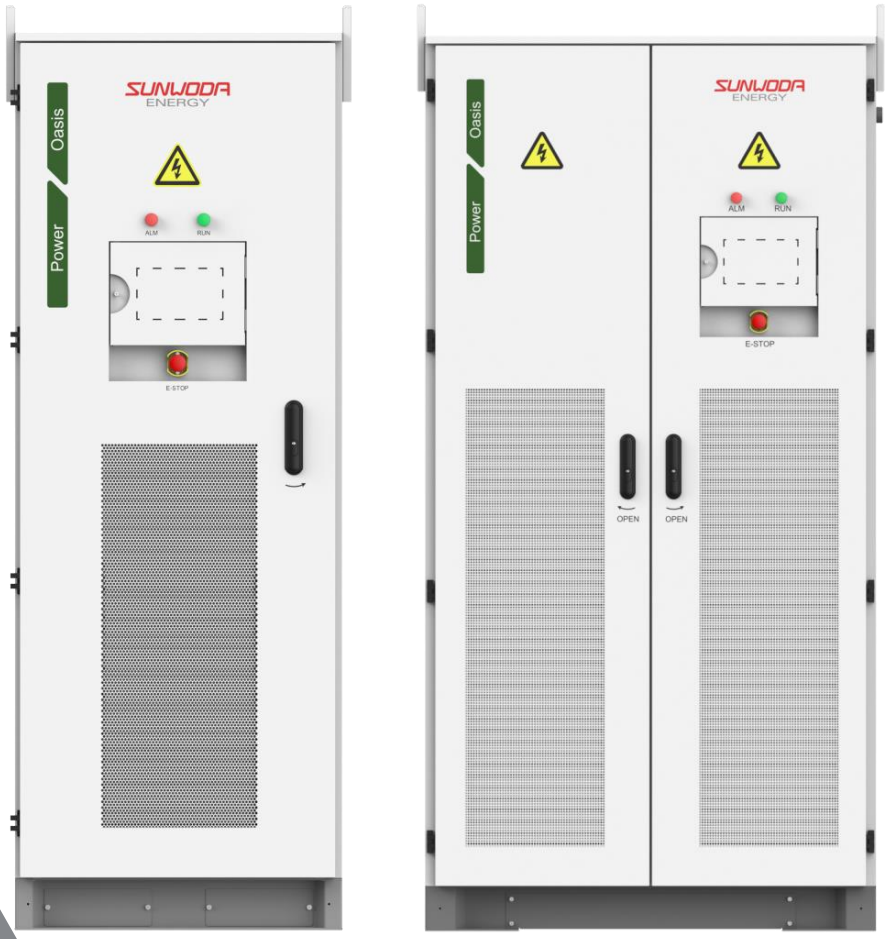
SUNWODA ENERGY

User Manual

OASIS Power

Energy Converter Systems



Preface

Thank you sincerely for purchasing and exploring products developed and manufactured by Shenzhen Sunwoda Energy Technology Co., Ltd. (hereinafter referred to as "Sunwoda"). We genuinely hope that our products and this manual will meet your needs. Your valuable feedback is warmly welcomed, and we will continuously improve and enhance our offerings.

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Content

1. About This Manual

1.1 Description

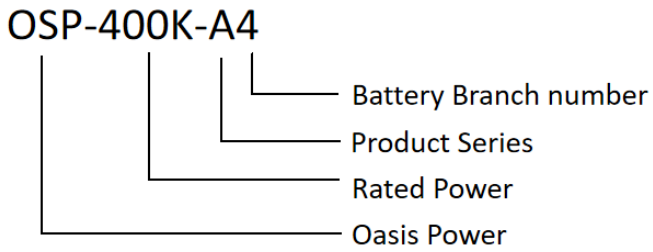
Inverter cabinet is a professional power distribution device. To ensure the correctness and safety of installation, operation, and other procedures, please read this manual thoroughly before proceeding. Installers must be professionally trained, possess a background in electrical technology, and be familiar with local grid regulations and relevant requirements. Sunwoda shall not be held legally liable for any losses or injuries resulting from failure to comply with the operational guidelines emphasized in this manual.

Focused on the OASIS Power Series, this manual details product functions, installation specifications, usage methods, troubleshooting, and routine maintenance. Due to product iterations, the manual will be updated periodically. For specific product details, please refer to the actual product you purchased.

Finally, we hope this product fully meets your needs, and we welcome any feedback or suggestions. For inquiries or requests, please contact us at any time.

1.2 Applicable Models

(1) Model description



Series	Application Scenarios	Configuration Components
A	Peak shaving & frequency regulation, Load shifting	PCS
B	Peak shaving & frequency regulation, Backup power response, Load shifting	PCS+STS

This manual applies to the following product models:

-A Series			
OSP-100K-A	OSP-200K-A	OSP-200K-A2	OSP-300K-A3
OSP-400K-A2	OSP-400K-A4		
-B Series			
OSP-200K-B	OSP-200K-B2		

2. Safety Declaration

2.1 General Requirements

(1) Before installing the equipment, disconnect all loads and grid circuits, and power off the device. Failure to do so may result in severe personal injury or equipment damage.

(2) Static electricity may cause irreversible damage to internal components. Strictly adhere to electrostatic discharge (ESD) protection protocols during operation.

(3) This product must not be directly connected to life-support or medical equipment. Consult the supplier for safety and compliance requirements prior to purchase.

(4) Before powering on the device, inspect the cabinet to ensure no tools or unnecessary items are left inside, as these may cause damage during operation.

(5) During maintenance, ensure the device is fully de-energized and wait at least 10 minutes for all charged components to discharge completely to avoid injury or damage.

2.2 Personnel Requirements

(1) All operations must be performed by qualified, certified technicians with specialized training in electrical systems and familiarity with local standards and safety regulations.

(2) Operators must thoroughly review this manual, including product structure, operating principles, and precautions, before installation.

(3) Wear personal protective equipment (PPE)—including safety suits, helmets, insulated gloves, safety shoes, and goggles—and use insulated tools with protected handles to ensure personal safety.

(4) When handling electronic components, wear anti-static wrist straps, gloves, and clothing to prevent electrostatic discharge.

2.3 Installation Environment

(1) Install the cabinet away from residential areas to minimize noise disturbance.

(2) Ensure adequate ventilation to maintain proper heat dissipation. Avoid enclosed or stagnant airflow environments.

(3) Leave sufficient clearance around the cabinet for maintenance access.

(4) Ambient temperature must be maintained between -20°C to 55°C for normal operation.

(5) Install in a dry, clean environment free from excessive moisture, dust, direct sunlight, rain, or snow to maximize product lifespan.

(6) Avoid environments with smoke, airborne particles, or corrosive substances.

(7) Never operate the device in humid, wet, or extreme conditions (e.g., rain, snow, or condensation-prone areas). Remove debris from the surroundings before use.

(8) Keep the cabinet away from liquids. Do not install below water pipes, air vents, or other condensation-prone locations.

(9) Prohibit flammable or explosive materials near the cabinet. Maintain distance from heat sources or open flames.

(10) Never obstruct ventilation ports or cooling systems during operation.

2.4 Electrical Connections

(1) Installation must comply with local grid regulations and safety standards.

(2) Only qualified electricians may operate the device due to high-voltage risks.

(3) Avoid contact with live conductors connected to the grid to prevent electric shock or arc flash.

(4) Use anti-static wrist straps when handling internal components.

(5) Do not tamper with grounding conductors. Operation is prohibited without proper grounding.

(6) Remove conductive accessories (e.g., watches, jewelry) during installation or maintenance to prevent electric shock.

(7) Verify zero voltage at contact points before touching conductors or terminals.

(8) Never clean electrical parts with water, alcohol, oil, or solvents.

(9) Immediately halt operations and report any faults posing risks to personnel or equipment.

(10) Do not energize the device until installation is complete and certified by professionals.

2.5 Mechanical Installation

(1) Only trained personnel may perform lifting or forklift operations due to the cabinet's weight.

(2) For overhead work, wear safety harnesses and helmets, and secure tools to stable structures. Avoid sharp edges or unstable supports.

(3) Use certified lifting tools free of defects or expiration. Ensure tools can bear the cabinet's weight.

(4) Secure adjacent cabinets before installation to prevent tipping or collapse.

(5) Lock the front door and stabilize heavy components before transport to avoid crushing hazards.

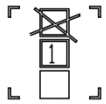
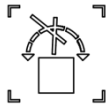
(6) Drilling into the cabinet is prohibited—it compromises sealing, EMI shielding, and internal components.

(7) Pre-install power cables before moving the cabinet to its final position for easier routing.

(8) Ensure the installation base is sturdy and load-bearing to prevent structural failure.

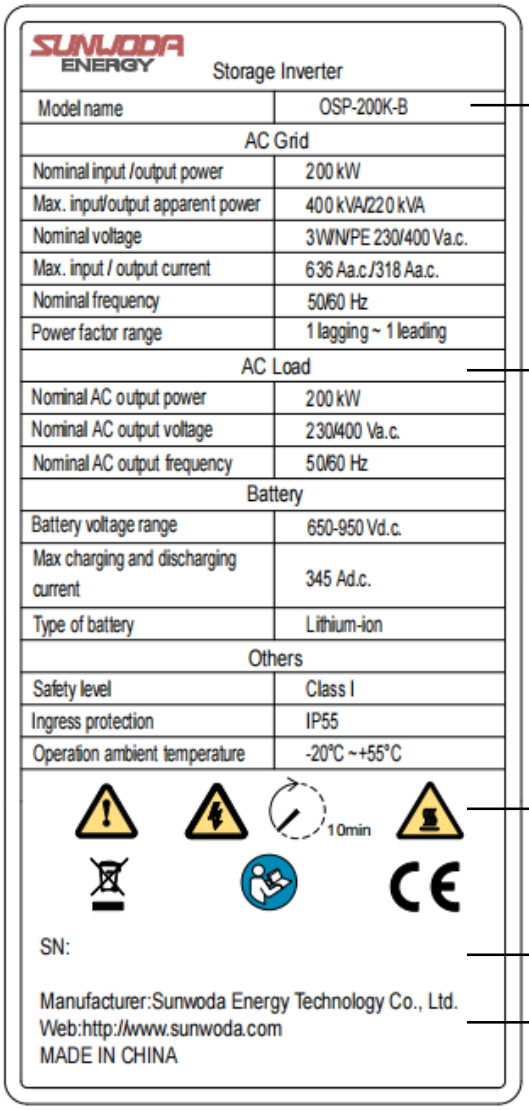
2.6 Safety Symbols

Adhere to all labels and symbols on the device during installation, operation, and maintenance. Replace faded or damaged labels promptly.

Symbol	Description
	This side up. Do not tilt, lay horizontally, or invert the cabinet.
	Handle with care. Avoid collisions during transport.
	Maximum stacking: 1 layer.
	Keep dry. Protect from rain or moisture.
	Avoid high temperatures. Shield from direct sunlight.
	Do not roll.
	Caution. Follow safety protocols.
	Dangerous voltage. For qualified personnel only.
	Wait 10 minutes after power-off to ensure full discharge.
	Hot surface. Risk of burns.
	Recycle after disposal.

2.7 Product Nameplate

The nameplate content varies by model. Refer to the diagram below for details.


SUNWODA ENERGY
Storage Inverter
Model name
OSP-200K-B
AC Grid
Nominal input /output power
200 kW
Max. input/output apparent power
400 kVA/220 kVA
Nominal voltage
3W/N/PE 230/400 Va.c.
Max. input / output current
636 Aa.c./318 Aa.c.
Nominal frequency
50/60 Hz
Power factor range
1 lagging ~ 1 leading
AC Load
Nominal AC output power
200 kW
Nominal AC output voltage
230/400 Va.c.
Nominal AC output frequency
50/60 Hz
Battery
Battery voltage range
650-950 Vd.c.
Max charging and discharging current
345 Ad.c.
Type of battery
Lithium-ion
Others
Safety level
Class I
Ingress protection
IP55
Operation ambient temperature
-20°C ~+55°C
10min
CE
SN:
Manufacturer:Sunwoda Energy Technology Co., Ltd.
Web:http://www.sunwoda.com
MADE IN CHINA
Product Type
Parameters
Safety and Certifications
Serie Number
Company Information

3. Product Overview

3.1 Product Introduction

3.1.1 System Description

This product is an inverter cabinet designed for industrial and commercial applications. It supports pure grid-tied and grid-tied/off-grid switching systems, with a maximum power output of 400kW in pure grid-tied mode and 200kW in switching mode. The system optionally integrates PCS, STS, UPS, and LCU. Among these, the STS is an optional component, enabling flexible adaptation to real-world requirements such as backup power response, peak shaving/frequency regulation, and load shifting.

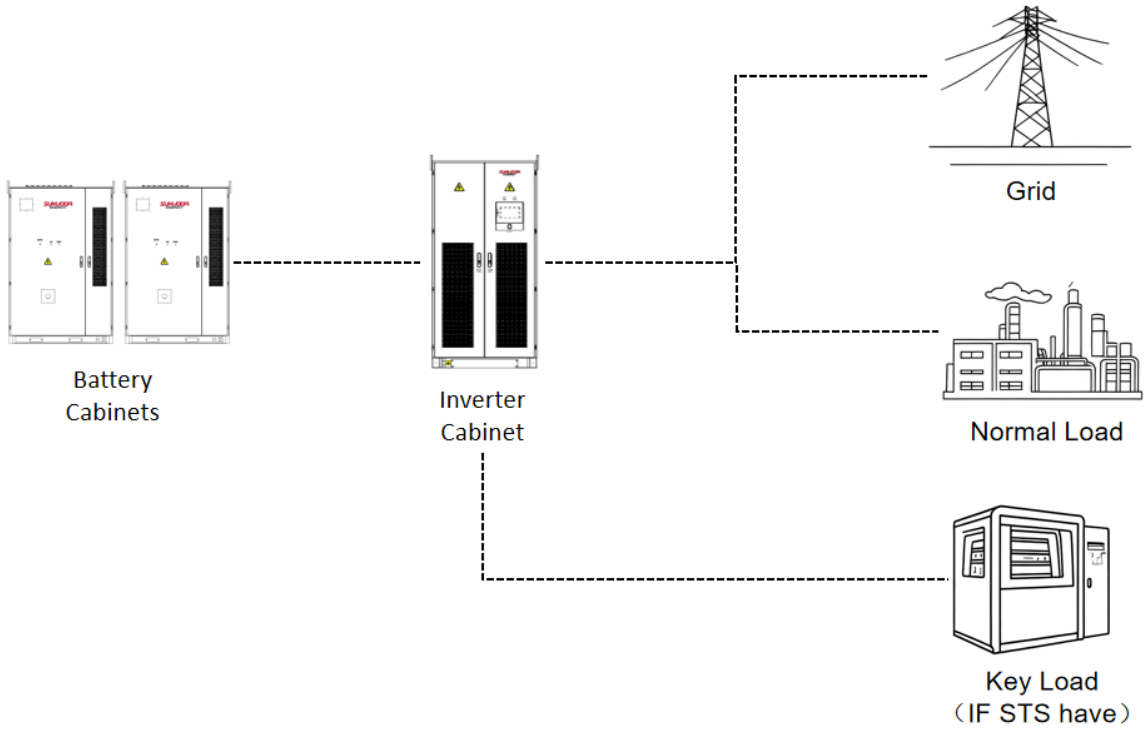


Figure3.1.1 Application Scenario

3.1.2 Key Features

(1) Seamless switching in milliseconds

The built-in STS module detects grid failure, triggers the PCS to switch from grid-tied (P/Q mode) to off-grid (V/F mode), and enables the EMS to adjust the PCS output power limits after evaluating battery SOC and load demand. The entire process is completed within 20ms.

(2) Supports 1–4 Battery Input Paths

Flexible configurations:

One-to-one connection between PCS modules and battery modules, with AC-side bus

convergence.

Two PCS modules connected to a single battery path before AC-side bus convergence.

Adaptable to 0.5C and 1C application scenarios.

(3) Comprehensive Functionality

Supports pure grid-tied and grid-tied/off-grid switching.

100% three-phase imbalance support and reactive power compensation.

(4) Off-Grid Power Supply

Built-in UPS:

With grid power: The UPS rectifies, filters, and stabilizes grid power to supply clean AC to auxiliary circuits while charging the built-in battery.

Grid failure: The UPS seamlessly switches to the battery power supply through a static switch. The inverter converts DC to stable AC, sustaining auxiliary circuits for 40–60 minutes.

(5) Black Start Capability

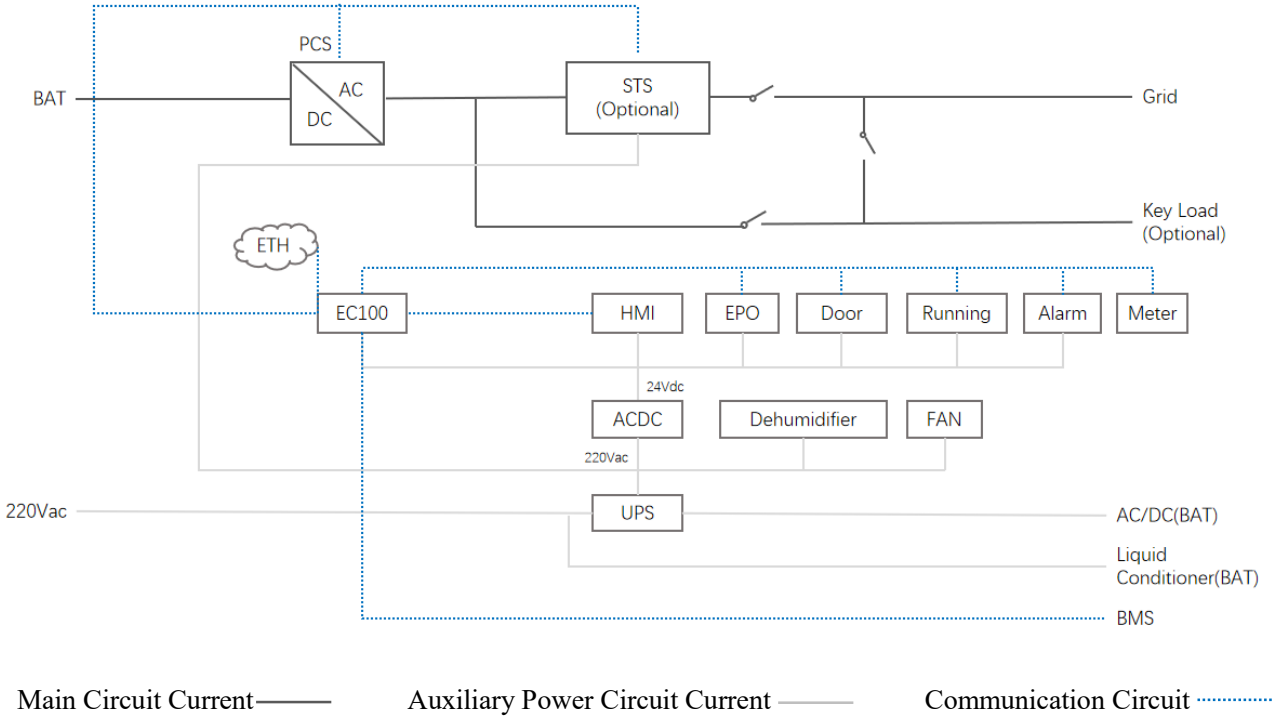
If the grid fails and the UPS reaches its minimum discharge limit, the system can maintain off-grid operation by connecting to the UPS via the AC-side interface.

