Air Cooling Energy Storage System

TRENE-P100B215I

User Manual

Version 1.0

www.solaxpower.com

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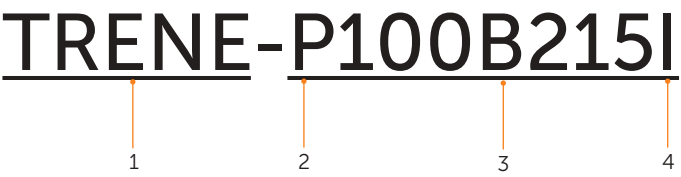
About This Manual

Scope of Validity

This manual is an integral part of TRENE-P100B215I intelligent all-in-one energy storage system. It describes the transportation, storage, installation, electrical connection, commissioning, maintenance and troubleshooting of the product. Please read it carefully before operating.

Model description



No.	Definition	Description
1	Product name	TRENE: Refer to the name of AC couple series project.
2	Power	P100: Indicate that the rate power of the PCS is 100 kW.
3	Battery capacity	B215: Indicate that the battery capacity is 215 kWh.
4	PCS model	I: Refer to an embedded PCS.

Target Group

The installation, maintenance and grid-related setting can only be performed by qualified personnel who:

- Are licensed and/or satisfy state and local regulations.
- Have good knowledge of this manual and other related documents.

Conventions

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

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

Change History

Version 1.0 (2024-10-30)

Updated "1 Safety";

Version 0.0 (2024-05-16)

Initial release

Table of Contents

1 Safety

1.1 General Safety

Before transporting, storing, installing, operating, using and/or maintaining the device, please carefully read and understand the document, and strictly follow the instructions and safety precautions given herein, as well as symbols affixed on the device. The safety instructions herein are only supplements to local laws and regulations.

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

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

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

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

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

1.2 Device Safety

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

1.2.1 Cabinet Safety

DANGER!

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

WARNING!

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

CAUTION!

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

NOTICE!

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

1.2.2 Battery Safety

DANGER!

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

WARNING!

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

⚠ WARNING!

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

NOTICE!

Transportation requirements for battery:

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

If the battery leaks electrolyte or any other chemical materials, the electrolyte leakage can lead to toxic gases. Therefore, do not contact with them at all times. In case of accidentally coming into contact with them, please do as follows:

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

NOTICE!

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

- In case a battery is charging when the fire breaks out, provided it is safe to do so, press the emergency stop button and unplug the power cable;
- In case a battery is not on fire yet, use a water-based fire extinguisher or a carbon dioxide extinguisher to extinguish the fire;
- In case a battery catches fire, do not try to put it out, and evacuate immediately;
- A battery may catch fire when it is heated above 150°F/60°C. 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 PCS Safety

PCS Safety

DANGER!

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

⚠ WARNING!

- Operators must wear PPE while installation and maintenance of the device.
- During operation, avoid touching any parts of the PCS other than the LED panel.
- Never connect or disconnect the AC and DC connector while the PCS is running.
- Prior to conducting any maintenance, turn off the AC and DC power and disconnect them from the PCS. Wait for 60 minutes to fully discharge the energy.
- Avoid touching the PCS while it is running, as it becomes hot during operation and may cause personal injuries.

NOTICE!

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

1.2.4 Utility Grid Safety

NOTICE!

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

1.3 Electrical Safety

⚠ DANGER!

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

WARNING!

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

CAUTION!

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

NOTICE!

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

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

NOTICE!

Grounding Requirements:

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

Cable Requirements:c

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

2 Product Overview

2.1 System Description

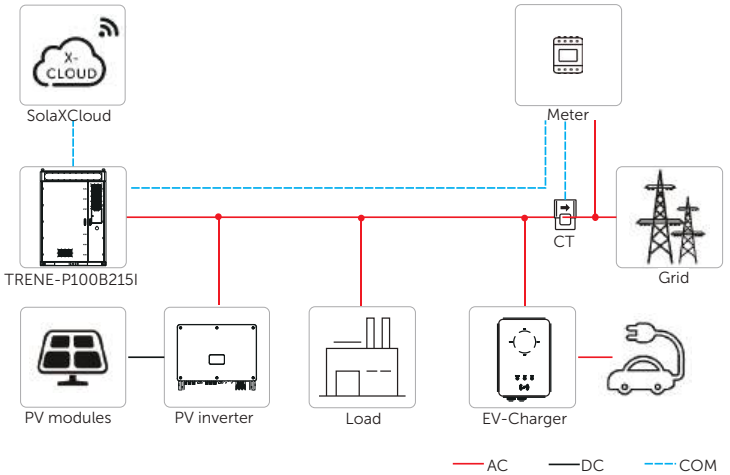


Figure 2-1 System overview diagram

NOTICE!
• An external communication cable should have shielding function.

Table 2-1 System item description

Item	Description
TRENE-P100B215I	TRENE-P100B215I is an "ALL-IN-ONE" intelligent outdoor energy storage system.
Meter/CT	The meter/CT is used for import / export or consumption readings, and manages the battery charge / discharge accordingly for smart energy management applications.
EV-Charger (Optional)	The system can communicate with SolaX EV-Charger to form a storage and EV charging energy system, thus maximizing the utilization of energy.
Grid	400 V / 230 V and 380 V / 220 V grid are supported.

Item	Description
PV Inverter	The PV inverter converts the direct current (DC) generated by solar panels into alternating current (AC) that is compatible with the power grid, and to facilitate the bidirectional flow of electricity, thereby maximizing the efficiency of solar energy utilization and providing grid support.
SolaXCloud	SolaXCloud is an intelligent, multifunctional monitoring platform that can be accessed either remotely or through a hard wired connection. With the SolaXCloud, the operators and installers can always view key and up-to-date data. Commercial platform can be connected through EMS1000 connection (EMS1000 is integrated into the cabinet).

2.2 Product Introduction

The product "**TRENE-P100B215I**", a smart outdoor energy storage system with easy installation and convenient expansion, integrates high-capacity battery modules, a high-performance PCS, smart EMS, and BMS in a cabinet based on the design concept of "ALL-IN-ONE". The industrial and commercial scenarios are designed to be broadly applicable.

2.2.1 Functions and features

Functions

The product "**TRENE-P100B215I**", a smart outdoor energy storage system with easy installation and convenient expansion, integrates high-capacity battery modules, a high-performance PCS, smart EMS, and BMS in a cabinet based on the design concept of "ALL-IN-ONE". The industrial and commercial scenarios are designed to be broadly applicable.

Features

- TRENE-P100B215I includes "2.4 AC Distribution System", "2.5 DC Side Battery System", "2.6 Power Conversion System", "2.7 Environmental Monitoring System", "2.8 Fire Suppression System", "2.9 Energy Management System" .It is characterised by safety, intelligence, reliability and economy.
- It is equipped with multiple safety protection measures. Built-in over-voltage, over-current, over-temperature and other protection functions, as well as fireproof materials and level 4 fire safety protection system, can detect and respond to potential live risks in time, and effectively control the speed of fire spread.
- Advanced EMS intelligent control of energy storage system operation strategy, independent implementation of intelligent scene switching according to the market price of electricity help to improve the operational efficiency of the entire energy storage system and shorten the investment recovery cycle.
- Supports three-phase unbalanced applications, rapid expansion and off-grid switching to ensure more reliable power supply.

2.2.2 System Appearance

Angle supports installed at front and rear sides

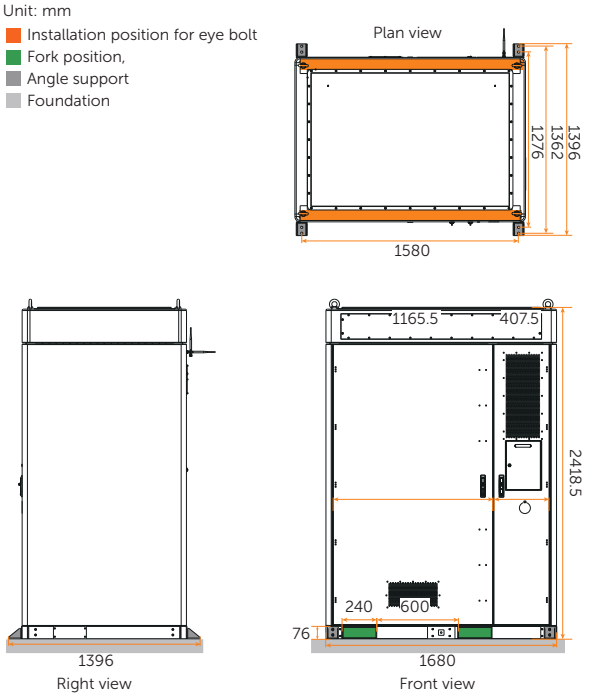


Figure 2-2 Appearance and dimension

Angle supports installed at left and right sides

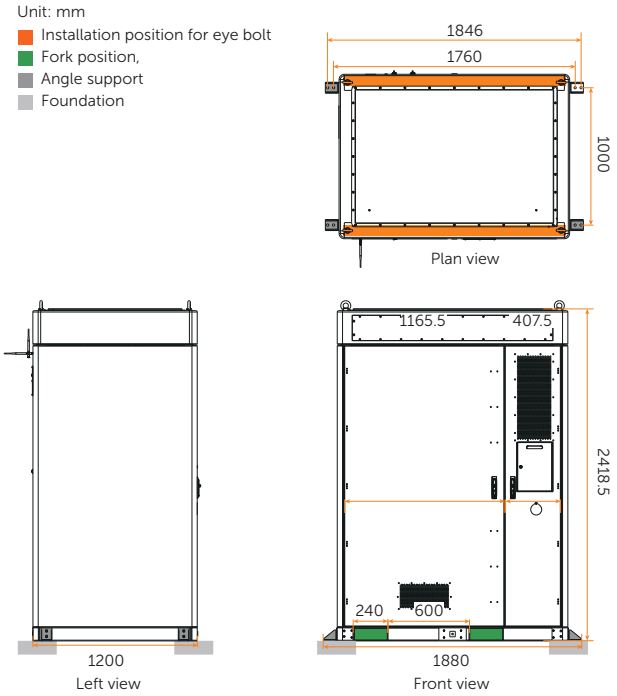


Figure 2-3 Appearance and dimension

2.3 Parts Description

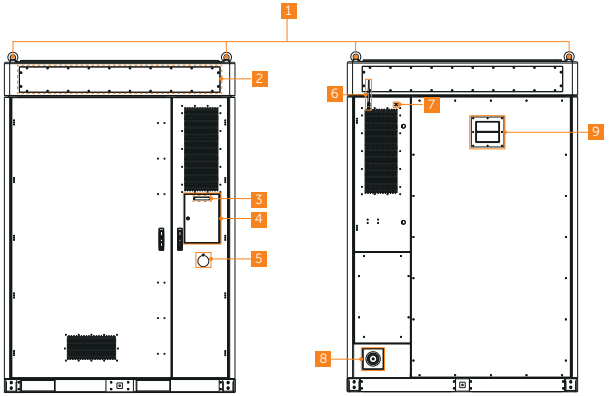


Figure 2-4 Parts description (in the closed state)

Table 2-1 Parts description

No.	Item	Description
1	Eye bolt	Material lifting applications.
2	Air conditioner	Energy storage system air conditioner.
3	LED light	To display status information of all processess running on the system.
4	Display screen	To display information of the whole system.
5	Emergency stop button	To shut down the system in emergency circumstances.
6	Antenna	A 4G antenna, to connect EMS.
7	A reserved antenna port	To connect wireless meter.
8	Fire hose nozzle	To connect the water supply sources.
9	Expansion-proof valve	To cool the escaping gases below the ignition temperature of the surrounding atmosphere.

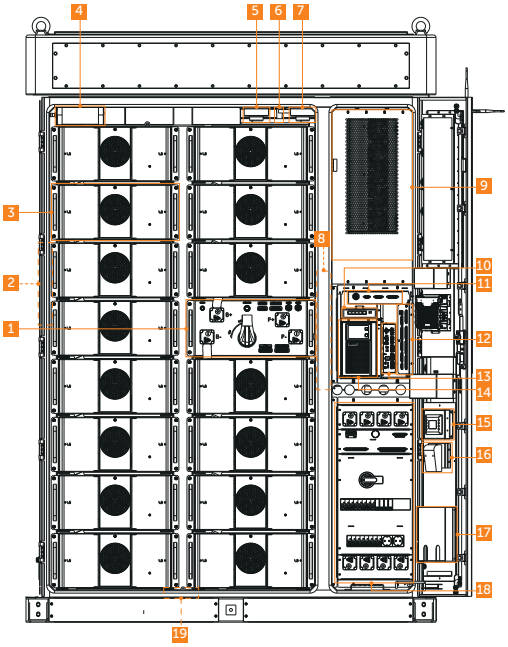


Figure 2-5 Parts description (in the opened state)

Table 2-2 Parts description

No.	Item	Description
1	High-voltage box	To collect current and voltage information on battery tower, ad control the charge and discharge of battery pack.
2*	Temperature and humidity sensor	To measure temperature and humidity.
3	Battery pack	/
4	Automatic fire sprinkler	To control or suppress the spread of fire
5	Temperature sensor	To detect temperature.
6	CO detector	To detect CO gases.
7	Smoke detector	To detect smoke.
8*	Door sensor	To alert you when the door is open.
9	PCS	/
10	Switch	To exchange information among multiple TCP devices.

No.	Item	Description
11	RS232 to RS485 Converter	/
12	IO module	To collect signal and control other modules.
13	EMS	A energy management system.
14	UPS	To provide backup power to ensure that the device is in a normal operating condition.
15	Control panel of air conditioner	To monitor the air conditioner and show relevant parameter.
16	Audible and visible alarm	To alter you when the abnormal conditions occur, such as temperature, smoke.
17	File pocket	To put documents.
18	Distribution box	To distribute AC power for the energy storage system.
19*	Water sensor	To detect water level based on the principle of potential difference between the two electrodes.

NOTICE!

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

The cabinet supports the installation of at least 7 battery packs (see "Figure 2-6 Seven battery packs") and up to 15 battery packs (see "Figure 2-7 Fifteen battery packs").

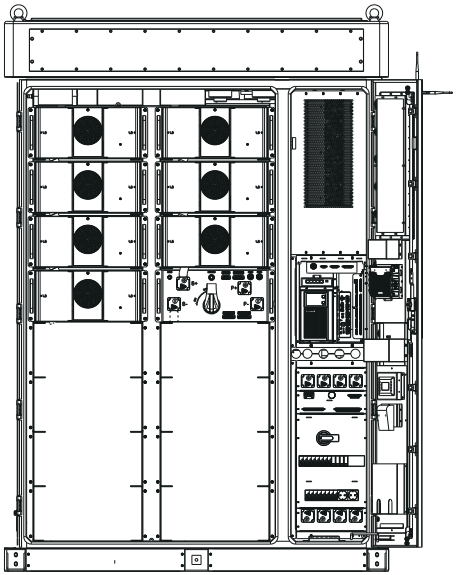


Figure 2-6 Seven battery packs

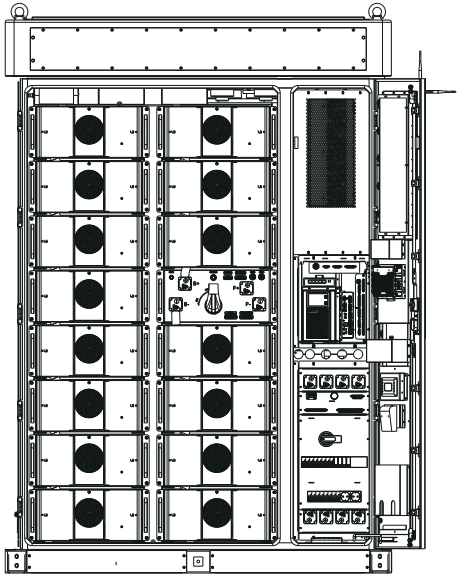


Figure 2-7 Fifteen battery packs

NOTICE!

- Given the wiring, it is suggested to install the high-voltage box at the position shown in the above figures.

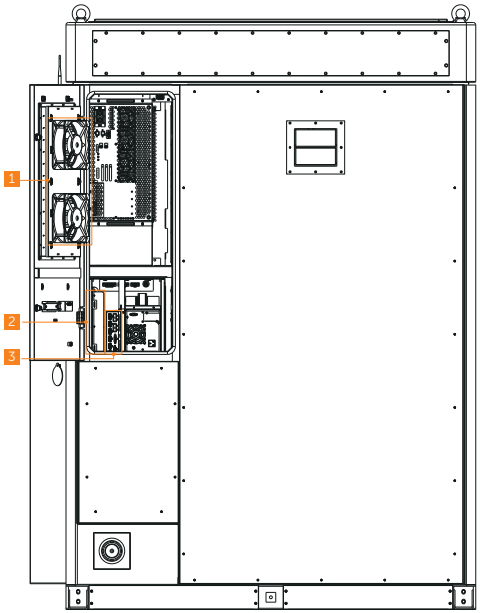


Figure 2-8 Parts description (in the opened state)

Table 2-3 Parts description

No.	Item	Description
1	Fan	To improve air circulation and dissipate heat when the temperature rises.
2	IO module	To collect signal and control other modules.
3	EMS	An energy management system.

