YUNT
云天数能

User Manual

Microgrid Integrated Machine

Neptune-H Series

125KW

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*.

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1 About This Manual

This manual describes the Neptune series microgrid integrated cabinet in terms of its product information, storage and transportation, installation, electrical connections, and system maintenance. Before installing and operating the microgrid integrated cabinet, please carefully read this manual, familiarize yourself with the product's functions, features, and precautions, and keep the manual in an easily accessible location. 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

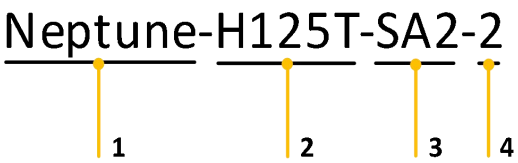


Figure 1- 1 Product model naming rules

Label	Example	Description
1	Neptune	Energy routing cabinet product series
2	H125T	H: Hybrid integrated cabinet 125: 125KW T: Includes a power frequency transformer
3	SA2	S: Indicates optional STS A: Indicates optional ATS 1: Indicates that the power of the STS/ATS is 1x the PCS power 2: Indicates that the power of the STS/ATS is 2x the PCS power
4	2	It is empty by default, indicating 3 MPPT modules fully configured 1~2 indicates 1~2 optional MPPT modules

1.2 Applicable Products

This manual applies to the following models of Microgrid Hybrid Inverter (the following are standard models, and the manual also applies to user-selected models):

- Neptune-H125T-SA2

The illustrations in this document are necessary displays. 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:

- Possesses expertise in electronics, electricity, and mechanics, and is familiar with electrical and mechanical circuit diagrams.
- Has received professional training related to the installation and commissioning of electrical equipment.
- Responds quickly to emergencies during installation, operation, and maintenance.
- Familiar with local standards and safety regulations related to electrical systems.
- Able to carefully read and understand the safety operation instructions related to the following content.

1.4 Terminology and abbreviation

Terminology and abbreviation	Definition	Functions
MPPT	Max. Power Point Tracking	MPPT is used for tracking the maximum power point in solar power generation, so that the photovoltaic modules can output the maximum power under different light, temperature, and external conditions, thereby improving the efficiency of photovoltaic power generation.
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.
PV	Photovoltaic	Solar photovoltaic panels
BAT	Battery	Battery
Grid	Power grid	Grid
DG	Diesel generator	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 busbars, contactors, and terminals inside the equipment, or any contacts connected to the utility electrical circuit, may cause fatal electric shock.

• 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 the battery/photovoltaic string, ensure that the voltage/power and other electrical specifications of the battery/photovoltaic string meet the microgrid integrated

cabinet's specifications.

• Before connecting the battery/photovoltaic string, carefully read the user manual of the battery/photovoltaic string, understand the product and corresponding precautions, and strictly follow the operational requirements of the battery/photovoltaic string.

• Pay attention to the polarity of the DC input, and ensure correct polarity connection.

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 mainly introduces the hybrid energy storage integrated cabinet, with Neptune-H125T-SA2 used as an example.

The integrated cabinet has the following features:

- It can simultaneously connect photovoltaic, batteries, grid, diesel engines, and emergency loads.
- Photovoltaic and batteries are coupled on the DC side and converted into AC through the PCS inverter to feed into the grid or diesel engine.
- An optional STS can be installed internally, allowing the system to automatically switch to off-grid operation in the event of grid or diesel engine 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.

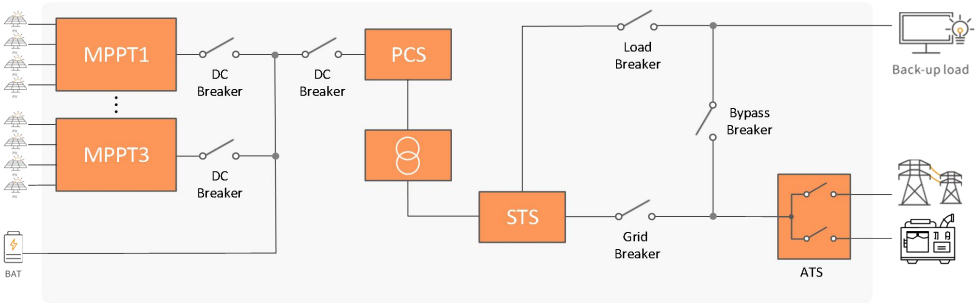


Figure 3- 1System block diagram of the 125KW integrated cabinet

3.2 Product introduction

3.2.1 Appearance

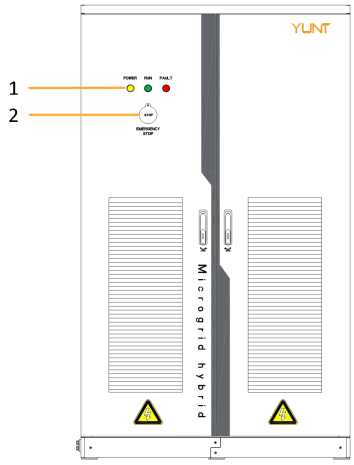


Figure 3- 2125KW integrated cabinet

Label	Component name	Description

1	Indicators (POWER/RUN/FAULT)	POWER: System power-on indicator RUN: System running indicator FAULT: System emergency stop or fault indicator
2	Emergency stop button	

3.2.2 System Block Diagram

The Neptune-H125T-SA2 system block diagram is shown below.