Residual UPS battery capacity enables black start for temporary off-grid operation.

(6) Remote Management

Built-in LCU and external EMS integration for local and remote maintenance/monitoring.

3.1.3 System Topology Diagram



3.2 Product Dimensions

Product Type	Dimensions	Model
Single-column Cabinet	750mm(W)*1200mm(D)*2060mm(H)	OSP-100K-A\OSP-200K-A\ OSP-200K-A2
Double-column Cabinet	1200mm(W)*1200mm(D)*2380mm(H)	OSP-200K-B\OSP-200K-B2 OSP-300K-A3\OSP-400K-A2\ OSP-400K-A4

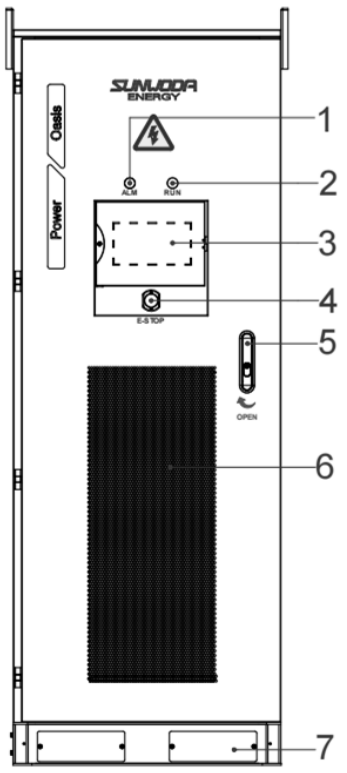
3.3 Structural Description

3.3.1 External Structure

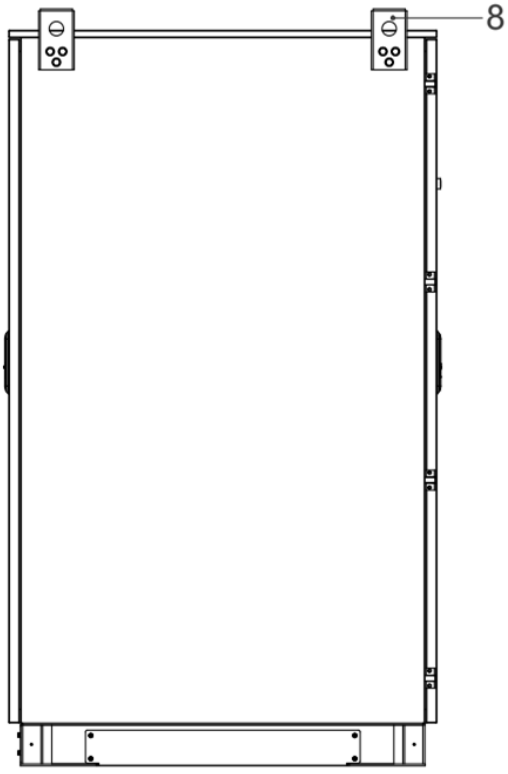
(1) Structural Diagrams

Single-column Cabinet

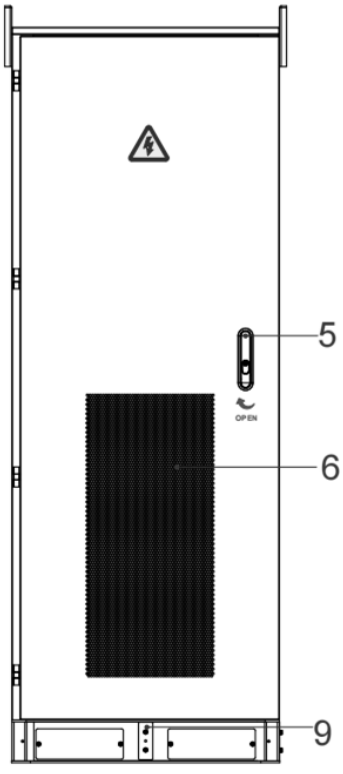
Front View



Right View

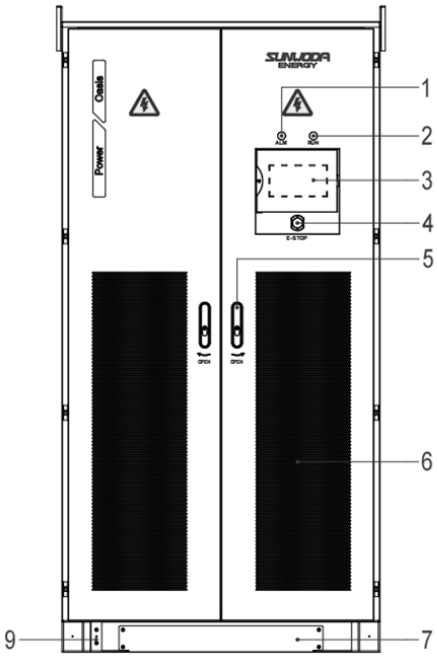


Rear View

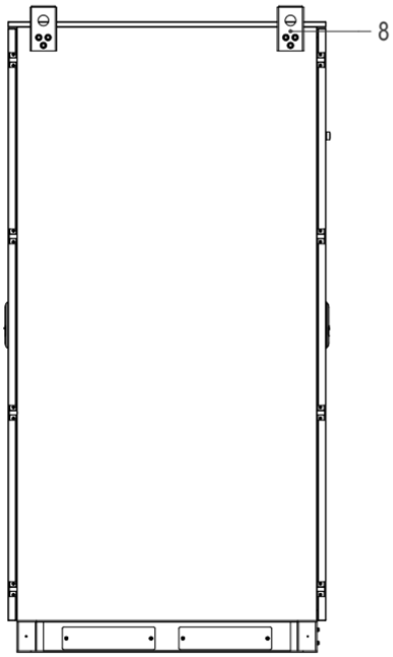


Double-column Cabinet

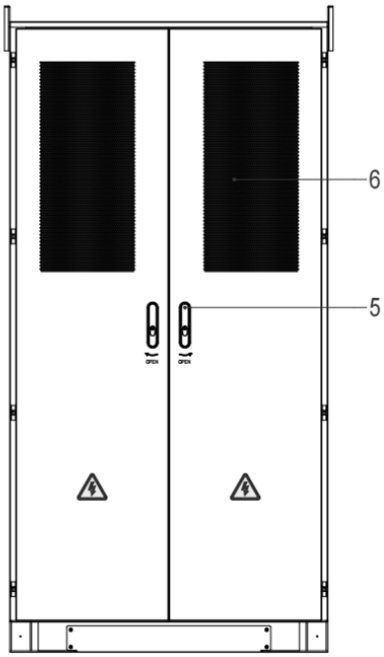
Front View



Right View



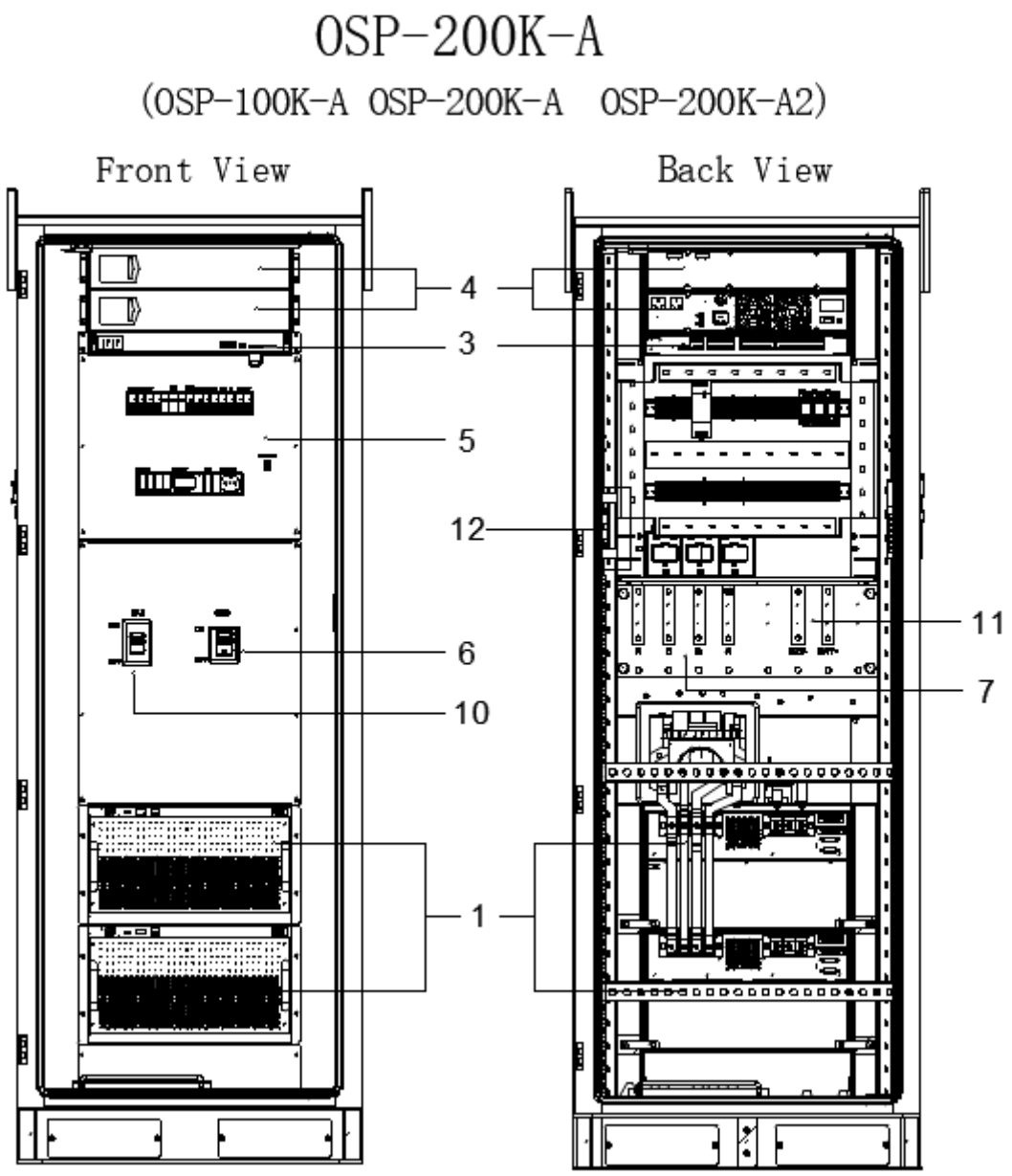
Rear View



(2) Structural Description

No.	Name	No.	Name
1	Fault Indicator	6	Ventilation Mesh (intake at front, exhaust at rear)
2	Operation Indicator	7	Forklift Holes (for forklift use)
3	LCU Display	8	Lifting Plates (for crane use)
4	Emergency Stop Button	9	Grounding Copper Bar
5	Door Lock		

3.3.2 Internal Layout

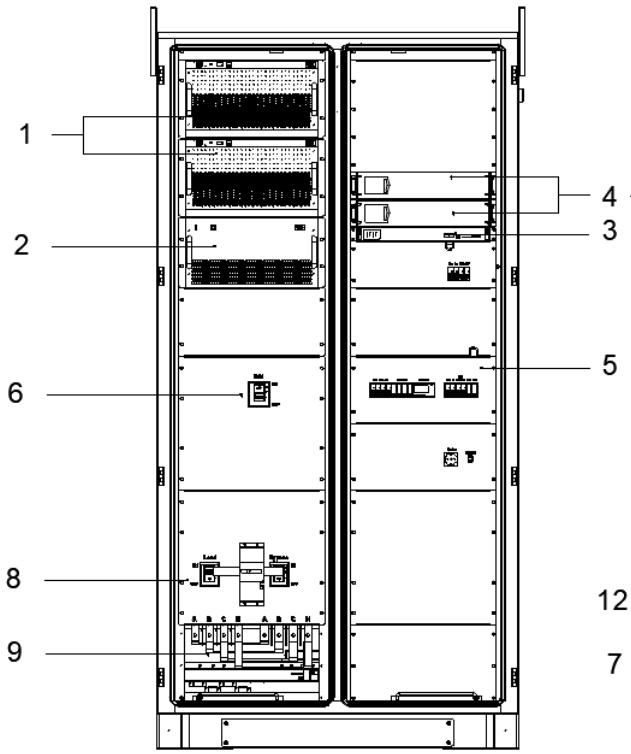


No.	1	2	3	4
Name	PCS Module	\	LCU Main Unit	UPS Module
No.	5	6	7	8
Name	Auxiliary Power Switch Control	Grid Switch	Grid Terminal	\
No.	9	10	11	12
Name	\	Battery Switch	Battery Terminal	Auxiliary Circuit Power Terminal

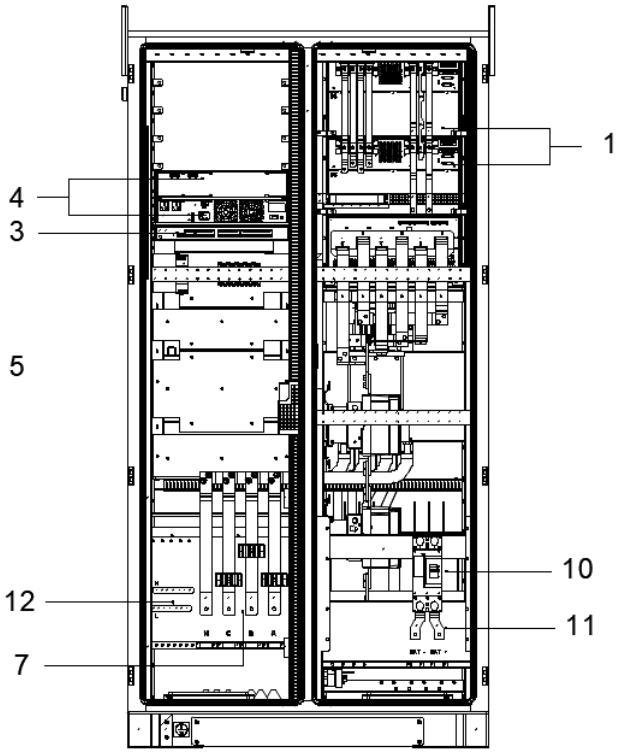
OSP-200K-B

(OSP-200K-B OSP-200K-B2)

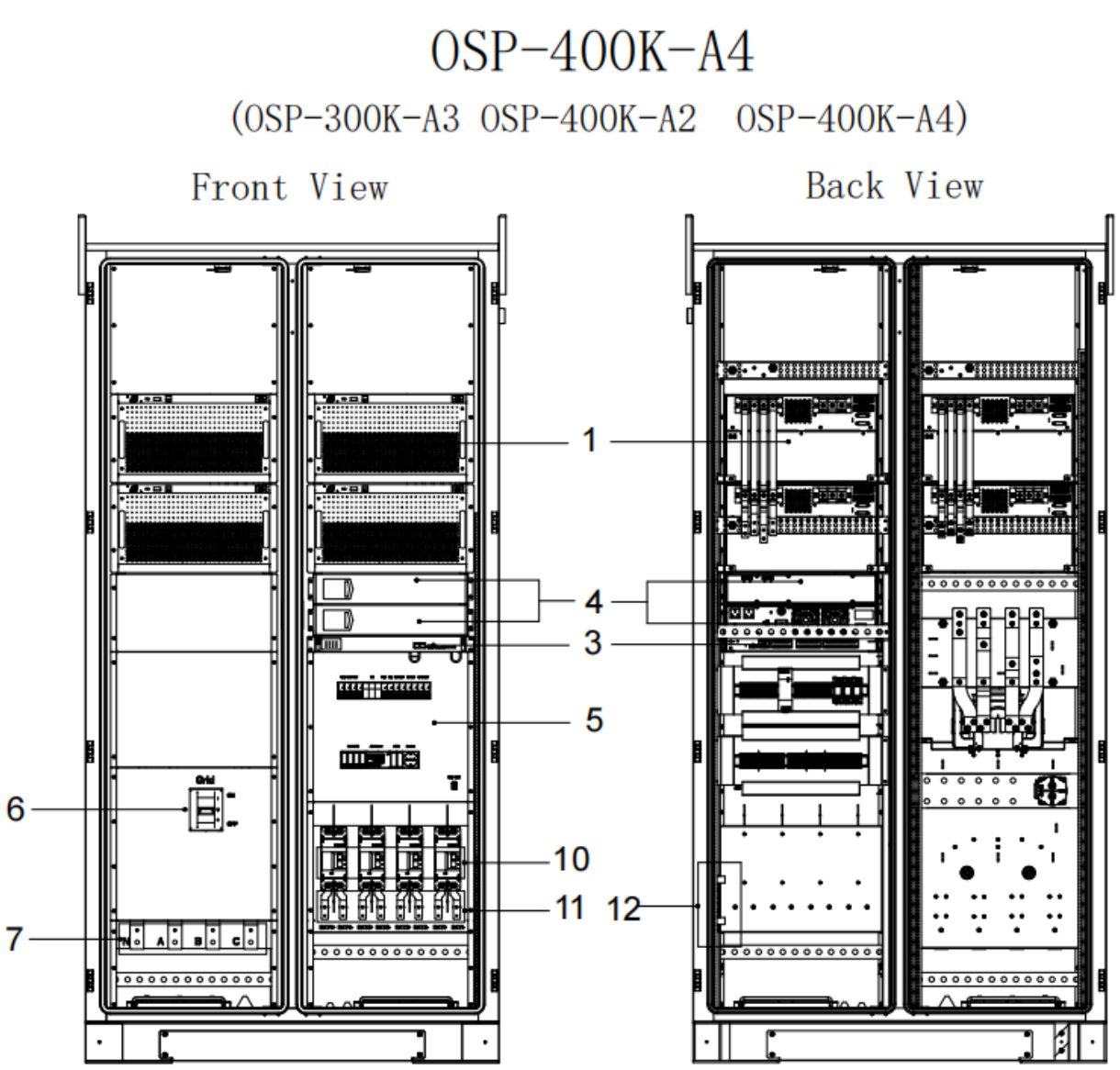
Front View



Back View



No.	1	2	3	4
Name	PCS Module	STS Module	LCU Main Unit	UPS Module
No.	5	6	7	8
Name	Auxiliary Power Switch Control	Grid Switch	Grid Terminal	Load Switch (Bypass Mode Enabled)
No.	9	10	11	12
Name	Critical Load Terminal	Battery Switch	Battery Terminal	Auxiliary Power Terminal



No.	1	2	3	4
Name	PCS Module	\	LCU Main Unit	UPS Module
No.	5	6	7	8
Name	Auxiliary Power Switch Control	Grid Switch	Grid Terminal	\
No.	9	10	11	12
Name	\	Battery Switch	Battery Terminal	Auxiliary Circuit Power Terminal

3.3 Component Description

3.3.1 UPS

(1) Main Unit

Item	Value

Input Characteristics	Input Type	Single-phase three-wire
	Input Voltage Range	120~295Vac
	Input Frequency Range	50/60 Hz ±10% (auto-sensing)
	Battery Voltage	36Vdc
Output Characteristics	Rated Output Power	1000VA/800W
	Output Voltage	Default: 220 Vac
	Output Frequency	Grid mode: Synchronized with grid; Battery mode: 50/60 Hz ±0.2%
	THDu	<2% (linear load), <5% (non-linear load)
	Output Power Factor	0.8 (0.9 for long-term operation)
	Bypass Transfer Time	0ms
	Dimensions (W×D×H)	438×413×86mm（2U）
	Weight	5.9kg

