove cables from EMS.

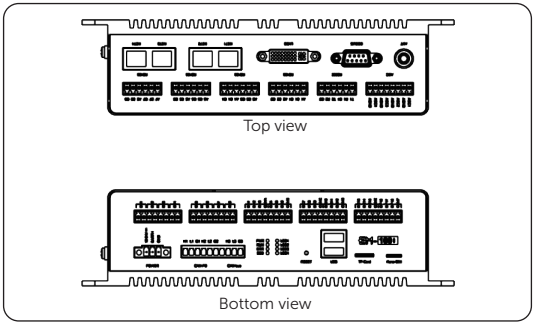


Figure 7-1 EMS Wiring Area

Step 2 Remove the EMS from the cabinet.

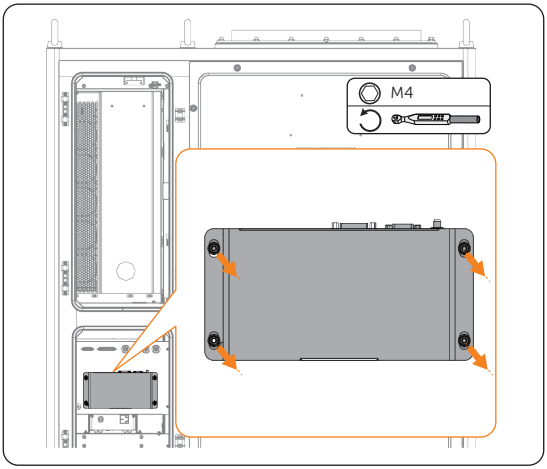


Figure 7-2 Removing the EMS

Step 3 Install a new EMS to the cabinet, and secure with screws (Screw size M4, torque 1.6±0.2 N·m).

Step 4 Connect the EMS cables according to silk screen and cable markings.

Checking after replacement

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

Step 2 See "4.2 EMS Setup" to pair the EMS.

Step 3 Check whether the system is back to normal by EMS1000 a web page or SolaXCloud.

8 Replacement of Switch

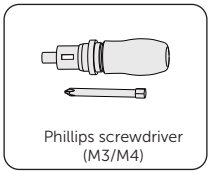
Fault location

a. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.

b. Refer to the alarm handling suggestions in the alarm details.

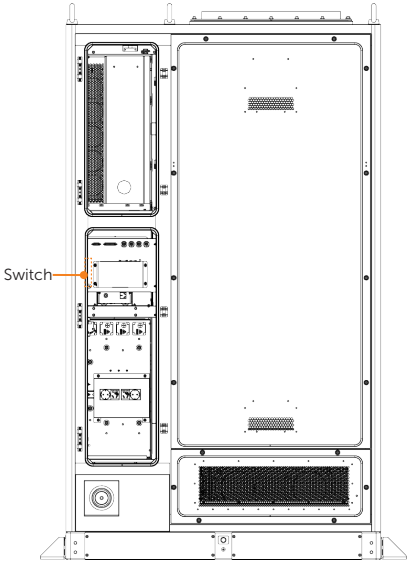
Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:



Phillips screwdriver (M3/M4)

- Position of the Switch in cabinet:



WARNING!

- Before replacing the Switch, 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 15 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

Procedure

Step 1 Remove the cables of Switch, then remove the Switch from the sheet metal.

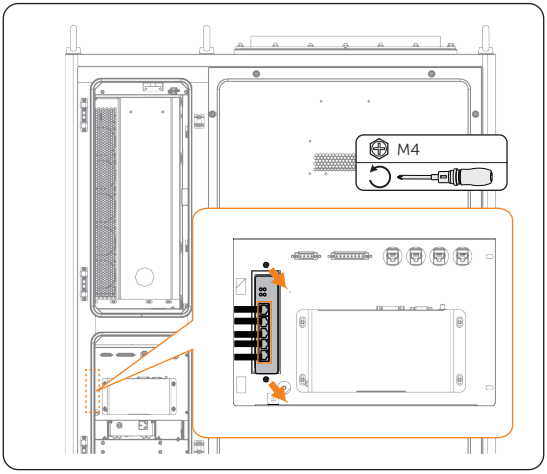


Figure 8-1 Removing the Switch

Step 2 Remove the Switch from the bracket.

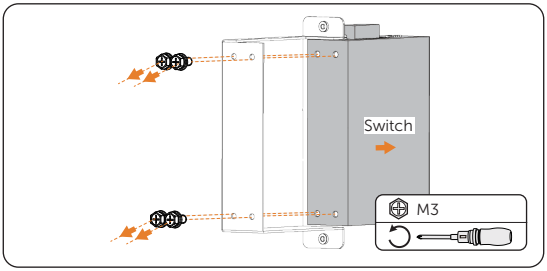


Figure 8-2 Removing the Switch

Step 3 Attach the new Switch to the mounting bracket (Screw size M3, torque 1.0±0.1

N·m).

Step 4 Install the Switch to the cabinet (Screw size M4, torque 1.6±0.2 N·m).

Step 5 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 Switch is flashing.

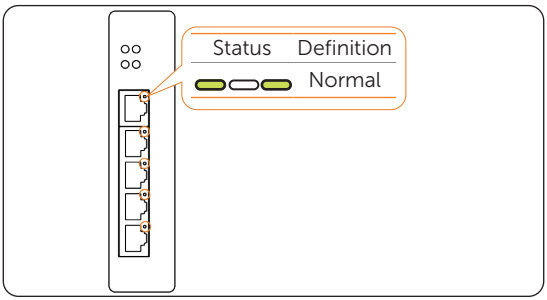


Figure 8-3 Switch Normal Operation Indicator

9 Replacement of UPS

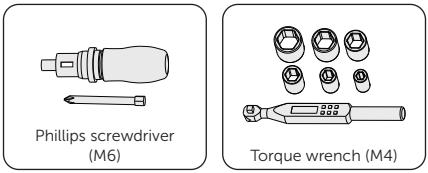
Fault location

a. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.

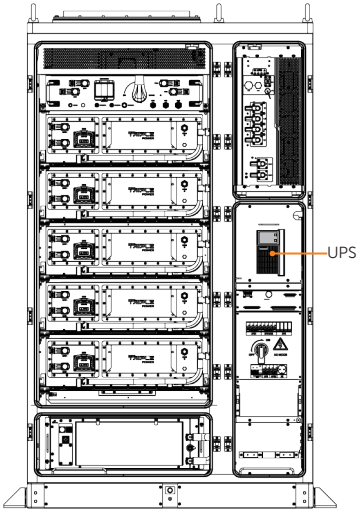
b. Refer to the alarm handling suggestions in the alarm details.

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 15 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

Procedure

Step 1 Remove the panel.

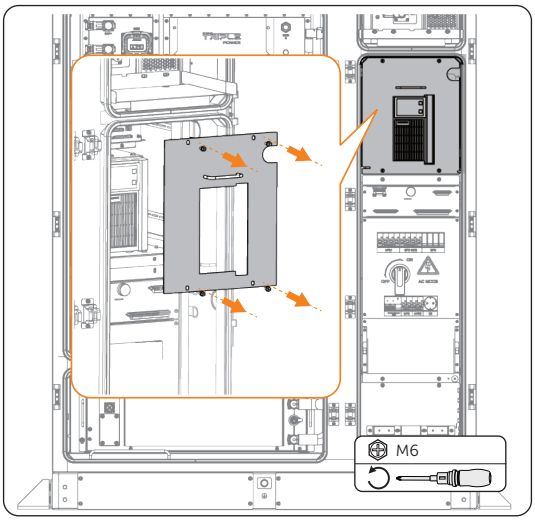


Figure 9-1 Removing the panel

Step 2 Unplug the UPS cables.

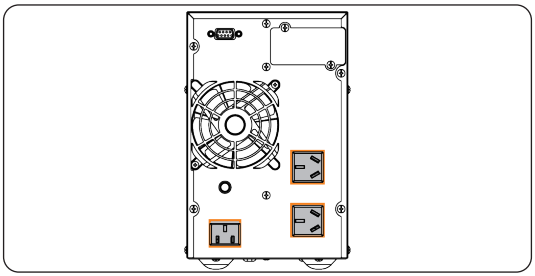


Figure 9-2 UPS Wiring Panel

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

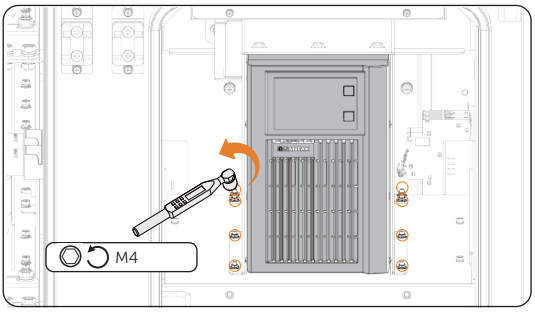


Figure 9-3 Removing the UPS

Step 4 Place the new UPS in the cabinet and screw on the screws (Screw size M4, torque 1.6±0.2 N·m).

Step 5 UPS wiring.

Step 6 Install the panel (Screw size M6, torque 5.0±0.5 N·m).

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, whether the screen can be displayed normally, and there is no alarm message on the screen. See the following chart for UPS screen display information.

