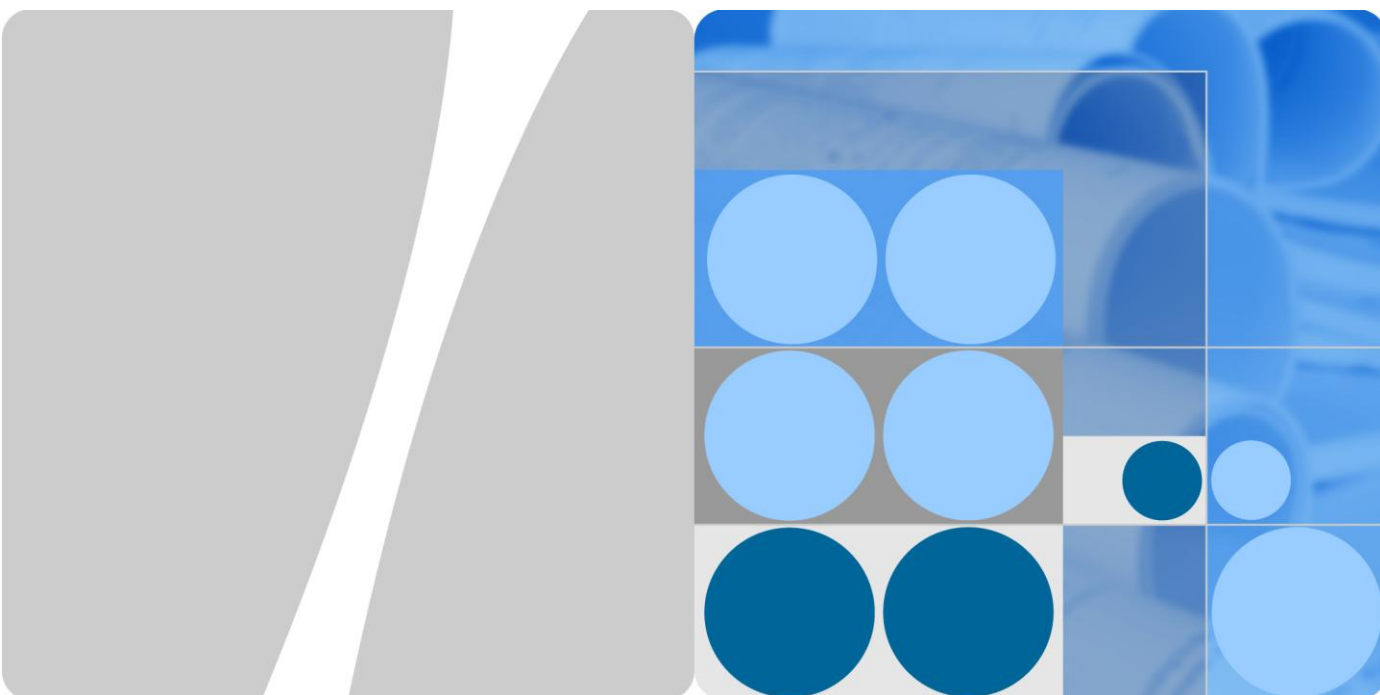


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pRRU3901

Compliance and Safety Manual

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1 Regulatory Compliance Information

1.1 About This Chapter

The following table lists the contents of this chapter.

Title	Description
1.2 Regulatory Compliance Standards	The regulatory compliance standards on EMC, safety, Laser Radiation, RF, health, and environmental protection.
1.3 Japanese Regulatory Compliance	The Japan regulatory compliance.

1.2 Regulatory Compliance Standards

pRRU3901 complies with the standards listed in Table 1-1.

