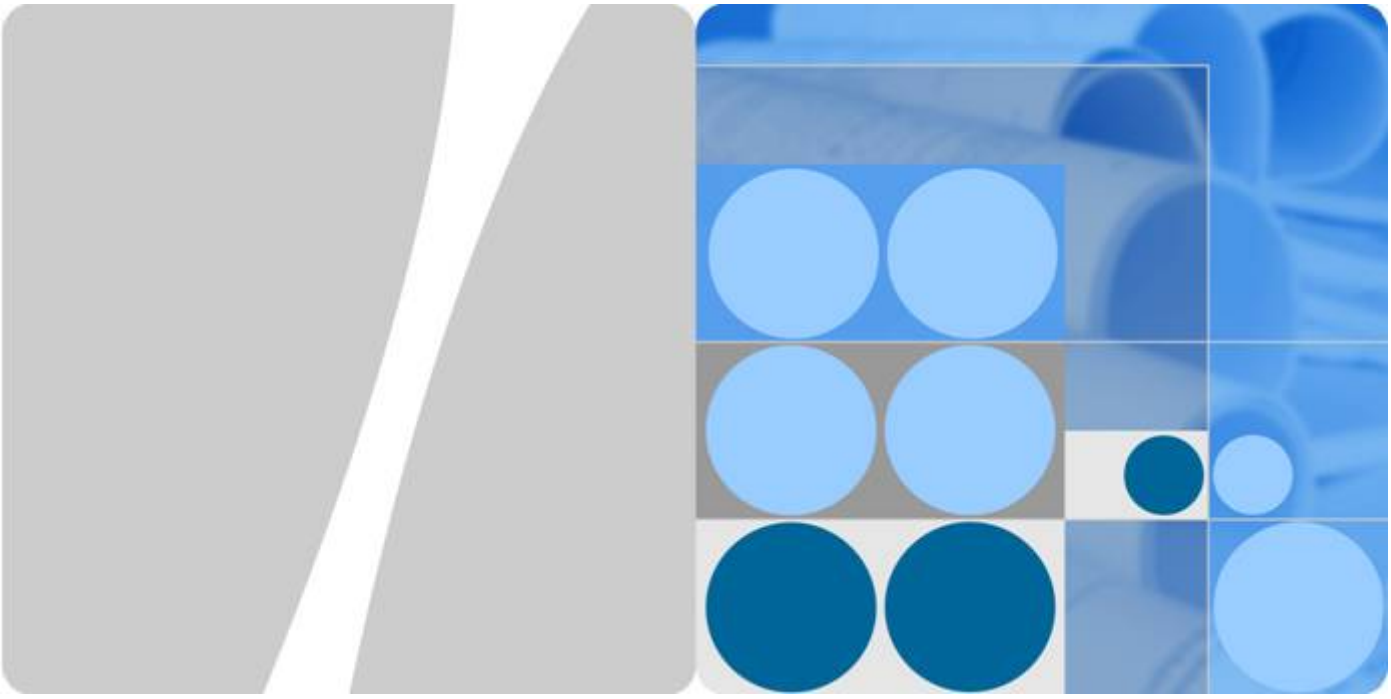

RRU3232

Installation Guide

Issue 05

Date 2011-10-20

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About This Document

Purpose

This document describes the process of installing a DC RRU3232 (referred to as RRU in this document).

Product Version

The following table lists the product version related to this document.

Product Name	Product Version
DBS3900 LTE	V100R003C00 and later versions

Intended Audience

This document is intended for:

Base station installation engineers

Organization

1 Changes in the RRU3232 Installation Guide

This chapter describes the changes in the *RRU3232 Installation Guide*.

2 Installation Preparations

This chapter describes the reference documents, tools, and instruments that must be ready before the installation. In addition, it specifies the skills and prerequisites that installation engineers must have.

3 Information About the Installation

Before installing an RRU, you must be familiar with its exterior, ports, installation options, physical supports, and installation clearance requirements.

4 Unpacking the Equipment

Unpack and check the delivered equipment to ensure that all the materials are included and intact.

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5 Installation Process

The installation process involves installing an RRU and RRU cables, checking the RRU hardware installation, and powering on the RRU.

6 Installing the RRU

This chapter describes the procedure for installing the RRU. The RRU can be installed on a pole, U-steel, angle steel, or wall. The procedure for installing the RRU varies depending on installation options.

7 Installing RRU Cables

This chapter describes the procedure for installing RRU cables.

8 Checking the RRU Hardware Installation

After an RRU is installed, check the hardware installation.

9 Powering On an RRU

After all the devices are installed, check the power-on status of an RRU.

10 Appendix

This section describes the procedure for adding an easy power receptacle (pressfit type) connector.

Conventions

Symbol Conventions

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

Symbol	Description
DANGER	Indicates a hazard with a high level of risk, which if not avoided, will result in death or serious injury.
WARNING	Indicates a hazard with a medium or low level of risk, which if not avoided, could result in minor or moderate injury.
CAUTION	Indicates a potentially hazardous situation, which if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results.
TIP	Indicates a tip that may help you solve a problem or save time.
NOTE	Provides additional information to emphasize or supplement important points of the main text.

General Conventions

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

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Convention	Description
Times New Roman	Normal paragraphs are in Times New Roman.
Boldface	Names of files, directories, folders, and users are in **boldface**. For example, log in as user **root**.
Italic	Book titles are in *italics*.
`Courier New`	Examples of information displayed on the screen are in Courier New.

Command Conventions

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

Convention	Description
Boldface	The keywords of a command line are in **boldface**.
Italic	Command arguments are in *italics*.
[ ]	Items (keywords or arguments) in brackets [ ] are optional.
{ x | y | ... }	Optional items are grouped in braces and separated by vertical bars. One item is selected.
[x | y | ...]	Optional items are grouped in brackets and separated by vertical bars. One item is selected or no item is selected.
{ x | y | ... }*	Optional items are grouped in braces and separated by vertical bars. A minimum of one item or a maximum of all items can be selected.
[x | y | ...]*	Optional items are grouped in brackets and separated by vertical bars. Several items or no item can be selected.

GUI Conventions

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

Convention	Description
Boldface	Buttons, menus, parameters, tabs, window, and dialog titles are in **boldface**. For example, click **OK**.
>	Multi-level menus are in **boldface** and separated by the ">" signs. For example, choose **File** > **Create** > **Folder**.

Keyboard Operations

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

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Format	Description
Key	Press the key. For example, press **Enter** and press **Tab**.
Key 1+**Key 2**	Press the keys concurrently. For example, pressing **Ctrl**+**Alt**+**A** means the three keys should be pressed concurrently.
Key 1, **Key 2**	Press the keys in turn. For example, pressing **Alt**, **A** means the two keys should be pressed in turn.

Mouse Operations

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

Action	Description
Click	Select and release the primary mouse button without moving the pointer.
Double-click	Press the primary mouse button twice continuously and quickly without moving the pointer.
Drag	Press and hold the primary mouse button and move the pointer to a certain position.

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1 Changes in the RRU3232 Installation Guide

This chapter describes the changes in the *RRU3232 Installation Guide*.

05 (2011-10-20)

This is the fifth official release.

Compared with issue 04 (2011-09-15), this issue does not add any information.

Compared with issue 04 (2011-09-15), this issue incorporates the following changes:

Topic	Change Description
7.6 Installing an RRU RF Jumper	Deleted the information about the external filter.

Compared with issue 04 (2011-09-15), this issue omits the following topic:

- Installing an SFP high-speed cable for cascaded RRUs

04 (2011-09-15)

This is the fourth official release.

Compared with issue 03 (2011-07-15), this issue does not add any information.

Compared with issue 03 (2011-07-15), this issue incorporates the following changes:

Topic	Change Description
9 Powering On an RRU	Optimized the description of the RRU power-on check.

Compared with issue 03 (2011-07-15), this issue does not remove any information.

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03 (2011-07-15)

This is the third official release.

Compared with issue 02 (2011-06-10), this issue does not add any information.

Compared with issue 02 (2011-06-10), this issue incorporates the following change:

Topic	Change Description
3.5.2 Installation Clearance for Multiple RRUs	Optimized the clearance requirements for multiple RRUs installed on a wall in standard mode.

Compared with issue 02 (2011-06-10), this issue does not remove any information.

02 (2011-06-10)

This is the second official release.

Compared with issue 01 (2011-05-15), this issue does not add any information.

Compared with issue 01 (2011-05-15), this issue incorporates the following change:

Topic	Change Description
3.1 RRU Exterior	Optimized the RRU exterior.

Compared with issue 01 (2011-05-15), this issue does not remove any information.

01(2011-05-15)

This is the first official release.

Compared with draft A (2011-03-15), this issue does not add any information.

Compared with draft A (2011-03-15), this issue incorporates the following changes:

Topic	Change Description
Installing an RRU RF Jumper	Optimized the procedure for waterproofing the connectors on the RRU RF jumper.
3.3 RRU Indicators	Optimized the status and meanings of CPRI indicators.
Installation Clearance Requirements of an RRU	Added the installation clearance requirements for an RRU equipped with external filters.
Installing an RRU RF Jumper	Added the procedure for installing an RRU RF jumper when the RRU is equipped with external filters.

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Compared with draft A (2011-03-15), this issue does not remove any information.

Draft A (2011-03-15)

This is the draft.

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2 Installation Preparations

About This Chapter

This chapter describes the reference documents, tools, and instruments that must be ready before the installation. In addition, it specifies the skills and prerequisites that installation engineers must have.

2.1 Reference Documents
Before the installation, you must be familiar with reference documents.

2.2 Tools and Instruments
All tools and instruments required for RRU installation must be ready before the installation.

2.3 Skills and Requirements for Onsite Personnel
Onsite personnel must be qualified and trained. Before performing any operation, onsite personnel must be familiar with correct operation methods and safety precautions.

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2.1 Reference Documents

Before the installation, you must be familiar with reference documents.

The following reference documents are required during RRU installation:

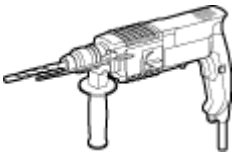
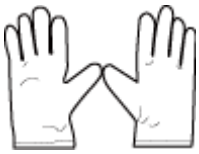
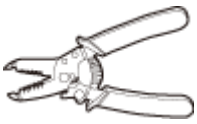
- RRU3232 Hardware Description
- RRU3232 Hardware Maintenance Guide
- DBS3900 Installation Guide
- OCB User Guide

This document describes the RRU installation on a pole, U-steel, angle steel, or wall. If RRUs are installed on the IFS06, the following reference document is required:

- DBS3900 (ICR) Installation Guide

2.2 Tools and Instruments

All tools and instruments required for RRU installation must be ready before the installation.

Hammer drill (a φ 14 bit) 	ESD gloves 	Vacuum cleaner
Heat gun	Phillips screwdriver (M3 to M6)	Flat-head screwdriver (M3 to M6)
Rubber mallet	COAX crimping tool	Wire stripper 
Utility knife	Cable cutter	Adjustable wrench (capacity ⩾ 32 mm [1.26 in.])

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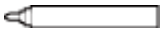
Level	Torque screwdriver 5 mm (M3 to M6) (M3 to M6)	Torque wrench Capacity: 17 mm [0.67 in.], 21 mm [0.82 in.], and 32 mm [1.26 in.] Combination wrench Capacity: 17 mm [0.67 in.], 21 mm [0.82 in.], and 32 mm [1.26 in.]
Multimeter	Marker (diameter ≤ 10 mm [0.39 in.]) 	Measuring tape

2.3 Skills and Requirements for Onsite Personnel

Onsite personnel must be qualified and trained. Before performing any operation, onsite personnel must be familiar with correct operation methods and safety precautions.

Before the installation, pay attention to the following items:

- The customer's technical engineers must be trained by Huawei and be familiar with the proper installation and operation methods.
- The number of onsite personnel depends on the engineering schedule and installation environment. Generally, only three to five onsite personnel are necessary.

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3 Information About the Installation

About This Chapter

Before installing an RRU, you must be familiar with its exterior, ports, installation options, physical supports, and installation clearance requirements.

3.1 RRU Exterior
This section describes the exterior and dimensions of an RRU.

3.2 RRU Ports
This section describes RRU ports positioned on the RRU panels. An RRU has a bottom panel, cabling cavity panel, and indicator panel.

3.3 RRU Indicators
This section describes six indicators on an RRU. They indicate the running status.

3.4 Installation Options
This section describes RRU installation options. An RRU can be installed on a pole, U-steel, angle steel, or wall.

3.5 Installation Clearance Requirements of an RRU
This section describes the requirements for the installation clearance of a single RRU and multiple RRUs and the requirements for the installation spacing between RRUs.

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3.1 RRU Exterior

This section describes the exterior and dimensions of an RRU.

Figure 3-1 shows an RRU.

The RRU on the left has a housing, and the RRU on the right does not have a housing.

Figure 3-1 RRU exterior

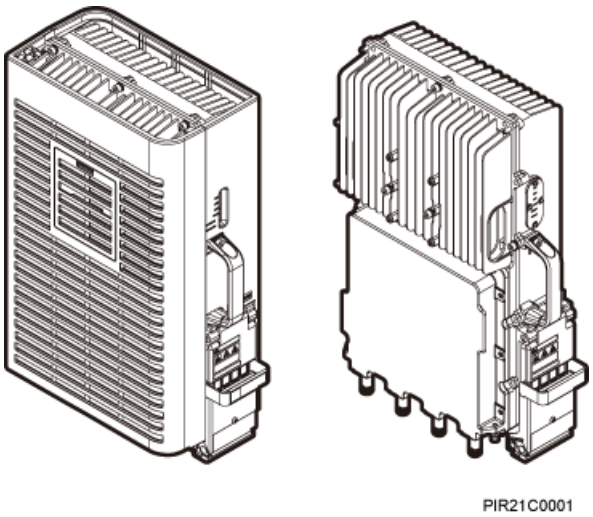
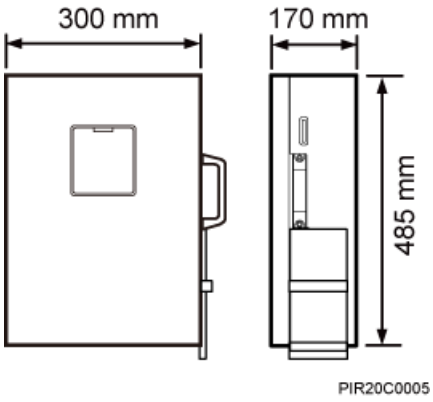


Figure 3-2 shows RRU dimensions.

Figure 3-2 RRU dimensions



3.2 RRU Ports

This section describes RRU ports positioned on the RRU panels. An RRU has a bottom panel, cabling cavity panel, and indicator panel.

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Figure 3-3 shows RRU ports on the panels.

Figure 3-3 RRU ports on the panels

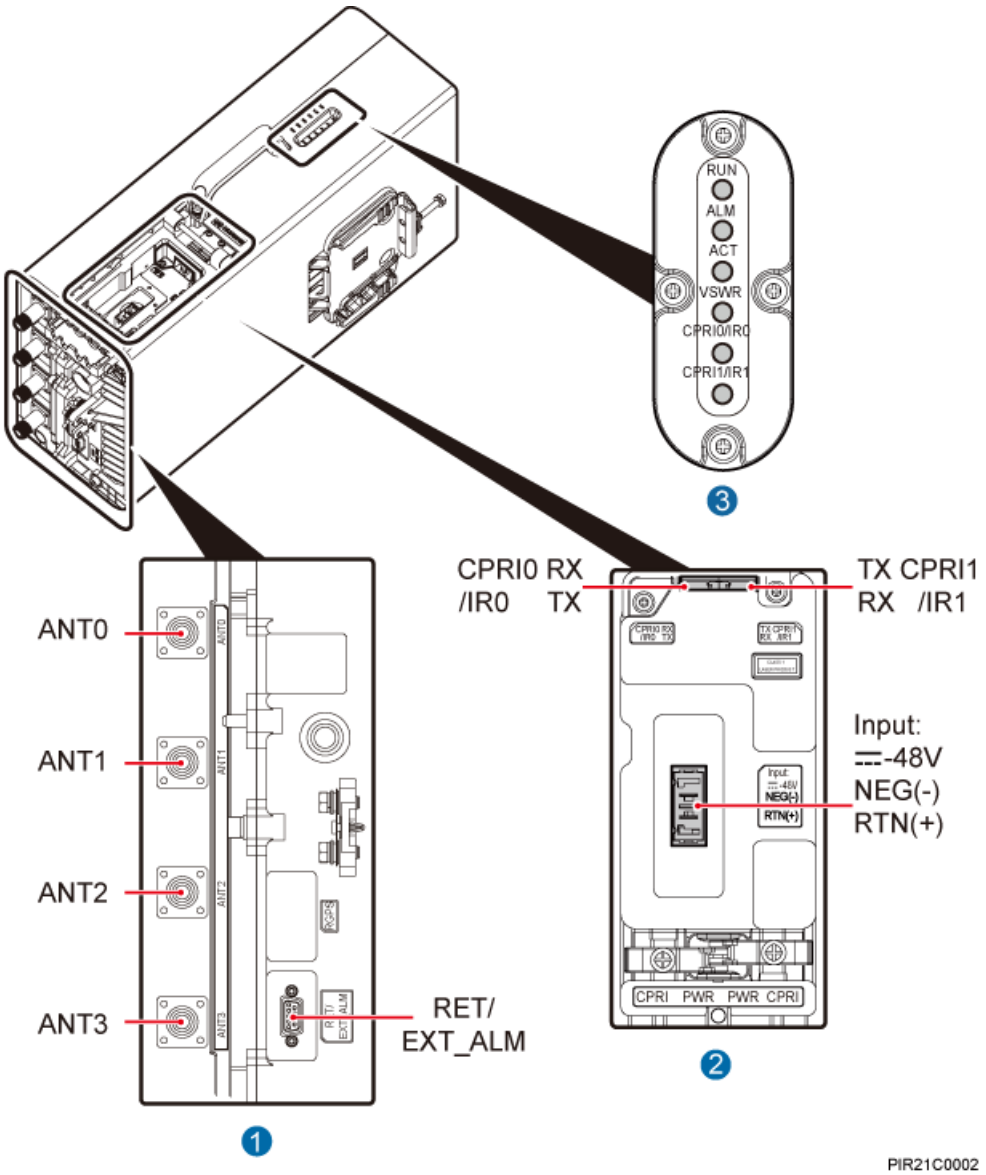

Table 3-1 describes RRU ports and indicators on the panels.

Table 3-1 RRU ports and indicators on the panels

Item	Label	Description
(1) Ports at the bottom	ANT0-ANT3	TX/RX port. ANT0 port supports RET signal transmission.
	RET/EXT_ALM	Communication port for the RET antenna or port for alarm reporting, supporting RET signal transmission

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Item	Label	Description
(2) Ports in the cabling cavity	CPRI0/IR0	Optical port
	CPRI1/IR1	
	RTN(+)	Power supply socket
	NEG(-)	
(3) Indicators	RUN	For details, see **3.3 RRU Indicators**.
	ALM	
	ACT	
	VSWR	
	CPRI0/IR0	
	CPRI1/IR1	

NOTE

When only two RF ports on the RRU are required to transmit RF signals, ports ANT0 and ANT1 are used by default.

The port for transmitting RET signals is determined by the software.

3.3 RRU Indicators

This section describes six indicators on an RRU. They indicate the running status.

For detailed positions of RRU indicators, see **3.2 RRU Ports**.

Table 3-2 describes RRU indicators.

Table 3-2 RRU indicators

Label	Color	Status	Description
RUN	Green	On	There is power supply, but the module is faulty.
		Off	There is no power supply, or the module is faulty.
		Blinking (on for 1s and off for 1s)	The module is working properly.
		Blinking (on for 0.125s and off for 0.125s)	Software is being loaded to the module, or the module is not started.
ALM	Red	On	Alarms are generated, and the module must be replaced.

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Label	Color	Status	Description
		Off	No alarm is generated.
		Blinking (on for 1s and off for 1s)	Alarms are generated. The alarms may be caused by the faults on the related boards or ports. Therefore, the necessity for module replacement is uncertain.
ACT	Green	On	The module is working properly with TX channels enabled.
		Blinking (on for 1s and off for 1s)	The module is working properly with TX channels disabled.
VSWR	Red	Off	No VSWR alarm is generated.
		On	VSWR alarms are generated.
CPRI0/ IR0	Red and green	Steady green	The CPRI link is available.
		Steady red	An optical module fails to transmit or receive signals because the optical module is faulty or the fiber optic cable is broken.
		Blinking red (on for 1s and off for 1s)	The CPRI link is out of lock because of mutual lock of dual-mode clock sources or mismatched data rates over CPRI ports (you are advised to check the system configuration to identify the fault).
		Off	The SFP module is not properly installed, or the optical module is powered off.
CPRI1/ IR1	Red and green	Steady green	The CPRI link is available.
		Steady red	An optical module fails to transmit or receive signals because the optical module is faulty or the fiber optic cable is broken.
		Blinking red (on for 1s and off for 1s)	The CPRI link is out of lock because of mutual lock of dual-mode clock sources or mismatched data rates over CPRI ports (you are advised to check the system configuration to identify the fault).
		Off	The SFP module is not properly installed, or the optical module is powered off.

