YUNT
云天数能

User Manual

Microgrid STS/ATS Cabinet

Neptune-D Series

375/500/750/1000kW

V1.0

Trademark authorization

Note

Due to product version upgrades or other reasons, the document content will be updated periodically. Unless otherwise specified, the document content does not replace the safety precautions on the product label. All descriptions in the document are for guidance only.

Warranty Statement

Under normal use, if the product malfunctions or is damaged, YUNT Digital Power will provide warranty service within the warranty period. After the warranty period or in cases where damage is caused by improper operation within the warranty period, repair fees will be charged. For detailed warranty information, please refer to the *Product Warranty Card*.

Contents

1. About this Manual

This manual describes the Neptune series microgrid STS/ATS cabinets in terms of product information, storage and transportation, installation, electrical connections, and system maintenance. Before installing and operating the microgrid STS/ATS cabinet, please carefully read this manual, familiarize yourself with the product's functions, features, and precautions. Keep the manual in a place where it can be easily accessed. The content of the manual may be updated periodically. Please refer to the actual product for the latest information. The latest version and other product details can be obtained from YUNT Digital Power's official website or sales channels.

1.1 Product Naming

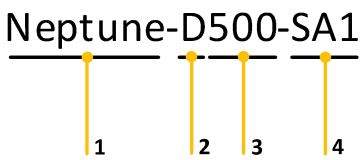


Figure 1-1 Product model naming rules

Label	Example	Description
1	Neptune	Energy routing cabinet product series
2	D	STS/ATS distribution cabinet
3	500	Rated total power: 375kW Rated total power: 500kW Rated total power: 750kW Rated total power: 1000kW
4	SA1	S: Indicates optional STS A: Indicates optional ATS 1: indicates that the STS/ATS power is 1 time the system power.

1.2 Applicable Products

This manual applies to the following models of microgrid STS/ATS cabinets (the following are standard models, and the manual also applies to user-selected models):

- Neptune-D375-SA1
- Neptune-D500-SA1
- Neptune-D750-SA1
- Neptune-D1000-SA1

The illustrations in this document are for display purposes. If they differ from the actual product, please refer to the actual product.

1.3 Intended Audience

This manual is intended for professional technical personnel responsible for equipment installation, operation, and maintenance. Professional technical personnel should meet the following requirements:

• Have expertise in electronics, electrical, and mechanical fields, and be familiar with electrical and mechanical schematics.

• Have received professional training related to electrical equipment installation and debugging.

• Be able to respond quickly to emergency situations during installation, operation, and maintenance.

• Be familiar with local standards and safety regulations related to electrical systems.

• Be able to carefully read this manual and understand safety operation instructions related to the following content.

1.4 Terminology and Abbreviations

Terminology and abbreviation	Definition	Functions
PCS	Power conversion system	The PCS can convert DC from storage batteries to AC, supplying the grid or AC loads; it can also convert AC from the grid to DC for charging storage batteries.
STS	Static transfer switch	The STS works with PCS equipment in the system to provide seamless switching between grid-connected and off-grid functions, enabling both seamless online-to-offline switching and automatic off-grid-to-online switching, thus ensuring uninterrupted and stable power supply for critical loads.
ATS	Auto transfer switch	ATS is used for the safe automatic switching device between diesel generators and power grid voltage sources.
Grid	Power grid	Grid
DG	Diesel generator	.
BL	Backup load	.
EMS	Energy Management System	An energy management system is an intelligent system that integrates hardware and software, used to monitor, control, and optimize the flow of energy and energy consumption in energy systems.

1.5 Revision History

The latest version includes updates from all previous manual versions.

Version: V1.0

2. Safety Instructions

2.1 Definition of Safety Symbols

This manual uses the following symbols to emphasize safety information. Please read the symbols carefully and understand their meanings.

Symbol	Description
	Indicates a high potential danger that could result in death or serious injury if not avoided.
	Indicates a moderate potential danger that could result in death or serious injury if not avoided.
 Caution	Indicates a low potential danger that, if not avoided, may result in moderate or minor injury to personnel.
	Emphasizes and supplements the content, and may also provide usage tips for product optimization to help you solve a problem or save time.

2.2 Important Safety Tips

When operating the equipment, please follow the instructions below to ensure personal safety:

• All electrical connections must comply with local and national electrical standards.

• The copper bars and live terminals inside the equipment may cause fatal electric shocks.

• Before making electrical connections, ensure all powered equipment is de-energized, and the cables are not live. Do not power on before electrical connections are completed to prevent injury and equipment damage.

• Use the correct tools, wear protective equipment, and do not operate while powered to avoid injury and equipment damage.

• After wiring and parameter setting, conduct a trial operation to confirm the machine operates safely. Failure to do so could result in injury or equipment damage.

• Maintenance must be performed by qualified electrical technicians to prevent serious hazards. Damage caused by improper maintenance will not be covered by the warranty.

• Before connecting to the grid/diesel generator, ensure that the voltage and other electrical specifications of the grid/diesel generator meet the microgrid STS/ATS cabinet specifications.

• Before connecting the diesel generator, carefully read the diesel generator's user manual, understand the product and corresponding precautions, and strictly follow the operation

requirements of the diesel generator.

• Pay attention to the phase sequence of the AC input to ensure the phase sequence is connected correctly.

Attention

• Before installing, operating, and maintaining the equipment, familiarize yourself with all safety instructions in this document and comply with them.

• All operations of the equipment must be performed by qualified electrical technicians who are familiar with local standards and electrical system safety regulations.

• Damage to the equipment or injury to personnel caused by improper installation and use according to the document's requirements is not the responsibility of the equipment manufacturer.

2.3 Safety Labels

The cabinet uses the following symbols to emphasize safety information. Please read the symbols carefully and understand their meanings.

Safety icon	Description
	Before operating the equipment, please carefully read the manual.
	High voltage danger. The equipment operates with high voltage. Please be cautious and never operate it while powered on.
	Equipment discharge time. After the equipment is powered off, it may still be charged internally for a period of time. Please wait 5 minutes for the equipment to discharge completely before operating.
	Caution danger. There are dangers during storage, transportation, installation, operation, and maintenance of the equipment that should be noted.
	Burn danger. The surface temperature of the equipment during operation may be high, potentially causing burns.

3. Product Introduction

3.1 Product Overview

This manual describes the STS/ATS cabinet, which includes four standard models: Neptune-D375-SA1, Neptune-D500-SA1, Neptune-D750-SA1, and Neptune-D1000-SA1. Main features of the STS/ATS cabinet include:

- The grid-to-off-grid switching time is less than 10ms;
- The ATS uses TUV safety certified switches;
- Modular design for easy maintenance;
- Optional STS internal, allowing the system to automatically switch to off-grid operation in the event of grid or diesel generator power failure, ensuring uninterrupted emergency load power supply;
- Optional ATS internal, allowing simultaneous connection to both grid and diesel generator, with ATS automatically switching the power supply system.

The internal system composition diagram for Neptune-D375-SA1 and Neptune-D500-SA1 is shown below. The system uses two 200KW/250KW STS modules connected in parallel.

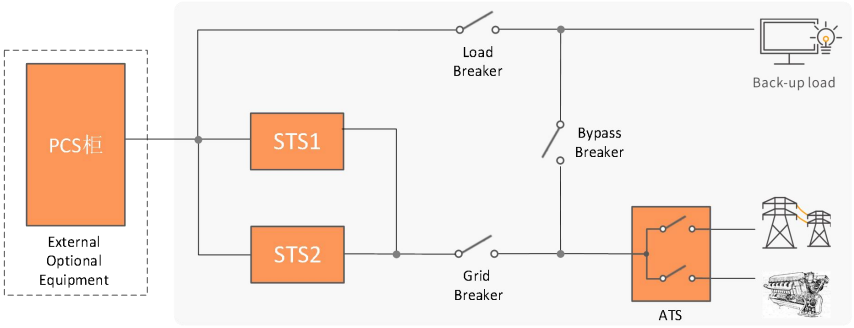


Figure 3-1 System block diagram of the 375kW/500kW STS/ATS cabinet

The internal system composition diagram for Neptune-D750/D1000-SA1 is shown below. The system uses one 750KW/1000KW STS module.

