V1.1 2026-11-24

Small-scale Microgrid

Static Transfer Switch

- GW250K-STS-PCS-G10
- GW500K-STS-PCS-G10

User Manual

GOODWE

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NOTICE

This document may be updated periodically due to product version upgrades or other reasons. Unless otherwise specified, its contents do not replace the safety precautions on the product label. All descriptions in this document are for guidance only.

Preface

Overview

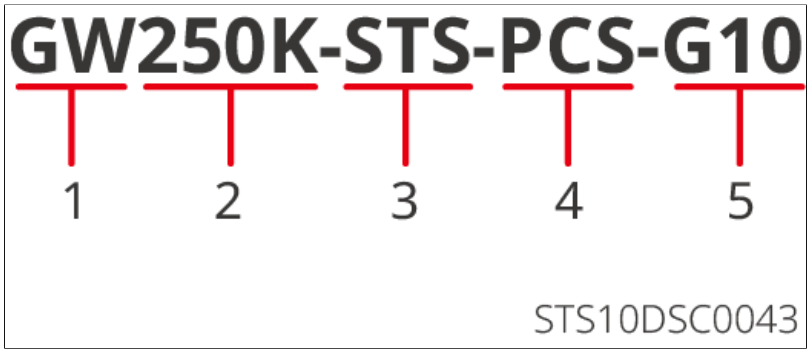
This document primarily describes the product information, installation and wiring, configuration and commissioning, troubleshooting, and maintenance of the static transfer switch (hereinafter referred to as the STS). Before installing or using this product, please read this manual carefully to understand the product safety information and become familiar with its functions and features.
This document is subject to change without notice. For the latest version and further product information, please visit our official website: https://en.goodwe.com/.

Applicable Products

This document applies to equipment of the following models:

- GW250K-STS-PCS-G10
- GW500K-STS-PCS-G10

Model Designation



No.	Description	Description
1	Brand Code	GW: GoodWe

No.	Description	Description
2	Rated Power	• 250K: Rated Power of 250 kW • 500K: Rated Power of 500 kW
3	Series Name	STS: STS Series
4	Feature Code	PCS: Compatible with GoodWe PCS only
5	Version Code	G10: First-generation product

Symbol Definitions

⚠DANGER
Indicates a potentially high risk that, if not avoided, could result in death or serious injury.

⚠WARNING
Indicates a medium potential hazard that, if not avoided, may result in death or serious injury.

⚠CAUTION
Indicates a low potential hazard that, if not avoided, may result in minor or moderate injury.

NOTICE
Emphasizes or supplements information. It may also provide tips or tricks for optimizing product use to help you solve a problem or save time.

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1 Safety Precautions

The safety information contained in this document must always be observed when operating the equipment.

⚠WARNING

The equipment is designed in strict accordance with safety regulations and has passed testing. However, as electrical equipment, it must be operated in accordance with the applicable safety instructions. Improper operation may result in serious injury or property damage.

1.1 General Safety

⚠DANGER

- Before making electrical connections, disconnect all upstream switches for the equipment and ensure that it is de-energized. Live working is strictly prohibited, as it may result in electric shock or other hazards.
- To prevent personal injury or equipment damage caused by live working, install a circuit breaker on the equipment's voltage input side.
- All activities, including transportation, storage, installation, operation, use, and maintenance, must comply with applicable laws, regulations, standards, and codes.
- The specifications of cables and components used for electrical connections must comply with local laws, regulations, standards, and codes.
- Use the cable connectors supplied with the product to connect the equipment cables. The equipment manufacturer is not liable for equipment damage caused by the use of other connector models.
- Ensure that all equipment cables are correctly and securely connected, with no loose connections. Incorrect wiring may result in poor contact or equipment damage.
- The equipment protective earth cable must be securely connected.
- To protect the equipment and its components from damage during transportation, ensure that transport personnel are professionally trained. Record the handling steps during transportation and keep the equipment balanced to prevent it from falling.
- The equipment is heavy. Assign an appropriate number of personnel based on its weight to avoid exceeding the safe carrying capacity and causing injury.
- Ensure that the equipment is placed securely and is not tilted. If it tips over, it may cause equipment damage or personal injury.

⚠WARNING

- During equipment installation, do not place any load on the wiring terminals, as this may damage them.
- Avoid subjecting cables to excessive tension, as this may result in poor electrical connections. Leave an appropriate length of cable when wiring to ensure that the cables are not taut.
- Secure and support the cables properly to prevent their weight, tension, bending force, torsion, or other external mechanical stress from acting on the terminals or connectors over an extended period.
- Ensure that the protective grounding conductor is securely connected and has adequate slack. In the event of external mechanical stress, such as accidental pulling, ensure that the protective grounding conductor does not disconnect before the other conductors.
- Bundle cables of the same type together. Route different types of cables at least 30 mm apart. Do not intertwine or cross them.
- Using cables in high-temperature environments may cause their insulation to age or become damaged. Maintain a distance of at least 30 mm between cables and heating devices or the perimeter of heat-source areas.

NOTICE

- This document may be updated periodically due to product version upgrades or other reasons. Unless otherwise specified, its contents do not replace the safety precautions on the product label. All descriptions in this document are for guidance only.
- Carefully read this document before installing the equipment to understand the product and its precautions.
- All work on the equipment must be performed by qualified electrical technicians who are familiar with the applicable standards and safety regulations in the project location.
- When working on the equipment, use insulated tools and wear personal protective equipment to ensure personal safety. When handling electronic components, wear antistatic gloves, an antistatic wrist strap, and antistatic clothing to protect the equipment from electrostatic discharge damage.
- Unauthorized disassembly or modification may damage the equipment, and such damage is not covered by the warranty.
- The equipment manufacturer is not liable for equipment damage or personal injury resulting from installation, use, or configuration of the equipment that does not comply with this document or the corresponding user manual. For more information about the product warranty, please visit the official website:https://www.goodwe.com/warrantyrelated.html。

1.2 Personnel Requirements

NOTICE

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

1. Professionals or qualified personnel include:
   - Personnel who understand the equipment's operating principles and system structure, are knowledgeable about related risks and hazards, and have received professional training or have extensive practical experience.
   - Personnel who have received relevant technical and safety training, have some practical experience, can recognize the hazards that specific tasks may pose to themselves, and can take protective measures to minimize risks to themselves and others.
   - Qualified electrical technicians who meet the regulatory requirements of the applicable country/region.
   - Personnel with a degree in electrical engineering, an advanced diploma in an electrical discipline, or an equivalent qualification; or a professional qualification in the electrical field, and at least 2/3/4 years of experience in testing and supervising work in accordance with electrical equipment safety standards.
2. Personnel performing special tasks such as electrical work, work at height, and operation of special equipment must hold valid qualification certificates required at the equipment's location.
3. Medium-voltage equipment must be operated by a certified high-voltage electrician.
4. Only authorized personnel may replace equipment and components.

1.3 EU Declaration of Conformity

1.3.1 Devices with Wireless Communication Capability

Equipment with wireless communication capabilities sold in the European market complies 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 Equipment Without Wireless Communication Capabilities

Equipment without wireless communication capabilities sold in the European market complies 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, labels and warning signs on the enclosure must remain clearly visible. Do not cover, alter, or damage them.
- The following descriptions of enclosure warning labels are for reference only. Refer to the labels actually affixed to the equipment.

No.	Symbol	Description
1		Potential hazards may exist while the equipment is operating. Take appropriate protective measures when operating the equipment.
2		High-voltage hazard. High voltage is present while the equipment is operating. Ensure the equipment is de-energized before working on it.
3		The equipment surface may become hot. Do not touch the equipment while it is operating, as this may cause burns.

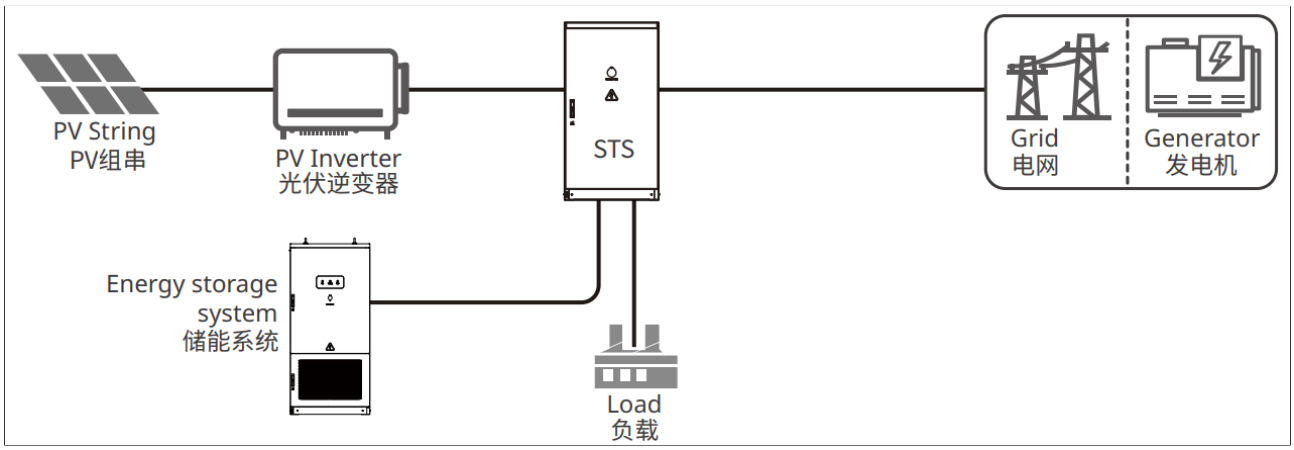
No.	Symbol	Description
4		Use the equipment as intended. Use under extreme conditions may pose an explosion risk.
5		The battery contains flammable materials. Keep away from fire.
6		The equipment contains corrosive electrolyte. Avoid contact with leaked electrolyte or vapor.
7		Delayed discharge. After de-energizing the equipment, wait 5 minutes for it to discharge completely.
8		Keep the equipment away from open flames and sources of ignition.
9		Keep the equipment out of reach of children.
10		Use the equipment as intended. Use under extreme conditions may pose an explosion risk.
11		The battery contains flammable materials. Keep away from fire.
12		Do not lift the equipment after wiring the battery system or while the battery system is operating.
13		Do not extinguish with water.
14	 	Read the product manual carefully before operating the equipment.

No.	Symbol	Description
15		Wear personal protective equipment during installation, operation, and maintenance.
16		Do not dispose of the equipment as household waste. Dispose of it in accordance with local laws and regulations, or return it to the equipment manufacturer.
17		Protective earth connection point.
18		Recycling symbol. The equipment should be placed in the appropriate location and recycled in accordance with local environmental regulations.
19		CE Certification mark.
20		RCM Certification mark.

2 Product Overview

2.1 Product Overview

The STS supports connection to PV inverters, energy storage systems, diesel generators, loads, and the grid, enabling seamless on/off-grid switching for the entire system to meet backup power needs in areas with unstable power supplies. The main application scenarios are as follows:



250K

Port	Description
Inverter/ESS/Back-up	Can connect to PV inverters/energy storage systems/loads. • The maximum PV inverter capacity that can be connected is 500 kVA. • The maximum energy storage system capacity that can be connected is 250 kVA. Supports connection of up to 2 ESA261 energy storage systems. • The maximum load capacity that can be connected is 250 kVA. Supports single-phase/three-phase loads, with a maximum phase current of 417.8 A.

Port	Description
Grid/Generator	Maximum configured capacity: 315 kVA; maximum input current: 478.6 A. For supported grid types, see2.3.Supported Grid Types(Page 20). The wiring configuration is 3L/N/PE.

500K

Port	Description
Inverter/ESS/Back-up	Can connect to PV inverters/energy storage systems/loads. • The maximum PV inverter capacity that can be connected is 1 MVA. • The maximum energy storage system capacity that can be connected is 500 kVA. Supports connection of up to 5 ESA261 energy storage systems. • The maximum load capacity that can be connected is 500 kVA. Supports single-phase/three-phase loads, with a maximum phase current of 835.6 A. Port capacity: 1 MVA.
Grid/Generator	Maximum configured capacity: 630 kVA; maximum input current: 1000 A. For supported grid types, see2.3.Supported Grid Types(Page 20). The wiring configuration is 3L/N/PE.

NOTICE
The load unbalance step change must not exceed 0.8 Sn, where Sn is the energy storage system capacity.

