

RU3832&RU3632

Installation Guide

Issue **05**
Date **2014-06-30**

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About This Document

Purpose

This document describes the process of installing DC blade RRU3832 and RRU3632 (referred to as RU in this document).

Product Versions

The following table lists the product versions related to this document for RRU3832.

Product Name	Solution Version	Product Version
DBS3900	SRAN6.0 and later versions	V100R004C00 and later versions
	RAN13.0 and later versions	V200R013C00 and later versions
	eRAN6.0 and later versions	V100R006C00 and later versions

The following table lists the product versions related to this document for RRU3632.

Product Name	Solution Version	Product Version
DBS3900	<ul style="list-style-type: none">SRAN8.0 and later versionseRAN6.0 and later versions	V100R008C00 and later versions

Intended Audience

This document is intended for:

Base station installation engineers

Organization

[1 Changes in the RRU3832&RU3632 Installation Guide](#)

This chapter describes the changes in the *RRU3832&RU3632 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 RU, you must be familiar with its exterior, ports, indicators, installation options and installation clearance requirements.

[4 Unpacking the Equipment](#)

This chapter describes how to unpack and check the delivered equipment to ensure that all the materials are included and intact.

[5 Installation Process](#)

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

[6 \(Optional\) Installing the Plastic Shells of the RU](#)

This section describes the procedure for installing the plastic shells of the RU.

[7 Hoisting an RU and Related Cables onto a Tower](#)

This section describes the procedure for hoisting an RU and related cables onto a tower and the precautions that must be taken.

[8 Installing the RU](#)

This chapter describes the procedure for installing the RU. The procedure for installing the RU varies depending on installation options.

[9 Installing RU Cables](#)

This chapter describes the procedure for installing RU cables.

[10 Checking the RU Hardware Installation](#)

After an RU is installed, check the hardware installation.

[11 Powering On an RU](#)

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






[12 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 an imminently hazardous situation which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
 NOTICE	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.
 NOTE	Calls attention to important information, best practices and tips. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

General Conventions

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 .
<i>Italic</i>	Book titles are in <i>italics</i> .
Courier New	Terminal display is in Courier New.

Command Conventions

Convention	Description
Boldface	The keywords of a command line are in boldface .
<i>Italic</i>	Command arguments are in <i>italics</i> .

Convention	Description
[]	Items (keywords or arguments) in square brackets [] are optional.
{ x y ... }	Alternative items are grouped in braces and separated by vertical bars. One is selected.
[x y ...]	Optional alternative items are grouped in square brackets and separated by vertical bars. One or none is selected.
{ x y ... } *	Alternative items are grouped in braces and separated by vertical bars. A minimum of one or a maximum of all can be selected.

GUI Conventions

Convention	Description
Boldface	Buttons, menus, parameters, tabs, windows, 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 Operation

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 Operation

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 RRU3832&RU3632 Installation Guide

This chapter describes the changes in the *RRU3832&RU3632 Installation Guide*.

05 (2014-06-30)

This is the fifth official release.

Compared with issue 04 (2013-12-30), this issue includes the following change:

Topic	Change Description
3.5.1 Clearance for a Single RU	Added the clearance for a single RU or multiple RUs on the bitumen ground.
3.5.2 Clearances for Three or More RUs	
9.8 Installing an RU Alarm Cable	Added notes under the procedure.
3.4 Installation Scenarios	Added restrictions on RU mounting kits in assembled installation mode.

Compared with issue 04 (2013-12-30), this issue does not include any new information and no information is deleted from this issue.

04 (2013-12-30)

This is the fourth official release.

Compared with issue 03 (2013-12-23), this issue includes the following change:

Topic	Change Description
3.4 Installation Scenarios	Modified the figure showing the U-steel specifications.

Compared with issue 03 (2013-12-23), this issue does not include any new information and no information is deleted from this issue.

03 (2013-12-23)

This is the third official release.

Compared with issue 02 (2013-06-26), this issue includes the following change:

Topic	Change Description
7.1 Hoisting an RU onto a Tower	Optimized the procedure for hoisting an RU onto a Tower.

Compared with issue 02 (2013-06-26), this issue does not include any new information and no information is deleted from this issue.

02 (2013-06-26)

This is the second official release.

Compared with issue 01 (2013-04-28), this issue includes the following change:

Topic	Change Description
9.10 Installing an RU Power Cable	Added the power device DCDCU-12B for the RU.

Compared with issue 01 (2013-04-28), this issue does not include any new information and no information is deleted from this issue.

01 (2013-04-28)

This is the first official release.

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

You must prepare the following tools and instruments 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.

2.1 Reference Documents

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

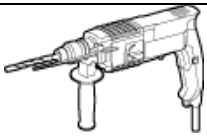
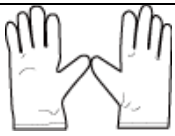





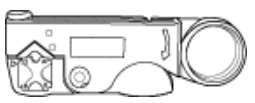
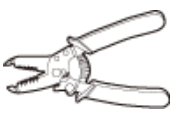



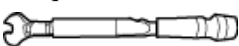







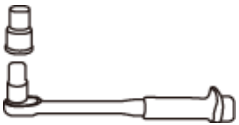

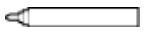

The following reference documents are required during RU installation:




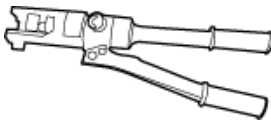
- RU3832&RU3632 Hardware Description
- DBS3900 Installation Guide
- OCB User Guide
- OCB-01M User Guide

2.2 Tools and Instruments

You must prepare the following tools and instruments before the installation.

Hammer drill (a ϕ 12 bit)	ESD gloves	Vacuum cleaner
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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 (size ≥ 32 mm [1.26 in.])  Torque wrench  Size: 16 mm (0.63 in.) and 32 mm (1.26 in.) Combination wrench  Size: 16 mm (0.63 in.) and 32 mm (1.26 in.)
Level 	Torque screwdriver   5 mm  5 mm  (M3 to M6)  (M3 to M6)	Torque socket 
Multimeter 	Marker (diameter ≤ 10 mm [0.39 in.]) 	Measuring tape 
Inner hexagon wrench	Fixed pulley	Lifting sling

 <p>5 mm</p>		
<p>Hydraulic pliers</p> 	<p>-</p>	<p>-</p>

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.

3 Information About the Installation

About This Chapter

Before installing an RU, you must be familiar with its exterior, ports, indicators, installation options and installation clearance requirements.

3.1 RU Exterior

This section describes the exterior and dimensions of an RU.

3.2 RU Ports

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

3.3 RU Indicators

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

3.4 Installation Scenarios

An RU can be installed on a pole, U-steel, angle steel, wall, or IFS06. Installation scenarios must meet heat-dissipation and waterproofing requirements of the RU.

3.5 Installation Clearance Requirements of an RU

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

3.1 RU Exterior

This section describes the exterior and dimensions of an RU.

[Figure 3-1](#) shows an RU.

Figure 3-1 RU exterior

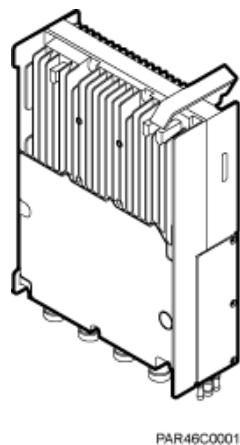
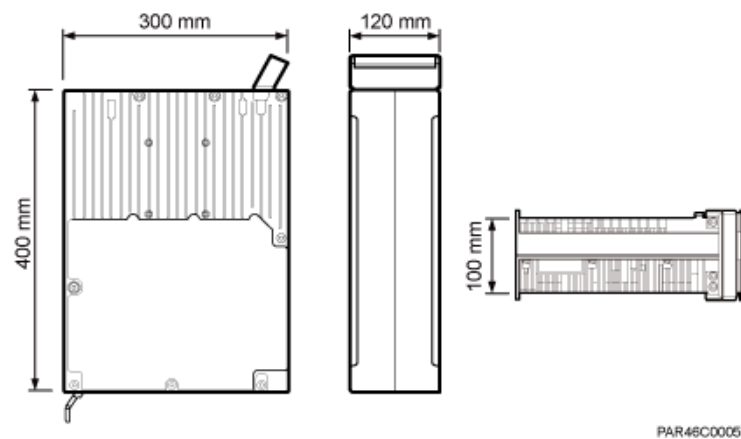


Figure 3-2 shows RU dimensions.

Figure 3-2 RU dimensions

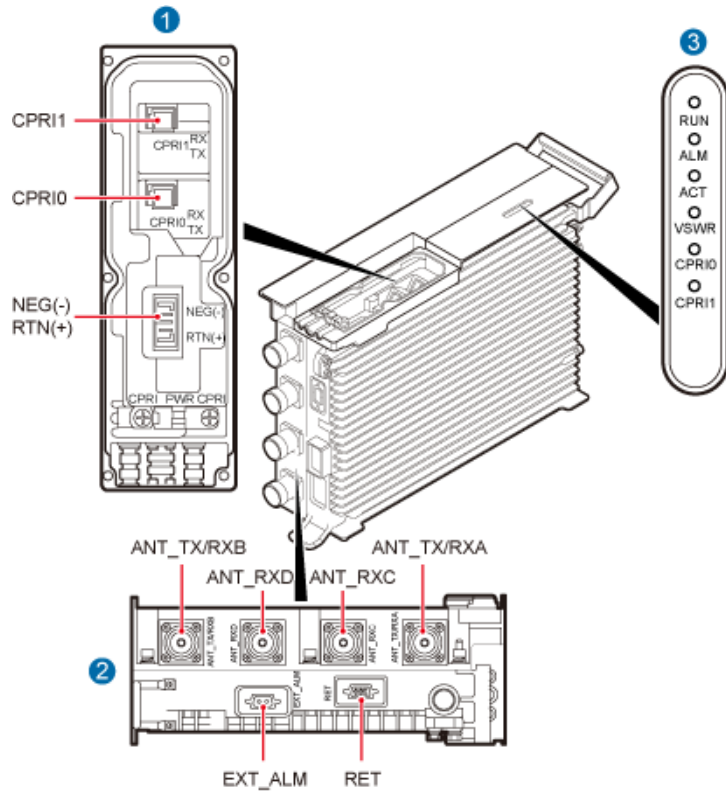


3.2 RU Ports

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

Figure 3-3 shows the ports on the RU panels.

Figure 3-3 Ports on the RU panels



PAR46C0002

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

Table 3-1 Ports and indicators on the RU panels

Item	Silkscreen	Remarks
(1) Ports in the cabling cavity	RTN(+)	Power supply socket
	NEG(-)	
	CPRI0	Optical/electrical port 0
	CPRI1	Optical/electrical port 1
(2) Ports at the bottom	ANT_TX/RXA	TX/RX port A, supporting RET signal transmission
	ANT_RXC	RX port C
	ANT_RXD Port	RX port D
	ANT_TX/RXB	TX/RX port B
	EXT_ALM	Alarm monitoring port used for monitoring one RS485 signal and two dry contact signals

Item	Silkscreen	Remarks
	RET	Communication port for the RET antenna, supporting RET signal transmission
(3) Indicators	RUN	See 3.3 RU Indicators .
	ALM	
	ACT	
	VSWR	
	CPRI0	
	CPRI1	



NOTE

- The port for transmitting RET signals is determined by the software.
- For the RU3832, CPRI0 is connected to the BBU or an upper-level RU and CPRI1 is connected to a lower-level RU.
- For the RU3632, CPRI0 is connected to the BBU and the CPRI1 is reserved.

[Table 3-2](#) describes how to use RF ports for RU3832.

Table 3-2 Usage of RF ports for RU3832

Product Version	TX/RX Channel	Number of Used RF Ports	Usage	Remarks
DBS3900 WCDMA V200R013C00	1 x 2T2R	2	ANT_TX/RXA and ANT_TX/RXB are used together.	A single sector
DBS3900 WCDMA V200R014C00 and later versions	1 x 1T2R	2	It is recommended that ANT_TX/RXA and ANT_RXC be used together. You can also use ANT_TX/RXB and ANT_RXD together.	A single sector
	1 x 2T2R	2	ANT_TX/RXA and ANT_TX/RXB are used together.	A single sector
	1 x 2T4R	4	ANT_TX/RXA, ANT_TX/RXB, ANT_RXC, and ANT_RXD are used together for one sector, with ANT_TX/RXA and ANT_RXC combined and ANT_TX/RXB and	A single sector

Product Version	TX/RX Channel	Number of Used RF Ports	Usage	Remarks
			ANT_RXD combined.	
	2 x 1T2R	4	ANT_TX/RXA and ANT_RXC are used for one sector; ANT_TX/RXB and ANT_RXD are used for the other sector.	Two sectors
DBS3900 LTE V100R006C00 and later versions	1 x 2T2R	2	ANT_TX/RXA and ANT_TX/RXB are used together.	A single sector
	1 x 2T4R	4	ANT_TX/RXA, ANT_TX/RXB, ANT_RXC, and ANT_RXD are used together for one sector, with ANT_TX/RXA and ANT_RXC combined and ANT_TX/RXB and ANT_RXD combined.	A single sector

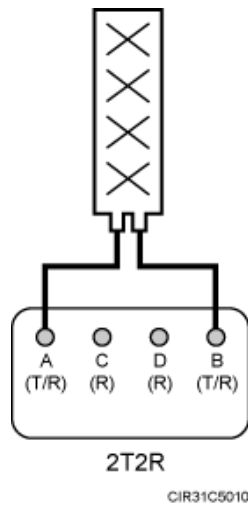
Table 3-3 describes how to use RF ports for RU3632.

Table 3-3 Usage of RF ports for RU3632

Product Version	TX/RX Channel	Number of Used RF Ports	Usage	Remarks
DBS3900 LTE V100R006C00 and later versions	1 x 2T2R	2	ANT_TX/RXA and ANT_TX/RXB are used together.	A single sector
	1 x 2T4R	4	ANT_TX/RXA, ANT_TX/RXB, ANT_RXC, and ANT_RXD are used together for one sector, with ANT_TX/RXA and ANT_RXC combined and ANT_TX/RXB and ANT_RXD combined.	A single sector

Figure 3-4 shows the recommended usage of the RF ports on an RU3832 used for DBS3900 WCDMA V200R013C00.

Figure 3-4 Recommended usage of the RF ports on an RU3832 used for DBS3900 WCDMA V200R013C00



[Figure 3-5](#) shows the recommended usage of the RF ports on an RU3832 used for DBS3900 WCDMA V200R014C00 and later versions.

Figure 3-5 Recommended usage of the RF ports on an RU3832 used for DBS3900 WCDMA V200R014C00 and later versions

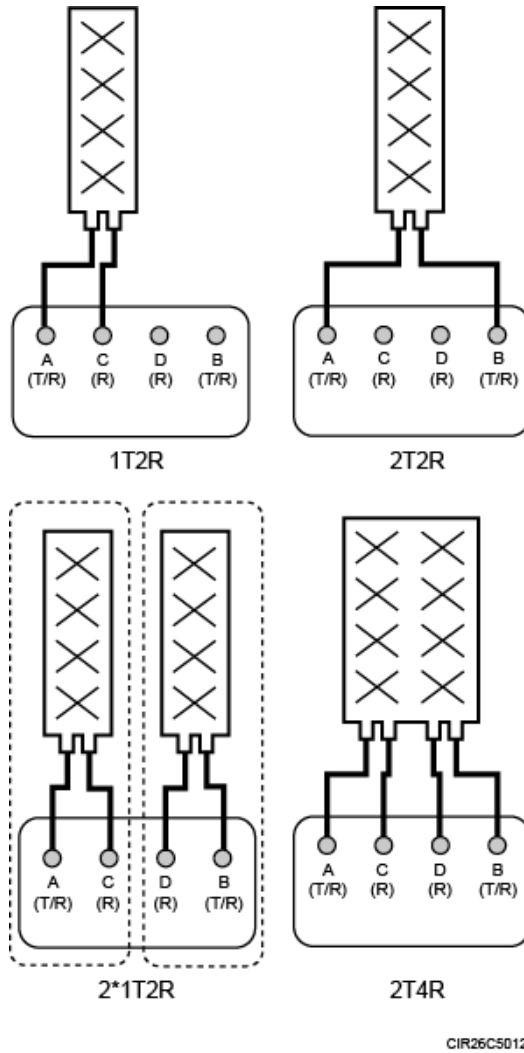
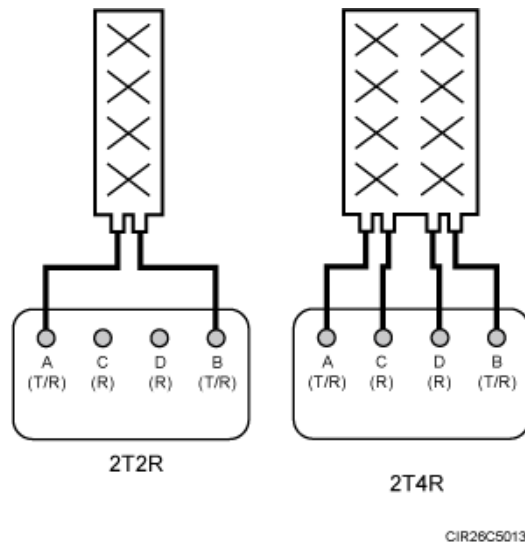


Figure 3-6 shows the recommended usage of the RF ports on RU3832 and RU3632 used for DBS3900 LTE V100R006C00 and later versions.

Figure 3-6 Recommended usage of the RF ports on RU3832 and RU3632 used for DBS3900 LTE V100R006C00 and later versions



3.3 RU Indicators

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

For detailed positions of RU indicators, see [3.2 RU Ports](#).

[Table 3-4](#) describes RU indicators.

Table 3-4 RU indicators

Indicator	Color	Status	Meaning
RUN	Green	Steady on	There is power supply, but the module is faulty.
		Steady off	There is no power supply, or the module is faulty.
		Blinking (on for 1s and off for 1s)	The board is functioning 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	Steady on	Alarms are generated, and the module must be replaced.
		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, you need to locate the fault before deciding whether to replace the module.

Indicator	Color	Status	Meaning
		Steady off	No alarm is generated.
ACT	Green	Steady on	The module is running properly with TX channels enabled or the software is being loaded without RU running.
		Blinking (on for 1s and off for 1s)	The module is running properly with TX channels disabled.
VSWR	Red	Steady off	No Voltage Standing Wave Ratio (VSWR) alarm is generated.
		Blinking (on for 1s and off for 1s)	VSWR alarms are generated on the ANT_TX/RXB port.
		Steady on	VSWR alarms are generated on the ANT_TX/RXA port.
		Blinking (on for 0.125s and off for 0.125s)	VSWR alarms are generated on the ANT_TX/RXA and ANT_TX/RXB ports.
CPRI0	Red or green	Steady green	The CPRI link is functioning properly.
		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 a failure in clock lock between two modes or mismatched data rates over CPRI ports.
		Steady off	The optical module cannot be detected, or the optical module is powered off.
CPRI1	Red or green	Steady green	The CPRI link is functioning properly.
		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 a failure in clock lock between two modes or mismatched data rates over CPRI ports.
		Steady off	The optical module cannot be detected, or the optical module is powered off.

3.4 Installation Scenarios

An RU can be installed on a pole, U-steel, angle steel, wall, or IFS06. Installation scenarios must meet heat-dissipation and waterproofing requirements of the RU.

Requirements for the Installation Scenarios

Application scenarios:

To ensure proper heat dissipation of the RU, the following requirements must be met:

- The RU cannot be installed in an enclosed cabinet without a cooling system.
- The RU cannot be installed in an enclosed camouflage box.
- The RU cannot be installed in an enclosed equipment room without a cooling system.
- When multiple RUs are installed in centralized mode, the minimum clearance requirements must be met. For details about the minimum clearance requirements, see [3.5.2 Clearances for Three or More RUs](#) and [3.5.3 Installation Spacing Between RUs](#).
- RU mounting kits in assembled installation mode are not allowed in indoor scenarios.



NOTICE

If the RU is improperly installed, heat dissipation of the RU deteriorates and the RU may not work properly, as shown in [Figure 3-7](#).

Figure 3-7 Improperly installed RUs

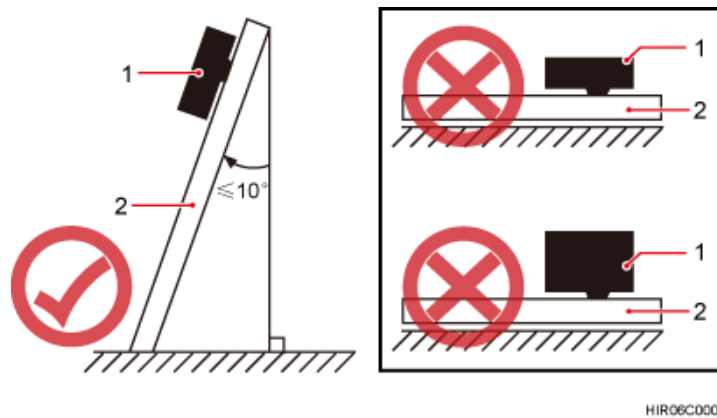


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Method of installation:

- To ensure the heat dissipation of the RU and waterproofing of the ports at the bottom of the RU, the vertical deviation angle of an RU must be less than or equal to 10 degrees, as shown in [Figure 3-8](#).
- On a tower, an RU can be installed on a pole, angle steel, or U-steel. The side-mounted installation mode (one side instead of the rear of an RU is mounted on the support) is recommended for RUs on the main pole secured on a tower. This installation mode allows multiple RUs to be installed next to each other at the same level on a pole. When the horizontal distance between the main and auxiliary poles on a tower is equal to or greater than 810 mm (23.62 in.), the side-mounted mode is recommended for installing RUs on the auxiliary pole to meet the minimum clearance requirements. Otherwise, the standard mode is recommended for installing RUs on the auxiliary pole.

Figure 3-8 Requirements for the vertical deviation angle of an RU



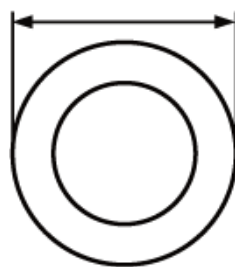
- (1) RU (2) Installation support (pole, U-steel, angle steel, or wall)

Installing an RU on a Pole

Figure 3-9 shows the diameter of a pole for installing an RU.

Figure 3-9 Diameter of a pole

60 mm - 114 mm

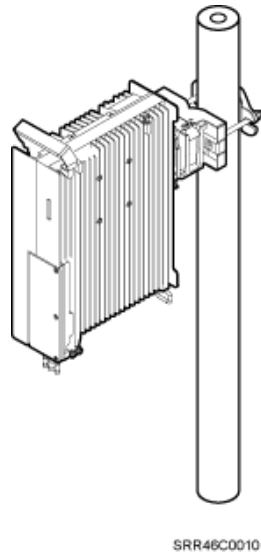


NOTICE

- The diameter of a pole for installing an RU ranges from 60 mm (2.36 in.) to 114 mm (4.49 in.). The recommended diameter is 80 mm (3.15 in.).
- When the diameter of a pole ranges from 60 mm (2.36 in.) to 76 mm (2.99 in.), a maximum of three RUs can be installed on the pole and the side-mounted installation is recommended.
- Only a pole whose diameter ranges from 76 mm (2.99 in.) to 114 mm (4.49 in.) supports more than three RUs.
- The recommended thickness of the wall of a pole is 3.5 mm (0.14 in.) or above.

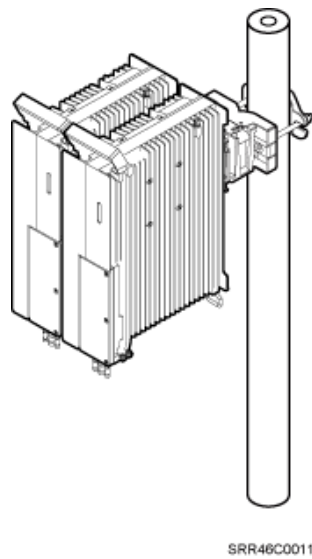
Figure 3-10 shows a single RU installed on a pole.

Figure 3-10 A single RU installed on a pole



[Figure 3-11](#) shows two RUs installed on a pole.

Figure 3-11 Two RUs installed on a pole



[Figure 3-12](#), [Figure 3-13](#), and [Figure 3-14](#) show three or more RUs installed on a pole.

Figure 3-12 Three RUs installed on a pole

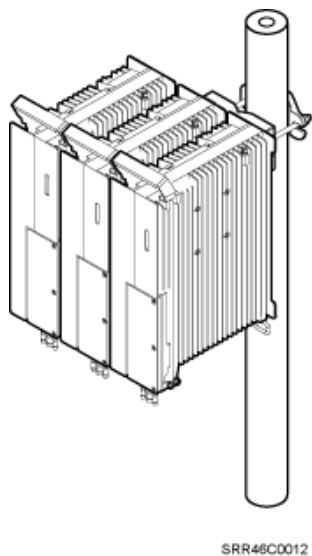


Figure 3-13 Four RUs installed on a pole

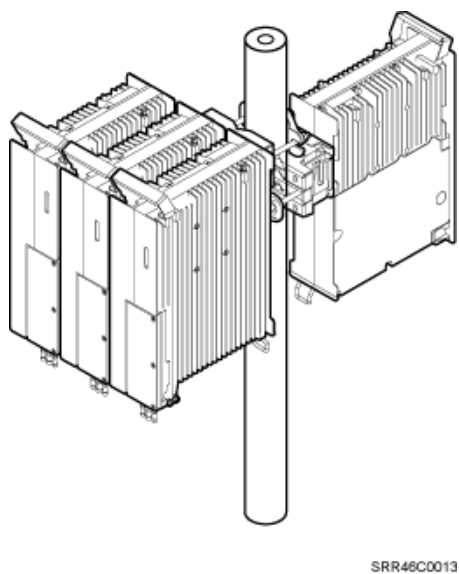
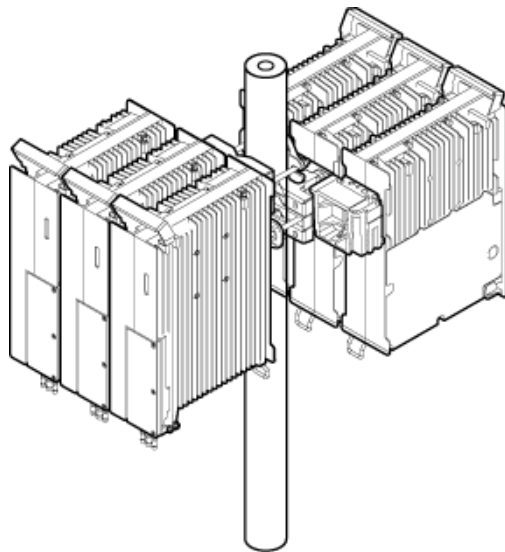


Figure 3-14 Six RUs installed on a pole

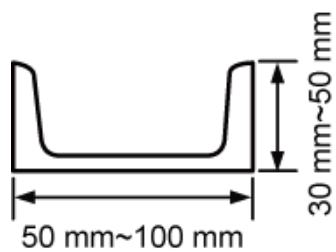


SRR48C0014

Installing an RU on U-steel

Figure 3-15 shows U-steel specifications.