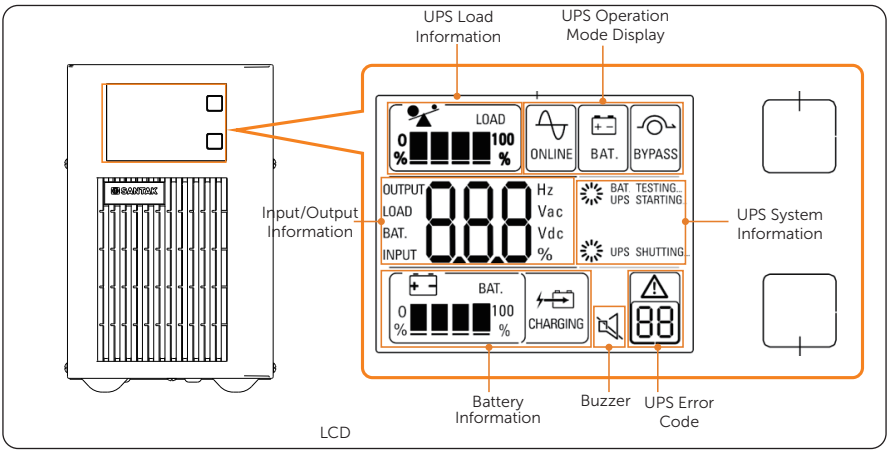


Figure 9-4 LED light

Table 9-3 Description

Display	Description
Input/Output Information	It indicates input and output voltage/frequency value, which are displayed alternately. It also indicate load per cent and battery voltage value.
UPS Operation Mode Display	It indicates UPS operating mode.
Load information	Indicates the load level. Each grid represents the level of 25%. If UPS is overloaded, the icon  would flash once time per second.
Battery Information	Indicates the battery capacity. Every grid represents the capacity of 25%. If the battery charger is running, the icon  would show.
Buzzer 	The icon will be displayed after panel key operation or serial command mute.
	The icon will be displayed when the buzzer sounds normally.
UPS System Information	Indicates UPS system information
UPS Error Code	Indicates the UPS is in Fault mode or has some warnings. Indicates Fault kind or Warning kind, several warning kinds at the same time could be displayed alternately. The icon  would falsh when having warnings. The icon  would show continuous when in Fault mode.

10 Replacement of IO Module

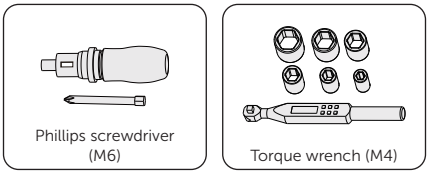
Fault location

a. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.

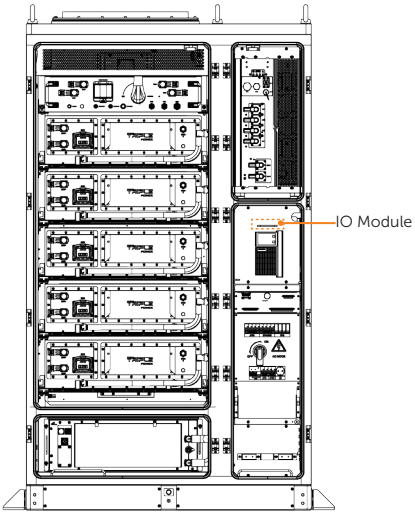
b. Refer to the alarm handling suggestions in the alarm details.

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 15 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

Procedure

Step 1 Remove the panel.

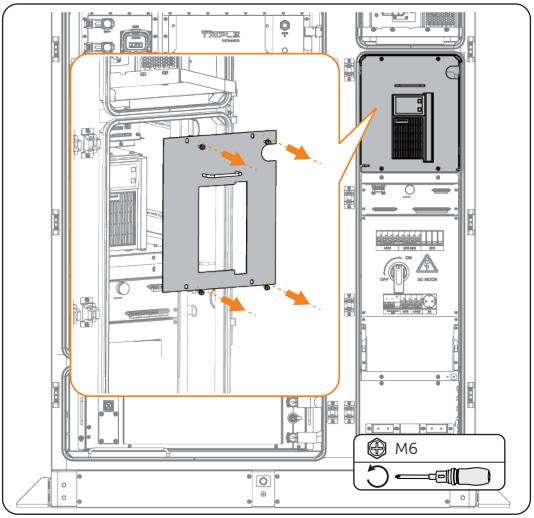


Figure 10-1 Removing panel

Step 2 Remove the cables from the IO module.

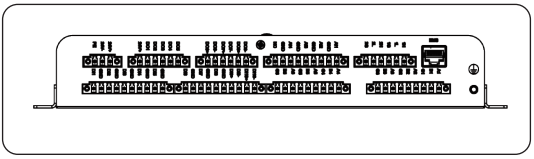


Figure 10-2 IO Module wiring panel

Step 3 Remove the IO module from the cabinet and the bracket.

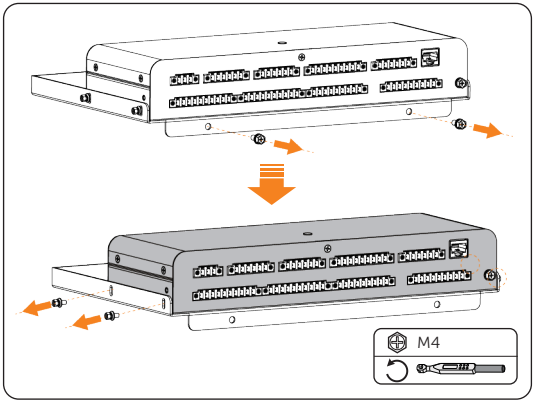


Figure 10-3 Removing the IO module

Step 4 Replace the new IO module and assemble the new IO module with the bracket (Screw size M4, torque 1.6±0.2 N·m).

Step 5 Install the IO module into the cabinet (Screw size M4, torque 1.6±0.2 N·m).

Step 6 Connect the cables according to the line label and screen printing.

Step 7 Mounting the panel (Screw size M6, torque 5.0±0.5 N·m).

Checking after replacement

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

Step 2 See "4.2 EMS Setup" to pair the IO module.

Step 3 Check whether the system is back to normal by EMS1000 a web page or SolaXCloud.

11 Replacement of CO Detector

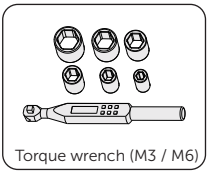
Fault location

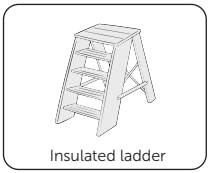
a. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.

b. Refer to the alarm handling suggestions in the alarm details.

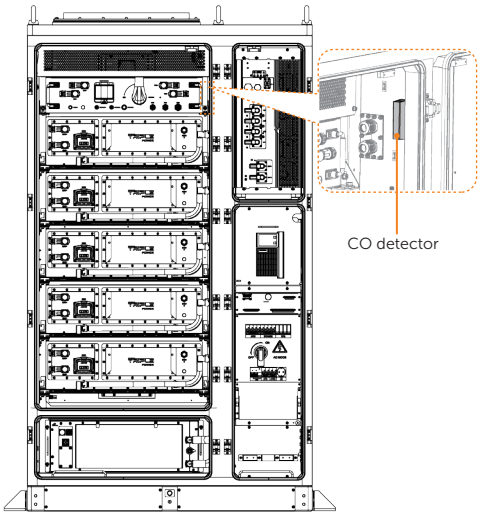
Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:


Torque wrench (M3 / M6)


Insulated ladder

- Position of the CO detector in 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 15 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

Procedure

Step 1 Remove the alignment plate.

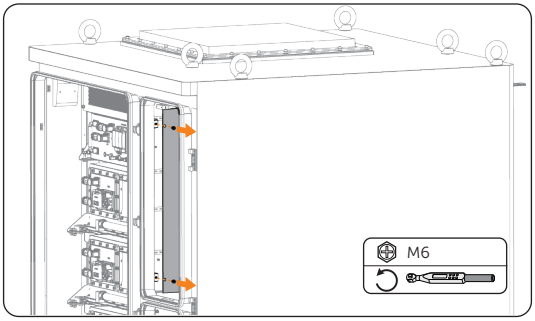


Figure 11-1 Removing the alignment plate

Step 2 Disconnect cable from faulty CO detector.

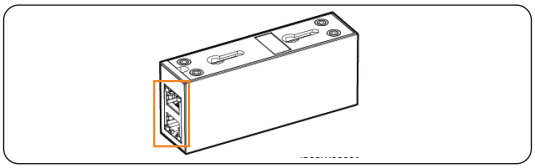


Figure 11-2 Removing wiring cables

Step 3 Remove the screws securing the CO detector and remove the CO detector.

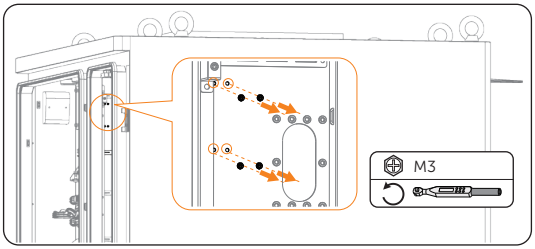


Figure 11-3 Removing CO detector

Step 4 Install a new CO detector (Screw size M3, torque 1.0±0.1 N·m), and connect cables.

Step 5 Reinstall the alignment plate (Screw size M6, torque 5.0±0.5 N·m).

Checking after replacement

For details of checking procedure after replacement, please refer to "24 Checking after replacement".

12 Replacement of Smoke Detector or Temperature Detector

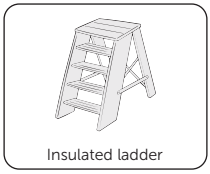
Fault location

a. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.

