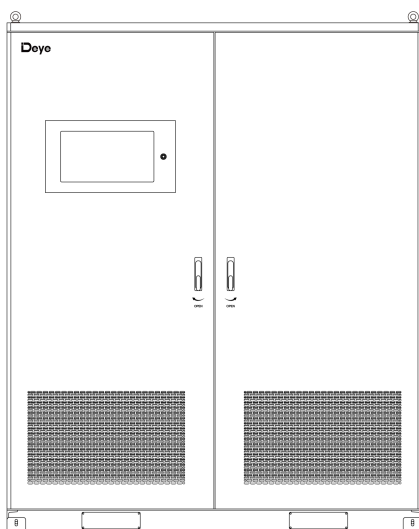


**Junction Panel Cabinet
WS-TS1000-2-A/B**



Preface

This manual provides information on safety, installation, electrical connection, operation, maintenance, and other relevant aspects of the product.

In this manual, the terms “equipment”, “device”, and “product” refer to the product or its components; the terms “manufacturer”, “producer”, and “the Company” refer to NINGBO DEYE ESS TECHNOLOGY CO., LTD. (hereinafter referred to as the “Company”) or its authorized agents.

The illustrations in this manual are for reference only and may differ from the actual product. The Company reserves the right to modify the content without prior notice. For the latest version, please visit our official website or contact our after-sales service.

The Company assumes no liability for any losses arising outside the scope of the warranty policy.

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Convention

Symbols	Description
 DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTE	Indicates supplementary explanation, clarification, or emphasis on a particular content for better understanding.



NINGBO DEYE ESS TECHNOLOGY CO., LTD. hereby confirms that the products described in this document comply with the fundamental requirements and other relevant provisions of the applicable EU directives.

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1 Safety

1.1 Symbols

Symbols	Description
	Warning; Electricity
	General Warning
	Warning; Hot surface
	Separate collection for waste electrical and electronic equipment is required
	Refer to instruction manual
	Operator's manual
	This way up
	Fragile
	Keep away from rain
	Do not roll
	Do not stack
	Center of gravity
	Insert the forklift forks at the position indicated
	Connect an earth terminal to the ground
	TÜV Rheinland Type Approved Mark

1.2 Safety Precautions

Personal safety



DANGER

- Keep the equipment out of reach of children and animals.
- Only personnel authorized by the company are permitted to repair or disassemble the system. Unauthorized operations may cause fatal electric shock.



WARNING

- Wiring and electrical connections must be performed by personnel with knowledge of electronics, electrical wiring, and mechanics, and who are familiar with the electrical and mechanical schematics of this equipment.



CAUTION

- Personnel planning to install, operate, or maintain this equipment must:
 - Read, understand and strictly comply with all safety instructions specified in this manual and relevant document.
 - Follow applicable local standards and regulations.
 - Be qualified professionals or trained personnel (as defined in the NOTE below).
- Avoid direct contact with equipment components to prevent scalding caused by high temperatures generated during malfunction.

NOTE

- Qualified professionals: Personnel familiar with the working principles and structure of the equipment, who have received training or have operation experience, and are fully aware of the sources and risk levels of potential hazards during equipment installation, operation and maintenance.
- Trained personnel: Personnel who have completed technical and safety training, have qualified practical operation experience, are aware of potential hazards to themselves and others during specific operations, and are capable of taking protective measures to minimize those hazards.

Electrical Safety



DANGER

- Dangerous lethal high voltage is present inside the unit. Contact with live terminals and internal charged parts will result in fatal electric shock.



WARNING

- Before any installation, maintenance or inspection work, cut off and isolate all external and internal power sources. Confirm the unit is fully de-energized before operation.
- The equipment must be reliably grounded with a grounding resistance complying with local regulations.
- During all operations, use insulated tools and wear personal protective equipment. Remove all metal accessories such as watches and rings.
- Keep terminals away from exposed wires and metal objects.
- Do not place any tools or metal parts on the high-voltage control box.
- All adjacent exposed live parts must be fully covered and shielded with insulating materials.



CAUTION

- Ensure correct wiring. Distinguish positive and negative poles strictly to prevent short circuits with external devices.
- Do not use faulty or incompatible power conversion equipment.
- Verify that system parameters are fully compatible with connected equipment.

Mechanical Safety



DANGER

- Installation or operation of the equipment in explosive or high-humidity areas is strictly prohibited.



WARNING

- Do not insert foreign objects into any part of the equipment.
- Set up standard warning signs and safety barriers near the equipment to prevent accidents caused by mis-operation or unauthorized access.



CAUTION

- Route all cables in designated positions. Exposed and irregular cable layout is susceptible to mechanical damage.

Maintenance Safety



DANGER

- Disassembling or modifying the equipment is strictly prohibited.



WARNING

- Fully de-energize the equipment before equipment relocation or any maintenance work.
- All terminals and circuit connectors must be disconnected before maintenance.
- Maintenance shall follow the sequence: equipment de-energization, lockout/tagout to prevent re-energization, zero-voltage verification, residual charge discharge and equipment grounding, and insulation shielding of adjacent live parts.
- Failure to observe warnings, improper installation, or operation by untrained personnel will lead to potential safety hazards.

NOTE

- Do not paint any internal or external components of equipment.
- Do not clean the equipment with cleaning solvents.
- The equipment should be commissioned no later than six months after delivery.

Environmental Safety



DANGER

- Open flames, sparks, and other ignition sources must be kept away from the equipment at all times.



WARNING

- Do not expose the equipment to flammable substances, corrosive chemicals, or their vapors.
- Do not submerge the equipment in water or expose it to excessive moisture. The ingress protection rating of the equipment is only valid for fully assembled and intact configuration.

NOTE

- Where this manual does not cover a specific scenario, applicable safety regulations and occupational health standards shall prevail.

2 Product Introduction

2.1 Product Overview

WS-TS1000-2-A/B is a static transfer switch cabinet rated at 1000 kW, designed for industrial and commercial energy storage and micro-grid applications. It enables seamless transition between multiple power sources, including the grid, energy storage systems, and diesel generators, to ensure uninterrupted power supply to critical loads.

The following tables lists the main difference in WS-TS1000 series.

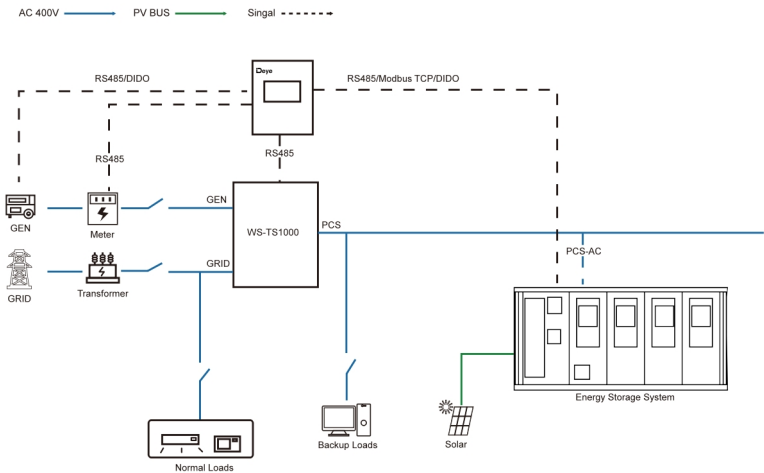
Model	Bypass Mode
WS-TS1000-2-A	Yes
WS-TS1000-2-B	No

This manual describes the product in its complete configuration with all optional features included.

2.2 Application Scenarios

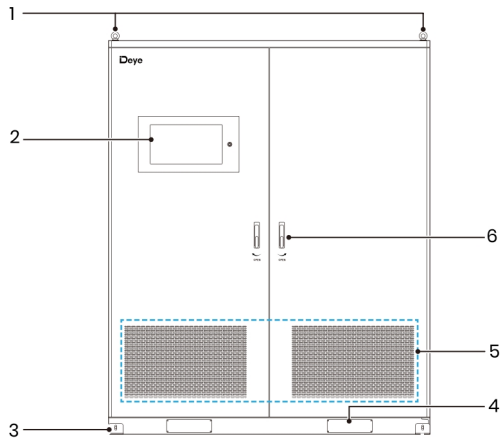
The WS-TS1000-2-A/B cabinet, when integrated with battery storage systems such as WS-GS2000 series or MC-L522 series, forms a complete on-grid/off-grid transfer system. This architecture supports a full-scenario micro-grid application that integrates solar PV, energy storage, an energy management system (EMS), and a diesel generator. For other possible system architectures tailored to specific requirements, please consult your system integrator.

A grid-tied application scenario integrating PV, an energy storage system, EMS, and diesel generators is shown below.



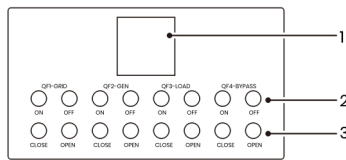
2.3 Product Appearance

Front View



No.	Item	No.	Item
1	Eye Bolt	4	Forklift Pocket
2	Control Panel*	5	Air Inlet
3	Cabinet Mounting Feet ×4	6	Door Lock

*Control Panel

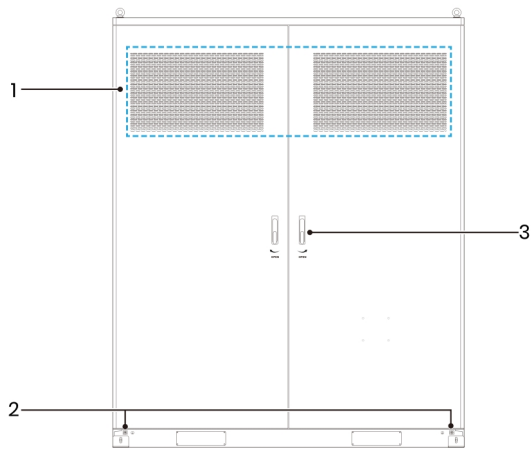


No.	Item	Description
1	Meter	Displays real-time electrical parameters of the cabinet.
2	ON/OFF Indicators	ON Indicator (Red): on when the corresponding circuit breaker is closed; OFF Indicator (Green): on when the corresponding circuit breaker is open.
3	CLOSE/OPEN Buttons	Press the CLOSE/OPEN button to close or open the corresponding circuit breaker.