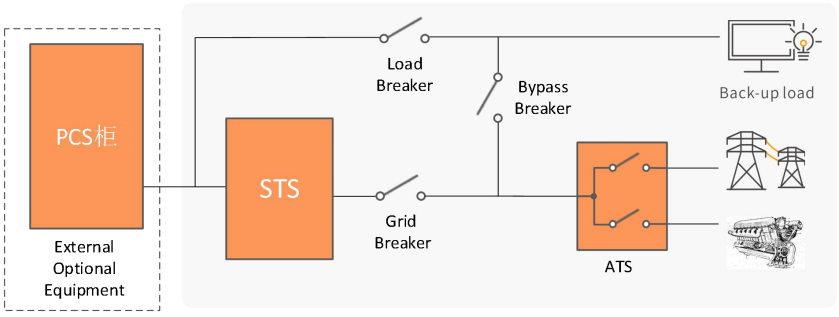


Figure 3-2 System block diagram of the 750kW/1000kW STS/ATS cabinet

3.2 375/500kW

3.2.1 Product Appearance

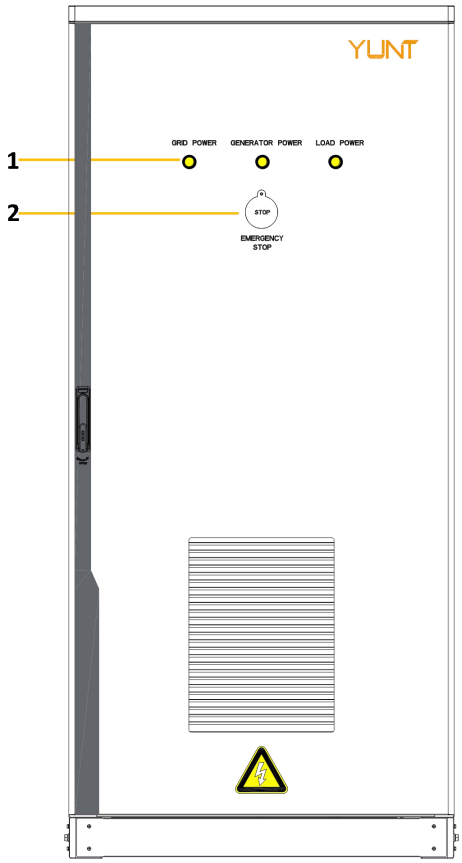


Figure 3-3 375kW/500kW STS/ATS cabinet appearance

Label	Component name	Description
1	Indicators	GRID POWER: Grid power-on indicator GENERATOR POWER: Generator power-on indicator LOAD POWER: Load power-on indicator
2	Emergency stop switch	

3.2.2 System Block Diagram

The Neptune-D375/D500-SA1 system block diagram is shown below.

When LN is connected to PE at the user end, the short-circuit copper busbar between PE1 and PE must be removed (the red dashed line in the figure indicates the location of the actual copper busbar, as shown by No. 15 in Figure 5-5).

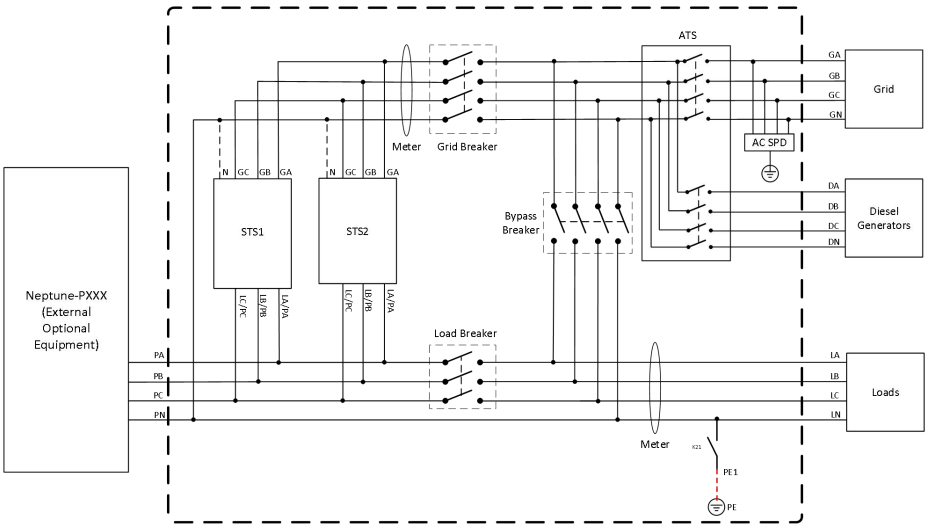


Figure 3-4 375kW/500kW STS/ATS cabinet system diagram

3.2.3 Internal Composition

The internal layout of Neptune-D375/D500-SA1 is shown below.

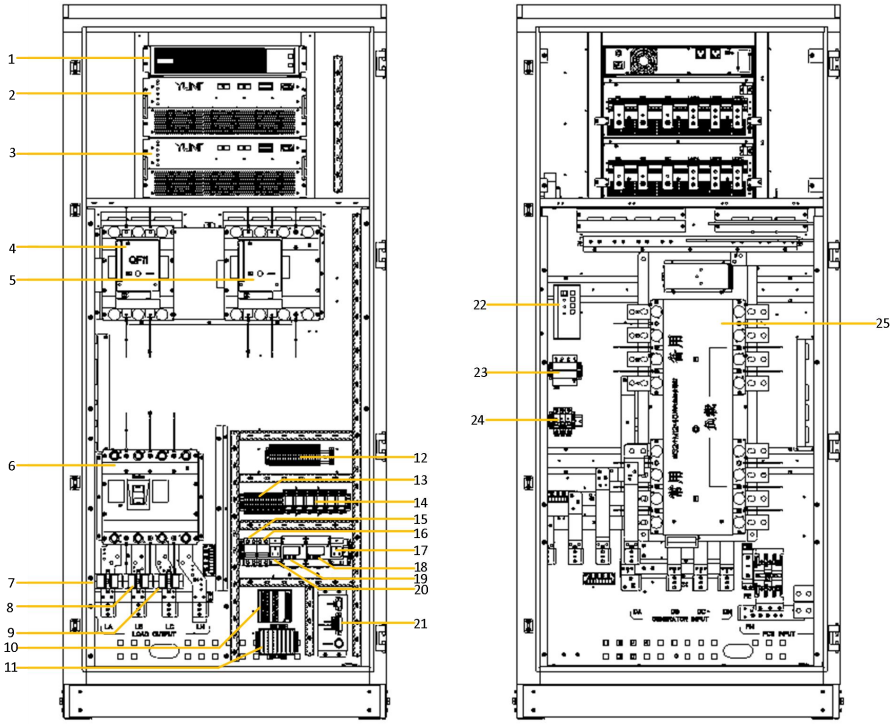


Figure 3-5 Internal layout of the 375kW/500kW STS/ATS cabinet

The relevant components indicated in the diagram are described in the table below.

Table 3-1 Internal components of the 375kW/500kW STS/ATS cabinet

Label	Component	Description
1	UPS	1kVA/230Vac 50/60Hz
2/3	STS1/STS2	-375kW model: Total power 375kW -500kW model: Total power 500kW Optional STS
4	AC grid circuit breaker (electric operation)	800A/400Vac
5	AC load circuit breaker (electric operation)	
6	AC bypass circuit breaker (manual operation)	
7	CT1	Load A-phase current transformer
8	CT2	Load B-phase current transformer
9	CT3	Load C-phase current transformer
10	Switching power supply	24Vdc power supply
11	DIO module	Cabinet internal DIO signal module
12	X1 terminal block	24Vdc auxiliary power supply
13	X5 terminal block X10 terminal block	UPS output (230Vac 50/60Hz) Communication terminal block
14	Intermediate relay	
15	Fan switch	
16	24Vdc output power switch	
17	XP2 socket	UPS input socket (230Vac 50/60Hz)
18	Load-side meter	Monitors the load power
19	Grid-side meter	Monitors the grid power
20	XP1 socket	Debugging power socket (230Vac 50/60Hz)
21	External signal terminal	XT1/XT2/XT3/XT4 external terminals
22	ATS control panel	
23	AC lightning arrester	
24	AC lightning protection circuit breaker	
25	ATS	Automatic switching between grid and diesel generator -375kW model: 630A/400Vac -500kW model: 800A/400Vac Optional ATS

3.3 750/1000kW

3.3.1 Product Appearance

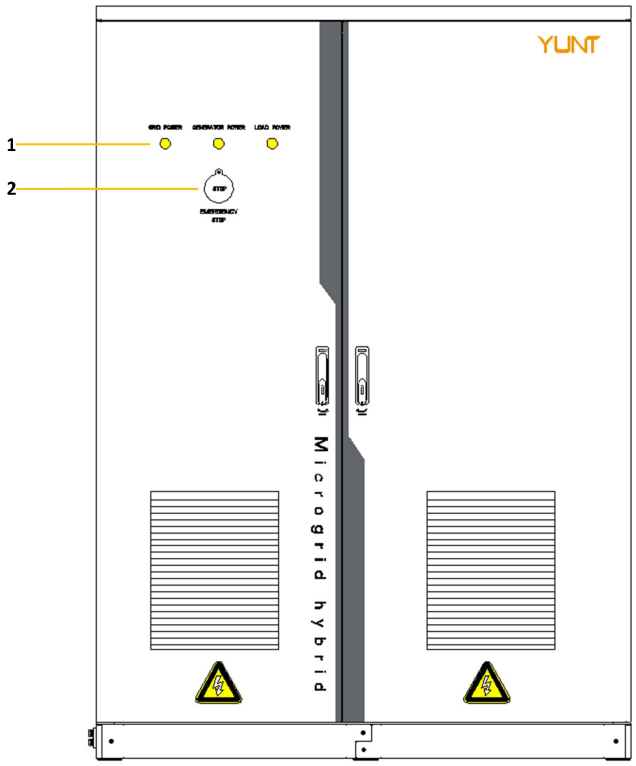


Figure 3-6 750kW/1000kW STS/ATS cabinet appearance

Label	Component name	Description
1	Indicators	GRID POWER: Grid-side power-on indicator GENERATOR POWER: Generator power-on indicator LOAD POWER: Load power-on indicator
2	Emergency stop switch	

3.3.2 System Block Diagram

The system block diagram of the Neptune-D750/D1000-SA1 is shown below.

