



ORI-B5015L-2H

User Manual

Version 0.0

www.solaxpower.com



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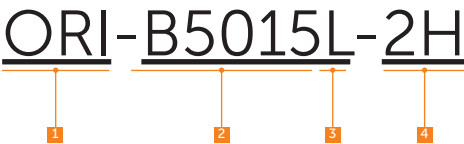
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About This Manual

Scope of Validity

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

Model Code



No.	Definition	Description
1	Product name	ORI: Refer to the equipment for Origin energy.
2	Battery capacity	B5015: Indicate that the battery capacity is 5015 kWh.
3	Type of cooling	L: Refer to liquid cooling.
4	Energy storage technique	2H: Refer to 2-hour energy storage system.

Target Group

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

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

Conventions

To help users better understand the *Manual*, the explanations for the format and symbols herein are shown as follows:

Format	Description
">"	">" represents that there are multiple selections. For example, the process of "Tap 'Settings' and then Tap 'User Setting'" will be represented in "'Settings'" > 'User Setting'".
" "	Radio buttons, checkboxes, and buttons will show with double quotation marks (" "). For example, tap "OK" button.

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 00 (2025/3/14)
Initial release

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1 Safety

1.1 General Safety

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

- Equipment damage due to force majeure, such as earthquake, flooding, thunderstorm, lighting, fire hazard, volcanic eruption, war, typhoon, tornado, etc.
- Equipment damage due to human cause.
- Equipment 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.
- Equipment damage caused during transportation by the customer or the third party.
- The equipment damage caused by strong vibrations from external factors before, during and after installation.
- Storage conditions that do not meet the requirements specified in this document
- Use of incompatible inverters or equipment.
- Installation and commissioning operated by unauthorized personnel who are not licensed and /or satisfy state and local jurisdiction regulations.

1.2 Equipment Safety

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

1.2.1 DC container Safety

DANGER!

- According to the local laws and regulations related to high-altitude work, operators must wear personal protection equipment (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.
- In the case of any of the following circumstances, do not touch any live parts.
 - a. Both the PCS DC-side switch and relay in the high-voltage box have not yet been turned off;
 - b. The PCS has not yet been discharged fully (duration of discharge: 30 s);
 - c. Before touching, you can use a multimeter (1500 V) to measure both the DC and AC voltage. If the meter displays "a value" with the unit "V" for volts, do not touch.
- Do not install the energy storage system in the following areas: flammable and explosive areas, environments that are prone to produce or accumulate corrosive gases, high-vibration areas, or areas with magnetic field strength exceeding 30 A/m.
- Do not perform the following actions when the equipment is running, to avoid the risk of electric shock or burns:
 - a. Touch the live parts;
 - b. Dismantle the equipment;
 - c. Touch the hot surface.

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 equipment 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 ($\geq 80\%$ 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;
 - b. Sensitive precision instruments.

NOTICE!

- The signs and messages on the labels and nameplates attached to the equipment 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.
- If you want to replace the damaged battery pack with a new one in the same battery cluster, please contact SolaX's technician in advance, to prevent personal injury or property damage arising from battery leakage or explosion.
- 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 equipment, 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 equipment 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 equipment.
- 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.
- 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.
- If the temperature is below the low limit of the operating temperature, do not charge. Otherwise, it may cause lithium plating, leading to performance degradation and shortened service life.
- 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 equipment 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.

NOTICE!

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.

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 Air-cooled chiller Safety

WARNING!

- When the chiller is running, please do not touch the internal components of the chiller with your hands at will to avoid electric shock or injury.

CAUTION!

- If severe vibration or abnormal sound occurs during running or debugging of the chiller, 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 equipment during installation and maintenance.

 CAUTION!

- Only when all the circuit switches are turned off and the internal control board no longer flashes the signal light, can you operate the equipment circuit and electronic equipment, 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 6 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 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.
- Please make sure that all the units' switches and breakers are disconnected to the "OFF" state, and use a tester and voltmeter to check whether the connected wires are alive before the electrical connection.
- Do not modify, change, or dismantle the equipment, 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 equipment during installation. Otherwise, it may cause a fire, personal injury, or equipment damage.
- Must remove earrings, rings, bracelets, watches, and any other metal jewellery 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 "13 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 equipment damage.

CAUTION!

- Do not power on the equipment 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.
- 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 equipment and power distribution equipment.

NOTICE!

- If the equipment 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 equipment.

Grounding Requirements:

- The equipment's grounding resistance is required to be no more than 4Ω . If the grounding resistance is required to be decreased, you should appropriately increase the density of the vertical grounding electrodes in the foundation.
- The equipment'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 equipment is reliably grounded before operation. The grounding cable should be removed last while dismantling and maintaining the equipment.
- Do not start the equipment if it is not fitted with a grounding conductor.
- All acts against the grounding conductor are prohibited.
- If the equipment is equipped with a three-pronged socket, make sure that the ground prong is reliably grounded.
- For the equipment 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.
- It is recommended to bundle similar cables with cable ties, to ensure that the inside of the equipment is neat and tidy and to avoid cable jacket damage.
- 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.

2 Product Overview

2.1 Product Introduction

SolaX designs the ORI series products in response to the market of origin energy - large-scale energy storage station, with the following features:

- Short production cycle, and easy operation and maintenance;
- Efficient heat dissipation;
- As a control layer, the battery cluster management unit for each battery cluster can improve system utilization;
- Noise $\leq 75\pm 3$ dB;
- Ingress protection: IP55;
- Corrosion rate: C4 (optional C5);
- Multi-level protection.

2.2 DC container Overview

2.2.1 Appearance and Dimension

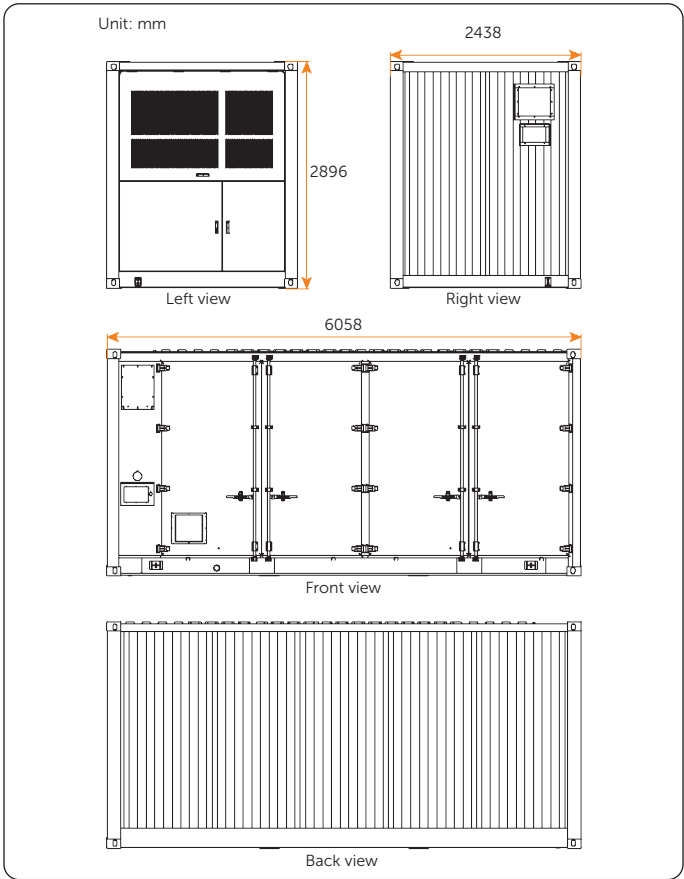


Figure 2-1 Appearance and dimension

2.2.2 Cabinet Parts Description

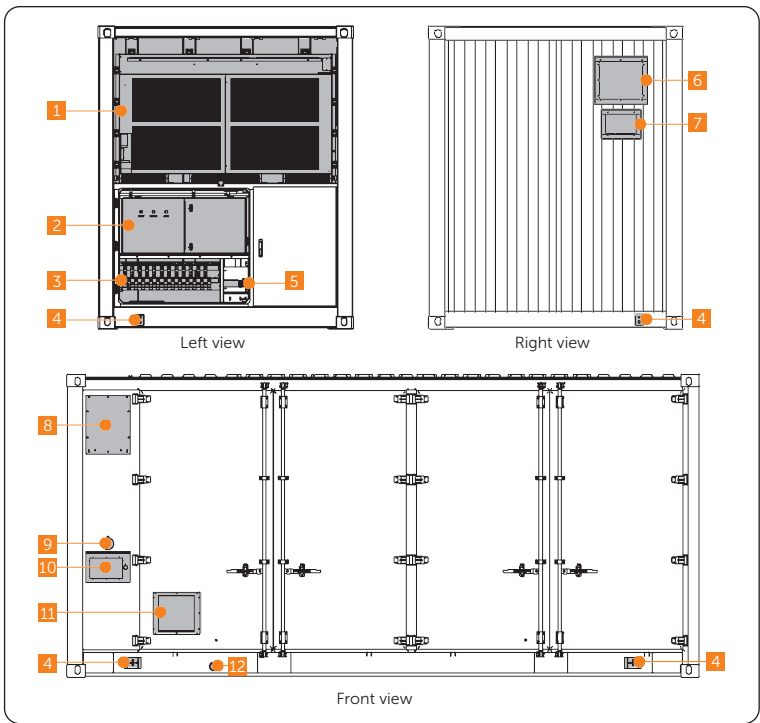


Figure 2-2 Parts description

Table 2-1 Parts description

No.	Item	No.	Item
1	Air-cooled chiller	7	Pressure relief port
2	Distribution box	8	Fire warning area
3	DC side copper busbars	9	System emergency stop button
4	Grounding point	10	Fire operation panel
5	Electrical connection area	11	Air inlet
6	Air outlet	12	Fire hose port

NOTICE!

- The No. 9 is designed for the whole system.

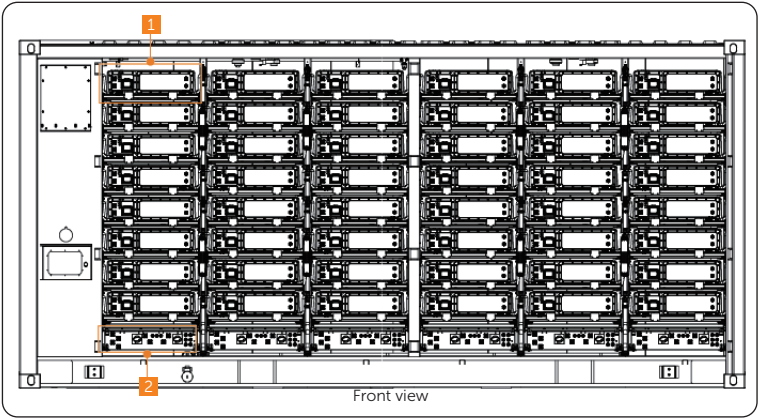


Figure 2-3 Parts description (in the opened state)

Table 2-2 Parts description

No.	Item	No.	Item
1	Battery pack	2	High-voltage box

NOTICE!

- The high-voltage box close to the fire fighting compartment is regarded as No. 1 high-voltage box.

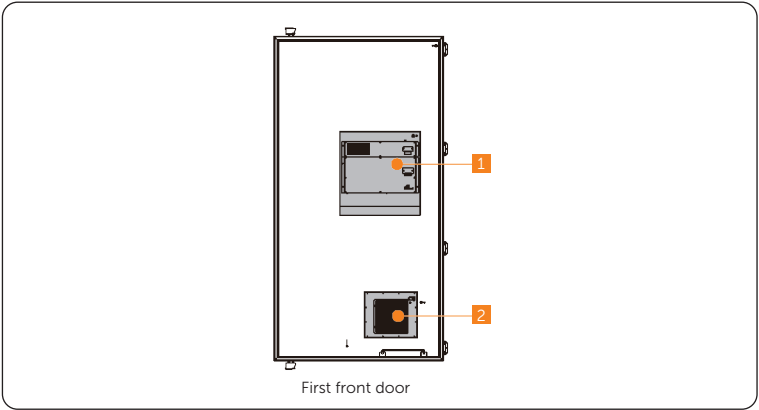


Figure 2-4 Introduction of front door

Table 2-3 Parts description

No.	Item	No.	Item
1	Dehumidifier	2	Air inlet

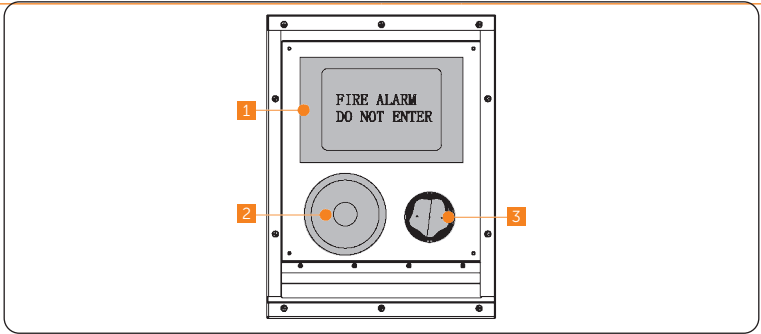


Figure 2-5 Parts description of warning area

Table 2-4 Parts description of warning area

No.	Item	No.	Item
1	Vent LED	3	Audible and visible alarm
2	Fire alarm bell		

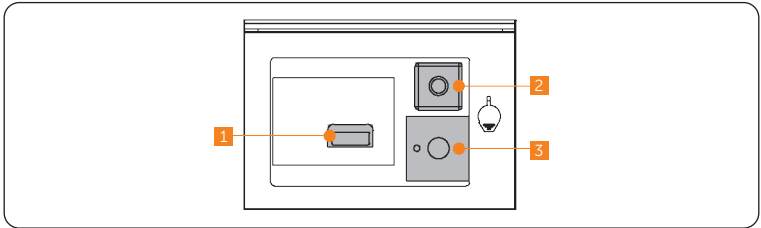


Figure 2-6 Parts description of emergency stop area

Table 2-5 Parts description of emergency stop area

No.	Item	No.	Item
1	Manual & automatic transfer switch and emergency start button	3	Fire emergency stop button
2	Fan start & stop button		

NOTICE!

- The No. 1 is designed for the fire suppression system.

2.3 High-voltage Box

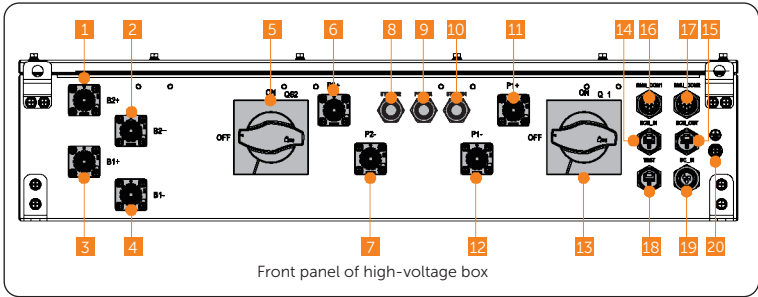


Figure 2-7 Front panel

Table 2-6 Description of front panel

No.	Item	Description	Remark
1	B2+	Positive input port for battery cluster 2	
2	B2-	Negative input port for battery cluster 2	
3	B1+	Positive input port for battery cluster 1	
4	B1-	Negative input port for battery cluster 1	
5	QS2	Main circuit switch for battery cluster 2	
6	P2+	Positive output port for battery cluster 2	
7	P2-	Negative output port for battery cluster 2	
8	STATUS2	Status light for battery cluster 2	
9	POWER	Running light for high-voltage box	
10	STATUS1	Status light for battery cluster 1	
11	P1+	Positive output port for battery cluster 1	
12	P1-	Negative output port for battery cluster 1	
13	QS1	Main circuit switch for battery cluster 1	
14	BCU_IN	Signal input port between two high-voltage boxes	The port in the first high-voltage box must be connected to BSC100.
15	BCU_OUT	Signal output port between two high-voltage boxes	The port in the last high-voltage box should be connected to a termination resistor.
16	BMU_COM1	Communication port between high-voltage box and battery cluster	
17	BMU_COM2	Communication port between high-voltage box and battery cluster	
18	TEST	Commissioning and monitoring port	
19	DC_IN	24VDC power input and output port	
20	PE	Grounding point	

You could see a high-voltage box connecting two battery clusters in the DC container. For details, see figure below.



Figure 2-8 Combination method between battery cluster and high-voltage box

NOTICE!

- If a 20-foot DC container is fully loaded, you can see 6 high-voltage boxes and 12 battery clusters.
- A high-voltage box connects two battery clusters.

2.4 Battery Pack

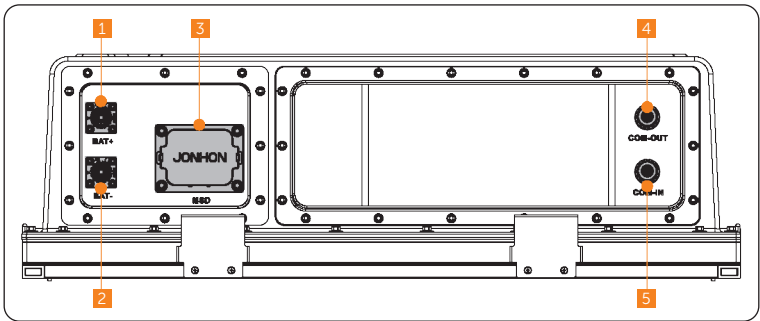


Figure 2-9 Front panel

Table 2-7 Description of front panel

No.	Item	Description	Remark
1	BAT+	Positive port	
2	BAT-	Negative port	
3	MSD	Maintenance support equipment: to offer high-voltage isolation and short circuit protection. For the detailed installation procedure, please refer to “6 Installation of MSD Plug” .	
4	COM-OUT	Communication port: to connect to COM-IN port of the adjacent battery pack	The port of the battery pack must be connected to the high-voltage box in the same battery cluster, and it in the last pack should be connected to a termination resistor.
5	COM-IN	Communication port: to connect to COM-OUT port of the adjacent battery pack	

2.5 Distribution Box

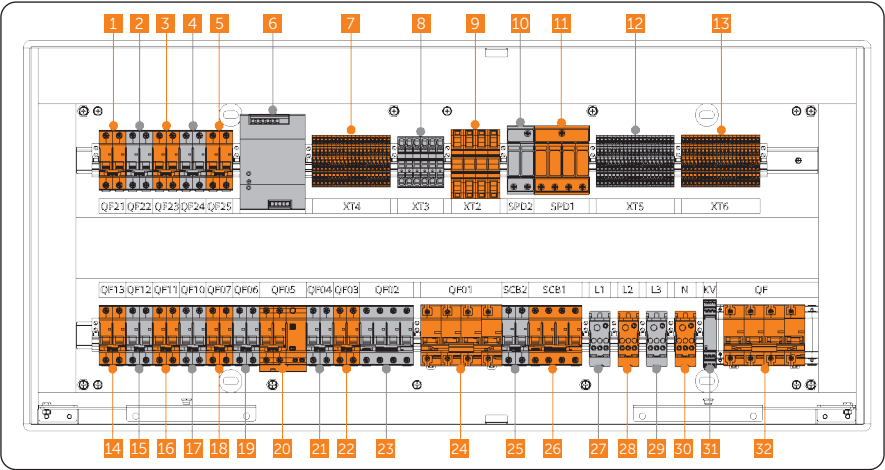


Figure 2-10 Introduction of distribution box

Table 2-8 Introduction of distribution box

No.	Item	Description	No.	Item	Description
1	QF21	Connection port for BSC100	17	QF10	Breaker for UPS entrance
2	QF22	Power supply for water sensor and temperature and humidity sensor	18	QF07	Power supply for fire-fighting device
3	QF23	QF shunt control for incoming breaker	19	QF06	Reserve breaker
4	QF24	Power supply for high-voltage box No. 1 to No. 3	20	QF05	Reserve breaker
5	QF25	Power supply for high-voltage box No. 4 to No. 6	21	QF04	Reserve breaker

No.	Item	Description	No.	Item	Description
6	AC/DC	24V switching power supply	22	QF03	Power supply for dehumidifier
7	XT4	Terminals for the DC container power supply (QF03~07/ QF11~12/ QF21~25)	23	QF02	Reserve breaker
8	XT3	Terminals for QF02/ QF03	24	QF01	Power supply for air-cooled chiller
9	XT2	Terminals for QF01	25	SCB2	Breaker for AC surge protective device at UPS entrance
10	SPD2	AC surge protective device for UPS entrance	26	SCB1	Breaker for AC surge protective device at 400V AC entrance
11	SPD1	AC surge protective device for 400V AC entrance	27	C:L1	L1 splitter terminal
12	XT5	Terminals for BSC DI/IO	28	C:L2	L2 splitter terminal
13	XT6	Terminals for BSC communication	29	C:L3	L3 splitter terminal
14	QF13	Switching power supply	30	C:N	N splitter terminal
15	QF12	Fire blower	31	KV	Voltage monitoring relay for 400 V AC entrance
16	QF11	Reserve breaker	32	QF	Master breaker for 400 V AC entrance

NOTICE!

- L1=A phase, L2=B phase, L3= C phase.

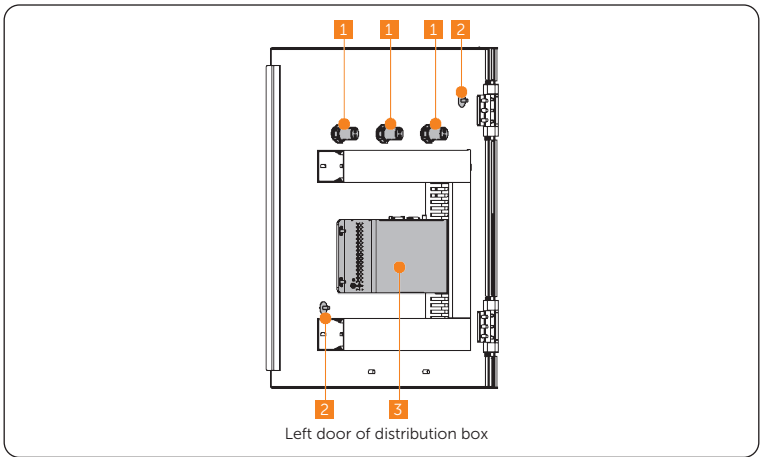


Figure 2-11 Introduction of parts on the left door of distribution box

Table 2-9 Introduction of parts on the left door of distribution box

No.	Item	No.	Item
1	LED	3	BSC100
2	Grounding bar/point		

2.6 Operating Principle

2.6.1 Electrical Block Diagram

For the electrical block diagram, please see the following figure.

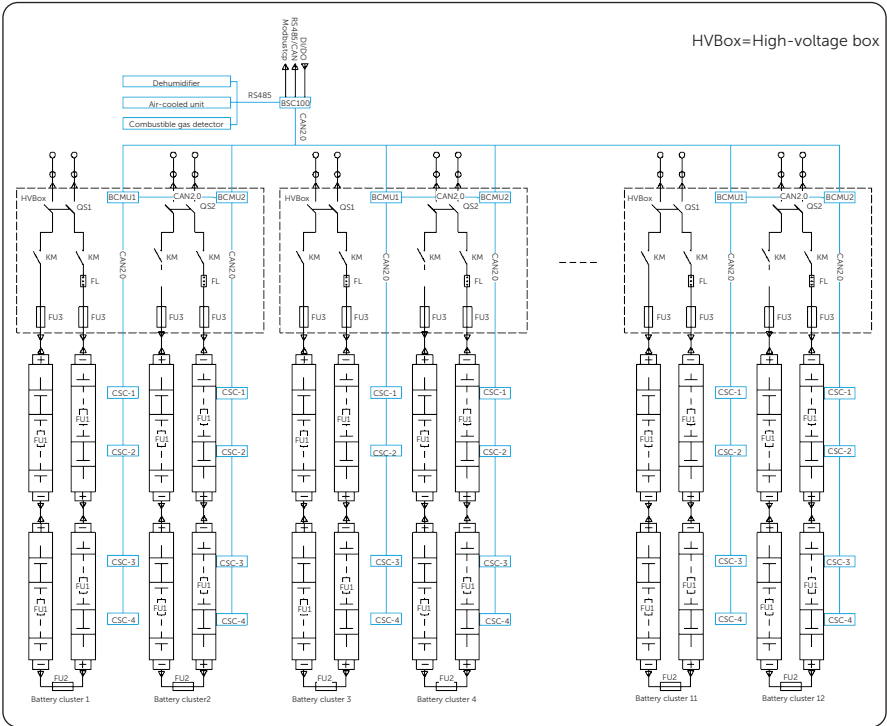


Figure 2-12 Electrical block diagram

2.6.2 Indicator

LED light on distribution box

You can see three LED lights on the distribution box, **Power**, **Running**, and **Fault**. For detailed information, please see below.

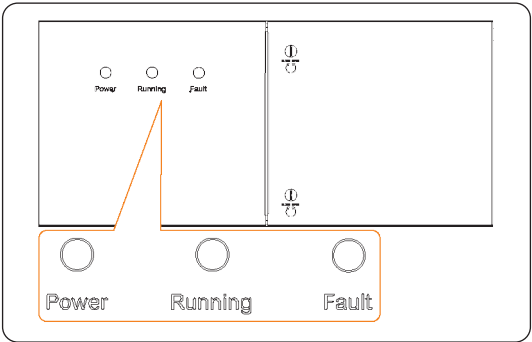


Figure 2-13 LED light

Table 2-10 Description of LED light

LED Light	Status	Description
Power		Solid green
		Off
Running		Solid green
		Off
Fault		Solid red
		Off

LED light on high-voltage box

You can see three LED lights on the high-voltage box, **STATUS2**, **POWER**, and **STATUS1**. For detailed information, please see below.

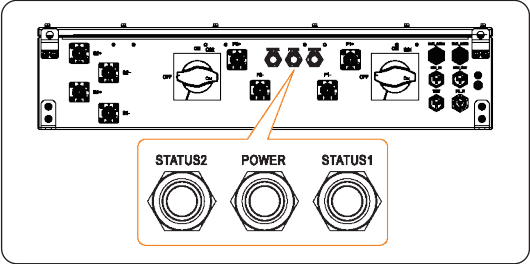
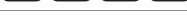


Figure 2-14 LED light

Table 2-11 Description of LED light

LED	Status	Description
STATUS2		Solid green Power on
		Flash green Power off
		Solid red Fault (Level ≥ 5)
		Flash red Fault (Level < 5)
POWER		Solid green In operation
		Off Power off
STATUS1		Solid green Power on
		Flash green Power off
		Solid red Fault (Level ≥ 5)
		Flash red Fault (Level < 5)

Three-phase voltage and phase-sequence relay

You can see four LED lights on the relay in the distribution box, **R**, **F1**, and **F2**. For detailed information, please see below.