NOTE

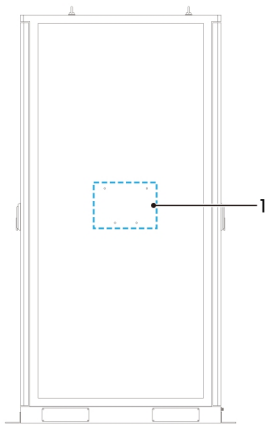
- The indicators and buttons for QF4-Bypass are only available on WS-TS1000-2-A.

Rear View



No.	Item	No.	Item
1	Air Outlet	3	Door Lock
2	Protective Earth Terminal	/	/

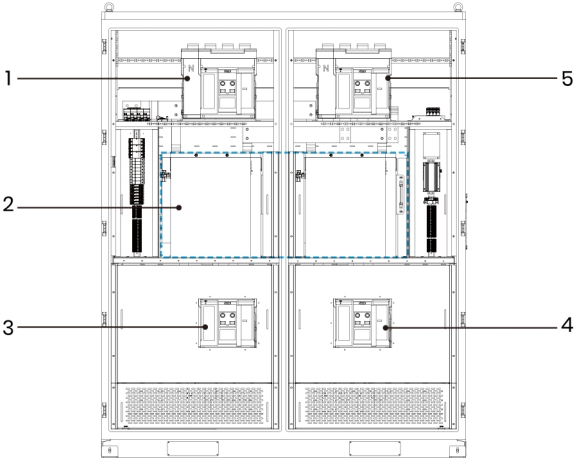
Left & Right View



No.	Item
1	Assembly Holes for MS-EMS Cabinet

2.4 Internal Structure

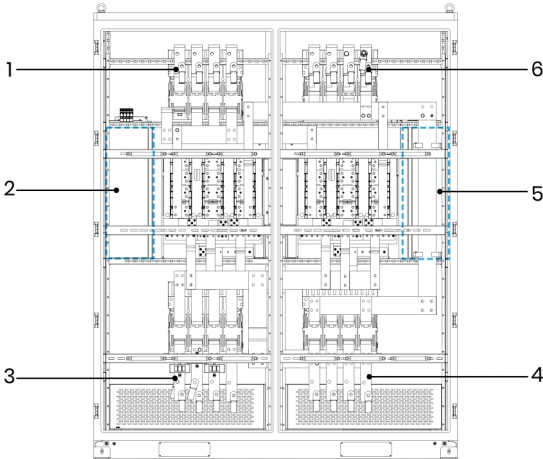
Internal Front View



No.	Item	No.	Item
1	Grid Breaker	4	Load Breaker
2	STS Switch	5	Diesel Generator Breaker
3	Bypass Breaker (Optional)*	/	/

*The Bypass Breaker is an optional component, available exclusively on the model WS-TS1000-2-A. With the bypass breaker, the load can be supplied directly from the grid during maintenance, enabling service without power interruption.

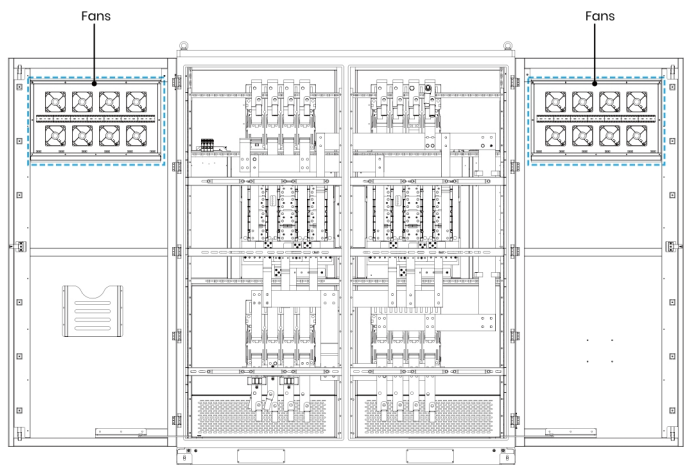
Internal Rear View



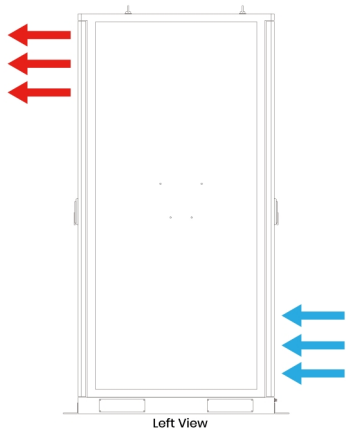
No.	Item	No.	Item
1	GEN (Generator) Terminals	4	ESS Terminals
2	Control Box	5	Control Box
3	Load Terminals	6	GRID Terminals

2.5 Thermal Management System (TMS)

The thermal management system consists of several fans, air inlets and air outlets.



The cabinet intakes cooling air via its front-panel air inlets and exhausts hot air through the rear air outlets.



3 Transportation

3.1 Safety Precautions



DANGER

- It is strictly prohibited to mix dangerous goods with food, medicine, animal feed and their additives in the same vehicle or container, and to transport with sharp objects in the same vehicle or container.
- Transport is strictly prohibited if the equipment shows any abnormalities such as unusual odor, leakage, smoke, or fire before departure.



WARNING

- Comply with all applicable safety rules and regulations of the local country or region during loading, unloading, and transportation.
- Before removing the transport protector, inspect the packaging for damage and check whether the impact indicator on the outer packaging has been triggered; if triggered, potential transport damage cannot be ruled out.
- Keep the equipment upright and securely fixed during sea or land transportation. The inclination angle of equipment shall not exceed 15° throughout the transportation process.
- Throughout the transportation process, protect the equipment from severe vibration, impact, and crushing. Avoid exposure to direct sunlight, rain, and moisture. Take appropriate rainproof, moisture-proof, and sun-protection measures.
- Smoking is strictly prohibited in transportation, loading and unloading areas.
- Freight personnel are strictly prohibited from opening the outer packaging of the equipment without authorization.
- All loading and unloading operations must be carried out by authorized and trained personnel.



CAUTION

- Handle with care during moving to prevent bumping.
- Transport operators must wear protective gloves and toe-cap safety shoes for personal protection, and pay special attention to avoiding scratches by sharp metal panels and crushing injuries by heavy objects.

NOTE

- Complete compliant and accurate declaration before transportation, and carefully check whether the packaging, labels and markings are intact.
- Do not remove the product transport packaging before arrival at the installation site.

3.2 Transportation Modes

Recommended transportation modes: sea freight and land freight.

Sea freight	▪ Seal all external gaps of the equipment and affix marks certified by the classification society. ▪ Equip the outer packaging with rainproof canvas covers to avoid paint finish scratches.
Land freight	▪ Land transport shall comply with ADR or JT/T 617 standards, as applicable. ▪ Remove obstacles along the transport route. ▪ Ensure that dangerous goods transport vehicles are equipped with two tested and certified CO₂ fire extinguishers. ▪ Sudden acceleration and emergency braking are prohibited. ▪ If the equipment exceeds the weight limit for ordinary roads, obtain an overweight transportation permit from the local authorities. ▪ Transport vehicles with twist locks are recommended. If twist locks are unavailable, the product shall be fixed at both the top and bottom with lashing straps to prevent shifting and rollover. ▪ If transportation on sloped roads is necessary, equip the vehicle with additional traction equipment.

3.3 Equipment Handling

3.3.1 Forklift



DANGER

- During forklift operation, unrelated personnel must keep at least a 2m safe distance; standing or riding on the forklift or cargo is strictly prohibited.
- Overloading and lifting loads too high are strictly prohibited to avoid forklift instability and rollover risks.
- Only certified professional forklift operators may perform operations; unauthorized operation by non-professionals is forbidden. Strictly follow all clauses; violators bear full responsibility for equipment damage and personal accidents.

Forklift Requirements

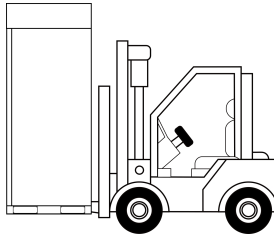
Item	Requirement
Load capacity	> 7 t
Fork length	≥ 1.5 m
Fork width	80~160 mm
Fork thickness	25~70 mm
Lifting height	≥ 2 m (when foundation height ≤ 0.3 m) Increase accordingly when foundation height > 0.3 m

Fork Positioning & Loading:



Insert forks strictly into the designated "Forklift Fork Insertion" mark (↓) on the packaging, following the supporting diagram for details. When lifting heavy or unbalanced loads,

align with the equipment's center of gravity mark (⊕) to ensure balanced stress.



Driving & Steering:

- Driving speed shall be strictly controlled below 3 miles per hour (3mph). Sharp turns are strictly prohibited to avoid cargo shaking and imbalance.
- Before reversing, the forklift operator must carefully check the rear area and confirm safety before reversing. When reversing in confined spaces, a special commander must be arranged to guide the operator throughout the process.
- Operating forklifts on slopes with a gradient $\geq 5^\circ$ is strictly prohibited. Slow down and operate carefully when lifting loads on uneven roads.
- Tilting or inverting the cabinet is strictly prohibited during the whole transfer process. If tilting or inversion is necessary under special circumstances, restore the cabinet to upright position as soon as possible, and leave it standing for 2 hours before power-on.

