RSU82 S1900

Hardware Installation

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LEGAL INFORMATION

Revision History

Revision No.	Revision Date	Revision Reason
R1.1	2016-03-23	V4.14.10.30.P30 This topic has been modified: Floor Mounting the Cabinet，modify the dimensions of the Base and Expansion Bolt Positions
R1.0	2015-05-22	First edition

Serial Number: SJ-20150203110107-011

Publishing Date: 2016-03-23 (R1.1)

Contents

About This Manual

Purpose

The BS8900A is an integrated outdoor macro base station that consists of the BBU and RSU82 S1900. In addition, space is reserved for the built-in power supply and battery in the cabinet, realizing an integrated device with the base station, power supply, and battery. This manual describes how to install the cabinet, modules, and cables of the BS8900A.

Intended Audience

This manual is intended for:

- Installation engineers
- Maintenance engineers

What Is in This Manual

This manual contains the following chapters.

Chapter 1, Installation Flow	Describes the installation flow of the ZXSDR BS8900A.
Chapter 2, Installation Preparation	Describes preparations before equipment installation.
Chapter 3, Unpacking and Inspection	Describes precautions about equipment unpacking and inspection.
Chapter 4, Cabinet Installation	Describes how to install the cabinet of the ZXSDR BS8900A.
Chapter 5, Component Installation in a Cabinet	Describes how to install the RSU and battery of the ZXSDR BS8900A.
Chapter 6, Installing the GPS Antenna (Optional)	Describes how to install the GPS antenna on the top of the cabinet.
Chapter 7, Cable Installation	Describes how to install the cables of the ZXSDR BS8900A on site.
Chapter 8, Post-Installation Check	Describes how to check the device after equipment installation.
Chapter 9, Powering on the Cabinet	Describes how to power on the ZXSDR BS8900A.
Chapter 10, Closure	Describes the clean-up operations after equipment installation.

Conventions

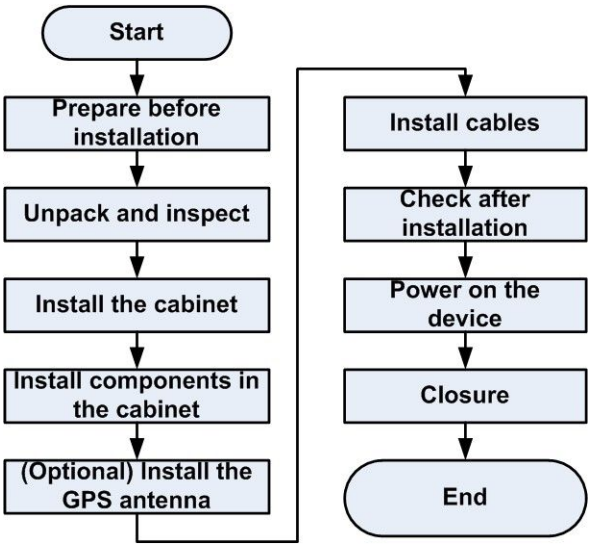
This manual uses the following conventions.

Italics	Variables in commands. It may also refer to other related manuals and documents.
Bold	Menus, menu options, function names, input fields, option button names, check boxes, drop-down lists, dialog box names, window names, parameters, and commands.
Constant width	Text that you type, program codes, filenames, directory names, and function names.
[ ]	Optional parameters.
{ }	Mandatory parameters.
|	Separates individual parameters in a series of parameters.
	Danger: indicates an imminently hazardous situation. Failure to comply will result in death or serious personal injury.
	Warning: indicates a potentially hazardous situation. Failure to comply can result in death or serious personal injury.
	Caution: indicates a potentially hazardous situation. Failure to comply can result in moderate or minor personal injury.
	Notice: indicates equipment or environment safety information. Failure to comply can result in equipment damage, data loss, equipment performance degradation, environmental contamination, or other unpredictable results.
	Note: provides additional information about a topic.

Chapter 1
Installation Flow

For the installation flow of the ZXSDR BS8900A, see Figure 1-1.

Figure 1-1 ZXSDR BS8900A Installation Flow



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Chapter 2
Installation Preparation

Table 2-1 shows tools and meters required during installation.

Table 2-1 Tools and Meters

Cate-gory	Name	Example
Special-purpose tools	Feeder connector knife	
	75 Ω coaxial cable stripper	
	Multi-functional crimping pliers	
	Multimeter	
	Standing wave ratio tester	
	Earth resistance tester	

Cate-gory	Name	Example
Punch-ing tools	Hammer drill	
	Auxiliary percussion drill bits	
	Vacuum cleaner	
	Power strip (providing at least three two-phase sockets and three three-phase sockets, with the current capacity larger than 15 A)	
General-purpose tools	Phillips screwdrivers (4", 6" and 8" each)	
	Flat head screwdrivers (4", 6" and 8" each)	
	Adjustable wrenches (6", 8", 10" and 12" each)	
	Dual-purpose wrenches (17" and 19" each)	
	Socket wrenches	
	Paper knife	
	5 kg claw hammer	

Cate-gory	Name	Example
	Irons (300 W and 40 W each)	
	Inner-hexagon wrench	
	Solder wires	
Mea-sure-ment tools	50 m (164 feet) tape measure	
	5 m (16 feet) steel tape	
	Angle instrument	

Cate-gory	Name	Example
	Compass	
	Level bar	
	Plumb	
Protec-tion tools	Antistatic wrist strap	
	slip-proof gloves	
	Safety helmet	
Clamp tools	Hacksaw (with several saw blades)	
	sharp-nose pliers (8")	
	diagonal pliers (8")	

Cate-gory	Name	Example
	round-nose pliers (8")	
	Pincer pliers (8")	
	Needle files (medium-sized)	
	Nippers	
	Paint brush	
	Scissors	
	Air heater	
	Solder removal tool	
	Hydraulic crimper	
	Crowbar	

Cate-gory	Name	Example
Auxiliary tools	Pulley set	
	Rope	
	Ladder	
Meters	Spectrum analyzer (required in certain special cases)	
	BTS tester	
	Field strength tester (required in certain special cases)	

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2.1 Technical Documents

It is necessary to prepare the following technical documents for ZXSDR BS8900A installation:

- *ZXSDR BS8900A Integrated Outdoor LTE Macro eNodeB Product Description*
- *ZXSDR BS8900A Integrated Outdoor LTE Macro eNodeB Hardware Description*

2.2 Precautions for cabinet transport

- A cabinet must be transported with the outer packing container to protect the cabinet from scratches.

Caution!

You must transport a cabinet in a packing container.

- After the packing container is removed on site, the cabinet must be protected when you move or store it. For example, when a cabinet is stored temporarily, cushioning materials must be put under the bottom of the cabinet to avoid direct contact with the ground and surrounding objects.
- When you transport a cabinet, use machines first. When you lift a cabinet up, the cabinet must be dragged properly to avoid collision with other objects.
- If a cabinet has to be transported without packing due to environment restrictions, cushioning materials such as foamed plastic and paperboard must be used to protect the cabinet from scratches.

2.3 Installation Precautions

The following precautions should be abided by during the installation:

- The ZXSDR BS8900A hardware installation personnel must participate in the training related to communication equipment installation to master installation skills.
- During the installation, ensure the personal safety and avoid accidents such as electric shock or bruise.
- The installation personnel should wear an antistatic wrist strap when inserting and pulling out boards. Ensure that the other end of the antistatic wrist strap is grounded well.
- When taking a board, take hold of the edge of the board and do not touch the circuit, components, and wires.
- Install boards along slots and avoid contacting adjacent boards to avoid short circuit. Give proper force to install the boards to avoid pin distortion.
- When installing or maintaining an optical fiber, do not directly stare at the section of optical fiber or an optical socket in case that laser beams hurt your eyes.

- The equipment must be powered on within 24 hours after the package is opened. Power-off cannot exceed 24 hours in maintenance.

Chapter 3
Unpacking and Inspection

Counting Goods

- Verify that the packaging boxes are intact. If any damage is found, contact the transport company immediately.
- Unpack the boxes and verify that the goods are consistent with the inspection checklist.
- Verify that the chassis is in good condition without scratches, peeling paint, blisters, or stains.
- Verify that the accessories required for the installation are correct and complete.

Equipment Handover

After the examination of goods, the engineering supervisor and the operator's representative should sign the *Unpacking Acceptance Report*. The *Unpacking Acceptance Report* is made in duplicate, and kept by both parties. The engineering supervisor must send the *Unpacking Acceptance Report* back to the representative office within seven days for archiving.

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Chapter 4
Cabinet Installation

The ZXSDR BS8900A is an outdoor device that is directly floor-mounted. It can be installed at a hill or roof. In general, a simple fence or house is required around the base station where the equipment is installed in the hill or under a tower.

A concrete platform needs to be set up before the cabinet installation to protect the base station equipment and ensure the normal usage of the communications equipment.

The ZXSDR BS8900A has three types of cabinets, the baseband cabinet (BC cabinet), RF cabinet (RC cabinet), and battery cabinet (PC cabinet). These cabinets can be stacked or installed side by side. The lower-layer cabinet in the stacked cabinet installation mode is RC8910A or PC8910A. The upper-layer cabinet in the stacked cabinet installation mode is BC8910A. The base does not accompany the delivery of these cabinets. The base needs to be installed before the floor-mounted cabinet installation.

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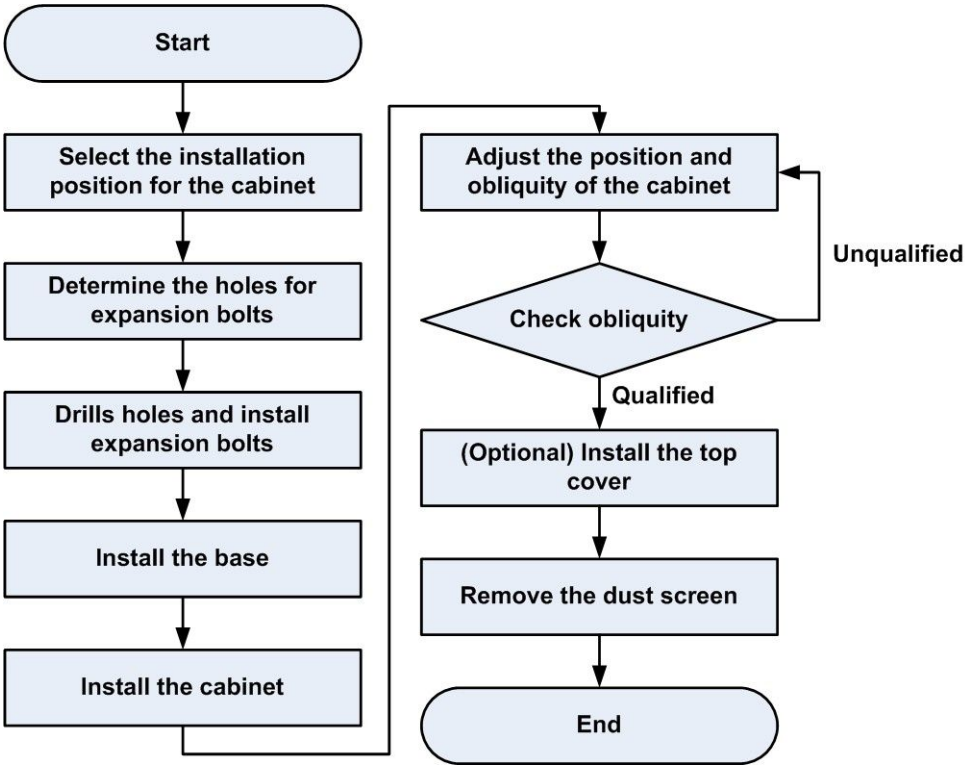
4.1 Cabinet Installation Process

Flow for Floor-Mounting a Cabinet

For the flow for floor-mounting the ZXSDR BS8900A cabinet, see Figure 4-1.

Figure 4-1 Flow for Floor-Mounting a Cabinet



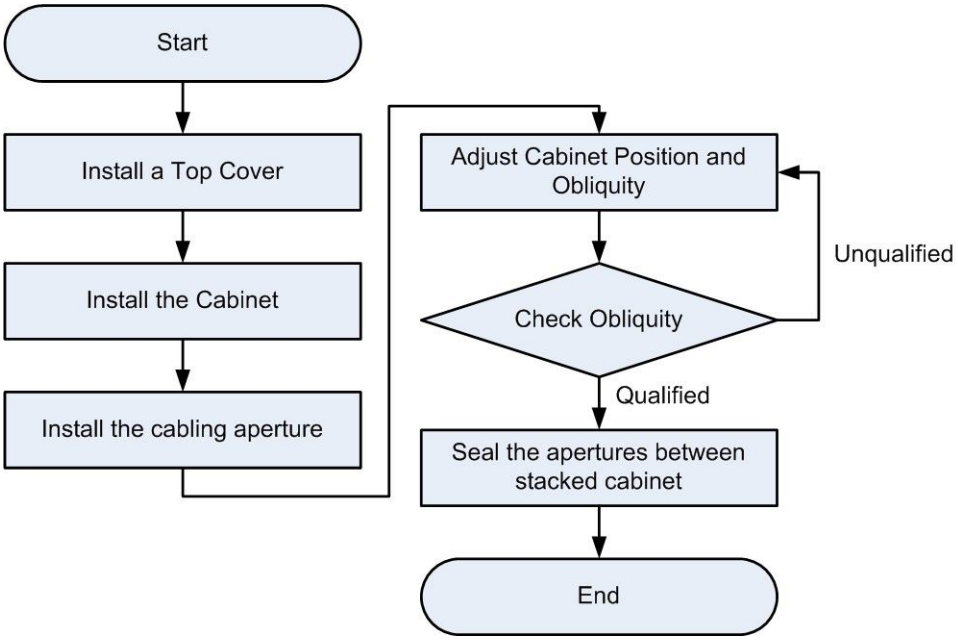
Note:

If a floor-mounted cabinet need not be stacked with another cabinet on its top, the floor-mounted cabinet needs to be installed with the top cover.

Flow for Stacking Cabinets

In the stacked cabinet installation, you just need to stack another cabinet onto the top of the floor-mounted cabinet. For the installation flow, see Figure 4-2.

Figure 4-2 Flow for Stacking Cabinets



4.2 Floor Mounting the Cabinet

This procedure describes how to mount a cabinet or the lower cabinet of the stacked cabinets on the floor.

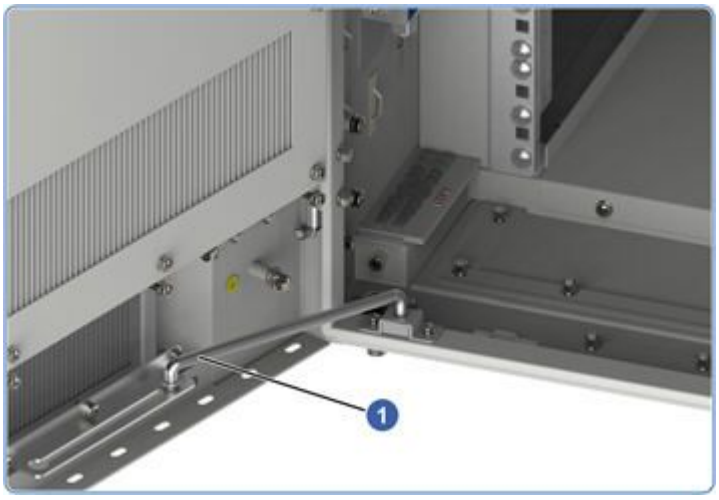
You can install the ZXSDR BS8900A cabinets in multiple modes as required, for example, stacking the BC8910A cabinet and RC8910A cabinet together with the PC8910A cabinet, and installing single BC8910A cabinet. The installation of the BC8910A cabinet or PC8910A cabinet on the floor is slightly different from that of a RC8910A cabinet. No clamping component is required for the installation of the BC8910A cabinet or PC8910A cabinet.

Context

Stabilizing the wind-proof pole

Use the wind-proof pole to stabilize the cabinet door when installing a cabinet or the relevant cables, see Figure 4-3.

Figure 4-3 Installing a Windproof Pole



Steps

1. Determine where the cabinet is to be installed.

   With the minimum installation space meeting the requirements of the ZXSDR BS8900A cabinet, select a proper installation place that ensures proper cable routing, good ventilation and heat dissipation, and easy operation.

