

# Ener Hexon® Smart261L CE

Liquid-Cooled Commercial & Industrial Energy Storage System

## Installation Manual



# ABOUT THIS MANUAL

## Applicable Products

This manual mainly describes the pre-installation safety precautions, loading/unloading and transportation requirements, and product installation procedures of the Ener Hexon® Smart261L CE Liquid-Cooled Commercial & Industrial Energy Storage System.

This installation manual serves as the installation guideline for the Ener Hexon® Smart261L CE Liquid-Cooled Commercial & Industrial Energy Storage System developed by YOTAI Digital Energy Technology (Shenzhen) Co., Ltd. The applicable product model is: YTDS5T261L-P0125S.

 <b>NOTE</b>	This installation manual does not cover every detail. Please read the product User Manual carefully or contact our after-sales personnel for further information. Detailed operations related to the system's air conditioning, fire protection, UPS, BMS, liquid-cooling unit, etc., should refer to the respective product user manuals or contact our after-sales personnel.
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## Target Audience

This manual is intended for personnel who carry out installation, operation, maintenance and related work for this product. Readers should possess appropriate electrical and related professional qualifications.

All installation operations must be performed only by qualified technical personnel who meet the following requirements:

- Have received specialized training and obtained the required qualifications.
- Have read this manual in full and grasp the related operational safety precautions.
- Are familiar with local standards and the relevant electrical safety regulations.

## Use of Symbols

To ensure personal and property safety and to enable more efficient and correct use of this product, this manual highlights important information using the following symbols.

The symbols that may appear in this manual and their meanings are listed below, please read them carefully to use this manual properly.

The following symbols may appear in this document, and their meanings are as follows:

Symbol	Description
 <b>DANGER</b>	Indicates an imminent hazardous situation which, if not avoided, will result in death or serious personal injury.
 <b>WARNING</b>	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious personal injury.
 <b>CAUTION</b>	Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate personal injury.
 <b>NOTICE</b>	Conveys equipment or environmental safety information. If not observed, it may result in equipment damage, data loss, reduced equipment performance, or other unforeseen consequences. "NOTICE" does not involve personal injury.
 <b>NOTE</b>	Used to emphasize important/key information, best practices and tips. "NOTE" is not a safety warning and does not relate to personal, equipment, or environmental hazards.

## Symbols on the Product

When you perform installation, operation, maintenance or other tasks, pay attention to the warning symbols on the product, including but not limited to the symbols described below:

Symbol	Description
	High Voltage — Indicates that high voltage or live parts are present. Touching may result in electric shock.
	Caution — If not avoided, may cause minor or moderate personal injury.
	Protective Earth (PE) — This symbol indicates the protective grounding terminal. It must be firmly grounded to ensure operator safety.
	Functional Earth
	Trip Hazard
	Pacemaker Warning
	No Smoking
	No Open Flame
	Do Not Climb
	Do Not Touch
	Do Not Step
	No Entry
	Do Not Lean
	Read Instructions Before Use — Failure to comply may result in danger.
<b>E-Stop</b>	Emergency Stop

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# 1 PRE-INSTALLATION NOTES

## 1.1 Safety Instruction

### 1.1.1 Declaration

Before the loading/unloading, transportation, structural installation, or electrical installation of the product, please read this manual carefully and follow all safety instructions marked on the product and provided in this manual. For additional information regarding product safety, transportation, storage, power-on operation, and O&M, please refer to the Ener Hexon® Smart261L CE Liquid-Cooled Commercial & Industrial Energy Storage System. Hereinafter referred to as the "User Manual".

The terms "Note," "Caution," "Warning," and "Danger" in this manual do not cover all safety precautions that must be observed; they serve only as supplements to general safety practices. The company assumes no responsibility for any consequences arising from violations of general safety requirements or of design, manufacturing, and product safety standards.

This product must be used in an environment that meets its design specifications. Otherwise, product failure may occur. Any resulting functional abnormalities, component damage, personal injury, or property loss will not be covered under the product warranty.

When installing, operating, or maintaining the product, local laws, regulations, and standards must be followed. The safety precautions in this manual are intended only as supplements to such laws and regulations.

Supplementary exemption clauses applicable to product installation are as follows. For detailed disclaimer terms, please refer to the User Manual. The company is not responsible for the following situations:

- (1) Installation or operating environments that do not comply with relevant international, national, or regional standards.
- (2) Operation outside the conditions described in this manual.
- (3) Unauthorized disassembly, modification of the product, or alteration of software code.
- (4) Failure to follow the operating instructions and safety warnings provided in the product and its documentation.
- (5) Product damage caused by abnormal natural events (force majeure), such as earthquakes, fires, storms, floods, landslides, mudslides, etc.
- (6) Failure of external electrical parameters or on-site operating conditions to meet the required environment for normal operation, including but not limited to: excessive or insufficient battery operating temperature, frequent grid outages, or unstable grid conditions.
- (7) Mixing different types of battery PACKs without the company's prior permission, including but not limited to mixing with other brands or with PACKs of different rated capacities.
- (8) Batteries exceeding the warranty period (based on the warranty contract) but not installed or commissioned due to reasons attributable to the customer.
- (9) Damage caused by cabinet tipping, impact, dropping, improper handling, or improper connection.

(10) Transportation damage resulting from failure to follow the transportation requirements specified in the User Manual and this manual.

(11) Damage caused by improper product storage, including failure to meet the storage requirements in the User Manual or leaving batteries uncharged for more than six months.

(12) Non-compliance with the User Manual during transportation, storage, or charging, or unauthorized changes to the intended application scenario.

(13) Damage to hardware or data caused by customer negligence, improper operation, or intentional actions.

(14) System damage caused by the customer or a third party, including relocation or installation not in accordance with this manual, and adjustments, modifications, or removal of identification labels that violate this manual.

(15) Defects, malfunctions, or damage caused by events or actions beyond the seller's reasonable control, including power outages or electrical failures, theft, war, riots, civil unrest, terrorism, or intentional/malicious damage.

(16) Damage resulting from operation performed by personnel without the required qualifications or certifications.

### 1.1.2 Safety Requirements

 **DANGER**

This product operates at high voltage. Improper handling may cause electric shock or fire, resulting in death, serious personal injury, or significant property damage. Please follow proper operating procedures:

- (1) Comply with all applicable laws, regulations, and standards in your country or region. For referenced standards without a year, use the latest version.
- (2) Follow the operational sequences and safety precautions in this manual, the user manual, and related documentation.
- (3) Observe all warning labels, cautions, and protective measures on the product.
- (4) Only authorized personnel should approach the product. Use temporary warning signs or barriers during operation.
- (5) Keep all warning labels and protective measures clearly visible. Do not alter, damage, or cover them. Replace if illegible.
- (6) Do not install, wire, maintain, or replace components while the equipment is energized. Contact with live parts may cause arcing, sparks, fire, or injury.
- (7) Improper operation while energized may cause fire, electric shock, or explosion, leading to injury or property damage.
- (8) Do not wear conductive objects such as watches, bracelets, rings, or necklaces during work.
- (9) Use dedicated insulated tools. Insulation ratings must comply with local laws, standards, and regulations.

(10) Use appropriate personal protective equipment (PPE), including protective clothing, insulated shoes, safety goggles, hard hats, and insulated gloves.

(11) Do not clean the product with flammable, conductive, or corrosive cleaning agents.

(12) Keep the product away from heat sources or open flames (fireworks, candles, heaters, etc.). Excessive heat may cause damage or fire.

(13) Do not operate the product in flammable or explosive gas environments.

(14) Do not block ventilation or cooling openings or cover the product during operation to prevent overheating or fire.

(15) Inspect the product for damage such as holes, dents, or signs of internal damage.

(16) Verify that pre-installed cables are securely connected.

(17) Ensure internal components are in place. Do not modify the product structure or installation sequence.

(18) Do not power on the product until installation is complete and verified by qualified personnel.

(19) Measure voltage before touching any conductor or terminal to ensure safety.

(20) Do not open the cabinet door while the system is operating.

(21) Verify the product is undamaged before making electrical connections.

(22) Improper operation may cause fire, electric shock, or other accidents.

(23) Prevent foreign objects from entering the product during operation to avoid short circuits, damage, power derating, or personal injury.

(24) Follow the manual's installation, operation, and maintenance steps exactly. Do not modify, add, or rearrange components.

(25) Disconnect the product and all upstream/downstream switches before installing or removing power cables.

(26) If liquid enters the product, immediately turn off power and cease use.

(27) Confirm correct cable positions and ensure insulation before installing power cables.

(28) Use torque tools within specified ranges when tightening screws. Ensure wrenches are aligned; torque deviation must not exceed 10%.

(29) After installation, ensure all protective covers and insulation devices are restored or added.

(30) For products with multiple inputs, disconnect all inputs and fully power down before operation.

(31) When maintaining downstream equipment, disconnect the corresponding output switch of the supply product.

**DANGER**

(32) During maintenance, hang "Do Not Close" signs on switches or breakers and post warnings. Restore power only after faults are cleared.

(33) For fault diagnosis requiring power disconnection: Power Off → Verify Voltage → Install Grounding → Hang Warning Signs and Barriers.

(34) Regularly inspect terminal screws to ensure tightness.

(35) Replace damaged cables only with qualified personnel.

(36) Use complete and certified tools. Do not use damaged, unqualified, or expired tools. Tools must be reliable and not overloaded.

(37) During transportation, handling, and installation, prevent cabinets from tipping or collapsing due to unstable centers of gravity.

(38) Do not drill, cut, or weld on the product. Drilling may compromise sealing, shielding, internal components, or cables and cause short circuits.

(39) Seal all cable access ports. Use sealing compound for used ports and original covers/gaskets for unused ports.

(40) Personnel performing lifting operations must be trained, ensure the environment meets installation requirements, and follow all product rules.

(41) The foundation and ground for lifting operations must meet equipment load-bearing requirements.

(42) When working at heights, wear helmets and harnesses secured to solid structures. Do not attach to unstable objects or sharp edges.

(43) Ensure all tools are prepared and certified. Do not use damaged or unqualified tools.

(44) The product weighs over 2.5 tons. Ensure lifting equipment meets safety standards.

(45) Exercise extreme caution when moving the product to prevent tipping or falling.

(46) Do not tilt the product during ground placement, transportation, or handling.

(47) Work above 2 meters is high-altitude work. Assign a supervisor, mark danger zones, and restrict access to unauthorized personnel.

(48) High-altitude personnel must follow safety regulations. The company is not liable for accidents caused by violations.

(49) Ensure the installation environment and conditions comply with all safety and regulatory requirements.

**! CAUTION**

(1) During transportation, handling, installation, wiring, and maintenance, comply with all applicable laws, regulations, and standards in the country or region of operation.

(2)The product is equipped with a fire suppression system. Do not press the emergency fire extinguishing start button except in genuine emergencies.

(3)In case of fire, de-energize the system if safe. Use a 5 kg CO<sub>2</sub> fire extinguisher on flames. If fire reaches the energy storage enclosure, call local emergency services and notify the manufacturer. Firefighters must avoid high-voltage components to prevent electric shock.

(4)Excessive battery temperature may cause deformation, damage, electrolyte leakage, and release of toxic gases. Wear respiratory protection and maintain a safe distance to avoid skin irritation or chemical burns.

(5)Disabling protective devices is strictly prohibited.

(6)During operation, the enclosure may become hot and cause burns. Do not touch.

(7)If any malfunction that could cause injury or product damage occurs during operation, immediately stop operation, report to the responsible person, and implement protective measures.

(8)Evacuate immediately if the fire alarm (audible or visual) is triggered.

(9)User-supplied materials and tools must comply with local laws, regulations, and standards.

(10)Obtain permission from the local power authority before connecting to the grid.

(11)Before opening the enclosure, remove accumulated water, ice, or debris from the top to prevent foreign objects from falling inside.

(12)Do not open the container door while the system is operating.

(13)The installation layout must comply with local fire separation distance standards or firewall requirements, including but not limited to the requirements of NFPA 855 Standard for the Installation of Stationary Energy Storage Systems (2023) and GB 51048 Code for Design of Electrochemical Energy Storage Stations.

(14)Dispose of used batteries according to local regulations. Do not treat batteries as household waste. Improper disposal may cause pollution or explosions. The manufacturer does not provide battery recycling services. Contact local or national recycling organizations for proper disposal.

## 1.2 Personnel Requirements

**! CAUTION**

To ensure the safety of product handling, transportation, installation, maintenance, and operation, the following individuals are not qualified to perform these tasks:

(1)Individuals with impaired vision or color blindness: Safe operation requires good eyesight to judge distances and recognize signals. Vision impairments or color blindness may increase accident risks.

(2)Individuals with hearing impairments: Sharp hearing is essential for crane operations and multi-person coordination. Hearing impairments may prevent timely detection of warnings or critical sounds.

(3)Individuals with certain medical conditions, such as epilepsy, fainting, heart disease, or hypertension: These may impair reaction under stress or emergencies, increasing operational risks.

(4)Individuals with mental health conditions: Depression, anxiety, or similar conditions may affect attention and judgment, making them unsuitable for high-pressure or crane operations.

(5)Individuals impaired by alcohol or drugs (including prohibited narcotics or medications): Impairment can affect judgment and reaction time, creating safety hazards.

(6)Individuals not meeting age requirements: Personnel must be at least 18 years old and possess required qualifications.

(7)Individuals in poor health: Operators must be physically and mentally fit, free from severe cardiovascular, mental, or other conditions that may compromise safety.

(8)Anti-state, anti-social, or violent terrorist elements are strictly prohibited.

(9)Personnel responsible for installation and maintenance must receive rigorous training, master operating procedures, understand all safety precautions, and be familiar with relevant standards. Untrained or unlicensed personnel are prohibited.

(10)Only qualified professionals or trained personnel may install, operate, and maintain equipment.

(11)Only qualified professionals may remove safety devices or perform maintenance.

(12)Personnel performing specialized tasks (electrical work, elevated operations, handling special equipment) must hold required certifications per local regulations.

(13)Operators of medium-voltage equipment must hold a high-voltage electrician license.

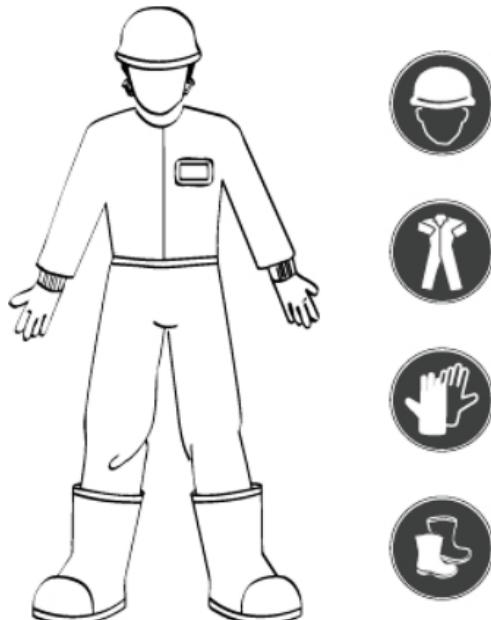
(14)Equipment or component replacement (including software) must be performed by authorized professionals.

(15)Personnel not operating the equipment must not approach it.

All operations including hoisting and transportation, installation and wiring, operation, and maintenance

must be performed by professionals who comply with the laws and regulations of the country or region, and who hold the required qualifications and certificates. Personnel must wear personal protective equipment (PPE) that meets local safety requirements, and select appropriate protective equipment according to the operational scenario.

Figure 1-1 Illustration of required personnel attire.