Off-Grid Load Capacity of the Microgrid System

Off-grid Load Capacity	Technical Specifications	Remarks
Total load	≤0.8*Pn	1. Single-phase rated capacity = (1/3) * Pn 2. Load per phase ≤ 0.8 * single-phase rated capacity, i.e., load per phase ≤ (1/3) * 0.8 * Pn 3. Setting the coefficient to 0.8 reserves a 20% dynamic adjustment margin, ensuring stable output even when the load fluctuates or has a power factor of 0.8.
Nonlinear load	Half-wave rectifier load ≤ 0.4 * Pn	The total harmonic content of the load current must meet applicable code or standard requirements
Unbalanced load	1. Two-phase loading: ≤ (2/3) * 0.8 * Pn 2. Single-phase loading: ≤ (1/3) * 0.8 * Pn	1. Single-phase rated capacity = (1/3) * Pn 2. Load per phase ≤ 0.8 * single-phase rated capacity, i.e., load per phase ≤ (1/3) * 0.8 * Pn

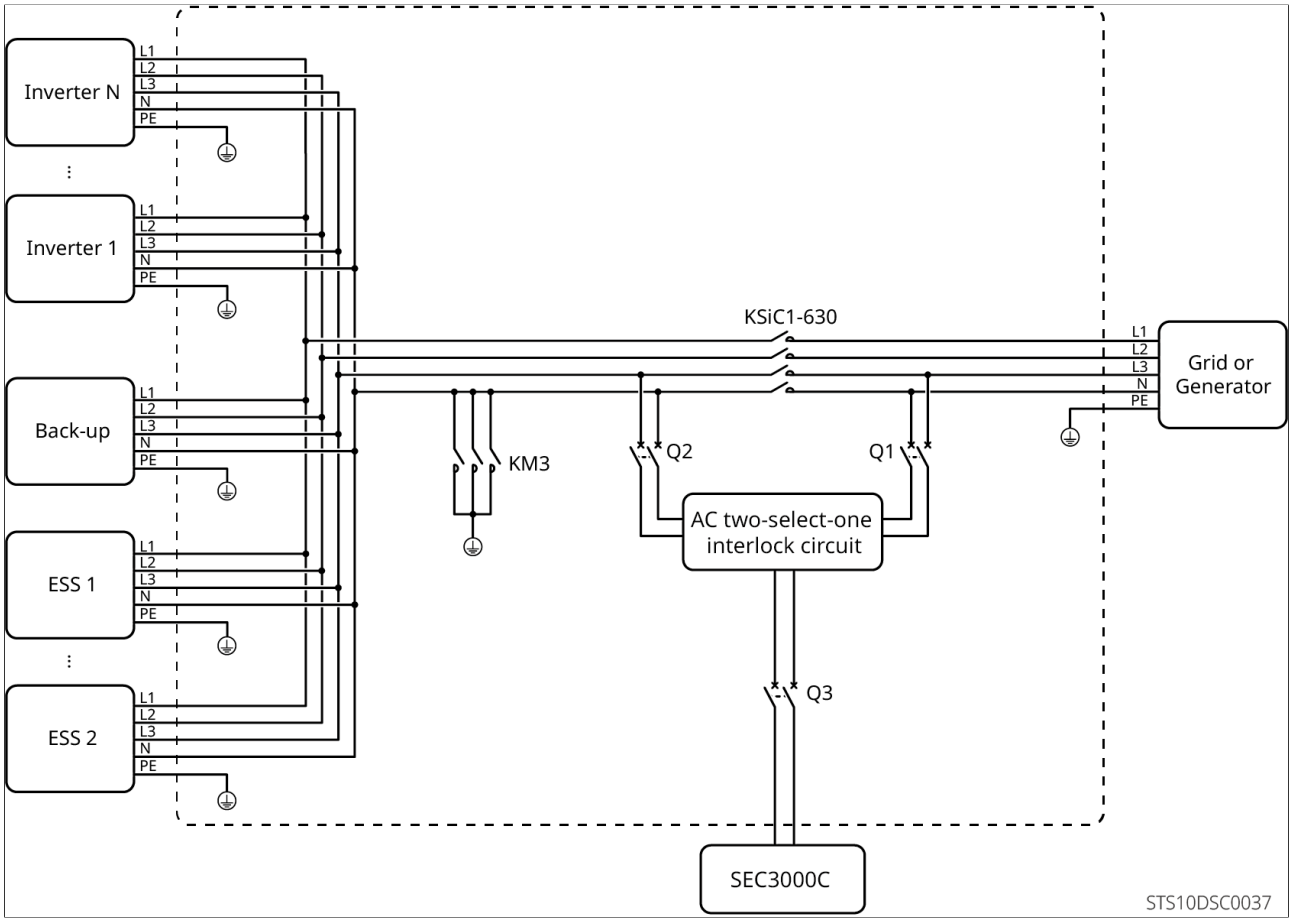
Off-grid Load Capacity	Technical Specifications	Remarks
Motor load	1. Direct-on-line starting: single motor load ≤ 0.1 * Pn 2. Star-delta starting: single motor load ≤ 0.2 * Pn 3. Variable-frequency-drive motor load ≤ 0.8 * Pn	1. If other base loads are present, the capacity for switching motor loads is reduced proportionally. The motor starting inrush current must be ≤ 8 * motor Rated Current; otherwise, installing a VFD for soft starting is recommended. 2. If the system includes motor loads and ordinary non-inrush loads, configure the load capacity as follows: A * 10 + 1.25 * B ≤ Pn, where: A: Capacity of motor loads starting simultaneously B: Other ordinary loads

Product Features

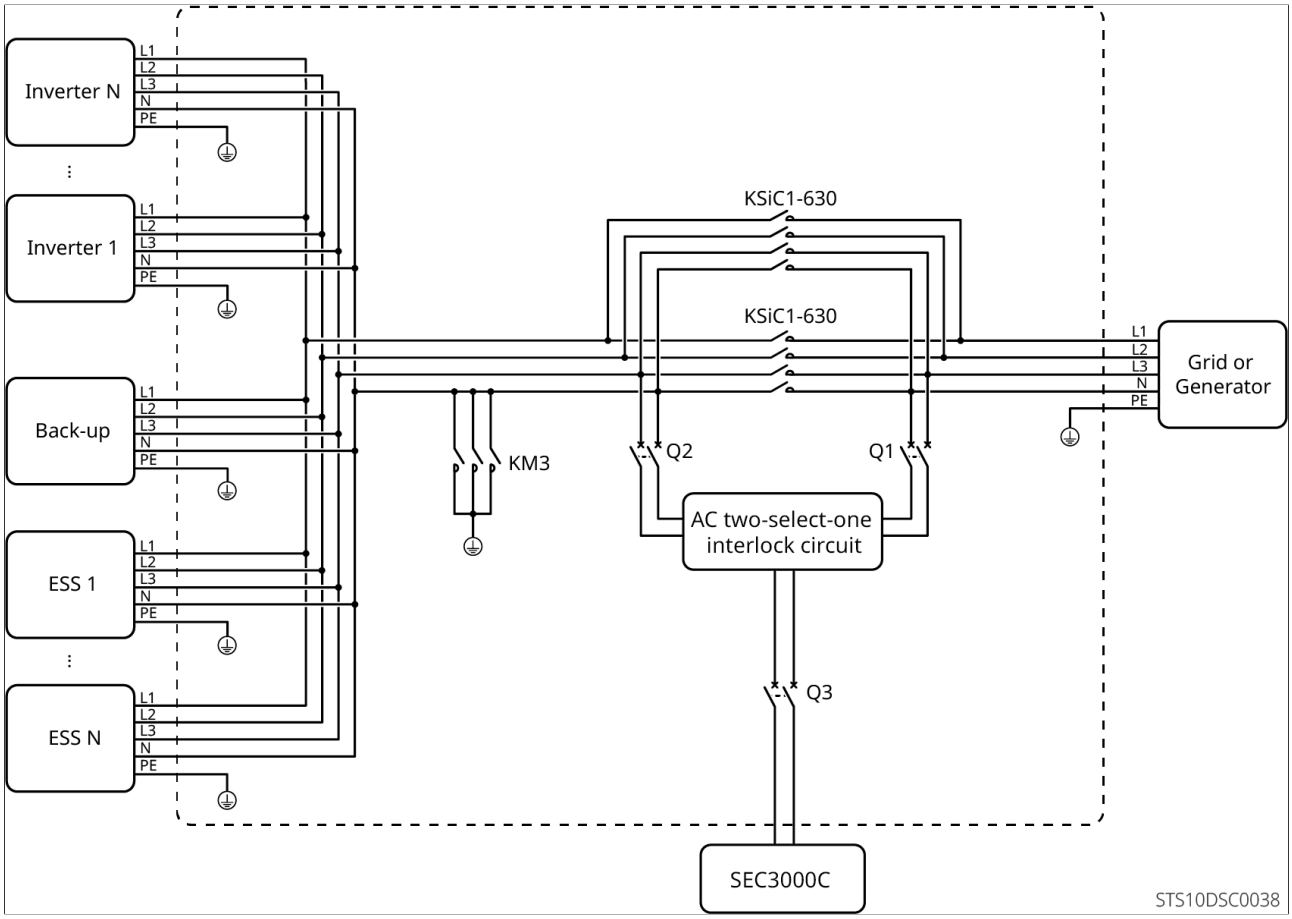
- Supports connection to PV grid-tied inverters, energy storage systems, diesel generators, loads, and the grid, with flexible configuration
- Supports seamless On/Off-grid switching within 20 ms
- When used with the SEC3000C, enables centralized management of energy and loads

2.2 Circuit Block Diagram

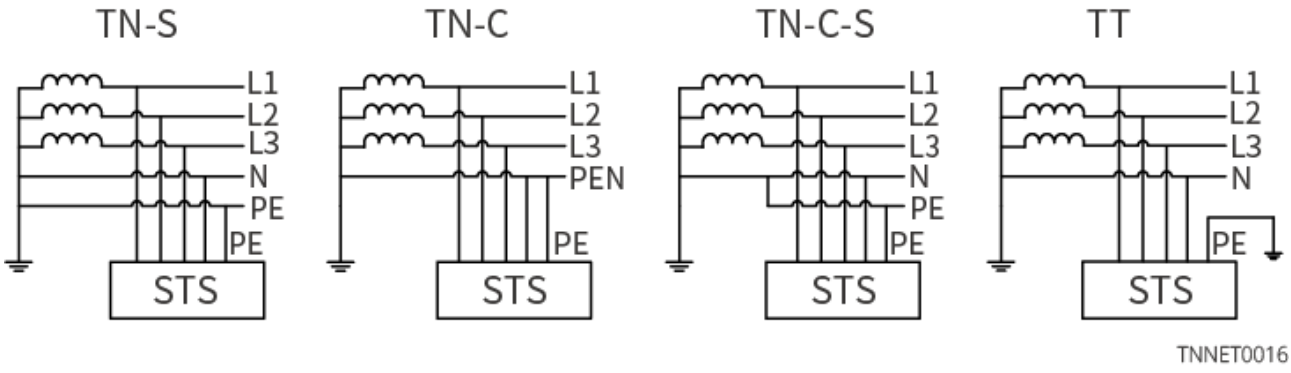
250K


Inverter N
L1
L2
L3
N
PE
Inverter 1
L1
L2
L3
N
PE
Back-up
L1
L2
L3
N
PE
ESS 1
L1
L2
L3
N
PE
ESS 2
L1
L2
L3
N
PE
KSiC1-630
KM3
Q2
Q1
AC two-select-one interlock circuit
Q3
SEC3000C
L1
L2
L3
N
PE
Grid or Generator
STS10DSC0037

500K

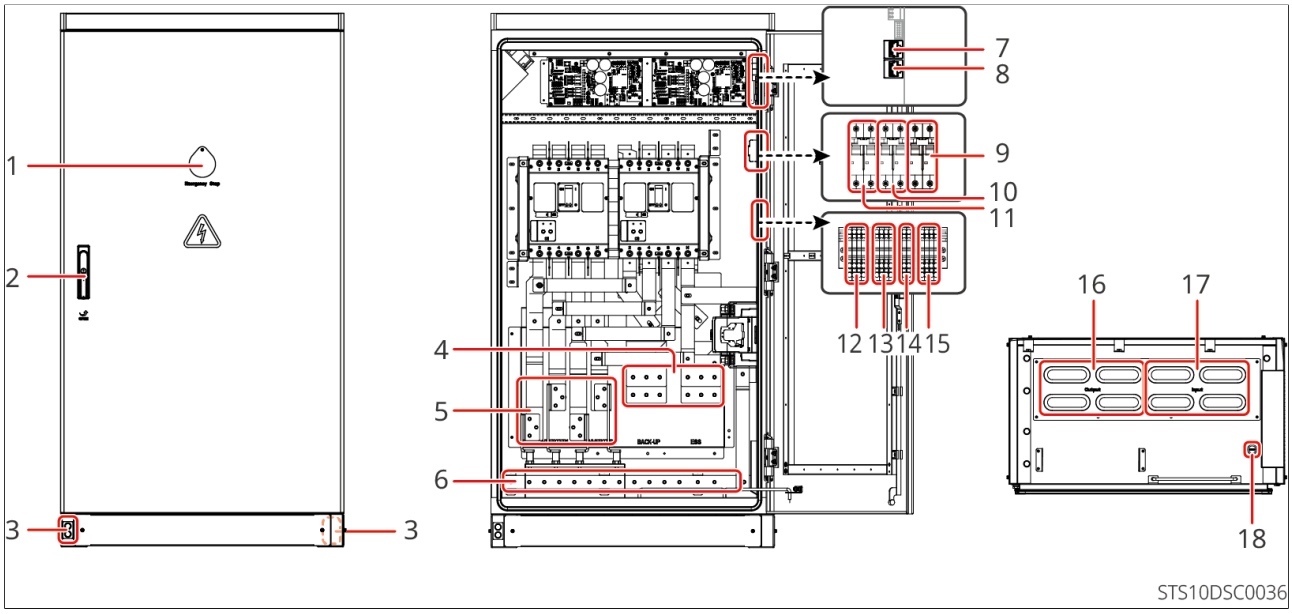


2.3 Supported Grid Types



2.4 Appearance & Dimensions

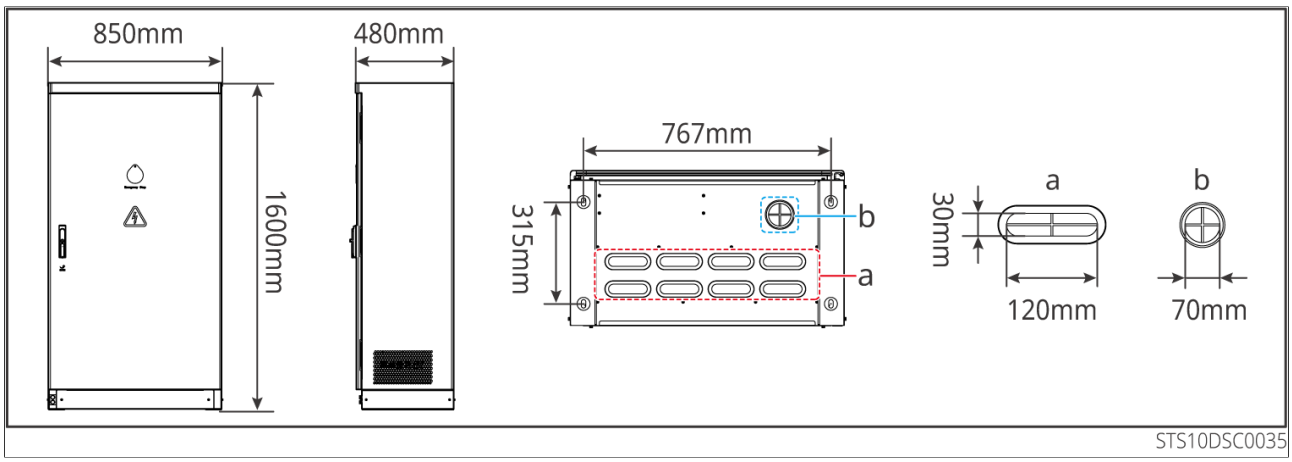
2.4.1 Appearance and Internal Components