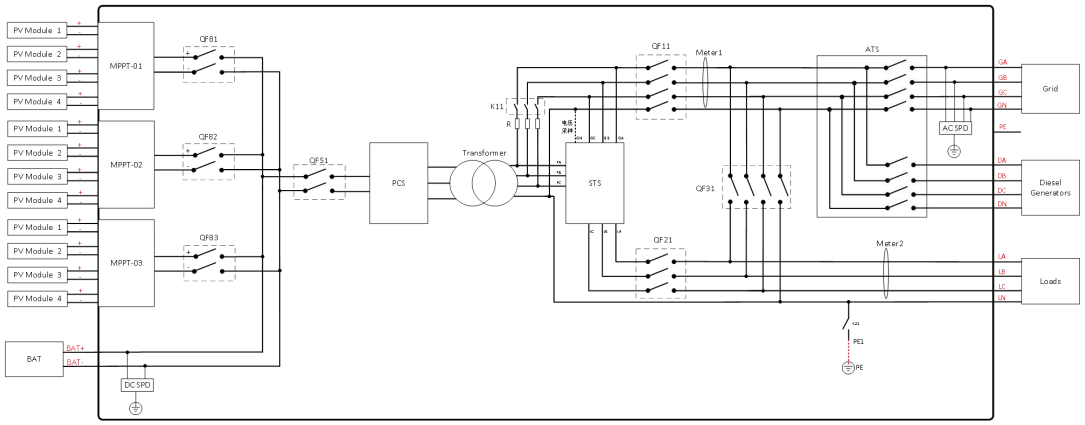


Figure 3- 3125KW integrated cabinet system

Note: When LN is connected to PE at the user end, the short-circuit copper busbar between PE1 and PE needs to be removed (the red dashed line in the figure indicates the actual location of the copper busbar, as shown by No. 17 in Figure 5-3).

3.2.3 Internal Structure

The internal layout of the Neptune-H125T-SA2 is shown below.

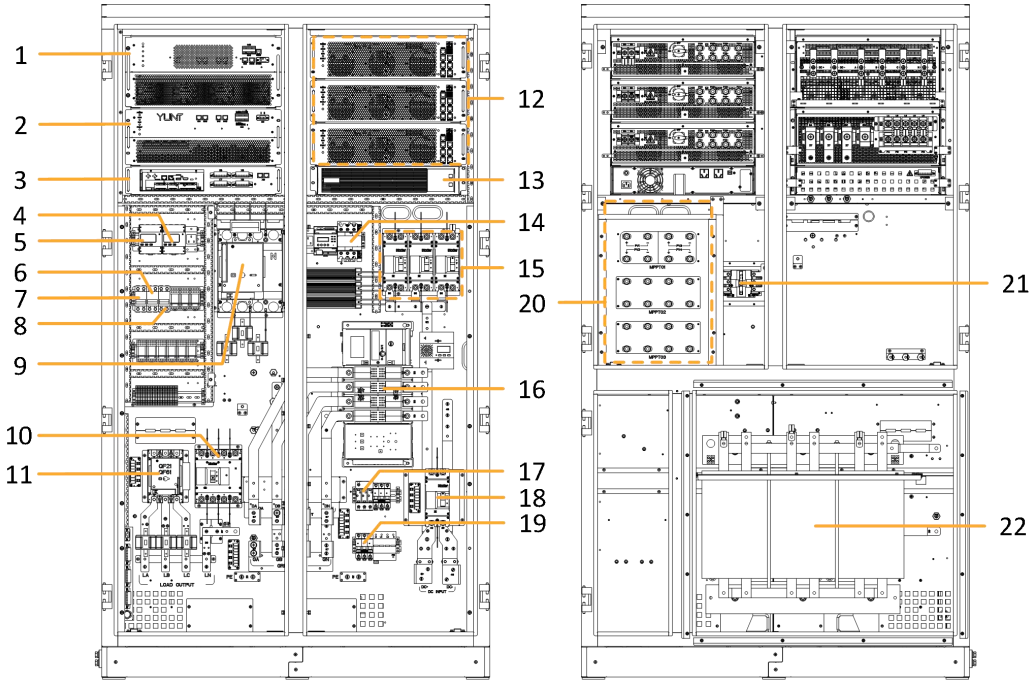


Figure 3- 4Internal layout of the 125KW integrated cabinet

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

Table 3- 1Internal components of the 125KW integrated cabinet

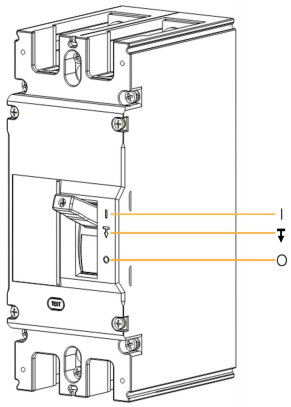
Label	Component	Description
1	PCS	125KW PCS module
2	STS	250KW STS module
3	EMS control box	
4	Load-side meter	
5	Grid-side meter	
6	Cabinet internal cooling fan switch	
7	24Vdc power supply switch	Ppowers 24Vdc devices inside the cabinet
8	Cabinet lighting switch	
9	AC grid circuit breaker	225A/400Vac
10	AC bypass circuit breaker	225A/400Vac
11	AC load circuit breaker	225A/400Vac
12	MPPT	3x 60kW MPPT modules MPPT01, MPPT02, MPPT03 (from top to bottom)
13	UPS	230Vac/1000VA 50/60Hz
14	AC soft start contactor	
15	MPPT module output circuit breaker	125A/1000Vdc QF81, QF82, and QF83 (from left to right)
16	ATS switch	Switches between grid and diesel generator automatically (400A/400Vac).

