



DBS3900 (Ver.B)

Installation Guide

Issue 06

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About This Document

Purpose

This document describes the installation of the cabinet, boards, modules, and cables for the DBS3900 (Ver.B) (referred to as the DBS3900 in this document) deployed indoors or outdoors. It also provides checklists for hardware installation.

Product Versions

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

Product Name	Product Version
DBS3900	V100R004C00
DBS3900 WCDMA	V200R013C00
DBS3900 GSM	V100R013C00
DBS3900 LTE	V100R004C00

Intended Audience

This document is intended for:

- Base station installation engineers

Organization

1 Changes in the DBS3900 (Ver.B) Installation Guide

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

2 Installation Preparations

This chapter describes document preparations, tool and instrument preparations, and skills and qualifications that installation engineers must possess.

3 Installation Scenarios

A DBS3900 mainly includes a BBU and RRUs. RRUs can be installed remotely so that a DBS3900 can be deployed indoors or outdoors. When a DBS3900 is deployed outdoors with AC or DC power supply, the BBU can be installed in an APM30H, TMC11H, or OMB. When a DBS3900 is deployed indoors with DC power supply, the BBU can be installed in an IMB03, 19-inch rack of customers, or wall.

4 Unpacking the Equipment

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

5 Obtaining the ESN

The Electronic Serial Number (ESN) is a unique identifier of a Network Element (NE). Record the ESN for later commissioning of the base station before installation.

6 Outdoor Scenario with AC Power Supply (BBU Installed in an APM30H)

This chapter describes the procedures for installing an APM30H, components in it, and related cables when a DBS3900 is deployed outdoors with AC power supply and the BBU is installed in the APM30H.

7 Outdoor Scenario with DC Power Supply (BBU Installed in a TMC11H)

This chapter describes the procedures for installing a TMC11H, components in it, and related cables when a DBS3900 is deployed outdoors with DC power supply and the BBU is installed in the TMC11H.

8 Outdoor Scenario with DC Power Supply (BBU Installed in a +24 V DC APM30H)

This chapter describes the procedures for installing a +24 V DC APM30H, components in it, and related cables when a DBS3900 is deployed outdoors with DC power supply and the BBU is installed in the +24 V DC APM30H.

9 Outdoor Scenario with DC Power Supply (BBU Installed in an OMB)

This chapter describes the procedures for installing an OMB, components in it, and related cables when a DBS3900 is deployed outdoors with DC power supply and the BBU is installed in the OMB.

10 Outdoor Scenario with AC Power Supply (BBU Installed in an OMB)

This chapter describes the procedures for installing an OMB, components in it, and related cables when a DBS3900 is deployed outdoors with AC power supply and the BBU is installed in the OMB.

11 Indoor Scenario with DC Power Supply (BBU Installed on a Wall)

This chapter describes the procedures for installing the BBU, DCDU-03B, and related cables on an indoor wall.

12 Indoor Scenario with DC Power Supply (BBU Installed in a 19-Inch Rack)

This chapter describes the procedures for installing all the components and related cables in a 19-inch rack indoors.

13 Indoor Scenario (BBU Installed in an IMB03)

This chapter describes the procedures for installing an IMB03, components in it, and related cables when a DBS3900 is deployed indoors and the BBU is installed in the IMB03.

14 Indoor Scenario with DC Power Supply (BBU Installed Indoors and RRU Powered Outdoors)

In this scenario, a DBS3900 is deployed indoors with DC power supply. The installation of the BBU is not described in this scenario. An APM30H is installed outdoors, supplying power to and monitoring only RRUs.

Conventions

Symbol Conventions

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

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

General Conventions

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

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

Command Conventions

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

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

GUI Conventions

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

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

Keyboard Operations

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

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

Mouse Operations

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

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

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1 Changes in the DBS3900 (Ver.B) Installation Guide

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

06 (2011-09-15)

This is the sixth official release.

Compared with 05 (2011-08-30), this issue incorporates the following changes:

Content	Change Description
6.5.2 Installing a Cable Outlet Module in a Cabinet	The description of the cable outlet modules is added.

Compared with 05 (2011-08-30), no content is added.

Compared with 05 (2011-08-30), no content is deleted.

05 (2011-08-30)

This is the fifth official release.

Compared with 04 (2011-07-15), this issue incorporates the following changes:

Content	Change Description
About This Document	Added Ver.B to the cabinet version in the document name.
Installing a FE/GE Optical Cable	Added the caution for installing an optical module.
Installing a FE/GE Optical Cable	
6.5.6 Installing a CPRI Optical Cable	

Compared with 04 (2011-07-15), no content is added.

Compared with 04 (2011-07-15), no content is deleted.

04 (2011-07-15)

This is the fourth official release.

Compared with 03 (2011-06-10), this issue incorporates the following changes:

Content	Change Description
3 Installation Scenarios	Optimized the information and figures in this document.
7.5.5 Installing Monitoring Signal Cables	
14.5.4 Installing a Monitoring Signal Cable for the RRU	Modified the procedure for installing the monitoring signal cable of an RRU.

Compared with 03 (2011-06-10), no content is added.

Compared with 03 (2011-06-10), no content is deleted.

03 (2011-06-10)

This is the third official release.

Compared with 02 (2011-05-25), this issue incorporates the following changes:

Content	Change Description
6.4.7 Installing the GPS Surge Protector	Modified the procedure for installing a dual-satellite receiver.
9.4.8 Installing a GPS Clock Signal Cable	
Installing the FE/GE Cable	Modified the procedure for grounding the shield layer of an FE/GE cable.
6.2.2 Installing a Cabinet on a Metal Pole	Modified the requirements for installing a cabinet at a height.
6.2.3 Installing a Cabinet on a Wall	
9.2.1 Installing an OMB on a Metal Pole	
9.2.2 Installing an OMB on a Wall	
Installing an Input Power Cable for the APM30H	Modified the procedures for routing AC power cables through pipes and waterproofing connectors.
Installing an Input Power Cable for the OMB	

Compared with 02 (2011-05-25), no content is added.

Compared with 02 (2011-05-25), no content is deleted.

02 (2011-05-25)

This is the second official release.

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

Content	Change Description
Installing a BBU Power Cable	The connections of the BBU power cables are changed when two UPEUs are installed in the BBU.
Installing a BBU Power Cable	
Installing a BBU Power Cable	
Installing IMB03 Cables	

Compared with 01 (2011-03-30), no content is added.

Compared with 01 (2011-03-30), no content is deleted.

01 (2011-03-30)

This is the first official release.

Compared with Draft A (2011-01-30), this issue incorporates the following changes:

Content	Change Description
6.7 Installation Checklist	The description about checking the cable installation is added.

Compared with Draft A (2011-01-30), this issue is added with the following topics:

- [6.4.7 Installing the GPS Surge Protector](#)
- [9.4.8 Installing a GPS Clock Signal Cable](#)

Compared with Draft A (2011-01-30), no content is deleted.

Draft A (2011-01-30)

This is the draft release.

Compared with the installation guide of MBTS V100R003C00, WCDMA-NodeB V200R012C00, and GSM-BTS V100R012C00, this document adds the following topics:

- The procedures for installing cabinets, boards or modules, and related cables in the indoor scenario with DC power supply (BBU installed indoors and RRU powered outdoors) and in the indoor scenario (BBU installed in an IMB).
- The procedures for installing cabinets, boards or modules, and related cables in an outdoor APM30H (Ver.B) or outdoor TMC11H (Ver.B).

Compared with the *DBS3900 Installation Guide* of MBTS V100R003C00, WCDMA-NodeB V200R012C00, and GSM-BTS V100R012C00, this document omits the following topics:

- The procedures for installing cabinets, boards or modules, and related cables in a scenario where the BBU is installed in an APM30, in an APM30H (Ver.A), TMC11H, or TMC11H (Ver.A).

2 Installation Preparations

About This Chapter

This chapter describes document preparations, tool and instrument preparations, and skills and qualifications that installation engineers must possess.

[2.1 Document Preparation](#)

Before installing a DBS3900, obtain related information in the following documents:

[2.2 Tools and Instruments](#)

You must prepare the following tools and instruments before 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 Document Preparation

Before installing a DBS3900, obtain related information in the following documents:

- BBU3900 Hardware Description
- BBU3900 Hardware Maintenance Guide
- OCB User Guide

For details about the installation of an RRU, see the following documents:

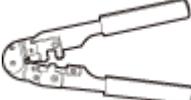
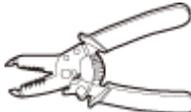
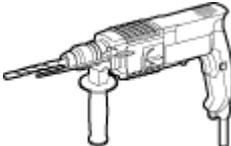
- RRU Installation Guide

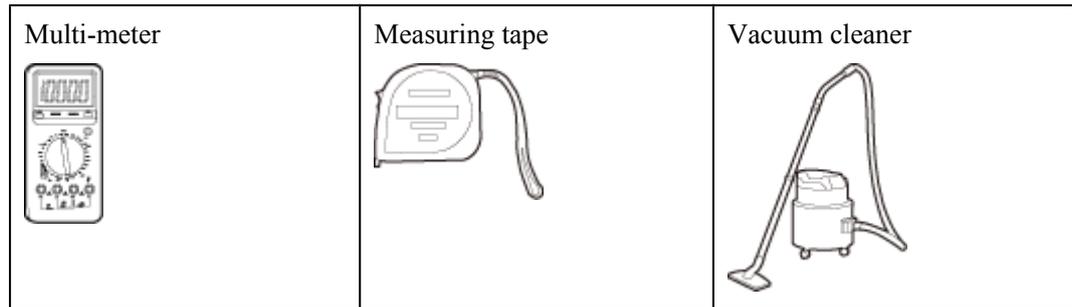
For details about the installation of an IFS06 and IMB03, see the following document:

- DBS3900 (ICR) Installation Guide

2.2 Tools and Instruments

You must prepare the following tools and instruments before installation.

<p>Marker</p>  <p>Level</p> 	<p>Phillips screwdriver (M3 to M6)</p>  <p>Flat-head screwdriver (M3 to M6)</p> 	<p>Diagonal pliers</p> 
<p>32 mm combination wrench</p> 	<p>Socket wrench</p> 	<p>Torque wrench</p> 
<p>Power cable crimping tool</p> 	<p>RJ11 crimping tool</p> 	<p>Cable cutter</p> 
<p>Rubber mallet</p> 	<p>Electric iron</p> 	<p>Wire stripper</p> 
<p>Hammer drill (Ø16)</p> 	<p>Heat gun</p> 	<p>Inner hexagon wrench (M10)</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 Installation Scenarios

A DBS3900 mainly includes a BBU and RRUs. RRUs can be installed remotely so that a DBS3900 can be deployed indoors or outdoors. When a DBS3900 is deployed outdoors with AC or DC power supply, the BBU can be installed in an APM30H, TMC11H, or OMB. When a DBS3900 is deployed indoors with DC power supply, the BBU can be installed in an IMB03, 19-inch rack of customers, or wall.

Table 3-1 describes the DBS3900 installation scenarios.

 **NOTE**

The APM30H, TMC11H, IBBS200T, and IBBS200D described in the following are the Ver.B series cabinets.

Table 3-1 Installation scenarios

Application Environment	Power Supply	Installation Position of Main Devices	Reference
Outdoors	AC	The BBU is installed in an APM30H, and the RRUs are installed remotely. The APM30H supplies power to the BBU and remote RRUs.	Outdoor Scenario with AC Power Supply (BBU Installed in an APM30H)
		The BBU is installed in an OMB, and the RRUs are installed remotely. The OMB supplies power to the BBU and remote RRUs.	Outdoor Scenario with AC Power Supply (BBU Installed in an OMB)

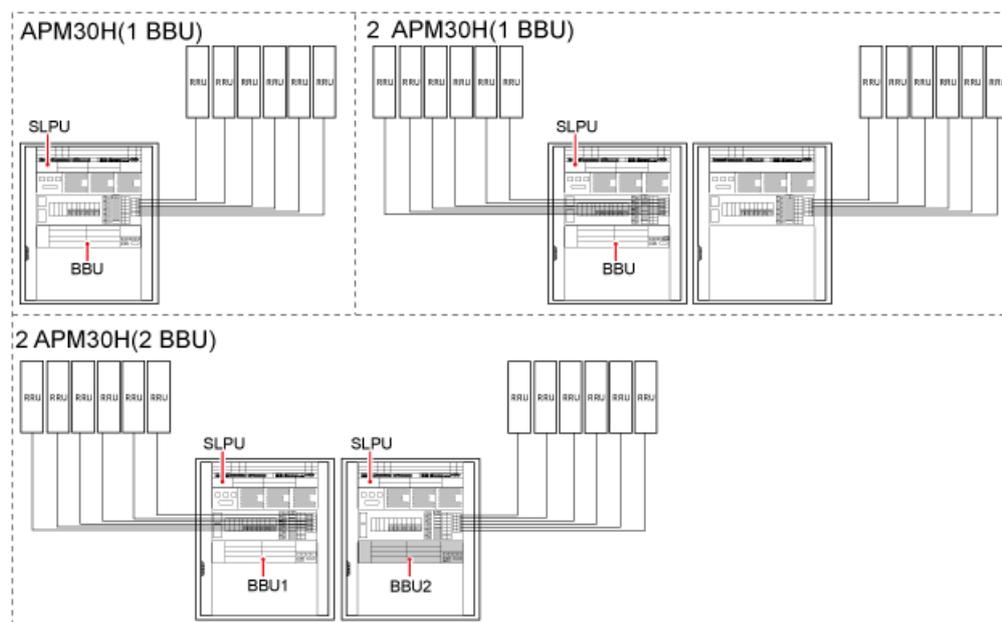
Application Environment	Power Supply	Installation Position of Main Devices	Reference
	DC	<p>The BBU is installed in a TMC11H, and the RRUs are installed remotely. The TMC11H supplies power to the BBU and remote RRUs.</p>	<p>Outdoor Scenario with DC Power Supply (BBU Installed in a TMC11H)</p>
		<p>The BBU is installed in an APM30H (+24 V), and the RRUs are installed remotely. The APM30H (+24 V) supplies power to the BBU and remote RRUs.</p>	<p>Outdoor Scenario with DC Power Supply (BBU Installed in a +24 V DC APM30H)</p>
		<p>The BBU is installed in an OMB, and the RRUs are installed remotely. The OMB supplies power to the BBU and remote RRUs.</p>	<p>Outdoor Scenario with DC Power Supply (BBU Installed in an OMB)</p>
Indoors	DC	<p>The BBU and DCDU-03B are installed in a 19-inch rack, and the RRUs are remotely installed outdoors. The DCDU-03B supplies power to the BBU and outdoor RRUs.</p>	<p>Indoor scenario with DC power supply (BBU installed in a 19-inch rack)</p>
		<p>The BBU and DCDU-03B are installed on a wall, and the RRUs are remotely installed outdoors. The DCDU-03B supplies power to the BBU and outdoor RRUs.</p>	<p>Indoor scenario with DC power supply (BBU installed on a wall)</p>

Application Environment	Power Supply	Installation Position of Main Devices	Reference
		The BBU is installed indoors, and the RRUs are remotely installed outdoors. An outdoor APM30H provides power to and monitors only RRUs.	Indoor Scenario with DC Power Supply (BBU Installed Indoors and RRU Powered Outdoors)
	DC/AC	The BBU is installed in an IMB03, and the RRUs are installed remotely. The IMB03 supplies power to the BBU and remote RRUs.	Indoor Scenario (BBU Installed in an IMB03)
		The BBU is installed in an IMB03, and the RRUs can be installed on the IFS06 with the IMB03 .	DBS3900 (ICR) Installation Guide

Outdoor Scenario with AC Power Supply (BBU Installed in an APM30H)

In the 110 V or 220 V AC scenario, a BBU can be installed in an APM30H, which provides power to a maximum of six RRUs. If more than six RRUs are configured, two APM30H cabinets are required. Two APM30H cabinets can house two BBUs, which enable the base station to work in triple mode. **Figure 3-1** shows the typical scenarios when no backup power or transmission space is required.

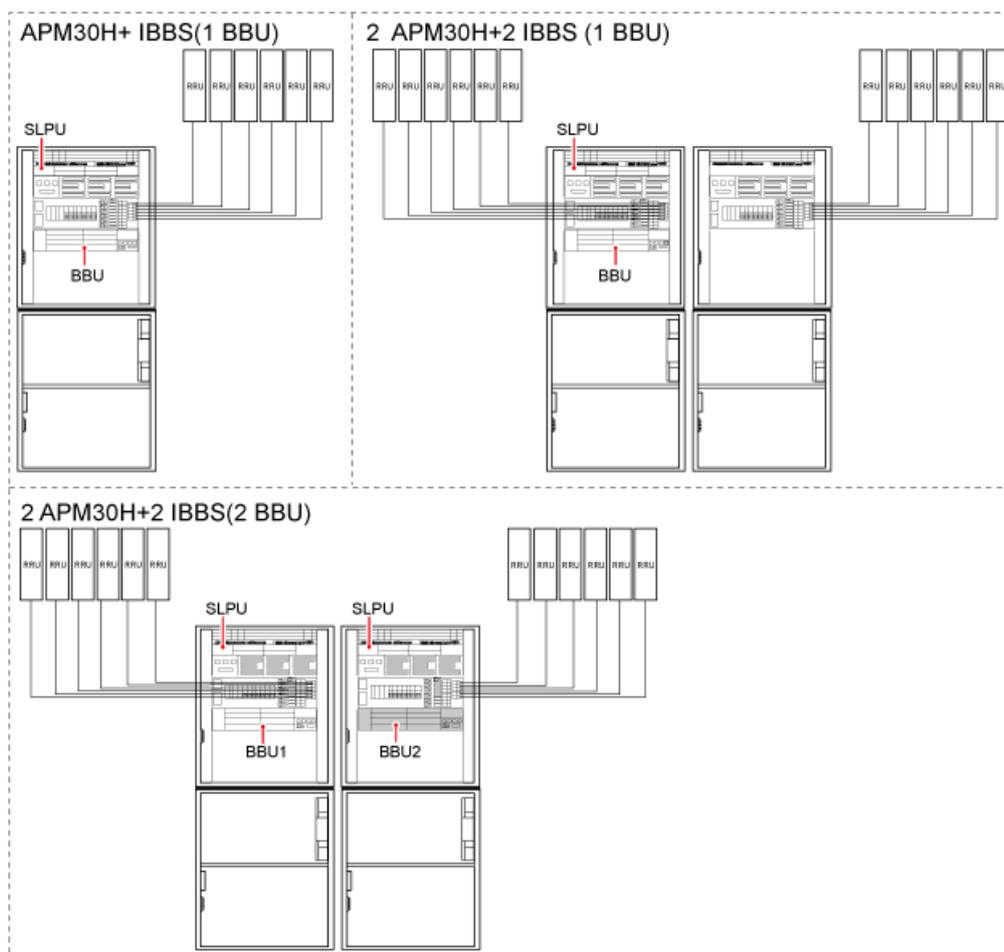
Figure 3-1 Outdoor scenario with AC power supply (BBU installed in an APM30H) (1)



SRH06C0019

In the 110 V or 220 V AC scenario, a BBU can be installed in an APM30H, which provides power to a maximum of six RRUs. If more than six RRUs are configured, two APM30H cabinets are required. Two APM30H cabinets can house two BBUs, which enable the base station to work in triple mode. [Figure 3-2](#) shows the typical scenarios when the backup power capacity is not greater than 184 Ah and no transmission space is required.

Figure 3-2 Outdoor scenario with AC power supply (BBU installed in an APM30H) (2)



SRH06C0020

In the 110 V or 220 V AC scenario, a BBU can be installed in an APM30H, which provides power to a maximum of six RRUs. If more than six RRUs are configured, two APM30H cabinets are required. Two APM30H cabinets can house two BBUs, which enable the base station to work in triple mode. [Figure 3-3](#) shows the typical scenarios when the backup power capacity is greater than 184 Ah and not greater than 368 Ah and no transmission space is required.

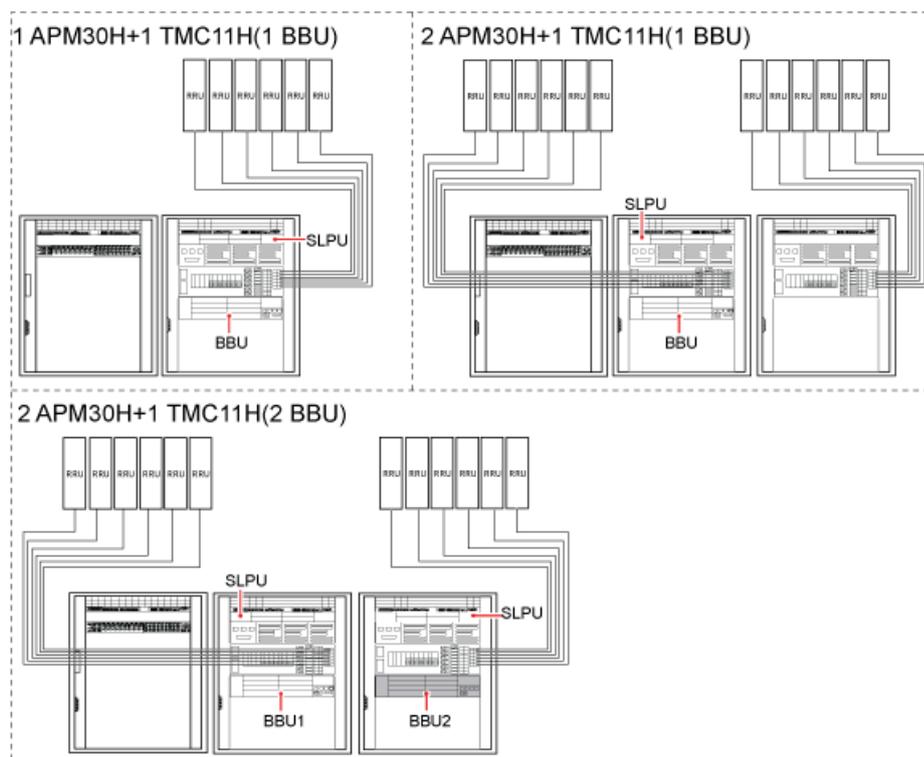
Figure 3-3 Outdoor scenario with AC power supply (BBU installed in an APM30H) (3)



SRH06C0021

In the 110 V or 220 V AC scenario, a BBU can be installed in an APM30H, which provides power to a maximum of six RRUs. If more than six RRUs are configured, two APM30H cabinets are required. Two APM30H cabinets can house two BBUs, which enable the base station to work in triple mode. [Figure 3-4](#) shows the typical scenarios when no backup power is required and transmission space is required.

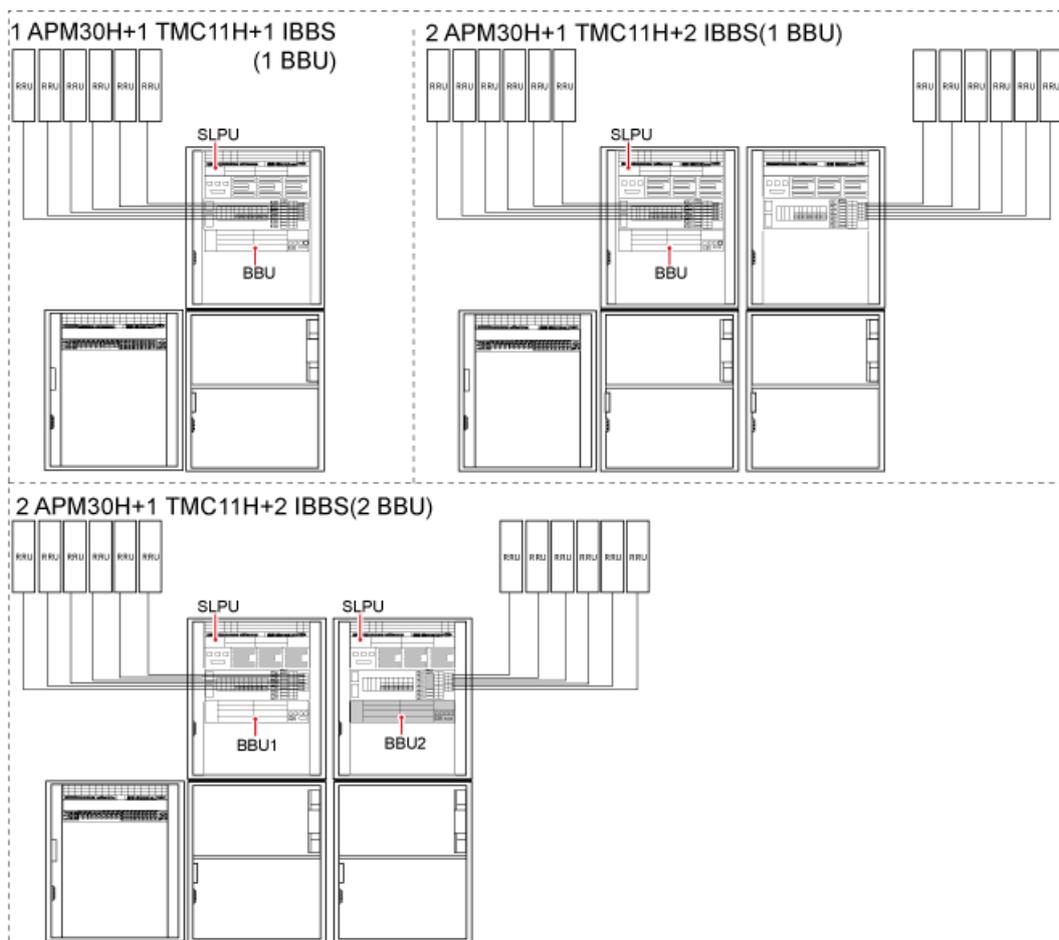
Figure 3-4 Outdoor scenario with AC power supply (BBU installed in an APM30H) (4)



SRH06C0022

In the 110 V or 220 V AC scenario, a BBU can be installed in an APM30H, which provides power to a maximum of six RRUs. If more than six RRUs are configured, two APM30H cabinets are required. Two APM30H cabinets can house two BBUs, which enable the base station to work in triple mode. [Figure 3-5](#) shows the typical scenarios when the backup power capacity is not greater than 184 Ah and transmission space is required.

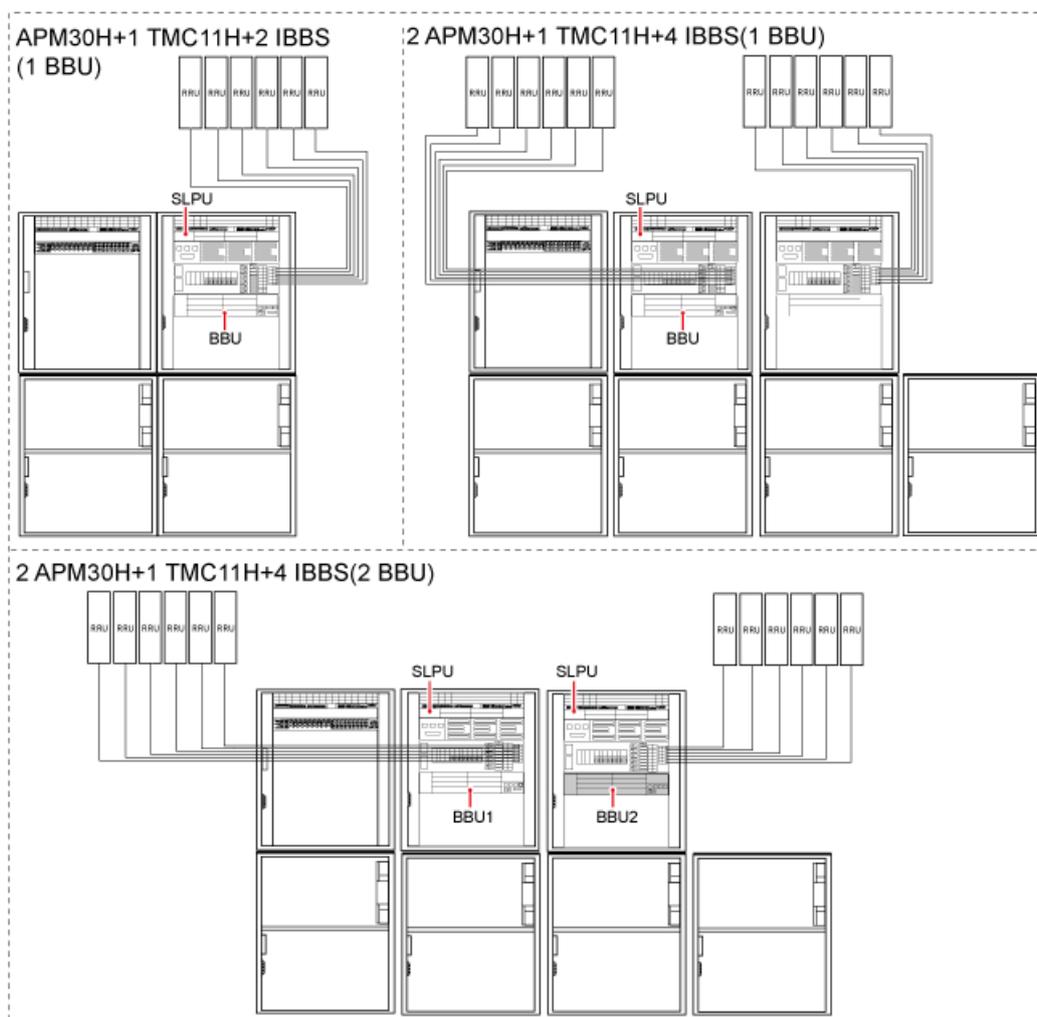
Figure 3-5 Outdoor scenario with AC power supply (BBU installed in an APM30H) (5)



SRH06C0023

In the 110 V or 220 V AC scenario, a BBU can be installed in an APM30H, which provides power to a maximum of six RRUs. If more than six RRUs are configured, two APM30H cabinets are required. Two APM30H cabinets can house two BBUs, which enable the base station to work in triple mode. [Figure 3-6](#) shows the typical scenarios when the backup power capacity is greater than 184 Ah and not greater than 368 Ah and transmission space is required.

Figure 3-6 Outdoor scenario with AC power supply (BBU installed in an APM30H) (6)

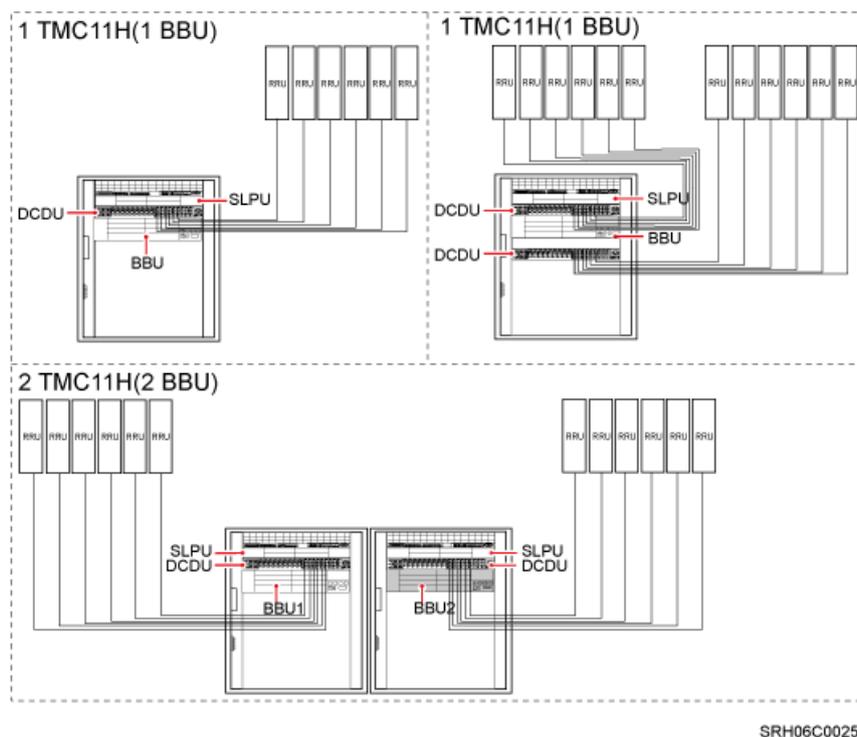


SRH06C0024

Outdoor Scenario with DC Power Supply (BBU Installed in a TMC11H)

In the -48 V DC power supply scenario, a BBU can be installed in an TMC11H, which provides power to a maximum of six RRUs. If more than six RRUs are configured, two TMC11H cabinets are required. Two TMC11H cabinets can house two BBUs, which enable the base station to work in triple mode, as shown in [Figure 3-7](#).

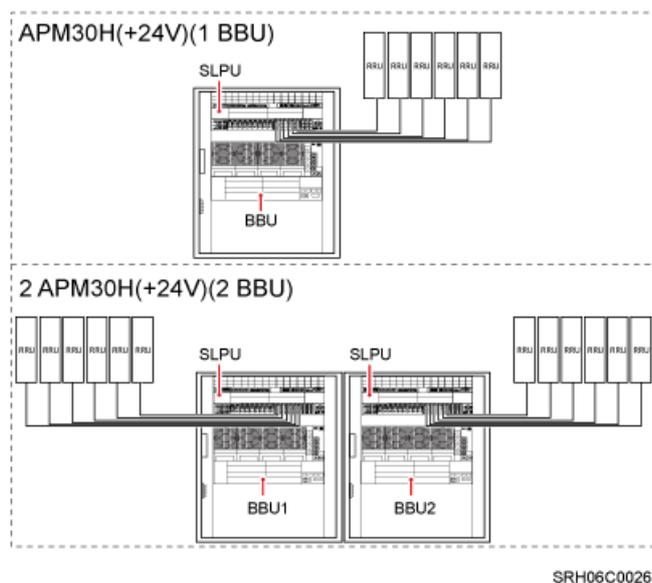
Figure 3-7 Outdoor Scenario with DC Power Supply (BBU Installed in a TMC11H)



Outdoor Scenario with DC Power Supply (BBU Installed in a +24 V DC APM30H)

In the +24 V DC power supply scenario, a BBU can be installed in a +24 V DC APM30H. Two +24 V DC APM30H cabinets can house two BBUs, which enable the base station to work in triple mode, as shown in [Figure 3-8](#).

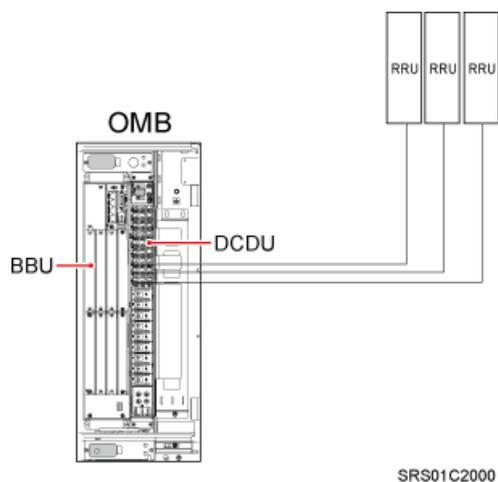
Figure 3-8 Outdoor Scenario with DC Power Supply (BBU Installed in a +24 V DC APM30H)



Outdoor Scenario with DC Power Supply (BBU Installed in an OMB)

In the -48 V DC power supply scenario, the BBU can be installed in an OMB if the transmission space of customers is not more than 3 U and the number of RRUs is not more than three, as shown in [Figure 3-9](#).

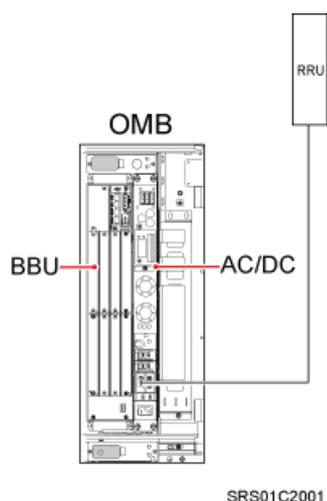
Figure 3-9 DC scenario (BBU installed in an OMB)



Outdoor Scenario with AC Power Supply (BBU Installed in an OMB)

In the 110 V or 220 V AC power supply scenario, the BBU can be installed in an OMB if the transmission space of customers is not more than 3 U and only one RRU is installed, as shown in [Figure 3-10](#).

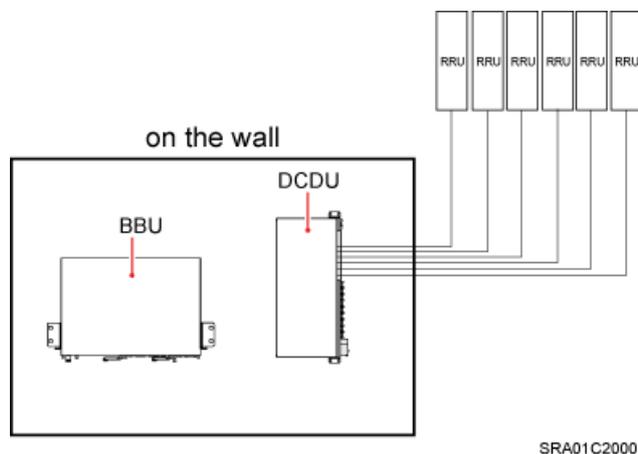
Figure 3-10 AC scenario (BBU installed in an OMB)



Indoor scenario with DC power supply (BBU installed on a wall)

In the -48 V DC power supply scenario, the BBU and DCDU-03B can be installed on an indoor wall, the RRUs are remotely installed outdoors, and the DCDU-03B provides power to the BBU and RRUs, as shown in [Figure 3-11](#).

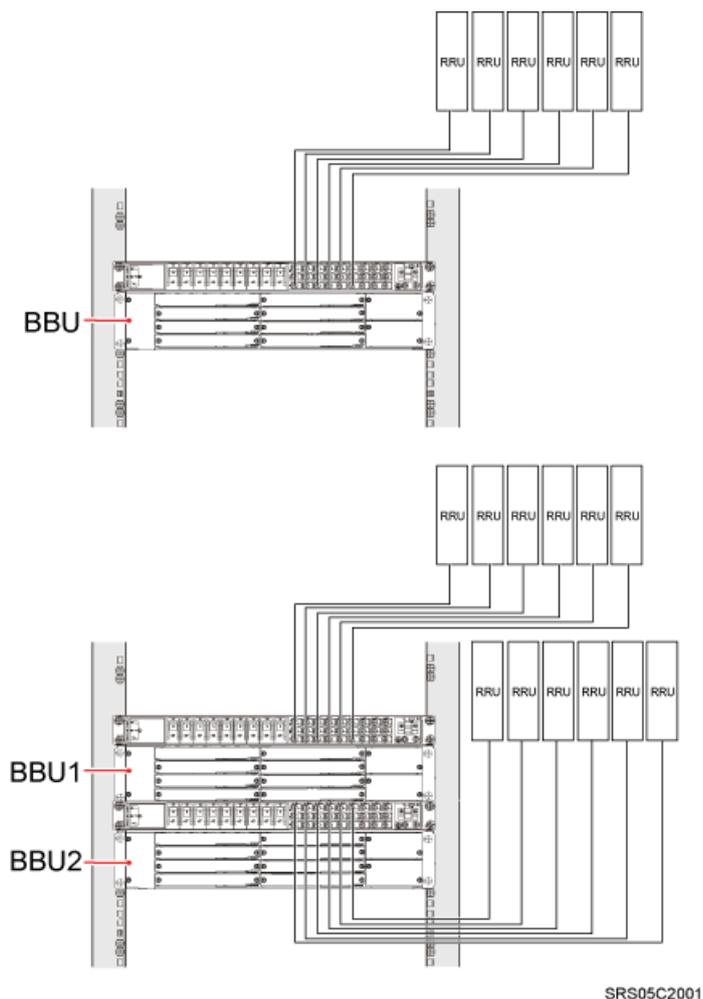
Figure 3-11 Indoor scenario with DC power supply (BBU installed on a wall)



Indoor scenario with DC power supply (BBU installed in a 19-inch rack)

In the -48 V DC power supply scenario, the BBU and DCDU-03B can be installed in any 19-inch rack provided by customers, the RRUs are remotely installed outdoors, and the DCDU-03B provides power to the BBU and RRUs. One 19-inch rack can house two BBUs and two DCDU-03Bs, which enable the base station to work in triple mode, as shown in [Figure 3-12](#).

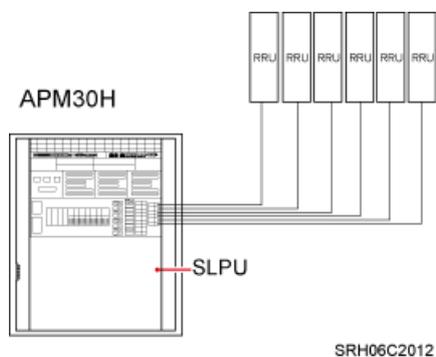
Figure 3-12 Indoor scenario with DC power supply (BBU installed in a 19-inch rack)



Indoor Scenario with DC Power Supply (BBU Installed Indoors and RRU Powered Outdoors)

In the 110 V or 220 V AC power supply scenario, an outdoor APM30H provides power to and monitors only RRUs, and the BBU is installed indoors, as shown in [Figure 3-13](#).

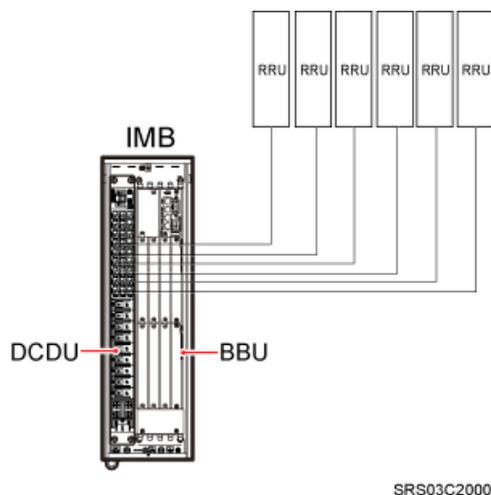
Figure 3-13 Indoor Scenario with DC Power Supply (BBU Installed Indoors and RRU Powered Outdoors)



Indoor Scenario (BBU Installed in an IMB03)

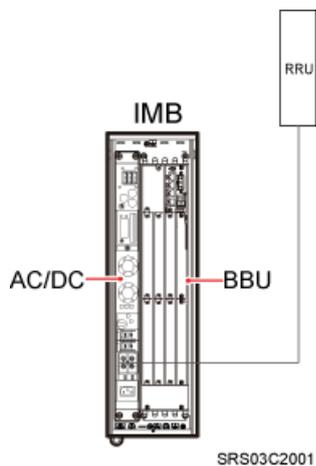
In the -48 V DC power supply scenario, the BBU can be installed in an IMB03 if the transmission space of customers is not more than 3 U and the number of RRUs is not more than six, as shown in [Figure 3-14](#).

Figure 3-14 DC scenario (BBU installed in an IMB03)



In the 110 V or 220 V AC power supply scenario, the BBU can be installed in an IMB03 if the transmission space of customers is not more than 3 U and only one RRU is installed, as shown in [Figure 3-15](#).

Figure 3-15 AC scenario (BBU installed in an IMB03)



4 Unpacking the Equipment

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

Context

 **NOTE**

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

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

Procedure

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

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

Step 2 Check the exterior of the packing case.

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

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

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



WARNING

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

---End

5 Obtaining the ESN

The Electronic Serial Number (ESN) is a unique identifier of a Network Element (NE). Record the ESN for later commissioning of the base station before installation.

Procedure

Step 1 Record the ESN on the BBU.

- If there is not a label on the FAN unit of the BBU, you must record the ESN and site information that is printed on a mounting ear of the BBU. **Figure 5-1** shows the position of the ESN.
- If there is a label on the FAN unit of the BBU, the ESN is printed on the label and a mounting ear of the BBU. In this case, you must take the label and record the site information on the side labeled Site, as shown in **Figure 5-2**.

Figure 5-1 Obtaining the ESN (1)

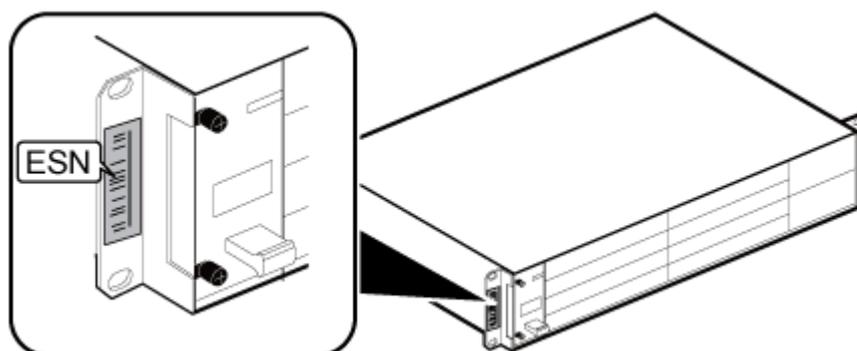
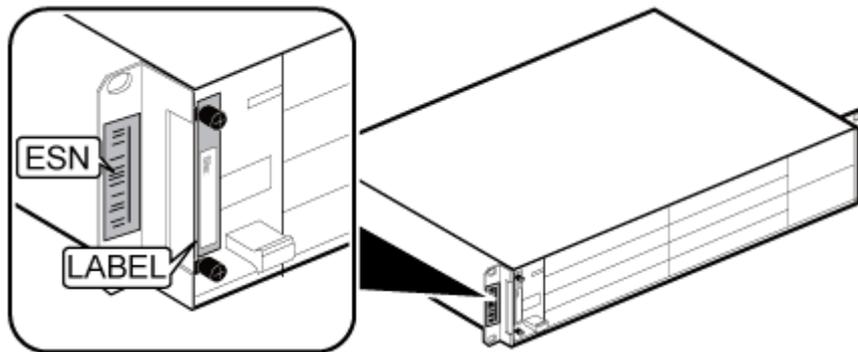


Figure 5-2 Obtaining the ESN (2)



Step 2 Report the ESN to the engineer for the commissioning of the base station.

---End

6 Outdoor Scenario with AC Power Supply (BBU Installed in an APM30H)

About This Chapter

This chapter describes the procedures for installing an APM30H, components in it, and related cables when a DBS3900 is deployed outdoors with AC power supply and the BBU is installed in the APM30H.

6.1 Installation Process

When a DBS3900 is deployed outdoors with AC power supply, and the BBU is installed in an APM30H, you must install the APM30H, components in it, and related cables. In addition, some optional components may be required based on actual requirements.

6.2 Installing a Cabinet

Based on different installation scenarios, an APM30H, TMC11H, IBBS200D, or IBBS200T can be installed on a concrete floor or a metal pole. In addition, installation in stack mode is also supported.

6.3 Installing a PGND Cable and Equi-potential Cable

The PGND cable is used to connect the PGND bolts on the cabinets to the PGND grounding bars on site, ensuring that the cabinets are properly grounded. The equi-potential cable is used to connect the PGND bolts on the cabinets, ensuring the equi-potential connections between the cabinets.

6.4 Installing Components

The BBU and SLPU must be installed in the APM30H and TMC11H. The SOU, heater, EMUA or GPS surge protector optional based on actual requirements.

6.5 Installing Cables

This section describes the procedures and precautions to be taken for installing power cables, transmission cables, monitoring signal cables, and CPRI cables when a DBS3900 is deployed outdoors with AC power supply and the BBU is installed in an APM30H.

6.6 Installing the Batteries and Related Cables

This section describes the procedure and precautions for installing the batteries and related cables.

6.7 Installation Checklist

Check the installation items, installation environment, and cable-related items after the cabinets and devices are all installed.

6.8 Power-On Check

Before a DBS3900 starts operating, you must check the power-on status of the cabinet and components in it.

6.9 Subsequent Operations

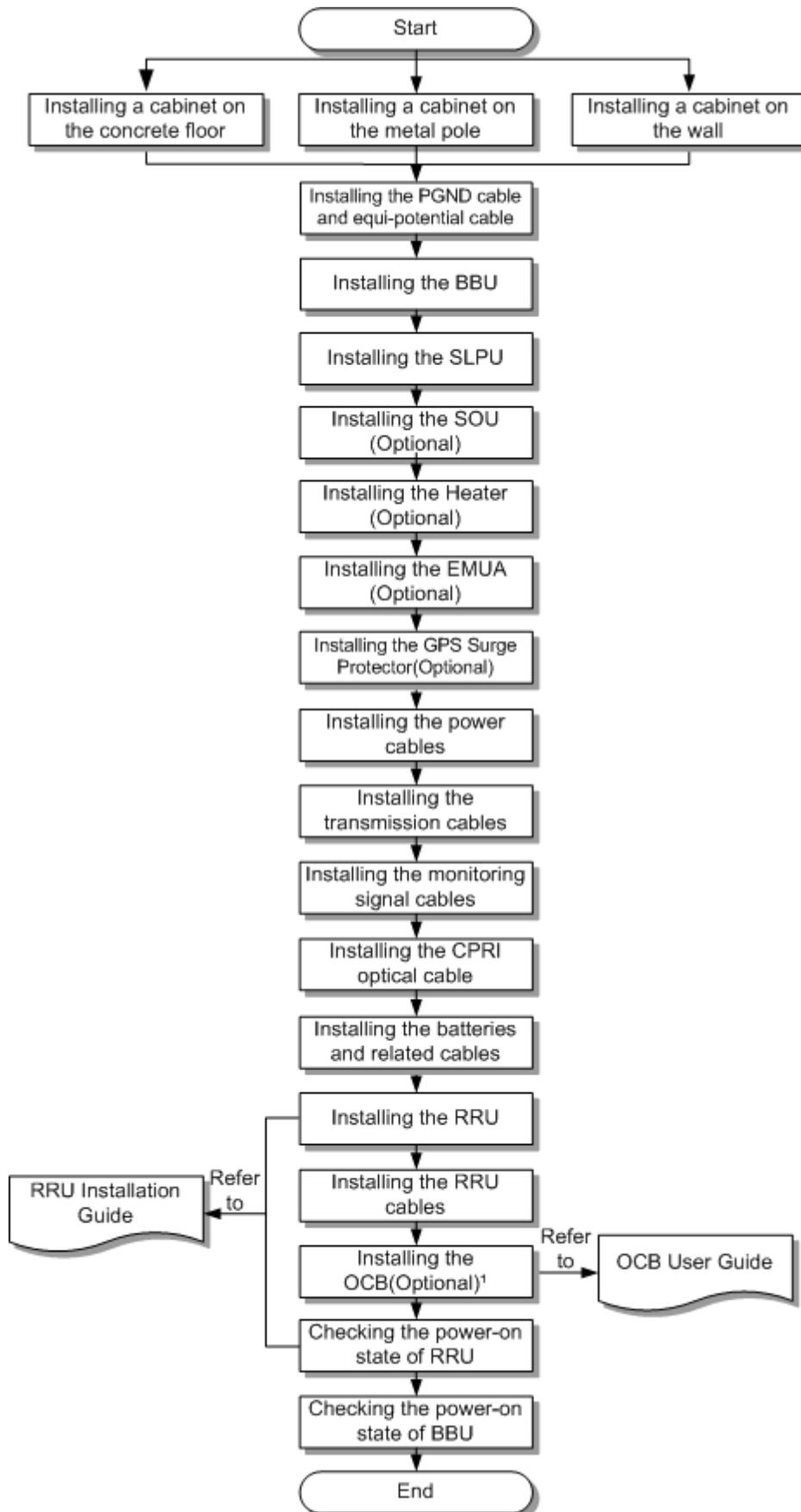
You must perform subsequent operations after installing a base station and checking related hardware installation.

6.1 Installation Process

When a DBS3900 is deployed outdoors with AC power supply, and the BBU is installed in an APM30H, you must install the APM30H, components in it, and related cables. In addition, some optional components may be required based on actual requirements.

Figure 6-1 shows the installation process.

Figure 6-1 Installation process



 **NOTE**

- The procedure for installing an RRU is not described in this document. For details about how to install an RRU, see the associated RRU installation guide according to the RRU model.
- The Outdoor Cable Conversion Box (OCB) is an optional component, which is used to connect cables with different cross-sectional areas. For details about an OCB, see the *OCB User Guide*.

6.2 Installing a Cabinet

Based on different installation scenarios, an APM30H, TMC11H, IBBS200D, or IBBS200T can be installed on a concrete floor or a metal pole. In addition, installation in stack mode is also supported.

6.2.1 Installing a Cabinet on a Concrete Floor

You must install a base on a concrete floor before installing an APM30H, TMC11H, IBBS200D, or IBBS200T on the base. You can stack another cabinet on the installed cabinet as required.

Installing a Base

This section describes the procedure and precautions to be taken for installing a base on a concrete floor. You must install a base on a concrete floor before installing an APM30H, TMC11H, IBBS200D, or IBBS200T on the base.

Context

- An APM30H, TMC11H, IBBS200D, or IBBS200T can be installed independently, side by side, or in stack mode. Different types of cabinet must be installed in compliance with cabinet configuration principles. For details about cabinet configuration principles and installation positions, see the associated cabinet configurations.
- When two cabinets are combined, the minimum distance between the cabinets is 40 mm, and the maximum distance between the cabinets is 150 mm. If the Noise Reduction Module (NRM) is installed, the distance between the cabinets is 150 mm.

Figure 6-2 shows the cabinet installation clearance.

Figure 6-2 Cabinet installation clearance (plan view)

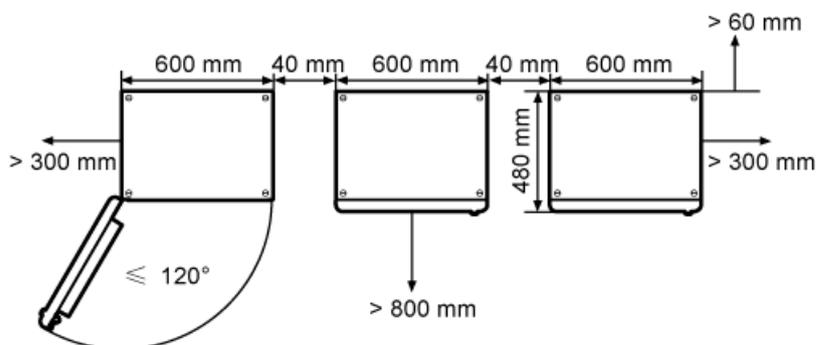
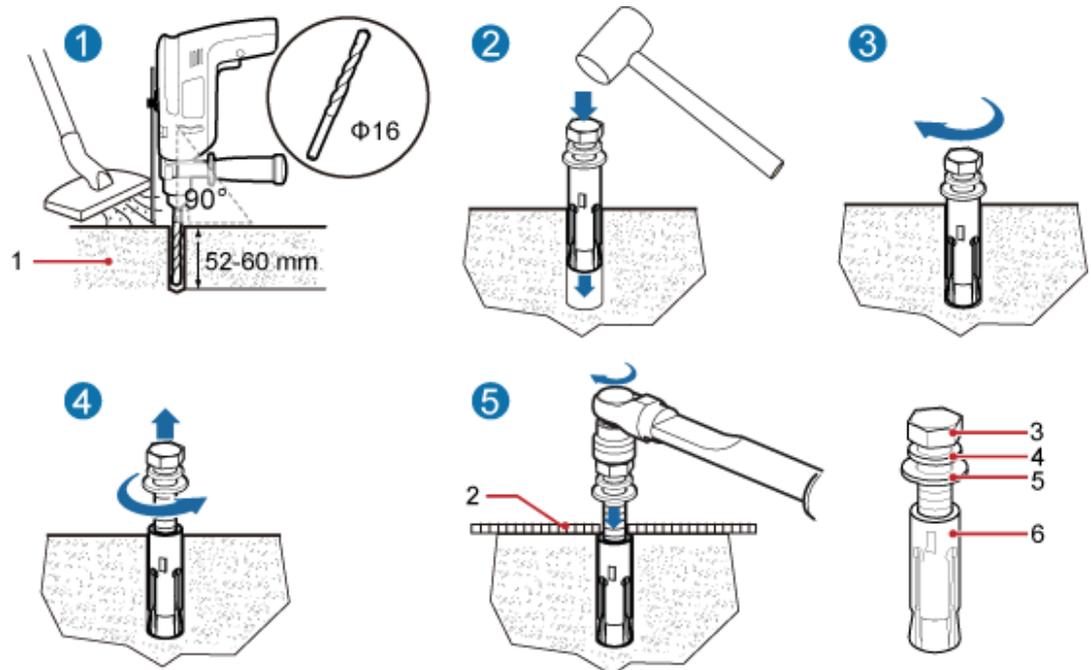


Figure 6-4 Drilling holes on the concrete pad



(1) Concrete pad (2) Base of the cabinet (3) M12x60 bolt (4) Spring washer (5) Flat washer (6) Expansion tube

1. Use a hammer drill with bit 16 to drill holes at the anchor points, and ensure that the depth of each hole ranges from 52 mm to 60 mm.



CAUTION

- Do not drill holes through the holes in the base by using a hammer drill. Drilling holes through the holes in the base may damage the paint on the base.
 - Take proper safety measures to protect your eyes and respiratory tract against the dust before drilling holes.
2. Use a vacuum cleaner to clear the dust inside and around the holes. If the inter-hole spacing is too wide or too narrow, locate and drill holes again.
 3. Slightly tighten the expansion bolt, and then put the expansion bolt assembly into the hole vertically.
 4. Use a rubber mallet to hammer the expansion bolt until the expansion tube is buried into the hole, and then tighten the bolt.
 5. Remove the bolt, spring washer, and flat washer counterclockwise.

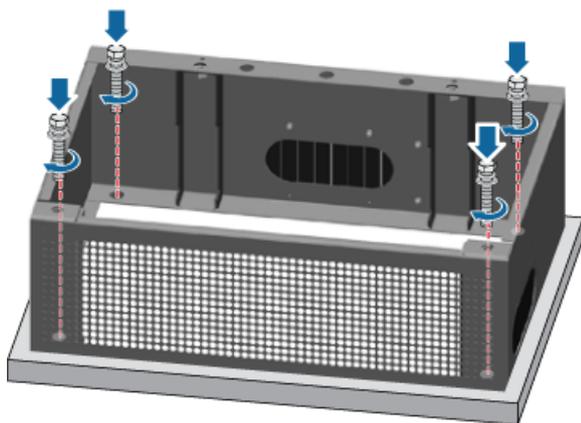


CAUTION

After dismantling the expansion bolt assembly, ensure that the top of the expansion tube is on the same level as the floor.

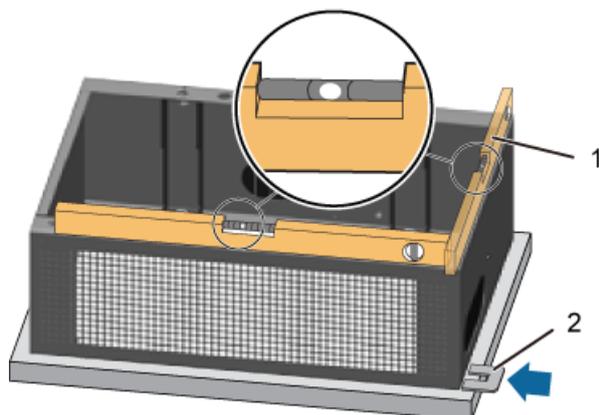
- Step 3** Align the base, and then install the bolt with the spring washer and flat washer, as shown in [Figure 6-5](#).

Figure 6-5 Aligning the base



- Step 4** Use a level to check the base level. If the base is not level, use adjusting pads to adjust the base level, as shown in [Figure 6-6](#).

Figure 6-6 Adjusting the base level

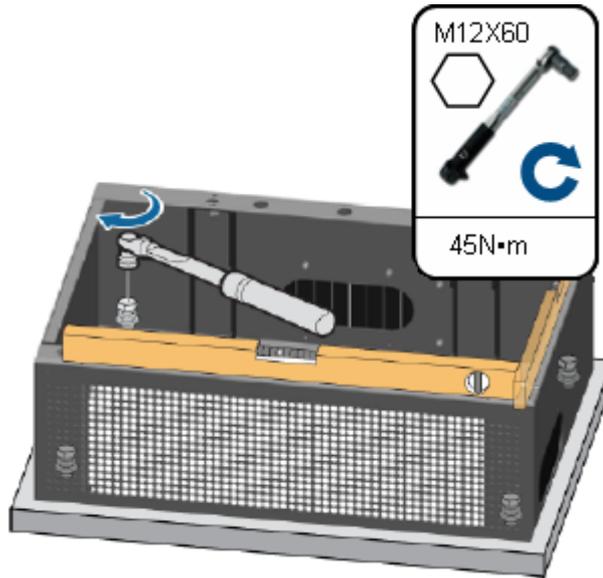


(1) Level

(2) Adjusting pad

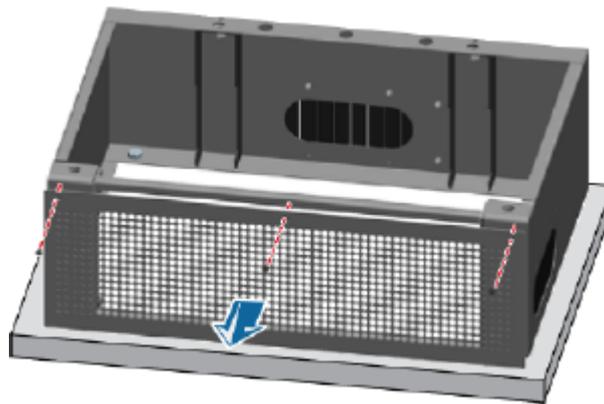
- Step 5** Use a torque wrench to tighten the bolts with the tightening torque of 45 N·m, as shown in [Figure 6-7](#).

Figure 6-7 Tightening the bolts



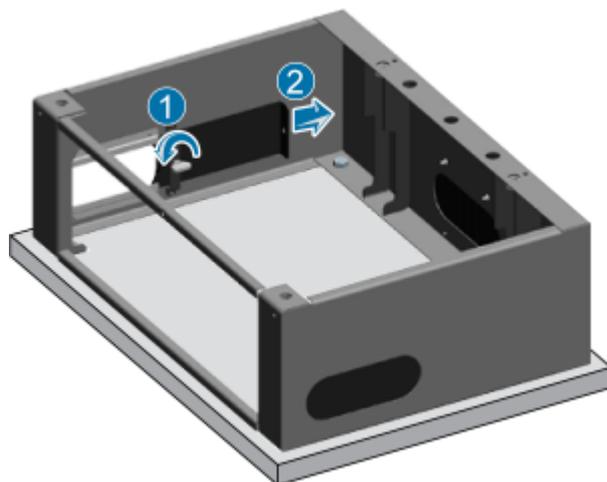
Step 6 Loosen the three screws on the front cover plate of the base, and then remove the front cover plate, as shown in [Figure 6-8](#).

Figure 6-8 Removing the front cover plate



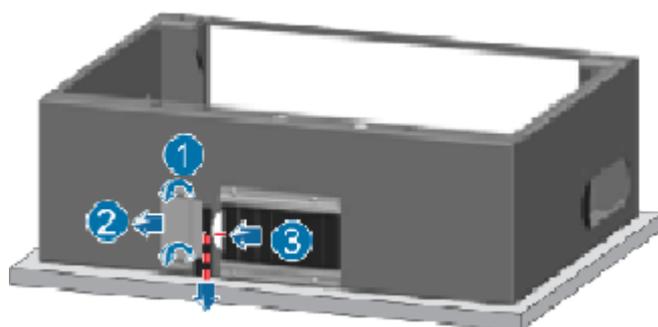
Step 7 Remove the baffle plate from either side of the base (by taking the left side as an example), as shown in [Figure 6-9](#).

Figure 6-9 Removing the baffle plate



Step 8 Remove the baffle plate from the back of the base, as shown in [Figure 6-10](#).

Figure 6-10 Removing the baffle plate from the back



---End

Installing a Cabinet on a Base

This section describes the procedure and precautions to be taken for installing a cabinet on a base after the base is installed on the concrete floor.

Context



NOTE

The following figures are based on the IBBS200D. The procedure for installing the APM30H, TMC11H, or IBBS200T is the same as that for installing the IBBS200D.

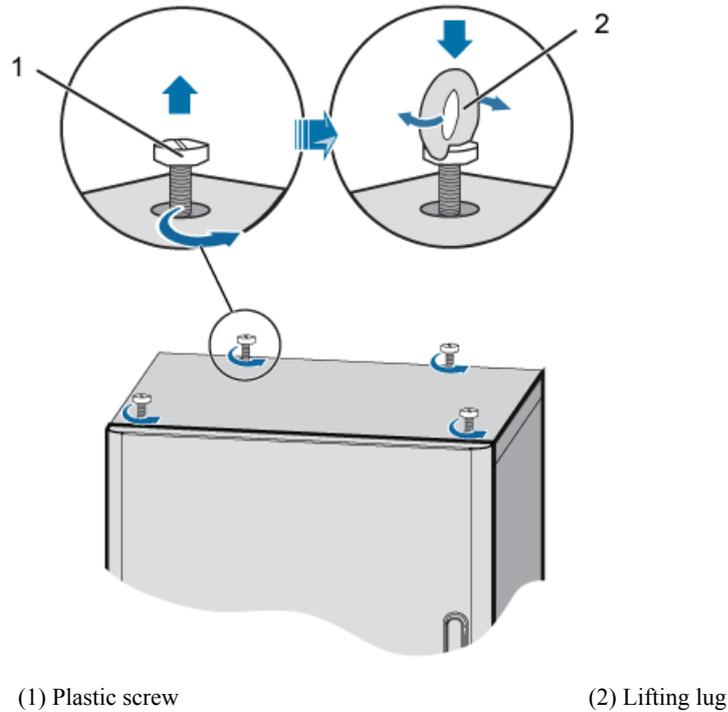
Procedure

Step 1 Remove the four plastic screws from the top of the cabinet, and then install the lifting lugs in the corresponding holes, as shown in Figure 1.

 **CAUTION**

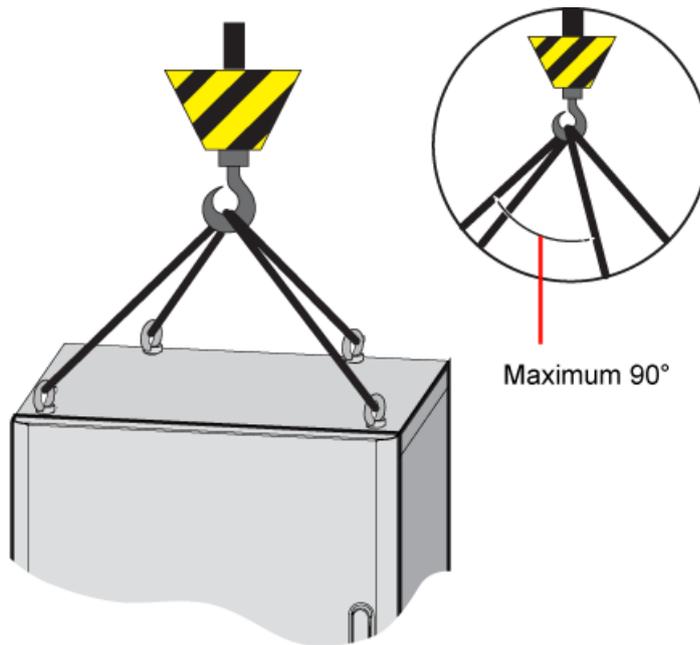
Reserve the plastic screws for later use.

Figure 6-11 Installing the lifting lugs



Step 2 Install ropes on the lifting lugs, and then lift the cabinet, as shown in Figure 2.

Figure 6-12 Installing the ropes



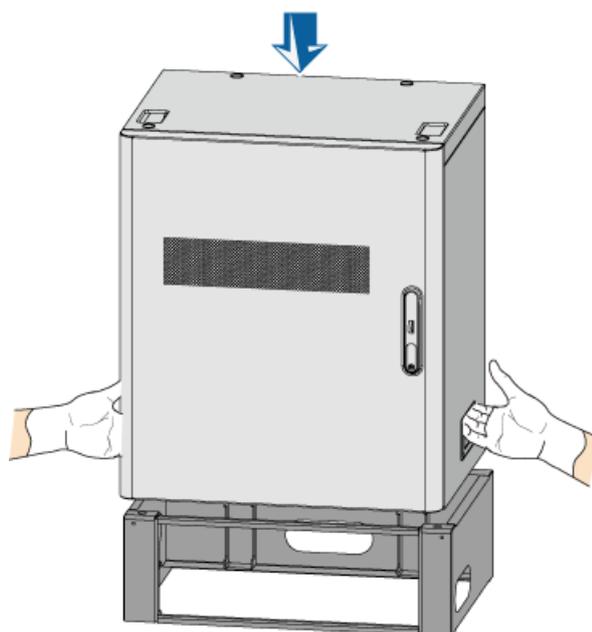
Step 3 Lift the cabinet onto the base, and then gently push the cabinet to align the cabinet with the base, as shown in [Figure 6-13](#).



WARNING

At least two installation engineers are required for lifting the cabinet.

Figure 6-13 Lifting a cabinet onto a base

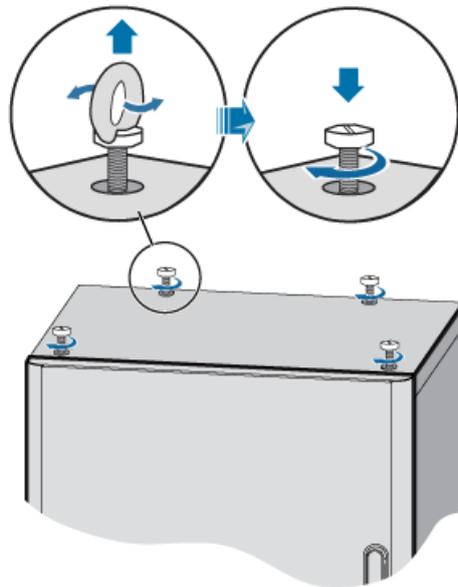


Step 4 Remove the ropes and lifting lugs, and then install the plastic screws, as shown in Figure 4.



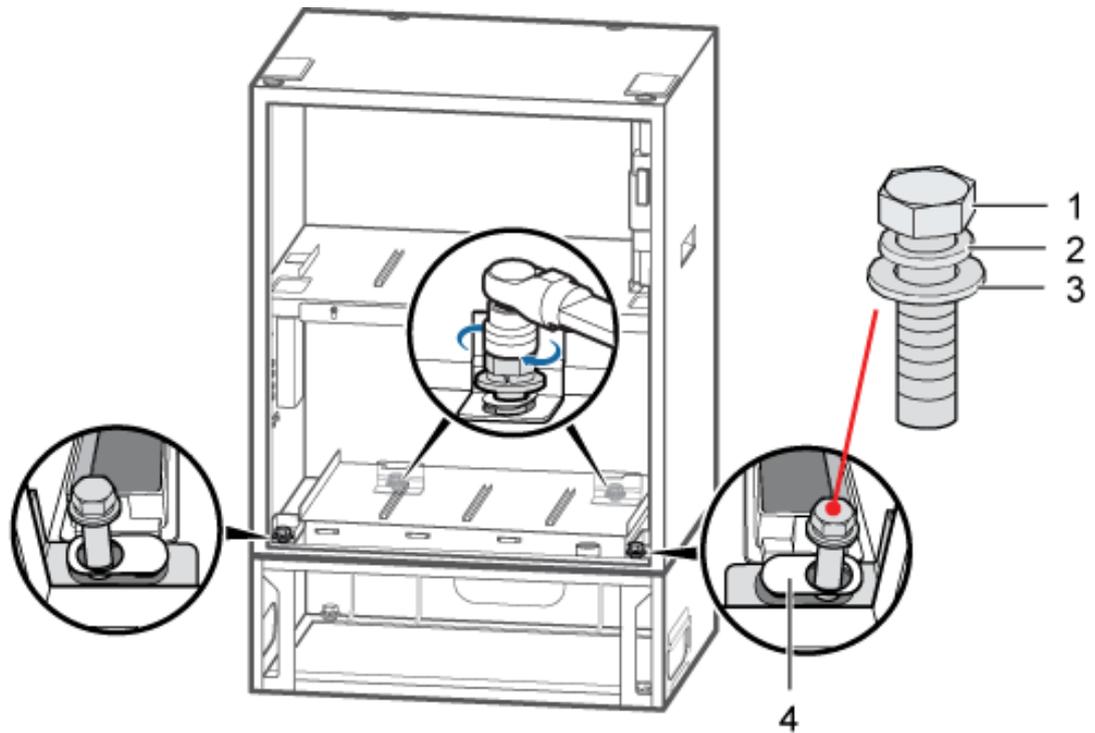
Before installing the rubber screws, clean the mounting holes to prevent entry of metal bits.

Figure 6-14 Installing the plastic screws



Step 5 Use four M12x30 bolts to secure the cabinet on the base, as shown in Figure 7.

Figure 6-15 Securing the IBBS200D on the base



- (1) M12x30 bolt (2) Spring washer (3) Flat washer (4) Gasket with an oblong hole

---End

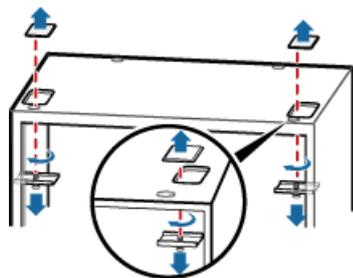
(Optional) Installing Two Cabinets in Stack Mode

This section describes the procedure and precautions to be taken for installing two cabinets in stack mode. After a cabinet is installed on a base, another cabinet can be stacked on this cabinet based on actual requirements.

Procedure

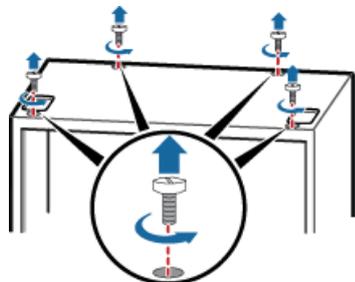
- Step 1** Remove the cover plates for cable holes from the top of the lower cabinet, as shown in [Figure 6-16](#).

Figure 6-16 Removing the cover plates for cable holes



Step 2 Remove the four plastic screws from the top of the lower cabinet, as shown in **Figure 6-17**.

Figure 6-17 Removing the plastic screws



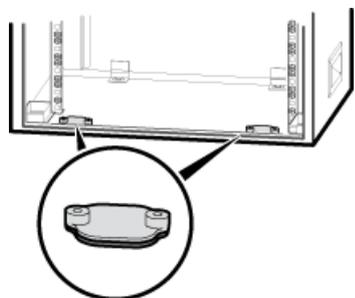
Step 3 Lift the upper cabinet onto the lower cabinet, and then align the cable holes of the upper cabinet with those of the lower cabinet, as shown in **Figure 6-19**.



CAUTION

Do not move the cover plates for the round cable holes to avoid entry of water into the cabinet. **Figure 6-18** shows the positions of the cover plates for the round cable holes.

Figure 6-18 Positions of the cover plates for the round cable holes



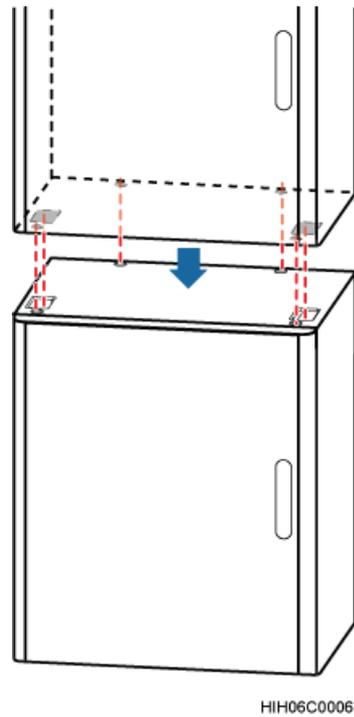
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WARNING

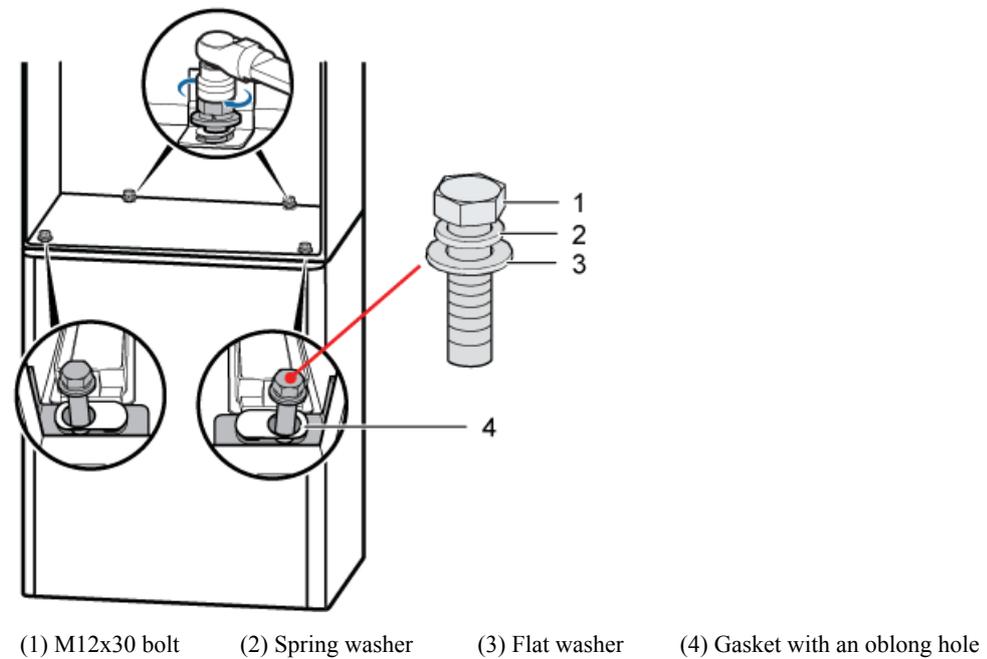
At least two installers are required for lifting a cabinet.

Figure 6-19 Stacking a cabinet onto another cabinet



Step 4 Use a torque wrench to tighten the four M12x30 bolts in the cabinet, as shown in **Figure 6-20**.

Figure 6-20 Tightening the bolts



---End

6.2.2 Installing a Cabinet on a Metal Pole

This section describes the procedure and precautions to be taken for installing a cabinet on a metal pole. An APM30H or TMC11H can be installed on a metal pole.

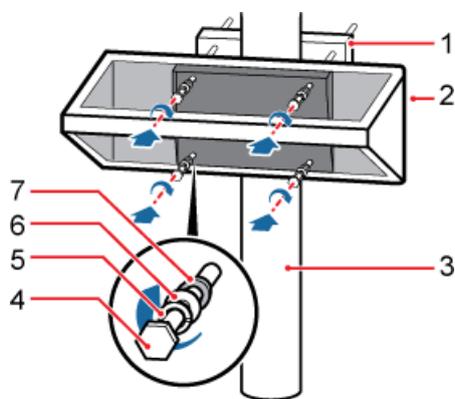
Procedure

Step 1 Use four M12×60 bolts to secure a trapezoidal rack at a proper height of a metal pole, as shown in [Figure 6-21](#).

 **NOTE**

- The cabinet cannot be installed at a height of more than 10,000 mm.
- The diameter of a metal pole must range from 60 mm to 114 mm.

Figure 6-21 Installing a trapezoidal rack

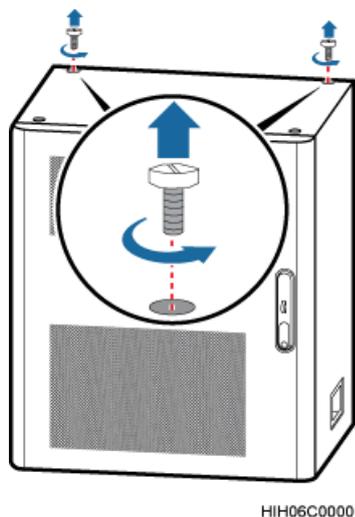


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- | | | |
|-----------------------|----------------------|-----------------|
| (1) Adapting piece | (2) Trapezoidal rack | (3) Metal pole |
| (4) Bolt | (5) Spring washer | (6) Flat washer |
| (7) Waterproof gasket | | |

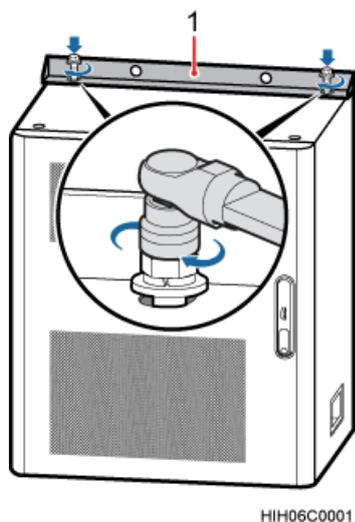
Step 2 Remove the two plastic screws that are near the back of the cabinet from the top of the cabinet, as shown in [Figure 6-22](#).

Figure 6-22 Removing plastic screws



Step 3 Install a fastening bar on the top of the cabinet, and then use a socket wrench to tighten the two M12×30 bolts, as shown in **Figure 6-23**.

Figure 6-23 Installing a fastening bar



(1) Fastening bar

Step 4 Lift the cabinet onto the trapezoidal rack, use four M12×30 bolts to secure the cabinet on the trapezoidal rack, and then use a socket wrench to tighten the bolts, as shown in **Figure 6-25**.



CAUTION

Do not move the cover plates for the round cable holes to avoid entry of water into the cabinet. **Figure 6-24** shows the positions of the cover plates for the round cable holes.

Figure 6-24 Positions of the cover plates for the round cable holes

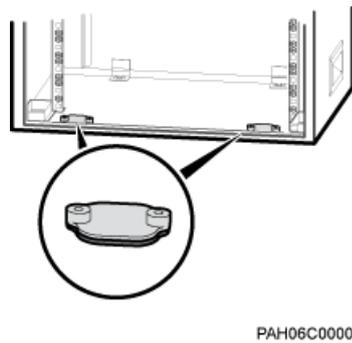
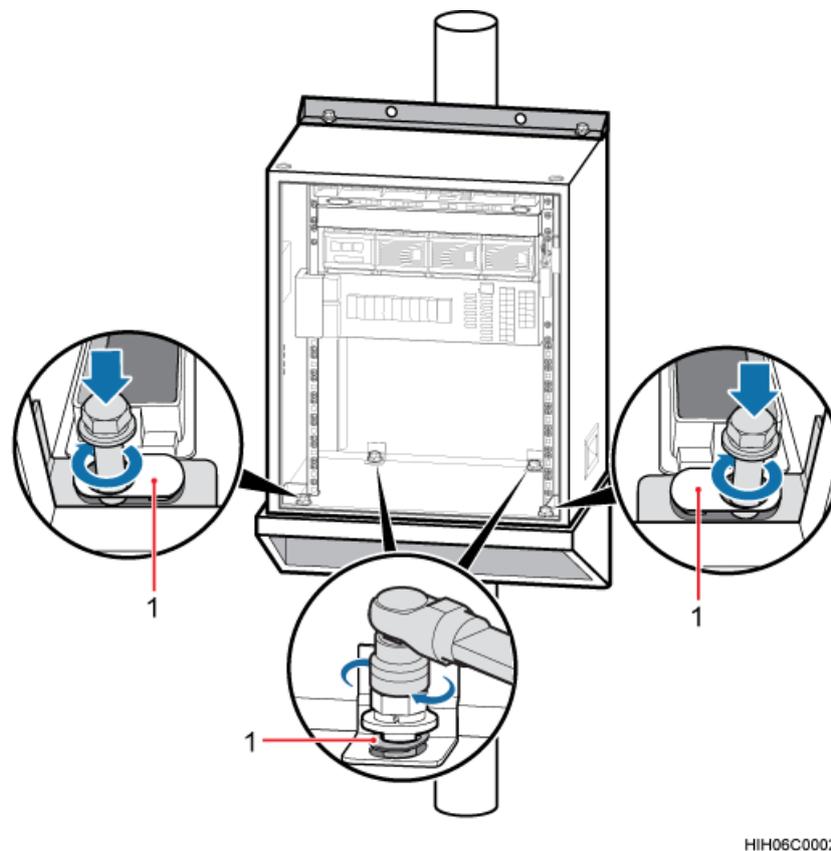


Figure 6-25 Installing a cabinet



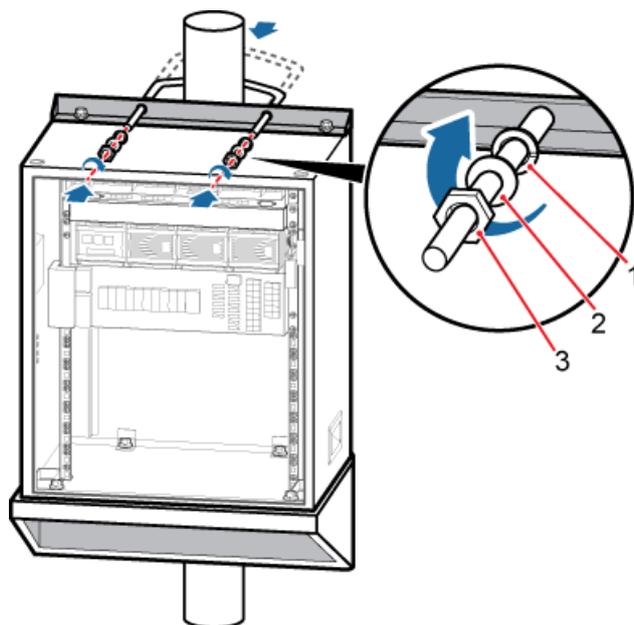
(1) Gasket with an oblong hole

Step 5 Lead the U-shaped piece through the holes on the fastening bar installed on the top of the cabinet, as shown in [Figure 6-26](#).

NOTE

When a cabinet is installed on a metal pole, grease must be applied. For details, see [6.9.3 Applying Grease](#).

Figure 6-26 Installing a U-shaped piece



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(1) Flat washer

(2) Spring washer

(3) Nut

---End

6.2.3 Installing a Cabinet on a Wall

This section describes the procedure and precautions to be taken for installing a cabinet on a wall. An APM30H or TMC11H can be installed on a wall.

Context

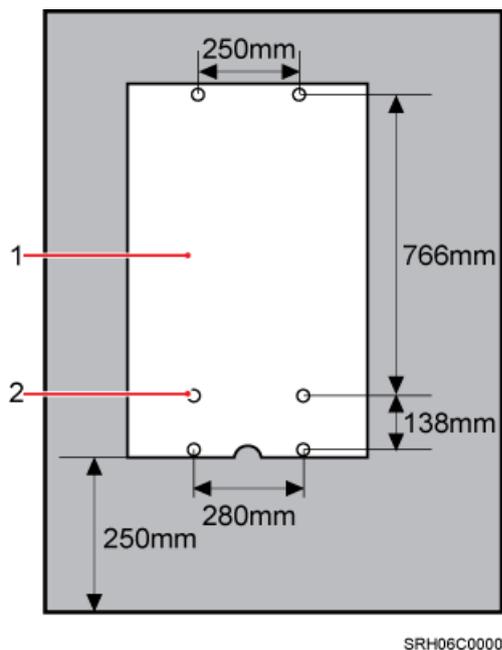
 **NOTE**

- The cabinet cannot be installed at a height of more than 10,000 mm.

Procedure

- Step 1** Press a marking template against the wall, and then mark six mounting holes based on the marking template, as shown in [Figure 6-27](#).

Figure 6-27 Marking mounting holes

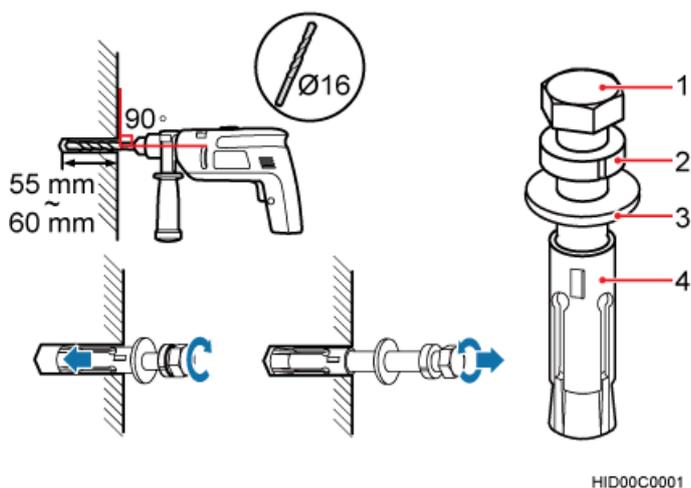


(1) Marking template

(2) Mounting holes

Step 2 Drill holes at the anchor points, and then install expansion bolt assemblies, as shown in [Figure 6-28](#).

Figure 6-28 Installing an expansion bolt



(1) Bolt

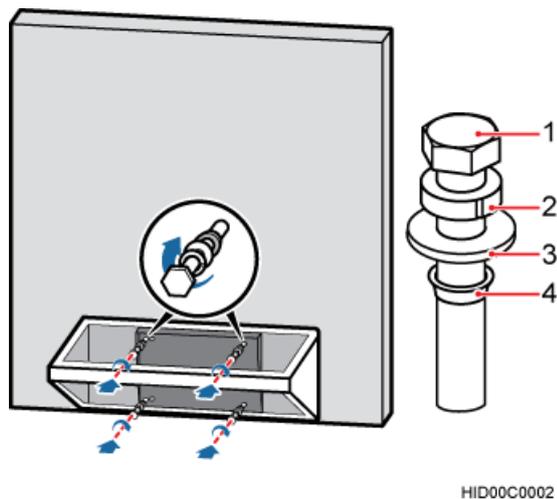
(2) Spring washer

(3) Flat washer

(4) Expansion tube

Step 3 Align the holes on the trapezoidal rack with the four lower mounting holes on the wall, and then use four M12×30 bolts to secure the trapezoidal rack, as shown in [Figure 6-29](#).

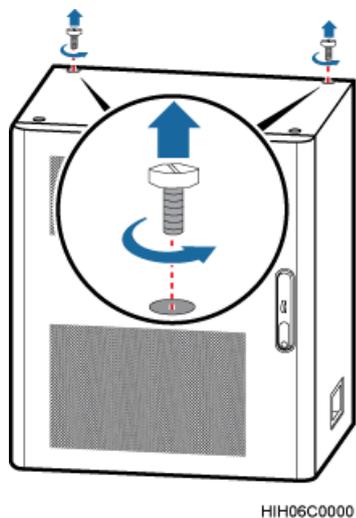
Figure 6-29 Installing a trapezoidal rack



- (1) M12x60 bolt (2) Spring washer (3) Flat washer (4) Waterproof gasket.

Step 4 Remove the two plastic screws that are near the back of the cabinet from the top of the cabinet, as shown in **Figure 6-30**.

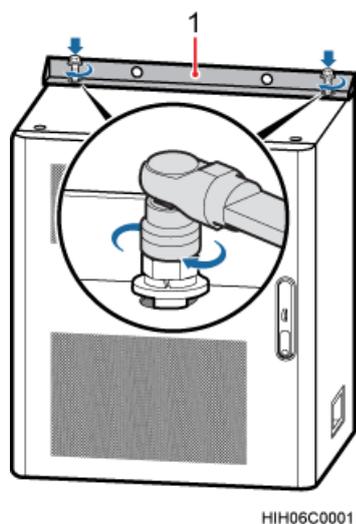
Figure 6-30 Removing plastic screws



- (1) Plastic screw

Step 5 Install a fastening bar on the top of the cabinet, and then use a socket wrench to tighten the two bolts, as shown in **Figure 6-31**.

Figure 6-31 Installing a fastening bar



(1) Fastening bar

Step 6 Lift the cabinet onto the trapezoidal rack, use four M12×30 bolts to secure the cabinet on the trapezoidal rack, and then use a socket wrench to tighten the bolts, as shown in **Figure 6-33**.



CAUTION

Do not move the cover plates for the round cable holes to avoid entry of water into the cabinet. **Figure 6-32** shows the positions of the cover plates for the round cable holes.

Figure 6-32 Positions of the cover plates for the round cable holes

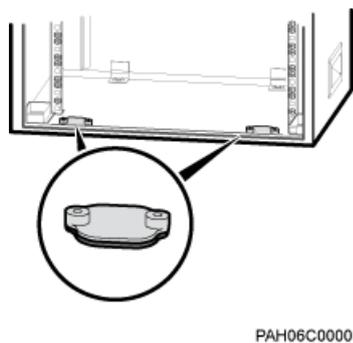
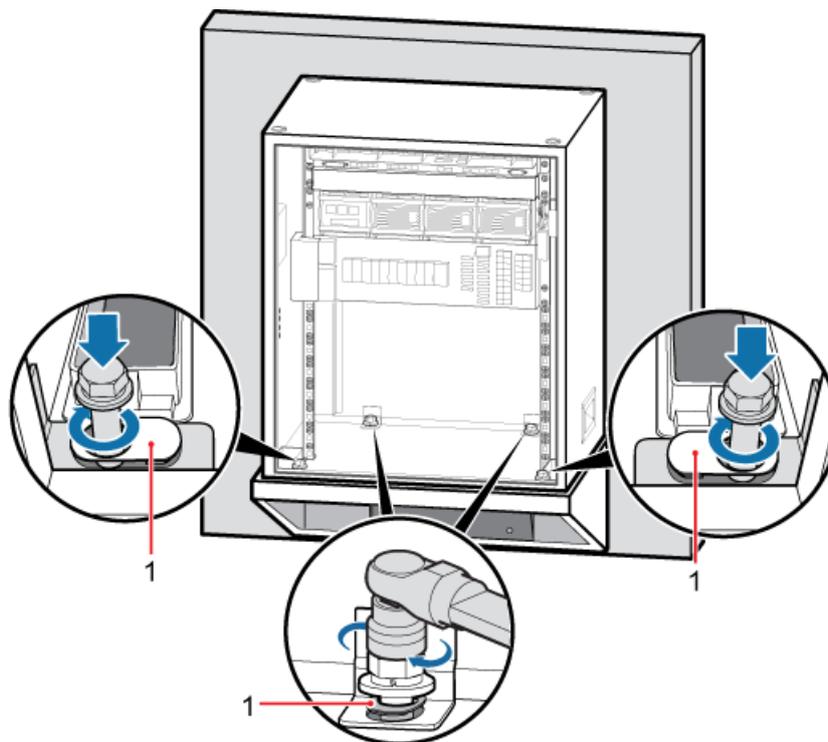


Figure 6-33 Installing a cabinet



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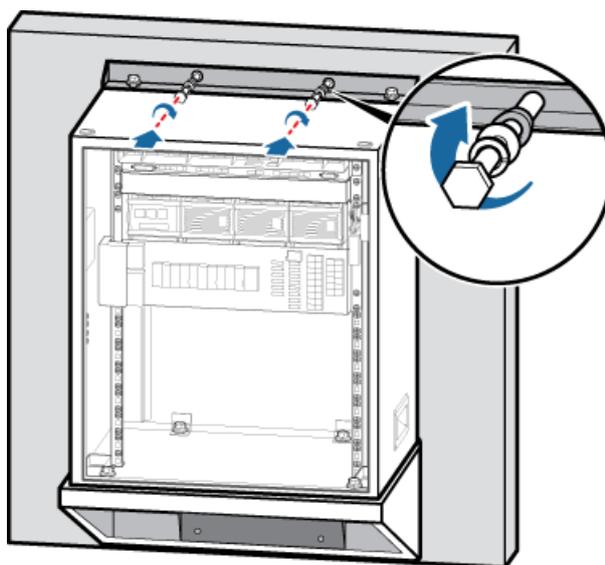
(1) Gasket with an oblong hole

Step 7 Use two bolts to secure the fastening bar on the wall, as shown in [Figure 6-34](#).

NOTE

When a cabinet is installed on the wall, grease must be applied. For details, see [6.9.3 Applying Grease](#).

Figure 6-34 Securing a fastening bar



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---End

6.3 Installing a PGND Cable and Equi-potential Cable

The PGND cable is used to connect the PGND bolts on the cabinets to the PGND grounding bars on site, ensuring that the cabinets are properly grounded. The equi-potential cable is used to connect the PGND bolts on the cabinets, ensuring the equi-potential connections between the cabinets.

Prerequisite

The tools, such as a Phillips screwdriver, a cable cutter, and a multi-purpose crimping tool, are ready.

Context

- An equi-potential cables connects a upper cabinet and a lower cabinet.
- An equi-potential cable connects two lower cabinets.
- A PGND cable connects the cabinet under the APM30H to an external ground bar to ground all cabinets.

Table 6-1 describes the specifications of the PGND cable and equi-potential cable.

Table 6-1 Specifications of the PGND cable and equi-potential cable

Cable Name	One End	The Other End	Remarks
PGND cable	M6 OT terminal	M6 OT terminal	Yellow and green cable, 16 mm ²
Equi-potential cable	M6 OT terminal	M6 OT terminal	Yellow and green cable, 16 mm ²

Procedure

Step 1 Prepare the PGND cable and equi-potential cable.

1. Prepare the cable of proper length based on the actual cable route.
2. Add OT terminals to both ends of the cable. For details, see Assembling the OT Terminal and the Power Cable.

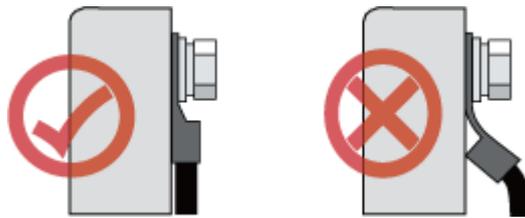
Step 2 Install a PGND cable and equi-potential cable.

1. Connect one end of the PGND cable to the ground bar on the inner side of the cabinet under the APM30H, use a spring washer and a bolt to secure the OT terminal on the cable, and then connect the other end to the external ground bar, as shown in **Figure 6-36**.

 **NOTE**

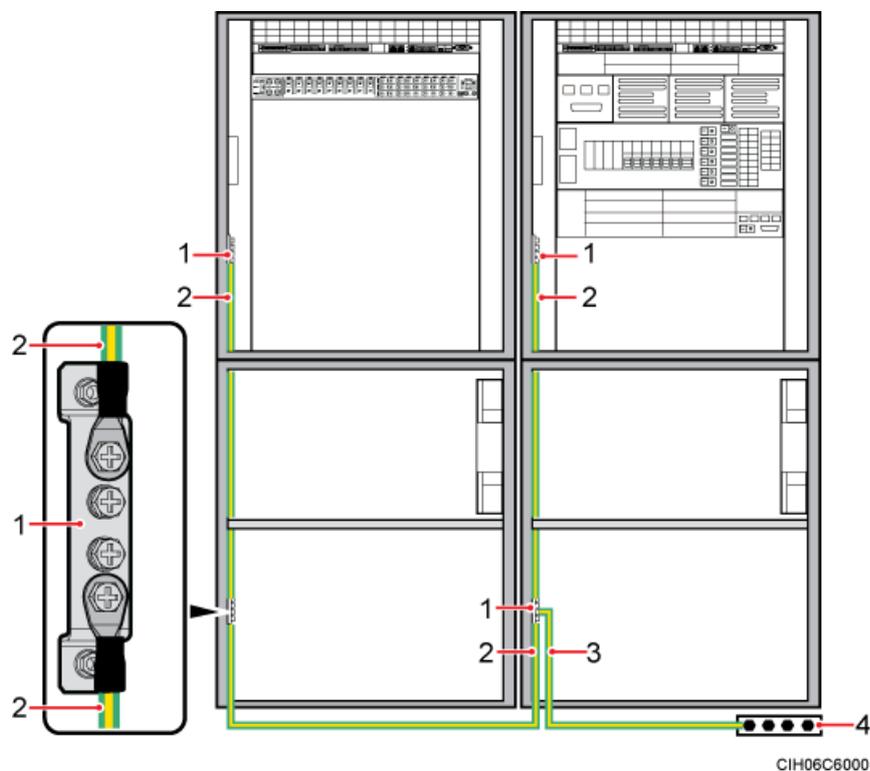
When installing the PGND cable, keep the crimping tube of the OT terminal in the direction shown in **Figure 6-35**.

Figure 6-35 Installing the OT terminal in the correct manner



2. Install an equi-potential cable in each cabinet, as shown in [Figure 6-36](#).

Figure 6-36 Installing a PGND cable and equi-potential cable



- (1) Ground bar on the inner side of the cabinet (2) Equi-potential cable (3) PGND cable (4) Ground busbar

Step 3 Route and bind the cables. For details, see [6.5.1 Cabling Requirements](#).

Step 4 Label the installed cables. For details, see [Attaching a Cable-Tying Label](#).

Step 5 Run each cable that leaves the cabinet in a PVC corrugated pipe, and then tie the pipe to the cable hole on the cabinet.

----End

6.4 Installing Components

The BBU and SLPU must be installed in the APM30H and TMC11H. The SOU, heater, EMUA or GPS surge protector optional based on actual requirements.

6.4.1 Installing a BBU

This section describes the procedure and precautions to be taken for installing a BBU in an APM30H, TMC11H, or 19-inch rack. A BBU occupies a space of 19 inch wide and 2 U high.

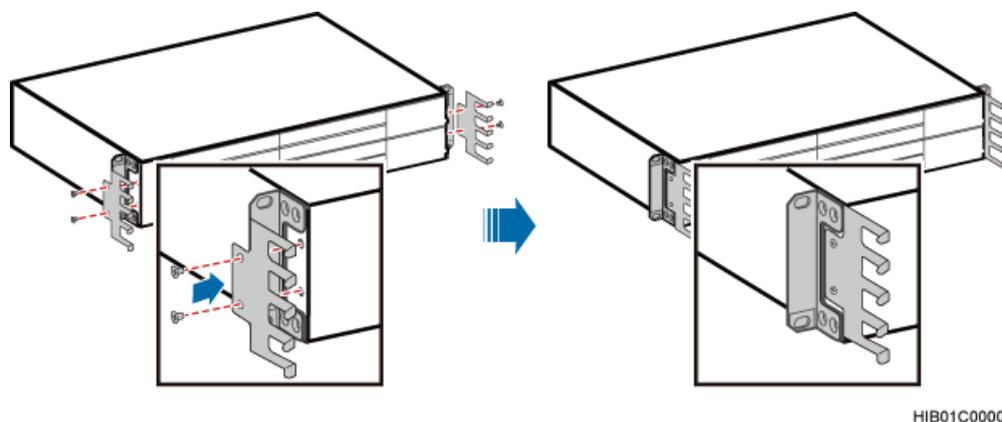
Context

In the triple mode scenario, two BBUs are required. A second BBU is installed in the same manner as the first BBU.

Procedure

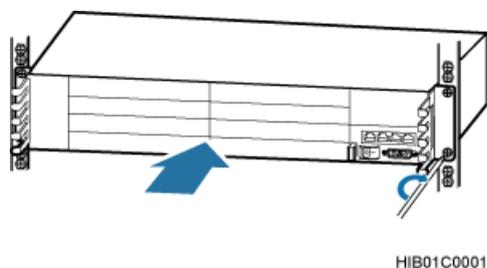
- Step 1** Align mounting holes on the cable holders with mounting holes on both sides of a BBU, and then use four M4 screws to secure the cable holders until the tightening torque reaches 1.2 N·m, as shown in [Figure 6-37](#).

Figure 6-37 Installing cable holders on a BBU



- Step 2** Wear ESD gloves or ESD wrist strap, and then slide the BBU into the cabinet along the guide rails using both hands.
- Step 3** Tighten four M6x16 screws on the panel until the tightening torque reaches 3 N·m, as shown in [Figure 6-38](#).

Figure 6-38 Installing a BBU



---End

6.4.2 Installing an SLPU

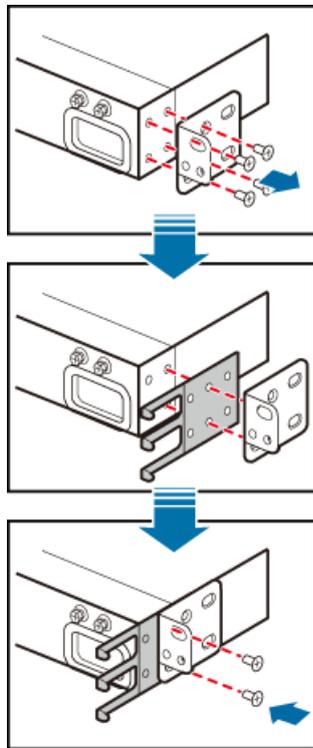
To protect trunk signals, an SLPU must be configured, which is installed in the 1 U space below the fan box on the top of the cabinet.

Procedure

Step 1 Install cable holders for an SLPU, as shown in [Figure 6-39](#).

1. Remove the four bolts from the mounting ears of the SLPU.
2. Move a mounting ear backwards, place each cable holder between the mounting ear and the SLPU, and then align the mounting holes on the cable holder with those on the mounting ear and SLPU.
3. Use the four M4 screws that are removed in [step Step 1.1](#) to secure the mounting ears, cable holders, and SLPU until the tightening torque reaches 1.2 N·m.

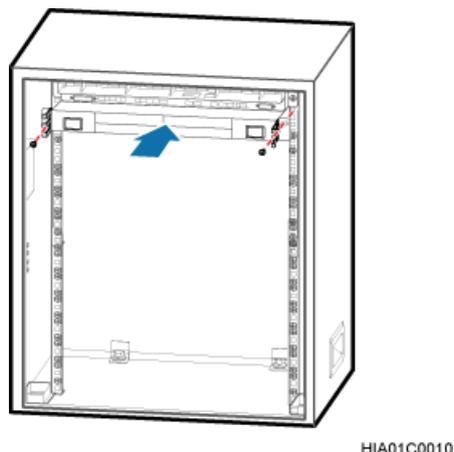
Figure 6-39 Installing cable holders on an SLPU



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Step 2 Slide the SLPU along the guide rails into the cabinet, and then tighten two M6x16 screws on the panel until the tightening torque reaches 3 N·m, as shown in [Figure 6-40](#).

Figure 6-40 Installing an SLPU



---End

6.4.3 Installing an SLPU

To protect monitoring signals, an SLPU may be configured, which is installed the 1 U space directly under the BBU.

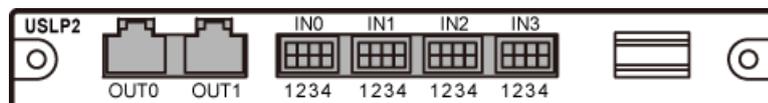
Prerequisite

The tools, such as a screwdriver and a pair of ESD gloves, are available.

Context

The SLPU that is used to protect monitoring signals is configured with two Universal Signal Lightning Protection unit type 2 (USLP2s) before delivery. [Figure 6-41](#) shows the panel of the USLP2.

Figure 6-41 The panel of the USLP2



[Figure 6-42](#) shows the mapping relationship between the pins in the input and output ports on the USLP2.

Figure 6-42 Mapping relationship between the pins in the input and output ports on the USLP2

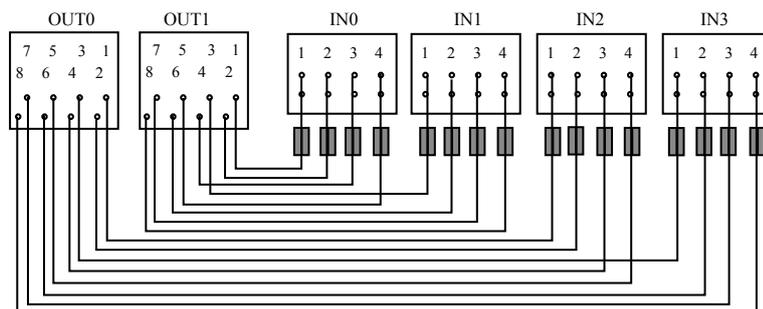


Table 6-2 lists the mapping relationship between the pins in the input and output ports on the USLP2.

Table 6-2 Mapping relationship between the pins in the input and output ports on the USLP2

Input		Output	
Label	Pin	Label	Pin
IN0	IN0.1	OUT1	OUT1.1
	IN0.2		OUT1.2
	IN0.3		OUT1.4
	IN0.4		OUT1.5
IN1	IN1.1		OUT1.3
	IN1.2		OUT1.6
	IN1.3		OUT1.7
	IN1.4		OUT1.8
IN2	IN2.1	OUT0	OUT0.1
	IN2.2		OUT0.2
	IN2.3		OUT0.4
	IN2.4		OUT0.5
IN3	IN3.1		OUT0.3
	IN3.2		OUT0.6
	IN3.3		OUT0.7
	IN3.4		OUT0.8

Table 6-3 lists the SLP2-related cables.

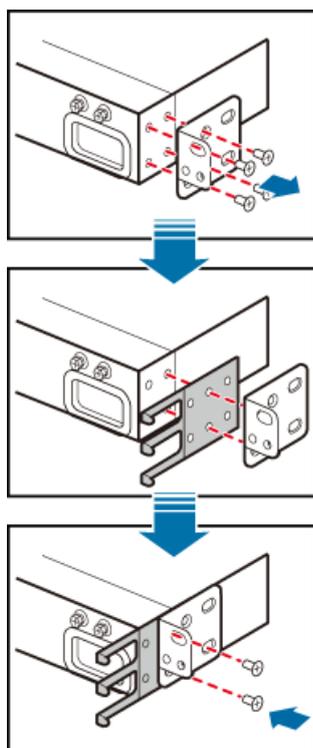
Table 6-3 SLPU-related cables

Cable	One End	The Other End	Remarks
Surge protection transfer cable for monitoring signals	RJ45 connector	RJ45 connector	Grey shielded straight-through cable
External dry-contact monitoring signal cable	Bare wire	Depending on the external equipment	-

Procedure

- Step 1** Install cable racks on both sides of the SLPU and ensure that the mounting ears are on the same plane as the SLPU panel, as shown in [Figure 6-43](#).

