

V1.0-2025-12-18

**Small-scale Microgrid**

# **Static Transfer Switch**

GW500K-STS-PCS-G10

**User Manual**

**GOODWE**

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## NOTICE

Due to product version upgrades or other reasons, the content of this document may be updated periodically. Unless otherwise agreed, the content of this document cannot replace the safety precautions on the product label. All descriptions in this document are for guidance only.

# About This Manual

## Overview

This document primarily introduces the product information, installation wiring, configuration debugging, troubleshooting, and maintenance of the GW500K-STS-PCS-G10 grid-connected/off-grid switching cabinet (hereinafter referred to as STS). Before installing and using this product, please read this manual carefully to understand the product safety information and familiarize yourself with the product's functions and features. The document may be updated periodically. Please obtain the latest version and more product information from the official website: <https://www.goodwe.com>.

## Applicable Model

This document applies to the following device models:

model	Nominal output power	Nominal output voltage
GW500K-STS-PCS-G10	500kW	220/380V, 230/400V, 3L/N/PE

## Symbol Definition

### DANGER

Indicates a situation with a high potential hazard, which, if not avoided, will result in death or serious injury.

### WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

 **CAUTION**

Indicates a situation with low potential danger, which if not avoided, could result in moderate or minor injury to personnel.

**NOTICE**

Emphasis and supplementation of content, may also provide tips or tricks for optimizing product usage, helping you solve problems or save time.

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# 1 Safety Precautions

Always adhere to the Safety Precautions information contained in this document when operating the device.

## **WARNING**

The device has been strictly designed and tested in accordance with safety regulations. However, as an electrical device, relevant safety instructions must be followed before performing any operations. Improper handling may lead to serious injury or property damage.

## 1.1 General Safety

## NOTICE

- Due to product version upgrades or other reasons, the content of this document may be updated periodically. Unless otherwise agreed, the document content cannot replace the safety precautions on the product label. All descriptions in the document are for guidance only.
- Please read this document carefully before installing the equipment to understand the product and its precautions.
- All operations on the equipment must be performed by professional, qualified electrical technicians who are familiar with the relevant standards and safety regulations in the project location.
- When operating the equipment, use insulated tools and wear personal protective equipment to ensure personal safety. Contact with electronic components requires wearing anti-static gloves, wrist straps, clothing, etc., to protect the equipment from electrostatic damage.
- Unauthorized disassembly or modification may cause equipment damage, and such damage is not covered under warranty.
- Equipment damage or personal injury resulting from installation, use, or configuration not in accordance with the requirements of this document or the corresponding user manual is beyond the manufacturer's liability. For more product warranty information, please visit the official website:  
<https://en.goodwe.com/warrantyrelated.html>.

## 1.2 personnel requirements

## NOTICE

To ensure safety, compliance, and efficiency throughout the entire process of equipment transportation, installation, wiring, operation, and maintenance, all work must be performed by qualified personnel or professionals.

1. Qualified personnel or professionals include:

- Personnel who have mastered the knowledge of equipment working principles, system structure, associated risks and hazards, and have received professional operational training or possess extensive practical experience.
- Personnel who have received relevant technical and safety training, possess certain operational experience, are aware of the potential dangers specific tasks may pose to themselves, and can take protective measures to minimize risks to themselves and others.
- Qualified electrical technicians meeting the regulatory requirements of the country/region.
- Personnel holding a degree in electrical engineering / an advanced diploma in electrical disciplines or equivalent / professional qualifications in the electrical field, with at least 2/3/4 years of experience in testing and supervision work using electrical equipment safety standards.

2. Personnel involved in special tasks such as electrical work, work at heights, and special equipment operation must hold valid qualification certificates as required by the location of the equipment.

3. Medium-voltage equipment operation must be performed by certified high-voltage electricians.

4. Equipment and component replacement is only permitted to be performed by authorized personnel.

## 1.3 EU Declaration of Conformity

### 1.3.1 Equipment with Wireless Communication Modules

Equipment with Wireless Communication Modules sold in the European market must comply with the following directives:

- Radio Equipment Directive 2014/53/EU (RED)
- Restrictions of Hazardous Substances Directive 2011/65/EU and (EU) 2015/863 (RoHS)

- Waste Electrical and Electronic Equipment 2012/19/EU
- Registration, Evaluation, Authorization and Restriction of Chemicals (EC) No 1907/2006 (REACH)

### 1.3.2 Devices without wireless communication functionality

Devices without wireless communication functionality that can be sold on the European market must comply with the following directives:

- Electromagnetic compatibility Directive 2014/30/EU (EMC)
- Electrical Apparatus Low Voltage Directive 2014/35/EU (LVD)
- Restrictions of Hazardous Substances Directive 2011/65/EU and (EU) 2015/863 (RoHS)
- Waste Electrical and Electronic Equipment 2012/19/EU
- Registration, Evaluation, Authorization and Restriction of Chemicals (EC) No 1907/2006 (REACH)

## 1.4 Safety Symbols and Certification Marks

### DANGER

- After the equipment is installed, the labels and warning signs on the enclosure must remain clearly visible. Do not block, alter, or damage them.
- The following enclosure warning label descriptions are for reference only. Please refer to the actual labels on the equipment.

No.	Symbol	Description
1		Potential hazard exists during equipment operation. Take precautions when operating the equipment.
2		High voltage hazard. High voltage is present during equipment operation. Ensure the equipment is powered off before performing any operations.
3		High surface temperature. Do not touch the equipment during operation to avoid burns.

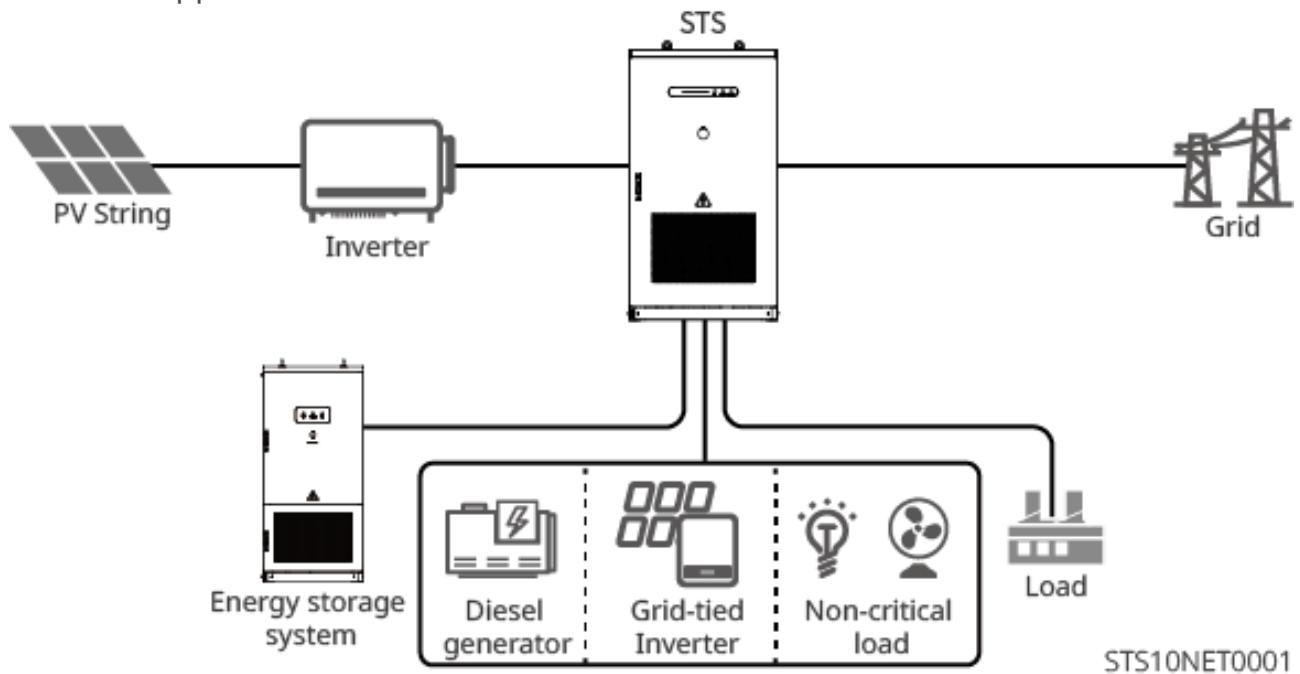
No.	Symbol	Description
4		Delayed discharge. After powering off the equipment, wait for 5 minutes until it is completely discharged.
5		Read the product manual carefully before operating the equipment.
6		Wear personal protective equipment during installation, operation, and maintenance.
7		This equipment must not be disposed of as household waste. Dispose of the equipment according to local laws and regulations, or return it to the manufacturer.
8		Grounding point.
9		Recycling symbol. The equipment should be placed at the appropriate location and recycled according to local environmental regulations.
10		CE certification mark.
11		DRM certification mark.

# 2 Product Introduction

## 2.1 Product Overview

STS supports the connection of photovoltaic inverters, energy storage systems, diesel generators, loads, and the grid, assisting the entire system in achieving seamless grid-tied/off-grid switching to meet the power backup needs of areas with unstable power supply.

The main application scenarios are as follows:



port	Description
Inverter	<p>Photovoltaic inverter connection port. Maximum port capacity 1MVA, supports 1 centralized (optional) and 5 string-type inputs.</p> <ul style="list-style-type: none"><li>Centralized: Port capacity 500kVA, maximum input current 1250A</li><li>String-type: Port capacity 500kVA, maximum input current per string 250A.</li></ul>

port	Description
ESS	Energy storage system connection port. Maximum port capacity 550kVA, supports up to 5 energy storage system inputs, maximum input current per string 250A.
Smart-port	Diesel generator/photovoltaic inverter/non-critical load connection port. Maximum port capacity 550kVA, maximum input current 1000A.
Back-up	Load connection port. Port capacity 500kVA. Supports single-phase/three-phase loading, maximum phase current 835.6A.
Grid	Maximum configuration capacity 630kVA, maximum input current 1000A. For Supported Grid Types, please refer to <a href="#">2.3.Supported Grid Types(Page 14)</a> . Wiring method: 3L/N/PE.

## NOTICE

1. When the Smart-port is connected to non-critical loads, the total load capacity of the Smart-port and Back-up ports must not exceed 500kVA.
2. The load imbalance transient must not exceed 0.8Pn, where Pn is the capacity of the energy storage system.
3. The microgrid system's off-grid load-carrying capability is as follows:
  - With motor/transformer loads:  $A*10 + B*1.5 \leq Pn$
  - Without motor/transformer loads:  $B \leq 0.8Pn$

Pn: Energy storage system capacity, A: Directly connected motor/transformer load capacity, B: Other ordinary load capacity

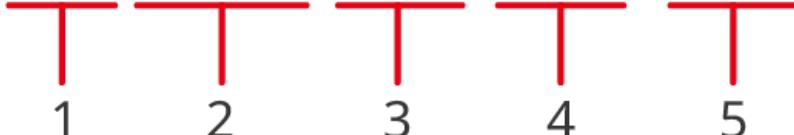
## Product Features

- Supports connection of grid-tied PV inverters, energy storage systems, diesel generators, loads, and the grid, offering flexible configuration
- Supports seamless grid-tied/off-grid switching within 20ms
- Seamless switching for diesel generators