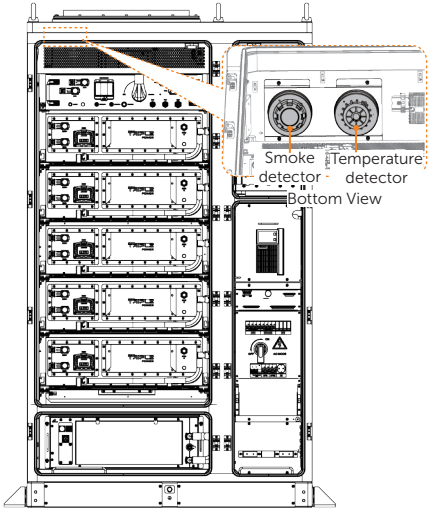
b. Refer to the alarm handling suggestions in the alarm details.

Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:


Insulated ladder

- 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 15 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

Procedure

Step 1 Loosen the cover of the detector counterclockwise.

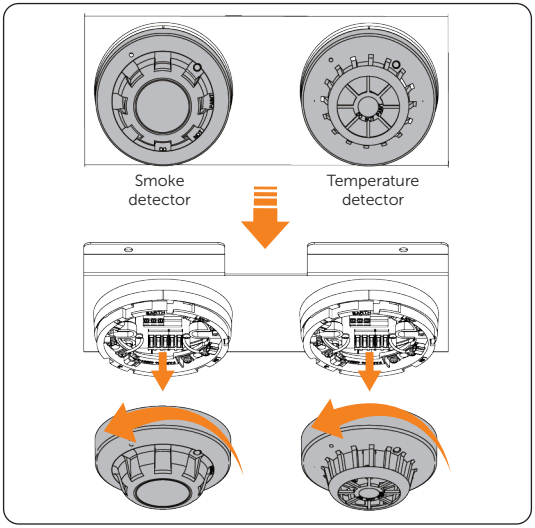


Figure 12-1 Removing the detector

Step 2 Install the new detector by rotating the detector clockwise until it locks into place and you hear a "click".

Checking after replacement

For details of checking procedure after replacement, please refer to "24 Checking after replacement".

13 Replacement of Door Sensor

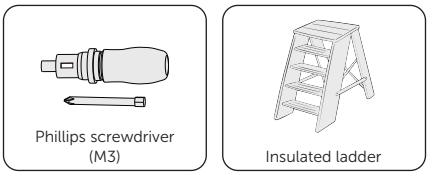
Fault location

a. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.

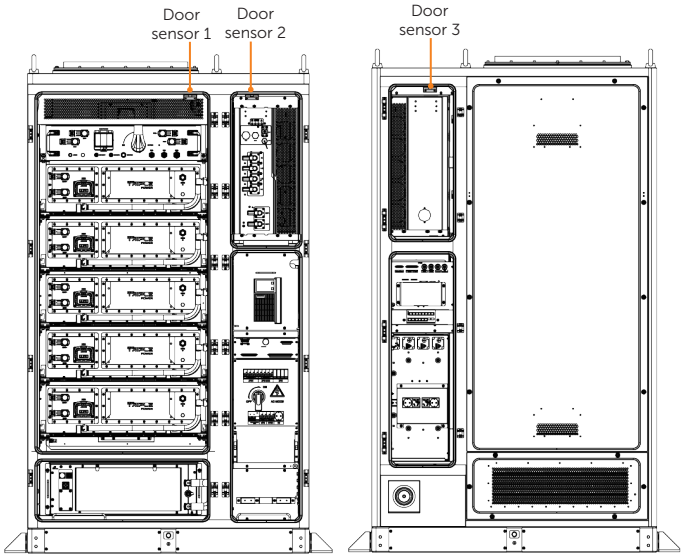
b. Refer to the alarm handling suggestions in the alarm details.

Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:



- Position of the door sensor in cabinet:



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 15 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

Procedure

Step 1 Remove the screws securing the door sensor and remove the door sensor.

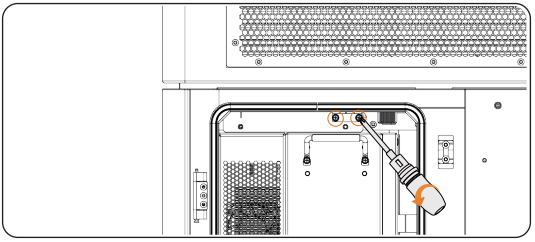


Figure 13-1 Removing the door sensor

Step 2 Install a new door sensor.

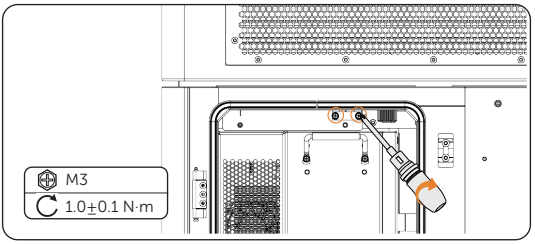


Figure 13-2 Installing a new door sensor.

Checking after replacement

For details of checking procedure after replacement, please refer to "24 Checking after replacement".

14 Replacement of Temperature and Humidity Sensor

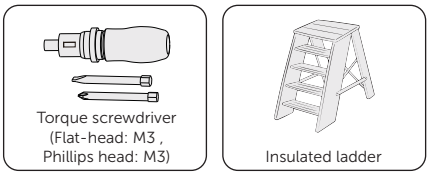
Fault location

a. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.

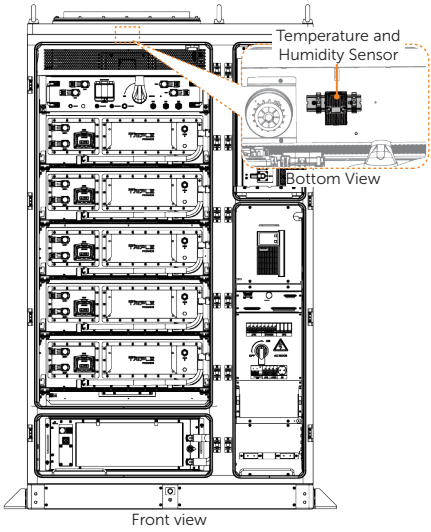
b. Refer to the alarm handling suggestions in the alarm details.

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 15 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

Procedure

Step 1 Remove the temperature and humidity sensor from the cabinet

a. Unscrew the terminal and remove the cables from temperature and humidity sensor;

b. Unscrew and remove the fixture outward along the guide, and then remove the temperature and humidity sensor.

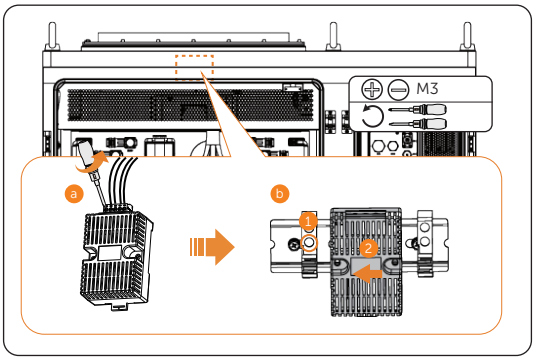


Figure 14-1 Removing temperature and humidity sensor

Step 2 Install the temperature and humidity sensor along the slide rail and lock the screw (Screw size M3, torque: 0.3±0.1 N·m).

Step 3 Connect the cable according to the cable label (Screw size M3, torque: 0.3±0.1 N·m).

Checking after replacement

For details of checking procedure after replacement, please refer to "24 Checking after replacement".

15 Replacement of Thermostat

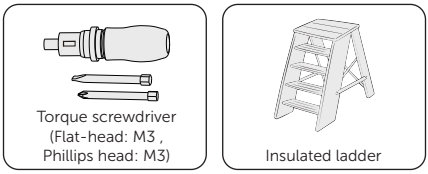
Fault location

a. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.

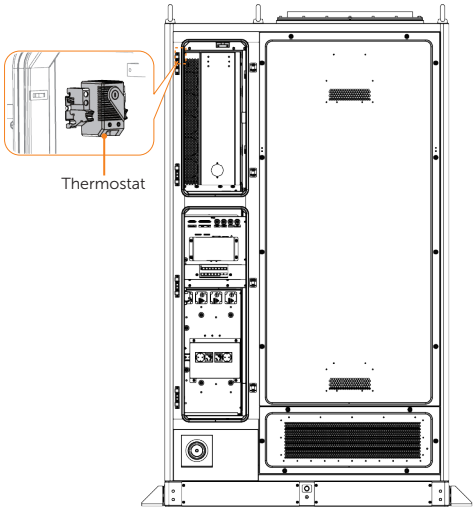
b. Refer to the alarm handling suggestions in the alarm details.

Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:



- Position of the thermostat in cabinet:



WARNING!

- Before replacing the thermostat, 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 15 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

Procedure

Step 1 Remove the thermostat from the cabinet

a. Unscrew the terminal and remove the cables from thermostat;

b. Unscrew and remove the fixture outward along the guide, and then remove the thermostat.

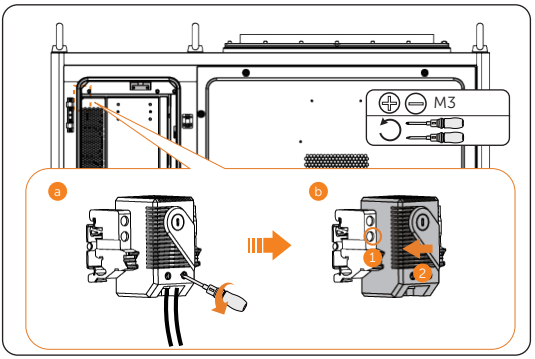


Figure 15-1 Removing the thermostat

Step 2 Install new thermostat and connect cables (Screw size M3, torque: 0.3±0.1 N·m).