No.	Component	Description
1	EPO button	In an emergency, press this button to stop the system.
2	Door lock	Use the key to unlock the cabinet door. Keep the door closed and locked when access to the equipment interior is not required.
3	Protective earthing point	For connecting the protective earth conductor
4	Grid/Generator terminal block	For connection to the grid/generator
5	Inverter/ESS/Back-up terminal block	For connection to the PV inverter/energy storage system/load
6	PE terminal block	For connection to the PE conductor
7	LAN port	For communication with SEC3000C
8	PCS port	For communication with the energy storage system
9	Control switch Q3	SEC3000C power supply switch

No.	Component	Description
10	Control switch Q2	BUS single-phase power supply circuit breaker
11	Control switch Q1	GRID single-phase power supply circuit breaker
12	Load control port	(Reserved) Two DO ports for LOAD control
13	Diesel Generation Control communication port	(Reserved) RS485 port for communication with the diesel generator
14	Diesel generator start/stop control port	(Reserved) DO port for controlling diesel generator start/stop
15	ATS communication feedback port	(Reserved) Identifies the type of power source connected to the system-grid or Diesel Generator-based on the ATS feedback signal
16	Input cable entry hole	For routing power cables through the Inverter/ESS/Back-up ports
17	Output cable entry hole	For routing power cables through the GRID/GENERATOR ports
18	COM cable entry hole	For routing communication cables

2.4.2 Product Dimensions



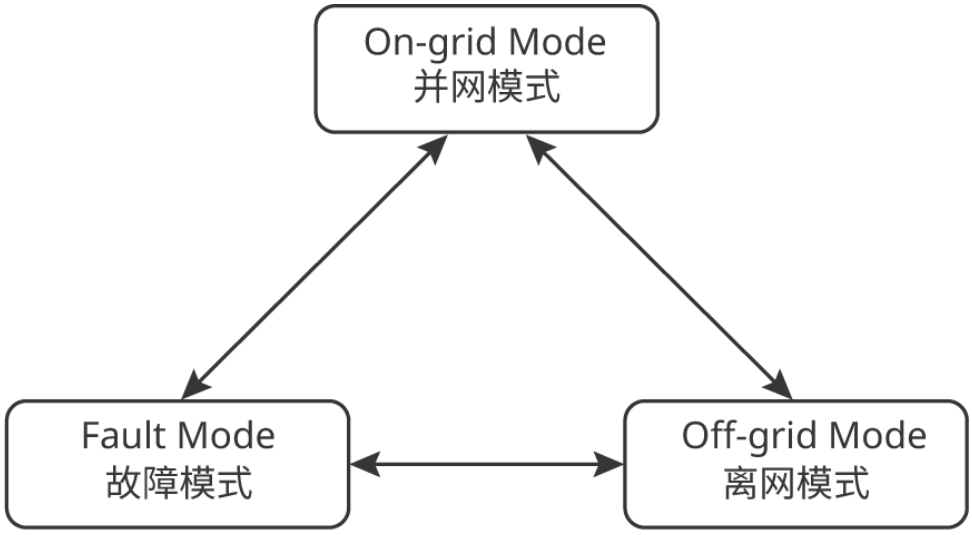
2.4.3 Jinggui Switch Indicator Light Description

NOTICE

- The Jinggui switch indicator light status must be checked with the cabinet door open.
- The indicator light status is used only to determine Jinggui switch faults. For STS faults, check the SEC3000C embedded WEB/SEMS+.
- The light is red when closed and green when open; the yellow light indicates an alarm.

Indicator Light 1	Indicator Light 2	Description
Yellow light flashes rapidly	Red/green lights flash rapidly	• Incorrect mode selection • Internal communication lost in parallel mode • N phase connected incorrectly to phases A, B, and C
Yellow light flashes rapidly	-	Disable Remote Control
Yellow light flashes slowly	-	Close-inhibited alarm
Yellow light remains on	-	General alarm; open and close commands are permitted
Yellow light remains on	Green light flashes	Relay drive fault or feedback fault SCR damage or current sampling fault

2.5 Operating Mode



STS10DSC0012

No.	Mode	Description
1	Grid-connected	When the grid is normal, the STS transfer switch is closed and the system is grid-connected.
2	Off-grid	When a Grid Power Outage occurs, the STS transfer switch opens and the system operates off-grid.
3	Fault	View this information via the SEC3000C web interface.

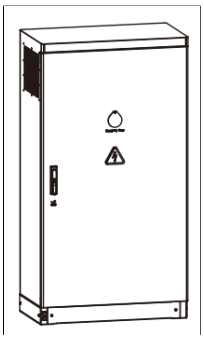
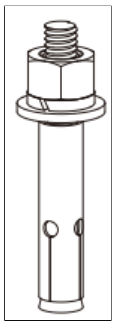
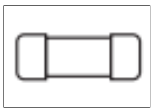
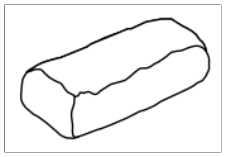
3 Equipment Inspection and Storage

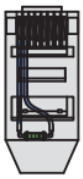
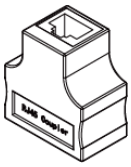
3.1 Equipment Inspection

Before accepting the product, carefully check the following items:

1. Check the outer packaging for damage, such as deformation, holes, cracks, or any other signs that may indicate damage to the equipment inside. If any damage is found, do not open the package and contact your distributor.
2. Check that the STS model is correct. If it does not match, do not open the packaging and contact your distributor.
3. Check that the type and quantity of delivered items are correct and that they are free of visible damage. If any damage is found, contact your distributor.

3.2 Scope of Delivery

Component	Description	Component	Description
	On/Off-grid switching cabinet ×1		Expansion bolts ×4
	Fuses ×2		Fireproof putty × 27

Component	Description	Component	Description
	Tubular terminals × 12		Terminating resistor × 1
	Double-ended RJ45 connector • 250K：×1 • 500K：×4 Reserved for equipment maintenance		User manual × 1

3.3 Equipment Storage

If the equipment will not be put into operation immediately, store it as follows:

1. Ensure that the outer packaging is not opened and that the desiccant inside the box is present.
2. Ensure that the storage environment is clean, that the temperature and humidity are within the specified ranges, and that there is no condensation.
3. Ensure that the stacking height and orientation of the equipment comply with the instructions on the labels on the packaging.
4. Ensure that the stacked equipment is not at risk of toppling over.
5. If the equipment has been in storage for more than two years, or has been idle for more than six months after installation, it is recommended that qualified personnel inspect and test it before putting it into operation.
6. To ensure the proper electrical performance of the electronic components inside the equipment, it is recommended that the equipment be energized once every six months during storage. If it has not been energized for more than six months, qualified personnel should inspect and test it before it is put into operation.

4 Installation

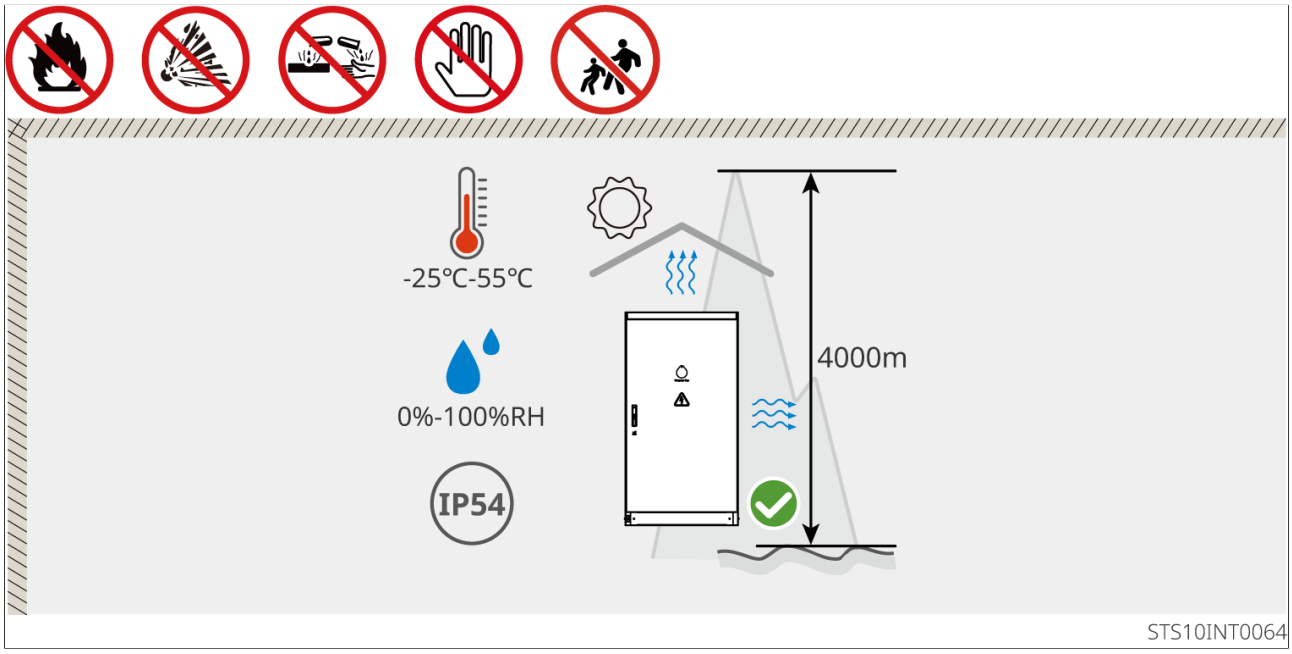
4.1 Installation Requirements

Installation Environment Requirements

1. Do not install the equipment in environments that are flammable, explosive, corrosive, or similar.
2. The installation space must meet the equipment's ventilation and heat dissipation requirements, as well as the clearance requirements for operation.
3. The equipment's Ingress Protection Rating is suitable for outdoor installation. The ambient temperature and humidity at the installation site must be within the appropriate ranges.
4. Avoid installing the equipment where it is exposed to direct sunlight, rain, or snow accumulation. Installation in a sheltered location is recommended; a sunshade may be installed if necessary.
5. Install the equipment out of children's reach and avoid locations where it can be easily touched.
6. Install the equipment at a height that allows convenient operation and maintenance. Ensure that the indicators and all labels are easy to view and that the terminals are easily accessible.
7. The equipment must be installed at an altitude below 4,000 m.
8. Equipment installed in salt-affected areas is subject to corrosion. Salt-affected areas are those within 500 m of the coast or exposed to sea breezes. The areas affected by sea breezes vary depending on weather conditions (such as typhoons and seasonal winds) and terrain (such as the presence of dikes or hills).
9. If the equipment is installed in a public area outside of work and residential areas (such as a parking lot, station, or factory), install a protective barrier around the equipment and post safety warning signs to restrict access by unauthorized personnel. This helps prevent personal injury or property damage caused by accidental contact by unqualified personnel or other causes while the equipment is operating.
10. Keep the equipment away from strong magnetic fields to avoid electromagnetic interference. If a radio station or radio communication equipment operating below 30 MHz is located near the installation site, install the equipment as follows:

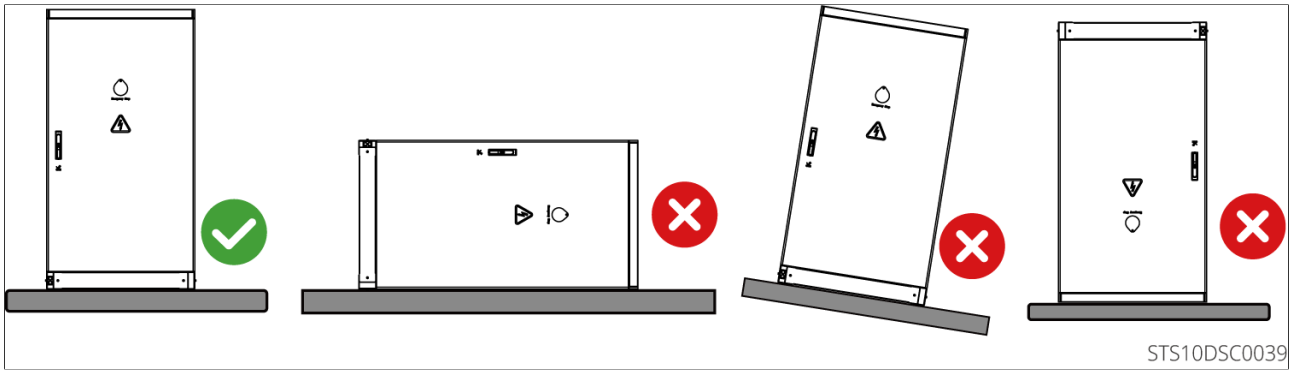
- Add a ferrite core with multiple turns around the equipment's AC cables, or install a low-pass EMI filter.

- Maintain a distance of more than 30 m between the equipment and the radio interference source.



Installation Angle

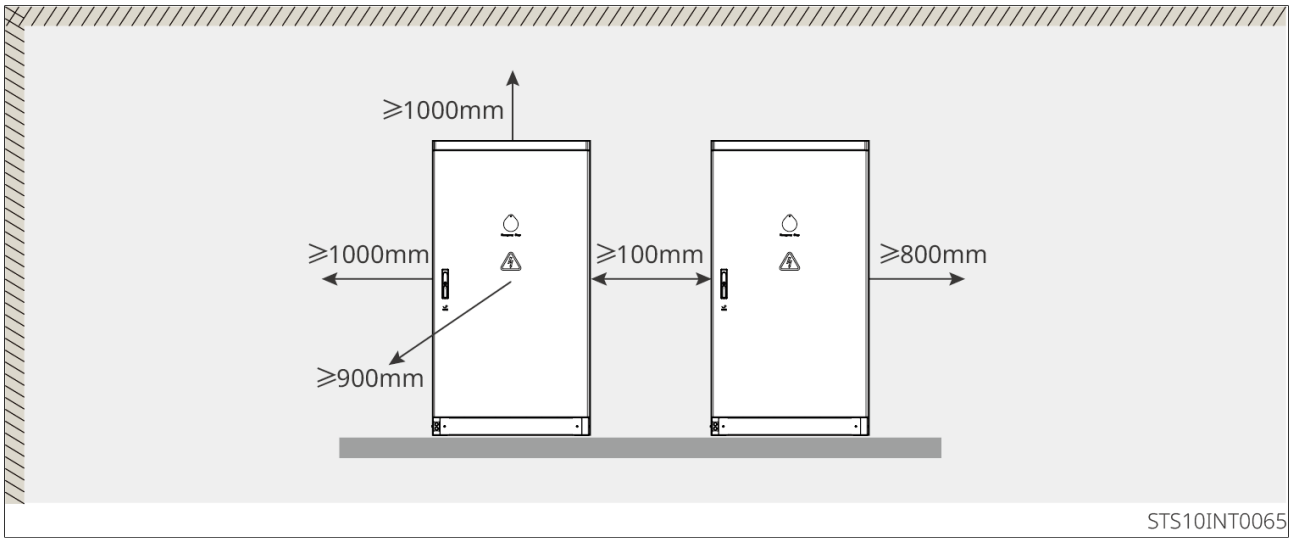
The equipment must be installed vertically and securely on the foundation to ensure stability and proper heat dissipation.
Do not tilt, lay on its side, or invert the equipment, as this may damage it, cause unstable operation, or create safety hazards.