- Enables centralized management of energy and loads when used with SEC3000C

### Model Number Meaning

**GW500K-STS-PCS-G10**

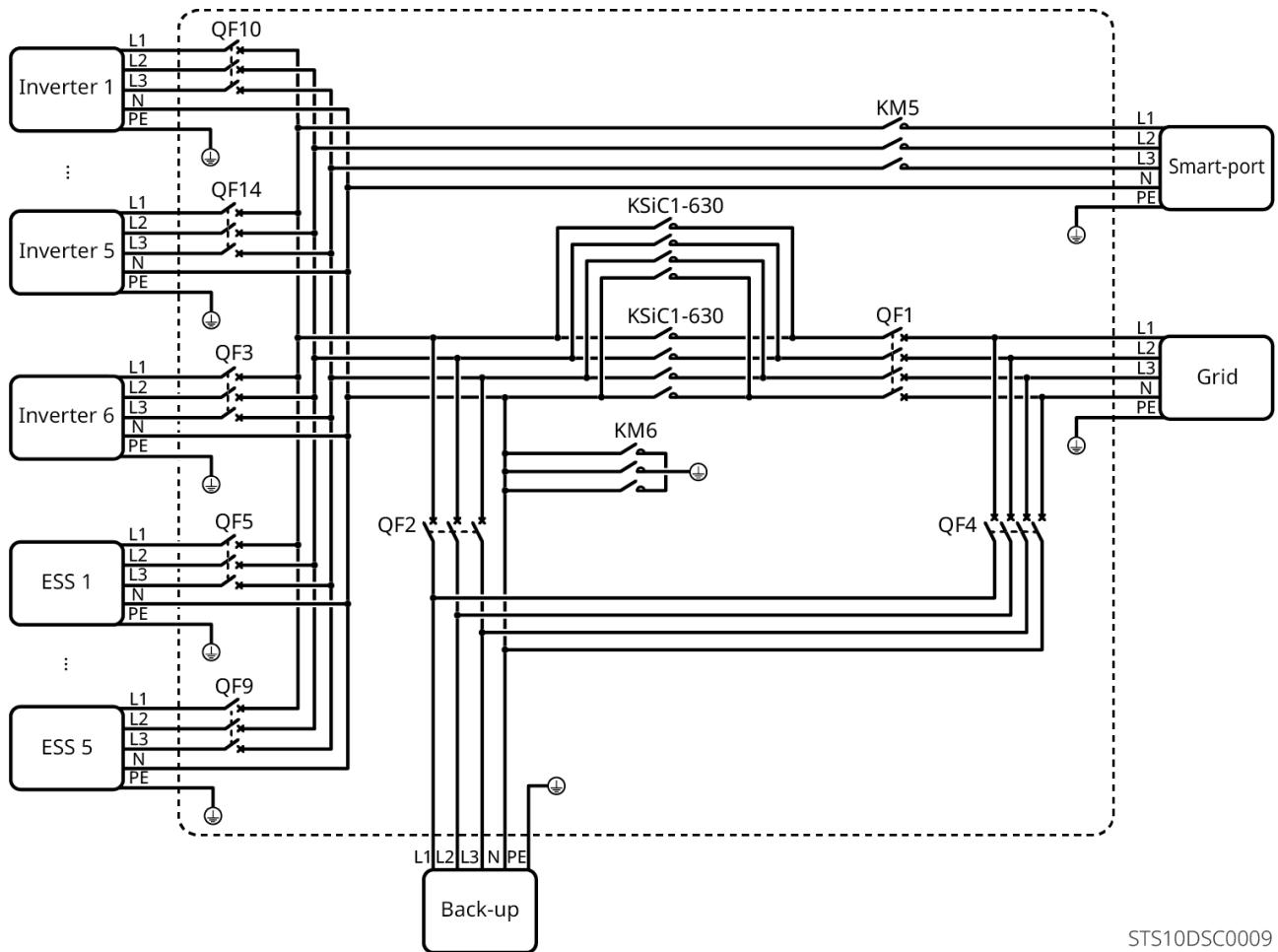


1 2 3 4 5

STS10DSC0008

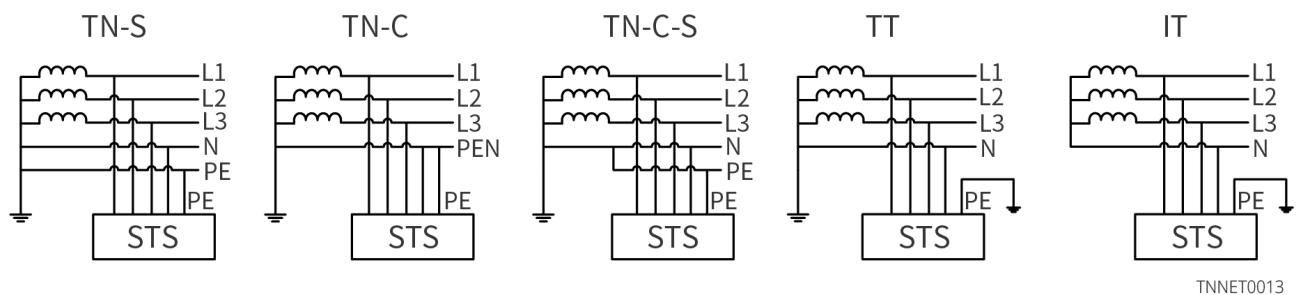
No.	Meaning	Description
1	Brand code	GW: GoodWe
2	Nominal power	500K: Nominal power is 500kW
3	Series code	STS: STS Series
4	Feature code	PCS: Only compatible with GoodWe PCS
5	Version code	G10: First generation product

## 2.2 Circuit Block Diagram



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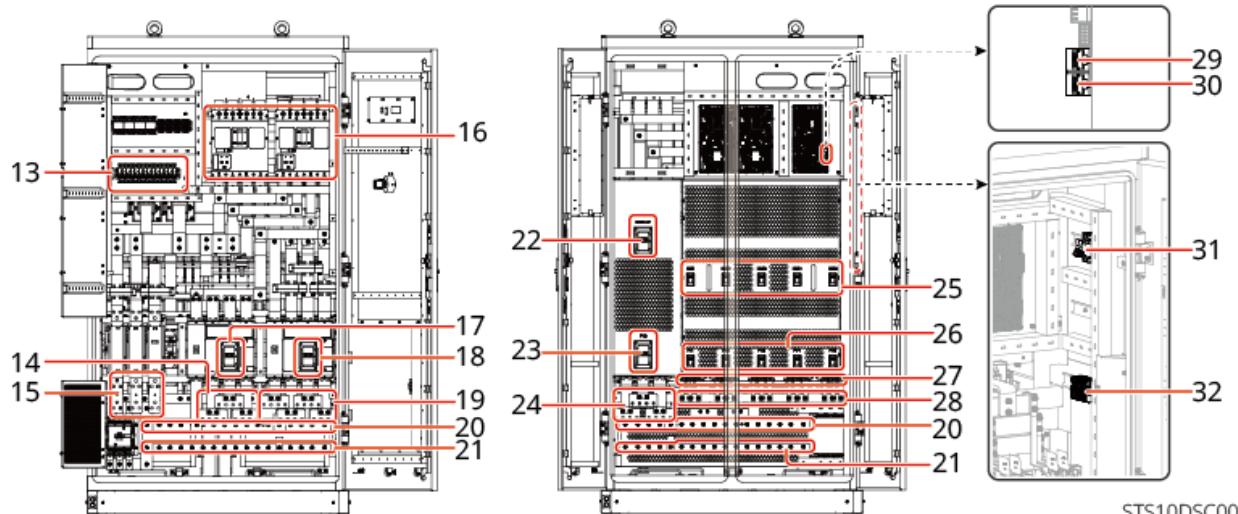
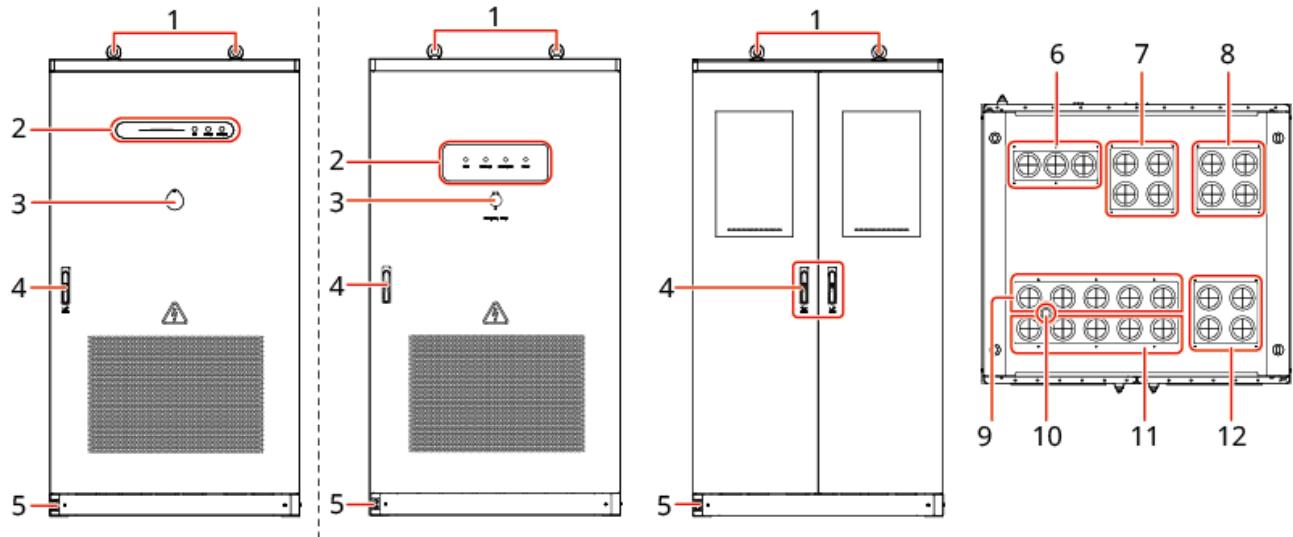
## 2.3 Supported Grid Types



TNNET0013

## 2.4 Appearance & Dimensions

### 2.4.1 Appearance and Internal Components Introduction



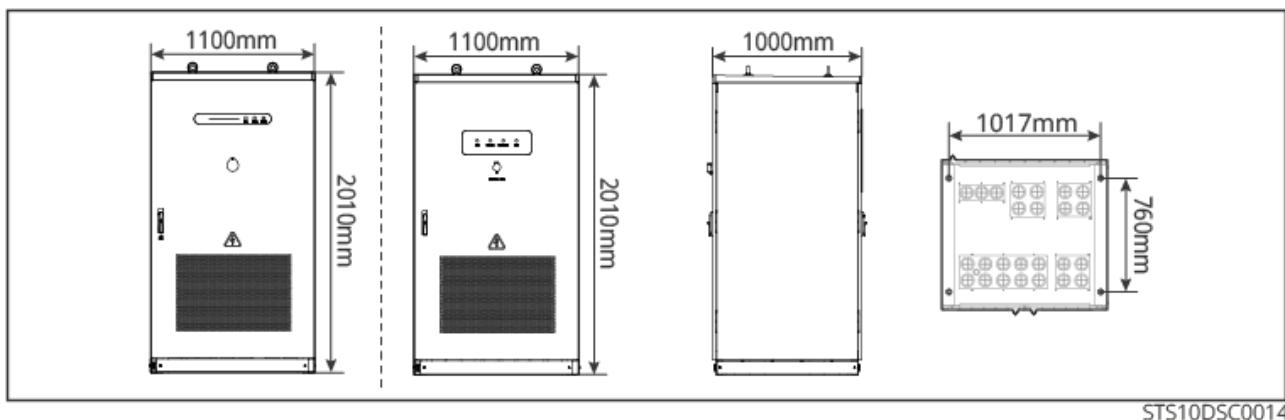
No.	Component	Description
1	Lifting Eye	For hoisting and handling
2	Indicator	Indicates the operating status of the STS
3	Emergency Stop Button	In case of an emergency, press this button to stop the system.
4	Door Lock	Use the key to unlock the cabinet door. Close and lock the cabinet door when no internal operation is required.
5	Protective Grounding Point	For connecting the protective ground wire

No.	Component	Description
6	Smart-port Port	For connecting diesel generator, PV inverter, and non-critical loads
7	Back-up Port	For connecting loads
8	Grid Port	For connecting to the power grid
9	ESS Port	For connecting to the energy storage system
10	COM Port	For connecting communication cables
11	Inverter Port	For connecting PV inverters (string type)
12	Inverter Port	For connecting PV inverters (centralized type)
13	Switches	Q1, Q2, Q3: Auxiliary power distribution supply switches Q4: Grid-side surge protector switch Q5: BUS-side surge protector switch
14	Back-up Port Terminal Block	For connecting power cables of loads
15	Smart-port Port Terminal Block	For connecting power cables of diesel generator/PV inverter/non-critical loads
16	Grid-tie/Off-grid Toggle Switch	For controlling system grid-tie/off-grid switching
17	Bypass Switch	The Bypass switch can control loads to be directly connected to the grid. When maintenance is required for the ESS/Inverter/Smart-port ports, to ensure uninterrupted load operation, close the Bypass switch and open all other switches to safely perform maintenance on these ports.

No.	Component	Description
18	Grid Input Circuit Breaker	For controlling grid input
19	Grid Port Terminal Block	For connecting grid-tie power cables
20	Neutral (N) Terminal Block	For connecting the neutral wire
21	Protective Earth (PE) Terminal Block	For connecting the protective earth wire
22	Load Input Circuit Breaker	For controlling load input
23	(Optional) Centralized PV Inverter Input Circuit Breaker	For controlling centralized PV inverter input
24	(Optional) Inverter Port Terminal Block	For connecting power cables of centralized PV inverters
25	Energy Storage System Circuit Breaker	For controlling energy storage system input
26	String PV Inverter Input Circuit Breaker	For controlling string PV inverter input
27	Inverter Port Terminal Block	For connecting power cables of string PV inverters
28	ESS Port Terminal Block	For connecting power cables of the energy storage system
29	LAN Port	For communicating with SEC3000C
30	PCS Port	For communicating with the energy storage system
31	Q6 Circuit Breaker	Reserved, external device power supply switch for controlling power supply to external devices. Can supply power to SEC3000C or third-party EMS.

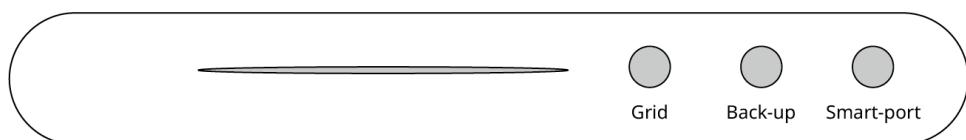
No.	Component	Description
32	Terminal Block	Reserved Bypass DI wire connection port. Reserved DO port for controlling diesel generator start/stop and RS485 port for communicating with diesel generator.