3.3.2 Hoisting

Hoisting Requirements

Item	Requirement
Crane lifting capacity	> 7 t
Working radius	≥ 2 m



DANGER

- Establish warning signs and a restricted area to prevent unauthorized personnel from entering the lifting zone.
- Keep all personnel at least 1 m away from the lifting area. No one is allowed to stand under the boom or within the operating radius during the entire hoisting process.
- Hoisting operations are prohibited in adverse weather conditions such as typhoons, heavy rain, thick fog, or thunderstorms.
- Ensure lifting tools are correctly and securely connected to the equipment before hoisting. Improper connection may result in product damage, serious injury, or death.
- Use only approved and certified lifting equipment. Non-standard lifting tools are strictly prohibited.
- Hoisting shall be performed only by qualified personnel.



WARNING

- Before hoisting, inspect the crane, slings, and other rigging equipment to confirm that their load ratings meet the product's weight requirements.
- Ensure all equipment doors are closed and locked before hoisting.
- Position the crane appropriately; long-distance hoisting is strictly prohibited.
- Ensure all sling connections are secure and reliable, and that the slings attached to the equipment corner fittings are of equal length.
- A designated signal person must direct the entire hoisting operation to ensure coordinated movement.
- Keep the equipment stable and level during hoisting. Do not swing the crane to avoid sudden drops or impacts on the equipment.

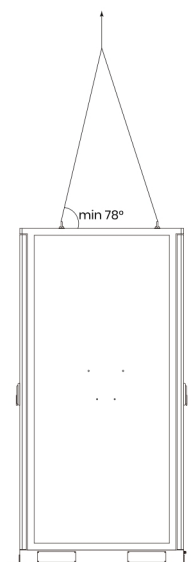
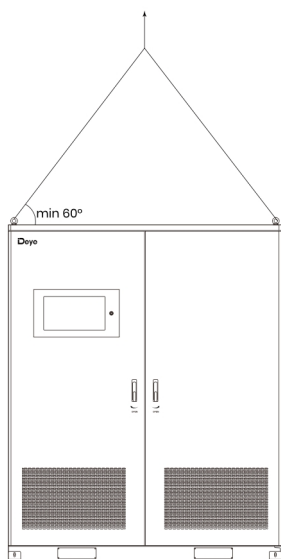


CAUTION

- Adjust sling lengths as required by site conditions to maintain hoisting balance.
- Hoist gently and lower the equipment slowly and smoothly into position. Avoid any

impact or collision.

- Use vertical hoisting only. Do not drag the equipment on any surface during lifting, or when attaching or detaching lifting tools, to prevent scratches.
- It is recommended to hoist the equipment while keeping it horizontally stable to ensure a smooth operation.
- Ensure the angle between the lifting sling and the horizontal plane meets the requirements as follows.



4 Installation



DANGER

- Do not expose the equipment to, or operate it in, flammable or explosive gases, smoke, or any corrosive environment. Otherwise, it may cause fire, explosion or equipment damage.
- There is a risk of static overload during the entire installation process, which may cause damage to building structures. Be sure to verify the site bearing capacity and anti-static measures in advance.



CAUTION

- Only qualified or trained personnel, who have mastered all necessary safety precautions and relevant applicable regulations, are permitted to install the equipment.
- Keep the equipment out of the reach of children and away from daily working or living areas.



WARNING

- The installation and usage environment must comply with relevant international and local laws and regulations. The user is obligated to protect the ESS against fire and other hazards.
- Product assembly must be carried out in strict accordance with the design scheme, process requirements, relevant regulations and national standards; unauthorized changes to assembly procedures are strictly prohibited.

4.1 Pre-Installation Preparation

4.1.1 Site Requirements



DANGER

- Do not install the equipment in low-lying areas where it may become submerged. The installation level must be at least 300 mm above the highest historical water level in the area. Do not install in any position that could be submerged in water.



WARNING

- Install the equipment in an outdoor area far from liquids. Do not install it under areas prone to condensation (e.g., under water pipes, air exhaust vents) or water

leakage (e.g., air conditioner vents, ventilation vents, equipment room feeder windows). Liquid ingress may cause equipment faults, short circuits, fires, or electric shock.

- To prevent high-temperature damage or fire, ensure that the equipment's ventilation vents and heat dissipation systems are not obstructed or covered by other objects during operation. Poor heat dissipation can lead to equipment overheating, fire, or explosion.
- To protect the equipment from wildfires caused by high summer temperatures, ensure there are no vegetation or flammable plants within 3 meters of the equipment. Wildfires can spread to the equipment, causing explosions or fires.
- For safety purposes, the distance between the equipment and residential buildings must be more than 12m, and the distance between the equipment and densely populated buildings (such as schools, hospitals) must be more than 30.5m. If this safety distance cannot be met, a firewall must be built between the equipment and the building to prevent fire or explosion hazards from affecting people.
- Outdoor storage systems must be at least 10 feet away from boundaries, public roads, buildings, flammable materials, hazardous materials, high piles, and other non-grid-related hazards to reduce the risk of fire, explosion, or collision-induced accidents.
- The ESS area shall be enclosed by lockable solid walls or fences with height over 2.2m; fire walls can serve as partial or full enclosure substitutes.
- The distance between the cabinet air outlets and the air intakes of heating, ventilation, and air conditioning systems, windows, doors, discharge platforms, and fire sources of other buildings or facilities must be more than 4.6m to prevent the spread of harmful gases or fire.
- Do not install the equipment in places without proper fire-fighting facilities or where firefighters cannot easily access. In the event of a fire, lack of fire protection or accessibility will lead to the rapid spread of fire, resulting in serious injury or death.
- Do not install the equipment in an easily accessible location. The enclosure and heat sink of the ESS reach high temperatures during operation, which may cause severe burns.
- Do not install the equipment in the following locations (including but not limited to):
 - Areas subject to severe vibration (such as ships, trains, or cars), intense noise, or strong electromagnetic interference;
 - Locations with dust, oil fumes, harmful gases, corrosive gases, and other pollutants;

- Spaces where corrosive, flammable, or explosive substances are stored;
 - Areas with existing underground facilities;
 - Ground with poor geological conditions, such as mucky soil and soft soil layers, which is prone to water accumulation and subsidence;
 - Spaces underneath reservoirs, water features, and water intake structures;
 - Seismic fault zones and regions with a seismic fortification intensity exceeding Grade 9.
 - Zones directly threatened by mudslides, landslides, quicksand, karst caves, and other geological disasters.
 - Areas within the scope of mining subsidence and ground displacement.
 - Regions inside blasting hazard zones.
 - Areas vulnerable to inundation caused by dam or dike failure.
 - Sanitary protection zones for key domestic water sources.
 - Protected zones of historical relics and cultural heritage sites.
 - Crowded public areas, high-rise buildings, and underground structures.
 - Urban road intersections and major traffic arteries.
- During the installation, commissioning, and operation of the equipment, ensure that each unit is equipped with no less than 2 fire extinguishers nearby. Insufficient fire-fighting equipment may result in uncontrollable fires, leading to death or serious injury.



CAUTION

- Do not install the equipment in areas conducive to the growth of microorganisms (such as fungi or mildew). Microbial growth may damage the equipment's surface or internal components, leading to malfunctions and potential minor injuries during maintenance.
- Do not install the equipment in salt-damaged or polluted areas. Corrosion caused by these environments may damage the equipment, leading to malfunctions and minor injuries during handling or maintenance.

The equipment must be installed in locations that meet the following criteria:

Condition	Required Distance	Examples
Distance from coast	More than 2000 m	/
Distance from third-party wireless communication facilities.	More than 30 m	/
Distance from pollution sources	Heavy pollution sources: ≥ 1500 m	Smelters, coal mines, thermal power plants
	Moderate pollution sources: ≥ 1000 m	Chemical, rubber, electroplating
	Mild pollution sources: ≥ 500 m	Food, leather, heating boilers, slaughter houses, centralized garbage dumps, sewage treatment stations

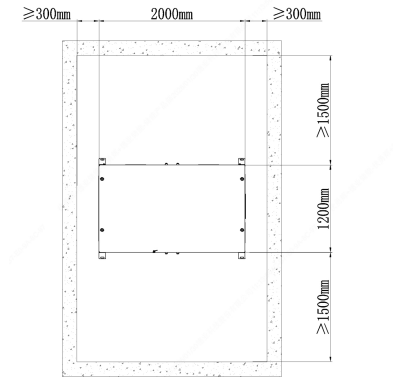
NOTE

- The safe distance between the equipment and production buildings shall comply with local fire codes or standards.
- Install the equipment in a clean, dry, and well-ventilated area with appropriate temperature, humidity, and altitude. For detailed parameters, refer to **Chapter 9 Technical Specifications**.
- Reserve sufficient space for expansion according to the whole-life cycle needs of the energy storage system.

Recommended Clearance

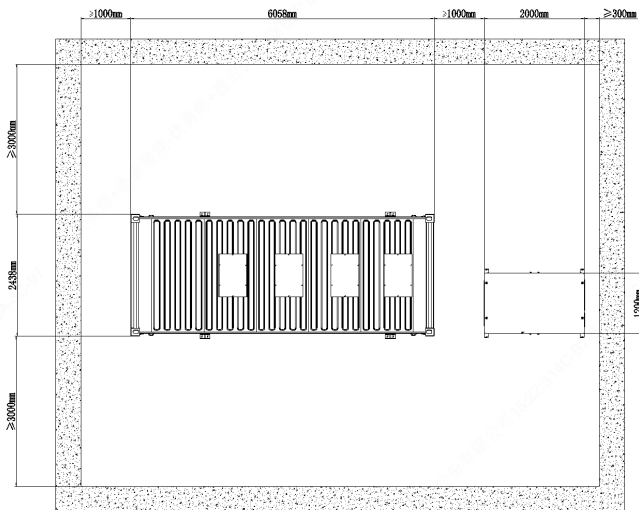
The following clearance requirements must be maintained before installation.