Table 1-1 Regulatory compliance standards

Discipline	Standards
EMC	<ul style="list-style-type: none"> • CISPR22 <i>Class B</i> • CISPR24 • EN55022 <i>Class B</i> • EN55024 • ETSI EN 301 489 <i>Class B</i> • CFR 47 FCC Part 15 <i>Class B</i> • ICES 003 <i>Class B</i> • AS/NZS CISPR22 <i>Class B</i> • GB9254 <i>Class B</i> • VCCI <i>Class B</i> • CNS 13438 <i>Class B</i>

Discipline	Standards
<p>Note:</p> <p>EMC: electromagnetic compatibility</p> <p>RF: radio frequency</p> <p>CISPR: International Special Committee on Radio Interference</p> <p>EN: European Standard</p> <p>ETSI: European Telecommunications Standards Institute</p> <p>CFR: Code of Federal Regulations</p> <p>FCC: Federal Communication Commission</p> <p>IEC: International Electrotechnical Commission</p> <p>AS/NZS: Australian/New Zealand Standard</p> <p>VCCI: Voluntary Control Council for Interference</p> <p>CNS: Chinese National Standard</p> <p>UL: Underwriters Laboratories</p> <p>CSA: Canadian Standards Association</p> <p>BS: British Standard</p> <p>IS: Indian Standard</p> <p>GR: general requirement</p> <p>FDA: Food and Drug Administration</p> <p>DBS: distribut transceiver station</p> <p>GSM: Global System for Mobile communications</p> <p>LTE: Long Term Evolution</p> <p>WiMAX: Worldwide interoperability Microwave Access</p> <p>WLAN: wireless local area network</p> <p>ICNIRP: International Commission on Non-Ionizing Radiation Protection</p> <p>OET: Office of Engineering Technology</p> <p>IEEE: Institute of Electrical and Electronics Engineers</p> <p>RoHS: restriction of the use of certain hazardous substances</p>	

1.3 Japanese Regulatory Compliance

1.3.1 VCCI

pRRU3901 complies with VCCI Class B by Information Technology Equipment (ITE).

The preceding translates as follows:

This is a Class B product based on the standard of the Voluntary Control Council for interference by Information Technology Equipment (VCCI). If this product is used near a radio or television receiver in a domestic environment. It may cause radio interference. Install and use the equipment according to the instruction manual.

この装置は、クラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。 VCCI-B

1.4 USA Regulatory Compliance

1.4.1 FCC Part 15

BTS3902E WCDMA complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device does not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

If this device is modified without authorization from Huawei, the device may no longer comply with FCC requirements for *Class B* digital devices. In that a case, your right to use the device may be limited by FCC regulations. Moreover, you may be required to correct any interference to radio or television communications at your own expense.

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This device generates, uses and radiates radio frequency energy. If it is not installed and used in accordance with the instructions, it may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this device does cause harmful interference to radio or television reception, which can be determined by turning the device off and on, the user may take one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Reinforce the separation between the device and receiver.
- Connect the device into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or TV technician for assistance.

1.5 Canada Regulatory Compliance

1.5.1 RSS-Gen statement

This device complies with Industry Canada licence-exempt RSS standard(s).

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radio électrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

1.5.2 RSS-102 statement:

This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by Industrial Canada and meets the requirements for radiation exposure limits set forth for an uncontrolled environment.

In order to avoid the possibility of exceeding the Industrial Canada radio frequency exposure limits, human proximity to the equipment shall not be less than 25cm.

Cet appareil est conçu et fabriqué pour ne pas dépasser les limites d'émission pour l'exposition à la fréquence radio (RF) de l'énergie fixée par l'Industrie Canada et répond aux exigences en matière de limites d'exposition aux rayonnements définies pour un environnement non contrôlé.

Afin d'éviter la possibilité de dépasser les limites d'exposition aux fréquences radio industrielle du Canada, la proximité humaine pour l'appareil ne doit pas être inférieure à 25cm.

2 Safety Information

2.1 About This Chapter

The following table lists the contents of this chapter.

Title	Description
2.2 Overview	Safety precautions to be taken before installing and maintaining the Huawei device.
2.3 Electricity Safety	Information about the electricity safety.
2.4 Electrostatic Discharge	Information about the electrostatic discharge safety.
2.5 Inflammable Environment	Information about the inflammable environment safety.
2.6 Working at Heights	Safety precautions to be taken before using the ladders or hoisting heavy objects.
2.7 Mechanical Safety	Safety precautions on drilling, on sharp objects, on handling fans, and on lifting heavy objects.
2.8 Miscellaneous	Safety precautions on inserting and removing boards, on bundling signal cables, and cabling requirements.