## 2.4.2 Product Dimensions



## 2.4.3 Indicator Light Instructions

### Type I

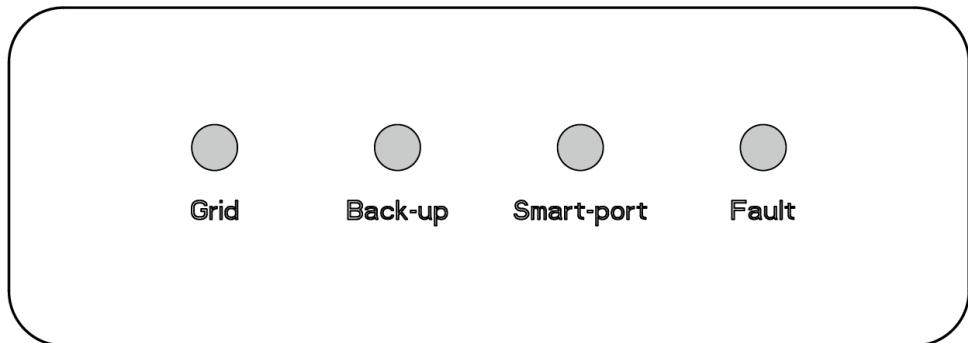


STS10DSC0011

Indicator	Status	Description
Grid		Steady on: Grid voltage is normal and the JINGUI switch is closed.
		Flashing: Grid voltage is normal, but the JINGUI switch is not closed.

Indicator	Status	Description
	_____	Off: No grid voltage.
Back-up	_____	Steady on: Load circuit breaker is closed.
	_____	Off: Load circuit breaker is open.
Smart-port	_____	Steady on: Smart port voltage is normal and the smart port contactor is closed.
		Flashing: Smart port voltage is normal, but the smart port contactor is open.
	_____	Off: No smart port voltage.
Fault Indicator	_____	Red light on: An alarm or fault has occurred.
	_____	Green light on: No fault or alarm.

## Type II

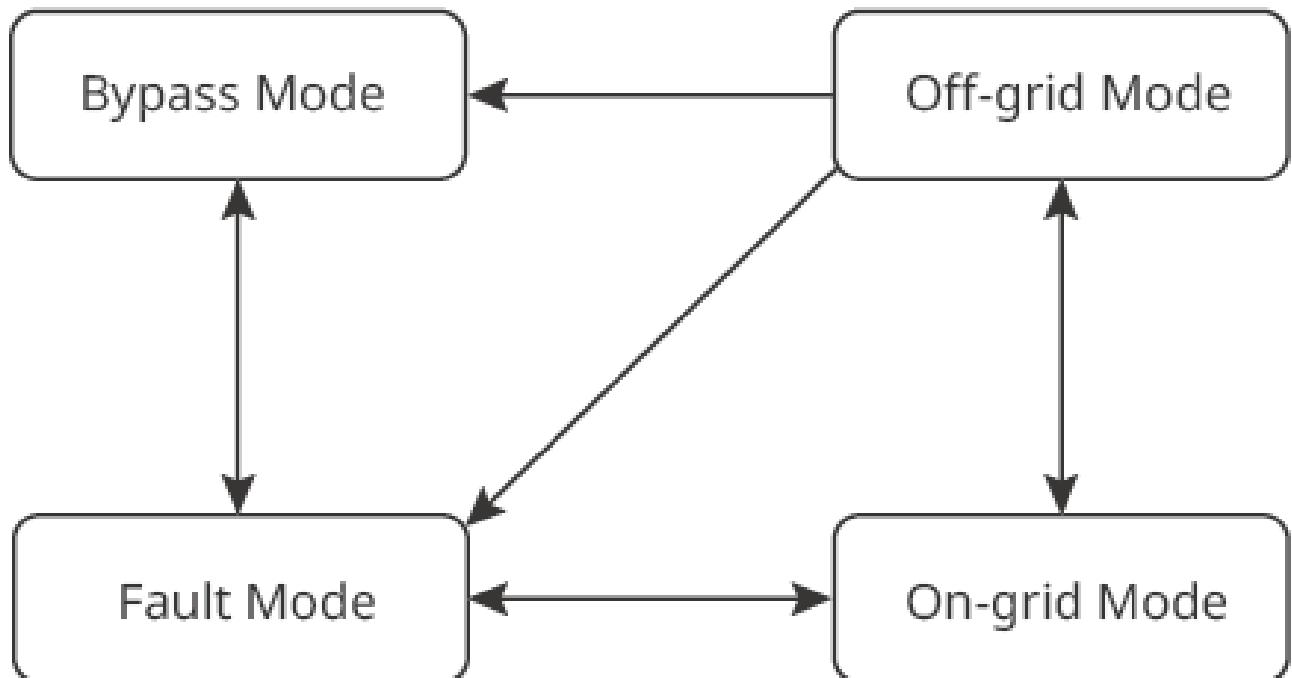


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Indicator	Status	Description
Grid	_____	Steady on: Grid voltage is normal and the grid-tie/islanding switch is closed.
	_____	Off: The grid-tie/islanding switch is open.
	_____	Steady on: The load circuit breaker is closed.

Indicator	Status	Description
	—	Off: The load circuit breaker is open.
		Steady on: Smart-port voltage is normal and the Smart-port contactor is closed.
	—	Off: The Smart-port has no voltage and the Smart-port contactor is open.
		Flashes red and beeps: A system fault has occurred.
	—	Off: No fault.

## 2.5 Operation Mode



STS10DSC0012

No.	Mode	Description
1	on-grid	When the grid is normal, the STS switch is closed, and it is in on-grid state.
2	off-grid	When the grid is powered off, the STS switch is open, and it is in off-grid state.
3	Bypass	When maintaining the ESS/Inverter/Smart-port ports, if it is necessary to maintain power supply to the Back-up port, please switch to bypass mode (close the Bypass switch and open all other switches).
4	fault	The fault indicator light is red, please handle it promptly.

# 3 Check and Storage

## 3.1 Check Before Receiving

Before signing for the product, please carefully inspect the following:

1. Check the outer packaging for any damage, such as deformation, holes, cracks, or other signs that could indicate damage to the equipment inside the box. If any damage is found, do not open the packaging and contact your distributor.
2. Verify that the inverter model is correct. If it does not match, do not open the packaging and contact your distributor.
3. Check that the types and quantities of delivered items are correct and inspect their appearance for any damage. If any damage is found, please contact your distributor.

## 3.2 deliverables

Component	Description	Component	Description
	Grid-tie/Off-grid switching cabinet ×1		Expansion bolt ×4
	Flange nut ×50		fireproofing mud ×50
 M8×16	M8X16 Hex head combination bolt ×5	 M8×25	M8X25 Hex head combination bolt ×50

Component	Description	Component	Description
 M8×30	M8X30 Hex head combination bolt ×50	 M8×35	M8X35 Hex head combination bolt ×10
	PIN terminal ×12		User manual ×1

### 3.3 Storage

If the device is not put into use immediately, please store it according to the following requirements:

1. Ensure the outer packaging box is not removed and the desiccant inside the box is not lost.
2. Ensure the storage environment is clean, with appropriate temperature and humidity ranges, and free from condensation.
3. Ensure the device stacking height and orientation are arranged according to the instructions on the packaging box label.
4. Ensure there is no risk of toppling after the devices are stacked.
5. If the device storage period exceeds two years or the device remains idle for more than 6 months after installation, it is recommended to have it inspected and tested by professional personnel before putting it into use.
6. To ensure the good electrical performance of the internal electronic components, it is recommended to power on the device every 6 months during storage. If it has not been powered on for more than 6 months, it is recommended to have it inspected and tested by professional personnel before putting it into use.

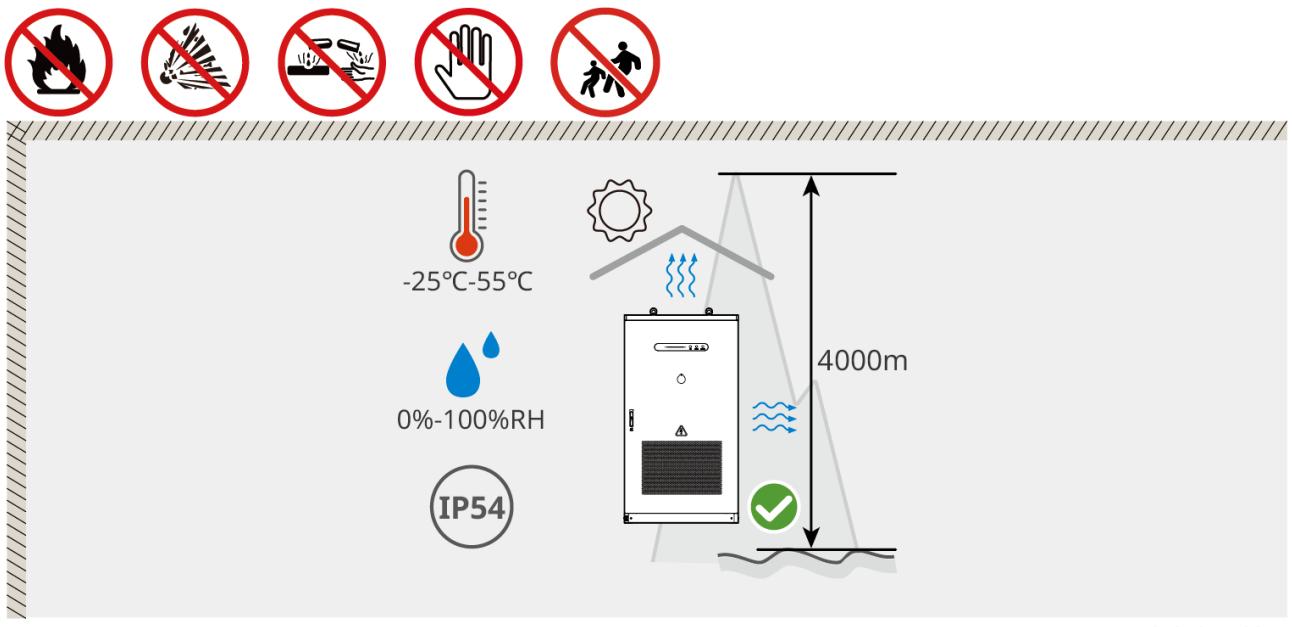
# 4 Installation

## 4.1 Installation Requirements

### Installation Environment Requirements

1. The device must not be installed in flammable, explosive, corrosive, or similar environments.
2. The installation space must meet the device's ventilation, heat dissipation, and operational space requirements.
3. The device's protection rating is suitable for outdoor installation; the installation environment's temperature and humidity must be within the appropriate range.
4. The device should avoid installation environments with direct sunlight, rain, snow accumulation, etc. It is recommended to install in a sheltered location; if necessary, a sunshade can be erected.
5. The installation location should be out of reach of children and avoid being placed in easily accessible positions.
6. The device installation height should facilitate operation and maintenance, ensuring device indicators, all labels are easily visible, and terminal blocks are easy to operate.
7. The device installation altitude must be below 4000m.
8. The device may corrode if installed in salt damage areas. Salt damage areas refer to regions within 500m of the coast or areas affected by sea breeze. The areas affected by sea breeze vary depending on meteorological conditions (e.g., typhoons, seasonal winds) or topography (with embankments, hills).
9. If the device is installed in public places other than work and living areas (such as parking lots, stations, factories, etc.), install a protective net around the device and erect safety warning signs for isolation. Unauthorized personnel are prohibited from approaching to prevent personal injury or property damage due to accidental contact by non-professionals or other reasons during device operation.
10. Stay away from strong magnetic field environments to avoid electromagnetic interference. If there are radio stations or wireless communication devices below 30MHz near the installation location, install the device according to the following requirements:
  - Add a ferrite core with multiple windings at the device's AC line, or add a low-pass EMI filter.
  - The distance between the device and wireless electromagnetic interference devices

should exceed 30m.

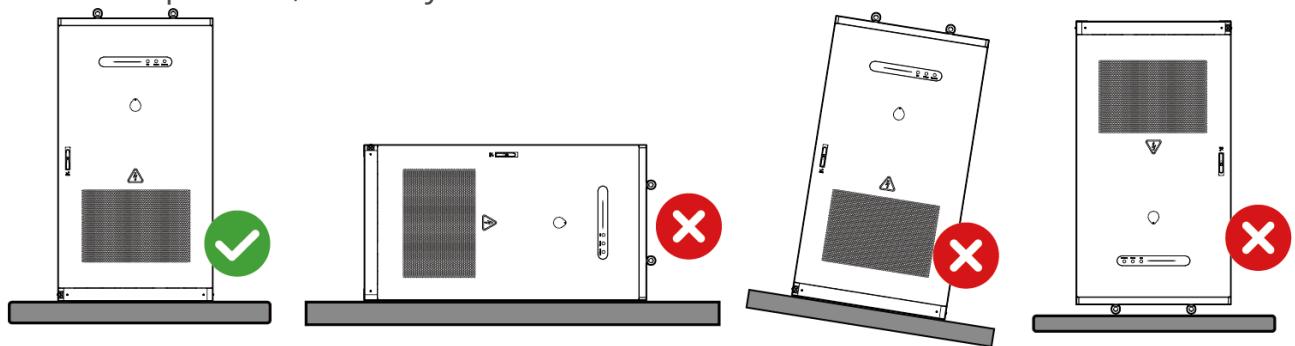


STS10INT0017

## Installation Angle Requirements

The device must be installed vertically and stably on the foundation to ensure device stability and normal heat dissipation.