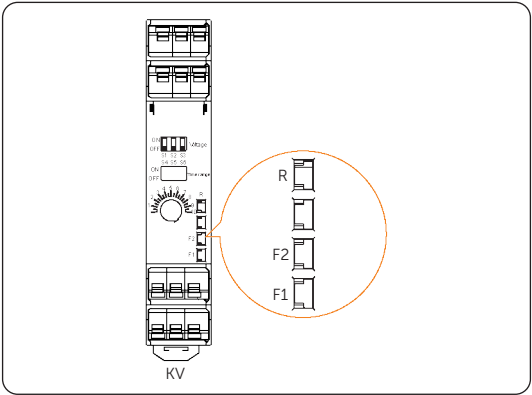


Figure 2-15 LED light on three-phase voltage and phase-sequence relay

Table 2-12 Light information about phase sequence and missing phase

Description	LED Light		Status
Correct phase sequence	R		Solid green
	F1		Off
	F2		Off
Missing phase	R		Off
	F1		Solid red
	F2		Off
Incorrect phase sequence	R		Off
	F1		Flash red
	F2		Off

Table 2-13 Light information about overvoltage and undervoltage

Description	LED Light		Status
Correct phase sequence	R		Solid green
	F1		Off
	F2		Off

Description	LED Light		Status
Voltage < undervoltage threshold	R		Off
	F1		Off
	F2		Solid red
Voltage > overvoltage threshold	R		Off
	F1		Off
	F2		Flash red

2.7 Symbols

Table 2-14 Symbol description

Symbol	Description
	CE mark of conformity.
	TUV certification.
	Protective grounding point.
	Grounding point.
	Caution, hot surface. The enclosure temperature may be high while running. Therefore, do not contact to avoid scalding.
	Danger, electric shock. Do not touch the equipment after it is powered on. Otherwise, an electric shock may occur.
	Danger. Due to possible risks, do not touch the equipment after it is powered on.
	Observe enclosed documentation.

Symbol	Description
	The equipment cannot be disposed together with the household waste.
	Danger of high voltage. Do not touch live parts for 30 seconds after disconnection from the power sources.
	The battery system must be disposed of at a proper facility for environmentally-safe recycling.
	The battery module may explode. The rechargeable battery can become hot during operation. Avoid touch during operation.
	Keep the equipment from open flames or ignition sources.
	Please wear ear protection.
	Do not walk or stand here.
	Danger of high voltage! Do not touch before the equipment is discharged fully.

3 Transportation and Storage

3.1 Transportation Requirements

DANGER!

- Please be careful to avoid physical collisions during transportation. Do not place the equipment upside down, be exposed to water, etc., which may result in equipment damage, or even a fire or an explosion.

WARNING!

- The equipment must be transported in its original packaging. SolaX will not be held responsible for any damage to the equipment caused by improper transportation or by transportation after it has been installed.
- Do not stack over four cabinets in transportation and storage.

NOTICE!

- Please strictly comply with the transportation requirements of the warning signs on the packaging and equipment.
- To reduce product damage caused by shocking, tilting or impacting during transportation, it is recommended to consider sea or road (with better conditions) transport instead of rail and air transports.
- Before transportation, a forwarding agent must obtain the relevant qualifications for the transport of dangerous goods. When transporting goods, it 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 not transport it.

3.1.1 Hoisting Requirement



HOISTING

- A professional lifting company should select the right steel wire ropes and crane based on the actual situation. Only professional personnel can conduct hoisting.
- The length of the steel wire rope for hoisting a 20-foot DC container must be over 6500 mm.
- You should place the four padding plates according to the foundation diagram.
- You can see 4 top corner pieces, which are the lifting positions, on the DC container. Since different products will have different focuses, you should adjust the length of the steel wire rope according to Figure 1. In addition, you must ensure that it moves with constant velocity during hoisting.
- You should take measures to protect the equipment from damage during hoisting.

POSITIONING

- Before positioning the container, you must ensure that the flatness tolerance of the foundation surface stays within 5 mm boundary. Otherwise, it will affect the opening and closing of the container's doors.
- After positioning the container, you must ensure that the flatness tolerance of the eight support points stays within 5 mm boundary. If the tolerance is over 5 mm, please place padding plates to adjust it.

- The hoist operator must wear PPE when working.
- Before hoisting, please check:
 - » Lifting tools are complete, tested and fully secured.
 - » The equipment doors are closed and locked to avoid accidental opening.
 - » The lifting sling's quality must meet standards, and it shall be fully secured, to avoid falling and fraying.
 - » At the workplace with a crane, wind speed requirements must be known and observed.
- Do not hoist outdoors in wind (> Force 6) and other bad weather.
- Do not enter overhead hoist in operation.
- If working during the night cannot be avoided, lighting equipment must be equipped, to ensure adequate lighting on the site.

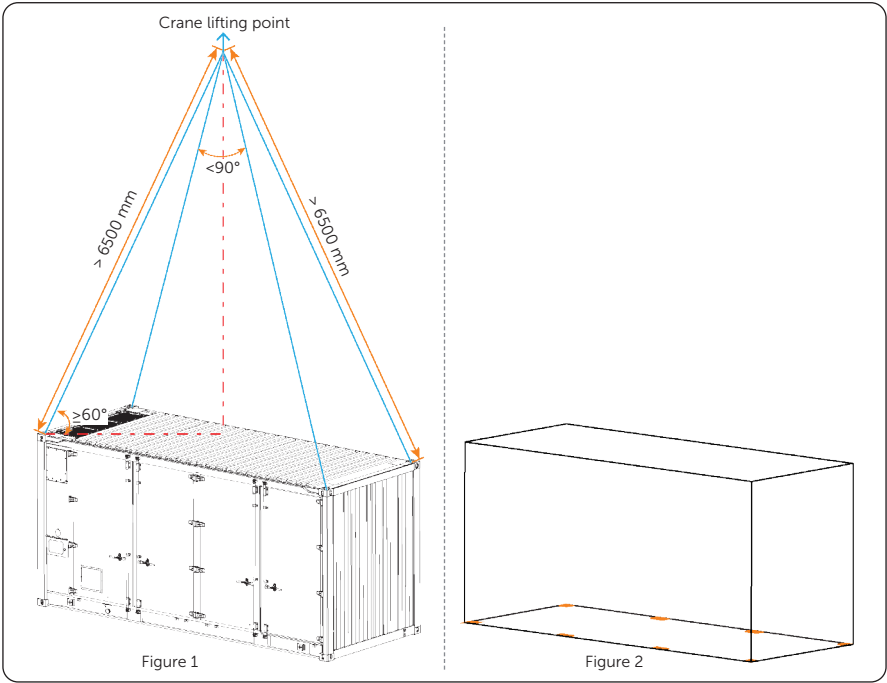


Figure 3-16 Proper way of hoisting

3.2 Storage Requirements

3.2.1 Cabinet Storage Requirement

- Please strictly comply with the storage requirements of the warning signs and other information on the packaging to avoid equipment damage.
- Storage temperature: $-30^{\circ}\text{C} \sim +60^{\circ}\text{C}$.
- Relative humidity for equipment storage: $0\% \sim 100\%$ (non-condensing).

NOTICE!

- Since the batteries have been installed in the cabinet in the factory, the storage requirements for the battery must also be abided by when storing the cabinet.

3.2.2 Battery Storage Requirement

 DANGER!

- The battery must be stored indoors, which the environment should meet the following requirements: 1. Avoiding direct sunlight and keeping out of rain; 2. Dry and well-ventilated; 3. Keeping away from heat and fire sources; 4. Keeping away from radiation; 5. Keeping away from chemicals; 6. Keeping away from dust and metal conductive dust; 7. Being equipped with fire facilities.
- Batteries must be stored in accordance with the requirements of the warning signs and other information on the packaging.
- Do not store with any other electronic equipment, chemicals, or other items that may cause interference or danger.
- Please pay attention to the height when stacking batteries to avoid deforming or damaging the battery at the bottom.

NOTICE!

- Do not store the batteries for a long time. If long periods of storage are unavoidable, please recharge it periodically to avoid battery damage. For details, see [“11.3.3 Maintenance of Battery Pack”](#).
- If a battery pack is stored for a long time, you must recharge it regularly. Although SolaX recommends recharging it regularly, you should know that the calendar aging for battery capacity is irreversible. For the details, see the table below:

Table 3-1 Storage information

Storage temperature range	Storage time
-30°C to 60°C	6 months

- Relative humidity for equipment storage: 0% ~ 100%.
- If the battery has been stored for more than 1 year, it must be checked and tested by professionals before use.

4 Preparation before Installation

4.1 Installation Site Selection

The installation site is critical to the safety, service life, and performance of the equipment, and it should be convenient for electrical connections, operation, and maintenance.

Therefore, the installation site should be selected according to the *NFPA 855 Standard for the Installation of Stationary Energy Storage Systems* and the local laws and regulations.

When you install the equipment, it is recommended that the installation site meets the following requirements:

- **Laws, regulations and industry standards:** The selection of installation sites must strictly comply with local laws, regulations, and related industry standards.
- **Fire safety:** Fire extinguishers must be configured at the installation site according to the local fire codes, and a port for the water fire extinguishing system shall be reserved.
- **Installation location:** It is recommended to install the equipment outdoors.
- **Safety spacing:**
 - » The installation distance between the equipment and residential areas, population centers, or production buildings should meet the requirements of the local fire codes and standards.
 - » If the safety spacing cannot be met, a firewall that meets the requirements of the local fire codes must be built between the equipment and adjacent buildings. During the planning phase, it is crucial to consider the space for transportation, installation and maintenance of the equipment.
- **Flood and waterlogging prevention:**
 - » Avoid low-lying and flood-prone areas. The installation site that the equipment is to be located must be at least 300 mm higher than the highest water level in history.
 - » Since winds and wind-driven waves from rivers, lakes, and seas can affect the equipment, the foundation must be built at least 0.6 m higher than the maximum wave height in history.
 - » If a large amount of water flows in or through the energy storage power station, drainage facilities should be set up.
 - » If the installation site is prone to water accumulation, take waterproof measures, including but not limited to installing water baffles, configuring a drainage system, or raising the height of the foundation to prevent equipment damage.
- **Avoid liquid intrusion:** The installation area should be far away from the area where liquid is likely to be generated or leaked to avoid equipment failure.

- **Good transportation:** Good transportation for the installation site.
- **Reserve space:** During the planning phase, please consider the space for capacity expansion or connection in parallel in the future.
- **Avoiding bad soil:** Do not install equipment on the undesirable soil that are prone to deformation and settlement.
- **Keeping away from salt-damaged and polluted areas:** Since the salt-damaged and polluted areas may corrode the equipment, the installation site must meet the following requirements:

Table 4-1 Installation spacing requirements

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

- **Additional fence:** For security reasons, the installation area should be surrounded by locking fences or walls accessible to qualified persons only.
- **Installation environment requirements:**
 - » Temperature: $-30^{\circ}\text{C} \sim +50^{\circ}\text{C}$.
 - » Relative humidity: $0 \sim 100\% \text{ RH}$.
 - » Altitude: Below 4000 meters.
 - » Good ventilation.
 - » Keep away from high temperature environment such as heat source and fire source, etc.
 - » Keep away from flammable and explosive materials and areas with dust.
 - » Keep away from corrosive substances.
 - » Keep away from strong electromagnetic fields and antenna.
 - » Keep away from strong vibration and noise sources.
 - » Keep away from areas with radiation.
 - » Keep away from areas with metal conductive and magnetic dust.
 - » Keep away from areas that produce or have toxic and harmful gases.
 - » Keep away from environments that are prone to microbial growth.

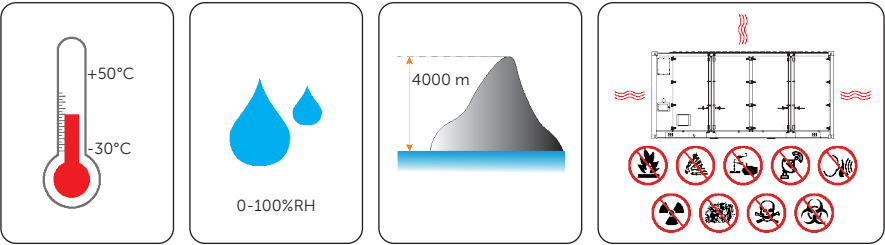


Figure 4-1 Installation environment requirements

NOTICE!

- If you want to install the cabinet at an average altitude of 4000 meters above sea level, please contact SolaX for customization.

4.1.1 Foundation Requirement

NOTICE!

- You should construct the foundation according to the actual situation and the local laws and regulations.

The requirements for foundation are shown as follows:

- The bottom of foundation fit must be strengthened and filled, and its surface must be solid, flat and level (horizontal deviation: length ≤ 10 mm, width ≤ 5 mm; title angle: horizontal title angle $\leq 0.1^\circ$, vertical title angle $\leq 0.24^\circ$). Sunken or titled foundation is not acceptable.
- Since the cabinet's weight is 43 t, if the foundation fails to meet the capacity-bearing requirement, you should take a retest.
- You should reserve a trench during design phase.
- When constructing the foundation, you should also construct support points. For details, see figure below.

Table 4-1 Support point and padding plate

Support point	Padding plate (see packing list)	Remark
2	Part I (necessary)	If the padding plate 3 and 4 are installed, but there are still a gap between the ground and equipment, you should add the padding plate 1 or 2 according to the actual situation.
3	Part G or H (optional)	
6	Part J (necessary)	
7	Part G or H (optional)	

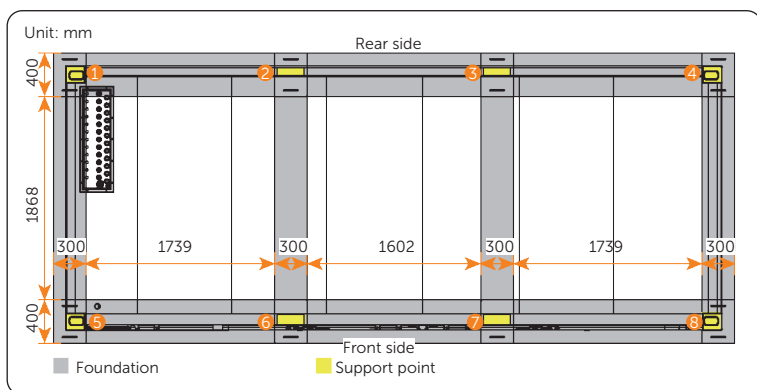


Figure 4-2 Foundation information

NOTICE!

- The support points 1, 4, 5 and 8 are corner fittings.
- Only the support points 2, 3, 6 and 7 require to install padding plates, and these points should be centered on the foundation.

4.1.2 Trench Requirement

You can see cable threading holes in the bottom left side of the cabinet. Therefore, when constructing a trench, you must pay more attention to the position and space where the cables thread. For detailed information, see the following figure.

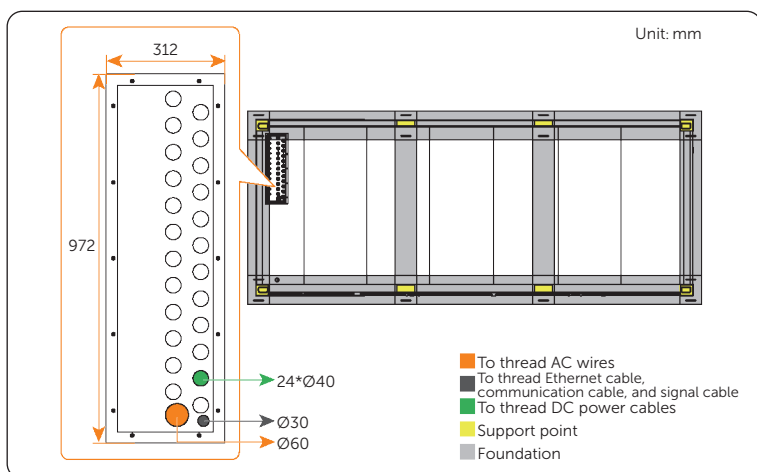


Figure 4-3 Trench information

4.1.3 Clearance Requirement

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

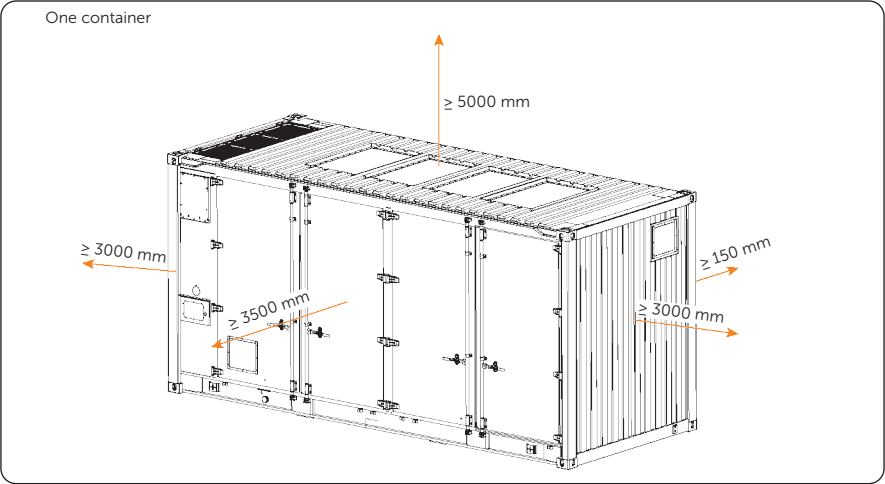


Figure 4-4 Installation of single cabinet

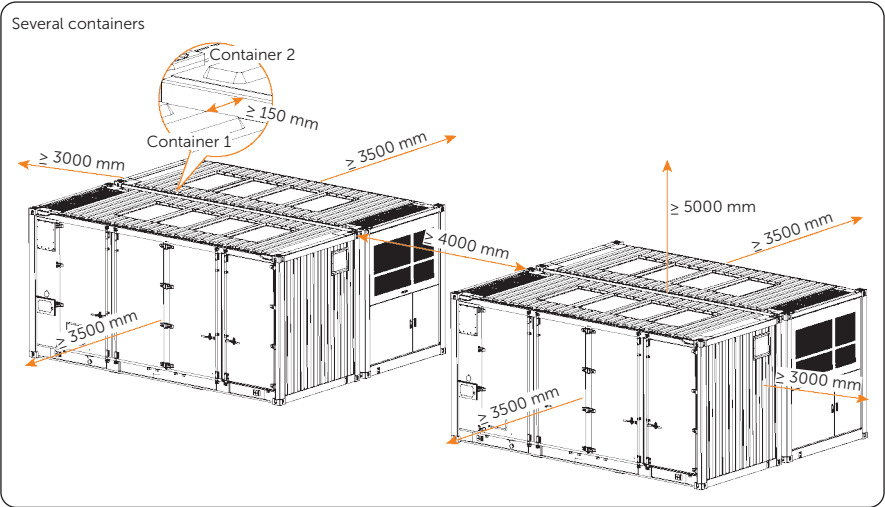
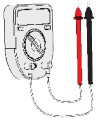


Figure 4-5 Installation of multiple cabinets

4.2 Tools Requirement

The tools used include but are not limited to the recommended tools below. Please use other auxiliary tools according to the site requirements. Please note that the tools used must comply with local regulations.

Multimeter (≥ 1500 V)

Withstand voltage tester



Insulation detector



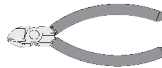
Spirit level



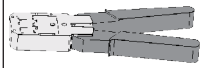
Wire cutter



Wire stripper



Diagonal pliers



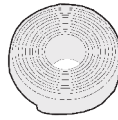
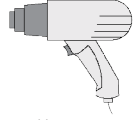
Crimping tool for RJ45



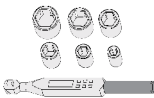
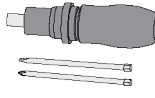
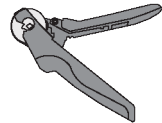
Hydraulic wire crimper



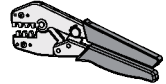
Utility knife

Heat shrink tubing
($\varnothing 4.5$ / $\varnothing 6$ / $\varnothing 9$ / $\varnothing 16$ mm)

Heat gun

Torque wrench
(M6\M8\M10)Torque screwdriver
(Phillips head: M6\M8\M10)

Crimping tool for ferrules



Crimping tool

All-terrain crane
(> 100 ton)

Wrench



Insulated ladder



Safety helmet



Insulating gloves



Safety goggles



Safety vest



Safety belt



4.3 Additionally Required Materials

When you install the equipment, the following list is recommended to prepare.

Table 4-2 Additionally required materials

No.	Required material	Type	Conductor Cross-section
1	DC power cable	 Recommend to use copper cable	70 mm ²
2	AC wires	 Five-core copper cable	L1/L2/L3/N: 35 mm ² PE: 16 mm ²
		 Four-core copper cable	L1/L2/L3/N: 35 mm ²
3	UPS wires	 Two-core copper cable	L1/N: 8 mm ²
		 Three-core copper cable	L1/N: 8 mm ² PE: 8 mm ²
4	Ethernet cable	 Cat 5e / Cat 6a	/
5	Communication cable	 STP cable / Cat 5e	0.35 mm ²
6	Signal cable	 /	0.5 mm ²
7	Copper ring terminal	 SC70-10, SC16-8, SCL6-8	/

No.	Required material		Type	Conductor Cross-section
6	RJ45		/	/
7	Ferrule		E4012, E0308, E0508	/

5 Unpacking and Inspection

5.1 Unpacking

- The equipment undergoes testing and inspection before shipping from the manufacturing facility. However, transport damage may still occur. Before unpacking the cabinet, please carefully check again.
- To ensure the cabinet remains stable during transportation, workers would use ropes to secure it to the transfer transportation vehicle from both the top and bottom ring.
- Due to the cabinet height exceeding 2m, please take necessary precautions for working at heights when removing the outer packaging.
- When unpacking, please handle all packaging materials properly for future storage or relocation of this equipment.
- After unpacking, please check if the equipment is intact and if all accessories are complete. If there is any damage or missing accessories, please contact your dealer immediately for assistance.

5.2 Packing List

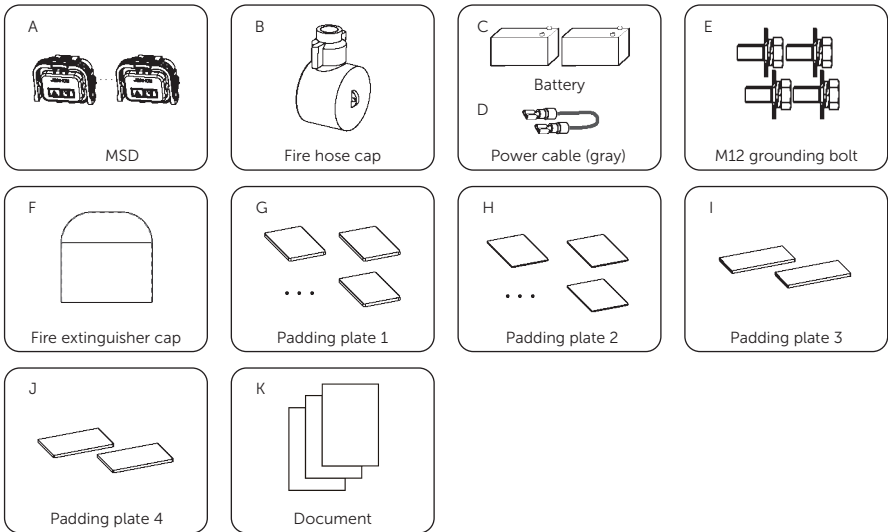


Table 5-1 Packing list

Item No.	Items	Quantity
A	MSD	48 pcs
B	Fire hose cap	1 pc
C	Battery	2 pcs
D	Power cable (gray)	1 pc
E	M12 grounding bolt	4 pcs
F	Fire extinguisher cap	1 pc
G	Padding plate 1 (W x H x D: 60 mm x 5 mm x 60 mm)	10 pcs
H	Padding plate 2 (W x H x D: 60 mm x 2 mm x 60 mm)	10 pcs
I	Padding plate 3 (W x H x D: 250 mm x 10 mm x 70 mm)	2 pcs
J	Padding plate 4 (W x H x D: 250 mm x 10 mm x 90 mm)	2 pcs
K	Document	/

6 Mechanical Installation

Pressure relief port (b) is optional. After receiving the container, you should remove the stickers on the system emergency stop button and pressure relief port (if any), respectively.

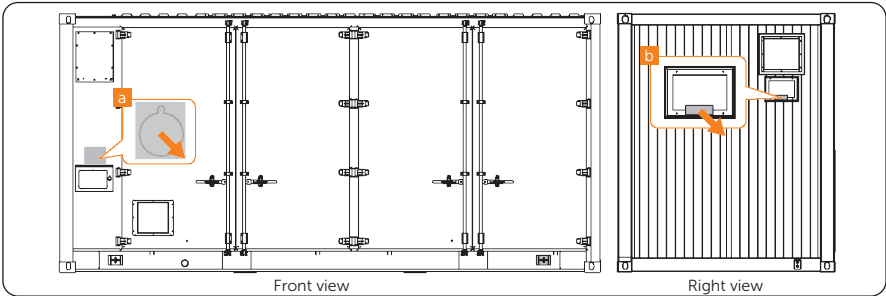


Figure 6-1 Removing stickers

The equipment supports the following situations:



6.1 Installation of MSD Plug

Before conducting cable connection, you should install the MSD plugs to every battery pack.



WARNING!

- Only maintenance technician can install the MSD plug.

Step 1: Use a key to open the lock, switch the handle to open the front doors, and then use the limiting rods to fix the doors.

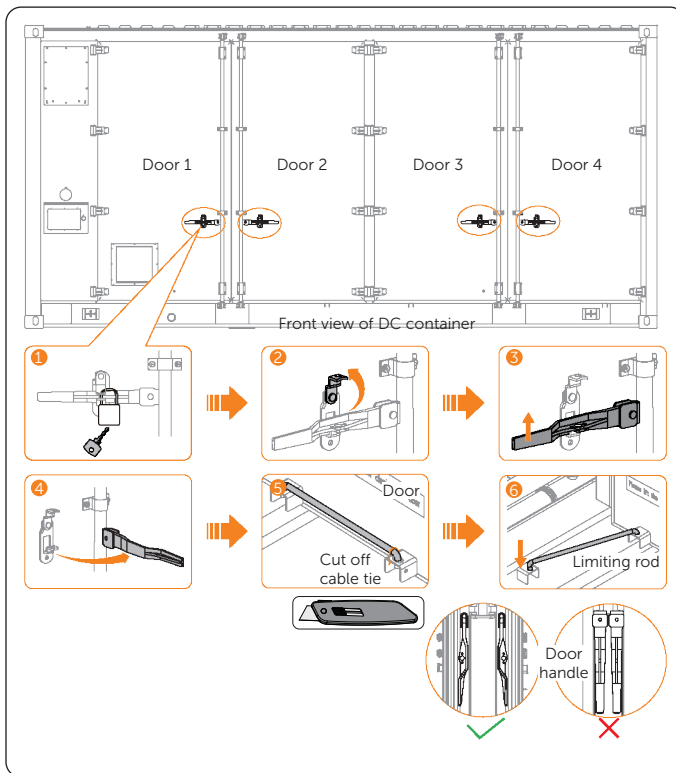


Figure 6-1 Opening the door

NOTICE!

- When door 2 and door 3 are opened at 90° and could be fixed by the door hooks, you should place the door handle according to the correct figure shown above.
- Before using the door hooks, you must cut off all the cable ties.

Step 2: Remove the cover on the MSD socket of the battery pack.