Installation Space Requirements

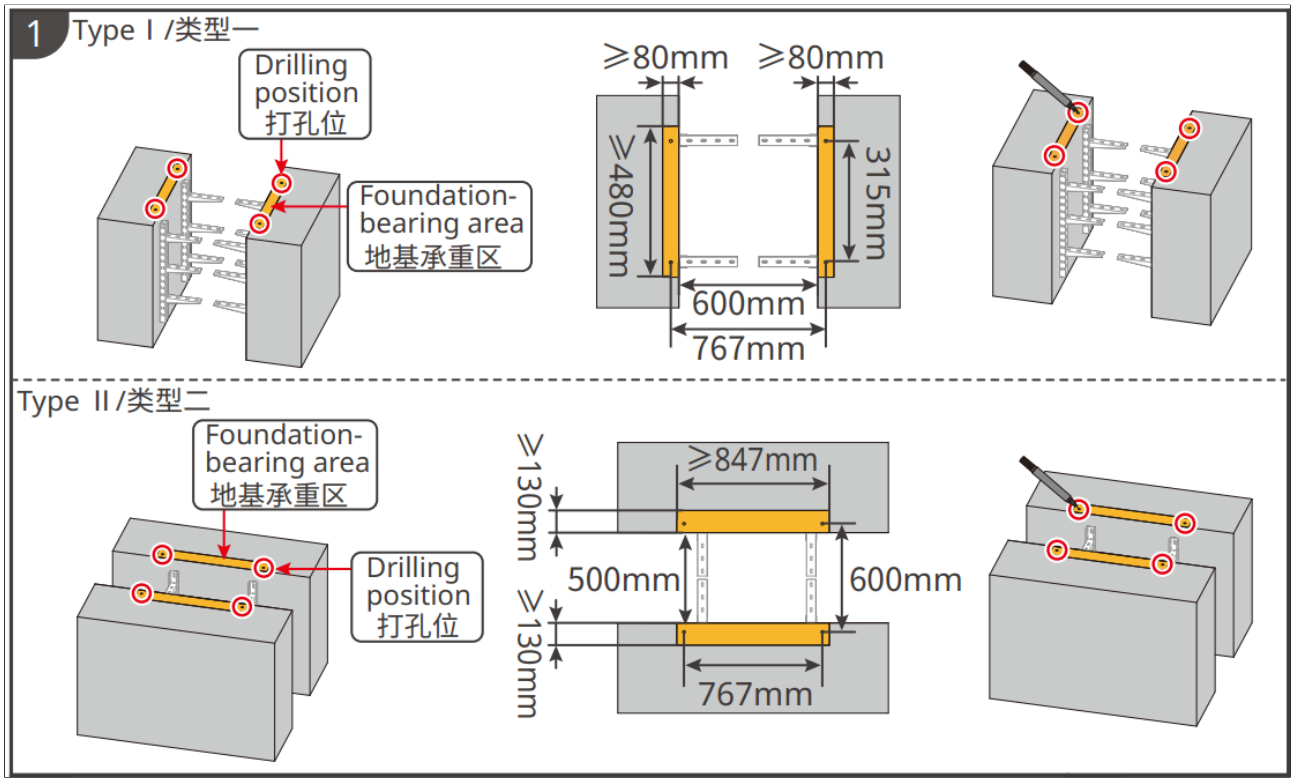
NOTICE

When using a forklift, maintain a clearance of at least 2.5 m at the front and rear of the equipment.



Foundation Requirements

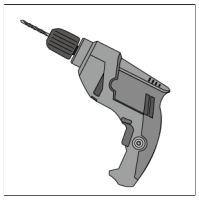
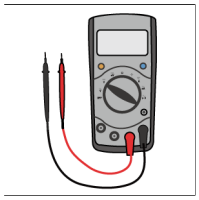
- The foundation for the equipment must be constructed using C35 concrete or concrete with equivalent performance.
- Before installation, ensure that the base is level, secure, flat, dry, and has sufficient load-bearing capacity. It must not be sunken or sloped.
- Embed conduits or provide cable outlet openings in the base to facilitate equipment wiring.
- The equipment uses bottom cable entry. The foundation must be designed to prevent dust and rodents from entering.
- The foundation must be designed to prevent water accumulation and moisture, which could cause cable aging and short circuits and affect normal equipment operation.
- Since the equipment cables are thick, allow sufficient space for them when designing the embedded conduits or cable outlet openings to ensure smooth connections and prevent abrasion.

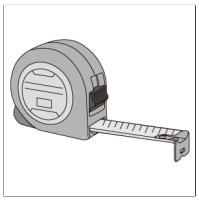
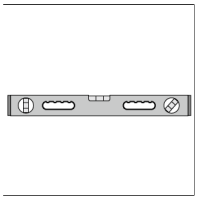
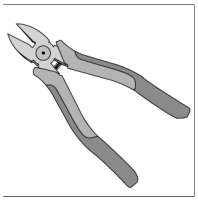
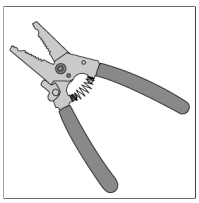
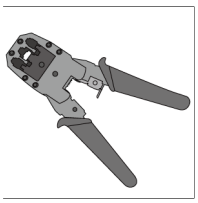
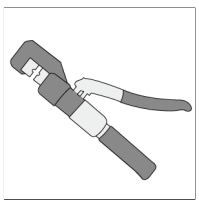
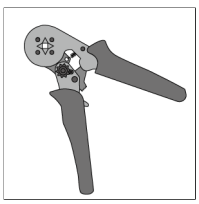


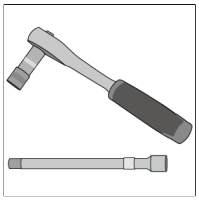
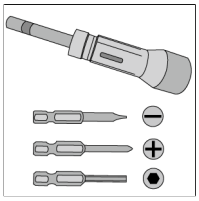
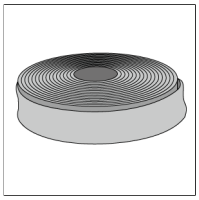
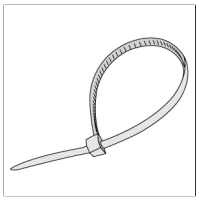
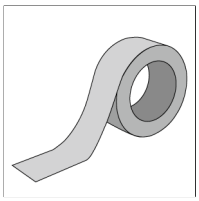
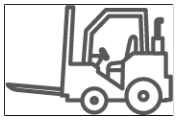
4.2 Tool Requirements

NOTICE
The following installation tools are recommended. Other auxiliary tools may be used on site as needed.

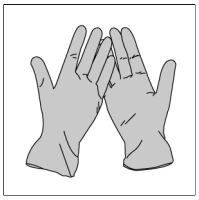
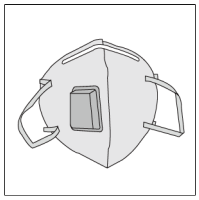
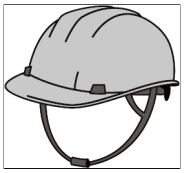
Installation Tools

Tool Type	Description	Tool Type	Description
	Hammer drill (16 mm drill bit)		Multimeter

Tool Type	Description	Tool Type	Description
	Tape measure		Utility knife
	Rubber mallet		Spirit level
	Marker		Diagonal cutting pliers
	Wire stripper		RJ45 crimping tool
	Hydraulic crimping tool		Ferrule crimping tool

Tool Type	Description	Tool Type	Description
	Socket wrench set		Torque screwdriver
	Heat gun		Heat-shrink tubing
	Vacuum cleaner		Cable ties
	Open-end wrench		Electrical insulation tape
	Forklift		

Personal Protective Equipment

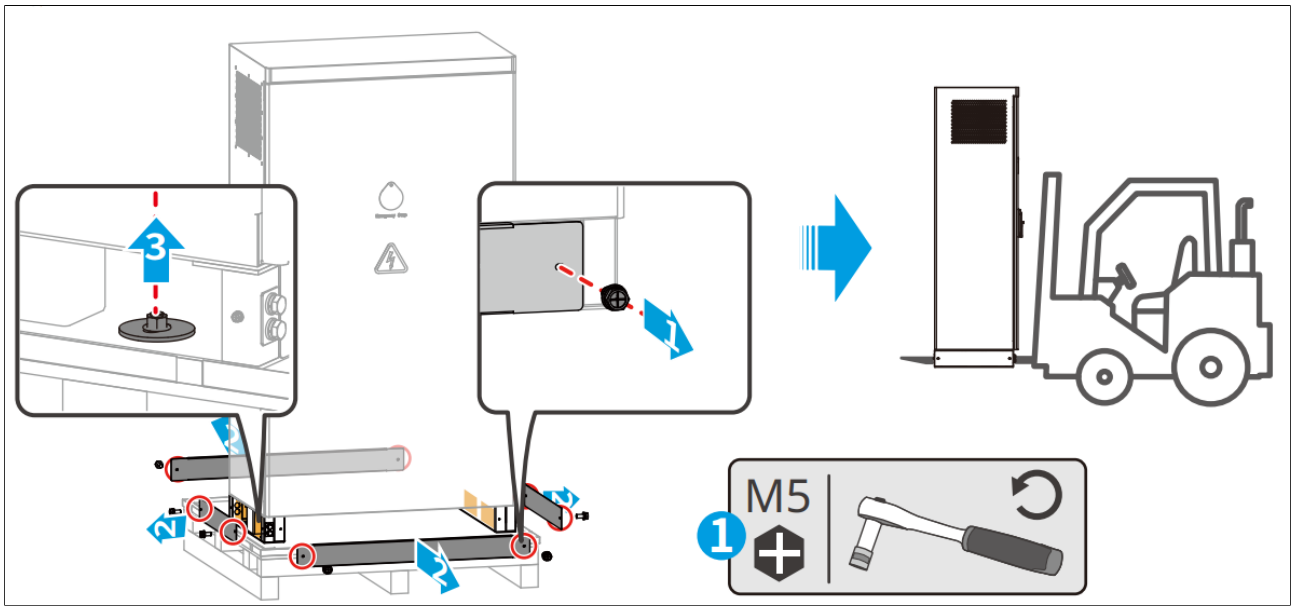
Tool Type	Description	Tool Type	Description
	Insulating gloves, protective gloves		Dust mask
	Safety glasses		Safety shoes
	Protective clothing		Safety helmet

4.3 Handling Requirements

⚠CAUTION

1. When transporting, handling, installing, or otherwise working with the equipment, comply with the laws, regulations, and applicable standards of the country or region where it is located.
2. To protect the equipment from damage during transport, ensure that transport personnel are professionally trained. Document the handling procedures during transport, keep the equipment balanced, and prevent it from falling.
3. Before installation, move the equipment to the installation location. To prevent personal injury or equipment damage during handling, observe the following precautions:

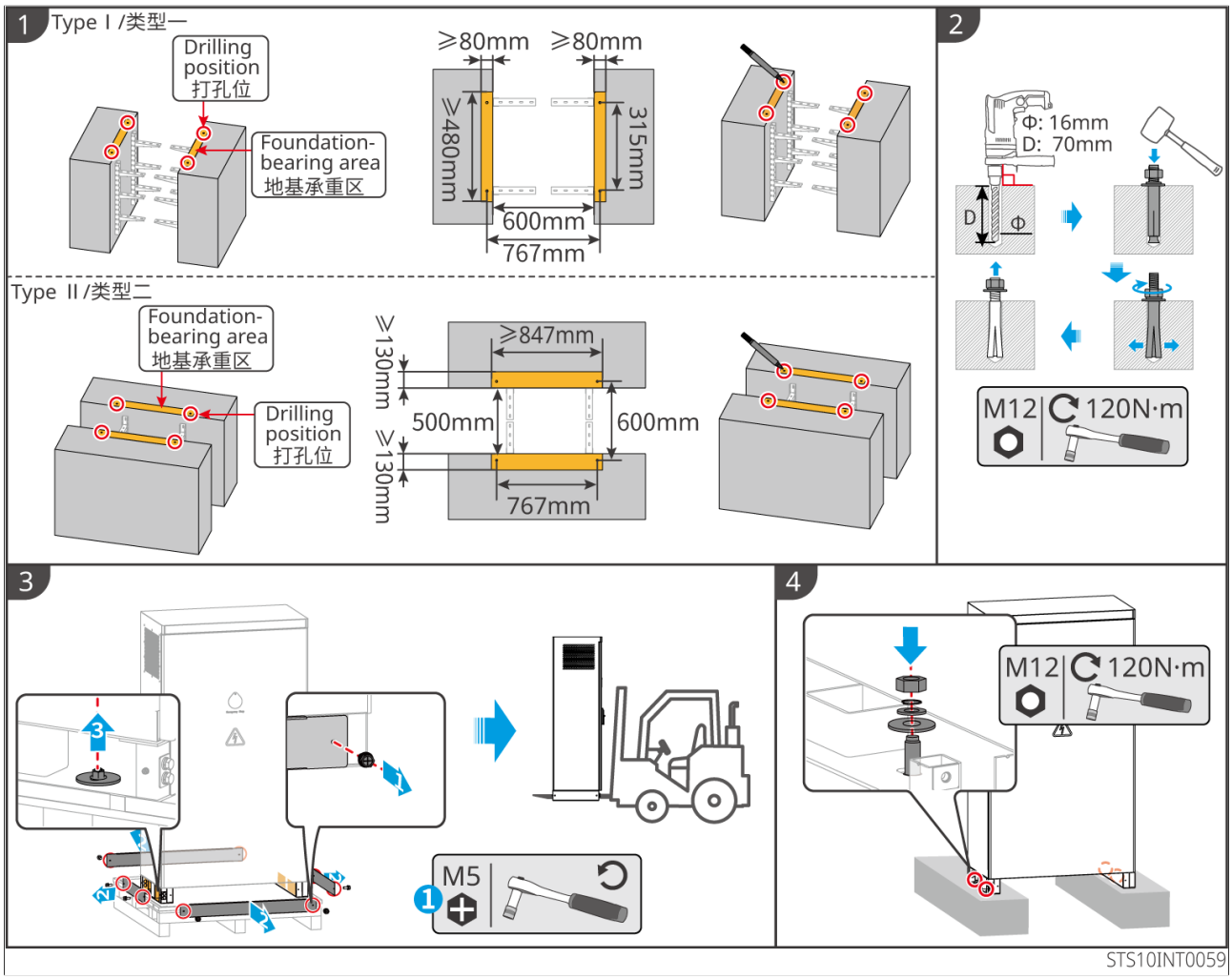
- Based on the equipment weight, provide the appropriate personnel and tools to prevent the equipment from exceeding the weight that can be safely handled by personnel and causing injury.
- Keep the equipment balanced during handling to prevent it from falling.
- Ensure that the cabinet doors are locked during equipment handling.