Do not tilt, place on its side, or invert the device, as these may cause device damage, unstable operation, or safety hazards.

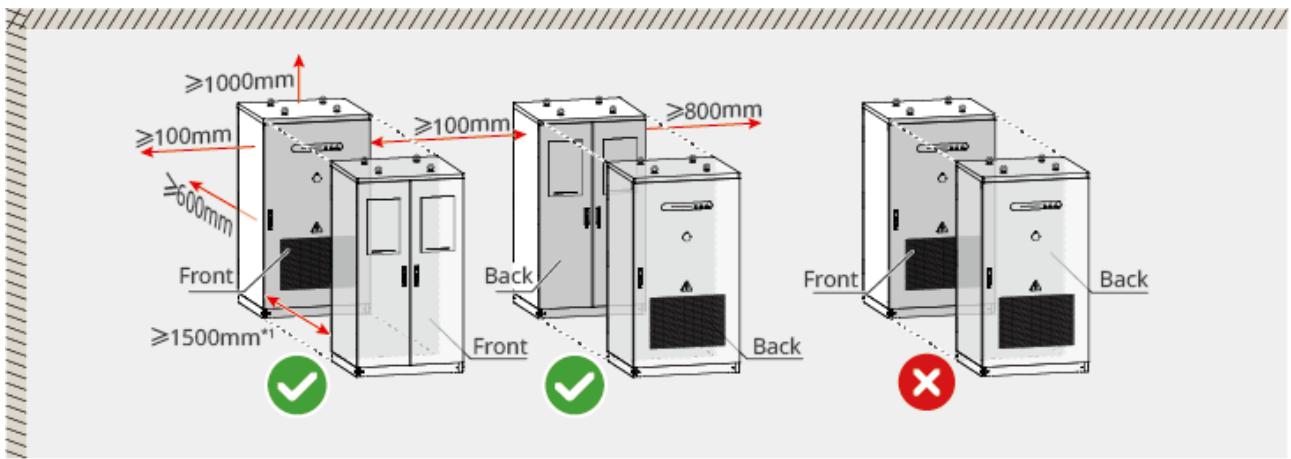


STS10DSC0010

## Installation Space Requirements

## NOTICE

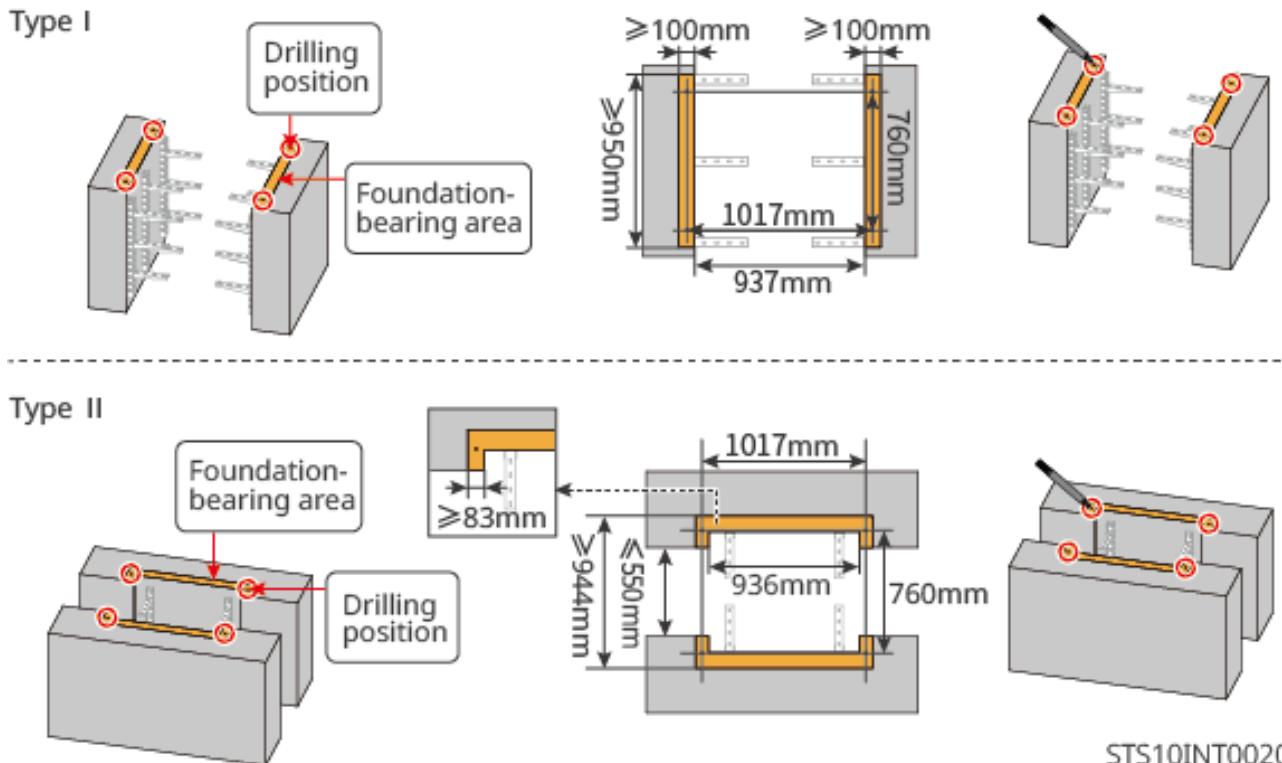
When using a forklift, the clearance between the front and rear of the equipment must be greater than or equal to 2.5m.



STS10INT0016

## Installation Foundation Requirements

- The device installation foundation should be constructed using C35 concrete or other concrete with equivalent performance.
- Before installation, ensure that the base is level, firm, flat, dry, has sufficient load-bearing capacity, and avoid any depressions or tilts.
- The base should have pre-buried pipes or reserved cable outlets to facilitate device wiring.
- The device uses bottom cable entry, so the foundation must have dust-proof and rodent-proof design to prevent foreign objects from entering.
- The foundation must have anti-water accumulation and moisture-proof design to prevent cable aging and short circuits, which could affect the normal operation of the device.
- Since the device cables are thick, the pre-buried pipes/reserved cable outlets should be designed with sufficient space for the cables to ensure smooth connection and prevent wear.



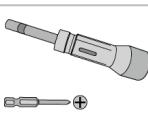
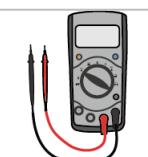
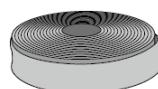
## 4.2 Tool Requirements

## NOTICE

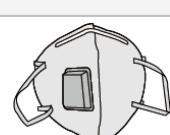
During installation, it is recommended to use the following installation tools. When necessary, other auxiliary tools can be used on site.

## Installation Tools

Tool Type	Description	Tool Type	Description
	diagonal plier		RJ45 connector crimping tool
	wire stripper		YQK-70 hydraulic crimper

Tool Type	Description	Tool Type	Description
	open-end wrench		PV terminal crimping tool PV-CZM-61100
	hammer drill (drill bit Φ8mm)		torque wrench
	rubber hammer		socket wrench
	marker pen		multimeter range ≤1100V
	heat shrink tubing		heat gun
	cable tie		vacuum cleaner

## Personal Protective Equipment

Tool Type	Description	Tool Type	Description
	Insulating gloves, protective gloves		Dust mask
	goggle		Safety shoes

## 4.3 Handling Requirements

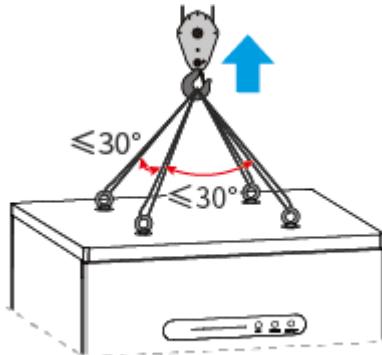
## CAUTION

1. When the equipment is being transported, turned over, installed, or operated, it must comply with the laws, regulations, and relevant standard requirements of the country or region where it is located.
2. To protect the equipment from damage during transportation, ensure that the transport personnel are professionally trained. Record the operation steps during transportation and keep the equipment balanced to avoid falling.
3. Before installation, the energy storage system needs to be moved to the installation site. To avoid personal injury or equipment damage during the moving process, please note the following:
  - Please allocate corresponding personnel and tools according to the weight of the equipment to prevent the equipment from exceeding the weight range that can be manually carried, causing injury to personnel.
  - Ensure that the equipment remains balanced during the moving process to avoid falling.
  - During the equipment moving process, ensure that the cabinet doors are locked.

## NOTICE

- The equipment can be transported to the installation site using hoisting or forklift.
- When using hoisting to move the equipment, please use flexible slings or straps, with a single strap load-bearing capacity of  $\geq 5t$ .
- When using a forklift to move the equipment, the forklift's load-bearing capacity must be  $\geq 5t$ .
- The door panel surface sticker is a vulnerable position during installation and transportation, please be careful.

### • Lifting and Handling

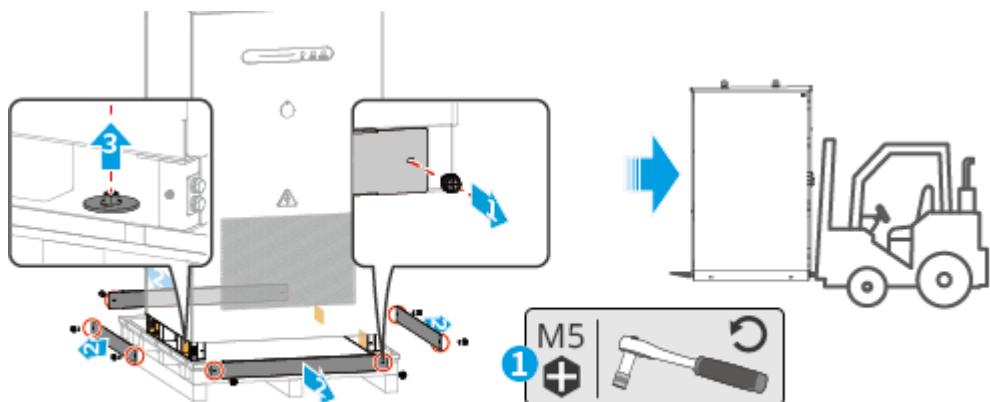


STS10INT0022

**Step 1:** Use a sling with a hook or U-hook to lift the equipment.

**Step 2:** Use a lifting device to hoist and move the equipment.

- **Forklift Handling**



STS10INT0021

**Step 1:** Remove the front and rear baffles of the equipment.

**Step 2:** Use a forklift to move the equipment, ensuring the equipment's center of gravity is centered on the forklift forks.