When LN is connected to PE at the user end, the short-circuit copper busbar between PE1 and PE must be removed (the red dashed line in the figure indicates the location of the actual copper busbar, see Figure 5-6, No. 15).

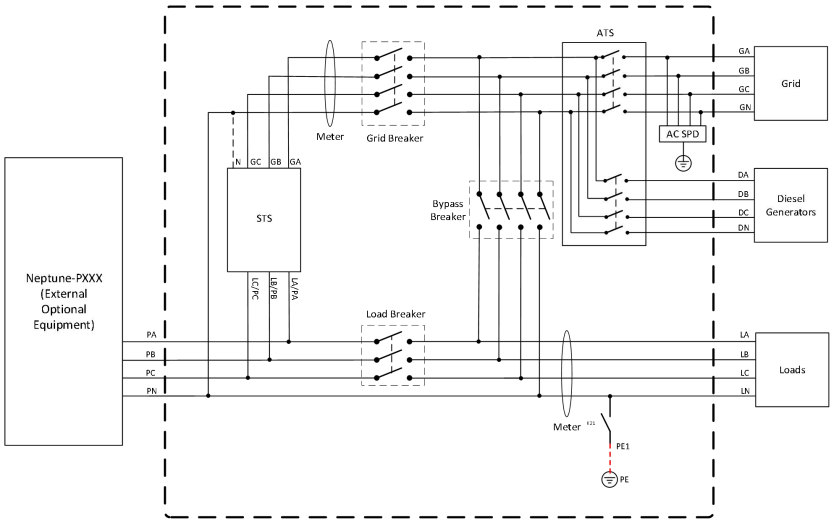


Figure 3-7 750kW/1000kW STS/ATS cabinet system

3.3.3 Internal Composition

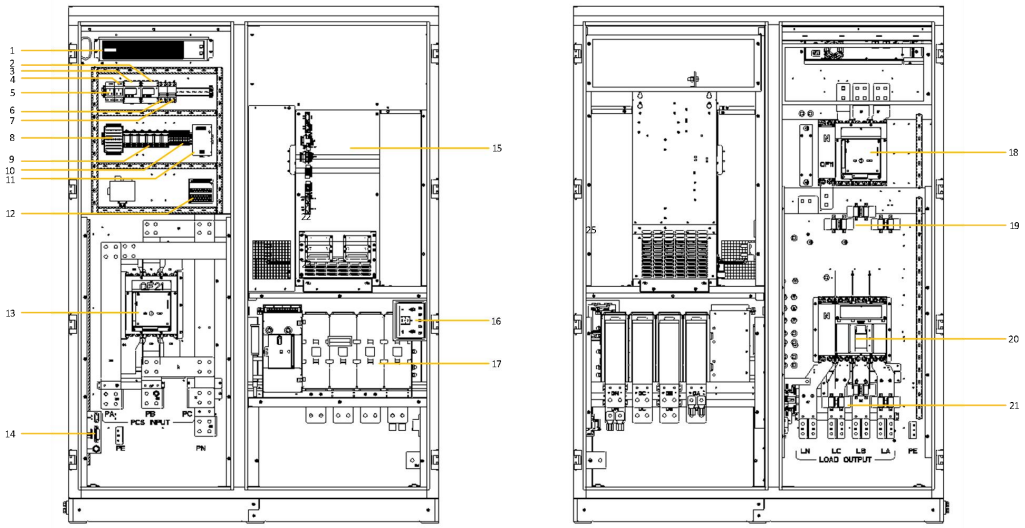


Figure 3-8 Internal layout of the 750kW/1000kW STS/ATS cabinet

The relevant components indicated in the diagram are described in the table below.

Table 3-2 Internal components of the 750kW/1000kW STS/ATS cabinet

Label	Component	Description
1	UPS	1kVA/230Vac 50/60Hz
2	Load-side meter	Monitors the load power
3	Grid-side meter	Monitors the grid power
4	XP2 socket	UPS input socket (230Vac 50/60Hz)
5	XP1 socket	Debugging power output socket (230Vac 50/60Hz)
6	Cabinet cooling fan power switch	
7	24Vdc power supply switch	

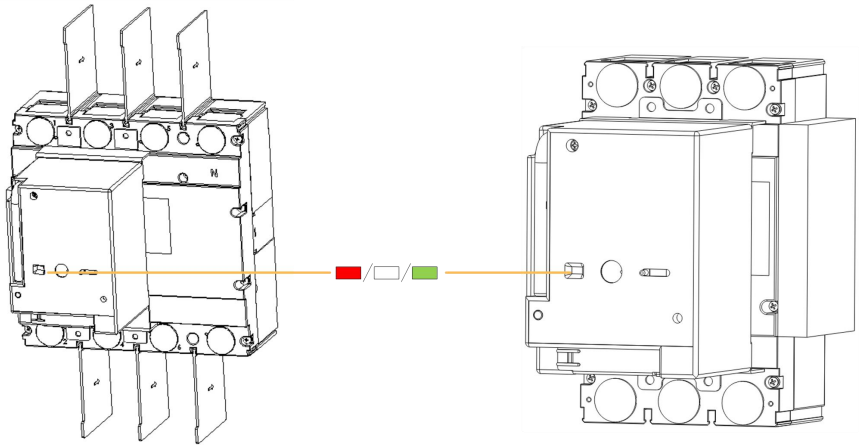
8	DIO module	Cabinet internal DIO signal module
9	Intermediate relay	Controls the cabinet's controllers
10	X1/X10 terminal block X5 terminal block	24V power/communication terminal block UPS output (230Vac 50/60Hz)
11	48Vdc output power module	Power supply for STS module fan
12	24Vdc output power module	
13	AC load circuit breaker (electric operation)	1600A/400Vac
14	External signal terminal	XT1/XT2/XT3 external terminals
15	STS	-750kW model: Total power 750kW -1000kW model: Total power 1000kW
16	ATS control panel	
17	ATS	Automatic switching between grid and diesel generator -750kW model: 1250A/400Vac -1000kW model: 1600A/400Vac
18	AC grid circuit breaker (electric operation)	1600A/400Vac
19	CT11~CT13	Grid A, B, C phase current transformers
20	AC bypass circuit breaker (manual operation)	1600A/400Vac
21	CT21~CT23	Load A, B, C phase current transformers

3.4 Switches

3.4.1 AC Switch

■ AC electric switch:

The AC electric switch includes grid input switch and load output switch.

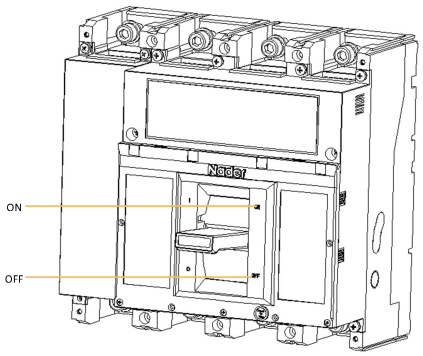


Grid circuit breaker　　Load circuit breaker

Status symbol	Status	Description
	Switch closed	The symbol is red, indicating the switch is in the closed state.
	Switch tripped	The symbol is white, indicating the switch is in the tripped state, and the switch has opened, disconnecting the connection.
	Switch open	The symbol is green, indicating the switch is in the open state.

■ **AC bypass switch:**

The AC bypass switch is used for the protective connection between the AC input and backup load in the case of system faults or maintenance.

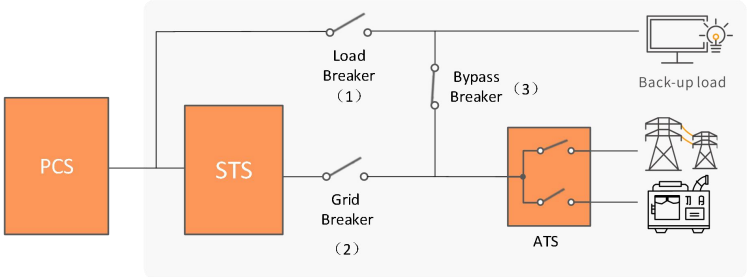


Status symbol	Status	Description
ON	Switch closed	The switch is in the closed state
OFF	Switch open	The switch is in the open state

Note:

• Do not close the AC bypass switch during normal system operation.

• In the event of a system fault, to ensure that critical loads are powered by the grid or diesel generator, disconnect the load switch (1) and grid switch (2), then close the bypass switch (3), as shown below.

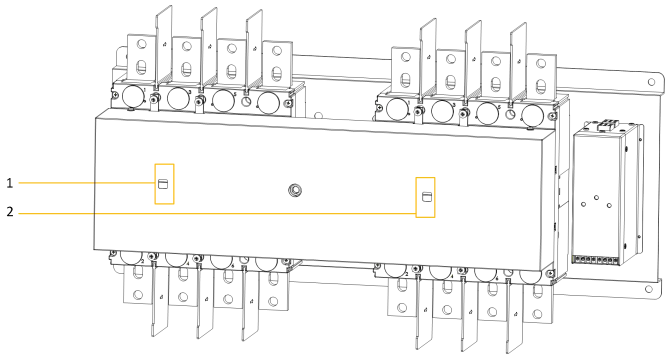


■ **ATS switch:**

The ATS automatically switches the main power to the diesel generator when the grid fails, ensuring continuous power supply to critical equipment. When the grid recovers, the main power

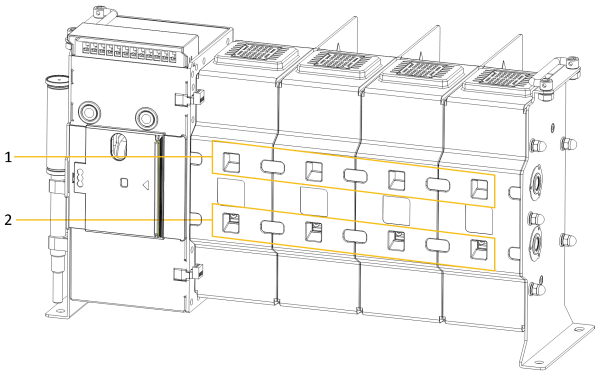
automatically switches back to the grid.