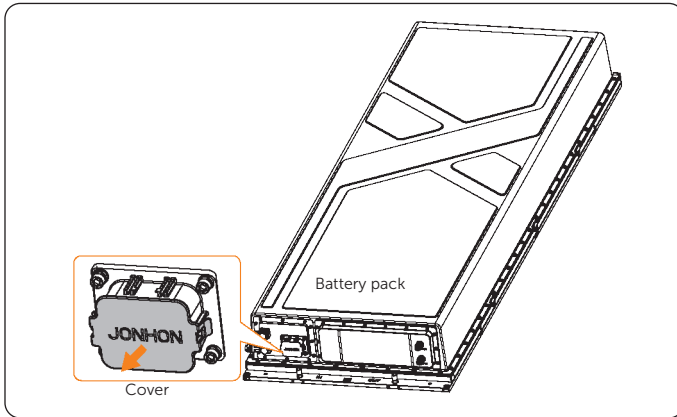


Figure 6-2 Removing cover

Step 3: Install the MSD plug (Part A).

- » Insert the MSD plug onto the MSD socket.
- » Push the handle up, to make sure that the plug is fully closed.
- » Pull the green sheet to lock.

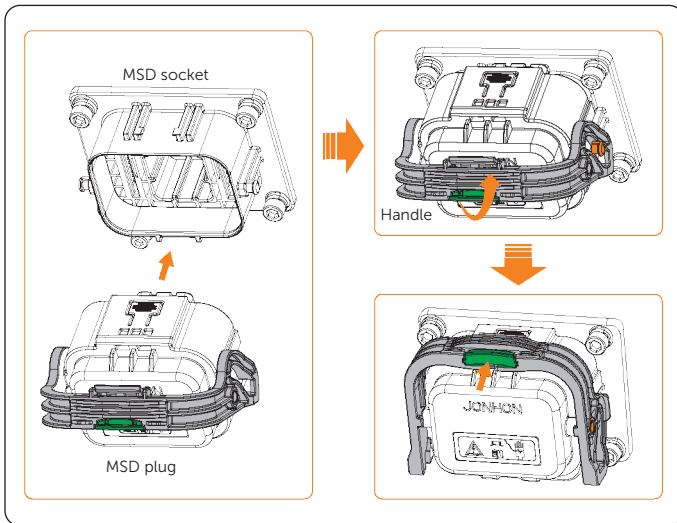


Figure 6-3 Installation of MSD plug

Step 4: Attach MSD plugs to the remaining battery packs by following Step 3.

6.2 Installation of Fire Hose Cap

When receiving the DC container, you can see that the fire hose cap does not be installed. Hence, after securing the cabinet, please do the following steps to install it.

Step 1: Remove the sealed packaging of the fire hose nozzle.

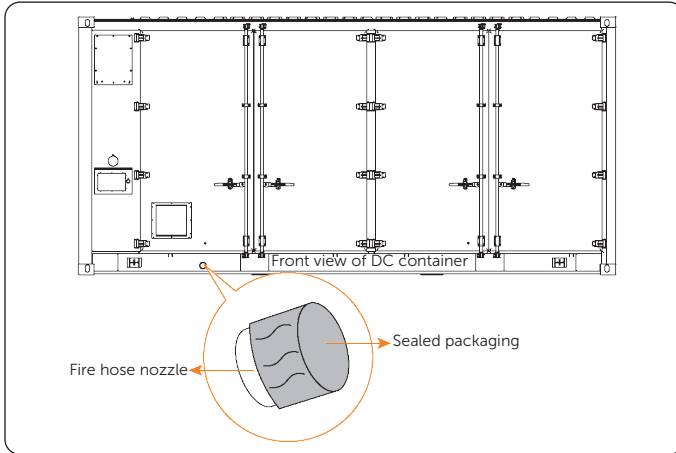


Figure 6-4 Removing sealed packaging

Step 2: Install fire hose cap (Part B), and then push the button to lock the cover.

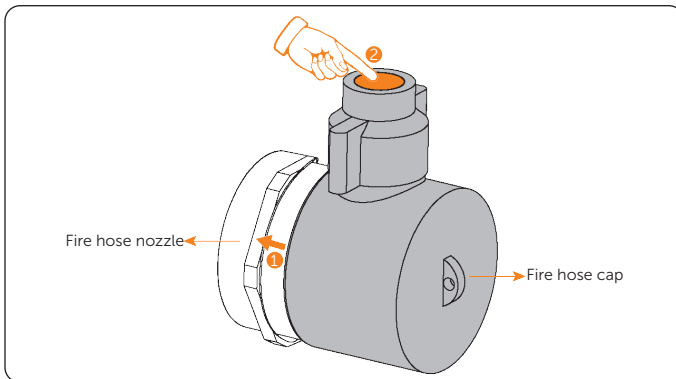


Figure 6-5 Installing fire hose cap and pushing button

NOTICE!

- The fire hose cap shown in the above figure is for reference only. The actual product received shall prevail.

7 Electrical Connection



WARNING!

- Before connecting cables, you must do:
 - » Perform withstand voltage and insulation resistance tests for the main circuit of the battery compartment, distribution box, and air-cooled chiller. Only when all the test results are qualified can you connect cables.
 - » Check that the upper and lower switches of a cable are in the open state.
 - » Perform tests for insulation resistance, voltage-withstand, and tensile strength of a cable. All the test results must be qualified. You should crimp terminals according to the local standards.
 - » Confirm that the cabinet has been grounded.
- It is recommended to ground the diagonal grounding ports when the equipment is grounded. The grounding resistance shall be no more than 4Ω .

7.1 PE Connection of DC container

You can see 4 PE points on the cabinet, see the figure below. You could ground the cabinet by welding or connecting PE cable. If you choose to ground with PE cable, please tighten the screws according to the torque (torque: 60~65 N·m).

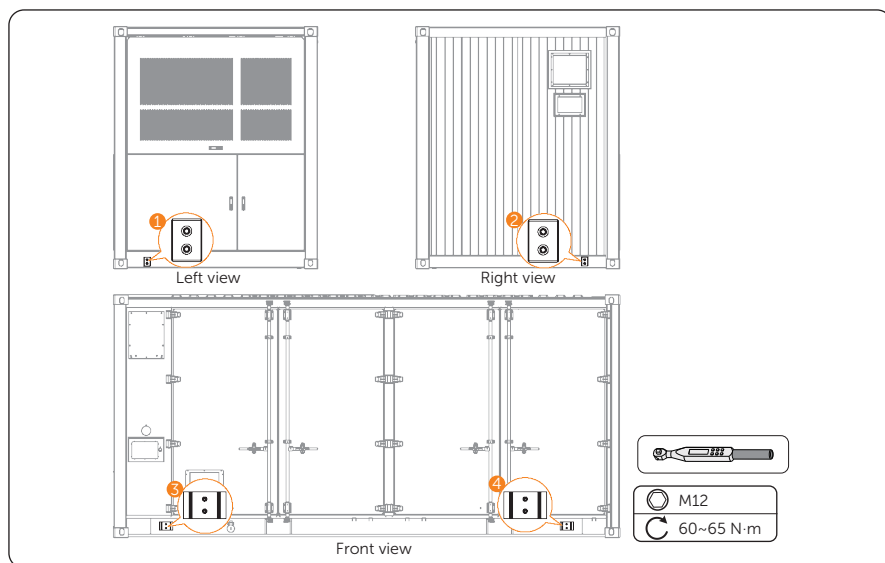


Figure 7-6 PE points

NOTICE!

- Grounding bolts for PE points ❶ and ❷ are included in the accessory kit (Part E).
- Grounding bolts for PE points ❸ and ❹ are already attached to the points upon delivery.

7.2 Cable Connection of Electrical Compartment

Before connecting cables, you need to know which areas require wiring.

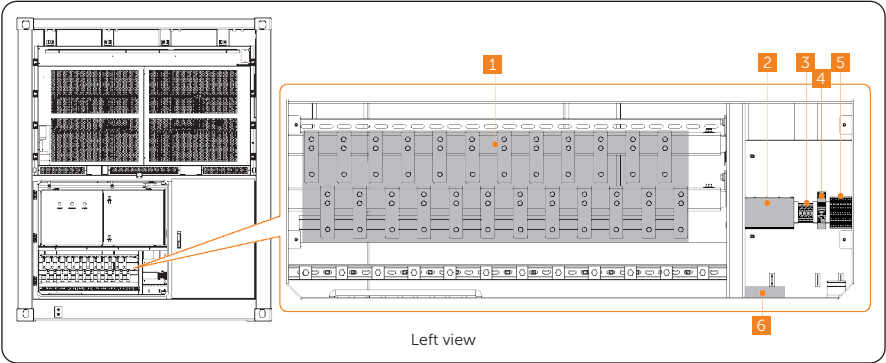


Figure 7-1 Wiring area

Table 7-1 Introduction of wiring area

Area	Description
1	To connect DC power cables.
2	To connect AC cable (3L+N+PE). You can decide to connect the PE wire or not.
3	To connect UPS cable (L+N+PE). You can decide to connect the PE wire or not.
4	To connect Ethernet cable.
5	To connect communication cable and signal cable. You can see that the cabinet is equipped with CAN port, RS485 port, and DI and DO ports. If you need to connect, please contact SolaX in advance.
6	To connect PE cable. You can decide to connect it or not.

Before connecting cables, please do as follows:

Step 1: Use a key to open the door of the electrical compartment.

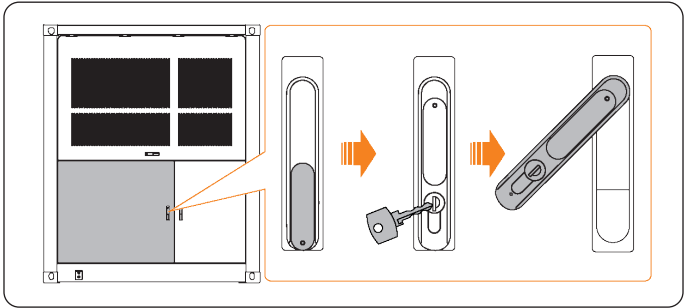


Figure 7-2 Opening the door of the electrical compartment

NOTICE!

- Please keep the keys properly.

Step 2: Remove the transparent insulating board.

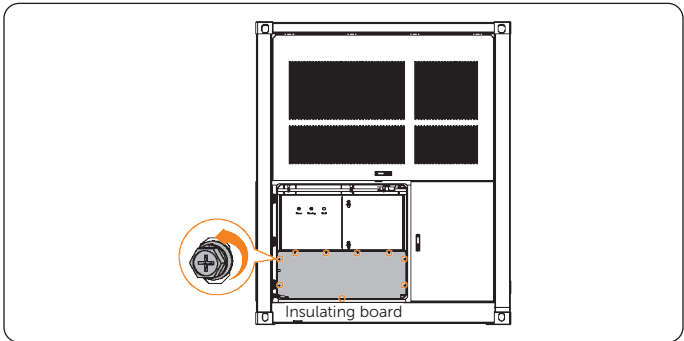


Figure 7-3 Removing the insulating board

Step 3: Thread positive power cables, negative power cables, AC cable, UPS cable, Ethernet cable, communication cable, and signal cable through the rubber seals.

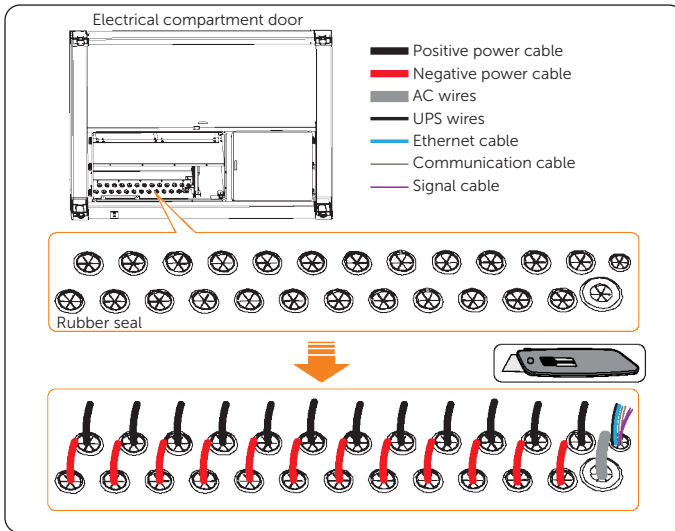


Figure 7-4 Threading cables through rubber seal

NOTICE!

- After routing cables, you should reserve about one meter of length in the compartment.
- You can see the rubber seals are already ripped. If the cables cannot pass through the rubber seal, you will rip it by using a knife.
- Before connection, you should check whether these cables are in good condition.

Step 4: Unscrew screws to open cable clamp.

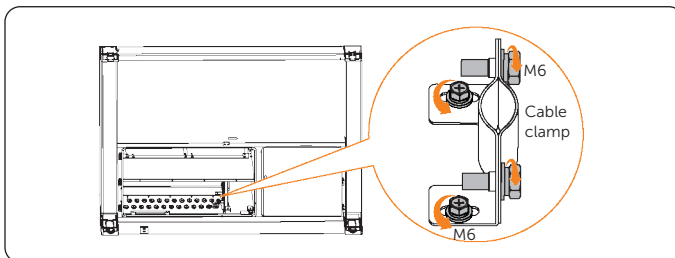


Figure 7-5 Opening cable clamp

NOTICE!

- Please keep the screws and cable clamp properly.

7.2.1 DC Power Cable Connection

WARNING!

- The order of cable connection: negative power cable → positive power cable.
- The cables prepared by yourself must be compatible with the system voltage and working current of the battery compartment.

- Step 1:** Take out SC70-10 terminals, heat-shrink tubing, and 70 mm² power cables.
- » Strip the cable jacket about 21 mm from the end.
 - » Cut a piece of heat-shrink tubing (Ø16 mm) 25 mm long.

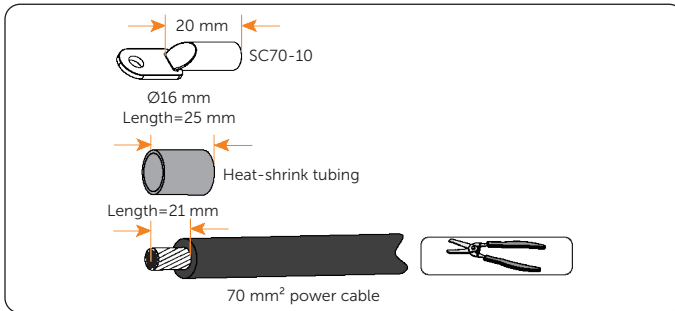


Figure 7-6 Stripping cable jacket

- Step 2:** Carefully slide the heat-shrink tubing onto one end of the cable, and slip the wires all the way into the terminal.

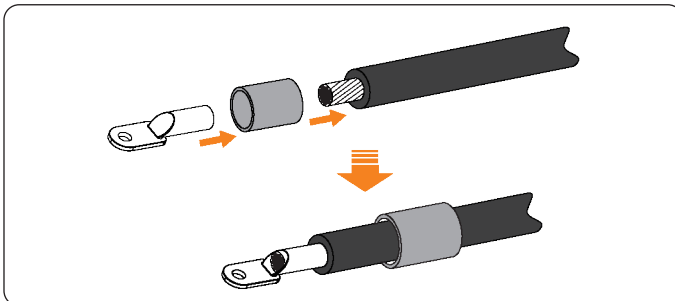


Figure 7-7 Assembling heat-shrink tubing, cable, and terminal

Step 3: Crimp the terminal by using a hydraulic wire crimper, and heating the heat-shrink tubing.

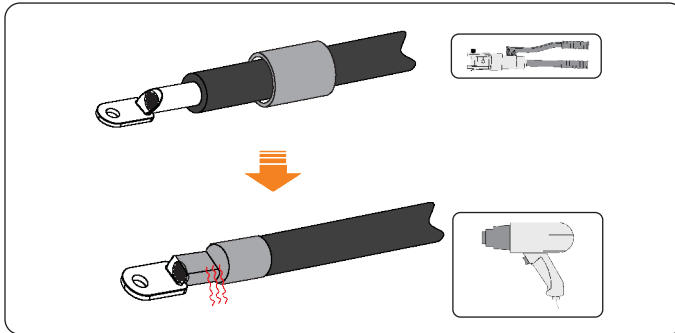


Figure 7-8 Crimping the terminal and heating the heat-shrink tubing

NOTICE!

- Do not damage the conductor insulation while crimping.
- Do not place the conductor insulation into the terminal.
- Keep the terminal round hole away from the heat-shrink tubing.
- Move the heat gun back and forth slowly to distribute the heat evenly across the surface of heat shrink tubing.

Step 4: Connect the power cables onto the copper bar.

» Unscrew M10 screws on the copper bar;

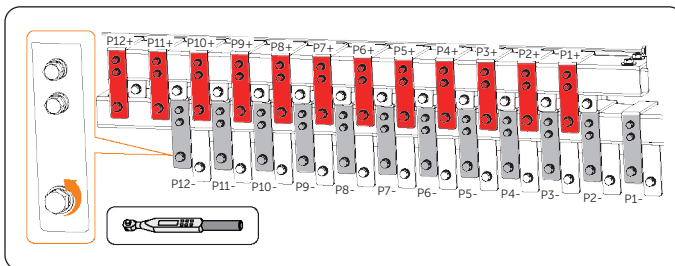


Figure 7-9 Unscrewing screws

NOTICE!

- The color of the copper bars shown in the above figure is for reference only. The actual product received shall prevail.
- Please keep the screws, flats, and nuts properly.

- » Unscrew M6 screws to thread power cables through the cable clamps;
- » Connect all the negative power cables to the copper bar, and tighten all the screws (torque: 27 N·m);
- » Connect all the positive power cables to the copper bar, and tighten all the screws (torque: 27 N·m);
- » Finally, tighten the M6 screws on the cable clamps.

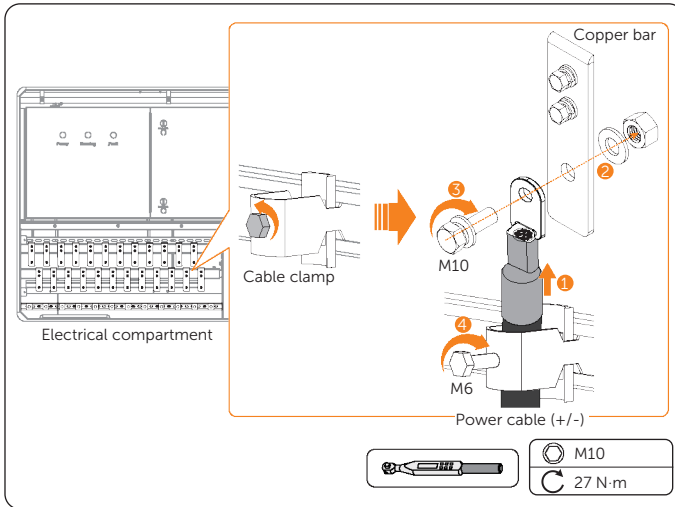


Figure 7-10 Connecting negative and positive power cables

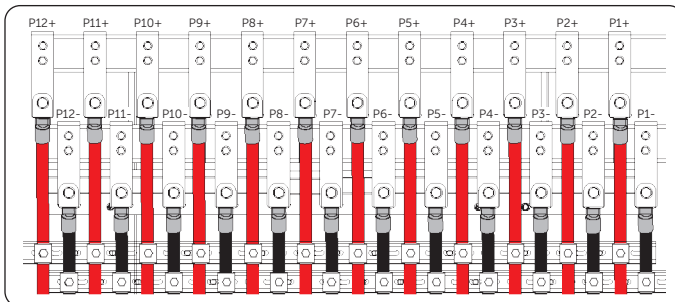


Figure 7-11 Final wiring diagram

Step 5: After finishing connection of DC power cable, you should attach the cable label in the electrical compartment, such as cable end label, or cable start and end label.

7.2.2 AC 400V In Cable Connection

NOTICE!

- If you use a single-core cable as the AC 400V In cable, the 3P+N wires must be threaded in the same hole, to avoid eddy current problems.
- When constructing the cable trench, you must adopt a pyramid-shaped or horizontal method to construct it according to the local laws and regulations.

The equipment supports four-core copper cable and five-core copper cable.

Step 1: Take out terminals, heat-shrink tubing, and five-core copper cable (or four-core copper cable)(L1/L2/L3/N: 35 mm², PE: 16 mm²).

- » Strip about 400 mm ~ 900 mm of sheath from the end of the cable;
- » Strip the cable jacket about 14 mm of L1, L2, L3, and N wires;
- » Strip the cable jacket about 10.5 mm of PE wire (five-core copper only);
- » Cut a piece of heat-shrink tubing (Ø9 mm) 25 mm long for L1, L2, L3, and N wires;
- » Cut a piece of heat-shrink tubing (Ø6 mm) 25 mm long for PE wire (for five-core cable only).

Table 7-1 Relevant information for assembling cable

Cable		Ring terminal	Heat-shrink tubing	
	Cross-sectional area		Diameter	Length
5-core cable or 4-core cable	Cable protective layer	/	/	/
	L1/L2/L3/N	35 mm ²	14 mm	SC35-8 Ø9 mm 25 mm
	PE (for five-core cable only)	16 mm ²	10.5 mm	SC16-8 Ø6 mm 25 mm

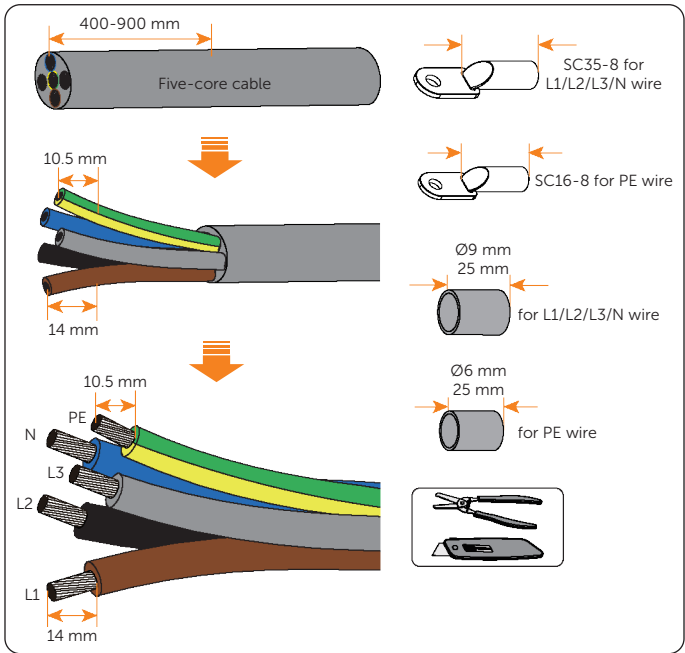


Figure 7-12 Stripping cable jacket

NOTICE!

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

Step 2: Heat-shrink tubing for wires.

- » Carefully slide it onto one end of the wires;
- » Carefully slip the wires all the way into the terminal.

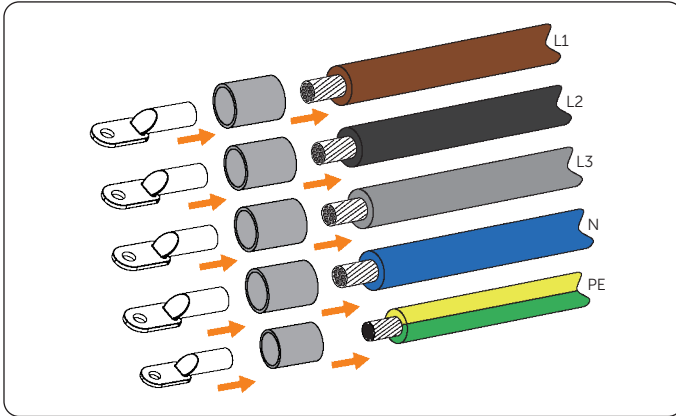


Figure 7-13 Assembling heat-shrink tubing, cable, and terminal

Step 3: Crimping the terminal and heating the heat-shrink tubing. Take the L2 wire, for instance.

- » Crimp the terminal by using a hydraulic wire crimper;
- » Heat the heat-shrink tubing after it wraps the end of terminal.

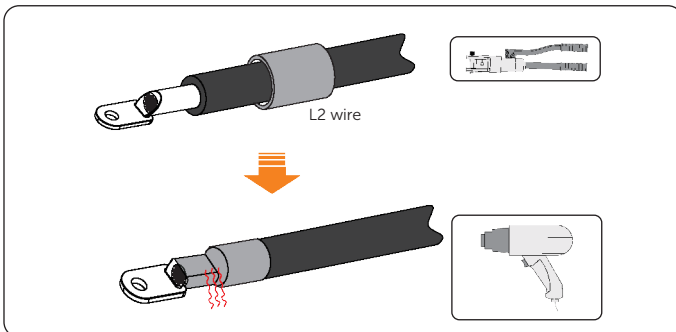


Figure 7-14 Crimping the terminal and heating the heat-shrink tubing

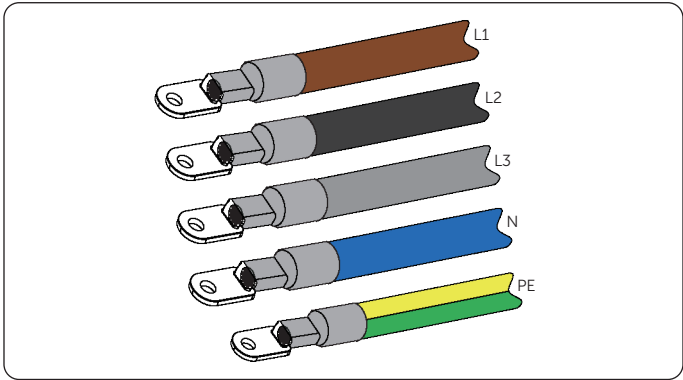


Figure 7-15 Wires after making

NOTICE!

- Do not damage the conductor insulation while crimping.
- Do not place the conductor insulation into the terminal.
- Keep the terminal round hole away from the heat-shrink tubing.
- Move the heat gun back and forth slowly to distribute the heat evenly across the surface of heat shrink tubing.

Step 4: Installation of five-core copper cable (or four-core copper cable).

» Open the cover of AC 400V In;

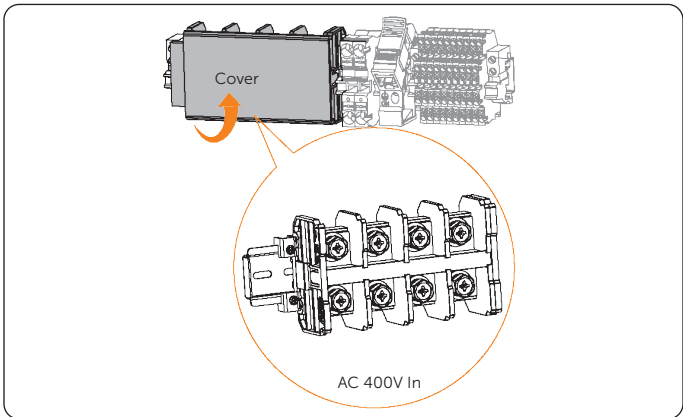


Figure 7-16 Opening cover

- » Unscrew M8 screws;

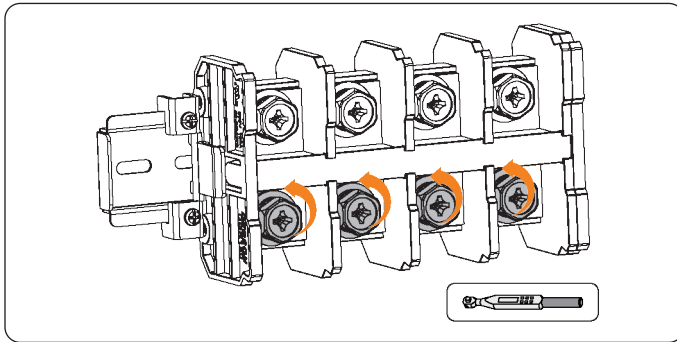


Figure 7-17 Unscrewing screws

- » Connect L1, L2, L3, and N wires, and tighten all the screws (torque: 10 N·m); and close the cover.