1. Remove the bottom baffle from the equipment.
2. Use a forklift to move the equipment, positioning its center of gravity at the center of the forklift forks.

4.4 Installing the on/off-Grid Switching Cabinet

1. Use a marker to mark the drilling positions on the foundation.
2. Drill holes in the ground using a rotary hammer drill, and install the expansion bolts.
3. Remove the bottom baffle from the equipment, then use a forklift to move the equipment onto the foundation.
4. Secure the equipment to the foundation.



5 Electrical Connections

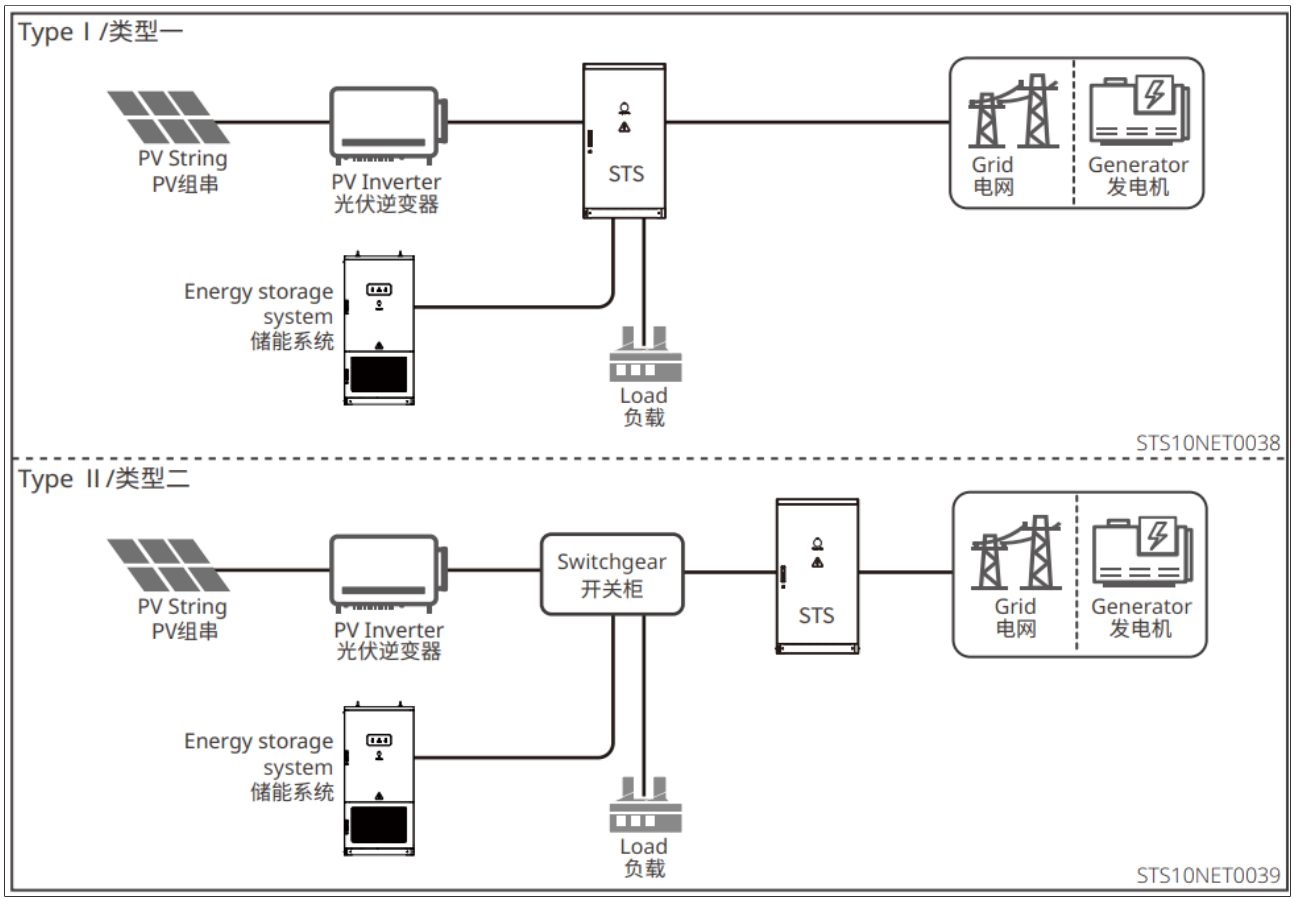
⚠DANGER

- All operations performed and the specifications of cables and components used during electrical connection must comply with local laws and regulations.
- Before connecting electrical cables, ensure that all upstream switches for the equipment are open.
- Before making electrical connections, open all switches for the equipment and ensure that it is de-energized. Live work is strictly prohibited, as it may cause electric shock or other hazards.
- Bundle cables of the same type together and route them separately from cables of other types. Do not twist or cross cables with one another.
- Excessive tension on cables may result in poor electrical connections. When wiring, leave sufficient slack in the cables before connecting them to the equipment terminals.
- When crimping a terminal, ensure that the cable conductor is in full contact with the terminal. Do not crimp the cable insulation together with the terminal, as this may prevent the equipment from operating or, during operation, cause heating due to an unreliable connection and damage the equipment terminal block.
- Using cables in high-temperature environments may cause their insulation to age or become damaged. Maintain a distance of at least 30 mm between cables and heating devices or the perimeter of heat-source areas.

NOTICE

- Before making electrical connections, wear personal protective equipment as required, including safety shoes, protective gloves, and insulating gloves.
- Only trained, qualified personnel are permitted to perform electrical connections and related operations.
- Keep the cabinet door key in a safe place.
- Cable colors shown in the illustrations in this document are for reference only. Actual cable specifications must comply with local regulations.

Wiring Overview



5.1 Preparation Before Wiring

Cable Preparation

No.	Cable	Type	Recommended Specifications	Description
1	Protection Grounding Conductor	Hot-dip galvanized flat steel	Must comply with local grounding design codes for AC electrical installations	Provided by the user

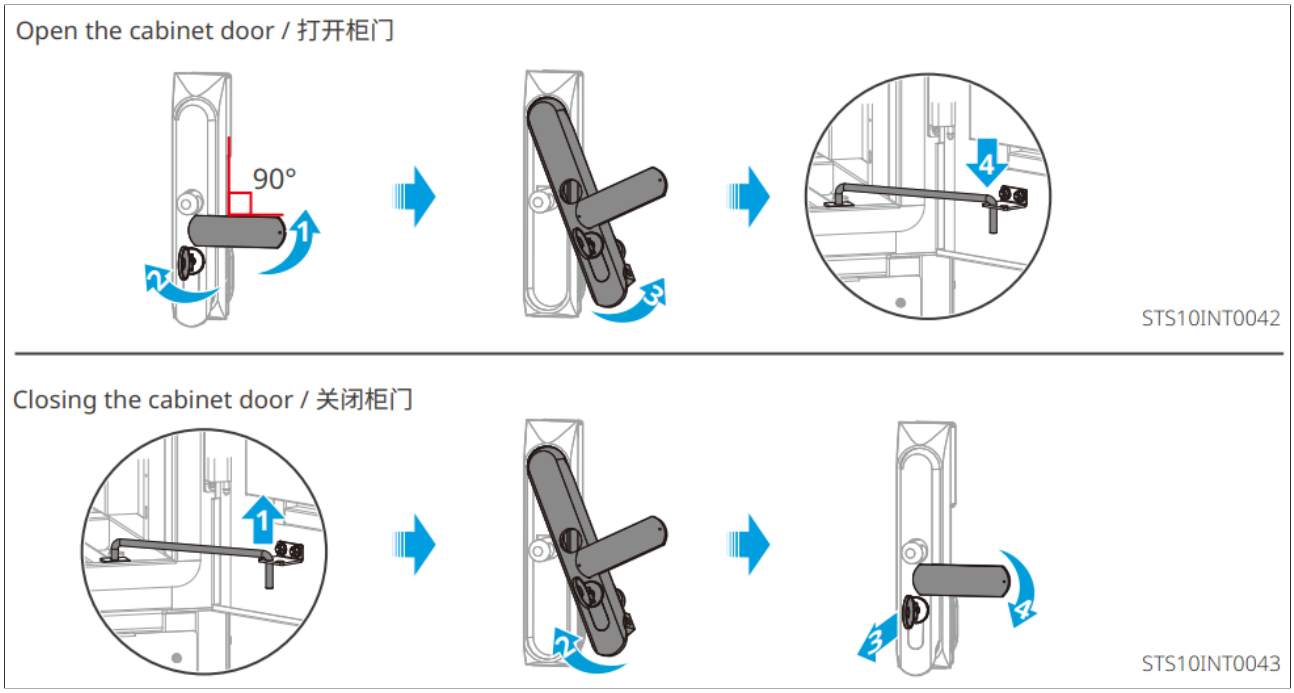
No.	Cable	Type	Recommended Specifications	Description
2	Power Cable	Outdoor five-core copper/aluminum cable	For the power cable and terminal specifications compatible with each port, refer to the5.3.Connecting the Power Cable(Page 41)section.	Cables and terminals are provided by the user
3		Single-phase AC Cable	• Single-core outdoor copper conductor cable • Conductor cross-sectional area: 2.5 mm^2–6.0 mm^2 • Cable outer diameter: 2.5–4.0 mm	Cables and terminals are provided by the user
4	DI Signal Cable	Outdoor copper-core twisted-pair cable compliant with local standards	Conductor cross-sectional area: 0.32–0.5 mm^2	Provided by the user
5	LAN Communication Cable	Standard shielded CAT 5E or higher-grade network cable with RJ45 connectors		Provided by the user
Note: The cable specifications recommended in the table are for reference only. When selecting cables, users must consider the effects of factors such as ambient installation temperature, installation method, number of parallel runs, voltage deviation, and thermal stability, and adjust the current-carrying capacity using the applicable correction factors. The selected cable must meet the following requirements: cable current-carrying capacity ≥ overcurrent protective device Rated Current ≥ maximum Rated Current				

UPS Preparation (Optional)

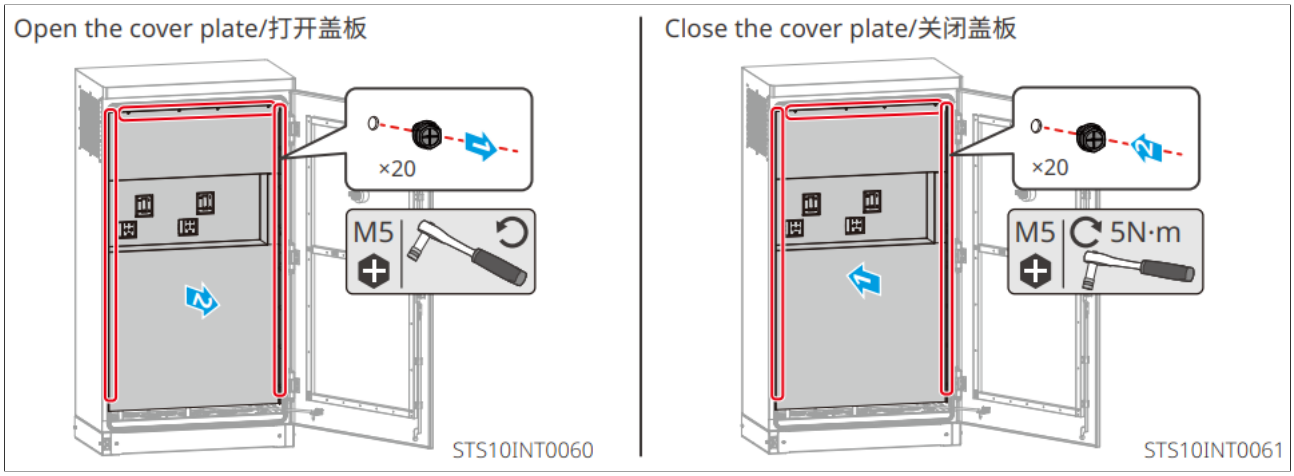
Brand		Schneider
Model		SPM1K
Input/Output	Nominal Input Voltage	220 V
	Input Voltage Range	110~300 VAC
	Input Current Protection	10 A Protection
	Output Voltage	220 V (default)/230 V/240 V
	Maximum Output Power	800 W
	Output Efficiency	88%
	Output Terminals	3 China Standard Sockets
Batteries	Battery Capacity	9 Ah*2
	Battery Voltage	24 V
	Charging Time	Charges to 90% in 4 hours
Other	Operating Temperature	0~+40℃
	Storage Temperature	-15~+60℃
	Altitude	1 km (output capacity decreases by 1% for every 100 m increase in altitude)
	Dimensions	145*288*223 mm
	Net Weight	9.3 kg