2.4 AC Distribution System

2.4.1 Distribution Box

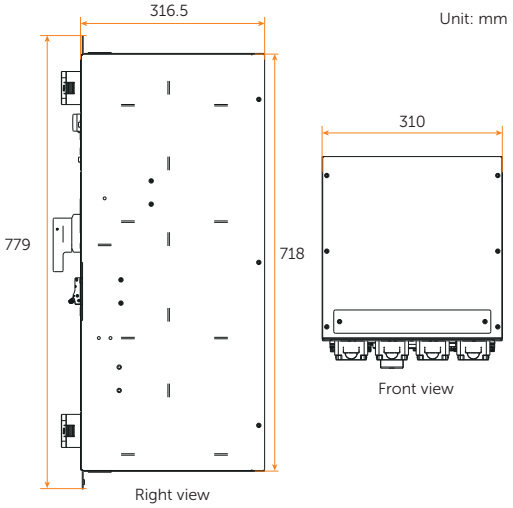


Figure 2-9 Dimension

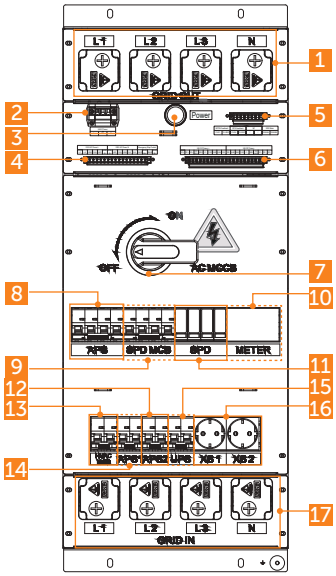


Figure 2-10 Front panel

Table 2-4 Description of front panel

No.	Item	Description
1	Grid out wire connector	For AC side
2	Power supply port for air conditioner	To connect to the air conditioner.
3	LED light	To display the operation state.
4	220 V power supply Port for controlling emergency stop switch	Provides 220V power for other devices in the cabinet. To manually turn off AC side for emergency.
5	Circuit breaker's electrical control signal	To remotely turn off AC power for emergency.
6	24V power supply port	To provide power supply for the devices inside the cabinet.
7	Disconnector	A switch for AC side.
8	APS	/
9	SPD maintenance breaker	/
10	Meter breaker	/
11	Current terminal	To connect to the grid.
12	ASP2	/
13	Air conditioner/liquid cooling unit on/off breaker	/
14	Auxiliary power breaker of High-voltage box	/
15	UPS breaker	To protect UPS breaker.
16	Socket	Power socket.
17	GRID IN wire connector	Port for connecting to power grid.

2.4.2 UPS

For UPS indicator instructions please refer to "9.4 UPS's Indicator Light".

2.5 DC Side Battery System

2.5.1 High-voltage Box

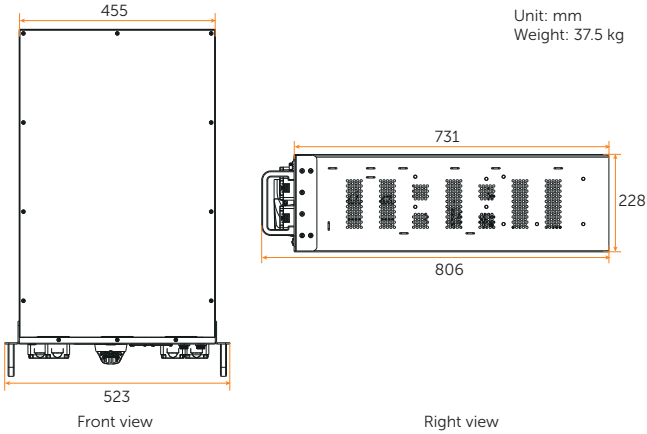


Figure 2-11 Dimension and weight

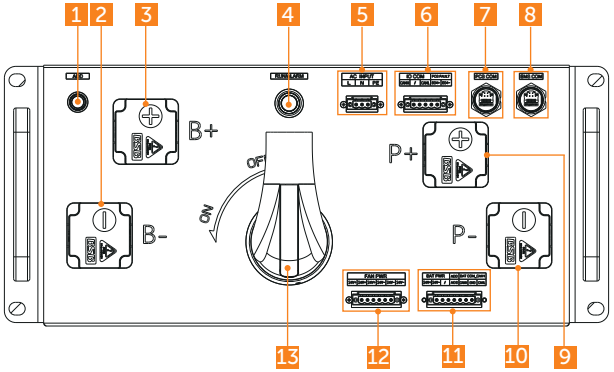


Figure 2-12 Front panel

Table 2-5 Description of front panel

No.	Item	Description
1	ADD button	To assign address.
2	Negative output port	To connect battery pack's negative terminal.
3	Positive output port	To connect battery pack's positive terminal.

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

2.5.2 Battery Pack

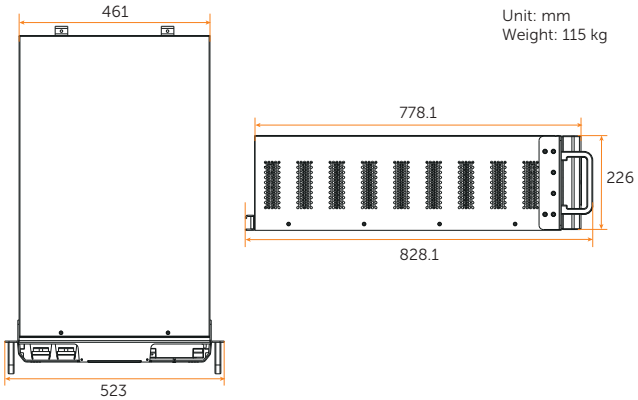


Figure 2-13 Dimension and weight

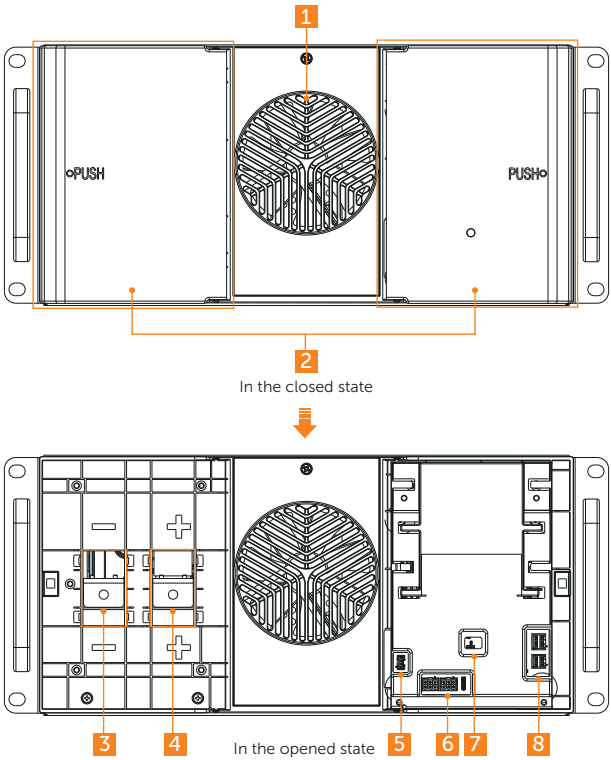


Figure 2-14 Front panel

Table 2-6 Description of front panel

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

2.6 Power Conversion System

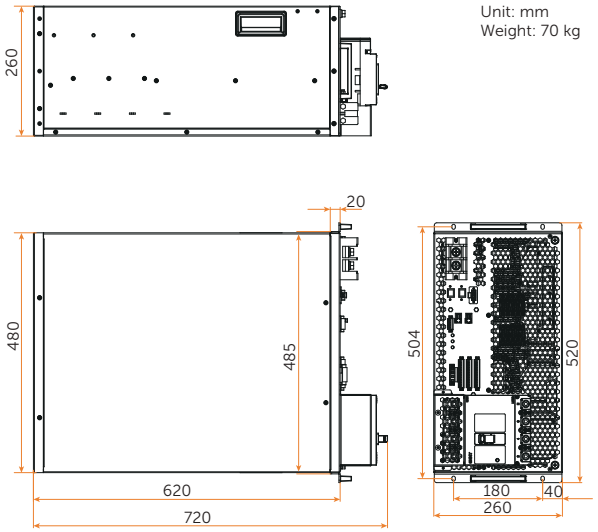


Figure 2-15 Dimension and weight

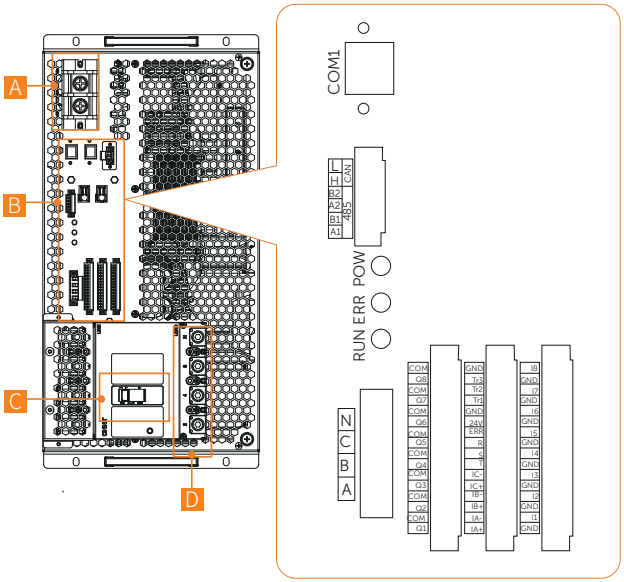


Figure 2-16 Front panel

Table 2-7 Description of front panel

No.	Item	Description
A	DC+/DC-	DC side connection
B	COM1	Communication connection
	CAN/485-1	CAN port and 485-1 port are used for BMS communication, and 485-2 is used for communication between PCS module and DC module;
	A/B/C/N	Reserved
	POW、ERR、RUN	Display Status
C	Switch	Control power
D	2/4/6/N	AC side connection

2.7 Environmental Monitoring System

2.7.1 Air Conditioner

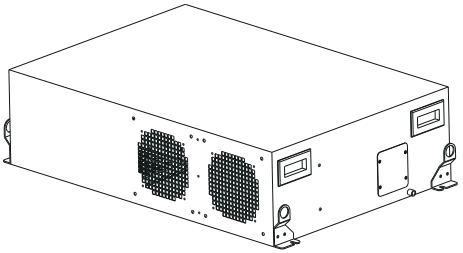


Figure 2-17 Appearance of air conditioner

NOTICE!

- Please refer to "10.3.2 Disassembly and Clean of Air Conditioner Filter" when it's time to clean or replace the air conditioner filter.

2.7.2 IO Module

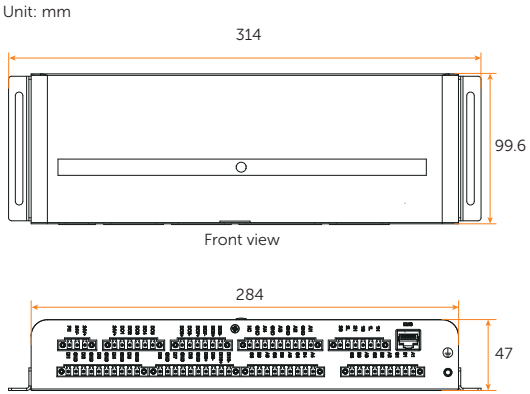
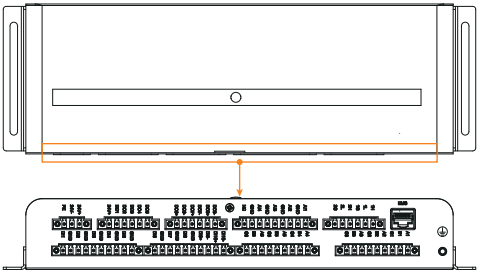


Figure 2-18 Dimension



Electric panel

Figure 2-19 Electric panel

2.7.3 Temperature and Humidity Sensor

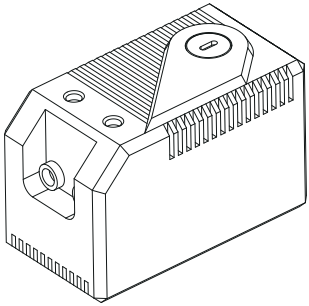


Figure 2-20 Appearance of temperature and humidity sensor

2.7.4 Water Sensor

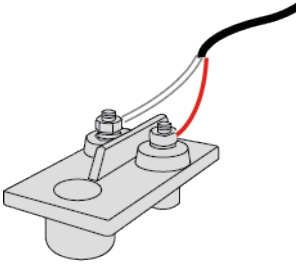


Figure 2-21 Appearance of water sensor

2.7.5 Door sensor

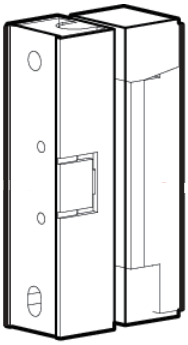


Figure 2-22 Appearance of door sensor

Figure 2-23

2.8 Fire Suppression System

2.8.1 Automatic Fire Sprinkler

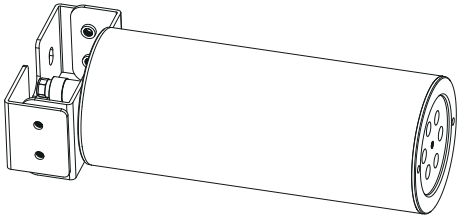


Figure 2-24 Appearance of automatic fire sprinkler

2.8.2 Temperature Sensor

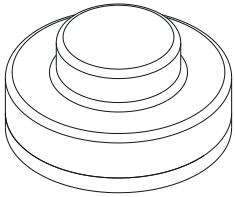


Figure 2-25 Appearance of temperature sensor

2.8.3 Smoke Detector

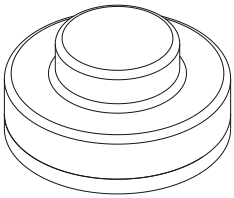


Figure 2-26 Appearance of smoke detector

2.8.4 CO Detector

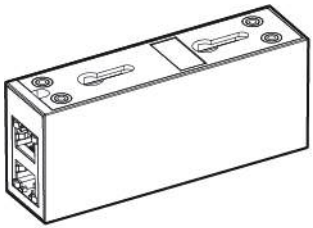


Figure 2-27 Appearance of CO detector

2.8.5 Audible and Visible Alarm

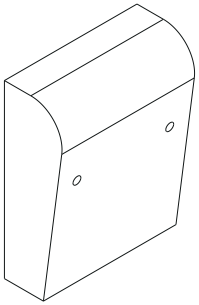


Figure 2-28 Appearance of audible and visible alarm

2.9 Energy Management System

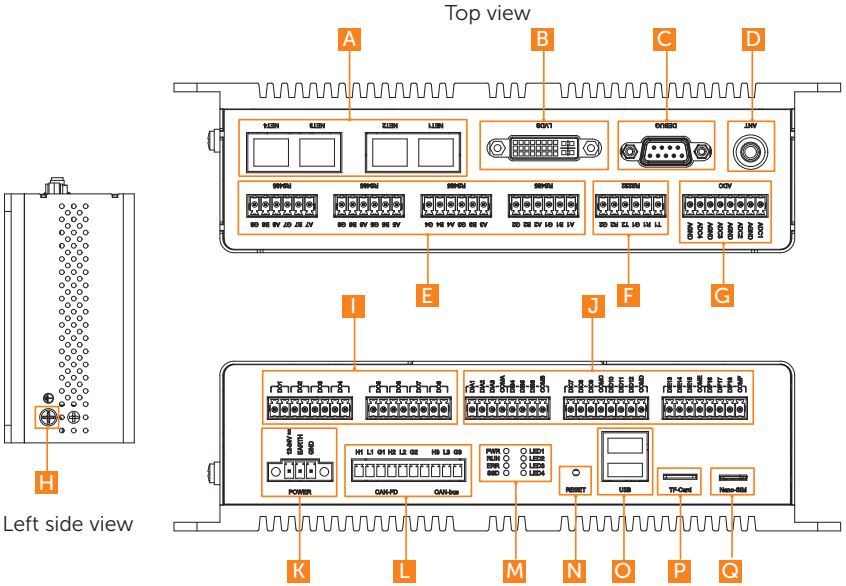


Figure 2-1 Appearance

Table 2-1 Description of appearance

Position	Area	Item	QTY	Description
Top	A	Ethernet terminal (NET)	4	• NET1: Reserved • NET2: Connected to the computer for commissioning • NET3: Connected to batteries • NET4: Connected to the router for network
	B	LVDS terminal	1	Reserved
	C	Debug terminal (DEBUG)	1	Reserved

Position	Area	Item	QTY	Description
Top	D	Antenna socket (ANT)	1	For expanding signal transmission
	E	RS485 terminal	8	• 1-5: Reserved • 6: Connected to other grid-connected inverters • 7: Only connected to the inverter in Aelio system • 8: Only connected to the meter
	F	RS232 terminal	2	Reserved
	G	ADC terminal	4	Reserved
Left side	H	Earthing terminal	1	For device earthing
Bottom	I	DO terminal	8	Reserved
	J	DI terminal	18	DIA1-DIA3 and COMA, DIB4 and COMB: Dry contact DIB5-COMF: Reserved
	K	Power supply (POWER)	1	12 Vdc-24 Vdc
	L	CAN terminal	3	2 × CAN-FD, and 1 × CAN-bus
	M	Indicators	8	• Power status (PWR) • Running status (RUN) • Error (ERR) • SSD status (SSD) • LED 1-LED4: Reserved
	N	Reset button (RESET)	1	For device resetting
	O	USB socket (USB)	2	For device update
	P	TF card socket (TF Card)	1	For firmware programming
	Q	Nano-SIM card socket (Nano-SIM)	1	For 4G communication

2.10 Operating Principle

2.10.1 Electrical Block Diagram

The label on Electrical Block Diagram should be pasted on the back door. For the position, see "Figure 2-2 Label position".

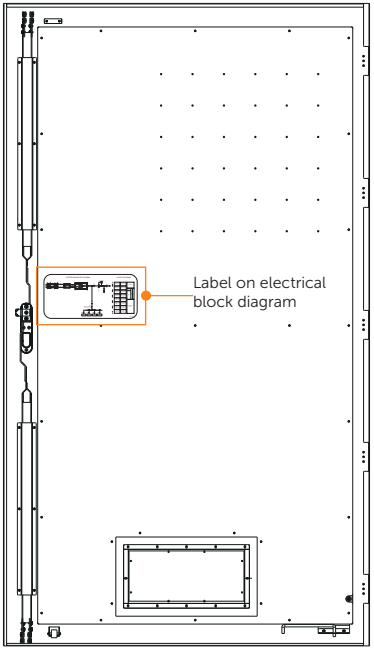


Figure 2-2 Label position

For the detailed information about the label, see "Figure 2-3 Electrical Block Diagram".