(1) 630A/800A ATS switch:



Power indicator	Status color	Status	Description
I (Grid)	Red	Grid power supply	The main power is from the grid
	Green	No grid power supply	The main power is not from the grid
II (Diesel generator)	Red	Diesel generator power supply	The main power is from the diesel generator
	Green	No diesel generator power supply	The main power is not from the diesel generator

(2) 1250A/1600A ATS switch:

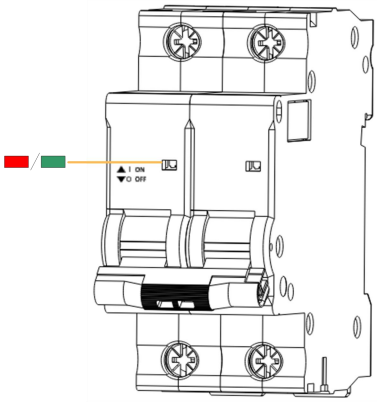


Power indicator	Status symbol	Status	Description
I (Grid)	|	Grid power supply	The symbol is red, indicating the main power is from the grid.
	O	No grid power supply	The symbol is green, indicating the main power is not from the grid.
II (Diesel	|	Diesel generator power supply	The symbol is red, indicating the main power is from the diesel generator

generator)	O	No diesel generator power supply	The symbol is green, indicating the main power is not from the diesel generator

3.4.2 Auxiliary Switch

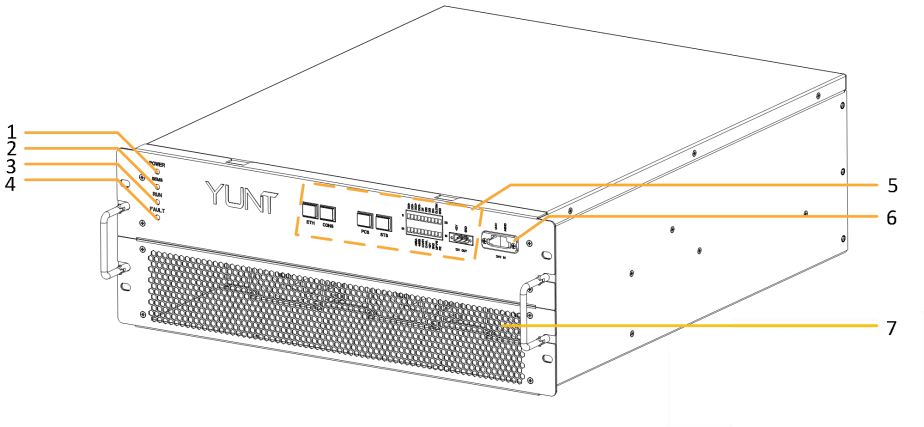
The auxiliary switch is responsible for the operation of the cabinet fans and switching power supply.



Status symbol	Status	Description
	Closed	The switch is in the closed state.
	Disconnected	The switch is in the open state.

3.5 Module Indicators

3.5.1 200/250kW STS Module

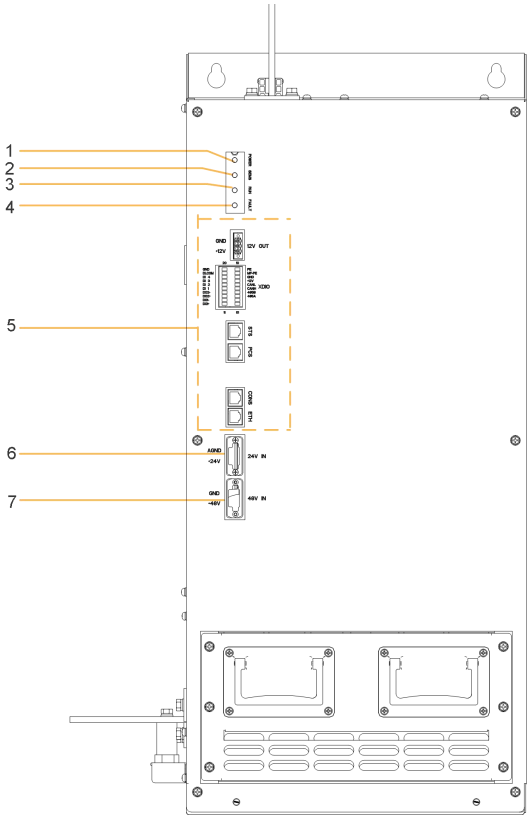


Position No.	Indicating component	Description
1	Power-on indicator POWER (green)	Steady on: PCS port, grid port, and external 24V are powered

		Fast blink: Software upgrade in progress Slow blink: External 24V, PCS port, or grid port powered Steady off: PCS port, grid port, and external 24V are not powered
2	Communication indicator SEMS (green)	Fast blink: Communication with PCS is normal Steady off: Communication with PCS is abnormal
3	Run indicator RUN (green)	Steady off: The STS is in shutdown state Steady on: The STS is in grid-connected state Fast blink: The STS is in off-grid state Slow blink: Grid-connected switch closed state
4	Fault indicator FAULT (red indicator)	Slow blink: Alarm Steady on: Fault, shutdown state
5	Communication port	Communication and debugging between modules and other devices
6	External 24VDC input port	Required +24V/15W
7	Cooling fan	Module cooling

[1] Fast blink cycle: 1 second; slow blink cycle: 3 seconds

3.5.2 750/1000kW STS Module



Position No.	Indicating component	Description
1	Power-on indicator POWER (green)	Steady on: PCS port, grid port, and external 24V are powered Fast blink: Software upgrade in progress Slow blink: External 24V, PCS port, or grid port powered Steady off: PCS port, grid port, and external 24V are not powered
2	Communication indicator SEMS (green)	Fast blink: Communication with PCS is normal Steady off: Communication with PCS is abnormal
3	Run indicator RUN (green)	Steady off: The STS is in shutdown state Steady on: The STS is in grid-connected state Fast blink: The STS is in off-grid state Slow blink: Grid-connected switch closed state
4	Fault indicator FAULT (red indicator)	Slow blink: Alarm Steady on: Fault, shutdown state
5	Communication port	Used for communication and debugging between modules and equipment
6	External 24VDC input	Required +24V/15W

	port	
7	External 48VDC input port	Required +48V/480W

[1] Fast blink cycle: 1 second; slow blink cycle: 3 seconds

4. Transportation and Storage

4.1 Transportation

■ Forklift transportation

If the installation site and transport roads are smooth, forklift transportation can be used. When using a forklift, the following requirements must be met:

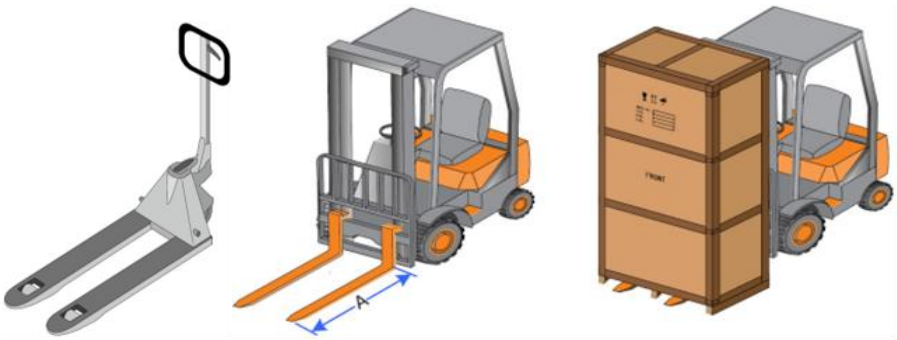
• Before transportation, ensure the cabinet door is tightly locked, transport under good weather conditions, clear any obstacles on the transport route, and ensure the road is clear. Make sure to evacuate personnel in advance and prohibit unauthorized personnel from entering the transport route.

• At least two people are required for transportation, and the forklift must have adequate load-bearing capacity. Fork leg length must meet equipment requirements. Perform a test adjustment before transportation to ensure the safety and reliability of the tools. The forklift legs should be inserted into the slots at the bottom of the cabinet. Do not transport through any place other than the fork legs.

• During transportation, ensure the cabinet remains balanced and transport at a steady speed. Keep the height variation as low as possible, avoiding large swings. Strive to keep the transportation process smooth.

• Lifting and lowering should be done gently to avoid impact or vibration.

• When moving, ensure the ground is smooth and free of debris, and avoid contact with sharp objects.