Cabinet Door and Cover Operation

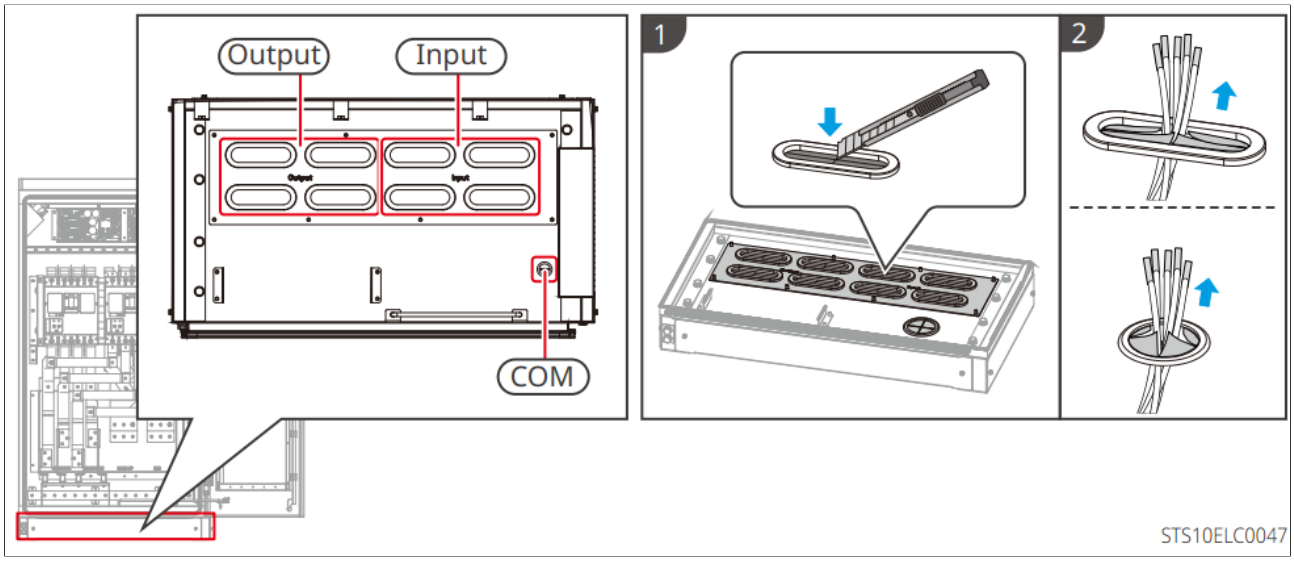
- **Cabinet Door**



- **Cover**



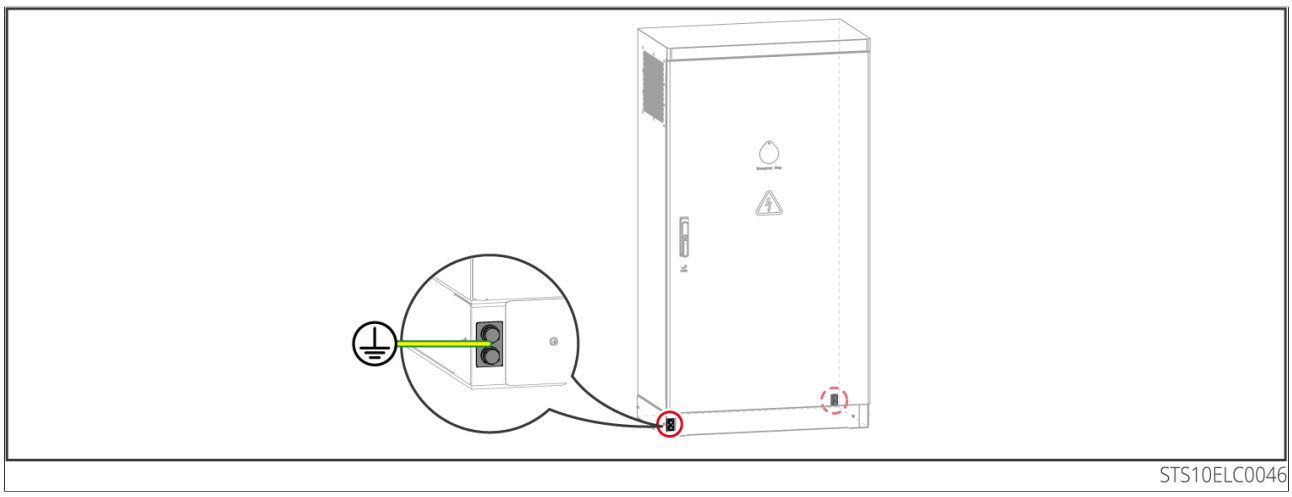
Cable Entry Hole Operation



5.2 Connecting the Protection Earth Conductor

WARNING

- Before working on the equipment, ensure that the system is reliably grounded and that the relevant protective measures are in place; otherwise, there may be a risk of electric shock.
- To improve the corrosion resistance of the terminal, after completing the ground connection, apply silicone sealant or paint to the exterior of the grounding terminal for protection.

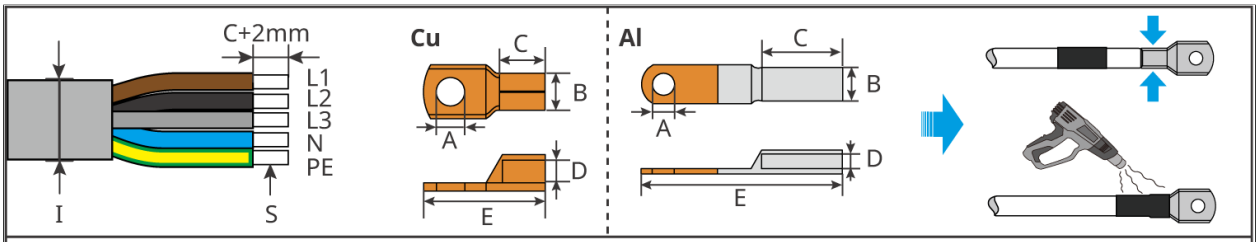


5.3 Connecting the Power Cable

AC (GRID/GENERATOR & INVERTER & ESS & BACK-UP)

NOTICE
The STS terminal block is made of copper. If using aluminum cables, provide copper-aluminum transition terminals.

1. Prepare the cables and terminals, and crimp them.



250K

端口 Port	线缆材质 Cable Material	线缆类型 Cable Type	A (mm)	B (mm)	D (mm)	E (mm)	I (mm)	S (mm²)	线缆数量 Cable Quantity	
BACK-UP INVERTER	Cu	L1/L2/L3	8.5-10	14.5-17	11.5-13.7	48.5-57	Φ: ≤70	70-95	BACK-UP: 70mm² ×3 / 95mm² ×2	INVERTER: 70mm² ×1 / 95mm² ×1
		N/PE		10.8-12.5	8.5-9.8	37-42.5		35-50	BACK-UP: 35mm² ×3 / 50mm² ×2	INVERTER: 35mm² ×1 / 50mm² ×1
	Al	L1/L2/L3	10-12.5	21-23	13.5-15.2	109-120		95-120	BACK-UP: 95mm² ×3 / 120mm² ×2	INVERTER: 70mm² ×1 / 95mm² ×1
		N/PE	8.5-10	16-18	9.5-11.5	90-100		50-70	BACK-UP: 50mm² ×3 / 70mm² ×2	INVERTER: 35mm² ×1 / 50mm² ×1
GRID / GENERATOR / Switchgear 开关柜	Cu	L1/L2/L3	8.5-10	17	13.7	57	Φ: ≤70	95	95mm² ×3	
		N/PE		12.5	9.8	42.5		50	50mm² ×3	
	Al	L1/L2/L3	12.5	23	15.2	120		120	120mm² ×2	
		N/PE	8.5-10	18	11.5	100		70	70mm² ×2	
ESS	Cu	L1/L2/L3	8.5-10	14.5	11.5	48.5	Φ: ≤70	70	70mm² ×1	
		N/PE		12.5-14.5	9.8-11.5	42.5-48.5		50-70	50mm² ×1 / 70mm² ×1	
	Al	L1/L2/L3		21	13.5	109		95	95mm² ×1	
		N/PE		16	9.5	90		50	50mm² ×1	

INVERTER & ESS: 1 × 5-core cable per unit, as per actual connections./INVERTER和ESS按实际接入数量，每台一根5芯线。

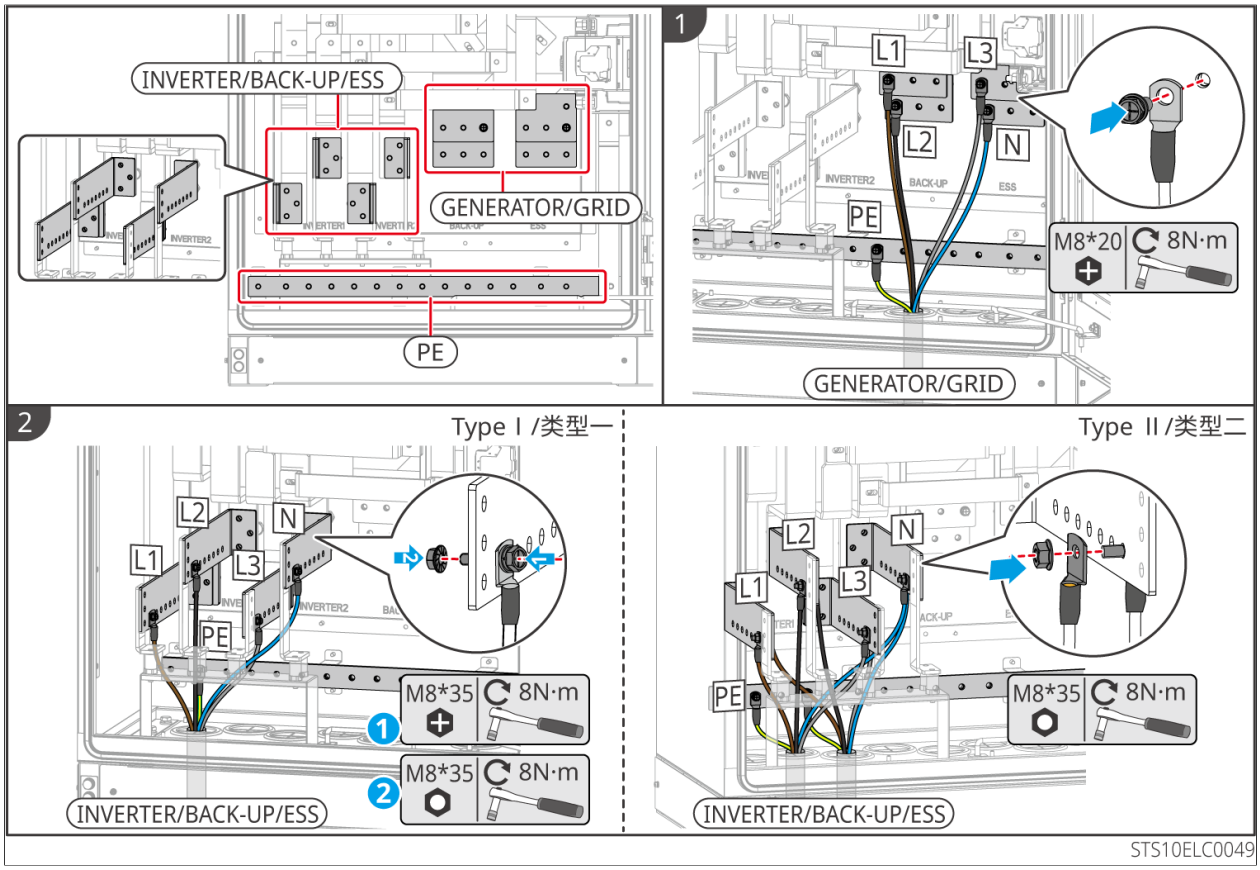
500K

端口 Port	线缆材质 Cable Material	线缆类型 Cable Type	A (mm)	B (mm)	D (mm)	E (mm)	I (mm)	S (mm²)	线缆数量 Cable Quantity
BACK-UP	Cu	L1/L2/L3	8.5-10	17-19	13.7-15	57-63	Φ: ≤70	95-120	95mm² ×4 / 120mm² ×3
		N/PE		12.5-14.5	9.8-11.5	42.5-48.5		50-70	50mm² ×4 / 70mm² ×3
	Al	L1/L2/L3	10-12.5	23-24	15.2-16.8	120-129		120-150	120mm² ×4 / 150mm² ×3
		N/PE	8.5-10	18	11.5	100		70	70mm² ×4 / 70mm² ×3
GRID / GENERATOR / Switchgear 开关柜	Cu	L1/L2/L3	12.5	21	16.7	70.5	Φ: ≤70	150	150mm² ×3
		N/PE	8.5-10	14.5-17	11.5-13.7	48.5-57		70-95	70mm² ×3 / 95mm² ×3
	Al	L1/L2/L3	12.5	27.1	18.8	129		185	185mm² ×3
		N/PE	8.5-10	21	13.5	109		95	95mm² ×3
ESS	Cu	L1/L2/L3	8.5-10	14.5	11.5	48.5-50	Φ: ≤70	70	70mm² ×1
		N/PE		12.5-14.5	9.8-11.5	42.5-48.5		50-70	50mm² ×1 / 70mm² ×1
	Al	L1/L2/L3	8.5-10	21	13.5	109		95	95mm² ×1
		N/PE		16	9.5	90		50	50mm² ×1
INVERTER	Cu	L1/L2/L3	8.5-10	14.5-17	11.5-13.7	48.5-57	Φ: ≤70	70-95	70mm² ×1 / 95mm² ×1
		N/PE		10.8-12.5	8.5-9.8	37-42.5		35-50	35mm² ×1 / 50mm² ×1
	Al	L1/L2/L3	10-12.5	21-23	13.5-15.2	109-120		95-120	95mm² ×1 / 120mm² ×1
		N/PE	8.5-10	16-18	9.5-11.5	90-100		50-70	50mm² ×1 / 70mm² ×1

INVERTER & ESS: 1 × 5-core cable per unit, as per actual connections./INVERTER和ESS按实际接入数量，每台一根5芯线。

STS10ELC0048

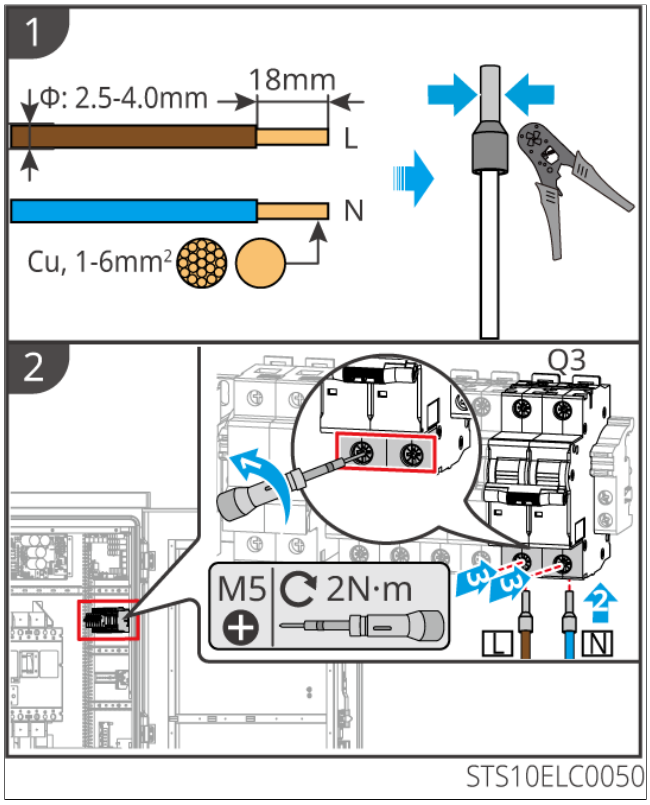
2. First, remove the screws and nuts from the terminal block. Then use the screws and nuts to secure the crimped cables to the terminal block.