### 1.3 Equipment Requirements

The equipment mentioned in this section specifically refers to the crane, powered forklift, and manual forklift used during product handling, transportation, and installation. Examples are shown below:

Figure 1-2-1 Crane Example

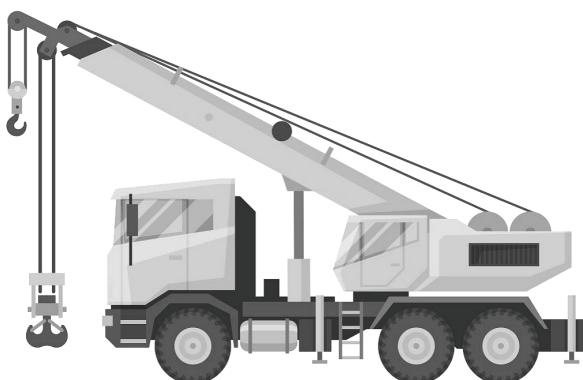


Figure 1-2-2 Powered Forklift Example



#### 1.3.1 Crane Requirements

**NOTICE**

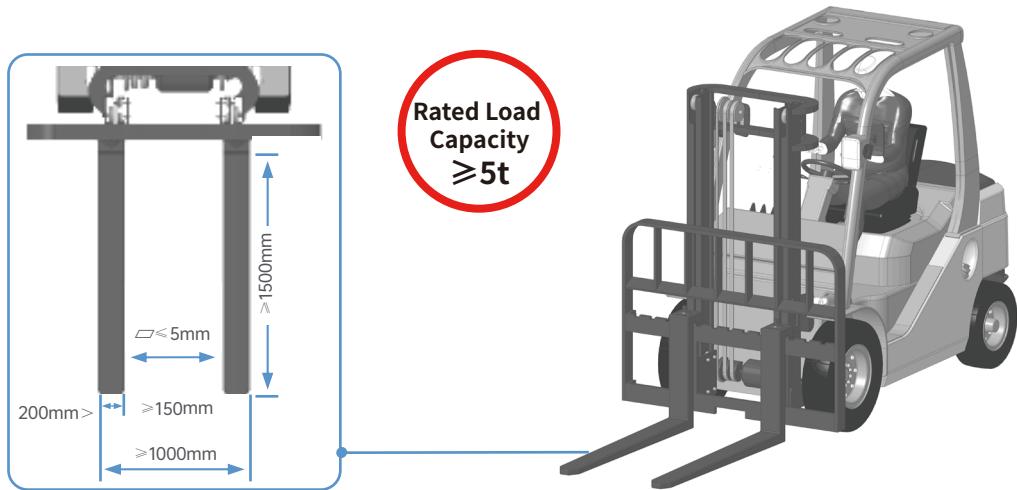
- (1)The net weight of the product exceeds 2.5 T. Select a crane that meets the required lifting capacity and lifting specifications based on the product characteristics and lifting environment.
- (2)The lifting accessories used by the crane, such as slings, hooks, and lifting belts, must fully meet the lifting requirements of the load.
- (3)The crane must comply with relevant national laws and regulations, including the Technical Management Regulations for Road Transport Vehicles, Lifting Operation Code, Special Equipment Safety Technical Code, and Safety Technical Code for Construction Lifting and Hoisting Engineering.
- (4)Crane operators must hold valid qualifications necessary for compliant and safe crane operation, including a safety operation certificate, a special-equipment operator certificate, a driver's license, and a health and safety certificate.
- (5)The crane provider must possess legal business qualifications and hold a valid work safety permit, meeting all safety production requirements.

### 1.3.2 Powered Forklift Requirements

**NOTICE**

- (1)The net weight of the product exceeds 2.5 T. Please select a forklift that meets the required load capacity and fork-handling specifications based on the product characteristics and installation environment.
- (2)The powered forklift must comply with the Safety Technical Supervision Regulations for Special Motor Vehicles Used in Industrial Premises, the Safety Specifications for the Use, Operation, and Maintenance of Industrial Vehicles, the Special Equipment Safety Technical Code, the Forklift Safety Operation Code, and other relevant requirements.
- (3)The forklift fork arm length must be  $\geq 1500$  mm.
- (4)The recommended fork arm width is  $\geq 150$  mm but  $< 200$  mm.
- (5)The flatness deviation between the two fork arms must be  $\leq 5$  mm.
- (6)The recommended maximum outer width of the opened fork arms is  $\geq 1000$  mm.
- (7)The effective load capacity of the powered forklift within its rated lifting height must be  $\geq 5$  T.
- (8)Forklift operators must hold valid and required qualifications, including a safety operation certificate, a special-equipment operator certificate, a driver's license, and a health and safety certificate, ensuring compliant and safe forklift operation.
- (9)The supplier of the powered forklift must possess legal business qualifications and provide a valid work safety permit, meeting all safety production requirements for lawful operation.

Figure 1-3 Requirements for Powered Forklifts



## 1.4 Environmental Requirements

### 1.4.1 Natural Environment Requirements

#### ⚠ WARNING

Forklift handling operations, product installation, commissioning, and maintenance are subject to strict climatic requirements to ensure operational safety and equipment stability. In adverse weather conditions such as strong winds, rain, snow, or heavy fog, forklift handling operations must be suspended or prohibited to prevent potential safety incidents, including but not limited to the following conditions:

- (1) Strong winds: Forklift handling and related operations must be suspended in outdoor environments with wind levels above Force 4, or during adverse weather such as heavy rain, snow, or dense fog. Forklift operation is also prohibited when wind speed exceeds the specified safety limits.
- (2) Lightning and thunderstorms: Forklift handling operations must not be carried out during lightning, rain, or snow. Lightning currents may strike the equipment, causing personal injury or equipment damage. During periods of frequent thunderstorms, accumulated water on the ground reduces traction, increasing the risk of forklift skidding and compromising safety.
- (3) Lighting requirements: Forklift handling and material transfer areas must have adequate illumination. Operations are prohibited under conditions where lighting or visibility is insufficient for safe forklift operation.
- (4) Temperature and humidity: The operating environment for lifting and handling equipment includes factors such as site conditions, weather, temperature, humidity, and dust. These factors are critical to the proper functioning of lifting equipment and have a significant impact on operational safety and efficiency.

## 1.4.2 Lifting Operation Environment Requirements

(1)The lifting operation site must be kept clean and tidy, free from debris, oil stains, or any factors that may affect operational safety.

(2)Clear safety warning signs must be set up at the lifting site to remind unauthorized personnel to stay away from the work area.

(3)The lifting operation site must have adequate lighting to ensure clear visibility during operation.

(4)Safety barriers must be installed around the lifting operation area to prevent unauthorized personnel from entering.

(5)Sufficient fire-fighting equipment must be provided at the lifting operation site to ensure timely response in case of fire.

(6)The lifting operation site must be well-ventilated to ensure timely discharge of toxic or harmful gases.

(7)The lifting site must be level and solid, capable of bearing the weight of lifting machinery and the load. The ground must not have noticeable unevenness, looseness, or subsidence.

(8)The site must be sufficiently spacious to accommodate the movement of lifting machinery and the load, and its size must match the load dimensions and the crane's working range.

(9)Any obstacles that may interfere with lifting operations—such as buildings, trees, or power lines—must be cleared or avoided to prevent collisions with the crane during operation.

(10)The ground bearing capacity along the crane's travel path must comply with the crane manufacturer's requirements. Roads for lifting equipment must be level and capable of supporting the equipment.

(11)Crawler cranes require higher ground stability; the ground conditions must comply with the crane manufacturer's requirements.

(12)Before operating a wheeled crane, the outriggers must be properly positioned and firmly supported according to the crane manufacturer's requirements.

(13)For high-altitude lifting operations, adequate protective measures—such as guardrails and safety nets—must be provided to prevent falls.

(14)When the lifting operation involves flammable or explosive materials, safety protection and management must be carried out in accordance with relevant regulations.

(15)Unauthorized personnel are strictly prohibited from entering the lifting area. No personnel may stand within the crane's operating radius or under the boom.

(16)When operating outdoors, lifting operations should preferably be carried out in



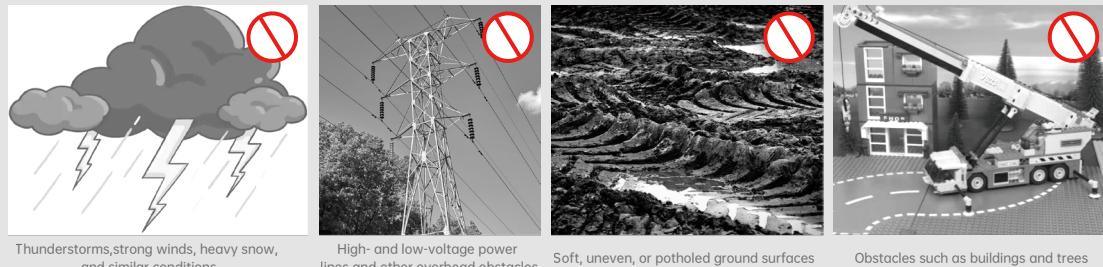
### CAUTION

**⚠ CAUTION**

clear and windless weather.

(17)When the cabinet contacts the base, remove the lifting cables only after the base is evenly loaded.

Figure 1-4 Environments Unsuitable for Lifting Operation



Thunderstorms, strong winds, heavy snow, and similar conditions

High- and low-voltage power lines and other overhead obstacles

Soft, uneven, or potholed ground surfaces

Obstacles such as buildings and trees

### 1.4.3 Crane Operation Environment Requirements

**⚠ CAUTION**

- (1)The ground must be level and firm, capable of supporting the weight of both the crane and the load, to avoid tipping caused by soft or uneven surfaces.
- (2)The ground must be clean and free of oil, water, or other slippery substances to prevent slips or loss of control.
- (3)This product is not suitable for hoisting or handling on uneven surfaces such as gravel roads, lawns, greenbelts, speed bumps, potholes, steps, or ships.
- (4)The work area must provide sufficient space for the crane to move freely without colliding with other equipment or obstacles. Unauthorized personnel are strictly prohibited from entering the work area, and no one may stand within it during operations.
- (5)Adequate space must be available for loading and unloading, taking into account the crane's turning radius and cargo dimensions.
- (6)The work area must have adequate lighting, especially at night or in low-visibility conditions, to ensure operators can clearly see the surroundings and cargo. Operations are strictly prohibited when visibility requirements are not met.

Figure 1-5 Environments or Conditions Unsuitable for Hoisting Operations



Thunderstorms, strong winds, heavy snow, and similar conditions

Uneven surfaces such as gravel roads, potholes, and speed bumps

Natural environments such as greenbelts

Locations with motion or instability such as ships

#### 1.4.4 Product Storage Environment

<b>⚠ CAUTION</b>	<p>(1)Stacking storage is prohibited. Inclined storage is prohibited. Inverted storage is prohibited.</p> <p>(2)For both long-term and temporary storage, the ground must be level, with a height error of less than 5 mm between the ground and the container contact surface.</p> <p>(3)Storage environment requirements: ≤1 month, SOC 30% (factory standard); for on-site storage &gt;1 month, recharge to SOC 50%. Relative humidity: 5%RH–95%RH (recommended around 50%RH).</p> <p>(4)Store in a clean and dry place, and protect against dust and moisture. Exposure to rainwater or ground flooding is prohibited. The ambient air must not contain corrosive, flammable, or explosive gases.</p> <p>(5)During storage, the ESS must be disconnected from the main power circuit. It is recommended to keep the auxiliary circuit powered to maintain normal monitoring system operation. Relevant evidence proving compliance with product storage requirements must be preserved, such as temperature and humidity log data, storage environment photos, and inspection reports.</p> <p>(6)For equipment other than PACKs and UPS, if the storage period is two years or more, it must be inspected and tested by qualified personnel before being put into use.</p>
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#### 1.5 Loading, Unloading, and Transportation Requirements

<b>⚠ DANGER</b>	<p>This product must be loaded, unloaded, and transported in accordance with local laws, regulations, and industry standards. Rough handling may cause internal battery short circuits or damage, which may lead to battery leakage, rupture, explosion, or fire.</p>
<b>⚠ CAUTION</b>	<p>(1)The transport of the ESS must comply with the UN Recommendations on the Transport of Dangerous Goods Model Regulations (TDG or Orange Book). It is classified as Class 9 hazardous goods and must meet the relevant tests specified in Part III, Section 38.3 of the UN Manual of Tests and Criteria for the Transport of Dangerous Goods.</p> <p>(2)Transport and storage service providers must possess hazardous goods operation qualifications in accordance with the laws and standards of the location where the services are provided. Transport must use rigid enclosed vehicles;</p>

open-top vehicles are strictly prohibited.

(3)Comply with the latest international and domestic regulations for hazardous goods transport and storage, including but not limited to the IMDG Code, Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), and JT/T617 Road Transport Rules for Dangerous Goods (China). Transport must also meet the regulatory requirements of the country of origin, transit countries, and destination country. Prior to transport and storage, products and packaging must be properly prepared, labeled, and tested according to local laws and standards.

(4)Transport should be conducted via sea or well-maintained roads; rail and air transport are not supported. Minimize shocks and tilting during transport.

(5)Before transport, ensure compliant and accurate declaration. Inspect packaging and labels for completeness and integrity. Transport is prohibited if any odor, leakage, smoke, or fire is detected.

(6)Transport packaging must be secure and stable. Handle carefully during loading, unloading, and transport. Side laying or inversion is prohibited. Ensure moisture protection, secure fastening to prevent movement, and hazardous goods labels must face outward.

(7)Handle with care during loading, unloading, and transport, and ensure moisture protection. Due to external factors (temperature, transport, storage, etc.), product specifications are based on the factory date.

(8)Unless otherwise specified, hazardous goods must not be transported in the same vehicle or container with food, medicine, animal feed, or additives. Sharp objects must not be loaded together in the same vehicle.

(9)If local regulations allow co-loading of certain types of hazardous goods or hazardous and non-hazardous goods, isolation must be performed according to local laws and standards. If no explicit requirements exist, the following isolation guidelines may be used when loading hazardous and non-hazardous goods in the same vehicle or container:

①Use barriers equal in height to the packaged goods.

②Maintain a minimum 0.8 m clearance around all sides.

(1)This product is packaged in a wooden crate or carton. The external package dimensions are D1480 × W1550 × H2480 mm, with a total weight exceeding 2.6 tons.

(2)Packaged units are only permitted to be handled using powered forklifts.

**⚠ CAUTION**

Hoisting with cranes is strictly prohibited. Take precautions to prevent tipping.

(3) Forklift handling operations for this product must comply with the requirements defined in Section 1.4 of this manual. Over-limit operations, noncompliant operations, and the presence of unauthorized personnel in the work area are strictly prohibited. No personnel may stand within the work area during operations.

(4) Operators must wear appropriate personal protective equipment (PPE), such as safety helmets, protective footwear, and gloves, during loading and unloading operations. The selected handling equipment and tools must meet operational requirements.

(5) Manual lifting, supporting, or moving by brute force is strictly prohibited. The use of manual forklifts or hand-pulled trailers for transfer is strictly forbidden.

(6) Forklifts must not be used for long-distance transportation. The recommended maximum transport distance with the product is no more than 500 meters, and the requirements defined in Section 1.4 must be met.

(7) Sudden braking, racing, collisions, and sharp turns are strictly prohibited during transportation.

(8) Parking on slopes, bridges, riverbanks, cliffs, or areas with falling-object hazards is strictly prohibited.

(9) During forklift handling, ensure that the fork arms are positioned at the designated forklift entry points of the product or packaging, aligned with the center position. The fork arm length must fully cover the base of both the product and its packaging.

(10) Forklift handling must be conducted smoothly and reliably.

(11) The recommended fork arm width is  $\geq 150$  mm but  $< 200$  mm.

(12) The forklift handling speed must be  $\leq 1$  km/h.

(13) The turning radius during forklift handling must be  $\geq 5$  meters.

(14) The forklift lifting/lowering speed must be  $\leq 0.15$  m/s.

**⚠ CAUTION**

When performing forklift handling, transportation, installation, operation, or maintenance, please carefully read the User Manual and this Installation Manual, and comply with local laws and regulations. The company assumes no responsibility for any accidents resulting from non-compliant operations.