Figure 3-15 U-steel specifications



HIR06C0037

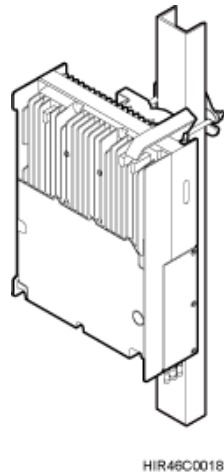


NOTICE

U-steel supports the standard or reverse installation of a single RU only.

Figure 3-16 shows an RU installed on U-steel.

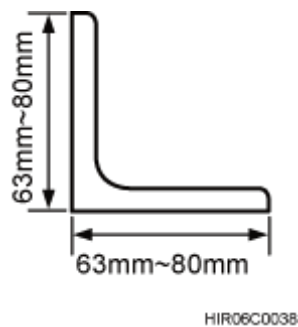
Figure 3-16 RU installed on U-steel



Installing an RU on Angle Steel

[Figure 3-17](#) shows angle steel specifications.

Figure 3-17 Angle steel specifications

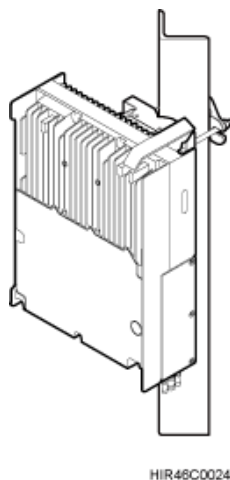


NOTICE

Angle steel supports the standard or reverse installation of a single RU only.

[Figure 3-18](#) shows an RU installed on angle steel.

Figure 3-18 RU installed on angle steel



Installing an RU on a Wall

The wall for installing RUs must meet the following requirements:

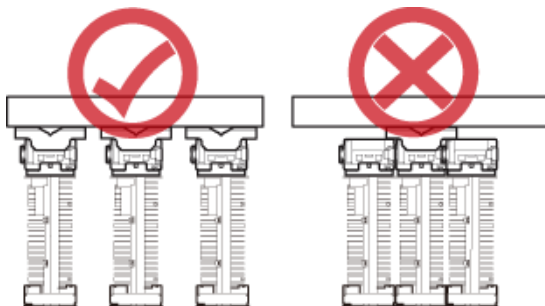
- For each RU, the wall must be able to bear a weight four times the RU's weight and the bolts' pulling force of 1.25 kN (281.25 lbf) vertical to the wall.
- Expansion anchor bolts must be tightened to 30 N·m (265.52 lbf·in.) so that the bolts stay secured without damaging the wall.



NOTICE

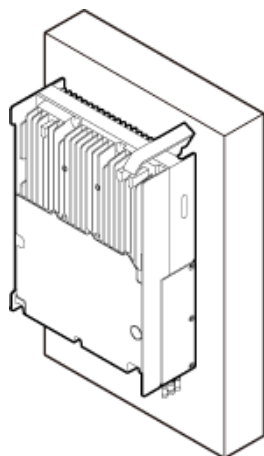
- It is recommended that the RU be installed on a wall in standard mode.
- When RUs are installed on a wall in side-mounted mode, do not combine mounting brackets for multiple RUs, as shown in [Figure 3-19](#).

Figure 3-19 Correct installation of mounting brackets for multiple RUs installed on a wall in side-mounted mode



[Figure 3-20](#) shows an RU installed on a wall.

Figure 3-20 RU installed on a wall



HIR46C0043

Installing an RU on an IFS06

In an IFS06 scenario:

- The upper and lower adjustable beams on an IFS06 can be moved up and down to fit for heights of RUs.
- The IFS06 supports at least three RUs when the ambient temperature is higher than or equal to the lowest operating temperature of the RU and at least 5 °C (41 °F) lower than the highest operating temperature of the RU. The IFS06 supports a maximum of six RUs when the ambient temperature is higher than or equal to the lowest operating temperature of the RU and at least 10 °C (50 °F) lower than the highest operating temperature of the RU.



NOTE

For details about the operating temperature of the RU, see section "Technical Specifications of RUs" in *3900 Series Base Station Technical Description*.



NOTICE

The mounting brackets for multiple RUs cannot be combined when the RUs are installed on an IFS06, as shown in [Figure 3-21](#).

Figure 3-21 Correct installation of mounting brackets for RUs installed on an IFS06

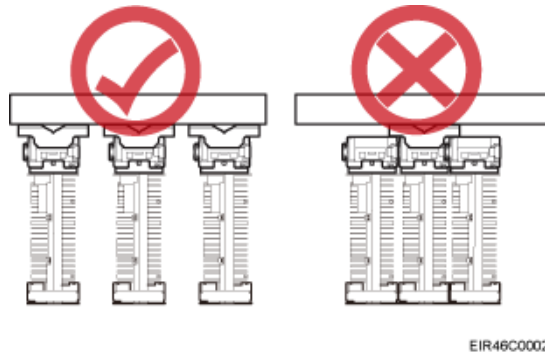
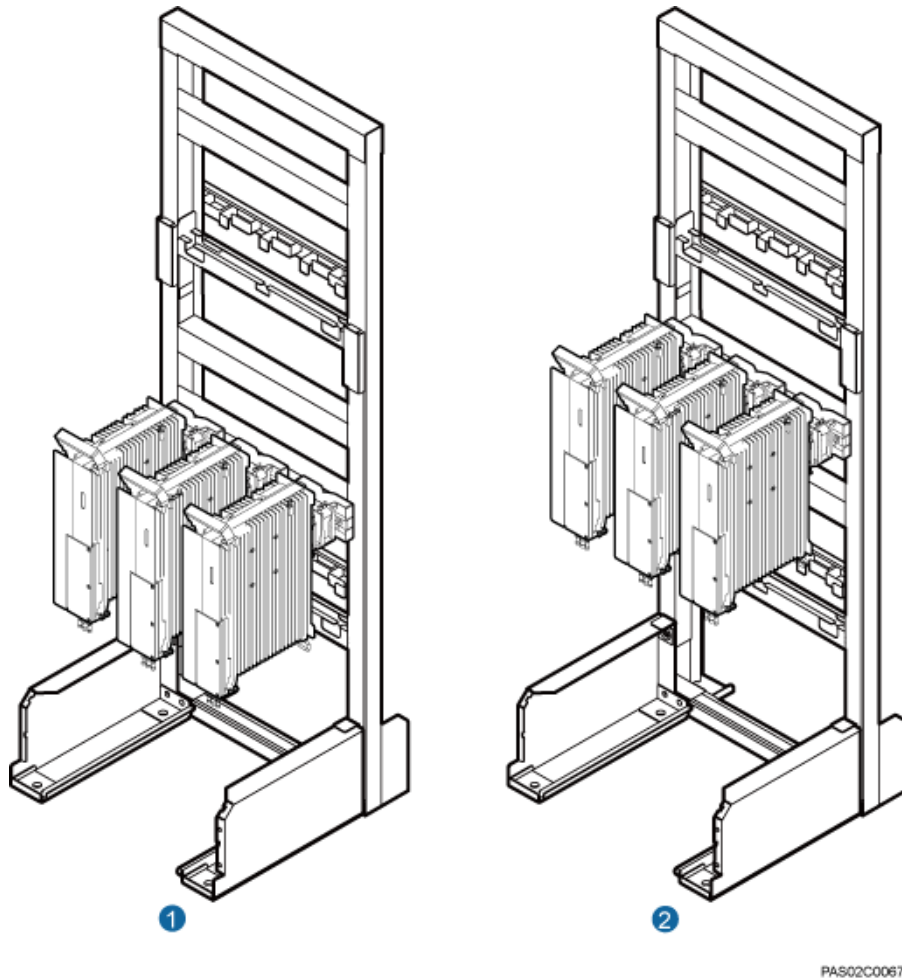


Figure 3-22 and Figure 3-23 show RUs installed on an IFS06.

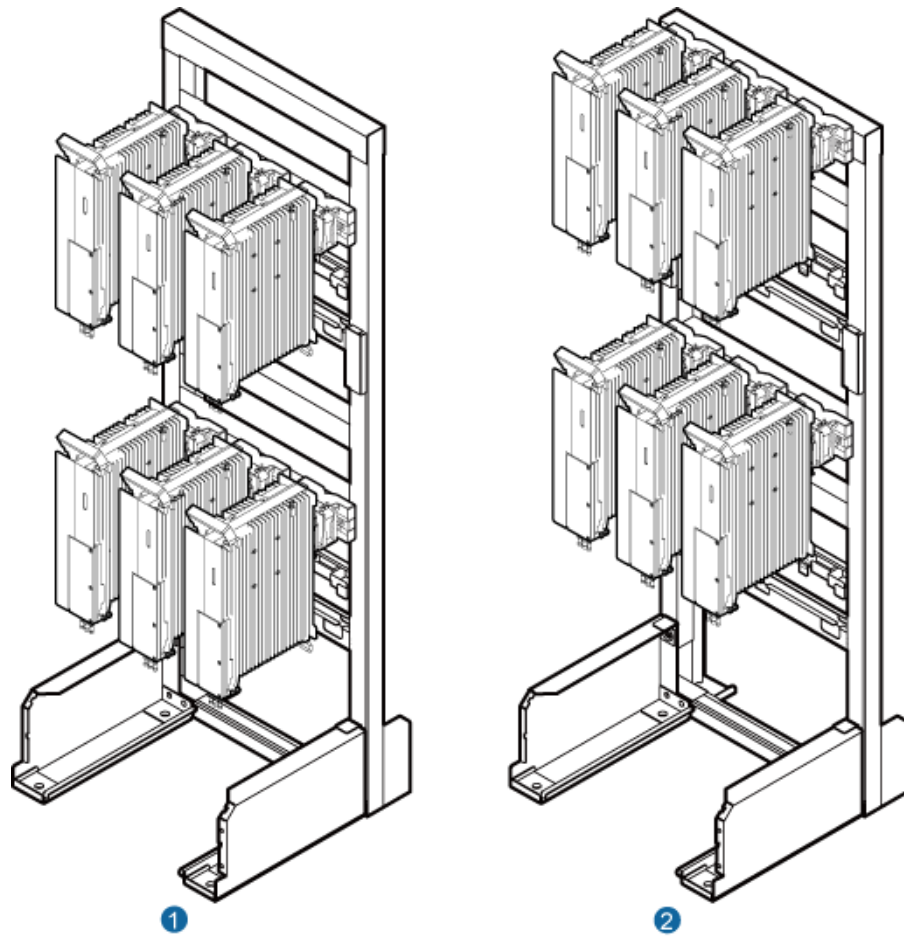
Figure 3-22 Three RUs installed on an IFS06



(1) Height-restricted scenario

(2) Height-unrestricted scenario

Figure 3-23 Six RUs installed on an IFS06



PA502C0068

(1) Height-restricted scenario

(2) Height-unrestricted scenario

3.5 Installation Clearance Requirements of an RU

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

3.5.1 Clearance for a Single RU

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



NOTICE

If an RU is installed on the bitumen ground, the RU must be at least 500 mm (700 mm or more as recommended) away from the bitumen ground. The following describes the space requirements for installing a single RU on the non-bitumen ground.



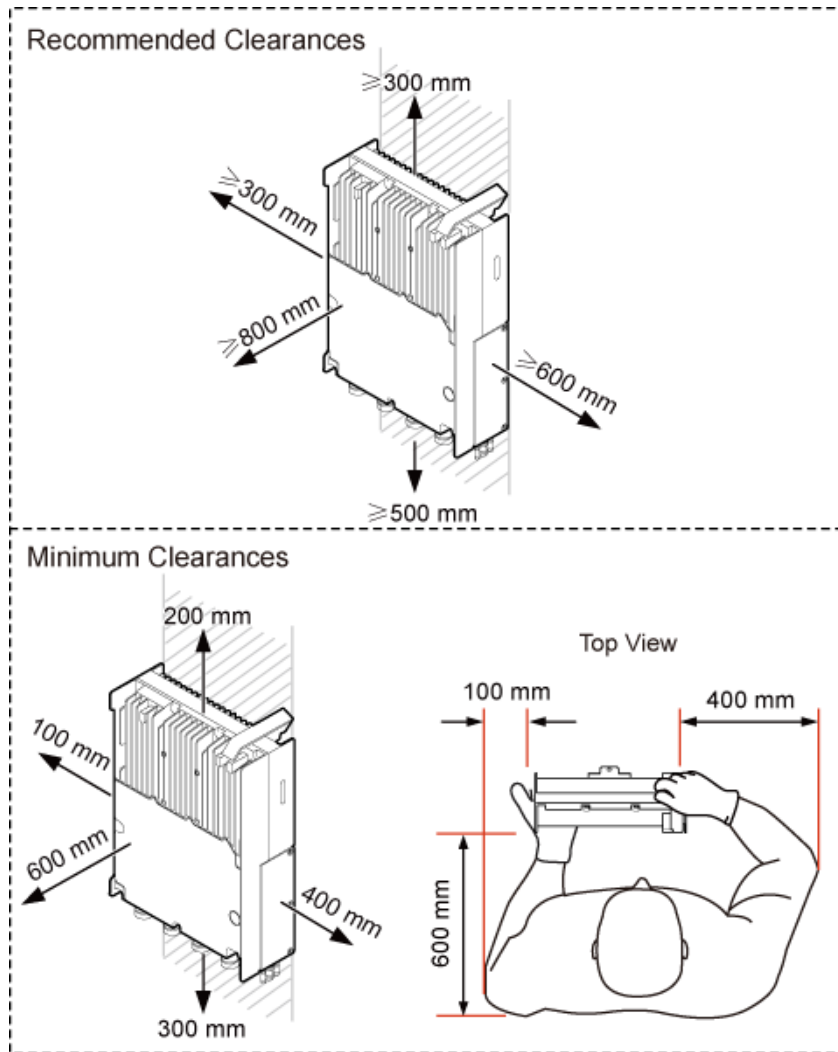
NOTE

- The recommended clearance ensures normal running and provides an appropriate space for operation and maintenance (OM). If there is sufficient space, leave the recommended clearance after installing the equipment.
- The minimum clearance ensures normal running and heat dissipation, but OM activities such as checking indicator status and opening the cabling cavity cannot be properly conducted. If the installation space is restricted, leave the minimum clearance after installing the equipment.

Clearance for a Single RU in Standard or Reverse Mode

[Figure 3-24](#) shows the clearance for a single RU in standard or reverse mode.

Figure 3-24 Clearance for a single RU in standard or reverse mode

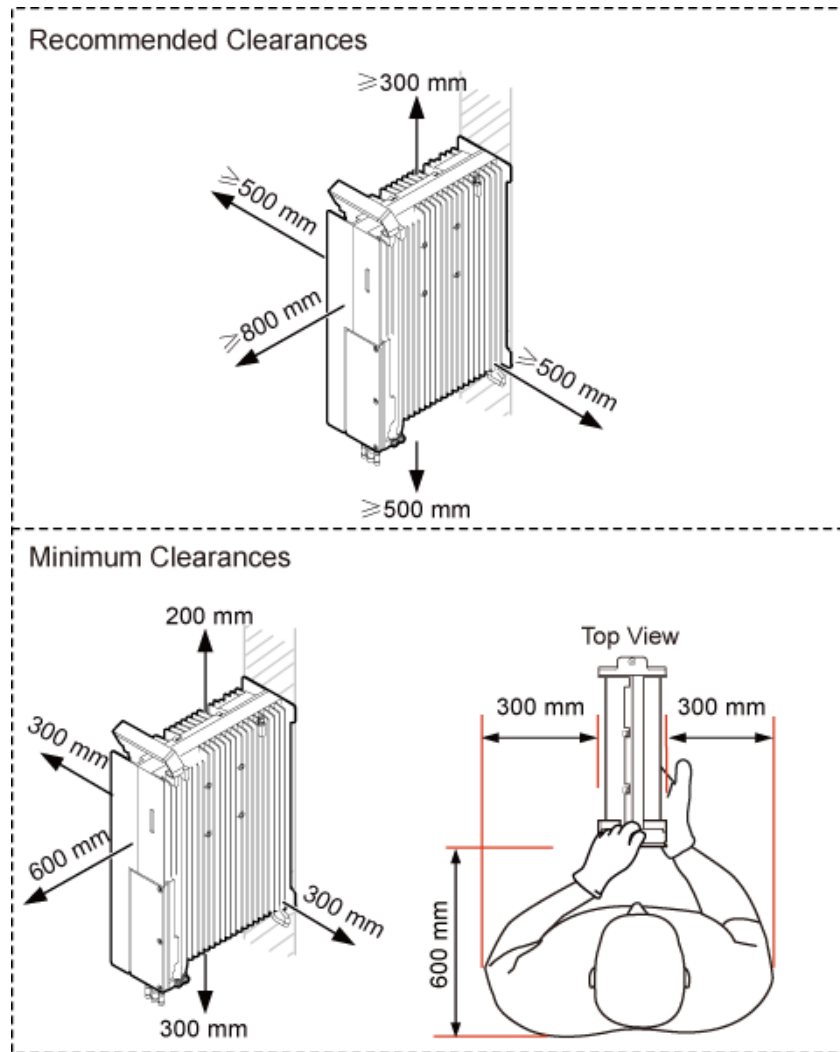


SRR46C0001

Clearance for a Single RU in Side-Mounted Mode

Figure 3-25 shows the clearance for a single RU in side-mounted mode.

Figure 3-25 Clearance for a single RU in side-mounted mode



SRR47C0002

Clearance for a Single Tower-mounted RU

Figure 3-26 and Figure 3-27 show the clearance for a single tower-mounted RU in standard or reverse mode and in side-mounted mode, respectively.

Figure 3-26 Minimum clearance for a single tower-mounted RU in standard or reverse mode

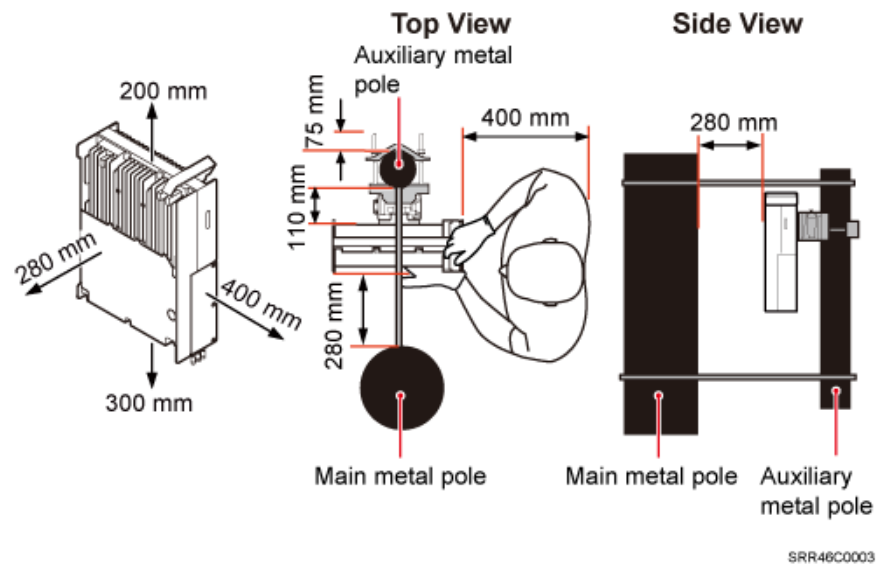
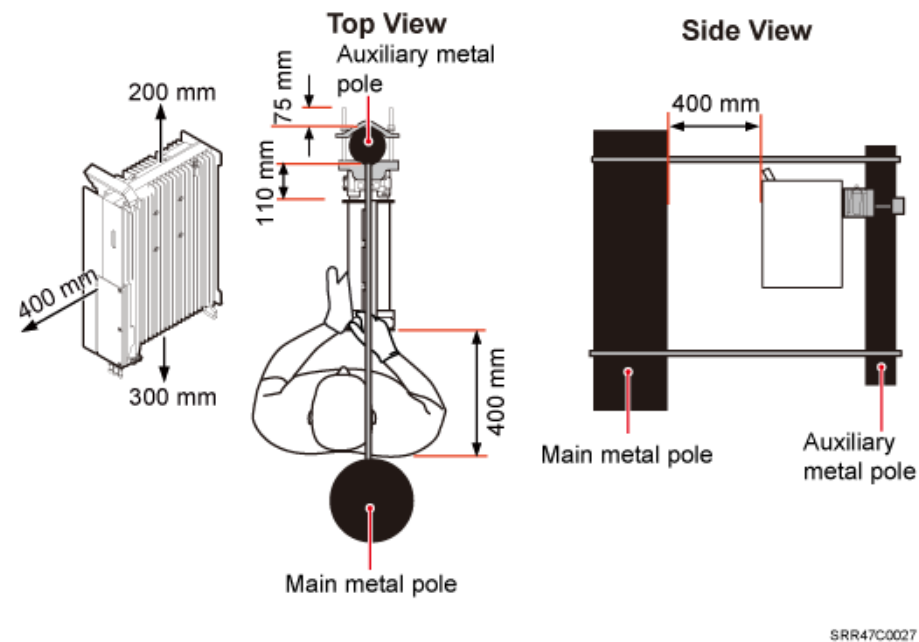


Figure 3-27 Minimum clearance for a single tower-mounted RU in side-mounted mode



3.5.2 Clearances for Three or More RUs

This section describes the recommended and minimum clearances for three or more RUs.



NOTICE

If an RU is installed on the bitumen ground, the RU must be at least 500 mm (700 mm or more as recommended) away from the bitumen ground. The following describes the space requirements for installing multiple RUs on the non-bitumen ground.



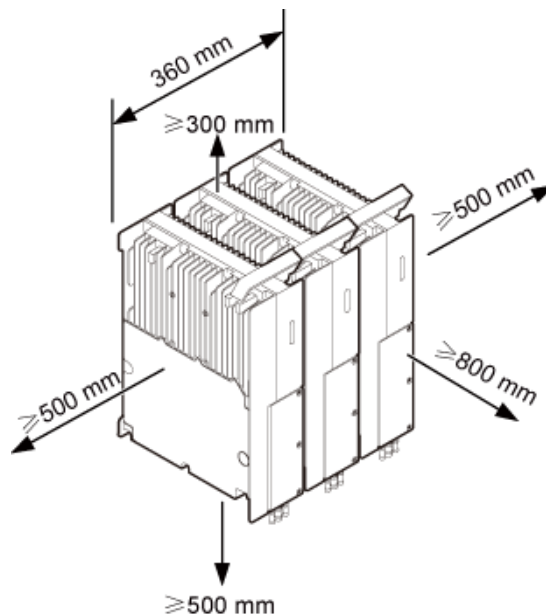
NOTE

- The recommended clearances ensure normal running and provide an appropriate space for operation and maintenance (OM). If there is sufficient space, retain the recommended clearances.
- The minimum clearances ensure normal running and heat dissipation but do not allow OM activities such as checking indicator status and opening the cabling cavity. If the installation space is insufficient, retain the minimum clearances after the installation.

Recommended Clearances for Three or More RUs Installed on a Pole

Figure 3-28 shows the recommended clearances for multiple RUs installed in centralized mode.

Figure 3-28 Recommended clearances for three or more RUs installed on a pole

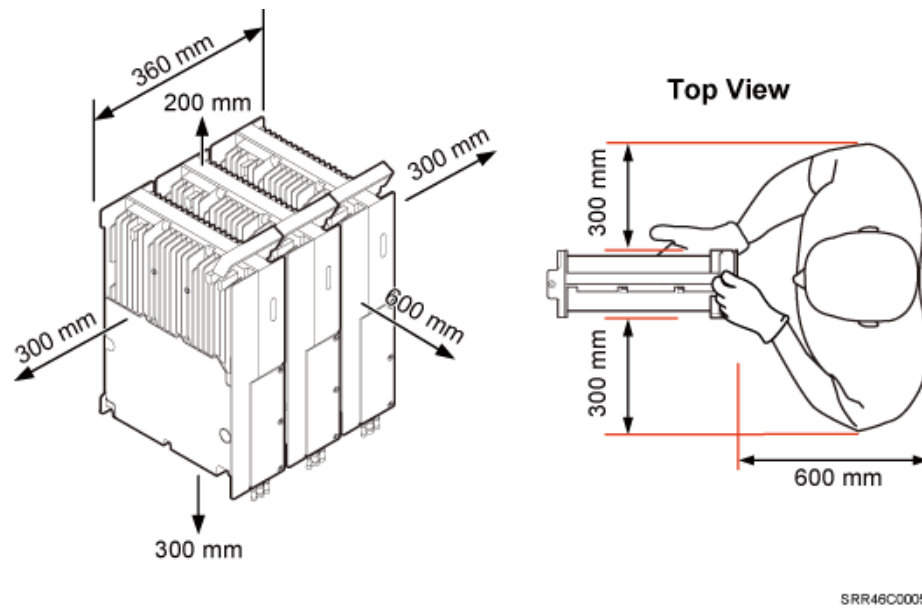


SRR46C0004

Minimum Clearances for Three or More RUs Installed on a Pole

Figure 3-29 shows the minimum clearances for multiple RUs installed in centralized mode.