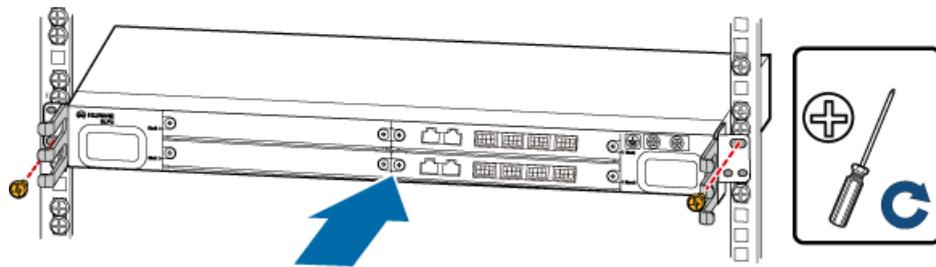
Figure 6-43 Installing cable racks



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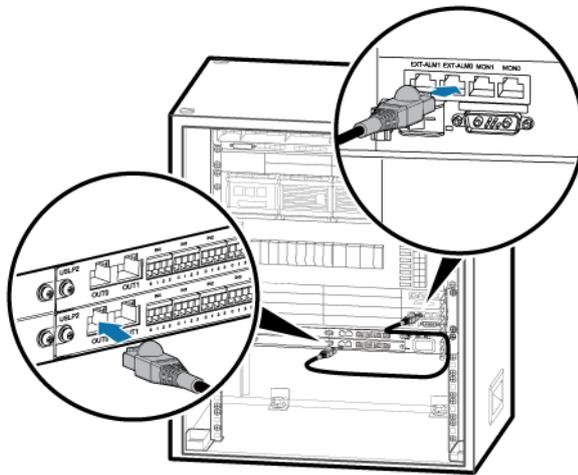
- Step 2** Slide the SLPU into the cabinet, and then use the screwdriver to tighten the two screws on the mounting ears of the SLPU, as shown in [Figure 6-44](#).

Figure 6-44 Installing the SLPU



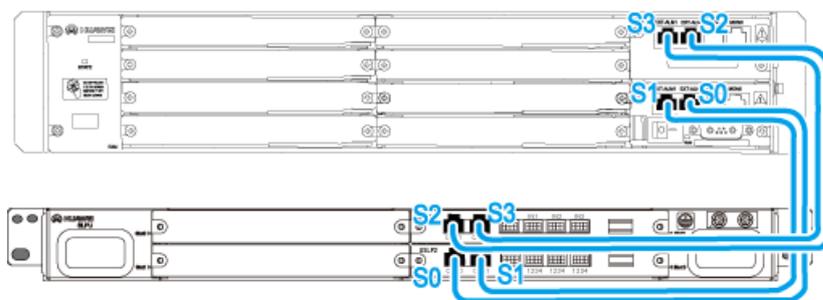
Step 3 Install the surge protection transfer cable for monitoring signals, as shown in **Figure 6-45**.

Figure 6-45 Installing the surge protection transfer cable for monitoring signals



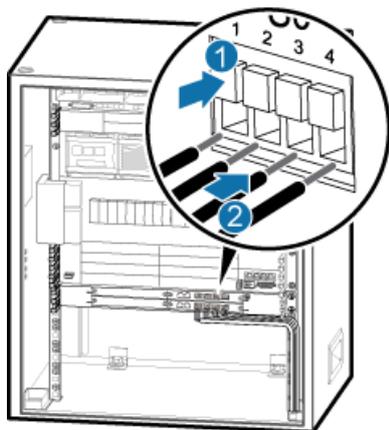
1. Connect one end of the cable to the OUT0 port on the USLP2 in slot 3 of the SLPU.
2. Connect the other end of the cable to the EXT_ALM0 port on the UPEU in the BBU.
3. Connect the other three surge protection transfer cables for monitoring signals by referring to **Figure 6-46**.

Figure 6-46 Connections of surge protection cables for monitoring signals



Step 4 Install the external dry-contact monitoring signal cables, as shown in **Figure 6-47**.

Figure 6-47 External dry-contact monitoring signal cables



1. Cut the cable to the required length based on the actual cable route.
2. Strip 8 mm long jacket off the cable that is connected to the SLPU.
3. Use the screwdriver to press the bulge of the connector, insert the bare wire of the cable into the connector, and then loosen the screwdriver to fix the cable. After the cable is connected, slightly pull the cable to check whether the cable is securely connected.

Step 5 Route the cable by referring to [6.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 6 Label the installed cables by referring to Attaching an L-Shaped Label.

----End

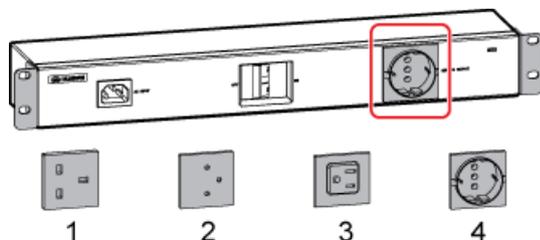
6.4.4 (Optional) Installing an SOU

This section describes the procedures for installing an SOU and related cables in an APM30H. An SOU may be required in an APM30H based on actual requirements.

Context

There are four types of SOU component, which meet the requirements from various countries. [Figure 6-48](#) shows an SOU and the types of component.

Figure 6-48 SOU and the types of component



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- (1) UK standard (2) Multi-purpose (3) American standard (4) European standard

Procedure

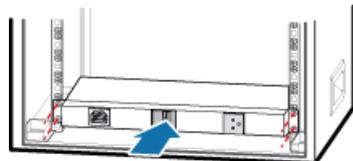
- Step 1** Slide an SOU along the guide rails into the cabinet, and then tighten four M6x16 screws on the panel until the tightening torque reaches 3 N·m, as shown in [Figure 6-49](#).



NOTE

An SOU is preferentially installed in the bottom 1 U space of the cabinet.

Figure 6-49 Installing an SOU

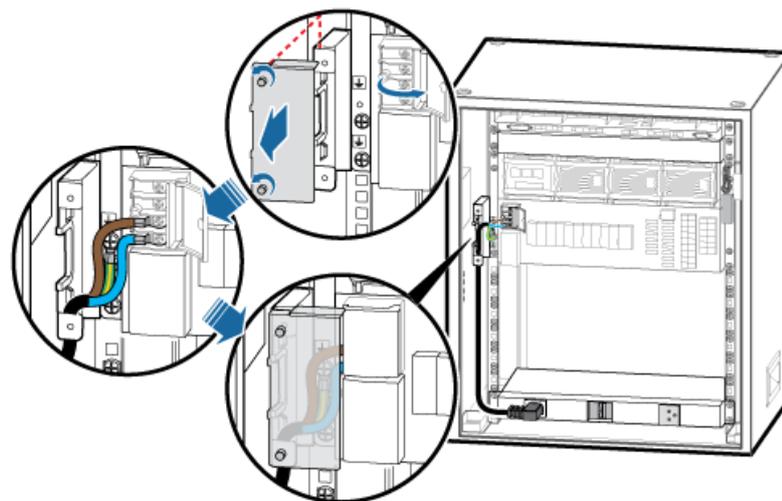


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- Step 2** Install a power cable for the SOU, as shown in [Figure 6-50](#).

1. Remove the protecting hood for the AC input terminal block, and then open the cover plate for the AC OUTPUT wiring terminals on the EPS subrack.
2. Respectively connect the OT terminals on the brown, blue, and green and yellow wires at one end of the power cable for the SOU to the AC OUTPUT wiring terminals labeled L2, N2, and PGND on the EPS subrack.
3. Link the C13 connector at the other end to the power supply socket on the SOU.
4. Close the cover plate for the AC OUTPUT wiring terminals on the EPS subrack, and then reinstall the protecting hood for the AC input terminal block.

Figure 6-50 Installing a power cable for the SOU



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- Step 3** Route and bind the cables. For details, see [6.5.1 Cabling Requirements](#).

Step 4 Label the installed cables. For details, see Attaching a Cable-Tying Label.

----End

6.4.5 (Optional) Installing an AC Heater

This section describes the procedures for installing an AC heater and related cables in an APM30H. AC Heaters may be required in an APM30H based on actual requirements.

Context

If an SOU is not installed in the cabinet, an AC heater is preferentially installed in the bottom 1 U space of the cabinet, as shown in [Figure 6-51](#). If an SOU is installed in the cabinet, an AC heater must be installed above the SOU, as shown in [Figure 6-52](#).

Figure 6-51 Position for installing an AC heater (1)

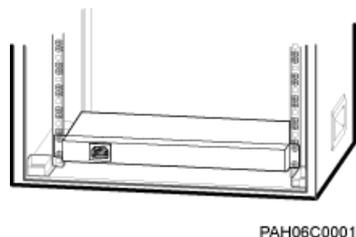
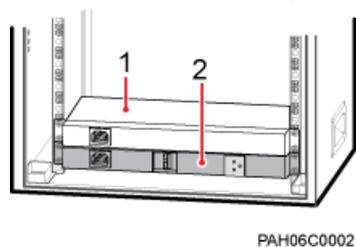


Figure 6-52 Position for installing an AC heater (2)



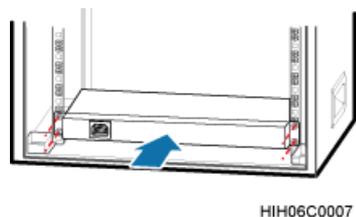
(1) AC heater

(2) SOU

Procedure

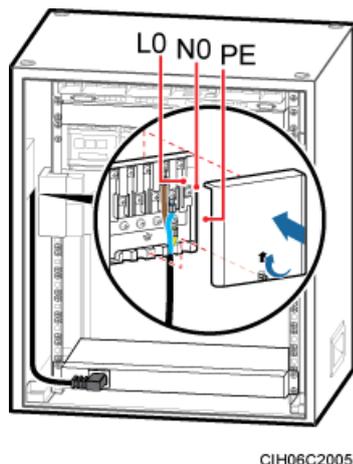
Step 1 Slide an AC heater along the guide rails into the cabinet, and then tighten four M6x16 screws on the panel until the tightening torque reaches 3 N·m, as shown in [Figure 6-53](#).

Figure 6-53 Installing an AC heater



- Step 2** Install a power cable for the heater, as shown in [Figure 6-54](#).
1. Remove the cover plate from the junction box.
 2. Respectively connect the OT terminals on the brown, blue, and yellow and green wires at one end of the power cable for the heater to the L0, N0, and PE wiring terminals in the junction box.
 3. Link the C13 connector at the other end to the power supply socket on the heater.

Figure 6-54 Installing a power cable for the AC heater



Step 3 Route and bind the cables. For details, see [6.5.1 Cabling Requirements](#).

Step 4 Label the installed cables. For details, see [Attaching a Cable-Tying Label](#).

---End

6.4.6 (Optional) Installing an EMUA

This section describes the procedures for installing an EMUA and related cables in an APM30H. An EMUA can be installed in a reserved 1 U space in the APM30H based on actual requirements.

Prerequisite

The tools such as the screwdriver and ESD gloves are available.

Context

[Table 6-4](#) describes the cables related to the EMUA.

Table 6-4 Cables related to the EMUA

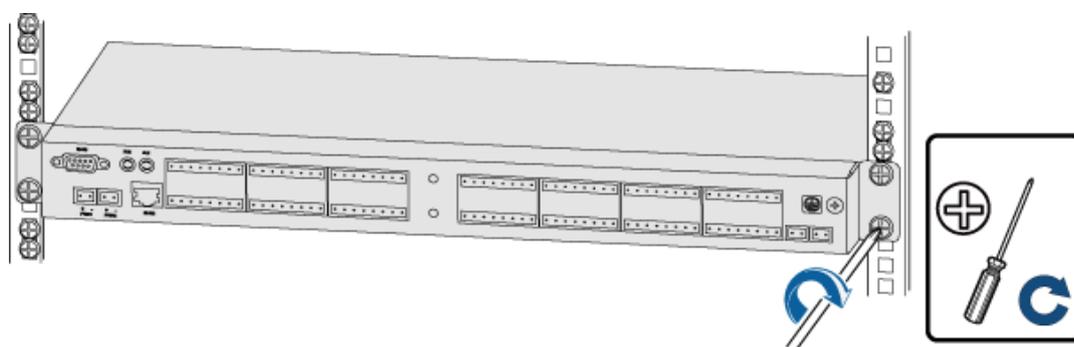
Cable List		One End	The Other End	Remarks
Power cable for	RTN(+) cable	Easy power receptacle (pressfit type) connector	Cord end terminal	Black

Cable List		One End	The Other End	Remarks
the EMUA	NEG(-) cable		Cord end terminal	Blue
EMUA monitoring signal cable		DB9 male connector	RJ45 connector	Black

Procedure

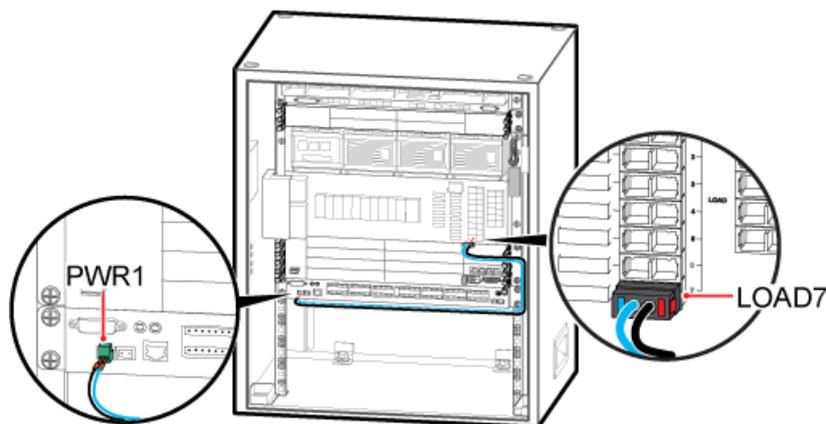
Step 1 Use four screws to install the EMUA in the APM30H cabinet, as shown in [Figure 6-55](#).

Figure 6-55 Installing the EMUA in the cabinet



Step 2 Install an EMUA power cable, as shown in [Figure 6-56](#).

Figure 6-56 Installing an EMUA power cable in an APM30H



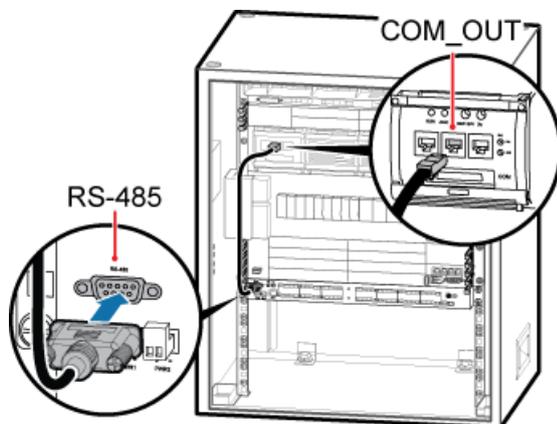
CIH06C2003

1. Install corresponding connectors on both ends of the power cable. For details, see Assembling the Cord End Terminal and the Power Cable and Assembling the Easy Power Receptacle (Pressfit Type) Connector and the Power Cable.
2. Connect the cord end terminal at one end of the power cable to the transfer terminal of the wiring terminal labeled **PWR1** of the EMUA power cable.

3. Connect the easy power receptacle (pressfit type) connector at the other end of the power cable to the DC output terminal on the EPS labeled **LOAD7** in the cabinet.

Step 3 **Figure 6-57** shows the connection of the EMUA monitoring signal cable.

Figure 6-57 Installing the EMUA monitoring signal cable



1. Connect the DB9 male connector at one end of the signal cable to the wiring terminal labeled **RS-485** in left of the EMUA panel.
2. Connect the RJ45 connector at the other end of the signal cable to **COM_OUT** of the PMU in the cabinet.

Step 4 Route the cables by referring to **6.5.1 Cabling Requirements** and use cable ties to bind the cables.

Step 5 Attach labels to the installed power cable and monitoring signal cable. For details, see Attaching a Sign Plate Label and Attaching an L-Shaped Label.

---End

6.4.7 Installing the GPS Surge Protector

This section describes the procedure and precautions for installing the GPS surge protector and related cables.

Context

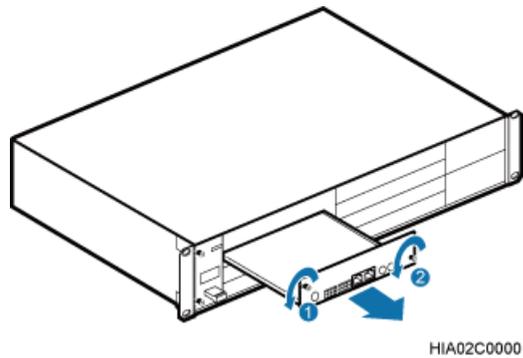
 **NOTE**

Only a dual-satellite receiver needs to be installed onsite.

Procedure

Step 1 Remove the two M3 screws on the panel, and then pull out the USCU, as shown in **Figure 6-58**.

Figure 6-58 Removing the USCU.



Step 2 Install a satellite receiver on the USCU, as shown in [Figure 6-59](#).

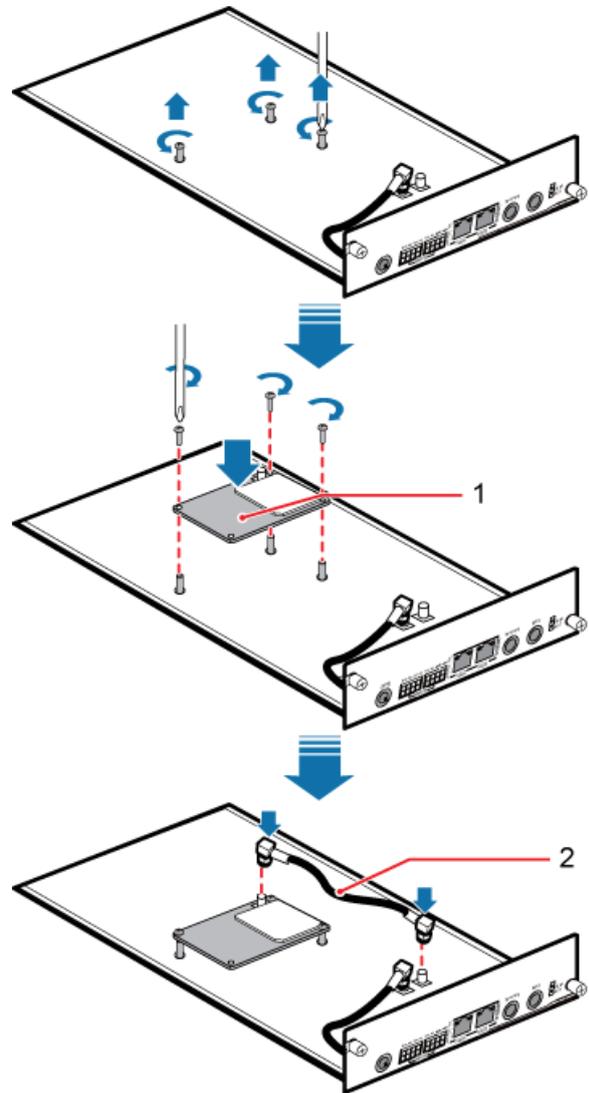
1. Remove the three M1.6 screws from the USCU.
2. Align the mounting holes on the satellite receiver with the bolts on the USCU.
3. Tighten the three M1.6 screws that were removed in [Step 2.1](#) to 0.1 N·m.
4. Connect one end of the RF jumper to the RF port on the satellite receiver and the other end to the GPS port on the USCU.



CAUTION

There are six mounting holes on the satellite receiver. You need to install only three screws on the receiver, as shown in [Figure 6-59](#)

Figure 6-59 Installing the satellite receiver on the USCU



CIA02C4006

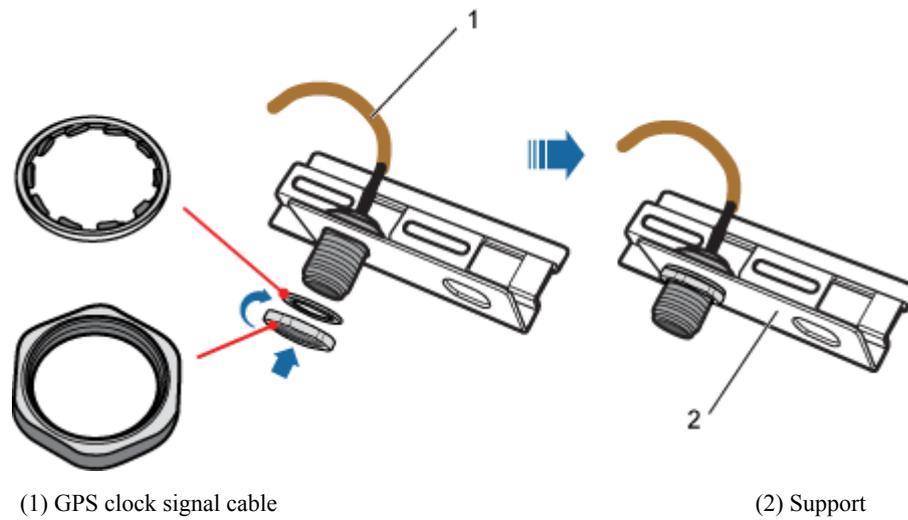
(1) Satellite receiver

(2) RF jumper

Step 3 Install the USCU equipped with the satellite receiver into the BBU, and tighten the screws on the USCU to 0.6 N·m.

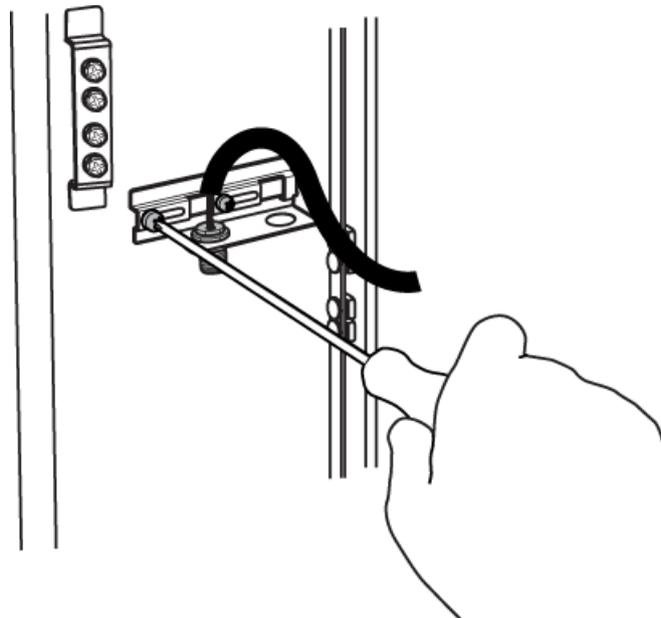
Step 4 Install the GPS clock signal cable on the support, as shown in [Figure 6-60](#).

Figure 6-60 Installing the GPS clock signal cable on the support



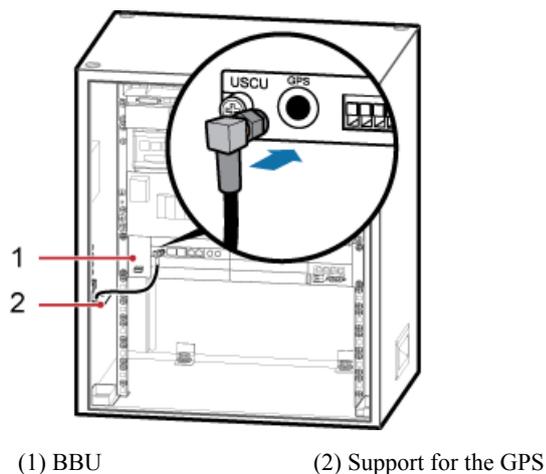
Step 5 Install the support on the left of the cabinet, as shown in [Figure 6-61](#).

Figure 6-61 Installing the support on the cabinet



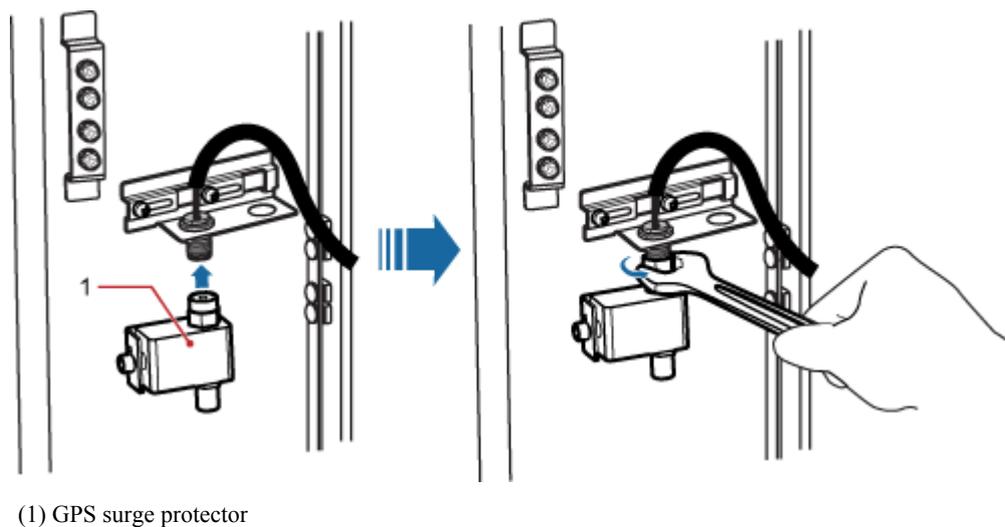
Step 6 Connect the GPS clock signal cable to the GPS port on the USCU, as shown in [Figure 6-62](#).

Figure 6-62 Installing the GPS clock signal cable on the USCU



Step 7 Install the GPS surge protector, as shown in **Figure 6-63**.

Figure 6-63 Installing the GPS surge protector

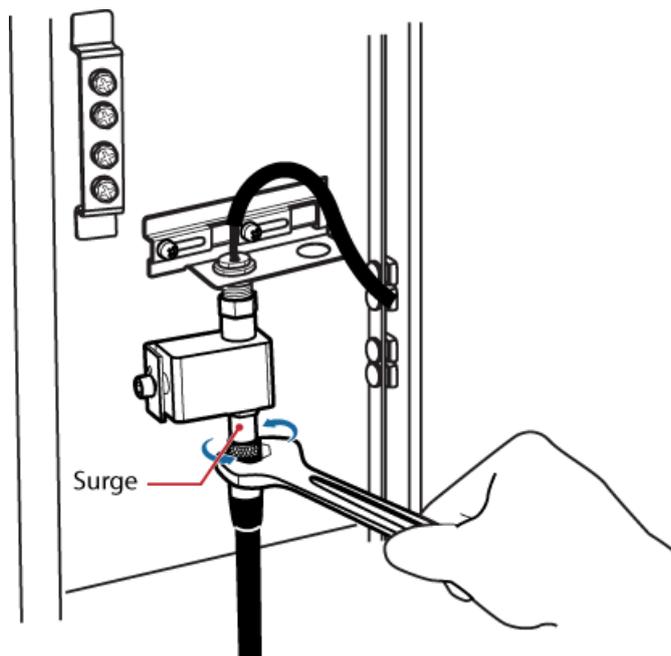


NOTE

The figure of the GPS surge protector is for reference only. The actual appearance may be different.

Step 8 Install the GPS jumper, as shown in **Figure 6-64**.

Figure 6-64 Installing the GPS jumper



Step 9 Route the cable by referring to [6.5.1 Cabling Requirements](#).

Step 10 Attach labels to the installed cable. For details, see Attaching a Sign Plate Label.

---End

6.5 Installing Cables

This section describes the procedures and precautions to be taken for installing power cables, transmission cables, monitoring signal cables, and CPRI cables when a DBS3900 is deployed outdoors with AC power supply and the BBU is installed in an APM30H.

6.5.1 Cabling Requirements

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



NOTE

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

General Cabling Requirements

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

- The bending radius of the 7/8" feeder must be more than 250 mm (9.84 in.), and the bending radius of the 5/4" feeder must be more than 380 mm (14.96 in.).
- The bending radius of the 1/4" jumper must be more than 35 mm (1.38 in.). The bending radius of the super-flexible 1/2" jumper must be more than 50 mm (1.97 in.), and the bending radius of the ordinary 1/2" jumper must be more than 127 mm (5 in.).

- The bending radius of the power cable or PGND cable must be at least five times the diameter of the cable.
- The bending radius of a fiber optic cable is at least 20 times the diameter of the fiber optic cable.
- The bending radius of the E1/T1 cable must be at least five times the diameter of the cable.
- The bending radius of the signal cable must be at least five times the diameter of the cable.

The cables must be bound as follows:

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

The cables must be routed as follows:

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

Special Cabling Requirements

Cabling requirements for power cables are as follows:

- -48 V power cables must be bound together.
- +24 V power cables must be bound together.
- Power cables, transmission cables, and signal cables are routed separately.
- Multiple power cables must be bound when routed.
- Power cables must be installed in the position specified in engineering design documents.
- If the length of power cables is insufficient, replace the cables rather than adding connectors or soldering joints to lengthen the cables.

Cabling requirements for PGND cables are as follows:

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

Cabling requirements for E1 cables are as follows:

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

Cabling requirements for fiber optic cables are as follows:

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

6.5.2 Installing a Cable Outlet Module in a Cabinet

During cable installation, you must lead the cables through the cable outlet modules at both sides of the bottom of the cabinet for effective sealing.

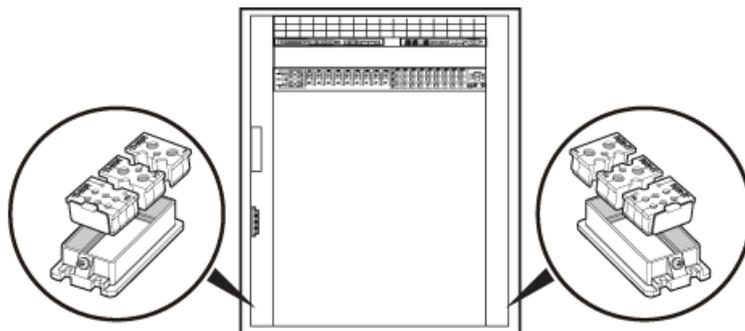
Context

There is a cable outlet module at each side of the bottom of an APM30H, TMC11H, IBBS200D, or IBBS200T, as shown in [Figure 6-65](#).

NOTE

- Cable outlet modules for an APM30H, TMC11H, IBBS200D, or IBBS200T are the same. The following description is based on the cable outlet modules in a TMC11H.
- When two IBBS200Ds or two IBBS200Ts are stacked, you do not need to install cable outlet modules in the upper IBBS.

Figure 6-65 Cable outlet modules in a TMC11H



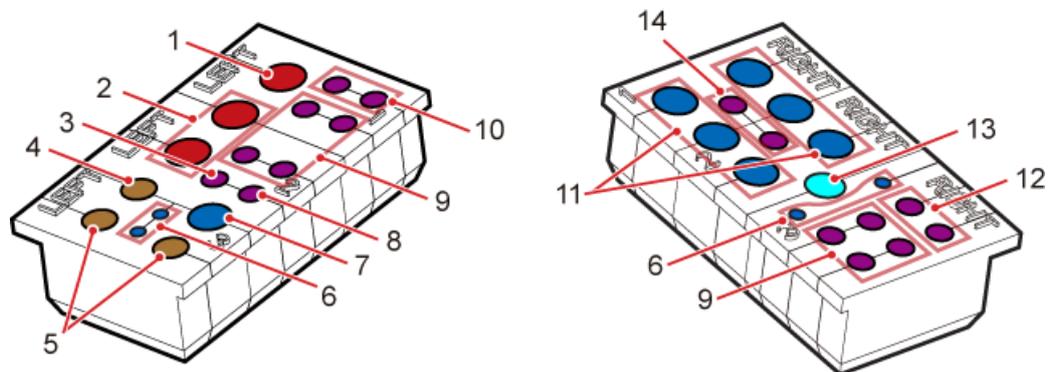
[Figure 6-66](#) shows the exterior of cable outlet modules of the TMC11H.

NOTE

- The cables can be routed through proper cable holes as required.
- The recommended cable routes through the cable outlet module is shown in [Figure 6-66](#). Different color indicates different cross-sectional areas of cables. The same color indicates the same cross-sectional area. You can route the cables that are not mentioned through vacant cable holes matching their cross-sectional areas.

Different colors of cable holes in the figure stand for different cable diameters.

Figure 6-66 Cable outlet modules of the TMC11H



PAD00C0376

- | | |
|--|--|
| (1) Cable hole for an AC input power cable | (8) Cable hole for an SDH cable |
| (2) Cable holes for GPS jumpers (1/2") | (9) Cable holes for CPRI optical cables |
| (3) Cable hole for a PGND cable | (10) Cable holes for AC output power cables, or DC output power cables |
| (4) Cable hole for an E1/T1 cable, or a GPS jumper (RG8) | (11) Cable holes for RRU power cables |
| (5) Cable holes for E1/T1 cables | (12) Cable holes for power cables for storage batteries |
| (6) Cable holes for DC output power cables (of the TMC and IBBS's FAN/TEC) | (13) Cable hole for a Boolean alarm signal cable, or an E1/T1 cable |
| (7) Cable hole for an fiber optic cable | (14) Cable holes for RS485 signal cables |

Procedure

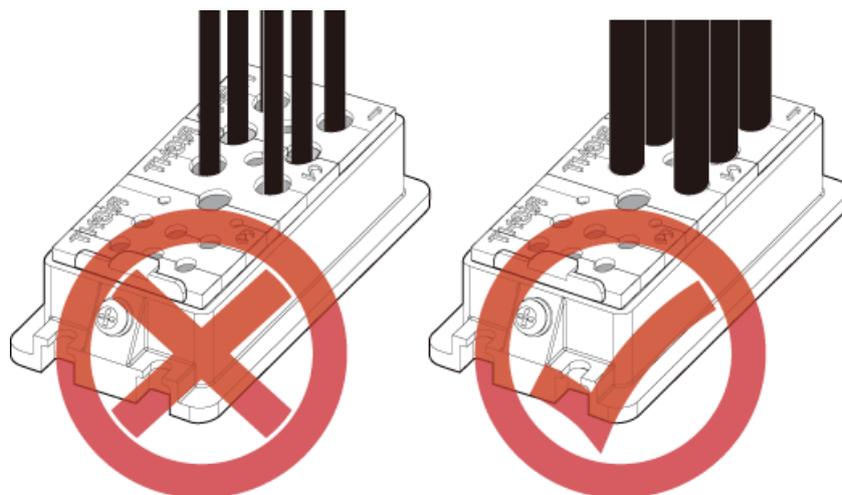
- Step 1** Lead cables with different cross-sectional areas through the cable outlet modules based on the apertures of the holes in the modules, and then insert the cable outlet modules into the cable outlets of the cabinet.



CAUTION

Lead a cable through the cable hole with an aperture matching the cross-sectional area of the cable for effective sealing, as shown in [Figure 6-67](#).

Figure 6-67 Leading cables through cable outlet modules



EIH06C0001

Step 2 Use rubber caps to seal the idle cable holes.

Step 3 Tighten the screws in the front of the cable module to fix the module.

----End

6.5.3 Installing Power Cables

When a DBS3900 is deployed outdoors with AC power supply, the BBU can be installed in an APM30H. If a single APM30H is installed, the input power cable for the APM30H, BBU power cable, and RRU power cables must be installed. If multiple cabinets are installed in stack mode, the power cable between the APM30H and the TMC11H and that between the APM30H and the IBBS200D or IBBS200T must also be installed.

Installing an Input Power Cable for the APM30H

An input power cable for the APM30H is used to connect the external power equipment to the EPS subrack, feeding external power into the APM30H.

Prerequisite

- The tools, such as a Phillips screwdriver, cable cutter, and multi-purpose crimping tool, are ready.
- The PGND cable is installed.

Context

The outdoor power supply to an APM30H can be 220 V AC three-phase, 220 V AC single-phase, or 110 V dual-live-wire power. Different input power cables are delivered for an APM30H in different power supply scenarios, as listed in [Table 6-5](#).

Table 6-5 Input power cables for the APM30H

Cable List	One End	The Other End	Remarks
220 V AC three-phase input power cable for the APM30H	OT terminal (M6, 4 mm ²)	Depending on the external equipment	Black, five wires in Brown, Black, Gray, blue, and green and yellow
220 V AC single-phase input power cable for the APM30H	OT terminal (M6, 6 mm ²)	Depending on the external equipment	Black, three wires in blue, brown, and green and yellow
110 V AC dual-live-wire input power cable for the APM30H	OT terminal (M6, 6 mm ²)	Depending on the external equipment	Black, four wires in black, red, white, and green

 **NOTE**

The colors and structures of cables vary according to countries and areas. If the cables are purchased locally, the colors and structures of the cables may be different.

Procedure

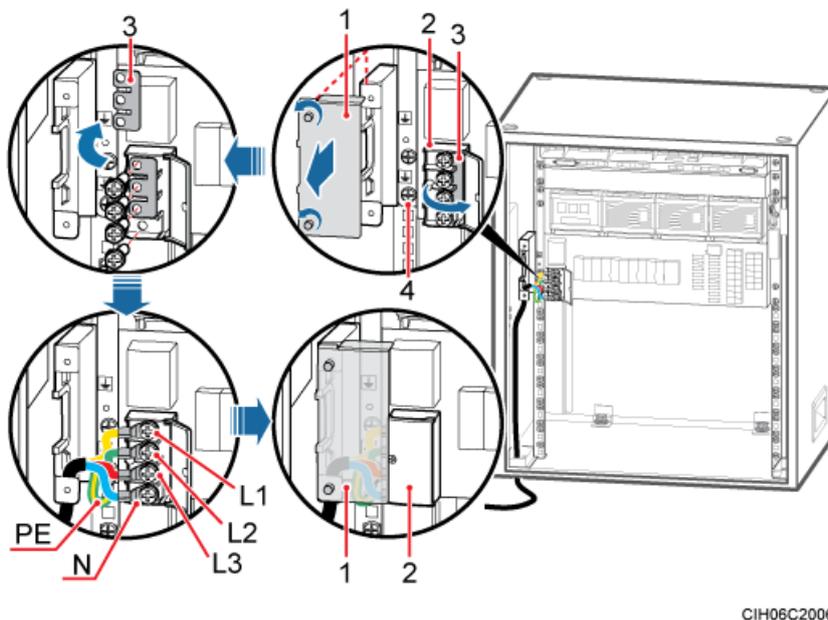
Step 1 Prepare the input power cable for the APM30H.

1. Cut the cable to the required length based on the actual cable route.
2. Add OT terminals to both ends of the cable. For details, see Assembling the OT Terminal and the Power Cable.

Step 2 Install the power cable, as shown in [Figure 6-68](#), [Figure 6-69](#), and [Figure 6-70](#).

1. Use a Phillips screwdriver to remove the upper and lower screws from the AC baffle plate, and then remove the AC baffle plate.
2. Use a Phillips screwdriver to remove the screw from the protecting hood for the AC input wiring terminals, and then open the protecting hood.
3. Remove the short-circuiting piece from the AC input L1, L2, and L3 terminals. Skip this step if the input power supply is 220 V single-phase or 110 V dual-live power.
4. Route the cable into the cabinet along the left side and connect each wire of the power cable to the corresponding terminal.
5. Reinstall the protecting hood for the AC input wiring terminals.
6. Reinstall the AC baffle plate.

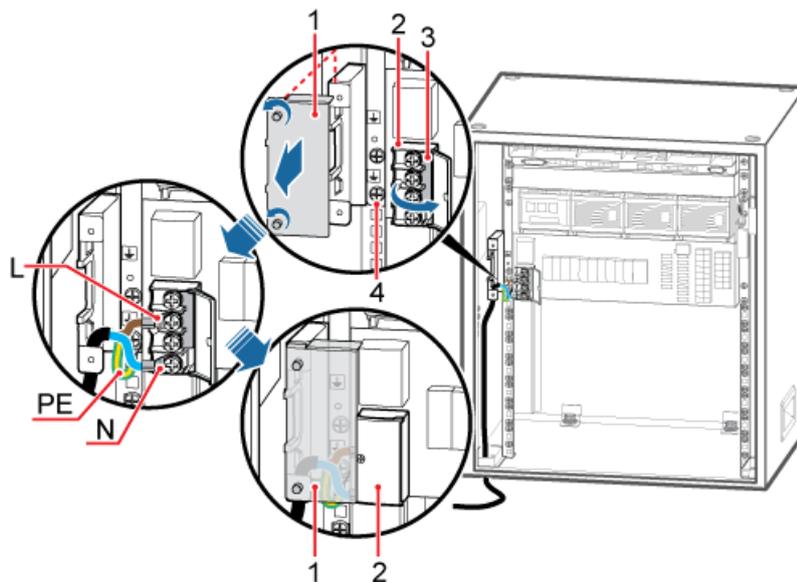
Figure 6-68 Installing a 220 V AC three-phase input power cable for the APM30H on the EPS subrack



CIH06C2006

(1) Protecting hood for the AC input (2) AC power supply box (3) Short-circuiting bar (4) PE wiring terminal terminal block

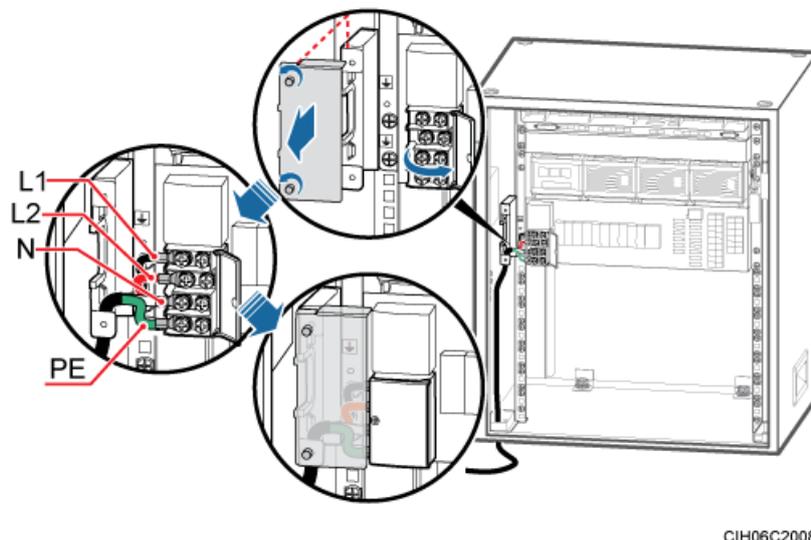
Figure 6-69 Installing a 220 V AC single-phase input power cable for the APM30H on the EPS subrack



CIH06C2007

(1) AC baffle plate (2) AC power supply box (3) Short-circuiting bar (4) PE wiring terminal

Figure 6-70 Installing a 110 V dual-live-wire input power cable for the APM30H on the EPS subrack



- Step 3** Route the cable by referring to [6.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.
- Step 4** Label the installed cables by referring to Attaching a Sign Plate Label.
- Step 5** Run each cable that leaves the cabinet in the PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.
- Step 6** Waterproof the connector.

----End

Installing the Power Cable Between the APM30H and the TMC11H

The power cables between the APM30H and the TMC11H are the input power cable for the TMC11H and power cable for the junction box in the TMC11H. The power cables are used to feed power to the TMC11H and other equipment from the APM30H. The power cables between the APM30H and the TMC11H are optional, which are delivered and used with the TMC11H.

Prerequisite

The tools, such as a Phillips screwdriver, a cable cutter, and a multi-purpose crimping tool, are ready.

Context

[Table 6-6](#) lists the power cables between the APM30H and the TMC11H.

Table 6-6 Power cables between the APM30H and the TMC11H

Cable		One End	The Other End	Remarks
Input power cable for the TMC11H	RTN(+) wire	Easy power receptacle (pressfit type) connector	OT terminal (4 mm ² , M6)	Black
	NEG(-) wire	Easy power receptacle (pressfit type) connector	OT terminal (4 mm ² , M6)	Blue
Power cable for the junction box in the TMC11H	L wire	OT terminal (1.5 mm ² , M4)	OT terminal (1.5 mm ² , M4)	Black, two wires in brown (L wire) and blue (N wire)
	N wire	OT terminal (1.5 mm ² , M4)	OT terminal (1.5 mm ² , M4)	

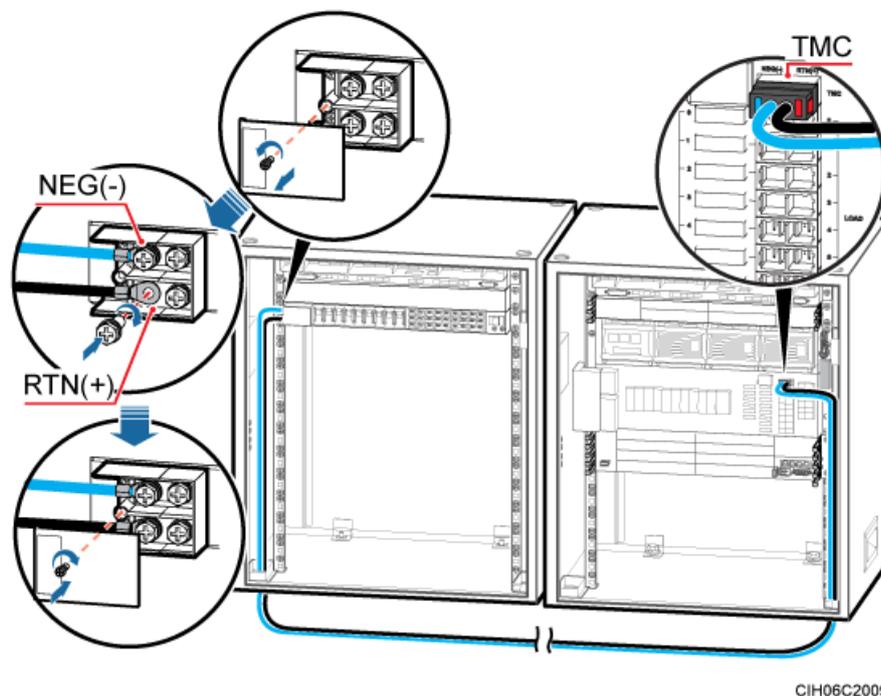
Procedure

- Step 1** Prepare the input power cable for the TMC11H and power cable for the junction box in the TMC11H.
1. Prepare the cable of proper length based on the actual cable route.
 2. Add connectors to both ends of the input power cable for the TMC11H and power cable for the junction box in the TMC11H according to Table 1. For details, see *Assembling the OT Terminal and the Power Cable* and *Assembling the Easy Power Receptacle (Pressfit Type) Connector and the Power Cable*.
- Step 2** Link the easy power receptacle (pressfit type) connector at one end of the input power cable for the TMC11H to the DC output wiring terminal labeled TMC on the EPS in the APM30H, and then link the OT terminal at the other end to the DC input wiring terminal on the DCDU-03, as shown in Figure 1.

 **NOTE**

Before installing the power cables, remove the protecting hood from the DC input wiring terminal block on the DCDU-03. After the cables are installed, reinstall the protecting hood.

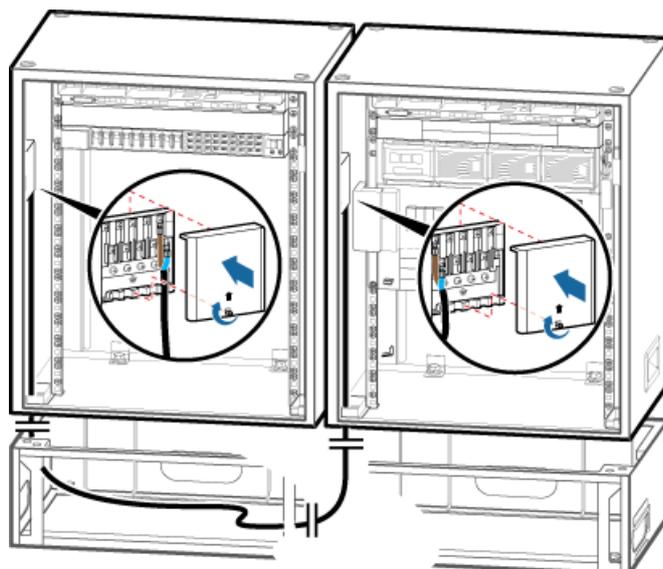
Figure 6-71 Installing the input power cable for the TMC11H



CIH06C2009

Step 3 Link the OT terminal at one end of the power cable for the junction box in the TMC11H to the AC output wiring terminals labeled L3 and N3 in the junction box in the APM30H, and then link the OT terminal at the other end to the AC input wiring terminal labeled L and N in the junction box in the TMC11H, as shown in [Figure 6-72](#).

Figure 6-72 Installing the power cable for the junction box in the TMC11H



- Step 4** Route the cable by referring to [6.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.
- Step 5** Label the installed cables by referring to Attaching a Sign Plate Label.
- Step 6** Run each cable that leaves the cabinet in the PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

---End

Installing Power Cables Between the APM30H and the IBBS200D

Power cables between the APM30H and the IBBS200D feed power into an IBBS200D and its components from an APM30H. The cables are optional, which are delivered and used with an IBBS200D.

Prerequisite

- The tools, such as a Phillips screwdriver, cable cutter, and multi-purpose crimping tool, are ready.
- The PGND cable is installed.

Context

According to backup power requirements of customers, the configuration proportion of APM30Hs and IBBS200Ds can be 1:1 or 1:2.

Power cables between the APM30H and the IBBS200D are the power cables for the batteries, cascaded batteries, fan in the IBBS200D, cascaded fans in the IBBS200Ds, and heating film in the IBBS200D. [Table 6-7](#) lists the cable specifications.

Table 6-7 Power cables between the APM30H and the IBBS200D

Cable		One End	The Other End	Remarks
Power cable for the batteries	RTN(+) wire	Power series 120 connector	OT terminal (M6, 16 mm ²)	Red
	NEG(-) wire		OT terminal (M6, 16 mm ²)	Black
Power cable for the cascaded batteries	RTN(+) wire	OT terminal (M6, 16 mm ²)	OT terminal (M6, 16 mm ²)	Red
	NEG(-) wire	OT terminal (M6, 16 mm ²)	OT terminal (M6, 16 mm ²)	Black
Power cable for the fan in the IBBS200D	RTN(+) wire	Easy power receptacle (pressfit type) connector	OT terminal (M4, 2.5 mm ²)	Black
	NEG(-) wire		OT terminal (M4, 2.5 mm ²)	Blue

Cable		One End	The Other End	Remarks
Power cable for the cascaded fans in the IBBS200Ds	RTN(+) wire	OT terminal (M4, 2.5 mm ²)	OT terminal (M4, 2.5 mm ²)	Black
	NEG(-) wire	OT terminal (M4, 2.5 mm ²)	OT terminal (M4, 2.5 mm ²)	Blue
Power cable for the heating film in the IBBS200D	L wire	OT terminal (M4, 1.5 mm ²)	OT terminal (M4, 1.5 mm ²)	Black cable with two wires in brown (L wire) and blue (N wire)
	N wire	OT terminal (M4, 1.5 mm ²)	OT terminal (M4, 1.5 mm ²)	

Procedure

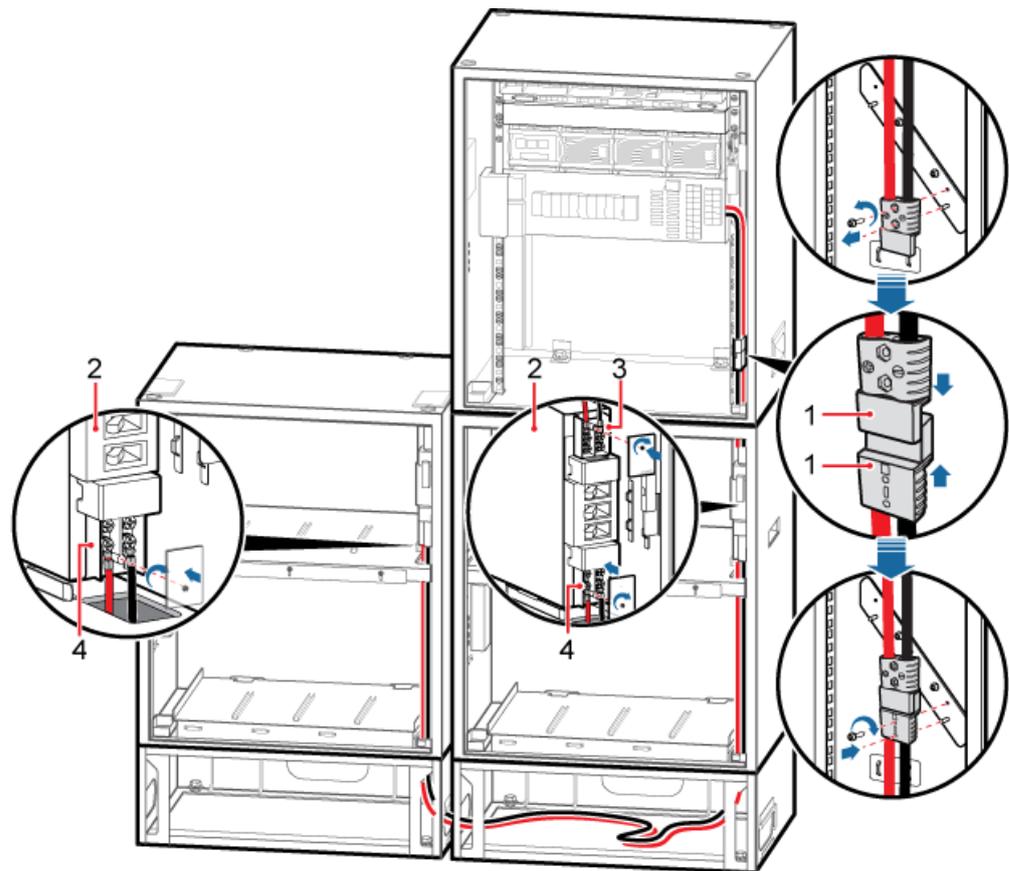
Step 1 Prepare power cables for the batteries, cascaded batteries, fan in the IBBS200D, cascaded fans in the IBBS200Ds, and heating film in the IBBS200D.

1. Cut the cable to the required length based on the actual cable route.
2. According to [Table 6-7](#), add a connector to each end of the power cables for the batteries, cascaded batteries, fan in the IBBS200D, cascaded fans in the IBBS200Ds, and heating film in the IBBS200D. For details, see [Assembling the Power Series 120 Connector and the Power Cable](#), [Assembling the Easy Power Receptacle \(Pressfit Type\) Connector and the Power Cable](#), and [Assembling the OT Terminal and the Power Cable](#).

Step 2 Install the power cables for the batteries and cascaded batteries.

1. Link the power series 120 connector at one end of the power cable for the batteries to the power supply terminal on the right in the APM30H, and then respectively link the OT terminals on the red and black wires at the other end to the RTN(+) and NEG(-) wiring terminals near the BTA label on the top of the power distribution box in the IBBS200D under the APM30H, as shown in [Figure 6-73](#).

Figure 6-73 Installing power cables for the IBBS200D and cascaded IBBS200Ds



CIH06C2010

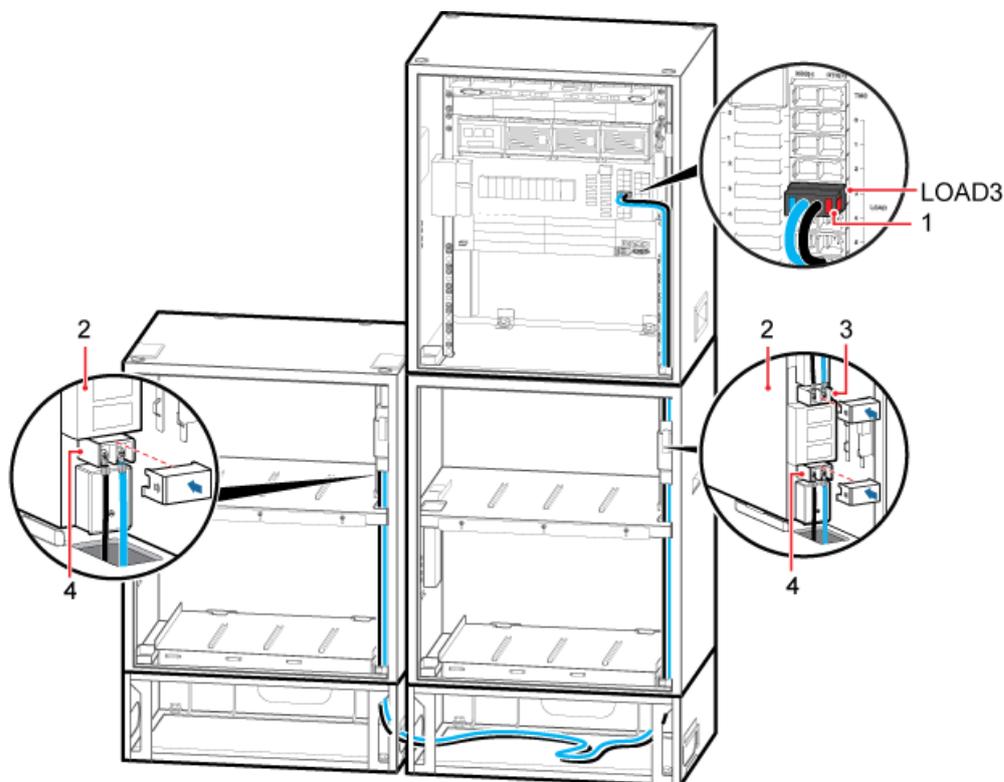
- | | | | |
|---|--|--|---|
| (1) Power supply terminal for the batteries | (2) Power distribution box for the batteries | (3) Wiring terminal at the top of the power distribution box for the batteries | (4) Wiring terminal at the bottom of the power distribution box for the batteries |
|---|--|--|---|

2. Install the power cable for the cascaded batteries if the configuration proportion of APM30Hs and IBBS200Ds is 1:2. Respectively link the OT terminals on the red and black wires at both ends of the power cable for the cascaded batteries to the RTN(+) and NEG (-) wiring terminals near the BTA label at the bottom of the power distribution box in the two IBBS200Ds, as shown in [Figure 6-73](#).

Step 3 Install the power cables for the fan in the IBBS200D and cascaded fans in the IBBS200Ds.

1. Link the easy power receptacle (pressfit type) connector at one end of the power cable for the fan in the IBBS200D to the DC output terminal labeled LOAD3 on the right of the EPS subrack in the APM30H, and then link the OT terminals on the black and blue wires at the other end to the RTN(+) and NEG(-) wiring terminals near the TEC/FAN label on the top of the power distribution box in the IBBS200D under the APM30H, as shown in [Figure 6-74](#).

Figure 6-74 Installing the power cables for the fan in the IBBS200D and cascaded fans in the IBBS200Ds



CIH06C2011

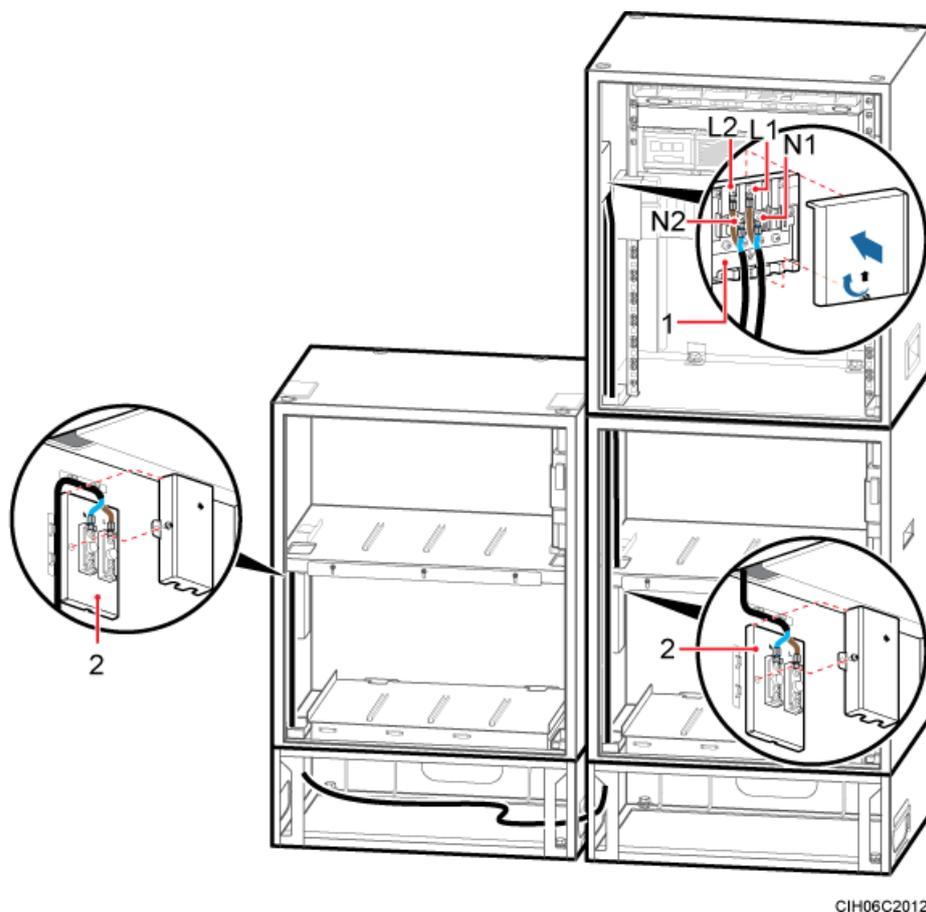
- | | | | |
|---|--|--|---|
| (1) Easy power receptacle (pressfit type) connector | (2) Power distribution box for the batteries | (3) Wiring terminal on the top of the power distribution box for the batteries | (4) Wiring terminal at the bottom of the power distribution box for the batteries |
|---|--|--|---|

2. Install the power cable for the cascaded fans in the IBBS200Ds if the configuration proportion of APM30Hs and IBBS200Ds is 1:2. Respectively link the OT terminals on the red and black wires at both ends of the power cable for the cascaded fans in the IBBS200Ds to the RTN(+) and NEG(-) wiring terminals near the TEC/FAN label at the bottom of the power distribution box in the two IBBS200Ds, as shown in [Figure 6-74](#).

Step 4 Install the power cable for the heating film in the IBBS200D.

1. Link the OT terminals on the brown and blue wires at one end of the power cable for the heating film in the IBBS200D to the L2 and N2 terminals in the junction box on the left of the APM30H, and then respectively link the OT terminals on the brown and blue wires at the other end to the L and N wiring terminals in the junction box for the heating film on the left of the IBBS200D under the APM30H, as shown in [Figure 6-75](#).

Figure 6-75 Installing the power cable for the heating film in the IBBS200D



(1) Junction box in the power cabinet

(2) Junction box for the heating film

2. Install the power cable for the heating film in a second IBBS200D if the configuration proportion of APM30Hs and IBBS200Ds is 1:2. Respectively link the OT terminals on the brown and blue wires at one end of the power cable for the heating film in the IBBS200D to the L1 and N1 terminals in the junction box on the left of the APM30H, and then respectively link the OT terminals on the brown and blue wires at the other end to the L and N wiring terminals in the junction box for the heating film on the left of the second IBBS200D, as shown in [Figure 6-75](#).

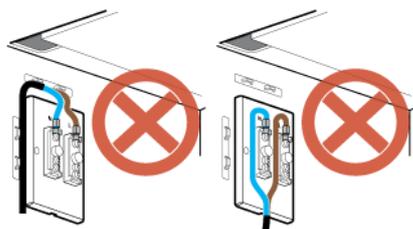


WARNING

When installing the power cable for the heating film near the junction box in the IBBS200D, do not connect the cables in the manner shown in [Figure 6-76](#).

- Do not expose the wires of the power cable for the heating film outside the power supply box for the heating film.
- The power cable for the heating film must be led into the power supply box for the heating film from the top, not from the bottom.

Figure 6-76 Incorrect connections of the heating-film power cable in the junction box in the IBBS200D



Step 5 Route the cable by referring to [6.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.

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

Step 7 Run each cable that leaves the cabinet in the PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

----End

Installing Power Cables Between the APM30H and the IBBS200T

Power cables between the APM30H and the IBBS200T feed power into an IBBS200T and its components from an APM30H. The cables are optional, which are delivered and used with an IBBS200T.

Prerequisite

- The tools, such as a Phillips screwdriver, cable cutter, and multi-purpose crimping tool, are ready.
- The PGND cable is installed.

Context

According to backup power requirements of customers, the configuration proportion of APM30Hs and IBBS200Ts can be 1:1 or 1:2.

The power cables between the APM30H and the IBBS200T are the power cables for the batteries, cascaded batteries, and TEC in the IBBS200T. [Table 6-8](#) lists the cable specifications.

Table 6-8 Power cables between the APM30H and the IBBS200T

Cable		One End	The Other End	Remarks
Power cable for the batteries	RTN(+) wire	Power series 120 connector	OT terminal (M6, 16 mm ²)	Red
	NEG(-) wire		OT terminal (M6, 16 mm ²)	Black

Cable		One End	The Other End	Remarks
Power cable for the cascaded batteries	RTN(+) wire	OT terminal (M6, 16 mm ²)	OT terminal (M6, 16 mm ²)	Red
	NEG(-) wire	OT terminal (M6, 16 mm ²)	OT terminal (M6, 16 mm ²)	Black
Power cable for the TEC in the IBBS200T	RTN(+) wire	Easy power receptacle (pressfit type) connector	OT terminal (M4, 2.5 mm ²)	Black
	NEG(-) wire		OT terminal (M4, 2.5 mm ²)	Blue

Procedure

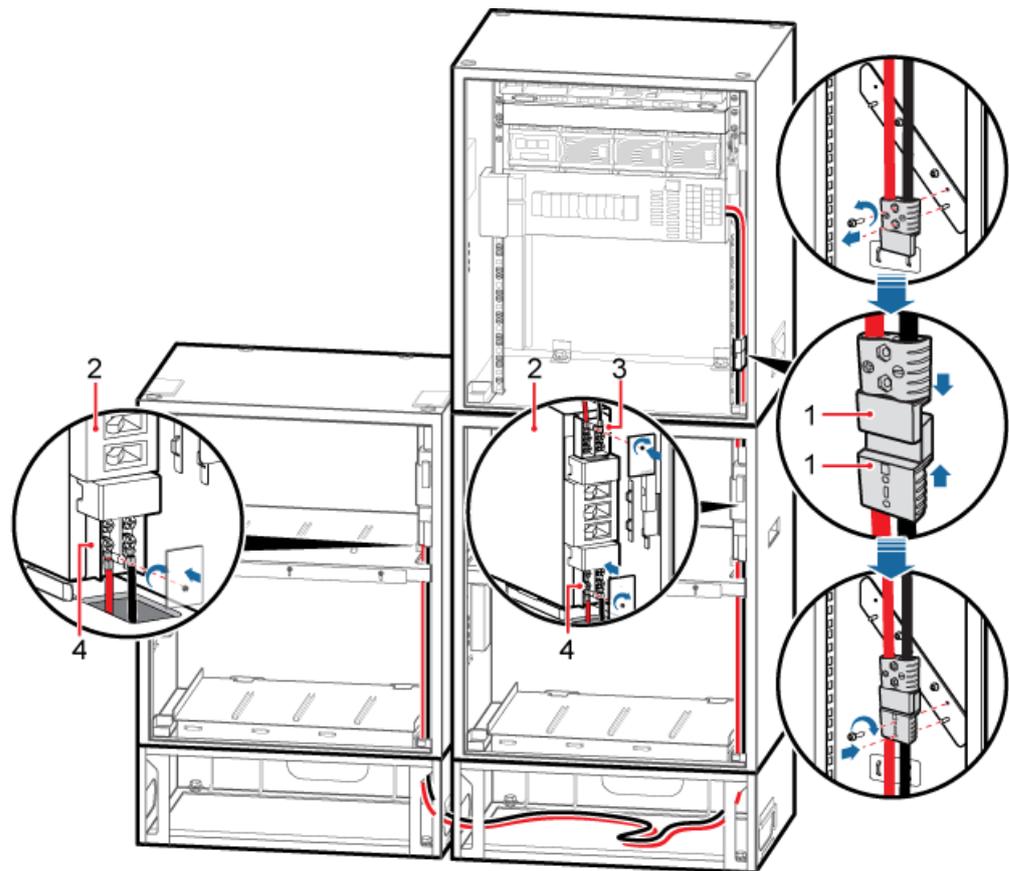
Step 1 Prepare power cables for the batteries, cascaded batteries, and TEC in the IBBS200T.

1. Cut the cable to the required length based on the actual cable route.
2. According to [Table 6-8](#), add a connector to each end of the power cables for the batteries, cascaded batteries, and TEC in the IBBS200T. For details, see [Assembling the Power Series 120 Connector and the Power Cable](#), [Assembling the Easy Power Receptacle \(Pressfit Type\) Connector and the Power Cable](#), and [Assembling the OT Terminal and the Power Cable](#).

Step 2 Install the power cables for the batteries and cascaded batteries.

1. Link the power series 120 connector at one end of the power cable for the batteries to the power supply terminal on the right of the APM30H, and then respectively link the OT terminals on the red and black wires at the other end to the RTN(+) and NEG(-) wiring terminals near the BTA label at the top of the power distribution box in the IBBS200T under the APM30H, as shown in [Figure 6-77](#).

Figure 6-77 Installing power cables for the batteries and cascaded batteries



CIH06C2010

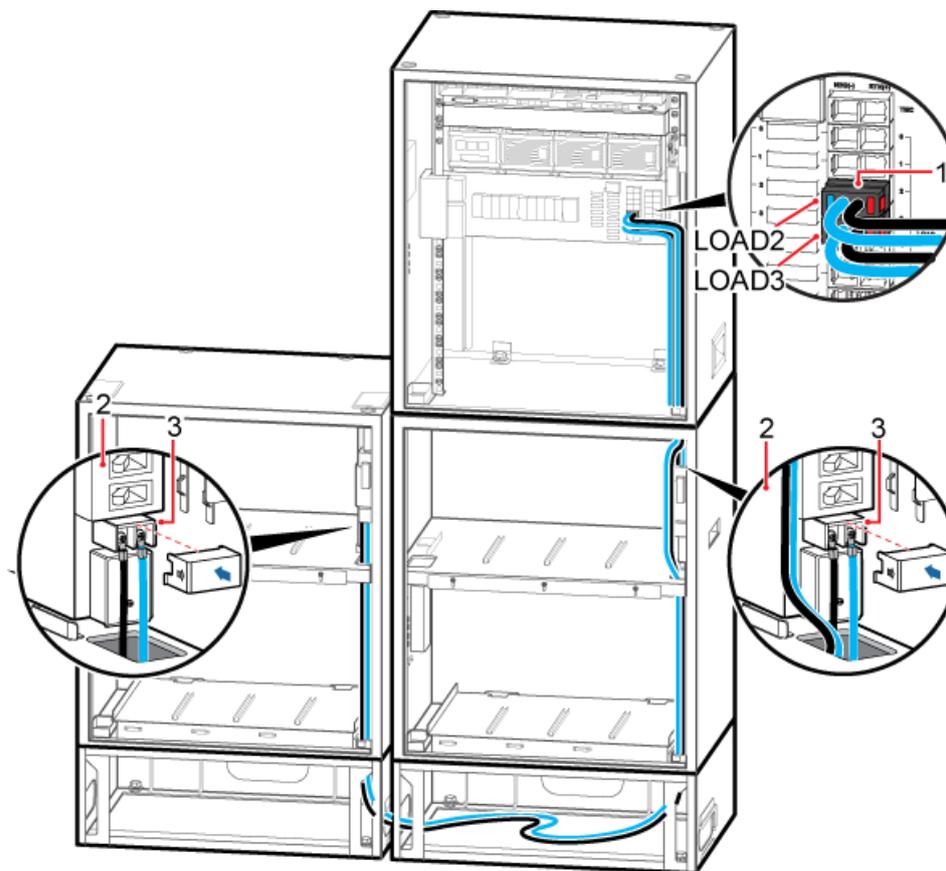
- | | | | |
|--------------------------------|--|--|---|
| (1) Power series 120 connector | (2) Power distribution box for the batteries | (3) Wiring terminal on the top of the power distribution box for the batteries | (4) Wiring terminal at the bottom of the power distribution box for the batteries |
|--------------------------------|--|--|---|

2. Install the power cable for the cascaded batteries if the configuration proportion of APM30Hs and IBBS200Ts is 1:2. Respectively link the OT terminals on the red and black wires at both ends of the power cable for the cascaded batteries to the RTN(+) and NEG (-) wiring terminals near the BTA label at the bottom of the power distribution box in the two IBBS200Ts, as shown in [Figure 6-77](#).

Step 3 Install the power cable for the TEC in the IBBS200T.

1. Link the easy power receptacle (pressfit type) connector at one end of the power cable for the TEC in the IBBS200T to the DC output terminal labeled LOAD3 on the right of the EPS subrack in the APM30H, and then respectively link the OT terminals on the black and blue wires at the other end to the RTN(+) and NEG(-) wiring terminals near the TEC/FAN label at the bottom of the power distribution box in the IBBS200T under the APM30H, as shown in [Figure 6-78](#).

Figure 6-78 Installing the power cable for the TEC in the IBBS200T



CIH06C2013

(1) Easy power receptacle (pressfit type) connector (2) Power distribution box for the batteries (3) TEC/FAN power supply terminal

2. Install the power cable for the TEC in a second IBBS200T if the configuration proportion of APM30Hs and IBBS200Ts is 1:2. Link the easy power receptacle (pressfit type) connector at one end of the power cable for the TEC to the DC output terminal labeled LOAD2 on the right of the EPS subrack in the APM30H, and then respectively link the OT terminals on the black and blue wires at the other end to the RTN(+) and NEG(-) wiring terminals near the TEC/FAN label at the bottom of the power distribution box in the second IBBS200T, as shown in [Figure 6-78](#).

NOTE

If the LOAD2 terminal is already occupied, the LOAD4 terminal is recommended. In this case, the fuse for the LOAD4 terminal must be replaced to meet the circuit breaker requirements of the IBBS. For details about the replacement operations, see Replacing the Fuse.

- Step 4** Route the cable by referring to [6.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.
- Step 5** Label the installed cables by referring to Attaching a Sign Plate Label.
- Step 6** Run each cable that leaves the cabinet in the PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

----End

Installing a BBU Power Cable

A BBU power cable in an APM30H feeds power into the BBU from the EPS subrack.

Prerequisite

- The tools, such as a Phillips screwdriver, cable cutter, and multi-purpose crimping tool, are ready.
- The PGND cable is installed.

Context

- In the triple mode scenario, two BBUs are required. A second BBU power cable is installed in the same manner as the first BBU power cable.
- [Table 6-9](#) lists the specifications of a BBU power cable when an EPS subrack supplies power.

Table 6-9 Specifications of a BBU power cable

Cable	One End	The Other End
BBU power cable	3V3 power connector	Easy power receptacle (pressfit type) connector

 **NOTE**

The colors and structures of cables vary according to countries and areas. If the cables are purchased locally, the colors and structures of the cables may be different.

Procedure

- Step 1** Add an easy power receptacle (pressfit type) connector to a BBU power cable. For details, see [Assembling the Easy Power Receptacle \(Pressfit Type\) Connector and the Power Cable](#).

 **NOTE**

A 3V3 power connector is added to one end of the BBU power cable, and you only need to add an easy power receptacle (pressfit type) connector to the other end onsite.

- Step 2** Install the BBU power cable, as shown in [Figure 6-79](#).
1. Link the 3V3 power connector at one end of the BBU power cable to the -48 V port on the UPEU in the BBU, and then tighten the screw on the connector until the tightening torque reaches 0.25 N·m.
 2. Link the easy power receptacle (pressfit type) connector at the other end to the LOAD1 port on the EPS subrack.



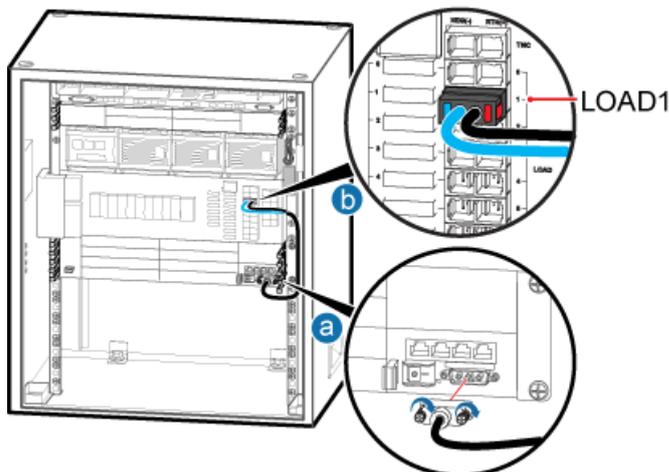
CAUTION

The blue and black wires on which the easy power receptacle (pressfit type) connector is added respectively correspond to the left and right ports on the EPS subrack.

 **NOTE**

A BBU power cable must be connected to each UPEU if two UPEUs are installed in the BBU. The 3V3 power connector at one end of each BBU power cable is connected to the -48V port on each UPEU in the BBU, and the easy power receptacle (pressfit type) connectors at the other end are connected to the LOAD1 and LOAD2 ports on the EPS, respectively.

Figure 6-79 Installing a BBU power cable



CIH06C2014

Step 3 Route the cable by referring to [6.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 4 Label the installed cables. For details, see Attaching an L-Shaped Label.

----End

Installing an RRU Power Cable

An RRU power cable feeds power into an RRU from the EPS subrack if an APM30H supplies power to the RRU.

Prerequisite

- The tools, such as a Phillips screwdriver, cable cutter, and multi-purpose crimping tool, are ready.
- The PGND cable is installed.

Context

Table 6-10 lists the specifications of an RRU power cable when an EPS subrack supplies power.

Table 6-10 Specifications of RRU power cables

Cable		One End	The Other End	Remarks
RRU power cable	RTN(+) wire	Easy power receptacle (pressfit type) connector	OT terminal [M4, 3.3 mm ² (12 AWG)]	North American standard Black
	NEG(-) wire		OT terminal [M4, 3.3 mm ² (12 AWG)]	North American standard Blue
RRU power cable	RTN(+) wire	Easy power receptacle (pressfit type) connector	OT terminal (M4, 4 mm ²)	European standard Brown
	NEG(-) wire		OT terminal (M4, 4 mm ²)	European standard Blue
RRU power cable		Easy power receptacle (pressfit type) connector	Easy power receptacle (pressfit type) connector	

 **NOTE**

The colors and structures of cables vary according to countries and areas. If the cables are purchased locally, the colors and structures of the cables may be different.

Procedure

Step 1 Prepare an RRU power cable.

- Cut the cable to the required length based on the actual cable route.
- Add an easy power receptacle (pressfit type) connector to one end of the RRU power cable. For details, see Assembling the Easy Power Receptacle (Pressfit Type) Connector and the Power Cable.
- Add OT terminals or an easy power receptacle (pressfit type) connector to the other end of the RRU power cable according to the type of power supply socket on the RRU.
 - Add an OT terminal. For details, see the related RRU Installation Guide.
 - Add an easy power receptacle (pressfit type) connector. For details, see the related RRU Installation Guide.

Step 2 Install an RRU power cable, as shown in [Figure 6-80](#).

- Link the easy power receptacle (pressfit type) connector at one end of the RRU power cable to the RRU0 port on the EPS subrack.

 **NOTE**

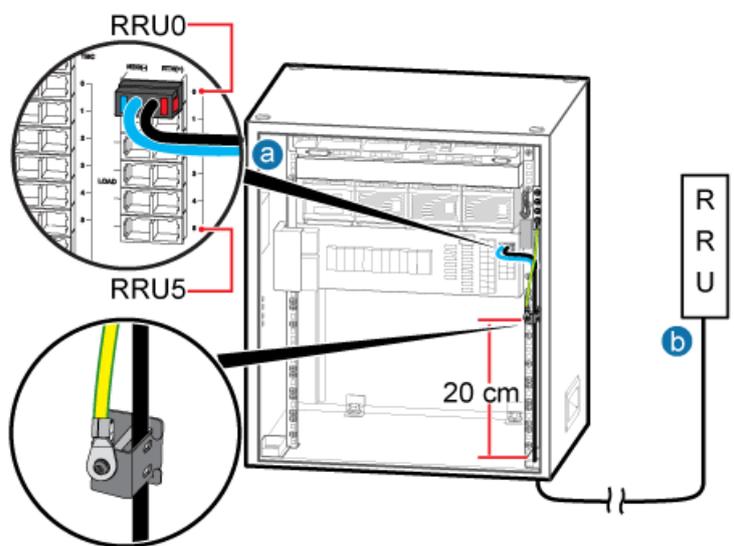
An EPS subrack supplies power to a maximum of six RRUs. Therefore, an RRU power cable can be connected to any of the RRU0 to RRU5 ports on the EPS subrack.

 **CAUTION**

The blue and black wires on which the easy power receptacle (pressfit type) connector is added respectively correspond to the left and right ports on the EPS subrack.

2. If OT terminals are at the other end of the RRU power cable, respectively link the OT terminals on the blue and black (or brown) wires to the NEG(-) and RTN(+) wiring terminals in the cabling cavity of an RRU. If an easy power receptacle (pressfit type) connector is at the other end of the RRU power cable, respectively link the blue and black (or brown) wires to the NEG(-) and RTN(+) ports in the cabling cavity of an RRU.

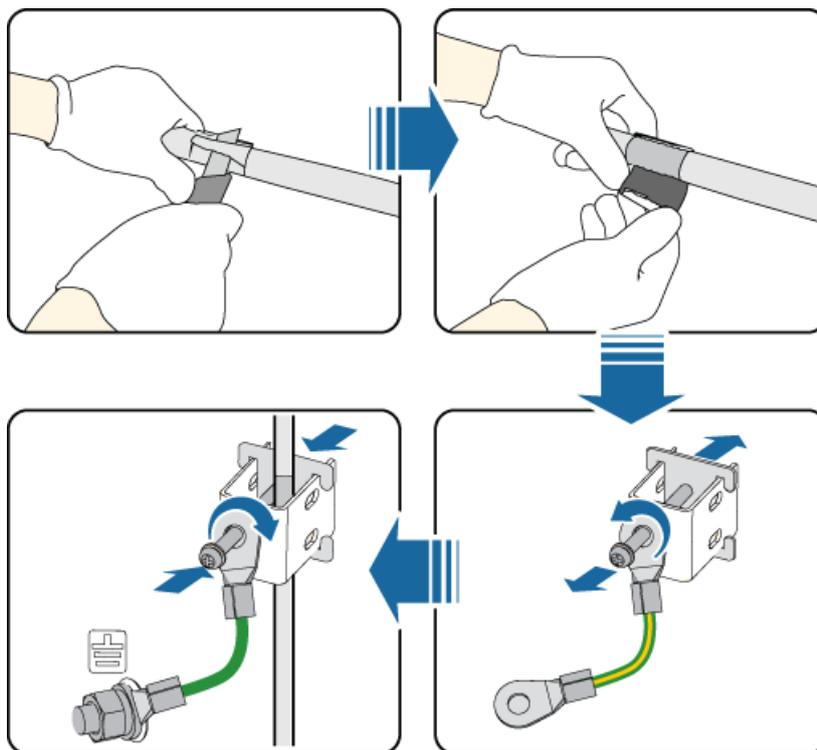
Figure 6-80 Installing an RRU power cable



CIH06C2000

- Step 3** In a position 20 cm away from the cable outlet module, strip the jacket for about 25 mm off the RRU power cable to expose the shield layer. Thread the cable through the ground clip to ensure full contact between the shield layer and the ground clip, and then tighten the M4 screws on the clip until the tightening torque reaches 1.2 N·m, as shown in [Figure 6-81](#).

Figure 6-81 Installing a grounding clip



Step 4 Route the cable by referring to [6.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 5 Label the installed cables by referring to Attaching a Sign Plate Label.

----End

6.5.4 Installing Transmission Cables

When a DBS3900 is deployed outdoors, transmission cables such as an E1/T1 cable, E1/T1 surge protection cable, FE/GE surge protection cable, FE/GE cable, or FE/GE optical cable must be installed based on onsite requirements.

Context

 **NOTE**

Install the transmission cables based on the connections of transmission cables. For details, see the *BBU3900 Hardware Description* Transmission Cable Connections.

Installing an E1/T1 Surge Protection Transfer Cable

An E1/T1 surge protection transfer cable connects the transmission board and surge protection unit for transferring surge protection signals.

Context

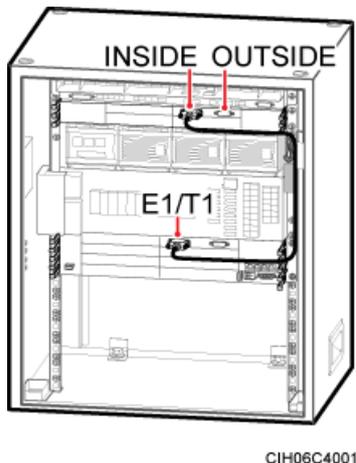
NOTE

The procedures for installing E1/T1 surge protection transfer cables in an APM30H and in a TMC11H are the same. The following description is based on the procedure for installing an E1/T1 surge protection transfer cable in an APM30H.

Procedure

- Step 1** Install an E1/T1 surge protection transfer cable, as shown in [Figure 6-82](#).
1. Link the DB26 connector at one end of the E1/T1 surge protection transfer cable to the E1/T1 port on the GTMU, WMPT, or UTRP in the BBU, and then tighten the plastic screws on the connector until the tightening torque reaches 0.25 N·m.
 2. Link the DB25 connector at the other end to the INSIDE port on the UELP in the SLPU, and then tighten the plastic screws on the connector until the tightening torque reaches 0.25 N·m.

Figure 6-82 Installing an E1/T1 surge protection transfer cable



- Step 2** Route the cables by referring to [6.5.1 Cabling Requirements](#), and then use cable ties to bind the cables.

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

----End

Installing the E1/T1 Cable

This section describes the procedure and precautions to be taken for installing an E1/T1 cable.

Prerequisite

Ensure that both ends of the E1 cable are disconnected from any devices. Then, weld connectors to the bare wires at one end of the E1 cable during the same session.

Context

Route the E1/T1 cable as follows:

- If a new base station supports not more than eight E1s, route the ends of the E1/T1 cables connected to the SLPU along the right of the cabinet.
- If a new base station supports more than eight E1s, route the ends of other E1/T1 cables connected to the SLPU along the left of the cabinet.



NOTE

The descriptions about the installation positions and routes of the E1/T1 cables in the -48 V DC cabinet and in the APM30H are the same. For details, see [Figure 6-83](#) or [Figure 6-84](#).

Procedure

- Step 1** Connect one end of the E1/T1 cable to the OUTSIDE port on the UELP, as shown in [Figure 6-83](#) or [Figure 6-84](#).



NOTE

For details about how to connect the E1/T1 cable, see Transmission Cable Connections.

Figure 6-83 Installing the E1/T1 cable (1)

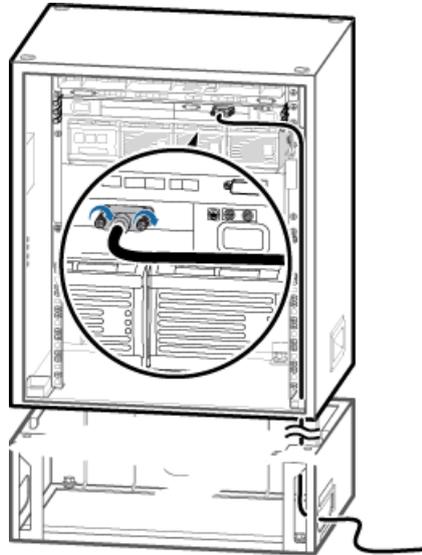
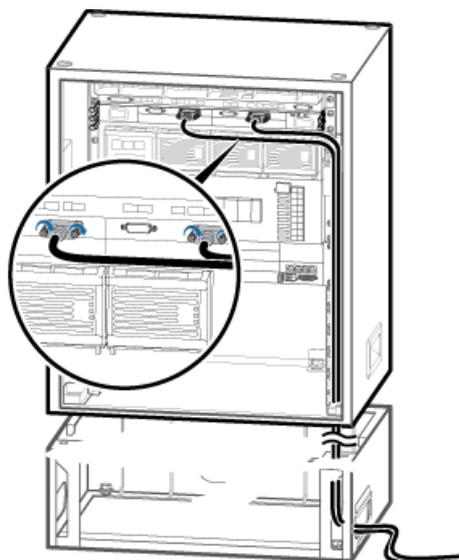


Figure 6-84 Installing the E1/T1 cable (2)



- Step 2** Lead the other end of the E1/T1 cable out of the cabinet through the cable hole at the bottom along the right of the cabinet.
- Step 3** Route the cable along the right of the cabinet by referring to [6.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.
- Step 4** Label the installed cables by referring to Attaching an L-Shaped Label.

---End

Installing a FE/GE Surge Protection Transfer Cable

A FE/GE surge protection transfer cable connects a transmission board and the UFLP, transferring surge protection transfer signals.

Context

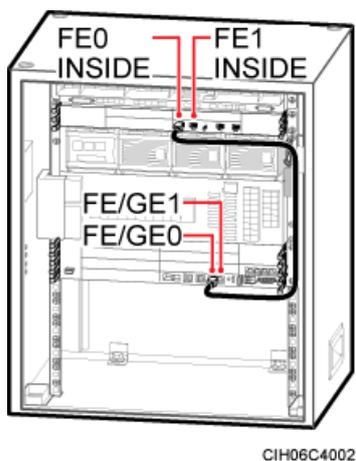
 **NOTE**

- The procedures for installing FE/GE surge protection transfer cables in an APM30H and in a TMC11H are the same. The following description is based on the procedure for installing a FE/GE surge protection transfer cable in an APM30H.

Procedure

- Step 1** Install a FE/GE surge protection transfer cable, as shown in [Figure 6-85](#).
1. Link the RJ45 connector at one end of the FE/GE surge protection transfer cable to the FE0 port on the GTMU or WMPT in the BBU.
 2. Connect the other end to the FE0 or FE1 port near the INSIDE label on the UFLP in the SLPU.

Figure 6-85 Installing a FE/GE surge protection transfer cable



Step 2 Route the cables by referring to [6.5.1 Cabling Requirements](#), and then use cable ties to bind the cables.

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

----End

Installing the FE/GE Cable

This section describes the procedure and precautions to be taken for installing an FE/GE cable.

Procedure

Step 1 Connect one end of the FE/GE cable to the FE0 or FE1 port near the OUTSIDE label on the UFLP, as shown in [Figure 6-86](#) or [Figure 6-87](#).

NOTE

- You must use shielded straight-through FE/GE cable.
- For details about how to connect the FE/GE cable, see Transmission Cable Connections.
- The descriptions about the installation positions and routes of the FE/GE cables in the -48 V DC cabinet and in the APM30H are the same. For details, see [Figure 6-86](#).

Figure 6-86 Installing the FE/GE cable (1)

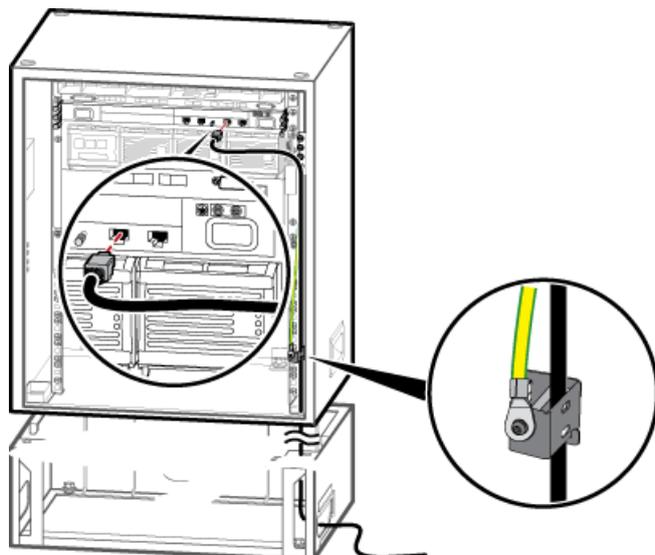
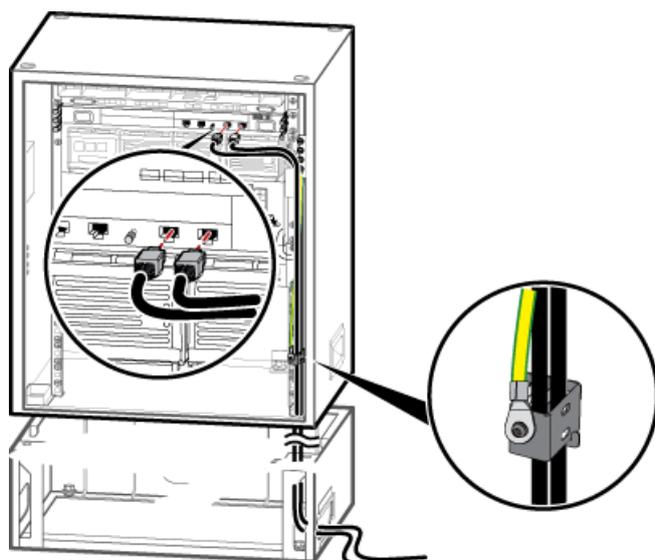


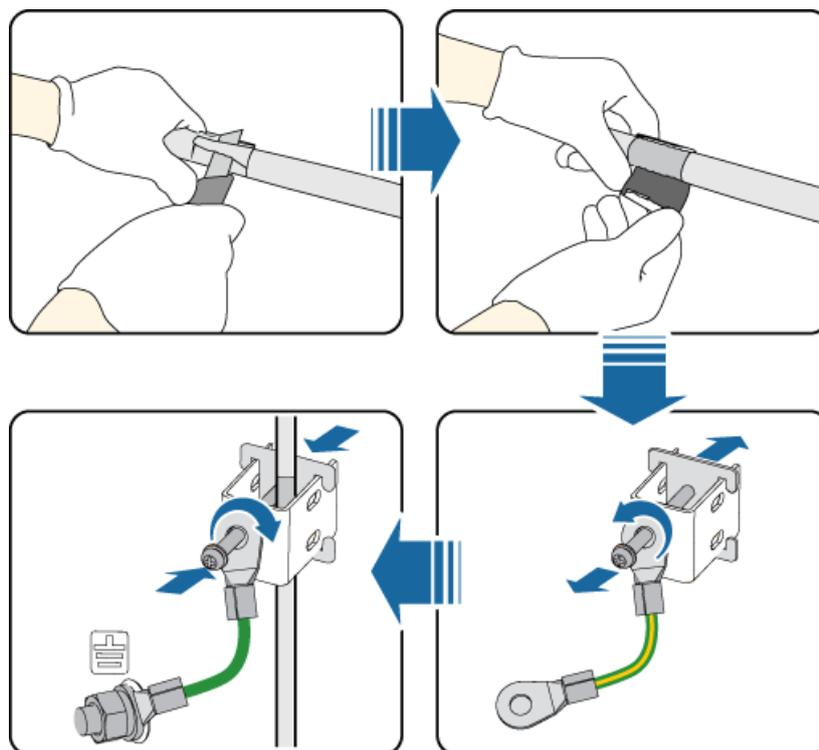
Figure 6-87 Installing the FE/GE cable (2)



Step 2 Install a ground clip for the FE/GE cable in a proper position within 1 m from the cable outlet of the cabinet, as shown in [Figure 6-88](#).

1. Determine the position for grounding the FE/GE cable, and strip the sheath off the cable for about 25 mm to expose the shield layer.
2. Loosen the screws on the ground clip, and route the FE/GE cable through the clip.
3. Make the shield layer of the FE/GE cable in full contact with the ground clip, and tighten the M4 screws on the clip until the tightening torque reaches 1.2 N·m.

Figure 6-88 Installing a grounding clip



- Step 3** Lead the other end of the FE/GE cable out of the cabinet through the cable hole at the bottom along the right of the cabinet.
- Step 4** Route the cable along the right of the cabinet by referring to [6.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.
- Step 5** Label the installed cables by referring to Attaching an L-Shaped Label.

---End

Installing a FE/GE Optical Cable

This section describes the procedure and precautions to be taken for installing a FE/GE optical cable.

Context

- The single-mode optical module is labeled "SM" and multi-mode optical module is labeled "MM".
- If the puller of an optical module is blue, the module is a single-mode optical module. If the puller of an optical module is black or grey, the module is a multi-mode optical module.
- The optical module to be installed must have a matching rate with the corresponding CPRI port.

 **CAUTION**

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

 **NOTE**

The procedures for installing FE/GE optical cables in an APM30H and in an TMC11H are the same. The following description is based on the procedure for installing a FE/GE optical cable in an APM30H.

 **NOTE**

When an LTE only base station uses FE/GE transmission, FE/GE optical cables are usually used for data transmission. The following description is based on the configuration of an LTE only base station.

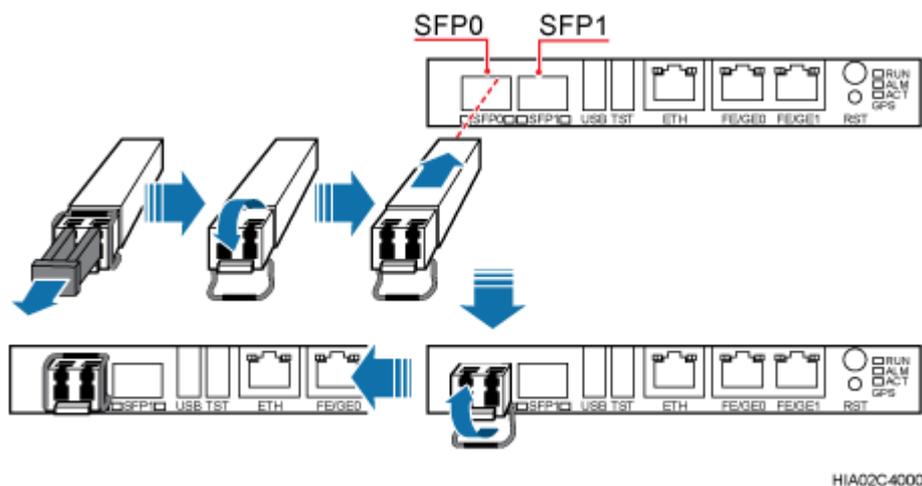
SFP0 and FE/GE0 ports on an LMPT are used for one GE input. Therefore, they cannot be used simultaneously.

SFP1 and FE/GE1 ports on an LMPT are used for another GE input. Therefore, they cannot be used simultaneously.

Procedure

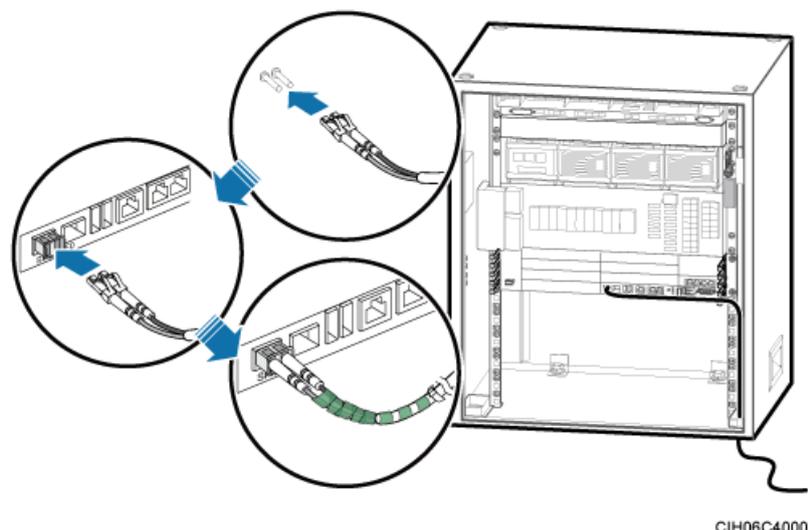
- Step 1** Turn the puller of an optical module outwards, and then insert the optical module into the SFP0 or SFP1 port on the LMPT, as shown in [Figure 6-89](#).

Figure 6-89 Installing an optical module



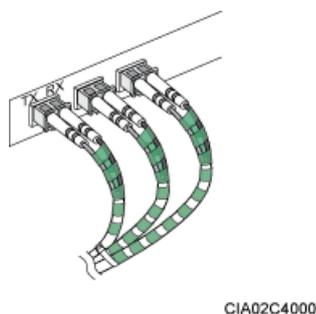
- Step 2** Insert a FE/GE optical cable into the optical module, as shown in [Figure 6-90](#).

Figure 6-90 Installing a FE/GE optical cable



- Step 3** Route the FE/GE optical cable along the cable trough on the right of the cabinet, and then use cable ties to bind the cable.
- Step 4** Route the cable by referring to [6.5.1 Cabling Requirements](#).
- Step 5** Attach labels on the optical cable. For details, see Attaching a Sign Plate Label.
- Step 6** Coil the optical fiber with winding plastic tape at the end connected to the BBU. The tape is coiled between the optical connector and the first cable tie on the cabinet, as shown in [Figure 6-91](#).

Figure 6-91 Coiling the optical fiber with winding plastic tape



----End

6.5.5 Installing Monitoring Signal Cables

When a DBS3900 is deployed outdoors with AC power supply, the BBU can be installed in an APM30H. In this case, monitoring signal cables must be installed based on actual cabinet configurations onsite, which are one APM30H, one APM30H+one IBBS200D/IBBS200T, one APM30H+two IBBS200Ds/IBBS200Ts, one APM30H+one TMC11H, one APM30H+one IBBS200D/IBBS200T+one TMC11H, and one APM30H+two IBBS200Ds/IBBS200Ts+one TMC.

Installing Monitoring Signal Cables in a Scenario of one APM30H

If a DBS3900 is configured with one APM30H, a monitoring signal cable between the CMUA and the BBU must be installed in the APM30H. If one more APM30H is configured, another

monitoring signal cable is required between the BBU in the APM30H and the CMUA in the extended APM30H.

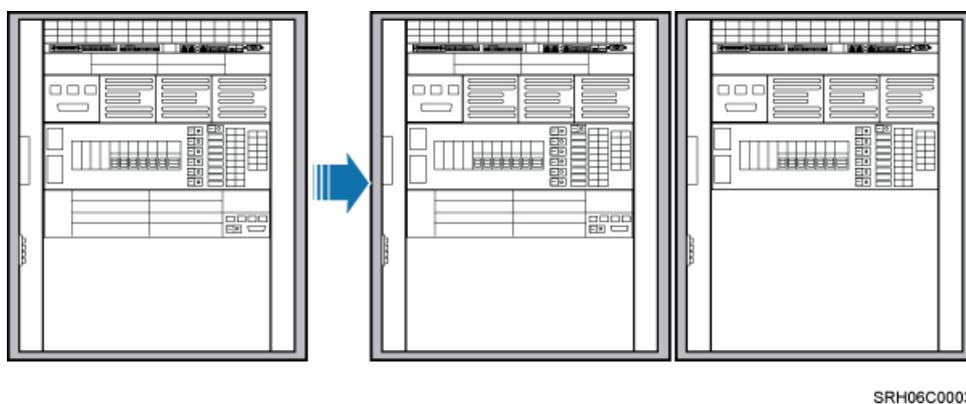
Prerequisite

- The tools, such as a Phillips screwdriver, cable cutter, and multi-purpose crimping tool, are ready.
- The PGND cable is installed.

Context

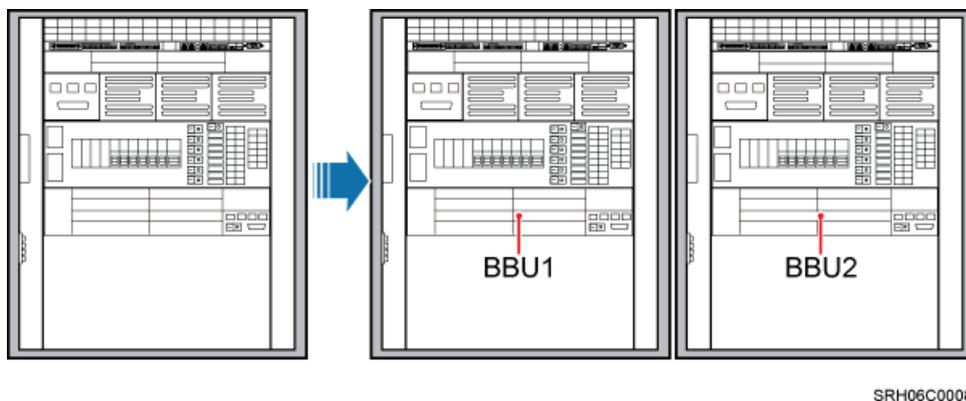
Based on the power supply requirements of RRUs, the cabinet configuration can be expanded from one APM30H to two APM30Hs, as shown in [Figure 6-92](#).

Figure 6-92 Expanding the configuration from one APM30H to two APM30Hs



In the triple mode scenario, the configuration is expanded from one APM30H to two APM30Hs based on the power supply requirements of the BBUs and RRUs. The BBU1 is installed in the APM30H, and the BBU2 is installed in the extended APM30H, and all the monitoring devices are connected to the BBU1, not BBU2, as shown in [Figure 6-93](#).

Figure 6-93 Expanding the configuration from one APM30H to two APM30Hs

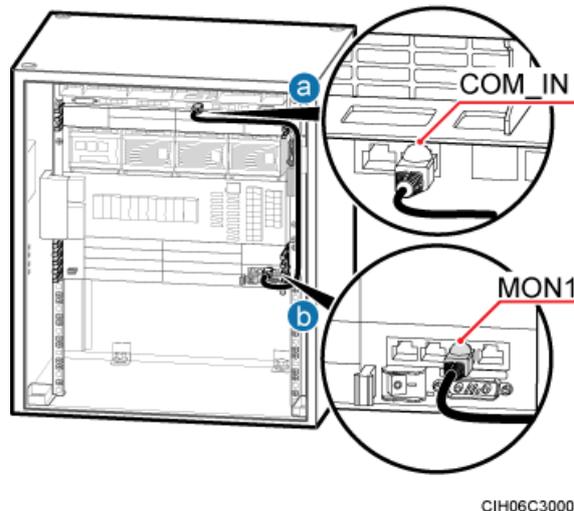


Procedure

Step 1 Install a monitoring signal cable between the CMUA and the BBU in an APM30H, as shown in [Figure 6-94](#).

1. Connect one end of the monitoring signal cable between the CMUA and the BBU to the COM_IN port on the CMUA in the APM30H.
2. Connect the other end to the MON1 port on the UPEU in the BBU.

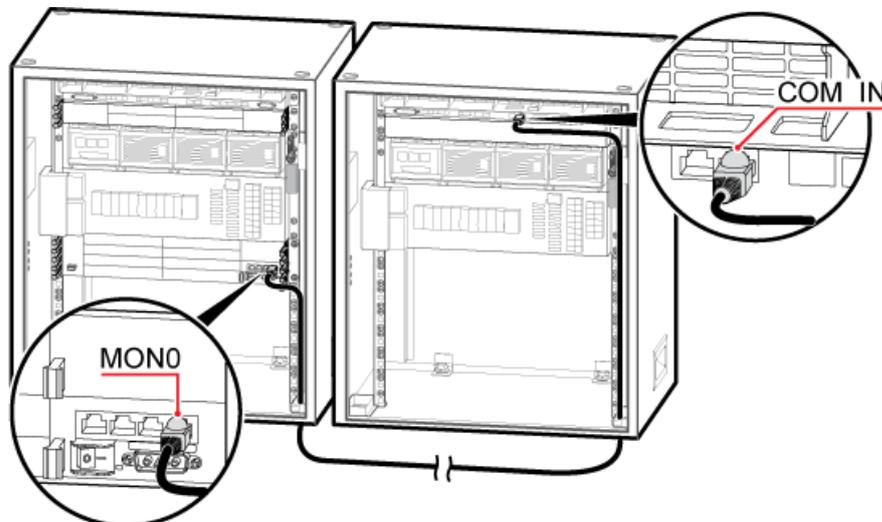
Figure 6-94 Installing a monitoring signal cable between the CMUA and the BBU in an APM30H



Step 2 If another APM30H is configured, install another monitoring signal cable between the BBU in the APM30H and the CMUA in the extended APM30H, as shown in [Figure 6-95](#).

1. Connect one end of the monitoring signal cable between the BBU in the APM30H and the CMUA in the extended APM30H to the MON0 port on the UPEU in the BBU.
2. Connect the other end to the COM_IN port on the CMUA in the extended APM30H.

Figure 6-95 Installing a monitoring signal cable between the BBU in the APM30H and the CMUA in the extended APM30H



CIH06C3001

- Step 3** Route the cable by referring to [6.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.
- Step 4** Label the installed cables. For details, see Attaching an L-Shaped Label.
- Step 5** Run each cable that leaves the cabinet in the PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

----End

Installing Monitoring Signal Cables in a Scenario of one APM30H+one IBBS200D/IBBS200T

If a DBS3900 is configured with one APM30H and one IBBS200D or IBBS200T, two monitoring signal cables are required between the CMUA and the BBU in the APM30H and between the APM30H and the IBBS200D or IBBS200T. If one more APM30H and one more IBBS200D or IBBS200T are configured, two more monitoring signal cables must be installed.

Prerequisite

- The tools, such as a Phillips screwdriver, cable cutter, and multi-purpose crimping tool, are ready.
- The PGND cable is installed.

Context

Based on the power supply requirements of customers and RRUs, the configuration can be expanded from one APM30H+one IBBS200D/IBBS200T to two APM30Hs+two IBBS200Ds/IBBS200Ts, as shown in [Figure 6-96](#).

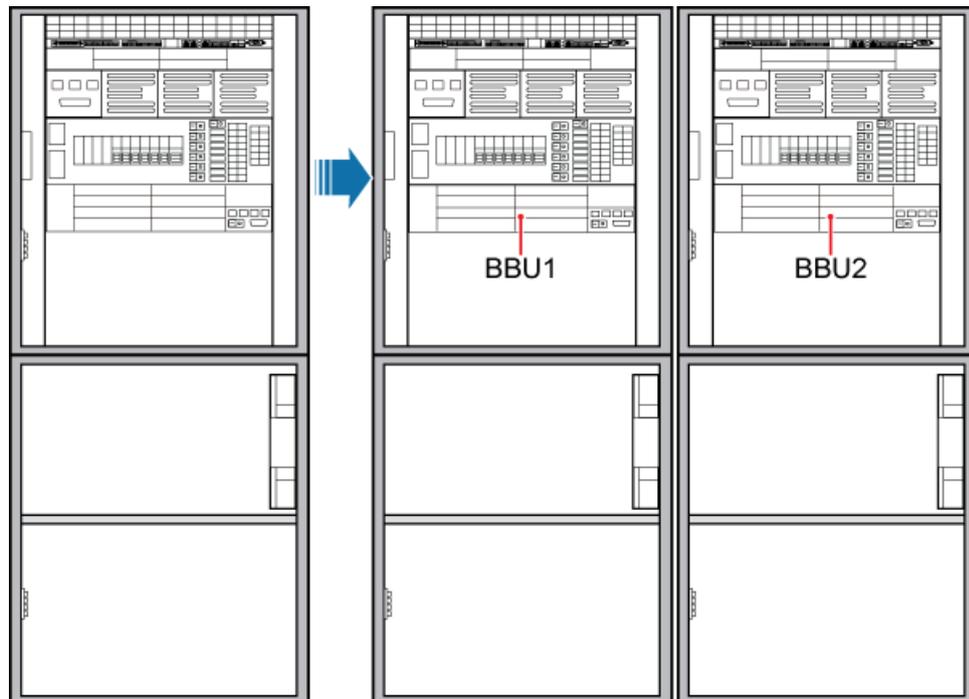
Figure 6-96 Expanding the configuration from one APM30H+one IBBS200D/IBBS200T to two APM30Hs+two IBBS200Ds/IBBS200Ts



SRH06C0004

In the triple mode scenario, the configuration is expanded from one APM30H to two APM30Hs based on the power supply requirements of the BBUs and RRUs. The BBU1 is installed in the APM30H, and the BBU2 is installed in the extended APM30H, and all the monitoring devices are connected to the BBU1, not BBU2, **Figure 6-97** shows the configuration expansion from one APM30H+one IBBS200D/IBBS200T to two APM30Hs+two IBBS200Ds/IBBS200Ts.