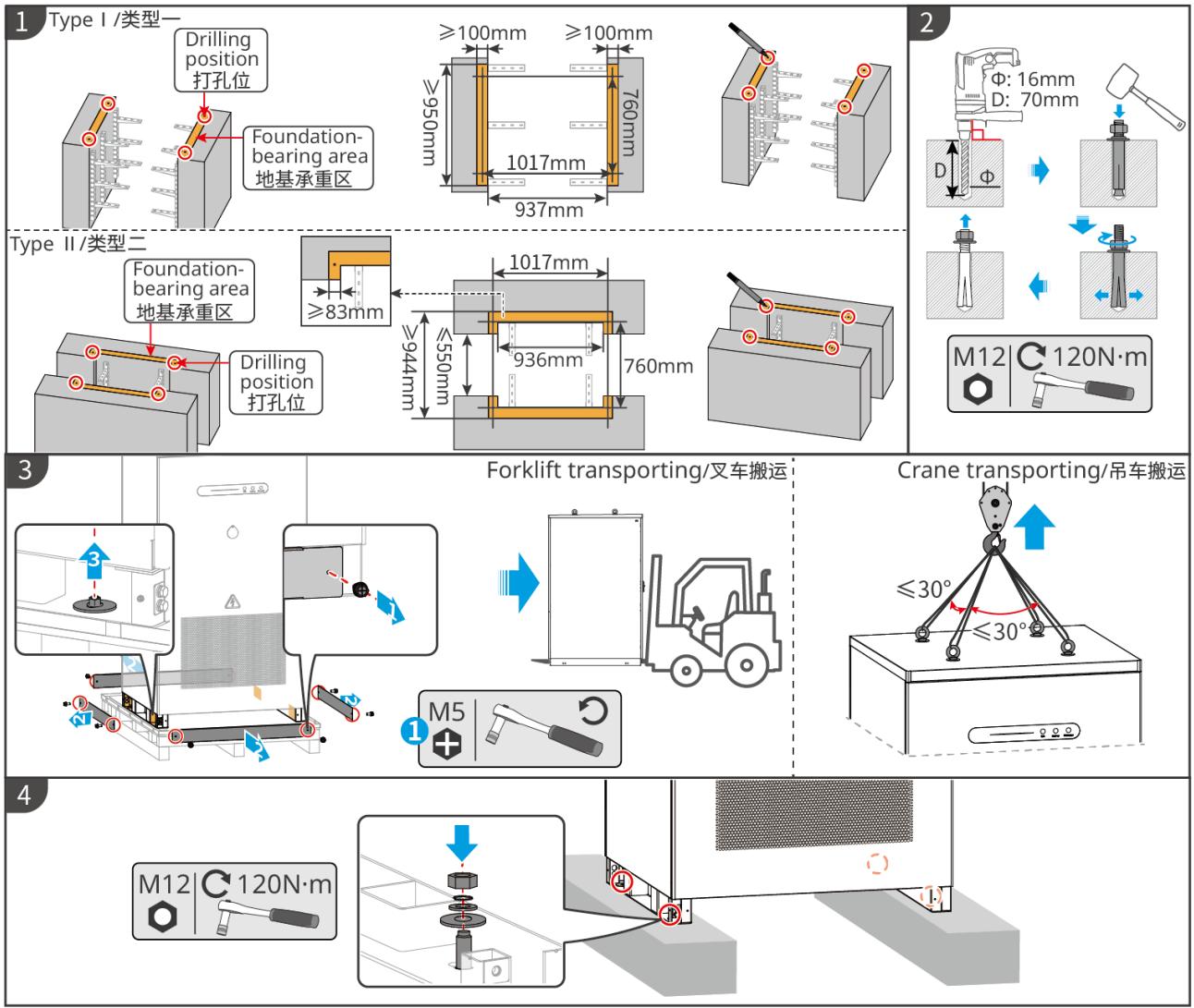
## 4.4 Installation of Grid-Connected and Off-Grid Switching Cabinet

**Step 1:** Use a marker pen to mark the drilling positions on the foundation.

**Step 2:** Use an impact drill to bore holes in the ground and install expansion bolts.

**Step 3:** Move the cabinet onto the foundation and remove the surrounding protective panels.

**Step 4:** Secure the cabinet to the foundation.



# 5 Electrical Connections

## DANGER

- All operations during electrical connection, as well as the specifications of cables and components used, must comply with local laws and regulations.
- Before connecting electrical cables, ensure all upstream switches of the equipment are disconnected.
- Before performing electrical connections, disconnect all switches of the equipment to ensure it is powered off. Live operation is strictly prohibited, as it may lead to dangers such as electric shock.
- Cables of the same type should be bundled together and routed separately from different types of cables. Intertwining or crossing of cables is prohibited.
- If the cable is subjected to excessive tension, poor connection may result. When wiring, leave a certain length of slack in the cable before connecting it to the equipment's terminal port.
- When crimping terminals, ensure the conductor part of the cable makes full contact with the terminal. Do not crimp the cable insulation together with the terminal, as this may cause the equipment to malfunction or, after operation, lead to conditions such as terminal block damage due to unreliable connections and overheating.
- Using cables in high-temperature environments may cause insulation aging and damage. Maintain a distance of at least 30mm between cables and heat-generating components or the periphery of heat source areas.

## NOTICE

- Before performing electrical connections, wear personal protective equipment such as safety shoes, protective gloves, and insulating gloves as required.
- Only trained professionals are permitted to perform operations such as electrical connections.
- Please keep the cabinet door keys in a safe place.
- The cable colors shown in the graphics of this document are for reference only. Specific cable specifications must comply with local regulatory requirements.

## 5.1 Preparation Before Wiring

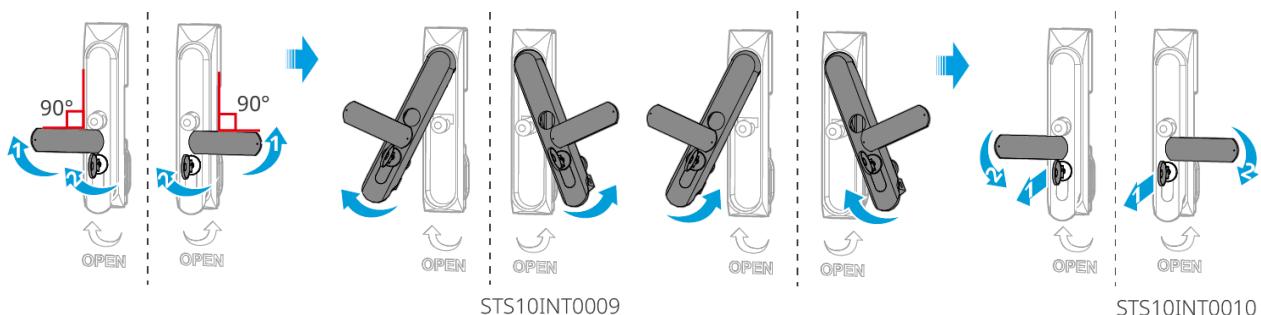
### Preparing Cables

No.	Cable	Type	Specification	Acquisition Method
1	PE cable	Hot-dip galvanized flat steel	Must comply with local AC electrical installation grounding design standards	Customer-supplied
2	Smart-port port connection cable	Multi-core outdoor copper cable, five-core cable recommended	<ul style="list-style-type: none"> <li>Conductor cross-sectional area: 120mm<sup>2</sup></li> <li>Cable outer diameter: 18.3mm</li> </ul>	Customer-supplied
3	Grid port connection cable			
4	Back-up port connection cable		<ul style="list-style-type: none"> <li>Conductor cross-sectional area: 95mm<sup>2</sup>/120mm<sup>2</sup></li> <li>Cable outer diameter: 18.3/19.9mm</li> </ul>	
5	Inverter port (Centralized) connection cable			
6	Inverter port (String) connection cable		<ul style="list-style-type: none"> <li>Conductor cross-sectional area: 70mm<sup>2</sup></li> <li>Cable outer diameter: 16.7mm</li> </ul>	

No.	Cable	Type	Specification	Acquisition Method
7	ESS port connection cable			
8	DI signal cable	Copper-core outdoor twisted pair cable meeting local standards	Conductor cross-sectional area: 0.22~0.32mm <sup>2</sup>	Customer-supplied
9	LAN communication cable	Standard shielded CAT 5E or higher network cable with RJ45 connector		Customer-supplied

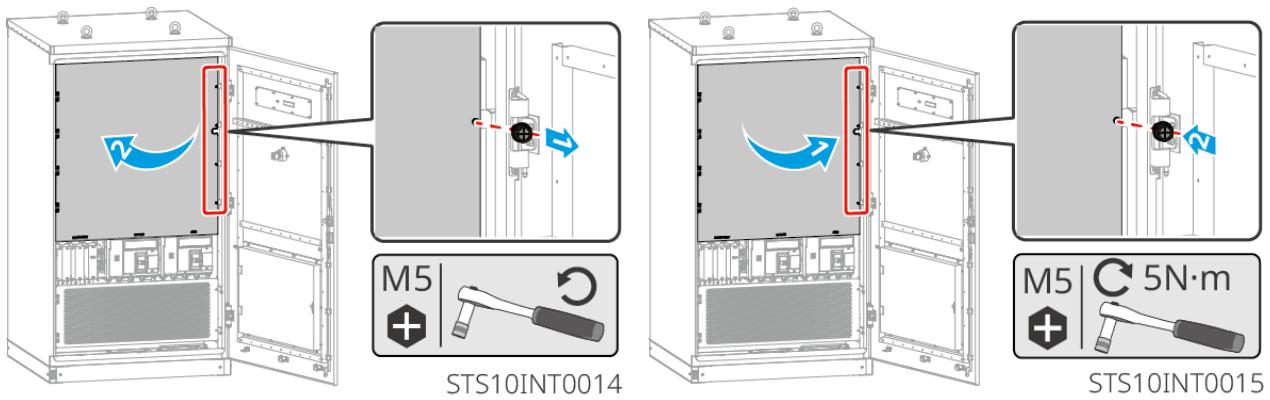
## Cabinet Door and Cover Plate Operations

- Cabinet Door

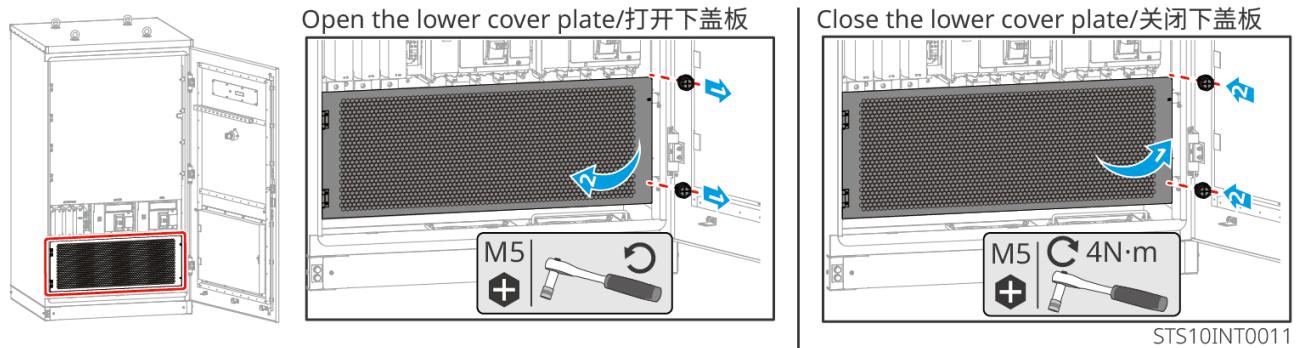


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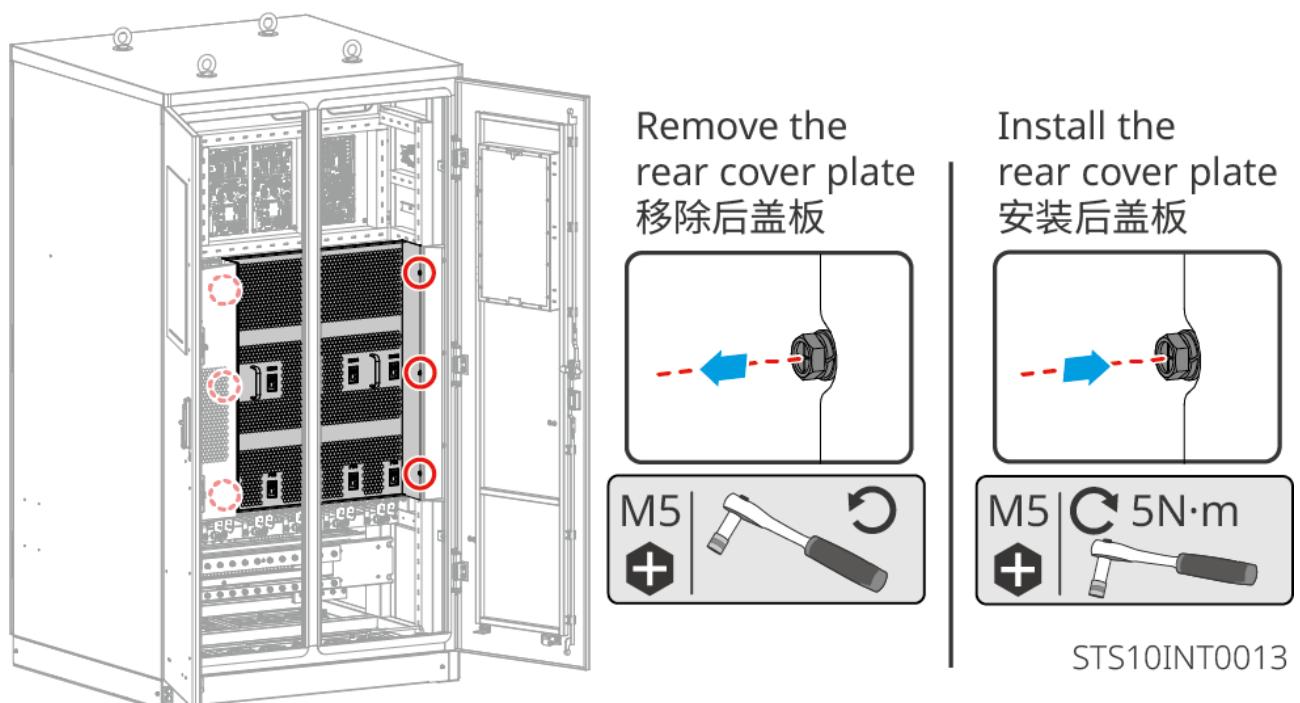
- Upper Cover Plate