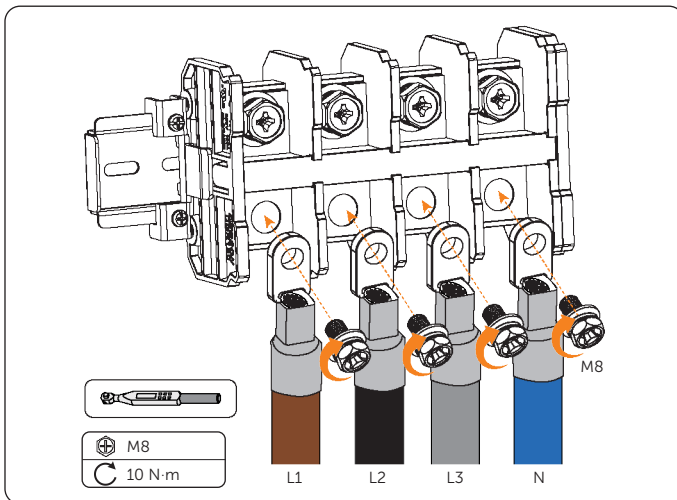


Figure 7-18 Connecting L1, L2, L3, and N wires

Step 5: Connect PE wire onto the copper bar (torque: 12 N·m). If you use a five-core copper cable, must connect the PE wire. If you use a four-core copper cable, do not need to connect the PE wire.

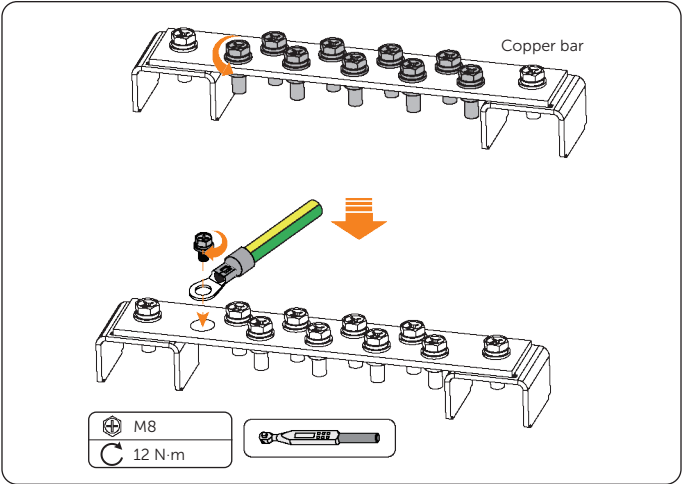


Figure 7-19 Connecting PE wire

NOTICE!

- The size of the screws on the copper bar are the same. You can choose any of them to connect PE wire.

7.2.3 UPS In Cable Connection

The equipment supports two-core copper cable and three-core copper cable.

Step 1: Take out a E4012 ferrules, heat-shrink tubing, and three-core copper cable (or two-core copper cable)(L/N: 4 mm², PE: 4 mm²).

- » Strip the cable about 200 mm to 300 mm;
- » Strip the cable jacket about 12 mm of L and N wires;;
- » Strip the cable jacket about 9 mm of PE wire (for three-core copper only);
- » Cut a piece of heat-shrink tubing (Ø4.5 mm) 25 mm long for PE wire (for three-core cable only).

Table 7-2 Relevant information for assembling cable

	Cable	Cross-sectional area	Strip length	Terminal	Heat-shrink tubing	
					Diameter	Length
3-core cable or 2-core cable	Cable protective layer	/	200-300 mm	/	/	/
	L/N	4 mm ²	12 mm	E4012	/	/
	PE (for 3-core cable only)	4 mm ²	9 mm	SCL6-8	Ø4.5 mm	25 mm

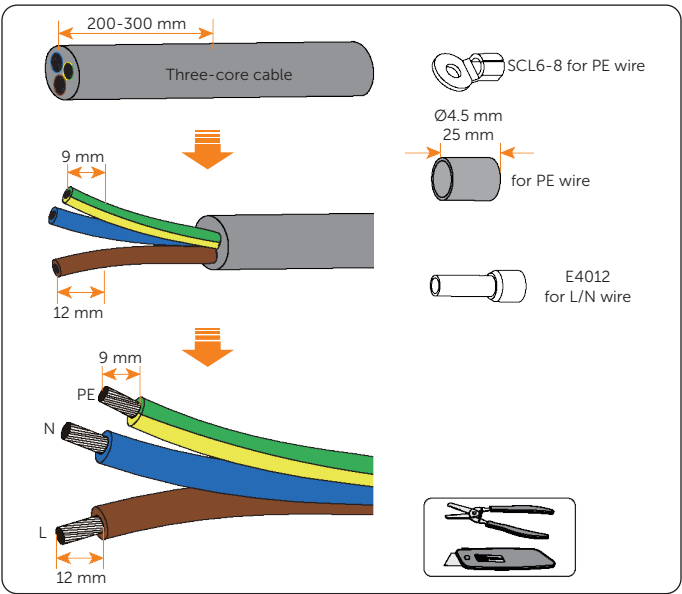


Figure 7-20 Stripping cable jacket

NOTICE!

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

Step 2: Ferrules, terminal, and/or heat-shrink tubing for wires.

- » Carefully slide ferrules onto one end of the L and N wires;
- » Carefully slip the wires all the way into the heat-shrink tubing and ring terminal (if necessary).

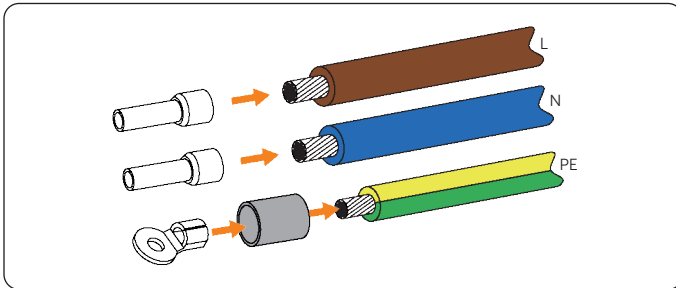


Figure 7-21 Cutting heat-shrink tubing

Step 3: Crimping ferrules and terminal, and/or heating the heat-shrink tubing.

- » Crimp the ferrules by using a crimping tool for ferrules;
- » Crimp ring terminal by using a crimping tool, and heat the heat-shrink tubing after it wraps the end of terminal (if necessary).

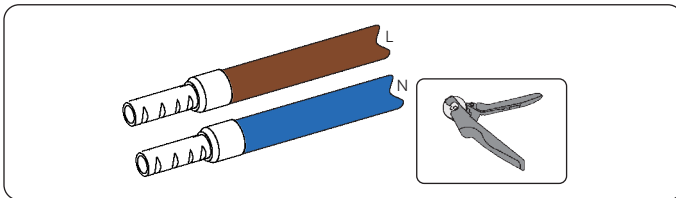


Figure 7-22 Crimping ferrules

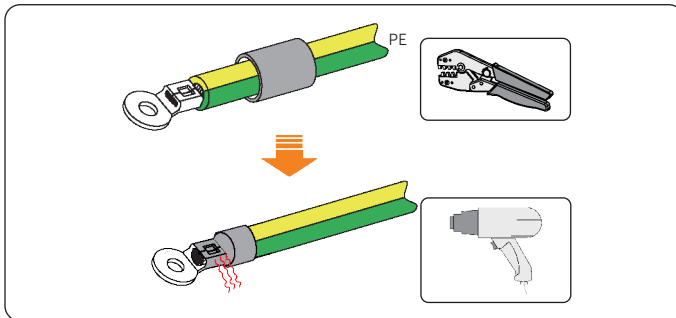


Figure 7-23 Crimping terminal and heating heat-shrink tubing

NOTICE!

- Do not damage the conductor insulation while crimping.
- Do not place the conductor insulation into the terminal.
- Keep the terminal round hole away from the heat-shrink tubing.
- Move the heat gun back and forth slowly to distribute the heat evenly across the surface of heat shrink tubing.

Step 4: Insert L and N wires into the **UPS In** ports.

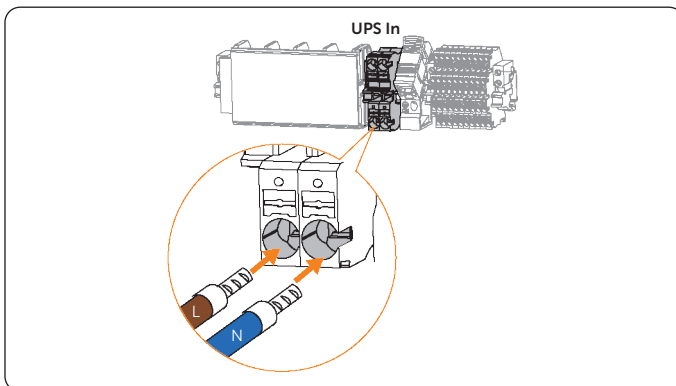


Figure 7-24 Inserting cables

Step 5: Connect PE wire onto the copper bar (torque: 12 N·m). If you use a three-core copper cable, must connect the PE wire. If you use a two-core copper cable, do not need to connect the PE wire.

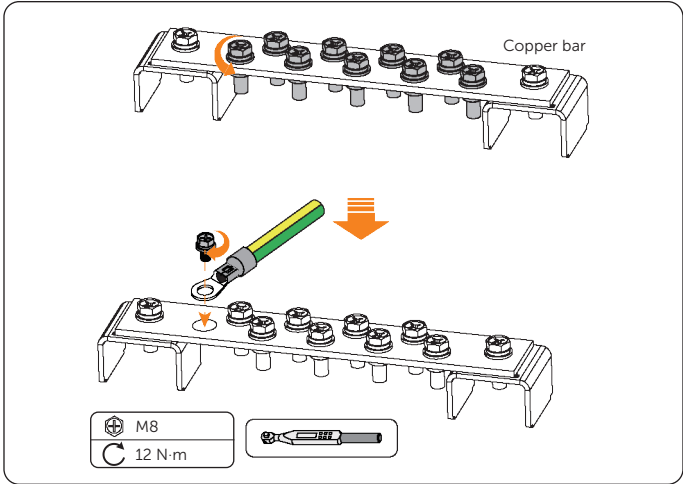


Figure 7-25 Connecting PE wire

NOTICE!

- The screw on the copper bar are the same. You can choose any of them to connect PE wire.

7.2.4 RJ45 Ethernet Cable Connection

To ensure normal communication, you should connect a Ethernet cable to the equipment.

Step 1: Take out an Ethernet cable (CAT-5E), and a RJ45.

- » Strip the cable jacket about 15 mm.

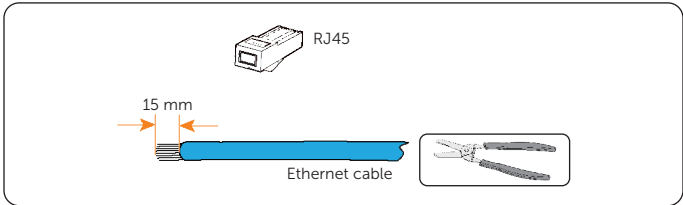


Figure 7-26 Stripping cable jacket

Step 2: RJ45 for cable.

- » Carefully slip the cable all the way into the RJ45;
- » Push the RJ45 inside the crimping tool and squeeze the crimper all the way down.

Table 7-3 Color of Ethernet cable

No.	1	2	3	4	5	6	7	8
Color	White with orange stripes	Orange	White with green stripes	Blue	White with blue stripes	Green	White with brown stripes	Brown

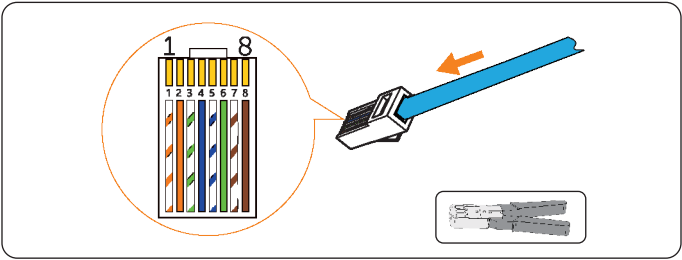


Figure 7-27 Making Ethernet cable

Step 3: Insert the cable into the Ethernet port.

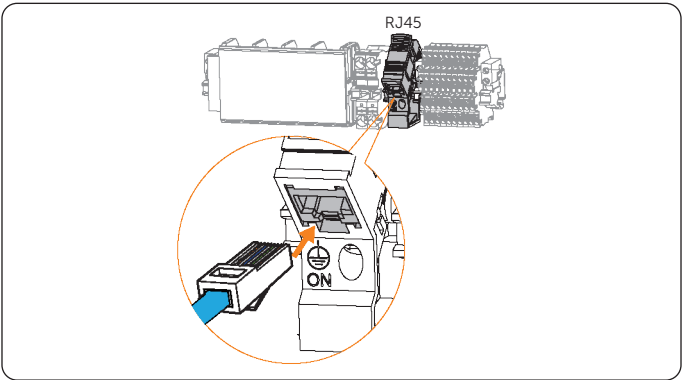


Figure 7-28 Inserting Ethernet cable

7.3 Signal Output Cable Connection



WARNING!

- As for the communication cable and signal cable, you can choose to connect or disconnect them. However, if you decide to connect them, please contact our company in advance.
- Before connecting cables, you must connect cables according to the silk-screen printing on the terminal block.

Please do the following steps to connect cables.

Step 1: Take out a communication cable and signal cable.

- » Strip the cable jacket about 15 mm.

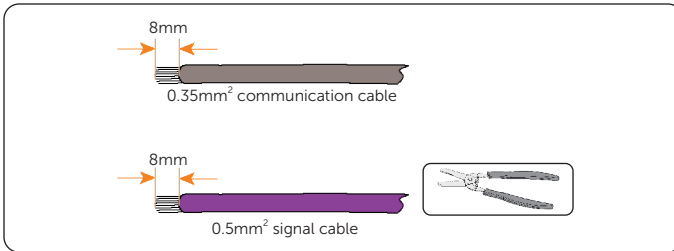


Figure 7-29 Stripping cable jacket

NOTICE!

- As for communication cable, it is recommended to use UL2517 0.35mm² cable. When installing the equipment in a complex electromagnetic environment, it is recommended to use UL2845 0.35mm² cable.
- As for signal cable, it is recommended to use UL1569 0.5mm² cable.

Step 2: Crimp the ferrules by using a crimping tool for ferrules.

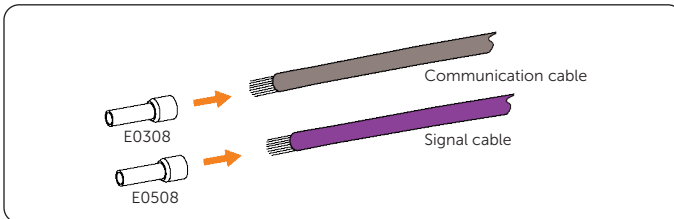


Figure 7-30 Assembling ferrule and cable

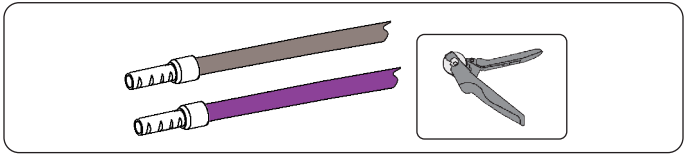


Figure 7-31 Crimping ferrules

Step 3: Insert cables into the relevant ports. The No. 1~6 and 11~16 of the terminal block have been connected before delivery. If necessary, you could connect wires to No. 7~10 and 17~20.

Table 7-4 Cable and corresponding port

Terminal definition									
1	2	3	4	5	6	7	8	9	10
FACP 1ST STAGE	1#12 2ND STAGE	3#12 FAULT RELAY	LOCAL FIRE	/	/	CANH	CANL	COM	COM
11	12	13	14	15	16	17	18	19	20
FACP 1ST STAGE	1#8 2ND STAGE	3#18 FAULT RELAY	LOCAL FIRE	/	/	485A	485B	DI	DO

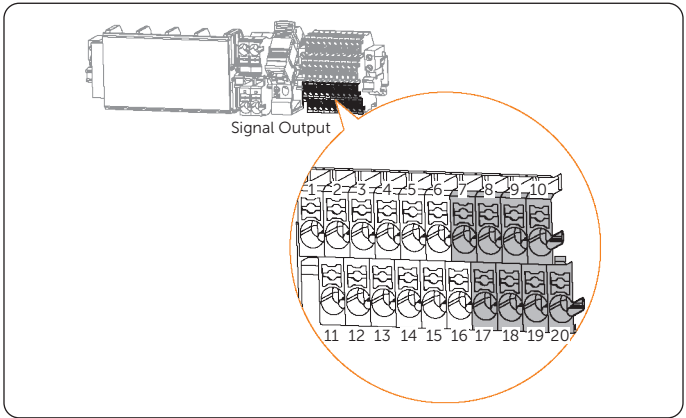


Figure 7-32 Port position

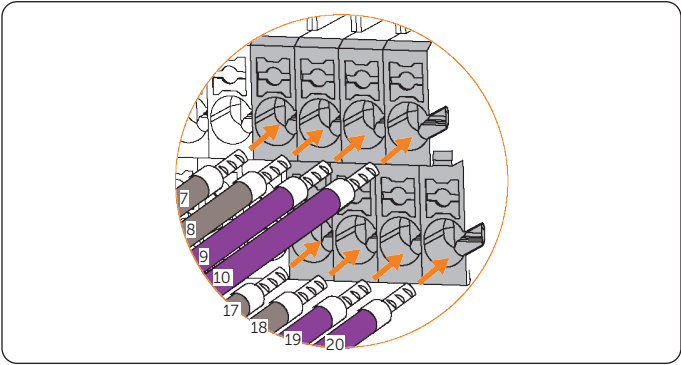


Figure 7-33 Connecting communication cable and signal cable

NOTICE!

- Transmission distance of communication signal is less than 1000 m. If you find that the equipment occurs communication failure, please check whether the signal exceeds the transmission distance.

Step 4: Operation about cable clamp.

- » Thread AC wires, UPS wires, Ethernet cable, communication cable, and signal cable through cable clamp, and then close the clamp;

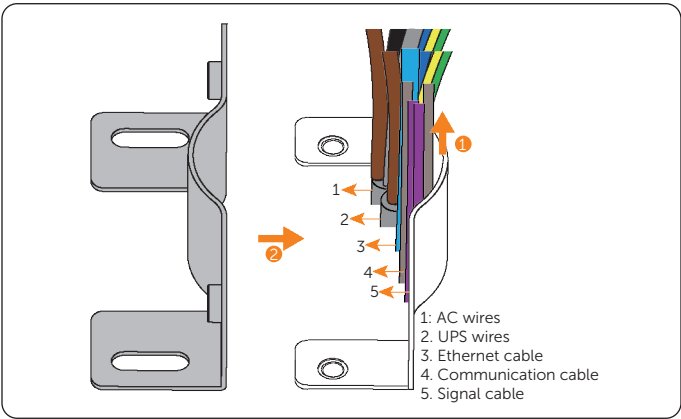


Figure 7-34 Threading wires and cable and closing cable clamp

- » Fully tighten M6 screws to secure the clamp (torque: $2 \pm 0.2 \text{ N}\cdot\text{m}$).

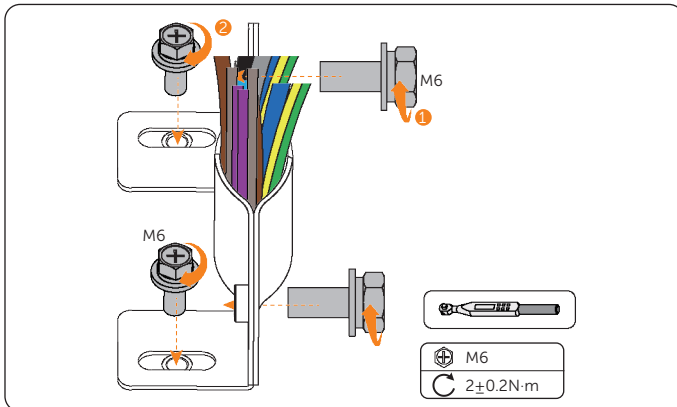


Figure 7-35 Tightening screw

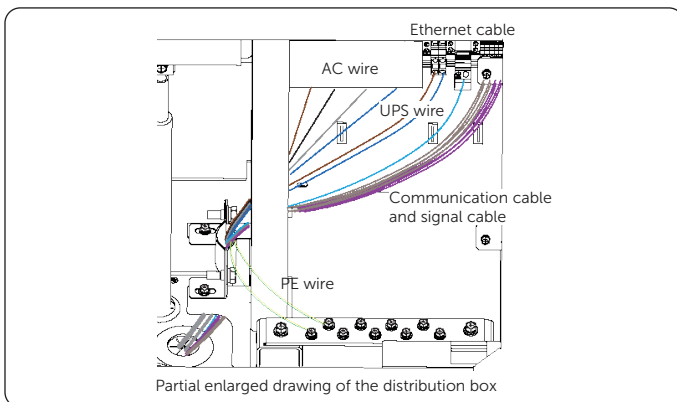


Figure 7-36 Partial enlarged drawing about wiring

NOTICE!

- After finishing the cable connection, you must use fireproof mud to seal the cable holes.

Step 5: Check that all the cables are connected correct, and then reinstall the insulating board.

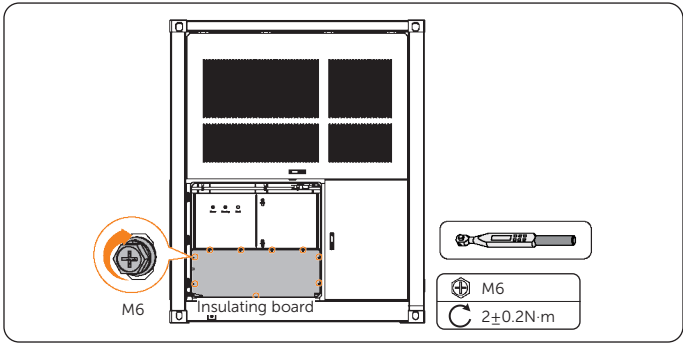


Figure 7-37 Reinstalling the insulating board

NOTICE!

- After finishing cable connection, you must clean the materials, such as metal parts, screws, and more, in the cabinet.

8 Liquid Cooling System

The liquid cooling system consists of air-cooled chiller and pipelines.

8.1 Air-cooled Chiller

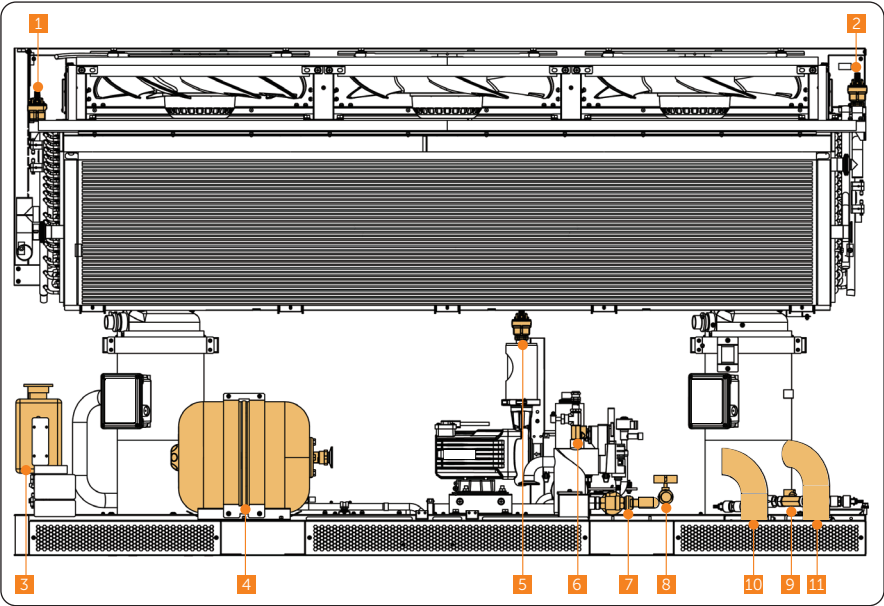


Figure 8-1 Parts of air-cooled chiller

Table 8-1 Parts of air-cooled chiller

No.	Item	No.	Item
1	Auto exhaust valve 1	7	Drain port
2	Auto exhaust valve 2	8	Filling & drain tank
3	Auto replenishment tank	9	Mini ball valve 2
4	Expansion tank	10	Coolant inlet
5	Auto exhaust valve 3	11	Coolant outlet
6	Mini ball valve 1		

NOTICE!

- After the air-cooled chiller is powered on, the heating belt in the compressor will automatically activate even if the compressor is not started.
- At the first power on, you must ensure that the heating belt has been worked over four hours before starting the chiller.
- If starting the compressor in a low temperature, you may find that the following situations might appear, difficult activation, poor loading, and poor unloading. Therefore, you should heat it four hours in advance. Do not cut off the power when the chiller stops running.

8.2 System Introduction

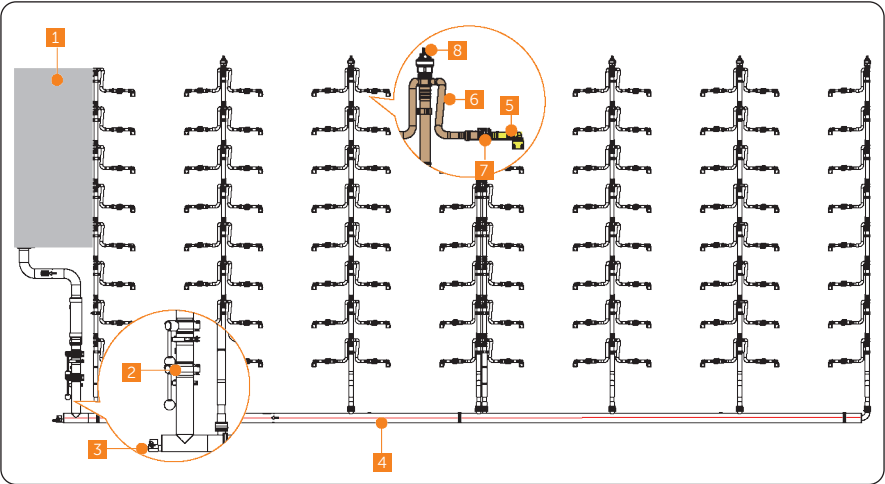


Figure 8-2 Pipelines and valves
Table 8-2 Introduction of pipeline

No.	Name	No.	Name
1	Air-cooled chiller (See 8.1 Air-cooled Chiller for details)	5	Tertiary pipeline
2	Butterfly valve	6	Secondary pipeline
3	Drain valve	7	Check valve
4	Primary pipeline	8	Vent valve

8.3 Checking Air-cooled Chiller Information

- Step 1:** Open the electrical compartment door, and connect cable to BSC100.
- » Connect the NET2 port of the BSC100 and a computer via an ethernet cable;

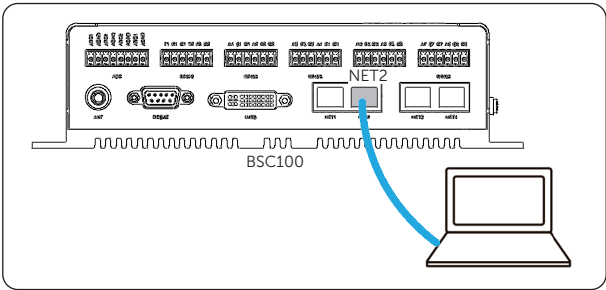


Figure 8-3 Connecting the BSC100 and a computer

- » Input the following web address (<http://192.168.2.136>), enter the username and password, and then click **Login**.