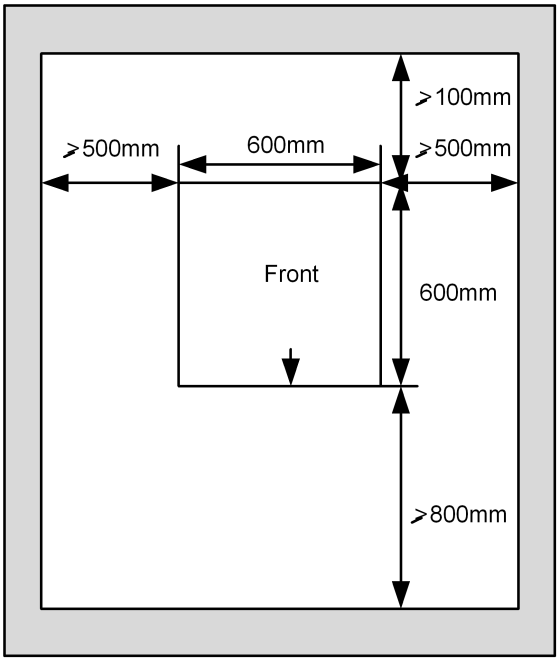
2. Concrete Platform Description.

   A concrete platform needs to be set up before the cabinet installation. The cabinet is installed onto the platform and particular operation space is reserved. Do not directly install the expansion bolts on the roof. The dimensions of the concrete platform are as follows:

   - Stacked cabinets

     The space must be greater than 1600 mm x 1500 mm in such a scenario, see Figure 4-4.

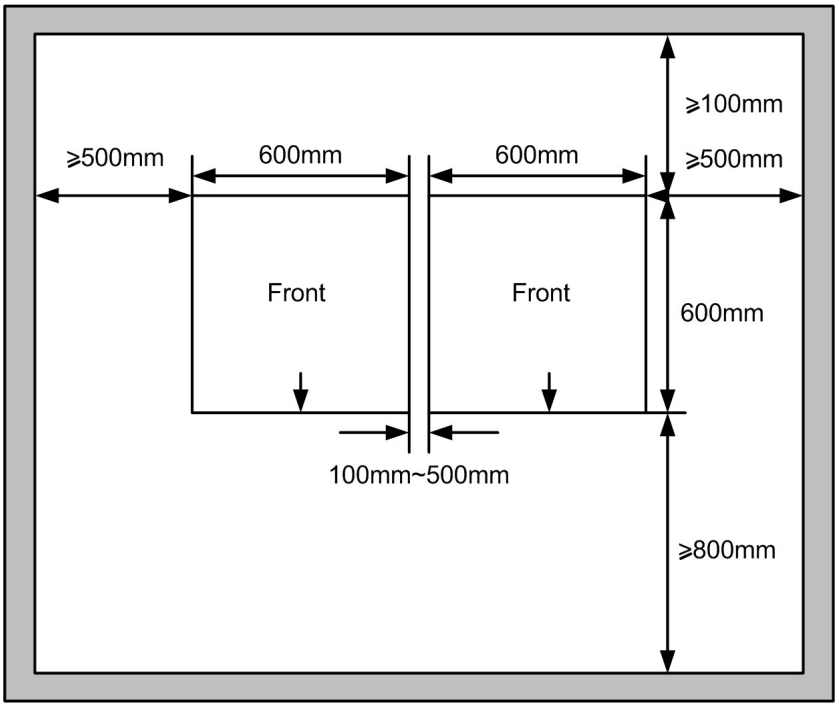
Figure 4-4 Concrete Base Size Requirement—For Stacked Cabinets



- Side-by-side installed cabinets

  The space must be greater than 2200 mm x 1500 mm in such a scenario, see Figure 4-5.

Figure 4-5 Concrete Base Size Requirement—For Side by Side Cabinets



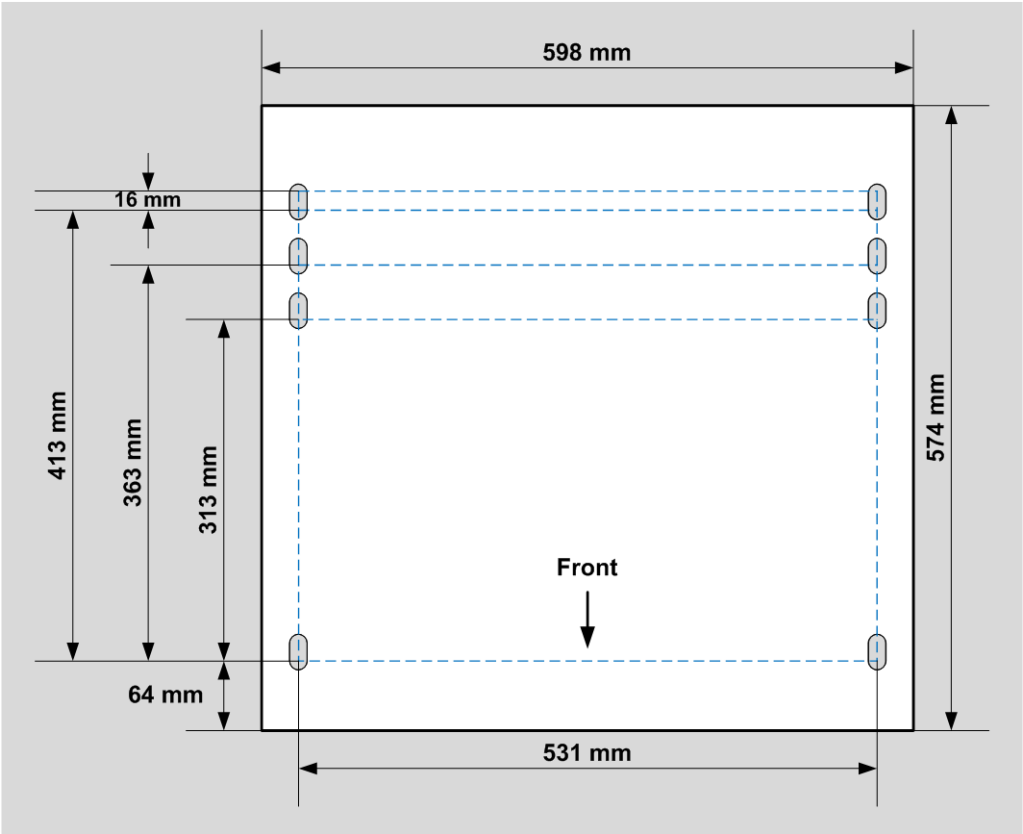
Caution!

Keep the cabinet top at least 200 mm away from obstacles.

3. Determine the holes for expansion bolts that fasten the cabinet base.

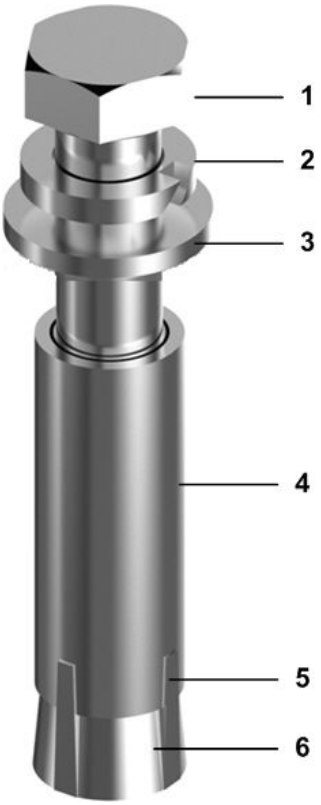
   In accordance with the hole drilling template or the dimensions in Figure 4-6, determine the holes for expansion bolts used for securing the cabinet base.

Figure 4-6 Dimensions of the Base and Expansion Bolt Positions



4. Drill holes and install the expansion bolts. For an overview of an expansion bolt, see Figure 4-7. For how to drill holes and install the expansion bolts, refer to Table 4-1.

Figure 4-7 Overview of an Expansion Bolt



1. Bolt
2. Spring washer
3. Flat washer
4. Expansion tube
5. Guide slot
6. Guide rib

Table 4-1 Descriptions for Drilling Holes and Installing Expansion Bolts

Step	Description
1	Use a φ16 drill bit to drill holes at the marked positions. The depth of the holes is 80 mm. Use a cleaner to remove dust. Keep the holes straight down to the ground during hole drilling, see Figure 4-8.
2	Screw a bolt clockwise slightly until the guide rib at the bottom of the expansion bolt cannot quit from the guide slot. Put the expansion bolt into the installation hole vertically, and knock the expansion bolt with a claw hammer until the top of the bolt aligns with the ground, see Figure 4-9.
3	Fasten the expansion bolt clockwise and ensure that the bolt is fixed to the expansion tube. Loosen and remove the nut, spring washer, and flat washer. They will be used later in base installation, see Figure 4-10.

Figure 4-8 Installing an Expansion Bolt 1

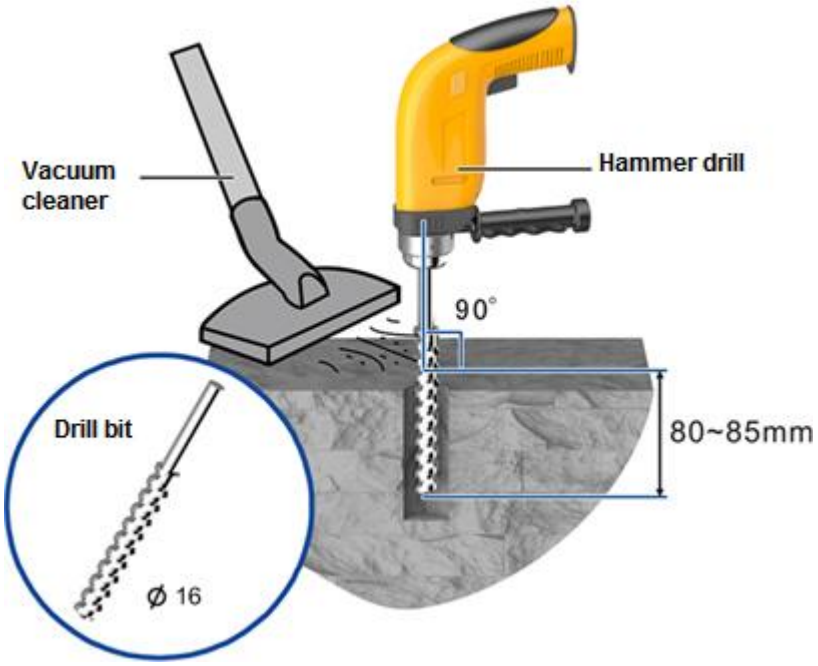
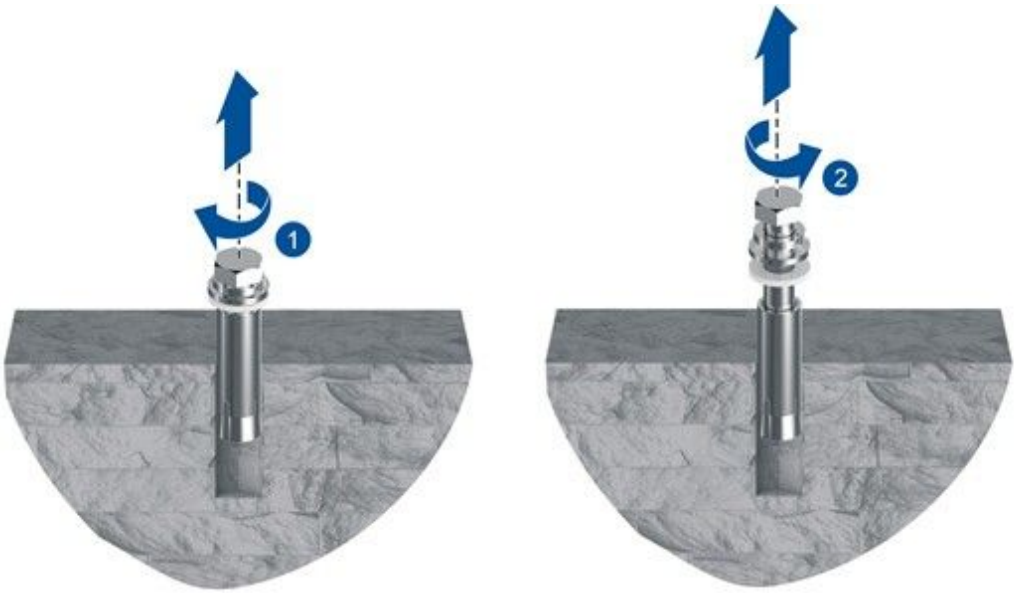


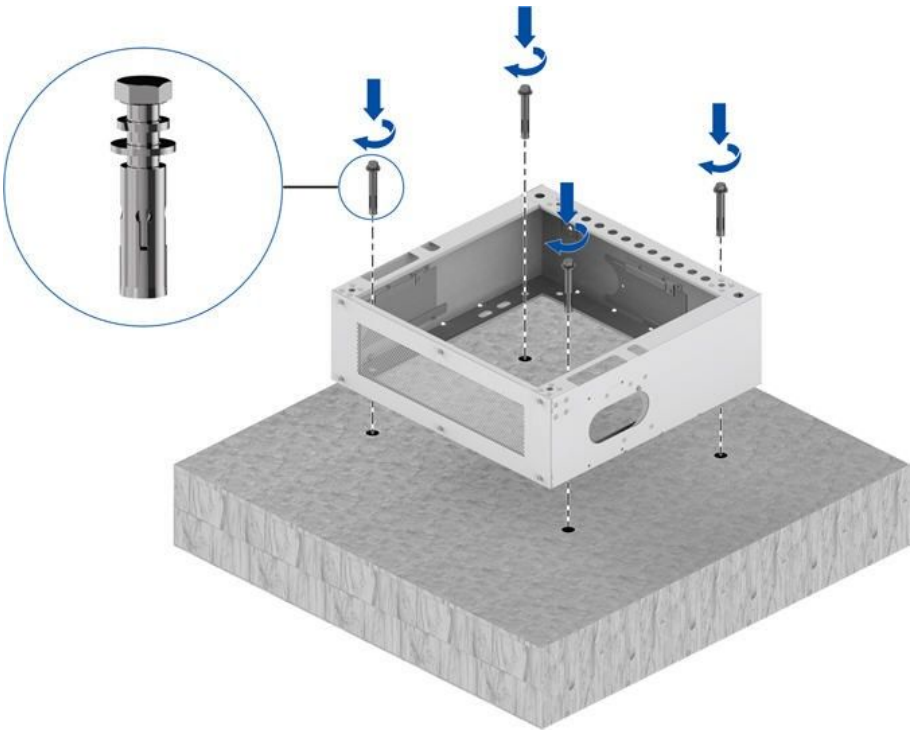
Figure 4-9 Installing an Expansion Bolt 2

Figure 4-10 Installing an Expansion Bolt 3



5. Install the base.
   a. Place the base onto the installation position.
   b. Verify that the installation position of the base is correct, pass the expansion bolts through the spring washers, flat washers, and base in turn, and then screw the bolts into the expansion tubes clockwise to make them fully expanded in the ground, see Figure 4-11.