Figure 1-6 Powered Forklift Handling of Packaged Carton

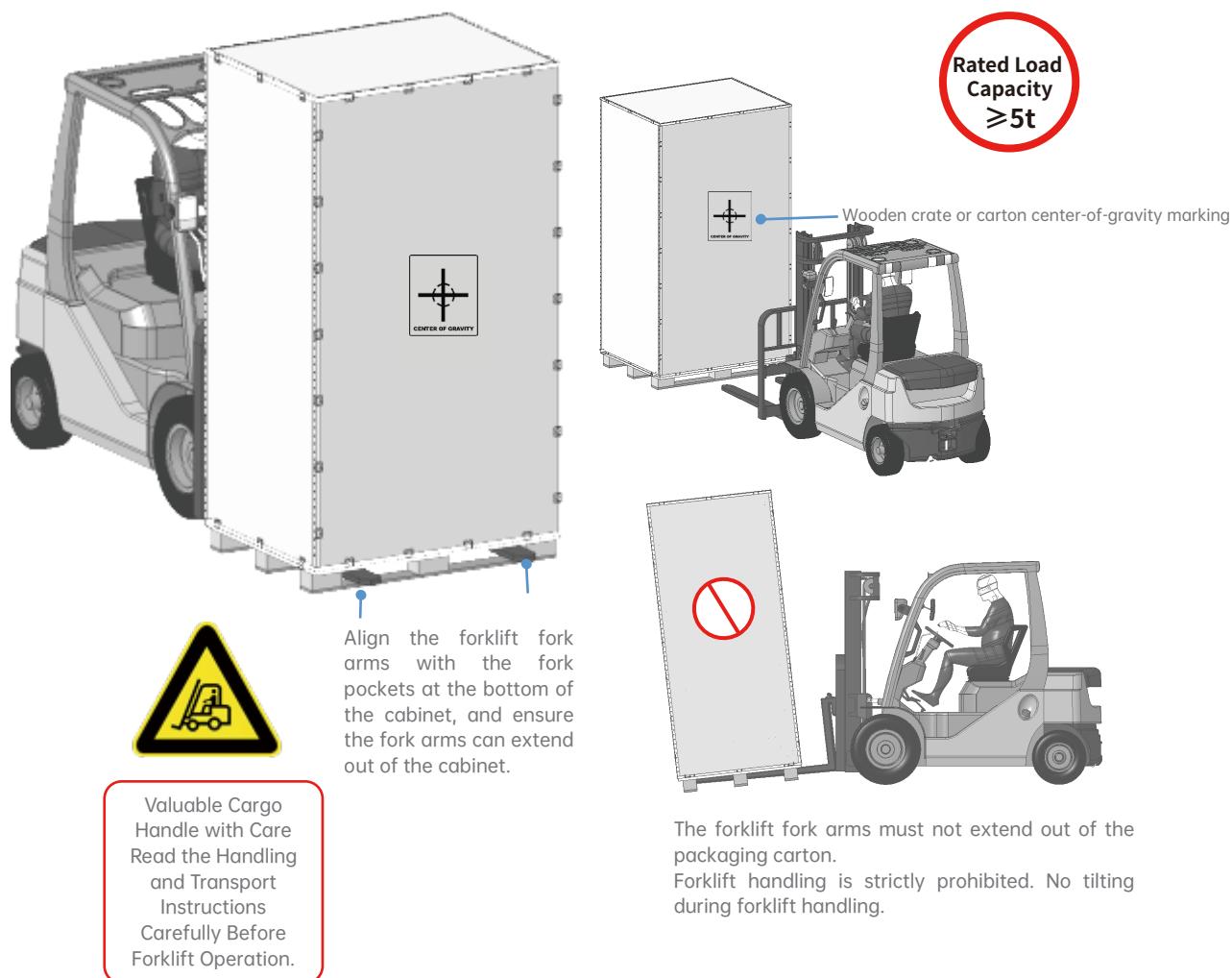
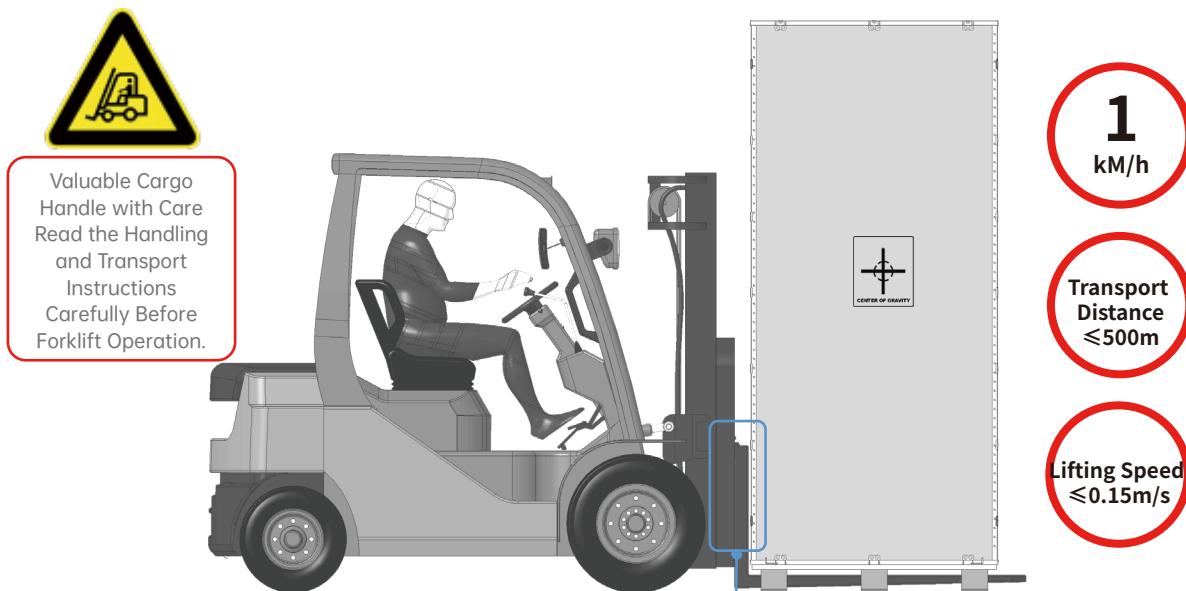


Figure 1-7 Powered Forklift Handling and Transfer of Packaged Carton



The packaging carton should be positioned tightly against the forklift fork arms.

Perform transfer and transportation operations smoothly and reliably.

Figure 1-8 Turning Radius for Powered Forklift Handling and Transfer of Packaged Carton

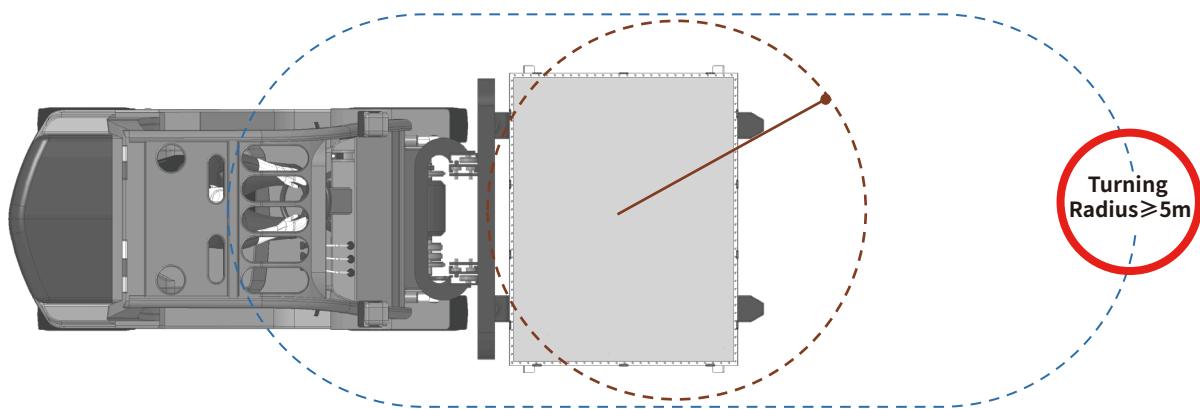
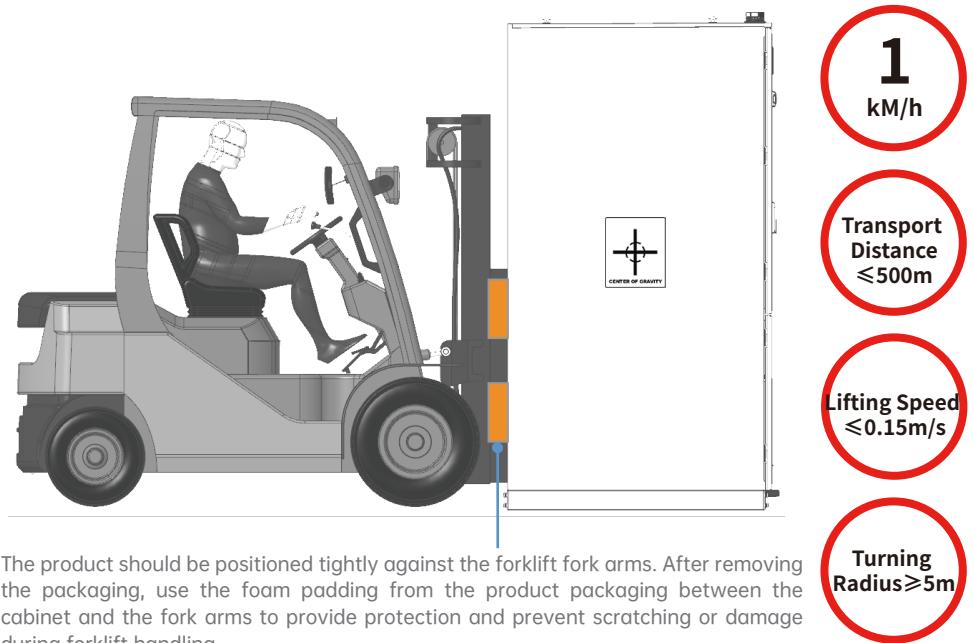
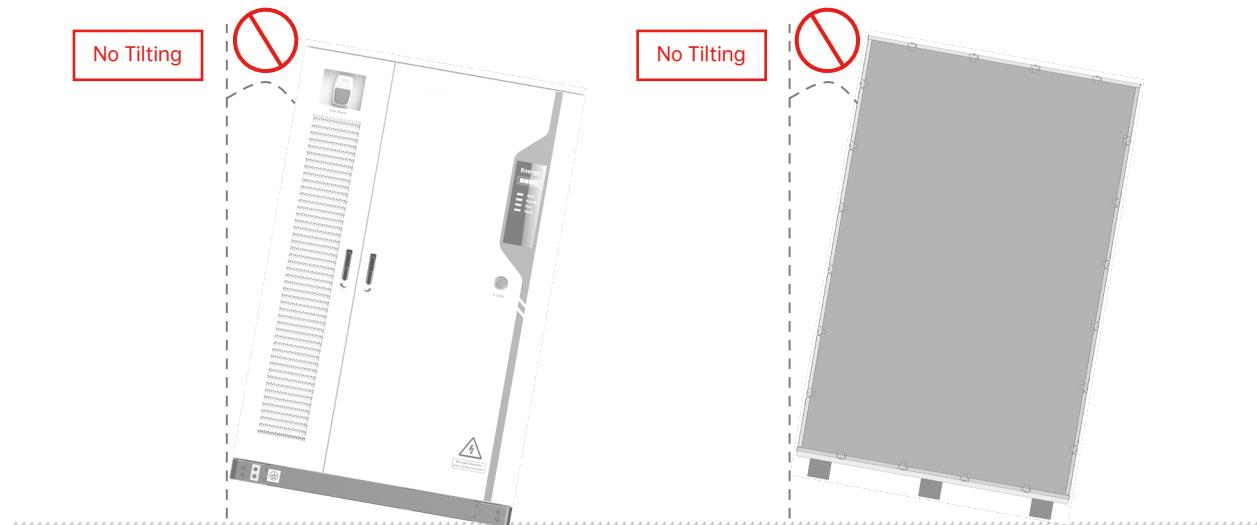


Figure 1-9 Powered Forklift Handling and Transfer of the Product



The product should be positioned tightly against the forklift fork arms. After removing the packaging, use the foam padding from the product packaging between the cabinet and the fork arms to provide protection and prevent scratching or damage during forklift handling.

Figure 1-10 Prohibition of Tilting for Cabinet and Packaging



## 1.6 Product Safety

(1) Do not short-circuit the positive and negative terminals of the PACK, as this will cause a short circuit. A short circuit can instantly generate a large current and release a large amount of energy, leading to battery leakage, smoke, release of flammable gases, thermal runaway, fire, or explosion. To avoid battery short circuits, maintenance is strictly prohibited while the product is in operation or under high voltage.

(2) Do not expose the product to high-temperature environments or place it near heat sources, such as direct sunlight, fire, transformers, or heaters. Overheating may cause internal batteries to leak, smoke, release flammable gases, undergo thermal runaway, catch fire, or explode.

(3) The product must not be subjected to mechanical vibration, dropping, collision, puncture by hard objects, or impact pressure, as this may damage the PACK or cause a fire.

(4) Disassembly, modification, or damage to the PACK is strictly prohibited (e.g., inserting foreign objects, external compression, immersion in water or other liquids), as this may cause battery leakage, smoke, release of flammable gases, thermal runaway, fire, or explosion.

(5) Using or replacing the PACK with an incorrect model poses risks of fire or explosion. Always use the manufacturer-recommended PACK model.

(6) Battery electrolyte is toxic and volatile. In the event of electrolyte leakage or unusual odors, avoid contact with the liquid or gas. Non-professionals must not approach. Contact qualified personnel immediately. Professionals must wear safety goggles, rubber gloves, respirators, and protective clothing, promptly power down the equipment, and consult technical engineers for handling.

(7) The PACKs in the ESS form a sealed system and will not release gases during normal operation. In cases of extreme misuse, such as fire, puncture, compression, lightning strikes, overcharging, or other conditions that may cause thermal runaway, batteries may be damaged or undergo abnormal chemical reactions. This can result in electrolyte leakage or the generation of gases such as CO or H<sub>2</sub>. Ensure combustible gas exhaust measures are functioning properly to prevent fire or equipment corrosion.

(8) Gases generated by battery combustion in the ESS can irritate the eyes, skin, and throat. Appropriate protective measures must be taken.



### DANGER

(1) The product must be installed in an area away from liquids. It is strictly prohibited to install it beneath liquid cooling unit outlets, ventilation openings,



### WARNING

equipment-room cable exits, water pipes, or any other locations prone to leakage, to prevent liquid ingress that may cause equipment failure or short circuits.

(2) During installation and commissioning, fire protection equipment such as fire sand and CO<sub>2</sub> extinguishers must be provided in accordance with construction standards and regulations. Before the system is put into operation, fire protection facilities compliant with local laws, regulations, and standards must be ensured.

(3) Before unpacking, ensure that the outer packaging remains intact during storage and transfer. The packaging must be placed according to the orientation indicated on the carton. Inversion, lateral placement, vertical placement, tilting, or improper stacking are strictly prohibited. Stacking must comply with the stacking instructions on the outer packaging to avoid collision, impact, or dropping that may lead to product damage or scrapping.

(4) After unpacking, the product must be placed in the designated orientation. Inversion, lateral placement, vertical placement, tilting, or stacking are strictly prohibited. Avoid any impact, collision, or dropping that may cause damage or render the product unusable.

(5) Tighten the copper bar or cable fastening screws to the torque specified in this manual. Periodically check whether they are properly tightened and inspect for rust, corrosion, or foreign matter. Clean and maintain the connections as required. Loose screws may cause excessive contact voltage drop, and under high current conditions, severe heating may occur, potentially damaging or destroying the product.

(6) After the battery has been discharged, it should be recharged promptly; otherwise, over-discharge may cause permanent battery damage.

#### ⚠️ WARNING

## 1.7 Emergency Response

#### ⚠️ WARNING

(1) If the product is dropped (with or without packaging), but there is no visible deformation or damage to the exterior and no obvious odor, smoke, or fire, operation may proceed only under the premise of ensuring safety.

(2) In a warehouse: evacuate personnel, and have professionals use mechanical tools to transfer the product to an open and safe area. Contact the company's after-sales personnel. After the product has been left to stand for 1 hour and its temperature is confirmed to be within ambient room temperature, proceed with handling.

(3) On the ESS site: evacuate personnel, close the system doors, and have profes-

sionals use mechanical tools to transfer the PACK to an open and safe area. Contact the company's after-sales personnel. After the product has been left to stand for 1 hour, proceed with handling.

**⚠ WARNING**

(4)If, after a drop, the product emits a strong odor, shows visible damage, smokes, or catches fire, evacuate personnel immediately, contact professionals, and call emergency services. Firefighting facilities must be used by professionals under safe conditions to extinguish the fire.

(5)After a product has experienced a drop, it is prohibited to continue using it. The company's after-sales personnel must be contacted for evaluation.

(1)In the event of a fire, evacuate the building or product area and activate the fire alarm bell. Immediately call the fire emergency number, notify professional firefighting personnel, and provide them with relevant product information, including but not limited to: battery type, ESS capacity, and product design layout.

(2)Under no circumstances should personnel re-enter the burning building or product area, nor should the ESS compartment doors be opened. The site must be isolated and monitored, and unauthorized personnel must be kept away.

(3)After calling the fire emergency number, and only if personal safety can be ensured, remotely power down the system (e.g., intelligent substation, energy storage controller, auxiliary power supply, combiner box, etc.).

(4)When professional firefighting personnel arrive, provide them with relevant product information, including but not limited to: battery type, ESS capacity, product design layout, and the user manual.

(5)After professional firefighting personnel confirm that the fire has been extinguished, follow local regulatory requirements and have qualified professionals handle the system. It is strictly prohibited to open the container doors without authorization.

(6)Post-disaster product maintenance: contact the company's after-sales personnel for evaluation.

(7)Firefighting operations must comply with local fire safety regulations and be carried out by professionals only.

