

DBS3900 (ICR)

Installation Guide

Issue 12
Date 2015-04-30

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About This Document

Overview

This document describes the process of installing the DBS3900 on an indoor centralized rack (ICR).

Product Version

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

Product Name	Solution Version	Product Version
DBS3900	SRAN7.0 and later versions	V100R007C00 and later versions
	GBSS14.0 and later versions	V100R014C00 and later versions
	RAN14.0 and later versions	V200R014C00 and later versions
	eRAN3.0 and later versions	V100R005C00 and later versions

Intended Audience

This document is intended for:

Base station installation personnel

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1 Changes in the DBS3900 (ICR) Installation Guide

This chapter describes the changes in the *DBS3900 (ICR) Installation Guide*.

12(2015-04-30)

This is the twelfth commercial release.

Compared with issue 11(2014-11-20), no information is added or deleted.

Compared with issue 11(2014-11-20), this issue incorporates the following changes:

Topic	Change Description
15.11.3 Installing FE/GE Optical Cables	Added a caution of replacing the optic module.

11(2014-11-20)

This is the eleventh commercial release.

Compared with issue 10 (2014-07-30), no information is added or deleted.

Compared with issue 10 (2014-07-30), this issue incorporates the following changes:

Topic	Change Description
13.2 Installing the BBU	Added descriptions of BBU ventilation channel.

10 (2014-07-30)

This is the tenth official release.

Compared with issue 09 (2013-12-23), this issue does not include any new information.

Compared with issue 09 (2013-12-23), this issue includes the following changes:

Topic	Change Description
8.1 Installing the IFS06 on the Concrete Floor	Modified drill holes with a depth ranging from 52 mm (1.94 in.) to 60 mm (2.36 in.) to a depth ranging from 55 mm (2.05 in.) to 60 mm (2.36 in.).
8.2 Installing the IFS06 on the ESD Floor	

Compared with issue 09 (2013-12-23), no information is deleted from this issue.

09 (2013-12-23)

This is the ninth official release.

Compared with issue 08 (2013-11-28), this issue does not include any new information.

Compared with issue 08 (2013-11-28), this issue includes the following changes:

Topic	Change Description
15.9 Installing RRU Power Cables	Added the installation procedure of ground clip for RRU power cable.

Compared with issue 08 (2013-11-28), no information is deleted from this issue.

08 (2013-11-28)

This is the eighth official release.

Compared with issue 07 (2012-12-30), this issue does not include any new information.

Compared with issue 07 (2012-12-30), this issue includes the following changes:

Topic	Change Description
9.1 Introduction to the Bracket Assembly	Modified the label of main brackets.
9.2 Installing the Main Brackets for DC RRUs	
9.3 Installing the Main Brackets for AC RRUs	

Compared with issue 07 (2012-12-30), no information is deleted from this issue.

07 (2012-12-30)

This is the seventh official release.

Compared with issue 06 (2012-09-15), this issue does not include any new information.

Compared with issue 06 (2012-09-15), this issue includes the following changes:

Topic	Change Description
15.10 (Optional) Installing BBU Inter-connection Cable	Modified the description of BBU interconnection signal cables in the context.

Compared with issue 06 (2012-09-15), no information is deleted from this issue.

06 (2012-09-15)

This is the sixth official release.

Compared with issue 05 (2012-07-06), this issue does not include any new information.

Compared with issue 05 (2012-07-06), this issue includes the following changes:

Topic	Change Description
3.1 Introduction to the Equipment	Improved the structure of the IMB03.
3.3 Requirements for Dimensions and Clearances	
11 Installing the IMB03	
13 Installing Components in the IMB03	
15 Installing Cables	

Compared with issue 05 (2012-07-06), no information is deleted from this issue.

05 (2012-07-06)

This is the fifth official release.

Compared with issue 04 (2012-05-19), this issue does not include any new information.

Compared with issue 04 (2012-05-19), this issue includes the following changes:

Topic	Change Description
About This Document	Added the version V100R007C01 to DBS3900 and V100R005C01 to DBS3900 LTE.

Compared with issue 04 (2012-05-19), no information is deleted from this issue.

04 (2012-05-19)

This is the fourth official release.

Compared with issue 03 (2012-01-20), this issue does not include any new information.

Compared with issue 03 (2012-01-20), this issue includes the following changes:

Topic	Change Description
9.2 Installing the Main Brackets for DC RRUs	Added the description about using expansion bolts to install the main bracket.
9.3 Installing the Main Brackets for AC RRUs	
13.3 Installing the DCDU-03B, DCDU-11B or DCDU-12B	Deleted the operations of installing the ground cable for the DCDU-03B.

Compared with issue 03 (2012-01-20), no information is deleted from this issue.

03 (2012-01-20)

This is the third official release.

Compared with issue 02 (2011-08-30), this issue does not include any new information.

Compared with issue 02 (2011-08-30), this issue includes the following changes:

Topic	Change Description
4 Unpacking the Equipment	Modified the unpacking check operations.

Compared with issue 02 (2011-08-30), no information is deleted from this issue.

02 (2011-08-30)

This is the second official release.

Compared with issue 01 (2011-03-30), this issue includes the following changes:

Topic	Change Description
3.1 Introduction to the Equipment	Reorganized these sections and optimized the related description and figures.
Height-Restricted Scenarios (-48 V DC)	
Height-Restricted Scenarios (220 V AC)	
Height-Restricted Scenarios (+24 V DC)	
Height-Unrestricted Scenarios (-48 V DC)	

Topic	Change Description
Height-Unrestricted Scenarios (220 V AC)	
Height-Unrestricted Scenarios (+24 V DC)	
10 Installing the GPS Surge Protector	Added the tools used for installing the surge protector.
15.3 Cable Installation Process	Optimized the figures.
15.14 Installing the GPS Clock Signal Cable	Optimized the figures.

Compared with issue 01 (2011-03-30), this issue does not include any new information.

Compared with issue 01 (2011-03-30), no information is deleted from this issue.

01 (2011-03-30)

This is the first official release.

Compared with draft A (2011-01-30), this issue does not include any changes.

Compared with draft A (2011-01-30), this issue does not include any new information.

Compared with draft A (2011-01-30), no information is deleted from this issue.

Draft A (2011-01-30)

This is a draft.

Compared with the issues for the MBTS V100R003C00, WCDMA NodeB V200R012C00, GSM BTS V100R012C00, and eNodeB V100R002C00, this issue includes the following changes:

Topic	Change Description
3.2 Installation Scenarios	Reorganized this section.

Compared with the issues for the MBTS V100R003C00, WCDMA NodeB V200R012C00, GSM BTS V100R012C00, and eNodeB V100R002C00, this issue includes the following new information:

- Added triple-mode scenarios.
- Added the cable connections in triple-mode scenarios.

Compared with the issues for the MBTS V100R003C00, WCDMA NodeB V200R012C00, GSM BTS V100R012C00, and eNodeB V100R002C00, no information is deleted from this issue.

2 Installation Preparations

About This Chapter

This chapter lists the tools and instruments that must be obtained before the installation, and it also specifies the skills that the engineering personnel must have.

[2.1 Reference Documents](#)

This section describes the documents that you need to obtain before performing the installation.

[2.2 Tools and Instruments](#)

This section lists the tools and instruments that must be obtained 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.




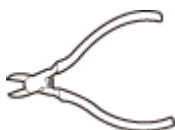


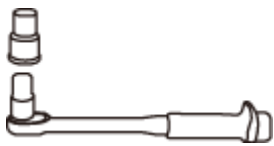

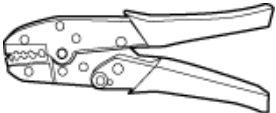
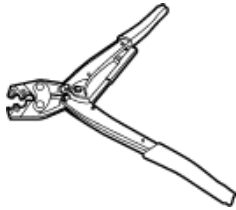


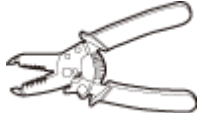
2.1 Reference Documents

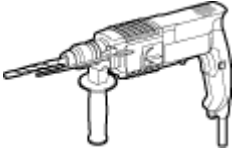



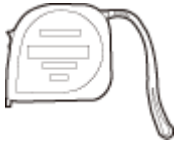

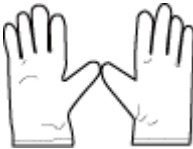

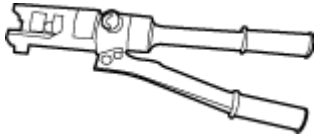
This section describes the documents that you need to obtain before performing the installation.

- Before the installation, familiarize yourself with related information in the following documents:
 - *BBU3900 Hardware Description*
 - For how to install RRUs, see the related RRU installation guide.
 - *Safety Precautions*
- During the installation, familiarize yourself with related information in the following document:
 - *Installation Reference*

2.2 Tools and Instruments

This section lists the tools and instruments that must be obtained before the installation.

Marker 	Phillips screwdriver (M4, M5, M6, M8)  Flat-head screwdriver (M4, M5, M6, M8) 	Diagonal pliers 
Adjustable wrench (size ≤ 19 mm or 0.75 in.) 	Socket wrench (M10, M12) 	Torque socket (30 N·m to 50 N·m or 265.52 lbf·in. to 442.54 lbf·in.) 
Torque screwdriver 	COAX crimping tool 	Wire clippers 
Rubber mallet 	Utility knife 	Wire stripper 

<p>Hammer drill ($\Phi 16$)</p> 	<p>Heat gun</p> 	<p>Level</p> 
<p>Multimeter</p> 	<p>Measuring tape</p> 	<p>Vacuum cleaner</p> 
<p>ESD gloves</p> 	<p>ESD wrist strap</p> 	<p>Hydraulic pliers</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 to Be Known Before the Installation

About This Chapter

This chapter describes the information about the installation, including exteriors, installation scenarios, and clearance requirements.

[3.1 Introduction to the Equipment](#)

This section describes the devices involved in the DBS3900 installation.

[3.2 Installation Scenarios](#)

This section describes ICR installation scenarios.

[3.3 Requirements for Dimensions and Clearances](#)

This section describes the requirements for dimensions and clearances of devices to be installed.

3.1 Introduction to the Equipment

This section describes the devices involved in the DBS3900 installation.

NOTE

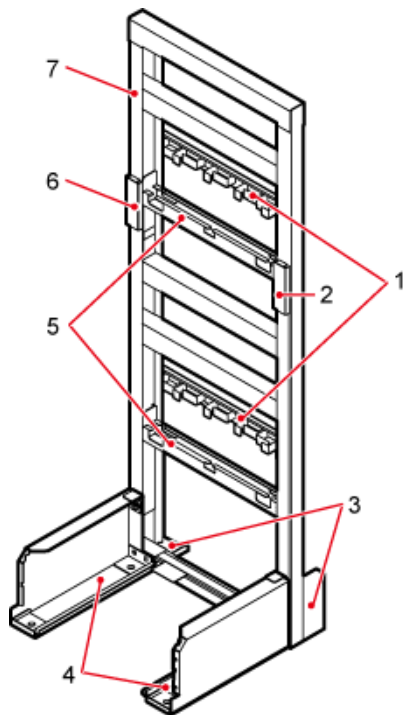
An indoor centralized rack (ICR) consists of an IFS06 and an IMB03:

- An IFS06 is a type of indoor floor installation support (IFS).
- An IMB03 is a type of indoor mini box.

IFS06

An IFS06 is an indoor floor installation support. It is used for installing the IMB03 and RRUs in a centralized manner. [Figure 3-1](#) shows an IFS06.

Figure 3-1 IFS06



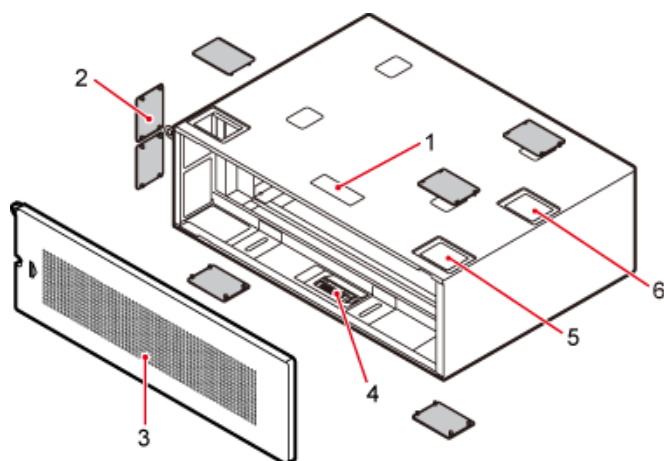
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- | | | | |
|---------------------|------------------|----------------|----------------|
| (1) Cable tray | (2) Ground bar 2 | (3) Rear foot | (4) Front foot |
| (5) Adjustable beam | (6) Ground bar 1 | (7) Main frame | - |

IMB03

An IMB03 is an indoor mini box. It is used for installing the BBU and power devices. [Figure 3-2](#) shows an IMB03.

Figure 3-2 IMB03

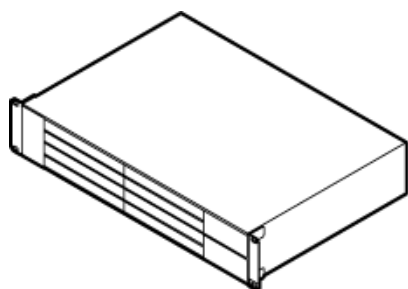


PAS02C0005

- | | | |
|---------------------------|----------------------|------------------------|
| (1) NO STEPPING sign | (2) Protective plate | (3) Cover plate |
| (4) Slot assignment label | (5) Cable outlet | (6) Dust disposal vent |

Figure 3-3 shows a BBU.

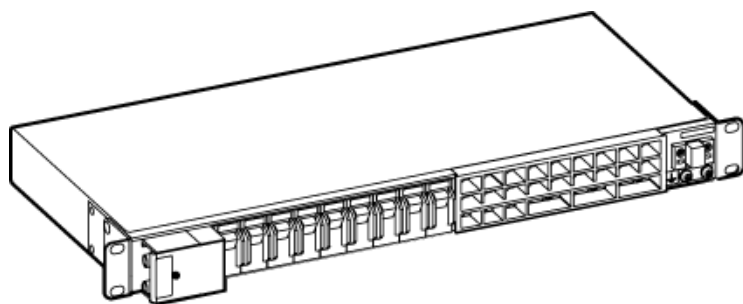
Figure 3-3 BBU



PAS03C0003

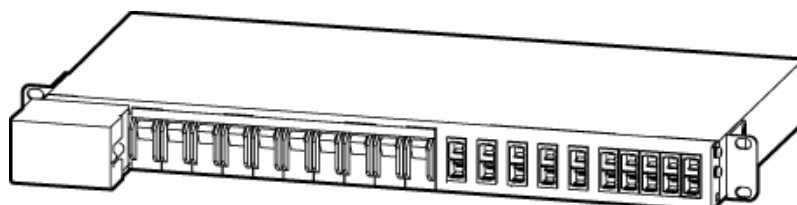
Power devices are the DCDCU-03B, DCDCU-11B, and AC/DC and DC/DC power devices. **Figure 3-4** shows a DCDCU-03B. **Figure 3-5** shows a DCDCU-11B. **Figure 3-6** shows an AC/DC power device. **Figure 3-7** shows a DC/DC power device.

Figure 3-4 DCDU-03B



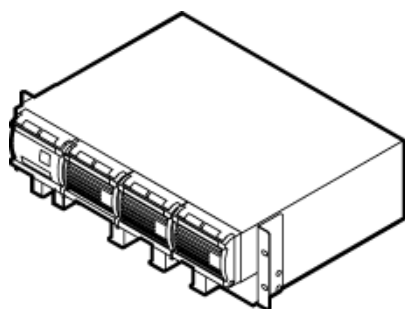
PAH09C0040

Figure 3-5 DCDU-11B



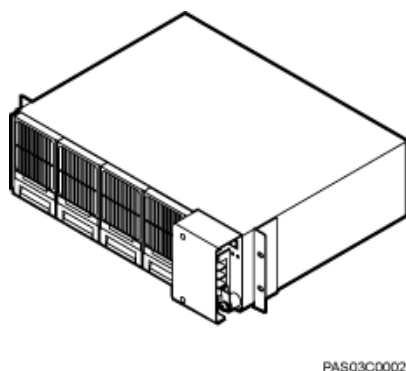
PAH09C0012

Figure 3-6 AC/DC power device



PAS03C0001

Figure 3-7 DC/DC power device



3.2 Installation Scenarios

This section describes ICR installation scenarios.

3.2.1 Installation Scenarios

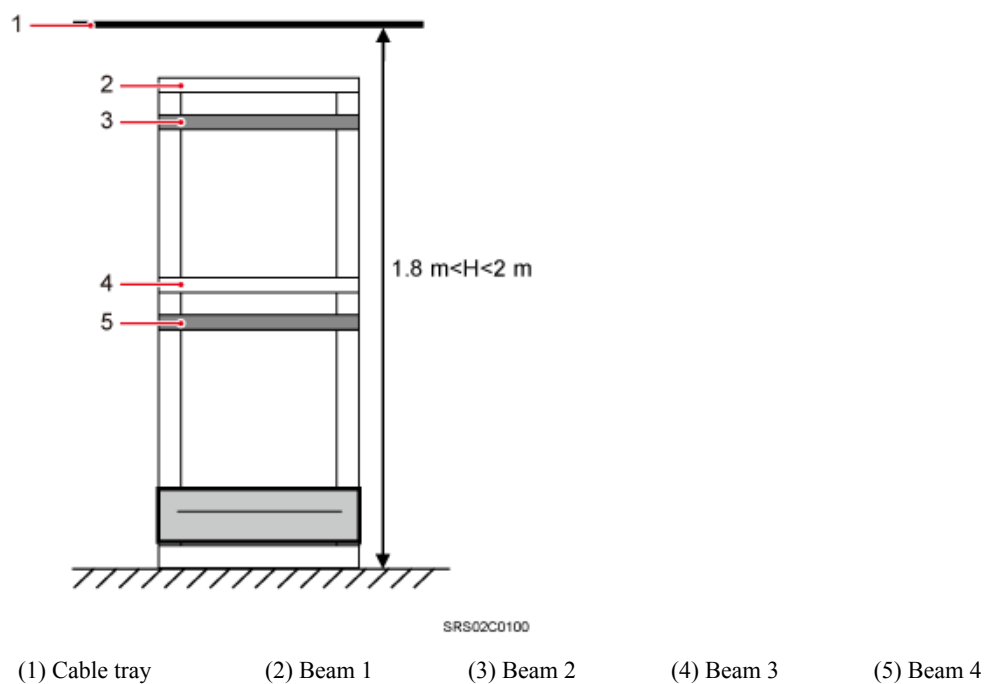
The ICR installation options vary according to height-restricted and height-unrestricted scenarios.

In the scenario where a cable tray is 1.8 m to 2 m (5.91 ft to 6.56 ft) above the floor (referred to as the height-restricted scenario), RRUs are installed on beam 2 and beam 4, as shown in [Figure 3-8](#).

 **NOTE**

- In height-restricted scenarios, the adjustable beams need to be moved to the position marked 1.8 m (5.91 ft).
- When RRUs are installed on beam 1 or 2, they are installed at the upper layer.
- When RRUs are installed on beam 3 or 4, they are installed at the lower layer.

Figure 3-8 Height-restricted scenarios

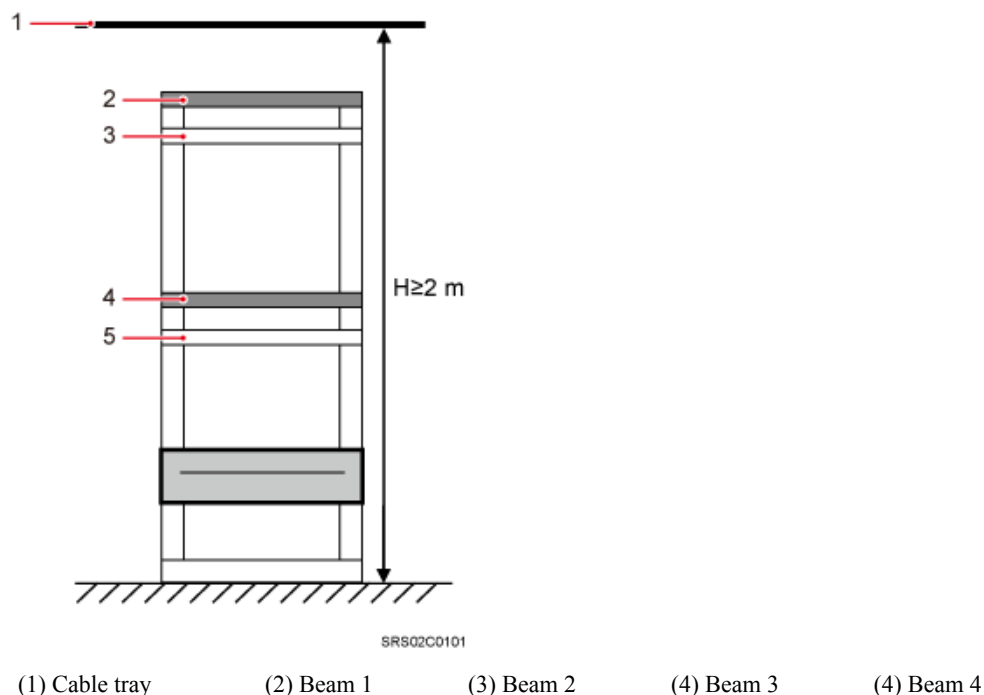


In the scenario where a cable tray is higher than 2 m (6.56 ft) above the floor (referred to as the height-unrestricted scenario), RRUs are installed on beam 1 and beam 3, as shown in [Figure 3-9](#).

NOTE

- When RRUs are installed on beam 1 or 2, they are installed at the upper layer.
- When RRUs are installed on beam 3 or 4, they are installed at the lower layer.

Figure 3-9 Height-unrestricted scenarios



3.2.2 Height-Restricted Scenarios

This section describes the height-restricted scenarios for installing the DBS3900 on an ICR.

Height-Restricted Scenarios (-48 V DC)

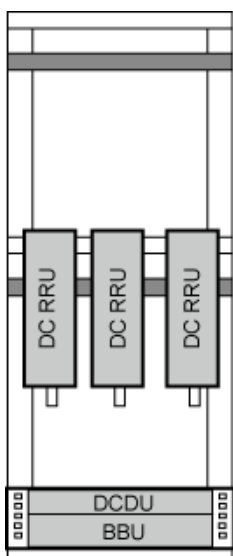
This section describes the height-restricted scenarios with external -48 V DC power supply. In these scenarios, DC RRUs can be installed together with an IMB03 on an IFS06 or independently on an IFS06.

DC RRUs and IMB03 Installed Together (IFS06+IMB03+DC RRUs)

In this scenario, a single IFS06 supports a maximum of six DC RRUs, and a single site supports a maximum of 12 DC RRUs. When only three DC RRUs need to be installed, they are installed at the lower layer.

- 1 IFS06+1 IMB03+3 DC RRUs

Figure 3-10 1 IFS06+1 IMB03+3 DC RRUs



SRS02C0117

Table 3-1 3 DC RRUs

Position	GSM	UMTS	LTE	GSM+UMTS/ GSM+LTE
Lower layer	3 RRU3008s	3 RRU3804s	3 RRU3201s	3 RRU3908s

NOTE

- RRU3008s are used as examples for RRUs in GSM mode.
- RRU3804s are used as examples for RRUs in UMTS mode.
- RRU3201s are used as examples for RRUs in LTE mode.
- RRU3908s are used as examples for RRUs in multiple modes.
- 1 IFS06+1 IMB03+6 DC RRUs

Figure 3-11 1 IFS06+1 IMB03+6 DC RRUs

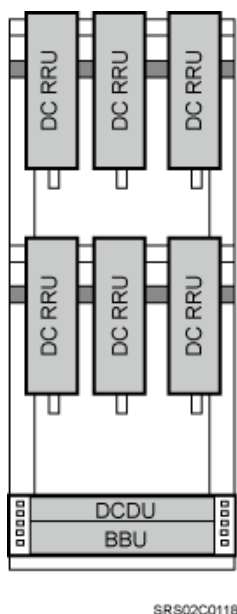


Table 3-2 6 DC RRUs (in GSM/UMTS mode)

Position	GSM	UMTS	GSM +UMTS	Co-Cabinet of GSM +UMTS and UMTS	Co-Cabinet of GSM and UMTS
Upper layer	3 RRU3008s	3 RRU3804s	3 RRU3908s	3 RRU3908s	3 RRU3008s
Lower layer	3 RRU3008s	3 RRU3804s	3 RRU3908s	3 RRU3804s	3 RRU3804s

Table 3-3 6 DC RRUs (in GSM/LTE mode)

Position	GSM	LTE	Co-Cabinet of GSM+LTE and LTE	Co-Cabinet of GSM and LTE
Upper layer	3 RRU3008s	3 RRU3201s	3 RRU3908s	3 RRU3008s
Lower layer	3 RRU3008s	3 RRU3201s	3 RRU3201s	3 RRU3201s

Table 3-4 6 DC RRUs (in UMTS/LTE mode)

Position	UMTS	LTE	Co-Cabinet of UMTS and LTE
Upper layer	3 RRU3804s	3 RRU3201s	3 RRU3804s
Lower layer	3 RRU3804s	3 RRU3201s	3 RRU3201s

- 2 IFS06s+2 IMB03s+12 DC RRUs

Figure 3-12 2 IFS06s+2 IMB03s+12 DC RRUs

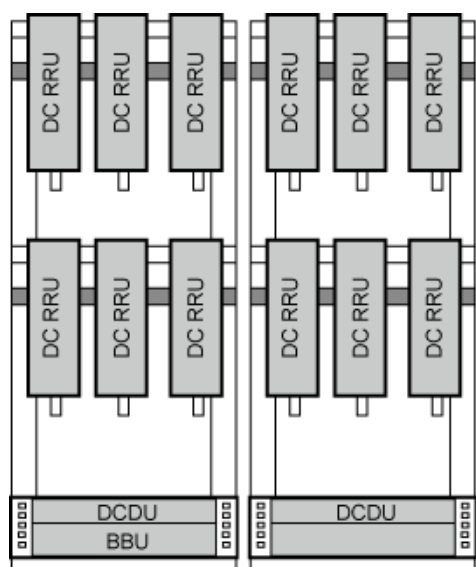


Table 3-5 12 DC RRUs (in GSM/UMTS mode)

Position	Co-Cabinet of GSM +UMTS and UMTS	Co-Cabinet of GSM and UMTS
ICR 1	6 RRU3908s	6 RRU3008s
ICR 2	6 RRU3804s	6 RRU3804s

Table 3-6 12 DC RRUs (in GSM/LTE mode)

Position	Co-Cabinet of GSM+LTE and LTE	Co-Cabinet of GSM and LTE
ICR 1	6 RRU3908s	6 RRU3008s

Position	Co-Cabinet of GSM+LTE and LTE	Co-Cabinet of GSM and LTE
ICR 2	6 RRU3201s	6 RRU3201s

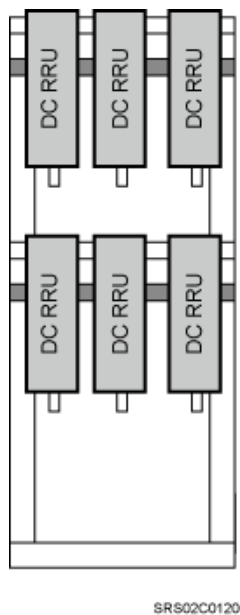
Table 3-7 12 DC RRUs (in UMTS/LTE mode)

Position	Co-Cabinet of UMTS and LTE
ICR 1	6 RRU3804s
ICR 2	6 RRU3201s

DC RRUs Installed Independently (IFS06+DC RRUs)

In this scenario, a single IFS06 supports three or six DC RRUs. **Figure 3-13** shows the scenario where six DC RRUs are installed. When only three DC RRUs need to be installed, they are installed at the lower layer.

Figure 3-13 DC RRUs installed on the IFS06



Height-Restricted Scenarios (220 V AC)

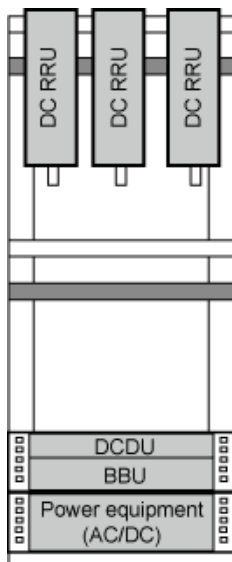
This section describes the height-restricted scenarios with external 220 V AC power supply. In these scenarios, RRUs can be installed together with an IMB03 on an IFS06 or independently on an IFS06.

DC RRUs and IMB03 Installed Together (IFS06+IMB03+DC RRUs)

In this scenario, a single IFS06 supports a maximum of three DC RRUs, and a single site supports a maximum of six DC RRUs.

- 1 IFS06+2 IMB03s+3 DC RRUs

Figure 3-14 1 IFS06+2 IMB03s+3 DC RRUs



SRS02C0121

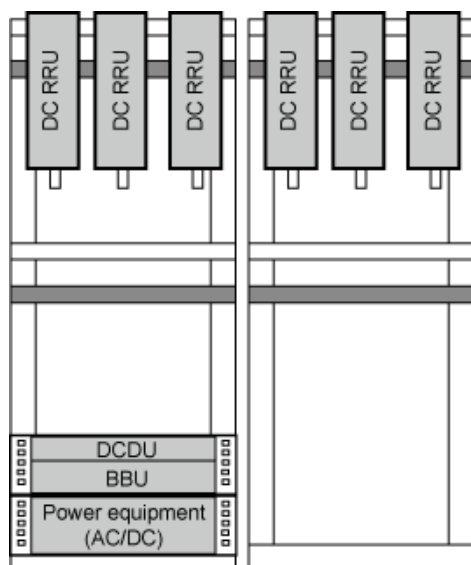
Table 3-8 3 DC RRUs

Position	GSM	UMTS	LTE	GSM+UMTS/ GSM+LTE
Upper layer	3 RRU3008s	3 RRU3804s	3 RRU3201s	3 RRU3908s

NOTE

- RRU3008s are used as examples for RRUs in GSM mode.
- RRU3804s are used as examples for RRUs in UMTS mode.
- RRU3201s are used as examples for RRUs in LTE mode.
- RRU3908s are used as examples for RRUs in multiple modes.
- 2 IFS06s+2 IMB03s+6 DC RRUs

Figure 3-15 2 IFS06s+2 IMB03s+6 DC RRUs



SRS02C0122

Table 3-9 6 DC RRUs (in GSM/UMTS mode)

Position	GSM	UMTS	GSM +UMTS	Co-Cabinet of GSM +UMTS and UMTS	Co-Cabinet of GSM and UMTS
ICR 1	3 RRU3008s	3 RRU3804s	3 RRU3908s	3 RRU3908s	3 RRU3008s
ICR 2	3 RRU3008s	3 RRU3804s	3 RRU3908s	3 RRU3804s	3 RRU3804s

Table 3-10 6 DC RRUs (in GSM/LTE mode)

Position	GSM	LTE	Co-Cabinet of GSM+LTE and LTE	Co-Cabinet of GSM and LTE
ICR 1	3 RRU3008s	3 RRU3201s	3 RRU3908s	3 RRU3008s
ICR 2	3 RRU3008s	3 RRU3201s	3 RRU3201s	3 RRU3201s

Table 3-11 6 DC RRUs (in UMTS/LTE mode)

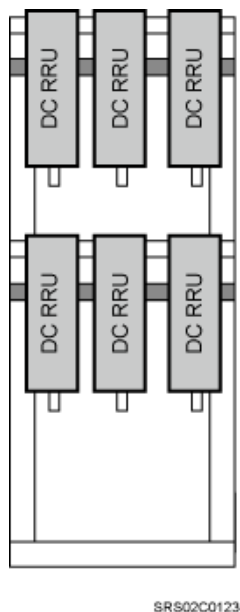
Position	UMTS	LTE	Co-Cabinet of UMTS and LTE
ICR 1	3 RRU3804s	3 RRU3201s	3 RRU3804s
ICR 2	3 RRU3804s	3 RRU3201s	3 RRU3201s

RRUs Installed Independently (IFS06+RRUs)

- 1 IFS06+6 DC RRUs

In this scenario, a single IFS06 supports three or six DC RRUs. **Figure 3-16** shows the scenario where six DC RRUs are installed. When only three DC RRUs need to be installed, they are installed at the upper layer.

Figure 3-16 DC RRUs installed on the IFS06



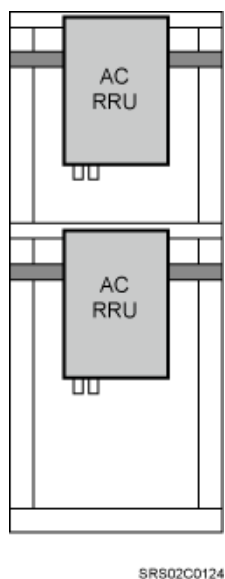
- 1 IFS06+2 AC RRUs

In this scenario, a single IFS06 supports a maximum two AC RRUs, as shown in **Figure 3-17**.

NOTE

This document uses AC RRU3908s as examples.

Figure 3-17 AC RRUs installed on the IFS06



Height-Restricted Scenarios (+24 V DC)

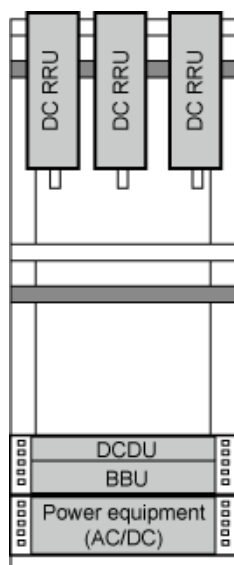
This section describes the height-restricted scenarios with external +24 V DC power supply. In these scenarios, DC RRUs can be installed together with an IMB03 on an IFS06 or independently on an IFS06.

DC RRUs and IMB03 Installed Together (IFS06+IMB03+DC RRUs)

In this scenario, a single IFS06 supports a maximum of three DC RRUs, and a single site supports a maximum of six DC RRUs.