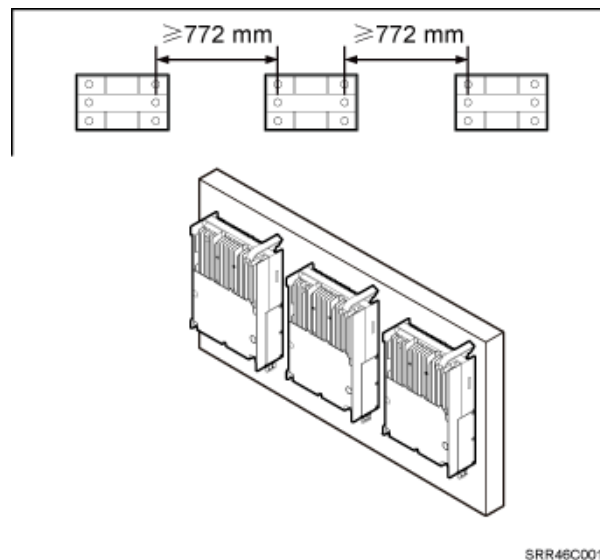
Figure 3-29 Minimum clearances for three or more RUs installed on a pole



Recommended Clearances for Three or More RUs Installed on a Wall in Standard Mode

Figure 3-30 shows the recommended clearances for multiple RUs installed on a wall in standard mode.

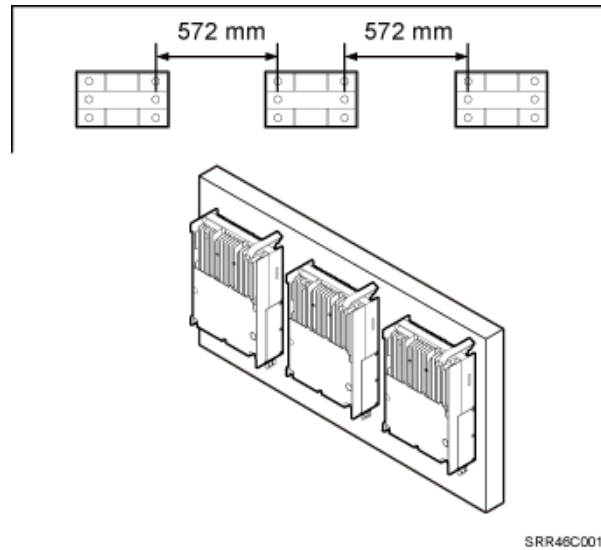
Figure 3-30 Recommended clearances for three or more RUs installed on a wall in standard mode



Minimum Clearances for Three or More RUs Installed on a Wall in Standard Mode

Figure 3-31 shows the minimum clearances for three or more RUs installed on a wall in standard mode.

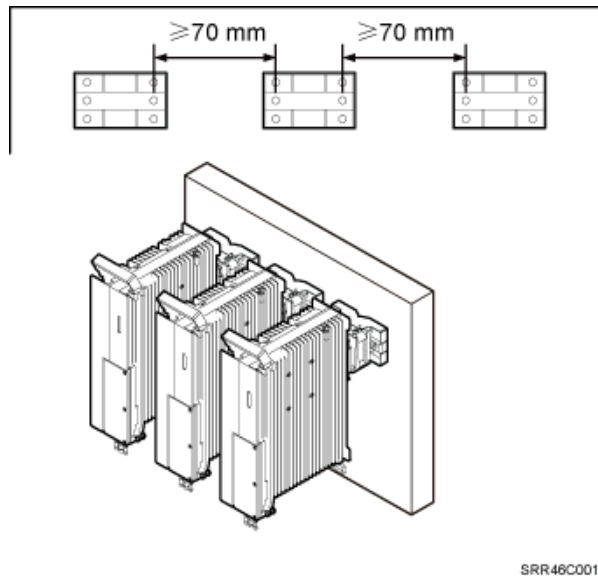
Figure 3-31 Minimum clearances for three or more RUs installed on a wall in standard mode



Recommended Clearances for Three or More RUs Installed on a Wall in Side-Mounted Mode

Figure 3-32 shows the recommended clearances for three or more RUs side-mounted on a wall.

Figure 3-32 Recommended clearances for three or more RUs installed on a wall in side-mounted mode



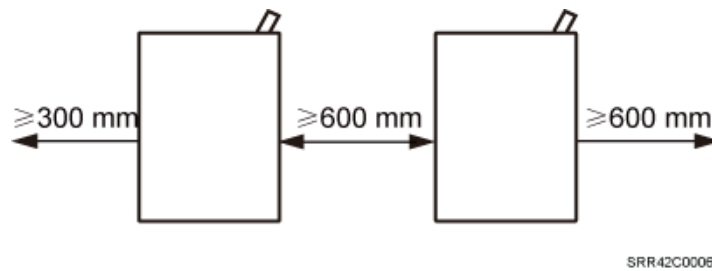
3.5.3 Installation Spacing Between RUs

This section describes the horizontal and vertical spacing between RUs.

Recommended Horizontal Spacing Between RUs

Figure 3-33 shows the recommended horizontal spacing between RUs.

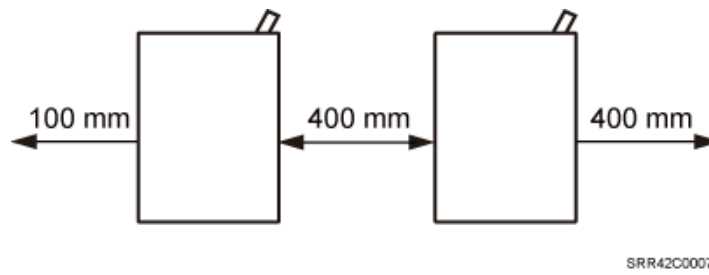
Figure 3-33 Recommended horizontal spacing between RUs



Minimum Horizontal Spacing Between RUs

Figure 3-34 shows the minimum horizontal spacing between RUs.

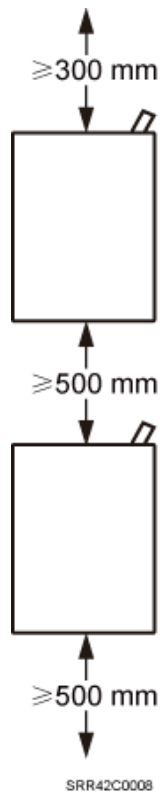
Figure 3-34 Minimum horizontal spacing between RUs



Recommended Vertical Spacing Between RUs

Figure 3-35 shows the recommended vertical spacing between RUs.

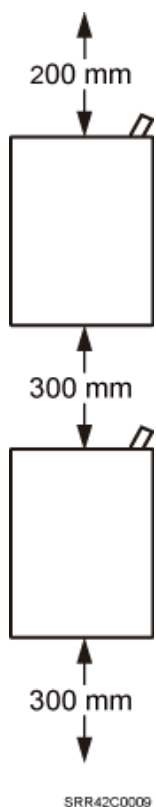
Figure 3-35 Recommended vertical spacing between RUs



Minimum Vertical Spacing Between RUs

Figure 3-36 shows the minimum vertical spacing between RUs.

Figure 3-36 Minimum vertical spacing between RUs



4 Unpacking the Equipment

This chapter describes how to 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.



NOTICE

- After a cabinet or an BBU is unpacked, it must be powered on within 7 days.
- After an RU is unpacked, it must be powered on within 24 hours.

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.

If ...	Then ...
Types and quantity of the article tally with those on the packing list	Sign the <i>Packing List</i> with the customer.
Either shipment shortage, wrong shipment or damaged articles.	Report to the local Huawei office.



CAUTION

- 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.
- Verify that the insulation layers of all RU cables are intact. If the insulation layers are damaged or broken, water will penetrate into the cables, which may cause damages to RUs or human injury.

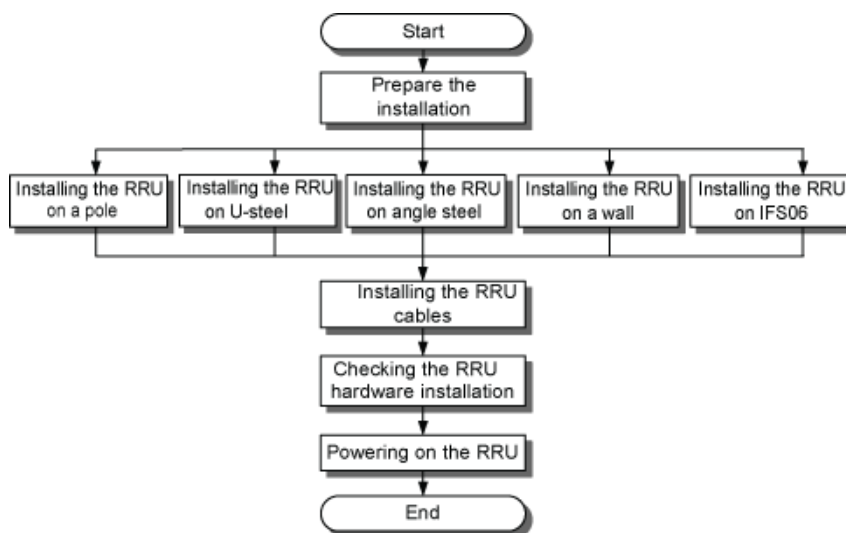
----End

5 Installation Process

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

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

Figure 5-1 Process of installing an RU



IPR42C0001

6 (Optional) Installing the Plastic Shells of the RU

This section describes the procedure for installing the plastic shells of the RU.

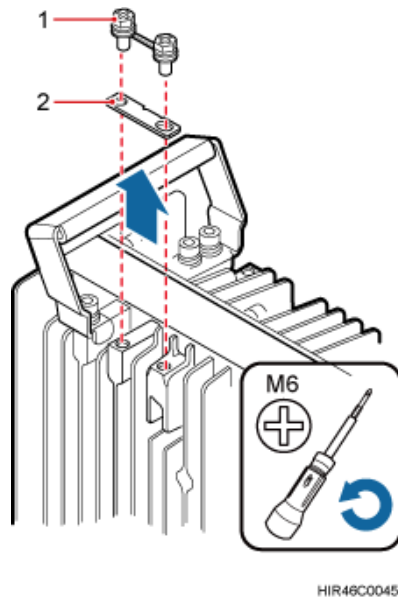
Context

An RU is equipped with a plastic shell only when necessary.

Procedure

- Step 1** Use an M6 Phillips screwdriver to loosen the two screws on the metal sheet of the RU and remove the metal sheet, as shown in [Figure 6-1](#).

Figure 6-1 Removing the metal sheet

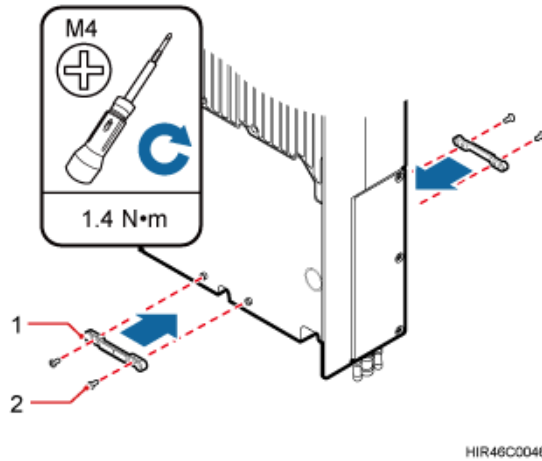


HIR46C0045

(1) Screw	(2) Metal sheet
-----------	-----------------

Step 2 Install a buckle on each side at the bottom of the RU, and use an M4 torque wrench to tighten the screws on the buckles to 1.4 N·m (12.39 lbf in.), as shown in [Figure 6-2](#).

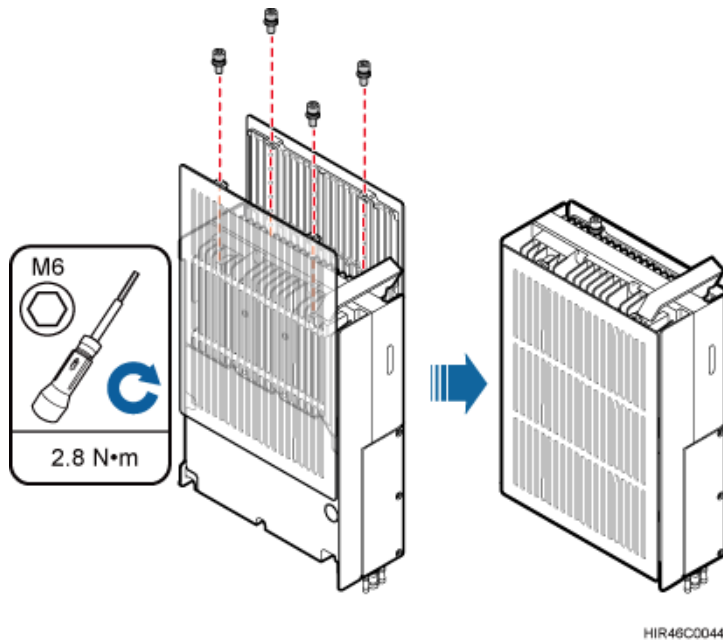
Figure 6-2 Installing buckles at the bottom



(1) Buckle	(2) Screw
------------	-----------

Step 3 Use four hex screws to secure the plastic shells onto the RU and use an M6 hex key wrench to tighten the screws to 2.8 N·m (24.78 lbf in.), as shown in [Figure 6-3](#).

Figure 6-3 Installing the plastic shells of the RU



----End

7 Hoisting an RU and Related Cables onto a Tower

About This Chapter

This section describes the procedure for hoisting an RU and related cables onto a tower and the precautions that must be taken.

7.1 Hoisting an RU onto a Tower

This section describes the procedures and precautions for hoisting an RU and its mounting kits onto a tower. In tower-mounted scenarios, the RU can be installed on a pole, U-steel, or angle steel.

7.2 Hoisting Fiber Optic Cables onto a Tower

This section describes the procedure for hoisting fiber optic cables onto a tower and the precautions that must be taken.

7.3 Hoisting Power Cables onto a Tower

This section describes the procedure for hoisting power cables onto a tower and the precautions that must be taken.

7.1 Hoisting an RU onto a Tower

This section describes the procedures and precautions for hoisting an RU and its mounting kits onto a tower. In tower-mounted scenarios, the RU can be installed on a pole, U-steel, or angle steel.

Prerequisites

When the RU is powered by an AC/DC power module, you need to install the AC/DC power module onto the RU before hoisting them onto a tower. For detailed operations, see *AC/DC Power Module User Guide* or *OPM15M User Guide*.



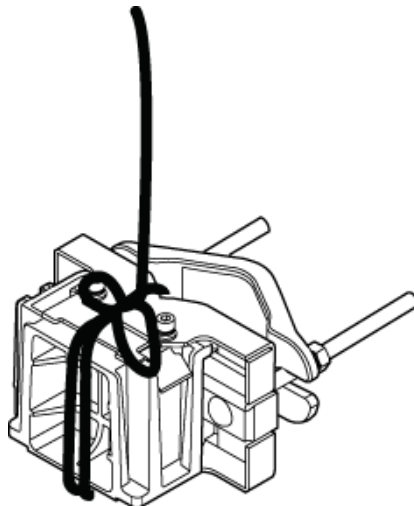
NOTICE

- Place a foam pad or cardboard on the ground to protect the housing of the RU from damage before the binding. Do not stand the RU upright because the RF ports cannot support the weight of the RU.
- The routing and protection of power cables should follow the local safety regulations, industry standards, and enterprise standards of the operator.

Procedure

- Step 1** After climbing up to the tower, technician A secures the fixed pulley to the tower platform support and leads the lifting sling through the fixed pulley.
- Step 2** Technician C binds the mounting kits using the lifting sling and traction sling on the ground, as shown in [Figure 7-1](#). Then technician B pulls the lifting sling downwards, and technician C pulls the traction sling outwards to protect the mounting kits from colliding with the tower.

Figure 7-1 Binding mounting kits for the RU

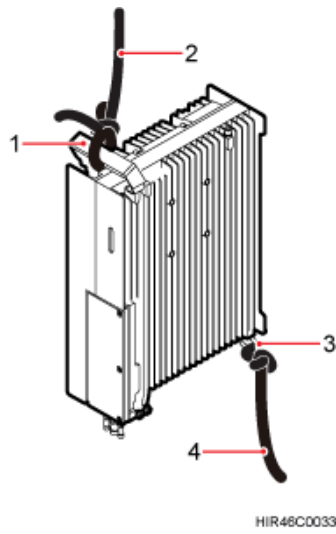


HIR42C0039

(1) Lifting sling	(2) Traction sling
-------------------	--------------------

- Step 3** Technician A catches the mounting kits and then unties the slings.
- Step 4** Install the mounting kits. For detailed operations, see steps 1 to 3 in [8.2.1 Installing a Single RU](#).
- Step 5** Technician C binds the RU using the lifting sling and traction sling, as shown in [Figure 7-2](#). The binding methods in [Figure 7-3](#) and [Figure 7-4](#) are incorrect.

Figure 7-2 Binding the RU



(1) Handle

(2) Lifting sling

(3) Traction eye

(4) Traction sling

Figure 7-3 Incorrect binding method (1)

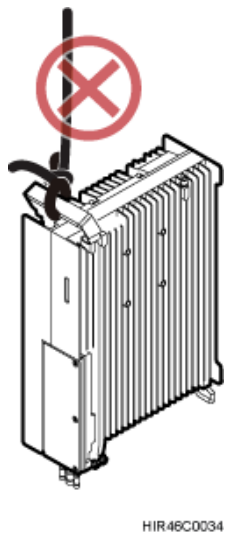
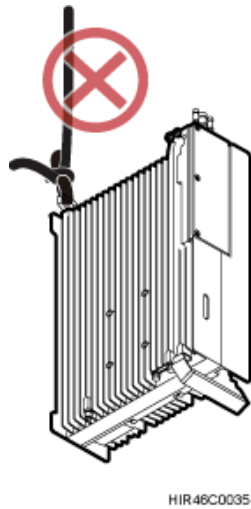
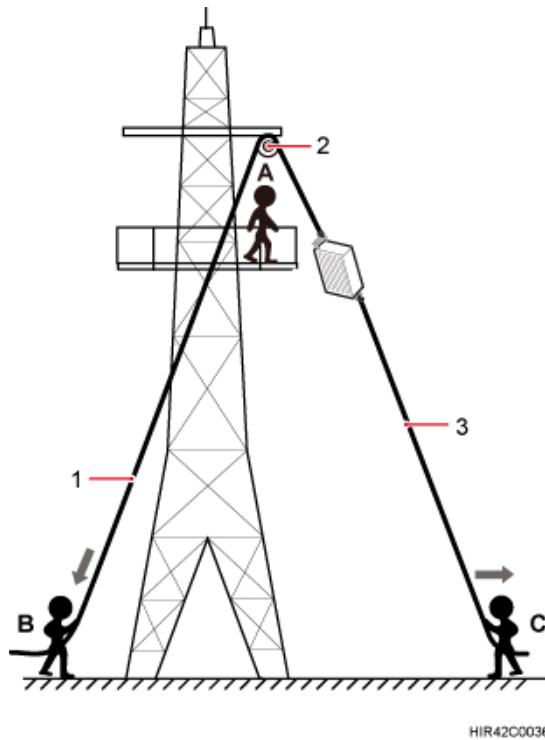


Figure 7-4 Incorrect binding method (2)



Step 6 Hoist the RU onto the tower, as shown in Figure 7-5. Technician B pulls the lifting sling downwards, and technician C pulls the traction sling outwards to protect the RU from colliding with the tower.

Figure 7-5 Hoisting the RU onto the tower



(1) Lifting sling

(2) Fixed pulley

(3) Traction sling



NOTICE

- The load-bearing capacity of each sling must be greater than 200 kg (441 lb) and the diameter of each sling must be less than 25 mm (0.98 in.).
 - When hoisting each device onto a tower, protect them from colliding with the tower.
 - Hoist the RU onto the tower before it is installed on a pole, angle steel, or U-steel.
 - Do not hoist any thing by the traction eye.
-

Step 7 Technician A catches the RU hoisted onto the tower.

Step 8 Technician A installs the RU onto the main bracket and uses an inner hexagon torque screwdriver to tighten the captive screw into the hole of the attachment plate and main bracket to 5 N·m (44.25 lbf·in.). For detailed operations, see steps 4 and 5 in [8.2.1 Installing a Single RU](#).

Step 9 Untie the lifting sling and traction sling.



NOTE

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

----End

7.2 Hoisting Fiber Optic Cables onto a Tower

This section describes the procedure for hoisting fiber optic cables onto a tower and the precautions that must be taken.

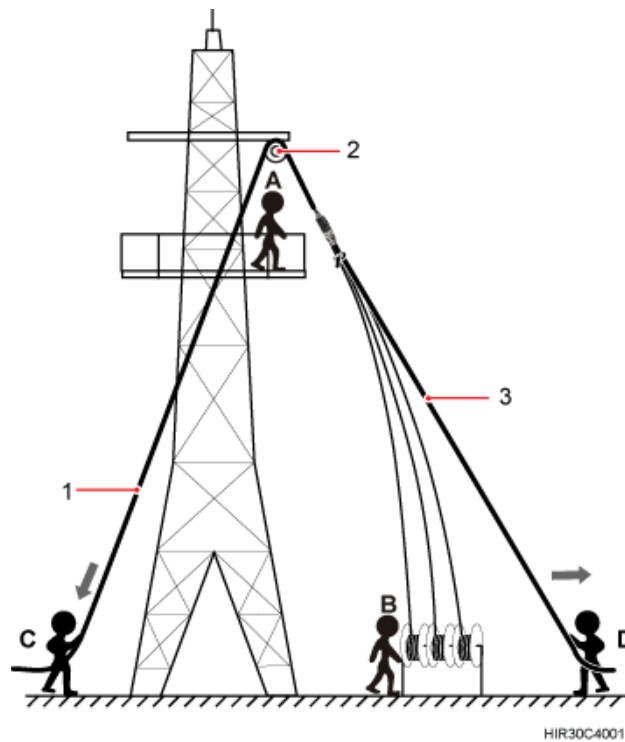
Context

Cabling requirements for power cables are met. For details, see [9.1 Cabling Requirements](#).

Procedure

Step 1 Hoist the fiber optic cables onto the tower, as shown in [Figure 7-6](#).

Figure 7-6 Hoisting fiber optic cables onto the tower



(1) Lifting sling

(2) Fixed pulley

(3) Traction sling

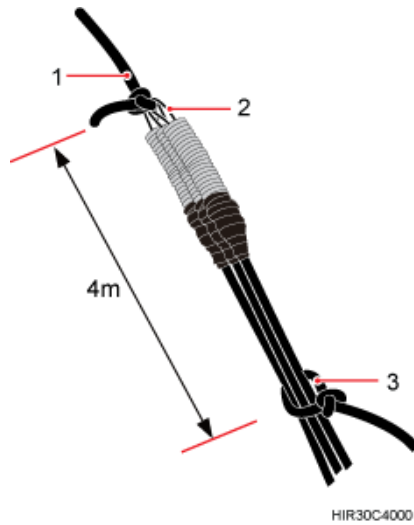


NOTICE

Before hoisting fiber optic cables onto the tower, connect the fiber optic cables to the RU or BBU based on the labels on both ends of the cables and determine the hoisting direction.

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 B places the fiber coiler for coiling fiber optic cables on the fiber spools, and installation engineer D lead the lifting sling through the stretch sling of the fiber optic cables and use the other sling as a traction sling to secure the cables 4 m (13.12 ft) away from the lifting sling, as shown in [Figure 7-7](#).

Figure 7-7 Binding fiber optic cables



(1) Lifting sling

(2) Stretch sling

(3) Traction sling



NOTICE

Do not remove the stretch sling and protection pipe or bind fiber optic cables using one sling, as shown in [Figure 7-8](#).

Figure 7-8 Incorrect binding method



3. Installation engineer B rotates the fiber spools at the speed of 5 m (16.4 ft) to 15 m (49.21 ft) per minute to coil the fiber optic cables.
4. Installation engineer C pulls the lifting sling downwards, and installation engineer D pulls the traction sling outwards to protect the fiber optic cables from colliding with the tower.

Step 2 Secure the fiber optic cables to the tower vertically using cable clips.

Step 3 Remove the lifting sling, traction sling, and protection pipe.



NOTE

The procedure for hoisting the fiber optic cables onto the tower is for your reference only.

----End

7.3 Hoisting Power Cables onto a Tower

This section describes the procedure for hoisting power cables onto a tower and the precautions that must be taken.

Context

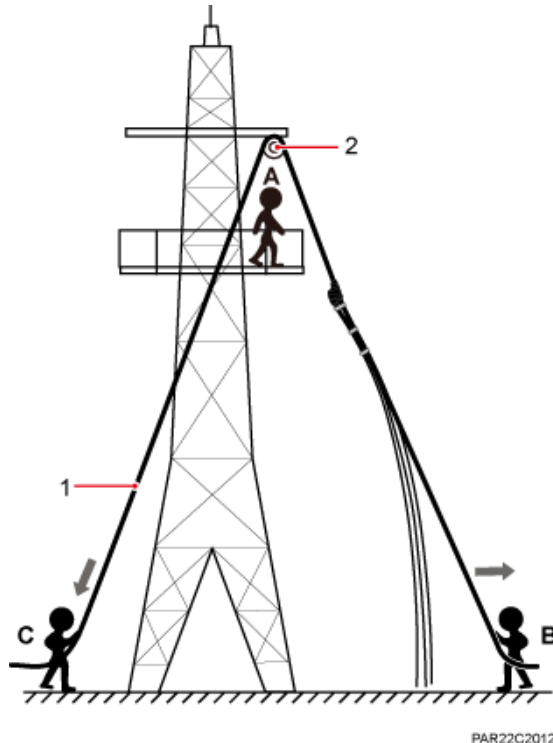
Cabling requirements for power cables are met. For details, see [9.1 Cabling Requirements](#).

The procedure for adding a connector to the RU power cable on the RU side is done under the tower.

Procedure

Step 1 Hoist the power cables onto the tower, as shown in [Figure 7-9](#).