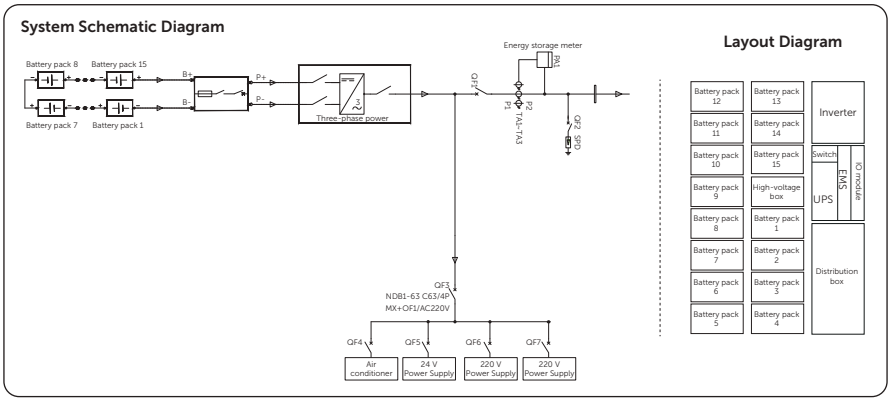


Figure 2-3 Electrical Block Diagram

NOTICE!

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

2.11 Work States

TRENE-P100B215I has Charging, Discharging and Standby states, and can store and release energy according to EMS requirements.

States	Description
Charging	The EMS controls the PCS to charge the battery and store excess energy in the battery.
Discharging	When the grid is insufficient to supply the load, the system needs to control the battery to supply the load, in which case the energy stored in the battery is converted by the PCS to be used by the load.
Standby	Power on without performing work.

2.12 Symbols

Table 2-2 Symbol description

Symbol	Description
CE	CE mark of conformity.
TUV	TUV certification.
RCM	RCM mark of conformity
	Protective grounding point.
	Grounding point.
	Caution, hot surface. The enclosure temperature may be high while running. Therefore, do not contact to avoid scalding.
	Danger, electric shock. Do not touch the device after it is powered on. Otherwise, an electric shock may occur.
	Danger. Due to possible risks, do not touch the device after it is powered on.
	Observe enclosed documentation.
	The device cannot be disposed together with the household waste.
	Do not operate the system until it is isolated from mains and battery.
15 mins	Danger of high voltage. Do not touch live parts for 15 minutes after disconnection from the power sources.

Symbol	Description
	Wait for 60 minutes after disconnecting the power to ensure the PCS is fully discharged.
	The battery system must be disposed of at a proper facility for environmentally-safe recycling.
	The battery module may explode. The rechargeable battery can become hot during operation. Avoid touch during operation.
	Keep the device away from children.
	Keep the device from open flames or ignition sources.

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.

NOTICE!

- Please strictly comply with the transportation requirements of the warning signs on the packaging and equipment.
- The tilt angle of the cabinet should be ≤10° while transporting and moving it.
- 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.
- 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.

3.1.1 Forklift

- Please confirm that the forklift's load-bearing capacity shall be ≥ 5 t before using it.
- The forklift should meet the following requirements: length of fork blade > 1.2 m, width of fork blade between 60 cm and 160 cm, and thickness of fork blade between 25 cm and 70 cm.

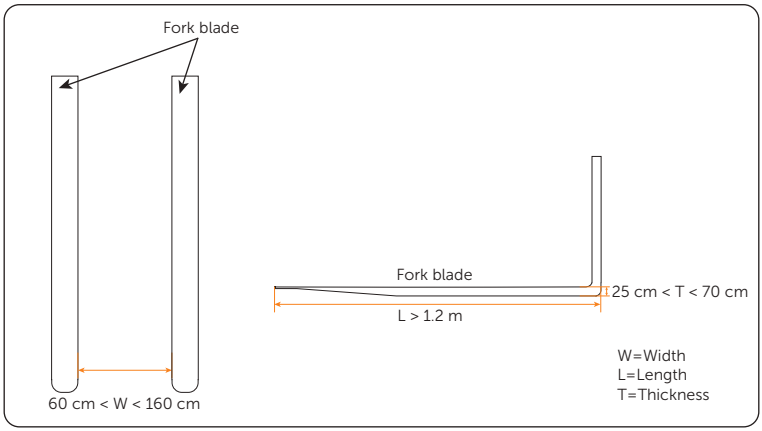


Figure 3-1 Forklift requirements

- Before moving the device, please pay attention to the center of gravity position of the load, and fully secure the load on the forklift by securing measures, such as ropes or bindings. In addition, please designate a person to supervise for safety concerns during transportation.
- Before unpacking, please accurately insert the fork blade into the fork holes on the carton when moving the device.

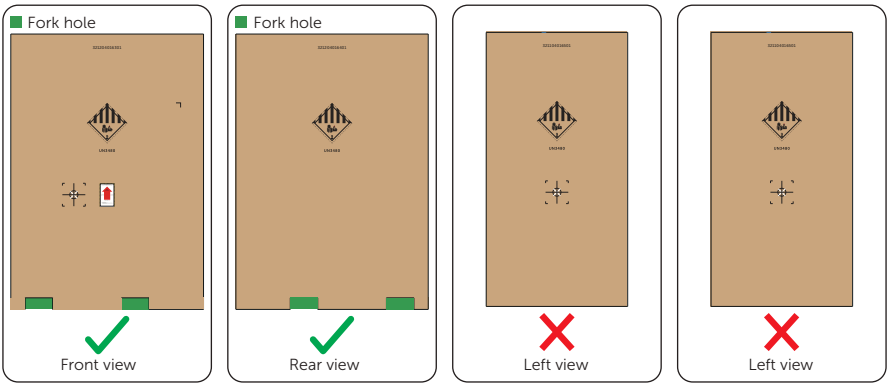


Figure 3-2 Carton fork holes

- For specific fork holes after unpacking, please refer to "6.1 Cabinet Handling".
- The equipment can only be transported by forklift before unpacking.

3.1.2 Hoisting

- A hoist operator with good operational skills and safety awareness, who must be trained and certified, shall be operated according to the local laws and regulations.
- After unpacking, the following requirements must be met when working with cranes and lifting ropes: crane hoisting capacity ≥ 5t, hoisting operating radius ≥ 2 m.
- Before hoisting, please check:
  - » Lifting tools are complete, tested and fully secured.
  - » The device door is closed and locked to avoid accidental opening.
  - » The lifting rope's quality must meet standards, and it shall be fully secured, to avoid falling and fraying.
- Do not hoist outdoors in rain, snow, wind and other bad weather.
- It is recommended to hoist devices in sequence and to ensure that the hoist moves in the same direction.

3.2 Storage Requirements

3.2.1 Cabinet Storage

- For long-term storage, do not remove the original packaging and check the packaging regularly.
- Please strictly comply with the storage requirements of the warning signs and other information on the packaging to avoid device damage.
- Storage temperature: -20°C ~ +60°C.
- Relative humidity for device storage: 5% ~ 95%.

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

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".

- Regarding with the storage information, see the following table:

Table 3-1 Storage information

Storage temperature range	Storage time
50°C to 60°C	3 months
30°C to 50°C	6 months
-20°C to 30°C	12 months

- Relative humidity for device storage: 5% ~ 95%.
- 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 device, 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.

The installation site shall meet 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.
- **Outdoor installation**: This device can only be used outdoors.
- **Safety spacing**:
  - » The installation distance between the device 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 device and adjacent buildings. During the planning phase, it is crucial to consider the space for transportation, installation and maintenance of the device.
- **Flood and waterlogging prevention**:
  - » Avoid low-lying and flood-prone areas. The installation site that the device 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 device, 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 device 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 device 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 devices 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 device, 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°C ~ +50°C.
  - » Relative humidity: 0 ~ 100% RH.
  - » Altitude: Below 3000 meters.
  - » Good ventilation.
  - » Keep away from sandy and dusty environments.
  - » 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.

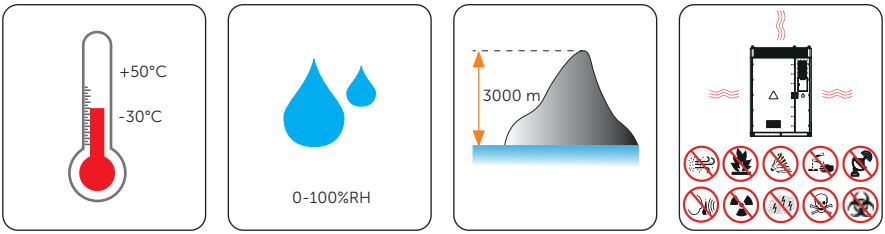


Figure 4-1 Installation environment requirements

4.1.1 Installation Foundation Requirements

The requirements for foundation are shown as follows:

- Type of foundation material: 1. Non-combustible materials such as solid bricks or concrete; 2. Steel.
- The bottom of the foundation pit must be strengthened and filled. The surface of the foundation shall be solid, flat and level (horizontal error ≤ 3mm, tilt angle ≤ 5°). Sunken or tilted foundation is not acceptable.
- The foundation's bearing capacity shall exceed 5 t. Otherwise, a retest is required.

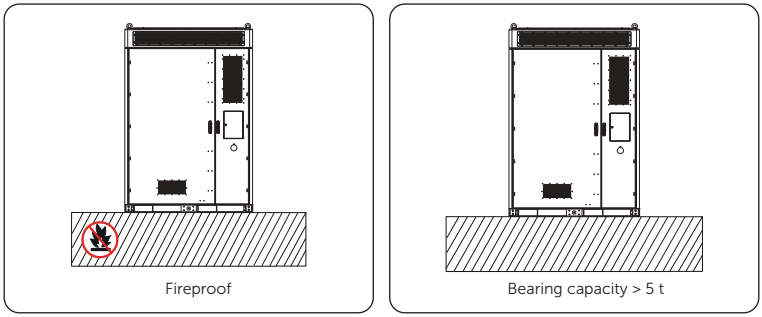


Figure 4-2 Foundation requirement

- A qualified drainage facility, of which the drainage capacity meets the requirements of the heaviest rain records in local history,shall be established according to the local geological conditions and municipal drainage standards.
- Reserve a trench or cable entry hole during the design phase.
- Avoid cables buried underground when constructing the foundation.
- The foundation drawing is only for reference. Operators shall recheck and revise it according to the environment, geological conditions, seismic requirements, etc. of the installation site.
  - » Angle support at the front and rear side.
  - » Angle support at the left and right side.

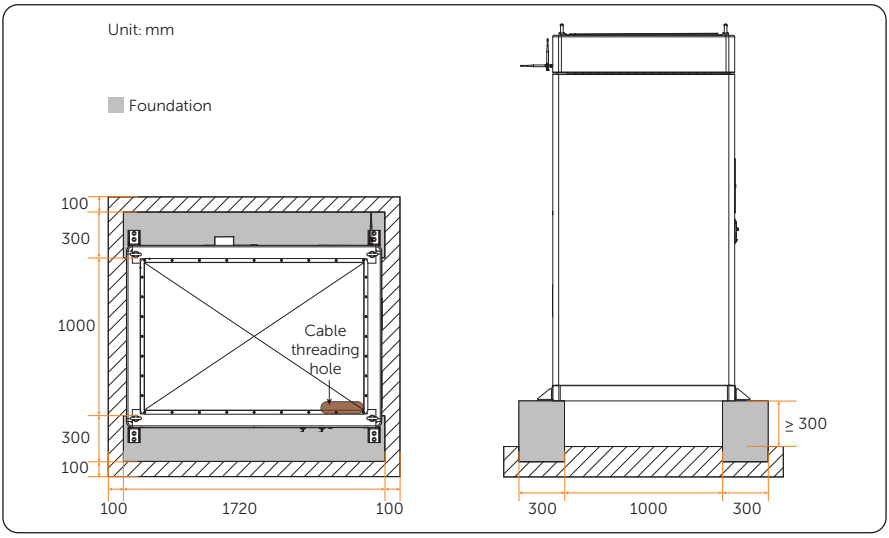


Figure 4-3 Foundation parameter requirements for angle supports at front and rear sides

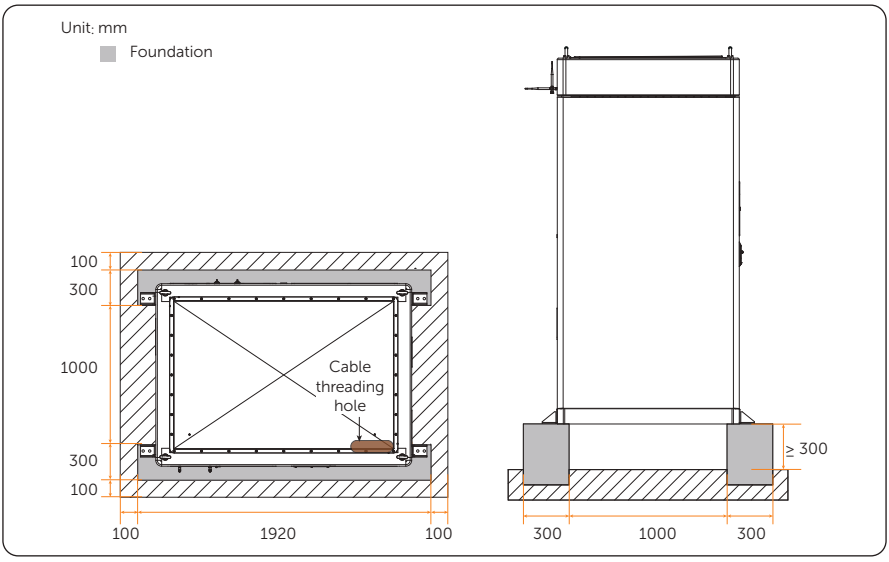


Figure 4-4 Foundation parameter requirements for angle supports at left and right sides

4.1.2 Forklift Requirements

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

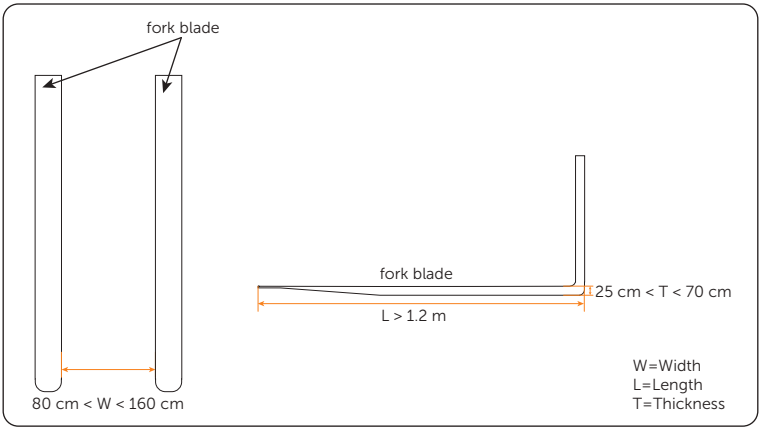


Figure 4-5 Requirements for forklift

4.1.3 Hoisting Requirements

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

Table 4-2 Precaution

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

4.1.4 Clearance Requirement

This equipment has multiple installation methods:

- Single cabinet
- Multiple cabinets: 1. Install separately; 2. Install multiple devices together.

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

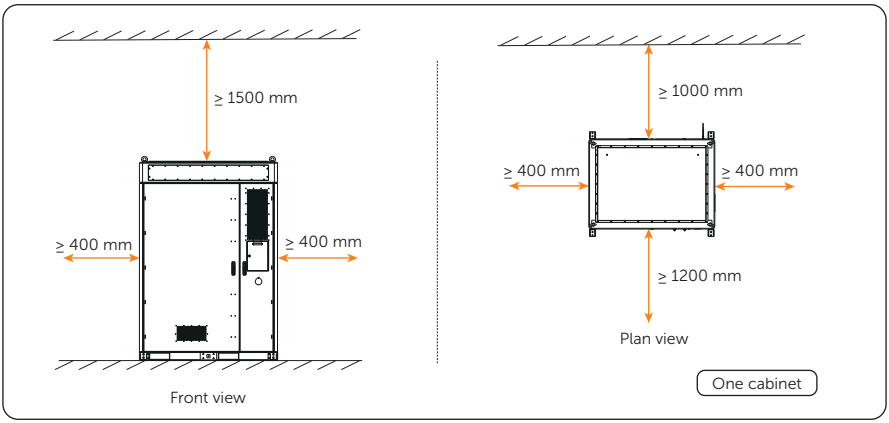


Figure 4-6 Single cabinet

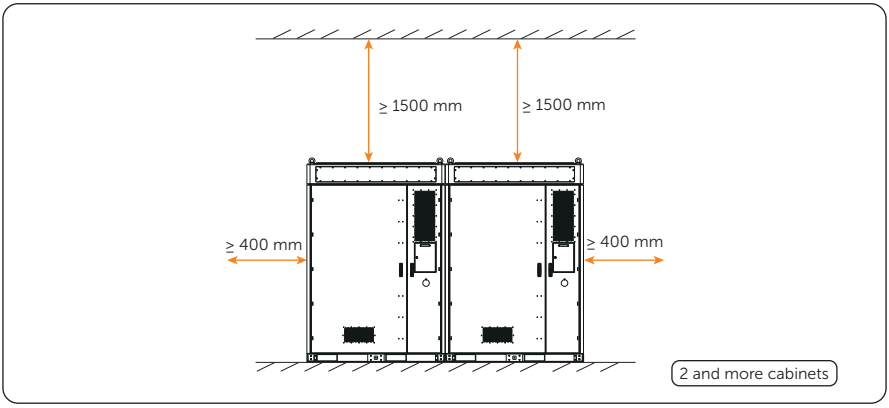
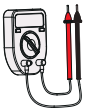


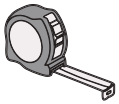
Figure 4-7 2 and more cabinets

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.