- 1 IFS06+2 IMB03s+3 DC RRUs

Figure 3-18 1 IFS06+2 IMB03s+3 DC RRUs



SRS02C0125

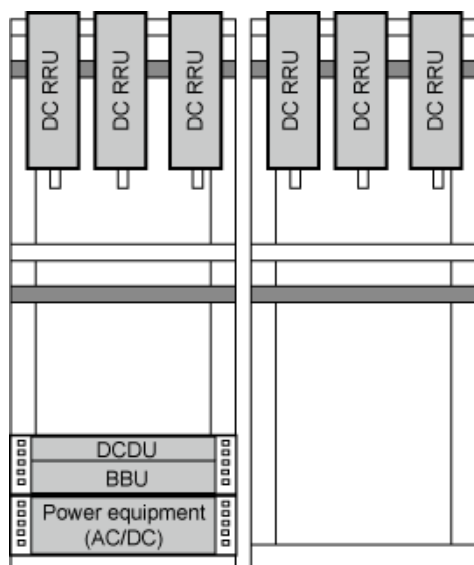
Table 3-12 3 DC RRUs

Position	GSM	UMTS	LTE	GSM+UMTS/ GSM+LTE
Upper layer	3 RRU3008s	3 RRU3804s	3 RRU3201s	3 RRU3908s

NOTE

- RRU3008s are used as examples for RRUs in GSM mode.
- RRU3804s are used as examples for RRUs in UMTS mode.
- RRU3201s are used as examples for RRUs in LTE mode.
- RRU3908s are used as examples for RRUs in multiple modes.
- 2 IFS06s+2 IMB03s+6 DC RRUs

Figure 3-19 2 IFS06s+2 IMB03s+6 DC RRUs



SRS02C0126

Table 3-13 6 DC RRUs (in GSM/UMTS mode)

Position	GSM	UMTS	GSM +UMTS	Co-Cabinet of GSM +UMTS and UMTS	Co-Cabinet of GSM and UMTS
ICR 1	3 RRU3008s	3 RRU3804s	3 RRU3908s	3 RRU3908s	3 RRU3008s
ICR 2	3 RRU3008s	3 RRU3804s	3 RRU3908s	3 RRU3804s	3 RRU3804s

Table 3-14 6 DC RRUs (in GSM/LTE mode)

Position	GSM	LTE	Co-Cabinet of GSM+LTE and LTE	Co-Cabinet of GSM and LTE
ICR 1	3 RRU3008s	3 RRU3201s	3 RRU3908s	3 RRU3008s
ICR 2	3 RRU3008s	3 RRU3201s	3 RRU3201s	3 RRU3201s

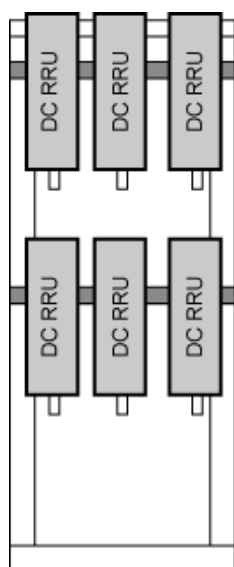
Table 3-15 6 DC RRUs (in UMTS/LTE mode)

Position	UMTS	LTE	Co-Cabinet of UMTS and LTE
ICR 1	3 RRU3804s	3 RRU3201s	3 RRU3804s
ICR 2	3 RRU3804s	3 RRU3201s	3 RRU3201s

DC RRUs Installed Independently (IFS06+DC RRUs)

In this scenario, a single IFS06 supports three or six DC RRUs. **Figure 3-20** shows the scenario where six DC RRUs are installed. When only three DC RRUs need to be installed, they are installed at the upper layer.

Figure 3-20 DC RRUs installed on the IFS06



SRS02C0127

3.2.3 Height-Unrestricted Scenarios

This section describes the height-unrestricted scenarios for installing the DBS3900 on an ICR.

Height-Unrestricted Scenarios (-48 V DC)

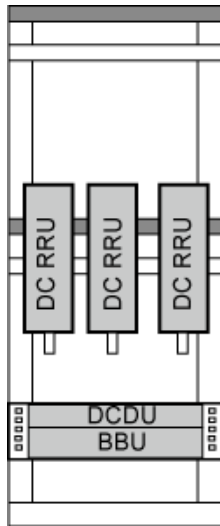
This section describes the height-unrestricted scenarios with external -48 V DC power supply. In these scenarios, DC RRUs can be installed together with an IMB03 on an IFS06 or independently on an IFS06.

DC RRUs and IMB03 Installed Together (IFS06+IMB03+DC RRUs)

In single- or dual-mode scenarios, a single IFS06 supports a maximum of six DC RRUs, and a single site supports a maximum of 12 DC RRUs. When only three DC RRUs need to be installed, they are installed at the lower layer.

- 1 IFS06+1 IMB03+3 DC RRUs

Figure 3-21 1 IFS06+1 IMB03+3 DC RRUs



5RS02C0102

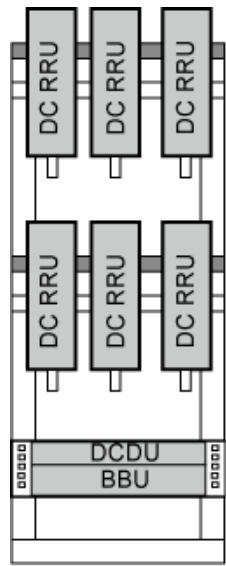
Table 3-16 3 DC RRUs

Position	GSM	UMTS	LTE	GSM+UMTS/ GSM+LTE
Lower layer	3 RRU3008s	3 RRU3804s	3 RRU3201s	3 RRU3908s

NOTE

- RRU3008s are used as examples for RRUs in GSM mode.
- RRU3804s are used as examples for RRUs in UMTS mode.
- RRU3201s are used as examples for RRUs in LTE mode.
- RRU3908s are used as examples for RRUs in multiple modes.
- 1 IFS06+1 IMB03+6 DC RRUs

Figure 3-22 1 IFS06+1 IMB03+6 DC RRUs



SR502C0103

Table 3-17 6 DC RRUs (in GSM/UMTS mode)

Position	GSM	UMTS	GSM +UMTS	Co-Cabinet of GSM +UMTS and UMTS	Co-Cabinet of GSM and UMTS
Upper layer	3 RRU3008s	3 RRU3804s	3 RRU3908s	3 RRU3908s	3 RRU3008s
Lower layer	3 RRU3008s	3 RRU3804s	3 RRU3908s	3 RRU3804s	3 RRU3804s

Table 3-18 6 DC RRUs (in GSM/LTE mode)

Position	GSM	LTE	Co-Cabinet of GSM+LTE and LTE	Co-Cabinet of GSM and LTE
Upper layer	3 RRU3008s	3 RRU3201s	3 RRU3908s	3 RRU3008s
Lower layer	3 RRU3008s	3 RRU3201s	3 RRU3201s	3 RRU3201s

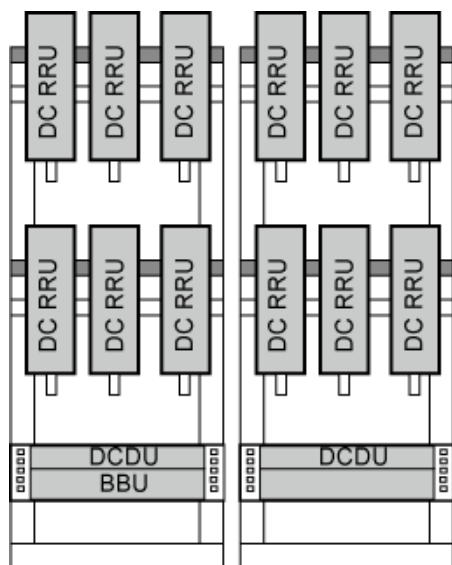
Table 3-19 6 DC RRUs (in UMTS/LTE mode)

Position	UMTS	LTE	Co-Cabinet of UMTS and LTE
Upper layer	3 RRU3804s	3 RRU3201s	3 RRU3804s

Position	UMTS	LTE	Co-Cabinet of UMTS and LTE
Lower layer	3 RRU3804s	3 RRU3201s	3 RRU3201s

- 2 IFS06s+2 IMB03s+12 DC RRUs

Figure 3-23 2 IFS06s+2 IMB03s+12 DC RRUs



SR502C0105

Table 3-20 12 DC RRUs (in GSM/UMTS mode)

Position	Co-Cabinet of GSM +UMTS and UMTS	Co-Cabinet of GSM and UMTS
ICR 1	6 RRU3908s	6 RRU3008s
ICR 2	6 RRU3804s	6 RRU3804s

Table 3-21 12 DC RRUs (in GSM/LTE mode)

Position	Co-Cabinet of GSM +UMTS and UMTS	Co-Cabinet of GSM and UMTS
ICR 1	6 RRU3908s	6 RRU3008s
ICR 2	6 RRU3201s	6 RRU3201s

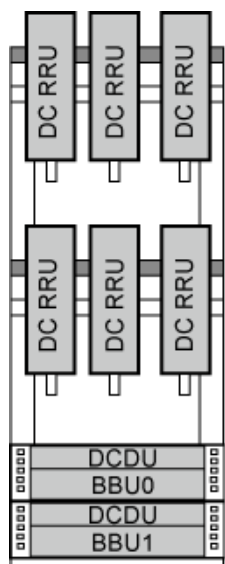
Table 3-22 12 DC RRUs (in UMTS/LTE mode)

Position	Co-Cabinet of UMTS and LTE
ICR 1	6 RRU3804s
ICR 2	6 RRU3201s

NOTE

In triple-mode scenarios, when only one ICR is used, two BBUs are installed separately in two IMB03s. BBU 0 (primary BBU) is installed in the upper IMB03, and BBU 1 (secondary BBU) is installed in the lower IMB03, as shown in [Figure 3-24](#).

Figure 3-24 Triple-mode scenario (6 DC RRUs)



SR502C0104

Table 3-23 6 DC RRUs (in GSM/UMTS/LTE mode)

Position	GU+LTE	GL+UMTS
Upper layer	3 RRU3908s	3 RRU3908s
Lower layer	3 RRU3201s	3 RRU3804s

NOTE

In triple-mode scenarios, when two ICRs are used, two BBUs are installed separately in two IMB03s. BBU 0 (primary BBU) is installed on the left IFS06, and BBU 1 (secondary BBU) is installed on the right IFS06, as shown in [Figure 3-25](#).

Figure 3-25 Triple-mode scenario (12 DC RRUs)

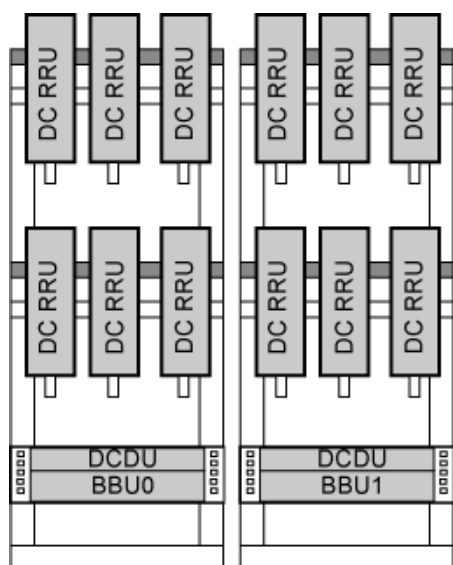


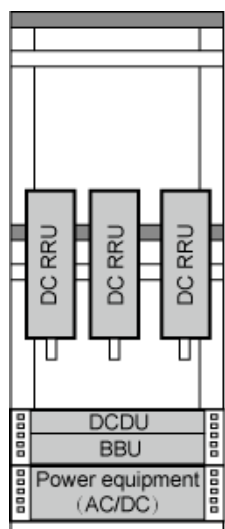
Table 3-24 12 DC RRUs (in GSM/UMTS/LTE mode)

Position	GU+LTE	GL+UMTS
ICR 1	6 RRU3908s	6 RRU3908s
ICR 2	6 RRU3201s	6 RRU3804s

RRUs Installed Independently (IFS06+DC RRUs)

In this scenario, a single IFS06 supports three or six DC RRUs. [Figure 3-26](#) shows the scenario where six DC RRUs are installed. When only three DC RRUs need to be installed, they are installed at the lower layer.

Figure 3-27 1 IFS06+2 IMB03s+3 DC RRUs



SRS02C0108

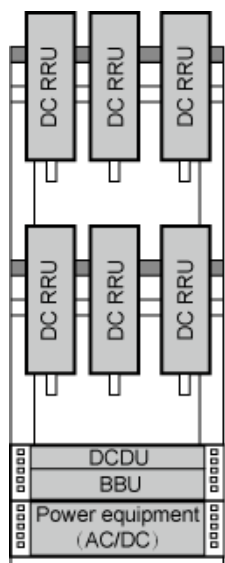
Table 3-25 3 DC RRUs

Position	GSM	UMTS	LTE	GSM+UMTS/ GSM+LTE
Lower layer	3 RRU3008s	3 RRU3804s	3 RRU3201s	3 RRU3908s

NOTE

- RRU3008s are used as examples for RRUs in GSM mode.
- RRU3804s are used as examples for RRUs in UMTS mode.
- RRU3201s are used as examples for RRUs in LTE mode.
- RRU3908s are used as examples for RRUs in multiple modes.
- 1 IFS06+2 IMB03s+6 DC RRUs

Figure 3-28 1 IFS06+2 IMB03s+6 DC RRUs



SR502C0109

Table 3-26 6 DC RRUs (in GSM/UMTS mode)

Position	GSM	UMTS	GSM +UMTS	Co-Cabinet of GSM +UMTS and UMTS	Co-Cabinet of GSM and UMTS
Upper layer	3 RRU3008s	3 RRU3804s	3 RRU3908s	3 RRU3908s	3 RRU3008s
Lower layer	3 RRU3008s	3 RRU3804s	3 RRU3908s	3 RRU3804s	3 RRU3804s

Table 3-27 6 DC RRUs (in GSM/LTE mode)

Position	GSM	LTE	Co-Cabinet of GSM+LTE and LTE	Co-Cabinet of GSM and LTE
Upper layer	3 RRU3008s	3 RRU3201s	3 RRU3908s	3 RRU3008s
Lower layer	3 RRU3008s	3 RRU3201s	3 RRU3201s	3 RRU3201s

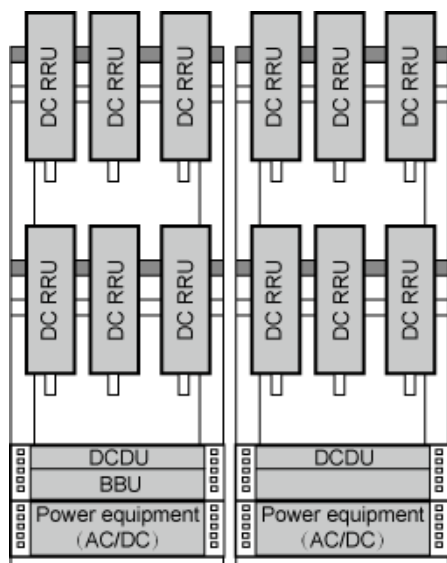
Table 3-28 6 DC RRUs (in UMTS/LTE mode)

Position	UMTS	LTE	Co-Cabinet of UMTS and LTE
Upper layer	3 RRU3804s	3 RRU3201s	3 RRU3804s

Position	UMTS	LTE	Co-Cabinet of UMTS and LTE
Lower layer	3 RRU3804s	3 RRU3201s	3 RRU3201s

- 2 IFS06s+4 IMB03s+12 DC RRUs

Figure 3-29 2 IFS06s+4 IMB03s+12 DC RRUs



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Table 3-29 12 DC RRUs (in GSM/UMTS mode)

Position	Co-Cabinet of GSM +UMTS and UMTS	Co-Cabinet of GSM and UMTS
ICR 1	6 RRU3908s	6 RRU3008s
ICR 2	6 RRU3804s	6 RRU3804s

Table 3-30 12 DC RRUs (in GSM/LTE mode)

Position	Co-Cabinet of GSM +UMTS and UMTS	Co-Cabinet of GSM and UMTS
ICR 1	6 RRU3908s	6 RRU3008s
ICR 2	6 RRU3201s	6 RRU3201s

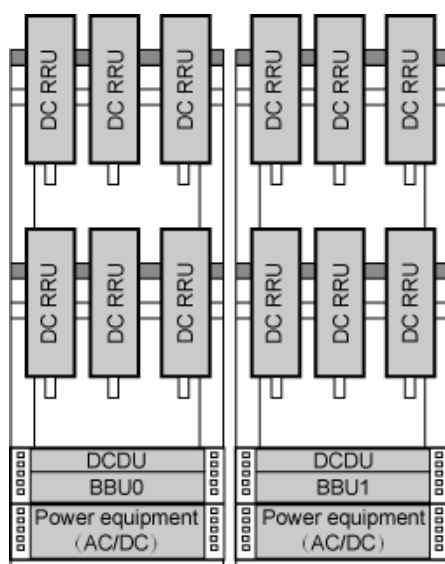
Table 3-31 12 DC RRUs (in UMTS/LTE mode)

Position	Co-Cabinet of UMTS and LTE
ICR 1	6 RRU3804s
ICR 2	6 RRU3201s

NOTE

In triple-mode scenarios, when two ICRs are used, two BBUs are installed separately in two IMB03s. BBU 0 (primary BBU) is installed on the left IFS06, and BBU 1 (secondary BBU) is installed on the right IFS06, as shown in [Figure 3-30](#).

Figure 3-30 Triple-mode scenario (12 DC RRUs)



SR502C0111

Table 3-32 12 DC RRUs (in GSM/UMTS/LTE mode)

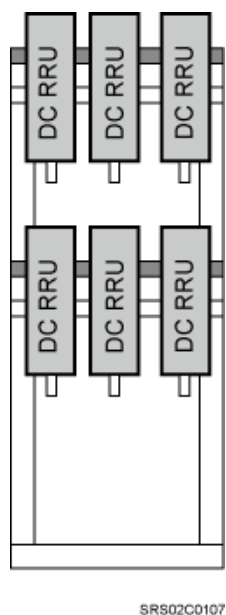
Position	GU+LTE	GL+UMTS
ICR 1	6 RRU3908s	6 RRU3908s
ICR 2	6 RRU3201s	6 RRU3804s

RRUs Installed Independently (IFS06+RRUs)

- IFS06+DC RRUs

In this scenario, a single IFS06 supports three or six DC RRUs. [Figure 3-31](#) shows the scenario where six DC RRUs are installed. When only three DC RRUs need to be installed, they are installed at the lower layer.

Figure 3-31 DC RRUs installed on the IFS06



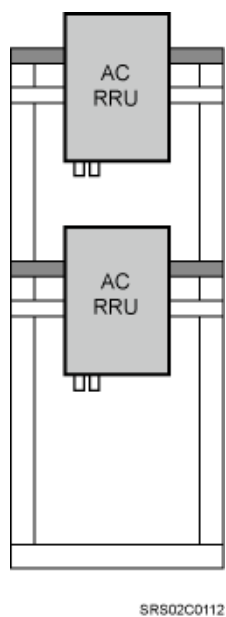
- IFS06+AC RRUs

In this scenario, a single IFS06 supports a maximum two AC RRUs, as shown in [Figure 3-32](#).

 **NOTE**

This document uses AC RRU3908s as examples.

Figure 3-32 AC RRUs installed on the IFS06



Height-Unrestricted Scenarios (+24 V DC)

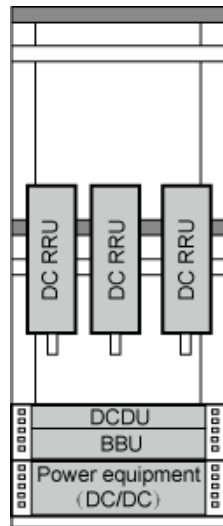
This section describes the height-unrestricted scenarios with external +24 V DC power supply. In these scenarios, DC RRUs can be installed together with an IMB03 on an IFS06 or independently on an IFS06.

DC RRUs and IMB03 Installed Together (IFS06+IMB03+DC RRUs)

In single- or dual-mode scenarios, a single IFS06 supports a maximum of six DC RRUs, and a single site supports a maximum of 12 DC RRUs. When only three DC RRUs need to be installed, they are installed at the lower layer.

- 1 IFS06+2 IMB03s+3 DC RRUs

Figure 3-33 1 IFS06+2 IMB03s+3 DC RRUs



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Table 3-33 3 DC RRUs

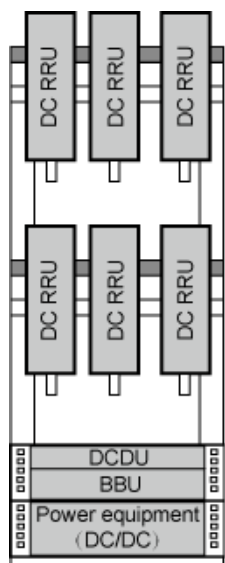
Position	GSM	UMTS	LTE	GSM+UMTS/ GSM+LTE
Lower layer	3 RRU3008s	3 RRU3804s	3 RRU3201s	3 RRU3908s

NOTE

- RRU3008s are used as examples for RRUs in GSM mode.
- RRU3804s are used as examples for RRUs in UMTS mode.
- RRU3201s are used as examples for RRUs in LTE mode.
- RRU3908s are used as examples for RRUs in multiple modes.

- 1 IFS06+2 IMB03s+6 DC RRUs

Figure 3-34 1 IFS06+2 IMB03s+6 DC RRUs



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Table 3-34 6 DC RRUs (in GSM/UMTS mode)

Position	GSM	UMTS	GSM +UMTS	Co-Cabinet of GSM +UMTS and UMTS	Co-Cabinet of GSM and UMTS
Upper layer	3 RRU3008s	3 RRU3804s	3 RRU3908s	3 RRU3908s	3 RRU3008s
Lower layer	3 RRU3008s	3 RRU3804s	3 RRU3908s	3 RRU3804s	3 RRU3804s

Table 3-35 6 DC RRUs (in GSM/LTE mode)

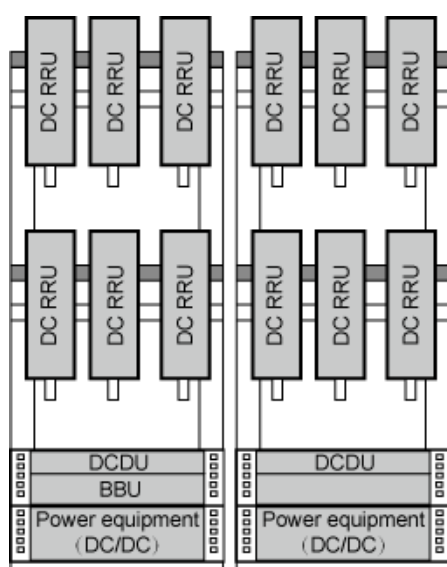
Position	GSM	LTE	Co-Cabinet of GSM+LTE and LTE	Co-Cabinet of GSM and LTE
Upper layer	3 RRU3008s	3 RRU3201s	3 RRU3908s	3 RRU3008s
Lower layer	3 RRU3008s	3 RRU3201s	3 RRU3201s	3 RRU3201s

Table 3-36 6 DC RRUs (in UMTS/LTE mode)

Position	UMTS	LTE	Co-Cabinet of UMTS and LTE
Upper layer	3 RRU3804s	3 RRU3201s	3 RRU3804s
Lower layer	3 RRU3804s	3 RRU3201s	3 RRU3201s

- 2 IFS06s+4 IMB03s+12 DC RRUs

Figure 3-35 2 IFS06s+4 IMB03s+12 DC RRUs



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Table 3-37 12 DC RRUs (in GSM/UMTS mode)

Position	Co-Cabinet of GSM +UMTS and UMTS	Co-Cabinet of GSM and UMTS
ICR 1	6 RRU3908s	6 RRU3008s
ICR 2	6 RRU3804s	6 RRU3804s

Table 3-38 12 DC RRUs (in GSM/LTE mode)

Position	Co-Cabinet of GSM +UMTS and UMTS	Co-Cabinet of GSM and UMTS
ICR 1	6 RRU3908s	6 RRU3008s

Position	Co-Cabinet of GSM +UMTS and UMTS	Co-Cabinet of GSM and UMTS
ICR 2	6 RRU3201s	6 RRU3201s

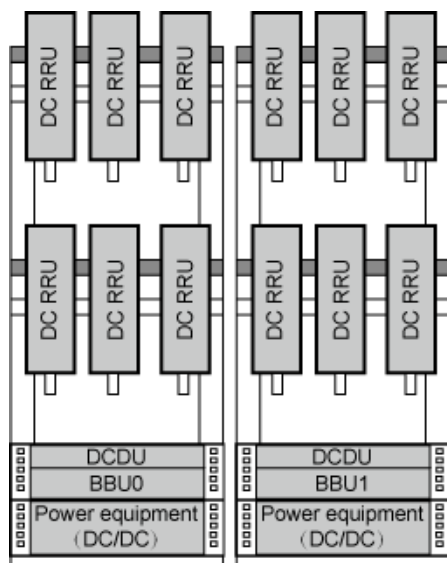
Table 3-39 12 DC RRUs (in UMTS/LTE mode)

Position	Co-Cabinet of UMTS and LTE
ICR 1	6 RRU3804s
ICR 2	6 RRU3201s

 **NOTE**

In triple-mode scenarios, when two ICRs are used, two BBUs are installed separately in two IMB03s. BBU 0 (primary BBU) is installed on the left IFS06, and BBU 1 (secondary BBU) is installed on the right IFS06, as shown in [Figure 3-36](#).

Figure 3-36 Triple-mode scenario



SR502C0116

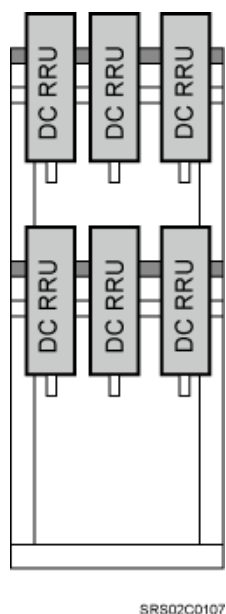
Table 3-40 12 DC RRUs (in GSM/UMTS/LTE mode)

Position	GU+LTE	GL+UMTS
ICR 1	6 RRU3908s	6 RRU3908s
ICR 2	6 RRU3201s	6 RRU3804s

RRUs Installed Independently (IFS06+DC RRUs)

In this scenario, a single IFS06 supports three or six DC RRUs. **Figure 3-37** shows the scenario where six DC RRUs are installed. When only three DC RRUs need to be installed, they are installed at the lower layer.

Figure 3-37 DC RRUs installed on the IFS06



3.3 Requirements for Dimensions and Clearances

This section describes the requirements for dimensions and clearances of devices to be installed.

Dimensions

Figure 3-38 shows the dimensions of an IFS06.

Figure 3-38 Dimensions of an IFS06

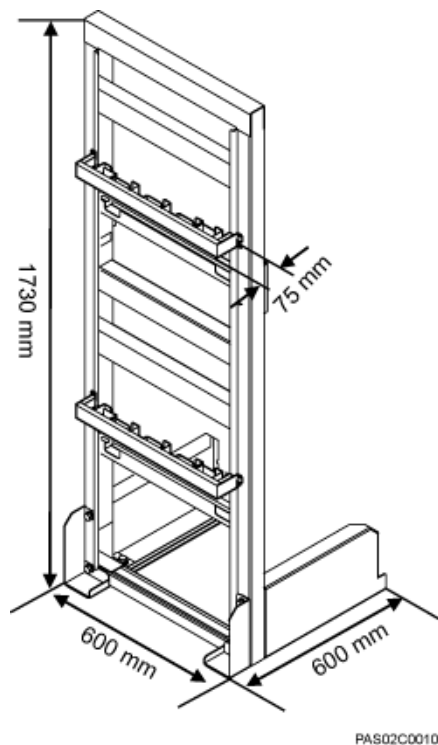
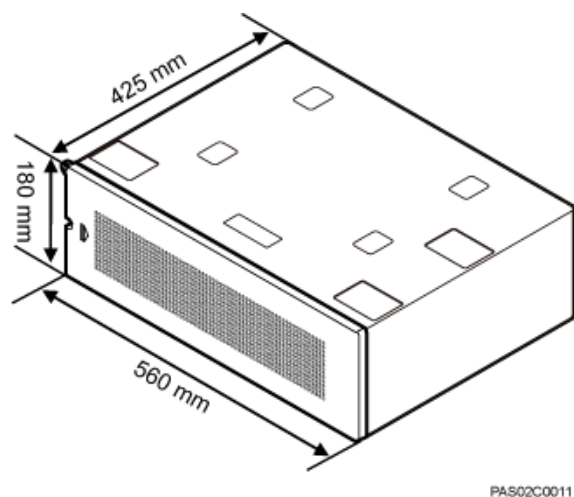


Figure 3-39 shows the dimensions of an IMB03.

Figure 3-39 Dimensions of an IMB03



Recommended Clearances

Figure 3-40 shows the recommended clearances for installing DC RRUs.

Figure 3-40 Recommended clearances (for DC RRUs)

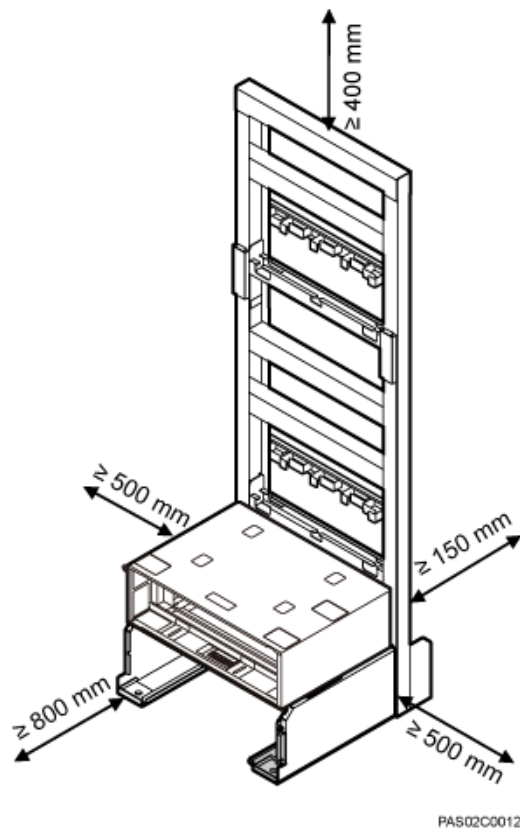
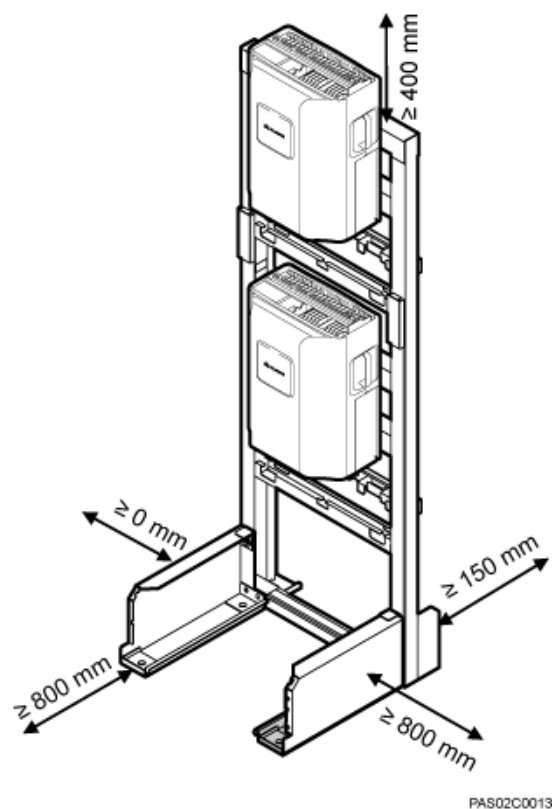


Figure 3-41 shows the recommended clearances for installing AC RRUs.

Figure 3-41 Recommended clearances (for AC RRUs)



NOTE

When an IFS06 needs to provide the recommended clearances for used for AC RRUs, it can be installed with its left side close to a wall.

Minimum Clearances

Figure 3-42 shows the minimum clearances for installing DC RRUs in height-unrestricted scenarios.

Figure 3-42 Minimum clearances for installing DC RRUs in height-unrestricted scenarios

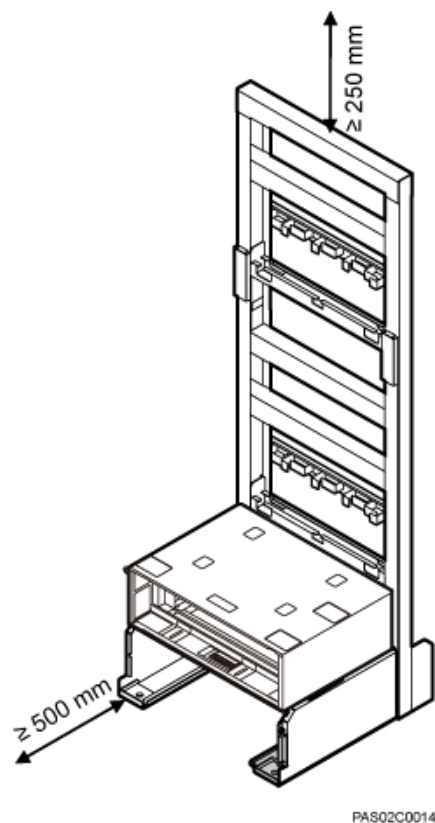
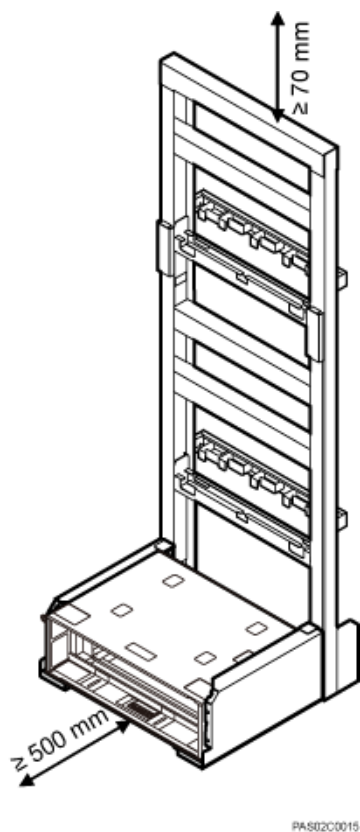


Figure 3-43 shows the minimum clearances for installing DC RRUs in height-restricted scenarios.

Figure 3-43 Minimum clearances for installing DC RRUs in height-restricted scenarios

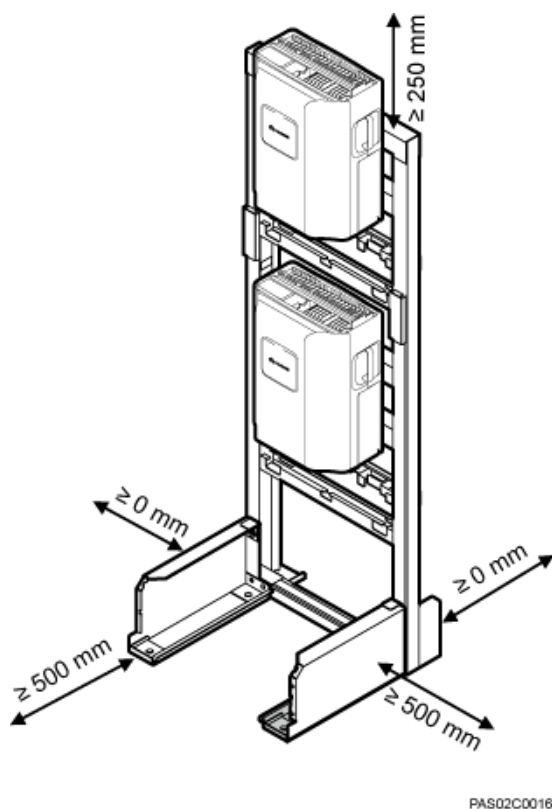


NOTE

When an IFS06 needs to provide the minimum clearances for DC RRUs, it can be installed with its rear and both sides close to walls.

Figure 3-44 shows the minimum clearances for installing AC RRUs.

Figure 3-44 Minimum clearances (for AC RRUs)



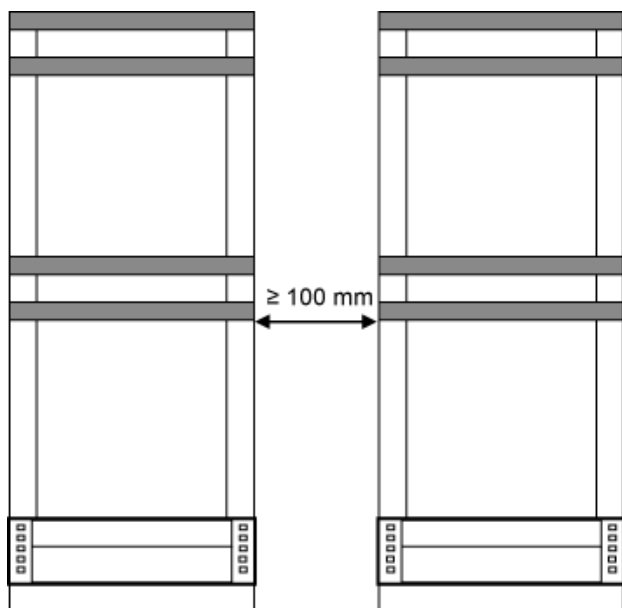
NOTE

When an IFS06 needs to provide the minimum clearances for AC RRUs, it can be installed with its rear and both sides close to walls.

