SolisStorage

User Manual

PrimePower-109kWh-50kW-NV
Integrated Energy Storage Cabinet

Version 1.0, Release Date:10,2025

Category

1. Manual Description

1.1. Scope of Application

This manual is applicable to the PrimePower-109kWh-50kW-NV integrated energy storage cabinet. Hereinafter referred to as "PrimePower ".

1.2. Purpose

The purpose of this manual is mainly designed to provide users with detailed information about the product and instructions for system installation, operation, maintenance and usage.

1.3. Manual usage

Before using this system, please carefully read the manual to confirm that you understand the safety precautions. Then, use the product.

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The content of the manual will be continuously updated and corrected. If there are slight discrepancies from the physical objects, users should refer to the purchased physical objects

1.4. Terms and Acronyms

SolisStorage	Ginlong Energy Storage Co., Ltd.
EMS	Energy Management System
EMU	Energy Management Unit
BMS	Battery Management System
HYI	Hybrid Inverter
CSC	Cell Supervision Circuit
CSU	Current Sample Unit
FSS	Fire Suppression System
HV	High Voltage
LV	Low Voltage
MBMU	Master battery management unit
SBMU	Slave Battery Management Unit
CAN	Controller Area Network
CCAN	CAN communication between BMU and CSC
BOL	Begin of Life
EOL	End of Life
SOC	State of Charge
SOH	State of Health
TMS	Thermal Management System

2. Safety Instructions

This section provides general safety instructions for the operation process. For specific safety instructions regarding the installation procedures, please refer to the corresponding chapters.

2.1. Symbol Usage Instructions

To ensure the safety of users' lives and properties during the use of this product, and to enable efficient and optimized usage of this product, the manual provides relevant information and highlights it with appropriate symbols.

The following lists the symbols that may be used in this manual. Please read them carefully to better utilize this manual.

Warnings in the document

DANGER	"DANGER" indicates a high potential for danger. If it is not avoided, it will result in the death or serious injury of personnel.
WARNING	"WARNING" sign indicates a moderate potential hazard. Failure to avoid it could result in the death or serious injury of personnel
CAUTION	"CAUTION" indicates a low level of potential danger. Failure to avoid it could result in moderate or minor injuries to personnel
NOTICE	"NOTICE" indicates potential risks. Failure to avoid these risks may result in the equipment not functioning properly. Or result in property damage.

Warnings on the product

	**Be aware of dangerous voltage** This product operates under high voltage. All operations on the product must be carried out in accordance with the instructions provided in the product manual.
	**Be aware of wrong operation** Personnel must operate correctly. Failure to do so may result in serious personal injury or equipment damage.
	**Be aware of excessive surface temperature** The product may get hot during operation. Please do not touch this product during the operation

	process.
	**Concern about compression** Do not place your hands inside the movable and/or rotating parts of the product
	**Be aware of Noise** The product generates a lot of noise. When using the product, wear hearing protection equipment

Product symbols

	**Be aware of angle** The opening angle of the door is between 0 and 120 degrees, and there are labels attached to the door.
	**unlock direction** Unlock direction label, which is located on the door
Please always pay attention to the danger warning signs on your body, which include:	
	This sign indicates that there is high pressure inside the body. Touching it may pose a risk of electric shock
	This symbol indicates that this is the PE terminal for protective grounding. It is necessary to ensure a firm connection for the purpose of safeguarding the safety of the operators.

2.2. Safe Usage Instructions

This section presents the general safety guidelines that need to be followed when operating the system. For the safety instructions in the specific usage and maintenance steps, please refer to the warning explanations in the corresponding chapters.

⚠DANGER

Electric shock hazard! Ignoring the following warnings may result in personal death or serious injury.

- Only qualified personnel are allowed to operate, install and maintain the system.
- Before work, safety protective equipment must be worn, and the protective equipment should comply with local laws, regulations and standards.
- Never touch any electrified parts directly.
- Before installing the equipment, the AC circuit must be isolated from the power grid, and the AC connection must be disconnected. The DC circuit must be isolated from the battery pack, and the DC connection must be disconnected.
- The equipment should have a grounding cable. If several devices are installed together, each device should be grounded separately. The grounding cable should comply with the corresponding safety standards.
- After installation or after a long power outage, the equipment should be dehumidified first, then the insulation resistance should be tested until the insulation test is passed before starting. The insulation resistance on the AC and DC sides should be no less than 1 MΩ.
- The PCB circuit board may generate high voltage when the equipment is powered on, especially the voltage sampling boards for AC and DC. Therefore, be careful of electric shock when using instruments such as an oscilloscope.
- When the equipment malfunctions, the main and auxiliary circuits may generate dangerous voltages. Therefore, before working, measure the voltage and ensure that the voltage is below the safe level.。
- Do not operate the equipment when the cover or door is open
- In rainy weather, do not open the equipment door to avoid water ingress and protect personnel from electric shock

⚠WARNING

Warning! Ignoring this warning may result in personal injury.

- Even if the power of the equipment has been turned off, the cooling fan may still be rotating. Please do not touch the rotating parts.
- When disassembling the components of the equipment, please wear gloves to prevent scratches.
- After the system is powered off, do not touch the radiator, heater surface, bus bars or capacitors. Maybe they are very hot and could burn you.
- Do not bump into the staff during landing.
- An isolation area should be set up during installation operations.
- During the lifting process, move and transfer the equipment carefully.
- The installation of all equipment must be carried out by installation personnel who have received training in handling high-voltage electricity.
- Do not use or install if the equipment has defects, cracks, damage or other damages
- Do not attempt to open, disassemble, repair, tamper with or modify the equipment.
- Do not install during severe weather such as rainstorms or sandstorms.
- To protect the equipment and its components from damage during transportation, handle them carefully. Do not hit, pull, drag or step on the equipment. Do not subject the equipment to any strong force. To prevent damage, keep the equipment in the transportation packaging until ready for installation
- Do not insert any foreign objects into any part of the equipment.
- Do not expose the equipment or its components to direct flames.
- Do not install the equipment near heating devices.
- Do not immerse the equipment or its components in water or other liquids.
- Place the equipment on a level surface to ensure it is stable and does not shake or tilt
- The installation of the equipment should take into account the load capacity of the installation ground and floor (according to the requirements of the construction drawings).

CAUTION

Be careful! Ignore the following warnings at your own risk, as it may damage the components of the product.

- When installing the equipment, do not place the conductive sweep device in the cabinet, as it may damage the equipment.
- Install the equipment on the platform using the specified strength bolts, and the bolts should comply with the installation requirements.
- Ensure that the equipment has good heat dissipation, and the ventilation pipe should not be blocked
- Ensure that the electrical bolts are always tightened to the exact torque specified in this document.
- If the equipment is not powered for a long time, its lifespan will be affected.
- Do not use cleaning agents to clean the equipment, or expose the equipment to flammable or irritating chemical substances or vapors.
- Do not use components that have not been authorized by Solis
- The transfer and lifting diagrams shown in this document are for reference only. The specific tools and equipment used in actual operation should be based on the actual operation.

NOTICE

- The power/battery module is too heavy and requires multiple people to move it. Appropriate protective equipment should be worn, and the protective equipment should comply with local laws, regulations and standards.
- Unless otherwise specified, all dimensions are in millimeters.

2.2.1. Personnel Requirements

- Only professional electricians or personnel with professional qualifications can perform all operations on this product.
- Operators should be fully familiar with the composition and working principle of the entire system.
- Operators should be fully acquainted with this manual.
- Operators should be fully aware of the relevant standards of the project's location area.

2.2.2. Setting of Safety Warning Signs

When implementing installation, daily maintenance, and inspection operations of this system, in order to prevent irrelevant personnel from approaching and causing incorrect operations or accidents, please follow the following guidelines:

- Set up clear signs at the front and rear switch positions of the equipment under maintenance to prevent accidental closing of the switch and resulting accidents
- Establish warning signboards or set up safety warning tapes near the operation area.

2.2.3. Requirements for Escape Routes

To ensure that staff can evacuate the site promptly in case of an emergency, please follow the following guidelines:

- During maintenance, repair, or other operations on the equipment, it is essential to ensure that the escape routes are completely unobstructed.
- It is strictly prohibited to pile up any items or occupy the escape routes in any way.

2.2.4. Electrical measurement

⚠DANGER

There is high voltage in the system. Accidental contact may cause a fatal electric shock hazard. Therefore, when conducting measurements while the system is energized, the following should be done:

- **Take protective measures (such as wearing insulating gloves).**
- **There must be a companion to ensure personal safety.**

2.2.5. Usage of Measuring Equipment

⚠WARNING

There is a high voltage in the system. Accidental contact could lead to a fatal electric shock hazard. Therefore, when conducting measurements while the system is energized, you should.

- **Select high-quality measuring equipment whose range and operational conditions meet the requirements of the site.**
- **Ensure that the connections of the measuring equipment and the operation follow the correct procedures to avoid potential hazards such as electric arcs**

2.2.6. System Parameter Settings

Some parameters in the system software can be set, and they are closely related to the operation of the system. Such parameters can only be set after a reliable analysis and evaluation of the system's operation status.

⚠WARNING

- **Improper parameter settings may affect the normal operation of the system.**
- **Only authorized professionals are permitted to set the parameters of the system.**

2.2.7. Moisture Protection

NOTICE

The ingress of moisture is highly likely to damage electrical equipment! To ensure the normal operation of all system functions, please follow the following items:

- **When the air humidity is over 95%, do not open the system or equipment doors.**
- **Avoid conducting maintenance or repair operations on the system in rainy or humid weather conditions.**

2.2.8. Precautions during maintenance or repair

⚠WARNING

After the system stops running, please wait for at least 10 minutes before conducting maintenance or repair operations on the system. After the system is shut down, when performing maintenance or repair operations on the system, be sure to:

- Ensure that the system will not be accidentally re-powered.
- Use a multi-meter or an electric tester to check and ensure that the system is completely de-energized.
- Cover the adjacent potentially electrified components with insulating materials.
- During the entire maintenance and repair process, ensure that the escape route is completely unobstructed.

2.2.9. Product Scrap

Scrap products shall be immediately recovered and disposed of by the designated qualified manufacturer. In order to avoid safety accidents or serious environmental pollution, it is strictly forbidden to discard discarded products

2.2.10. Personal Protective equipment (PPE)

⚠WARNING

- It is strictly prohibited to carry out maintenance or repair operations when the equipment is powered on
- When conducting maintenance or repair on the equipment, it is recommended that at least two personnel be present on site.
- When performing maintenance or repair on the equipment, turn off the system and use a multimeter or an electric tester pen to test to ensure that the system is completely de-energized.

PPE is determined by the temperature (in cal/cm²) generated by the arc flash at a certain distance (typically 18 inches) and the accident energy at that location. The requirements for personal protective equipment (PPE) for preventing PrimePower operations are classified as Class 2.

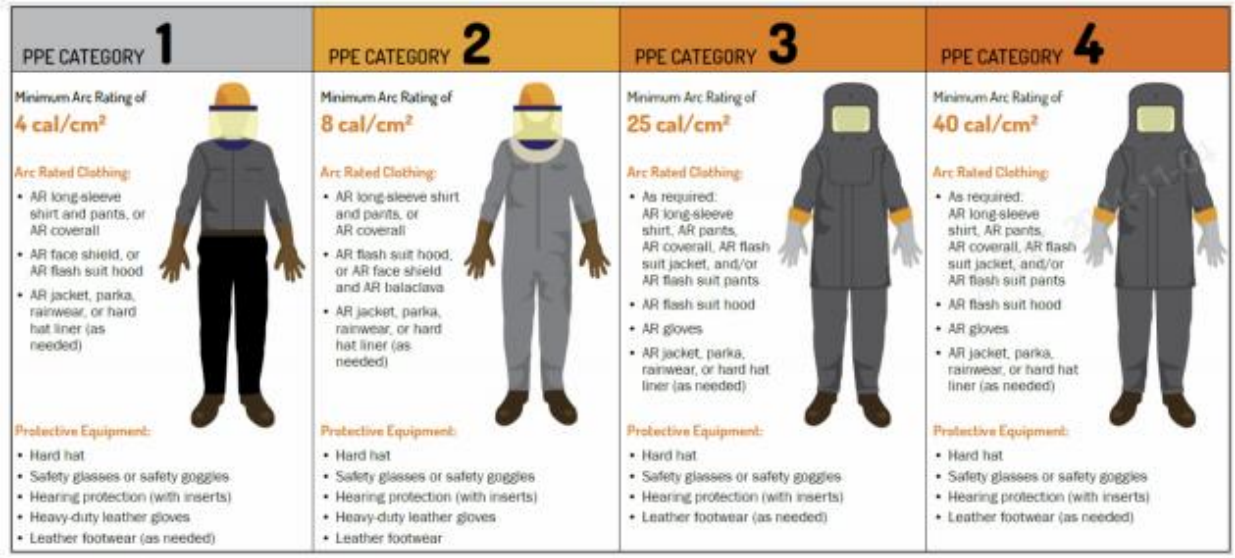


Figure 2-1 PPE Classification

2.2.11. Other Important Notes

In addition, the following protective or emergency measures should be taken according to the on-site needs:

When conducting maintenance, repair, or other operations on the system, relevant personnel should take appropriate protective measures as needed at the site, such as wearing noise-proof earplugs, insulated shoes, insulated gloves, and heat-resistant gloves.

All necessary auxiliary measures should be adopted to ensure the safety of personnel and equipment.

This manual cannot cover all possible situations during operation, maintenance, and repair processes. If there are situations not explained in the manual, please contact SolisStorage in time.

To facilitate users' better reading and use of this manual, a large number of pictures are configured in the manual. All pictures are only for explanatory purposes. Users should refer to the actual product received.

3. Product Introduction

3.1. Product Overview

3.1.1. Product appearance and system composition

PrimePower consists of a Solis hybrid inverter, a battery system, a Battery Management System (BMS), a Fire Suppression System (FSS), a Thermal Management System (TMS), and an auxiliary distribution system.

Figure 3-1 Product Appearance

3.1.2. Datasheet

NO	Item		Specification
1	Pack number		7
2	Nominal capacity		109.67kWh
3	Nominal voltage		358.4Vd.c.
4	Range of voltage		313.6~403.2Vd.c.
5	Nominal Charging power		50kW
6	Nominal Discharging power		50kW
7	Auxiliary power supply	Voltage	220Vac;
		Power	~1.5kW
8	Operating ambient temperature	Charging	-25℃~+55℃
		Discharging	-25℃~+55℃
9	Ambient requirement	Storage temperature	-25℃~+45℃
		Operating Height	≤4000m，derating is required when the altitude is above 2000m
10	General	Dimension	950(W)*1356.8(D)*2070(H)mm(not include the size of the hybrid inverter)
		Weight	1320kg
		IP	IP55
		Cooling method	Industrial-grade air-conditioning (Cabinet) Natural cooling (Pack) Intelligent fan-cooling(Inverter)
		Communication protocol	TCP/IP,CAN，RS485
		Refrigerating fluid	R134a
11	Compliance standard	System	UN38.3
			IEC 62619

			IEC 60730-1
			IEC 63056
			IEC 62477-1
			IEC 61000-6-2/IEC 61000-6-4
			UN3480
*More detailed parameter about hybrid inverter ,you can refer document on Solis official website			

3.1.3. System schematic

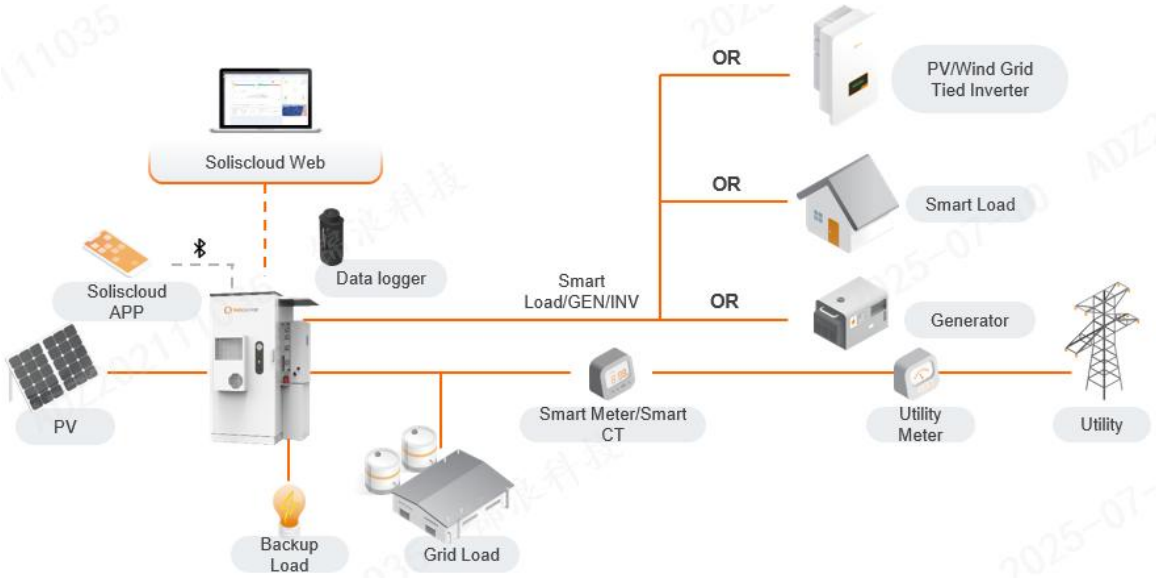


Figure 3-2 System Schematic

3.2. System Overview

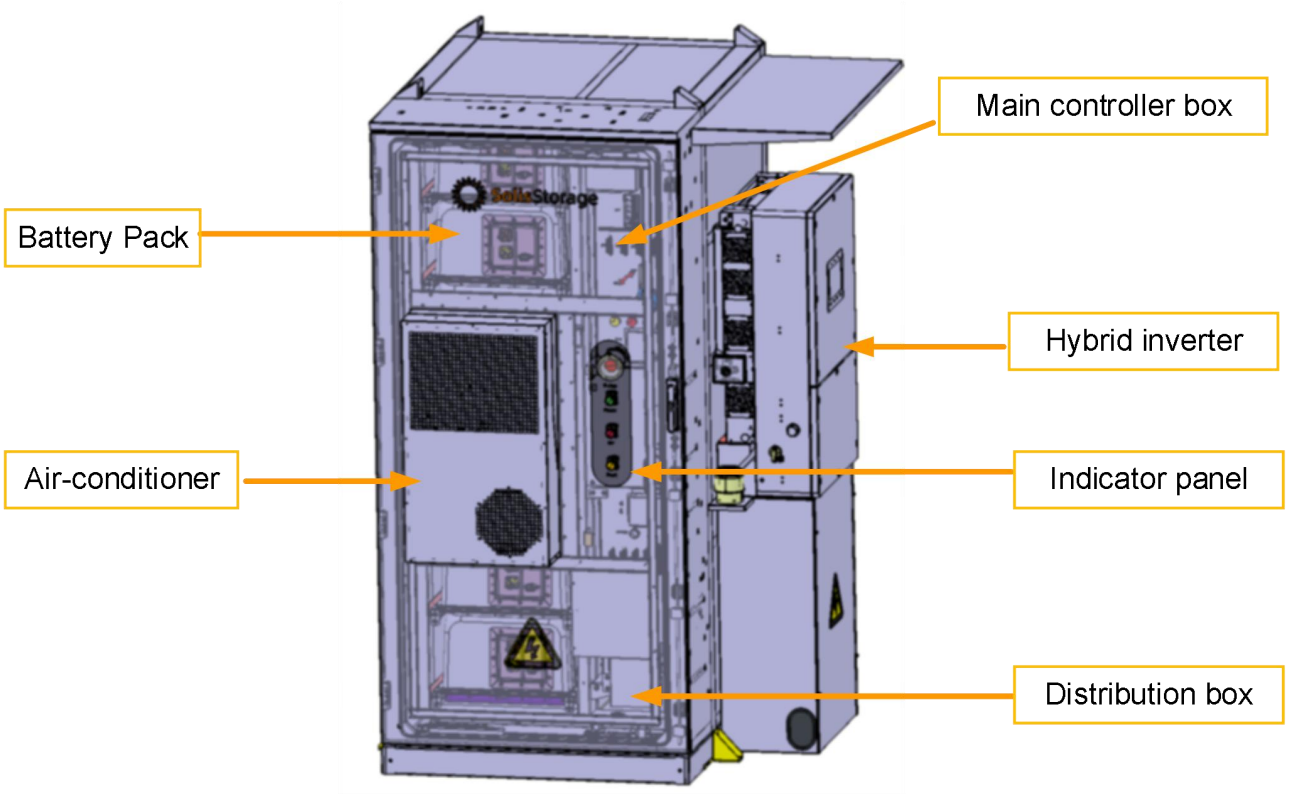


Figure 3-3 main component

The system consists of a single battery cluster, the battery cluster contains 7 battery packs, each of which is composed of 16 series connected cells. The system contains a total of 112 battery cells.

Table 3-1 System Configuration

System	Component	Amount	Remark
Battery system	Pack	7	Including CSC
Communication system	EMS (local)	1	Including EMU
	BMS	1	Including SBMU. etc.
TMS	Air-conditioner	1	Including Air conditioner .etc.
FSS	Fire suppression system	1	Including temperature detectors, smoke detectors, gas detectors (optional), explosion relief panel (optional), etc.
Auxiliary power	Electrical control cabinet	1	Auxiliary power system

3.2.1. Auxiliary power

The auxiliary power distribution system is used to provide auxiliary power for the entire control system and air conditioner.

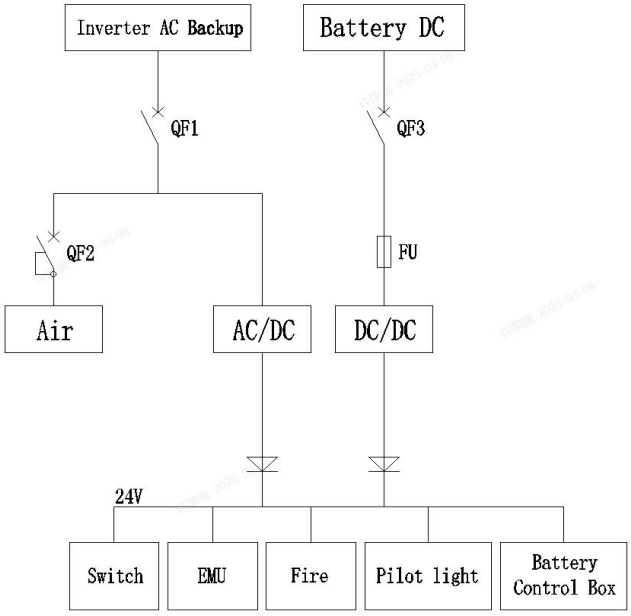


Figure 3-4 Distribution box diagram

The character of auxiliary power

The auxiliary power supply mainly consists of AC circuit power supply and DC self-power supply. The AC circuit power supply is taken from the Backup load output port of the hybrid inverter, and is used for powering the air conditioner and the control system. The DC self-power supply is taken from the inner side of the battery and is used for powering the control system.

3.2.2. Thermal Management System（TMS）

The Thermal Management System (TMS) consists of an air conditioner, an air duct, and a box fin under the battery pack. The environment and self-temperature of the battery system will directly affect the normal operation of the system, the cycle life of the battery core, charging and discharging, output power, available capacity, safety and reliability and other performances. In order to achieve the best performance and life of the battery, it is necessary to control the temperature of the battery system and operate in a better environment through thermal management.

Due to the high performance TMS, the whole system cell can obtain high consistency and thus maintain

a long service time. The main features of the system include:

1. Refrigerant type of air conditioner: R134A

2. Suitable for extreme ambient temperature applications:-25 ℃~ 55 ℃

3. One energy storage cabinet is equipped with a cold air conditioner, which can provide a cooling power of 2.1kW

4. Fan-less design

Table 3-2 TMS related parameter

TMS configuration	Parameter
Air conditioner units	1
refrigerating capacity	2100W @L35/L35
heating capacity	1000W
Rated Power	845W@L35/L35
Rated voltage	220±15%VAC~50Hz

3.2.3. Fire Suppression System

The entire fire suppression system is divided into components as follows:

1. Fire alarm system

2. Gas fire suppression system

3. Explosion and pressure relief system

4. Water inlet

The main equipment and functions of each system:

(1) The main equipment of the fire alarm system includes: smoke detectors, temperature detectors, flammable gas detectors (optional), and audible and visual alarm (optional).

(2) The main equipment of the gas fire suppression system includes: temperature-starting aerosol.

(3) The main equipment of the pressure relief and explosion suppression system: pressure relief valves, explosion-relief panel (optional).

(4) The main equipment of the fire water inlet system: DN65 external threaded external connection pipes, DN65 fire hydrant quick connectors (optional), and DN65 fire hydrant plugs (optional).

Fire suppression operation process:

1. Initial fire detection: Smoke detectors and temperature detectors detect fire signals, output dry contact signals to the energy management system, and at the same time, the flammable gas detector (hydrogen) detects the concentration value reaching the low alarm value, outputs a dry contact signal to the energy management system, and starts the audible and visual alarm.

2. When the battery cabinet temperature reaches 165±5℃, the aerosol automatically sprays to perform initial fire suppression. If the fire cannot be controlled, the pressure in the battery cabinet increases, the pressure relief valve will automatically pop open to prevent the accumulation of flammable gas and deformation of the box due to excessive pressure. When the flammable gas explodes, the internal explosion shock wave will cause the explosion-proof plate to automatically burst and release the shock wave from the top. Finally, this system is reserved with a fire water injection interface. After the customer connects the fire water pipe on site, it can be controlled by the client's EMS to achieve water injection fire suppression.

As an outdoor non-entry energy storage system, this project provides a complete fire suppression system solution, with detection, pressure relief and explosion control, and fire suppression functions. The fire suppression strategy is divided into 4 levels:

Level 1: Alarm of detectors and warning of sound and light, informing the ESS to do power-off protection;

Level 2: Release aerosol to extinguish the initial fire, the aerosol feedback device alarms, informing the ESS to do power-off protection;

Level 3: Pressure relief and explosion suppression system, preventing secondary damage from explosion;

Level 4: Water injection fire suppression, preventing re-ignition;

Main components in below table

Table 3-3 Main components of the FSS system

NO.	Item	component name	amount	Remark
1	Detection and alarm system	Flammable gas detector	1	**Optional configuration**
2		Temperature sensor	1	Standard configuration
3		Smoke Sensor	1	Standard configuration
4		Audible and Visual Alarm	1	**Optional configuration**
5	Explosion relief and pressure release system	Pressure relief valve	1	Standard configuration
6		Explosion release panel	1	**Optional configuration**
7	gas fire-extinguishing system	Temperature-initiated aerosol	1	Standard configuration
8	Fire Water inlet system	DN65 external thread external pipe connector	1	Standard configuration
9		DN65 fire hydrant quick connector	1	**Optional configuration**: Customers can remove it and connect it to an external water supply network.
10		DN65 fire hydrant cover	1	**Optional configuration**: Customers can remove it and connect it to an external water supply network.

3.2.3.1. Fire detection system

The detection system consists of 3 types of detectors: smoke detector, temperature detector and flammable gas detector (optional). The number of detectors and installation locations are as follows

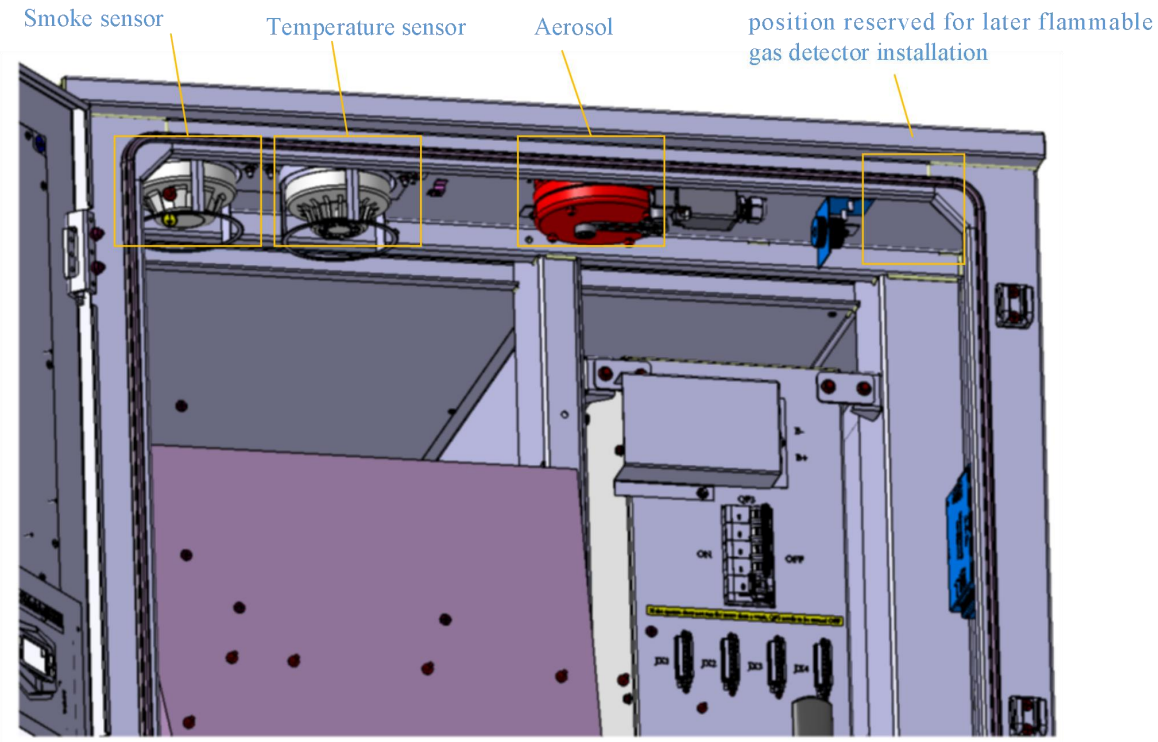


Figure 3-5 Detector installation layout

3.2.3.2. Explosion and pressure relief system

The explosion and pressure relief system consists of pressure relief valve and explosion relief plate (optional), and the installation position is as follows.