Table 8-1 Account information

Username	Password	Remarks
User	123456 by default	The password can be modified on the webpage.

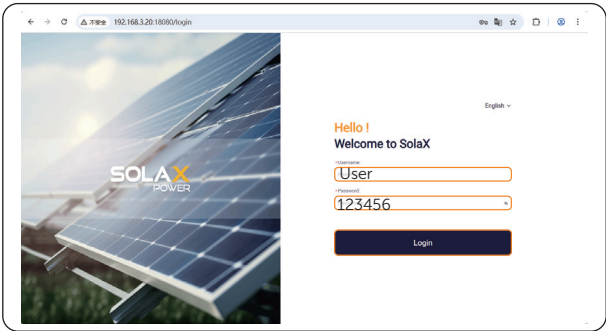


Figure 8-4 Inputting account name and password

» Click **Real-time Data > Liquid Cooling Host** to check information.

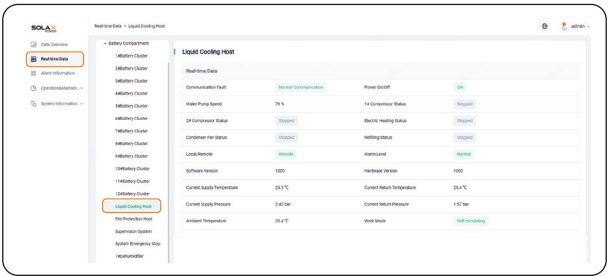


Figure 8-5 Checking information

NOTICE!

- If you want to change the password, please click **user > Change Password** to enter original and new passwords, and then click **Confirm**. For detailed steps, see the figure below.

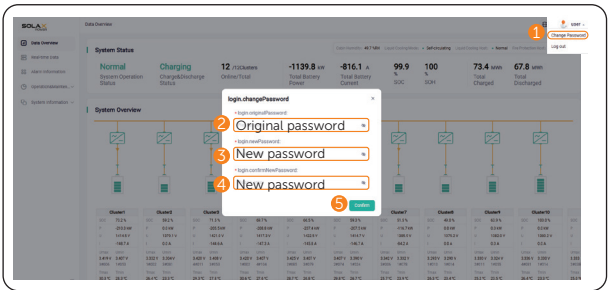


Figure 8-6 Changing password

9 Fire Protection System



WARNING!

- The fire protection system has two modes: automatic mode, and manual mode. Do not change to manual mode, except for maintenance and commissioning before power on.

9.1 Components of Fire Protection System

The whole fire protection system consists of combustible gas and ventilation and exhaust subsystem, fire detection and alarm subsystem, gas fire-extinguishing subsystem, and water-based fire protection subsystem. In addition, the cabinet can also optionally equipped with explosion-proof plate.

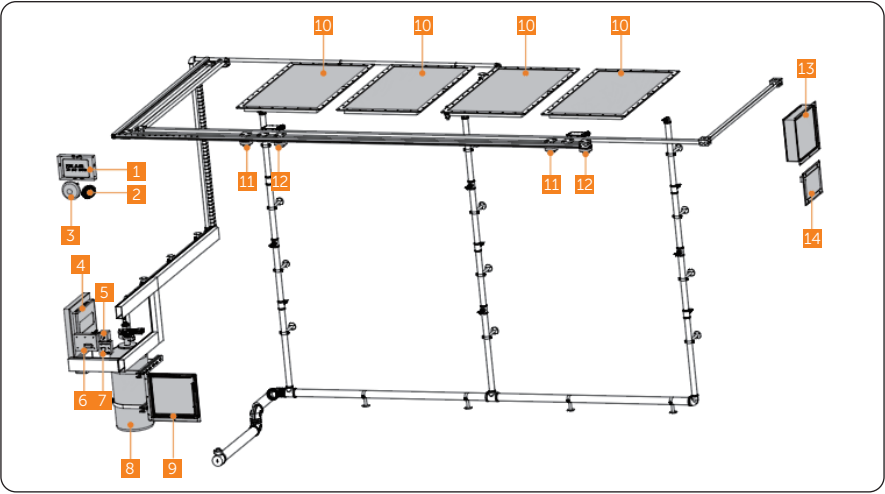


Figure 9-1 Component position of fire protection system

Table 9-1 Component of fire protection system

No.	Item	No.	Item
1	Vent LED	8	Perfluorohexanone fire extinguishing device
2	Audible and visible alarm	9	Air inlet
3	Fire alarm bell	10	Explosion-proof plate (optional)
4	Fire control panel	11	Smoke detector

No.	Item	No.	Item
5	Fan start & stop button	12	Temperature detector
6	Manual & automatic transfer switch and emergency start button	13	Air outlet
7	Fire emergency stop button	14	Pressure relief port

9.2 Logic Diagram of Fire Protection System

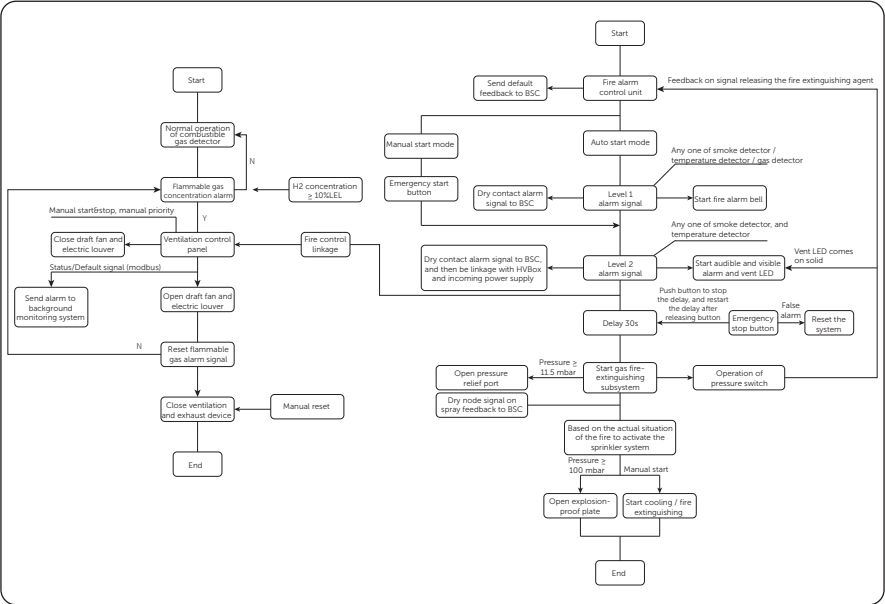


Figure 9-2 Logic diagram

9.2.1 Fire Detection and Alarm Subsystem



WARNING!

- The fire detection and alarm subsystem has two modes: auto mode, and manual mode. Under normal conditions, the system should be running in "auto mode". However, under maintenance or other special conditions, you must change the mode from "auto mode" to "manual mode".

The fire detection and alarm subsystem will work simultaneously with the gas fire-extinguishing subsystem. It has two modes:

- Auto mode: In case of a fire alarm, the system will automatically identify whether it is a level-1 alarm fire or level-2 alarm fire. Then the system will take measures to deal with it automatically.
- Manual mode: All the operations in manual mode are the same as in the auto mode, except for the inability to link the vent LED and start the gas spraying procedure. How to switch to manual mode? Please refer to the next chapter.

9.2.2 Gas Fire-extinguishing Subsystem



WARNING!

- The gas fire-extinguishing subsystem has three modes: auto mode, manual mode, and emergency mechanical mode. Under normal conditions, the system should be running in auto mode. However, under emergency conditions, you could change the mode from auto mode to manual mode or emergency mechanical mode.
- If you need to operate the system in normal conditions, please switch the manual & automatic transfer switch from **Auto & Manual** to **Manual Only**. Do not forget to reset after finishing the operation.

Before starting the system, you should install the actuator and batteries.

Step 1: Switch the manual & automatic transfer switch from auto mode to manual mode via emergency stop area or fire control panel.

- » Emergency stop area: open the cover, insert the key into the hole, and then turn the key clockwise to **Manual Only**.

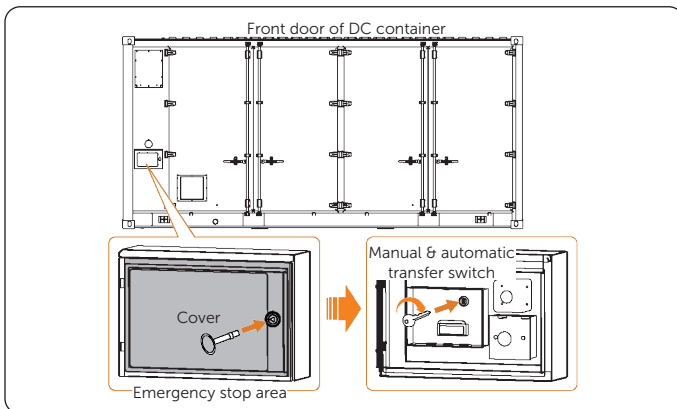


Figure 9-3 Switching to Manual Only

- » Fire control panel: open the cover, insert the key into the hole, and then turn the key clockwise to **Manual Only**.

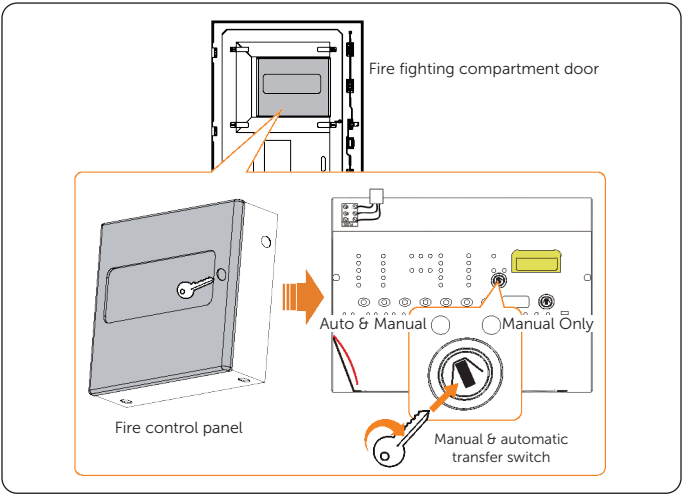


Figure 9-4 Switching to Manual Only

Step 2: Open the door of the fire fighting compartment;

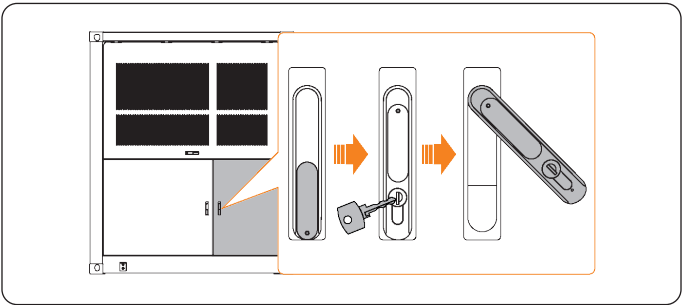


Figure 9-5 Opening the door

Installation procedure for actuator

Step 1: Remove the actuator installed on the wall inside the compartment, and turn anti-clockwise to remove the cap on the Perfluorohexanone fire extinguishing device;

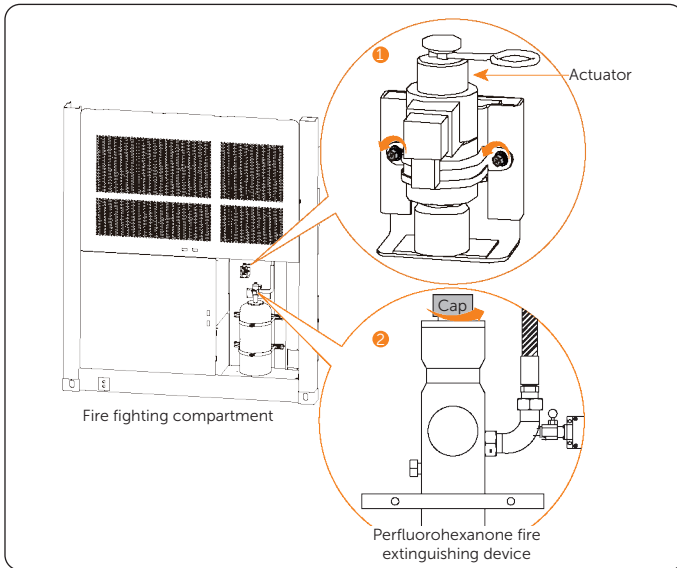


Figure 9-6 Removing actuator and cap

Step 2: Loosen up the resetting screw;

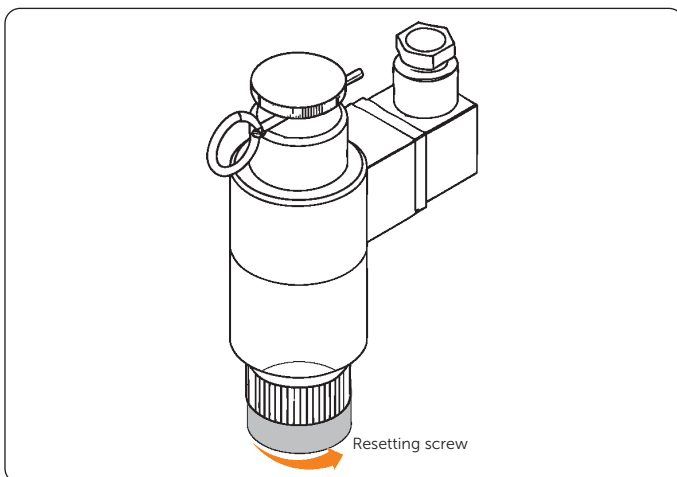


Figure 9-7 Loosening up the resetting screw

Step 3: Install the actuator on the Perfluorohexanone fire extinguishing device, and then turn it clockwise fully.

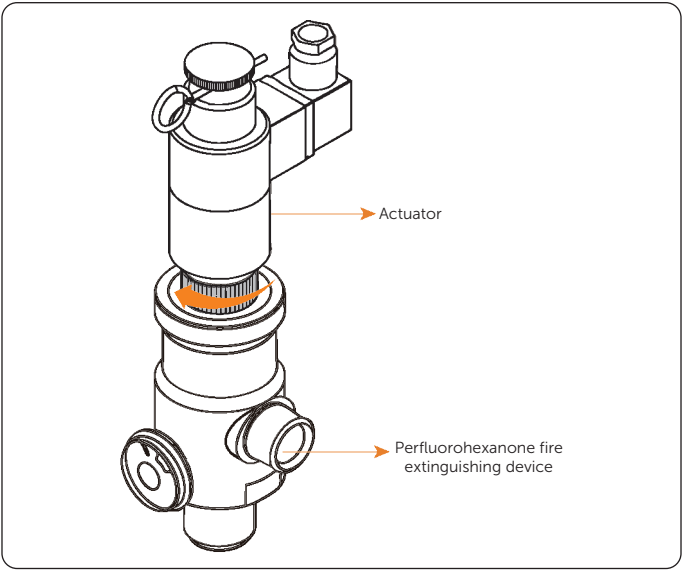


Figure 9-8 Installing the actuator

Installation procedure for battery

Step 1: After opening the door of the fire control panel, you can see a red positive power cable and a black negative power cable.

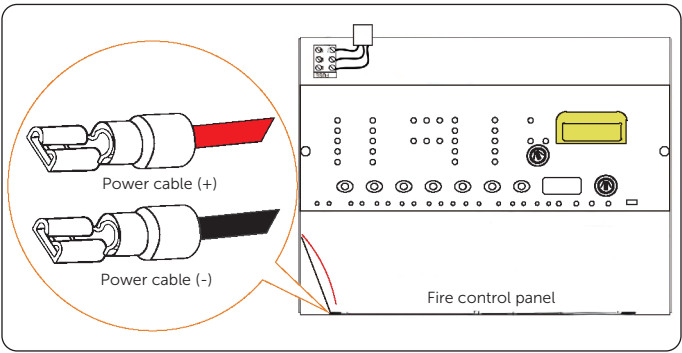


Figure 9-9 Position of the power cables

Step 2: Take out batteries (Part C) and power cable (Part D), and connect the cable between the two batteries.

- » Connect the grey power cable to the "-" terminal of battery 1 and the "+" terminal of battery 2;

Table 9-2 Connection of cable

	Cable
"-" terminal of Battery 1 → "+" terminal of Battery 2	Gray power cable
"+" terminal of Battery 1 → Fire control panel	Red positive power cable
"-" terminal of Battery 2 → Fire control panel	Black negative power cable

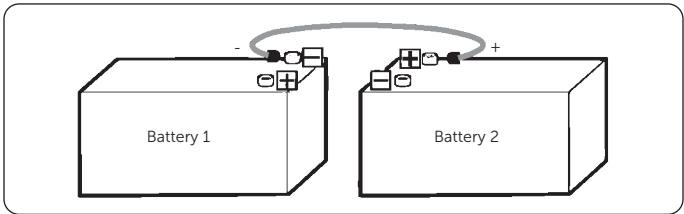


Figure 9-10 Connecting cable between two batteries

- » Connect the positive power cable to the "+" terminal of Battery 1, as well as the negative power cable to the "-" terminal of Battery 2.
- » Place the batteries into the fire control panel.

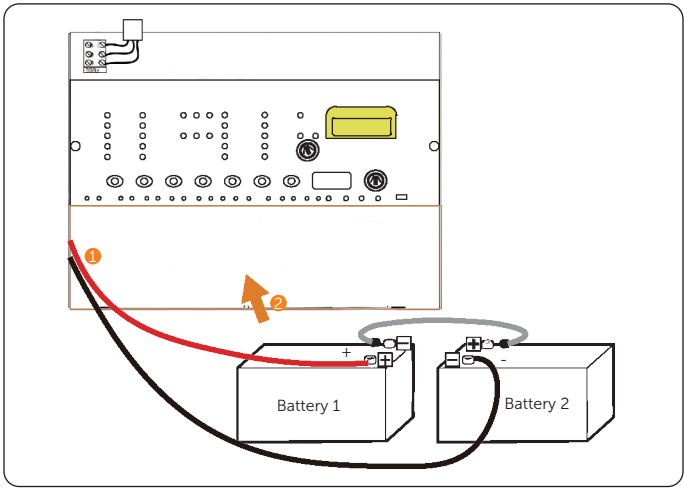


Figure 9-11 Connecting cables between batteries and fire control panel

Step 3: Reset the manual & auto transfer switch.

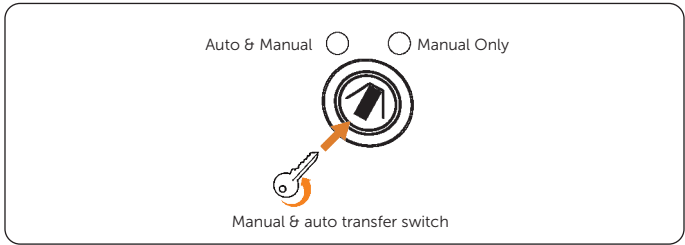


Figure 9-12 Resetting the manual & auto transfer switch

Step 4: Close the door of the fire fighting compartment.

9.3 Activation of Gas Fire-extinguishing Subsystem

The gas fire-extinguishing subsystem has three modes: auto mode, manual mode, and emergency mechanical mode.

Auto mode

When the fire detection and alarm subsystem is in auto mode and it triggers level-2 alarm fire, the gas fire-extinguishing subsystem will activate automatically. As for the activation principle of the gas fire-extinguishing subsystem, please see Figure 9-2.

Manual mode

You can press the emergency stop button in the emergency stop area or fire control panel to start the gas fire-extinguishing subsystem. Then it will automatically spray the fire extinguishing agent.

- In emergency stop area: open the cover of emergency stop button, and then press the button.

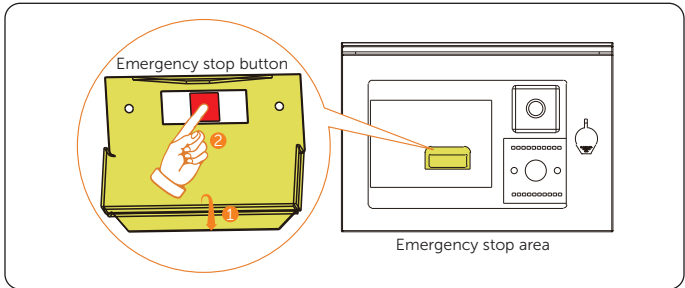


Figure 9-13 Pressing the emergency stop button

- In fire control panel: open the cover of emergency stop button, and then press the button.

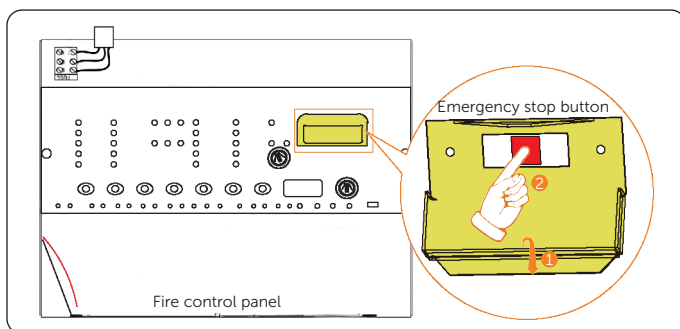


Figure 9-14 Pressing the emergency stop button

Emergency mechanical mode

If a fire occurs when the cabinet is powered off, you can manually operate the actuator to activate the gas fire-extinguishing subsystem. You can do as the following steps:

Step 1: Pull out the pull ring of the actuator;

Step 2: Press the actuator head.

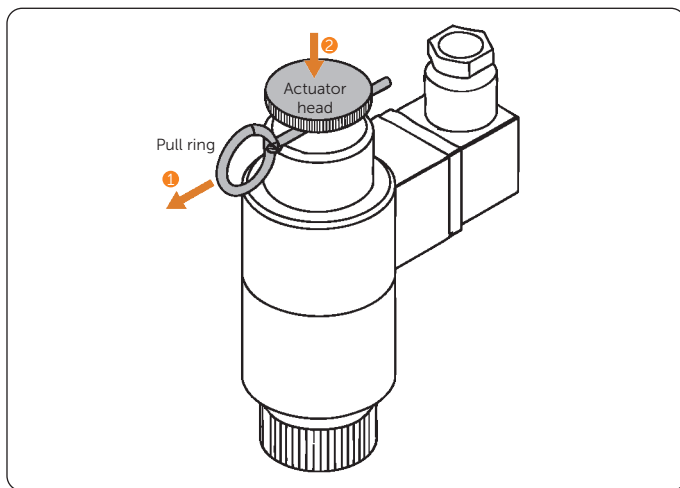


Figure 9-15 Activating the actuator

9.3.1 Water-based Fire Protection Subsystem and Explosion-proof Plate

You can see a fire hose port meeting DN65 standard on the cabinet. It can connect to outdoor fire hydrants or rescue trucks. When the gas fire-extinguishing subsystem cannot control the fire, you can connect the fire hose port to activate the water-based fire protection sub-system, to prevent the fire from spreading.

- Water pressure at the fire hose port: ≥ 1.99 bar.

The explosion-proof plate is an optional part. Hence, you can choose to install it or not. The explosion-proof plate could automatically open according to the pressure in the cabinet.

9.4 Precaution and Measures after Stopping the Gas Fire-extinguishing Subsystem

9.4.1 Precaution



After stopping the gas fire-extinguishing subsystem, please pay attention to:

- Keep sources of heat and flame away from the cabinet, because there may still be remaining flammable gases. Otherwise, it might lead to after-combustion or explosion.
- Please wear PPE before entering the dangerous area, because there may still be remaining toxic gases. Otherwise, it might threaten workers' health and safety.
- After extinguishing a fire, do not directly open the doors of the DC container until obtain the approval of the professional firefighters.

- The personnel involved in firefighting must wear respiratory protection equipment meeting the OSHA standards, to avoid inhaling toxic substances and fire extinguishing agents.
- Check whether there are any remaining fire extinguishing agents in the cabinet. If so, you must fully clean up the agents.
- In some cases, devices and surfaces near discharge nozzle are prone to accumulating gas fire extinguishing agent. Therefore, you should check and fully clean up the agents.
- When the relative humidity level is high, you should ventilate the dangerous area, and then turn on the dehumidifier.
- You should deal with the used gas extinguisher according to the local laws and regulations.
- If the gas fire-extinguishing sub-system needs to be debugged, or the gas extinguisher needs to be replaced, please contact the service provider to deal with it.

9.4.2 Measures

- You could use the compressed air method and spray in a direction quickly, to clean dust and the residual liquid after drying;
- You could use a toothbrush to remove the remaining particles and residual liquid after drying;
- You must use lint-free cotton cloth to absorb any remaining liquid by gently wiping the circuit board.

NOTICE!

- Do not use ordinary fabric to wipe the circuit board, to avoid damaging components or prevent the components from dropping.
- Do not use papers to wipe the circuit board, to prevent it from scratching the circuit board.

10 Commissioning

10.1 Check before Power On

Before power on, you should make sure that all the cables are connected and securely fastened. For the detailed check list, please see the following table.

Table 10-1 Checklist

No.	Item	Description
1	Equipment inspection	• Perform insulation and withstand voltage tests on the DC main circuit, distribution box, high-voltage box, and battery cluster, and all the test results must be qualified. • Measure the grounding resistance of the DC container's grounding point. The grounding resistance shall be no more than 4Ω. • Check whether the insulating boards in the DC wiring area have been installed. • Check whether the insulating boards in the distribution box have been installed.
2	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.
3	Cable appearance	• Check that the cable jacket is in good condition. • Check that the protective pipes are in good condition.
4	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.
5	Wiring	• Ensure that the wiring procedure is consistent with the principle of separation of strong and weak electricity. • Ensure that the cables are neatly places. • Leave a little extra length for adjustments. • Keep cables tidy in the cabinet.
6	Copper bars in the battery pack	• Check to make sure the copper bars are not deformed.
7	Button/Switch	• Check the distribution box's switches are "OFF". • Check the high-voltage boxes' switches are "OFF".

10.2 Power ON the System

NOTICE!

- Before powering on, you should do:
 - » Check that the emergency stop button remains in the closed position.
 - » Ensure that the MSD plugs are installed.
 - » Ensure that all the cables have been connected.
 - » Ensure that the manual & auto transfer switch is at **Manual Only**.

Step 1: Switch the manual & automatic transfer switch from auto mode to manual mode via emergency stop area or fire control panel.

- » Emergency stop area: open the cover, insert the key into the hole, and then turn the key clockwise to **Manual Only**.