Single WS-TS1000-2-A/B:



- Maintain a minimum clearance of 1500 mm at the front and rear of the cabinet.
- Maintain a minimum clearance of 300 mm on both sides of the cabinet.

Single WS-TS1000-2-A/B with a WS-GS2000 unit



- Maintain a minimum clearance of 3000 mm at the front and rear of the cabinet.
- Maintain a minimum clearance of 1000 mm between the TS1000 and the WS-GS2000.
- Maintain a minimum clearance of 300 mm between the TS1000 and the wall.

4.1.2 Foundation Requirements

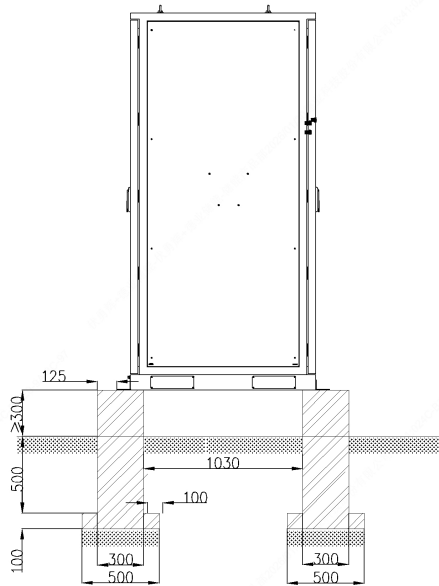
An inadequately designed foundation can cause installation difficulties, compromise equipment operation, and undermine overall system performance. Therefore, the foundation for the energy storage system must be carefully designed and constructed in strict compliance with applicable industry and local standards to ensure proper mechanical support, cable routing, and future maintenance access.

At a minimum, the following requirements shall be met.

Requirement	Description
General Requirements	
Surface material	Install cabinets on concrete or other non- combustible surfaces.
Surface condition	The surface must be level, stable, flat, and free of depressions or tilts, with sufficient load- bearing capacity.
Load capacity	The foundation must support the total weight of the equipment. If the bearing capacity is insufficient, re- verification is required.
Floor Edge Extension	300 mm beyond the cabinet fixing parts on each side.

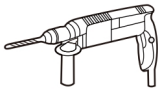
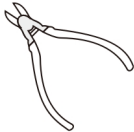
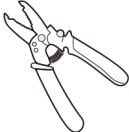
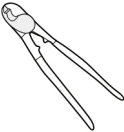
Foundation Construction Requirements	
Concrete grade & thickness	Default C30, unless otherwise specified
Bedding layer	200 mm thick, C15 concrete below the slab
Reinforcing steel bars	HRB400 (Grade III), 12 mm diameter at 150 mm spacing
Corrosion protection	Apply standard anti-corrosion measures to steel bars after rust removal.
Bearing stratum	Undisturbed soil, bearing capacity ≥ 100 kPa
Construction & Excavation Requirements	
Foundation pit bottom	Thoroughly compacted and leveled
Excavation safety	Ensure proper safety measures for excavation support.
Water prevention after excavation	The pit must not be soaked. If water intrusion occurs, further excavation and replacement filling are required.
Surface leveling tolerance	Levelness error between foundation and cabinet contact surface ≤ 3 mm.
Height & Drainage Requirements	
Height above ground	≥ 300 mm above ground level, higher than local historical highest water level
Drainage system	Drainage facilities should be based on local geology and municipal requirements to prevent water accumulation at the foundation. The system must accommodate the local historical maximum rainfall. Discharged water must comply with local environmental regulations.
Cable Management & Sealing	
Cable inlets/ trenches	Reserve cable inlets/trenches as required
Sealing	All reserved cable inlet holes shall be fully sealed post-installation.
Cable Trench Requirements (for bottom cable entry)	
Dust & Rodent Protection	Prevent foreign objects from entering the equipment.
Waterproof & Moisture Protection	Protect cables from aging and short circuits that could affect normal operation.
Cable cross-section & bending radius	Trench design must accommodate the required cable cross-sectional area and provide sufficient bending radius.

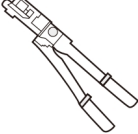
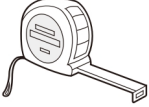
The recommended foundation construction details are provided below and may be adjusted based on actual site conditions.



4.1.3 Tool Requirements

Recommended installation tools are listed below and the pictures are for reference only.

Tools			
			
Hammer drill	Phillips insulated torque screwdriver	Flat-head insulated torque screwdriver	Insulated torque socket wrench
			
Diagonal pliers	Wire stripper	Cable cutter	Ferrule crimping pliers

			
Hydraulic pliers	Needle-nose pliers	Marker	Utility knife
			
Steel tape measure	Spirit Level	Multimeter	Heat shrink tubing
			
Heat gun	Cable tie	Insulated ladder	Forklift
			
Crane			

Personal Protective Equipment			
			
Insulated gloves	Protective gloves	Safety goggles	Dust mask

			
Insulated shoes	Safety helmet	Protective suit	

4.2 Unpacking



WARNING

- If the installation environment is not conducive to equipment protection, take measures to prevent internal failure caused by condensation or dust corrosion (e.g., cover with woven cloth or dust cover).
- During component handling and storage, collision and scratch are strictly prohibited. Keep parts dry and rust-free to avoid damage and part failure.



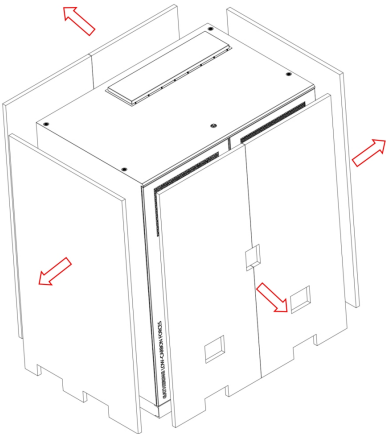
CAUTION

- If possible, do not remove the transport packaging until the equipment arrives at the installation site.
- After preparing the equipment for installation, unpack it carefully to avoid scratching the equipment.
- Keep the equipment stable during unpacking.

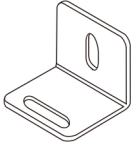
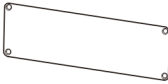
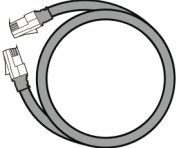
NOTE

- Keep the packaging material for future transportation or long-term storage.
- All components must be thoroughly cleaned before assembly to remove burrs, flash edges, oxide layers, rust, sand particles, dust and stains, ensuring a clean and impurity-free surface.

Unpack and inspect the equipment immediately upon receipt. If the unit is damaged or missing accessories are found, contact the local distributor or the after-sales service department



Packing List

			
Cabinet Mounting Feet ×4 pcs	M10×35 Hex Head Bolt Assembly (with spring & flat washers) ×4 pcs	Fire-proof Mud ×1 bag (2 kg)	M6×25 Hex Head Bolt Assembly (with spring & flat washers) ×32 pcs
			
M16×70 Expansion Bolt ×4 pcs	M8×30 Hex Head Bolt Assembly (with spring & flat washers) ×2 pcs	Forklift Pocket Cover ×8 pcs	CAT5E FTP Communication Cable <u>24AWG</u> ×1 pc

Recommended Torque

Applicable for sheet metal parts

Bolt Specification	Recommended Torque	Unit
M3	0.7 ~ 0.9	N·m
M4	1.6 ~ 2.2	N·m
M5	3.2 ~ 4.4	N·m
M6	5.3 ~ 7.4	N·m
M8	12 ~ 19	N·m
M10	25 ~ 38	N·m
M12	44 ~ 65	N·m
M14	54 ~ 108	N·m
M16	110 ~ 165	N·m
M18	150 ~ 240	N·m
M20	216 ~ 335	N·m

NOTE

- Strictly adhere to the specified torque values to prevent over-tightening or under-tightening.
- The torque value is for reference only for standard bolts during normal assembly; adjust appropriately for special working conditions (high vibration/harsh environment).
- Use a calibrated torque wrench for installation to ensure torque accuracy.

4.3 Installation Procedures

4.3.1 Install Cabinet Mounting Feet

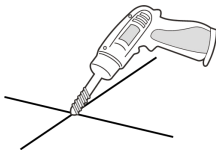
NOTE

- Due to variations in drilling accuracy and bit material, it is recommended to use a drill bit with a diameter ranging from $\Phi 20.5$ to $\Phi 21$.

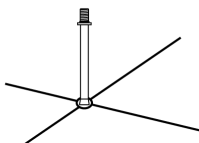
To secure the cabinet to the ground, install the four cabinet mounting feet:

1. Position the cabinet at the installation site.
2. Attach the mounting feet to the cabinet using the M16×45 hex bolts. Do not tighten the bolts.
3. Mark hole positions on the ground using a marker.

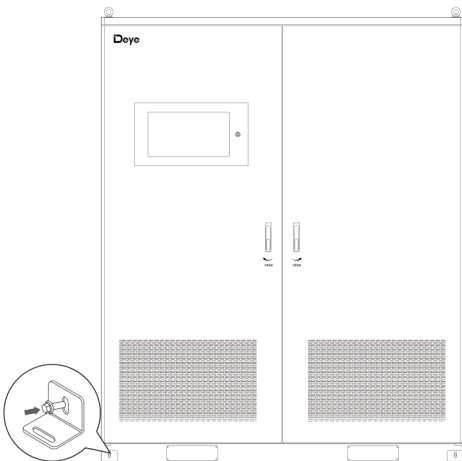
4. Remove the M10×35 hex bolts and mounting feet. Then, drill holes using a hammer drill according to the expansion bolt size.