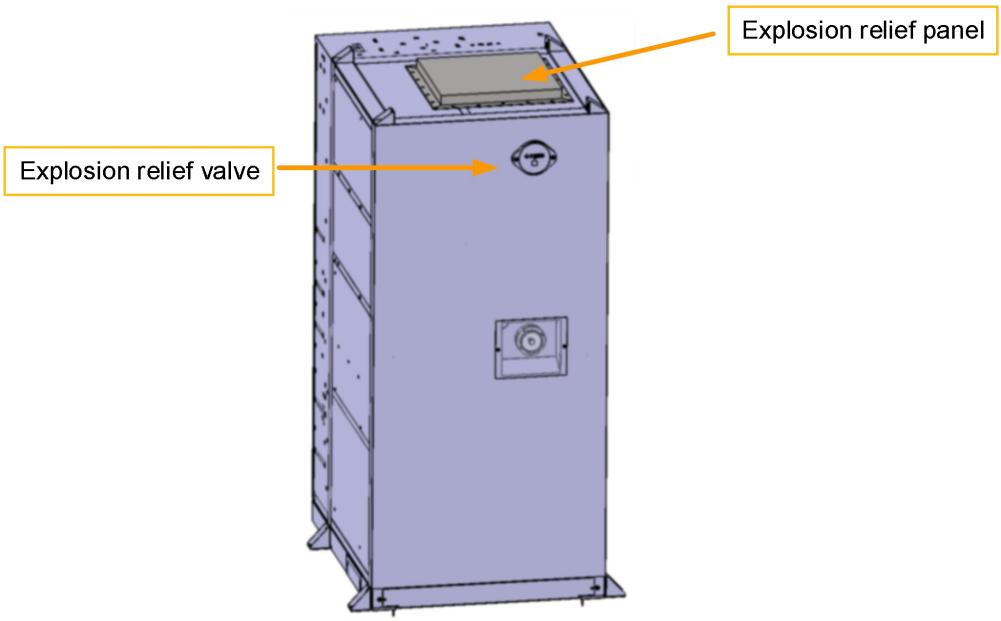


Figure 3-6 Layout of explosion relief plate and relief valve

3.2.3.3. Fire extinguishing system

(1) Aerosol fire extinguishing system

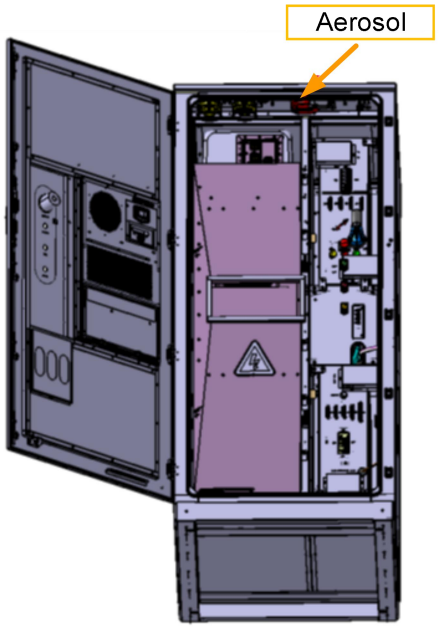


Table 3-7 Aerosol device layout

（2）Water injection system

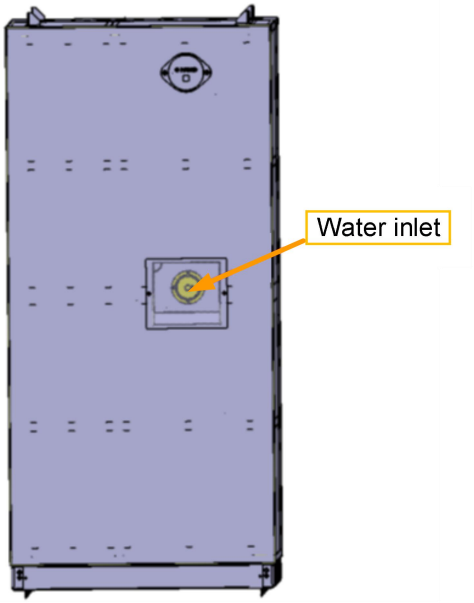


Table 3-8 Water injection port layout

3.2.4. Fire suppression control logic

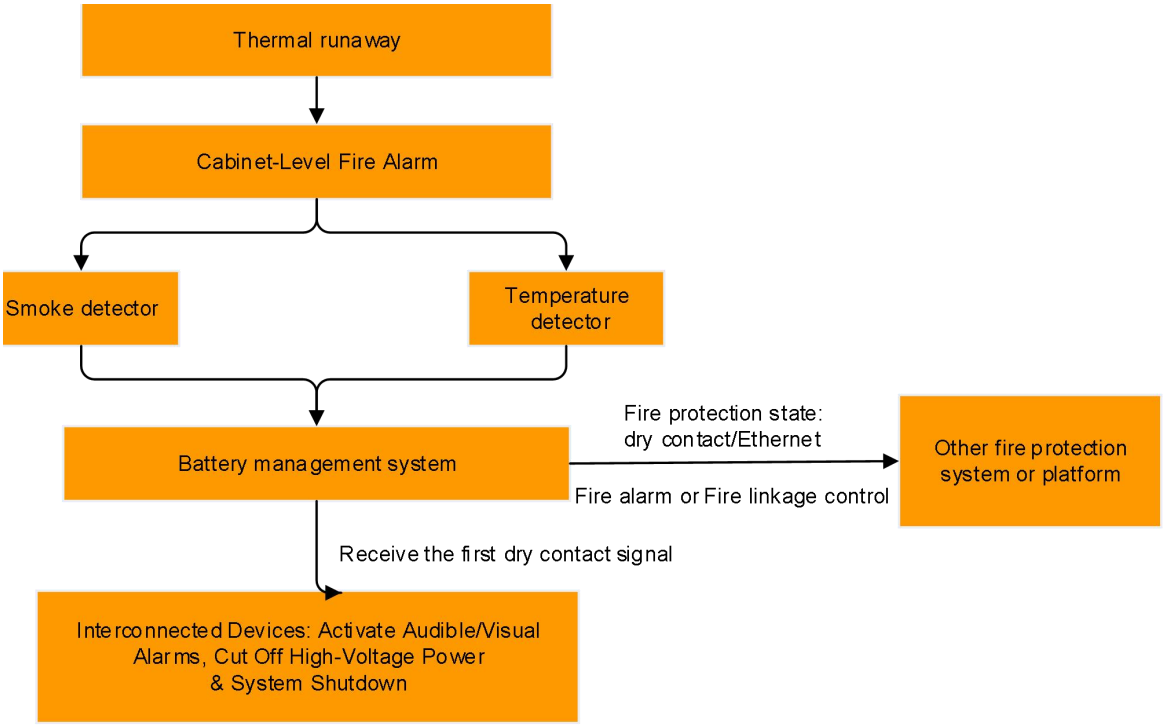


Figure 3-9 FSS logic figure 1(smoke sensor/temperature sensor)

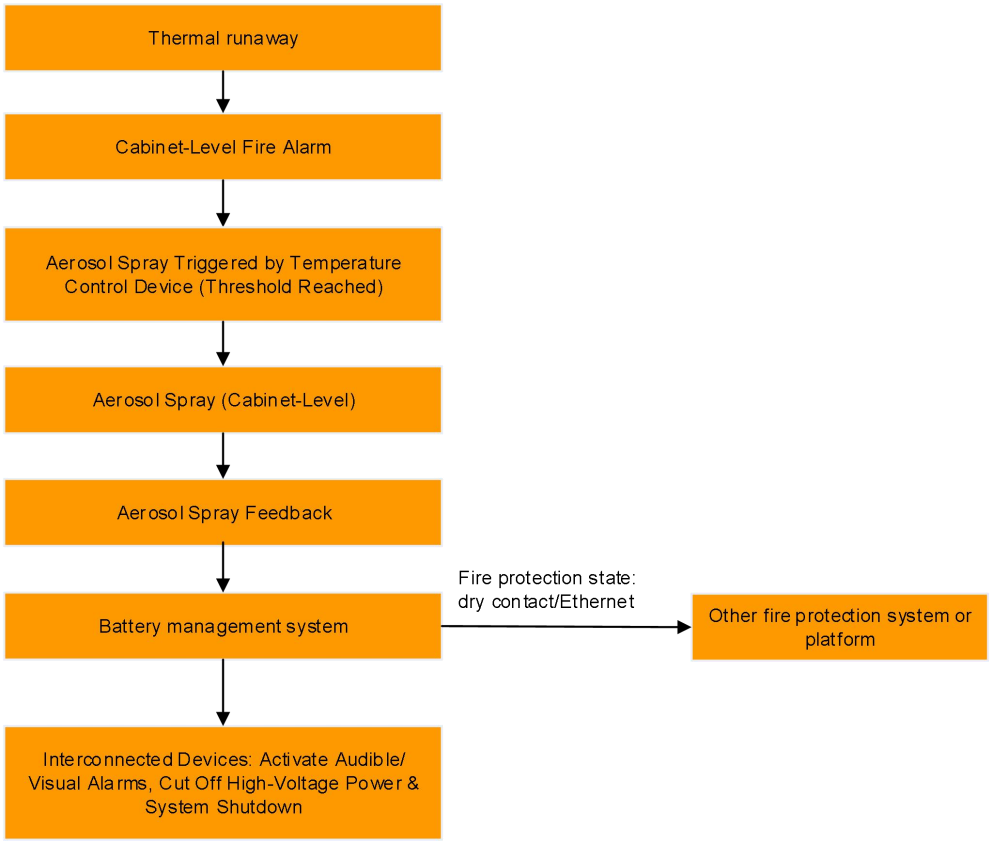


Figure 3-10 FSS logic figure 2-(Aerosol)

3.3. System special application introduction

During operation, both the AC grid and customer load must be connected to different terminals inside the PrimePower.AC side connection on inverter itself, load side connection inside the cabinet.

When the product malfunctions seriously and fails to operate, the power grid cannot continue to supply power to the customer's load. So PrimePower does not belong to UPS product and has no bypass function.

If the customer needs to add a bypass function, the customer needs to add an ATS switch outside PrimePower to achieve the bypass function.

3.4. Load type requirement in system application

The Backup port of PrimePower's hybrid inverter has a short-term overload capacity: specifically, 1.2 times the rated power for no more than 600 seconds. 1.4 times the rated power shall not exceed 60 seconds. 1.5 times the rated power shall not exceed 10 seconds. 1.6 times the rated power shall not exceed 2 seconds.

Meanwhile, due to the differences in load types, the Backup port of PrimePower's hybrid inverter has different load-carrying capacities and requirements for different loads, as detailed below

(1) Resistive and RCD loads: When connecting single-phase resistive loads, it should not exceed 100% of the single-phase power; when connecting RCD loads, it should not exceed 60% of the rated power of the hybrid inverter.

(2) Motor-based loads: For direct motor loads, the starting impact power should not exceed 1.1 times the rated power of the hybrid inverter. For motor loads using frequency converters or soft-start types, the power should not exceed 60% of the rated power of the hybrid inverter.

(3) RLC load: The total load capacity shall not exceed the rated power of the hybrid inverter, the peak current at the moment of load switching (peak inrush current) shall not exceed twice the rated current of the hybrid inverter, and the minimum power factor shall not be less than 0.8.

(4) If a hybrid inverter is used for loading, apart from the RLC load, the motor load and the RCD load need to be proportionally reduced.

(5) Isolation transformer: The isolation transformer that comes with the hybrid inverter must be started simultaneously with the hybrid inverter. It is not allowed to start the hybrid inverter first and then put the isolation transformer into operation. Moreover, the inrush current at the moment of transformer start-up should not exceed twice the rated current, and the inrush power should not exceed 1.1 times the rated power of the hybrid inverter. Otherwise, a soft starter needs to be added to the transformer.

(6) The peak current at the moment of load switching (base current + inrush current) does not exceed 1.1 times the rated current of the hybrid inverter

4. Transportation and Storage

4.1. Transportation Process and Requirements

4.1.1. Requirements for Transportation Methods

Maritime cargo and land transportation. During the loading and unloading process, handle with care to prevent throwing, rolling and excessive pressure; during transportation, avoid external mechanical impacts.

➢The transportation plan for bulk goods must be evaluated in advance;

➢The speed of vehicles (trucks) must not exceed 100 kilometers per hour and must comply with local laws;

➢During driving, do not make sudden braking or sharp turns;

➢Maintain the good condition of the vehicles and frequently check the transportation status of the vehicles to promptly identify and solve problems;

4.1.2. Requirements for Transportation

Based on the characteristics of the battery, in order to maximize the performance of the battery, the transportation and storage should meet the following requirements:

⚠CAUTION
1. To reduce the impact of condensation water during transportation on the products, desiccants are installed in each box of the products. Please remove them during operation. 2. The desiccants should not be left in the powered equipment for a long time. If they are not removed in time, they will cause damage to the equipment and may even lead to short circuits or even explosions in the electrical equipment.

➢ Allowed transportation temperature: -25 ~ + 45 ℃

➢ Humidity: ≤ 85% (no condensation).

➢ Take appropriate protective measures to keep the SOC level at around 30%, and ensure no short circuit occurs, or prevent liquids from entering the PrimePower or being immersed in liquids (such as water, oil, etc.).

4.2. Lifting and hoisting equipment

4.2.1. Equipment Requirements

(1) Based on the on-site conditions and the performance of the mechanical equipment, select high-performance lifting equipment, rigging, and shackles for calculation and selection; ensure that the crane and the steel wire rope meet the load-bearing requirements.

(2) Before entering the site, all types of slings, including slings and shackles, should be inspected to ensure they are in good condition. Before the formal lifting operation, the specifications and quality should be reconfirmed to meet the requirements of this lifting operation.

(3) The lifting points are located at the top of the four terminal corners of PrimePower.

(4) When installing or dismantling the lifting device, do not drag PrimePower. Otherwise, PrimePower may be damaged.

4.2.2. Lifting Equipment Hoisting Parameters

Table 4-1 Lifting parameter requirement

Equipment Lifting load-bearing requirements	Length of cable	Number of cables	Acceleration
＞1.5T	＞1m	4	≤0.2g

Note: The lifting equipment is provided by the client.

CAUTION
During the lifting process, the center of gravity of PrimePower must remain stable.

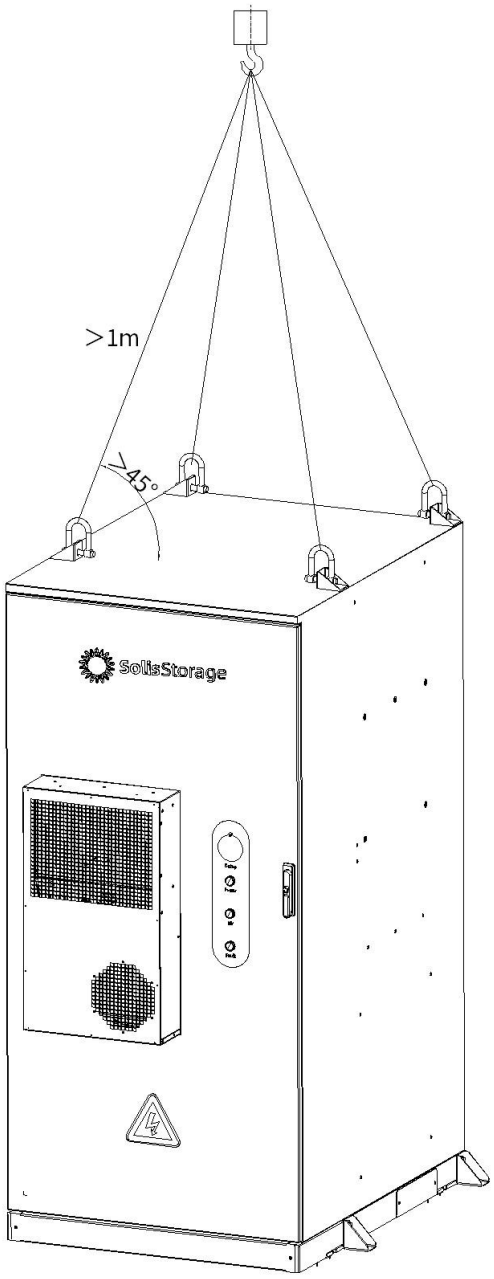


Table 4-1 Lifting Installation Diagram

4.2.3. Precautions for Lifting Operations

Lifting process	Precautionary measures
Before lifting	The lifting capacity and working radius of the crane meet the requirements. If the on-site working conditions do not meet the requirements, a professional assessment should be sought.
	PrimePower for outdoor use, we recommend that you operate the PrimePower in clear, windless and rain-free weather conditions.
	The suspended ceiling of PrimePower can be carried out by using slings with hooks or U-hooks.
	The hook size must match the hole diameter(D=22mm)
	Each hook should be supported 1.5~2T weight
	Before hoisting, ensure that the crane and the steel wire rope meet the requirements.
	Make sure that all the doors of PrimePower have been closed and locked.
In the lifting process	Unauthorized personnel are not allowed to enter the lifting area. Do not stand under the crane arm.
	Ensure that the crane is in the correct position. Do not perform long-distance lifting.
	Maintain the stability of PrimePower. The diagonal inclination of PrimePower should be less than or equal to 5 °
	Lift gently. The cabinet should fall slowly and steadily when dropping to avoid impact on the internal equipment.
	When PrimePower comes into contact with the base, the steel cable should be removed after the base is evenly stressed.
	PrimePower can only be lifted after it is securely fixed.

4.2.4. Risk Identification for Hoisting Operations

⚠WARNING
To prevent personal injury or equipment damage, risk identification must be conducted before the lifting operation.

1. The compression or impact caused to the human body during the operation of the crane;

2. The crane hook breaks due to overloading and is lifted when the sling slides off the hook;

3. The falling of the heavy object causes an impact, the heavy object drops from the air and rebounds and injures people;

4. The hoist or sling accidentally comes into contact with the conductive wire;

5. The ground at the working site of the truck crane is uneven, the support is unstable, the weight is unbalanced, and the heavy object exceeds the rated lifting weight, causing the crane to overturn;

6. The wind force is too strong, and the operation is carried out illegally, causing the crane to tip over;

7. Someone is standing under the crane boom and other dangerous areas;

8. Someone is standing or sitting on the hook;

9. No one is directing during lifting, there are people staying in the operation area, and the spare parts and heavy objects of the operating crane swing and strike pedestrians;

10. The crane and other operators do not wear safety helmets and other personal protective equipment;

11. The driver's cabin glass is not cleaned, resulting in unclear vision;

12. The communication between the driver and the commander was poor, or they misunderstood the lifting signals;

13. The lifting method was incorrect, causing the heavy object to fall off the hook;

14. The used lifting ropes exceeded the safety factor;

15. The steel wire rope jumped out of the pulley groove;

16. The brake cracked and the friction pad was worn out excessively.

4.2.5. Lifting safety measures

⚠WARNING
To prevent personal injury or equipment damage, safety measures must be followed.

1. Strengthen on-site construction management. Set up a warning zone at the lifting site and assign full-time safety personnel to supervise and warn. Non-operational personnel are strictly prohibited from entering.

2. Carefully complete the preparatory work before lifting. Prepare mechanical equipment and heavy lifting rigging according to the plan requirements. Strictly follow the performance inspection of lifting equipment, inspection of lifting rigging, pre-lifting detection and lifting procedures to ensure the safety and reliability of the lifting operation.

3. Before all personnel involved in the construction work arrive, conduct detailed technical briefings to make them understand the essentials, procedures and requirements of the operation. After the crane enters the site, the crane driver will introduce the lifting plan in detail and clearly define the unified command signals.

4. The operation position of the crane and the walking route should be carried out according to the plan requirements. The legs' pads must be safe and reliable. Use special roadbed box layers under the legs to expand the unit force surface. The lifting operation of the crane should be smooth, with slow movements. Pay close attention to the settlement of the crane legs during the lifting operation.

5. The communication between the on-site commander and the crane driver should be timely and reliable. The command signals, flags and gestures should be clear. If any abnormal situation is found, report it to the overall commander of the lifting site promptly to take effective measures as soon as possible.

6. When the wind force is 5 or above, lifting is strictly prohibited in thunderstorms, foggy weather.

7. Construction personnel entering the lifting operation site must strictly abide by the on-site safety regulations and wear labor protection clothing and safety helmets as required.

8. The lifting operation should be under unified command. Operators should hold their own opinions, closely cooperate, and complete the lifting operation safely and smoothly.

4.2.6. Forklift transportation requirement

4.2.6.1. Requirement of Forklift

1) Recommended load capacity: ≥5000kg;

2) The length of the fork arm should not be less than the depth to which the product needs to be lifted. It is recommended that the length of the fork arm (as indicated by the arrow at the lower right corner of the following figure) be ≥1.4 meters.

Figure 4-2 forklift transfer illustration

3) When performing forklift transfer operations, it is necessary to ensure that the two sides of the inserted fork arms are at equal distances from the center of gravity of the product. The distance between the two fork arms (excluding the width of the fork arms) should be ≥450mm, as shown in Figure

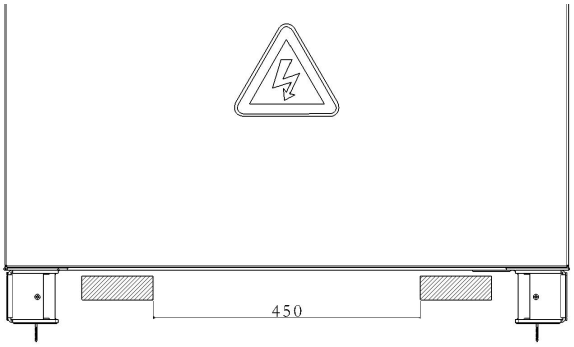


Figure 4-3 Indication of the distance between the fork arms

4.2.6.2. Precautions for Forklift Transfer

1) Remove the sealing plates at the bottom of the front and back of the cabinet to ensure that the bottom of the front and back of the cabinet is unobstructed.

2) Before the forklift's fork arm extends into the bottom of the cabinet, ensure that the height of the fork arm is lower than the bottom of the cabinet, with a gap of no less than 5 centimeters, to avoid colliding with the cabinet. The fork arm slowly penetrates into the bottom of the cabinet to ensure the stability of the product and the forklift during operation.

3) When the fork arm is fully extended and in place, ensure the product is stable. Lift the product carefully and keep the lifting process at a constant speed to avoid sudden lifting or shaking.

4) During the transfer process, avoid pedestrians or obstacles in advance, keep the forklift at a low and constant speed, pay attention to the surrounding environment, and slow down when turning to prevent the goods from toppling over and falling.

5) After reaching the destination, descend slowly to ensure the goods are safely and smoothly delivered.

4.3. Storage Requirements

PrimePower should be stored in a location free of harmful gases, flammable and explosive products, and corrosive chemicals. It should be kept away from mechanical shocks, heavy pressure, and strong magnetic fields, and also far from heat sources.

The battery system must operate within the optimal working temperature range to extend the battery's service life and enhance its safety performance.

5. Product Installation

DANGER

Electric shock danger! Ignoring the following warnings may result in death or serious injury.

- **Make sure that no DC voltage is supplied to the equipment and there is no AC voltage on the AC lines; otherwise, it may cause serious injury or death. Provide warning labels to notify all personnel whose devices are not turned on. This label should be hung on the outside of the door and remain clearly visible. Make sure that the external AC side circuit breaker and DC circuit breaker are in the open position.**
- **Do not touch the live parts of the device.**
- **Do not place flammable materials near the equipment**

WARNING

- **The cables or copper bars provided by the customer should meet the requirements of current-carrying capacity**
- **It is necessary to comply with all country-specific standards and regulations**
- **PCS can only be connected to the public power grid after obtaining authorization from the local network operator**
- **Only professional electricians can perform the operations described in this chapter**
- **All wiring instructions must be followed**
- **All input and output circuits are isolated from the housing**
- **Make sure the electrical insulation meets the requirements before laying the cables**
- **In accordance with EMC regulations, power lines and communication cables should be laid in layers**
- **Provide support and protection for the cables when necessary to reduce their stress**
- **Before wiring, please ensure that the equipment is turned off**
- **Operators are strictly prohibited from operating without training**
- **It is strictly prohibited for workers to work by hand without wearing protective equipment**
- **The key points of connection are: ensuring that the connection is correct, reliable (without looseness), has good contact and no short circuit.**
- **During the wiring process, the positive and negative poles of the DC combiner cabinet must not be reversed**
- **Strictly prevent any form of short circuit during the connection process**

NOTICE

- **Moisture can damage equipment. For the normal operation of the equipment, please abide by the following rules**
- **Do not open the equipment door when the relative humidity is higher than 95%**
- **Do not maintain or repair the equipment in rainy or other bad weather**
- **The installation and design of the equipment must comply with national and local standards and regulations**
- **The wire dimensions and rated values are provided by the manufacturer in the corresponding table. If other cable sizes comply with local standards or regulations, they can also be used**
- **The size of the grounding wire must be larger than half of the size of the AC or DC cable**

5.1. Requirements for the Site and Environment

5.1.1. Basic Requirements and Product installation distance requirement

PrimePower is suitable for general outdoor scenarios. According to local laws and regulations, the site selection requirements are as follows:

1. The installation location should not be in low-lying areas, and the site level should be higher than the historical highest water level in that area.

2. The soil conditions should be good, and the ground should be solid. There should be no poor geological conditions such as rubber soil or soft soil layers. Avoid ground that is prone to water accumulation and subsidence.

3. The equipment should be installed in a well-ventilated area.

4. The equipment should be installed on a foundation, with the foundation height from the ground not less than 200mm. The foundation should be flat, solid, and able to bear the weight of the equipment.

5. Stay away from strong vibrations, noise sources, and electromagnetic interference areas. Try to avoid existing underground facilities.

6. Stay away from places that produce dust, smoke, and harmful gases, and from places that produce or

store corrosive, flammable, and explosive substances. The distance from airports, landfill sites, riverbanks, coasts, or dams should not be less than 2000 meters.

7. Select an open location according to the requirements of Figure 5-1 and ensure there are no obstacles from surrounding areas.

8. Maintain a distance of at least 50 meters from residential areas to avoid noise pollution.

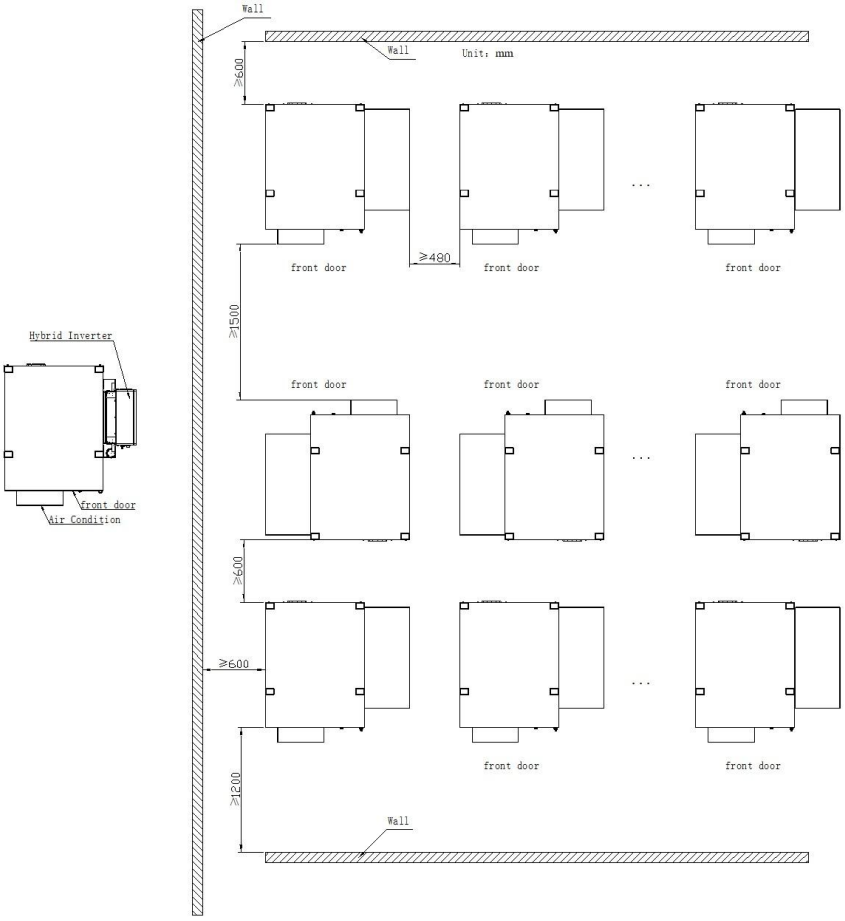


Figure 5-1 Product installation distance requirement

1. The minimum distance between back-to-back units is 600mm.

2. The recommended distance when facing each other should be ≥ 1500mm (between air conditioners).

3. The minimum gap between the back of the cabinet and the wall is 600mm.

4. The recommended minimum distance between the front of the cabinet and the wall is 1200mm (between the wall and the cabinet door).

5. The minimum distance on the side of the inverter is suggested to be 600mm.

⚠CAUTION

The above minimum interval parameters are for reference only. The specific requirements and standards should be in accordance with those of the local fire department.

5.1.2. System anti-vibration protection requirements

In PrimePower, batteries are connected in series, and the management system and various sensing devices are installed. The whole battery system must be installed firmly and reliably without loosening or shaking. Collision avoidance devices of sufficient strength must be installed at the periphery of the battery system installation space to ensure that no safety incidents (e.g. direct short circuit, overheating and combustion) will be caused by general collisions and will not directly damage the battery system and battery.

5.1.3. Ventilation and heat dissipation requirements

PrimePower generates a large amount of heat during operation. Excessive equipment temperature will directly affect its electrical performance and even damage the equipment. Therefore, when designing the placement space for PrimePower, it is necessary to fully consider the dissipation of these heats to ensure the normal and efficient operation of the equipment. To meet the ventilation requirements of PrimePower, its installation environment must at least meet the following requirements:

1. Avoid installing it in a closed space or a place with poor ventilation. Greater ventilation volume can be obtained through construction measures such as adding air supply grilles or fans.