Checking after replacement

For details of checking procedure after replacement, please refer to "24 Checking after replacement".

16 Replacement of Distribution Box

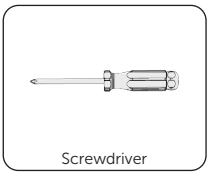
Fault location

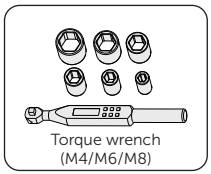
a. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.

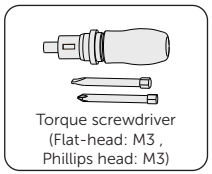
b. Refer to the alarm handling suggestions in the alarm details.

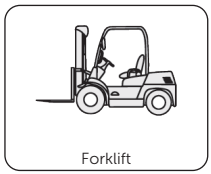
Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:

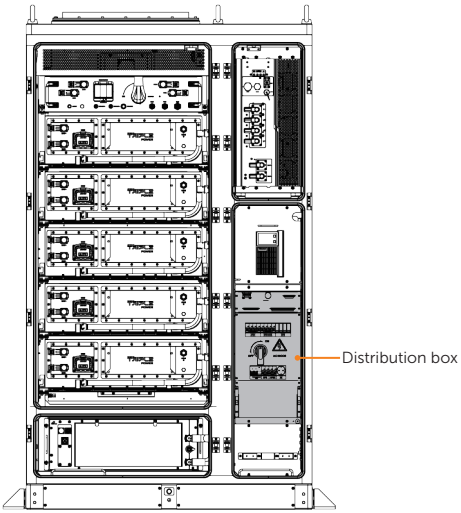

Screwdriver


Torque wrench (M4/M6/M8)


Torque screwdriver (Flat-head: M3 , Phillips head: M3)


Forklift

- 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 15 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 cables.

a. Remove the terminal;

b. Remove the screws securing the cable cover, remove the cable cover, and then remove the mains connection cable.

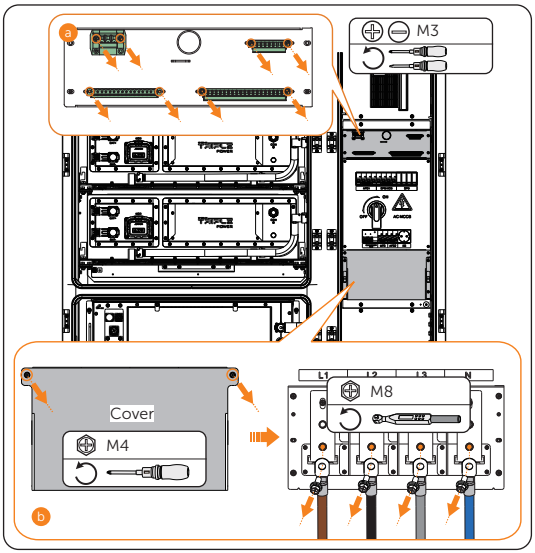


Figure 16-1 Removing the cables

Step 2 Open the rear cabinet door and remove the cover by pinching both sides of the cover. Loosen the screw and remove the cables.

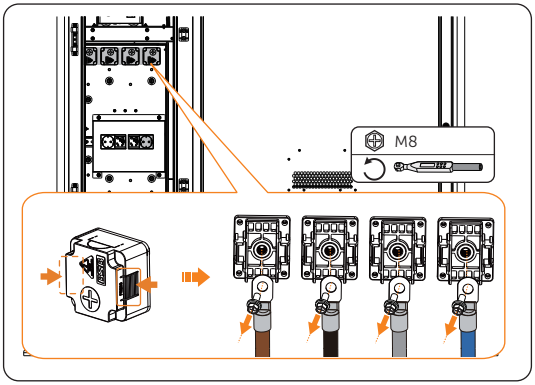


Figure 16-2 Removing the cables

Step 3 Unscrew the screw on the distribution box and take out the distribution box.

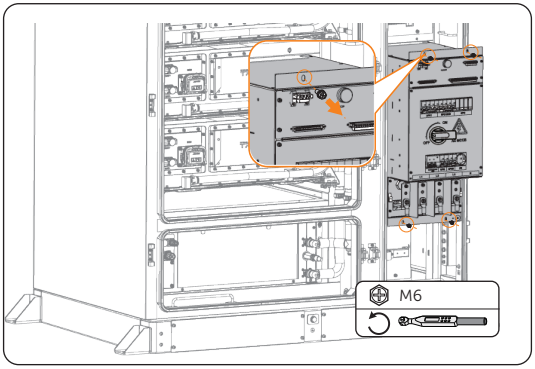


Figure 16-3 Removing distribution box

Step 4 Install the new distribution box to the cabinet and secure the screws (Screw size M6, torque 5.0±0.5 N·m).

Step 5 Insert the screw to secure and connect the assembled L1/L2/L3/N cable to the wiring interface, and tighten the screw (Screw size M8, torque 12.0±1.0 N·m).

Step 6 Fix the cable cover to the distribution box, and tighten the screws (Screw size M4, torque 1.6±0.2 N·m).

Step 7 Insert the Terminal Block into the port and tighten the set screw (Screw size M3, torque: 0.3±0.1 N·m).

Step 8 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 screws

(Screw size M8, torque 12.0±1.0 N·m).

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 Remove the panel (No need to remove the distribution box from the cabinet).

a. Remove the cable cover;

b. Remove the front panel.

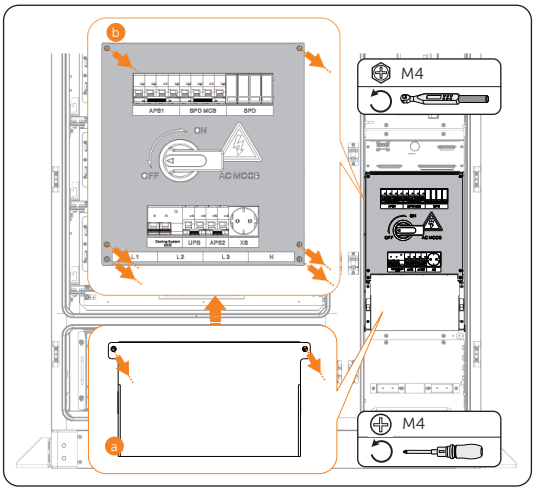


Figure 16-4 Removing the front panel

WARNING!

- Make sure that there is no residual power and heat before replacing it, otherwise it may cause electric shock and body burns.

Step 2 Remove the cable from the SPD module.

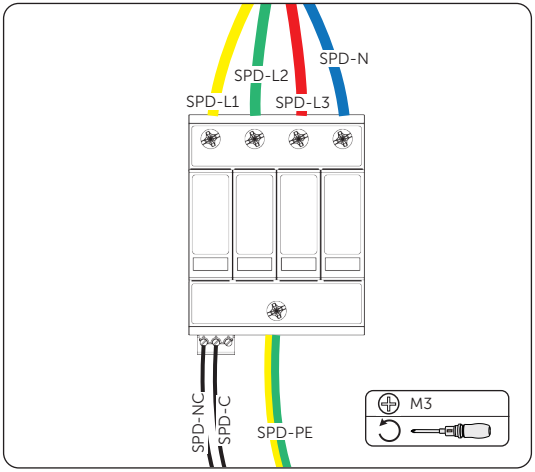


Figure 16-5 Removing the cables of SPD module

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

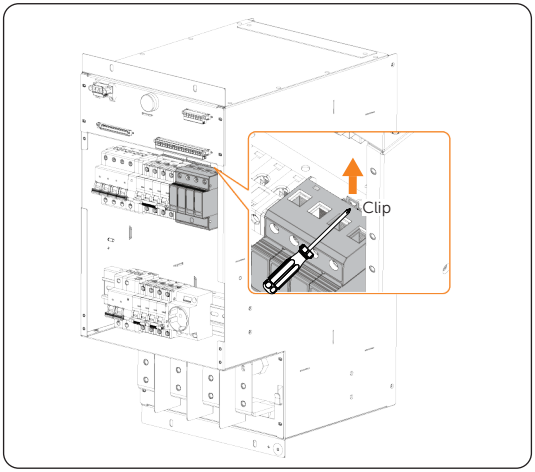


Figure 16-6 Removing the SPD module

Step 4 Pry the clip, install a new SPD module and wire it (Screw size M3, torque: 0.3±0.1 N·m).

Step 5 Install the panel and cable cover (Screw size M4, torque: 1.2±0.1 N·m).

Checking after replacement

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

Step 2 Check if the indicator is green.

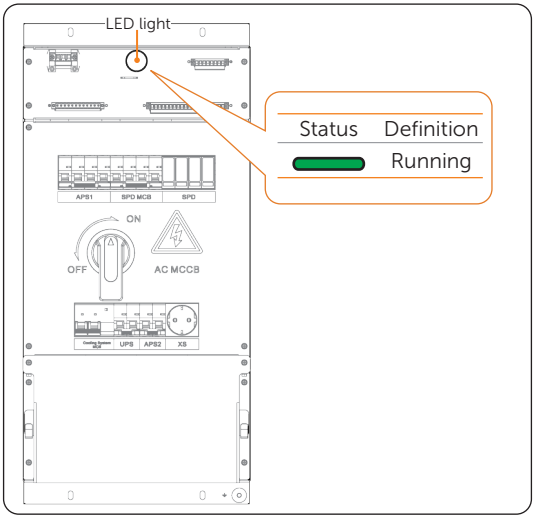


Figure 16-7 Distribution box Indicator

Step 3 Check whether the status of the distribution box is normal via EMS1000 webpage or SolaX Cloud App.