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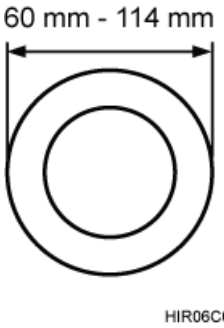
3.4 Installation Options

This section describes RRU installation options. An RRU can be installed on a pole, U-steel, angle steel, or wall.

Installing an RRU on a Pole

Figure 3-4 shows the diameter of pole for installing an AAU3801.

Figure 3-4 Diameter of a pole



CAUTION

- The diameter of a pole for installing an RRU ranges from 60 mm (2.36 in.) to 114 mm (4.49 in.). The recommended diameter is 80 mm (3.15 in.).
- If the diameter of a pole ranges from 60 mm (2.36 in.) to 76 mm (2.99 in.), a maximum of two RRUs can be installed on the pole and the side-mounted installation is not recommended.
- If three or more RRUs must be installed on a pole in centralized mode, the diameter of the pole must range from 76 mm (2.99 in.) mm to 114 mm (4.49 in.).

Figure 3-5 shows an RRU installed on a pole.

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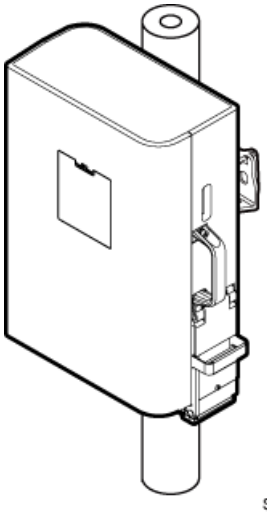
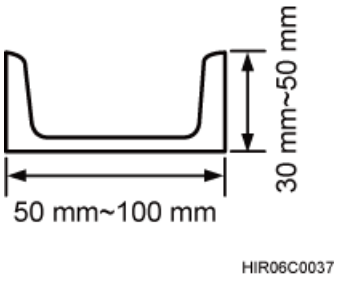
Figure 3-5 RRU installed on a pole



Installing an RRU on U-steel

Figure 3-6 shows U-steel specifications.

Figure 3-6 U-steel specifications



CAUTION

- It is recommended that only one RRU be installed on U-steel.
- The vertical deviation angle of U-steel must be less than or equal to 10 degrees, as shown in **Figure 3-7**.

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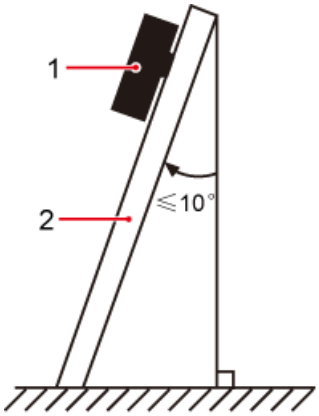
Figure 3-7 Requirements for the vertical deviation angle of U-steel or angle steel



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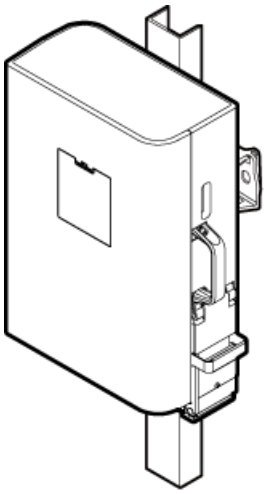
(1) RRU (2) U-steel or angle steel

Figure 3-8 shows an RRU installed on U-steel.

Figure 3-8 RRU installed on U-steel



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Installing an RRU on Angle Steel

Figure 3-9 shows angle steel specifications.

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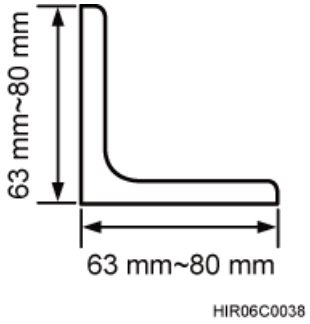
Figure 3-9 Angle steel specifications

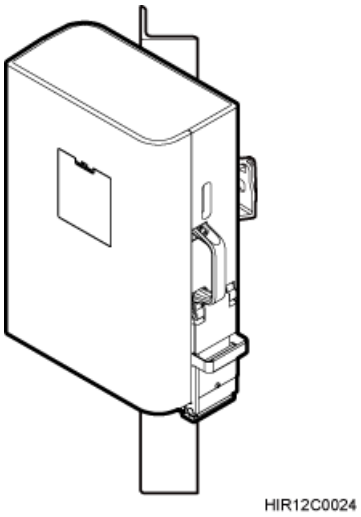


CAUTION

- It is recommended that only one RRU be installed on angle steel.
- The vertical deviation angle of angle steel must be less than or equal to 10 degrees, as shown in **Figure 3-7**.

Figure 3-10 shows an RRU installed on angle steel.

Figure 3-10 RRU installed on angle steel



Installing an RRU on a Wall

The wall on which RRUs are installed must meet the following requirements:

- When a single RRU is installed, the wall has a capacity of bearing at least four times the weight of the RRU.
- Expansion bolts must be tightened to 30 N·m (265.52 lbf·in.) to ensure the bolts work properly and the wall remains intact without cracks in it.

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CAUTION

The brackets cannot be combined when RRUs are installed on a wall, as shown in **Figure 3-11**.

Figure 3-11 Correct placement of brackets

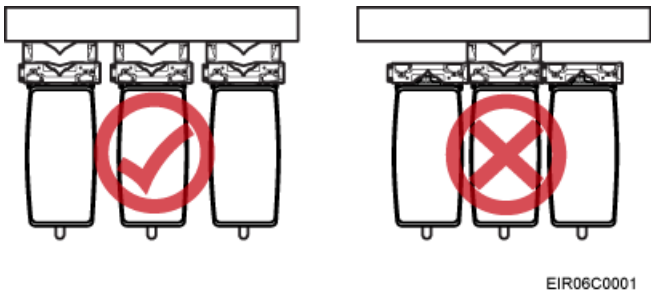
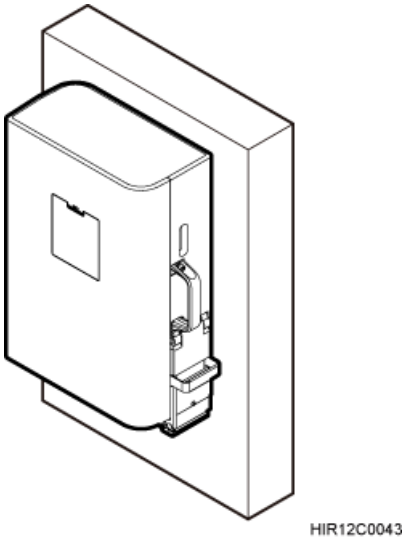


Figure 3-12 shows an RRU installed on a wall.

Figure 3-12 RRU installed on a wall



3.5 Installation Clearance Requirements of an RRU

This section describes the requirements for the installation clearance of a single RRU and multiple RRUs and the requirements for the installation spacing between RRUs.

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NOTE

The recommended installation clearance ensures normal running and provides an appropriate space for Operation and Maintenance (O&M). If there is sufficient space, leave the recommended installation clearance.

The minimum installation clearance ensures normal running and heat dissipation, but OM activities such as checking indicator status and opening the maintenance cavity cannot be properly conducted. If the installation space is restricted, leave the minimum installation clearance.

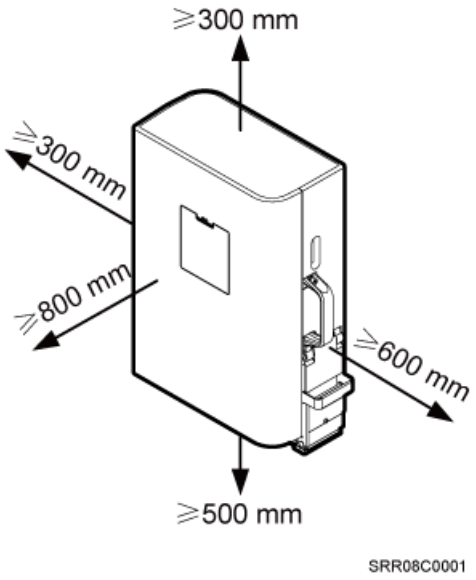
3.5.1 Installation Clearance for a Single RRU

This section describes the recommended and minimum installation clearance for a single RRU.

Recommended Installation Clearance for a Single RRU

Figure 3-13 shows the recommended installation clearance for a single RRU.

Figure 3-13 Recommended installation clearance for a single RRU



Minimum Installation Clearance for a Single RRU

Figure 3-14 shows the minimum installation clearance for a single RRU.

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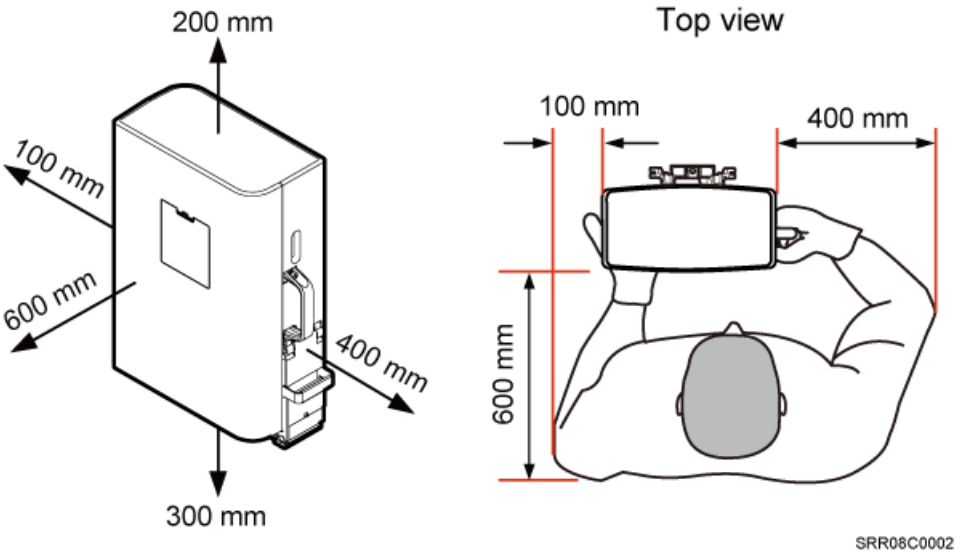
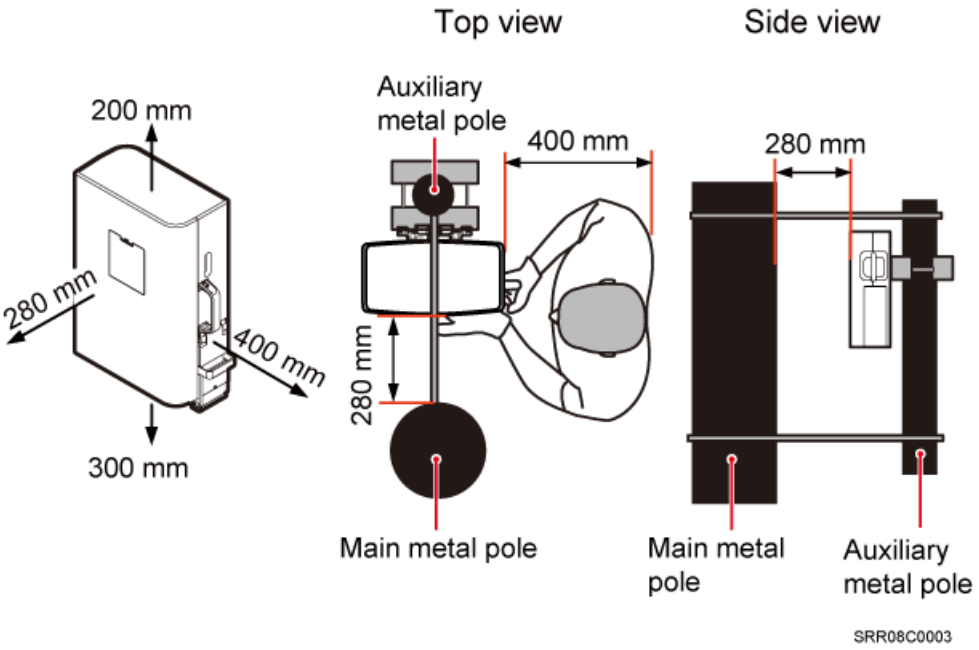
Figure 3-14 Minimum installation clearance for a single RRU



Minimum Installation Clearance for a Single RRU Installed on a Tower

Figure 3-15 shows the minimum installation clearance for a single RRU installed on a tower.

Figure 3-15 Minimum installation clearance for a single RRU installed on a tower



3.5.2 Installation Clearance for Multiple RRUs

This section describes the recommended and minimum installation clearance for multiple RRUs.

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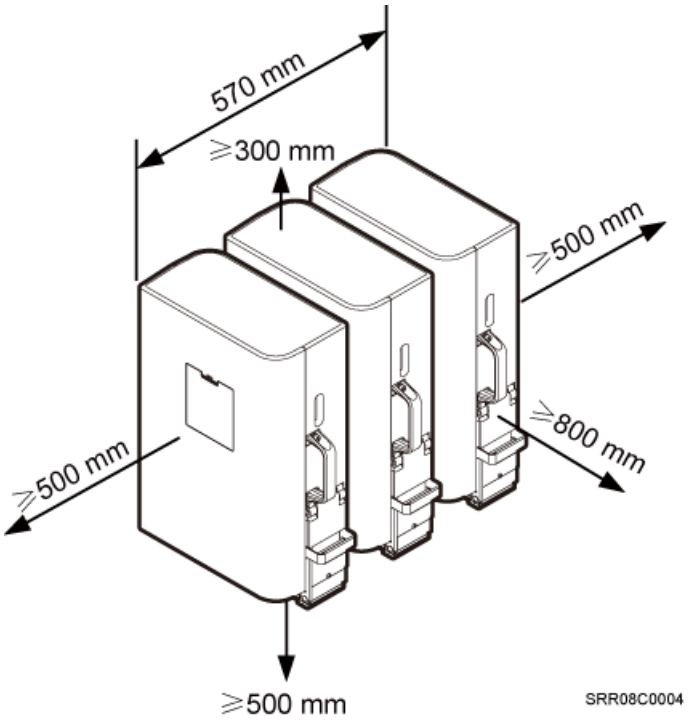
Recommended Installation Clearance for Multiple RRUs Installed in Centralized Mode

Figure 3-16 shows the recommended installation clearance for multiple RRUs installed in centralized mode.

Figure 3-16 Recommended installation clearance for multiple RRUs installed in centralized mode



Minimum Installation Clearance for Multiple RRUs Installed in Centralized Mode

Figure 3-17 shows the minimum installation clearance for multiple RRUs installed in centralized mode.

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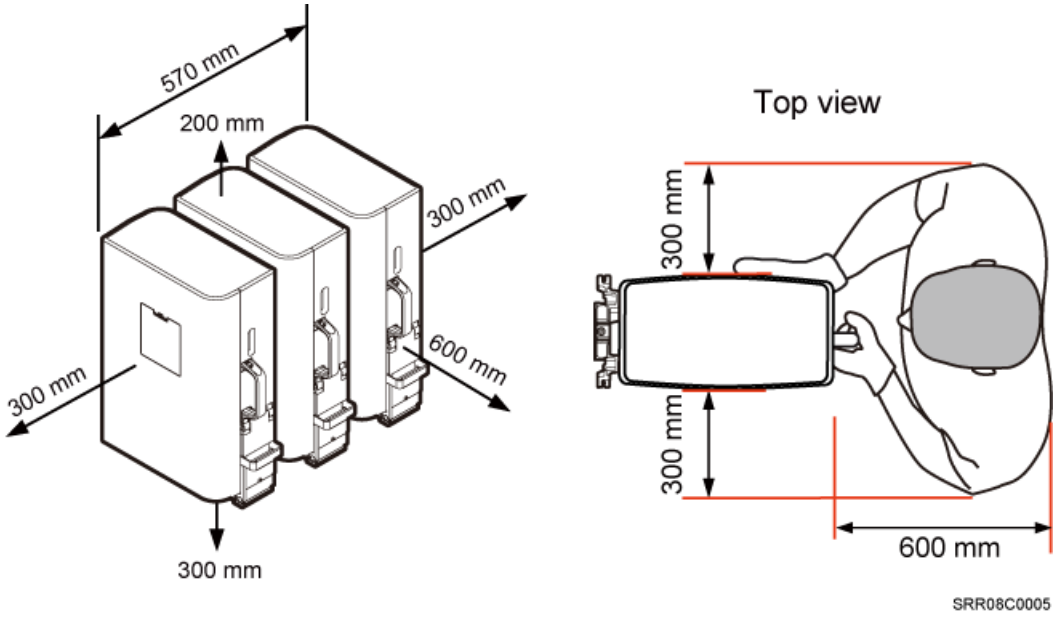
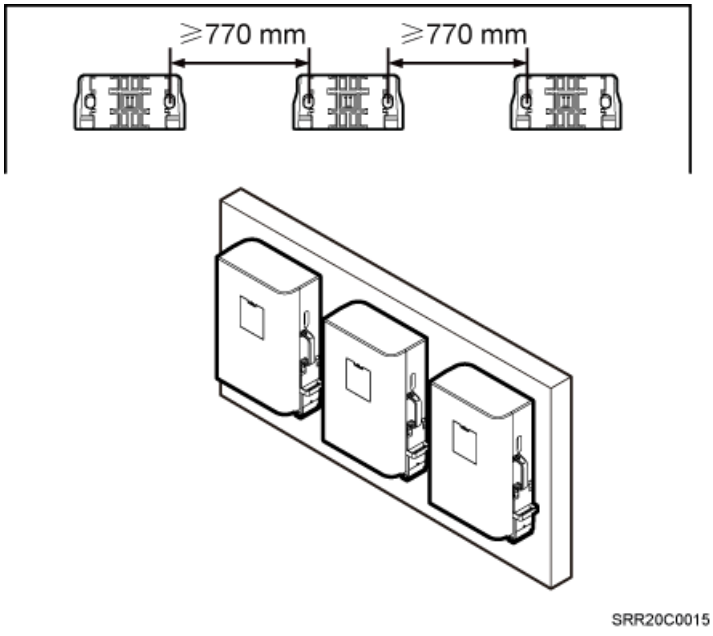
Figure 3-17 Minimum installation clearance for multiple RRUs installed in centralized mode



Recommended Clearance for Multiple RRUs Installed on a Wall in Standard Mode

Figure 3-18 shows the recommended clearance for multiple RRUs installed on a wall in standard mode.

Figure 3-18 Recommended clearance for multiple RRUs installed on a wall in standard mode



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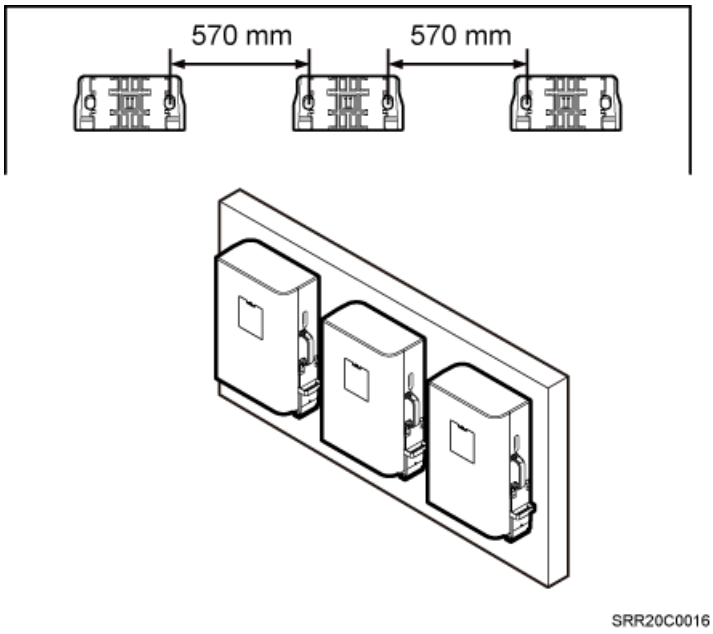
Minimum Clearance for Multiple RRUs Installed on a Wall in Standard Mode

Figure 3-19 shows the minimum clearance for multiple RRUs installed on a wall in standard mode.

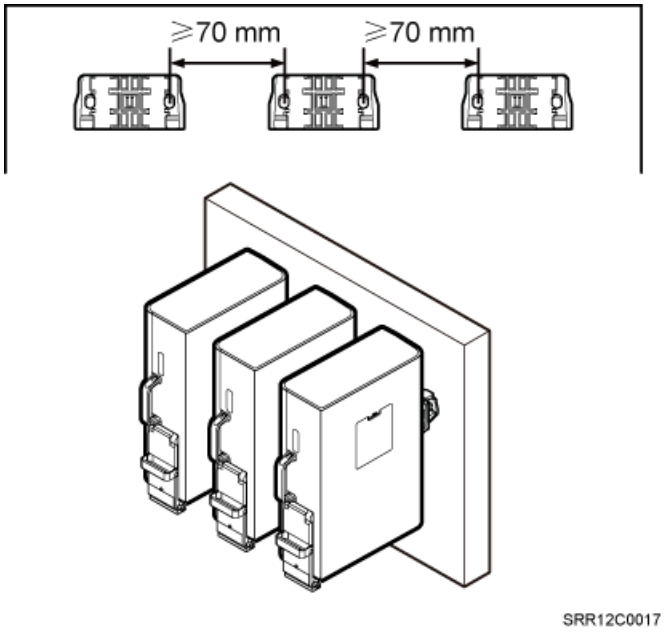
Figure 3-19 Minimum clearance for multiple RRUs installed on a wall in standard mode



Recommended Clearance for Multiple RRUs Side-Mounted on a Wall

Figure 3-20 shows the recommended clearance for multiple RRUs side-mounted on a wall.