(2) Battery Box

Item	Value
Capacity	36V/14Ah
Dimensions (W×D×H)	438mm*413mm*86mm
Net Weight	17.5kg

3.3.2 LCU

Item	Value
Power Supply	DC24V
Indicators	Power, Run, Alarm, Communication LEDs
User Interface	10.1-inch display
Communication Protocol	Ethernet, RS485, CAN
Protection Rating	IP20
Dimensions (W×D×H)	440mm*120mm*44mm
Weight	1.84kg

3.3.3 STS (Optional)

Item		Value
Power Parameters	Grid Port Power	500kW
	Grid Port Max Current	794A
	Load Port Power	500kW
	Critical Load Max Power	250kW
	Note: Critical load power + PCS-side power ≤ product max power	
	Rated Voltage	400Vac
	Grid Voltage Range	400Vac±15%
	Rated Frequency	50/60Hz
	Overload Capacity	110% continuous
	Grid/Off-grid Switching	<20ms

	Time	
	Efficiency	>99.5%
Communication	Port	RS485
	Protocol	Modbus RTU
System Parameters	Cooling	Intelligent forced air cooling
	Protection Rating	IP20
	Wiring Configuration	Three-phase three-wire
	Dimensions (W×D×H)	484*606*232mm
	Weight	32kg

3.3.4 PCS

Item		Value
DC Side	Operating Voltage	650V~950V（3W+N+PE）
	Full-load Voltage	680~950V（3W+N+PE）
	Input Paths	1
	Max Current	170 A
AC Side (On-grid)	Rated Voltage	230/400V
	Voltage Tolerance	-10%~+10%
	AC Output Type	3W+N+PE (three-phase four-wire)
	Rated Output Power	105kW
	Max Output Power	116kW
	Max Current	167 A
	Rated Grid Frequency	50/60Hz
	Power Factor	0.99
	Power Factor Range	1 (leading) to 1 (lagging)
	THDi	<3% (rated power)
	DC Component	0.5%
	Overload Capacity	110% continuous
	Max Efficiency	98.5%
AC Side (Off-grid)	Rated Output Voltage	230/400V
	AC Voltage THD	<3% (linear load)
	Rated Frequency	50/60 Hz
	Rated Output Power	105kW
	Max Apparent Power	116kVA
	Max Output Current	167A

System Parameters	Dimensions (W×D×H)	484mm×703mm×256.5mm
	Weight	50 kg
	Cooling	Intelligent forced air cooling
	Protection Rating	IP20
	Communication Ports	CAN/RS485

3.4 System Specifications

3.4.1 OSP-A Series

Model	OSP-100K-A	OSP-200K-A\A2	OSP-300K-A3	OSP-400K-A2\A4
Battery-side Parameters				
Operating Voltage	650~950V			
Full-power Voltage	715~950V			
Max Input Current	171	342/171*2	171*3	342*2/171*4
Battery Paths	1	1/2	3	2/4
Grid-side Parameters(On-Grid)				
Max Power (kVA)	110	220	330	440
Rated Power (kW)	100	200	300	400
Rated Voltage (V)	230/400			
Rated Current(A)	144	288	432	576
Max Current (A)	159	318	477	636
Rated Frequency (Hz)	50/60（±5Hz）			
THDi	≤3%			
Power Factor	-1 (leading) to 1 (lagging)			
Wiring Configuration	3W+N+PE			
System Parameters				
Operating Temperature	-20 to +55 ℃ (derating at 45 ℃)			
Humidity	5–95% RH (non-condensing)			
Installation	Outdoor			
Corrosion Resistance	C3			
Noise	<75dB			
Max Altitude	2000m			
Cooling	Intelligent forced air cooling			
Protection Rating	IP54			

Weight	490kg	540kg / 545kg	850kg	900kg / 905kg
Dimensions W *D* H	750*1200*2060mm		1200*1200*2380mm	
Certifications	IEC 61000-6-1/3; IEC62109-1/2; IEC 62477-1; EN 50549-1，EN 50549-10，EN 50438，C10/C11，EIFS			

3.4.2 OSP-B Series

Model	OSP-200K-B	OSP-200K-B2
Battery-side Parameters		
Operating Voltage (V)	650~950	
Full-power Voltage (V)	715~950	
Max Input Current (A)	342	171*2
Battery Paths	1	2
Grid-side Parameters(On-grid）		
Max Power (kVA)	220	
Rated Power (kW)	200	
Rated Voltage(V)	230/400	
Rated Current(A)	288	
Max Current (A)	318	
Rated Frequency(Hz)	50/60Hz	
Frequency Range(Hz)	45-55/55-65Hz	
THDi	≤3%	
Power Factor	-1 (leading) to 1 (lagging)	
Wiring Configuration	3W+N+PE	
Grid-side Parameters (Off-grid)		
Max Power (kW)	198	
Rated Power (kW)	180	
Rated Voltage(V)	230/400	
Rated Current (A)	130*2	
Max Current (A)	143*2	
Rated Frequency(Hz)	50/60(±5Hz)	
THDu	<3% (resistive load)	
System Parameters		
Grid/Off-grid Switching Time	≤20ms	
Operating Temperature	-20 to +55℃ (derating at 45℃)	
Humidity	5–95% RH (non-condensing)	
Installation	户外	
Corrosion Resistance	C3	

Noise	<75dB	
Max Altitude	2000m	
Cooling	Intelligent forced air cooling	
Protection Rating	IP54	
Weight	820kg	825kg
Dimensions (W×D×H)	1200*1200*2380mm	
Certifications	IEC 61000-6-1/3; IEC62109-1/2; IEC 62477-1; EN 50549-1，EN 50549-10，EN 50438，C10/C11，EIFS	

4. Transportation and Unpacking Inspection

4.1 Transportation Requirements

Improper transportation methods may result in personal injury or equipment damage. Strictly adhere to the following requirements during transportation:

(1) Pre-Transport Inspection: Verify the packaging is intact. If damage is observed, do not open and contact your supplier immediately.

(2) Qualified Personnel: Only professionally trained personnel may perform transportation on public roads.

(3) Packaged Transport: Transport the device in its original packaging and follow all safety labels on the packaging.

(4) Securing Devices: Use appropriate restraints (e.g., straps, brackets) to prevent movement during transit.

(5) Upright Position: Keep the device vertically upright. Horizontal or inverted placement is prohibited to avoid internal component displacement.

(6) Tilt Limit: The tilt angle during upright transport must not exceed 10°.

(7) No Disassembly: Transport the device as a complete unit. Unauthorized disassembly voids the warranty.

(8) Avoid Impacts: Prevent severe vibration, shocks, or compression. Sudden drops or lifts are prohibited. Minimize bumps and tilting.

(9) Orientation Compliance: Follow the "This Side Up" label on the cabinet. Avoid inversion, tilting, drops, collisions, rain/snow exposure, or submersion.

(10) Regulatory Compliance: Adhere to international road transport regulations and requirements of origin, transit, and destination countries.

(11) Transport Routes: Use sea freight or well-paved roads. Rail or air transport is unsupported.

(12) Professional Handling: Loading/unloading must be performed by trained personnel.

(13) Gentle Handling: Handle with care to prevent damage or injury.

(14) PPE Required: Wear safety helmets, non-slip shoes, and other protective gear during handling.

(15) Moisture Protection: Implement basic moisture-proof measures if necessary.

(16) Equipment for Handling: Use forklifts, cranes, or trolleys. Test lifting/stability before full operation.

(17) Visibility Assurance: Assign assistants during handling to avoid obstructing the operator’s

view.

(18) Balance Maintenance: Monitor the device’s center of gravity to ensure stability.

4.2 Unpacking and Delivery Inspection

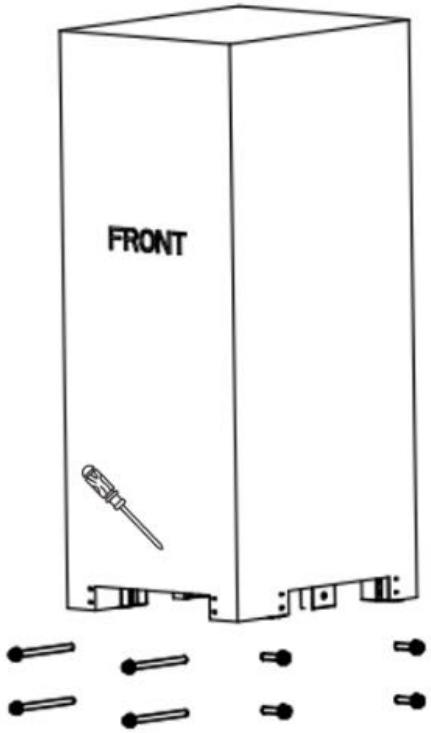
4.2.1 Unpacking Steps

Step1. Remove the four bolts on the cabinet feet at the bottom of the packaging.

Step2. Dismantle the wooden side and top panels of the packaging.

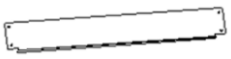
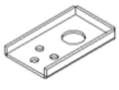
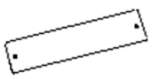
Step3. Remove external packaging materials from the electrical cabinet.

Step4. Open the rear door of the cabinet and retrieve the accessory box.



4.2.2 Delivery Inspection

Verify all received items against the packing list. Reference images below (actual items may vary):

No.	1	2	3
Name	Emergency Power Supply Cables (L/N Lines)	Forklift Hole Cover Plates (Long×N/Short×4)	Lifting Hole Cover Plates (4 pcs)
Image	L Line： 		
	N Line：		
No.	4		
Name	M6×14 Bolt Kit		

	(for forklift hole covers)		
Image			

5. Installation and Wiring

5.1 Installation Requirements

5.1.1 Environmental Requirements

No.	Items
1	Do not install in flammable, explosive, or corrosive environments.
2	Keep the installation site away from children's activity areas to prevent accidental contact or injury.
3	Avoid extreme conditions such as direct sunlight, rain, or snow accumulation.
4	Ensure adequate space for ventilation, heat dissipation, and operation (minimum 0.8m clearance around the device).
5	Install at a height that facilitates maintenance, ensuring labels, indicators, and terminals are easily visible/accessible.
6	Suitable for altitudes ≤2000m and temperatures -20℃ to +55℃ (derating at 45℃).
7	Avoid installation in strong magnetic fields or environments prone to electromagnetic interference.

5.1.2 Structural Requirements

No.	Items
1	Recommended: Build a dedicated foundation for the electrical cabinet.
2	Do not install on flammable materials. The base must have fire-resistant properties.
3	Ensure the installation base is sturdy and load-bearing to support the cabinet's weight.
4	Avoid mounting on vibration-sensitive structures to minimize noise impact on surrounding areas.

5.1.3 Orientation Requirements

No.	Items
1	Install the device vertically and horizontally. Tilting or inversion is strictly prohibited.

5.1.4 Spatial Requirements

When installing electrical cabinets alongside battery cabinets, adhere to the following clearances:

No.	Items
1	Battery cabinet to battery cabinet: >300mm
2	Battery cabinet to electrical cabinet: ≤200mm
3	Rear of battery/electrical cabinet to wall: ≥600mm
4	Side of battery cabinet to wall: ≥300mm
5	Side of electrical cabinet to wall: ≥600mm

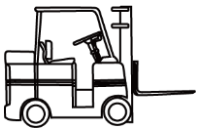
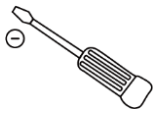
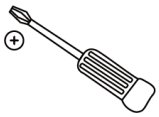
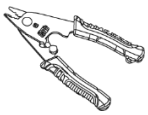
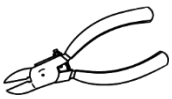
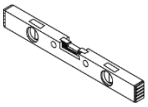
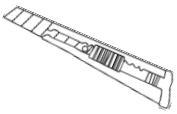
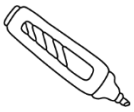
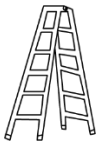
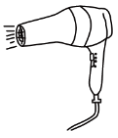
6	Front of battery/electrical cabinet: ≥800mm
Note: Consider on-site cable lengths when spacing battery cabinets.	

5.1.5 Tool Requirements

(1) Safety Equipment

				
Insulated Gloves	Work Gloves	Safety Helmet	Insulated Shoes	Reflective Vest

(2) Installation Tools

			
Forklift	Insulated Torque Wrench	Flathead Screwdriver	Phillips Screwdriver
			
Crimping Tool	Wire Stripper	Wire Cutter	Rubber Mallet
			
Multimeter	Level	Tape Measure	Utility Knife
			
Marker Pen	Insulated Ladder	Heat Gun	

5.2 Mechanical Installation

5.2.1 Foundation Construction

When selecting a foundation site, adhere to the following principles:

No.	Items
1	Consider the climatic conditions, geological features (e.g., stress wave propagation, groundwater level), and site characteristics.
2	Ensure a dry, well-ventilated environment away from flammable/explosive zones.

3	The soil must have sufficient compactness. A relative compactness ⩾98% is recommended. For loose soil, reinforce the foundation to ensure stability.

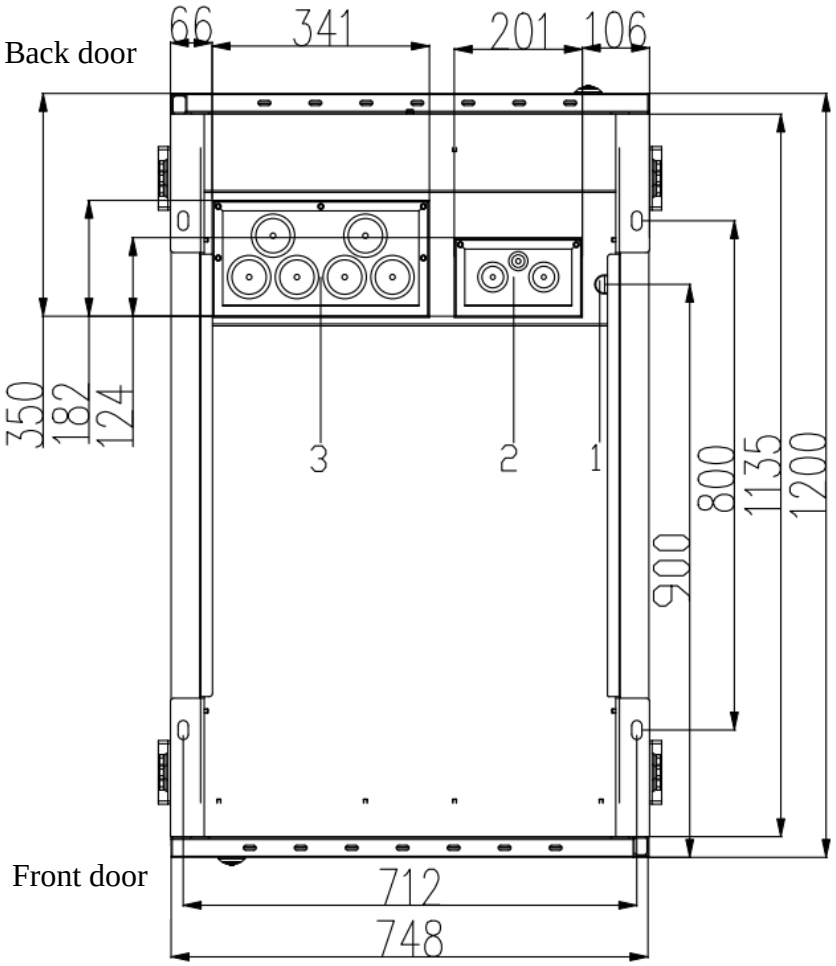
Poor foundation design may lead to difficulties in system placement, door operation, and long-term performance. The foundation must be designed and constructed to meet the following requirements:

No.	Items
1	Level and compact the base of the foundation trench.
2	The foundation must provide effective support for the electrical cabinet and integrated energy storage system, with a load-bearing capacity ⩾2 tons.
3	Ensure the foundation matches the cabinet's footprint and allows front/rear door accessibility.
4	Reserve cable routing holes during construction.
5	Pre-install power cables before positioning the cabinet, as post-installation routing is challenging due to cable thickness.

(1) Cabinet Base Structure

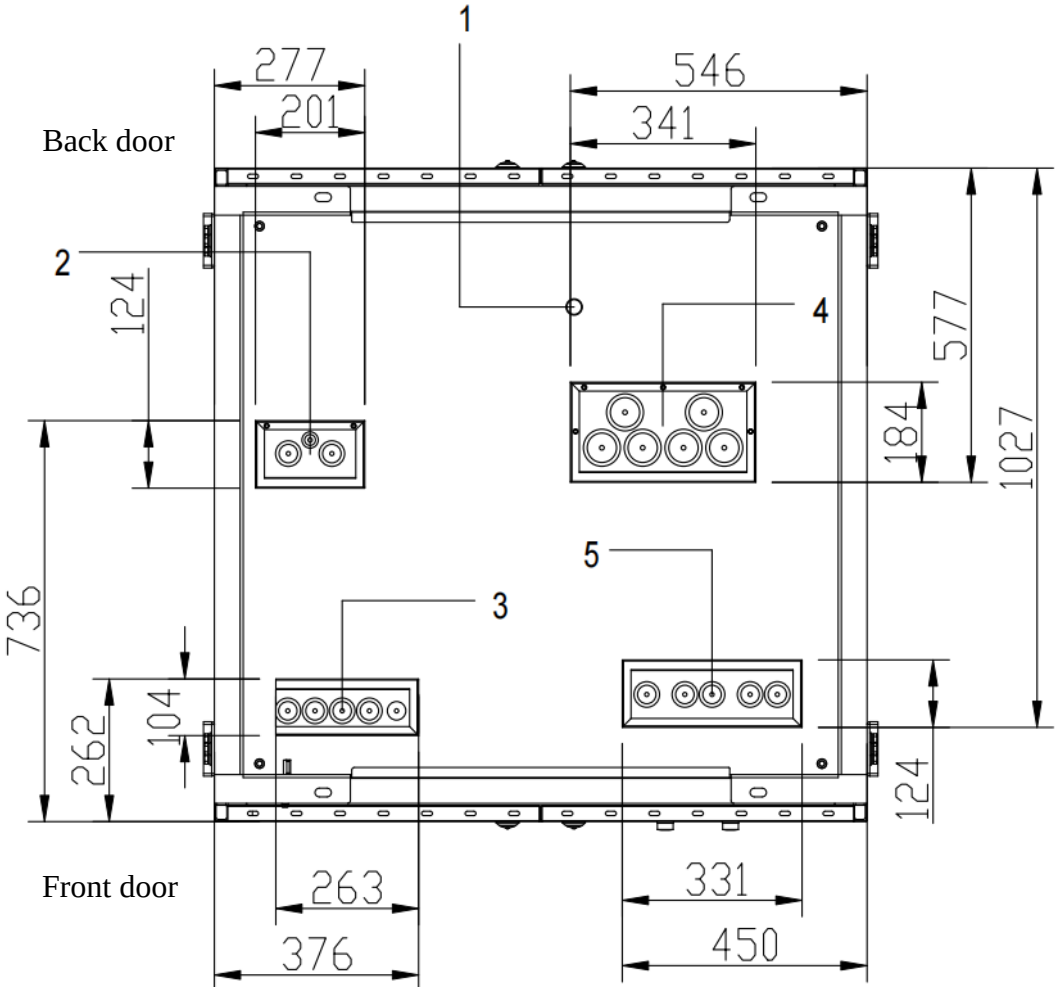
Construct the foundation according to the cabinet's base structure and dimensions.