17 Replacement of Dehumidifier

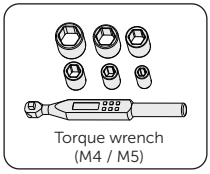
Fault location

a. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.

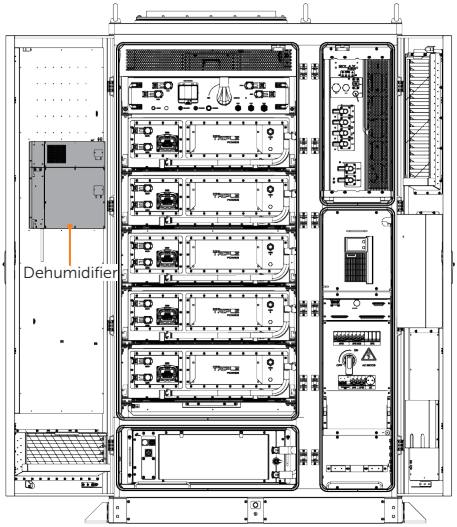
b. Refer to the alarm handling suggestions in the alarm details.

Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:



- Position of the dehumidifier in cabinet:



WARNING!

- Before replacing the dehumidifier, 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 15 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

Procedure

Step 1 Remove the dehumidifier from the cabinet

a. Remove the cables from the dehumidifier;

b. Remove the PE cables;

c. Remove the dehumidifier after removing the fixing screws

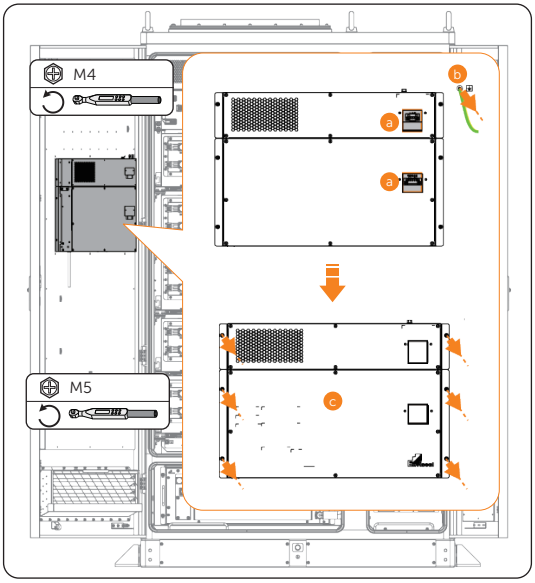


Figure 17-1 Removing the dehumidifier

Step 2 Install the dehumidifier, fix screws (Screw size M5, torque 3.0±0.3 N·m).

Step 3 Connect cables, secure PE cable (Screw size M4, torque 1.6±0.2 N·m).

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 Water Sensor

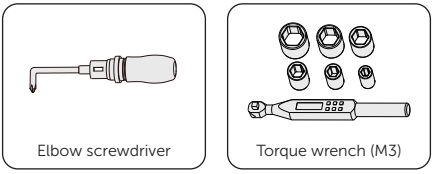
Fault location

a. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.

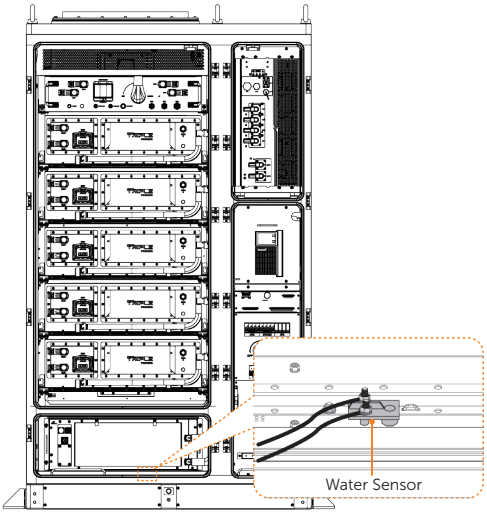
b. Refer to the alarm handling suggestions in the alarm details.

Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:



- 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 15 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

Procedure

Step 1 Unscrew the screws to remove the water sensor cables and the water sensor.

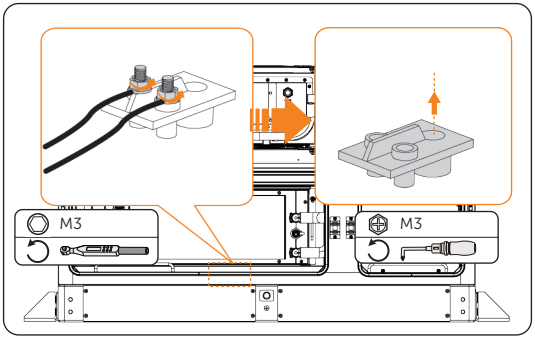


Figure 18-1 Removing the water sensor

Step 2 Install new water sensor, fix to cabinet (Screw size M3, torque: 1.0±0.1 N·m).

Step 3 Connect the cables (Screw size M3, torque: 0.3±0.1 N·m).

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 Replacement of Audible and Visual Alarm

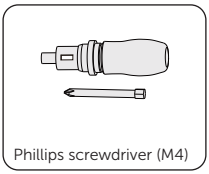
Fault location

a. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.

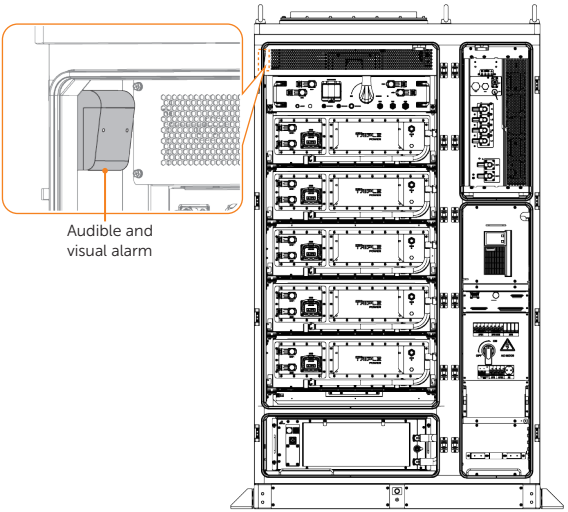
b. Refer to the alarm handling suggestions in the alarm details.

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 15 minutes after the power failure.
- Equipment maintenance must be carried out by professional personnel.

Procedure

Step 1 Remove the outer cover, then Unscrew the screw and remove the audible and visual alarm.

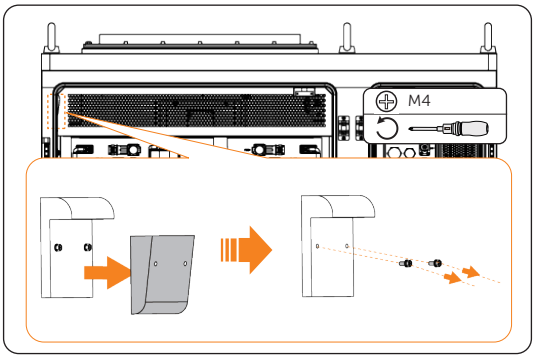


Figure 19-1 Removing the audible and visual alarm

Step 2 Install new audible and visual alarms (Screw size M4, torque 1.6±0.2 N·m).

Step 3 Install cover for audible and visual alarm.

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.

20 Replacement of PCS

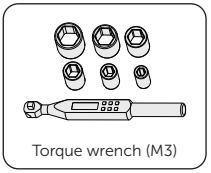
Fault location

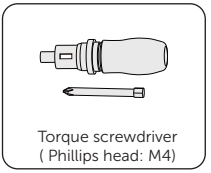
a. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.

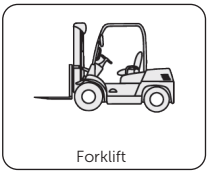
b. Refer to the alarm handling suggestions in the alarm details.

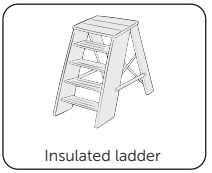
Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:

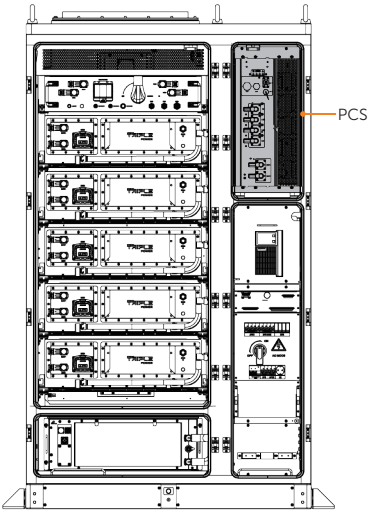

Torque wrench (M3)


Torque screwdriver
(Phillips head: M4)


Forklift


Insulated ladder

- Position of the PCS in cabinet:



WARNING!

- Before replacing the PCS, 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 15 minutes after the power outage.
- Equipment maintenance must be carried out by professional personnel.

20.1 Replacement of PCS

Procedure

Step 1 Remove the PCS cables; Unscrew the screws and remove the bracket that secures the PCS, then remove the PCS from cabinet.