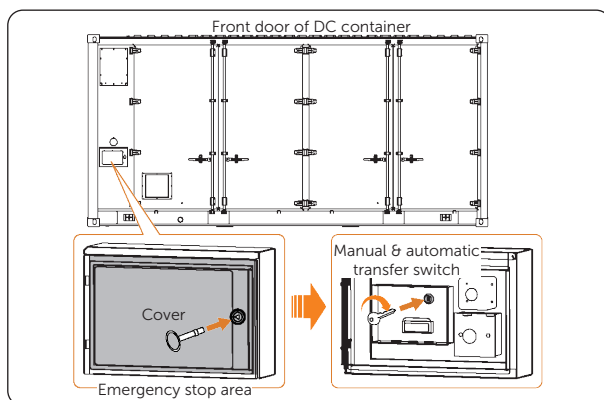


Figure 10-16 Switching to Manual Only

- » Fire control panel: open the cover, insert the key into the hole, and then turn the key clockwise to **Manual Only**.

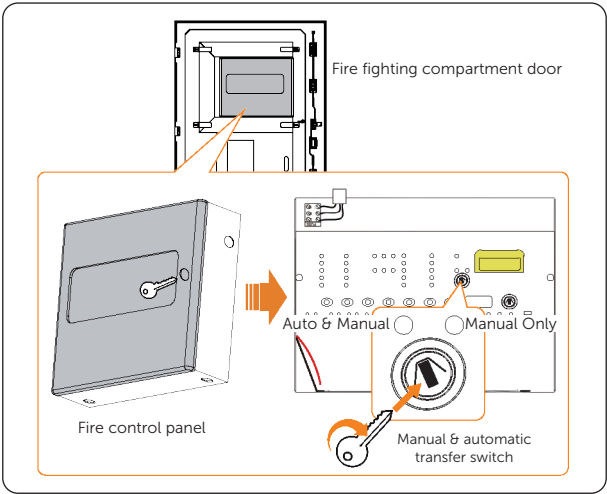


Figure 10-17 Switching to Manual Only

Step 2: Open the door of the electrical compartment and rotate the two rotary switches to open the distribution box.

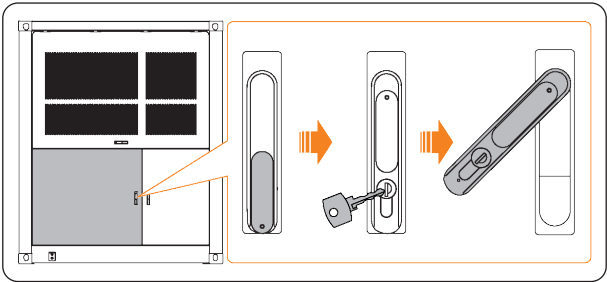


Figure 10-18 Opening the door of electrical compartment

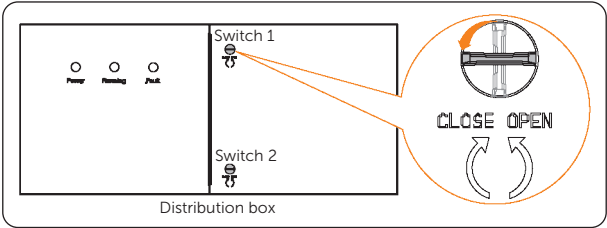


Figure 10-1 Rotating rotary switches

Step 3: Operation about the breakers in the distribution box in order. For the detailed location of breakers, please refer to [“2.5 Distribution Box”](#).



WARNING!

- Before flipping up breakers, you must confirm that the lights of the three-phase voltage and phase-sequence relay show normal. For details, please see [“Three-phase voltage and phase-sequence relay”](#).
- Before flipping up the next breaker, you must perform a voltage test on the previous breaker. And the test result shows normal.

- » Flip up breakers **SCB1 > SCB2**;
- » Flip up breaker **QF**;
- » Flip up breakers **QF01 > QF03 > QF07 > QF10**;
- » Flip up breakers **QF12, QF13, QF21, QF22, QF23, QF24, QF25**.

Sequence of power-up procedure: ①-②>③>④-⑤>⑥-⑦>⑧>⑨

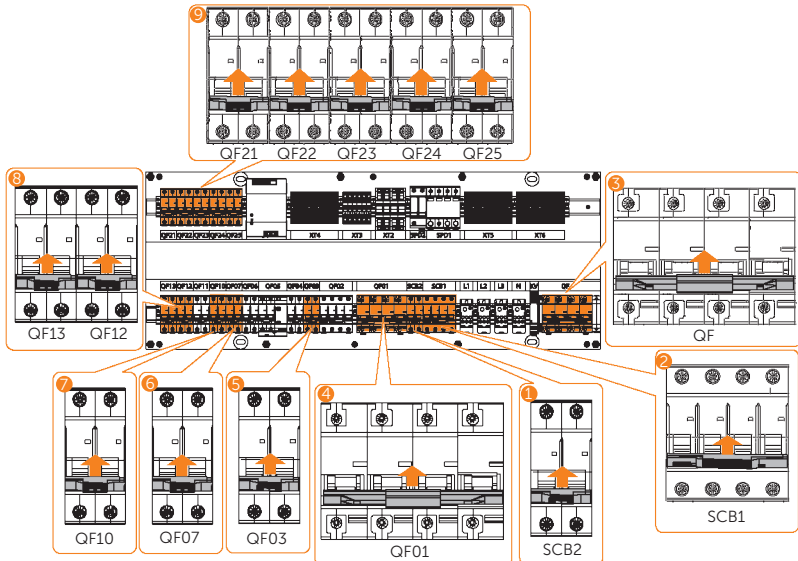


Figure 10-2 Sequence of power-up procedure

Step 4: Log in the LC100 website, and check whether each functional module is operating normally. For details, please refer to the User Manual of ORI-P7500-33.

Step 5: Open the front door and rotate the two main circuit switches on the high-voltage box to **ON** position.

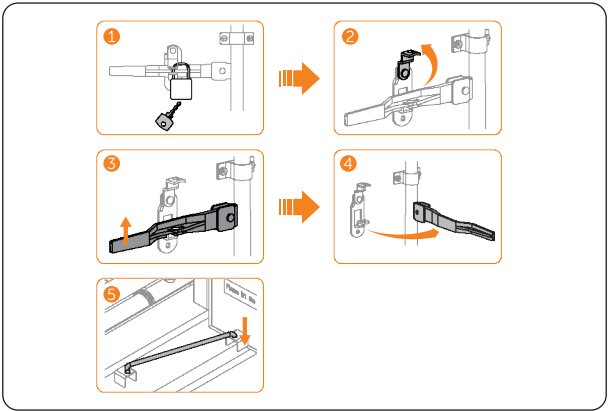


Figure 10-3 Opening the front door

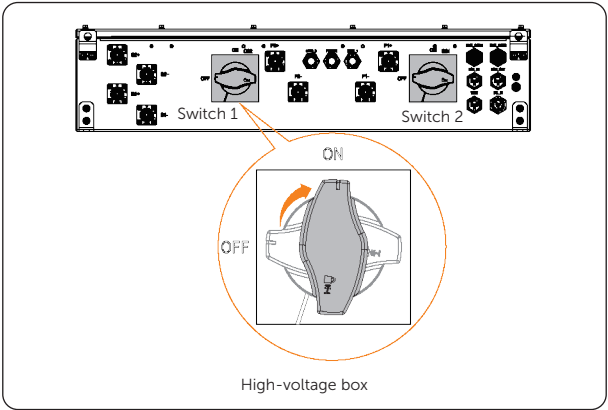


Figure 10-4 Rotating main circuit switch

! WARNING!

- Before rotating the switch, you should check that all the lights are in normal state.
- You must rotate all the circuit switch of the high-voltage boxes in the DC container.

Step 6: Log in the LC100 website to start the system. For details, please refer to the User Manual of ORI-P7500-33.

NOTICE!

- Before powering on the system, you should confirm that the PCS has received the BMS data from the LC100 and the data are displayed according to the communication points between the BMS and PCS.

Step 7: Reset the manual & auto transfer switch.

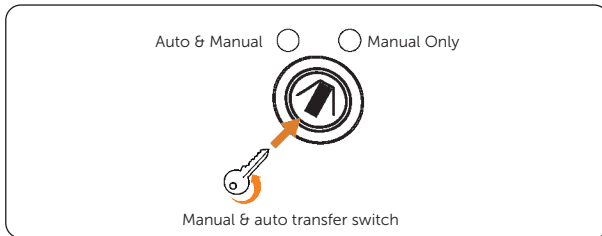


Figure 10-5 Resetting the manual & auto transfer switch

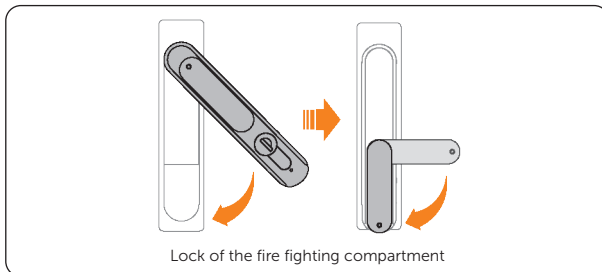


Figure 10-6 Closing the door of fire fighting compartment

Step 8: Closing doors.

- » Rotate the two rotary switches to close the distribution box's door;

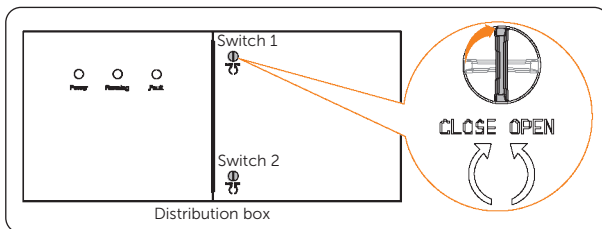


Figure 10-7 Closing distribution box's door

- » Rotate the handle to close the left door of the DC container;

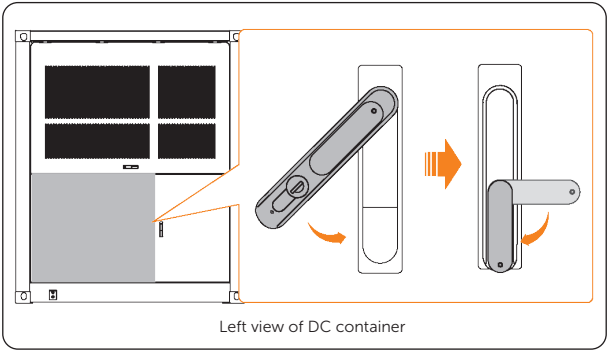


Figure 10-8 Closing left door of the DC container

- » Rotate the handle to close the front door of the DC container.

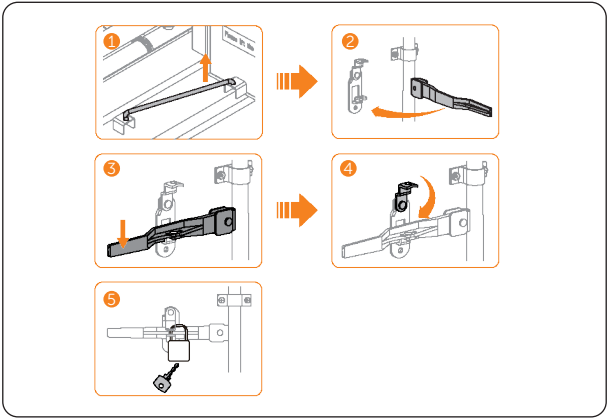


Figure 10-9 Closing the front door of the DC container

NOTICE!

- Please properly keep the key.

11 Troubleshooting and Maintenance

11.1 Power Off



- The equipment may still have power and heat after turning off, which may cause electric shock and personal injuries. Therefore, please allow it to cool and wear PPE before conducting maintenance.
 - » In case of SolaX PCS, please wait for at 30 seconds;
 - » In case of the third-party PCS, please check the DC discharge time.
- Before maintenance of cables, you must do as follows: check of the status of switches > verification of live part > maintenance.
- Before power off, you must check whether the system is still running. If the equipment is "under load", do not power off.

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

Normal Power Off

Step 1: Log in the LC100 website to power off the system. For details, please refer to the User Manual of ORI-P7500-33.

NOTICE!

- Before clicking Power Off, you must ensure that the DC switch on the PCS has been disconnected.

Step 2: Switch the manual & automatic transfer switch from auto mode to manual mode via emergency stop area or fire control panel.

- » Emergency stop area: open the cover, insert the key into the hole, and then turn the key clockwise to **Manual Only**.

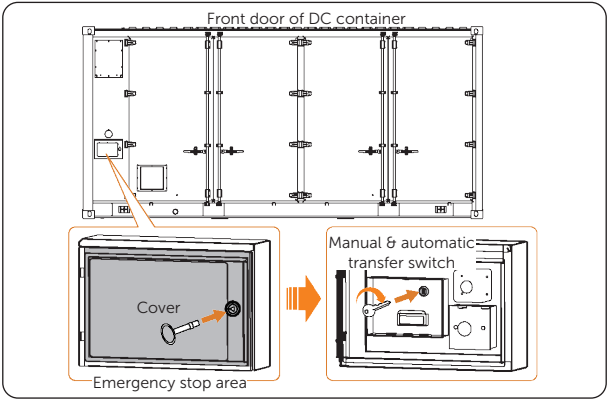


Figure 11-10 Switching to Manual Only

- » Fire control panel: open the cover, insert the key into the hole, and then turn the key clockwise to **Manual Only**.

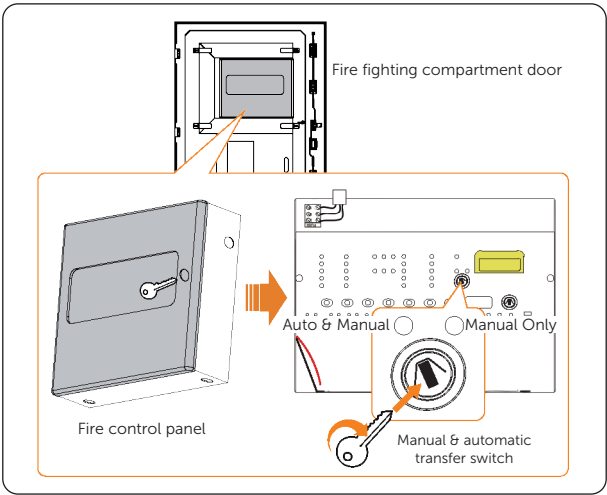


Figure 11-11 Switching to Manual Only

Step 3: Operation of the high-voltage box.

- » Use the key to open the front doors;

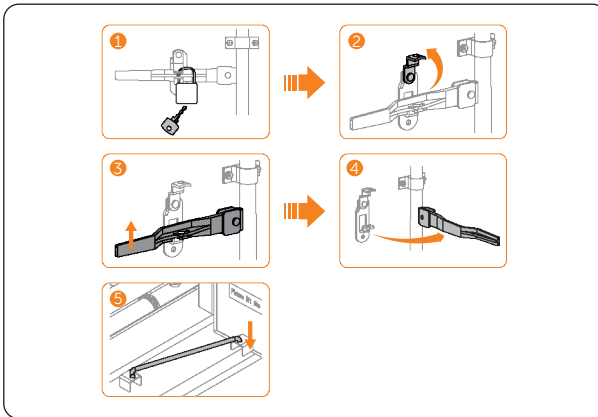


Figure 11-12 Opening the door

- » Rotate the two main circuit switches on the high-voltage box to **OFF** position.

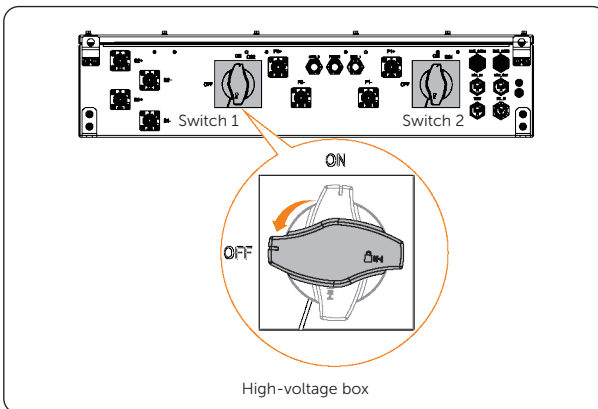


Figure 11-13 Rotating main circuit switch



WARNING!

- You must rotate all the circuit switch of the high-voltage boxes in the DC container.

Step 4: Opening the left doors of the DC container, and rotate the two rotary switches to open the distribution box's door.

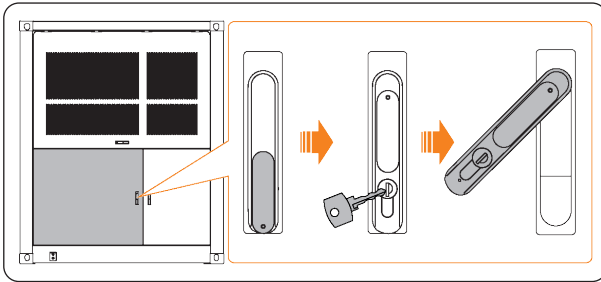


Figure 11-14 Opening the left door of the DC container

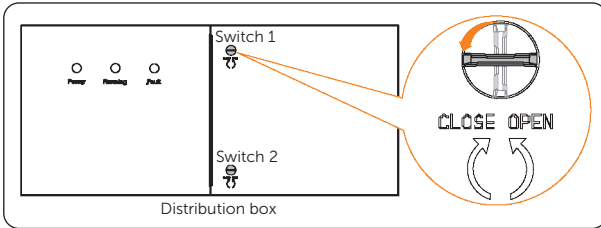


Figure 11-15 Rotating rotary switches

Step 5: Operation about the breakers in the distribution box. For the detailed location of breakers, please refer to ["2.5 Distribution Box"](#).

- » Flip down breakers **QF12, QF13, QF21, QF22, QF23, QF24, QF25**;
- » Flip down breaker **QF10 > QF07 > QF03 > QF01**;
- » Flip down breaker **QF**;
- » Flip down breakers **SCB2 > SCB1**.

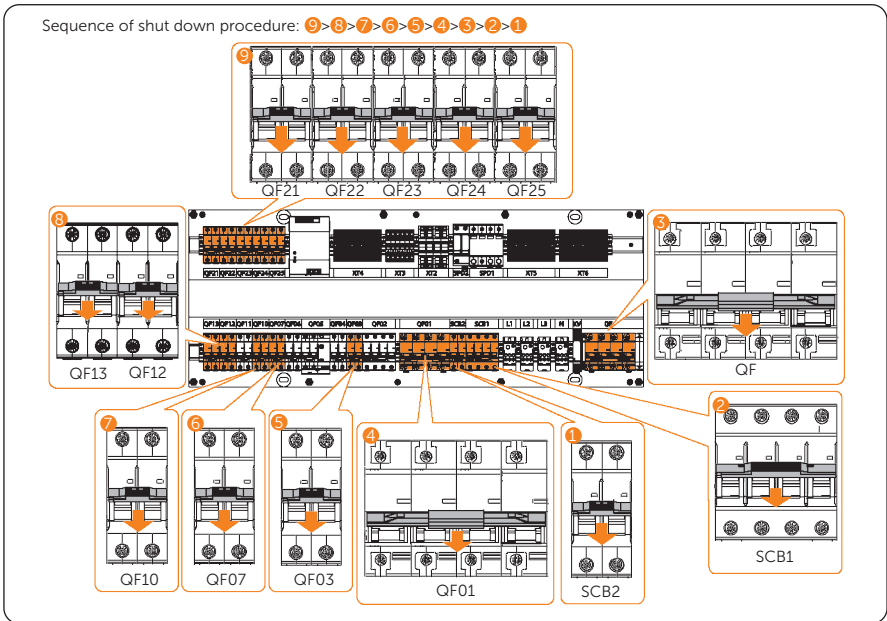


Figure 11-16 Flipping down breakers

Step 6: Reset the manual & auto transfer switch.

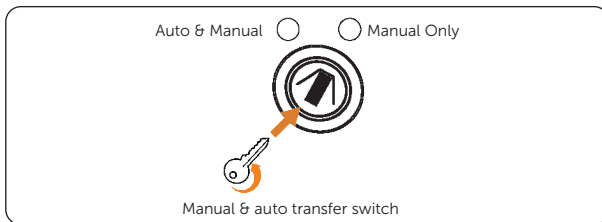


Figure 11-17 Resetting the manual & auto transfer switch

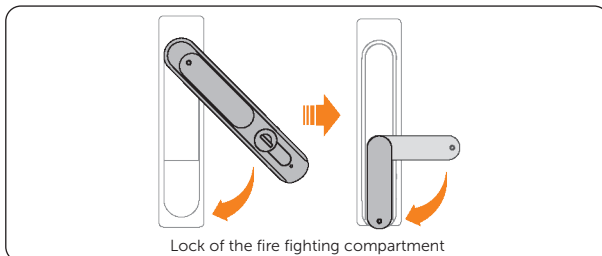


Figure 11-18 Closing the door of fire fighting compartment

Step 7: Closing doors.

- » Rotate the two rotary switches to close the distribution box's door;

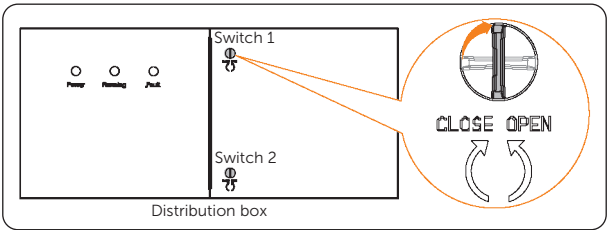


Figure 11-19 Closing distribution box's door

- » Rotate the handle to close the left door of the DC container;

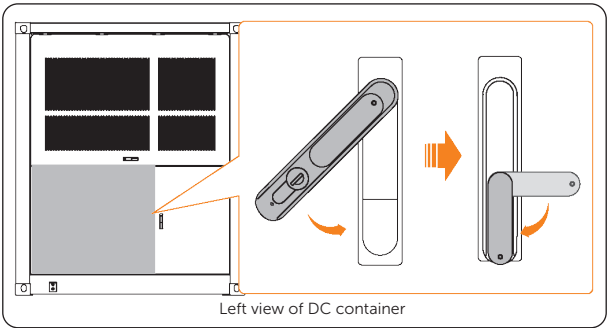


Figure 11-20 Closing left door of the DC container

- » Rotate the handle to close the front door of the DC container.

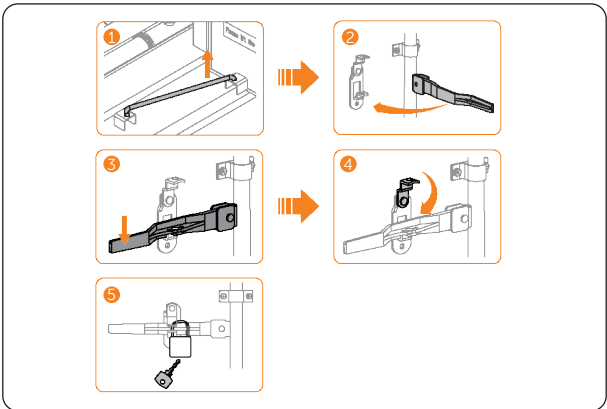


Figure 11-21 Closing the front door of the DC container

WARNING!

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

NOTICE!

- Please properly keep the key.

Emergency Power Off

WARNING!

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

Step 1: Rotate the cover

Step 2: Press the emergency stop button.

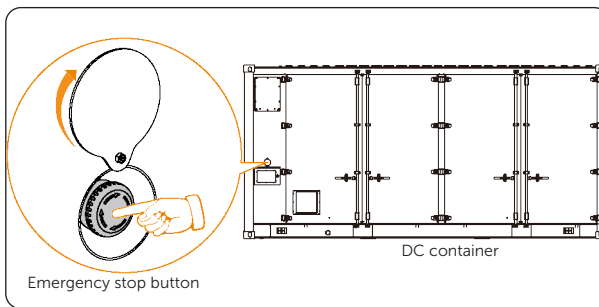


Figure 11-22 Pressing emergency stop button

NOTICE!

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

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

11.2 Troubleshooting

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

11.2.1 Battery Troubleshooting

Table 11-2 Troubleshooting and Suggestion

Fault code	Fault cause	Suggestion
1	Battery cell overvoltage category I	- Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
2	Battery cell undervoltage category I	- Do not power on, and the discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
3	Overvoltage category I of total battery cluster voltage	- Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
4	Undervoltage category I of total battery cluster voltage	- Do not power on, and the discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
6	Charging current level 1 for a battery cluster	- Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
7	Discharging current level 1 for a battery cluster	- Do not power on, and the discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
8	First-level cycle failure between battery clusters	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
9	Charging overcurrent level 1 of a system	- Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
10	Discharging overcurrent level 1 of a system	- Do not power on, and the discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
14	Insulation resistance class 1 of a battery cluster	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.

Fault code	Fault cause	Suggestion
15	Internal communication fault level 1	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
16	Intermediate communication fault level 1	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
17	Main positive relay sticking contact level 1	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
18	Main positive relay open circuit level 1	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
19	Main negative relay sticking contact level 1	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
20	Main negative relay open circuit level 1	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
21	Voltage sensor fault level 1	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
22	Voltage sampling fault level 1 of a battery cell	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
23	Temperature sampling fault level 1 of a battery cell	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
24	Self-test fault level 1	Do not power on.
26	Terminal pole over-temperature level 1 of battery compartment	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
27	MSD fault level 1	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.

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Fault code	Fault cause	Suggestion
28	HVU communication fault level 1	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
29	Contactors over-temperature level 1 of high-voltage box	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
30	Intermediate network fault level 1 of a system	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
31	System fault level 1	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
32	Fuse fault level 1	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
33	Module overvoltage category I	- Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
34	Module undervoltage category I	- Do not power on, and the discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
36	First-level deviation threshold of voltage between modules in a battery cluster when charging	- Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
37	First-level deviation threshold of voltage between modules in a battery cluster when discharging	- Do not power on, and the discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
38	First-level deviation threshold of voltage between battery cells in a battery cluster when charging	- Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
39	First-level deviation threshold of voltage between battery cells in a battery cluster when discharging	- Do not power on, and the discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
40	High temperature level 1 for charging of a battery cell	- Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
41	High temperature level 1 for discharging of a battery cell	- Do not power on, and the discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.

Fault code	Fault cause	Suggestion
42	Low temperature level 1 for charging of a battery cell	- Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
43	Low temperature level 1 for discharging of a battery cell	- Do not power on, and the discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
44	First-level deviation threshold of temperature between battery cells in a battery cluster when charging	- Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
45	First-level deviation threshold of temperature between battery cells in a battery cluster when discharging	- Do not power on, and the discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
46	Fuse over-temperature level 1	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
47	Excessive voltage difference level 1 between battery clusters	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
101	Battery cell overvoltage category II	The equipment allows to discharge instead of charge, and the charging current is limited to 0 A.
102	Battery cell undervoltage category II	The equipment allows to charge instead of discharge, and the discharging current is limited to 0 A.
103	Overvoltage category II of total battery cluster voltage	The equipment allows to discharge instead of charge, and the charging current is limited to 0 A.
104	Undervoltage category II of total battery cluster voltage	The equipment allows to charge instead of discharge, and the discharging current is limited to 0 A.
107	Charging current level 2 for a battery cluster	The equipment allows to discharge instead of charge, and the charging current is limited to 0 A.
108	Discharging current level 2 for a battery cluster	The equipment allows to charge instead of discharge, and the discharging current is limited to 0 A.
109	Second-level cycle failure between battery clusters	The equipment allows to charge and discharge, but the charging and discharging power shall be reduced to 50% SOP..
110	Charging overcurrent level 2 of a system	The equipment allows to discharge instead of charge, and the charging current is limited to 0 A.
114	Insulation resistance class 2 of a battery cluster	The equipment allows to charge and discharge, but the charging and discharging power shall be reduced to 50% SOP..
115	Contactors over-temperature level 2 of high-voltage box	The equipment allows to charge and discharge, but the charging and discharging power shall be reduced to 50% SOP..
116	Module overvoltage category II	The equipment allows to discharge instead of charge, and the charging current is limited to 0 A.
117	Module undervoltage category II	The equipment allows to charge instead of discharge, and the discharging current is limited to 0 A.