2. The air inlet should have an adequate supply of fresh air, that is, it is necessary to prevent air short circuit (hot air from the air outlet being sucked in from the air inlet).

NOTICE

- **Please observe the following items:**
- **Regularly (suggested every 3 months) clean the grilles, filters and filter cotton at the air intake and exhaust ports of the equipment.**
- **Regularly (suggested every 3 months) check whether the exhaust fan inside the PrimePower equipment is functioning properly.**

⚠WARNING
It is essential to ensure the unobstructed flow of air through the intake and exhaust ports; otherwise, it will seriously affect the operation of the equipment.

5.2. Foundation Requirements

The PrimePower product can support both foundation installation and flat installation. Customers can choose the installation method by themselves. The requirements for foundation installation are detailed in 5.2.1, and those for flat installation are detailed in Chapter 5.2.2.

5.2.1. PrimePower Foundation Requirements

Before installing this PrimePower, please construct the foundation and ditches on the selected ground. The construction requirements for the foundation are as follows:

1. The size of the foundation should meet the installation and bearing capacity requirements of PrimePower, as shown in Table 5-1.

Table5-1 The construction requirements

Type of ground	Requirement	Remark
Concrete floor	The ground needs to be able to bear a load of 1.5*n (where n represents the number of parallel machines) tons.	The ground should meet the following requirements: ◆ Horizontal deviation≤ ±10 millimeters ◆ Plane degree deviation≤ ±4 millimeters per 2 meters
Level land surface		

2. Foundation Requirement

Foundation requirements (for a single machine):

As shown in Figure 5-2, each cabinet has four fixed points.

At the fixed points, 4-M12 stainless steel screws are pre-installed, with the screw protruding 38mm above the ground

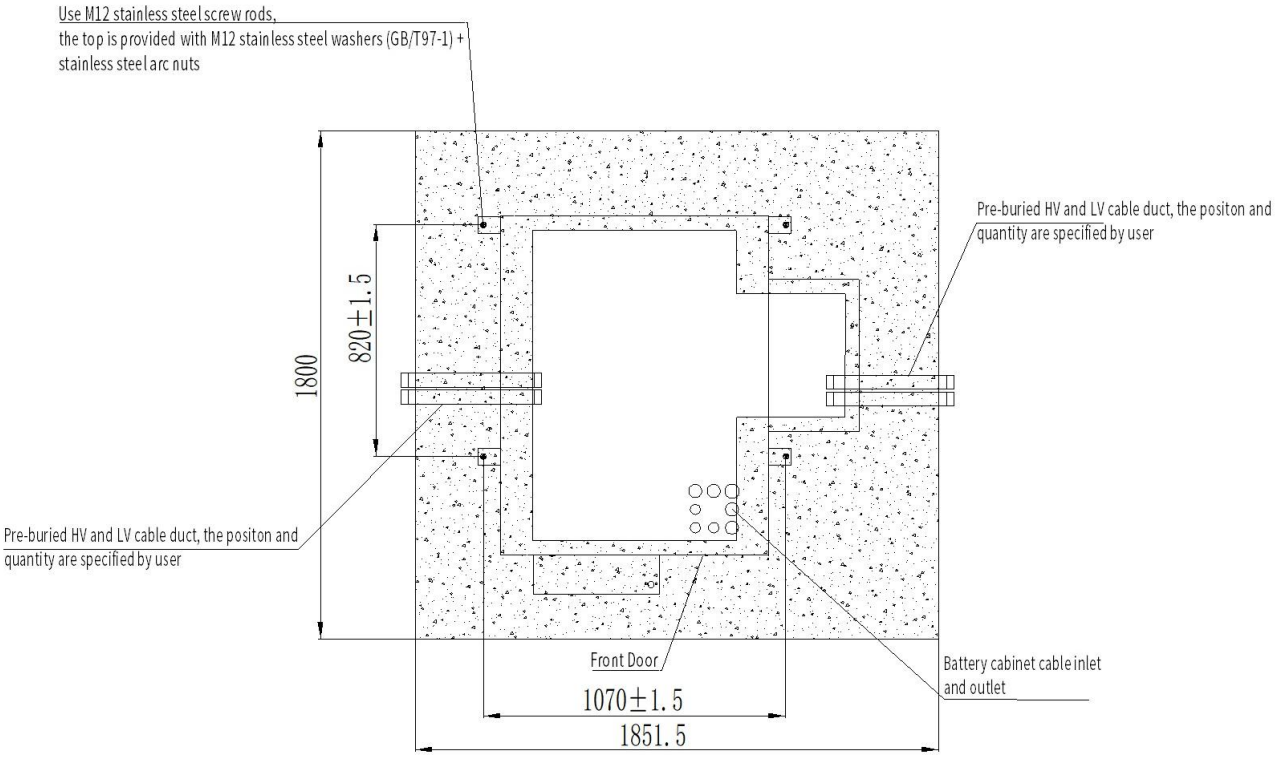


Figure 5-2 Foundation

3.Other Requirements：

- Place the grounding grid and reserve grounding strips at the PrimePower's ground position. Connect one end of the grounding grid to the embedded grounding grid, and the other end to the PrimePower's grounding point. When the grounding network is embedded, ensure there is sufficient length for the grounding plate to connect to the grounding point on PrimePower.
- The grounding resistance of PrimePower should be less than or equal to 0.1 Ω.
- The PrimePower energy storage system adopts bottom wiring, so the cables need to be buried below the power cabinet in advance.
- The inner diameter of the protective pipe should be no less than 1.5 times the outer diameter of the cable (including the protective layer).
- The foundation construction should meet the drainage requirements for the local maximum historical rainfall. The discharged water should be treated in accordance with local laws and regulations.

5.2.2. Level land surface installation

Before installing this PrimePower, please establish the foundation and cable tray on the selected ground. The requirements for foundation construction are as follows:

1. The foundation dimensions should meet the installation and bearing capacity requirements of PrimePower, as shown in Table 5-2 below.

Table5-2 The construction requirements

Type of ground	Requirement	Remark
Concrete floor	The ground needs to be able to bear a load of 1.5*n (where n represents the number of parallel machines) tons.	The ground should meet the following requirements: ◆ Horizontal deviation≤±10 millimeters ◆ Plane degree deviation≤±4 millimeters per 2 meters
Level land surface		

(Take PrimePower installation as an example)

- As shown in figure 5-2, each cabinet has four fixed points;
- Pre-embedded 4-M12 stainless steel screws at fixed points, with the height of the screws protruding from the ground being 38mm;
- Flat ground installation is suitable for areas where there will be no high (≥50mm) water accumulation. If the installation area is prone to water accumulation, it is recommended to add a foundation.

2. Requirements for cable trays

- Wire slot is recommended to be made of corrosion-resistant metal wire slot (such as stainless steel, aluminum alloy, etc.) to adapt to the environment of the plant station.as the figure5-4 shown

The total cross-sectional area of the cable should not exceed 40% (for power lines) or 50% (for control cables) of the cross-sectional area within the cable tray. It is recommended that the specification of a single cable tray should be no less than 50mm*100mm. The specific quantity and specification should be confirmed based on the number of parallel units in the plant station and the cable specification.

- Wire slot must be reliably grounded throughout, with electrical connection between each section

and connection to the grounding grid of the plant station.

● After the cable is wired, all holes in the cable ducts and joints of the cable troughs must be sealed to prevent small animals from entering and to prevent fire.

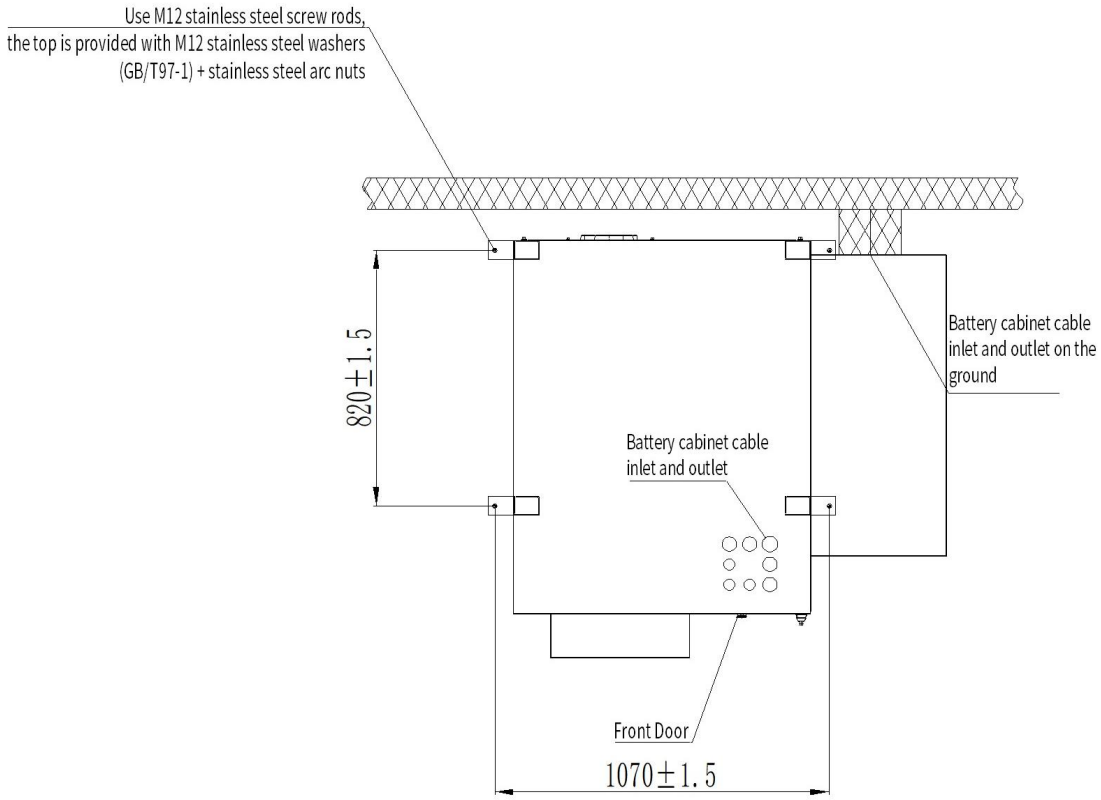


Figure 5-3 Foundation requirement

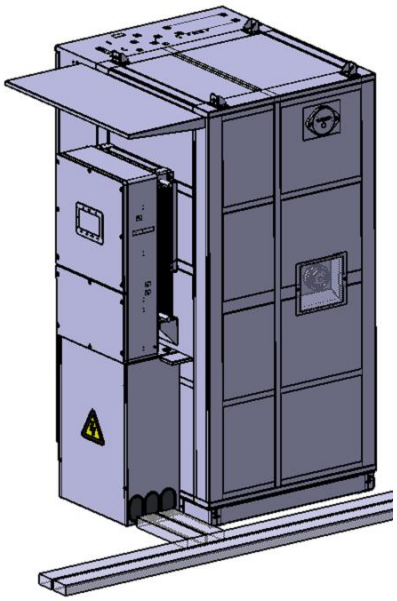


Figure 5-4 Foundation requirement

3. Other requirements：

- Bury the grounding grid and reserve grounding strips at the ground position of primrpower. Connect one end of the grounding grid to the embedded grounding grid and the other end to the primepower grounding point. When embedding the grounding network, reserve sufficient length so that the grounding sheet can be connected to the grounding point on primepower
- The ground continuity resistance of primepower is less than or equal to 4 Ω. The foundation construction should meet the drainage requirements of the local historical maximum rainfall.
- The discharged water should be treated in accordance with local laws and regulations

5.3. Mechanical Installation

5.3.1. Requirements for Disassembly of Product Outer Packaging

The unpacking steps are as follows:

1. Remove the wrapping film outside the packaging box.

2. First, remove the top cover of the wooden box, and then take off the four side panels.

3. Remove the packaging bag, unscrew the four nuts on the wooden box pallet, and take off the bolts and washers.

4. Remove the equipment from the tray.

5. Unpacking is complete.

5.3.2. PrimePower Installation and fixation requirements

The bottom surface of the cabinet should be directly facing the installation surface of the foundation, placed in the center, and there should be no obvious skew.

Installing the cabinet: The cabinet should be firmly and reliably installed. The bolts (M12 stainless steel screws) used to fix the cabinet need to be pre-buried in the base simultaneously during the concrete pouring process. The pre-buried depth should be no less than 20mm. The installation surface of the base should be flat, without any unevenness or obvious inclination.

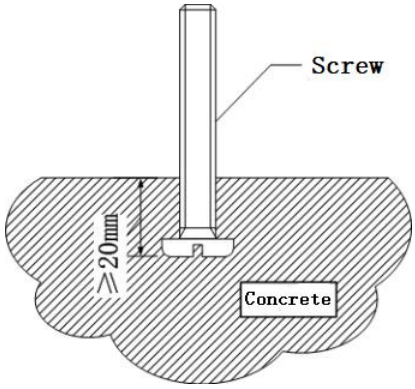


Figure 5-3 Sectional view of embedded screws

After the cabinet is placed on the base, it is locked with stainless steel arc nuts, and the locking torque is 32-40 N.m.

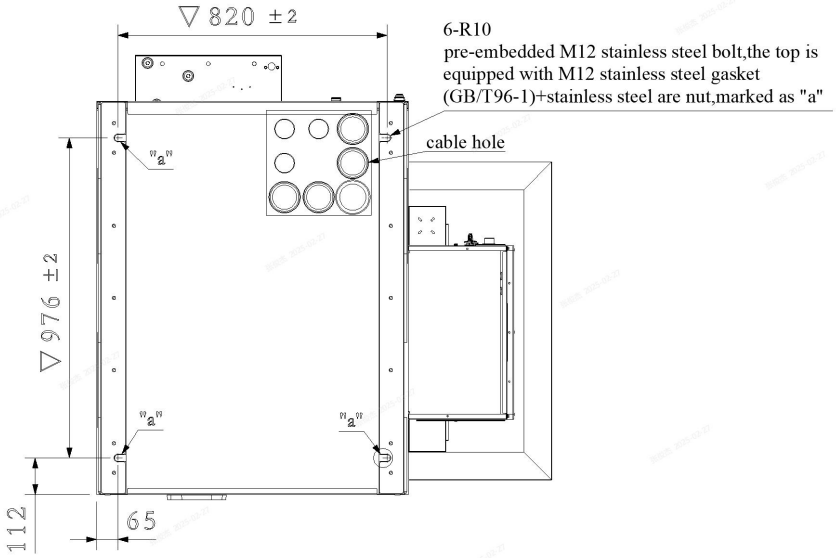
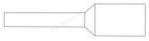
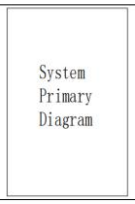
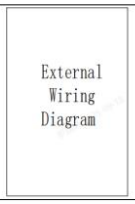
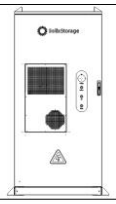
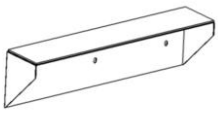
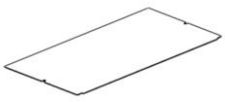
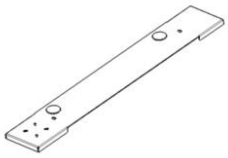
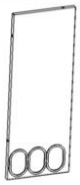
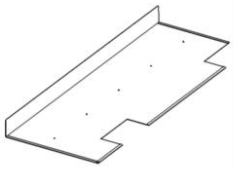
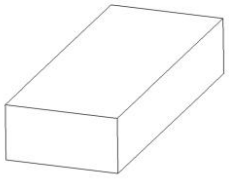
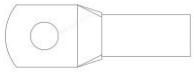


Figure 5-4 Cabinet installation holes position diagram

5.3.3. Packaging

Please ensure that the following items are included in the packaging with your machine:

				
INV_BAT1 HV CABLE ×1	INV_BAT2 HV CABLE ×1	Power cable for AC Backup Port ×1	INV-Earthing Cable ×2	network cable_5m_Black ×1
				
Cold terminal_16mm2 ×10	Cold terminal_0.5mm2 ×20	Ribbon ×20	Bracket_ fixation of integrated cabinet ×4	Quick Installation Manual×1
				
FAT Report×1	System Primary Diagram×1	External Wiring Diagram×1		
				
PrimePower integrated cabinet ×1	Anti- theft lock ×1	Bracket_Inverter fixed ×1	Bracket_external cover panel 5 ×1	Bracket_external cover panel 4 ×1
				
M6×10 hexagon flange bolt ×17	M10×16 hexagon flange bolt ×9	M5 hexagon flange nut ×2	Bracket_external cover panel 2 ×1	Bracket_external cover panel 1 ×1
				
Bracket__nverter cover panel02 ×1	Bracket__Cabinet bottom baffle plate ×1	Bracket_external cover panel 3 ×1	Fireproof sealing adhesive ×3000g	Copper lug _25mm2 ×2

If anything is missing, please contact your local Solis distributor.

Comparison table of accessories and labels:

NO.	Label	Name	unit	Set
1	M170001-02510	Bracket_Inverter fixed	pcs	1
2	M170001-02442	Bracket_external cover panel 1	pcs	1
3	M170001-02443	Bracket_external cover panel 2	pcs	1
4	M170001-02444	Bracket_external cover panel 3	pcs	1
5	M170001-02445	Bracket_external cover panel 4	pcs	1
6	M170001-02446	Bracket_external cover panel 5	pcs	1
7	M170001-02447	Anti- theft lock	pcs	1
8	M170001-02466	Bracket__nverter cover panel02	pcs	1
9	M170001-02467	Bracket__Cabinet bottom baffle plate	pcs	1
10	M170001-02468	Bracket_ fixation of integrated cabinet	pcs	4
11	FP02N09-0001	M5 hexagon flange nut	pcs	2
12	FP03B03-0004	M6×10 hexagon flange bolt	pcs	17
13	FP05B03-0001	M10×16 hexagon flange bolt	pcs	9
14	L061101-02097	INV_BAT1 HV CABLE	pcs	1

15	L061101-02098	INV_BAT2 HV CABLE	pcs	1
16	L061101-02099	Power cable for AC Backup Port	pcs	1
17	L071101-02170	INV-Earthing Cable	pcs	2
18	L130001-02005	network cable_5m_Black	pcs	1
19	L110301-0023	Cold terminal_16mm^2	pcs	10
20	L110301-0016	Cold terminal_0.5mm^2	pcs	20
21	K09PA01-0800	Ribbon	pcs	20
22	L100101-0804	Copper lug _25mm^2	pcs	2
23	G040000-02001	Fireproof sealing adhesive	g	3000
24	U020000-02010	PrimePower integrated cabinet	set	1
25	/	Quick Installation Manual	copy	1
26	/	FAT Report	copy	1
27	/	System Primary Diagram	copy	1
28	/	External Wiring Diagram	copy	1

5.3.4. PrimePower cabinets installation with hybrid inverters

Note: (N) means the label of accessory

The battery cabinet and the hybrid inverter are shipped separately. At the customer's site, the hybrid inverter needs to be installed on the battery cabinet first. The installation steps are as follows:

1. If the cabinet anchor uses external locking bracket **(10)M170001-02468**, it is necessary to use M10×16 hexagonal flange face bolts to fix the locking bracket at 4 anchors, draw lines at the ground screw holes, remove the bracket for drilling operation, install the M12 stainless steel screw after the drilling is completed, and lock the bracket with M10×16 hexagonal flange face bolts and M12 nuts;

2. Use M6×10 hexagonal flange bolts to fix **(8) M170001-02466** at the upper right position of the cabinet.

3. Use M10×16 hexagonal flange bolts to lock the back plate of the hybrid inverter onto the cabinet body, and then use a lift truck to assemble the hybrid inverter onto the back plate. Lift the hybrid inverter (be careful to avoid physical strain), and align the back plate of the hybrid inverter with the raised part of the installation bracket. Hang the hybrid inverter on the installation bracket and make sure it is firmly installed.

4. Fix **(1) M170001-02510** to the bottom of the hybrid inverter using M6×10 hexagonal flange bolts. When fixing, ensure that **(1) M170001-02510** is in close contact with the bottom of the hybrid inverter.

5. Use M5×10 hexagonal flange bolts to fix **(2) M170001-02442**, **(3) M170001-02443** and **(4) M170001-02444** on the right side of the cabinet as shown in the diagram.

6. Use M5 hexagonal flange nuts to fix **(6) M170001-02446** to the bottom of **(2) M170001-02442** and **(3) M170001-02443**. Note that the notch position of **(6) M170001-02446** should face the cabinet body. If a foundation well has been built below, this component does not need to be assembled.

7. Before installing the wiring harness, place the **(9) M170001-02467** at the bottom of the cabinet, align the two notches with the anchor bolts, and place the rear end above the bent edge of the rear anchor bolt cover plate. After the wiring harness is installed, when installing the front end cover plate, flip the lower end of the front end cover plate and insert it below the **(9) M170001-02467**.

8. After the hybrid inverter wiring harness is assembled, use M6×10 hexagonal flange bolts to fix the **(5) M170001-0244**5 onto the **(2) M170001-02442** and **(3) M170001-02443** to prevent the wiring harness from being exposed ,and use M6×10 hexagonal flange bolts to fix the (7)M170001-02447 onto the cabinet.

Table 5-2 Bolt and nut torque gauge

Bolt diameter	Torque(N.m)	Re-twisting torque(N.m)
M5	6	5
M6	10	8
M10	40	32

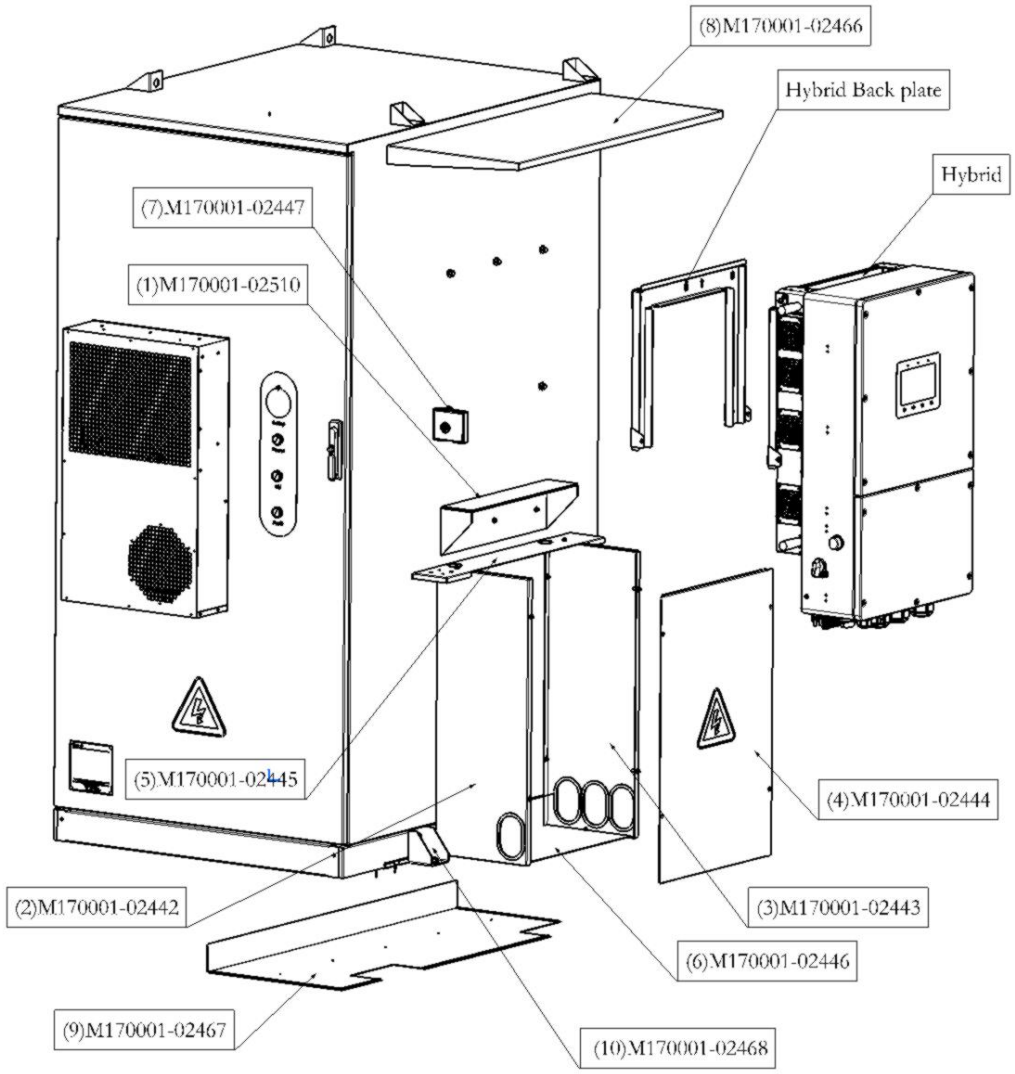


Figure 5-5 Installation diagram of the hybrid inverter and battery cabinet

5.3.5. Tool list

The main tools used during the installation process can be referred to in the following figure and table.

Table 5-3 List of Tools

No.	Tool	Technical requirements	Amount
1	Insulating gloves	Insulation class ≥1500V	2pcs
2	Insulating shoes	Insulation class ≥1500V	2pcs
3	Protective mask or goggles		
4	Insulation sleeve wrench	Insulation class ≥ 1500V Insulation bushing kit	1set
5	Forklifts or lifting gear and cranes	Rated load-bearing capacity of over 2 tons (> product weight 1.5 tons)	1set
6	Torque wrench	0-150N.m	1pcs
7	Wrench and socket set	6-32mm	1set
8	Wrench assembly component	6-32mm	1set
9	Screwdriver set	Slotted head, crosshead and hexagonal head	1set
10	MC4 dedicated wire crimping pliers		1pcs
11	Wire stripper		1pcs

12	Terminal crimping device		1pcs
13	Hot air blower		1pcs
14	Hex key	M8	1set
15	Insulation Resistance Meter	Test voltage ≥ 1500V	1set
16	Network cable tester		1set
17	Multimeter		1set
18	Phase sequence table		1set

5.3.6. Product Installation Requirements

When choosing the installation location for the product, the following criteria should be considered:

1) Direct exposure to sunlight may cause the inverter to output reduced power due to overheating. It is recommended to avoid installing the inverter in a position directly exposed to sunlight. The ideal location is where the surrounding temperature does not exceed 40°C.

2) It is recommended to install the inverter at a position where rain and snow will not directly fall on it. The ideal installation location is on the north-facing wall under the eaves.

3) Do not install the inverter in an environment where there may be explosive atmospheres.

4) The inverter must be installed vertically (90 degrees, or tilted backward by no more than 15 degrees).

5) The temperature of the inverter's heat sink can reach 75°C.

6) Product installation gap requirements, please refer to Section 5.1.1 for detailed information.

7) Avoid direct exposure to sunlight.

It is advisable to avoid installing the inverter in a location exposed to direct sunlight. Direct sunlight may cause:

- Reduced power output (resulting in decreased system energy output)
- Early wear of electrical/mechanical components
- Early wear of mechanical components (seals) and user interface

1) Air circulation

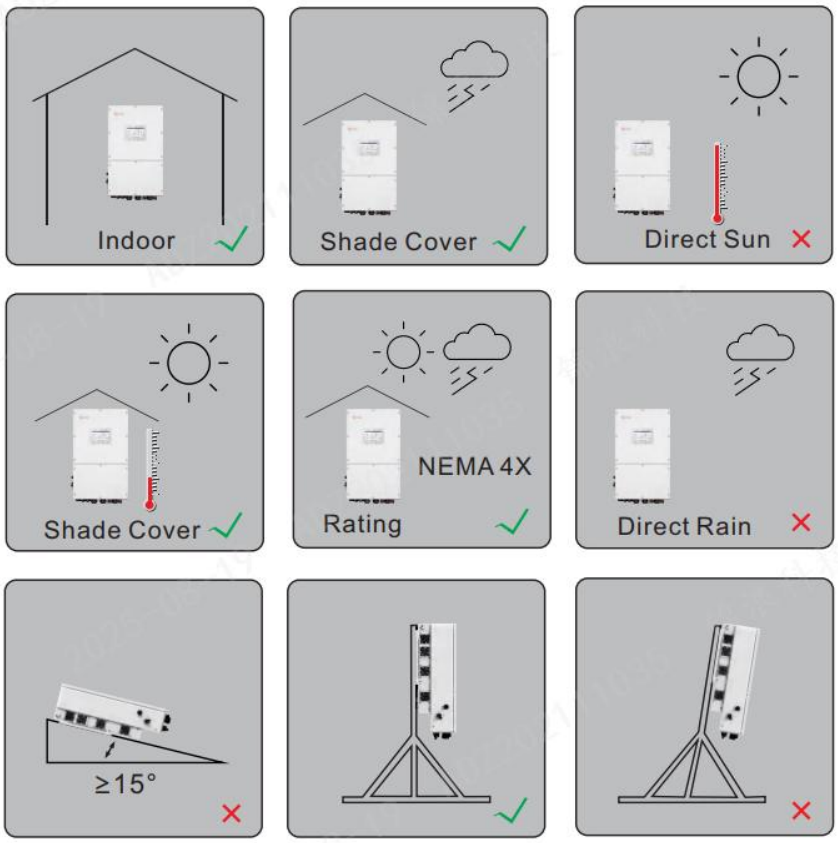
- Do not install it in a small, enclosed room where air cannot flow freely
- To prevent overheating, always ensure that the air circulation around the inverter is not obstructed

2) Flammable substances

- Do not install it near flammable substances. Keep at least three meters (10 feet) away from such substances

3) Living area

- Do not install it in a living area where people or animals stay for a long time. Depending on the installation location of the inverter (such as the type of surface around the inverter, the general attributes of the room, etc.) and the power supply quality, the sound level of the inverter may be very high.

