

**FusionDC1000A Prefabricated All-in-One Data
Center
V100R021C10**

Installation Guide (ICT Scenario)

Issue 01
Date 2021-07-21



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About This Document

Purpose

This document describes the site requirements and preparations for installing the FusionDC1000A prefabricated all-in-one data center (FusionDC1000 for short) as well as the methods and skills required for installing the pre-fab. module, devices, pipes, and cables, providing installation guidance and technical support for onsite installation personnel and technical support engineers.

Intended Audience

This document is intended for:

- Hardware installation engineers
- Technical support engineers
- Commissioning engineers
- Maintenance engineers

Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
 DANGER	Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
 NOTICE	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.

Symbol	Description
 NOTE	Supplements the important information in the main text. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

Change History

Changes between document issues are cumulative. The latest document issue contains all updates made in previous issues.

Issue 01 (2021-07-21)

This issue is the first official release.

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1 Safety Information

1.1 General Safety

Statement

Before installing, operating, and maintaining the equipment, read this document and observe all the safety instructions on the equipment and in this document.

The "NOTICE", "CAUTION", "WARNING", and "DANGER" statements in this document do not cover all the safety instructions. They are only supplements to the safety instructions. Huawei will not be liable for any consequence caused by the violation of general safety requirements or design, production, and usage safety standards.

Ensure that the equipment is used in environments that meet its design specifications. Otherwise, the equipment may become faulty, and the resulting equipment malfunction, component damage, personal injuries, or property damage are not covered under the warranty.

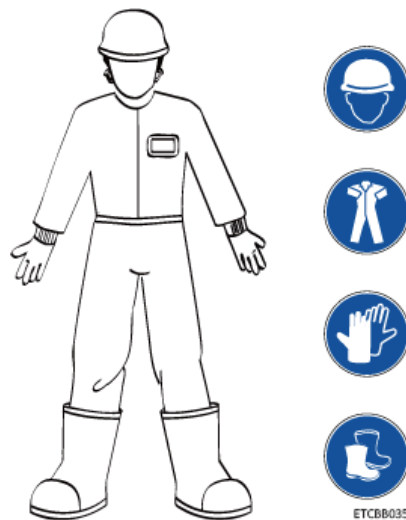
Follow local laws and regulations when installing, operating, or maintaining the equipment. The safety instructions in this document are only supplements to local laws and regulations.

Huawei will not be liable for any consequences of the following circumstances:

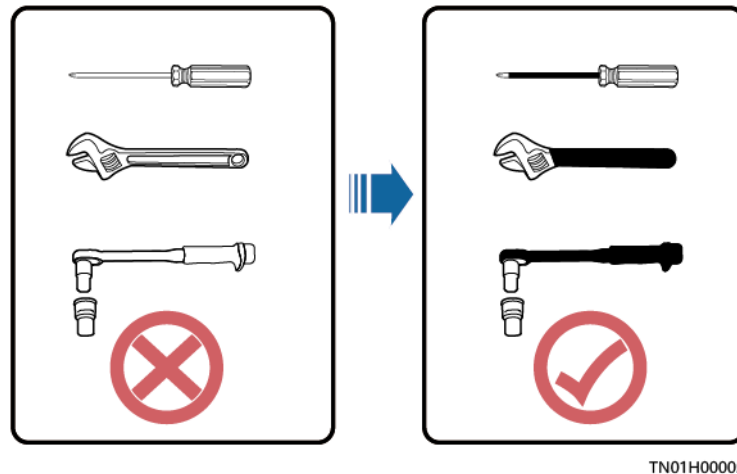
- Operation beyond the conditions specified in this document
- Installation or use in environments which are not specified in relevant international or national standards
- Unauthorized modifications to the product or software code or removal of the product
- Failure to follow the operation instructions and safety precautions on the product and in this document
- Equipment damage due to force majeure, such as earthquakes, fire, and storms
- Damage caused during transportation by the customer
- Storage conditions that do not meet the requirements specified in this document

General Requirements

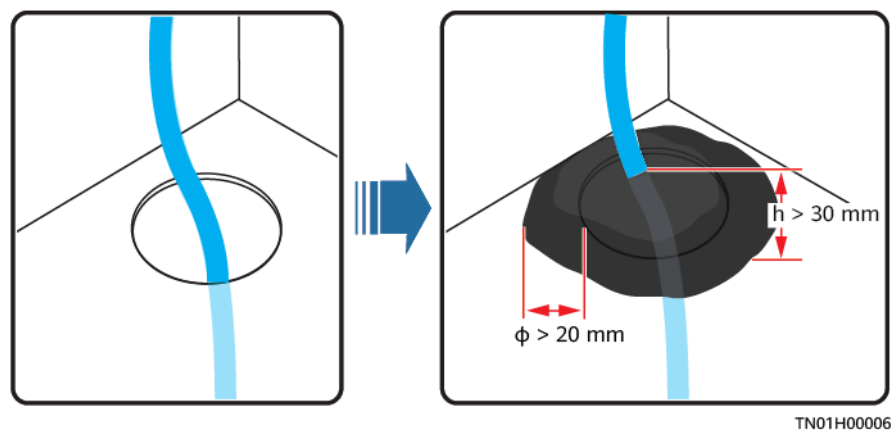
- Do not install, use, or operate outdoor equipment and cables (including but not limited to moving equipment, operating equipment and cables, inserting connectors to or removing connectors from signal ports connected to outdoor facilities, working at heights, and performing outdoor installation) in harsh weather conditions such as lightning, rain, snow, and level 6 or stronger wind.
- Before installing, operating, or maintaining the equipment, remove any conductive objects such as watches or metal jewelry like bracelets, bangles, and rings to avoid electric shock.
- When installing, operating, or maintaining the equipment, wear personal protective equipment such as insulation gloves, goggles, and safety clothing, helmet, and shoes, as shown in the following figure.



- Follow the specified procedures for installation, operation, and maintenance.
- Before handling a conductor surface or terminal, measure the contact point voltage and ensure that there is no risk of electric shock.
- After installing the equipment, remove idle packing materials such as cartons, foam, plastics, and cable ties from the equipment area.
- In the case of a fire, immediately leave the building or the equipment area, and turn on the fire alarm bell or make an emergency call. Do not enter the building on fire in any case.
- Do not stop using protective devices. Pay attention to the warnings, cautions, and related precautionary measures in this document and on the equipment. Promptly replace warning labels that have worn out.
- Keep irrelevant people away from the equipment. Only operators are allowed to access the equipment.
- Use insulated tools or tools with insulated handles, as shown in the following figure.



- All cable holes should be sealed. Seal the used cable holes with firestop putty. Seal the unused cable holes with the caps delivered with the cabinet. The following figure shows the criteria for correct sealing with firestop putty.



- Do not scrawl, damage, or block any warning label on the equipment.
- When installing devices, use a torque wrench with a proper measurement range to tighten bolts. Ensure that the wrench is not skewed and the torque error does not exceed 10%.
- Do not work with power on during installation.
- Repaint any paint scratches caused during equipment transportation or installation in a timely manner. Equipment with scratches cannot be exposed to an outdoor environment for a long period of time.
- Before operations, ensure that the equipment is firmly secured to the floor or other solid objects, such as a wall or an installation rack.
- Do not use water to clean electrical components inside or outside of a cabinet.
- Do not change the structure or installation sequence of equipment without permission.
- Do not touch a running fan with your fingers, components, screws, tools, or boards before the fan is powered off or stops running.

Personal Safety

- If there is a probability of personal injury or equipment damage during operations on the equipment, immediately stop the operations, report the case to the supervisor, and take feasible protective measures.
- To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telecommunication network voltage (TNV) circuits.
- Do not power on the equipment before it is installed or confirmed by professionals.

1.2 Personnel Requirements

- Personnel who plan to install or maintain Huawei equipment must receive thorough training, understand all necessary safety precautions, and be able to correctly perform all operations.
- Only qualified professionals or trained personnel are allowed to install, operate, and maintain the equipment.
- Only qualified professionals are allowed to remove safety facilities and inspect the equipment.
- Personnel who will operate the equipment, including operators, trained personnel, and professionals, should possess the local national required qualifications in special operations such as high-voltage operations, working at heights, and operations of special equipment.
- Professionals: personnel who are trained or experienced in equipment operations and are clear of the sources and degree of various potential hazards in equipment installation, operation, maintenance
- Trained personnel: personnel who are technically trained, have required experience, are aware of possible hazards on themselves in certain operations, and are able to take protective measures to minimize the hazards on themselves and other people
- Operators: operation personnel who may come in contact with the equipment, except trained personnel and professionals
- Only professionals or authorized personnel are allowed to replace the equipment or components (including software).

1.3 Electrical Safety

Grounding

- For the equipment that needs to be grounded, install the ground cable first when installing the equipment and remove the ground cable last when removing the equipment.
- Do not damage the ground conductor.
- Do not operate the equipment in the absence of a properly installed ground conductor.
- Ensure that the equipment is connected permanently to the protective ground. Before operating the equipment, check its electrical connection to ensure that it is securely grounded.

General Requirements

Use dedicated insulated tools when performing high-voltage operations.

AC and DC Power

DANGER

Do not connect or disconnect power cables with power on. Transient contact between the core of the power cable and the conductor will generate electric arcs or sparks, which may cause fire or personal injury.

- If a "high electricity leakage" tag is attached on the equipment, ground the protective ground terminal on the equipment enclosure before connecting the AC power supply; otherwise, electric shock as a result of electricity leakage may occur.
- Before installing or removing a power cable, turn off the power switch.
- Before connecting a power cable, check that the label on the power cable is correct.
- If the equipment has multiple inputs, disconnect all the inputs before operating the equipment.
- A circuit breaker equipped with a residual current device (RCD) is not recommended.
- A damaged power cable must be replaced by the manufacturer, service agent, or professionals to avoid risks.
- High voltage operations and installation of AC-powered facilities must be performed by qualified personnel.

Cabling

- When routing cables, ensure that a distance of at least 30 mm exists between the cables and heat-generating components or areas. This prevents damage to the insulation layer of the cables.
- Do not route cables behind the air intake and exhaust vents of the equipment.
- Ensure that cables meet the VW-1 or ZB flame spread rating requirements or higher.
- Bind cables of the same type together. When routing cables of different types, ensure that they are at least 30 mm away from each other.
- If an AC input power cable is connected to the cabinet from the top, bend the cable in a U shape outside the cabinet and then route it into the cabinet.
- When the temperature is low, violent impact or vibration may damage the plastic cable sheathing. To ensure safety, comply with the following requirements:
 - Cables can be laid or installed only when the temperature is higher than 0°C. Handle cables with caution, especially at a low temperature.
 - Cables stored at subzero temperatures must be stored at room temperature for at least 24 hours before they are laid out.

- Do not perform any improper operations, for example, dropping cables directly from a vehicle.
- When selecting, connecting, and routing cables, follow local safety regulations and rules.

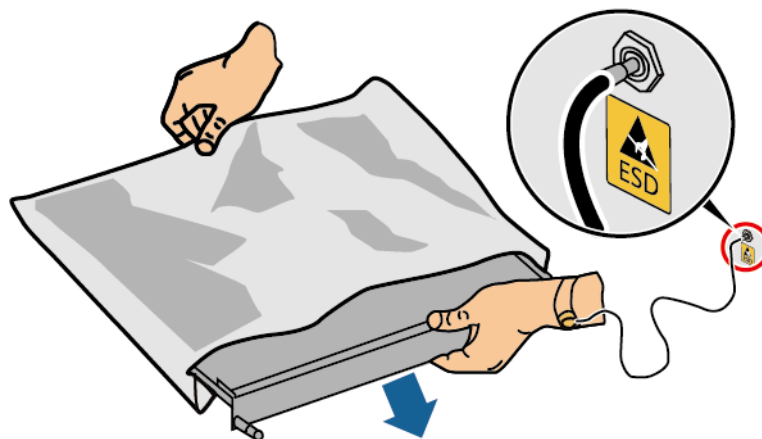
ESD

NOTICE

The static electricity generated by human bodies may damage the electrostatic-sensitive components on boards, for example, the large-scale integrated (LSI) circuits.

- Wear ESD gloves or a well-grounded ESD wrist strap when touching the device or handling boards or application-specific integrated circuits (ASICs).
- When holding a board, hold its edge without touching any components. Do not touch the components with your bare hands.
- Package boards with ESD packaging materials before storing or transporting them.

Figure 1-1 Wearing an ESD wrist strap



DC15000001

Neutral-Ground Voltage

It is recommended that the three-phase loads be equalized and the neutral-ground voltage be kept at less than 2 V to meet power distribution requirements.

1.4 Installation Environment Requirements

- To prevent fire due to high temperature, ensure that the ventilation vents or heat dissipation system are not blocked when the equipment is running.
- Install the equipment in an area far away from liquids. Do not install it under areas prone to condensation, such as under water pipes and air exhaust vents, or areas prone to water leakage, such as air conditioner vents, ventilation

vents, or feeder windows of the equipment room. Ensure that no liquid enters the equipment to prevent faults or short circuits.

- If any liquid is detected inside the equipment, immediately disconnect the power supply and contact the administrator.
- Do not expose the equipment to flammable or explosive gas or smoke. Do not perform any operation on the equipment in such environments.
- Ensure that the equipment room provides good heat insulation, and the walls and floor are dampproof.
- Install a rat guard at the door of the equipment room.

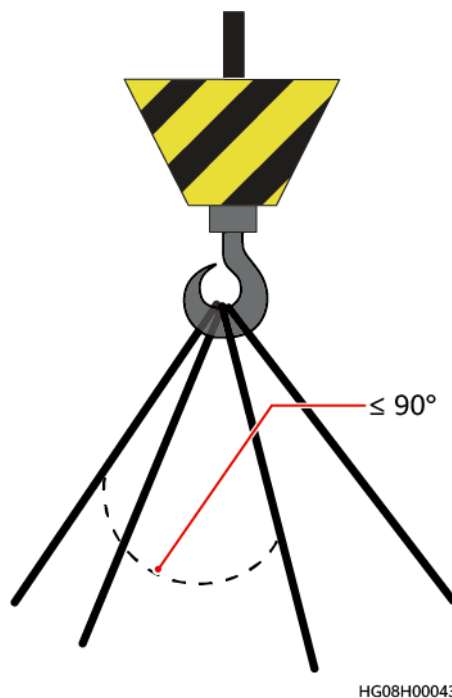
Installation at Heights

- Working at heights refers to operations that are performed at least 2 meters above the ground.
- Do not work at heights if the steel pipes are wet or other potential danger exists. After the preceding conditions no longer exist, the safety director and relevant technical personnel need to check the involved equipment. Operators can begin working only after obtaining consent.
- When working at heights, comply with local relevant laws and regulations.
- Only trained and qualified personnel are allowed to work at heights.
- Before working at heights, check the climbing tools and safety gears such as safety helmets, safety belts, ladders, springboards, scaffolding, and lifting equipment. If they do not meet the requirements, take corrective measures or disallow working at heights.
- Wear personal protective equipment such as the safety helmet and safety belt or waist rope and fasten it to a solid structure. Do not mount it on an insecure moveable object or metal object with sharp edges. Make sure that the hooks will not slide off.
- Set a restricted area and eye-catching signs for working at heights to warn away irrelevant personnel.
- Carry the operation machinery and tools properly to prevent them from falling off and causing injuries.
- Personnel involving working at heights are not allowed to throw objects from the height to the ground, or vice versa. Objects should be transported by tough slings, hanging baskets, highline trolleys, or cranes.
- Ensure that guard rails and warning signs are set at the edges and openings of the area involving working at heights to prevent falls.
- Do not pile up scaffolding, springboards, or other sundries on the ground under the area involving working at heights. Do not allow people to stay or pass under the area involving working at heights.
- Inspect the scaffolding, springboards, and workbenches used for working at heights in advance to ensure that their structures are solid and not overloaded.
- Any violations must be promptly pointed out by the site manager or safety supervisor and the involved personnel should be prompted for correction. Personnel who fail to stop violations will be forbidden from working.

1.5 Mechanical Safety

Hoisting Devices

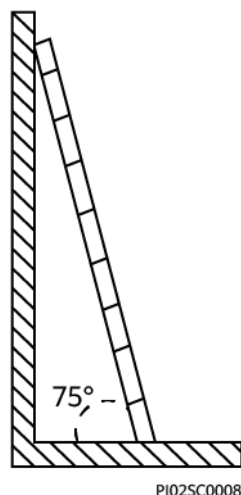
- Do not walk under hoisted objects.
- Only trained and qualified personnel should perform hoisting operations.
- Check that hoisting tools are available and in good condition.
- Before hoisting objects, ensure that hoisting tools are firmly secured onto a load-bearing object or wall.
- Ensure that the angle formed by two hoisting cables is no more than 90 degrees, as shown in the following figure.



- Do not drag steel ropes and hoisting tools or bump hoisted objects against hard objects during hoisting.

Using Ladders

- Use wooden or fiberglass ladders when you need to perform live working at heights.
- When a step ladder is used, ensure that the pull ropes are secured and the ladder is held firm.
- Before using a ladder, check that it is intact and confirm its load bearing capacity. Do not overload it.
- Ensure that the ladder is securely positioned. The recommended angle for a ladder against the floor is 75 degrees, as shown in the following figure. An angle rule can be used to measure the angle. Ensure that the wider end of the ladder is at the bottom, or protective measures have been taken at the bottom to prevent the ladder from sliding.



- When climbing a ladder, take the following precautions to reduce risks and ensure safety:
 - Keep your body steady.
 - Do not climb higher than the fourth rung of the ladder from the top.
 - Ensure that your body's center of gravity does not shift outside the legs of the ladder.

Drilling Holes

When drilling holes into a wall or floor, observe the following safety precautions:

NOTICE

Do not drill holes into the equipment. Doing so may affect the electromagnetic shielding of the equipment and damage components or cables inside. Metal shavings from drilling may short-circuit boards inside the equipment.

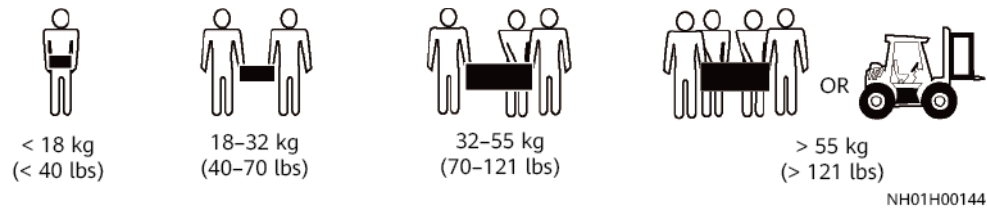
- Obtain consent from the customer and contractor before drilling holes.
- Wear goggles and protective gloves when drilling holes.
- When drilling holes, protect the equipment from shavings. After drilling, clean up any shavings that have accumulated inside or outside the equipment.

Moving Heavy Objects

DANGER

When pulling the equipment out of a cabinet, be aware of unstable or heavy objects on the cabinet to prevent injury.

- Be cautious to avoid injury when moving heavy objects.



- When moving the equipment by hand, wear protective gloves to prevent injuries.
- Move or lift the equipment by holding its handles or lower edges. Do not hold the handles of modules (such as power supply units, fans, and boards) that are installed in the equipment because they cannot support the weight of the equipment.
- Avoid scratching the cabinet surface or damaging cabinet components and cables during equipment transportation.
- When transporting the equipment using a forklift truck, ensure that the forks are properly positioned so that the equipment does not topple. Before moving the equipment, secure it to the forklift truck using ropes. When moving the equipment, assign dedicated personnel to take care of it.
- Choose a road with good conditions or sea for transportation to ensure equipment safety. Avoid tilt or jolt during transportation.
- Move the cabinet with caution. Any bumping or falling may damage the equipment.

1.6 Cooling System Safety

Storage and Recycling

- Do not store devices near a heat source or under direct sunshine.
- Keep devices away from fire or high-temperature objects, especially devices injected with pressurized nitrogen or refrigerant; otherwise, explosion or refrigerant leakage may occur, causing personal injury.



-  The sign indicates that the product cannot be disposed of with other wastes that have a shell in European Union (EU) areas. To avoid environment pollution and harm to human health, wastes must be classified and recycled. This also promotes resource reuse. When recycling a device, fill in the device information in the recycling collection system or contact your dealer for help. The dealer can help you recycle devices in a safe and environment-friendly way.

1.7 Pre-fab. Module Safety

- Ensure that the installation environment meets the following requirements:
 - The ground must be solid without spongy or soft soil, and is not prone to subsidence.
 - The site must be clean and far away from dust, oil fume, and harmful gas.

- The site must be far away from corrosive, flammable, and explosive materials.
- The site must be far away from sources of strong variation, loud noises, and strong electromagnetic interference.
- The site must not be located in a low-lying land or an area prone to water accumulation. It must be above the highest water level of the local area.
- Do not install other equipment on the top of a pre-fab. module without evaluation by Huawei.
- When performing operations (such as installing an awning or outdoor unit) over the top of a pre-fab. module, take measures to protect the top of the pre-fab. module against damage. Do not perform operations such as arc welding, drilling, and cutting on the top of a pre-fab. module.
- Do not smoke or use open flame inside a pre-fab. module.
- Before performing fire operations inside a pre-fab. module, obtain the customer's approval and the required work permit and fully evaluate risks.

1.8 Battery Safety

Basic Requirements

Before operating batteries, carefully read the safety precautions for battery handling and master the correct battery connection methods.



DANGER

- Do not expose batteries at high temperatures or around heat-generating devices, such as sunlight, fire sources, transformers, and heaters. Overheating may cause the batteries to explode.
- Do not burn batteries. Otherwise, the batteries may explode.
- To avoid leakage, overheating, fire, or explosions, do not disassemble, alter, or damage batteries, for example, insert sundries into batteries or immerse batteries in water or other liquids.

-
- Wear goggles, rubber gloves, and protective clothes.
 - Move batteries in the required direction. Do not place a battery upside down or tilt it.
 - Keep the battery loop disconnected during installation and maintenance.
 - Use batteries of specified models. Using batteries of other models may damage the batteries.
 - Dispose of waste batteries in accordance with local laws and regulations. Do not dispose of batteries as household waste. If a battery is disposed of improperly, it may explode.
 - The site must be equipped with qualified fire extinguishing facilities, such as firefighting sands and powder fire extinguishers.

NOTICE

To ensure battery safety and battery management accuracy, use batteries provided with the DC power system by Huawei. Huawei is not responsible for any battery faults caused by batteries not provided by Huawei.

Battery Installation

Before installing batteries, observe the following safety precautions:

- Install batteries in a well-ventilated, dry, and cool environment that is far away from heat sources, flammable materials, moisture, extensive infrared radiation, organic solvents, and corrosive gases. Take fire prevention measures.
- Place and secure batteries horizontally.
- Note the polarities when installing batteries. Do not short-circuit the positive and negative poles of the same battery or battery string. Otherwise, the battery may be short-circuited.
- Check battery connections periodically, ensuring that all screws are securely tightened.
- When installing batteries, do not place installation tools on the batteries.

Battery Short Circuit

DANGER

Battery short circuits can generate high instantaneous current and release a great amount of energy, which may cause equipment damage or personal injury.

To avoid battery short circuit, do not maintain batteries with power on.

Lithium Battery

The safety precautions for lithium batteries are similar to those for lead-acid batteries except that you also need to observe the following precautions.

WARNING

There is a risk of explosion if a battery is replaced with an incorrect model.

- A battery can be replaced only with a battery of the same or similar model recommended by the manufacturer.
- When handling a lithium battery, do not place it upside down, tilt it, or bump it with other objects.
- Keep the lithium battery loop disconnected during installation and maintenance.

- Do not charge a battery when the ambient temperature is below the lower limit of the operating temperature (charging is forbidden at 0°C). Low-temperature charging may cause crystallization, which will result in a short circuit inside the battery.
- Use batteries within the allowed temperature range; otherwise, the battery performance and safety will be compromised.
- Do not throw a lithium battery in fire.
- When maintenance is complete, return the waste lithium battery to the maintenance office.

1.9 Others

- Exercise caution when shutting down the smart cooling product. Doing so may cause equipment and room overheating, which will damage the equipment.
- Exercise caution when setting battery parameters. Incorrect settings will affect the power supply and battery lifespan.

2 Site Requirements

2.1 Site Selection Requirements

- The power supply is stable and reliable.
- The communication and traffic are convenient.
- The site is far away from dust, smoke, harmful gas, and corrosive, flammable, or explosive objects.
- The site is not on a low-lying land, and above the highest water level of that area.
- The site is far away from sources of strong variation, loud noises, and strong electromagnetic interference.
- The ground is solid without spongy or soft soil, and is not prone to water aggregation or subsidence.
- The site is in an open area, meets the pre-fab. module installation and maintenance requirements.
- The site is far away from a class D environment or at least 500 m away from the seashore.

2.2 Field Requirements

The FusionDC1000 can be installed on bases or concrete platforms depending on the actual scenario. The site requirements vary with the selected installation mode.

NOTICE

1. Concrete platform scenario:

- The horizontal error between concrete platforms must be less than 5 mm. It is recommended that a concrete platform be 500 mm higher than the ground.
- Determine the actual height of the concrete platforms based on the local drainage and weather conditions.
- The concrete platform should have a maximum load bearing capacity of 15,000 kg and the recommended seismic acceleration is 3g. The specific strength is calculated based on the contact area (a single supporting point installed on the ground is 400 cm²).

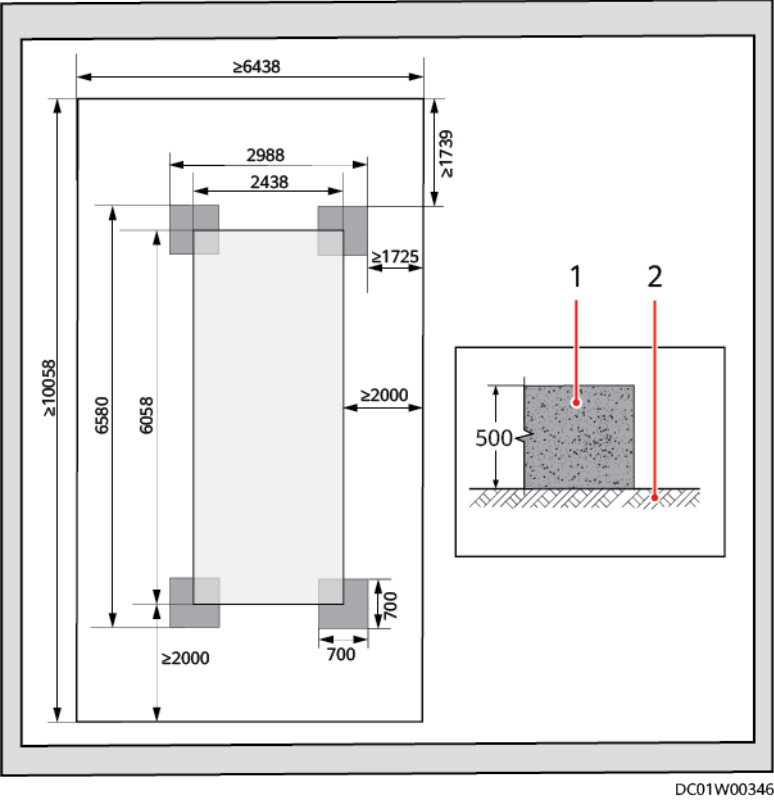
2. Base installation scenario:

- The horizontal error between concrete platforms must be less than 5 mm. It is recommended that a concrete platform be 200 mm higher than the ground.
 - Determine the actual height of the concrete platforms based on the local drainage and weather conditions.
 - The concrete platform should have a maximum load bearing capacity of 15,000 kg and the recommended seismic acceleration is 3g. The specific strength is calculated based on the contact area (a single-capacity base installed on the ground is 1720 cm²).
-

2.2.1 (Optional) Concrete Platform Scenario

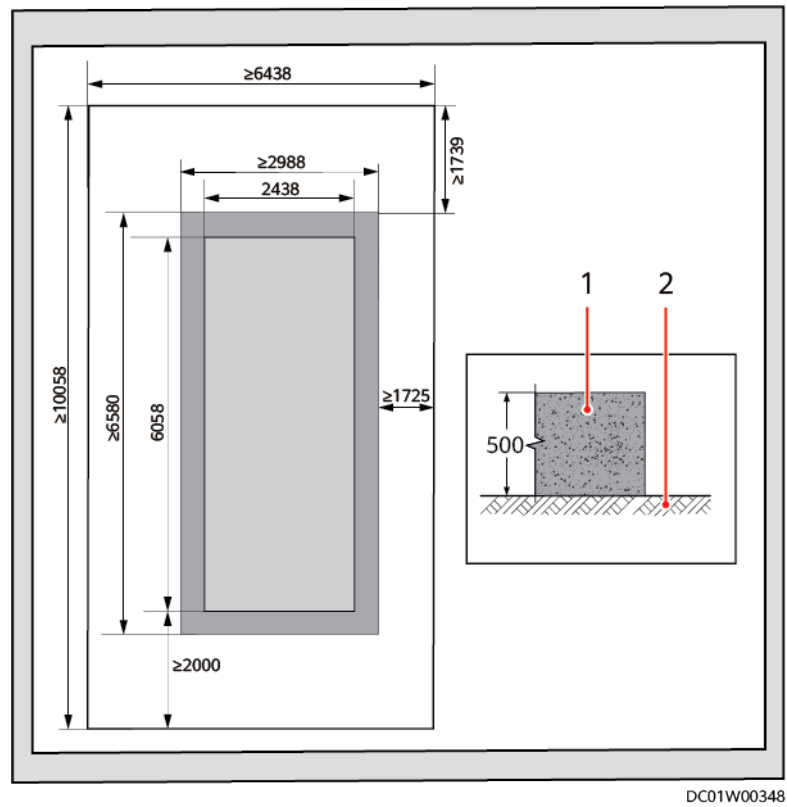
- Build concrete platforms on the selected installation site.
- Concrete pads or passages with the bearing capacity meeting local civil work standards can be built on the field outside the concrete platforms for access and maintenance.