17	DC-side lightning protection	
18	Battery input circuit breaker QF51	250A/1000V
19	Grid-side lightning protection	
20	PV terminal block	Connects external photovoltaics
21	N-PE contactor	Controls the connection between N line and PE.
22	Power frequency transformer	

3.3 Switches

3.3.1 DC Switch

The DC switch is used for the protective connection between external DC input (battery and photovoltaic) and the common DC bus.

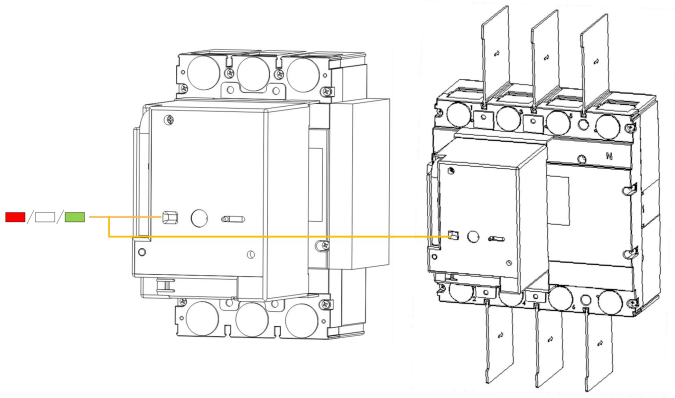


Status symbol	Status	Description
	Switch closed	When the switch is in the closed state, DC power is supplied to the microgrid integrated cabinet.
	Switch tripped	The switch is in the tripped state, and the connection is disconnected.
O	Switch open	When the switch is in the open state, it disconnects the DC power from the Microgrid Hybrid Inverter.

3.3.2 AC Switch

■ AC electric switch:

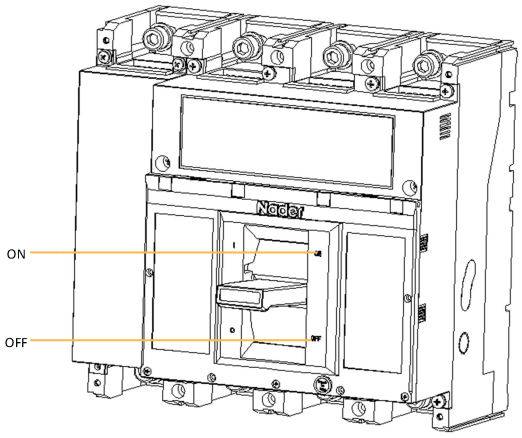
The AC electric switch includes grid input switch and load output switch.



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.

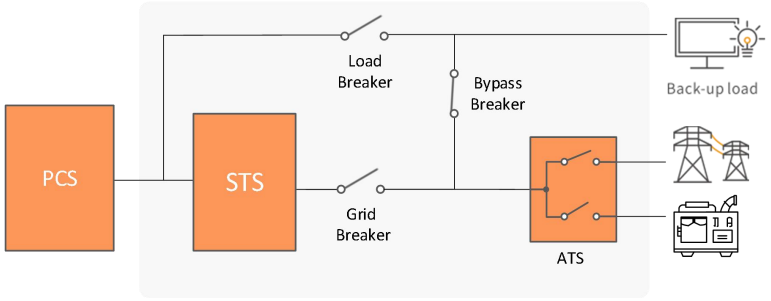


Status symbol	Status	Description
ON	Switch closed	The switch is in the closed state
OFF	Switch open	The switch is in the open state

Note:

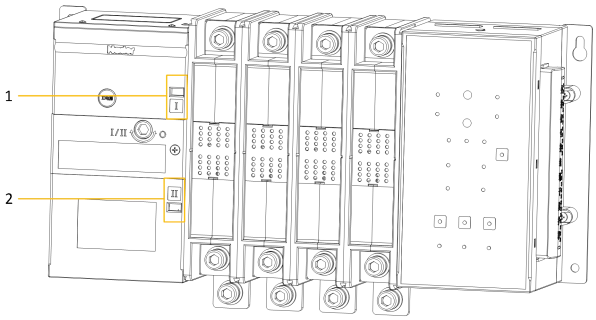
• Do not close the AC bypass switch during normal system operation.

• In case of system abnormalities, to ensure that the critical load is powered by the grid or diesel generator, during system shutdown, first disconnect the load switch and grid switch in Figure 3-3, then close the bypass switch as shown below.



■ ATS:

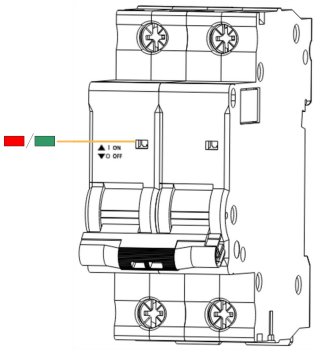
The ATS automatically switches the main power to the diesel generator when the grid fails, ensuring continuous power supply to critical equipment. When the grid recovers, the main power automatically switches back to the grid.