Clearance Requirements of Combined Cabinets

Figure 3-45 shows the clearance requirements of combined cabinets.

Figure 3-45 Clearance requirements of combined cabinets



PAS02C0111

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 RRU 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.

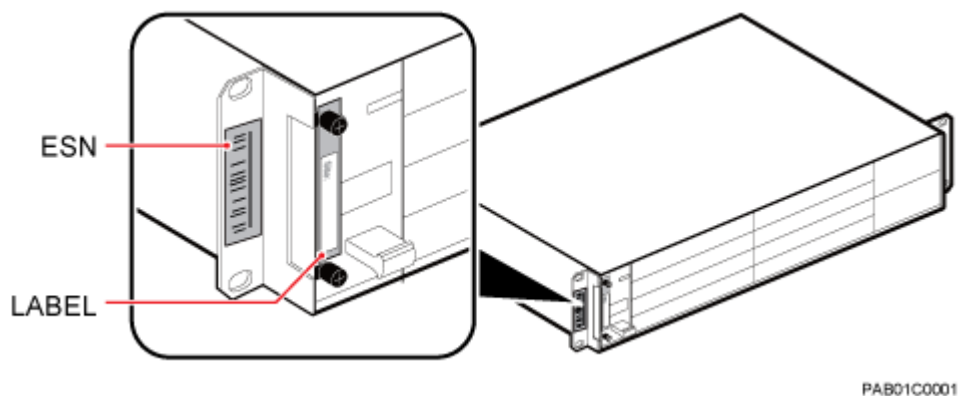


CAUTION

- 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 RRU cables are intact. If the insulation layers are damaged or broken, water will penetrate into the cables, which may cause damages to RRUs or human injury.

---End

Figure 5-2 Obtaining the ESN (2)

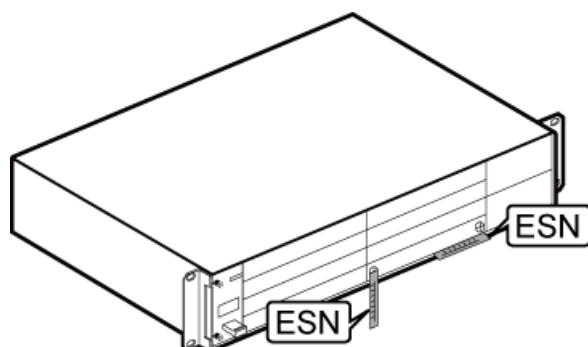


PAB01C0001

Step 2 Record the ESN on the WMPT.

Figure 5-3 shows the position of the ESN.

Figure 5-3 Obtaining the ESN



Step 3 Report the ESN to the engineer for the commissioning of the base station.

NOTE

If multiple BBUs need to be configured on site, record the ESN for each BBU and report them to the engineer responsible for base station commissioning.

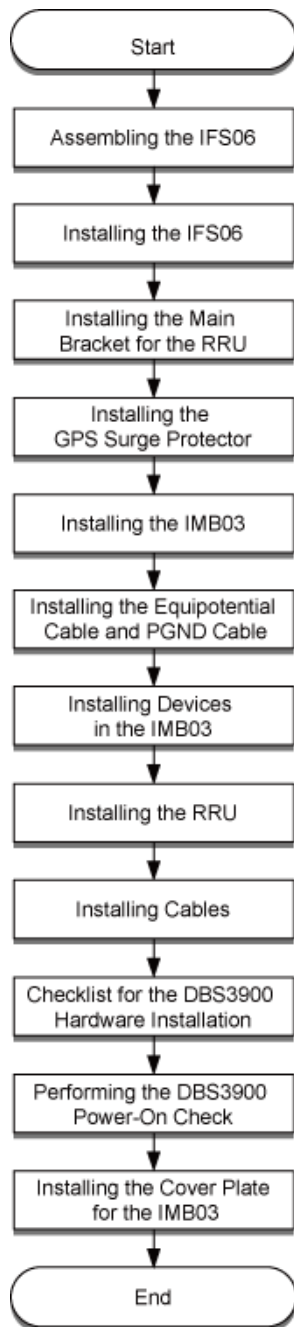
---End

6 Installation Process

This section describes the process of installing the DBS3900 on an ICR.

Figure 6-1 shows the installation process.

Figure 6-1 Installation process



IPS02C0003

7 Assembling the IFS06

This chapter describes the procedure for assembling an IFS06.

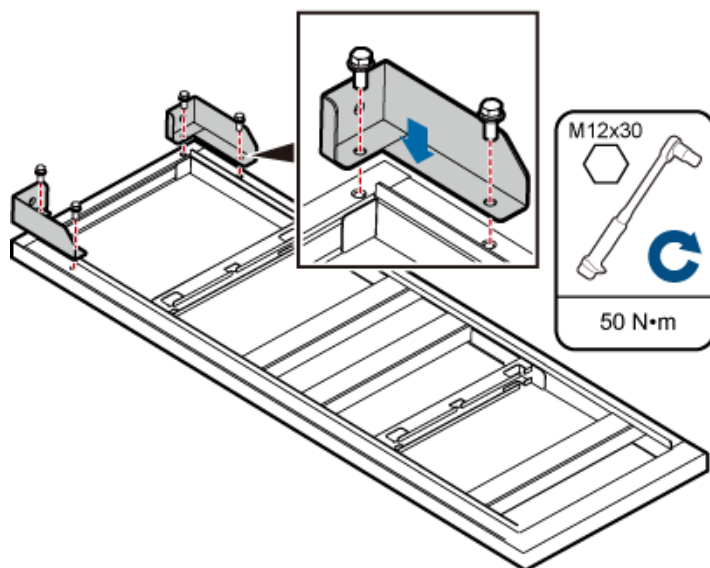
Procedure

- Step 1** Use four M12×30 bolt assemblies to secure rear feet to the main frame, with a torque of 50 N·m (442.54 lbf·in.), as shown in [Figure 7-1](#).

 **NOTE**

Place a foam pad or cardboard under the IFS06 to prevent any damage to the paint.

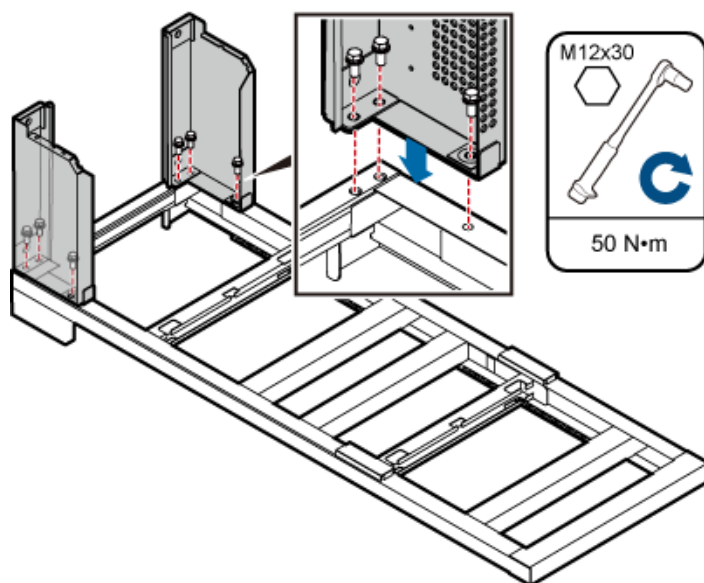
Figure 7-1 Installing the rear feet



PAS02C0018

- Step 2** Turn over the IFS06 and use six M12×30 bolt assemblies to secure front feet to the main frame, with a torque of 50 N·m (442.54 lbf·in.), as shown in [Figure 7-2](#).

Figure 7-2 Installing the front feet



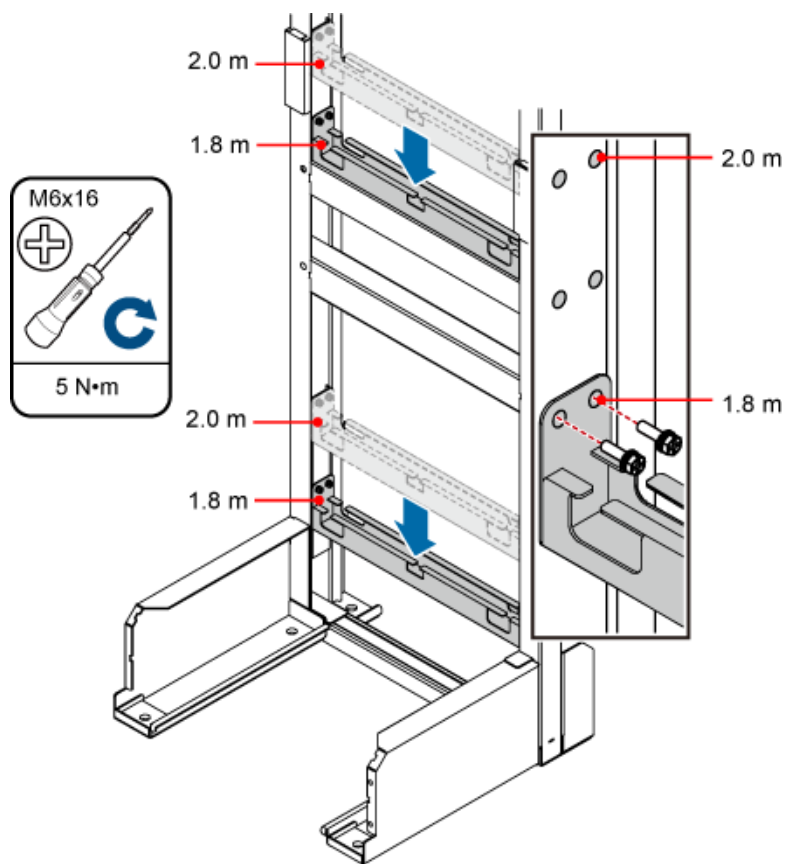
PAS02C0017

Step 3 Optional: In height-restricted scenarios, move the adjustable beams from the positions marked 2 m (6.56 ft) to the positions marked 1.8 m (5.91 ft), as shown in [Figure 7-3](#).

 **NOTE**

The adjustable beams do not need to be moved in height-unrestricted scenarios.

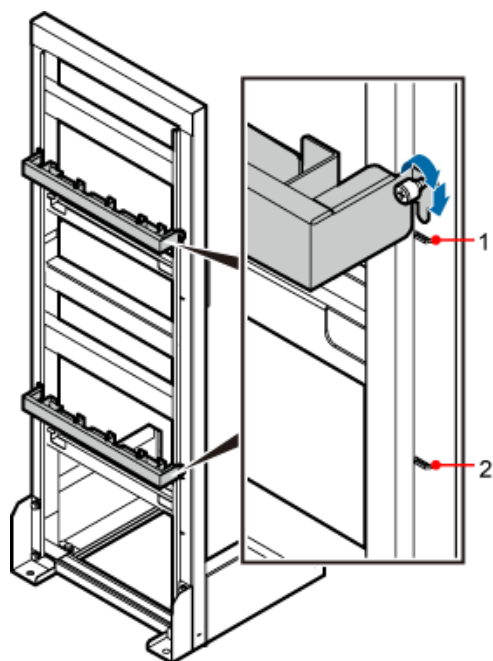
Figure 7-3 Moving the adjustable beam



PAS02C0112

Step 4 Insert the tabs of the cable trays into the slots on the columns of the IFS06, as shown in [Figure 7-4](#).

Figure 7-4 Installing cable trays

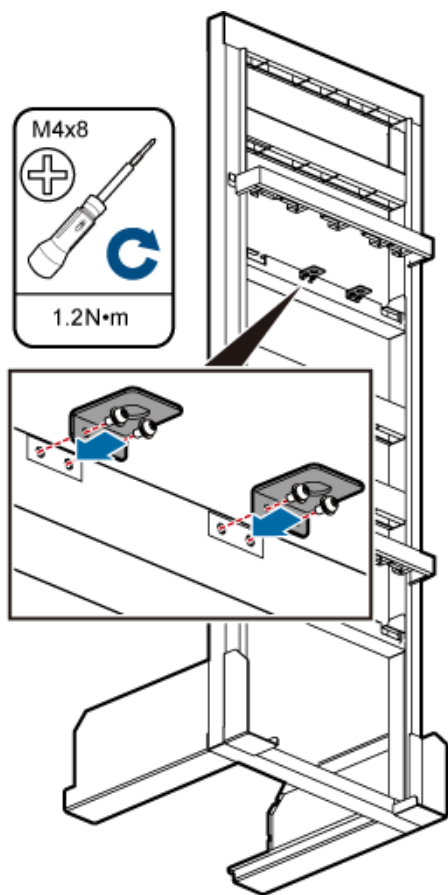


PAS02C0019

(1) Slots for installing cable trays in height-unrestricted scenarios (2) Slots for installing cable trays in height-restricted scenarios

Step 5 Secure the attachment plates for the GPS surge protector onto the upper adjustable beam, as shown in [Figure 7-5](#).

Figure 7-5 Installing the attachment plates for the GPS surge protector



PA502C0020

---End

8 Installing the IFS06

About This Chapter

This chapter describes the procedures for installing the IFS06 on the concrete floor and ESD floor.

[8.1 Installing the IFS06 on the Concrete Floor](#)

This section describes the procedure for installing the IFS06 on the concrete floor.

[8.2 Installing the IFS06 on the ESD Floor](#)

This section describes the procedure for installing the IFS06 on the ESD floor.

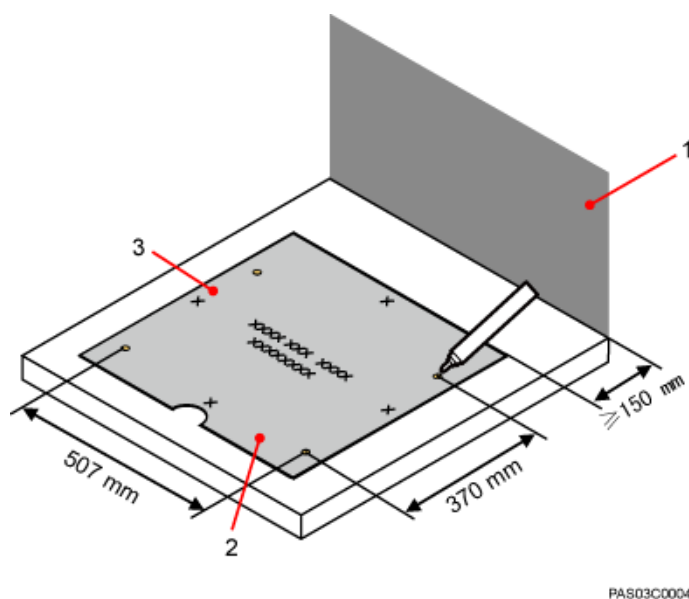
8.1 Installing the IFS06 on the Concrete Floor

This section describes the procedure for installing the IFS06 on the concrete floor.

Procedure

- Step 1** Place the marking-off template on the floor. Then use a marker to mark four anchor points, as shown in [Figure 8-1](#).

Figure 8-1 Marking anchor points



(1) Wall

(2) Front

(3) Left

- Step 2** Drill holes at the anchor points and install expansion bolt assemblies in the holes, as shown in the following figure.



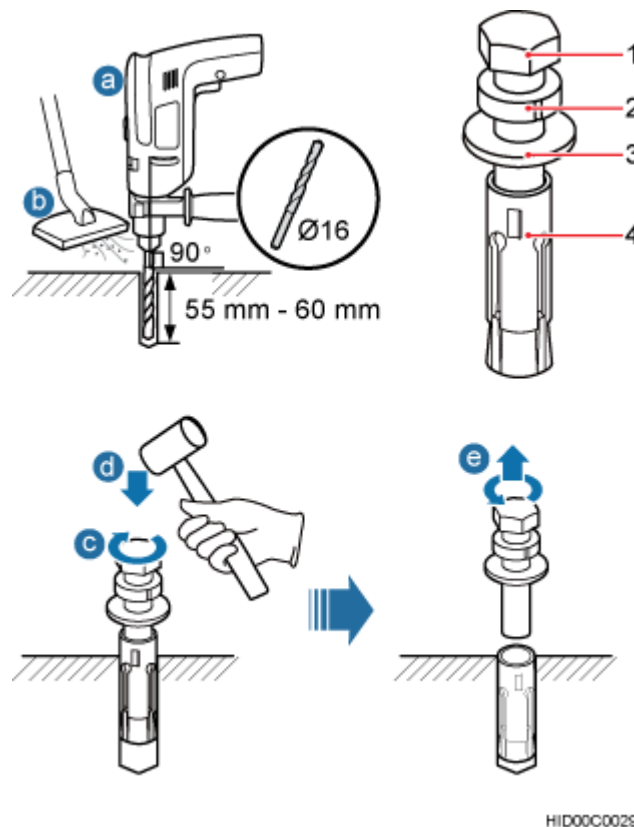
CAUTION

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

NOTE

Generally, the concrete floor is solid and smooth. Therefore, you can use the center punch to help locate the drill bit. If the conditions of the floor allow direct drilling, skip this step.

Figure 8-2 Drilling a hole and inserting an expansion bolt assembly



- (1) M12x60 bolts (2) Spring washer (3) Flat washer (4) Expansion tube

1. Use a hammer drill with a $\Phi 16$ drill bit to drill holes with a depth ranging from 55 mm (2.05 in.) to 60 mm (2.36 in.).
2. Use a vacuum cleaner to clear the dust out from inside and around the holes, and measure the distances between holes. If any of the hole is beyond the acceptable range, mark a new anchor point and drill a new hole.
3. Tighten an expansion bolt slightly and place it vertically into each hole.
4. Hit the expansion bolt with a rubber mallet until the expansion tube completely enters the hole.
5. Turning the M12x60 bolt, spring washer, and flat washer counterclockwise, and remove them in sequence.

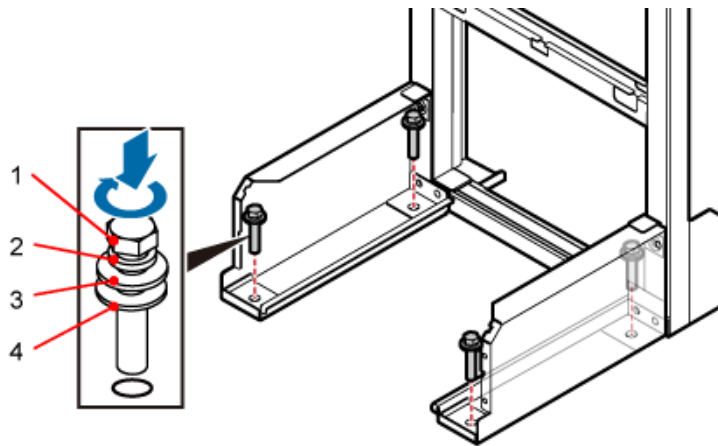
 **CAUTION**

After dismantling the expansion bolt assembly, ensure that the top of the expansion tube is level with the concrete floor. Otherwise, the cabinet cannot be installed on the concrete floor evenly and securely.

Step 3 Place the IFS06, as shown in [Figure 8-3](#).

1. Place the IFS06, with the mounting holes on the IFS06 aligned with the anchor points on the floor.
2. Lead each bolt through the spring washer, flat washer, and insulation washer in sequence. Then install the bolts in the mounting holes on the IFS06.
3. Partially tighten the bolts into the expansion tubes.

Figure 8-3 Installing the bolts



PAS02C0100

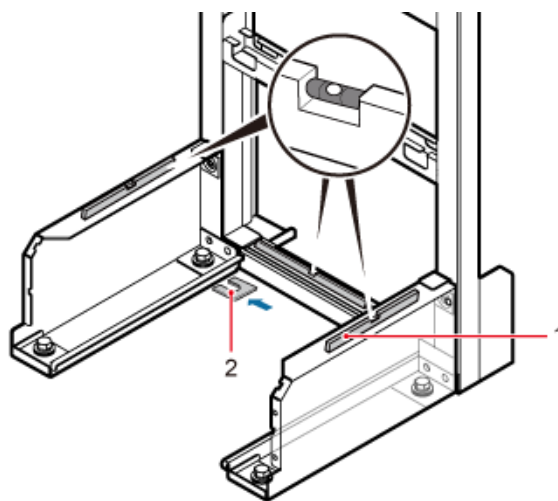
- (1) M12x60 bolt (2) Spring washer (3) Flat washer (4) Insulation washer

Step 4 Use a level to measure all sides of the frame and use spacers to level the frame if necessary, as shown in **Figure 8-4**.

NOTE

Spacers must be added at the positions where the expansion bolt assemblies are installed.

Figure 8-4 Checking and leveling the IFS06

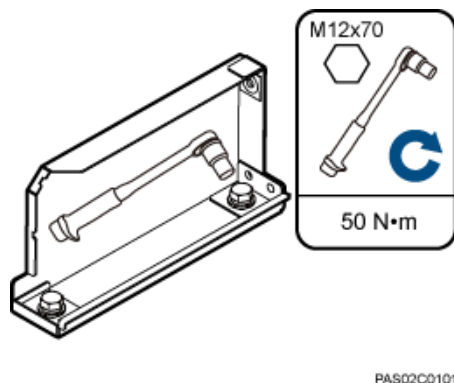


PAS02C0117

- (1) Level (2) Spacer

Step 5 Use a socket wrench to tighten the bolts to 50 N·m (442.54 lbf·in.), as shown in **Figure 8-5**.

Figure 8-5 Tightening the bolts



---End

8.2 Installing the IFS06 on the ESD Floor

This section describes the procedure for installing the IFS06 on the ESD floor.

Context

The following figure shows the support for installing the ESD floor.

Figure 8-6 Support for installing the ESD floor

(1) Mounting holes for the ESD floor (2) Support (3) Mounting holes for the concrete floor

There are three models of ESD floor supports, all of which are adjustable. The heights of ESD floors supported by the three models are listed in the following table.

Table 8-1 Heights of the two types of supports

Component	Applicable Height	Remark
Model I	$200 (7.87 \text{ in.}) \leq H \leq 270 (10.63 \text{ in.})$	<ul style="list-style-type: none"> ● The height can be adjusted within the adjustable range. ● When the height of the ESD floor is the same as the maximum or minimum value of the adjustable ranges, the model with a smaller adjustable range is preferred. For example, when the height of the
Model II	$270 (10.63 \text{ in.}) \leq H \leq 410 (16.14 \text{ in.})$	

Component	Applicable Height	Remark
Model III	410 (16.14 in.) ≤ H ≤ 700 (27.56 in.)	ESD floor is 410 mm (16.14 in.), model II is preferentially selected.

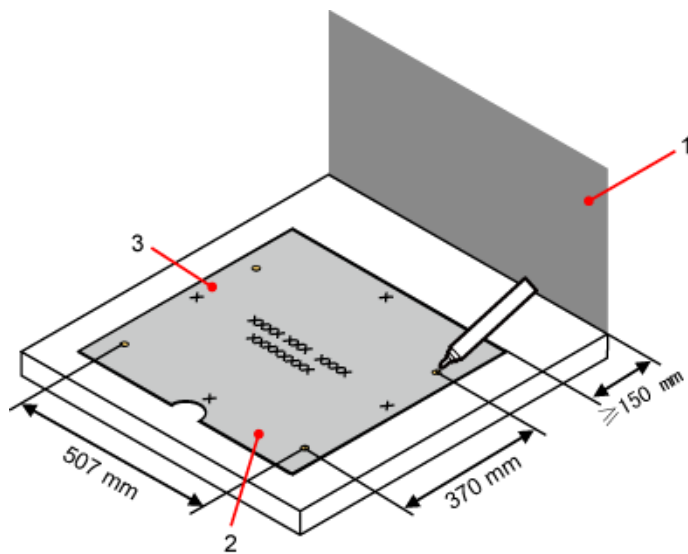
NOTE

The height of an ESD floor is the spacing between the concrete floor and the upper surface of the ESD floor.

Procedure

Step 1 Place the marking-off template on the ESD floor. Then use a marker to mark four anchor points, as shown in **Figure 8-7**.

Figure 8-7 Marking anchor points



(1) Wall

(2) Front

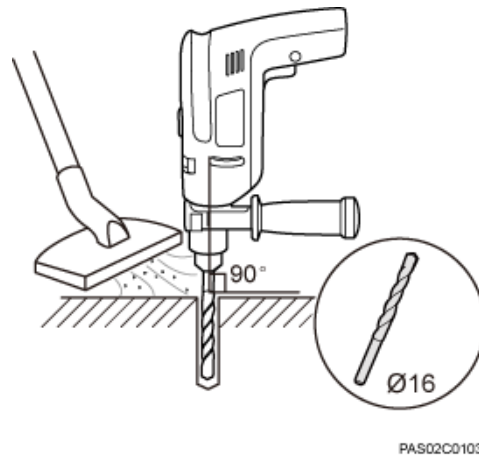
(3) Left

Step 2 Drill holes on the ESD floor, as shown in **Figure 8-8**. Ensure that the hammer drill penetrates the ESD floor.

NOTE

Use a vacuum cleaner to clear the dust out from inside and around all the holes, and measure the distances between holes. If any hole does not meet the requirements, mark new anchor points and drill new holes.

Figure 8-8 Drilling holes



Step 3 Drill holes on the concrete floor, as shown in **Figure 8-9**.

1. Place the support under the ESD floor, and use M12x70 bolts to fix the ESD floor to the support temporarily.
2. According to the support's mounting hole for the concrete floor, use a marker to mark the positions for installing expansion bolts.
3. Use a measuring tape to measure the inter-hole spacing, and ensure that the center-to-center separations of the holes are consistent.

Figure 8-9 Fixing the support to the ESD floor

(1) Mounting holes on the ESD floor (2) ESD floor (3) Mounting holes for the concrete floor

Step 4 Drill holes at the anchor points and install expansion bolt assemblies in the holes, as shown in the following figure.

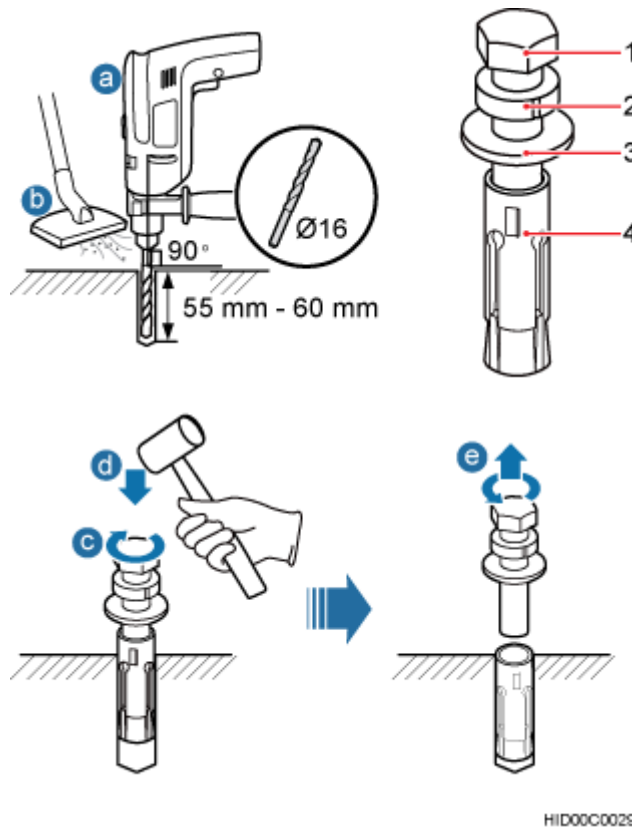
 **CAUTION**

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

 **NOTE**

Generally, the concrete floor is solid and smooth. Therefore, you can use the center punch to help locate the drill bit. If the conditions of the floor allow direct drilling, skip this step.

Figure 8-10 Drilling a hole and inserting an expansion bolt assembly



- (1) M12x60 bolts (2) Spring washer (3) Flat washer (4) Expansion tube

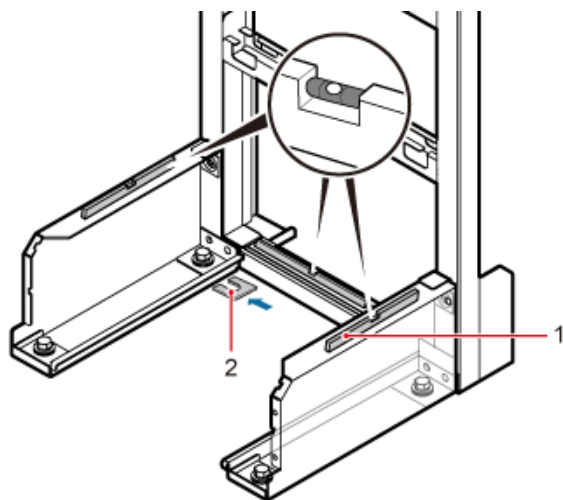
1. Use a hammer drill with a $\Phi 16$ drill bit to drill holes with a depth ranging from 55 mm (2.05 in.) to 60 mm (2.36 in.).
2. Use a vacuum cleaner to clear the dust out from inside and around the holes, and measure the distances between holes. If any of the hole is beyond the acceptable range, mark a new anchor point and drill a new hole.
3. Tighten an expansion bolt slightly and place it vertically into each hole.
4. Hit the expansion bolt with a rubber mallet until the expansion tube completely enters the hole.
5. Turning the M12x60 bolt, spring washer, and flat washer counterclockwise, and remove them in sequence.

 **CAUTION**

After dismantling the expansion bolt assembly, ensure that the top of the expansion tube is level with the concrete floor. Otherwise, the cabinet cannot be installed on the concrete floor evenly and securely.

- Step 5** Use a level to measure all sides of the frame and use spacers to level the frame if necessary, as shown in [Figure 8-11](#).

Figure 8-11 Checking and leveling the IFS06



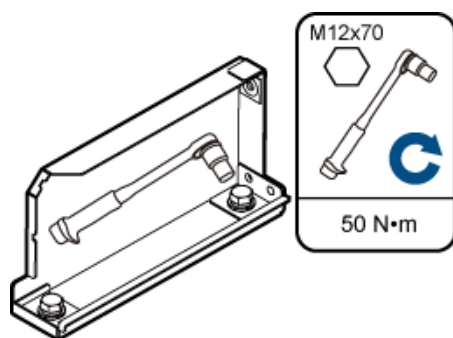
PAS02C0117

(1) Level

(2) Spacer

Step 6 Use a socket wrench to tighten the bolts to 50 N·m (442.54 lbf·in.), as shown in **Figure 8-12**.

Figure 8-12 Tightening the bolts



PAS02C0101

---End

9 Installing the Main Brackets for RRUs

About This Chapter

This chapter describes the procedures for installing the main brackets for DC RRUs and AC RRUs.

[9.1 Introduction to the Bracket Assembly](#)

This section describes the bracket assembly.

[9.2 Installing the Main Brackets for DC RRUs](#)

This section describes the procedure for installing the main brackets for DC RRUs.

[9.3 Installing the Main Brackets for AC RRUs](#)

This section describes the procedure for installing the main brackets for AC RRUs.

9.1 Introduction to the Bracket Assembly

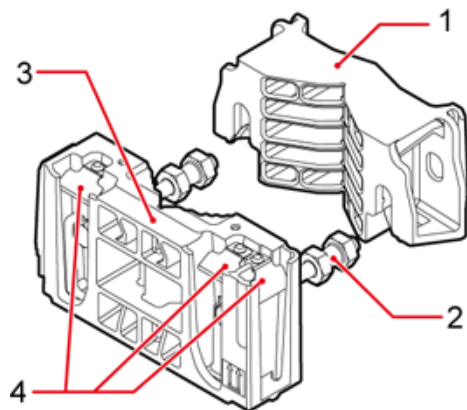
This section describes the bracket assembly.

Bracket assembly has three kinds, **Figure 9-1**, **Figure 9-2** and **Figure 9-3** shows a bracket assembly.

 **NOTE**

Only the main bracket is required for installing an RRU on an IFS06.

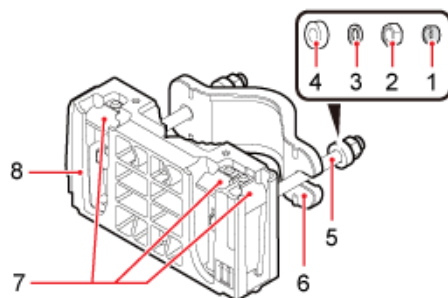
Figure 9-1 Bracket assembly (1)



PIR06C0004

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

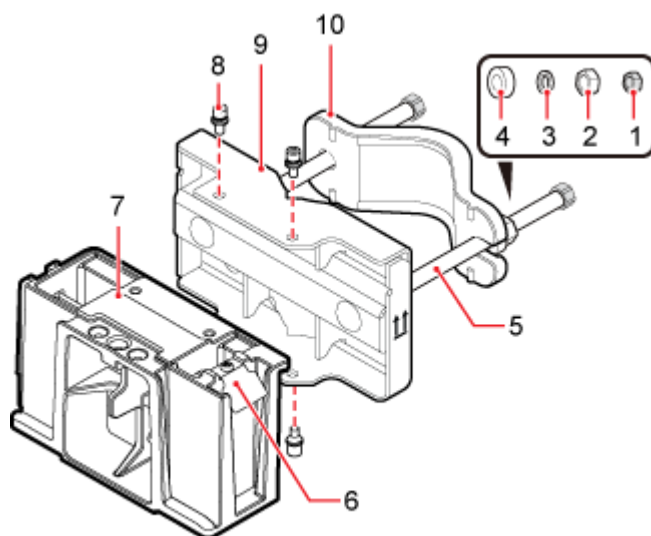
Figure 9-2 Bracket assembly (2)



PIR45C0004

- (1) Plastic cap (2) Standard M10 nut (3) Spring washer (4) Thick flat washer
(5) M10x150 bolt (6) Auxiliary bracket (7) Hoist clamp on the main bracket (8) Main bracket

Figure 9-3 Bracket assembly (3)



PIR61C0004

- | | | | | |
|-------------------------------------|----------------------|-------------------------|-------------------------------|------------------------|
| (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 |

9.2 Installing the Main Brackets for DC RRUs

This section describes the procedure for installing the main brackets for DC RRUs.

Context

NOTICE

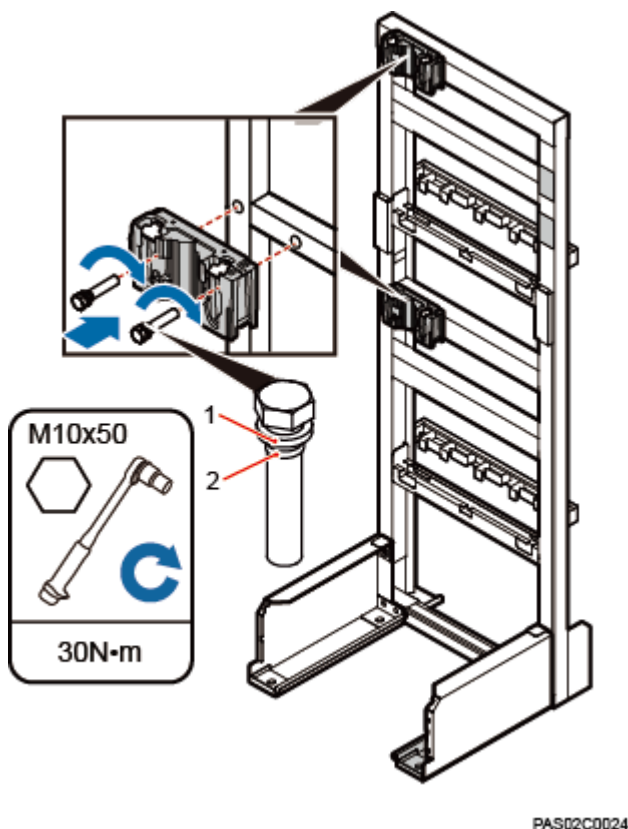
- Use the M10x50 bolts delivered with the IFS06 to install the main brackets for DC RRUs.
 - Install RRUs in the sequence from bottom to top and from left to right.
 - Ensure that the contact pieces on the main brackets are locked before RRUs are mounted.
 - Rubber washers are easily compressed or broken, whereas do not need to be replaced.
-

Procedure

- Height-unrestricted scenarios

Install the main brackets according to the label on the IFS06, as shown in [Figure 9-4](#).