Figure 2-1 Concrete platform 1 (unit: mm)



- (1) Concrete platform
- (2) Ground

Figure 2-2 Concrete platform 2 (unit: mm)



(1) Concrete platform

(2) Ground

2.2.2 (Optional) Base Installation Scenario

- Build concrete platforms on the selected installation site.

Figure 2-3 Base installation scenario diagram 1 (unit: mm)

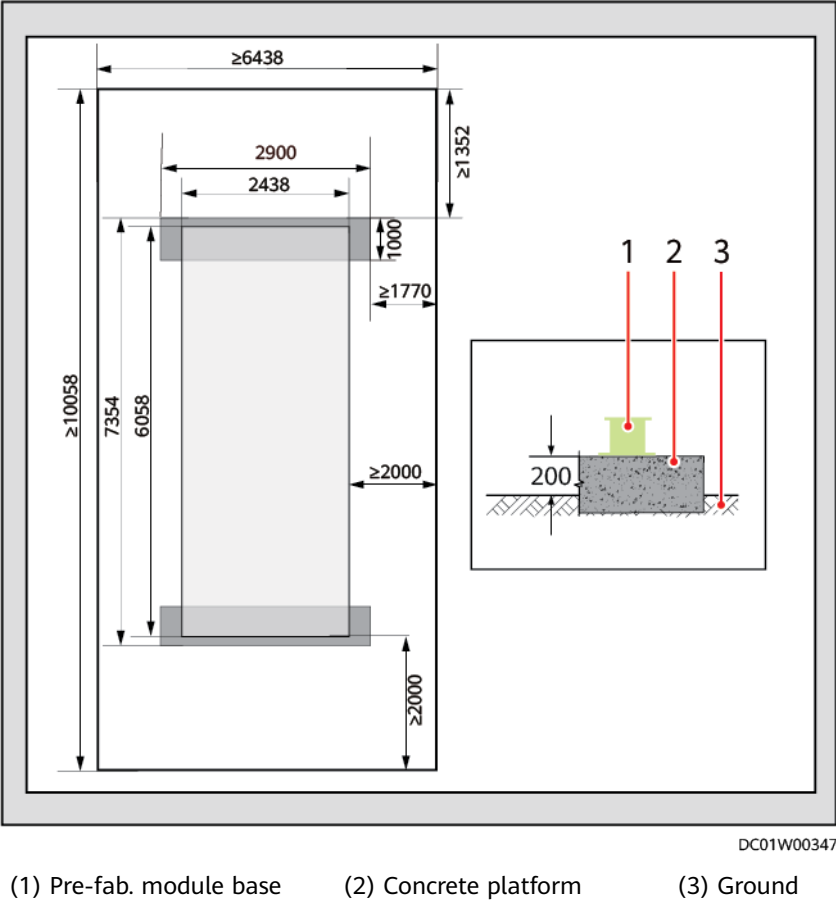
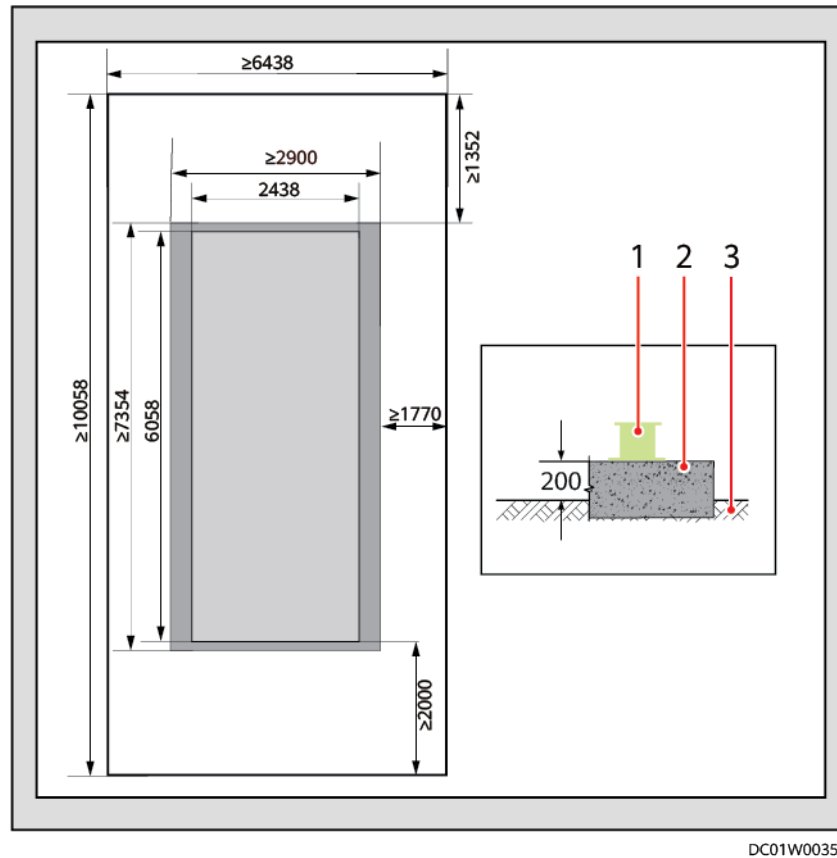


Figure 2-4 Base installation scenario diagram 2 (unit: mm)



(1) Pre-fab. module base (2) Concrete platform (3) Ground

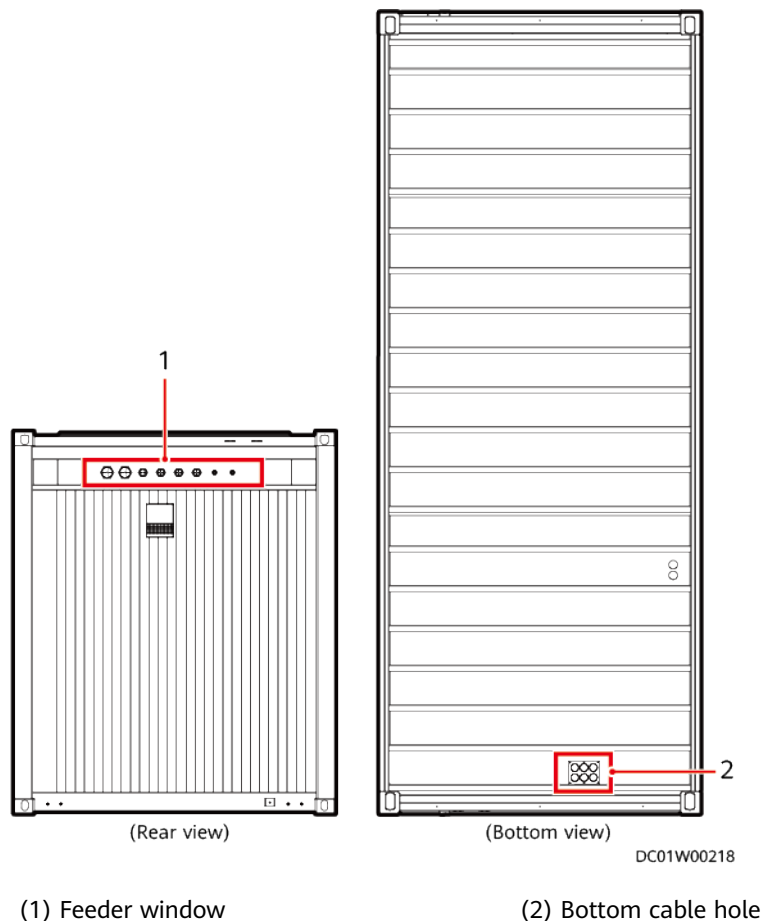
- Concrete pads or passages with the load-bearing capacity meeting local civil work standards can be built on the site outside the concrete platforms for access and servicing.

2.3 Power Supply and Distribution Requirements

- The power supply for the FusionDC1000 can be the mains or a diesel generating set (genset). For the detailed input routes and capacity, see the power supply and distribution system diagram for the solution in use.
- The supported power supply system is 380/400/415 V, 50 Hz/60 Hz, three-phase, four-wire, and PE.
- A Class I surge protective device (SPD) with a maximum discharge current ($I_{\max}$) no less than 100 kA (8/20 μ s) is required for the upstream input power distribution frame (PDF) for the FusionDC1000.
- External cables of the FusionDC1000 are routed into the pre-fab. module through the feeder window or the bottom cable hole. It is recommended that external cables be buried underground.
- If a "high electricity leakage" tag is attached on the equipment, ground the protective ground terminal on the equipment enclosure before connecting the AC input power supply; otherwise, electric shock as a result of electricity leakage may occur.

- The prefabricated modular data center product contains devices with large leakage currents. Do not configure a circuit breaker that has the leakage current protection function.

Figure 2-5 Pre-fab. module exterior ports



2.4 Grounding Requirements

- The external ground resistance of the pre-fab. module must not exceed 10 ohms, or the equivalent radius of the ground grid is no less than 5 m.
- The pre-buried ground grid must be at least 0.7 m underground. In cold areas, the ground electrodes must be buried under the frozen layer.
- A pre-fab. module can be grounded using ground lugs or ground cables.
 - Ground lug method: Use a ground lug made of hot-dip zinc-coated flat steel sheet with a cross-sectional area of 40 mm x 4 mm, connect one end of the ground lug to the pre-buried ground grid, and connect the other end to the pre-fab. module ground point. When a ground grid is pre-buried, the ground lug must be long enough to connect to a ground point on the pre-fab. module.
 - Ground cable method: Use a 95 mm² cable as the ground cable, connect one end of the cable to the pre-buried ground grid, and connect the other end to the pre-fab. module ground point. When a ground cable is

used, the ground cable must be routed through a plastic-coated metal hose.

 NOTE

- The screw reserved at a ground point is an M12 screw.
- A pre-fab. module can be grounded in the TN-S or TN-C-S mode.

2.5 External Environment Requirements

- Temperature: -20°C to $+55^{\circ}\text{C}$
- Relative humidity: 5%–95% RH
- Solar radiation: $\leq 1120 \text{ W/m}^2$

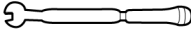
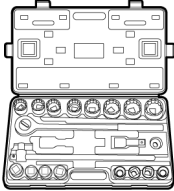
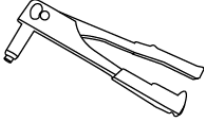
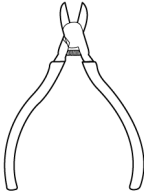
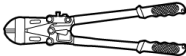
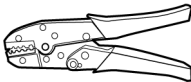
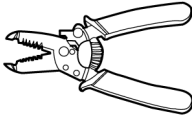
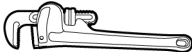
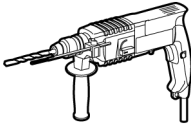
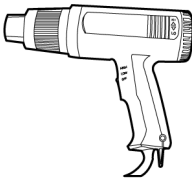
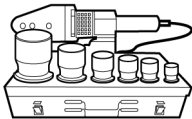
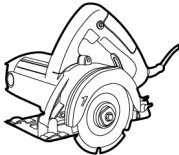
3 Installation Preparations

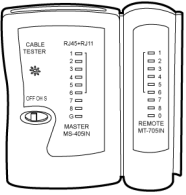
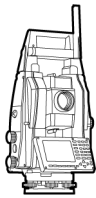
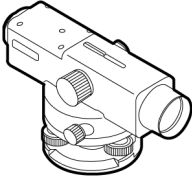
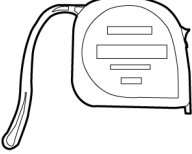
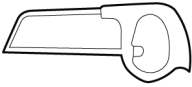
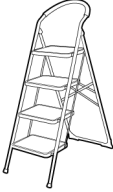
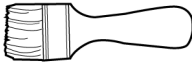
Before the installation, unpack and check the products, make available all required technical documents, tools, and materials, check the installation environment, drill holes based on the installation positions, fix the pre-fab. module bases, and train onsite installation personnel.

3.1 Tools and Materials

Table 3-1 Tools and materials

Categ ory	Tools and Materials		
Tighte ning tools	Phillips screwdriver (M5, M6, and M8) 	Flat-head screwdriver (2–5 mm) 	Phillips screwdriver M4 (length < 100 mm) 
	Phillips screwdriver M8 (100–200 mm) 	Solid wrench 	Adjustable wrench 

Category	Tools and Materials		
	Torque wrench 	Socket wrench 	Rivet gun 
Pliers	Pliers 	Diagonal pliers 	Wire clippers 
	Crimping tool 	Wire stripper 	Hydraulic pliers 
	Pipe wrench 	-	-
Power tools	Hammer drill and drill bit (Φ22 mm, 7/8 inch) 	Heat gun 	Vacuum cleaner 
	Hot melt device 	Crane 	Small cutter 

Category	Tools and Materials		
	Electric screwdriver 	-	-
Instruments	Multimeter 	Electroprobe 	Network cable tester 
	Height gauge 	Level gauge 	-
Auxiliary tools	Right angle 	Measuring tape (5 m) 	Level 
	Long leather measuring tape 	Claw hammer 	Utility knife 
	Hacksaw 	Step ladder (2 m) 	Brush 

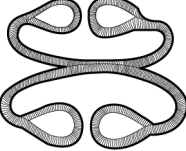
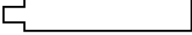
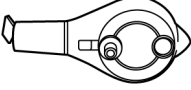
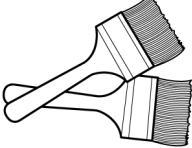
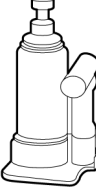
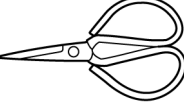
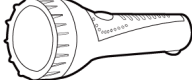
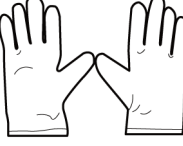
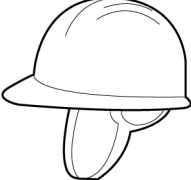
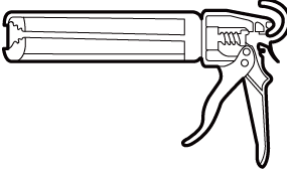
Category	Tools and Materials		
	Hoisting rope 	Floating nut puller 	Ink fountain 
	Cable reel 	Paint brush 	Jack 
Consumables (personal protective equipment)	Scissors 	Flashlight 	Marker 
	ESD gloves 	Protective gloves 	Safety helmet 
	Safety belt 	Safety goggles 	Anti-skid shoes 
	ESD wrist strap 	Rubber gloves 	Glue gun 

Table 3-2 Materials recommended for local purchase

Name	Model/Function	Quantity
(Optional) Silicone sealant	Installs rain and snow covers.	1 bottle
(Optional) Glue gun	Applies glue to rain and snow covers.	1 PCS
PPR pipe wrench or hacksaw	Cuts PPR pipes.	1 PCS
Water refill or condensate pipe	DN25-PP-R, including the straight section, elbow, and straight-through connector	Depending on the actual pipe route
Pipe thermal insulation	10 mm thick thermal insulation foam, such as rubber-plastic foam or glass wool	Depending on the actual pipe route
Pipe fastener	Supports pipes.	Depending on the actual pipe route
Cable tie	Binds and secures cables onsite.	1 package, 200–300 PCS
Power cable	- Electronic Electric Cable, 600 V/1000 V, ZA-YJV, (4 x 120 + 1 x 70) mm², Black (4+1 Cores: Yellow, Green, Red, Blue, Black), 322 A, CE - Connects mains input power cables.	Depending on site requirements
Insulation tape	Insulates cables onsite.	1 roll
Terminal	- Bare crimping terminal, DT, 120 mm², M12, 380 A, tin plating - Connects mains input power cables.	18 PCS
	- Bare crimping terminal, DT, 70 mm², M12, 260 A, tin plating - Connects mains input power cables.	5 PCS
Bolt for securing the ground point.	M12x30 stainless steel bolt assembly	Configure 1 PCS for each ground point.
Ground lug or ground cable terminal	Hot-dip zinc-coated flat steel sheet with a cross-sectional area of 40 mm x 4 mm or Electronic Electric Cable, 450 V/750 V, 60227 IEC 02 (RV), 95 mm ² , Yellow/Green, 258 A, CCC, CE and Bare crimping terminal, DT, 95 mm ² , M12, tin plating	Configure 1 PCS for each ground point.

Name	Model/Function	Quantity
Heat shrink tubing	• Diameter: 50 mm; radial shrinkage: 50%; operating temperature range: 55°C to 105°C • Connects mains input power cables.	Colors subject to local regulations, 10 m long for each
SIM card	The SIM card is installed in a card slot in the ECC800-Pro main control module. The SIM card must support GSM and WCDMA.	1 PCS
MicroSD card	The microSD card is installed in a card slot in the ECC800-Pro main control module. The capacity ranges from 16 GB to 128 GB. The recommended capacity is 32 GB.	1 PCS

 NOTE

- This table may not list some tools required at specific sites. Onsite installation personnel and technical support personnel should prepare tools based on site requirements.
- The materials listed in the preceding table are for reference only. Purchase the materials based on site requirements.
- Preventive measures should be applied before installation to avoid water seepage into pre-fab. modules and equipment in the case of a sudden change in the weather.

3.2 Installation Personnel Requirements

- Installation personnel must be trained and qualified by Huawei to master methods for system installation, and must obtain work permits before they begin to install the equipment.
- Technical personnel from the customer must be trained by Huawei and master the installation method.
- The number of construction personnel depends on the project progress and installation environment.
- Construction personnel have read through the safety precautions and related product documents before they begin working.

 NOTE

- Common technician: familiar with the equipment installation process.
- Skilled technician: familiar with the equipment installation process and having an electrician certificate.

3.3 Checking the Installation Environment

Check the site requirements one by one, and start installation only after all requirements are met. Huawei will not be liable for any consequences caused if the installation environment does not meet the requirements.

 NOTE

Mark the security zone: Use red caution belts to delimit a security zone, clean up obstacles in that zone, and place construction signs and warning signs in eye-catching positions.

4 Installing a Pre-fab. Module

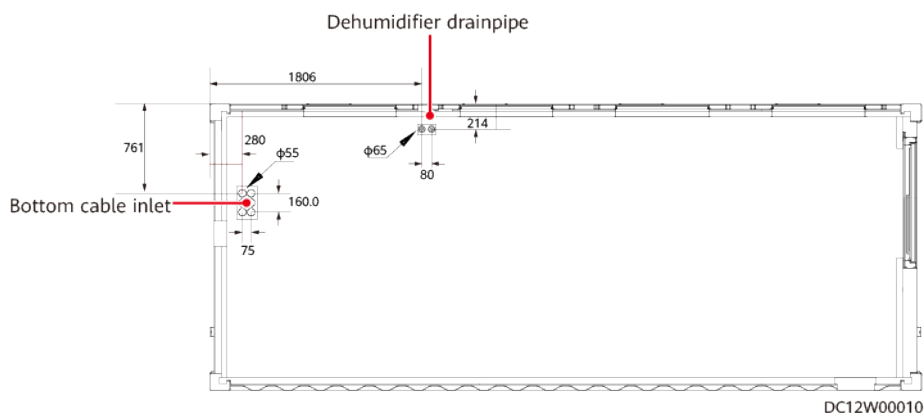
Prerequisites

- Before installing a pre-fab. module, check whether a dehumidifier is configured. If a dehumidifier is configured, ensure that the position reserved for the outdoor drainpipe of the dehumidifier corresponds to the drainage port of the dehumidifier inside the pre-fab. module.
- Before installing a pre-fab. module, check the general cable routing mode of the pre-fab. module. If cables are routed from the bottom, align the external cable inlet with the cable inlet at the bottom.

NOTICE

Before installing a pre-fab. module, check the general cable routing mode of the power system and the drainage mode of the dehumidifier. If a full-board concrete platform is used onsite, bases need to be configured. Ensure that the bottom cable inlets and drainage ports are 300 mm away from the full-board concrete platform to meet the height requirements for routing cables or pipes.

Figure 4-1 External inlets



4.1 (Optional) Concrete Platform Scenario

4.1.1 Determining the Pre-fab. Module Installation Position

Prerequisites

- The field meets site requirements.
- Before installing a pre-fab. module, check the height of concrete platforms and ensure that the height (altitude) error between the upper surfaces of all platforms does not exceed 5 mm.

NOTICE

Concrete platform levelness is critical to pre-fab. module installation. Ensure that the concrete platforms meet requirements before installing pre-fab. modules.

Recommended method for measuring the levelness:

1. Use a level gauge to measure the heights of all concrete platforms. If the height difference does not exceed 5 mm, the platforms are level.
 2. Bend the transparent soft water pipe into a U shape and inject water into it. Secure one end of the water pipe on one side of the platform so that the water level is flush with the platform height. Align the other end of the water pipe with the other side of the platform to check whether the water level is flush with the platform height. If the water level is flush with the platform height, the platform is level.
-

Context

Before installing a pre-fab. module, determine its installation position and direction based on site space.

Preparations

Tools: marker, ink foundation, long leather measuring tape

Materials: none

Skill requirement: skilled technician

Procedure

- Step 1** Determine the reference points for installing a pre-fab. module on the concrete platforms and the onsite installation space. Mark the reference points using a marker.
- Step 2** On the basis of the reference points, mark the mounting positions for the four corner fittings of a pre-fab. module using an ink fountain and long leather measuring tape.

NOTICE

When marking the mounting positions for corner fittings, ensure that the four lines form a rectangle.

Figure 4-2 Concrete platform 1 (unit: mm)

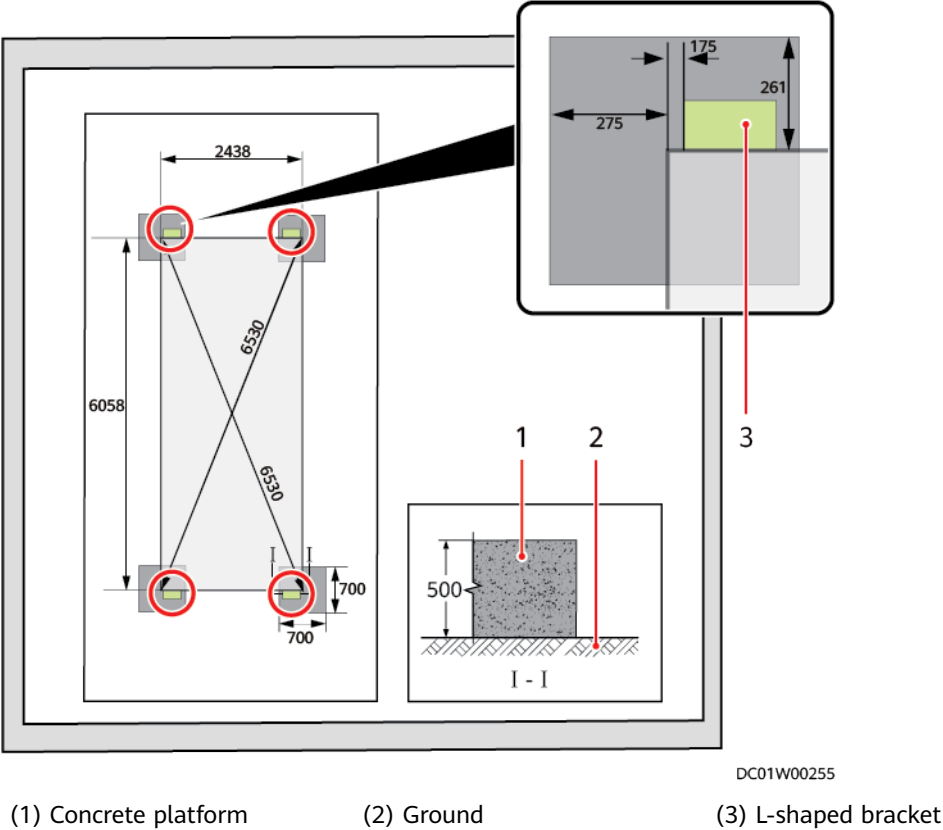
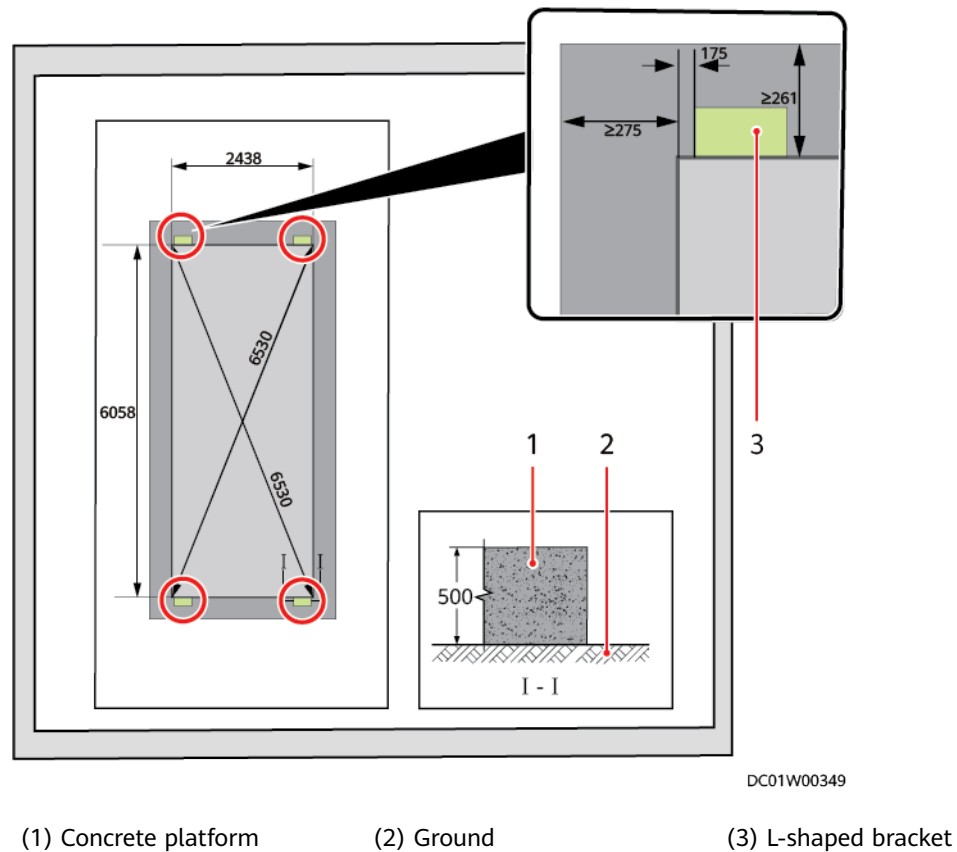


Figure 4-3 Concrete platform 2 (unit: mm)



----End

4.1.2 Removing the Pre-fab. Module Protective Cover

Prerequisites

The weather condition is good without rain or snow.

Context

A protective cover is installed to protect the pre-fab. module during transportation.

Preparations

Tools: safety helmet, safety belt, step ladder, protective gloves, utility knife

Materials: none

Skill requirement: common technician

Procedure

Step 1 Cut open the protective cover using a utility knife and remove the protective cover.

 NOTE

When removing the protective cover, take protective measures for working at heights.

----End

4.1.3 Hoisting and Securing the Pre-fab. Module

Prerequisites

NOTICE

To facilitate subsequent installation, ensure that the pre-fab. module is level after hoisting.

- Select an appropriate crane based on standards of the crane company, and ask a professional to assess the crane onsite.
- The hoisting ropes are available.
- The positions of pre-fab. module corner fittings are correctly marked.
- The doors of the pre-fab. module to be hoisted are closed.
- Ensure that the weather condition is good without wind when pre-fab. modules need to be hoisted outdoors.

Context

The crane and steel ropes must meet the pre-fab. module hoisting requirements.

Table 4-1 Parameters for hoisting a pre-fab. module

Weight	Steel Rope Length	Steel Rope Quantity	Dimensions (H x W x D)
Net weight: < 7000 kg	> 6.5 m	4 PCS	2896 mm x 2438 mm x 6058 mm

Hoisting Precautions

Stage	Precautions
Before hoisting	Ensure that the crane and steel ropes provide the required bearing capacity.
	Ensure that the steel ropes are securely connected.
During hoisting	Do not allow any unauthorized people to enter the hazardous areas and never stand under the crane arm during hoisting.

Stage	Precautions
	Ensure that the crane is properly located and avoid long-distance hoisting.
	Keep the pre-fab. module stable and horizontal during hoisting, and ensure that the diagonal gradient of the pre-fab. module is within 5 degrees.
	Lift and land a pre-fab. module slowly to prevent shock to equipment inside it.
	Remove the steel ropes after ensuring that the pre-fab. module is placed evenly on the concrete platforms.