Hammer drill (Ø16 mm)


Multimeter
(Range: 1500 V)

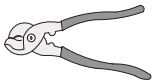

Measuring tape


Utility knife


Marker


Cross screwdriver

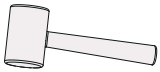

Flat-head screwdriver

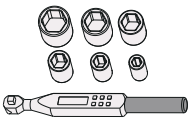

Wire cutter

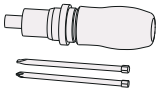

Wire stripper

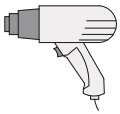

Crimping tool for RJ45


Hydraulic wire crimper

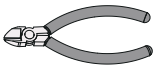

Rubber mallet


Torque wrench (M4~M12)


Torque screwdriver
(Flat-head: M3)
(Phillips head: M5)


Heat gun


Heat shrink tubing
(Ø30~60 mm)


Diagonal pliers


Vacuum cleaner


Cable tie


Insulated ladder


Crane


Steel wire rope

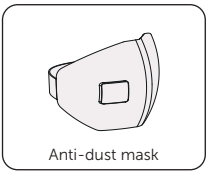

Electric forklift


Steel pipe
Ø25~30 mm

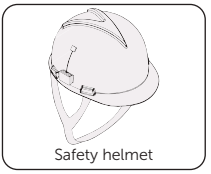

Insulating gloves

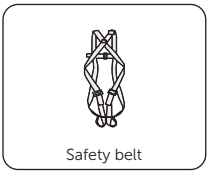

Safety boots


Safety goggles


Anti-dust mask


Safety vest


Safety helmet


Safety belt

4.3 Additionally Required Materials

The following is a recommended list of equipment required for installation of the system.

Table 4-3 Additionally required wires

No.	Required Material		Type	Conductor Cross-section
1	Grounding plate		Galvanized iron plate	Width: 40 mm Depth: 4mm
2	Grid wire		Five-core copper cable * The conductor cross-section of copper cables connecting to the distribution box (a total of 4 copper cables) is 50 mm^2, as well as 35 mm^2 for a copper cable that is connected to the grounding.	50 mm^2 * 4 + 35 mm^2 * 1

5 Unpacking and Inspection

5.1 Unpacking

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

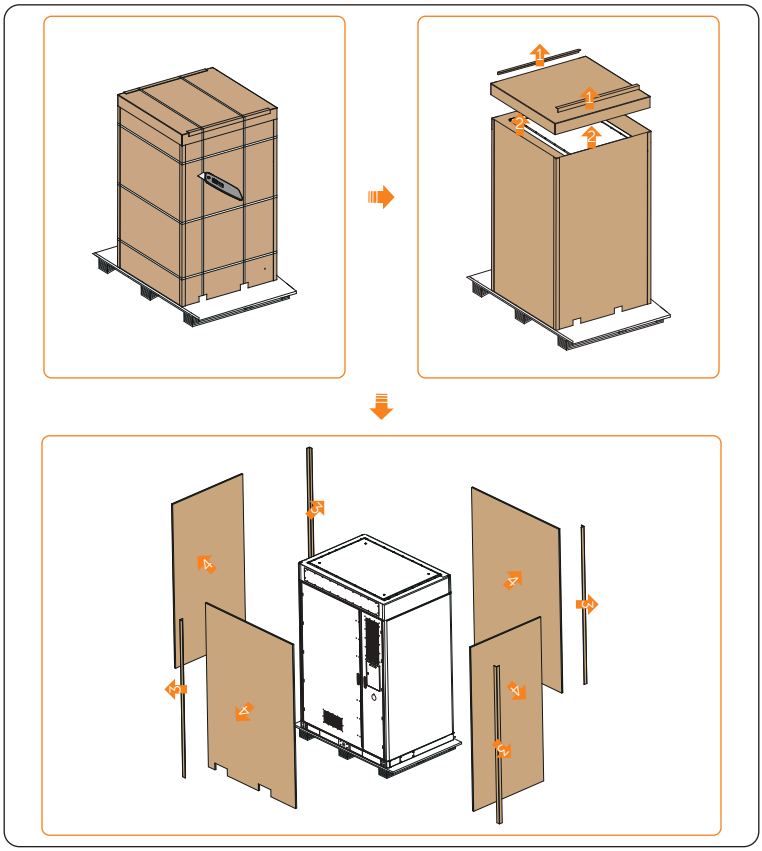


Figure 5-1 Unpacking

- When unpacking, please handle all packaging materials properly for future storage or relocation of this 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

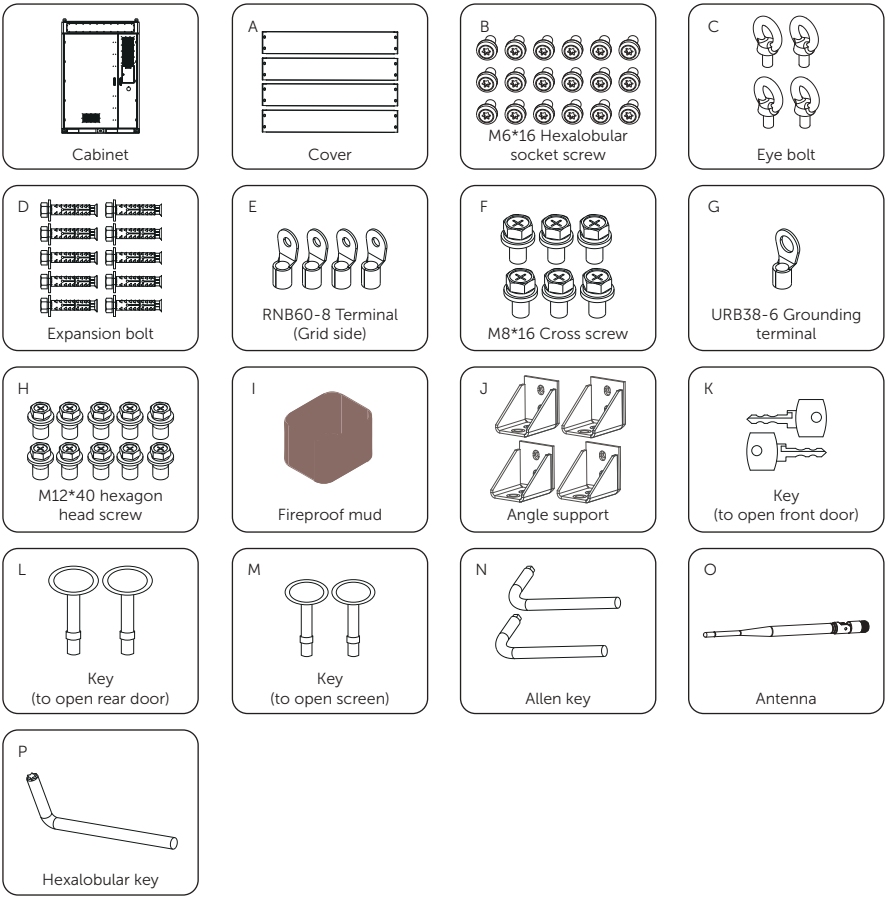


Table 5-1 Packing list

Item No.	Items	Quantity
/	Cabinet	1 pc
A	Cover	4 pcs
B	M6*16 Cross screw	18 pcs
C	Eye bolt	4 pcs
D	Expansion bolt	10 pcs
E	RNB60-8 Terminal (Grid side)	4 pcs
F	M8*16 Cross screw	6 pcs

Item No.	Items	Quantity
G	URB38-6 Grounding terminal	1 pc
H	M12*40 hexagon head screw	10 pcs
I	Fireproof mud	2 kg
J	Angle support	4 pcs
K	Key (to open the front doors)	2 pcs
L	Key (to open rear door)	2 pcs
M	Key (to open screen)	2 pcs
N	Allen key	2 pcs
O	Antenna	1 pc
P	Hexalobular key	1 pc

6 Mechanical Installation

After determining the installation site, please take out the required underground cables.

WARNING!

- Avoid installing, operating and maintaining the device or cables outdoors under severe weather conditions such as lightning, rain or snow.
- The device must be installed by professionals in accordance with local regulations and standards.
- Before drilling, please check and ensure that the area is free of pipes, light switches, sockets, and wires, and safe to drill into.
- Please wear PPE, and take steps to cover the device to prevent debris from entering it while drilling holes.
- After drilling, clean up the site in time.

6.1 Cabinet Handling

NOTICE!

- There are two ways to move a cabinet: using a crane or a forklift. Please refer to "3.1 Transportation Requirements" for related handling precautions.

6.1.1 Crane Handling

NOTICE!

When hoisting:

- Temporary warning signs or fences should be set up in the hoisting area, and only the qualified persons can access it.
- Never stand and walk under or near the device being lifted or lowered.
- For safety reasons, avoid long-distance hoisting operations.
- Please be careful when hoisting and placing the device, and do not remove the ropes before it is seated on the foundation. Please make sure that the boom lift moves level and the cabinet's tile angle is ≤ 5° during hoisting.
- The angle in both the diagonal ropes shall be ≤60°.
- Do not lift the next one before the previous cabinet has been installed on the foundation.

Installation of eye bolt

NOTICE!

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

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

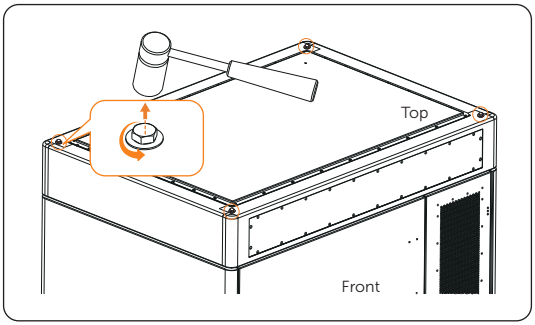


Figure 6-1 Unscrewing M20 screws

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

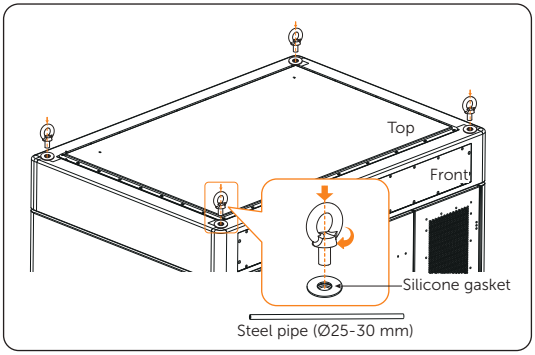


Figure 6-2 Tightening eye bolts

NOTICE!

- Put the silicone gaskets in place before inserting the eye bolts.

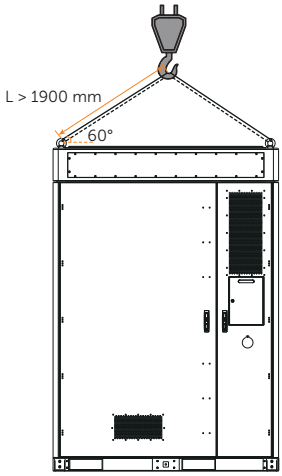


Figure 6-3 Lifting

NOTICE!

- L=Length

6.1.2 Fork Position

NOTICE!

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

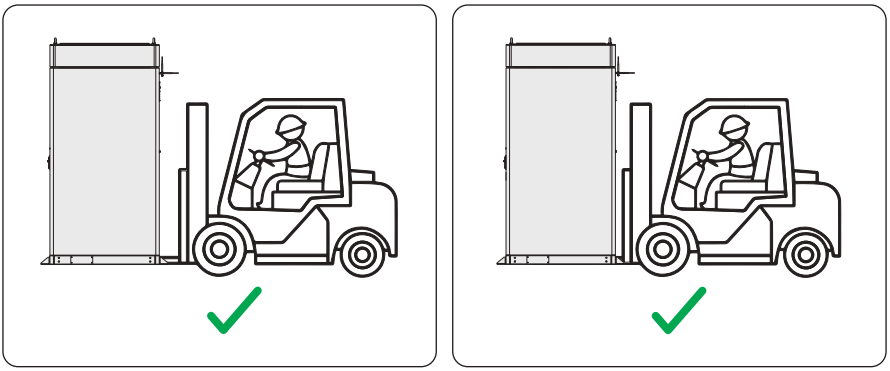


Figure 6-4 Right positions

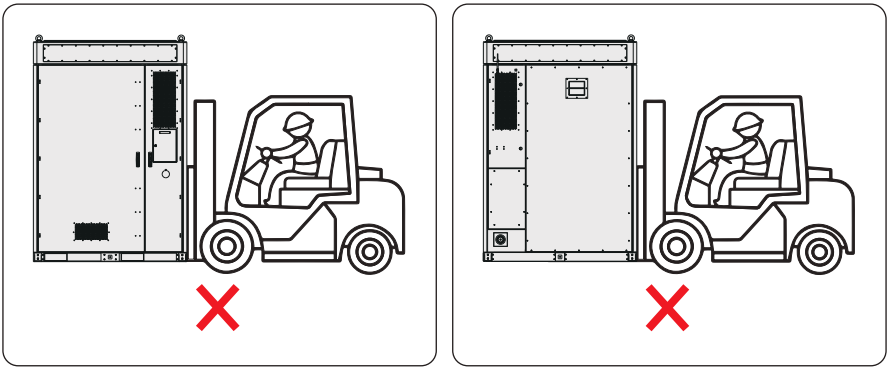


Figure 6-5 Wrong positions

NOTICE!

- For installation space requirements, please refer to "4.1.4 Clearance Requirement".
- For foundation requirements, please refer to "4.1.1 Installation Foundation Requirements".

6.1.3 Antenna Installation

NOTICE!

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

There are two antenna ports in the cabinet. The left one is required to be installed an antenna, and the right one is a reserved port. For the antenna installation steps, please do as follows.

Step 1: Remove the silicone cap.

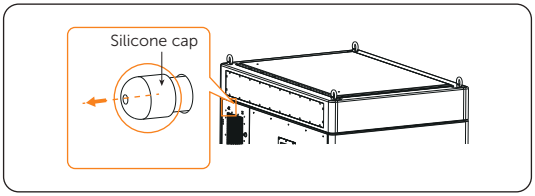


Figure 6-6 Removing silicone cap

Step 2: Fold the antenna (Part O) up 90°.

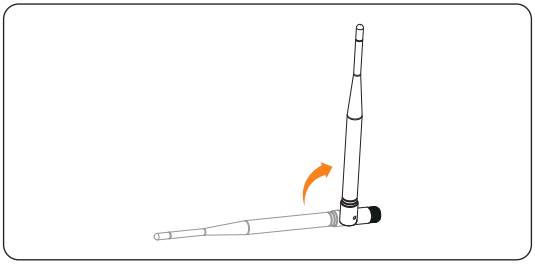


Figure 6-7 Folding the antenna.

Step 3: Take out the antenna, and make sure that it is securely inserted and tightened by turning it clockwise.

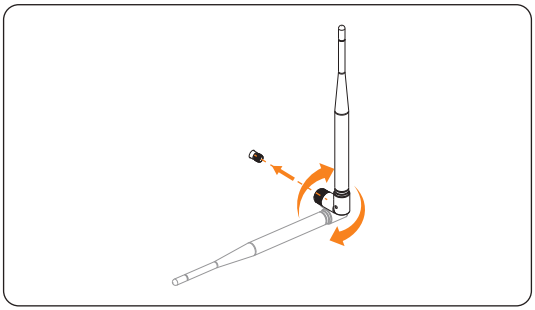


Figure 6-8 Installing antenna

After installing the antenna, see Figure 6-9.

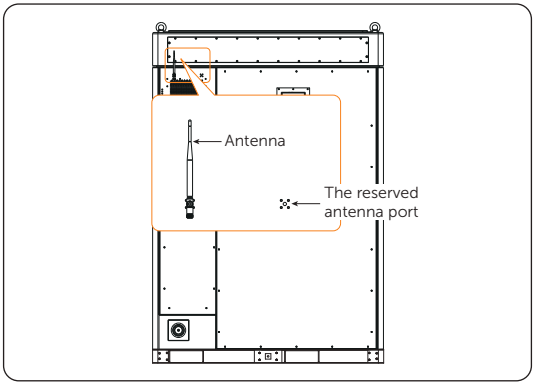


Figure 6-9 Installing an antenna

6.1.4 Installation Dimensions

Before installation, please refer to "Figure 2-4 Parts description" for installation, ensuring sufficient space is reserved for the installation and heat dissipation of the entire equipment.

6.1.5 Installation Procedure for Angle Support and Cover

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

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

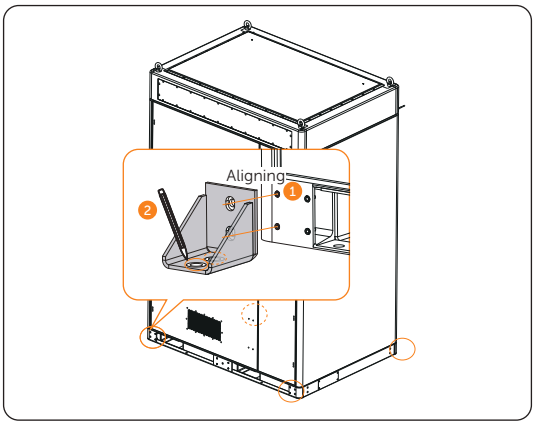


Figure 6-10 Marking hole position

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

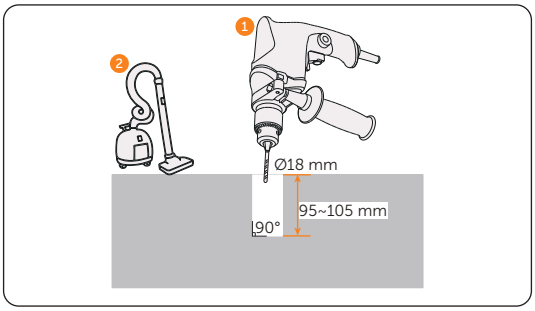


Figure 6-11 Drilling

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

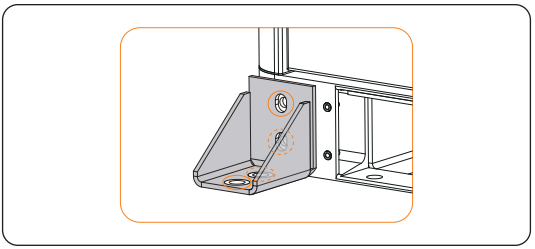


Figure 6-12 Aligning screw holes

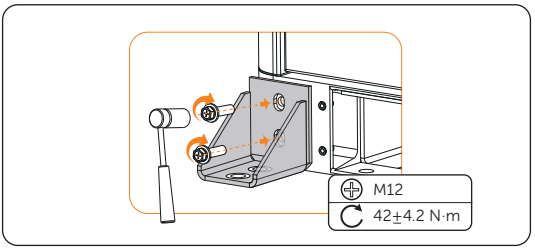


Figure 6-13 Tightening M12 screws

NOTICE!