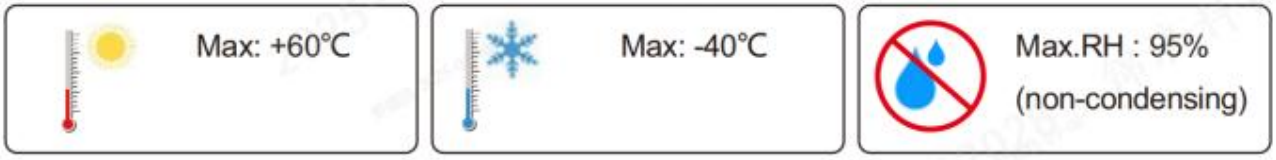


⚠WARNING

Hot Surface

The temperature of the inverter heat-sink can reach 75℃.

The ambient temperature and relative humidity of the installation environment should meet the following requirements:



5.4. Electrical Connections

5.4.1. Wiring Requirements

The cables used in the system are divided into power cables, auxiliary power supply cables and communication cables. It is recommended to place the power cables, auxiliary power supply cables and communication cables in different cable trenches to reduce electromagnetic interference caused by voltage fluctuations.

The power cables, auxiliary power supply cables and communication cables should run side by side, with a distance of more than 200mm. The wiring should avoid crossing as much as possible, and at the crossing points, the cables need to maintain a 90 degree right angle, with a distance of no less than 250mm.

The recommended minimum space distance between parallel cables and power cables and the corresponding relationship in the field are shown in the following table.

Table 5-4 Minimum spatial distance

Length of parallel cables	Minimum spatial distance
200m	0.2m
300m	0.3m
500m	1.2m

5.4.2. Cable Fixing Requirements

In order to prevent the connection copper terminals from loosening due to force, resulting in poor contact, increased contact resistance, overheating and even fire, it is necessary to ensure that when tightening the screws of the connection copper terminals, the following torque requirements should be met:

Table 5-5 Screw Torque Table

Screw specification	M3	M4	M5	M6	M8	M10	M12	M16
Torque (N.m)	0.8-1	1.8-2.2	4-5	6-8	12-15	32-40	56-70	96-120

To reduce the force exerted on the copper terminals of the wiring, the cables should be fixed at appropriate positions.

5.4.3. System Grounding Requirements

Grounding resistance requirements:

1. Continuity of equipment grounding: R < 0.1 Ω;

2. Recommended value for system grounding resistance: no more than 4 Ω

5.4.4. PrimePower Electrical Connection

The external connections of PrimePower mainly include **power cable connections**, **auxiliary power connections** and **communication interfaces**. Since PrimePower ships the battery cabinet and the hybrid inverter separately when delivering the products, the electrical connections of PrimePower are mainly divided into two parts. One part is the electrical connection between the battery cabinet and the hybrid inverter, and the other part is the connection between PrimePower and the on-site equipment.

The electrical connection between the battery cabinet and the hybrid inverter mainly consists of DC circuit cable connections, AC auxiliary power connections, communication cable connections and grounding cable connections.

The connection between PrimePower and the equipment site mainly includes the wiring of the PV module circuit, the grid circuit wiring, the wiring of the customer load (Backup port), the diesel generator circuit wiring, the connection of PrimePower to the site's grounding wire, and the connection of PrimePower to the communication cables at the site.

DANGER

- **Before installing the cables, make sure that the OCPD (circuit breaker) is turned off.**
- **Before proceeding with the operation, use a multimeter to confirm that the voltage is 0Vac**

5.4.4.1. The electrical connection between the battery cabinet and the hybrid inverter

5.4.4.1.1. DC circuit cable connection between the battery cabinet and the hybrid inverter

1. DC circuit cable connection: The hybrid inverter is connected to the battery cabinet distribution box via two dc power cables.

2. The label of the cable is: L061101-02097 (BAT1), L061101-02098 (BAT2). Connect according to the

connection points shown in Figure 5-7. When wiring, pay attention to the polarity definition. The following is the interface definition:

3. Note: When connecting the battery cabinet, remove the surface protective cover plate first before wiring. After wiring is completed, put the protective cover plate back.

Position	Terminal 1	Terminal type	Position	Terminal 2	Terminal type	remark
Battery cabinet	BAT1+	Copper- lug	Hybrid inverter	BAT1	Tubular terminal	DC+
	BAT1-	Copper- lug			Tubular terminal	DC-
	BAT2+	Copper- lug		BAT2	Tubular terminal	DC+
	BAT2-	Copper- lug			Tubular terminal	DC-

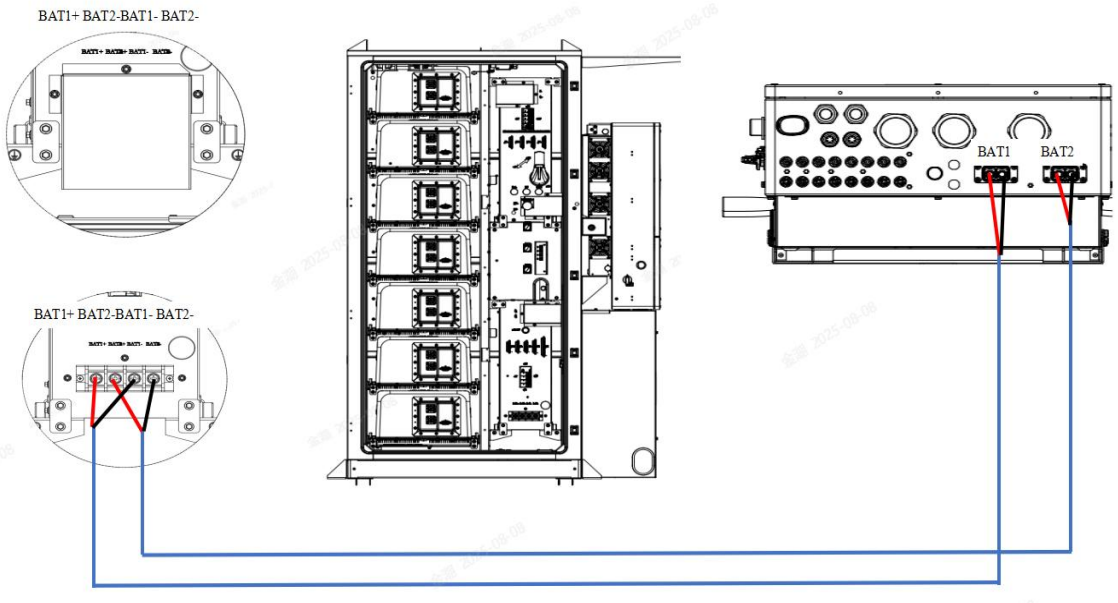
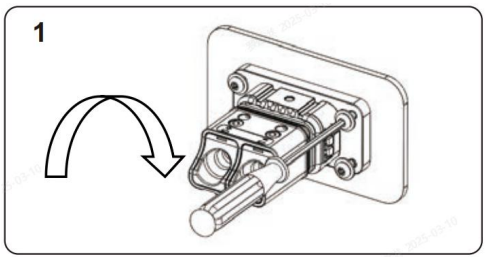


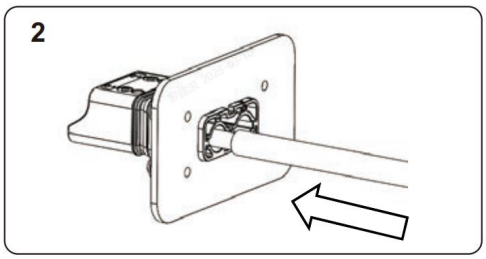
Figure 5-7 Diagram of DC circuit connection for battery cabinet

5.4.4.1.1.1. Steps for connecting the battery terminals of the hybrid inverter:

1) Press the locking plate screws with the T20 Torx Screwdriver, with a torque of 1.2 ± 0.1 N.m.

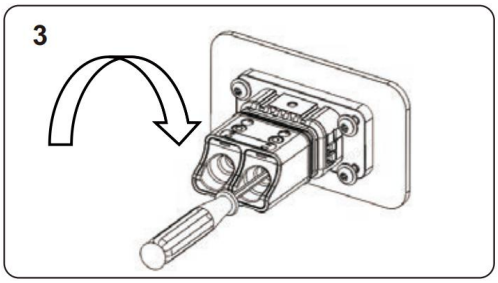
2) Insert the stripped wires into the corresponding connection holes in the order of wiring.

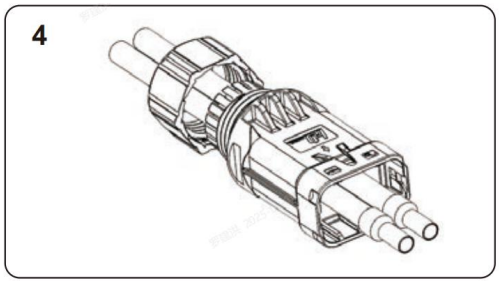




3) Press the wiring with a T8 Torx Screwdriver, with a torque of 1.2 ± 0.1 N.m.

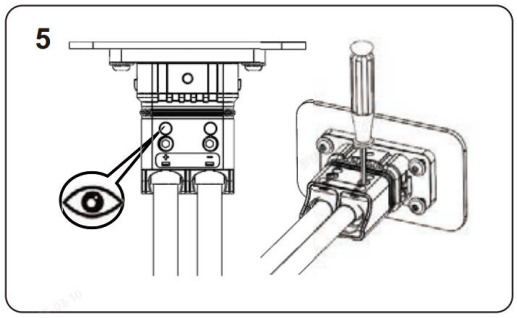
4) One by one，insert the stripped wires into the locking nut and the main body (soft wires need to be riveted to the insulation terminals).

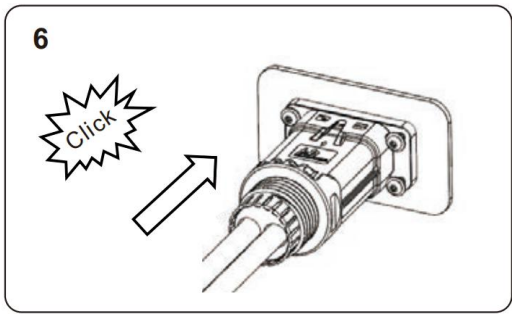




5) Insert the cable into the rubber core in the order of the lines. Observe the viewing hole. The cable is in place. The torque of the crimping screwdriver is 4 ± 0.1 N.m.

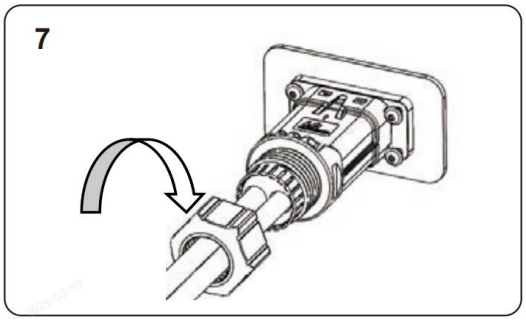
6) Insert the main body into the rubber core and hear the "click" sound.

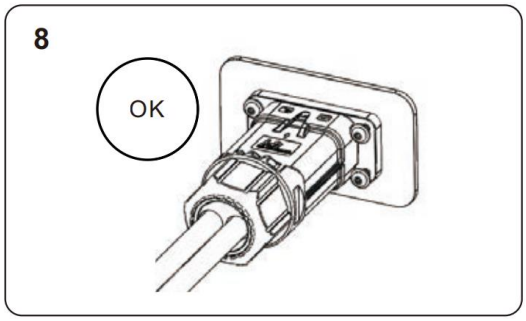




7) Tighten the nut with an open-end wrench (torque 10.0 ± 0.1 N.m).

8) Installation completed.





5.4.4.1.2. AC auxiliary power connection between the battery cabinet and the hybrid inverter

1. The label of the wiring harness is: L061101-02099. Connect according to the connection points shown in Figure 5-8. The following is the interface definition:

Position	Terminal 1	Terminal type	Position	Terminal 2	Terminal type	Remark
cabinet XT terminal	XT：1	Tubular terminal	Inverter Backup port	L4	Copper lug	A phase
	XT：3	Tubular terminal		L5	Copper lug	B phase
	XT：5	Tubular terminal		L6	Copper lug	C phase
	XT：7	Tubular terminal		N	Copper lug	Neutral
	XT：9	Tubular terminal		PE	Copper lug	PE

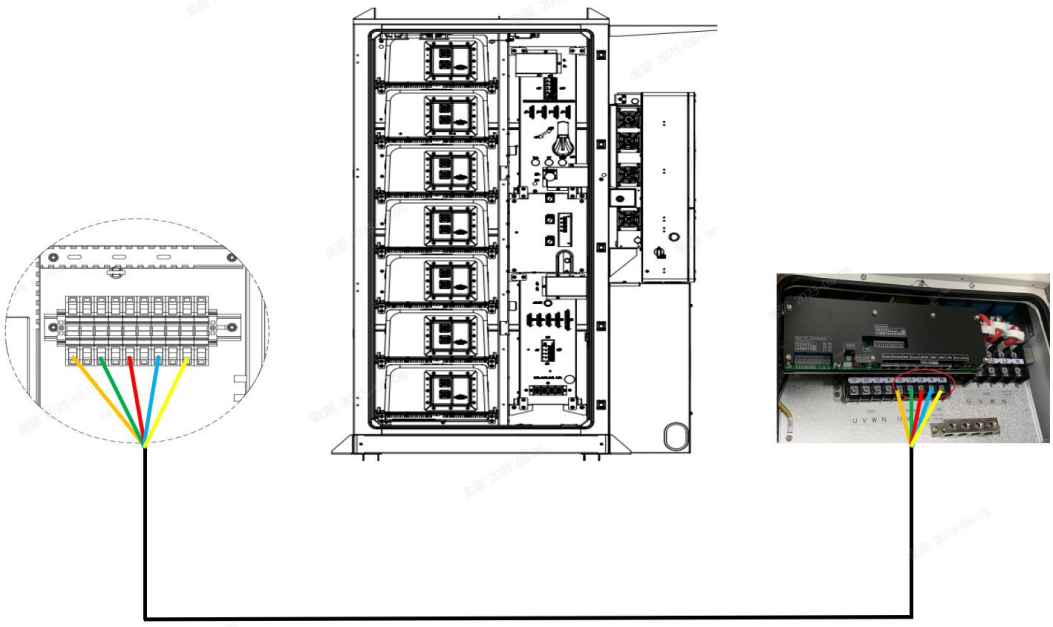


Figure 5-8 Auxiliary power connection

2. Connection precautions for the AC cables at the hybrid inverter (including Smart port/ Backup port /Grid port)

- There are three sets of AC output terminals, and the installation steps are almost same.
- The allowed maximum temperature when connecting the AC power and the battery terminals is 85°C.

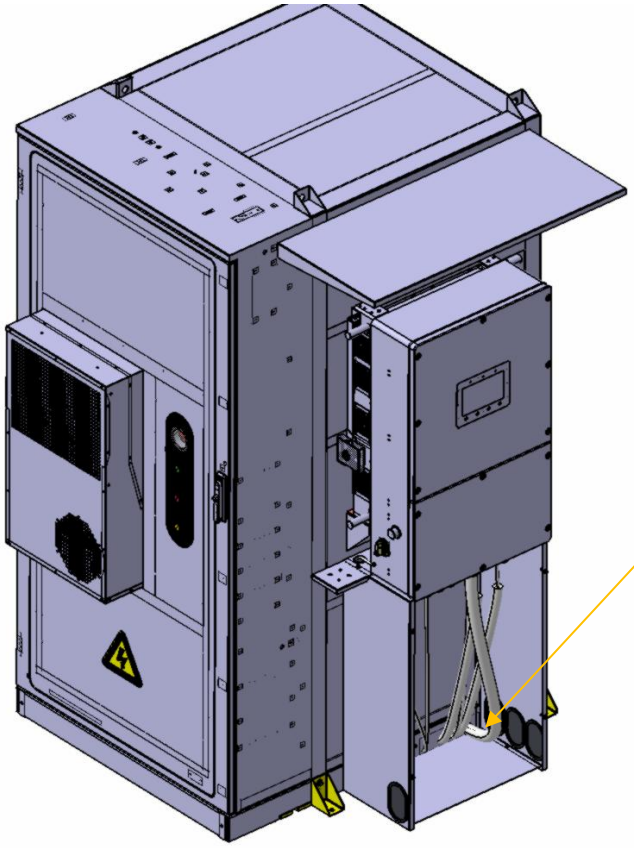


Figure 5-9 AC Auxiliary power cable wiring from inverter bottom

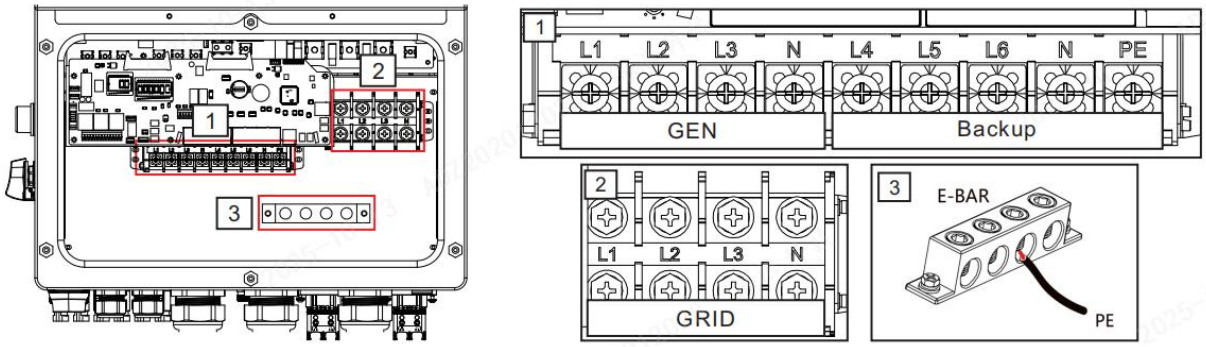


Figure 5-10 AC terminal in inverter wiring box

	Smart port(GEN)/ Backup/ Grid	Earth bar
AWG	4/4/0 AWG	2 AWG
Torque	3.4N.m /3.4N.m /5.1N.m	3.4N.m
Diameter	16 mm^2/16 mm^2/50 mm^2	25 mm^2
Nut specification	M6/M6/M8	M12

1) Connect the power cables of the backup port in inverter wiring box. The backup port should not be electrically connected to the grid port.(here is introduction about auxiliary power connection, only

need inverter backup port connection)

2) Strip 13 millimeters of insulation from the end of each cable and press-fit an R-type connector at the end.

3) Remove the terminal bolts, insert them into the connectors, and then tighten the bolts using a torque wrench.

4) Please refer to the terminal labels to connect the AC wires to the correct terminals in battery cabinet.

5) The recommended installation torque for the cable clips is 7-7.5 N.m. To ensure a waterproof effect, the operator should regularly check if the installation is secure.

3. XT terminal installation notices.

1) Be aware of the risk of electric shock. Only connect or remove wires when the power has been turned off.

2) Pay attention to the danger of terminal loosening: The screwdriver used to open and close the cantilever must be inserted to the bottom, and only a suitable 5.5mm flat-head screwdriver (such as SZF 3-1,0X5.5, 1206612) should be used. An unsuitable flat-head screwdriver may cause deformation of the XT terminal.

3) The XT terminal must be pressed in place. Press the cantilever down until the three marking points align, and then it is considered to be pressed in place.

4. The installation steps of the XT terminal are illustrated as follows

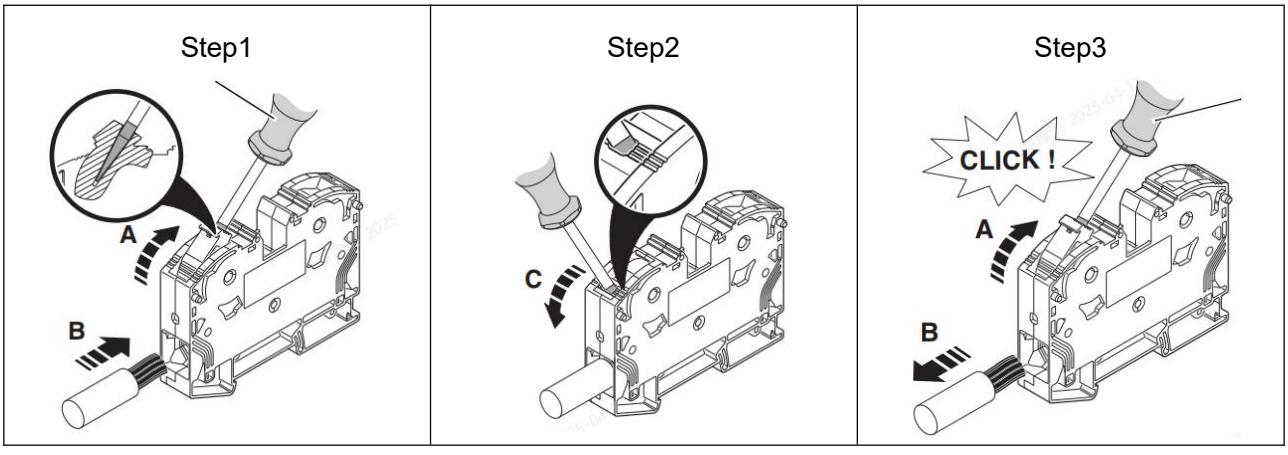


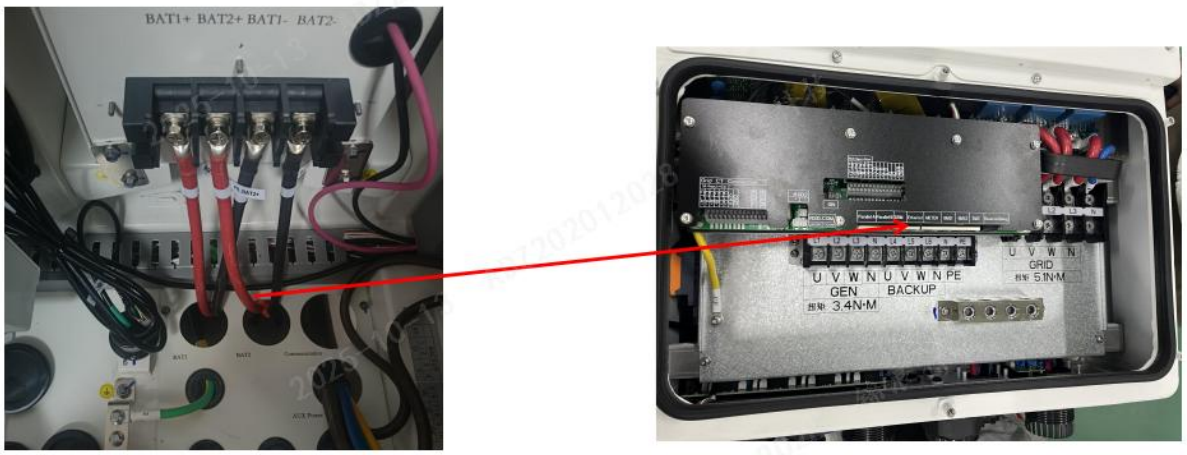
Figure 5-11 XT terminal installation steps

5.4.4.1.3. The communication cable connection between battery cabinet and the hybrid inverter

1. The communication cable from the hybrid inverter to the battery cabinet. Connecting the one CAN cables (with the label L071101-02150) reserved in the integrated cabinet according to Figure 5-10. Connect the end with the RJ45 to the communication interface of the hybrid inverter. The following is the interface definition.

Position	Terminal 1	Terminal Type	Position	Terminal 2	Terminal Type	Remark
Cabinet JX8 The battery terminal JX8 has been pre-installed	JX8：7	Tubular terminal	inverter arm board BMS1 Port	BMS1（for battery communication）	RJ45	CAN-H
	JX8：8	Tubular terminal				CAN-L

2. The battery terminal JX8 has been pre-installed. The RJ45 port is reserved at the below figure indicated position. During installation, pull out the cable and connect it to the corresponding port (BMS1) of the hybrid inverter according to the port definitions in the above table.



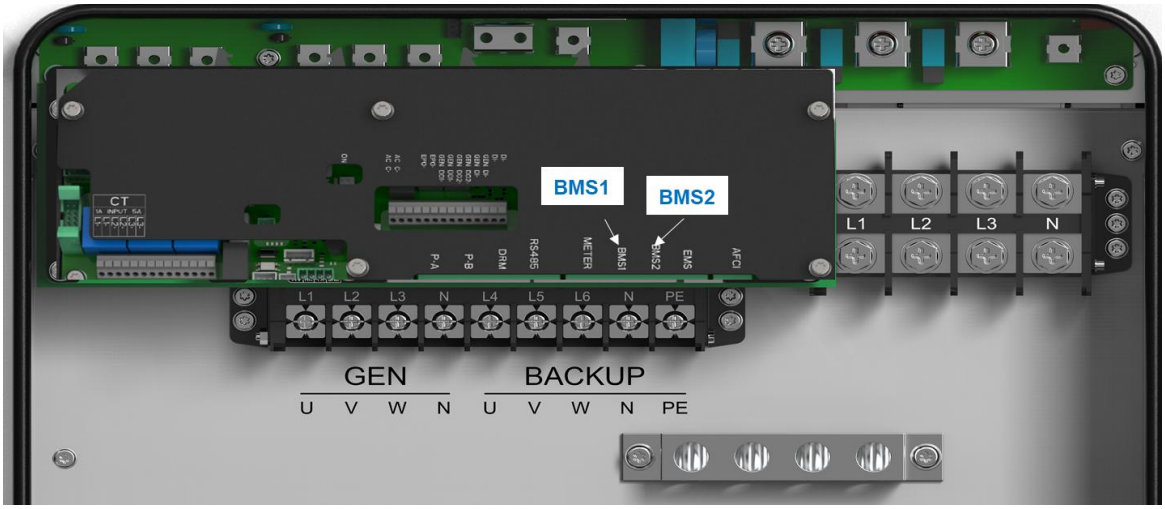
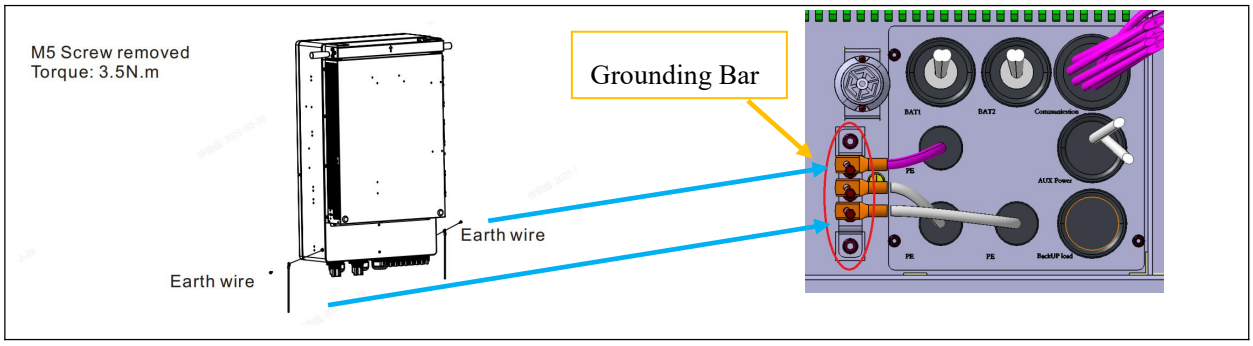


Figure 5-12 Communication cable connection diagram

5.4.4.1.4. The grounding cable connection between the battery cabinet and the hybrid inverter

1. As shown in Figure 5-13, on the right is the grounding copper bar of the battery cabinet. The holes in the copper bar are M6. SolisStorage will provide two grounding cables. The cable label is: L071101-02170 Connect the two grounding cables from the left and right shells of the hybrid inverter to the grounding copper bar.

2. About grounding copper bar in battery cabinet, please note that the first one and the third one terminal for hybrid inverter grounding cable connection, the middle one used for cabinet grounding to foundation ground.



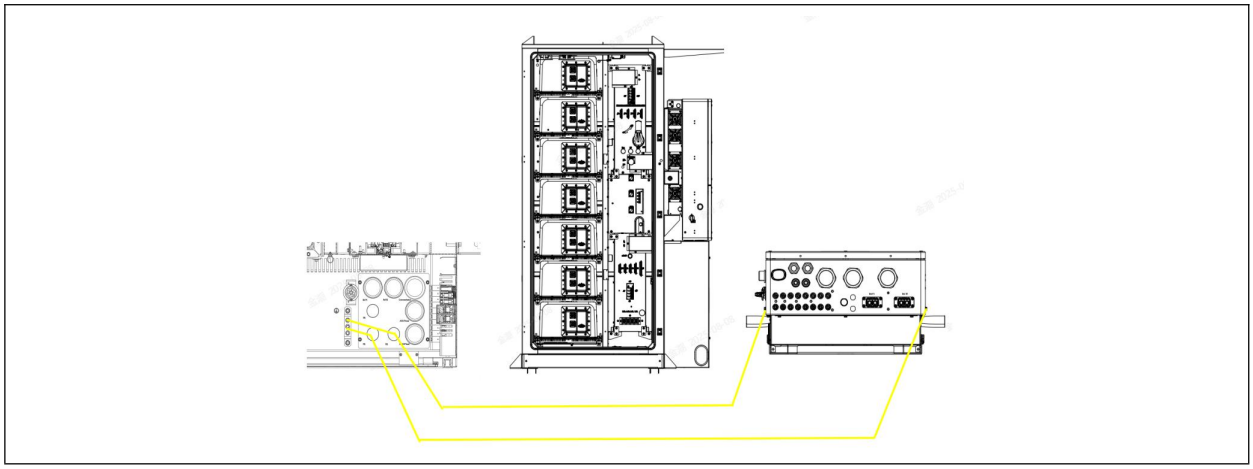


Figure 5-13 Grounding cable connection diagram

5.4.4.1.5. Connection between the cabinet and the Audible and Visual Alarm device (optional)

1. The audible and visual alarm is an optional component. When an audible and visual alarm is configured, using the wiring cable provided by SolisStorage. The label of the wiring harness is L071101-02125(it is an optional configuration if customer need), connect it according to Figure 5-14. Below is the interface definition.