Figure 6-97 Expanding the configuration from one APM30H+one IBBS200D/IBBS200T to two APM30Hs+two IBBS200Ds/IBBS200Ts



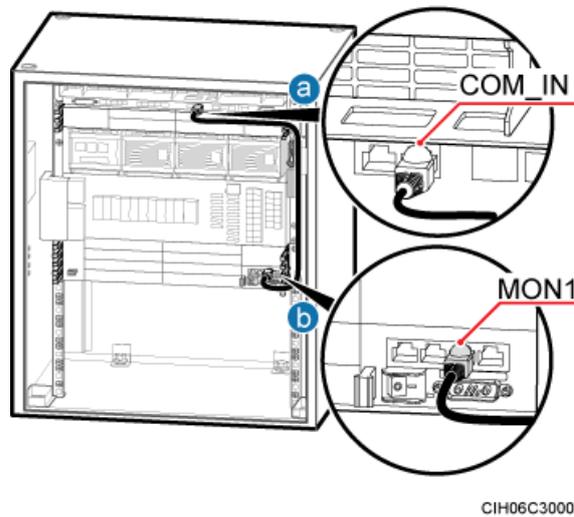
SRH06C0013

Procedure

Step 1 Install a monitoring signal cable between the CMUA and the BBU in an APM30H, as shown in [Figure 6-98](#).

1. Connect one end of the monitoring signal cable between the CMUA and the BBU to the COM_IN port on the CMUA in the APM30H.
2. Connect the other end to the MON1 port on the UPEU in the BBU.

Figure 6-98 Installing a monitoring signal cable between the CMUA and the BBU in an APM30H



- Step 2** Install a monitoring signal cable between the APM30H and the IBBS200D or IBBS200T, as shown in [Figure 6-99](#) and [Figure 6-100](#).
1. Connect one end of the monitoring signal cable between the APM30H and the IBBS200D or IBBS200T to the COM_IN port on the CMUA on the cabinet door of the IBBS200D or IBBS200T.
 2. Connect the other end to the COM_485 port on the PMU in the APM30H.

Figure 6-99 Installing a monitoring signal cable between the APM30H and the IBBS200D

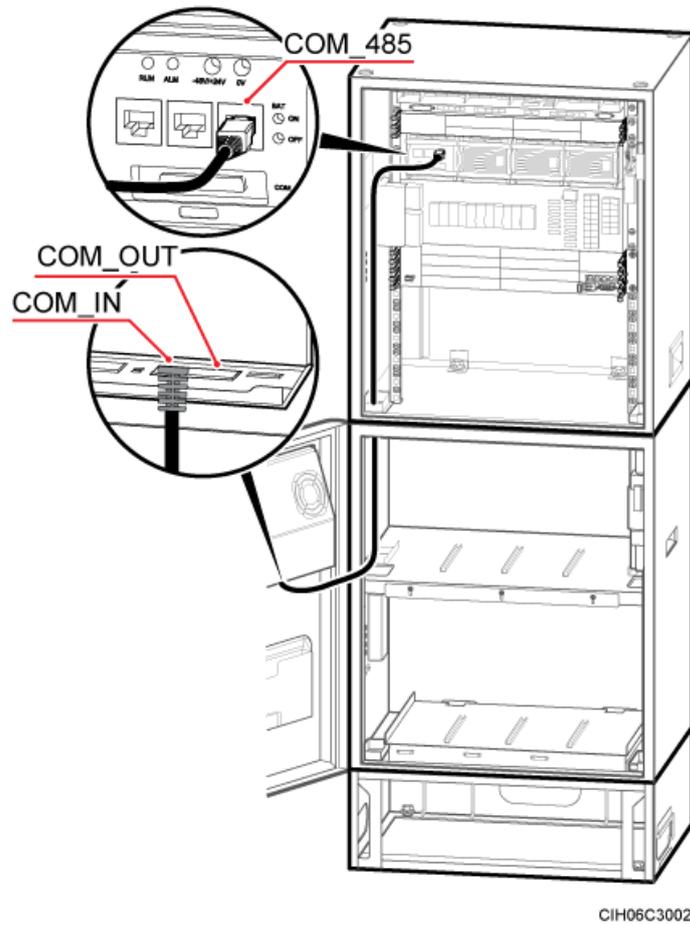
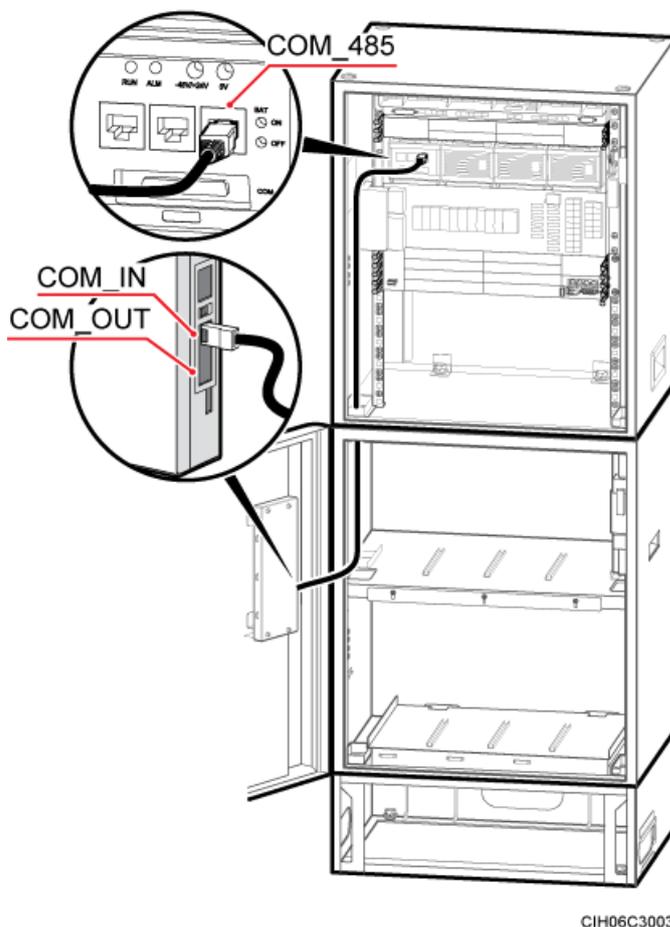


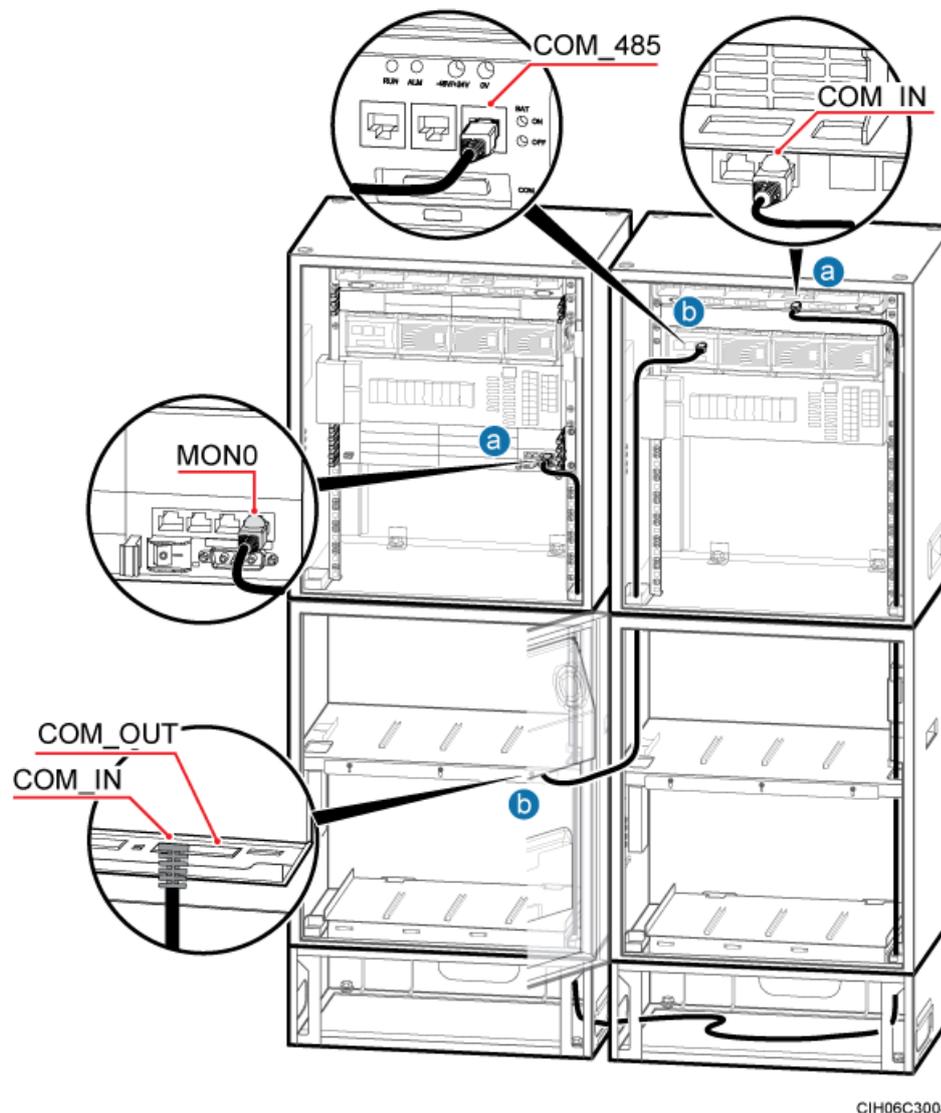
Figure 6-100 Installing a monitoring signal cable between the APM30H and the IBBS200T



Step 3 If one more APM30H and one more IBBS200D or IBBS200T are configured, install two more monitoring signal cables, as shown in [Figure 6-101](#).

1. Connect one end of a monitoring signal cable between the BBU in the APM30H and the CMUA in the extended APM30H to the MON0 port on the UPEU in the BBU, and then connect the other end to the COM_IN port on the CMUA.
2. Connect one end of a monitoring signal cable between the extended APM30H and the IBBS200D or IBBS200T under the APM30H to the COM_IN port on the CMUA on the cabinet door of the IBBS200D or IBBS200T, and then connect the other end to the COM_485 port on the PMU in the APM30H.

Figure 6-101 Installing monitoring signal cables in the scenario of two APM30Hs+two IBBS200Ds/IBBS200Ts



- Step 4** Route the cable by referring to [6.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.
- Step 5** Label the installed cables. For details, see Attaching an L-Shaped Label.
- Step 6** Run each cable that leaves the cabinet in the PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

----End

Installing Monitoring Signal Cables in a Scenario of one APM30H+two IBBS200Ds/IBBS200Ts

If a DBS3900 is configured with one APM30H and two IBBS200Ds or IBBS200Ts, monitoring signal cables between the CMUA and the BBU in an APM30H, between the APM30H and the

IBBS200D or IBBS200T under the APM30H, and between the cascaded CMUAs in the two IBBS200Ds or IBBS200Ts must be installed. If one more APM30H and two more IBBS200Ds or IBBS200Ts are configured, three more monitoring signal cables must be installed.

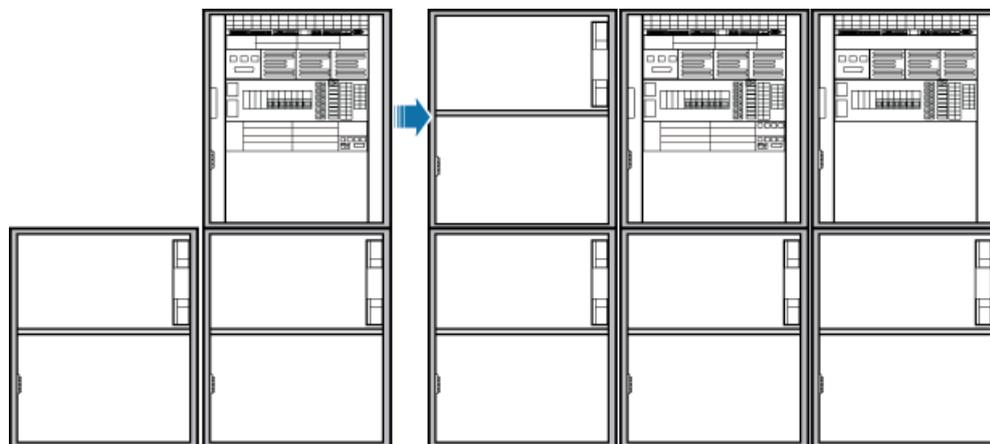
Prerequisite

- The tools, such as a Phillips screwdriver, cable cutter, and multi-purpose crimping tool, are ready.
- The PGND cable is installed.

Context

Based on the power supply requirements of customers and RRUs, the configuration can be expanded from one APM30H+two IBBS200Ds/IBBS200Ts to two APM30Hs+four IBBS200Ds/IBBS200Ts, as shown in [Figure 6-102](#).

Figure 6-102 Expanding the configuration from one APM30H+two IBBS200Ds/IBBS200Ts to two APM30Hs+four IBBS200Ds/IBBS200Ts



SRH06C0005

In the triple mode scenario, the configuration is expanded from one APM30H to two AMP30Hs based on the power supply requirements of the BBUs and RRUs. The BBU1 is installed in the APM30H, and the BBU2 is installed in the extended APM30H, and all the monitoring devices are connected to the BBU1, not BBU2, [Figure 6-103](#) shows the configuration expansion from one APM30H+two IBBS200Ds/IBBS200Ts to two APM30Hs+four IBBS200Ds/IBBS200Ts.

Figure 6-103 Expanding the configuration from one APM30H+two IBBS200Ds/IBBS200Ts to two APM30Hs+four IBBS200Ds/IBBS200Ts

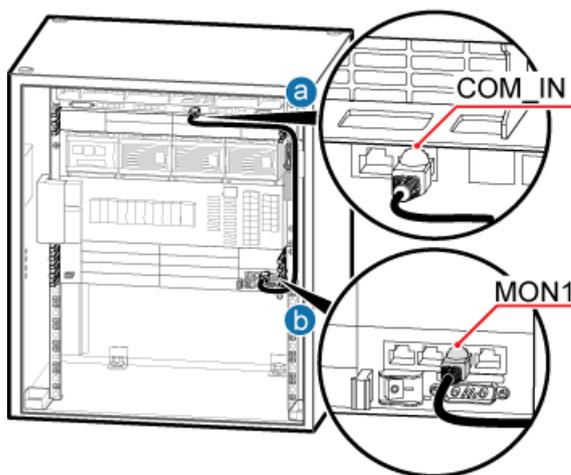


SRH06C0016

Procedure

- Step 1** Install a monitoring signal cable between the CMUA and the BBU in an APM30H, as shown in [Figure 6-104](#).
1. Connect one end of the monitoring signal cable between the CMUA and the BBU to the COM_IN port on the CMUA in the APM30H.
 2. Connect the other end to the MON1 port on the UPEU in the BBU.

Figure 6-104 Installing a monitoring signal cable between the CMUA and the BBU in an APM30H

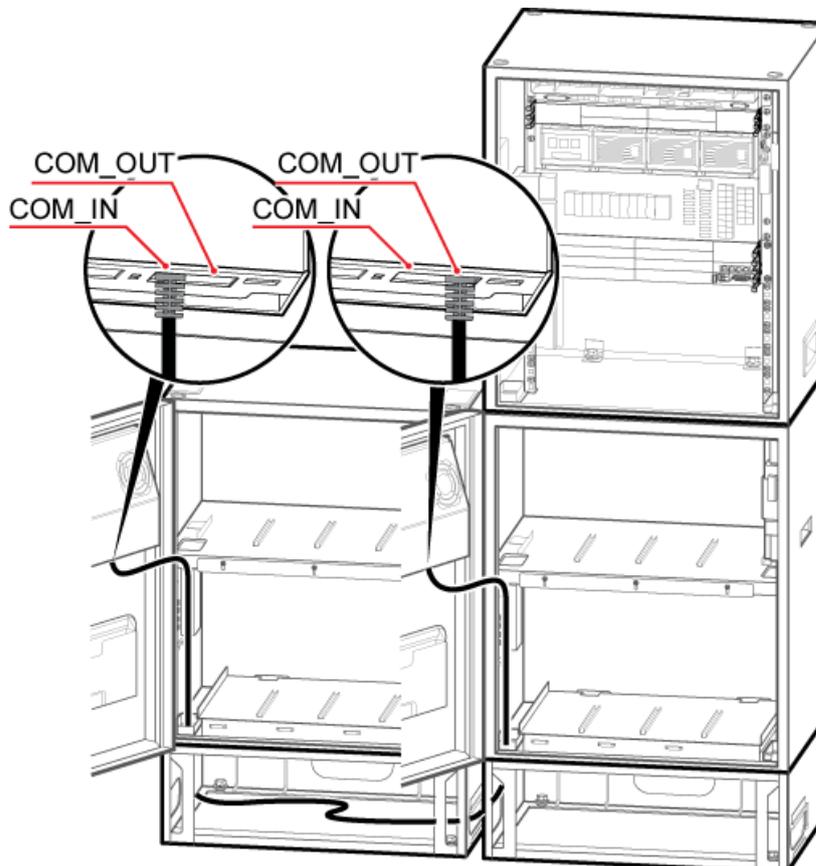


CIH06C3000

- Step 2** Install a monitoring signal cable between the cascaded CMUAs in the two IBBS200Ds or IBBS200Ts, as shown in [Figure 6-105](#).

1. Connect one end of the monitoring signal cable between the cascaded CMUAs to the COM_OUT port on the CMUA on the cabinet door of the IBBS200D or IBBS200T under the APM30H.
2. Connect the other end to the COM_IN port on the CMUA on the cabinet door of the second IBBS200D or IBBS200T.

Figure 6-105 Installing a monitoring signal cable between cascaded CMUAs



Step 3 Install a monitoring signal cable between the APM30H and the IBBS200D or IBBS200T, as shown in [Figure 6-106](#) and [Figure 6-107](#).

1. Connect one end of the monitoring signal cable between the APM30H and the IBBS200D or IBBS200T to the COM_IN port on the CMUA on the cabinet door of the IBBS200D or IBBS200T.
2. Connect the other end to the COM_485 port on the PMU in the APM30H.

Figure 6-106 Installing a monitoring signal cable between the APM30H and the IBBS200D

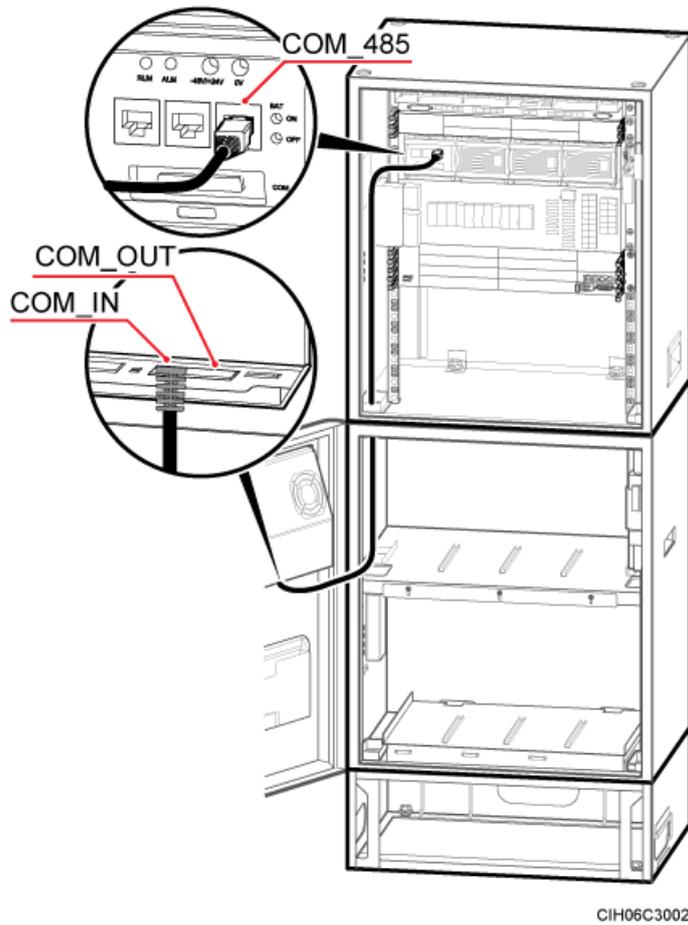
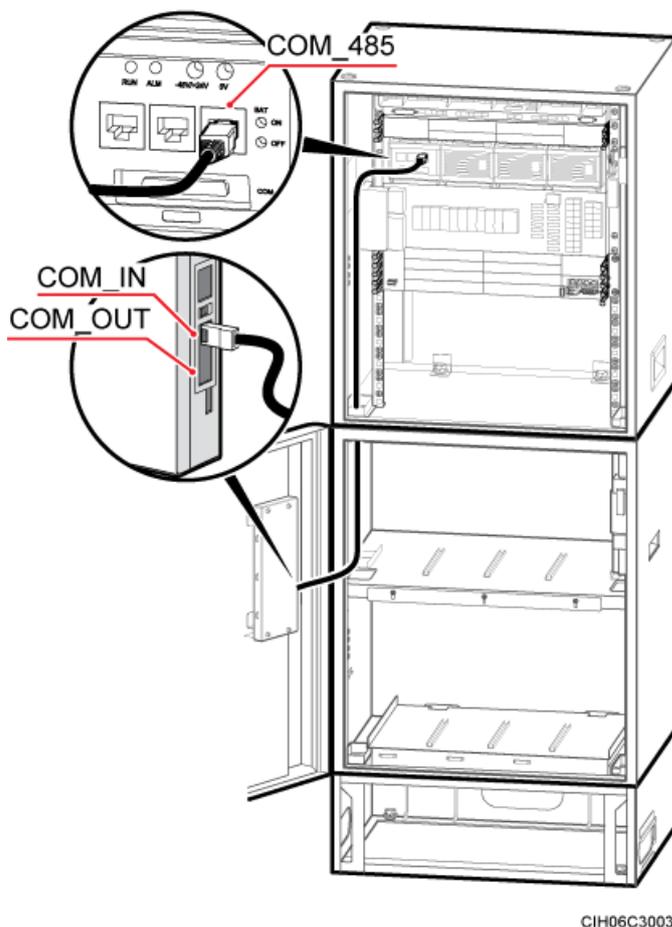


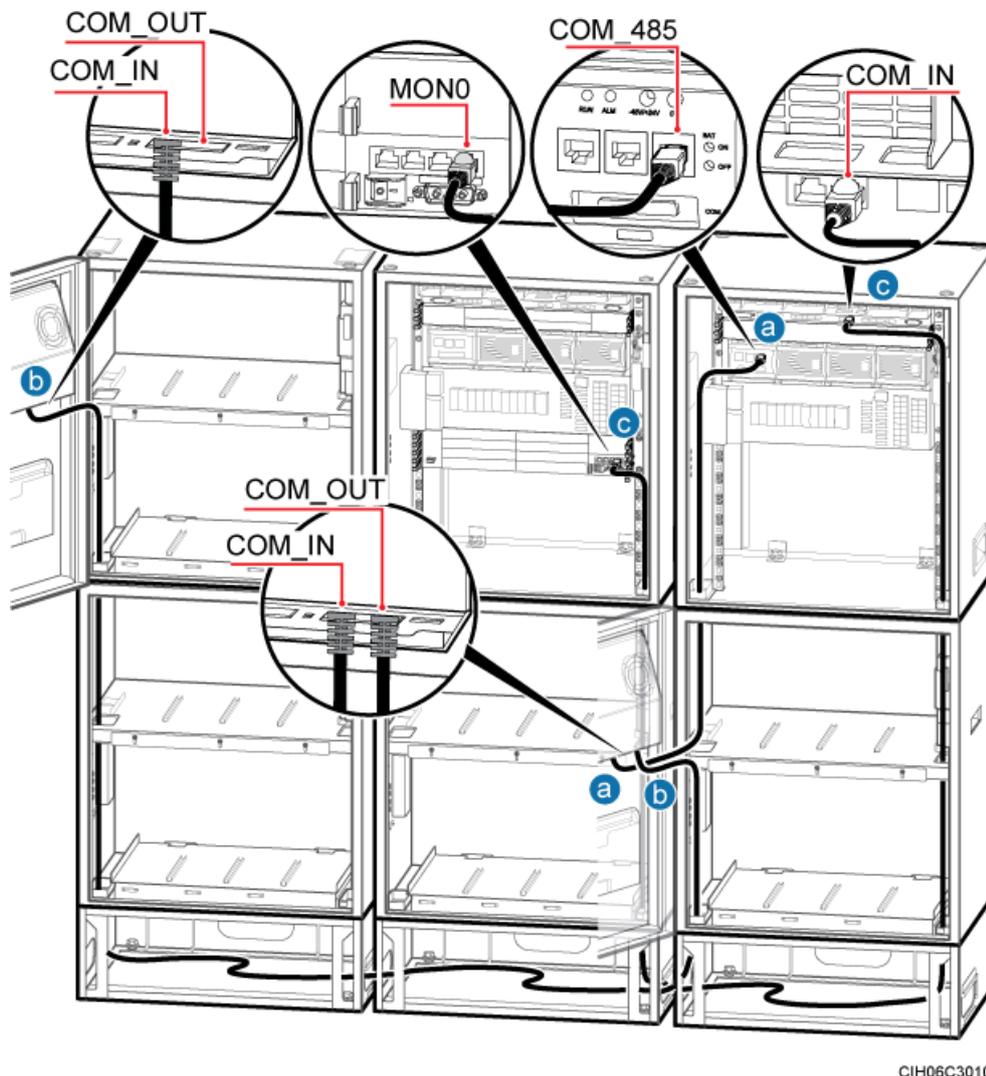
Figure 6-107 Installing a monitoring signal cable between the APM30H and the IBBS200T



Step 4 If the configuration is expanded from one APM30H+two IBBS200Ds/IBBS200Ts to two APM30Hs+four IBBS200Ds/IBBS200Ts, install three more monitoring signal cables, as shown in [Figure 6-108](#).

1. Connect one end of a monitoring signal cable between the extended APM30H and the IBBS200D or IBBS200T under the APM30H to the COM_IN port on the CMUA on the cabinet door of the IBBS200D or IBBS200T, and then connect the other end to the COM_485 port on the PMU in the APM30H.
2. Connect one end of a monitoring signal cable between the cascaded CMUAs in the two IBBS200Ds or IBBS200Ts to the COM_OUT port on the CMUA on the cabinet door of the IBBS200D or IBBS200T under the extended APM30H, and then connect the other end to the COM_IN port on the CMUA on the cabinet door of the second extended IBBS200D or IBBS200T.
3. Connect one end of a monitoring signal cable between the BBU in the APM30H and the CMUA in the extended APM30H to the MON0 port on the UPEU in the BBU, and then connect the other end to the COM_IN port on the CMUA.

Figure 6-108 Installing a monitoring signal cable in the scenario of two APM30Hs+four IBBS200Ds/IBBS200Ts



C1H06C3010

- (1) Monitoring signal cable between the APM30H and the IBBS200D/IBBS200T
 (2) Monitoring signal cable between the cascaded CMUAs
 (3) Monitoring signal cable between the CMUA and the BBU

Step 5 Route the cable by referring to [6.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 6 Label the installed cables. For details, see Attaching an L-Shaped Label.

Step 7 Run each cable that leaves the cabinet in the PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

----End

Installing Monitoring Signal Cables in a Scenario of one APM30H+one TMC11H

If a DBS3900 is configured with one APM30H and one TMC11H, monitoring signal cables between the CMUA and the BBU in the APM30H and between the BBU in the APM30H and the CMUA in the TMC11H must be installed. If one more APM30H is configured, one more monitoring signal cable is required.

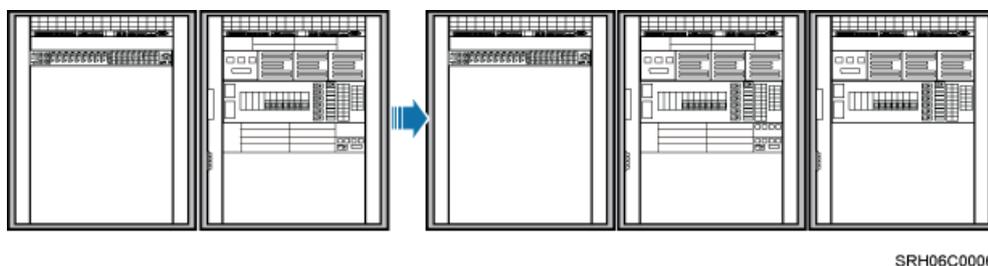
Prerequisite

- The tools, such as a Phillips screwdriver, cable cutter, and multi-purpose crimping tool, are ready.
- The PGND cable is installed.

Context

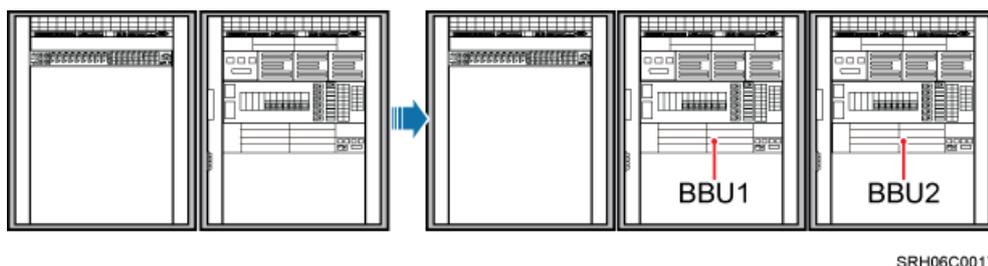
Based on the transmission space requirements of customers and power supply requirements of RRUs, the configuration can be expanded from one APM30H+one IBBS200D/IBBS200T to two APM30Hs+one TMC11H, as shown in [Figure 6-109](#).

Figure 6-109 Expanding the configuration from one APM30H+one TMC11H to two APM30Hs +one TMC11H



In the triple mode scenario, the configuration is expanded from one APM30H to two AMP30Hs based on the power supply requirements of the BBUs and RRUs. The BBU1 is installed in the APM30H, and the BBU2 is installed in the extended APM30H, and all the monitoring devices are connected to the BBU1, not BBU2, [Figure 6-110](#) shows the configuration expansion from one APM30H+one TMC11H to two APM30Hs+one TMC11H.

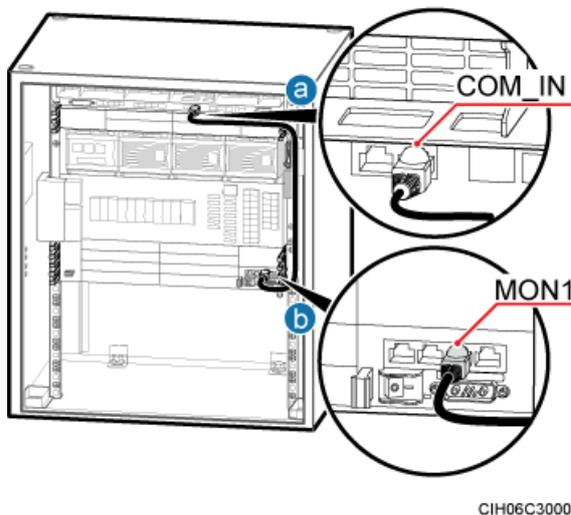
Figure 6-110 Expanding the configuration from one APM30H+one TMC11H to two APM30Hs +one TMC11H



Procedure

- Step 1** Install a monitoring signal cable between the CMUA and the BBU in an APM30H, as shown in [Figure 6-111](#).
1. Connect one end of the monitoring signal cable between the CMUA and the BBU to the COM_IN port on the CMUA in the APM30H.
 2. Connect the other end to the MON1 port on the UPEU in the BBU.

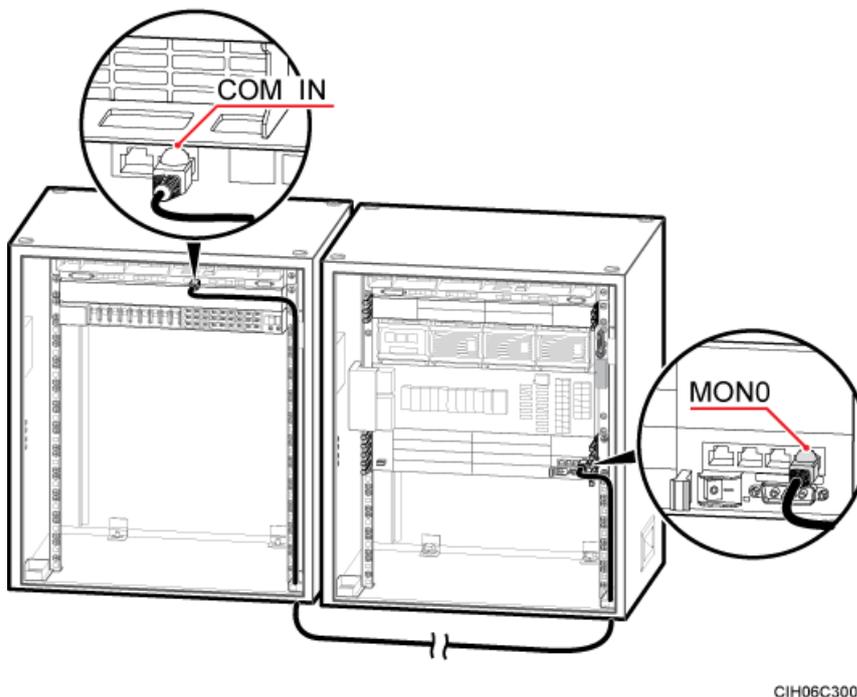
Figure 6-111 Installing a monitoring signal cable between the CMUA and the BBU in an APM30H



Step 2 Install a monitoring signal cable between the BBU in the APM30H and the CMUA in the TMC11H, as shown in **Figure 6-112**.

1. Connect one end of the monitoring signal cable between the BBU in the APM30H and the CMUA in the TMC11H to the COM_IN port on the CMUA.
2. Connect the other end to the MON0 port on the UPEU in the BBU.

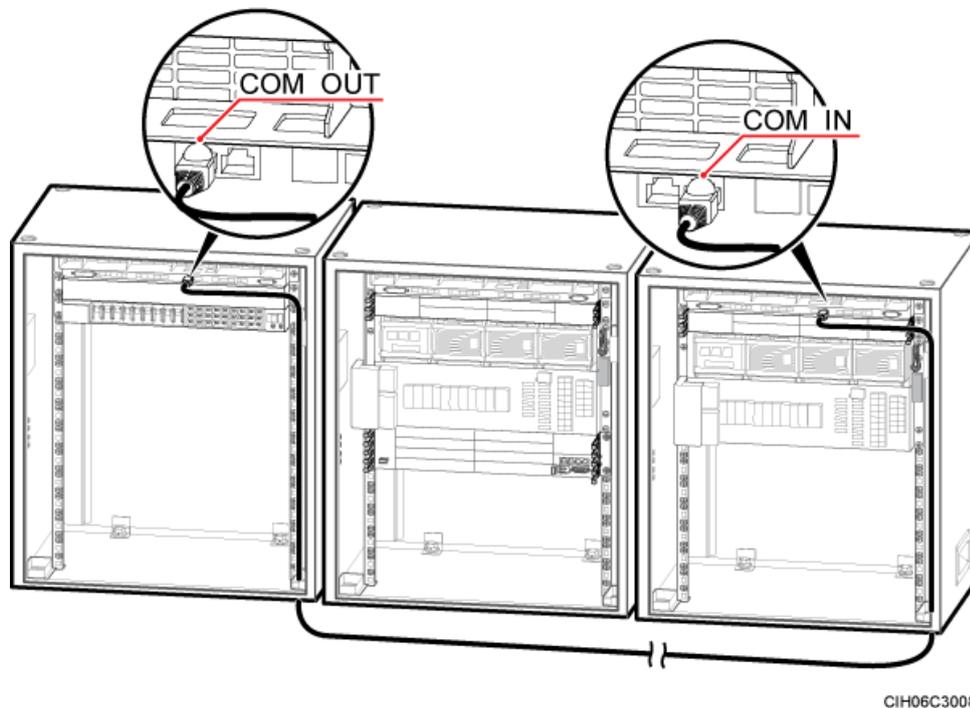
Figure 6-112 Installing a monitoring signal cable between the BBU in the APM30H and the CMUA in the TMC11H



Step 3 If one more APM30H is configured, connect one end of the monitoring signal cable between the BBU in the APM30H and the CMUA in the extended APM30H to the MON1 port on the

UPEU in the BBU, and then connect the other end to the COM_IN port on the CMUA, as shown in [Figure 6-113](#).

Figure 6-113 Installing monitoring signal cables in a scenario of two APM30Hs+one TMC11H



- Step 4** Route the cable by referring to [6.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.
- Step 5** Label the installed cables. For details, see Attaching an L-Shaped Label.
- Step 6** Run each cable that leaves the cabinet in the PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

----End

Installing Monitoring Signal Cables in a Scenario of one APM30H+one IBBS200D/IBBS200T+one TMC11H

If a DBS3900 is configured with one APM30H, one TMC11H, and one IBBS200D or IBBS200T, monitoring signal cables between the CMUA and the BBU in the APM30H, between the APM30H and the IBBS200D or IBBS200T, and between the APM30H and the TMC11H must be installed. If one more APM30H and one more IBBS200D or IBBS200T are configured, two more monitoring signal cables must be installed.

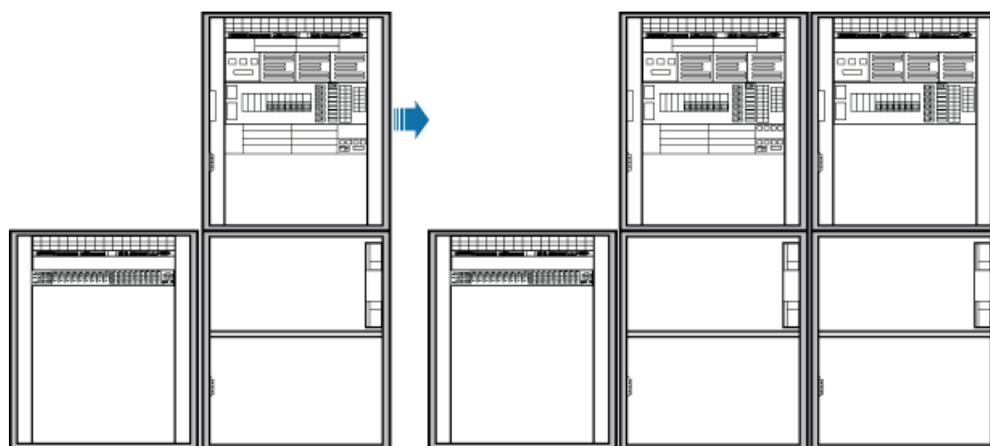
Prerequisite

- The tools, such as a Phillips screwdriver, cable cutter, and multi-purpose crimping tool, are ready.
- The PGND cable is installed.

Context

Based on the power supply requirements of customers and RRUs, the configuration can be expanded from one APM30H+one IBBS200D/IBBS200T+one TMC11H to two APM30Hs +two IBBS200Ds/IBBS200Ts+one TMC11H, as shown in **Figure 6-114**.

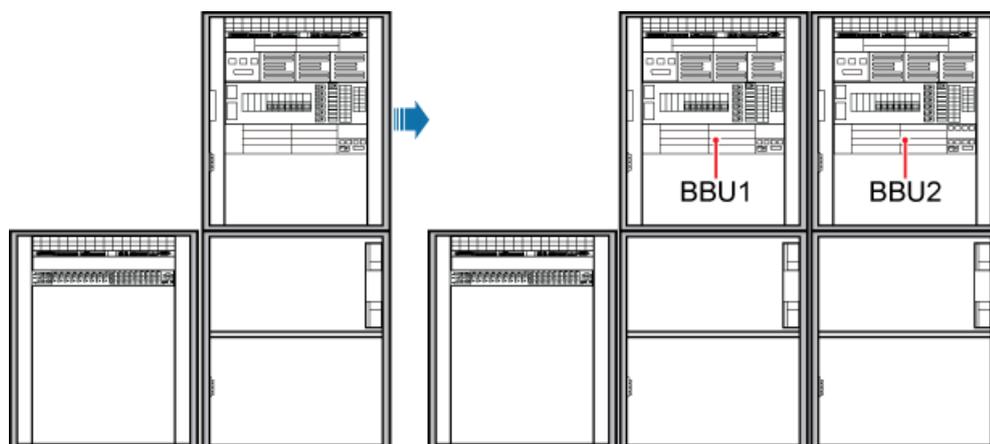
Figure 6-114 Expanding the configuration from one APM30H+one IBBS200D/IBBS200T+one TMC11H to two APM30Hs+two IBBS200Ds/IBBS200Ts+one TMC11H



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In the triple mode scenario, the configuration is expanded from one APM30H to two APM30Hs based on the power supply requirements of the BBUs and RRUs. The BBU1 is installed in the APM30H, and the BBU2 is installed in the extended APM30H, and all the monitoring devices are connected to the BBU1, not BBU2, **Figure 6-115** shows the configuration expansion from one APM30H+one IBBS200D/IBBS200T+one TMC11H to two APM30Hs+two IBBS200Ds/IBBS200Ts+one TMC11H.

Figure 6-115 Expanding the configuration from one APM30H+one IBBS200D/IBBS200T+one TMC11H to two APM30Hs+two IBBS200Ds/IBBS200Ts+one TMC11H



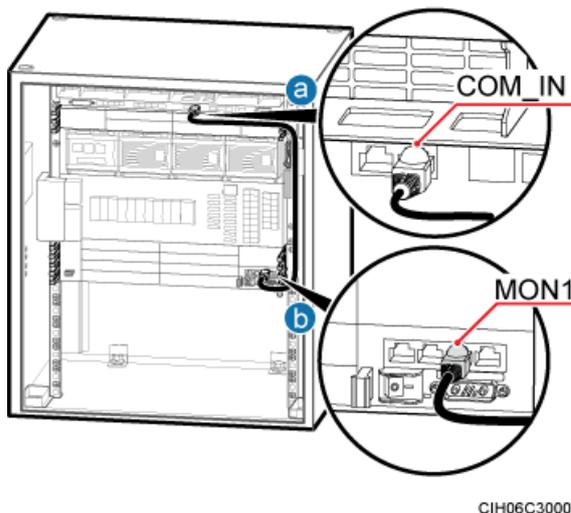
SRH06C0014

Procedure

Step 1 Install a monitoring signal cable between the CMUA and the BBU in an APM30H, as shown in [Figure 6-116](#).

1. Connect one end of the monitoring signal cable between the CMUA and the BBU to the COM_IN port on the CMUA in the APM30H.
2. Connect the other end to the MON1 port on the UPEU in the BBU.

Figure 6-116 Installing a monitoring signal cable between the CMUA and the BBU in an APM30H



CIH06C3000

Step 2 Install a monitoring signal cable between the APM30H and the IBBS200D or IBBS200T, as shown in [Figure 6-117](#) and [Figure 6-118](#).

1. Connect one end of the monitoring signal cable between the APM30H and the IBBS200D or IBBS200T to the COM_IN port on the CMUA on the cabinet door of the IBBS200D or IBBS200T.
2. Connect the other end to the COM_485 port on the PMU in the APM30H.

Figure 6-117 Installing a monitoring signal cable between the APM30H and the IBBS200D

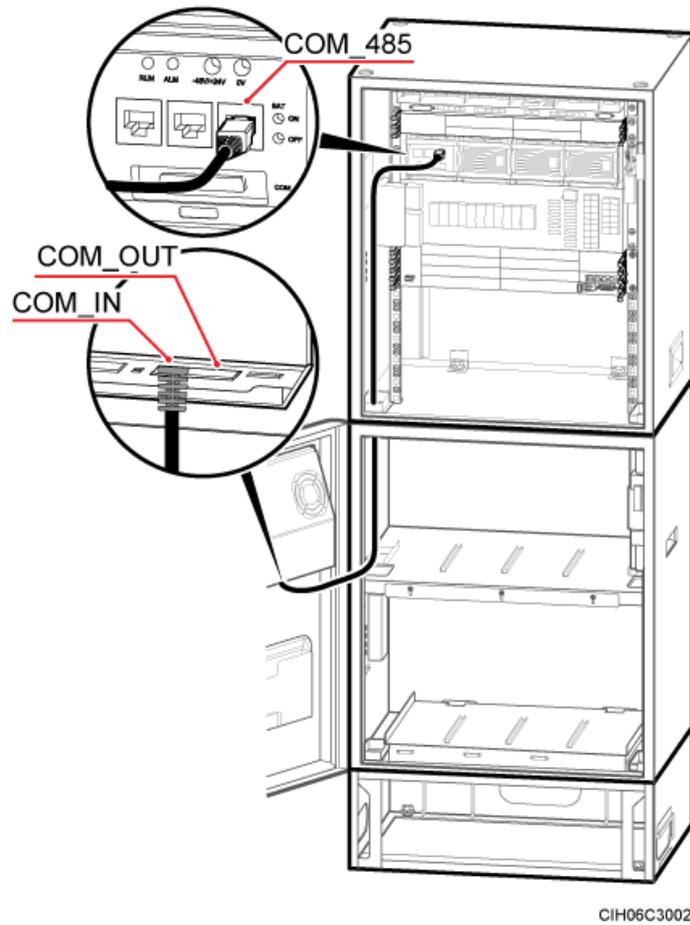
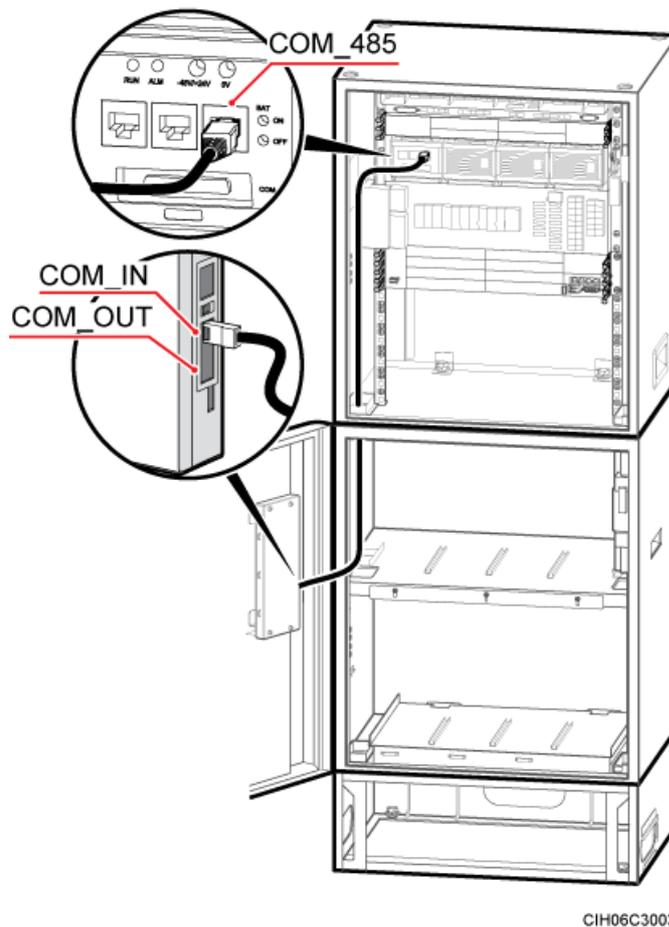


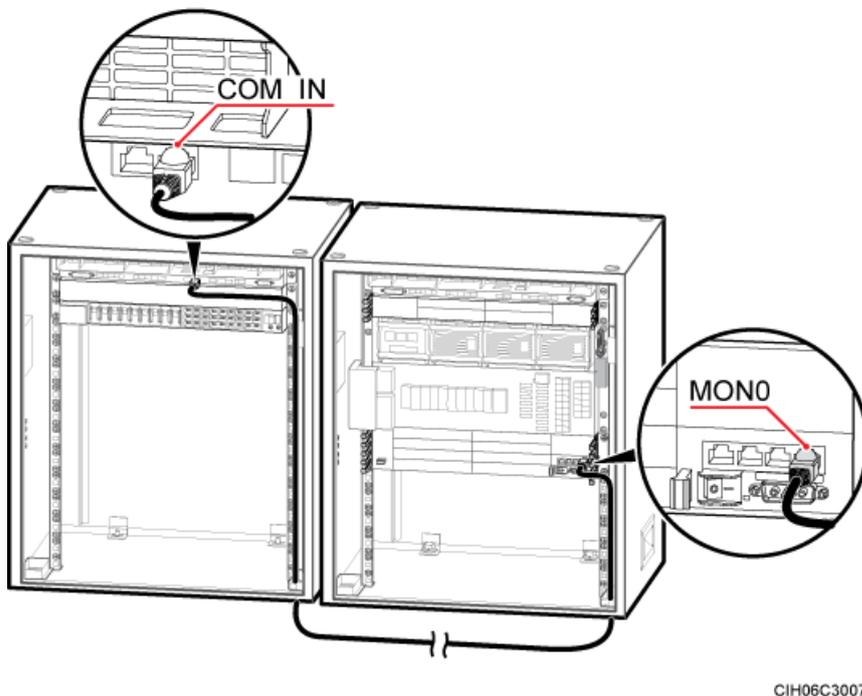
Figure 6-118 Installing a monitoring signal cable between the APM30H and the IBBS200T



Step 3 Install a monitoring signal cable between the BBU in the APM30H and the CMUA in the TMC11H, as shown in [Figure 6-119](#).

1. Connect one end of the monitoring signal cable between the BBU in the APM30H and the CMUA in the TMC11H to the COM_IN port on the CMUA.
2. Connect the other end to the MON0 port on the UPEU in the BBU.

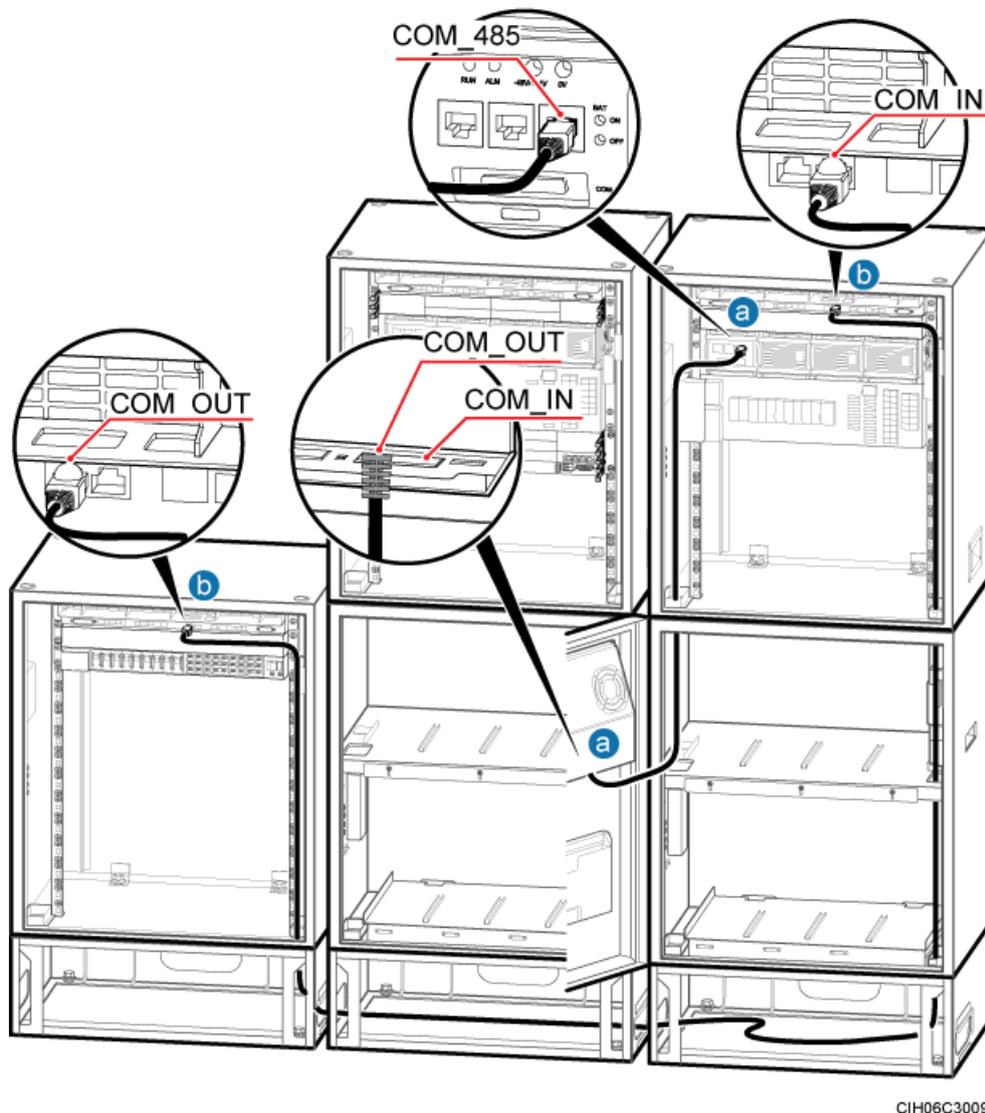
Figure 6-119 Installing a monitoring signal cable between the BBU in the APM30H and the CMUA in the TMC11H



Step 4 If the configuration is expanded from one APM30H+one IBBS200D/IBBS200T+one TMC11H to two APM30Hs+two IBBS200Ds/IBBS200Ts+one TMC11H, install two more monitoring signal cables, as shown in [Figure 6-120](#).

1. Connect one end of a monitoring signal cable between the extended APM30H and the IBBS200D or IBBS200T under the APM30H to the COM_IN port on the CMUA on the cabinet door of the IBBS200D or IBBS200T, and then connect the other end to the COM_485 port on the PMU in the APM30H.
2. Connect one end of a monitoring signal cable between the APM30H and the extended APM30H to the COM_OUT port on the CMUA in the TMC11H, and then connect the other end to the COM_IN port on the CMUA in the extended APM30H.

Figure 6-120 Installing monitoring signal cables in a scenario of two APM30Hs+two IBBS200Ds/IBBS200Ts+one TMC11H



- Step 5** Route the cable by referring to [6.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.
- Step 6** Label the installed cables. For details, see Attaching an L-Shaped Label.
- Step 7** Run each cable that leaves the cabinet in the PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

----End

Installing Monitoring Signal Cables in a Scenario of one APM30H+two IBBS200Ds/IBBS200Ts+one TMC

If a DBS3900 is configured with one APM30H, one TMC, and two IBBS200Ds or IBBS200Ts, monitoring signal cables between the CMUA and the BBU in the APM30H, between the APM30H and the IBBS200D or IBBS200T under the APM30H, between the cascaded CMUAs in the two IBBS200Ds or IBBS200Ts, and between the BBU in the APM30H and the CMUA

in the TMC11H must be installed. If one more APM30H and two more IBBS200Ds or IBBS200Ts are configured, four more monitoring signal cables are required.

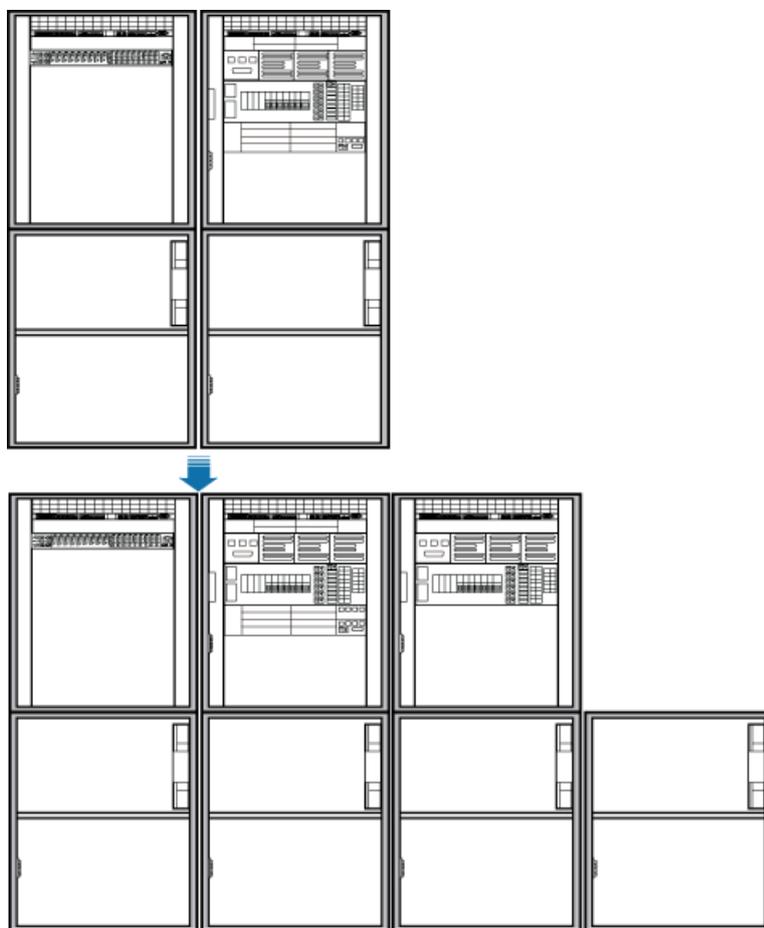
Prerequisite

- The tools, such as a Phillips screwdriver, cable cutter, and multi-purpose crimping tool, are ready.
- The PGND cable is installed.

Context

Based on the power supply requirements of customers and RRUs, the configuration can be expanded from one APM30H+two IBBS200Ds/IBBS200Ts+one TMC to two APM30Hs+four IBBS200Ds/IBBS200Ts+one TMC, as shown in **Figure 6-121**.

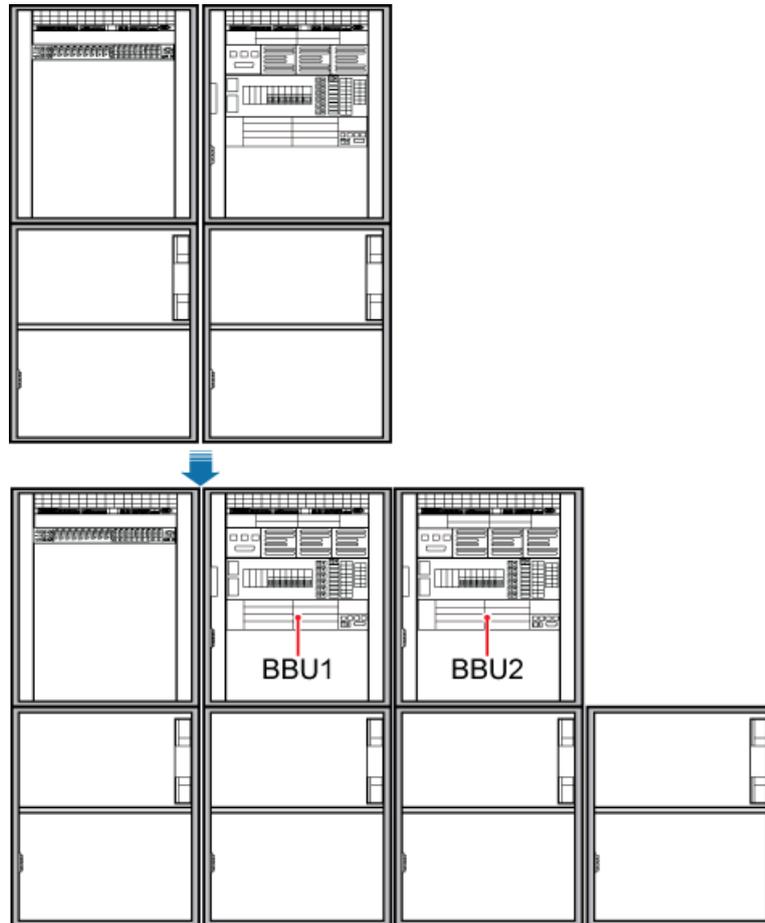
Figure 6-121 Expanding the configuration from one APM30H+two IBBS200Ds/IBBS200Ts+one TMC to two APM30Hs+four IBBS200Ds/IBBS200Ts+one TMC



SRH06C0001

In the triple mode scenario, the configuration is expanded from one APM30H to two APM30Hs based on the power supply requirements of the BBUs and RRUs. The BBU1 is installed in the APM30H, and the BBU2 is installed in the extended APM30H, and all the monitoring devices are connected to the BBU1, not BBU2, **Figure 6-122** shows the configuration expansion from one APM30H+two IBBS200Ds/IBBS200Ts+one TMC to two APM30Hs+four IBBS200Ds/IBBS200Ts+one TMC.

Figure 6-122 Expanding the configuration from one APM30H+two IBBS200Ds/IBBS200Ts+one TMC to two APM30Hs+four IBBS200Ds/IBBS200Ts+one TMC



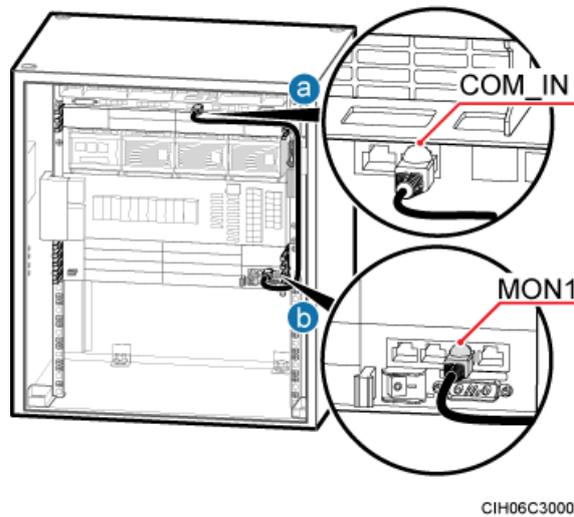
SRH06C0018

Procedure

Step 1 Install a monitoring signal cable between the CMUA and the BBU in an APM30H, as shown in [Figure 6-123](#).

1. Connect one end of the monitoring signal cable between the CMUA and the BBU to the COM_IN port on the CMUA in the APM30H.
2. Connect the other end to the MON1 port on the UPEU in the BBU.

Figure 6-123 Installing a monitoring signal cable between the CMUA and the BBU in an APM30H



- Step 2** Install a monitoring signal cable between the APM30H and the IBBS200D or IBBS200T, as shown in [Figure 6-124](#) and [Figure 6-125](#).
1. Connect one end of the monitoring signal cable between the APM30H and the IBBS200D or IBBS200T to the COM_IN port on the CMUA on the cabinet door of the IBBS200D or IBBS200T.
 2. Connect the other end to the COM_485 port on the PMU in the APM30H.

Figure 6-124 Installing a monitoring signal cable between the APM30H and the IBBS200D

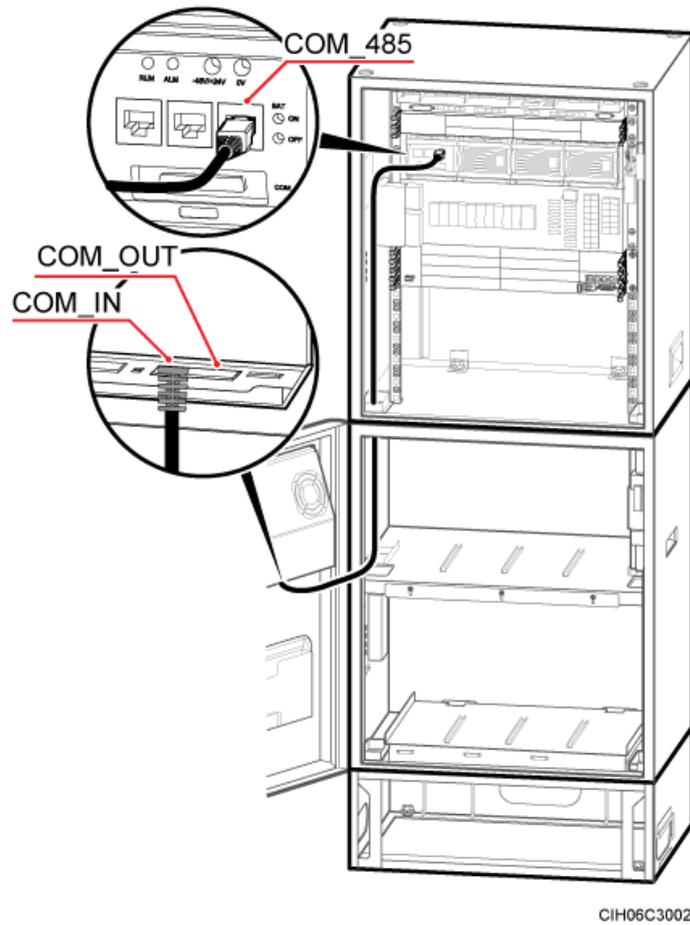
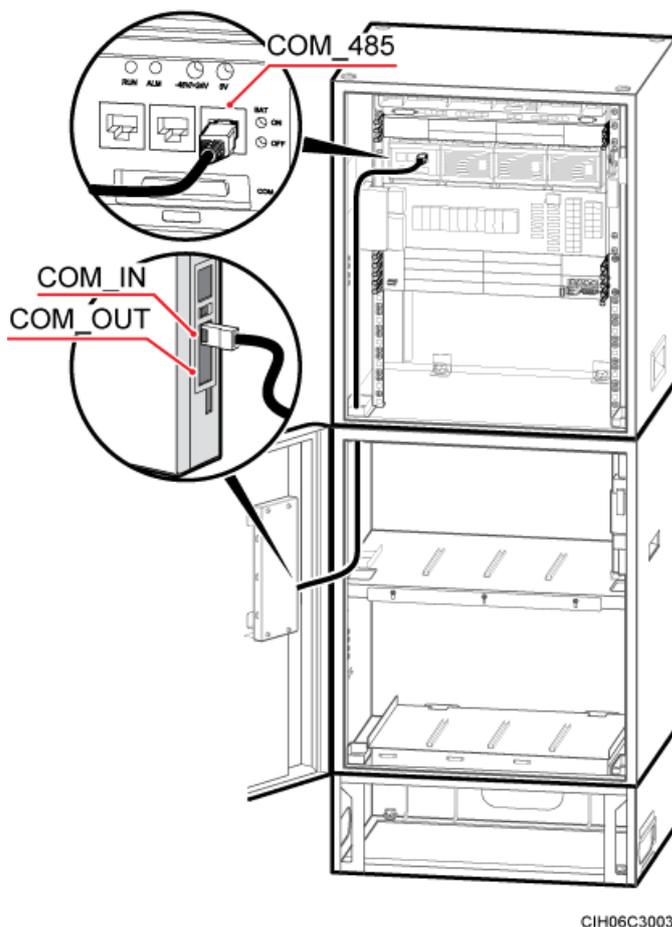
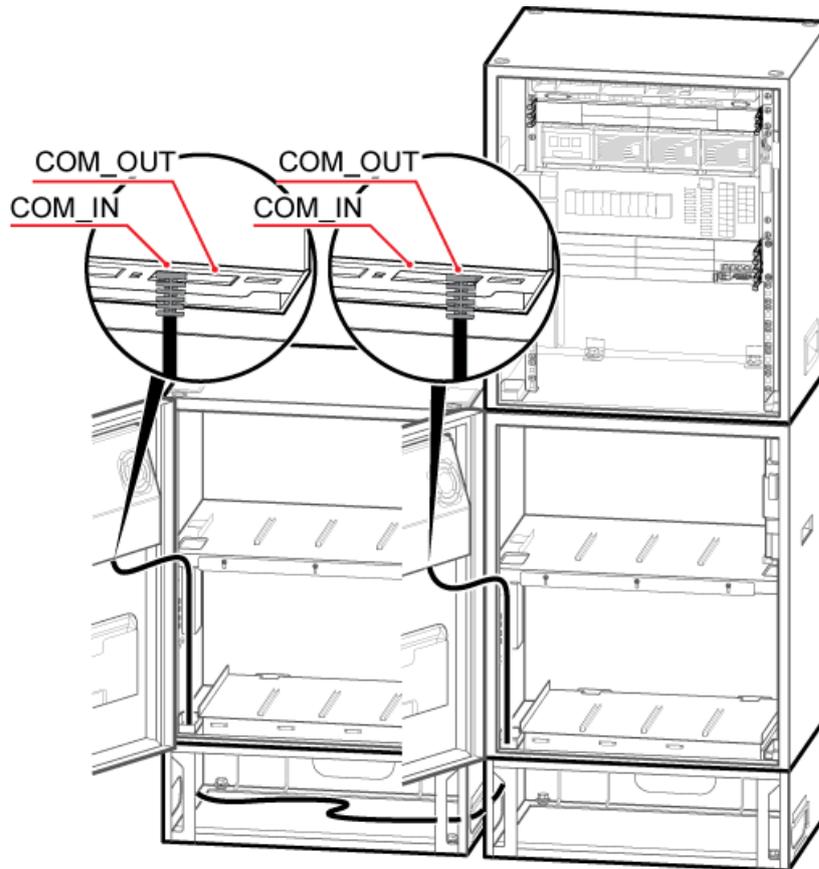


Figure 6-125 Installing a monitoring signal cable between the APM30H and the IBBS200T



- Step 3** Install a monitoring signal cable between the cascaded CMUAs in the two IBBS200Ds or IBBS200Ts, as shown in [Figure 6-126](#).
1. Connect one end of the monitoring signal cable between the cascaded CMUAs to the COM_OUT port on the CMUA on the cabinet door of the IBBS200D or IBBS200T under the APM30H.
 2. Connect the other end to the COM_IN port on the CMUA on the cabinet door of the second IBBS200D or IBBS200T.

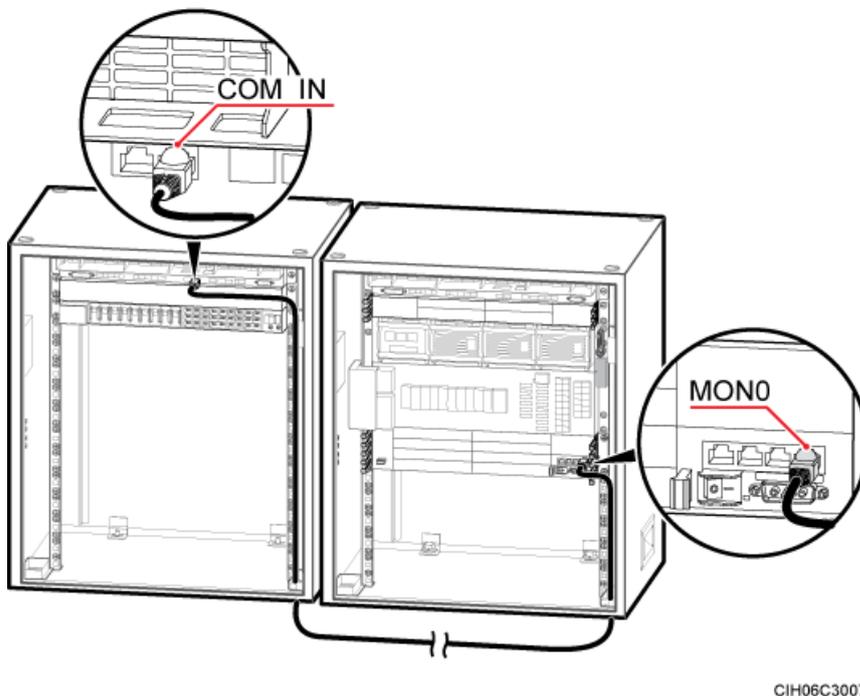
Figure 6-126 Installing a monitoring signal cable between cascaded CMUAs



Step 4 Install a monitoring signal cable between the BBU in the APM30H and the CMUA in the TMC11H, as shown in [Figure 6-127](#).

1. Connect one end of the monitoring signal cable between the BBU in the APM30H and the CMUA in the TMC11H to the COM_IN port on the CMUA.
2. Connect the other end to the MON0 port on the UPEU in the BBU.

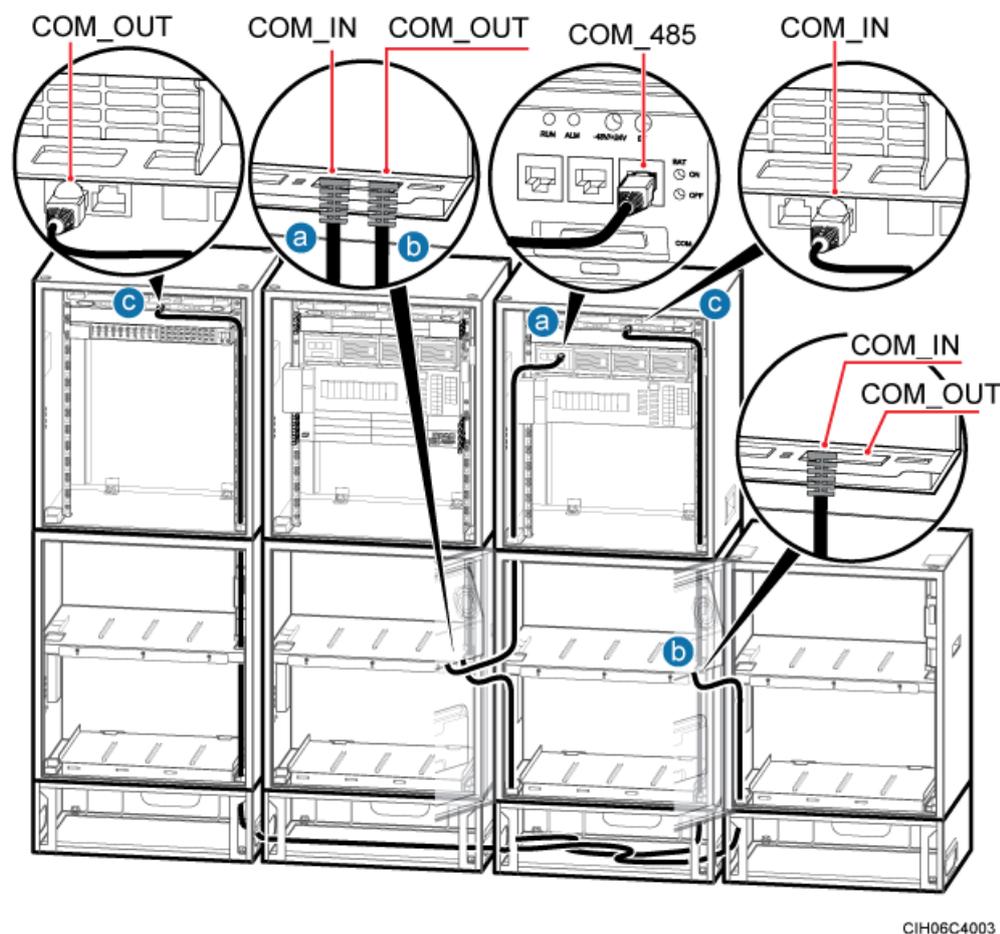
Figure 6-127 Installing a monitoring signal cable between the BBU in the APM30H and the CMUA in the TMC11H



Step 5 If the configuration is expanded from one APM30H+two IBBS200Ds/IBBS200Ts+one TMC to two APM30Hs+four IBBS200Ds/IBBS200Ts+one TMC, install three more monitoring signal cables, as shown in [Figure 6-128](#).

1. Connect one end of a monitoring signal cable between the extended APM30H and the IBBS200D or IBBS200T under the APM30H to the COM_IN port on the CMUA on the cabinet door of the IBBS200D or IBBS200T, and then connect the other end to the COM_485 port on the PMU in the APM30H.
2. Connect one end of a monitoring signal cable between the cascaded CMUAs in the two IBBS200Ds or IBBS200Ts to the COM_OUT port on the CMUA on the cabinet door of the IBBS200D or IBBS200T under the extended APM30H, and then connect the other end to the COM_IN port on the CMUA on the cabinet door of the second extended IBBS200D or IBBS200T.
3. Connect one end of a monitoring signal cable between the APM30H and the extended APM30H to the COM_OUT port on the CMUA in the TMC11H, and then connect the other end to the COM_IN port on the CMUA in the extended APM30H.

Figure 6-128 Installing monitoring signal cables in a scenario of two APM30Hs+four IBBS200D/IBBS200T+one TMC



- Step 6** Route the cable by referring to [6.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.
- Step 7** Label the installed cables. For details, see Attaching an L-Shaped Label.
- Step 8** Run each cable that leaves the cabinet in the PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

----End

6.5.6 Installing a CPRI Optical Cable

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

Context

- The single-mode optical module is labeled "SM" and multi-mode optical module is labeled "MM".
- If the puller of an optical module is blue, the module is a single-mode optical module. If the puller of an optical module is black or grey, the module is a multi-mode optical module.
- The optical module to be installed must have a matching rate with the corresponding CPRI port.

 **CAUTION**

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

Procedure

Step 1 Install an optical module, as shown in [Figure 6-129](#).

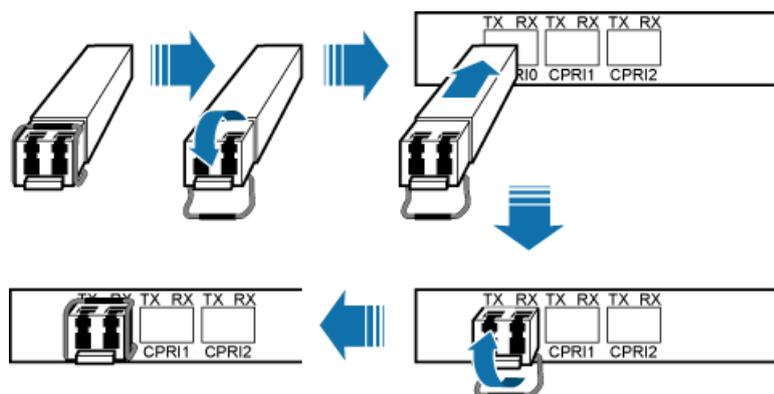
1. Turn the puller on the optical module outwards.
2. Insert the optical module into the CPRI port on the GTMU, WBBPb, WBBPd, or LBBP, and then insert the optical module of the same type⁽¹⁾ into the CPRI_W or CPRI0 port on an RRU.

 **NOTE**

(1) The optical modules with the same label are of the same type.

3. Turn the puller on the optical module inwards.

Figure 6-129 Installing an optical module



Step 2 Install a CPRI optical cable, as shown in [Figure 6-130](#).

 **NOTE**

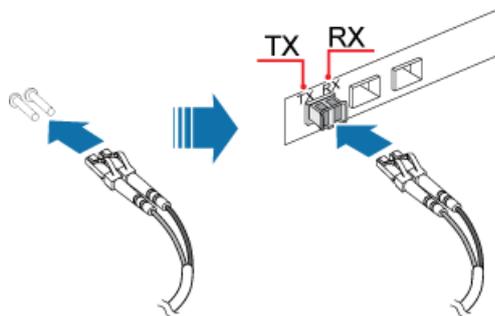
For details about the connections of the CPRI optical cables, see the *BBU3900 Hardware Description* CPRI Cable Connections.

1. Remove the dustproof caps from the connectors of the optical cable.
2. Insert the DLC connectors labeled 2A and 2B at one end of the CPRI optical cable into the optical module on the GTMU, WBBPb, WBBPd, or LBBP, and then insert the DLC connectors labeled 1A and 1B at the other end into the optical module on the RRU.

 **CAUTION**

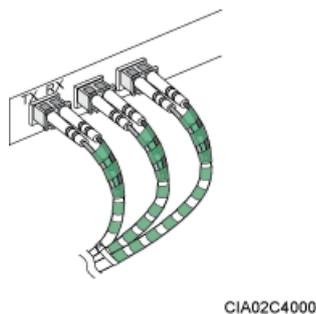
If both ends of the optical cable are the LC connectors, the TX and RX ports on the BBU are respectively connected to the TX and RX ports on the RRU.

Figure 6-130 Installing a CPRI optical cable



- Step 3** Route the CPRI optical cable along the left of the cabinet, and then lead it out of the cabinet from the cable hole on the left of the bottom. For details, see [6.5.1 Cabling Requirements](#).
- Step 4** Attach labels on the optical cable. For details, see Attaching a Sign Plate Label.
- Step 5** Coil the optical fiber with winding plastic tape at the end connected to the BBU. The tape is coiled between the optical connector and the first cable tie on the cabinet, as shown in [Figure 6-131](#).

Figure 6-131 Coiling the optical fiber with winding plastic tape



---End

6.6 Installing the Batteries and Related Cables

This section describes the procedure and precautions for installing the batteries and related cables.

Prerequisite



Before installing the batteries, ensure that the battery MCBs on the EPS in the APM30H and in the power distribution box in the battery cabinet are set to OFF to prevent high current.

Procedure

- Step 1** Install the batteries from bottom to top and from left to right, as shown in [Figure 6-132](#).

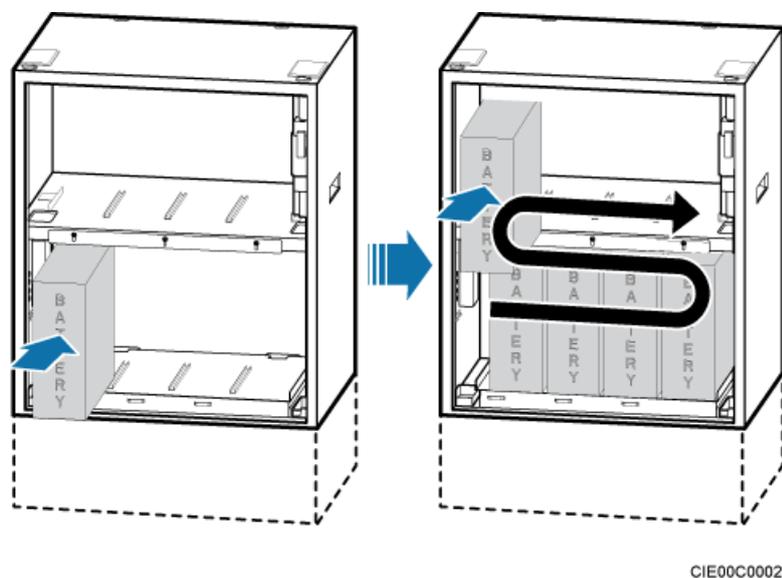
 **NOTE**

The battery cell should be installed along the guide rails so that certain spacing is reserved between battery cells.

 **DANGER**

During the installation of the batteries, use insulated tools such as wrenches and screwdrivers, and do not reversely connect the positive and negative poles. Otherwise, the batteries may be burnt, and the installers may be injured.

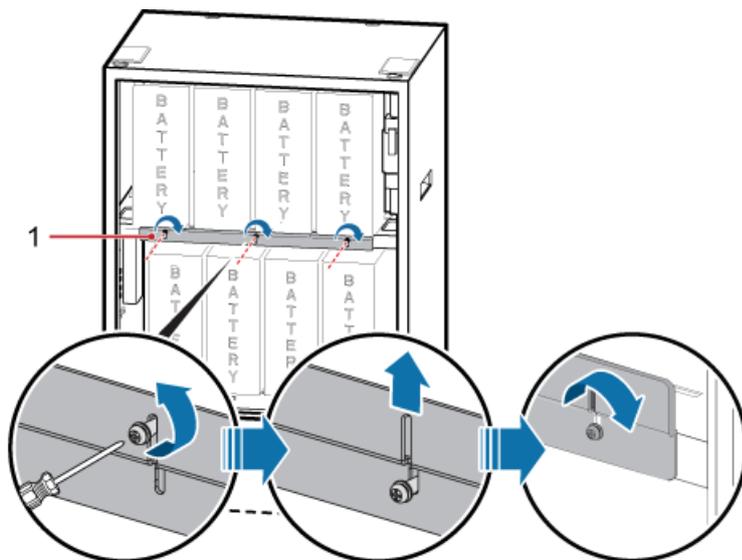
Figure 6-132 Installing the batteries



CIE00C0002

Step 2 Securing the baffle plate, as shown in [Figure 6-133](#).

Figure 6-133 Securing the baffle plate



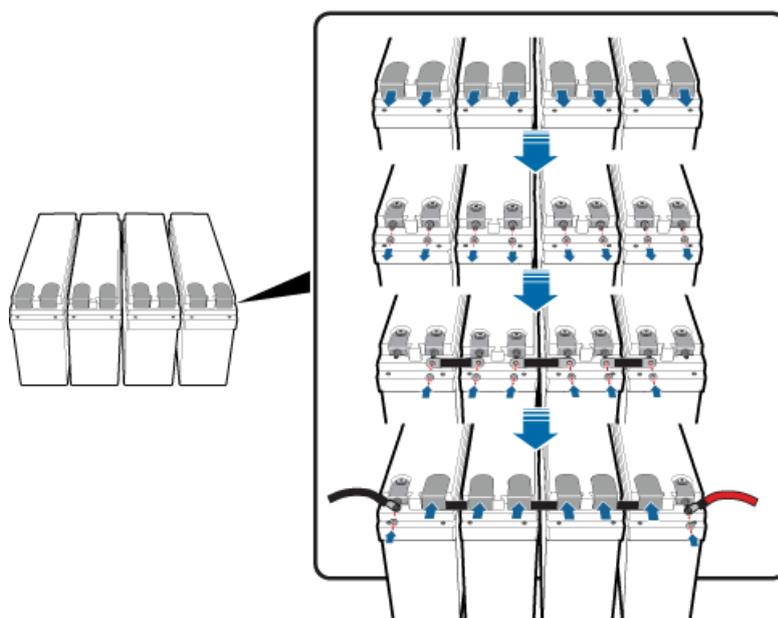
CIE00C0001

(1) Baffle plate

1. Loosen the three screws on the baffle plate.
2. Move the baffle plate upward until it touches the screws.
3. Tighten the screws to secure the baffle plate until the tightening torque reaches 1.2 N·m (10.62 lbf·in.).

Step 3 Install the power cable for the batteries, as shown in **Figure 6-134**.

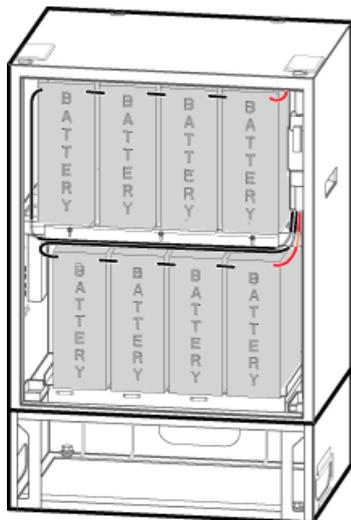
Figure 6-134 Installing the power cable for the batteries



1. Remove the protecting hood from the electrical pole of the battery.
2. Install the series connection copper bar on the electrical poles of neighboring battery cells.
3. Install the cables for the batteries. The red cable is the power cable for the positive pole, and the black cable is the power cable for the negative pole.

Figure 6-135 shows the routes of the power cables in the battery cabinet.

Figure 6-135 Routes of the power cables for the batteries



---End

6.7 Installation Checklist

Check the installation items, installation environment, and cable-related items after the cabinets and devices are all installed.

Cabinet Installation Checklist

Table 6-11 describes the cabinet installation checklist.

Table 6-11 Cabinet installation checklist

No.	Item
1	The installation position of the cabinet strictly complies with the engineering design.
2	In the wall-mounted scenario, the holes of the mounting ears are well aligned with the holes of the expansion bolt assemblies. In addition, the mounting ears are secured on the wall evenly and steadily.
3	In the metal-pole-mounted scenario, the supports for the metal pole are secure on the floor.

No.	Item
4	If the cabinet is installed on the floor, the base is securely installed.
5	Either the horizontal error or vertical error of the cabinet is less than 3 mm.
6	All the bolts, especially those for electrical connections, are tight. Both the spring washer and the flat washer are installed in the correct sequence.
7	The cabinet is neat and clean.
8	The paint on the surface is intact. If any paint is damaged, you must apply touch-up paint to avoid erosion.
9	Filler panels are installed in the space reserved for customer equipment.
10	The cabinet door can be easily opened or closed, the lock works properly, and the gag lever post is secure.
11	All labels, tags, and nameplates are correct, legible, and complete.

Cabinet Installation Environment Checklist

Table 6-12 describes the cabinet installation environment checklist.

Table 6-12 Cabinet installation environment checklist

No.	Item
1	There are no fingerprints or other smears on the surface of the cabinet.
2	There are no excessive straps or adhesive tape on the cables.
3	No tapes, tails of cable ties, paper, or packing bags are left around the cabinet.
4	All the items around the cabinet are neat, clean, and intact.

Electrical Connection Checklist

Table 6-13 describes the electric connection checklist of the cabinet.

Table 6-13 Electric connection checklist of the cabinet

No.	Item
1	All self-made PGND cables are copper-based with the proper wire diameters. No breaking device such as switch and fuse is allowed for the electric connection of the grounding system. No short circuit is allowed.

No.	Item
2	The PGND cable is securely connected and the AC lead-in cable and cables in the cabinet are correctly connected according to the electrical design of the power system. The screws are tightened. In addition, the inputs or outputs are not short-circuited.
3	The redundant part of the power cable or PGND cable is stripped off rather than coiled.
4	The terminals at both ends of the power cable or PGND cable are securely soldered or crimped.
5	The bare wires and the terminal handles at the wiring terminals are coated with heat-shrinkable tubes.
6	The flat washer and the spring washer are well mounted on all OT terminals.
7	The exterior of the battery is intact without any scratch, dent, or crack.
8	The shell of the battery is clean without any leakage trace.
9	The wiring post on the battery stands properly without any damage, and the post is not covered with any acidic substances.
10	The pressure relief valve of the battery is not transformed, and no liquid leaks.
11	The power cables for the batteries are connected to the positive and negative polarities correctly.
12	The voltage of the battery is normal. <ul style="list-style-type: none"> ● The voltage of a 2 V battery cell ranges from 1.8 V to 2.35 V. ● The voltage of a 12 V battery cell ranges from 10.8 V to 14.1 V. ● The total voltage of the batteries ranges from 43.2 V to 56.4 V.
13	The fans work properly. <ul style="list-style-type: none"> ● The fan in the IBBS200D rotates in a low speed in a normal situation. ● The outer air circulation fan in the IBBS200T stops in a normal situation (with the ambient temperature of lower than 30°C), and the inner air circulation fan rotates in a high speed. ● The outer air circulation fan in the APM30H stops in a normal situation (with the ambient temperature of lower than 35°C), and the inner air circulation fan rotates in a low speed.
14	The MCBs for the batteries are set to OFF.

Cable Installation Checklist

Table 6-14 describes the cable installation checklist.

Table 6-14 Cable installation checklist

No.	Item
1	All cables are connected securely and reliably. Pay special attention to the communication cable connections and cable connections at the bottom of the cabinet.
2	The cables are neatly and tightly bound. The cable ties are evenly spaced and face the same direction.
3	Different types of cable, such as the power cable, ground cable, feeder, optical cable, E1/T1 cable, and FE cable are separately bound.
4	The cable layout facilitates maintenance and future capacity expansion.
5	All the labels at both ends of the cables are legible.
6	The extra length of the indoor cable ties is cut, and the cut surfaces are smooth without sharp edges. The extra length of 3 mm to 5mm of the outdoor cable ties is reserved when the cable ties are cut.
7	The idle port that no cable is connected to is properly protected.
8	The connectors of the RF cables are fixed in position to avoid false connection that may cause an abnormal voltage standing wave ratio (VSWR).

BBU Hardware Installation Checklist

Table 6-15 describes the BBU hardware installation checklist.

Table 6-15 BBU hardware installation checklist

No.	Item
1	All self-made PGND cables are copper-based with the proper wire diameters. No switch, fuse, or similar object is allowed for the electrical connection of the grounding system. No short circuit is allowed. Only one OT terminal of the PGND cable can be connected to each terminal on the ground bar.
2	The redundant part of the power cable or PGND cable is stripped off rather than coiled.
3	The terminals at both ends of the power cable or PGND cable are securely soldered or crimped.
4	The bare wires at the terminals and terminal handles are covered with heat-shrinkable tubes.
5	The flat washer and spring washer are well mounted on all OT terminals, and the OT terminals are intact and contact the wiring terminals properly.
6	All the cables, including those on the bottom of the cabinet, are securely connected.

No.	Item
7	The cables are neatly and tightly bound. The cable ties are evenly spaced and face the same direction.
8	The power cable, PGND cable, feeder, optical cable, and the E1/T1/FE cable are bound separately with spacing of more than 30 mm.
9	The cable layout facilitates maintenance and future capacity expansion, and the bending radius of the cable meets the requirements.
10	Legible labels are attached to both ends of all cables.
11	The extra length of the indoor cable ties is cut, and the cut surfaces are smooth without sharp edges. The extra length of 3 mm to 5 mm of the outdoor cable ties is reserved when the cable ties are cut.
12	The unused ports are properly protected.

6.8 Power-On Check

Before a DBS3900 starts operating, you must check the power-on status of the cabinet and components in it.



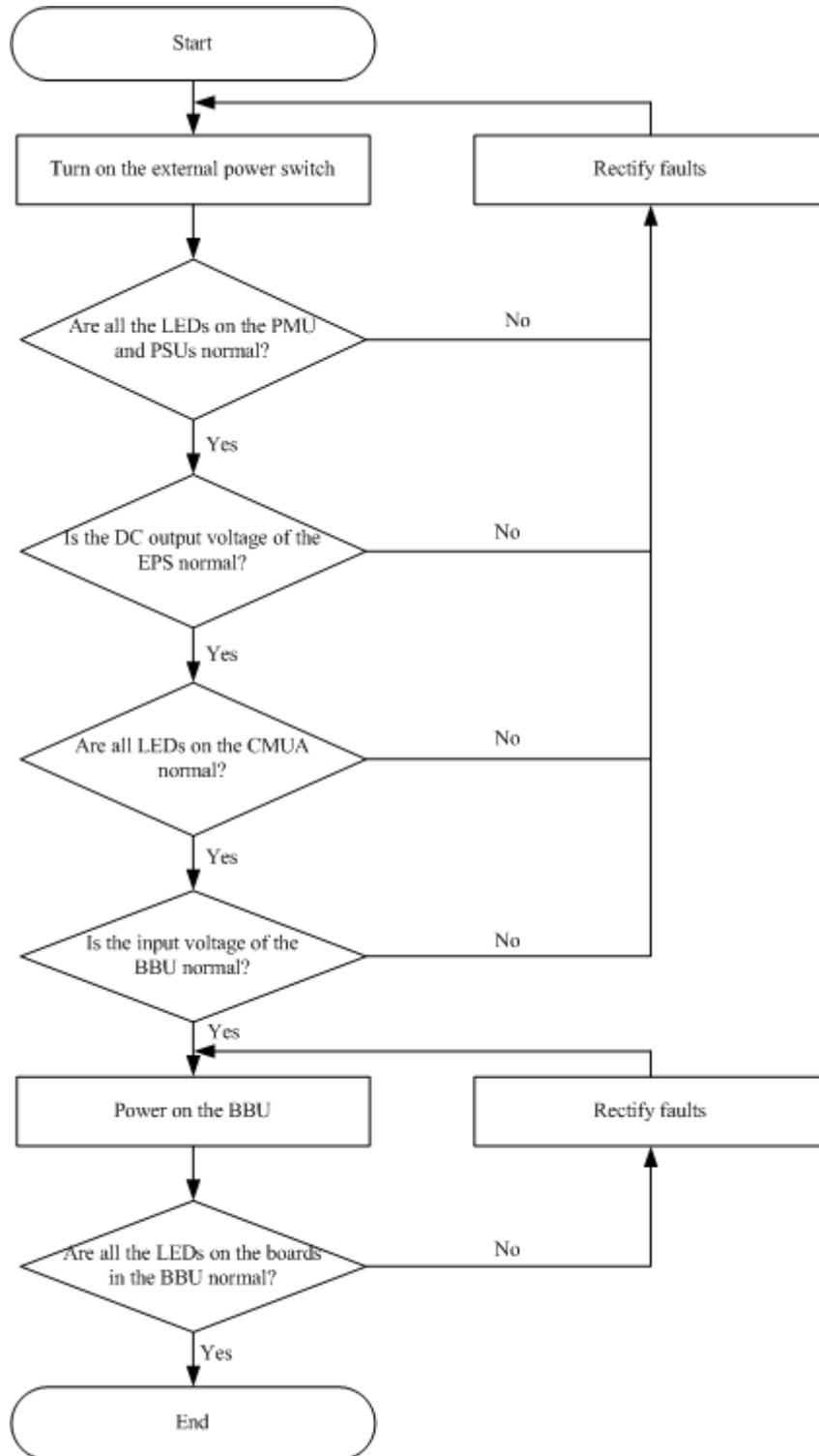
CAUTION

The DBS3900 must be powered on within seven days after it is unpacked, and the period for which the DBS3900 remains powered-off during maintenance must not exceed 48 hours.

Power-On Check in the Outdoor Scenario with AC Power Supply (BBU Installed in an APM30H)

Figure 6-136 shows the power-on check when a DBS3900 is deployed outdoors with AC power supply and the BBU is installed in an APM30H.

Figure 6-136 Power-on check in the outdoor scenario with AC power supply (BBU installed in an APM30H)



LED Status and Output Voltage Check

- The normal status of the LEDs on a PMU is as follows:
RUN LED: blinking
ALM LED: off
- The normal status of the LEDs on a PSU is as follows:
Power LED: steady green
Protection LED: off
Fault LED: off
- The DC output voltage of an EPS ranges from -43.2 V DC to -57 V DC.
- The normal status of the LEDs on a CMUA is as follows:
RUN LED: blinking
ALM LED: off
- The normal status of the LEDs on a GTMU, WMPT, WBBP, LMPT, LBBP, and UTRP is as follows:
 - RUN LED: on for 1s and off for 1s
 - ALM LED: off
 - ACT LED: on
- RUN LED on the UPEU: on
- STATE LED on the FAN unit: blinking green slowly (on for 1s and off for 1s)

6.9 Subsequent Operations

You must perform subsequent operations after installing a base station and checking related hardware installation.

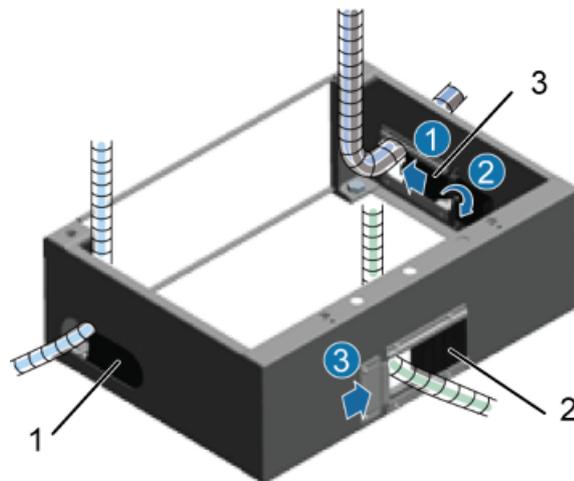
6.9.1 Sealing the Cable Holes on the Base

After all the cables are installed, you need to seal the cable holes of the base.

Procedure

- Step 1** Use baffle plates to cover the idle cable holes, and then tighten screws on the plates, as shown in [Figure 6-137](#).

Figure 6-137 Sealing the cable holes of the base by using the baffle plates



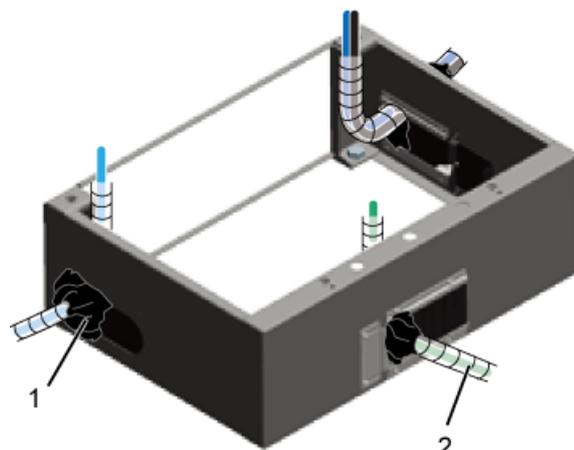
(1) Baffle plate on the right

(2) Baffle plate at the rear

(3) Baffle plate on the left

Step 2 Use fireproof clay to seal the cable holes of the base, as shown in [Figure 6-138](#).

Figure 6-138 Sealing the cable holes of the base by using the fireproof clay



(1) Fireproof clay

(2) PVC corrugated pipe

NOTE

Fireproof clay can be used only for sealing the cable outlet hole in the base. It cannot be used for sealing the cable outlet hole of the cabinet.

Step 3 Tighten the screws on the front baffle plate of the base.

----End

6.9.2 Applying Touch-Up Paint

The paint on the surface is intact. If any paint is damaged, you must apply touch-up paint to avoid erosion.

Prerequisite

Before applying touch-up paint, select the same color as the original coating, as listed in [Table 6-16](#).

Table 6-16 Code of color samples

Object	Color	Code of Huawei Color Sample	International Color Code
Cabinet (including the APM30H, RFC, TMC11H, IBBS200T, and IBBS200D)	RAL7035	YB026	RAL7035
Base	3010 Light gray	YB030	Pontone 422U

Procedure

- Step 1** If there are stains in the damaged area or rust on the material, use fine sandpaper to polish the damaged area to remove the stains or rust.
- Step 2** Use clean cotton cloth to remove the stains or dust from the surface of the area to be polished or repaired.
- Step 3** Shake the paint well, and then use a small brush inside the bottle to absorb paint and evenly spread the paint on the damaged area until the area is covered.



CAUTION

The paint coating should be as thin as possible. No drops are allowed on the paint coating, and the surface should be smooth.

- Step 4** Perform subsequent operations after the repaired paint coating is exposed in the air for 30 minutes.

NOTE

The color of the repaired paint coating area should be consistent with that of the surrounding areas, without obvious edges and bulges, and the original damage should no longer be distinguishable. In addition, there should be no paint peeled off.

---End

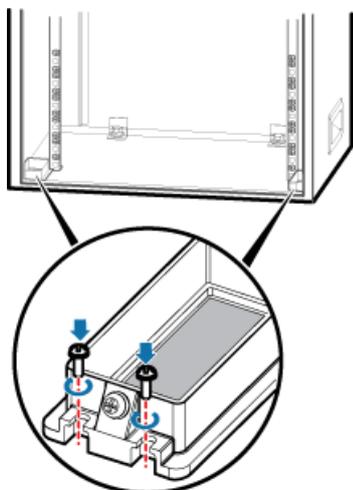
6.9.3 Applying Grease

When the APM30H and TMC11H are installed on a wall or metal pole, you must apply grease to the cable outlet module and the four screws for securing the cabinet to the trapezoidal rack.

Procedure

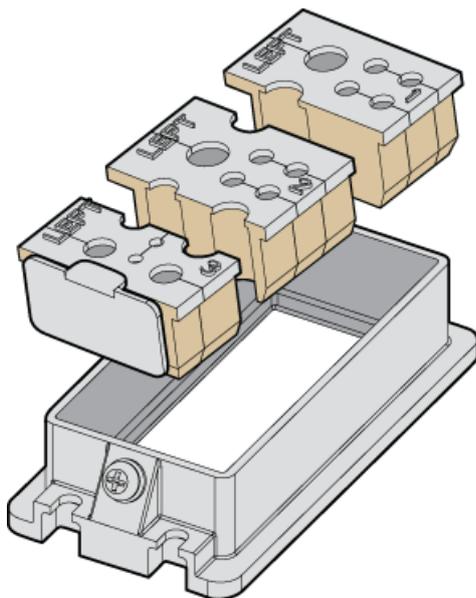
- Step 1** Install a cable outlet subrack on both sides at the bottom of a cabinet, as shown in [Figure 6-139](#).

Figure 6-139 Installing a cable outlet subrack



Step 2 Apply delivered grease to the surfaces and gaps of the three cable outlet modules evenly, and then insert the modules into the cable outlet subrack, as shown in [Figure 6-140](#).

Figure 6-140 Applying grease to cable outlet modules

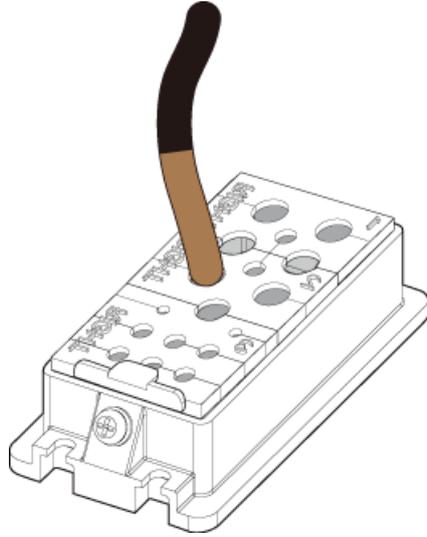


 **NOTE**

When a cabinet is installed on a wall or metal pole, you must apply grease to the cable outlet module and the four screws for securing the cabinet to the trapezoidal rack.

Step 3 Apply grease to the surfaces of the cables, and then route the cables through the cable outlet modules. Apply grease to the rubber caps evenly, and then insert the rubber caps into unused cable holes, as shown in [Figure 6-141](#).

Figure 6-141 Applying grease to cables and rubber caps



---End

7 Outdoor Scenario with DC Power Supply (BBU Installed in a TMC11H)

About This Chapter

This chapter describes the procedures for installing a TMC11H, components in it, and related cables when a DBS3900 is deployed outdoors with DC power supply and the BBU is installed in the TMC11H.

[7.1 Installation Process](#)

When a DBS3900 is deployed outdoors with AC power supply and the BBU is installed in a TMC11H, you must install the TMC11H, components in it, and related cables. In addition, some optional components may be required based on actual requirements.

[7.2 Installing a Cabinet](#)

Based on different installation scenarios, an APM30H, TMC11H, IBBS200D, or IBBS200T can be installed on a concrete floor or a metal pole. In addition, installation in stack mode is also supported.

[7.3 Installing a PGND Cable and Equi-potential Cable](#)

The equi-potential PGND cable is used to connect the PGND bolts on the cabinets to the PGND grounding bars on site, ensuring that the cabinets are properly grounded. The equi-potential cable is used to connect the PGND bolts on the cabinets, ensuring the equi-potential connections between the cabinets.

[7.4 Installing Components](#)

A BBU and SLPU must be installed in a TMC11H. A SOU, heaters, an EMUA or GPS surge protector may also be installed based on actual requirements.

[7.5 Installing Cables](#)

This section describes the procedures and precautions to be taken for installing power cables, transmission cables, monitoring signal cables, and CPRI cables when a DBS3900 is deployed outdoors with DC power supply and the BBU is installed in a TMC11H.

[7.6 Installation Checklist](#)

Check the installation items, installation environment, and cable-related items after the cabinets and devices are all installed.

[7.7 Power-On Check](#)

Before a DBS3900 starts operating, you must check the power-on status of the cabinet and components in it.

[7.8 Subsequent Operations](#)

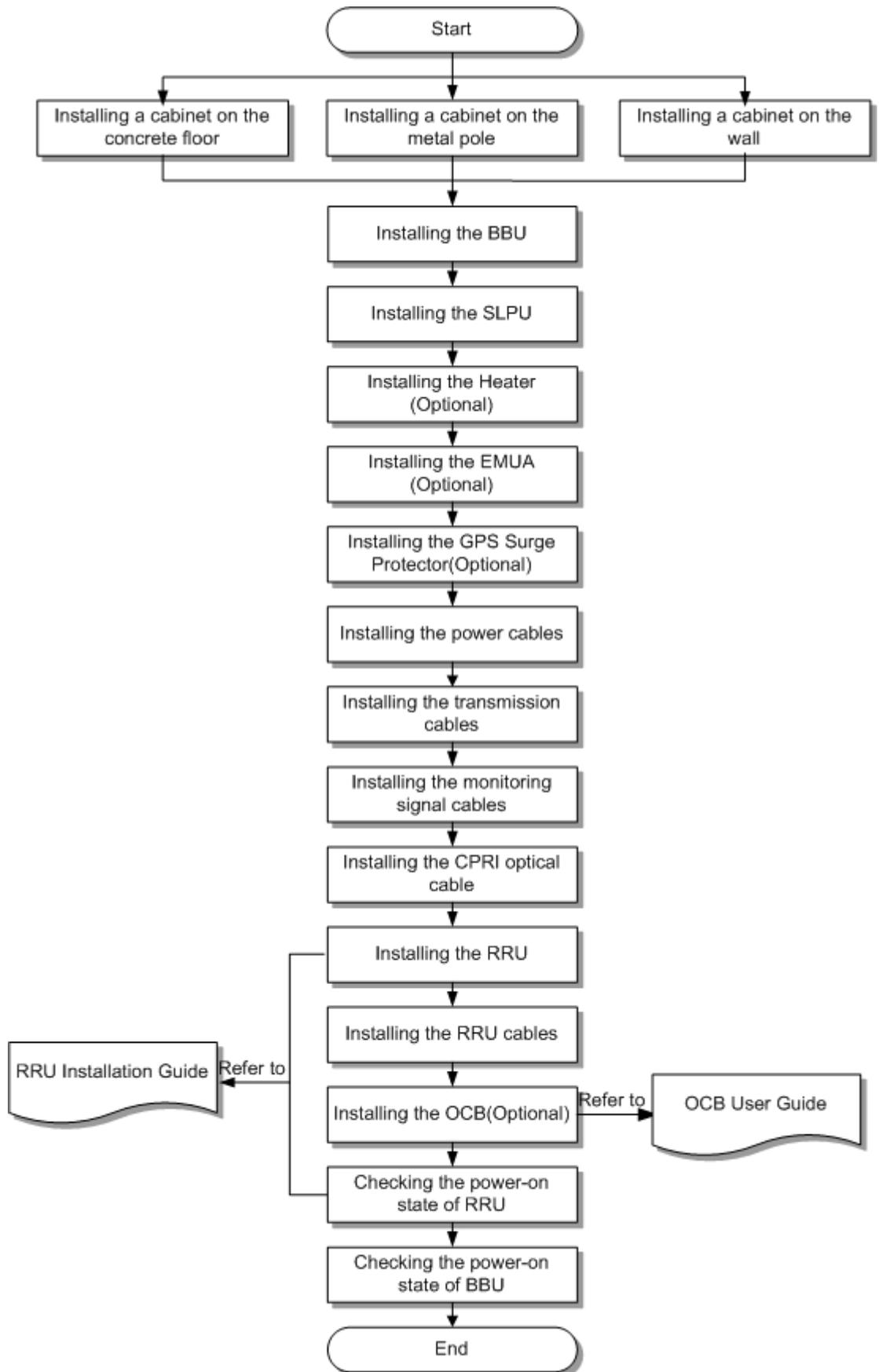
You must perform subsequent operations after installing a base station and checking related hardware installation.