Forklift outer width ≥ 685mm　　A ≥ 1200mm　　Load capacity (at least 3t)

■ Lifting transportation

When using lifting for transportation, the following requirements must be met:

• Before transportation, ensure the cabinet door is tightly locked and transport under good weather conditions.

• Evacuate personnel in advance, and prohibit people within 5m-10m of the lifting area and

equipment to ensure safety.

• A professional operator must be present for the entire transportation process.

• The lifting straps used must have the strength to bear the equipment's weight.

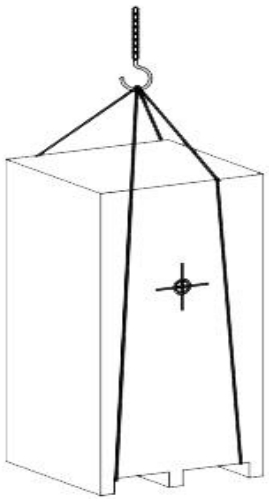
• Use all necessary auxiliary means to ensure a smooth transportation process. Otherwise, there may be a risk of the equipment tipping over or falling.

• Perform a test lift before transportation. After lifting 300mm from the support surface, pause for inspection to ensure the lifting straps and connections are secure before proceeding with the lift.

• During lifting, ensure vertical lifting. Do not drag or push the equipment. During lifting, the equipment should be transported at a steady speed, keeping height variation as low as possible. Avoid large swings.

• Lifting and lowering should be done gently to avoid impact or vibration. During lifting and lowering, the cabinet must not pass over people, and no one should remain under it.

• The area where the equipment is placed should be solid, flat, well-drained, and free from obstacles or protruding objects.



4.2 Storage

If the equipment is not in use, it should meet the following requirements:

• Do not open the outer packaging of the equipment. If the equipment is unpacked, try to repack it in the original packaging box provided by the company.

• The storage location should be clean, dry, and maintain a temperature between -40℃ and +60℃, with a temperature change of less than 1℃ per minute. Prevent corrosion from dust and water vapor.

• Avoid storing in high-temperature, sun-exposed, low-temperature, and humid environments.

• For long-term storage, it is recommended to inspect the equipment every three months, promptly identify any abnormalities, and address them (such as damage to the outer packaging by insects or rodents).

• After long-term storage, the equipment must be inspected by a professional before being put into use again.

5. Installation

5.1 Pre-installation Check

Before installation, carefully check the following:

• Check if the outer packaging is damaged. If there is any damage, deformation, or cracking, it may cause internal damage to the equipment. In such cases, do not open the packaging or sign for it, and contact the distributor.

• Check if the model of the received equipment matches the model ordered. If they do not match, do not open the packaging or sign for it, and contact the distributor.

• Check if the cabinet shell and internal components are intact and undamaged.

5.2 Accessories Inspection

Before signing for receipt, please carefully check the following:

• Check the packing list to ensure all materials are complete and check for any external damage. If there is any issue, do not sign for the delivery and contact the distributor.

When making electrical connections, if the accessories come with dedicated terminal blocks, please be sure to use them. Using incompatible terminal blocks may cause damage to the equipment.

5.3 Site Requirements

• Before installing, operating, and maintaining the equipment, familiarize yourself with all safety instructions in this document and comply with them.

• All equipment operations must be performed by professional and qualified electrical technicians, who must be familiar with local standards and safety regulations related to electrical systems.

The installation environment must meet the following requirements:

• When choosing the installation site, fully consider the local climate, geological conditions (such as stress wave emissions, groundwater level), etc. Avoid installing in environments that are flammable, explosive, corrosive, or prone to mechanical impact or strong magnetic fields. The temperature and humidity in the installation environment should be within the specified range for the equipment, and proper ventilation must be ensured.

• Ensure there are no trees near the installation site to prevent wind from knocking branches down or leaves from blocking the cabinet door or intake.

• The installation site should avoid gas pipelines, water pipes, and other cable pathways to prevent damage to pipes, cables, and the equipment.

• Ensure the installation site is free of debris and leave enough space for future installation, wiring,

and maintenance.

• During installation, ensure the equipment's indicators, warning signs, and labels are unobstructed for easy viewing and warnings.

• The equipment generates some noise during operation, so it is recommended to install it in an area that does not disturb the daily life of yourself or others.

5.3 Foundation Requirements

Danger

The equipment is quite heavy, so before constructing the foundation, the installation site conditions (mainly geological and environmental conditions) must be thoroughly investigated. Only after this investigation can the foundation design and construction begin.

An unreasonable foundation design may cause significant difficulties or issues with placing the equipment, opening and closing doors, and later operation. Therefore, the foundation must be designed and built according to certain standards to meet mechanical support, cable routing, and future maintenance needs.

Attention

Embed grounding units according to the relevant standards of the country/region where the project is located.

5.4 Installation Space Requirements

To ensure better heat dissipation and maintenance of the equipment, it is recommended to leave sufficient space in front and behind the cabinet, ensuring that the cabinet door can be opened smoothly, with appropriate distance on both sides for parallel machine installation.

■ 375kW/500kW STS/ATS cabinet:

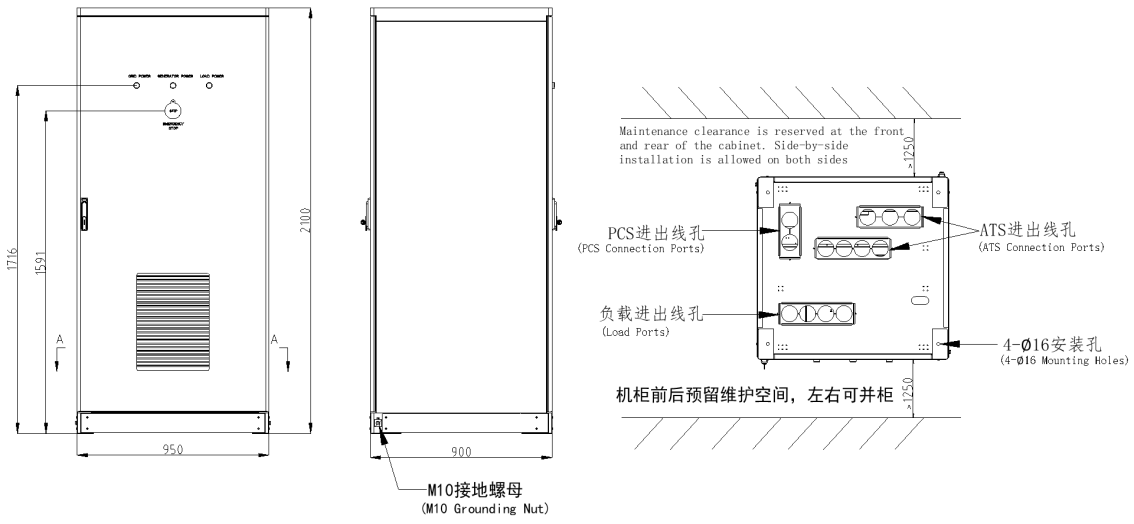


Figure 5-1 375kW/500kW STS/ATS cabinet installation space requirements

■ 750kW/1000kW STS/ATS cabinet:

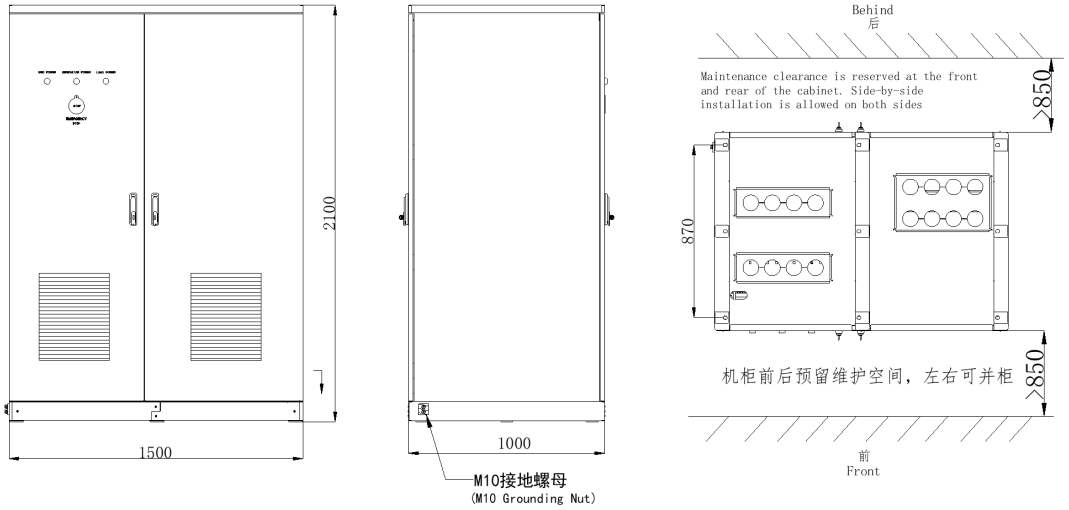


Figure 5-2 Installation space requirements of the 750kW/1000kW STS/ATS cabinet

5.5 Mechanical Installation

The product installation steps are as follows:

• Ensure that the installation plane of the cabinet is level, and the fixed holes on the installation plane align with the bottom mounting holes of the cabinet. There should be a fixed hole at each of the four corners; refer to the diagram for the fixed hole positions.