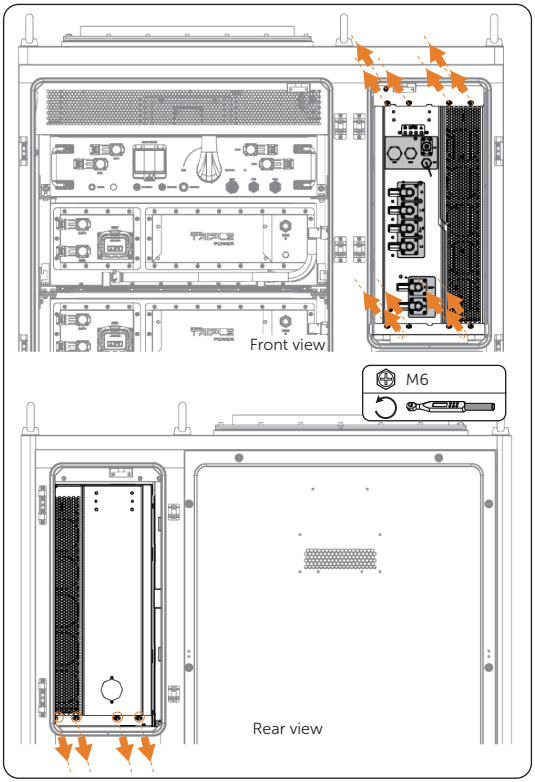


Figure 20-1 Removing the PCS

Step 2 Place a new PCS into the cabinet. Install the bracket that secures the PCS to the cabinet (Screw size M6, torque: 5.0±0.5 N·m).

Step 3 Wiring the PCS.

Checking after replacement

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

Step 2 See "4.2 EMS Setup" to pair the PCS.

Step 3 Check whether the system is back to normal by EMS1000 a web page or SolaXCloud.

20.2 Replacement of External Fan

Procedure

Step 1 Remove the PCS. For details, refer to "20.1 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.

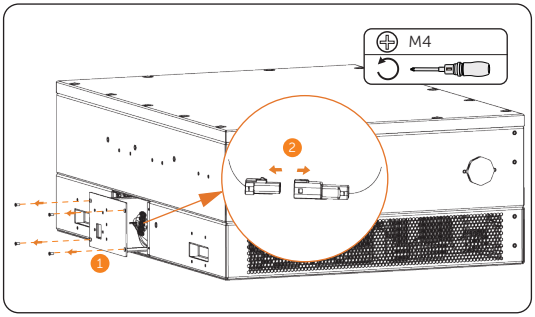


Figure 20-2 Disconnecting the fan

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

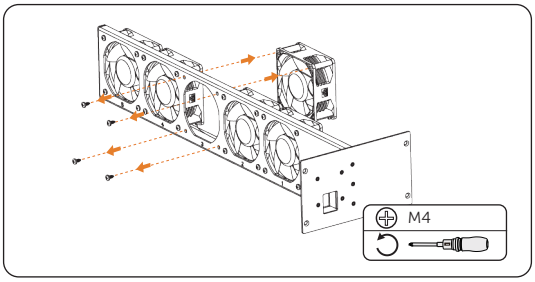


Figure 20-3 Fan remove

Step 4 After replacing the fan, follow the sequence install a new fan (Screw size M4, torque: 1.2±0.2 N·m).

Step 5 Install the PCS into the cabinet, reference "20.1 Replacement of 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.

21 Replacement of Liquid Cooling Unit

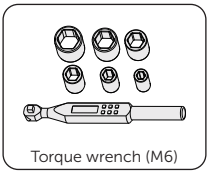
Fault location

a. View alarm information via cabinet screen, EMS1000 webpage, SolaXCloud App or troubleshooting manual.

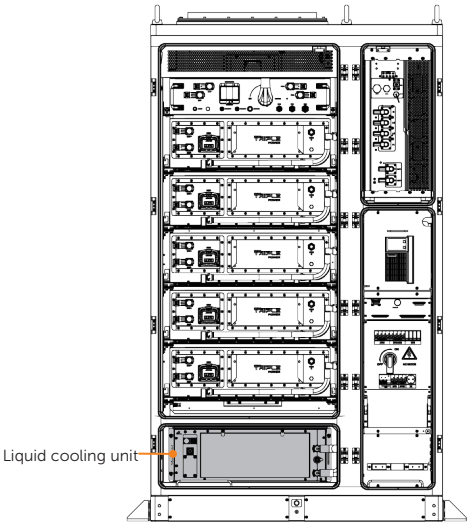
b. Refer to the alarm handling suggestions in the alarm details.

Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:



- Position of the Liquid Cooling Unit in cabinet:



WARNING!

- Before replacing the Liquid cooling unit, 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 15 minutes after the power outage.
- Equipment maintenance must be carried out by professional personnel.

NOTICE!

- It is recommended to contact SolaX for maintenance.

Procedure

Step 1 Refer to "25.2 System Drain Operation", Drain the coolant.

Step 2 Remove the liquid cooling unit.

a. Remove the electrical connections;

b. Remove the inlet and outlet pipes: Unplug the valves on the inlet and outlet pipes, unplug the pipes

c. Remove the screws securing the liquid cooling unit and take the liquid cooling unit out of the cabinet.

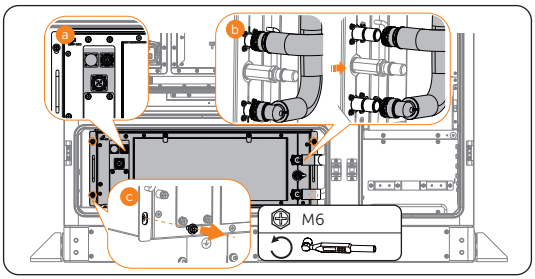


Figure 21-1 Removing the liquid cooling unit

Step 3 Install the new liquid cooling unit and secure it (Screw size M6, torque: 5.0±0.5 N·m).

Step 4 Connect the coolant inlet and outlet pipes of the liquid cooling unit according to the screen printing. You will hear a "Click".

Step 5 Connect the cables of liquid cooling unit.

Step 6 Referring to "25.1 Coolant Filling Operation", fill with coolant.

Checking after replacement

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

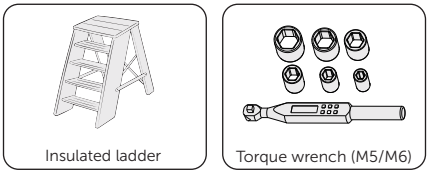
Step 2 Check whether the system is back to normal by EMS1000 a web page or SolaXCloud.

22 Replacement of Automatic Fire Sprinkler

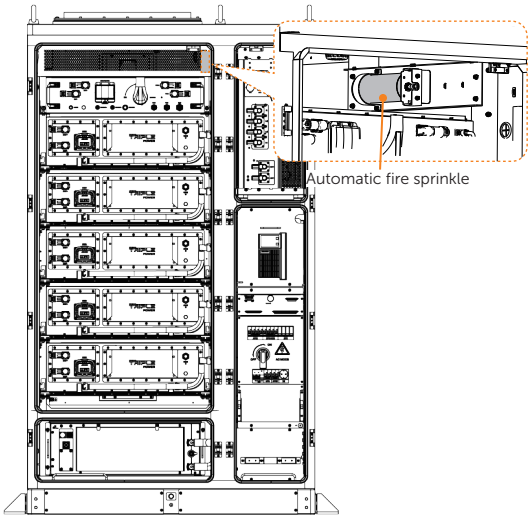
NOTICE!
• Automatic fire sprinkler is valid for 10 years from the date of shipment of the cabinet from the factory. Please contact SolaX for purchase after the expiration date.

Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:



- Position of the Automatic fire sprinkle in cabinet:



WARNING!

- Before replacing the automatic fire sprinkle, 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 15 minutes after the power outage.
- Equipment maintenance must be carried out by professional personnel.

Procedure

Step 1 Loosen the screws, then remove the front panel.

Step 2 Remove the automatic fire sprinkler connection cable

Step 3 Remove the old automatic fire sprinkle.

a. Unscrewing of hoops for fixing automatic fire sprinkle.

b. Push the automatic fire sprinkle forward after loosening the screws shown in the figure and remove it outward.

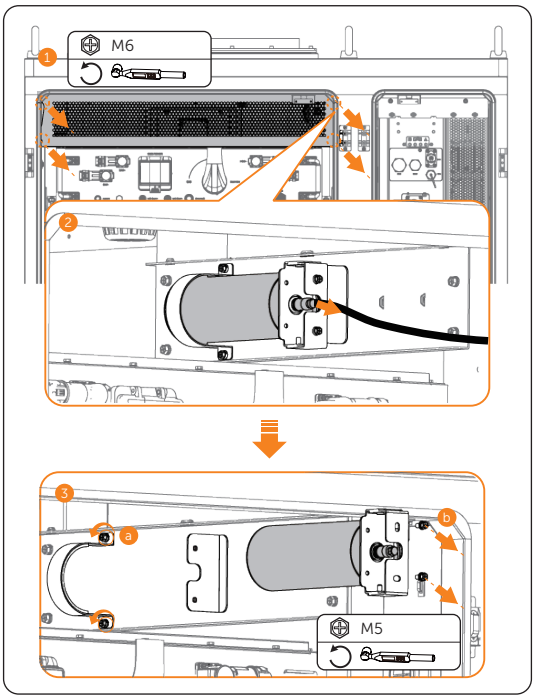


Figure 22-2 Removing the automatic fire sprinkle

Step 4 Install a new automatic fire sprinkle into the cabinet and screw it (Screw size M5, torque: 3.0±0.3 N·m).

Step 5 Connect the cable.