**⚠ DANGER**

## 2 PRODUCT DESCRIPTION

This product is a cabinet-type C&I ESS. The system consists of lithium-ion battery modules, an energy storage PCS, a liquid cooling unit, a fire protection system, an EMS, and an auxiliary power distribution system, enabling the storage and release of electrical energy. The cabinet dimensions are W1400 × D1400 × H2280 mm, with a weight of approximately 2.5 tons. The product is primarily used for peak shaving and valley filling, PV-ESS-Charging stations, virtual power plant participation, power quality improvement, and dynamic capacity expansion. The external dimensions of the product are shown below:

Figure 2-1 Product Appearance Diagram

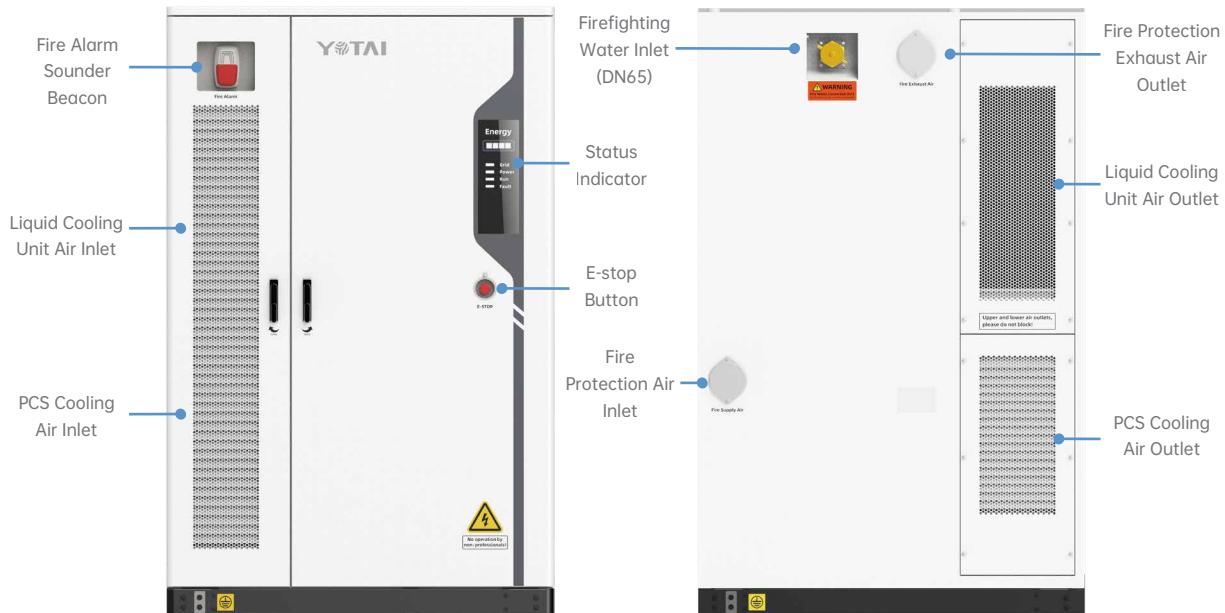
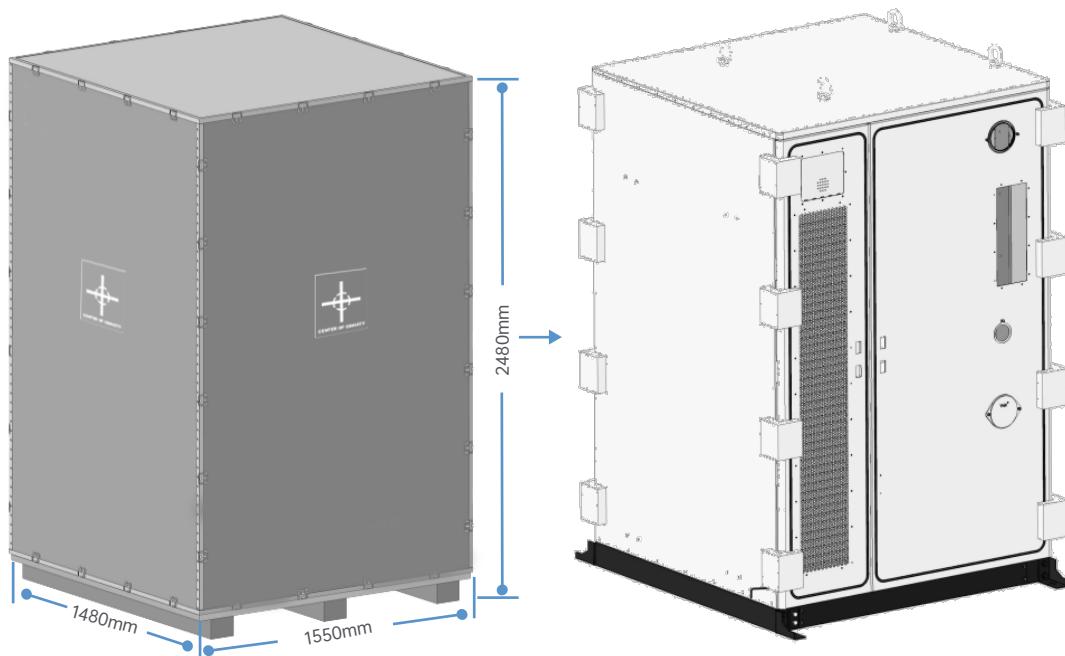


Figure 2-2 Packaging Appearance and Unpacked View



### 3 HANDLING AND TRANSPORTATION

#### 3.1 ESS Loading and Unloading

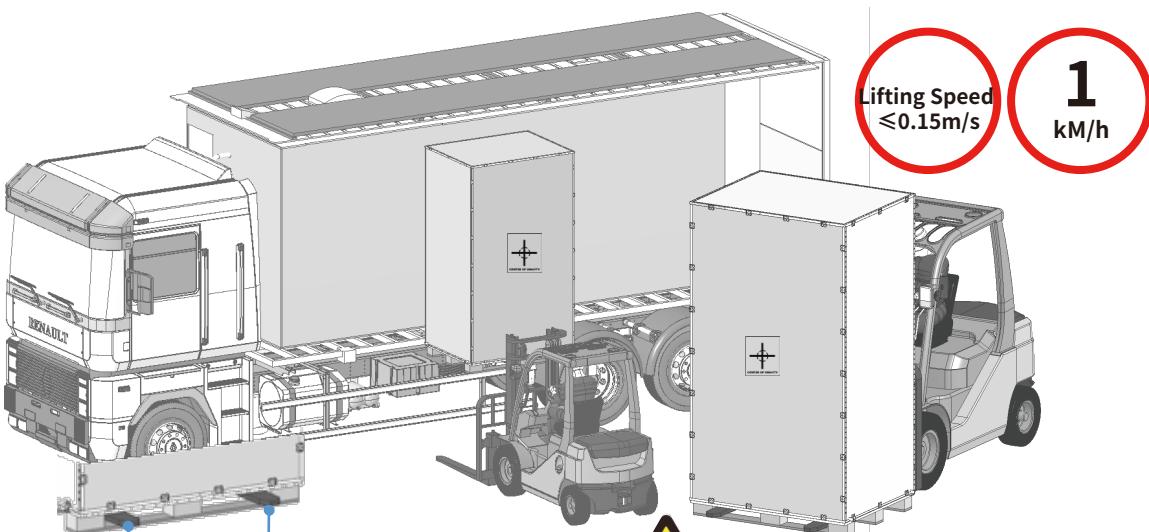
##### ⚠ CAUTION

- (1) Product loading and unloading include both the installation and unloading of packaged units.
- (2) Forklift loading and unloading operations must comply with the requirements specified in Chapter 1 "Pre-installation Notes" of this manual.
- (3) It is recommended that the truck unload the product at the shortest possible distance from the final installation location.
- (4) It is recommended to use a powered forklift for short-distance transportation ( $\leq 500$  meters) in accordance with the specified requirements.
- (5) When transporting the product inside a vehicle, the product must be properly secured, and additional anti-collision protection—such as cushioning foam or padding—shall be added around it to prevent damage caused by sudden braking or impact during transportation.

When using a powered forklift to load or unload the product, the forklift must align its forks with the forklift openings on both sides of the cabinet base when handling the packaged unit inside the truck compartment. The forklift arms must extend fully beneath the product. During lifting and lowering, the forklift shall operate smoothly and slowly. The lifting/lowering speed shall be  $\leq 0.15$  m/s, and the moving speed shall be  $\leq 1$  km/h. Shaking, vibration, drifting, or any other conditions that may severely affect operational safety are strictly prohibited.

Refer to the illustration below:

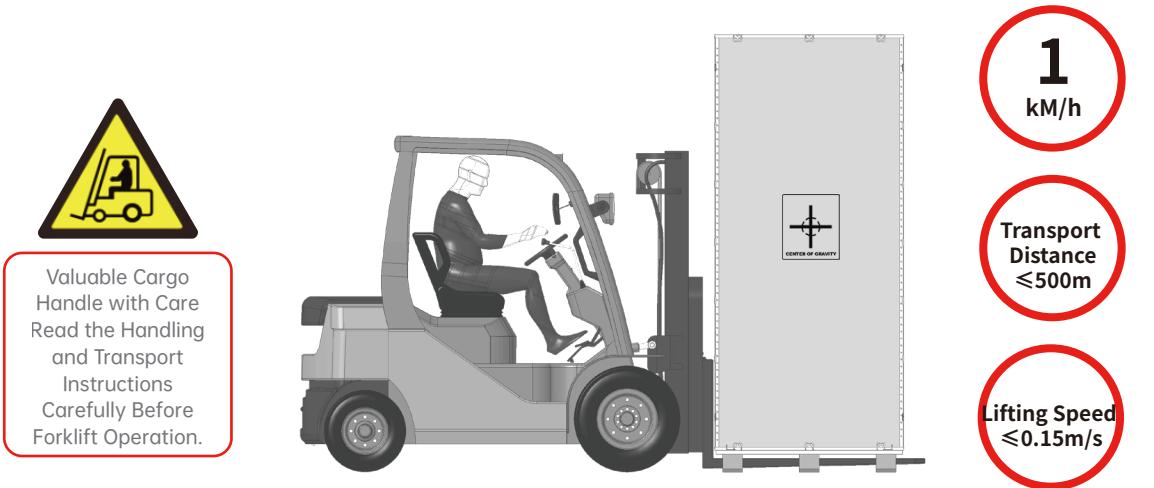
Figure 3-1 Wooden Crate or Carton Unloading Operation Diagram



The forklift arms must align closely with both sides of the forklift pockets on the wooden crate or carton base, and the forklift arms must be able to extend fully through the crate.

## 3.2 ESS Transportation

Figure 3-2 Short-Distance Transport According to Section 1.5 of This Manual



## 3.3 Package Removal

Please prepare following tools before package removal

Table 3-1 Package Removal Preparation Tools List

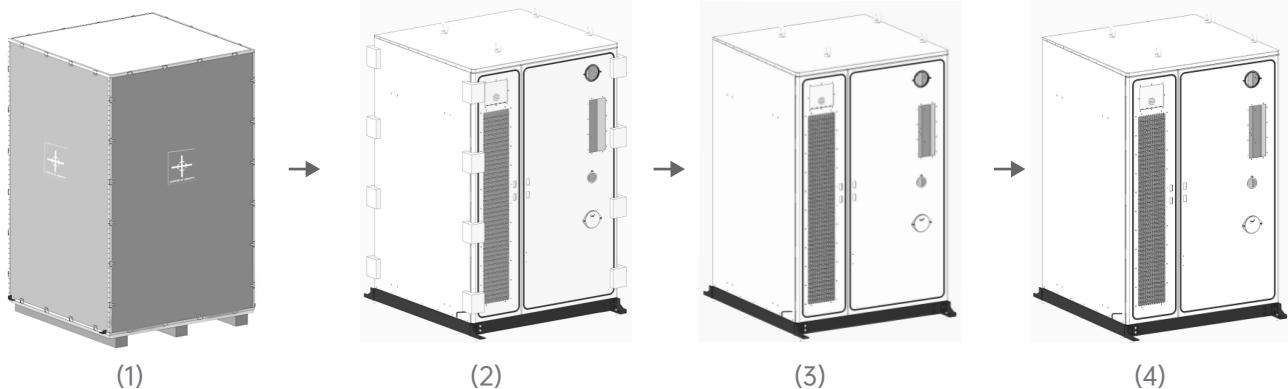
Socket Wrench Set	Phillips/Flathead Screwdrivers	Pry Bar	Claw Hammer

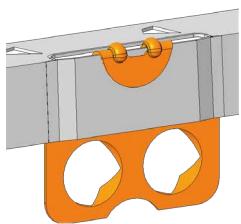
Steel Tape Measure	Digital or Bubble Level	Stepladder	Personal Protective Equipment (PPE)

<b>! CAUTION</b>	<p>(1)The product is packaged in an assembled wooden crate or carton. When unpacking, use tools such as a pry bar or claw hammer to remove the metal fasteners of the assembled wooden crate or carton.</p> <p>(2)It is strictly forbidden to use cutting machines, hammers, feet, heavy tools, electric drills, or any forceful methods to dismantle the wooden crate or carton.</p> <p>(3)Proper personal protective equipment must be worn during the wooden crate or carton dismantling process.</p>
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Figure 3-3 Wooden Crate or Carton Unpacking Diagram



- (1) Designated Location for Wooden Crate or Carton Transportation.
- (2) Dismantling and Assembling the Wooden Crate or Carton Packaging.
- (3) Remove the protective foam padding and PE bag.
- (4) Inventory the accompanying accessories inside the cabinet.



Use a pry bar and claw hammer to loosen the metal clips



Do not kick or step on the product



Do not use an electric drill



Do not use a sledgehammer



Do not use a cutting machine

### 3.4 Accessory Inspection and Inventory

After the packaging is removed, the accessories are placed inside the cabinet. Refer to the table below to check and inventory the accompanying accessories.:

Table 3-2 Accessory List

No.	Category	Equipment Description	Quantity per Unit	Unit	Remarks
On-site Engineering Installation Parts					
1	Equipment	Energy Storage Cabinet / YTDS5T261L-P0125S	1	pcs	According to production finished-goods material code
2	Structural Material	Hex Torx Wrench	1	pcs	Wrench for removing rear cover plate
3	Structural Material	Left Foot-Mount Fastener	2	pcs	Cabinet fixing
4	Structural Material	Right Foot-Mount Fastener	2	pcs	Cabinet fixing

No.	Category	Equipment Description	Quantity per Unit	Unit	Remarks
5	Structural Material	Energy Storage Cabinet Keys	4	pcs	Cabinet anti-theft
6	Installation Accessories	Expansion Bolt M16	4	pcs	Cabinet fixing
7	Electrical Components	Manual Service Disconnect (MSD)	5	pcs	Electrical Connection
8	Electrical Components	Hexagon Combination Screw M6*16	10	pcs	Battery Compartment Sealing Plate Fixing
Factory Delivery Documentation					
1	Paper Document	Product Factory Inspection Report	1	set	
2	Paper Document	Product Certificate of Conformity	1	set	
3	Paper Document	Factory FAT Test Report	1	set	
4	Electronic	Document	Energy Storage System User Manual	1	
5	Electronic	Document	Energy Storage System Installation Manual	1	
6	Electronic	Document	PCS User Manual	1	
7	Electronic	Document	Liquid Cooling Unit User Manual	1	
8	Electronic	Document	Cloud Platform WEB Operation Guide	1	
9	Electronic	Document	EMS Operation Manual	1	
10	Paper Document	Packing List	1	set	

## 4 INSTALLATION AND SECURING

**NOTICE**

The site selection must comply with the NFPA 855 Standard for the Installation of Stationary Energy Storage Systems-2023 and local regulations.

**NOTE**

- (1)If the required safety distance at the selected site cannot meet the relevant standards, it is recommended to choose another site.
- (2)According to NFPA 855 – Standard for the Installation of Stationary Energy Storage Systems (2023): When an outdoor ESS is installed with an independent 1-hour fire-rated firewall barrier, and the firewall's length and height extend at least 5 feet (1.5 m) beyond the physical boundary of the prefabricated container, the spacing shall comply with the requirements of Section 4.1.
- (3)According to NFPA 855 Standard for the Installation of Stationary Energy Storage Systems-2023 : When a non-combustible exterior wall—with no openings or combustible finishes—is installed near the ESS, and the wall has a 2-hour fire rating in accordance with ASTM E119 or UL 263, the spacing shall comply with the requirements of Section 4.1.