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

Step 4: Use a rubber hammer to drive the expansion bolts (Part D) into the foundation screw holes, and then tighten them clockwise with a torque wrench (M12) (torque: 42±4.2 N·m).

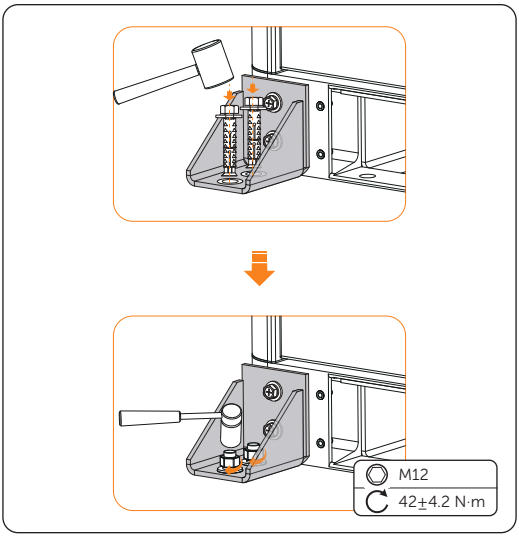


Figure 6-14 Tightening expansion bolts

Step 5: After the angle supports have been installed, take out the covers (Part A) to seal the forklift hole and tighten the screws (M6) (Part B) (torque: 5±0.5 N·m). Each cover has 4 screws, with a total of 4 covers.

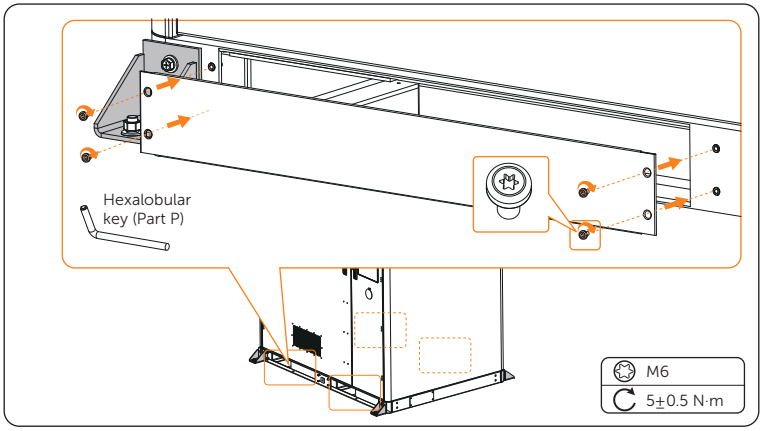


Figure 6-15 Fixed covers

7 Electrical Connection

7.1 Operation before Connection

NOTICE!

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

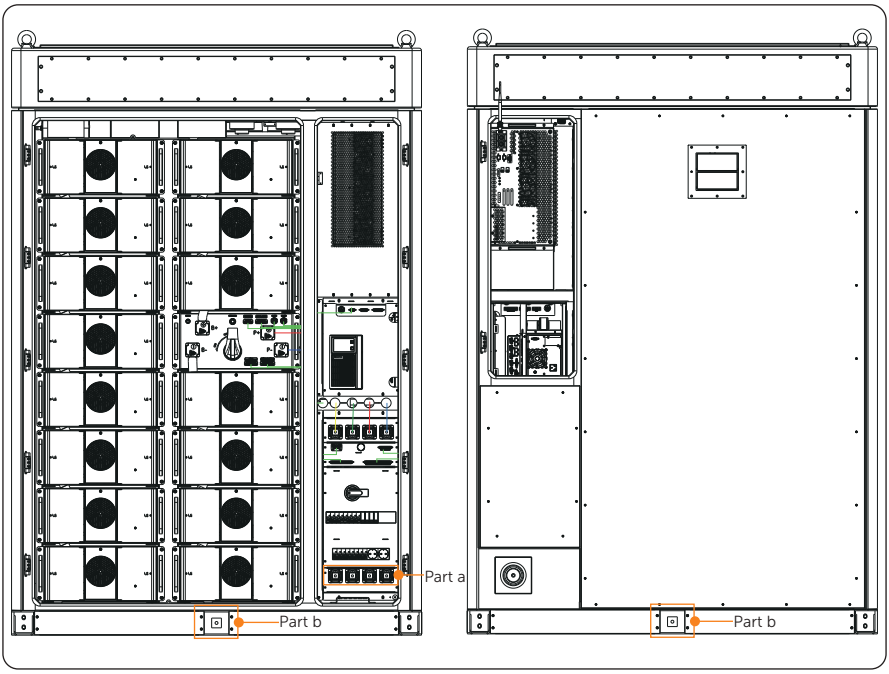


Figure 7-1 Part that needs wiring

Step 1: Use an Allen key (Part N) and a key (Part K) to open the door before wiring.

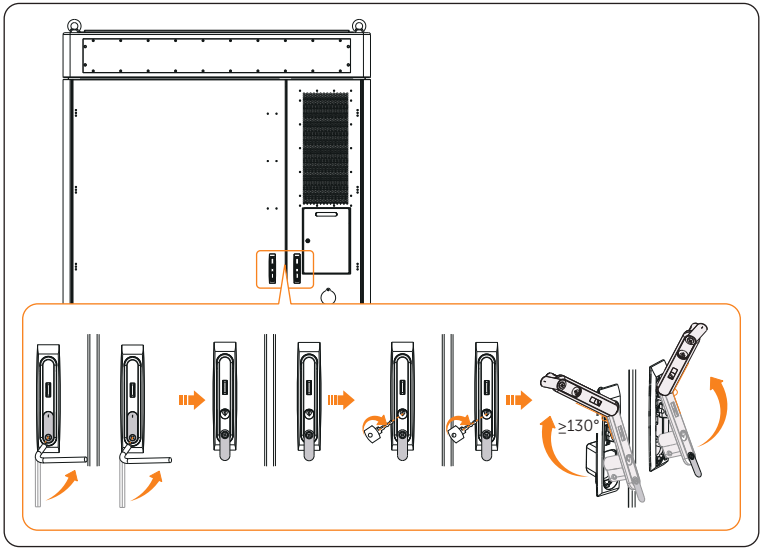


Figure 7-2 Opening the door

NOTICE!

- Please keep the keys properly.

Step 2: Unscrew M4 screws, and remove the cover. There are totalling 4 pieces of M4 screws.

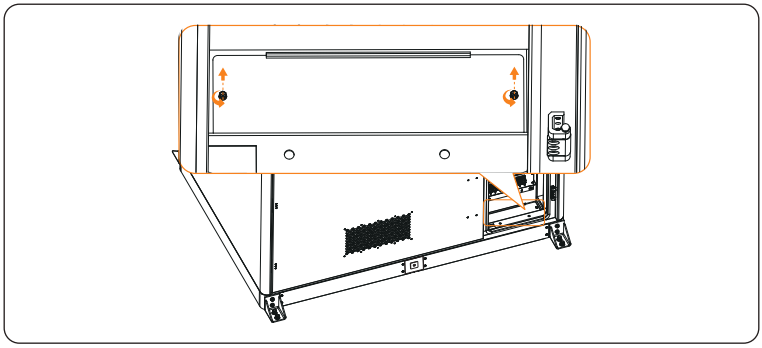


Figure 7-3 Unscrewing M4 screws and removing cover

7.2 Grid Connection

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

Step 1: Strip the five-core cable about 220 mm to 260 mm.
Strip the cable jacket (for L1/L2/L3/N) about 18 mm to 24 mm,
Strip the PE cable jacket about 14 mm to 20 mm.

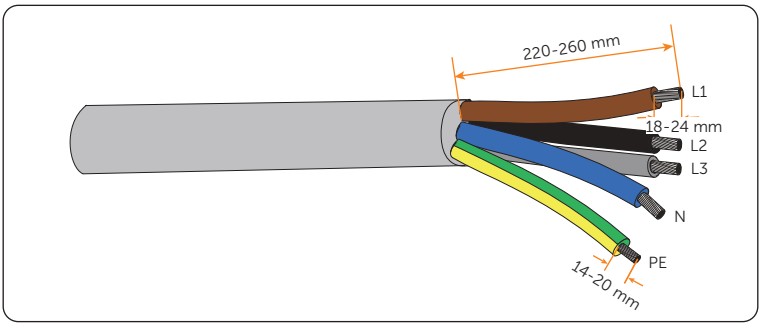


Figure 7-4 Striping cable jacket

NOTICE!

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

Step 2: Cut the heat-shrink tubing (Ø15~20 mm) to about 40 to 50 mm long for L1/L2/L3/N wires;
Cut the heat-shrink tubing (Ø10-14 mm) to about 30 to 40 mm long for PE wire;
Carefully slide it onto the end of the cable, and then carefully slip the wires all the way into the copper terminals (Part E and G).

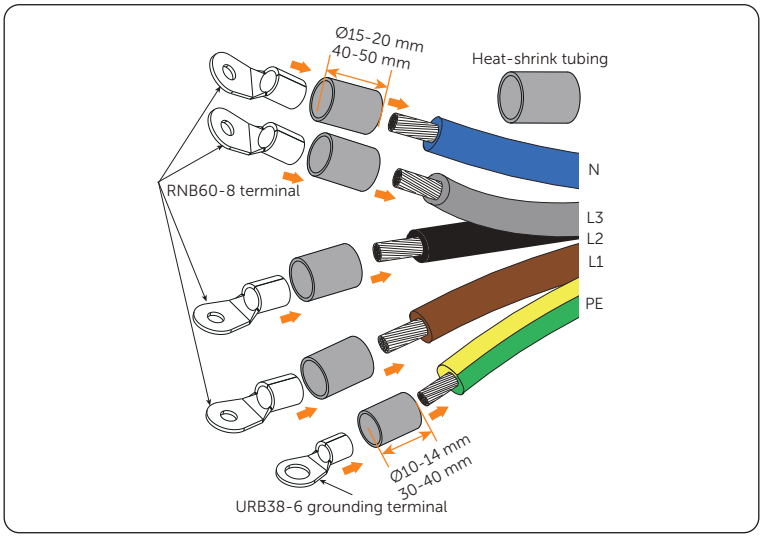


Figure 7-5 Cutting heat-shrink tubing

Step 3: Crimp the terminal using hydraulic wire crimper. Since the procedure for installing a terminal is same, the following steps take the L1 copper wire as an example.

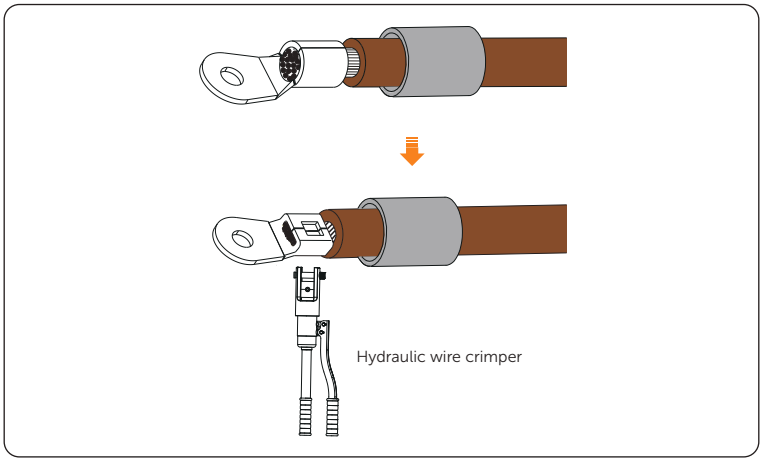


Figure 7-6 Crimping

NOTICE!

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

Step 4: Heat the heat-shrink tubing after it wraps the end of terminal.

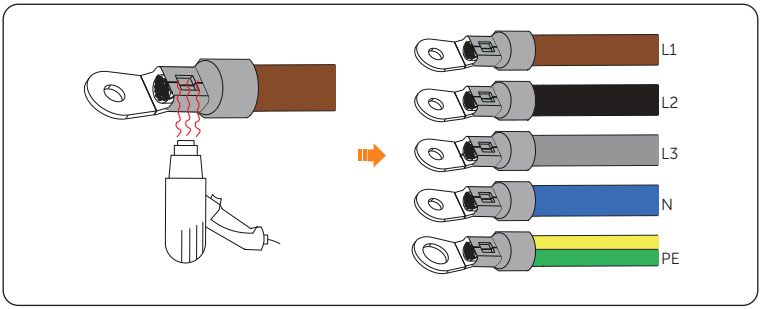


Figure 7-7 Heating

NOTICE!

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

Step 5: Run the cable through the cabinet. See Figure 7-8.

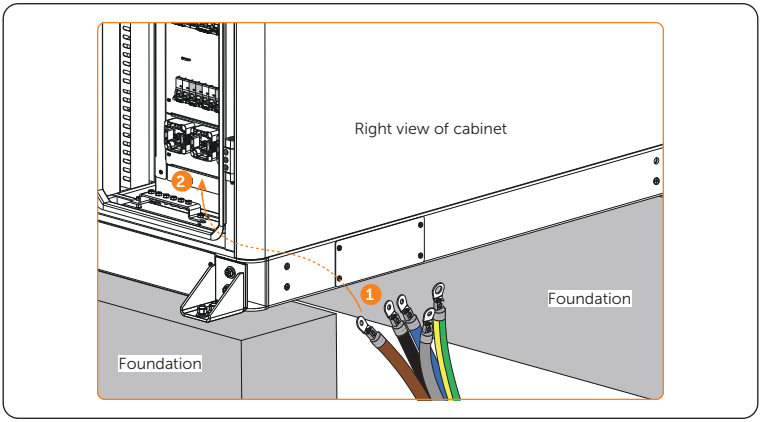


Figure 7-8 Running cable through the cabinet

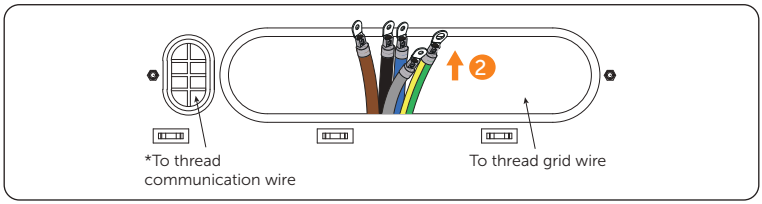


Figure 7-9 Treading cable out of cable threading hole

NOTICE!

- The mark "*" indicates that the cable threading hole is reserved for parallel.

Step 6: Pull out terminal covers by pressing the buttons on both sides of the cover.

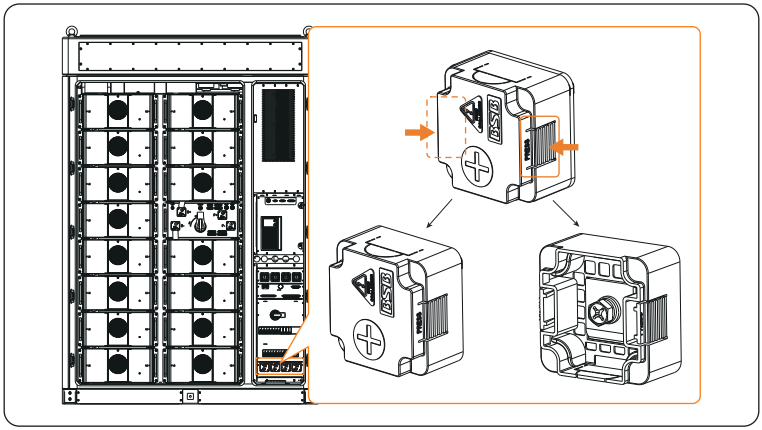


Figure 7-10 Pulling out covers

Step 7: Unscrew the M8 screws using torque wrench, connect the assembled L1/L2/L3/N wires to the wire interface, and then tighten them (torque: 12±1 N·m). There are a total of 4 pieces of M8 screws.

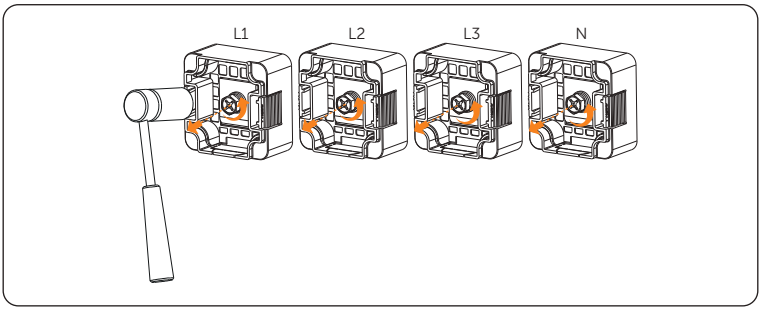


Figure 7-11 Unscrewing M8 screws

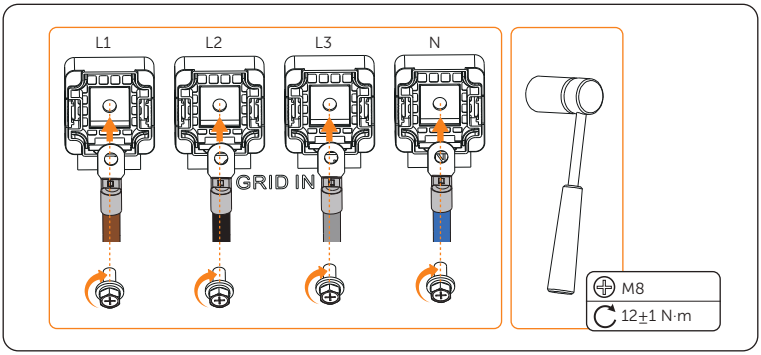


Figure 7-12 Tightening M8 screws

Step 8: Reinstall the terminal covers on L1/L2/L3/N ports.