Q6 (Connect the SEC3000C Power Cable)

NOTICE
It is recommended to install a UPS between the Q3 power supply port and the SEC3000C to ensure stable operation of the SEC3000C. For recommended UPS models, see5.1.Preparation Before Wiring(Page 37)。

1. Prepare the single-phase AC cable and tubular terminals, and crimp the terminals.
2. Loosen the screw at the bottom of the Q3 circuit breaker, insert the terminal, and then tighten the screw.

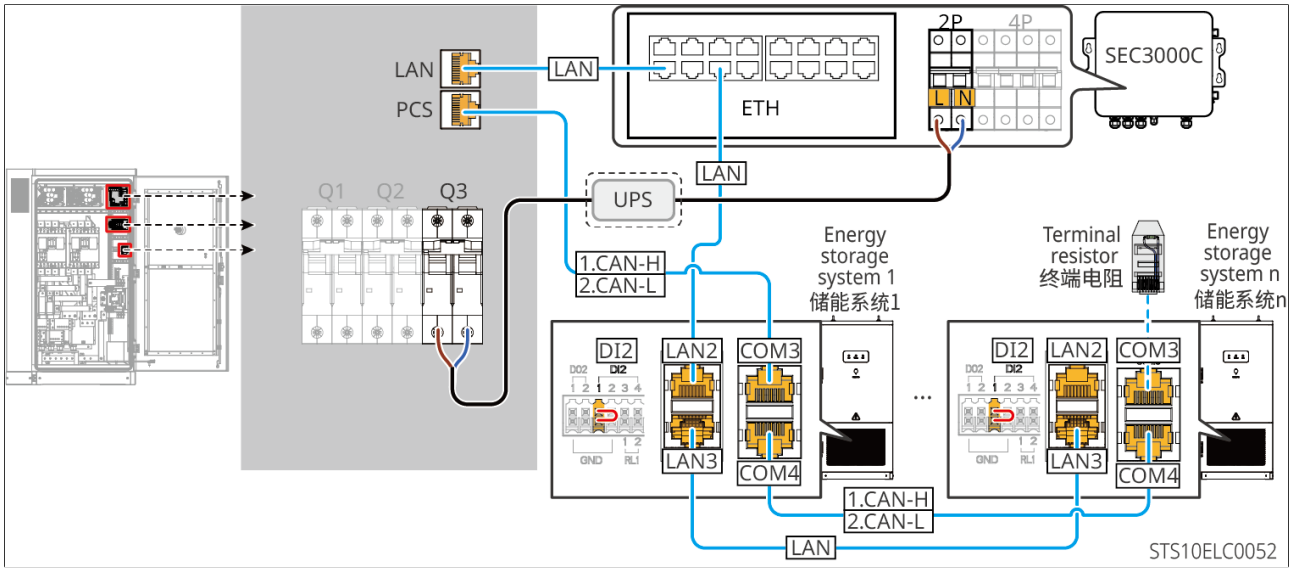


5.4 Connecting Communication Cables

NOTICE

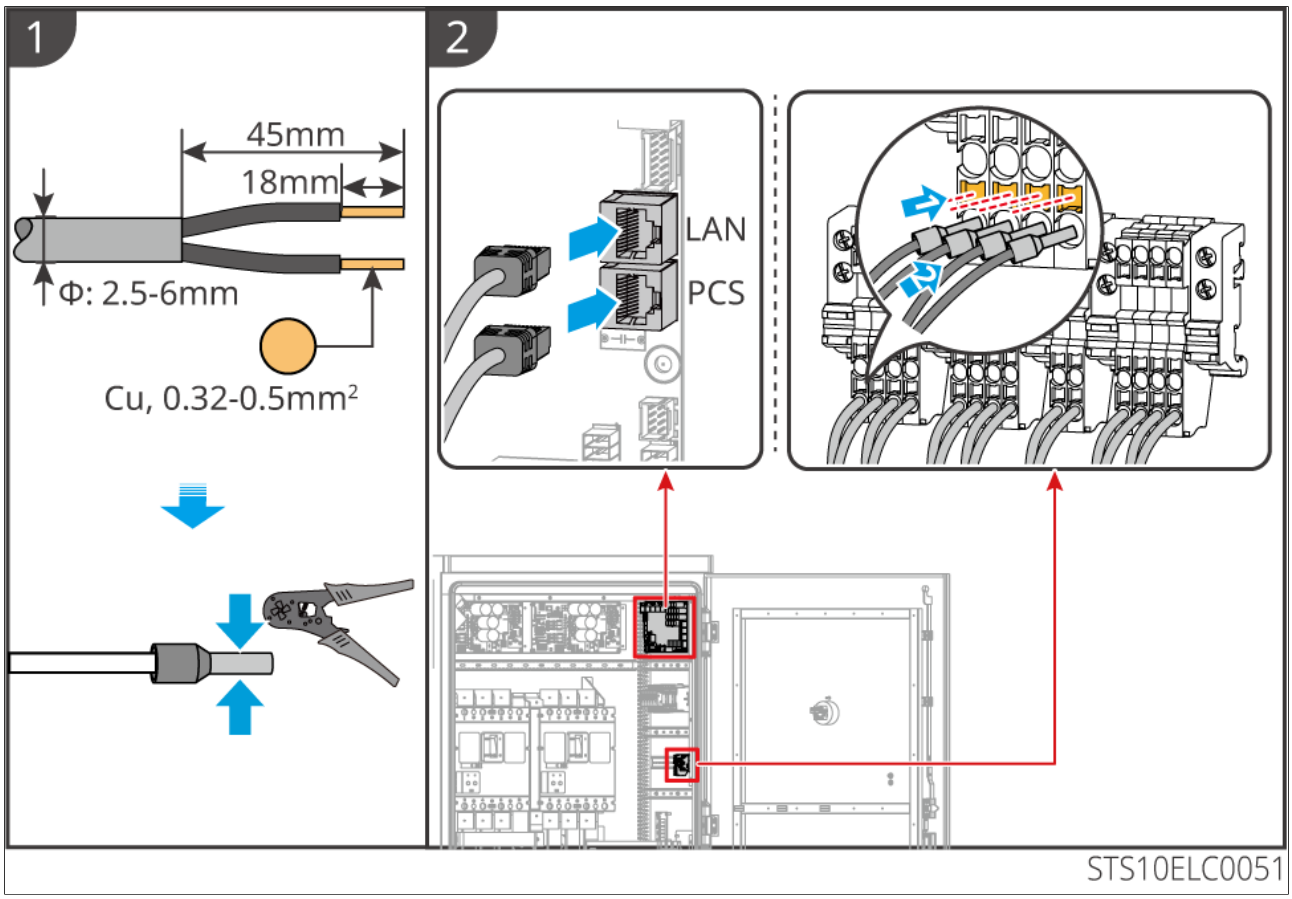
- Open the cover before connecting the communication cables.
- The communication cable between the STS and the nearest energy storage system must not exceed 45 m in length. The communication cable between two adjacent energy storage systems must not exceed 5 m.
- When multiple energy storage systems are connected in parallel, insert a terminating resistor into the COM port of the last energy storage system.
- When multiple energy storage systems are connected in parallel and one system develops a fault and must be completely powered down, disconnect the Ethernet cables from its COM3 and COM4 ports, then connect the two cables using a dual-ended RJ45 coupler. If the last energy storage system develops a fault, disconnect the Ethernet cable from its COM port and the cable from the COM port of the preceding system, then remove the terminating resistor from the faulty system and plug it into the COM port of the preceding system.
- It is recommended to install a UPS between the STS and SEC3000C. With a UPS installed, the system can perform a remote black start; without a UPS, remote black start is not possible.

Wiring Overview



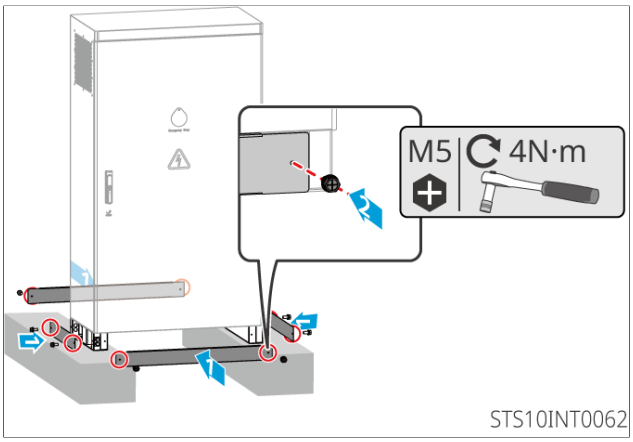
Procedure

1. Prepare the communication cable and crimp the terminals.
2. Route the communication cable through the bottom COM port and connect it to the corresponding communication port.

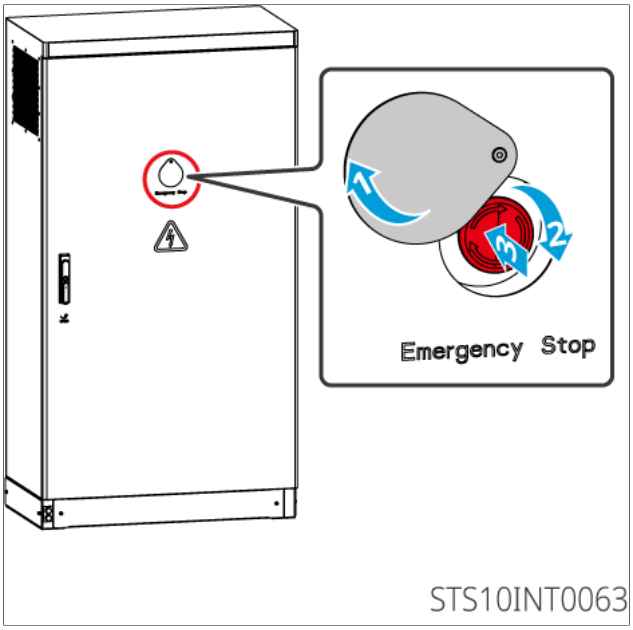


5.5 Operations After Wiring

1. Install the baffle.



2. Release the EPO switch.



6 Device Trial Run

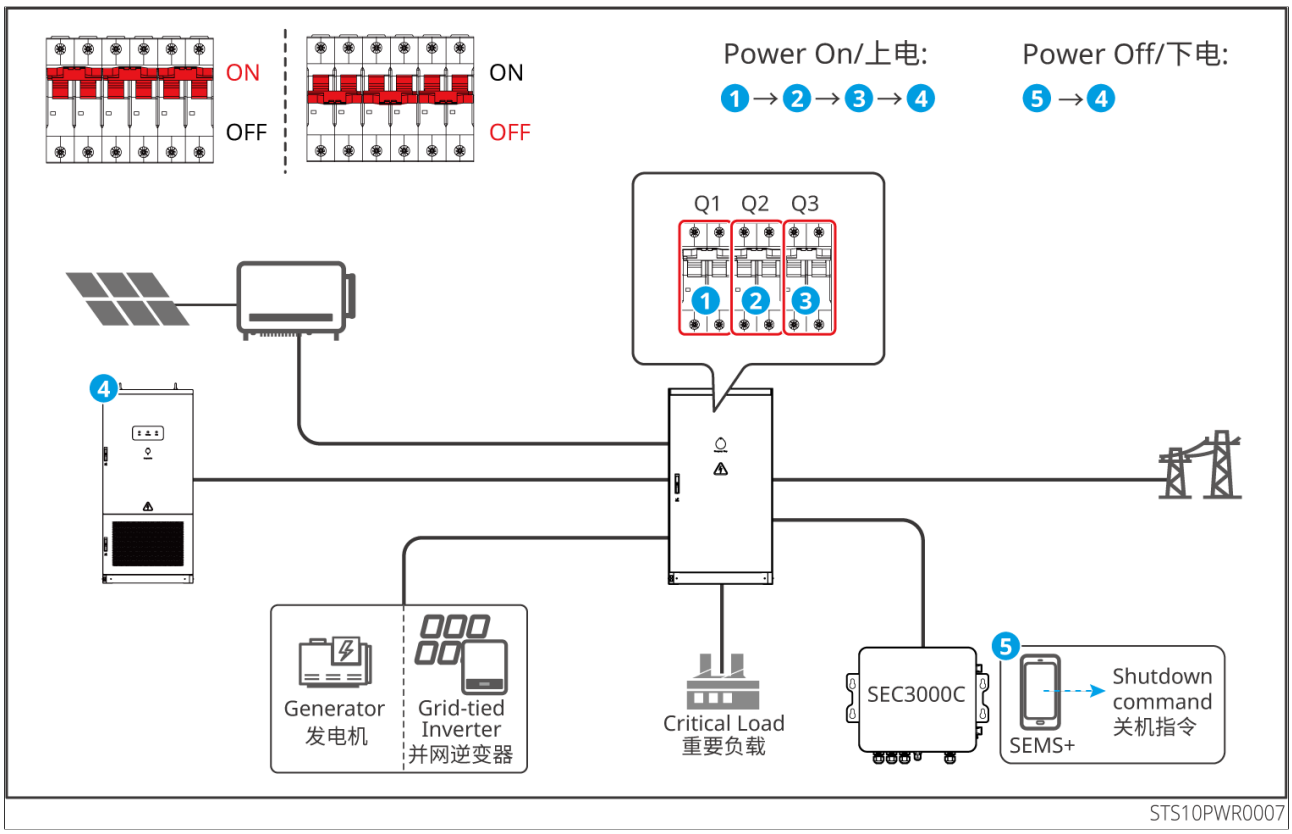
6.1 Pre-Energization Checks

No.	Check Item
1	The equipment is securely installed in a location that allows easy operation and maintenance, with adequate space for ventilation and heat dissipation. The installation environment is clean and tidy.
2	The protection ground wire, power cables, and communication cables are connected correctly and securely.
3	Cables are bundled in accordance with routing requirements, arranged properly, and free from damage.
4	Unused cable entry holes and ports must be securely sealed using the supplied terminals and properly plugged.
5	Ensure that all cable entry holes in use are properly sealed.
6	The voltage and frequency at the equipment's grid connection point meet the grid-connection requirements.