Figure 3-20 Recommended clearance for multiple RRUs side-mounted on a wall



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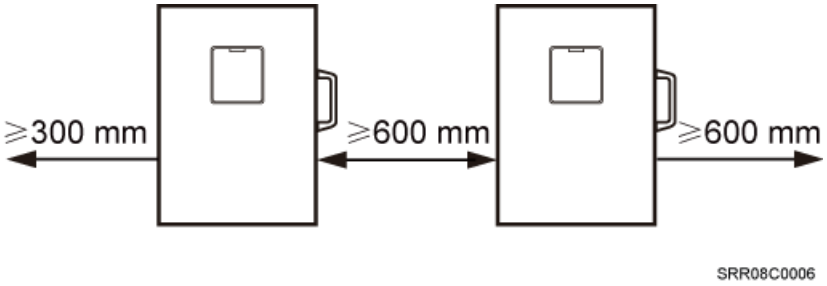
3.5.3 Installation Spacing Between RRUs

This section describes the horizontal and vertical installation spacing between RRUs.

Recommended Horizontal Spacing Between RRUs

Figure 3-21 shows the recommended horizontal spacing between RRUs.

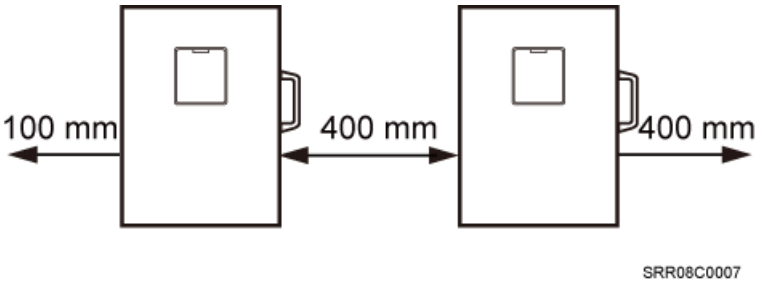
Figure 3-21 Recommended horizontal spacing between RRUs



Minimum Horizontal Spacing Between RRUs

Figure 3-22 shows the minimum horizontal spacing between RRUs.

Figure 3-22 Minimum horizontal spacing between RRUs



Recommended Vertical Spacing Between RRUs

Figure 3-23 shows the recommended vertical spacing between RRUs.

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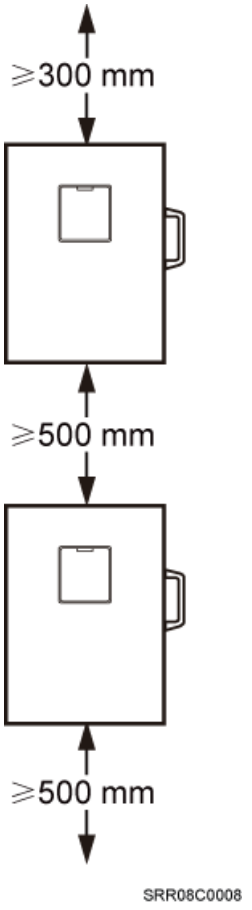
Figure 3-23 Recommended vertical spacing between RRUs



Minimum Vertical Spacing Between RRUs

Figure 3-24 shows the minimum vertical spacing between RRUs.

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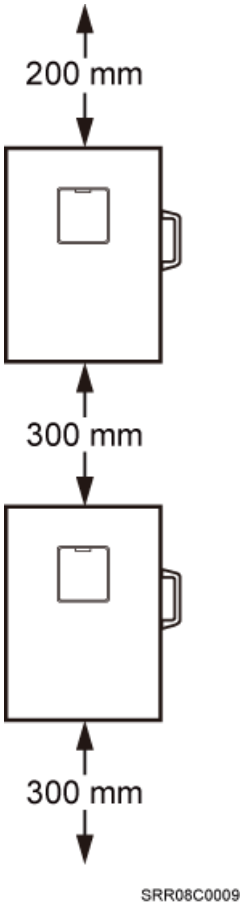
Figure 3-24 Minimum vertical spacing between RRUs



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4 Unpacking the Equipment

Unpack and check the delivered equipment to ensure that all the materials are included and intact.

Context

NOTE

When transporting, moving, or installing the equipment, components, or parts, you must:

- Prevent them from colliding with doors, walls, shelves, or other objects.
- Wear clean gloves, and avoid touching the equipment, components, or parts with bare hands, sweat-soaked gloves, or dirty gloves.

Procedure

Step 1 Check the total number of articles in each case according to the packing list.

If ...	Then ...
The total number tallies with the packing list	Go to **Step 2**.
The total number does not tally with the packing list	Find out the cause and report any missing articles to the local Huawei office.

Step 2 Check the exterior of the packing case.

If ...	Then ...
The outer packing is intact	Go to **Step 3**.
The outer packing is severely damaged or soaked	Find out the cause and report it to the local Huawei office.

Step 3 Check the type and quantity of the equipment in the cases according to the packing list.

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If ...	Then ...
Types and quantity of the article tally with those on the packing list	Sign the *Packing List* with the customer.
There is any shipment shortage or wrong shipment	Fill in and submit the *Cargo Shortage and Mishandling Report*.
Articles are damaged.	Fill in and submit the *Article Replacement Report*.

WARNING

To protect the equipment and prevent damage to the equipment, you are advised to keep the unpacked equipment and packing materials indoors, take photos of the stocking environment, packing case or carton, packing materials, and any rusted or eroded equipment, and then file the photos.

----End

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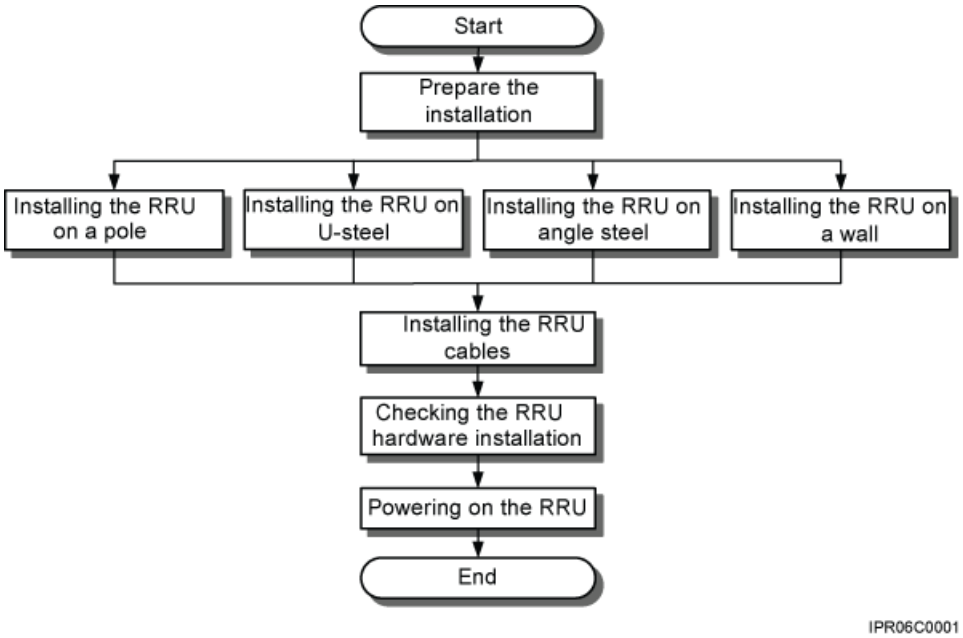
5 Installation Process

The installation process involves installing an RRU and RRU cables, checking the RRU hardware installation, and powering on the RRU.

Figure 5-1 shows the process of installing an RRU.

Figure 5-1 Process of installing an RRU



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6 Installing the RRU

About This Chapter

This chapter describes the procedure for installing the RRU. The RRU can be installed on a pole, U-steel, angle steel, or wall. The procedure for installing the RRU varies depending on installation options.

CAUTION

- Do not stand the RRU upright because the load-bearing capacity of the RF ports at the RRU bottom is low.
- Place a foam pad or cardboard under an RRU to protect the RRU housing from damage during the installation.

6.1 Mounting Kits for an RRU
This section describes the bracket assembly and the attachment plate for an RRU.

6.2 Installing the RRU on a Pole
One or more RRUs can be installed on a pole.

6.3 Installing the RRU on U-steel
This section describes the procedure for installing the RRU on U-steel and the precautions that must be taken during the installation. The RRU installed on U-steel can be mounted to a tower or placed on the ground. It is recommended that only one RRU be installed on U-steel.

6.4 Installing the RRU on Angle Steel
This section describes the procedure for installing the RRU on angle steel and the precautions that must be taken during the installation. The RRU installed on angle steel can be mounted to a tower or placed on the ground. It is recommended that only one RRU be installed on angle steel.

6.5 Installing the RRU on a Wall
This section describes the procedure for installing the RRU on a wall and the precautions that must be taken during the installation.

6.6 Hoisting the RRU and Mounting Kits onto a Tower

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Before installing an RRU on a tower, bind the RRU and mounting kits and then hoist them onto the tower. The RRU can be installed on a pole, U-steel, or angle steel. This section describes the procedure for hoisting the RRU and mounting kits onto the tower and the precautions that must be taken.

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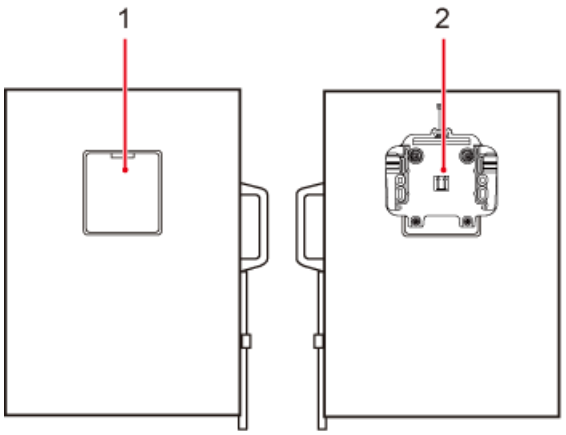
6.1 Mounting Kits for an RRU

This section describes the bracket assembly and the attachment plate for an RRU.

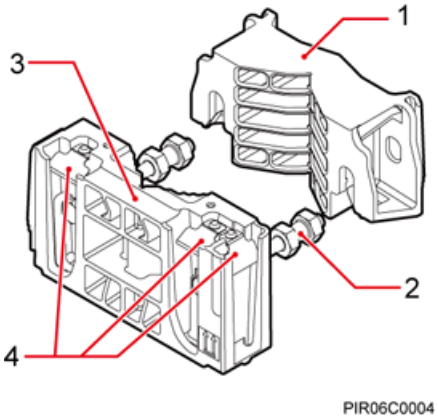
Figure 6-1 Front and rear view of an RRU



(1) Cover plate (2) Attachment plate

Figure 6-2 shows the bracket assembly for an RRU.

Figure 6-2 Bracket assembly for an RRU



(1) Auxiliary mounting bracket (2) Dual-nut bolt assembly (3) Main mounting bracket (4) Hoist clamp on the main mounting bracket

6.2 Installing the RRU on a Pole

One or more RRUs can be installed on a pole.

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Figure 6-3 shows a single RRU installed on a pole.

Figure 6-3 A single RRU installed on a pole

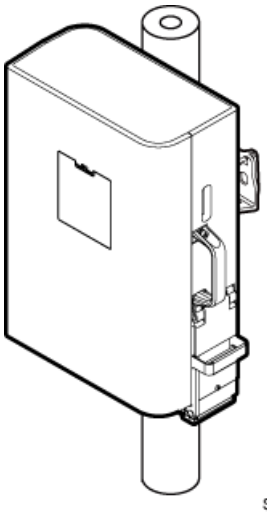

Figure 6-4 shows two RRUs installed on a pole.

Figure 6-4 Two RRUs installed on a pole

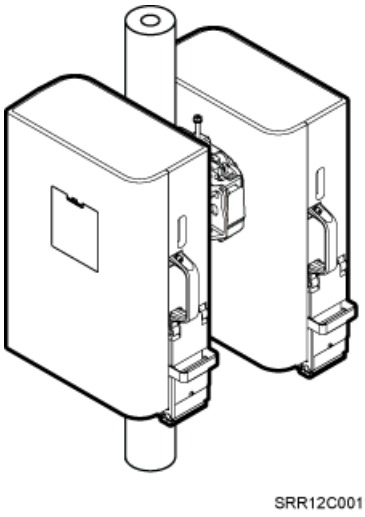

Figure 6-5, **Figure 6-6**, and **Figure 6-7** show more than two RRUs installed on a pole.

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Figure 6-5 Three RRUs installed on a pole in centralized mode

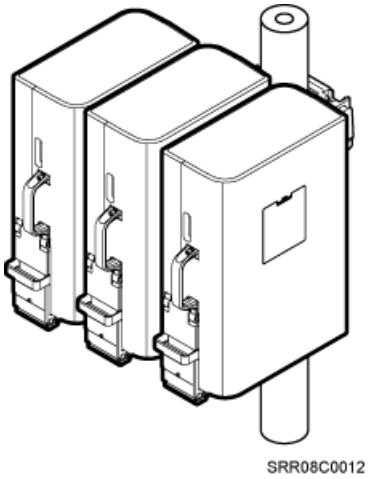

Figure 6-6 Four RRUs installed on a pole in centralized mode

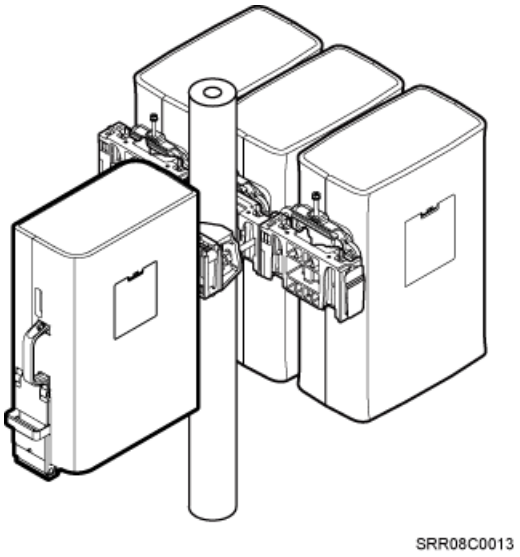

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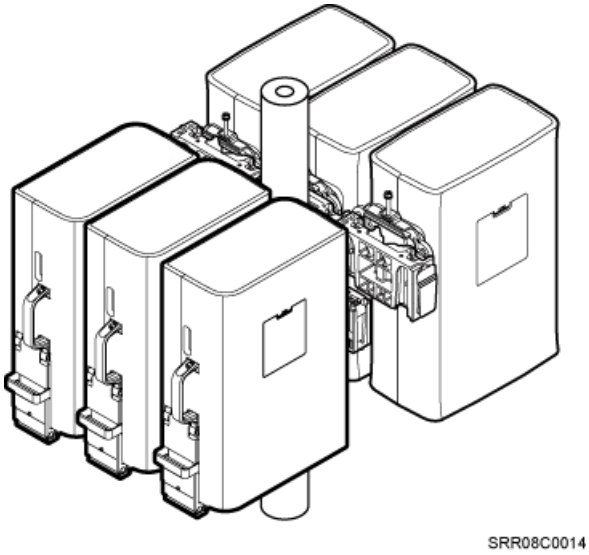
Figure 6-7 Six RRUs installed on a pole in centralized mode



6.2.1 Installing a Single RRU

This section describes the procedure for installing a single RRU on a pole and the precautions that must be taken during the installation.

Prerequisite

Before you install an RRU on a tower, the RRU and mounting kits are hoisted onto the tower. For details, see **6.6 Hoisting the RRU and Mounting Kits onto a Tower**.

The hoist clamp on the main mounting bracket is secured properly.

Procedure

Step 1 Determine a position for installing the main mounting bracket.

- If the RRU must be installed on a tower, see **3.5.1 Installation Clearance for a Single RRU** to determine a position.
- If the RRU must be installed on the ground, see **Figure 6-8** to determine a position.

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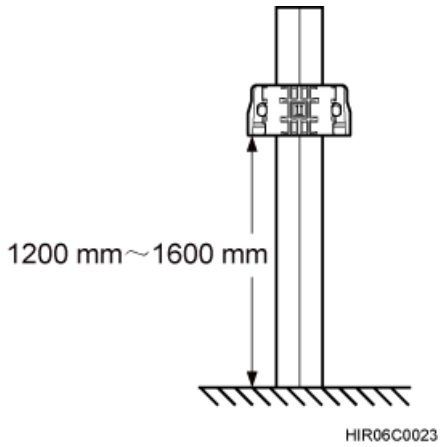
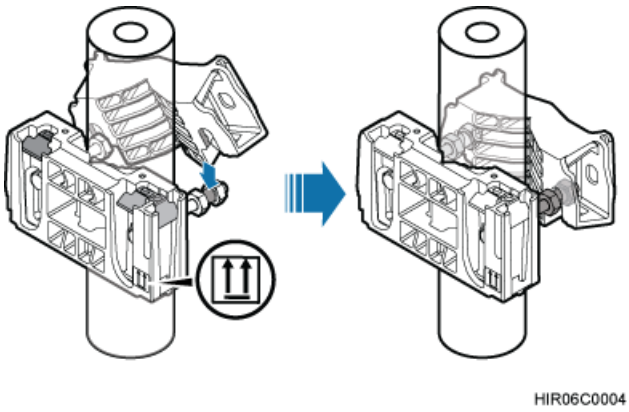
Figure 6-8 Distance between the main mounting bracket and the ground



Step 2 Fit one end of the auxiliary mounting bracket to one dual-nut bolt assembly of the main mounting bracket.

Step 3 Install the bracket assembly on the pole, and then fit the other end of the auxiliary mounting bracket to the other dual-nut bolt assembly, as shown in **Figure 6-9**.

Figure 6-9 Installing the bracket assembly



NOTE

Verify that the arrow on the main mounting bracket is pointing up.

Step 4 Using a torque wrench, tighten the nuts to 40 N·m (354.03 lbf·in.) to secure the bracket assembly onto the pole, as shown in **Figure 6-10**.

CAUTION

Tighten the two dual-nut bolt assemblies alternatively. After the main and auxiliary brackets are secured properly, measure the spacing between the brackets on both sides and ensure that the spacing is the same on the two sides.

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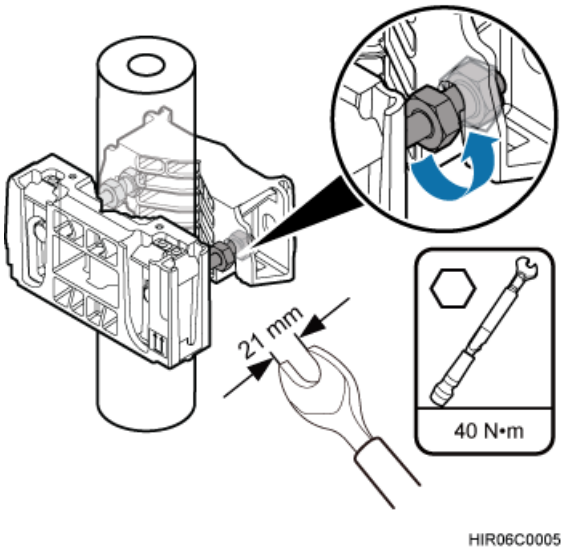
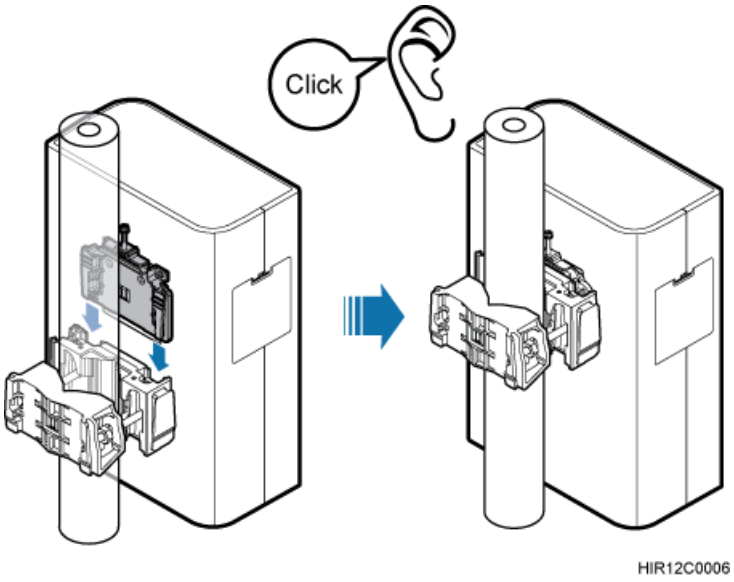
Figure 6-10 Securing the bracket assembly onto the pole



Step 5 Install the RRU on the main mounting bracket until the RRU snaps shut, as shown in **Figure 6-11**.

Figure 6-11 Installing the RRU on the main mounting bracket



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6.2.2 Installing Two RRUs

This section describes the procedure for installing two RRUs on a pole and the precautions that must be taken during the installation.