2.2 Overview

2.2.1 Safety Precautions

This section describes the safety precautions to be taken before installing and maintaining the Huawei device.

- Before performing an operation, read the operation instructions and precautions to be taken, and follow them to prevent accidents. The Caution, Warning and Danger items in other documents do not cover all the safety precautions that must be followed. They are only supplementary information. The installation and maintenance personnel need to understand the basic safety precautions to be taken.
- When operating the device, obey the local safety regulations. The safety precautions provided in the documents are supplementary and shall be in compliance with the local safety regulations.
- When operating the Huawei device, in addition to the precautions, follow the specific safety instructions given by Huawei.

- The installation and maintenance personnel must receive training in safety precautions. Only qualified personnel can install or maintain the device.

2.2.2 General Requirements

To minimize the technically residual risk, it is imperative to obey the following rules. Read all the instructions before operation.

For DC model: Reinforce insulation or double insulation must be provided to isolate DC source from the AC mains supply.

Installation

- The device (or system) must be installed or used in the access restricted location.
- When installing the unit, always make the ground connection first and disconnect it at the end.
- The device must be fixed securely on the floor or other reliable objects, such as the walls and the mounting racks before opera.

Ground

- Do not damage the ground conductor or operate the device in the absence of well installed ground conductor. Conduct the appropriate electrical inspection.
- The device (or system) must be connected permanently to the protection ground before an operation. The cross sectional area of protective ground conductor shall be at least 16 mm²

Power Supply

- For DC supplied model: The device applies to DC power source that complies with the Safety Extra-Low Voltage (SELV) requirements in IEC 60950-1 based safety standards.
- Prepared conductors are connected to the terminal block, and only appropriate AWG/Type of wire is secured in the listed lug terminals.
- This device relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a fuse or circuit breaker no larger than 80 VDC, 25 A for DC supplied model is used on the phase conductors (all current-carrying conductors).
- For this device, a readily accessible disconnect device shall be incorporated in the building installation wiring.
- To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord.

Human Safety

- Do not operate the device or cables at lightning strikes.
- To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telecommunication network voltage (TNV) circuits.
- Do not look directly into the optical port to prevent the laser radiation from injuring your eyes.
- Do not wear jewelry or watches when you operate the device.

Operator

- Only qualified and skilled personnel must install, configure, and disassemble the device.

- Only the personnel authorized must operate the device.
- Any replacement or change to the device or parts of the device (including the software) must be done by qualified or authorized personnel of Huawei.
- Any fault or error that might cause safety problems must be reported immediately to the person in charge.
- Only qualified personnel must remove or disable the safety facilities, or to troubleshoot and maintain the device.

Ensure that the instructions provided in this document are followed completely. The document also provides guidelines in selecting the measuring and testing device.

2.3 Electricity Safety

2.3.1 High Voltage



DANGER

The high voltage power supply offers power for the device operation. Direct or indirect contact (through damp objects) with high voltage and AC mains supply may result in fatal danger.

- During the installation of the AC power supply facility, follow the local safety regulations. The personnel who install the AC facility must be qualified to perform high voltage and AC operations.
- Do not wear conductive articles, such as watches, hand chains, bracelets and rings during the operation.
- When water is found in the rack or the rack is damp, switch off the power supply immediately.
- When the operation is performed in a damp environment, make sure that the device is dry.



WARNING

Non-standard and improper high voltage operations may result in fire and electric shock. Therefore, you must obey the local rules and regulations when bridging and wiring AC cables. Only qualified personnel must perform high voltage and AC operations.

2.3.2 Thunderstorm

**DANGER**

High voltage and AC operations or operations on a steel tower and a mast are prohibited during thunderstorm.