Figure 9-4 Installing the main brackets in height-unrestricted scenarios



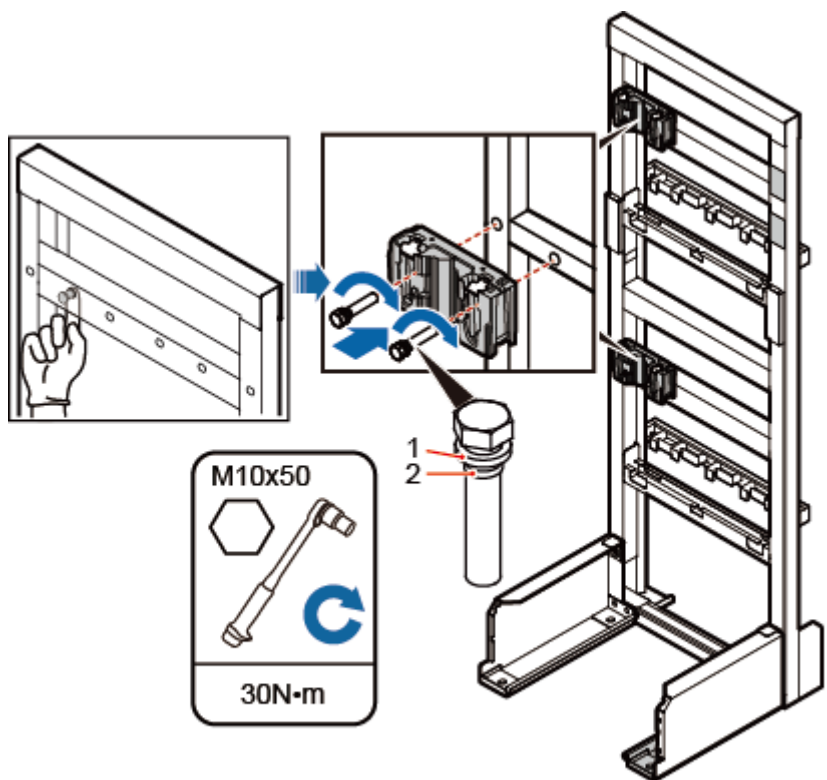
(1) Spring washer

(2) Rubber washer

- Height-restricted scenarios

Use one of your fingers to push and remove the rubber plugs on the beam and install the main brackets according to the label on the IFS06, as shown in [Figure 9-5](#).

Figure 9-5 Installing the main brackets in height-restricted scenarios



(1) Spring washer

(2) Rubber washer

---End

9.3 Installing the Main Brackets for AC RRUs

This section describes the procedure for installing the main brackets for AC RRUs.

Context



NOTICE

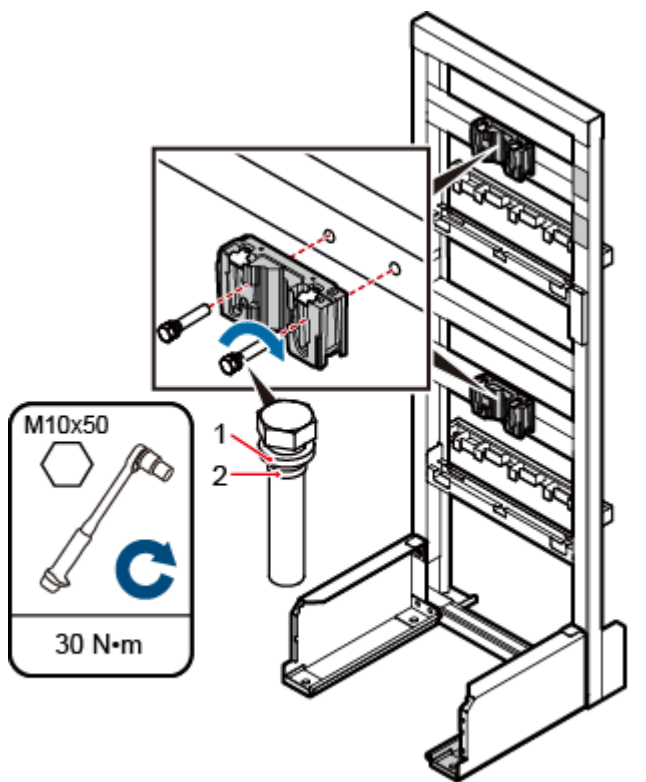
- Use the M10x50 bolts delivered with the IFS06 to install the main brackets for AC RRUs.
- Install RRUs in the sequence from bottom to top and from left to right.
- Ensure that the contact pieces on the main brackets are locked before RRUs are mounted.
- Rubber washers are easily compressed or broken, whereas do not need to be replaced.

Procedure

- Height-unrestricted scenarios

Install the main brackets according to the label on the IFS06, as shown in [Figure 9-6](#).

Figure 9-6 Installing the main brackets in height-unrestricted scenarios



PAS02C0021

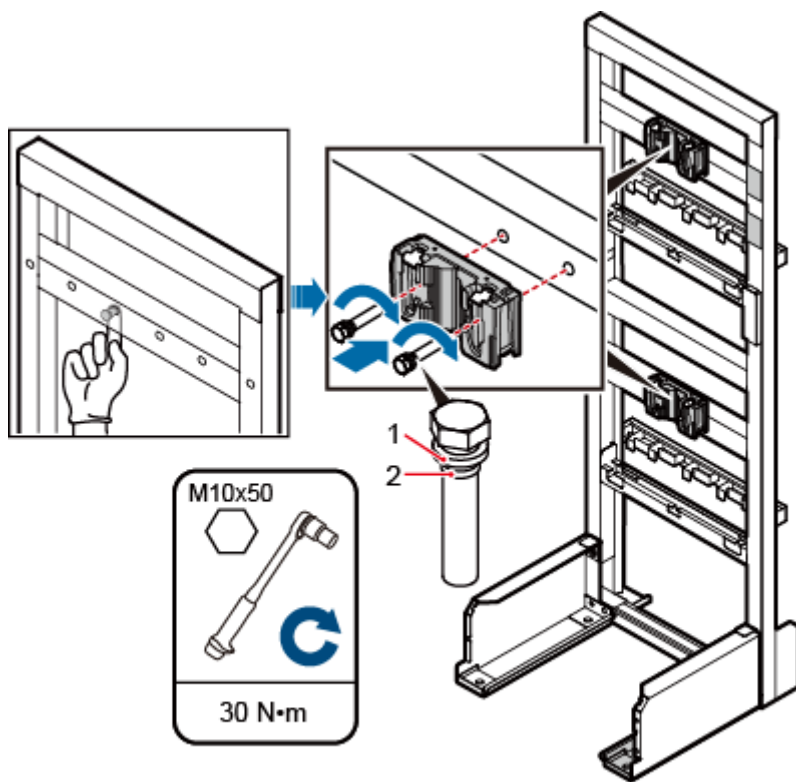
(1) Spring washer

(2) Rubber washer

- Height-restricted scenarios

Use one of your fingers to push and remove the rubber plugs on the beam and install the main brackets according to the label on the IFS06, as shown in [Figure 9-7](#).

Figure 9-7 Installing the main brackets in height-restricted scenarios



PAS02C0023

(1) Spring washer

(2) Rubber washer

---End

10 Installing the GPS Surge Protector

This chapter describes the procedure for installing the GPS surge protector.

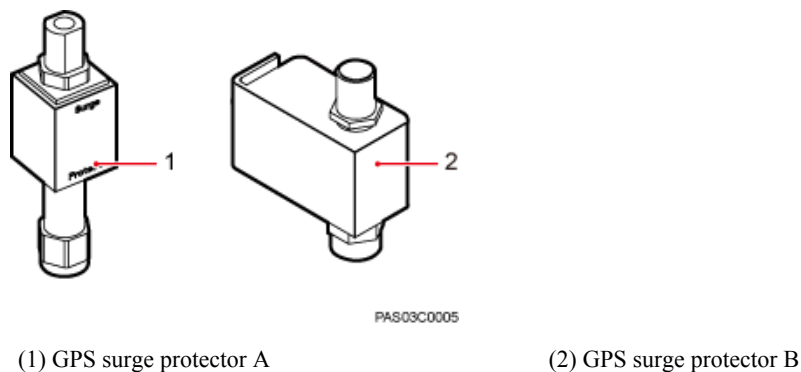
Context

Two types of GPS surge protector can be installed on the IFS06, as shown in [Figure 10-1](#).

NOTE

- One or two GPS surge protectors can be installed on the IFS06, depending on the onsite requirements.
- GPS surge protector A does not require a PGND cable.

Figure 10-1 GPS surge protector



Procedure

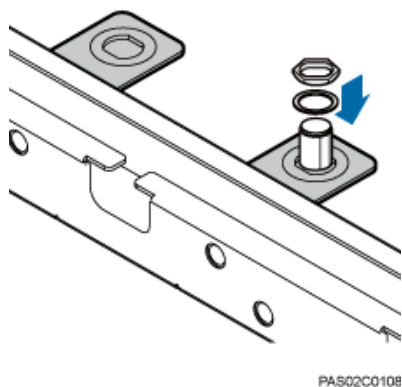
- Step 1** Remove the nut and toothed washer from the type N female connector of the GPS clock signal cable, as shown in [Figure 10-2](#).

Figure 10-2 Removing the nut and toothed washer



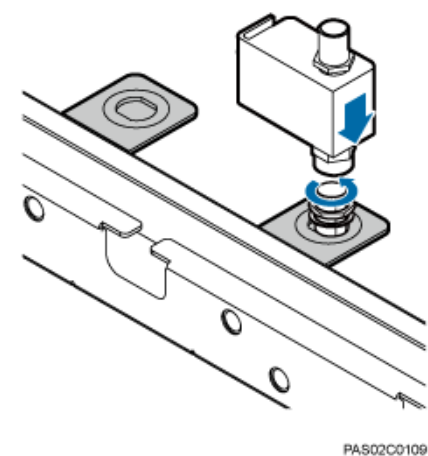
- Step 2** Fix the type N female connector of the GPS clock signal cable to the attachment plate, as shown in [Figure 10-3](#).

Figure 10-3 Installing the type N female connector



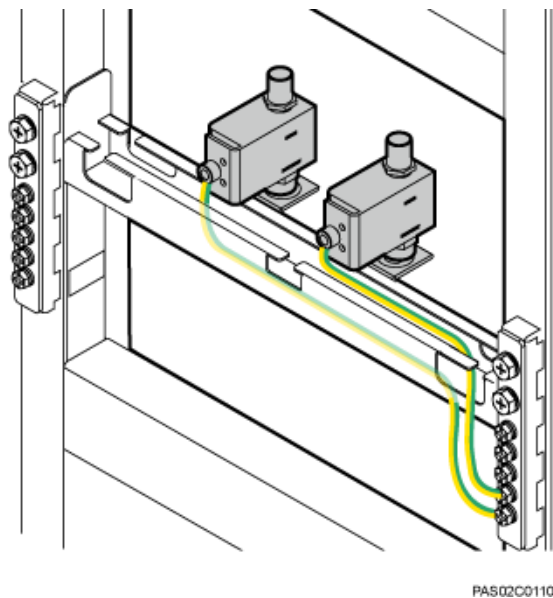
- Step 3** Secure the GPS surge protector to the attachment plate. Partially tighten the GPS surge protector with hands, and use an adjustable wrench to tighten it, as shown in [Figure 10-4](#).

Figure 10-4 Installing the GPS surge protector



- Step 4** Connect the OT terminal at one end of the PGND cable for the GPS surge protector to the ground terminal on the GPS surge protector, and the other end of the PGND cable to the ground bar on the IFS06, as shown in [Figure 10-5](#).

Figure 10-5 Installing the PGND cable for the GPS surge protector



- Step 5** Lay out the cables according to the instructions in [15.1 Cabling Requirements](#), and use cable ties to bind the cables.
- Step 6** Label the installed cables according to the instructions in [Attaching a Sign Plate Label](#).

---End

11 Installing the IMB03

About This Chapter

This chapter describes the procedure for installing the IMB03.

[11.1 Installing the Upper IMB03 Independently](#)

This section describes the procedure for installing the upper IMB03 independently.

[11.2 Installing the Lower IMB03 Independently](#)

This section describes the procedure for installing the lower IMB03 independently.

[11.3 Installing the IMB03s on the Upper and Lower Levels](#)

This section describes the procedure for installing the IMB03s on the upper and lower levels.

11.1 Installing the Upper IMB03 Independently

This section describes the procedure for installing the upper IMB03 independently.

Context

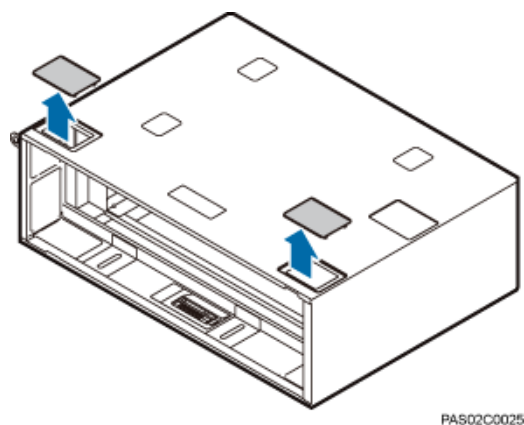
 **NOTE**

The operations in this section apply to the scenario where only the upper IMB03 is required.

Procedure

- Step 1** Use one of your fingers to push and remove the two protective plates on the top of the IMB03, as shown in [Figure 11-1](#).

Figure 11-1 Removing the protective plates

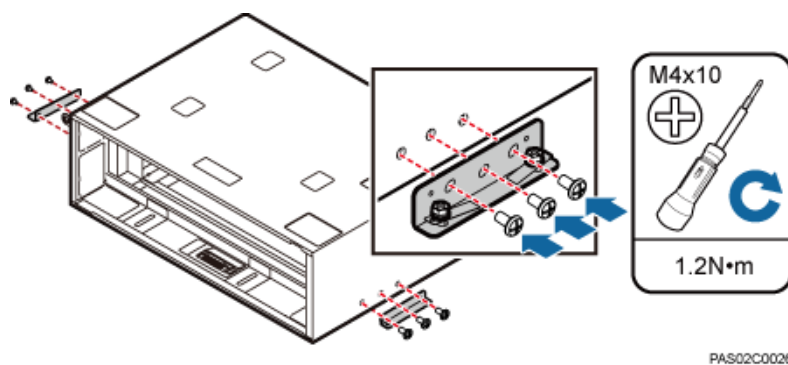


 **NOTE**

After all cables are installed, if there is spare space in the cable holes, cut the protective plates to an appropriate shape to seal the cable holes.

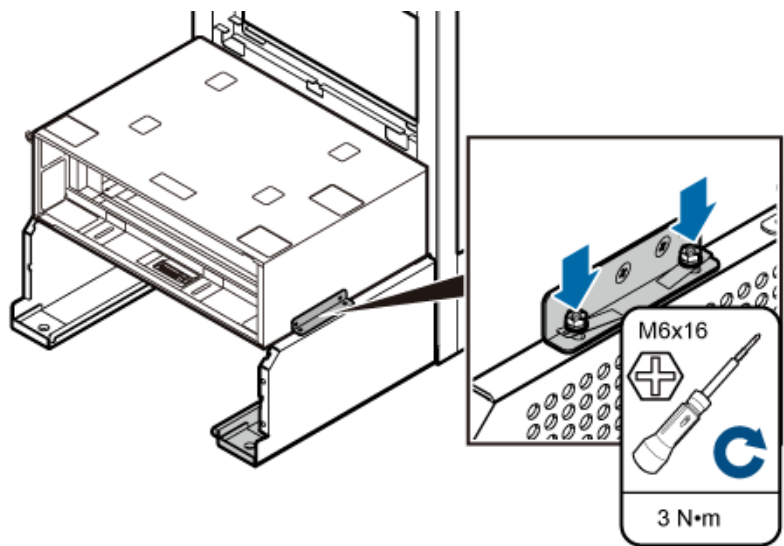
- Step 2** Install two mounting ears horizontally on both sides of the IMB03 and tighten the three screws on each side to 1.2 N·m (10.62 lbf·in.), as shown in [Figure 11-2](#).

Figure 11-2 Installing mounting ears horizontally



- Step 3** Place the IMB03 on the feet and tighten the two screws on both feet to secure the IMB03 onto the ICR, with a torque of 3 N·m (26.55 lbf·in.), as shown in [Figure 11-3](#).

Figure 11-3 Securing the IMB03 to the feet of the ICR



PAS02C0028

---End

11.2 Installing the Lower IMB03 Independently

This section describes the procedure for installing the lower IMB03 independently.

Context

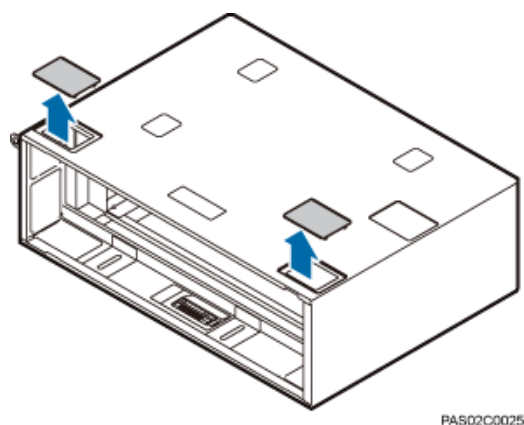
 **NOTE**

The operations in this section apply to the scenario where only the lower IMB03 is required.

Procedure

- Step 1** Use one of your fingers to push and remove the two protective plates on the top of the lower IMB03, as shown in [Figure 11-4](#).

Figure 11-4 Removing the protective plates

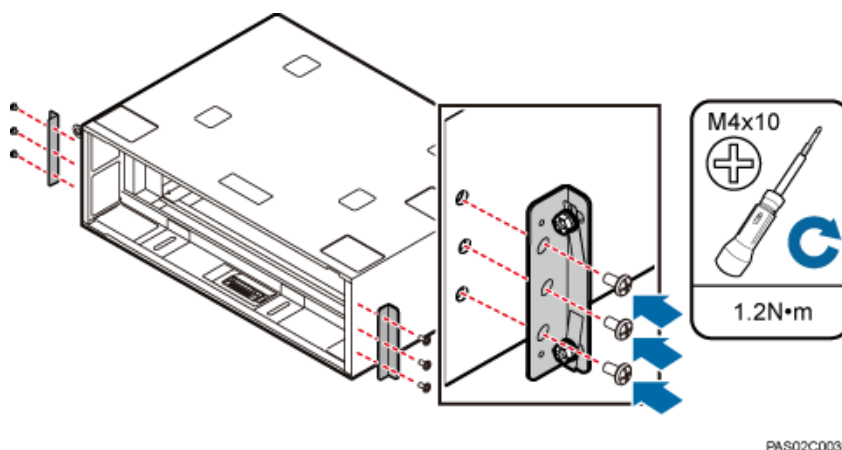


NOTE

After all cables are installed, if there is spare space in the cable holes, cut the protective plates to an appropriate shape to seal the cable holes.

- Step 2** Install two mounting ears vertically on both sides of the IMB03 and tighten the three screws on each side to 1.2 N·m (10.62 lbf·in.), as shown in **Figure 11-5**.

Figure 11-5 Installing mounting ears vertically



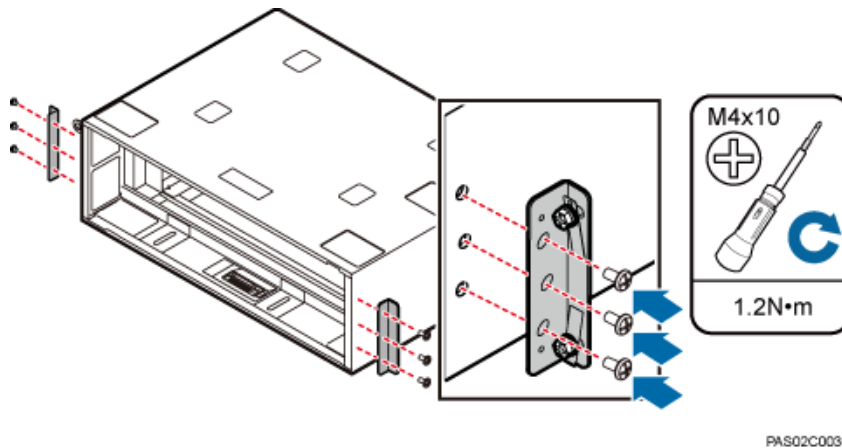
- Step 3** Place the IMB03 in between the feet and tighten the two screws on both feet to secure the IMB03 onto the ICR, with a torque of 3 N·m (26.55 lbf·in.), as shown in **Figure 11-6**.

 **NOTE**

After all cables are installed, if there is spare space in the cable holes, cut the protective plates to an appropriate shape to seal the cable holes.

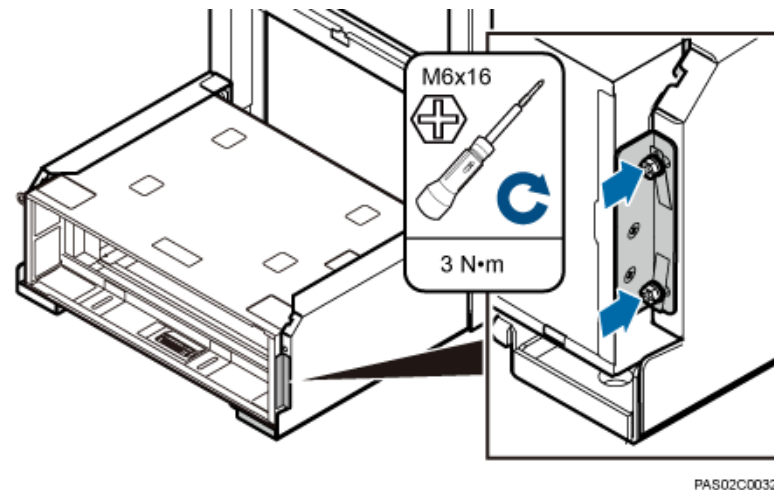
- Step 2** Install two mounting ears vertically on both sides of the IMB03 and tighten the three screws on each side to 1.2 N·m (10.62 lbf·in.), as shown in [Figure 11-8](#).

Figure 11-8 Installing mounting ears vertically



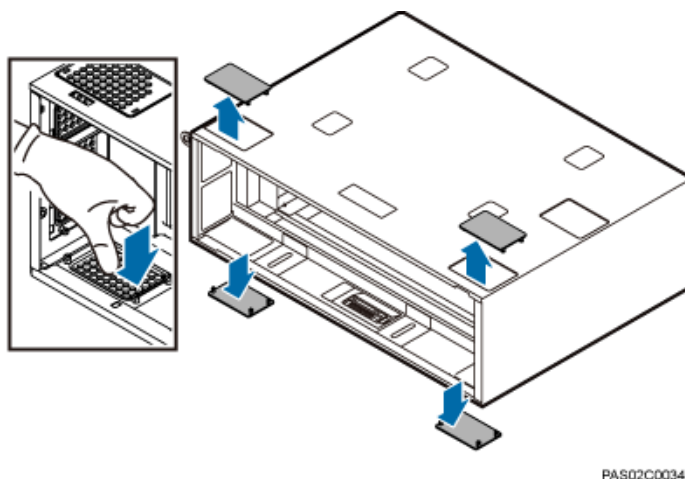
- Step 3** Place the IMB03 in between the feet and tighten the two screws on both feet to secure the IMB03 onto the ICR, with a torque of 3 N·m (26.55 lbf·in.), as shown in [Figure 11-9](#).

Figure 11-9 Securing the IMB03 to the feet of the ICR



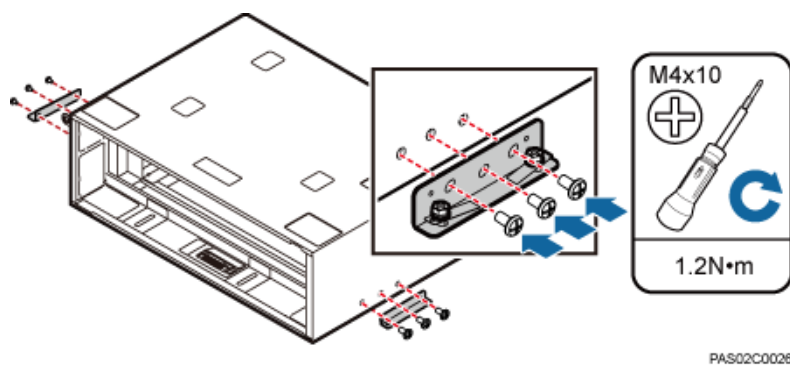
- Step 4** Use one of your fingers to push and remove the two protective plates on the top and two protective plates at the bottom of the upper IMB03, as shown in [Figure 11-10](#).

Figure 11-10 Removing the protective plates from the upper IMB03



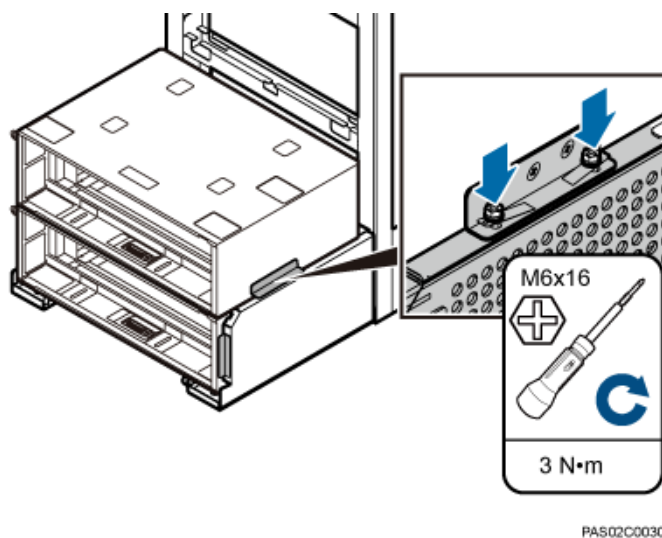
Step 5 Install two mounting ears horizontally on both sides of the IMB03 and tighten the three screws on each side to 1.2 N·m (10.62 lbf·in.), as shown in **Figure 11-11**.

Figure 11-11 Installing mounting ears horizontally



Step 6 Place the IMB03 on the feet and tighten the two screws on each foot to secure the IMB03 onto the ICR, with a torque of 3 N·m (26.55 lbf·in.), as shown in **Figure 11-12**.

Figure 11-12 Securing the IMB03 to the feet of the ICR



---End

12 Installing the Equipotential Cable and PGND Cable

This chapter describes the procedures for installing the equipotential cable and PGND cable.

Prerequisites

A PGND cable and an equipotential cable need to be prepared onsite. [Table 12-1](#) lists the specifications of a PGND cable and an equipotential cable.

Table 12-1 Cable specifications

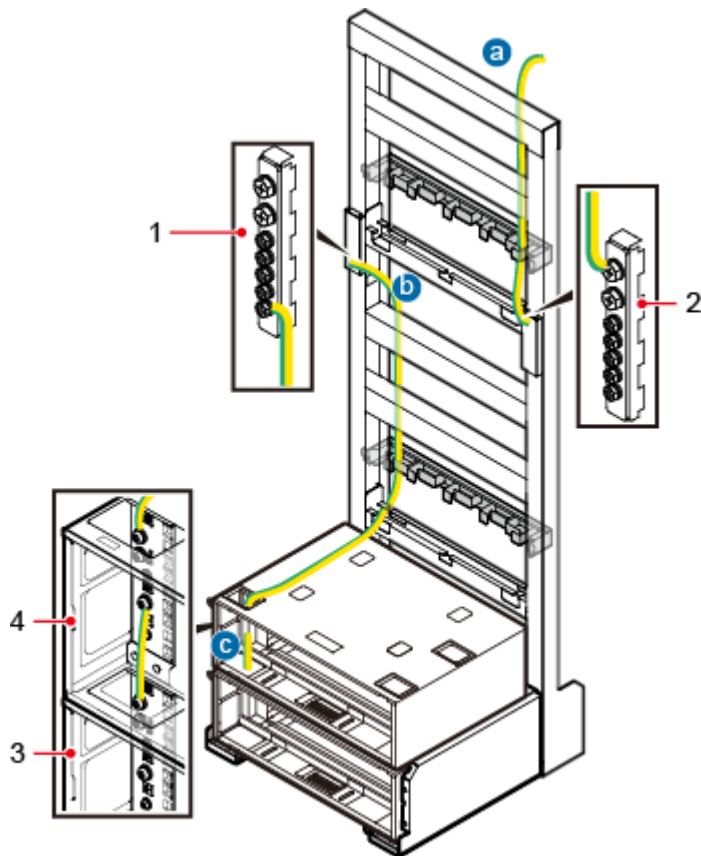
Cable	Connector at One End	Connector at the Other End	Cross-Sectional Area of the Cable
PGND cable	OT terminal (M8)	Depending on the external ground bar	16 mm ² (0.025 in. ²)
Equipotential cable between the IFS06 and the IMB03	OT terminal (M6)	OT terminal (M6)	16 mm ² (0.025 in. ²)
Equipotential cable between the upper and lower IMB03s	OT terminal (M4)	OT terminal (M4)	6 mm ² (0.009 in. ²)

Procedure

- Step 1** Cut the cable to a length suitable for the actual cable route.
- Step 2** Add an OT terminal to each end of the cable according to the instructions in Assembling the OT Terminal and the Power Cable.
- Step 3** Install the PGND cable and equipotential cable, as shown in [Figure 12-1](#).

1. Connect one end of the PGND cable to ground bar 2 on the IFS06.
2. Connect one end of the equipotential cable to ground bar 1 on the IFS06 and the other end to the ground bar on the upper IMB03.
3. Connect one end of the equipotential cable to the ground bar on the upper IMB03 and the other end to the ground bar on the lower IMB03.

Figure 12-1 Installing a PGND cable and an equipotential cable



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(1) Ground bar 1

(2) Ground bar 2

(3) Lower IMB03

(4) Upper IMB03

Step 4 Lay out the cables according to the instructions in [15.1 Cabling Requirements](#), and use cable ties to bind the cables.

Step 5 Label the installed cables according to the instructions in [Attaching a Cable-Tying Label](#).

----End

13 Installing Components in the IMB03

About This Chapter

This chapter describes the procedures for installing components in the IMB03.

[13.1 Components in an IMB03](#)

This section describes the components to be installed in an IMB03.

[13.2 Installing the BBU](#)

This chapter describes the procedure for installing the BBU in the IMB03.

[13.3 Installing the DCDU-03B, DCDU-11B or DCDU-12B](#)

This chapter describes the procedure for installing the DCDU-03B, DCDU-11B or DCDU-12B in the IMB03.

[13.4 \(Optional\) Installing the DC/DC Power System](#)

This section describes the procedure for installing the DC/DC power system in the IMB03.

[13.5 \(Optional\) Installing the AC/DC Power System](#)

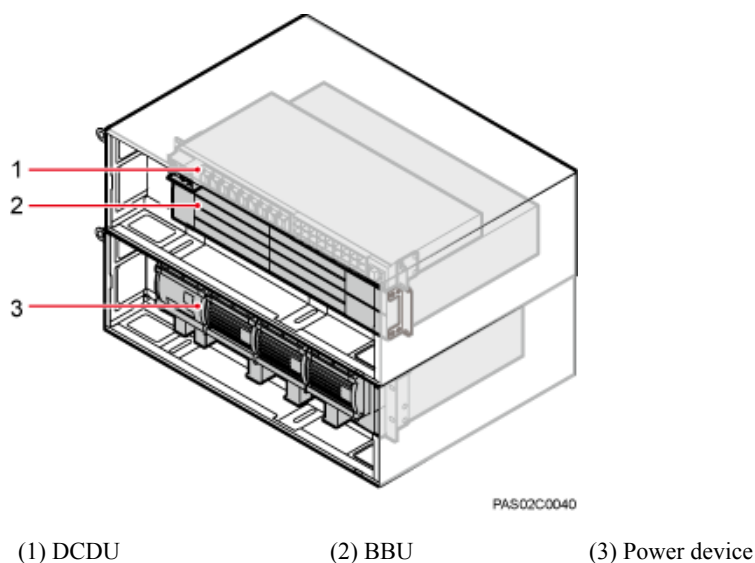
This section describes the procedure for installing the AC/DC power system in the IMB03.

13.1 Components in an IMB03

This section describes the components to be installed in an IMB03.

See [3.2 Installation Scenarios](#) for the number of required IMB03 subracks and the components to be installed in each IMB03 subrack. Then see the slot assignment label in the IMB03 for the component installation positions. [Figure 13-1](#) shows the scenario where the DCDU, BBU, and power devices are installed in two IMB03 subracks.

Figure 13-1 IMB03 slot assignment



13.2 Installing the BBU

This chapter describes the procedure for installing the BBU in the IMB03.

Context

 **NOTE**

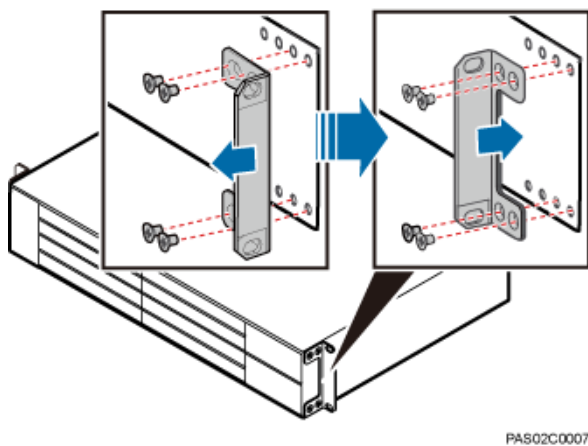
- The BBU3900/BBU3910 has a left-in-right-out ventilation channel. It can be stacked with equipment using a left-in-right-out ventilation channel but cannot be stacked with equipment using a right-in-left-out ventilation channel.
- For an indoor application, the BBU3900/BBU3910 can be installed in a standardized indoor equipment room but cannot be installed in an equipment room using direct ventilation.
- For an outdoor application, the BBU3900/BBU3910 can be installed in a cabinet using a heat exchanger but cannot be installed in a cabinet using direct ventilation. For the specific cabinet types, see the related hardware documentation.

Procedure

- Step 1** Install a mounting ear reversely on each side of the BBU, as shown in [Figure 13-2](#).