Preparations

Tools: crane, socket wrench, torque wrench, Phillips screwdriver, jack, steel hoisting rope, level, level gauge, hammer drill, angle rule, marker, ink fountain, long leather measuring tape, claw hammer, vacuum cleaner

Materials: pre-fab. module to be hoisted, expansion bolt, L-shaped bracket (4 PCS)

Skill requirement: skilled technician, common technician, crane driver

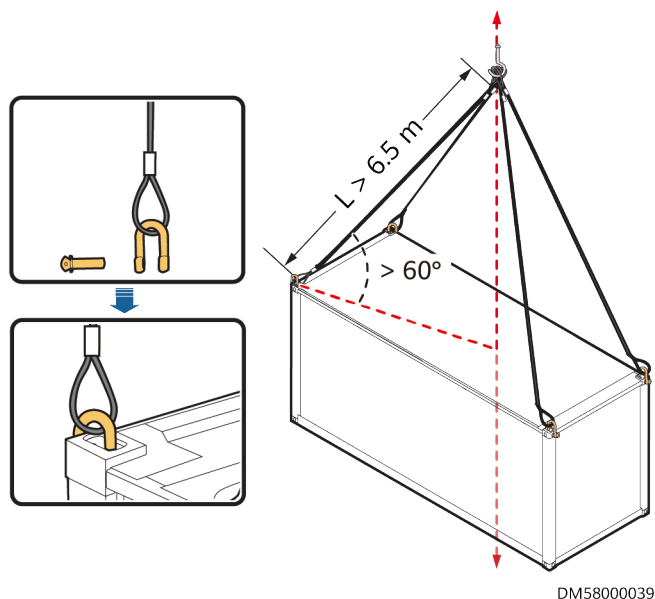
Procedure

- Step 1** Adjust the pre-fab. module in the installation direction, connect the steel hoisting ropes, and hoist the pre-fab. module onto the concrete platforms.

NOTICE

- When hoisting a pre-fab. module, ensure that the four corner fittings of the pre-fab. module are aligned with the marked mounting positions for corner fittings on the concrete platforms.
- You are advised to use a dedicated hoisting tool to ensure that the steel ropes used for hoisting pre-fab. modules are of the same length. Otherwise, the horizontal stress on the top beam of the pre-fab. modules may be uneven.

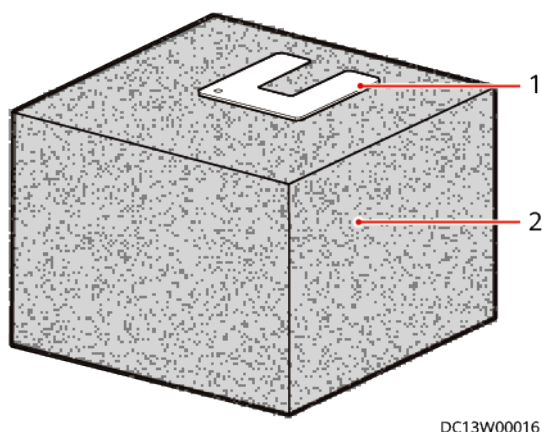
Figure 4-4 Hoisting a pre-fab. module



Step 2 Level all concrete platforms.

1. Use a level gauge to measure the heights of all concrete platforms and record the heights.
2. Use the concrete platform with the highest upper surface as the leveling reference.
3. Select spacers based on the difference between the height of each concrete platform and the reference value to level the concrete platforms. Ensure that the height difference between all concrete platforms is less than or equal to 5 mm.

Figure 4-5 Installing a spacer



(1) Spacer

(2) Concrete platform

 NOTE

Spacers are used to level the height of the concrete platforms. The spacers should be installed in the same positions as the corner fittings of the pre-fab. modules.

Two specifications are available: 2 mm and 5 mm.

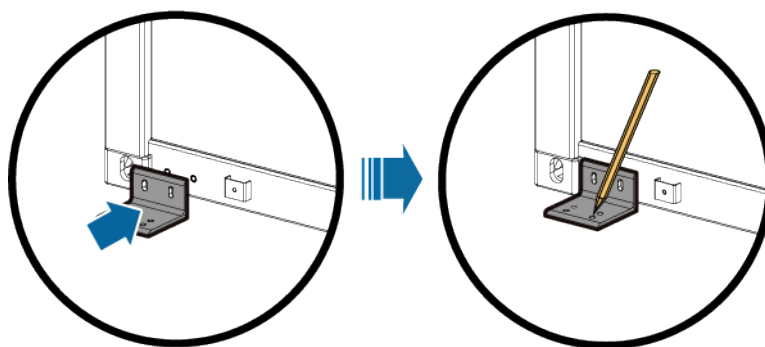
Step 3 Use four L-shaped brackets to secure the pre-fab. module.

1. Align the two mounting holes in an L-shaped bracket with the two holes on the pre-fab. module, and mark the hole positions for mounting the L-shaped bracket on the concrete platforms using a marker.

NOTICE

- Mark all four mounting holes where each L-shaped bracket contacts the concrete platform.
- Place a wooden block on the top of an expansion bolt, and then knock at the wooden block using a claw hammer to avoid damaging the expansion bolt.
- When you drill a hole using a hammer drill, keep the drill bit perpendicular to the ground and hold the drill stock firmly with both hands to prevent irregular drilling and damage to the ground.
- If the ground is too hard and smooth for the drill bit to secure its position, use a chisel to punch a pit before drilling.
- Before you hammer an expansion bolt vertically into a mounting hole, clean up dust from the inside and surrounding of the hole.
- Each L-shaped bracket must be secured by two mounting holes. Preferentially drill the outer two mounting holes. If steel bars in a concrete platform block the drill bit, drill the inner mounting holes.

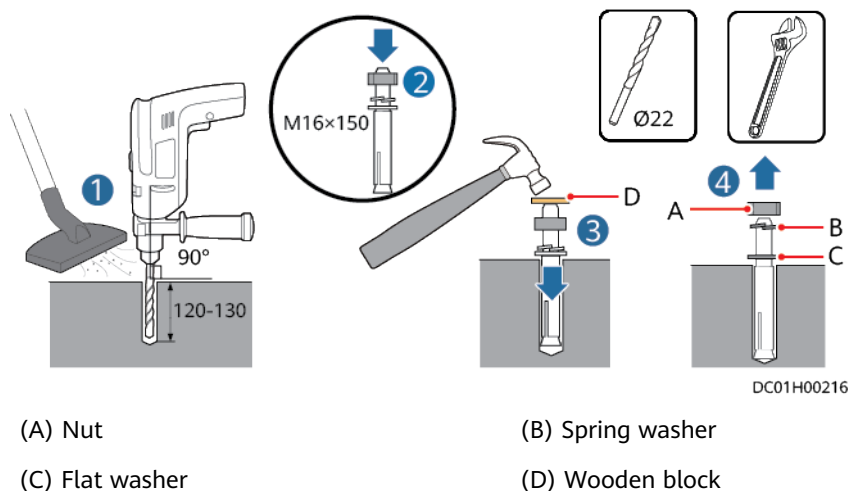
Figure 4-6 Marking mounting holes for an L-shaped bracket



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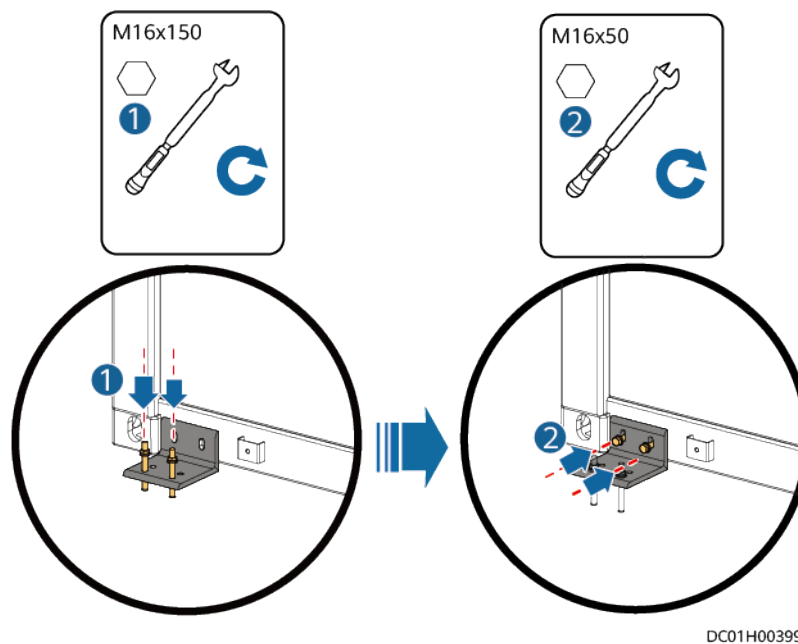
2. Drill mounting holes using a hammer drill.
3. Rotate nuts onto expansion sleeves to prevent the expansion sleeves from fluttering.
4. Knock the expansion bolts vertically into mounting holes until the flat washers are flush with the floor.
5. Remove the nuts, spring washers, and flat washers.

Figure 4-7 Installing an expansion bolt (unit: mm)



6. Reinstall the L-shaped brackets to the concrete platforms with the expansion bolts securing the L-shaped brackets. Remount the flat washers, spring washers, and nuts on the expansion bolts and tighten the expansion bolts in sequence using a torque wrench.

Figure 4-8 Securing the L-shaped bracket



7. Remove the rubber plugs from the pre-fab. module fixing holes using a Phillips screwdriver.
8. Secure the L-shaped brackets to the pre-fab. module using bolt assemblies.

----End

Follow-up Procedure

After a pre-fab. module is hoisted and installed, verify the installation to ensure normal use of products and smooth subsequent installation.

Table 4-2 Post-installation checklist

No.	Check Item	Check Method	Criteria
1	Contact between the pre-fab. module and concrete platforms	Observe.	The pre-fab. module is in close contact with and evenly supported by the concrete platforms.
2	Bolts and nuts	Partially tighten them using a wrench.	Bolts and nuts are tightened.
3	Pre-fab. module doors	Open and close each pre-fab. module door once.	All pre-fab. module doors can be smoothly opened and closed.

4.2 (Optional) Base Scenario

4.2.1 Installing Pre-fab. Module Bases

Prerequisites

- The field meets site requirements.
- Before installing a pre-fab. module, check the height of concrete platforms and ensure that the height (altitude) error between the upper surfaces of all platforms does not exceed 5 mm.

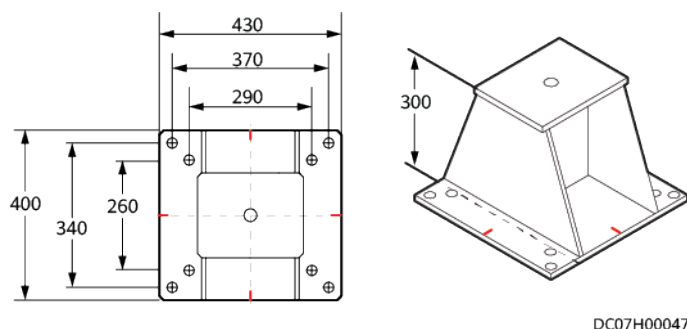
CAUTION

Concrete platform levelness is critical to pre-fab. module installation. Ensure that the concrete platform meet requirements before installing pre-fab. module bases.

Context

Before installing a pre-fab. module, determine its installation position and direction based on site space.

Figure 4-9 Single-capacity base (unit: mm)



DC07H00047

Preparations

Tools: torque wrench, adjustable wrench, level, level gauge, hammer drill, right angle, marker, ink fountain, long leather measuring tape, claw hammer, vacuum cleaner

Materials: single-capacity base (4 PCS), twistlock, expansion bolt, spacer

Skill requirement: skilled technician

Procedure

Step 1 Draw the base installation area on the concrete platforms using an ink fountain.

Figure 4-10 Base installation scenario diagram 1 (unit: mm)

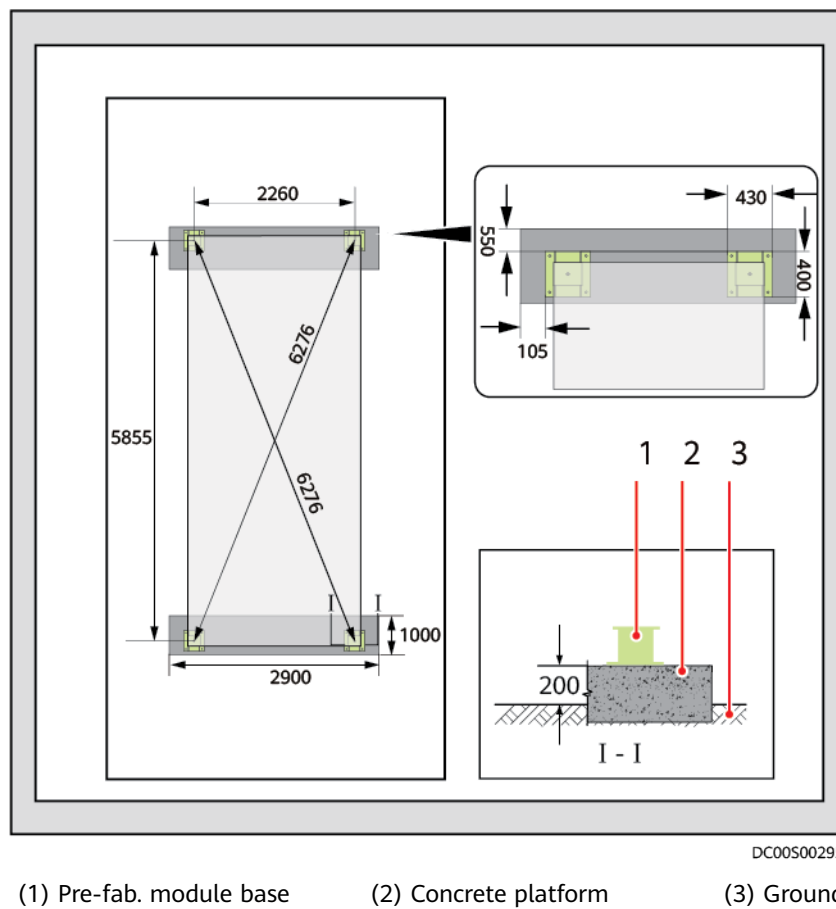
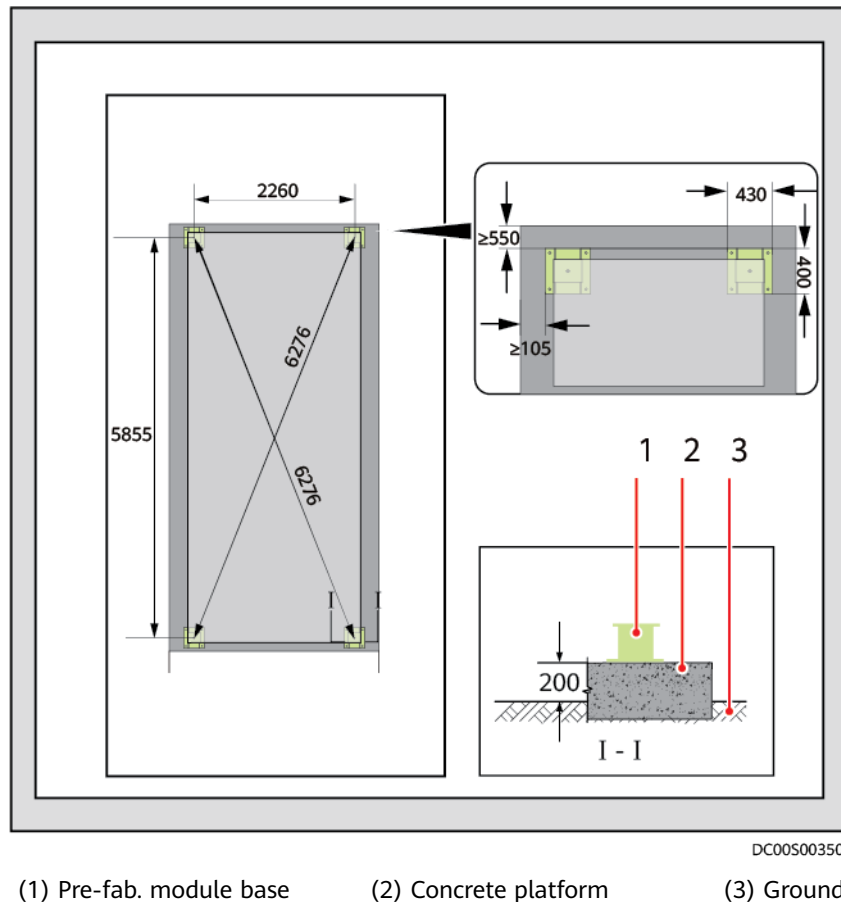


Figure 4-11 Base installation scenario diagram 2 (unit: mm)



Step 2 Determine the installation position for the first base in the installation area based on the site space, and draw longitude and latitude reference lines between the first base and other bases.

NOTICE

- Lines should be perpendicular or parallel, with an angle of 90 degrees at cross points.
- The point where the reference lines intersect is the middle point for installing a pre-fab. module base.

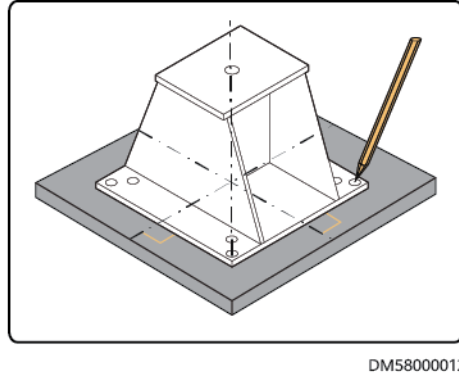
Step 3 Place bases based on the reference lines.

NOTICE

- Ensure that the 400 mm edge of the base is parallel with the length direction of the pre-fab. module and that the steel stamp on the base is aligned with the reference line.
- After placing all the bases, measure the diagonal distances between the four outermost bases for the pre-fab. module, and ensure that the diagonal length deviation is within 5 mm.

- Step 4** Mark the hole positions for installing pre-fab. module bases on the concrete platforms using a marker.

Figure 4-12 Determining hole positions for installing a pre-fab. module base



NOTICE

- When marking hole positions for a base, ensure that the steel stamps on the base are aligned with the reference lines you marked.
- There are eight mounting holes for one single-capacity base. Mark all the hole positions.

- Step 5** Move away the pre-fab. module bases, and install expansion bolts in the base mounting holes.

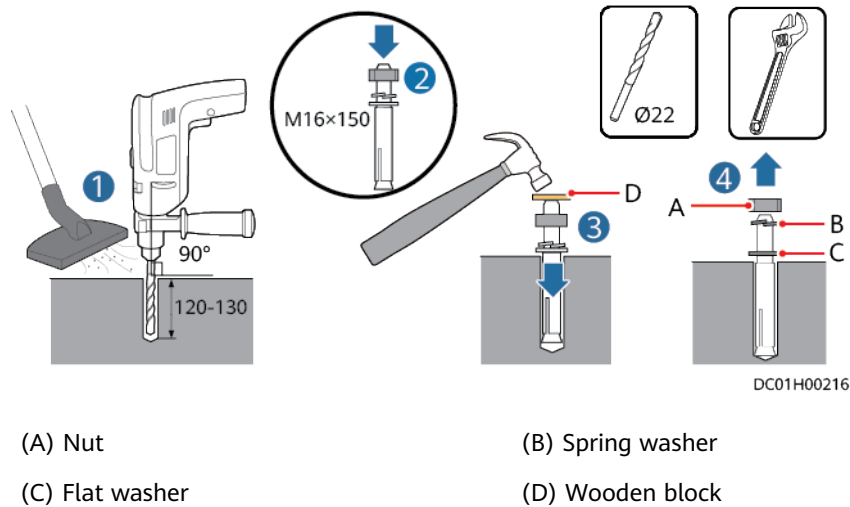
NOTICE

- Each base must be secured by four mounting holes. Preferentially drill the outer four mounting holes. If steel bars in the concrete platform block the drill bit, drill the inner mounting holes.
- Place a wooden block on the top of an expansion bolt, and then knock at the wooden block using a claw hammer to avoid damaging the expansion bolt.
- When you drill a hole using a hammer drill, keep the drill bit perpendicular to the ground and hold the drill stock firmly with both hands to prevent irregular drilling and damage to the ground.
- If the ground is too hard and smooth for the drill bit to secure its position, use a chisel to punch a pit before drilling.
- Before you hammer an expansion bolt vertically into a mounting hole, clean up dust from the inside and surrounding of the hole.

1. Drill mounting holes using a hammer drill.
2. Rotate nuts onto expansion sleeves to prevent the expansion sleeves from fluttering.
3. Knock the expansion bolts vertically into mounting holes until the flat washers are flush with the floor.

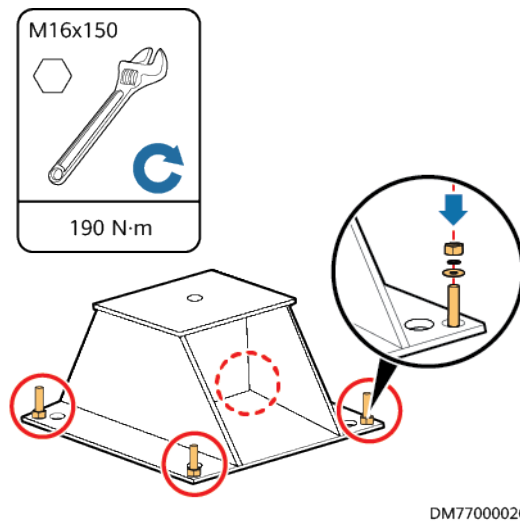
4. Remove the nuts, spring washers, and flat washers.

Figure 4-13 Installing an expansion bolt (unit: mm)



- Step 6** Reinstall the pre-fab. module bases to the concrete platforms with the expansion bolts securing the bases. Remount the flat washers, spring washers, and nuts on the expansion bolts and tighten the expansion bolts in sequence using a torque wrench.

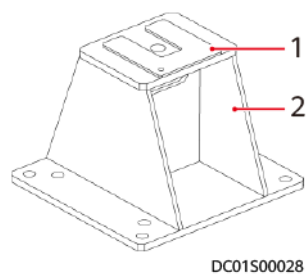
Figure 4-14 Securing pre-fab. module bases



- Step 7** Level all bases.

1. Measure the height of each base using the level gauge, and record the height on its upper surface using the marker.
2. Identify the base with the highest upper surface, and use it as the adjustment reference.
3. Select spacers based on the height difference between a base and the reference base, and add spacers to adjust the height. Ensure that the height difference is within 5 mm after adjustment.

Figure 4-15 Installing a spacer



(1) Spacer

(2) Base

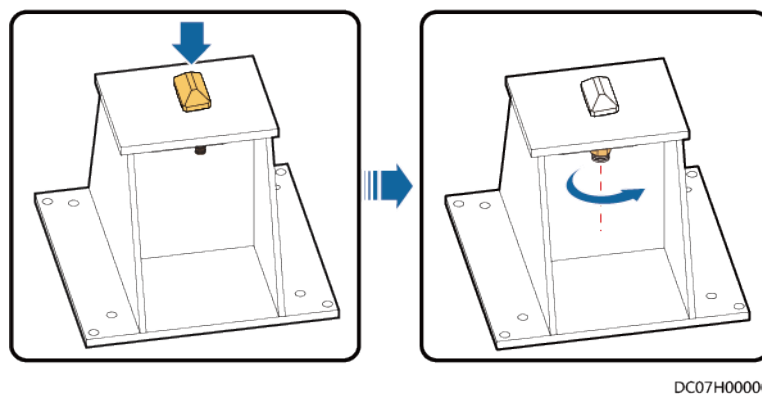
NOTE

Spacers delivered with the bases have two specifications: 2 mm and 5 mm thick.

Step 8 Insert a twistlock into the mounting hole in a single-capacity base and keep the lock head in the pre-fab. module length direction.

Step 9 Pre-mount the nuts onto the twistlocks using an adjustable wrench.

Figure 4-16 Installing a twistlock for a single-capacity base



NOTE

It is recommended that you tighten the base twistlocks after the pre-fab. module is hoisted in place.

----End

4.2.2 Removing the Pre-fab. Module Protective Cover

Prerequisites

The weather condition is good without rain or snow.

Context

A protective cover is installed to protect the pre-fab. module during transportation.

Preparations

Tools: safety helmet, safety belt, step ladder, protective gloves, utility knife

Materials: none

Skill requirement: common technician

Procedure

Step 1 Cut open the protective cover using a utility knife and remove the protective cover.

NOTE

When removing the protective cover, take protective measures for working at heights.

----End

4.2.3 Hoisting and Securing the Pre-fab. Module

Prerequisites

NOTICE

To facilitate subsequent installation, ensure that the pre-fab. module is level after hoisting.

- Select an appropriate crane based on standards of the crane company, and ask a professional to assess the crane onsite.
- Twistlocks in pre-fab. module bases are in correct positions.
- The hoisting ropes are available.
- The doors of the pre-fab. module to be hoisted are closed.
- Ensure that the weather condition is good without wind when pre-fab. modules need to be hoisted outdoors.

Context

Ensure that the crane and steel ropes can bear the load weight.

Table 4-3 Hoisting specifications

Weight	Steel Rope Length	Steel Rope Quantity	Dimensions (H x W x D)
Net weight: < 7000 kg	> 6.5 m	4 PCS	2896 mm x 2438 mm x 6058 mm

Hoisting Precautions

Stage	Precautions
Before hoisting	Ensure that the crane and steel ropes provide the required bearing capacity.
	Ensure that the twistlocks in the bases are in correct positions.
	Ensure that the steel ropes are securely connected.
During hoisting	Do not allow any unauthorized people to enter the hazardous areas and never stand under the crane arm during hoisting.
	Ensure that the crane is properly located and avoid long-distance hoisting.
	Keep the pre-fab. module stable and horizontal during hoisting, and ensure that the diagonal gradient of the pre-fab. module is within 5 degrees.
	Lift and land a pre-fab. module slowly to prevent shock to equipment inside it.
	Remove the steel ropes after ensuring that the pre-fab. module is placed evenly on the four bases.

Preparations

Tools: crane, torque wrench, steel hoisting rope, level

Materials: pre-fab. module to be hoisted, spacer

Skill requirement: skilled technician, common technician, crane driver

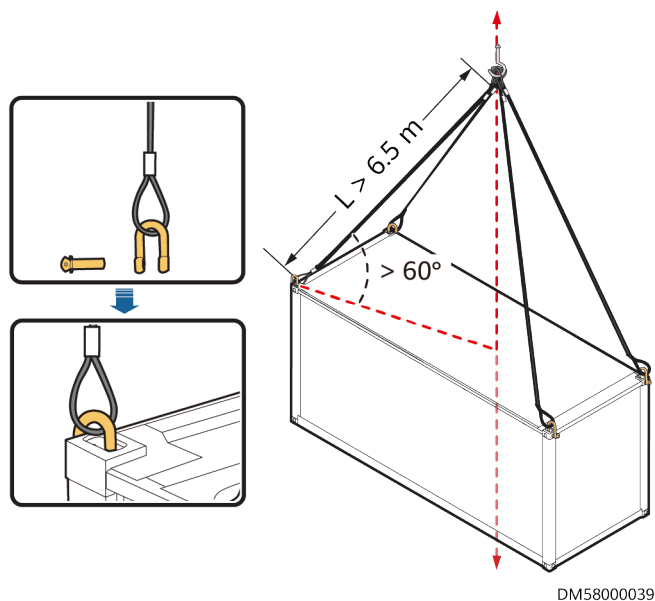
Procedure

- Step 1** Adjust the pre-fab. module in the installation direction, connect the steel hoisting ropes, and hoist the pre-fab. module onto the bases.

Figure 4-17 Hoisting a pre-fab. module

NOTICE

You are advised to use dedicated hoisting tools or hangers to reduce the horizontal stress on the top beam of the pre-fab. module.

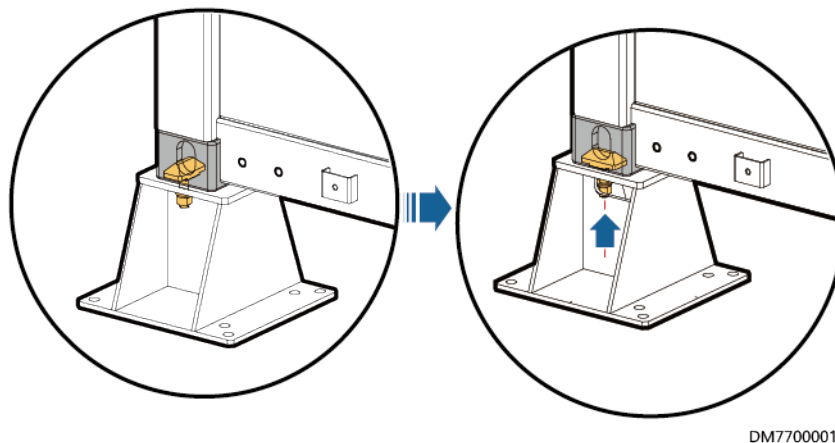


Step 2 Turn the twistlocks in the bases by 90 degrees to lock the pre-fab. module, and tighten the twistlocks using a torque wrench.

NOTICE

Before you tighten twistlocks, ensure that the twistlocks lock the pre-fab. module.

Figure 4-18 Tightening a twistlock in a single-capacity base



----End

Follow-up Procedure

After a pre-fab. module is hoisted and installed, verify the installation to ensure normal use of products and smooth subsequent installation.

Table 4-4 Post-installation checklist

No.	Check Item	Check Method	Criteria
1	Bolts and nuts of twistlocks	Partially tighten them using a wrench.	Bolts and nuts are tightened.
2	Contact between the pre-fab. module and bases	Observe.	The pre-fab. module is in close contact with and evenly supported by the bases underneath.
3	Pre-fab. module doors	Open and close each pre-fab. module door once.	All pre-fab. module doors can be smoothly opened and closed.

4.3 Grounding the Pre-fab. Module

Context

A pre-fab. module can be grounded using ground lugs or ground cables. The requirements are as follows:

- Ground lug: Use ground lugs made of hot-dip zinc-coated flat steel with a cross-sectional area of 40 mm x 4 mm, and leave 500 mm of each ground lug out of the concrete platform.
- Ground cable: Use 95 mm² ground cables and route them through a plastic-coated metal hose.