Single-column Cabinet Base Diagram:



No.	1	2	3
Name	Dehumidifier Drain Hole	Battery Power Cable Routing Hole	Three-phase Grid Cable Routing Hole
Note: The cable routing holes are equipped with waterproof plugs. If unused, do not remove them.			

Double-column Cabinet Base Diagram:



No.	1	2	3
Name	Dehumidifier Drain Hole	Battery Power Cable Routing Hole	Load Power Cable Routing Hole
No.	4	5	
Name	Three-phase Grid Cable Routing Hole	Routing Hole Reserved	
Note: The cable routing holes are equipped with waterproof plugs. If unused, do not remove them.			

(2) Pre-Embedded Stainless Steel Connection Plate

Embed the Q235 stainless steel connection plate into the concrete foundation according to the diagram below.

Notes:

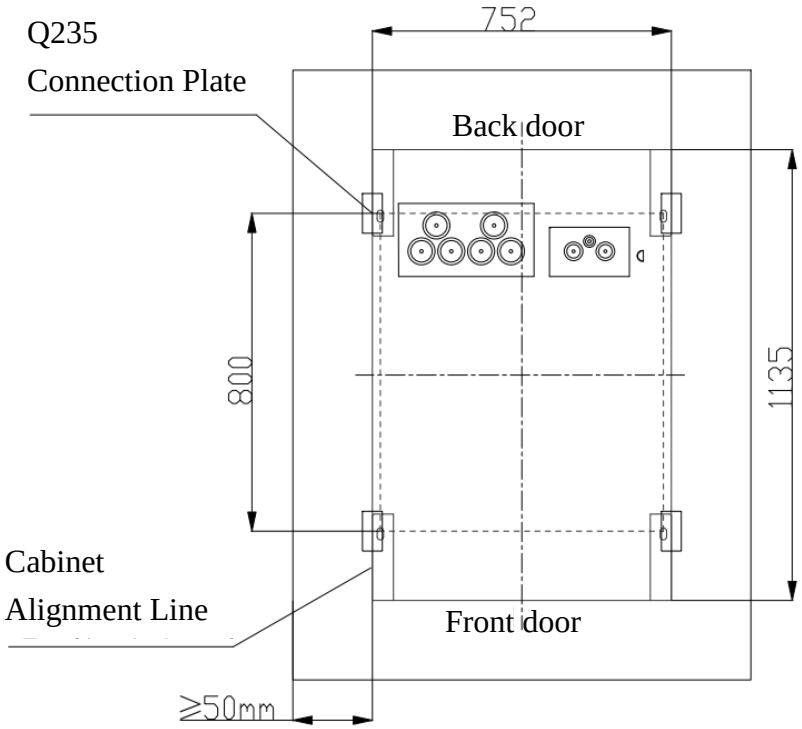
① Recommended dimensions: 100×50×15 mm.

② The plate must be flush with the concrete foundation surface.

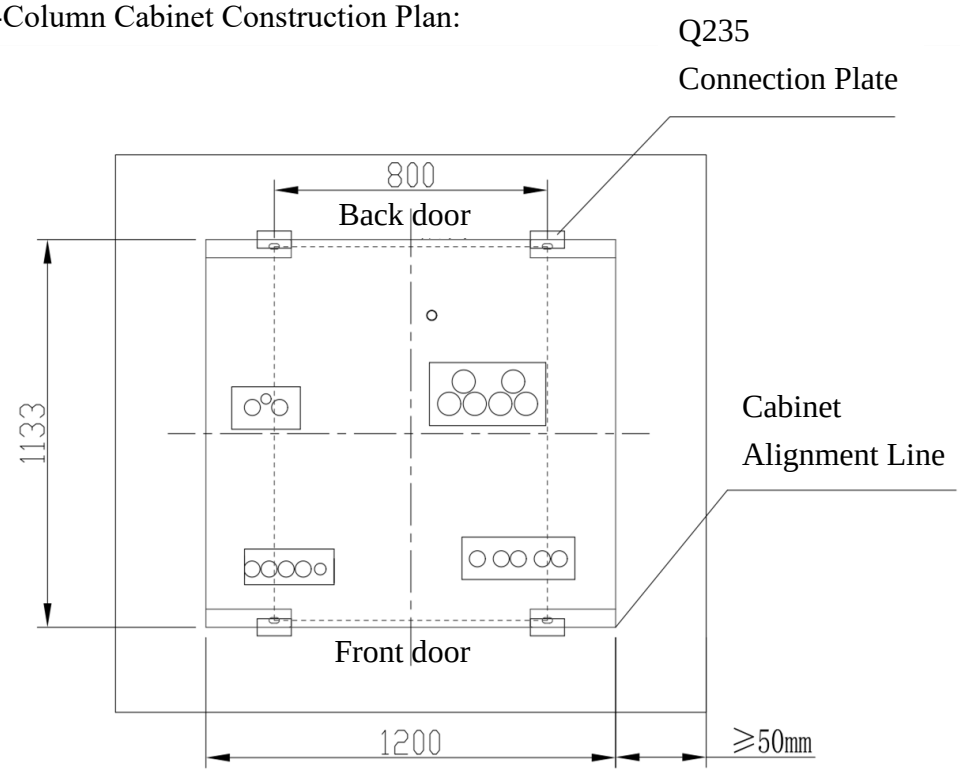
③ Foundation depth recommendation

Above ground: 200 mm Below ground: 800 mm (adjust based on site survey results).

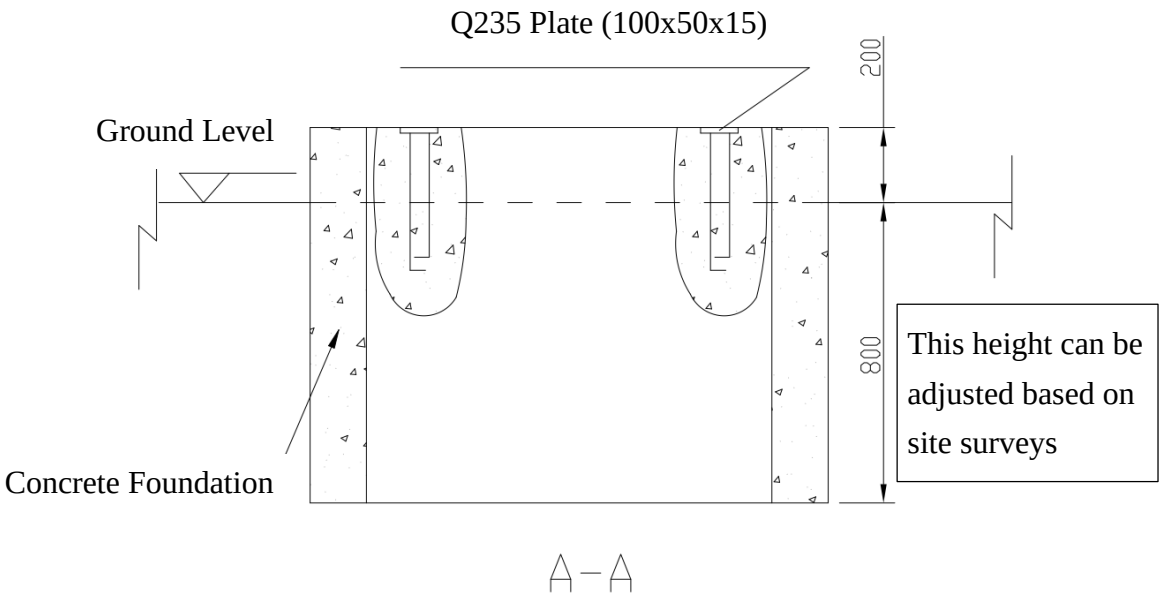
Single-Column Cabinet Construction Plan:



Double-Column Cabinet Construction Plan:



Embedded Sectional View of Stainless Steel Q235 Connection Plate:



5.2.2 Handling and Transportation

(1) Precautions

Lifting and Transportation Precautions:

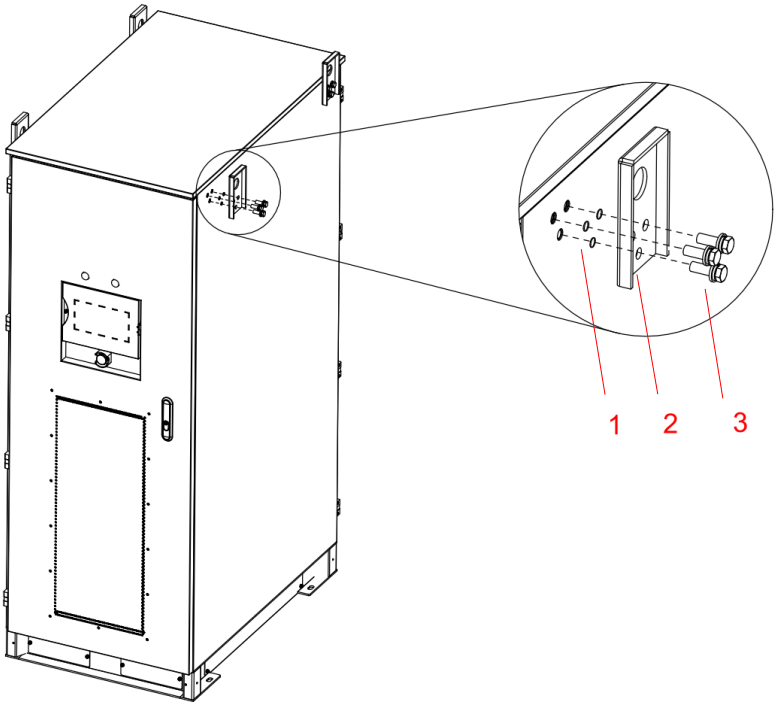
No.	Items
1	Ensure site safety during lifting. Professionals must supervise and direct the operation.
2	Use lifting slings with sufficient strength to bear the cabinet's weight. Perform a test lift before full operation.
3	Secure all sling connections. Ensure equal-length slings are attached to corner fittings.
4	Adjust sling lengths based on on-site requirements.
5	Maintain cabinet balance and alignment during lifting.
6	Use the four lifting plates on the cabinet for hoisting.
7	Lock the front/rear doors and implement auxiliary measures to ensure safe lifting.
8	Use slings with hooks or U-shaped connectors to link securely to the cabinet.

Forklift Precautions:

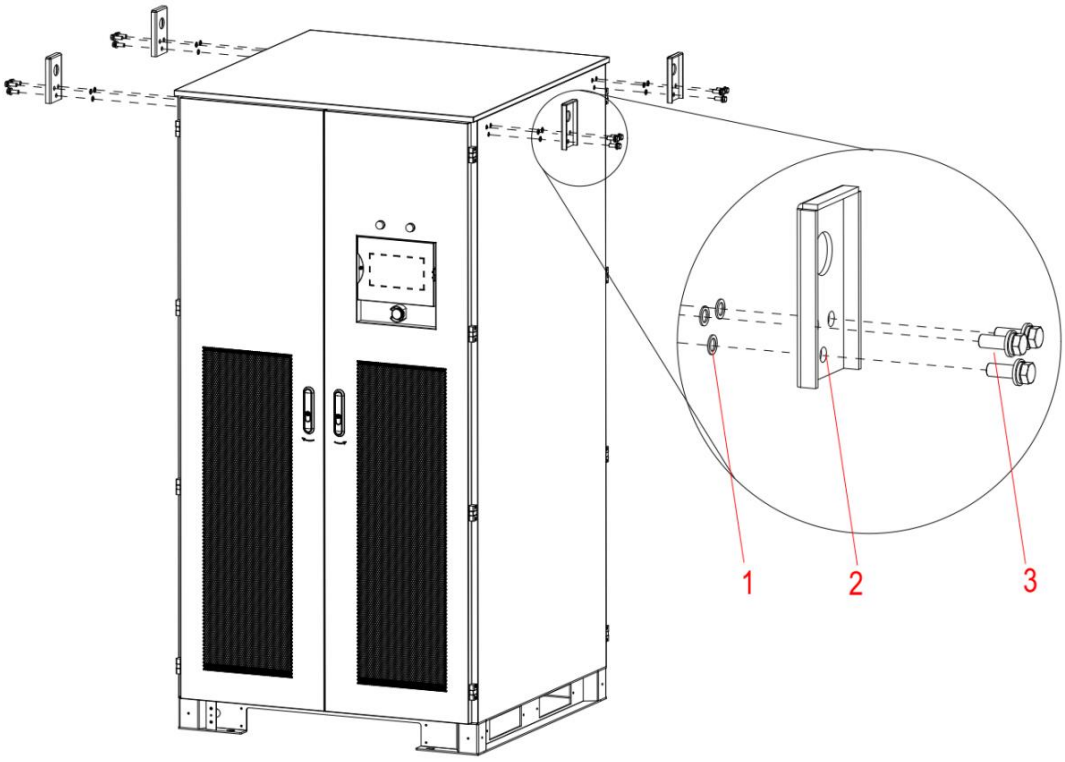
No.	Items
1	Use a forklift with≥3-ton capacity.
2	Ensure forklift prongs are appropriately sized. Perform a test lifting before transport.
3	Keep the cabinet stable during movement. Avoid tilting or abrupt elevation changes.
4	Handle gently to prevent shocks or vibrations. Operate on flat, even ground.
5	Only trained professionals may operate the forklift.
6	Lock all cabinet doors before transport to avoid damage or injury.
7	Use auxiliary measures (e.g., stabilizers) to ensure safe delivery to the target location.

(2) Installing Lifting Plates

Single-Column Cabinet:



Double-Column Cabinet:



No.	1	2	3
Name	O-Ring Seal	Lifting Plate	M12×35 Bolt
Note	Pre-installed on the cabinet	Included as accessory	Pre-installed on the cabinet

Note: The seals will be iterated out later, and the cabinet will be made watertight with screw structure modifications.

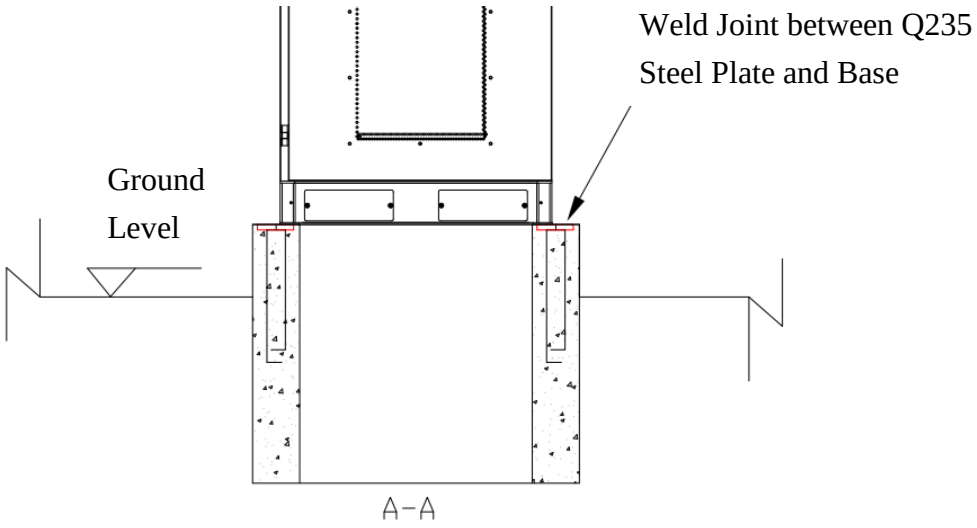
(3) Equipment Handling

Note: Due to the large size of the electrical cabinet, which may obstruct the operator's view, assign assistants during transportation to ensure safety.

5.2.3 Securing the Equipment

Weld the cabinet's base channel steel to the pre-embedded stainless steel connection plates. Refer to the diagrams below:

Single-Column Cabinet:



Double-Column Cabinet:

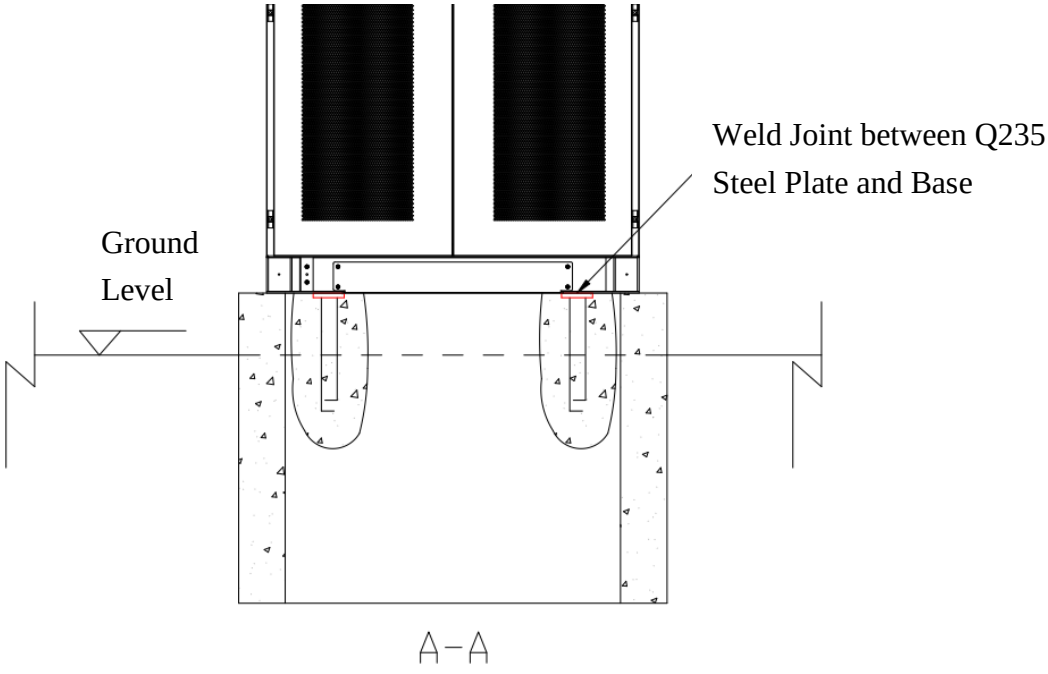


Figure 5.2.3.1 Welding Diagram of Cabinet and Embedded Steel Plate

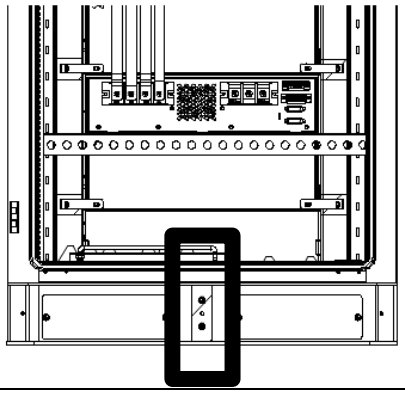
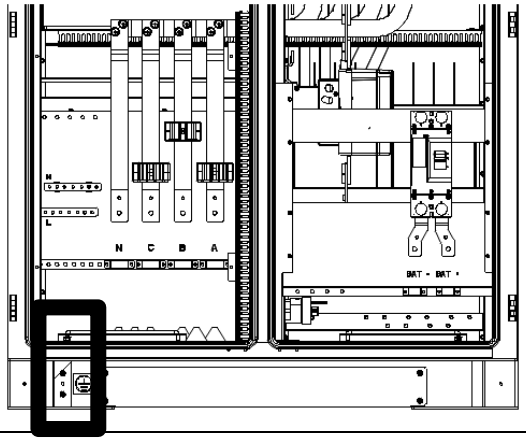
5.3 Electrical Installation

5.3.1 Wiring Precautions

No.	Items
1	Ground the cabinet first during wiring.
2	Perform all wiring operations with the power off.
3	High-voltage electric shock hazard exists during operation. Only qualified electricians may operate the cabinet.
4	Incorrect connections to input/output terminals will damage the equipment.
5	Failure to follow these warnings may result in severe injury, equipment damage, or death!