Position	Terminal 1	Terminal type	Position	Terminal 2	Terminal type	Remark
cabinet JX10	JX10:5	Tubular terminal	Audible and Visual Alarm	+	Tubular terminal	Power 24V+
	JX10:6	Tubular terminal		-	Tubular terminal	Power 24V-

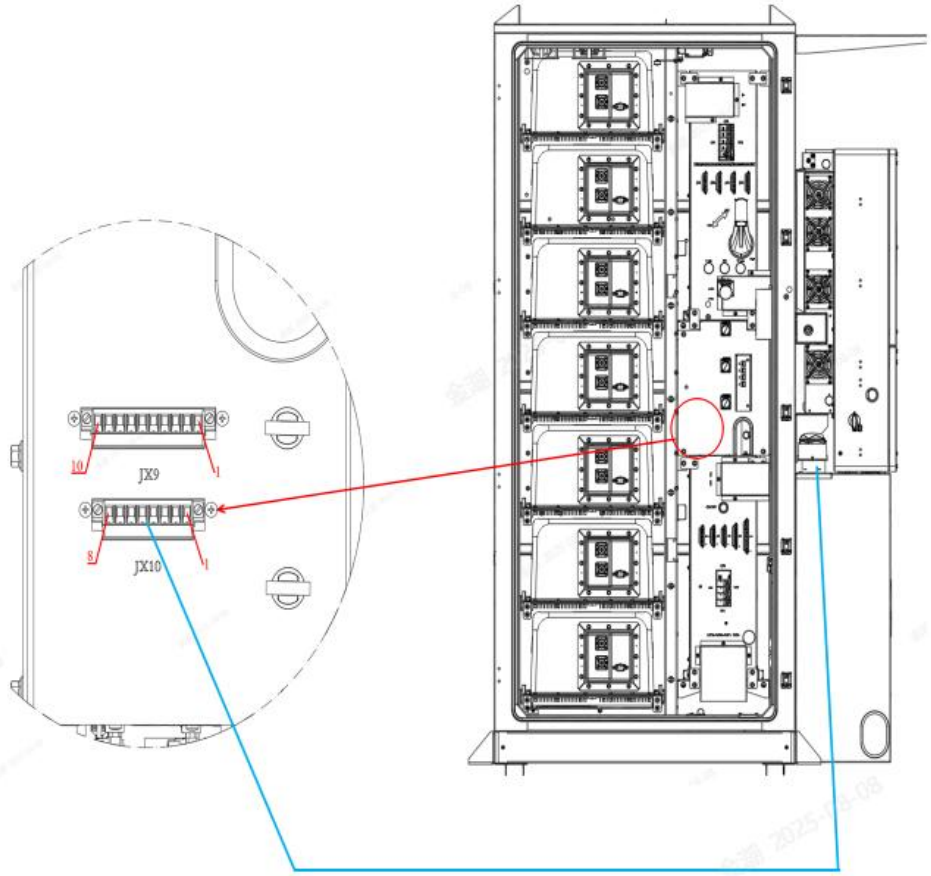


Figure 5-14 wiring for the audible and visual alarm

5.4.4.2. Connecting PrimePower to the Field Equipment

5.4.4.2.1. PrimePower Connection with on-site PV modules

DANGER

- Before connecting the inverter, make sure that the open-circuit voltage of the photovoltaic array is within the limit range of the inverter.
- Before connection, confirm that the polarity of the output voltage of the photovoltaic array matches the "DC+" and "DC-" symbols.
- Please use the approved DC cables for the photovoltaic system.

The customer's on-site PV system should be connected to the hybrid inverter. Please refer to Figure 5-15 for the wiring instructions:

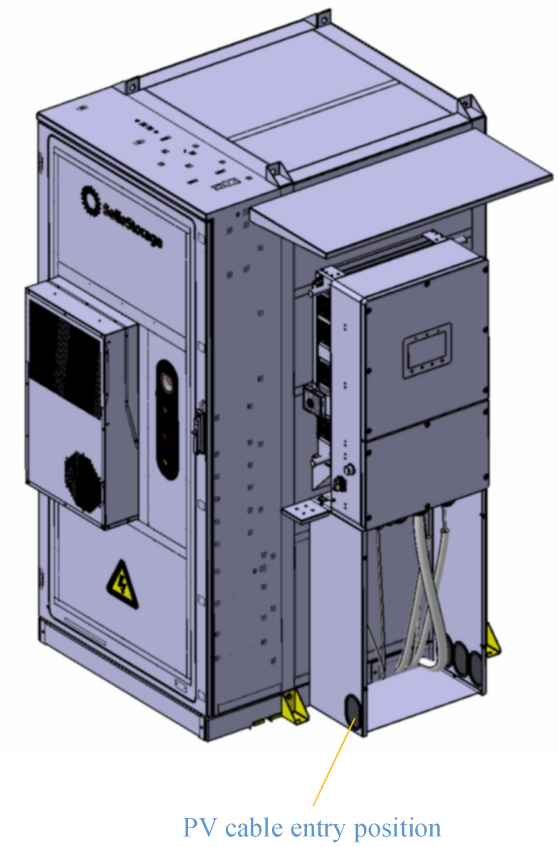
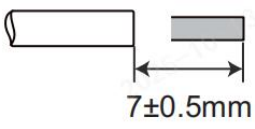


Figure 5-15 Photovoltaic Wiring Diagram

1. PV Cable Installation

1. Select the appropriate DC cable and strip the outer sheath of the wire by 7 ± 0.5 millimeters. Please refer to the table below for specific specifications.



Cable type	Cross section（mm²）	
	Range	Recommended value
Industry generic PV cable	4.0~6.0 (12~10AWG)	4.0（12AWG）

Figure 5-16-1

2. Remove the DC terminals of the accessory package, rotate the nut to disassemble it, and remove the waterproof rubber ring.

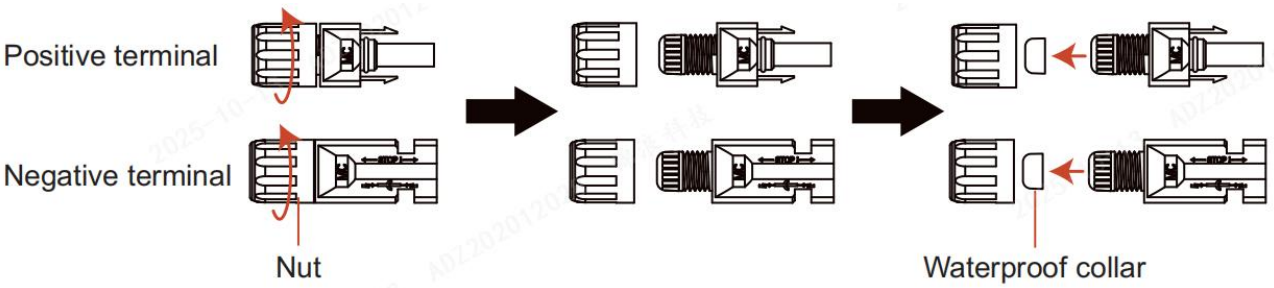


Figure 5-16-2

3. Pass the stripped DC cable through the nut and the waterproof rubber ring.

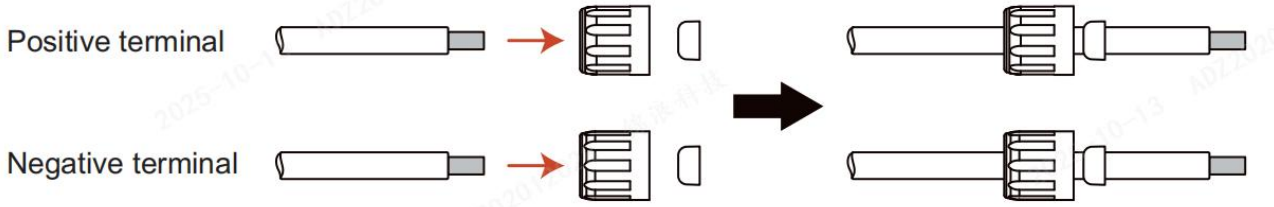


Figure 5-16-3

4. Connect the wire part of the DC cable to the metal DC terminal, and use the dedicated DC terminal crimping tool for crimping.

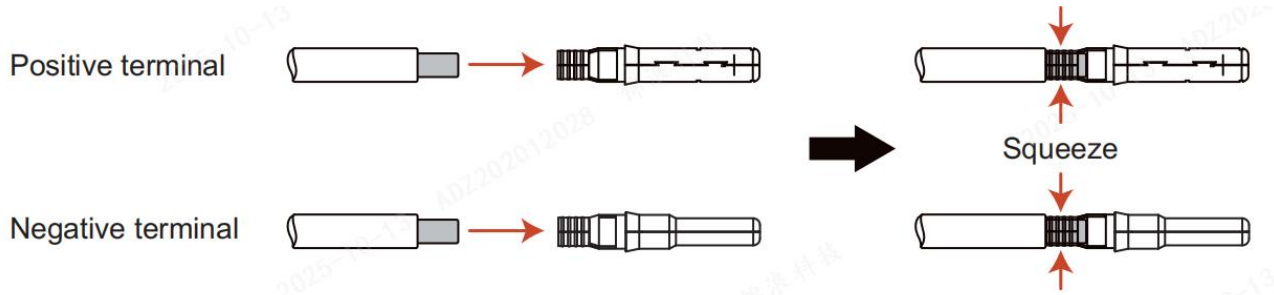


Figure 5-16-4

5. Insert the press-welded DC cable firmly into the DC terminal, then insert the waterproof rubber ring into the DC terminal and tighten the nut.

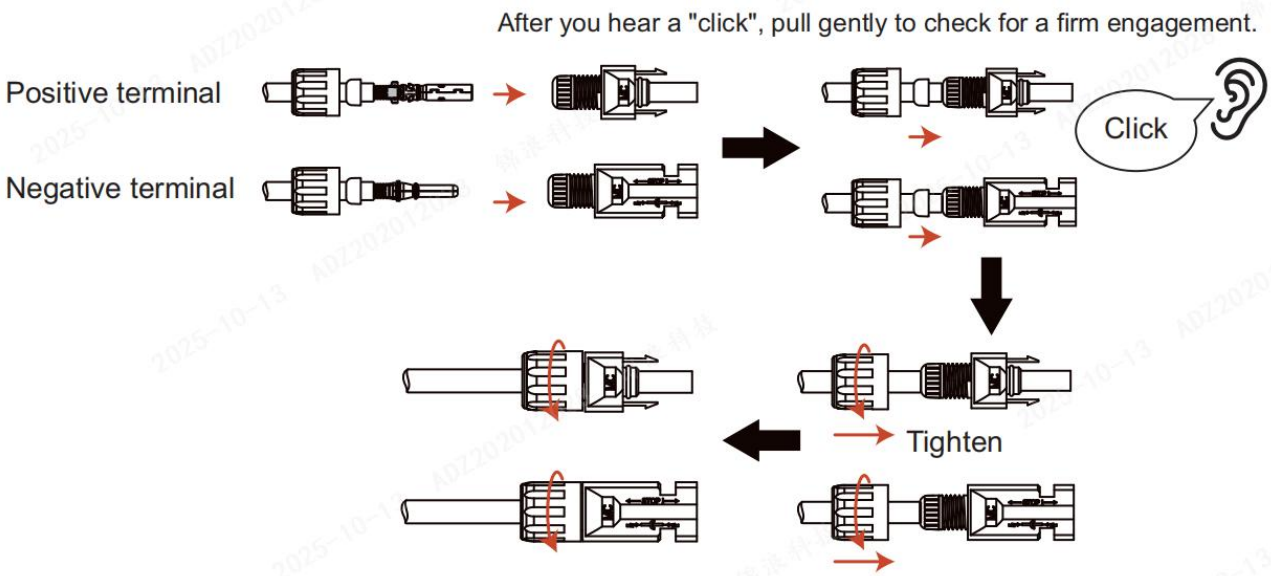


Figure 5-16-5

6. Use a multimeter to measure the DC input photovoltaic voltage and verify the polarity of the DC input cable.

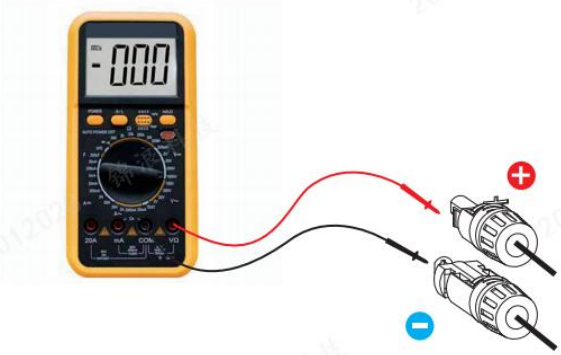


Figure 5-16-6

7. Connect the already wired DC terminals to the inverter as shown in the figure, and gently tighten the nuts to ensure a secure connection.When you hear a "click" sound, it indicates that the connection is correct and secure.

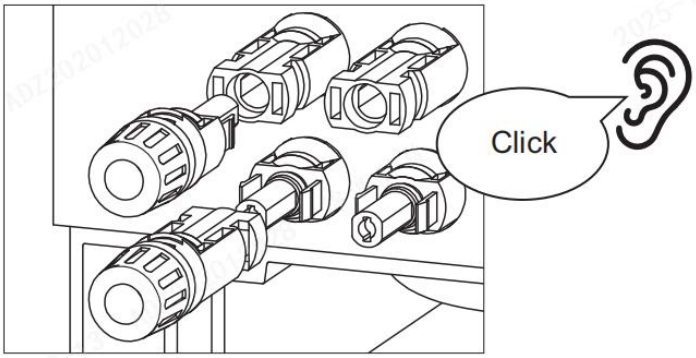


Figure 5-16-7

When installing, please pay attention to the following points:

If the DC input is accidentally reversed or the inverter malfunctions or operates abnormally, the DC switch must not be turned off. Otherwise, it may cause a DC arc, damage the inverter, and even lead to a fire.

The correct operation is:

- Use the clamp-type clamp meter to measure the DC series current.
- If the current is higher than 0.5A, wait until the solar irradiance decreases until the current drops below 0.5A.
- Only when the current is lower than 0.5A, is it allowed to close the DC switch and disconnect the photovoltaic series.
- To completely eliminate the possibility of faults, disconnect the photovoltaic series after closing the DC switch to avoid secondary faults caused by continuous photovoltaic energy the next day.
- Please note that any damage caused by incorrect operation is not covered by the equipment warranty.

5.4.4.2.1.1. Requirement of PV input

PV input requirement	
Max input voltage	1000V
Rated voltage	600V
Start voltage	180V
MPPT voltage range	150-850 V

Max input current	4*40A
Max short current	4-60A
MPPT number/Max input strings number	4/8

Please note that the maximum operating altitude is 4000 meters. However, when the altitude exceeds 2000 meters, the maximum input photovoltaic voltage will decrease. The table below shows the relationship between altitude and voltage.

Altitude（m）	Voltage (Vdc)
2000	1000
2700	1000
3000	981
3500	925
4000	875

5.4.4.2.2. Connecting PrimePower to the power grid

1. About local grid connection with inverter. Please refer to Figure 5-17 for the wiring procedure:

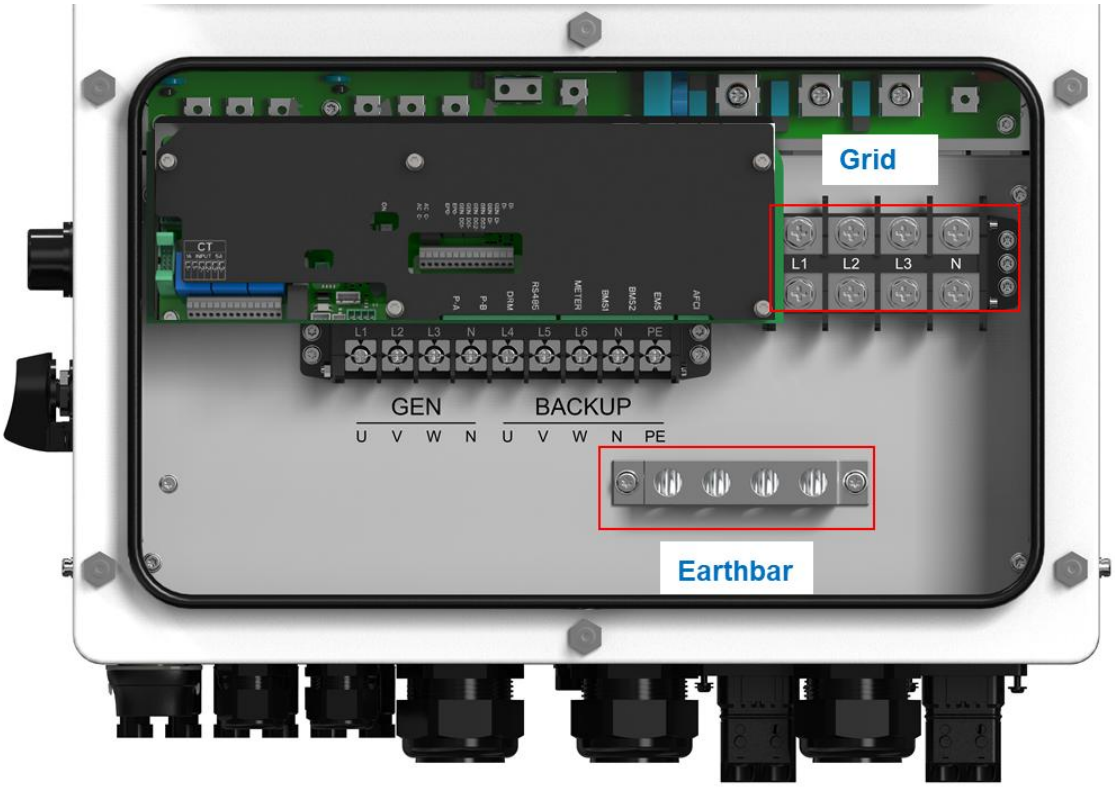


Figure 5-17 Connection for power grid

2. AC grid connection

Position	Terminal 2	Terminal type	Recommended Specification	Position	Terminal 1	Terminal type	Remark
Grid	A phase	Depends on the grid type of client side	50mm^2	Hybrid inverter GRID	U	R-type terminal	Torque: 5.1 N.m
	B phase		50mm^2		V	R-type terminal	Torque: 5.1 N.m
	C phase		50mm^2		W	R-type terminal	Torque: 5.1 N.m
	Neutral		50mm^2		N	R-type terminal	Torque: 5.1 N.m
	PE		25mm^2		PE	R-type terminal	Torque: 5.1 N.m

1) Connect the power cables of the grid port in inverter wiring box.

2) Strip 13 millimeters of insulation from the end of each cable and press-fit an R-type connector at the

end.

3) Remove the terminal bolts, insert them into the connectors, and then tighten the bolts using a torque wrench.
4) Please refer to the terminal labels to connect the AC wires to the correct terminals.
5) The recommended installation torque for the cable clips is 7-7.5 N.m. To ensure a waterproof effect, the operator should regularly check if the installation is secure.
6) The detailed connection information you can refer the Solis hybrid inverter manual

5.4.4.2.3. Connection between PrimePower and customers load

1. The power cable of the customer load is connected to the XT terminals of the cabinet. The connection should be carried out according to Figure 5-16. The following is the interface definition:

Position	Terminal 1	Terminal type	Recommended specification	Position	Terminal 2	Terminal type	Remark
Load side	A phase	Depend on load	16mm^2	Cabinet XT terminal	XT：2	Tubular terminal	A phase
	B phase		16mm^2		XT：4	Tubular terminal	B phase
	C phase		16mm^2		XT：6	Tubular terminal	C phase
	Neutral		16mm^2		XT：8	Tubular terminal	Neutral
	PE		16mm^2		XT：10	Tubular terminal	PE

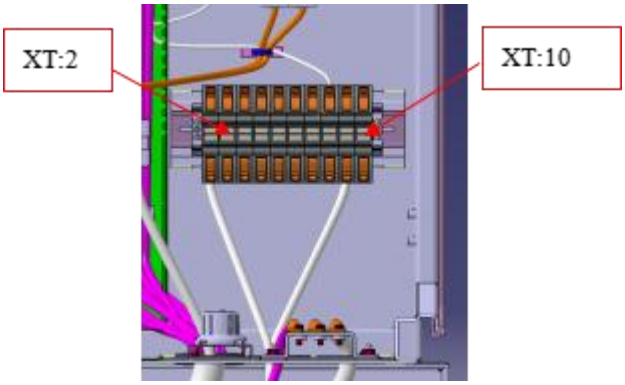


Figure 5-18 Backup Load connection position

When connecting the XT terminal block, please note the following: As shown in the picture below, for the XT terminal block, use a screwdriver to lift it up, and then insert the wire bundle terminal of the accessory into it.

5.4.4.2.4. Connection between generator and PrimePower

1. The diesel generator has been connected to the PrimePower hybrid inverter. Please refer to Figure 5-19 for the connection procedure.

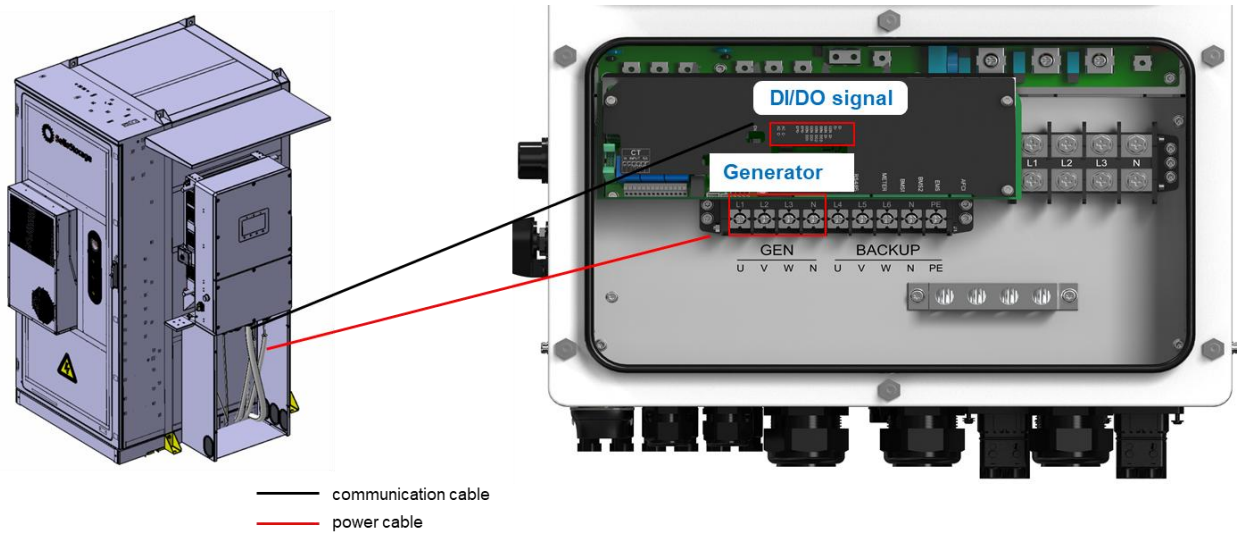


Figure 5-19 Generator connection position

2. Generator connection

Position	Terminal 1	Terminal type	Recommended Specification	Position	Terminal 2	Terminal type	Remark

Generator	A phase	Depend on generator	16mm^2	Hybrid GEN port	U	R-type terminal	Torque: 3.4 N.m
	B phase		16mm^2		V	R-type terminal	Torque: 3.4 N.m
	C phase		16mm^2		W	R-type terminal	Torque: 3.4 N.m
	Neutral		16mm^2		N	R-type terminal	Torque: 3.4 N.m
	PE		16mm^2		PE	R-type terminal	Torque: 3.4 N.m

1) Connect the power cables of the generator in inverter wiring box.
2) Strip 13 millimeters of insulation from the end of each cable and press-fit an R-type connector at the end.
3) Remove the terminal bolts, insert them into the connectors, and then tighten the bolts using a torque wrench.
4) Please refer to the terminal labels to connect the AC cables to the correct terminals.
5) The recommended installation torque for the cable clips is 7-7.5 N.m. To ensure a waterproof effect, the operator should regularly check if the installation is secure.
6) The detailed connection information you can refer the Solis hybrid inverter manual

5.4.4.2.5. Grounding cable Connection with PrimePower

As shown in Figure 5-20, PrimePower has a grounding connection copper bar. The copper bar has a M6 hole and requires the customer to connect a ground cable to the ground point at the site.

The recommended cable diameter is 25mm^2

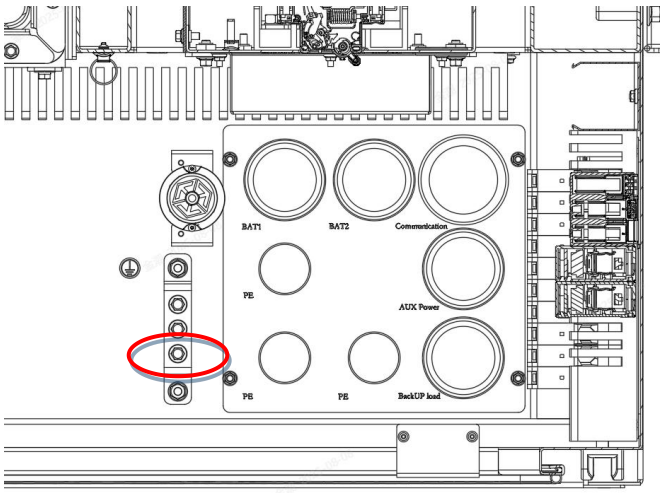


Figure 5-20 Grounding connection schematic diagram

5.4.4.2.6. Communication connection with PrimePower on site

1. The on-site Ethernet cable should be connected to the network port of the battery cabinet switch. The switch port can be wired arbitrarily, and there is no fixed position requirement Follow the connection method shown in Figure 5-21. The following is the interface definition.

Position	Terminal 1	Terminal type	Ethernet cable type	Position	Terminal 2	Terminal type	Remark
Customer device	Depend on customer	Depend on customer	CAT5e	Switch in cabinet	RJ45 Connector	RJ45 Connector	Ethernet cable

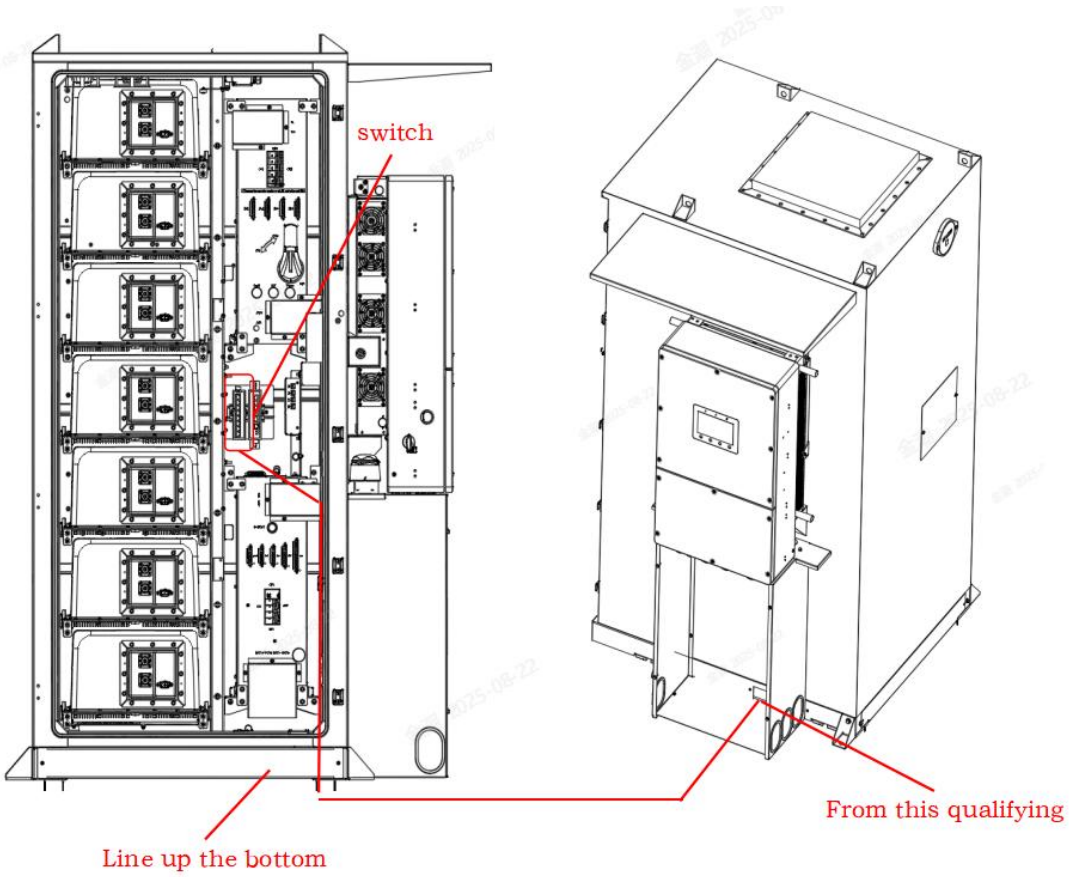


Figure 5-21 Communication cable schematic diagram

5.4.4.2.7. CT connection

DANGER
Make sure that the AC cable is completely disconnected from the AC power source before connecting the current transformer (CT)

1) When installing the Inverter, the CT provided in the product box must be used. It can be used to detect the direction of the grid current and provide information about the system operation status to the hybrid inverter.