Preparations

Tool: torque wrench

Materials: ground lug (2 PCS) or ground cable (2 PCS)

Skill requirement: common technician

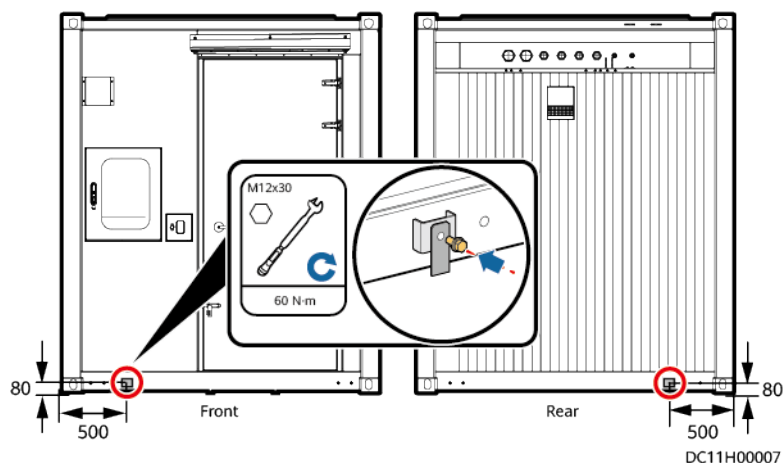
Procedure

- Step 1** Secure the ground lugs to the pre-fab. module ground points by tightening M12x30 stainless steel bolt assemblies.

NOTE

Before the installation, remove the tinfoil from the ground lugs.

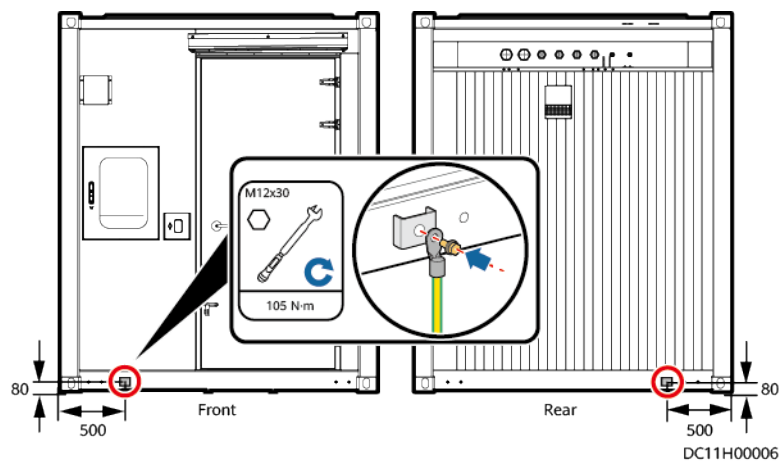
Figure 4-19 Installing a ground lug



NOTE

In addition to using ground lugs, you can also connect ground cables to pre-fab. module ground points using M12x30 stainless steel bolt assemblies, as shown in the following figure. Ground cables can be routed through plastic-coated metal hoses for protection based on site requirements.

Figure 4-20 Installing a ground cable



----End

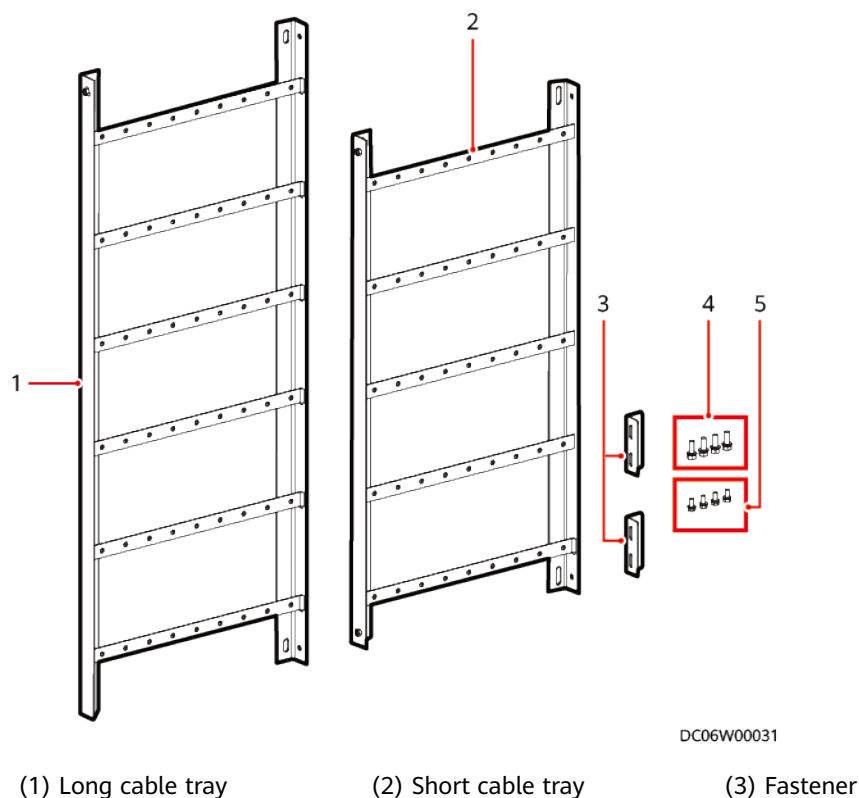
5 Installing External Accessories for the Pre-fab. Module

5.1 (Optional) Installing External Cable Trays

Context

The external cable tray fittings consist of long cable trays, short cable trays, fasteners, M8 bolt assemblies, and M10 bolt assemblies.

Figure 5-1 Composition of the external cable tray



(4) M10 bolt assemblies

(5) M10 bolt assemblies

Preparations

Tools: adjustable wrench, Phillips screwdriver

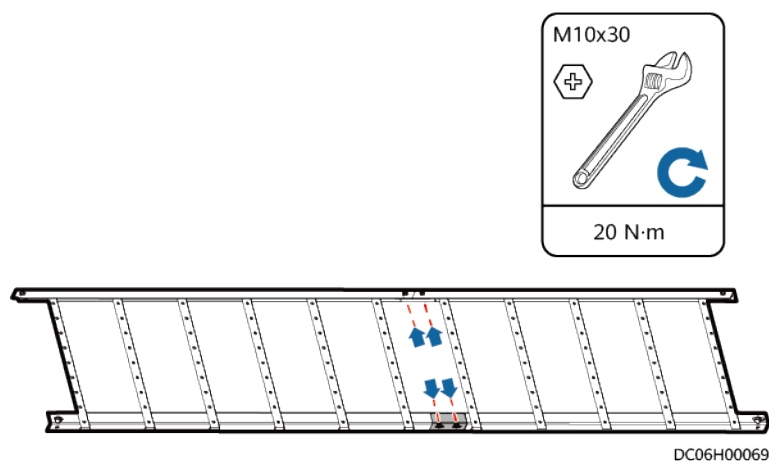
Materials: external cable tray, external cable tray screws

Skill requirement: common technician

Procedure

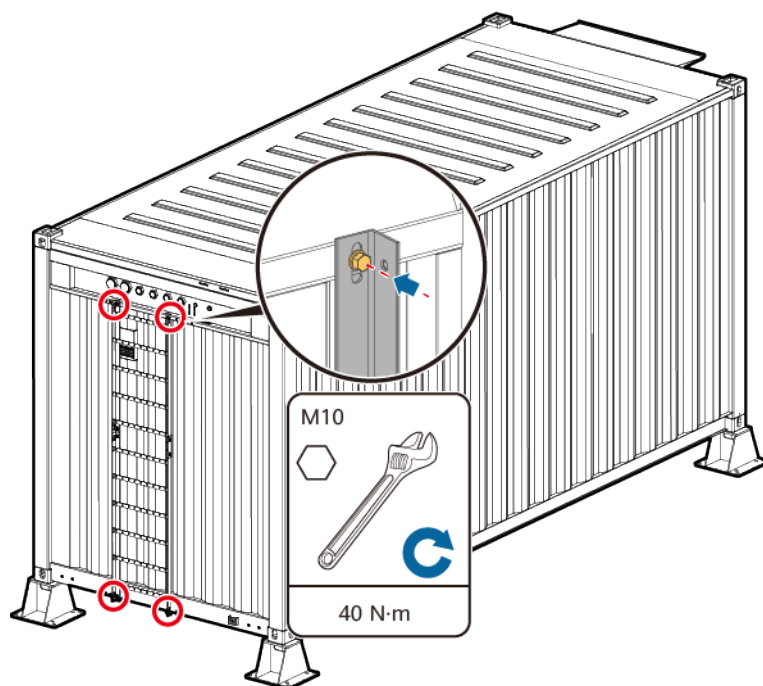
- Step 1** Locate the external cable tray installation position, and remove the rubber plugs from the corresponding mounting holes in the pre-fab. module using a Phillips screwdriver.
- Step 2** Align the ends of long and short cable trays, and secure the long and short cable trays using fasteners.

Figure 5-2 Assembling the cable tray



- Step 3** Secure the cable tray to the ports reserved on the pre-fab. module.

Figure 5-3 Securing the cable tray



----End

5.2 (Optional) Installing a Rain and Snow Cover

Preparations

Tools: socket wrench, Phillips screwdriver, glue gun, step ladder

Materials: rain and snow cover, mounting plate of the rain and snow cover, rubber pad, white sealant, rain and snow cover bolt, washer

Skill requirement: common technician

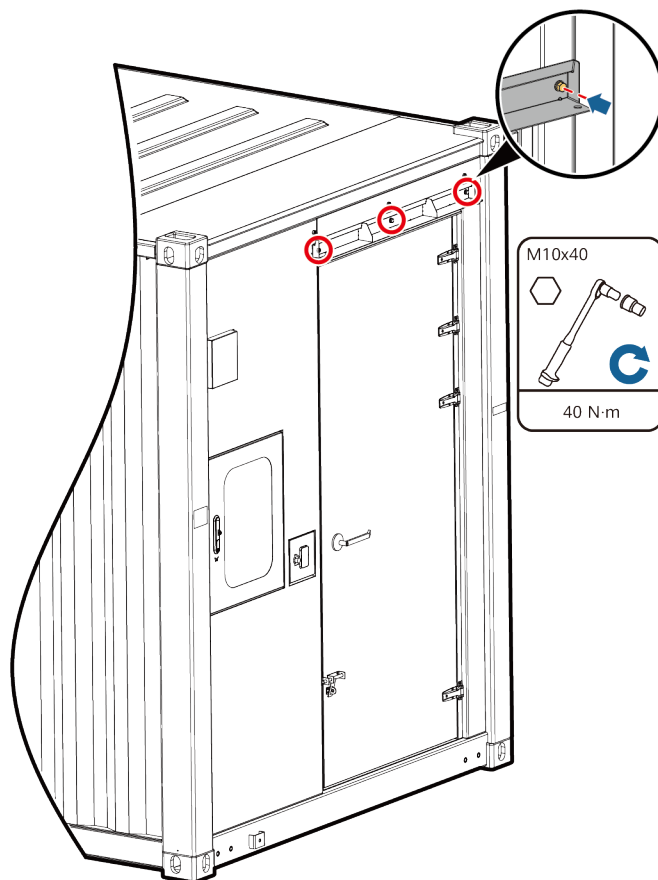
Procedure

- Step 1** Secure the mounting plate of the rain and snow cover at the top of the pre-fab. module door.

NOTICE

There are two rows of screw holes on the top of the pre-fab. module door. The screws on the mounting plate of the rain and snow cover need to be installed in the three holes in the lower row, as shown in the following figure.

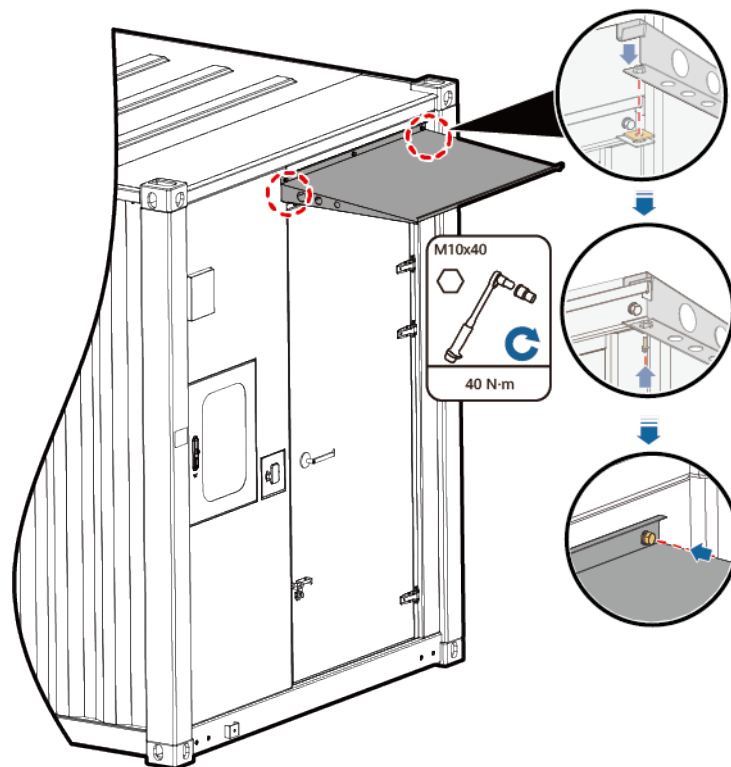
Figure 5-4 Installing the mounting plate of the rain and snow cover



DC11H00160

- Step 2** Lift the rain and snow cover and insert it into the U-shaped slot in the mounting plate of the rain and snow cover from above the mounting plate.
- Step 3** Insert a rubber pad between the bottom of the rain and snow cover and the mounting plate. Install screws on both sides and three screws on the top of the rain and snow cover to partially secure the rain and snow cover.

Figure 5-5 Installing a rain and snow cover

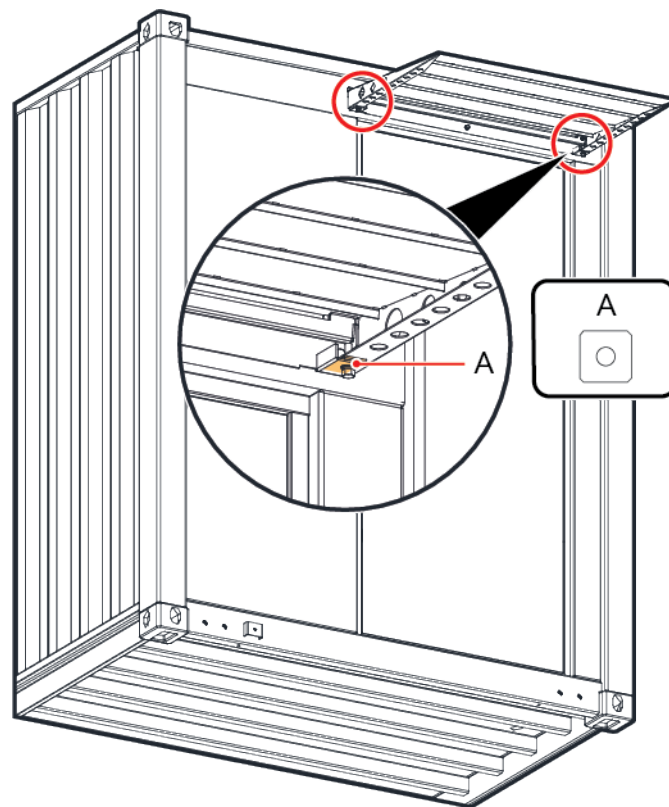


Step 4 (Optional) If the rain and snow cover is unstable after being partially secured, install washers.

NOTE

- A certain number of washers can be installed onsite based on the actual situation to ensure that the rain and snow cover is securely installed and does not affect the fireproof door operation.
- When installing a holeless washer, tighten the screws to prevent the washer from falling off.

Figure 5-6 Adjusting the rain and snow cover



DC00S00628

(A) Round-hole washer

Step 5 Secure the rain and snow cover.

Step 6 Apply white sealant on the joint between the rain and snow cover top and the pre-fab. module.

---End

55

Step 2 Place the step ladder in the middle outside the outward opening door of the pre-fab. module, and mark mounting holes on the concrete pad for the step ladder.

Step 3 Drill mounting holes using a hammer drill.

 NOTE

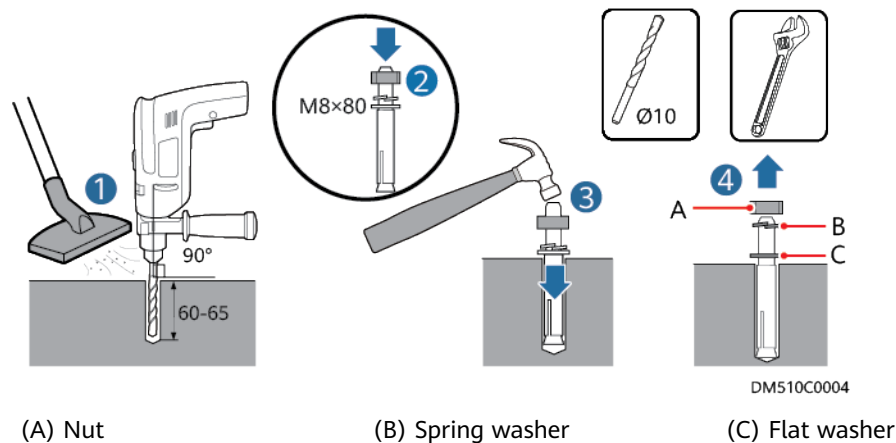
- When you drill a hole using a hammer drill, keep the drill bit perpendicular to the ground and hold the drill stock firmly with both hands to prevent irregular drilling and damage to the ground.
- If the ground is too hard and smooth for the drill bit to secure its position, use a chisel to punch a pit before drilling.

Step 4 Rotate nuts onto expansion sleeves to prevent the expansion sleeves from fluttering.

Step 5 Knock the expansion bolts vertically into mounting holes until the flat washers are flush with the floor.

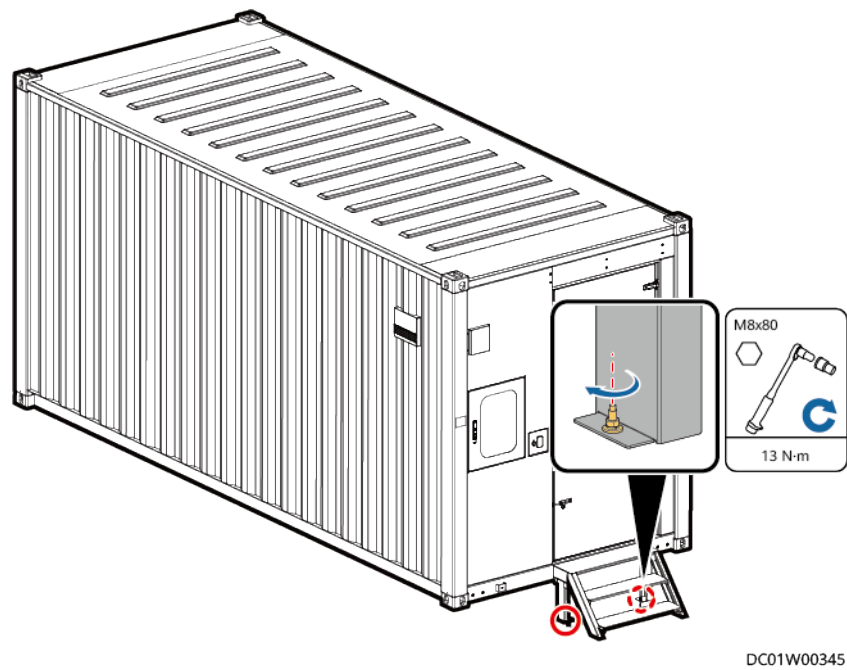
Step 6 Remove the nuts, spring washers, and flat washers.

Figure 5-9 Installing an expansion bolt (unit: mm)



Step 7 Install the step ladder on the concrete pad with the expansion bolts securing them. Remount the flat washers, spring washers, and nuts on the expansion bolts and tighten the expansion bolts.

Figure 5-10 Installing Step Ladders



----End

6 Installing Devices Inside the Pre-fab. Module

6.1 Installing Cooling Devices

6.1.1 Installing a 13.5 kW Integrated Air Conditioner

Prerequisites

Four installation positions are reserved at the pre-fab. module. Select four installation positions based on the site requirements.

Preparations

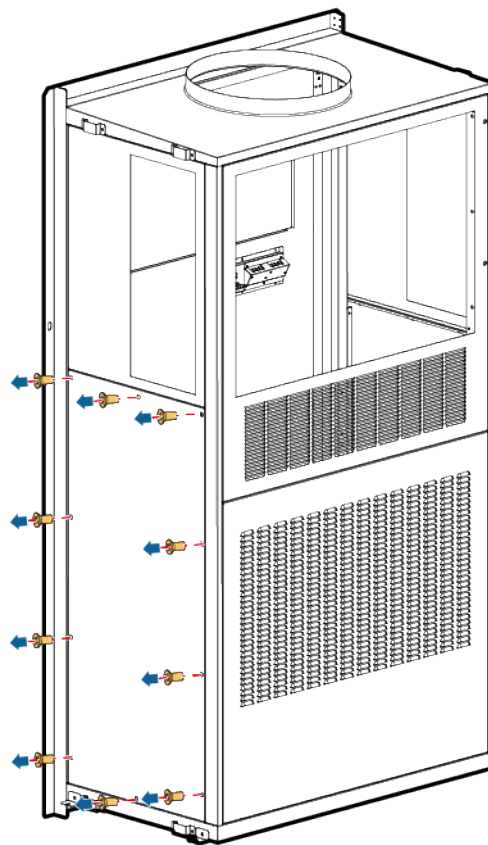
Tools: socket wrench, elbow-line electric screwdriver, antitheft screw wrench

Skill requirement: common technician

Procedure

- Step 1** Use a socket wrench and utility knife to remove the tapping screws and plastic protective film from the feet of the unit.
- Step 2** Open the front panel of the unit, loosen the two M8 nuts from the compressor base using a socket wrench, remove the two compressor fasteners, and tighten the two M8 bolts again, as shown in the following figure.

Figure 6-1 Open the front panel of the unit



DC01W00344

Figure 6-2 Removing compressor fasteners



DA05W00132

Step 3 Remove the covers of the connection box, air intake vent, and air exhaust vent from the pre-fab. module.

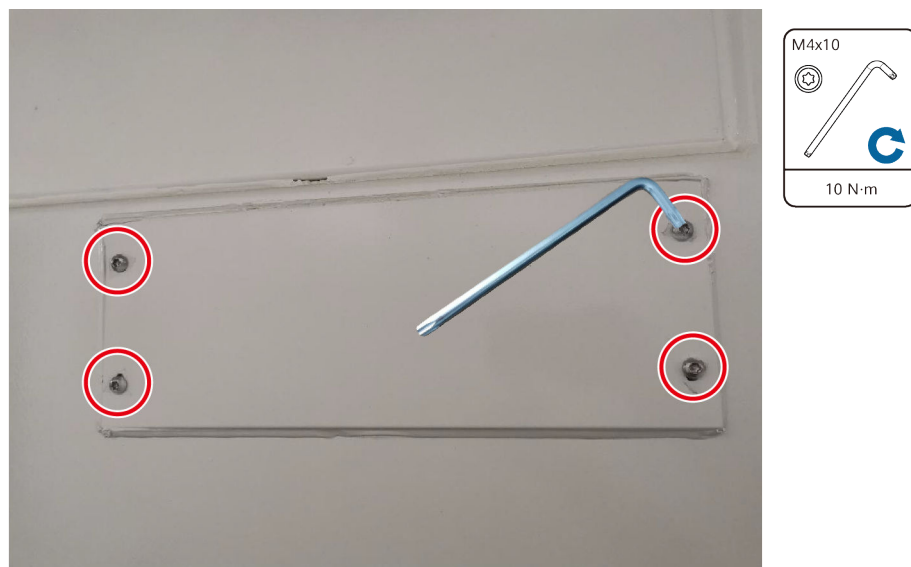
Figure 6-3 Cover positions



(1) Air exhaust vent cover (2) Connection box cover (3) Air intake vent cover

1. Use an antitheft screw wrench to remove the screws reserved on the cover of the connection box from the outside of the pre-fab. module.

Figure 6-4 Removing screws from the connection box cover



2. Cut the glue between the cover and the pre-fab. module using a utility knife.

Figure 6-5 Cutting off the glue from the connection box



3. Remove the connection box cover.

Figure 6-6 Removing the connection box cover



4. Remove the screws at the air intake and exhaust vents inside the pre-fab. module using a Phillips screwdriver, and cut off the glue attached to the cover using a utility knife.

Figure 6-7 Cutting off the glue



5. Remove the covers from the air intake and exhaust vents.

Figure 6-8 Removing the covers



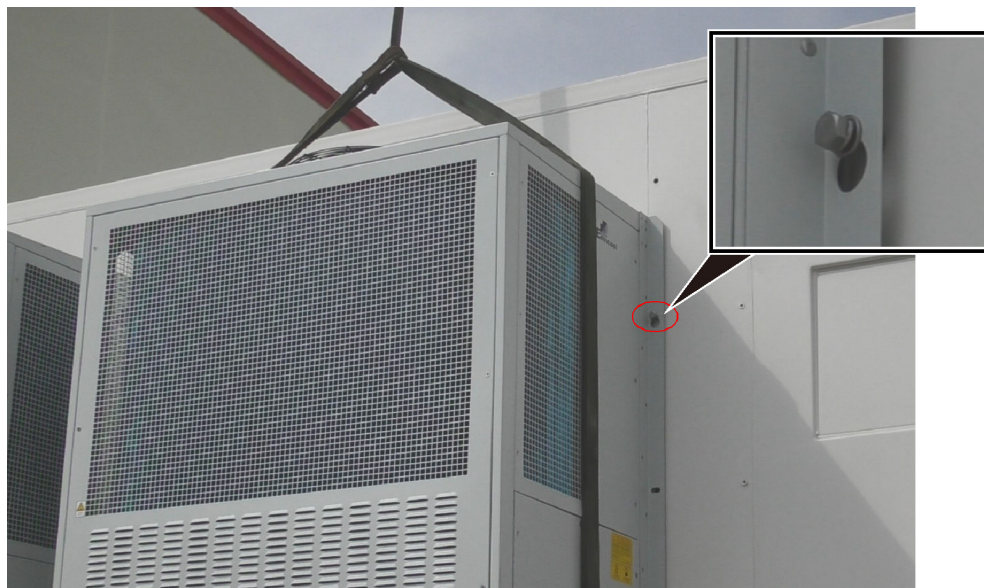
Step 4 Install two bolts on the outdoor side wall to hang the device.

Figure 6-9 Pre-installing two bolts



Step 5 Hoist the 13.5 kW integrated air conditioner to the installation position using a crane and mount it on the two bolts that have been installed.

Figure 6-10 Mounting



Step 6 Align the air intake and exhaust vents on the indoor side of the 13.5 kW integrated air conditioner with the air intake and exhaust vent holes on the pre-fab. module, and install all bolts.

NOTE

Secure the two bolts on the outdoor fan using an elbow-line electric screwdriver.

Step 7 After the screws are tightened, apply waterproof sealant on the flange edges of the air conditioner and around the screws, and ensure that the sealant is applied continuously and neatly.

----End

6.1.2 Connecting Cables to the 13.5 kW Integrated Air Conditioner

Context

Figure 6-11 Signal terminals

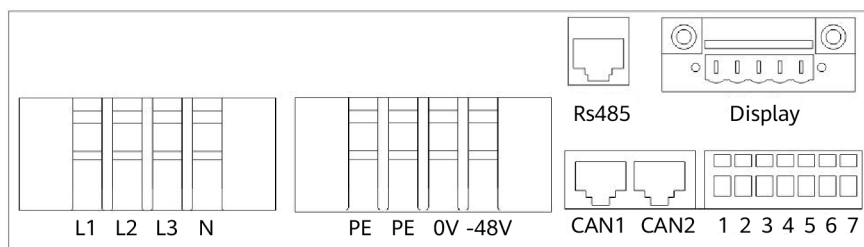


Table 6-1 Symbol description

Symbol	Meaning
L1	Phase wire
L2	Phase wire
L3	Phase wire
N	Neutral wire
PE (left)	Cable grounding
PE (right)	Enclosure grounding
0V	Positive
-48VDC	Negative
RS485	Host communication port
Display	Display port
CAN1	Teamwork communication (+)
CAN2	Teamwork communication (-)
1	Port for remote startup and shutdown
2	
3	N/A
4	N/A
5	Alarm dry contact, normally closed (NC)
6	Alarm dry contact, common (COM)
7	Alarm dry contact, normally open (NO)



CAUTION

Ports 1 and 2 receive only passive (non-energized) switch signals. If active (energized) signals are received, components inside the unit will be burnt.

Use shielded cables for signals such as remote startup and shutdown and ensure reliable grounding.

Procedure

Step 1 Connect the equipotential ground cable to the PE (right) terminal.

Step 2 Connect the reserved AC power cables in the pre-fab. module to the L1, L2, L3, N, and PE (left) terminals of the product.

NOTICE

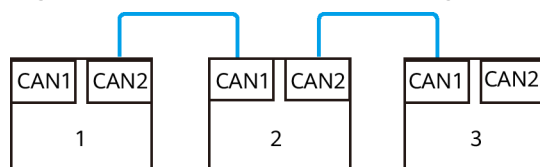
1. Only trained and qualified personnel are allowed to connect cables.
2. Do not perform operations with power on when connecting the power cables.
3. The power supply voltage should be the same as the rated voltage on the equipment nameplate.

Step 3 Connect the reserved DC power cables in the pre-fab. module to the 0 and -48V terminals of the product.

Step 4 Connect the communications cable to the RS485 port.

Step 5 Connect the teamwork cables to the CAN1 and CAN2 ports in hand-in-hand mode.

Figure 6-12 Teamwork networking



----End

6.1.3 (Optional) Installing a Dehumidifier

Preparations

Perform this procedure if a dehumidifier is configured.