7.1 Installation Process

When a DBS3900 is deployed outdoors with AC power supply and the BBU is installed in a TMC11H, you must install the TMC11H, components in it, and related cables. In addition, some optional components may be required based on actual requirements.

Figure 7-1 shows the installation process.

Figure 7-1 Installation process



 NOTE

- The procedure for installing an RRU is not described in this document. For details about how to install an RRU, see the associated RRU installation guide according to the RRU model.
- The Outdoor Cable Conversion Box (OCB) is an optional component, which is used to connect cables with different cross-sectional areas. For details about an OCB, see the *OCB User Guide*.

7.2 Installing a Cabinet

Based on different installation scenarios, an APM30H, TMC11H, IBBS200D, or IBBS200T can be installed on a concrete floor or a metal pole. In addition, installation in stack mode is also supported.

7.2.1 Installing a Cabinet on a Concrete Floor

You must install a base on a concrete floor before installing an APM30H, TMC11H, IBBS200D, or IBBS200T on the base. You can stack another cabinet on the installed cabinet as required.

Installing a Base

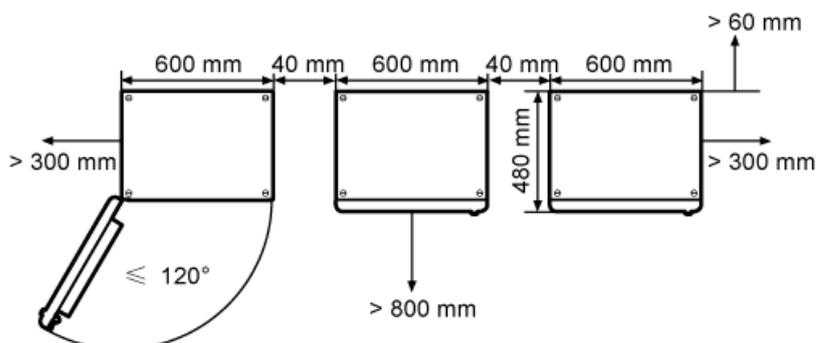
This section describes the procedure and precautions to be taken for installing a base on a concrete floor. You must install a base on a concrete floor before installing an APM30H, TMC11H, IBBS200D, or IBBS200T on the base.

Context

- An APM30H, TMC11H, IBBS200D, or IBBS200T can be installed independently, side by side, or in stack mode. Different types of cabinet must be installed in compliance with cabinet configuration principles. For details about cabinet configuration principles and installation positions, see the associated cabinet configurations.
- When two cabinets are combined, the minimum distance between the cabinets is 40 mm, and the maximum distance between the cabinets is 150 mm. If the Noise Reduction Module (NRM) is installed, the distance between the cabinets is 150 mm.

Figure 7-2 shows the cabinet installation clearance.

Figure 7-2 Cabinet installation clearance (plan view)



 **NOTE**

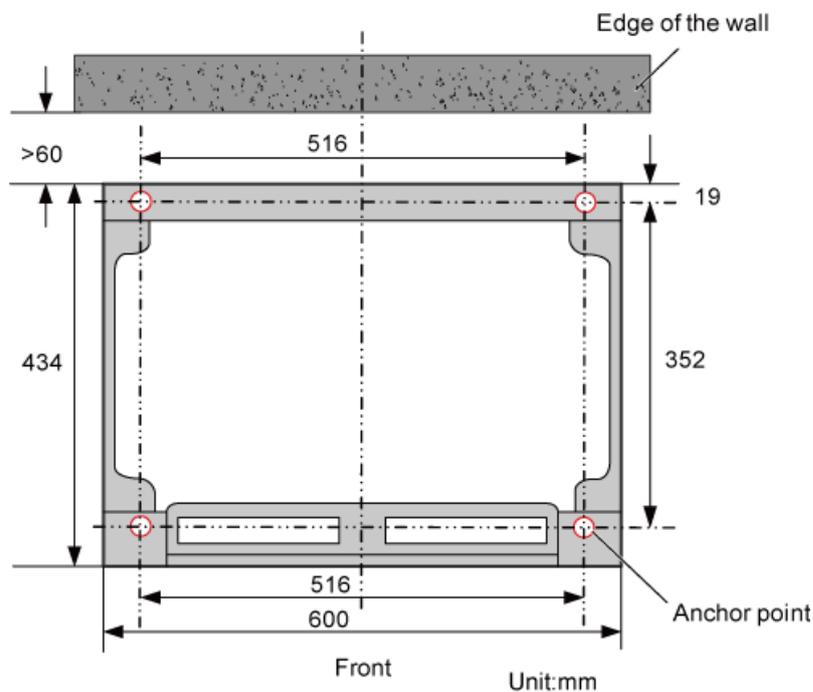
The type of cabinet in [Figure 7-2](#) can be APM30H, TMC11H, or IBBS200D.

Procedure

Step 1 Determine the position for installing a base.

1. According to the engineering drawing and installation clearance requirements, determine the position for installing a cabinet.
2. On the concrete pad, mark holes to determine the installation position of the base, as shown in [Figure 7-3](#).

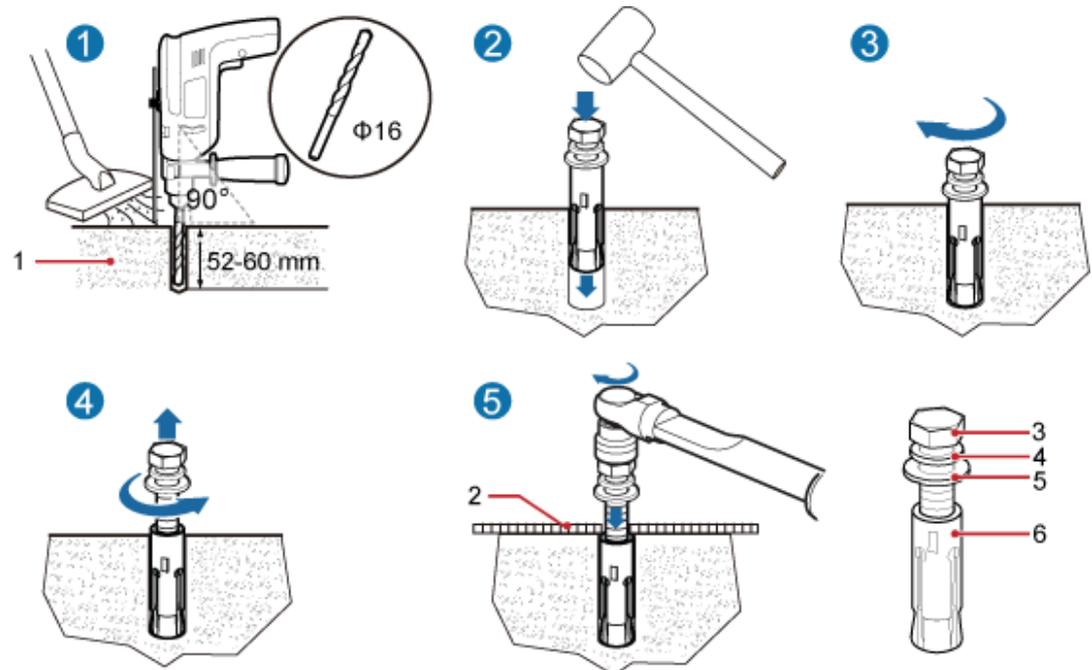
Figure 7-3 Installation holes of the base



3. After marking all the holes, use the measuring tape to check whether the distances between the holes are accurate.

Step 2 Drill holes at the anchor points, and then install the expansion bolt assemblies, as shown in [Figure 7-4](#).

Figure 7-4 Drilling holes on the concrete pad



(1) Concrete pad (2) Base of the cabinet (3) M12x60 bolt (4) Spring washer (5) Flat washer (6) Expansion tube

1. Use a hammer drill with bit 16 to drill holes at the anchor points, and ensure that the depth of each hole ranges from 52 mm to 60 mm.

CAUTION

- Do not drill holes through the holes in the base by using a hammer drill. Drilling holes through the holes in the base may damage the paint on the base.
- Take proper safety measures to protect your eyes and respiratory tract against the dust before drilling holes.

2. Use a vacuum cleaner to clear the dust inside and around the holes. If the inter-hole spacing is too wide or too narrow, locate and drill holes again.
3. Slightly tighten the expansion bolt, and then put the expansion bolt assembly into the hole vertically.
4. Use a rubber mallet to hammer the expansion bolt until the expansion tube is buried into the hole, and then tighten the bolt.
5. Remove the bolt, spring washer, and flat washer counterclockwise.

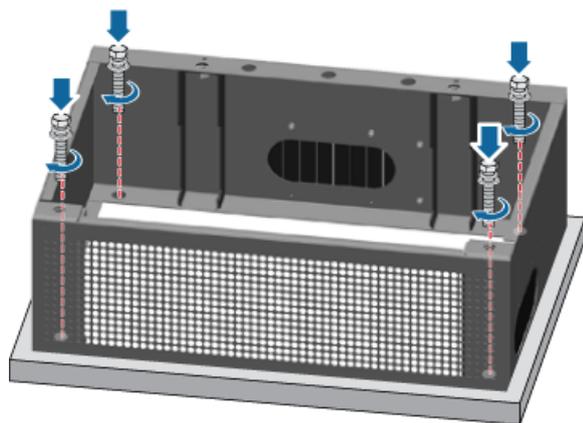


CAUTION

After dismantling the expansion bolt assembly, ensure that the top of the expansion tube is on the same level as the floor.

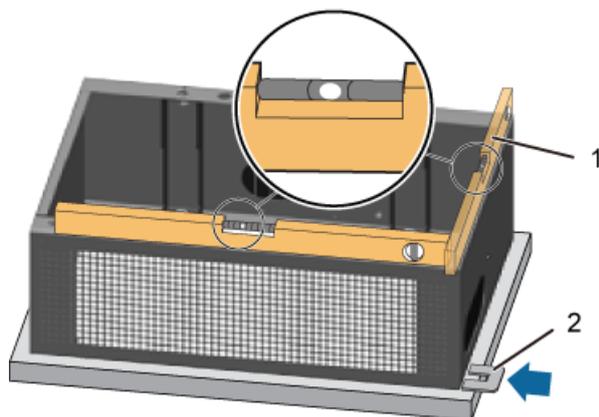
- Step 3** Align the base, and then install the bolt with the spring washer and flat washer, as shown in [Figure 7-5](#).

Figure 7-5 Aligning the base



- Step 4** Use a level to check the base level. If the base is not level, use adjusting pads to adjust the base level, as shown in [Figure 7-6](#).

Figure 7-6 Adjusting the base level

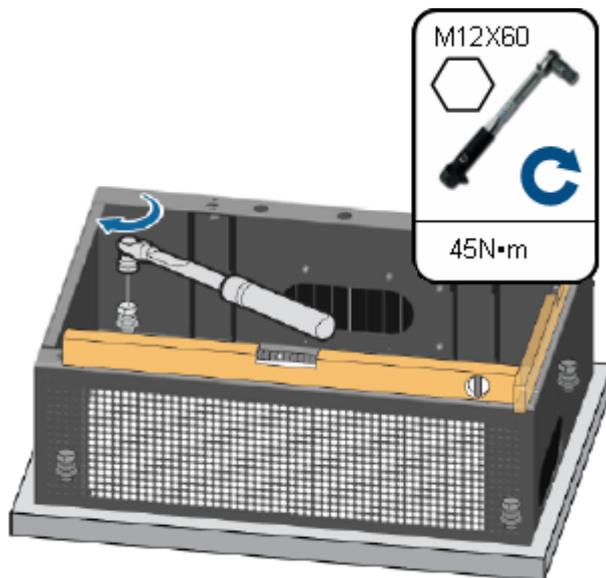


(1) Level

(2) Adjusting pad

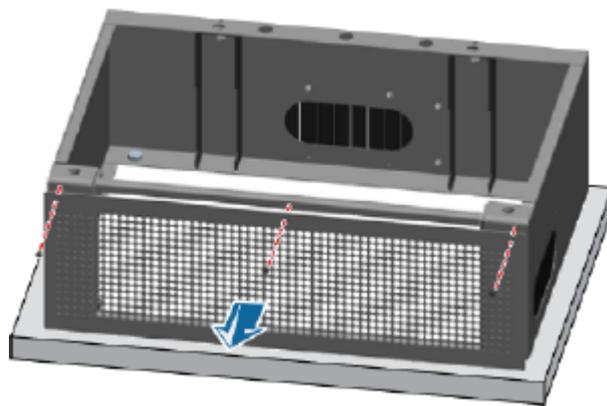
- Step 5** Use a torque wrench to tighten the bolts with the tightening torque of 45 N·m, as shown in [Figure 7-7](#).

Figure 7-7 Tightening the bolts



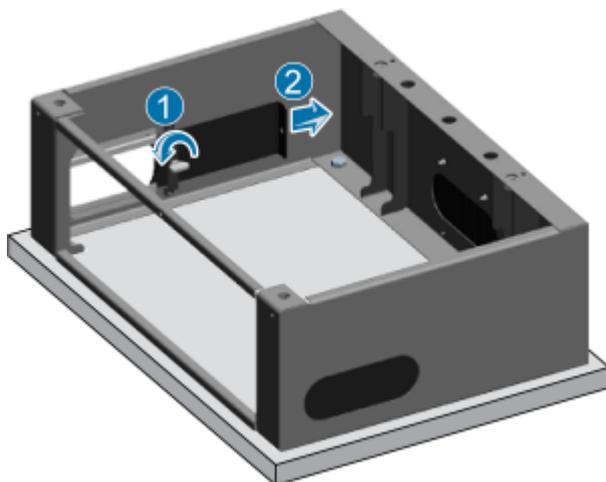
Step 6 Loosen the three screws on the front cover plate of the base, and then remove the front cover plate, as shown in [Figure 7-8](#).

Figure 7-8 Removing the front cover plate



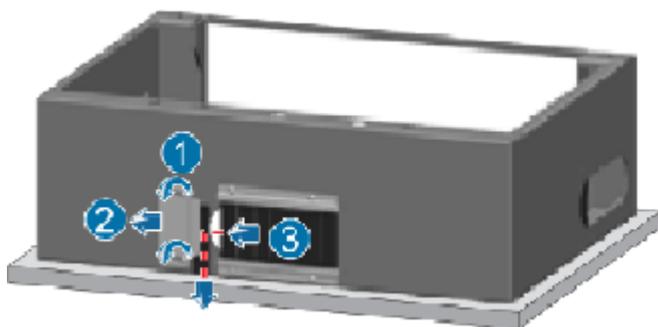
Step 7 Remove the baffle plate from either side of the base (by taking the left side as an example), as shown in [Figure 7-9](#).

Figure 7-9 Removing the baffle plate



Step 8 Remove the baffle plate from the back of the base, as shown in [Figure 7-10](#).

Figure 7-10 Removing the baffle plate from the back



---End

Installing a Cabinet on a Base

This section describes the procedure and precautions to be taken for installing a cabinet on a base after the base is installed on the concrete floor.

Context



NOTE

The following figures are based on the IBBS200D. The procedure for installing the APM30H, TMC11H, or IBBS200T is the same as that for installing the IBBS200D.

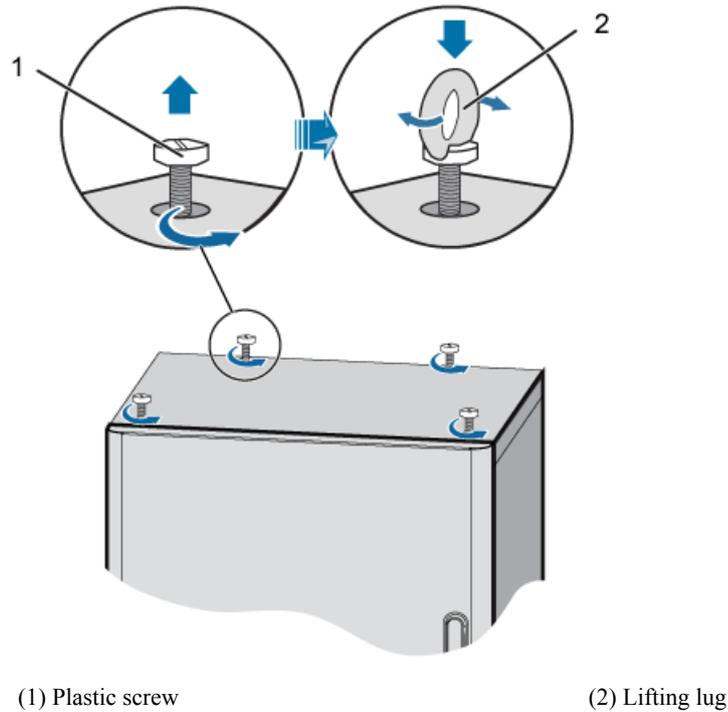
Procedure

Step 1 Remove the four plastic screws from the top of the cabinet, and then install the lifting lugs in the corresponding holes, as shown in Figure 1.

 **CAUTION**

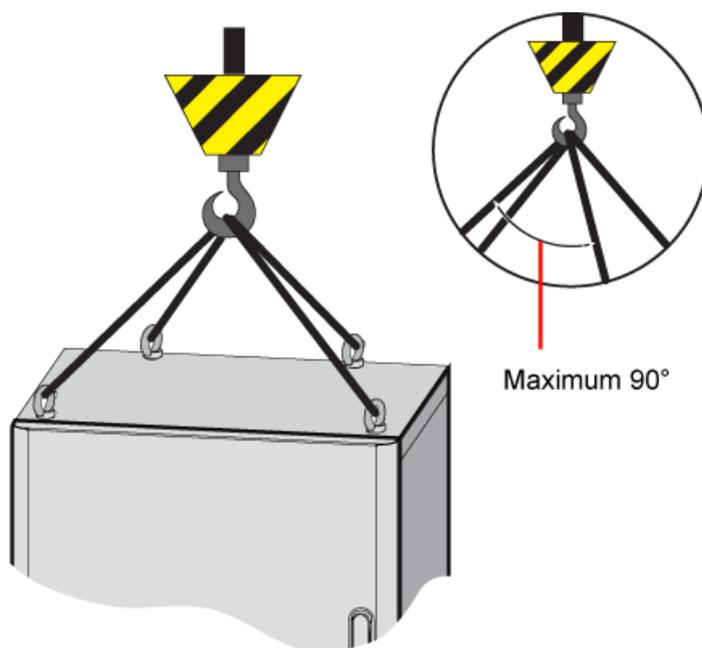
Reserve the plastic screws for later use.

Figure 7-11 Installing the lifting lugs



Step 2 Install ropes on the lifting lugs, and then lift the cabinet, as shown in Figure 2.

Figure 7-12 Installing the ropes



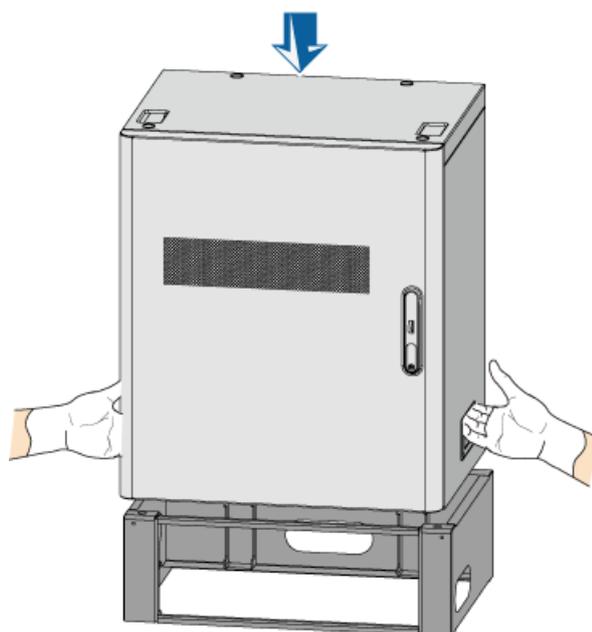
Step 3 Lift the cabinet onto the base, and then gently push the cabinet to align the cabinet with the base, as shown in [Figure 7-13](#).



WARNING

At least two installation engineers are required for lifting the cabinet.

Figure 7-13 Lifting a cabinet onto a base



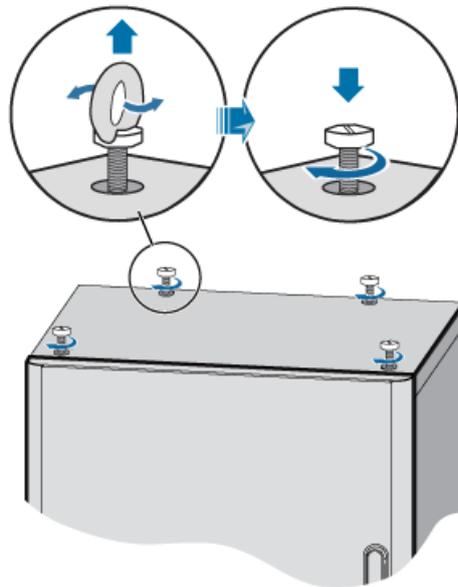
Step 4 Remove the ropes and lifting lugs, and then install the plastic screws, as shown in Figure 4.



CAUTION

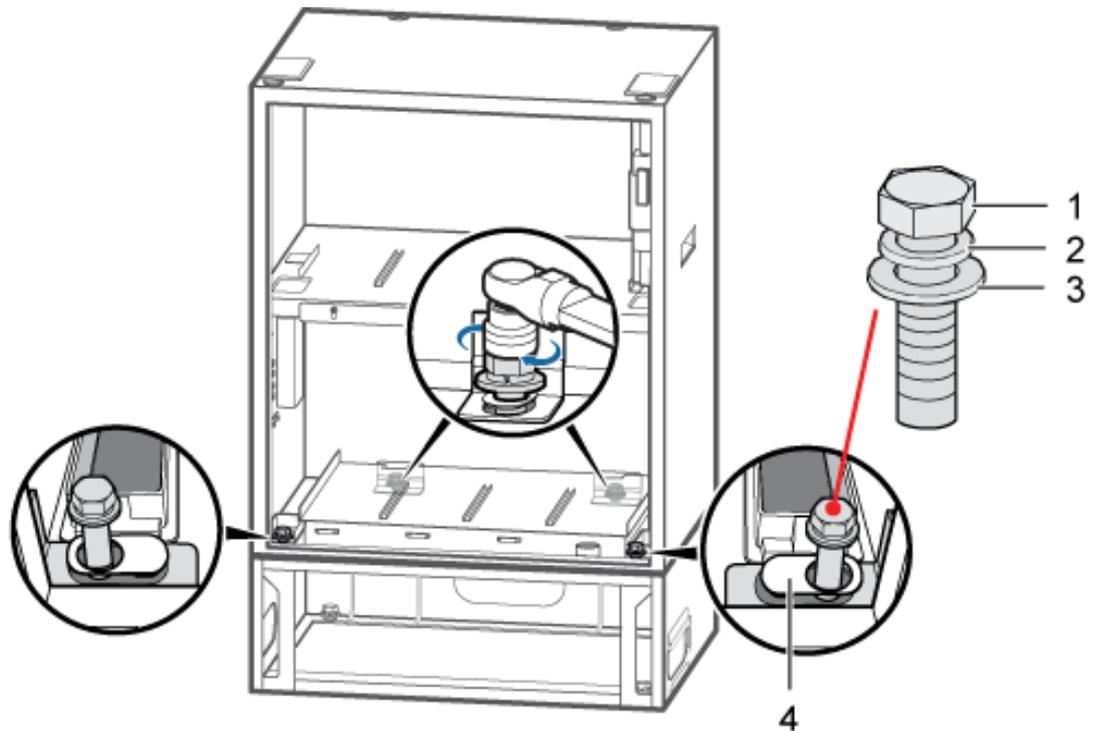
Before installing the rubber screws, clean the mounting holes to prevent entry of metal bits.

Figure 7-14 Installing the plastic screws



Step 5 Use four M12x30 bolts to secure the cabinet on the base, as shown in Figure 7.

Figure 7-15 Securing the IBBS200D on the base



- (1) M12x30 bolt (2) Spring washer (3) Flat washer (4) Gasket with an oblong hole

---End

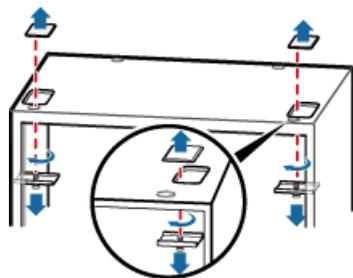
(Optional) Installing Two Cabinets in Stack Mode

This section describes the procedure and precautions to be taken for installing two cabinets in stack mode. After a cabinet is installed on a base, another cabinet can be stacked on this cabinet based on actual requirements.

Procedure

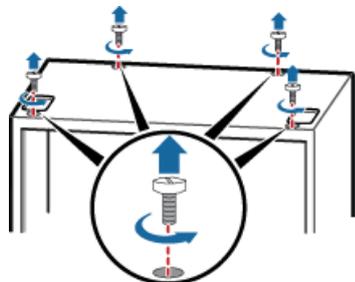
- Step 1** Remove the cover plates for cable holes from the top of the lower cabinet, as shown in [Figure 7-16](#).

Figure 7-16 Removing the cover plates for cable holes



Step 2 Remove the four plastic screws from the top of the lower cabinet, as shown in [Figure 7-17](#).

Figure 7-17 Removing the plastic screws



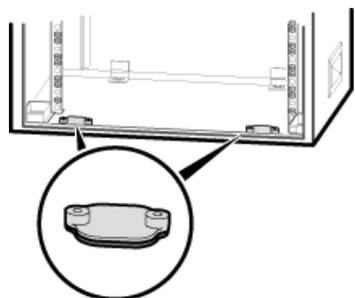
Step 3 Lift the upper cabinet onto the lower cabinet, and then align the cable holes of the upper cabinet with those of the lower cabinet, as shown in [Figure 7-19](#).



CAUTION

Do not move the cover plates for the round cable holes to avoid entry of water into the cabinet. [Figure 7-18](#) shows the positions of the cover plates for the round cable holes.

Figure 7-18 Positions of the cover plates for the round cable holes



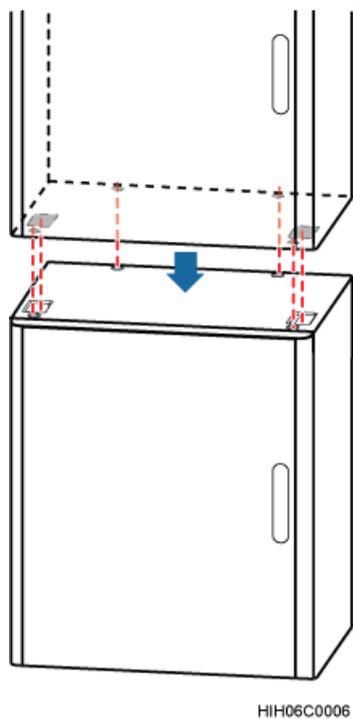
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WARNING

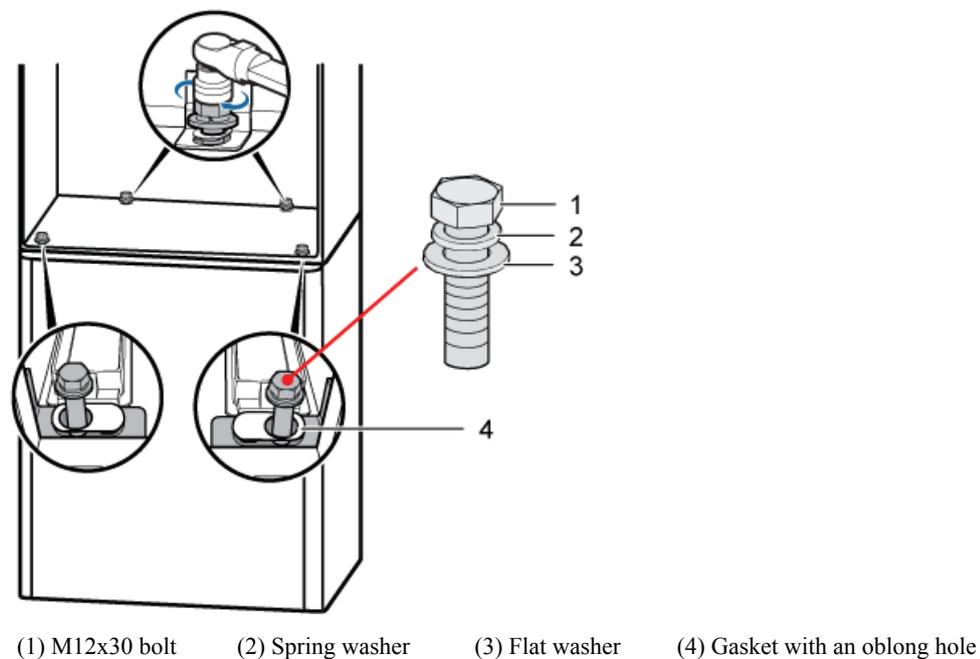
At least two installers are required for lifting a cabinet.

Figure 7-19 Stacking a cabinet onto another cabinet



Step 4 Use a torque wrench to tighten the four M12x30 bolts in the cabinet, as shown in **Figure 7-20**.

Figure 7-20 Tightening the bolts



---End

7.2.2 Installing a Cabinet on a Metal Pole

This section describes the procedure and precautions to be taken for installing a cabinet on a metal pole. An APM30H or TMC11H can be installed on a metal pole.

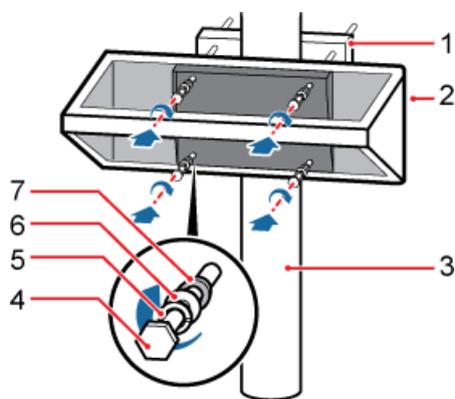
Procedure

Step 1 Use four M12×60 bolts to secure a trapezoidal rack at a proper height of a metal pole, as shown in [Figure 7-21](#).

 **NOTE**

- The cabinet cannot be installed at a height of more than 10,000 mm.
- The diameter of a metal pole must range from 60 mm to 114 mm.

Figure 7-21 Installing a trapezoidal rack

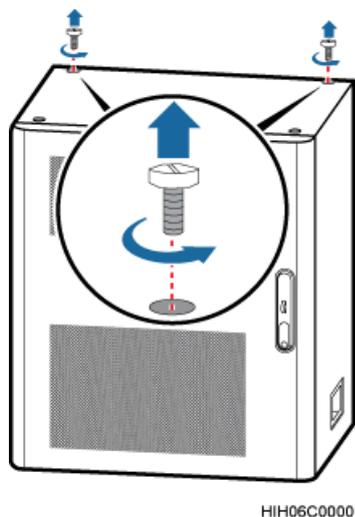


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- | | | |
|-----------------------|----------------------|-----------------|
| (1) Adapting piece | (2) Trapezoidal rack | (3) Metal pole |
| (4) Bolt | (5) Spring washer | (6) Flat washer |
| (7) Waterproof gasket | | |

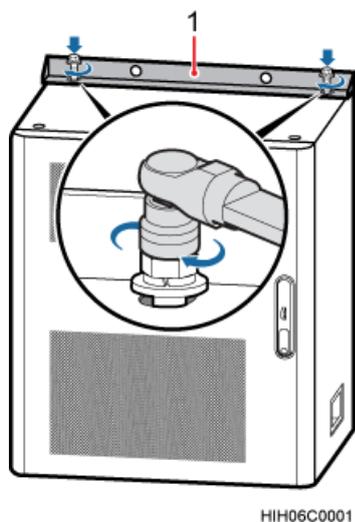
Step 2 Remove the two plastic screws that are near the back of the cabinet from the top of the cabinet, as shown in [Figure 7-22](#).

Figure 7-22 Removing plastic screws



Step 3 Install a fastening bar on the top of the cabinet, and then use a socket wrench to tighten the two M12×30 bolts, as shown in **Figure 7-23**.

Figure 7-23 Installing a fastening bar



(1) Fastening bar

Step 4 Lift the cabinet onto the trapezoidal rack, use four M12×30 bolts to secure the cabinet on the trapezoidal rack, and then use a socket wrench to tighten the bolts, as shown in **Figure 7-25**.



CAUTION

Do not move the cover plates for the round cable holes to avoid entry of water into the cabinet. **Figure 7-24** shows the positions of the cover plates for the round cable holes.

Figure 7-24 Positions of the cover plates for the round cable holes

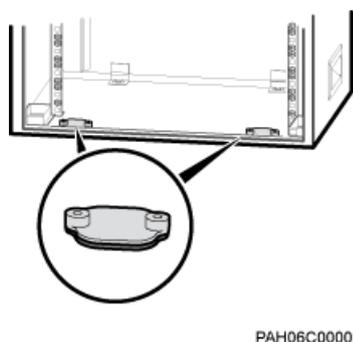
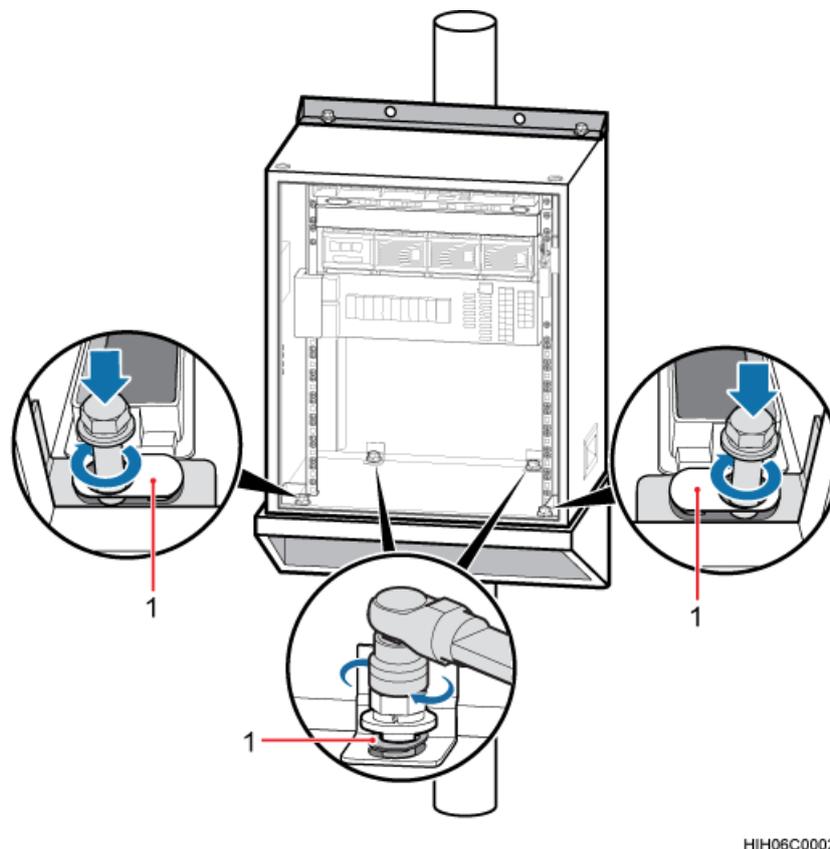


Figure 7-25 Installing a cabinet



(1) Gasket with an oblong hole

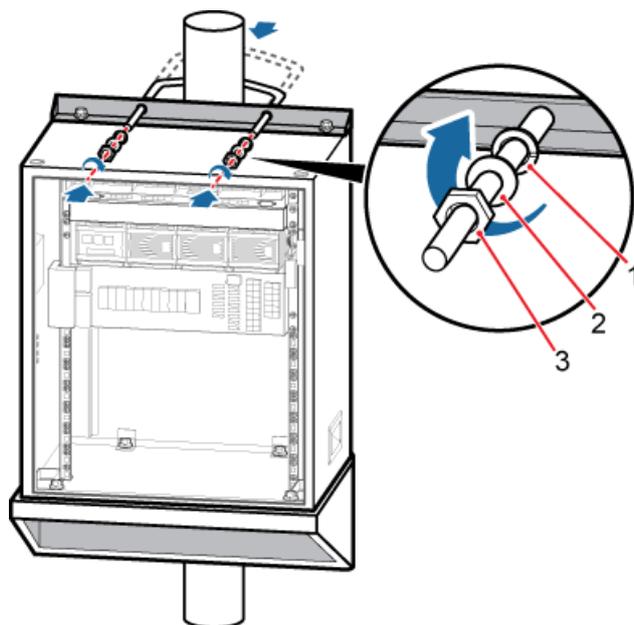
Step 5 Lead the U-shaped piece through the holes on the fastening bar installed on the top of the cabinet, as shown in [Figure 7-26](#).



NOTE

When a cabinet is installed on a metal pole, grease must be applied. For details, see [7.8.3 Applying Grease](#).

Figure 7-26 Installing a U-shaped piece



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(1) Flat washer

(2) Spring washer

(3) Nut

---End

7.2.3 Installing a Cabinet on a Wall

This section describes the procedure and precautions to be taken for installing a cabinet on a wall. An APM30H or TMC11H can be installed on a wall.

Context

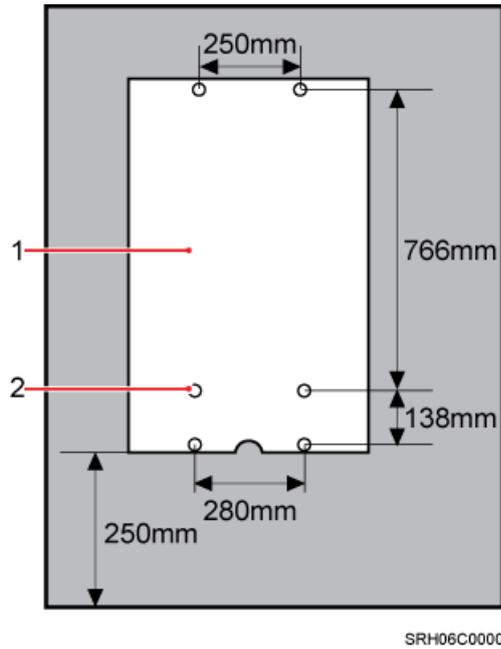
 **NOTE**

- The cabinet cannot be installed at a height of more than 10,000 mm.

Procedure

- Step 1** Press a marking template against the wall, and then mark six mounting holes based on the marking template, as shown in [Figure 7-27](#).

Figure 7-27 Marking mounting holes

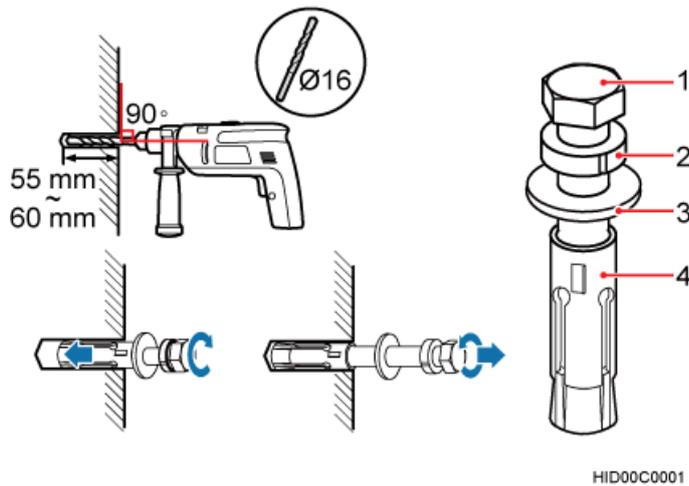


(1) Marking template

(2) Mounting holes

Step 2 Drill holes at the anchor points, and then install expansion bolt assemblies, as shown in [Figure 7-28](#).

Figure 7-28 Installing an expansion bolt



(1) Bolt

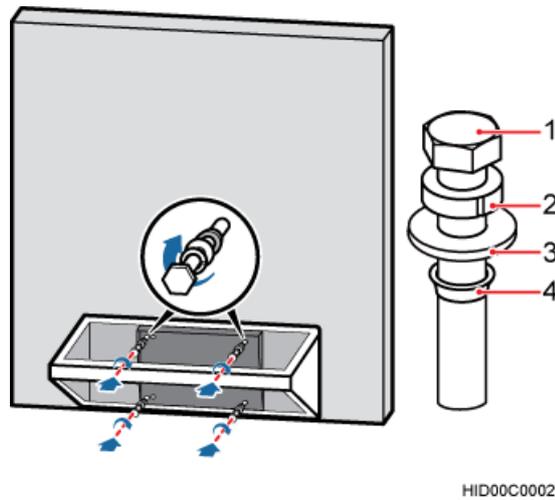
(2) Spring washer

(3) Flat washer

(4) Expansion tube

Step 3 Align the holes on the trapezoidal rack with the four lower mounting holes on the wall, and then use four M12×30 bolts to secure the trapezoidal rack, as shown in [Figure 7-29](#).

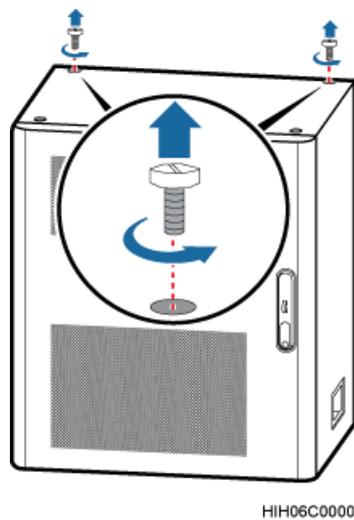
Figure 7-29 Installing a trapezoidal rack



- (1) M12x60 bolt (2) Spring washer (3) Flat washer (4) Waterproof gasket.

Step 4 Remove the two plastic screws that are near the back of the cabinet from the top of the cabinet, as shown in [Figure 7-30](#).

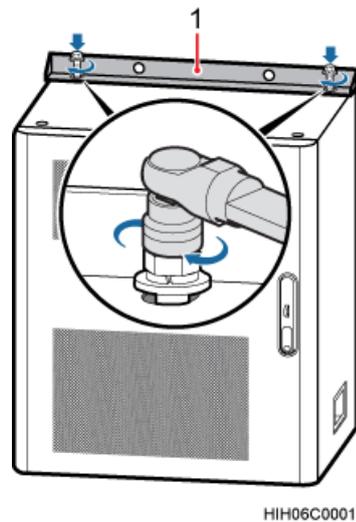
Figure 7-30 Removing plastic screws



- (1) Plastic screw

Step 5 Install a fastening bar on the top of the cabinet, and then use a socket wrench to tighten the two bolts, as shown in [Figure 7-31](#).

Figure 7-31 Installing a fastening bar



(1) Fastening bar

Step 6 Lift the cabinet onto the trapezoidal rack, use four M12×30 bolts to secure the cabinet on the trapezoidal rack, and then use a socket wrench to tighten the bolts, as shown in [Figure 7-33](#).



CAUTION

Do not move the cover plates for the round cable holes to avoid entry of water into the cabinet. [Figure 7-32](#) shows the positions of the cover plates for the round cable holes.

Figure 7-32 Positions of the cover plates for the round cable holes

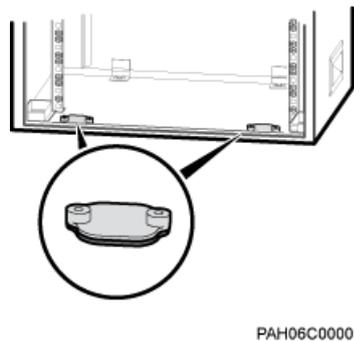
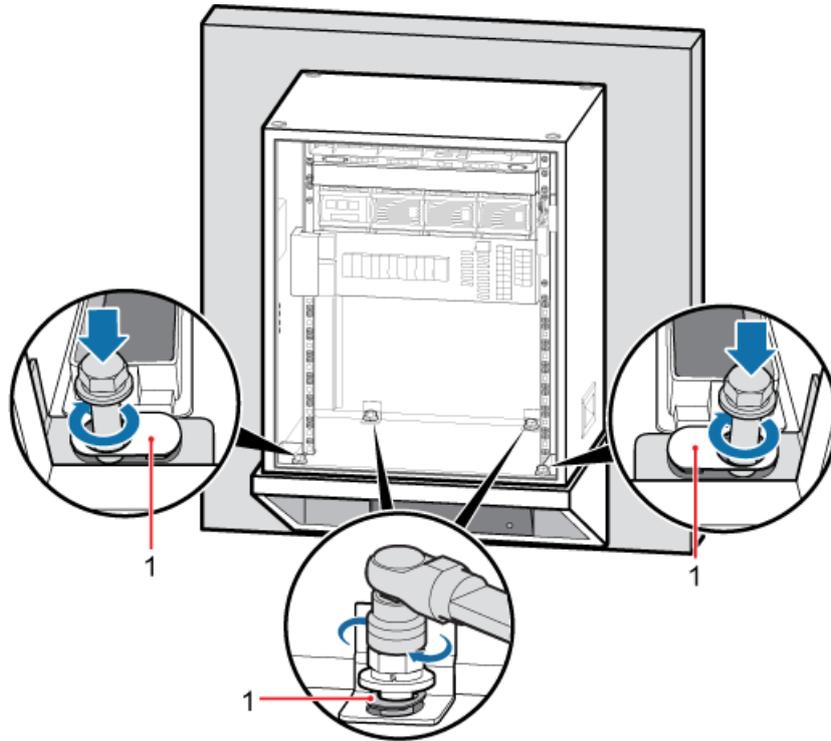


Figure 7-33 Installing a cabinet



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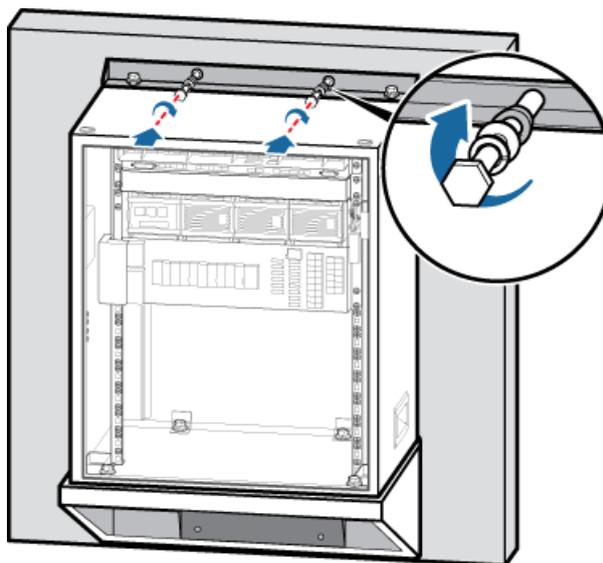
(1) Gasket with an oblong hole

Step 7 Use two bolts to secure the fastening bar on the wall, as shown in [Figure 7-34](#).

NOTE

When a cabinet is installed on the wall, grease must be applied. For details, see [7.8.3 Applying Grease](#).

Figure 7-34 Securing a fastening bar



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---End

7.3 Installing a PGND Cable and Equi-potential Cable

The equi-potential PGND cable is used to connect the PGND bolts on the cabinets to the PGND grounding bars on site, ensuring that the cabinets are properly grounded. The equi-potential cable is used to connect the PGND bolts on the cabinets, ensuring the equi-potential connections between the cabinets.

Prerequisite

The tools, such as a Phillips screwdriver, a cable cutter, and a multi-purpose crimping tool, are ready.

Context

- In the triple mode scenario, a maximum of two TMC11Hs can be configured. In this case, BBU1 is installed in an TMC11H, and BBU2 is installed in an extended TMC11H.
- An equi-potential cable connects the two TMC11Hs.
- A PGND cable is installed in the TMC11H housing BBU1.

Table 7-1 describes the specifications of the PGND cable and equi-potential cable.

Table 7-1 Specifications of the PGND cable and equi-potential cable

Cable Name	One End	The Other End	Remarks
PGND cable	M6 OT terminal	M6 OT terminal	Yellow and green cable, 16 mm ²
Equi-potential cable	M6 OT terminal	M6 OT terminal	Yellow and green cable, 16 mm ²

Procedure

Step 1 Prepare the PGND cable and equi-potential cable.

1. Prepare the cable of proper length based on the actual cable route.
2. Add OT terminals to both ends of the cable. For details, see Assembling the OT Terminal and the Power Cable.

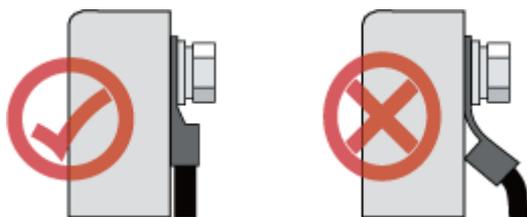
Step 2 Install a PGND cable and Equi-potential Cable.

1. Connect one end of the PGND cable to the ground bar on the inner side of the cabinet under the TMC11H, use a spring washer and a bolt to secure the OT terminal on the cable, and then connect the other end to the external ground bar, as shown in **Figure 7-36**.

 **NOTE**

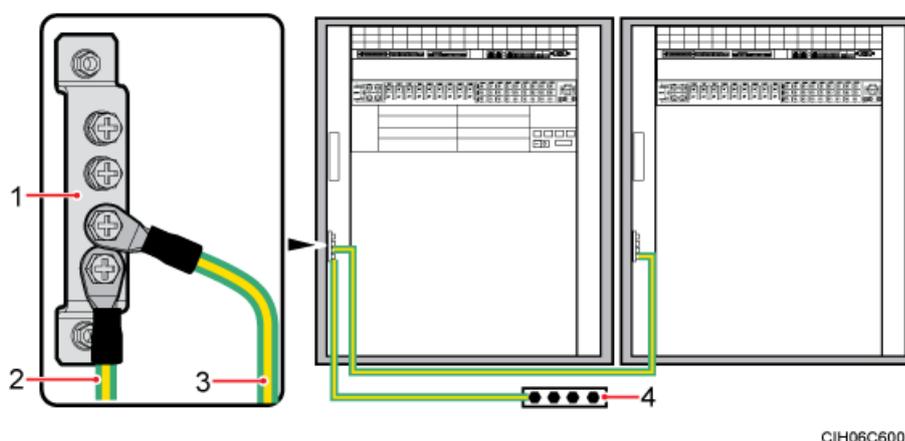
When installing the PGND cable, keep the crimping tube of the OT terminal in the direction shown in **Figure 7-35**.

Figure 7-35 Installing the OT terminal in the correct manner



2. Install an equi-potential cable in each cabinet, as shown in [Figure 7-36](#).

Figure 7-36 Installing a PGND cable and equi-potential cable



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- (1) Ground bar on the inner side of the cabinet (2) PGND cable (3) Equi-potential cable (4) Ground busbar

Step 3 Route and bind the cables. For details, see [7.5.1 Cabling Requirements](#).

Step 4 Label the installed cables. For details, see [Attaching a Cable-Tying Label](#).

Step 5 Run each cable that leaves the cabinet in a PVC corrugated pipe, and then tie the pipe to the cable hole on the cabinet.

----End

7.4 Installing Components

A BBU and SLPU must be installed in a TMC11H. A SOU, heaters, an EMUA or GPS surge protector may also be installed based on actual requirements.

7.4.1 Installing a BBU

This section describes the procedure and precautions to be taken for installing a BBU in an APM30H, TMC11H, or 19-inch rack. A BBU occupies a space of 19 inch wide and 2 U high.

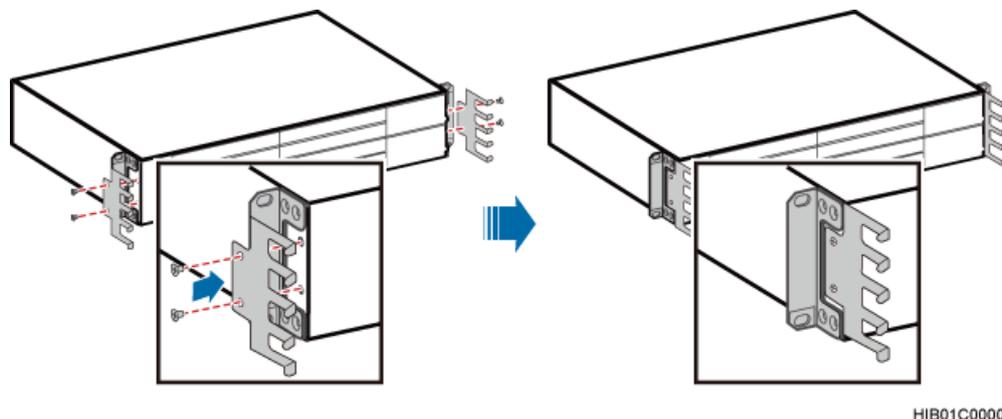
Context

In the triple mode scenario, two BBUs are required. A second BBU is installed in the same manner as the first BBU.

Procedure

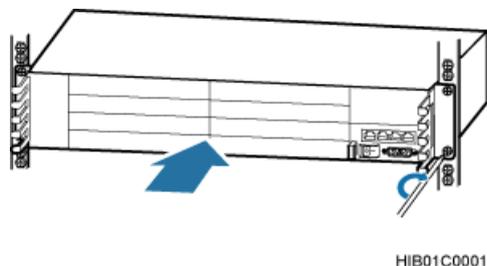
- Step 1** Align mounting holes on the cable holders with mounting holes on both sides of a BBU, and then use four M4 screws to secure the cable holes until the tightening torque reaches 1.2 N·m, as shown in [Figure 7-37](#).

Figure 7-37 Installing cable holders on a BBU



- Step 2** Wear ESD gloves or ESD wrist strap, and then slide the BBU into the cabinet along the guide rails using both hands.
- Step 3** Tighten four M6x16 screws on the panel until the tightening torque reaches 3 N·m, as shown in [Figure 7-38](#).

Figure 7-38 Installing a BBU



----End

7.4.2 Installing an SLPU

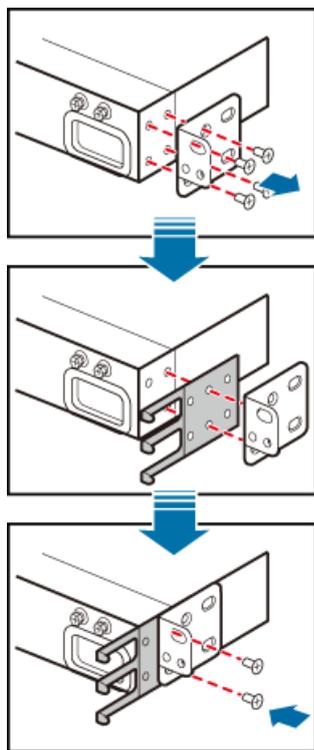
To protect trunk signals, an SLPU must be configured, which is installed in the 1 U space below the fan box on the top of the cabinet.

Procedure

- Step 1** Install cable holders for an SLPU, as shown in [Figure 7-39](#).
1. Remove the four bolts from the mounting ears of the SLPU.

2. Move a mounting ear backwards, place each cable holder between the mounting ear and the SLPU, and then align the mounting holes on the cable holder with those on the mounting ear and SLPU.
3. Use the four M4 screws that are removed in step [Step 1.1](#) to secure the mounting ears, cable holders, and SLPU until the tightening torque reaches 1.2 N·m.

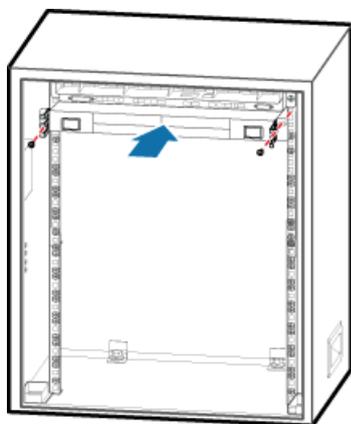
Figure 7-39 Installing cable holders on an SLPU



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- Step 2** Slide the SLPU along the guide rails into the cabinet, and then tighten two M6x16 screws on the panel until the tightening torque reaches 3 N·m, as shown in [Figure 7-40](#).

Figure 7-40 Installing an SLPU



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---End

7.4.3 Installing an SLPU

To protect monitoring signals, an SLPU may be configured, which is installed the 1 U space directly under the BBU.

Prerequisite

The tools, such as a screwdriver and a pair of ESD gloves, are available.

Context

The SLPU that is used to protect monitoring signals is configured with two Universal Signal Lightning Protection unit type 2 (USLP2s) before delivery. **Figure 7-41** shows the panel of the USLP2.

Figure 7-41 The panel of the USLP2

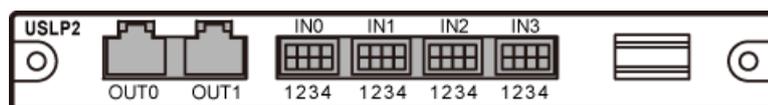


Figure 7-42 shows the mapping relationship between the pins in the input and output ports on the USLP2.

Figure 7-42 Mapping relationship between the pins in the input and output ports on the USLP2

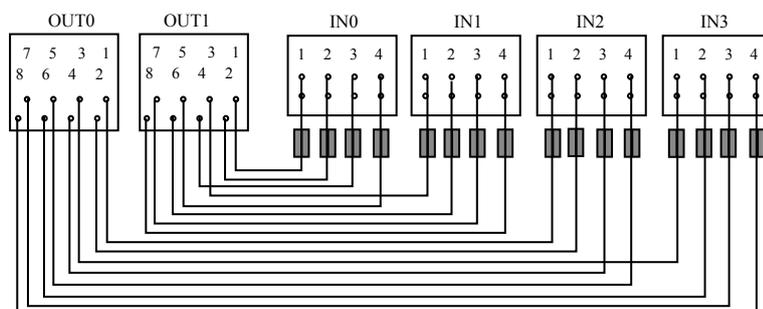


Table 7-2 lists the mapping relationship between the pins in the input and output ports on the USLP2.

Table 7-2 Mapping relationship between the pins in the input and output ports on the USLP2

Input		Output	
Label	Pin	Label	Pin
IN0	IN0.1	OUT1	OUT1.1

Input		Output	
Label	Pin	Label	Pin
	IN0.2		OUT1.2
	IN0.3		OUT1.4
	IN0.4		OUT1.5
IN1	IN1.1		OUT1.3
	IN1.2		OUT1.6
	IN1.3		OUT1.7
	IN1.4		OUT1.8
IN2	IN2.1		OUT0
	IN2.2	OUT0.2	
	IN2.3	OUT0.4	
	IN2.4	OUT0.5	
IN3	IN3.1	OUT0.3	
	IN3.2	OUT0.6	
	IN3.3	OUT0.7	
	IN3.4	OUT0.8	

Table 7-3 lists the SLPU-related cables.

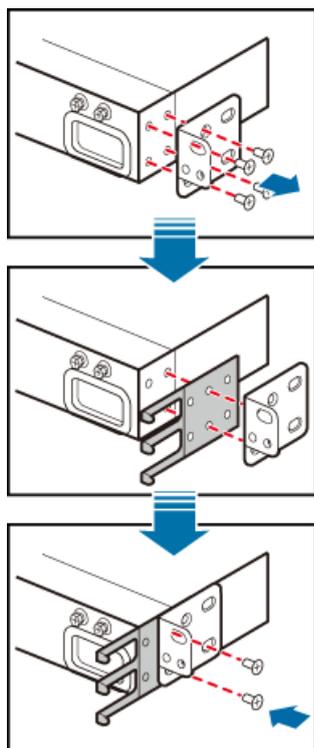
Table 7-3 SLPU-related cables

Cable	One End	The Other End	Remarks
Surge protection transfer cable for monitoring signals	RJ45 connector	RJ45 connector	Grey shielded straight-through cable
External dry-contact monitoring signal cable	Bare wire	Depending on the external equipment	-

Procedure

- Step 1** Install cable racks on both sides of the SLPU and ensure that the mounting ears are on the same plane as the SLPU panel, as shown in [Figure 7-43](#).

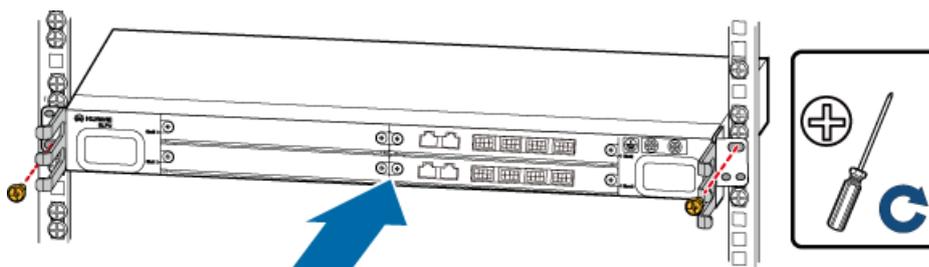
Figure 7-43 Installing cable racks



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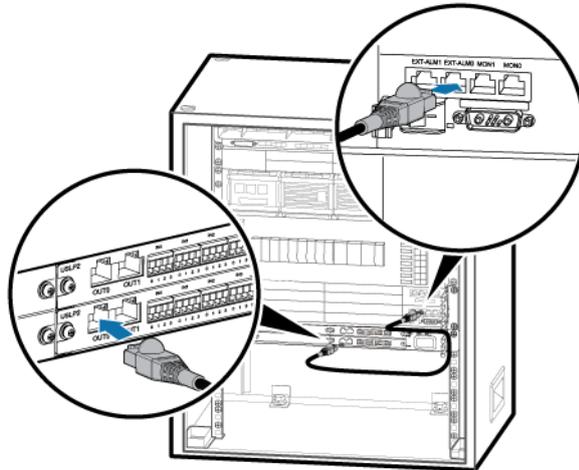
Step 2 Slide the SLPU into the cabinet, and then use the screwdriver to tighten the two screws on the mounting ears of the SLPU, as shown in [Figure 7-44](#).

Figure 7-44 Installing the SLPU



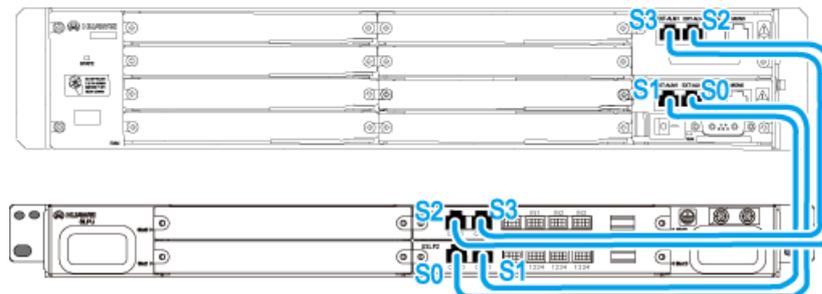
Step 3 Install the surge protection transfer cable for monitoring signals, as shown in [Figure 7-45](#).

Figure 7-45 Installing the surge protection transfer cable for monitoring signals



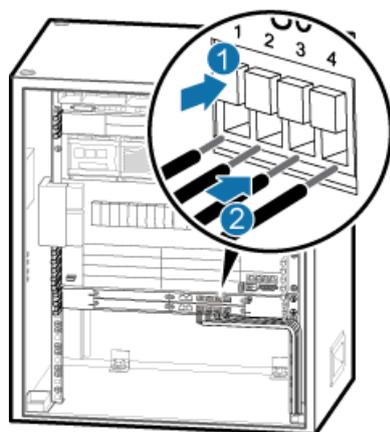
1. Connect one end of the cable to the OUT0 port on the USLFP2 in slot 3 of the SLPU.
2. Connect the other end of the cable to the EXT_ALM0 port on the UPEU in the BBU.
3. Connect the other three surge protection transfer cables for monitoring signals by referring to [Figure 7-46](#).

Figure 7-46 Connections of surge protection cables for monitoring signals



Step 4 Install the external dry-contact monitoring signal cables, as shown in [Figure 7-47](#).

Figure 7-47 External dry-contact monitoring signal cables



1. Cut the cable to the required length based on the actual cable route.
2. Strip 8 mm long jacket off the cable that is connected to the SLPU.
3. Use the screwdriver to press the bulge of the connector, insert the bare wire of the cable into the connector, and then loosen the screwdriver to fix the cable. After the cable is connected, slightly pull the cable to check whether the cable is securely connected.

Step 5 Route the cable by referring to [7.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 6 Label the installed cables by referring to Attaching an L-Shaped Label.

----End

7.4.4 (Optional) Installing a AC Heater

This section describes the procedures for installing a heater and related cables in a TMC11H. Heaters may be required in a TMC11H based on actual requirements.

Context

If an SOU is not installed in the cabinet, an AC heater is preferentially installed in the bottom 1 U space of the cabinet, as shown in [Figure 7-48](#). If an SOU is installed in the cabinet, an AC heater must be installed above the SOU, as shown in [Figure 7-49](#).

Figure 7-48 Position for installing an AC heater (1)

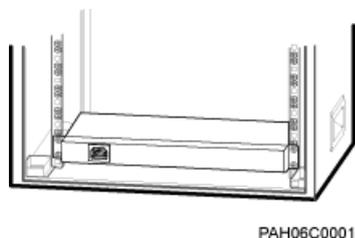
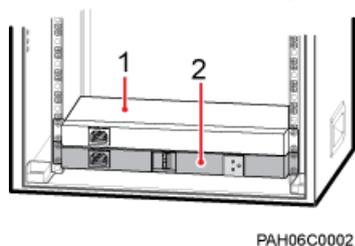


Figure 7-49 Position for installing an AC heater (2)



(1) AC heater

(2) SOU

Procedure

- Step 1** Slide an AC heater along the guide rails into the cabinet, and then tighten four M6x16 screws on the panel until the tightening torque reaches 3 N·m, as shown in **Figure 7-50**.

Figure 7-50 Installing an AC heater

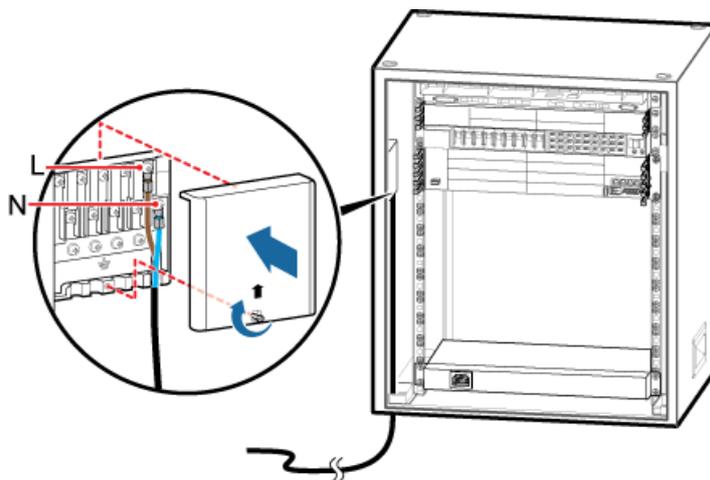


HIH06C0007

- Step 2** Install a power cable for the heater, as shown in **Figure 7-52**.

1. Remove the cover plate from the junction box.
2. Route the power cable for the junction box into the TMC11H along the left, link the OT terminal at one end of the cable to AC power input terminals labeled L and N in the junction box in the TMC11H, as shown in **Figure 7-51**.

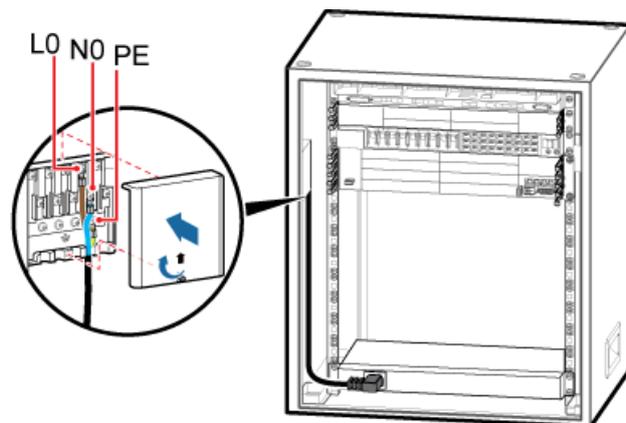
Figure 7-51 Installing the power cable for the junction box in the TMC11H



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3. Respectively connect the OT terminals on the brown, blue, and yellow and green wires at one end of the power cable for the heater to the L0, N0, and PE wiring terminals in the junction box.
4. Link the C13 connector at the other end to the power supply socket on the heater.

Figure 7-52 Installing a power cable for the AC heater



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Step 3 Route and bind the cables. For details, see [7.5.1 Cabling Requirements](#).

Step 4 Label the installed cables. For details, see [Attaching a Cable-Tying Label](#).

---End

7.4.5 (Optional) Installing an EMUA

This section describes the procedures for installing an EMUA and related cables in a TMC11H. An EMUA can be installed in the reserved 1 U space in the TMC11H based on actual requirements.

Prerequisite

The tools such as the screwdriver and ESD gloves are available.

Context

[Table 7-4](#) describes the cables related to the EMUA.

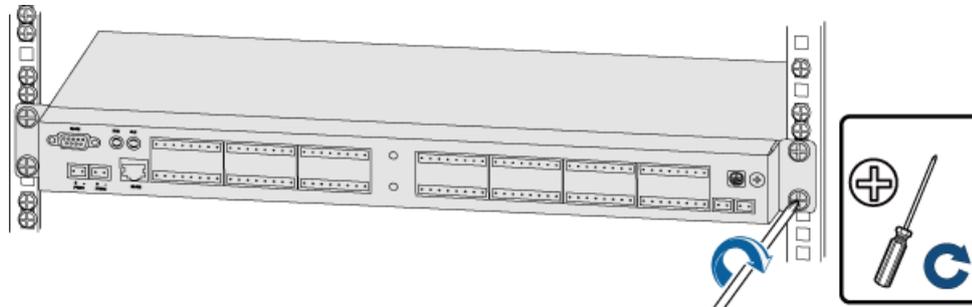
Table 7-4 Cables related to the EMUA

Cable List		One End	The Other End	Remarks
Power cable for the EMUA	RTN(+) cable	M4 OT terminal	Cord end terminal	Black, 1.5 mm ² , two wires in black and blue
	NEG(-) cable	M4 OT terminal	Cord end terminal	
EMUA monitoring signal cable		DB9 male connector	RJ45 connector	Black

Procedure

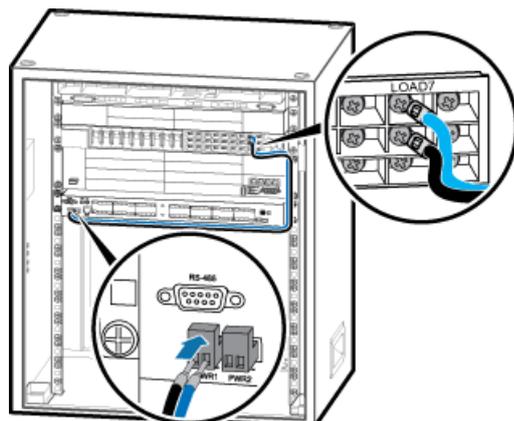
Step 1 Use four screws to install the EMUA in the TMC11H cabinet, as shown in [Figure 7-53](#).

Figure 7-53 Installing the EMUA in the cabinet



Step 2 [Figure 7-54](#) shows the connection of the power cable for the EMUA.

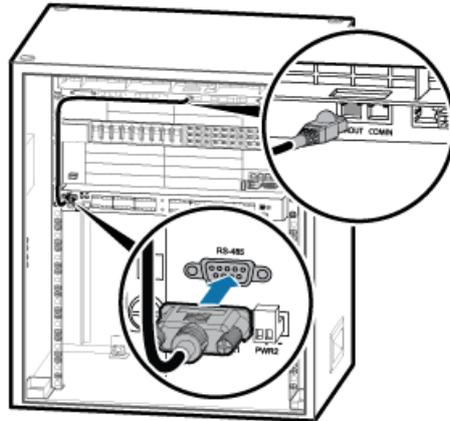
Figure 7-54 Installing the power cable for the EMUA



1. Install corresponding connectors on both ends of the power cable. For details, see [Assembling the OT Terminal and the Power Cable](#) and [Assembling the Cord End Terminal and the Power Cable](#).
2. Connect the cord end terminal at one end of the power cable to the transfer terminal of the wiring terminal labeled **PWR1** of the EMUA power cable.
3. Connect the OT terminal at the other end of the power cable to the DC output terminal labeled **LOAD7** on the DCDCU-03.

Step 3 [Figure 7-55](#) shows the connection of the EMUA monitoring signal cable.

Figure 7-55 Installing the EMUA monitoring signal cable



1. Connect the DB9 male connector at one end of the signal cable to the wiring terminal labeled **RS-485** in left of the EMUA panel.
2. Connect the RJ-45 connector at the other end of the signal cable to **COM OUT** of the EMUA in the cabinet.

Step 4 Route the cables by referring to [7.5.1 Cabling Requirements](#) and use cable ties to bind the cables.

Step 5 Attach labels to the installed power cable and monitoring signal cable. For details, see Attaching a Sign Plate Label and Attaching an L-Shaped Label.

---End

7.4.6 Installing the GPS Surge Protector

This section describes the procedure and precautions for installing the GPS surge protector and related cables.

Context

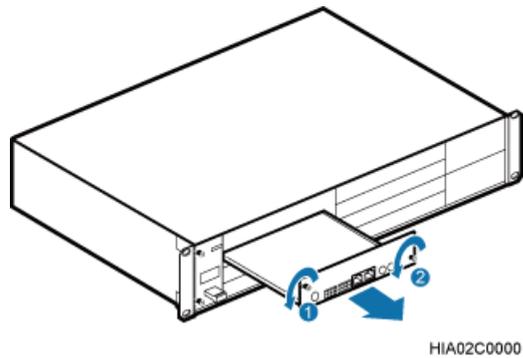
 **NOTE**

Only a dual-satellite receiver needs to be installed onsite.

Procedure

Step 1 Remove the two M3 screws on the panel, and then pull out the USCU, as shown in [Figure 7-56](#).

Figure 7-56 Removing the USCU.



Step 2 Install a satellite receiver on the USCU, as shown in [Figure 7-57](#).

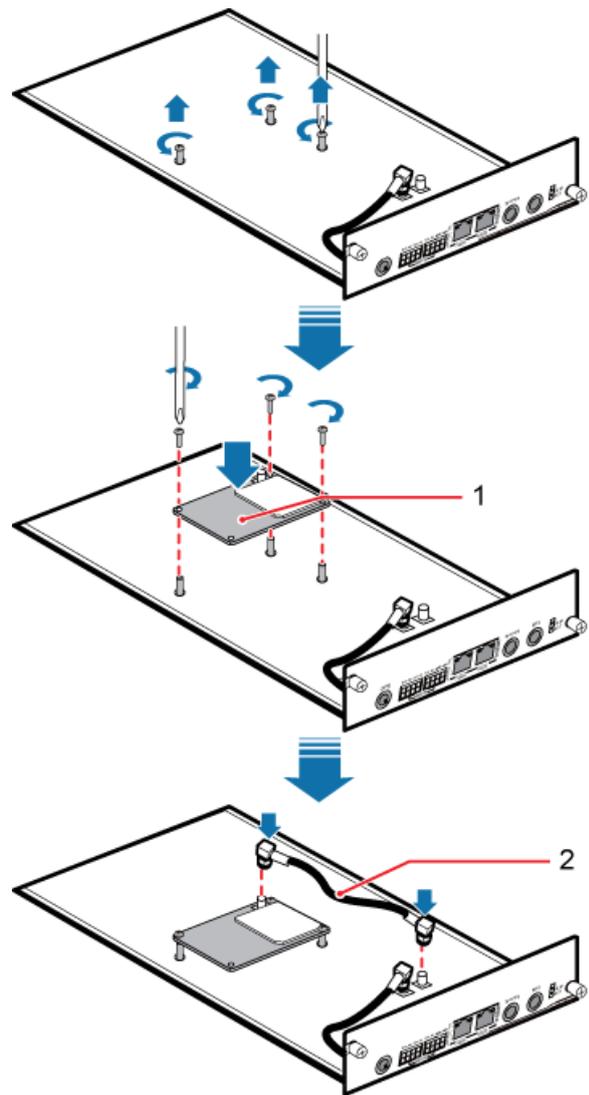
1. Remove the three M1.6 screws from the USCU.
2. Align the mounting holes on the satellite receiver with the bolts on the USCU.
3. Tighten the three M1.6 screws that were removed in [Step 2.1](#) to 0.1 N·m.
4. Connect one end of the RF jumper to the RF port on the satellite receiver and the other end to the GPS port on the USCU.



CAUTION

There are six mounting holes on the satellite receiver. You need to install only three screws on the receiver, as shown in [Figure 7-57](#)

Figure 7-57 Installing the satellite receiver on the USCU



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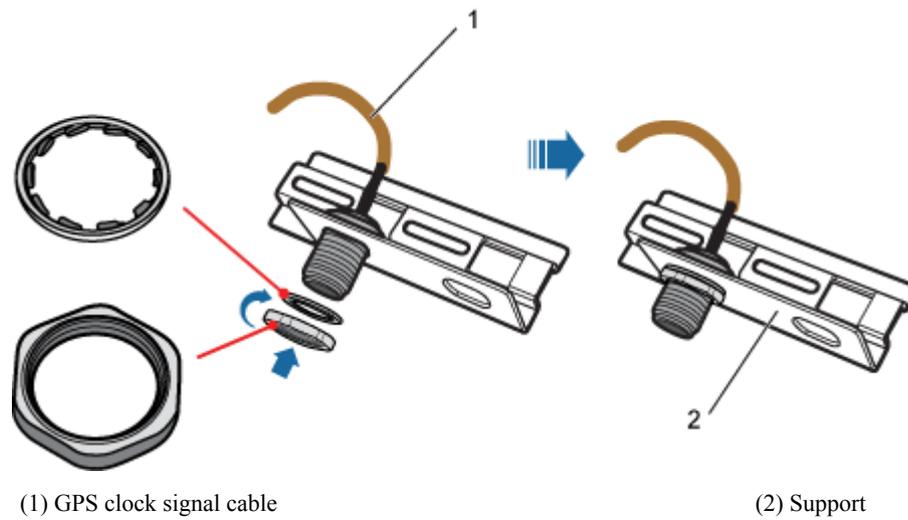
(1) Satellite receiver

(2) RF jumper

Step 3 Install the USCU equipped with the satellite receiver into the BBU, and tighten the screws on the USCU to 0.6 N·m.

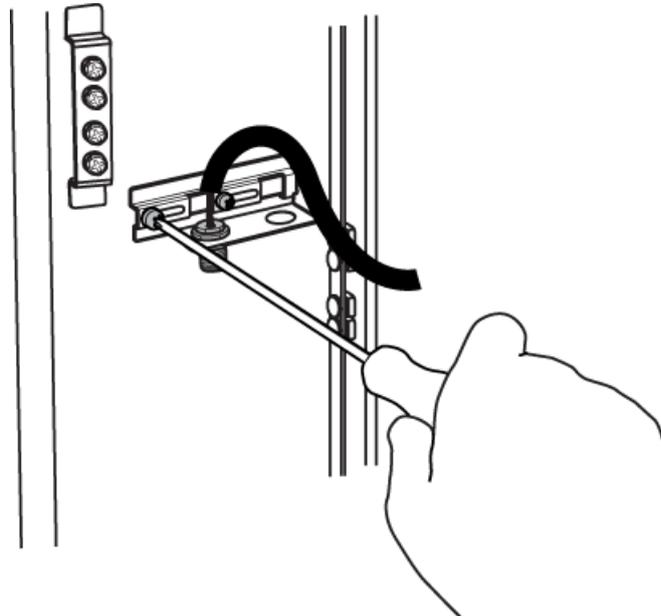
Step 4 Install the GPS clock signal cable on the support, as shown in [Figure 7-58](#).

Figure 7-58 Installing the GPS clock signal cable on the support



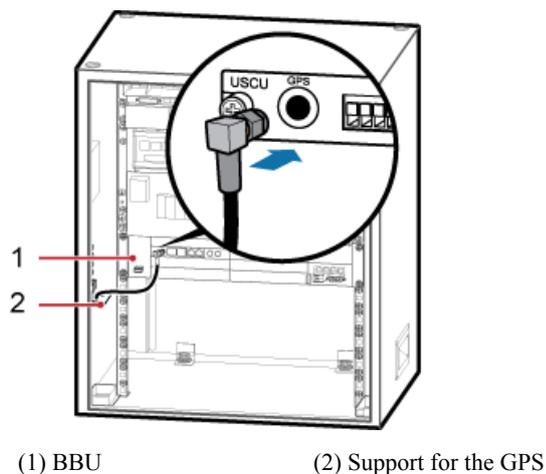
Step 5 Install the support on the left of the cabinet, as shown in [Figure 7-59](#).

Figure 7-59 Installing the support on the cabinet



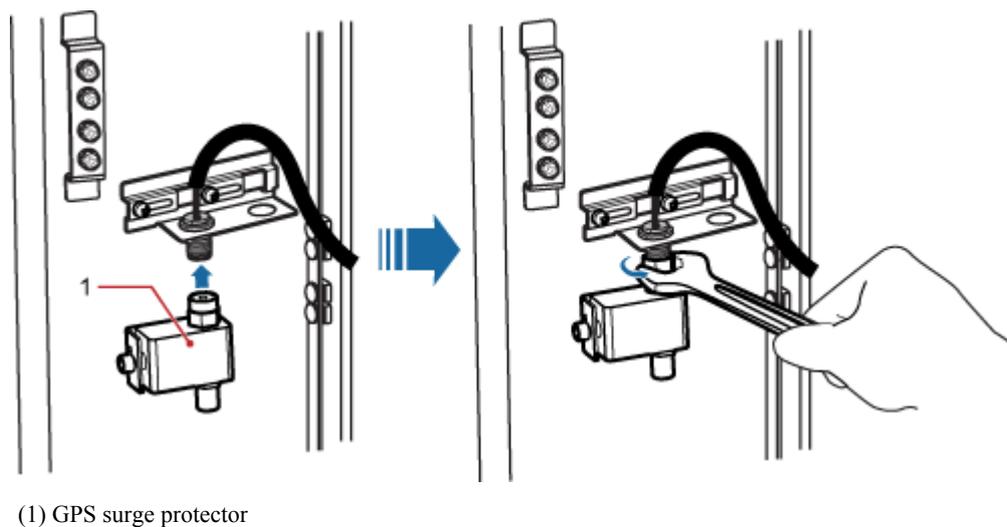
Step 6 Connect the GPS clock signal cable to the GPS port on the USCU, as shown in [Figure 7-60](#).

Figure 7-60 Installing the GPS clock signal cable on the USCU



Step 7 Install the GPS surge protector, as shown in **Figure 7-61**.

Figure 7-61 Installing the GPS surge protector

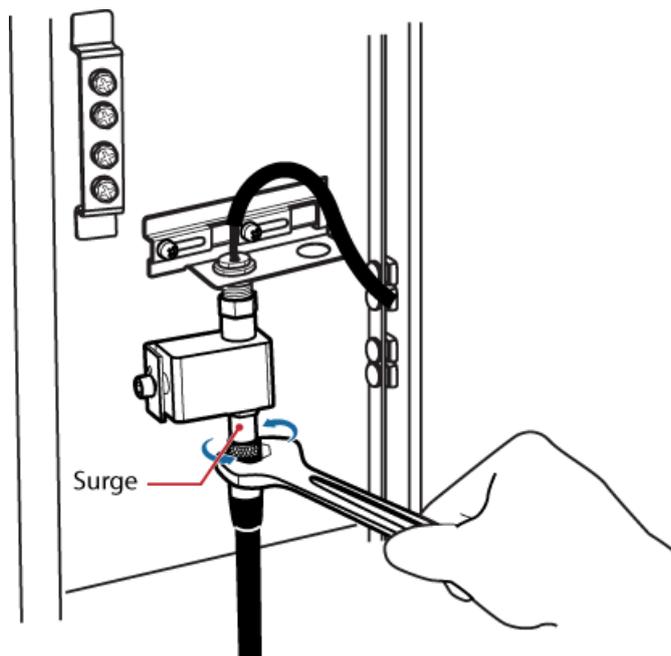


NOTE

The figure of the GPS surge protector is for reference only. The actual appearance may be different.

Step 8 Install the GPS jumper, as shown in **Figure 7-62**.

Figure 7-62 Installing the GPS jumper



Step 9 Route the cable by referring to [7.5.1 Cabling Requirements](#).

Step 10 Attach labels to the installed cable. For details, see Attaching a Sign Plate Label.

---End

7.5 Installing Cables

This section describes the procedures and precautions to be taken for installing power cables, transmission cables, monitoring signal cables, and CPRI cables when a DBS3900 is deployed outdoors with DC power supply and the BBU is installed in a TMC11H.

7.5.1 Cabling Requirements

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

NOTE

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

General Cabling Requirements

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

- The bending radius of the 7/8" feeder must be more than 250 mm (9.84 in.), and the bending radius of the 5/4" feeder must be more than 380 mm (14.96 in.).
- The bending radius of the 1/4" jumper must be more than 35 mm (1.38 in.). The bending radius of the super-flexible 1/2" jumper must be more than 50 mm (1.97 in.), and the bending radius of the ordinary 1/2" jumper must be more than 127 mm (5 in.).

- The bending radius of the power cable or PGND cable must be at least five times the diameter of the cable.
- The bending radius of a fiber optic cable is at least 20 times the diameter of the fiber optic cable.
- The bending radius of the E1/T1 cable must be at least five times the diameter of the cable.
- The bending radius of the signal cable must be at least five times the diameter of the cable.

The cables must be bound as follows:

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

The cables must be routed as follows:

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

Special Cabling Requirements

Cabling requirements for power cables are as follows:

- -48 V power cables must be bound together.
- +24 V power cables must be bound together.
- Power cables, transmission cables, and signal cables are routed separately.
- Multiple power cables must be bound when routed.
- Power cables must be installed in the position specified in engineering design documents.
- If the length of power cables is insufficient, replace the cables rather than adding connectors or soldering joints to lengthen the cables.

Cabling requirements for PGND cables are as follows:

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

Cabling requirements for E1 cables are as follows:

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

Cabling requirements for fiber optic cables are as follows:

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

7.5.2 Installing a Cable Outlet Module in a Cabinet

During cable installation, you must lead the cables through the cable outlet modules at both sides of the bottom of the cabinet for effective sealing.

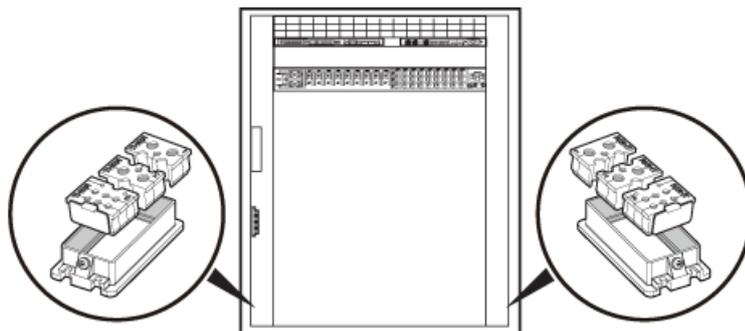
Context

There is a cable outlet module at each side of the bottom of an APM30H, TMC11H, IBBS200D, or IBBS200T, as shown in [Figure 7-63](#).

NOTE

- Cable outlet modules for an APM30H, TMC11H, IBBS200D, or IBBS200T are the same. The following description is based on the cable outlet modules in a TMC11H.
- When two IBBS200Ds or two IBBS200Ts are stacked, you do not need to install cable outlet modules in the upper IBBS.

Figure 7-63 Cable outlet modules in a TMC11H



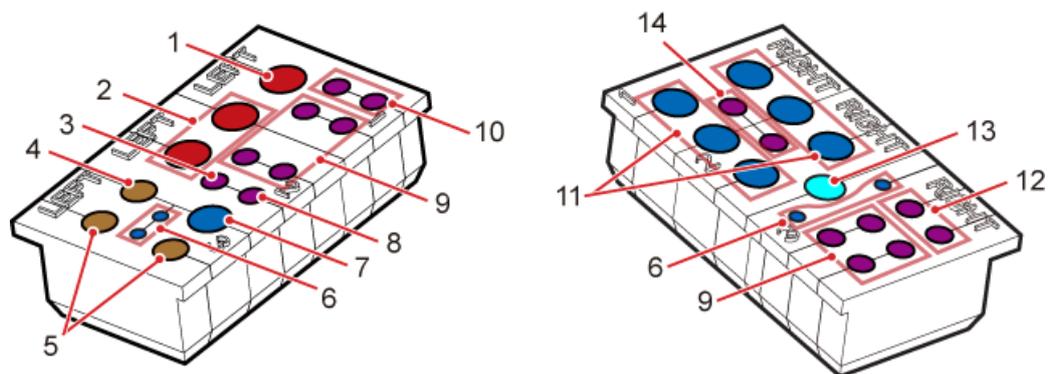
[Figure 7-64](#) shows the exterior of cable outlet modules of the TMC11H.

NOTE

- The cables can be routed through proper cable holes as required.
- The recommended cable routes through the cable outlet module is shown in [Figure 7-64](#). Different color indicates different cross-sectional areas of cables. The same color indicates the same cross-sectional area. You can route the cables that are not mentioned through vacant cable holes matching their cross-sectional areas.

Different colors of cable holes in the figure stand for different cable diameters.

Figure 7-64 Cable outlet modules of the TMC11H



PAD00C0376

- | | |
|--|--|
| (1) Cable hole for an AC input power cable | (8) Cable hole for an SDH cable |
| (2) Cable holes for GPS jumpers (1/2") | (9) Cable holes for CPRI optical cables |
| (3) Cable hole for a PGND cable | (10) Cable holes for AC output power cables, or DC output power cables |
| (4) Cable hole for an E1/T1 cable, or a GPS jumper (RG8) | (11) Cable holes for RRU power cables |
| (5) Cable holes for E1/T1 cables | (12) Cable holes for power cables for storage batteries |
| (6) Cable holes for DC output power cables (of the TMC and IBBS's FAN/TEC) | (13) Cable hole for a Boolean alarm signal cable, or an E1/T1 cable |
| (7) Cable hole for an fiber optic cable | (14) Cable holes for RS485 signal cables |

Procedure

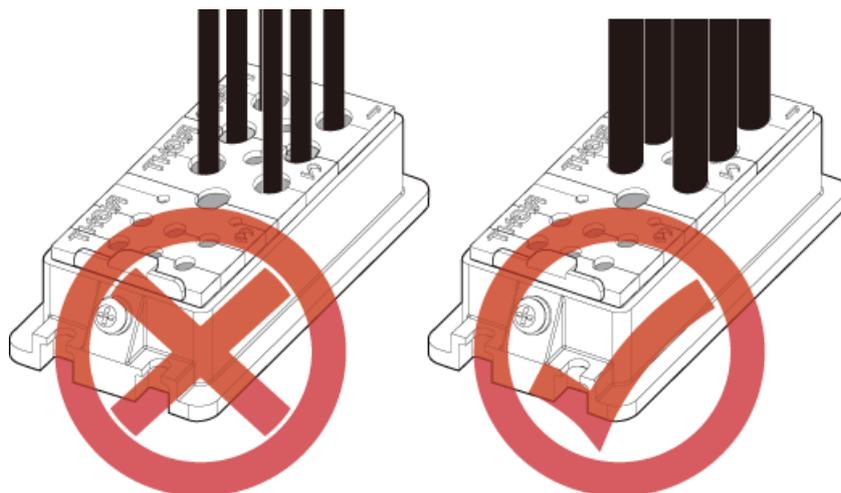
- Step 1** Lead cables with different cross-sectional areas through the cable outlet modules based on the apertures of the holes in the modules, and then insert the cable outlet modules into the cable outlets of the cabinet.



CAUTION

Lead a cable through the cable hole with an aperture matching the cross-sectional area of the cable for effective sealing, as shown in [Figure 7-65](#).

Figure 7-65 Leading cables through cable outlet modules



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Step 2 Use rubber caps to seal the idle cable holes.

Step 3 Tighten the screws in the front of the cable module to fix the module.

----End

7.5.3 Installing Power Cables

When a DBS3900 is deployed outdoors with DC power supply and the BBU is installed in a TMC11H, power cables such as an input power cable for the TMC11H, BBU power cable, and RRU power cables must be installed.

Installing an Input Power Cable for the TMC11H

An input power cable for the TMC11H connects a TMC11H to external power equipment, feeding external power into the TMC11H.

Prerequisite

- The tools, such as a Phillips screwdriver, a cable cutter, and a multi-purpose crimping tool, are ready.
- The PGND cable and equipotential cable are installed.

Context

Table 7-5 lists the specifications of an input power cable for the TMC11H.

Table 7-5 Specifications of an input power cable for the TMC11H

Cable		One End	The Other End	Description
Input power cable for the TMC11H	RTN(+) wire	OT terminal (M6, 4 mm ²)	Depending on the external equipment	Black

Cable		One End	The Other End	Description
	NEG(-) wire	OT terminal (M6, 4 mm ²)	Depending on the external equipment	Blue

Procedure

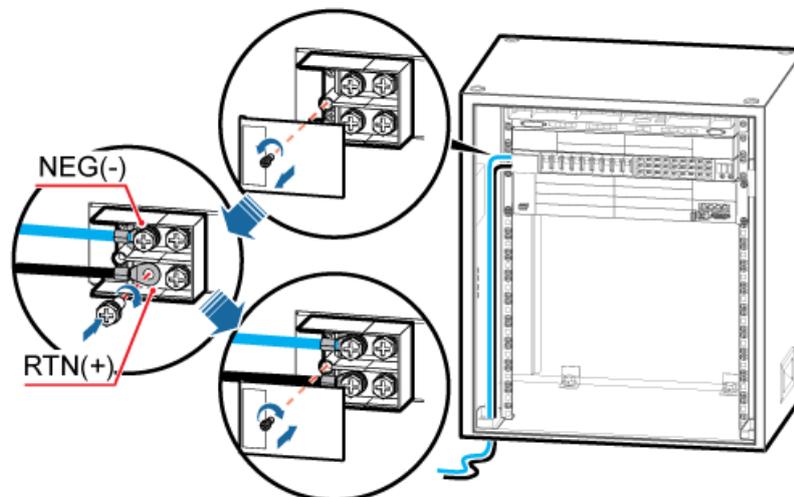
Step 1 Prepare an input power cable for the TMC11H.

1. Prepare the cable of proper length based on the actual cable route.
2. Add connectors to both ends of the input power cable for the TMC11H according to [Table 7-5](#). For details, see Assembling the OT Terminal and the Power Cable.

Step 2 Install the input power cable for the TMC11H, as shown in [Figure 7-66](#).

1. Link the OT terminals on the blue and black wires at one end of the input power cable for the TMC11H to the wiring terminals labeled NEG(-) and RTN(+) on the DCDCU-03B in the TMC11H respectively.
2. Connect the other end to external power equipment.

Figure 7-66 Installing an input power cable for the TMC11H



Step 3 Route the cable by referring to [7.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 4 Label the installed cables. For details, see Attaching a Cable-Tying Label.

Step 5 Run each cable that leaves the cabinet in the PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

---End

Installing a BBU Power Cable

A BBU power cable feeds power into a BBU.

Context

- In the triple mode scenario, two BBUs are required. A second BBU power cable is installed in the same manner as the first BBU power cable.
- **Table 7-6** lists the specifications for a BBU power cable when a DCDU-03B supplies power.

Table 7-6 Specifications of a BBU power cable

Cable		One End	The Other End	Description
BBU power cable	RTN(+) wire	3V3 power connector	OT terminals bent by 90° (M4, 6 mm ²)	Black
	NEG(-) wire		OT terminals bent by 90° (M4, 6 mm ²)	Blue

 **NOTE**

The colors and structures of cables vary according to countries and areas. If the cables are purchased locally, the colors and structures of the cables may be different.

Procedure

- Step 1** Add OT terminals to a BBU power cable. For details, see *Assembling the OT Terminal and the Power Cable*.

 **NOTE**

A 3V3 power connector is added to one end of a BBU power cable, and you only need to add OT terminals to the other end onsite.

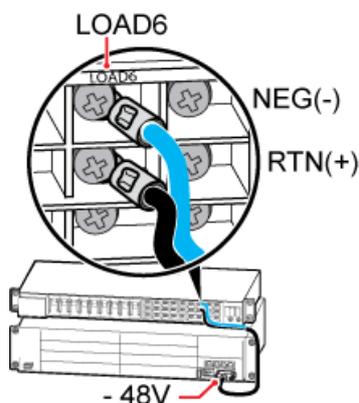
- Step 2** Install the BBU power cable, as shown in **Figure 7-67**.

1. Link the 3V3 power connector at one end of the BBU power cable to the -48 V port on the UPEU in the BBU, and then tighten the screw on the connector until the tightening torque reaches 0.25 N·m.
2. Link the OT terminals on the blue and black wires at the other end to the wiring terminals labeled NEG(-) and RTN(+) near the LOAD6 label on the DCDU-03B respectively.

 **NOTE**

A BBU power cable must be connected to each UPEU if two UPEUs are installed in the BBU. The 3V3 power connector at one end of each BBU power cable is connected to the -48V port on each UPEU in the BBU, and the easy power receptacle (pressfit type) connectors at the other end are connected to the LOAD6 and LOAD7 ports on the DCDU-03B, respectively.

Figure 7-67 Installing a BBU power cable



Step 3 Route the cable by referring to [7.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 4 Label the installed cables. For details, see Attaching an L-Shaped Label.

---End

Installing an RRU Power Cable

An RRU power cable feeds -48 V DC power into an RRU from a DCDU-03B.

Context

[Table 7-7](#) lists the specifications of RRU power cables when a DCDU-03B supplies power.

Table 7-7 Specifications of RRU power cables

Cable		One End	The Other End	Remarks
RRU power cable	RTN(+) wire	OT terminals bent by 90° [M4, 3.3 mm ² (12 AWG)]	OT terminal [M4, 3.3 mm ² (12 AWG)]	North American standard Black
	NEG(-) wire	OT terminals bent by 90° [M4, 3.3 mm ² (12 AWG)]	OT terminal [M4, 3.3 mm ² (12 AWG)]	North American standard Blue
	Shield layer	OT terminals bent by 90° [M4]		Heat shrink tubing Black
RRU power cable	RTN(+) wire	OT terminals bent by 90° (M4, 4 mm ²)	OT terminal (M4, 4 mm ²)	European standard Brown

Cable		One End	The Other End	Remarks
	NEG(-) wire	OT terminals bent by 90° (M4, 4 mm ²)	OT terminal (M4, 4 mm ²)	European standard Blue
	Shield layer	OT terminals bent by 90° [M4]		Heat shrink tubing Black
RRU power cable	RTN(+) wire	OT terminals bent by 90° (M4, 4 mm ²)	Easy power receptacle (pressfit type) connector	
	NEG(-) wire	OT terminals bent by 90° (M4, 4 mm ²)		

 **NOTE**

The colors and structures of cables vary according to countries and areas. If the cables are purchased locally, the colors and structures of the cables may be different.

Procedure

Step 1 Prepare an RRU power cable.

- Cut the cable to the required length based on the actual cable route.
- Add OT terminals to the blue, black (or brown) wires and shield layer of the RRU power cable at the DCDU-03B end, as shown in Adding OT Terminals to the DC RRU Power Cable on the DCDU Side.
- Add OT terminals or an easy power receptacle (pressfit type) connector to the other end of the RRU power cable according to the type of power supply socket on the RRU.
 - Add an OT terminal. For details, see the related RRU Installation Guide.
 - Add an easy power receptacle (pressfit type) connector. For details, see the related RRU Installation Guide.

Step 2 Install the RRU power cable, as shown in [Figure 11-17](#).

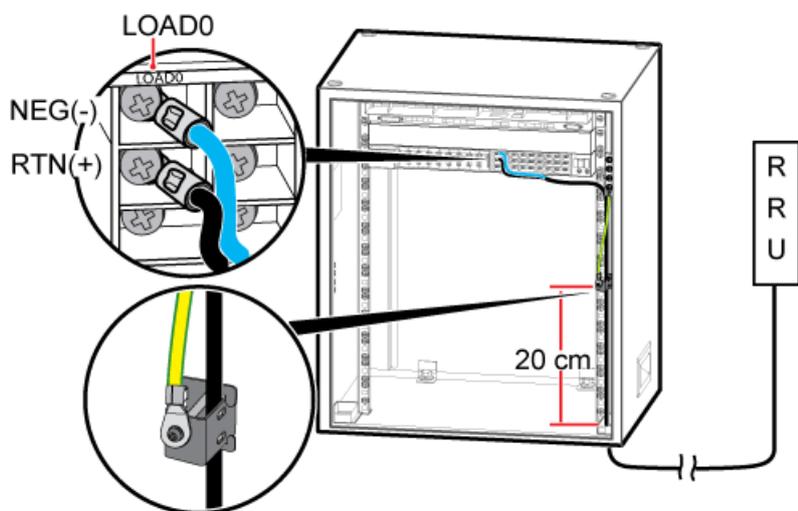
- Link the OT terminals on the blue, black (or brown) wires and shield layer of the RRU power cable to the wiring terminals labeled NEG(-), RTN(+) and PGND near the LOAD0 label on the DCDU-03B respectively.

 **NOTE**

A DCDU-03B supplies power to a maximum of six RRUs, and an RRU power cable can be connected to any of the wiring terminals labeled LOAD0 to LOAD5 on the DCDU-03B.

- Connect the blue and black (or brown) wires at the other end to the wiring terminals labeled NEG(-) and RTN(+) in the cabling cavity of the RRU respectively.

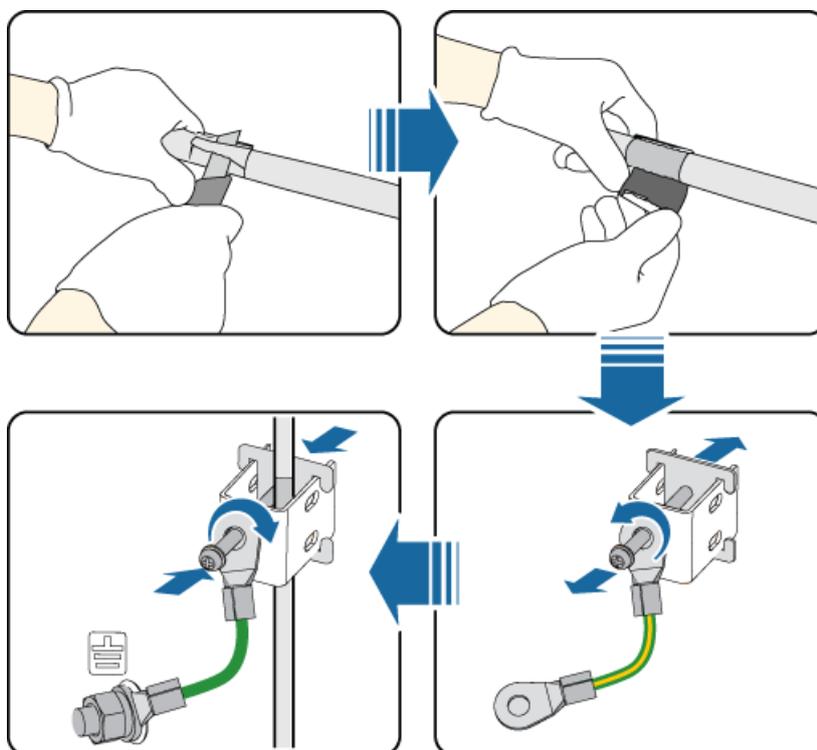
Figure 7-68 Installing an RRU power cable



CIH06C2001

- Step 3** In a position 20 cm away from the cable outlet module, strip the jacket for about 25 mm off the RRU power cable to expose the shield layer. Thread the cable through the ground clip to ensure full contact between the shield layer and the ground clip, and then tighten the M4 screws on the clip until the tightening torque reaches 1.2 N·m, as shown in [Figure 7-69](#).

Figure 7-69 Installing a grounding clip



- Step 4** Route the cable by referring to [7.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.

- Step 5** Run each cable that leaves the cabinet in the PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

---End

7.5.4 Installing Transmission Cables

When a DBS3900 is deployed outdoors, transmission cables such as an E1/T1 cable, E1/T1 surge protection cable, FE/GE surge protection cable, FE/GE cable, or FE/GE optical cable must be installed based on onsite requirements.

Context



NOTE

Install the transmission cables based on the connections of transmission cables. For details, see the *BBU3900 Hardware Description* Transmission Cable Connections.

Installing an E1/T1 Surge Protection Transfer Cable

An E1/T1 surge protection transfer cable connects the transmission board and surge protection unit for transferring surge protection signals.

Context



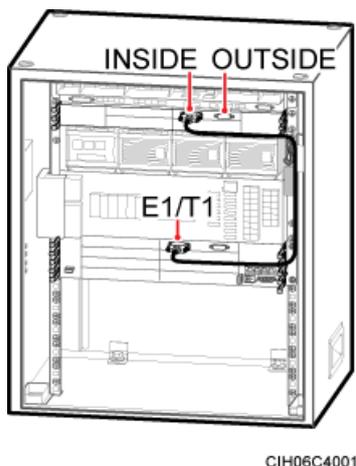
NOTE

The procedures for installing E1/T1 surge protection transfer cables in an APM30H and in a TMC11H are the same. The following description is based on the procedure for installing an E1/T1 surge protection transfer cable in an APM30H.

Procedure

- Step 1** Install an E1/T1 surge protection transfer cable, as shown in [Figure 7-70](#).
1. Link the DB26 connector at one end of the E1/T1 surge protection transfer cable to the E1/T1 port on the GTMU, WMPT, or UTRP in the BBU, and then tighten the plastic screws on the connector until the tightening torque reaches 0.25 N·m.
 2. Link the DB25 connector at the other end to the INSIDE port on the UELP in the SLPU, and then tighten the plastic screws on the connector until the tightening torque reaches 0.25 N·m.

Figure 7-70 Installing an E1/T1 surge protection transfer cable



Step 2 Route the cables by referring to [7.5.1 Cabling Requirements](#), and then use cable ties to bind the cables.

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

----End

Installing the E1/T1 Cable

This section describes the procedure and precautions to be taken for installing an E1/T1 cable.

Prerequisite

Ensure that both ends of the E1 cable are disconnected from any devices. Then, weld connectors to the bare wires at one end of the E1 cable during the same session.

Context

Route the E1/T1 cable as follows:

- If a new base station supports not more than eight E1s, route the ends of the E1/T1 cables connected to the SLPUs along the right of the cabinet.
- If a new base station supports more than eight E1s, route the ends of other E1/T1 cables connected to the SLPUs along the left of the cabinet.

NOTE

The descriptions about the installation positions and routes of the E1/T1 cables in the -48 V DC cabinet and in the APM30H are the same. For details, see [Figure 7-71](#) or [Figure 7-72](#).

Procedure

Step 1 Connect one end of the E1/T1 cable to the OUTSIDE port on the UELP, as shown in [Figure 7-71](#) or [Figure 7-72](#).

NOTE

For details about how to connect the E1/T1 cable, see Transmission Cable Connections.

Figure 7-71 Installing the E1/T1 cable (1)

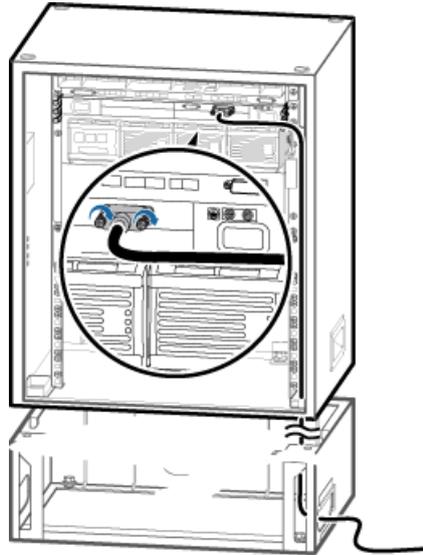
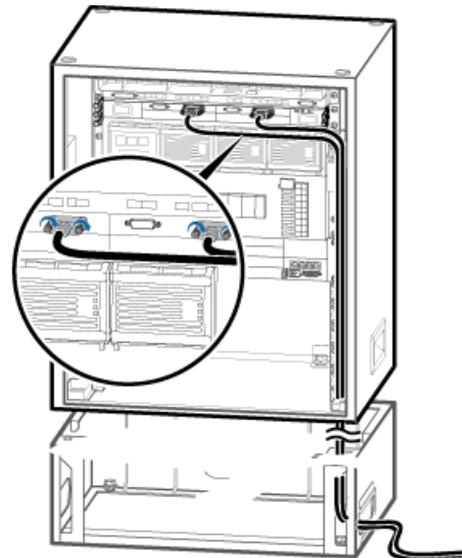


Figure 7-72 Installing the E1/T1 cable (2)



- Step 2** Lead the other end of the E1/T1 cable out of the cabinet through the cable hole at the bottom along the right of the cabinet.
- Step 3** Route the cable along the right of the cabinet by referring to [7.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.
- Step 4** Label the installed cables by referring to Attaching an L-Shaped Label.

----End

Installing a FE/GE Surge Protection Transfer Cable

A FE/GE surge protection transfer cable connects a transmission board and the UFLP, transferring surge protection transfer signals.