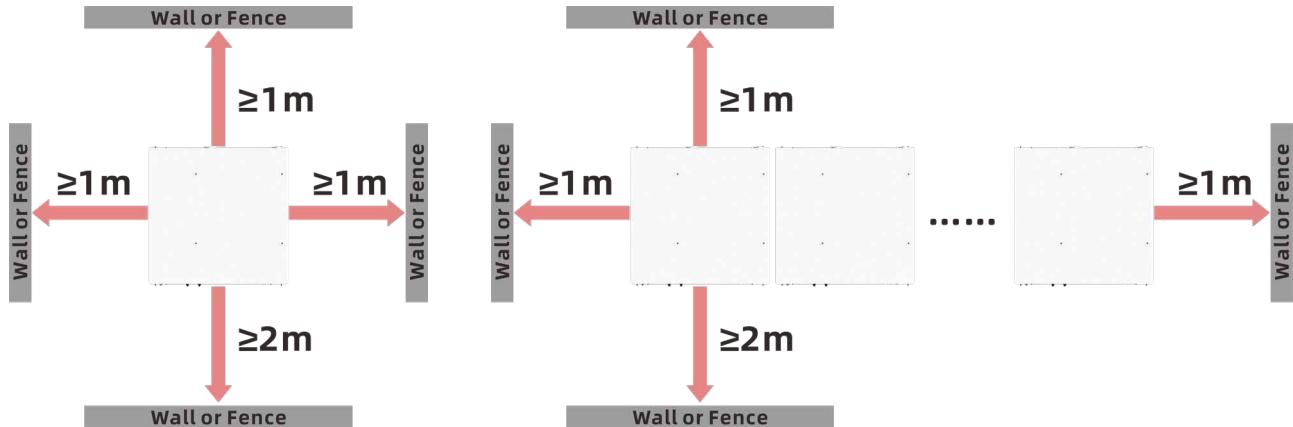
### 4.1 Installation Space

**NOTE**

To ensure proper maintenance of the equipment inside the cabinet and to allow transportation tools to move smoothly, it is recommended to reserve sufficient clearance around the installation area of the cabinet. The minimum clearance shall not be less than the dimensions shown in the diagram below:

- (1)A minimum clearance of  $\geq 1000$  mm shall be reserved at the rear of the energy storage system,  $\geq 1500$  mm at the top, and  $\geq 2000$  mm at the front for installation and maintenance operations.
- (2)A maintenance aisle shall be arranged around or on at least one side of the cabinet, with a net width of  $\geq 1000$  mm.
- (3)It is recommended that the energy storage equipment area be isolated with a solid wall or fence. A fireproof wall can replace part or all of the enclosure. The fireproof wall thickness shall be  $\geq 200$  mm, to be determined comprehensively by the designer.
- (4)The above clearance requirements are based solely on installation and O&M needs. Final spacing must also comply with local fire protection regulations.
- (5)No items shall be placed on the top of the cabinet.

Figure 4-1 Cabinet Installation Space



## 4.2 Installation Foundation

**NOTE**

Please install the foundation according to the system foundation drawing

**WARNING**

(1) The product weighs 2.5 tons. Before constructing the foundation, a detailed assessment of all installation site conditions—including geological conditions and environmental/climatic factors—must be carried out. The foundation design and construction may only begin on this basis.

(2) The energy storage system must be installed on a concrete or other non-combustible surface. The installation surface must be level, solid, and even, with sufficient load-bearing capacity. Any depressions or inclinations are strictly prohibited.

(3) The user shall verify the foundation design parameters of the energy storage system in accordance with local laws and regulations, installation environment, ground load-bearing capacity, geological conditions, and seismic requirements. Technical communication and support regarding the foundation design can be provided by the company.

**WARNING**

The installation of the product should be carried out by a professional construction team following building construction standards:

(1) During excavation of the foundation pit, compact the natural soil. Loose or wet soil must be reinforced. The foundation site should be selected at the highest point of the surrounding terrain and at least 300 mm above the horizontal ground to prevent water accumulation and damage. Do not place loads within 5m of the pit edge to avoid collapse.

(2) The foundation must be constructed according to the foundation drawings

**⚠ WARNING**

provided by the supplier or drawings confirmed by our company. The surface tolerance of the foundation top must be  $\leq 3$  mm.

(3) Installation pedestals should be made of reinforced concrete, and the bearing capacity of the pedestal foundation bottom must not be less than  $2000 \text{ kg/m}^2$ .

(4) The grounding bus and grounding electrodes should follow standard substation grounding practices. It is recommended to use  $50 \times 4 \text{ mm}^2$  galvanized flat steel to form a grounding mesh. The length is determined by site conditions, and the grounding resistance should be less than  $4 \Omega$ .

(5) Before foundation construction, perform site investigation. During excavation, implement slope protection or deep pit support according to the actual site conditions and geotechnical report to ensure construction safety.

(6) For unmarked embedded components, grounding, and embedded conduits, refer to the construction drawings and manufacturer's requirements to avoid secondary excavation. Both ends of all embedded conduits should be temporarily sealed to prevent debris entry.

(7) The foundation surface should be leveled with a spirit level. The bottom plane of the foundation should be slightly sloped to both sides to ensure drainage. Drainage must meet the local historical maximum rainfall requirements, and discharged water must comply with local laws and regulations.

(8) The specification and quantity of perforated conduits should be determined according to the cable type and the number of incoming/outgoing lines.

(9) According to the positions and dimensions of the product's cable inlets and outlets, allocate sufficient space for AC/DC cable trenches in the foundation and embed cable conduits in advance.

(10) A drainage system should be constructed to prevent water from accumulating under the product or inside equipment during heavy rainfall or wet seasons.

(11) After all cables are connected, seal the cable inlets, outlets, and joints with fire-resistant mortar or other suitable materials to prevent entry by rodents.

### 4.3 Foundation Drilling

**⚠ WARNING**

(1) Improper drilling operations may result in fastening failure, product collapse, personal injury, or other serious hazards. Before performing drilling work, ensure that you have the necessary professional skills and are aware of the severe consequences of non-compliant operations.

(2) The construction team must obtain construction permits, and personnel must hold valid construction qualifications.

(3) Avoid pre-embedded pipes or cables when drilling to prevent short circuits or other hazards.

(4) Protect the equipment during drilling to prevent debris from falling inside, and clean up debris immediately after drilling.

(5) If feeder cables are pre-laid, ensure that they are de-energized.

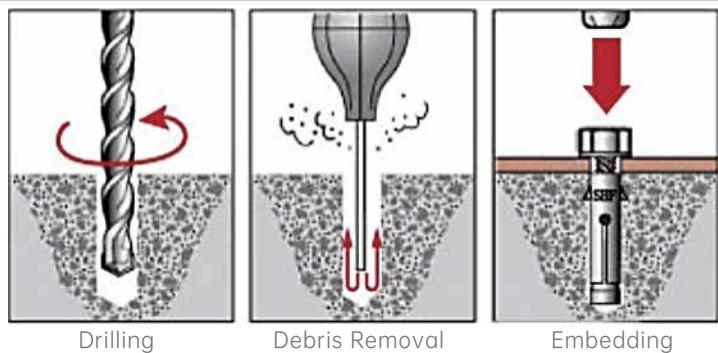
(6) Do not remove nuts during embedding to prevent them from falling into the holes.

(7) The drilling depth shall not be less than 140 mm.

※ Based on construction team experience, foundation drilling can also be performed after the product has been positioned on the foundation base.

### ⚠ WARNING

Figure 4-2 General Steps for Foundation Drilling Operations



## 4.4 ESS Lifting

### ⚠ CAUTION

(1) The product weighs 2.5 tons. Select lifting tools, slings, and cranes that meet regulatory requirements and are suitable for the lifting operation. Each individual lifting tool or sling must have a load capacity of at least 5 tons.

(2) When performing lifting operations, the requirements in Chapter 1 "Pre-installation Notes" of this manual must be followed.

(3) Before lifting, all environmental constraints and potential risks must be fully identified, and necessary precautions shall be taken to prevent lifting hazards.

(4) During lifting, protect the painted surfaces when using heavy hooks and lifting rings. If any paint peeling occurs, it shall be repaired promptly.



Thunderstorms, strong winds, heavy snow, and similar conditions



High- and low-voltage power lines and other overhead obstacles

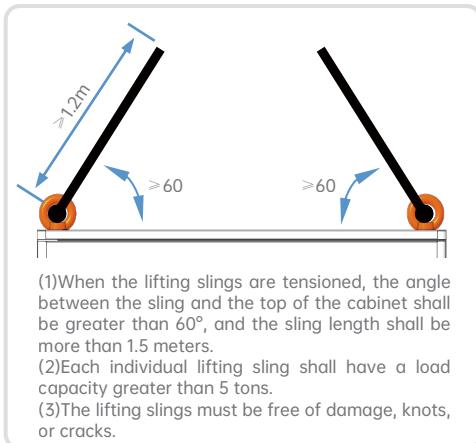
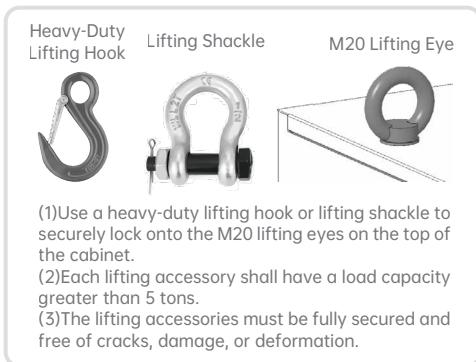


Soft, uneven, or potholed ground surfaces



Obstacles such as buildings and trees

Figure 4-3 Lifting Operation Diagram



## 4.5 ESS Forklift Operation

### ⚠ CAUTION

- (1) The product weighs 2.5 tons. Select a forklift that meets regulatory requirements and is suitable for forklift handling, with an effective load capacity of  $\geq 5$  tons.
- (2) The ground surface shall be level, firm, and capable of bearing the weight of both the forklift and the load. Soft or uneven surfaces shall be avoided to prevent forklift overturning.
- (3) The ground surface shall be clean and free of oil stains, water, or other slippery substances to prevent skidding or loss of control.
- (4) This product is not suitable for forklift handling or transfer operations on uneven surfaces such as gravel roads, grass areas, landscaped zones, speed bumps, potholes, steps, or on ships.
- (5) The operation area shall have sufficient space to allow the forklift to move freely without colliding with other equipment or obstacles.
- (6) Adequate space must be reserved for loading and unloading, taking into consideration the forklift's turning radius and the size of the cargo.
- (7) The operation area shall have proper lighting, especially during nighttime or in

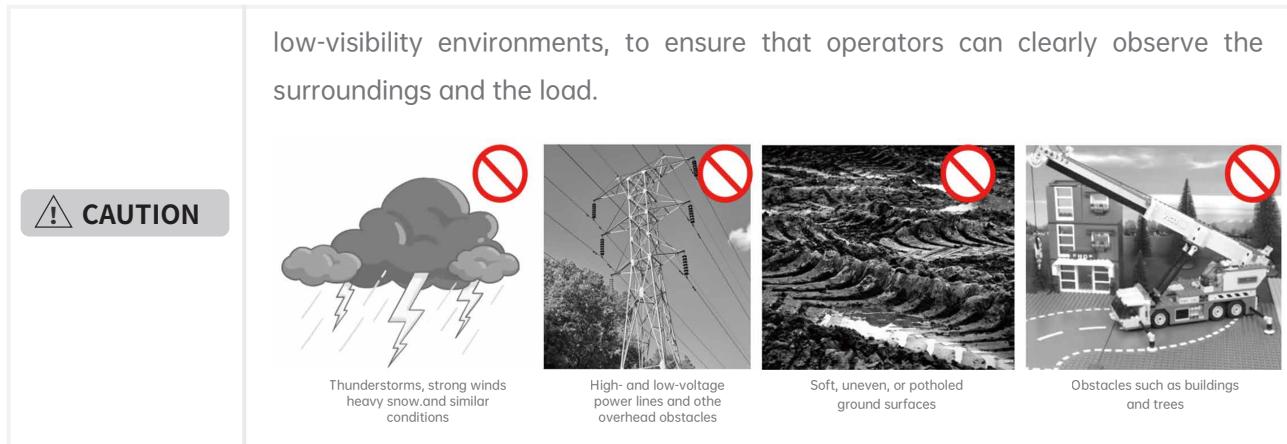
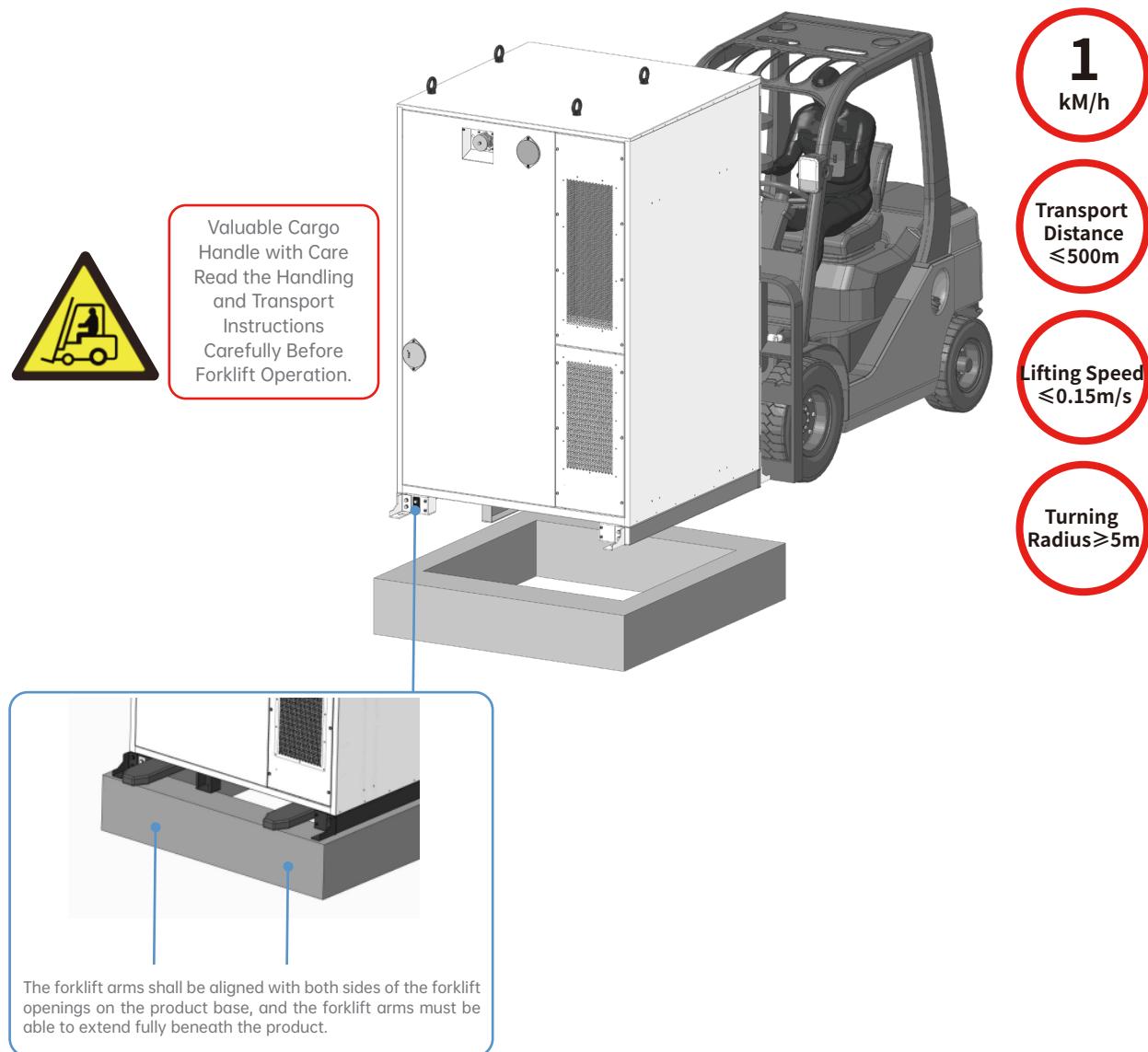
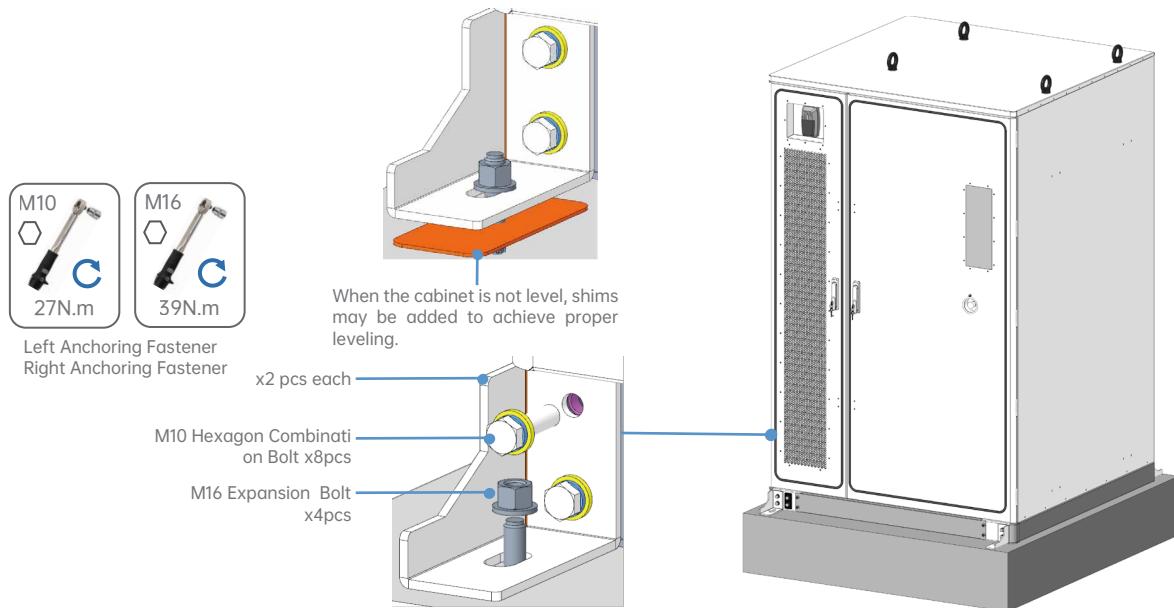