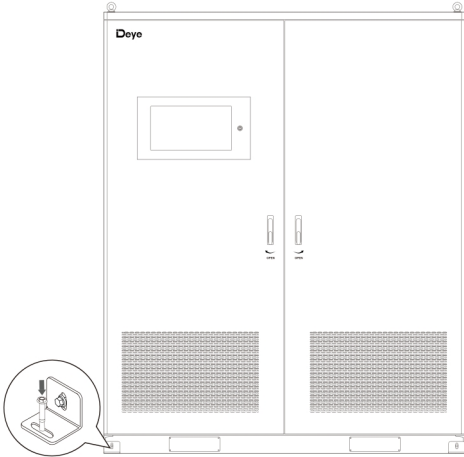
5. Insert the 4 pieces of M16×70 expansion bolts (without nuts and washers) into the drilled holes and tap the expansion sleeves until they are fully seated.



6. Slide the mounting feet over the expansion bolt studs. Then, secure mounting feet to the cabinet with M10×35 hex bolts.



7. Place the washers and nuts onto the studs, then tighten the expansion bolt nuts to secure the cabinet to the ground (Recommended torque: 160 N·m).



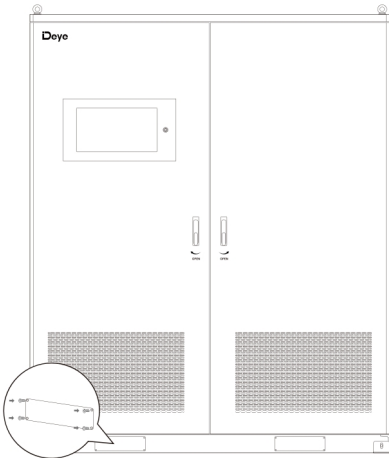
4.3.2 Install the Forklift Pocket Cover



WARNING

- Do not install the forklift pocket covers until the cabinet is fully secured in its final location and the installation site has been verified to meet all requirements in this manual and all applicable local safety regulations.

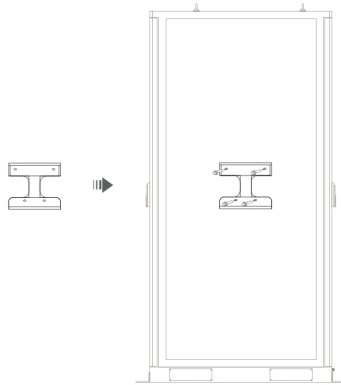
Secure the 8 forklift pocket covers to the forklift pockets at the bottom edge of the cabinet using 32 M6×25 bolts (4 per cover). Tighten the bolts to a torque of 6 N·m.



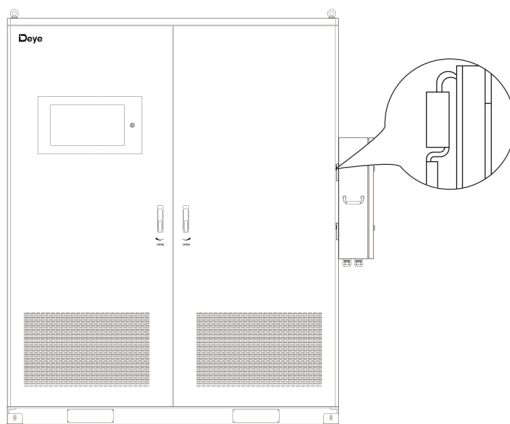
4.3.3 Install the MS-EMS Cabinet (Optional)

NOTE

- If you have purchased the MS-EMS cabinet of our company, mount the MS-EMS cabinet on the left/right side panel of the WS-TS1000-2-A/B.
1. Secure the mounting plate onto the left/right side panel of the WS-TS1000-2-A/B with M6×100 expansion bolts. The mounting plate and expansion bolts are included with the MS-EMS cabinet.



2. Mount the wall-mounting bracket on the rear of the MS-EMS cabinet. For detailed steps, refer to the MS-EMS cabinet user manual.
3. Attach the MS-EMS cabinet onto the mounting plate installed in Step 1.



5 Electrical Connection

5.1 Safety Precautions



DANGER

- All electrical connections must be performed only when the equipment is completely de-energized and isolated from all power sources.
- Do not expose the equipment to flammable or explosive gases, smoke, or any explosive environments.
- Always wear appropriate PPE and use only dedicated insulated tools when working on energized circuits to prevent electric shock, personal injury, or equipment damage.



WARNING

- Only qualified electrical professionals can perform the electrical connection.
- The product can only be used in situations equipped with overvoltage protection devices.
- Do not perform electrical connections in the event of severe weather.
- Do not contact live parts directly without protection.
- Before cable connection, ensure that there is no voltage on the AC side and DC side.
- Ensure correct polarity during wiring: connect positive (+) to positive (+) and negative (-) to negative (-).
- Before connecting cables, check that the polarity of all input cables is correct. Do not pull wires and cables forcibly during electrical installation; otherwise, the insulation performance may be affected. Ensure all cables have sufficient bending space and take necessary auxiliary measures to reduce cable stress.
- Keep the equipment clear of the cable preparation area. Cable scraps entering the equipment can cause sparks, resulting in personal injury or equipment damage.
- All grounding connections must be completed and verified before connecting any high-voltage circuits.

NOTE

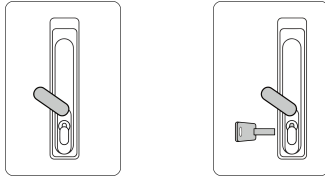
- After cable connection, carefully verify that all connections are correct and secure.

5.2 Access the Cabinet Interior

5.2.1 Open the Cabinet Door

The front and rear doors are locked before delivery. Before cable connection, open the cabinet door as follows:

1. Slide the protective cover upward to expose the keyhole.
2. Insert the door key into the keyhole and turn it clockwise to release the handle.
3. Rotate the door handle in the indicated direction to unlock and open the door.



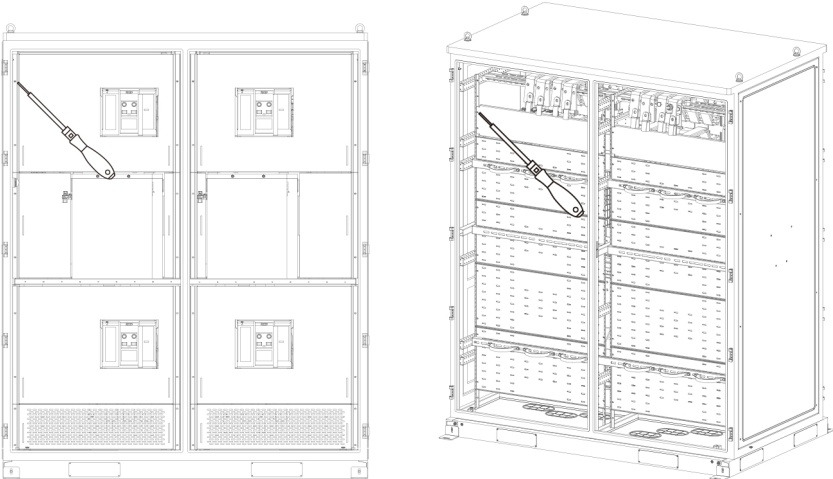
NOTE

- After the electrical connection is complete, lock the door and keep the key.

5.2.2 Remove Protective Baffles

To access the terminals and ports for electrical connection, the protective baffle inside the cabinet must be removed.

Open the front or rear door, unscrew the screws using a screwdriver, and then remove the protective baffles.



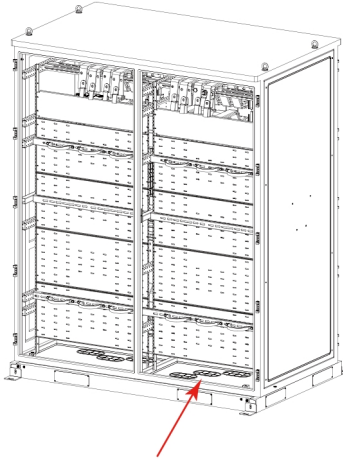
5.2.3 Prepare the Cable Inlet



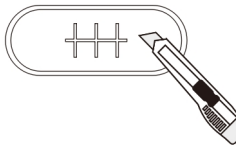
NOTE

- Select the appropriate cable grommet on the cabinet bottom based on on-site conditions.

1. Open the rear door and locate the cable grommets.

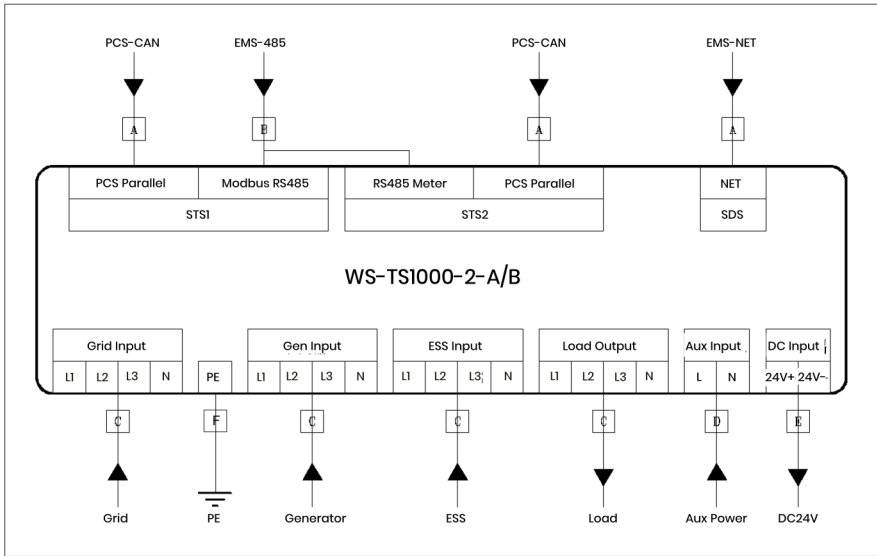


2. Select the appropriate grommet, cut an opening in the rubber seal using a utility knife and then clean all debris.



5.3 Cable Preparation

5.3.1 Recommended Cables



Use	Item	Phase/Color	Cable Size (mm ²)	Terminal	Torque (N·m)	Quantity
Comm.	A	CAT5 Black	CAT5E FTP	RJ45	/	3
Comm.	B	STP	0.5 mm ² (UL 20AWG)	E7510	/	1
Grid/Gen/ ESS/Load	C	L1 Brown	240 mm ²	DT-240-17	85	4
		L2 Black	240 mm ²	DT-240-17	85	4
		L3 Grey	240 mm ²	DT-240-17	85	4
		N Blue	240 mm ²	DT-240-17	85	4
Auxiliary Power Input	D	L Red	1.3 mm ² (UL 16AWG)	E1512	5.5	1
		N Blue	1.3 mm ² (UL 16AWG)	E1512	5.5	1
DC 24V Output	E	24V+	1.3 mm ² (UL 16AWG)	E1512	/	1
		24V-	1.3 mm ² (UL 16AWG)	E1512	/	1
Grounding	F	Grounding flat steel	50 × 5 mm ²	/	30	1