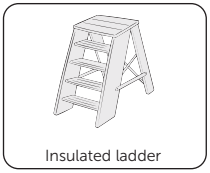
Step 6 Install the front panel of the cabinet (Screw size M6, torque: 3.0±0.3 N·m).

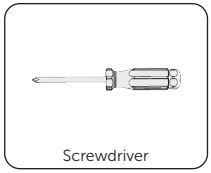
23 Replacement of Coolant Pipe

NOTICE!
• It is recommended to contact SolaX for maintenance. • Replacement is not recommended when the temperature < -15°C.

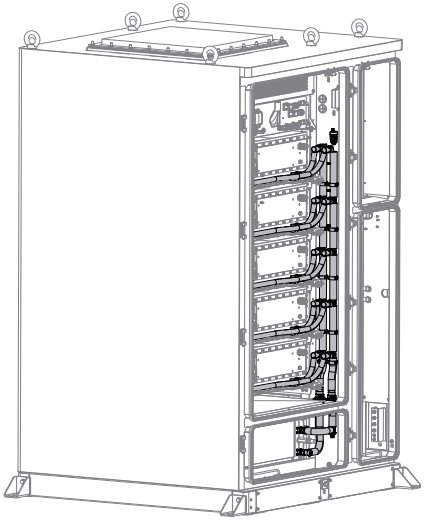
Preparation before replacement

- Contact SolaX and order replacement parts.
- Tools:


Insulated ladder


Screwdriver

- Position of the Pipe in cabinet:



WARNING!

- Before replacing the coolant pipe, 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 15 minutes after the power outage.
- Equipment maintenance must be carried out by professional personnel.

23.1 Replacement of Battery Pack Pipe

Procedure

Step 1 Refer to the liquid drain procedure in the "25.2 System Drain Operation" and perform the drain.

Step 2 Disconnect both sides of the pipe to be replaced.

a. Push down the shut-off valve and pull out it.

b. Disconnect the pipe using a screwdriver or other pry tool.

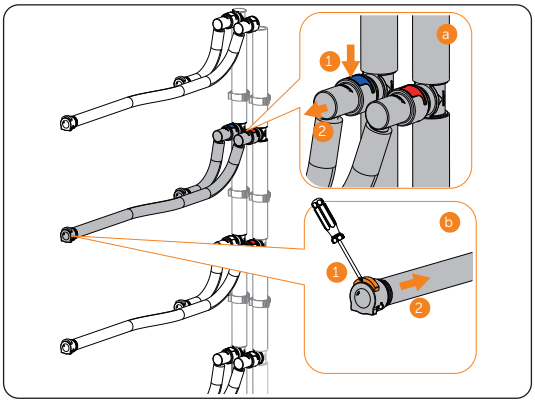


Figure 23-3 Removing the battery pack pipe

Step 3 Reinstall the new pipe in the same way. A “Clik” will be heard when the shutoff valve and piping are successfully connected.

Step 4 Refill the machine according to "25.1 Coolant Filling Operation".

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.

23.2 Replacement of Cabinet Pipe

Procedure

Step 1 Refer to the liquid drain procedure in the "25.2 System Drain Operation" and perform the drain.

Step 2 Remove the pipe.

a. Push down the shut-off valve and pull out it (Total 5 pairs).

b. Disconnect the piping at the divider between the liquid cooling unit compartment and the pack compartment.

c. Using a screwdriver or other pry tool, remove the hoops (Total 10 places) from the sheet metal part and disconnect the piping from the cabinet.

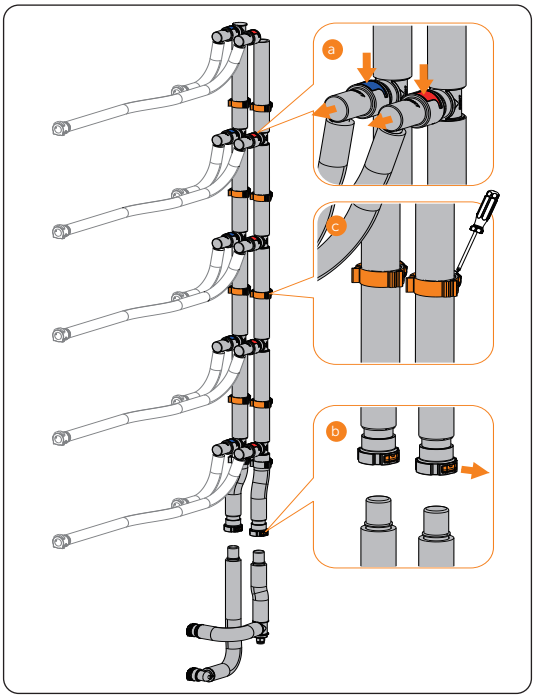


Figure 23-4 Removing the cabinet pipe

Step 3 Reinstall the new pipe in the same way. A “Clik” will be heard when the shutoff valve and piping are successfully connected.

Step 4 Refill the machine according to "25.1 Coolant Filling Operation".

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.

24 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.

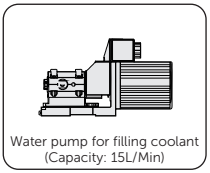
25 Appendix

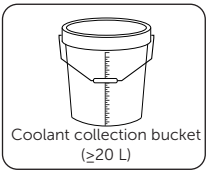
25.1 Coolant Filling Operation

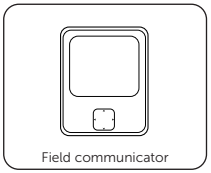
NOTICE!
• It is recommended to contact SolaX for maintenance.

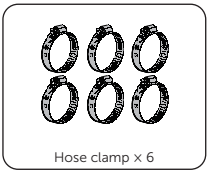
Preparation

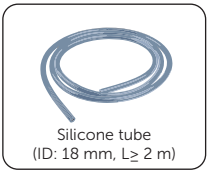
- Tools:

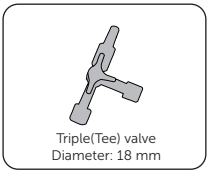

Water pump for filling coolant (Capacity: 15L/Min)

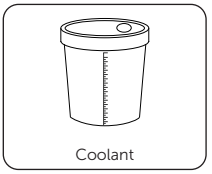

Coolant collection bucket (≥20 L)


Field communicator


Hose clamp × 6


Silicone tube (ID: 18 mm, L≥ 2 m)


Triple(Tee) valve Diameter: 18 mm


Coolant

Precautions

- It is forbidden to run the liquid cooling unit in a scenario where no coolant is added.
- It is recommended that the relevant pressures be controlled within the limits of "Table 25-1 Recommended Pressure Standard". Please pay attention to the pressure control when using an external coolant filling kit for coolant filling. The following data refers to the running data.

Table 25-1 Recommended Pressure Standard

Parameter	Value
Outlet Water Press	2.2-2.5 Bar
Inlet Water Press	> 1.2 Bar

- If the Outlet Water Pressure < 1.5 Bar, it is necessary to perform coolant

replenishment operations, refer to "25.3 Coolant Replenishment Operation" for details.

- The cleanliness of the coolant must meet the following requirements: the maximum particle diameter of residual impurities < 0.6 m, and the total mass ≤ 80 mg.
- When adding coolant to the liquid cooling unit, it is recommended to equip a filter screen with a size of 30 mesh or above to prevent dust and other impurities from entering the coolant circulation system.
- When using water-glycol mixed coolant, please refer to "Table 25-2 Coolant specifications" to check whether the coolant specifications meet the requirements. During use, it is necessary to regularly check the quality of the coolant and deal with it to avoid abnormalities such as precipitation, which will affect the performance of the liquid cooling unit.
- The coolant must have low hardness (calcium hardness), otherwise it will cause scale precipitation or loose layering, and the coolant cannot be soft water. Up to 50% of the volume fraction of ethylene glycol aqueous solution is allowed.
- During the long-term use of the liquid cooling unit, the concentration of the coolant becomes higher, which will reduce the cooling efficiency of the liquid cooling unit. It is recommended to check the coolant concentration in the circulation system of the liquid cooling unit every 1 year. If the coolant concentration is too high, the value can be restored to the normal range by completely replacing the coolant.
- During the long-term use of the liquid cooling unit, the coolant may appear mechanical dirt, high hardness, high chemical dirt content, biological dirt, slime bacteria, and algae. It is recommended that the coolant be tested every 1 year, and if the PH <7, replace the coolant.
- Ethylene glycol is a substance that pollutes groundwater. When using liquid cooling unit, please comply with relevant national and regional regulations on groundwater resources protection.
- Coolant Specifications (It is recommended to contact SolaX for purchase to avoid mixing different coolants to affect system performance):

Table 25-2 Coolant specifications

Parameter	Value
PH	(7)7.5-8.5
Conductivity	200-3000 μS/cm
Evaporation residue	< 500 mg/dm^3
Sedimentary material	< 3 mg/dm^3
Hardness	3-8°dH (for German-speaking regions)
Ca + Mg	0.5-2 mmol/l (for international regions)
Bicarbonates	1-5 mmol/dm^3 (60-300 mg/dm^3)
Free carbon monoxide	< 10 mg/dm^3
Sulfide	< 0.01 mg/dm^3
Chloride	< 50 mg/dm^3

Parameter	Value
Sulfate	< 250 mg/dm^3
Nitrate	< 25 mg/dm^3
Nitrite	< 0.1 mg/m^3
CSB	< 7 mg/dm^3
NH4	< 0.05 mg/dm^3
Fe	< 0.1 mg/dm^3
Mn	< 0.1 mg/dm^3
Cu	< 0.1 mg/dm

Procedure

Step 1 Open the exhaust valve at the highest point of the pipeline.