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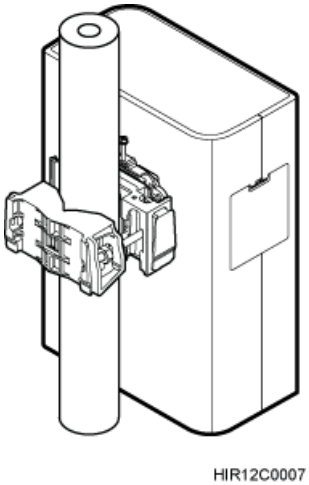
Procedure

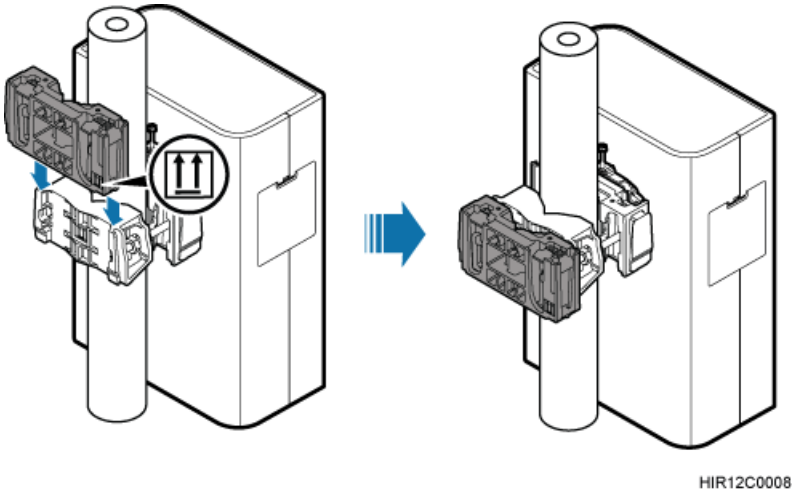
Step 1 Install the first RRU, as shown in **Figure 6-12**. For details, see **6.2.1 Installing a Single RRU**.

Figure 6-12 Installing the first RRU



Step 2 Install the other main mounting bracket on the auxiliary mounting bracket to secure the second RRU, as shown in **Figure 6-13**.

Figure 6-13 Installing the second main mounting bracket



Step 3 Interchange the cover plate and plastic screws in the front and the attachment plate and stainless steel screws at the rear of the second RRU, as shown in **Figure 6-14**.

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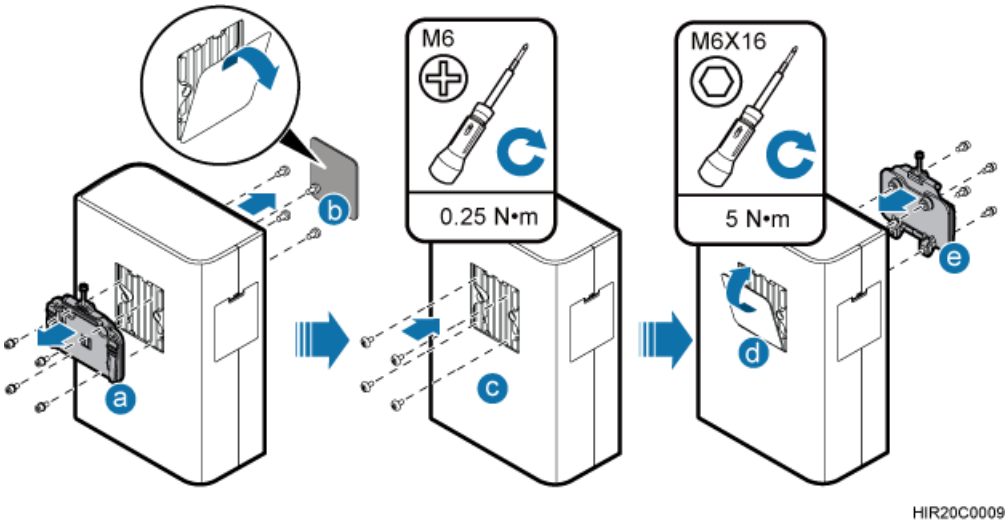
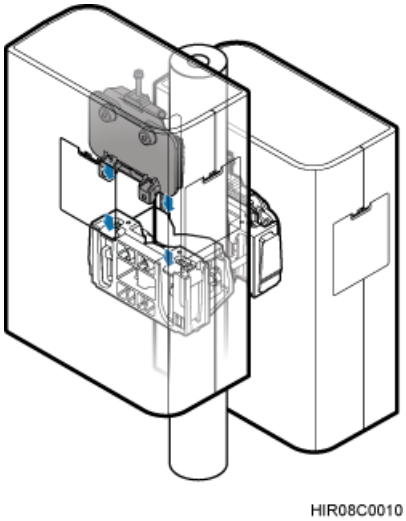
Figure 6-14 Interchanging the cover plate in the front and the attachment plate at the rear of the second RRU



1. Remove the attachment plate from the RRU rear using an inner hexagon screwdriver.
2. Remove the cover plate from the RRU front, and use a Phillips screwdriver to remove the plastic screws from the RRU.
3. Install the plastic screws onto the RRU rear, and tighten the screws to 0.25 N·m (2.21 lbf·in.) using a torque screwdriver.
4. Install the cover plate onto the RRU rear.
5. Install the attachment plate onto the RRU front, and tighten the stainless steel screws on the attachment plate to 5 N·m (44.25 lbf·in.) using a torque screwdriver.

Step 4 Install the second RRU on the main mounting bracket, as shown in **Figure 6-15**.

Figure 6-15 Installing the second RRU on the main mounting bracket



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6.2.3 Installing Multiple RRUs

The section describes the procedure for installing multiple RRUs on a pole and the precautions that must be taken during the installation.

Context

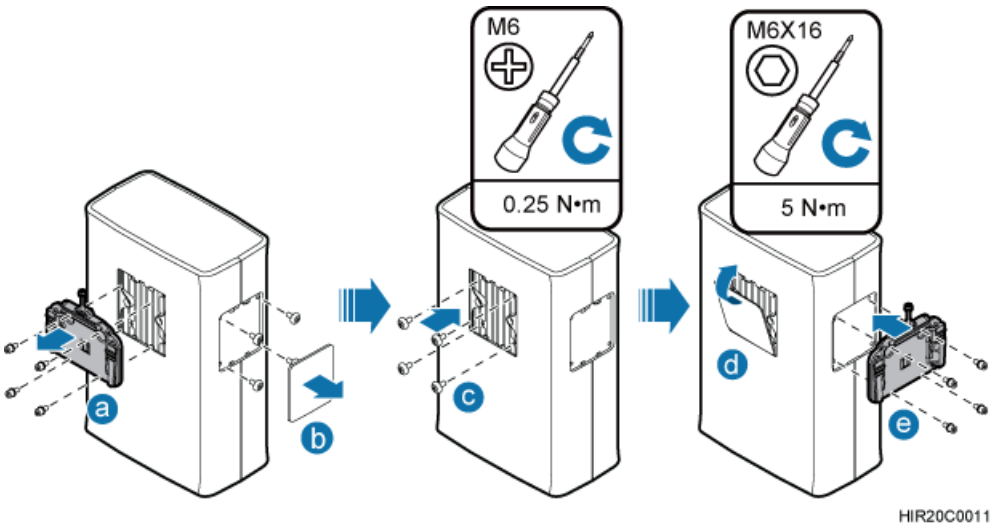
A pole supports the installation of three, four, or six RRUs. The procedures for installing them are the same. Following is the procedure of installing four RRUs on a pole.

Procedure

Step 1 Install one set of bracket assembly on a pole. For details, see **6.2.1 Installing a Single RRU**.

Step 2 Interchange the attachment plate and stainless steel screws at the RRU rear and the cover plate and plastic screws on the RRU side, as shown in **Figure 6-16**.

Figure 6-16 Interchanging the attachment plate at the RRU rear and the cover plate on the RRU side



1. Remove the attachment plate from the RRU rear using an inner hexagon screwdriver.
2. Remove the cover plate from the RRU side, and use a Phillips screwdriver to remove the plastic screws from the RRU.
3. Install the plastic screws onto the RRU rear, and tighten the screws to 0.25 N·m (2.21 lbf·in.) using a torque screwdriver.
4. Install the cover plate onto the RRU rear.
5. Install the attachment plate onto the RRU side, and tighten the stainless steel screws on the attachment plate to 5 N·m (44.25 lbf·in.) using a torque screwdriver.

Step 3 Install the first RRU on the main mounting bracket, as shown in **Figure 6-17**.

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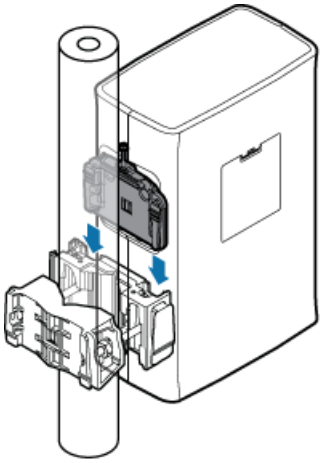
Figure 6-17 Installing the first RRU on the main mounting bracket



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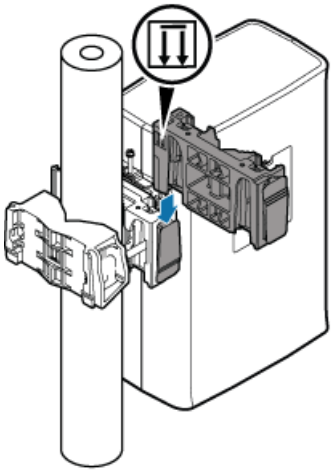
Step 4 Install the second main mounting bracket on the side of the first main mounting bracket, as shown in **Figure 6-18**.

Figure 6-18 Installing the second main mounting bracket



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Step 5 Install the second RRU on the second main mounting bracket, as shown in **Figure 6-19**.

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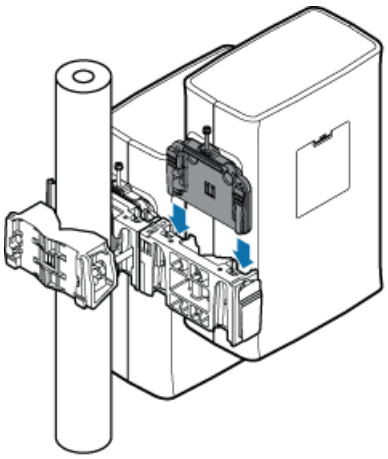
Figure 6-19 Installing the second RRU on the second main mounting bracket



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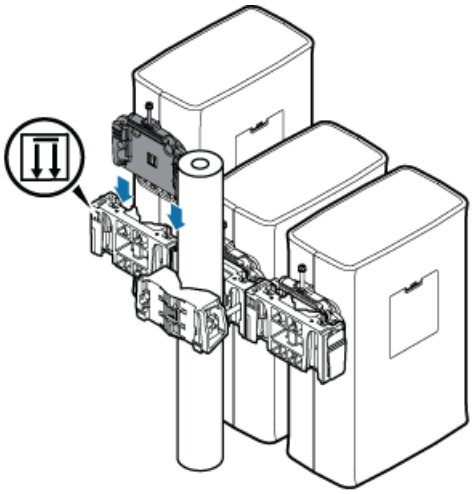
Step 6 Install the third main mounting bracket, and then install the third RRU on the main mounting bracket, as shown in **Figure 6-20**.

Figure 6-20 Installing the third RRU on the third main mounting bracket



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Step 7 Install the fourth main mounting bracket, as shown in **Figure 6-21**.

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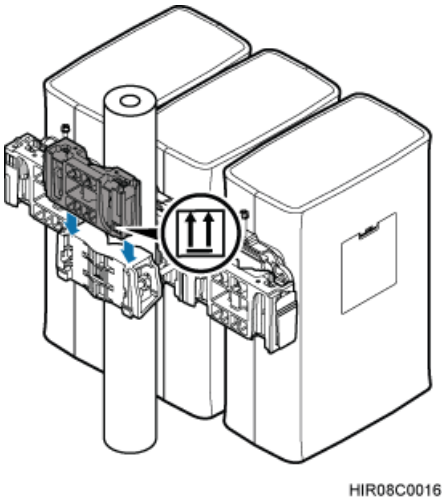
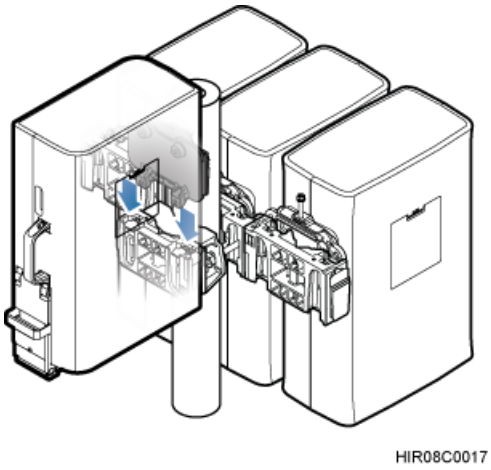
Figure 6-21 Installing the fourth main mounting bracket



Step 8 Install the fourth RRU on the fourth main mounting bracket, as shown in **Figure 6-22**.

Figure 6-22 Installing the fourth RRU on the fourth main mounting bracket



----End

6.3 Installing the RRU on U-steel

This section describes the procedure for installing the RRU on U-steel and the precautions that must be taken during the installation. The RRU installed on U-steel can be mounted to a tower or placed on the ground. It is recommended that only one RRU be installed on U-steel.

Prerequisite

Before you install an RRU on a tower, the RRU and mounting kits are hoisted onto the tower. For details, see **6.6 Hoisting the RRU and Mounting Kits onto a Tower**.

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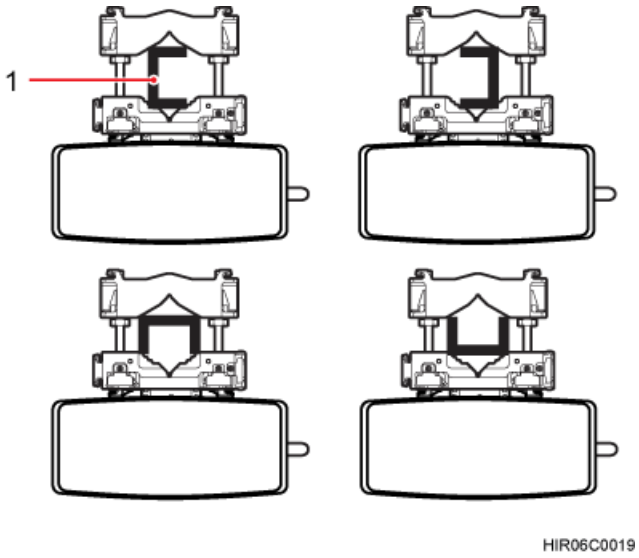
The hoist clamp on the main mounting bracket is secured properly.

Context

Figure 6-23 shows the top view of the RRU installed on U-steel.

Figure 6-23 Top view of the RRU



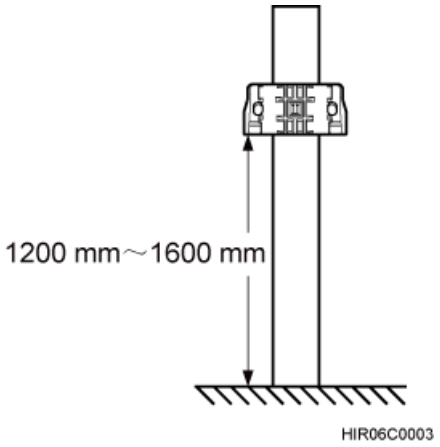
(1) U-steel

Procedure

Step 1 Determine a position for installing the main mounting bracket.

- If the RRU must be installed on a tower, see **3.5.1 Installation Clearance for a Single RRU** to determine a position.
- If the RRU must be installed on the ground, see **Figure 6-24** to determine a position.

Figure 6-24 Distance between the main mounting bracket and the ground



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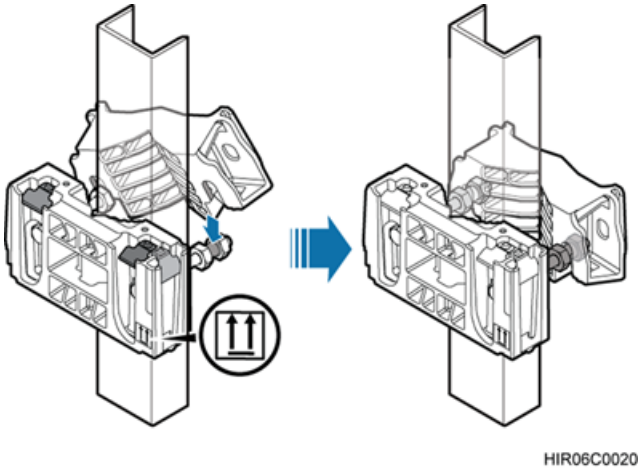
NOTE

It is recommended that the main mounting bracket be 1,200 mm (47.24 in.) to 1,600 mm (62.99 in.) above the ground.

Step 2 Fit one end of the auxiliary mounting bracket to one dual-nut bolt assembly of the main mounting bracket.

Step 3 Install the bracket assembly on U-steel, and then fit the other end of the auxiliary mounting bracket to the other dual-nut bolt assembly, as shown in **Figure 6-25**.

Figure 6-25 Installing the bracket assembly



NOTE

Verify that the arrow on the main mounting bracket is pointing up.

Step 4 Using a torque wrench, tighten the nuts to 40 N·m (354.03 lbf·in.) to secure the bracket assembly onto the U-steel, as shown in **Figure 6-26**.

CAUTION

Tighten the two dual-nut bolt assemblies alternatively. After the main and auxiliary brackets are secured properly, measure the spacing between the brackets on both sides and ensure that the spacing is the same on the two sides.

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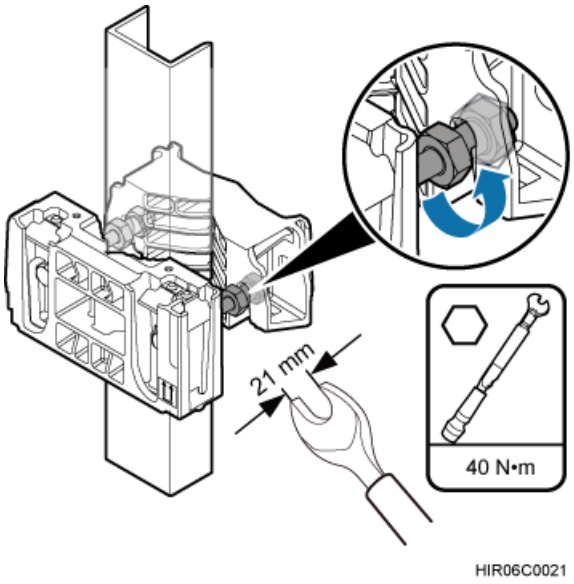
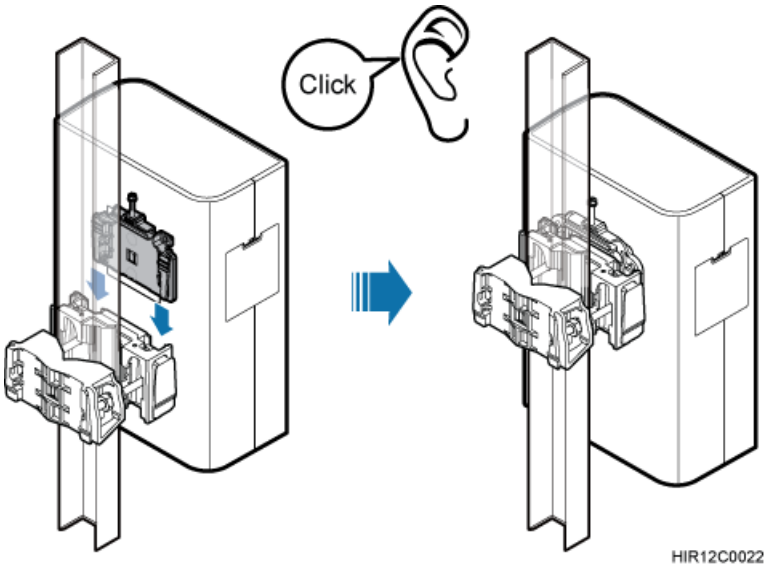
Figure 6-26 Securing the bracket assembly onto U-steel



Step 5 Install the RRU on the main mounting bracket until the RRU snaps shut, as shown in **Figure 6-27**.

Figure 6-27 Installing the RRU on the main mounting bracket



----End

6.4 Installing the RRU on Angle Steel

This section describes the procedure for installing the RRU on angle steel and the precautions that must be taken during the installation. The RRU installed on angle steel can be mounted to

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a tower or placed on the ground. It is recommended that only one RRU be installed on angle steel.

Prerequisite

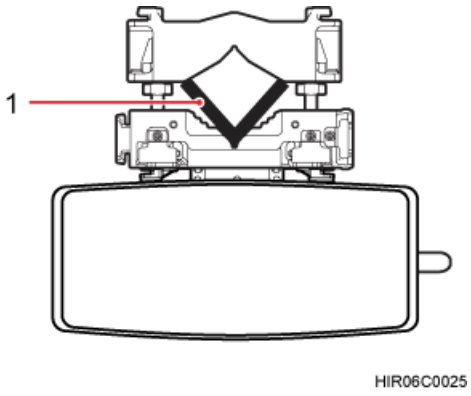
Before you install an RRU on a tower, the RRU and mounting kits are hoisted onto the tower. For details, see **6.6 Hoisting the RRU and Mounting Kits onto a Tower**.

The hoist clamp on the main mounting bracket is secured properly.

