

# 1 Safety Precautions

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## About This Chapter

This part describes the safety precautions you must take when installing and maintaining the network equipment.

## 1.1 General Instructions



### CAUTION

Before performing any operation, read the instructions and precautions to prevent accidents. The indications such as caution, attention, warning, and danger in the documents are only additional information. They do not contain all the safety precautions for operations.

Abide by local safety regulations during the operations. Safety precautions in this document are only a supplement to local safety regulations.

When performing any operation of the Huawei equipment, abide by the precautions and safety instructions. Safety warnings listed in the document indicate the precautions that Huawei is aware of. Huawei is not liable for any consequences that result from the violation of universal regulations for safety operations and safety codes on design, production, and equipment use.

Personnel performing the installation and maintenance of the Huawei equipment must be familiar with the basics of safety operations. They must be trained and qualified.

## 1.2 Symbols

Safety prompts are of the following classes: danger, caution, and note. A safety class lies to the right of a symbol. The description of the safety prompt is given below the symbol.



### DANGER

The symbol indicates that a casualty or serious accident may occur if you ignore the safety instruction.



### CAUTION

The symbol indicates that a serious or major injury may occur if you ignore the safety instruction.



### NOTE

The symbol indicates that the operation may be easier if you pay attention to the safety instruction.

## 1.3 Toxic Articles

### Beryllium Oxide



#### CAUTION

Some parts of the equipment contain toxic beryllium oxide.

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- Beryllium oxide does harm to human bodies only when the parts carrying beryllium oxide are damaged. Personnel who handle the parts should be aware of the characteristics of the parts and take preventive measures in advance.
- Many parts of the equipment, such as power amplifier circuit and combiner circuit, carry beryllium oxide. Do not lay them in the environment where the mechanical damage or discharge of beryllium oxide may occur.
- Dispose of parts that carry beryllium with care. Abide by local safety regulations for the treatment of chemicals or waste that has beryllium oxide.

### Hydrochloride



#### CAUTION

Some parts of the equipment contain hydrochloride. If burned, they emit toxic gases.

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- Take preventive measures so that the parts do not get burned.
- Dispose of burned waste with care. Abide by local safety regulations for the treatment of any component or waste that has hydrochloride.
- When disposing of the parts or waste, take necessary measures to avoid inhaling toxic gases.

### Hydrofluoride



#### CAUTION

Some parts of the equipment contain hydrofluoride. If burned, these parts emit toxic gases.

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- Take preventive measures so that the parts do not get burned.
- Dispose of burned waste with care. Abide by local safety regulations for the treatment of any component and waste that has hydrofluoride.
- When disposing of the parts or waste, take necessary measures to avoid inhaling toxic gases.

## 1.4 Electric Safety

### High Voltage



#### **DANGER**

High-voltage power provides electricity for the equipment. A direct or indirect contact with damp objects that connect to high-voltage wires or mains supply may be fatal.

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#### **CAUTION**

Improper high-voltage operations may result in accidents such as fire and electric shock. Abide by local codes and regulations when routing AC power cables. Personnel performing high-voltage operations must be trained and qualified.

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- When installing the AC power supply equipment, abide by the local safety regulations. Ensure that the personnel are qualified for high-voltage and AC power operations.
  - During the operation, do not wear any object that may easily conduct electricity, such as the watch, hand chain, bracelet, or ring.
  - If the cabinet is damp, switch off the power immediately.
  - Prevent water from entering the equipment when performing any operation in a humid environment.
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### Power Cables



#### **CAUTION**

Do not install or disconnect live power cables. Electric sparks or arcs may be generated by the contact between the power cables and the conductors and they may cause a fire or eye injury.

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- Switch off the power before installing or disconnecting the power cables.
  - Before connecting the cables, ensure that the cables and their tags are correct.
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### Labels on the Cables



#### **CAUTION**

Before connecting the cables, ensure that their labels are correct.

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## Binding of Signal Cables



### CAUTION

Do not bind the signal cables and the power cables together. When the signal cables and the power cables are parallel, they must be at least 10 mm apart inside the cabinet and 100 mm apart outside the cabinet.

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## High Leakage Current



### CAUTION

To prevent high leakage current, ground the equipment before connecting it to the power supply.

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Before supplying AC power to the equipment, connect the grounding terminal of the equipment housing to the earth, which aims to prevent electric shock to human bodies due to leakage current. The leakage current is caused by the earth capacitance of the EMI filter at the AC input end and by the Y capacitance of the primary power.

## Fuses



### CAUTION

Do not install or remove fuses that are in use.