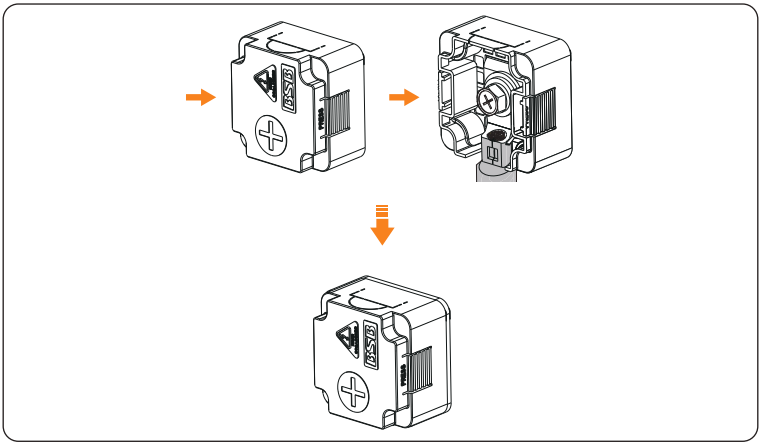


Figure 7-13 Reinstalling terminal cover

Step 9: Unscrew M8 screw using torque wrench, connect the assembled PE wire to the copper bar, and then tighten it (torque: 12±1 N·m).

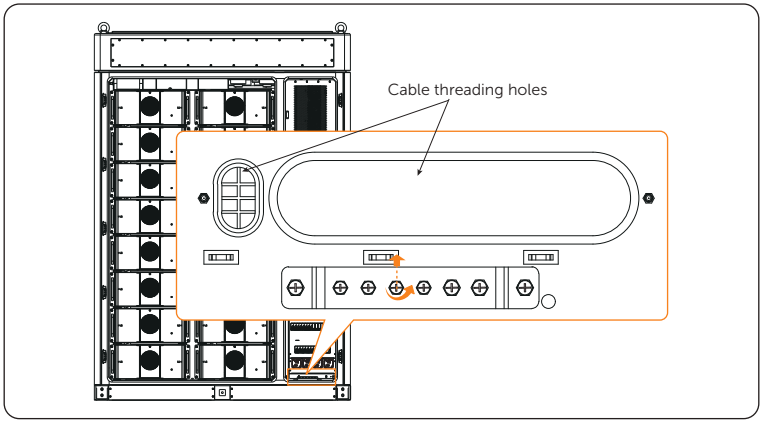


Figure 7-14 Unscrewing M8 screws

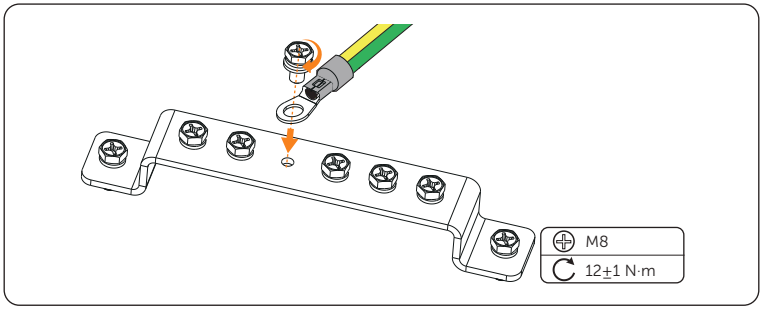


Figure 7-15 Tightening M8 screws

NOTICE!

- There are four common grounding points in the copper bar. Any one of these point can be selected.

Step 10: Lay the fireproof mud (Part I) to plug of the hole.

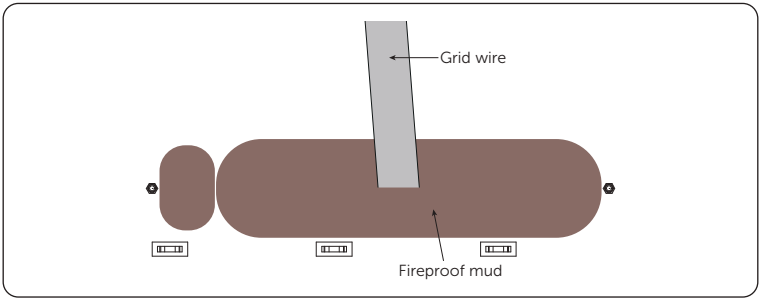


Figure 7-16 Laying fireproof mud

NOTICE!

Notice for fireproofing mud:

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

7.3 Grounding Plate Connection

Regarding the grounding plate connection, namely **Part b** in "Figure 7-1 Part that needs wiring", either connection area is available, please strictly follow the steps below.

Step 11: Insert and tighten M12 screw to secure grounding plate (torque: 42±2 N·m).

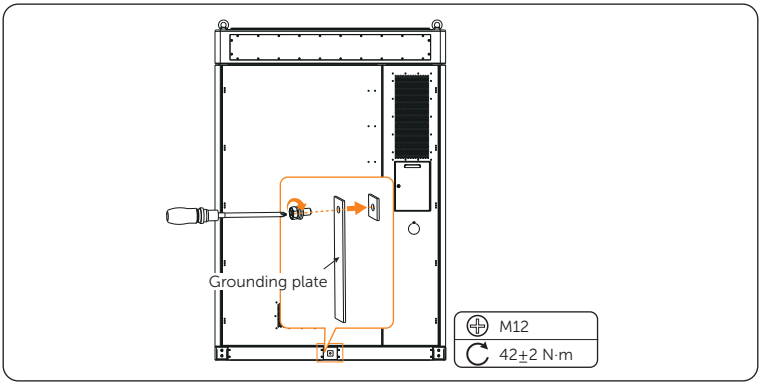


Figure 7-17 Tightening M12 screws

NOTICE!

- The grounding plate is prepared by the user self. Regarding the requirement for the grounding plate, please refer to "4.3 Additionally Required Materials".

8 System Commissioning

8.1 Check before Power On

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

Table 8-1 Checklist

No.	Item	Description
1	Equipment appearance	• Check the equipment is in good condition, with a clean, non-peeling paint, and rust-free surface. • Ensure that the labels on the equipment are clear and easy to read. If it is damaged, the label shall be replaced at once.
2	Cable appearance	• Check that the cable jacket is in good condition. • Check that the protective pipes are in good condition.
3	Cable connection	• Check that the cable connection position is consistent with the design principles. • Ensure that the procdure for crimping terminals strictly observe the requirements, and the terminals are securely fastened. • Check that the lables on the both sides of cables are clear, and the direction of both labels is the same.
4	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.
5	Copper bars in the battery pack	• Check to make sure the copper bars are not deformed.
6	Button/Switch	• Check the distribution box's switch is "OFF". • Check the battery packs' switches are "OFF".

8.2 Power ON

Regarding the detailed location of the modules in the cabinet, please refer to "Figure 2-4 Parts description".

Step 1: Rotate the switch on the distribution box 90° counter-clockwise to "ON".

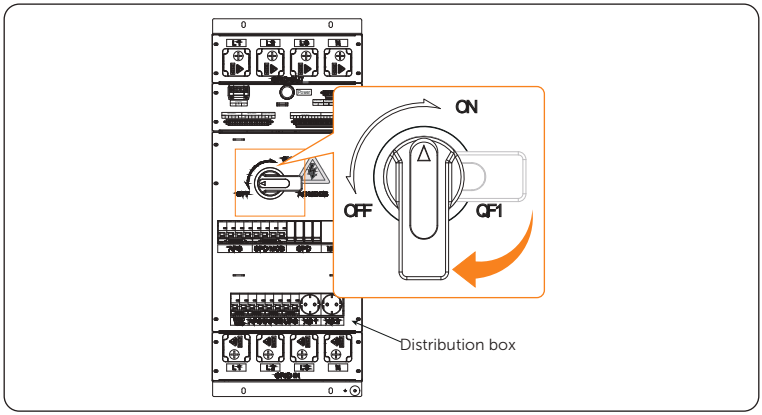


Figure 8-1 Rotating switch

Step 2: Flip up breakers on the distribution box orderly, with correct order of "APS", "SPD MCB", "HVAC MCB", "APS1", "APS2" and "UPS".

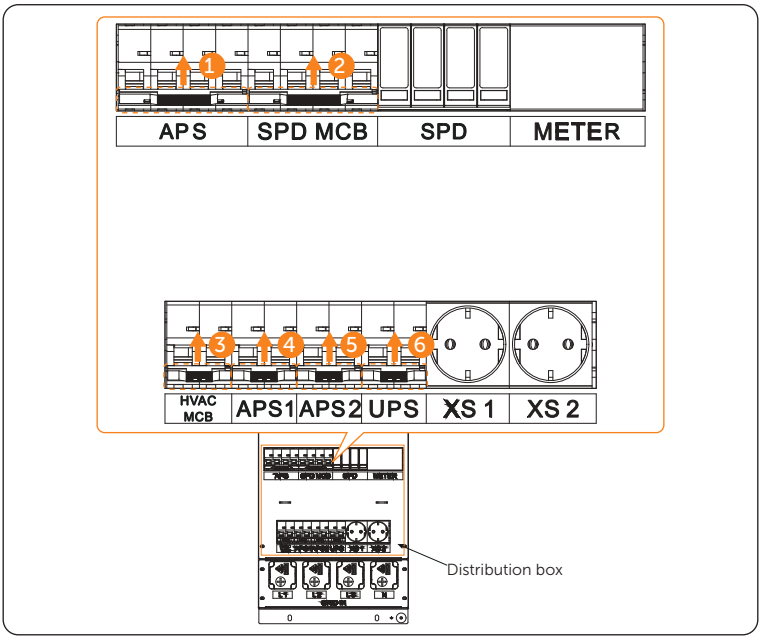


Figure 8-2 Flipping up breakers

Step 3: The startup sound on boot will be heard when holding and pressing the "Power on/off" button to start the UPS.

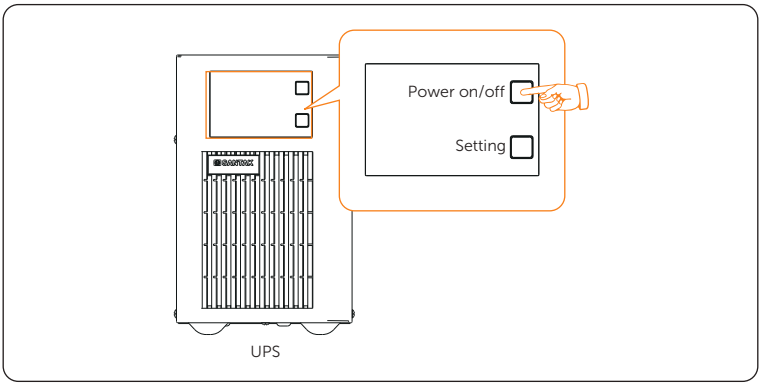


Figure 8-3 Holding and pressing "ON" button

Step 4: Rotate the disconnector of the high-voltage box to "ON".

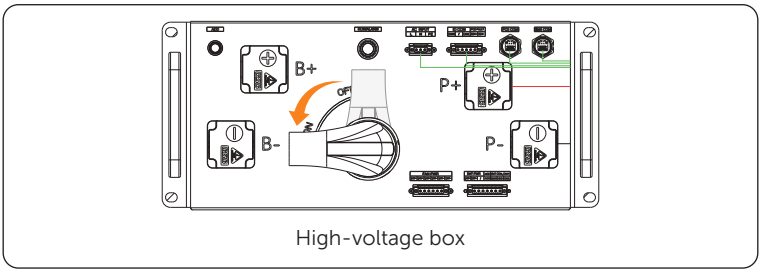


Figure 8-4 Rotating the disconnector

Step 5: Open the rear door

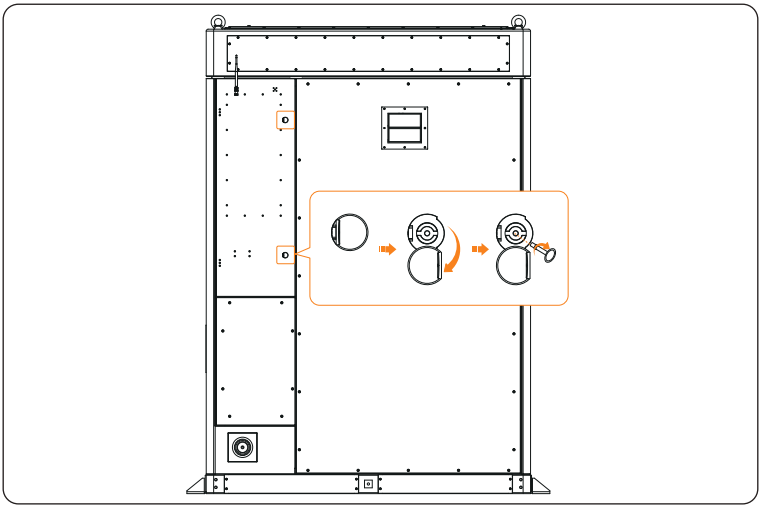


Figure 8-5 Opening the rear door

Step 6: Start up the PCS.

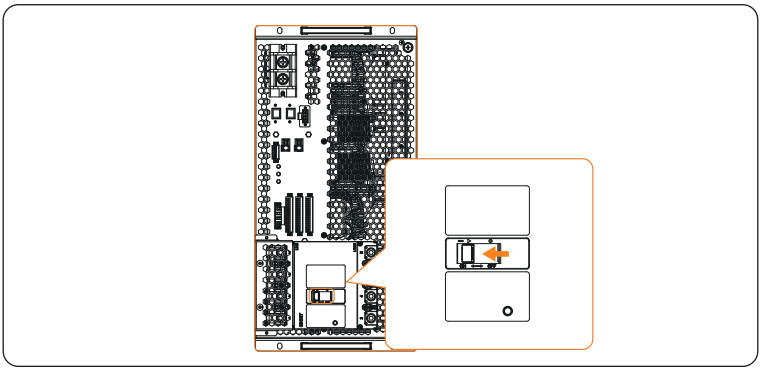
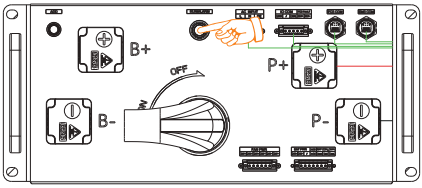


Figure 8-6 Starting up the PCS

Step 7: After starting up the PCS, lock the rear door.

Step 8: Gently press the power button. At the point, the LED light will come on green.



High-voltage box

Figure 8-7 Pressing power button gently

Step 9: Close the door after the equipment has been started.

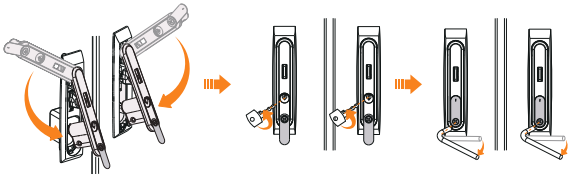


Figure 8-8 Closing the door

NOTICE!
• Please properly keep the key.

9 Operation Status Display

9.1 Cabinet's LED Light

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

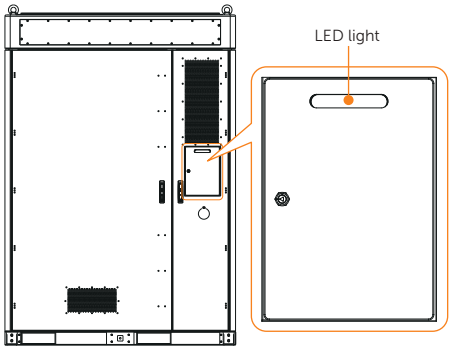


Figure 9-1 LED light

Table 9-1 Description

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

9.2 Hight-voltage Box's Indicator Light

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

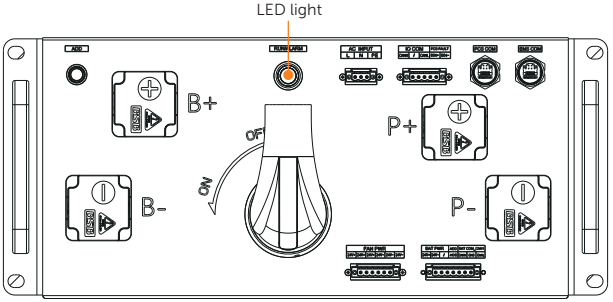


Figure 9-2 LED light

Table 9-2 Description

Status		Description
Flashing green light		In operation
Solid green light		Rely in off state
Solid red light		System failure

9.3 Battery Pack's LED light

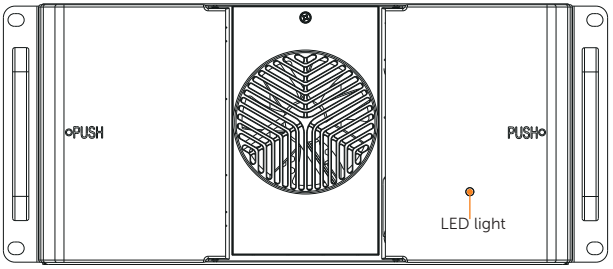


Figure 9-3 LED light

Table 9-3 Description

Status		Description
Flashing green light		In operation

9.4 UPS's Indicator Light

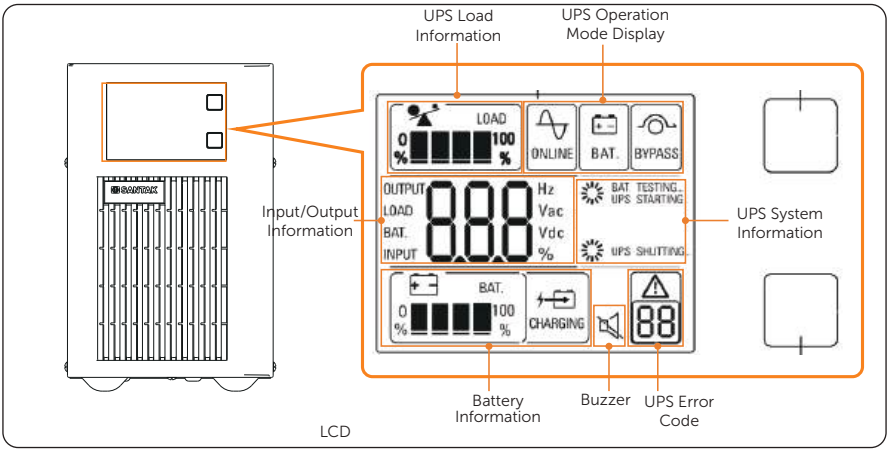


Figure 9-4 LED light

Table 9-4 Description

Display		Description
Input/Output Information		It indicates input and output voltage/frequency value, which are displayed alternately. It also indicate load per cent and battery voltage value.
UPS Operation Mode Display		It indicates UPS operating mode.
Load information		Indicates the load level. Each grid represents the level of 25%. If UPS is overloaded, the icon would flash once time per second.
Battery Information		Indicates the battery capacity. Every grid represents the capacity of 25%. If the battery charger is running, the icon would show.
Buzzer		The icon will be displayed after panel key operation or serial command mute.
		The icon will be displayed when the buzzer sounds normally.