Context

Figure 6-28 shows the top view of the RRU installed on angle steel.

Figure 6-28 Top view of the RRU



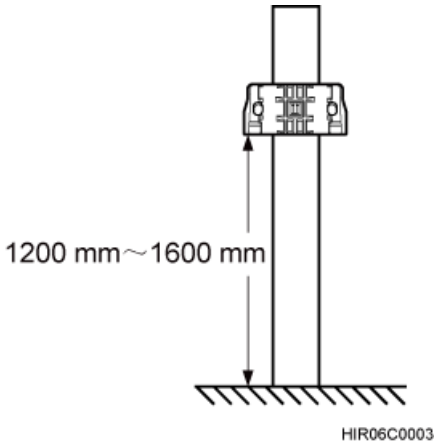
(1) Angle steel

Procedure

Step 1 Determine a position for installing the main mounting bracket.

- If the RRU must be installed on a tower, see **3.5.1 Installation Clearance for a Single RRU** to determine a position.
- If the RRU must be installed on the ground, see **Figure 6-29** to determine a position.

Figure 6-29 Distance between the main mounting bracket and the ground



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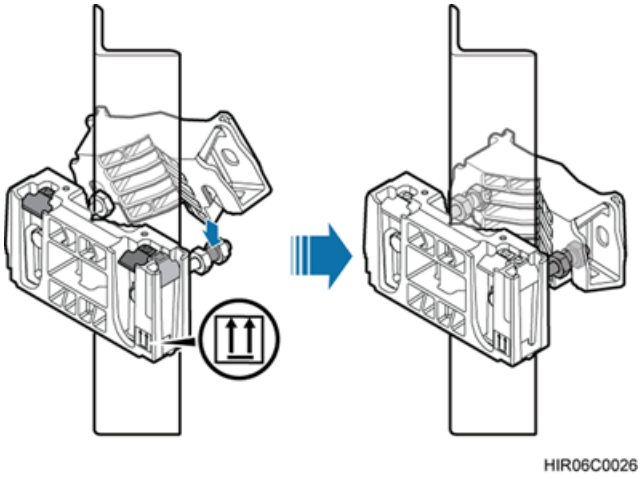
NOTE

It is recommended that the main mounting bracket be 1,200 mm (47.24 in.) to 1,600 mm (62.99 in.) above the ground.

Step 2 Fit one end of the auxiliary mounting bracket to one dual-nut bolt assembly of the main mounting bracket.

Step 3 Install the bracket assembly on angle steel, and then fit the other end of the auxiliary mounting bracket to the other dual-nut bolt assembly, as shown in **Figure 6-30**.

Figure 6-30 Installing the bracket assembly



NOTE

Verify that the arrow on the main mounting bracket is pointing up.

Step 4 Using a torque wrench, tighten the nuts to 40 N·m (354.03 lbf·in.) to secure both the bracket assembly onto the angle steel, as shown in **Figure 6-31**.

CAUTION

Tighten the two dual-nut bolt assemblies alternatively. After the main and auxiliary brackets are secured properly, measure the spacing between the brackets on both sides and ensure that the spacing is the same on the two sides.

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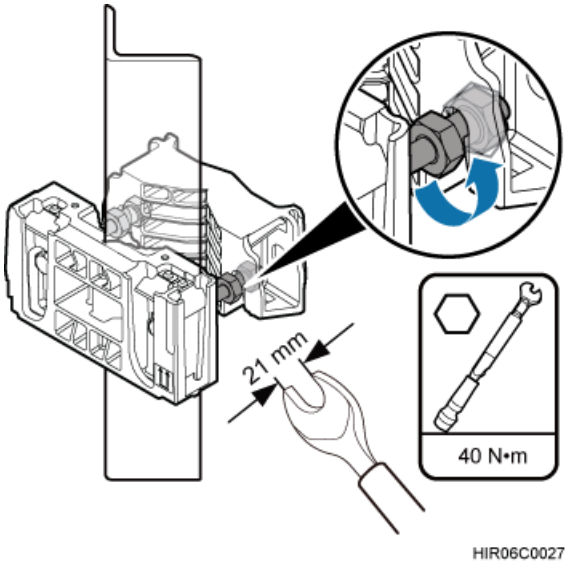
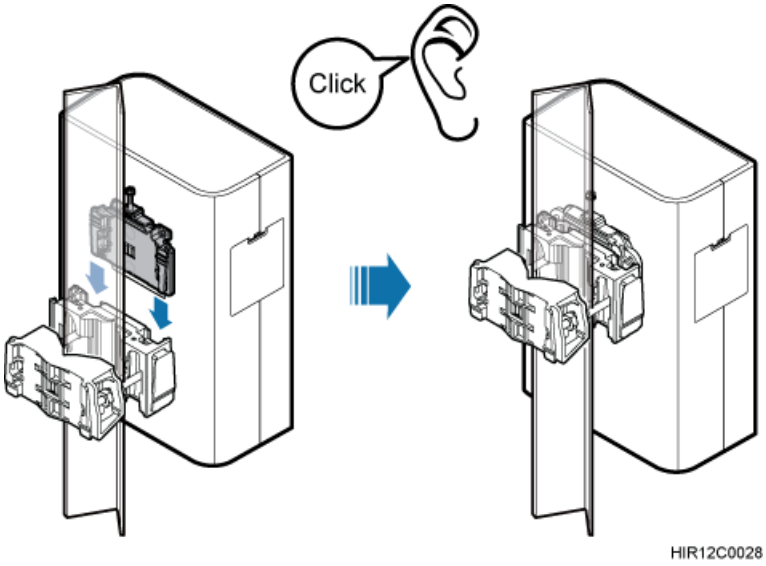
Figure 6-31 Securing the bracket assembly onto angle steel



Step 5 Install the RRU on the main mounting bracket until the RRU snaps shut, as shown in **Figure 6-32**.

Figure 6-32 Installing the RRU on the main mounting bracket



----End

6.5 Installing the RRU on a Wall

This section describes the procedure for installing the RRU on a wall and the precautions that must be taken during the installation.

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Prerequisite

The hoist clamp on the main mounting bracket is secured properly.

Context

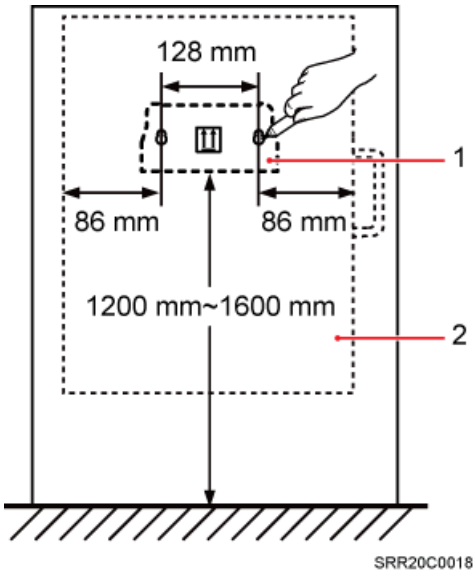
The wall on which RRUs are installed must meet the following requirements:

- When a single RRU is installed, the wall has a capacity of bearing at least four times the weight of the RRU.
- Expansion bolts must be tightened to 30 N·m (265.52 lbf·in.) to ensure the bolts work properly and the wall remains intact without cracks in it.

Procedure

Step 1 Place the auxiliary mounting bracket against the installation position, use a level to verify that the auxiliary mounting bracket is placed horizontally, and then mark anchor points with a marker, as shown in **Figure 6-33**.

Figure 6-33 Marking anchor points



(1) Auxiliary mounting bracket (2) RRU

NOTE

It is recommended that the auxiliary mounting bracket be 1,200 mm (47.24 in.) to 1,600 mm (62.99 in.) above the ground.

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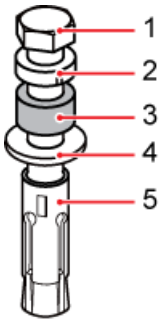
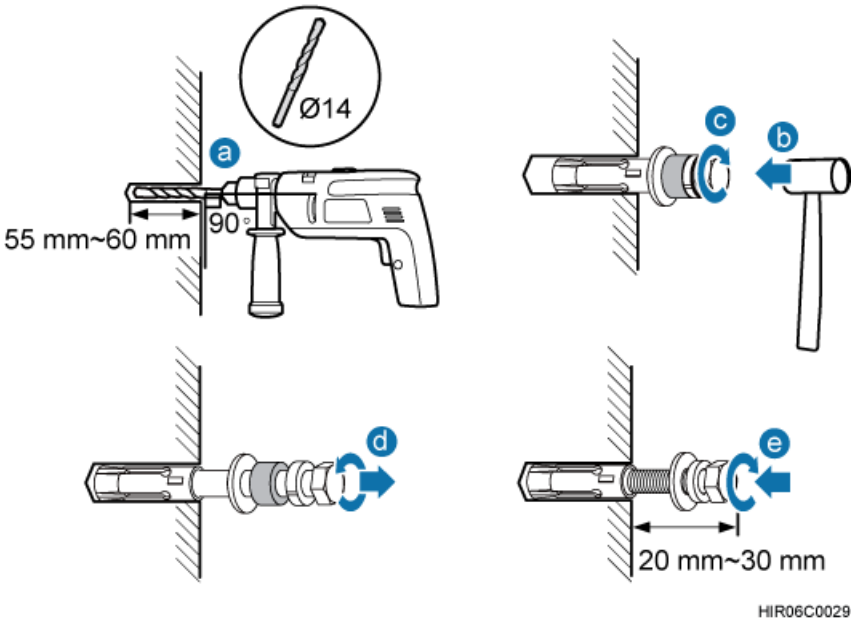
Figure 6-34 Expansion bolt assembly



(1) M10x65 bolt (2) Spring washer 10 (3) Plastic tube (4) Flat washer 10 (5) Expansion tube

Step 2 Drill holes at the anchor points, and then insert expansion bolt assemblies, as shown in **Figure 6-35**.

Figure 6-35 Drilling a hole and inserting an expansion bolt assembly



1. Use a hammer drill with a φ14 bit to drill holes vertically at the marked anchor points. Ensure that the depth of each hole ranges from 55 mm (2.17 in.) to 60 mm (2.36 in.).

WARNING

Take proper safety measures to protect your eyes and respiratory tract against the dust before drilling holes.

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2. Hit the expansion bolt with a rubber mallet until the expansion tube completely enters the hole.
3. Tighten an expansion bolt slightly and place it vertically into each hole.
4. Remove the M10x65 bolt, spring washer, plastic tube, and flat washer from each expansion bolt assembly in sequence.

   NOTE

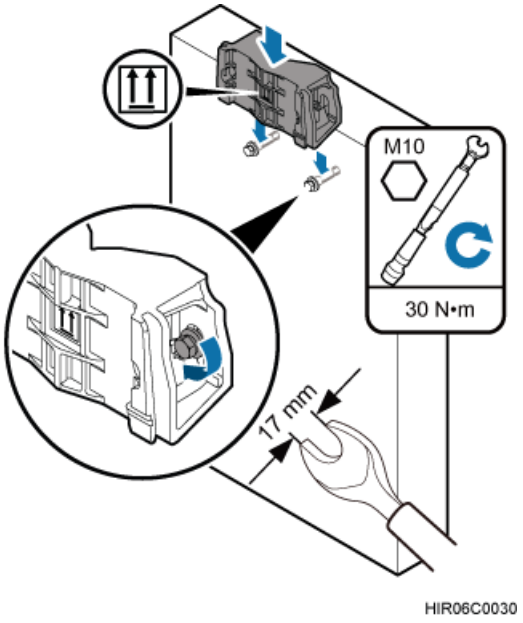
   After completely removing an expansion bolt, store the plastic tube properly.
5. Hammer the bolt into the wall.

CAUTION

Do not hammer the expansion bolt entirely into the wall. Instead, leave 20 mm (0.79 in.) to 30 mm (1.18 in.) of the expansion bolt outside the wall.

Step 3 Fit the auxiliary mounting bracket on the expansion bolt, and then use a torque wrench (17 mm [0.67 in.]) to tighten the expansion bolt to 30 N·m (265.52 lbf·in.), as shown in **Figure 6-36**.

Figure 6-36 Fitting the auxiliary mounting bracket on expansion bolts



CAUTION

Verify that the arrow on the auxiliary mounting bracket is pointing up.

Step 4 Loosen the screws on the main mounting bracket and store them properly.

Step 5 Install the main mounting bracket, as shown in **Figure 6-37**.

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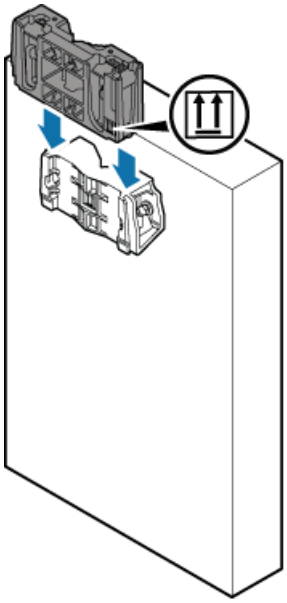
Figure 6-37 Installing the main mounting bracket



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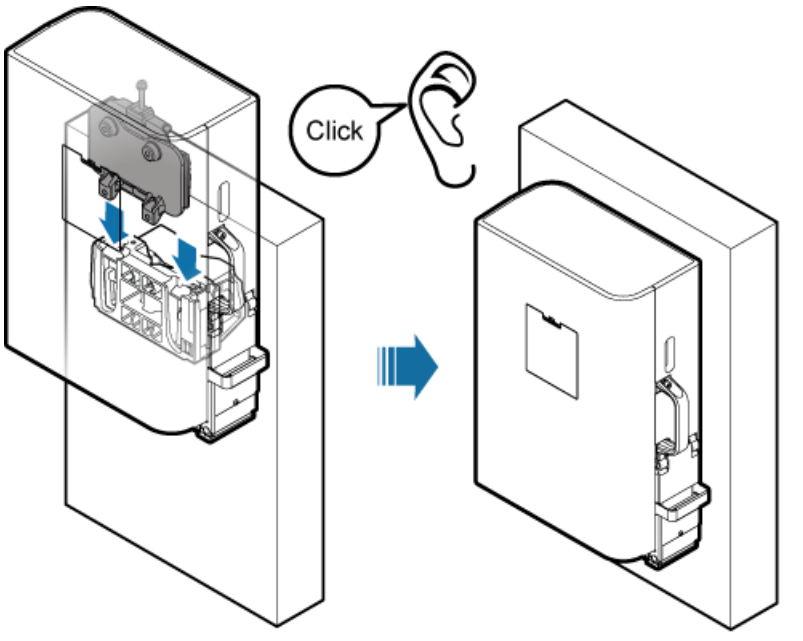
Step 6 Install the RRU on the main mounting bracket until the RRU snaps shut, as shown in **Figure 6-38**.

Figure 6-38 Installing the RRU



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----End

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6.6 Hoisting the RRU and Mounting Kits onto a Tower

Before installing an RRU on a tower, bind the RRU and mounting kits and then hoist them onto the tower. The RRU can be installed on a pole, U-steel, or angle steel. This section describes the procedure for hoisting the RRU and mounting kits onto the tower and the precautions that must be taken.

Prerequisite

Place a foam pad or cardboard on the ground to protect the housing of the RRU from damage before the binding. Do not stand the RRU upright because the load-bearing capacity of the RF ports at the RRU bottom is low.

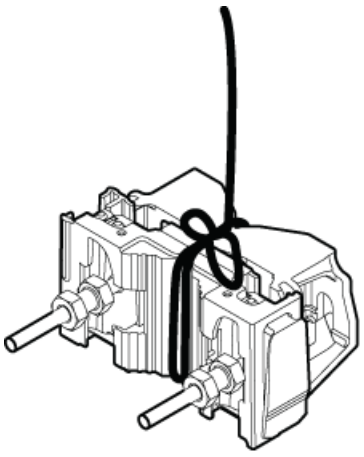
CAUTION

When installed on a tower, only one RRU can be installed in standard mode or reverse mode, and two RRUs can be installed on a pole in back-to-back mode. RRUs cannot be installed on the side, and the brackets for more than two RRUs cannot be combined.

Procedure

Step 1 Bind the RRU and mounting kits properly using a lifting sling, as shown in **Figure 6-39**.

Figure 6-39 Binding mounting kits for the RRU



Step 2 Bind the RRU by leading the lifting sling along the bottom of the attachment plate and through the RRU handle. Then, bind mounting kits to the lifting sling and bind the RRU handle to the traction sling, as shown in **Figure 6-40**.

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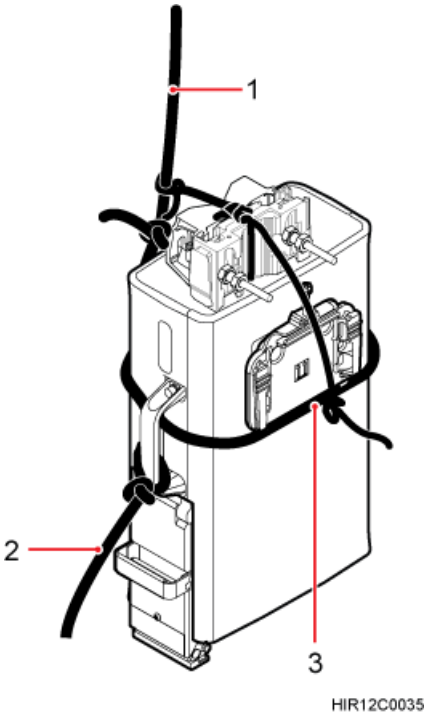
Figure 6-40 Binding the RRU and mounting kits



(1) Lifting sling (2) Traction sling (3) Bottom of the attachment plate

CAUTION

- When hoisting the RRU and mounting kits onto the tower, protect them from colliding with the ground and tower.
- Hoist the RRU onto the tower before it is installed on a pole, angle steel, or U-steel.

CAUTION

Do not hoist the RRU by the handle only, as shown in **Figure 6-41**.

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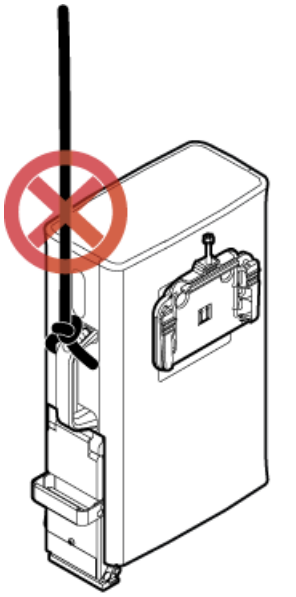
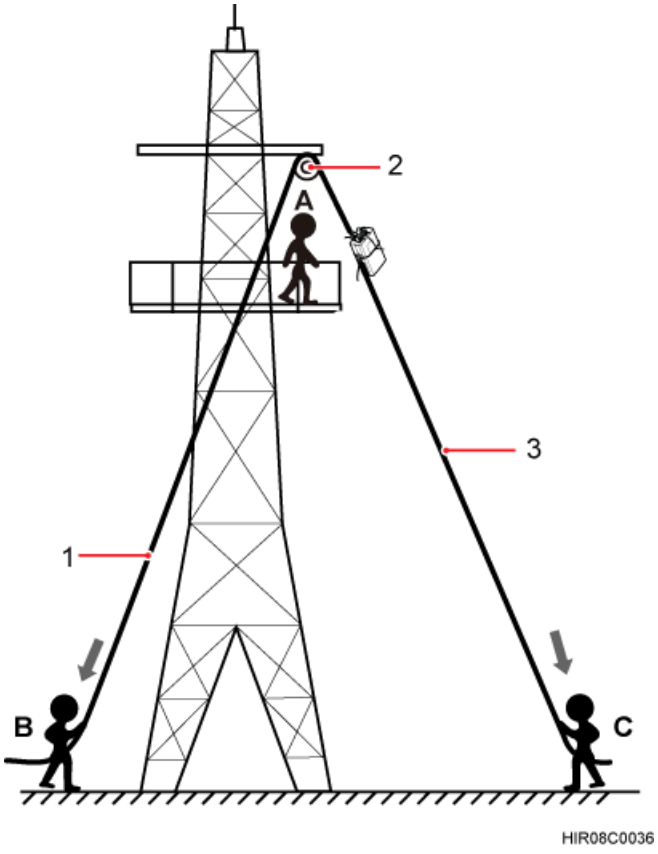
Figure 6-41 Incorrect binding method



Step 3 Hoist the RRU and mounting kits onto the tower, as shown in **Figure 6-42**.

Figure 6-42 Hoisting the RRU and mounting kits onto the tower



(1) Lifting sling (2) Fixed pulley (3) Traction sling

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1. After climbing up to the tower, installation engineer A secures the fixed pulley to the tower platform support and leads the lifting sling through the fixed pulley.
2. Installation engineer C binds the RRU and mounting kits using the lifting sling and secures the traction sling to the RRU handle.
3. Installation engineer B pulls the lifting sling downwards, and installation engineer C pulls the traction sling outwards to protect the RRU and mounting kits from colliding with the tower.
4. Installation engineer A catches the RRU and mounting kits and then unties the sling.

   NOTE

   The procedure for hoisting the RRU and mounting kits onto the tower is for your reference only.

----End

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7 Installing RRU Cables

About This Chapter

This chapter describes the procedure for installing RRU cables.

7.1 Cabling Requirements
Cables must be routed according to the specified cabling requirements to prevent signal interference.