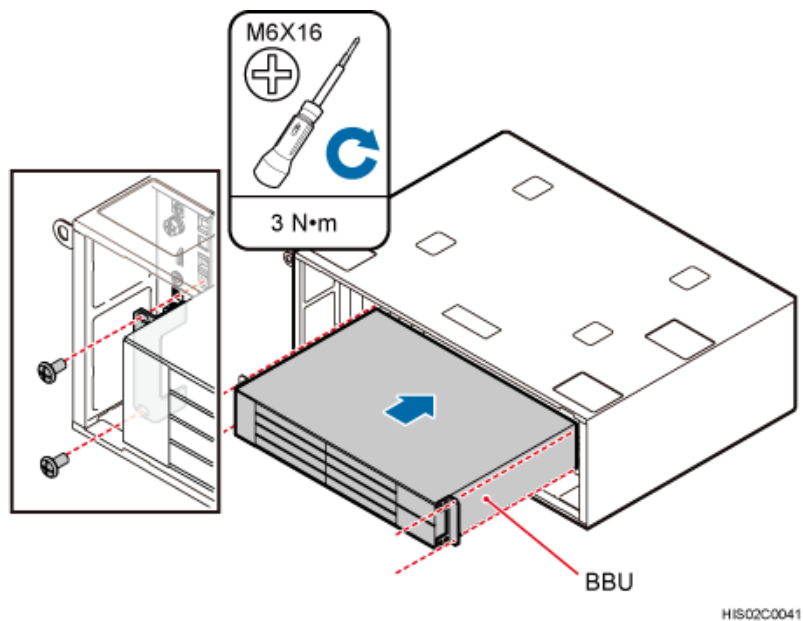
1. Remove the four M4 screws from the mounting ear on each side of the BBU.
2. Install the mounting ears reversely and tighten the four M4 screws on each of the mounting ears, with a torque of 1.2 N·m (10.62 lbf·in.).

Figure 13-2 Installing mounting ears reversely



- Step 2** Install the BBU into the corresponding slot in the IMB03. Then tighten the four M6x16 screws on the mounting ears to 3 N·m (26.55 lbf·in.), as shown in [Figure 13-3](#).

Figure 13-3 Installing the BBU



---End

13.3 Installing the DCDU-03B, DCDU-11B or DCDU-12B

This chapter describes the procedure for installing the DCDU-03B, DCDU-11B or DCDU-12B in the IMB03.

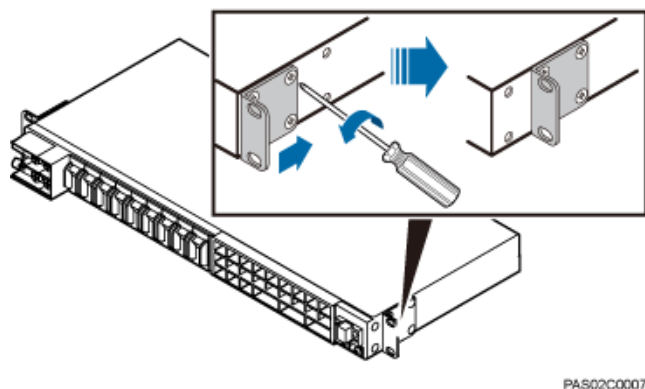
Context

The method of installing the DCDU-11B and DCDU-12B is the same as the method of installing the DCDU-03B. This section uses the DCDU-03B as an example.

Procedure

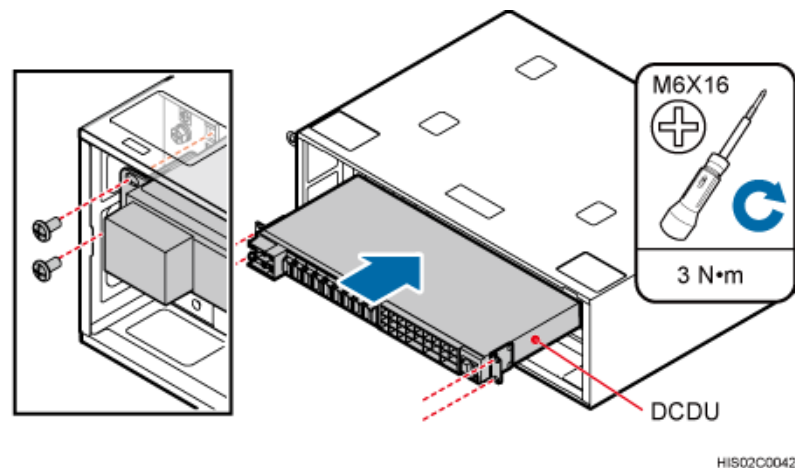
- Step 1** Move the mounting ears on the DCDU-03B, as shown in [Figure 13-4](#).
1. Remove the four M4 screws from the mounting ear on each side of the DCDU-03B.
 2. Move each mounting ear backwards by one hole and tighten the four removed M4 screws on the mounting ear to 1.2 N·m (10.62 lbf·in.).

Figure 13-4 Installing the DCDU-03B



- Step 2** Install the DCDU-03B into the corresponding slot in the IMB03. Then tighten the four M6x16 screws on the mounting ears to 3 N·m (26.55 lbf·in.), as shown in [Figure 13-5](#).

Figure 13-5 Installing the DCDU-03B



---End

13.4 (Optional) Installing the DC/DC Power System

This section describes the procedure for installing the DC/DC power system in the IMB03.

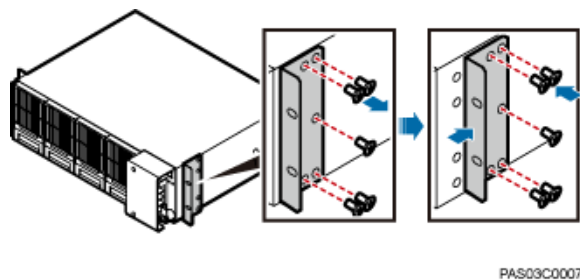
Context

The DC/DC power system needs to be installed in the scenarios with +24 V DC power supply.

Procedure

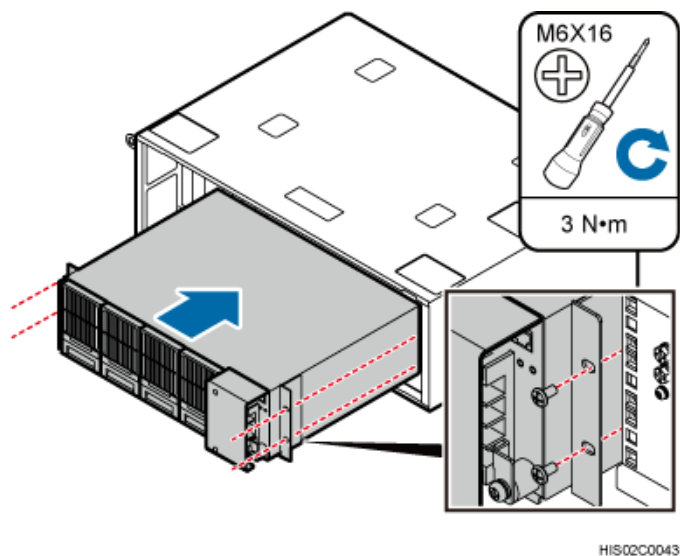
- Step 1** Move the mounting ears on the DC/DC power system to the middle holes, as shown in [Figure 13-6](#).
1. Remove the screws on the mounting ears on both sides of the DC/DC power system.
 2. Move the mounting ears backwards to the middle holes.
 3. Tighten the mounting ear on each side of the DC/DC power system to 1.2 N·m (10.62 lbf·in.).

Figure 13-6 Moving the mounting ears to the middle holes



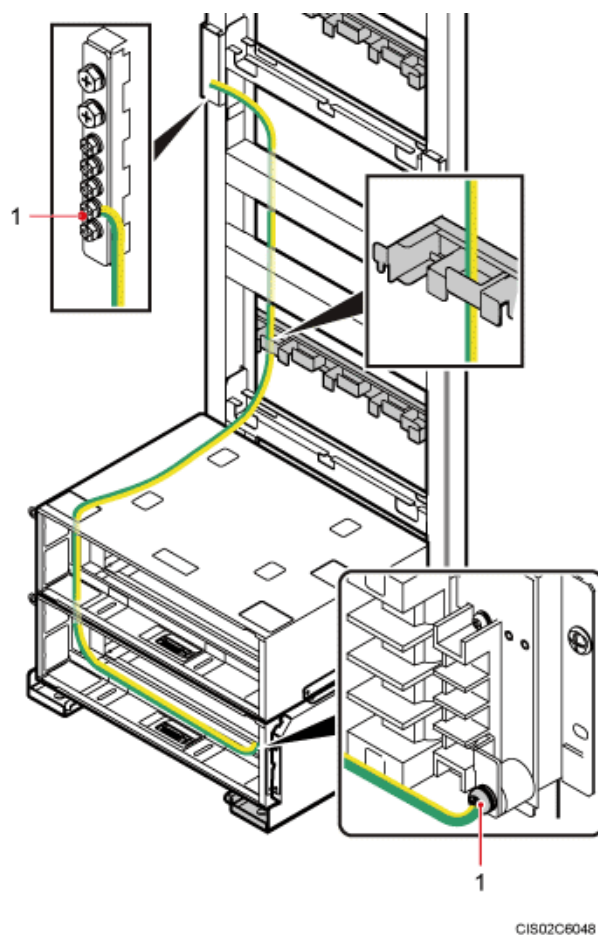
- Step 2** Install the DC/DC power system into the corresponding slot in the lower IMB03. Then tighten the four M6x16 panel screws to 3 N·m (26.55 lbf·in.), as shown in [Figure 13-7](#).

Figure 13-7 Installing the DC/DC power system



- Step 3** Cut the PGND cable to a length suitable for the actual cable route.
- Step 4** Add an OT terminal to each end of the cable according to the instructions in Assembling the OT Terminal and the Power Cable.
- Step 5** Connect the OT terminal (M6) at one end of the PGND cable to the DC/DC power system and the OT terminal (M6) at other end to the IFS06, as shown in [Figure 13-8](#).

Figure 13-8 Installing the PGND cable for the DC/DC power system



(1) OT terminal (M6)

----End

13.5 (Optional) Installing the AC/DC Power System

This section describes the procedure for installing the AC/DC power system in the IMB03.

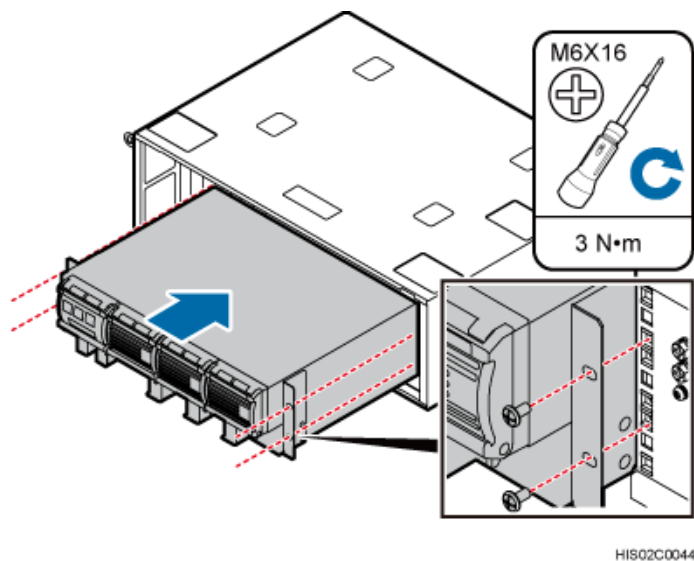
Context

The AC/DC power system needs to be installed in the scenarios with 220 V AC power supply.

Procedure

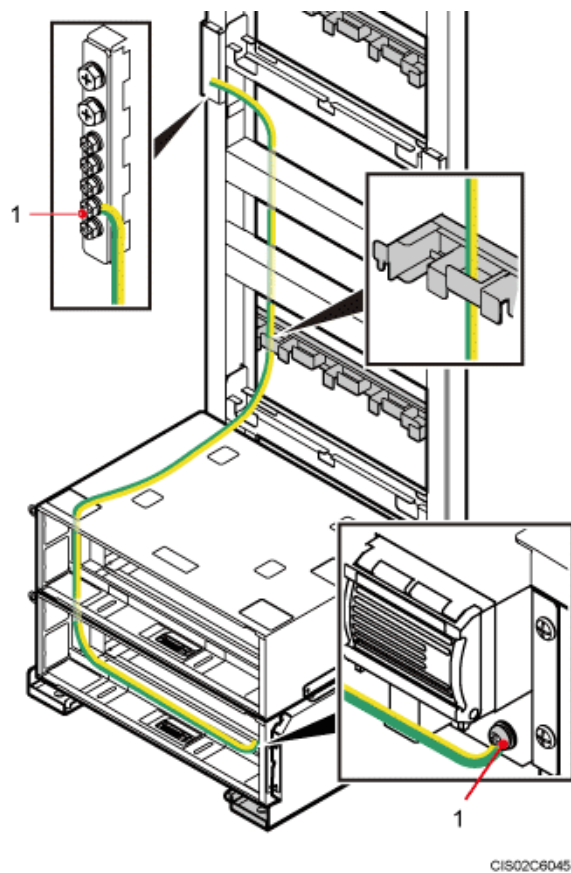
- Step 1** Install the AC/DC power system into the corresponding slot in the lower IMB03. Then tighten the four M6x16 panel screws to 3 N·m (26.55 lbf·in.), as shown in [Figure 13-9](#).

Figure 13-9 Installing the AC/DC power system



- Step 2** Cut the PGND cable to a length suitable for the actual cable route.
- Step 3** Add an OT terminal to each end of the cable according to the instructions in Assembling the OT Terminal and the Power Cable.
- Step 4** Connect the OT terminal (M6) at one end of the PGND cable to the AC/DC power system and the OT terminal (M6) at other end to the IFS06, as shown in [Figure 13-10](#).

Figure 13-10 Installing the PGND cable for the AC/DC power system



(1) OT terminal (M6)

Step 5 Lay out the cable according to the instructions in [15.1 Cabling Requirements](#), and use cable ties to bind the cable.

Step 6 Label the installed cable according to the instructions in [Attaching a Cable-Tying Label](#).

----End

14 Installing RRUs

About This Chapter

This chapter describes the procedures for installing DC and AC RRUs.

[14.1 Installing DC RRUs](#)

This section describes the procedure for installing DC RRUs.

[14.2 Installing AC RRUs](#)

This section describes the procedure for installing AC RRUs.

14.1 Installing DC RRUs

This section describes the procedure for installing DC RRUs.

Context

The method of installing DC RRUs in the IFS06+IMB03+RRU scenario is the same as the method of installing DC RRUs in the IFS06+RRU scenario. This section uses the IFS06+RRU scenario as an example.

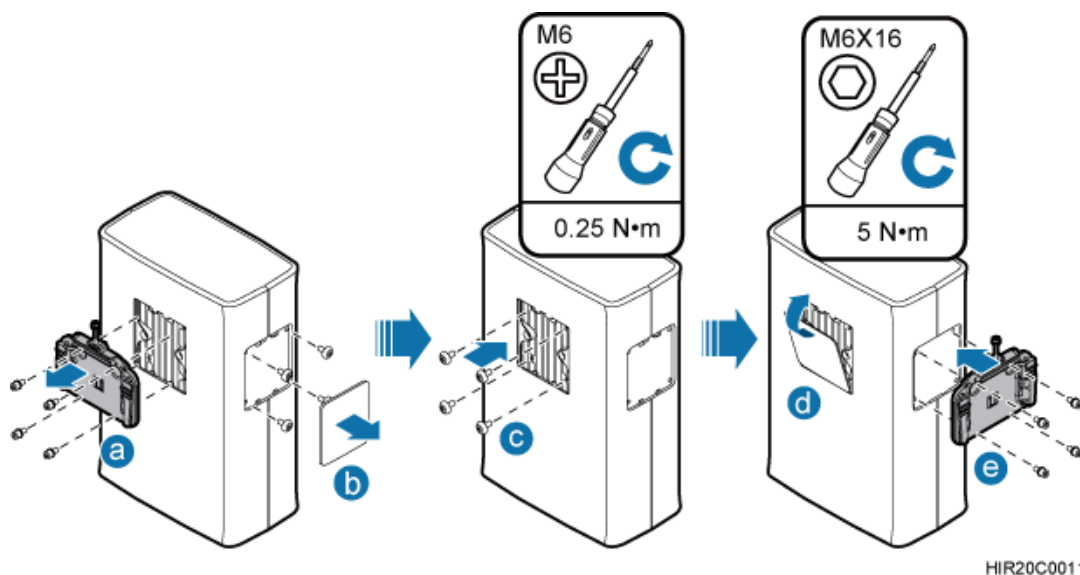
NOTE

- Place a foam pad or cardboard under an RRU to protect the RRU housing from damage during the installation.
- Do not stand the RRU upright because the RF ports cannot support the weight of the RRU.
- The bolts used for installing an attachment plate on one side of an RRU are the bolts removed from the attachment plate at the rear of the RRU.

Procedure

- Step 1** Interchange the attachment plate and stainless steel screws at the rear of the RRU and the cover plate and plastic screws on one side of the RRU, as shown in [Figure 14-1](#).

Figure 14-1 Interchanging the attachment plate at the rear of the RRU with the cover plate on one side of the RRU



1. Use a hex key wrench to remove the attachment plate from the rear of the RRU.
2. **Optional:** Remove the cover plate from one side of the RRU, and use a Phillips screwdriver to remove the plastic screws from the RRU.

NOTE

The plastic screws of some RRUs do not need to be removed.

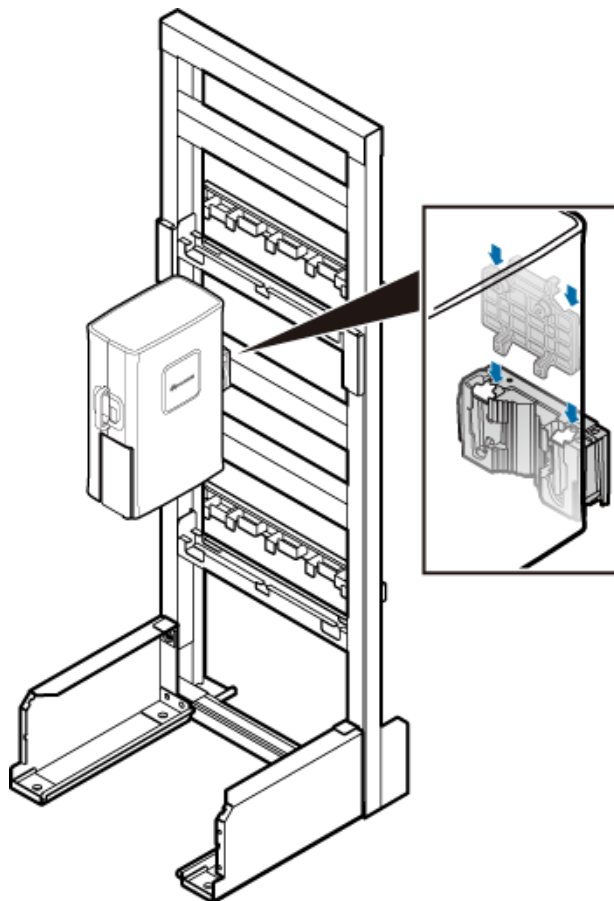
3. **Optional:** Install the plastic screws onto the rear of the RRU, and use a torque screwdriver to tighten the screws to 0.25 N·m (2.21 lbf·in.).
4. Install the cover plate onto the rear of the RRU.
5. Install the attachment plate onto one side of the RRU, and use a torque screwdriver to tighten the stainless steel screws on the attachment plate to 5 N·m (44.25 lbf·in.).

Step 2 Install the RRU onto the main bracket, as shown in [Figure 14-2](#).

 **NOTICE**

Do not step on the IMB03 when installing an RRU.

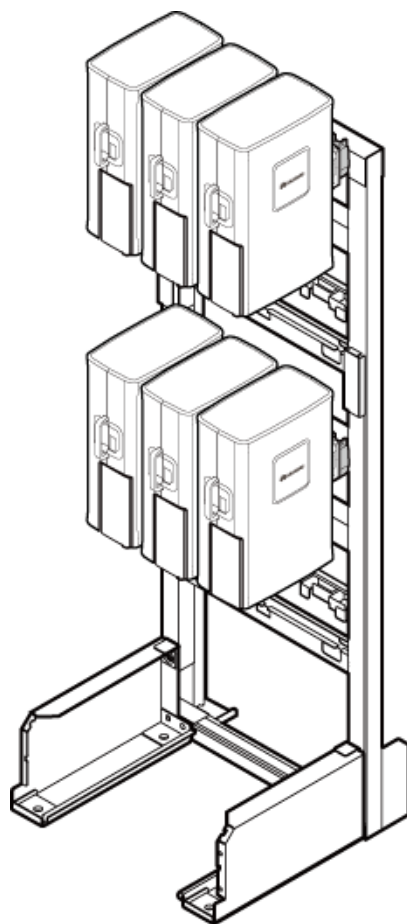
Figure 14-2 Installing the RRU onto the main bracket



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Step 3 Repeat [Step 1](#) and [Step 2](#) to install more RRUs, as shown in [Figure 14-3](#).

Figure 14-3 Installing multiple RRUs



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---End

14.2 Installing AC RRUs

This section describes the procedure for installing AC RRUs.

Context

 NOTE

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

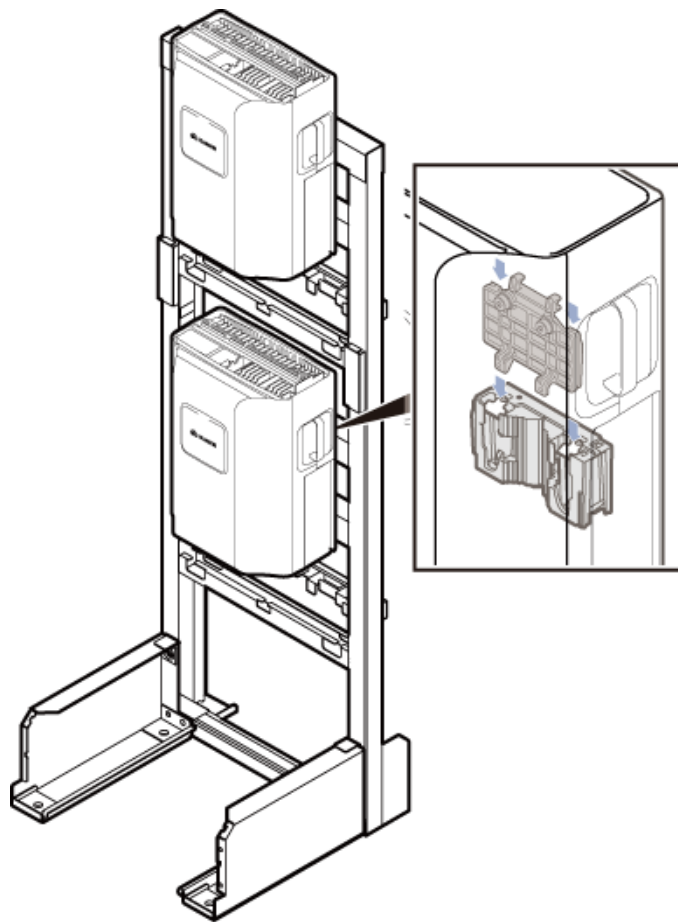
Procedure

Step 1 Install the AC RRU onto the main bracket, as shown in [Figure 14-4](#).

 NOTE

When installing AC RRUs, install the lower RRU first and then the upper RRU.

Figure 14-4 Installing AC RRUs onto the main brackets



PAS02C0115

---End

15 Installing Cables

About This Chapter

This chapter describes the procedure and precautions for installing and routing all ICR cables.

[15.1 Cabling Requirements](#)

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

[15.2 Cable Connections](#)

This section describes the cable connections for scenarios with various power supplies.

[15.3 Cable Installation Process](#)

This section describes the process of installing ICR cables.

[15.4 Cable Routes](#)

This section describes the cable routes.

[15.5 Installing PGND Cables for RRUs](#)

This section describes the procedure for installing PGND cables for RRUs.

[15.6 Installing the BBU Power Cable](#)

This section describes the procedure for installing the BBU power cable.

[15.7 Installing Input Power Cables](#)

This section describes the procedure for installing input power cables.

[15.8 \(Optional\) Installing the DCDC Power Cable and Monitoring Signal Cable](#)

This section describes the procedures for installing the DCDC power cable and monitoring signal cable for the scenarios with 220 V AC or +24 V DC power supply.

[15.9 Installing RRU Power Cables](#)

This section describes the procedures for installing RRU power cables, which feed DC power to RRUs.

[15.10 \(Optional\) Installing BBU Inter-connection Cable](#)

This section describes the procedure for installing inter-BBU signal cables for a base station.

[15.11 Installing Transmission Cables](#)

This chapter describes the procedures and precautions for installing transmission cables.

[15.12 Installing CPRI Optical Cables](#)

This section describes the procedure for installing CPRI optical cables, which transmit CPRI signals between a BBU and RRUs.

[15.13 Installing RF Jumpers](#)

This section describes the procedure for installing RF jumpers.

[15.14 Installing the GPS Clock Signal Cable](#)

This section describes the procedure and precautions for installing a GPS clock signal cable.

15.1 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.

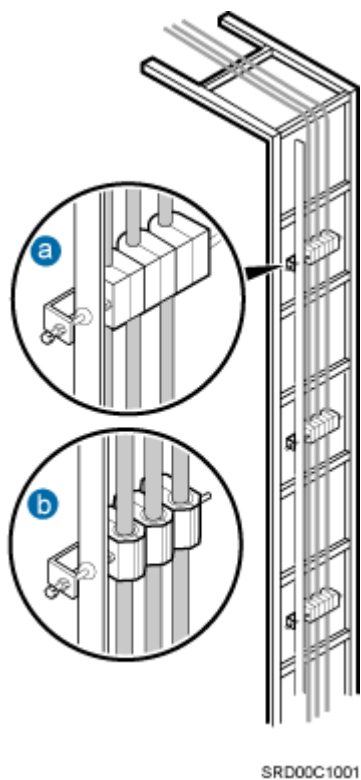
- Drip loops must be made outside the feeder window, and the requirements for the minimum bending radius are met.
- When cables are routed indoors, engineers are required indoors for cooperation.
- The feeder window must be waterproofed.

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 RRU cables, ensure that the highest positions of the routes of all RRU cables (except RF cables and AISG cables) must be lower than the bottom of the RRU.
- 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.

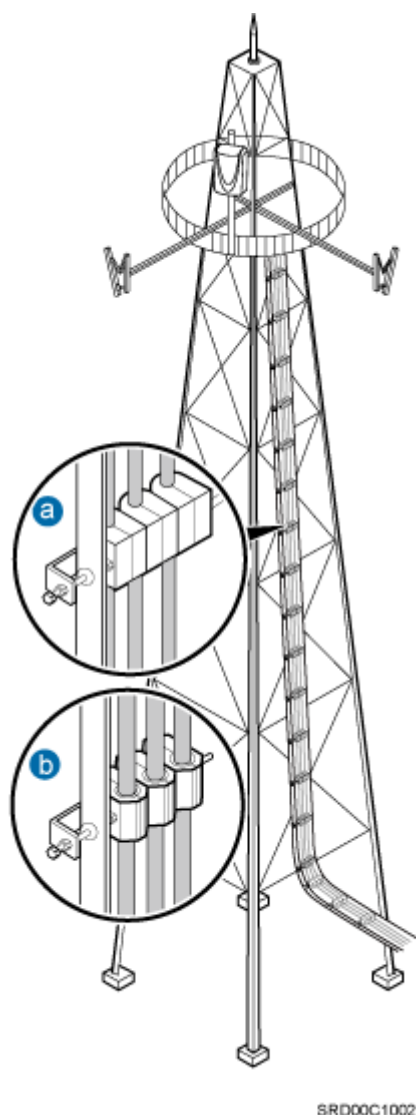
Secure cables on the cable tray, as shown in [Figure 15-1](#).

Figure 15-1 Securing cables on the cable tray



Secure cables on the tower, as shown in [Figure 15-2](#).

Figure 15-2 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.

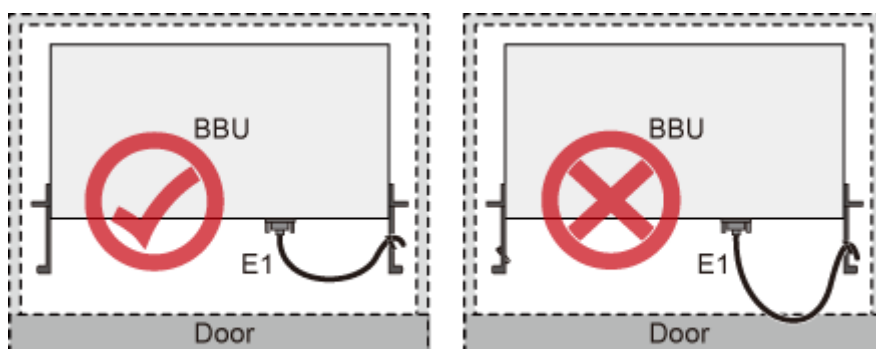
Cabling Requirements for PGND Cables

- 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 15-3](#).

Figure 15-3 E1 cables routed through the cabinet



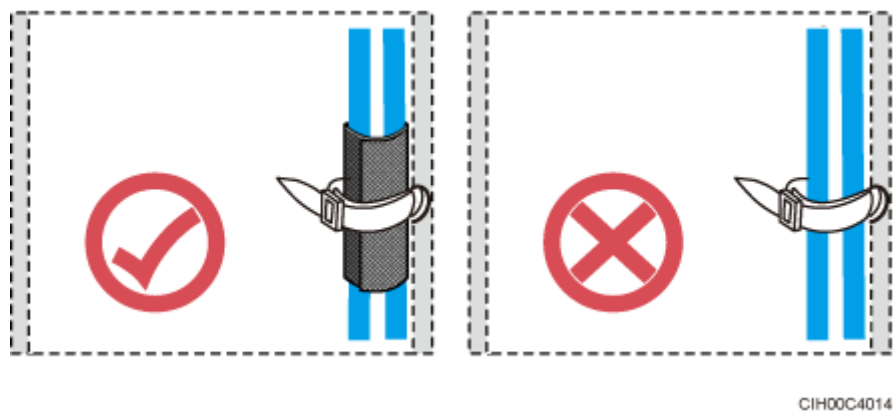
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Cabling Requirements for Fiber Optic Cables

- 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 15-4 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 15-5](#), [Figure 15-6](#) and [Figure 15-7](#).

Figure 15-5 CPRI fiber optic cables routed through the cabinet (1)

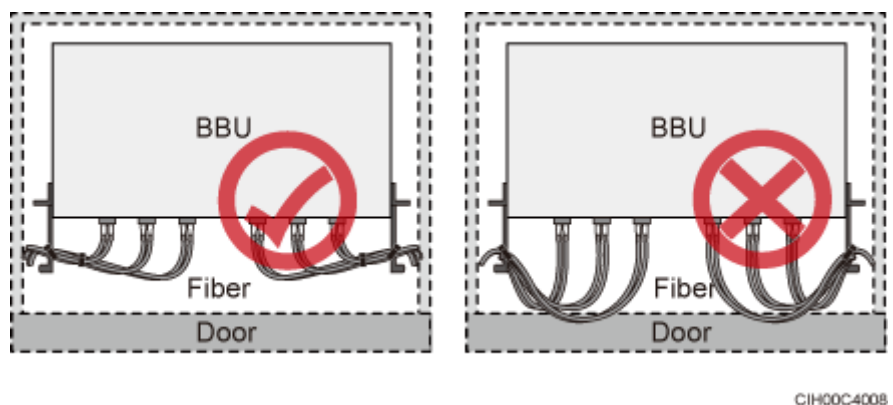
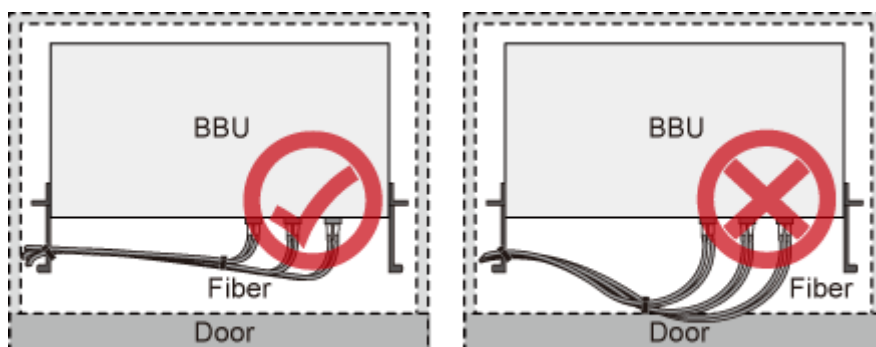
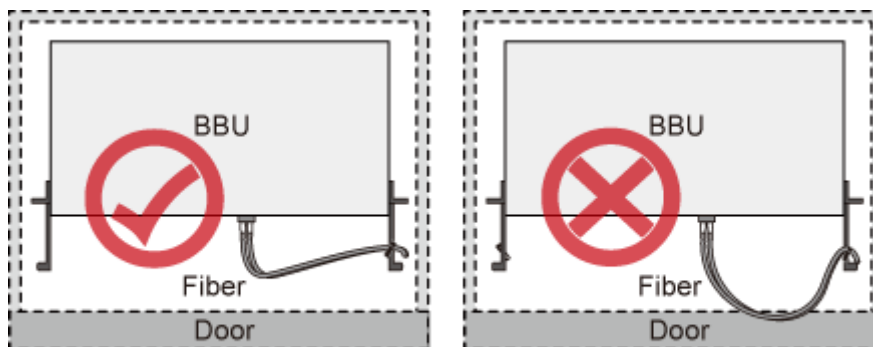


Figure 15-6 CPRI fiber optic cables routed through the cabinet (2)



CIH00C4009

Figure 15-7 FE/GE cables routed through the cabinet



CIH00C4011

- 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.

15.2 Cable Connections

This section describes the cable connections for scenarios with various power supplies.

15.2.1 Cable Connections (-48 V DC)

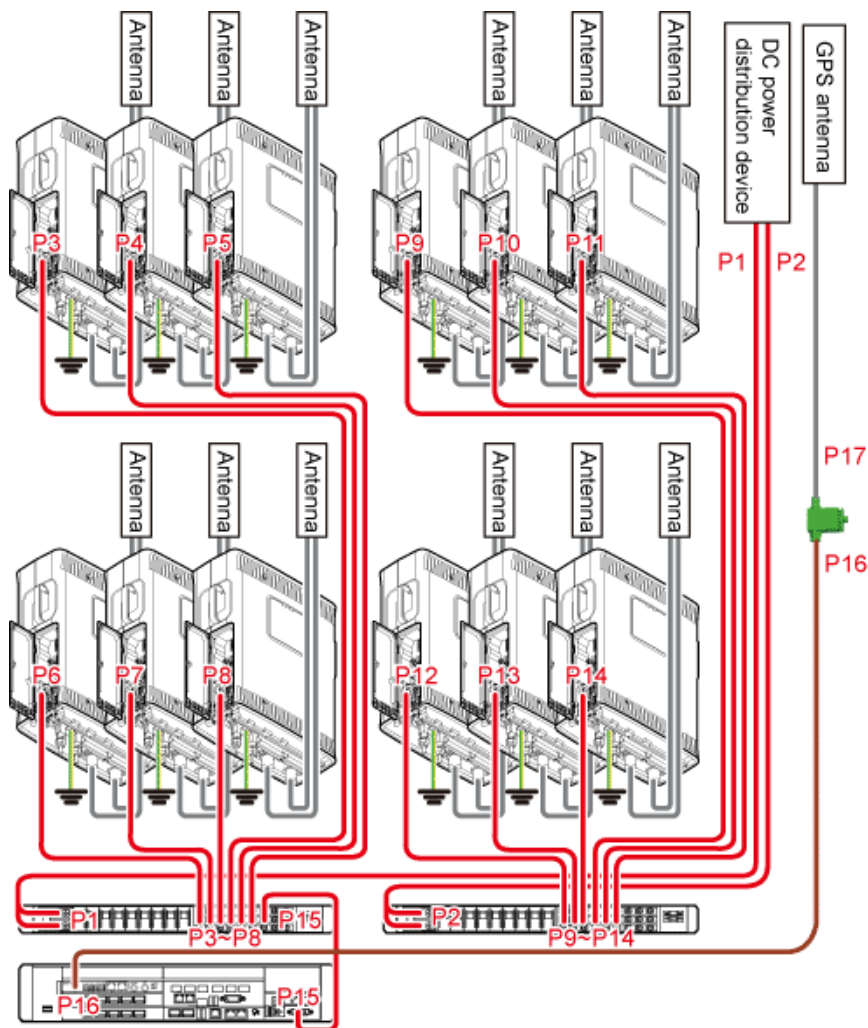
This section describes the cable connections for the scenarios with -48 V DC power supply.