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

3.3.3 Auxiliary switch

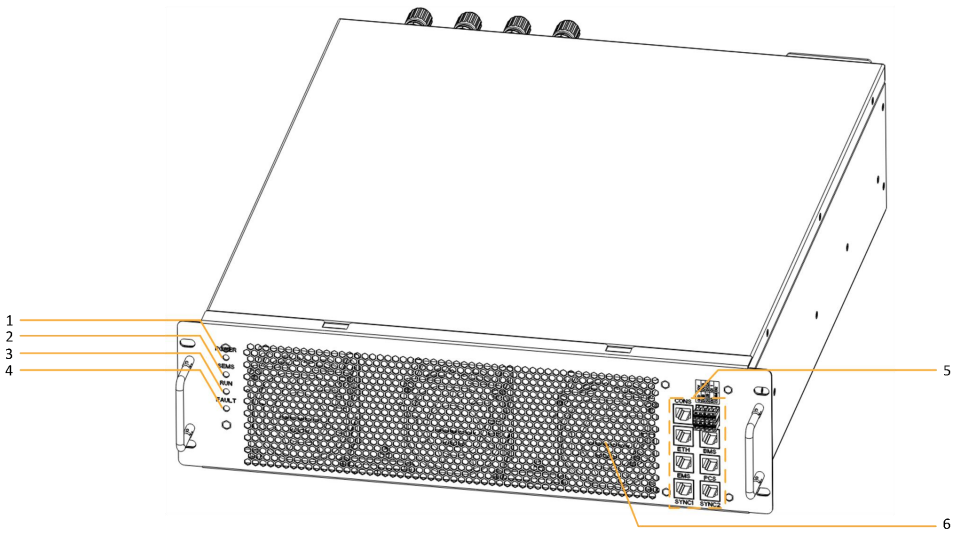
The auxiliary switch is responsible for providing 24VDC power to the cabinet and turning on the cabinet fans.



Status symbol	Status	Description
	Switch closed	The symbol is red, indicating the switch is in the closed state.
	Switch open	The symbol is green, indicating the switch is in the open state.

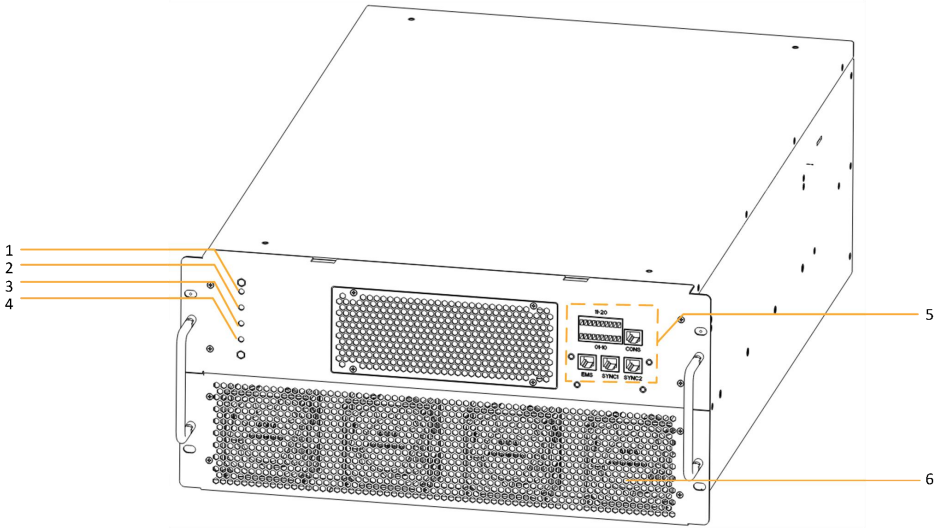
3.4 Module Indicators

3.4.1 MPPT module



Position No.	Indicating component	Description
1	Power-on indicator POWER (green light)	On: The converter has low-voltage side battery, or PV, or high-voltage side power connected Off: The converter system is not powered
2	EMS communication indicator SEMS (green light)	Blinking: Communication normal Off: Communication abnormal
3	Run indicator RUN (green light)	On: The converter is in operation Off: The converter is not operating.
4	Fault indicator FAULT (red indicator)	On: Converter fault, shutdown state Off: No fault or alarm in the converter
5	Communication port	Communication and debugging between modules and other devices
6	Cooling fan	Module cooling

3.4.2 PCS Module



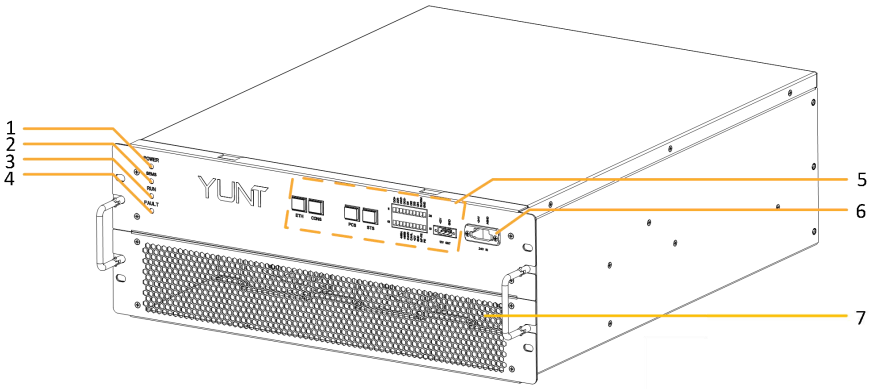
Position No.	Indicating component	Description
1	Power-on indicator POWER (green light)	Steady on: Battery and grid both connected Fast blink: Battery not connected Slow blink: Grid not connected Steady off: Battery and grid both not connected
2	EMS communication indicator SEMS (green light)	Fast blink: Communication normal Off: Communication abnormal
3	Run indicator RUN (green light)	Steady off: The PCS is in shutdown state Steady on: The PCS is in standby state Fast blink: The PCS is in operation 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	Cooling fan	Module cooling

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

[2] Shutdown state: The PCS is powered on but not working;

[3] Standby state: The PCS operates in grid-connected mode with grid power at 0KW.