• Move the cabinet to the installation location, align the screw holes, and secure the cabinet to the channel steel or foundation using the appropriate bolts.

• The cabinet can also be welded onto the channel steel or the metal floor of a prefabricated warehouse. Be sure to avoid welding damage and take rust prevention measures.

• After installation, apply corrosion protection to the fixed areas.

5.5.1 375/500KW Cabinet Installation

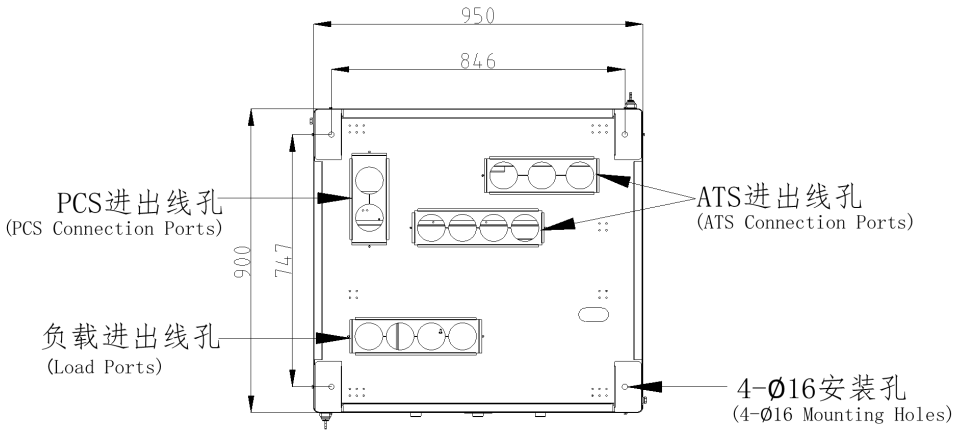


Figure 5-3 375kW/500kW STS/ATS cabinet installation holes

5.5.2 750/1000KW Cabinet Installation

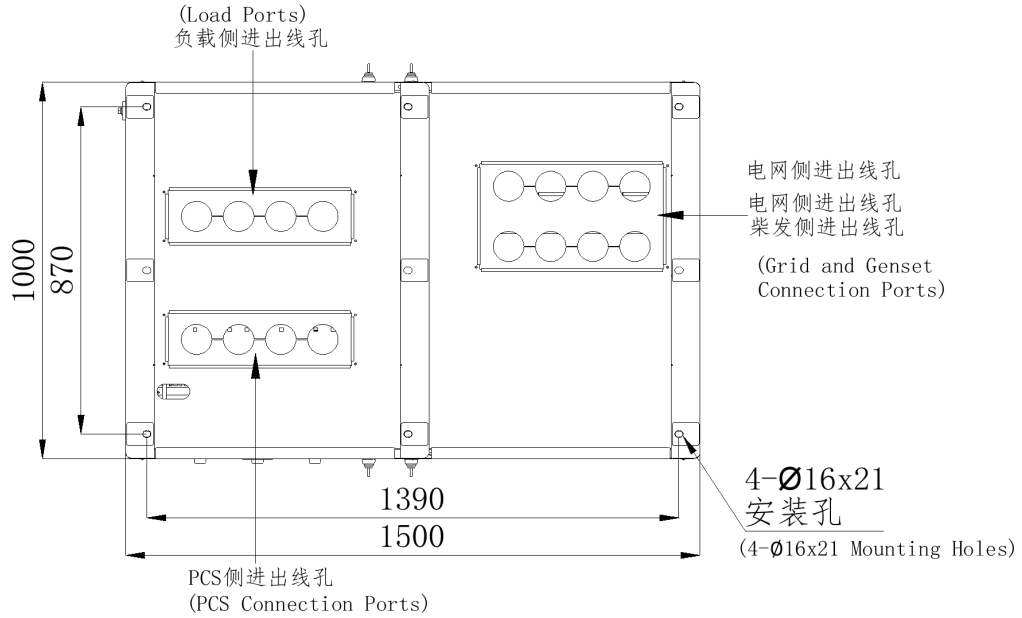


Figure 5-4 750kW/1000kW STS/ATS cabinet installation holes

Notes:

• During the handling of the cabinet, it must be done slowly and steadily. When placing the cabinet, ensure that the installation surface is flat and can bear the weight of the cabinet.

• The cabinet must be secured to the installation surface with expansion bolts. Use expansion bolts with appropriate hole sizes, and it is recommended that the bolt protrudes 45mm above the

surface.

5.6 Electrical Installation

When making electrical connections, to ensure personal safety, please follow the instructions below:

• It is strictly prohibited for non-professional personnel to install, wire, maintain, inspect, or replace components of the equipment.

• Before making any connections, cut off the power to all equipment and use a multimeter to ensure that there is no power before proceeding. Do not touch powered equipment or perform installations with power on.

• Installers must use the correct tools and wear protective gear to avoid personal injury and damage to the equipment.

• After wiring, check the connections to ensure they are secure and that the phase sequence is correct.

• Choose the connection cables according to the voltage and current levels of the system's power supply and system specifications. Failure to do so may lead to severe electrical failures.

5.6.1 375/500KW Power Interface

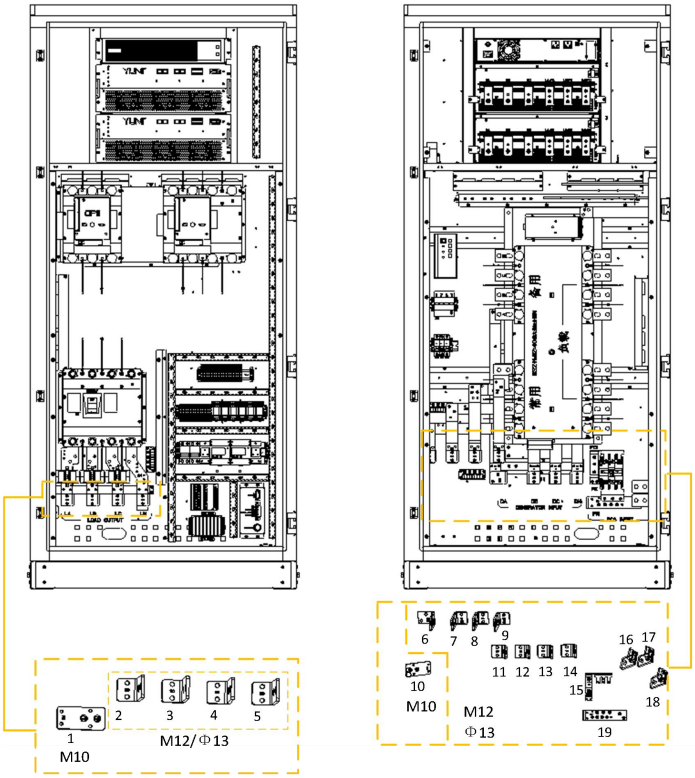


Figure 5-5 375kW/500kW STS/ATS cabinet power interfaces

The power interface definition of the 375kW/500kW STS/ATS cabinet is as follows:

Table 5-1 Power interface definition of the 375kW/500kW STS/ATS cabinet

Position No.	Name	Description
1	PE	Grounding port
2	LA	Load-side A phase port
3	LB	Load-side B phase port
4	LC	Load-side C phase port
5	LN	Load-side N phase port
6	GA	Grid-side A phase port
7	GB	Grid-side B phase port
8	GC	Grid-side C phase port
9	GN	Grid-side N phase port
10	PE	Grounding port
11	DA	Diesel engine A-phase port
12	DB	Diesel engine B-phase port
13	DC	Diesel engine C-phase port
14	DN	Diesel engine N-phase port
15	PE1-PE	PE1-PE short-circuit copper bar
16	PA	PCS A-phase port