Display	Description
UPS Error Code	Indicates the UPS is in Fault mode or has some warnings. Indicates Fault kind or Warning kind, several warning kinds at the same time could be displayed alternately. The icon ⚠ would flash when having warnings. The icon ⚠ would show continuous when in Fault mode.
UPS System Information	Indicates UPS system information

9.5 PCS's LED Light

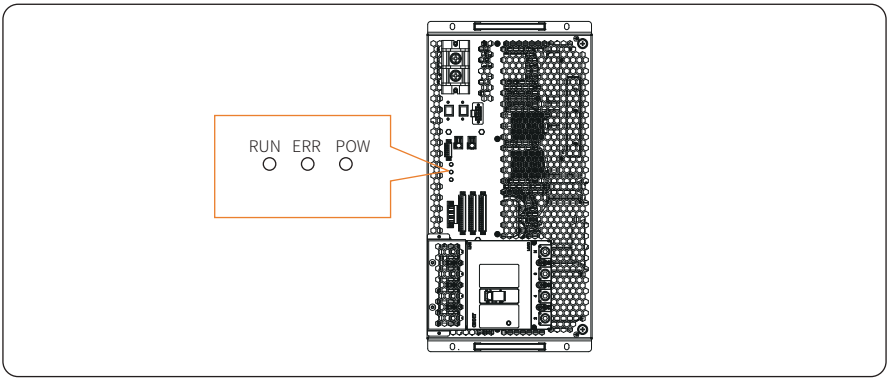


Figure 9-5 LED light

Table 9-5 Description

Status		Description
ERR	Steady	Operational fault
RUN	Steady	DC Input
POW	Steady	Running normally
	Flashing	Standby

10 EMS Logging in

10.1 Local Screen Login

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

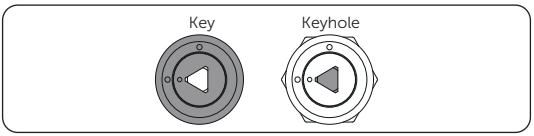


Figure 10-1 Correct position

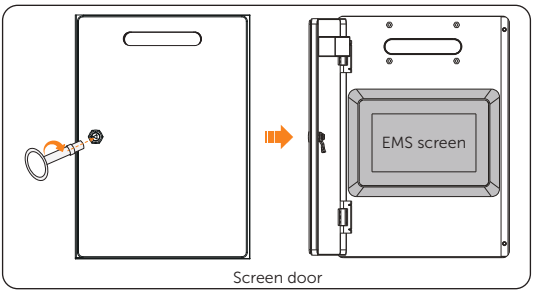


Figure 10-2 Unlocking screen door

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

- Username: user
- Password: 123456

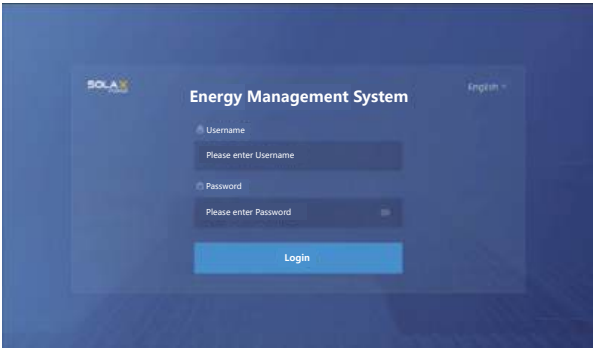


Figure 10-3 Local login

10.2 Webpage Login

NOTICE!
IE browser is not supported currently, and we recommend logging in to the webpage through Chrome.

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

» For wired connection: 192.168.11.10

» For hotspot connection: 192.168.10.10

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

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

- Username: user
- Password: 123456

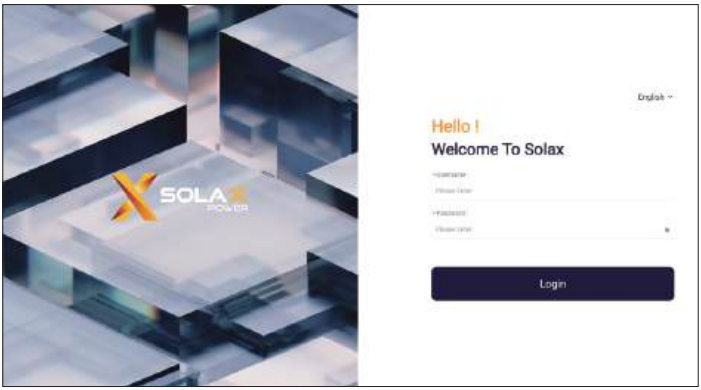


Figure 10-4 Login page

10.3 SolaXCloud APP Login

Step 1: Downloading and installing App.

Select and scan the QR code below to download SolaxCloud APP. You can also find the QR codes at the button right of the login page of www.solaxcloud.com. In addition, you can search with the key word SolaxCloud in Apple Store or app store to download it.

Figure 10-5 QR code

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

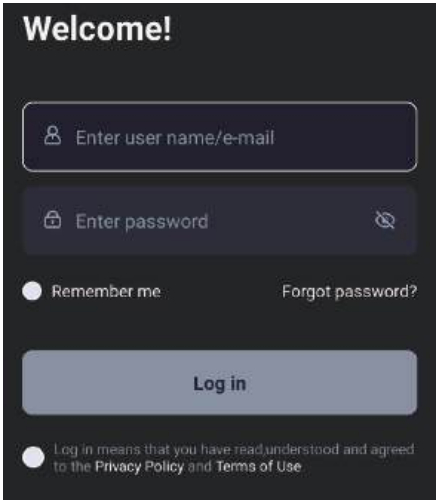


Figure 10-6 Login page

11 Troubleshooting and Maintenance

11.1 Power Off

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

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

Regarding the detailed location of the modules in the cabinet, please refer to "Figure 2-4 Parts description".

Normal Power Off

Step 1: Open the door.

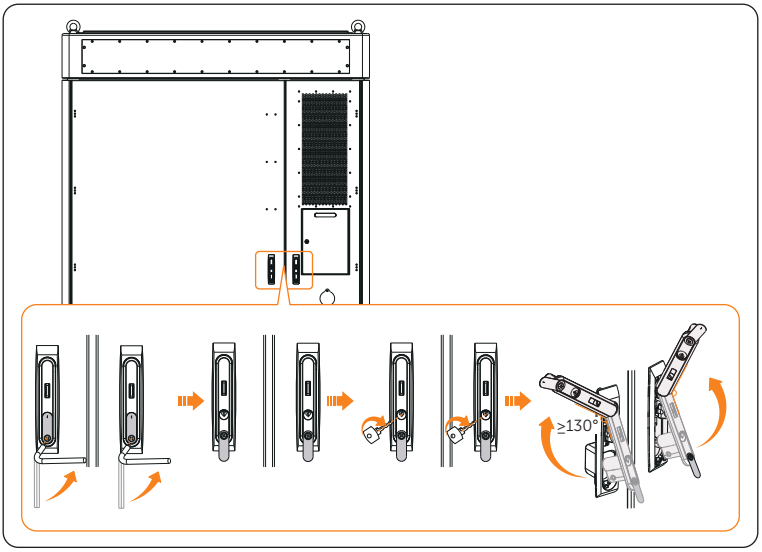


Figure 11-1 Opening the door

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

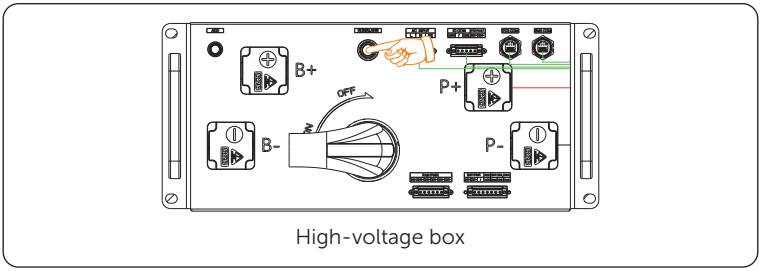


Figure 11-2 Pressing power button

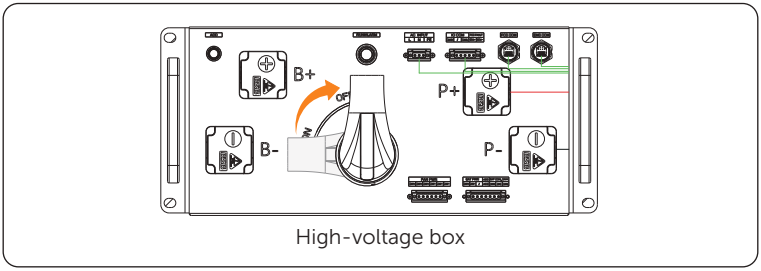


Figure 11-3 Rotating the disconnector

Step 3: Open the rear door

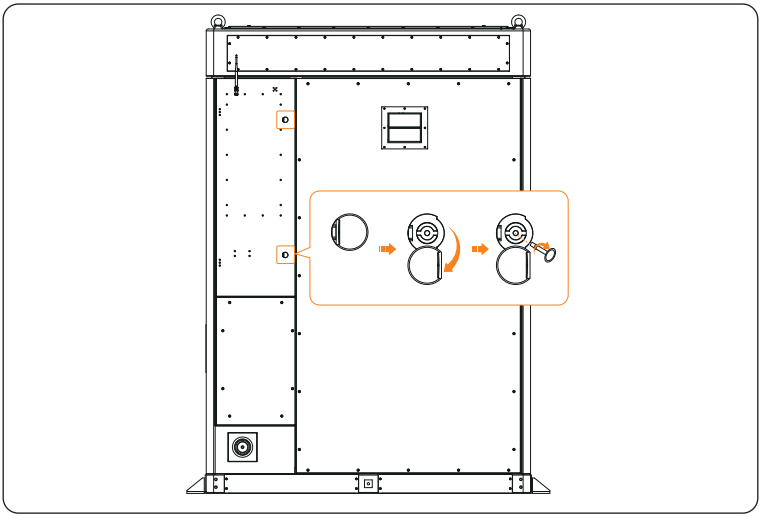


Figure 11-4 Opening the rear door

Step 4: Shut down the PCS.

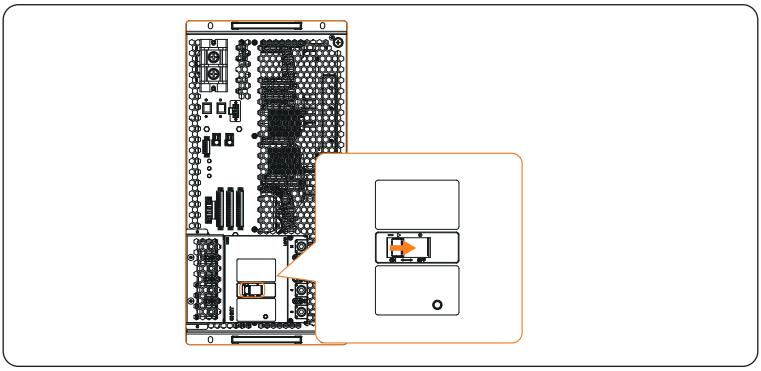


Figure 11-5 Shutting down the PCS

Step 5: After shutting down the PCS, lock the rear door.

Step 6: Hold and press the "Power on/off" button to power off the UPS.

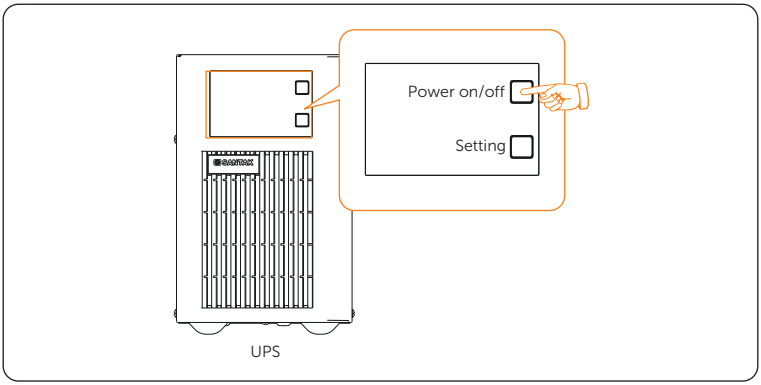


Figure 11-6 Holding and pressing OFF button

Step 7: Flip down breakers on the distribution box orderly, with correct order of "APS", "SPD MCB", "HVAC MCB", "APS1", "APS2" and "UPS".

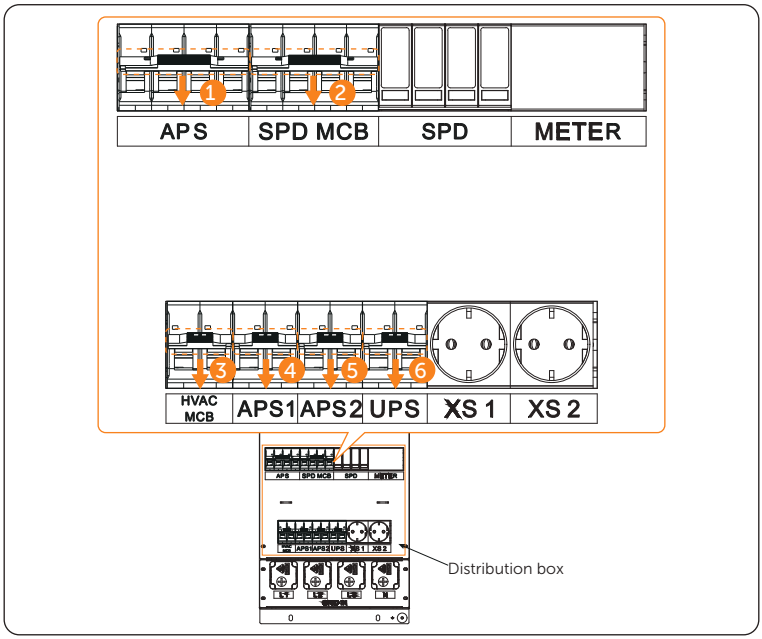


Figure 11-7 Flipping down breakers

Step 8: Rotate the switch on the distribution box 90° clockwise to "OFF".

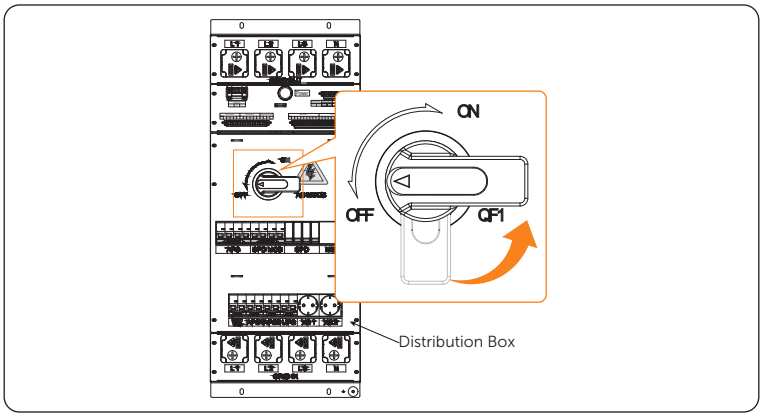


Figure 11-8 Rotating switch

WARNING!

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

Emergency Power Off

WARNING!

- Do not press the emergency stop button except for emergencies.

Step 1: Rotate the cover

Step 2: Press the emergency stop button.

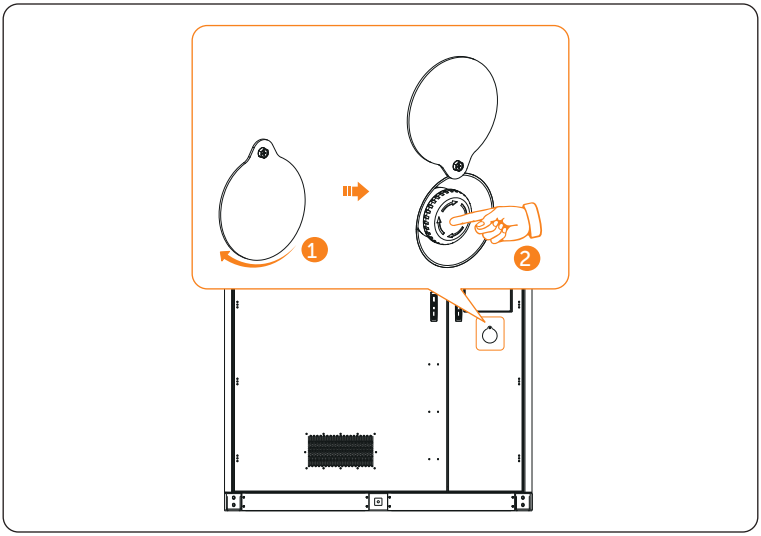


Figure 11-9 Pressing emergency stop button

NOTICE!

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

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

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.

Table 11-1 Troubleshooting list

Facult	Description and Diagnosis
UCellHi_4	Single Cell Overvoltage Category IV • Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. • Or contact SolaX for help.
UCellHi_5	Single Cell Overvoltage Category V • Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. • Or contact SolaX for help.
UCellLow_4	Single Cell Undervoltage Category IV • Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. • Or contact SolaX for help.
UCellLow_5	Single Cell Undervoltage Category V • Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. • Or contact SolaX for help.
UCellDiff	Voltage difference fault • Or contact SolaX for help.
HVBOver_4	Overvoltage category IV of total voltage • The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. • Or contact SolaX for help.