3.4.3 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 power supply port	+24V/15W
7	Cooling fan	Module cooling

[1] Fast blink period: 1 second; slow blink period: 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:

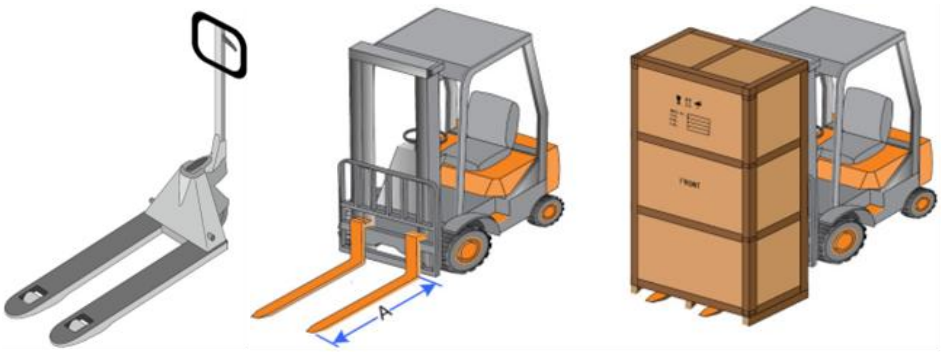
• Before transportation, ensure the cabinet door is tightly locked, transport under good weather conditions, clear any obstacles on the transport route, and ensure the road is clear. Make sure to evacuate personnel in advance and prohibit unauthorized personnel from entering the transport route.

• 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

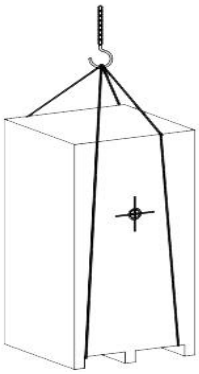
may be a risk of the equipment tipping over or falling.

• 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 Inspection

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 Accessory 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.

5.4 Foundation Requirements

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.

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

5.5 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 for smooth door opening and for parallel machine installation.

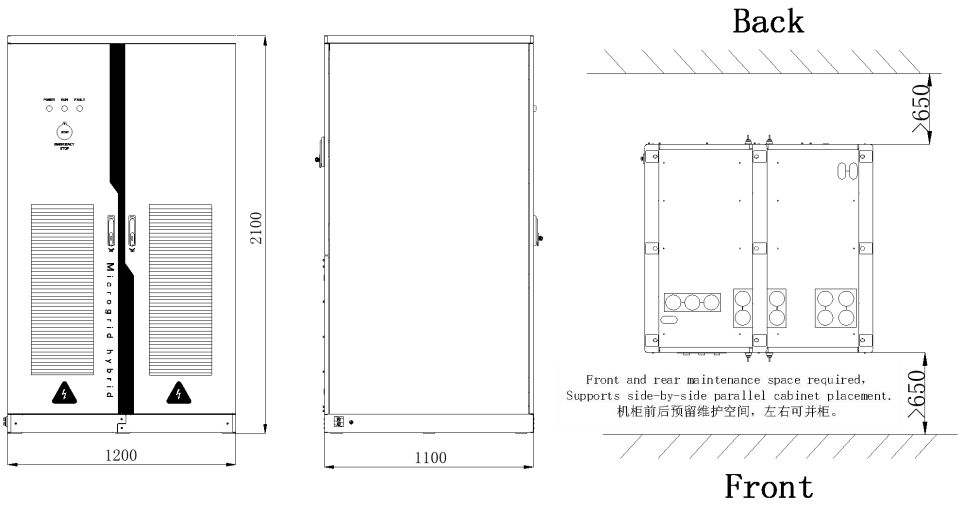


Figure 5- 1 Installation space requirements of the 125KW integrated cabinet

5.6 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.

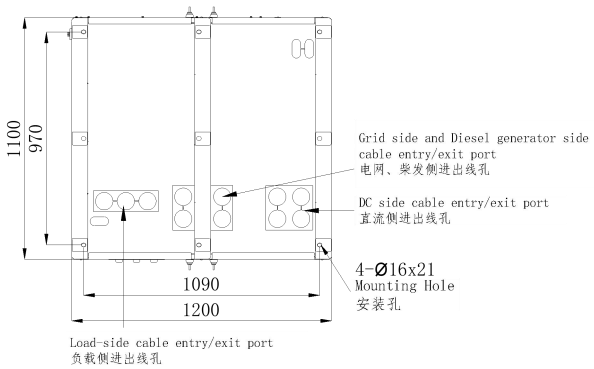


Figure 5- 2 Hole positions of the 125KW integrated cabinet

Notes:

- During cabinet transportation, it must be handled slowly and steadily. Ensure that the installation surface is flat and can bear the cabinet's weight.
- The cabinet should be fixed to the installation surface using expansion bolts, with appropriate hole positions. It is recommended that the bolts protrude 45mm above the surface.

5.7 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 installation wiring, disconnect all equipment's power supply, discharge the equipment completely, and use a multimeter to ensure no voltage before operating. Do not touch the powered equipment or perform live installation.