Context

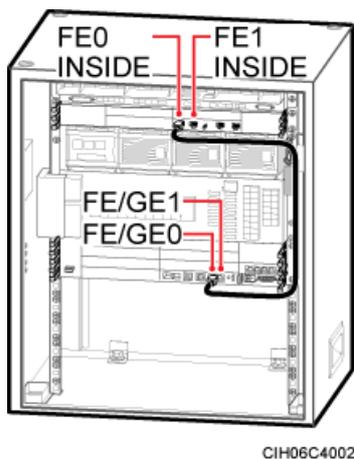
NOTE

- The procedures for installing FE/GE surge protection transfer cables in an APM30H and in a TMC11H are the same. The following description is based on the procedure for installing a FE/GE surge protection transfer cable in an APM30H.

Procedure

- Step 1** Install a FE/GE surge protection transfer cable, as shown in [Figure 7-73](#).
1. Link the RJ45 connector at one end of the FE/GE surge protection transfer cable to the FE0 port on the GTMU or WMPT in the BBU.
 2. Connect the other end to the FE0 or FE1 port near the INSIDE label on the UFLP in the SLPU.

Figure 7-73 Installing a FE/GE surge protection transfer cable



- Step 2** Route the cables by referring to [7.5.1 Cabling Requirements](#), and then use cable ties to bind the cables.
- Step 3** Label the installed cables by referring to Attaching an L-Shaped Label.

----End

Installing the FE/GE Cable

This section describes the procedure and precautions to be taken for installing an FE/GE cable.

Procedure

- Step 1** Connect one end of the FE/GE cable to the FE0 or FE1 port near the OUTSIDE label on the UFLP, as shown in [Figure 7-74](#) or [Figure 7-75](#).

 **NOTE**

- You must use shielded straight-through FE/GE cable.
- For details about how to connect the FE/GE cable, see Transmission Cable Connections.
- The descriptions about the installation positions and routes of the FE/GE cables in the -48 V DC cabinet and in the APM30H are the same. For details, see [Figure 7-74](#).

Figure 7-74 Installing the FE/GE cable (1)

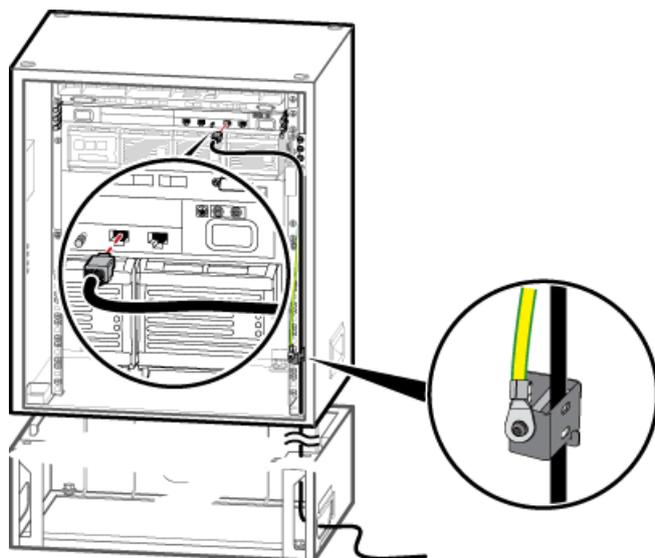
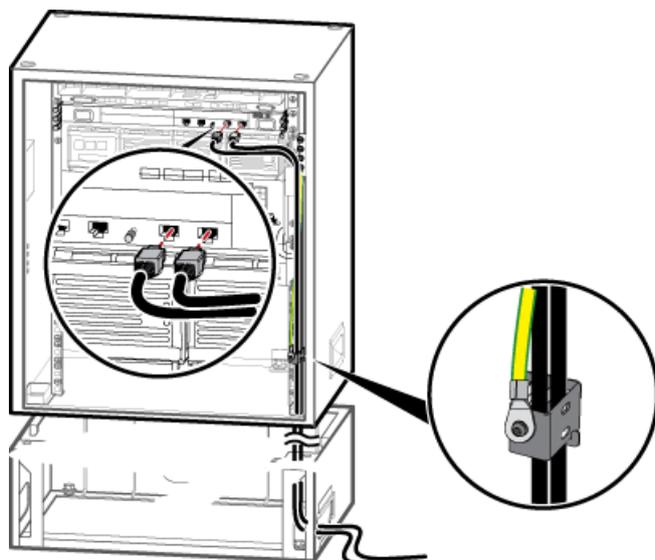


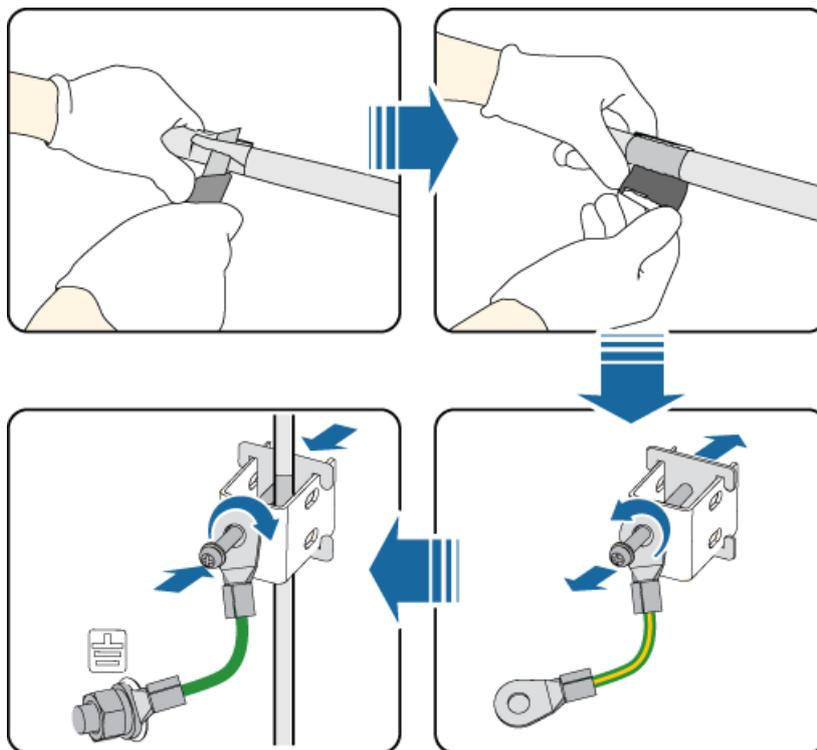
Figure 7-75 Installing the FE/GE cable (2)



Step 2 Install a ground clip for the FE/GE cable in a proper position within 1 m from the cable outlet of the cabinet, as shown in [Figure 7-76](#).

1. Determine the position for grounding the FE/GE cable, and strip the sheath off the cable for about 25 mm to expose the shield layer.
2. Loosen the screws on the ground clip, and route the FE/GE cable through the clip.
3. Make the shield layer of the FE/GE cable in full contact with the ground clip, and tighten the M4 screws on the clip until the tightening torque reaches 1.2 N·m.

Figure 7-76 Installing a grounding clip



- Step 3** Lead the other end of the FE/GE cable out of the cabinet through the cable hole at the bottom along the right of the cabinet.
- Step 4** Route the cable along the right of the cabinet by referring to [7.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.
- Step 5** Label the installed cables by referring to Attaching an L-Shaped Label.

----End

Installing a FE/GE Optical Cable

This section describes the procedure and precautions to be taken for installing a FE/GE optical cable.

Context

- The single-mode optical module is labeled "SM" and multi-mode optical module is labeled "MM".

- If the puller of an optical module is blue, the module is a single-mode optical module. If the puller of an optical module is black or grey, the module is a multi-mode optical module.
- The optical module to be installed must have a matching rate with the corresponding CPRI port.



CAUTION

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



NOTE

The procedures for installing FE/GE optical cables in an APM30H and in a TMC11H are the same. The following description is based on the procedure for installing a FE/GE optical cable in an APM30H.



NOTE

When an LTE only base station uses FE/GE transmission, FE/GE optical cables are usually used for data transmission. The following description is based on the configuration of an LTE only base station.

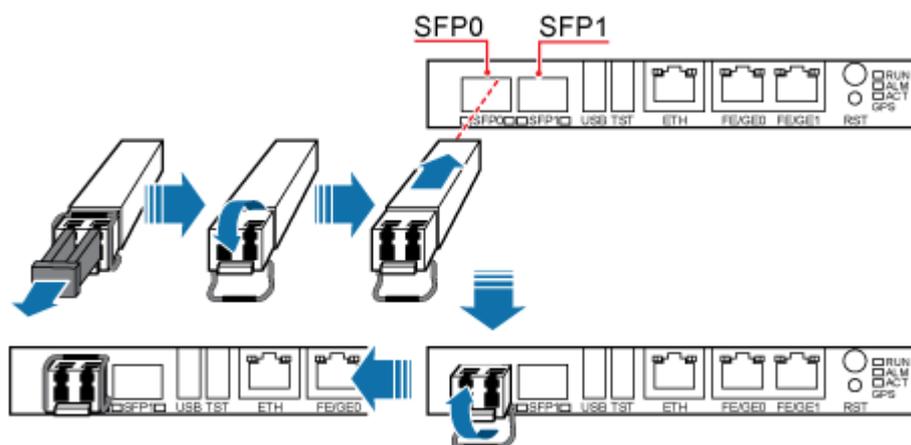
SFP0 and FE/GE0 ports on an LMPT are used for one GE input. Therefore, they cannot be used simultaneously.

SFP1 and FE/GE1 ports on an LMPT are used for another GE input. Therefore, they cannot be used simultaneously.

Procedure

- Step 1** Turn the puller of an optical module outwards, and then insert the optical module into the SFP0 or SFP1 port on the LMPT, as shown in [Figure 7-77](#).

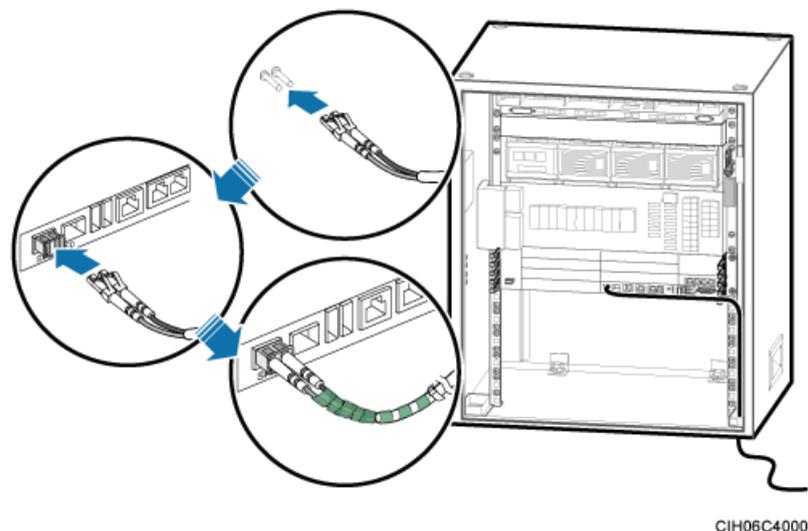
Figure 7-77 Installing an optical module



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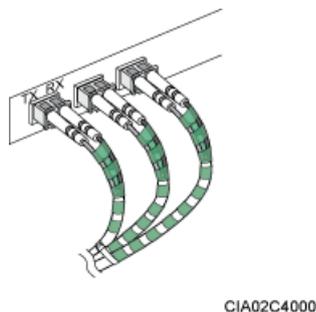
- Step 2** Insert a FE/GE optical cable into the optical module, as shown in [Figure 7-78](#).

Figure 7-78 Installing a FE/GE optical cable



- Step 3** Route the FE/GE optical cable along the cable trough on the right of the cabinet, and then use cable ties to bind the cable.
- Step 4** Route the cable by referring to [7.5.1 Cabling Requirements](#).
- Step 5** Attach labels on the optical cable. For details, see Attaching a Sign Plate Label.
- Step 6** Coil the optical fiber with winding plastic tape at the end connected to the BBU. The tape is coiled between the optical connector and the first cable tie on the cabinet, as shown in [Figure 7-79](#).

Figure 7-79 Coiling the optical fiber with winding plastic tape



----End

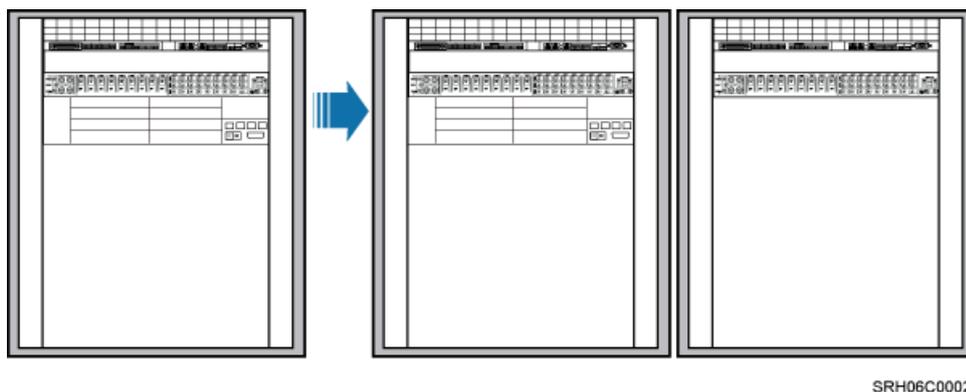
7.5.5 Installing Monitoring Signal Cables

When a DBS3900 is configured with one TMC11H, a monitoring signal cable between the CMUA and the BBU must be installed in the TMC11H. If another TMC11H is configured, another monitoring signal cable is required.

Context

Based on the transmission space requirements of customers, the configuration can be expanded from one TMC11H to two TMC11Hs, as shown in [Figure 7-80](#).

Figure 7-80 Expanding the configuration from one TMC11H to two TMC11Hs



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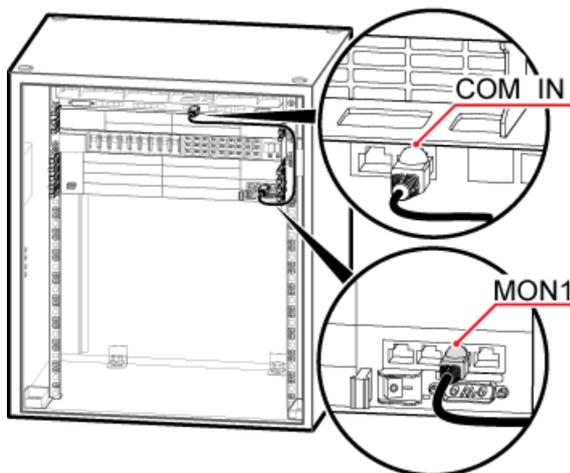
In the triple mode scenario, a maximum of two -48 V DC cabinets can be configured. In this case, BBU1 is installed in the TMC11H, BBU2 is installed in the extended TMC11H, and all the monitoring devices are connected to the BBU1, not BBU2.

Procedure

Step 1 Install a monitoring signal cable between the CMUA and the BBU in a TMC11H, as shown in [Figure 7-81](#).

1. Connect one end of the monitoring signal cable between the CMUA and the BBU to the COM_IN port on the CMUA in the TMC11H.
2. Connect the other end to the MON1 port on the UPEU in the BBU.

Figure 7-81 Installing a monitoring signal cable between the CMUA and the BBU in a TMC11H

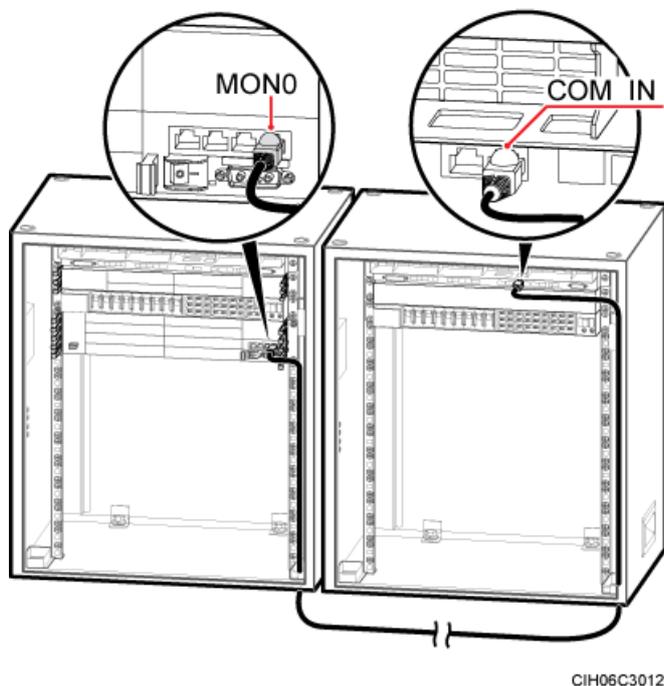


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Step 2 Install another monitoring signal cable between the TMC11H and the extended TMC11H when the configuration is expanded from one TMC11H to two TMC11Hs, as shown in [Figure 7-82](#).

1. Connect one end of the monitoring signal cable between the TMC11H and the extended TMC11H to the MON0 port on the UPEU in the BBU in the TMC11H.
2. Connect the other end to the COM_IN port on the CMUA in the extended TMC11H.

Figure 7-82 Installing monitoring signal cables in two TMC11Hs



- Step 3** Route the cable by referring to [7.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.
- Step 4** Label the installed cables. For details, see Attaching an L-Shaped Label.
- Step 5** Run each cable that leaves the cabinet in the PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

----End

7.5.6 Installing a CPRI Optical Cable

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

Context

- The single-mode optical module is labeled "SM" and multi-mode optical module is labeled "MM".
- If the puller of an optical module is blue, the module is a single-mode optical module. If the puller of an optical module is black or grey, the module is a multi-mode optical module.
- The optical module to be installed must have a matching rate with the corresponding CPRI port.



CAUTION

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

Procedure

Step 1 Install an optical module, as shown in **Figure 7-83**.

1. Turn the puller on the optical module outwards.
2. Insert the optical module into the CPRI port on the GTMU, WBBPb, WBBPd, or LBBP, and then insert the optical module of the same type⁽¹⁾ into the CPRI_W or CPRI0 port on an RRU.

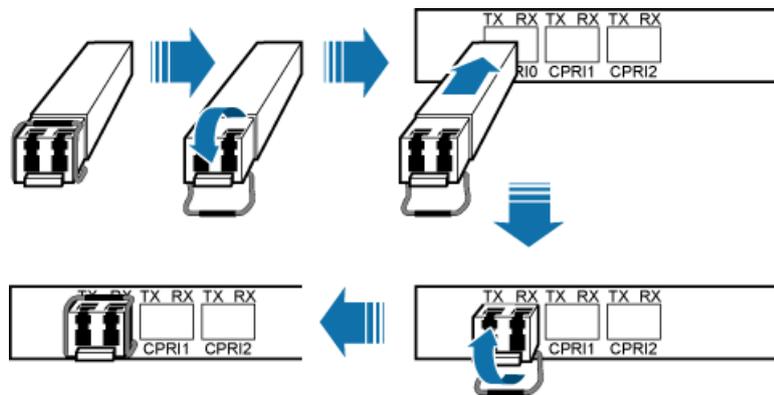


NOTE

(1) The optical modules with the same label are of the same type.

3. Turn the puller on the optical module inwards.

Figure 7-83 Installing an optical module



Step 2 Install a CPRI optical cable, as shown in **Figure 7-84**.



NOTE

For details about the connections of the CPRI optical cables, see the *BBU3900 Hardware Description* CPRI Cable Connections.

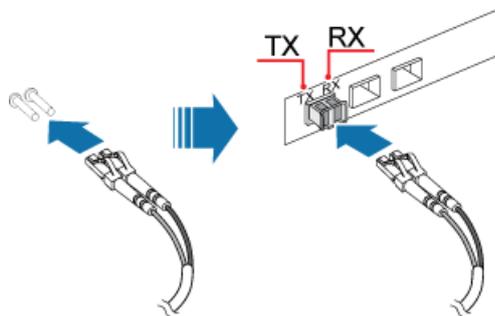
1. Remove the dustproof caps from the connectors of the optical cable.
2. Insert the DLC connectors labeled 2A and 2B at one end of the CPRI optical cable into the optical module on the GTMU, WBBPb, WBBPd, or LBBP, and then insert the DLC connectors labeled 1A and 1B at the other end into the optical module on the RRU.



CAUTION

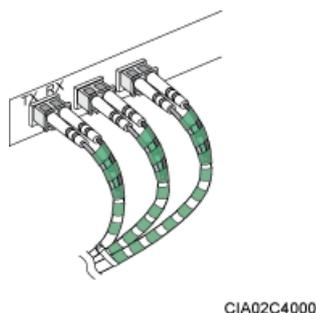
If both ends of the optical cable are the LC connectors, the TX and RX ports on the BBU are respectively connected to the TX and RX ports on the RRU.

Figure 7-84 Installing a CPRI optical cable



- Step 3** Route the CPRI optical cable along the left of the cabinet, and then lead it out of the cabinet from the cable hole on the left of the bottom. For details, see [7.5.1 Cabling Requirements](#).
- Step 4** Attach labels on the optical cable. For details, see Attaching a Sign Plate Label.
- Step 5** Coil the optical fiber with winding plastic tape at the end connected to the BBU. The tape is coiled between the optical connector and the first cable tie on the cabinet, as shown in [Figure 7-85](#).

Figure 7-85 Coiling the optical fiber with winding plastic tape



----End

7.6 Installation Checklist

Check the installation items, installation environment, and cable-related items after the cabinets and devices are all installed.

Cabinet Installation Checklist

[Table 7-8](#) describes the cabinet installation checklist.

Table 7-8 Cabinet installation checklist

No.	Item
1	The installation position of the cabinet strictly complies with the engineering design.
2	In the wall-mounted scenario, the holes of the mounting ears are well aligned with the holes of the expansion bolt assemblies. In addition, the mounting ears are secured on the wall evenly and steadily.

No.	Item
3	In the metal-pole-mounted scenario, the supports for the metal pole are secure on the floor.
4	If the cabinet is installed on the floor, the base is securely installed.
5	Either the horizontal error or vertical error of the cabinet is less than 3 mm.
6	All the bolts, especially those for electrical connections, are tight. Both the spring washer and the flat washer are installed in the correct sequence.
7	The cabinet is neat and clean.
8	The paint on the surface is intact. If any paint is damaged, you must apply touch-up paint to avoid erosion.
9	Filler panels are installed in the space reserved for customer equipment.
10	The cabinet door can be easily opened or closed, the lock works properly, and the gag lever post is secure.
11	All labels, tags, and nameplates are correct, legible, and complete.

Cabinet Installation Environment Checklist

Table 7-9 describes the cabinet installation environment checklist.

Table 7-9 Cabinet installation environment checklist

No.	Item
1	There are no fingerprints or other smears on the surface of the cabinet.
2	There are no excessive straps or adhesive tape on the cables.
3	No tapes, tails of cable ties, paper, or packing bags are left around the cabinet.
4	All the items around the cabinet are neat, clean, and intact.

Electrical Connection Checklist

Table 7-10 describes the electric connection checklist of the cabinet.

Table 7-10 Electric connection checklist of the cabinet

No.	Item
1	All self-made PGND cables are copper-based with the proper wire diameters. No breaking device such as switch and fuse is allowed for the electric connection of the grounding system. No short circuit is allowed.

No.	Item
2	The PGND cable is securely connected and the AC lead-in cable and cables in the cabinet are correctly connected according to the electrical design of the power system. The screws are tightened. In addition, the inputs or outputs are not short-circuited.
3	The redundant part of the power cable or PGND cable is stripped off rather than coiled.
4	The terminals at both ends of the power cable or PGND cable are securely soldered or crimped.
5	The bare wires and the terminal handles at the wiring terminals are coated with heat-shrinkable tubes.
6	The flat washer and the spring washer are well mounted on all OT terminals.
7	The exterior of the battery is intact without any scratch, dent, or crack.
8	The shell of the battery is clean without any leakage trace.
9	The wiring post on the battery stands properly without any damage, and the post is not covered with any acidic substances.
10	The pressure relief valve of the battery is not transformed, and no liquid leaks.
11	The power cables for the batteries are connected to the positive and negative polarities correctly.
12	The voltage of the battery is normal. <ul style="list-style-type: none">● The voltage of a 2 V battery cell ranges from 1.8 V to 2.35 V.● The voltage of a 12 V battery cell ranges from 10.8 V to 14.1 V.● The total voltage of the batteries ranges from 43.2 V to 56.4 V.
13	The fans work properly. <ul style="list-style-type: none">● The fan in the IBBS200D rotates in a low speed in a normal situation.● The outer air circulation fan in the IBBS200T stops in a normal situation (with the ambient temperature of lower than 30°C), and the inner air circulation fan rotates in a high speed.● The outer air circulation fan in the APM30H stops in a normal situation (with the ambient temperature of lower than 35°C), and the inner air circulation fan rotates in a low speed.
14	The MCBs for the batteries are set to OFF.

Cable Installation Checklist

Table 7-11 describes the cable installation checklist.

Table 7-11 Cable installation checklist

No.	Item
1	All cables are connected securely and reliably. Pay special attention to the communication cable connections and cable connections at the bottom of the cabinet.
2	The cables are neatly and tightly bound. The cable ties are evenly spaced and face the same direction.
3	Different types of cable, such as the power cable, ground cable, feeder, optical cable, E1/T1 cable, and FE cable are separately bound.
4	The cable layout facilitates maintenance and future capacity expansion.
5	All the labels at both ends of the cables are legible.
6	The extra length of the indoor cable ties is cut, and the cut surfaces are smooth without sharp edges. The extra length of 3 mm to 5mm of the outdoor cable ties is reserved when the cable ties are cut.
7	The idle port that no cable is connected to is properly protected.
8	The connectors of the RF cables are fixed in position to avoid false connection that may cause an abnormal voltage standing wave ratio (VSWR).

BBU Hardware Installation Checklist

Table 7-12 describes the BBU hardware installation checklist.

Table 7-12 BBU hardware installation checklist

No.	Item
1	All self-made PGND cables are copper-based with the proper wire diameters. No switch, fuse, or similar object is allowed for the electrical connection of the grounding system. No short circuit is allowed. Only one OT terminal of the PGND cable can be connected to each terminal on the ground bar.
2	The redundant part of the power cable or PGND cable is stripped off rather than coiled.
3	The terminals at both ends of the power cable or PGND cable are securely soldered or crimped.
4	The bare wires at the terminals and terminal handles are covered with heat-shrinkable tubes.
5	The flat washer and spring washer are well mounted on all OT terminals, and the OT terminals are intact and contact the wiring terminals properly.
6	All the cables, including those on the bottom of the cabinet, are securely connected.

No.	Item
7	The cables are neatly and tightly bound. The cable ties are evenly spaced and face the same direction.
8	The power cable, PGND cable, feeder, optical cable, and the E1/T1/FE cable are bound separately with spacing of more than 30 mm.
9	The cable layout facilitates maintenance and future capacity expansion, and the bending radius of the cable meets the requirements.
10	Legible labels are attached to both ends of all cables.
11	The extra length of the indoor cable ties is cut, and the cut surfaces are smooth without sharp edges. The extra length of 3 mm to 5 mm of the outdoor cable ties is reserved when the cable ties are cut.
12	The unused ports are properly protected.

7.7 Power-On Check

Before a DBS3900 starts operating, you must check the power-on status of the cabinet and components in it.



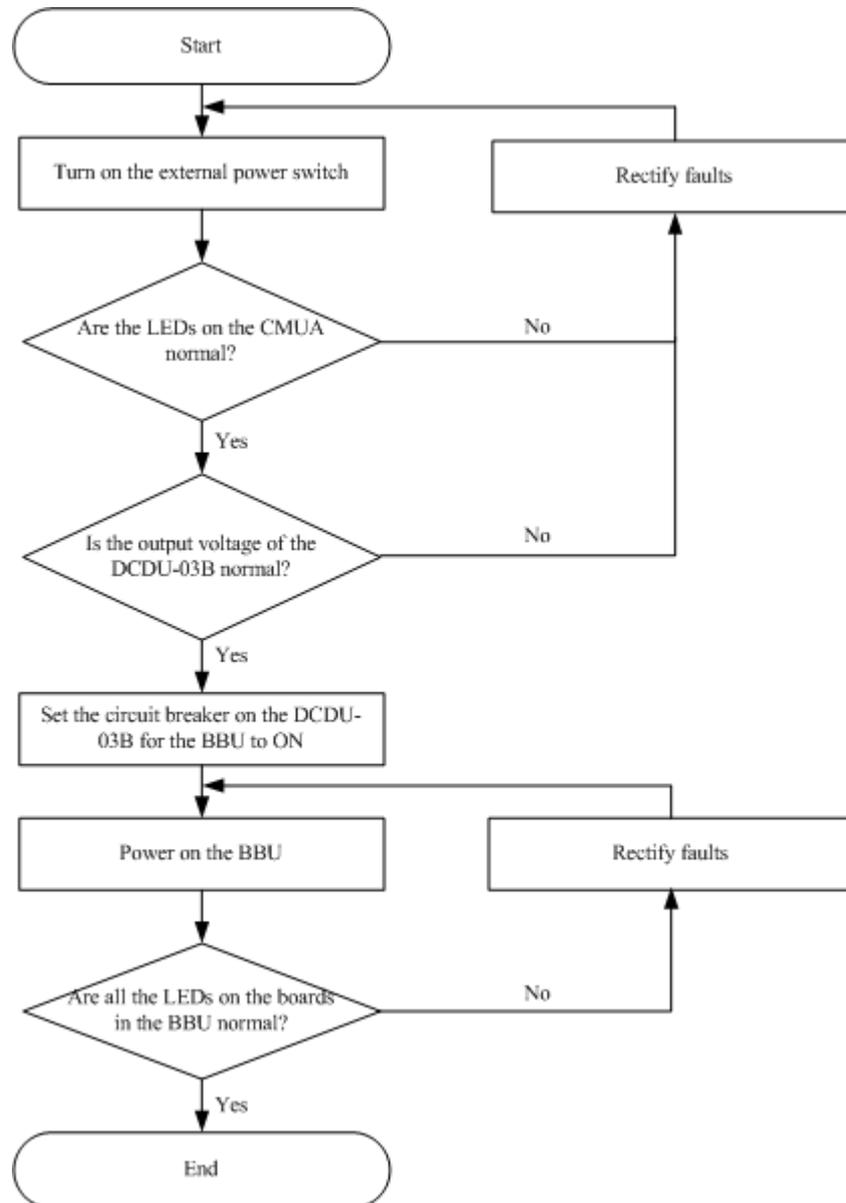
CAUTION

The DBS3900 must be powered on within seven days after it is unpacked, and the period for which the DBS3900 remains powered-off during maintenance must not exceed 48 hours.

Power-On Check in the Outdoor Scenario with DC Power Supply (BBU Installed in a TMC11H)

Figure 7-86 shows the power-on check when a DBS3900 is deployed outdoors with DC power supply and the BBU is installed in a TMC11H.

Figure 7-86 Power-on check in the outdoor scenario with DC power supply (BBU installed in a TMC11H)



LED Status and Output Voltage Check

- The normal status of the LEDs on a CMUA is as follows:
 - RUN LED: blinking
 - ALM LED: off
- The DC output voltage of a DCDU-03B ranges from -43.2 V DC to -57 V DC.
- The normal status of the LEDs on a GTMU, WMPT, WBBP, LMPT, LBBP, and UTRP is as follows:
 - RUN LED: on for 1s and off for 1s

- ALM LED: off
- ACT LED: on
- RUN LED on the UPEU: on
- STATE LED on the FAN unit: blinking green slowly (on for 1s and off for 1s)

7.8 Subsequent Operations

You must perform subsequent operations after installing a base station and checking related hardware installation.

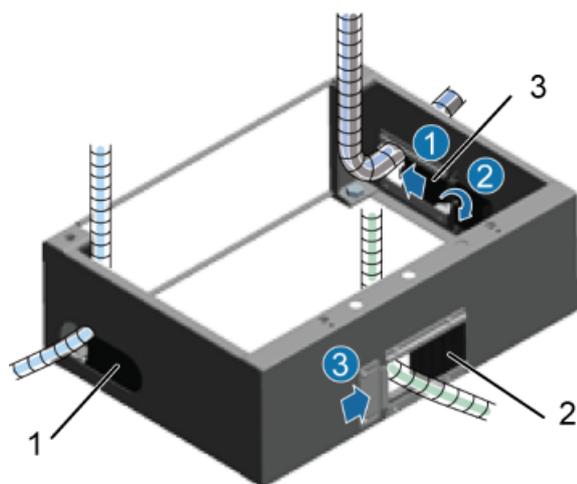
7.8.1 Sealing the Cable Holes on the Base

After all the cables are installed, you need to seal the cable holes of the base.

Procedure

- Step 1** Use baffle plates to cover the idle cable holes, and then tighten screws on the plates, as shown in [Figure 7-87](#).

Figure 7-87 Sealing the cable holes of the base by using the baffle plates



(1) Baffle plate on the right

(2) Baffle plate at the rear

(3) Baffle plate on the left

- Step 2** Use fireproof clay to seal the cable holes of the base, as shown in [Figure 7-88](#).

Procedure

- Step 1** If there are stains in the damaged area or rust on the material, use fine sandpaper to polish the damaged area to remove the stains or rust.
- Step 2** Use clean cotton cloth to remove the stains or dust from the surface of the area to be polished or repaired.
- Step 3** Shake the paint well, and then use a small brush inside the bottle to absorb paint and evenly spread the paint on the damaged area until the area is covered.



CAUTION

The paint coating should be as thin as possible. No drops are allowed on the paint coating, and the surface should be smooth.

- Step 4** Perform subsequent operations after the repaired paint coating is exposed in the air for 30 minutes.



NOTE

The color of the repaired paint coating area should be consistent with that of the surrounding areas, without obvious edges and bulges, and the original damage should no longer be distinguishable. In addition, there should be no paint peeled off.

---End

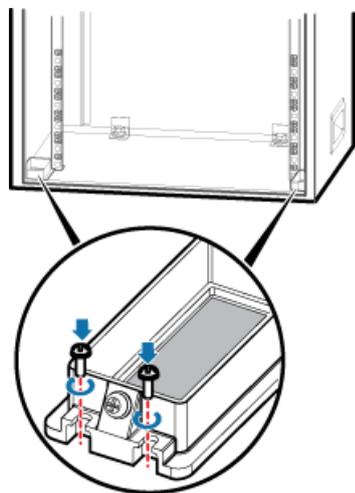
7.8.3 Applying Grease

When the APM30H and TMC11H are installed on a wall or metal pole, you must apply grease to the cable outlet module and the four screws for securing the cabinet to the trapezoidal rack.

Procedure

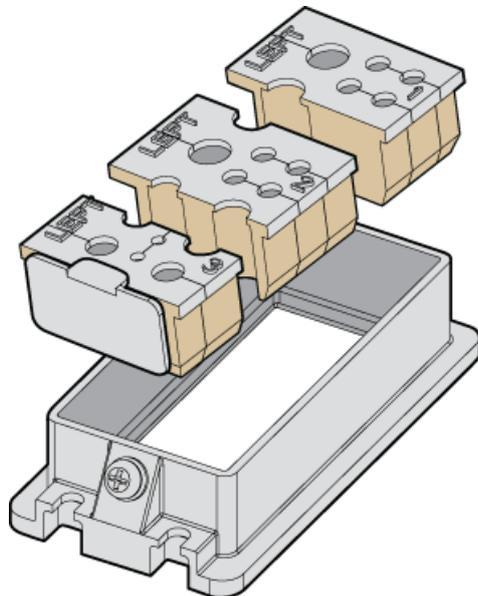
- Step 1** Install a cable outlet subrack on both sides at the bottom of a cabinet, as shown in [Figure 7-89](#).

Figure 7-89 Installing a cable outlet subrack



- Step 2** Apply delivered grease to the surfaces and gaps of the three cable outlet modules evenly, and then insert the modules into the cable outlet subrack, as shown in **Figure 7-90**.

Figure 7-90 Applying grease to cable outlet modules

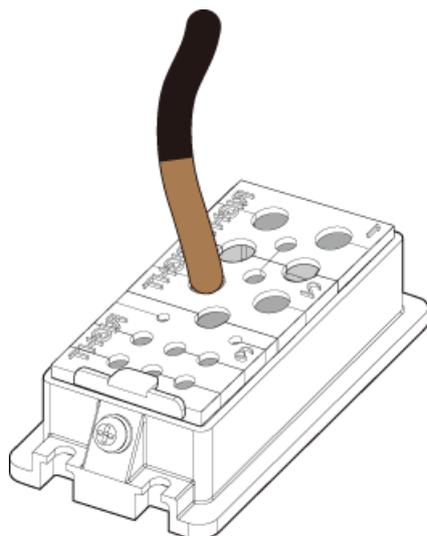


 **NOTE**

When a cabinet is installed on a wall or metal pole, you must apply grease to the cable outlet module and the four screws for securing the cabinet to the trapezoidal rack.

- Step 3** Apply grease to the surfaces of the cables, and then route the cables through the cable outlet modules. Apply grease to the rubber caps evenly, and then insert the rubber caps into unused cable holes, as shown in **Figure 7-91**.

Figure 7-91 Applying grease to cables and rubber caps



----End

8 Outdoor Scenario with DC Power Supply (BBU Installed in a +24 V DC APM30H)

About This Chapter

This chapter describes the procedures for installing a +24 V DC APM30H, components in it, and related cables when a DBS3900 is deployed outdoors with DC power supply and the BBU is installed in the +24 V DC APM30H.

8.1 Installation Process

When a DBS3900 is deployed outdoors with AC power supply and the BBU is installed in a +24 V DC APM30H, you must install the APM30H, components in it, and related cables on site. In addition, some optional components may be required based on actual requirements.

8.2 Installing a Cabinet

Based on different installation scenarios, an APM30H, TMC11H, IBBS200D, or IBBS200T can be installed on a concrete floor or a metal pole. In addition, installation in stack mode is also supported.

8.3 Installing a PGND Cable and Equipotential Cable

The equi-potential PGND cable is used to connect the PGND bolts on the cabinets to the PGND grounding bars on site, ensuring that the cabinets are properly grounded. The equi-potential cable is used to connect the PGND bolts on the cabinets, ensuring the equi-potential connections between the cabinets.

8.4 Installing Components

The BBU and SLPU must be installed in the APM30H. The SOU, EMUA or GPS surge protector optional based on actual requirements.

8.5 Installing Cables

This section describes the procedures and precautions to be taken for installing power cables, transmission cables, monitoring signal cables, and CPRI cables when a DBS3900 is deployed outdoors with DC power supply and the BBU is installed in a +24 V DC APM30H.

8.6 Installation Checklist

Check the installation items, installation environment, and cable-related items after the cabinets and devices are all installed.

8.7 Power-On Check

Before a DBS3900 starts operating, you must check the power-on status of the cabinet and components in it.

8.8 Subsequent Operations

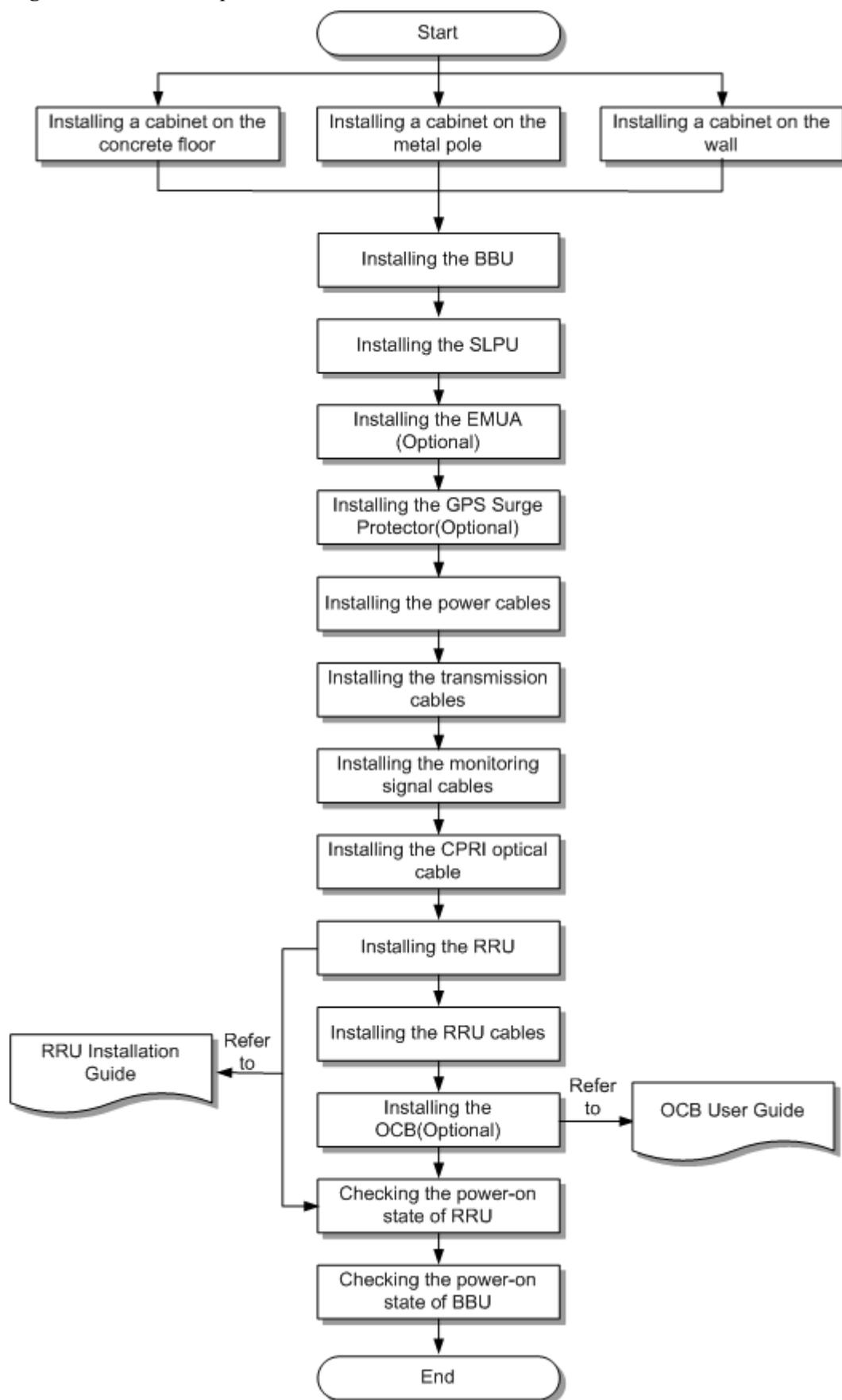
You must perform subsequent operations after installing a base station and checking related hardware installation.

8.1 Installation Process

When a DBS3900 is deployed outdoors with AC power supply and the BBU is installed in a +24 V DC APM30H, you must install the APM30H, components in it, and related cables on site. In addition, some optional components may be required based on actual requirements.

Figure 8-1 shows the installation process.

Figure 8-1 Installation process



 NOTE

- The procedure for installing an RRU is not described in this document. For details about how to install an RRU, see the associated RRU installation guide according to the RRU model.
- The Outdoor Cable Conversion Box (OCB) is an optional component, which is used to connect cables with different cross-sectional areas. For details about an OCB, see the *OCB User Guide*.

8.2 Installing a Cabinet

Based on different installation scenarios, an APM30H, TMC11H, IBBS200D, or IBBS200T can be installed on a concrete floor or a metal pole. In addition, installation in stack mode is also supported.

8.2.1 Installing a Cabinet on a Concrete Floor

You must install a base on a concrete floor before installing an APM30H, TMC11H, IBBS200D, or IBBS200T on the base. You can stack another cabinet on the installed cabinet as required.

Installing a Base

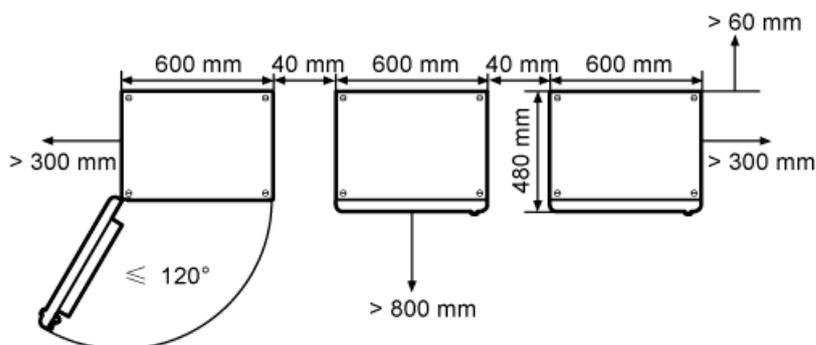
This section describes the procedure and precautions to be taken for installing a base on a concrete floor. You must install a base on a concrete floor before installing an APM30H, TMC11H, IBBS200D, or IBBS200T on the base.

Context

- An APM30H, TMC11H, IBBS200D, or IBBS200T can be installed independently, side by side, or in stack mode. Different types of cabinet must be installed in compliance with cabinet configuration principles. For details about cabinet configuration principles and installation positions, see the associated cabinet configurations.
- When two cabinets are combined, the minimum distance between the cabinets is 40 mm, and the maximum distance between the cabinets is 150 mm. If the Noise Reduction Module (NRM) is installed, the distance between the cabinets is 150 mm.

Figure 8-2 shows the cabinet installation clearance.

Figure 8-2 Cabinet installation clearance (plan view)



 **NOTE**

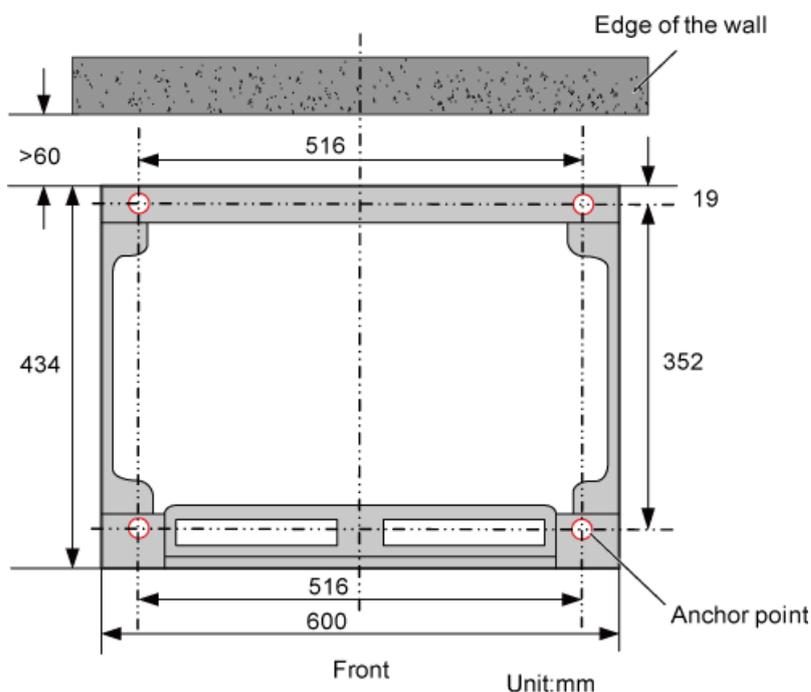
The type of cabinet in [Figure 8-2](#) can be APM30H, TMC11H, or IBBS200D.

Procedure

Step 1 Determine the position for installing a base.

1. According to the engineering drawing and installation clearance requirements, determine the position for installing a cabinet.
2. On the concrete pad, mark holes to determine the installation position of the base, as shown in [Figure 8-3](#).

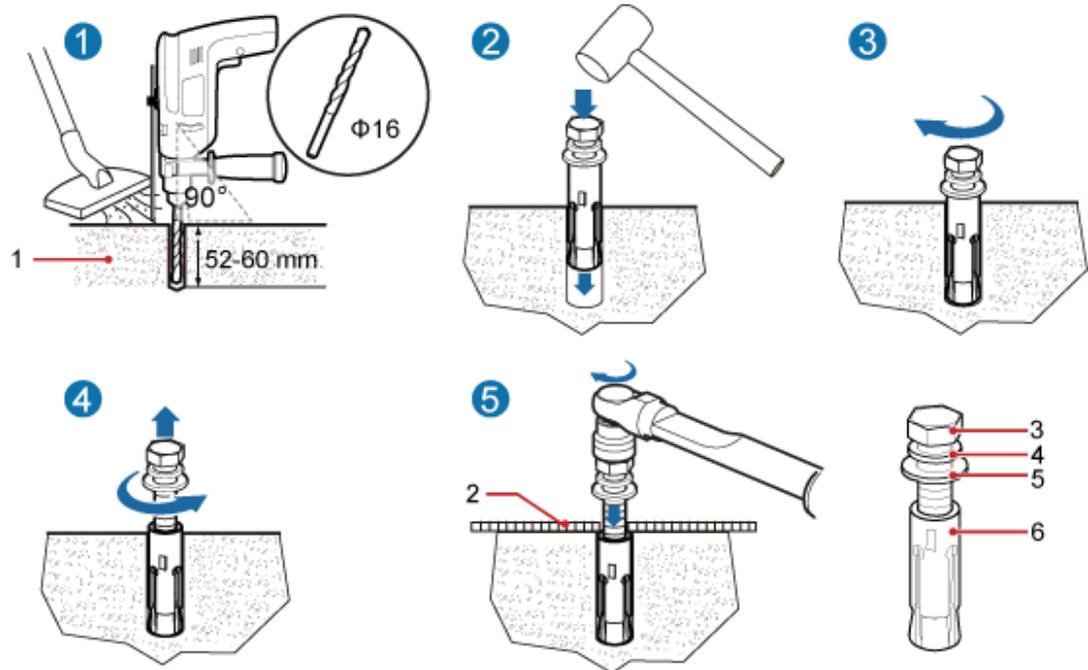
Figure 8-3 Installation holes of the base



3. After marking all the holes, use the measuring tape to check whether the distances between the holes are accurate.

Step 2 Drill holes at the anchor points, and then install the expansion bolt assemblies, as shown in [Figure 8-4](#).

Figure 8-4 Drilling holes on the concrete pad



(1) Concrete pad (2) Base of the cabinet (3) M12x60 bolt (4) Spring washer (5) Flat washer (6) Expansion tube

1. Use a hammer drill with bit 16 to drill holes at the anchor points, and ensure that the depth of each hole ranges from 52 mm to 60 mm.

 **CAUTION**

- Do not drill holes through the holes in the base by using a hammer drill. Drilling holes through the holes in the base may damage the paint on the base.
 - Take proper safety measures to protect your eyes and respiratory tract against the dust before drilling holes.
-
2. Use a vacuum cleaner to clear the dust inside and around the holes. If the inter-hole spacing is too wide or too narrow, locate and drill holes again.
 3. Slightly tighten the expansion bolt, and then put the expansion bolt assembly into the hole vertically.
 4. Use a rubber mallet to hammer the expansion bolt until the expansion tube is buried into the hole, and then tighten the bolt.
 5. Remove the bolt, spring washer, and flat washer counterclockwise.

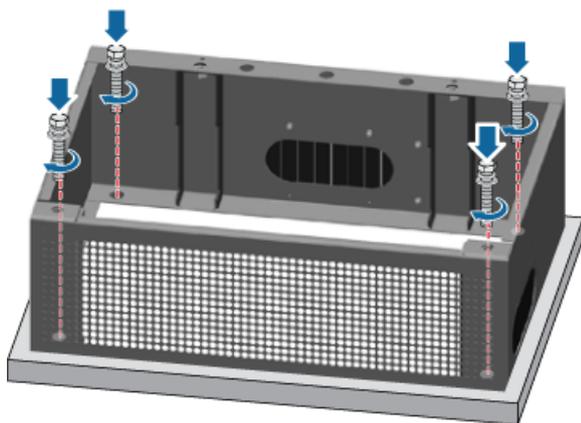


CAUTION

After dismantling the expansion bolt assembly, ensure that the top of the expansion tube is on the same level as the floor.

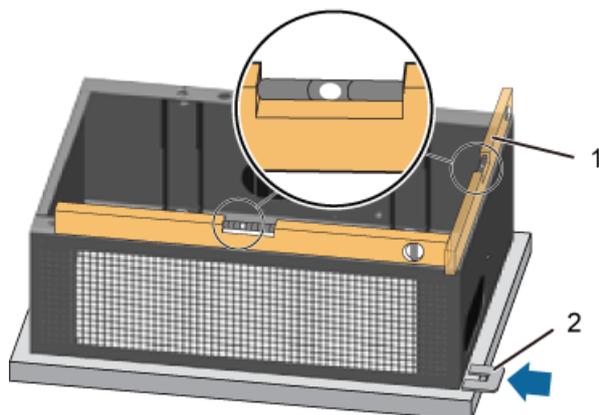
- Step 3** Align the base, and then install the bolt with the spring washer and flat washer, as shown in [Figure 8-5](#).

Figure 8-5 Aligning the base



- Step 4** Use a level to check the base level. If the base is not level, use adjusting pads to adjust the base level, as shown in [Figure 8-6](#).

Figure 8-6 Adjusting the base level

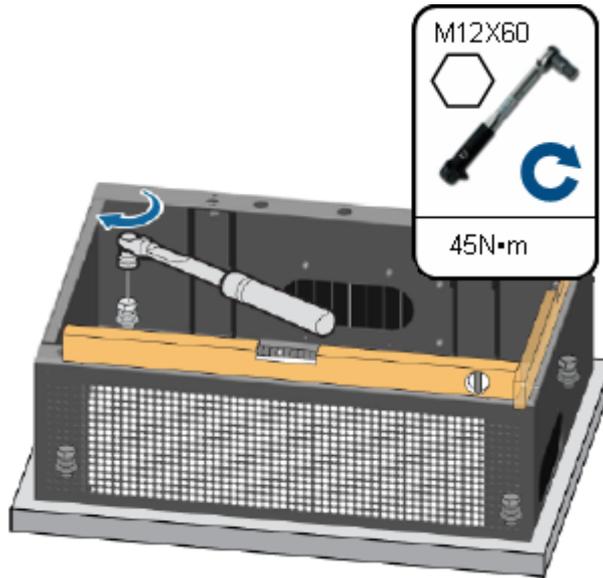


(1) Level

(2) Adjusting pad

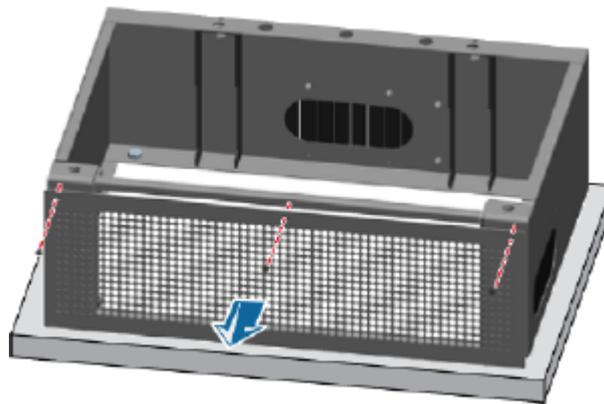
- Step 5** Use a torque wrench to tighten the bolts with the tightening torque of 45 N·m, as shown in [Figure 8-7](#).

Figure 8-7 Tightening the bolts



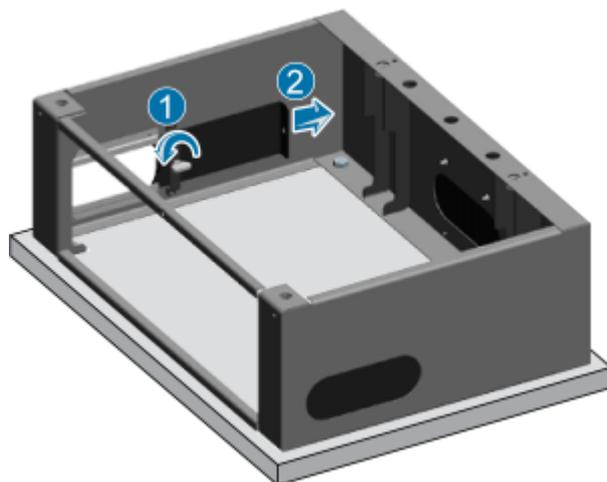
Step 6 Loosen the three screws on the front cover plate of the base, and then remove the front cover plate, as shown in [Figure 8-8](#).

Figure 8-8 Removing the front cover plate



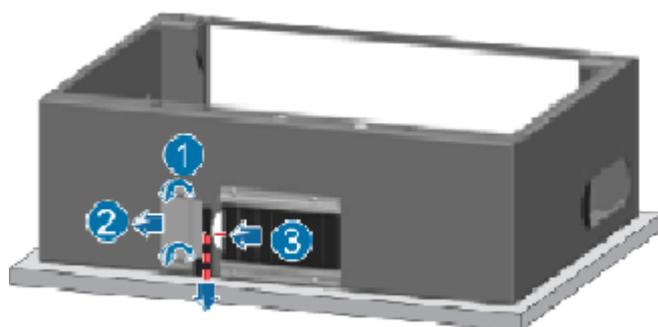
Step 7 Remove the baffle plate from either side of the base (by taking the left side as an example), as shown in [Figure 8-9](#).

Figure 8-9 Removing the baffle plate



Step 8 Remove the baffle plate from the back of the base, as shown in [Figure 8-10](#).

Figure 8-10 Removing the baffle plate from the back



---End

Installing a Cabinet on a Base

This section describes the procedure and precautions to be taken for installing a cabinet on a base after the base is installed on the concrete floor.

Context



NOTE

The following figures are based on the IBBS200D. The procedure for installing the APM30H, TMC11H, or IBBS200T is the same as that for installing the IBBS200D.

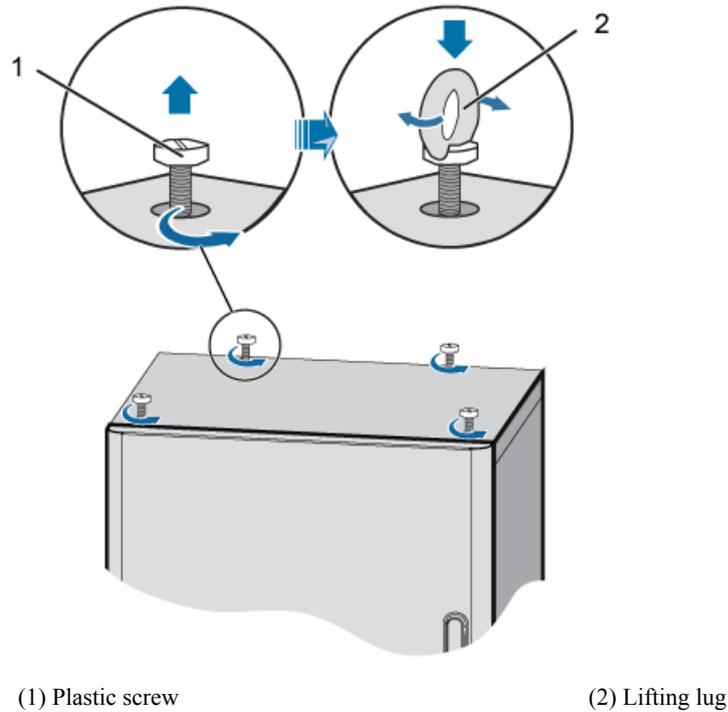
Procedure

Step 1 Remove the four plastic screws from the top of the cabinet, and then install the lifting lugs in the corresponding holes, as shown in Figure 1.

 **CAUTION**

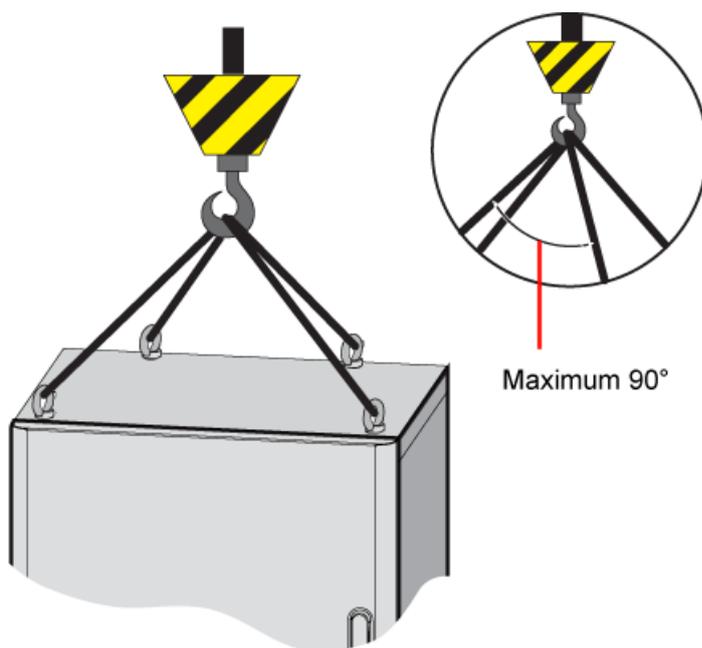
Reserve the plastic screws for later use.

Figure 8-11 Installing the lifting lugs



Step 2 Install ropes on the lifting lugs, and then lift the cabinet, as shown in Figure 2.

Figure 8-12 Installing the ropes



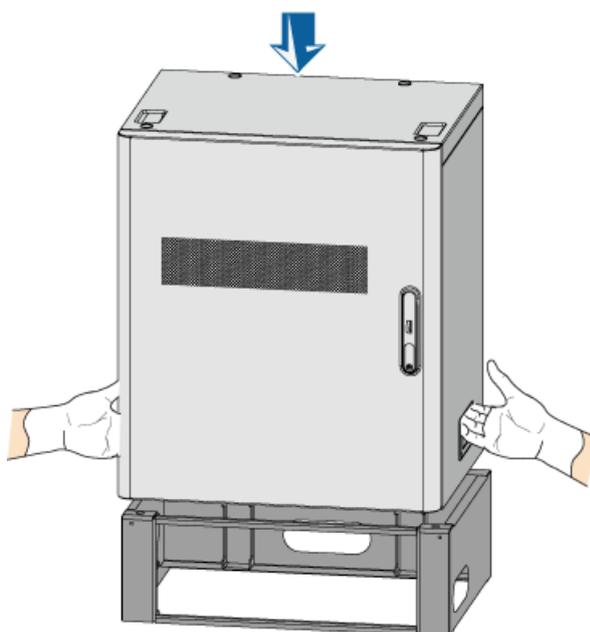
Step 3 Lift the cabinet onto the base, and then gently push the cabinet to align the cabinet with the base, as shown in [Figure 8-13](#).



WARNING

At least two installation engineers are required for lifting the cabinet.

Figure 8-13 Lifting a cabinet onto a base



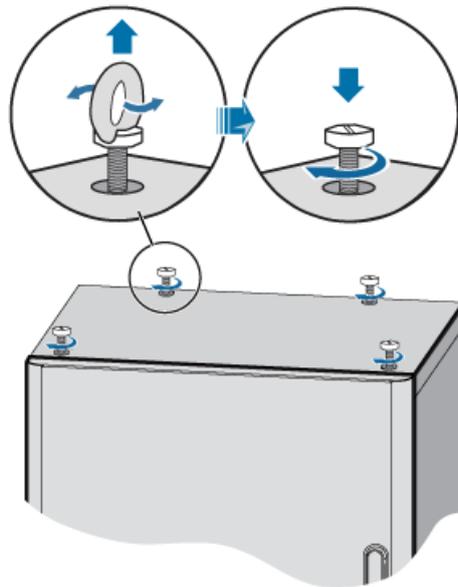
Step 4 Remove the ropes and lifting lugs, and then install the plastic screws, as shown in Figure 4.



CAUTION

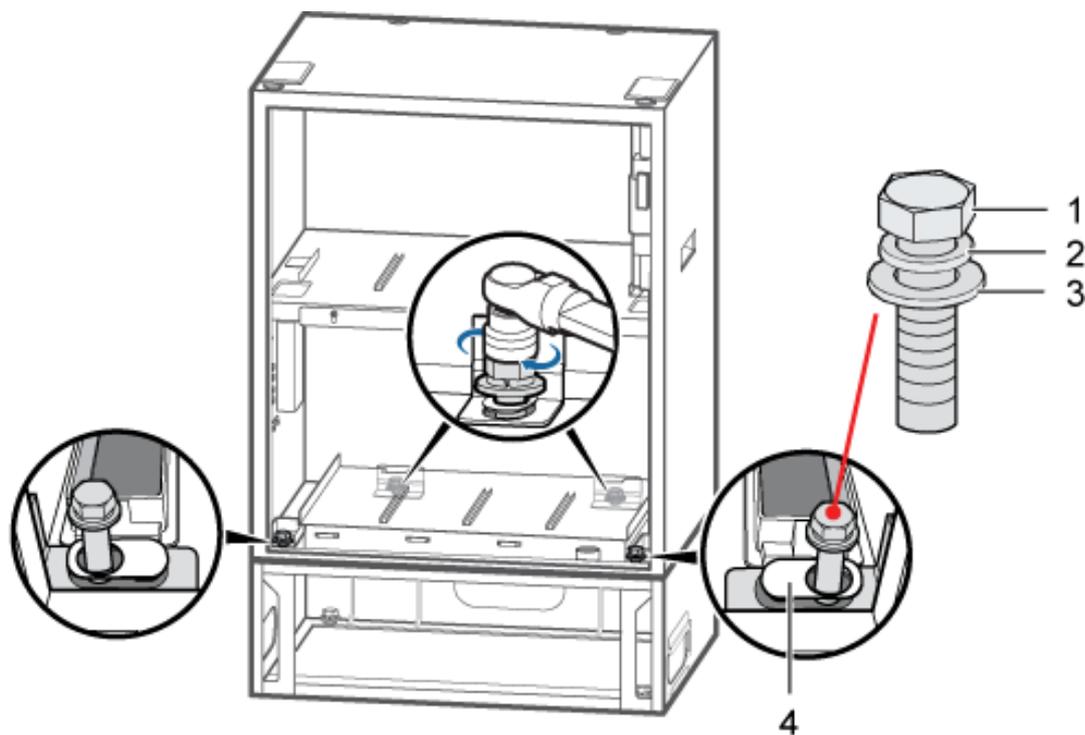
Before installing the rubber screws, clean the mounting holes to prevent entry of metal bits.

Figure 8-14 Installing the plastic screws



Step 5 Use four M12x30 bolts to secure the cabinet on the base, as shown in Figure 7.

Figure 8-15 Securing the IBBS200D on the base



- (1) M12x30 bolt (2) Spring washer (3) Flat washer (4) Gasket with an oblong hole

---End

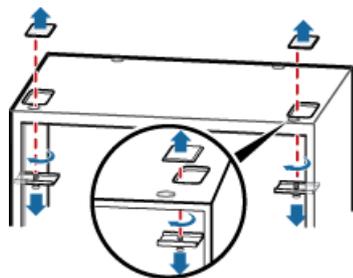
(Optional) Installing Two Cabinets in Stack Mode

This section describes the procedure and precautions to be taken for installing two cabinets in stack mode. After a cabinet is installed on a base, another cabinet can be stacked on this cabinet based on actual requirements.

Procedure

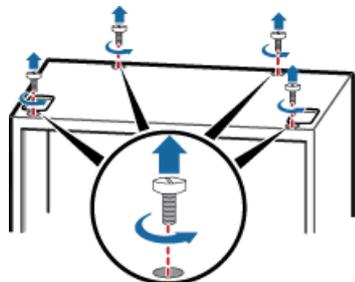
- Step 1** Remove the cover plates for cable holes from the top of the lower cabinet, as shown in [Figure 8-16](#).

Figure 8-16 Removing the cover plates for cable holes



Step 2 Remove the four plastic screws from the top of the lower cabinet, as shown in [Figure 8-17](#).

Figure 8-17 Removing the plastic screws



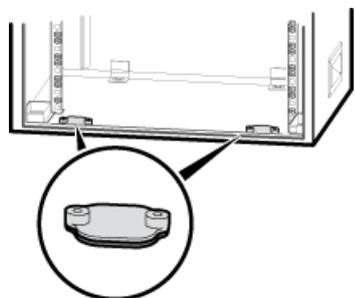
Step 3 Lift the upper cabinet onto the lower cabinet, and then align the cable holes of the upper cabinet with those of the lower cabinet, as shown in [Figure 8-19](#).



CAUTION

Do not move the cover plates for the round cable holes to avoid entry of water into the cabinet. [Figure 8-18](#) shows the positions of the cover plates for the round cable holes.

Figure 8-18 Positions of the cover plates for the round cable holes



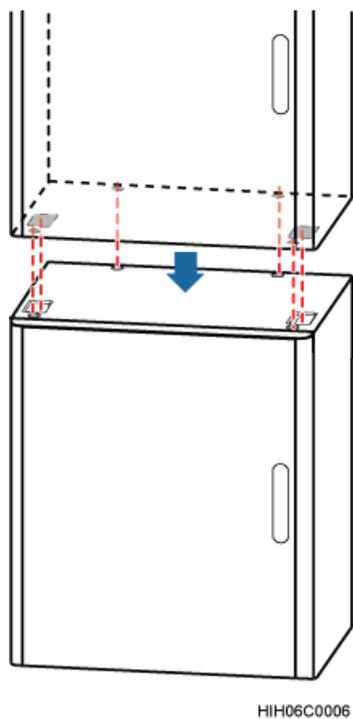
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WARNING

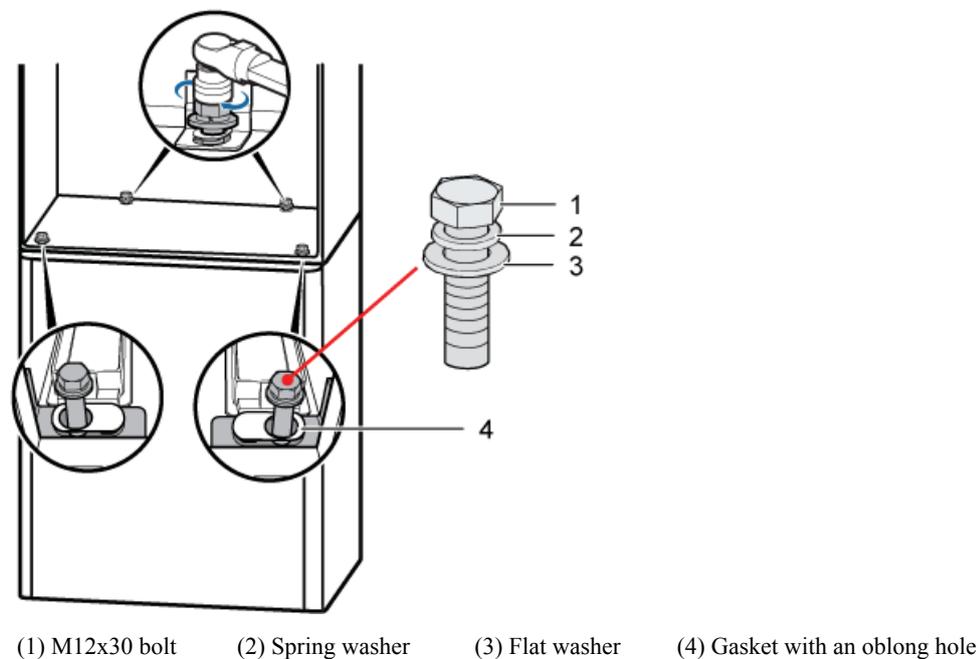
At least two installers are required for lifting a cabinet.

Figure 8-19 Stacking a cabinet onto another cabinet



Step 4 Use a torque wrench to tighten the four M12x30 bolts in the cabinet, as shown in **Figure 8-20**.

Figure 8-20 Tightening the bolts



---End

8.2.2 Installing a Cabinet on a Metal Pole

This section describes the procedure and precautions to be taken for installing a cabinet on a metal pole. An APM30H or TMC11H can be installed on a metal pole.

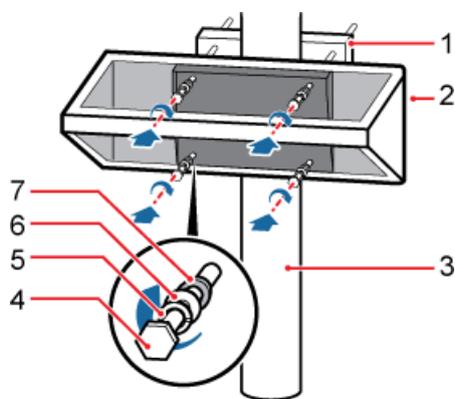
Procedure

Step 1 Use four M12×60 bolts to secure a trapezoidal rack at a proper height of a metal pole, as shown in [Figure 8-21](#).

 **NOTE**

- The cabinet cannot be installed at a height of more than 10,000 mm.
- The diameter of a metal pole must range from 60 mm to 114 mm.

Figure 8-21 Installing a trapezoidal rack

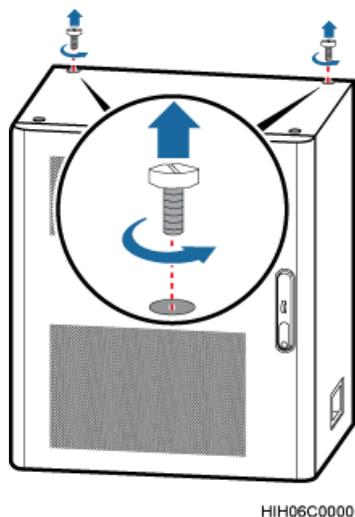


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- | | | |
|-----------------------|----------------------|-----------------|
| (1) Adapting piece | (2) Trapezoidal rack | (3) Metal pole |
| (4) Bolt | (5) Spring washer | (6) Flat washer |
| (7) Waterproof gasket | | |

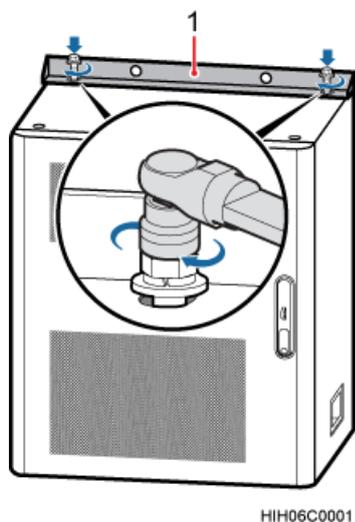
Step 2 Remove the two plastic screws that are near the back of the cabinet from the top of the cabinet, as shown in [Figure 8-22](#).

Figure 8-22 Removing plastic screws



Step 3 Install a fastening bar on the top of the cabinet, and then use a socket wrench to tighten the two M12×30 bolts, as shown in **Figure 8-23**.

Figure 8-23 Installing a fastening bar



(1) Fastening bar

Step 4 Lift the cabinet onto the trapezoidal rack, use four M12×30 bolts to secure the cabinet on the trapezoidal rack, and then use a socket wrench to tighten the bolts, as shown in **Figure 8-25**.



CAUTION

Do not move the cover plates for the round cable holes to avoid entry of water into the cabinet. **Figure 8-24** shows the positions of the cover plates for the round cable holes.

Figure 8-24 Positions of the cover plates for the round cable holes

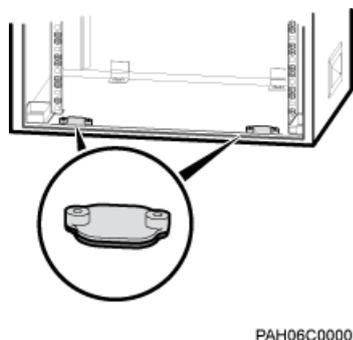
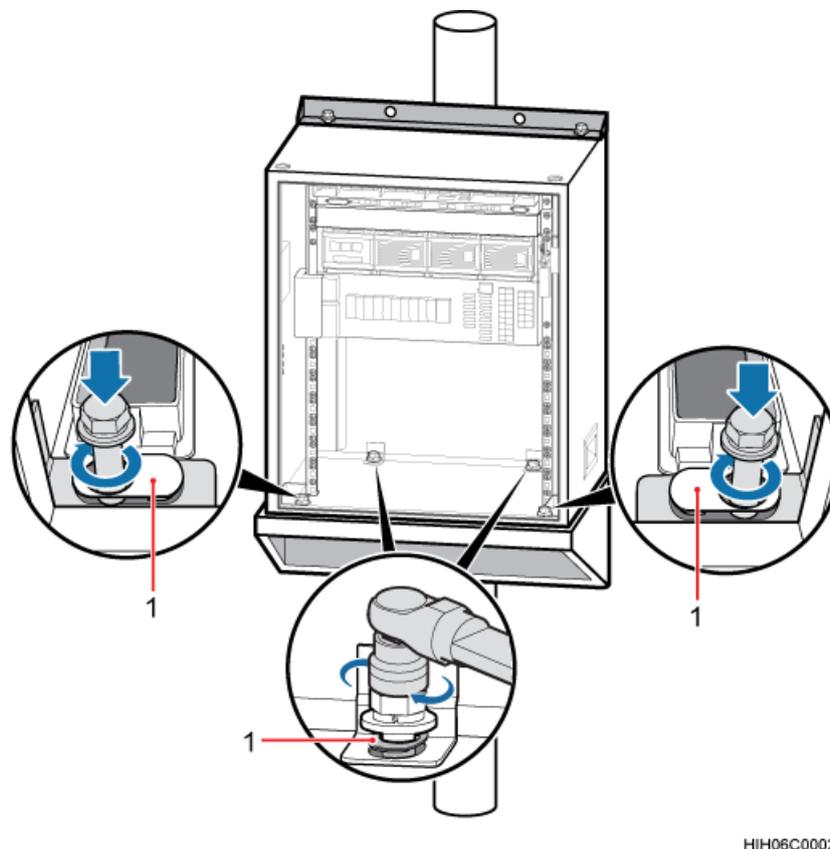


Figure 8-25 Installing a cabinet



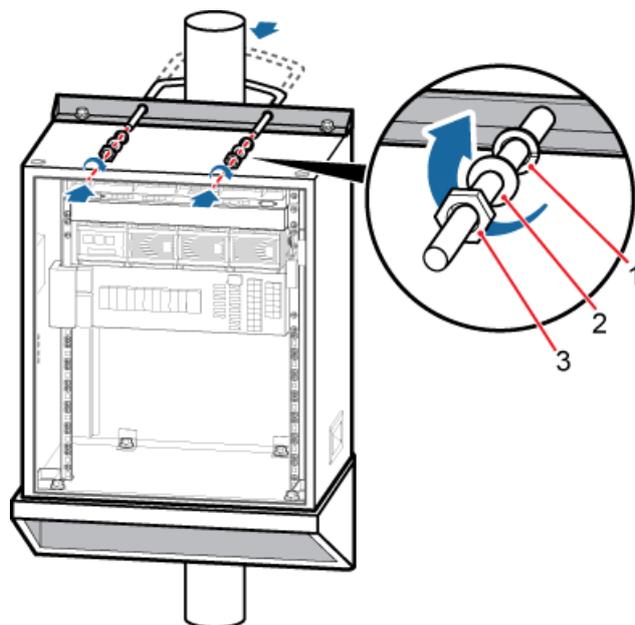
(1) Gasket with an oblong hole

Step 5 Lead the U-shaped piece through the holes on the fastening bar installed on the top of the cabinet, as shown in [Figure 8-26](#).

NOTE

When a cabinet is installed on a metal pole, grease must be applied. For details, see [8.8.3 Applying Grease](#).

Figure 8-26 Installing a U-shaped piece



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(1) Flat washer

(2) Spring washer

(3) Nut

---End

8.2.3 Installing a Cabinet on a Wall

This section describes the procedure and precautions to be taken for installing a cabinet on a wall. An APM30H or TMC11H can be installed on a wall.

Context

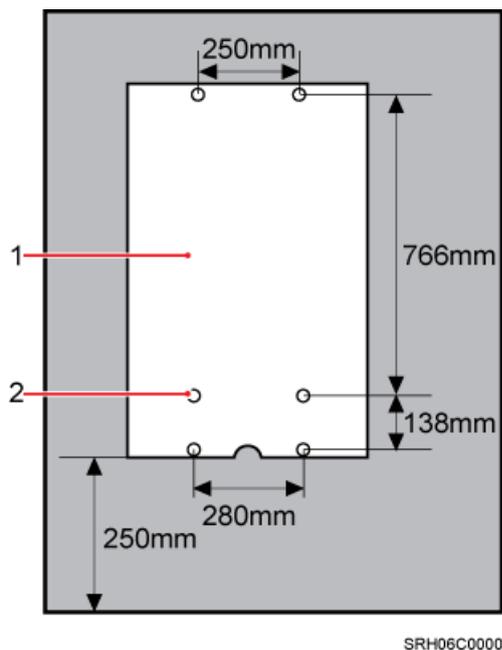
 **NOTE**

- The cabinet cannot be installed at a height of more than 10,000 mm.

Procedure

- Step 1** Press a marking template against the wall, and then mark six mounting holes based on the marking template, as shown in [Figure 8-27](#).

Figure 8-27 Marking mounting holes

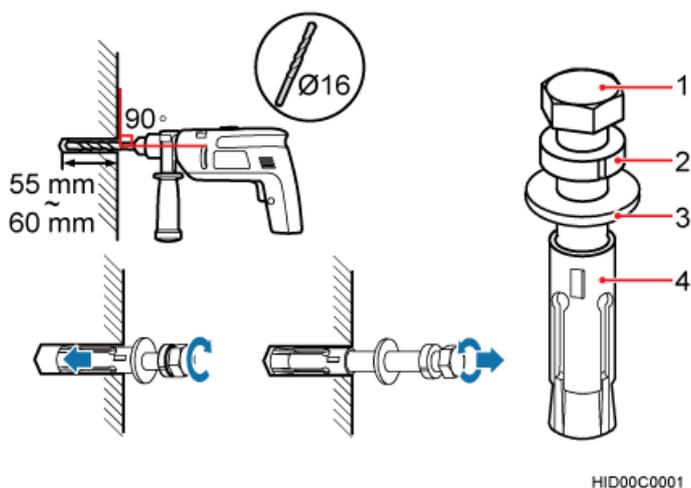


(1) Marking template

(2) Mounting holes

Step 2 Drill holes at the anchor points, and then install expansion bolt assemblies, as shown in [Figure 8-28](#).

Figure 8-28 Installing an expansion bolt



(1) Bolt

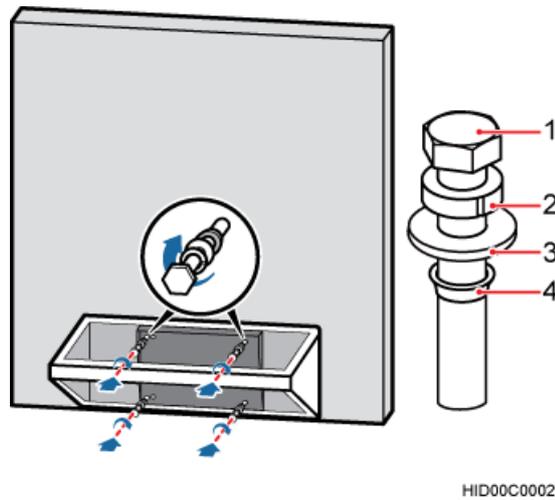
(2) Spring washer

(3) Flat washer

(4) Expansion tube

Step 3 Align the holes on the trapezoidal rack with the four lower mounting holes on the wall, and then use four M12×30 bolts to secure the trapezoidal rack, as shown in [Figure 8-29](#).

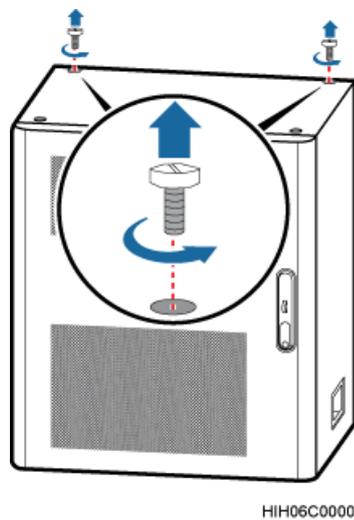
Figure 8-29 Installing a trapezoidal rack



- (1) M12x60 bolt (2) Spring washer (3) Flat washer (4) Waterproof gasket.

Step 4 Remove the two plastic screws that are near the back of the cabinet from the top of the cabinet, as shown in [Figure 8-30](#).

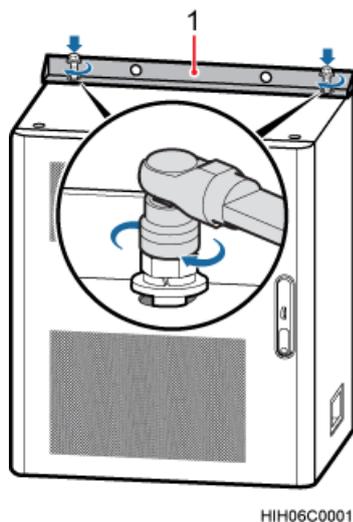
Figure 8-30 Removing plastic screws



- (1) Plastic screw

Step 5 Install a fastening bar on the top of the cabinet, and then use a socket wrench to tighten the two bolts, as shown in [Figure 8-31](#).

Figure 8-31 Installing a fastening bar



(1) Fastening bar

Step 6 Lift the cabinet onto the trapezoidal rack, use four M12×30 bolts to secure the cabinet on the trapezoidal rack, and then use a socket wrench to tighten the bolts, as shown in **Figure 8-33**.



CAUTION

Do not move the cover plates for the round cable holes to avoid entry of water into the cabinet. **Figure 8-32** shows the positions of the cover plates for the round cable holes.

Figure 8-32 Positions of the cover plates for the round cable holes

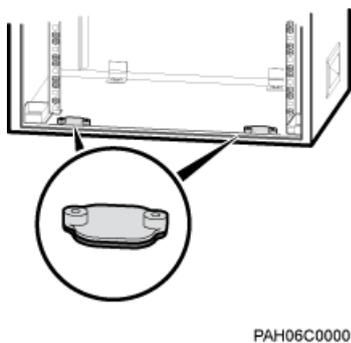
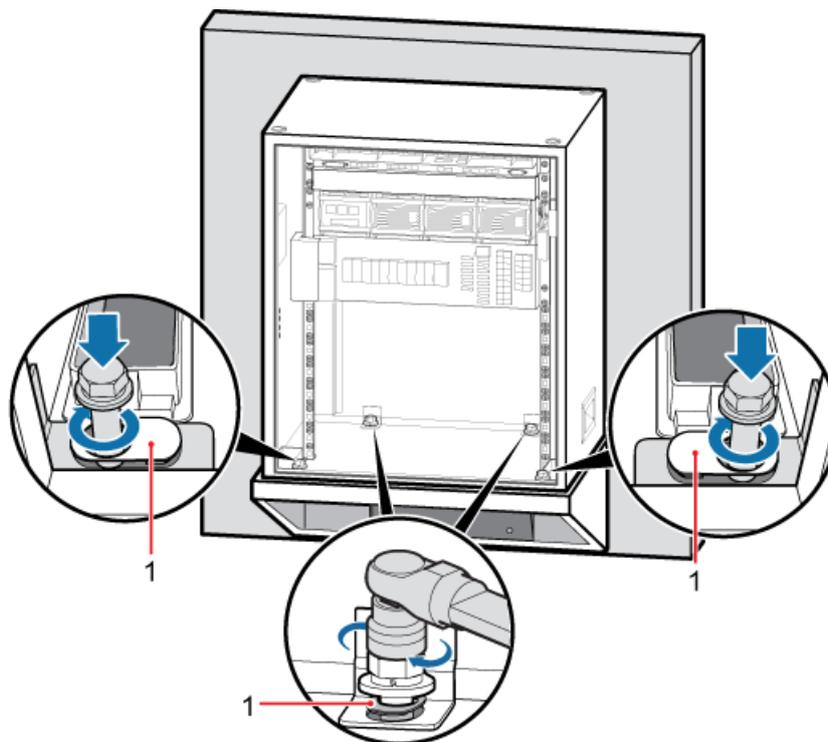


Figure 8-33 Installing a cabinet



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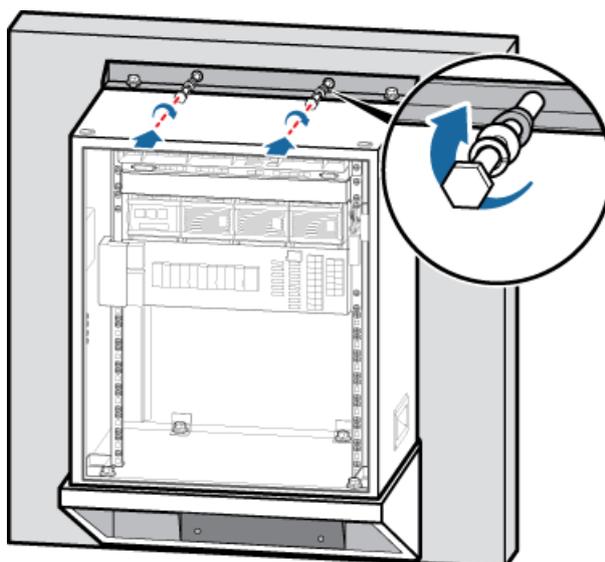
(1) Gasket with an oblong hole

Step 7 Use two bolts to secure the fastening bar on the wall, as shown in **Figure 8-34**.

NOTE

When a cabinet is installed on the wall, grease must be applied. For details, see **8.8.3 Applying Grease**.

Figure 8-34 Securing a fastening bar



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---End

8.3 Installing a PGND Cable and Equipotential Cable

The equi-potential PGND cable is used to connect the PGND bolts on the cabinets to the PGND grounding bars on site, ensuring that the cabinets are properly grounded. The equi-potential cable is used to connect the PGND bolts on the cabinets, ensuring the equi-potential connections between the cabinets.

Prerequisite

The tools, such as a Phillips screwdriver, a cable cutter, and a multi-purpose crimping tool, are ready.

Context

- In the triple mode scenario, a maximum of two +24 V DC APM30H can be configured. In this case, BBU1 is installed in an APM30H, and BBU2 is installed in an extended APM30H.
- An equipotential cable connects the two APM30Hs.
- A PGND cable is installed in the APM30H housing BBU1.

Table 8-1 describes the specifications of the PGND cable and equi-potential cable.

Table 8-1 Specifications of the PGND cable and equi-potential cable

Cable Name	One End	The Other End	Remarks
PGND cable	M6 OT terminal	M6 OT terminal	Yellow and green cable, 16 mm ²
Equi-potential cable	M6 OT terminal	M6 OT terminal	Yellow and green cable, 16 mm ²

Procedure

Step 1 Prepare the PGND cable and equi-potential cable.

1. Prepare the cable of proper length based on the actual cable route.
2. Add OT terminals to both ends of the cable. For details, see Assembling the OT Terminal and the Power Cable.

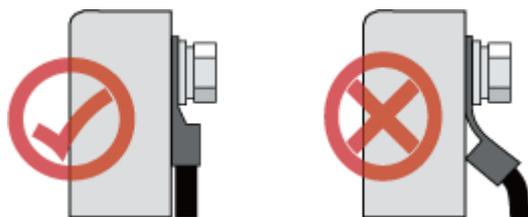
Step 2 Install a PGND cable and Equipotential Cable.

1. Connect one end of the PGND cable to the ground bar on the inner side of the cabinet under the +24 V DC APM30H, use a spring washer and a bolt to secure the OT terminal on the cable, and then connect the other end to the external ground bar, as shown in **Figure 8-36**.

NOTE

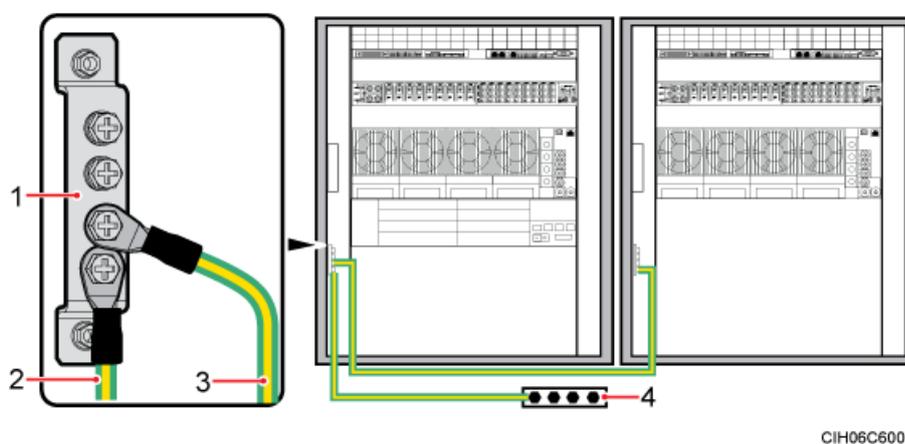
When installing the PGND cable, keep the crimping tube of the OT terminal in the direction shown in **Figure 8-35**.

Figure 8-35 Installing the OT terminal in the correct manner



2. Install an equipotential cable in each cabinet, as shown in [Figure 8-36](#).

Figure 8-36 Installing a PGND cable and equipotential cable



(1) Ground bar on the inner side of the cabinet (2) PGND cable (3) Equipotential cable (4) Ground busbar

- Step 3** Route and bind the cables. For details, see [8.5.1 Cabling Requirements](#).
- Step 4** Label the installed cables. For details, see [Attaching a Cable-Tying Label](#).
- Step 5** Run each cable that leaves the cabinet in a PVC corrugated pipe, and then tie the pipe to the cable hole on the cabinet.

----End

8.4 Installing Components

The BBU and SLPU must be installed in the APM30H. The SOU, EMUA or GPS surge protector optional based on actual requirements.

8.4.1 Installing a BBU

This section describes the procedure and precautions to be taken for installing a BBU in an APM30H, TMC11H, or 19-inch rack. A BBU occupies a space of 19 inch wide and 2 U high.

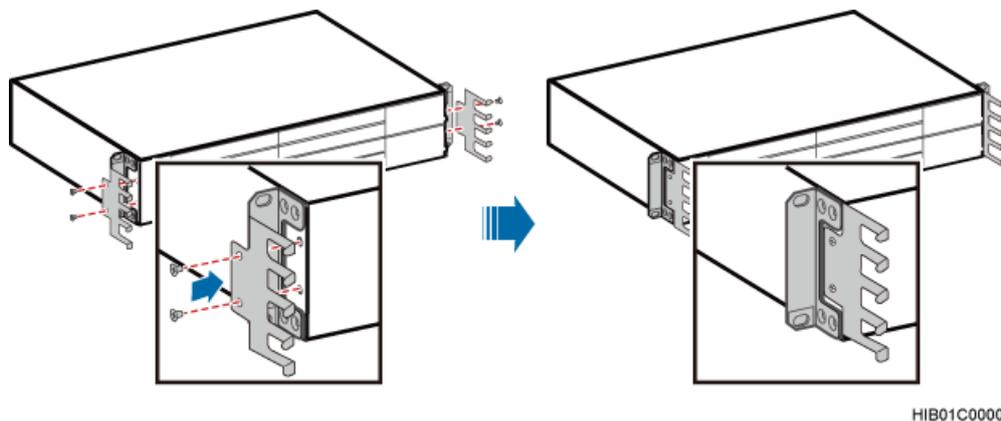
Context

In the triple mode scenario, two BBUs are required. A second BBU is installed in the same manner as the first BBU.

Procedure

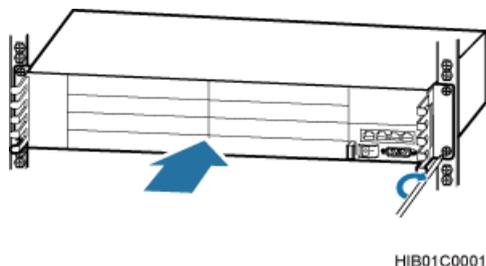
- Step 1** Align mounting holes on the cable holders with mounting holes on both sides of a BBU, and then use four M4 screws to secure the cable holes until the tightening torque reaches 1.2 N·m, as shown in [Figure 8-37](#).

Figure 8-37 Installing cable holders on a BBU



- Step 2** Wear ESD gloves or ESD wrist strap, and then slide the BBU into the cabinet along the guide rails using both hands.
- Step 3** Tighten four M6x16 screws on the panel until the tightening torque reaches 3 N·m, as shown in [Figure 8-38](#).

Figure 8-38 Installing a BBU



----End

8.4.2 Installing an SLPU

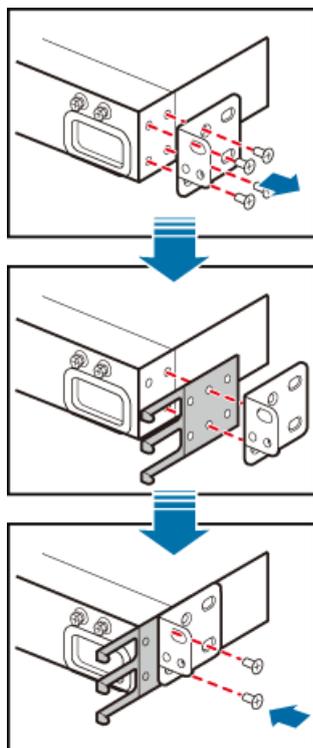
To protect trunk signals, an SLPU must be configured, which is installed in the 1 U space below the fan box on the top of the cabinet.

Procedure

- Step 1** Install cable holders for an SLPU, as shown in [Figure 8-39](#).
1. Remove the four bolts from the mounting ears of the SLPU.

2. Move a mounting ear backwards, place each cable holder between the mounting ear and the SLPU, and then align the mounting holes on the cable holder with those on the mounting ear and SLPU.
3. Use the four M4 screws that are removed in step [Step 1.1](#) to secure the mounting ears, cable holders, and SLPU until the tightening torque reaches 1.2 N·m.

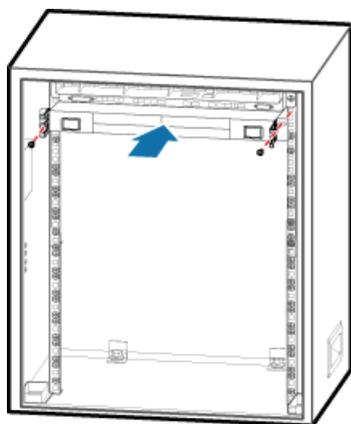
Figure 8-39 Installing cable holders on an SLPU



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- Step 2** Slide the SLPU along the guide rails into the cabinet, and then tighten two M6x16 screws on the panel until the tightening torque reaches 3 N·m, as shown in [Figure 8-40](#).

Figure 8-40 Installing an SLPU



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---End

8.4.3 Installing an SLPU

To protect monitoring signals, an SLPU may be configured, which is installed the 1 U space directly under the BBU.

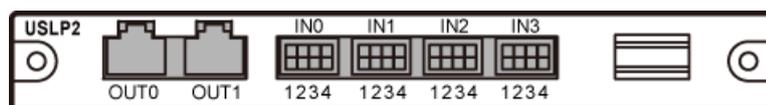
Prerequisite

The tools, such as a screwdriver and a pair of ESD gloves, are available.

Context

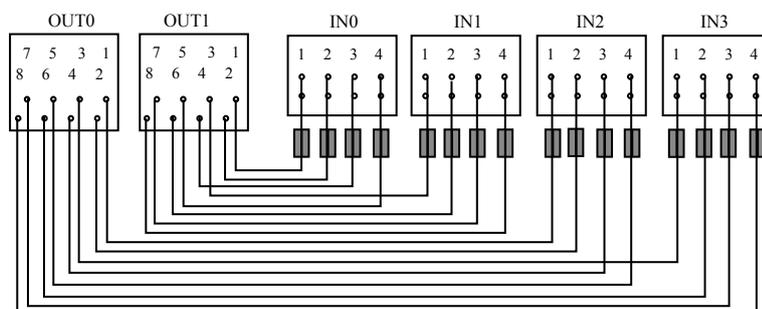
The SLPU that is used to protect monitoring signals is configured with two Universal Signal Lightning Protection unit type 2 (USLP2s) before delivery. [Figure 8-41](#) shows the panel of the USLP2.

Figure 8-41 The panel of the USLP2



[Figure 8-42](#) shows the mapping relationship between the pins in the input and output ports on the USLP2.

Figure 8-42 Mapping relationship between the pins in the input and output ports on the USLP2



[Table 8-2](#) lists the mapping relationship between the pins in the input and output ports on the USLP2.

Table 8-2 Mapping relationship between the pins in the input and output ports on the USLP2

Input		Output	
Label	Pin	Label	Pin
IN0	IN0.1	OUT1	OUT1.1

Input		Output	
Label	Pin	Label	Pin
	IN0.2		OUT1.2
	IN0.3		OUT1.4
	IN0.4		OUT1.5
IN1	IN1.1		OUT1.3
	IN1.2		OUT1.6
	IN1.3		OUT1.7
	IN1.4		OUT1.8
IN2	IN2.1		OUT0
	IN2.2	OUT0.2	
	IN2.3	OUT0.4	
	IN2.4	OUT0.5	
IN3	IN3.1	OUT0.3	
	IN3.2	OUT0.6	
	IN3.3	OUT0.7	
	IN3.4	OUT0.8	

Table 8-3 lists the SLPU-related cables.

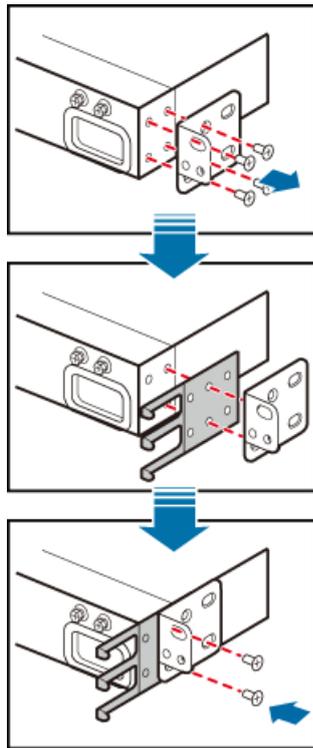
Table 8-3 SLPU-related cables

Cable	One End	The Other End	Remarks
Surge protection transfer cable for monitoring signals	RJ45 connector	RJ45 connector	Grey shielded straight-through cable
External dry-contact monitoring signal cable	Bare wire	Depending on the external equipment	-

Procedure

- Step 1** Install cable racks on both sides of the SLPU and ensure that the mounting ears are on the same plane as the SLPU panel, as shown in [Figure 8-43](#).

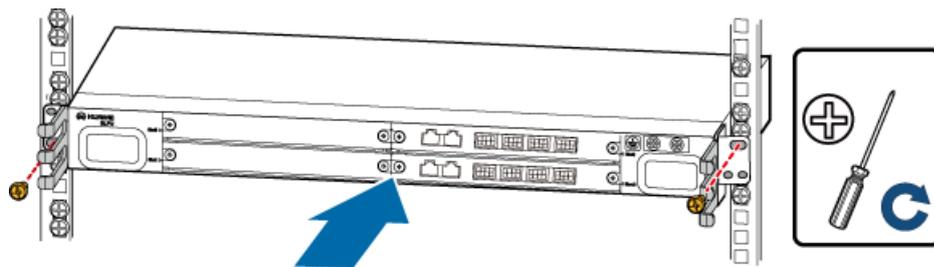
Figure 8-43 Installing cable racks



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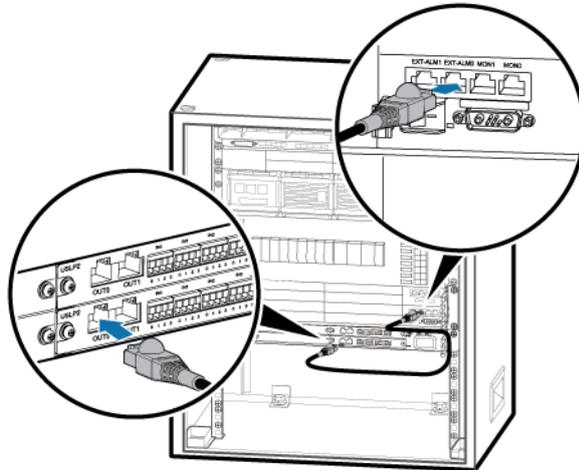
Step 2 Slide the SLPU into the cabinet, and then use the screwdriver to tighten the two screws on the mounting ears of the SLPU, as shown in [Figure 8-44](#).

Figure 8-44 Installing the SLPU



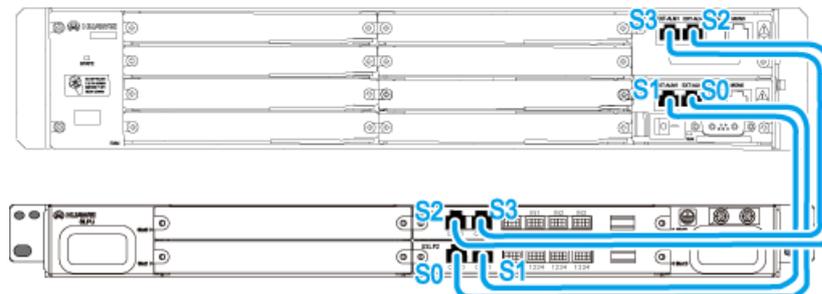
Step 3 Install the surge protection transfer cable for monitoring signals, as shown in [Figure 8-45](#).

Figure 8-45 Installing the surge protection transfer cable for monitoring signals



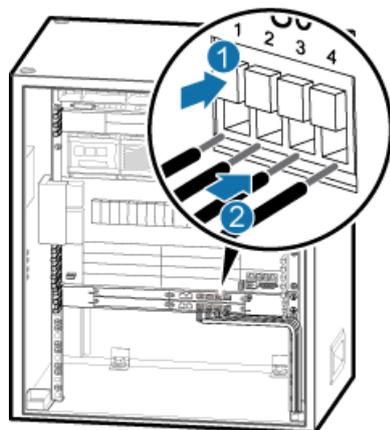
1. Connect one end of the cable to the OUT0 port on the USLP2 in slot 3 of the SLPU.
2. Connect the other end of the cable to the EXT_ALM0 port on the UPEU in the BBU.
3. Connect the other three surge protection transfer cables for monitoring signals by referring to [Figure 8-46](#).

Figure 8-46 Connections of surge protection cables for monitoring signals



Step 4 Install the external dry-contact monitoring signal cables, as shown in [Figure 8-47](#).

Figure 8-47 External dry-contact monitoring signal cables



1. Cut the cable to the required length based on the actual cable route.
2. Strip 8 mm long jacket off the cable that is connected to the SLPU.
3. Use the screwdriver to press the bulge of the connector, insert the bare wire of the cable into the connector, and then loosen the screwdriver to fix the cable. After the cable is connected, slightly pull the cable to check whether the cable is securely connected.

Step 5 Route the cable by referring to [8.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 6 Label the installed cables by referring to Attaching an L-Shaped Label.

---End

8.4.4 (Optional) Installing an EMUA

This section describes the procedures for installing an EMUA and related cables in a +24 V DC APM30H. An EMUA can be installed in a reserved 1 U space in the +24 V DC AMP30H based on actual requirements.

Prerequisite

The tools such as the screwdriver and ESD gloves are available.

Context

[Table 8-4](#) describes the cables related to the EMUA.

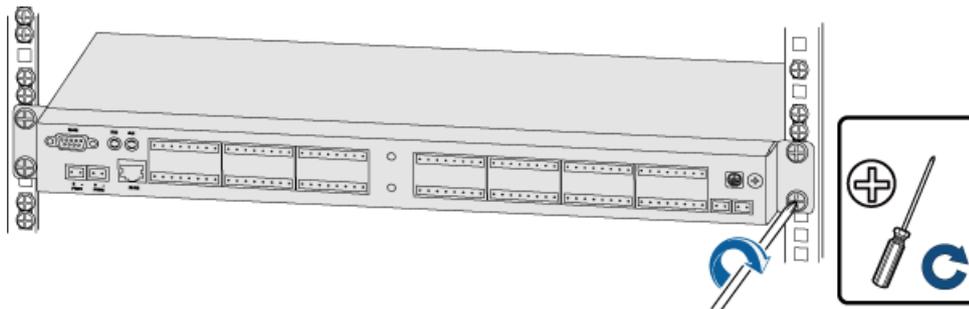
Table 8-4 Cables related to the EMUA

Cable List		One End	The Other End	Remarks
Power cable for the EMUA	RTN(+) cable	M4 OT terminal	Cord end terminal	Black, 1.5 mm ² , two wires in black and blue
	NEG(-) cable	M4 OT terminal	Cord end terminal	
EMUA monitoring signal cable		DB9 male connector	RJ45 connector	Black

Procedure

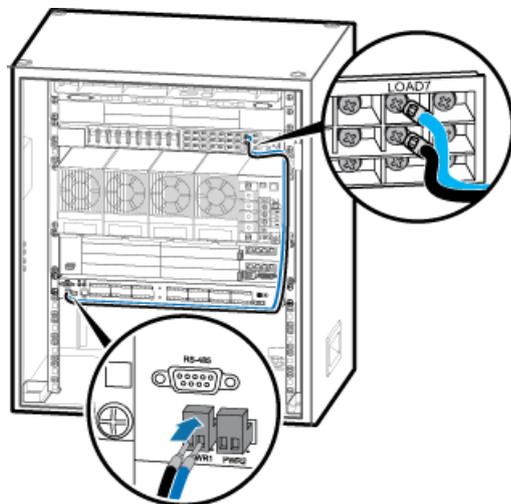
Step 1 Use four screws to install the EMUA in the TMC11H cabinet, as shown in [Figure 8-48](#).

Figure 8-48 Installing the EMUA in the cabinet



Step 2 Install an EMUA power cable, as shown in [Figure 8-49](#).

Figure 8-49 Installing an EMUA power cable in an APM30H

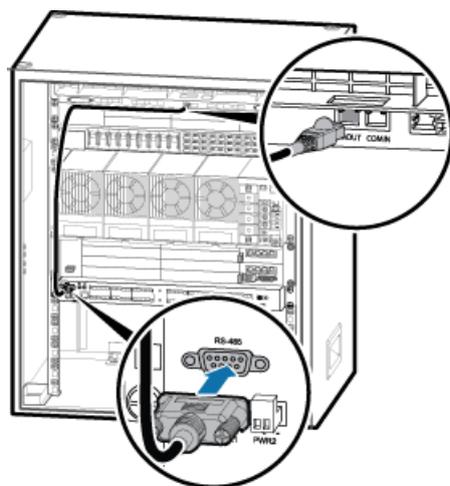


CIH06C2000

1. Install corresponding connectors on both ends of the power cable. For details, see [Assembling the OT Terminal and the Power Cable](#) and [Assembling the Cord End Terminal and the Power Cable](#).
2. Connect the cord end terminal at one end of the power cable to the transfer terminal of the wiring terminal labeled **PWR1** of the EMUA power cable.
3. Connect the OT terminal at the other end of the power cable to the DC output terminal labeled **LOAD7** on the DCDCU-03.