Fault code	Fault cause	Suggestion
119	Second-level deviation threshold of voltage between charging modules in a battery cluster	The equipment allows to charge and discharge, but the discharging power shall be reduced to 50% SOP.
120	Second-level deviation threshold of voltage between discharging modules in a battery cluster	The equipment allows to charge and discharge, but the discharging power shall be reduced to 50% SOP.
121	Second-level deviation threshold of voltage between battery cells in a battery cluster when charging	The equipment allows to charge and discharge, but the charging power shall be reduced to 50% SOP..
122	Second-level deviation threshold of voltage between battery cells in a battery cluster when discharging	The equipment allows to charge and discharge, but the discharging power shall be reduced to 50% SOP.
123	High temperature level 2 for charging of a battery cell	The equipment allows to discharge instead of charge, and the charging current is limited to 0 A.
124	High temperature level 2 for discharging of a battery cell	The equipment allows to charge instead of discharge, and the discharging current is limited to 0 A.
125	Low temperature level 2 for charging of a battery cell	The equipment allows to charge and discharge, but the charging power shall be reduced to 50% SOP..
126	Low temperature level 2 for discharging of a battery cell	The equipment allows to charge and discharge, but the discharging power shall be reduced to 50% SOP.
12	Second-level deviation threshold of temperature between battery cells in a battery cluster when charging	The equipment allows to charge and discharge, but the charging power shall be reduced to 50% SOP..
128	Second-level deviation threshold of temperature between battery cells in a battery cluster when discharging	The equipment allows to charge and discharge, but the discharging power shall be reduced to 50% SOP.
129	Excessive voltage difference level 2 between battery clusters	The equipment allows to charge and discharge, but the charging and discharging power shall be reduced to 50% SOP..
201	Battery cell overvoltage category III	Send an alarm, but take no action.
202	Battery cell undervoltage category III	Send an alarm, but take no action.
203	Overvoltage category III of total battery cluster voltage	The equipment allows to discharge instead of charge, and the charging current is limited to 0 A.
204	Undervoltage category III of total battery cluster voltage	Send an alarm, but take no action.
206	Charging current level 3 for a battery cluster	The equipment allows to charge and discharge, but the charging power shall be reduced to 50% SOP..
207	Discharging current level 3 for a battery cluster	The equipment allows to charge and discharge, but the discharging power shall be reduced to 50% SOP.
208	Third-level cycle failure between battery clusters	Send an alarm, but take no action.
209	Charging overcurrent level 3 of a system	The equipment allows to charge and discharge, but the charging power shall be reduced to 50% SOP..
210	Discharging overcurrent level 3 of a system	The equipment allows to charge and discharge, but the discharging power shall be reduced to 50% SOP.
214	Insulation resistance class 3 of a battery cluster	Send an alarm, but take no action.
215	Current sensor fault level 3	Send an alarm, but take no action.
216	Temperature sampling fault level 3 of a battery cell	Send an alarm, but take no action.
217	ID duplication fault 3 of a system	Send an alarm, but take no action.

Fault code	Fault cause	Suggestion
218	Intermediate network fault level 3 of a system	Send an alarm, but take no action.
219	Module overvoltage category III	The equipment allows to charge and discharge, but the charging power shall be reduced to 50% SOP.
220	Module undervoltage category III	The equipment allows to charge and discharge, but the discharging power shall be reduced to 50% SOP.
222	Third-level deviation threshold of voltage between charging modules in a battery cluster	Send an alarm, but take no action.
223	Third-level deviation threshold of voltage between discharging modules in a battery cluster	Send an alarm, but take no action.
224	Third-level deviation threshold of voltage between battery cells in a battery cluster when charging	Send an alarm, but take no action.
225	Third-level deviation threshold of voltage between battery cells in a battery cluster when discharging	Send an alarm, but take no action.
226	High temperature level 3 for charging of a battery cell	Send an alarm, but take no action.
227	High temperature level 3 for discharging of a battery cell	Send an alarm, but take no action.
228	Low temperature level 3 for charging of a battery cell	The equipment allows to charge and discharge, but the charging power should be reduced to 70% SOP.
229	Low temperature level 3 for discharging of a battery cell	The equipment allows to charge and discharge, but the discharging power should be reduced to 70% SOP.
230	Third-level deviation threshold of temperature between battery cells in a battery cluster when charging	Send an alarm, but take no action.
231	Third-level deviation threshold of temperature between battery cells in a battery cluster when discharging	Send an alarm, but take no action.
232	Excessive voltage difference level 3 between battery clusters	Send an alarm, but take no action.
233	Fuse and fan fault of high-voltage box	Send an alarm, but take no action.
234	Main positive relay open circuit level 3	Send an alarm, but take no action.
235	Voltage sensor fault level 3	Send an alarm, but take no action.

11.2.2 Troubleshooting for Battery Cluster

Table 11-3 Troubleshooting and Suggestion

Fault code	Fault cause	Suggestion
1	Battery cell overvoltage category I	- Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
2	Battery cell undervoltage category I	- Do not power on, and the discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.

Fault code	Fault cause	Suggestion
3	Module overvoltage category I	- Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
4	Module undervoltage category I	- Do not power on, and the discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
5	Overvoltage category I of total battery cluster voltage	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
6	Undervoltage category I of total battery cluster voltage	- Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
9	Charging current level 1 for a battery cluster	- Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
10	Discharging current level 1 for a battery cluster	- Do not power on, and the discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
14	Insulation resistance class 1 of a battery cluster	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
15	Internal communication fault level 1	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
16	Intermediate communication fault level 1	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
17	Main positive relay sticking contact level 1	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
18	Main positive relay open circuit level 1	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
19	Main negative relay sticking contact level 1	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.

Fault code	Fault cause	Suggestion
20	Main negative relay open circuit level 1	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
21	Voltage sensor fault level 1	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
22	Voltage sampling fault level 1 of a battery cell	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
23	Temperature sampling fault level 1 of a battery cell	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
24	Self-test fault level 1	Do not power on.
26	Terminal pole over-temperature level 1 of battery compartment	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
27	MSD fault level 1	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
28	HVU communication fault level 1	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
29	Contactor over-temperature level 1 of high-voltage box	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
30	Fuse fault level 1	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
31	First-level deviation threshold of voltage between modules in a battery cluster when charging	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
32	First-level deviation threshold of voltage between modules in a battery cluster when discharging	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.

Fault code	Fault cause	Suggestion
33	First-level deviation threshold of voltage between battery cells in a battery cluster when charging	- Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
34	First-level deviation threshold of voltage between battery cells in a battery cluster when discharging	- Do not power on, and the discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
35	High temperature level 1 for charging of a battery cell	- Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
36	High temperature level 1 for discharging of a battery cell	- Do not power on, and the discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
37	Low temperature level 1 for charging of a battery cell	- Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
38	Low temperature level 1 for discharging of a battery cell	- Do not power on, and the discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
39	First-level deviation threshold of temperature between battery cells in a battery cluster when charging	- Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
40	First-level deviation threshold of temperature between battery cells in a battery cluster when discharging	- Do not power on, and the discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
41	Fuse over-temperature level 1	- Do not power on, and the charging and discharging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. - Do not close the relay before the fault has been resolved.
101	Battery cell overvoltage category II	The equipment allows to discharge instead of charge, and the charging current is limited to 0 A.
102	Battery cell undervoltage category II	The equipment allows to charge instead of discharge, and the discharging current is limited to 0 A.
103	Module overvoltage category II	The equipment allows to discharge instead of charge, and the charging current is limited to 0 A.
104	Module undervoltage category II	The equipment allows to charge instead of discharge, and the discharging current is limited to 0 A.
105	Overvoltage category II of total battery cluster voltage	The equipment allows to charge and discharge, but the charging and discharging power shall be reduced to 50% SOP..
106	Undervoltage category II of total battery cluster voltage	The equipment allows to discharge instead of charge, and the charging current is limited to 0 A.
109	Charging current level 2 for a battery cluster	The equipment allows to discharge instead of charge, and the charging current is limited to 0 A.
110	Discharging current level 2 for a battery cluster	The equipment allows to charge instead of discharge, and the discharging current is limited to 0 A.
114	Insulation resistance class 2 of a battery cluster	The equipment allows to charge and discharge, but the charging and discharging power shall be reduced to 50% SOP..

Fault code	Fault cause	Suggestion
115	Contactor over-temperature level 2 of high-voltage box	The equipment allows to charge and discharge, but the charging and discharging power shall be reduced to 50% SOP..
116	Second-level deviation threshold of voltage between modules in a battery cluster when charging	The equipment allows to charge and discharge, but the charging power shall be reduced to 50% SOP..
117	Second-level deviation threshold of voltage between modules in a battery cluster when discharging	The equipment allows to charge and discharge, but the discharging power shall be reduced to 50% SOP.
118	Second-level deviation threshold of voltage between battery cells in a battery cluster when charging	The equipment allows to charge and discharge, but the charging power shall be reduced to 50% SOP..
119	Second-level deviation threshold of voltage between battery cells in a battery cluster when discharging	The equipment allows to charge and discharge, but the discharging power shall be reduced to 50% SOP.
120	High temperature level 2 for charging of a battery cell	Do not charge and discharge, and the charging and discharging current should be limited to 0 A.
121	High temperature level 2 for discharging of a battery cell	Do not charge and discharge, and the charging and discharging current should be limited to 0 A.
122	Low temperature level 2 for charging of a battery cell	The equipment allows to charge and discharge, but the charging power shall be reduced to 50% SOP..
123	Low temperature level 2 for discharging of a battery cell	The equipment allows to charge and discharge, but the discharging power shall be reduced to 50% SOP.
124	Second-level deviation threshold of temperature between battery cells in a battery cluster when charging	The equipment allows to charge and discharge, but the charging power shall be reduced to 50% SOP..
125	Second-level deviation threshold of temperature between battery cells in a battery cluster when discharging	The equipment allows to charge and discharge, but the discharging power shall be reduced to 50% SOP.
201	Battery cell overvoltage category III	Send an alarm, but take no action.
202	Battery cell undervoltage category III	Send an alarm, but take no action.
203	Module overvoltage category III	The equipment allows to charge and discharge, but the charging power shall be reduced to 50% SOP..
204	Module undervoltage category III	The equipment allows to charge and discharge, but the discharging power shall be reduced to 50% SOP.
205	Overvoltage category III of total battery cluster voltage	Do not charge and discharge, and the charging and discharging current should be limited to 0 A.
206	Undervoltage category III of total battery cluster voltage	Send an alarm, but take no action.
209	Charging current level 3 for a battery cluster	The equipment allows to charge and discharge, but the charging power shall be reduced to 50% SOP..
210	Discharging current level 3 for a battery cluster	The equipment allows to charge and discharge, but the discharging power shall be reduced to 50% SOP.
214	Insulation resistance class 3 of a battery cluster	Send an alarm, but take no action.
215	Current sensor fault level 3	Send an alarm, but take no action.
216	Temperature sampling fault level 3 of a battery cell	Send an alarm, but take no action.
217	Third-level deviation threshold of voltage between modules in a battery cluster when charging	Send an alarm, but take no action.

Fault code	Fault cause	Suggestion
218	Third-level deviation threshold of voltage between modules in a battery cluster when discharging	Send an alarm, but take no action.
219	Third-level deviation threshold of voltage between battery cells in a battery cluster when charging	Send an alarm, but take no action.
220	Third-level deviation threshold of voltage between battery cells in a battery cluster when discharging	Send an alarm, but take no action.
221	High temperature level 3 for charging of a battery cell	Send an alarm, but take no action.
222	High temperature level 3 for discharging of a battery cell	Send an alarm, but take no action.
223	Low temperature level 3 for charging of a battery cell	The equipment allows to charge and discharge, but the charging current should be 70% of SOP.
224	Low temperature level 1 for discharging of a battery cell	The equipment allows to charge and discharge, but the discharging current should be 70% of SOP.
225	Third-level deviation threshold of temperature between battery cells in a battery cluster when charging	Send an alarm, but take no action.
226	Third-level deviation threshold of temperature between battery cells in a battery cluster when discharging	Send an alarm, but take no action.
227	Fuse and fan fault of high-voltage box	Send an alarm, but take no action.
228	Main positive relay open circuit level 3	Send an alarm, but take no action.
229	Voltage sensor fault level 3	Send an alarm, but take no action.

11.2.3 Troubleshooting for Liquid Cooling System

NOTICE!

- Only qualified professionals can deal with it.

Table 11-4 Troubleshooting and Suggestion

Fault code	Fault information	Possible cause	Suggestion
1	Communication fault	The electrical control wire is loose, or the cable is damaged.	Tighten the electrical control wire or replace the cable.
2	System with coolant shortage alarm	Coolant leakage	Check for a coolant leak in the circulation system. If there is any leakage, you should maintain the system firstly, and then replenish coolant.

Fault code	Fault information	Possible cause	Suggestion
3	1# excessive condensing pressure alarm	- The condenser is seriously dirty and blocked. - Excessive environmental temperature - Too much refrigerant	- Flush the condenser until the water flowing out from the drain hole becomes clean. - Check the environmental temperature; - Discharge a small amount of refrigerant.
4	2# excessive condensing pressure alarm		
5	Excessive water outlet pressure alarm	- Coolant circulation system is blocked. - Excessive coolant.	- Check whether there are any foreign objects in the circulation system pipes. - Open drain valve to discharge a small amount of coolant.
6	Low water inlet pressure alarm	Insufficient coolant	Connect the coolant replenishment kit to replenish coolant
34	1# exhaust temperature sensor failure	- The electrical control wire of temperature sensor is loose, or the cable is damaged. - Temperature sensor failure.	- Tighten the electrical control wire or replace the cable. - Replace the temperature sensor.
35	1# condensation temperature sensor failure		
36	1# exhaust temperature sensor malfunction		
37	1# condensation temperature sensor malfunction		
38	Temperature sensor malfunction for water inlet		
39	Temperature sensor malfunction for water outlet	- Do not require to deal with it. - The alarm will be automatically cancelled after a few seconds.	- Tighten the electrical control wire or replace the cable. - Replace the pressure sensor.
40	Environmental temperature sensor failure		
41	Abnormal power down alarm	- Directly power off without shutdown. - Temporary power outage of the power supply grid	- Do not require to deal with it. - The alarm will be automatically cancelled after a few seconds.
42	1# high-pressure pressure sensor failure	- The electrical control wire of pressure sensor is loose, or the cable is damaged. - Pressure sensor failure.	- Tighten the electrical control wire or replace the cable. - Replace the pressure sensor.
43	2# high-pressure pressure sensor failure		
44	Low-coolant level of auto replenishment tank	- The tank is running low on coolant. - Level sensor has malfunctioned, or the float is stuck to the base.	- Check the coolant. - Clean the objects on the float.
47	Pressure sensor malfunction for water inlet	- The electrical control wire of pressure sensor is loose, or the cable is damaged. - Pressure sensor failure.	- Tighten the electrical control wire or replace the cable. - Replace the pressure sensor.
48	Pressure sensor malfunction for water outlet		

Troubleshooting and Maintenance

Fault code	Fault information	Possible cause	Suggestion
66	1# high pressure locking	- Excessive environmental temperature; - The cable connection of the high-voltage switch is loose, or its cable is damaged. - The condenser is seriously dirty and blocked. - The air inlet is blocked by the debris. - The fan is out of power or working abnormally.	- Check the environmental temperature; - Tighten the cable of the high-voltage switch, or replace the cable. - Clean the condenser. - Clean up the debris. - If it is not due to power fault, repair or replace the fan.
67	1# high exhaust temperature locking	- The outdoor temperature is too high. - Air outlet of the air-cooled chiller is blocked by debris. - The power of external circulation fan goes out, or the fan is working abnormally. - The condenser is seriously dirty and blocked.	- Confirm the outdoor temperature; - Clean up the debris. - If it is not due to power fault, repair or replace the external circulation fan. - Clean condenser.
68	1# system low pressure locking	- The refrigerant has leaked. - The electronic expansion valve is malfunctioning.	- Check leakage point, and then replenish the refrigerant after finishing maintenance. - Replace the electronic expansion valve.
69	1# low-pressure pressure sensor failure	- The electrical control wire of pressure sensor is loose, or the cable is damaged. - Pressure sensor failure.	- Tighten the electrical control wire or replace the cable. - Replace the pressure sensor.
70	1# evaporation outlet temperature sensor failure	- The electrical control wire of temperature sensor is loose, or the cable is damaged. - Temperature sensor failure.	- Tighten the electrical control wire or replace the cable. - Replace the temperature sensor.
71	1# frequency converter malfunction for compressor	Compressor has malfunctioned.	Replace the compressor.
72	1# frequency converter communication malfunction for compressor	- The host computer works abnormally. - The communication cable of the frequency converter is loose or damaged. - Communication parameters are set incorrectly.	- Check whether the cable of host computer is tightened fully. - Tighten or change communication cable. - Set correct communication parameters.
73	1# frequency converter malfunction for outside fan	Frequency converter of the outside fan has malfunctioned.	Replace the frequency converter of the outside fan.
74	1# frequency converter communication malfunction for outside fan	- The host computer works abnormally. - The communication cable of the frequency converter is loose or damaged. - Communication parameters are set incorrectly.	- Check whether the cable of host computer is tightened fully. - Tighten or change communication cable. - Set correct communication parameters.
75	2# high pressure locking	- Excessive environmental temperature; - The cable connection of the high-voltage switch is loose, or its cable is damaged. - The condenser is seriously dirty and blocked. - The air inlet is blocked by the debris. - The fan is out of power or working abnormally.	- Check the environmental temperature; - Tighten the cable of the high-voltage switch, or replace the cable. - Clean the condenser. - Clean up the debris. - If it is not due to power fault, repair or replace the fan.

Fault code	Fault information	Possible cause	Suggestion
76	2# high exhaust temperature locking	- The outdoor temperature is too high. - Air outlet of the air-cooled chiller is blocked by debris. - The power of external circulation fan goes out, or the fan is working abnormally. - The condenser is seriously dirty and blocked.	- Confirm the outdoor temperature; - Clean up the debris. - If it is not due to power fault, repair or replace the external circulation fan. - Clean condenser.
77	2# system low pressure locking	- The refrigerant has leaked. - The electronic expansion valve is malfunctioning.	- Check leakage point, and then replenish the refrigerant after finishing maintenance. - Replace the electronic expansion valve.
78	2# low-pressure pressure sensor failure	- The electrical control wire of pressure sensor is loose, or the cable is damaged. - Pressure sensor failure.	- Tighten the electrical control wire or replace the cable. - Replace the pressure sensor.
79	2# evaporation outlet temperature sensor failure	- The electrical control wire of temperature sensor is loose, or the cable is damaged. - Temperature sensor failure.	- Tighten the electrical control wire or replace the cable. - Replace the temperature sensor.
80	2# frequency converter malfunction for compressor	Compressor has malfunctioned.	Replace the compressor.
81	2# frequency converter communication malfunction for compressor	- The host computer works abnormally. - The communication cable of the frequency converter is loose or damaged. - Communication parameters are set incorrectly.	- Check whether the cable of host computer is tightened fully. - Tighten or change communication cable. - Set correct communication parameters.
82	Expansion module communication malfunction	The electrical control wire is loose, or the cable is damaged.	Tighten the electrical control wire or replace the cable.
83	2# frequency converter malfunction for outside fan	Frequency converter of the outside fan has malfunctioned.	Replace the frequency converter of the outside fan.
84	2# frequency converter communication malfunction for outside fan	- The host computer works abnormally. - The communication cable of the frequency converter is loose or damaged. - Communication parameters are set incorrectly.	- Check whether the cable of host computer is tightened fully. - Tighten or change communication cable. - Set correct communication parameters.
85	Low pressure difference of water pump	- Not power on. - The cable connection is loose. - Fault of frequency converter for the water pump - Water pump self-protection mechanism is activated due to the lack of coolant. - Pump body fault	- Confirm that the main power switch has been opened, and check whether the chiller has been turned on through the operation interface of control system. - Tighten the connector. - Replace the frequency converter for water pump. - Check the coolant in the circulation system. In the case of the lack of coolant, please replenish it. - Replace the water pump.

Troubleshooting and Maintenance

Fault code	Fault information	Possible cause	Suggestion
86	Water inlet and outlet temperature sensor malfunction	- The electrical control wire of temperature sensor is loose, or the cable is damaged. - Temperature sensor failure.	- Tighten the electrical control wire or replace the cable. - Replace the temperature sensor.
87	Power failure	- Reserve connection of power cables leads to reverse phase. - A loose connection of a certain phase of the circuit breaker leads to a phase loss. - Unstable power supply leads to overvoltage or undervoltage.	- Correctly connect the power cables of the air-cooled chiller. - Tighten the electrical wiring of the input power supply. - Check the power supply. If you confirmed that there is a problem with the power grid, it is recommended to equip a voltage stabilizer.
88	Water inlet and outlet pressure sensor malfunction	Sensor failure.	Replace the sensor.
90	1# frequency converter failure of circulating water pump	Frequency converter failure of the circulating water pump.	Replace the frequency converter of the circulating water pump.
91	1# frequency converter communication failure of circulating water pump	- The host computer works abnormally. - The communication cable of the frequency converter is loose or damaged. - Communication parameters are set incorrectly.	- Check whether the cable of host computer is tightened fully. - Tighten or change communication cable. - Set correct communication parameters.
92	1# electric heater fault locking	- The electrical control wire of electric heater is loose, or the cable is damaged. - Electric heater failure.	- Tighten the electrical control wire or replace the cable. - Replace the electric heater.
93	High temperature of water outlet	- Malfunction of compressor, electronic expansion valve, circulating water pump or fan; - Coolant leakage.	- Check the state of compressor, electronic expansion valve, circulating water pump or fan. - Check leakage point. In case of leakage point, you should must maintain before replenish coolant.
94	Low temperature of water outlet	Circulating water pump or electric heater failure	Check the state of the circulating water pump and electric heater.
99	2# frequency converter failure of circulating water pump	Frequency converter failure of the circulating water pump.	Replace the frequency converter of the circulating water pump.
100	2# frequency converter communication failure of circulating water pump	- The host computer works abnormally. - The communication cable of the frequency converter is loose or damaged. - Communication parameters are set incorrectly.	- Check whether the cable of host computer is tightened fully. - Tighten or change communication cable. - Set correct communication parameters.
101	2# electric heater fault locking	- The electrical control wire of electric heater is loose, or the cable is damaged. - Electric heater failure.	- Tighten the electrical control wire or replace the cable. - Replace the electric heater.
103	DC_DC1 module failure	The cable is loose or damaged.	Tighten or replace the cable.
104	DC_DC2 module failure	Module is damaged.	Replace the DC_DC module.

Fault code	Fault information	Possible cause	Suggestion
105	1# high-temperature condensing locking	- The condenser is seriously dirty and blocked. - Excessive environmental temperature - Too much refrigerant	- Flush the condenser until the water flowing out from the drain hole becomes clean. - Check the environmental temperature; - Discharge a small amount of refrigerant.
106	2# high-temperature condensing locking		
107	1# high condensing pressure locking	- Leakage of refrigerant; - The electronic expansion valve works abnormally.	- Check leakage points. If there is any leakage, you should repair compressor before replenish refrigerant. - Replace the electronic expansion valve.
108	2# high condensing pressure locking		

11.2.4 Troubleshooting for Dehumidifier

Table 11-5 Troubleshooting and Suggestion

Fault code	Fault cause	Possible cause	Suggestion
1	Communication fault	The electrical control wire is loose, or the cable is damaged.	Tighten the electrical control wire or replace the cable.
2	High temperature alarm	- Check if the high-temperature alarm value is reasonable. - Check if there are any abnormal alarm messages. - Check if the dehumidifier's cooling capacity meets the requirements.	- Please modify the value according to the rules. - See the respective suggestions to deal with it. - Increase the quantity of air conditioners.
3	Dehumidifier fan fault alarm	- Check for any open circuit or short circuit. - Check if the fan is damaged. - Check if there is any objects inside the equipment.	- Please correctly connect cables according to the wiring diagram. If one of the cables is damaged, please replace it. - Replace the fan. - Keep no objects inside the equipment.
4	Refrigeration fan fault alarm	- Check for any open circuit or short circuit. - Check if the fan is damaged. - Check if there is any objects inside the equipment.	- Please correctly connect cables according to the wiring diagram. If one of the cables is damaged, please replace it. - Replace the fan. - Keep no objects inside the equipment.
5	Compressor fault alarm	Check if the temperature sensor has an open circuit or short circuit.	Replace the compressor.
6	Internal temperature fault of the cabinet	Check if the temperature sensor has an open circuit or short circuit.	Please correctly connect cables according to the wiring diagram. If one of the cables is damaged, please replace it.
7	Low temperature alarm	- Check if the high-temperature alarm value is reasonable. - Check if the dehumidifier's cooling capacity meets the requirements.	- Please modify the value according to the rules. - Decrease the quantity of air conditioners.
8	DC overvoltage alarm	Check if the power input is normal.	Replace the power supply.
9	DC undervoltage alarm	Check if the power input is normal.	Replace the power supply.

Fault code	Fault cause	Possible cause	Suggestion
10	Condenser temperature fault	Check if the temperature sensor has an open circuit or short circuit.	Please correctly connect cables according to the wiring diagram. If one of the cables is damaged, please replace it.
11	High humidity alarm	- Check if the high-humidity alarm value is reasonable. - Check if there are any abnormal alarm messages. - Check if the dehumidifier's humidity percentage meets the requirements.	- Please modify the value according to the rules. - See the respective suggestions to deal with it. - Increase the quantity of air conditioners.
12	Condenser overtemperature	- Check if the condenser is dirty or blocked. - Check whether the temperature is too high. - Check if the refrigerant is released too much.	- Flush the condenser until the water flowing out from the drain hole becomes clean. - Check for the environmental temperature. - Discharge a small amount of refrigerant.
13	Condenser overtemperature locking	- Check if the condenser is dirty or blocked. - Check whether the temperature is too high. - Check if the refrigerant is released too much.	- Flush the condenser until the water flowing out from the drain hole becomes clean. - Check for the environmental temperature. - Discharge a small amount of refrigerant.