• 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.

5.7.1 Power Interfaces

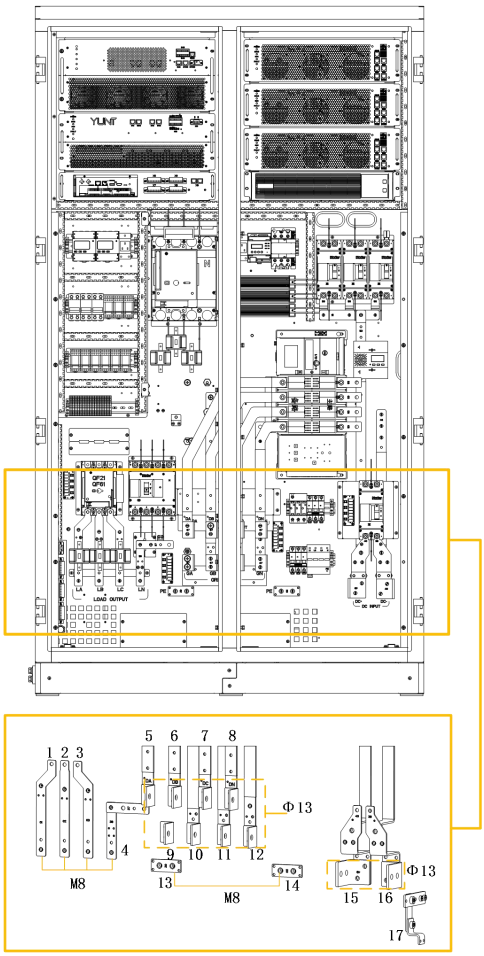


Figure 5- 3 Power front interfaces of the 125KW integrated cabinet

The power interfaces of the 125KW integrated cabinet are defined as shown in the table below.

Table 5- 1 Power interface definition of the 125KW integrated cabinet

Position No.	Name	Description
1	LA	Load A-phase port
2	LB	Load B-phase port
3	LC	Load C-phase port
4	LN	Load N-phase port
5	DA	Diesel generator A phase port
6	DB	Diesel generator B phase port
7	DC	Diesel generator C phase port
8	DN	Diesel generator N phase port
9	GA	Grid A-phase port
10	GB	Grid B-phase port
11	GC	Grid C-phase port
12	GN	Grid N-phase port

13	PE	AC side grounding port
14	PE	DC side grounding port
15	DC+	DC bus positive terminal
16	DC-	DC bus negative terminal
17	N-PE	PE1-PE short-circuit copper bar

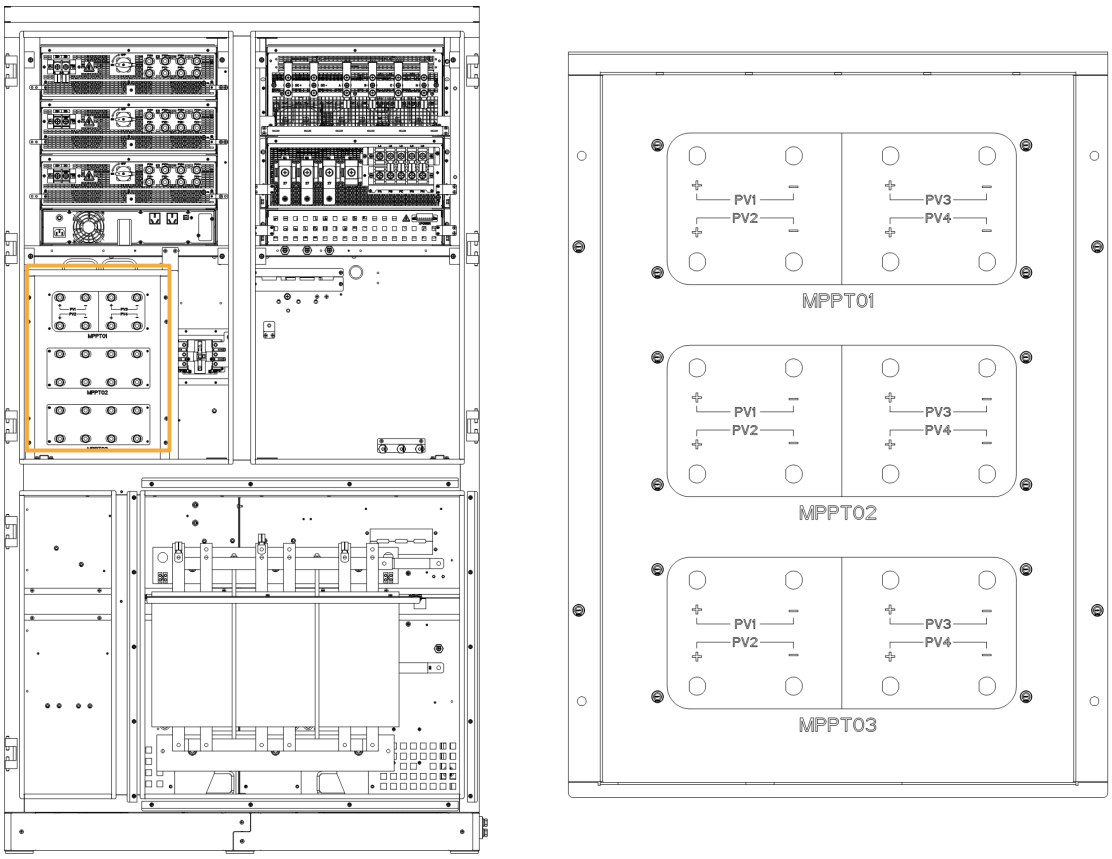


Figure5- 4 PV interfaces of the 125KW integrated cabinet

The PV input interfaces of the 125KW integrated cabinet are defined as shown in the table below.