7.2 Cable Connections
This section describes the cable connections for a single RRU and multiple RRUs.

7.3 Installation Process
This section describes the process of installing RRU cables.

7.4 RRU Cable List
This section describes RRU cable connections.

7.5 Installing an RRU PGND Cable
This section describes the procedure for installing an RRU PGND cable.

7.6 Installing an RRU RF Jumper
This section describes the procedure for installing an RRU RF jumper.

7.7 Installing an RRU Alarm Cable
This section describes the procedure for installing an RRU alarm cable.

7.8 Installing an RRU AISG Multi-Wire Cable and AISG Extension Cable
This section describes the procedures for installing an RRU AISG multi-wire cable and AISG extension cable.

7.9 Opening the Cover Plate of an RRU Cabling Cavity
This section describes the procedure for opening the cover plate of an RRU cabling cavity.

7.10 Installing an RRU power cable
This section describes the procedure for installing an RRU power cable.

7.11 Installing a CPRI Fiber Optic Cable
This section describes the procedure for installing a CPRI fiber optic cable.

7.12 Installing an SFP High-Speed Cable for Cascading RRUs
This section describes the procedure for installing an SFP high-speed cable for cascading RRUs.

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7.13 Closing the Cover Plate of an RRU Cabling Cavity

This section describes the procedure for closing the cover plate of an RRU cabling cavity.

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7.1 Cabling Requirements

Cables must be routed according to the specified cabling requirements to prevent signal interference.

NOTE

If a cable listed below is not required, skip the routing requirements of the cable.

General Cabling Requirements

The bending radius of the cables must meet the following specifications:

- The bending radius of the 7/8" feeder must be more than 250 mm (9.84 in.), and the bending radius of the 5/4" feeder must be more than 380 mm (14.96 in.).
- The bending radius of the 1/4" jumper must be more than 35 mm (1.38 in.). The bending radius of the super-flexible 1/2" jumper must be more than 50 mm (1.97 in.), and the bending radius of the ordinary 1/2" jumper must be more than 127 mm (5 in.).
- The bending radius of the power cable or PGND cable must be at least five times the diameter of the cable.
- The bending radius of an fiber optic cable is at least 20 times the diameter of the fiber optic cable.
- The bending radius of the E1/T1 cable must be at least five times the diameter of the cable.
- The bending radius of the signal cable must be at least five times the diameter of the cable.

The cables must be bound as follows:

- Different types of cables must be separately routed and cannot be entangled.
- The cables must be bound tightly and neatly. The sheaths of the cables must not be damaged.
- The cable ties must face the same direction, and those at the same horizontal line must be in a straight line. Extra length of cable ties must be cut.
- Labels or nameplates must be attached to the cables after they are installed.

The cables must be routed as follows:

- Different types of cables must be separately routed with a minimum space of 30 mm (1.18 in.) between every two cables.
- Different types of cables must be installed in an untangled and orderly fashion.
- Different types of cables must be routed in parallel or separated by special objects.

Special Cabling Requirements

Cabling requirements for power cables are as follows:

- -48 V power cables must be bound together.
- +24 V power cables must be bound together.
- Power cables, transmission cables, and signal cables are routed separately.
- Multiple power cables must be bound when routed.
- Power cables must be installed in the position specified in engineering design documents.

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- If the length of power cables is insufficient, replace the cables rather than adding connectors or soldering joints to lengthen the cables.

Cabling requirements for PGND cables are as follows:

- PGND cables for the base station must be connected to the same ground bar.
- PGND cables must be buried in the ground or routed indoors. They should not be routed overhead before they are led into the equipment room.
- The exterior of the coaxial wire and the shield layer of the shielded cable must have proper electrical contact with the metal surface of the equipment to which they are connected.
- PGND cables and signal cables must be installed in an untangled and orderly fashion. A certain distance must be reserved between them to prevent interference from each other.
- Fuses or switches must not be installed on the PGND cables.
- Other devices must not be used for electrical connections of the PGND cables.
- All the metal parts in the housing of the equipment must be reliably connected to the ground terminal.

Cabling requirements for E1 cables are as follows:

- E1 cables must not cross power cables, PGND cables, or RF cables when routed. If transmission cables are routed with power cables, PGND cables, or RF cables in parallel, the spacing between them must be greater than 30 mm (1.18 in.).
- E1 cables are routed straightly and bound neatly with cable ties.
- Sufficient slack is provided in E1 cables at turns.

Cabling requirements for fiber optic cables are as follows:

- Do not stretch, step on, or place heavy objects on fiber optic cables. Keep the cables away from sharp objects.
- When fiber optic cables are routed, the extra length of the cables must be coiled around special devices, such as a fiber coiler.
- When coiling fiber optic cables, apply even strength. Do not bend the cables with force.
- Vacant optical connectors must be covered with dustproof caps.

7.2 Cable Connections

This section describes the cable connections for a single RRU and multiple RRUs.

NOTE

A lower-level RRU obtains power directly from the external power system, but not from an upper-level RRU using a power cable.

Figure 7-1 shows the cable connections for a single RRU when the alarm monitoring function is performed.

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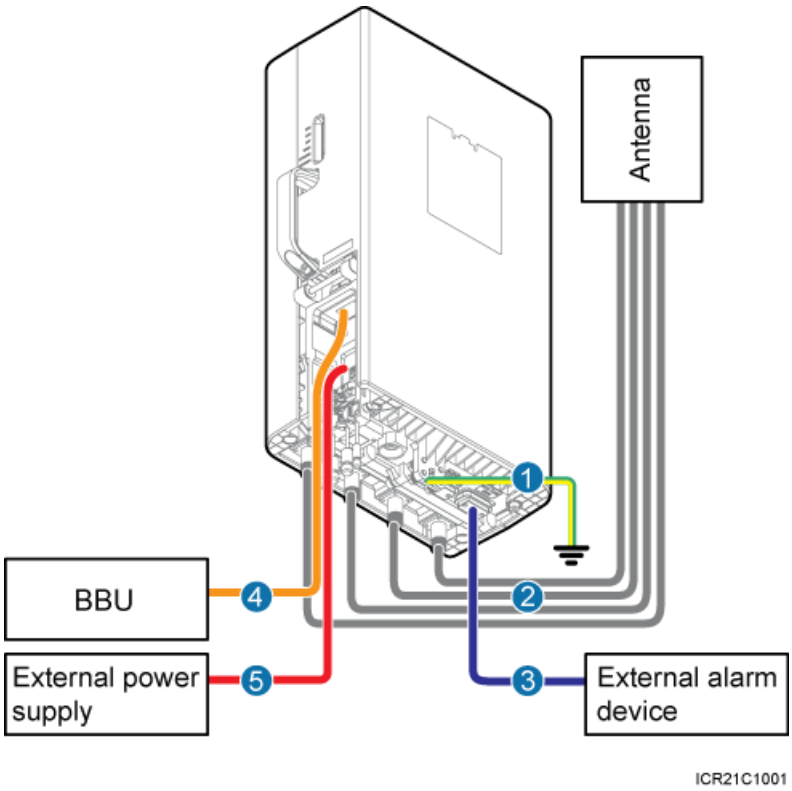
Figure 7-1 Cable connections for a single RRU (1)



(1) PGND cable	(2) RRU RF jumper	(3) RRU alarm cable
(4) CPRI fiber optic cable	(5) RRU power cable	-

Figure 7-2 shows the cable connections for a single RRU when the RET function is performed.

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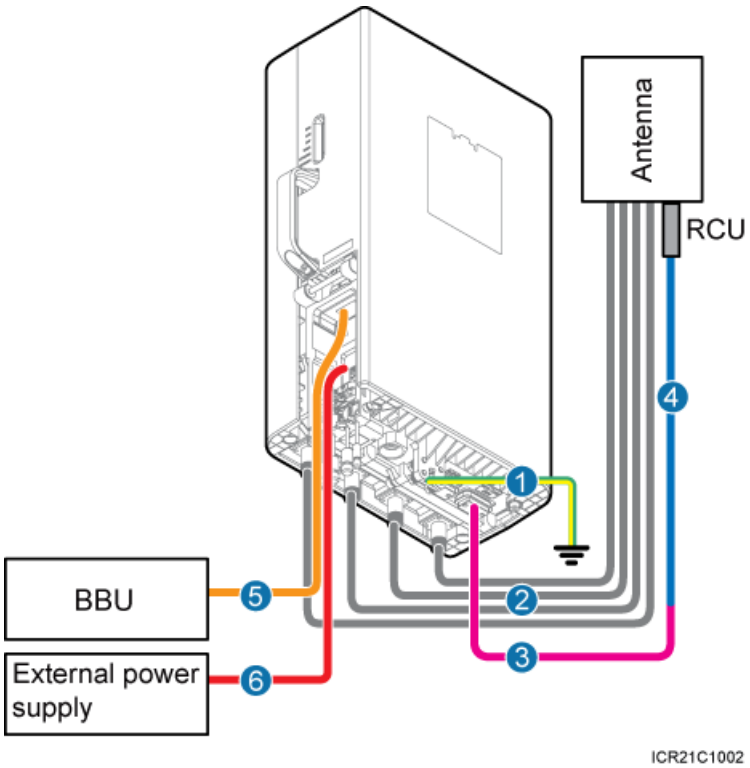
Figure 7-2 Cable connections for a single RRU (2)



(1) PGND cable
(2) RRU RF jumper
(3) RRU AISG multi-wire cable
(4) RRU AISG extension cable
(5) CPRI fiber optic cable
(6) RRU power cable

Figure 7-3 shows the cable connections for multiple RRUs when the alarm monitoring function is performed.

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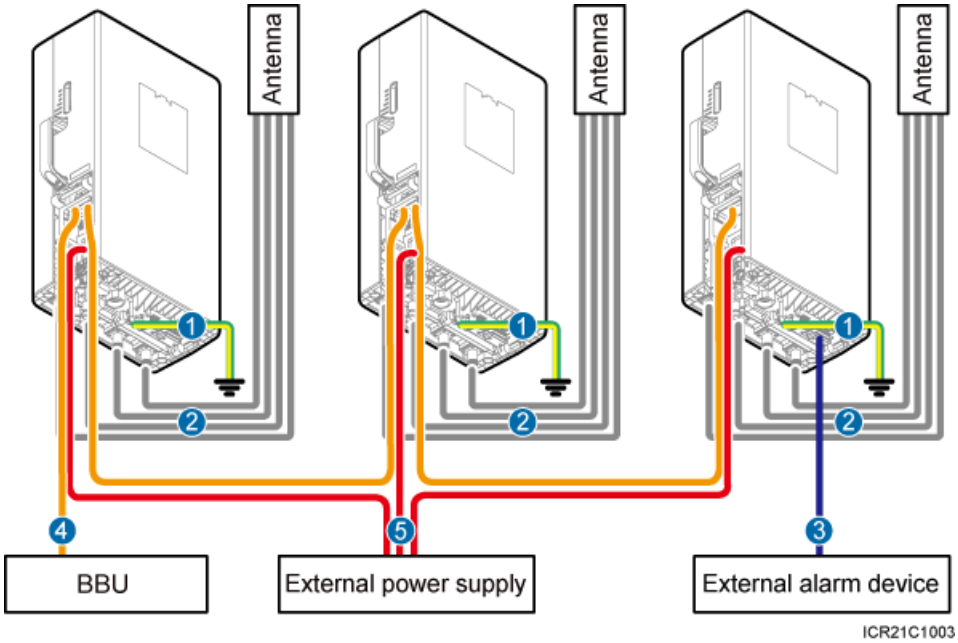
Figure 7-3 Cable connections for multiple RRUs (1)



(1) PGND cable (2) RRU RF jumper (3) RRU alarm cable

(4) CPRI fiber optic cable/SFP high-speed cable for cascaded RRUs (5) RRU power cable -

NOTE

If you must cascade two or more RRUs in the same cell, for example, when expanding capacity, install the alarm cable to the last RRU.

Figure 7-4 shows the cable connections for multiple RRUs when the RET function is performed.

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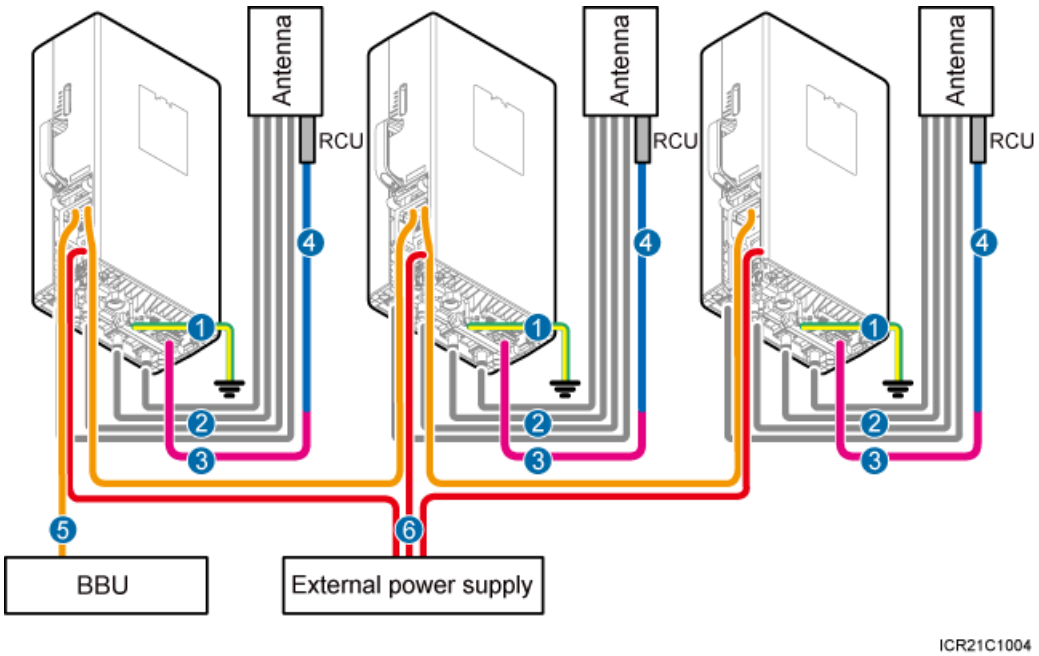
Figure 7-4 Cable connections for multiple RRUs



(1) PGND cable
(2) RRU RF jumper
(3) RRU AISG multi-wire cable
(4) RRU AISG extension cable
(5) CPRI fiber optic cable/SFP high-speed cable for cascaded RRUs
(6) RRU power cable

7.3 Installation Process

This section describes the process of installing RRU cables.

Figure 7-5 shows the process of installing RRU cables.

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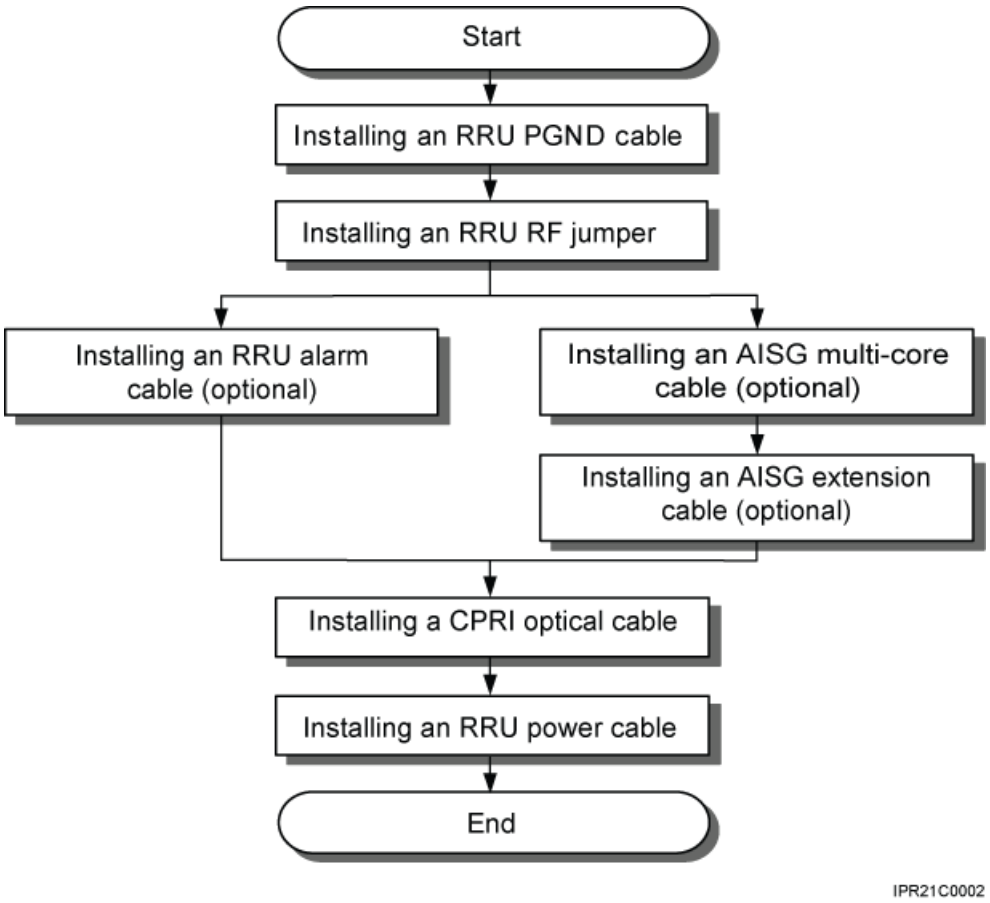
Figure 7-5 Process of installing RRU cables



7.4 RRU Cable List

This section describes RRU cable connections.

Table 7-1 lists RRU cables.

Table 7-1 RRU cables

Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
RRU PGND Cable	OT terminal (M6, 16 mm^2 [0.025 $in.^2$])	Ground terminal on the RRU	OT terminal (M8, 16 mm^2 [0.025 $in.^2$])	Ground terminal on the ground bar
RRU Power Cable	Easy power receptacle (pressfit type) connector	NEG(-) and RTN(+) ports on the RRU	Easy power receptacle (pressfit type) connector	RRU0 to RRU5 on the EPS

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Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
			OT terminal (M4, 3.3 mm^2 [0.005 $in.^2$]), complying with North American standards OT terminal (M4, 4 mm^2 [0.006 $in.^2$]), complying with European standards	One of LOAD0 to LOAD5 ports on the DCDU One of LOAD4 to LOAD9 ports on the PDU
CPRI Fiber Optic Cable	DLC connector	CPRI0/IR0 port on the RRU	DLC connector	CPRI port on the LBBP in the BBU
		CPRI1/IR1 port on the RRU		CPRI0/IR0 port on the RRU
RRU RF Jumper	Type N connector	ANT0 to ANT3 ports on the RRU	Type N connector	Antenna system
RRU Alarm Cable	Waterproofed DB9 male connector	RET/ EXT_ALM port on the RRU	Cord end terminal	External alarm device
RRU AISG Multi-Wire Cable	Waterproofed DB9 male connector	RET/ EXT_ALM port on the RRU	Standard AISG female connector	Standard AISG male connector on the RCU or on the AISG extension cable
RRU AISG Extension Cable	Standard AISG male connector	Standard AISG female connector on the AISG multi-wire cable	Standard AISG female connector	Standard AISG male connector on the RCU

7.5 Installing an RRU PGND Cable

This section describes the procedure for installing an RRU PGND cable.

Context

The cross-sectional area of an RRU PGND cable is 16 mm^2 (0.025 $in.^2$). The OT terminals at two ends of the cable are M6 and M8 terminals respectively.

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Procedure

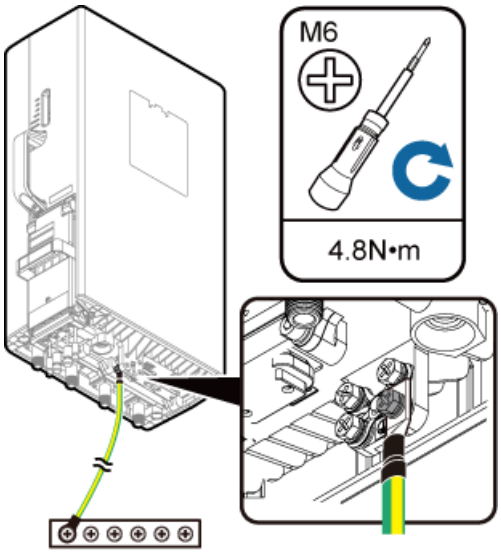
Step 1 Prepare an RRU PGND cable.

1. Cut the cable to the required length based on the actual cable route.
2. Add an OT terminal to each end of the cable by referring to Assembling the OT Terminal and the Power Cable.

Step 2 Install the RRU PGND cable.

Connect the M6 OT terminal at one end of the PGND cable to the ground terminal at the RRU bottom and the M8 OT terminal at the other end to the external ground bar, as shown in **Figure 7-6**.

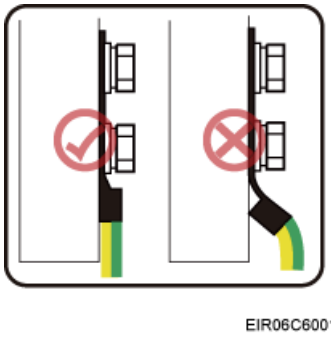
Figure 7-6 Installing an RRU PGND cable



NOTE

Crimp OT terminals in correct positions, as shown in **Figure 7-7**.

Figure 7-7 Correct position of an OT terminal



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Step 3 Label the installed cable by referring to Attaching a Cable-Tying Label.