Figure 7-9 Hoisting power cables onto the tower



(1) Lifting sling

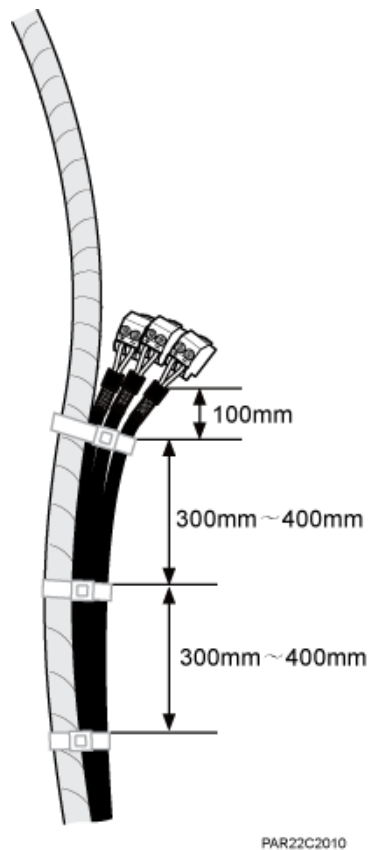
(2) Fixed pulley

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 B secures three cable ties to the power cable connector, and then secures the power cable to the lifting sling, as shown in [Figure 7-10](#).

 **NOTE**

The connector on the power cable in the figure is only an example. The actual connector may vary according to the situation.

Figure 7-10 Binding cable ties

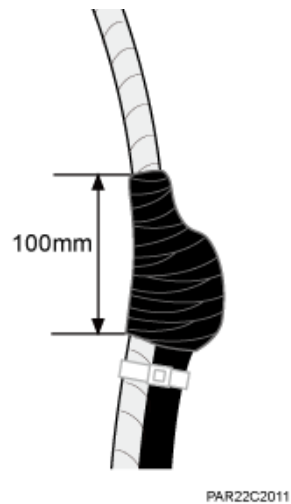


3. Installation engineer B wraps the power cable connector with a layer of PVC insulation tape, as shown in [Figure 7-11](#).

 **NOTE**

Wrap the PVC insulation tape from 30 mm (1.18 in.) away from one end of the connector until it reaches the other end of the connector. The total length of the wrapped connector is 100 mm (3.94 in.).

Figure 7-11 Wrapping the PVC insulation tape



4. Installation engineer C pulls the lifting sling downwards, and installation engineer B pulls the other end of the lifting sling outwards to protect the power cables from colliding with the tower.

Step 2 Secure the power cables to the tower vertically using cable clips.

Step 3 Remove the cable ties, PVC insulation tape, and lifting sling.



NOTE

The procedure for hoisting the power cables onto the tower is for your reference only.

----End

8 Installing the RU

About This Chapter

This chapter describes the procedure for installing the RU. The procedure for installing the RU varies depending on installation options.

8.1 Mounting Kits for an RU

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

8.2 Installing the RU on a Pole

One or more RUs can be installed on a pole.

8.3 Installing the RU on U-steel

This section describes the procedure and precautions for installing the RU on U-steel. An RU can be installed on U-steel secured on the ground or a tower. Each piece of U-steel allows only one RU to be installed in standard or reverse mode.

8.4 Installing the RU on Angle Steel

This section describes the procedure and precautions for installing the RU on angle steel. An RU can be installed on angle steel secured on the ground or a tower. Each piece of angle steel allows only one RU to be installed in standard or reverse mode.

8.5 Installing the RU on a Wall

This section describes the procedure and precautions for installing the RU on a wall.

8.6 Installing an RU on an IFS06

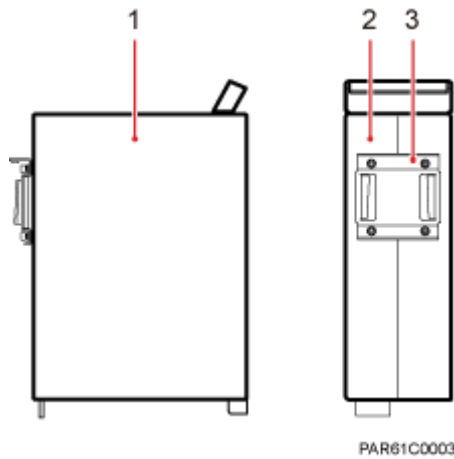
This section describes the procedure and precautions for installing an RU on an IFS06.

8.1 Mounting Kits for an RU

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

[Figure 8-1](#) shows the front and side of an RU.

Figure 8-1 Front and side view of an RU

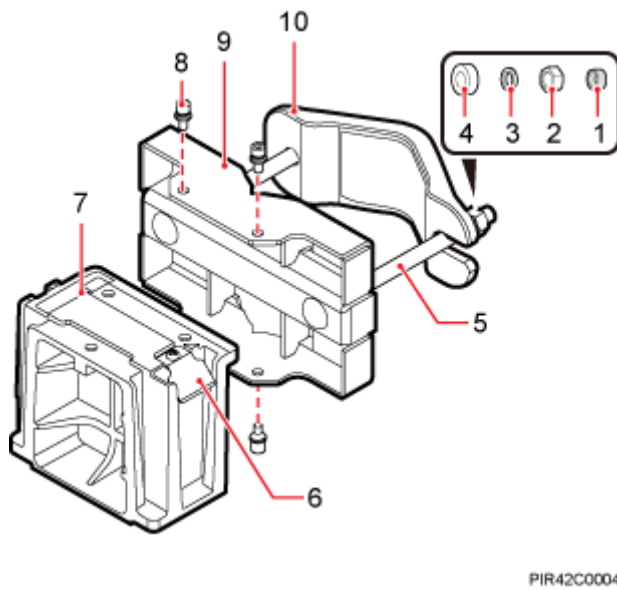


(1) Front view

(2) Side view

Figure 8-2 shows the bracket assembly for an RU.

Figure 8-2 12 L blade RU mounting kit



- | | | | | |
|-------------------------------------|----------------------|-------------------------|-------------------------------|------------------------|
| (1) Plastic cap | (2) Standard M10 nut | (3) Spring washer | (4) Thick flat washer | (5) Square-neck bolt |
| (6) Hoist clamp on the main bracket | (7) Main bracket | (8) Inner hexagon screw | (9) Pole installation bracket | (10) Auxiliary bracket |

8.2 Installing the RU on a Pole

One or more RUs can be installed on a pole.

8.2.1 Installing a Single RU

This section describes the procedure and precautions for installing a single RU on a pole.

Prerequisites

Before you install an RU on a pole secured on a tower, the RU and its mounting brackets are hoisted onto the tower. For details, see [7.1 Hoisting an RU onto a Tower](#).

The hoist clamp on the main bracket is secured properly.



NOTICE

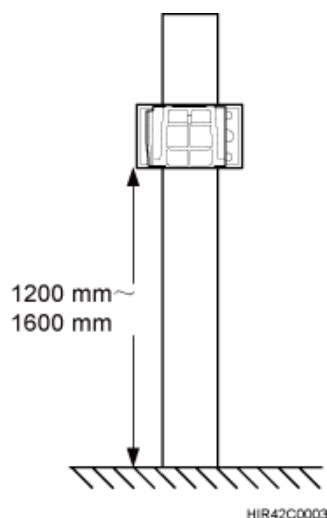
- Do not stand the RU upright because the RF ports cannot support the weight of the RU.
 - Place a foam pad or cardboard under the RU to protect the RU housing from damage during the installation.
-

Procedure

Step 1 Determine a position for installing the mounting brackets.

- If the pole must be installed on a tower, determine a position for installing the mounting brackets according to the instructions in [3.5.1 Clearance for a Single RU](#).
- If the pole must be installed on the ground, determine a position for installing the mounting brackets according to [Figure 8-3](#).

Figure 8-3 Distance between the mounting brackets and the ground

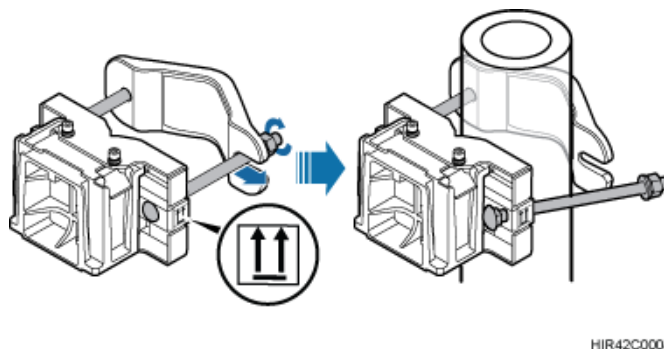


 **NOTE**

It is recommended that the mounting brackets be installed at a height of 1200 mm (47.24 in.) to 1600 mm (62.99 in.) above the ground.

Step 2 Install the RU mounting brackets, as shown in [Figure 8-4](#).

Figure 8-4 Installing the RU mounting brackets



 **NOTE**

Verify that the arrows on the mounting brackets are pointing up.

1. Adjust the position of the nut and remove one end of the square-neck bolt from the slot on the auxiliary bracket.
2. Slide the mounting brackets onto the pole horizontally and insert the square-neck bolt into the slot.

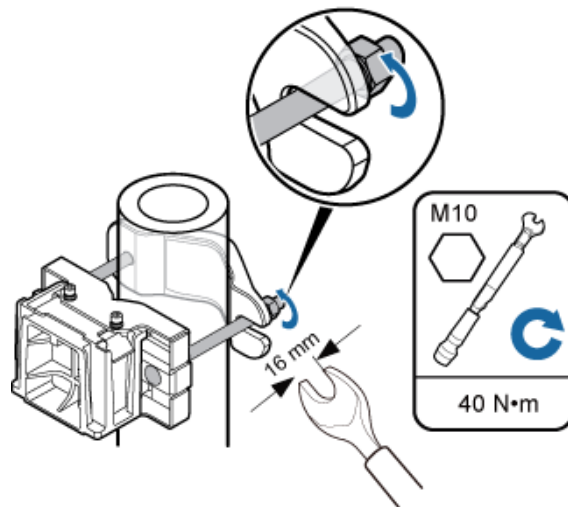
Step 3 Use a 16 mm (0.63 in.) M10 torque wrench to tighten the nuts to 40 N·m (354.03 lbf in.) so that the mounting brackets are secured onto the pole, as shown in [Figure 8-5](#).



NOTICE

Tighten the nuts on the two square-neck bolts 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.

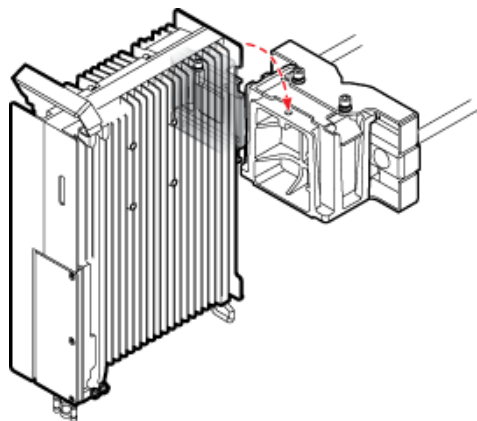
Figure 8-5 Securing the RU mounting brackets



HIR42C0005

Step 4 Install the RU onto the main bracket, as shown in [Figure 8-6](#).

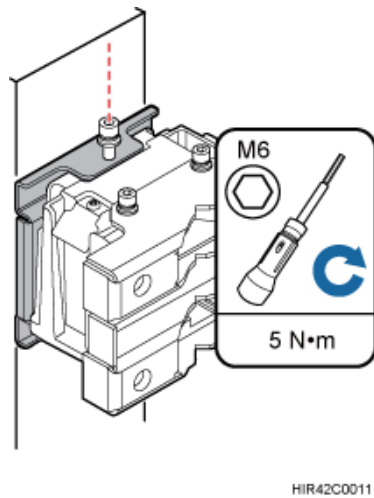
Figure 8-6 Installing the RU onto the main bracket



HIR46C0006

Step 5 Use an inner hexagon torque screwdriver to tighten the captive screw into the holes on the top of the attachment plate and main bracket to 5 N m (44.25 lbf in.) so that the attachment plate and main bracket are firmly secured, as shown in [Figure 8-7](#).

Figure 8-7 Securing the captive screw into the connection hole



----End

8.2.2 Installing Two RUs

This section describes the procedure and precautions for installing two RUs on a pole.

Prerequisites

The hoist clamp on the main bracket is secured properly.



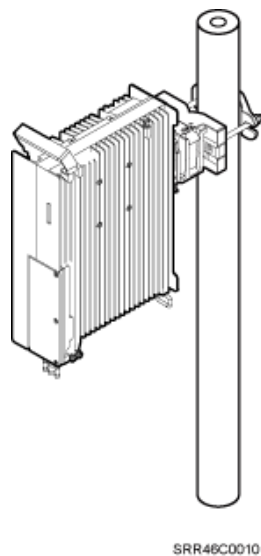
NOTICE

- Do not stand the RU upright because the RF ports cannot support the weight of the RU.
 - Place a foam pad or cardboard under the RU to protect the RU housing from damage during the installation.
-

Procedure

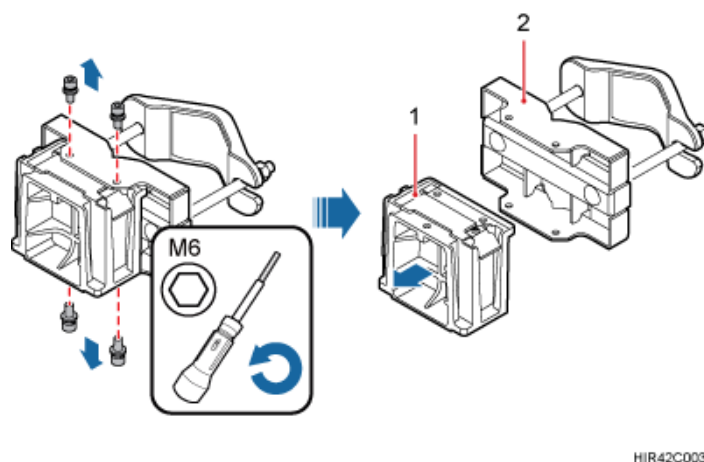
- Step 1** Install the first RU onto the main bracket, as shown in [Figure 8-8](#). For details, see [8.2.1 Installing a Single RU](#).

Figure 8-8 Installing the first RU onto the main bracket



Step 2 Use an M6 inner hexagon screwdriver to remove the four inner hexagon screws from the second set of mounting brackets, and remove the main bracket from the auxiliary bracket, as shown in [Figure 8-9](#).

Figure 8-9 Removing the RU main bracket



(1) Main bracket

(2) Pole installation bracket

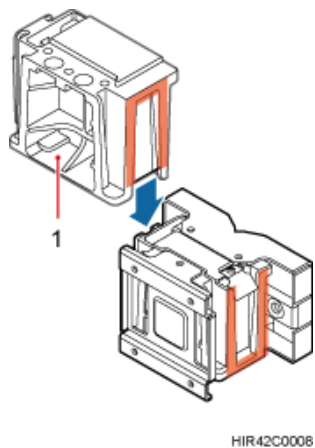
Step 3 Install the removed main bracket on one side of the first main bracket, as shown in [Figure 8-10](#).



NOTICE

The second main bracket must be installed with the opening ends of U-shaped slots on both sides facing downwards.

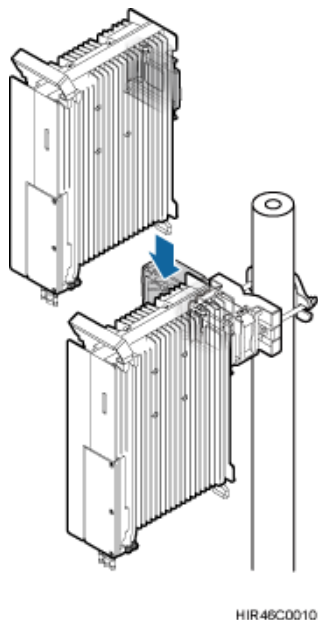
Figure 8-10 Installing the second main bracket



(1) Removed main bracket

Step 4 Install the second RU onto the main bracket, as shown in [Figure 8-11](#).

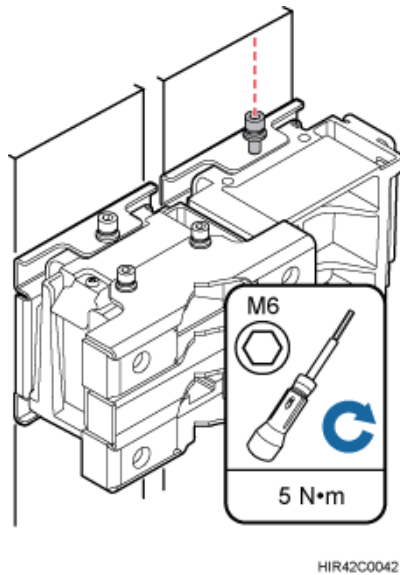
Figure 8-11 Installing the second RU onto the main bracket



 **NOTICE**

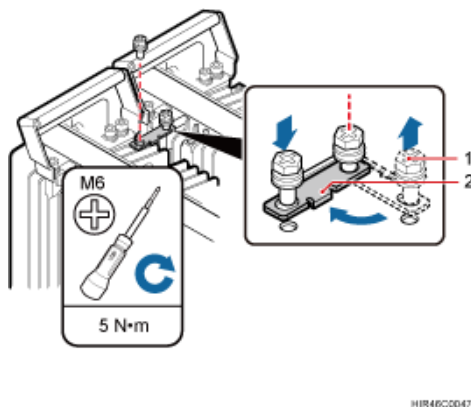
After installing each RU on its main bracket, use an inner hexagon torque screwdriver to tighten the captive screw into the holes of the attachment plate and main bracket to 5 N·m (44.25 lbf in.) so that the attachment plate and main bracket are firmly secured, as shown in [Figure 8-12](#).

Figure 8-12 Securing the captive screw into the connection hole



Step 5 Install the metal sheet for neighboring RUs, as shown in [Figure 8-13](#).

Figure 8-13 Installing the metal sheet



(1) Screw

(2) Metal sheet

1. Use an M6 Phillips screwdriver to loosen the screw on the metal sheet farther from the handle of the second RU and remove the screw.

2. Use an M6 Phillips screwdriver to loosen the screw on the metal sheet closer to handle of the second RU. Then rotate the metal sheet to align the vacant hole in the metal sheet with a hole on the top of the first RU.
3. Insert the removed screw into the hole on the top of the first RU and use an M6 torque screwdriver to tighten the screw to 5 N·m (44.25 lbf·in.).

----End

8.2.3 Installing Three or More RUs

The section describes the procedure and precautions for installing three or more RUs on a pole.

Prerequisites

The hoist clamp on the main bracket is secured properly.



NOTICE

- Do not stand the RU upright because the RF ports cannot support the weight of the RU.
 - Place a foam pad or cardboard under the RU to protect the RU housing from damage during the installation.
-

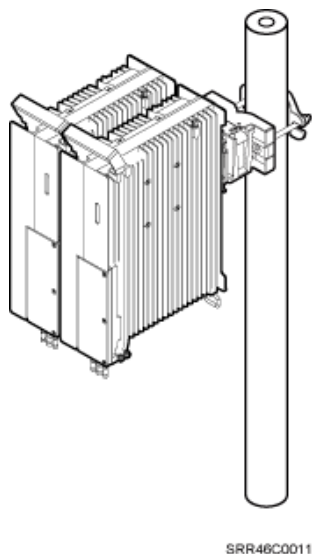
Context

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

Procedure

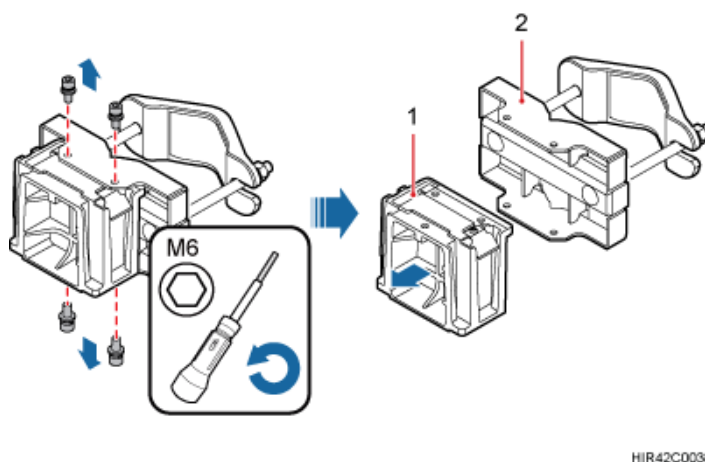
- Step 1** Install the two RUs, as shown in [Figure 8-14](#). For details, see [8.2.2 Installing Two RUs](#).

Figure 8-14 Two RUs installed on a pole



Step 2 Use an M6 inner hexagon screwdriver to remove the four inner hexagon screws from the second set of mounting brackets, and remove the main bracket from the auxiliary bracket, as shown in [Figure 8-15](#).

Figure 8-15 Removing the RU main bracket



(1) Main bracket

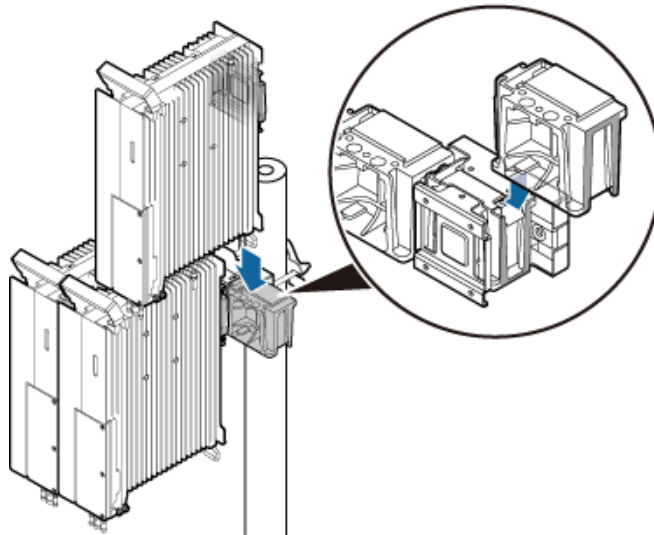
(2) Pole installation bracket

Step 3 Install the third main bracket and install the third RU onto the third main bracket. Then use an inner hexagon torque screwdriver to tighten the captive screw into the connection holes on the top of the attachment plate and main bracket for the RU, with a torque of 5 N·m (44.25 lbf in.), as shown in [Figure 8-16](#).

 **NOTICE**

The third main bracket must be installed with the opening ends of U-shaped slots on both sides facing downwards.

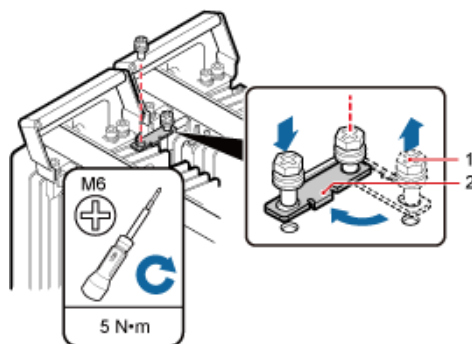
Figure 8-16 Installing the third RU onto the third main bracket



HIR46C0015

Step 4 Install the metal sheet for neighboring RUs, as shown in [Figure 8-17](#).

Figure 8-17 Installing the metal sheet



HIR46C0047

(1) Screw

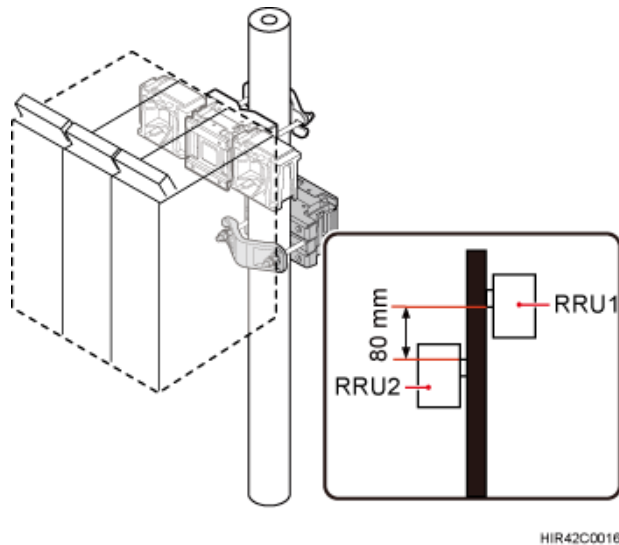
(2) Metal sheet

1. Use an M6 Phillips screwdriver to loosen the screw on the metal sheet farther from the handle of the first RU and remove the screw.

2. Use an M6 Phillips screwdriver to loosen the screw on the metal sheet closer to handle of the first RU. Then rotate the metal sheet to align the vacant hole in the metal sheet with a hole on the top of the third RU.
3. Insert the removed screw into the hole on the top of the third RU and use an M6 torque screwdriver to tighten the screw to 5 N·m (44.25 lbf in.).

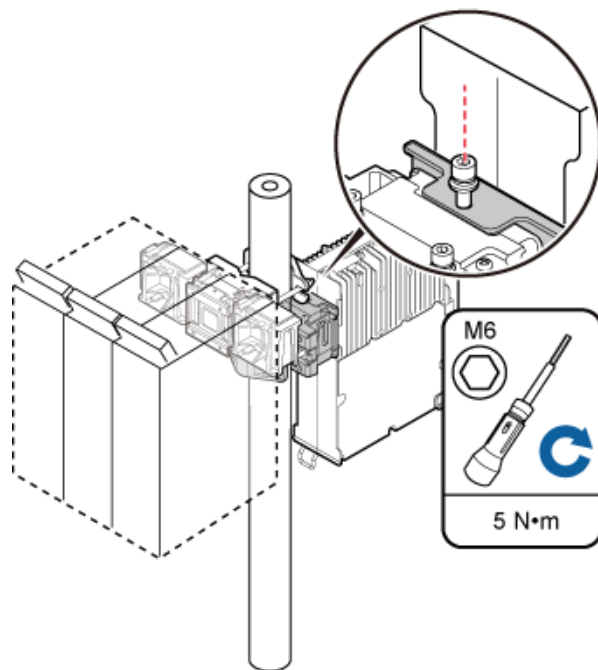
Step 5 Install the second set of RU mounting brackets above or below the first set of RU mounting brackets and maintain a space equal to or greater than 80 mm (3.15 in.) between the two sets of brackets, as shown in [Figure 8-18](#).