NOTE

- Cable connections for the scenario with the DCDU-11B installed are the same as those for the scenario with the DCDU-03B installed. This section uses the cable connections for the latter scenario as an example.
- For the connections of CPRI optical cables, see section "CPRI Cable Connections" in the *BBU3900 Hardware Description*.
- For the connections of transmission cables, see section "Transmission Cable Connections" in the *BBU3900 Hardware Description*.

Figure 15-8 shows and Table 15-1 lists the cable connections for a single- or dual-mode base station supplied with -48 V DC power.

Figure 15-8 Cable connections for a single- or dual-mode base station



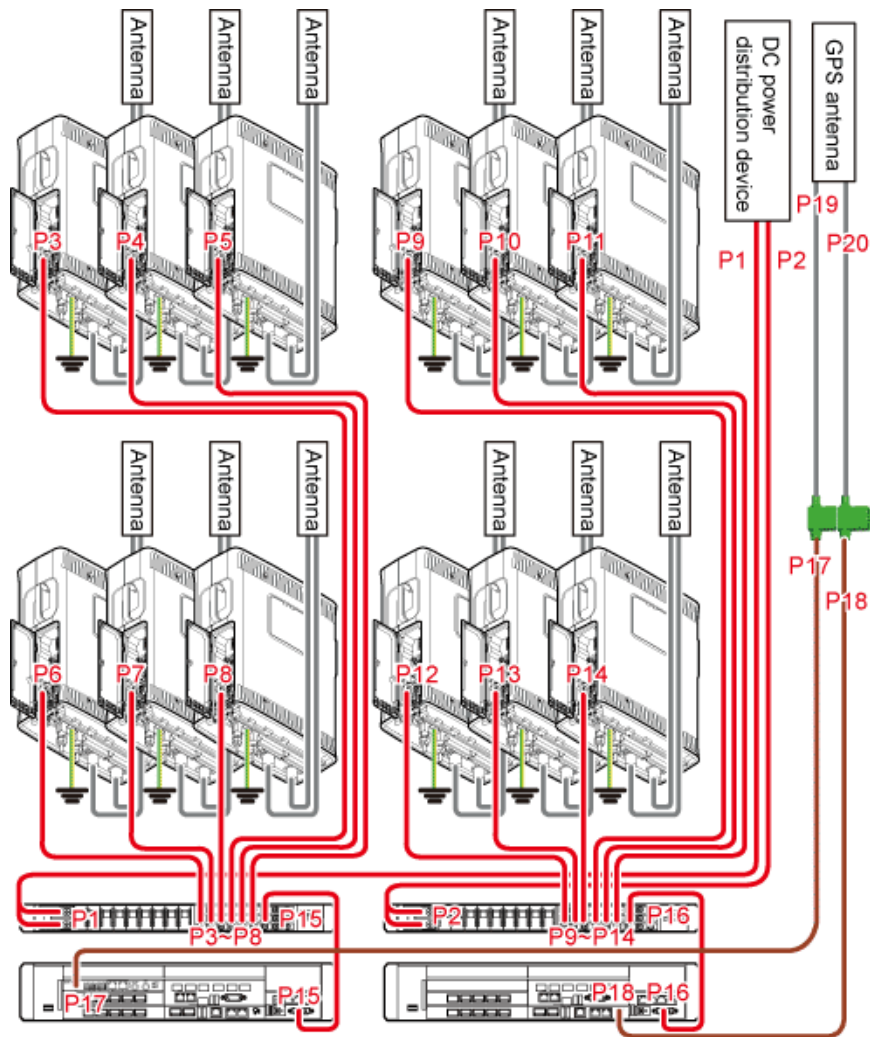
CIS02C-1002

Table 15-1 Cable description

No.	Cable	One End		One End	
		Connector	Installation Position	Connector	Installation Position
P1 and P2	External input power cable	OT terminal	RTN(+) and NEG(-) terminals on the DCDU	-	External power equipment
P3 to P14	RRU power cable	OT terminal	LOAD0 to LOAD5 terminals on the DCDU	Depending on the RRU model	DC power supply port on the RRU
P15	BBU power cable	OT terminal	LOAD6 terminal on the DCDU	3V3 power connector	PWR port on the UPEU
P16	GPS clock signal cable	SMA male connector	GPS port on the USCU in the BBU	Type N female connector	Protect port on the GPS surge protector
P17	GPS jumper	Type N male connector	Surge port on the GPS surge protector	Type N male connector	GPS antenna

Figure 15-9 shows and **Table 15-2** lists the cable connections for a triple-mode base station supplied with -48 V DC power.

Figure 15-9 Cable connections for a triple-mode base station



CIS02C-1003

Table 15-2 Cable description

No.	Cable	One End		One End	
		Connector	Installation Position	Connector	Installation Position
P1 and P2	External input power cable	OT terminal	RTN(+) and NEG(-) terminals on the DCDU	-	External power equipment
P3 to P14	RRU power cable	OT terminal	LOAD0 to LOAD5 terminals on the DCDU	Depending on the RRU model	DC power supply port on the RRU

No.	Cable	One End		One End	
		Connector	Installation Position	Connector	Installation Position
P15 and P16	BBU power cable	OT terminal	LOAD6 terminal on the DCDU	3V3 power connector	PWR port on the UPEU
P17 and P18	GPS clock signal cable	SMA male connector	GPS port on the USCU or LMPT in the BBU	Type N female connector	Protect port on the GPS surge protector
P19 and P20	GPS jumper	Type N male connector	Surge port on the GPS surge protector	Type N male connector	GPS antenna

15.2.2 Cable Connections (220 V AC)

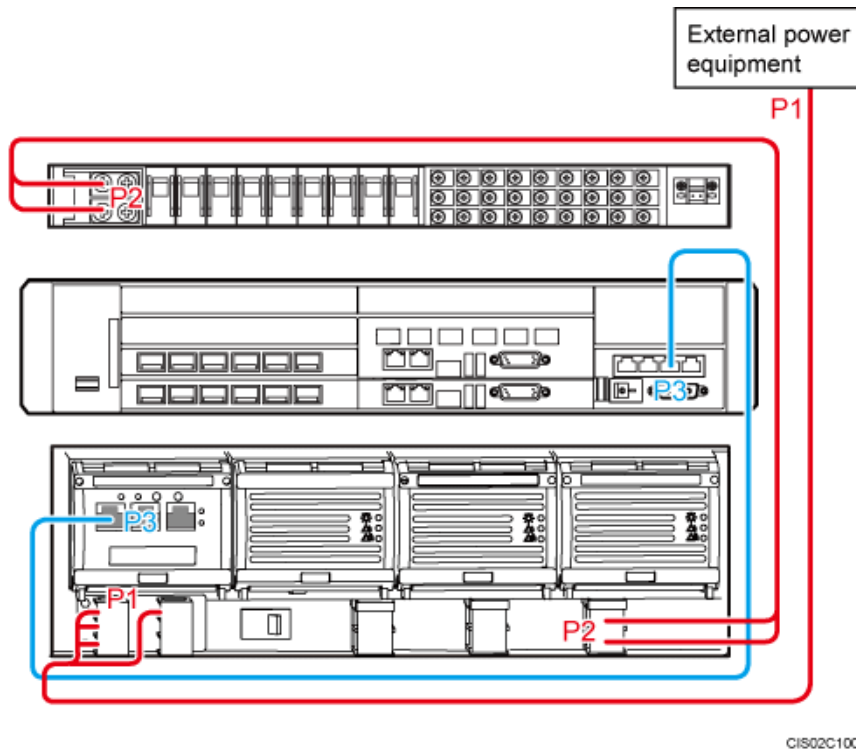
This section describes the cable connections for the scenarios with 220 V AC power supply.

NOTE

- Cable connections for the scenario with the DCDU-11B installed are the same as those for the scenario with the DCDU-03B installed. This section uses the cable connections for the latter scenario as an example.
- RRU cable connections for the scenario with 220 V AC power supply are the same as those for the scenario with -48 V DC power supply, which is described in [15.2.1 Cable Connections \(-48 V DC\)](#).

[Figure 15-10](#) shows and [Table 15-3](#) lists the cable connections for a base station supplied with 220 V AC power.

Figure 15-10 Cable connections



CIS02C1001

Table 15-3 Cable description

No.	Cable	One End		One End	
		Connector	Installation Position	Connector	Installation Position
P1	External input power cable	OT terminal	Power input wiring terminal for the AC/DC power device	-	External power equipment
P2	DCDU power cable	OT terminal	RTN(+) and NEG(-) terminals on the DCDCU	OT terminal	RTN(+) and LOAD1(-) or LOAD2(-) terminals on the AC/DC power device
P3	PMU monitoring signal cable	RJ45 connector	RS232/RS485 port on the PMU	RJ45 connector	MON1 port on the UPEU

15.2.3 Cable Connections (+24 V DC)

This section describes the cable connections for the scenarios with +24 V DC power supply.

NOTE

- Cable connections for the scenario with the DCDU-11B installed are the same as those for the scenario with the DCDU-03B installed. This section uses the cable connections for the latter scenario as an example.
- RRU cable connections for the scenario with +24 V DC power supply are the same as those for the scenario with -48 V DC power supply, which is described in **15.2.1 Cable Connections (-48 V DC)**.

Figure 15-11 shows and **Table 15-4** lists the cable connections for a base station supplied with +24 V DC power.

Figure 15-11 Cable connections

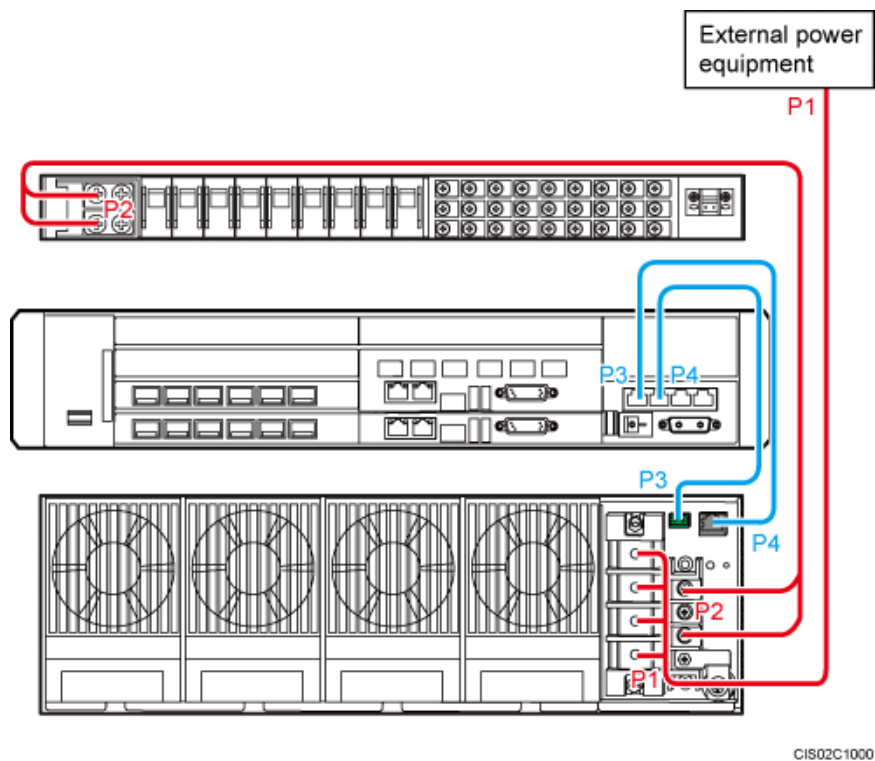


Table 15-4 Cable description

No.	Cable	One End		One End	
		Connector	Installation Position	Connector	Installation Position
P1	External input power cable	OT terminal	Power input wiring terminal for the DC/DC power device	-	External power equipment
P2	DCDU power cable	OT terminal	RTN(+) and NEG(-) terminals on the DCDU	OT terminal	RTN(+) and LOAD(-) terminals on the DC/DC power device
P3	PSU in-position signal cable	RJ45 connector	PRESENT port on the DC/DC power device	RJ45 connector	EXT-ALM1 port on the UPEU
P4	PSU monitoring signal cable	Cord end terminal	ALM port on the DC/DC power device	RJ45 connector	EXT-ALM0 port on the UPEU

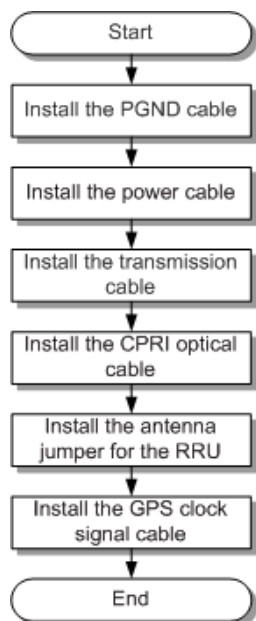
15.3 Cable Installation Process

This section describes the process of installing ICR cables.

Cable Installation Process

[Figure 15-12](#) shows the cable installation process.

Figure 15-12 Cable installation process



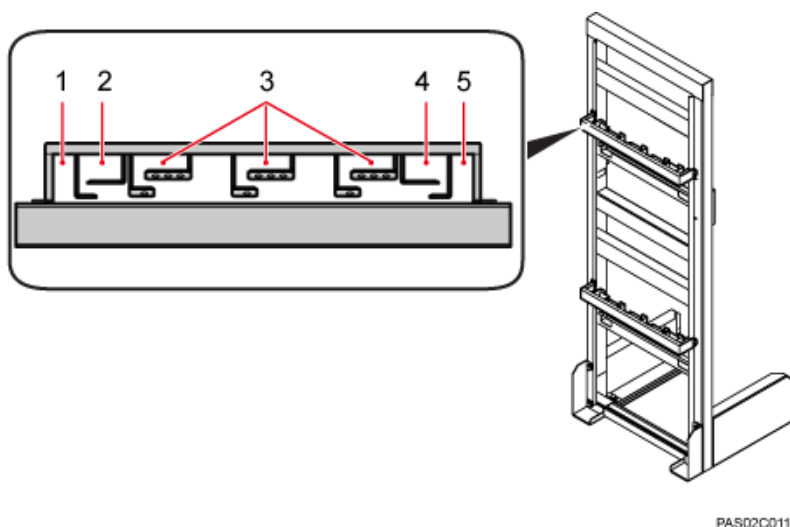
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15.4 Cable Routes

This section describes the cable routes.

Figure 15-13 shows the planform of the cable tray. By studying the figure, you can know the cable routes.

Figure 15-13 Cable routes



PAS02C0116

- (1) -48 V DC or 220 V AC input power cable (2) Optical cables and PGND cables
- (3) Feeders for RRUs at the lower layer
- (4) RRU power cables, E1/T1 cables, (5) +24 V DC input power cable and FE/GE Ethernet or optical cables

15.5 Installing PGND Cables for RRUs

This section describes the procedure for installing PGND cables for RRUs.

Context

The cross-sectional area of the PGND cable for an RRU is 16 mm² (0.025 in.²).

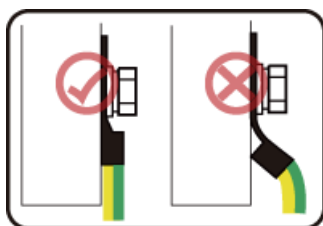
Procedure

- To install the PGND cable for a DC RRU, perform the following operations:
 1. Cut the cable to a length suitable for the actual cable route.
 2. Add an OT terminal to each end of the cable according to the instructions in *Assembling the OT Terminal and the Power Cable*.
 3. Connect one end of the PGND cable to the RRU, as shown in [Figure 15-15](#).

NOTE

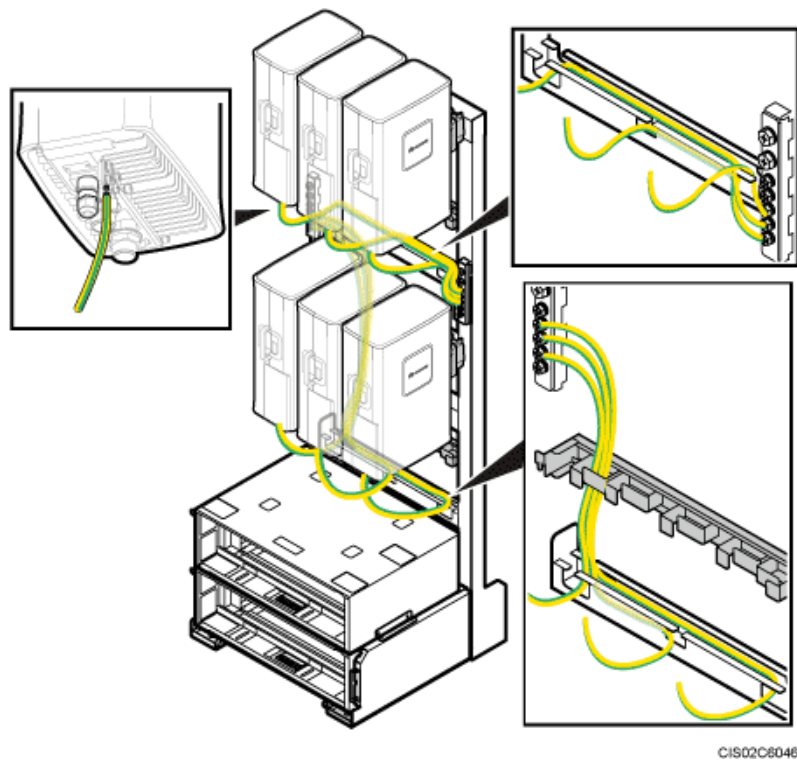
Crimp OT terminals in correct directions, as shown in [Figure 15-14](#).

Figure 15-14 Correct direction of an OT terminal



EIR22C6001

Figure 15-15 PGND cable for the DC RRU



4. Connect the other end of the PGND cable to the ground bar on the IFS06.
 5. Lay out the cables according to the instructions in [15.1 Cabling Requirements](#), and use cable ties to bind the cables.
 6. Label the installed cables according to the instructions in [Attaching a Cable-Tying Label](#).
- To install the PGND cable for an AC RRU, perform the following operations:
 1. Cut the cable to a length suitable for the actual cable route.
 2. Add an OT terminal to each end of the cable according to the instructions in [Assembling the OT Terminal and the Power Cable](#).
 3. Connect one end of the PGND cable to the RRU, as shown in [Figure 15-17](#).

 **NOTE**

Crimp OT terminals in correct directions, as shown in [Figure 15-16](#).

Figure 15-16 Correct direction of an OT terminal

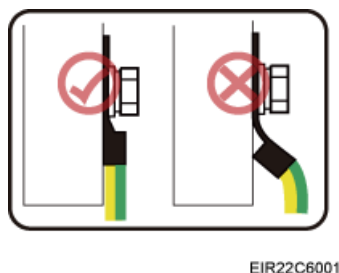
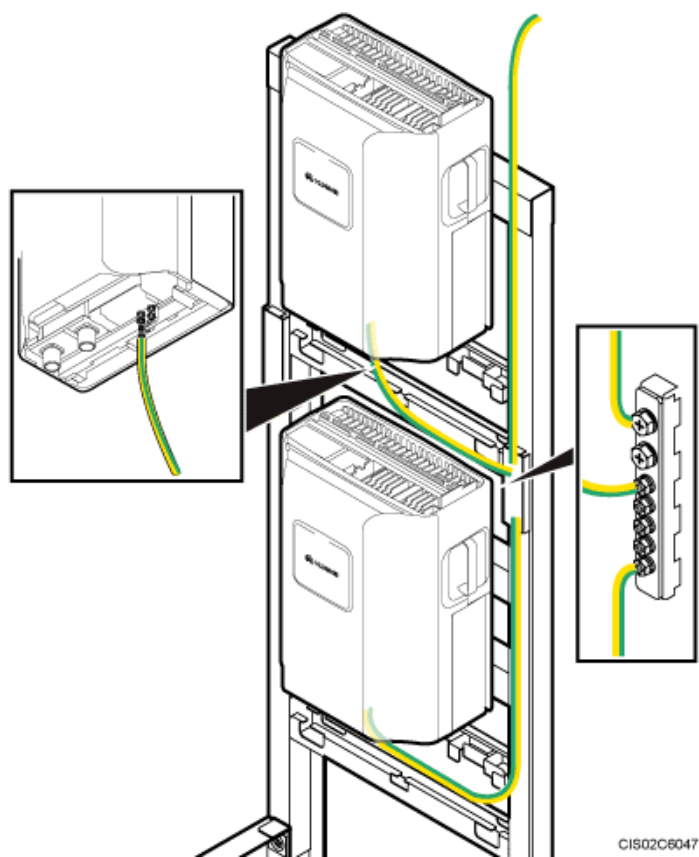


Figure 15-17 PGND cable for the AC RRU



4. Connect the other end of the PGND cable to the ground bar on the IFS06.
5. Lay out the cables according to the instructions in [15.1 Cabling Requirements](#), and use cable ties to bind the cables.
6. Label the installed cables according to the instructions in Attaching a Cable-Tying Label.

----End

15.6 Installing the BBU Power Cable

This section describes the procedure for installing the BBU power cable.

Context

[Table 15-5](#) lists the specifications of a BBU power cable.

Table 15-5 Specifications of a BBU power cable

Power Device	Connector on the BBU Side	Connector on the Power Device Side
DCDU-03B	3V3 connector	OT terminal (M4) bent by 90°
DCDU-11B	3V3 connector	Tool-less female connector (pressfit type)
DCDU-12B	3V3 connector	EPC4 Connector

NOTE

This section describes how to install the BBU power cable when the DCDU-03B is used as the power device.

Procedure

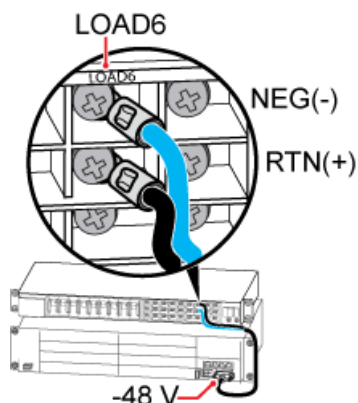
- Step 1** Add a connector to the BBU power cable on the power device side according to the instructions in *Assembling the OT Terminal and the Power Cable*.

NOTE

A 3V3 connector has been added to one end of the BBU power cable before delivery. Another connector must be added to the other end of the cable onsite.

- Step 2** Install the BBU power cable, as shown in **Figure 15-18**.
1. Connect the 3V3 connector at one end of the BBU power cable to the PWR port on the UPEU in the BBU. Then tighten the screws on the connector to 0.25 N·m (2.21 lbf·in.).
 2. Connect the blue and black OT terminals at the other end of the BBU power cable to the NEG(-) and RTN(+) terminals, respectively, in the LOAD6 column on the DCDU-03B. Then tighten the screws on the connector to 1.2 N·m (10.61 lbf·in.).

Figure 15-18 Installing the BBU power cable



- Step 3** Lay out the cable according to the instructions in **15.1 Cabling Requirements**, and use cable ties to bind the cable.

Step 4 Label the installed cable according to the instructions in Attaching a Cable-Tying Label.

----End

15.7 Installing Input Power Cables

This section describes the procedure for installing input power cables.

Context

An ICR supports power inputs of -48 V DC, +24 V DC, and 220 V AC.

The input power cables for an ICR must be prepared onsite. [Table 15-6](#) lists the specifications of input power cables.

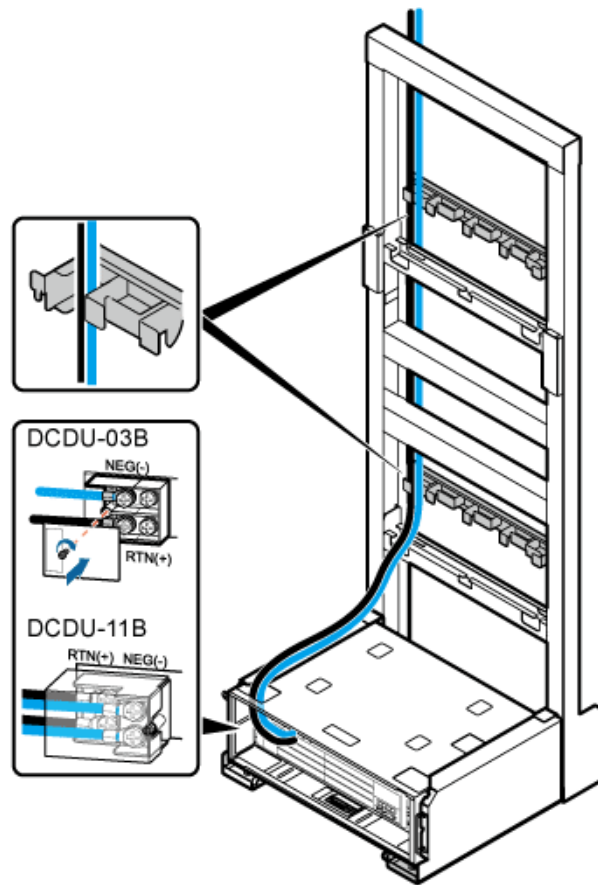
Table 15-6 Specifications of input power cables

Cable	Connector at One End	Connector at the Other End	Cross-Sectional Area
-48 V DC input power cable (DCDU-03B)	OT terminal (M6)	Depending on the external power system	16 mm ² (0.025 in. ² , a pair)
-48 V DC input power cable (DCDU-11B)	OT terminal (M6)	Depending on the external power system	16 mm ² (0.025 in. ² , two pairs)
+24 V DC input power cable	OT terminal (M6)	Depending on the external power system	25 mm ² (0.039 in. ²)
220 V AC single-phase input power cable	OT terminal (M6)	Depending on the external power system	6 mm ² (0.009 in. ²)
220 V AC three-phase input power cable	OT terminal (M6)	Depending on the external power system	2.5 mm ² (0.004 in. ²)

Procedure

- To install the -48 V DC input power cable, perform the following operations:
 1. Cut the cable to a length suitable for the actual cable route.
 2. Add an OT terminal to one end of the cable according to the instructions in Assembling the OT Terminal and the Power Cable.
 3. Connect one end of the power cable to the corresponding RTN(+) and NEG(-) terminals on the DCDU-03B or DCDU-11B, as shown in [Figure 15-19](#).

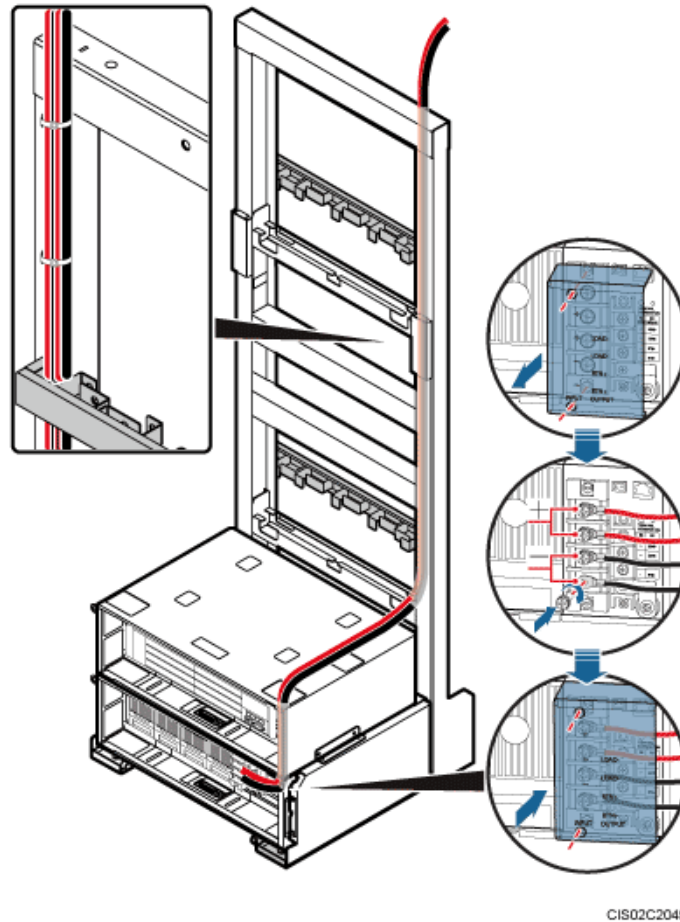
Figure 15-19 Installing the -48 V DC input power cable



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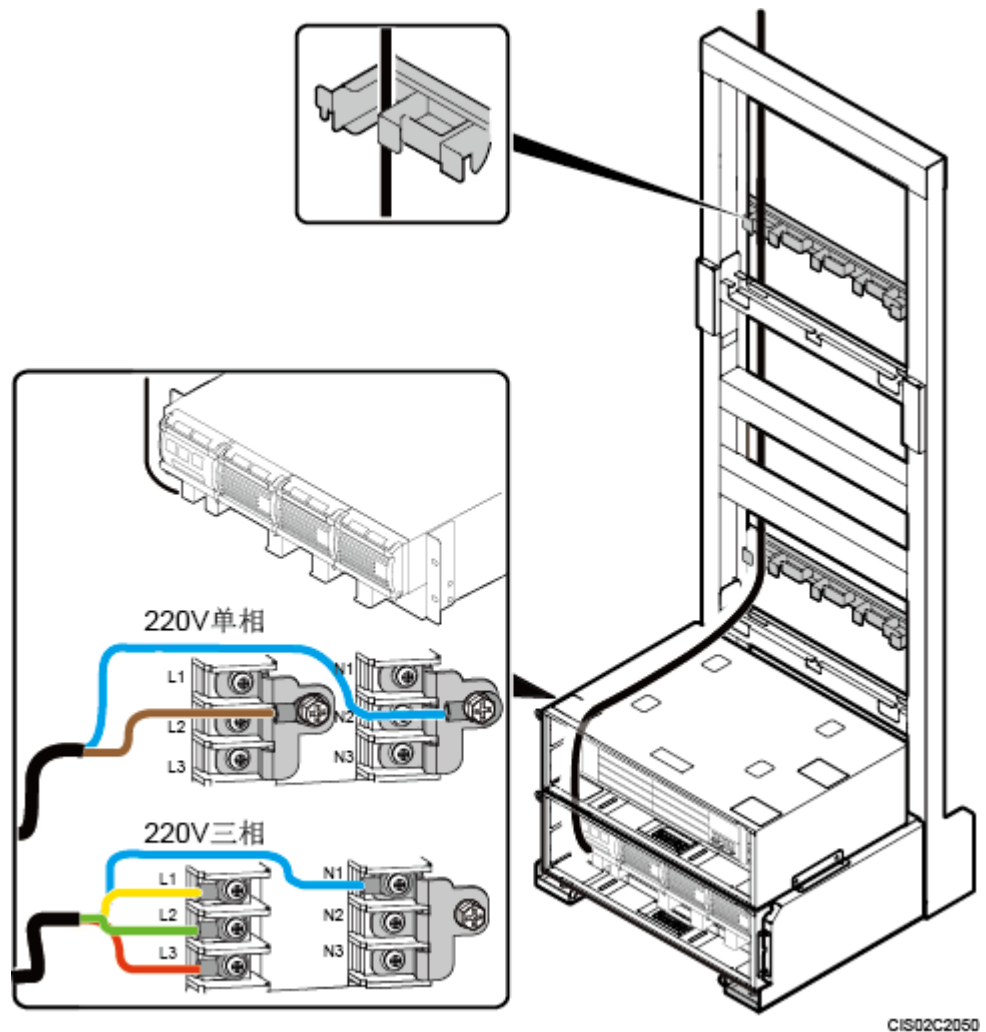
4. Route the other end of the power cable along the cable trough at the rear left of the IFS06. Then connect the power cable to the external power system, as shown in [Figure 15-19](#).
 5. Lay out the cable according to the instructions in [15.1 Cabling Requirements](#), and use cable ties to bind the cable.
 6. Label the installed cable according to the instructions in [Attaching a Cable-Tying Label](#).
- To install the +24 V DC input power cable, perform the following operations:
 1. Cut the cable to a length suitable for the actual cable route.
 2. Add an OT terminal to one end of the cable according to the instructions in [Assembling the OT Terminal and the Power Cable](#).
 3. Connect one end of the power cable to the wiring terminals marked + and - on the wiring unit of the DC/DC power system, as shown in [Figure 15-20](#).

Figure 15-20 Installing the +24 V DC input power cable



4. Route the other end of the power cable along the cable trough at the rear left of the IFS06. Then connect the power cable to the external power system, as shown in [Figure 15-20](#).
 5. Lay out the cable according to the instructions in [15.1 Cabling Requirements](#), and use cable ties to bind the cable.
 6. Label the installed cable according to the instructions in [Attaching a Cable-Tying Label](#).
- To install the 220 V AC input power cable, perform the following operations:
 1. Cut the cable to a length suitable for the actual cable route.
 2. Add an OT terminal to one end of the cable according to the instructions in [Assembling the OT Terminal and the Power Cable](#).
 3. Connect one end of the power cable to the AC INPUT port on the AC/DC power system, as shown in [Figure 15-21](#).

Figure 15-21 Installing the 220 V AC input power cable



4. Route the other end of the power cable along the cable trough at the rear left of the IFS06. Then connect the power cable to the external power system, as shown in [Figure 15-21](#).
5. Lay out the cable according to the instructions in [15.1 Cabling Requirements](#), and use cable ties to bind the cable.
6. Label the installed cable according to the instructions in [Attaching a Cable-Tying Label](#).

---End

15.8 (Optional) Installing the DCDCU Power Cable and Monitoring Signal Cable

This section describes the procedures for installing the DCDCU power cable and monitoring signal cable for the scenarios with 220 V AC or +24 V DC power supply.

Context

- DCDU-03B can use a pair of power cables with cross-sectional area of 16 mm² (0.025 in.²).
- DCDU-11B or DCDU-12B can use two pairs of power cables with cross-sectional area of 16 mm² (0.025 in.²).
- In the scenarios with 220 V AC or +24 V DC power supply, a power cable between the power system and the DCDU must be installed as well as a monitoring signal cable between the power system and the BBU.