5.3.2 Grounding Grid Connection

(1) Grounding Bar Locations

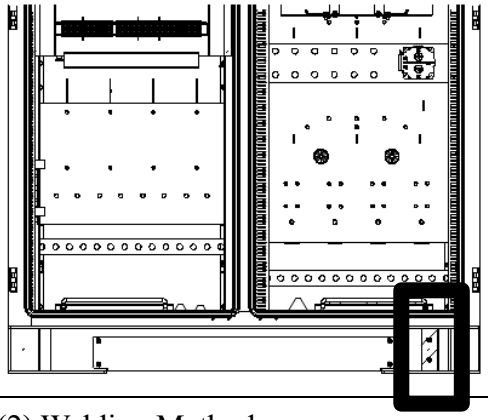
Position 1	Position 2
OSP-200K-A (OSP-100K-A) (OSP-200K-A OSP-200K-A2) Back View 	OSP-200K-B (OSP-200K-B OSP-200K-B2) Back View 
Position 3	

OSP-400K-A4

(OSP-300K-A3)

(OSP-400K-A2 OSP-400K-A4)

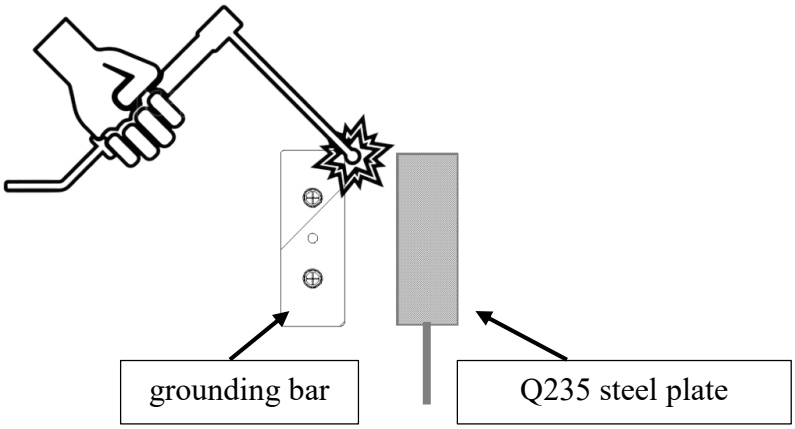
Back View



(2) Welding Method

Components: Grounding bar ↔ Q235 connection plate.

Procedure: Weld the Q235 steel plate to the grounding bar.

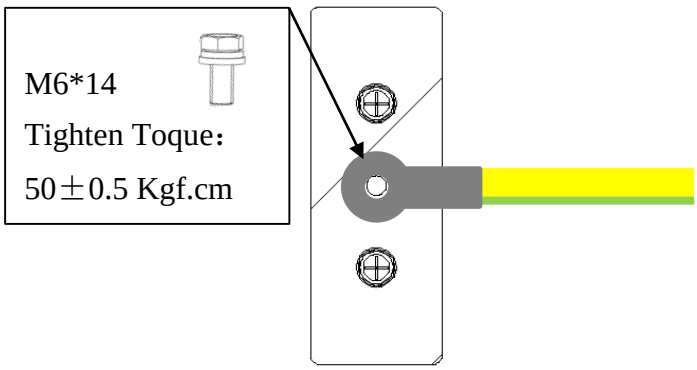


(3) Wired Connection Method

Cable Specifications:

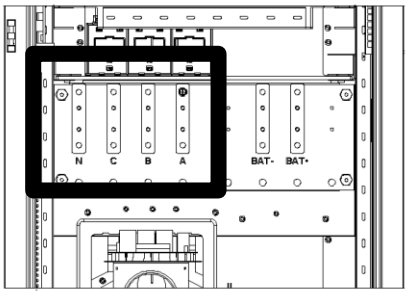
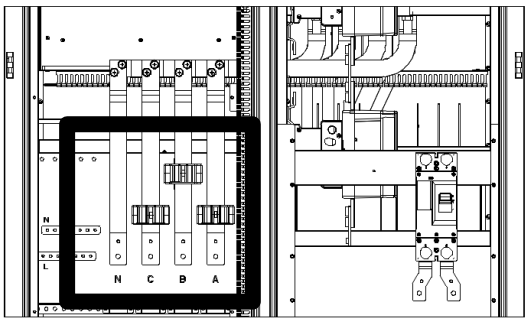
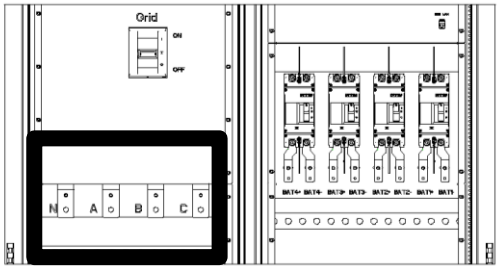
Cross-section: 10 mm² (UL10269 standard).

Terminal Bolt: M6×14. Torque: 50 ±0.5 kgf·cm.



5.3.3 Grid Connection

(1) Wiring Positions

Position 1	Position 2
OSP-200K-A (OSP-100K-A) (OSP-200K-A OSP-200K-A2) Back View 	OSP-200K-B (OSP-200K-B OSP-200K-B2) Back View 
Position 3	
OSP-400K-A4 (OSP-300K-A3) (OSP-400K-A2 OSP-400K-A4) Front View 	

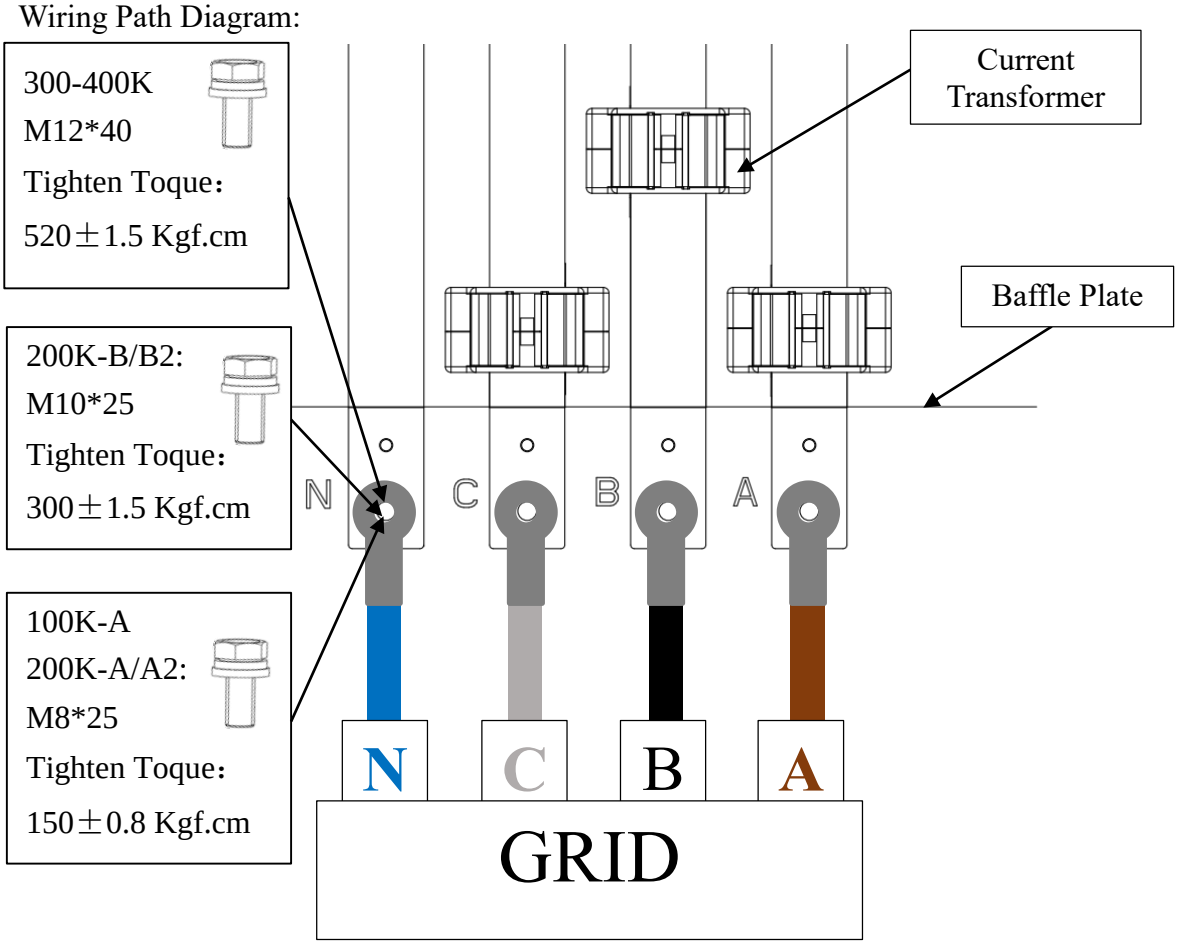
(2) Cable Specifications

Model	Cable Specifications
OSP-100K-A	Insulated copper cable, OT terminals. Recommended cross-section: 70 mm² (70-10), UL3932.
OSP-200K-A\A2	Insulated copper cable, OT terminals. Recommended cross-section: 150 mm² (150-12), UL3932.
OSP-200K-B\B2	Insulated copper cable, OT terminals. Recommended cross-section: 2×150 mm² (150-12), UL3932.
OSP-300K-A3	Insulated copper cable, OT terminals. Recommended cross-section: 2×120 mm² (120-12), UL3932.
OSP-400K-A2\A4	Insulated copper cable, OT terminals. Recommended cross-section: 2×150 mm² (150-12), UL3932.

(3) Wiring Requirements

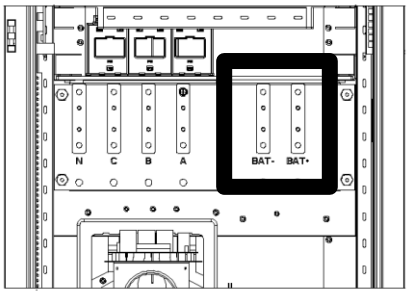
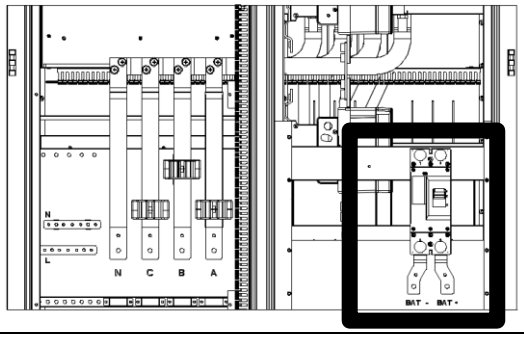
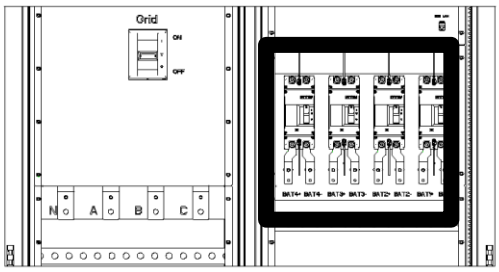
No.	Requirement
1	Connect Phase A to Phase A, Phase B to Phase B, etc. Do not cross phases.
2	Follow the silkscreen labels on the device for Phase A/B/C/N positions.
3	Ensure the ground wire is connected and the grid-side power is disconnected.

Wiring Path Diagram:



5.3.4 BAT Connection

(1) Wiring Positions

<table>
<tr><td>Position 1</td><td>Position 2</td></tr>
<tr><td>OSP-200K-A
(OSP-100K-A)
(OSP-200K-A OSP-200K-A2)
Back View
  </td><td>OSP-200K-B
(OSP-200K-B OSP-200K-B2)
Back View
  </td></tr>
<tr><td>Position 3</td><td></td></tr>
<tr><td>OSP-400K-A4
(OSP-300K-A3)
(OSP-400K-A2 OSP-400K-A4)
Front View
  </td><td></td></tr>
</table>

（2）Cable Specifications

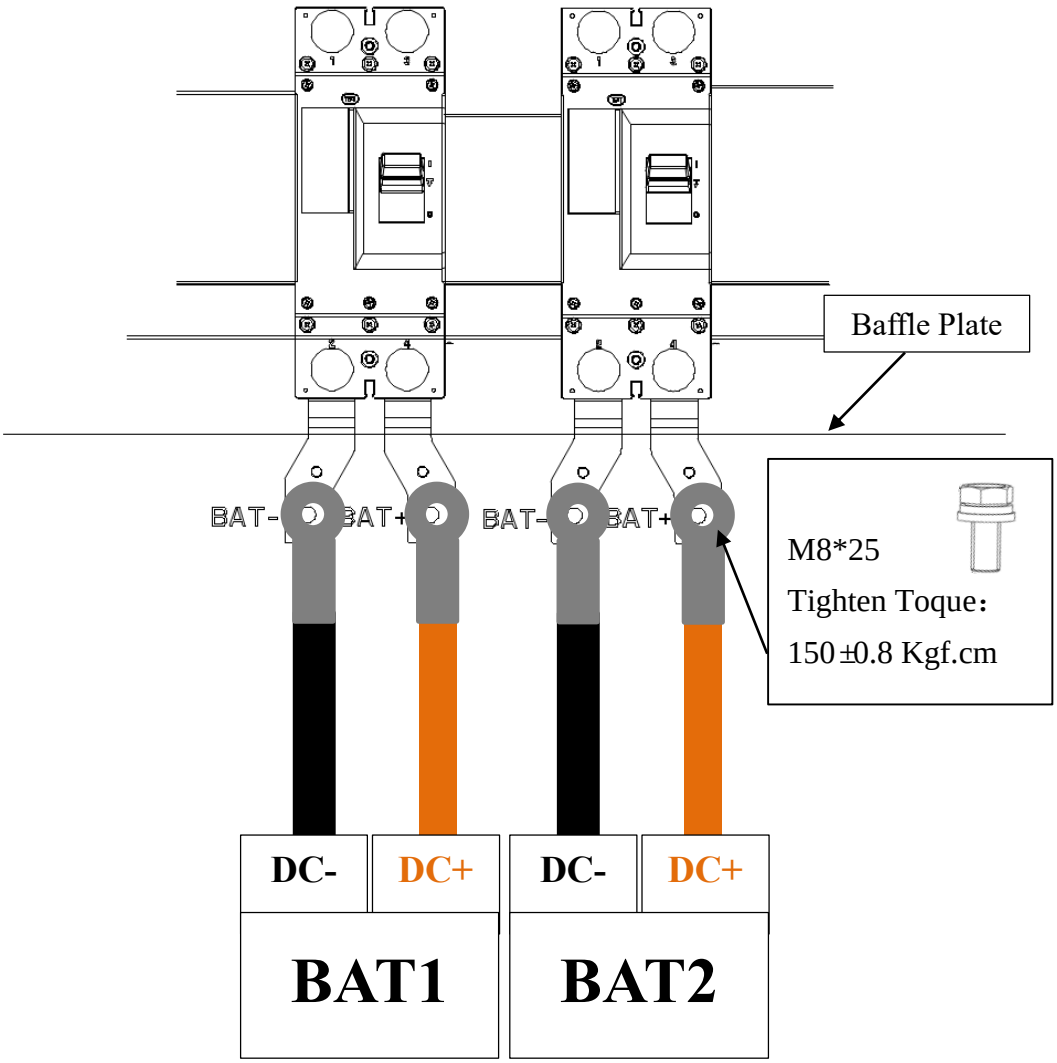
Name	Recommended Specifications
BAT+/− Power Cables	Insulated copper cable, OT terminals, UL3932. Cross-section: 50 mm ²/ 70 mm ² / 95 mm ²(when using self-supplied cables, align with the connector inner diameter on the battery cabinet side).

(3) Wiring Requirements

No.	Requirement
1	Connect positive to positive and negative to negative. Do not reverse polarity.
2	Follow the silkscreen labels on the device for BAT+ and BAT− positions.

3	Ensure the ground wire is connected and the battery-side power is disconnected.

Wiring Path Diagram:



5.3.5 Connect Critical Loads (Optional)

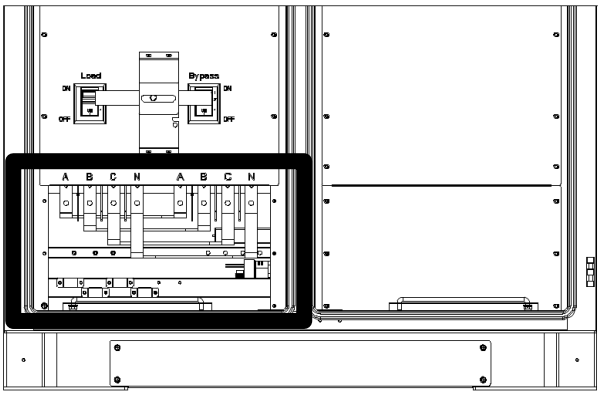
Note: Only Series-B products include critical load terminals. Skip this section for Series-A.