Tools: Phillips screwdriver, utility knife

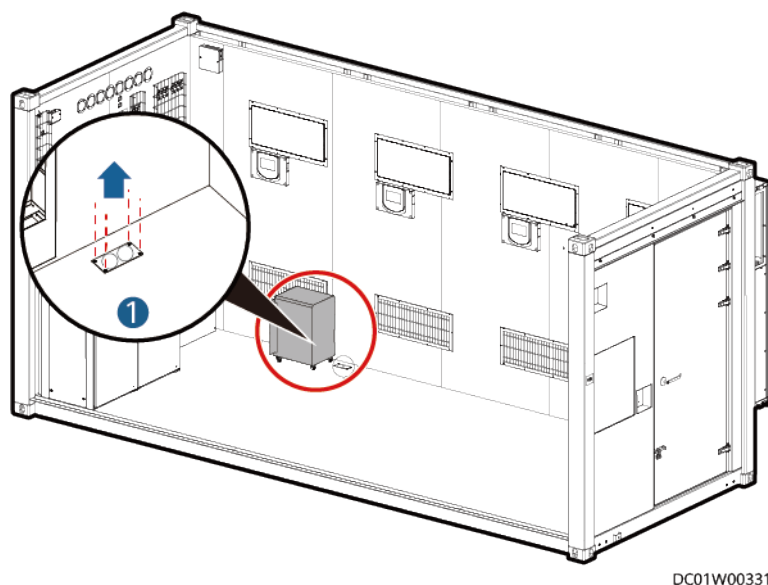
Material: cover (with holes)

Skill requirement: common technician

Procedure

Step 1 Remove the pipe hole cover (holeless).

Figure 6-13 Installing a dehumidifier



Step 2 Route the drainpipe through the cover (with holes) and then through the drainage hole of the pre-fab. module.

Step 3 Seal the outer side of the drainage hole at the bottom of the pre-fab. module using sealing putty, and reinstall the drainage hole cover (with holes).

----End

6.1.4 (Optional) Installing the Electric Heating Belt

Preparations

Tools: None

Materials: electric heating belt, tinfoil, thermal insulation foam

Skill requirement: common technician

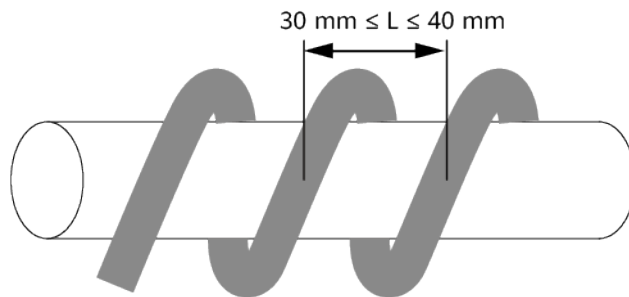
Procedure

Step 1 Wrap the electric heating belt around the drainpipe and water refill pipe outside the pre-fab. module.

NOTE

- The drainpipe is pre-integrated with the electric heating belt in the outdoor unit compartment. The outdoor part is reserved in the outdoor unit compartment and needs to be routed onsite.
- The water refill pipe needs to be routed onsite.

Figure 6-14 Wrap the electric heating belt around the drainpipe and water refill pipe



DF19W00003

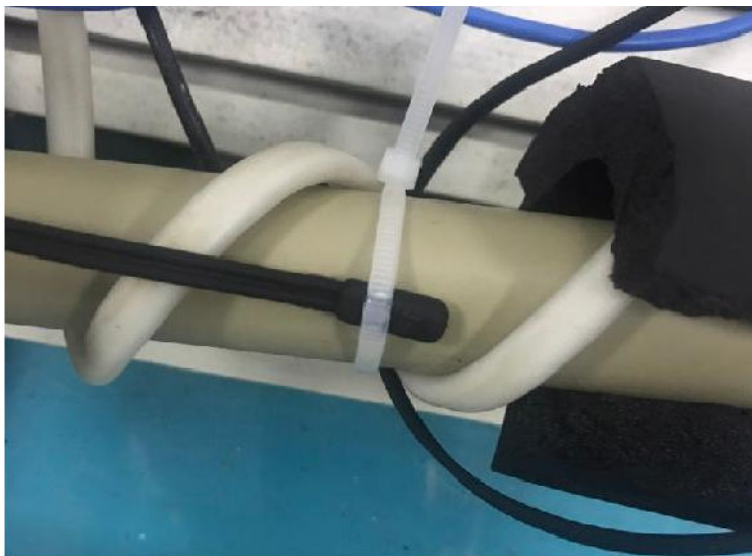
Step 2 Wrap the electric heating belt and pipes with tinfoil.

Step 3 Secure the temperature probe to the pipe using a cable tie.

 NOTE

Secure the temperature probe to the position on the water refill and drainage pipe. The position is the point where the electric heating belt is wrapped 50 cm long around the water refill and drainage pipe from the water refill and drainage pipe port.

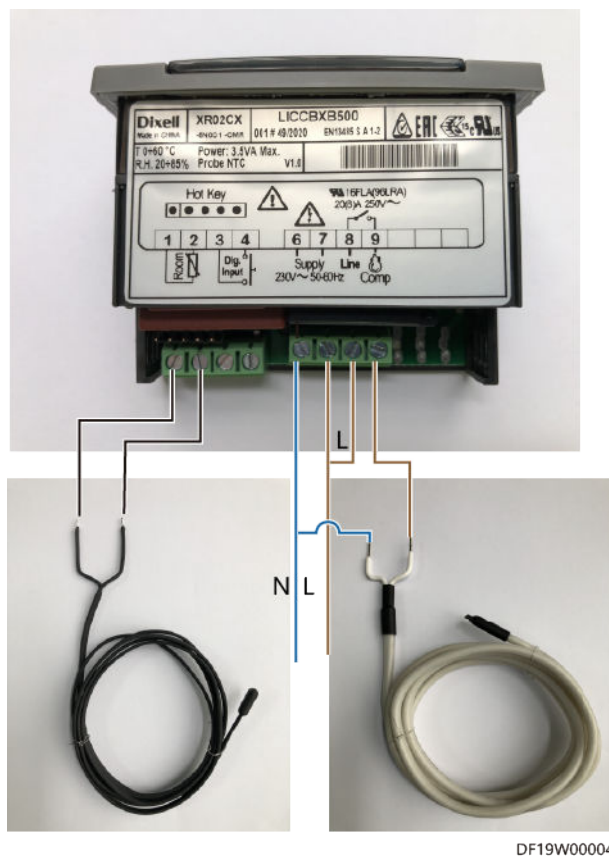
Figure 6-15 Secure the temperature probe



DP24H00018

Step 4 Connect the electric heating belt and temperature probe to the controller.

Figure 6-16 Wiring diagram



Step 5 Install thermal insulation foam on pipes.

NOTE

Wrap the electric heating belt before wrapping the thermal insulation foam, and the thermal insulation foam covers the electric heating belt. Verify that the thermal insulation foam can withstand a temperature greater than or equal to 200°C.

----End

6.2 Installing Power Supply and Distribution Devices

6.2.1 Installing a Rectifier (MTS9606B)

Prerequisites

The rectifier delivered onsite is complete and intact after unpacking and acceptance. If any problem is found, contact your local Huawei office.

Preparations

Tools: none

Materials: nine 4 kW rectifiers

Skill requirement: skilled technician

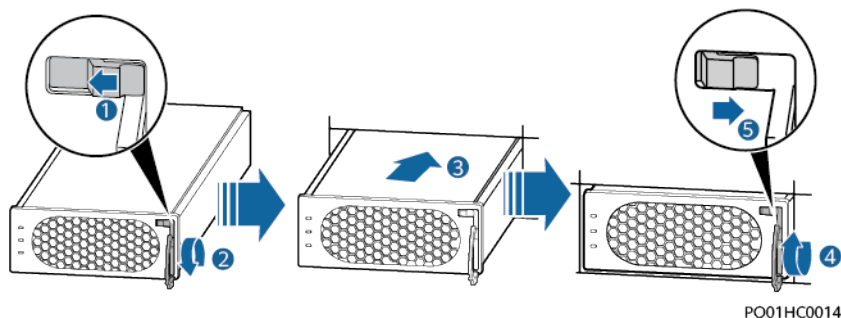
DANGER

- To avoid electric shock, do not put your hands into a rectifier slot.
- When a rectifier is running, a high temperature is generated around the air exhaust vent at the rear. Do not touch the vent or cover the vent with cables or other objects.

Procedure

- Step 1** Determine the rectifier installation position.
- Step 2** (Optional) Remove filler panels from the rectifier installation position based on the installation requirements.
- Step 3** Push the locking latch leftward and pull out the handle.
- Step 4** Gently push the rectifier into its slot along the guide rails.
- Step 5** Push the handle upward.
- Step 6** Push the locking latch rightward to lock the handle.

Figure 6-17 Installing a rectifier



----End

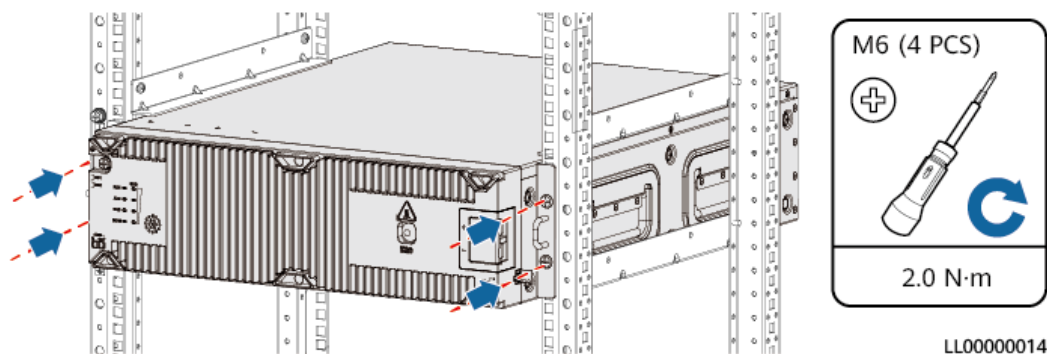
6.2.2 Installing CloudLi Energy Storage Modules and Cables (ESM-48150B1)

6.2.2.1 Installation an ESM

Procedure

- Step 1** Install an ESM according to the quick installation guide and check whether floating nuts are installed on both sides of the rack. If not installed, install the floating nuts delivered with the cabinet on both sides of the rack.
- Step 2** Push the ESM into the cabinet and fasten the ESM.

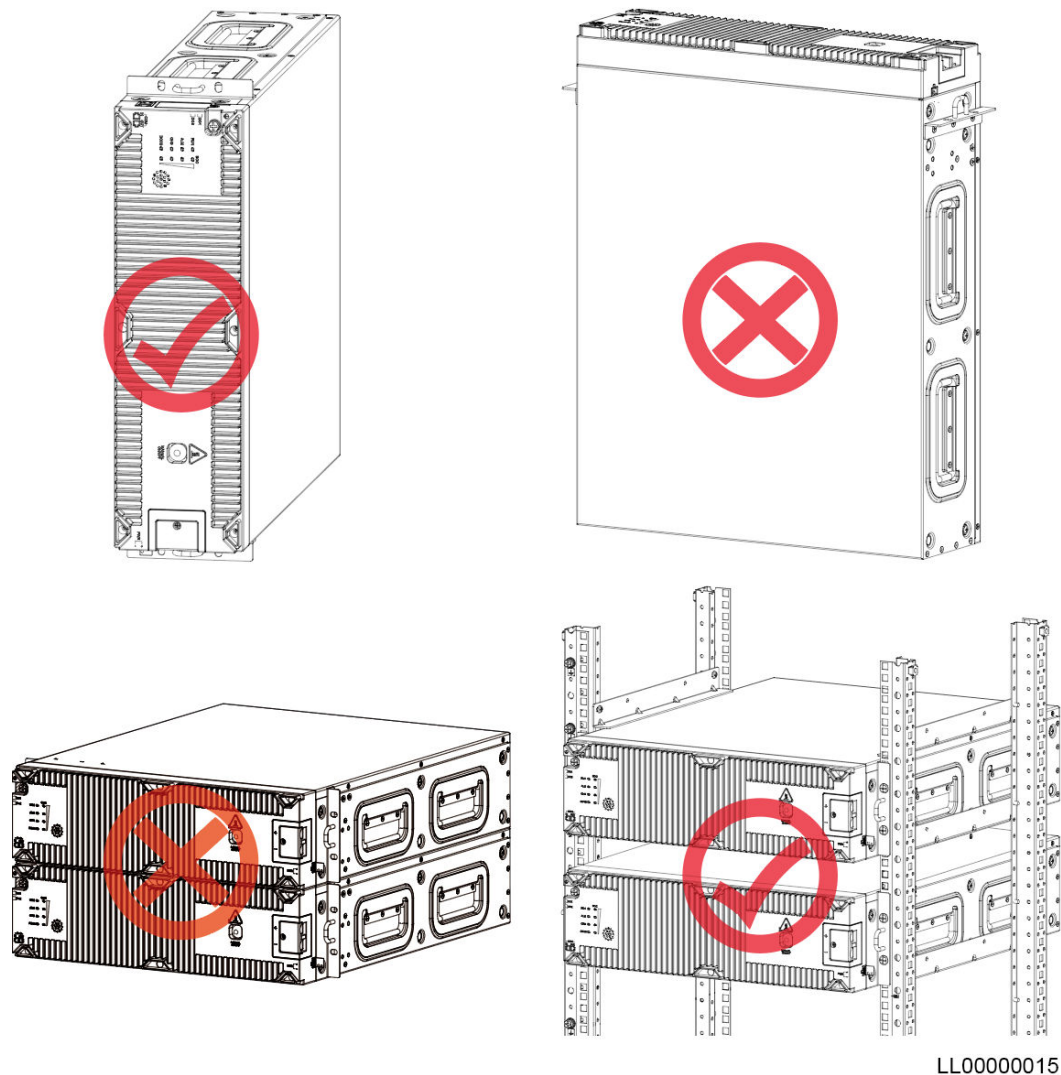
Figure 6-18 Installing an ESM



NOTICE

- The weight of an ESM-48150B1 is about 64 kg. Check the load-bearing capability of the rack tray before installation.
- ESM-48150B1 is 560 mm deep. Check the rack depth before installation.
- The ESM can be installed in a 19-inch rack with guide rails and a tray. Check whether the load-bearing capability meets requirements.
- If multiple ESMs are installed, clearances should be reserved. The average space for each ESM should be at least 3 U. It is not supported to stack ESMs or make an ESM land on its back panel.
- Install ESMs from bottom to top. You are advised to install ESMs on three layers.

Figure 6-19 Correct installation diagram



-----End

6.2.2.2 Installing ESM Cables

Prerequisites

The ESMs have been correctly installed.

The protective gloves, socket wrench, and cabinet door key are available.

Procedure

Step 1 Wear protective gloves.

Step 2 Install the ESM ground cable.

Figure 6-20 Installing the ESM ground cable



(1) Ground bar

Step 3 Install the ESM communications cables.

NOTE

After the ESM communications cables are installed, connect a build-out resistor to the COM_OUT port of the last ESM.

Figure 6-21 Installing ESM communications cables (method 1)

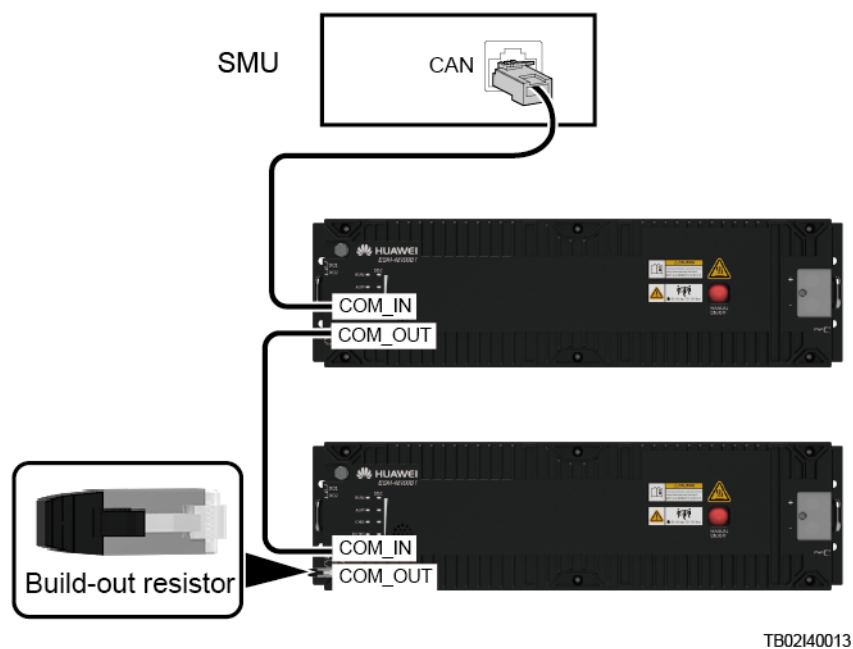
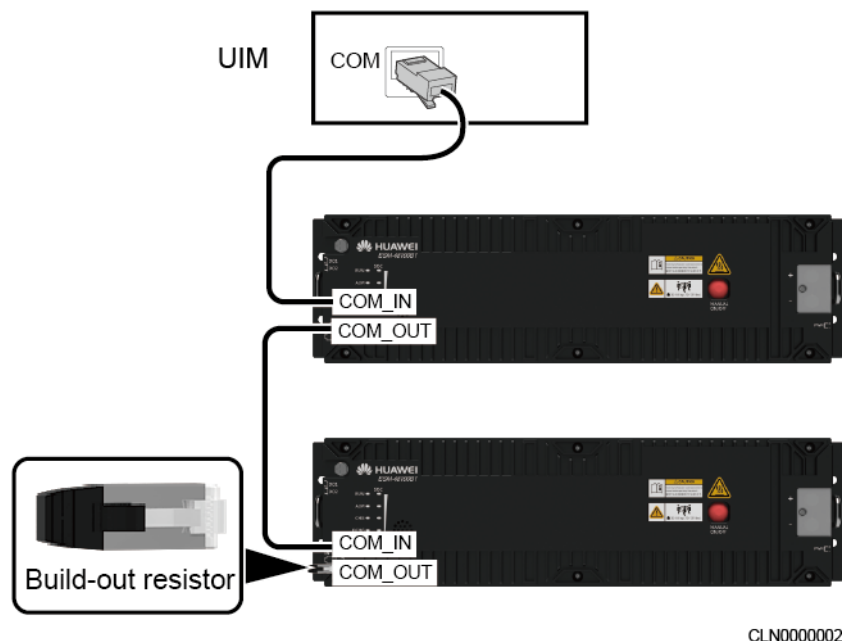
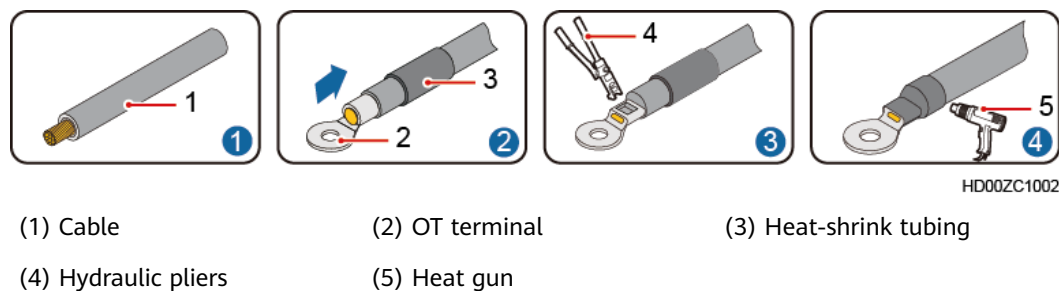


Figure 6-22 Installing ESM communications cables (method 2)



Step 4 Prepare power cable OT terminals for the ESMs.

Figure 6-23 Preparing an OT terminal



Step 5 Install negative and positive power cables for the ESMs.

CAUTION

- When installing an ESM power cable, ensure that the protruding part of the OT terminal on the cable faces outwards.
- Do not connect two or more cables to the positive or negative power port of the ESMs in parallel.

Figure 6-24 Installing ESM power cables

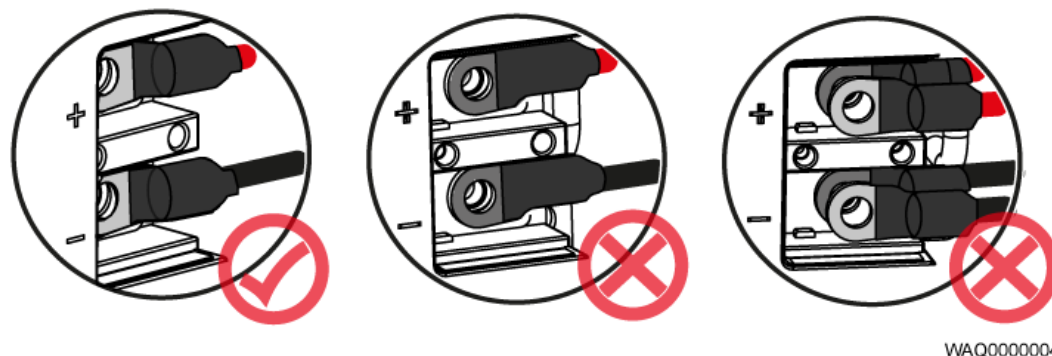
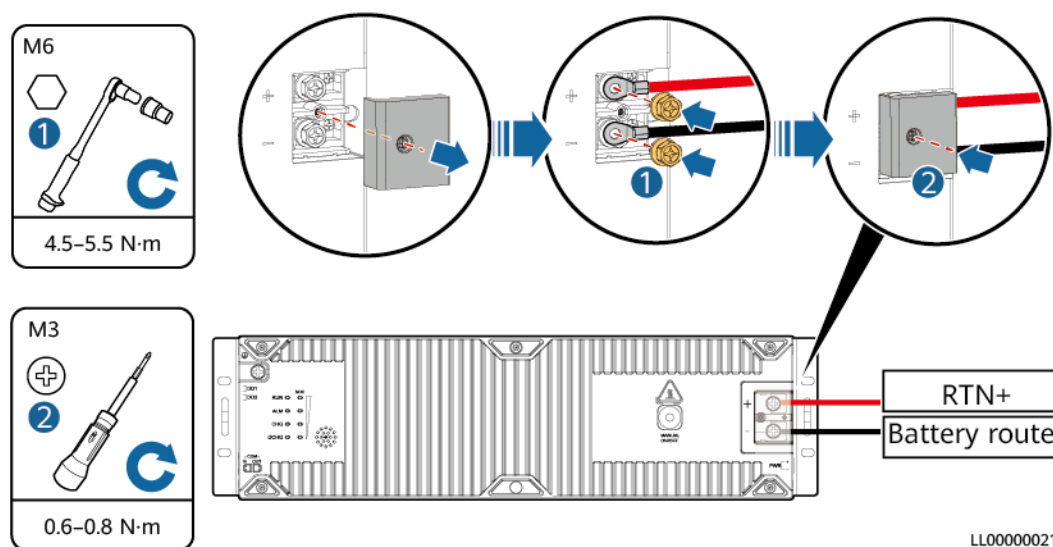


Figure 6-25 Installing negative and positive power cables for the ESMs



Step 6 Remove the protective gloves and pack up all tools.

----End

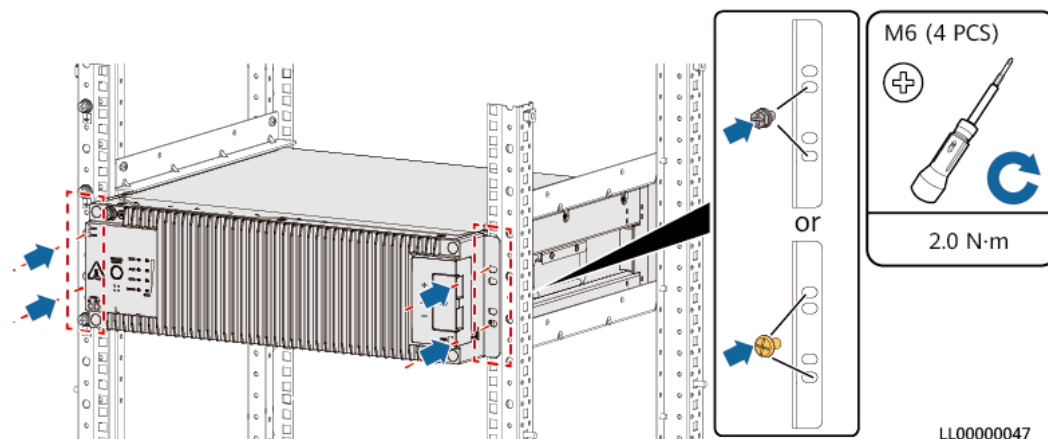
6.2.3 Installing CloudLi Energy Storage Modules and Cables (ESM-48100B1)

6.2.3.1 Installing an ESM

Procedure

- Step 1** Install and check according to the installation guide. If there are no floating nuts on both sides of the rack, install the floating nuts delivered with the cabinet.
- Step 2** Push an ESM into the cabinet and fasten the ESM.

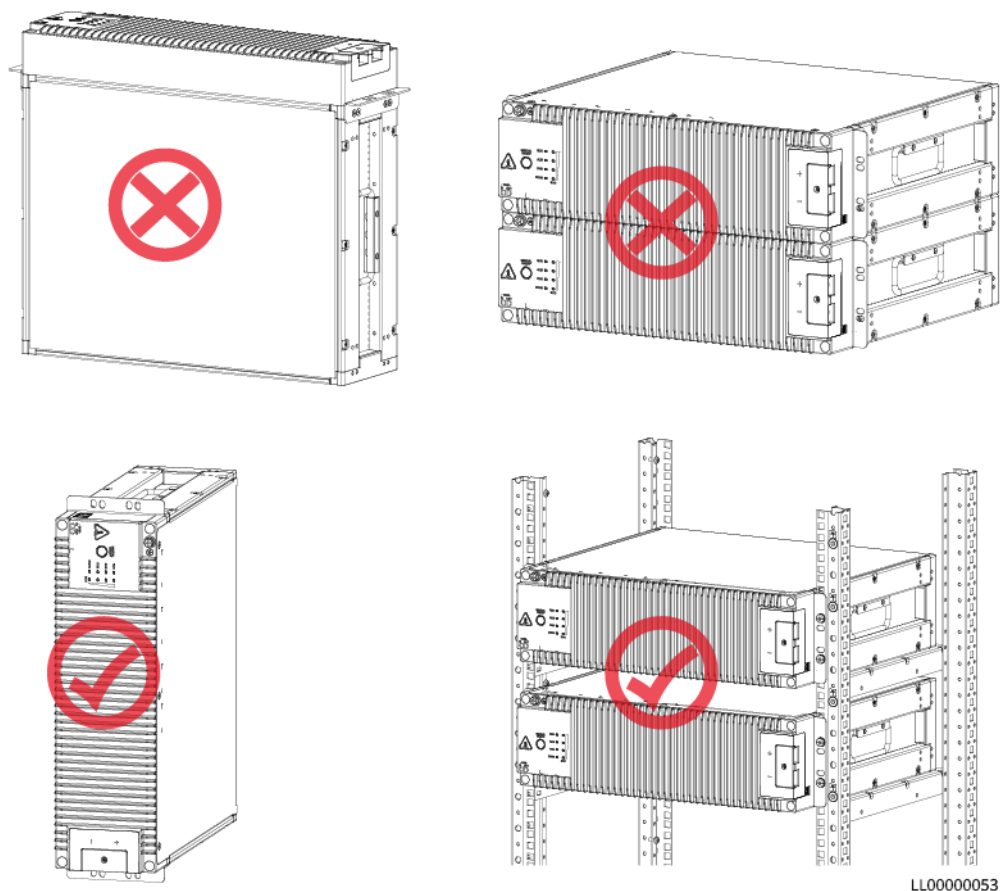
Figure 6-26 Installing an ESM



NOTICE

- An ESM-48100B1 weighs about 46 kg. Check the load-bearing capacity of the rack tray before installation.
- The depth of an ESM-48100B1 is 396 mm. Check the rack depth before installation.
- The ESM can be installed in a 19-inch rack with guide rails and a tray. Check whether the load-bearing capability meets requirements.
- If multiple ESMs are installed, certain clearances should be reserved. The space for each ESM should be at least 3 U. The ESMs cannot be directly stacked or vertically placed.
- Install ESMs from bottom to top. It is advised to install ESMs on three layers.

Figure 6-27 Correct installation



----End

6.2.3.2 Cable Connections (Huawei Power System)

Prerequisites

The ESMs have been correctly installed.

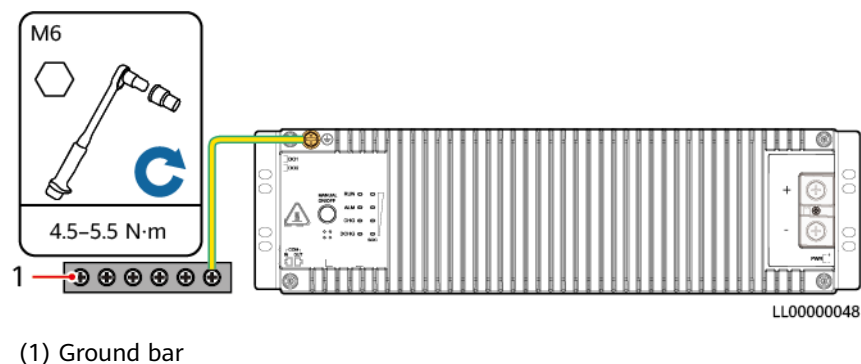
The protective gloves, socket wrench, and cabinet door key are available.