During thunderstorm, the electromagnetic field generated in the thunderstorm area may damage the electronic parts. To prevent damage to the device during lightning, ground the device properly.

2.3.3 Tools

**WARNING**

Suggestion: Dedicated tools must be used during high voltage and AC operations. Avoid using ordinary tools.

2.3.4 High Electrical Leakage

**WARNING**

Ground the device before powering on the device. Otherwise, the personnel and device are in danger.

If the "high electrical leakage" flag is stuck to the power terminal of the device, you must ground the device before powering it on.

2.3.5 Power Cable

**WARNING**

Installation and removal of live line are prohibited. Transient contact between the core of the power cable and the conductor may generate electric arc or spark, which may cause fire or eye injury.

- Before installing or removing the power cable, turn off the power switch.
- Before connecting the power cable, confirm that the power cable and label comply with the requirements of the actual installation.

2.3.6 Fuse



WARNING

If a fuse is to be replaced, the new fuse shall be of the same type and specifications.

2.3.7 Battery

I. Storage Battery



DANGER

Before operating storage batteries, carefully read the safety precautions for battery handling and connection.



CAUTION

Improper handling of storage batteries causes hazards.

When operating storage batteries, avoid short circuit and overflow or leakage of the electrolyte. Electrolyte overflow may damage the device. It will corrode metal parts and circuit boards, and ultimately damage the device and cause short circuit of circuit boards.

Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

II. Basic Precautions

Before installing and maintaining the battery, note the following:

- Do not wear metal articles such as wristwatch, hand chain, bracelet, and ring.
- Use special insulation tools.
- Take care to protect your eyes when operating the device.
- Wear rubber gloves and a protective coat in case of electrolyte overflow.
- When handling a storage battery, ensure that its electrodes are upward. Leaning or reversing the storage battery is prohibited.

III. Short Circuit

**WARNING**

Battery short circuit may cause human injuries. Although the voltage of ordinary batteries is low, the instantaneous high current caused by the short circuit releases a great deal of energy.

There is danger of explosion if the battery is incorrectly replaced. Therefore, replace the battery only with the same or equivalent type recommended by the manufacturer.

**CAUTION**

Keep away metal objects, which may cause battery short circuit, from batteries. If metal objects must be used, first disconnect the batteries in use before performing any other operations.

IV. Hazardous Gas

**CAUTION**

- Do not use unsealed lead acid storage batteries. Lead acid storage batteries must be placed horizontally and stably to prevent the batteries from releasing flammable gas, which may cause fire or erode the device.
- Lead acid storage batteries in use emit flammable gas. Therefore, ventilation and fireproofing measures must be taken at the sites where lead acid storage batteries are used.

V. Battery Temperature

**CAUTION**

If a battery overheats, the battery may be deformed or damaged, and the electrolyte may overflow.

When the temperature of the battery is higher than 60°C, check the battery for electrolyte overflow. If the electrolyte overflows, absorb and counteract the electrolyte immediately.

VI. Battery Leakage

**CAUTION**

When the electrolyte overflows, absorb and counteract the electrolyte immediately.

When moving or handling a battery whose electrolyte leaks, note that the leaking electrolyte may hurt human bodies. When you find the electrolyte leaks, use the following substances to counteract and absorb the leaking electrolyte:

- Sodium bicarbonate (baking soda): NaHCO_3
- Sodium carbonate (soda): Na_2CO_3

Select a substance to counteract and absorb the leaking electrolyte according to the instructions of the battery manufacturer.

VII. Lithium Battery



WARNING

- There is danger of explosion if the battery is incorrectly replaced. Therefore, replace the battery only with the same or equivalent type recommended by the manufacturer.
 - Exhausted lithium ion batteries must be disposed of according to the instructions.
 - Do not throw lithium ion batteries into fire.
-

2.4 Electrostatic Discharge



CAUTION

The static electricity generated by the human body may damage the electrostatic sensitive components on the circuit board, such as the large-scale integrated circuit (LSI).