Figure 8-18 Installing the second set of RU mounting brackets



Step 6 Install the fourth RU onto the fourth main bracket, use an inner hexagon torque screwdriver to tighten the captive screw into the holes of the attachment plate and main bracket to 5 N·m (44.25 lbf in.) so that the attachment plate and main bracket are firmly secured, as shown in [Figure 8-19](#).

Figure 8-19 Installing the fourth RU onto the fourth main bracket



HIR46C0017

----End

8.3 Installing the RU on U-steel

This section describes the procedure and precautions for installing the RU on U-steel. An RU can be installed on U-steel secured on the ground or a tower. Each piece of U-steel allows only one RU to be installed in standard or reverse mode.

Prerequisites

Before you install an RU on U-steel secured on a tower, the RU and its mounting brackets are hoisted onto the tower. For details, see [7.1 Hoisting an RU onto a Tower](#).

The hoist clamp on the main bracket is secured properly.

 **NOTICE**

- Do not stand the RU upright because the RF ports cannot support the weight of the RU.
- Place a foam pad or cardboard under the RU to protect the RU housing from damage during the installation.

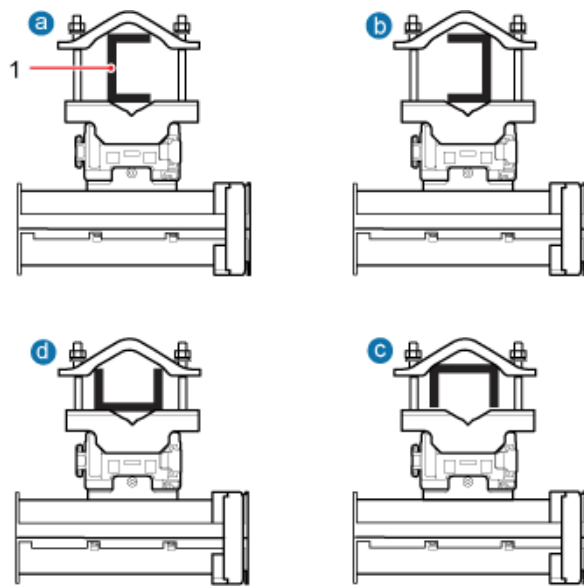
Context

Figure 8-20 shows the top view of the RU installed on U-steel.

 **NOTICE**

When the width of the narrower edges of the U-steel is less than 40 mm (1.57 in.), only the a and b modes are supported.

Figure 8-20 Top view of the RU



HIR42C0019

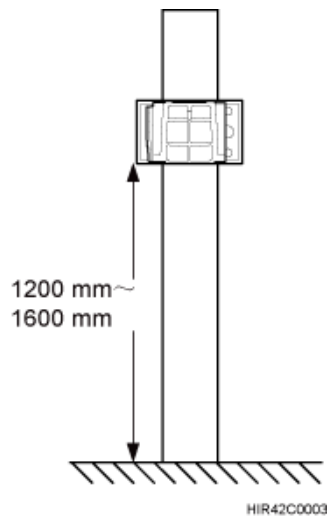
(1) U-steel

Procedure

Step 1 Determine a position for installing the mounting brackets.

- If the RU must be installed on U-steel secured on a tower, see [3.5.1 Clearance for a Single RU](#) to determine a position.
- If the RU must be installed on U-steel secured on the ground, see [Figure 8-21](#) to determine a position.

Figure 8-21 Distance between the mounting brackets and the ground

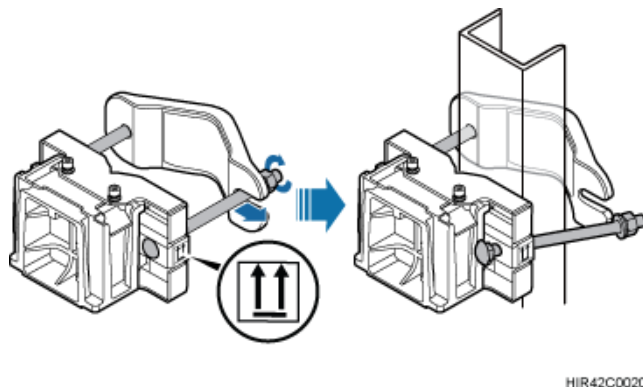


NOTE

It is recommended that the mounting brackets be installed at a height of 1200 mm (47.24 in.) to 1600 mm (62.99 in.) above the ground.

Step 2 Install the RU mounting brackets, as shown in [Figure 8-22](#).

Figure 8-22 Installing the RU mounting brackets



NOTE

Verify that the arrows on the mounting brackets are pointing up.

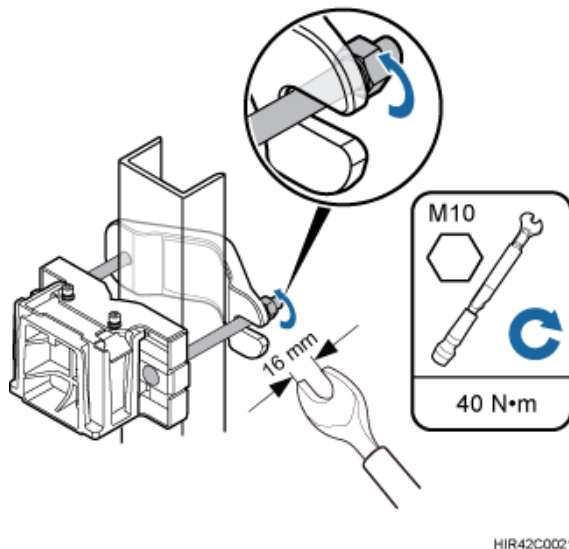
1. Adjust the position of the nut and remove one end of the square-neck bolt from the slot on the auxiliary bracket.
2. Slide the mounting brackets onto the U-steel horizontally and insert the square-neck bolt into the slot.

Step 3 Use a 16 mm (0.67 in.) M10 torque wrench to tighten the nuts to 40 N·m (354.03 lbf in.) so that the mounting brackets are secured onto the U-steel, as shown in [Figure 8-23](#).

 **NOTICE**

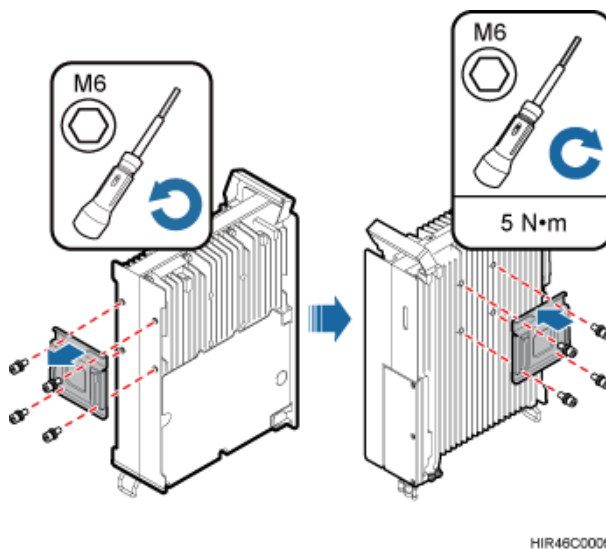
Tighten the nuts on the two square-neck bolts alternatively. After the main and auxiliary brackets are secured properly, measure the spacing between the brackets on both sides and ensure that the spacing is the same on the two sides.

Figure 8-23 Securing the RU mounting brackets



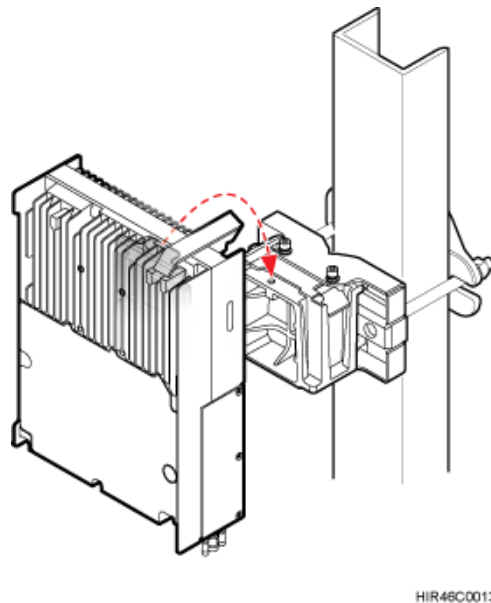
Step 4 Use an inner hexagon screwdriver to remove the attachment plate from one side of the RU, reinstall the attachment plate onto the rear of the RU, and tighten the four stainless screws to 5 N m (44.25 lbf in.), as shown in [Figure 8-24](#).

Figure 8-24 Installing the attachment plate onto the rear of the RU



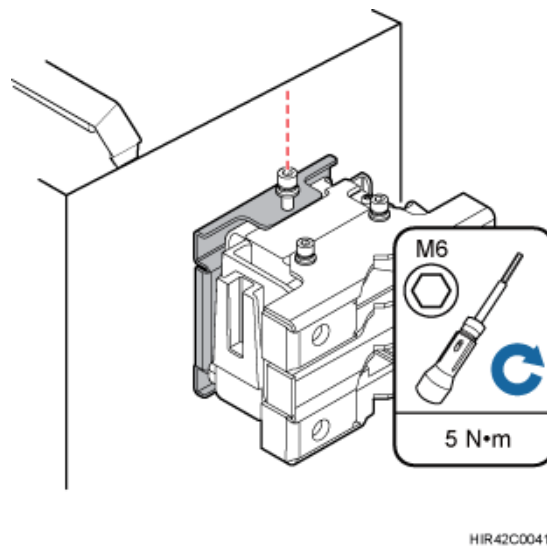
Step 5 Install the RU onto the main bracket, as shown in [Figure 8-25](#).

Figure 8-25 Installing the RU onto the main bracket



Step 6 Use an inner hexagon screwdriver to tighten the captive screw into the holes on the top of the attachment plate and main bracket to 5 N·m (44.25 lbf in.) so that the attachment plate and main bracket are firmly secured, as shown in [Figure 8-26](#).

Figure 8-26 Securing the captive screw into the connection hole



----End

8.4 Installing the RU on Angle Steel

This section describes the procedure and precautions for installing the RU on angle steel. An RU can be installed on angle steel secured on the ground or a tower. Each piece of angle steel allows only one RU to be installed in standard or reverse mode.

Prerequisites

Before you install an RU on angle steel secured on a tower, the RU and its mounting brackets are hoisted onto the tower. For details, see [7.1 Hoisting an RU onto a Tower](#).

The hoist clamp on the main bracket is secured properly.



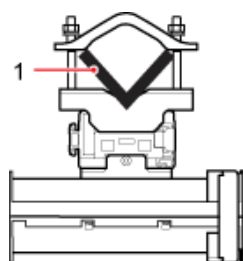
NOTICE

- Do not stand the RU upright because the RF ports cannot support the weight of the RU.
 - Place a foam pad or cardboard under the RU to protect the RU housing from damage during the installation.
-

Context

[Figure 8-27](#) shows the top view of the RU installed on angle steel.

Figure 8-27 Top view of the RU



HIR42C0025

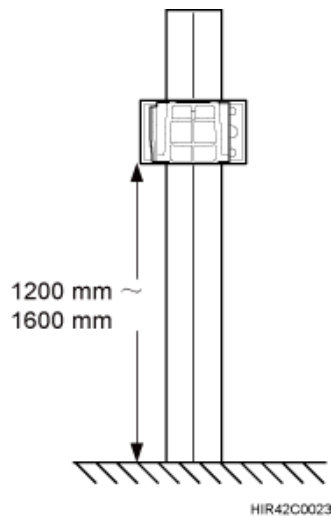
(1) Angle steel

Procedure

Step 1 Determine a position for installing the mounting brackets.

- If the RU must be installed on angle steel secured on a tower, see [3.5.1 Clearance for a Single RU](#) to determine a position.
- If the RU must be installed on angle steel secured on the ground, see [Figure 8-28](#) to determine a position.

Figure 8-28 Distance between the mounting brackets and the ground

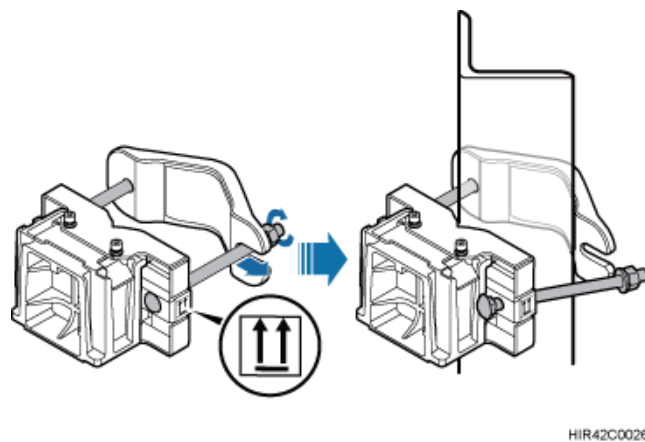


NOTE

It is recommended that the mounting brackets be installed at a height of 1200 mm (47.24 in.) to 1600 mm (62.99 in.) above the ground.

Step 2 Install the RU mounting brackets, as shown in [Figure 8-29](#).

Figure 8-29 Installing the RU mounting brackets



NOTE

Verify that the arrows on the mounting brackets are pointing up.

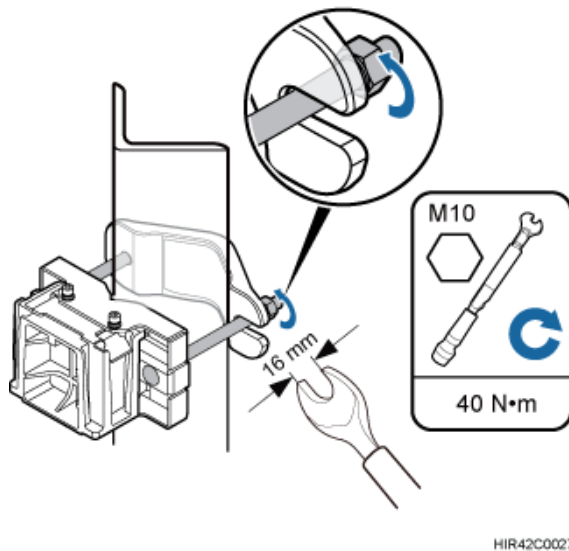
1. Adjust the position of the nut and remove one end of the square-neck bolt from the slot on the auxiliary bracket.
2. Slide the mounting brackets onto the angle steel horizontally and insert the square-neck bolt into the slot.

Step 3 Use a 16 mm (0.67 in.) M10 torque wrench to tighten the nuts to 40 N·m (354.03 lbf in.) so that the mounting brackets are secured onto the angle steel, as shown in [Figure 8-30](#).

 **NOTICE**

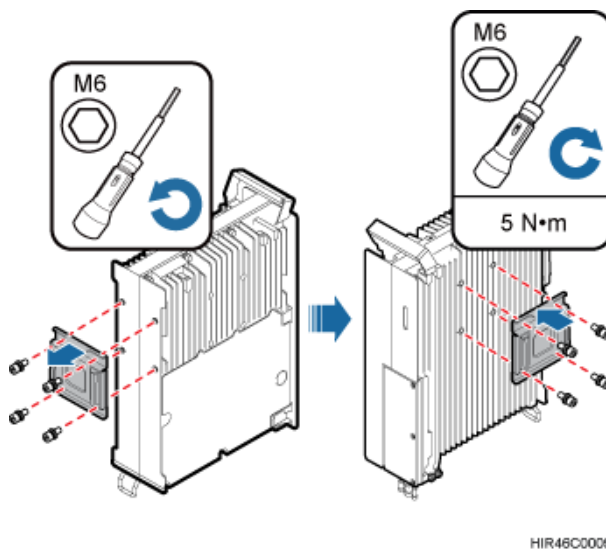
Tighten the nuts on the two square-neck bolts alternatively. After the main and auxiliary brackets are secured properly, measure the spacing between the brackets on both sides and ensure that the spacing is the same on the two sides.

Figure 8-30 Securing the RU mounting brackets



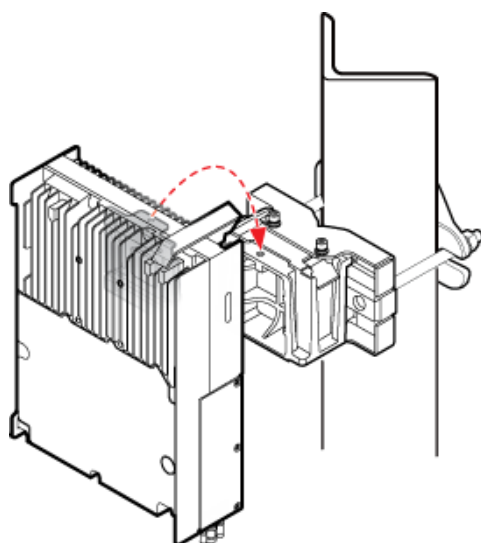
Step 4 Use an inner hexagon screwdriver to remove the attachment plate from one side of the RU, reinstall the attachment plate onto the rear of the RU, and tighten the four stainless screws to 5 N m (44.25 lbf in.), as shown in [Figure 8-31](#).

Figure 8-31 Installing the attachment plate onto the rear of the RU



Step 5 Install the RU onto the main bracket, as shown in [Figure 8-32](#).

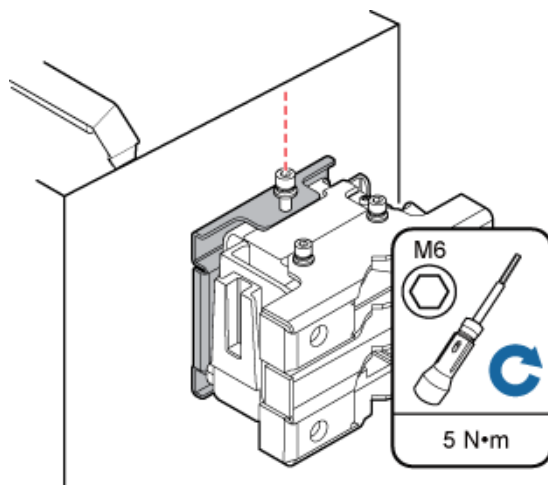
Figure 8-32 Installing the RU onto the main bracket



HIR46C0014

Step 6 Use an inner hexagon screwdriver to tighten the captive screw into the holes on the top of the attachment plate and main bracket to 5 N·m (44.25 lbf in.) so that the attachment plate and main bracket are firmly secured, as shown in [Figure 8-33](#).

Figure 8-33 Securing the captive screw into the connection hole



HIR42C0041

----End

8.5 Installing the RU on a Wall

This section describes the procedure and precautions for installing the RU on a wall.

Prerequisites

The hoist clamp on the main bracket is secured properly.



NOTICE

- Do not stand the RU upright because the RF ports cannot support the weight of the RU.
- Place a foam pad or cardboard under the RU to protect the RU housing from damage during the installation.

Context

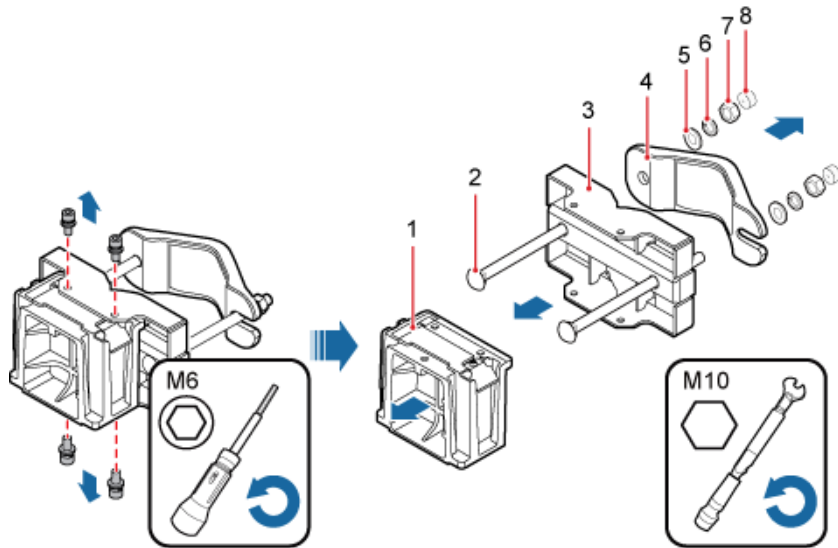
The wall on which RUs are installed must meet the following requirements:

- For each RU, the wall must be able to bear a weight four times the RU's weight and the bolts' pulling force of 1.25 kN (281.25 lbf) vertical to the wall.
- Expansion anchor bolts must be tightened to 30 N·m (265.52 lbf·in.) so that the bolts stay secured without damaging the wall.

Procedure

Step 1 Disassemble the RU mounting brackets, as shown in [Figure 8-34](#).

Figure 8-34 Disassembling the mounting brackets



HIR42C0040

(1) Main
bracket

(2) Square-neck
bolt

(3) Pole installation
bracket

(4) Auxiliary
bracket

(5) Flat washer

(6) Spring washer

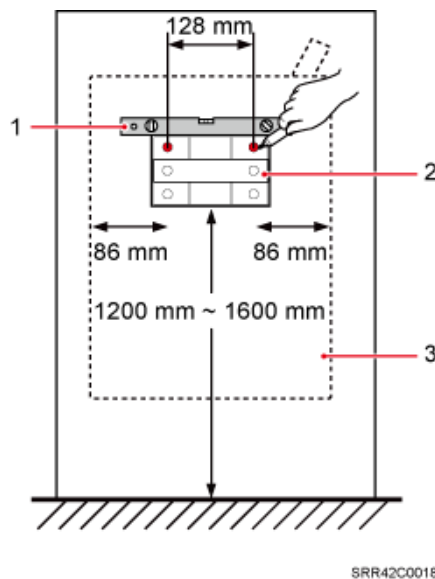
(7) Nut

(8) Plastic cap

1. Use an M6 inner hexagon torque screwdriver to remove the four inner hexagon screws on the pole installation bracket, and remove the main bracket from the pole installation bracket.
2. Use an M10 torque wrench to loosen the nuts on the two square-neck bolts, and remove the plastic cap, nuts, spring washers, flat washers, square-neck bolts, and pole installation bracket from the auxiliary bracket.

Step 2 Place the pole installation bracket against the installation position, use a level to verify that the pole installation bracket is placed horizontally, and then mark anchor points with a marker, as shown in [Figure 8-35](#).

Figure 8-35 Marking anchor points



(1) Level

(2) Pole installation bracket

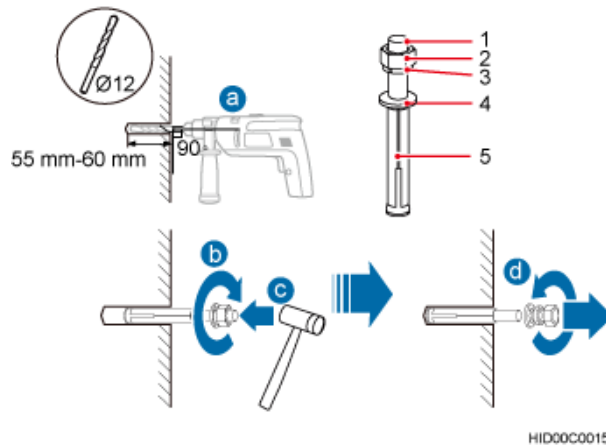
(3) RU

 **NOTE**

It is recommended that the pole installation bracket be installed at a height of 1200 mm (47.24 in.) to 1600 mm (62.99 in.) above the ground.

Step 3 Drill holes at the anchor points, and then insert expansion anchor bolt assemblies, as shown in [Figure 8-36](#).

Figure 8-36 Drilling a hole and inserting expansion anchor bolt assemblies



- (1) M10x80 bolt (2) Nut (3) Spring washer (4) Flat washer (5) Expansion tube

1. Use a hammer drill with a $\Phi 12$ 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.).



NOTICE

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

2. Tighten the expansion anchor bolts slightly and place one vertically into each hole.
3. Use a rubber mallet to pound the expansion anchor bolt until it goes all the way into the hole.
4. Tighten and then loosen the expansion bolt, and remove the M10 bolt, spring washer, and flat washer in sequence.

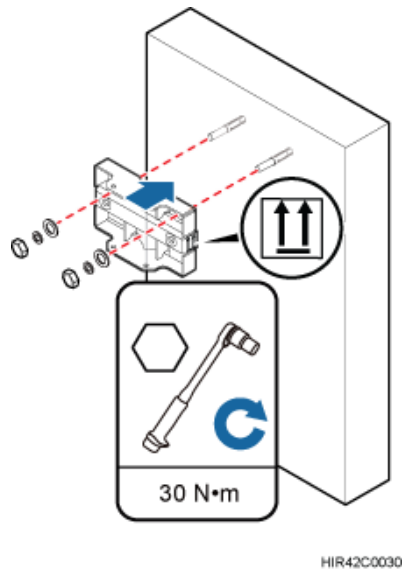


NOTICE

After dismantling an expansion anchor bolt, ensure that the top of the expansion tube is on the same level as the wall. Otherwise, the device cannot be installed on the wall evenly and securely.

- Step 4** Install the pole installation bracket on the expansion anchor bolts, place the flat washers, spring washers, and nuts through the expansion anchor bolts in sequence, and then use a 16 mm (0.63 in.) torque socket to tighten the nuts to 30 N m (265.52 lbf in.), as shown in [Figure 8-37](#).