Procedure

Step 1 Wear protective gloves.

Step 2 Install the ESM ground cable.

Figure 6-28 Installing the ESM ground cable



Step 3 Install the ESM communications cables.

NOTE

After the ESM communications cables are installed, connect a build-out resistor to the COM_OUT port of the last ESM.

Figure 6-29 Installing ESM communications cables (method 1)

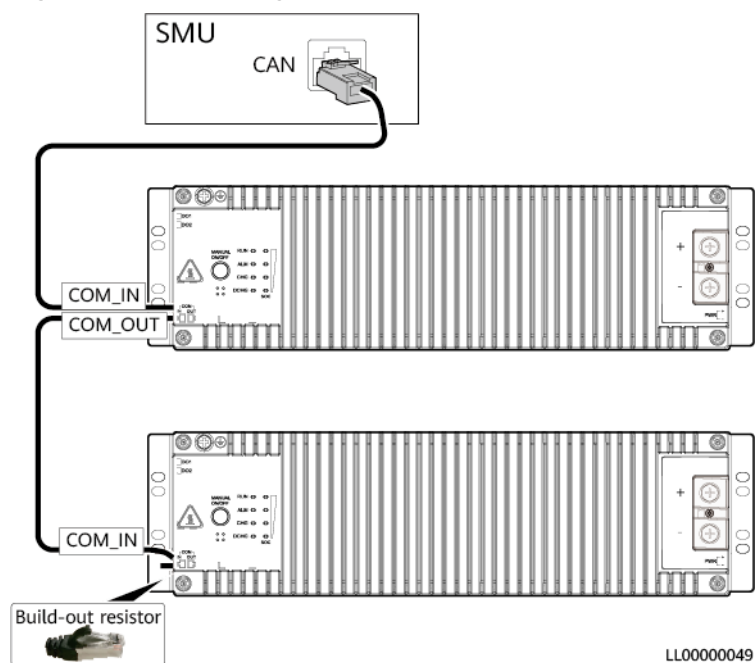
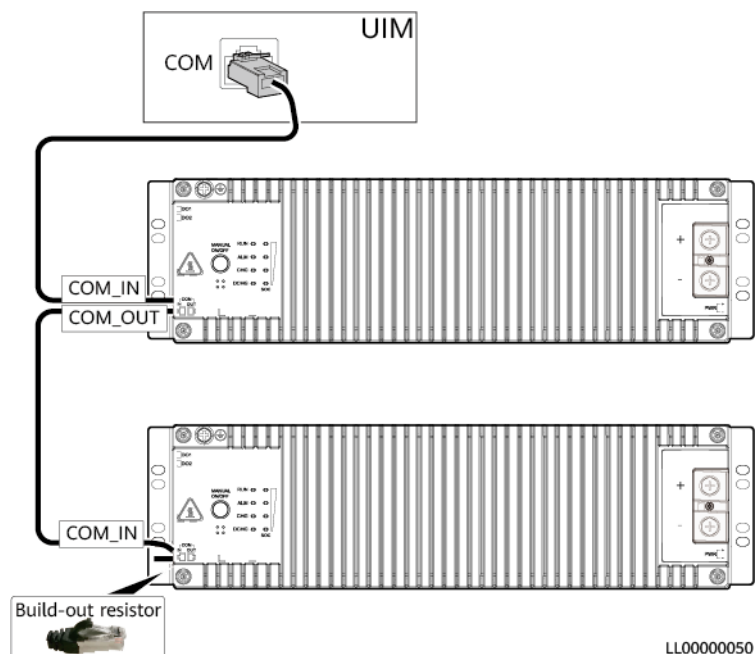
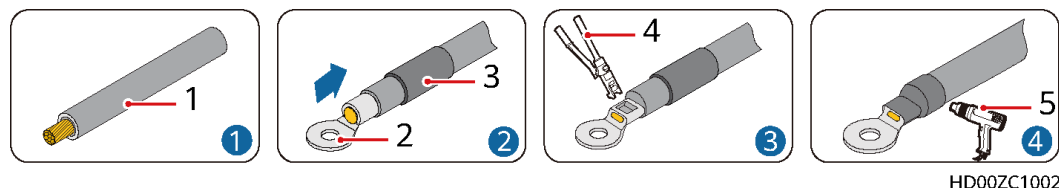


Figure 6-30 Installing ESM communications cables (method 2)



Step 4 Prepare power cable OT terminals for the ESMs.

Figure 6-31 Preparing an OT terminal



(1) Cable

(2) OT terminal

(3) Heat-shrink tubing

(4) Hydraulic pliers

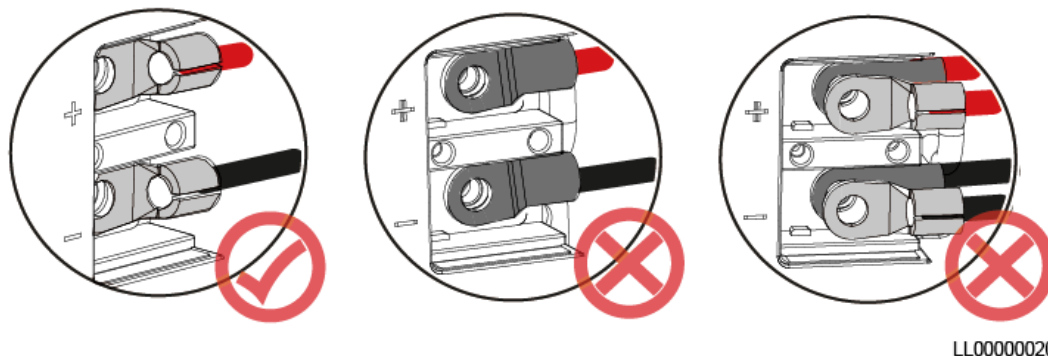
(5) Heat gun

Step 5 Install negative and positive power cables for the ESMs.

CAUTION

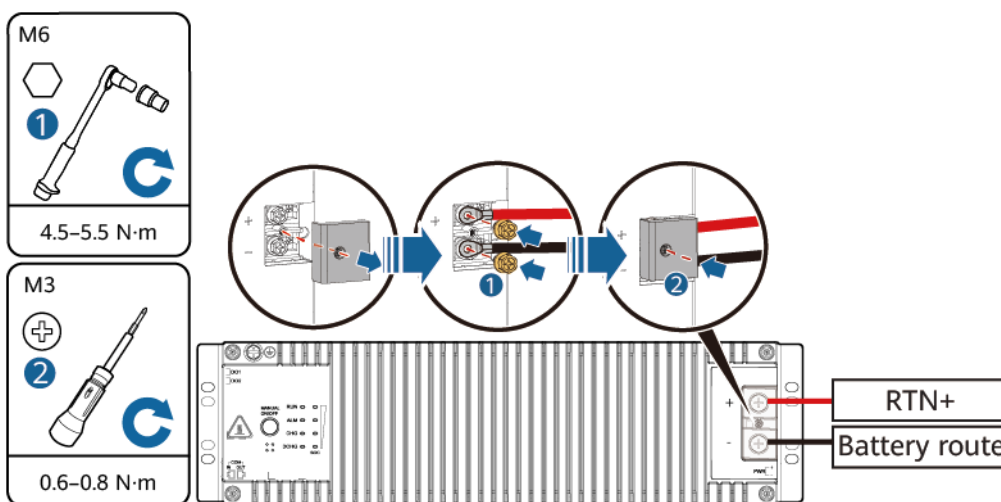
- When installing an ESM power cable, ensure that the protruding part of the OT terminal on the cable faces outwards.
- Do not connect two or more cables to the positive or negative power port of the ESMs in parallel.

Figure 6-32 Installing ESM power cables



LL00000020

Figure 6-33 Installing negative and positive power cables for the ESM



LL00000052

Step 6 Remove the protective gloves and pack up all tools.

----End

6.2.4 (Optional) Installing an Inverter Module

NOTICE

The peak capacity of a motor may reach several times of the rated capacity when it is started. Therefore, configure the number of inverter modules based on the peak capacity of the downstream load.

Prerequisites

The inverter module delivered onsite is complete and intact after unpacking and acceptance.

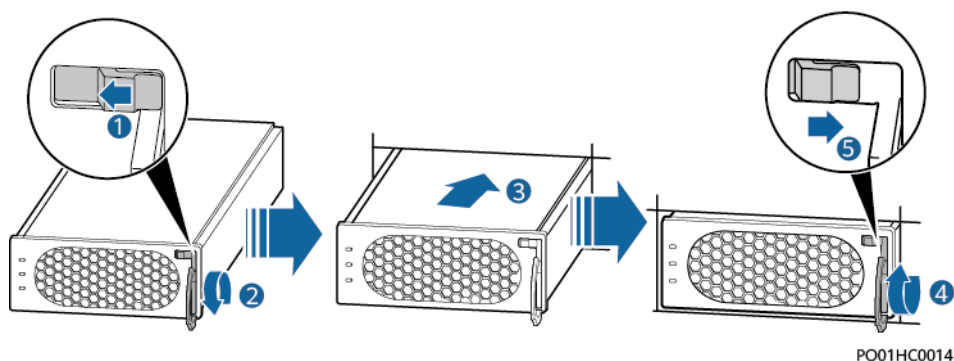
NOTICE

- If an inverter module is damaged, contact your local Huawei office.
- Do not put your hands into an inverter module slot to avoid electric shock.
- When an inverter module is running, a high temperature is generated around the air exhaust vent at the rear. Do not touch the vent or cover the vent with cables or other objects.
- In an outdoor scenario, you are advised to power on the inverter module within 24 hours after unpacking. If the inverter module cannot be powered on in time, place it in a dry indoor environment without corrosive gas.
- In an indoor scenario, you are advised to power on the inverter module within seven days after unpacking. If the inverter module cannot be powered on in time, place it in a dry indoor environment without corrosive gas.

Procedure

- Step 1** Push the locking latch leftward.
- Step 2** Pull out the handle.
- Step 3** Gently push the inverter module into its slot along the guide rails.
- Step 4** Push the handle upward.
- Step 5** Push the locking latch rightward to lock the handle.

Figure 6-34 Installing an inverter module



----End

6.3 Installing Monitoring Devices

This document does not describe how to install upper-layer monitoring devices. For details about how to install them, see *iMaster NetEco V600R021C10 Installation and Commissioning Guide (Data Center)*.

6.3.1 (Optional) Installing a TaiShan 200 Server

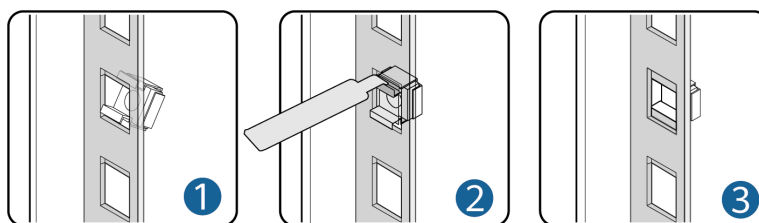
Context

This section uses a TaiShan 200 server as an example. For more information, see the documents delivered with the server.

Procedure

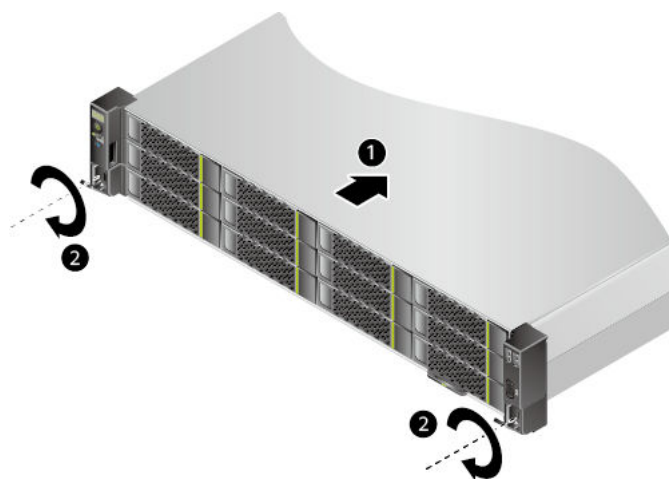
- Step 1** Determine the installation position of the server and check whether floating nuts are installed. If not, install them first.

Figure 6-35 Installing a floating nut



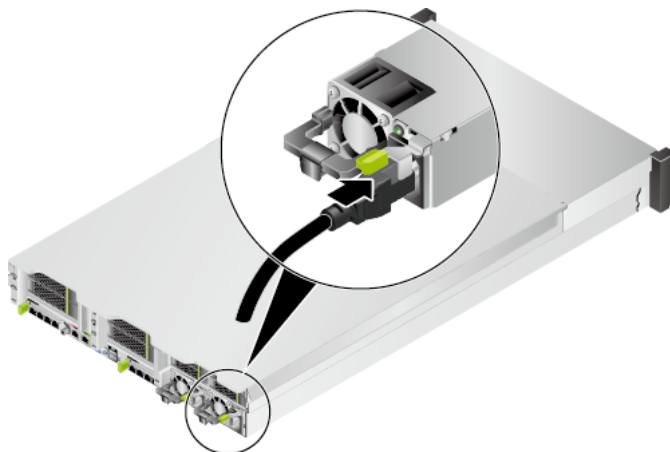
- Step 2** Lift the server. This task requires at least two people.
- Step 3** Place the server on the guide rails and push it in to the cabinet.
- Step 4** When the two mounting ears on the server contact the mounting bars on the rack, tighten the captive screws on the mounting ears clockwise to secure the server.

Figure 6-36 Installing a TaiShan 200 server



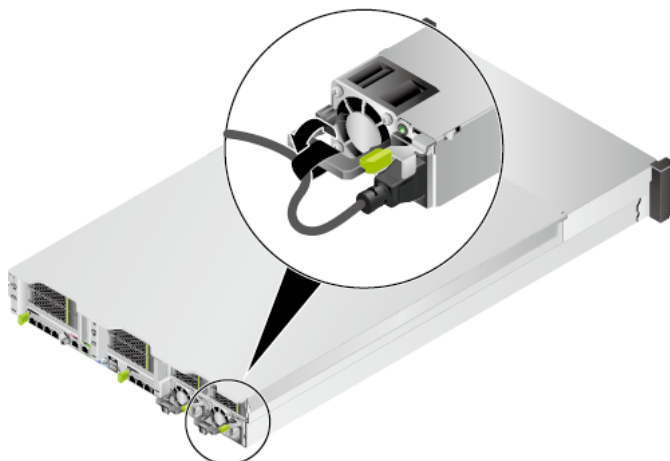
- Step 5** Connect the power cable to the TaiShan 200 server.
1. Wear an ESD wrist strap or ESD gloves.
 2. Connect one end of the power cable to the cable port on the AC power module of the server.

Figure 6-37 Connecting the power cable



3. Use a hook-and-loop fastener to secure the power cable.

Figure 6-38 Securing the power cable



4. Route the power cable along the cable tray neatly, use cable ties to bind the power cable, and use diagonal pliers to trim off the excess of the cable ties.

----End

6.3.2 (Optional) Installing a 2288X V5 Server

Context

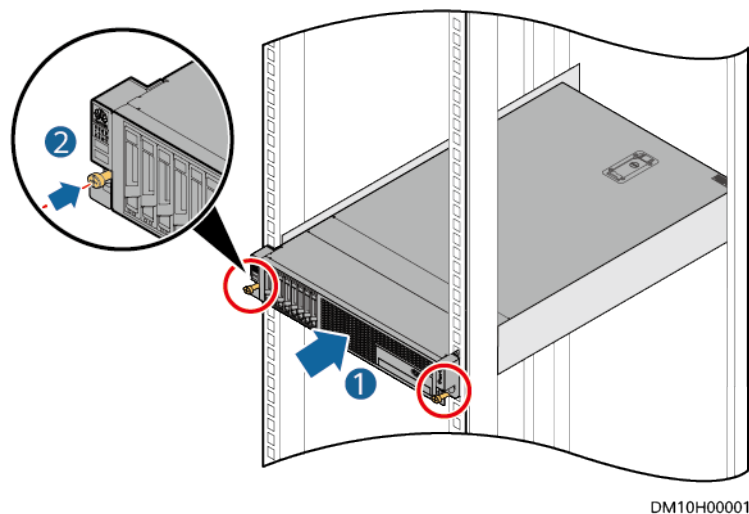
Tool: Phillips screwdriver

Material: 2288X V5 server

Procedure

- Step 1** Place the server on the guide rails and slide it along the guide rails into the cabinet.
- Step 2** Align the two mounting ears of the server with the mounting bars of the cabinet and tighten the screws on the mounting ears.

Figure 6-39 Installing a server

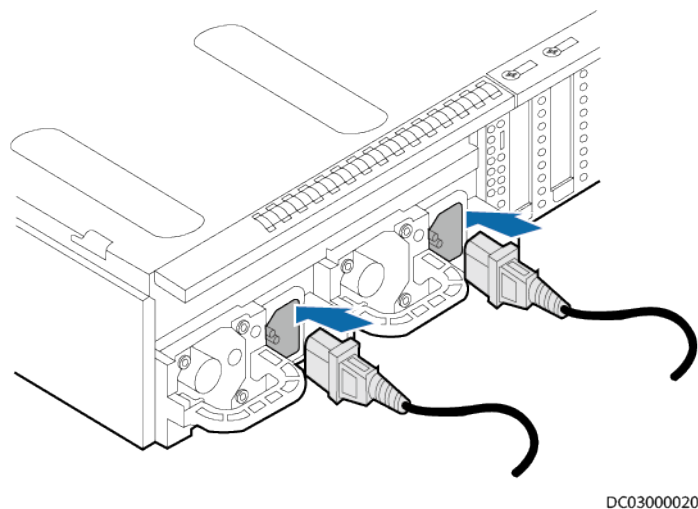


Step 3 Connect the server power cables to the PDU2000.

NOTE

The server uses dual power supplies. Connect the two power cables to different PDU2000s.

Figure 6-40 Connecting server power cables



----End

6.3.3 (Optional) Installing ECC800-Pro Accessories

Preparations

Tool: Phillips screwdriver

Materials: microSD card, SIM card, 4G antenna, RF_Z antenna

NOTICE

The SIM card needs to support Global System for Mobile Communications (GSM) and Wideband Code Division Multiple Access (WCDMA).

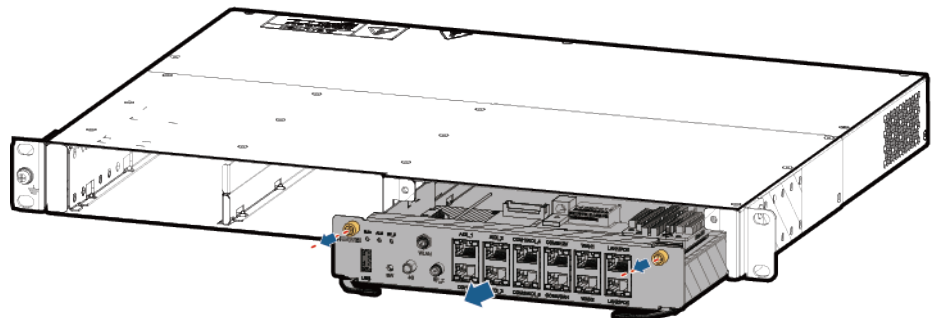
Skill requirement: common technician

Procedure

Step 1 (Optional) Remove the ECC800-Pro main control module, and install the SIM card and SD card in the corresponding slots based on the configuration.

1. Loosen the screws on both sides of the ECC800-Pro main control module panel.
2. Pull the handles on both sides of the ECC800-Pro main control module panel and remove the ECC800-Pro main control module.

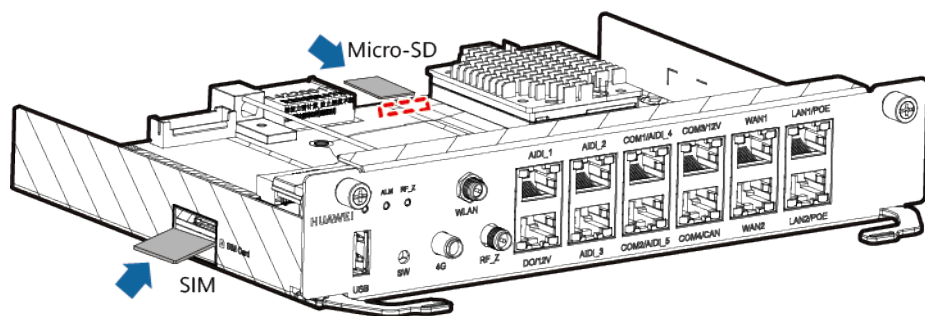
Figure 6-41 Removing the ECC800-Pro main control module



DM02H00026

3. Install the microSD card and SIM card in the corresponding slots in the ECC800-Pro main control module.

Figure 6-42 Installing the microSD card and SIM card



DM02H00023

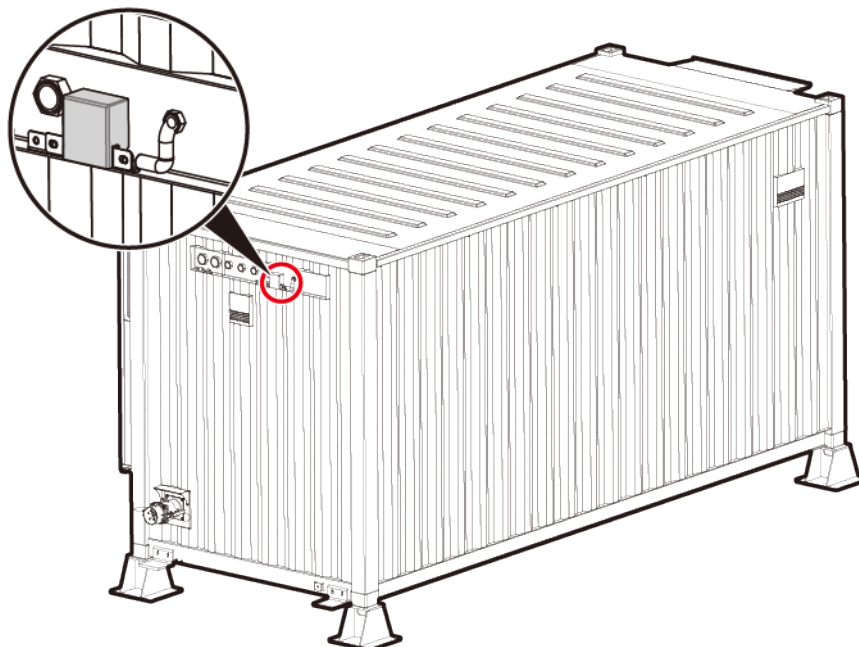
4. Reinstall the ECC800-Pro main control module in the ECC800-Pro subrack.

Step 2 Remove the 4G antenna transport protection box and attach the 4G antenna to the top of the feeder window of the pre-fab. module.

1. Use an adjustable wrench to remove the screws on both sides of the 4G antenna transport protection box.
2. Use a utility knife to remove the binding straps from the 4G antenna.

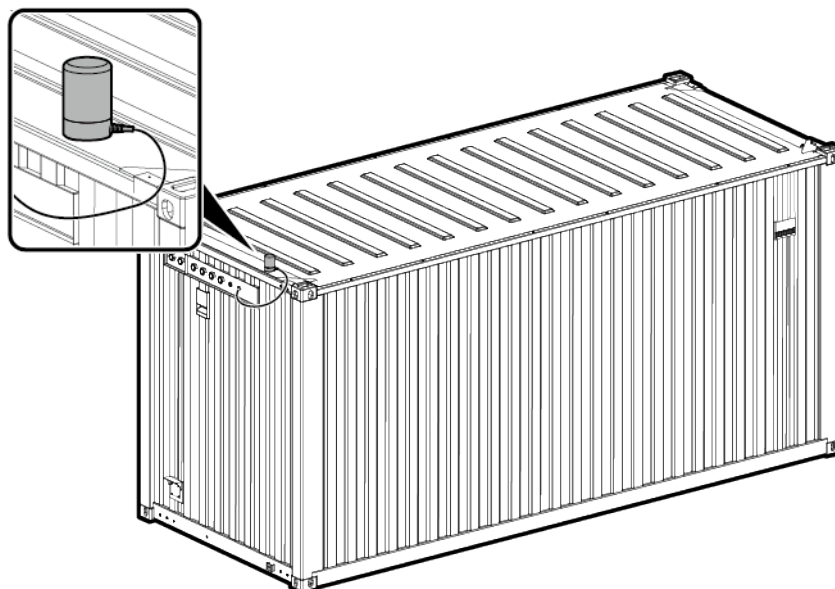
3. Pull out the network cable from the metal corrugated pipe, and seal the opening of the pipe with white sealant.
4. The cable outside the pre-fab. module can be bent only in the U-shape. Attach the 4G antenna on the top of the pre-fab. module.

Figure 6-43 Removing the 4G antenna transport protection box



DC01W00332

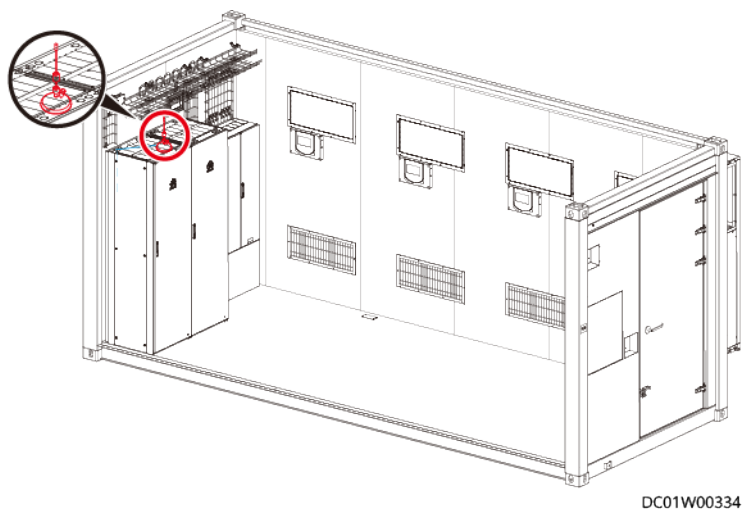
Figure 6-44 Installing the 4G antenna



DC11H00153

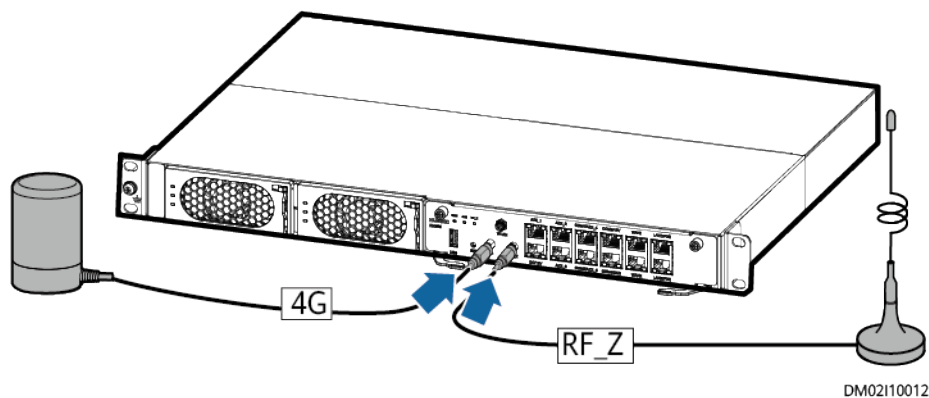
Step 3 Attach the RF_Z antenna on the top of the power cabinet.

Figure 6-45 Installing the RF_Z antenna



Step 4 Connect the 4G antenna cable and RF_Z antenna cable to the ECC800-Pro.

Figure 6-46 Installing the antenna



----End

6.3.4 (Optional) Installing a PAD

Context

Tool: Phillips screwdriver

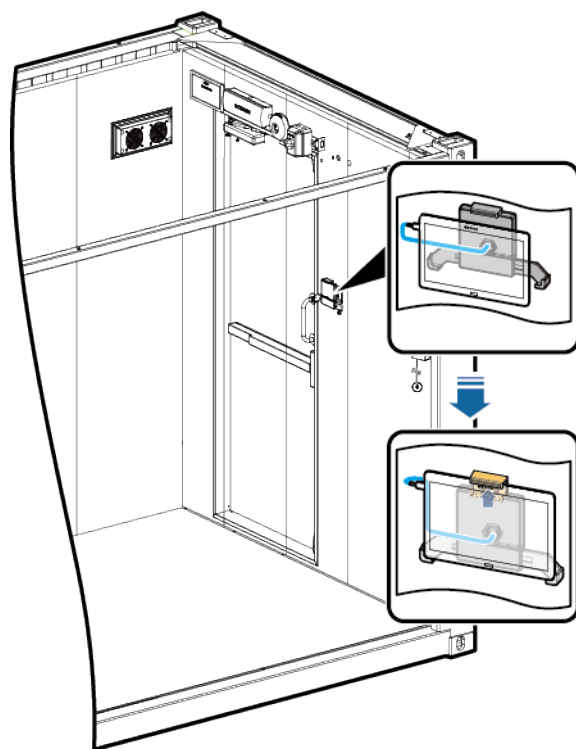
Materials: PAD and PAD charging cable

Skill requirement: common technician

Procedure

- Step 1** Adjust the feet at the bottom of the PAD mounting support until they are in the same width as the PAD. Route the PAD power cable through the cable hole in the pad mounting support and then connect the cable to the PAD.
- Step 2** Adjust the feet on the top of the PAD mounting support and clamp the PAD to the PAD mounting support.

Figure 6-47 Installing a PAD



DC11H00156

----End

6.4 (Optional) Installing CE-Certified Fire Extinguishing Devices

6.4.1 (Optional) Installing the Fire Cylinder

Prerequisites

The extinguishant in the fire cylinder meets the requirement.