   CT model: ESCT-T50-300A/5A

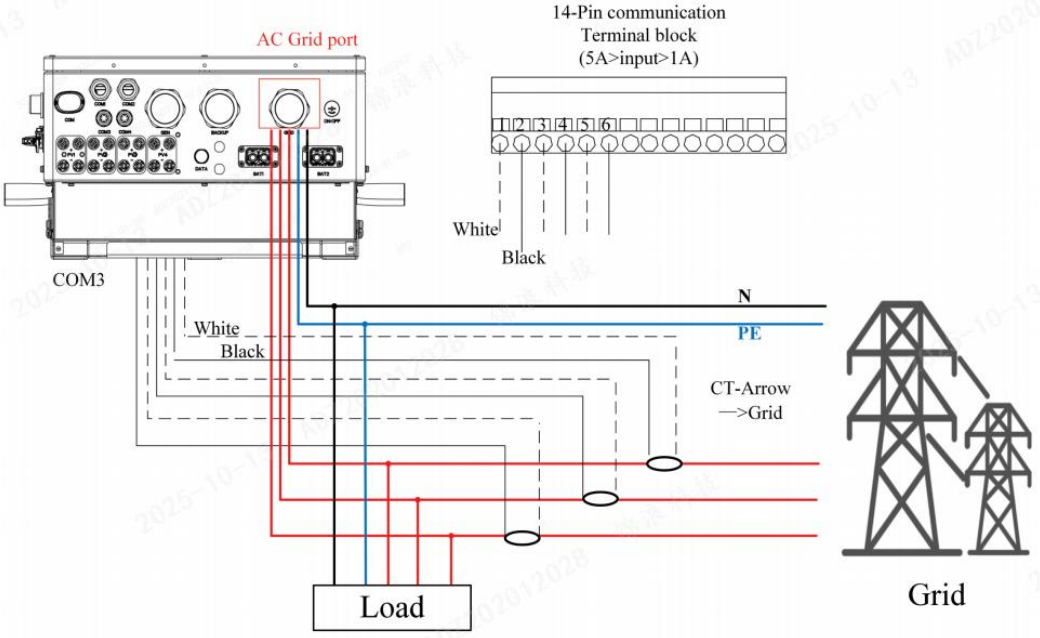
   CT Cable：diameter - 2.3mm^2，length - 4m

2) Please install the CT on the grid side of the system connection, not at the grid port of inverter. The arrow on the CT should point in the direction of the grid.

3) Pass the CT wire through the COM3 port at the bottom of the inverter and connect the CT wire to

the 14-pin communication terminal block.

CT cable	14 PIN communication terminal block
white	Pin 1 (Form left to right)
black	Pin 2 (Form left to right)
white	Pin 3 (Form left to right)
black	Pin 4 (Form left to right)
white	Pin 5 (Form left to right)
black	Pin 6 (Form left to right)



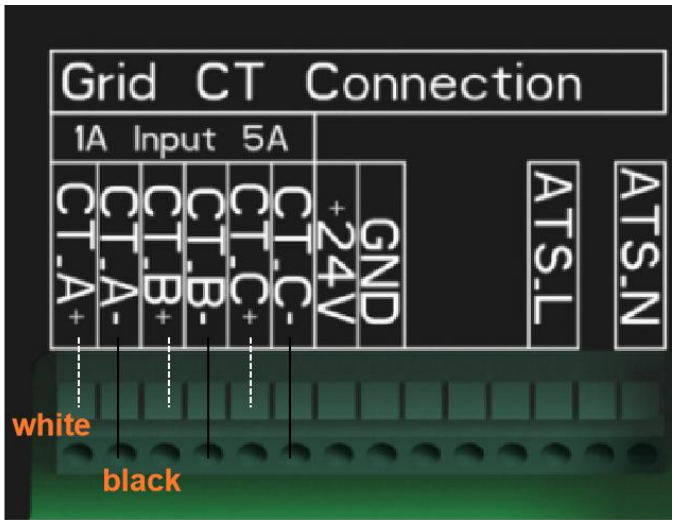


Figure 5-22 CT cable connection terminal in inverter

Note: Solis supply the 2 measurement methods, pleases choose one of the two options.

1. CT

2. CT + Smart Meter

5.4.4.2.8. Connection between inverter and smart meter

The wiring principle between the smart meter and the CT is shown in the following diagram. It mainly consists of two parts:

One part is the wiring between the smart meter itself and the CT, and the other part is the wiring between the smart meter and the hybrid inverter.

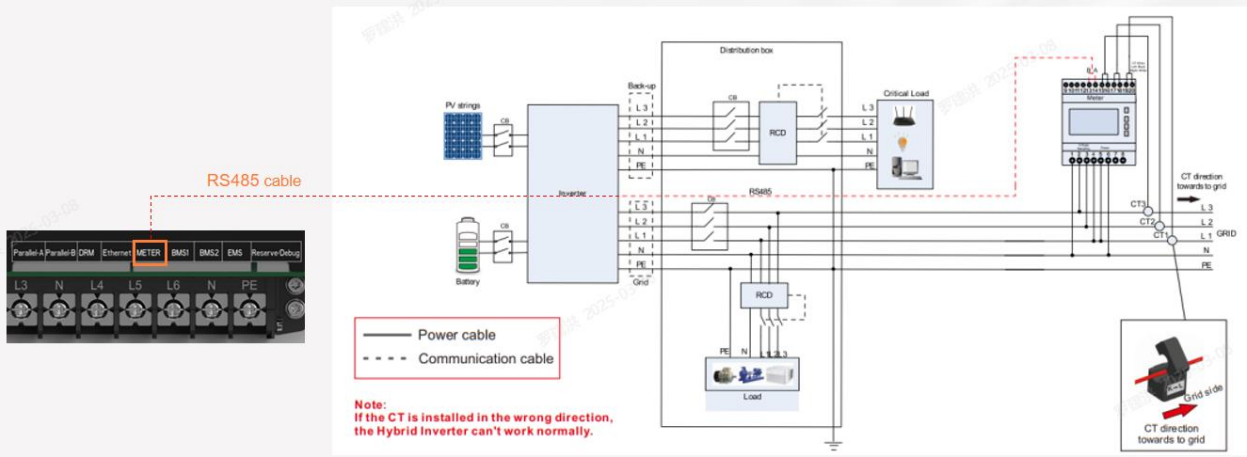


Figure 5-23 Meter & CT connection diagram

The connections related to the smart meter and CT are mainly divided into voltage input, current input, auxiliary power supply, communication lines, as shown in the following diagram:

1. The voltage measurement cable should be directly connected to the input port of the client's power grid, including L1, L2, L3 and the N line.。

2. The current measurement should be detected by CT， CT device must be installed on each phase cable of the power grid. When connecting, be sure to pay attention to the polarity of the CT and ensure that the phase sequence of the CT connected to L1, L2, and L3 is correct; otherwise, it will affect the normal use of the product.

CT cable	Ports on meter
L1 CT cable(white)	20($S1_1$)
L1 CT cable(black)	19($S2_1$)
L2 CT cable (white)	18($S1_2$)
L3 CT cable (black)	17($S2_2$)
L4 CT cable (white)	16($S1_3$)
L5 CT cable (black)	15($S2_3$)

3. Auxiliary power supply: An external 220Vac power supply must be provided separately to power the electricity meter. The power line needs to be connected to the LA (5) and NA(6) terminals of the smart meter.

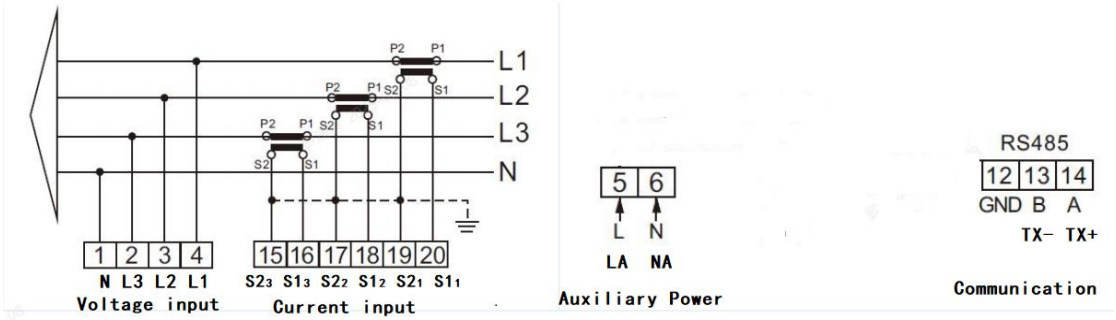
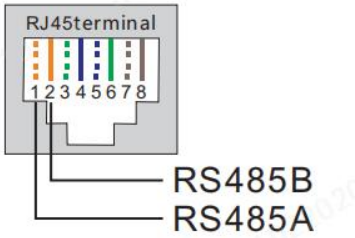


Figure 5-22 Meter cable connection

- The wiring between the smart meter and the hybrid inverter consists only of the communication lines. The wiring method is as follows.

  1. Pass the RS485 cable of the electricity meter through the COM1 or COM2 port of the inverter bottom, and connect it to the smart meter terminals of the inverter wiring box using RJ45 connector.

  RJ45 Connector Wire sequence definition:
  NOTE:
  Pin definition of the Meter Terminal is following EIA/TIA 568B.
  RS485A on Pin 1:Orange/white
  RS485B on Pin 2:Orange



The correspondence between communication lines is as shown in the table below.

Hybrid inverter RJ45 Connector	Smart meter ports
RS485A on Pin 1:Orange/white	14（TX+/A）
RS485B on Pin 2:Orange	13（TX-/B）

Note: When using, the hybrid inverter can be connected to both the meter and the CT, or it can be connected only to the CT. Choose one of the two options.

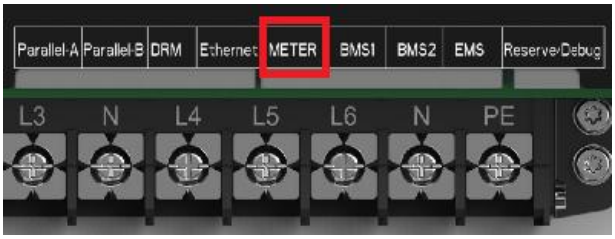
Meter communication port in inverter wiring box


Figure 5-23 Meter connection

5.4.4.2.9. 4G router installation and wiring (optional)

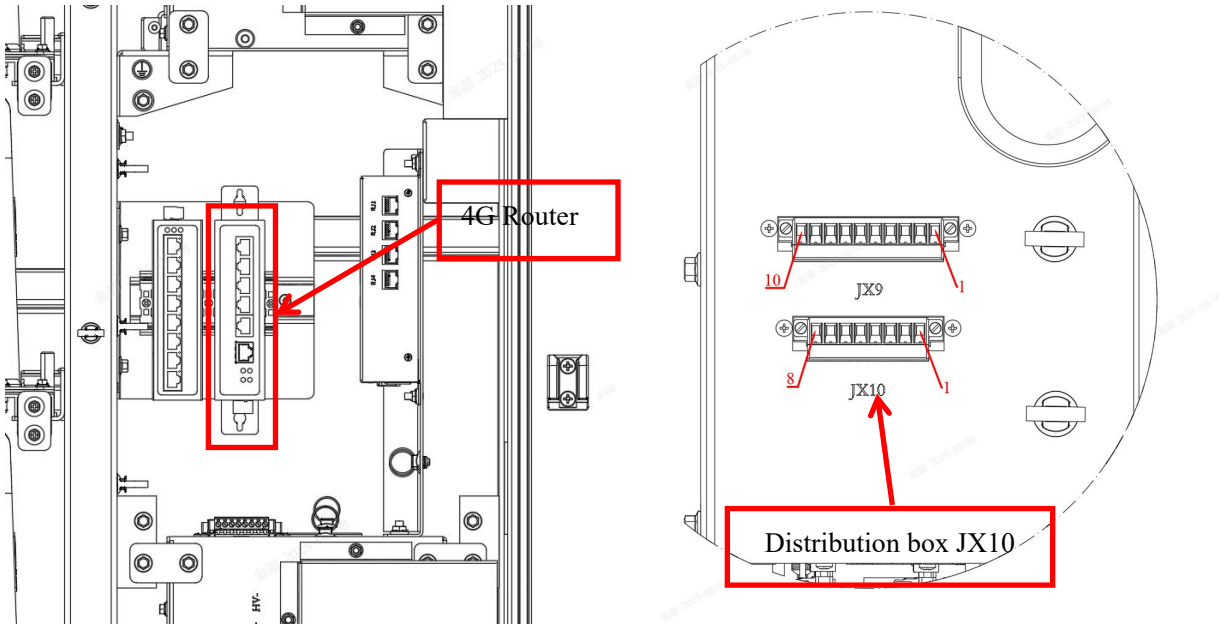


Figure 5-24 4G router installation position

1. As shown in the figure above, the 4G router can be installed on the rail together with the switch, and the power supply and communication wiring are defined as follows:

Position	Terminal 1	Terminal type	Recommended Specification	Position	Terminal 2	Terminal type
4G router	V+	Pin terminals	0.5mm^2	Distribution box	JX10:1	Pin terminals
	V-	Pin terminals	0.5mm^2	Distribution box	JX10:12	Pin terminals
	PE	Pin terminals	0.5mm^2	Grounded nearby	/	R-type terminal
	LAN	Crystal head	CAT5e	switch	RJ45-2	Crystal head

2. Antenna mounting position and wiring harness mounting

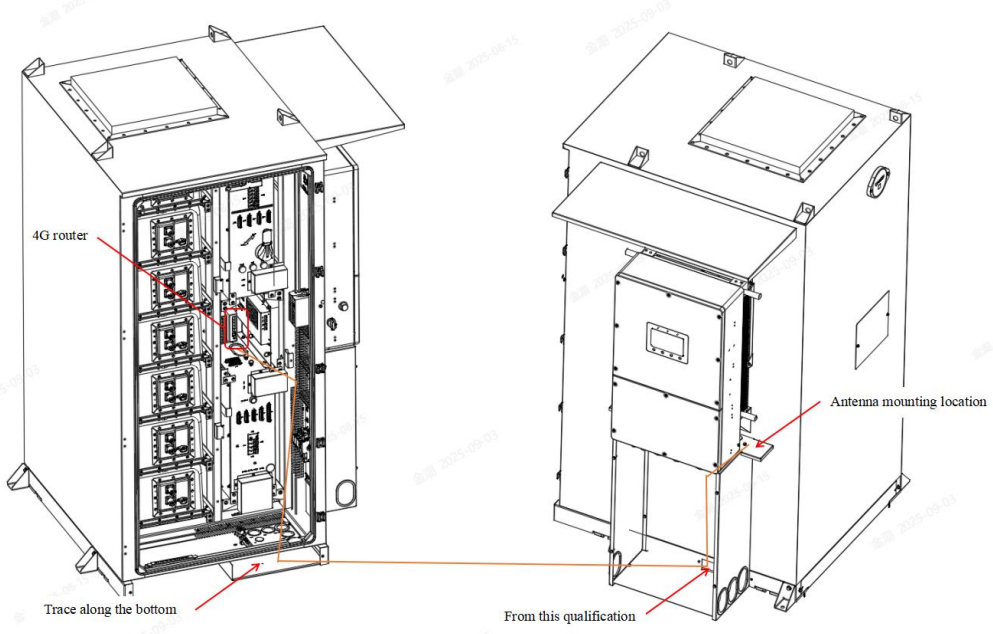


Figure 5-25 Antenna Installation position

5.4.4.3. Cat5e Cable crimping fabrication

RJ45 Connector Wire crimping instructions

Tools and materials Preparation

- Ethernet cable (Cat5e、Cat6.etc)
- RJ45 connector
- Network cable pliers (with functions of cutting and stripping wires)
- Wire tester (used for testing connectivity)
- Scissors or wire strippers

Procedure:

1. Remove the outer sheath of the cable.

2. Use an Ethernet cable stripper or a stripping tool to remove about 2-3 centimeters of the outer sheath of the network cable, exposing the 8 inner wire cores.

3. be careful not to damage the inner wire cores.

4. Arrange the wire sequence:

- Arrange the 8 wire cores in a standard order:

- White orange, orange, white green, blue, white blue, green, white brown, brown

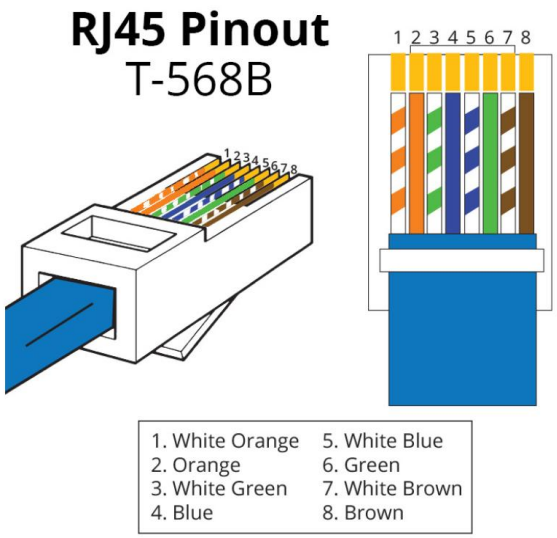


Figure 5-26 Ethernet cable wiring sequence

After arranging them, use your fingers to straighten the wire cores, and then use scissors to trim the ends of the wire cores evenly.

5. Inserting the connector

- Insert the neatly arranged wire cores into the RJ45 connector, making sure each wire core reaches the front end of the connector.

- Also, check if the outer skin of the network cable has entered the internal part of the connector to ensure a more secure connection after the crimping.

6. Crimping the connector

- Place the connector into the crimping slot of the network cable pliers, and firmly press the handle to ensure that the metal piece of the connector makes full contact with the wire cores.

- After the crimping is completed, check if the metal piece of the connector is flattened and pressed down properly.

5.4.4.4. External dry contact signal connection

1. The PrimePower system features a dry contact output (normally closed) for system fault indication. When the system detects a critical fault requiring disconnection from the high-voltage side, it will activate the fault dry contact to send a signal to the client's EMS.
2. The PrimePower system provides a dry contact output for Fire Protection Linkage activation. Upon detecting fire protection linkage system activation, the system will enable the Fire Protection Linkage dry contact to transmit a signal to the client's EMS.
3. The PrimePower system is equipped with a function to monitor the client's emergency stop signal (normally closed). When the system detects activation of the emergency stop signal, it will initiate power shutdown on the high-voltage side.
4. The PrimePower system includes capability to detect the client's fire activation signal (normally closed). Upon receiving the fire activation signal, the system will execute power shutdown on the high-voltage side.

Table 5-6 External fire alarm activation and emergency stop fault dry contact interface

Position	Terminal	Definition of terminal	Connector type
PrimePower JX11	JX11:31	Emergency Stop Feedback Signal	Cold Crimp Terminal
	JX11:32		Cold Crimp Terminal
	JX11:33	Fire Protection Linkage	Cold Crimp Terminal
	JX11:34		Cold Crimp Terminal
	JX11:35	Client fire protection activation signal	Cold Crimp Terminal
	JX11:36		Cold Crimp Terminal
	JX11:37	Client Emergency Stop signal	Cold Crimp Terminal
	JX11:38		Cold Crimp Terminal

Note: Client Emergency Stop signal (JX11:37 and JX11:38) and the Client fire protection activation signal (JX11:35 and JX11:36) are both normally-closed signals. When these signals were manufactured, they were preset to be short-circuited. The customer should first disconnect the shorting wire and then connect it to the normally-closed dry contact point of the client device.

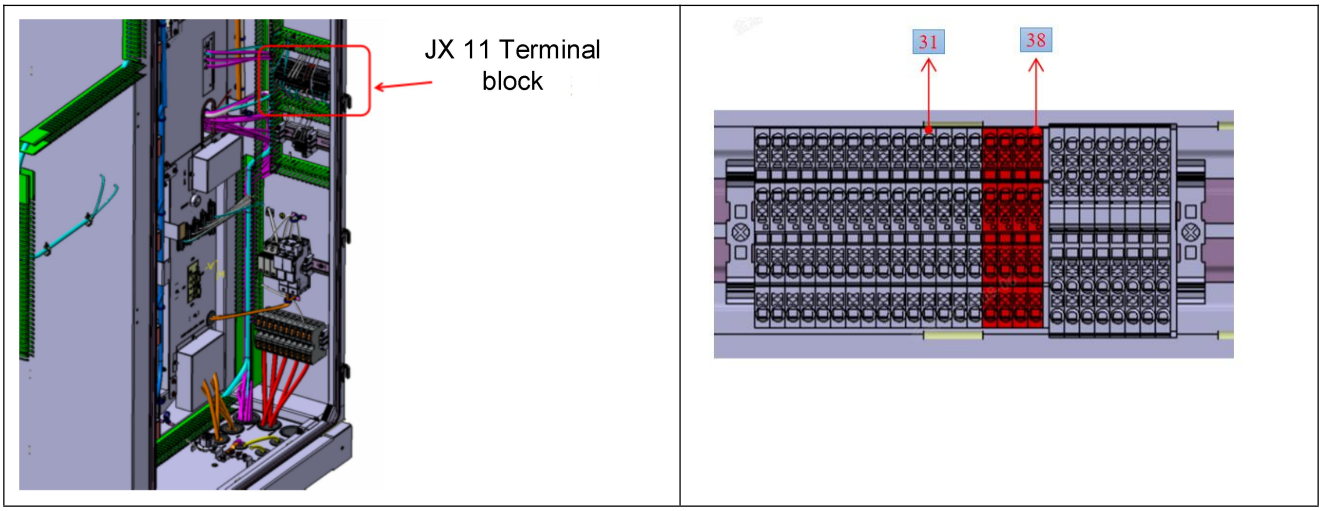


Figure 5-27 External dry contact control

5.4.4.5. Installation instructions for bottom cable threading

As shown in the figure below, for each wiring hole, define the wiring according to it. Before wiring, use a knife to cut the protective coil into a cross shape, then pass the wire bundle through it, and finally seal it with fireproof mud.

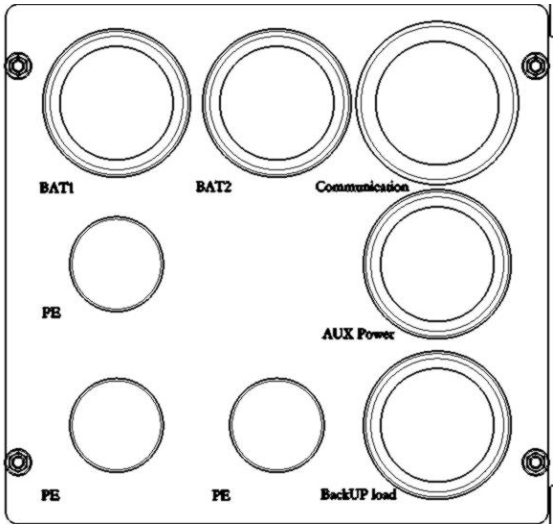


Figure 5-28 Bottom wiring hole of cabinet

5.4.5. Inspection of Wiring Quality

1. Check whether the polarity of the DC cables is correct, whether the nuts are installed properly, and whether the cable labels are correct.
2. Check whether the phase sequence of the AC cables is correct, whether the connection terminals are fixed properly, and whether the cable labels are correct.
3. Check whether the insulation resistance of all equipment meets the requirements.
4. Check whether the positive and negative poles of PrimePower are short-circuited, and whether the AC cable terminals U, V, W, N, and PE are short-circuited.
5. Check whether the grounding conductance of the grounding wire is good.
6. Before powering on, check the connection cables of the entire system to ensure reliable cable connections, without aging, cracking, or insulation damage.
7. Check whether all communication cables and connection terminals are tightly and reliably connected;

5.4.6 Instructions for Sealing the Inlet Port

1. After the system integration and trial operation, the equipment inlet and outlet openings are sealed with fireproof mud.

2. Fireproof mud is a flexible flame-retardant material with excellent fire-blocking, smoke-blocking, oil-resistance, water-resistance, and corrosion-resistance properties, and it has functions such as fire prevention and dust prevention.

3. Sealing range: All the wiring bundles at the bottom entrances and exits of the equipment cabinet.

⚠DANGER

- **If the inlet and outlet openings are not sealed, in the event of a fire, an effective fire-blocking isolation cannot be achieved.**
- **If the inlet and outlet openings are not sealed, the moisture-proof and dust-proof properties will be reduced, which is not conducive to the long-term stable operation of the system.**
- **If the inlet and outlet openings are not sealed, there is a risk of small animals entering the equipment, which may cause short circuits and damage to the equipment.**

5.5. Instructions for Using Aerosols

The aerosol is generally installed on the top of the cabinet. The aerosol is equipped with a temperature-starting detection line. The starting temperature of the detection line is approximately 165℃±5℃. When using it, the detection line should be kept as exposed as possible. In areas with high humidity, it is recommended to take moisture-proof measures at the end of the temperature-starting detection line of the aerosol:

Figure 5-29 Aerosols activated by thermal sensitive wires

5.6. Installation Instructions for Fire Water Inlet Connector

1. A DN65 water pipe is reserved on the back of the cabinet, and a corresponding DN65 fire hydrant quick connector is also selected. Before use, the acrylic cover plate should be broken or removed first. There are two usage schemes for this water filling port:

(1) When configuring the DN65 fire hydrant quick connector, the DN65 quick-connect fire hose can be directly connected.

(2) When there is no DN65 fire hydrant quick connector (or when it is removed), the pre-action pipe network can be connected to this DN65 water pipe connector.

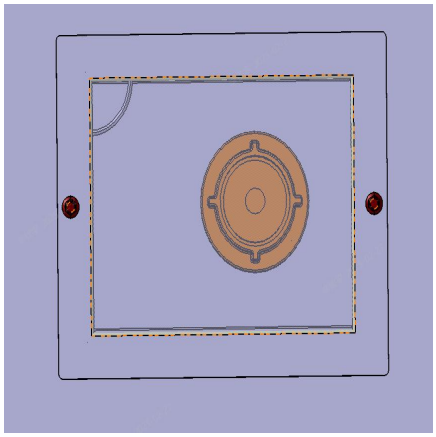


Figure 5-30
water injection interface location diagram (back of the cabinet)

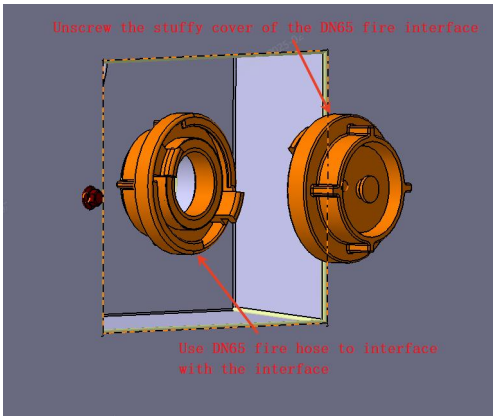


Figure 5-31

Disassembly Diagram of Fire Extinguisher Water Injection Interface Scheme 1

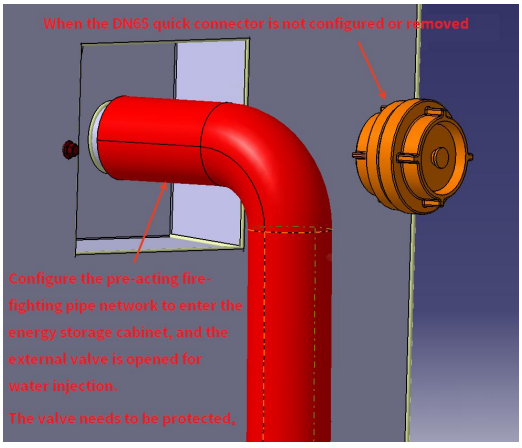


Figure 5-32 Disassembly Diagram of Fire Water Injection Interface Scheme 2

5.7. Battery pack wiring

The power cables of the battery compartment that have been removed need to be manually connected at the delivery site. The orange ones should be connected to the positive terminal (B+), and the black ones to the negative terminal (B-). The detailed operation steps are as follows:

- As shown in Figure 5-30, use the socket tool to remove the M5 flange nut, and then open the air duct.
- Remove the masking tape of battery pack B+ and B-.
- Remove the protective film of the DC cable connector.
- Before installation, it should be confirmed that the pins of the power line connector are not skewed or broken, and should be inserted as vertically as possible.
- Install the DC power line according to the color and refer to Figure 5-33. When connecting the wire harness, do not pull the wire harness forcefully.
- After the connector is assembled in place, you should hear a click. Gently pull the connector by hand; it must not be loose.
- After installation is completed, restore the air duct and re-tighten it

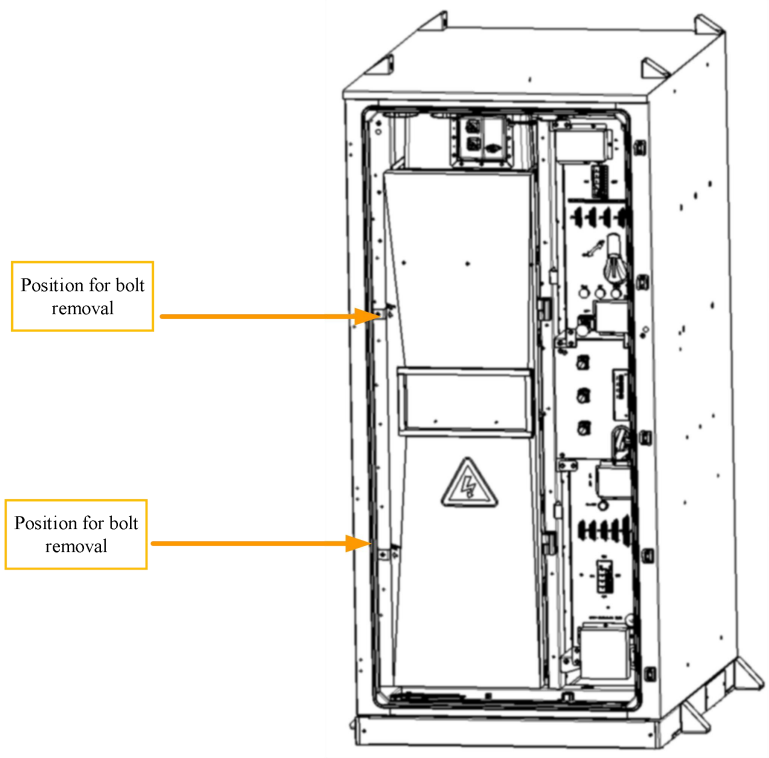


Figure 5-33 diagram of disassembling air duct bolts

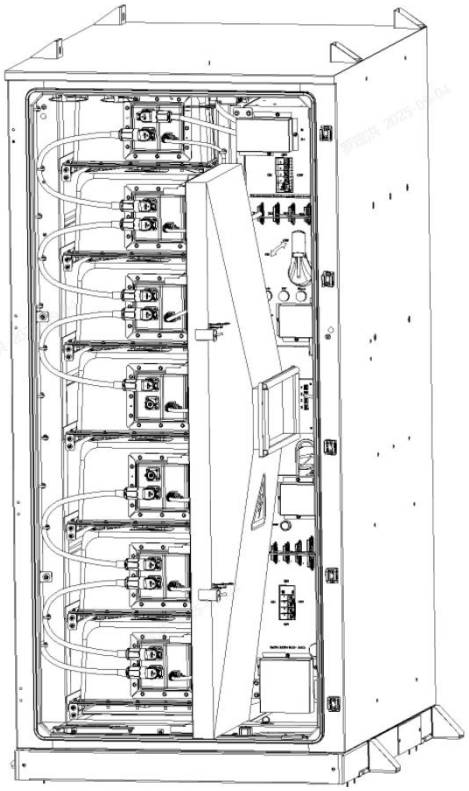


Figure 5-34 diagram of power cables in the battery compartment

6. Operation of System

6.1. Requirements for Trial Operation

Before the trial run, please check the following items:

NO	Inspection items
1	Check if all cable connections are reliable.
2	Check if PrimePower is well ventilated.
3	Check if PrimePower is reliably grounded.
4	Test the AC input items of PrimePower to ensure if they are correct.
5	Check if all switches of PrimePower are in the off position.
6	Check if the main control box isolating switch is in the off position.
7	Ensure that the grid voltage and frequency on the AC side are in accordance with the input requirements of PrimePower.