NOTE

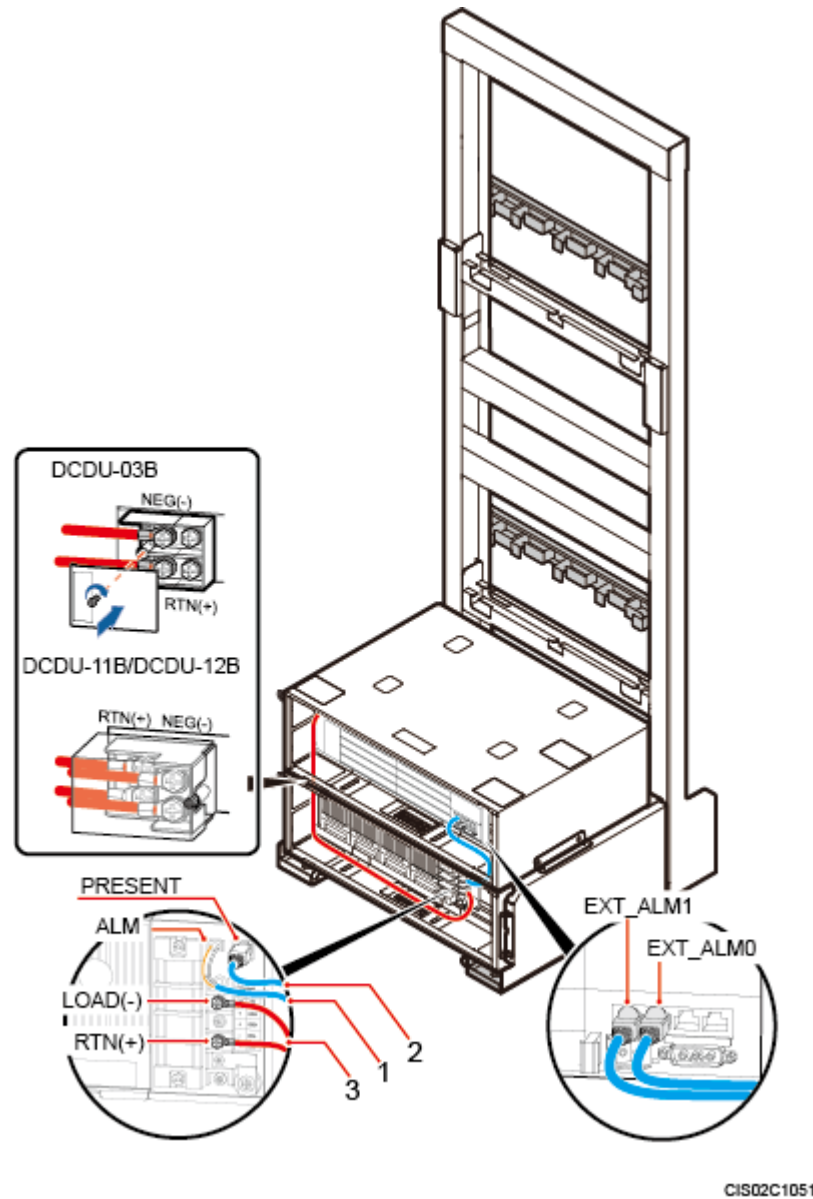
In the scenarios with -48 V DC power supply, one end of the power cable is directly connected to the DCDU and one end of the monitoring signal cable is directly connected to the BBU; the other ends of the cables are connected to the external power system.

Procedure

- To install the DCDU power cable and monitoring signal cable in the scenarios with +24 V DC power supply, perform the following operations:
 1. Cut the power cable to a length suitable for the actual cable route.
 2. Add an OT terminal to each end of the power cable according to the instructions in Assembling the OT Terminal and the Power Cable.
 3. Connect one end of the power cable to the wiring terminals marked LOAD(-) and RTN(+) on the wiring unit of the DC/DC power system, as shown in [Figure 15-23](#).

In [Figure 15-22](#), the red line is the power cable, and the blue line is the monitoring signal cable.

Figure 15-22 Power cable and monitoring signal cable in scenarios with +24 V DC power supply



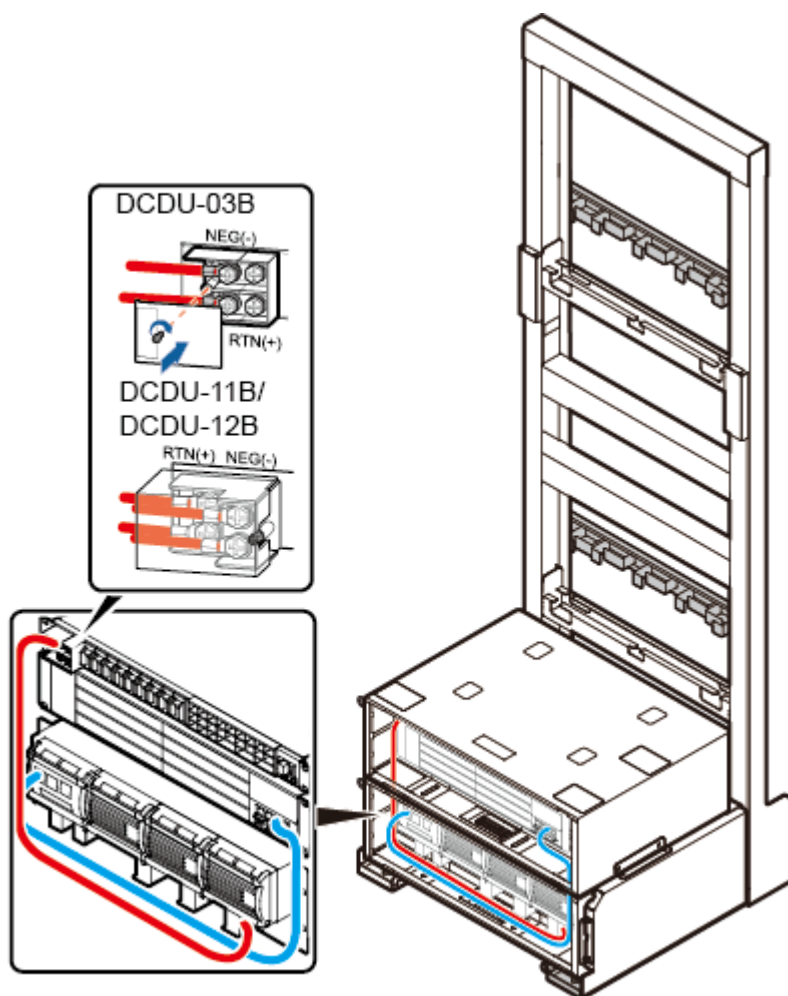
(1) PSU in-position signal cable (2) PSU monitoring signal cable (3) DCDCU power cable

4. Connect the other end of the power cable to the wiring terminals marked NEG(-) and RTN(+) on the DCDCU.
5. Connect one end of the PSU monitoring signal cable to the EXT-ALM0 port on the UPEU, and the other end to the ALM port on the DC/DC power system.
6. Connect one end of the PSU in-position signal cable to the EXT-ALM1 port on the UPEU, and the other end to the PRESENT port on the DC/DC power system.
7. Lay out the cables according to the instructions in [15.1 Cabling Requirements](#), and use cable ties to bind the cables.
8. Label the installed cables according to the instructions in [Attaching an L-Shaped Label](#).

- To install the DCDC power cable and monitoring signal cable in the scenarios with 220 V AC power supply, perform the following operations:
 1. Cut the power cable to a length suitable for the actual cable route.
 2. Add an OT terminal to each end of the power cable according to the instructions in Assembling the OT Terminal and the Power Cable.
 3. Connect one end of the power cable to the wiring terminals marked LOAD1(-)/LOAD2(-) and RTN(+) on the wiring unit of the AC/DC power system, as shown in **Figure 15-23**.

In **Figure 15-23**, the red line is the power cable, and the blue line is the monitoring signal cable.

Figure 15-23 DCDC power cable and monitoring signal cable in scenarios with 220 V AC power supply



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4. Connect the other end of the power cable to the wiring terminals marked NEG(-) and RTN(+) on the DCDC-03B.
5. Connect one end of the monitoring signal cable to the MON1 port on the UPEU, and the other end to the RS232/RS485 port on the AC/DC power system.

6. Lay out the cables according to the instructions in [15.1 Cabling Requirements](#), and use cable ties to bind the cables.
7. Label the installed cables according to the instructions in [Attaching an L-Shaped Label](#).

---End

15.9 Installing RRU Power Cables

This section describes the procedures for installing RRU power cables, which feed DC power to RRUs.

Context

[Table 15-7](#) lists the specifications of RRU power cables.

Table 15-7 Specifications of RRU power cables

Cable	Power Device	Connector on the Power Device Side	Connector on the RRU Side
RRU power cable	DCDU-12B	EPC5 connector	Depending on the RRU model
	DCDU-11B	Tool-less female connector (pressfit type)	
	DCDU-03B	Bent OT terminal (M4)	

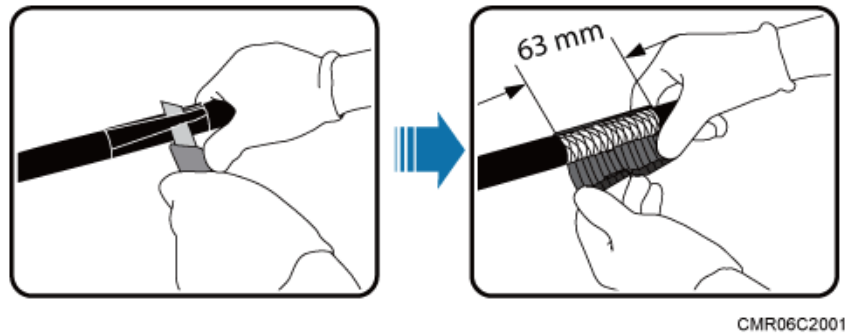
NOTE

- Colors and structures of cables vary in different regions. If cables are purchased at local markets, they must comply with local rules and regulations.
- The type of connector at the other end of an RRU power cable depends on the type of the RRU to which the power cable is connected. For how to add a connector to an RRU power cable, see the related RRU installation guide.

Procedure

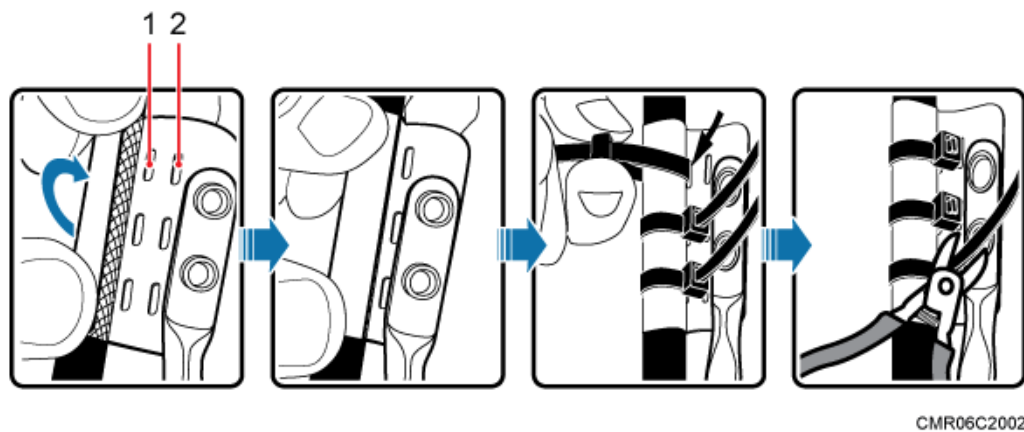
- To install the power cable for a DC RRU, perform the following operations:
 1. Open the cover plate of the RRU cabling cavity.
 2. Cut the cable to a length suitable for the actual cable route.
 3. Add a connector to each end of the RRU power cable.
 4. Route the RRU power cable from the RRU side to the power equipment side through the feeder window. Install a ground clip near the feeder window outside the equipment room, and connect the PGND cable on the ground clip to the external ground bar. The installation procedure of ground clip is as follows:
 - a. Use a wire stripper to strip 63 mm (2.48 in.) long jacket off the power cable to expose the shield layer.

Figure 15-24 Stripping the jacket off the power cable



- b. Wrap the copper sheet of the ground clip around the shield layer of the power cable, and use cable ties to bind them tightly. Then trim off surplus part from the heads of the cable ties without leaving any sharp edge.

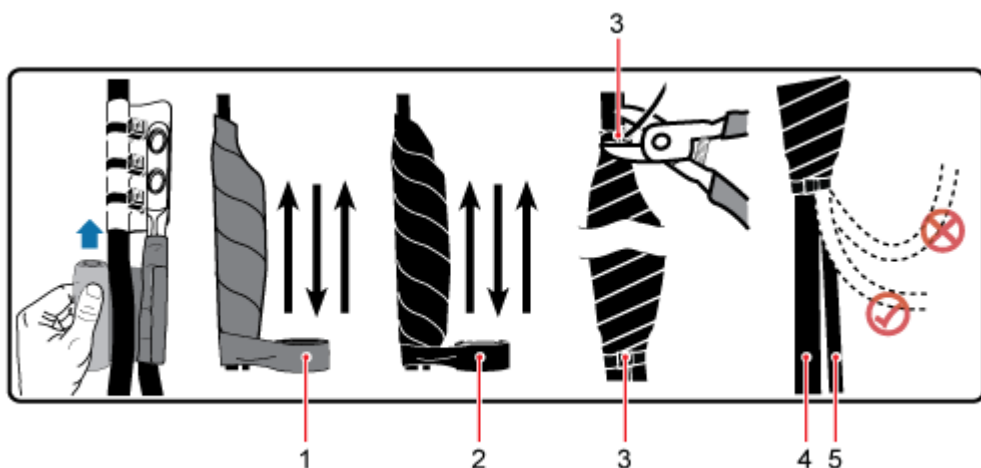
Figure 15-25 Wrapping and tying the copper sheet of the ground clip



(1) Hole for a cable tie (12AWG/4 mm² or 0.006 in.²) (2) Hole for a cable tie (≥ 6 mm² or 0.009 in.²)

- c. Wrap three layers of waterproof tape and three layers of insulation tape around the ground clip.

Figure 15-26 Wrapping the waterproof tape and insulation tape



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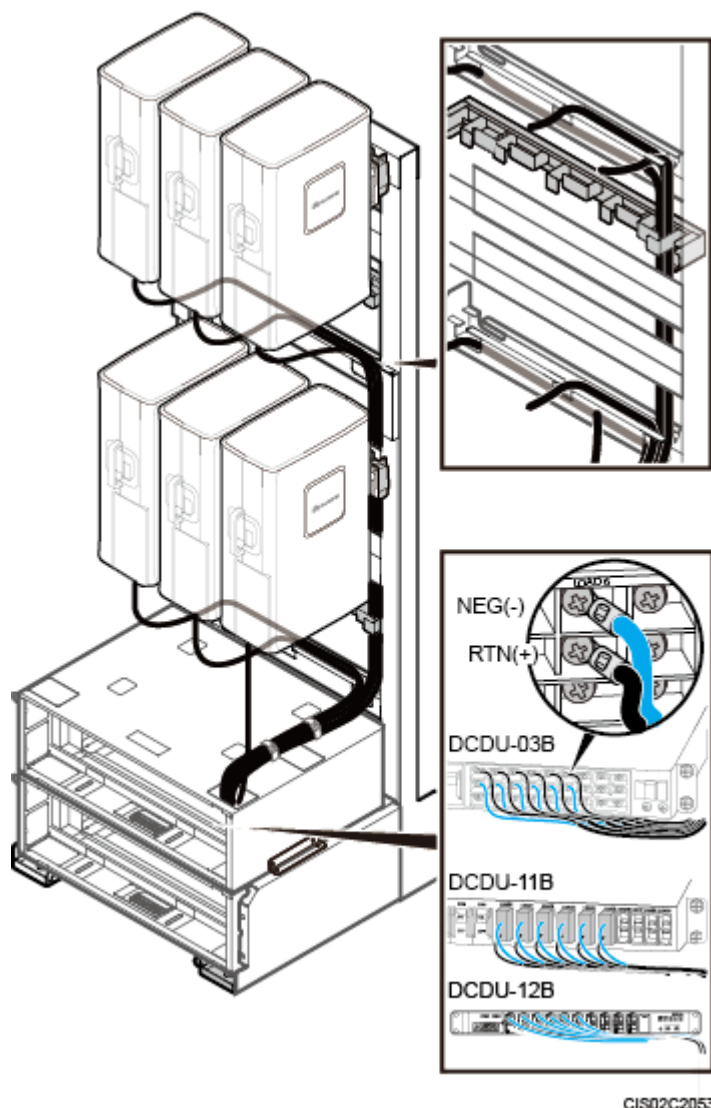
- | | | |
|---------------------|---------------------|---------------|
| (1) Waterproof tape | (2) Insulation tape | (3) Cable tie |
| (4) Power cable | (5) PGND cable | - |

 **NOTICE**

Trim off surplus part of the cable ties at the position 3 mm (0.12 in.) to 5 mm (0.20 in.) away from the head of the cable tie.

-
5. Connect one end of the RRU power cable to the DC power port on the DC RRU, as shown in [Figure 15-27](#).

Figure 15-27 Installing the power cable for a DC RRU



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6. Connect the other end of the RRU power cable to one of the LOAD0 to LOAD5 ports on the DCDU. When the power device is DCDU-03B, then tighten the screws on the connector to 1.2 N·m (10.61 lbf·in.).
7. Lay out the cable according to the instructions in [15.1 Cabling Requirements](#), and use cable ties to bind the cable.

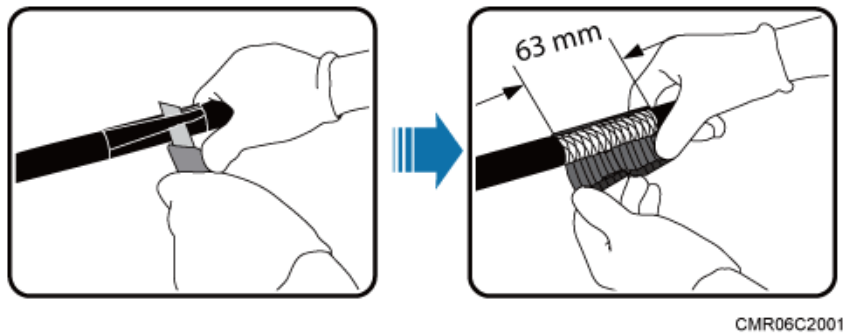
 **NOTICE**

When routing the RRU power cable on the top of the IMB03, avoid obstructing the heat dissipation holes of the IMB03.

8. Label the installed cable according to the instructions in [Attaching a Cable-Tying Label](#).
- To install the power cable for an AC RRU, perform the following operations:

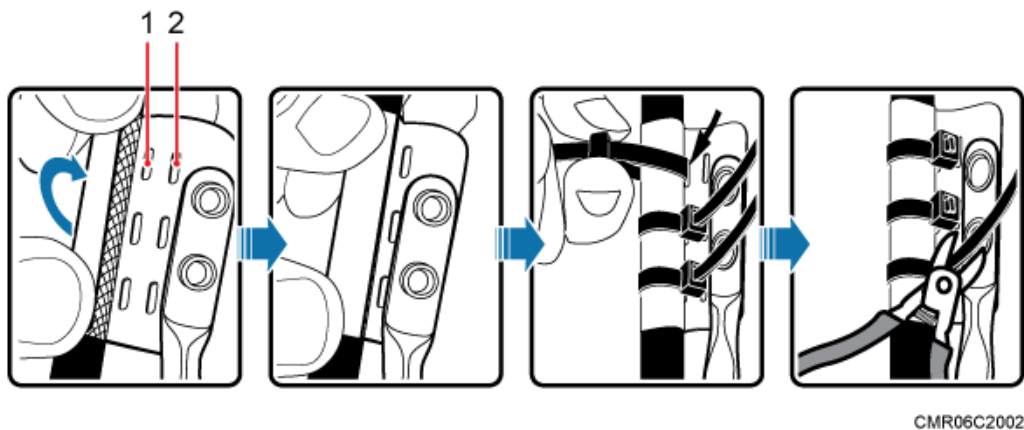
1. Cut the cable to a length suitable for the actual cable route.
2. Add a connector to each end of the RRU power cable.
3. Route the RRU power cable from the RRU side to the power equipment side through the feeder window. Install a ground clip near the feeder window outside the equipment room, and connect the PGND cable on the ground clip to the external ground bar. The installation procedure of ground clip is as follows:
 - a. Use a wire stripper to strip 63 mm (2.48 in.) long jacket off the power cable to expose the shield layer.

Figure 15-28 Stripping the jacket off the power cable



- b. Wrap the copper sheet of the ground clip around the shield layer of the power cable, and use cable ties to bind them tightly. Then trim off surplus part from the heads of the cable ties without leaving any sharp edge.

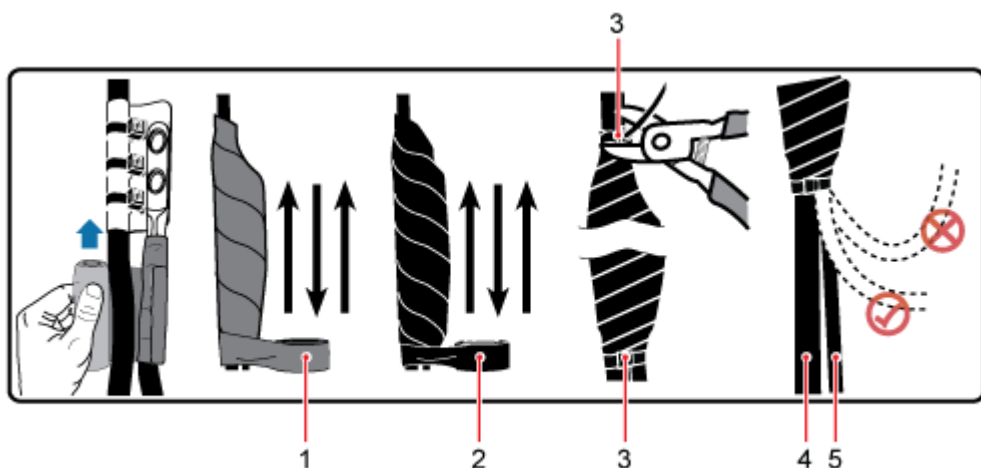
Figure 15-29 Wrapping and tying the copper sheet of the ground clip



(1) Hole for a cable tie (12AWG/4 mm² or 0.006 in.²) (2) Hole for a cable tie (≥ 6 mm² or 0.009 in.²)

- c. Wrap three layers of waterproof tape and three layers of insulation tape around the ground clip.

Figure 15-30 Wrapping the waterproof tape and insulation tape



CMR06C2003

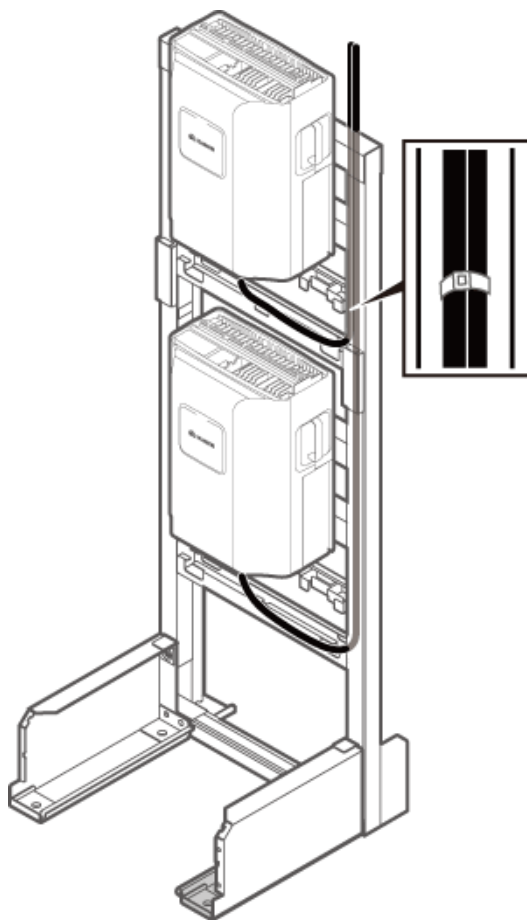
- | | | |
|---------------------|---------------------|---------------|
| (1) Waterproof tape | (2) Insulation tape | (3) Cable tie |
| (4) Power cable | (5) PGND cable | - |

 **NOTICE**

Trim off surplus part of the cable ties at the position 3 mm (0.12 in.) to 5 mm (0.20 in.) away from the head of the cable tie.

-
4. Connect one end of the RRU power cable to the AC power port at the bottom of the AC RRU, as shown in [Figure 15-31](#).

Figure 15-31 Installing the power cable for an AC RRU



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5. Connect the other end of the RRU power cable to the external power system.
6. Lay out the cable according to the instructions in [15.1 Cabling Requirements](#), and use cable ties to bind the cable.
7. Label the installed cable according to the instructions in Attaching a Cable-Tying Label.

---End

15.10 (Optional) Installing BBU Inter-connection Cable

This section describes the procedure for installing inter-BBU signal cables for a base station.

Prerequisites

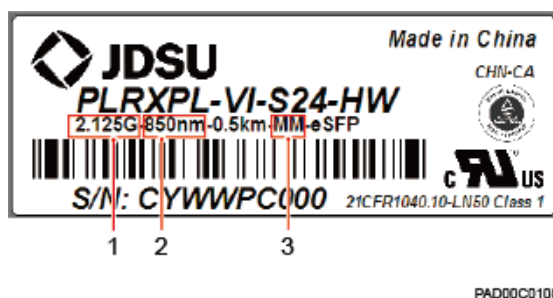
- A new BBU has been added.
- Optical modules and fiber optic cables meeting the following requirements are available:
 - The optical modules and fiber optic cables are of the multimode type.
 - The multimode optical modules to be installed on the UMPT and UCIU support the rates of 5 Gbit/s and 2.5 Gbit/s.

- The interconnection signal cable between the WBBPf boards in two BBUs must be a QSFP cable.

 **NOTE**

- Single-mode optical modules are labeled as SM and multimode optical modules are labeled as MM.
- The puller of a single-mode optical module is blue. The puller of a multimode optical module is black or gray.
- [Figure 15-32](#) shows the label on an optical module.

Figure 15-32 Label on an optical module



(1) Maximum rate

(2) Wavelength

(3) Transmission mode

Context

[Table 15-8](#) lists the BBU interconnection scenarios and the ports to which inter-BBU signal cables are connected. For details about the BBU interconnection, see Inter-BBU Signal Cable Connections.

Table 15-8 Ports to which inter-BBU signal cables are connected

Scenario	Installation Position	
	BBU 0	BBU 1
UCIU+UCIU	M0 port on the UCIU	S0 port on the UCIU

 **NOTE**

BBU 0 is the root BBU, and BBU 1 is the leaf BBU.

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.

Procedure

- Step 1** Determine the positions for connecting the inter-BBU signal cables according to the actual interconnection scenarios.
- Step 2** Install the optical modules in BBU 0, as shown in [Figure 15-33](#) and [Figure 15-34](#).
1. Remove the dustproof caps from the corresponding ports on BBU 0.
 2. Lower the puller on the optical module.
 3. Insert the optical modules into the ports.
 4. Raise the puller on the optical module.

Figure 15-33 Removing the dustproof cap from the port

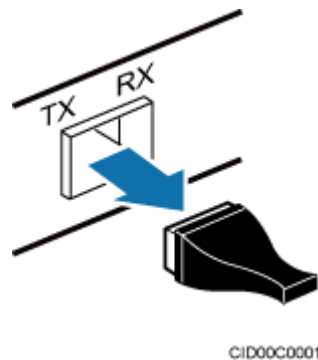
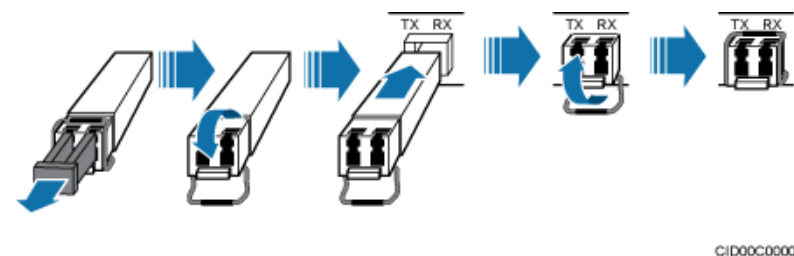


Figure 15-34 Installing the optical module



- Step 3** Install the BBU inter-connection cable, as shown in [Figure 15-35](#) and [Figure 15-36](#).
1. Remove the dustproof caps from the optical connectors at the end labeled 2A and 2B on the fiber optic cables, and insert the optical connectors into the optical modules in BBU 0.
 2. Route the fiber optic cable to the ports on the BBU1 side.
 3. On BBU 1, install optical modules of the same type as those on BBU 0.
- NOTE**
Optical modules with the same labels are of the same type.
4. Remove the dustproof caps from the optical connectors at the end labeled 1A and 1B on the fiber optic cables, and insert the optical connectors into the optical modules in BBU 1.

 **NOTICE**

The TX ports on BBU 0 must be connected to the RX ports on BBU 1, and the RX ports on BBU 0 must be connected to the TX ports on BBU 1.

Figure 15-35 Removing the dustproof cap from the fiber optic cable

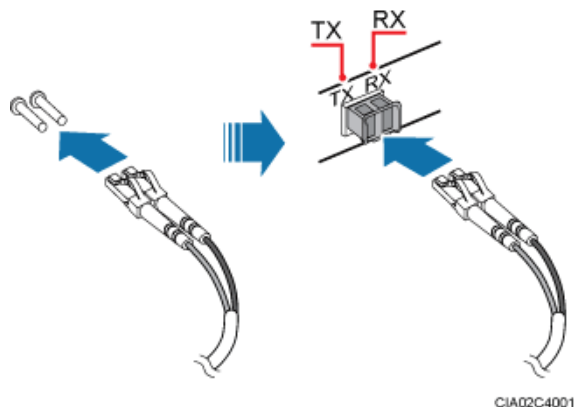
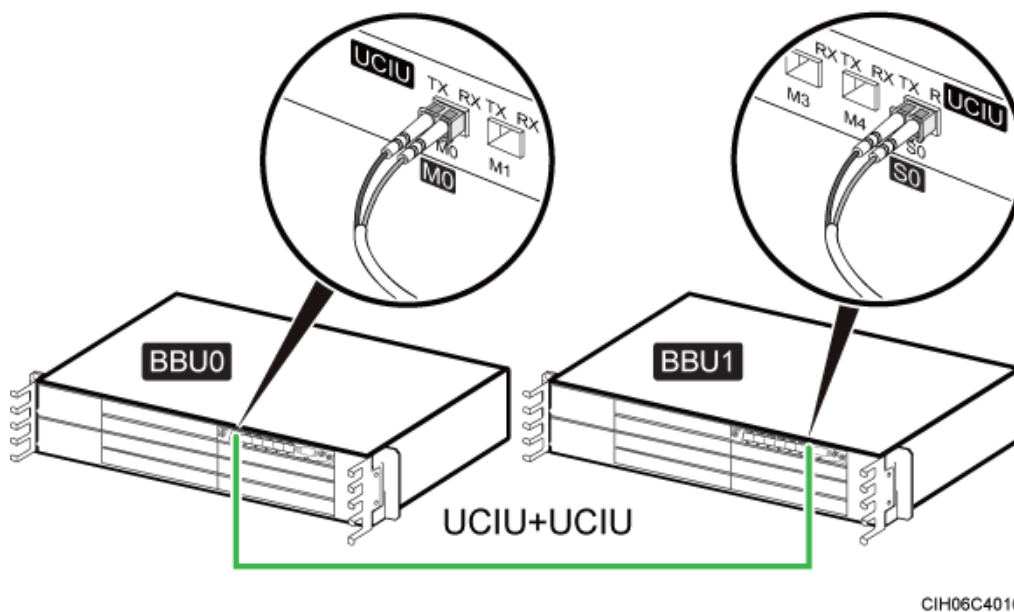


Figure 15-36 Installing the BBU inter-connection cable



Step 4 Lay out the cables according to the instructions in Cabling Requirements. If a fiber optic patch cord is used as a BBU interconnection signal cable, use binding straps to bind the BBU interconnection signal cable before using cable ties to secure it. If another type of cable is used as a BBU interconnection signal cable, directly use cable ties to secure it.

Step 5 Label the installed cables according to the instructions in Attaching an L-Shaped Label.

----End

15.11 Installing Transmission Cables

This chapter describes the procedures and precautions for installing transmission cables.

15.11.1 Installing E1/T1 Cables

This section describes the procedure and precautions for installing E1/T1 cables.

Prerequisites

Ensure that both ends of the E1/T1 cables are disconnected from any equipment. Then solder all connectors to the E1/T1 cables during the same session.

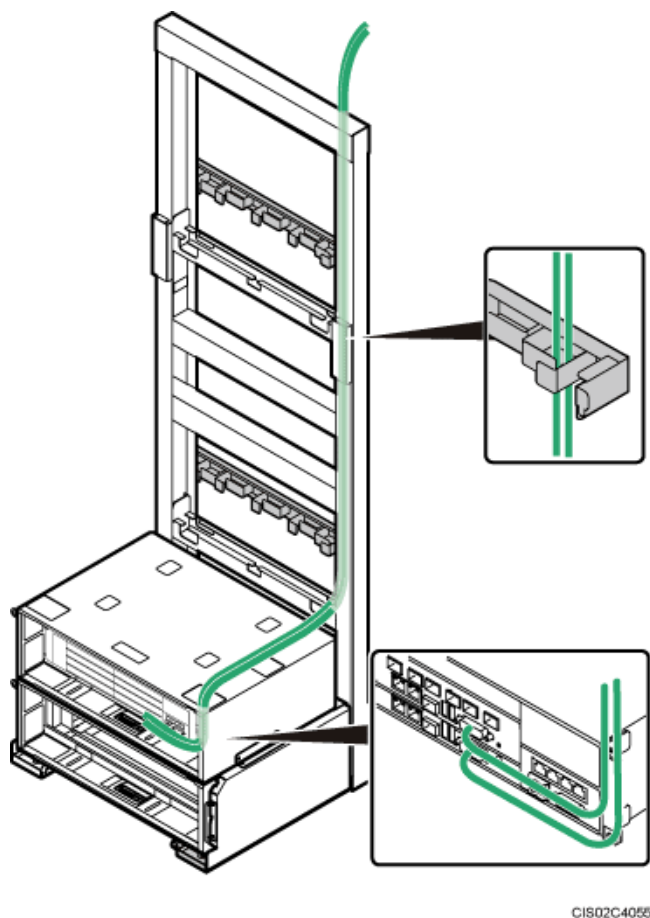
Procedure

- Step 1** Connect the DB26 male connector at one end of an E1/T1 cable to the E1/T1 port on the GTMU, and the DB26 male connector at one end of another E1/T1 cable to the E1/T1 port on the WMPT or UMPT, as shown in [Figure 15-37](#).

 **NOTE**

This section describes the procedures for installing E1/T1 cables in a GU base station using independent transmission. For the E1/T1 cable connections in other scenarios, see section "Transmission Cable Connections" in the *DBS3900 Hardware Description*.

Figure 15-37 Installing E1/T1 cables



- Step 2** Tighten the screws on the DB26 male connectors to 0.4 N·m (3.54 lbf·in.).
- Step 3** Route the other end of the cable through the right side on the top of the IMB03. Then connect it to the external transmission device.
- Step 4** Route the cables along the right side of the cabinet according to the instructions in [15.1 Cabling Requirements](#), and use cable ties to bind the cables.
- Step 5** Label the installed cables according to the instructions in Attaching an L-Shaped Label.

----End

15.11.2 Installing FE/GE Ethernet Cables

This section describes the procedure and precautions for installing FE/GE Ethernet cables.