Figure 8-37 Installing the pole installation bracket on the expansion anchor bolts

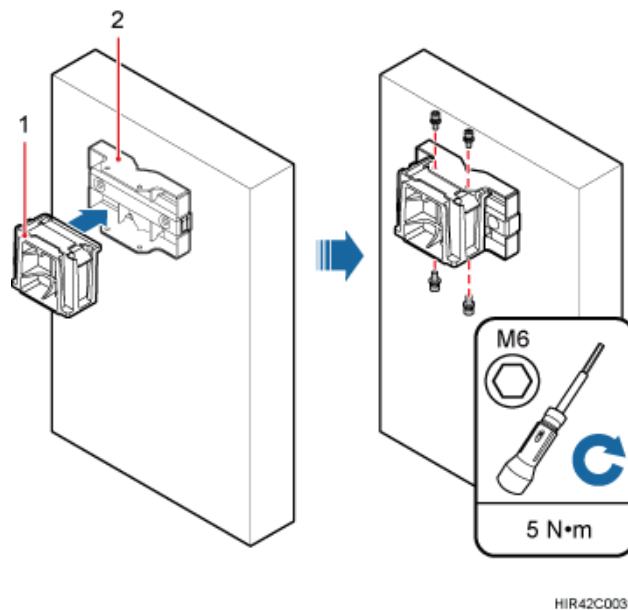


NOTICE

Verify that the arrows on the pole installation bracket are pointing up.

- Step 5** Install the main bracket onto the pole installation bracket, and use an inner hexagon screwdriver to tighten four M6x16 inner hexagon screws to 5 N·m (44.25 lbf in.) so that the main bracket and pole installation bracket are firmly secured, as shown in [Figure 8-38](#).

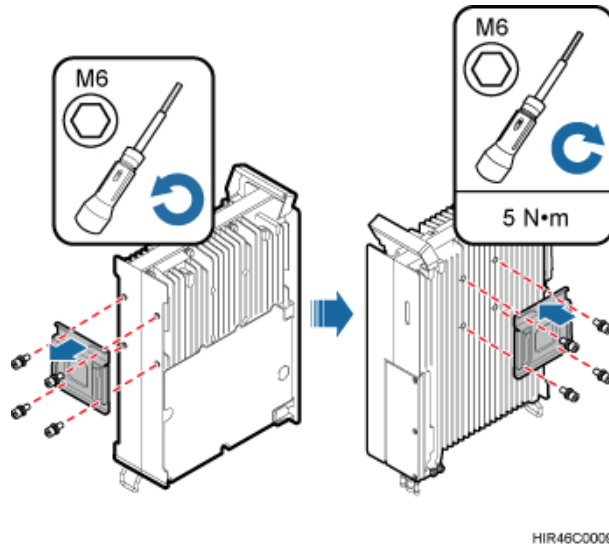
Figure 8-38 Installing the main bracket



(1) Main bracket	(2) Pole installation bracket
------------------	-------------------------------

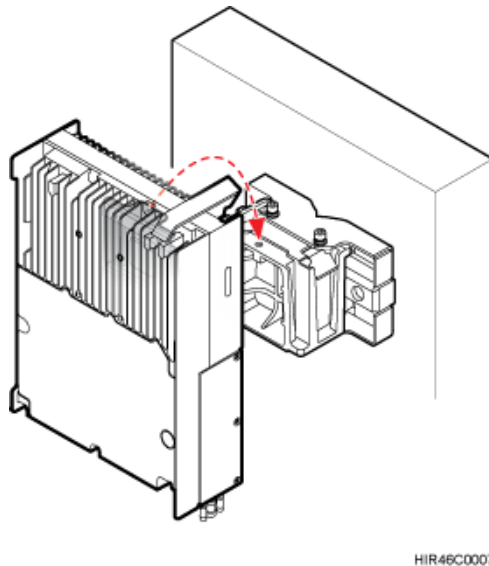
Step 6 Use an inner hexagon screwdriver to remove the attachment plate from one side of the RU, reinstall the attachment plate onto the rear of the RU, and tighten the four stainless screws to 5 N·m (44.25 lbf in.), as shown in [Figure 8-39](#).

Figure 8-39 Installing the attachment plate onto the rear of the RU



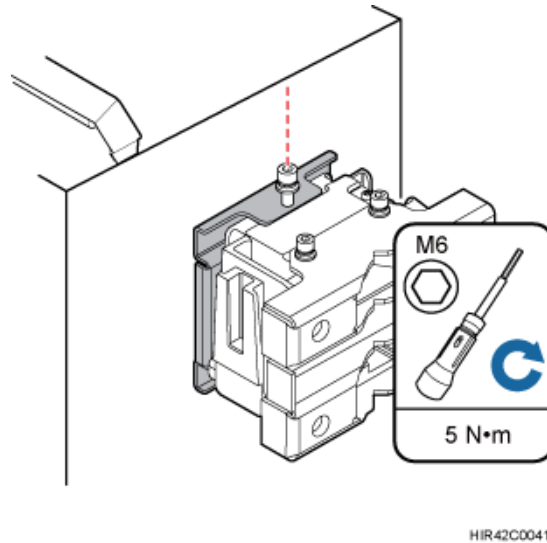
Step 7 Install the RU onto the main bracket, as shown in [Figure 8-40](#).

Figure 8-40 Installing the RU onto the main bracket



Step 8 Use an inner hexagon screwdriver to tighten the captive screw into the holes on the top of the attachment plate and main bracket to 5 N·m (44.25 lbf in.) so that the attachment plate and main bracket are firmly secured, as shown in [Figure 8-41](#).

Figure 8-41 Securing the captive screw into the connection hole



----End

8.6 Installing an RU on an IFS06

This section describes the procedure and precautions for installing an RU on an IFS06.

Prerequisites

The hoist clamp on the main bracket is secured properly.



NOTICE

- Do not stand the RU upright because the RF ports cannot support the weight of the RU.
 - Place a foam pad or cardboard under the RU to protect the RU housing from damage during the installation.
-

Context

- The upper and lower adjustable beams on an IFS06 can be moved up and down to fit for heights of RUs.
- RUs can be installed on an IFS06 only when the ambient temperature is higher than or equal to the lowest working temperature of the RU and at least 5 °C (41 °F) lower than the highest working temperature of the RU. In this scenario, the IFS06 supports at least three RUs. When the ambient temperature is higher than or equal to the lowest working temperature of the RU and at least 10 °C (50 °F) lower than the highest working temperature of the RU, the IFS06 supports a maximum of six RUs.



NOTE

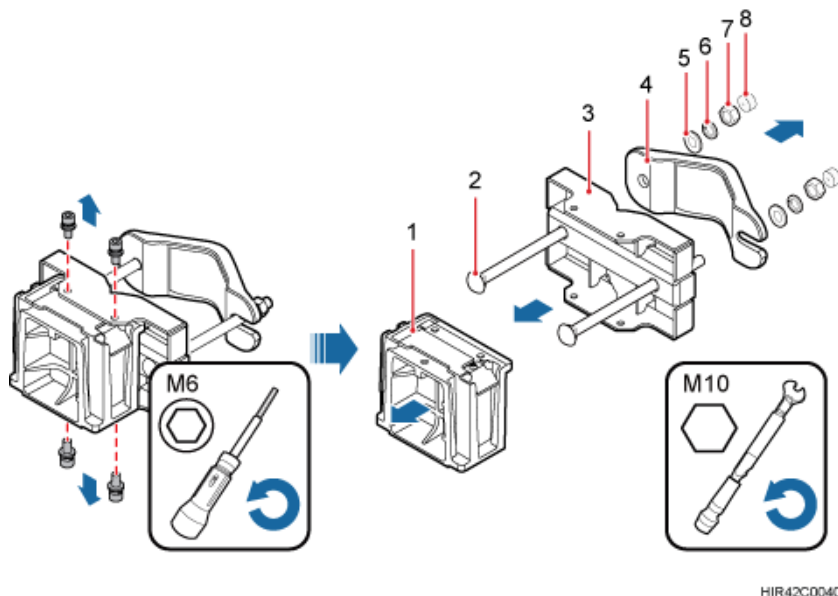
For details about the operating temperature of the RU, see section "Technical Specifications of RUs" in *3900 Series Base Station Technical Description*.

- Install RUs in the sequence from bottom to top and from left to right.
- This section describes how to install an RU in height-unrestricted scenarios. The procedure for installing an RU in height-restricted scenarios is the same as that in height-unrestricted scenarios.
- When installing the pole installation bracket, you need to use the M10x50 bolts delivered with the IFS06.
- Rubber washers are easily compressed or broken, whereas do not need to be replaced.

Procedure

Step 1 Disassemble the RU mounting brackets, as shown in [Figure 8-42](#).

Figure 8-42 Disassembling the mounting brackets



- | | | | |
|------------------|----------------------|-------------------------------|-----------------------|
| (1) Main bracket | (2) Square-neck bolt | (3) Pole installation bracket | (4) Auxiliary bracket |
| (5) Flat washer | (6) Spring washer | (7) Nut | (8) Plastic cap |

1. Use an M6 inner hexagon torque screwdriver to remove the four inner hexagon screws on the pole installation bracket, and remove the main bracket from the pole installation bracket.
2. Use an M10 torque wrench to loosen the nuts on the two square-neck bolts, and remove the plastic cap, nuts, spring washers, flat washers, square-neck bolts, and pole installation bracket from the auxiliary bracket.

Step 2 Use the M10x50 bolts delivered with the IFS06 to secure the pole installation bracket to the IFS06, and then use an M10 torque socket wrench to secure the bolts to 30 N·m (265.52 lbf in.).

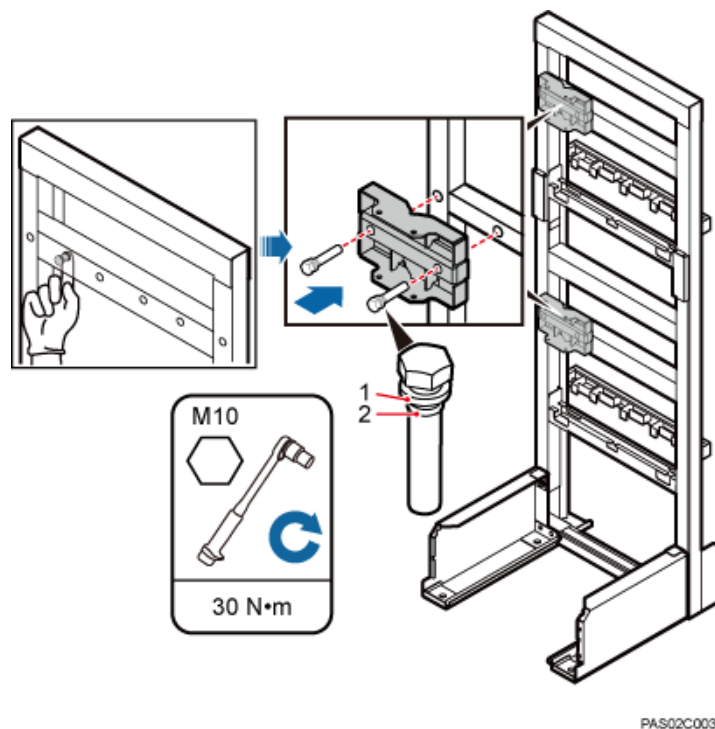
 **NOTICE**

Ensure that the arrows on the pole installation bracket are pointing up.

- Height-restricted scenarios

Use one finger to push and remove the rubber plugs on the beam and then install the pole installation bracket, as shown in [Figure 8-43](#).

Figure 8-43 Installing the pole installation bracket in height-restricted scenarios



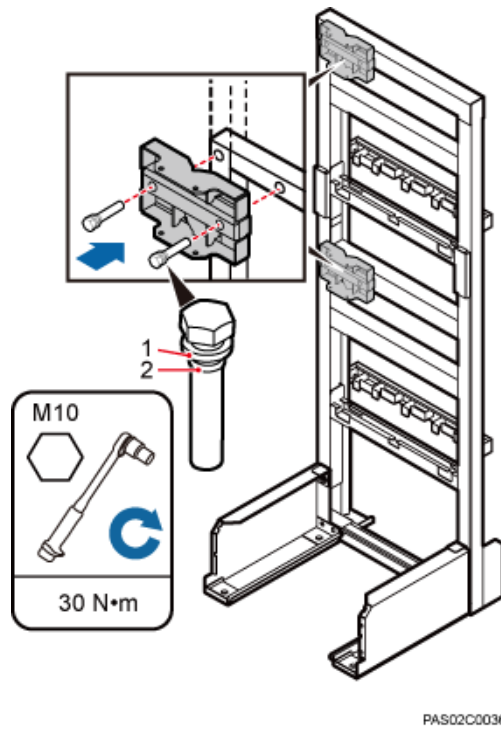
(1) Spring washer

(2) Rubber washer

- Height-unrestricted scenarios

Install the pole installation bracket, as shown in [Figure 8-44](#).

Figure 8-44 Installing the pole installation bracket in height-unrestricted scenarios

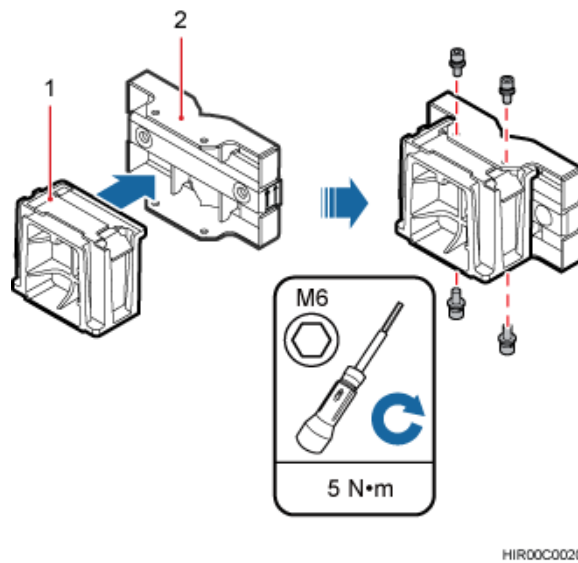


(1) Spring washer

(2) Rubber washer

Step 3 Attach the main bracket to the pole installation bracket, and use an inner hexagon screwdriver to tighten four M6x16 screws to 5 N m (44.25 lbf in.) so that the main bracket and pole installation bracket are firmly secured, as shown in [Figure 8-45](#).

Figure 8-45 Installing the main bracket

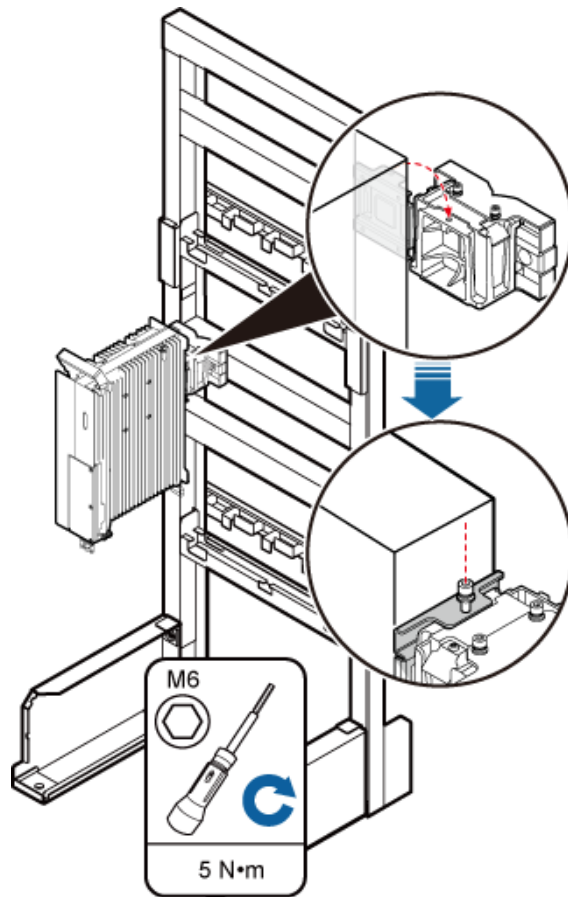


(1) Main bracket

(2) Pole installation bracket

- Step 4** Attach the RU to the main bracket, and then use an inner hexagon screwdriver to tighten the captive screw into the holes of the attachment plate and main bracket to 5 N·m (44.25 lbf in.) so that the attachment plate and main bracket are firmly secured, as shown in [Figure 8-46](#).

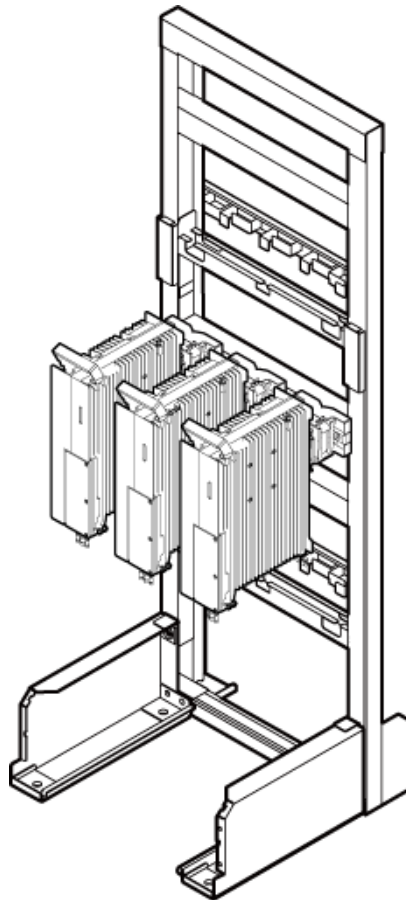
Figure 8-46 Installing the RU onto the main bracket



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- Step 5** Install the RUs on the lower level from left to right, as shown in [Figure 8-47](#).

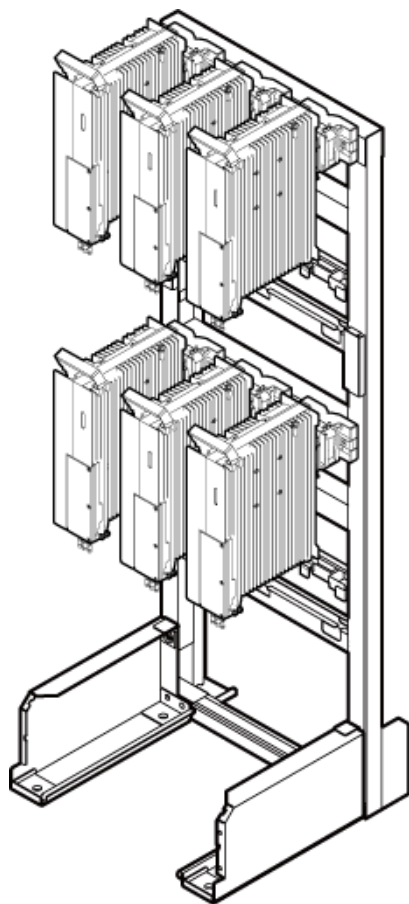
Figure 8-47 Installing RUs on the lower level



PAR46C0007

Step 6 Optional: When the ambient temperature is equal to or higher than the lowest operating temperature of the RU and at least 10 °C (10 °F) lower than the highest operating temperature of the RU, repeat the preceding steps to install the RUs on the higher level, as shown in [Figure 8-48](#).

Figure 8-48 Installing RUs on the higher level



PAR46C0006

----End

9 Installing RU Cables

About This Chapter

This chapter describes the procedure for installing RU cables.

9.1 Cabling Requirements

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

9.2 Cable Connections

This section describes the cable connections for a single RU and multiple RUs.

9.3 Installation Process

This section describes the process of installing RU cables.

9.4 RU Cable List

This section describes RU cable connections.

9.5 Installing an RU PGND Cable

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

9.6 Installing an RU RF Jumper

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

9.7 Installing an RU AISG Multi-Wire Cable and AISG Extension Cable

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

9.8 Installing an RU Alarm Cable

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

9.9 Opening the Cover Plate of an RU Cabling Cavity

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

9.10 Installing an RU Power Cable

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

9.11 Installing a CPRI Fiber Optic Cable

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

9.12 Closing the Cover Plate of an RU Cabling Cavity

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

9.1 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

Requirements for Bending Radius

- 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 three times the diameter of the cable.
- The bending radius of a fiber optic cable is at least 20 times the diameter of the fiber optic cable, and the minimum bending radius of the breakout cable at each end of the fiber optic cable is 30 mm (1.18 in.).
- The bending radius of the E1/T1 cable must be at least three times the diameter of the cable.
- The bending radius of the signal cable must be at least five times the diameter of the cable.

Requirements for Cable Binding

- The same types of cable must be bound together.
- Different types of cable must be separately routed with the minimum spacing of 30 mm (1.18 in.) and cannot be entangled.
- The cables must be bound tightly and neatly. The sheaths of the cables must not be damaged.
- Cable ties are installed in the same direction, and those at the same horizontal line must be in a straight line.
- The excess of indoor cable ties is trimmed off, and the excess of outdoor cable ties allows about 5 mm (0.2 in.), without remaining rough edges.
- Labels or nameplates must be attached to both ends, joints, or turns of cables after they are installed.

Security Requirements

- Cables should be placed away from sharp objects or wall burrs. If these positions are inevitable, protect the cables with protection pipes.

- Cables must be routed away from heat sources, or heat-insulation materials are added between cables and heat sources.
- Sufficient slack (recommended for about 0.1 m [0.33 ft]) is provided in cables at turns or the position close to a device, facilitating cable and device maintenance.

Indoor Cabling Requirements

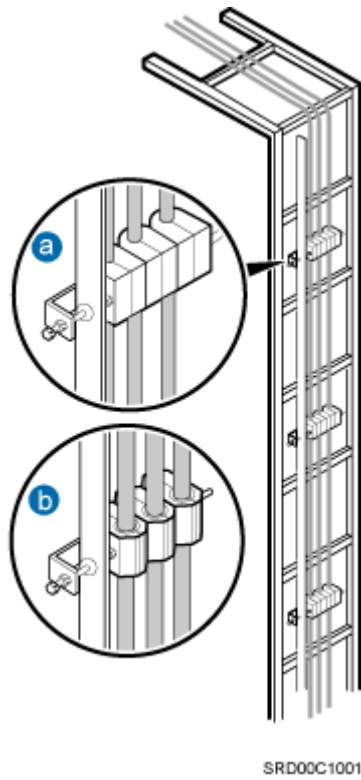
- Cables are routed indoors through the feeder window.
- Drip loops must be made outside the feeder window, and the requirements for the minimum bending radius are met.
- When cables are routed indoors, engineers are required indoors for cooperation.
- The feeder window must be waterproofed.

Outdoor Cabling Requirements

- Cables routed outdoors must be led through a pipe when they may be damaged.
- AC power cables, transmission cables, and cables buried in the ground must be protected.
- If cables at the cabinet bottom need to be routed through a pipe along the ground, lead the pipe into the cabinet base for about 30 mm (1.18 in.) to 50 mm (1.97 in.), not into the cabinet. Block the pipe with waterproof tape or silicon gel, and secure the pipe to the cable hole at the cabinet bottom with metal piece.
- If cables at the cabinet bottom need to be routed through a pipe along the metal cable trough, do not lead the pipe into the cabinet base. The cable trough must be sealed and routed through the cable hole at the cabinet bottom.
- When routing RU cables, ensure that the highest positions of the routes of all RU cables (except RF cables and AISG cables) must be lower than the bottom of the RU.
- Cables are secured with cable clips.
- Cables are routed neatly along the specified cabling direction and secured with cable clips.
- The positions for cable clips are determined onsite. For example, the cable clips for the 7/8" feeder are installed at the spacing of 1.5 m (4.92 ft) to 2 m (6.56 ft) in the same direction, and the cable clips for the power cables are installed at the spacing of 1.5 m (4.92 ft) to 2 m (6.56 ft) in the same direction.
- Cable clips must be vertical with cables, and the cables in a cable clip must be parallel.
- After routing cables neatly and correctly, tighten the screws on cable clips.

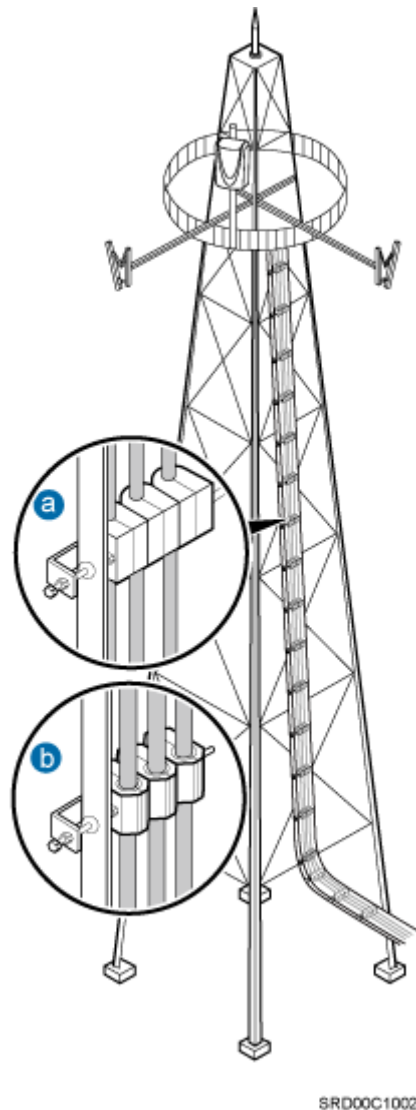
Secure cables on the cable tray, as shown in [Figure 9-1](#).

Figure 9-1 Securing cables on the cable tray



Secure cables on the tower, as shown in [Figure 9-2](#).

Figure 9-2 Securing cables on the tower



Special Cabling Requirements

Cabling Requirements for Power Cables

- Power cables must be installed in the position specified in engineering design documents.
- If the length of power cables is insufficient, replace the cables rather than adding connectors or soldering joints to lengthen the cables.
- Cables must be routed by only qualified and trained personnel before all preparations are made.
- Cables are routed in an untangled and orderly fashion.
- If DC power cables need to be routed on the tower platform, lay out the cables on the guardrail with the shortest distance and route the cables along the guardrail.

- If DC power cables need to be routed close to a device on the tower, secure the cables to the guardrail or pole with cable clips. The device cannot be far away from the position for securing the cables.