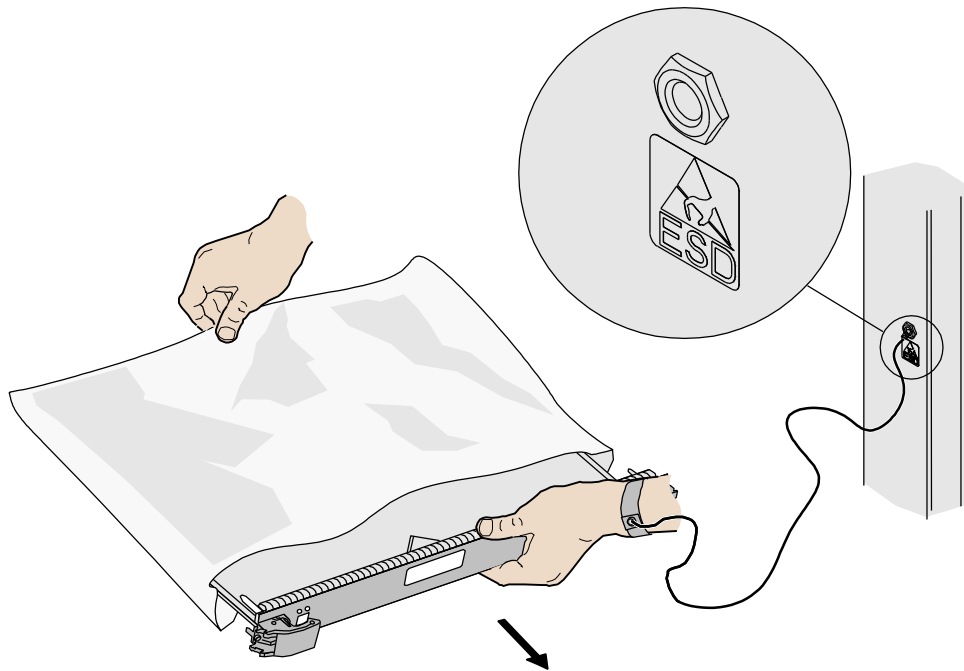
In the following situations, the human body will generate a static electromagnetic field:

- Human body moving
- Clothes friction
- Friction between shoes and the ground
- Holding ordinary plastic in hand

The static electromagnetic field will remain within the human body for a long time.

Before touching the device, hand-operating parts, circuit boards, or ASICs, wear a grounded electrostatic discharge (ESD) wrist strap. It can prevent the sensitive components from damage by the static electricity in the human body.

Figure 2-1 shows the wearing of an ESD wrist strap.

Figure 2-1 Wearing an ESD wrist strap

2.5 Inflammable Environment

Operating the electrical device in inflammable environment can be fatal.



DANGER

Do not place the device in the environment that has inflammable and explosive air or fog. Do not perform any operation in this environment.

2.5.1 Laser

The laser hazard level of this device is **Class 1**.



WARNING

When handling optical fibers, do not stand close to, or look at the optical fiber outlet directly with unaided eyes.

General Laser Information

Laser transceivers or transmitters are used in the optical transmission system and associated test tools. The wavelength of the laser is between 780 nm and 1600 nm. Because the laser is transmitted through the optical fiber, it has very high power density and is invisible to human eyes. When a beam of light enters the eye, the retina may be damaged.

Laser of wavelengths used in telecommunications can cause thermal damage to the retina.

Lasers used in lightwave systems have a larger beam divergence, typically 10 to 20 degrees. Viewing an un-terminated fiber or damaged fiber with the unaided eye at distances greater than 150 mm (6 inches) will normally not cause eye injury. However, damage may occur if an optical tool such as a microscope, magnifying glass or eye loupe is used to view the energized fiber end.

In its normal operating mode, a lightwave system is totally enclosed and presents no risk of eye injury. Additional safety is achieved by an automatic laser shut-down (ALS) of the system. The ALS, however, can be applied for bi-directional transmission only. If the receiver side does not detect the laser from the transmission side, it will give the transmission side a signal. Upon receiving the signal, the ALS will shut down the laser emission within 100 ms.