Figure 4-4 Forklift Operation Diagram



## 4.6 ESS Securing

Figure 4-5 ESS Securing Operation Diagram

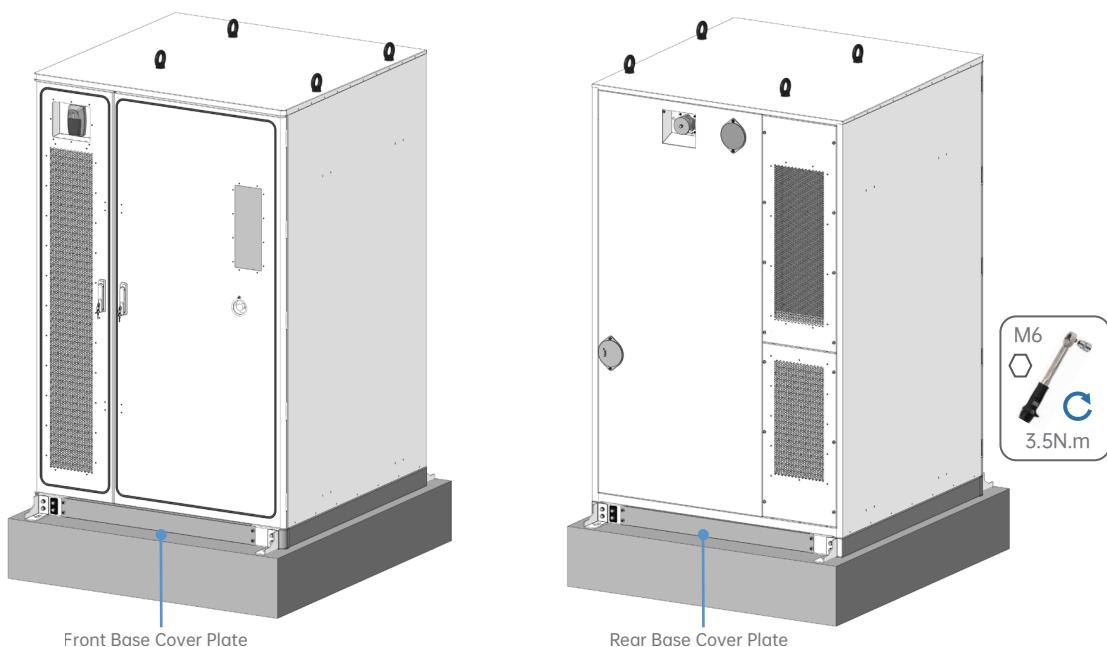


## 4.7 ESS Recovery

### ⚠ CAUTION

- (1) After cable connections are completed, the product's protective components must be restored.
- (2) The screws on the front and rear base cover plates shall be tightened according to the specified torque. Refer to Appendix B, Table 1 for the standard torque values.
- (3) After the product's structural installation and securing are completed, the forklift arm position label at the bottom of the front door panel may be removed.

Figure 4-6 Base Front and Rear Cover Plate Installation Diagram



## 5 ELECTRICAL INSTALLATION

### 5.1 Prerequisites

<b>! WARNING</b>	It is strictly prohibited to install fuses, switches, or any other devices on the protective earth (PE) conductor.
<b>! CAUTION</b>	The grounding must comply with local electrical safety regulations.

- (1)The ESS has been confirmed to be complete.
- (2)The structural installation of the ESS has been completed in accordance with the installation manual, and a safety inspection has been performed.
- (3)The wiring requirements have been clearly defined.

### 5.2 Connecting the Protective Earth (PE) Conductor

The specific requirements for the protective earth (PE) conductor are as follows:

Type	Grounding Method	Recommended Specification	Terminal Requirements	Source
Cabinet Grounding	Grounding Cable	ZC-YJV-0.6/1kV-1*35mm <sup>2</sup> (yellow-green)	OT/DT terminals, M10 bolts	User-supplied
Cabinet Grounding	Grounding Bar	D4 × W40 mm (hot-dip galvanized, minimum coating thickness ≥70 μm)	M10 × 25 screws	User-supplied
System Grounding	Grounding Cable	ZC-YJV-0.6/1kV-1*35mm <sup>2</sup> (yellow-green)	OT/DT terminals, M8 bolts	User-supplied

#### NOTE:

- (1)The cabinet grounding options include either a grounding cable or a grounding bar—only one method shall be selected.
- (2)The cabinet enclosure grounding is already connected to the system grounding bar. The cabinet grounding and system grounding must be reliably connected in accordance with local regulatory requirements. The grounding cable or grounding bar shall be connected to the nearest grounding grid.
- (3)The grounding cable cross-section and color shall follow the specifications in this table or be selected based on calculations according to IEC 60364-5-54:2011/AMD1:2021.

<b>! WARNING</b>	<p>(1)Dual grounding bars are reserved on both the front and rear sides of the product exterior, and the grounding cable shall be connected to the grounding bar.</p> <p>(2)Grounding screws must be tightened according to the standard torque requirements. Refer to Appendix B, Table 1 for the standard torque values.</p>
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(3)The grounding impedance of the equipment shall meet local electrical standards. The grounding resistance between the PE grounding bar and the metal components of the cabinet shall not exceed  $0.1\ \Omega$ , and the grounding resistance between the cabinet grounding bar or the ESS grounding bar and the grounding grid shall not exceed  $4\ \Omega$ .

**⚠️WARNING**

(4)The cabinet and the system must be permanently connected to the protective earth. Before operating the equipment, check all electrical connections to ensure reliable grounding.

(5)It is prohibited to operate the equipment without the grounding conductor installed.

(6)It is prohibited to damage or disconnect the grounding conductor.

(7)For equipment with high touch current, the protective earth terminal of the equipment enclosure must be grounded before connecting the input power, in order to prevent electric shock caused by touch current.

Figure 5-1 Connecting the Cabinet PE Conductor / Grounding Bar

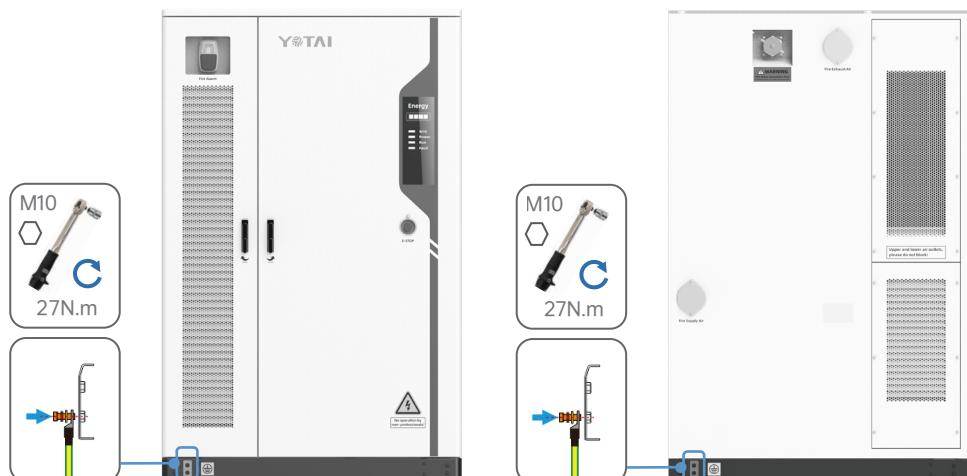
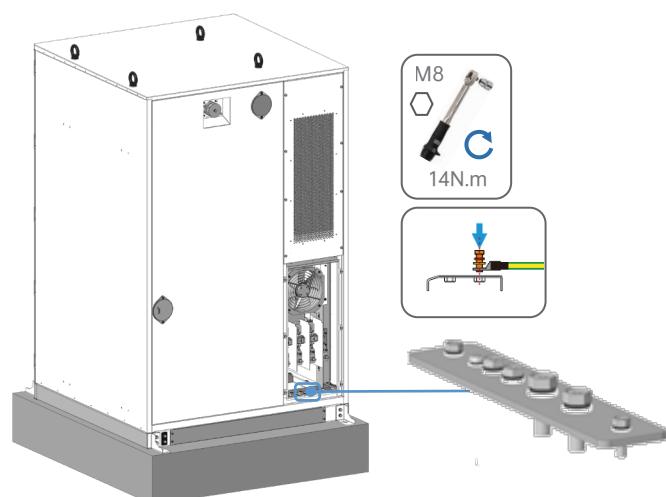


Figure 5-2 Connecting the System PE Copper Grounding Bar

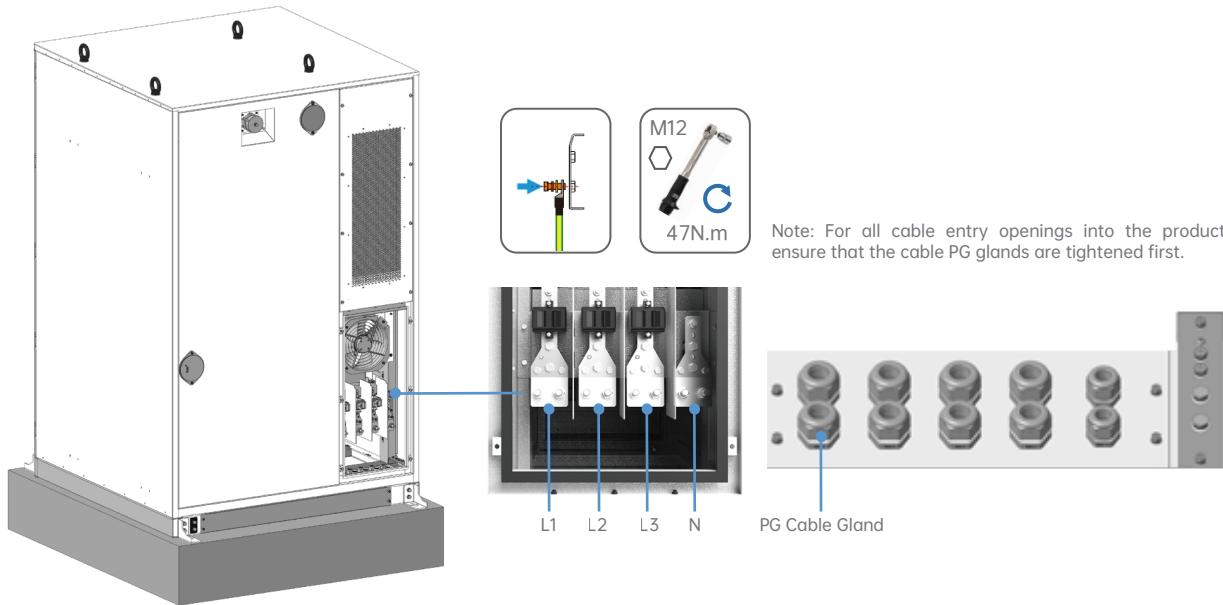


## 5.3 AC Grid-Connection Wiring

Recommended Wiring for a Single Battery Cabinet:

Recommended Cable	Recommended Specification	Recommended Terminal Model	Source
AC Cable	ZR-YJV22-0.6/1kV-4*70 mm <sup>2</sup> + 1*35 mm <sup>2</sup>	OT/DT terminals, M12 bolts	User-supplied

Figure 5-3 AC Grid-Connection Cable Wiring Procedure for a Single Battery Cabinet



(1)When connecting the AC cables, ensure that no cable is damaged or broken, and make sure the neutral (N) conductor is reliably connected. Failure to do so may result in damage to the AC equipment within the system.

(2)After completing the AC cable connection, ensure that the OT terminals are fully fitted and in good contact with the copper busbar, and that the AC input cables are routed vertically downward.

(3)Tighten the fastening bolts according to the standard torque requirements. Refer to Appendix B, Table 1 for the standard torque values.

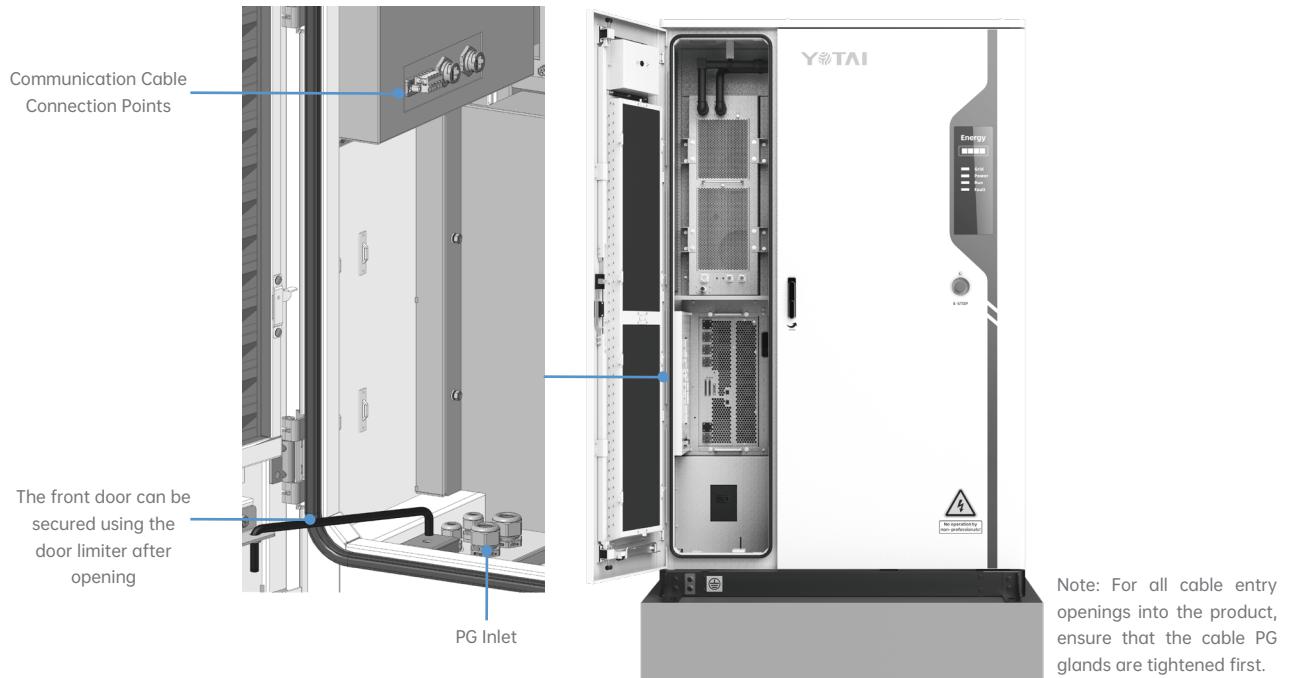
(4)Use a marker to apply alignment marks on the nuts after the torque has been verified.

(5)The cable installation must comply with the PG gland specifications in Section 5.5; otherwise, the cables cannot be correctly inserted, fixed, or sealed.