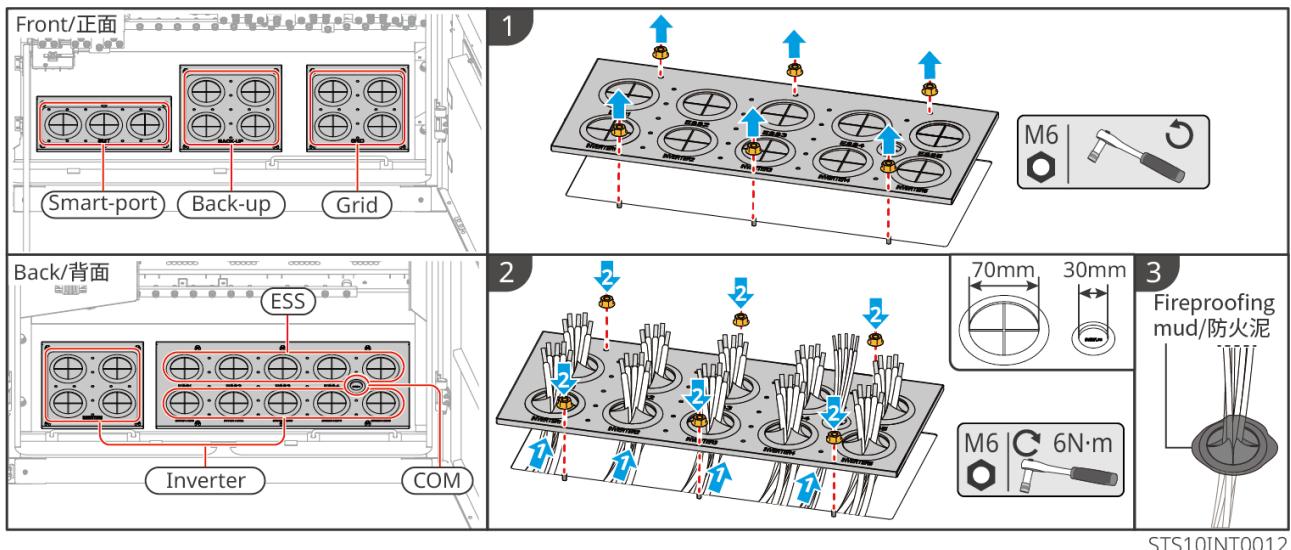
#### • Lower Cover Plate



#### • Rear Cover Plate



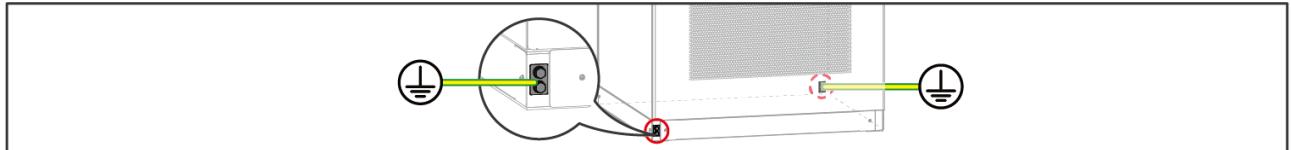
## Wiring Port and Wire Protection Plate Operations



## 5.2 Connecting the PE cable

### WARNING

- Before operating the device, ensure that the system is reliably grounded and take relevant protective measures; otherwise, there may be a risk of electric shock.
- To improve the corrosion resistance of the terminals, it is recommended to apply silicone or paint on the exterior of the grounding terminals after the ground wire connection is completed for protection.



## 5.3 Connecting Power Lines

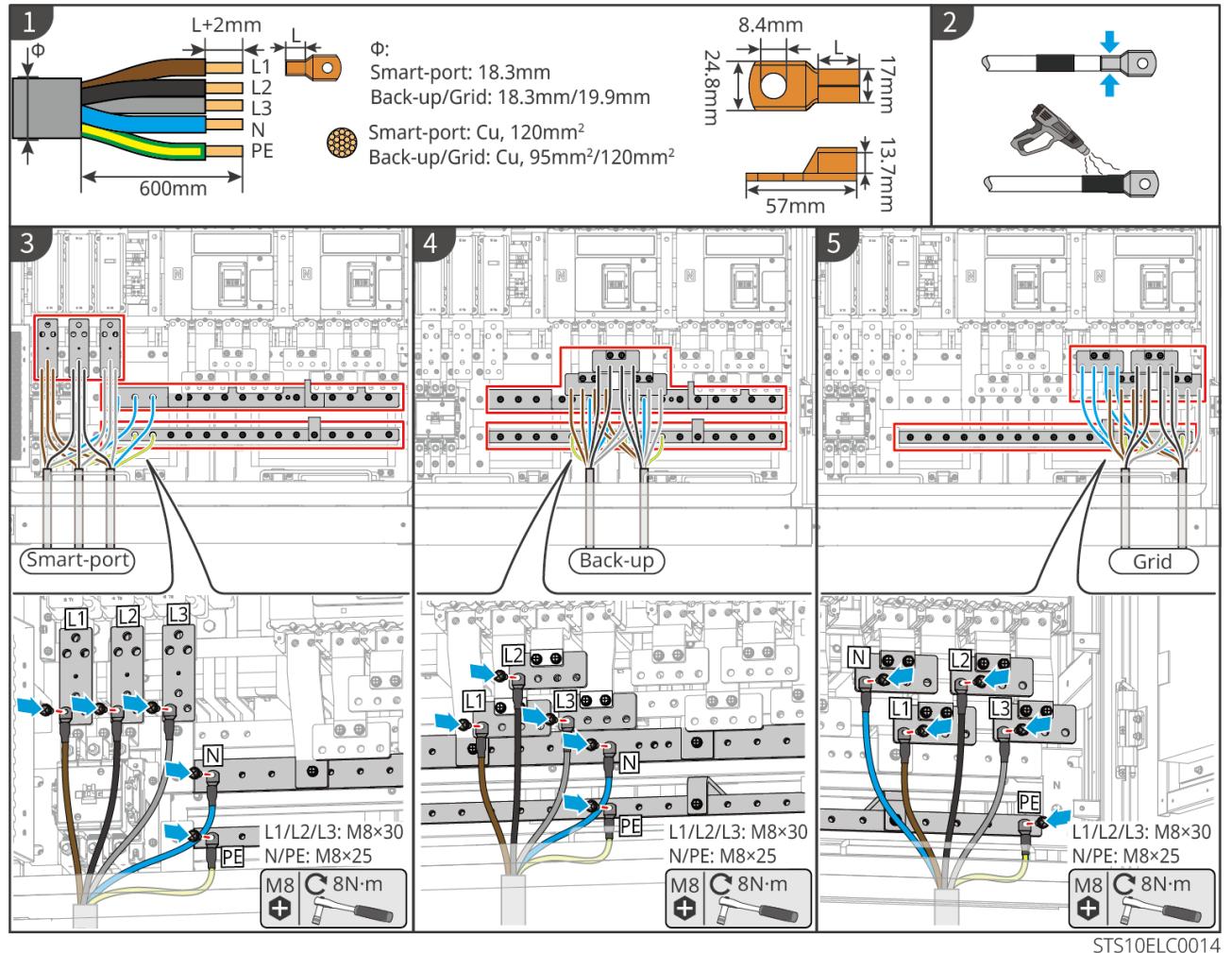
**Step 1:** Prepare the cable and terminal.

**Step 2:** Crimp the terminal.

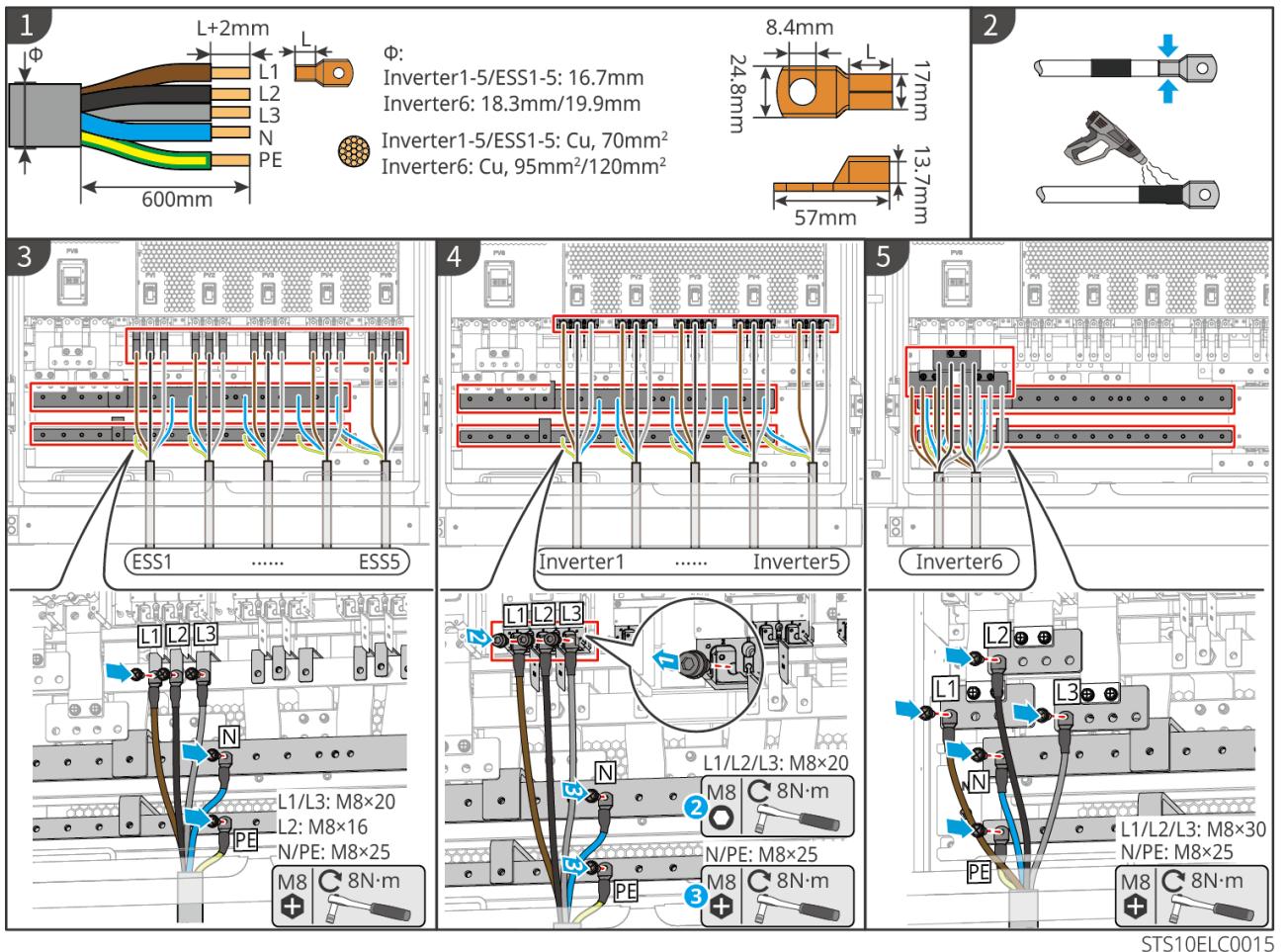
**Step 3:** Unscrew the screw on the corresponding copper busbar, and secure the

cable to the copper busbar using the screw.