Table 5- 2 PV interface terminal definition

PV wiring area	Name	Functions	Wiring description
MPPT01 MPPT02 MPPT03	PV1+	PV1 positive	Use the MC4 terminals provided in the accessories to connect the customer's wiring terminals. It is strictly prohibited to use MC4 terminals of different models.
	PV1-	PV1 negative	
	PV2+	PV2 positive	
	PV2-	PV2 negative	
	PV3+	PV3 positive	
	PV3-	PV3 negative	
	PV4+	PV4 positive	
	PV4-	PV4 negative	

5.7.2 Notes for wiring

■ Battery 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.

Danger

• The positive and negative terminals of the battery should not be connected in reverse. Please measure with a multimeter before wiring.

• 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.

■ **MPPT terminal**

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.

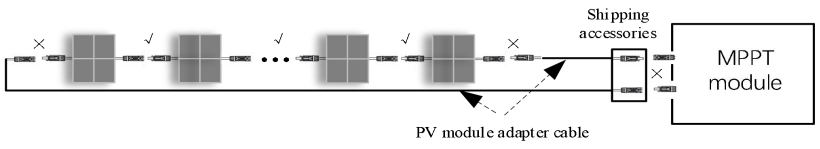
Attention

• The MPPT modules for PV input must have their photovoltaic cables and MC4 connectors installed by the customer before initial use.

Danger

• Before making MC4 quick plug connector wiring, disconnect the connector wire from the photovoltaic panel to the MPPT module.

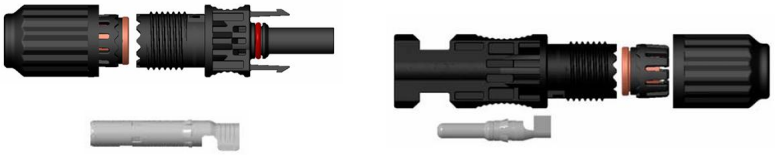
Before first connecting the shipped PV quick-plug terminals to the cable ends, ensure that the interconnection cable between the PV module terminals and the MPPT module is in a disconnected state.



1）The PV module comes with standard-length positive and negative output quick-plug cables.

2）The interconnection cable is configured due to the transmission distance between the PV module and MPPT.

3）The interconnection cable at the PV module end needs to use MC4

	from the PV manufacturer, and the interconnection cable at the MPPT end should use the MC4 from our shipment accessories. 4）The customer must disconnect the interconnection cable between the PV module and MPPT module during initial on-site processing of the interconnection cable and during subsequent maintenance of MPPT products by the company. The disconnection point is shown as "×" in the figure above. Operations should not be performed while powered on.
MC4 terminal wiring description	1）Match the male and female shell and terminal core of the terminal:  2）PV interconnection cables: Strip the wire length L to 7~8mm, and ensure no more than 3 broken strands:  3) Insert the stripped wire core into the terminal hole, ensuring all the wire cores are inside the terminal hole:  4) The cable insulation layer should contact the crimp core, and use crimping pliers to tightly press the wire core and terminal core.  5) Insert the crimped female and male terminals through end cap 1, end cap 2, and the sealing ring as shown in the diagram, and insert them into the pre-assembled plug (positive) & socket (negative) terminal block until they engage. When it clicks into place, you will hear a "click" sound, and the terminal cannot be pulled out once inserted.

6) After the MC4 terminal of the interconnection cable is installed, it can be connected to the MPPT module MC4 terminal.

Danger

• Before the first use of the MPPT module, and during subsequent maintenance, it is essential to follow the wiring and power-off instructions strictly, otherwise, there is a risk of electric shock.

• Do not disconnect the connector wires while the MPPT is running. Ensure the MPPT is stopped, and the isolation switch on the MPPT module is in the open position.

• The MC4 connectors used to connect with our MPPT must be the ones provided in the product's shipping accessories. Customers are prohibited from using other MC4 connectors, as this may cause damage to the equipment.

• The photovoltaic cables connected to our MC4 should be tinned cables.

• The connector protection level is IP68, but it is strictly prohibited to use it underwater for extended periods.

• It is strictly prohibited for MC4 connectors to come into contact with corrosive substances.

• The positive and negative terminals of the MPPT input must not be reversed. Before wiring, please measure with a multimeter.

■ 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.

5.8 Signal Connection

The signal interfaces of the integrated cabinet are shown in the figure below. The specific details are described in the table.