Figure 4-11 Fixing the Base



6. Perform the following operations based on the type of the cabinet installed on the base.

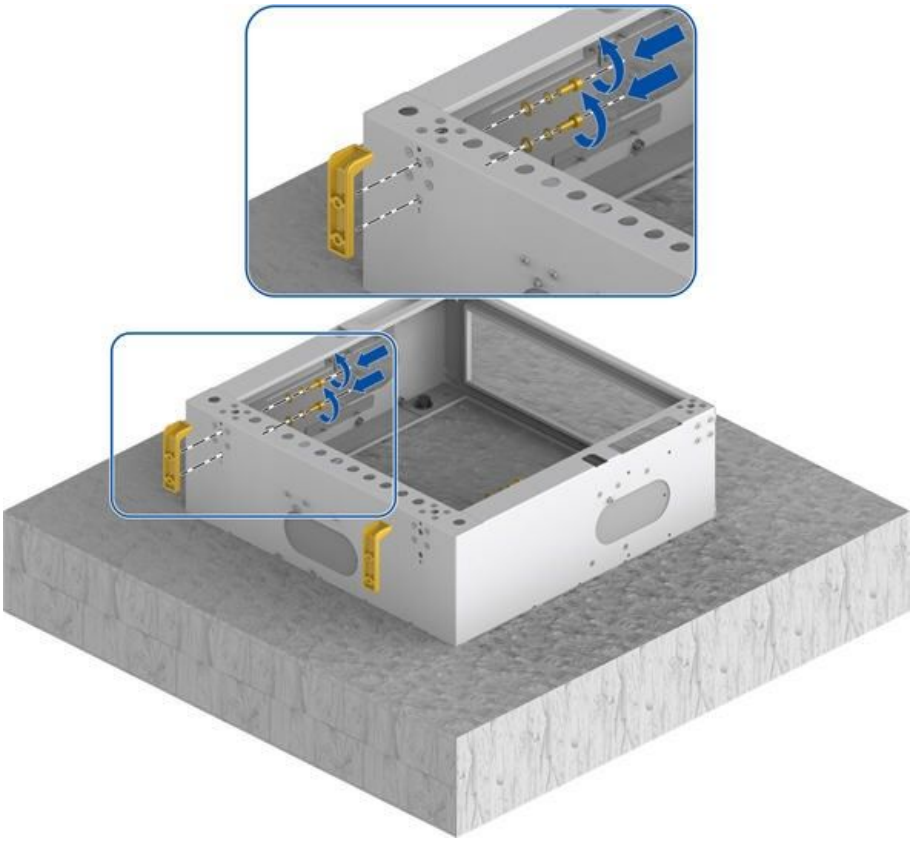
If...	Then...
It is an RF cabinet	Go to 7.
It is a baseband cabinet or battery cabinet	Go to 8.

7. Install the RC8910A cabinet onto the base.

   a. Install the clamping components.

      Use two M6 hexagonal screws to fasten the clamping components to the corresponding installation holes of the rear side of the base, see Figure 4-12.

Figure 4-12 Installing the Clamping Component

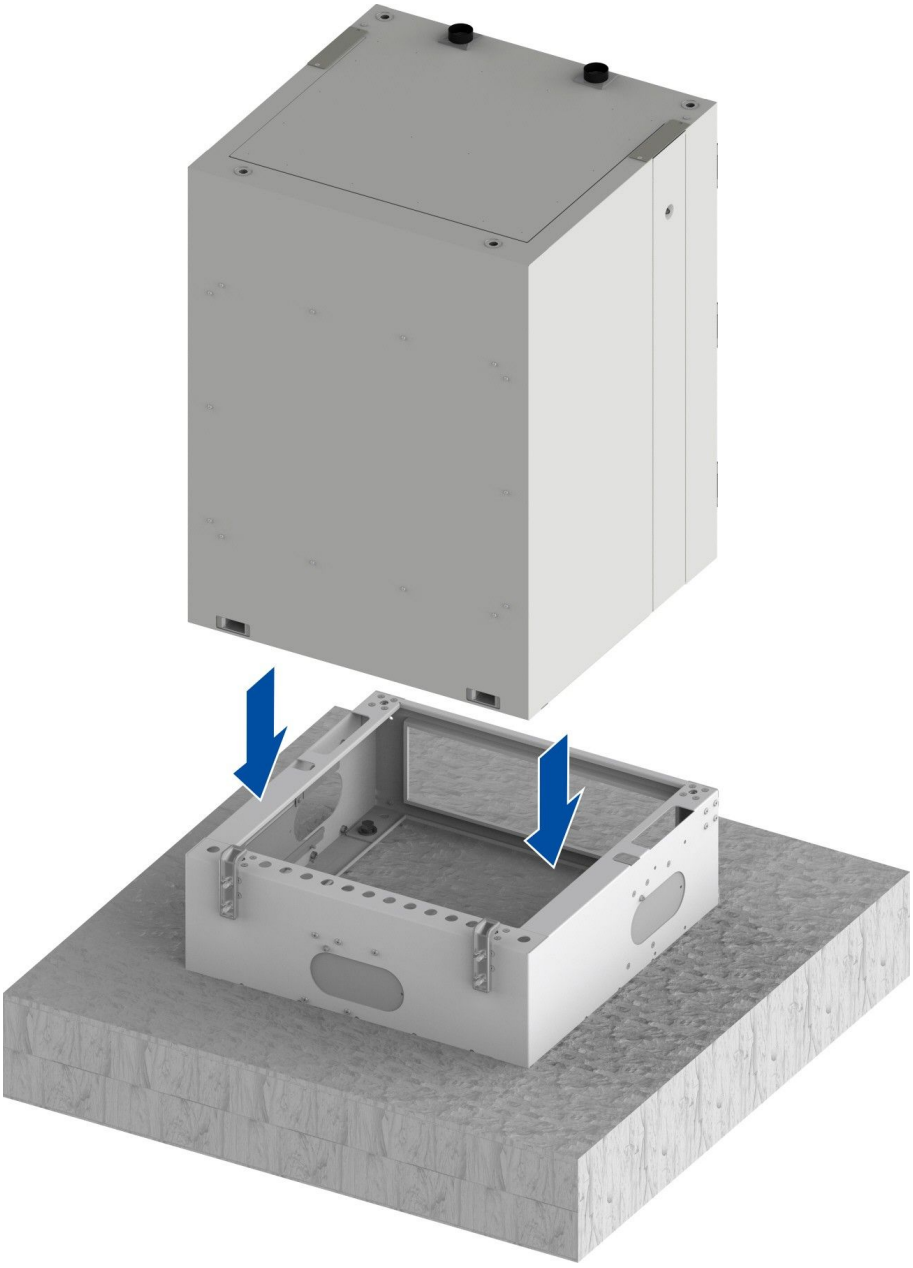


Note:

Ensure that the clamping components are vertical to the base. Otherwise, the cabinet installation may be difficult.

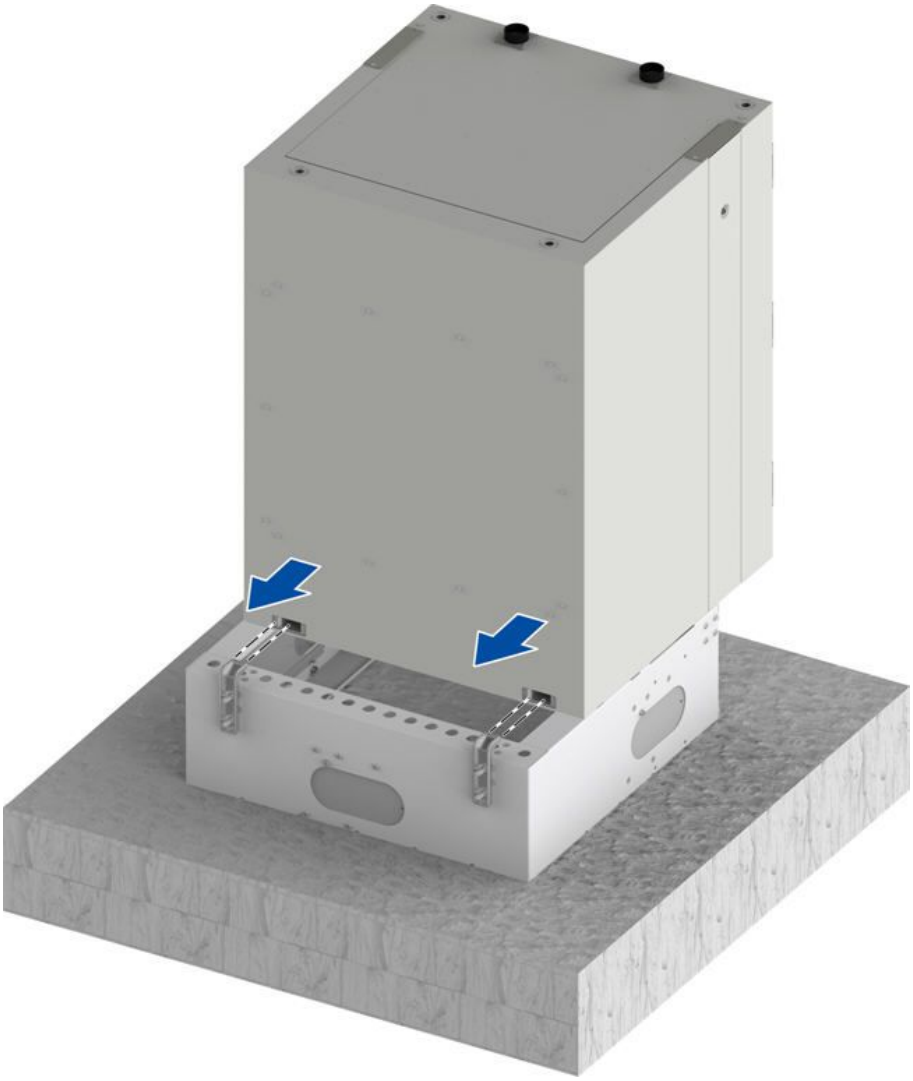
   b. Place the cabinet onto the base, see Figure 4-13.

Figure 4-13 Placing the Cabinet on the Base



c. Steadily push the cabinet backwards until the clamping components are fully inserted in the holes on the rear side of the cabinet and the cabinet is aligned with the base edges, see Figure 4-14.

Figure 4-14 Pushing the Cabinet Backward



Caution!

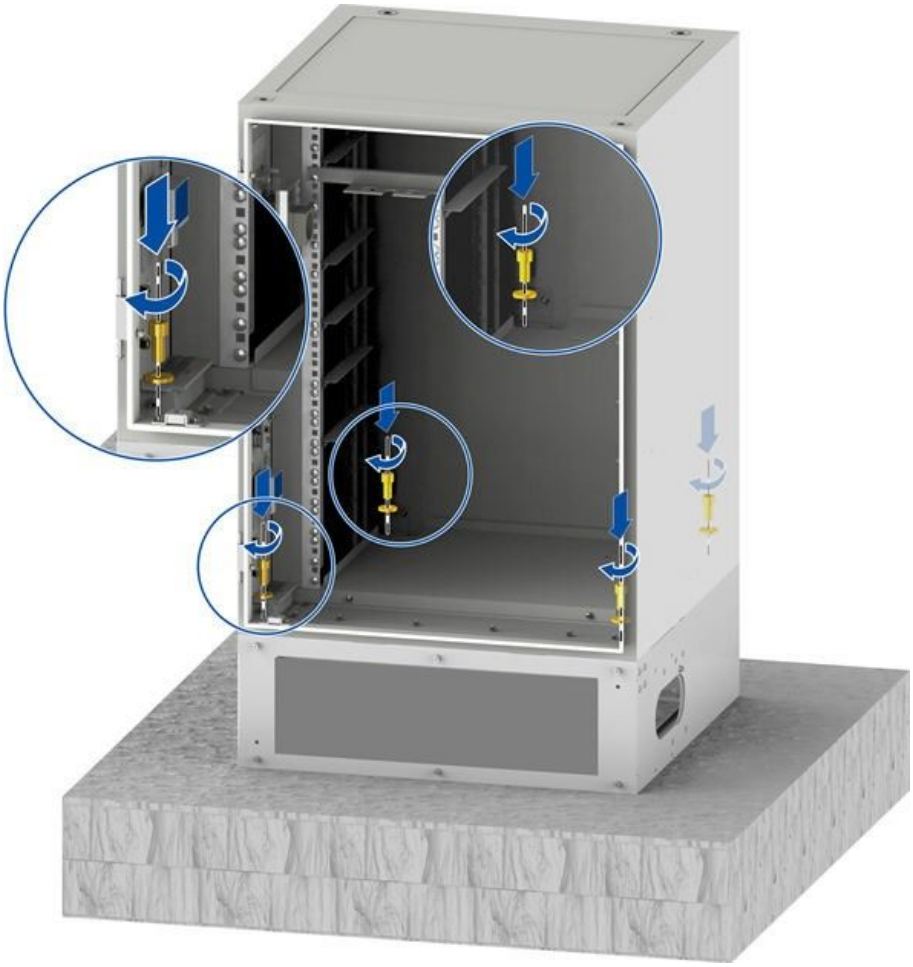
Push the cabinet steadily so as to prevent the cabinet from falling down.

d. Use two M12 hexagonal screws (with rubber washers) at the both sides of the front of the cabinet to secure the cabinet to the base, see Figure 4-15.

Figure 4-15 Securing the RC8910A Cabinet

8. Install the BC8910A cabinet or PC8910A cabinet on the base.
   a. Place the cabinet on the base.
   b. Secure the cabinet to the base by using four M12 hexagonal screws (with rubber washers) at each bottom corner of the cabinet, see Figure 4-16.

Figure 4-16 Securing the BC8910A Cabinet



The procedure of securing a PC8910A cabinet is similar to that of securing the BC8910A cabinet. The difference is that when you secure the PC8910A cabinet, the cabinet bottom does not need to be removed.

9. Adjust the cabinet installation position and cabinet tilt.

   Adjust the cabinet horizontally and vertically (using the iron plate at the low place or adjusting the tilt) to make the vertical tilt of no more than 5°.

10. Verify the installation.

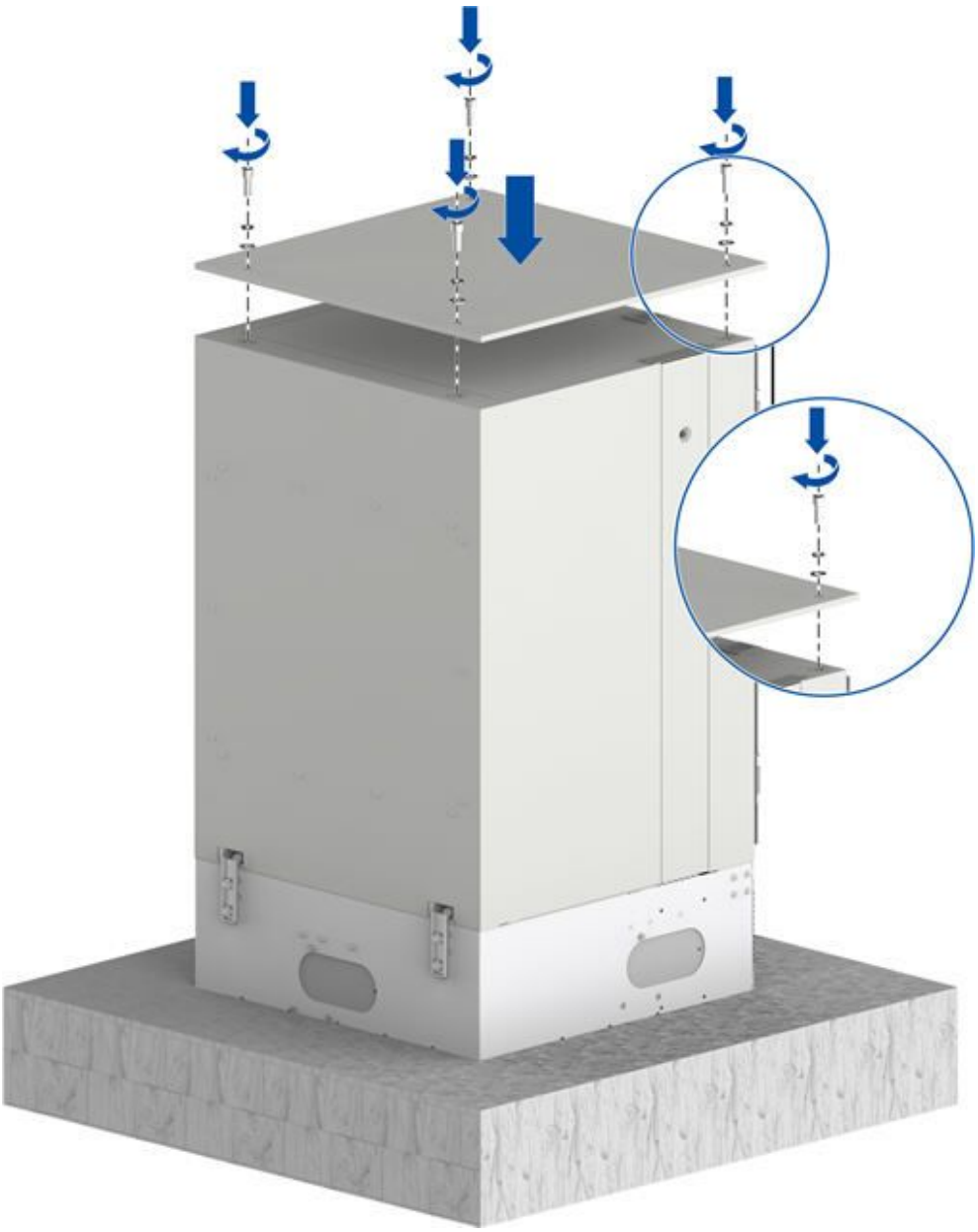
    Check the cabinet installation position and cabinet tilt after fastening screws tightly. The vertical gradient cannot be greater than 5°.