----End

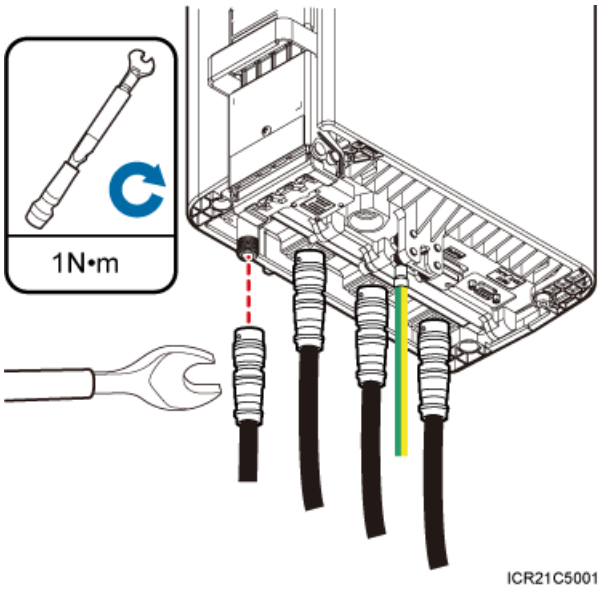
7.6 Installing an RRU RF Jumper

This section describes the procedure for installing an RRU RF jumper.

Procedure

Step 1 Link the type N connector at one end of the RF jumper to the ANT port and use a torque wrench to tighten the connector to 1N·m (8.85 lbf·in.), as shown in **Figure 7-8**.

Figure 7-8 Installing an RRU RF jumper



CAUTION

On AC-powered electric railways, such as high speed railways, when leaky cables are connected to RRUs installed in tunnels, high-voltage-resistance DC blocks must be installed between RRU RF jumpers and the leaky cables to protect the RRUs against damage.

Step 2 Link the other end of the RF jumper to the external antenna system.

Step 3 Waterproof the connectors of the RF jumper by referring to **Figure 7-9**.

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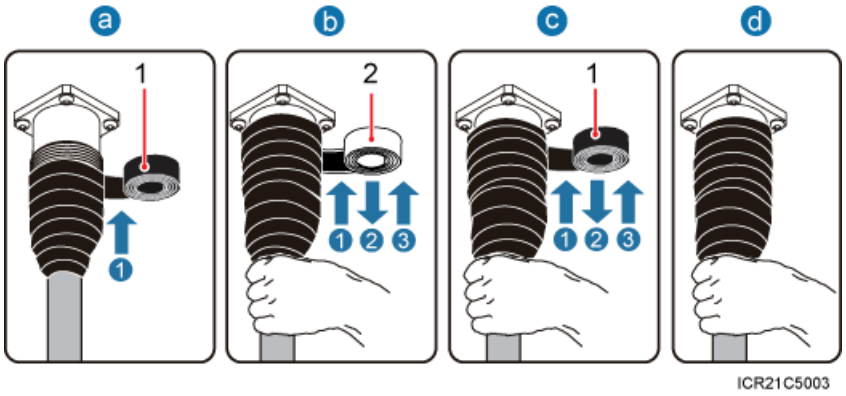
Figure 7-9 Waterproofing a connector of the RF jumper



(1) PVC insulation tape	(2) Waterproof tape

NOTE

- Before wrapping waterproof tape, stretch the tape evenly until the width of the tape is half of its original width.
- Wrap each layer of tape around the connector tightly and neatly, and ensure that each layer of tape overlaps more than 50% of the preceding layer.

1. Wrap each connector with one layer of insulation tape from bottom up.
2. Wrap each connector with three layers of waterproof tape, from bottom up, then from top down, and finally from bottom up. Do not cut the tape until all the three layers of the tape are already wrapped. Wrap each layer of tape around the connector tightly.
3. Wrap each connector with three layers of PVC insulation tape, from bottom up, then from top down, and finally from bottom up. Do not cut the tape until all the three layers of the tape are already wrapped. Wrap each layer of tape around the connector tightly.

Step 4 Check the dustproof caps on antenna connectors. Dustproof caps must be waterproofed, as shown in **Figure 7-10**.

CAUTION

Do not remove dustproof caps from vacant antenna connectors.

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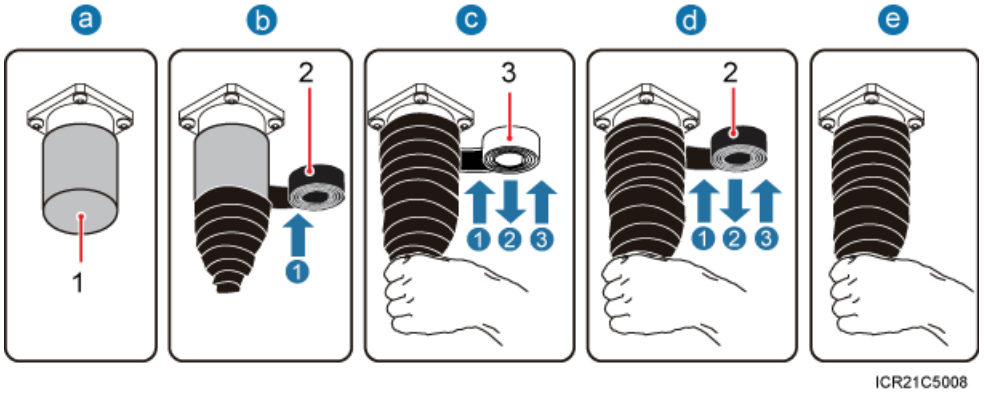
Figure 7-10 Waterproofing a dustproof cap



(1) Dustproof cap (2) PVC insulation tape (3) Waterproof tape

NOTE

- Before wrapping waterproof tape, stretch the tape evenly until the width of the tape is half of its original width.
- Wrap each layer of tape around the connector tightly and neatly, and ensure that each layer of tape overlaps more than 50% of the preceding layer.

1. Verify that dustproof caps are not removed.
2. Wrap each dustproof cap with one layer of PVC insulation tape from bottom up.
3. Wrap each dustproof cap with three layers of waterproof tape, from bottom up, then from top down, and finally from bottom up. Do not cut the tape until all the three layers of the tape are already wrapped. Wrap each layer of tape around the cap tightly.
4. Wrap each dustproof cap with three layers of PVC insulation tape, from bottom up, then from top down, and finally from bottom up. Do not cut the tape until all the three layers of the tape are already wrapped. Wrap each layer of tape around the connector tightly.

Step 5 Lay out the jumper by referring to **7.1 Cabling Requirements**, and then bind the jumper using cable ties.

Step 6 Label the installed jumper by referring to Attaching a Sign Plate Label.

Step 7 Attach colored insulation tapes to the jumper by referring to Attaching the Color Ring.

----End

7.7 Installing an RRU Alarm Cable

This section describes the procedure for installing an RRU alarm cable.

Procedure

Step 1 Link the DB9 connector at one end of the RRU alarm cable to the EXT_ALM port on the RRU, and link the eight cord end terminals at the other end to the external alarm device, as shown in **Figure 7-11**.

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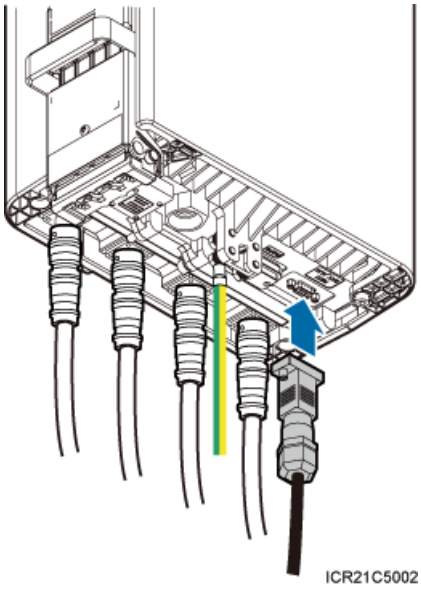
Figure 7-11 Installing an RRU alarm cable



Step 2 Lay out the cable by referring to **7.1 Cabling Requirements**, and then bind the cable using cable ties.

Step 3 Label the installed cable by referring to Attaching an L-Shaped Label.

----End

7.8 Installing an RRU AISG Multi-Wire Cable and AISG Extension Cable

This section describes the procedures for installing an RRU AISG multi-wire cable and AISG extension cable.

Context

When the distance between an RRU and a Remote Control Unit (RCU) is longer than 5 m (16.4 ft.), an AISG multi-wire cable is not long enough to connect the RRU and the RCU. In this case, an AISG extension cable is used to extend the AISG multi-wire cable.

Procedure

- Install an AISG multi-wire cable that is not configured with an AISG extension cable.
  1. Link the waterproofed DB9 connector at one end the AISG multi-wire cable to the RET port on the RRU bottom, as shown in **Figure 7-12**.

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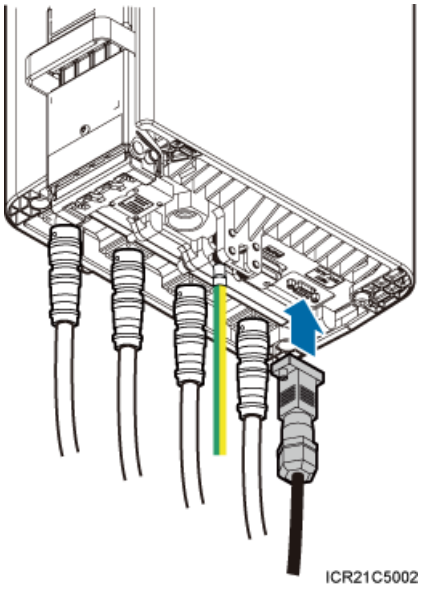
Figure 7-12 Installing an RRU AISG multi-wire cable

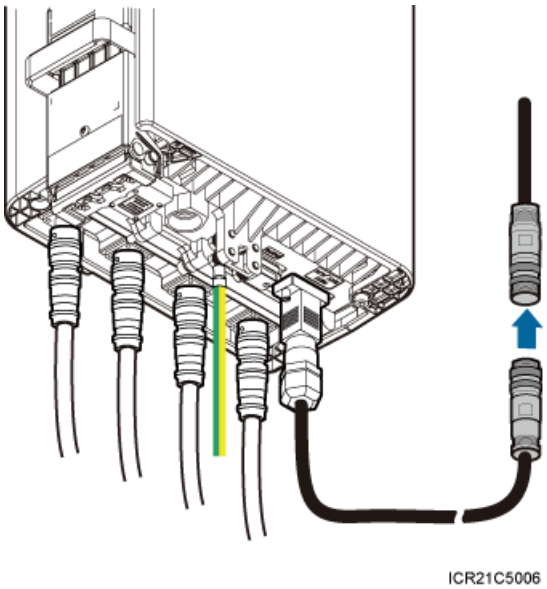


2. Connect the other end of the cable to the standard AISG male connector on the RCU.
3. Lay out the cable by referring to **7.1 Cabling Requirements**, and then bind the cable using cable ties.
4. Label the installed cable by referring to Attaching an L-Shaped Label.

- Install an AISG multi-wire cable that is configured with an AISG extension cable.

1. Link the waterproofed DB9 connector at one end of the AISG multi-wire cable to the RET port on the RRU bottom, and link the other end to the standard AISG male connector of the AISG extension cable, as shown in **Figure 7-13**.

Figure 7-13 Installing an RRU AISG multi-wire cable



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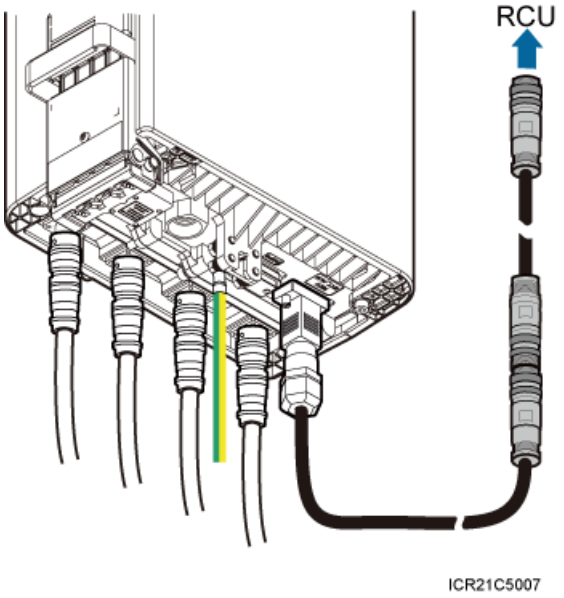
2. Connect the other end of the AISG extension cable to the standard AISG male connector on the RCU, as shown in **Figure 7-14**.

Figure 7-14 Installing an RRU AISG extension cable



3. Lay out the cable by referring to **7.1 Cabling Requirements**, and then bind the cable using cable ties.
4. Label the installed cable by referring to Attaching an L-Shaped Label.

----End

7.9 Opening the Cover Plate of an RRU Cabling Cavity

This section describes the procedure for opening the cover plate of an RRU cabling cavity.

Procedure

Step 1 Wear ESD gloves.

CAUTION

Take proper ESD protection measures, for example, wear ESD gloves, to prevent electrostatic damage to the boards, modules, or electronic components.

Step 2 Loosen the protection screw on the cover plate of the RRU cabling cavity using an M4 Phillips screwdriver, and then lower the handle to open the cover plate, as shown in **Figure 7-15**.

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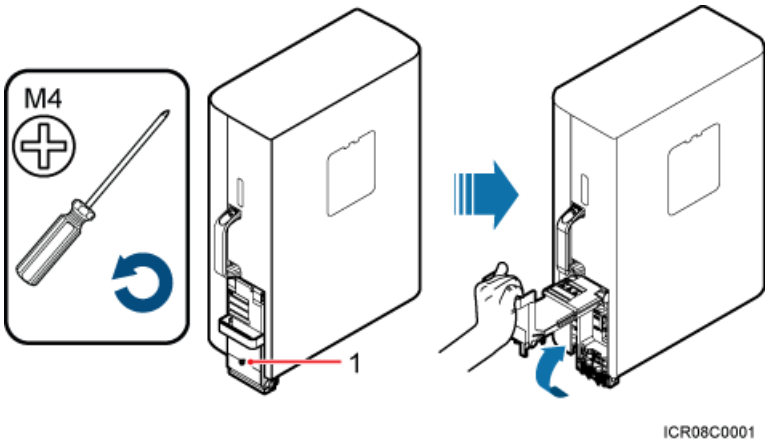
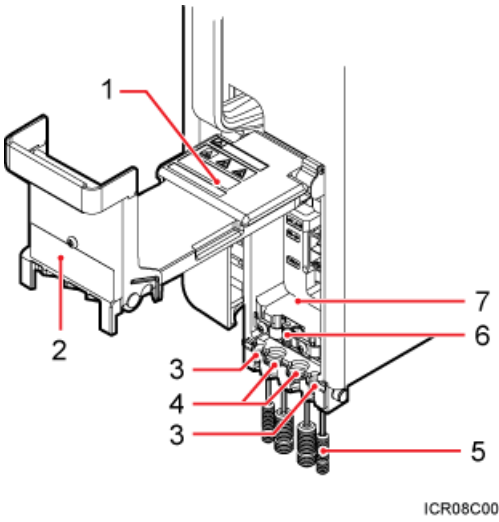
Figure 7-15 Opening the cover plate of the RRU cabling cavity



(1) Protection screw

Figure 7-16 shows the RRU cabling cavity.

Figure 7-16 RRU cabling cavity



(1) Cover plate	(2) Cable diagram on labels	(3) Cable trough for the fiber optic cable
(4) Cable trough for the power cable	(5) Waterproof block	(6) Clip
(7) Cabling cavity	-	-

Step 3 Loosen the screws on the clip, and open the clip, as shown **Figure 7-17**.

NOTE

Open the clip only for the associated cable.

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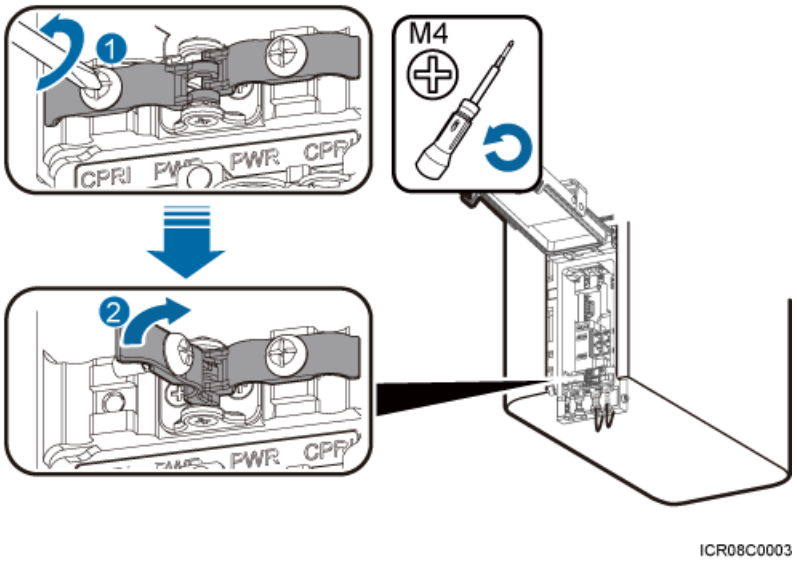
Figure 7-17 Opening clips



----End

7.10 Installing an RRU power cable

This section describes the procedure for installing an RRU power cable.

Prerequisite

- An easy power receptacle (pressfit type) connector is added to the RRU power cable on the RRU side. For details, see **10.1 Adding an Easy Power Receptacle (Pressfit Type) Connector to the RRU Power Cable on the RRU Side**.
- A connector or OT terminals are added to the RRU power cable on the power device side. For details, see the *DBS3900 Installation Guide*.

Context

There are two types of RRU power cables in terms of cross-sectional areas: 3.3 mm^2 (0.005 $in.^2$) (12 AWG) complying with North American standards and 4 mm^2 (0.006 $in.^2$) complying with European standards.

Procedure

- Install an RRU power cable that feeds power to an RRU from a DCDU-03B when the DCDU-03B is configured.
  1. Link the easy power receptacle (pressfit type) connector at one end of the RRU power cable to the power supply socket on the RRU, as shown in **Figure 7-18**.

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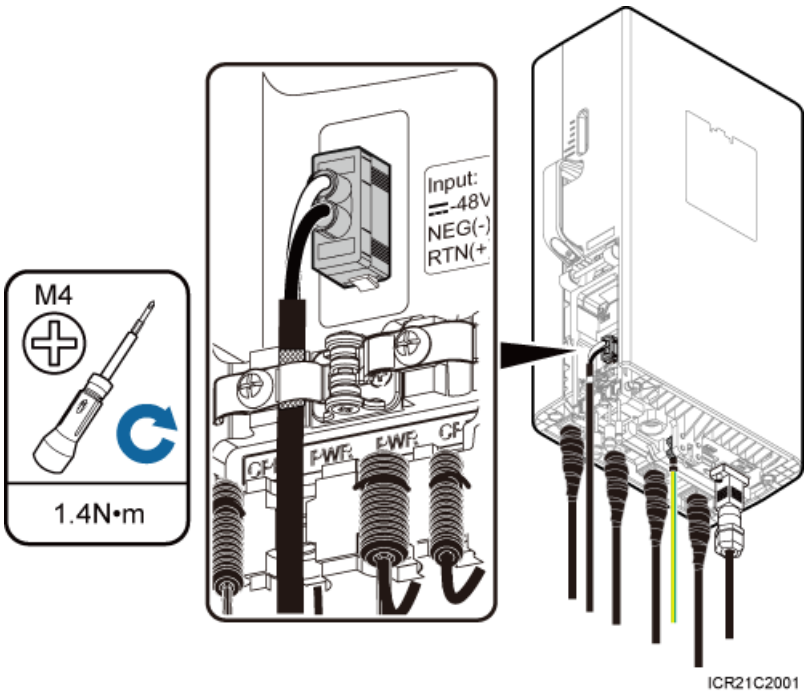
Figure 7-18 Installing an RRU power cable



CAUTION

Ensure that the exposed shield layer of the power cable is properly tightened using the clip.

2. Connect the OT terminals of the blue and black/brown core wires at the other end of the RRU power cable to the NEG(-) and RTN(+) wiring terminals of the LOAD0 on the DCDU-03B respectively.

   NOTE

   One DCDU-03B can supply power to a maximum of six RRUs. The RRU power cable can be connected to any wiring terminal from LOAD0 to LOAD5 on the DCDU-03B.

3. Lay out the cable by referring to **7.1 Cabling Requirements**, and then bind the cable using cable ties.
4. Label the installed cable by referring to Attaching a Cable-Tying Label.

- Install an RRU power cable that feeds power to an RRU from the embedded power system (EPS) when the EPS is configured.
  1. Link the easy power receptacle (pressfit type) connector at one end of the RRU power cable to the power supply socket on the RRU, as shown in **Figure 7-18**.
  2. Link the easy power receptacle (pressfit type) connector at one end of the RRU power cable to the RRU0 port on the EPS subrack.

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NOTE

- The blue core wire in the easy power receptacle (pressfit type) connector is linked to the left port on the EPS subrack, and the black/brown core wire is linked to the right port on the EPS subrack.
- The EPS can supply power to a maximum of six RRUs. The RRU power cable can be connected to any of RRU0 to RRU5 ports on the EPS subrack.