### ⚠ CAUTION

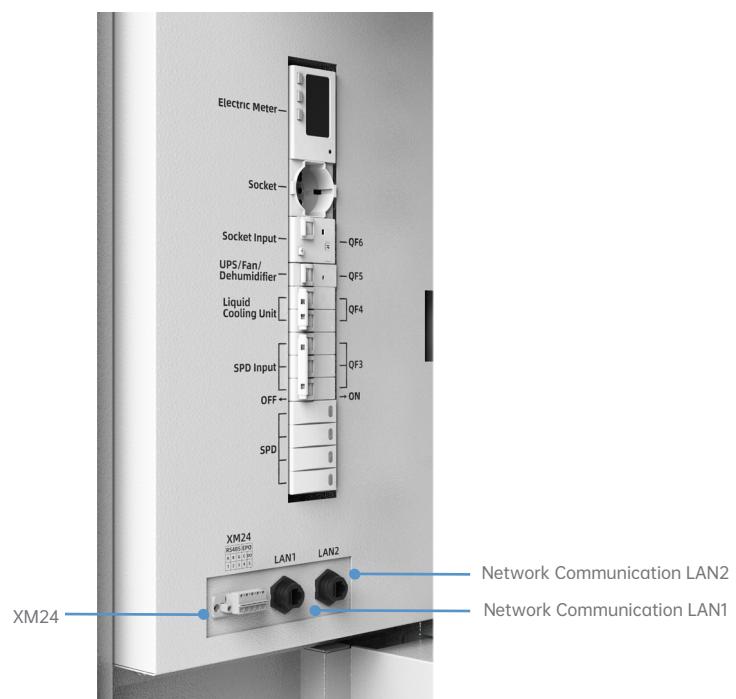
## 5.4 Communication Cable Connection

Figure 5-4 Communication Cable Wiring Diagram

**⚠ CAUTION**

When 2–5 units are operating in off-grid parallel mode, an additional off-grid parallel communication cable must be connected in addition to the communication cables mentioned above.

Figure 5-5 External Interface Definitions



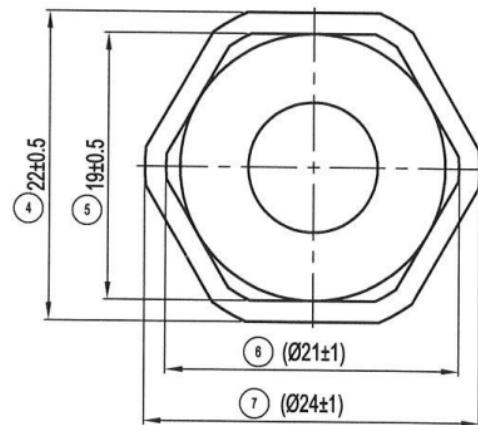
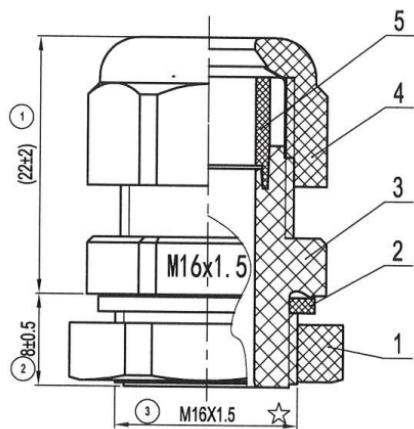
Terminal Code	Pin Number	Function	Definition	Recommended Cable	Terminal Model	PG Gland Specification	Source		
XM24	1	Electric Meter RS485 Communication	RS485-A	ZC-RVPS22-300/300 V-2×1.5	Pre-insulated tubular ferrule E1512	M20×1.5	User-supplied		
	2		RS485-B						
	3		RS485-GND						
	4	External EPO Dry Contact Output (Normally Closed, Passive)	EMS-EPO-C	ZC-RVPS22-300/300 V-2×1.5	Pre-insulated tubular ferrule E1512				
	5		EMS-EPO-DO						
LAN1	/	Connection to Upper-Level System or External Network	WAN	CAT5E-SFTP-1/0.5×4P (shielded CAT5e network cable)	RJ45	M16×1.5	User-supplied		
LAN2	/	Connection to Internal Network and Internal Device Communication	LAN/CON	CAT5E-SFTP-1/0.5×4P (shielded CAT5e network cable)	RJ45	M16×1.5	User-supplied		

#### Note:

- (1)The communication cables mentioned above shall be selected and connected according to the project requirements. When the network cable length exceeds 100 m, optical fiber must be used. The recommended armored optical fiber is G.652, 4-core. The customer must provide a switch equipped with optical ports.
- (2)The RS485 communication cable for the energy meter and the external EPO cable must be shorter than 1000 m.
- (3)If 2–5 battery cabinets are required to operate in off-grid parallel mode (for additional quantities, please contact our service engineer), PCS parallel communication cables must be connected for information synchronization. For details on PCS off-grid parallel communication cable connections, please refer to the PCS Off-Grid Parallel Operation Guide.
- (4)The cable installation process must comply with the PG gland specifications and usage instructions described in Section 5.5; otherwise, proper cable insertion, securing, and sealing cannot be ensured.

## 5.5 Cable PG Gland Specification Instructions

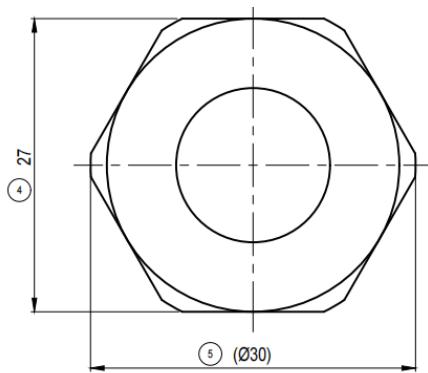
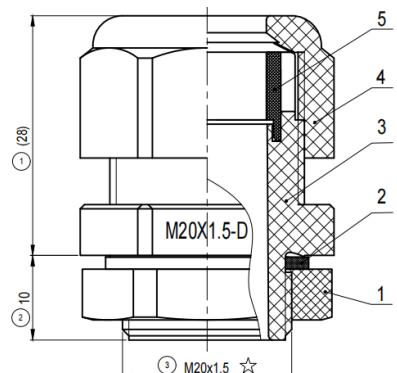
①M16×1.5



## Instructions for PG Gland M16×1.5

Item	Technical Parameter	Remarks
Clamping Diameter Range	4-8mm	The selected cable outer diameter must fall within the clamping range
Installation Torque	1.5-2.5N·m	Mark the tightened position with a marker for future maintenance checks.
Cable Locking Torque	2.5-3.5N·m	
Protection Rating	IP68	A cable must be retained for sealing after installation
Operating Temperature	-40°C~100°C	The cable temperature must not exceed this limit

②M20×1.5



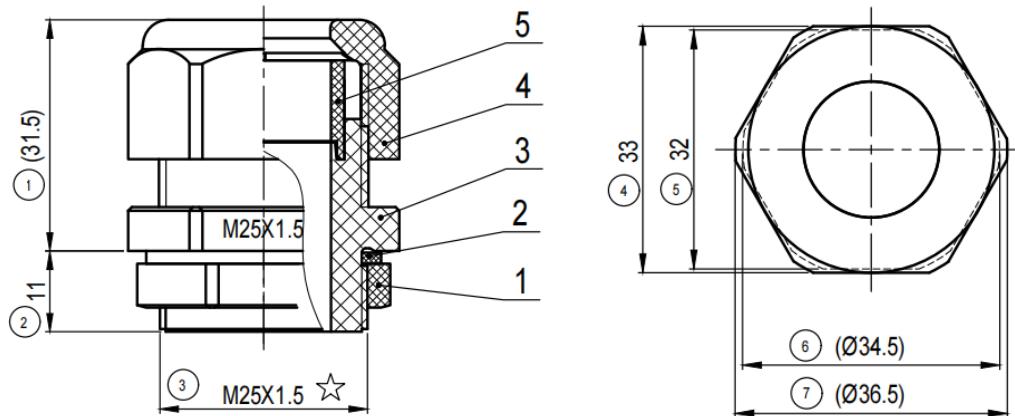
## Instructions for PG Gland M20×1.5

Item	Technical Parameter	Remarks
Clamping Diameter Range	8-14 mm	The selected cable outer diameter must fall within the clamping range
Installation Torque	2-3 N·m	Mark the tightened position with a marker for future maintenance checks
Cable Locking Torque	5-7.5 N·m	

## Instructions for PG Gland M20×1.5

Item	Technical Parameter	Remarks
Protection Rating	IP68	A cable must be retained for sealing after installation
Operating Temperature	-40°C~100°C	The cable temperature must not exceed this limit

③M25×1.5



## Instructions for PG Gland M25×1.5

Item	Technical Parameter	Remarks
Clamping Diameter Range	13-18 mm	The selected cable outer diameter must fall within the clamping range
Installation Torque	3.5-5 N·m	After tightening, mark the position with a marker pen for future maintenance inspection
Cable Locking Torque	7.5-11 N·m	
Protection Rating	IP68	If used, a cable must be retained for sealing
Operating Temperature	-40°C~100°C	The cable temperature must not exceed this limit

## PG Gland Material Specification

No.	Name	Remarks
1	Nylon Locknut	
2	Flat Sealing Ring	
3	Gland Body	
4	Dome Nut	
5	Sealing Insert	

## 6 FIRE PROTECTION AND SIM CARD INSTALLATION

### 6.1 Fire Protection Installation

#### ⚠ WARNING

- (1)Do not place the fire-extinguishing aerosol near heat sources or subject it to impact, to avoid accidental activation of the fire-suppression discharge.
- (2)When pulling out the safety pin, the operator must wear protective goggles and gloves to prevent injury in the event of accidental activation.
- (3)To ensure proper protection by the fire protection system, make sure the aerosol safety pin has been removed and the detector's dust cover and adhesive tape have been taken off.

(1)Before putting the fire protection system into operation, check whether the safety pin on the thermal activation head of the aerosol fire-extinguishing device has been removed. If the safety pin has not yet been removed, it must be pulled out immediately to ensure that the aerosol device can activate normally when the temperature reaches the preset discharge threshold.

Figure 6-1 Aerosol Fire-Extinguishing Device Safety Pin



(2)Before putting the fire protection system into operation, remove all dust covers and adhesive tapes from the smoke detectors and heat detectors.

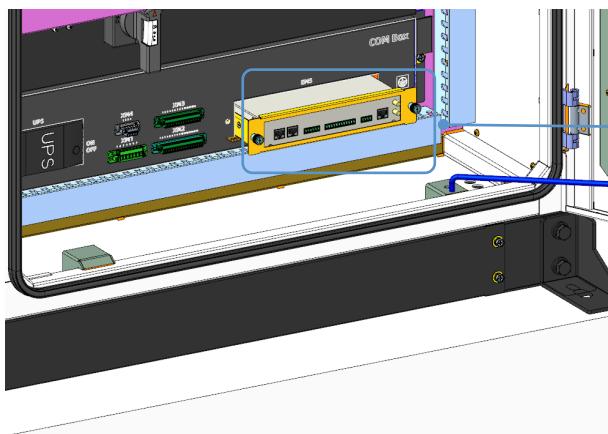
(3)Remove all structural protective components from the fire protection devices after transportation to the site.

(4)For initial commissioning, remove the battery compartment cover plate according to Section 6.3, and then proceed with the operations specified in Section 6.1.

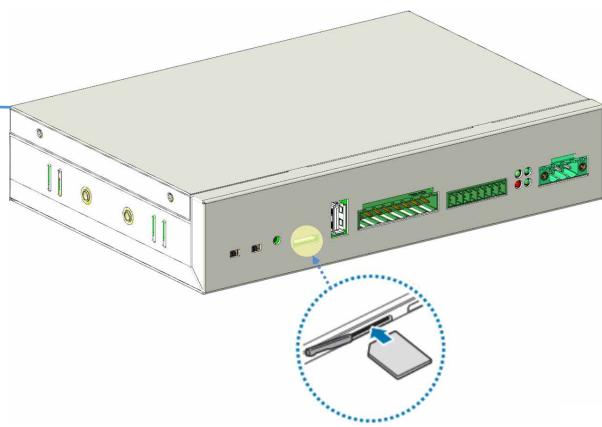
## 6.2 SIM Card Installation

The EMS supports SIM cards from different countries and regions. Through 4G communication, the EMS uploads data to the cloud platform. No SIM card is included by default; users must prepare their own SIM card and install it into the EMS SIM card slot. The installation procedure is as follows.

Figure 6-2 SIM Card Installation



Step 1 Pull out the EMS module



Step 2 Install the SIM card

## 6.3 MSD Installation and Disassembly

### ⚠️ WARNING

(1)For transport safety, the MSD must be removed prior to shipping. The MSD should then be installed to establish the electrical connection before equipment operation.

(2)During maintenance and inspection, to ensure personnel safety, the MSD must be removed (disconnecting the electrical connection) only after confirming that the equipment has been shut down and de-energized. Reinstallation should be performed after maintenance is complete.

(3)When installing and removing the MSD, it is strictly prohibited to operate the system under load, and operation by non-dedicated personnel is forbidden.

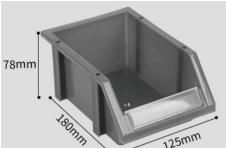
(4)When installing and removing the MSD, operators are required to wear protective face shields and gloves to prevent electric shock and arc flash injuries.

(5)Installation of the MSD must follow the specified operating procedures to ensure reliable electrical connection; otherwise, the equipment may be damaged.

The installation and removal of the MSD must be performed only when the system is safely shut down and de-energized. Specific procedures are as follows.

Prepare the tools listed in the table below before installing or removing the MSD:

Table 6-1 MSD Installation and Disassembly Tool Preparation List

				
Socket Wrench Set	Oil-based Marker	Step Ladder	Personal protective Equipment (PPE)	Screw Storage Box

Preparation of Tools and Materials before MSD Installation or Removal:

Table 6-2 MSD Installation and Removal Material Preparation List

No.	Category	Description	Qty per Unit	Unit	Remarks
Field Engineering Installation Parts					
1	Electrical Components	Manual Service Disconnected (MSD)	5	pcs	Electrical connection
2	Structural Materials	Hexagon combination screw M6*16	10	pcs	Battery compartment cover plate comes with 32 pcs total; 10 pcs for spare parts

### Step 1: Remove the Sealing Plate

As shown in Figure 6-3, use a 10mm socket wrench to remove the 32 fixing screws from the battery compartment sealing plate. Place the screws in a storage box to prevent loss. Avoid using excessive force during removal to prevent stripping or damaging the screw heads. If a screw is accidentally damaged, replace it with a spare; damaged screws must not be reused. During removal and handling, take care to prevent bumps or impacts that could cause deformation, as this may compromise the sealing performance.

Figure 6-3 Battery Compartment Sealing Plate Removal

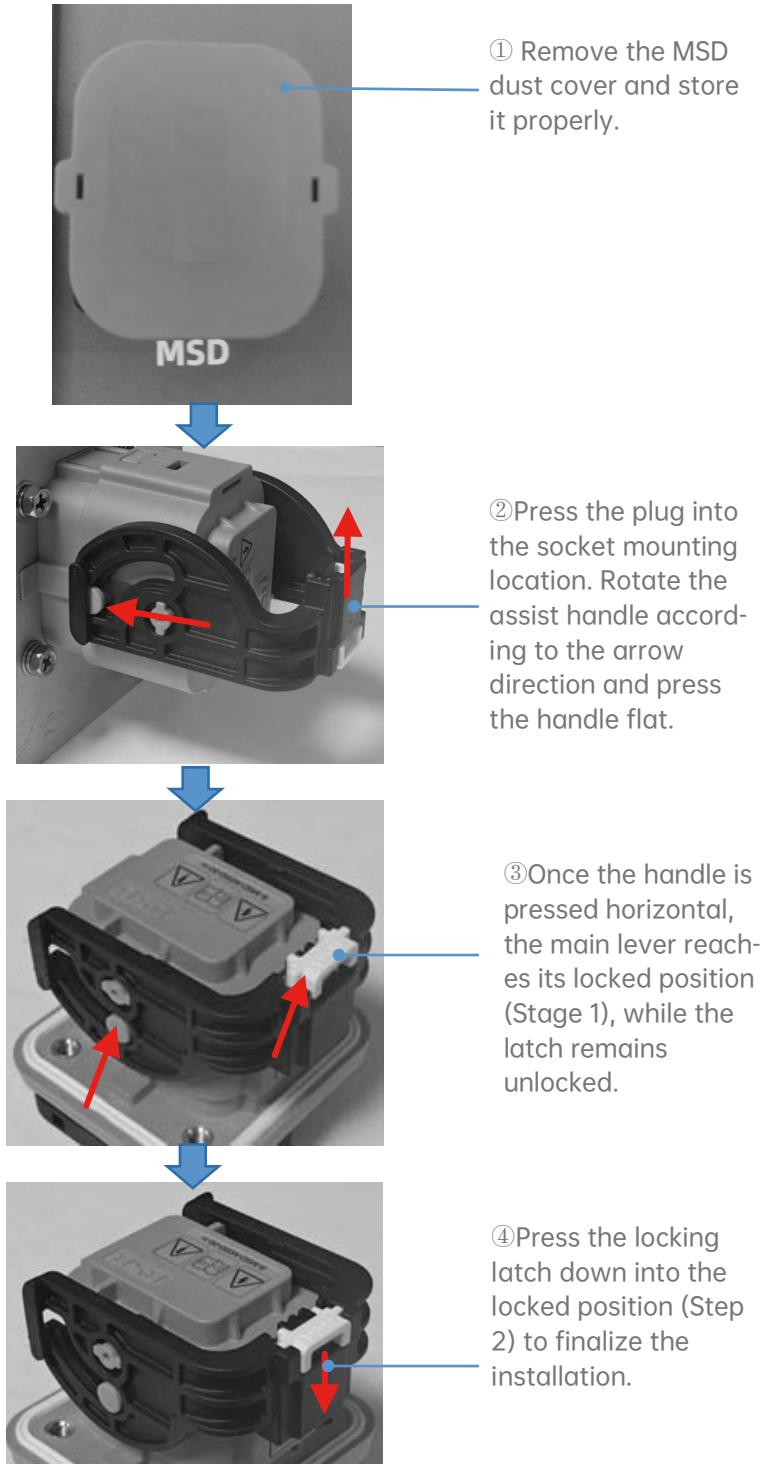


## Step 2: MSD Installation or Removal

## (1) MSD Installation

As shown in Figure 6-4, remove the dust cover from the MSD socket if present. Insert the MSD plug into the MSD socket of the liquid-cooled PACK. When inserting, press down on the plug and then rotate the assist lever (handle) to secure it.