Step 3 Install a monitoring signal cable for the EMUA, as shown in [Figure 8-50](#).

Figure 8-50 Installing a monitoring signal cable for the EMUA



CIH06C3000

1. Connect the DB9 male connector at one end of the signal cable to the wiring terminal labeled **RS-485** in left of the EMUA panel.

2. Connect the RJ-45 connector at the other end of the signal cable to **COM OUT** of the CMUA in the cabinet.

Step 4 Route the cables by referring to [8.5.1 Cabling Requirements](#) and use cable ties to bind the cables.

Step 5 Attach labels to the installed power cable and monitoring signal cable. For details, see Attaching a Sign Plate Label and Attaching an L-Shaped Label.

---End

8.4.5 Installing the GPS Surge Protector

This section describes the procedure and precautions for installing the GPS surge protector and related cables.

Context

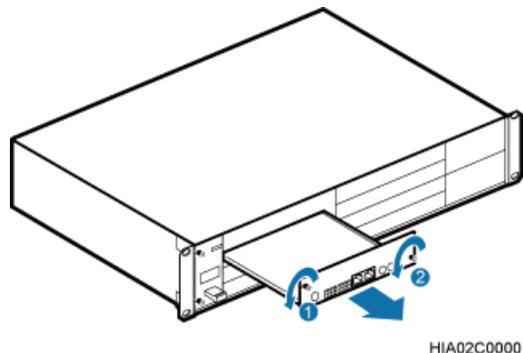
 **NOTE**

Only a dual-satellite receiver needs to be installed onsite.

Procedure

Step 1 Remove the two M3 screws on the panel, and then pull out the USCU, as shown in [Figure 8-51](#).

Figure 8-51 Removing the USCU.



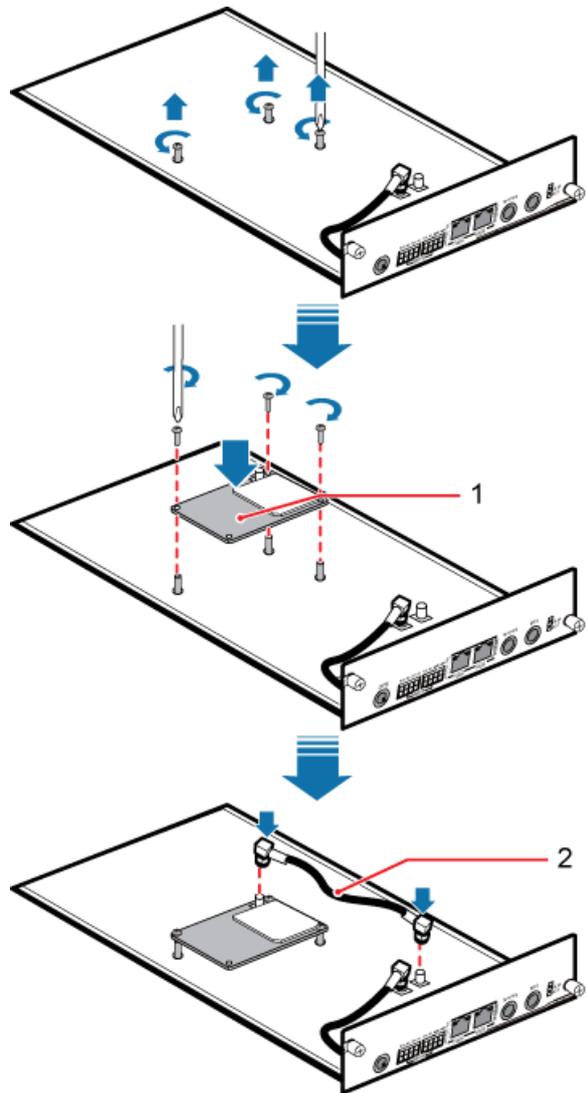
Step 2 Install a satellite receiver on the USCU, as shown in [Figure 8-52](#).

1. Remove the three M1.6 screws from the USCU.
2. Align the mounting holes on the satellite receiver with the bolts on the USCU.
3. Tighten the three M1.6 screws that were removed in [Step 2.1](#) to 0.1 N·m.
4. Connect one end of the RF jumper to the RF port on the satellite receiver and the other end to the GPS port on the USCU.

 **CAUTION**

There are six mounting holes on the satellite receiver. You need to install only three screws on the receiver, as shown in [Figure 8-52](#)

Figure 8-52 Installing the satellite receiver on the USCU



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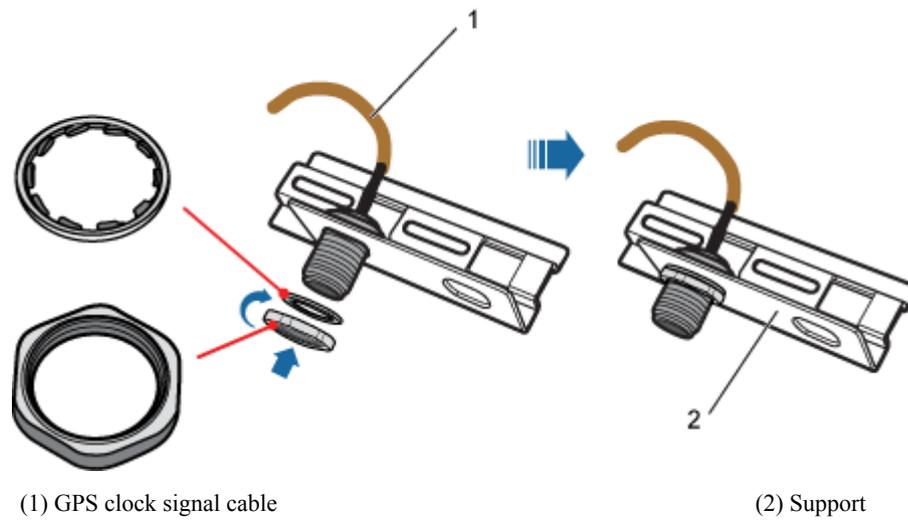
(1) Satellite receiver

(2) RF jumper

Step 3 Install the USCU equipped with the satellite receiver into the BBU, and tighten the screws on the USCU to 0.6 N·m.

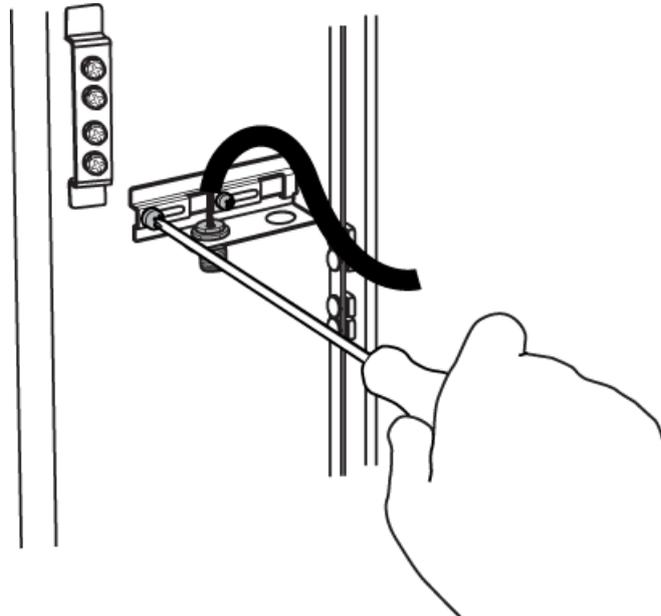
Step 4 Install the GPS clock signal cable on the support, as shown in [Figure 8-53](#).

Figure 8-53 Installing the GPS clock signal cable on the support



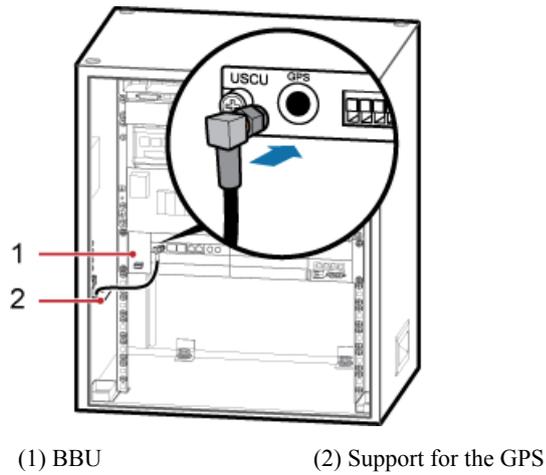
Step 5 Install the support on the left of the cabinet, as shown in [Figure 8-54](#).

Figure 8-54 Installing the support on the cabinet



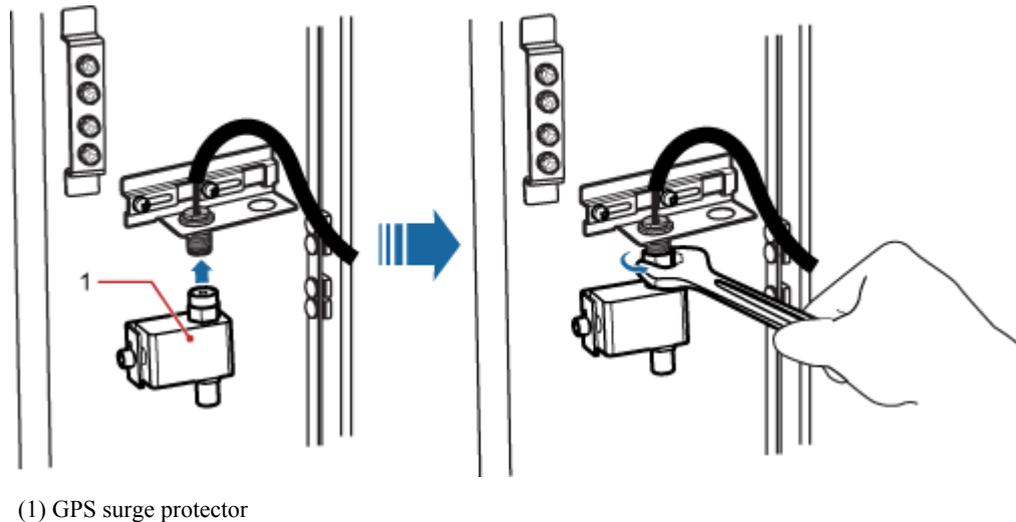
Step 6 Connect the GPS clock signal cable to the GPS port on the USCU, as shown in [Figure 8-55](#).

Figure 8-55 Installing the GPS clock signal cable on the USCU



Step 7 Install the GPS surge protector, as shown in [Figure 8-56](#).

Figure 8-56 Installing the GPS surge protector

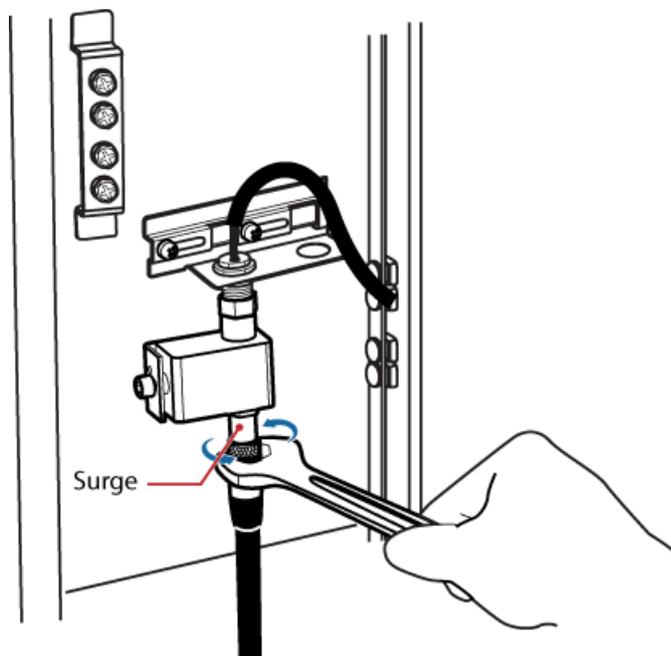


NOTE

The figure of the GPS surge protector is for reference only. The actual appearance may be different.

Step 8 Install the GPS jumper, as shown in [Figure 8-57](#).

Figure 8-57 Installing the GPS jumper



Step 9 Route the cable by referring to [8.5.1 Cabling Requirements](#).

Step 10 Attach labels to the installed cable. For details, see Attaching a Sign Plate Label.

---End

8.5 Installing Cables

This section describes the procedures and precautions to be taken for installing power cables, transmission cables, monitoring signal cables, and CPRI cables when a DBS3900 is deployed outdoors with DC power supply and the BBU is installed in a +24 V DC APM30H.

8.5.1 Cabling Requirements

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



NOTE

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

General Cabling Requirements

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

- The bending radius of the 7/8" feeder must be more than 250 mm (9.84 in.), and the bending radius of the 5/4" feeder must be more than 380 mm (14.96 in.).
- The bending radius of the 1/4" jumper must be more than 35 mm (1.38 in.). The bending radius of the super-flexible 1/2" jumper must be more than 50 mm (1.97 in.), and the bending radius of the ordinary 1/2" jumper must be more than 127 mm (5 in.).

- The bending radius of the power cable or PGND cable must be at least five times the diameter of the cable.
- The bending radius of a fiber optic cable is at least 20 times the diameter of the fiber optic cable.
- The bending radius of the E1/T1 cable must be at least five times the diameter of the cable.
- The bending radius of the signal cable must be at least five times the diameter of the cable.

The cables must be bound as follows:

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

The cables must be routed as follows:

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

Special Cabling Requirements

Cabling requirements for power cables are as follows:

- -48 V power cables must be bound together.
- +24 V power cables must be bound together.
- Power cables, transmission cables, and signal cables are routed separately.
- Multiple power cables must be bound when routed.
- Power cables must be installed in the position specified in engineering design documents.
- If the length of power cables is insufficient, replace the cables rather than adding connectors or soldering joints to lengthen the cables.

Cabling requirements for PGND cables are as follows:

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

Cabling requirements for E1 cables are as follows:

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

Cabling requirements for fiber optic cables are as follows:

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

8.5.2 Installing a Cable Outlet Module in a Cabinet

During cable installation, you must lead the cables through the cable outlet modules at both sides of the bottom of the cabinet for effective sealing.

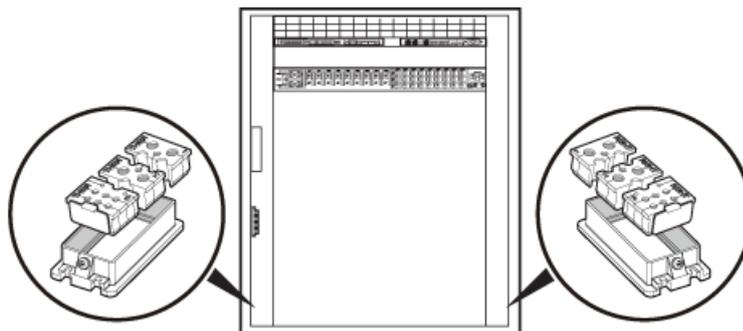
Context

There is a cable outlet module at each side of the bottom of an APM30H, TMC11H, IBBS200D, or IBBS200T, as shown in [Figure 8-58](#).

NOTE

- Cable outlet modules for an APM30H, TMC11H, IBBS200D, or IBBS200T are the same. The following description is based on the cable outlet modules in a TMC11H.
- When two IBBS200Ds or two IBBS200Ts are stacked, you do not need to install cable outlet modules in the upper IBBS.

Figure 8-58 Cable outlet modules in a TMC11H



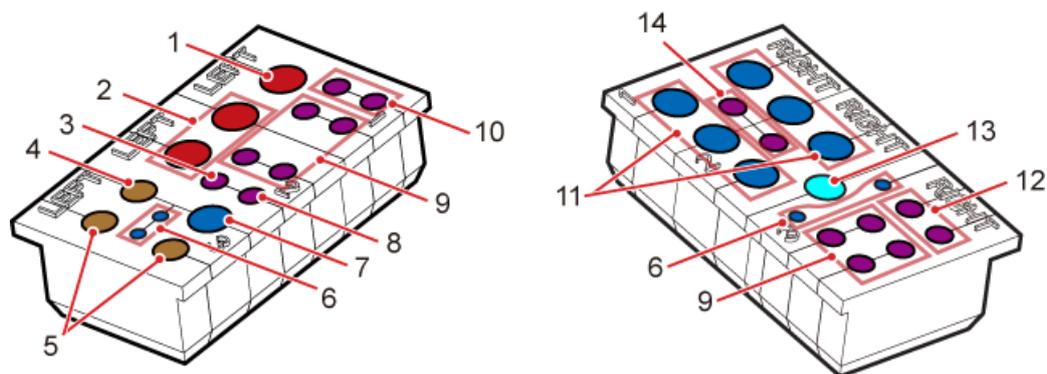
[Figure 8-59](#) shows the exterior of cable outlet modules of the TMC11H.

NOTE

- The cables can be routed through proper cable holes as required.
- The recommended cable routes through the cable outlet module is shown in [Figure 8-59](#). Different color indicates different cross-sectional areas of cables. The same color indicates the same cross-sectional area. You can route the cables that are not mentioned through vacant cable holes matching their cross-sectional areas.

Different colors of cable holes in the figure stand for different cable diameters.

Figure 8-59 Cable outlet modules of the TMC11H



PAD00C0376

- | | |
|--|--|
| (1) Cable hole for an AC input power cable | (8) Cable hole for an SDH cable |
| (2) Cable holes for GPS jumpers (1/2") | (9) Cable holes for CPRI optical cables |
| (3) Cable hole for a PGND cable | (10) Cable holes for AC output power cables, or DC output power cables |
| (4) Cable hole for an E1/T1 cable, or a GPS jumper (RG8) | (11) Cable holes for RRU power cables |
| (5) Cable holes for E1/T1 cables | (12) Cable holes for power cables for storage batteries |
| (6) Cable holes for DC output power cables (of the TMC and IBBS's FAN/TEC) | (13) Cable hole for a Boolean alarm signal cable, or an E1/T1 cable |
| (7) Cable hole for an fiber optic cable | (14) Cable holes for RS485 signal cables |

Procedure

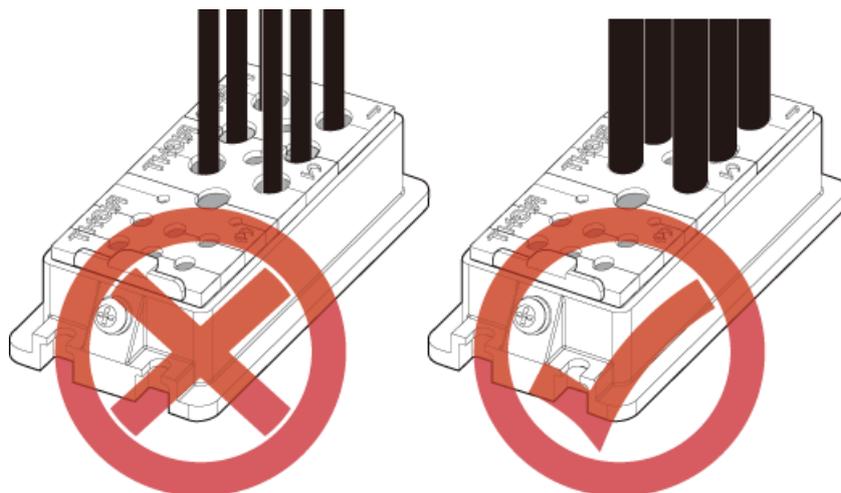
- Step 1** Lead cables with different cross-sectional areas through the cable outlet modules based on the apertures of the holes in the modules, and then insert the cable outlet modules into the cable outlets of the cabinet.



CAUTION

Lead a cable through the cable hole with an aperture matching the cross-sectional area of the cable for effective sealing, as shown in [Figure 8-60](#).

Figure 8-60 Leading cables through cable outlet modules



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Step 2 Use rubber caps to seal the idle cable holes.

Step 3 Tighten the screws in the front of the cable module to fix the module.

----End

8.5.3 Installing Power Cables

When a DBS3900 is deployed outdoors with DC power supply and the BBU is installed in a +24 V DC APM30H, power cables such as an input power cable for the APM30H, BBU power cable, and RRU power cables must be installed.

Installing an Input Power Cable for the +24 V DC APM30H

An input power cable for the +24 V DC APM30H connects a +24 V DC APM30H to external power equipment, feeding external power into the APM30H.

Context

Table 8-5 lists the specifications of an input power cable for the +24 V DC APM30H.

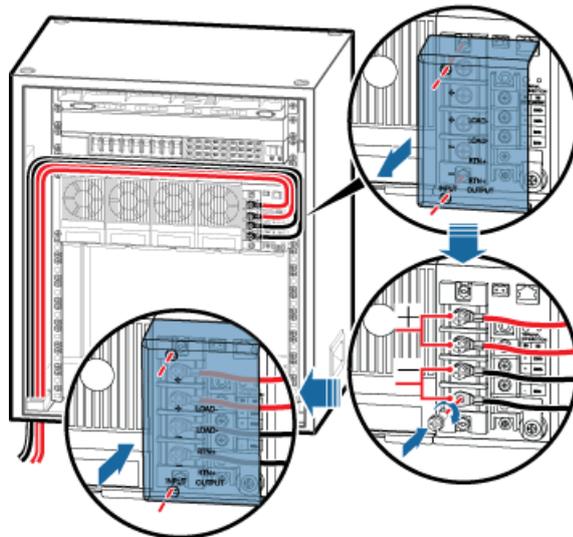
Table 8-5 Specifications of an input power cable for the +24 V DC APM30H

Cable		One End	The Other End	Description
Input power cable for the +24 V DC APM30H	+	OT terminal (M6, 25 mm ²)	Depending on the external equipment	Red
	-	OT terminal (M6, 25 mm ²)	Depending on the external equipment	Black

Procedure

- Step 1** Prepare an input power cable for the +24 V DC APM30H.
1. Cut the cable to the required length based on the actual cable route.
 2. Add connectors to either end of the input power cable for the +24 V DC APM30H according to [Table 8-5](#). For details, see Assembling the OT Terminal and the Power Cable.
- Step 2** Use a Phillips screwdriver to remove the screws from the protecting hood for the wiring terminals of the power subrack (DC/DC), and then remove the protecting hood.
- Step 3** Install the input power cable for the +24 V DC APM30H, as shown in [Figure 8-61](#).
1. Connect the two red and black wires at one end of the input power cable for the +24 V DC APM30H to the wiring terminal labeled + and - on the power subrack (DC/DC) respectively, and then tighten the screws on the wiring terminals using a screwdriver.
 2. Install the protecting hood, and then use a screwdriver to tighten the screws.
 3. Connect the other end to external power equipment.

Figure 8-61 Installing an input power cable for the +24 V DC APM30H



- Step 4** Route the cable by referring to [8.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.
- Step 5** Label the installed cables. For details, see Attaching a Cable-Tying Label.
- Step 6** Run each cable that leaves the cabinet in the PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

----End

Installing a BBU Power Cable

A BBU power cable feeds power into a BBU.

Context

- In the triple mode scenario, two BBUs are required. A second BBU power cable is installed in the same manner as the first BBU power cable.
- **Table 8-6** lists the specifications for a BBU power cable when a DCDU-03B supplies power.

Table 8-6 Specifications of a BBU power cable

Cable		One End	The Other End	Description
BBU power cable	RTN(+) wire	3V3 power connector	OT terminals bent by 90° (M4, 6 mm ²)	Black
	NEG(-) wire		OT terminals bent by 90° (M4, 6 mm ²)	Blue

 **NOTE**

The colors and structures of cables vary according to countries and areas. If the cables are purchased locally, the colors and structures of the cables may be different.

Procedure

- Step 1** Add OT terminals to a BBU power cable. For details, see *Assembling the OT Terminal and the Power Cable*.

 **NOTE**

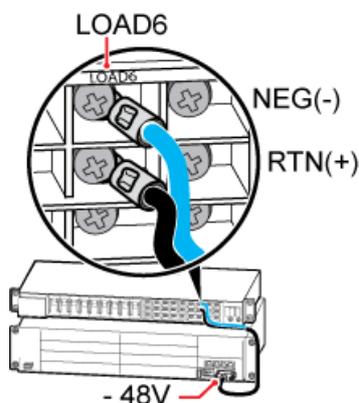
A 3V3 power connector is added to one end of a BBU power cable, and you only need to add OT terminals to the other end onsite.

- Step 2** Install the BBU power cable, as shown in **Figure 8-62**.
1. Link the 3V3 power connector at one end of the BBU power cable to the -48 V port on the UPEU in the BBU, and then tighten the screw on the connector until the tightening torque reaches 0.25 N·m.
 2. Link the OT terminals on the blue and black wires at the other end to the wiring terminals labeled NEG(-) and RTN(+) near the LOAD6 label on the DCDU-03B respectively.

 **NOTE**

A BBU power cable must be connected to each UPEU if two UPEUs are installed in the BBU. The 3V3 power connector at one end of each BBU power cable is connected to the -48V port on each UPEU in the BBU, and the easy power receptacle (pressfit type) connectors at the other end are connected to the LOAD6 and LOAD7 ports on the DCDU-03B, respectively.

Figure 8-62 Installing a BBU power cable



Step 3 Route the cable by referring to [8.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 4 Label the installed cables. For details, see Attaching an L-Shaped Label.

---End

Installing an RRU Power Cable

An RRU power cable feeds -48 V DC power into an RRU from a DCDU-03B.

Context

[Table 8-7](#) lists the specifications of RRU power cables when a DCDU-03B supplies power.

Table 8-7 Specifications of RRU power cables

Cable		One End	The Other End	Remarks
RRU power cable	RTN(+) wire	OT terminals bent by 90° [M4, 3.3 mm ² (12 AWG)]	OT terminal [M4, 3.3 mm ² (12 AWG)]	North American standard Black
	NEG(-) wire	OT terminals bent by 90° [M4, 3.3 mm ² (12 AWG)]	OT terminal [M4, 3.3 mm ² (12 AWG)]	North American standard Blue
	Shield layer	OT terminals bent by 90° [M4]		Heat shrink tubing Black
RRU power cable	RTN(+) wire	OT terminals bent by 90° (M4, 4 mm ²)	OT terminal (M4, 4 mm ²)	European standard Brown

Cable		One End	The Other End	Remarks
	NEG(-) wire	OT terminals bent by 90° (M4, 4 mm ²)	OT terminal (M4, 4 mm ²)	European standard Blue
	Shield layer	OT terminals bent by 90° [M4]		Heat shrink tubing Black
RRU power cable	RTN(+) wire	OT terminals bent by 90° (M4, 4 mm ²)	Easy power receptacle (pressfit type) connector	
	NEG(-) wire	OT terminals bent by 90° (M4, 4 mm ²)		

 **NOTE**

The colors and structures of cables vary according to countries and areas. If the cables are purchased locally, the colors and structures of the cables may be different.

Procedure

Step 1 Prepare an RRU power cable.

- Cut the cable to the required length based on the actual cable route.
- Add OT terminals to the blue, black (or brown) wires and shield layer of the RRU power cable at the DCDU-03B end, as shown in Adding OT Terminals to the DC RRU Power Cable on the DCDU Side.
- Add OT terminals or an easy power receptacle (pressfit type) connector to the other end of the RRU power cable according to the type of power supply socket on the RRU.
 - Add an OT terminal. For details, see the related RRU Installation Guide.
 - Add an easy power receptacle (pressfit type) connector. For details, see the related RRU Installation Guide.

Step 2 Install the RRU power cable, as shown in [Figure 11-17](#).

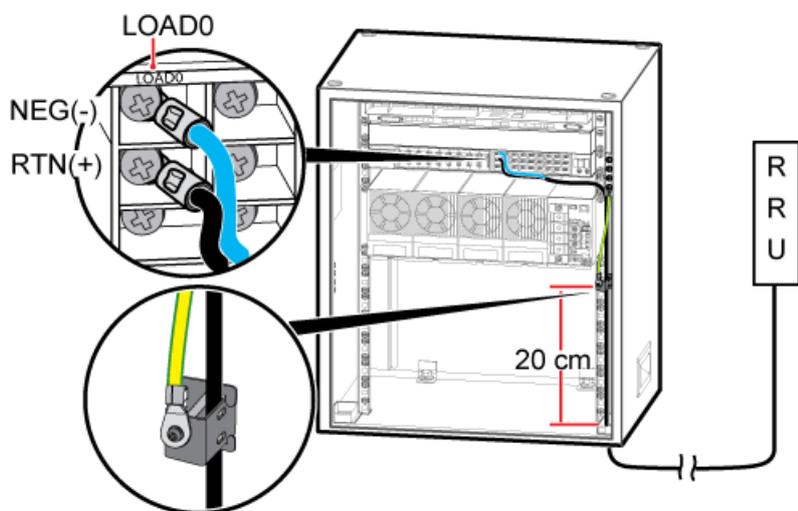
- Link the OT terminals on the blue, black (or brown) wires and shield layer of the RRU power cable to the wiring terminals labeled NEG(-), RTN(+) and PGND near the LOAD0 label on the DCDU-03B respectively.

 **NOTE**

A DCDU-03B supplies power to a maximum of six RRUs, and an RRU power cable can be connected to any of the wiring terminals labeled LOAD0 to LOAD5 on the DCDU-03B.

- Connect the blue and black wires at the other end to the wiring terminals labeled NEG(-) and RTN(+) in the cabling cavity of the RRU respectively.

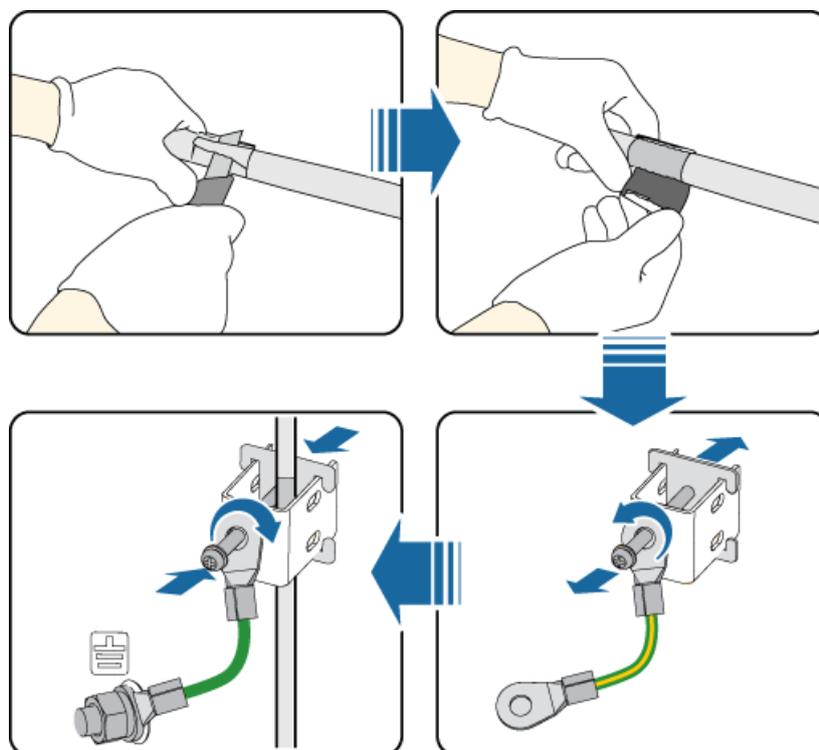
Figure 8-63 Installing an RRU power cable



C1H06C2002

Step 3 In a position 20 cm away from the cable outlet module, strip the jacket for about 25 mm off the RRU power cable to expose the shield layer. Thread the cable through the ground clip to ensure full contact between the shield layer and the ground clip, and then tighten the M4 screws on the clip until the tightening torque reaches 1.2 N·m, as shown in [Figure 8-64](#).

Figure 8-64 Installing a grounding clip



Step 4 Route the cable by referring to [8.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.

- Step 5** Run each cable that leaves the cabinet in the PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

---End

8.5.4 Installing Transmission Cables

When a DBS3900 is deployed outdoors, transmission cables such as an E1/T1 cable, E1/T1 surge protection cable, FE/GE surge protection cable, FE/GE cable, or FE/GE optical cable must be installed based on onsite requirements.

Context

 **NOTE**

Install the transmission cables based on the connections of transmission cables. For details, see the *BBU3900 Hardware Description* Transmission Cable Connections.

Installing an E1/T1 Surge Protection Transfer Cable

An E1/T1 surge protection transfer cable connects the transmission board and surge protection unit for transferring surge protection signals.

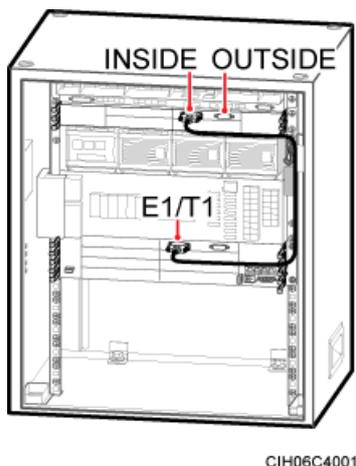
Context

 **NOTE**

The procedures for installing E1/T1 surge protection transfer cables in an APM30H and in a TMC11H are the same. The following description is based on the procedure for installing an E1/T1 surge protection transfer cable in an APM30H.

Procedure

- Step 1** Install an E1/T1 surge protection transfer cable, as shown in [Figure 8-65](#).
1. Link the DB26 connector at one end of the E1/T1 surge protection transfer cable to the E1/T1 port on the GTMU, WMPT, or UTRP in the BBU, and then tighten the plastic screws on the connector until the tightening torque reaches 0.25 N·m.
 2. Link the DB25 connector at the other end to the INSIDE port on the UELP in the SLPU, and then tighten the plastic screws on the connector until the tightening torque reaches 0.25 N·m.

Figure 8-65 Installing an E1/T1 surge protection transfer cable

Step 2 Route the cables by referring to [8.5.1 Cabling Requirements](#), and then use cable ties to bind the cables.

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

----End

Installing the E1/T1 Cable

This section describes the procedure and precautions to be taken for installing an E1/T1 cable.

Prerequisite

Ensure that both ends of the E1 cable are disconnected from any devices. Then, weld connectors to the bare wires at one end of the E1 cable during the same session.

Context

Route the E1/T1 cable as follows:

- If a new base station supports not more than eight E1s, route the ends of the E1/T1 cables connected to the SLPUs along the right of the cabinet.
- If a new base station supports more than eight E1s, route the ends of other E1/T1 cables connected to the SLPUs along the left of the cabinet.

NOTE

The descriptions about the installation positions and routes of the E1/T1 cables in the -48 V DC cabinet and in the APM30H are the same. For details, see [Figure 8-66](#) or [Figure 8-67](#).

Procedure

Step 1 Connect one end of the E1/T1 cable to the OUTSIDE port on the UELP, as shown in [Figure 8-66](#) or [Figure 8-67](#).

NOTE

For details about how to connect the E1/T1 cable, see Transmission Cable Connections.

Figure 8-66 Installing the E1/T1 cable (1)

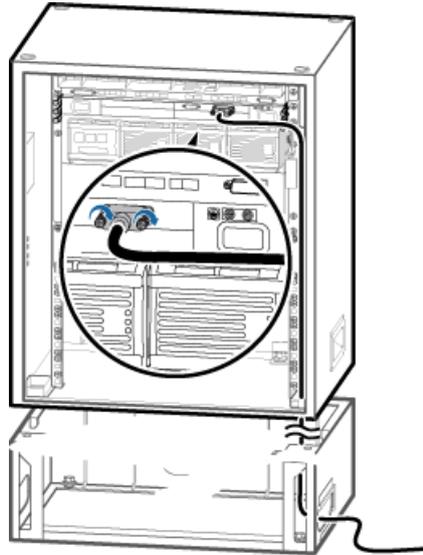
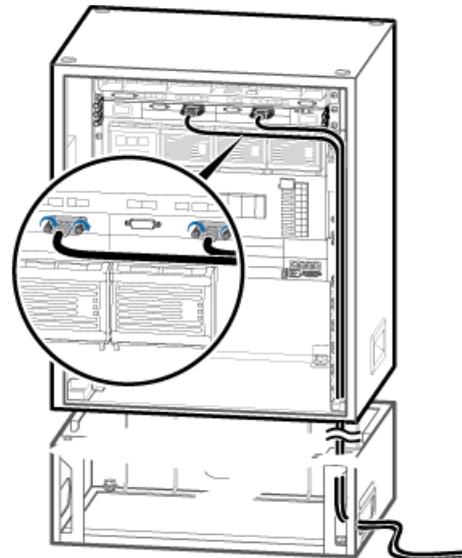


Figure 8-67 Installing the E1/T1 cable (2)



- Step 2** Lead the other end of the E1/T1 cable out of the cabinet through the cable hole at the bottom along the right of the cabinet.
- Step 3** Route the cable along the right of the cabinet by referring to [8.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.
- Step 4** Label the installed cables by referring to Attaching an L-Shaped Label.

----End

Installing a FE/GE Surge Protection Transfer Cable

A FE/GE surge protection transfer cable connects a transmission board and the UFLP, transferring surge protection transfer signals.

Context

NOTE

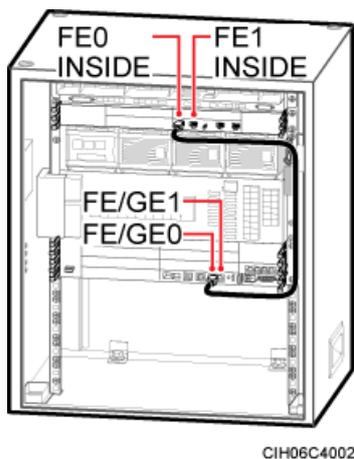
- The procedures for installing FE/GE surge protection transfer cables in an APM30H and in a TMC11H are the same. The following description is based on the procedure for installing a FE/GE surge protection transfer cable in an APM30H.

Procedure

Step 1 Install a FE/GE surge protection transfer cable, as shown in [Figure 8-68](#).

1. Link the RJ45 connector at one end of the FE/GE surge protection transfer cable to the FE0 port on the GTMU or WMPT in the BBU.
2. Connect the other end to the FE0 or FE1 port near the INSIDE label on the UFLP in the SLPU.

Figure 8-68 Installing a FE/GE surge protection transfer cable



Step 2 Route the cables by referring to [8.5.1 Cabling Requirements](#), and then use cable ties to bind the cables.

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

----End

Installing the FE/GE Cable

This section describes the procedure and precautions to be taken for installing an FE/GE cable.

Procedure

Step 1 Connect one end of the FE/GE cable to the FE0 or FE1 port near the OUTSIDE label on the UFLP, as shown in [Figure 8-69](#) or [Figure 8-70](#).

 **NOTE**

- You must use shielded straight-through FE/GE cable.
- For details about how to connect the FE/GE cable, see Transmission Cable Connections.
- The descriptions about the installation positions and routes of the FE/GE cables in the -48 V DC cabinet and in the APM30H are the same. For details, see [Figure 8-69](#).

Figure 8-69 Installing the FE/GE cable (1)

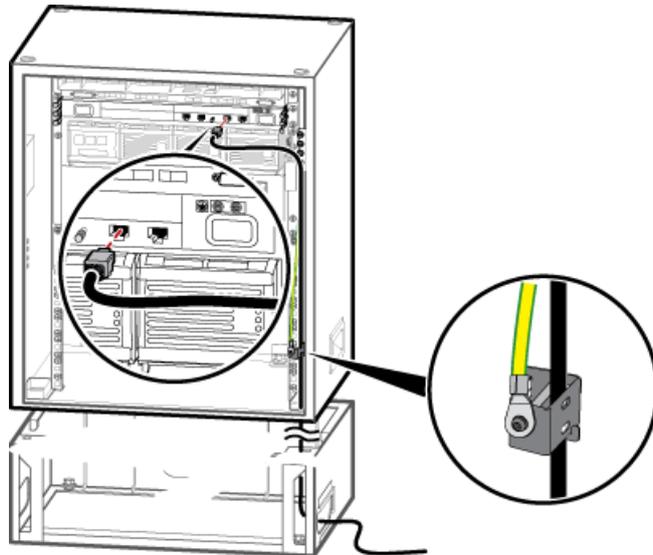
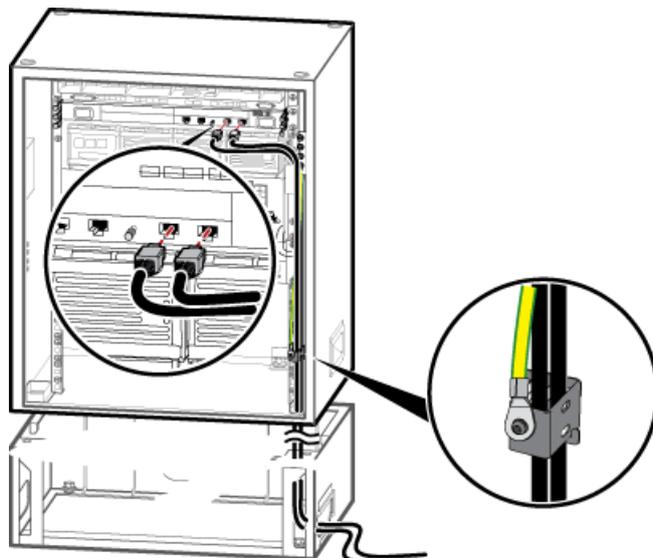


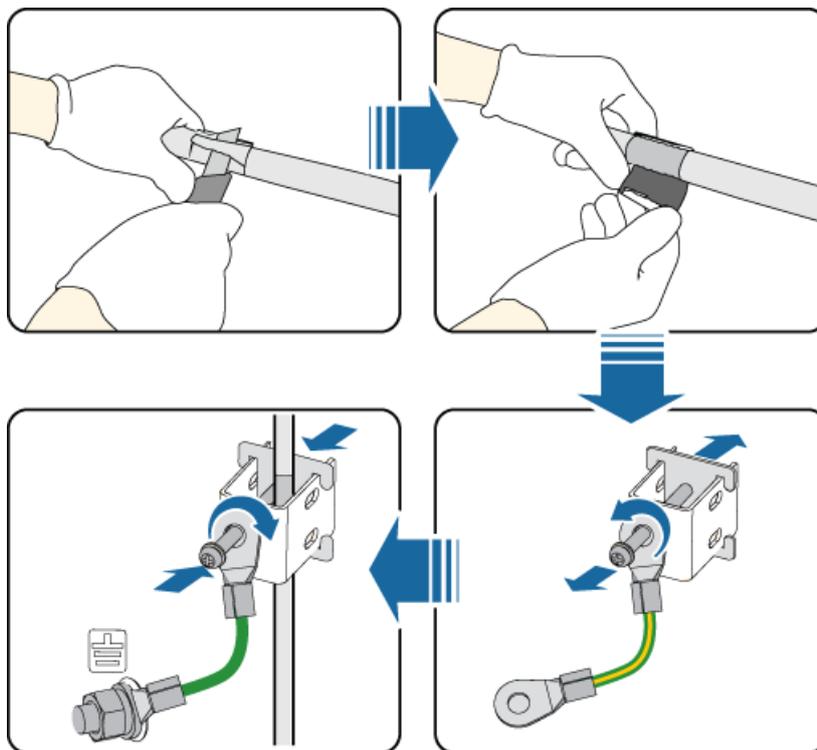
Figure 8-70 Installing the FE/GE cable (2)



Step 2 Install a ground clip for the FE/GE cable in a proper position within 1 m from the cable outlet of the cabinet, as shown in [Figure 8-71](#).

1. Determine the position for grounding the FE/GE cable, and strip the sheath off the cable for about 25 mm to expose the shield layer.
2. Loosen the screws on the ground clip, and route the FE/GE cable through the clip.
3. Make the shield layer of the FE/GE cable in full contact with the ground clip, and tighten the M4 screws on the clip until the tightening torque reaches 1.2 N·m.

Figure 8-71 Installing a grounding clip



- Step 3** Lead the other end of the FE/GE cable out of the cabinet through the cable hole at the bottom along the right of the cabinet.
- Step 4** Route the cable along the right of the cabinet by referring to [8.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.
- Step 5** Label the installed cables by referring to Attaching an L-Shaped Label.

----End

Installing a FE/GE Optical Cable

This section describes the procedure and precautions to be taken for installing a FE/GE optical cable.

Context

- The single-mode optical module is labeled "SM" and multi-mode optical module is labeled "MM".

- If the puller of an optical module is blue, the module is a single-mode optical module. If the puller of an optical module is black or grey, the module is a multi-mode optical module.
- The optical module to be installed must have a matching rate with the corresponding CPRI port.



CAUTION

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



NOTE

The procedures for installing FE/GE optical cables in an APM30H and in an TMC11H are the same. The following description is based on the procedure for installing a FE/GE optical cable in an APM30H.



NOTE

When an LTE only base station uses FE/GE transmission, FE/GE optical cables are usually used for data transmission. The following description is based on the configuration of an LTE only base station.

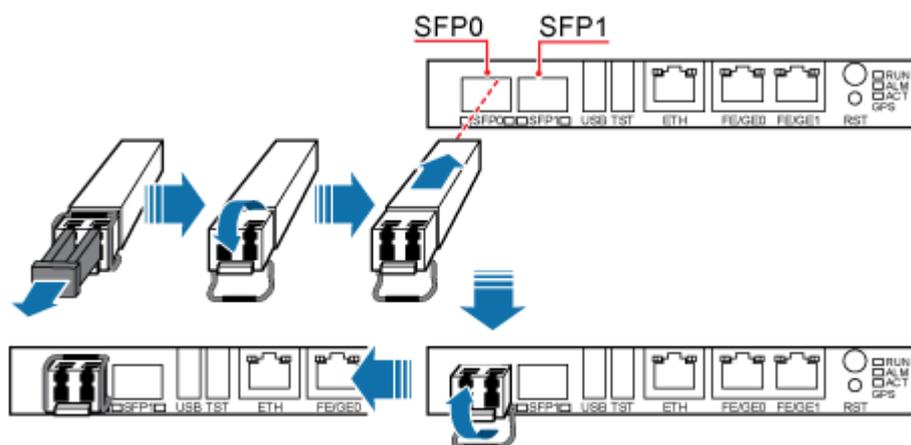
SFP0 and FE/GE0 ports on an LMPT are used for one GE input. Therefore, they cannot be used simultaneously.

SFP1 and FE/GE1 ports on an LMPT are used for another GE input. Therefore, they cannot be used simultaneously.

Procedure

- Step 1** Turn the puller of an optical module outwards, and then insert the optical module into the SFP0 or SFP1 port on the LMPT, as shown in [Figure 8-72](#).

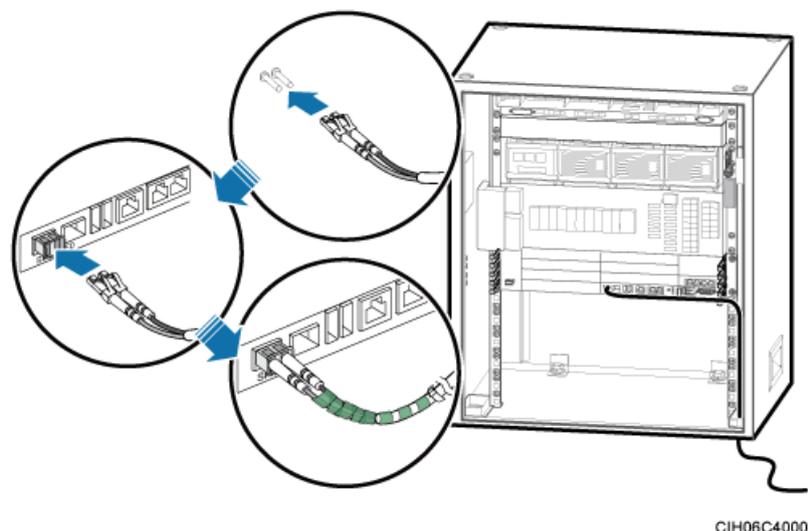
Figure 8-72 Installing an optical module



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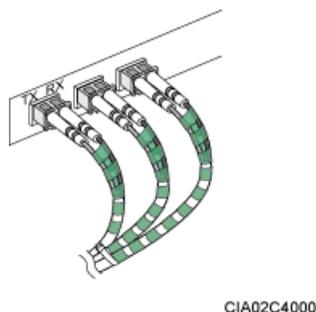
- Step 2** Insert a FE/GE optical cable into the optical module, as shown in [Figure 8-73](#).

Figure 8-73 Installing a FE/GE optical cable



- Step 3** Route the FE/GE optical cable along the cable trough on the right of the cabinet, and then use cable ties to bind the cable.
- Step 4** Route the cable by referring to [8.5.1 Cabling Requirements](#).
- Step 5** Attach labels on the optical cable. For details, see Attaching a Sign Plate Label.
- Step 6** Coil the optical fiber with winding plastic tape at the end connected to the BBU. The tape is coiled between the optical connector and the first cable tie on the cabinet, as shown in [Figure 8-74](#).

Figure 8-74 Coiling the optical fiber with winding plastic tape



---End

8.5.5 Installing Monitoring Signal Cables

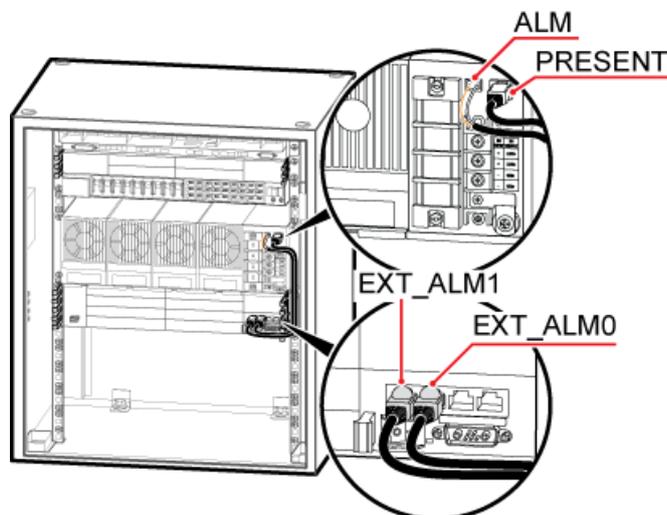
When a DBS3900 is configured with one +24 V DC APM30H, you must install a monitoring signal cable and in-position signal cable for the PSU (DC/DC).

Procedure

- Step 1** Install a monitoring signal cable for the PSU (DC/DC), as shown in [Figure 8-75](#).
 1. Connect one end of the monitoring signal cable for the PSU (DC/DC) to the EXT_ALM0 port on the UPEU in the BBU.

2. Connect the other end to the ALM port on the power subrack (DC/DC).

Figure 8-75 Installing a monitoring signal cable and in-position signal cable for the PSU (DC/DC)



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- Step 2** Install an in-position signal cable for the PSU (DC/DC), as shown in [Figure 8-75](#).
1. Connect one end of the in-position signal cable for the PSU (DC/DC) to the EXT_ALM1 port on the UPEU in the BBU.
 2. Connect the other end to the PRESENT port on the power subrack (DC/DC).
- Step 3** Route the cable by referring to [8.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.
- Step 4** Label the installed cables by referring to Attaching a Sign Plate Label.
- Step 5** Run each cable that leaves the cabinet in the PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

---End

8.5.6 Installing a CPRI Optical Cable

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

Context

- The single-mode optical module is labeled "SM" and multi-mode optical module is labeled "MM".
- If the puller of an optical module is blue, the module is a single-mode optical module. If the puller of an optical module is black or grey, the module is a multi-mode optical module.
- The optical module to be installed must have a matching rate with the corresponding CPRI port.

CAUTION

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

Procedure

Step 1 Install an optical module, as shown in [Figure 8-76](#).

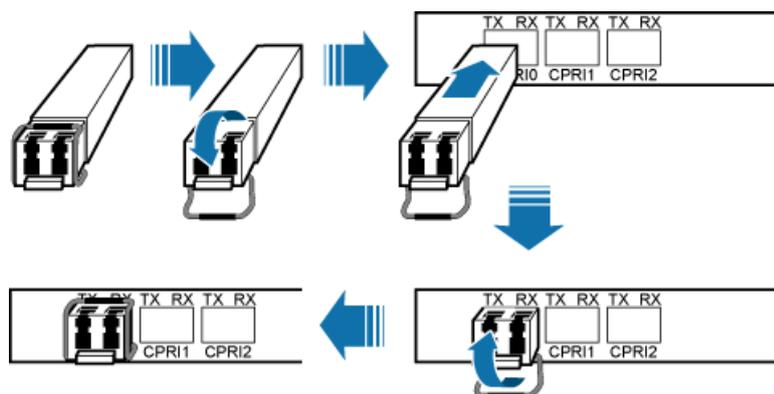
1. Turn the puller on the optical module outwards.
2. Insert the optical module into the CPRI port on the GTMU, WBBPb, WBBPd, or LBBP, and then insert the optical module of the same type⁽¹⁾ into the CPRI_W or CPRI0 port on an RRU.

NOTE

(1) The optical modules with the same label are of the same type.

3. Turn the puller on the optical module inwards.

Figure 8-76 Installing an optical module



Step 2 Install a CPRI optical cable, as shown in [Figure 8-77](#).

NOTE

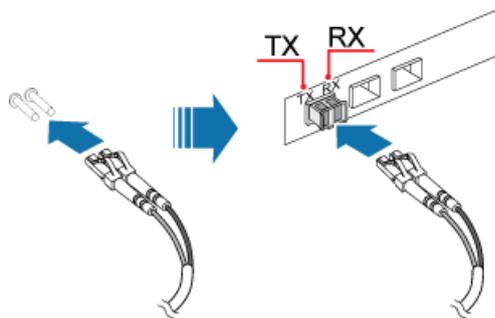
For details about the connections of the CPRI optical cables, see the *BBU3900 Hardware Description* CPRI Cable Connections.

1. Remove the dustproof caps from the connectors of the optical cable.
2. Insert the DLC connectors labeled 2A and 2B at one end of the CPRI optical cable into the optical module on the GTMU, WBBPb, WBBPd, or LBBP, and then insert the DLC connectors labeled 1A and 1B at the other end into the optical module on the RRU.

CAUTION

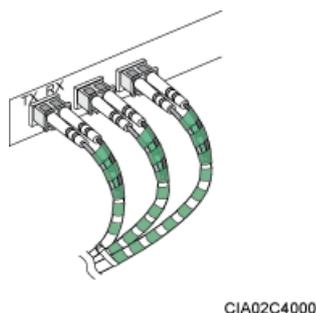
If both ends of the optical cable are the LC connectors, the TX and RX ports on the BBU are respectively connected to the TX and RX ports on the RRU.

Figure 8-77 Installing a CPRI optical cable



- Step 3** Route the CPRI optical cable along the left of the cabinet, and then lead it out of the cabinet from the cable hole on the left of the bottom. For details, see [8.5.1 Cabling Requirements](#).
- Step 4** Attach labels on the optical cable. For details, see Attaching a Sign Plate Label.
- Step 5** Coil the optical fiber with winding plastic tape at the end connected to the BBU. The tape is coiled between the optical connector and the first cable tie on the cabinet, as shown in [Figure 8-78](#).

Figure 8-78 Coiling the optical fiber with winding plastic tape



----End

8.6 Installation Checklist

Check the installation items, installation environment, and cable-related items after the cabinets and devices are all installed.

Cabinet Installation Checklist

[Table 8-8](#) describes the cabinet installation checklist.

Table 8-8 Cabinet installation checklist

No.	Item
1	The installation position of the cabinet strictly complies with the engineering design.
2	In the wall-mounted scenario, the holes of the mounting ears are well aligned with the holes of the expansion bolt assemblies. In addition, the mounting ears are secured on the wall evenly and steadily.

No.	Item
3	In the metal-pole-mounted scenario, the supports for the metal pole are secure on the floor.
4	If the cabinet is installed on the floor, the base is securely installed.
5	Either the horizontal error or vertical error of the cabinet is less than 3 mm.
6	All the bolts, especially those for electrical connections, are tight. Both the spring washer and the flat washer are installed in the correct sequence.
7	The cabinet is neat and clean.
8	The paint on the surface is intact. If any paint is damaged, you must apply touch-up paint to avoid erosion.
9	Filler panels are installed in the space reserved for customer equipment.
10	The cabinet door can be easily opened or closed, the lock works properly, and the gag lever post is secure.
11	All labels, tags, and nameplates are correct, legible, and complete.

Cabinet Installation Environment Checklist

Table 8-9 describes the cabinet installation environment checklist.

Table 8-9 Cabinet installation environment checklist

No.	Item
1	There are no fingerprints or other smears on the surface of the cabinet.
2	There are no excessive straps or adhesive tape on the cables.
3	No tapes, tails of cable ties, paper, or packing bags are left around the cabinet.
4	All the items around the cabinet are neat, clean, and intact.

Electrical Connection Checklist

Table 8-10 describes the electric connection checklist of the cabinet.

Table 8-10 Electric connection checklist of the cabinet

No.	Item
1	All self-made PGND cables are copper-based with the proper wire diameters. No breaking device such as switch and fuse is allowed for the electric connection of the grounding system. No short circuit is allowed.

No.	Item
2	The PGND cable is securely connected and the AC lead-in cable and cables in the cabinet are correctly connected according to the electrical design of the power system. The screws are tightened. In addition, the inputs or outputs are not short-circuited.
3	The redundant part of the power cable or PGND cable is stripped off rather than coiled.
4	The terminals at both ends of the power cable or PGND cable are securely soldered or crimped.
5	The bare wires and the terminal handles at the wiring terminals are coated with heat-shrinkable tubes.
6	The flat washer and the spring washer are well mounted on all OT terminals.
7	The exterior of the battery is intact without any scratch, dent, or crack.
8	The shell of the battery is clean without any leakage trace.
9	The wiring post on the battery stands properly without any damage, and the post is not covered with any acidic substances.
10	The pressure relief valve of the battery is not transformed, and no liquid leaks.
11	The power cables for the batteries are connected to the positive and negative polarities correctly.
12	The voltage of the battery is normal. <ul style="list-style-type: none">● The voltage of a 2 V battery cell ranges from 1.8 V to 2.35 V.● The voltage of a 12 V battery cell ranges from 10.8 V to 14.1 V.● The total voltage of the batteries ranges from 43.2 V to 56.4 V.
13	The fans work properly. <ul style="list-style-type: none">● The fan in the IBBS200D rotates in a low speed in a normal situation.● The outer air circulation fan in the IBBS200T stops in a normal situation (with the ambient temperature of lower than 30°C), and the inner air circulation fan rotates in a high speed.● The outer air circulation fan in the APM30H stops in a normal situation (with the ambient temperature of lower than 35°C), and the inner air circulation fan rotates in a low speed.
14	The MCBs for the batteries are set to OFF.

Cable Installation Checklist

Table 8-11 describes the cable installation checklist.

Table 8-11 Cable installation checklist

No.	Item
1	All cables are connected securely and reliably. Pay special attention to the communication cable connections and cable connections at the bottom of the cabinet.
2	The cables are neatly and tightly bound. The cable ties are evenly spaced and face the same direction.
3	Different types of cable, such as the power cable, ground cable, feeder, optical cable, E1/T1 cable, and FE cable are separately bound.
4	The cable layout facilitates maintenance and future capacity expansion.
5	All the labels at both ends of the cables are legible.
6	The extra length of the indoor cable ties is cut, and the cut surfaces are smooth without sharp edges. The extra length of 3 mm to 5mm of the outdoor cable ties is reserved when the cable ties are cut.
7	The idle port that no cable is connected to is properly protected.
8	The connectors of the RF cables are fixed in position to avoid false connection that may cause an abnormal voltage standing wave ratio (VSWR).

BBU Hardware Installation Checklist

Table 8-12 describes the BBU hardware installation checklist.

Table 8-12 BBU hardware installation checklist

No.	Item
1	All self-made PGND cables are copper-based with the proper wire diameters. No switch, fuse, or similar object is allowed for the electrical connection of the grounding system. No short circuit is allowed. Only one OT terminal of the PGND cable can be connected to each terminal on the ground bar.
2	The redundant part of the power cable or PGND cable is stripped off rather than coiled.
3	The terminals at both ends of the power cable or PGND cable are securely soldered or crimped.
4	The bare wires at the terminals and terminal handles are covered with heat-shrinkable tubes.
5	The flat washer and spring washer are well mounted on all OT terminals, and the OT terminals are intact and contact the wiring terminals properly.
6	All the cables, including those on the bottom of the cabinet, are securely connected.

No.	Item
7	The cables are neatly and tightly bound. The cable ties are evenly spaced and face the same direction.
8	The power cable, PGND cable, feeder, optical cable, and the E1/T1/FE cable are bound separately with spacing of more than 30 mm.
9	The cable layout facilitates maintenance and future capacity expansion, and the bending radius of the cable meets the requirements.
10	Legible labels are attached to both ends of all cables.
11	The extra length of the indoor cable ties is cut, and the cut surfaces are smooth without sharp edges. The extra length of 3 mm to 5 mm of the outdoor cable ties is reserved when the cable ties are cut.
12	The unused ports are properly protected.

8.7 Power-On Check

Before a DBS3900 starts operating, you must check the power-on status of the cabinet and components in it.



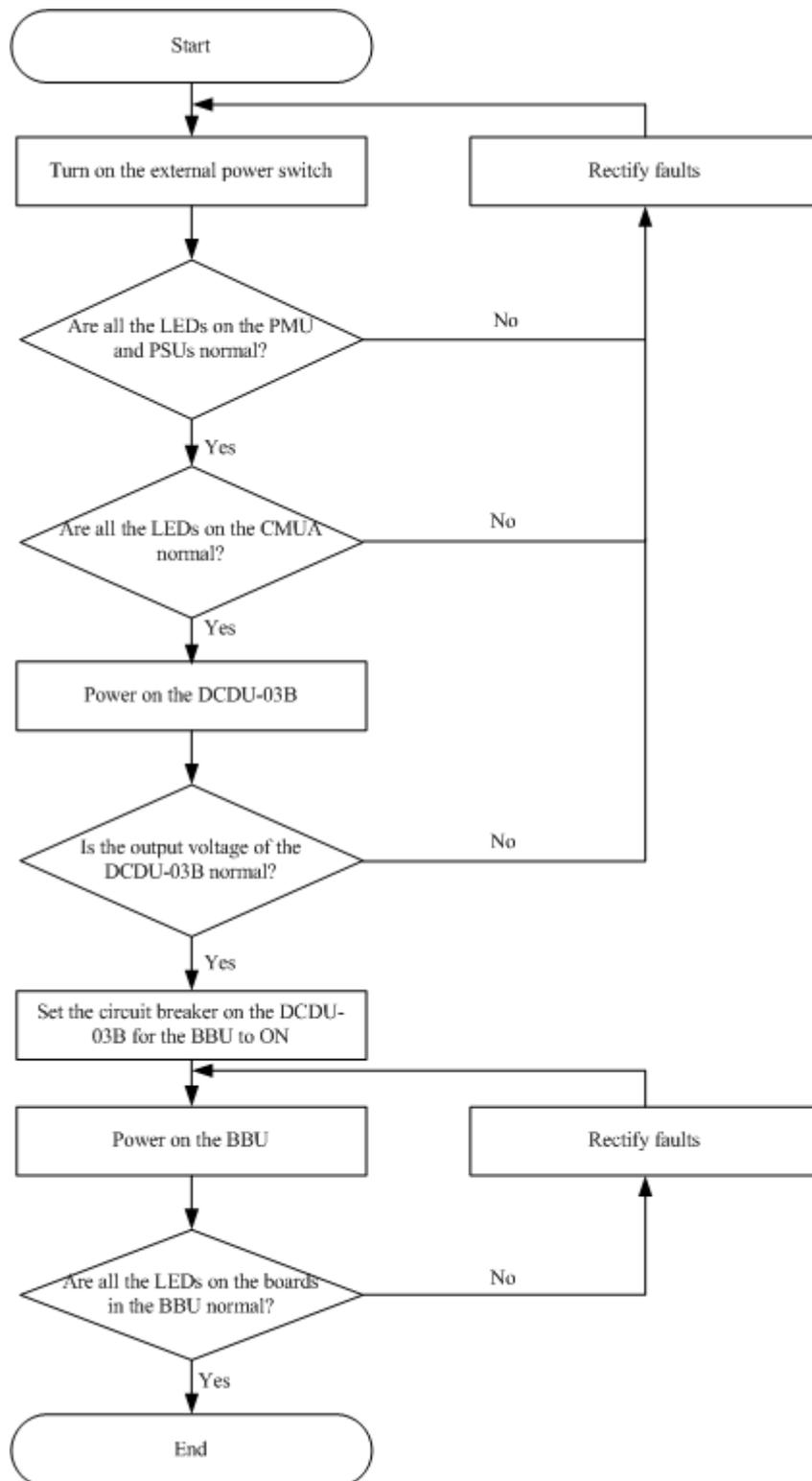
CAUTION

The DBS3900 must be powered on within seven days after it is unpacked, and the period for which the DBS3900 remains powered-off during maintenance must not exceed 48 hours.

Power-On Check in the Outdoor Scenario with DC Power Supply (BBU Installed in a +24 V DC APM30H)

Figure 8-79 shows the power-on check when a DBS3900 is deployed outdoors with DC power supply and the BBU is installed in a +24 V DC APM30H.

Figure 8-79 Power-on check in the outdoor scenario with DC power supply (BBU installed in a +24 V DC APM30H)



LED Status and Output Voltage Check

- The normal status of the LEDs on a PMU is as follows:
RUN LED: blinking
ALM LED: off
- The normal status of the LEDs on a PSU is as follows:
Power LED: steady green
Protection LED: off
Fault LED: off
- The normal status of the LEDs on a CMUA is as follows:
RUN LED: blinking
ALM LED: off
- The DC output voltage of a DCDU-03B ranges from -43.2 V DC to -57 V DC.
- The normal status of the LEDs on a GTMU, WMPT, WBBP, LMPT, LBBP, and UTRP is as follows:
 - RUN LED: on for 1s and off for 1s
 - ALM LED: off
 - ACT LED: on
- RUN LED on the UPEU: on
- STATE LED on the FAN unit: blinking green slowly (on for 1s and off for 1s)

8.8 Subsequent Operations

You must perform subsequent operations after installing a base station and checking related hardware installation.

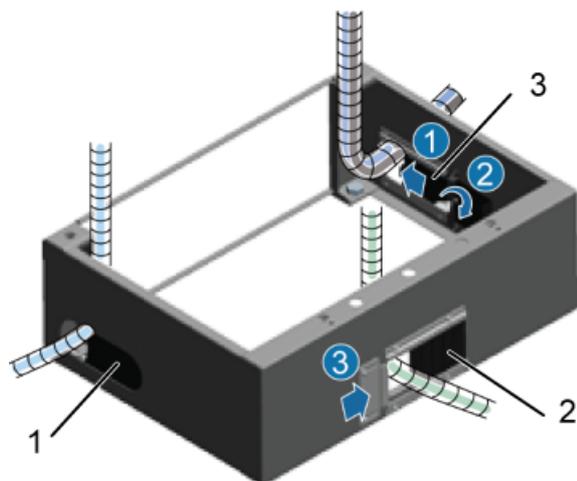
8.8.1 Sealing the Cable Holes on the Base

After all the cables are installed, you need to seal the cable holes of the base.

Procedure

- Step 1** Use baffle plates to cover the idle cable holes, and then tighten screws on the plates, as shown in [Figure 8-80](#).

Figure 8-80 Sealing the cable holes of the base by using the baffle plates



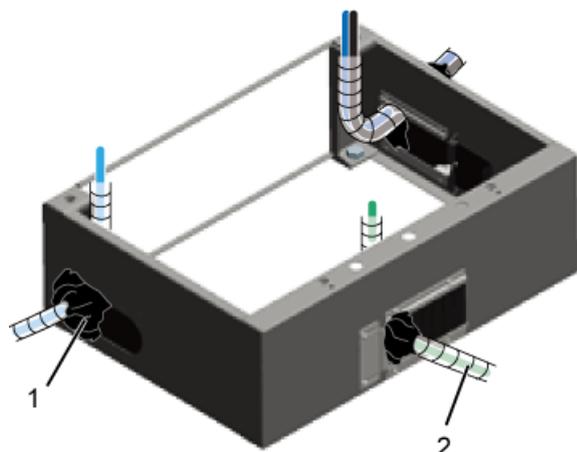
(1) Baffle plate on the right

(2) Baffle plate at the rear

(3) Baffle plate on the left

Step 2 Use fireproof clay to seal the cable holes of the base, as shown in [Figure 8-81](#).

Figure 8-81 Sealing the cable holes of the base by using the fireproof clay



(1) Fireproof clay

(2) PVC corrugated pipe

NOTE

Fireproof clay can be used only for sealing the cable outlet hole in the base. It cannot be used for sealing the cable outlet hole of the cabinet.

Step 3 Tighten the screws on the front baffle plate of the base.

----End

8.8.2 Applying Touch-Up Paint

The paint on the surface is intact. If any paint is damaged, you must apply touch-up paint to avoid erosion.

Prerequisite

Before applying touch-up paint, select the same color as the original coating, as listed in [Table 8-13](#).

Table 8-13 Code of color samples

Object	Color	Code of Huawei Color Sample	International Color Code
Cabinet (including the APM30H, RFC, TMC11H, IBBS200T, and IBBS200D)	RAL7035	YB026	RAL7035
Base	3010 Light gray	YB030	Pontone 422U

Procedure

- Step 1** If there are stains in the damaged area or rust on the material, use fine sandpaper to polish the damaged area to remove the stains or rust.
- Step 2** Use clean cotton cloth to remove the stains or dust from the surface of the area to be polished or repaired.
- Step 3** Shake the paint well, and then use a small brush inside the bottle to absorb paint and evenly spread the paint on the damaged area until the area is covered.



CAUTION

The paint coating should be as thin as possible. No drops are allowed on the paint coating, and the surface should be smooth.

- Step 4** Perform subsequent operations after the repaired paint coating is exposed in the air for 30 minutes.

NOTE

The color of the repaired paint coating area should be consistent with that of the surrounding areas, without obvious edges and bulges, and the original damage should no longer be distinguishable. In addition, there should be no paint peeled off.

---End

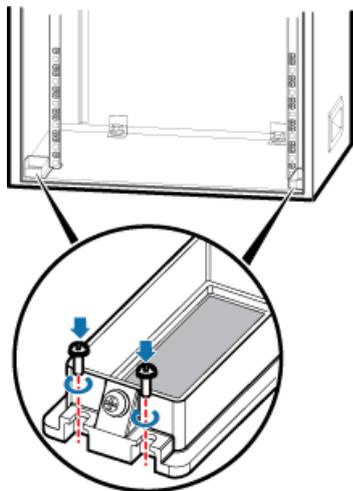
8.8.3 Applying Grease

When the APM30H and TMC11H are installed on a wall or metal pole, you must apply grease to the cable outlet module and the four screws for securing the cabinet to the trapezoidal rack.

Procedure

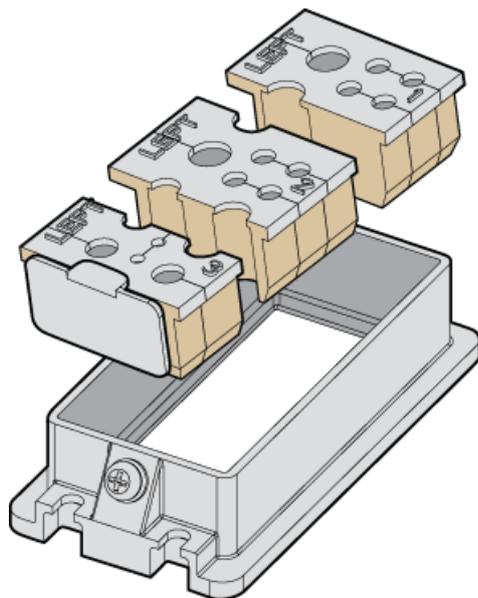
- Step 1** Install a cable outlet subrack on both sides at the bottom of a cabinet, as shown in [Figure 8-82](#).

Figure 8-82 Installing a cable outlet subrack



Step 2 Apply delivered grease to the surfaces and gaps of the three cable outlet modules evenly, and then insert the modules into the cable outlet subrack, as shown in [Figure 8-83](#).

Figure 8-83 Applying grease to cable outlet modules

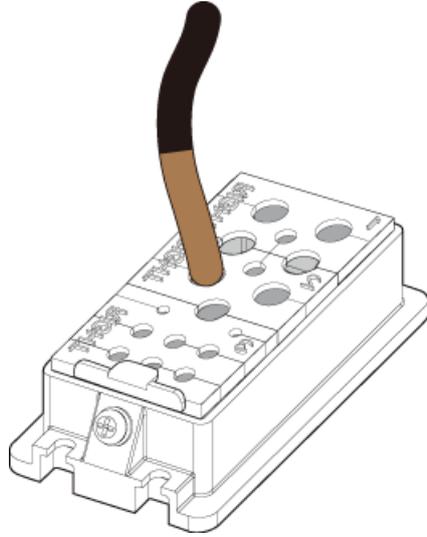


 **NOTE**

When a cabinet is installed on a wall or metal pole, you must apply grease to the cable outlet module and the four screws for securing the cabinet to the trapezoidal rack.

Step 3 Apply grease to the surfaces of the cables, and then route the cables through the cable outlet modules. Apply grease to the rubber caps evenly, and then insert the rubber caps into unused cable holes, as shown in [Figure 8-84](#).

Figure 8-84 Applying grease to cables and rubber caps



---End

9 Outdoor Scenario with DC Power Supply (BBU Installed in an OMB)

About This Chapter

This chapter describes the procedures for installing an OMB, components in it, and related cables when a DBS3900 is deployed outdoors with DC power supply and the BBU is installed in the OMB.

9.1 Installation Process

When a DBS3900 is deployed outdoors and the BBU is installed in an OMB, you must install the OMB, components in it, and related cables. In addition, some optional components may be required based on actual requirements.

9.2 Installing an OMB

An OMB can be installed on a pole or wall depending on site requirements.

9.3 Installing a BBU

This section describes the procedure and precautions to be taken for installing a BBU in an OMB when a DBS3900 is deployed outdoors.

9.4 Installing Cables

This section describes the procedures and precautions to be taken for installing power cables, transmission cables, monitoring signal cables, and CPRI cables when a DBS3900 is deployed outdoors and the BBU is installed in an OMB.

9.5 Installation Checklist

Check the installation items, installation environment, and cable-related items after the cabinets and devices are all installed.

9.6 Power-On Check

Before a DBS3900 starts operating, you must check the power-on status of the cabinet and components in it.

9.7 Applying Touch-Up Paint

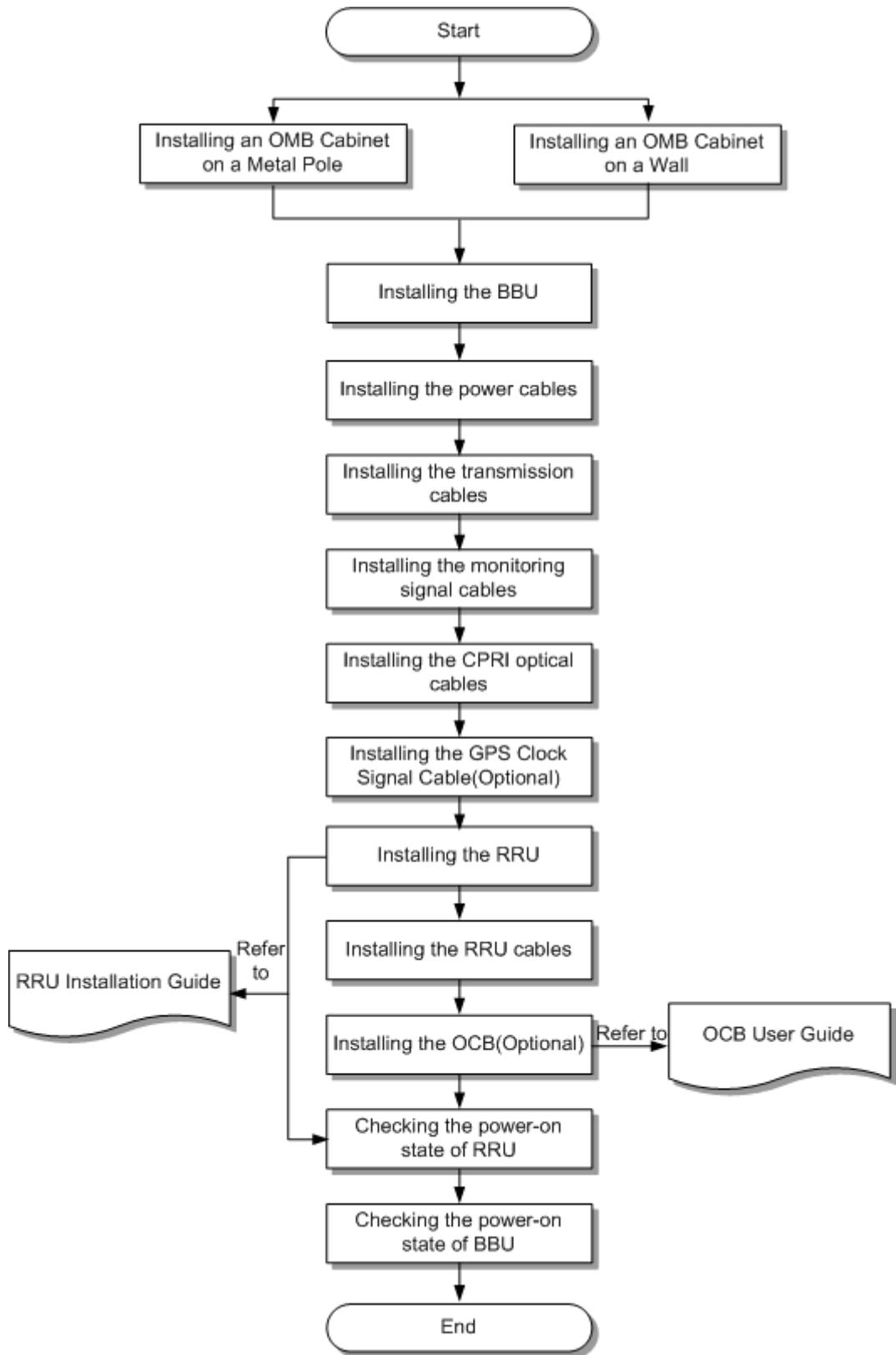
The paint on the surface is intact. If any paint is damaged, you must apply touch-up paint to avoid erosion.

9.1 Installation Process

When a DBS3900 is deployed outdoors and the BBU is installed in an OMB, you must install the OMB, components in it, and related cables. In addition, some optional components may be required based on actual requirements.

Figure 9-1 shows the installation process.

Figure 9-1 Installation process



 NOTE

- The procedure for installing an RRU is not described in this document. For details about how to install an RRU, see the associated RRU installation guide according to the RRU model.
- The Outdoor Cable Conversion Box (OCB) is an optional component, which is used to connect cables with different cross-sectional areas. For details about an OCB, see the *OCB User Guide*.

9.2 Installing an OMB

An OMB can be installed on a pole or wall depending on site requirements.

9.2.1 Installing an OMB on a Metal Pole

This section describes the procedure and precautions to be taken for installing an OMB on a metal pole. An OMB can be installed on a metal pole outdoors.

Context

 NOTE

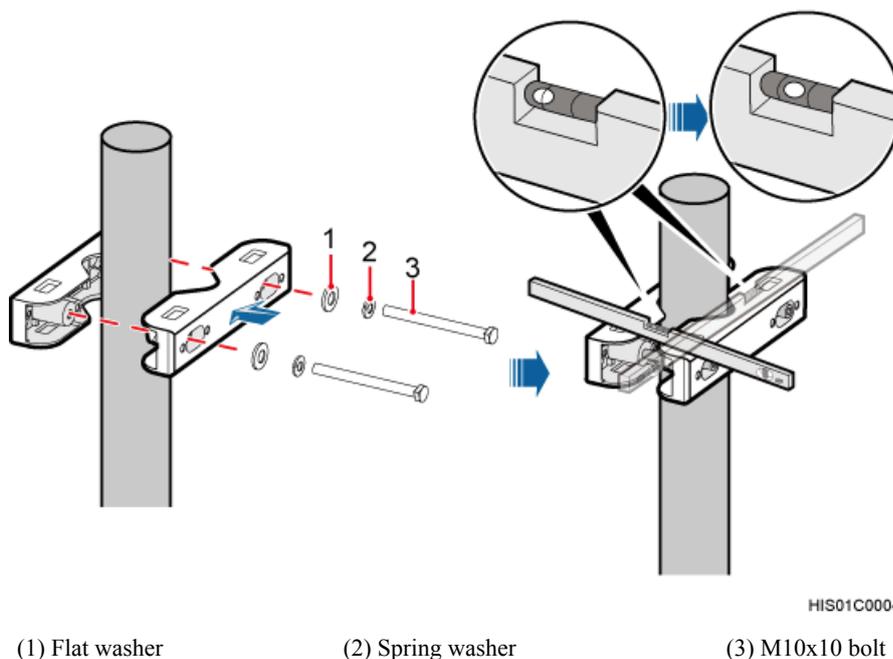
- The cabinet cannot be installed at a height of more than 10,000 mm.
- The diameter of a metal pole for installing an OMB ranges from 60 mm to 140 mm.

Procedure

Step 1 Install upper brackets, as shown in [Figure 9-2](#).

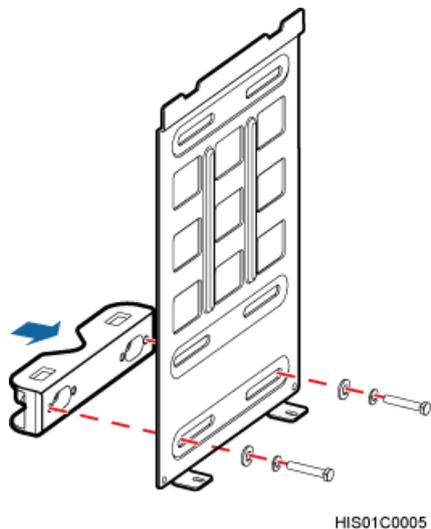
1. Install upper brackets on a metal pole, lead each M10x110 bolt through a spring washer, flat washer, and brackets in sequence, and then use an inner hexagon wrench to secure them until the tightening torque reaches 28 N·m.
2. Use a level to check whether the brackets are on a horizontal plane.

Figure 9-2 Installing upper brackets



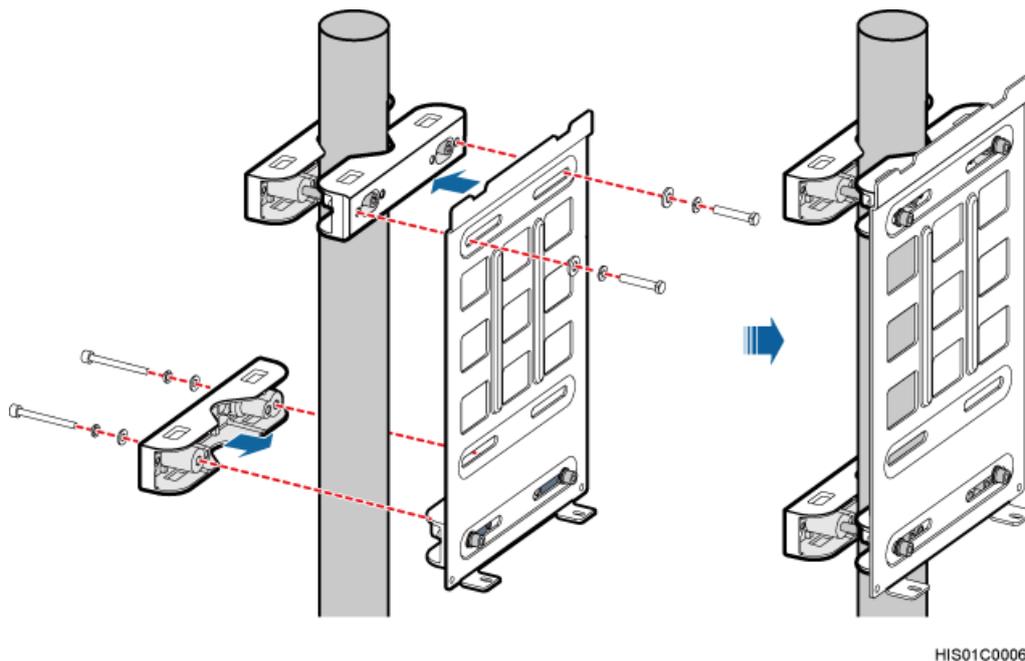
- Step 2** Lead each M10x40 bolt through a spring washer and flat washer in sequence, and then secure the back mounting plate on the lower bracket until the tightening torque reaches 28 N·m, as shown in **Figure 9-3**.

Figure 9-3 Installing a back mounting plate on a lower bracket



- Step 3** Lead each M10x110 bolt through a spring washer, flat washer, and lower brackets on which the back mounting plate is secured, and then tighten the bolts until the tightening torque of 28 N·m, as shown in **Figure 9-4**.

Figure 9-4 Installing a backplane on a metal pole



- Step 4** Place an OMB onto the back mounting plate, and then use M6x16 bolts to secure the back mounting plate on the attachment plate at the bottom of the OMB until the tightening torque reaches 4.8 N·m, as shown in [Figure 9-5](#).

Figure 9-5 Installing an OMB



---End

9.2.2 Installing an OMB on a Wall

This section describes the procedure and precautions to be taken for installing an OMB on a wall. An OMB can be installed on a wall outdoors.

Context

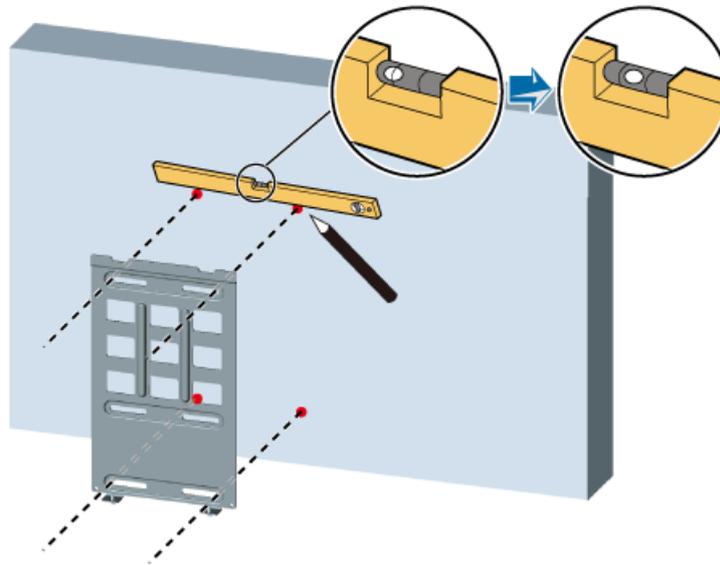
 **NOTE**

- The cabinet cannot be installed at a height of more than 10,000 mm.

Procedure

- Step 1** Mark four anchor points based on the positions of the holes in the backplane, and ensure that two anchor points are on the same horizontal plane by using the level, as shown in [Figure 9-6](#).

Figure 9-6 Marking anchor points

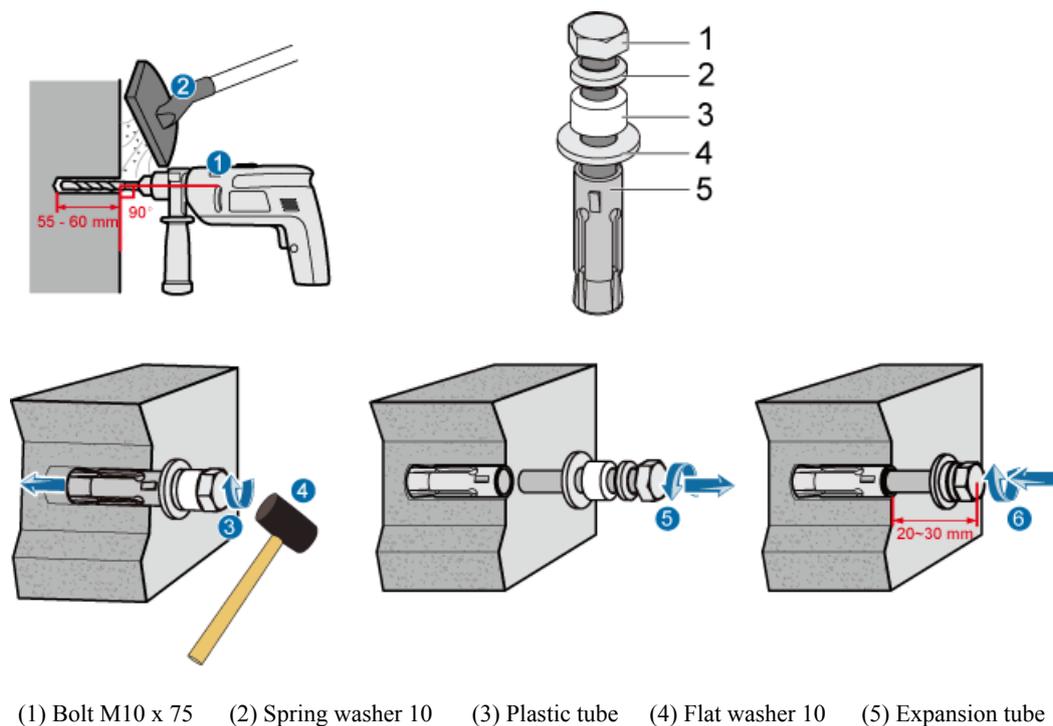


Step 2 Use the hammer drill with a $\Phi 14$ bit to drill a hole at each marked anchor points, and then install an expansion bolt assembly, as shown in [Figure 9-7](#).

 **NOTE**

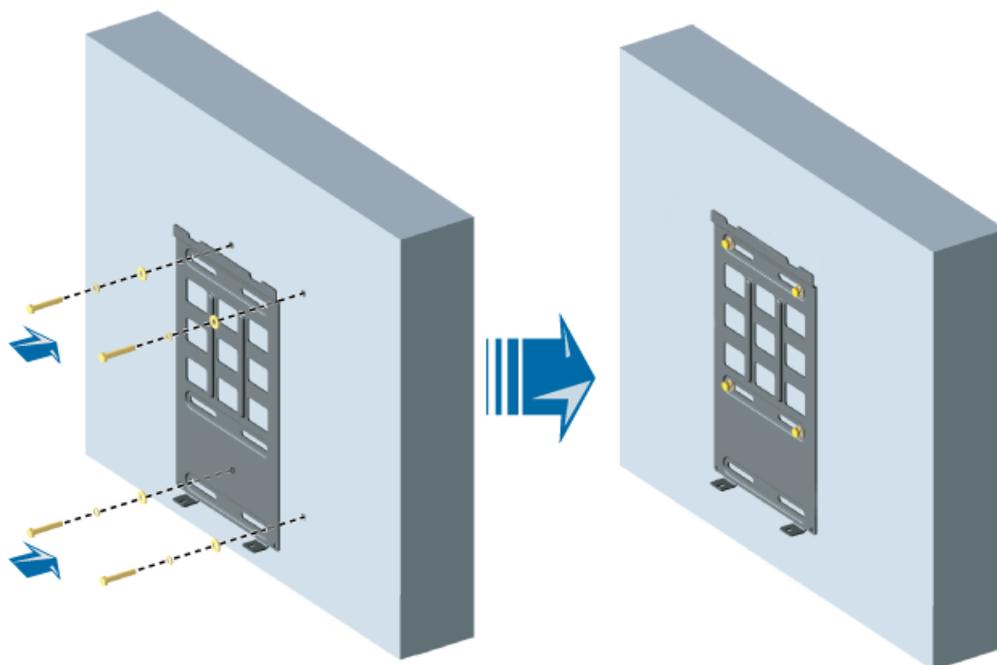
After the expansion bolt assembly is removed from the wall, the plastic tube must be discarded.

Figure 9-7 Installing the expansion bolt assembly



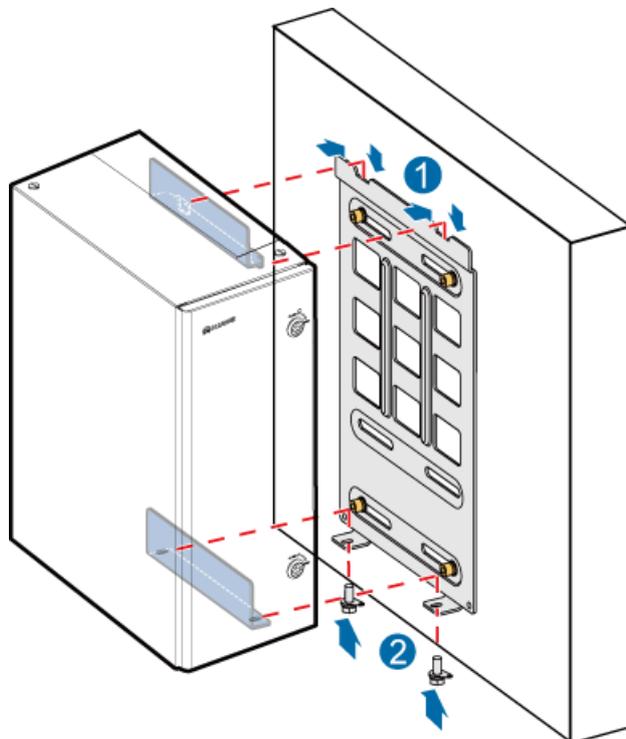
Step 3 Align the expansion bolt assemblies with the hole and secure the backplane to the wall, as shown in [Figure 9-8](#).

Figure 9-8 Installing the backplane



- Step 4** Place an OMB onto the back mounting plate, and then use M6x16 bolts to secure the back mounting plate on the attachment plate at the bottom of the OMB until the tightening torque reaches 4.8 N·m, as shown in **Figure 9-9**.

Figure 9-9 Installing the OMB



---End

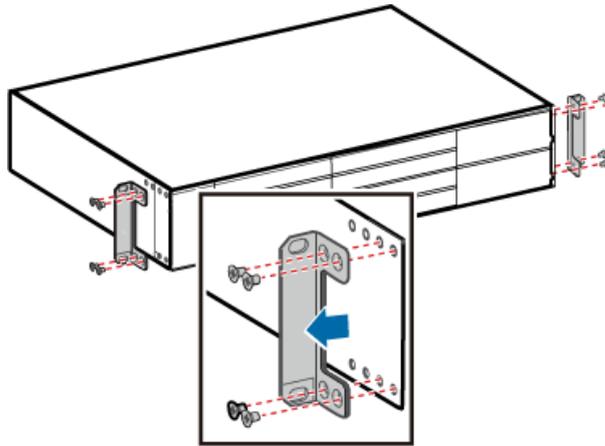
9.3 Installing a BBU

This section describes the procedure and precautions to be taken for installing a BBU in an OMB when a DBS3900 is deployed outdoors.

Procedure

- Step 1** Install the mounting ears on both sides of the BBU reversely.
1. Remove the mounting ears, as shown in **Figure 9-10**.

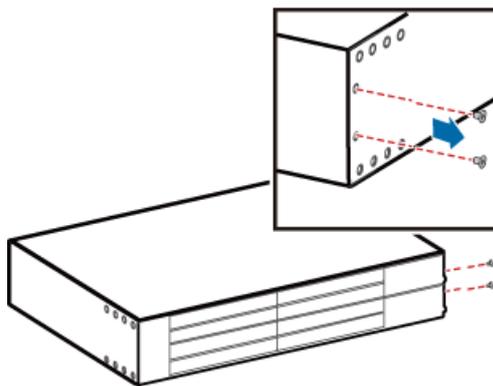
Figure 9-10 Removing the mounting ears



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2. Removing two ground screws, as shown in [Figure 9-11](#).

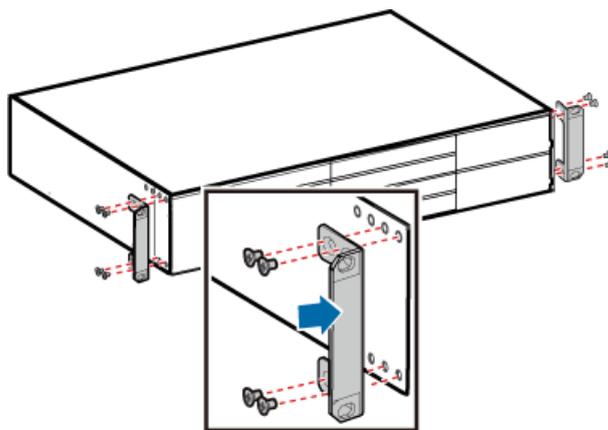
Figure 9-11 Removing the ground screws



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3. Install the mounting ears reversely, as shown in [Figure 9-12](#).

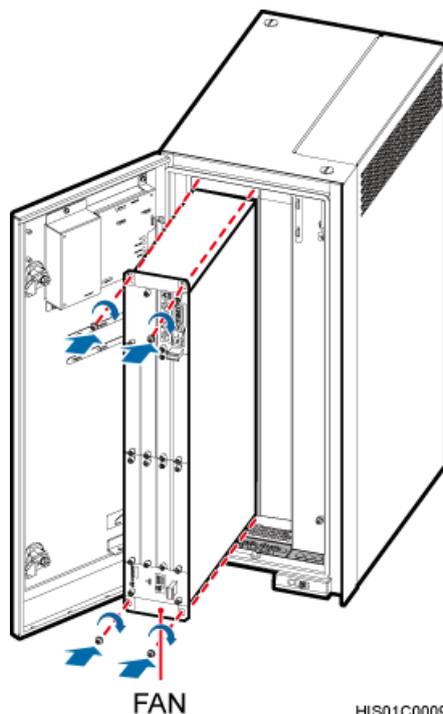
Figure 9-12 Installing the mounting ears reversely



HIB01C0003

Step 2 Slide a BBU along the guide rails into an OMB, and then tighten four M6x16 screws on the panel until the tightening torque reaches 3 N·m, as shown in [Figure 9-13](#).

Figure 9-13 Installing a BBU



---End

9.4 Installing Cables

This section describes the procedures and precautions to be taken for installing power cables, transmission cables, monitoring signal cables, and CPRI cables when a DBS3900 is deployed outdoors and the BBU is installed in an OMB.

9.4.1 Cabling Requirements

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



NOTE

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

General Cabling Requirements

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

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

The cables must be bound as follows:

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

The cables must be routed as follows:

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

Special Cabling Requirements

Cabling requirements for power cables are as follows:

- -48 V power cables must be bound together.
- +24 V power cables must be bound together.
- Power cables, transmission cables, and signal cables are routed separately.
- Multiple power cables must be bound when routed.
- Power cables must be installed in the position specified in engineering design documents.
- If the length of power cables is insufficient, replace the cables rather than adding connectors or soldering joints to lengthen the cables.

Cabling requirements for PGND cables are as follows:

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

Cabling requirements for E1 cables are as follows:

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

Cabling requirements for fiber optic cables are as follows:

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

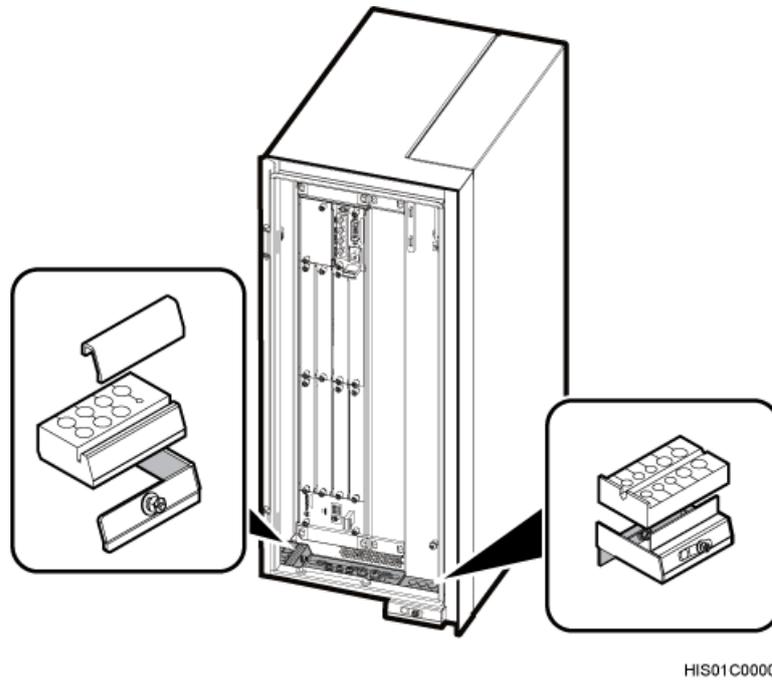
9.4.2 Installing a Cable Outlet Module in an OMB

During cable installation, you must remove cable outlet modules at the bottom of an OMB, lead cables through the cables holes on the cable outlet modules, and then reinstall the modules for effective sealing.

Context

- Cable outlet modules are installed on both sides at the bottom of an OMB, as shown in [Figure 9-14](#).

Figure 9-14 Positions of cable outlet modules



- There are multiple cable holes in a cable outlet module at the bottom of an OMB. **Figure 9-15** shows the cable holes in the left cable outlet module, and **Figure 9-16** shows the cable holes in the right cable outlet module.

Figure 9-15 Cable holes in the left cable outlet module

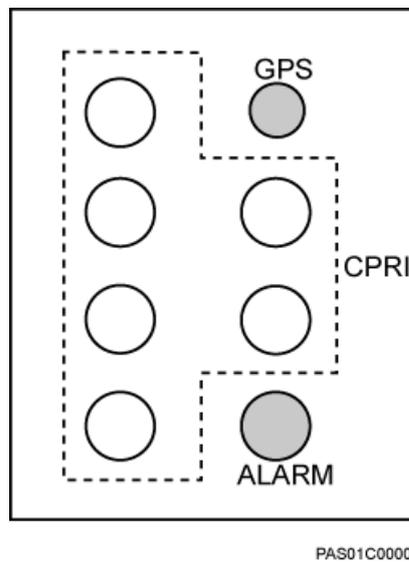
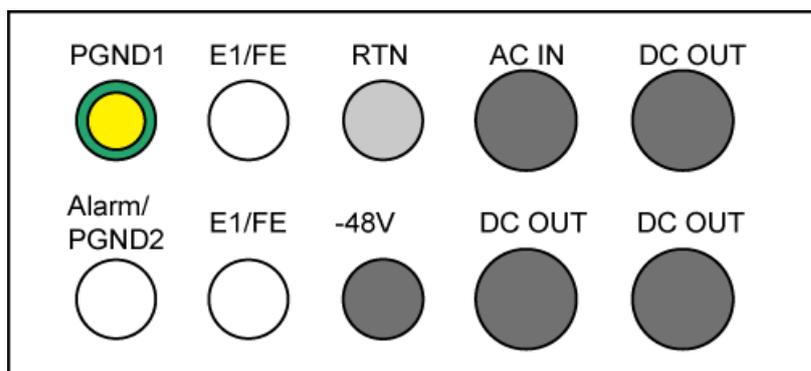


Figure 9-16 Cable holes in the right cable outlet module

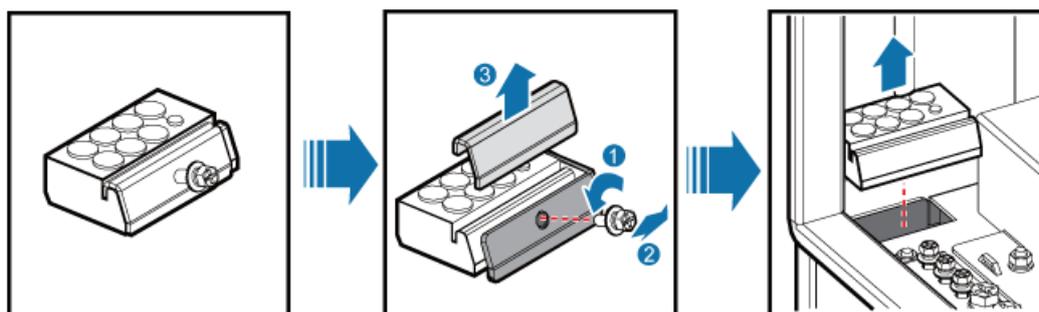


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Procedure

- Step 1** Remove baffle plate and bolts from a cable outlet module, and then remove the cable outlet module from the cable trough at the bottom of an OMB, as shown in [Figure 9-17](#).

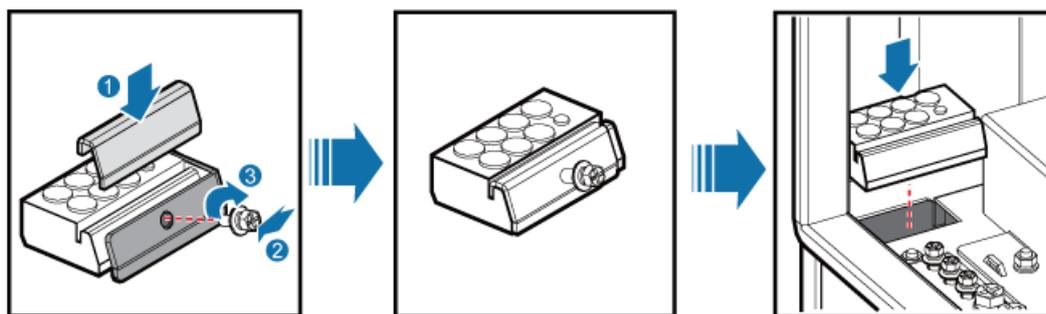
Figure 9-17 Removing a cable outlet module



HIS01C0001

- Step 2** According to the labels near the cable holes in the cable outlet module, remove rubber caps from cable holes, and then lead each cable through a corresponding cable hole.
- Step 3** Place the cable outlet module in the cable through at the bottom, and then install the baffle plate and bolts, as shown in [Figure 9-18](#).

Figure 9-18 Installing a cable outlet module



HIS01C0002

---End

9.4.3 Installing a PGND Cable

A PGND cable connects the ground bar in a cabinet to an external ground bar, ensuring proper grounding of the cabinet.

Prerequisite

The tools, such as a Phillips screwdriver, cable cutter, and multi-purpose crimping tool, are ready.

Context

Table 9-1 lists the specifications of a PGND cable.

Table 9-1 Specifications of a PGND cable

Cable	One End	The Other End	Description
PGND cable	OT terminal (M6, 16 mm ²)	OT terminal (M6, 16 mm ²)	Green and yellow

Procedure

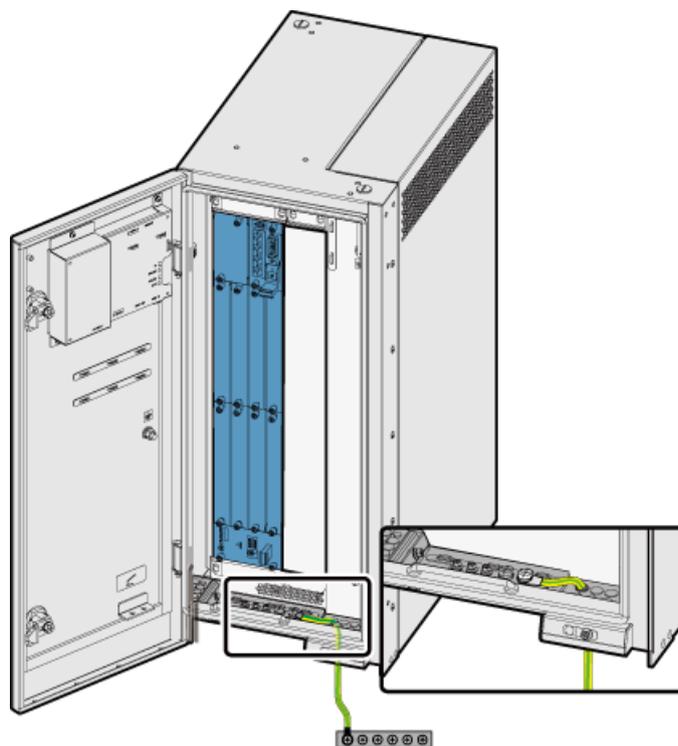
Step 1 Prepare a PGND cable.

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

Step 2 Install the PGND cable, as shown in **Figure 9-19**.

1. Connect one end of the PGND cable to the rightmost ground terminal on the ground bar at the bottom of an OMB, and then tighten the screw on the ground terminal.
2. Connect the other end to an external ground bar.

Figure 9-19 Installing a PGND cable



Step 3 Route the cable by referring to [9.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 4 Label the installed cables by referring to Attaching a Sign Plate Label.

---End

9.4.4 Installing Power Cables

When a DBS3900 is deployed outdoors with DC power supply and the BBU is installed in an OMB, power cables such as an input power cable for the OMB, BBU power cable, and RRU power cables must be installed.

Installing an Input Power Cable for the OMB

An input power cable for the OMB feeds power into an OMB for its components from external power equipment.

Context

Only -48 V DC power can be supplied to an OMB. [Table 9-2](#) lists the specifications of an input power cable for the OMB.

Table 9-2 Specifications of an input power cable for the OMB

Cable		One End	The Other End	Description
-48 V DC input power cable for the OMB	RTN(+) wire	OT terminal (M6, 16 mm ²)	Depending on the external equipment	Black
	NEG(-) wire	OT terminal (M6, 16 mm ²)	Depending on the external equipment	Blue

NOTE

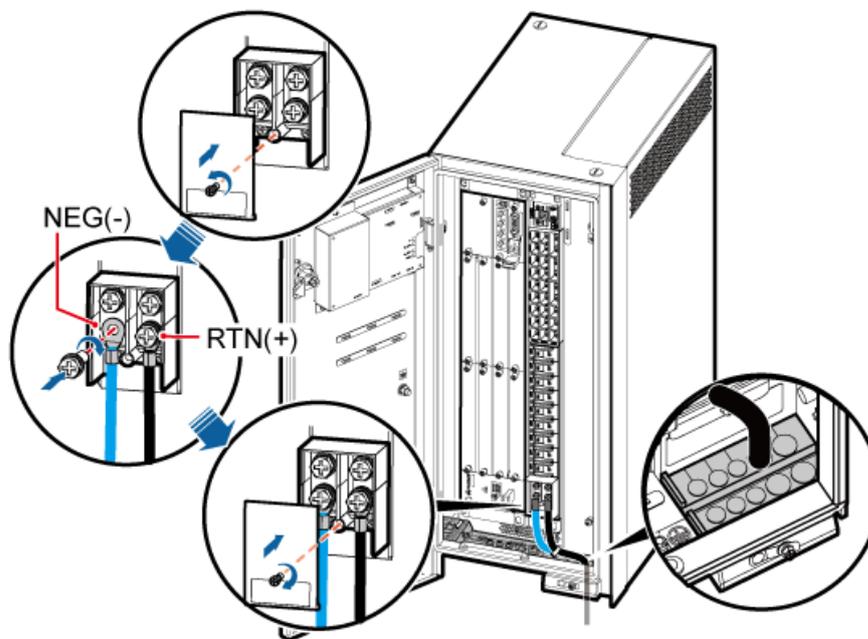
The colors and structures of cables vary according to countries and areas. If the cables are purchased locally, the colors and structures of the cables may be different.