NOTE

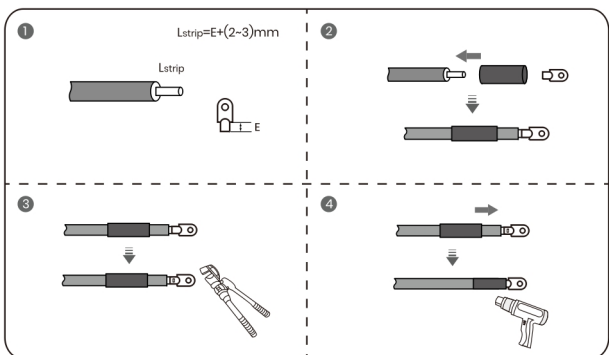
- All specifications listed above are recommendations and may be adjusted to suit on-site conditions.

5.3.2 Terminal Crimping

Crimp SC Terminals

For connecting with grid/ESS system/load/diesel generator, crimp the terminal as follows:

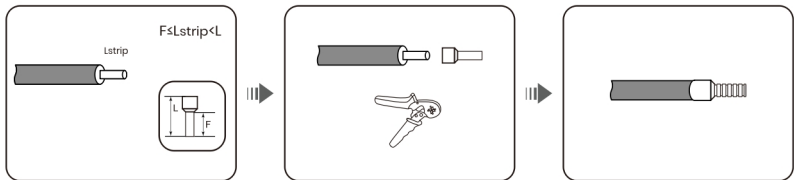
1. Strip the cable insulation to the length 2-3mm longer than the terminal barrel length.
2. Slide the heat shrink tubing onto the cable, and insert the core wire fully to the bottom of the terminal barrel.
3. Crimp the terminal firmly with a matching hydraulic crimping tool.
2. Move the heat shrink tubing over the terminal barrel and apply a heat gun until it tightly seals and insulates the joint.



Crimp cord-end terminals

For connecting with auxiliary power supply, crimp the terminal as follows:

1. Strip cable insulation to the specified stripping length L_{strip} ($FsL_{strip} < L$).
2. Insert the core wire fully to the ferrule barrel.
3. Crimp the terminal securely with ferrule crimping pliers.



5.4 Cable Connection

5.4.1 Equipment Grounding



WARNING

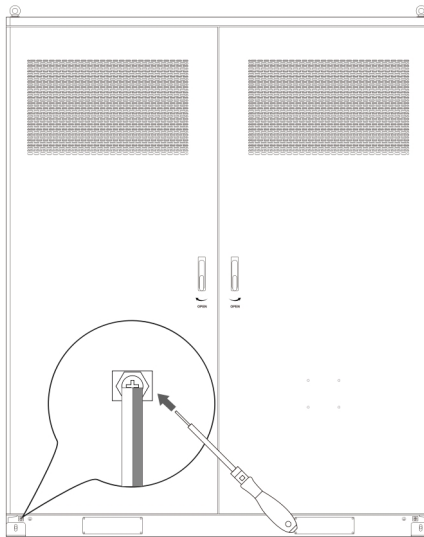
- Ensure the equipment is reliably grounded to prevent electric shock.



CAUTION

- After completing the grounding connection, grounding resistance must be measured and must comply with applicable national/local standards and regulations.

1. Ensure the cabinet and external power supply are fully de-energized.
2. Verify the PE terminal marking on the cabinet is intact and legible.
3. Remove the screws on the protective earth terminal of the cabinet with a screwdriver.
4. Connect the grounding flat steel ($50 \times 5 \text{ mm}^2$) to the protective earth terminal on the cabinet with the included M8×30 bolts (Recommended torque: 30 N·m).

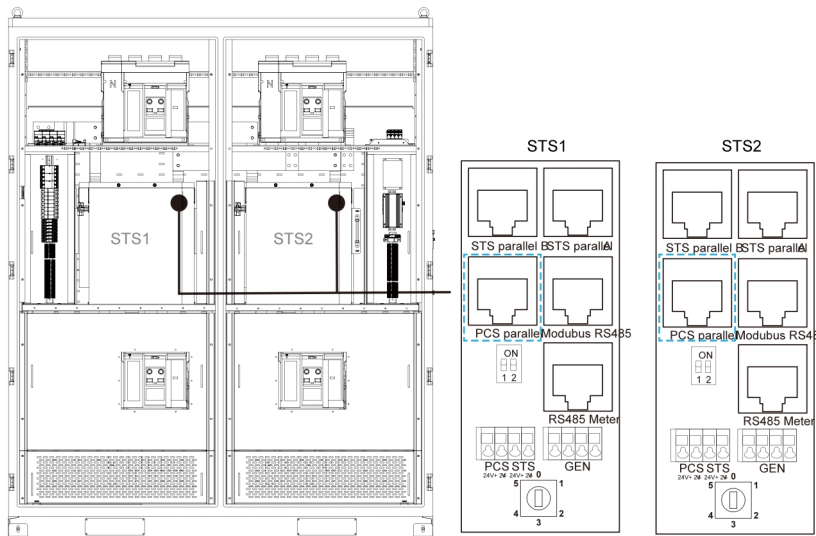


5.4.2 Connect Communication Cables

This cabinet provides multiple communication ports for connecting to external devices (PCS, battery cabinets, EMS cabinets, etc.). Connect communication cables according to the following steps:

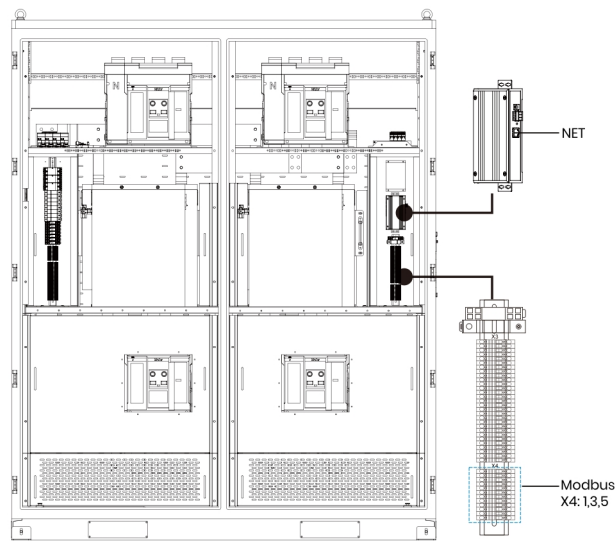
1. Ensure the cabinet and all connected external equipment are fully de-energized.
2. Open the front door to locate the communication ports.
3. Verify all the terminal markings are intact and legible.
4. Route the communication cables through the prepared cable inlet.
5. Connect one end of the communication cable to the external equipment; the other end to the designated communication ports as shown below.

Communication with PCS cabinet



Position	Terminal/Port	Description	Recommended Cable
STS1	PCS Parallel	Supports communication between STS1 and PCS.	Communication cable CAT5E FTP Terminal: RJ45
STS2	PCS Parallel	Supports communication between STS2 and PCS.	

Communication with the EMS cabinet

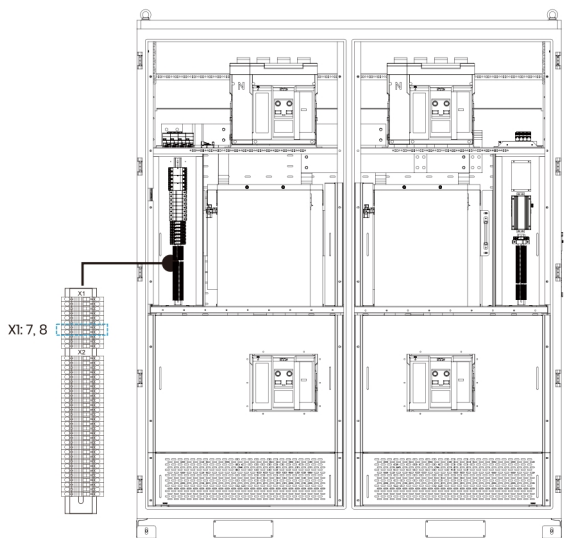


Position	Terminal/Port	Description	Recommended Cable
Control Box	NET	Supports communication between the SDS module in the TS1000 and the MS-EMS cabinet	CAT5E FTP communication cable Terminal: RJ45 (Included)
	X4: 1, 3, 5	Supports communication between STS1 & STS2 of the TS1000 and the MS-EMS cabinet.	STP communication cable Size: 0.5 mm ² (UL 20AWG) Terminal: E7510

5.4.3 Connect Auxiliary Power Cables

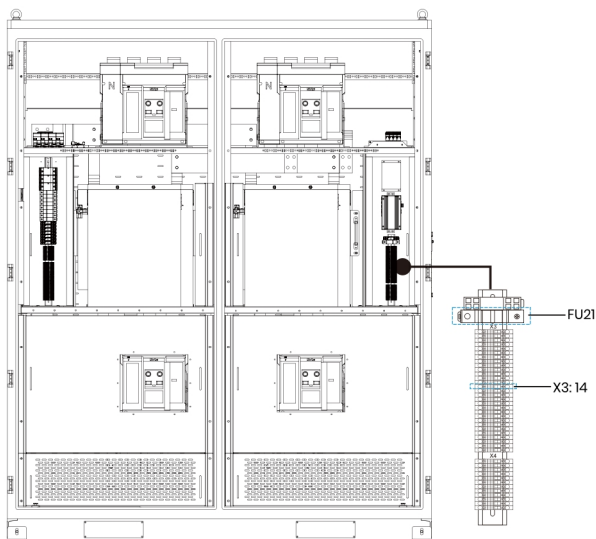
1. Ensure the cabinet and the auxiliary power source are fully de-energized.
2. Open the front door to locate the auxiliary power interface.
3. Verify all the terminal markings are intact and legible.
4. Route the cables through the prepared cable inlet.
5. Connect the AC 220V L/N input conductors, and DC 24V output positive and negative power cables to the corresponding terminals specified below.