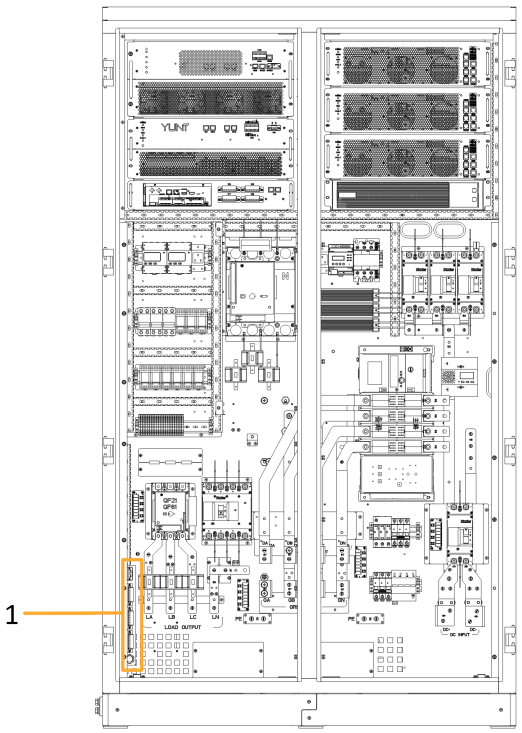
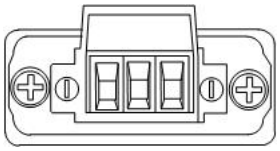


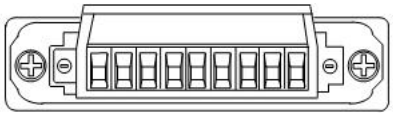
Figure 5- 5 External signal interfaces of the 125KW integrated cabinet

The signal interfaces of the 125KW integrated cabinet are defined as shown in the table below.

Table 5- 3 External signal interface definition of the 125KW integrated cabinet



Position No.	No.	Definition	Description
XT1	1	L	AC 220Vac output (300W)
	2	NC	
	3	N	



Position No.	No.	Definition	Description
XT2	1	DO-	Diesel generator DO interface
	2	DO+	
	3	DI1-	Fire alarm feedback interface
	4	DI1+	
	5	DI2-	Emergency stop feedback interface (default external short circuit)
	6	DI2+	
	7	NC	Reserved

	8	NC	
Position No.	**No.**	**Definition**	**Description**
XT3	1	RS485-A	RS485 communication interface between BMS and EMS
	2	RS485-B	
	3	CAN_H	CAN communication interface between BMS and EMS
	4	CAN_L	
	5	CAN_H	CAN communication interface between BMS and PCS
	6	CAN_L	
	7	NC	Reserved
	8	NC	
Position No.	**No.**	**Definition**	**Description**
XT4	1	RS485-A	RS485 communication interface between the meter and EMS
	2	RS485-B	
	3	RS485-A	RS485 communication interface between MPPT and EMS
	4	RS485-B	
	5	CAN_H	Reserved CAN communication interface
	6	CAN_L	
	7	NC	Reserved
	8	NC	
			
Position No.	**No.**	**Definition**	**Description**
XT5	1	Ethernet	Communication interface with third-party EMS

5.9 Pre-operation Inspection

After the installation of the Neptune series microgrid integrated cabinet, please 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 DC and AC-side voltages are within the specified range.
4	Check the temperature, humidity, and ventilation conditions around the cabinet.
5	Check if the DC and AC-side voltages match the cable specifications and if 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 perform 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, DC 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 Scrapping 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

Product model	Neptune-H125T-SA2
DC (PV input)	
PV voltage range	150V-Vbat(min),maximum 1000V
Max. PV Power	180KW (60KW*3）
Num. of MPPT's per module	4
Rated current per MPPT	45A
Rated power per MPPT	15kW
DC (BAT Input)	
Battery voltage range	600-1000V (Min.680V for off-grid）
Max charge/discharge current	216A
Max charge/discharge power	125KW
AC (on-grid)	
Rated output apparent power	125kVA
Rated output current	182A
Max. input apparent power	250kVA
Max. input current	364A
Rated voltage	400V
Rated frequency	50/60Hz
PF	>0.99 (-0.8~0.8)
THDi	< 3% (@rated power）
AC connection	3W+N+PE
AC (off-grid)	
Rated output power	125kW (@resistive load）
Rated output voltage	400V
Rated output current	182A
Rated frequency	50/60Hz
THDu	< 3% (@linear load）
Overload capability	120%-1min
System data	
Built-in integration	Transformer, STS, ATS
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%/℃)
Relative humidity	0~95% (non-condensing)
Maximum operating altitude	4000m (derating above 3000m, derating factor 1%/100m)

Lightning protection	Type II for AC&PV
Communication	RS485/CAN for BMS, RS485 for meter
Remote communication	WLAN/4G/Ethernet
Display	LED+LCD+APP
Dimensions (W*D*H)	1200*1100*2100mm
Weight	1350kg
Certificate	
IEC 62109-1, IEC 62477-1, IEC 61000-6-2, IEC 61000-6-4, NRS 097-2-1	
Expand models	
Expand models	Neptune-H125T-S2
	Neptune-H125T-A2
	Neptune-H125T

8.2 Quality Assurance

Precautions:

- Products should avoid dust and moisture penetration to prevent damage or impact on product functionality.
- Maintenance should be performed when the power is fully turned off, discharged, and with no electrical current.
- After installation, protective measures should be taken to prevent direct contact with live parts.
- Products should be used strictly within the proper operating parameters specified in the user manual to avoid abnormal equipment performance.
- After operation, periodically check the product's ventilation conditions and clean dust from the operating environment.
- Avoid operating the product in environments with corrosive gases or pollutants.

Liability exemption:

The quality guarantee does not apply in the following cases:

- Damage caused by impact or improper operation during transportation, handling, or installation.
- Incorrect installation or modification.
- Exceeding the usage conditions specified in the product manual, such as overvoltage, overcurrent, incorrect input sources, abnormal external load devices, high or low temperature, and 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, photovoltaic module type, and load conditions
- 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

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