11. (Optional) Install a top cover.

    It is required to install a top cover on the top of the floor-mounted cabinet or the upper cabinet of the stacked cabinets.

    Place the top cover on the top of the cabinet, and fix the top cover to the cabinet by using four M12 cap screws with steel washers, see Figure 4-17.

Figure 4-17 Placing a Top Cover



12. Remove the air filter.

    Remove the six anti-theft screws from the front panel of the base by using a special wrench, and remove the air filter, see Figure 4-18.

    To route cables, the front panel of the cabinet bottom and the air filter must be removed. After all the cables of the ZXSDR BS8900A are installed, you must install the air filter and the front panel of the cabinet bottom.

Figure 4-18 Removing the Air Filter

– End of Steps –

4.3 Installing Stacked Cabinets

This procedure describes how to install stacked cabinets.

Prerequisite

The lower-layer cabinet in the stacked cabinet installation mode is installed.

Context

The common combination modes of the ZXSDR BS8900A cabinets are described as follows:

- Combination 1: BC8910A + RC8910A+PC8910A
- Combination 2: BC8910A + RC8910A

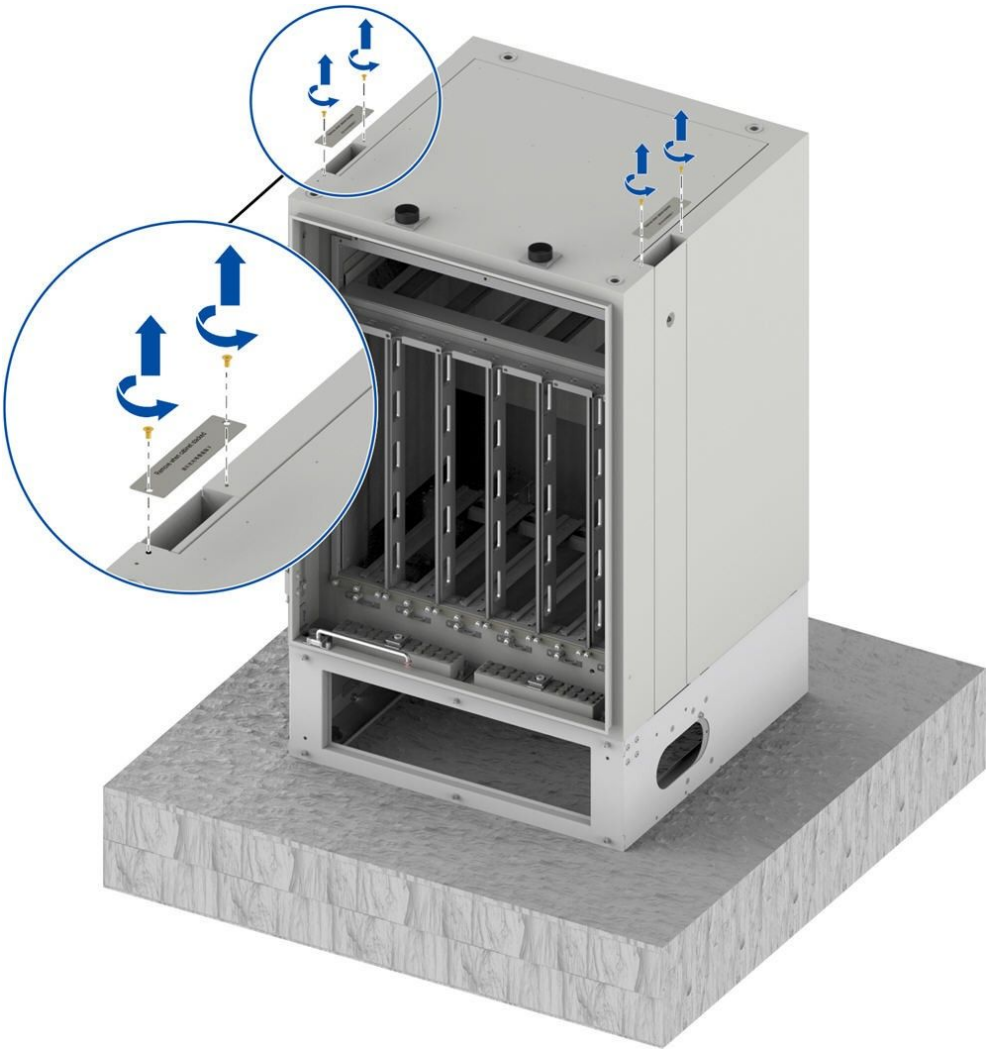
In these two combinations, BC8910A is the cabinet that needs to be stacked.

Steps

1. Place the top cover on the top of the upper-layer cabinet, and fix it to the cabinet using four M12 hexagon bolts with steel gaskets.

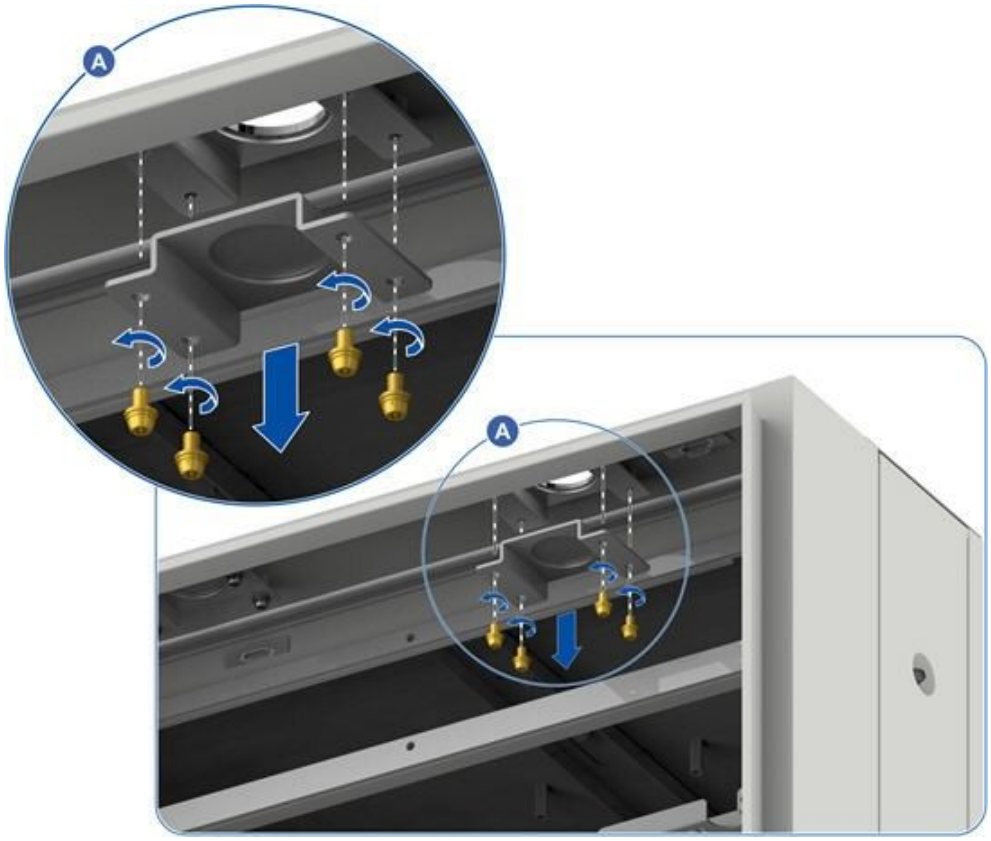
2. Remove the cover plate of the cable trough on the lower-layer cabinet by removing the screws, see Figure 4-19.

Figure 4-19 Removing the Screws from the Cover Plate of the Cable Trough



3. Remove the cover plate of the routing hole by removing the four screws inside the lower-layer cabinet, see Figure 4-20.

Figure 4-20 Removing the Screws from the Cover Plate of the Routing Hole



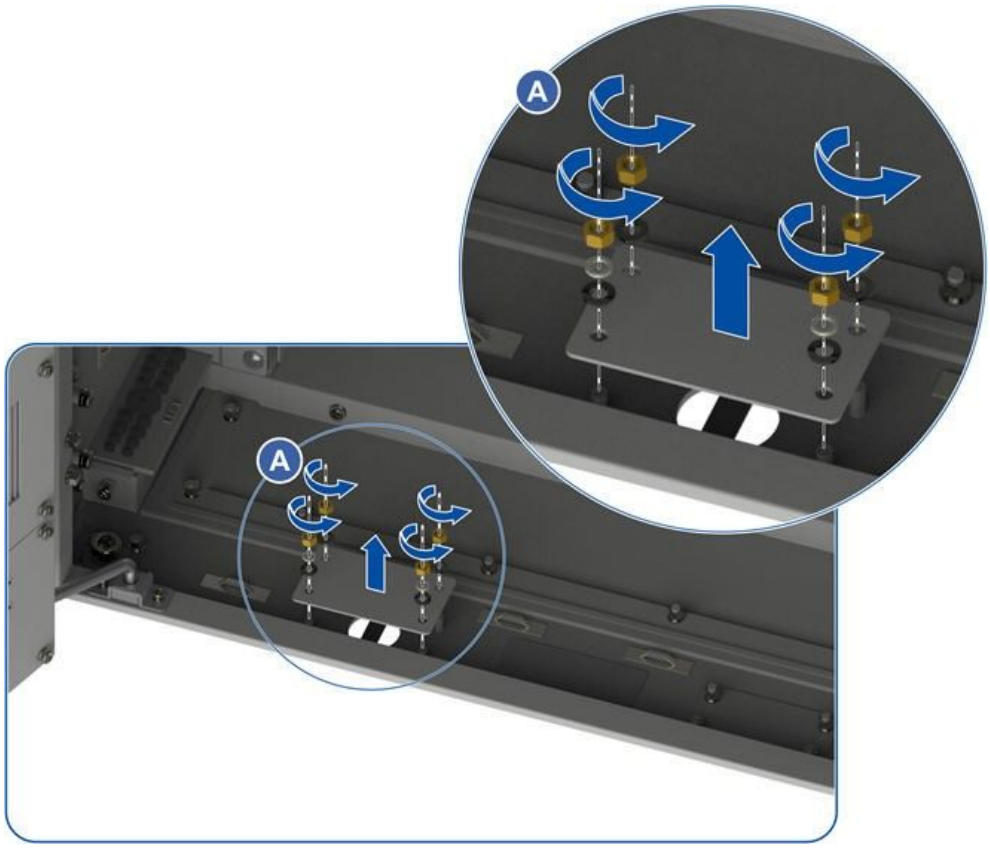
4. Insert four M12 bolts (with rubber washers) through the holes at the four corners of the upper-layer and low-layer cabinets to fix the cabinets, see Figure 4-21.

Figure 4-21 Fixing the Upper–Layer Cabinet to the Lower–Layer Cabinet

If a heater is installed in the BC8910A cabinet, the heater will cover the M12 bolt installation holes at the rear of the cabinet. You need to remove the locking screws of the heater first and then pull out the heater partially before installing M12 bolts. The power cable of the heater is not required to be removed.

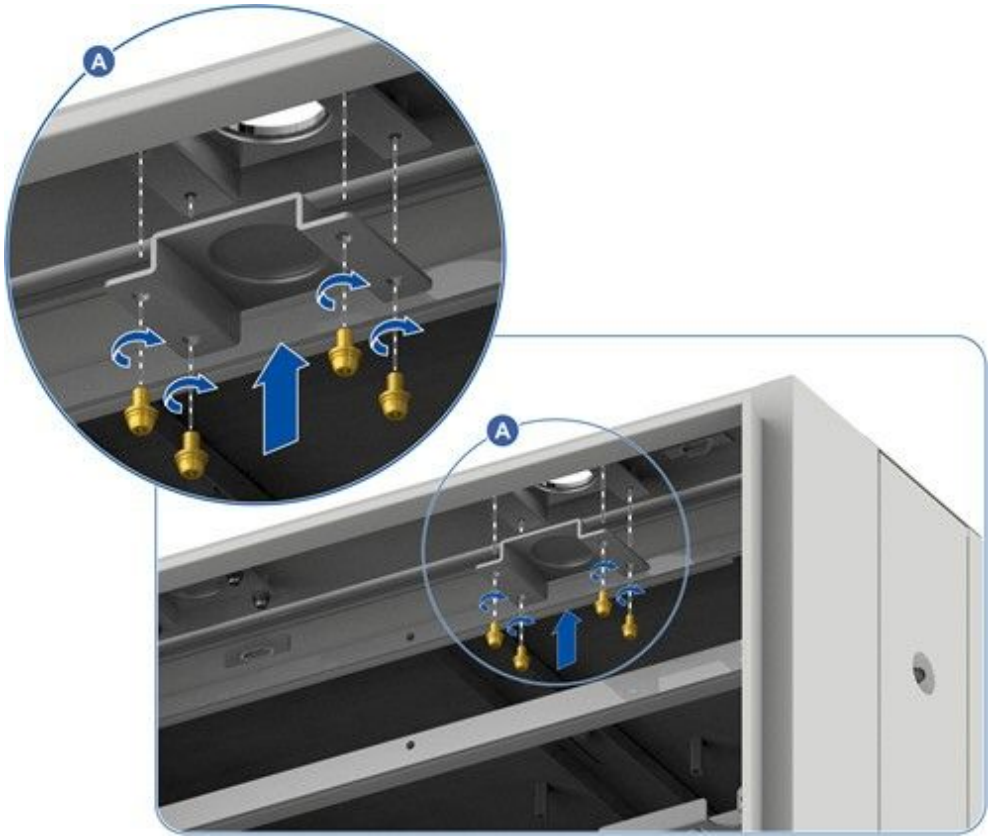
5. Remove the cover plate of the routing hole at the bottom of the upper–layer cabinet, see Figure 4-22.

Figure 4-22 Removing the Cover Plate of the Routing Hole



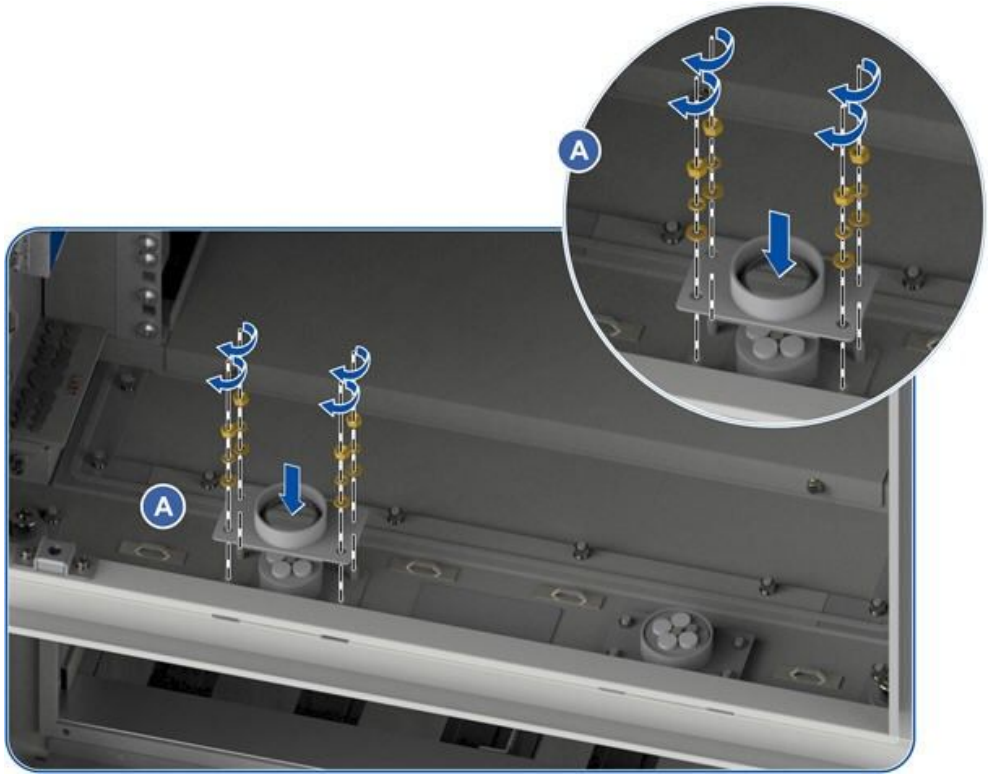
6. Secure the routing hole components beneath the cabinet routing hole on the top of the lower-layer cabinet, see Figure 4-23.