Connect AC220V L/N Input Conductors



Position	Terminal/Port	Description	Recommended Cable
Control Box	X1: 7	Port for L conductor of the AC auxiliary power input	Cable size: 1.3 mm ² (UL 16AWG)
	X1: 8	Port for N conductor of the AC auxiliary power input	Terminal: E1512 Torque: 5.5 N·m

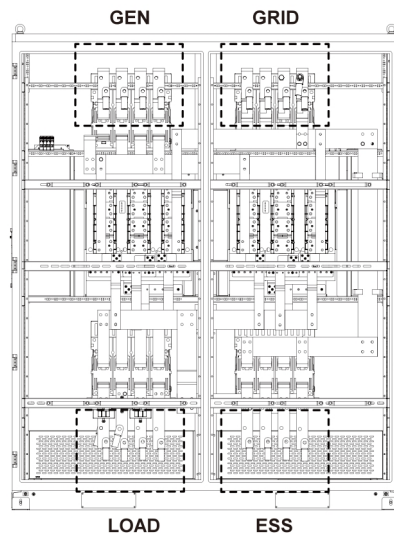
Connect DC24V Output Power Cables



Position	Terminal/Port	Description	Recommended Cable
Control Box	FU21	Port for DC24V positive power cable	Cable size: 1.3 mm ² (UL 16AWG) Terminal: E1512
	X3:14	Port for DC24V negative power cable	

5.4.4 Connect Main Power Cables

1. Turn off the mains power supply and ensure the cabinet is de-energized.
2. Open the rear door to locate the GEN/GRID/LOAD/ ESS terminals.
3. Verify all the terminal markings are intact and legible.
4. Route the cables through the prepared cable inlet.
5. Connect the power cables as follows:
 - **GRID:** Connect 4 conductors per phase (L1/L2/L3) and 4 neutral conductors from the grid supply to GRID terminals.
 - **GEN:** Connect 4 conductors per phase (L1/L2/L3) and 4 neutral conductors from the diesel generator to GEN terminals.
 - **LOAD:** Connect 4 conductors per phase (L1/L2/L3) and 4 neutral conductors from the load circuit to LOAD terminals.
 - **ESS:** Connect the 4 conductors per phase (L1/L2/L3) and 4 neutral conductors from the ESS to ESS terminals.



Position	Terminal/Port	Description	Recommended Cable
GEN/GRID/LOAD/ESS Terminals	L1/L2/L3/N	Port for L1/L2/L3/N conductors of the diesel generator, grid, load, and ESS system.	Cable size: 240 mm ² Terminal: DT-240-17 Torque: 85 N·m

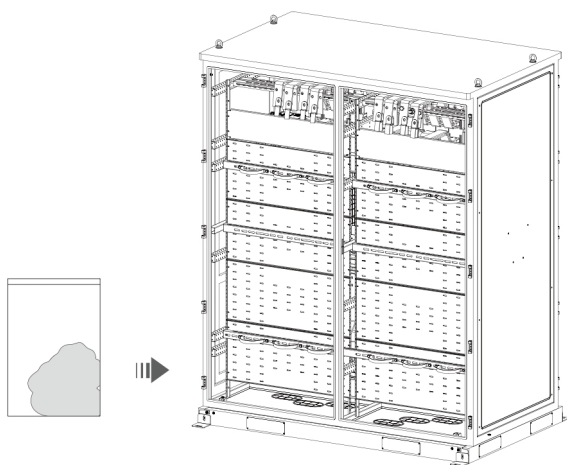
5.4.5 Apply Fire-Proof Mud



CAUTION

- The fire-proof mud must be applied where cables pass through the cabinet bottom.
- Before applying the fire-proof mud, pull the cables slightly by hand to ensure secure connections.

After completing the wiring, use the fire-proof mud to seal the bottom cable inlet. Only the holes through which cables are routed need to be sealed.



6 Operation

6.1 Check Before Power-On

No.	Item	Criteria
1	Equipment Appearance	● Equipment is intact, no rust or paint flake-off; Repair damaged paint if any. ● Device labels are clear. Replace damaged labels if any. ● Door lock of each cabinet functions properly.
2	Cabinet Installation	● Installation site and foundation meets design requirements. ● Cabinet is level and secured by mounting feet. ● Clearance around the cabinet meets requirements.
3	Cabinet Grounding	● Cabinet grounded correctly with the ground cable securely connected to the cabinet PE terminal.
4	Switch/circuit breaker	● All circuit breakers are in the "OFF" position. ● All disconnectors are in correct position.
5	Cable	● Cables are intact with sheathings wrapped properly. ● Cable specifications meet the requirements and terminals are prepared as required. ● Cables are connected in designated positions ● Labels at both ends of cables are clear. ● Cables are routed with adequate slack at bending points to avoid mechanical stress. ● Cables are routed neatly without twists or crossovers in the cabinets.
6	Cable Inlet Sealing	● Cable inlets are sealed using cable cover or fire-proof mud.
7	Ventilation/Heat Dissipation	● Fans and cooling vents are unobstructed.

6.2 Power-On



DANGER

- Wear insulated gloves and use insulated tools. Failure to do so will result in electric shock, short circuit, or death.
- Monitor the system during power-on. If any fault is detected, power off the system immediately, rectify the fault, then resume operation.



WARNING

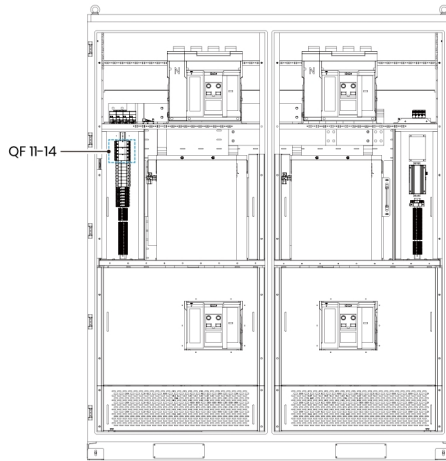
- If the installed system remains unused for 6 months or longer, it must be inspected and tested by qualified personnel before being put back into operation.
- If any circuit breaker inside the system trips, inspect the corresponding load side for faults.
- Only restore the circuit breaker after confirming no short circuit or other abnormality exists, to prevent fault escalation and potential hazards.



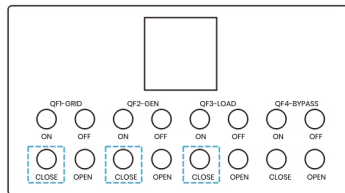
CAUTION

- Remove all desiccants from the equipment before initial power-on and long-term operation, and dispose of them in accordance with local waste regulations.
- Clear the equipment working area, and strictly prohibit unrelated personnel and animals from entering the operation range.
- Keep foreign objects, especially metal debris, away from the cabinet to avoid short circuit risks.

1. Close the circuit breaker **QF11, QF12, QF13, QF14** in sequence.



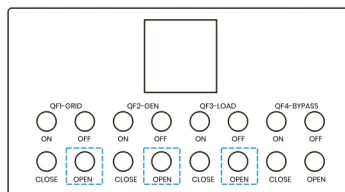
2. Press the green **CLOSE** buttons for QF1-GRID, QF2-GEN, and QF3-LOAD.



3. Configure automatic grid-tied/off-grid switching via PCS or Deye EMS platform to activate the cabinet.

6.3 Power-Off

1. Send the shutdown command via PCS or Deye EMS to stop the cabinet.
2. Press the red **OPEN** buttons for QF1-GRID, QF2-GEN, and QF3-LOAD.



7 Product Monitoring

7.1 Energy Management System

The WS-TS1000-2-A/B cabinet can be monitored via the MS-EMS Energy Management System (EMS), which is the core control unit for energy storage systems, responsible for overall operation monitoring, energy dispatch, safety protection, and data analysis. For detailed operation and configuration instructions, please refer to the EMS user manual. Scan the QR code below and enter the keyword “EMS” to obtain the manual.



7.2 DEYE ESS APP

Follow the steps below to add the equipment to your station on the Deye ESS App:

1. Scan the QR code to download the app.



2. Ensure your equipment is connected to network via 4G or an Ethernet cable.
3. Log in to the Deye ESS Energy Management System (EMS), click **“Create Station”** → **“Create QR Code”** to generate the QR code. Ensure **“Cloud Mode”** is set to 4G mode or Ethernet mode according to your actual conditions.
4. Open the Deye ESS App and scan the QR code to add the equipment.