6.2. System Startup Operation Procedure

During the trial operation or after completing maintenance or repair, the system can be powered on only after all the aforementioned inspection and testing items have been carried out. The power-on process must be carried out strictly in accordance with the following steps.

⚠WARNING

For systems with long downtime, a comprehensive and detailed inspection of all system lines is necessary. Only after ensuring that all indicators meet the requirements can the system be restarted.

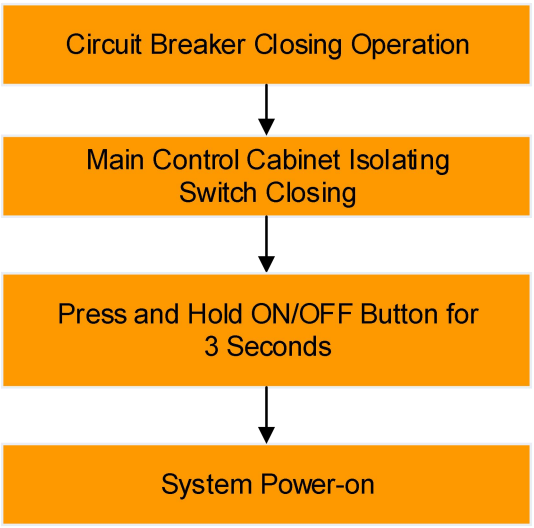


Figure 6-1 System Startup Flowchart

6.3. System Startup Operation Instructions

6.3.1. Closing of switch

The switches include:

① Auxiliary power supply switch QF1

② Air conditioner power supply switch QF2

③ DC power take-in switch QF3

The electrical primary diagram of the distribution cabinet is shown in Figure 3

The closing operation of the switches follows these steps:

Step 1: Close the auxiliary power supply switch (QF1)

QF1 is the auxiliary power supply switch. By manually operating and pushing the lever upwards, it can be switched from the "OFF" position to the "ON" position to perform the closing operation.

Step 2: Close the air conditioner power supply switch (QF2)

QF2 is the air conditioner power supply switch. By manually operating and pushing the lever upwards, it can be switched from the "OFF" position to the "ON" position to perform the closing operation.

Step 3: Close the DC power take-in switch (QF3)

QF3 is the DC power take-in switch. By manually operating and pushing the lever upwards, it can be switched from the "OFF" position to the "ON" position to perform the closing operation.

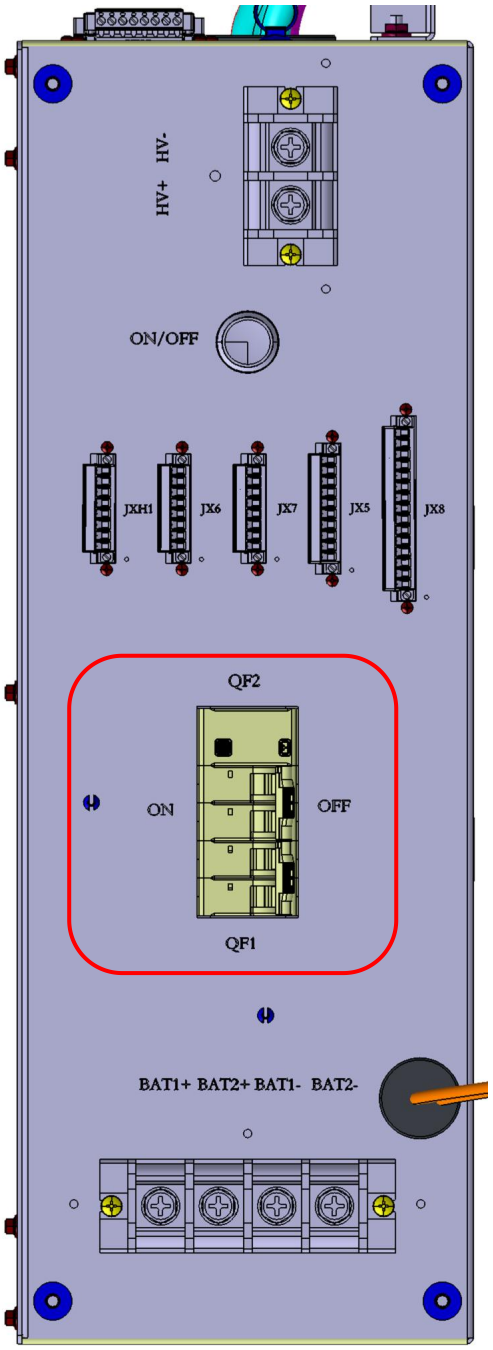


Figure 6-2 Switch QF1、QF2

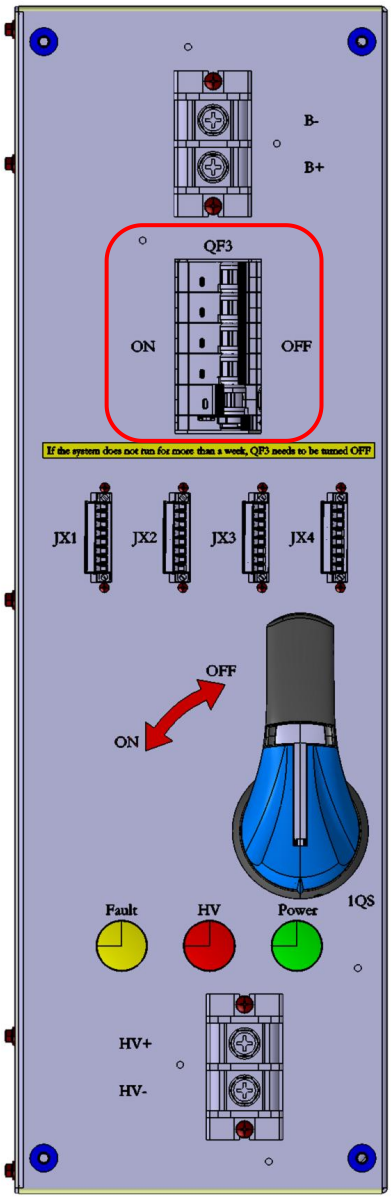


Figure 6-3 Switch QF3

6.3.2. Main control box Isolating switch closing operation

Switch the isolating switch (QS) of the main control box from the "OFF" position to the "ON" position.

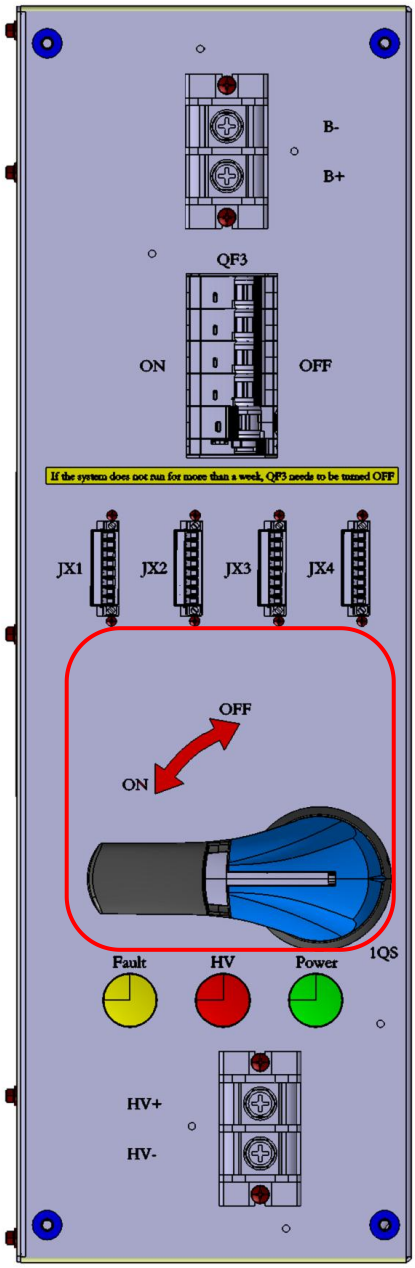


Figure 6-4 Schematic diagram of the main control box disconnect switch (QS)

6.3.3. Press and hold the ON/OFF button for 3 seconds

After the switch is closed and opened, the "POWER" indicator light on the main control box will be on (green) and the "FAULT" indicator light will also be on (yellow). Wait for 5 to 10 minutes, then the "FAULT" indicator light will go out (yellow), and then press the ON/OFF button on the distribution box for 3 seconds, the "HV" indicator light will be on (red), the ON/OFF button light will be on (blue), the system is in high voltage mode, and the system starts to operate.

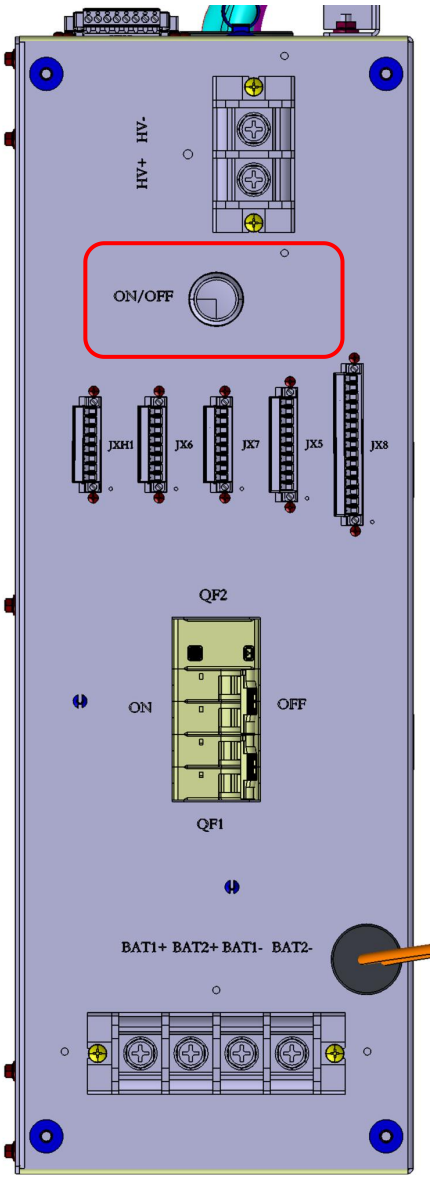


Figure 6-4 Diagram of ON/OFF Button

6.3.4. Indicator light status and position

1. The "Power" indicator light is on (green), indicating normal auxiliary power supply operation;
2. The "HV" indicator light is on (red), indicating the battery system is in a high voltage (HV) state;
3. The "Fault" indicator light is on (yellow), indicating a fault currently exists in the battery system.

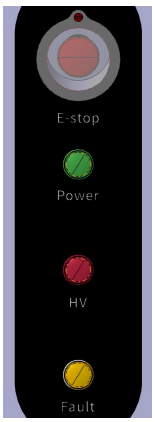


Figure 6-5 System operation. Indicator

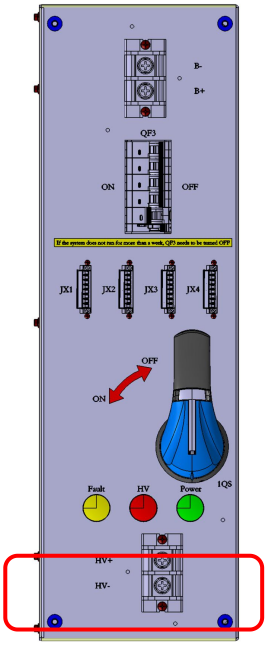


Figure 6-6 Main control box operation indicator light

NOTICE

After confirming that the working power indicator light and the working status indicator light on the front panel of the main control box are both normal, you can proceed with the subsequent

operations. Otherwise, you need to first troubleshoot the problem.

6.4. System Shutdown Procedure

When the system needs maintenance or repair, it must be powered off. The shutdown process must be carried out strictly in accordance with the following steps.

⚠WARNING

After the system stops running, please wait for at least 10 minutes before conducting maintenance or repair operations on the system. After the system is shut down, when performing maintenance or repair operations on the system, be sure to:

Ensure that the system will not be accidentally re-powered.

Using a multimeter or an electric tester to check and ensure that the system is completely de-energized.

Cover the adjacent potentially electrified components with insulating materials.

During the entire maintenance and repair process, ensure that the escape routes are completely unobstructed.

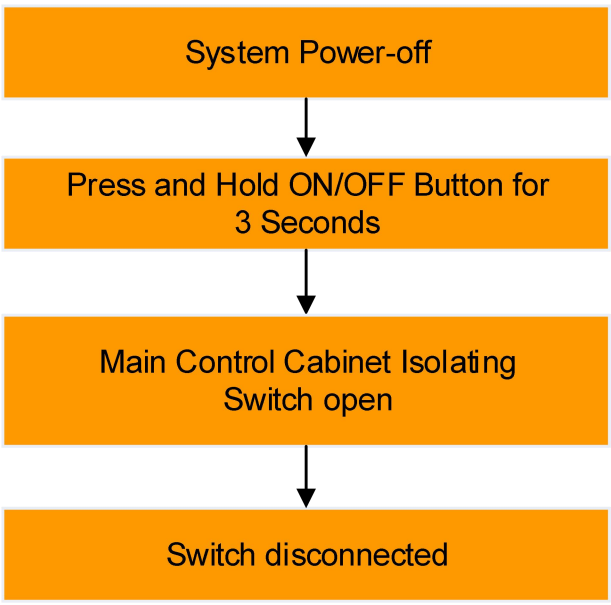


Figure 6-7 System shutdown procedure

6.5. System Shutdown Operation Instructions

6.5.1. Press and hold the ON/OFF button for 3 seconds to power off the system.

When it is necessary to power down the system, press and hold the ON/OFF button for 3 seconds. The system will power off, and the "HV" indicator light (red) will go out, as well as the ON/OFF button light (blue).

6.5.2. Main control box switch disconnection

Switch the isolating switch (QS) of the main control box from the "ON" position to the "OFF" position.

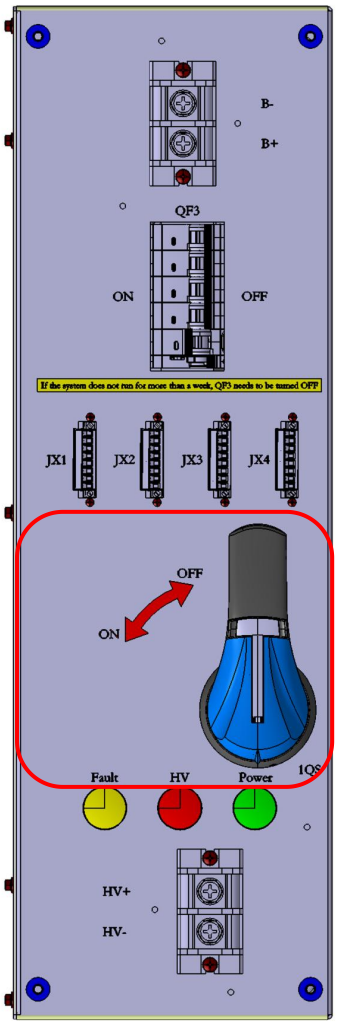


Figure 6-8 Schematic diagram of the main control box disconnect switch (QS)

6.5.3. Open circuit

Step 1: Open the auxiliary power supply switch (QF1)

QF1 is the auxiliary power supply switch. By manually operating and pulling the lever down, it can be switched from the "ON" position to the "OFF" position to perform the disconnection.

Step 2: Open the air conditioner power supply switch (QF2)

QF2 is the air conditioner power supply switch. By manually operating and pulling the lever down, it can be switched from the "ON" position to the "OFF" position to perform the disconnection.

Step 3: Open the DC power take switch (QF3)

QF3 is the DC power take switch. By manually operating and pulling the lever down, it can be switched from the "ON" position to the "OFF" position to perform the connection.

7. Product Maintenance

Due to the influence of environmental temperature, humidity, dust, vibration, etc., the internal components of the system or equipment will age or wear out, which may lead to potential faults within the system or equipment. Therefore, it is necessary to conduct daily and regular maintenance on the system to ensure its normal operation and service life.

7.1. Safety Precautions

⚠WARNING

1. Only qualified personnel with authorization can perform operations such as maintenance on the system.

2. During the maintenance process, do not leave any metal parts such as screws, washers, and tools inside the equipment. Otherwise, it may damage the equipment.

3. After the system stops running, still need to press the system emergency stop switch and the photovoltaic controller emergency stop switch. Then, it is necessary to wait for at least 10 minutes before conducting maintenance or repair operations on the system. After the system is shut down, when performing maintenance or repair operations on the system, pay attention to:

- **Ensure that the system will not be accidentally re-powered.**
- **Use a multimeter or an electric tester to check and ensure that the system is completely de-energized.**
- **Cover the adjacent potentially electrified components with insulating material fabric.**
- **During the entire maintenance and repair process, ensure that the escape route is completely unobstructed.**

7.2. Maintenance Work and Cycle

During the daily operation of the equipment, the following matters should be noted:

(1) Regularly clean the PrimePower system, especially pay attention to cleaning the air intake and outlet of the fan. If necessary, use a vacuum cleaner for cleaning to ensure that the air can flow freely within the PrimePower cabinet.

(2) Ensure that there are no any debris inside the PrimePower system, and there are no debris around the system that hinders maintenance personnel from performing maintenance and repair on the system.

(3) Regularly check whether the cable connection terminals are loose, whether the surface of the terminals is severely rusted or oxidized, and whether the contact is good.

(4) Regularly check whether the emergency stop switch of the system is effective, to ensure that the system can be stopped quickly in emergency situations.

(5) Regularly check the fire extinguishing device configured for the system to ensure that its condition is good.

7.2.1. Product Maintenance Inspection

Throughout the entire product lifecycle, abnormal operations must be avoided. Regular equipment maintenance is mandatory to ensure safe and reliable operation and to achieve the best performance of the system. For detailed maintenance procedures, please refer to the Appendix: Product Maintenance Inspection Checklist.


Throughout the entire product lifecycle, the casing must not have any rusted or bent structures.

7.3. Requirements for Product Appearance Maintenance

Check PrimePower once every twelve months and keep a record of the inspection. If there are any of the following damages on the paint surface of PrimePower, please repaint according to the following steps:

- Light scratches (on the unexposed steel substrate)
- Irremovable stains or rust
- Deep scratches (damage to the primer, exposure of the steel substrate)

Preparations

■ In an outdoor environment without any coverings, re-coating under adverse weather conditions is strictly prohibited.

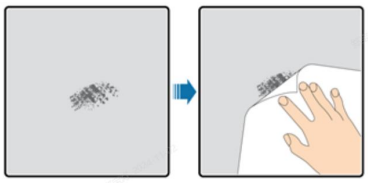
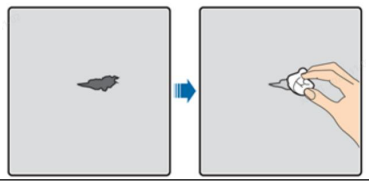
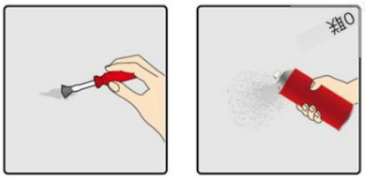
■ Prepare the corresponding paint of the same color as the equipment surface.

■ Conduct a visual inspection of the severity of paint damage on the equipment surface, prepare the

corresponding tools and materials, and assess the quantity of on-site materials based on the re-coating situation.

- Prepared the paint that meets the requirements according to the paint surface color code RAL9003 of the equipment.
- The exterior of the equipment should be intact. If the paint on the PrimePower surface is damaged or cracked, re-coat immediately.
- Tools and materials: Hand spray paint or paint, brushes (for small area painting), fine sandpaper, isopropyl alcohol, cotton cloth, and spray gun.

Maintenance steps

Steps	Operation method
1	Gently sand the damaged area with fine sandpaper to remove dirt or rust. 
2	Moisten the cotton cloth with absolute ethanol, wipe the polished or repaired area to remove dirt and dust, and then dry it with a clean cotton cloth. 
3	Depending on the extent of the paint damage, use one of the following methods to evenly apply the paint onto the damaged coating until the damage is no longer visible: 1. For minor scratches and small areas of stains, rust, it is recommended to use hand spray painting or brush painting. 2. For extensive scratches and large areas of stains and rust, use a spray gun for spraying. 
4	Allow the paint to dry for 30 minutes, and then check whether the re-coated area meets the requirements.

⚠CAUTION

1. If the base of the area to be repaired is exposed, apply the primer first. After the primer dries, apply the intermediate layer paint and the polyurethane topcoat after the base is no longer exposed. Use the corresponding color of primer or polyurethane topcoat.

2. Please note that the paint film should be as thin and uniform as possible. The paint film should not be in droplet form and the surface should be smooth.

If there are different colors on the box pattern, cover the parts of other colors (except for the damaged paint) with tape and white paper before painting to avoid contaminating other colored parts during the paint repair process.

3. The paint patch area should be consistent in color with the surrounding area, without obvious boundaries, obvious protrusions, damage marks and paint peeling. If the user wants to spray paint, it is recommended to spray three times first, and then check if it meets the requirements. If not, repeat the above operation until the requirements are met

7.4. Battery system maintenance requirements

7.4.1. Battery System Maintenance and Calibration

The battery of the system will be maintained once every twelve months according to the following plan to prevent battery damage.

1) Scheme 1 (This scheme is applicable when the SOC of the battery system is low)

■ Discharge the battery system to the cut-off state (minimum voltage < 2.7V), then stop discharging and let it stand for 1 hour.

■ The battery system automatically charges to full (maximum voltage > 3.65V), then let it stand for 1 hour after charging.

■ Discharge the battery system to 30% and stop.

2) Scheme 2 (This scheme is applicable when the SOC of the battery system is high)

■ Charge the battery system automatically (maximum voltage > 3.65V), let it stand for 1 hour after charging.

■ Discharge the battery system to the cut-off state (minimum voltage < 2.7V), then stop discharging and let it stand for 1 hour.

■ Charge the battery system to 30% and stop.

CAUTION

1. Before performing maintenance operations, conduct checks to ensure environmental safety, system security, no alarms, and no faults.

2. After battery maintenance is completed, it is recommended to notify the SOLIS after-sales engineers to conduct free data analysis.

7.4.2. Pack Replacement Instructions

1. Remove the wind cover and air guide bracket in front of the pack.
2. Remove the high and low voltage wiring harness of the pack.
3. Remove the fixing bolts and washers on both sides in front of the pack.
4. Pull it out of the slide rail.
5. Replace the pack.
6. Install it back into the slide rail.
7. Re-fix the fixing bolts and washers on both sides in front of the electrical box.
8. Restore the cables and connectors.
9. Re-assemble the air guide bracket and wind cover to their original positions.

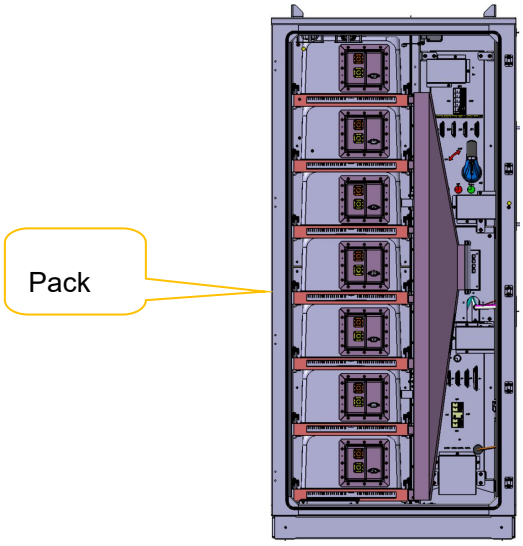


Figure 7-1 Pack position

7.5. Requirements for Thermal Management System Maintenance

7.5.1. Requirements for Maintenance of Air-Cooled Air Conditioner

- When the air conditioner unit is in operation, it is strictly prohibited for personnel to touch the internal circulation side of the unit;
- Non-professionals are strictly forbidden to disassemble it;
- Heavy objects are strictly prohibited from pressing on the air conditioner unit;
- Every six months, check whether there is any dust or foreign matter blocking the air intake and outlet of the air conditioner unit. If any abnormalities are found, use compressed air or a vacuum cleaner with a brush head to clean the air intake and outlet of the air conditioner unit. Do not use hot water or organic solvents such as gasoline for cleaning.

7.6. Fire Protection System Maintenance Management

The reliability of the fire protection system is of vital importance for ensuring the safety of personnel and property. To ensure that the system can function effectively in case of fire or emergency, the users of the PrimePower system should conduct professional inspections, tests and maintenance of each subsystem of the product on a regular basis. These operations not only help to ensure that the system is in the best working condition, but also help to avoid potential failures.

The detectors of this product's fire protection system do not require any specific maintenance (except for gas detectors), but if the equipment is damaged, replacement should be carried out according to the following procedures.

7.6.1. Replace smoke detectors and temperature detectors

1. Cut off the power distribution circuit of the system.
2. Rotate the thermal sensor detector counterclockwise to remove it from the base.
3. Install the new thermal sensor detector on the base and rotate it clockwise until you hear a "click" sound, indicating that it is securely fastened.
4. After the replacement is completed, restore the power distribution circuit of the system.

Figure 7-2 smoke sensor

Figure 7-3 temperature sensor

7.6.2. Replacement of the flammable gas detector

1. Cut off the power distribution circuit of the system.

2. Loosen the two nuts that fix the base and remove the combustible gas detector.

3. Use two nuts to fix the new gas detector and its base in their original positions.

4. Rotate the cap of the gas detector head, lock the detector head, and then complete the wiring between the gas detector head and the gas processing module according to the wiring diagram, as shown in the following figure.

After the wiring is completed, restore the power distribution circuit of the system.