(1) Terminal Locations

Position 1 (with cover plate removed):	Position 1 (with cover plate installed):

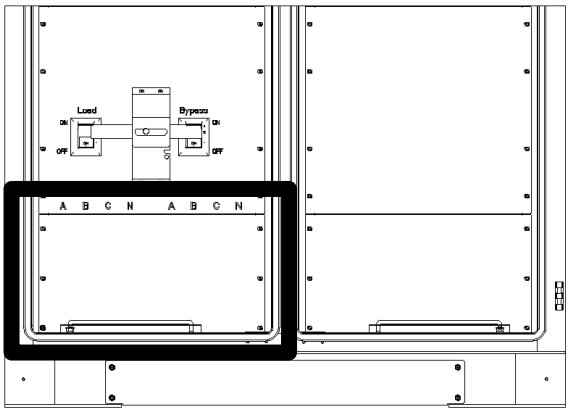
OSP-200K-B\B2

Front View



OSP-200K-B\B2

Front View



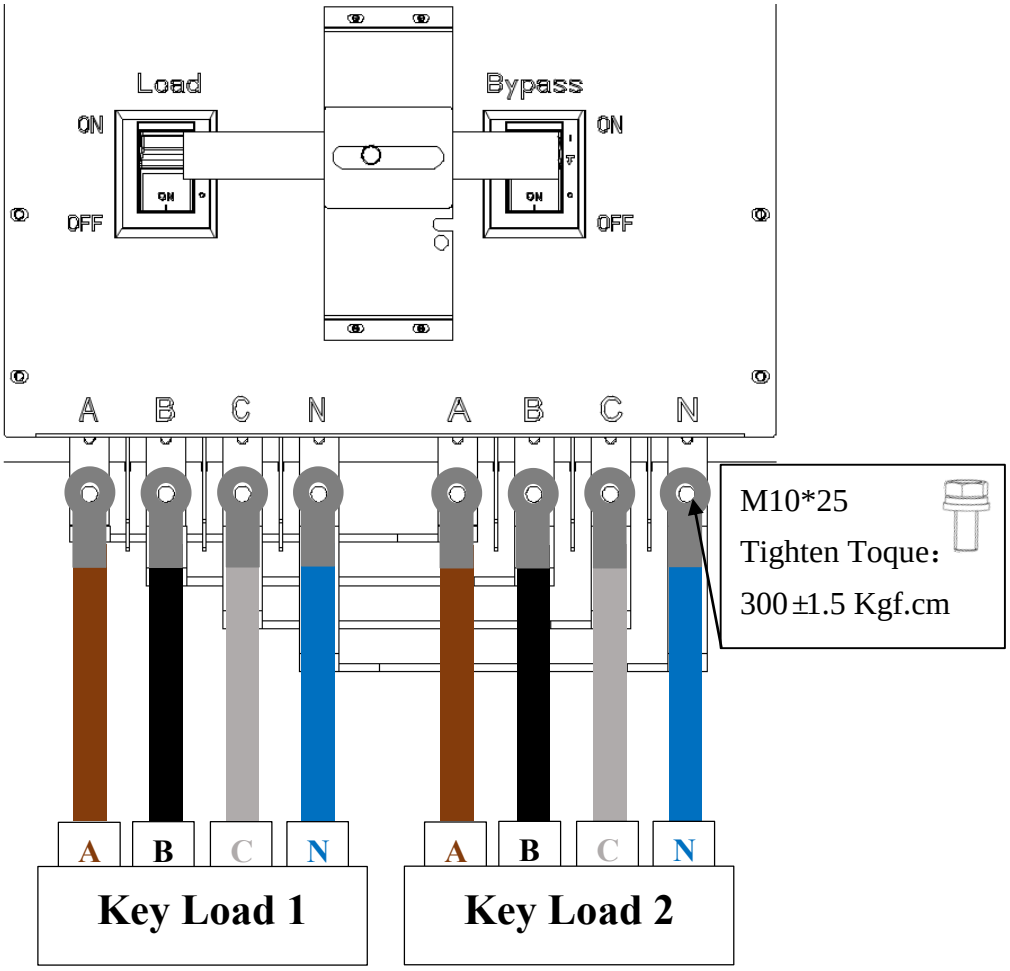
(2) Cable Specifications

Name	Recommended Specifications
A/B/C/N Phase Wires	Insulated copper cable, OT terminals. Cross-section: 95 mm ²(95-10), UL3932.

(3) Wiring Requirements

No.	Requirement
1	Connect Phase A to Phase A, Phase B to Phase B, etc. Do not mismatch phases.
2	Follow the silkscreen labels on the device for Phase A/B/C/N positions.
3	Ensure the ground wire is connected and AC load side power is off during wiring.
4	The key load side supports two-way access, but the total power on the load side needs to be less than 200kW.

Wiring Path Diagram:



5.3.6 Connect Auxiliary Power

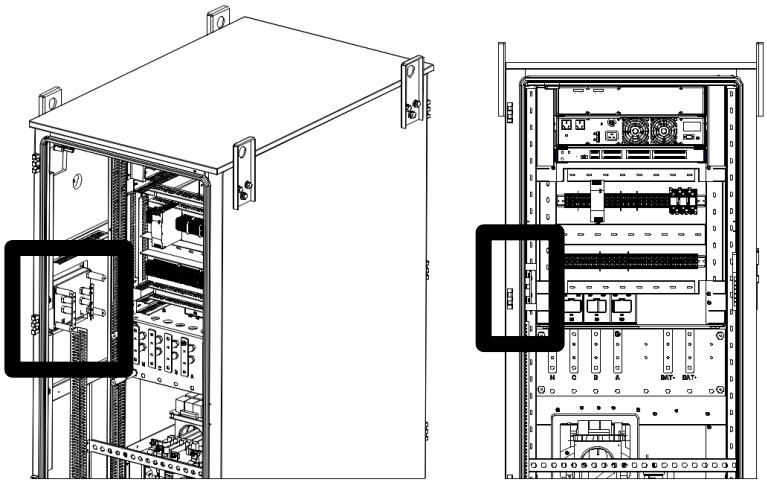
(1) Terminal Location

Position 1

OSP-200K-A

(OSP-100K-A OSP-200K-A OSP-200K-A2)

Back View



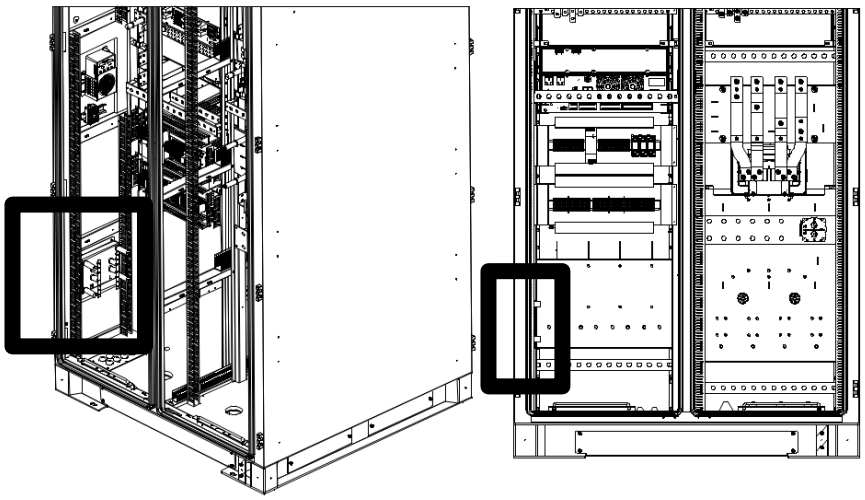
Position: 2

OSP-400K-A4

(OSP-300K-A3)

(OSP-400K-A2 OSP-400K-A4)

Back View

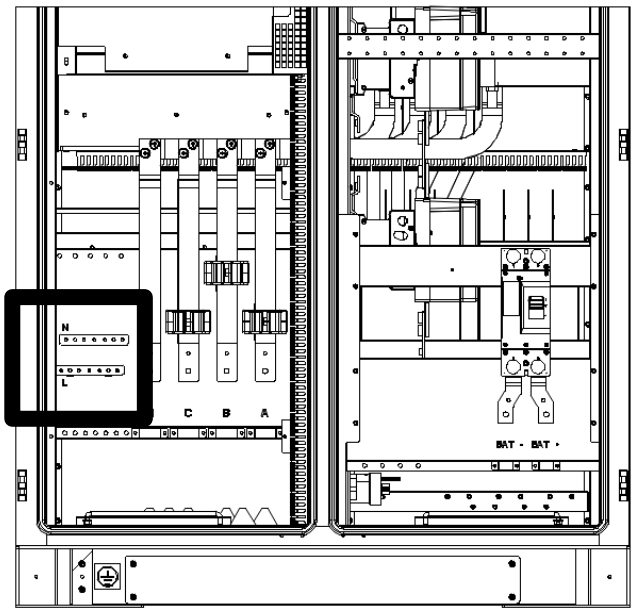


Position: 3

OSP-200K-B

(OSP-200K-B OSP-200K-B2)

Back View



(2) Cable Specifications

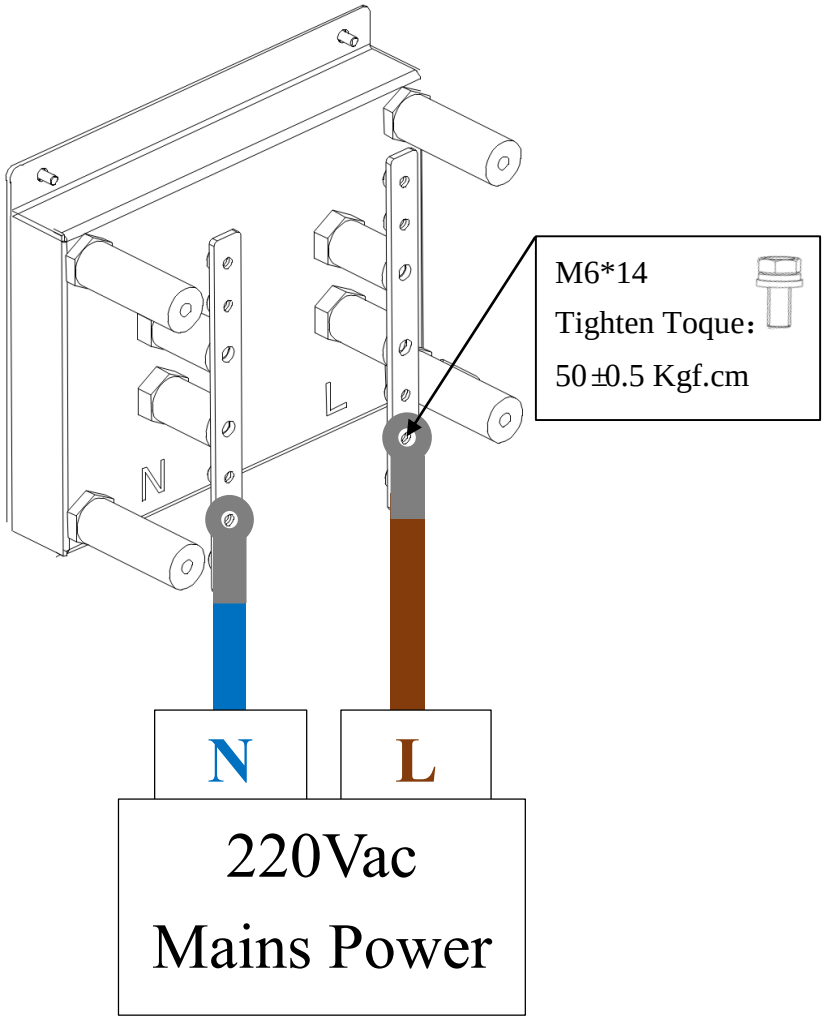
Name	Quantity of Oasis L215	Recommended Specifications

L/N Lines	1pcs	10AWG，UL10269，OT terminals；
	2pcs	6AWG，UL10269，OT terminals；
	3pcs	4AWG, UL10269，OT terminals；
	4pcs	3AWG, UL10269，OT terminals；

(3) Wiring Requirements

No.	Items
1	Connect Live (L) to Live(L) and Neutral (N) to Neutral(N). Do not cross-connect.
2	Follow the silkscreen labels on the device for Live (L) and Neutral (N) positions.
3	Ensure the ground wire is connected and the 220Vac mains power is disconnected during wiring.

Wiring Path Diagram:



5.3.7 Connect BAT Liquid Cooler Power Cables

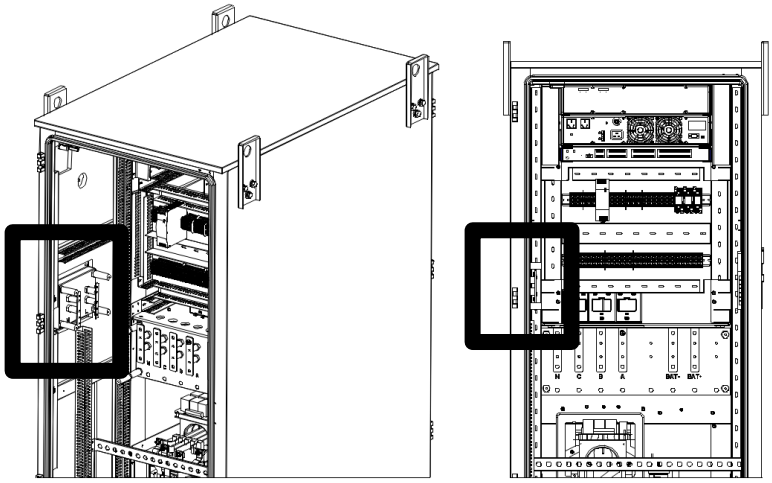
(1) Terminal Location

Position 1

OSP-200K-A

(OSP-100K-A OSP-200K-A OSP-200K-A2)

Back View



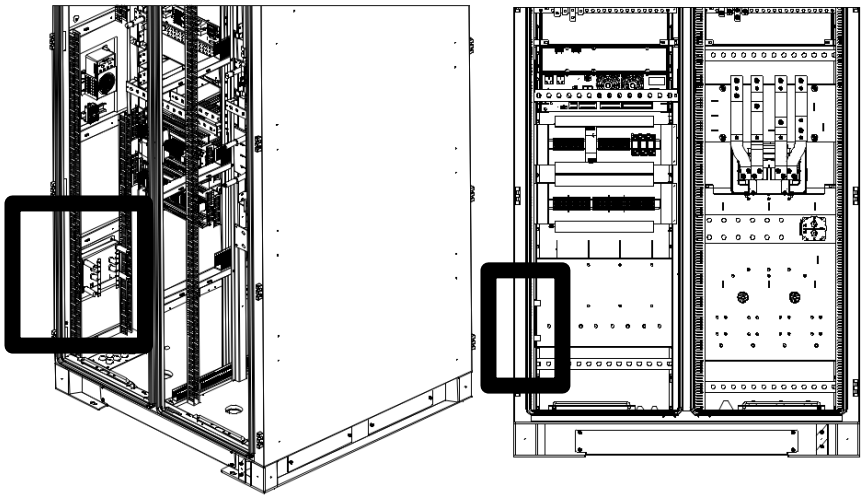
Position 2

OSP-400K-A4

(OSP-300K-A3)

(OSP-400K-A2 OSP-400K-A4)

Back View

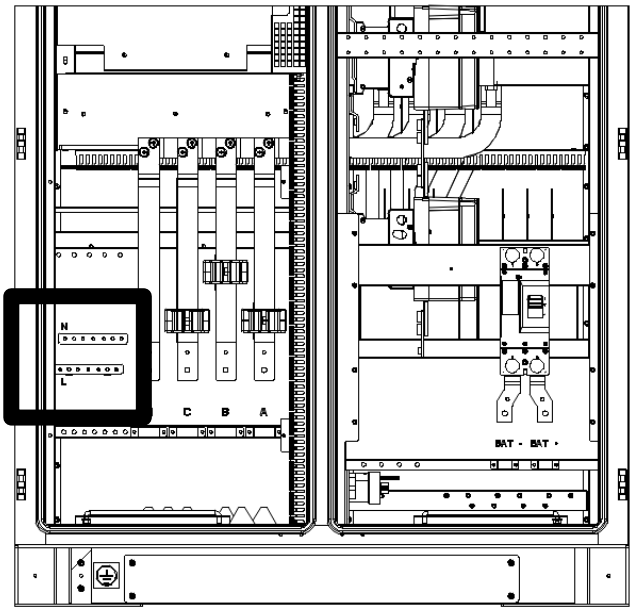


Position 3

OSP-200K-B

(OSP-200K-B OSP-200K-B2)

Back View



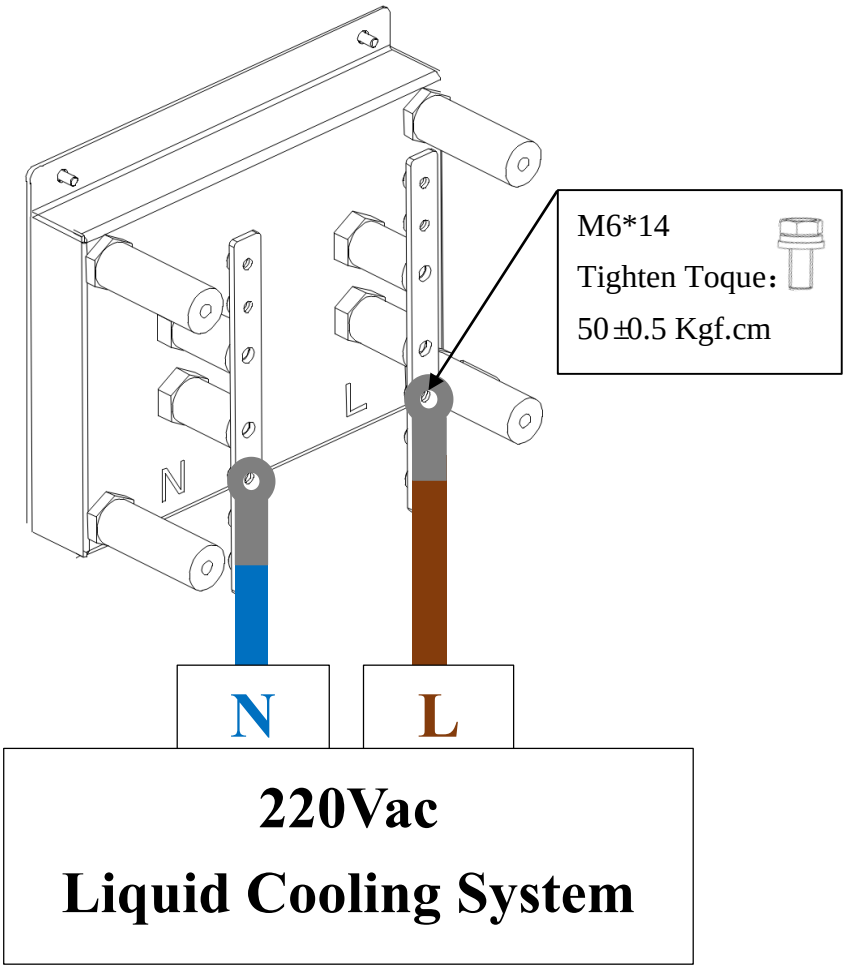
(2) Cable Specifications

Name	Recommended Specifications
L/N Lines	UL10269 10AWG cable with OT terminals (Oasis Power) and EVN6010 ring terminals (Oasis L215).
Note: If the system includes a DC combiner cabinet, refer to its manual for cable specifications.	

(3) Wiring Requirements

No.	Items
1	Connect Line (L) to Line and Neutral (N) to Neutral. Do not reverse polarity.
2	Follow the silkscreen labels on the device for L/N terminal positions.
3	Ensure the ground wire is connected, and power off both the liquid cooler and the entire energy storage system.
Note: If the system includes a DC combiner cabinet, connect the liquid cooler power cables to the DC combiner cabinet instead of the Oasis Power.	