11.2.5 Troubleshooting for Fire Suppression System

Table 11-6 Troubleshooting and Suggestion

Fault code	Item	Cause	Suggestion
1	1# communication fault of combustible gas detector	The electrical control wire is loose, or the cable is damaged.	Tighten the electrical control wire or replace the cable.
2	1# combustible gas detector alarm	- Wiring troubles. - Others.	- Inspect the wiring of the combustible gas detector. - Replace the combustible gas detector.
3	1# combustible gas detector failure		
4	1# combustible gas detector preheating	- If the preheating duration is less than 20 mins, it is a normal phenomenon. - If the preheating duration is over 20 mins.	- Not need to deal with. - Replace the combustible gas detector.
5	2# combustible gas detector preheating	- Wiring troubles. - Others.	- Inspect the wiring of the combustible gas detector. - Replace the combustible gas detector.
6	2# combustible gas detector alarm		
7	2# combustible gas detector failure		
8	2# combustible gas detector preheating	- If the preheating duration is less than 20 mins, it is a normal phenomenon. - If the preheating duration is over 20 mins.	- Not need to deal with. - Replace the combustible gas detector.

Fault code	Item	Cause	Suggestion
9	Level-1 alarm fire	False alarm of smoke detector	• The smoke detector is dirty. • The smoke detector is damaged. • Fire control panel cannot function properly due to water infiltration of the smoke detector or cables. • The mainboard of the fire control panel is damaged. • Contact the service provider to clean the smoke detector. • Replace the smoke detector. • Replace the smoke detector. • Replace the fire control panel.
	Level-1 alarm fire	False alarm of temperature detector	• The temperature detector is damaged. • Fire control panel cannot function properly due to water infiltration of the temperature detector or cables. • The mainboard of the fire control panel is damaged. • Replace the temperature detector. • Replace the temperature detector. • Replace the fire control panel.
	Level-1 alarm fire	False alarm of combustible gas detector	• The combustible gas detector is dirty. • The combustible gas detector is damaged. • Fire control panel cannot function properly due to water infiltration of the combustible gas detector or cables. • The mainboard of the fire control panel is damaged. • Contact the service provider to clean the combustible gas detector. • Replace the combustible gas detector. • Replace the combustible gas detector. • Replace the fire control panel.
10	Level-2 alarm fire	Press the emergency stop button.	• Reset the emergency stop button.
11	Fire support coordination	Wiring troubles.	• Inspect the wiring.
12	Fire fighting failure	• Wiring troubles. • Device failure.	• Inspect the wiring. • Replace the device.
14	Door state of the battery compartment	• The door is not closed.	• Close the door.
15	Door state of the electrical compartment	• The door is not closed.	• Close the door.
16	Door state of the fire fighting compartment	• The door is not closed.	• Close the door.
18	Water sensor alarm	• Coolant leakage or water infiltration.	• In the case of the leakage of the liquid cooling system, please contact our company's after-sales personnel to deal with it. • In the case of water getting into the equipment, please contact our company's after-sales personnel to repair the areas where the water enters into it; in the case of condensate water, please clean it up and reset the water sensor.
19	Grid abnormal	• An abnormal phase sequence. • Overvoltage • Undervoltage	• Check the phase sequence of the three-phase power supply. • Check whether there is a short circuit or open circuit in the incoming cable. • Check if the voltage is stable and meets the power supply requirements.
20	Gas spray feedback	• Wiring troubles. • Accidental release.	• Inspect the wiring. • Replace the gas fire-extinguishing subsystem.

Fault code	Item	Cause	Suggestion
21	Activation of fire fighting fan	- False alarm of combustible gas detector - Wiring troubles. - Others.	- Inspect the wiring of the combustible gas detector. - Replace the combustible gas detector.
		- Accidentally pressing the fan start button - Accidentally press the fan start button.	Reset the emergency stop button.
22	Fire fighting fan failure	- Wiring troubles. - Others.	- Inspect the wiring of the fan. - Replace the fan.
23	Emergency shut down	- Fire fighting device failure. - Level-2 alarm fire.	- Check the fire alarm status. - Check the fire alarm status. If there is any fire alarm, please urgently activate the fire suppression system.

11.3 Maintenance

To ensure that equipment operates efficiently and lasts longer, you should carry out regular maintenance according to the following tables. If the equipment is located in a harsh environment, you should increase maintenance frequency. Please make records of the maintenance.

 **WARNING!**

- Only qualified professionals can maintain the equipment.
- Only the spare parts and accessories approved by SolaX should be used.
- If the equipment is often exposed to sandy and windy weather conditions, you should increase maintenance frequency. Besides, you should perform maintenance on the cabinet, distribution box, and air-cooled chiller every month.
- You should check and inspect the equipment according to the local laws and regulations.

11.3.1 Maintenance Routine for DC container

Table 11-7 Maintenance list

Check Item	Description	Interval Time
The operating status and environment of the system	- Check whether there is any damage to the distributed energy system, and the equipment is deformed. - Check whether there are any abnormal noise in the running system. - Check whether the parameter is correct shown in the screen. - Check whether there is any damage to the main components.	Every 6 months

Check Item	Description	Interval Time
The operating status and environment of the system	• Check whether the temperature of the equipment shell is normal. Meanwhile, it is suggested to use a thermal imager or any other monitoring systems to identify signs of heat. • Check whether the surrounding is at normal humidity level, and there is any damage to the dust and air filters. a. Must ensure that the air intake is well ventilated. Otherwise, the battery pack failure will be caused due to overheating. b. Please gently open the door to prevent raising dust from the filter cotton. Otherwise, the smoke detector will alarm and give a command to the automatic fire sprinkler to spray gas.	Every 6 months
System cleaning	• Check whether the circuit boards and components are clean. • If necessary, clean the modules by air compressor. Note: 1. The system must be shut down before cleaning. 2. The maintenance period shall be shortened if the cabinet is installed in heavily polluted environments.	Every 6 months
Electrical connection	• Check whether the power cables are fastened securely. If not, please tighten them again according to the torque written in the document. • Check whether there is any damage to the cables, especially the cable jacket connecting with the metal parts. • Check whether the electrical insulation tape is in good condition and no peeling.	Every 6 months
Terminal and block connection	• Check whether the screws are fastened securely. If not, please tighten them again according to the torque written in the document. • Check whether there is any fading to the screws and copper bars. • Check whether the wiring arrangement is reasonable. • Check whether the loop terminals are in good condition, and the temperature of the screws is normal.	Every 6 months

Check Item	Description	Interval Time
Water sensor maintenance	• Check whether the surface of the sensor is clean. • Check whether the sensor runs normally. • Check the appearance of the sensor.	Every 6 months

11.3.2 Maintenance Routine for Liquid Cooling System

Table 11-8 Maintenance list

Check Item	Description	Interval Time
Appearance of air-cooled chiller	• Check whether the surface of the unit is clean.	Every 6 months
Fan	• Check if there is any accumulated dust on the fan, and there are any objects blocking the air inlet. • Check whether the fan blades are in good condition, and whether there is any abnormal sound while running.	Every 6 months
Reliability of the power cables and terminals for connection panel	• Check whether the cables and terminals are secure. • Check whether the cables have the following circumstances: aged, damaged, abnormal heat, or others. • Check whether there is any accumulated dust on the connection panel.	Every 6 months
Condenser	• Check whether there is any accumulated dust on the condenser, or whether there are any objects blocking the condenser. • Check whether the fins of the condenser are severely bent or deformed.	Every 6 months
Coolant maintenance	• Coolant concentration must meet the following requirements. • PH value and electrolyte concentration must meet the following requirements. • Confirm that there is no dirt, sediment, or algae in the coolant.	Every 6 months

For the coolant requirements, please see the table below:

Table 11-9 Sample value

No.	Item	Value	No.	Item	Value
1	Colour	Blue	7	Turbidity	<5NTU
2	Smell	Without pungent smell	8	Copper	<5mg/L
3	PH@20°C	7.5~9.5	9	Aluminum	<5mg/L
4	Electrical conductivity@25°C	2000~4000μS/cm	10	Iron	<5mg/L
5	Reserve alkalinity	> 1.5 mL	11	Silicon	<10mg/L
6	Sulfate radical	< 50 mg/L	12	Total hardness	<20mg/L

11.3.3 Maintenance Routine for Fire Suppression System



WARNING!

- If you decide to replace or add battery packs, please confirm that the state of charge (SOC) of each battery pack should be kept consistent. If

Maintenance item and period (once per quarter)

Table 11-10 Maintenance item and period

No.	Item	Description	Period
1	Smoke detector	• Check if the indicator light of the detector can flash red normally. • Check if there is any accumulated dust or stain on the surface. • Check if there are any objects covering the detector.	Every quarter
2	Temperature detector	• Check if the indicator light of the detector can flash red normally. • Check if there is any accumulated dust or stain on the surface. • Check if there are any objects covering the detector.	Every quarter
3	Combustible gas detector	• Check if the indicator light of the detector can come on green normally. • Check if there is any damage to the monitoring modules, cables, or sensor, or if there is any visible damage to the structure. • Check if there is any accumulated dust at the sensor inlet.	Every quarter

No.	Item	Description	Period
4	Exhaust fan and electric ventilation louver	• Check if the devices are deformed, corroded, or aged. • Check if the device is installed securely.	Every quarter
5	Fan start & stop button	• Check if the devices are deformed, corroded, or aged. • Check if the device is installed securely.	Every quarter

Maintenance item and period (once per half year)

Table 11-11 Maintenance item and period

No.	Item	Description	Period
1	Signal of the fire control panel	• Check if the panel can normally send signal.	Every 6 months
2	Manual & automatic transfer switch and emergency start button	• Check if the device is deformed, corroded, or aged. • Check if the device is installed securely.	Every 6 months
3	Fire alarm bell	• Check if the device is deformed, corroded, or aged. • Check if the device is installed securely.	Every 6 months
4	Audible and visible alarm	• Check if the device is deformed, corroded, or aged. • Check if the device is installed securely.	Every 6 months
5	Fire emergency stop button	• Check if the device is deformed, corroded, or aged. • Check if the device is installed securely.	Every 6 months
6	Vent LED	• Check if the device is deformed, corroded, or aged. • Check if the device is installed securely.	Every 6 months
7	Gas fire extinguishing device	• Check if the bracket which supports the device is loose. • Check if the body of the device is damaged. • Check if the aerosol inside the device is expired. • Check if the pressure is within normal range.	Every 6 months
8	Combustible gas detector	• Check if the alarm light of the detector can come on normally.	Every 6 months

No.	Item	Description	Period
9	Battery	• Check if the labels on the battery are clearly visible. • Check if the temperature of its negative pole is over 18°C. If so, please replace the battery. • If the battery is fully charged, you should: » Check whether the voltage is within the normal range; » Check whether the resistance value meets the standards.	Every 6 months

Maintenance item and period (once per year (or three years))

Table 11-12 Maintenance item and period

No.	Item	Description	Period
1	Fire control panel	• Check if the indicator light of the detector can come on normally. • Check if the fuse is aged. • Check if the cables for interface device are connected correctly. • Check if the main power supply occurs the following circumstances: open circuit, loose connection of cables, phase loss, overheating, short circuit, overload, and more.	Every year
2	Gas fire extinguishing device	• Check if there are any issues in the battery compartment structure that might cause the leakage of fire extinguishing agent or change in protective volume.	Every year
3	Explosion-proof plate (optional)	• Check if the plate is deformed, corroded, or aged. • Check if the plate is installed securely.	Every year
4	Smoke detector	• Check if the detector can normally send signal.	Every year
5	Temperature detector	• Check if the detector can normally send signal.	Every year
6	Combustible gas detector	• Check if the detector can normally send signal.	Every year
7	Manual & automatic transfer switch and emergency start button	• Check if the detector can normally send signal.	Every year
8	Fire emergency stop button	• Check if the stopping delay is running normally.	Every year

No.	Item	Description	Period
9	Vent LED	• Check if the light can come on normally. • Check if the light intensity meets the specified value.	Every year
10	Fire alarm bell	• Check if the alarm sound could be heard when the system is triggered. • Check if the alarm sound meets the specified decibel level.	Every year
11	Audible and visible alarm	• Check if the light can come on normally. • Check if the light intensity meets the specified value.	Every year
12	Relay	• Check if the relay can normally send signal.	Every year
13	Battery	• Please test the battery, and then check if the battery capacity after the test is equal or less than 80%.	Every 3 years

11.3.4 System Recharging

- If the entire system stops running, you should recharge the battery packs every six months, to make sure that the SOC range is within 30%~50%, as well as the standby battery packs.
- If the system and the standby battery pack fail to work because they are not recharged during the storage period of six months, SolaX will not assume any responsibility. For details, please see the Commercial Contract.

Table 11-13 Recharging information

Item	Recharging period
System	Every 6 month
Standby battery pack	Every 6 month

12 Dispose of Wasted or Damaged Battery Pack

Regarding the wasted or damaged battery packs, SolaX will not recycle them. Therefore, you might contact a recycling agency to dispose of them, and also you would assume the expenses incurred by yourselves.

Step 1: Contact a recycling agency, and estimate the expenses.

Step 2: The recycling agency will take full responsibility for dispose of the wasted or damaged battery packs.

13 Technical Data

DC container

Model	ORI-B5015L-2H	ORI-B4597L-2H	ORI-B4179L-2H	ORI-B3761L-2H	ORI-B3343L-2H
DC rated voltage [d.c. V]	1331.2				
DC voltage range [d.c. V]	1123.2 ~ 1497.6				
Pack structure	1P416S x 12	1P416S x 11	1P416S x 10	1P416S x 9	1P416S x 8
Cell type	LFP 314 Ah / 3.2 d.c. V				
Battery pack type	314 Ah / 332.8 d.c. V				
Battery cluster type	314 Ah / 1331.2 d.c. V				
Nominal energy capacity [kWh]	5015	4597	4179	3761	3343
Cooling method	Liquid cooling				
Operation temperature range [°C]	-30 ~ 50				
Storage temperature range [°C]	-30 ~ 60				
Operation humidity range [RH%]	≤ 100 (non-condensing)				
Max. Continuous Charge/Discharge Power [kW]	2508	2298	2089	1880	1671
Max. operating altitude [m]	≤ 4000				
Dimension (W x H x D) [mm]	6058 x 2896 x 2438				
Gross weight [t]	≤ 43	≤ 40.4	≤ 37.8	≤ 35.2	≤ 32.6
Ingress protection	IP55				
Corrosion rate	C4 (optional C5)				
Configuration of safety	Gas Fire Suppression + Water-based Fire Suppression + Ventilation (optional explosion-proof plates)				
Standard	IEC 62619, EN 62477-1, UL 9540A, IEC 60356, IEC 62933-5-2, IEC 61000-2/4				

Battery Cell

Battery type	LFP
Nominal voltage [d.c. V]	3.2
Nominal capacity [Ah]	314
Nominal charge current [d.c. A]	157
Max. charge current [d.c. A]	186
Nominal discharge current [d.c. A]	157
Max. discharge current [d.c. A]	186
Voltage range [d.c. V]	2.7~3.6
Operation temperature range	Charge: 0°C~50°C Discharge: -30°C~50°C
Storage temperature range	-30°C~60°C

Battery module

Type	TB-HR1044
Configuration	1P104S
Rated capacity [Ah]	314
Rated energy [kWh]	104.4
Rated voltage [d.c. V]	332.8
Rated charge\discharge rate	≤0.5P
Operation voltage range [d.c. V]	280.8~374.4
Cooling method	Liquid cooling
Weight [kg]	670
Dimension (W*D*H) [mm]	790×2190×247

High-voltage box

Type	TBMS-15D
Dimension (W*D*H) [mm]	770*1000*172.5
Rated voltage [d.c. V]	1331.2
Rated current [d.c. A]	157
Max. allowable voltage [d.c. V]	1500
Max. allowable current [d.c. A]	250
Ingress protection	IP65

Battery cluster

Type	ORI-C417L
Configuration	1P104S*4
Rated capacity [Ah]	314
Rated energy [kWh]	417.9
Rated voltage [d.c. V]	1331.2
Rated charge\discharge rate	≤0.5P
Operation voltage range [d.c. V]	1123.2~1497.6
Cooling method	Liquid cooling
Operation temperature range	Charge: 0°C~50°C Discharge: -30°C~50°C
Storage temperature range	-30°C~60°C
Altitude [m]	≤4000
Ingress protection	IP65

14 Appendix

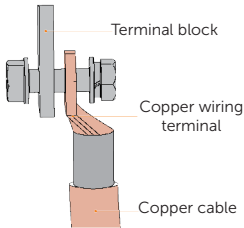
14.1 Requirements for SC Terminal

For different types of cables, select proper terminals and additional components for connection.

 **CAUTION!**

- Do not connect the aluminum wiring terminal directly to the terminal block or copper bar in case of electrochemical corrosion, which might affect the reliability of cable connection.

Table 14-1 Terminal requirements for different types of cables

Scenario	Cable Type	Wiring Terminal Type	Figure Illustration
1	Cooper cable	Copper wiring terminal	

14.2 How to Repaint the Cabinet

Check the paint damage on the surface of the cabinet, with details below:

- For light scratches or small areas of stubborn stains, please see ["14.2.1 Light Scratches & Small Areas of Stubborn Stains"](#) to treat them.
- If the deep scratches or large areas of stubborn stains can be treated by users, please refer to ["14.2.2 Deep Scratches and Large Areas of Stubborn Stains"](#).
- If the damaged area is too large and cannot be treated, please contact the after-sale personnel for assistance.

 **WARNING!**

- If the cabinet is installed outdoors without shield, do not repaint it in rainy, snowy, windy, or stormy days.

NOTICE!

- Use paint of C-045-480.
- For light scratches and small areas of stubborn stains, spray paint and hairbrush are recommended.
- For deep scratches or large areas of stubborn stains, oil paint and paint sprayer are recommended.

14.2.1 Light Scratches & Small Areas of Stubborn Stains

This solution applies to light scratches without reaching the steel substrate and stubborn stains on the surface.

Tools and Materials Required

Prepare tools and enough materials according to actual conditions.

Table 14-2 Tools and materials

No.	Tool/Material	No.	Tool/Material
1	Spray/oil paint	2	Fine sandpaper
3	Anhydrous ethanol	4	Cotton cloth
5	Hairbrush (for small scratched area)	6	Spray paint (if there is a large area of light scratch, paint sprayer is recommended.)

Repainting Procedure

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

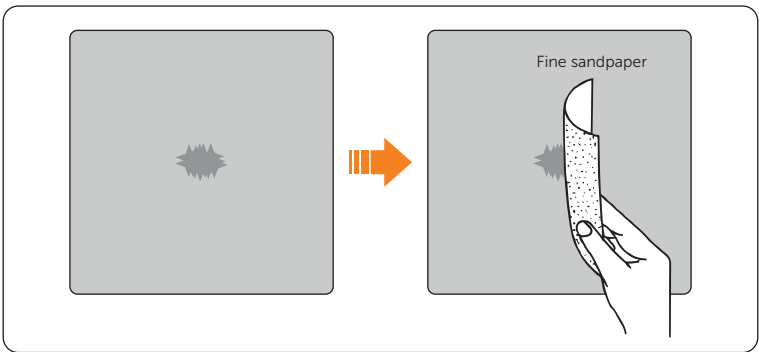


Figure 14-1 Sanding the scratched area

Step 2: Moisten a cotton cloth with anhydrous ethanol, wipe the scratched area with it to remove dust and dirt, and then use a dry cotton cloth to wipe the area dry.

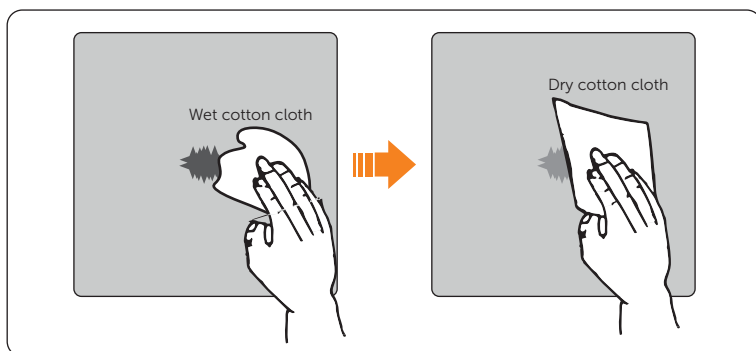


Figure 14-2 Cleaning the scratched area

Step 3: Use hairbrush or spray paint to apply paint to the surface of the scratched area until it is fully and evenly covered.

NOTICE!

- While applying paint, make sure the newly applied paint is thin and even, so that the scratched area can appear consistent and smooth on the surface.
- If there is color difference between the scratched area and the surroundings, cover the surrounding area with tape or paper in case of color contamination.

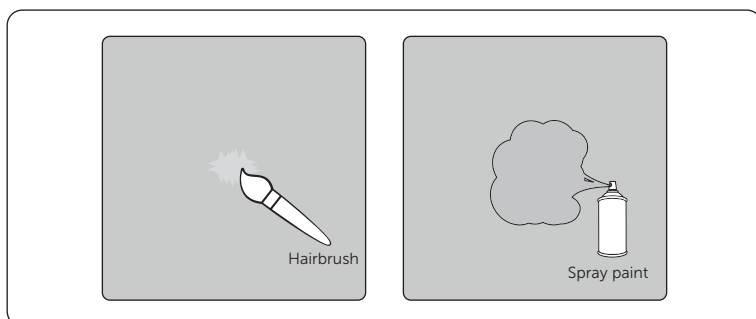


Figure 14-3 Applying paint

Step 4: After completing applying the paint, wait for around 30 minutes for the paint to get dry, and then check whether the repaired area meets the requirements.

NOTICE!

- The color of the repaired area shall be consistent with the surrounding area.
 - » Use a colorimeter to measure the color difference, of which Delta E shall be ≤ 3 .
 - » If the color cannot be measured by a colorimeter, make sure that there is no obvious color difference at the edges between the repaired area and the surrounding area, as well as no bumps, scratches, flakings, or breaks.
- For spray painting, we recommend painting for at least 3 times before pausing to check the effect, and then repeat spray painting and observing until it meets the requirements.

14.2.2 Deep Scratches and Large Areas of Stubborn Stains

This solution applies to deep scratches where the primer has been damaged and reach the steel substrate.

Tools and Materials Required

Prepare tools and enough materials according to actual conditions.

Table 14-3 Tools and materials

No.	Tool/Material	No.	Tool/Material
1	Spray/oil paint	5	Cotton cloth
2	Zinc-rich primer	6	Hairbrush (for small areas of deep scratches and stubborn stains)
3	Fine sandpaper	7	Paint sprayer (for large areas of deep scratches and stubborn stains)
4	Anhydrous ethanol		

Repainting Procedure

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

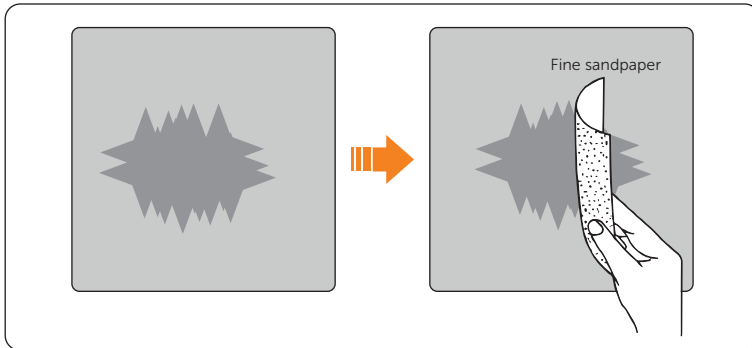


Figure 14-4 Sanding the scratched area

Step 2: Moisten a cotton cloth with anhydrous ethanol, wipe the scratched area with it to remove dust and dirt, and then use a dry cotton cloth to wipe the area dry.

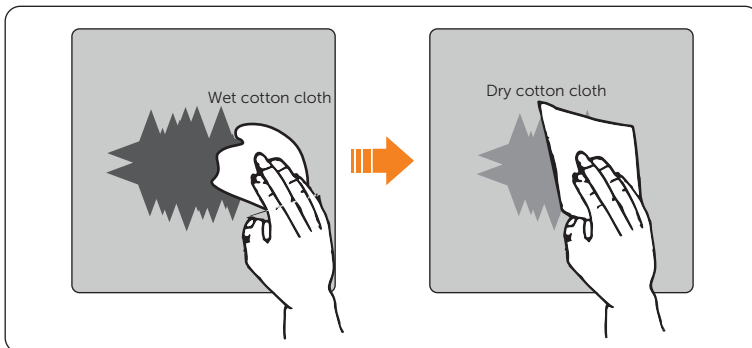


Figure 14-5 Cleaning the scratched area

Step 3: Use a paint spray to apply the zinc-rich primer to the scratched area.

NOTICE!

- If the steel substrate is visible on the scratched area, the zinc-rich primer must be applied first to entirely cover the substrate.
- Wait for the primer to get dry before applying the top coat to the scratched area.

Step 4: Use a paint spray to apply paint to the surface of the scratched area until it is fully and evenly covered.

NOTICE!

- While applying paint, make sure the newly applied paint is thin and even, so that the scratched can appear consistent and smooth on the surface.
- If there is color different between the scratched area and the surroundings, cover the surrounding area with tape or paper in case of color contamination.

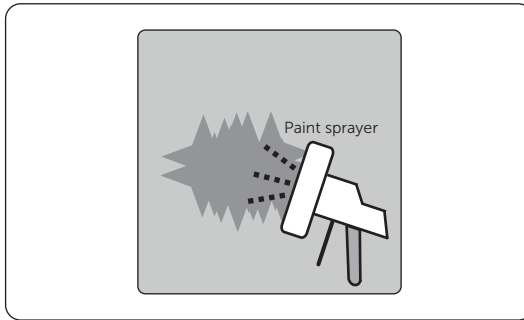


Figure 14-6 Applying paint

Step 5: After completing applying the paint, wait for around 30 minutes for the paint to get dry, and then check whether the repaired area meets the requirements.

NOTICE!

- The color of the repaired area shall be consistent with the surrounding area.
 - » Use a colorimeter to measure the color difference, of which Delta E shall be ≤ 3 .
 - » If the color cannot be measured by a colorimeter, make sure that there is no obvious color difference at the edges between the repaired area and the surrounding area, as well as no bumps, scratches, flakings, or breaks.
- For spray painting, we recommend painting for at least 3 times before pausing to check the effect, and then repeat spray painting and observing until it meets the requirements.

14.3 Abbreviation

You can see lots of abbreviation in the manual, with details shown as the table below.

Table 14-4 Abbreviation

	Explanation
HL	Indicator light
PE	Grounding bus/point
QF	Miniature circuit breaker
AC/DC	24V switching power supply
XT	Terminal block
SPD	Surge protection device
BSC100	Main control module
LC100	Local controller
MSD	Manual service disconnect
SCB	Surge protection circuit breaker
C:	Distribution terminal
KV	Phase sequence relay
CCS	Cell contact system
CSC	Cell supervision circuit
HVU	High voltage unit
BMU	Battery management unit
MBMU	Main battery management unit
PDU	Power distribution unit
BAU	Battery array unit
BMS	Battery management system
EESS	Electrical energy storage system
PCS	Power conversion system
DOD	Depth of discharge
SOC	State of charge
SOH	State of health
SOE	State of energy
SOP	State of power
DI	Digital in
DO	Digital out
COM	Common
*COMM	Communication

*Note: The actual silk-screening COMM on the container is COM.

14.4 Wire Gauge Conversion

NOTICE!

- Since there is conversion relationship between AWG and mm², the value shown in the following table is for reference only.

Cross-sectional area (mm ²)	AWG
0.35	22
0.5	20
4	11
16	5
35	2
70	2/0

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