8 Maintenance

8.1 Safety Precautions



DANGER

- Fully de-energize the equipment before any maintenance work.
- Maintenance shall be performed or supervised by qualified professional personnel.
- Wear personal protective equipment (PPE) and use dedicated insulated tools to avoid electric shocks or short circuits.
- Do not smoke or have open flames in the vicinity of the equipment.
- Do not wear jewelry, watches or other metallic accessories during maintenance.
- All terminals must be disconnected for maintenance.



WARNING

- Residual voltage may remain in the high-voltage circuit even after power is disconnected. Wait for at least 5 minutes and verify zero voltage with a standard professional voltmeter before any operation.
- Maintenance shall follow the sequence: equipment de-energization, lockout/tagout to prevent re-energization, zero-voltage verification, residual charge discharge and equipment grounding, and insulation shielding of adjacent live parts.
- Install a lockout device on the switch and attach a warning tag to indicate that the switch must not be operated.
- Improper decommissioning may cause damage to equipment. Ensure the product is decommissioned in accordance with relevant provisions before maintenance.
- Do not clean the equipment with water or any solvent.
- The bypass breaker is exclusively available on the model WS-TS1000-2-A.
 - WS-TS1000-2-A: In case of equipment failure, the system can switch to bypass mode to maintain load power supply.
 - WS-TS1000-2-B: In case of equipment failure, the output power supply will be interrupted immediately. The system must be fully shut down, and normal operation can be resumed only after the equipment is repaired.



CAUTION

- Before maintenance, set up warning signs or safety barriers to prevent unauthorized access.
- Use an electroscope of the proper voltage level to verify the equipment is completely de-energized.
- Before maintenance or repair, securely connect the circuit to be serviced to the main grounding system. Remove the grounding connection upon completion.
- Ensure that the air inlets and outlets are not blocked. Remove any debris around the vents to guarantee proper heat dissipation.
- Insert and remove cables in accordance with regulations; violent or forced operations are prohibited.
- Clean tools and materials promptly after maintenance, and check for any metallic objects left inside or on top of the product.
- Contact the customer service center for any operation and maintenance queries; unauthorized operation is prohibited.

A full inspection and test shall be performed upon completion of maintenance before the equipment is powered on again.

8.2 Maintenance Schedule

NOTE

- Perform maintenance as required by site conditions.
- In sandstorm-prone areas, clean the air conditioner filter after each sandstorm with a high-pressure water gun.
- Contact the supplier within 24 hours if any abnormality occurs to the cabinet.

Maintenance Item	Description	Frequency
Environment & Safety	Check that temperature and humidity inside/outside the equipment are within reasonable ranges.	1 day
	Ensure no flammable or explosive materials around the equipment.	1 day
	Check that warning labels are legible and intact.	1 day
	Check if the fire-proof mud is with good adhesion and foundation intact and smooth	3 months
Appearance & Structure	Check that status indicators are in normal condition.	1 day

	Ensure no foreign objects wrap or cover the equipment enclosure.	1 day
	Check the equipment for paint peeling/ rust, door lock damage and blocked vents.	3 months
	Verify that there are no foreign objects in the cabinet, check internal screws for loss and rust, and ensure copper bus-bars are free from stains and corrosion.	12 months
Internal Components	ACDC Module: ensure all wiring is reliable, free from corrosion, looseness or overheating; check the CAN communication circuits; verify that input and output voltage, current, power and other parameters are within the normal operating range; verify protection functions including overload, over-voltage and over-temperature protection work properly.	3 months
	Auxiliary Distribution Board: verify that the indicator lights of all components remain lit; check that all connections are tight and free of looseness, corrosion or overheating; clean internal dust to maintain proper heat dissipation.	3 months
	Cooling Fan Assembly: check the fans and speed control function for normal operation; clean the fan surface to maintain proper heat dissipation; ensure all wiring is reliable, free from corrosion and looseness; check the dust filter and replace it promptly.	3 months
Electrical Connections	Check all cables for loose connection, damage and water ingress.	3 months
	Verify that grounding and equipotential bonding are reliable.	12 months
System	Log into the charging management system to check for any alarms.	1 day

8.3 Post-Maintenance Requirements

After completing maintenance operations, follow the steps below to restore the site and archive the maintenance records:

Step	Operation
1. Cleaning & Restoration	Remove all temporary measures (e.g., grounding and warning signs) and wiring is restored to original condition. Prevent foreign objects from being left behind or personnel from inadvertently entering.
2. Power-up & Verification	Restore system power step by step per the power-up procedure. Verify that the system has no alarms and operating parameters are normal.
3. Recording & Archiving	Create traceable maintenance records, including the time, personnel and equipment status, and archive the records.

8.4 Storage

NOTE

- For long-term storage, keep the original packaging and check it regularly.



WARNING

- Keep the product far away from high-temperature heat sources, open flames, flammable and explosive areas, and all ignition sources, and do not expose it to direct sunlight or rain.
- During storage, ensure the product is completely disconnected from external equipment, with all operation indicators off.
- Store the product in a dry, clean, well-ventilated indoor area on flat, solid ground, away from strong infrared radiation, organic solvents, corrosive gases, and conductive metal dust.
- Handle with care. Dropping, collision, overturning, side placement, or tilting are strictly prohibited. Do not stack or roll the product improperly.
- Strictly comply with the storage requirements of the warning signs and other information on the packaging to avoid device damage.
- The storage area must be equipped with qualified fire-fighting facilities, including fire sand and special fire extinguishers.

- If the equipment is stored for more than 6 months, it must be tested by qualified personnel before installation and supplementary charging is required.

Storage Requirements

- **Storage Temperature:** -20°C ~ 60°C
- **Humidity:** 0% ~ 95% RH, non-condensing;
- **Altitude:** ≤3000 m

Long-Term Storage

- Replace desiccants with the same specifications and quantity regularly.
- Check the outer packaging every 3 months, and replace damaged packaging immediately.
- Storage duration is calculated from the latest charge date marked on the packaging. If the allowable storage period is exceeded, report to the person in charge immediately.
- Maintain temperature and humidity per the storage requirements.

9 Technical Specifications

Model	WS-TS1000-2-A/B
Grid Side	
Rated AC Input/Output Active Power (kw)	1000
Rated AC Input/Output Current (A)	1450
Rated Input/Output Voltage (V)	220/380,230/400 (three phase)
Grid Connection Form	3L/N/PE
Rated Input/Output Grid Frequency	50Hz/60Hz
Load Side Data	
Rated AC Input/Output Active Power (kw)	1000
Rated AC Input/Output Current (A)	1450
Rated Input/Output Voltage (V)	220/380,230/400 (three phase)
Grid Connection Form	3L/N/PE
Rated Input/Output Grid Frequency	50Hz/60Hz
GEN Side Data	
Rated AC Input/Output Active Power (kw)	1000
Rated AC Input/Output Current (A)	1450
Rated Input/Output Voltage (V)	220/380,230/400 (three phase)
Grid Connection Form	3L/N/PE
Rated Input/Output Grid Frequency	50Hz/60Hz
System Data	
Dimension (W×D×H, mm)	2000 × 1200 × 2450
Weight Appr. (kg)	1600
Operating Temperature (℃)	-20~55
Operating Altitude (m)	≤3000
IP Rating of Enclosure	IP54
Switching Time (ms)	≤20

Appendix I Troubleshooting

If any fault occurs, contact the service center or service engineers for help.

Appendix II Emergency Handling



DANGER

- In the event of natural disasters (earthquake, typhoon, flood, wildfire, etc.): Prioritize personnel safety, cut off power and stop the equipment immediately.
- Do NOT operate damaged equipment without professional inspection and qualified testing after the disaster.
- Keep away from waterlogged or fire-damaged units and contact our service engineers for professional handling.



WARNING

- When the air intake/exhaust system is operating, do NOT face the exhaust vents under any circumstance.
- Refer to the user manual/product manual for product information. Do NOT open the cabinet door if internal safety cannot be guaranteed.

➤ **Fire/Explosion Hazards**

- Do not open the door. Evacuate immediately to at least 50 meters away from the site and call the fire department.
- Wear respiratory protection. Disconnect the upstream power supply only when safe.
- Isolate the accident area only when safe to keep unauthorized personnel away.
- Post-incident maintenance must be performed by professionals or our after-sales engineers.

➤ **Electric Shock**

- Ensure personal safety, then disconnect the power supply immediately to avoid secondary electric shock.
- Use an insulated object to separate the victim from the power source and perform first aid such as cardiopulmonary resuscitation (CPR).
- Call the emergency medical number immediately to obtain professional medical treatment.
- Protect the accident scene for investigation and evidence preservation.
- Contact professionals to conduct a comprehensive inspection of the ESS. The system may only be put back into use after repair or replacement and passing qualified testing.

➤ **Mechanical Injury**

- In the event of equipment tipping, dropping or component detachment, disconnect power and stop operation immediately.
- In case of personnel injury, administer first aid (hemostasis, bandaging, etc.) and call the emergency medical number immediately.
- If obvious odor, damage, smoke or fire is detected, evacuate personnel immediately, call the fire department, and allow professionals to handle firefighting and subsequent treatment.
- If any abnormalities are observed, professionals shall use move the equipment to an open, safe area, let it stand for 1 hour while monitoring temperature, and contact the engineers.
- Contact professionals to repair or replace damaged components. The system may only be returned to service after passing inspection and testing.

➤ **Natural Disasters**

- In the event of natural disasters including earthquake, typhoon, flood, wildfire, etc., disconnect the power supply and stop operation immediately.
- If the equipment is submerged or flooded, do not touch the equipment and keep clear of the waterlogged area.
- Do not use water-soaked equipment under any circumstances. Contact a qualified recycling service for proper disposal and scrapping.
- Before a wildfire approaches, establish a firebreak around the equipment and prepare adequate fire-fighting equipment such as fire extinguishers, fire sand, fire hoses, etc.
- After the disaster, contact professionals to fully inspect the support structure, electrical connections, etc. The equipment may only be reused after repair/replacement and qualified testing.