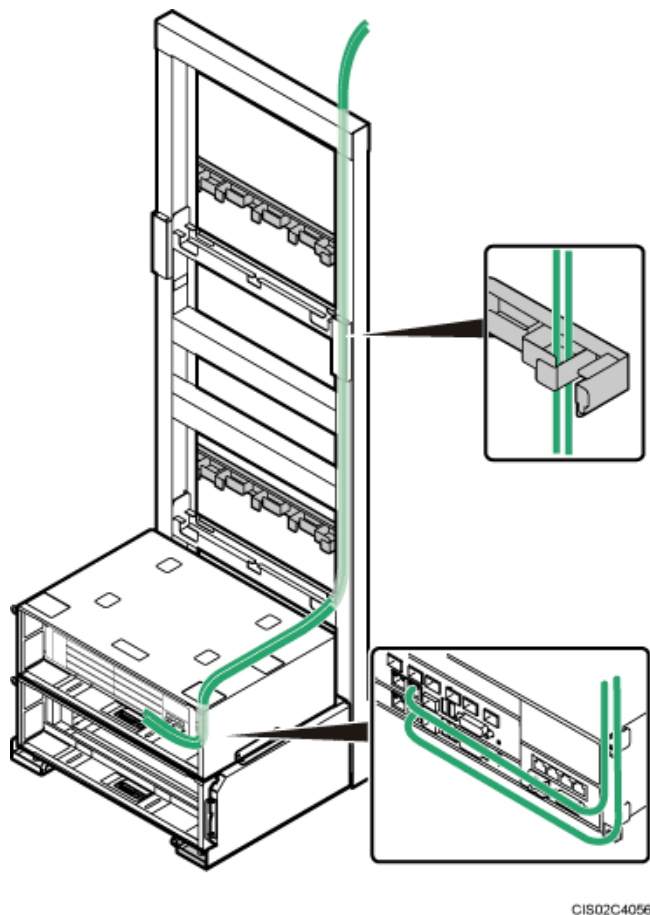
Procedure

- Step 1** Connect one end of an FE/GE Ethernet cable to the FE0 port on the GTMU, and one end of another FE/GE Ethernet cable to the FE0 port on the WMPT or FE/GE0 port on the UMPT, as shown in [Figure 15-38](#).

 **NOTE**

- An FE/GE Ethernet cable must be a shielded straight-through cable.
- This section describes how to install FE/GE Ethernet cables in a GU base station using independent transmission. For the FE/GE Ethernet cable connections in other configuration scenarios, see section "Transmission Cable Connections" in the *DBS3900 Hardware Description*.

Figure 15-38 Installing FE/GE Ethernet cables



- Step 2** Route the other end of the cable through the right side on the top of the IMB03. Then connect it to the external transmission device.
- Step 3** Route the cables along the right side of the cabinet according to the instructions in [15.1 Cabling Requirements](#), and use cable ties to bind the cables.
- Step 4** Label the installed cables according to the instructions in Attaching an L-Shaped Label.

---End

15.11.3 Installing FE/GE Optical Cables

This section describes the procedure and precautions for installing FE/GE optical cables.

Context

- Single-mode optical modules are labeled as SM and multimode optical modules are labeled as MM.

- The puller of a single-mode optical module is blue. The puller of a multimode optical module is black or gray.
- An FE/GE optical cable has an LC connector at one end and an FC connector, SC connector, or LC connector at the other end.
- SFP0 and FE/GE0 ports on the LMPT are used for one GE input. Therefore, they are not used simultaneously.
- SFP1 and FE/GE1 ports on the LMPT are used for another GE input. Therefore, they are not used simultaneously.
- This section describes how to install FE/GE optical cables in a GU base station using independent transmission. For the FE/GE optical cable connections in other configuration scenarios, see section "Transmission Cable Connections" in the *DBS3900 Hardware Description*.

 **NOTICE**

The performance of an optical module may deteriorate if it is exposed to the air for more than 20 minutes. Therefore, insert a fiber optic cable into an unpacked optical module within 20 minutes.

 **NOTICE**

The optical modules to be installed must match the rates of their corresponding ports. For example, the FE1 port (optical transmission port) on a GTMU/GTMUb /GTMUc supports only the transmission rate of 100 Mbit/s and therefore can only use an optical module supporting the transmission rate of 100 Mbit/s. If the port uses an optical module supporting the transmission rate of 1000 Mbit/s, the transmission link may be disconnected.

Procedure

- Step 1** Install an optical module, as shown in [Figure 15-39](#) and [Figure 15-40](#).
1. Remove the dustproof cap from the corresponding FE/GE optical port on the corresponding BBU board.
 2. Remove the dustproof cap from the optical module.
 3. Lower the puller on the optical module.
 4. Insert the optical module into the FE/GE optical port.
 5. Raise the puller on the optical module.

Figure 15-39 Removing the dustproof cap from the port

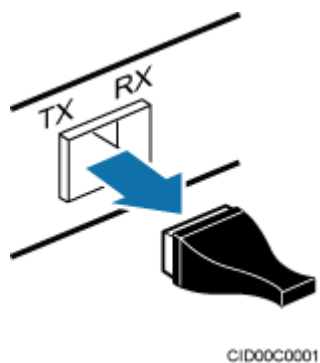
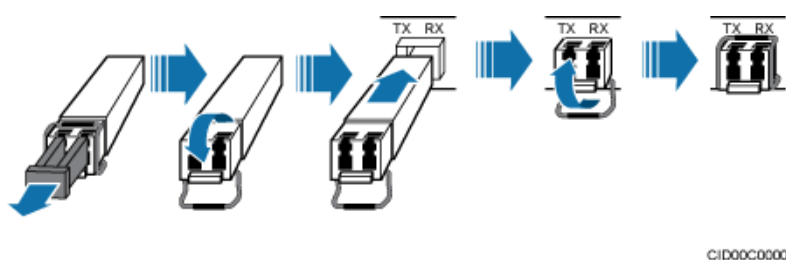


Figure 15-40 Installing an optical module



Step 2 Install an optical cable, as shown in [Figure 15-41](#) and [Figure 15-42](#).

1. Remove the dustproof caps from the connectors at the end labeled 2A and 2B on the optical cable, and insert the connector into the optical module on the BBU.
2. Route the other end of the optical cable through the right side on the top of the IMB03. Then connect it to the external transmission device.

 **NOTICE**

The TX and RX ports on the BBU boards must be connected to the RX and TX ports on the transmission equipment, respectively.

Figure 15-41 Removing the dustproof caps from the optical cable

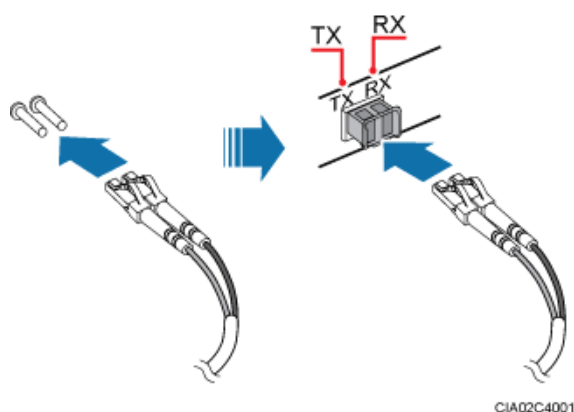
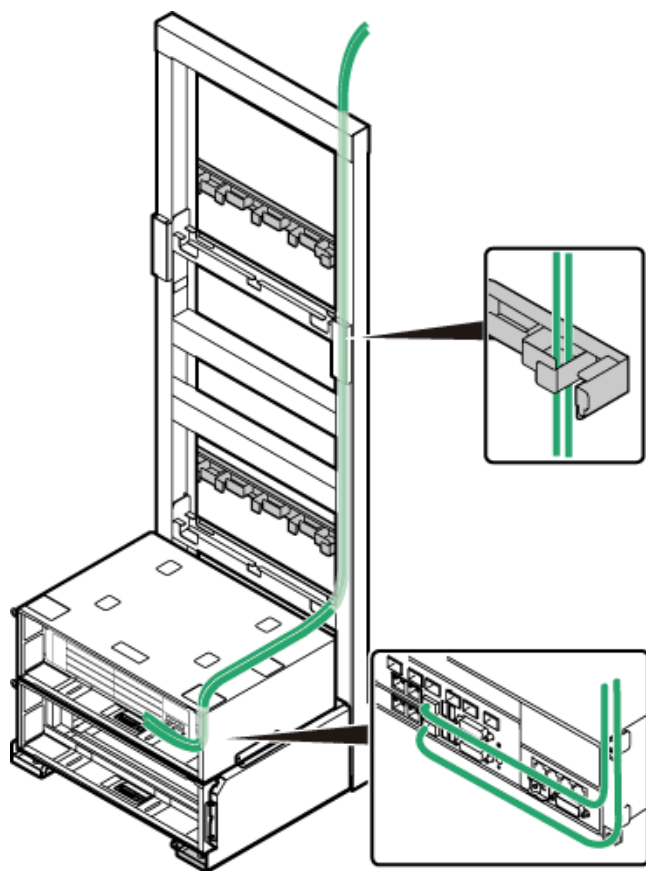


Figure 15-42 Installing the optical cable



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Step 3 Route the cables along the right side of the cabinet according to the instructions in [15.1 Cabling Requirements](#), and use cable ties to bind the cables.

Step 4 Label the installed cables according to the instructions in Attaching an L-Shaped Label.

---End

15.12 Installing CPRI Optical Cables

This section describes the procedure for installing CPRI optical cables, which transmit CPRI signals between a BBU and RRUs.

Context

NOTE

- Single-mode optical modules are labeled as SM and multimode optical modules are labeled as MM.
- The puller of a single-mode optical module is blue. The puller of a multimode optical module is black or gray.
- The optical modules to be installed must match the rates of their corresponding ports.

**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 an fiber optic cable into an unpacked optical module within 20 minutes.

Procedure

Step 1 Install an optical module on the BBU side, as shown in [Figure 15-43](#) and [Figure 15-44](#).

1. Remove the dustproof caps from the CPRI ports on the BBU boards.
2. Lower the puller on the optical module.
3. Insert the optical module into the CPRI port.
4. Raise the puller on the optical module.

Figure 15-43 Removing the dustproof cap from the port

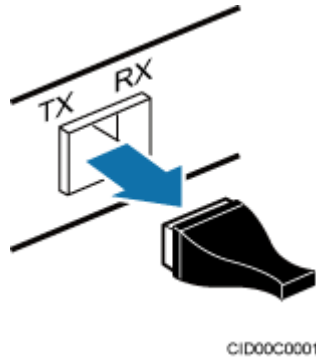
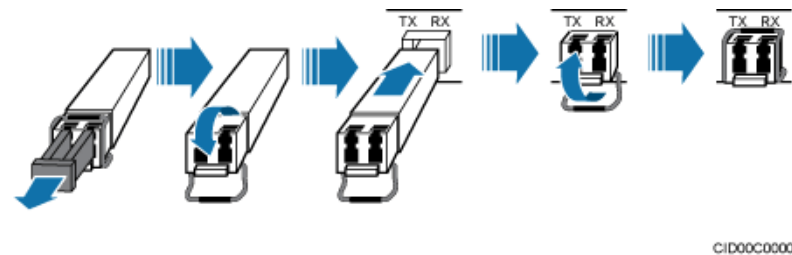


Figure 15-44 Installing an optical module



Step 2 Install an optical cable, as shown in [Figure 15-45](#), [Figure 15-46](#), and [Figure 15-47](#).

1. Remove the dustproof caps from the connectors at the end labeled 2A and 2B on the optical cable, and insert the connectors into the optical module on the BBU.
2. Route the CPRI optical cable along the right side of the ICR and into the cable trough.

 **NOTICE**

- When routing optical cables, coil the cables and place them on the top center of the upper-level IMB03 to ensure that the holes for heat dissipation are not covered.
- The minimum bending radius of the fiber is 140 mm. When coiling the optical cable, do not bend it excessively.

-
3. Insert optical modules into the CPRI_W/CPRI0/CPRI0/IR0 ports on the RF modules. The optical modules must be the same as those on the BBU side.

 **NOTE**

- Optical modules with the same labels are of the same type.
 - The method of installing the CPRI optical cable for an AC RRU is the same as the method of installing the CPRI optical cable for a DC RRU. The following figures use the CPRI optical cable for a DC RRU as an example.
4. Remove the dustproof caps from the connectors at the end labeled 1A and 1B on the optical cable, and insert the connectors into the optical module on the RRU.

 **NOTICE**

- When a CPRI optical cable connects a BBU and an RRU, the break-out optical cables on the BBU side and on the RRU side are 0.34 m (13.39 in.) and 0.03 m (1.18 in.), respectively.
 - If an LC-LC optical cable is used, the TX port on the BBU must be connected to the RX port on the RF module, and the RX port on the BBU must be connected to the TX port on the RF module.
-

Figure 15-45 Removing the dustproof caps from the optical cable

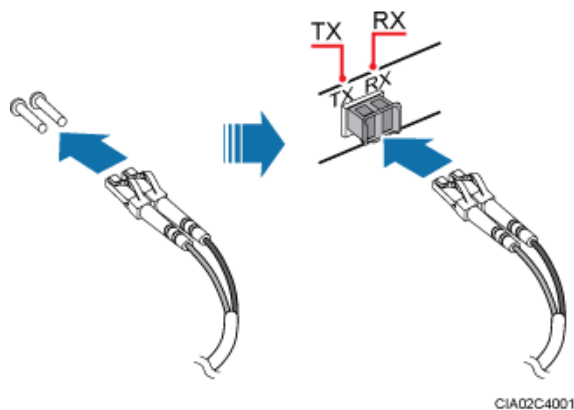
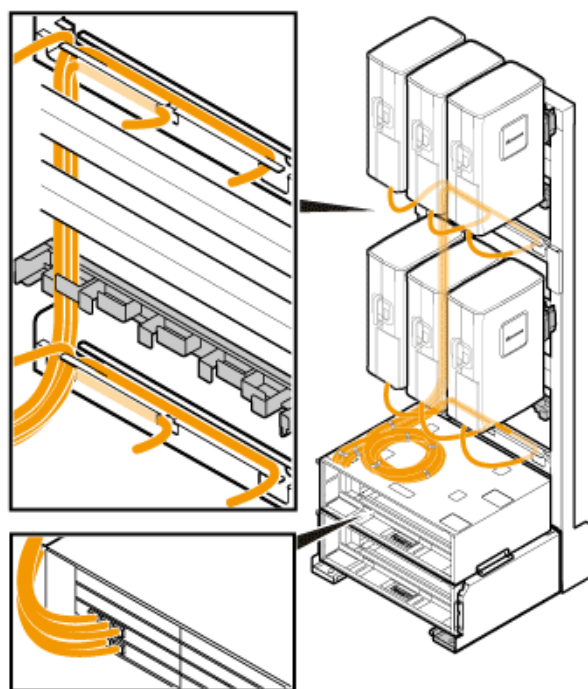
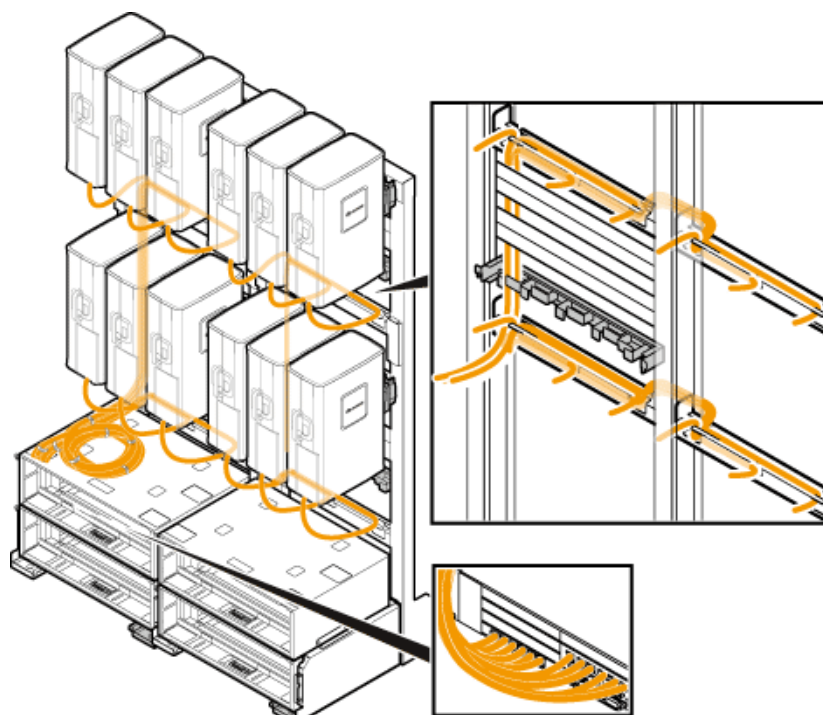


Figure 15-46 Installing the CPRI optical cable (1)



CIS02C4058

Figure 15-47 Installing the CPRI optical cable (2)



CIS02C4059

Step 3 Route the cables along the right side of the cabinet according to the instructions in [15.1 Cabling Requirements](#), and use cable ties to bind the cables.

Step 4 Label the installed cables according to the instructions in Attaching an L-Shaped Label.

---End

15.13 Installing RF Jumpers

This section describes the procedure for installing RF jumpers.

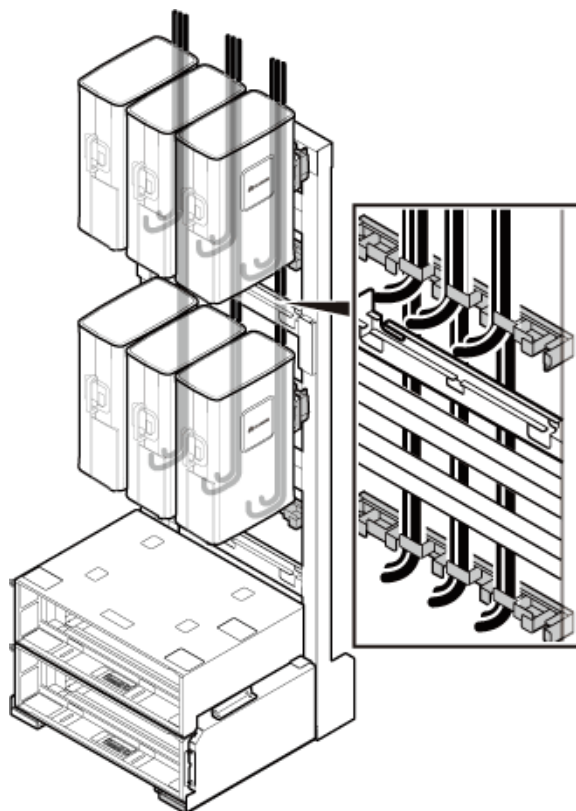
Context

- When connecting the DIN connectors on a DC RRU's RF jumper, first connect the DIN connector close to the cable tray and then the DIN connector at the other end. Bend an RF jumper before connecting it to an RRU.
- RF jumpers are routed through the three slots in the middle of the cable trough. Each of the three slots can hold four RF jumpers. Install the lower RF jumpers before the upper RF jumpers.
- The bending radius of an RF jumper must be more than or equal to 100 mm (3.94 in.).

Procedure

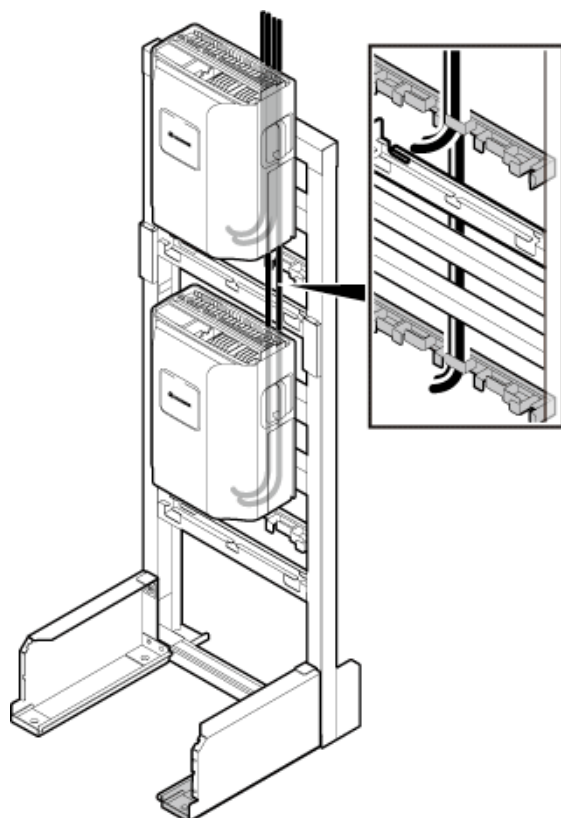
Step 1 Connect one end of the RF jumper to the RF port at the bottom of the RRU, as shown in [Figure 15-48](#) and [Figure 15-49](#).

Figure 15-48 Installing the RF jumper for a DC RRU



CIS02C5060

Figure 15-49 Installing the RF jumper for an AC RRU



CIS02C5061

- Step 2** Connect the other end of the RF jumper to the feeder or antenna.
- Step 3** Route the RF jumper along the right side of the cabinet according to the instructions in [15.1 Cabling Requirements](#), and use cable ties to bind the RF jumper.
- Step 4** Label the installed RF jumper according to the instructions in Attaching a Sign Plate Label.
- Step 5** Apply color-coding to the installed RF jumper according to the instructions in Attaching the Color Ring.

----End

15.14 Installing the GPS Clock Signal Cable

This section describes the procedure and precautions for installing a GPS clock signal cable.

Context

 **NOTE**

A satellite card needs to be installed onsite only for a USCU that supports the dual-satellite mode.

Procedure

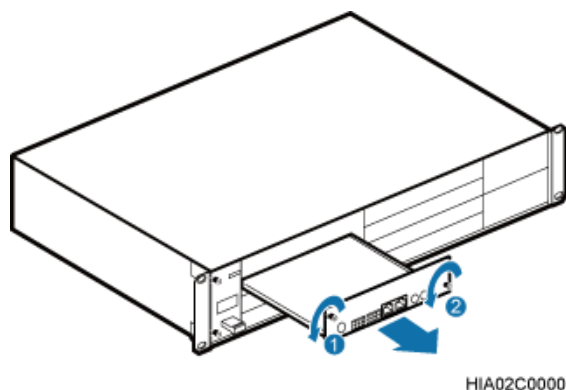
- Step 1** Put on an ESD wrist strap or a pair of ESD gloves.

 **NOTICE**

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

- Step 2 Optional:** Loosen the two M3 screws on the panel, and then pull out the USCU, as shown in [Figure 15-50](#).

Figure 15-50 Removing the USCU.



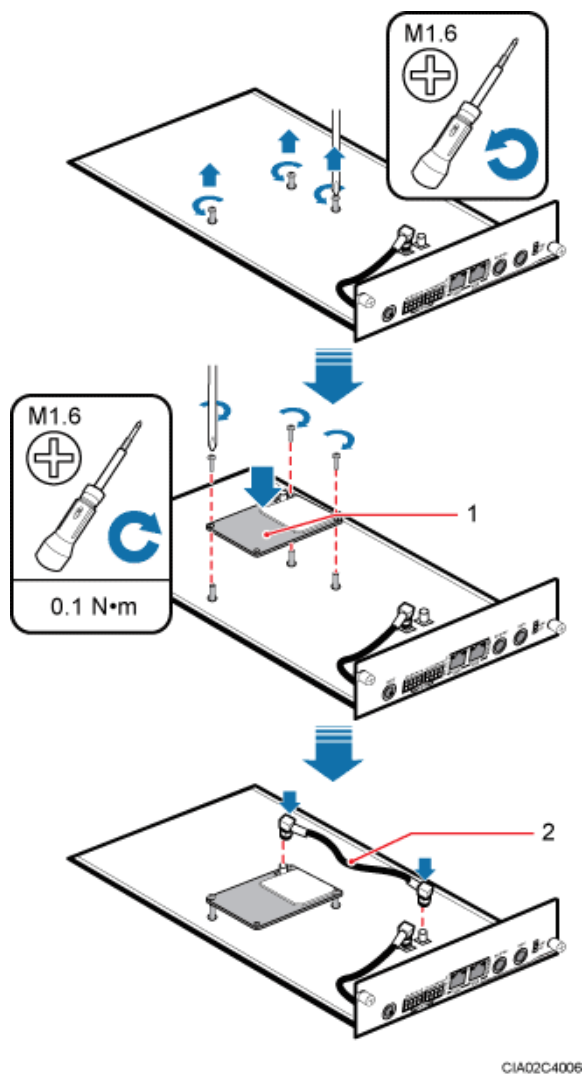
- Step 3 Optional:** Install a satellite card on the USCU, as shown in [Figure 15-51](#).

1. Remove the three M1.6 screws from the USCU.
2. Align the mounting holes on the satellite card with the bolts on the USCU.
3. Tighten the three M1.6 screws that were removed in [Step 3.1](#) to 0.1 N·m.
4. Connect one end of the RF jumper to the RF port on the satellite card and the other end to the GPS port on the USCU.

 **NOTICE**

There are six mounting holes on the satellite card. You need to install only three screws on the receiver, as shown in [Figure 15-51](#)

Figure 15-51 Installing the satellite card on the USCU



(1) Satellite card

(2) RF jumper

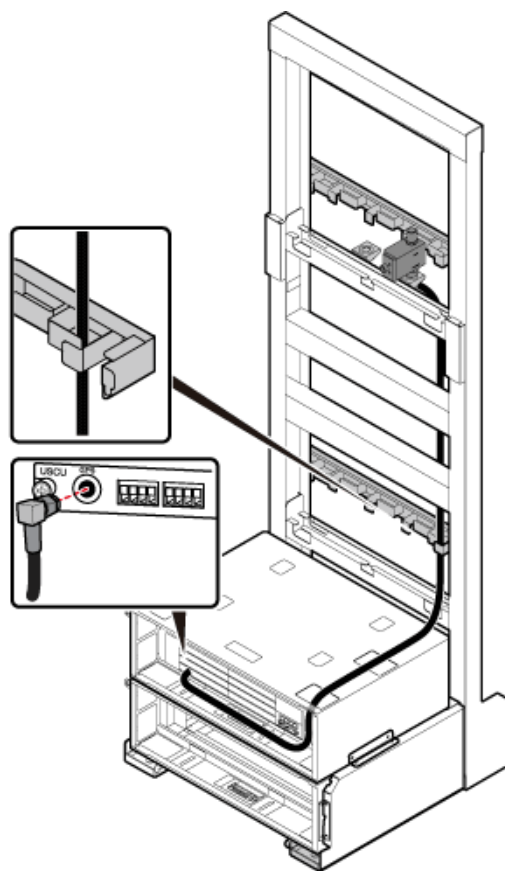
Step 4 Optional: Install the USCU equipped with the satellite card into the BBU, and tighten the screws on the USCU to 0.6 N·m.

Step 5 Connect the SMA male connector at the other end of the GPS clock signal cable to the GPS port on the USCU or LMPT, as shown in [Figure 15-52](#).

NOTE

If the USCU is not configured, connect the GPS clock signal cable to the GPS port on the LMPT.

Figure 15-52 Installing the GPS clock signal cable

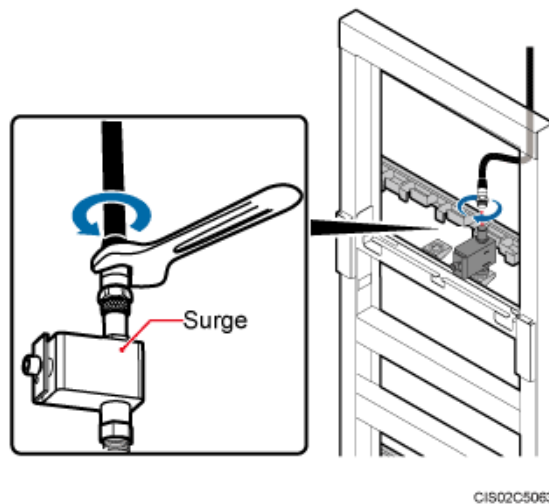


CIS02C5062

Step 6 Install the GPS jumper, as shown in [Figure 15-53](#).

1. Cut the cable to a length suitable for the actual cable route.
2. Install an N50 straight male connector at each end of the cable according to the instructions in [Installing the Type N Coaxial Connector](#).
3. Connect one end of the cable to the type N female connector (labeled Surge) on the GPS surge protector.
4. Route the other end of the cable along the right side of the IFS06. Then connect it to the external GPS antenna.

Figure 15-53 Installing the GPS jumper



Step 7 Lay out the cable according to the instructions in [15.1 Cabling Requirements](#), and use cable ties to bind the cable.

Step 8 Label the installed cable according to the instructions in [Attaching a Sign Plate Label](#).

----End

16 Installation Checklist

This chapter describes the hardware installation checklist.

Table 16-1 Hardware installation checklist

No.	Item
1	The position for each device conforms to the engineering drawing and meets clearance requirements. Sufficient space is reserved for equipment maintenance.
2	The BBU, RRUs, and auxiliary devices are securely installed, and all screws are tightened.
3	The DIP switch on the BBU is correctly set.
4	The cover plate is securely installed on the RRU cabling cavity.
5	None of power cables and PGND cables are short-circuited or reversely connected. In addition, these cables are not damaged or broken.
6	There are no connectors or joints on each power cable or PGND cable.
7	The terminals at both ends of the power cable or PGND cable are securely soldered or crimped.
8	Bare wires and OT terminals at the wiring terminals are tightly wrapped with insulation tapes or heat shrink tubing.
9	The work grounding and protection grounding of the base station share one group of ground bodies with the surge protection grounding of the building.
10	The connectors of each signal cable are intact, and these cables are not damaged or broken.
11	The distance between the bundled fibers and the BBU panel is between 40 mm (1.57 in.) and 70 mm (2.76 in.). This avoids the interference by the cover plate of the IMB03.
12	Labels are correct, legible, and complete at both ends of each cable.

17 Power-On Check

Before powering on a base station, field engineers need to check the power-on status of the cabinet and its components.



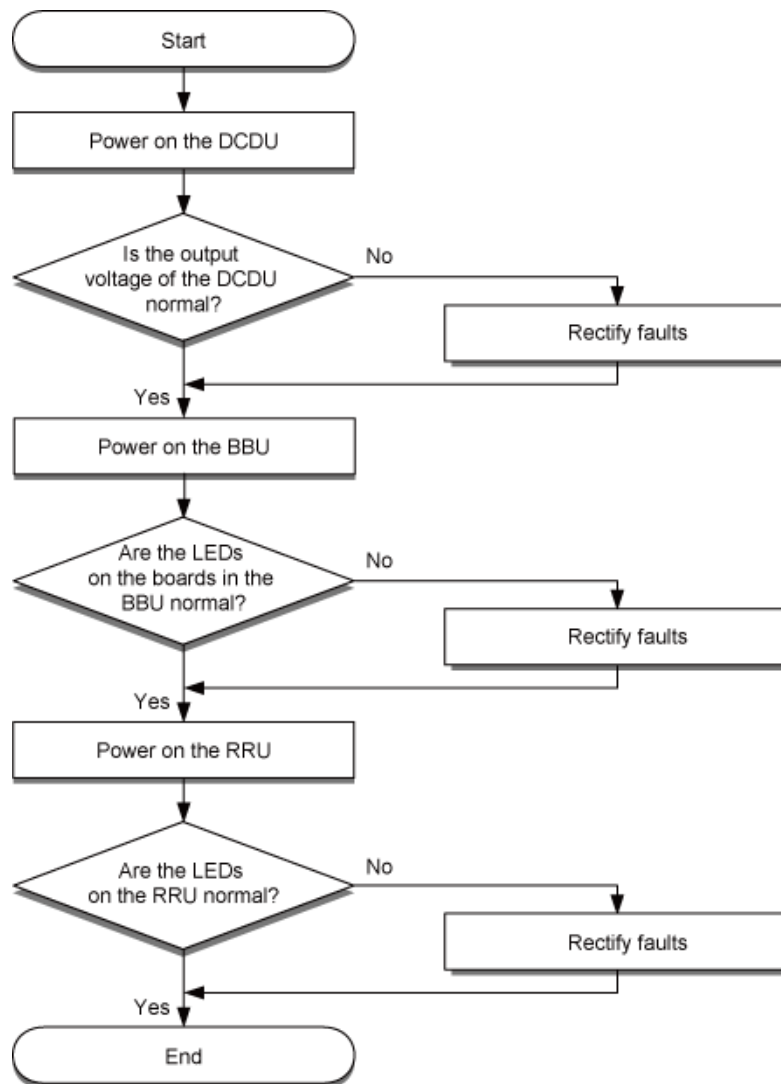
NOTICE

- Power on a component within 7 days after unpacking it. If you power off the component for maintenance, restore power to the component within 48 hours.
 - Power on an RRU within 24 hours after unpacking it. If you power off an RRU for maintenance, restore power to the RRU within 24 hours.
-

Power-On Check

[Figure 17-1](#) shows the power-on check process.

Figure 17-1 Power-on check



IPS02C0002

Checking the Indicator Status and Output Voltage Range

The DC output voltage of the DCDU ranges from -43.2 V DC to -57 V DC.

The normal status of the indicators on the BBU is as follows:

- UPEU: The RUN indicator is steady green.
- FAN: The STATE indicator blinks green (on for 1s and off for 1s).
- Other BBU boards: The RUN indicator blinks green (on for 1s and off for 1s).

The normal status of the indicators on the RRU is as follows:

- The RUN indicator blinks green (on for 1s and off for 1s).

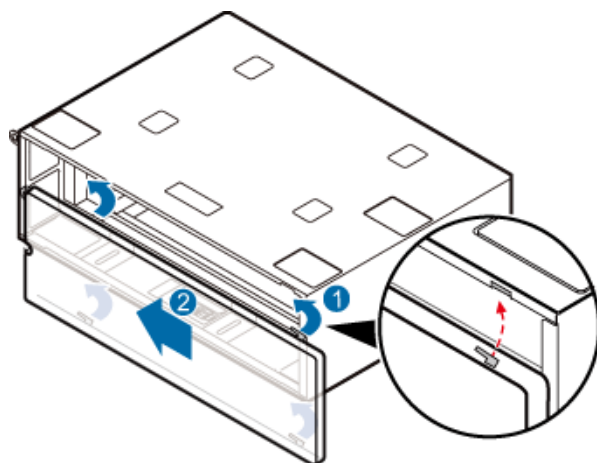
18 Installing the Cover Plate of the IMB03

This chapter describes the procedure for installing the cover plate of the IMB03.

Procedure

- Step 1** Fit the tabs on the cover plate into the slots in the IMB03, as shown in [Figure 18-1](#).

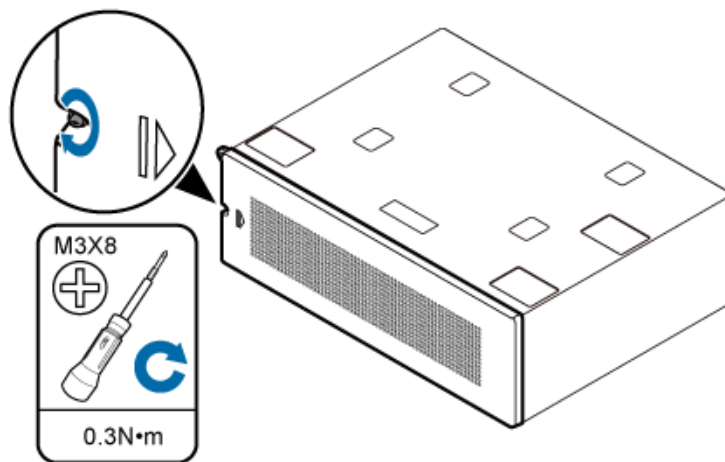
Figure 18-1 Installing the cover plate



HIS02C0063

- Step 2** Use a Phillips screwdriver to tighten the M3x8 bolts on the right side of the cover plate to 0.3 N·m (2.66 lbf·in.), as shown in [Figure 18-2](#).

Figure 18-2 Securing the cover plate



HIS02C0064

---End