Laser Safety Guidelines

Read the following guidelines to avoid laser radiation:

- Read the instructions before installing, operating and maintaining the device. Ignoring the instructions can cause exposure to dangerous laser radiation.
- Wear a pair of eye-protective glasses when you are handling lasers or fibers.
- All the operation shall be performed by personnel who have completed the approved training courses.
- Make sure that the optical source is switched off before disconnecting optical fiber connectors.
- Before opening the front door of an optical transmission system, make sure that you are not exposed to laser radiation.
- Do not look at the end of an exposed fiber or an open connector when you are not sure whether the optical source is switched off or not.
- Use an optical power meter to check and ensure that the optical source is switched off by measuring the optical power.
- Do not use an optical tool such as a microscope, a magnifying glass or an eye loupe to view the optical connector or fiber.

Handling Fibers

Read the instructions before handling fibers.

- Cutting and splicing fibers must be performed by the trained personnel only.
- Before cutting or splicing a fiber, ensure the fiber is disconnected from the optical source. After disconnecting the fiber, use protecting caps to protect all the optical connectors.

2.6 Working at Heights

**WARNING**

When working at heights, be careful to prevent objects from falling.

When working at heights, shall comply with the following requirements.

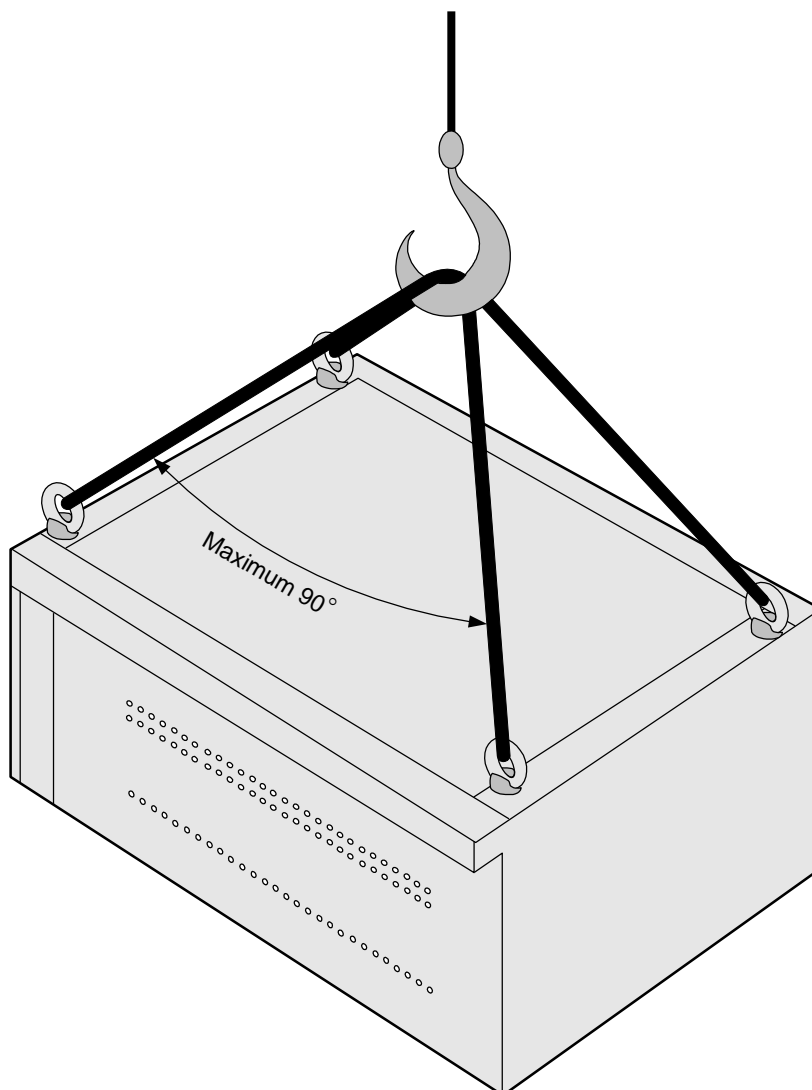
- The personnel who work at heights must be trained.
- The operating machines and tools shall be carried and handled safely to avoid falling.
- Safety protection measures, such as wearing a helmet and a safety belt, shall be taken.
- In cold regions, wear warm clothes when performing high-altitude operation.
- All lifting appliances must be thoroughly checked before the work is started.