If the fire cylinder is transported without extinguishant, fill extinguishant into the cylinder onsite before installing it.



CAUTION

- As the fire cylinder is heavy, determine the installation position, port, and fastening mode in advance to avoid long-distance movement.
- Do not impact or strike the fire cylinder during transportation or installation. Do not remove or flip the dowel on the fire cylinder.
- Assign at least four persons for transportation and installation if no auxiliary tool is available.
- Do not touch any button in the fire extinguishing system without permission during installation.
- Do not power on the fire extinguishing system during installation.

Preparations

Tools: protective gloves, pallet truck, pipe wrench, adjustable wrench, step ladder

Materials: fire cylinder, high-pressure hose, sealing tape, threaded adapter, I-shaped connector

Skill requirement: common technician

Procedure

- Step 1** Transport the fire cylinder to a professional refilling station, and fill 26 kg of heptafluoropropane (HFC-227ea) into the fire cylinder until the pressure reaches 2.5 ± 0.3 MPa. The operations must comply with BS ISO 14520-2006 and EN 12094-2003.



NOTE

If the fire cylinder is transported without extinguishant, fill extinguishant into the cylinder onsite before installing it.

- Step 2** Move the fire cylinder to the installation position using a pallet truck and secure it using steel belts.

NOTICE

- Do not move the fire cylinder over a long distance by hands.
- Keep the pressure gauge panel outwards so that people can view the reading, which also facilitates later maintenance.

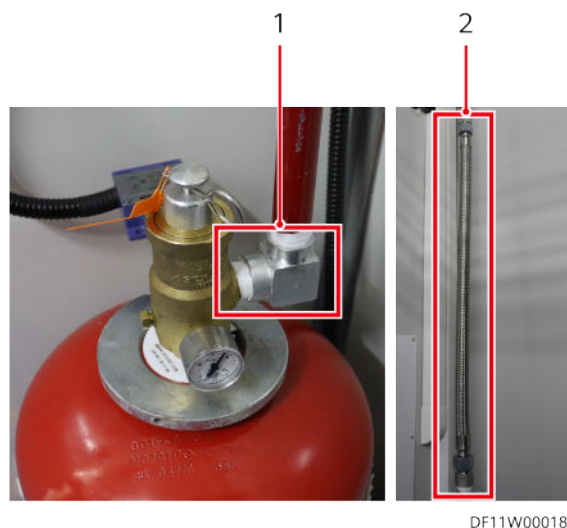
- Step 3** Connect the fire cylinder to the fire extinguishing pipeline.

NOTICE

Wrap the threads with liquid sealing tape to ensure air tightness.

1. Remove the protective cover at the threaded adapter position of the container valve, and connect the threaded adapter to the fire cylinder, as shown by (1) in the figure.
2. Connect the I-shaped connection pipe to the threaded adapter.
3. Connect one end of the high-pressure hose to the fire cylinder and the other end to the fire extinguishing pipeline, as shown by (2) in the figure.

Figure 6-48 Positions of the threaded adapter and high-pressure hose



(1) Threaded adapter

(2) High-pressure hose

Step 4 Screw the pressure switch to the container valve.

Figure 6-49 Installing the pneumatic switch



NOTE

Wrap the pneumatic switch connector with liquid sealing tape to ensure air tightness.

Step 5 Install the electrical actuator.

NOTE

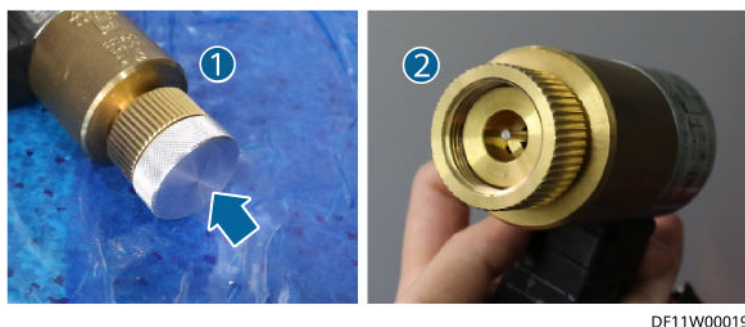
Do not install the electrical actuator when installing the fire cylinder for the first time. Install the electrical actuator when commissioning the fire extinguishing system.

1. Verify that the electrical actuator ejector is reset. If the ejector is not reset, press down the ejector, as shown by (1) in the figure. (2) in the figure shows the effect after the ejector is pressed down.

NOTICE

If the ejector is not pressed down, extinguishant may be released.

Figure 6-50 Operating the electrical actuator ejector



2. Remove the protective cover at the electrical actuator installation position on the container valve. Align the electrical actuator and the container valve, and tighten the electrical actuator clockwise

----End

6.4.2 Connecting the Cables to Extinguishant Control Panel Batteries

Context

The extinguishant control panel batteries been installed before delivery. You only need to connect the reserved cables to the batteries onsite.

Preparations

Tools: protective gloves

Materials: none

Skill requirement: common technician

Procedure

- Step 1** Open the door of the extinguishant control panel.
- Step 2** Remove the protective foam from the batteries and check whether the batteries are intact or leak.

NOTICE

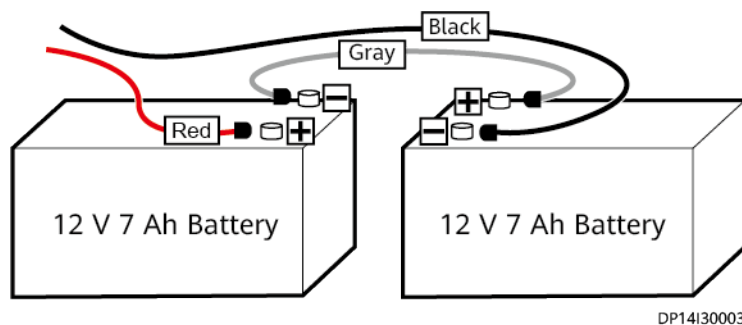
If a battery is damaged or leaks, contact Huawei technical support to replace the battery.

Step 3 Connect the battery cables to the reserved power cable terminals.

Figure 6-51 Battery position



Figure 6-52 Connecting battery cables



NOTICE

- Do not connect the red positive cable until power-on commissioning.
- Ensure that battery cables for the extinguishant control panel are connected to correct polarities.

Step 4 Close the door of the extinguishant control panel.

----End

6.4.3 (Optional) Connecting the Cables to ASD Power Box Batteries

Context

The ASD power box and batteries inside the pre-fab. module have been installed before delivery. You only need to connect the reserved cables to the batteries onsite.

Preparations

Tool: Phillips screwdriver

Materials: none

Skill requirement: common technician

Procedure

- Step 1** Open the power box using a key.
- Step 2** Remove the protective foam from the batteries and check whether the batteries are intact or leak.

NOTICE

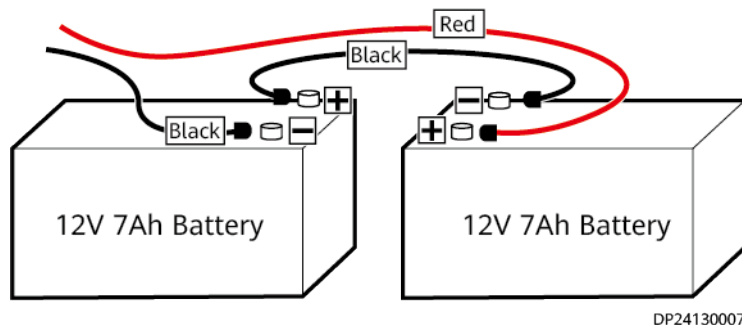
If a battery is damaged or leaks, contact Huawei technical support to replace the battery.

- Step 3** Connect the reserved battery cables.

NOTICE

Distinguish the positive and negative battery terminals when connecting battery cables.

Figure 6-53 ASD battery wiring diagram



DP24130007

----End

6.4.4 Removing the Fire Cylinder of the Fire Detection and Extinguishing Equipment and Filling Extinguishant

Preparations

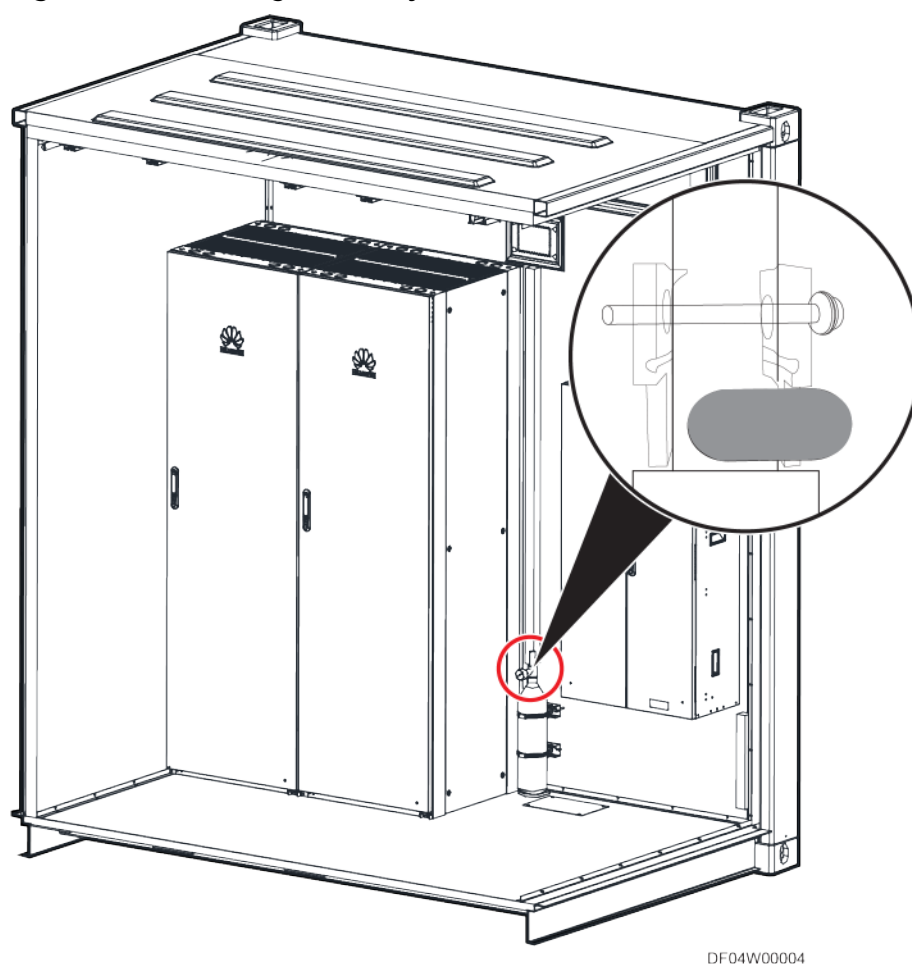
The fire cylinder of the fire detection and extinguishing equipment needs to be filled with extinguishant onsite.

Tools: insulated socket wrench, insulation gloves, Phillips screwdriver, key to the cabinet door, torque wrench, pipe cutter, and pipe holder

Procedure

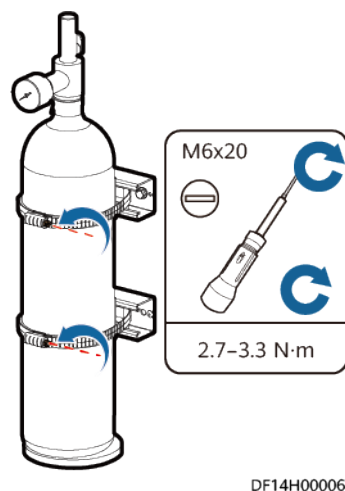
Step 1 Check that the fire cylinder valve is closed (vertical to the cylinder).

Figure 6-54 Checking the fire cylinder valve



Step 2 Remove the fire cylinder fastener and take out the fire cylinder.

Figure 6-55 Removing the fire cylinder fastener



- Step 3** Check the fire cylinder and all components for any damage, abrasion, or corrosion. If there is any visible abrasion or corrosion, replace the damaged components and all corroded components.
- Step 4** Send the fire cylinder to the gas station to fill extinguishant. Heptafluoropropane is recommended. The required amount is 3 kg.

NOTICE

- In the process of assembling and filling, ensure that the valve, container, and other parts are clean and not polluted.
 - The internal impurities of the fire cylinder have been cleaned and the container valve has been sealed. Do not remove the container valve and its components. For other operations, see the related filling specifications.
 - The end pressure gauge of the cabinet is used only to determine whether the pressure of the fire cylinder decreases during routine O&M inspection. It cannot accurately indicate the pressure value.
1. Connect the extinguishant filling port of the container valve to the extinguishant filling device. The thread specification of the extinguishant filling port is M10x1.
 2. Remove the valve positioning kit, open the valve, and fill 3 kg extinguishant. Close the valve after filling the extinguishant.
 3. Connect the filling port of the container valve to the nitrogen filling device, open the valve, and fill nitrogen until the filling pressure reaches the specified value. After filling nitrogen, close the valve.
 4. Shake the cylinder for 10 times and then fill nitrogen until the pressure reaches the specified value. Repeat this step for two to three times until the pressure does not change. Then install the valve positioning kit. After 12 hours, observe the pressure again. If the pressure does not reach the value listed in the following table, add nitrogen until the pressure reaches the required value.

Table 6-2 Mapping between temperatures and pressures

Temperature (°C)	Recommended Pressure	Allowed Pressure Range
0	12 bar (1.2 MPa)	11–13 bar (1.1–1.3 MPa)
10	14 bar (1.4 MPa)	13–15 bar (1.3–1.5 MPa)
20	17 bar (1.7 MPa)	16–18 bar (1.6–1.8 MPa)
25	18.5 bar (1.85 MPa)	17.5–19.5 bar (1.75–1.95 MPa)
30	20 bar (2.0 MPa)	19–21 bar (1.9–2.1 MPa)
40	23 bar (2.3 MPa)	22–24 bar (2.2–2.4 MPa)

5. After the filling is complete, check for leakage according to the procedure of the filling station.

Step 5 Check the status of the fire cylinder after filling extinguishant. If the fire cylinder is not reinstalled immediately after extinguishant is filled, check the status of the fire cylinder again before installation.

- Check that the valve is closed (vertical to the cylinder).
- Check that the reading of the pressure gauge on the fire cylinder is greater than 1.6 MPa at 20°C and the pointer is in the green zone.

Step 6 Reinstall the fire cylinder.

NOTICE

- Keep the fire cylinder upright.
- Ensure that the front of the pressure gauge faces the right side of the cabinet and that the cylinder does not interfere with the battery trays and the rear cover of the cabinet.

Step 7 Install the fire-trace tube.

NOTICE

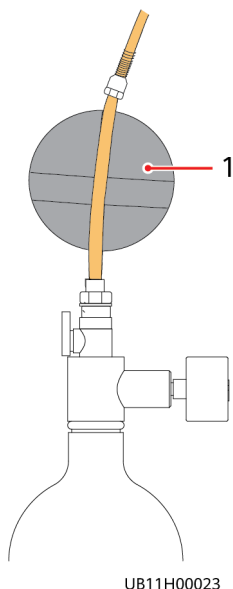
Do not bend or twist the fire-trace tube. Otherwise, extinguishant may leak.

1. Clamp the end of the fire-trace tube to the threaded nozzle using a pipe holder.

NOTICE

Hold the pipe holder close to the end to avoid bending the tube during pipe insertion.

Figure 6-56 Installing a fire-trace tube



(1) If the pipe holding device is slip-proof gloves, install the fire-trace tube using slip-proof gloves.

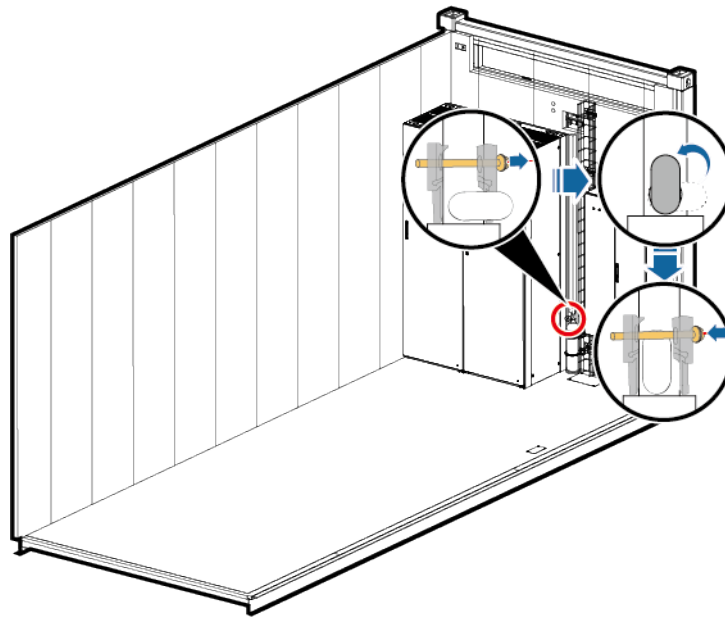
2. Tighten the connection nut to 7 N·m using an adjustable torque wrench.

Step 8 Remove the valve positioning kit, open the valve, reinstall the positioning kit, and secure it.

NOTICE

Slowly open the valve. To avoid unexpected blowout, do not quickly open the valve.

Figure 6-57 Opening the valve



DC13W00017

Step 9 Check the end pressure gauge on the front top of the fire cylinder. The pointer should be in the green zone and the pressure reading should be greater than 1.6 MPa at 20°C. Record the reading of the pressure gauge. 8 hours later, observe the pressure gauge again. The pressure reading should remain unchanged.

----End

7 Installing Cables Outside the Pre-fab. Module

7.1 Installing External Input Power Cables

Preparations

Tools: crimping tool, Phillips screwdriver, adjustable wrench, cable cutter, heat gun

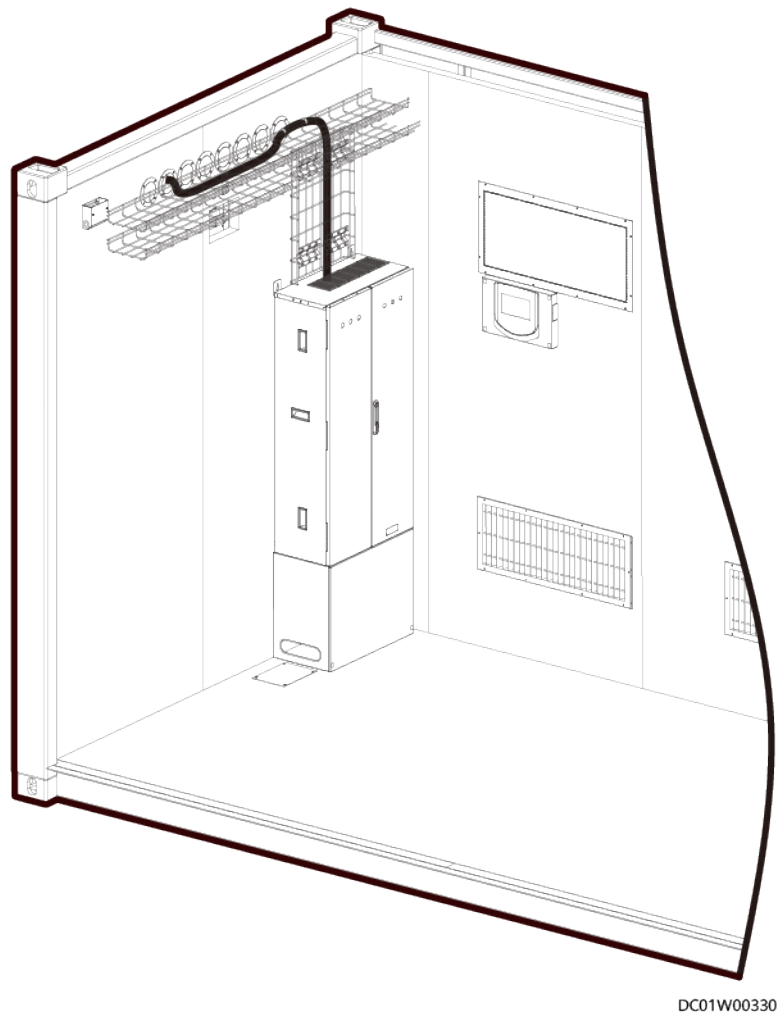
Materials: cable tie, cable, terminal, heat shrink tube

Skill requirement: skilled technician

Procedure

- Step 1** Open the door of the main input PDB.
- Step 2** Route the external input power cables into the pre-fab. module through the feeder window. For details, see [A.1.6 Routing Cables into Feeder Windows](#).

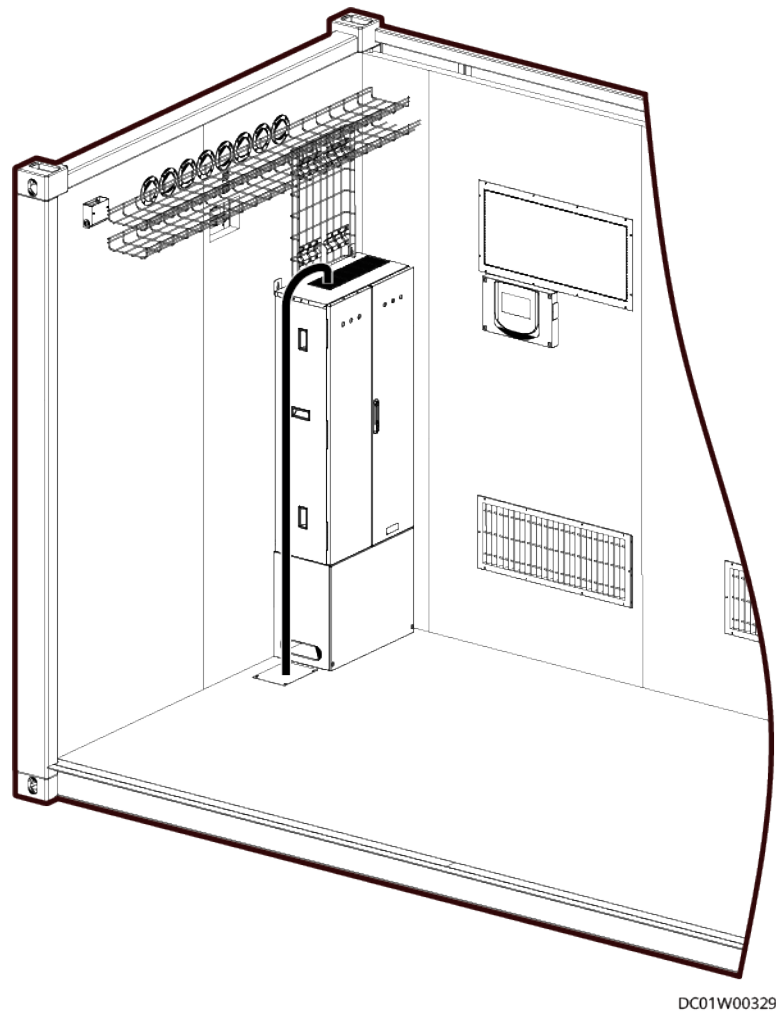
Figure 7-1 Wall cabling



NOTE

Add a drip loop for external cables routed into the feeder window to prevent water from flowing along the cables into the PDF.

Figure 7-2 Bottom cabling



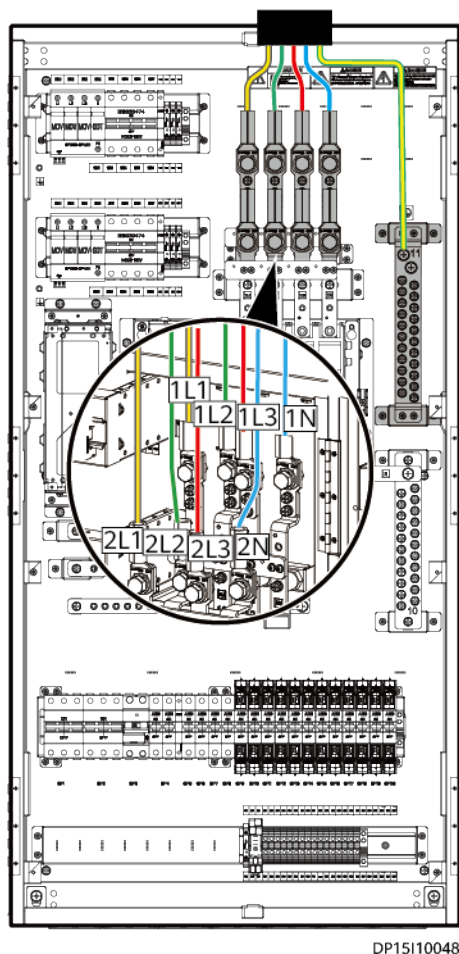
DC01W00329

NOTE

After bottom cabling is completed, use sealing putty to seal the cable holes.

Step 3 Connect the PDB input power cables.

Figure 7-3 Connecting the input power cables of the PDB (02404923)



NOTICE

N+X scenario: 1L1–1N connects to the mains; 2L1–2N connects to the genset.
2N scenario: 1L1–1N connects to mains 1; 2L1–2N connects to mains 2.

Step 4 Close the door of the main input PDB.

----End

7.2 (Optional) Connecting the Genset Start/Stop Cable (ATS Input)

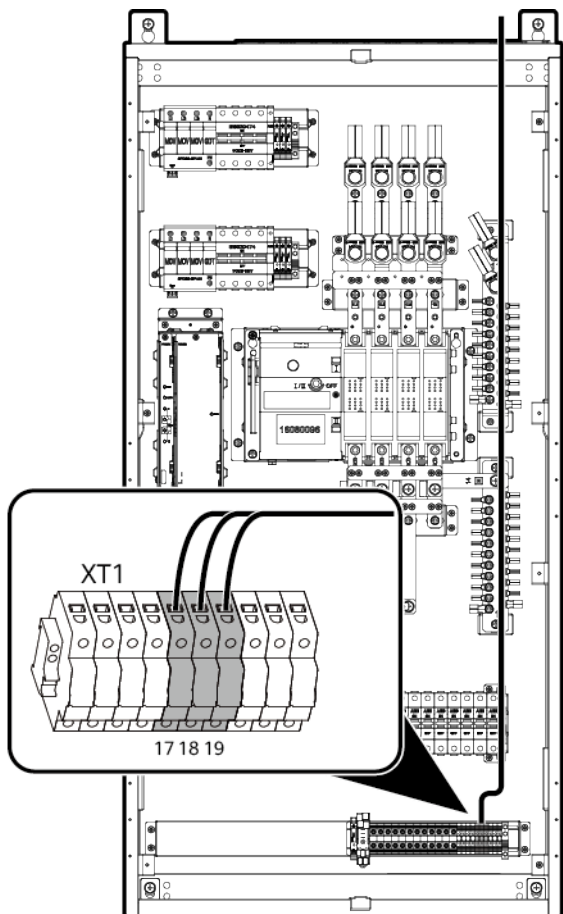
Context

Check the mains supply before starting or shutting down the DG. If there is no mains supply, the DG starts. If there is mains supply, the DG cools and shuts down.

Procedure

- Step 1** Connect the genset start/stop cable to the corresponding terminal block in the PDB.

Figure 7-4 Connecting a genset start/stop cable (02404923)



NOTE

XT1-17 stands for Start, XT1-18 stands for Com, and XT1-19 stands for Stop.

----End

8 Removing Transport Protection Materials

8.1 Removing Transport Protection Materials from Fire Extinguishing and Monitoring Devices

Context

Transport protection materials are installed for fire extinguishing and monitoring devices to prevent them from falling off or being damaged due to strong vibration during FusionDC1000 transportation.

NOTE

To prevent damage to aisle floors in the FusionDC1000, it is recommended that you remove the protective films after the FusionDC1000 is installed.

Preparations

Tool: step ladder

Materials: none

Skill requirement: common technician

Procedure

Step 1 Get familiar with the internal layout of the FusionDC1000.

Step 2 Remove transport protection materials on top of aisles inside the FusionDC1000.

Table 8-1 Protection materials to be removed

No.	Device	Protection Materials
1	Smoke detector	Securing tape and red cover

No.	Device	Protection Materials
2	Heat detector	Securing tape and red cover
3	Horn strobe	Securing tape
4	Fire alarm bell	Securing tape
5	Emergency light	Securing tape
6	Temperature and humidity (T/H) sensor	Securing tape
7	Camera	Securing tape
8	Emergency door release button	Plastic cover
9	Battery for the ASD	Foam
10	Battery for the extinguishant control panel	Foam

Figure 8-1 Securing tape and red cover



DF04W00002

Figure 8-2 Plastic protective cover for the emergency door release button



DM20I40004

Figure 8-3 Removing the transport sealing plate from the outdoor horn strobe



DC01W00333

NOTE

Properly store the screws removed from the transport sealing plate of the outdoor horn strobe. After the removal is complete, reinstall the four screws.

----End

9 Installation Verification

After the FusionDC1000 is installed, you need to verify the installation.

Table 9-1 Post-installation checklist

No.	Check Item	Check Method	Criteria
1	Pre-fab. module installation	Observe.	The installation conforms to the design requirements.
2	Equipment appearance	Observe.	• The equipment is intact and free from inclination, distortion, pain drop, and rust. • All connections are secure.
3	Water pipe connections	Observe.	Water pipes are securely connected.
4	Thermal insulation layers on water pipes	Observe.	All pipes are seamlessly wrapped with thermal insulation layers.
5	External grounding	Observe.	• Each pre-fab. module has at least two ground points and is grounded securely with a ground resistance of 10 ohms or less. • Each row of cable trays has at least two ground points and is grounded securely with a ground resistance of 10 ohms or less.