Figure 4-23 Securing the Cable-Through Components of the Lower–Layer Cabinet



7. Secure the routing components onto the cabinet routing hole at the bottom of the upper-layer cabinet, see Figure 4-24.

Figure 4-24 Securing the Routing Components of the Upper-Layer Cabinet



Note:

The routing hole components must be tightened to prevent the cabinet from water leakage.

8. To ensure that the cabinet is horizontal and properly positioned, adjust the cabinet position and gradient.
9. Seal the apertures by using seamgum.
   There are apertures between the upper and lower cabinets after the cabinets are installed in stack mode, which may cause water logging and equipment corrosion. You need to seal the apertures by using seamgum after the cabinets are installed in stack mode.
   a. Seal the apertures evenly by using seamgum, see Figure 4-25.

Figure 4-25 Sealing Apertures of Stacked Cabinets by Using Seamgum

The cable troughs on the left and right sides of the lower cabinet are not required to be sealed.

b. Remove the overflowing seamgum by using cloth.

– End of Steps –

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Chapter 5
Component Installation in a Cabinet

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5.1 Installing an RF Unit in the RC8910A Cabinet (Optional)

This procedure describes how to install an RF unit in the RC8910A cabinet. In most cases, the RF unit is installed. You follow this procedure to install the RF unit if required.

The RC8910A cabinet supports six RF modules (RSUs) installed.

When only one boot section of the RSU 2T4R is used in high carrier frequency (two transmit links are in the same boot section and use different carrier frequencies), the antenna jumper wires can only connect to the ANT1 and ANT3 ports.

Prerequisite

You wore an ESD wrist strap.

Steps

1. Determine the target slot to install the RSU, hold the handle of the RSU with one hand, support the bottom of the RSU with the other hand, try to make parallel the module and the guiding plane, and push it slightly into the cabinet.

   Note:

   You should note the direction of the RSU. The power interface must be downward, and the ANT interface must be upward.

2. Fix the RSU and ground lug with five M5 x 20 screws, see Figure 5-1.

Figure 5-1 Fixing the RSU

1. Fixing the RSU
2. Fixing the ground plug

3. After the RSU module is installed, connect the black power cable from the PDM to the **POWER** port of the RSU module.

– End of Steps –

5.2 Installing Batteries

This procedure describes how to install batteries in the PC8910A cabinet.

Caution!

If only four batteries are used, the unconnected terminals for batteries must be wrapped up with insulation materials.

Prerequisite

Relevant cables should be deployed before the PC8910A cabinet is placed. Otherwise, it may be difficult to deploy the cables.

Context

For the internal layout of the PC8910A cabinet, see Figure 5-2.

Figure 5-2 PC8910A Layout

The PC8910A cabinet can be configured with two packs of batteries and each battery pack has four 12 V batteries in serial connection. Refer to the followings to ensure that the dimensions and weight of the selected batteries are applicable to the PC8910A cabinet before these batteries are installed into the PC8910A cabinet:

- Every battery rack supports 260 kg at most, meaning that each battery is 65 kg at most.

- Assume that the battery spacing is 2 mm, at least 12 mm should be reserved in height and depth. The left and right sides of each battery pack should be at least 9 mm away from the inner wall of the PC8910A cabinet for electrical safety.
- In accordance with the dimensions of batteries and their space, calculate W1 (space between the right and left sides of the battery pack and the inner wall of the PC8910A cabinet), H1 (space between the top of the battery pack and the inner wall of the PC8910A cabinet), and D1 (space between the rear side of the battery pack and the inner wall of the PC8910A cabinet). Make a table shown in Table 5-1, and enter relevant values in Actual Spacing cells.

Table 5-1 Space Between the Battery Pack and the Inner Wall of the PC8910A Cabinet

Item	Stated Spacing	Actual Spacing
Battery Spacing	2 mm	
Spacing between the leftmost/rightmost battery and the PC8910A cabinet (W1)	≥ 9 mm	
Spacing between the battery top and the PC8910A cabinet (H1)	≥ 12 mm	
Spacing between the battery back and the PC8910A cabinet (D1)	≥12 mm	

Steps

1. Use the multimeter to verify that each battery is functioning properly by measuring the voltage of its terminals.

   Batteries from different suppliers may have various voltage ranges. See the relevant battery specifications to learn the voltage range of a battery. If the detected voltage of a battery is out of the normal range, it indicates that the battery is faulty. Replace the faulty battery with a functional one of the same type and from the same supplier.

2. Place batteries one by one onto the battery rack by the polarity directions.

Caution!

- Read the battery precautions carefully (such as safety requirements if g the batteries are carried) and learn about the correct battery connections before any operations on the batteries are performed. Improper operations on the batteries may cause danger. Avoid short circuits or electrolyte overflow during operations on batteries. Electrolyte overflow poses latent threat to the equipment because it corrodes metallic objects or circuit boards and damages the equipment (such as short-circuiting the circuit board).
- The wiring terminals of the batteries must face outwards to facilitate wire connection.
- Place the battery packs in the middle and reserve at least 9 mm from the left and right sides and top of each battery pack to the inner wall of the PC8910A cabinet for electrical safety, so as to avoid short circuits or even fire caused by wiring terminals touching with the inner wall.

3. Connect the terminals of the batteries.
4. Check the installation against the checklist shown in Table 5-2 and ensure that the answer to each item is Yes.

Table 5-2 Installation Verification Checklist

SN	Check Criterion	Check Result
1	The installed cabinet stands firmly and looks eye-pleasing and neat.	Yes No
2	The gradient of the installed cabinet is smaller than 5°.	Yes No
3	All screws are fastened reliably, with the flat washers and spring washers correctly used.	Yes No
4	The cabinet is free from damages or fallen paint.	Yes No
5	The cabinet is clean without dust, pollutant or sundries.	Yes No
6	The cabinet door can be opened or closed easily, and the door lock is functioning properly.	Yes No
7	Other components (for example, the rectifier unit and monitoring unit) is secure.	Yes No

– End of Steps –

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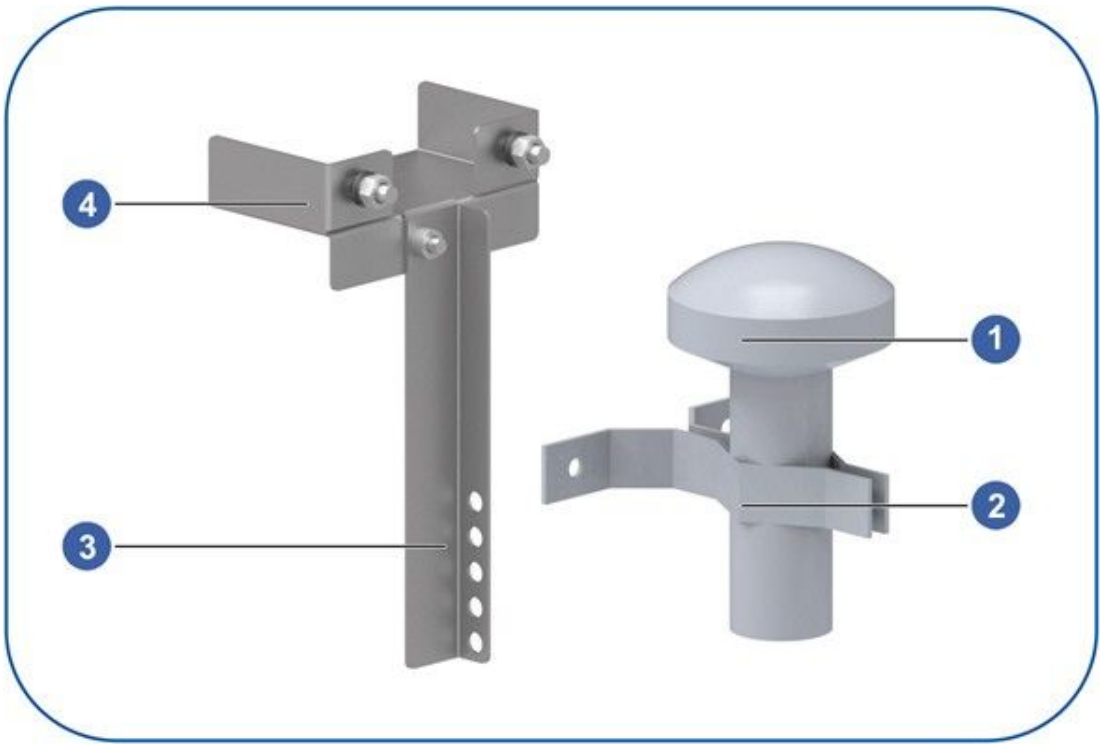
Chapter 6
Installing the GPS Antenna (Optional)

The ZXSDR BS8900A supports a GPS antenna installed on any cornet of the cabinet top. The GPS antenna is installed on the top of the cabinet to shorten the distance between the GPS antenna and the cabinet, to reduce the complexity of installing the GPS antenna and cables, and to save installation space and time.

Context

To install the GPS antenna on the top of the cabinet, you need to install GPS installation assembly on the hanger on the top of the cabinet. For GPS installation assemble, see Figure 6-1.

Figure 6-1 GPS Installation Assembly



1. GPS antenna
2. GPS installation clamp
3. GPS cable trough
4. GPS installation accessory

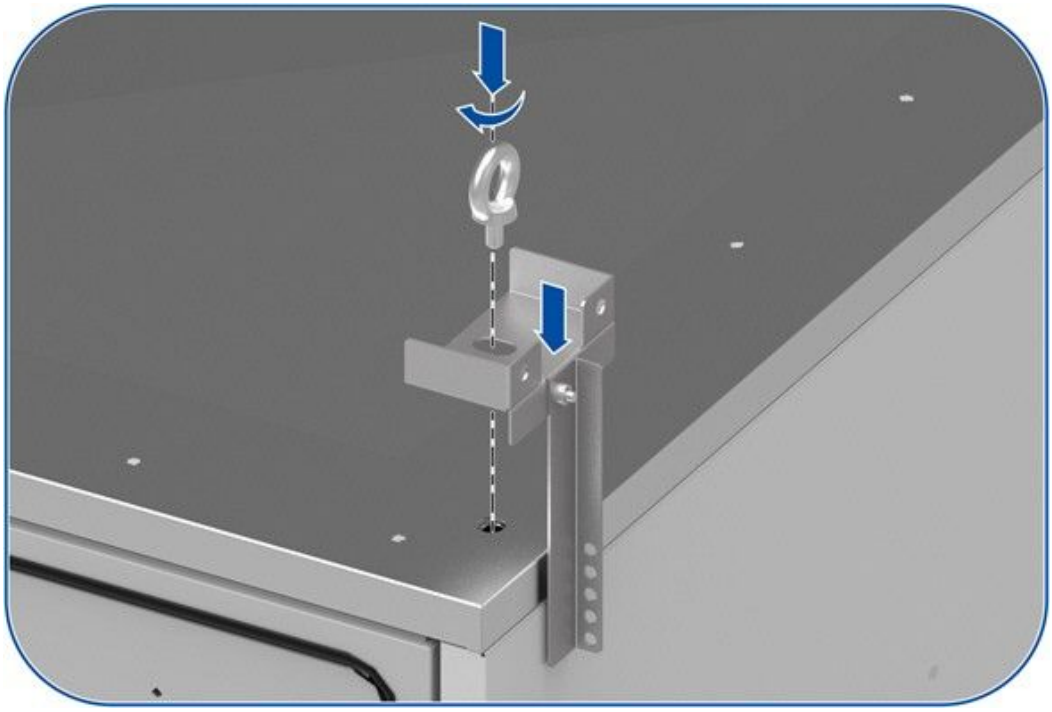
Steps

1. Place the GPS installation accessory at the hole on the top of the cabinet where the hanger will be installed. Fasten the hanger to fix the GPS installation accessory, see Figure 6-2.

Note:

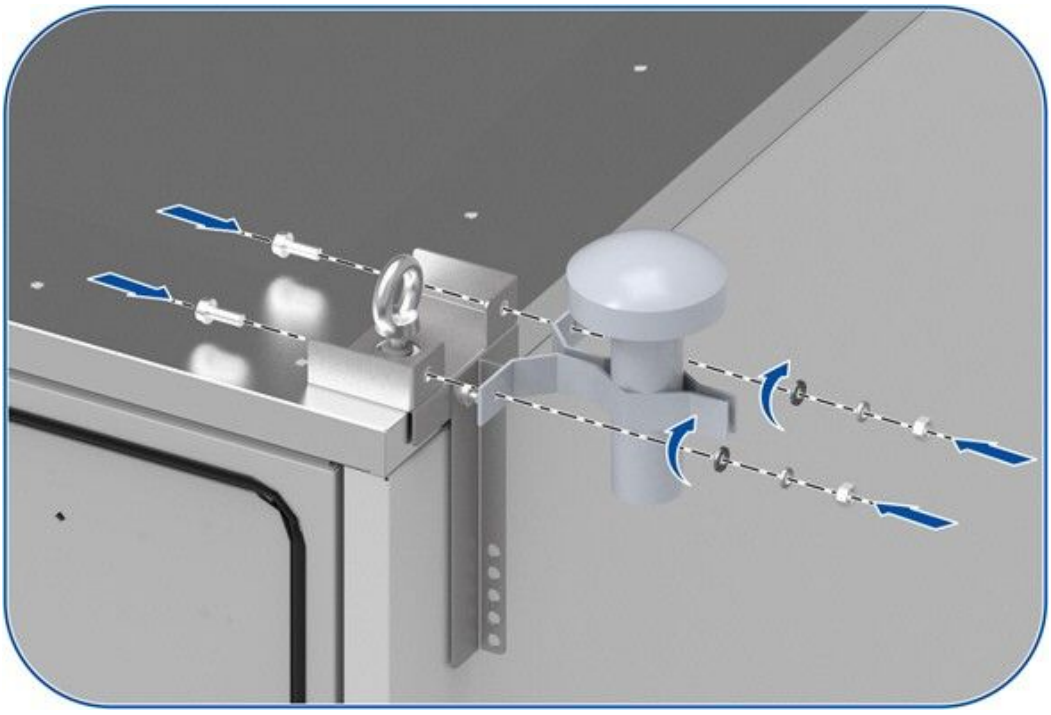
The GPS cable trough is fixed to the GPS installation accessory to bind the GPS cable.

Figure 6-2 Fixing the GPS Accessory on the Top of the Cabinet



2. Use a GPS clamp to fix the GPS antenna, and use two bolts to fix the GPS clamp on the GPS installation accessory, see Figure 6-3.

Figure 6-3 Fixing the GPS Antenna



– End of Steps –

Result

For the installed GPS antenna on the top of the cabinet, see Figure 6-4.

Figure 6-4 GPS Antenna Installed on the Top of the Cabinet

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Chapter 7
Cable Installation

The cables of the ZXSDR BS8900A cabinet can be classified as grounding cables, power cables, transport cables, and monitoring cables. In accordance with the cable routing in stacked cabinets, these cables are classified as external cables and inter-cabinet cables. The two types of cables are threaded through different cable holes and waterproof modules during cable routing.

Table of Contents

7.1 Cabling Overview

External Cables of Stacked Cabinets

The external cables are used to connect the BC8910A cabinet and RC8910A cabinet to external devices.

The external cables are routed into the BC8910A cabinet or RC8910A cabinet through the waterproof module at the bottom of the cabinet and then connected to the corresponding ports.

External Cables of the BC Cabinet

The external cables of the BC8910A cabinet include:

- Grounding cable
- External power input cables
  - → AC power input cable of the BC cabinet
  - → DC power input cable of the BC cabinet
  - → DC power input cable of the PC cabinet
- Transport cables

- → Ethernet network cable
- → transport fibers

- Signal cables
  - → Outdoor optical fibers
  - → GPS feeder
  - → E1/T1 cable
- Monitoring cable

External Cable Routing of the BC Cabinet

For stacked cables, the external cables of the BC8910A cables are threaded through the waterproof modules on two sides of the BC8910A cabinet and then routed along the cable troughs of the RC8910A cabinet. For external cable routing of the BC8910A cabinet, see Figure 7-1.