Wiring Path Diagram:



5.3.8Connect BAT High-Voltage Box Power Cables

(1) Terminal Locations

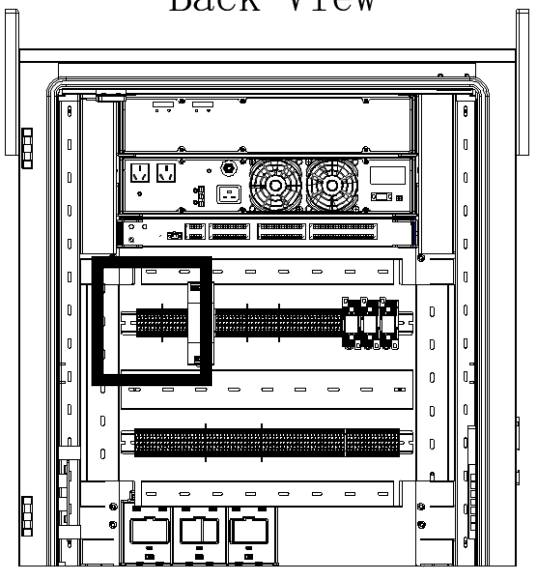
Position 1	Position 2

OSP-200K-A

(OSP-100K-A)

(OSP-200K-A OSP-200K-A2)

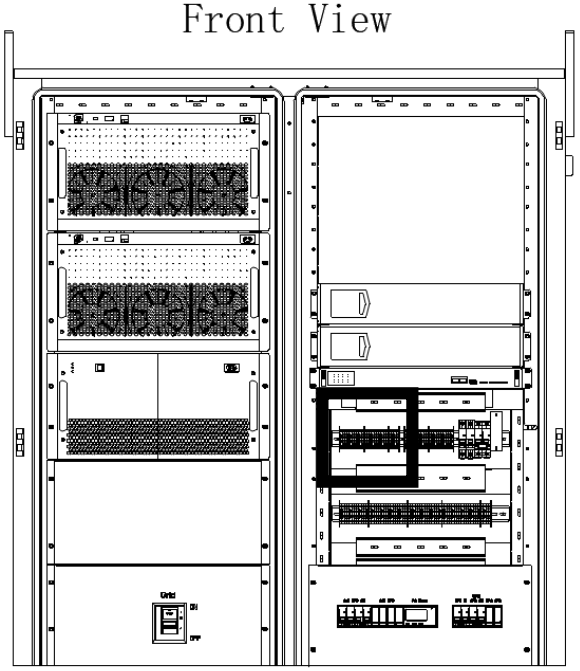
Back View



OSP-200K-B

(OSP-200K-B OSP-200K-B2)

Front View



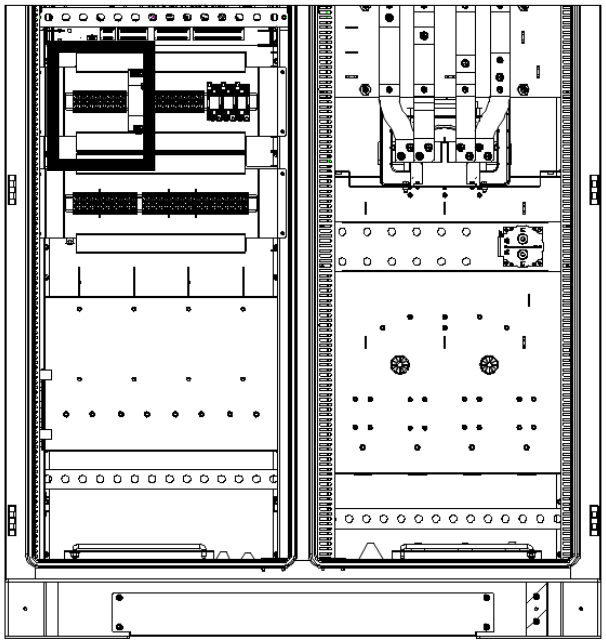
Position 3

OSP-400K-A4

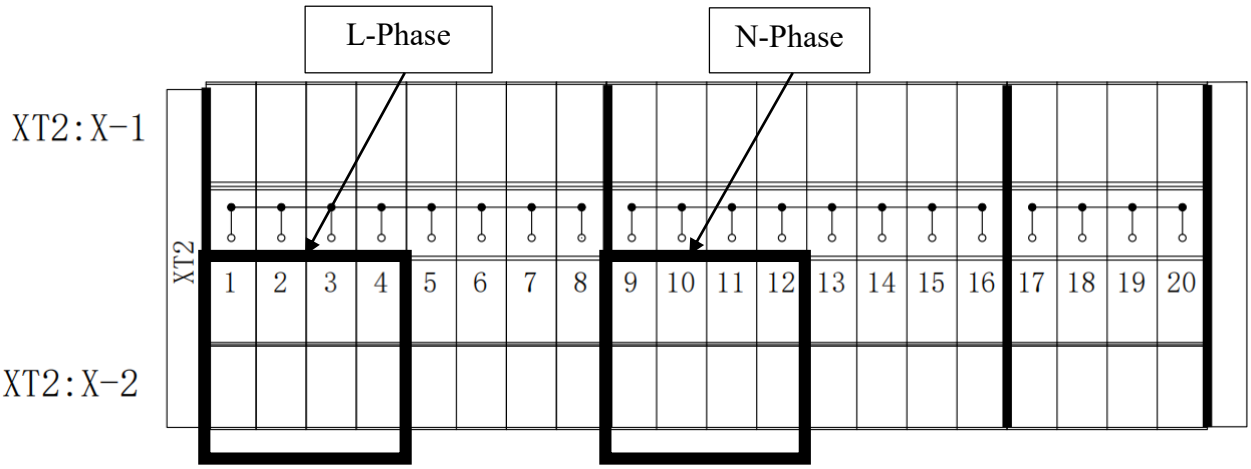
(OSP-300K-A3)

(OSP-400K-A2 OSP-400K-A4)

Back View



Description (Partial Zoom View):



Note: For -B Series products (OSP-200K-B/B2), terminal access points are visible only after removing the cover plate.

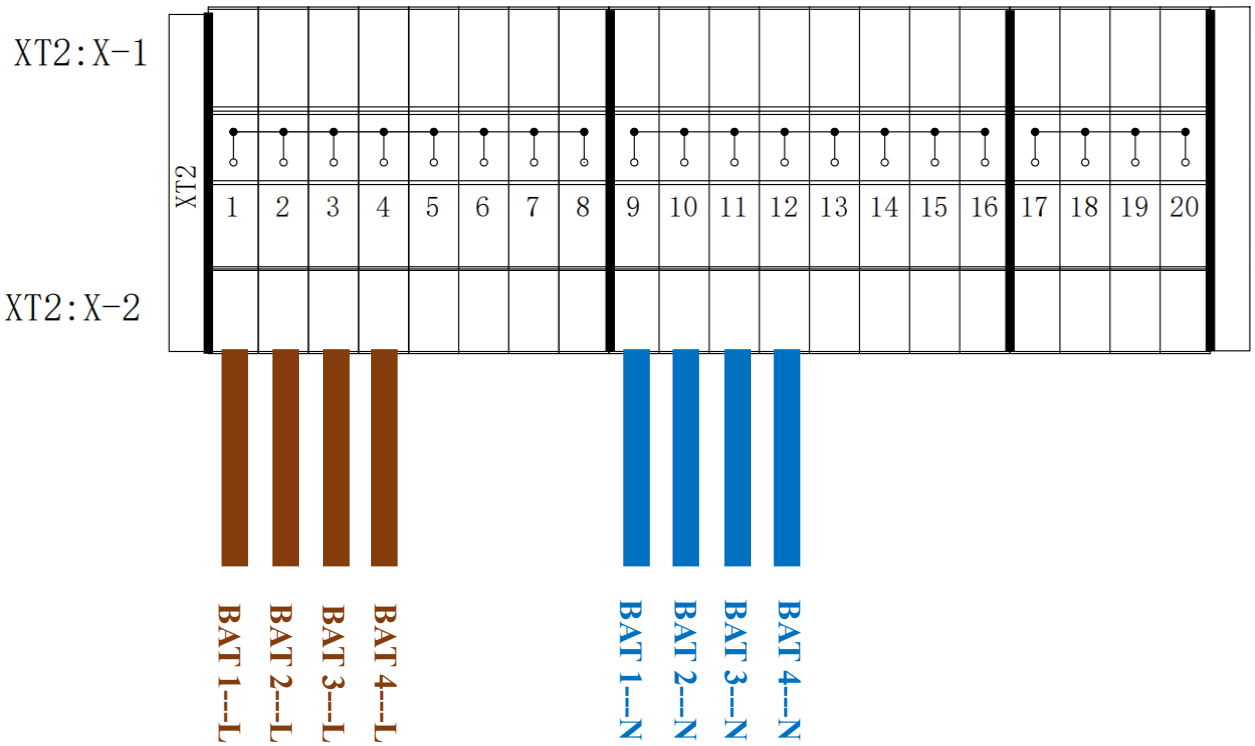
(2) Cable Specifications

Name	Recommended Specifications
L/N Lines	UL10269 18AWG cable with EVN2510 ring terminals (Oasis L215 series).
Note: If the system includes a DC combiner cabinet, refer to its manual for cable specifications.	

(3) Wiring Requirements

No.	Requirement		
1	Ensure the ground wire is connected, and power off the battery system and inverter cabinet.		
2	Follow the silkscreen labels on the device for terminal positions.		
3	Terminal assignments for different battery cabinets:		
	Battery 1 Auxiliary Power	L-Phase	XT2:1-2；
		N-Phase	XT2:9-2；
	Battery 2 Auxiliary Power	L-Phase	XT2:2-2；
		N-Phase	XT2:10-2；
	Battery 3 Auxiliary Power	L-Phase	XT2:3-2；
		N-Phase	XT2:11-2；
	Battery 4 Auxiliary Power	L-Phase	XT2:4-2；
		N-Phase	XT2:12-2；
Note: If the system includes a DC combiner cabinet, connect battery auxiliary power cables to the DC combiner cabinet instead of Oasis Power.			

Wiring Path Diagram:



5.3.9 Connect BMS Communication Lines

(1) Terminal Locations

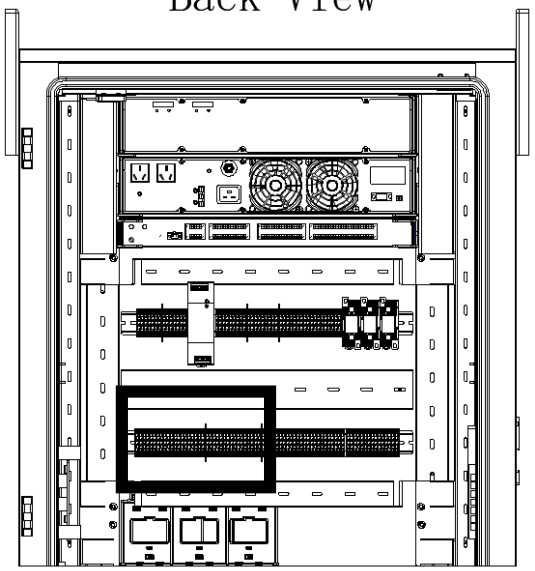
Position 1	Position 2

OSP-200K-A

(OSP-100K-A)

(OSP-200K-A OSP-200K-A2)

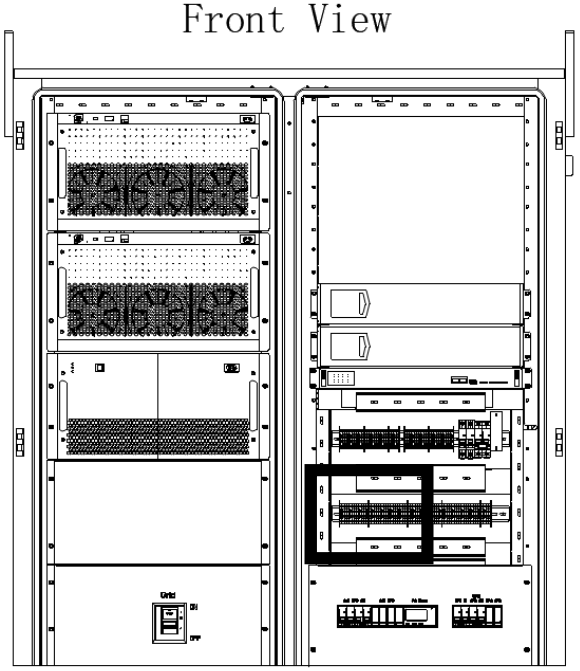
Back View



OSP-200K-B

(OSP-200K-B OSP-200K-B2)

Front View



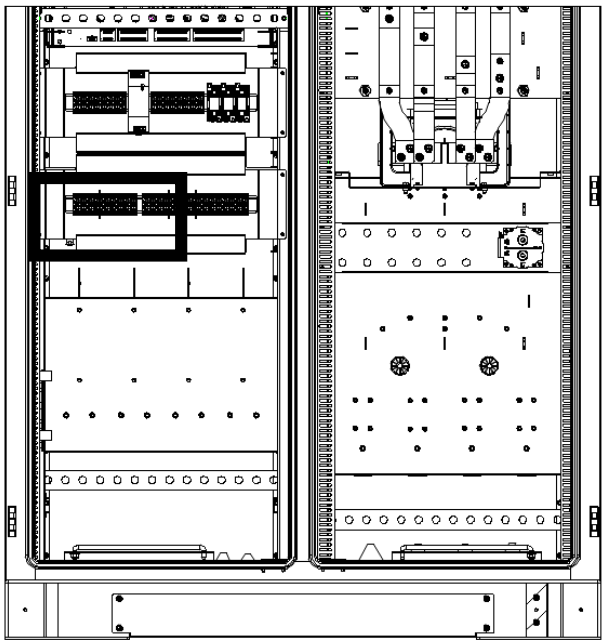
Position 3

OSP-400K-A4

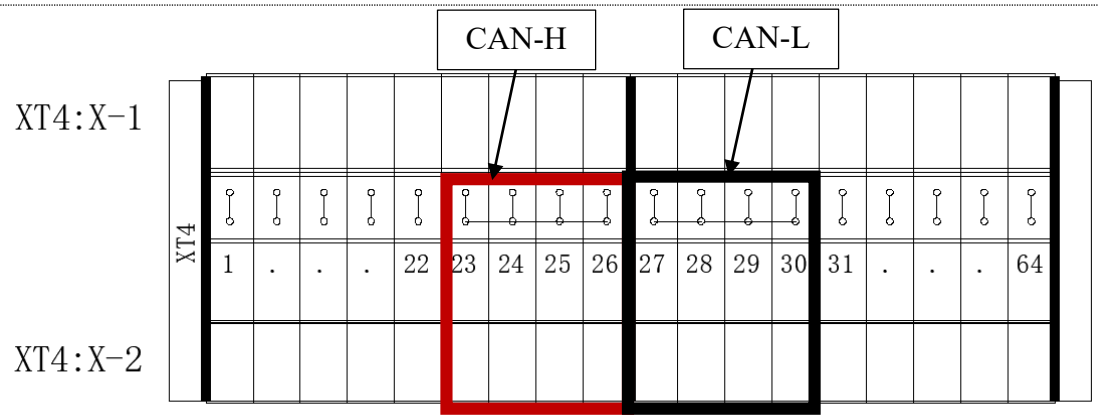
(OSP-300K-A3)

(OSP-400K-A2 OSP-400K-A4)

Back View



Description (Partial Zoom View):



Note: For Series-B products (OSP-200K-B/B2), the terminal access points are visible only after removing the cover plate.

(2) Cable Specifications

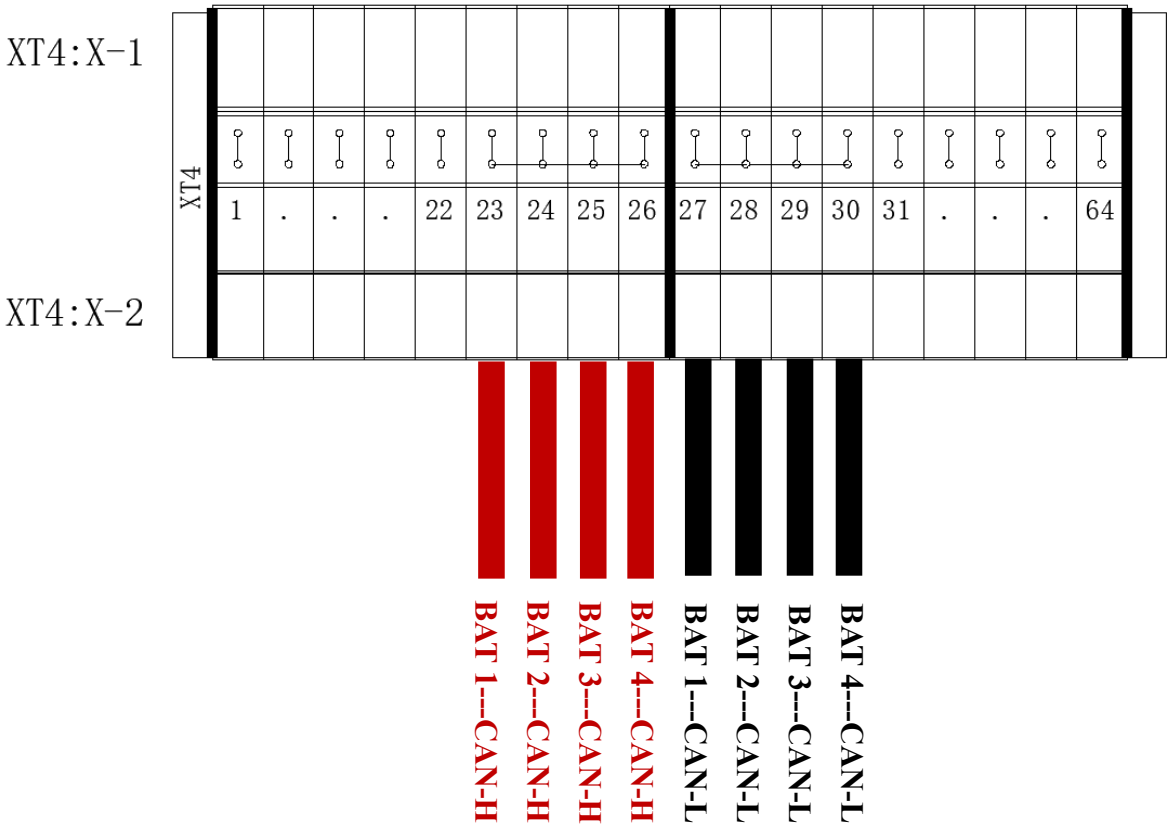
Cable Name	Recommended Specifications	Application
CAN-H/L Communication Lines	UL2517 22AWG cable with EVN0508 ring terminals (Oasis Power side) and EVN0510 ring terminals (Oasis L215 BAT side).	Connect to Oasis L215.
LAN Cable	Cat5e shielded twisted-pair (STP) cable.	Connect to DC combiner cabinet.

(3) Wiring Requirements

No.	Items		
1	Ensure the ground wire is connected, and power off the battery system and Oasis power cabinet.		
2	Follow the silkscreen labels on the device for terminal positions.		
3	Terminal assignments for different battery cabinets:		
	Battery 1 BMS Lines	CAN-H	XT4:23-2；
		CAN-L	XT4:27-2；
	Battery 2 BMS Lines	CAN-H	XT4:24-2；
		CAN-L	XT4:28-2；
	Battery 3 BMS Lines	CAN-H	XT4:25-2；
		CAN-L	XT4:29-2；
	Battery 4 BMS Lines	CAN-H	XT4:26-2；
		CAN-L	XT4:30-2；

	DC combiner cabinet BMS Lines:	LAN cable	Reserved LAN port on the EMS module.
Note: If the system includes multiple DC combiner cabinets, contact the manufacturer in advance for hardware configuration. The combiner cabinet currently supports only one busbar cabinet connection.			