2.6.1 Weight Lifting

**WARNING**

Do not access the areas under the jib arm and the goods in suspension when lifting weight.

- Ensure the operators have completed the related training and are qualified.
- Check the weight lifting tools and confirm that the tools are in good condition.
- Lift the weight only when the weight lifting tools are firmly fixed onto the weight-bearing object or the wall.
- Use a concise command to avoid incorrect operation.
- Ensure the angle between the two cables is less than or equal to 90 degrees during the lift. (see Figure 2-2).

Figure 2-2 Weight lifting

2.6.2 Safety Guide on Ladder Use

Checking the Ladder

Before using the ladder, first check if the ladder is in good condition. Make sure that you know the maximum weight that the ladder can support; overweight on the ladder is strictly prohibited.

Placing the Ladder

Slant angle is suggested to be 75 degrees. The slant can be measured with the angle square or with arms. When using a ladder, place the wider end of the ladder on the ground. Otherwise, take protective measures on the base part of the ladder to avoid skidding. Place the ladder on stable ground.

Climbing the Ladder

When climbing the ladder, note the following.

- Ensure the gravity center of your body does not deviate from the ladder edge.
- To lessen the danger and ensure the safety, hold your balance on the ladder before any operation.
- Do not climb higher than the fourth highest step of the ladder.
- If you are about to climb to the top, the length of the ladder shall be one meter higher than the eave.

2.7 Mechanical Safety

2.7.1 Drilling



WARNING

Drilling on the rack without permission is strictly prohibited. Drilling that does not satisfy the requirements concerned may damage the wires and cables inside the rack. If the metal shavings from the drilling fall into the rack, it may result in short circuit of the circuit boards.

-
- Before drilling a hole on the rack, wear insulation gloves, and remove the cables inside the rack.
 - During the drilling, ensure that your eyes are well protected. The hot shavings may injure your eyes.
 - Ensure that the metal shavings do not get into the rack.
 - Non-standard drilling may damage the electromagnetic shielding performance of the rack.
 - After drilling, clean the metal shavings in time.

2.7.2 Sharp Objects



WARNING

When carrying the device by hand, wear protection gloves to avoid injury by sharp objects.

2.7.3 Handling Fans

Ensure the following:

- When replacing a component, place the component, screw, and tool at a safe place to prevent them from falling into the running fan.

- When replacing the ambient equipment around the fan, do not place the finger or board into the running fan until the fan is switched off and stops running.

2.7.4 Lifting Heavy Objects



WARNING

When lifting heavy objects, do not stand or walk under the arm or the lifted object.

2.8 Miscellaneous

2.8.1 Inserting and Removing a Board

To insert or remove a board, abide by the following requirements:



CAUTION

When inserting a board, handle it gently to avoid distorting pins on the backplane.

- Insert the board along the slot guide.
- The two sides of one board should not contact another board to avoid short-circuit or scratch.
- When holding a board in hand, do not touch the board circuit, components, connectors, or connection slots.

2.8.2 Bundling Signal Cables



CAUTION

- Bundle the signal cables separately from the strong current cables or high voltage cables.
 - Maintain a minimum space of 150 mm between adjacent ties.
-

2.8.3 Cabling Requirements

At a very low temperature, movement of the cable may damage the plastic skin of the cable. To ensure the construction safety, comply with the following requirements:

- When installing cables, ensure that the environment temperature is above 0 °C.
- If cables are stored in the place below 0 °C, move the cables into a place at a room temperature and store the cables for more than 24 hours before installation.

- Move the cables with care, especially at a low temperature. Do not drop the cables directly from the vehicle.