Figure 7-1 External Cable Routing of the BC8910A Cabinet

External Cables of the RC Cabinet

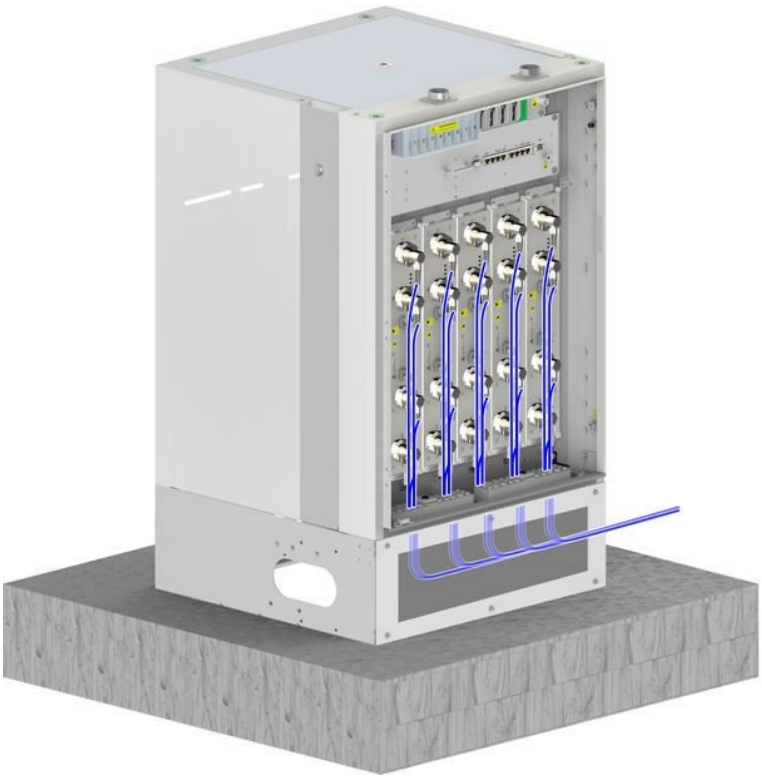
The external cables of the RC8910A cabinet include:

- Antenna jumper
- AISG cable

External Cable Routing of the RC Cabinet

The jumper wires are threaded though the waterproof module at the bottom of the cabinet, see Figure 7-2.

Figure 7-2 External Cable Routing of the RC8910A Cabinet



Inter-Cabinet Cables

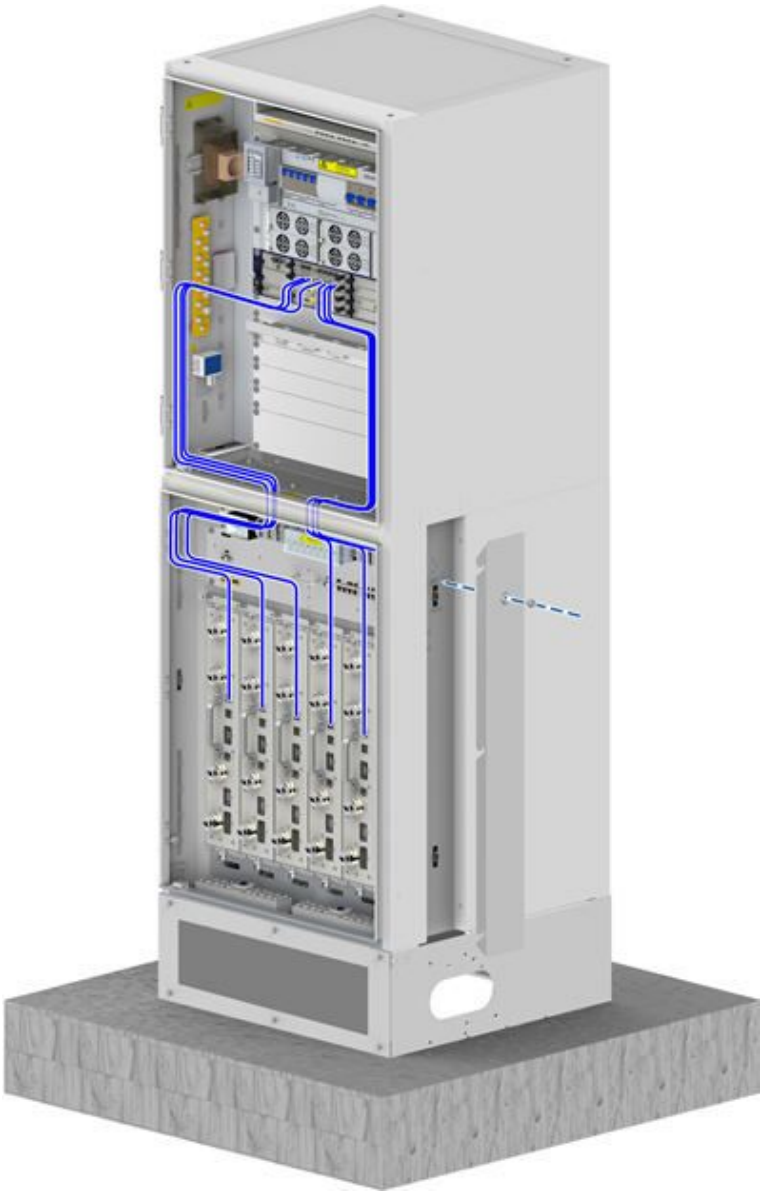
The inter-cabinet cables refer to the cables connecting the BC cabinet to the RC cabinet.

The inter-cabinet cables include:

- Grounding cable of the RC cabinet
- DC power input cable of the RC cabinet
- SFP cable

The inter-cabinet cables are threaded through the cable-through holes on the BC8910A cabinet and RC8910A cabinet and then connected to the corresponding ports, see Figure 7-3.

Figure 7-3 Cable Routing for Stacked Cabinets



Cable Routing Requirements

- Before power cables and grounding cables are laid out, the connectors must be covered by insulation tape.
- The power cables, grounding cables, and signal cables must be routed separately.
- When signal cables, DC power cables, AC power cables, and feeders are routed in parallel along a cable ladder, ensure that a spacing greater than 100 mm is reserved between different types of cables.
- If signal cables and power cables need to be laid out in a cross manner, the cross angle must be 90°.
- If a cable needs to bend, ensure that the bending radius meets the minimum bending radius requirement, meaning that the bending radius must be equal to or greater than 20 times of the cable's outer diameter.

- When the power cable is connected to the connector of the power distribution box in the cabinet, the cable must be routed in a smooth and straight manner.
- The actual installation positions of the cables must meet the engineering survey requirements and be consistent with configurations.
- The cable routing paths are clear and reasonable with even and smooth bends, and meet the specifications in engineering drawings.
- Signal cables are aligned neatly and smoothly without cross.
- Cables are laid out for convenient maintenance and capacity expansion.
- You know clearly the planned route of each feeder. It' etter to draw the routing in a piece of paper to avoid reword due to feeder cross.
- The bending radius of a common feeder must be greater than 20 times of the outer diameter. The bending radius of a soft feeder must be greater than 10 times of the outer diameter.
- For the requirements of the bending radius of feeders, refer to Table 7-1.

Table 7-1 Requirements of Bending Radius of Feeders

Feeder Type	Minimum Bending Radius (Recommended)	
	Single Bending	Continuous Bending (≤ 15 times)
Soft 1/2" feeder	150 mm	300 mm
1/2" feeder	500 mm	1250 mm
7/8" feeder	900 mm	2500 mm
5/4" feeder	1500 mm	3800 mm

Cable Bundle Requirements

- The cable ties must be at an even spacing with enough slack and face the same direction.
- The surplus part of cable clips should be trimmed evenly from the ends without sharp edges.
- Power cables and grounding cables should be bound separately from signal cables.
- Cables in the cabinet must be bound properly with cable ties.
- Cables routed along cable troughs must be bound. The bound cables must be routed straight and orderly close to each other.
- Proper redundant length must be reserved for each connector for installation and removing.

7.2 Cable-Through Holes

There are two cable-through holes and two waterproof modules at the bottom of the BC8910A cabinet. The cable-through holes are used to thread the inter-cabinet cables. The waterproof modules communicate with the cable troughs on the two sides of the RC8910A cabinet and PC8910A cabinet.

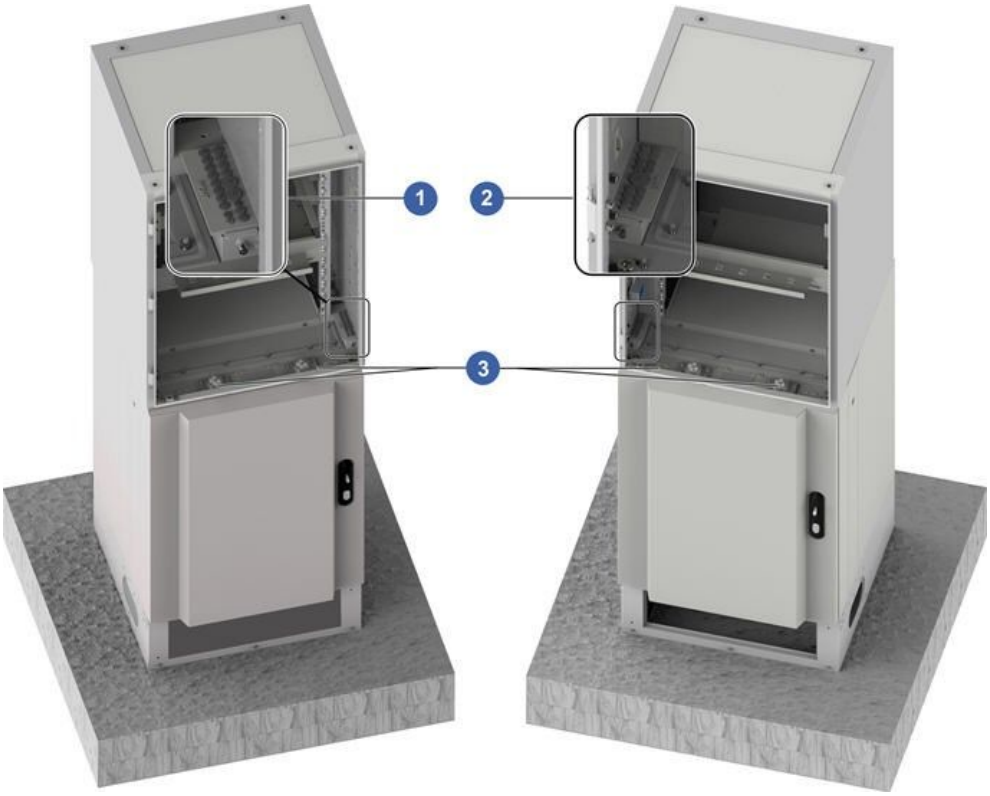
There are two cable troughs on the two sides of the RC8910A cabinet and PC8910A cabinet. The cable troughs are used for routing the external cables of the BC8910A cabinet when two cabinets are stacked.

The PC8910A cabinet provides two cable-through holes at the bottom of the box. The cable-through holes are used for routing the power cable and monitoring cable of the PC8910A cabinet.

Cable-Through Holes of BC8910A

For the cable-through holes of the BC8910As when being stalled in a stacked manner, see Figure 7-4.

Figure 7-4 Cable-Through Hole of the BC8910A



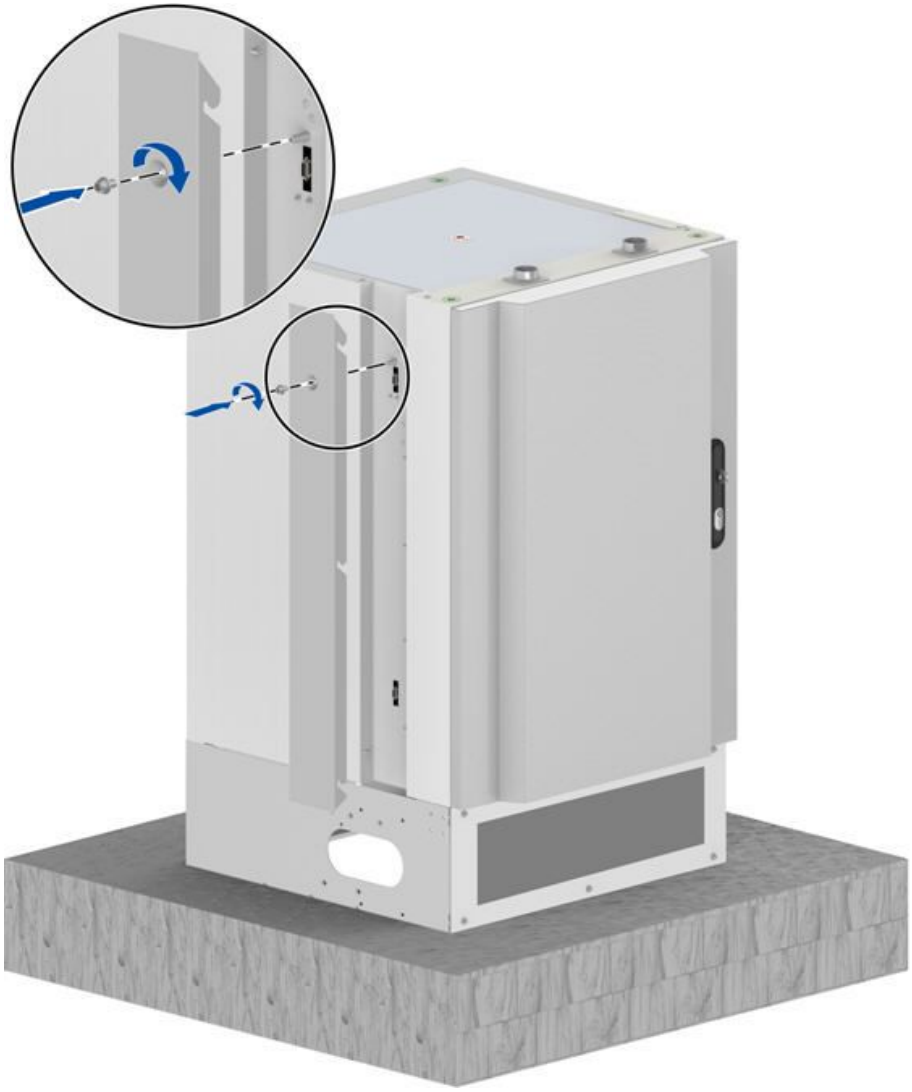
1. Waterproof module on the right side
2. Waterproof module on the left side
3. Cable-through hole

Cable-Through Holes of the RC8910A Cabinet

To facilitate the routing of cables when the RF and baseband cabinets are stacked and installed, two cable-through holes and two routing troughs are designed on the top of the cabinet. The two routing troughs are located on the left and right sides of the RF cabinet. They are interoperable with external environment and facilitate the routing of the BC8910A cabinet. The two cable-through holes are located on the front top of the cabinet to facilitate the routing between RC8910A and BC8910A cabinets.

- When routing cables along a trough, remove the cover of the trough with a hexagon anti-theft ring wrench of the RC8910A cabinet (specifically, unscrewing the six screws on the rear cover), and reseat the cover after all cables are routed, see Figure 7-5.

Figure 7-5 Cover of the Cable Tray



- Before the stacked installation, the waterproof plates for the two cable-through holes must be removed and then reseated after cables are routed.

Cable-Through Holes of the PC8910A Cabinet

Two cable-through holes (right and left) are designed on the bottom of the PC8910A cabinet and the two holes are protected with waterproof plugs. Remove these plugs before the cables are routed and reseat them after the cables are routed.

7.3 Waterproof Module Description

7.3.1 Waterproof Module of the Baseband Cabinet

Waterproof Module Description

External cables are routed into the rectangular cable troughs with waterproof modules on the left and right sides of the BC8901A cabinet. The cables between stacked cabinets are routed through the two round cable-through holes in the front of the cabinet. If batteries are installed in the lower cabinet, an acid-gas-prevention module must be installed.

Note:

If there are too external cables in the baseband cabinet to be routed through the cable-through hole reserved by the waterproof module, the waterproof should be removed. You can route the cables through the cable tray directly, and fill the gaps with fireproof clay.

For the structure of the waterproof module of the baseband cabinet, see Figure 7-6.