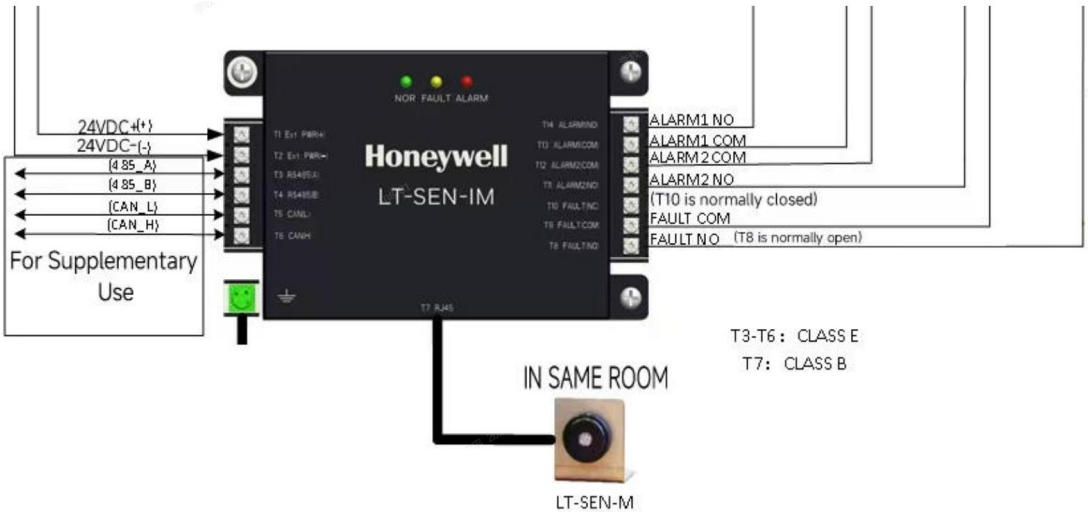


Figure 7-4 Flammable gas detector wiring diagram

7.6.3. Replacement of Audible and Visual Alarm

1. Cut off the power distribution circuit of the system.

2. Remove the front cover of the Audible and Visual Alarm, and disconnect the wires on the base.

3. Complete the wiring of the new Audible and Visual Alarm according to the wiring diagram and install it in place.

4. After the replacement is completed, restore the power distribution circuit of the system.

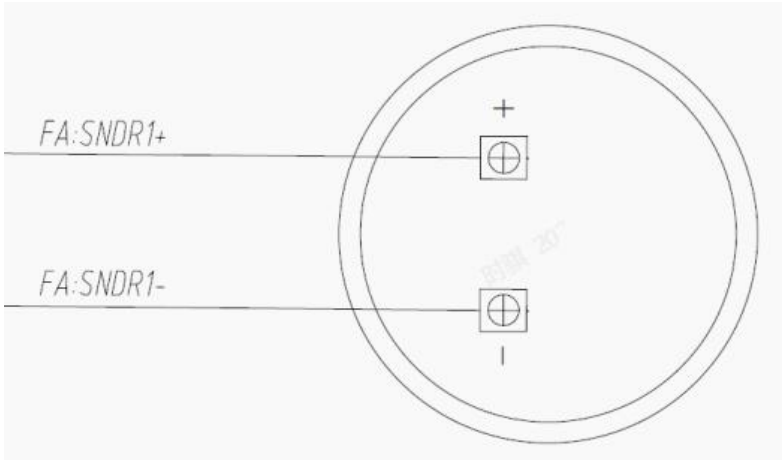


Figure 7-4 wiring diagram of audible and visual alarm Device

7.6.4. Replacement of Aerosol device

1. Cut off the power distribution circuit of the system.

2. Adjust the temperature activation line on the aerosol.

3. Use a socket wrench to loosen and remove the fixing nut on the aerosol fire extinguishing device.

4. Then remove the aerosol and reinstall the new aerosol fire extinguishing device.

6. Fix it again with nuts.

7. After the replacement is completed, restore the power distribution circuit of the system.

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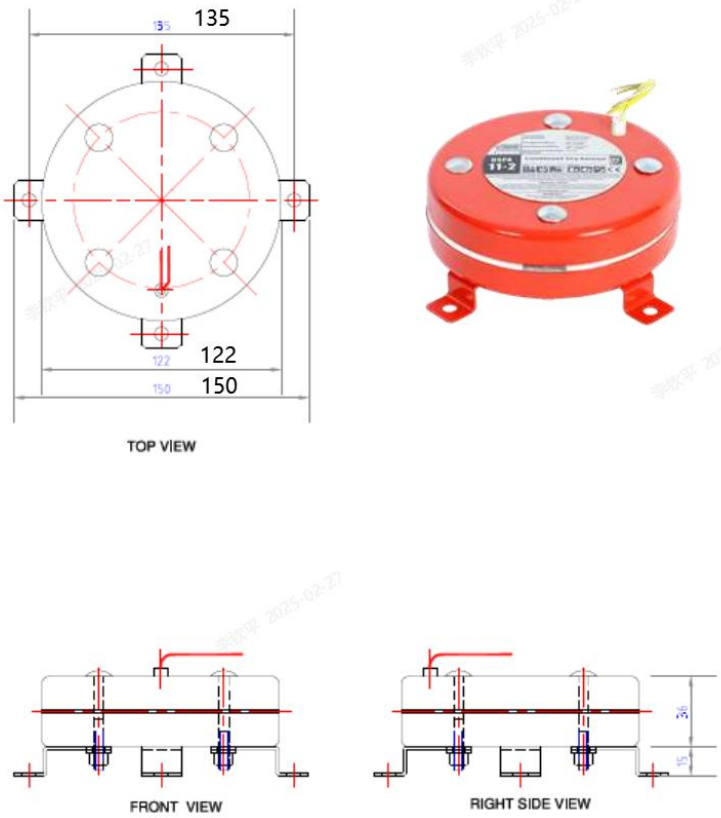

Figure 7-5 Aerosol

7.6.5. Post-Aerosol Spraying Precautions

1. There may be flammable gases in the PrimePower, which could cause re-ignition or explosion. Do not carry any open flames, heat sources or lit cigarettes when entering the dangerous area.

2. There may be toxic gases in the PrimePower, which could pose risks to the safety and health of the workers. Before entering the dangerous area, ensure proper personal protection.

3. After the aerosol is sprayed for fire extinguishing, professional firefighters must assess the safety risks inside the PrimePower and only open the cabinet door after confirming there are no dangers.

4. The workers involved in the on-site fire accident response must wear personal protective equipment that complies with Directive 89/656/EEC requirements to avoid contact with unnecessary toxic substances and fire extinguishing agents.

5. If there are small amounts of residual aerosol fire extinguishing agents that remain during the ventilation period, thorough suction and scrubbing must be carried out as soon as possible.

6. The aerosol fire extinguishing agents may accumulate near the equipment or surfaces of the aerosol fire extinguishing device after being sprayed. Timely inspection and thorough suction and scrubbing must be carried out to ensure no fire extinguishing agents are accumulated.

7. For a period of time after spraying, the used aerosol fire extinguishing device may still have a relatively high temperature. Do not touch it. When removing the aerosol fire extinguishing device, wear appropriate protective gloves and follow the operation procedures for removal.

8. If the air humidity is high, perform dehumidification treatment after ventilating the dangerous area. Unremoved residual fire extinguishing agent residues will absorb moisture and may cause corrosion of metal and electronic equipment.

9. Dispose of the used aerosol fire extinguishing device in accordance with the requirements of your local area.

10. If you need to re-calibrate the aerosol fire extinguishing system or replace the aerosol fire extinguishing device, contact SOLIS for handling.

11. Gently press the circuit board with non-abrasive fabric and absorb the remaining liquid.

12. Do not use fabric to wipe the circuit board to avoid scratching components or causing components to fall off.

13. Do not use any paper products as they may leave paper fibers that could scratch the circuit board.

14. Use a toothbrush to remove the remaining particles, including the residual liquid after drying.

15. Use compressed air to blow away dust and residual liquid residues. Ensure to spray in a rapid and short-duration direction.

7.7. Electrical System Maintenance & Management

7.7.1. Main control box

The reference steps for maintenance and replacement of the main control box are as follows:

(1) Unplug the connection cables of the main control box

(2) Remove the fixing bolts and washers around the main control box

(3) Replace the main control box

(4) Reinstall the fixing bolts and washers around the main control box

(5) Restore the connection cables

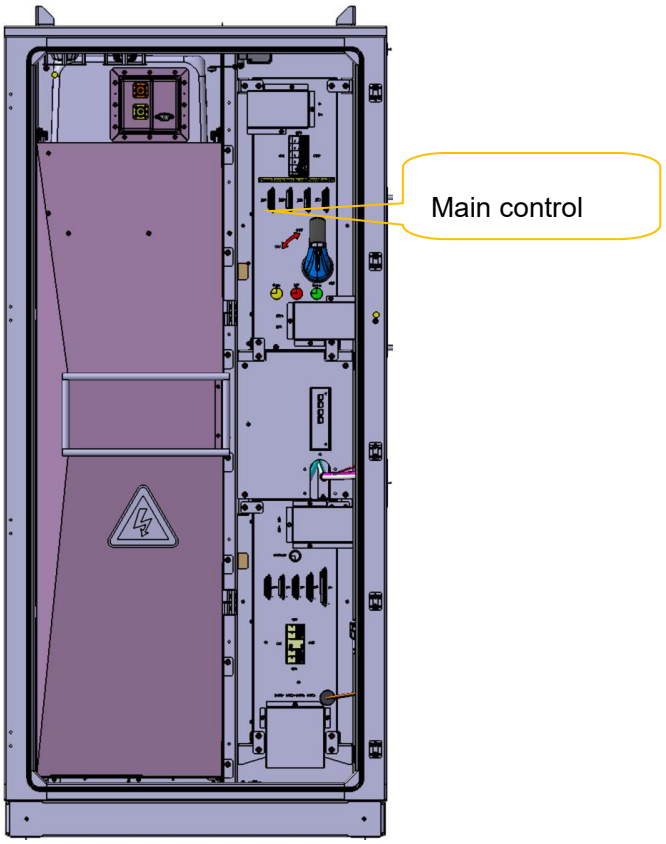

Figure 7-6 Main box position

7.7.2. Power distribution box

The reference steps for maintenance and replacement of the distribution box are as follows:

(1) Unplug the connection lines of the distribution box connector

(2) Remove the fixing bolts and washers around the distribution box

(3) Replace the distribution box

(4) Reinstall the fixing bolts and washers around the distribution box

(5) Restore the connection lines of the connector

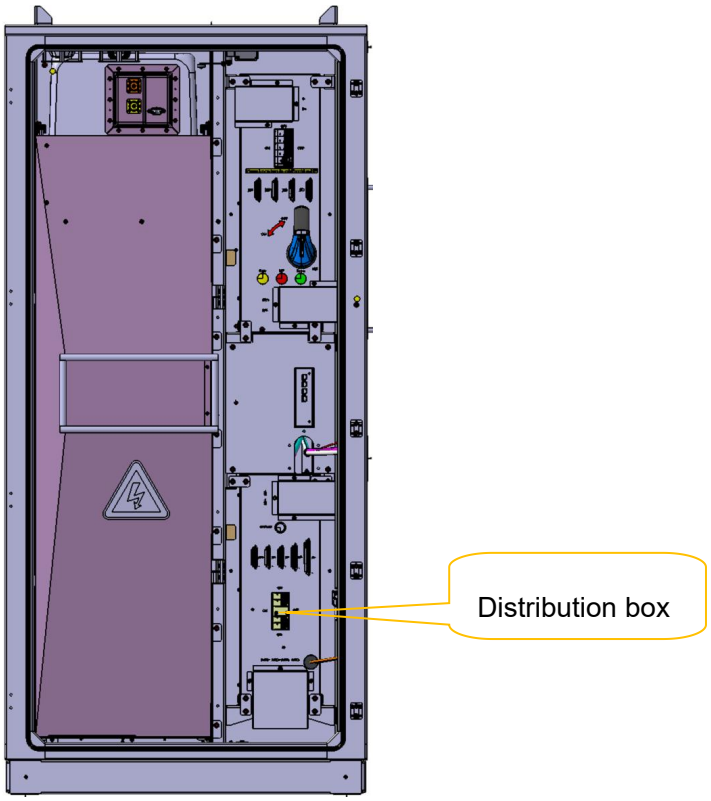

Figure 7-7 Distribution box

7.7.3. Air –conditioner

The reference steps for air conditioner maintenance and replacement are as follows:

(1) Unplug the connection cable of the air conditioner

(2) Remove the sealant from the inner and outer sides

(3) Remove the fixing screws

(4) Replace the air conditioner

(5) Reinstall the screws

(6) Reapply sealant along the edge of the air conditioner

(7) Restore the connection cable

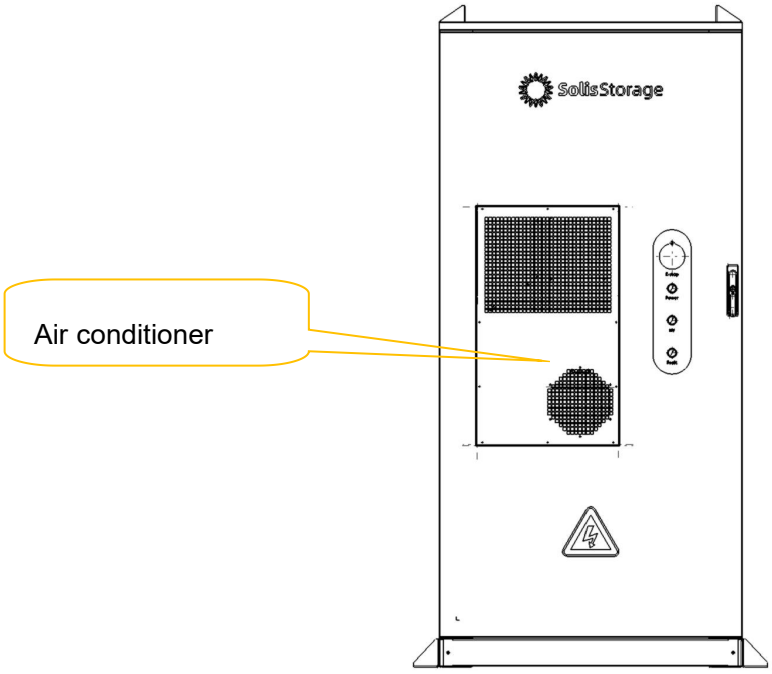

Figure 7- 9 Air conditioner position

8. Trouble shooting

WARNING

After the system stops running, please wait for at least 10 minutes before conducting maintenance or repair operations on the system. After the system is shut down, when performing maintenance or repair operations on the system, please note:

- **Ensure that the system will not be accidentally re-powered.**
- **Use a multimeter or an electric tester to check and ensure that the system is completely de-energized.**
- **Cover the adjacent potentially electrified components with insulating materials.**
- **During the entire maintenance and repair process, ensure that the escape route is completely unobstructed.**

8.1. Battery System Failures Trouble shooting

8.1.1. Fault, Alarm Handling and Countermeasures

If there is an alarm message displayed in the "System Alarm Information" tab, or if the battery system malfunctions, please follow the corresponding handling procedures as described in the table below. If the problem still cannot be resolved, please contact SolisStorage

Table 8-1 Explanation of Common Fault Information

NO	Fault or alarm phenomenon	Possible causes	Solution
1	The low voltage indicator light of the main control box is not illuminated.	1. not good contact of wiring cable 2. SBU malfunction 3. indicator light failure	1. Inspect the indicator light wiring 2. Replace the SBU 3. Replace the indicator light
2	The high-voltage indicator light of the main control box is not illuminated.	1.high-voltage relay damaged 2. SBU fault 3. indicator light failed	1. replace the relay 2. replace the SBU 3. replace the indicator light
3	The pre-charging relay cannot close.	1. the main positive relay wiring is not properly connected. 2.failure of pre-charging relay 3. SBMU malfunction	1. inspect the wiring connections. 2. replace the pre-charging relay. 3. replace the SBMU.

4	The main relay cannot be closed.	1. the main positive relay wiring is not properly connected. 2. The relay is damaged. 3. The SBMU malfunctioned.	1. inspect the wiring connections. 2. replace the pre-charging relay. 3. replace the SBMU.
5	The main contactor cannot close.	1. the main positive relay wiring is not properly connected. 2. the relay is damaged. 3. the SBMU malfunctioned.	1. inspect the wiring connections. 2. replace the pre-charging relay. 3. replace the SBMU.
6	Main positive relay report Sticking	the main positive relay is damaged.	replace main positive relay
7	Main negative relay report Sticking	the main negative relay is damaged.	replace main negative relay
8	CSC shutdown	the wake-up signal cable is lost or has bad connection.	check wake-up signal
9	Abnormal alarm for cell voltage sampling	1.bad connection of the voltage detection cable 2. CSC failure.	1.check cable connection 2.replace CSC
10	Abnormal alarm for cell temperature sampling	1.the temperature sampling line is not properly connected. 2. the temperature sensor failure. 3.the CSC failure	1.check cable connection. 2.replace temperature sensor 3.replace CSC
11	Abnormal alarm Battery pack voltage sampling	1.voltage detection cable connection is not tight 2.SBMU fault	1.check cable connection. 2.replace CSC
12	Internal communication failure alarm	internal can cable connection not good	unplug can cable and check it
13	Temperature extremes	cell temperature higher than normal working temperature range	stop charging and discharging
14	Voltage extremes	cell voltage higher than normal working range	stop charging and discharging
15	SBMU shutdown automatically	1.MBMU wake up signal cable connection not good	1.check the cable connection 2,replace SBMU

		2.MBMU wake up signal output not good	
16	Cell over-voltage alarm	1.balanced performance bad 2.system over charging	1.stop charging and conduct balance function in standby state 2.stop charging
17	Cell under-voltage alarm	1. balanced performance bad 2. system over discharging	1.stop discharging and conduct balance function in standby state 2.stop discharging
18	Cell over-temperature alarm	1.single cell temperature is too high 2.cahrging/discharging current is too larger	1.check whether the cooling function of the cooler is operating 2.reduce the charging and discharging current appropriately
19	Cell under-temperature alarm	1.single cell temperature is too low 2.environment temperature is too low	1.check whether the heating function of the cooler is running 2.stop charging
20	Battery pack over voltage alarm	system over charging	stop charging
21	Battery pack under voltage alarm	system over discharging	stop discharging
22	Battery pack over temperature alarm	1.battery pack temperature is too high 2.Temperarue sensor failure	1. check whether the cooling function of the cooler is operating 2.replace the temperature sensor
23	Battery pack under temperature alarm	1.battery bracket low temperature 2.environmental temperature is too low	1.check whether the heating function of the cooler is running 2.stop charging
24	Charging over current alarm	The system charging current is too large	decrease the charging current
25	Discharging over current alarm	The system discharging current is too large	Decrease the load power
26	High SOC alarm	system already charging fully(over charging)	stop charging system
27	Low SOC alarm	system has been discharged and emptied(over discharging)	stop discharging system
28	Cells excessive temperature difference alarm	1、cabinet dissipation not uniformity 2、temperature sensor failure	1.check whether the cooler is turned on 2.replace the temperature sensor
29	Alarm for excessive cell voltage difference	the SOC difference of battery cell is too large	charge the battery system to over 80%SOC to achieve standby

			balancing
30	Air conditioner is not running and there is no display	1.no power supply 2, a lightning strike caused the fuse to burn out	1. check if there is electricity at the power input terminal of the air conditioner 2. check if the fuse of the air conditioner has blown. If it has, replace the fuse
31	Air conditioner compressor failure	1. the condenser is clogged or scaled; 2. the significant impact received by the machine body during rough handling 3. the AC power supply voltage is either too low or too high.	1. clean the condenser heat exchanger regularly; 2. transport as vertically as possible and handle with care. 3. add a voltage stabilizing device。
32	Smoke sensor fault	1. smoke sensor bad contact 2. smoke sensor failure	1.check the connection cable 2.replace the smoke sensors
33	Temperature sensor fault	1.temperature sensor bad contact 2. temperature sensor failure	1.check the connection cable 2.replace the temperature sensors

8.1.2. Battery System Fault Diagnosis and Elimination Procedure

(1) Shut down and temporarily stop this unit from operating.

(2) Status recording: Record the phenomena at the time of the failure immediately, try to keep it complete, such as taking photos, making videos, taking screenshots of the screen, and saving the corresponding data.

(3) Fault type identification: Refer to the following fault information description table, preliminarily determine the fault type, and send the records and confirmation results together to the supplier or technical support engineer. The user's feedback information is extremely important for the maintenance work.

(4) Notify the technical engineer and follow his guidance, combine the diagnostic methods provided in the table above, conduct a preliminary diagnosis, and further confirm the specific type of the fault.

(5) After confirming the specific fault type, contact the engineer to solve the problem on-site immediately.

(6) Fault record: After the failure is resolved, fill in the daily operation fault record form to facilitate retrospect.

8.1.3. Handling of Abnormalities and Accidents

In case of abnormalities or accidents in the battery system, appropriate and effective handling measures should be taken promptly to eliminate further damage and losses:

- Overheating:

Under normal circumstances, when the battery in the system overheats, the cooling system of the battery system will automatically operate to dissipate heat and cool the system to the optimal working temperature range. If the battery system fails to reach the target temperature within the specified time or the temperature exceeds the safe usage limit, the management system will issue a warning and require immediate cessation of use. In this case, the battery should be immediately stopped and the relevant technicians should be notified for a comprehensive inspection to eliminate the fault before it can be used again.

- Leakage:

During use, if leakage is detected in the battery system, personnel in the energy storage room must be evacuated immediately, and relevant technicians must be notified to handle the situation on site. The system can be used again only after the fault is eliminated. It is strictly prohibited to operate the battery with faults or continue to use it forcefully.

- Over-discharge:

When the battery system is completely discharged, the overall voltage is too low or the voltage of some individual batteries is lower than their normal working voltage range. The management system will issue a warning and require immediate cessation of use of the battery and charging. At this time, the discharge of the battery should be immediately stopped, and charging should be started for the battery. It is strictly prohibited to forcibly continue discharging the battery at this time, as it will damage the battery's performance and, in severe cases, may cause the battery to be permanently damaged and unable to be used.

- Short Circuit:

Battery system short circuits caused by various reasons must be immediately evacuated the personnel in the energy storage room, the relevant power sources and electrical equipment must be cut off (if possible), the battery and the system must be disconnected, and relevant technicians must be notified to arrive on site for maintenance and fault elimination. Batteries that have been severely short-circuited cannot be used again. They must be fully inspected by the manufacturer before a decision can be made on whether partial repair and use is possible.

- Fire:

Battery system fire accidents caused by various reasons must be immediately evacuated the personnel in the energy storage room. No irrelevant personnel are allowed to approach the energy storage room within the safe range (because there may be explosion risks). Special fire extinguishers should be used by professionals for firefighting. After the fire is extinguished, personnel wearing necessary protective equipment should first cut off the power connection lines, and the battery system should be fully discharged through resistance (to zero volts) before the battery system can be removed for subsequent operation analysis.

- Battery system collision:

Due to various reasons, if the battery system is collided, deformed or pierced by foreign objects, it should be immediately disconnected from the power connection line, and relevant technicians should be notified to handle the situation. If the battery needs to be removed, it should be fully discharged by personnel wearing necessary protective equipment before the battery can be removed.

- Other accidents:

When the battery system needs to be repaired or the battery system needs to be removed due to other accidents, the battery circuit should be disconnected to ensure that the battery will not be short-circuited. The battery system should be removed under safe conditions to prevent damage from collisions, falls, upside-down, etc. If such situations occur, please follow the above regulations for handling.

8.2. Trouble shooting for Air conditioner

8.2.1. Trouble Shooting

NO	Fault or alarm phenomenon	Possible causes	Solution
1	Temperature sensor failure	1. The sensor is damaged, broken or short-circuited; 2. Sensor damage.	1.check if the cable connection is tight 2.If the above issues are not resolved, contact SOLIS.
2	System HV alarm	1. The condenser is clogged or scaled; 2. Failure of the external fan; 3. The external circulating air is short-circuited or blocked; 4. Excessive refrigerant was charged during maintenance; 5. Excessively high ambient temperature; 6. False alarm from the sensor in the middle of the condenser.	1. Clean the condensing heat exchanger regularly; 2. Inspect/Replace the condensing fan; 3. The air inlet and outlet of the external mask must be well isolated, and it should be ensured that there are no close-range obstructions directly in front of the on-site cabinet installation. 4. Please have it repaired by professionals and add the appropriate amount of refrigerant as required by the nameplate. 5. Appropriately lower the ambient temperature or add shading devices; 6. If the above issues are not resolved, contact SOLIS.
3	Cabinet high-temperature	1. The condenser is clogged or scaled; 2. Excessively high ambient temperature; 3. The refrigeration system malfunctions; 4. A cabinet with a relatively high heat generation has been added Equipment;	1. Clean the condenser heat exchanger regularly; 2. Appropriately lower the ambient temperature or add shading devices; 3. Please have professionals conduct inspection and maintenance. 4. Reevaluate the calorific

		5. The temperature setting is inappropriate; 6. False alarm from the temperature sensor inside the cabinet.	value and make adjustments; 5. Re-evaluate the temperature setting value and its deviation; 6. If the above issues are not resolved, contact SOLIS.
4	Cabinet low-temperature	1. The temperature setting is inappropriate; 2. The refrigeration system cannot be turned off. 3. False alarm from the temperature sensor inside the cabinet.	1.Re-evaluate the temperature setting value and its deviation; 2. If the above issues are not resolved, contact SOLIS.
5	The evaporator is frozen	1. Internal air circulation short circuit; 2. Poor air intake or exhaust inside the cabinet; 3. Internal fan failure; 4. The refrigeration system cannot be turned off. 5. The temperature sensor in the middle of the evaporator gave a false alarm.	1. Ensure that there is a certain distance between the internal circulation air inlet and the equipment inside the cabinet, and add an intermediate partition. 2. Ensure smooth air circulation at the air inlet and outlet of the internal circulation without severe blockage. 3. If the above issues are not resolved, contact SOLIS.
6	Abnormal communication	The terminal of the wire harness is loose.	Check if the wiring has come loose.

8.3. Fire Protection System Trouble Shooting

8.3.1. Smoke detector fault

NO	Fault or alarm phenomenon	Causes	Solution
1	The test smoke detector did not alarm	The smoke detector is damaged	Replace smoke detector, refer to chapter 7.6
2	The smoke detector gave a false fire alarm	The smoke detector is damaged	Replace smoke detector, refer to chapter 7.6

8.3.2. Temperature detector fault

NO	Fault or alarm phenomenon	Causes	Solution
1	The test temperature detector did not alarm	The temperature detector is damaged	Replace temperature detector, refer to chapter 7.6

2	The temperature detector gave a false fire alarm	The temperature detector is damaged	Replace temperature detector, refer to chapter 7.6

8.3.3. Gas detector alarm

NO	Fault or alarm phenomenon	Causes	Solution
1	The test detector did not alarm	detector is damaged	Replace the detector
2	LED indicator display Continuous yellow	1.cable failure 2need calibration 3. detector is damaged	1.check it 2.re-calibration 3.replace it

8.3.4. Audible and visual alarm fault

NO	Fault or alarm phenomenon	Causes	Solution
1	The detector tested not alarm	The alarm is damaged	Replace it

9. Appendix

9.1. Maintenance Inspection Checklist

NO	System	Item	Standard	Frequency	Remark
1	Fire protection	Check the indicator light of the smoke detector	The indicator light of the smoke detector flashes every 6 seconds.	every six months	
2		Check the indicator light of the temperature detector	The indicator light of the temperature detector flashes every 6 seconds.	every six months	
3		Check whether the fixing brackets of the aerosol fire extinguishing device are loose.	No loosening	every year	
4		Check whether the aerosol fire extinguishing device is damaged	No Damage	every year	
5		Check if the aerosol has expired	The aerosol must be within the warranty period; The aerosol must be replaced every 15 years.	every year	
6		Use a smoke gun to spray smoke into the smoke detector.	If the smoke concentration does not exceed the alarm threshold, the indicator light flashes every 6 seconds; if the smoke concentration exceeds the alarm threshold, the indicator light	every year	

			remains on, indicating a fire alarm.		
7		Use the heating device to approach the temperature detector	If the temperature does not exceed the alarm threshold, the indicator light flashes once every 6 seconds; if the temperature exceeds the alarm threshold, the indicator light remains on and the EMS displays a fire alarm.	every year	
8		Audible and Visual Alarm	Check for any deformation, rusting, aging or other damages to the appearance. Check the installation for its firmness.	every year	
9		Gas detector	Check if the working condition is normal. Check for any deformation, rusting, aging or other damages to the appearance. Check if the installation is secure.	every year	
10		Gas detector calibration and testing	Refer to Section 7.7	every six months	

11	**Battery**	Are the fixing bolts of the internal structural components loose or missing?	No loosening or missing parts	every six months	
12		Check if the SBMU/CSC is not properly connected.	Judged based on warnings or abnormal data via EMS; If the SBMU/CSC is abnormal, please replace it.	Every day	
13		Check if there are any abnormal alarms in the main control box.	Based on the EMS warnings or abnormal data; if there is an abnormality in the main control box's hardware, then replacement is required.	every day	
14	Air conditioner	Inlet and outlet vents	Check whether the inlet and outlet air vents of the air conditioner, as well as the inlet and outlet air vents of the protective cover outside the cabinet, are clogged.	every six months	
15		Power cord and communication cable	Check whether the power lines and communication lines of the cabinet air conditioner are functioning properly.	every six months	
16		Sound	Check for any abnormal sounds when the fans, pumps and compressors are operating normally.	every six months	

17		Check whether there is water accumulation in the installation area and the cable trench.	The installation area and cable trench are free of water accumulation (if there is any water, please clean it and check the insulation condition)	Every month and after rainy days	
18		Check Is there any odor inside the equipment, such as a burnt smell, a foul odor or a pungent smell	There are no abnormalities around the equipment.	every day	
19	**System**	Check the connection of the power cord, whether the connections between each device and the terminals are loose, damaged or rusted, etc.。	The power cord connections are not loose, and the wires between the devices are not damaged. There is no burning, no abnormal terminals, and no loosening, rusting or abnormality.	every six months	
20		Check whether the appearance is deformed, rusted or damaged	The appearance is normal, without rust or damage.	every six months	
21		Regular dust removal: Clean the air intake filter, exhaust filter and floor drain.	Keep the air intake mesh, exhaust outlet mesh and drain holes clean (if clogged, they may need to be cleaned or replaced)	every three months	
22		Check whether the indicator lights correspond to the operating status.	The indicator light is operating and corresponds to the operating status.	every day	

23		Regularly export the host monitoring data	Regularly export and store the data of the host system	every six months	
24		Regular charging and discharging	The system should be fully charged and discharged regularly for calibration to ensure the consistency of the battery system.	every months	
25		Check whether the data uploaded to EMS is functioning properly	Data is complete and there are no abnormal alarms.	every day	
26		Sealing inspection	All sealing points (including valves, pump seals, threaded/clip/法兰 joints) are tightly connected without any looseness or leakage. The sealing strips are undamaged or not loose.	every six months	
27		Check the insulation impedance (high-voltage circuit)	Check every day whether there are any insulation alarms in the EMS. Use an insulation tester to check the insulation resistance once a year.	Daily (EMS Annual)Insulation Test	
28		Check the grounding condition of each battery pack. Check the grounding of other electrical cabinets.	The grounding resistance of each pack should be less than 0.1Ω (measured) and the grounding resistance of the site system should not exceed 4Ω.	every year	

9.2. Daily Operation Fault Record Sheet

Daily Operation Fault Record Sheet						
Date	Fault description	Fault type	Fault position	Causes and solution	Fault handling result	Engineer

9.3. Regular Maintenance Record Sheet

Regular Maintenance Record Sheet				
Date	Maintenance items	Signature of maintenance personnel	Next maintenance date	Remarks

10. After-sales Instructions

Solis provides customers with comprehensive technical support and after-sales services.

1. Customers can obtain services by calling our company's service hotline.

Service hotline: +86 (0)574 6578 1806

2. The free warranty period is in accordance with the contract.

The following situations are not covered by our company's free warranty service:

(1) System damage caused by improper operation in accordance with the user manual, or faults resulting therefrom.

(2) Damage or faults caused by incorrect wiring and power supply in accordance with relevant electrical safety regulations, or due to poor on-site conditions.

(3) System damage caused by user's unauthorized modifications.

(4) System damage or faults caused by natural disasters such as typhoons, earthquakes, floods, fires, or adverse environmental conditions (high temperature, low temperature, high humidity, acid rain, etc.).

(5) If the user does not maintain the initial fault state after the occurrence of the fault, fails to notify the manufacturer in time and handles it by themselves, resulting in inability to make a practical fault diagnosis of the cause of the fault.

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Please adhere to the actual products in case of any discrepancies in this user manual.
If you encounter any problem on the inverter, please find out the inverter S/N and contact us, we will try to respond to your question ASAP.