## Smart-port & Back-up & Grid

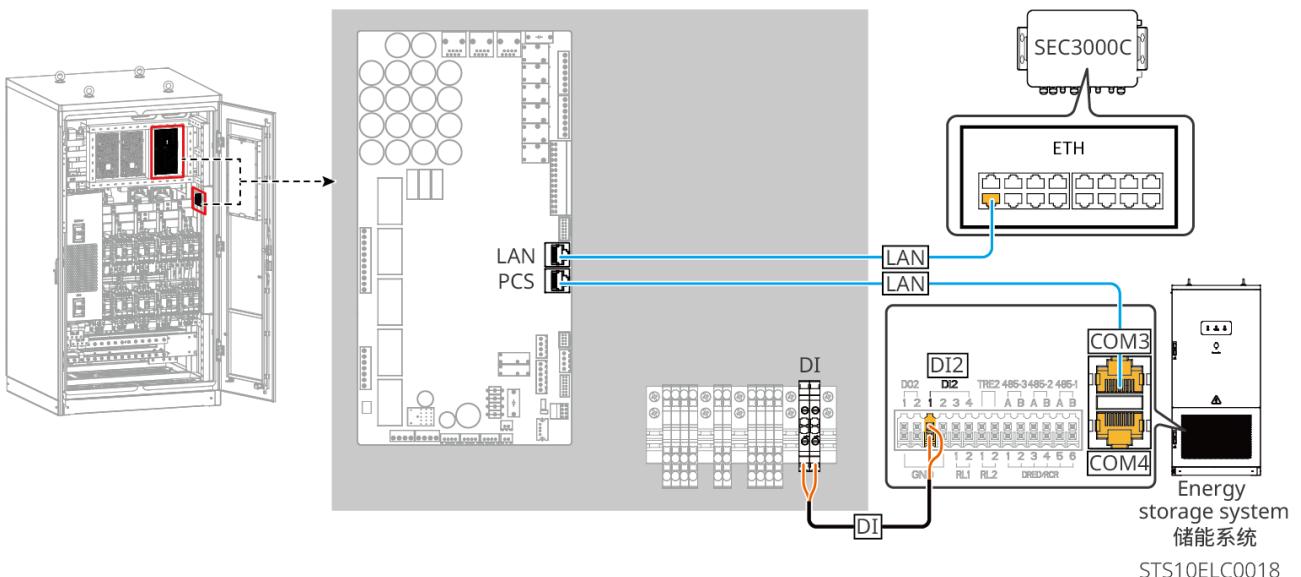


## ESS & Inverter



## 5.4 Connecting Communication Cables

### Wiring Overview



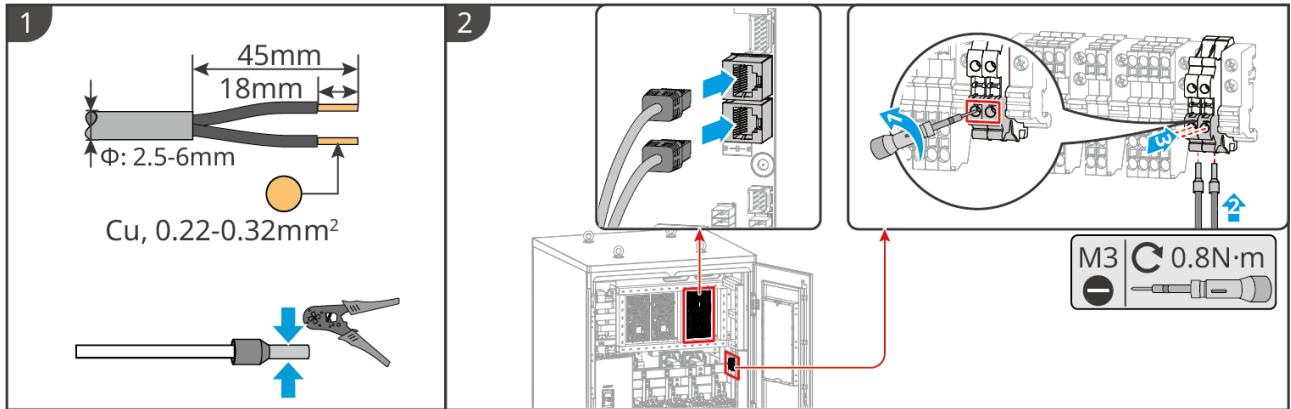
## Procedure

### NOTICE

Before connecting the communication cable, please open the back cover first.

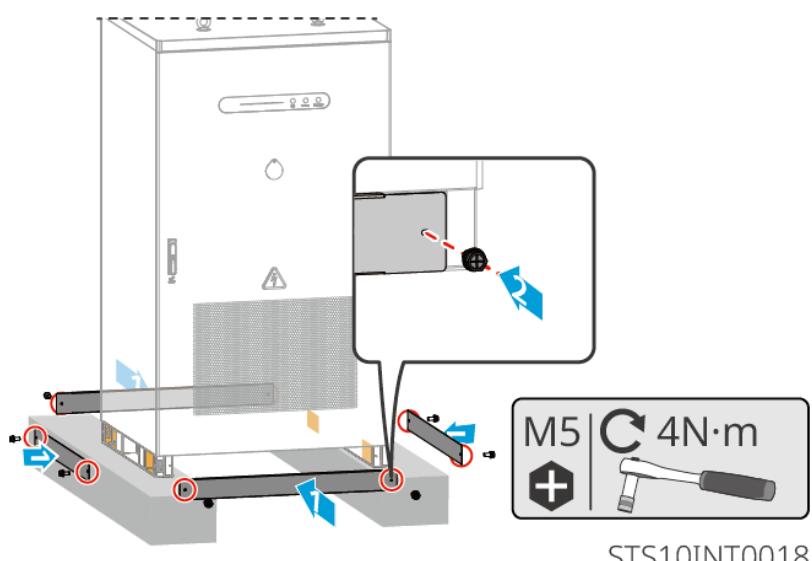
**Step 1:** Prepare the communication cable and crimp the terminal.

**Step 2:** Pass the communication cable through the bottom COM port and insert it into the corresponding communication port.

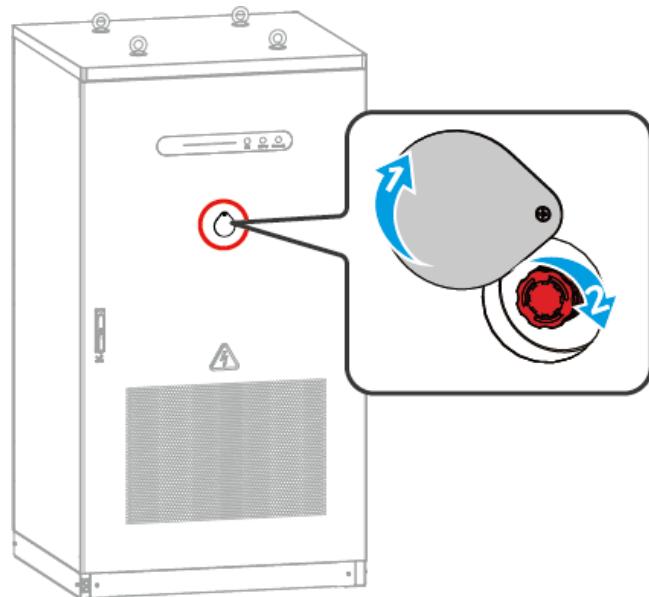


## 5.5 Post-Wiring Operations

**Step 1:** Install the baffle.



**Step 2:** Release the emergency stop switch.



STS10INT0019

# 6 Equipment Trial Run

## 6.1 Pre-Power Checklist

No.	Inspection Item
1	The equipment is installed securely, in a location convenient for operation and maintenance, with sufficient space for ventilation and heat dissipation, and in a clean and tidy environment.
2	The PE cable, power cable, and communication cable are connected correctly and securely.
3	Cable bundling meets wiring requirements, is distributed reasonably, and shows no damage.
4	Unused ports are sealed.
5	The voltage and frequency at the equipment's grid connection point meet the grid connection requirements.

## 6.2 Device Power On

### NOTICE

Before powering on, please open the upper cover panel first.

**Step 1:** Close the Q1 switch (GRID single-phase power supply circuit breaker).

**Step 2:** Close the Q2 switch (BUS single-phase power supply circuit breaker).

**Step 3:** Close the Q3 switch (Smart-port single-phase power supply circuit breaker).

**Step 4:** Close the Q4 switch (Grid-connected surge protector circuit breaker).

**Step 5:** Close the Q5 switch (Off-grid surge protector circuit breaker).

**Step 6:** Close the Q6 switch (SEC3000C power supply switch).

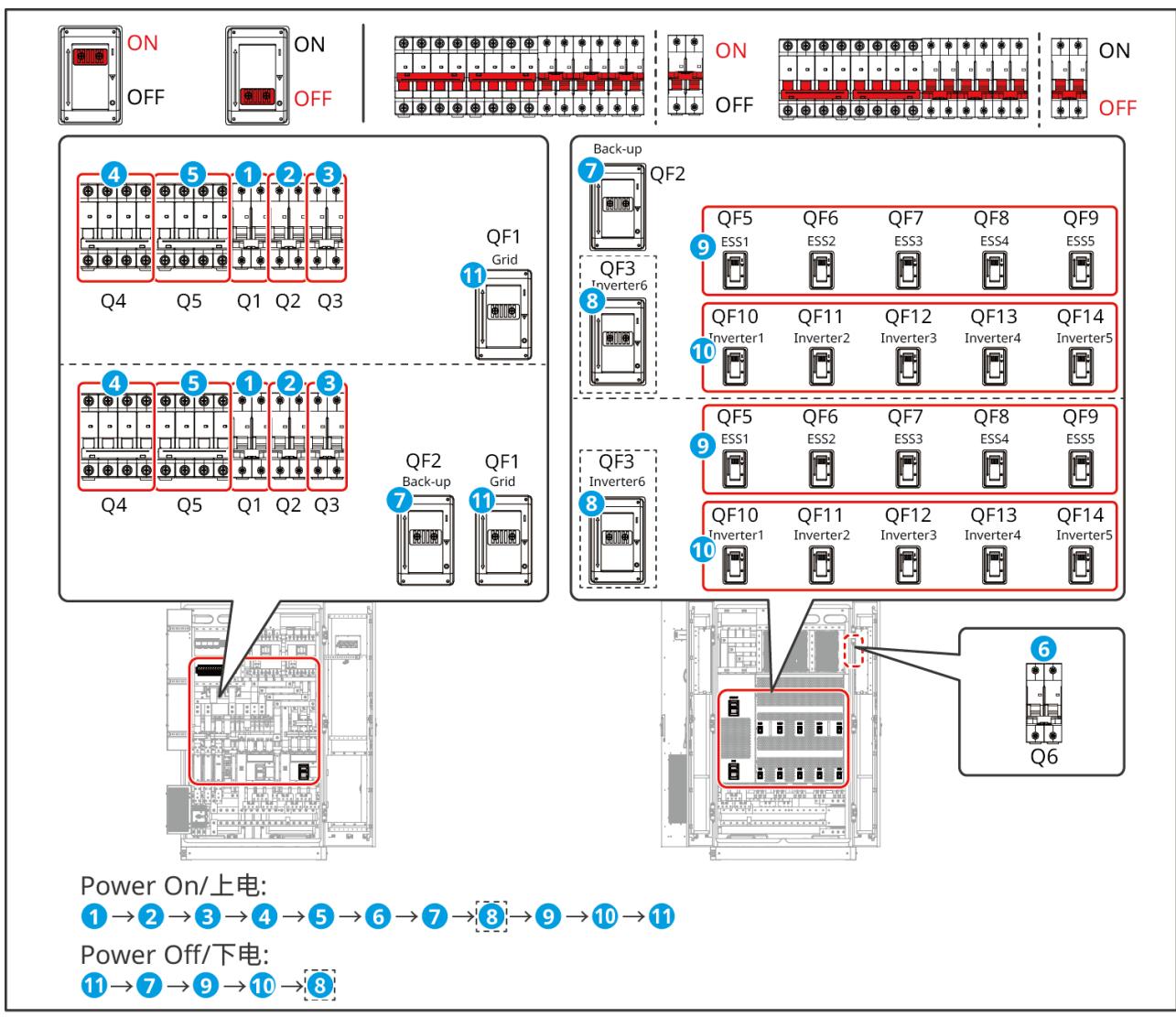
**Step 7:** Close the QF2 switch (Load switch).

**Step 8:** Close the QF3 switch (Centralized switch after PV inverter combiner).

**Step 9:** Close the QF5~QF9 switches (Energy storage system switches).

**Step 10:** Close the QF10~QF14 switches (PV inverter switches).

**Step 11:** Close the QF1 switch (Main incoming line switch).



STS10PWR0002

## 7 Device Debugging via SEC3000C Embedded Web

The SEC3000C Smart Energy Control Box is a dedicated device for the photovoltaic power generation system monitoring and management platform. It can be used to collect data from devices in the photovoltaic power generation system, such as grid-tied inverters, hybrid inverters, electricity meters, etc., store logs, and send the data to the monitoring and management platform to achieve centralized monitoring, operation, and maintenance of the photovoltaic system.

For detailed functions, please refer to the [SEC3000C User Manual](#).

## 8 Power Plant Monitoring via SEMS+

SEMS+ is a monitoring platform that communicates with devices via WiFi/LAN/4G. The following are common functions of SEMS+:

- Manage organization or user information, etc.
- Add and monitor power plant information, etc.
- Maintain equipment.

For detailed functions, please refer to the [SEMS+ User Manual](#).

# 9 Maintenance

## 9.1 Device Power Down

### NOTICE

After powering down is complete, please close the top cover.