6.2 Energizing the Equipment

NOTICE
Open the cover before powering on the equipment.

1. Close switch Q1 (GRID single-phase power supply circuit breaker).
2. Close switch Q2 (BUS single-phase power supply circuit breaker).
3. Close switch Q3 (SEC3000C power supply switch).
4. Power on the energy storage system.


ON
OFF
ON
OFF
Power On/上电:
1→2→3→4
Power Off/下电:
5→4
Q1 Q2 Q3
1
2
3
4
5
Generator
发电机
Grid-tied
Inverter
并网逆变器
Critical Load
重要负载
SEC3000C
SEMS+
Shutdown
command
关机指令
STS10PWR0007

7 Commission Equipment via the SEC3000C Embedded Web Interface

The SEC3000C Smart Energy Control Cabinet is a dedicated device for the monitoring and management platform of PV power generation systems. It can collect data from equipment in the PV power generation system, such as grid-tied inverters, energy storage inverters, and meters, store logs, and send data to the monitoring and management platform, enabling centralized monitoring, operation, and maintenance of the PV system.
For detailed functions, refer to the SEC3000C User Manual.

8 Monitor the PV Plant via SEMS+

SEMS+ is a monitoring platform that communicates with equipment via WiFi, LAN, or 4G. The following are commonly used SEMS+ functions:

- Manage organizations, user information, and more.
- Add and monitor PV plant information, and more.
- Maintain equipment.

Scan the QR code below to download and install the app.



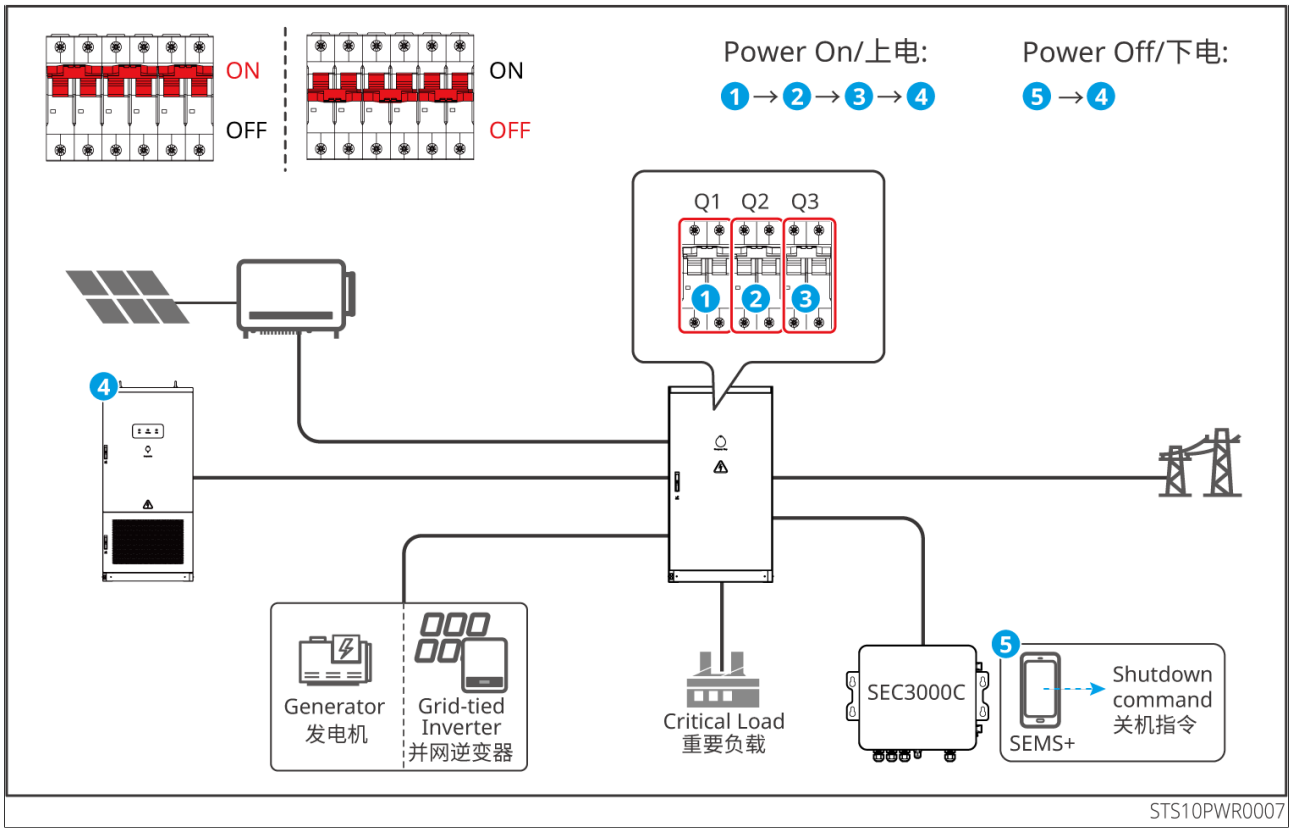
For detailed functions, see the 《SEMS+ User Manual》。

9 System Maintenance

9.1 De-Energizing the Equipment

NOTICE
After powering off the equipment, close the cover.

1. Send a shutdown command to the system via the SEC3000C web interface.
2. Power down the energy storage system.



9.2 Troubleshooting

Troubleshoot the fault using the methods below. If these methods do not resolve the issue, contact the after-sales service center.
When contacting the after-sales service center, collect the following information to

help resolve the issue quickly.

1. Equipment information, such as the serial number, software version, equipment installation time, fault occurrence time, and fault frequency.
2. Equipment installation environment, such as weather conditions and installation location. Photos, videos, and other files are recommended to help analyze issues with the installation environment.
3. Grid conditions.

Fault Type	Fault Message	Troubleshooting
MC Control Board Fault	NTC Abnormal	Please contact your distributor or the GoodWe After-Sales Service Center.
	Fan Abnormal	Please contact your distributor or the GoodWe After-Sales Service Center.
	DSP Communication Failure	1. After powering down, check whether the RJ45 port for PCS communication controlled by the MC and the RJ45 port of the COM port on the 261 integrated cabinet are connected properly or have any issues. 2. After resolving the issue, power the system back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.
	Contactor Communication Failure	1. After powering down, check whether the CN20 control port on the MC and the Phoenix terminals on the Jinggui switch are connected properly or have any issues. 2. After resolving the issue, power the system back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.

Fault Type	Fault Message	Troubleshooting
	DG Communication Failure	1. After powering down, check whether the RS485 port on the generator terminal block inside the cabinet and the communication terminals on the generator side are connected properly or have any issues. 2. After resolving the issue, power the system back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.
EPO	Cabinet Fault	1. If the EPO button was pressed accidentally, first confirm that the STS is completely powered down and safe, then rotate the EPO button to reset it. 2. If the EPO was pressed in an emergency due to a hazardous situation, contact your distributor or GoodWe After-Sales Service Center.
Contactor Failure 1	Magnetic Latching Switch Spurious Trip Warning	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.
	Magnetic Latching Switch Spurious Closing Warning	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.
	Main Magnetic Latching Switch Closing Failure	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.

Fault Type	Fault Message	Troubleshooting
	Main Magnetic Latching Switch Opening Failure	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.
	Relay Unexpectedly Opened While Closed	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.
	Relay Unexpectedly Closed While Open	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.
	Relay Closing Failure	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.
	Relay Opening Failure	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.
	Phase A Current Interruption Timeout During Opening	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.

Fault Type	Fault Message	Troubleshooting
	Phase B Current Interruption Timeout During Opening	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.
	Phase C Current Interruption Timeout During Opening	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.
	Three-Phase Input Power Loss	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.
	24 V Supply Undervoltage	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.
	Magnetic Latching Drive Undervoltage	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.
	Incorrect Dual-Unit Mode Setting	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.
	Internal RS485 Communication Lost	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.

Fault Type	Fault Message	Troubleshooting
Contactor Failure 2	Parallel Slave Unit Operation Failure	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.
	Incorrect N-phase wiring	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.
	ABC phase sequence error	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.
	Phase loss error	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.
	MCU overtemperature error	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.
	One switch open and the other closed in parallel operation	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.
	Both units closed during interlocked operation	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.

Fault Type	Fault Message	Troubleshooting
	Control contacts triggered simultaneously	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.
	Excessive switching frequency	Power down the entire system. After 5 minutes, power it back on. If the fault persists, contact your distributor or GoodWe After-Sales Service Center.
Overload Protection 1	Overload Protection (GRID)	1. Power off the entire system, then power it back on after 5 minutes. If the fault clears, no further action is required. 2. If this occurs twice or more within one month, contact your dealer or the GoodWe After-Sales Service Center.

9.3 Periodic Maintenance

⚠DANGER

Before maintenance, ensure the STS is completely powered off. Live work may damage the equipment or cause an electric shock hazard.

Maintenance Item	Maintenance Method	Maintenance Interval
System Appearance	• Check the enclosure for any visible coating peeling, scratches, or paint loss. • Check the cabinet and internal components for corrosion. • Check that the door lock functions properly. • Check the ventilation openings for dust accumulation, foreign objects, or blockage. • Check that the labels are firmly affixed.	Once every six months
Electrical Connections	• Check that the cables are securely connected and are not detached or loose. • Check the cable outer sheath for damage. • Check that the grounding cable is reliably grounded.	Once every six months
Sealing	Check that the equipment cable-entry openings are adequately sealed. If gaps are too large or remain unsealed, reseal them.	Once a year

9.4 Equipment Removal

⚠CAUTION

- Before removing the STS, ensure that the equipment is completely powered off.
- Wear personal protective equipment during operation.

1. Open the cabinet door.
2. Disconnect all electrical connections to the STS, including power cables, communication cables, and Protection ground cables.
3. Remove the mounting screws from the STS base.

4. Use lifting equipment or a forklift to move the STS off the base.
5. Store the equipment properly. If it will be used again, ensure that the storage conditions meet the requirements.

9.5 Equipment Disposal

When the equipment can no longer be used and must be decommissioned, dispose of it in accordance with the electrical waste disposal regulations of the country/region where it is located. Do not dispose of the equipment as household waste.

10 Technical Data

Technical Data	GW250K-STS-PCS-G10	GW500K-STS-PCS-G10
Grid side		
Nominal Voltage (V)	220/380, 230/400, 240/415, 3L/N/PE	220/380, 230/400, 3L/N/PE
Voltage Range (V)	340~440	340~440
Nominal Frequency (Hz)	50/60	50/60
Frequency Range (Hz)	47.5~52.5/57.5~62.5	47.5~52.5 /57.5~62.5
Rated. Current (A)	478.6	957.2
Max. Current (A)	550@10s	1000@10s
Rated Power (kW)	250	500
Max. Apparent Power (kVA)	315	630
Rated Conditional Short-circuit Current (kA)	10	20
Back-up side		
Nominal Voltage (V)	220/380, 230/400, 240/415, 3L/N/PE	220/380, 230/400, 3L/N/PE
Voltage Range (V)	340~440	340~440
Nominal Frequency (Hz)	50/60	50/60
Frequency Range (Hz)	47.5~52.5/57.5~62.5	47.5~52.5 /57.5~62.5
Rated. Current (A)	417.8	835.6
Max. Current (A)	550@10s	1000@10s

Technical Data	GW250K-STS-PCS-G10	GW500K-STS-PCS-G10
Rated Power (kW)	250	500
Max. Apparent Power (kVA)	275	550
Rated Conditional Short-circuit Current (kA)	10	20
ESS side		
Nominal Voltage (V)	220/380, 230/400, 240/415, 3L/N/PE	220/380, 230/400, 3L/N/PE
Voltage Range (V)	340~440	340~440
Nominal Frequency (Hz)	50/60	50/60
Frequency Range (Hz)	47.5~52.5/57.5~62.5	47.5~52.5 /57.5~62.5
Rated. Current (A)	417.8	835.6
Max. Current (A)	550@10s	1000@10s
Rated Power (kW)	250	500
Max. Apparent Power (kVA)	275	550
Rated Conditional Short-circuit Current (kA)	10	20
Inverter side		
Nominal Voltage (V)	220/380, 230/400, 240/415, 3L/N/PE	220/380, 230/400, 3L/N/PE
Voltage Range (V)	340~440	340~440
Nominal Frequency (Hz)	50/60	50/60

Technical Data	GW250K-STS-PCS-G10	GW500K-STS-PCS-G10
Frequency Range (Hz)	47.5~52.5/57.5~62.5	47.5~52.5 /57.5~62.5
Rated. Current (A)	835.6	1519.4
Max. Current (A)	1100@10s	1800@10s
Rated Power (kW)	500	1000
Max. Apparent Power (kVA)	550	1000
Rated Conditional Short-circuit Current (kA)	10	20
General Data		
On/Off Grid Transfer Time (ms)	<20	<20
Operating Temperature Range (℃)	-25~+55	-25~+55
Storage Temperature (℃)	-40~+70	-40~+70
Relative Humidity	0~100%	0~100%
Pollution Degree	III	III
Max. Operating Altitude (m)	4000	4000
Cooling Method	Smart Fan Cooling	Smart Fan Cooling
Communication	LAN、CAN	LAN, CAN
Weight (kg)		
Dimension (W×H×D mm)	850×1600×480	850×1600×480

Technical Data	GW250K-STS-PCS-G10	GW500K-STS-PCS-G10
Mounting Method	Grounded	Grounded
Noise Emission (dB)	<60	<60
Ingress Protection Rating	IP54	IP54
Overvoltage Category	III	III
Protective Class	I	I
Certification		
Safety Regulation	IEC 61439-1、IEC 61439-2、EN 61439-1、EN 61439-1、IEC 60730	

11 Contact Details

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