Figure 7-6 Waterproof Module of the Baseband Cabinet

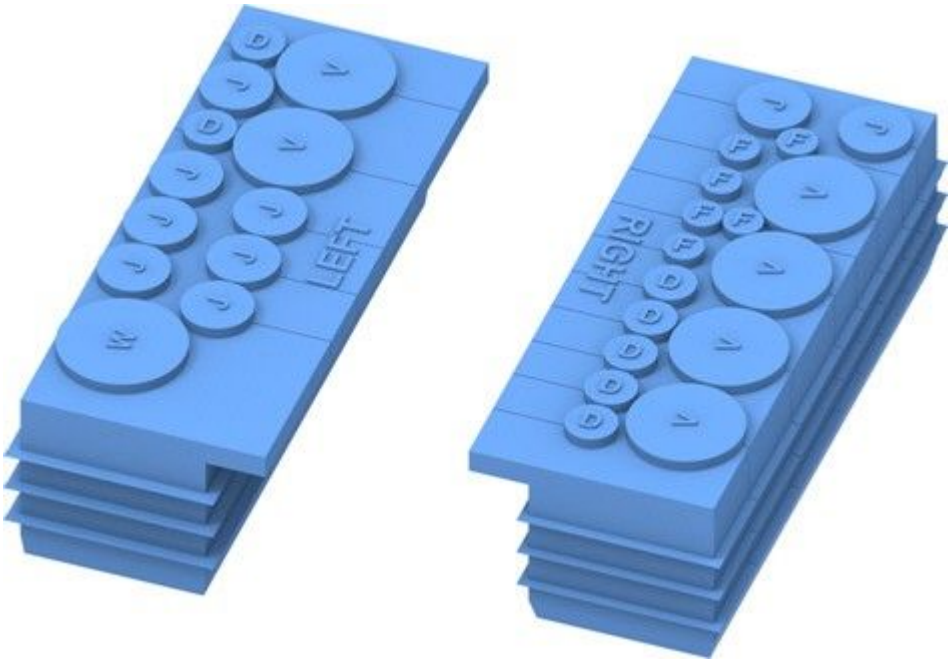


Table 7-2 Aperture Description

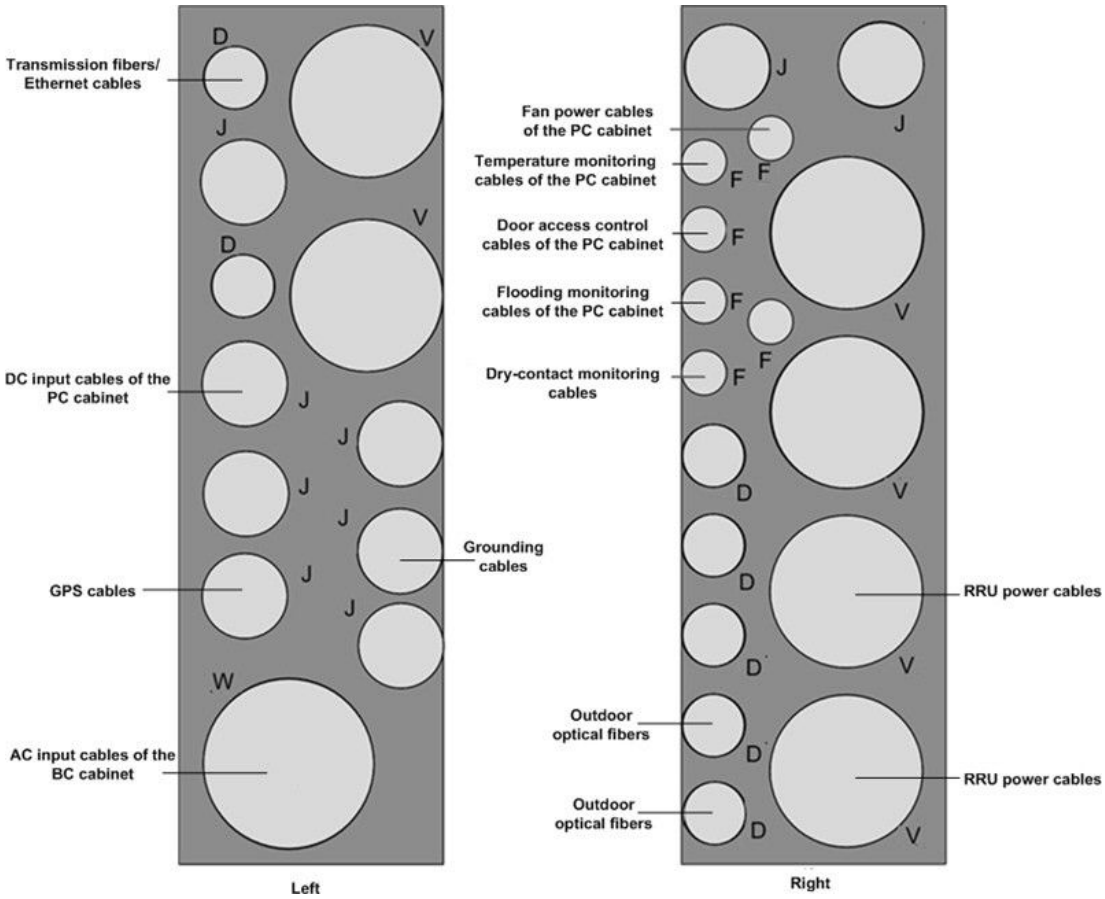
Waterproof Module	Hole	Quantity	Aperture (mm)	Function
Waterproof on the lift side	D	2	7	For outdoor optical fibers of RRUs, Ethernet cables, and T1 cables
	J	7	9.5	For DC input power cables, grounding cables, battery power cables, GPS cables, and E1 (75/120Ω) trunking cables
	V	2	17	For RRU power cables
	W	1	19	For AC input power cables
Waterproof on the right side	D	5	7	For outdoor optical fibers of RRUs, Ethernet cables, and T1 cables
	F	6	5	For monitoring cables such as temperature monitoring cables, door access control cables, fan power cables of the PC cabinet, and dry-contact cables.
	J	2	9.5	For DC input power cables, grounding cables, battery power cables, GPS cables, and E1 (75/120Ω) trunking cables
	V	4	17	For RRU power cables

Cable Routing Example

For cables routed through the waterproof module of the baseband cabinet, see Figure 7-7. Cables can be routed through other holes with the same aperture as the cable-through holes of the waterproof module if required.

Install the waterproof module after routing all the cables.

Figure 7-7 Cable Routing Through the Waterproof Module of the Baseband Cabinet



7.3.2 Waterproof Module of the RF Cabinet

Waterproof Module Description

For the structure of the waterproof module at the bottom of the RF cabinet, see Figure 7-8.

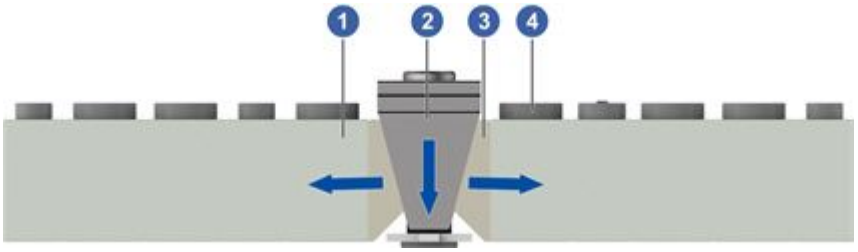
Figure 7-8 Waterproof Module of the RF Cabinet

Table 7-3 Descriptions for Holes on the Waterproof Module

Hole	Quantity	Diameter (mm)	Function
F	9	6.5	For optical fibers and AISG cables
P	3	9	For power cables
R	12	12.5	For antenna cables

When the screw is tightened, the vertical slider applies force vertically, and the horizontal sliders apply force horizontally. The cable plugs contact closely with the cables to waterproof the cables. For the operation principle of waterproof module in the RC8910A cabinet, see Figure 7-9.

Figure 7-9 Operation Principle of the Waterproof Module in the RF Cabinet

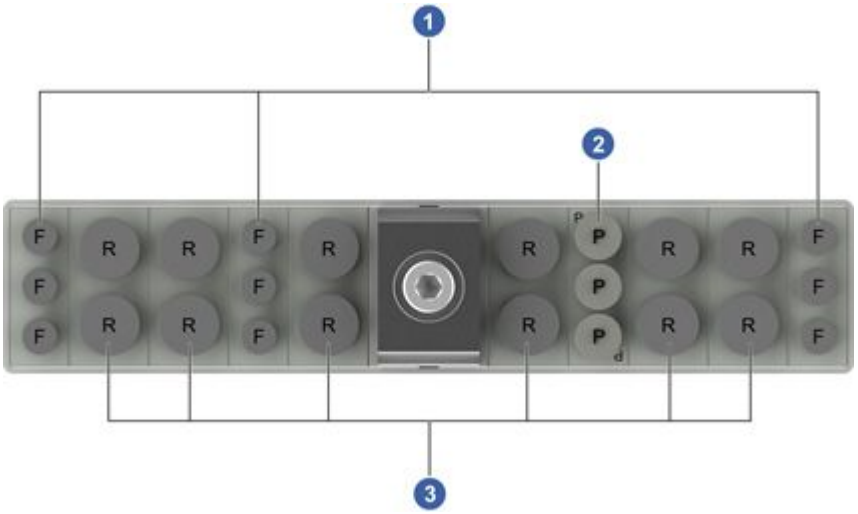


1. Cable plug
2. Vertical slider
3. Horizontal slider
4. Waterproof cap

Cable Routing Example

For cables routed through the waterproof module of the RF cabinet, see Figure 7-10.

Figure 7-10 Cable Routing Through the Waterproof Module of the RF Cabinet



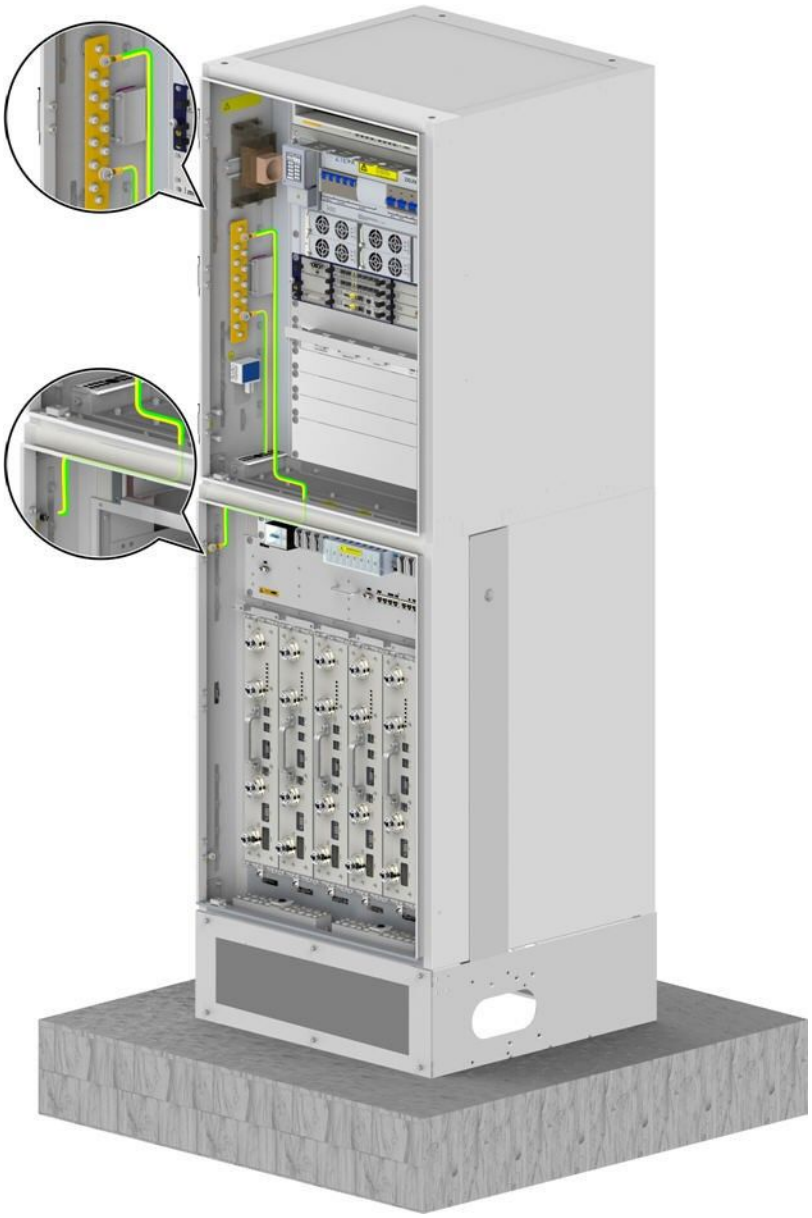
1. Optical fibers
2. Power cables
3. Antenna cables

7.4 Grounding Cable Installation

The grounding cable installation includes installation of the grounding cables of stacked cabinets and single cabinet. This procedure describes how to install the grounding cables for stacked cabinets (BC8910A cabinet and RC8910A cabinet) and the PC8910A cabinet.

The grounding cables of the stacked cabinets include the grounding cables of the BC8910A cabinet and RC8910A cabinet. For the grounding cable routing of the stacked cabinets, see Figure 7-11.

Figure 7-11 Grounding Cable Routing of Stacked Cabinets



The grounding cable of the single cabinet is connected to a nearby outdoor grounding busbar.

7.4.1 Installing a Grounding Cable for the BC8910A Cabinet

This procedure describes how to install the bus grounding cable of the stacked cabinets. The bus grounding cable is connected to a nearby outdoor grounding busbar.

Prerequisite

- The ESD wrist strap must be worn.
- The tributary output of the power supply is cut off.

Context

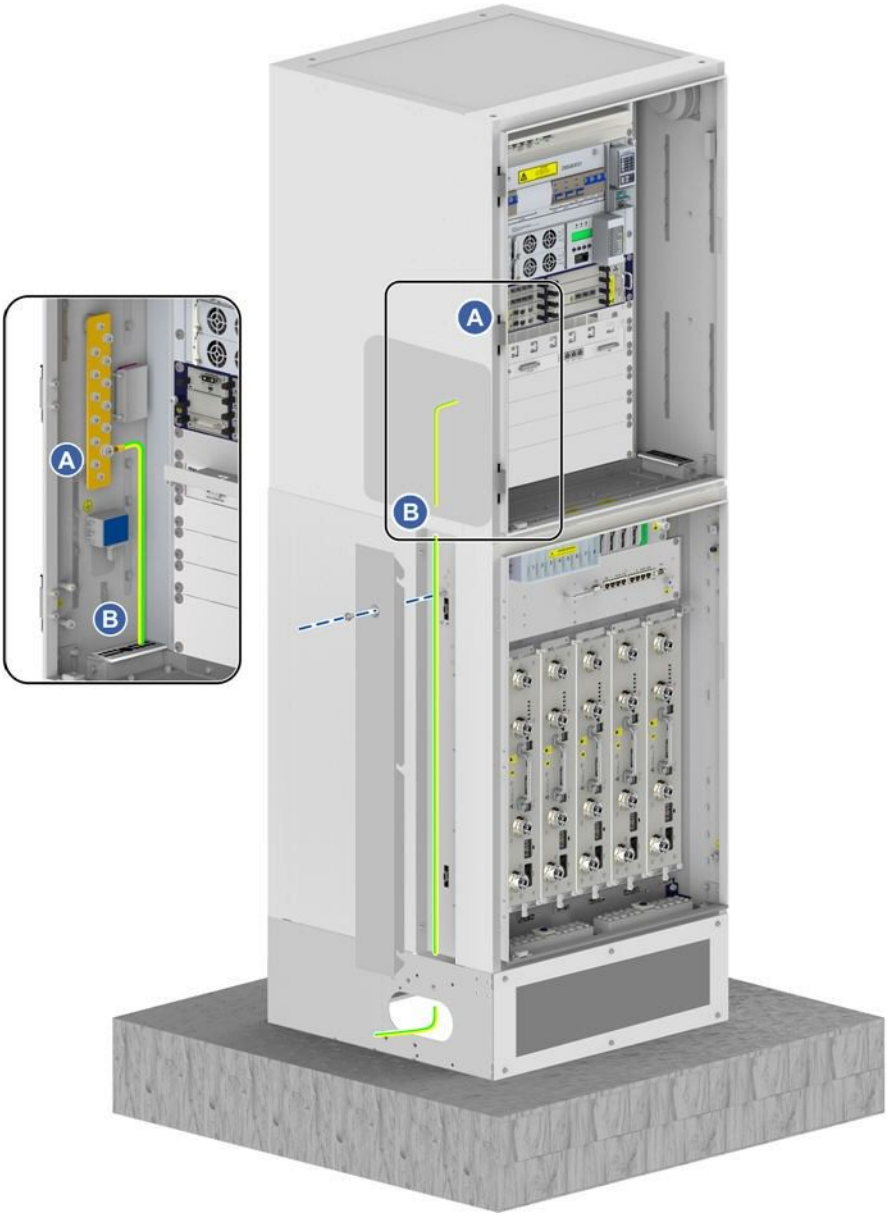
On-site engineering personnel need to install the ground PE cable from the outdoor grounding bar to the bus bar of the baseband cabinet to protect the ZXSDR BS8900A.