Step 2 Connect the Silicone tube .

a. Connect the tube to the inlet port of the water pump, lock it with the hose clamp, and put the other end of the tube into the bottom of the coolant.

b. The outlet port of the water pump is connected to the coolant filling port of the liquid cooling unit through a triple valve and locked with a hose clamp.

c. The remaining end of the triple valve is connected to the water tube and locked with a hose clamp, and then put into the coolant collection bucket. When filling with liquid, it is necessary to close the valve of C.

NOTICE!

- If air enters the tube, please empty the connecting tube by filling coolant in advance.

Step 3 Start the water pump and fill with coolant. Observe the coolant until it is filled with 9-10L, turn off the water pump and stop filling the coolant.

NOTICE!

- Please pay attention to the liquid level in the coolant storage tank to ensure that the inlet of the pump is immersed in the coolant.

Step 4 Power up the system, refer to "3.4 Power On" for specific steps.

Step 5 Connect the DEBUG port of the liquid cooling unit to the filed communicator, and power on it. Observe the field communicator to show whether the pressure reaches standard in "Table 25-1 Recommended Pressure Standard", if not, then replenish the coolant until it reaches the requirement.

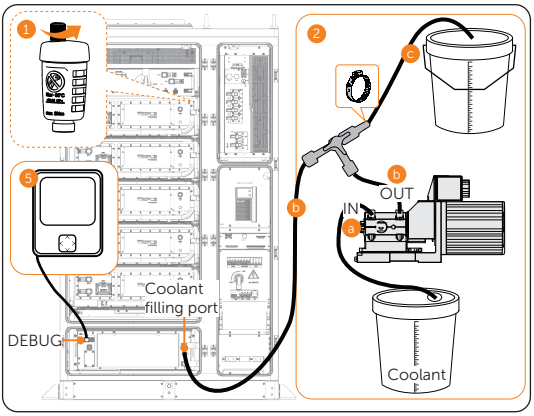


Figure 25-5 Coolant filling

Step 6 After the liquid filling is complete, remove the tubes.

NOTICE!

- Keeping the Liquid cooling unit ON at the field communicator.
- Observe the liquid filling process to ensure that the liquid filling is working normally, and the system lasts about 30 minutes for a one-time complete liquid filling process.

Step 7 Power down the system, detailed steps refer to "3.3 Power Off".

Step 8 Clean the residual liquid inside the cabinet. Ensure that no liquid remains in the filling port.

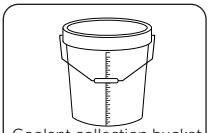
25.2 System Drain Operation

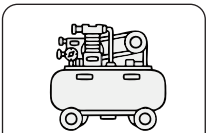
NOTICE!

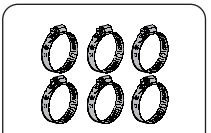
- It is recommended to contact SolaX for maintenance.
- A small amount of coolant residue may come out when unplugging the pipe, this is normal. Wipe the residue away.

Preparation

- Tools:


Coolant collection bucket (≥20 L)


Air compressor (Discharge pressure < 0.3 MPa)


Hose clamp × 6


Silicone tube (ID: 18 mm, L≥ 2 m)

Procedure

Step 1 Connect one end of the pipeline to the outlet of the liquid cooling unit and the other end to a coolant collection bucket (ethylene glycol aqueous solution cannot be directly discharged into the environment).

Step 2 Open the valve. Keep the coolant flowing naturally until no coolant comes out of the outlet.

Step 3 Remove the inlet and outlet pipes of the Liquid cooling unit and drain the coolant from the pipes. After the coolant is drained from the pipe, install it back in.

Step 4 Remove the battery pack inlet and outlet pipes.

a. Push down the shut-off valve and pull out it.

b. Disconnect the pipe using a screwdriver or other pry tool.

Step 5 Connect the inlet pipe of the battery pack to the air compressor.

Step 6 Place the outlet connection pipe into the coolant collection bucket.

Step 7 Open the air compressor to release the liquid in the battery pack until no coolant comes out.

Step 8 Repeat Step 4-7 to drain all battery packs of liquid.

Step 9 Install the battery pack inlet and outlet pipes.

a. Push down the shut-off valve and install it, you will hear a "click".

b. Connect the pipe, you will hear a "click".

Step 10 Clean the residual liquid inside the cabinet. Ensure that no liquid remains in the cabinet.

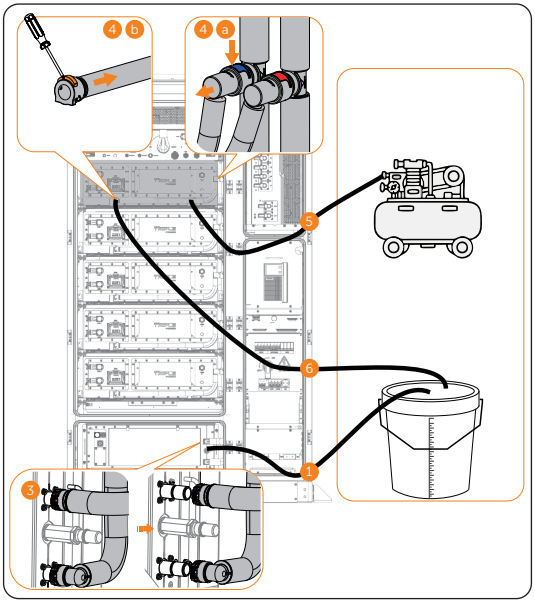
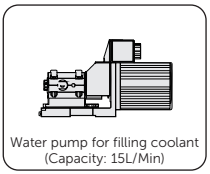


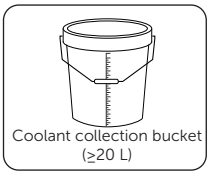
Figure 25-6 Draining the coolant

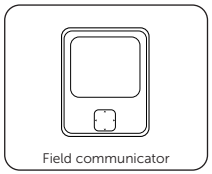
25.3 Coolant Replenishment Operation

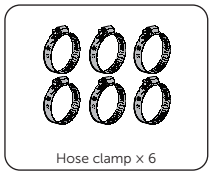
Preparation

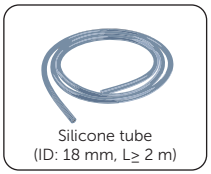
- Tools:

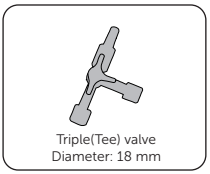

Water pump for filling coolant (Capacity: 15L/Min)

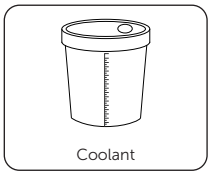

Coolant collection bucket (≥20 L)


Field communicator


Hose clamp x 6


Silicone tube (ID: 18 mm, L≥ 2 m)


Triple(Tee) valve Diameter: 18 mm


Coolant

Precautions

- It is recommended to contact SolaX for purchase to avoid mixing different coolants to affect system performance

Procedure

Step 1 Rotate the switch on the high-voltage box to "OFF" position.

Step 2 Remove the MSD of five battery pack and put the cover on: Rotate the handle to vertical, press the position shown in the following figure with one hand, pull the handle with the other hand, and pull out the MSD;

Step 3 Open the exhaust valve at the highest point of the pipeline.

Step 4 Connect the Silicone tube .

a. Connect the tube to the inlet port of the water pump, lock it with the hose clamp, and put the other end of the tube into the bottom of the coolant.

b. The outlet port of the water pump is connected to the coolant filling port of the liquid cooling unit through a triple valve and locked with a hose clamp.

c. The remaining end of the triple valve is connected to the water tube and locked with a hose clamp, and then put into the coolant collection bucket. When filling with liquid, it is necessary to close the valve of C.

NOTICE!

- If air enters the tube, please empty the connecting tube by filling coolant in advance.
- Please pay attention to the liquid level in the coolant storage tank to ensure that the inlet of the pump is immersed in the coolant.

Step 5 Connect the DEBUG port of the liquid cooling unit to the filed communicator, and power on it.

Step 6 Start the water pump and fill with coolant.

Step 7 Observe the field communicator to show whether the pressure reaches standard in "Table 25-1 Recommended Pressure Standard", if not, then replenish the coolant until it reaches the requirement.

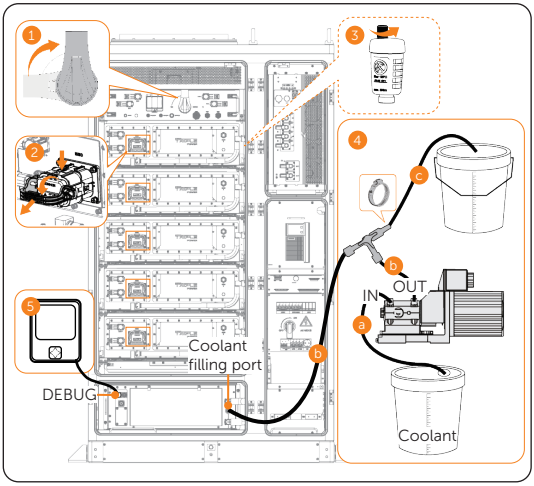


Figure 25-7 Coolant filling

Step 8 After the liquid filling is complete, remove the tubes.

Step 9 Clean the residual liquid inside the cabinet. Ensure that no liquid remains in the filling port.

NOTICE!

- Keeping the Liquid cooling unit ON at the field communicator.

Step 10 Install the MSD of battery pack.

Step 11 Rotate the switch on the high-voltage box to "ON" position.

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