Facult	Description and Diagnosis
HVBOver_5	Overvoltage category V of total voltage • The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. • Or contact SolaX for help.
HVBLow	Undervoltage category IV of total voltage • The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. • Or contact SolaX for help.
HVBLow	Undervoltage category V of total voltage • The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. • Or contact SolaX for help.
PosRlyAdh	Sticking contacts of main positive relay • The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. • Or contact SolaX for help.
PosRlyOpen	Open circuit of main positive relay • The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. • Or contact SolaX for help.
TempHigh	Overtemperature fault • The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. • Or contact SolaX for help.
TLineFlt_1	Temperature sampling fault level 1 • Check if the temperature sensor is short-circuited. • Or contact SolaX for help.
TLineFlt_4	Temperature sampling fault level 4 • The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. • Or contact SolaX for help.

Facult	Description and Diagnosis
TempLow	Low-temperature fault • The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. • Or contact SolaX for help.
DsgOver_4	Discharge overcurrent fault level 4 • The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. • Or contact SolaX for help.
DsgOver_5	Discharge overcurrent fault level 5 • The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. • Or contact SolaX for help.
ChgOver_4	Charge overcurrent fault level 4 • The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. • Or contact SolaX for help.
ChgOver_5	Charge overcurrent fault level 5 • The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. • Or contact SolaX for help.
ICOMFault	Internal communication fault • Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. • Or contact SolaX for help.
OCOMFault	External communication fault • Do not power on, and the charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. • Or contact SolaX for help.
MCOMFault	Intermediate network communication fault • Do not power on, and the charging current is limited to 0 A. • Or contact SolaX for help.

Facult	Description and Diagnosis
UCellLineOpenFlt	Voltage sampling fault • The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. • Or contact SolaX for help.
VoltSensorFlt	Voltage sensor fault • The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. • Or contact SolaX for help.
CurrSensorFlt	Current sensor fault • Contact SolaX for help.
NegRlyAdh	Sticking contacts of main negative relay • Restart the device. • Or contact SolaX for help.
NegRlyOpen	Open circuit of main negative relay • Restart the device. • Or contact SolaX for help.
FlashFlt	Flash fault • Check if the external Flash communication is normal. • Or contact SolaX for help.
ChgReqFlt	Charging request fault • Check the device is properly charged. • Or contact SolaX for help.
InsFlt	Insulation fault • The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. • Or contact SolaX for help.
SOCLowFlt	Low SOC • Check if the device is running out of power. • Or contact SolaX for help.
PreChgFailFlt	External short-circuit fault • The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. • Or contact SolaX for help.

Facult	Description and Diagnosis
AFEProtectFlt	Battery's hardware protection fault • The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. • Or contact SolaX for help.
SelfCheckFlt	Self-test fault • The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 1 second. • Or contact SolaX for help.
LinkerTempHilFlt_3	Fault on overtermperature of high-voltage connector • Check whether the charge/discharge current is over 50% of rated charge/discharge current. • Or contact SolaX for help.
LinkerTempHilFlt_5	Fault on overtermperature of high-voltage connector • Check whether the charge/discharge current is over 50% of rated charge/discharge current. • Or contact SolaX for help.
BatLinkerTempHi_5	High-temperature fault of pole • The charging current is limited to 0 A. If the relay does not receive a power-off instruction from the inverter, it will be turned off forcefully after 3 seconds. • Or contact SolaX for help.
FanFault	Fan fault • Check whether any foreign objects stick to the fan. • Contact SolaX for help.
FuseSt	Fuse fault • Contact SolaX for help.
DCSwitch	DC switch fault • Contact SolaX for help.

11.3 Maintenance

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

⚠ WARNING!

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

11.3.1 Maintenance Routine

Table 11-1 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. • 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: The system must be shut down before cleaning.**	Every 6 months

Check Item	Description	Interval Time
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 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
Relay maintenance	• Do a routine inspection for the corrosion of all metal components. • Do an annual inspection for the connectors (auxiliary switches and microswitches) to make sure that the equipment is in good running condition. • Check whether the parameter is correct (especially the voltage and insulation).	Every 6 months
Aerosol inspection	• Check whether the aerosol is in good condition, and wiring are fastened securely.	Every 6 months
Safety function	• Check whether the emergency stop button and LED is in good working condition. • Check the stopping signal and communication by simulating the shutdown operation. • Check whether there are any damages to warning signs and other labels pasted on the equipment. If so, please replace them in time.	Every 6 months

11.3.2 Disassembly and Clean of Air Conditioner Filter

WARNING!

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

Step 1: Unscrew M5 screws, and orderly dismantle aluminum mesh plate, stainless steel gauze, and black filter.

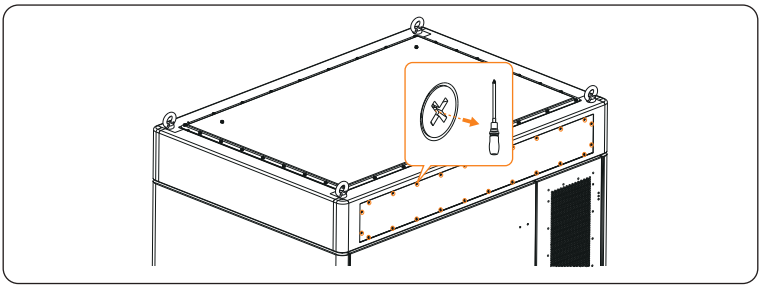


Figure 11-10 Unscrewing M5 screws

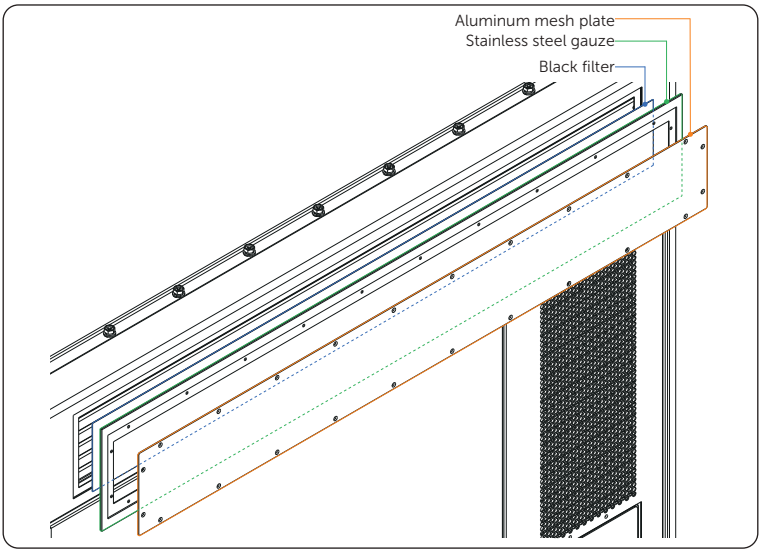


Figure 11-11 Dismantling aluminum mesh plate, stainless steel gauze, black filter

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

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

Step 4: Insert and tighten M5 screws (x 24) (torque: 0.6-0.8 N·m).

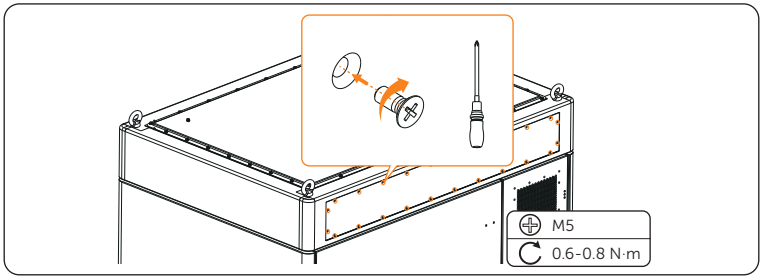


Figure 11-12 Tightening M5 screws

11.3.3 Maintenance of Battery Pack

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

WARNING!

- Only qualified person can perform the maintenance for the device.

12 Dispose of Wasted and Damaged Battery Pack

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

NOTICE!

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

13 Technical Data

13.1 TRENE-P100B215I

AC Side

Model	TRENE-P100B215I
Rated AC power [kW]	100
Rated AC current [A]	144.4
Max. AC apparent power [kVA]	110
Nominal grid voltage [V]	400 (-20% ~ +15%)
Nominal grid frequency [Hz]	50 / 60
Adjustable power factor range	0.99 leading ~ 0.99 lagging
THDi (Rated power) [%]	< 3
Max. efficiency [%]	98%
DC side anticipated short circuit current [A]	8500
AC side anticipated short circuit current [kA]	8

Battery

Model	TRENE-P100B215I
Battery type	LiFePO4
Battery capacity [kWh]	215
Rated battery voltage [V]	768
Battery voltage range [V]	600 ~ 876
Discharge depth [%]	90
Rated charge/discharge current [A]	140

General

Model	TRENE-P100B215I
Dimension (W×H×D) [mm]	1680 × 2420 × 1200
Weight [kg]	2800
Operating temperature range [°C]	-30 ~ 50
Relative humidity (Non-condensing) [%]	0 ~ 95
Altitude [m]	3000
Cooling concept	Smart air cooling
Ingress protection	IP55
Fire protection	Aerosol (Optional: Novec1230) / Water

Model	TRENE-P100B215I
Topology	Non-isolated
Certificates	IEC 62619, IEC 63056:2000, IEC 61000, IEC 62477-1, UN 38.3, GB/T 36276, GB/T 34131

13.2 TRENE-B215

Product Name	TRENE-B215
Battery Designation	IFpP74/175/208[(16S)15S]M/-20+50/95
Battery Type	LiFePO4
Rated Capacity [Ah]	280
Cell Manufacturer	A
Rated DC Voltage [d.c.V]	768
Rated Energy [kWh]	215
DC Voltage Range [d.c.V]	636 ~ 876
Max. Charge/Discharge Current [A]	140
Conditional Short-circuit Current (Icc) [A]	< 10000
Output Short-circuit Current [A]	4500 (Duration: 1.3 ms)
Charge Temperature [°C]	0 ~ 50
Discharge Temperature [°C]	-20 ~ 50
Storage Temperature [°C]	50 ~ 60 (3 months); 30 ~ 50 (6 months); -20 ~ 30 (12 months)
Altitude [m]	< 3000
Ingress Protection	IP55
Protection Class	I
Certificates	IEC 62619, IEC 63056

14 Appendix

14.1 Requirements for OT/DT/TO Terminal

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

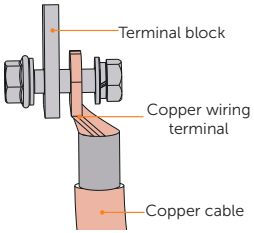
CAUTION!

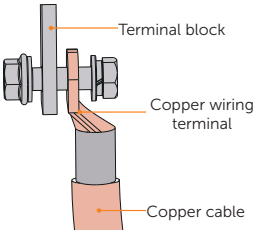
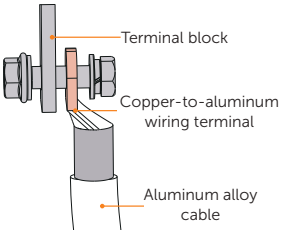
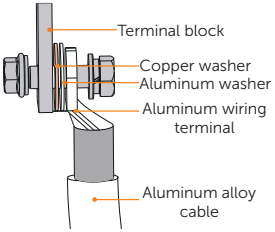
- Do not connect the aluminum wiring terminal directly to the terminal block or copper bar in case of electrochemical corrosion, which might affect the reliability of cable connection.
- While using an aluminum wiring terminal, copper washer, and aluminum washer, pay special attention to the position of the two washers. The copper washer shall make contact with the terminal block, and the aluminum washer shall make contact with the aluminum wiring terminal.

NOTICE!

- The copper-to-aluminum wiring terminal used in scenario 3, and aluminum wiring terminal, copper washer, and aluminum washer used in scenario 4 must comply with the requirements in IEC61238-1.

Table 14-1 Terminal requirements for different types of cables

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

Scenario	Cable Type	Wiring Terminal Type	Figure Illustration
2	Copper-clad aluminum cable	Copper wiring terminal	
3	Aluminum alloy cable	Copper-to-aluminum wiring terminal	
4	Aluminum alloy cable	• Aluminum wiring terminal • Copper washer • Aluminum washer	

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 pantone11-4202TPG color.
- 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.

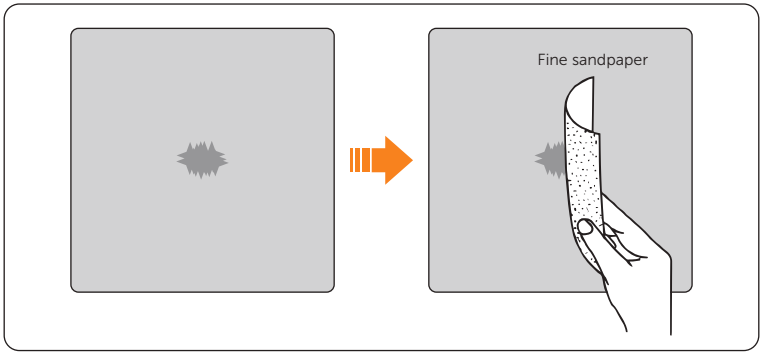


Figure 14-1 Sanding the scratched area

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.

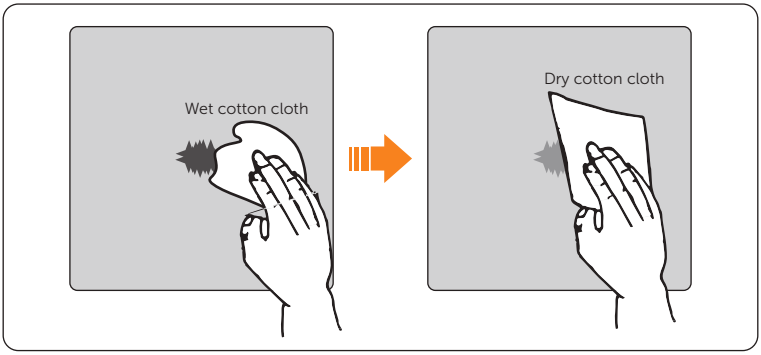


Figure 14-2 Cleaning the scratched area

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.

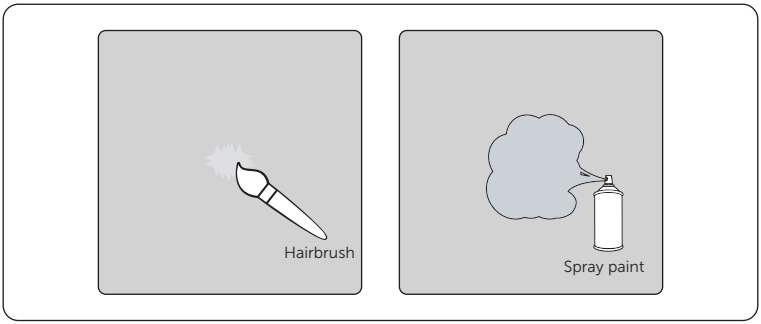


Figure 14-3 Applying paint

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	2	Zinc-rich primer
3	Fine sandpaper	4	Anhydrous ethanol
5	Cotton cloth	6	Hairbrush (for small areas of deep scratches and stubborn stains)
7	Paint sprayer (for large areas of deep scratches and stubborn stains)		

Repainting Procedure

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

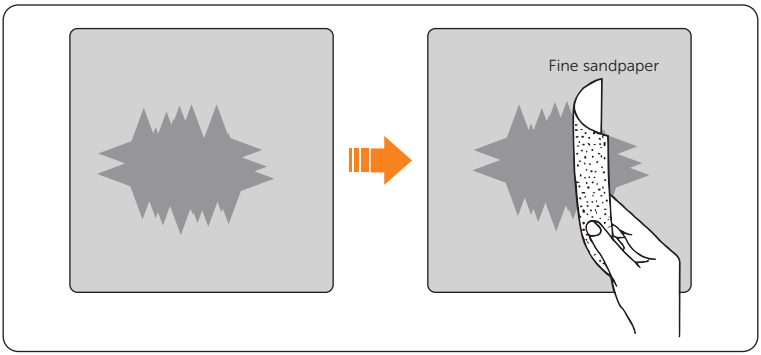


Figure 14-4 Sanding the scratched area

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.

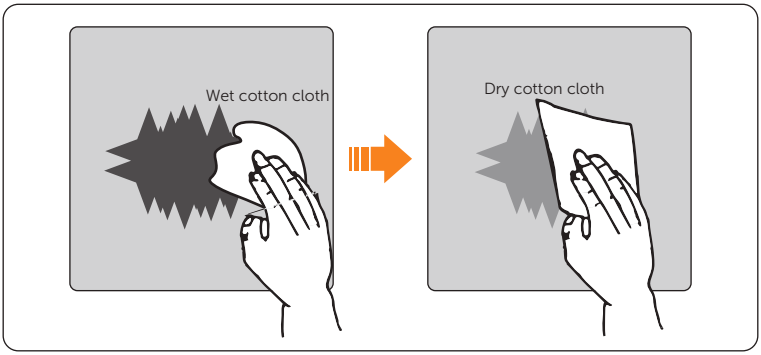


Figure 14-5 Cleaning the scratched area

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.

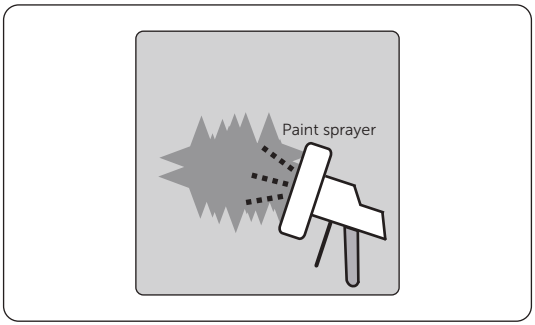


Figure 14-6 Applying paint

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.

14.2.3 Logo & Pattern damaged, Dents or Dings

In this case, we recommend contacting a local spray painting company for customized treatment based on the actual conditions.

Table 14-4 Damage extent and recommended solution

No.	Damaged Area	Recommended Solution
1	• Size < 100 mm^2 • depth < 3 mm	Use a poly-putty base to fix the dents and dings first, and then deal with them according to "Repainting Procedure" for Deep Scratches.
2	• Size > 100 mm^2 • depth > 3 mm	Contact local supplier to make a plan for repair.

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