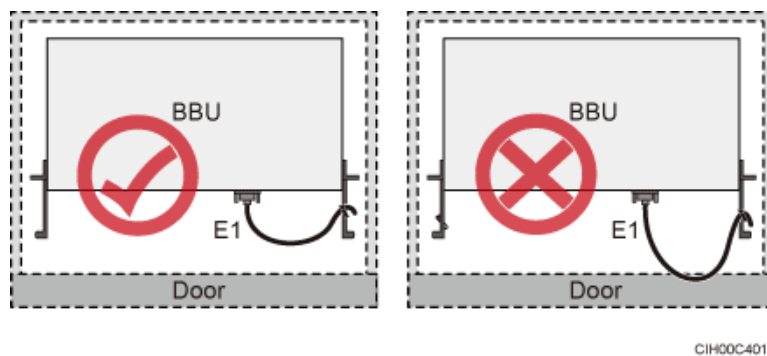
Cabling Requirements for PGND Cables

- 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

- 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.
- E1 cables cannot be squeezed by the cabinet door when routed through the cabinet, as shown in [Figure 9-3](#).

Figure 9-3 E1 cables routed through the cabinet

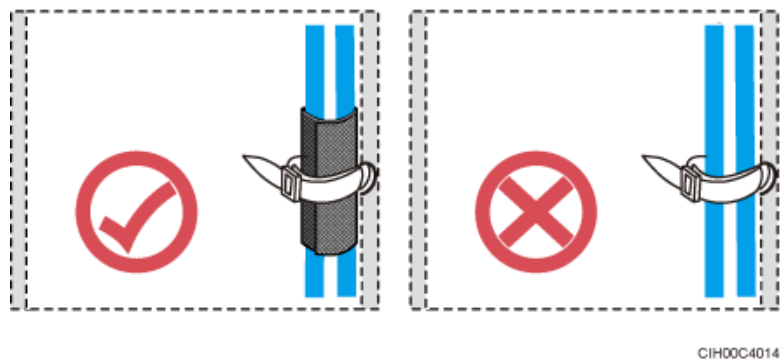


Cabling Requirements for Fiber Optic Cables

- Fiber optic cables must be routed by at least three qualified and trained personnel before all preparations are made.
- Fiber optic cables are used within the temperature range of -40 °C to 60 °C. If the current temperature is out of the range, make protection measures or route the cables again.
- Cables are routed in an untangled and orderly fashion.
- Do not bind fiber optic cables at turns.

- 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 excess of the cables must be coiled around special devices, such as a fiber coiler.
- An unarmored fiber optic cable must be bound using binding straps. If a fiber optic patch cord needs to be secured in a cabinet or a piece of equipment, use binding straps to bind it and then use cable ties to secure the binding straps to the cabinet or equipment. Ensure that the fiber optic cables can flexibly move in the cable ties. Do not bend the fiber optic cables sharply. The following figure shows how to bind the fiber optic cables correctly.

Figure 9-4 Binding fiber optic cables



- When coiling fiber optic cables, apply even strength. Do not bend the cables with force.
- Vacant optical connectors must be covered with dustproof caps.
- Fiber optic cables cannot be squeezed by the cabinet door when routed through the cabinet, as shown in [Figure 9-5](#), [Figure 9-6](#) and [Figure 9-7](#).

Figure 9-5 CPRI fiber optic cables routed through the cabinet (1)

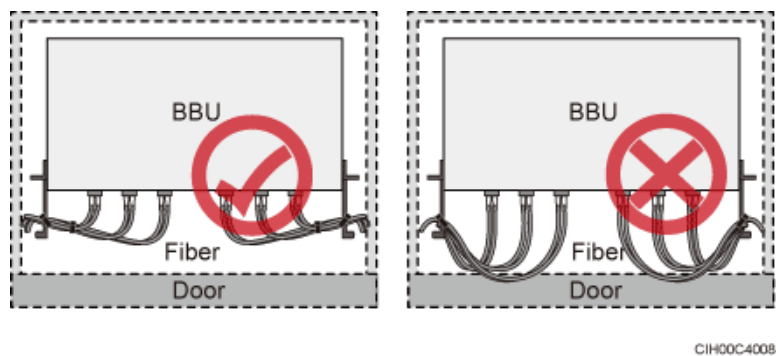


Figure 9-6 CPRI fiber optic cables routed through the cabinet (2)

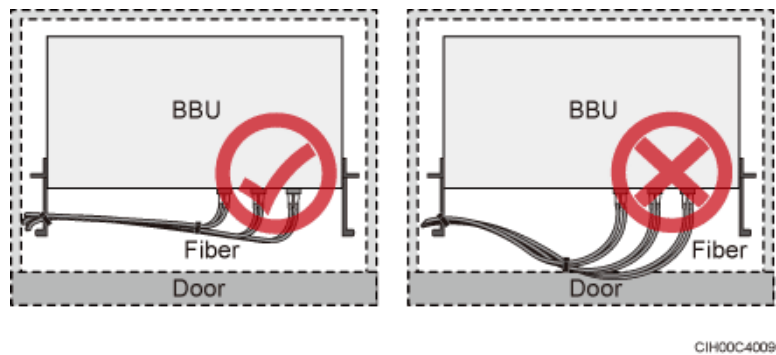
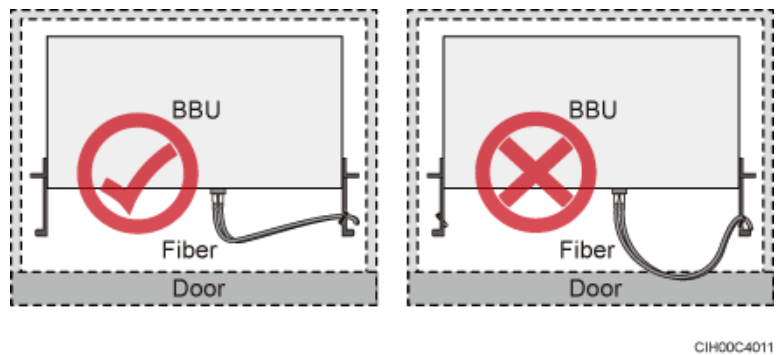


Figure 9-7 FE/GE cables routed through the cabinet



- If fiber optic cables need to be routed on the tower platform, lay out the cables on the guardrail with the shortest distance and route the cables along the guardrail.
- If fiber optic cables need to be routed close to a device on the tower, secure the cables to the guardrail or pole with cable clips. The device cannot be far away from the position for securing the cables.
- If the fiber optic cables close to a device are too long, coil the excess of the cables and secure them on the tower.

9.2 Cable Connections

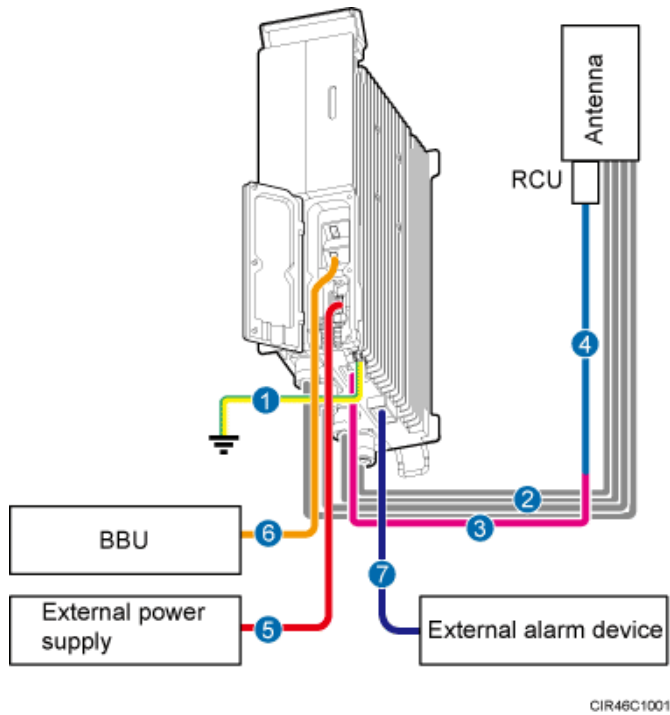
This section describes the cable connections for a single RU and multiple RUs.

 **NOTE**

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

Figure 9-8 shows the cable connections for a single RU.

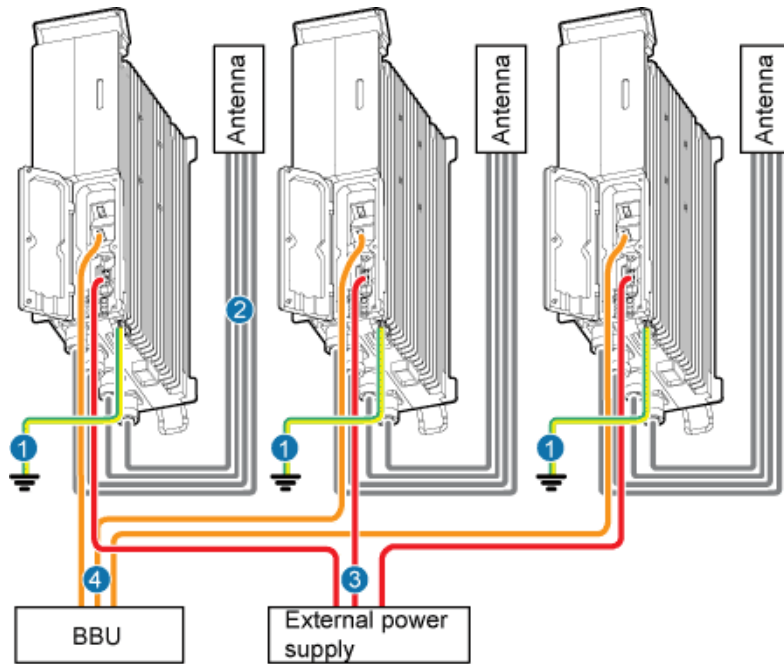
Figure 9-8 Cable connections for a single RU



- | | | |
|-----------------------------|--------------------|------------------------------|
| (1) PGND cable | (2) RU RF jumper | (3) RU AISG multi-wire cable |
| (4) RU AISG extension cable | (5) RU power cable | (6) CPRI fiber optic cable |
| (7) RU alarm cable | - | - |

Figure 9-9 shows the cable connections for multiple RUs.

Figure 9-9 Cable connections for multiple RUs



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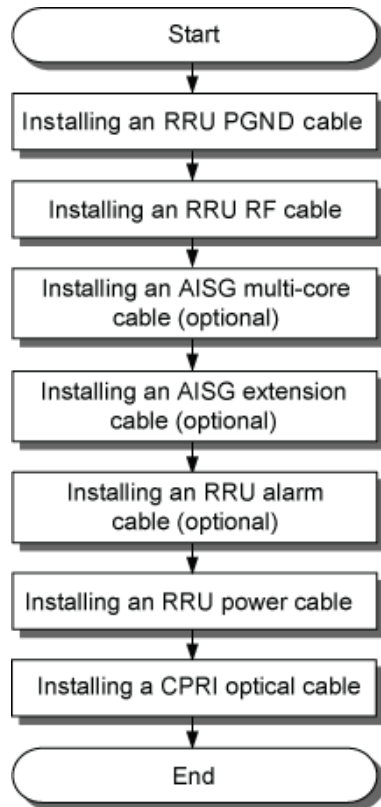
- | | | |
|----------------------------|------------------|--------------------|
| (1) PGND cable | (2) RU RF jumper | (3) RU power cable |
| (4) CPRI fiber optic cable | - | - |

9.3 Installation Process

This section describes the process of installing RU cables.

Figure 9-10 shows the process of installing RU cables.

Figure 9-10 Process of installing RU cables



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9.4 RU Cable List

This section describes RU cable connections.

[Table 9-1](#) lists RU cables.

Table 9-1 RU cables

Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
RU PGND Cable	OT terminal (M6, 16 mm ² or 0.025 in. ²)	Ground terminal on the RU	OT terminal (M8, 16 mm ² or 0.025 in. ²)	Ground terminal on the ground bar
RU Power Cable	Tool-less female connector (pressfit type)	NEG(-) and RTN(+) ports on the RU	Depending on the power supply equipment	External power equipment
RU Alarm Cable	DB15 waterproof male	EXT_ALM port on the RU	Cord end terminal	External alarm device

Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
	connector			
CPRI Fiber Optic Cable(RU3832)	DLC connector	CPRI0 port on the RU	DLC connector	CPRI port on a board in the BBU or CPRI1 port on the upper-level RU
		CPRI1 port on the RU		CPRI0 port on the lower-level RU
CPRI Fiber Optic Cable(RU3632)	DLC connector	CPRI0 port on the RU	DLC connector	CPRI port on a board in the BBU
RU RF Jumper	DIN male connector	ANT_TX/RX A, ANT_TX/RX B, ANT_RXC, or ANT_RXD port on the RU	DIN male connector	Antenna system
RU AISG Multi-Wire Cable	DB9 waterproof male connector	RET port on the RU	Standard AISG female connector	Standard AISG male connector on the RCU or on the AISG extension cable
RU 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

9.5 Installing an RU PGND Cable

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

Context

The cross-sectional area of an RU PGND cable is 16 mm² (0.025 in.²). The cable has an M6 OT terminal at one end and an M8 terminal at the other end.

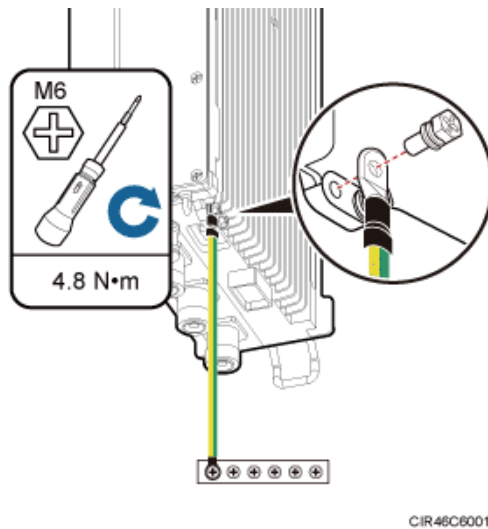
Procedure

Step 1 According to the actual cable route, cut the PGND cable into a proper length to prepare an RU PGND cable. Then add an OT terminal at each end of the cable according to the instructions in Assembling the OT Terminal and the Power Cable.

Step 2 Install the RU PGND cable.

Connect the M6 OT terminal at one end of the PGND cable to the ground terminal at the RU bottom and the M8 OT terminal at the other end to the external ground bar, as shown in [Figure 9-11](#).

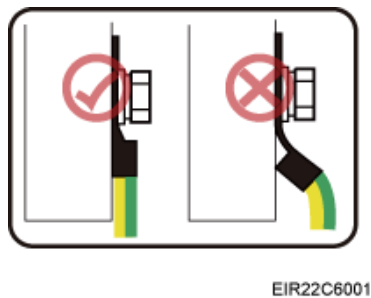
Figure 9-11 Installing an RU PGND cable



 **NOTE**

Crimp OT terminals in correct positions, as shown in [Figure 9-12](#).

Figure 9-12 Correct position of an OT terminal



Step 3 Label the installed cables according to the instructions in Attaching a Cable-Tying Label.

----End

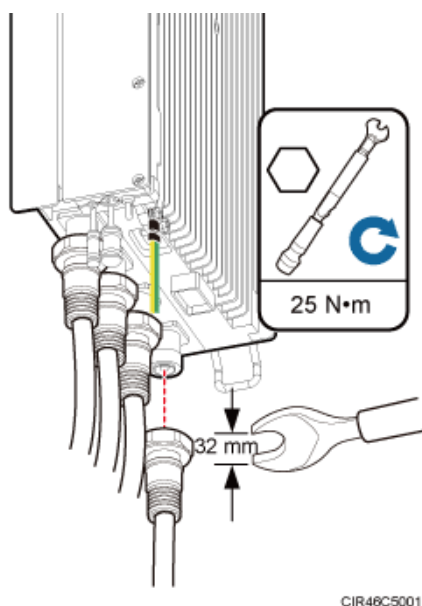
9.6 Installing an RU RF Jumper

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

Procedure

- Step 1** Connect the DIN male connector at one end of the RU RF jumper to the ANT port on the RU, and use a torque wrench to tighten the connector to 25 N·m (221.27 lbf in.), as shown in [Figure 9-13](#).

Figure 9-13 Installing an RU RF jumper

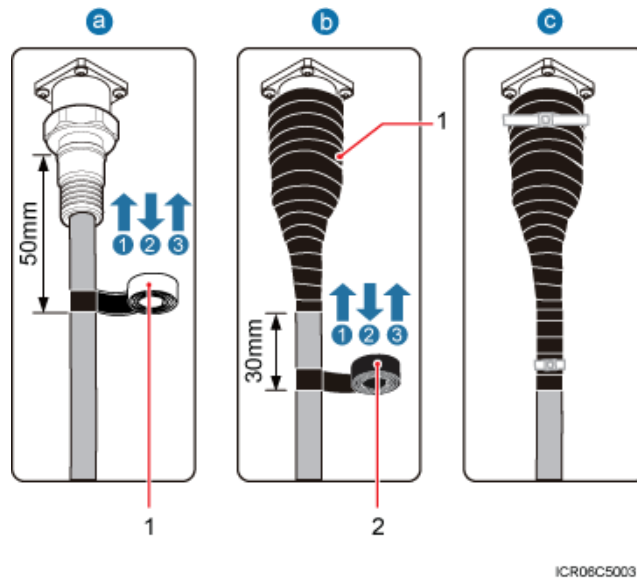


NOTICE

On AC-powered electric railways, such as high speed railways, when leaky cables are connected to RUs installed in tunnels, high-voltage-resistance DC blocks must be installed between RU RF jumpers and the leaky cables to protect the RUs 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 9-14](#).

Figure 9-14 Waterproofing a connector of the RF jumper



(1) Waterproof tape	(2) PVC insulation tape
---------------------	-------------------------

NOTE

- Before wrapping waterproof tape, stretch the tape evenly until the length of the tape becomes twice its original length.
- Do not stretch the PVC insulation tape when wrapping the PVC insulation tape.
- 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. Ensure that neighboring layers are stuck to each other.
- Ensure that the adhesive surface of the tape overlaps the lower layer.
- When cutting off the cable ties, reserve a redundant length of 3 mm (0.12 in.) to 5 mm (0.2 in.).

1. Wrap three layers of waterproof tape on the connector, first from bottom up, then from top down, and finally from bottom up. Start wrapping the connector at a position 50 mm (1.97 in.) away below the bottom of the connector to the top of the connector, first from bottom up, then from top down, and finally from bottom up. Cut off the redundant tape after three layers are wrapped. Wrap each layer of tape around the connector tightly.
2. Wrap three layers of PVC insulation tape. Start the wrapping at a position 30 mm (1.18 in.) away below the bottom of the waterproof tape to the top of the connector, first from bottom up, then from top down, and finally from bottom up. Cut off the redundant tape after three layers are wrapped. Wrap each layer of tape around the connector tightly.
3. Start binding cable ties to the cable at a position 3 mm (0.12 in.) to 5 mm (0.2 in.) away from one end of the PVC insulation tape.

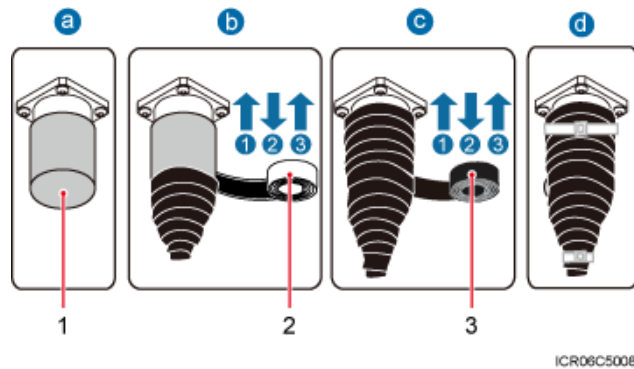
Step 4 Check the dustproof caps on antenna connectors. In outdoor scenarios, dustproof caps must be waterproofed, as shown in [Figure 9-15](#).



NOTICE

Do not remove dustproof caps from vacant antenna connectors.

Figure 9-15 Waterproofing a dustproof cap



(1) Dustproof cap

(2) Waterproof tape

(3) PVC insulation tape

NOTE

- Before wrapping waterproof tape, stretch the tape evenly until the length of the tape becomes twice its original length.
- Do not stretch the PVC insulation tape when wrapping the PVC insulation tape.
- 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. Ensure that neighboring layers are stuck to each other.
- Ensure that the adhesive surface of the tape overlaps the lower layer.
- When cutting off the cable ties, reserve a redundant length of 3 mm (0.12 in.) to 5 mm (0.2 in.).

1. Verify that dustproof caps are not removed.
2. Wrap three layers of waterproof tape on the connector, first from bottom up, then from top down, and finally from bottom up. 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. Cut off the redundant tape after three layers are wrapped. Wrap each layer of tape around the connector tightly.
3. Wrap three layers of PVC insulation tape. 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. Cut off the redundant tape after three layers are wrapped. Wrap each layer of tape around the connector tightly.
4. Start binding cable ties to the cable at a position 3 mm (0.12 in.) to 5 mm (0.2 in.) away from one end of the PVC insulation tape.

Step 5 Route the cables according to the instructions in [9.1 Cabling Requirements](#), and then use cable ties to bind the cables.

Step 6 Label the installed cables according to the instructions in [Attaching a Sign Plate Label](#).

Step 7 Attach color-coding to the installed RF jumper according to the instructions in [Attaching the Color Ring](#).

----End

9.7 Installing an RU AISG Multi-Wire Cable and AISG Extension Cable

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

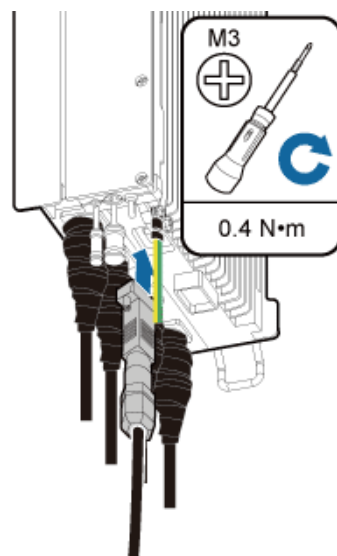
Context

When the distance between an RU 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 RU 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. Use an M3 flat-head screwdriver to loosen the screws on the dustproof cap on the RET port and remove the dustproof cap.
 2. Link the waterproofed DB9 connector at one end the AISG multi-wire cable to the RET port on the RU bottom, as shown in [Figure 9-16](#).

Figure 9-16 Installing an RU AISG multi-wire cable

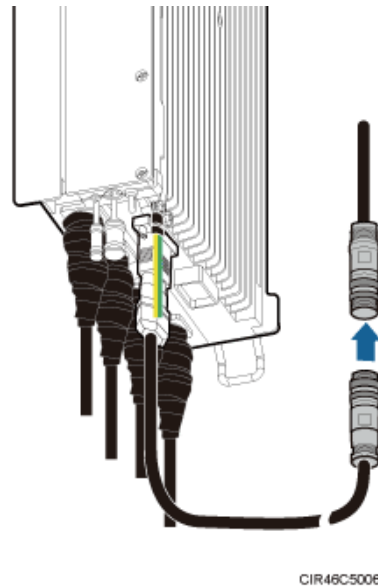


CIR46C5003

3. Use an M3 Phillips screwdriver to tighten the posts on both sides of the waterproof DB9 connector to 0.4 N m (3.54 lbf in.).
 4. Connect the other end of the cable to the standard AISG male connector on the RCU.
 5. Route the cables according to the instructions in [9.1 Cabling Requirements](#), and then use cable ties to bind the cables.
 6. Label the installed cables according to the instructions in [Attaching an L-Shaped Label](#).
- Install an AISG multi-wire cable that is configured with an AISG extension cable.
 1. Use an M3 flat-head screwdriver to loosen the screws on the dustproof cap on the RET port and remove the dustproof cap.

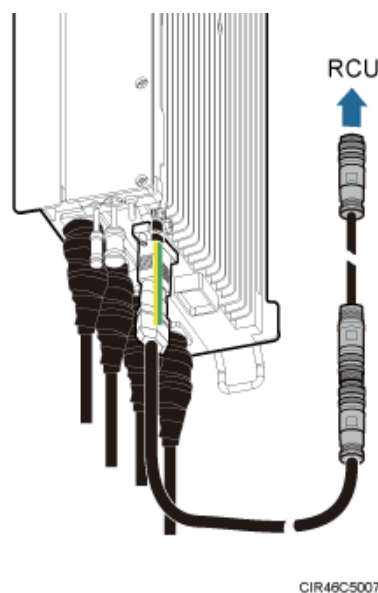
2. Link the waterproofed DB9 connector at one end of the AISG multi-wire cable to the RET port on the RU bottom, and link the other end to the standard AISG male connector of the AISG extension cable, as shown in [Figure 9-17](#).

Figure 9-17 Installing an RU AISG multi-wire cable



3. Use an M3 Phillips screwdriver to tighten the posts on both sides of the waterproof DB9 connector to 0.4 N·m (3.54 lbf·in.).
4. Connect the other end of the AISG extension cable to the standard AISG male connector on the RCU, as shown in [Figure 9-18](#).

Figure 9-18 Installing an RU AISG extension cable



5. Route the cables according to the instructions in [9.1 Cabling Requirements](#), and then use cable ties to bind the cables.
6. Label the installed cables according to the instructions in [Attaching an L-Shaped Label](#).

----End

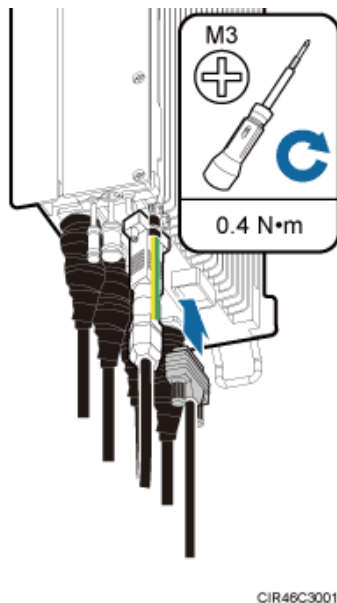
9.8 Installing an RU Alarm Cable

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

Procedure

- Step 1** Use an M3 Phillips screwdriver to loosen the screws on the dustproof cap on the EXT_ALM port and remove the dustproof cap.
- Step 2** Connect the waterproof DB15 connector at one end of the RU alarm cable to the EXT_ALM port on the RU, as shown in [Figure 9-19](#).