Procedure

Step 1 Install an input power cable for the OMB, as shown in **Figure 9-20**.

1. Link the OT terminals on the blue and black wires at one end of the input power cable for the OMB to the wiring terminals labeled NEG(-) and RTN(+) on the DCDU-03B respectively.

Figure 9-20 Installing an input power cable for the OMB



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2. Lead the other end through the cable outlet module on the right at the bottom of the OMB, and then route the cable to external power equipment. For details about how to install a cable outlet module, see [9.4.2 Installing a Cable Outlet Module in an OMB](#).

Step 2 Route the cable by referring to [9.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 3 Label the installed cables. For details, see [Attaching a Cable-Tying Label](#).

Step 4 Run each cable that leaves the cabinet in the PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

Step 5 Waterproof the connector.

----End

Installing a BBU Power Cable

A BBU power cable feeds power into the BBU from the DCDCU-03B when a DBS3900 works in DC power supply scenario.

Context

[Table 9-3](#) lists the specifications of a BBU power cable when a DCDCU-03B supplies power. For details about a BBU power cable, see [BBU Power Cable \(OMB\)](#).

Table 9-3 Specifications of a BBU power cable

Cable		One End	The Other End	Description
BBU power cable	RTN(+) wire	3V3 power connector	OT terminals bent by 90° (M4, 6 mm ²)	Black
	NEG(-) wire		OT terminals bent by 90° (M4, 6 mm ²)	Blue

NOTE

The colors and structures of cables vary according to countries and areas. If the cables are purchased locally, the colors and structures of the cables may be different.

Procedure

Step 1 Add OT terminals to a BBU power cable. For details, see [Assembling the OT Terminal and the Power Cable](#).

NOTE

A 3V3 power connector is added to one end of a BBU power cable, and you only need to add OT terminals to the other end onsite.

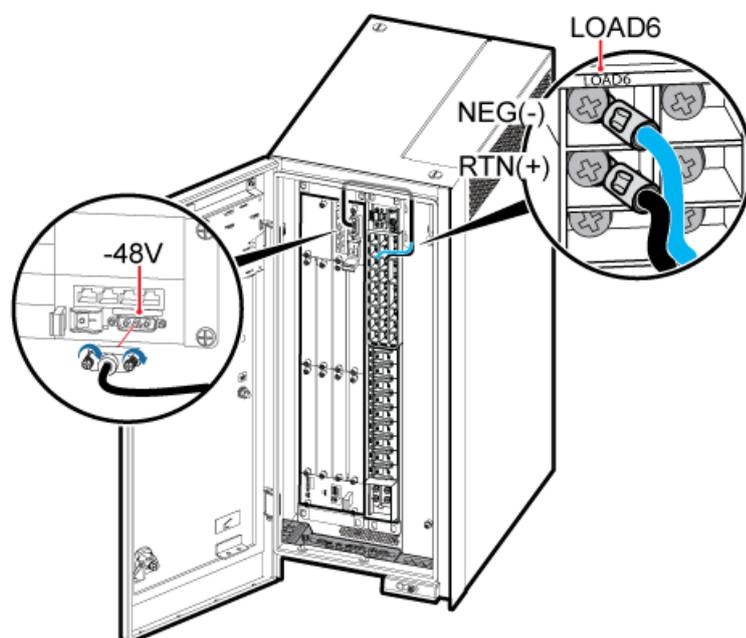
Step 2 Install a BBU power cable, as shown in [Figure 9-21](#).

1. Link the 3V3 power connector at one end of the BBU power cable to the -48 V port on the UPEU in the BBU, and then tighten the screw on the connector until the tightening torque reaches 0.25 N·m.
2. Link the OT terminals on the blue and black wires at the other end to the wiring terminals labeled NEG(-) and RTN(+) near the LOAD6 label on the DCDU-03B respectively.

 **NOTE**

A BBU power cable must be connected to each UPEU if two UPEUs are installed in the BBU. The 3V3 power connector at one end of each BBU power cable is connected to the -48V port on each UPEU in the BBU, and the easy power receptacle (pressfit type) connectors at the other end are connected to the LOAD6 and LOAD8 ports on the DCDU-03B, respectively.

Figure 9-21 Installing a BBU power cable



CIS01C2005

Step 3 Route the cable by referring to [9.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 4 Label the installed cables. For details, see Attaching an L-Shaped Label.

----End

Installing an RRU Power Cable

An RRU power cable feeds -48 V DC power into an RRU from a DCDU-03B.

Context

[Table 9-4](#) lists the specifications of RRU power cables when a DCDU-03B supplies power.

Table 9-4 Specifications of RRU power cables

Cable		One End	The Other End	Remarks
RRU power cable	RTN(+) wire	OT terminals bent by 90° [M4, 3.3 mm ² (12 AWG)]	OT terminal [M4, 3.3 mm ² (12 AWG)]	North American standard Black
	NEG(-) wire	OT terminals bent by 90° [M4, 3.3 mm ² (12 AWG)]	OT terminal [M4, 3.3 mm ² (12 AWG)]	North American standard Blue
	Shield layer	OT terminals bent by 90° [M4]		Heat shrink tubing Black
RRU power cable	RTN(+) wire	OT terminals bent by 90° (M4, 4 mm ²)	OT terminal (M4, 4 mm ²)	European standard Brown
	NEG(-) wire	OT terminals bent by 90° (M4, 4 mm ²)	OT terminal (M4, 4 mm ²)	European standard Blue
	Shield layer	OT terminals bent by 90° [M4]		Heat shrink tubing Black
RRU power cable	RTN(+) wire	OT terminals bent by 90° (M4, 4 mm ²)	Easy power receptacle (pressfit type) connector	
	NEG(-) wire	OT terminals bent by 90° (M4, 4 mm ²)		

 **NOTE**

The colors and structures of cables vary according to countries and areas. If the cables are purchased locally, the colors and structures of the cables may be different.

Procedure

Step 1 Prepare an RRU power cable.

- Cut the cable to the required length based on the actual cable route.
- Add OT terminals to the blue, black (or brown) wires and shield layer of the RRU power cable at the DCDU-03B end, as shown in Adding OT Terminals to the DC RRU Power Cable on the DCDU Side.
- Add OT terminals or an easy power receptacle (pressfit type) connector to the other end of the RRU power cable according to the type of power supply socket on the RRU.
 - Add an OT terminal. For details, see the related RRU Installation Guide.

- Add an easy power receptacle (pressfit type) connector. For details, see the related RRU Installation Guide.

Step 2 Install an RRU power cable, as shown in **Figure 9-22**.

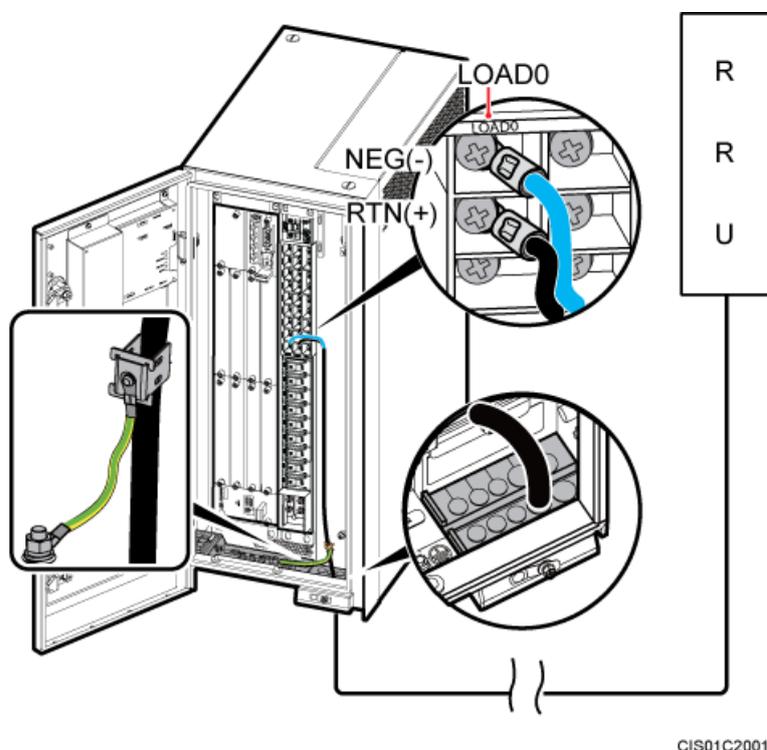
1. Link the OT terminals on the blue and black (or brown) wires of the RRU power cable to the wiring terminals labeled NEG(-) and RTN(+) near the LOAD0 label on the DCDU-03B respectively.

NOTE

In the -48 V DC power supply scenario, three DC MRRUs can be installed. Therefore, an RRU power cable can be connected to any of the LOAD0 to LOAD5 wiring terminals on the DCDU-03B.

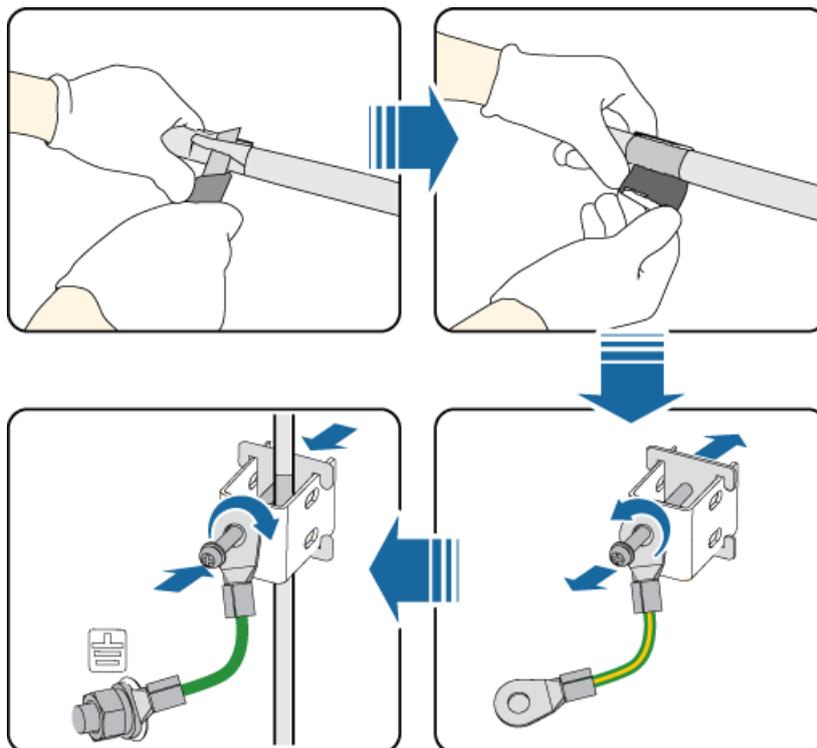
2. Connect the blue and black wires at the other end to the wiring terminals labeled NEG(-) and RTN(+) in the cabling cavity of the RRU respectively.

Figure 9-22 Installing an RRU power cable



- Step 3** In a position 20 cm away from the cable outlet module, strip the jacket for about 25 mm off the RRU power cable to expose the shield layer. Thread the cable through the ground clip to ensure full contact between the shield layer and the ground clip, and then tighten the M4 screws on the clip until the tightening torque reaches 1.2 N·m, as shown in **Figure 9-23**.

Figure 9-23 Installing a grounding clip



Step 4 Route the cable by referring to [9.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 5 Run each cable that leaves the cabinet in the PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

---End

9.4.5 Installing Transmission Cables

When a DBS3900 is deployed outdoors with DC power supply and the BBU is installed in an OMB, transmission cables such as an E1/T1 cable and E1/T1 surge protection transfer cable or FE/GE cable and FE/GE surge protection transfer cable must be installed based on actual requirements onsite.

Context

 **NOTE**

Install the transmission cables based on the connections of transmission cables. For details, see the *BBU3900 Hardware Description* Transmission Cable Connections.

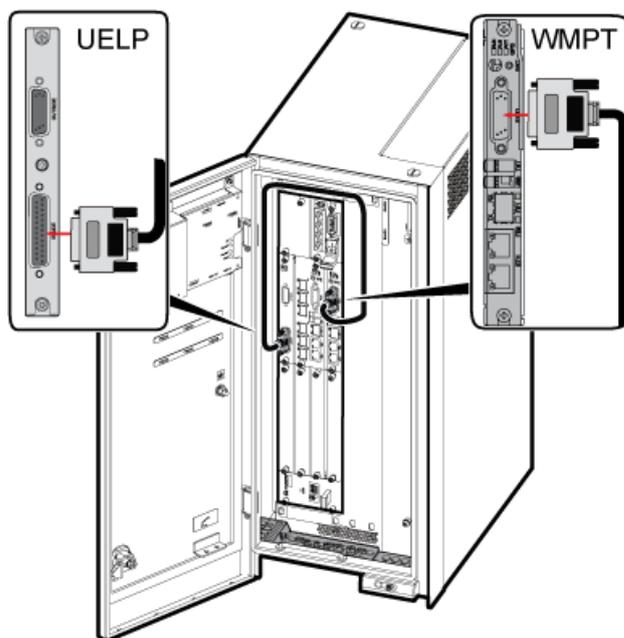
Installing an E1/T1 Surge Protection Transfer Cable

An E1/T1 surge protection transfer cable connects the transmission board and surge protection unit for transferring surge protection signals.

Procedure

- Step 1** Install an E1/T1 surge protection transfer cable, as shown in [Figure 9-24](#).
1. Link the DB26 connector at one end of the E1/T1 surge protection transfer cable to the E1/T1 port on the GTMU, WMPT, or UTRP in the BBU, and then tighten the plastic screws on the connector until the tightening torque reaches 0.25 N·m.
 2. Link the DB25 connector at the other end to the INSIDE port on the UELP in the BBU, and then tighten the plastic screws on the connector until the tightening torque reaches 0.25 N·m.

Figure 9-24 Installing an E1/T1 surge protection transfer cable



CIS01C4000

- Step 2** Route the cable by referring to [9.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

- Step 3** Label the installed cables. For details, see Attaching an L-Shaped Label.

---End

Installing an E1/T1 cable

When a DBS3900 is deployed outdoors with DC power supply, the BBU can be installed in an OMB. In this case, an E1/T1 cable connects the surge protection unit and external transmission equipment for E1/T1 signal transmission.

Prerequisite



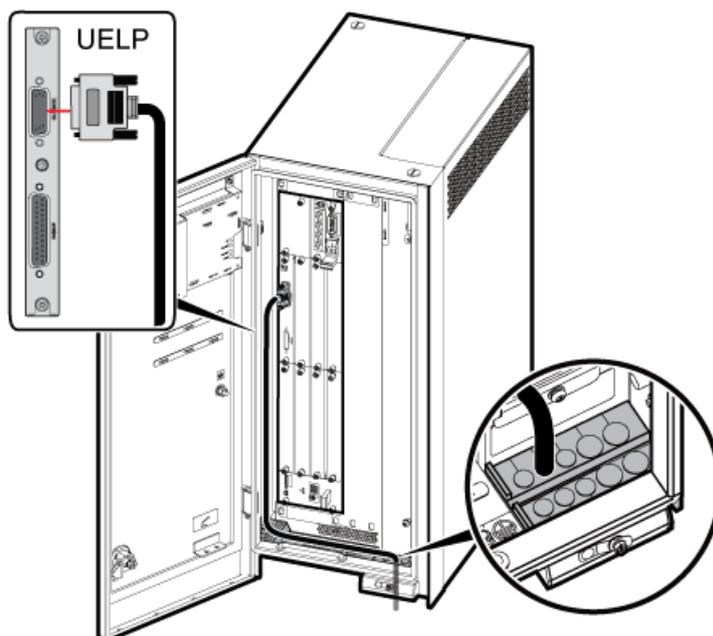
WARNING

Before soldering the connectors to the E1/T1 cable, ensure that both ends of the E1 cable are disconnected from any devices. In addition, all the connectors are soldered to the E1 cable during the same session.

Procedure

- Step 1** Install an E1/T1 cable, as shown in [Figure 9-25](#).
1. Link the DB26 connector at one end of the E1/T1 cable to the OUTSIDE port on the UELP in the BBU, and then tighten the plastic screws on the connector until the tightening torque reaches 0.25 N·m.
 2. Lead the other end out of the cabinet through the cable outlet module on the bottom right of the cabinet, and then connect the E1/T1 cable to the external transmission equipment. For details about how to install the cable outlet module, see [9.4.2 Installing a Cable Outlet Module in an OMB](#).

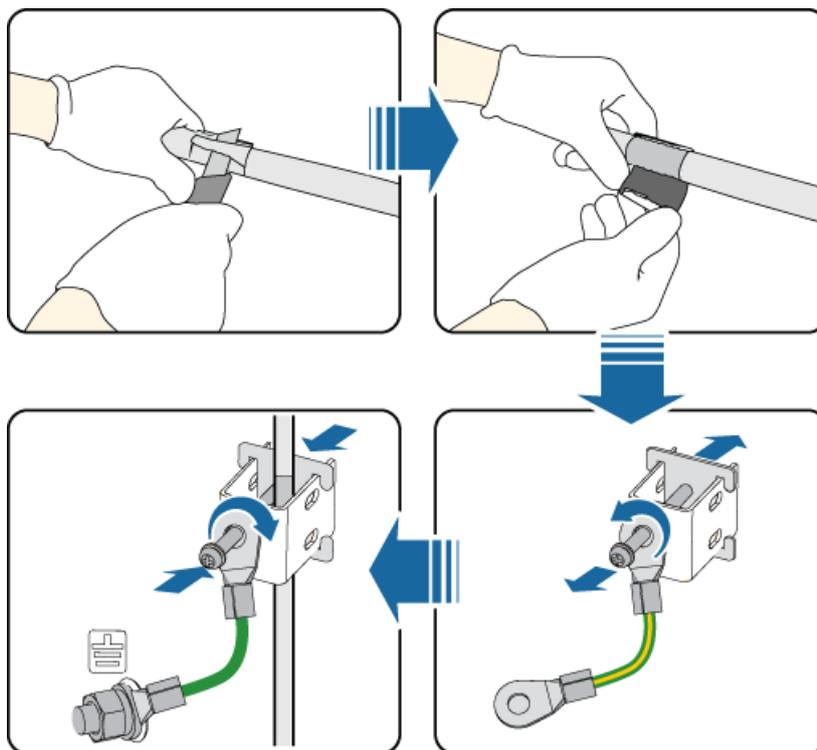
Figure 9-25 Installing an E1/T1 cable



CIS01C4001

- Step 2** In a position 20 cm away from the cable outlet module, strip the jacket for about 25 mm off the E1/T1 cable to expose the shielding layer. Thread the E1/T1 cable through the ground clip to ensure full contact between the shielding layer and the ground clip, and then tighten the M4 screws on the clip until the tightening torque reaches 1.2 N·m, as shown in [Figure 9-26](#).

Figure 9-26 Installing a ground clip



Step 3 Route the cable by referring to [9.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 4 Label the installed cables. For details, see Attaching an L-Shaped Label.

----End

Installing a FE/GE Surge Protection Transfer Cable

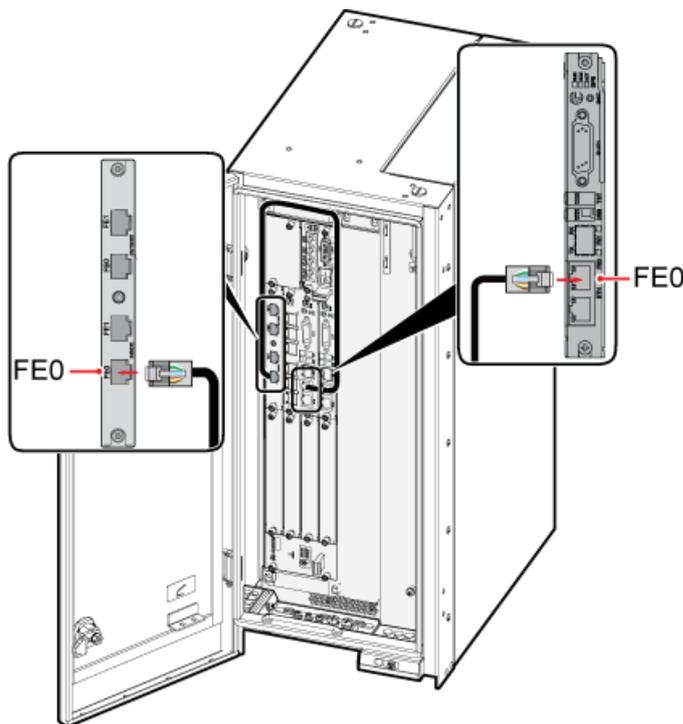
A FE/GE surge protection transfer cable connects a transmission board and the UFLP, transferring surge protection transfer signals.

Procedure

Step 1 Install a FE/GE surge protection transfer cable, as shown in [Figure 9-27](#).

1. Link the RJ-45 connector at one end of the FE/GE surge protection transfer cable to the FE0 port on the GTMU or WMPT or FE/GE port on the UTRP9 in the BBU.
2. Connect the other end to the FE0 or FE1 port near the INSIDE label on the UFLP in the BBU.

Figure 9-27 Installing a FE/GE surge protection transfer cable



CIS01C4002

Step 2 Route the cable by referring to [9.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 3 Label the installed cables. For details, see Attaching an L-Shaped Label.

----End

Installing a FE/GE Cable

When a DBS3900 is deployed outdoors, a FE/GE cable connects the surge protection unit and external transmission equipment for FE/GE signal transmission.

Procedure

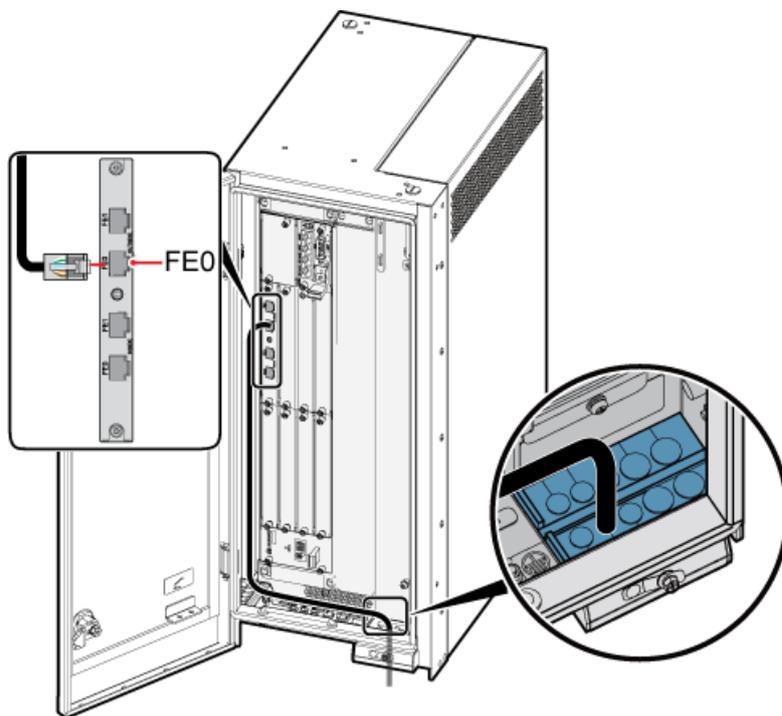
Step 1 Install a FE/GE cable, as shown in [Figure 9-28](#).

1. Connect one end of the FE/GE cable to the FE0 or FE1 port near the OUTSIDE label on the UFLP in the BBU.
2. Lead the other end out of the cabinet through the cable outlet module on the bottom right of the cabinet, and then connect the FE/GE cable to the external transmission equipment. For details about how to install the cable outlet module, see [9.4.2 Installing a Cable Outlet Module in an OMB](#).

 **NOTE**

You must use a shielded straight-through FE/GE cable.

Figure 9-28 Installing a FE/GE cable



CIS01C4003

Step 2 Route the cable by referring to [9.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 3 Label the installed cables. For details, see Attaching an L-Shaped Label.

----End

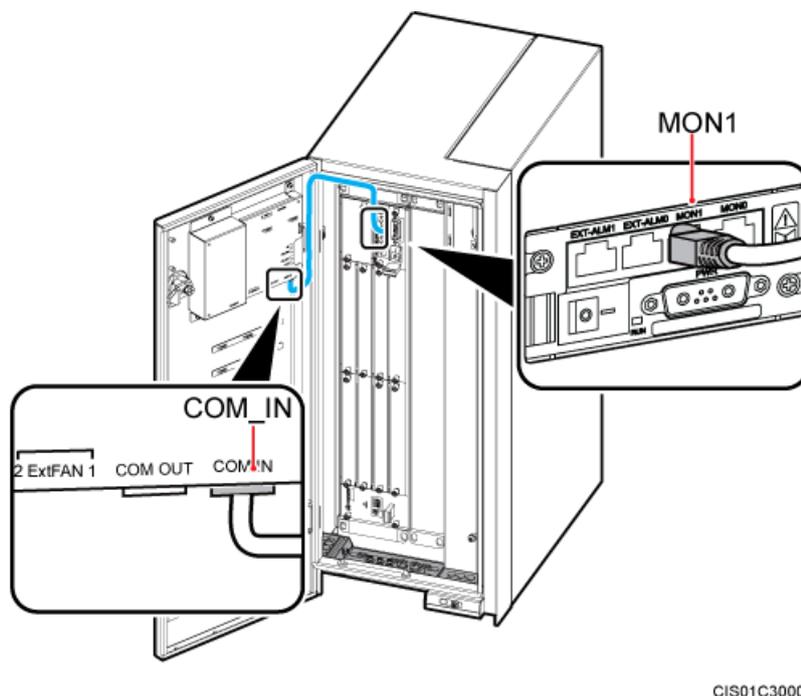
9.4.6 Installing a Monitoring Signal Cable Between the HEUA and the BBU

You only need to install a monitoring signal cable between the HEUA and the BBU when the BBU is installed in an OMB.

Procedure

- Step 1** Install a monitoring signal cable between the HEUA and the BBU, as shown in [Figure 9-29](#).
1. Connect one end of the monitoring signal cable between the HEUA and the BBU to the COM IN port on the HEUA on the door of the OMB.
 2. Connect the other end to the MON1 port on the UPEU in the BBU.

Figure 9-29 Installing a monitoring signal cable between the HEUA and the BBU



Step 2 Route the cable by referring to [9.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 3 Label the installed cables. For details, see Attaching an L-Shaped Label.

----End

9.4.7 Installing a CPRI Optical Cable

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

Context

- The single-mode optical module is labeled "SM" and multi-mode optical module is labeled "MM".
- If the puller of an optical module is blue, the module is a single-mode optical module. If the puller of an optical module is black or grey, the module is a multi-mode optical module.
- The optical module to be installed must have a matching rate with the corresponding CPRI port.



CAUTION

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

Procedure

Step 1 Install an optical module, as shown in [Figure 9-30](#).

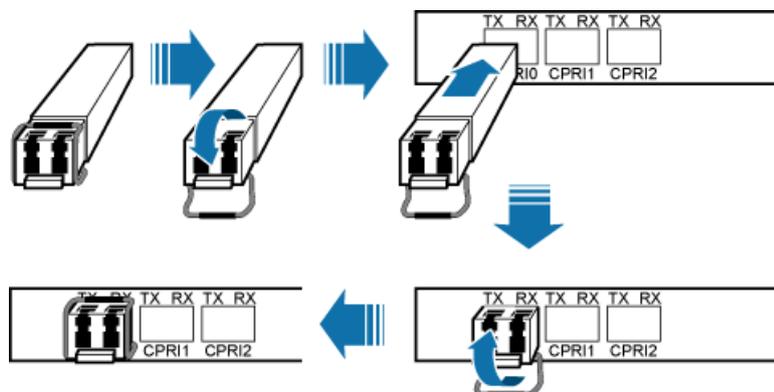
1. Turn the puller on the optical module outwards.
2. Insert the optical module into the CPRI port on the GTMU, WBBPb, WBBPd, or LBBP, and then insert the optical module of the same type⁽¹⁾ into the CPRI_W or CPRI0 port on an RRU.

 **NOTE**

(1) The optical modules with the same label are of the same type.

3. Turn the puller on the optical module inwards.

Figure 9-30 Installing an optical module



Step 2 Install a CPRI optical cable, as shown in [Figure 9-31](#).

 **NOTE**

For details about the connections of the CPRI optical cables, see the *BBU3900 Hardware Description* CPRI Cable Connections.

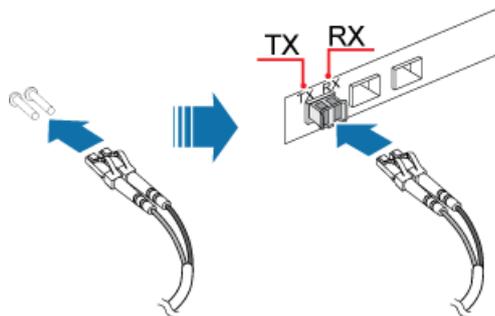
1. Remove the dustproof caps from the connectors of the optical cable.
2. Insert the DLC connectors labeled 2A and 2B at one end of the CPRI optical cable into the optical module on the GTMU, WBBPb, WBBPd, or LBBP, and then insert the DLC connectors labeled 1A and 1B at the other end into the optical module on the RRU.



CAUTION

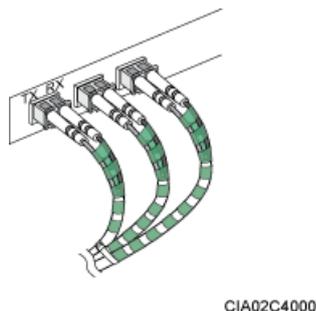
If both ends of the optical cable are the LC connectors, the TX and RX ports on the BBU are respectively connected to the TX and RX ports on the RRU.

Figure 9-31 Installing a CPRI optical cable



- Step 3** Route the CPRI optical cable along the left of the cabinet, and then lead it out of the cabinet from the cable hole on the left of the bottom. For details, see [9.4.1 Cabling Requirements](#).
- Step 4** Attach labels on the optical cable. For details, see [Attaching a Sign Plate Label](#).
- Step 5** Coil the optical fiber with winding plastic tape at the end connected to the BBU. The tape is coiled between the optical connector and the first cable tie on the cabinet, as shown in [Figure 9-32](#).

Figure 9-32 Coiling the optical fiber with winding plastic tape



----End

9.4.8 Installing a GPS Clock Signal Cable

The GPS clock signal cable is an optional cable that transmits GPS clock signals from the GPS antenna system to the BBU. The GPS clock signals serve as the clock reference of the BBU.

Context

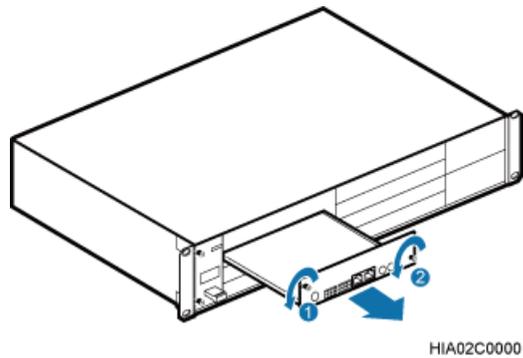
 **NOTE**

Only a dual-satellite receiver needs to be installed onsite.

Procedure

- Step 1** Remove the two M3 screws on the panel, and then pull out the USCU, as shown in [Figure 9-33](#).

Figure 9-33 Removing the USCU.



Step 2 Install a satellite receiver on the USCU, as shown in [Figure 9-34](#).

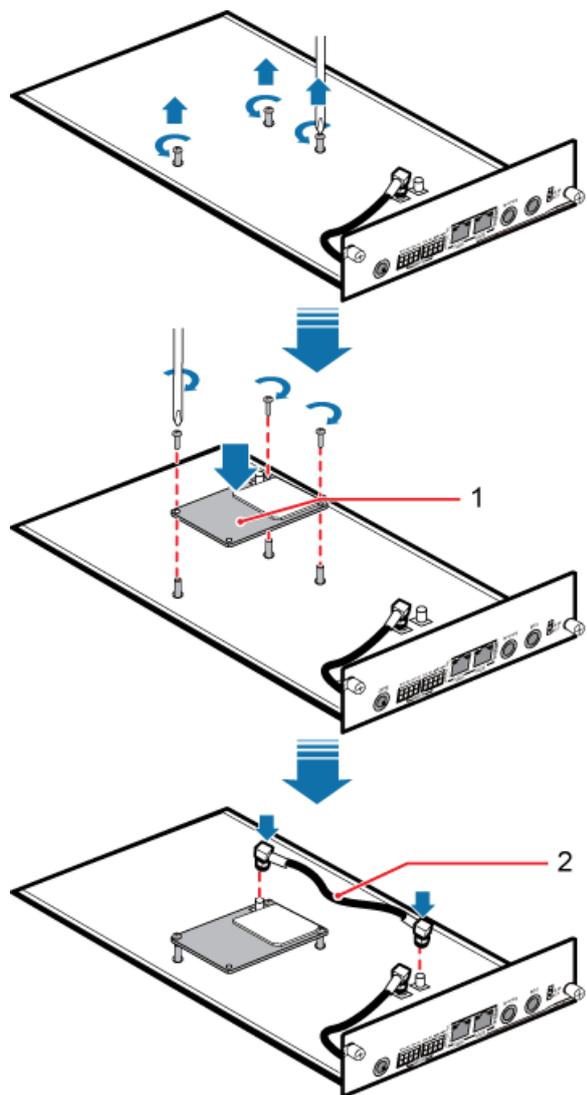
1. Remove the three M1.6 screws from the USCU.
2. Align the mounting holes on the satellite receiver with the bolts on the USCU.
3. Tighten the three M1.6 screws that were removed in [Step 2.1](#) to 0.1 N·m.
4. Connect one end of the RF jumper to the RF port on the satellite receiver and the other end to the GPS port on the USCU.



CAUTION

There are six mounting holes on the satellite receiver. You need to install only three screws on the receiver, as shown in [Figure 9-34](#)

Figure 9-34 Installing the satellite receiver on the USCU



CIA02C4006

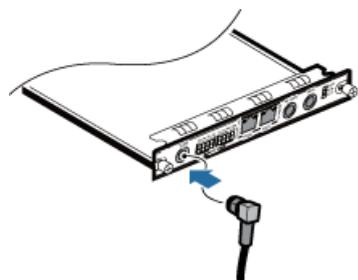
(1) Satellite receiver

(2) RF jumper

Step 3 Install the USCU equipped with the satellite receiver into the BBU, and tighten the screws on the USCU to 0.6 N·m.

Step 4 Connect the GPS clock signal cable to the GPS port on the USCU, as shown in [Figure 9-35](#).

Figure 9-35 Installing a GPS Clock Signal cable



CIA02C4004

Step 5 Route the cables by referring to [9.4.1 Cabling Requirements](#), and then use cable ties to bind the cables.

Step 6 Label the installed cables by referring to Attaching an L-Shaped Label.

---End

9.5 Installation Checklist

Check the installation items, installation environment, and cable-related items after the cabinets and devices are all installed.

Cabinet Installation Checklist

[Table 9-5](#) describes the cabinet installation checklist.

Table 9-5 Cabinet installation checklist

No.	Item
1	The installation position of the cabinet strictly complies with the engineering design.
2	In the wall-mounted scenario, the holes of the mounting ears are well aligned with the holes of the expansion bolt assemblies. In addition, the mounting ears are secured on the wall evenly and steadily.
3	In the metal-pole-mounted scenario, the supports for the metal pole are secure on the floor.
4	If the cabinet is installed on the floor, the base is securely installed.
5	Either the horizontal error or vertical error of the cabinet is less than 3 mm.
6	All the bolts, especially those for electrical connections, are tight. Both the spring washer and the flat washer are installed in the correct sequence.
7	The cabinet is neat and clean.
8	The paint on the surface is intact. If any paint is damaged, you must apply touch-up paint to avoid erosion.
9	Filler panels are installed in the space reserved for customer equipment.

No.	Item
10	The cabinet door can be easily opened or closed, the lock works properly, and the gag lever post is secure.
11	All labels, tags, and nameplates are correct, legible, and complete.

Cabinet Installation Environment Checklist

Table 9-6 describes the cabinet installation environment checklist.

Table 9-6 Cabinet installation environment checklist

No.	Item
1	There are no fingerprints or other smears on the surface of the cabinet.
2	There are no excessive straps or adhesive tape on the cables.
3	No tapes, tails of cable ties, paper, or packing bags are left around the cabinet.
4	All the items around the cabinet are neat, clean, and intact.

Electrical Connection Checklist

Table 9-7 describes the electric connection checklist of the cabinet.

Table 9-7 Electric connection checklist of the cabinet

No.	Item
1	All self-made PGND cables are copper-based with the proper wire diameters. No breaking device such as switch and fuse is allowed for the electric connection of the grounding system. No short circuit is allowed.
2	The PGND cable is securely connected and the AC lead-in cable and cables in the cabinet are correctly connected according to the electrical design of the power system. The screws are tightened. In addition, the inputs or outputs are not short-circuited.
3	The redundant part of the power cable or PGND cable is stripped off rather than coiled.
4	The terminals at both ends of the power cable or PGND cable are securely soldered or crimped.
5	The bare wires and the terminal handles at the wiring terminals are coated with heat-shrinkable tubes.
6	The flat washer and the spring washer are well mounted on all OT terminals.
7	The exterior of the battery is intact without any scratch, dent, or crack.

No.	Item
8	The shell of the battery is clean without any leakage trace.
9	The wiring post on the battery stands properly without any damage, and the post is not covered with any acidic substances.
10	The pressure relief valve of the battery is not transformed, and no liquid leaks.
11	The power cables for the batteries are connected to the positive and negative polarities correctly.
12	The voltage of the battery is normal. <ul style="list-style-type: none"> ● The voltage of a 2 V battery cell ranges from 1.8 V to 2.35 V. ● The voltage of a 12 V battery cell ranges from 10.8 V to 14.1 V. ● The total voltage of the batteries ranges from 43.2 V to 56.4 V.
13	The fans work properly. <ul style="list-style-type: none"> ● The fan in the IBBS200D rotates in a low speed in a normal situation. ● The outer air circulation fan in the IBBS200T stops in a normal situation (with the ambient temperature of lower than 30°C), and the inner air circulation fan rotates in a high speed. ● The outer air circulation fan in the APM30H stops in a normal situation (with the ambient temperature of lower than 35°C), and the inner air circulation fan rotates in a low speed.
14	The MCBs for the batteries are set to OFF.

Cable Installation Checklist

[Table 9-8](#) describes the cable installation checklist.

Table 9-8 Cable installation checklist

No.	Item
1	All cables are connected securely and reliably. Pay special attention to the communication cable connections and cable connections at the bottom of the cabinet.
2	The cables are neatly and tightly bound. The cable ties are evenly spaced and face the same direction.
3	Different types of cable, such as the power cable, ground cable, feeder, optical cable, E1/T1 cable, and FE cable are separately bound.
4	The cable layout facilitates maintenance and future capacity expansion.
5	All the labels at both ends of the cables are legible.

No.	Item
6	The extra length of the indoor cable ties is cut, and the cut surfaces are smooth without sharp edges. The extra length of 3 mm to 5mm of the outdoor cable ties is reserved when the cable ties are cut.
7	The idle port that no cable is connected to is properly protected.
8	The connectors of the RF cables are fixed in position to avoid false connection that may cause an abnormal voltage standing wave ratio (VSWR).

BBU Hardware Installation Checklist

Table 9-9 describes the BBU hardware installation checklist.

Table 9-9 BBU hardware installation checklist

No.	Item
1	All self-made PGND cables are copper-based with the proper wire diameters. No switch, fuse, or similar object is allowed for the electrical connection of the grounding system. No short circuit is allowed. Only one OT terminal of the PGND cable can be connected to each terminal on the ground bar.
2	The redundant part of the power cable or PGND cable is stripped off rather than coiled.
3	The terminals at both ends of the power cable or PGND cable are securely soldered or crimped.
4	The bare wires at the terminals and terminal handles are covered with heat-shrinkable tubes.
5	The flat washer and spring washer are well mounted on all OT terminals, and the OT terminals are intact and contact the wiring terminals properly.
6	All the cables, including those on the bottom of the cabinet, are securely connected.
7	The cables are neatly and tightly bound. The cable ties are evenly spaced and face the same direction.
8	The power cable, PGND cable, feeder, optical cable, and the E1/T1/FE cable are bound separately with spacing of more than 30 mm.
9	The cable layout facilitates maintenance and future capacity expansion, and the bending radius of the cable meets the requirements.
10	Legible labels are attached to both ends of all cables.
11	The extra length of the indoor cable ties is cut, and the cut surfaces are smooth without sharp edges. The extra length of 3 mm to 5 mm of the outdoor cable ties is reserved when the cable ties are cut.
12	The unused ports are properly protected.

9.6 Power-On Check

Before a DBS3900 starts operating, you must check the power-on status of the cabinet and components in it.

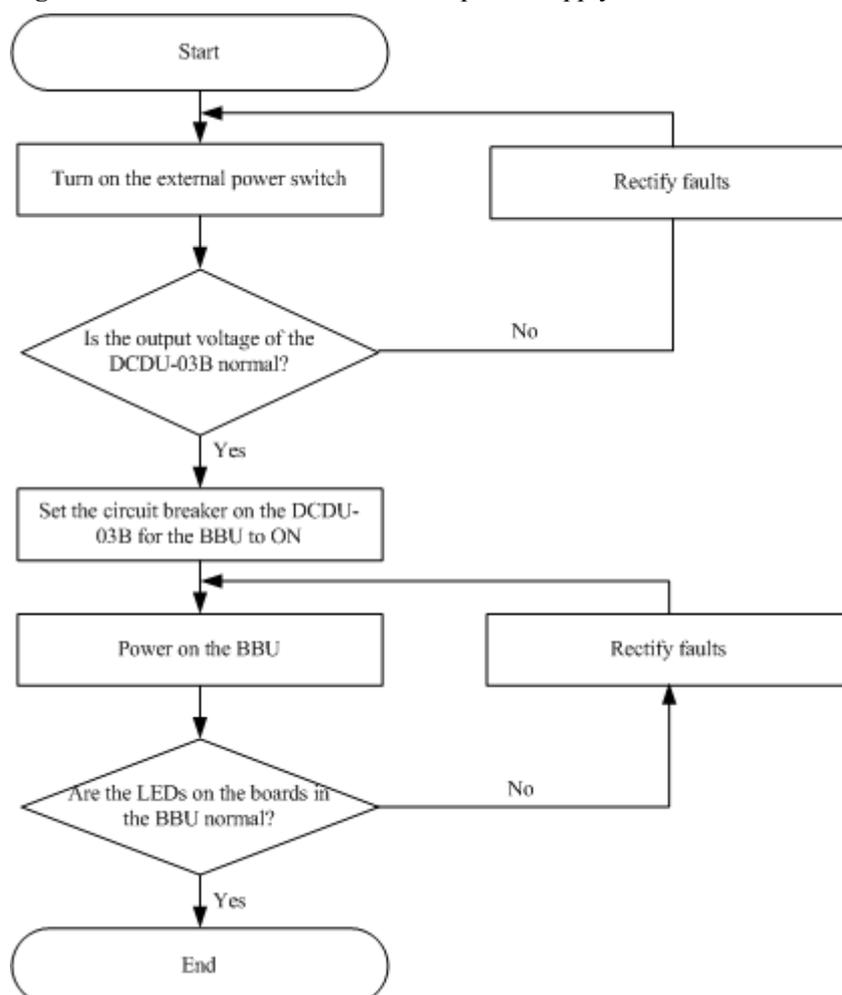


The DBS3900 must be powered on within seven days after it is unpacked, and the period for which the DBS3900 remains powered-off during maintenance must not exceed 48 hours.

Power-On Check in the AC Power Supply Scenario

Figure 9-36 shows the power-on check when a DBS3900 is deployed in the DC power supply scenario.

Figure 9-36 Power-on check in the DC power supply scenario



LED Status and Output Voltage Check

- The DC output voltage of a DCDU-03B ranges from -43.2 V DC to -57 V DC.
- The normal status of the LEDs on a GTMU, WMPT, WBBP, LMPT, LBBP, and UTRP is as follows:
 - RUN LED: on for 1s and off for 1s
 - ALM LED: off
 - ACT LED: on
- RUN LED on the UPEU: on
- STATE LED on the FAN unit: blinking green slowly (on for 1s and off for 1s)

9.7 Applying Touch-Up Paint

The paint on the surface is intact. If any paint is damaged, you must apply touch-up paint to avoid erosion.

Prerequisite

Before applying touch-up paint, select the same color as the original coating, as listed in [Table 9-10](#).

Table 9-10 Code of color samples

Object	Color	Code of Huawei Color Sample	International Color Code
Cabinet (including the APM30H, RFC, TMC11H, IBBS200T, and IBBS200D)	RAL7035	YB026	RAL7035
Base	3010 Light gray	YB030	Pontone 422U

Procedure

- Step 1** If there are stains in the damaged area or rust on the material, use fine sandpaper to polish the damaged area to remove the stains or rust.
- Step 2** Use clean cotton cloth to remove the stains or dust from the surface of the area to be polished or repaired.
- Step 3** Shake the paint well, and then use a small brush inside the bottle to absorb paint and evenly spread the paint on the damaged area until the area is covered.



CAUTION

The paint coating should be as thin as possible. No drops are allowed on the paint coating, and the surface should be smooth.

Step 4 Perform subsequent operations after the repaired paint coating is exposed in the air for 30 minutes.



NOTE

The color of the repaired paint coating area should be consistent with that of the surrounding areas, without obvious edges and bulges, and the original damage should no longer be distinguishable. In addition, there should be no paint peeled off.

---End

10 Outdoor Scenario with AC Power Supply (BBU Installed in an OMB)

About This Chapter

This chapter describes the procedures for installing an OMB, components in it, and related cables when a DBS3900 is deployed outdoors with AC power supply and the BBU is installed in the OMB.

[10.1 Installation Process](#)

When a DBS3900 is deployed outdoors and the BBU is installed in an OMB, you must install the OMB, components in it, and related cables. In addition, some optional components may be required based on actual requirements.

[10.2 Installing an OMB](#)

An OMB can be installed on a pole or wall depending on site requirements.

[10.3 Installing a BBU](#)

This section describes the procedure and precautions to be taken for installing a BBU in an OMB when a DBS3900 is deployed outdoors.

[10.4 Installing Cables](#)

This section describes the procedures and precautions to be taken for installing power cables, transmission cables, monitoring signal cables, and CPRI cables when a DBS3900 is deployed outdoors and the BBU is installed in an OMB.

[10.5 Installation Checklist](#)

Check the installation items, installation environment, and cable-related items after the cabinets and devices are all installed.

[10.6 Power-On Check](#)

Before a DBS3900 starts operating, you must check the power-on status of the cabinet and components in it.

[10.7 Applying Touch-Up Paint](#)

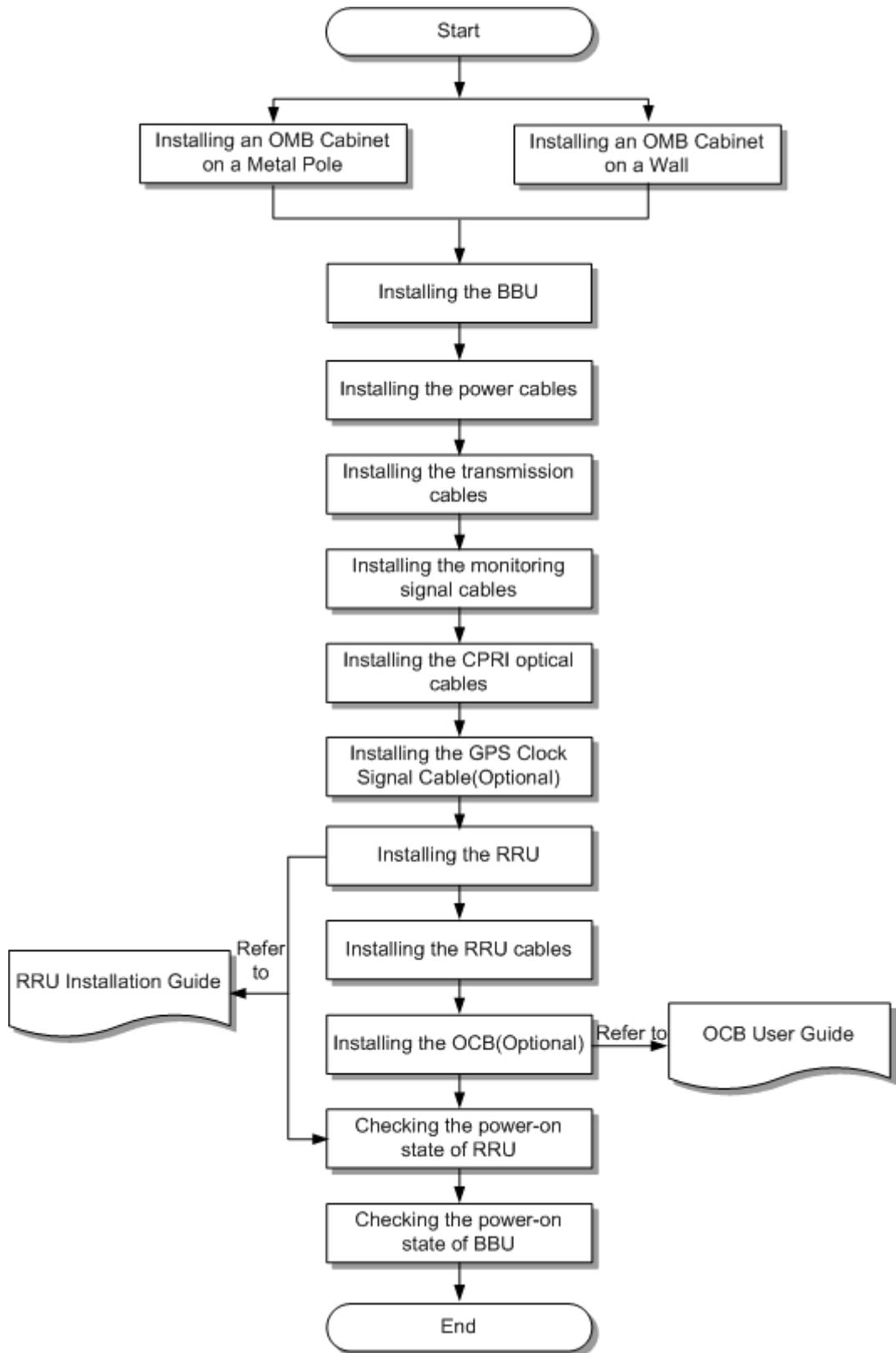
The paint on the surface is intact. If any paint is damaged, you must apply touch-up paint to avoid erosion.

10.1 Installation Process

When a DBS3900 is deployed outdoors and the BBU is installed in an OMB, you must install the OMB, components in it, and related cables. In addition, some optional components may be required based on actual requirements.

Figure 10-1 shows the installation process.

Figure 10-1 Installation process



 **NOTE**

- The procedure for installing an RRU is not described in this document. For details about how to install an RRU, see the associated RRU installation guide according to the RRU model.
- The Outdoor Cable Conversion Box (OCB) is an optional component, which is used to connect cables with different cross-sectional areas. For details about an OCB, see the *OCB User Guide*.

10.2 Installing an OMB

An OMB can be installed on a pole or wall depending on site requirements.

10.2.1 Installing an OMB on a Metal Pole

This section describes the procedure and precautions to be taken for installing an OMB on a metal pole. An OMB can be installed on a metal pole outdoors.

Context

 **NOTE**

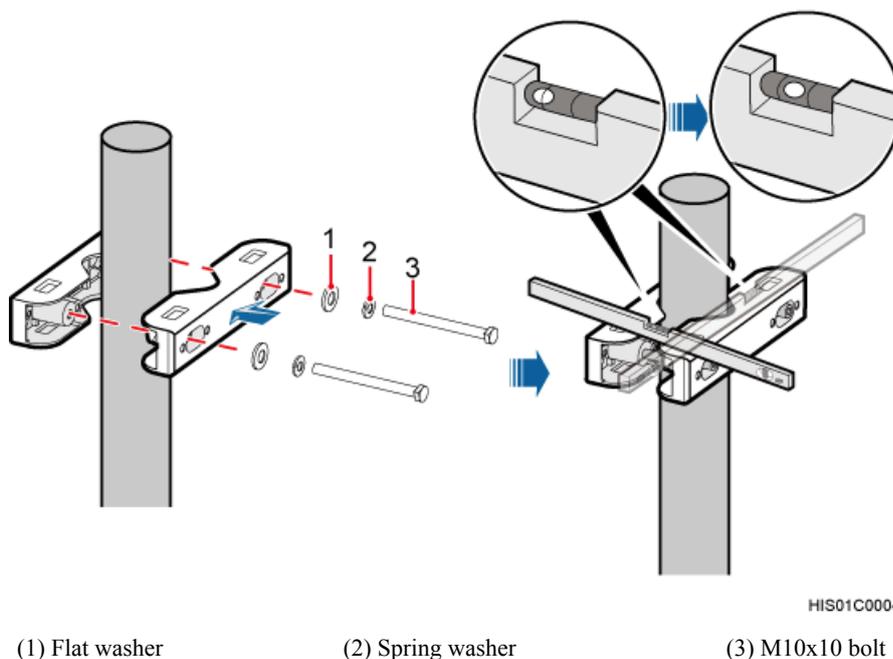
- The cabinet cannot be installed at a height of more than 10,000 mm.
- The diameter of a metal pole for installing an OMB ranges from 60 mm to 140 mm.

Procedure

Step 1 Install upper brackets, as shown in [Figure 10-2](#).

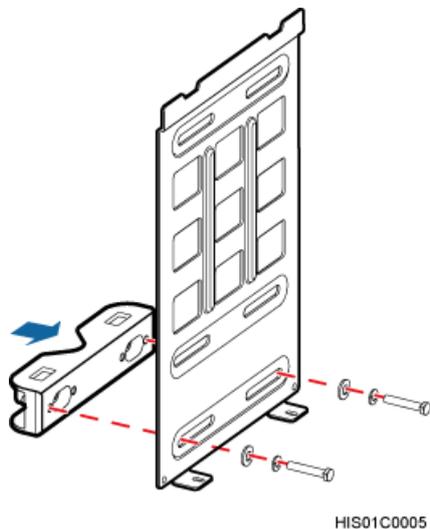
1. Install upper brackets on a metal pole, lead each M10x110 bolt through a spring washer, flat washer, and brackets in sequence, and then use an inner hexagon wrench to secure them until the tightening torque reaches 28 N·m.
2. Use a level to check whether the brackets are on a horizontal plane.

Figure 10-2 Installing upper brackets



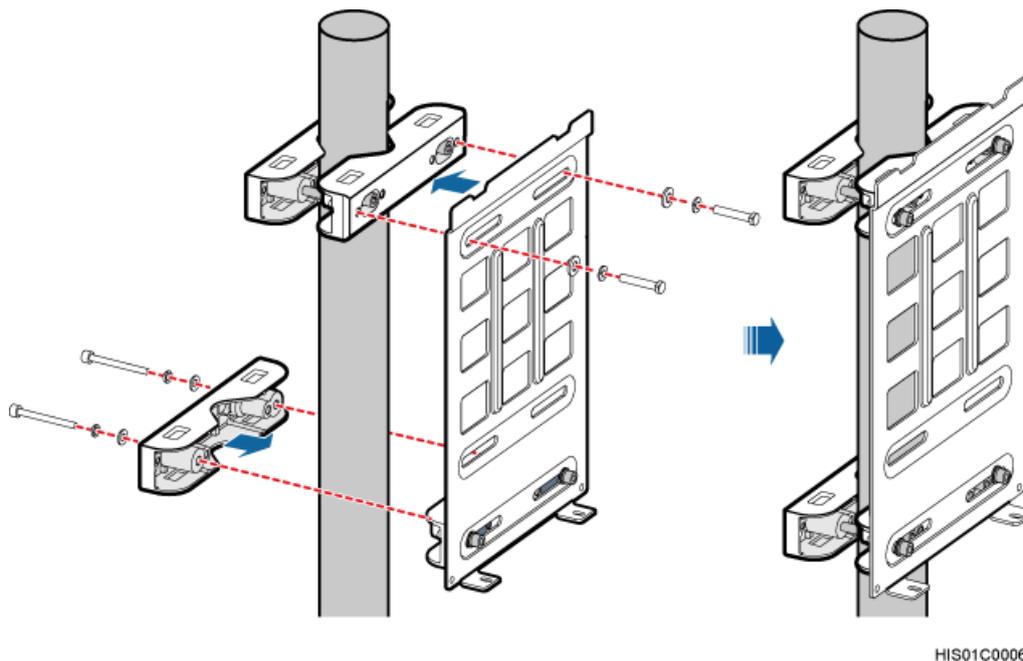
- Step 2** Lead each M10x40 bolt through a spring washer and flat washer in sequence, and then secure the back mounting plate on the lower bracket until the tightening torque reaches 28 N·m, as shown in [Figure 10-3](#).

Figure 10-3 Installing a back mounting plate on a lower bracket



- Step 3** Lead each M10x110 bolt through a spring washer, flat washer, and lower brackets on which the back mounting plate is secured, and then tighten the bolts until the tightening torque of 28 N·m, as shown in [Figure 10-4](#).

Figure 10-4 Installing a backplane on a metal pole



- Step 4** Place an OMB onto the back mounting plate, and then use M6x16 bolts to secure the back mounting plate on the attachment plate at the bottom of the OMB until the tightening torque reaches 4.8 N·m, as shown in [Figure 10-5](#).

Figure 10-5 Installing an OMB



---End

10.2.2 Installing an OMB on a Wall

This section describes the procedure and precautions to be taken for installing an OMB on a wall. An OMB can be installed on a wall outdoors.

Context

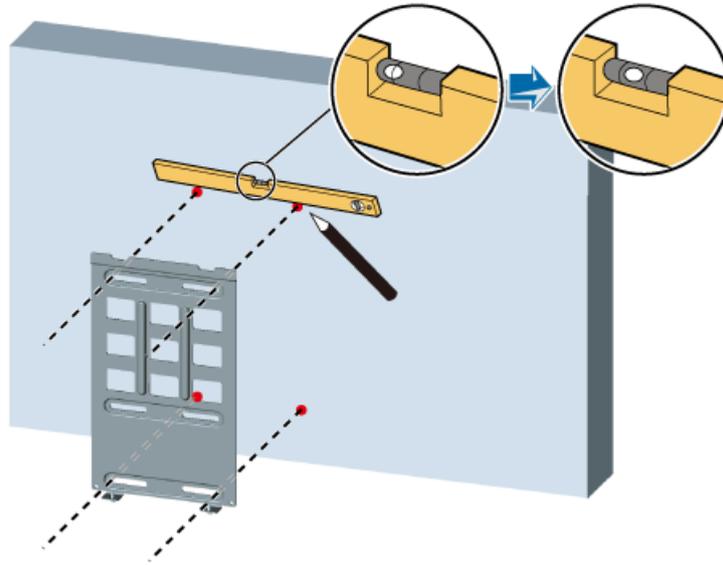
 **NOTE**

- The cabinet cannot be installed at a height of more than 10,000 mm.

Procedure

- Step 1** Mark four anchor points based on the positions of the holes in the backplane, and ensure that two anchor points are on the same horizontal plane by using the level, as shown in [Figure 10-6](#).

Figure 10-6 Marking anchor points

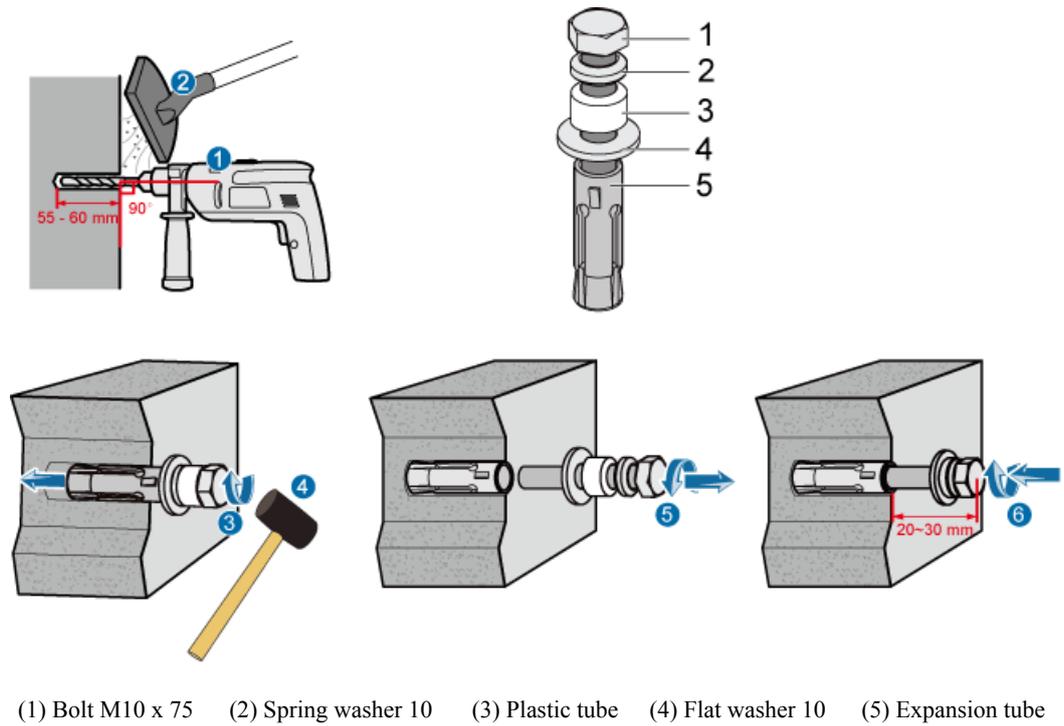


Step 2 Use the hammer drill with a $\Phi 14$ bit to drill a hole at each marked anchor points, and then install an expansion bolt assembly, as shown in [Figure 10-7](#).

 **NOTE**

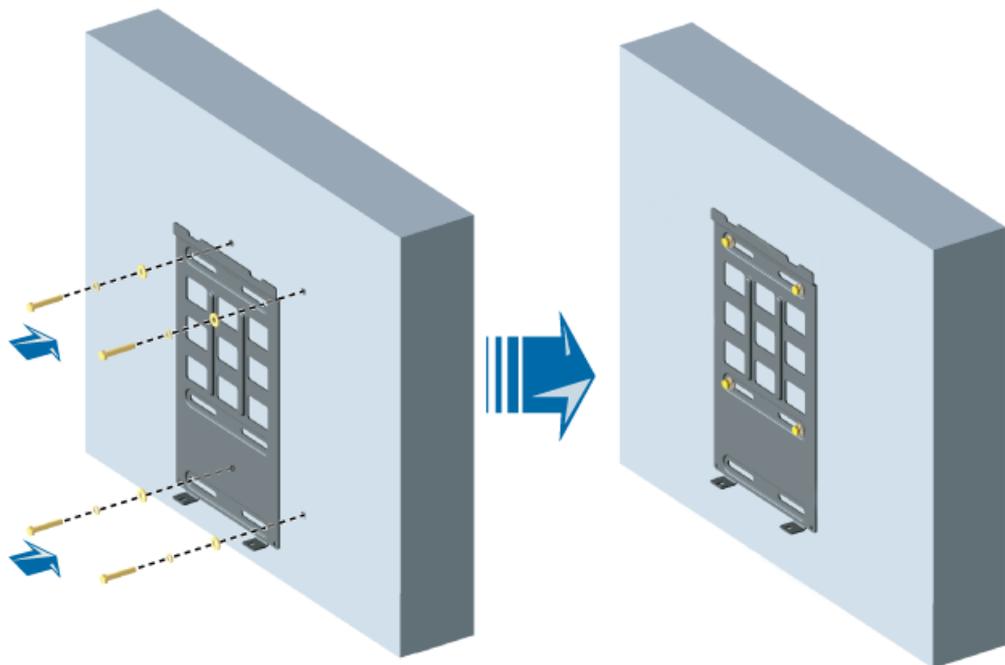
After the expansion bolt assembly is removed from the wall, the plastic tube must be discarded.

Figure 10-7 Installing the expansion bolt assembly



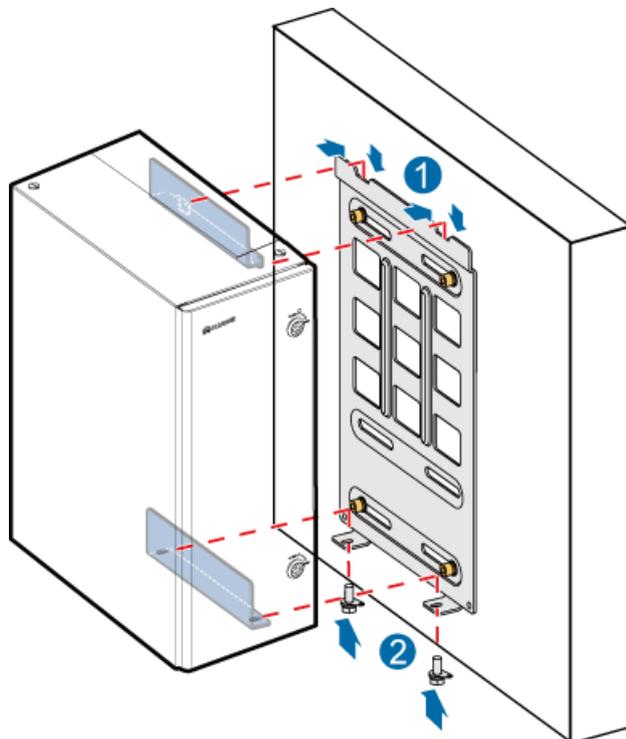
Step 3 Align the expansion bolt assemblies with the hole and secure the backplane to the wall, as shown in [Figure 10-8](#).

Figure 10-8 Installing the backplane



- Step 4** Place an OMB onto the back mounting plate, and then use M6x16 bolts to secure the back mounting plate on the attachment plate at the bottom of the OMB until the tightening torque reaches 4.8 N·m, as shown in [Figure 10-9](#).

Figure 10-9 Installing the OMB



---End

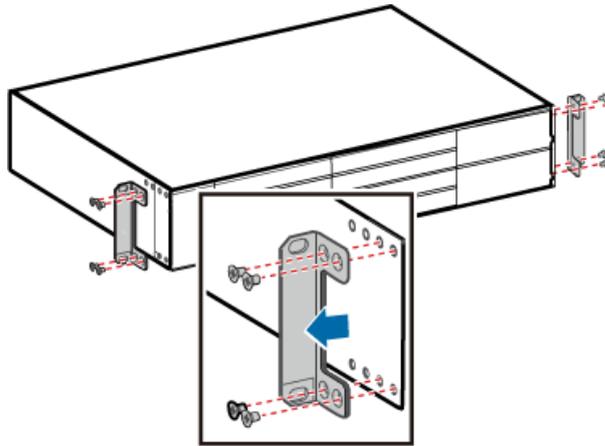
10.3 Installing a BBU

This section describes the procedure and precautions to be taken for installing a BBU in an OMB when a DBS3900 is deployed outdoors.

Procedure

- Step 1** Install the mounting ears on both sides of the BBU reversely.
1. Remove the mounting ears, as shown in [Figure 10-10](#).

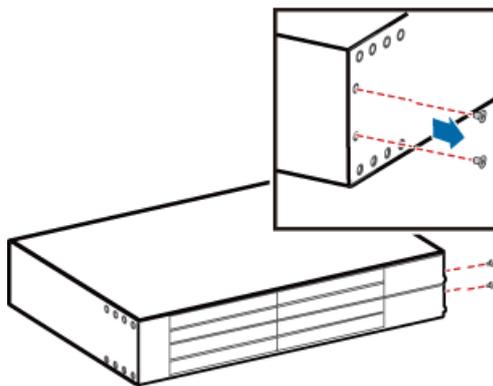
Figure 10-10 Removing the mounting ears



HIB01C0002

2. Removing two ground screws, as shown in [Figure 10-11](#).

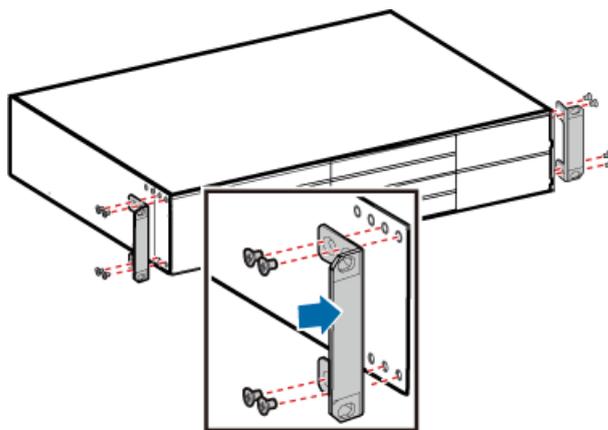
Figure 10-11 Removing the ground screws



HIB01C0020

3. Install the mounting ears reversely, as shown in [Figure 10-12](#).

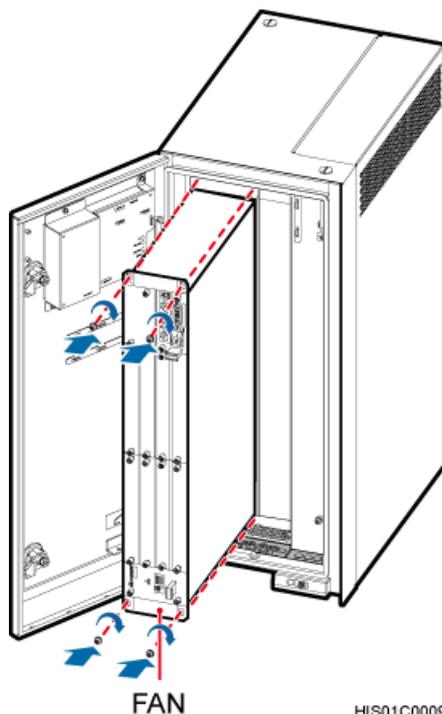
Figure 10-12 Installing the mounting ears reversely



HIB01C0003

Step 2 Slide a BBU along the guide rails into an OMB, and then tighten four M6x16 screws on the panel until the tightening torque reaches 3 N·m, as shown in [Figure 10-13](#).

Figure 10-13 Installing a BBU



---End

10.4 Installing Cables

This section describes the procedures and precautions to be taken for installing power cables, transmission cables, monitoring signal cables, and CPRI cables when a DBS3900 is deployed outdoors and the BBU is installed in an OMB.

10.4.1 Cabling Requirements

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

 **NOTE**

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

General Cabling Requirements

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

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

The cables must be bound as follows:

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

The cables must be routed as follows:

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

Special Cabling Requirements

Cabling requirements for power cables are as follows:

- -48 V power cables must be bound together.
- +24 V power cables must be bound together.
- Power cables, transmission cables, and signal cables are routed separately.
- Multiple power cables must be bound when routed.
- Power cables must be installed in the position specified in engineering design documents.
- If the length of power cables is insufficient, replace the cables rather than adding connectors or soldering joints to lengthen the cables.

Cabling requirements for PGND cables are as follows:

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

Cabling requirements for E1 cables are as follows:

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

Cabling requirements for fiber optic cables are as follows:

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

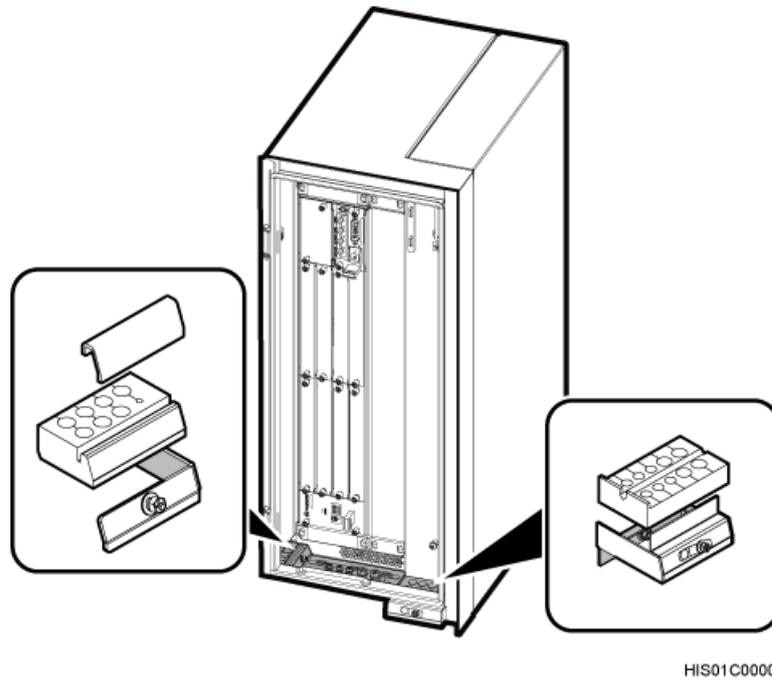
10.4.2 Installing a Cable Outlet Module in an OMB

During cable installation, you must remove cable outlet modules at the bottom of an OMB, lead cables through the cables holes on the cable outlet modules, and then reinstall the modules for effective sealing.

Context

- Cable outlet modules are installed on both sides at the bottom of an OMB, as shown in [Figure 10-14](#).

Figure 10-14 Positions of cable outlet modules



- There are multiple cable holes in a cable outlet module at the bottom of an OMB. **Figure 10-15** shows the cable holes in the left cable outlet module, and **Figure 10-16** shows the cable holes in the right cable outlet module.

Figure 10-15 Cable holes in the left cable outlet module

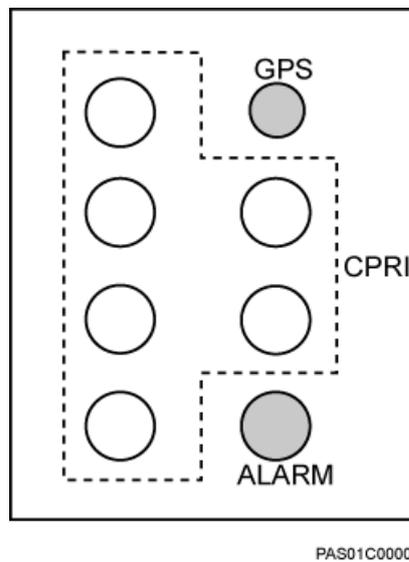
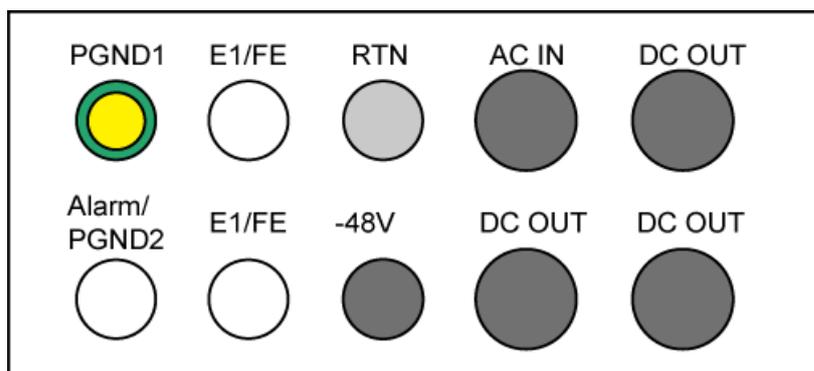


Figure 10-16 Cable holes in the right cable outlet module

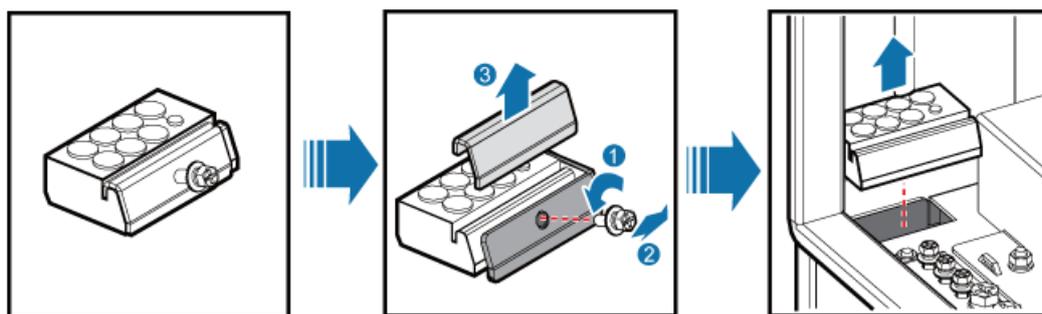


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Procedure

- Step 1** Remove baffle plate and bolts from a cable outlet module, and then remove the cable outlet module from the cable trough at the bottom of an OMB, as shown in [Figure 10-17](#).

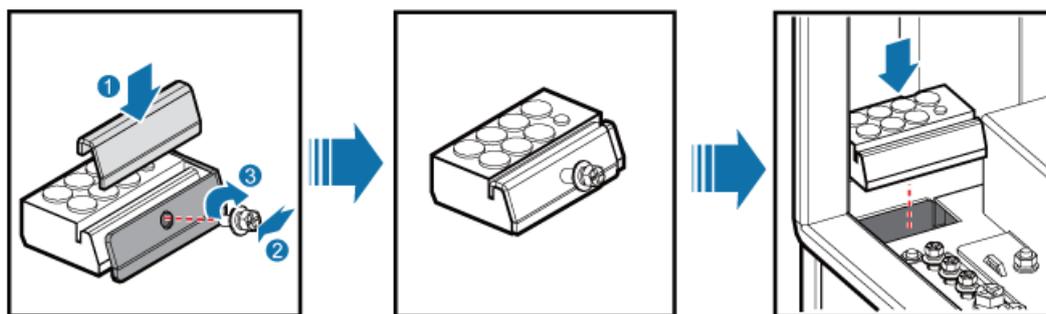
Figure 10-17 Removing a cable outlet module



HIS01C0001

- Step 2** According to the labels near the cable holes in the cable outlet module, remove rubber caps from cable holes, and then lead each cable through a corresponding cable hole.
- Step 3** Place the cable outlet module in the cable through at the bottom, and then install the baffle plate and bolts, as shown in [Figure 10-18](#).

Figure 10-18 Installing a cable outlet module



HIS01C0002

---End

10.4.3 Installing a PGND Cable

A PGND cable connects the ground bar in a cabinet to an external ground bar, ensuring proper grounding of the cabinet.

Prerequisite

The tools, such as a Phillips screwdriver, cable cutter, and multi-purpose crimping tool, are ready.

Context

Table 10-1 lists the specifications of a PGND cable.

Table 10-1 Specifications of a PGND cable

Cable	One End	The Other End	Description
PGND cable	OT terminal (M6, 16 mm ²)	OT terminal (M6, 16 mm ²)	Green and yellow

Procedure

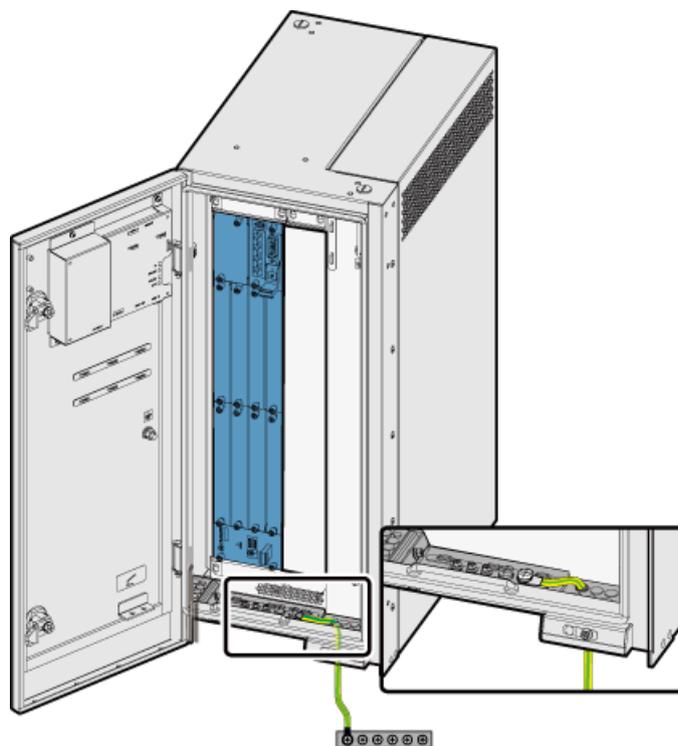
Step 1 Prepare a PGND cable.

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

Step 2 Install the PGND cable, as shown in **Figure 10-19**.

1. Connect one end of the PGND cable to the rightmost ground terminal on the ground bar at the bottom of an OMB, and then tighten the screw on the ground terminal.
2. Connect the other end to an external ground bar.

Figure 10-19 Installing a PGND cable



Step 3 Route the cable by referring to [10.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 4 Label the installed cables by referring to Attaching a Sign Plate Label.

---End

10.4.4 Installing Power Cables

When a DBS3900 is deployed outdoors with AC power supply and the BBU is installed in an OMB, power cables such as an input power cable for the OMB, BBU power cable, and RRU power cables must be installed.

Installing an Input Power Cable for the OMB

An input power cable for the OMB feeds external power into an OMB for its components from external power equipment.

Context

220 V AC single-phase or 110 V dual-live-wire AC power cable can be fed into an OMB. [Table 10-2](#) lists the specifications of an input power cable for the OMB. The following description is based on the installation of the 220 V AC single-phase power cable.

Table 10-2 Specifications of input power cables for the OMB

Cable	One End	The Other End	Description
220 V AC single-phase input power cable for the OMB	OT terminal (M6, 2.5 mm ²)	Depending on the external equipment	Black cable with three wires in blue, brown, and green and yellow
110 V AC dual-live-wire input power cable for the OMB	OT terminal (M6, 2.5 mm ²)	Depending on the external equipment	Black cable with four wires in black, red, white, and green

NOTE

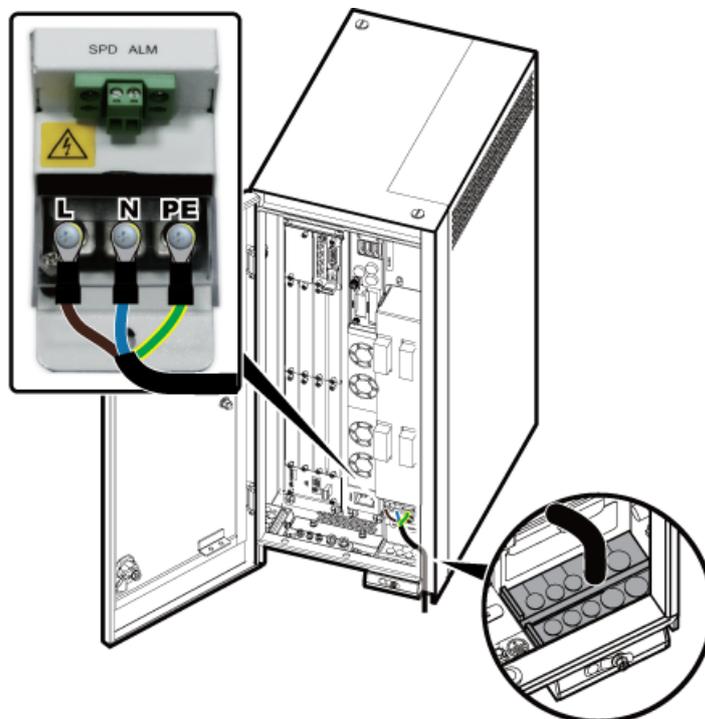
The colors and structures of cables vary according to countries and areas. If the cables are purchased locally, the colors and structures of the cables may be different.

Procedure

Step 1 Install an input power cable for the OMB, as shown in **Figure 10-20**.

1. Link the OT terminals on the blue, brown, and green and yellow wires at one end of the input power cable for the OMB to the wiring terminals labeled N, L, and PE on the AC/DC power equipment.

Figure 10-20 Installing an input power cable for the OMB



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2. Lead the other end through the cable outlet module on the right at the bottom of the OMB, and then route the cable to external power equipment. For details about how to install a cable outlet module, see [10.4.2 Installing a Cable Outlet Module in an OMB](#).

Step 2 Route the cable by referring to [10.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 3 Label the installed cables. For details, see Attaching a Cable-Tying Label.

---End

Installing a BBU Power Cable

When AC power is fed into a DBS3900, a BBU power cable feeds power into the BBU from a power equipment (AC/DC). A BBU power cable feeds power into a BBU.

Context

Table 10-3 lists the specifications of a BBU power cable when a power cable (AC/DC) supplies power. For details about a BBU power cable, see BBU Power Cable (OMB).

Table 10-3 Specifications of a BBU power cable

Cable	One End	The Other End	Description
BBU power cable [power supplied from a power equipment (AC/DC)]	H4 connector	3V3 power connector	
		3V3 power connector	

 **NOTE**

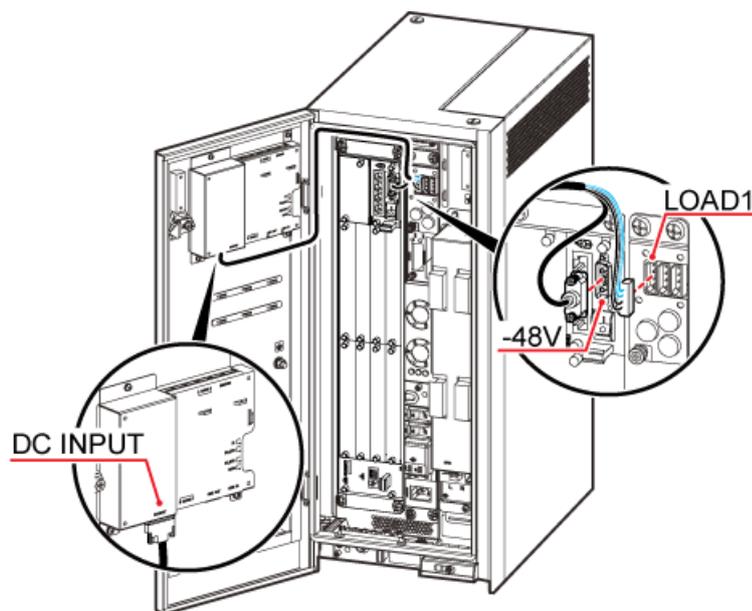
The colors and structures of cables vary according to countries and areas. If the cables are purchased locally, the colors and structures of the cables may be different.

Procedure

Step 1 Install a BBU power cable, as shown in [Figure 10-21](#).

1. Link the H4 connector at one end of the BBU power cable to the DC output wiring terminal labeled LOAD1 on the power equipment (AC/DC).
2. Link a 3V3 power connector at the other end to the -48 V port on the UPEU in the BBU, and then tighten the screws on the connector until the tightening torque reaches 0.25 N·m.
3. Link another 3V3 power connector at the other end to the DC INPUT port on the HEUA.

Figure 10-21 Installing a BBU power cable



CIS01C2002

Step 2 Route the cable by referring to [10.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 3 Label the installed cables. For details, see Attaching an L-Shaped Label.

---End

Installing an RRU Power Cable

An RRU power cable feeds -48 V DC power into an RRU from a power equipment (AC/DC).

Context

[Table 10-4](#) lists the specifications of an RRU power cable when a power equipment (AC/DC) supplies power.

Table 10-4 Specifications of RRU power cables

Cable		One End	The Other End	Description
RRU power cable	RTN(+) wire	OT terminal [M4, 3.3 mm ² (12 AWG)]	OT terminal [M4, 3.3 mm ² (12 AWG)]	North American standard Black
	NEG(-) wire	OT terminal [M4, 3.3 mm ² (12 AWG)]	OT terminal [M4, 3.3 mm ² (12 AWG)]	North American standard Blue

Cable		One End	The Other End	Description
RRU power cable	RTN(+) wire	OT terminal (M4, 4 mm ²)	OT terminal (M4, 4 mm ²)	European standard Brown
	NEG(-) wire	OT terminal (M4, 4 mm ²)	OT terminal (M4, 4 mm ²)	European standard Blue
RRU power cable	RTN(+) wire	OT terminal (M4, 4 mm ²)	Easy power receptacle (pressfit type) connector	
	NEG(-) wire	OT terminal (M4, 4 mm ²)		

 **NOTE**

The colors and structures of cables vary according to countries and areas. If the cables are purchased locally, the colors and structures of the cables may be different.

Procedure

Step 1 Prepare an RRU power cable.

- Cut the cable to the required length based on the actual cable route.
- Add OT terminals to the blue, black (or brown) wires and shield layer of the RRU power cable at the power equipment (AC/DC) end, as shown in Adding OT Terminals to the DC RRU Power Cable on the DCDU Side.
- Add OT terminals or an easy power receptacle (pressfit type) connector to the other end of the RRU power cable according to the type of power supply socket on the RRU.
 - Add an OT terminal. For details, see the related RRU Installation Guide.
 - Add an easy power receptacle (pressfit type) connector. For details, see the related RRU Installation Guide.

Step 2 Install an RRU power cable, as shown in [Figure 10-22](#).

- Link the OT terminals on the blue and black (or brown) wires of the RRU power cable to the wiring terminals labeled NEG(-) and RTN(+) on the PDU in the power equipment (AC/DC) respectively.

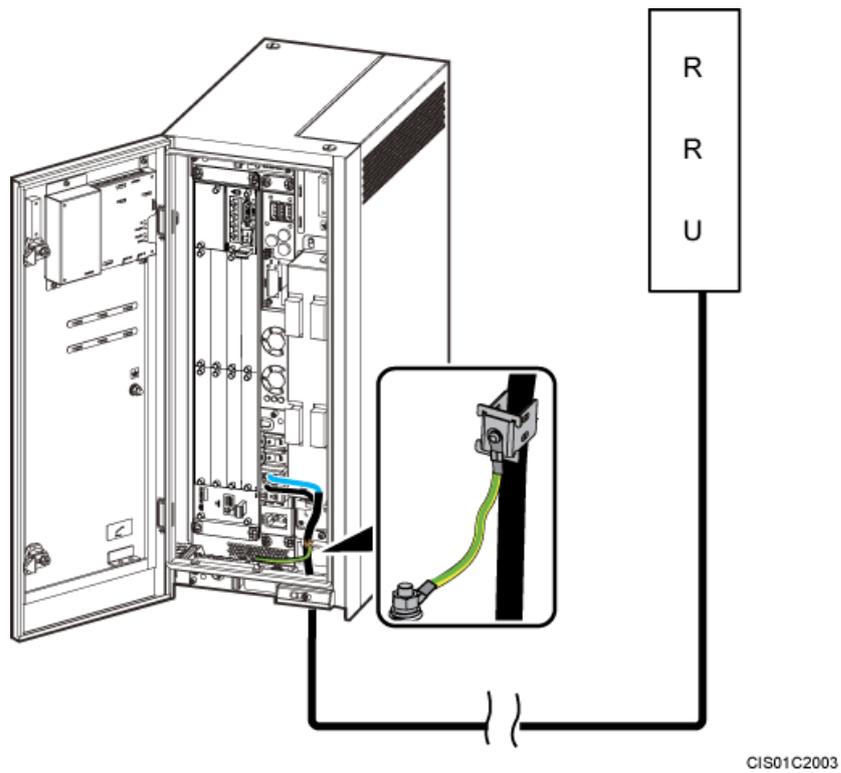
 **NOTE**

In the 220 V AC single-phase and 110 V AC dual-live-wire power supply scenario, only one MRRU can be installed because the power supply capacity of the power equipment (AC/DC) is limited.

No surge protection is required for DC power supply. In this case, an RRU power cable can be used for a distance of not greater than 5 m.

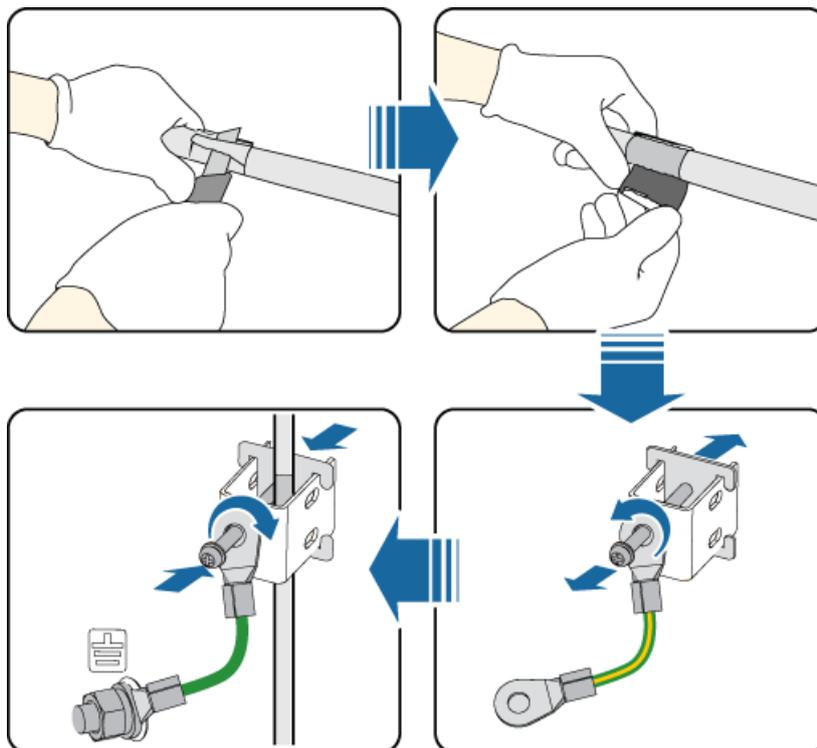
- Connect the blue and black wires at the other end to the wiring terminals labeled NEG(-) and RTN(+) in the cabling cavity of the RRU respectively.

Figure 10-22 Installing an RRU power cable



- Step 3** In a position 20 cm away from the cable outlet module, strip the jacket for about 25 mm off the RRU power cable to expose the shield layer. Thread the cable through the ground clip to ensure full contact between the shield layer and the ground clip, and then tighten the M4 screws on the clip until the tightening torque reaches 1.2 N·m, as shown in [Figure 10-23](#).

Figure 10-23 Installing a grounding clip



Step 4 Route the cable by referring to [10.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 5 Run each cable that leaves the cabinet in the PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

---End

10.4.5 Installing Transmission Cables

When a DBS3900 is deployed outdoors with AC power supply and the BBU is installed in an OMB, transmission cables such as an E1/T1 cable and E1/T1 surge protection transfer cable or FE/GE cable and FE/GE surge protection transfer cable must be installed based on actual requirements onsite.

Context

 **NOTE**

Install the transmission cables based on the connections of transmission cables. For details, see the *BBU3900 Hardware Description* Transmission Cable Connections.

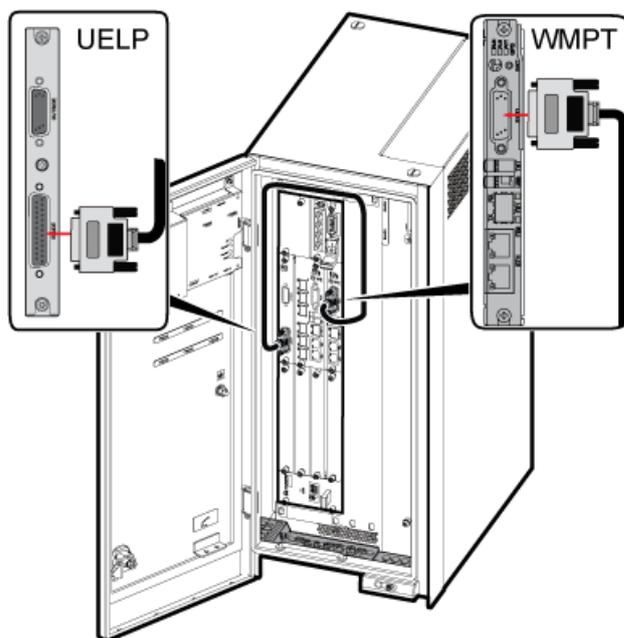
Installing an E1/T1 Surge Protection Transfer Cable

An E1/T1 surge protection transfer cable connects the transmission board and surge protection unit for transferring surge protection signals.

Procedure

- Step 1** Install an E1/T1 surge protection transfer cable, as shown in [Figure 10-24](#).
1. Link the DB26 connector at one end of the E1/T1 surge protection transfer cable to the E1/T1 port on the GTMU, WMPT, or UTRP in the BBU, and then tighten the plastic screws on the connector until the tightening torque reaches 0.25 N·m.
 2. Link the DB25 connector at the other end to the INSIDE port on the UELP in the BBU, and then tighten the plastic screws on the connector until the tightening torque reaches 0.25 N·m.

Figure 10-24 Installing an E1/T1 surge protection transfer cable



CIS01C4000

- Step 2** Route the cable by referring to [10.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

- Step 3** Label the installed cables. For details, see Attaching an L-Shaped Label.

---End

Installing an E1/T1 cable

When a DBS3900 is deployed outdoors with DC power supply, the BBU can be installed in an OMB. In this case, an E1/T1 cable connects the surge protection unit and external transmission equipment for E1/T1 signal transmission.

Prerequisite



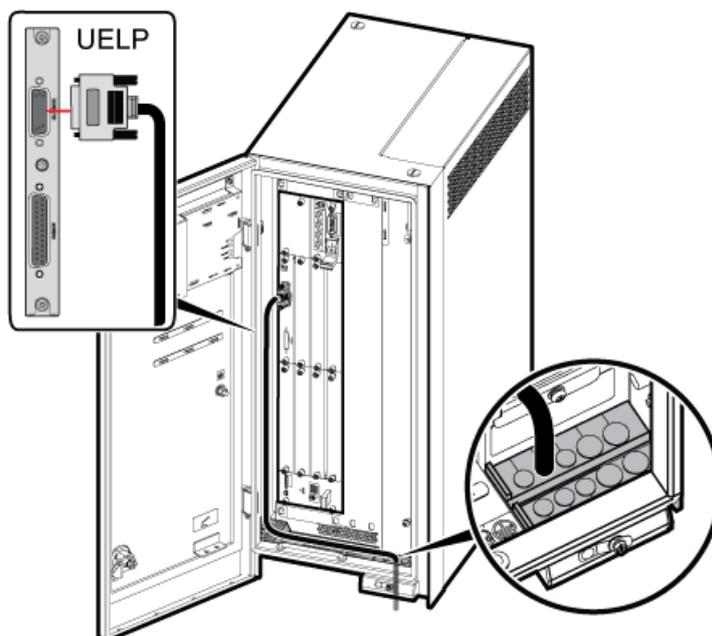
WARNING

Before soldering the connectors to the E1/T1 cable, ensure that both ends of the E1 cable are disconnected from any devices. In addition, all the connectors are soldered to the E1 cable during the same session.

Procedure

- Step 1** Install an E1/T1 cable, as shown in [Figure 10-25](#).
1. Link the DB26 connector at one end of the E1/T1 cable to the OUTSIDE port on the UELP in the BBU, and then tighten the plastic screws on the connector until the tightening torque reaches 0.25 N·m.
 2. Lead the other end out of the cabinet through the cable outlet module on the bottom right of the cabinet, and then connect the E1/T1 cable to the external transmission equipment. For details about how to install the cable outlet module, see [10.4.2 Installing a Cable Outlet Module in an OMB](#).

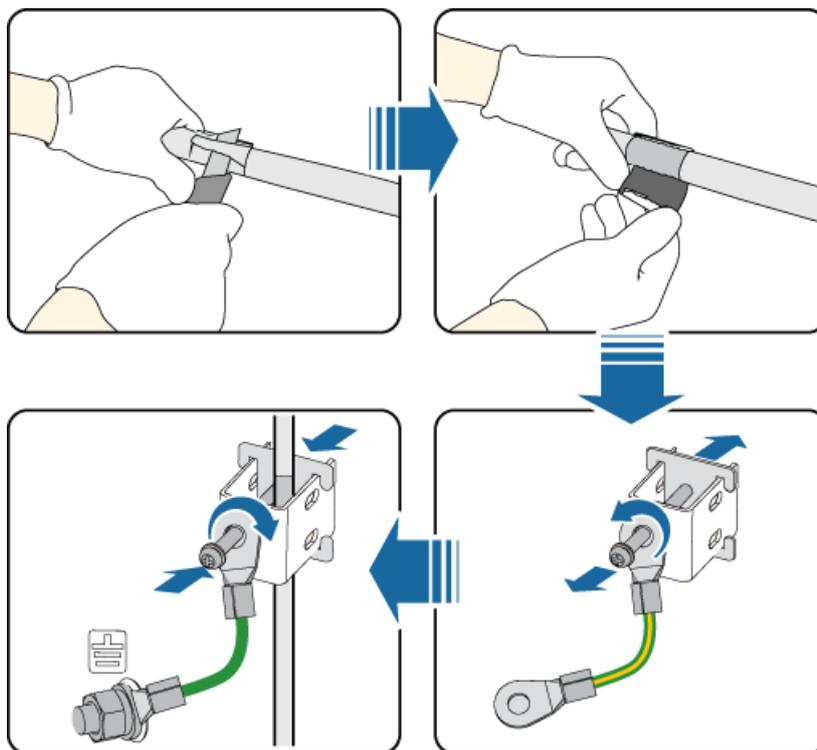
Figure 10-25 Installing an E1/T1 cable



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- Step 2** In a position 20 cm away from the cable outlet module, strip the jacket for about 25 mm off the E1/T1 cable to expose the shielding layer. Thread the E1/T1 cable through the ground clip to ensure full contact between the shielding layer and the ground clip, and then tighten the M4 screws on the clip until the tightening torque reaches 1.2 N·m, as shown in [Figure 10-26](#).

Figure 10-26 Installing a ground clip



Step 3 Route the cable by referring to [10.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 4 Label the installed cables. For details, see Attaching an L-Shaped Label.

----End

Installing a FE/GE Surge Protection Transfer Cable

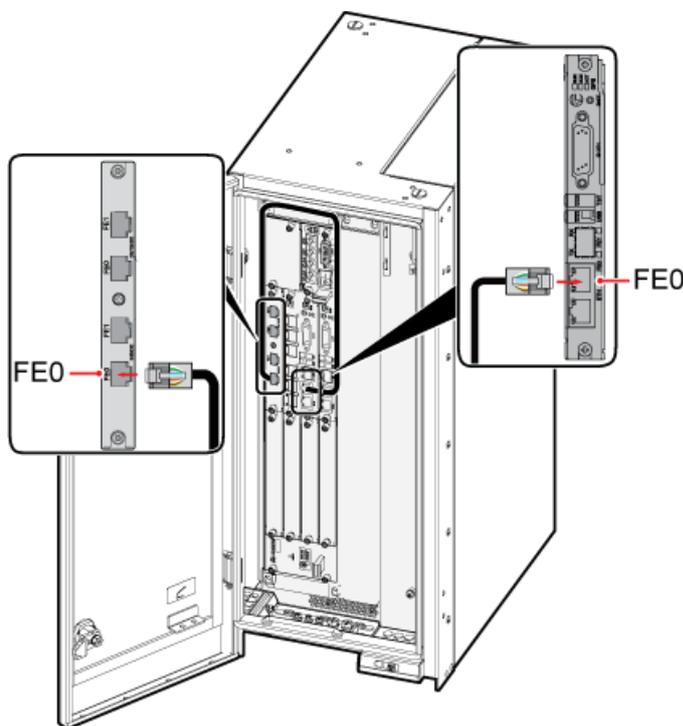
A FE/GE surge protection transfer cable connects a transmission board and the UFLP, transferring surge protection transfer signals.

Procedure

Step 1 Install a FE/GE surge protection transfer cable, as shown in [Figure 10-27](#).

1. Link the RJ-45 connector at one end of the FE/GE surge protection transfer cable to the FE0 port on the GTMU or WMPT or FE/GE port on the UTRP9 in the BBU.
2. Connect the other end to the FE0 or FE1 port near the INSIDE label on the UFLP in the BBU.

Figure 10-27 Installing a FE/GE surge protection transfer cable



CIS01C4002

Step 2 Route the cable by referring to [10.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 3 Label the installed cables. For details, see Attaching an L-Shaped Label.

----End

Installing a FE/GE Cable

When a DBS3900 is deployed outdoors, a FE/GE cable connects the surge protection unit and external transmission equipment for FE/GE signal transmission.

Procedure

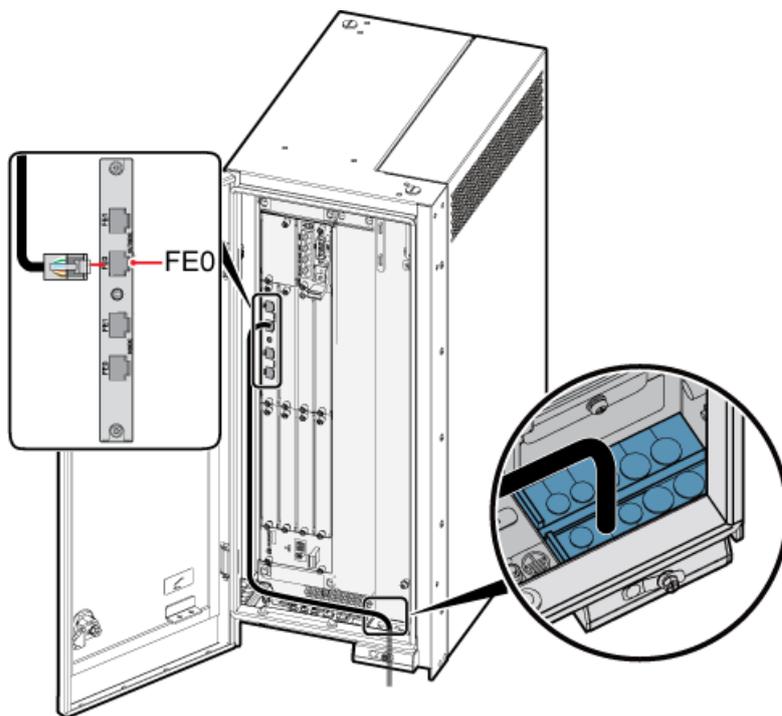
Step 1 Install a FE/GE cable, as shown in [Figure 10-28](#).

1. Connect one end of the FE/GE cable to the FE0 or FE1 port near the OUTSIDE label on the UFLP in the BBU.
2. Lead the other end out of the cabinet through the cable outlet module on the bottom right of the cabinet, and then connect the FE/GE cable to the external transmission equipment. For details about how to install the cable outlet module, see [10.4.2 Installing a Cable Outlet Module in an OMB](#).

NOTE

You must use a shielded straight-through FE/GE cable.

Figure 10-28 Installing a FE/GE cable



CIS01C4003

Step 2 Route the cable by referring to [10.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 3 Label the installed cables. For details, see Attaching an L-Shaped Label.

----End

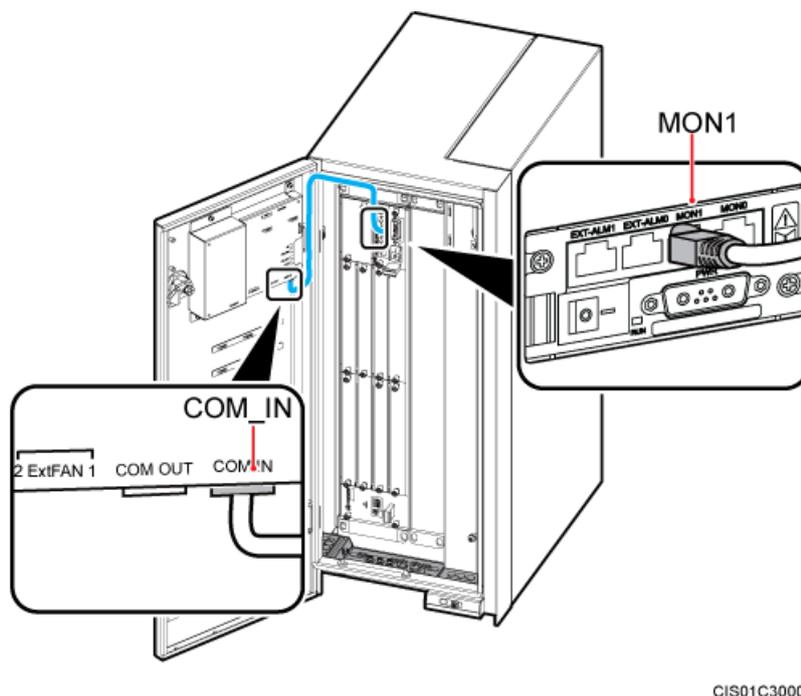
10.4.6 Installing a Monitoring Signal Cable Between the HEUA and the BBU

You only need to install a monitoring signal cable between the HEUA and the BBU when the BBU is installed in an OMB.

Procedure

- Step 1** Install a monitoring signal cable between the HEUA and the BBU, as shown in [Figure 10-29](#).
1. Connect one end of the monitoring signal cable between the HEUA and the BBU to the COM IN port on the HEUA on the door of the OMB.
 2. Connect the other end to the MON1 port on the UPEU in the BBU.

Figure 10-29 Installing a monitoring signal cable between the HEUA and the BBU



Step 2 Route the cable by referring to [10.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 3 Label the installed cables. For details, see Attaching an L-Shaped Label.

----End

10.4.7 Installing a CPRI Optical Cable

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

Context

- The single-mode optical module is labeled "SM" and multi-mode optical module is labeled "MM".
- If the puller of an optical module is blue, the module is a single-mode optical module. If the puller of an optical module is black or grey, the module is a multi-mode optical module.
- The optical module to be installed must have a matching rate with the corresponding CPRI port.



CAUTION

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

Procedure

Step 1 Install an optical module, as shown in **Figure 10-30**.