Wiring Path Diagram:



5.3.10 Emergency Auxiliary Power Connection During Grid Outage

(1) Cable package number

Cable Name	L-Line	N-Line
Metarial Number	1499000008031	

Note: This harness is only active during grid outages. It supplies 220V AC power (converted by Oasis Power from battery power) to auxiliary circuit equipment in the energy system.

(2) Wiring Methods

Series-A:

Connect from the grid-side output port of cabinet to the auxiliary power terminal.

Refer to Sections 5.3.3 and 5.3.6 for detailed steps.

Series-B:

Connect from the load-side output port of cabinet to the auxiliary power terminal.

Refer to Sections 5.3.4 and 5.3.6 for detailed steps.

5.4 Installation Inspection

5.4.1 Electrical Checks

No.	Items
1	**Grounding Connections:** Ensure all grounding wires are complete, securely fastened, with no loose, missing, or miswired connections.
2	**Power Cable Connections:** Verify all power cables are fully connected, tightly secured, with no reversed polarity, missing connections, or incorrect terminals.
3	**Communication Cable Connections:**Confirm communication cables are correctly wired, securely fastened, with no loose, missing, or miswired connections.
4	**Cable Routing:** ① Cables must follow the separation principle for low-voltage and high-voltage circuits. ② Ensure wiring is straight, smooth, and free of crossovers.
5	**Cable Integrity:** ① Inspect for damage or cracks in all cables. ② Verify cables are properly routed with sufficient slack at bends.
6	**Ground Resistance Test:** Measure ground resistance to confirm the grounding grid is properly bonded.

5.4.2 Structural Checks

No.	Items
1	**Equipment Condition:** Ensure cabinets are intact with no physical damage, corrosion, or paint peeling. Repair immediately if found.
2	**Label Legibility:** All labels (e.g., terminals, warnings) must be clearly visible. Replace damaged labels.
3	**Installation Stability:** ① Verify equipment is securely installed with no wobbling. ② Confirm clearance around the equipment meets specifications.
4	**Cleanliness:** ① Ensure the work area is clean and tidy. ② Remove all construction debris from inside inverter cabinets.
5	**Reinstalled Components:**

	All protective covers, panels, and baffles removed during installation must be reinstalled with no missing components.

6. Commissioning Guide

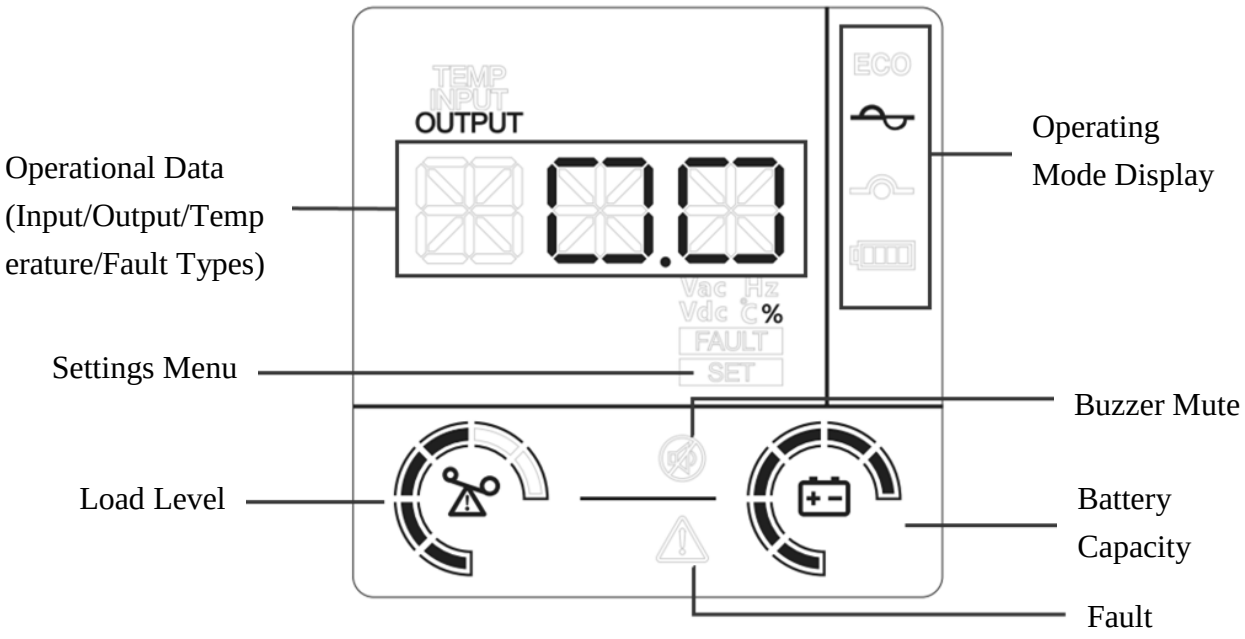
6.1 Indicator Descriptions

6.1.1 Cabinet Indicators

No.	ALM	RUN	Description
1	Off	On&Steady	Normal operation.
2	On&Steady	Off	Fault detected (system halted).
3	On&Steady	On&Steady	Abnormal operation (derated mode).

6.1.2 Module Indicators

（1）UPS



No.	Indicator	State	Description	Buzzer Action
1	Fault Alert	Off	Normal operation.	Silent.
		Flashing	Abnormal operation.	Intermittent beep.
2	Load Level	All flashing	UPS overload warning. Output shutdown imminent. Reduce load.	Rapid beep (0.5s intervals).
		Rightmost flashing	UPS overload protection activated. Output shut down.	Continuous beep.
		"Short" symbol flashing	Output short circuit. Output shut down.	Continuous beep.
3	Battery Capacity	All flashing	UPS Battery overvoltage. Check battery/charger.	Slow beep (2s intervals).
		Leftmost flashing	UPS Battery critically low.	Rapid beep

			Save data and shut down devices.	(0.5s intervals).
4	Inverter	Flashing (mains normal)	UPS power supply anomaly.	Intermittent beep.
5	Bypass Power	Flashing	PCS module fault.	Continuous beep.

Abnormal Operation Details:

Press the selection key to view fault types:			
No.	Fault Type	Description	Buzzer Action
1	EPO	UPS Emergency power-off activated. Bypass and inverter outputs disabled.	Continuous beep.
2	BUS	Internal bus voltage fault. Inverter output disabled.	Continuous beep.
3	TMP	Over-temperature protection. Check fans and airflow.	Continuous beep.
4	FAN	Fan fault warning. Inverter shutdown imminent. Check fan for damage.	Rapid beep (0.5s intervals).
		Fan fault protection. Inverter disabled.	Continuous beep.
5	OUT	Output fault (short circuit or overload).	Continuous beep.
6	BAT	Battery fault (under/over voltage).	Continuous beep.

（2）LCU

No.	Symbol	Name	State	Description
1	PWR	Power	On&Steady	Power ON.
			Off	No power or fault.
2	RUN	Running	Flashing	Normal operation.
3	ALM	Alarm	Flashing	General warning.
			On&Steady	Critical fault.
			Off	No alarms.
4	RF	4G Comms	Steady	4G module active.
5	COM1~COM8	Serial Ports	Flashing	Data transmission (orange/green).
6	NET	4G Network	\	Reserved.
7	SYNC	4G Status	\	Reserved.

（3）STS

No.	Symbol	Name	Description
1	FAULT	Fault	Steady = abnormal operation.
2	RUN	Running	Flashing = normal.
3	POWER	Power	Steady = power ON.

（4）PCS

No.	State	Description

1	Steady green	Normal operation.
2	0.5s green flash	Standby (0kW).
3	1s green flash	Powered off (no faults).
4	Steady red	Critical fault.

6.2 Commissioning Guide

6.2.1 Pre-Start Checks

(1) Mechanical Installation Checks

No.	Check Item
1	Ensure equipment is intact (no damage, rust, or peeling paint). Repaint immediately if defects are found.
2	Verify all labels are legible and undamaged. Replace damaged labels.
3	Confirm equipment is securely installed with adequate surrounding clearance.
4	Ensure the work area is clean and free of debris, especially inside the inverter cabinet.
5	Reinstall all protective covers, panels, or baffles removed during wiring.

(2) Electrical Installation Checks

No.	Check Item
1	Grounding connections are complete, secure, and free of errors.
2	Power cables are correctly polarized, fully connected, and free of reversed polarity/miswiring.
3	Communication cables are properly routed, securely fastened, and error-free.
4	High-voltage (HV) and low-voltage (LV) cables are separated and neatly routed without crossovers.
5	Inspect cables for damage or cracks; ensure bends have sufficient slack.
6	Test ground resistance to confirm proper grounding grid bonding.

6.2.2 Power-Up Sequence

Step 1: AC Secondary Power Activation

(1) Turn on UPS SPD SW switch.

(2) Turn on UPS IN switch (UPS powers on but remains idle).

(3) Press and hold the"|" (Power On) button on the UPS for 3–5 seconds to activate 220V output.

(4) Turn on UPS OUT switch (LCU/HMI/STS will start).

(5) Turn on FAN, DRY, and dehumidifier switches.

Step 2: Battery Cabinet DC Power Activation

(1) Turn on battery cabinet switches:

QF1 (Liquid Cooling)

QF2 (BMS Monitoring)

QF3 (Exhaust Fan)

(Located on the lower side of the battery cabinet compartment)

(2) Turn on QFB2 (220V Auxiliary Power) in the main control box.

(3) Rotate the main control switch to start the battery cabinet.

Step 3: DC Power Activation

(1) Turn on the BAT switch.

Step 4: Grid Power Activation

(1) Turn on the GRID switch.

Step 5: System Initialization

(1) Wait 3–5 minutes for the system to enter normal operation.

6.2.3 Startup Modes

Manual Startup (Default):

(1) On the HMI screen, navigate to Control Interface.

(2) Manually start PCS, DCDC, and MPPT modules.

(3) Set the operating mode.

Indicator: RUN LED turns steady green.

Auto-Startup (Optional):

Enable via HMI or remote client (see Section 6.2.5).

6.2.4 Shutdown & Power-Down

(1) Shutdown Procedure

On the HMI screen, select Control Interface → Shutdown

Note: This stops power modules but keeps terminals live.

(2) Power-Down Sequence

Step 1: Grid Power Deactivation

(1) Turn off the GRID switch.

Step 2: Oasis Power Cabinet DC Power Deactivation

(1) Turn off the BAT switch.

Step 3: Battery Cabinet DC Power Deactivation

(1) Rotate the main control switch to OFF.

(2) Turn off QFB2 (220V Auxiliary Power).

(3) Turn off QF1, QF2, and QF3 in the battery cabinet.

Step 3: Battery Cabinet DC Power Deactivation

(1) Rotate the main control switch to OFF.

(2) Turn off QFB2 (220V Auxiliary Power).

(3) Turn off QF1 (Liquid Cooling), QF2(BMS Monitoring), and QF3(Exhaust Fan) in the battery cabinet.

Step 4: AC Secondary Power Deactivation

(1) Turn off FAN, DRY, and dehumidifier switches.

(2) Turn off UPS OUT (LCU/HMI/STS will shut down).

(3) Press and hold the "〇" (Power Off) button on the UPS for 3–5 seconds.

(4) Turn off UPS IN and UPS SPD SW switches.

6.2.5 Manual/Auto Mode Adjustment

Configure via HMI or remote client to enable automatic startup after power-up.

Requirement: Battery voltage must remain within the operational range.

7. Fault Maintenance&Handling

7.1 Fault Identification & Resolution

Fault Code	Description	Resolution
F001	EPO Signal	Emergency Power Off (EPO) button on the front panel is pressed: Check if the EPO button is engaged. Follow the reset instructions on the button if required.
F002	IGBTOCP Fault	IGBT short circuit detected: Power cycle the system. If the fault persists, contact our support team.
F003	High-Voltage Side Hardware Overvoltage	High-voltage side exceeds hardware protection threshold: (1) Check for system faults causing bus overvoltage. (2) Verify bus voltage sampling lines are correctly connected.
F004	High-Voltage Side Hardware Overcurrent	High-voltage side exceeds hardware overcurrent threshold: (1) Check for system faults causing bus overcurrent. (2) Verify bus current sampling lines are secure.
F005	IGBT Hardware Overcurrent	IGBT Vce protection triggered: Check if the red LED on the corresponding driver board is lit. If lit: (1) Inspect ribbon cable polarity/connection between detection and driver boards. (2) Secure IGBT driver lines. (3) Check driver board for damage; replace if faulty. (4) Replace faulty IGBT module. If not lit: Check grounding integrity and control/detection board connections.
F017	24V Power Fault	Auxiliary power +15V < +12V or -15V > -12V: 1. Verify power supply to signal processing board is within range. 2. Check wiring between auxiliary power and detection boards. 3. Secure ribbon cables. 4. Replace faulty detection board.
F018	Fan Fault	Check for fan blockage or failure.
F019	Single Board Connection Fault	Abnormal connection between internal driver board and control board: Check wiring and power cycle. If unresolved, contact supplier.
F023	Surge Arrester Fault	Abnormal auxiliary contact feedback: Check surge arrester status indicator (replace if red).
F025	IGBT Module Overtemperature	IGBT temperature exceeds threshold: (1) Verify overheating (check fan operation).

		(2) Secure grid-side driver connections. (3) Replace faulty grid-side detection board.
F027	±15V Power Fault	+15V < +12V or -15V > -12V: (1) Verify signal processing board power supply. (2) Check wiring between auxiliary power and detection boards. (3) Secure ribbon cables. (4) Replace faulty detection board.
F033-F038	Grid Phase Overvoltage/Undervoltage (AB/BC/CA Line)	Line voltage exceeds/falls below thresholds: (1) Confirm grid voltage stability. (2) Adjust protection settings if needed. (3) Secure voltage detection lines.
F039	Grid Overfrequency	Grid frequency exceeds threshold: (1) Verify grid frequency. (2) Adjust overfrequency protection settings.
F040	Grid Underfrequency	Grid frequency below threshold: (1) Verify grid frequency. (2) Adjust underfrequency protection settings.
F041	Grid Phase Sequence Error	Incorrect phase sequence (ABC required): (1) Correct grid phase wiring. (2) Adjust voltage sampling line sequence.
F042-F044	Grid Phase A/B/C Software Overcurrent	Phase overcurrent detected during operation: (1) Investigate grid overcurrent causes. (2) Adjust overcurrent protection settings.
F049	Precharge Bus Overvoltage	Bus voltage too high during precharge: (1) Validate bus voltage accuracy. (2) Test precharge contactor in step-debug mode. (3) Adjust precharge overvoltage threshold.
F050	Precharge Bus Undervoltage	Bus voltage too low during precharge: (1) Validate bus voltage accuracy. (2) Test precharge contactor. (3) Adjust undervoltage threshold.
F051	Uncontrolled Rectification Bus Overvoltage	Bus overvoltage during uncontrolled rectification: (1) Verify bus voltage accuracy. (2) Adjust overvoltage settings.
F052	Uncontrolled Rectification Bus Undervoltage	Bus undervoltage during uncontrolled rectification: (1) Verify bus voltage accuracy. (2) Test main contactor operation. (3) Adjust settings.
F053	Modulation Bus Overvoltage	Bus overvoltage during normal operation: (1) Verify bus voltage accuracy. (2) Adjust overvoltage settings.
F054	Modulation Bus Undervoltage	Bus undervoltage during normal operation: (1) Verify bus voltage accuracy. (2) Test main contactor operation. (3) Adjust undervoltage settings.
F057	Current Mode Bus Undervoltage	Bus undervoltage in current mode: Confirm external battery or DCDC supply voltage is normal.

F065	Precharge Timeout	Precharge fails to reach target voltage: (1) Validate bus voltage accuracy. (2) Test precharge contactor. (3) Adjust precharge voltage/time thresholds.
F066	Precharge Phase A Overcurrent	Overcurrent during Phase A precharge: (1) Inspect precharge circuit wiring. (2) Verify current sampling circuit.
F067	Precharge Phase B Overcurrent	Overcurrent during Phase B precharge: (1) Inspect precharge circuit wiring. (2) Verify current sampling circuit.
F068	Precharge Phase C Overcurrent	Overcurrent during Phase C precharge: (1) Inspect precharge circuit wiring. (2) Verify current sampling circuit.
F069	AC Capacitor Overcurrent	Filter capacitor current exceeds threshold: Confirm capacitor overcurrent condition.
F070	AC Capacitor Overvoltage	Filter capacitor voltage exceeds threshold: Check capacitor voltage detection circuit.
F083	ADC Zero Drift	Excessive ADC channel zero drift: (1) Secure current/voltage sampling lines. (2) Replace grid-side detection board.
F101	Main Contactor Closure Failure	Contactor fails to close: (1) Verify timing parameters. (2) Secure driver/status lines (P1A). (3) Inspect relay and contactor. (4) Replace faulty contactor.
F102	Main Contactor Opening Failure	Contactor fails to open: (1) Verify timing parameters. (2) Secure driver/status lines (P1A). (3) Inspect relay and contactor. (4) Replace faulty contactor.
F103	Main Contactor Closure State Error	Contactor detected as open during operation: (1) Inspect contactor. (2) Secure status feedback line (P1A).
F104	Main Contactor Opening State Error	Contactor detected as closed during shutdown: (1) Inspect contactor. (2) Secure status feedback line (P1A).
F116	Grid Islanding	Grid power loss detected: Confirm grid status.
F117	System Discharge Fault	Contact supplier.
F118	System Resonance	System resonance detected: Confirm grid resonance conditions; contact support if unresolved.
…	…	Contact supplier.

7.2 Routine Maintenance

Environmental factors (temperature, humidity, dust, vibration) accelerate component aging and wear, increasing the risk of latent faults. Regular maintenance is critical to ensure operational reliability

and extend service life.

All measures to keep equipment in optimal condition fall under maintenance scope.

7.2.1 Safety Precautions

No.	Items
1	Authorization: Only qualified and authorized personnel may perform maintenance.
2	Debris Control: Avoid leaving metal objects (screws, washers) inside equipment.
3	Live Terminals: Terminals remain live even if circuit breakers are open.
4	Pre-Maintenance Steps: Disconnect all circuit breakers (front/rear). Wait≥5 minute after shutdown. Disconnect external/internal power cables.
5	Re-energization Prevention: Lock out/tag out all power sources.
6	De-energization Verification: Use a multimeter to confirm no residual voltage.
7	Grounding & Short-Circuiting: Implement temporary grounding for high-voltage components.
8	Insulation: Cover nearby live parts with non-conductive materials.

7.2.2 Electrical & Mechanical Inspections

Perform quarterly checks and document results:

No.	Item	Status (✓/✗)
1	Grounding Connections	
2	DC Input Wiring	
3	DC Output Wiring	
4	AC Input Wiring	
5	AC Output Wiring	
6	Communication Cables	
7	DC Switches & Fans	
8	Fault Log Review	

7.2.3 Cleaning & Dust Management

Pre-Commissioning: Clean terminals and ventilation mesh.

Ongoing:

(1) Cabinet Exterior: Remove dust from cabinet tops and fan inlets every 3 months.

(2) Dust Filter Mesh: Replace or wash door-mounted filters (power off required during replacement).

(3) Equipment Room: Clean dust, check ventilation/exhaust systems, and clear debris from fan outlets and insect screens.

Critical Note:

Fan blockage due to dust accumulation may cause overheating shutdowns. Clean mandatorily every 3 months.

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