3. Lay out the cable by referring to **7.1 Cabling Requirements**, and then bind the cable using cable ties.
4. Label the installed cable by referring to Attaching a Cable-Tying Label.

----End

7.11 Installing a CPRI Fiber Optic Cable

This section describes the procedure for installing a CPRI fiber optic cable.

Prerequisite

Before the installation, single-mode optical modules can be distinguished from multi-mode optical modules in either of the following ways:

- SM and MM labels on an optical module: SM indicates a single-mode optical module, and MM indicates a multi-mode optical module.
- Color of the puller on an optical module: Blue indicates a single-mode optical module, and black or gray indicates a multi-mode optical module.

CAUTION

The optical modules to be installed must match CPRI rates.

Context

A CPRI fiber optic cable transmits CPRI signals between a BBU and an RRU.

For details about CPRI fiber optic cable connections, see the descriptions of connections for the CPRI fiber optic cable in the *BBU3900 Hardware Description*.

Procedure

Step 1 Lower the pullers of two optical modules, insert one optical module into the port on the RRU and the other optical module into the CPRI port on the BBU, and then raise the pullers, as shown in **Figure 7-19**.

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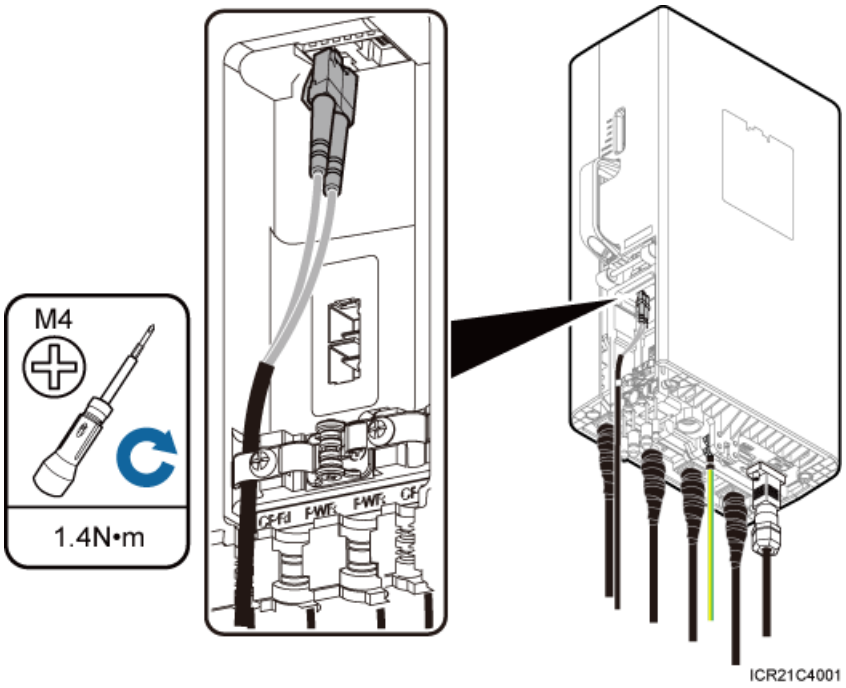
Figure 7-19 Installing an optical module

CAUTION

The performance of an optical module that is exposed to the air for more than 20 minutes may be abnormal. Therefore, you must insert an fiber optic cable into an unpacked optical module within 20 minutes.

Step 2 Connect the end labeled 1A and 1B of the fiber optic cable to the optical module on the RRU side, as shown in **Figure 7-20**.

Figure 7-20 Installing a CPRI fiber optic cable



CAUTION

Install the fiber optic cable in the cable clip near the power cable to leave some slack at the bend. Tighten the screws on the cable clip to 1.4 N·m (12.39 lbf·in.).

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Step 3 Connect the end labeled 2A and 2B of the fiber optic cable to the optical module on the BBU side.

Step 4 Lay out the fiber optic cable by referring to **7.1 Cabling Requirements**, and then bind the cable using cable ties.

Step 5 Label the fiber optic cable by referring to Attaching an L-Shaped Label.

----End

7.12 Installing an SFP High-Speed Cable for Cascading RRUs

This section describes the procedure for installing an SFP high-speed cable for cascading RRUs.

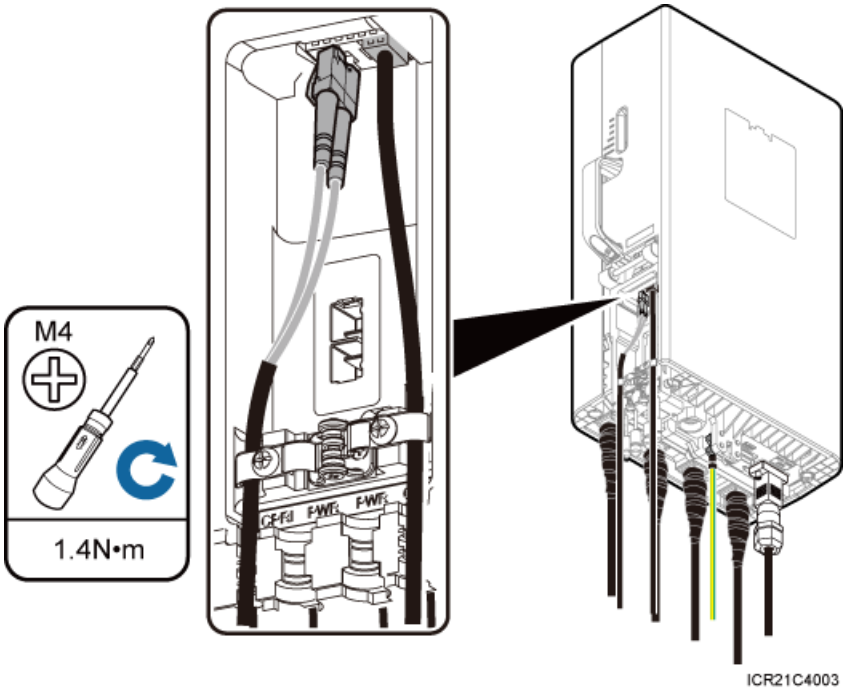
Context

An SFP high-speed cable for cascading RRUs connects to CPRI ports between two RRUs within a distance of 2 m (6.56 ft.) and transmits CPRI signals between the RRUs.

Procedure

Step 1 Connect one end of the SFP high-speed cable to the CPRI1 port on the cabling cavity of the upper-level RRU.

Figure 7-21 Installing an SFP high-speed cable for cascading RRUs



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CAUTION

Install the SFP high-speed cable in the cable clip near the power cable to leave some slack at the bend.

Step 2 Connect the other end of the SFP high-speed cable to the CPRI0 port on the cabling cavity of the lower-level RRU.

Step 3 Lay out the cable by referring to **7.1 Cabling Requirements**, and then bind the cable using cable ties.

Step 4 Label the installed cable by referring to Attaching an L-Shaped Label.

----End

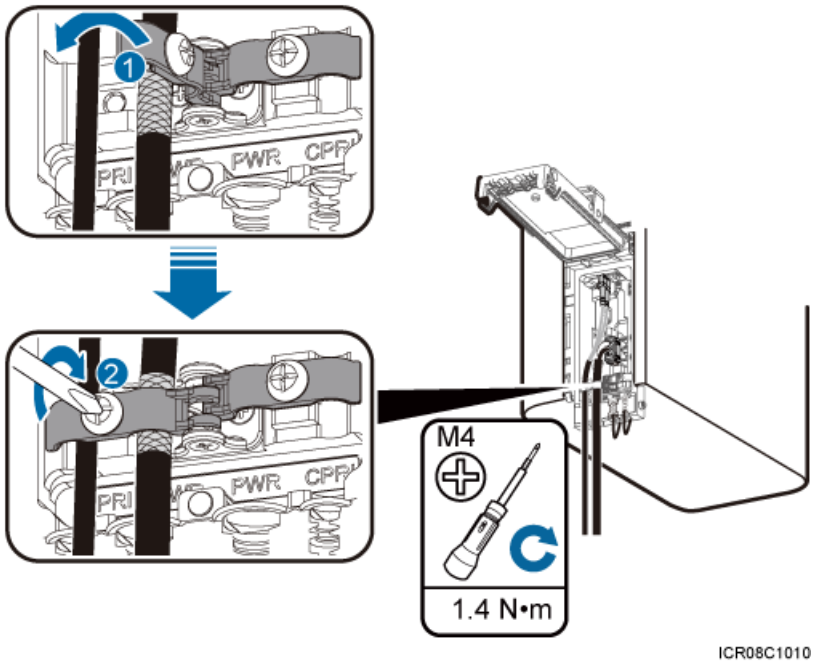
7.13 Closing the Cover Plate of an RRU Cabling Cavity

This section describes the procedure for closing the cover plate of an RRU cabling cavity.

Procedure

Step 1 Close clips and tighten the screws on each clip to 1.4 N·m (12.39 lbf·in.) using a torque screwdriver, as shown in **Figure 7-22**.

Figure 7-22 Closing clips



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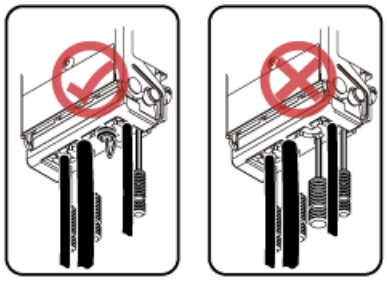
CAUTION

Ensure that the exposed shield layer of the power cable is properly tightened using the clip.

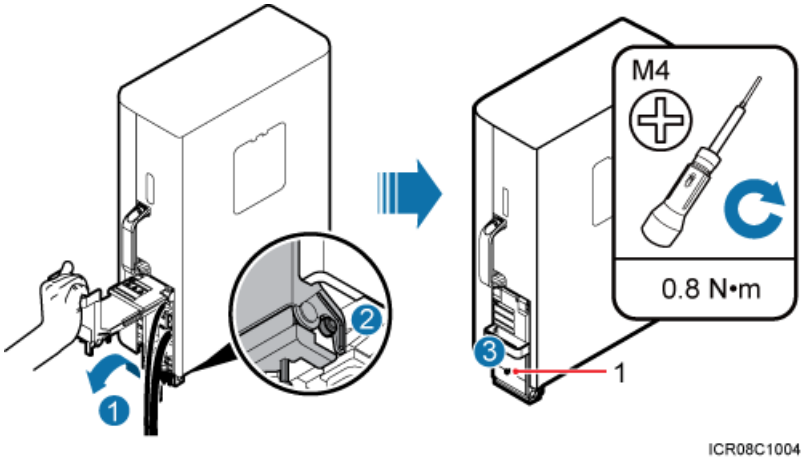
Step 2 Insert waterproof blocks into vacant cable troughs in the cabling cavity, as shown in **Figure 7-23**.

Figure 7-23 Correct placement of waterproof blocks



Step 3 Close the cover plate of the RRU cabling cavity and tighten the screws on the cover plate to 0.8 N·m (7.08 lbf·in.) using a torque screwdriver, as shown in **Figure 7-24**.

Figure 7-24 Closing the cover plate of the RRU cabling cavity



(1) Protection screw

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CAUTION

- Before tightening the screws on the cover plate, ensure that cables and waterproof blocks are properly inserted into troughs.
- Tighten the screws on the cover plate in the sequence shown in the figure.

Step 4 Take off the ESD gloves, and pack up all the tools.

----End

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8 Checking the RRU Hardware Installation

After an RRU is installed, check the hardware installation.

Table 8-1 provides the checklist for the RRU hardware installation.

Table 8-1 Checklist for the RRU hardware installation

SN	Item
1	The position for each device conforms to the engineering drawing and meets the space requirement. Sufficient space is reserved for equipment maintenance.
2	The RRU is securely installed.
3	The cover plate is securely installed on the RRU cabling cavity.
4	Waterproof blocks are securely installed in vacant cable troughs of the RRU cabling cavity, and the cover plate for the cabling cavity is securely installed. In addition, vacant RF ports are covered with dustproof caps and the caps are waterproofed.
5	There are no connectors or joints on each power cable or PGND cable.
6	The terminals at two ends of each power cable or PGND cable are securely soldered or crimped.
7	None of power cables and PGND cables can be short-circuited or reversely connected. In addition, these cables are not damaged or broken.
8	Power cables and PGND cables are separately bound from other cables.
9	The protection grounding of the RRU and the surge protection grounding of the building share one group of ground conductors.
10	The connectors of each signal cable are intact and securely linked, and these cables are not damaged or broken.
11	Labels are correct, legible, and complete at both ends of each cable, feeder, and jumper.

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9 Powering On an RRU

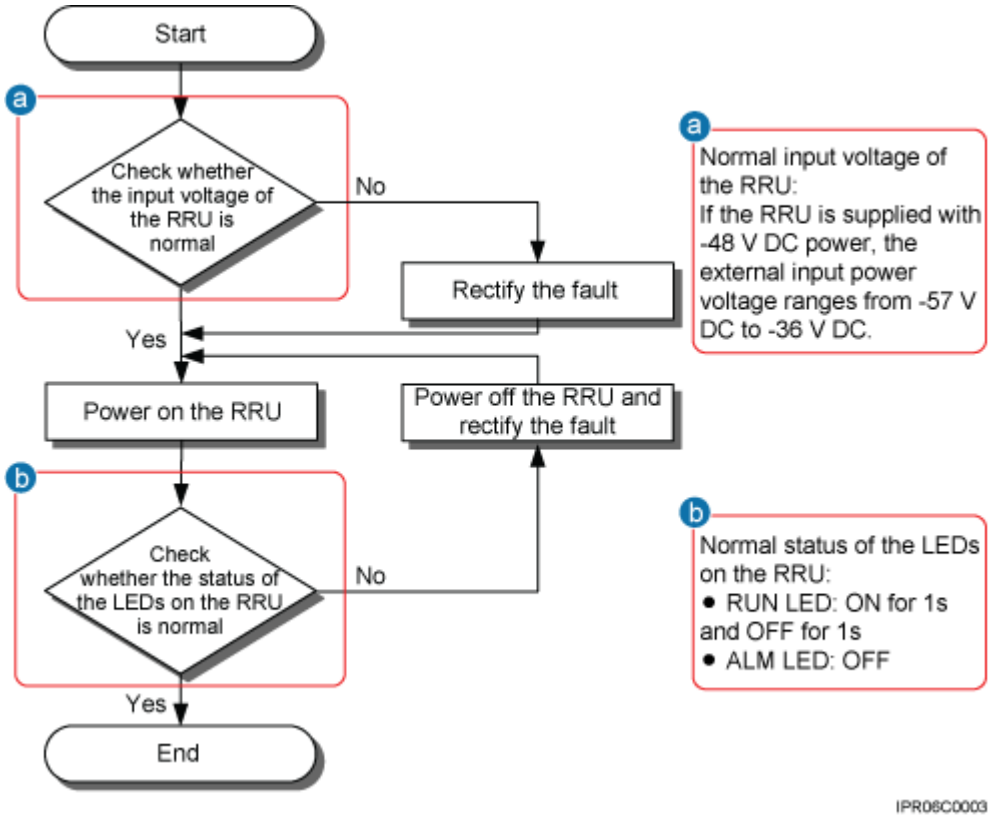
After all the devices are installed, check the power-on status of an RRU.

CAUTION

After you unpack an RRU, you must power on it within 24 hours. If you power off the RRU for maintenance, you must restore power to the RRU within 24 hours.

Figure 9-1 shows the RRU power-on check process.

Figure 9-1 RRU power-on check process



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10 Appendix

About This Chapter

This section describes the procedure for adding an easy power receptacle (pressfit type) connector.

10.1 Adding an Easy Power Receptacle (Pressfit Type) Connector to the RRU Power Cable on the RRU Side
This section describes the procedure for adding an easy power receptacle (pressfit type) connector to the RRU power cable on the RRU side.

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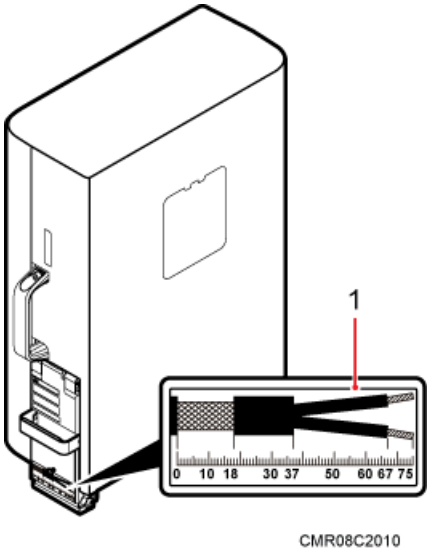
10.1 Adding an Easy Power Receptacle (Pressfit Type) Connector to the RRU Power Cable on the RRU Side

This section describes the procedure for adding an easy power receptacle (pressfit type) connector to the RRU power cable on the RRU side.

Procedure

Step 1 Figure 10-1 shows the cable diagram on labels.

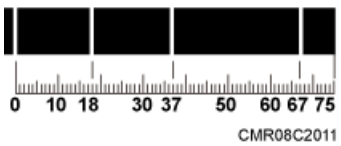
Figure 10-1 Cable diagram on labels



(1) Cable diagram on labels

Step 2 Determine the length of the power cable for different operations based on the labels, as shown in Figure 10-2.

Figure 10-2 Determining the length of the power cable



Step 3 Strip the specified length of the sheath off the power cable, as shown in Figure 10-3.

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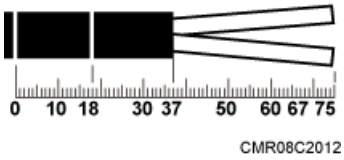
Figure 10-3 Stripping the specified length of sheath



Step 4 Strip 8 mm (0.31 in.) of the sheath off each core wire. The length must be consistent with the length of the notch in the easy power receptacle (pressfit type) connector, as shown in **Figure 10-4**.

Figure 10-4 Stripping the sheath off each core wire

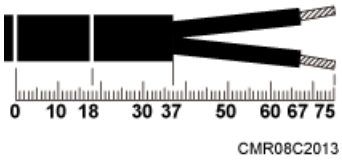
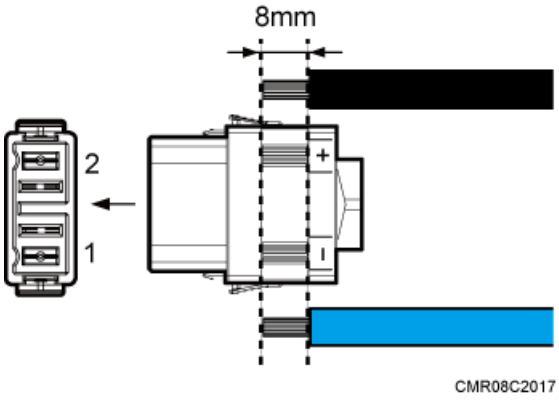


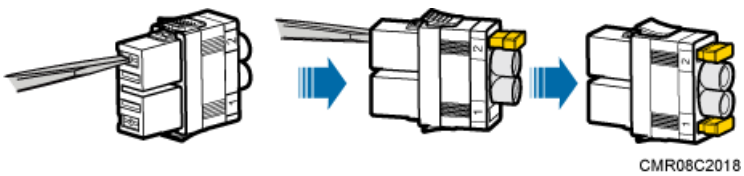
Figure 10-5 Matched length



Step 5 Add an easy power receptacle (pressfit type) connector to two core wires.

1. Use a flat-head screwdriver to push sliding blocks, as shown in **Figure 10-6**.

Figure 10-6 Pushing sliding blocks



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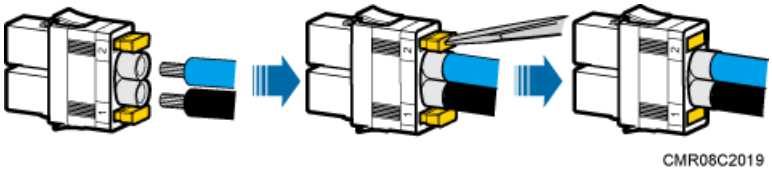
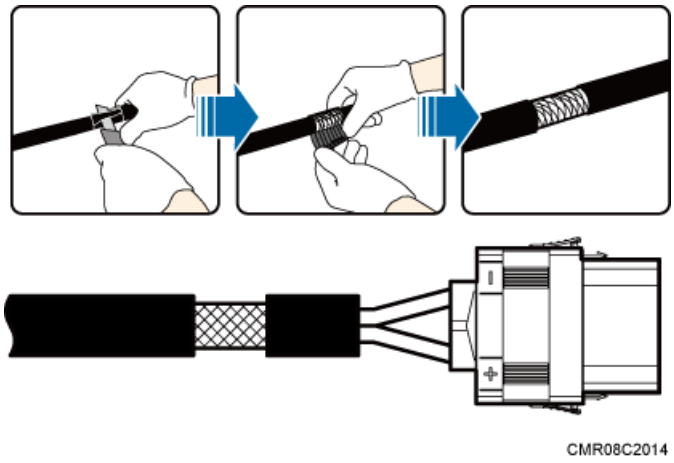
2. Connect the blue core wire labeled NEG(-) to the **2** or **-** port and the black/brown core wire labeled RTN(+) to the **1** or **+** port on the easy power receptacle (pressfit type) connector securely, and then push back the sliding blocks, as shown in **Figure 10-7**.

Figure 10-7 Adding an easy power receptacle (pressfit type) connector to two core wires



Step 6 Strip the specified length of the sheath off the power cable to expose the intact shield layer, as shown in **Figure 10-8**.

Figure 10-8 Stripping the sheath off the power cable



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