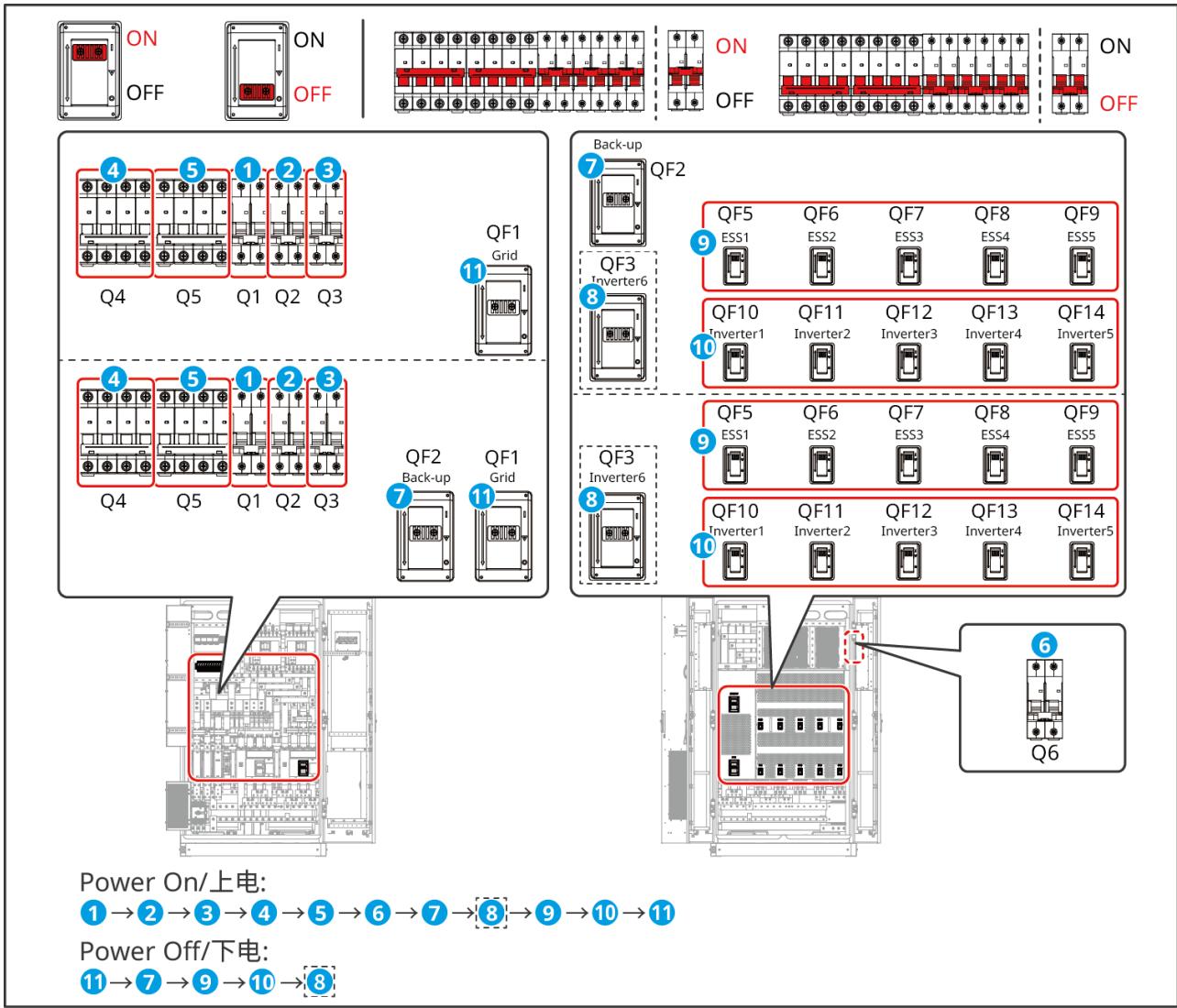
**Step 1:** Disconnect the QF1 switch (main incoming line switch).

**Step 2:** Disconnect the QF2 switch (load switch).

**Step 3:** Disconnect the QF5~QF9 switches (energy storage system switches).

**Step 4:** Disconnect the QF10~QF14 switches (photovoltaic inverter switches).

**Step 5:** Disconnect the QF3 switch (centralized switch after photovoltaic inverter confluence).



STS10PWR0002

## 9.2 Troubleshooting

Please follow the methods below for fault investigation. If these troubleshooting methods cannot help you, please contact the after-sales service center. When contacting the after-sales service center, please collect the following information to facilitate a quick resolution.

1. Device information, such as: serial number, software version, device installation time, fault occurrence time, fault frequency, etc.
2. Device installation environment, such as: weather conditions, whether components are obstructed or shaded, etc. It is recommended to provide photos, videos, and other files to assist in problem analysis.

### 3. Grid conditions.

Fault Type	Fault Prompt	Troubleshooting
MC Control Board Fault	NTC Abnormal (Ambient Temperature)	Please contact the distributor/GoodWe After-sales Service Center
	Internal Fan Abnormal	Please contact the distributor/GoodWe After-sales Service Center
	DSP Communication Failure	<p>1. After powering off, check if the PCS communication RJ45 port on the MC control board and the COM port RJ45 of the 261 integrated cabinet LC are connected or abnormal.</p> <p>2. If the fault persists after eliminating the abnormality and powering on again, please contact the distributor/GoodWe After-sales Service Center.</p>
	Contactor Communication Fault	<p>1. After powering off, check if the CN20 control port on the MC control board and the Phoenix terminal of the Jinggui switch are connected or abnormal.</p> <p>2. If the fault persists after eliminating the abnormality and powering on again, please contact the distributor/GoodWe After-sales Service Center.</p>
	Diesel Generator Communication Fault	<p>1. After powering off, check if the RS485 port of the diesel generator terminal block inside the cabinet and the communication terminal on the diesel generator side are connected or abnormal.</p> <p>2. If the fault persists after eliminating the abnormality and powering on again, please contact the distributor/GoodWe After-sales Service Center.</p>

Fault Type	Fault Prompt	Troubleshooting
Emergency Stop	Internal Cabinet Fault	<p>1. If the emergency stop button was pressed due to human error, rotate the emergency stop button to reset after confirming the STS is completely powered off and safe.</p> <p>2. If the emergency stop was pressed due to an emergency danger, please contact the distributor/GoodWe After-sales Service Center.</p>
Contactor Fault 1	Magnetic Latching Mis-open Warning	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.
	Magnetic Latching Mis-close Warning	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.
	Main Magnetic Latching Close Failure	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.
	Main Magnetic Latching Open Failure	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.
	Relay Abnormal Disconnection in Closed State	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.

Fault Type	Fault Prompt	Troubleshooting
	Relay Abnormal Closure in Open State	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.
	Relay Close Failure	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.
	Relay Open Failure	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.
	Phase A Current Open Shut-off Timeout	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.
	Phase B Current Open Shut-off Timeout	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.
	Phase C Current Open Shut-off Timeout	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.
	Input Three-phase Power Loss	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.

Fault Type	Fault Prompt	Troubleshooting
Contactor Fault 2	24V Power Supply Undervoltage	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.
	Magnetic Latching Drive Undervoltage	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.
	Dual-unit Mode Setting Error	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.
	Internal 485 Communication Loss	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.
Contactor Fault 2	Parallel Slave Action Failure	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.
	N-phase Wiring Error	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.
	ABC Phase Sequence Error	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.
	Phase Loss Error	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.

Fault Type	Fault Prompt	Troubleshooting
	MCU Overtemperature Error	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.
	One Open One Closed in Parallel Mode	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.
	Both Units Closed in Interlock Mode	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.
	Control Contacts Triggered Simultaneously	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.
	Open/Close Frequency Too High	Power off the entire system, wait 5 minutes, then power on again. If the fault still exists, please contact the distributor/GoodWe After-sales Service Center.
Overload Protection 1	Overload Protection (GRID)	<ol style="list-style-type: none"> <li>1. Power off the entire system, wait 5 minutes, then power on again. It's acceptable if the fault disappears.</li> <li>2. If it occurs twice or more within one month, please contact the distributor/GoodWe After-sales Service Center.</li> </ol>

Fault Type	Fault Prompt	Troubleshooting
Overload Protection 2	Overload Protection (Smart-port)	<p>1. Power off the entire system, wait 5 minutes, then power on again. It's acceptable if the fault disappears.</p> <p>2. If it occurs twice or more within one month, please contact the distributor/GoodWe After-sales Service Center.</p>
Lightning Protection Fault 1	Grid-side SPD1 Activated	Check if the surge protective device SPD1 has activated. Please contact the distributor/GoodWe After-sales Service Center and report the activation status.
Lightning Protection Fault 2	Off-grid-side SPD2 Activated	Check if the surge protective device SPD2 has activated. Please contact the distributor/GoodWe After-sales Service Center and report the activation status.

## 9.3 Routine Maintenance

### DANGER

Before maintenance, please ensure that the STS is completely powered off. Operating with power on may cause equipment damage or electric shock DANGER.

Maintenance Content	Maintenance Method	Maintenance Cycle
System Cleaning	<ul style="list-style-type: none"> <li>Check if there are any foreign objects or dust on the heat sink and air inlet/outlet vents.</li> <li>Check if the fan and dust filter are clean, with no dust accumulation.</li> </ul>	Once every six months

Maintenance Content	Maintenance Method	Maintenance Cycle
Fan	Check if the fan is operating normally, if there is any abnormal noise, and if its appearance is normal.	Once a year
Electrical Connections	Check if electrical connections are loose, if the cable appearance is damaged, or if exposed copper is present.	Once every six months to once a year
Sealing	Check if the sealing of the equipment's cable entry holes meets requirements. If gaps are too large or unsealed, reseal them.	Once a year

## 9.4 Removing the Equipment

### ⚠️ CAUTION

- Before removing STS, please ensure the equipment is powered off.
- During operation, please wear personal protective equipment.

**Step 1:** Open the cabinet door.

**Step 2:** Disconnect all electrical connections of the STS, including: power cable, Communication cable, protective ground wire.

**Step 3:** Unscrew the fixing screws on the STS base.

**Step 4:** Using hoisting or forklift handling, move the STS away from the base.

**Step 5:** Store the equipment properly. If it will be put into use later, ensure the storage conditions meet the requirements.

## 9.5 Disposing of the Equipment

When the equipment can no longer be used and needs to be disposed of, please dispose of the equipment according to the electrical waste disposal requirements of the country/region where the equipment is located. Do not treat the equipment as household waste.



# 10 Technical Data

Technical Data	GW500K-STS-PCS-G10
<b>Grid</b>	
Nominal Voltage (V)	220/380, 230/400, 3L/N/PE
Voltage Range (V)	340~440
Nominal Frequency (Hz)	50/60
Frequency Range (Hz)	47.5~52.5 /57.5~62.5
Rated Current (A)	957.2
Max. Current (A)	1000@10s
Rated Power (kW)	500
Max. Apparent Power (kVA)	630
Rated Conditional Short-time Current (kA)	20
<b>Back-up</b>	
Nominal Voltage (V)	220/380, 230/400, 3L/N/PE
Voltage Range (V)	340~440
Nominal Frequency (Hz)	50/60
Frequency Range (Hz)	47.5~52.5 /57.5~62.5
Rated Current (A)	835.6
Max. Current (A)	1000@10s
Rated Power (kW)	500
Max. Apparent Power (kVA)	550
Rated Conditional Short-time Current (kA)	20
<b>ESS</b>	

<b>Technical Data</b>	<b>GW500K-STS-PCS-G10</b>
Nominal Voltage (V)	220/380, 230/400, 3L/N/PE
Voltage Range (V)	340~440
Nominal Frequency (Hz)	50/60
Frequency Range (Hz)	47.5~52.5 /57.5~62.5
Rated Current (A)	835.6
Max. Current (A)	1000@10s
Rated Power (kW)	500
Max. Apparent Power (kVA)	550
Rated Conditional Short-time Current (kA)	20

### **Smart-port**

Nominal Voltage (V)	220/380, 230/400, 3L/N/PE
Voltage Range (V)	340~440
Nominal Frequency (Hz)	50/60
Frequency Range (Hz)	47.5~52.5 /57.5~62.5
Rated Current (A)	835.6
Max. Current (A)	1000@10s
Rated Power (kW)	500
Max. Apparent Power (kVA)	550
Rated Conditional Short-time Current (kA)	20

### **Inverter**

Nominal Voltage (V)	220/380, 230/400, 3L/N/PE
Voltage Range (V)	340~440
Nominal Frequency (Hz)	50/60

<b>Technical Data</b>		<b>GW500K-STS-PCS-G10</b>
Frequency Range (Hz)		47.5~52.5 / 57.5~62.5
Rated Current (A)		1519.4
Max. Current (A)		1800@10s
Rated Power (kW)		1000 (Centralized Access 500 + Independent Access 500)
Max. Apparent Power (kVA)		1000 (Centralized Access 500 + Independent Access 500)
Rated Conditional Short-time Current (kA)		20
<b>General Data</b>		
On/Off Grid Transfer Time (ms)		<20
Operating Temperature Range (°C)		-25~+55
Storage Temperature (°C)		-40~+70
Relative Humidity		0~100%
Pollution Degree		III
Max. Operating Altitude (m)		4000
Cooling Method		Smart Fan Cooling
Communication With EMS		LAN+CAN
Weight (kg)		<750
Dimension (W×H×D mm)		1100*2010*1000
Mounting Method		Grounded
Noise Emission (dB)		<60
Ingress Protection Rating		IP54
Overvoltage Category		III
Protective Class		I

<b>Technical Data</b>	<b>GW500K-STS-PCS-G10</b>
<b>Certification</b>	
Grid Standards	NA
Safety Regulation	IEC61439-1, IEC61439-2, EN61439-1, EN61439-2, IEC60730