Figure 9-19 Installing an RU alarm cable



NOTE

Install the waterproof DB15 male connector on the RU alarm cable with caution, preventing the pin assignment from being damaged.

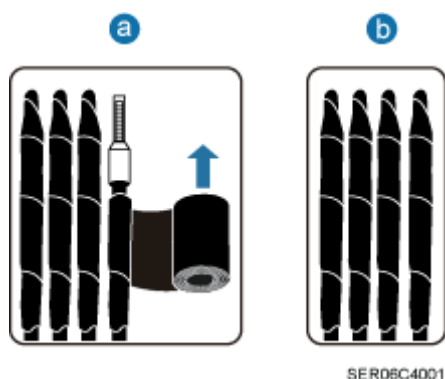
- Step 3** Use an M3 Phillips screwdriver to tighten the posts on both sides of the waterproof DB15 male connector to 0.4 N·m (3.54 lbf in.).
- Step 4** Connect the eight cord end terminals at the other end to external alarm devices.



NOTE

Use insulating adhesive tapes to wrap cord end terminals that are not in use and fix them at a proper position based on the onsite situations. This prevents false alarm reporting and equipment damage due to contact of exposed cables. [Figure 9-20](#) shows the method for handling cord end terminals not in use.

Figure 9-20 Method for handling cord end terminals that are not in use



Step 5 Route the cables according to the instructions in [9.1 Cabling Requirements](#), and then use cable ties to bind the cables.

Step 6 Label the installed cables according to the instructions in [Attaching an L-Shaped Label](#).

----End

9.9 Opening the Cover Plate of an RU Cabling Cavity

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

Procedure

Step 1 Wear ESD gloves.

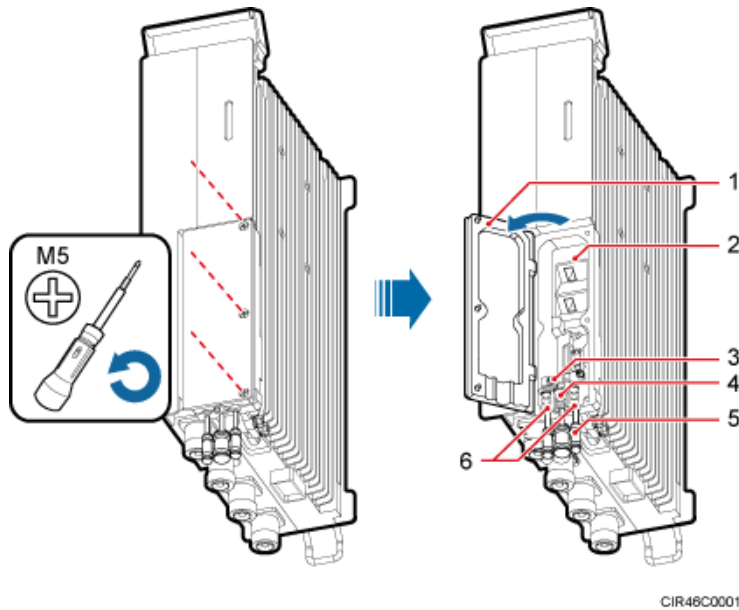


NOTICE

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

Step 2 Use an M5 Phillips screwdriver to loosen the three screws on the cover plate of the RU cabling cavity, and open the cover plate, as shown in [Figure 9-21](#).

Figure 9-21 Opening the cover plate of the RU cabling cavity



CIR46C0001

(1) Cover plate

(2) Cabling cavity

(3) Clip

(4) Cable trough for the power cable

(5) Waterproof block

(6) Cable trough for the fiber optic cable

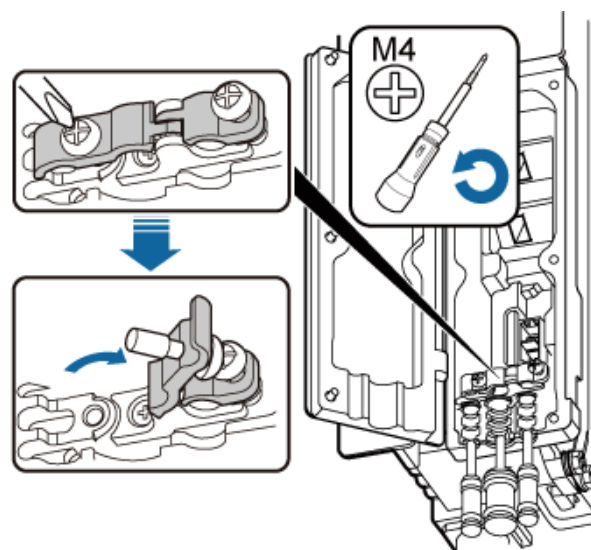
Step 3 Loosen the screws on the clip using an M4 Phillips screwdriver, and open the clip, as shown [Figure 9-22](#).



NOTE

Open the clip only for the associated cable.

Figure 9-22 Opening clips



CIR42C0003

Step 4 Remove the waterproof block.



NOTE

Remove only the waterproof blocks for the cables to be installed.

----End

9.10 Installing an RU Power Cable

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

Prerequisites

- A tool-less female connector (pressfit type) is added to the RU power cable on the RU side. For details, see [12.1 Adding a Tool-Less Female Connector \(Pressfit Type\) to the RU Power Cable on the RU Side](#).
- A connector or OT terminals are added to the RU power cable on the power device side. For details, see the *DBS3900 Installation Guide*.

Context

If a power device provided by the customer is used, the recommended specification of the circuit breaker on this power device is 15 A to 30 A.

There are four types of RU power cables in terms of cross-sectional areas: 3.3 mm² (0.005 in.²) (12 AWG) and 5.3 mm² (0.008 in.²) (10 AWG) complying with North American standards, and 4 mm² (0.006 in.²) and 6 mm² (0.009 in.²) complying with European standards.

[Table 9-2](#) describes the RU power cable.

Table 9-2 RU power cable

Cable	On the RU Side	On the Power Device Side	Power Device	Color
RU power cable	Tool-less female connector (pressfit type)	Tool-less female connector (pressfit type)	EPU	A cable with a black jacket and two wires inside <ul style="list-style-type: none"> • North American standards: The RTN(+) wire is black and the RNEG(-) wire is blue. • European standards: The RTN(+) wire is brown and the RNEG(-) wire is blue.
		EPC5 connector	DCD U-12 B	



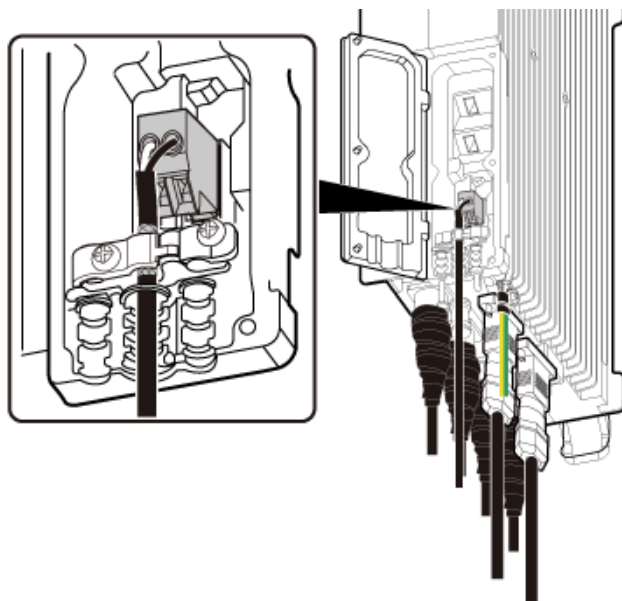
CAUTION

Ensure that the RU power cable must be connected to the RU first and then to the power device. The operations in the reverse sequence may cause component damage or personal injury.

Procedure

- Step 1** Connect the tool-less female connector (pressfit type) at one end of the RU power cable to the power supply socket on the RU, as shown in [Figure 9-23](#).

Figure 9-23 Installing an RU power cable



CIR46C2001



NOTICE

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

- Step 2** Connect the connector at the other end of the RU power cable to the corresponding position on the power device.



NOTE

- A DCDCU-11B/DCDCU-12B can supply power to a maximum of six RUs. Ensure that the RU power cable is connected to one of LOAD0 to LOAD5 ports on the DCDCU-11B/DCDCU-12B.
- One EPU can supply power to a maximum of six RUs. Ensure that the RU power cable is connected to one of RU0 to RU5 ports on the EPU.
- When the RU power cable is connected to the EPU, the blue core wire in the tool-less female connector (pressfit type) is connected to the upper port on the EPU, and the black/brown core wire is connected to the lower port on the EPU.

- Step 3** Route the cable according to the instructions in [9.1 Cabling Requirements](#), and then use a cable tie to bind the cable.
- Step 4** Label the installed cable according to the instructions in [Attaching a Cable-Tying Label](#).
- End

9.11 Installing a CPRI Fiber Optic Cable

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

Prerequisites

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.



NOTICE

The optical modules to be installed must match CPRI rates.

Context

- For RU3632, A CPRI fiber optic cable transmits CPRI signals between a BBU and an RU.
- For RU3832, the CPRI fiber optic cable transmits CPRI signals between a BBU and an RU or between RUs. When the fiber optic cable is used for connecting RUs, the end labeled 1A and 1B is connected to the CPRI0 port on the cabling cavity of the lower-level RU, and the end labeled 2A and 2B is connected to the CPRI1 port on the cabling cavity of the upper-level RU.
- For details about CPRI fiber optic cable connections, see section "CPRI Cable Connections" in the *BBU3900 Hardware Description* or *DBS3900 Hardware Description*.
- Following is the procedure for installing a CPRI fiber optic cable between a BBU and an RU.

Procedure

- Step 1** Lower the pullers of two optical modules, insert one optical module into the CPRI0 port on the RU and the other optical module into the CPRI port on the BBU, and raise the pullers, as shown in [Figure 9-24](#).

Figure 9-24 Installing an optical module



ICR06C4002

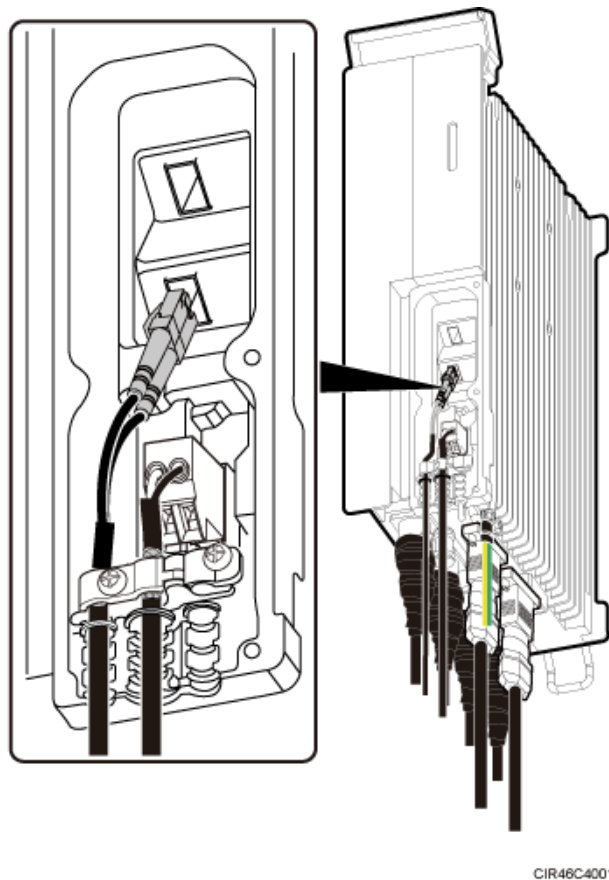


NOTICE

The performance of an optical module that is exposed to the air for more than 20 minutes may be abnormal. Therefore, you must insert a 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 RU side, as shown in [Figure 9-25](#).

Figure 9-25 Installing a CPRI fiber optic cable



NOTICE

- To avoid any damage to fiber optic cables, the cables connected to the RU must be installed according to the installation process. For details about the installation process, see [9.3 Installation Process](#).

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

Step 4 Route the cables according to the instructions in [9.1 Cabling Requirements](#), and then use cable ties to bind the cables.

Step 5 Label the installed cables according to the instructions in [Attaching an L-Shaped Label](#).

----End

9.12 Closing the Cover Plate of an RU Cabling Cavity

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

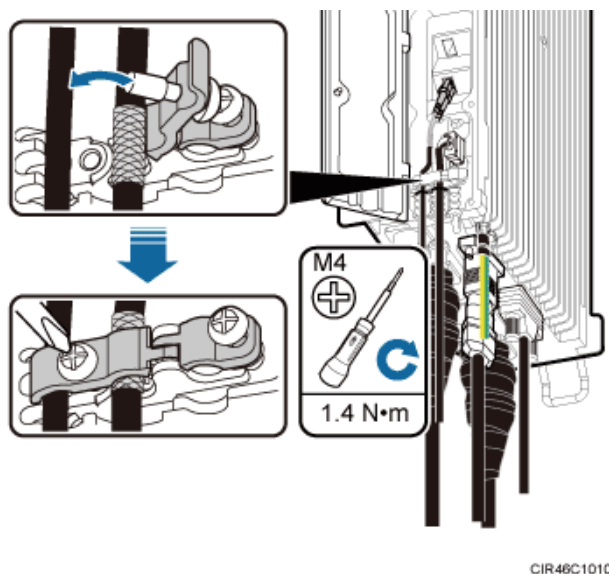
Procedure

- Step 1** Close the clips for the installed cables. Use an M4 torque screwdriver to tighten the screws on each clip to 1.4 N·m (12.39 lbf in.), as shown in [Figure 9-26](#).

 **NOTICE**

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

Figure 9-26 Closing clips

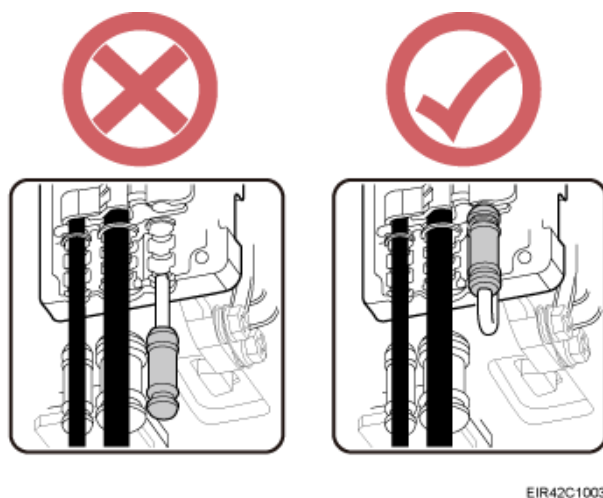


- Step 2** Insert waterproof blocks into vacant cable troughs in the cabling cavity, as shown in [Figure 9-27](#).

 **NOTICE**

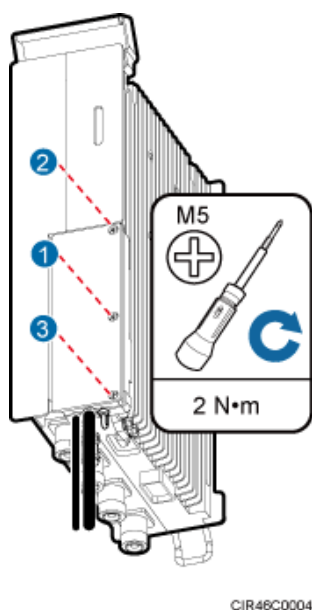
Ensure that cables and waterproof blocks are properly inserted into troughs.

Figure 9-27 Correct placement of waterproof blocks



Step 3 Close the cover plate of the RU cabling cavity. Use an M5 torque screwdriver to partially tighten the screws on the cover plate in the sequence shown in [Figure 9-28](#). Then tighten the screws to 2 N·m (17.7 lbf in.) in the same sequence.

Figure 9-28 Closing the cover plate of an RU cabling cavity



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

----End

10 Checking the RU Hardware Installation

After an RU is installed, check the hardware installation.

Table 10-1 provides the checklist for the RU hardware installation.

Table 10-1 Checklist for the RU 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 RU is securely installed.
3	The cover plate is securely installed on the RU cabling cavity.
4	Waterproof blocks are securely installed in vacant cable troughs of the RU 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 tightened.
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 RU 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.

11 Powering On an RU

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



NOTICE

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

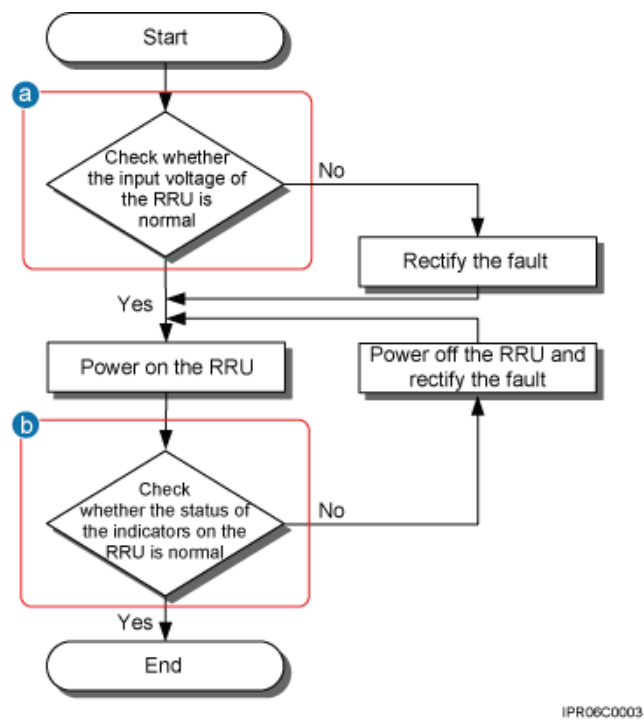
[Figure 11-1](#) shows the RU power-on check process.



NOTE

For details about how to power on an RU, see *Powering On an RU*. For details about how to power off an RU, see section "Powering-Off the RU" in *RU Maintenance Guide*.

Figure 11-1 RU power-on check process



(a) The normal input voltage of an RU is -48 V DC. The voltage of the external power supply should range from -36 V DC to -57 V DC.

(b) The RUN indicator on the RU is on for 1s and off for 1s. The ALM indicator is steady off.

12 Appendix

About This Chapter

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

[12.1 Adding a Tool-Less Female Connector \(Pressfit Type\) to the RU Power Cable on the RU Side](#)

This section describes the procedure for adding a tool-less female connector (pressfit type) to the RU power cable on the RU side.

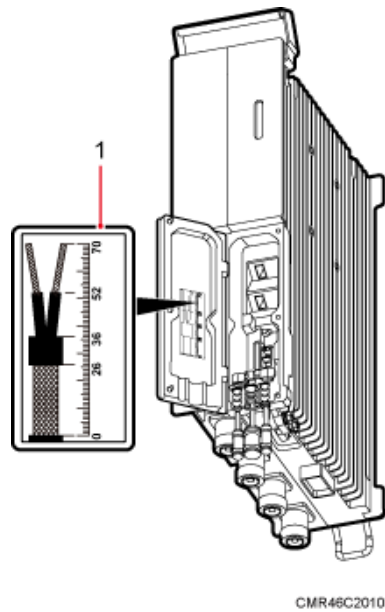
12.1 Adding a Tool-Less Female Connector (Pressfit Type) to the RU Power Cable on the RU Side

This section describes the procedure for adding a tool-less female connector (pressfit type) to the RU power cable on the RU side.

Context

[Figure 12-1](#) shows the cable diagram on labels.

Figure 12-1 Cable diagram on labels

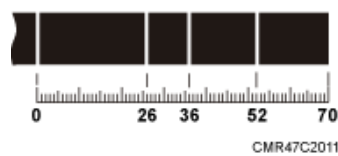


(1) Cable diagram on labels

Procedure

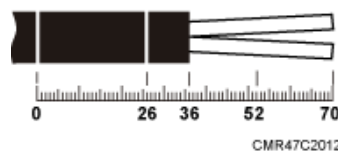
- Step 1** Determine the length of the power cable for different operations based on the labels, as shown in [Figure 12-2](#).

Figure 12-2 Determining the length of the power cable



- Step 2** Strip the specified length of the sheath off the power cable, as shown in [Figure 12-3](#).

Figure 12-3 Stripping the specified length of sheath



- Step 3** Strip a specified length of sheath off each core wire. The length must be consistent with the length of the notch in the tool-less female connector (pressfit type), as shown in [Figure 12-4](#).

Figure 12-4 Stripping the sheath off each core wire

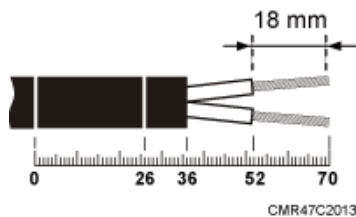
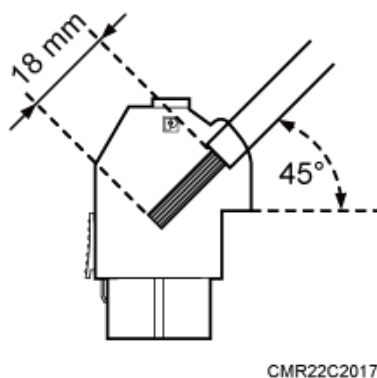


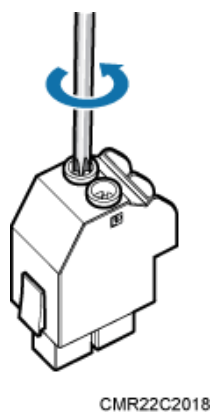
Figure 12-5 Matched length



Step 4 Add a tool-less female connector (pressfit type) to two core wires.

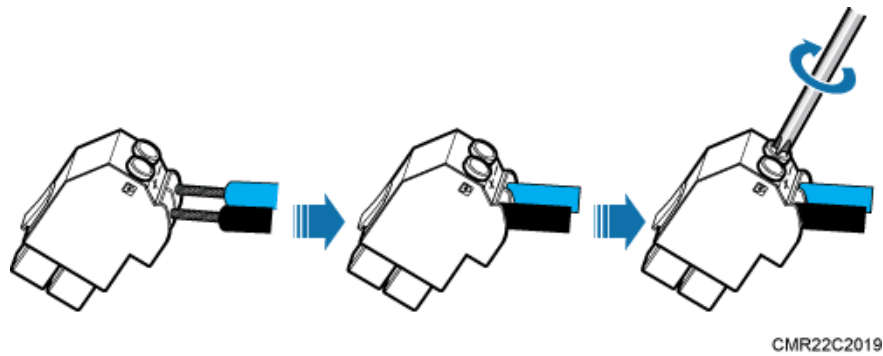
1. Tighten the screws using a Phillips screwdriver, as shown in [Figure 12-6](#).

Figure 12-6 Tightening screws



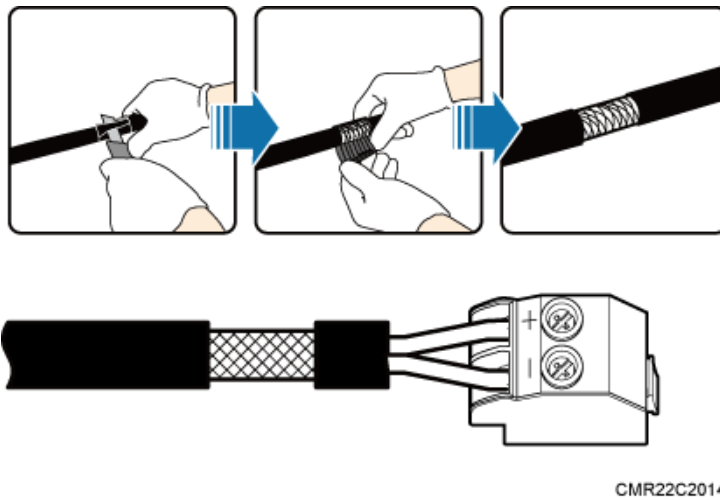
2. Connect the blue core wire labeled NEG(-) to the - port and the black/brown core wire labeled RTN(+) to the + port on the tool-less female connector (pressfit type), and then tighten the screws using a Phillips screwdriver, and then use a torque screwdriver to tighten the M4 screws to 1.4 N m (12.39 lbf in.), as shown in [Figure 12-7](#).

Figure 12-7 Adding a tool-less female connector (pressfit type) to two core wires



Step 5 Strip the specified length of the sheath off the power cable to expose the intact shield layer, as shown in [Figure 12-8](#).

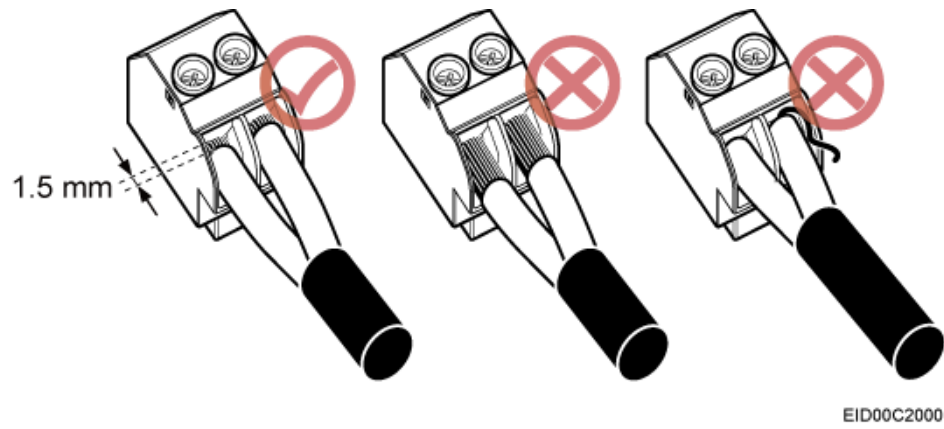
Figure 12-8 Stripping the sheath off the power cable



NOTICE

Each core wire is exposed outside the tool-less female connector (pressfit type) for 1.5 mm (0.059 [in.]), as shown in [Figure 12-9](#).

Figure 12-9 Inserting core wires into the tool-less female connector (pressfit type)



----End