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## Tools



### CAUTION

High-voltage and AC power operations require special tools instead of general-purpose or nonspecific tools.

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## Hole Drilling



### CAUTION

Do not drill holes in the cabinet without prior permission. Improper drilling may damage the connections and cables inside the cabinet. Metal filings from the drilling may cause short-circuit to the boards if the fillings fall into the cabinet.

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- When drilling holes in the cabinet, put on insulated gloves and disconnect the cables inside the cabinet.
- Protect your eyes when drilling holes. Flying metal filings may hurt your eyes or skin.
- Prevent metal filings from falling into the cabinet.
- Improper drilling may reduce the electromagnetic shielding performance of the cabinet.
- Remove all metal filings after the drilling.

## Thunderstorm



### DANGER

Do not perform high-voltage and AC power operations on a tower or a pole during a thunderstorm.

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A thunderstorm may generate a powerful electromagnetic field in the atmosphere. Ground the equipment properly to protect the equipment from lightning.

## Environment with Flammable Air



### DANGER

Do not place the equipment in any environment where flammable or explosive air or smoke exists. Do not perform any operation in such an environment.

## 1.5 ESD Protection



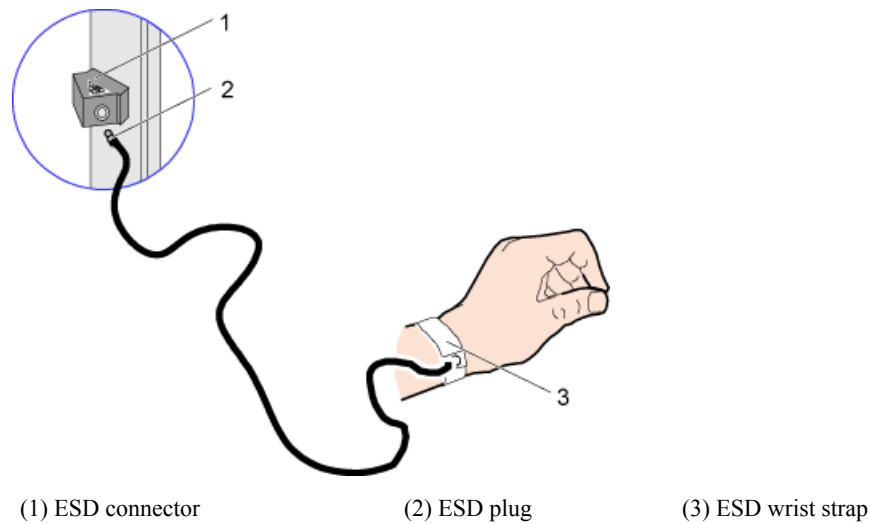
### CAUTION

Static electricity generated by human bodies may damage the electrostatic-sensitive parts, such as a large-scale integrated circuit, of a Printing Circuit Board (PCB).

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Wear an ESD wrist strap correctly and insert the ESD plug into the ESD connector. Ensure that the ESD wrist strap makes good contact with your skin, as shown in [Figure 1-1](#).

**Figure 1-1** Putting on an ESD wrist strap



- In a dry climate, the static electricity generated by the human body may reach as high as 30 kV. The static electricity may remain in the human body for a long time. The contact between the operator and the equipment parts may cause damage to the parts due to the static electricity. Before handling any board or module, put on the ESD wrist strap to discharge your static electricity.
- Before handling the equipment, board, or IC chip, put on the ESD wrist strap with the other end properly grounded.
- Add a 1 megaohm resistor to the serial connection between the ESD wrist strap and the grounding point, which aims to prevent accidental electrical shock. Check the ESD wrist strap regularly. Do not use any other cable to replace the cable preinstalled on the ESD wrist strap.
- Electrostatic-sensitive boards or modules should not be in contact with any object with static electricity or any object that is prone to generate static electricity. For example, the electrostatic-sensitive device may generate static electricity if the packing bag or box made of insulating materials makes contact with the belt conveyer. The device may be damaged by the contact between the device and your body or the earth.
- Electrostatic-sensitive boards or modules can be packed with only discharge materials of superior quality such as ESD bags. Boards in stock or transportation must be packed in ESD bags.
- Before connecting the measurement device to a board or module, discharge its static electricity by grounding that device.
- Keep a board or module at least 10 cm away from the cathode ray tube of a display or any other strong DC magnetic field.
- The damage caused by static electricity is accumulative in effect. If the damage is slight, the component may not malfunction. However, a larger number of damage attempts may cause a sudden failure of the parts. There are two types of damage: explicit and implicit. Implicit damage is invisible, but the parts become more vulnerable in such conditions as overvoltage and high temperature.