17	PB	PCS B-phase port
18	PC	PCS C-phase port
19	PN	PCS N-phase port

5.6.2 750/1000KW Power Interface

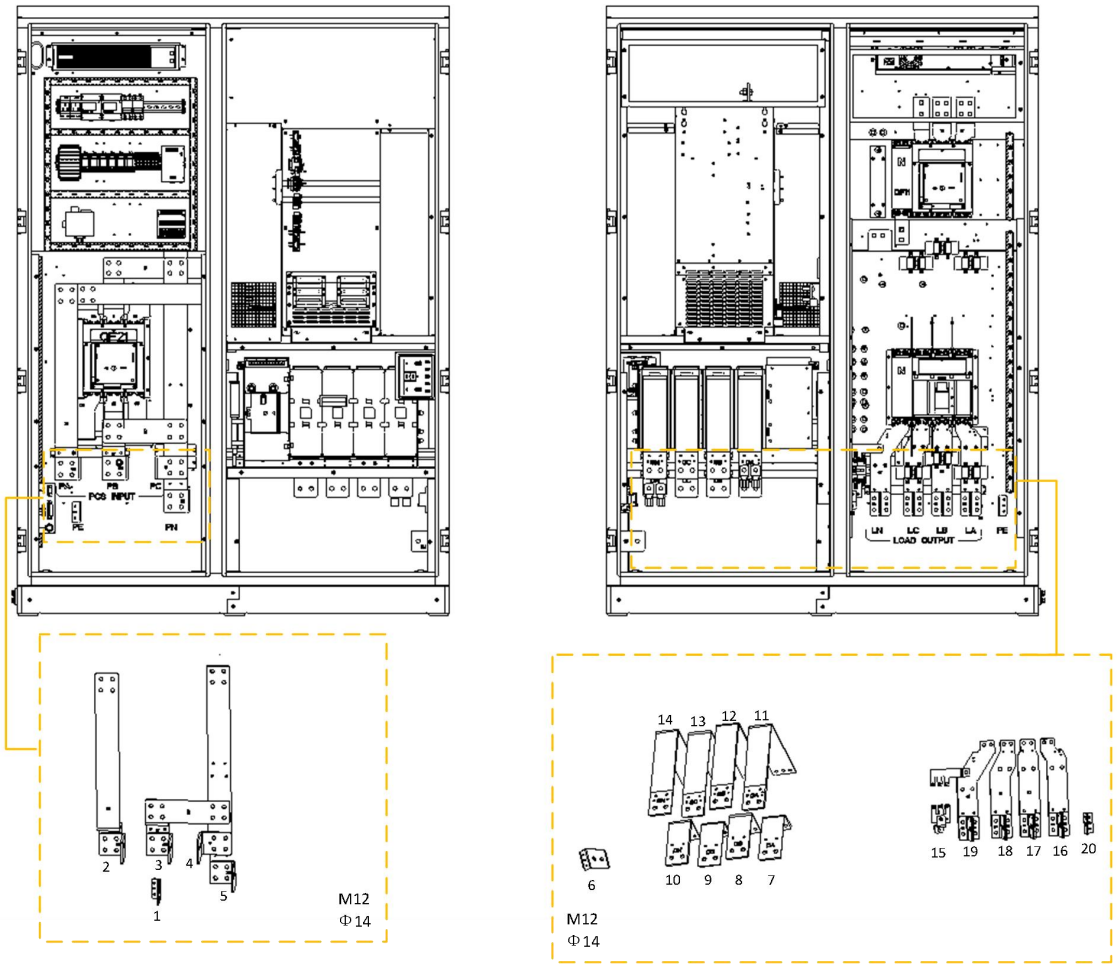


Figure 5-6 750kW/1000kW STS/ATS cabinet power interfaces

The power interface definition of the 750kW/1000kW STS/ATS cabinet is as follows:

Table 5-2 Power interface definition of the 750kW/1000kW STS/ATS cabinet

Position No.	Name	Description
1	PE	Grounding port
2	PA	PCS A-phase port
3	PB	PCS B-phase port
4	PC	PCS C-phase port
5	PN	PCS N-phase port
6	PE	Grounding port
7	DA	Diesel engine A-phase port

8	DB	Diesel engine B-phase port
9	DC	Diesel engine C-phase port
10	DN	Diesel engine N-phase port
11	GA	Grid-side A phase port
12	GB	Grid-side B phase port
13	GC	Grid-side C phase port
14	GN	Grid-side N phase port
15	PE1-PE	PE1-PE short-circuit copper bar
16	LA	Load-side A phase port
17	LB	Load-side B phase port
18	LC	Load-side C phase port
19	LN	Load-side N phase port
20	PE	Grounding port

5.6.3 Wiring Precautions

■ AC side

Wiring must be performed with the system powered off. Ensure there is no hazardous voltage at any port of the system during wiring. Cables should be labeled, and after wiring, the layout should be clearly visible.

Attention

Before installing a system with grid connection functionality, obtain permission from the local power department. The grid connection requirements and the PCS-related parameter settings must comply with local grid connection regulations.

Warning

• When performing AC-side wiring, ensure that the cable phase sequence is correct. Measure with a multimeter before wiring to prevent equipment damage and avoid electrical accidents.

• Electrically live bolts must be connected with the specified torque. A torque that is too low can reduce the current-carrying capacity of the connection point, causing overheating of the contact components and damaging the equipment. A torque that is too high and repeated tightening can lead to the connection components breaking.

■ Grounding connection

The internal equipment is grounded through the internal frame and cabinet body, with a grounding copper bar inside the cabinet.

Warning

• The neutral point of the AC port inside the cabinet is not connected to the cabinet shell.

• The cabinet should be reliably grounded, with a grounding impedance of less than 4Ω.

Cross-sectional area S (mm²) of phase conductors	Minimum cross-sectional area (mm²) of external protection grounding conductor
S ≤ 16	S
16 ＜S ≤ 35	16
35 ＜S	S/2

Note: The values in this table are valid only when the external protective grounding conductor is made of the same metal as the phase conductor. If this is not the case, the cross-sectional area of the external protection grounding conductor should be determined to produce the same electrical conductivity as the result in this table.

5.7 Signal Connection

In addition to the power cables, the STS/ATS cabinet also has external signal interfaces that can be connected as needed.

5.7.1 375/500KW Signal Interfaces

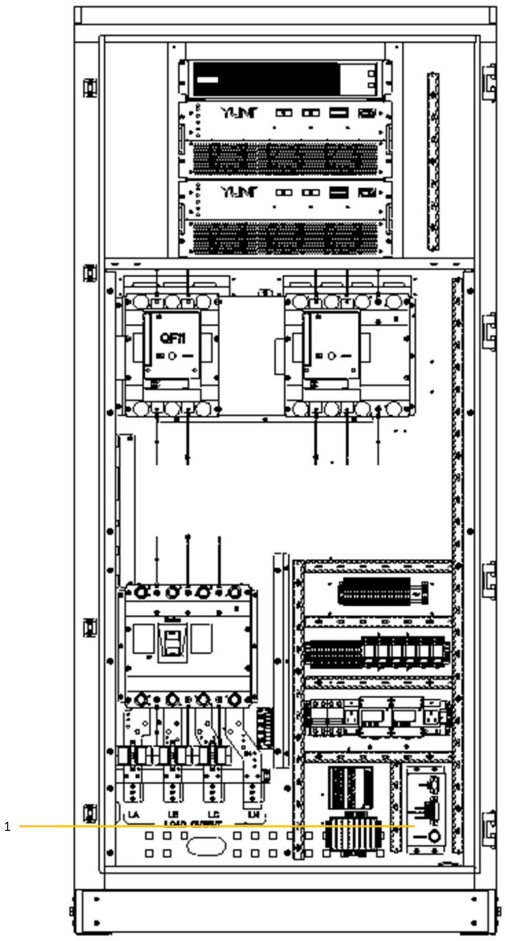
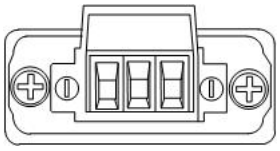
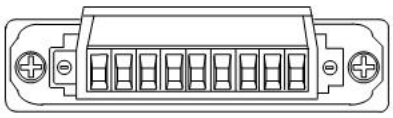


Figure 5-7 External signal interfaces of the 375kW/500kW STS/ATS cabinet

The external signal interface definition of the 375kW/500kW STS/ATS cabinet is as follows:

Table 5-3 External signal interface definition of the 375kW/500kW STS/ATS cabinet

<table>
<tr><td colspan="4">  </td></tr>
<tr><th>Terminal block No.</th><th>No.</th><th>Definition</th><th>Description</th></tr>
<tr><td rowspan="3">XT1</td><td>1</td><td>L</td><td rowspan="3">230Vac external power supply (230Vac/50Hz/60Hz 300W)</td></tr>
<tr><td>2</td><td>NC</td></tr>
<tr><td>3</td><td>N</td></tr>
<tr><td colspan="4">  </td></tr>
<tr><td rowspan="8">XT2</td><td>1</td><td>DI1+</td><td rowspan="2">Emergency stop signal interface (default external short circuit)</td></tr>
<tr><td>2</td><td>DI1-</td></tr>
<tr><td>3</td><td>485A</td><td rowspan="2">EMS and STS module communication interface</td></tr>
<tr><td>4</td><td>485B</td></tr>
<tr><td>5</td><td>485A</td><td rowspan="2">EMS and STS/ATS cabinet communication interface</td></tr>
<tr><td>6</td><td>485B</td></tr>
<tr><td>7</td><td>485A</td><td rowspan="2">EMS and ATS switch communication interface</td></tr>
<tr><td>8</td><td>485B</td></tr>
<tr><td colspan="4">  </td></tr>
<tr><td>XT3</td><td>1</td><td>RS485</td><td>PCS and STS module communication interface</td></tr>
</table>