No.	Check Item	Check Method	Criteria
6	Cable connections	Observe.	• All cable connections are secure, especially network cable connections. • Bear cables and terminal barrels near wearing terminals are wrapped in insulation tape or heat shrink tubing. • Flat washers and spring washers of all wiring terminals are securely installed. • Cables are routed in the way convenient for future maintenance and expansion. • Cabinets are clean and have no dust, excessive cable ties, cable cuts, or other foreign matter inside.
7	Cable binding	Observe.	• Cables are neat and not coiled, and excessive parts are cut. • Cable ties do not overlap, and the joints are evenly cut without burrs. • Cables are placed properly and not tense at turning points. • Cable routes are straight and smooth, and do not intersect inside a cabinet.
8	Installation of external accessories	Observe.	The number and positions of external accessories installed conform to design requirements.
9	Labels	Observe.	All labels are correct, clear, and complete.

A Basic Installation Operations

A.1 Cable Installation Techniques

A.1.1 Cabling Rules

Cable Layout

When laying out cables, observe the following rules:

- Determine the cable specifications, route, cross-sectional area, and location according to the construction drawings.
- Cables must be neatly arranged and cable insulation layers must be intact.
- Different types of cables must be routed separately.
- Connection ports and cabling methods must facilitate maintenance, cable routing, and capacity expansion.
- Cable connectors prepared onsite must be secure, reliable, and neat, and conform to specifications.
- Power cables, ground cables, and signal cables must be securely connected. Adapters must be securely plugged or screwed.

Binding Cables

When binding cables, observe the following rules:

- Power cables and signal cables must be bound separately.
- Bind cables with a proper strength and do not pull the cables during binding.
- The labels on both sides of a cable must be concise, easy to understand, and face outwards.
- Cable ties must be neatly cut without sharp burs, evenly distributed, bound to a proper strength, and fastened towards the same direction, as shown in the figures.
- Cables must be bound closely and neatly. Each bundle must not exceed 15 cables.

- Extra cables must be coiled neatly and easy to find.

 NOTE

IT load power cables are connected to the ACDB in the MTS9606B-N20C2 DC power cabinet. The power cables are arranged neatly and bound to the nearest cable ties. The cables are routed along the left side of the cabinet and routed out through the U-shaped cable hole in the lower left corner of the cabinet top.

CT load power cables are connected to a DC circuit breaker in the MTS9606B-N20C2 DC power cabinet. The power cables are arranged neatly and bound to the nearest cable ties. The cables are routed along the right side of the cabinet and routed out through the U-shaped cable hole in the lower left corner of the cabinet top.

Figure A-1 Cable ties without sharp burs

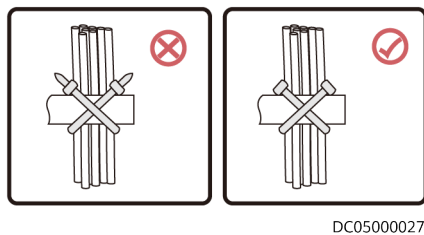
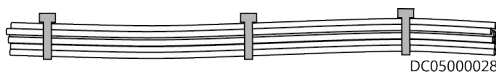


Figure A-2 Cable ties in the same direction

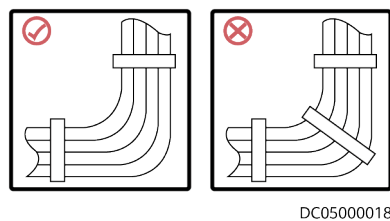


Bending Cables

When bending cables, observe the following rules:

- Cables must not be overly bent because over bending may damage the cable cores.
- The curvature radius of cables should meet the local requirements and specifications.
- Cables must not be tied where they bend.

Figure A-3 Binding cables at a turning point



A.1.2 Measuring Cables

Prerequisites

- The pre-fab. module has been installed.
- External cable trays have been installed.

Preparations

Tools: thin rope, protective gloves, and measuring tape

Material: cable

Skill requirement: common technician

Procedure

Step 1 Select a cable to be connected between two devices. Measure the cable route length between the two devices using a thin rope or small cable (such as a signal cable or fire control cable) available on-site.

Step 2 Add the length reserved for installing terminals and a tolerance to the cable length measured in **Step 1** to determine the required cable run length.

NOTE

- To improve installation efficiency, complete all cable measurements before you perform subsequent operations.
- Determine the length of the other cables between the devices based on the length of the cable measured.
- To facilitate installation, it is recommended that you lay out cables to the measured cable route length plus about 2 m.

----End

A.1.3 Laying Out Cables

Prerequisites

- Do not lay out cables outdoors under bad weather conditions if no shelter is available.
- Cables have been measured.

NOTICE

Some external cables for the FusionDC1000 are long and thick. Assign at least two persons to lay out cables especially armored cables if no assistant tool is available onsite.

Preparations

Tools: protective gloves and marker

Material: cable

Skill requirement: common technician

Procedure

Step 1 Select the designed cables.

Step 2 Lay out cables to the required run length.

NOTICE

To protect cable sheathings, do not press or stab cables with a hard object and do not drag cables on the ground at will during cable layout.

Step 3 Attach labels to both ends of cables that you have laid out.

NOTICE

Ensure that the labels are clear, durable, and consistent between both ends.

----End

A.1.4 Routing Cables Through a Plastic-coated Metal Hose

Prerequisites

- Do not route cables through a plastic-coated metal hose under bad weather conditions if no shelter is available.
- Cables have been labeled.

NOTICE

- In the FusionDC1000, external cables except armored cables must be routed through a plastic-coated metal hose.
 - To prevent burrs on cable ends from hurting people and scraping the corrugated hose, wrap the cable ends properly before routing cables through a plastic-coated metal hose.
 - To protect cable sheathings, do not drag the cables at will when routing cables through a plastic-coated metal hose.
 - Wear a pair of protective gloves when pulling the thin copper cable. Ensure that protective treatment has been applied on the contact with the copper cable.
 - Some external cables for the FusionDC1000 are long and thick. Assign sufficient people (at least three persons) to route cables especially armored cables through a plastic-coated metal hose if no assistant tool is available onsite.
-

Preparations

Tools: protective gloves

Material: plastic-coated metal hose

Skill requirement: skilled technician

Procedure

Step 1 Select an appropriate plastic-coated metal hose.

 NOTE

Deduct the cable length of both ends in pre-fab. modules from the actual cable run length to determine the required length of the plastic-coated metal hose.

Step 2 Cut the plastic-coated metal hose to the required length.

 NOTE

- To facilitate installation, it is recommended that you lay out cables to the measured cable route length plus about 1 m.
- Do not tread on the plastic-coated metal hose during cable layout and routing.

Step 3 Install the cover lock nut, guarding, and ferrule for the DPJ end connector.

 NOTE

For details about the installation method, see step 1 to step 5 in [A.1.6.1 Installing DPJ End Connectors](#).

Step 4 Route cables through the plastic-coated metal hose.

NOTICE

All monitoring cables must be routed at the same time through the same plastic-coated metal hose.

1. Put a thin copper cable through a plastic-coated metal hose, with sufficient length reserved at both ends to facilitate subsequent operations.
2. Lay out the plastic-coated metal hose with the thin copper cable in a straight line.
3. When installing cables, bind all cables of the same category between two devices.
4. Tie a cable or a bundle of cables with the thin copper cable at one end of the plastic-coated metal hose. Pull the thin copper cable at the other end when another person is holding the plastic-coated metal hose to pull the cables through the hose.

----End

A.1.5 Mounting Cables on the Cable Tray

Prerequisites

- Do not mount cables on a cable tray outdoors under bad weather conditions if no shelter is available.
- The selected cables have been routed through a plastic-coated metal hose.

 NOTE

Some external cables for the FusionDC1000 are long and have a large diameter. Assign sufficient people to mount cables especially armored cables on cable trays if no assistant tool is available onsite.

Preparations

Tools: step ladder, protective gloves, and safety helmet

Materials: cable tie and rubber pad

Skill requirement: skilled technician

Procedure

Step 1 (Optional) Install a rubber pad in the position where external mains or genset power cables will be mounted on a cable tray.

 NOTE

A rubber pad is installed in the mounting position to prevent cable tray burrs from scraping cable sheathings.

Step 2 Carry the cables routed into a plastic coated metal hose onto the cable tray, and bind them with cable ties.

NOTICE

- The cables are long. Assign sufficient people and ladders to carry the cables onto the cable tray.
- Before mounting cables on the cable tray, understand the installation precautions and the regulations for working at heights, and put on necessary protective equipment such as safety helmets and gloves.
- After mounting cables on the cable tray, lay out the cables horizontally without twists and bind the cables in proper positions with cable ties.
- Reserve sufficient cable length and bending space when turning an armored power cable.
- If possible, place armored cables and thick cables on the outside and lower layer of the cable tray.

Step 3 Cut the cable ties and adjust the cables.

NOTICE

The cable adjustment requirements are as follows:

- The cable bend radius must meet requirements.
 - Fire control cables and monitoring cables must be placed in the inside on the upper layer of cable trays.
 - Armored cables and power cables must be placed in the outside and bottom layer of cable trays.
 - Cables must be level, without unevenness and deflection.
-

Step 4 After adjusting cables as required, bind them with cable ties.

NOTICE

Cables must be bound neatly, and cable ties must be secured evenly and properly in the same direction.

----End

A.1.6 Routing Cables into Feeder Windows

DPJ end connectors and waterproof metal connectors are available on pre-fab. module feeder windows. When routing cables through a feeder window, follow the appropriate installation procedure.

NOTICE

- After cables are routed into feeder windows on the ends of pre-fab. modules, use Styrofoam to seal the hole inside the pre-fab. modules.
 - The armored cables must be grounded.
-

External cables must be routed from bottom to top and have backwater bend.

Figure A-4 Backwater bend



DC01H00270

A.1.6.1 Installing DPJ End Connectors

Prerequisites

- Do not operate a feeder window outdoors under bad weather conditions if no shelter is available.
- Cables have been mounted on cable trays.
- Cables need to be routed into a feeder window using DPJ end connectors.

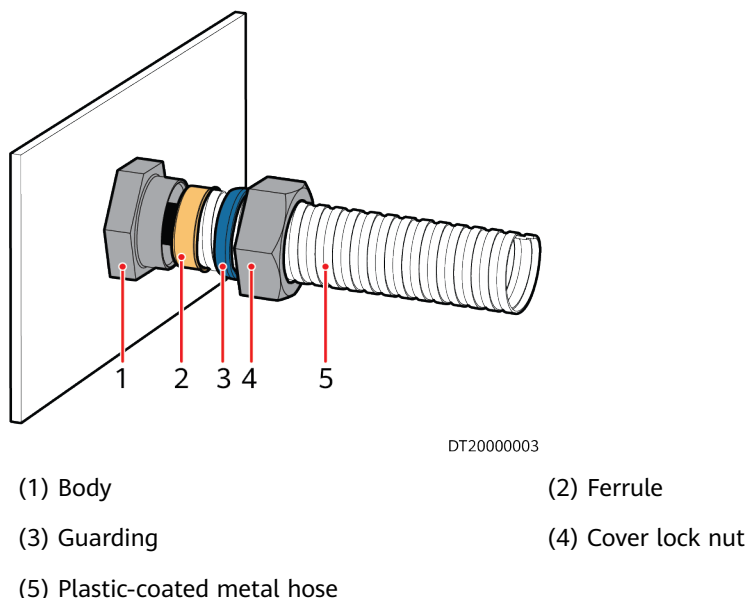
NOTE

Except armored power cables among FusionDC1000 external cables, the other cables must be routed through a feeder window using DPJ end connectors.

Context

A DPJ end connector consists of a body, ferrule, guarding, and cover lock nut.

Figure A-5 DPJ end connector



Preparations

Tools: small cutter, scissors, wrench dedicated for feeder windows, glue gun

Material: sealant

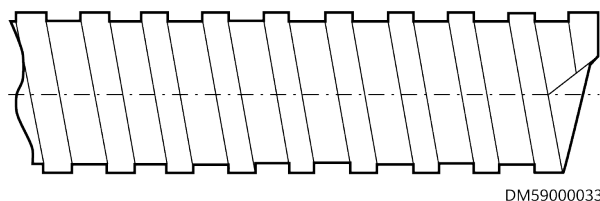
Skill requirement: skilled technician

Procedure

Step 1 Cut the plastic-coated metal hose to facilitate connection between the metal hose and the ferrule.

1. Use a small cutter or a pair of scissors to cut the hose at the joint between the plastic-coated metal hose and the end connector at an angle of 30 to 45 degrees.

Figure A-6 Cutting a hose



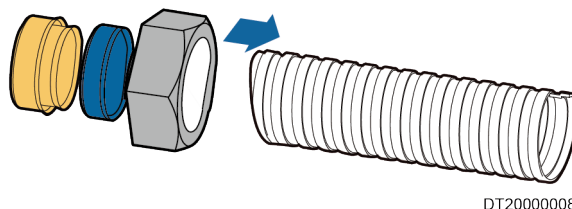
2. Trim any burrs on the cut.

Step 2 Remove the sealant from the DPJ end connector.

Step 3 Remove the cover lock nut, guarding, and ferrule from the DPJ end connector using the feeder window wrench shipped with pre-fab. modules.

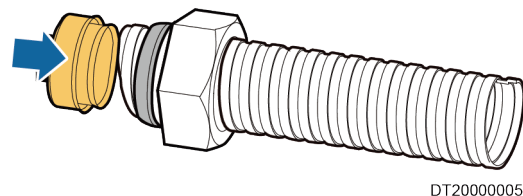
Step 4 Place the cover lock nut and guarding into the plastic-coated metal hose.

Figure A-7 Connecting the hose to the DPJ end connector



Step 5 Screw the ferrule into the plastic-coated metal hose.

Figure A-8 Installing a DPJ end connector



NOTE

The preceding steps need to be performed when routing the plastic-coated metal hose.

Step 6 Route the cable into the pre-fab. module through the body of the DPJ end connector.

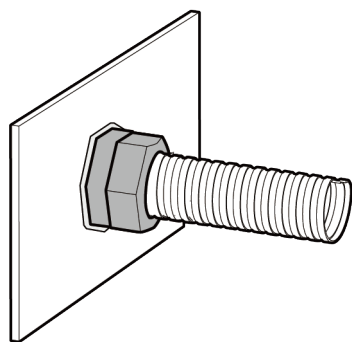
NOTICE

- People inside and outside the pre-fab. module should work together to route the cable to the specified connection position inside the pre-fab. module.
- To facilitate operation during internal routing, you can remove some top plate in the pre-fab. module aisle.

Step 7 Connect the ferrule to the body and tighten the cover lock nut using the dedicated feeder window wrench.

Step 8 Apply sealant between the end connector with the plastic-coated metal hose end and the pre-fab. module.

Figure A-9 Applying sealant



DT20000002

Step 9 Spray water to test the waterproof performance of the DPJ end connector.

Step 10 After routing cables, apply sealant to the gap between the end of the plastic-coated metal hose and the cables.

----End

A.1.6.2 Installing Waterproof Metal Connectors

Prerequisites

- Do not operate a feeder window outdoors under bad weather conditions if no shelter is available.
- Cables have been mounted on cable trays.
- Cables need to be routed into a feeder window using waterproof metal connectors.

Preparations

Tool: wrench dedicated for the feeder window

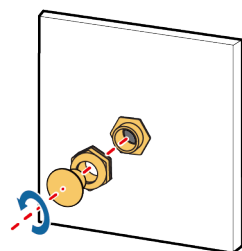
Materials: transparent sealant, sealing rubber strip

Skill requirement: skilled technician

Procedure

Step 1 Disassemble a waterproof metal connector using the dedicated feeder window wrench shipped with the pre-fab. module, and take the plug out of the connector.

Figure A-10 Disassembling a waterproof metal connector



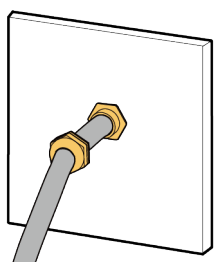
DM66000006

Step 2 Route a cable into the pre-fab. module through the waterproof metal connector.

NOTICE

- People inside and outside the pre-fab. module should work together to route the armored power cable to the specified connection position inside the pre-fab. module.
- To facilitate operation during internal routing, you can remove some top plate in the pre-fab. module aisle.

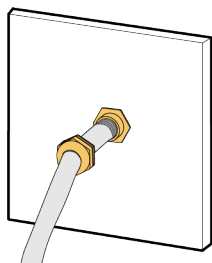
Figure A-11 Routing a cable



DM66000007

Step 3 Wrap four circles of waterproof sealing tape around the joint between the cable and the waterproof metal connector.

Figure A-12 Wrapping sealing tape



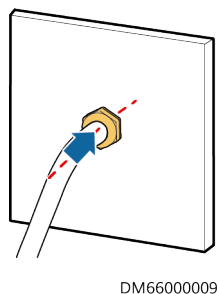
DM66000008

NOTE

If the cable is not regular or the size does not meet the requirements, wrap waterproof sealing tape.

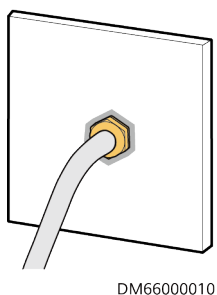
Step 4 Secure the waterproof metal connector using the dedicated feeder window wrench by tightening the nut to a torque of 100 N·m.

Figure A-13 Securing the waterproof metal connector



Step 5 Apply transparent sealant onto the joint between the waterproof metal connector and the sheet metal on the pre-fab. module.

Figure A-14 Applying sealant



Step 6 Spray water to test the waterproof performance of the waterproof metal connector.

----End

A.1.7 Attaching Cable Labels

Prerequisites

- Cables have been connected.
- You are clear about the connections of cables to be labeled.

NOTE

Clear and specific label information facilitates future pre-fab. module maintenance work.

Preparations

Tool: pen

Material: label

Skill requirement: common technician

Procedure

Step 1 (Optional) Prepare labels based on site requirements.

NOTICE

- Label information must be clear and specific.
 - Labels must be easy to attach and can be securely attached.
 - Labels must be resistant to corrosion and deterioration.
-

Step 2 Select correct cable labels.

Step 3 Remove the simple labels attached to a cable during layout and attach the selected labels to both ends of the cable.

NOTICE

- Labels must be securely attached.
 - Labels must be attached in eye-catching positions on cables for ease of maintenance.
 - The labels on both ends of a cable must be the same.
-

----End

A.2 Preparing Cable Terminals

Preparations

Tools: hydraulic pliers, heat gun, and crimping tool

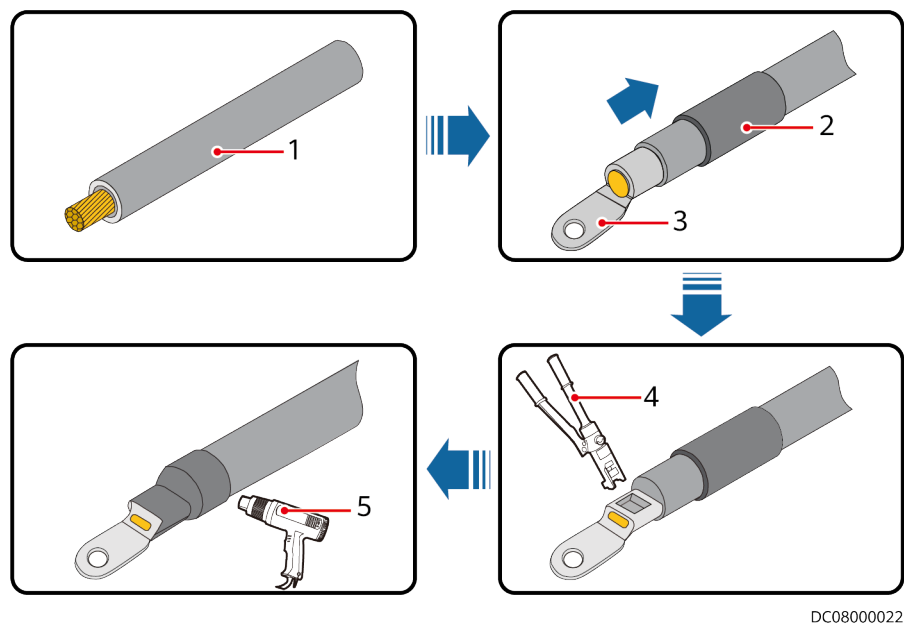
Materials: heat shrink tubing, DT terminal, OT terminal, and cord end terminal

Skill requirement: common technician

Procedure

Step 1 The following figure shows how to prepare a DT terminal.

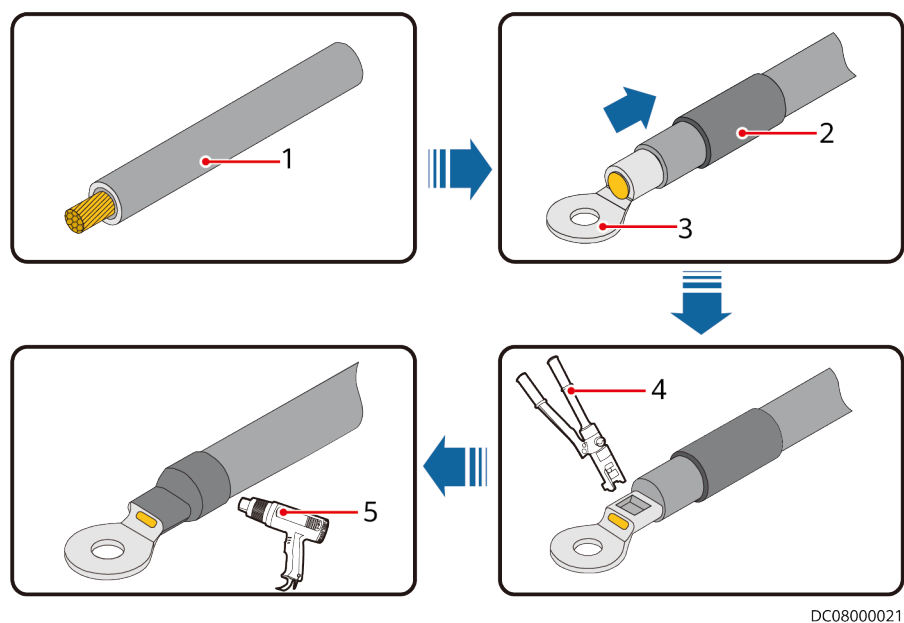
Figure A-15 Preparing a DT terminal



- (1) Cable (2) Heat shrink tubing (3) DT terminal
(4) Hydraulic pliers (5) Heat gun

Step 2 The following figure shows how to prepare an OT terminal.

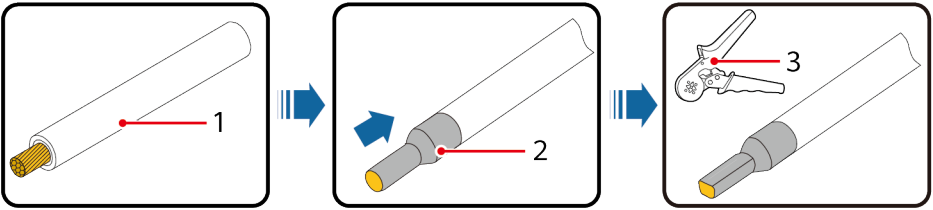
Figure A-16 Preparing an OT terminal



- (1) Cable (2) Heat shrink tubing (3) OT terminal
(4) Hydraulic pliers (5) Heat gun

Step 3 The following figure shows how to prepare a cord end terminal.

Figure A-17 Preparing a cord end terminal



(1) Cable

(2) Cord end terminal

(3) Crimping tool

-----End

B Cleaning Pre-fab. Modules

Prerequisites

The pre-fab. module has been installed.

Preparations

Tools: long-handled soft brush, barrel, vacuum cleaner, cotton cloth

Materials: detergent and clean water

Skill requirement: common technician

Procedure

Step 1 Clean the interior of a pre-fab. module.

1. Clean metal scraps in all holes drilled inside the pre-fab. module.
2. Clear all smudges inside the pre-fab. module.
3. Clean visible rubbish and dust inside the pre-fab. module.

Step 2 Clean the exterior of a pre-fab. module.

1. Clean up sundries (such as iron scraps) on the pre-fab. module exterior.
2. Clear dust, rain marks, or stains on the outer panels of the pre-fab. module using a long-handled soft brush dipped with alkaline or neutral detergent.
3. Wash the pre-fab. module with clean water.

NOTE

It is recommended that you clean the pre-fab. modules once every quarter.

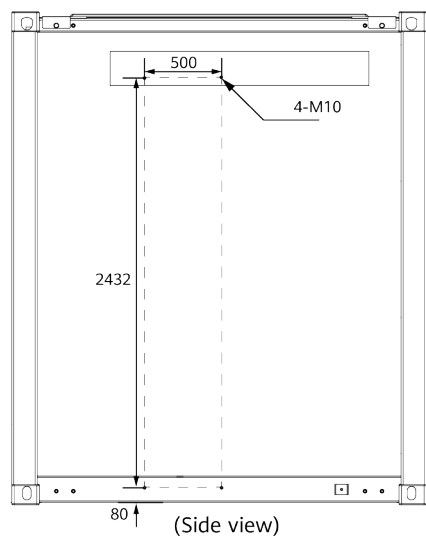
----End

C Dimensions of External Cable Trays and Fixed Ladders

NOTE

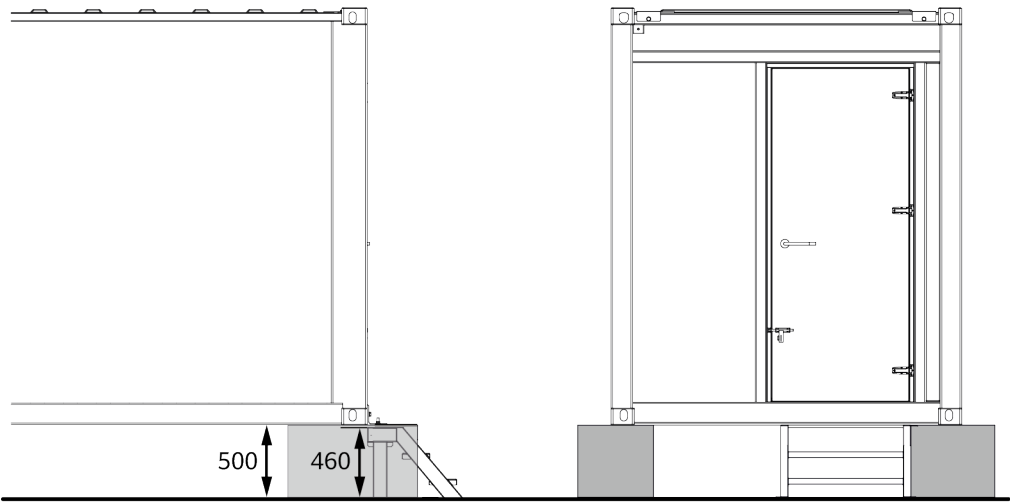
The external cable trays and step ladders are optional.
The unit of the dimensions in the figure is mm.

Figure C-1 Installation dimensions of external cable trays



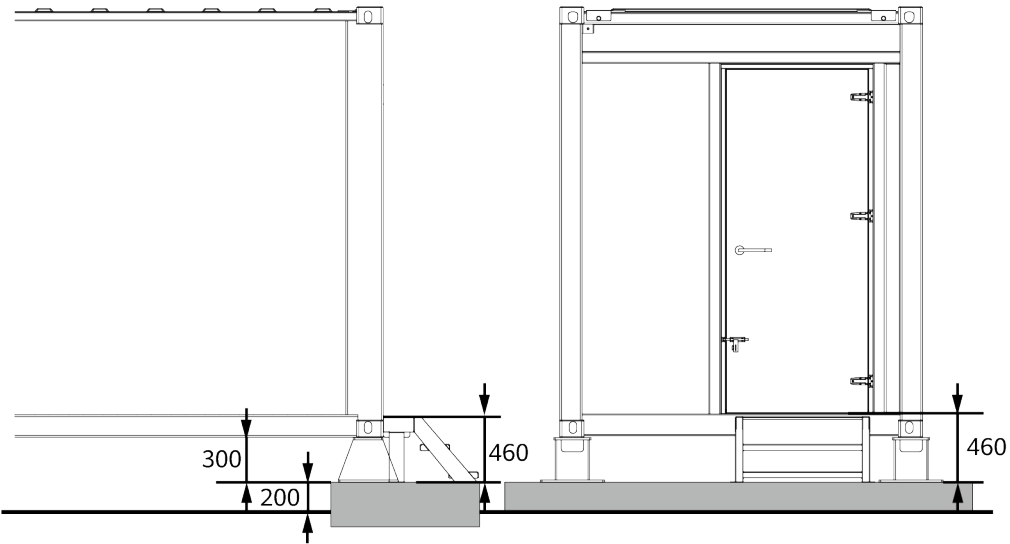
DC01W00267

Figure C-2 Installation dimensions of fixed ladders (concrete platform scenario)



DC06S00003

Figure C-3 Fixed ladder port dimensions (base scenario)



DC06S00004

D Acronyms and Abbreviations

A

AC	alternating current
ASD	aspirating smoke detector
ATS	automatic transfer switch

C

CAN	control area network
CE	Conformite Europe

E

ECC	energy control center
ESM	energy storage module

L

LCD	liquid crystal display
-----	------------------------

M

MDU	monitoring display unit
-----	-------------------------

P

PDF	power distribution frame
PDU	power distribution unit
POE	power over Ethernet
PVC	polyvinyl chloride

R

rPDU	rack power distribution unit
------	------------------------------

S

SPD	surge protective device
-----	-------------------------

T

TCP/IP	Transmission Control Protocol/Internet Protocol
--------	---

U

UPS	uninterruptible power system
-----	------------------------------

I

IVS	intelligent video system
-----	--------------------------