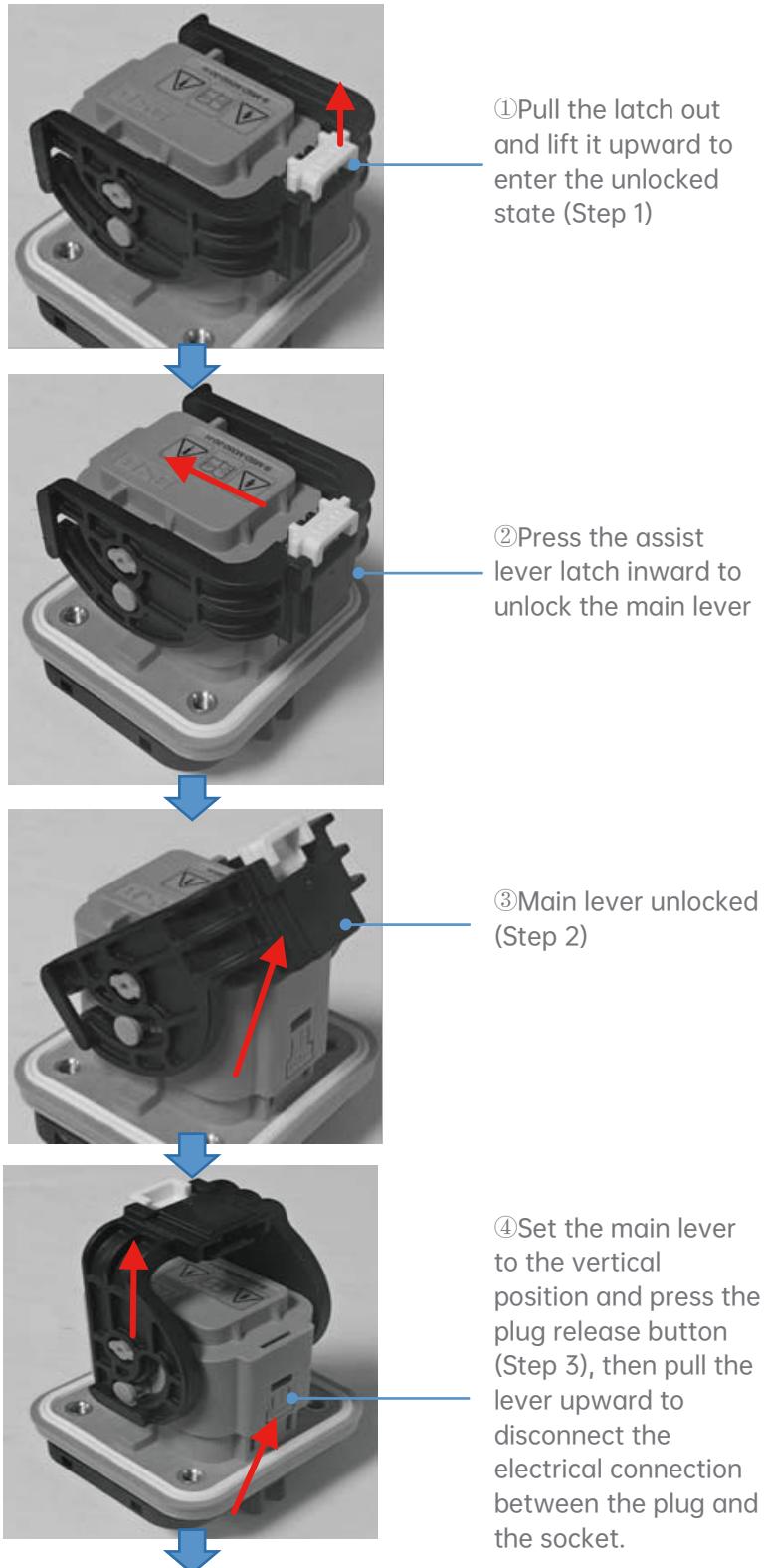
Figure 6-4 MSD Installation Process

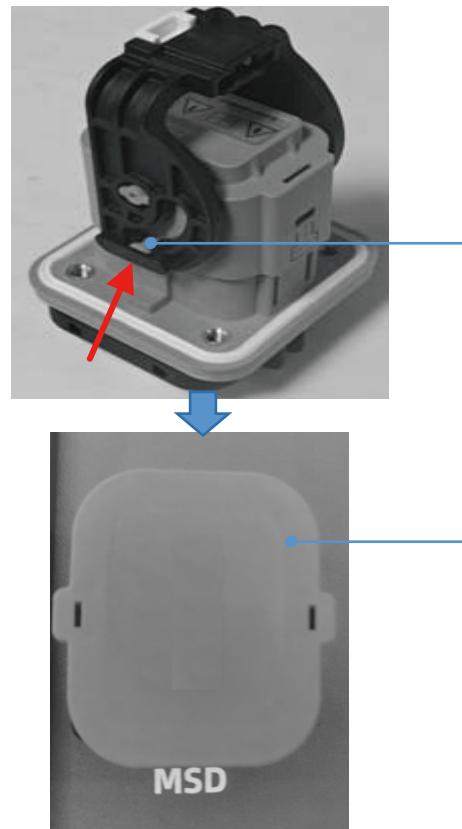


## (2) MSD Removal/Disassembly

If maintenance or inspection is required, follow the MSD removal steps shown in Figure 6-5. Note the following safety precautions: Before removal, the system must be shut down (stopped). Operating under load is strictly prohibited to avoid arc flash injuries.

Figure 6-5 MSD Removal Process





⑤Plug unlocked (Step 4). After separating the plug, collect the MSD plug and store it for protection.

⑥Install and press down the MSD dust cover onto the socket for dust protection to complete the MSD removal.

The connection locations for the five sets of MSDs on the equipment are shown in Figure 6-6.

Figure 6-6 Schematic of Connection Positions for the MSD Sets



#### Step 3: Pull out Fire Safety Pins and Remove Sensor Dust Covers

During the initial system operation, the fire safety pins must be pulled out and the sensor dust covers removed. Refer to Section 6.1 for detailed operations.

#### Step 4: Install the Sealing Plate

As shown in Figure 6-7, reinstall the battery compartment sealing plate with the mounting surface facing outward and upward. First, pre-tighten all screws (32 pieces in total), then tighten them to the specified torque. After inspection, use a marker to draw alignment lines (marking lines) to ensure the sealing integrity is maintained.

Figure 6-7 Schematic of Battery Compartment Sealing Plate Installation



## APPENDIX A

# CRIMPING OT/DT TERMINALS

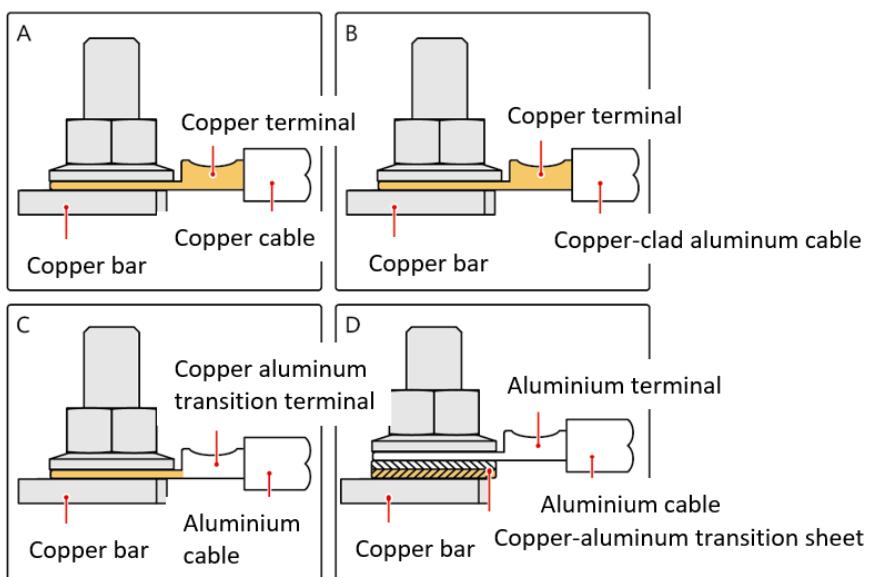
### A.1 OT/DT Terminal Requirements

- (1) When using copper cable, please use copper terminal.
- (2) When using copper-clad aluminum cable, please use copper terminal.
- (3) When using aluminum cable, please use copper-aluminum transition terminal, or aluminum terminal with copper-aluminum transition sheet.

 **NOTE**

- (1) It is strictly prohibited to connect aluminum terminals directly to the terminal block, as this may cause galvanic corrosion and compromise the reliability of the cable connection.
- (2) When using copper-aluminum transition terminals, or aluminum terminals with copper-aluminum transition sheet, compliance with IEC 61238-1 is required.
- (3) When using copper-aluminum transition sheet, pay attention to the orientation: ensure the aluminum side contacts the aluminum terminal, and the copper side contacts the terminal block.

Diagram A1.1 OT/DT Terminal Requirements



### A.2 OT/DT Terminal Crimping

 **NOTE**

- (1) When stripping wires, avoid scratching the conductor.
- (2) After crimping, the conductor crimping section of the OT/DT terminal should completely enclose the conductor, ensuring a tight fit without looseness.

 **NOTE**

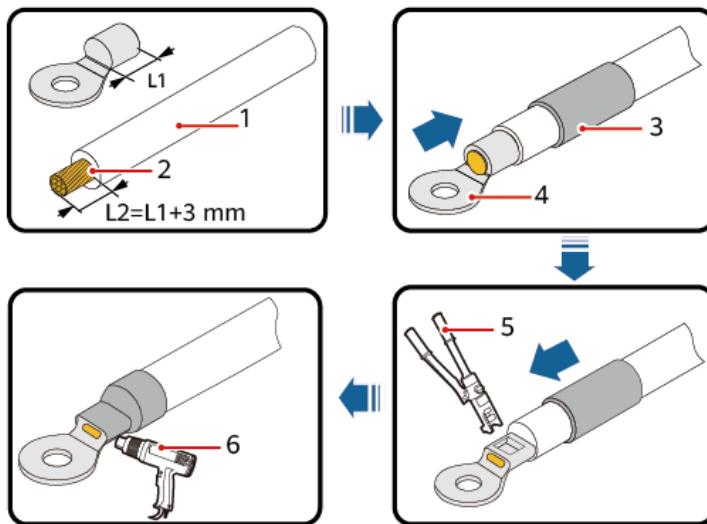
(3) The crimped section may be covered with heat-shrink tubing or insulating tape.

(4) When using a heat gun, take protective measures to prevent damage to the product from overheating.

(5) For cables larger than 50 mm<sup>2</sup>, apply conductive grease to the contact surface between the terminal block and copper terminal to reduce contact resistance and improve oxidation and corrosion resistance.

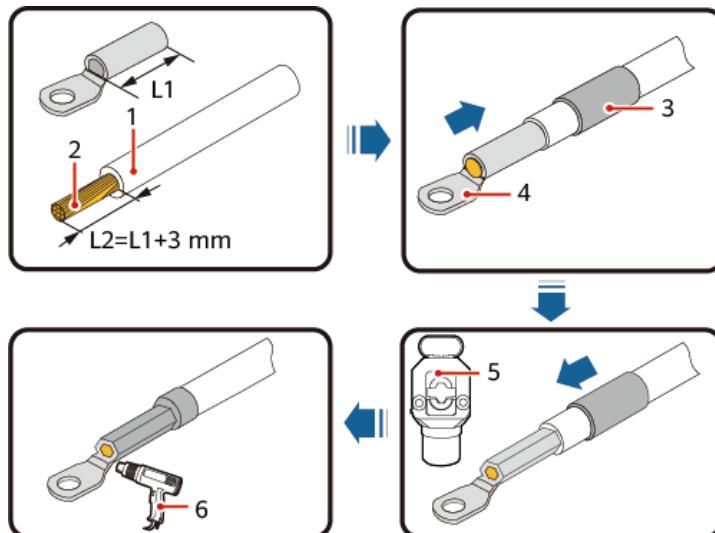
(6) Use a hydraulic crimping tool with undamaged, defect-free dies. The crimping height should meet the standard, the crimping shape should be hexagonal, and the crimping strength should comply with the pull-out force standard in Diagram A2.1.

Diagram A2.1 Crimp OT Terminals



- (1) →Cable
- (2) →Conductor
- (3) →Heat shrink tubing
- (4) →OT terminal
- (5) →Hydraulic crimping tool
- (6) →Heat gun

Diagram A2.2 Crimp DT Terminals



- (1) →Cable
- (2) →Conductor
- (3) →Heat shrink tubing
- (4) →DT terminal
- (5) →Hydraulic crimping tool
- (6) →Heat gun

Table A2.1 Pull-out Force Standards

No.	Conductor Size		Pull-out Force Standard N
	AWG	mm <sup>2</sup>	
1	26	0.13	13
2	24	0.2	22
3	22	0.324	35
4	20	0.519	50
5	18	0.823	80
6	16	1.31	150
7	14	2.08	180
8	12	3.31	270
9	10	5.261	400
10	8	8.367	500
11	6	13.3	550
12	4	21.15	1500
13	3	26.67	1650
14	2	33.62	2050
15	1	42.41	2200
16	1/0	53.49	2700
17	2/0	67.43	2700
18	3/0	85.01	2700
19	4/0	107.2	2700
20	250kcmil	127	2700
21	300kcmil	156	5000
22	350kcmil	177	5000
23	400kcmil	203	5000
24	500kcmil	253	5000
25	600kcmil	304	5000

Note: For GB-standard cables, select the closest conductor size value. Interpolation is permitted

## APPENDIX B

### STANDARD TORQUE TABLE FOR SCREWS

Table B.1 General Threaded Connection Torque / Unit: kgf·cm (Torque range  $\pm 10\%$ )

Specification		Connection Type							
				General Connection		High-Density Connection (Sealing, Heat Dissipation, Shielding, and High Current >16A)			
Major Category	Sub-category	Plastic-Plastic	Steel-Plastic / Copper-Copper	Steel-Steel	Steel-Cast Aluminum / Steel-Aluminum Profile / Steel-Copper	Copper-Copper	Steel-Cast Aluminum / Steel-Copper	Steel-Aluminum Profiles	
Phillips screw	M2	/	0.8	1.5	1.5	2.5	2.5	1.5	
	M2.5	/	1.6	3	3	5.5	4.5	3	
	M3	1.5	3	6	5	10	8	6	
	M4	/	6	16	10	14	12	12	
	M5	/	10	30	13	30	28	20	
	M6	/	15	50	28	70	48	30	
	M8	/	/	130	/	140	/		
	M10	/	/	270	/	270	/		
	M12	/	/	470	/	470	/	/	
	M14	/	/	740	/	740	/	/	
	M16	/	/	1200	/	1200	/	/	

Note: (1)The various connection types listed above refer to the materials of the screw and threaded hole; the tightening torque for chemical adhesive (capsule) screws should also follow the values in the table above;

(2)1kgf.cm=0.098N.m.

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