## 1.6 Microwaves and Magnetic Fields



### CAUTION

When performing operations on the equipment with high intensity RF signals, be aware that high intensity microwaves are detrimental to your health.

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The antenna in service produces electromagnetic radiation. Standing too close to the antenna is against safety regulations. Only trained and qualified personnel should install and maintain the equipment.

## 1.7 Laser



### CAUTION

Laser beams inside optical fibers may injure your eyes.

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When installing or maintaining optical fibers, keep your eyes away from or avoid looking directly at the connectors of the optical fibers.

## 1.8 High Temperature



### CAUTION

The temperature of some parts may be rather high. Do not touch the surface to protect yourself from scald.

## 1.9 Aloft Work

### General Operations



### CAUTION

When working at a height, be cautious not to let objects fall.

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When doing aloft work, abide by related national regulations.

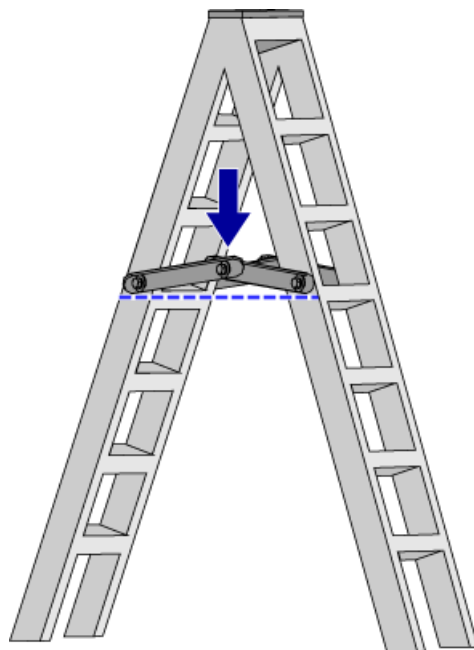


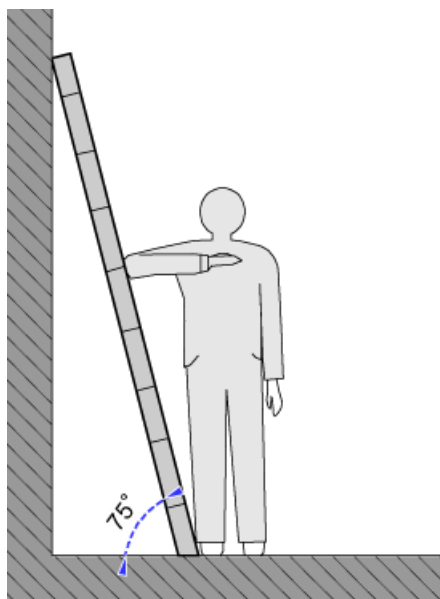
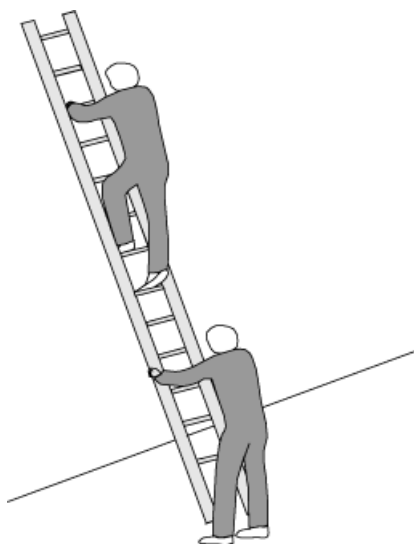
- Ensure that personnel doing aloft work are trained.
- Take care of the machines and tools and prevent them from falling.
- Place the tools back into the tool kit immediately after the use.
- Take safety measures, for example, by putting on the helmet and safety belt.
- Wear cold protective clothes before doing aloft work in cold regions.
- Check all the lifting devices before working at a height.