The fan subrack, BBU subrack, and LPU grounding cable of the baseband cabinet are already installed. Engineering personnel need to verify that the cables are securely fixed.

Steps

1. Remove the cover of the left-side routing trough and the front baffle of the base.
2. Route the grounding cable along the left-side waterproof module of the baseband cabinet and the left-side routing trough of the RF cabinet, and connect the cable to the grounding copper bar of the baseband cabinet, see Figure 7-12. Prepare the grounding cable of a particular length in accordance with the distance between the baseband cabinet and the grounding copper bar.

Figure 7-12 Fixing the Grounding Cable to the Copper Grounding Bar



Note:

A redundant length must be reserved when you prepare the grounding cable.

3. Secure one end of the grounding cable to the ground copper bar of the left side of the BC8910A cabinet, see Figure 7-12.
4. Connect the other end of the grounding cable to the outdoor grounding copper bar.
5. Bundle and fasten the grounding cable along the side wall of the cabinet.

– End of Steps –

7.4.2 Installing a Grounding Cable for the RC8910A Cabinet and PC8910A Cabinet

For stacked cabinets, the grounding cable of the lower cabinet is connected to the grounding busbar of the BC8910A cabinet.

The grounding cable of the single cabinet is connected to the outdoor grounding busbar.

For stacked cabinets (BC8910A cabinet and RC8910A cabinet), the RC8910A cabinet is grounded through the grounding busbar of the BC8910A cabinet. For a standalone PC8910A cabinet, the PC8910A cabinet is grounded directly.

Prerequisite

- The ESD wrist strap must be worn.
- The tributary output of the power supply is cut off.

Steps

Installing the grounding cable of stacked cabinets

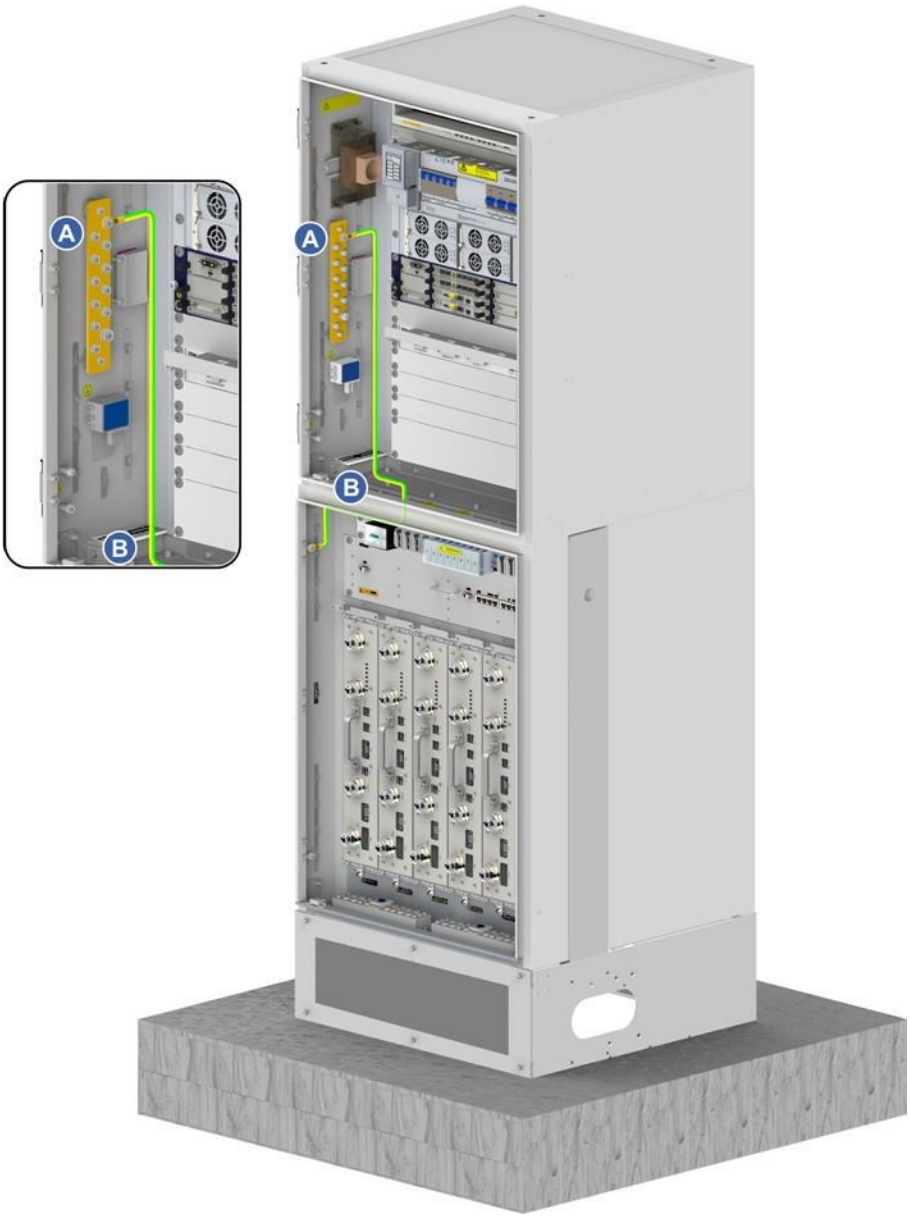
1. Prepare the grounding cable of a particular length in accordance with the distance between the BC8910A cabinet and the grounding copper bar.

   Note:

   A redundant length must be reserved when you prepare the grounding cable.

2. Remove the screw configured for the ground nut on the side of the RC8910A cabinet and secure one end of the grounding cable to the grounding point at the top-left corner of the cabinet.
3. Route the grounding cable along the left-side cable-through hole and the left-side ground copper bar of the BC8910A cabinet, see Figure 7-13.

Figure 7-13 Installing the Grounding Cable For the RF Cabinet



4. Bundle and fasten the grounding cable along the side wall of the cabinet.

Installing the grounding cable of a standalone cabinet

5. Prepare the grounding cable of a particular length in accordance with the distance between the PC8910A cabinet and the outdoor grounding copper busbar.
6. Remove the screw on the grounding nut of the PC8910A cabinet and secure one end of the grounding cable to the cabinet.
7. Thread the grounding cable though the cable-through hole at the bottom of the cabinet, route the cable to the outdoor grounding copper busbar, and then secure the other end of the cable to the busbar.

8. Bind and secure the cable to the cabinet.

– End of Steps –

7.5 Power Cable Installation

The power cables include AC or DC input cables of the BC cabinet, DC input cables of the RC cabinets and PC cabinet.

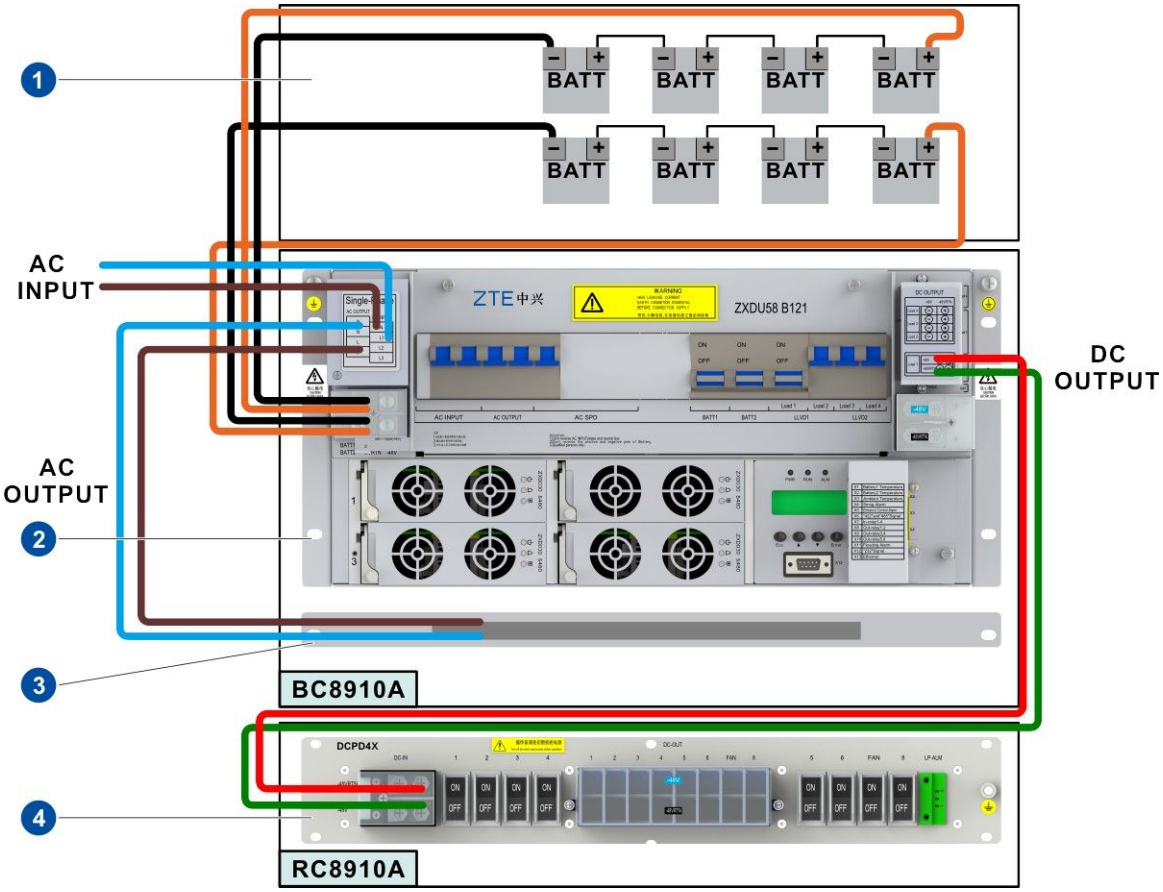
The power cable connections of the three cabinets of the ZXSDR BS8900A depend on the power supply mode (AC or DC) of the BC cabinet.

AC Power Input for the BC Cabinet

AC power is supplied to the B201, B900, or B121 PDM of the BC8910A cabinet, converted to be DC power in the PDM, and then distributed to other cabinets. For the AC power distribution of the ZXSDR BS8900A cabinets, see Figure 7-14.

Figure 7-14 shows the power distribution from the BC8910A cabinet to the RC8910A and PC8910A cabinets when the B121 PDM is installed. When installing the ZXSDR BS8900A cabinets, you need to connect the corresponding power cables in Figure 7-14 as required. The way to connect the cable of the B201 PDM is similar to that of the B121 PDM.

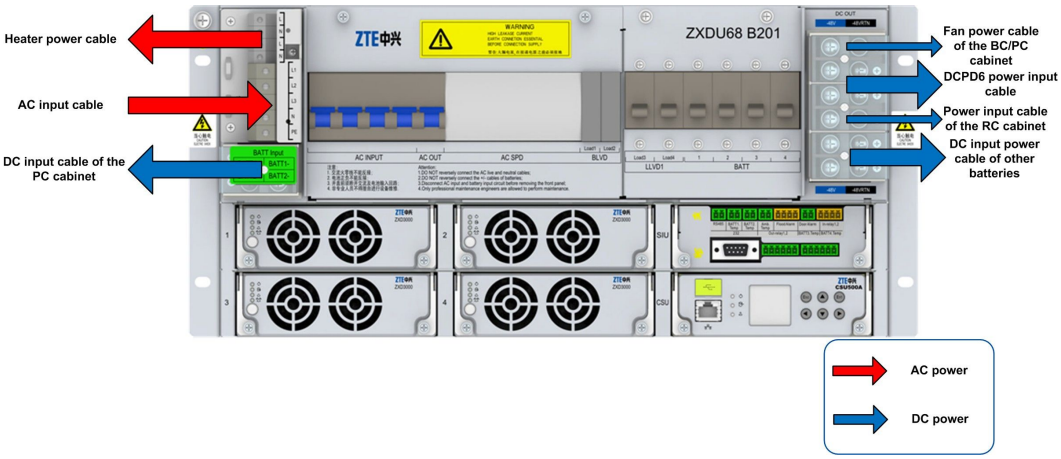
Figure 7-14 AC Power Distribution of the ZXSDR BS8900A Cabinets 1



1. Batteries of the PC8910A cabinet
2. PDU
3. Heater
4. PDM of the RC8910A cabinet

If the ZXSDR BS8900A connects RRUs, the DCPD6 module is installed in the baseband cabinet to provide power for RRUs. For power cable connections, see Figure 7-15. The BBU subrack is powered by the DCPD module. Figure 7-15 shows the power distribution when the B201 PDM is installed. The way to connect the cable of the B121 PDM is similar to that of the B201 PDM.

Figure 7-15 AC Power Distribution of the ZXSDR BS8900A Cabinets 2



The BC cabinet supports single-phase and three-phase AC input. The connected terminals of single-phase and three-phase AC power are different.

- Three-phase AC power input cable

  For the connectors of the three-phase AC power input cable, see Figure 7-16.

Figure 7-16 Connectors of the Three-Phase AC Power Input Cable

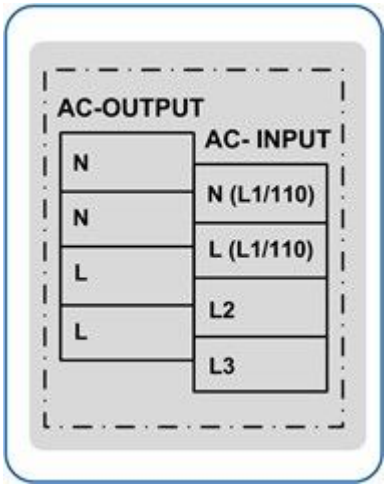


Table 7-4 Chromatograph Descriptions of the Three-phase AC Power Input Cable

Pin	Signal Definition	Signal Description	Color	End A	End B
1	L1(U)	L1 or U phase wire	Yellow	AC power input terminal of the B201/B121 PDM or ADPD1	AC power distribution device
2	L2(V)	L2 or V phase wire	Green		
3	L3(W)	L3 or W phase wire	Red		
4	N	N phase wire	Blue		
5	PE	Protective ground	Yellow/green	Grounding terminal of the B201/B121 PDM	Protective grounding busbar of the cabinet

- Single-phase AC power input cable

  For the connectors of the single-phase AC power input cable, see Figure 7-17.

Figure 7-17 Connectors of the Single-Phase AC Power Input Cable

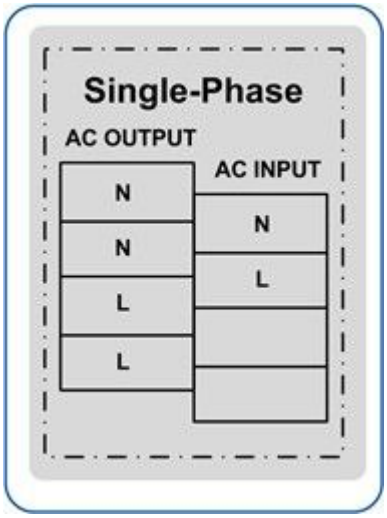


Table 7-5 Chromatograph Descriptions of the Single-phase AC Power Input Cable

Pin	Signal Definition	Signal Description	Color	End A	End B
1	L	L phase wire	Red	AC power input terminal of the B201/B121 PDM or ADPD1	AC power distribution device
2	N	AC neutral wire	Blue		
3	PE	Protective ground	Yellow/green		

DC Power Input for the BC Cabinet

DC power is distributed to the DCPD6 of the BC8910A cabinet and the DCPD4X of the RC8910 cabinet, and then distributed to other modules, see Figure 7-18.