5.7.2 750/1000KW Signal Interface

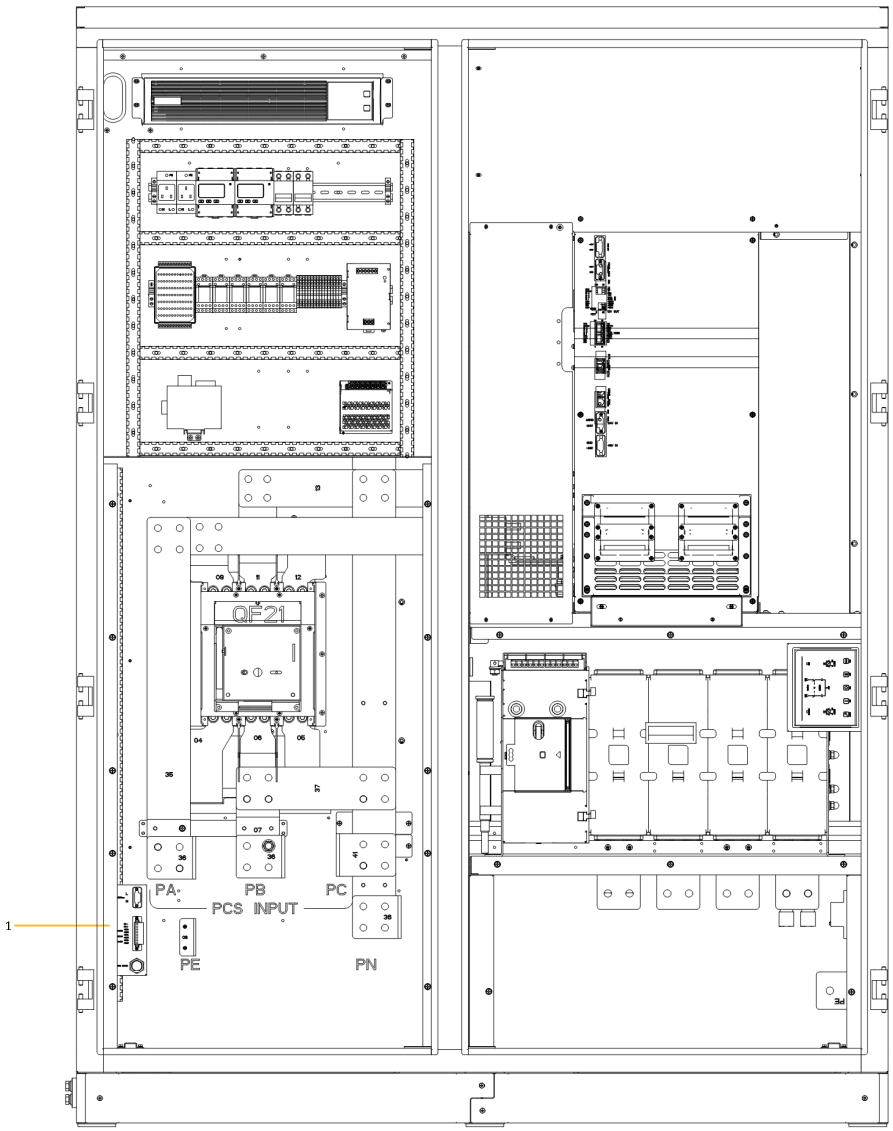
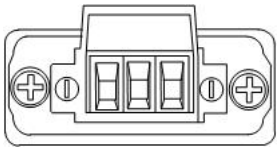


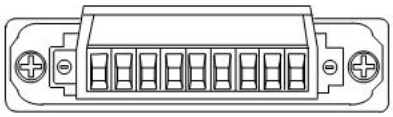
Figure 5-8 External signal interfaces of the 750kW/1000kW STS/ATS cabinet

The external signal interface definition of the 750kW/1000kW STS/ATS cabinet is as follows:

Table 5-4 External signal interface definition of the 750kW/1000kW STS/ATS cabinet



Terminal block No.	No.	Definition	Description
XT1	1	L	230Vac external power supply (230Vac/50Hz/60Hz 300W)
	2	NC	
	3	N	

			
XT2	1	DI1+	Emergency stop signal interface (default external short circuit)
	2	DI1-	
	3	485A	EMS and STS module communication interface
	4	485B	
	5	485A	EMS and STS/ATS cabinet communication interface
	6	485B	
	7	NC	
	8	NC	
			
XT3	1	RS485	PCS and STS module communication interface

5.8 Pre-operation Inspection

After the Neptune series microgrid STS/ATS cabinet is installed, perform the following checks before startup:

No.	Check item
1	Check if the cables are correctly connected and if the connection points are secure.
2	Check if any installation tools or debris are left inside the cabinet.
3	Check if the AC side voltage is within the specified range.
4	Check the temperature, humidity, and ventilation conditions around the cabinet.
5	Check if the AC side voltage matches the cable specifications and the grid phase sequence is correct.
6	Check if the cable markings are correct and clearly visible.
7	Check if the safety labels are unobstructed or damaged.
8	Check if the cabinet is deformed or at risk of water ingress.

6. System Maintenance

Due to the influence of environmental temperature, humidity, dust, and vibration, the internal components of the equipment may age, leading to potential failures or reduced service life. Therefore, it is necessary to carry out daily and periodic maintenance, especially in high-temperature environments, frequent starts and stops, with AC power and load fluctuations, strong vibrations or impacts, or corrosive environments with dust/metal dust/hydrochloric acid. In such cases, the interval for regular inspections should be shortened.

■ Regular inspection items:

The following table lists the regular inspection items for this product. It is generally recommended to conduct a regular inspection every 6 months. During actual maintenance, please determine the actual inspection cycle based on the product's usage and working environment. Regular maintenance helps prevent product function deterioration and equipment damage.

No.	Check item
1	Check if the surface of the entire machine has debris, dirt, or dust accumulation.
2	Check if the power cable connections are loose, discolored, or if the cable insulation is aging or cracked.
3	Check the display information
4	Check the external indicators.
5	Check the cabinet and module fans
6	Check if the safety labels are unobstructed or damaged.
7	Check if the dust filter is blocked, and if the fan is abnormal. If there is severe dust accumulation, replace the dust filter.
8	Check if there is condensation inside the equipment. If there is condensation, ventilate first.
9	Check the AC lightning protection device
10	Check the AC switch and auxiliary switch

Danger

• When performing maintenance operations on the equipment, do not operate it while powered on. Disconnect all power sources and leave warning signs to prevent electric shock or equipment damage.

• Maintenance personnel must have professional electrical training and carry qualified maintenance and safety tools.

• The equipment may still be powered after power-off for a period of time. After the internal capacitors are fully discharged and the DC and AC-side switches are completely turned off, the equipment can be operated. Ensure that the equipment is in a no-power state before operating.

7. Disposal

When the equipment can no longer be used and needs to be disposed of, follow the electrical waste disposal regulations of the country/region where the equipment is located. It must not be disposed of as household waste.

8. Appendix

8.1 Technical Data

	Neptune-D375-S1	Neptune-D500-S1	Neptune-D750-S1	Neptune-D1000-S1
Electrical parameters				
Rated AC voltage	400V	400V	400V	400V
Rated AC current	546A	728A	1092A	1456A
Rated AC frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz
Rated apparent power	375kVA	500kVA	750kVA	1000kVA
Max. load output apparent power	375kVA	500kVA	750kVA	1000kVA
Max. load output current	546A	728A	1092A	1456A
Max. PCS apparent power	375kVA	500kVA	750kVA	1000kVA
Max. PCS current	546A	728A	1092A	1456A
System data				
Build-in STS	Yes			
Build-in ATS	Yes			
IP level	IP54			
Transfer between on/off grid with STS	< 10ms			
Cooling method	Intelligent air cooling			
Operating temperature range	-40~60℃ (45~60℃ derating, derating factor 5%/℃)			
Storage temperature range	-40~70℃ (non-condensing)			
Relative humidity	0~95% (non-condensing)			
Noise	< 75dB(A) @1m			
Maximum operating altitude	4000m (derating above 3000m, derating factor 1%/100m)			
AC lightning protection	Type II			
Communication	RS485			
Dimensions (W*D*H)	950*900*2100mm	950*900*2100mm	1500*1000*2100mm	1500*1000*2100mm
Weight	580kg	580kg	850kg	850kg
Certificate				
IEC 61439-1, IEC 61439-2				
Expand models				
Expand models	Neptune-D375-SA1	Neptune-D500-S1	Neptune-D750-SA1	Neptune-D1000-SA1
	Neptune-D375-A1	Neptune-D500-A1	Neptune-D750-A1	Neptune-D1000-A1
		Neptune-D500		Neptune-D1000

8.2 Quality Assurance Statement

Precautions:

- The product should be protected from dust and moisture to prevent damage or functionality issues.
- Maintenance should be carried out only when the product is fully powered off, discharged, and unpowered.
- After installation, protective measures should be taken to prevent direct contact with live parts.
- The product must be used strictly according to the user manual to avoid abnormal operation.
- After the product is in operation, regular inspections should be performed on the ventilation conditions and dust inside the equipment.
- Avoid using the product in environments with corrosive gases or pollutants.

Liability exemption:

The following conditions are not covered under the quality assurance:

- Damage caused during transportation, handling, or installation due to impact or improper operation.
- Improper installation methods or modifications.
- Exceeding the usage conditions specified in the product manual, such as voltage or current beyond the product specifications, incorrect input power, abnormal external load devices, excessive temperature, or corrosive environments.
- Abnormal equipment caused by disassembly, repair, modification, or research by non-company personnel.
- Damage caused by changing the product's default protection parameters or operating and configuring the product using non-company software.
- Damage caused by abnormal natural environments.

8.3 Contact Information

For any questions during the use of this product, please feel free to contact us.

Please provide the following information to help us assist you better:

- Equipment model
- Equipment SN
- Battery type and photovoltaic module type
- External communication method of the equipment
- Software version number
- Fault code/name
- A brief description of the issue

YUNT website: www.yunt-power.com

Tel: 0755-23592426

Service email: sales@yunt-power.com

Company address: No. 15 Tianbao Road, Shiyan Street, Bao'an District, Shenzhen City, Guangdong Province

YUNT
云天数能