## Safety Regulation of Ladder Use

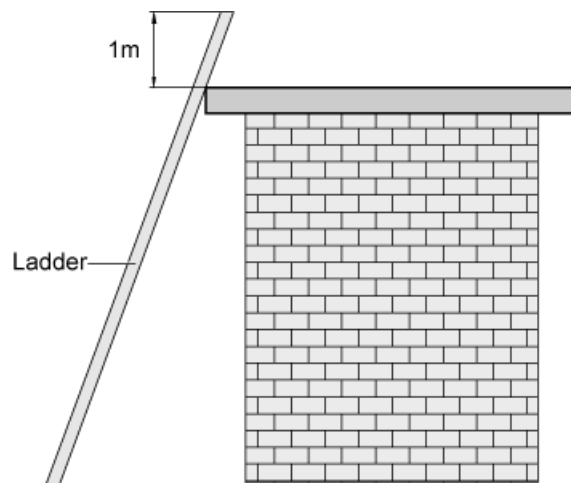
- Check the ladder and ensure that the ladder is safe. Do not overload the ladder.
- Take safety measures. For example, ask your partner to support the ladder when the ladder is 5 m or higher, when the A-shaped ladder is 3 m or higher, or when you work in a dangerous situation. Unfold the A-shaped ladder fully, as shown in [Figure 1-2](#).
- The recommended slant of the ladder is 75°, as shown in [Figure 1-3](#). Keep the ladder at that slant by using the angle square or your arm. When using the ladder, place the wider end of the ladder on the ground or take protective measures against ladder skidding. Put the ladder in a secure and solid place. Do not place the ladder against a carton or stone to prevent the ladder from falling.
- When climbing the ladder, face the steps and keep your gravity center within both sides of the ladder. To ensure your safety, keep your feet on the steps and grasp the ladder with one hand, as shown in [Figure 1-4](#). Do not climb the ladder beyond the highest four steps. If you need to climb to the rooftop, ensure that the top end of the ladder is at least one meter above the eave, as shown in [Figure 1-5](#).

**Figure 1-2** Fully unfolded A-shaped ladder



**Figure 1-3** Ladder slant**Figure 1-4** Using the long ladder in a safe way

**Figure 1-5** Ladder with its top end one meter above the eave



## 1.10 Others

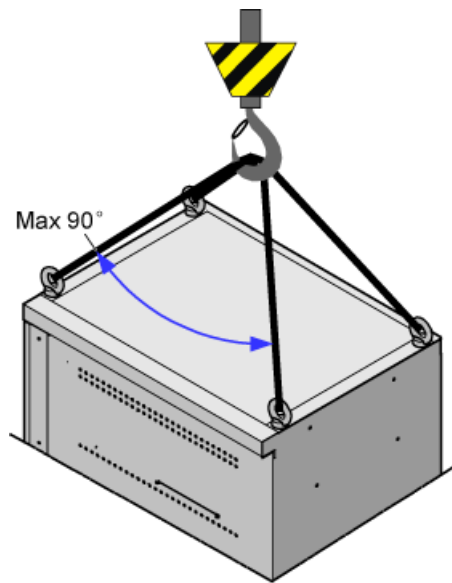
### Weight Hoisting



#### CAUTION

When a heavy object is hoisted, do not move about under the arm of the lifting device or the object.

- The operators who hoist weights should be trained and qualified. Check all the devices in advance. Hoist the objects only after the lifting device is firmly fixed to the fixity, for example, a wall, that has enough bearing capacity.
- When hoisting the cabinet, ensure that the angle between any two parts of the ropes are no greater than  $90^\circ$ , as shown in [Figure 1-6](#). A greater angle may break the ropes.

**Figure 1-6** Hoisting a heavy object

## Moving of Heavy Objects

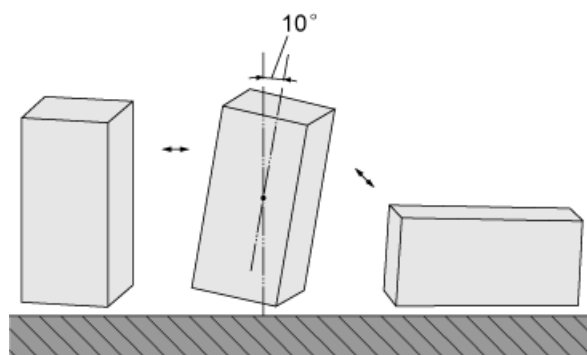


### CAUTION

When moving heavy objects, such as cabinets, take safety measures to prevent objects from falling and causing injury to people standing below.

Get at least two or three partners to install or maintain the cabinet, for example, slanting, putting down, or placing upright the cabinet. When the gravity of the cabinet slants over  $10^\circ$ , the cabinet may fall down.

**Figure 1-7** shows how to put down and place upright the cabinet.

**Figure 1-7** Laying down and placing upright the cabinet

## Objects with Sharp Edges



### **CAUTION**

When handling the equipment, wear a pair of gloves to protect yourself from damage caused by sharp edges.

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