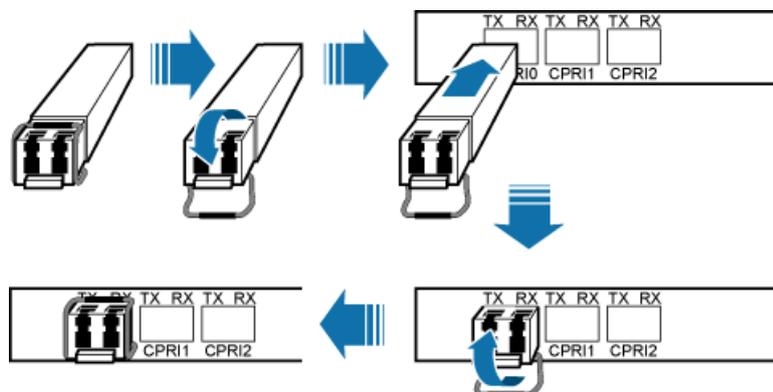
1. Turn the puller on the optical module outwards.
2. Insert the optical module into the CPRI port on the GTMU, WBBPb, WBBPd, or LBBP, and then insert the optical module of the same type⁽¹⁾ into the CPRI_W or CPRI0 port on an RRU.

 **NOTE**

(1) The optical modules with the same label are of the same type.

3. Turn the puller on the optical module inwards.

Figure 10-30 Installing an optical module



Step 2 Install a CPRI optical cable, as shown in **Figure 10-31**.

 **NOTE**

For details about the connections of the CPRI optical cables, see the *BBU3900 Hardware Description* CPRI Cable Connections.

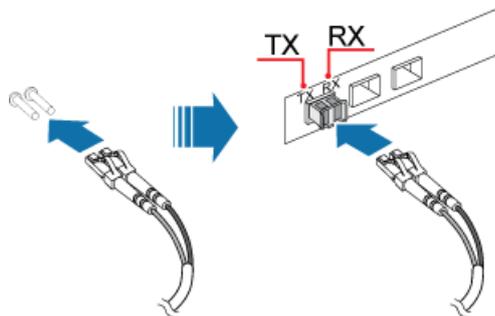
1. Remove the dustproof caps from the connectors of the optical cable.
2. Insert the DLC connectors labeled 2A and 2B at one end of the CPRI optical cable into the optical module on the GTMU, WBBPb, WBBPd, or LBBP, and then insert the DLC connectors labeled 1A and 1B at the other end into the optical module on the RRU.



CAUTION

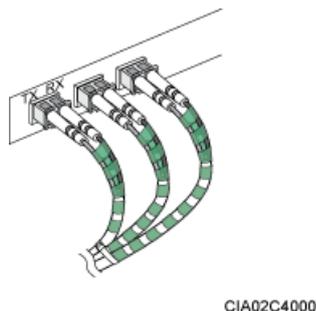
If both ends of the optical cable are the LC connectors, the TX and RX ports on the BBU are respectively connected to the TX and RX ports on the RRU.

Figure 10-31 Installing a CPRI optical cable



- Step 3** Route the CPRI optical cable along the left of the cabinet, and then lead it out of the cabinet from the cable hole on the left of the bottom. For details, see [10.4.1 Cabling Requirements](#).
- Step 4** Attach labels on the optical cable. For details, see [Attaching a Sign Plate Label](#).
- Step 5** Coil the optical fiber with winding plastic tape at the end connected to the BBU. The tape is coiled between the optical connector and the first cable tie on the cabinet, as shown in [Figure 10-32](#).

Figure 10-32 Coiling the optical fiber with winding plastic tape



----End

10.4.8 Installing a GPS Clock Signal Cable

The GPS clock signal cable is an optional cable that transmits GPS clock signals from the GPS antenna system to the BBU. The GPS clock signals serve as the clock reference of the BBU.

Context

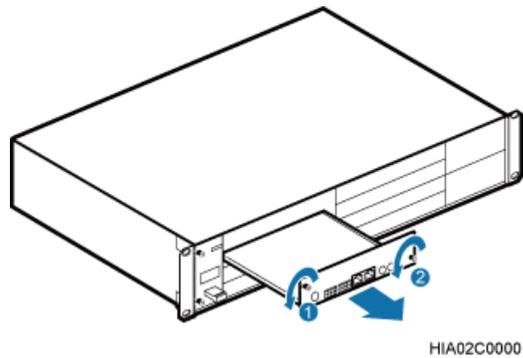
 **NOTE**

Only a dual-satellite receiver needs to be installed onsite.

Procedure

- Step 1** Remove the two M3 screws on the panel, and then pull out the USCU, as shown in [Figure 10-33](#).

Figure 10-33 Removing the USCU.



Step 2 Install a satellite receiver on the USCU, as shown in [Figure 10-34](#).

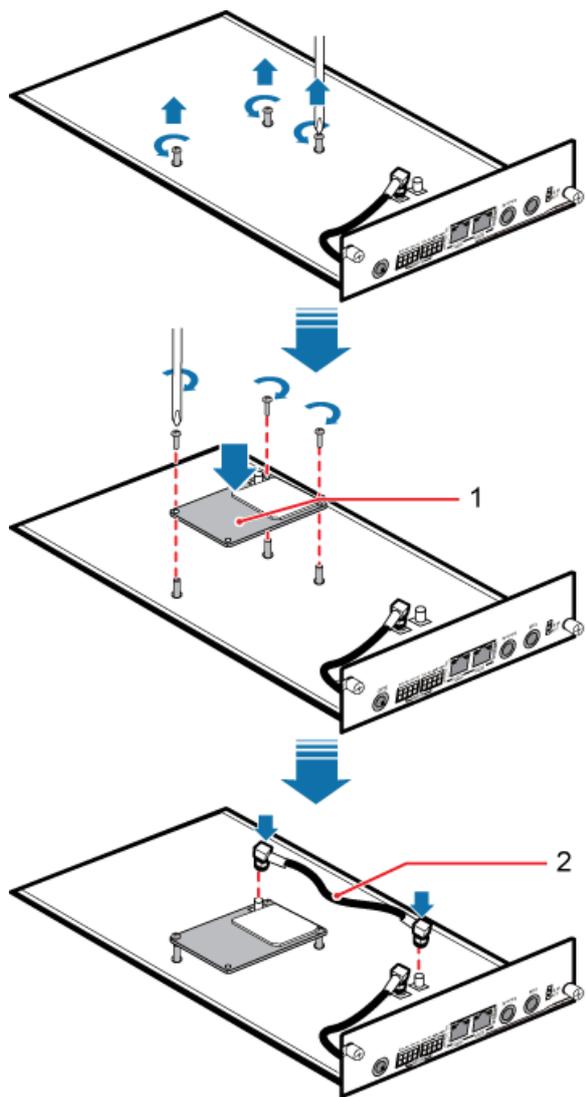
1. Remove the three M1.6 screws from the USCU.
2. Align the mounting holes on the satellite receiver with the bolts on the USCU.
3. Tighten the three M1.6 screws that were removed in [Step 2.1](#) to 0.1 N·m.
4. Connect one end of the RF jumper to the RF port on the satellite receiver and the other end to the GPS port on the USCU.



CAUTION

There are six mounting holes on the satellite receiver. You need to install only three screws on the receiver, as shown in [Figure 10-34](#)

Figure 10-34 Installing the satellite receiver on the USCU



CIA02C4006

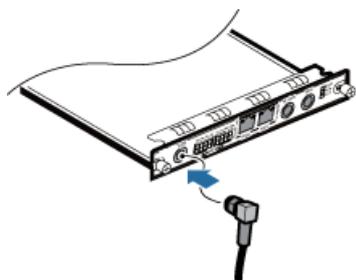
(1) Satellite receiver

(2) RF jumper

Step 3 Install the USCU equipped with the satellite receiver into the BBU, and tighten the screws on the USCU to 0.6 N·m.

Step 4 Connect the GPS clock signal cable to the GPS port on the USCU, as shown in [Figure 10-35](#).

Figure 10-35 Installing a GPS Clock Signal cable



CIA02C4004

Step 5 Route the cables by referring to [10.4.1 Cabling Requirements](#), and then use cable ties to bind the cables.

Step 6 Label the installed cables by referring to Attaching an L-Shaped Label.

---End

10.5 Installation Checklist

Check the installation items, installation environment, and cable-related items after the cabinets and devices are all installed.

Cabinet Installation Checklist

[Table 10-5](#) describes the cabinet installation checklist.

Table 10-5 Cabinet installation checklist

No.	Item
1	The installation position of the cabinet strictly complies with the engineering design.
2	In the wall-mounted scenario, the holes of the mounting ears are well aligned with the holes of the expansion bolt assemblies. In addition, the mounting ears are secured on the wall evenly and steadily.
3	In the metal-pole-mounted scenario, the supports for the metal pole are secure on the floor.
4	If the cabinet is installed on the floor, the base is securely installed.
5	Either the horizontal error or vertical error of the cabinet is less than 3 mm.
6	All the bolts, especially those for electrical connections, are tight. Both the spring washer and the flat washer are installed in the correct sequence.
7	The cabinet is neat and clean.
8	The paint on the surface is intact. If any paint is damaged, you must apply touch-up paint to avoid erosion.
9	Filler panels are installed in the space reserved for customer equipment.

No.	Item
10	The cabinet door can be easily opened or closed, the lock works properly, and the gag lever post is secure.
11	All labels, tags, and nameplates are correct, legible, and complete.

Cabinet Installation Environment Checklist

Table 10-6 describes the cabinet installation environment checklist.

Table 10-6 Cabinet installation environment checklist

No.	Item
1	There are no fingerprints or other smears on the surface of the cabinet.
2	There are no excessive straps or adhesive tape on the cables.
3	No tapes, tails of cable ties, paper, or packing bags are left around the cabinet.
4	All the items around the cabinet are neat, clean, and intact.

Electrical Connection Checklist

Table 10-7 describes the electric connection checklist of the cabinet.

Table 10-7 Electric connection checklist of the cabinet

No.	Item
1	All self-made PGND cables are copper-based with the proper wire diameters. No breaking device such as switch and fuse is allowed for the electric connection of the grounding system. No short circuit is allowed.
2	The PGND cable is securely connected and the AC lead-in cable and cables in the cabinet are correctly connected according to the electrical design of the power system. The screws are tightened. In addition, the inputs or outputs are not short-circuited.
3	The redundant part of the power cable or PGND cable is stripped off rather than coiled.
4	The terminals at both ends of the power cable or PGND cable are securely soldered or crimped.
5	The bare wires and the terminal handles at the wiring terminals are coated with heat-shrinkable tubes.
6	The flat washer and the spring washer are well mounted on all OT terminals.
7	The exterior of the battery is intact without any scratch, dent, or crack.

No.	Item
8	The shell of the battery is clean without any leakage trace.
9	The wiring post on the battery stands properly without any damage, and the post is not covered with any acidic substances.
10	The pressure relief valve of the battery is not transformed, and no liquid leaks.
11	The power cables for the batteries are connected to the positive and negative polarities correctly.
12	The voltage of the battery is normal. <ul style="list-style-type: none"> ● The voltage of a 2 V battery cell ranges from 1.8 V to 2.35 V. ● The voltage of a 12 V battery cell ranges from 10.8 V to 14.1 V. ● The total voltage of the batteries ranges from 43.2 V to 56.4 V.
13	The fans work properly. <ul style="list-style-type: none"> ● The fan in the IBBS200D rotates in a low speed in a normal situation. ● The outer air circulation fan in the IBBS200T stops in a normal situation (with the ambient temperature of lower than 30°C), and the inner air circulation fan rotates in a high speed. ● The outer air circulation fan in the APM30H stops in a normal situation (with the ambient temperature of lower than 35°C), and the inner air circulation fan rotates in a low speed.
14	The MCBs for the batteries are set to OFF.

Cable Installation Checklist

Table 10-8 describes the cable installation checklist.

Table 10-8 Cable installation checklist

No.	Item
1	All cables are connected securely and reliably. Pay special attention to the communication cable connections and cable connections at the bottom of the cabinet.
2	The cables are neatly and tightly bound. The cable ties are evenly spaced and face the same direction.
3	Different types of cable, such as the power cable, ground cable, feeder, optical cable, E1/T1 cable, and FE cable are separately bound.
4	The cable layout facilitates maintenance and future capacity expansion.
5	All the labels at both ends of the cables are legible.

No.	Item
6	The extra length of the indoor cable ties is cut, and the cut surfaces are smooth without sharp edges. The extra length of 3 mm to 5mm of the outdoor cable ties is reserved when the cable ties are cut.
7	The idle port that no cable is connected to is properly protected.
8	The connectors of the RF cables are fixed in position to avoid false connection that may cause an abnormal voltage standing wave ratio (VSWR).

BBU Hardware Installation Checklist

[Table 10-9](#) describes the BBU hardware installation checklist.

Table 10-9 BBU hardware installation checklist

No.	Item
1	All self-made PGND cables are copper-based with the proper wire diameters. No switch, fuse, or similar object is allowed for the electrical connection of the grounding system. No short circuit is allowed. Only one OT terminal of the PGND cable can be connected to each terminal on the ground bar.
2	The redundant part of the power cable or PGND cable is stripped off rather than coiled.
3	The terminals at both ends of the power cable or PGND cable are securely soldered or crimped.
4	The bare wires at the terminals and terminal handles are covered with heat-shrinkable tubes.
5	The flat washer and spring washer are well mounted on all OT terminals, and the OT terminals are intact and contact the wiring terminals properly.
6	All the cables, including those on the bottom of the cabinet, are securely connected.
7	The cables are neatly and tightly bound. The cable ties are evenly spaced and face the same direction.
8	The power cable, PGND cable, feeder, optical cable, and the E1/T1/FE cable are bound separately with spacing of more than 30 mm.
9	The cable layout facilitates maintenance and future capacity expansion, and the bending radius of the cable meets the requirements.
10	Legible labels are attached to both ends of all cables.
11	The extra length of the indoor cable ties is cut, and the cut surfaces are smooth without sharp edges. The extra length of 3 mm to 5 mm of the outdoor cable ties is reserved when the cable ties are cut.
12	The unused ports are properly protected.

10.6 Power-On Check

Before a DBS3900 starts operating, you must check the power-on status of the cabinet and components in it.



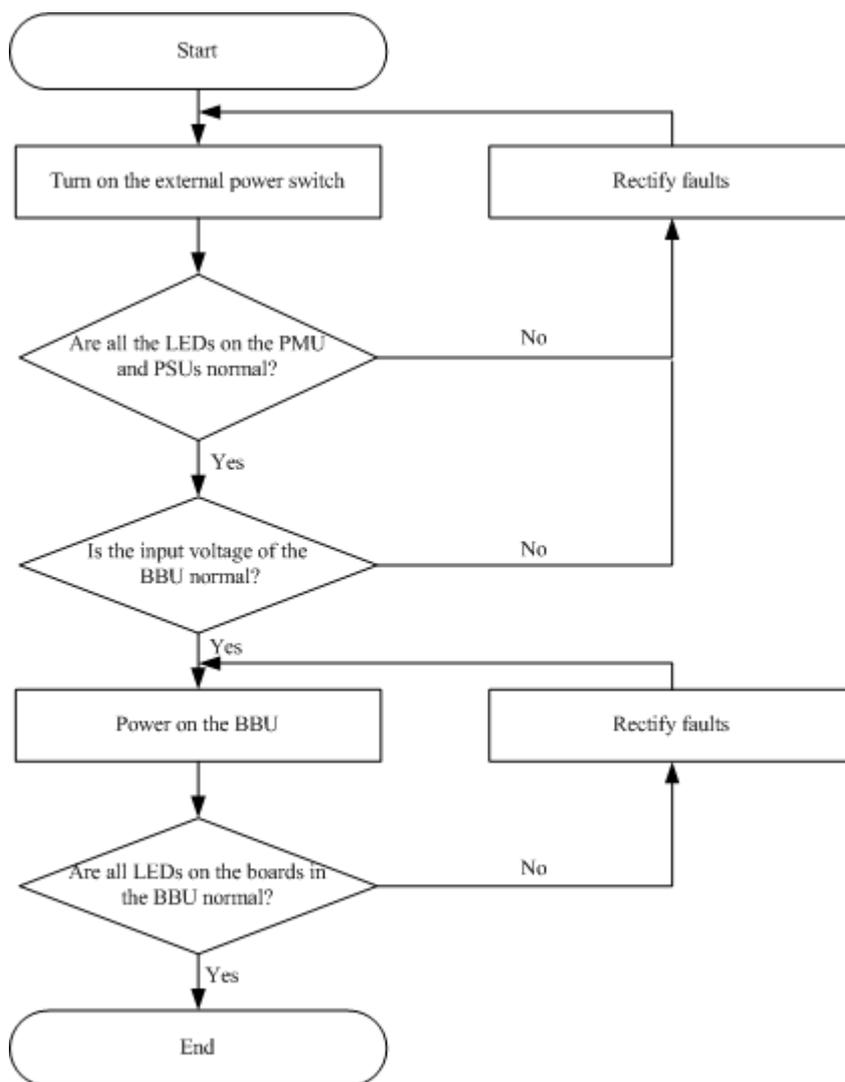
CAUTION

The DBS3900 must be powered on within seven days after it is unpacked, and the period for which the DBS3900 remains powered-off during maintenance must not exceed 48 hours.

Power-On Check in the AC Power Supply Scenario

Figure 10-36 shows the power-on check when a DBS3900 is deployed in the AC power supply scenario.

Figure 10-36 Power-on check in the AC power supply scenario



D1011-L0P1-T1L12

LED Status and Output Voltage Check

- The normal status of the LEDs on a PMU is as follows:
 - RUN LED: blinking
 - ALM LED: off
- The normal status of the LEDs on a PSU is as follows:
 - Power LED: steady green
 - Protection LED: off
 - Fault LED: off
- The normal status of the LEDs on a GTMU, WMPT, WBBP, LMPT, LBBP, and UTRP is as follows:
 - RUN LED: on for 1s and off for 1s

- ALM LED: off
- ACT LED: on
- RUN LED on the UPEU: on
- STATE LED on the FAN unit: blinking green slowly (on for 1s and off for 1s)

10.7 Applying Touch-Up Paint

The paint on the surface is intact. If any paint is damaged, you must apply touch-up paint to avoid erosion.

Prerequisite

Before applying touch-up paint, select the same color as the original coating, as listed in [Table 10-10](#).

Table 10-10 Code of color samples

Object	Color	Code of Huawei Color Sample	International Color Code
Cabinet (including the APM30H, RFC, TMC11H, IBBS200T, and IBBS200D)	RAL7035	YB026	RAL7035
Base	3010 Light gray	YB030	Pontone 422U

Procedure

- Step 1** If there are stains in the damaged area or rust on the material, use fine sandpaper to polish the damaged area to remove the stains or rust.
- Step 2** Use clean cotton cloth to remove the stains or dust from the surface of the area to be polished or repaired.
- Step 3** Shake the paint well, and then use a small brush inside the bottle to absorb paint and evenly spread the paint on the damaged area until the area is covered.



CAUTION

The paint coating should be as thin as possible. No drops are allowed on the paint coating, and the surface should be smooth.

- Step 4** Perform subsequent operations after the repaired paint coating is exposed in the air for 30 minutes.

 **NOTE**

The color of the repaired paint coating area should be consistent with that of the surrounding areas, without obvious edges and bulges, and the original damage should no longer be distinguishable. In addition, there should be no paint peeled off.

----End

11 Indoor Scenario with DC Power Supply (BBU Installed on a Wall)

About This Chapter

This chapter describes the procedures for installing the BBU, DCDU-03B, and related cables on an indoor wall.

[11.1 Installation Clearance Requirements](#)

In an indoor scenario with DC power supply, a BBU and DCDU-03B can be installed on a wall. In this case, the DCDU-03B supplies power to the BBU.

[11.2 Installation Process](#)

In an indoor wall-mounted scenario, you must install components and related cables on a wall.

[11.3 Installing Components on a Wall](#)

In an indoor wall-mounted scenario, a BBU and DCDU-03B are installed on a wall.

[11.4 Installing Cables](#)

This section describes the procedures and precautions to be taken for installing PGND cables, power cables, transmission cables, monitoring signal cables or alarm cables, and CPRI cables in an indoor wall-mounted scenario for a DBS3900.

[11.5 Installation Checklist](#)

Check the installation items, installation environment, and cable-related items after the cabinets and devices are all installed.

[11.6 Power-On Check](#)

Before a DBS3900 starts operating, you must check the power-on status of the cabinet and components in it.

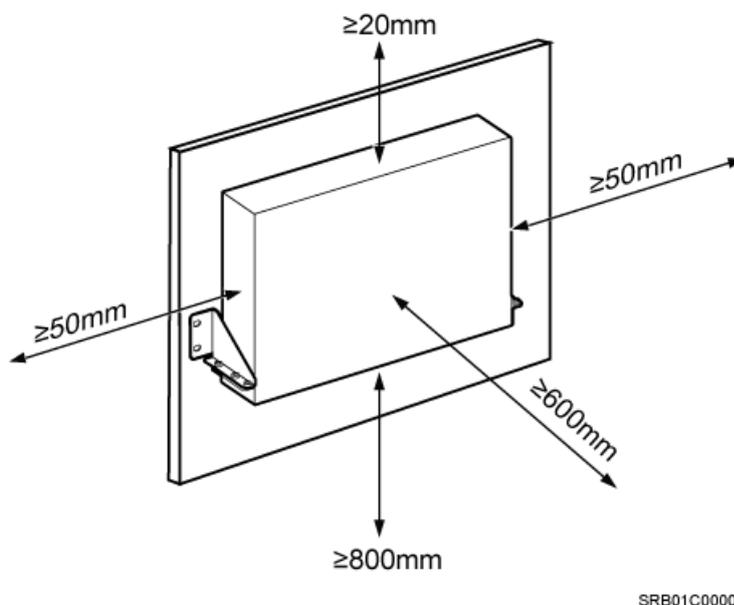
11.1 Installation Clearance Requirements

In an indoor scenario with DC power supply, a BBU and DCDU-03B can be installed on a wall. In this case, the DCDU-03B supplies power to the BBU.

Installation Clearance Requirements for a Separate Wall-Mounted BBU

Figure 11-1 shows the installation clearance requirements for a separate wall-mounted BBU.

Figure 11-1 Installation clearance requirements for a separate wall-mounted BBU



 **NOTE**

- A minimum of 600 mm in front of the BBU is reserved for maintenance.
- A minimum of 20 mm above the BBU is reserved for maintenance.
- A minimum of 800 mm below the BBU is reserved for maintenance.
- A minimum of 50 mm on the left or right of the BBU is respectively reserved for maintenance.

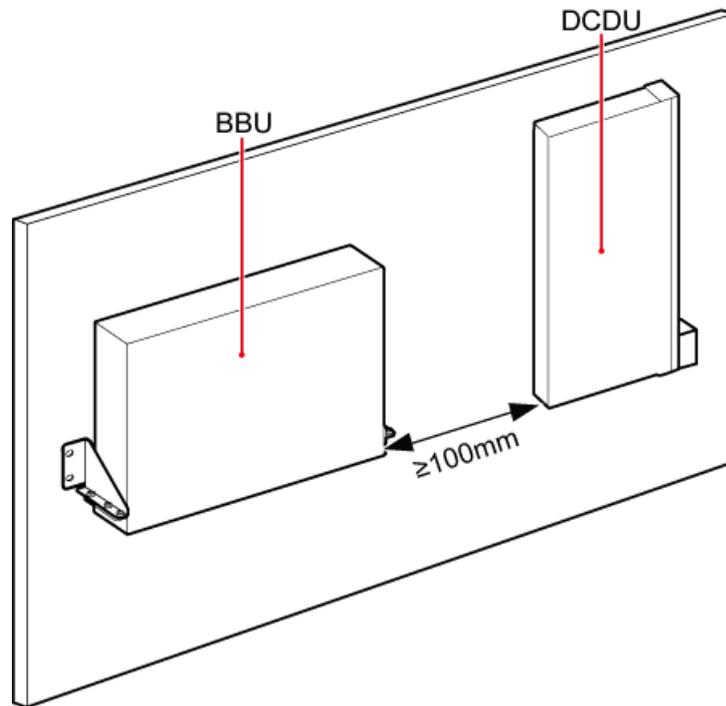
Installation Clearance Requirements for a Wall-Mounted BBU and DCDU-03B

If a BBU and DCDU-03B are installed on a wall, a minimum of 100 mm between them must be reserved for maintenance, as shown in **Figure 11-2**.

 **NOTE**

A DCDU-03B must be installed close to a BBU.

Figure 11-2 Installation clearance requirements for a wall-mounted BBU and DCDU-03B



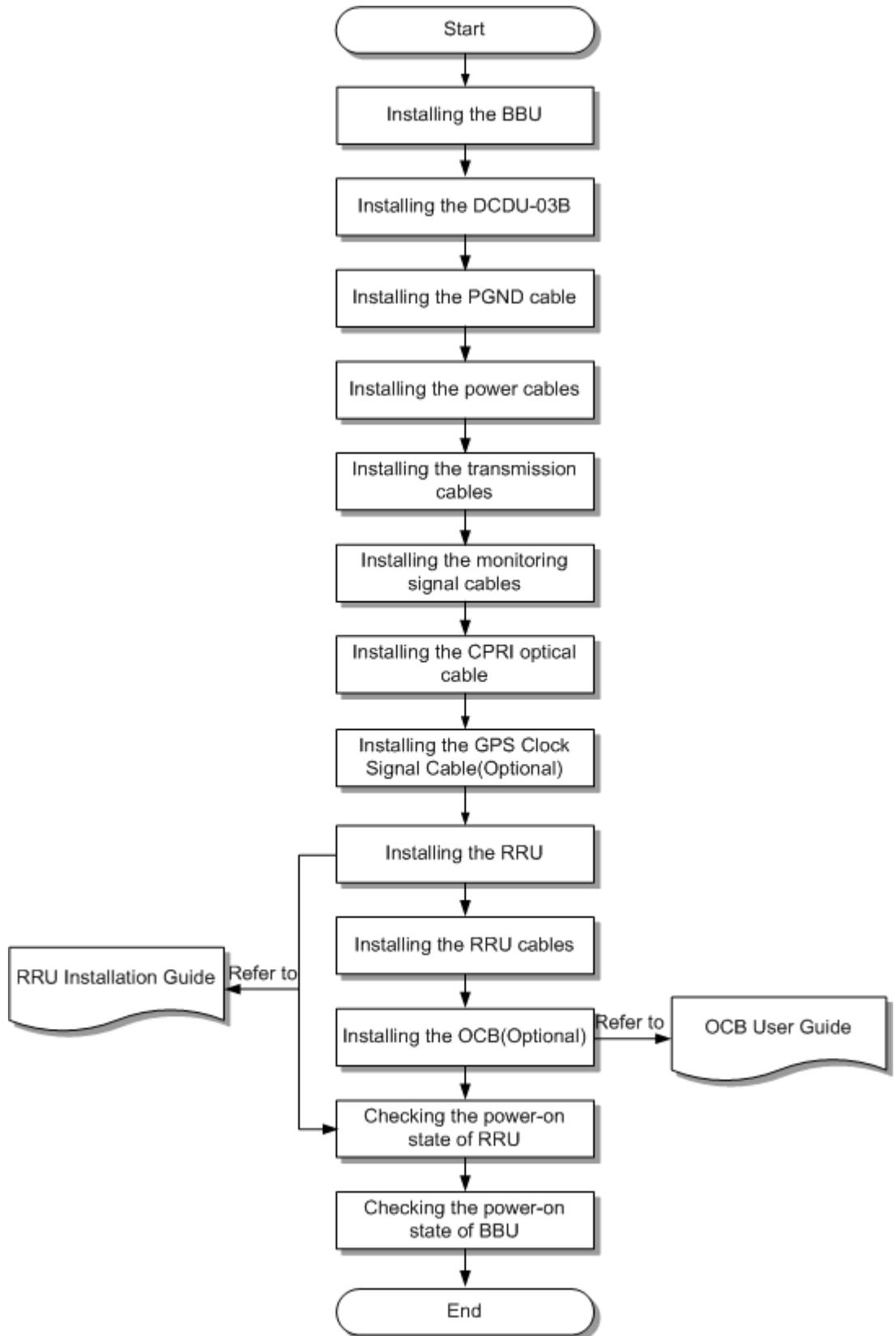
SRE00C0002

11.2 Installation Process

In an indoor wall-mounted scenario, you must install components and related cables on a wall.

Figure 11-3 shows the installation process.

Figure 11-3 Installation process



 **NOTE**

- The procedure for installing an RRU is not described in this document. For details about how to install an RRU, see the associated RRU installation guide according to the RRU model.
- The Outdoor Cable Conversion Box (OCB) is an optional component, which is used to connect cables with different cross-sectional areas. For details about an OCB, see the *OCB User Guide*.

11.3 Installing Components on a Wall

In an indoor wall-mounted scenario, a BBU and DCDU-03B are installed on a wall.

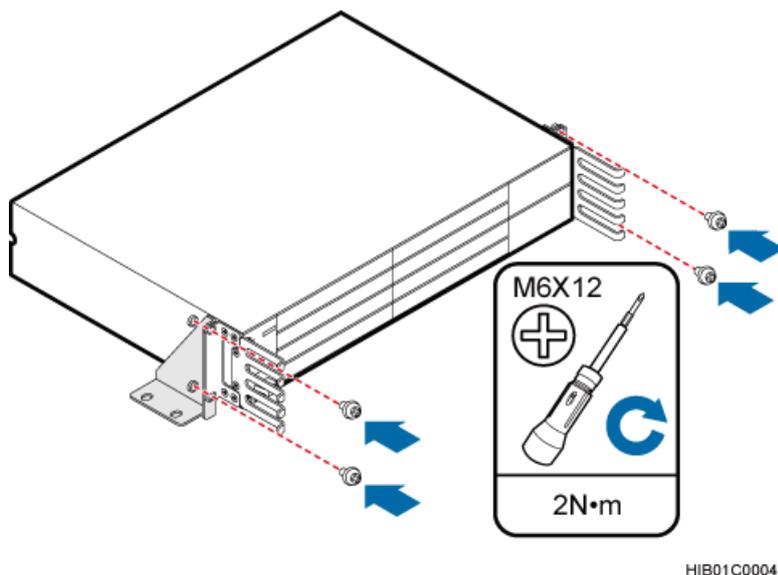
11.3.1 Installing a BBU

This section describes the procedure and precautions to be taken for installing a BBU on a wall.

Procedure

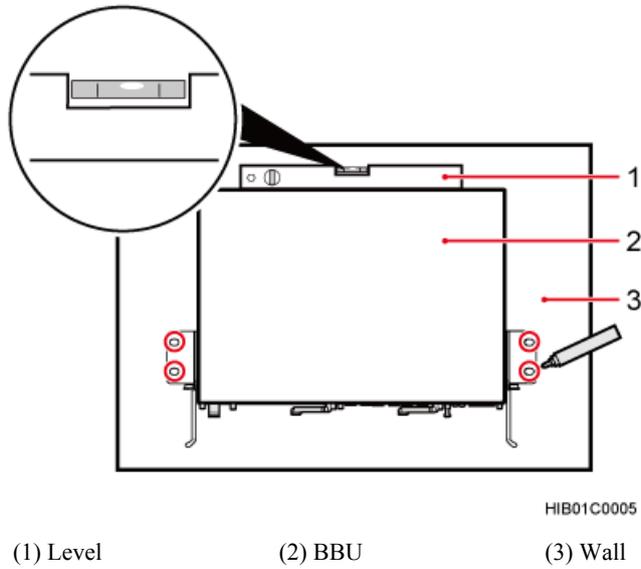
- Step 1** Tighten four M6x12 bolts to secure wall-mounting ears for the BBU on the mounting ears for the BBU until the tightening torque reaches 2 N·m, as shown in [Figure 11-4](#).

Figure 11-4 Securing wall-mounting ears for the BBU on the mounting ears for the BBU



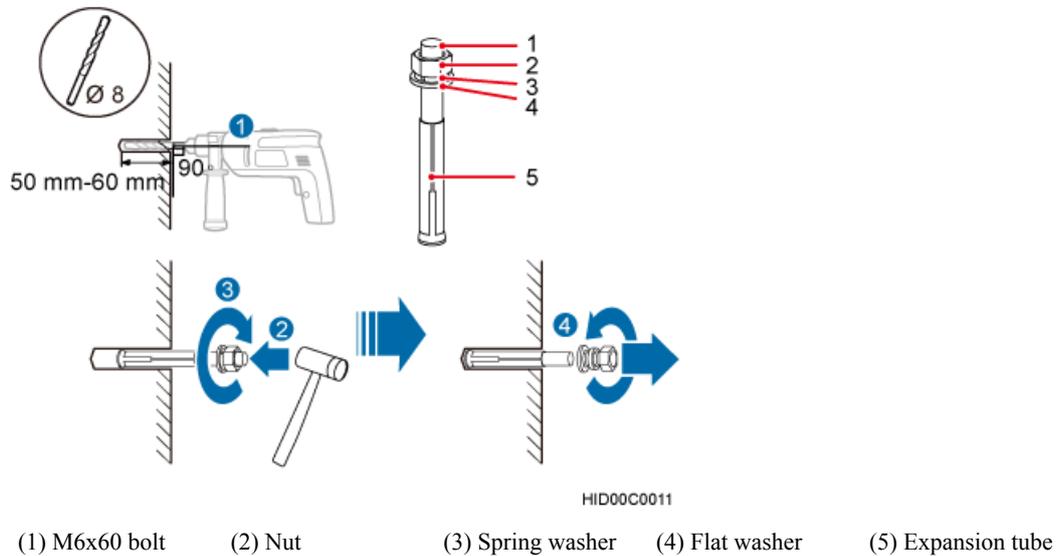
- Step 2** Tightly press the BBU against the wall, and then use a marker to mark anchor points for the wall-mounting ears, as shown in [Figure 11-5](#).

Figure 11-5 Marking anchor points for the wall-mounting ears for the BBU



Step 3 Drill holes at the anchor points, and then install expansion bolt assemblies, as shown in **Figure 11-6**.

Figure 11-6 Drilling holes and installing expansion bolt assemblies



1. Use a hammer drill with bit 8 to perpendicularly drill holes ranging from 50 mm to 60 mm at the marked anchor points.



WARNING

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

2. Use a vacuum cleaner to clear the dust inside and around the holes. If the inter-hole spacing is too wide or too narrow, locate and drill holes again.
3. Slightly tighten an expansion bolt, and then put the expansion bolt assembly into the hole perpendicularly.
4. Use a rubber mallet to hammer the expansion bolt until the expansion tube is completely buried in the hole.
5. Remove the M6x60 bolt, Nut, spring washer, and flat washer from each expansion bolt assembly in sequence.

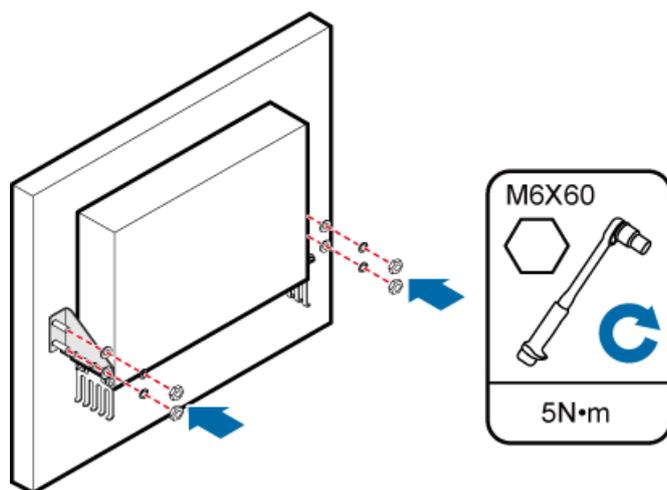


CAUTION

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

- Step 4** Tightly press the BBU against the wall with its back facing upwards, and then use a torque wrench to tighten four M6x60 bolts on the wall-mounting ears for the BBU until the tightening torque reaches 5 N·m, as shown in [Figure 11-7](#).

Figure 11-7 Installing a BBU



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---End

11.3.2 Installing a DCDU-03B

This section describes the procedure and precautions to be taken for installing a DCDU-03B on a wall.

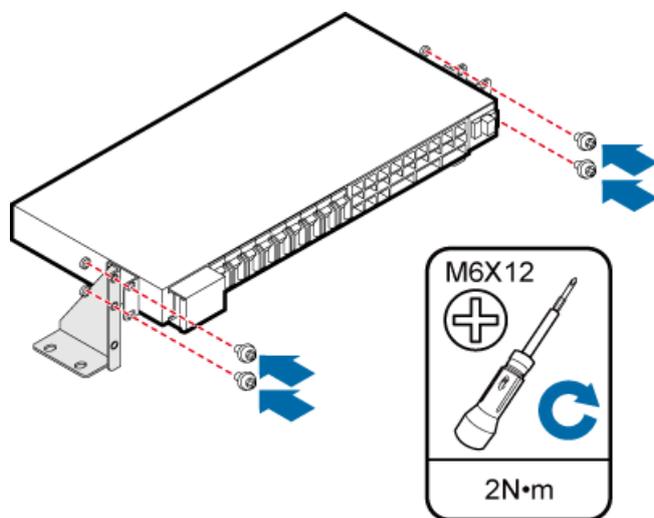
Context

In an indoor wall-mounted scenario, a BBU and DCDU-03B can be installed on a wall. In this case, the DCDU-03B supplies power to the BBU.

Procedure

- Step 1** Tighten four M6x12 bolts to secure wall-mounting ears for the DCDU-03B on the mounting ears for the DCDU-03B until the tightening torque reaches 2 N·m, as shown in [Figure 11-8](#).

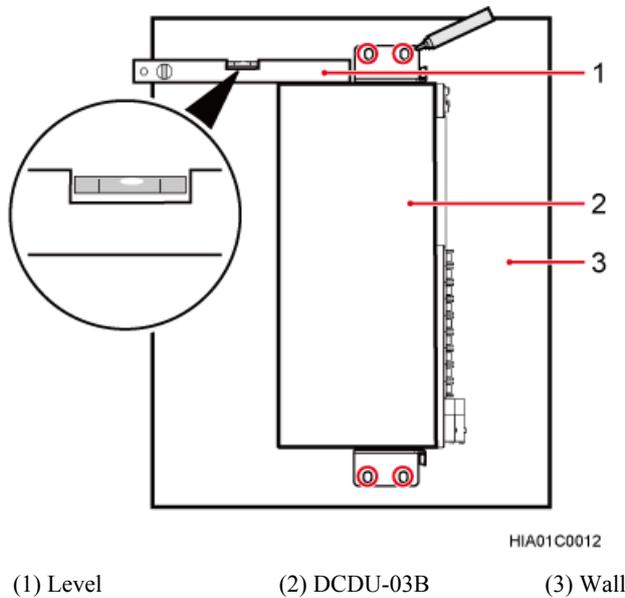
Figure 11-8 Securing wall-mounting ears for the DCDU-03B on the mounting ears for the DCDU-03B



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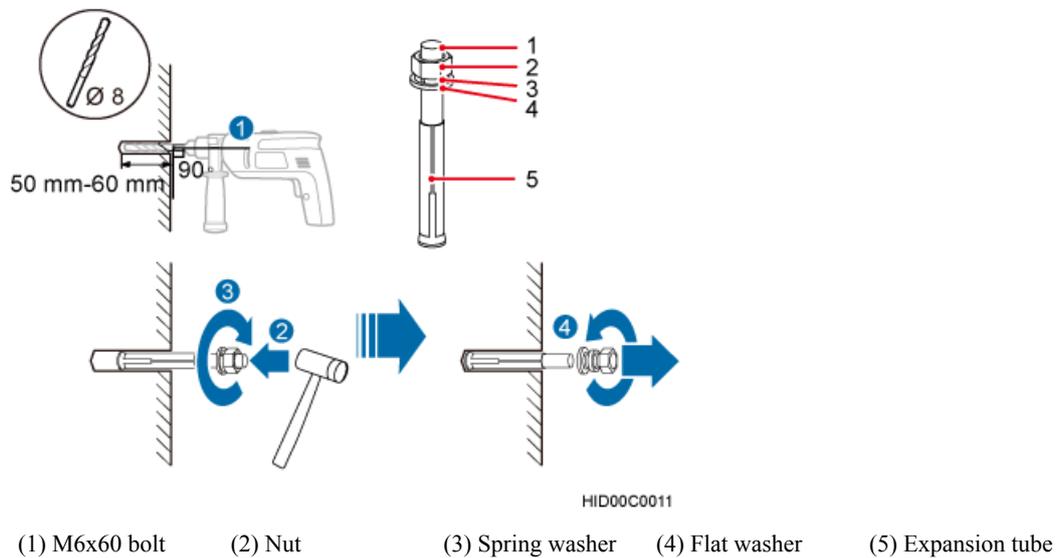
- Step 2** Tightly press the DCDU-03B against the wall, and then use a marker to mark anchor points for the wall-mounting ears, as shown in [Figure 11-9](#).

Figure 11-9 Marking anchor points for the wall-mounting ears for the DCDU-03B



Step 3 Drill holes at the anchor points, and then install expansion bolt assemblies, as shown in [Figure 11-10](#).

Figure 11-10 Drilling holes and installing expansion bolt assemblies



1. Use a hammer drill with bit 8 to perpendicularly drill holes ranging from 50 mm to 60 mm at the marked anchor points.



WARNING

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

2. Use a vacuum cleaner to clear the dust inside and around the holes. If the inter-hole spacing is too wide or too narrow, locate and drill holes again.
3. Slightly tighten an expansion bolt, and then put the expansion bolt assembly into the hole perpendicularly.
4. Use a rubber mallet to hammer the expansion bolt until the expansion tube is completely buried in the hole. Ensure that the bolt sticks out of the wall for 20 mm.
5. Remove the M6x60 bolt, spring washer, and flat washer from each expansion bolt assembly in sequence.

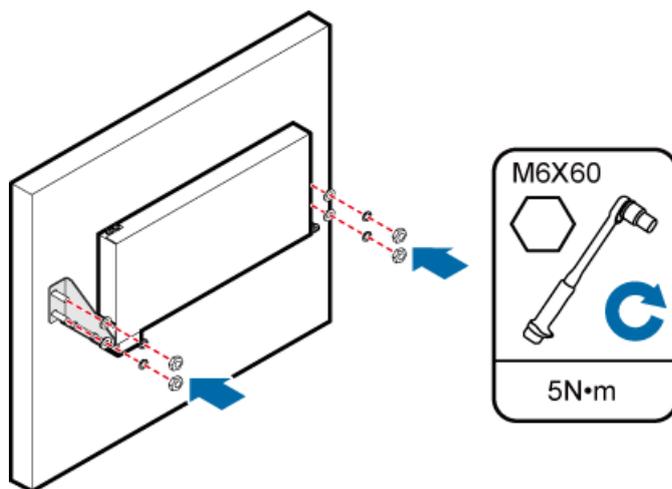


CAUTION

After dismantling an expansion bolt assembly, ensure that the top of the expansion tube is on the same level as the wall. Otherwise, the DCDU-03B cannot be installed on the wall evenly and securely.

- Step 4** Tightly press the DCDU-03B against the wall with the front panel facing the right and power supply socket facing upwards, and then use a torque wrench to tighten four M6x60 bolts on the wall-mounting ears for the DCDU-03B until the tightening torque reaches 5 N·m, as shown in [Figure 11-11](#).

Figure 11-11 Installing a DCDU-03B



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---End

11.4 Installing Cables

This section describes the procedures and precautions to be taken for installing PGND cables, power cables, transmission cables, monitoring signal cables or alarm cables, and CPRI cables in an indoor wall-mounted scenario for a DBS3900.

11.4.1 Cabling Requirements

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



NOTE

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

General Cabling Requirements

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

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

The cables must be bound as follows:

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

The cables must be routed as follows:

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

Special Cabling Requirements

Cabling requirements for power cables are as follows:

- -48 V power cables must be bound together.

- +24 V power cables must be bound together.
- Power cables, transmission cables, and signal cables are routed separately.
- Multiple power cables must be bound when routed.
- Power cables must be installed in the position specified in engineering design documents.
- If the length of power cables is insufficient, replace the cables rather than adding connectors or soldering joints to lengthen the cables.

Cabling requirements for PGND cables are as follows:

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

Cabling requirements for E1 cables are as follows:

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

Cabling requirements for fiber optic cables are as follows:

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

11.4.2 Installing PGND Cables

When a DBS3900 is deployed in an indoor wall-mounted scenario, PGND cables such as a BBU PGND cable and DCDU-03B PGND cable must be installed.

Installing a BBU PGND Cable

A BBU PGND cable ensures proper grounding of a BBU.

Context

Table 11-1 lists the specifications of a BBU PGND cable.

Table 11-1 Specifications of a BBU PGND cable

Cable	One End	The Other End	Description
BBU PGND cable	OT terminal (M4, 6 mm ²)	OT terminal (M8, 6 mm ²)	Green and yellow

Procedure

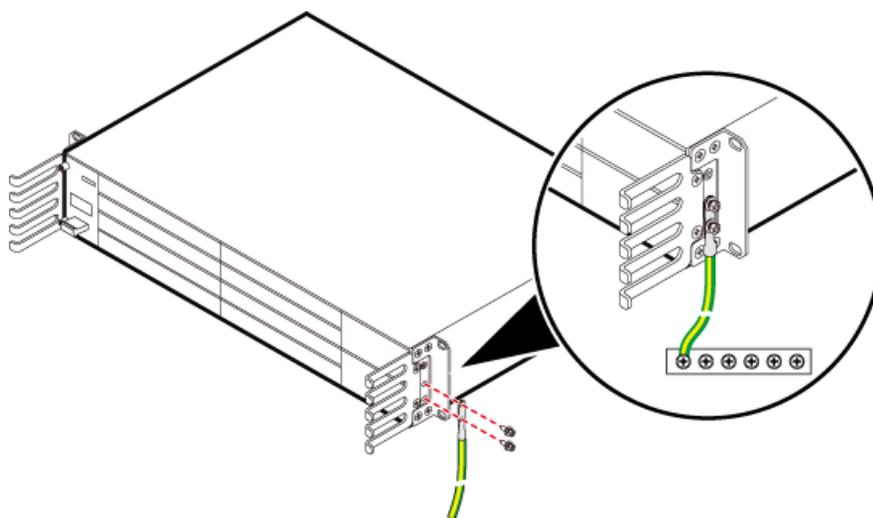
Step 1 Prepare a BBU PGND cable.

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

Step 2 Install the BBU PGND cable.

Link the M4 OT terminal at one end of the BBU PGND cable to the ground terminal on the BBU, and then link the M8 OT terminal at the other end to an external ground bar, as shown in [Figure 11-12](#).

Figure 11-12 Installing a BBU PGND cable

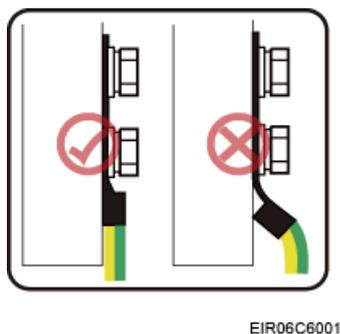


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NOTE

When installing the PGND cable, tightly press the OT terminal in the correct direction, as shown in [Figure 11-13](#).

Figure 11-13 Installing an OT terminal in the correct manner



Step 3 Label the installed cables. For details, see Labeling Power Cables.

---End

Installing a DCDU-03B PGND Cable

A DCDU-03B PGND cable ensures the proper grounding of a DCDU-03B.

Context

Table 11-2 lists the specifications of a DCDU-03B PGND cable.

Table 11-2 Specifications of a DCDU-03B PGND cable

Cable	One End	The Other End	Description
DCDU-03B PGND cable	OT terminal (M6, 6 mm ²)	OT terminal (M6, 6 mm ²)	Green and yellow

Procedure

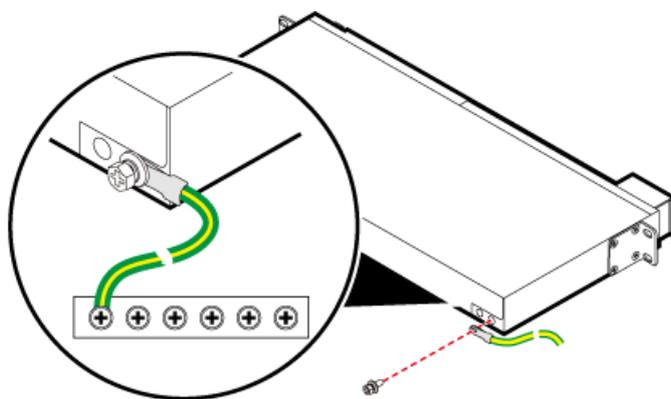
Step 1 Prepare a DCDU-03B PGND cable.

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

Step 2 Install the DCDU-03B PGND cable.

Connect one end of the DCDU-03B PGND cable to the ground terminal on the DCDU-03B, and then connect the other end to an external ground bar, as shown in **Figure 11-14**.

Figure 11-14 Installing a DCDU-03B PGND cable



NOTE

A DCDU-03B PGND cable is required only in the DC power supply scenario.

Step 3 Label the installed cables. For details, see Labeling Power Cables.

---End

11.4.3 Installing Power Cables

When a DBS3900 is deployed indoors with DC power supply, power cables such as a DCDU-03B power cable, BBU power cable, and RRU power cables must be installed.

Installing a DCDU-03B Power Cable

A DCDU-03B power cable feeds power into a DCDU-03B.

Context

Only -48 V DC power can be supplied to a DCDU-03B. [Table 11-3](#) lists the specifications of a DCDU-03B power cable.

Table 11-3 Specifications of a DCDU-03B power cable

Cable		One End	The Other End	Description
-48 V DC DCDU-03B power cable	RTN(+) wire	OT terminal (M6, 16 mm ²)	Depending on the external equipment	Black
	NEG(-) wire	OT terminal (M6, 16 mm ²)	Depending on the external equipment	Blue

 **NOTE**

The colors and structures of cables vary according to countries and areas. If the cables are purchased locally, the colors and structures of the cables may be different.

Procedure

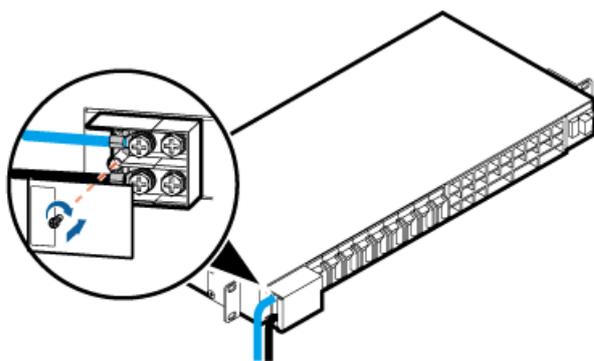
Step 1 Prepare a DCDU-03B power cable.

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

Step 2 Install the DCDU-03B power cable, as shown in [Figure 11-15](#).

1. Link the OT terminals at one end of the DCDU-03B power cable to the wiring terminals labeled NEG(-) and RTN(+) on the DCDU-03B.
2. Link the OT terminals at the other end to external power equipment.

Figure 11-15 Installing a DCDU-03B power cable



Step 3 Route the cable by referring to [11.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 4 Label the installed cables. For details, see Attaching a Cable-Tying Label.

----End

Installing a BBU Power Cable

A BBU power cable feeds power into a BBU.

Context

- In the triple mode scenario, two BBUs are required. A second BBU power cable is installed in the same manner as the first BBU power cable.
- [Table 11-4](#) lists the specifications for a BBU power cable when a DCDU-03B supplies power.

Table 11-4 Specifications of a BBU power cable

Cable		One End	The Other End	Description
BBU power cable	RTN(+) wire	3V3 power connector	OT terminals bent by 90° (M4, 6 mm ²)	Black
	NEG(-) wire		OT terminals bent by 90° (M4, 6 mm ²)	Blue

NOTE

The colors and structures of cables vary according to countries and areas. If the cables are purchased locally, the colors and structures of the cables may be different.

Procedure

Step 1 Add OT terminals to a BBU power cable. For details, see *Assembling the OT Terminal and the Power Cable*.

NOTE

A 3V3 power connector is added to one end of a BBU power cable, and you only need to add OT terminals to the other end onsite.

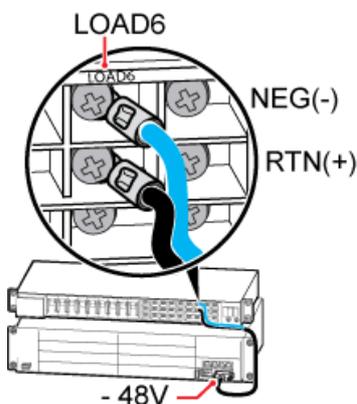
Step 2 Install the BBU power cable, as shown in **Figure 11-16**.

1. Link the 3V3 power connector at one end of the BBU power cable to the -48 V port on the UPEU in the BBU, and then tighten the screw on the connector until the tightening torque reaches 0.25 N·m.
2. Link the OT terminals on the blue and black wires at the other end to the wiring terminals labeled NEG(-) and RTN(+) near the LOAD6 label on the DCDU-03B respectively.

NOTE

A BBU power cable must be connected to each UPEU if two UPEUs are installed in the BBU. The 3V3 power connector at one end of each BBU power cable is connected to the -48V port on each UPEU in the BBU, and the easy power receptacle (pressfit type) connectors at the other end are connected to the LOAD6 and LOAD7 ports on the DCDU-03B, respectively.

Figure 11-16 Installing a BBU power cable



Step 3 Route the cable by referring to **11.4.1 Cabling Requirements**, and then use cable ties to bind the cable.

Step 4 Label the installed cables. For details, see Attaching an L-Shaped Label.

---End

Installing an RRU Power Cable

An RRU power cable feeds power to an RRU from a DCDU-03B when the DCDU-03B is configured.

Context

Table 11-5 lists the specifications of RRU power cables when a DCDU-03B supplies power.

Table 11-5 Specifications of RRU power cables

Cable		One End	The Other End	Remarks
RRU power cable	RTN(+) wire	OT terminals bent by 90° [M4, 3.3 mm ² (12 AWG)]	OT terminal [M4, 3.3 mm ² (12 AWG)]	North American standard Black
	NEG(-) wire	OT terminals bent by 90° [M4, 3.3 mm ² (12 AWG)]	OT terminal [M4, 3.3 mm ² (12 AWG)]	North American standard Blue
	Shield layer	OT terminals bent by 90° [M4]		Heat shrink tubing Black
RRU power cable	RTN(+) wire	OT terminals bent by 90° (M4, 4 mm ²)	OT terminal (M4, 4 mm ²)	European standard Brown
	NEG(-) wire	OT terminals bent by 90° (M4, 4 mm ²)	OT terminal (M4, 4 mm ²)	European standard Blue
	Shield layer	OT terminals bent by 90° [M4]		Heat shrink tubing Black
RRU power cable	RTN(+) wire	OT terminals bent by 90° (M4, 4 mm ²)	Easy power receptacle (pressfit type) connector	
	NEG(-) wire	OT terminals bent by 90° (M4, 4 mm ²)		

 **NOTE**

The colors and structures of cables vary according to countries and areas. If the cables are purchased locally, the colors and structures of the cables may be different.

Procedure

Step 1 Prepare an RRU power cable.

1. Cut the cable to the required length based on the actual cable route.
2. Add OT terminals to the blue, black (or brown) wires and shield layer of the RRU power cable at the DCDU-03B end, as shown in Adding OT Terminals to the DC RRU Power Cable on the DCDU Side.
3. Add OT terminals or an easy power receptacle (pressfit type) connector to the other end of the RRU power cable according to the type of power supply socket on the RRU.
 - Add an OT terminal. For details, see the related RRU Installation Guide.
 - Add an easy power receptacle (pressfit type) connector. For details, see the related RRU Installation Guide.

Step 2 Install the RRU power cable, as shown in [Figure 11-17](#).

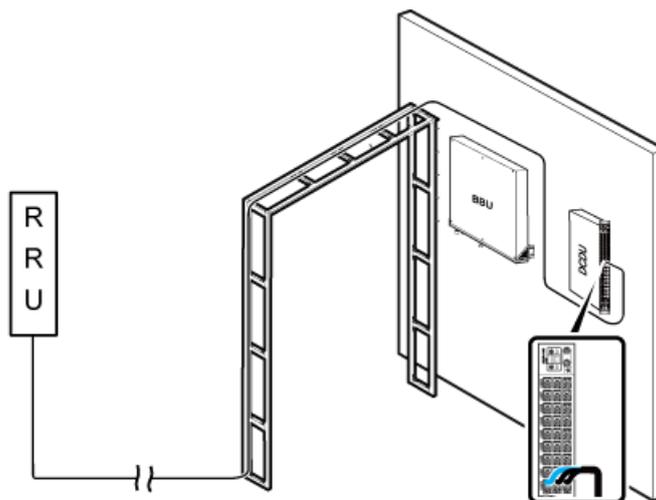
1. Link the OT terminals on the blue, black (or brown) wires and shield layer of the RRU power cable to the wiring terminals labeled NEG(-), RTN(+) and PGND near the LOAD0 label on the DCDU-03B respectively.

 **NOTE**

A DCDU-03B supplies power to a maximum of six RRUs, and an RRU power cable can be connected to any of the wiring terminals labeled LOAD0 to LOAD5 on the DCDU-03B.

2. Connect the blue and black (or brown) wires at the other end to the wiring terminals labeled NEG(-) and RTN(+) in the cabling cavity of the RRU respectively.

Figure 11-17 Installing an RRU power cable



3. Route the cable by referring to [11.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 4 Label the installed cables by referring to Attaching a Sign Plate Label.

----End

11.4.4 Installing Transmission Cables

When a DBS3900 is deployed indoors with DC power supply, transmission cables such as E1/T1 cables, FE/GE cables, and FE/GE optical cables must be installed based on onsite requirements.

Context



Install the transmission cables based on the connections of transmission cables. For details, see the *BBU3900 Hardware Description* Transmission Cable Connections.

Installing an E1/T1 Cable

An E1/T1 cable transmits E1/T1 signals between a BBU and external transmission equipment when a DBS3900 is deployed indoors.

Prerequisite



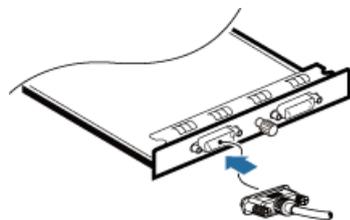
WARNING

Before soldering the connectors to the E1/T1 cable, ensure that both ends of the E1 cable are disconnected from any devices. In addition, all the connectors are soldered to the E1 cable during the same session.

Procedure

Step 1 Link the DB26 male connector of the E1/T1 cable to the port labeled E1/T1 on the UTRP, GTMU, or WMPT, as shown in [Figure 11-18](#).

Figure 11-18



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Step 2 Route the cables by referring to [11.4.1 Cabling Requirements](#), and then use cable ties to bind the cables.

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

----End

Installing a FE/GE Cable

A FE/GE cable transmits baseband signals between a BBU and external transmission equipment when a DBS3900 is deployed indoors.

Procedure

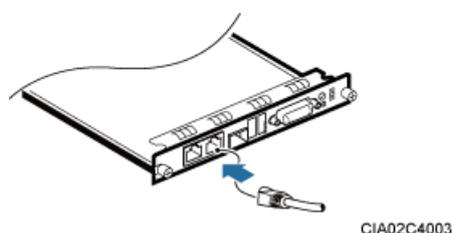
- Step 1** Connect one end of a FE/GE cable to the port labeled FE0 on the GTMU or WMPT in a BBU, as shown in [Figure 11-19](#).



NOTE

You must use a shielded straight-through FE/GE cable.

Figure 11-19 Installing a FE/GE cable



- Step 2** Route the cables by referring to [11.4.1 Cabling Requirements](#), and then use cable ties to bind the cables.
- Step 3** Label the installed cables by referring to [Attaching an L-Shaped Label](#).

----End

Installing a FE/GE Optical Cable

This section describes the procedure and precautions to be taken for installing a FE/GE optical cable.

Context

- The single-mode optical module is labeled "SM" and multi-mode optical module is labeled "MM".
- If the puller of an optical module is blue, the module is a single-mode optical module. If the puller of an optical module is black or grey, the module is a multi-mode optical module.
- The optical module to be installed must have a matching rate with the corresponding CPRI port.



CAUTION

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

 **NOTE**

When an LTE only base station uses FE/GE transmission, FE/GE optical cables are usually used for data transmission. The following description is based on the configuration of an LTE only base station.

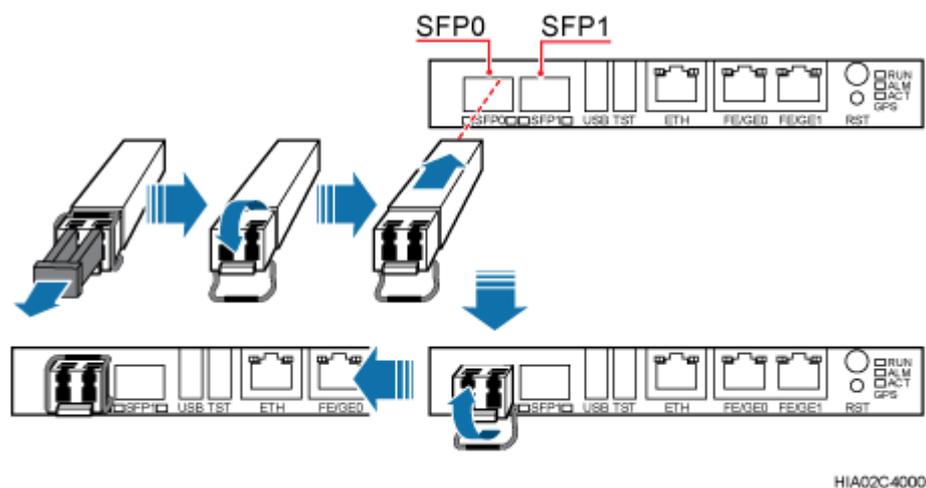
SFP0 and FE/GE0 ports on an LMPT are used for one GE input. Therefore, they cannot be used simultaneously.

SFP1 and FE/GE1 ports on an LMPT are used for another GE input. Therefore, they cannot be used simultaneously.

Procedure

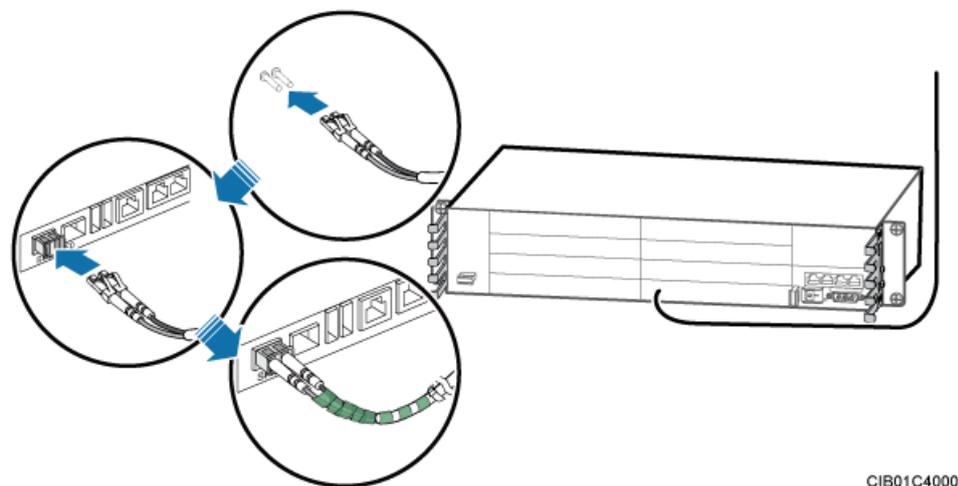
- Step 1** Turn the puller of an optical module outwards, and then insert the optical module into the SFP0 or SFP1 port on the LMPT, as shown in [Figure 11-20](#).

Figure 11-20 Installing an optical module



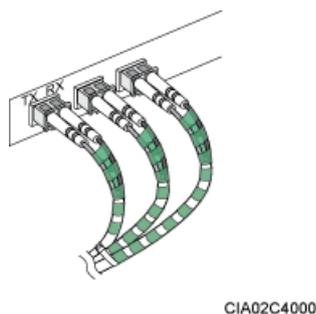
- Step 2** Insert a FE/GE optical cable into the optical module, as shown in [Figure 11-21](#).

Figure 11-21 Installing a FE/GE optical cable



- Step 3** Route the FE/GE optical cable along the cable trough on the right of the cabinet, and then use cable ties to bind the cable.
- Step 4** Route the cable by referring to [11.4.1 Cabling Requirements](#).
- Step 5** Attach labels on the optical cable. For details, see Attaching a Sign Plate Label.
- Step 6** Coil the optical fiber with winding plastic tape at the end connected to the BBU. The tape is coiled between the optical connector and the first cable tie on the cabinet, as shown in [Figure 11-22](#).

Figure 11-22 Coiling the optical fiber with winding plastic tape



----End

11.4.5 (Optional) Installing a Monitoring Signal Cable for the EMUA

A monitoring signal cable for the EMUA transmits monitoring signals from an EMUA to a BBU.

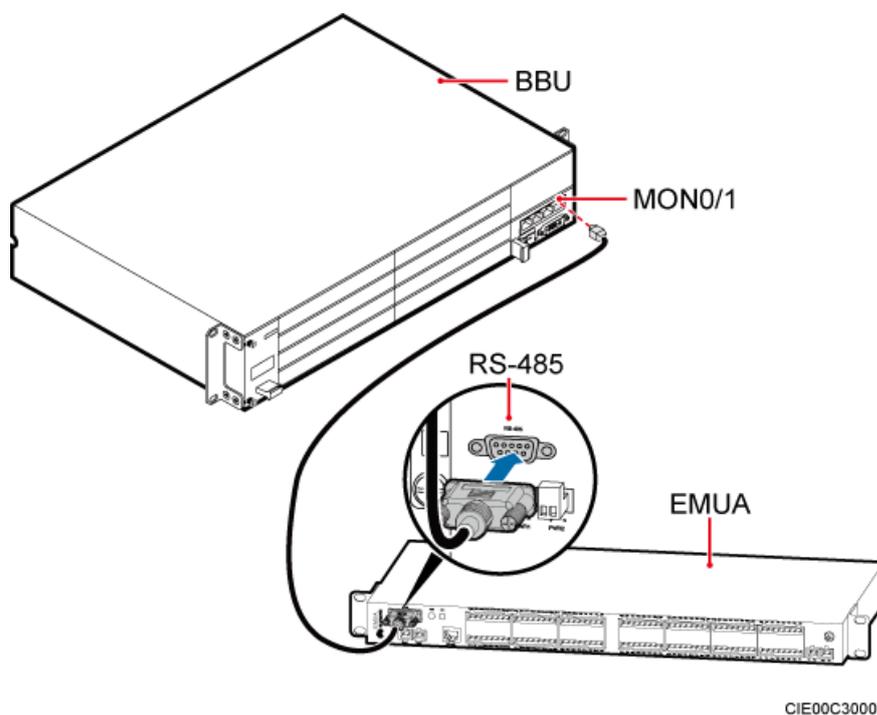
Context

A BBU provides ports for a maximum of four Boolean inputs and four RS485 inputs. If the number of Boolean inputs or RS485 inputs exceeds the specifications, an EMU or EMUA must be configured. For details, see BBU Monitoring Port and Monitoring Schemes of the APM30 or APM30H (Ver.A).

Procedure

- Step 1** Install a monitoring signal cable for the EMUA, as shown in [Figure 11-23](#).
1. Link the RJ45 connector at one end of the monitoring signal cable to the MON0/MON1 port on the UPEU in the BBU.
 2. Link the DB9 male connector at the other end to the EMUA.

Figure 11-23 Installing a monitoring signal cable for the EMUA



Step 2 Route the cable by referring to [11.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 3 Label the installed cables. For details, see Attaching an L-Shaped Label.

---End

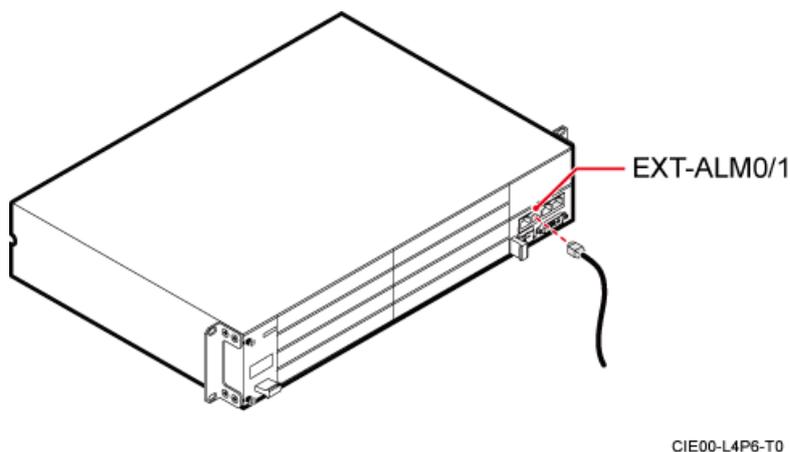
11.4.6 Installing a BBU Alarm Cable

A BBU alarm cable transmits alarm signals from external alarm equipment to a BBU.

Procedure

- Step 1** Install a BBU alarm cable, as shown in [Figure 11-24](#). For details about a BBU alarm cable, see BBU Alarm Cable.
1. Link the RJ45 connector at one end of the BBU alarm cable to the port labeled EXT-ALM0/EXT-ALM1 on the UPEU in the BBU.
 2. Link the RJ45 connector at the other end to external alarm equipment.

Figure 11-24 Installing a BBU alarm cable



Step 2 Route the cable by referring to [11.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 3 Label the installed cables. For details, see Attaching an L-Shaped Label.

---End

11.4.7 Installing a CPRI Optical Cable

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

Context

- The single-mode optical module is labeled "SM" and multi-mode optical module is labeled "MM".
- If the puller of an optical module is blue, the module is a single-mode optical module. If the puller of an optical module is black or grey, the module is a multi-mode optical module.
- The optical module to be installed must have a matching rate with the corresponding CPRI port.



CAUTION

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

Procedure

Step 1 Install an optical module, as shown in [Figure 11-25](#).

1. Turn the puller on the optical module outwards.

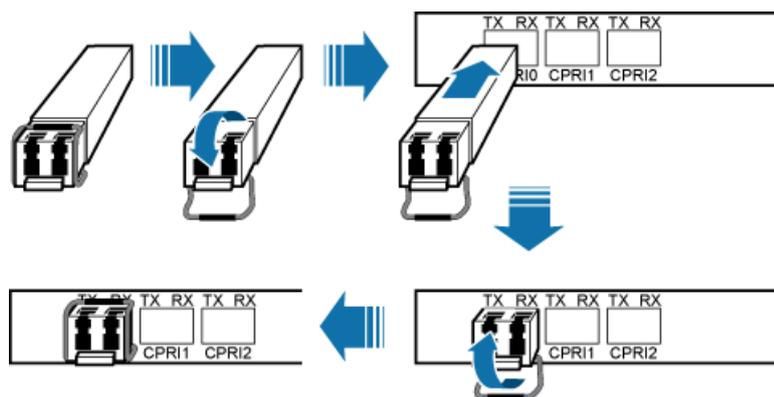
2. Insert the optical module into the CPRI port on the GTMU, WBBPb, WBBPd, or LBBP, and then insert the optical module of the same type⁽¹⁾ into the CPRI_W or CPRI0 port on an RRU.

NOTE

(1) The optical modules with the same label are of the same type.

3. Turn the puller on the optical module inwards.

Figure 11-25 Installing an optical module



Step 2 Install an CPRI optical cable, as shown in [Figure 11-26](#).

NOTE

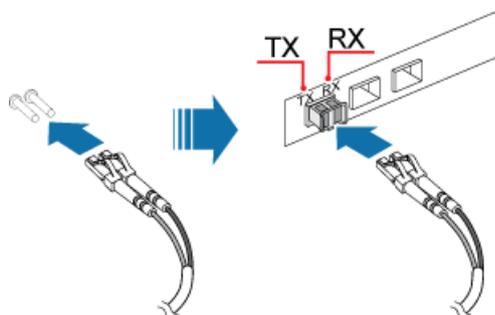
For details about the connections of the CPRI optical cables, see the *BBU3900 Hardware Description* CPRI Cable Connections.

1. Remove the dustproof caps from the connectors of the optical cable.
2. Insert the DLC connectors labeled 2A and 2B at one end of the CPRI optical cable into the optical module on the GTMU, WBBPb, WBBPd, or LBBP, and then insert the DLC connectors labeled 1A and 1B at the other end into the optical module on the RRU.

CAUTION

If both ends of the optical cable are the LC connectors, the TX and RX ports on the BBU are respectively connected to the TX and RX ports on the RRU.

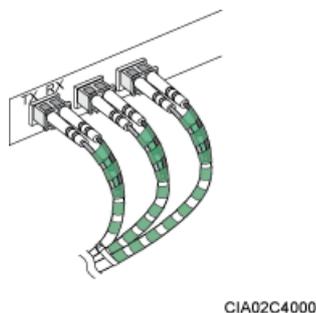
Figure 11-26 Installing a CPRI optical cable



Step 3 Route the CPRI optical cable along the left of the cabinet, and then lead it out of the cabinet from the cable hole on the left of the bottom. For details, see [11.4.1 Cabling Requirements](#).

- Step 4** Attach labels on the optical cable. For details, see Attaching a Sign Plate Label.
- Step 5** Coil the optical fiber with winding plastic tape at the end connected to the BBU. The tape is coiled between the optical connector and the first cable tie on the cabinet, as shown in [Figure 11-27](#).

Figure 11-27 Coiling the optical fiber with winding plastic tape



---End

11.4.8 Installing a GPS Clock Signal Cable

The GPS clock signal cable is an optional cable that transmits GPS clock signals from the GPS antenna system to the BBU. The GPS clock signals serve as the clock reference of the BBU.

Context



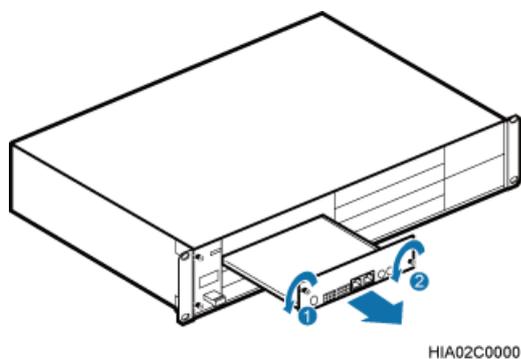
NOTE

Only a dual-satellite receiver needs to be installed onsite.

Procedure

- Step 1** Remove the two M3 screws on the panel, and then pull out the USCU, as shown in [Figure 11-28](#).

Figure 11-28 Removing the USCU.



- Step 2** Install a satellite receiver on the USCU, as shown in [Figure 11-29](#).

1. Remove the three M1.6 screws from the USCU.

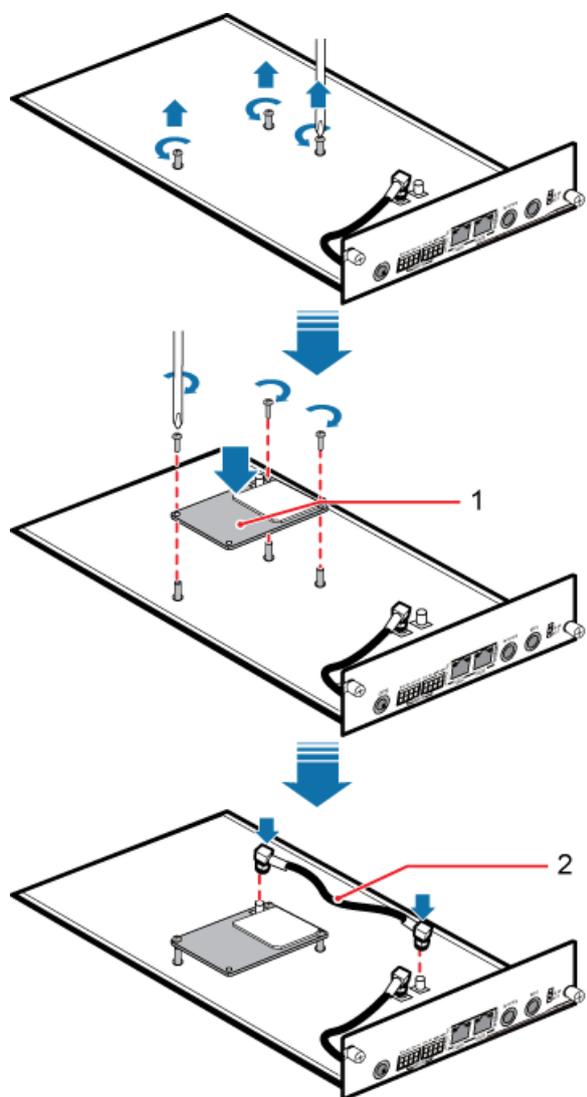
2. Align the mounting holes on the satellite receiver with the bolts on the USCU.
3. Tighten the three M1.6 screws that were removed in [Step 2.1](#) to 0.1 N·m.
4. Connect one end of the RF jumper to the RF port on the satellite receiver and the other end to the GPS port on the USCU.



CAUTION

There are six mounting holes on the satellite receiver. You need to install only three screws on the receiver, as shown in [Figure 11-29](#)

Figure 11-29 Installing the satellite receiver on the USCU



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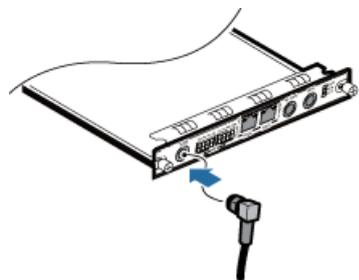
(1) Satellite receiver

(2) RF jumper

Step 3 Install the USCU equipped with the satellite receiver into the BBU, and tighten the screws on the USCU to 0.6 N·m.

Step 4 Connect the GPS clock signal cable to the GPS port on the USCU, as shown in **Figure 11-30**.

Figure 11-30 Installing a GPS Clock Signal cable



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Step 5 Route the cables by referring to **11.4.1 Cabling Requirements**, and then use cable ties to bind the cables.

Step 6 Label the installed cables by referring to Attaching an L-Shaped Label.

---End

11.5 Installation Checklist

Check the installation items, installation environment, and cable-related items after the cabinets and devices are all installed.

Cabinet Installation Checklist

Table 11-6 describes the cabinet installation checklist.

Table 11-6 Cabinet installation checklist

No.	Item
1	The installation position of the cabinet strictly complies with the engineering design.
2	In the wall-mounted scenario, the holes of the mounting ears are well aligned with the holes of the expansion bolt assemblies. In addition, the mounting ears are secured on the wall evenly and steadily.
3	In the metal-pole-mounted scenario, the supports for the metal pole are secure on the floor.
4	If the cabinet is installed on the floor, the base is securely installed.
5	Either the horizontal error or vertical error of the cabinet is less than 3 mm.
6	All the bolts, especially those for electrical connections, are tight. Both the spring washer and the flat washer are installed in the correct sequence.
7	The cabinet is neat and clean.

No.	Item
8	The paint on the surface is intact. If any paint is damaged, you must apply touch-up paint to avoid erosion.
9	Filler panels are installed in the space reserved for customer equipment.
10	The cabinet door can be easily opened or closed, the lock works properly, and the gag lever post is secure.
11	All labels, tags, and nameplates are correct, legible, and complete.

Cabinet Installation Environment Checklist

Table 11-7 describes the cabinet installation environment checklist.

Table 11-7 Cabinet installation environment checklist

No.	Item
1	There are no fingerprints or other smears on the surface of the cabinet.
2	There are no excessive straps or adhesive tape on the cables.
3	No tapes, tails of cable ties, paper, or packing bags are left around the cabinet.
4	All the items around the cabinet are neat, clean, and intact.

Electrical Connection Checklist

Table 11-8 describes the electric connection checklist of the cabinet.

Table 11-8 Electric connection checklist of the cabinet

No.	Item
1	All self-made PGND cables are copper-based with the proper wire diameters. No breaking device such as switch and fuse is allowed for the electric connection of the grounding system. No short circuit is allowed.
2	The PGND cable is securely connected and the AC lead-in cable and cables in the cabinet are correctly connected according to the electrical design of the power system. The screws are tightened. In addition, the inputs or outputs are not short-circuited.
3	The redundant part of the power cable or PGND cable is stripped off rather than coiled.
4	The terminals at both ends of the power cable or PGND cable are securely soldered or crimped.

No.	Item
5	The bare wires and the terminal handles at the wiring terminals are coated with heat-shrinkable tubes.
6	The flat washer and the spring washer are well mounted on all OT terminals.
7	The exterior of the battery is intact without any scratch, dent, or crack.
8	The shell of the battery is clean without any leakage trace.
9	The wiring post on the battery stands properly without any damage, and the post is not covered with any acidic substances.
10	The pressure relief valve of the battery is not transformed, and no liquid leaks.
11	The power cables for the batteries are connected to the positive and negative polarities correctly.
12	The voltage of the battery is normal. <ul style="list-style-type: none"> ● The voltage of a 2 V battery cell ranges from 1.8 V to 2.35 V. ● The voltage of a 12 V battery cell ranges from 10.8 V to 14.1 V. ● The total voltage of the batteries ranges from 43.2 V to 56.4 V.
13	The fans work properly. <ul style="list-style-type: none"> ● The fan in the IBBS200D rotates in a low speed in a normal situation. ● The outer air circulation fan in the IBBS200T stops in a normal situation (with the ambient temperature of lower than 30°C), and the inner air circulation fan rotates in a high speed. ● The outer air circulation fan in the APM30H stops in a normal situation (with the ambient temperature of lower than 35°C), and the inner air circulation fan rotates in a low speed.
14	The MCBs for the batteries are set to OFF.

Cable Installation Checklist

[Table 11-9](#) describes the cable installation checklist.

Table 11-9 Cable installation checklist

No.	Item
1	All cables are connected securely and reliably. Pay special attention to the communication cable connections and cable connections at the bottom of the cabinet.
2	The cables are neatly and tightly bound. The cable ties are evenly spaced and face the same direction.
3	Different types of cable, such as the power cable, ground cable, feeder, optical cable, E1/T1 cable, and FE cable are separately bound.

No.	Item
4	The cable layout facilitates maintenance and future capacity expansion.
5	All the labels at both ends of the cables are legible.
6	The extra length of the indoor cable ties is cut, and the cut surfaces are smooth without sharp edges. The extra length of 3 mm to 5mm of the outdoor cable ties is reserved when the cable ties are cut.
7	The idle port that no cable is connected to is properly protected.
8	The connectors of the RF cables are fixed in position to avoid false connection that may cause an abnormal voltage standing wave ratio (VSWR).

BBU Hardware Installation Checklist

Table 11-10 describes the BBU hardware installation checklist.

Table 11-10 BBU hardware installation checklist

No.	Item
1	All self-made PGND cables are copper-based with the proper wire diameters. No switch, fuse, or similar object is allowed for the electrical connection of the grounding system. No short circuit is allowed. Only one OT terminal of the PGND cable can be connected to each terminal on the ground bar.
2	The redundant part of the power cable or PGND cable is stripped off rather than coiled.
3	The terminals at both ends of the power cable or PGND cable are securely soldered or crimped.
4	The bare wires at the terminals and terminal handles are covered with heat-shrinkable tubes.
5	The flat washer and spring washer are well mounted on all OT terminals, and the OT terminals are intact and contact the wiring terminals properly.
6	All the cables, including those on the bottom of the cabinet, are securely connected.
7	The cables are neatly and tightly bound. The cable ties are evenly spaced and face the same direction.
8	The power cable, PGND cable, feeder, optical cable, and the E1/T1/FE cable are bound separately with spacing of more than 30 mm.
9	The cable layout facilitates maintenance and future capacity expansion, and the bending radius of the cable meets the requirements.
10	Legible labels are attached to both ends of all cables.

No.	Item
11	The extra length of the indoor cable ties is cut, and the cut surfaces are smooth without sharp edges. The extra length of 3 mm to 5 mm of the outdoor cable ties is reserved when the cable ties are cut.
12	The unused ports are properly protected.

11.6 Power-On Check

Before a DBS3900 starts operating, you must check the power-on status of the cabinet and components in it.



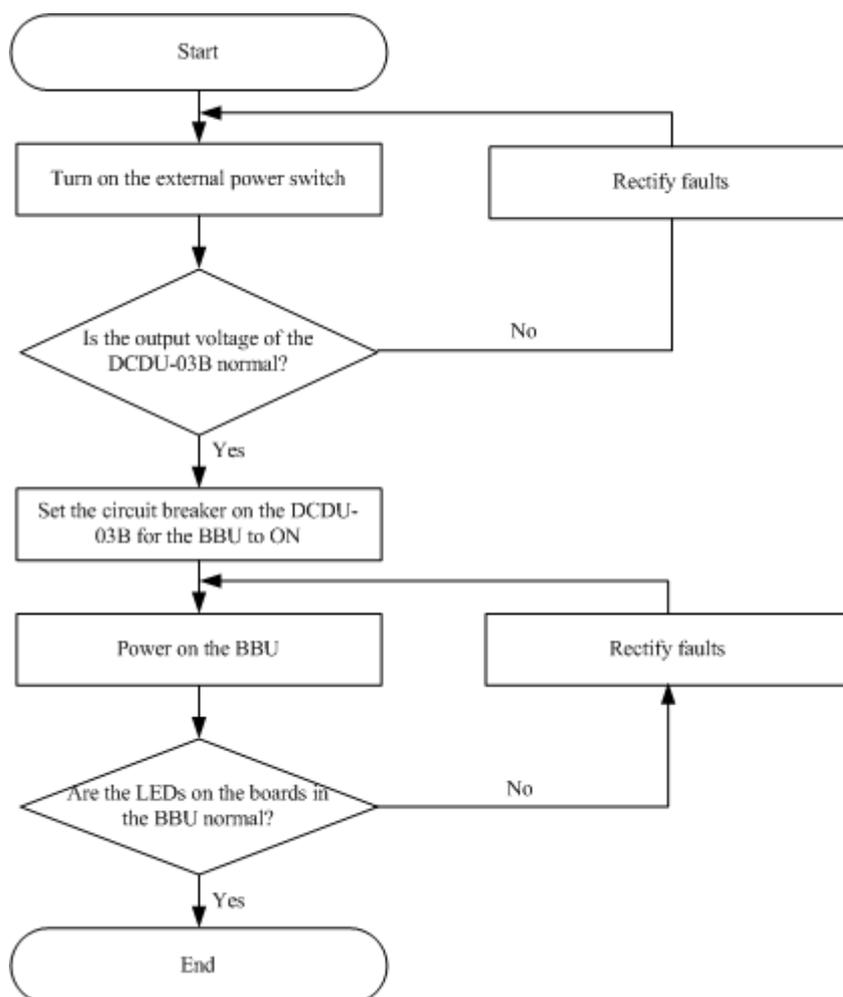
CAUTION

The DBS3900 must be powered on within seven days after it is unpacked, and the period for which the DBS3900 remains powered-off during maintenance must not exceed 48 hours.

Power-On Check in the AC Power Supply Scenario

Figure 11-31 shows the power-on check when a DBS3900 is deployed in the DC power supply scenario.

Figure 11-31 Power-on check in the DC power supply scenario



LED Status and Output Voltage Check

- The DC output voltage of a DCDU-03B ranges from -43.2 V DC to -57 V DC.
- The normal status of the LEDs on a GTMU, WMPT, WBBP, LMPT, LBBP, and UTRP is as follows:
 - RUN LED: on for 1s and off for 1s
 - ALM LED: off
 - ACT LED: on
- RUN LED on the UPEU: on
- STATE LED on the FAN unit: blinking green slowly (on for 1s and off for 1s)

12 Indoor Scenario with DC Power Supply (BBU Installed in a 19-Inch Rack)

About This Chapter

This chapter describes the procedures for installing all the components and related cables in a 19-inch rack indoors.

[12.1 Installation Clearance Requirements for a BBU](#)

This section describes the installation clearance requirements for a BBU when it is installed in a 19-inch rack in an indoor scenario with DC power supply.

[12.2 Installation Process](#)

In an indoor 19-inch-rack-mounted scenario, you must install components and related cables in a 19-inch rack.

[12.3 Installing Components in a 19-Inch Rack](#)

A BBU and DCDU-03B can be installed in a 19-inch rack. In addition, a WCDMA GPS Receiving Unit (WGRU) can also be installed in the rack based on actual requirements.

[12.4 Installing Cables](#)

This section describes the procedures and precautions to be taken for installing PGND cables, power cables, transmission cables, monitoring signal cables or alarm cables, and CPRI cables when a DBS3900 is deployed in a 19-inch rack.

[12.5 Installation Checklist](#)

Check the installation items, installation environment, and cable-related items after the cabinets and devices are all installed.

[12.6 Power-On Check](#)

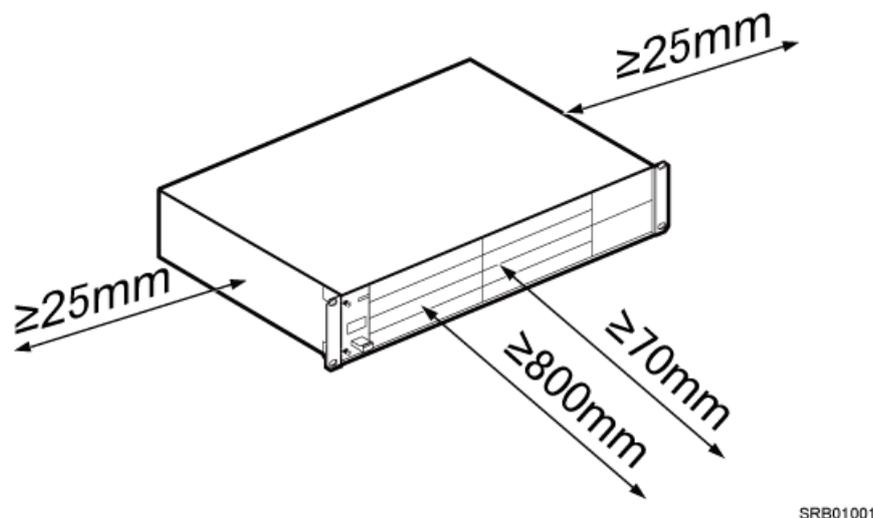
Before a DBS3900 starts operating, you must check the power-on status of the cabinet and components in it.

12.1 Installation Clearance Requirements for a BBU

This section describes the installation clearance requirements for a BBU when it is installed in a 19-inch rack in an indoor scenario with DC power supply.

Figure 12-1 shows the installation clearance requirements for a BBU installed in a 19-inch rack.

Figure 12-1 Installation clearance requirements for a BBU installed in a 19-inch rack



NOTE

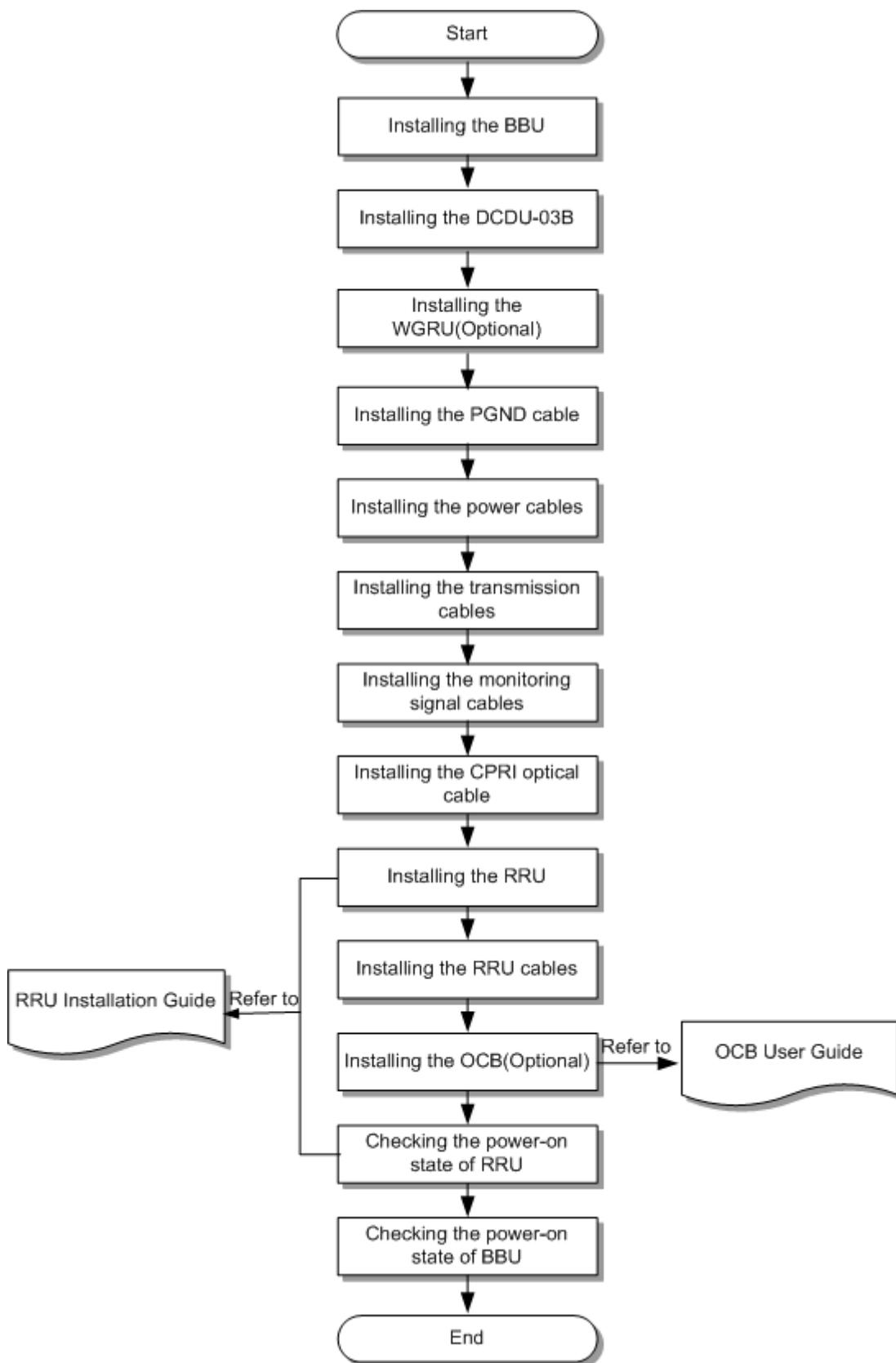
- 25 mm on the left of the BBU is reserved for ventilation.
- 25 mm on the right of the BBU is reserved for ventilation.
- 70 mm in front of the BBU is reserved for cabling, and 800 mm in front of the BBU is reserved for maintenance.

12.2 Installation Process

In an indoor 19-inch-rack-mounted scenario, you must install components and related cables in a 19-inch rack.

Figure 12-2 shows the installation process.

Figure 12-2 Installation process



 NOTE

- The procedure for installing an RRU is not described in this document. For details about how to install an RRU, see the associated RRU installation guide according to the RRU model.
- The Outdoor Cable Conversion Box (OCB) is an optional component, which is used to connect cables with different cross-sectional areas. For details about an OCB, see the *OCB User Guide*.

12.3 Installing Components in a 19-Inch Rack

A BBU and DCDU-03B can be installed in a 19-inch rack. In addition, a WCDMA GPS Receiving Unit (WGRU) can also be installed in the rack based on actual requirements.

12.3.1 Installing a BBU

This section describes the procedure and precautions to be taken for installing a BBU in an APM30H, TMC11H, or 19-inch rack. A BBU occupies a space of 19 inch wide and 2 U high.

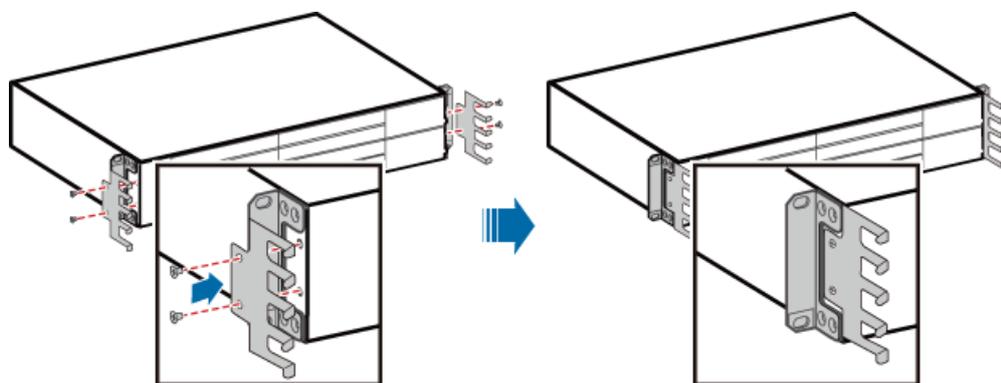
Context

In the triple mode scenario, two BBUs are required. A second BBU is installed in the same manner as the first BBU.

Procedure

- Step 1** Align mounting holes on the cable holders with mounting holes on both sides of a BBU, and then use four M4 screws to secure the cable holes until the tightening torque reaches 1.2 N·m, as shown in [Figure 12-3](#).

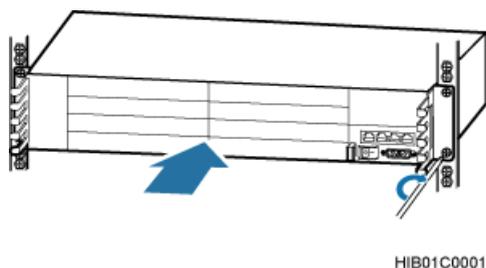
Figure 12-3 Installing cable holders on a BBU



HIB01C0000

- Step 2** Wear ESD gloves or ESD wrist strap, and then slide the BBU into the cabinet along the guide rails using both hands.
- Step 3** Tighten four M6x16 screws on the panel until the tightening torque reaches 3 N·m, as shown in [Figure 12-4](#).

Figure 12-4 Installing a BBU



---End

12.3.2 Installing a DCDU-03B

This section describes the procedure for installing a DCDU-03B in a 19-inch rack.

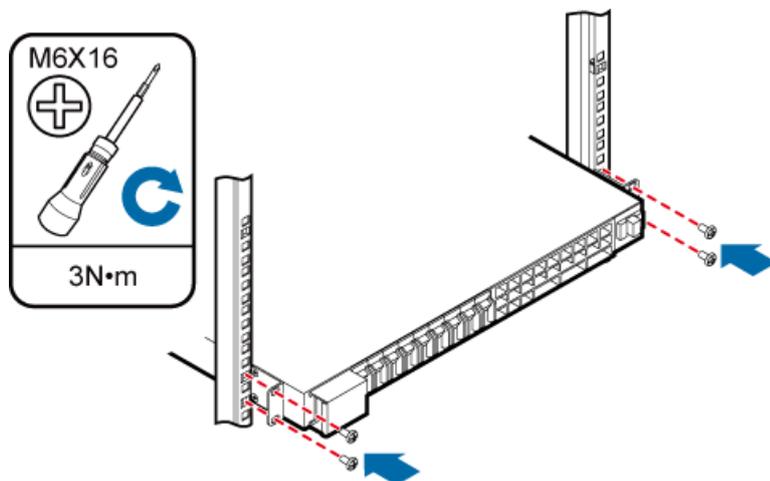
Context

When a WGRU is configured, the WGRU is installed in the 1 U space above the BBU, and a DCDU-03B is installed in the 1 U space above the WGRU.

Procedure

- Step 1** Slide a DCDU-03B along the guide rails into the cabinet, and then tighten four M6x16 screws on the panel until the tightening torque reaches 3 N·m, as shown in [Figure 12-5](#).

Figure 12-5 Installing a DCDU-03B



---End

12.3.3 (Optional) Installing a WGRU

This section describes the procedure and precautions to be taken for installing a WGRU and related cables in a 19-inch rack.

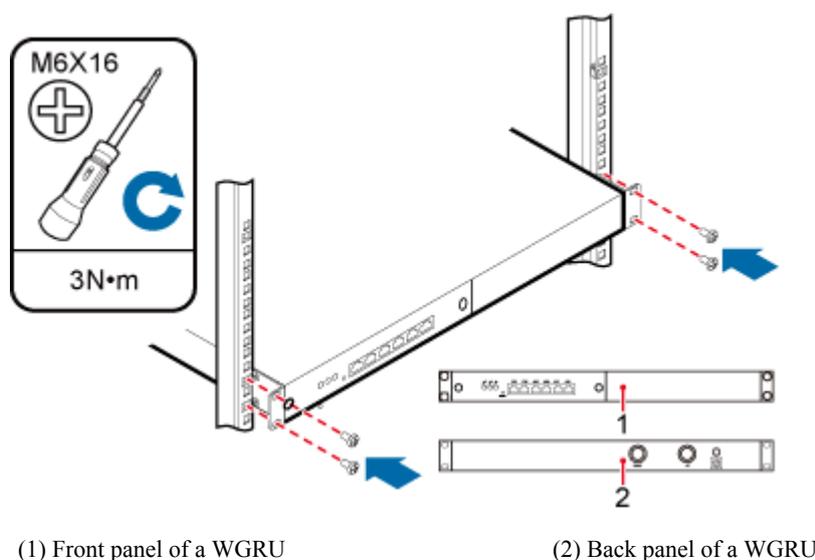
Context

The WGRU is optional, which provides the location function for a base station. For details, see WGRU.

Procedure

- Step 1** Slide a WGRU along the guide rails into a rack, and then tighten four M6x16 screws on the panel until the tightening torque reaches 3 N·m, as shown in [Figure 12-6](#).

Figure 12-6 Installing a WGRU

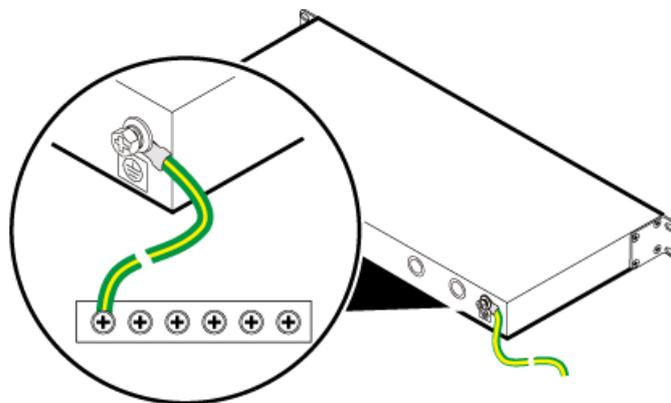


NOTE

- A minimum of 25 mm space on the left and right of a WGRU must be provided for ventilation.
- A minimum of 70 mm and 800 mm space must be respectively provided in the front and at the back of the WGRU for cabling or maintenance.

- Step 2** Install a WGRU PGND cable.
1. Cut the cable to the required length based on the actual cable route.
 2. Add an OT terminal to each end of the cable. For details, see [Assembling the OT Terminal and the Power Cable](#).
 3. Link the OT terminal at one end of the WGRU PGND cable to the ground bolt on the back panel of the WGRU, and then link the OT terminal at the other end to external ground bar, as shown in [Figure 12-7](#).

Figure 12-7 Installing a WGRU PGND cable



 **NOTE**

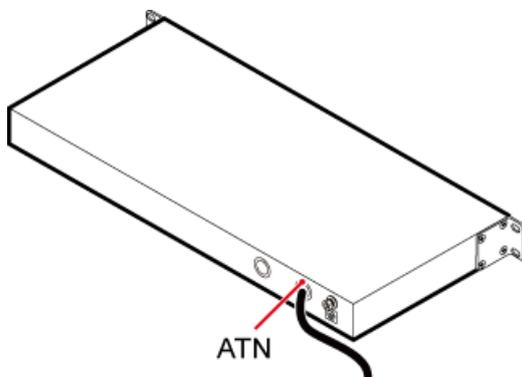
The WGRU PGND cable is connected to the closest ground bar.

4. Route the cable by referring to [12.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 3 Install a GPS clock signal cable.

1. Link the N-type female connector at one end of the GPS clock signal cable to the ATN port on the back panel of the WGRU, and then link the SMA male connector at the other end to the GPS antenna, as shown in [Figure 12-8](#).

Figure 12-8 Installing a GPS clock signal cable



2. Route the GPS clock signal cable upwards along the column of the cabinet, and then use cable ties to bind the cable securely. For details, see [12.4.1 Cabling Requirements](#).

Step 4 Install a WGRU power cable.

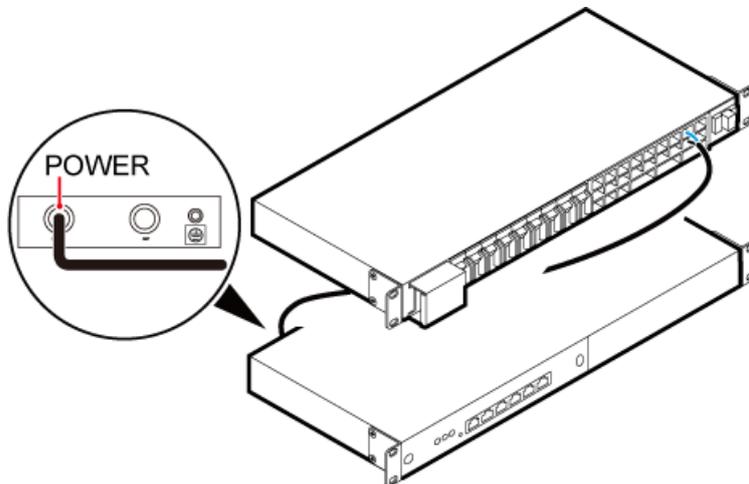
 **NOTE**

A 2-hole male connector is added to one end of a WGRU power cable, and you only need to add an OT terminal at the other end.

1. Cut the cable to the required length based on the actual cable route.
2. Add an OT terminal to one end of the cable. For details, see [Assembling the OT Terminal and the Power Cable](#).

3. Link the 2-hole male connector at one end of the WGRU power cable to the POWER port on the back panel of the WGRU, and then link the OT terminal at the other end to the LOAD7 or LOAD8 terminal on the DCDU-03B, as shown in [Figure 12-9](#).

Figure 12-9 Installing a WGRU power cable



4. Route the power cable along the right of the DCDU-03B to the back of the WGRU to avoid blocking the front panels of the DCDU-03B and WGRU, and then use cable ties to bind the cable securely. For details, see [12.4.1 Cabling Requirements](#).

Step 5 Install a PPS signal cable and GPS signal cable, as shown in [Figure 12-10](#).

NOTE

A GPS signal cable transmits GPS signals over the COM1 port, and a PPS signal cable transmits PPS signals over the PPS1 port.

The PPS signal cable or GPS signal cable has an RJ-45 connector at each end before delivery. Before cable connection, you must cut the RJ-45 connector at one end of each cable to expose the bare wire terminal.

1. Link the RJ-45 connector at one end of the PPS signal cable to the PPS1 port on the front panel of the WGRU, and then link the bare wire terminal at the other end to the RGPS port on the USCU in the BBU. [Table 12-1](#) lists the pin assignment for the bare wires.
2. Link the bare wire terminal at one end of the GPS signal cable to the COM1 port on the front panel of the WGRU, and then link the RJ-45 connector at the other end to the RGPS port on the USCU in the BBU. [Table 12-1](#) lists the pin assignment for the bare wires.

Figure 12-10 Installing a PPS signal cable and GPS signal cable

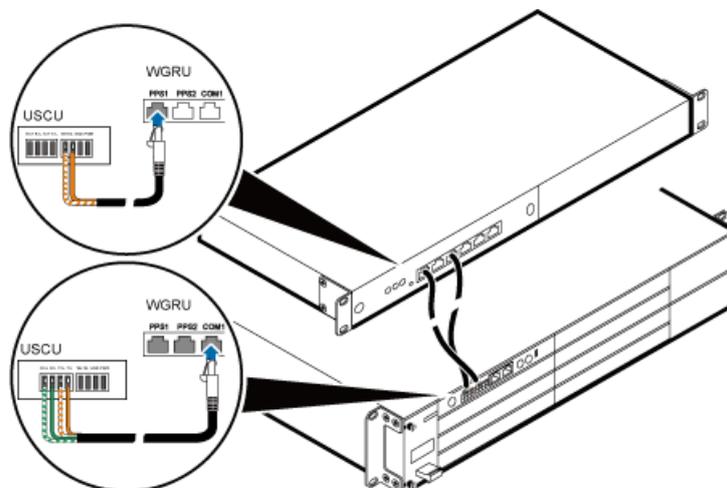


Table 12-1 Pin assignment for the wires of a PPS signal cable and GPS signal cable

Port	Pin Assignment	Port	Silkscreen	Color
WGRU-PPS1	Pin 1-CLK1_PPS_TXD+	USCU-RGPS	1S+	White and orange
WGRU-PPS1	Pin 2-CLK1_PPS_TXD-	USCU-RGPS	1S-	Orange
WGRU-COM1	Pin 1-COM1_COM_RXD+	USCU-RGPS	TX+	White and orange
WGRU-COM1	Pin 2-COM1_COM_RXD-	USCU-RGPS	TX-	Orange
WGRU-COM1	Pin 3-COM1_COM_TXD+	USCU-RGPS	RX+	White and green
WGRU-COM1	Pin 6-COM1_COM_TXD-	USCU-RGPS	RX-	Green

- Route and bind the cables. For details, see [12.4.1 Cabling Requirements](#).

Step 6 Label the installed cables. For details, see Attaching an L-Shaped Label.

---End

12.4 Installing Cables

This section describes the procedures and precautions to be taken for installing PGND cables, power cables, transmission cables, monitoring signal cables or alarm cables, and CPRI cables when a DBS3900 is deployed in a 19-inch rack.

12.4.1 Cabling Requirements

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



NOTE

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

General Cabling Requirements

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

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

The cables must be bound as follows:

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

The cables must be routed as follows:

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

Special Cabling Requirements

Cabling requirements for power cables are as follows:

- -48 V power cables must be bound together.

- +24 V power cables must be bound together.
- Power cables, transmission cables, and signal cables are routed separately.
- Multiple power cables must be bound when routed.
- Power cables must be installed in the position specified in engineering design documents.
- If the length of power cables is insufficient, replace the cables rather than adding connectors or soldering joints to lengthen the cables.

Cabling requirements for PGND cables are as follows:

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

Cabling requirements for E1 cables are as follows:

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

Cabling requirements for fiber optic cables are as follows:

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

12.4.2 Installing a DCDU-03B PGND Cable

A DCDU-03B PGND cable ensures the proper grounding of a DCDU-03B.

Context

[Table 12-2](#) lists the specifications of a DCDU-03B PGND cable.

Table 12-2 Specifications of a DCDU-03B PGND cable

Cable	One End	The Other End	Description
DCDU-03B PGND cable	OT terminal (M4, 6 mm ²)	OT terminal (M4, 6 mm ²)	Green and yellow

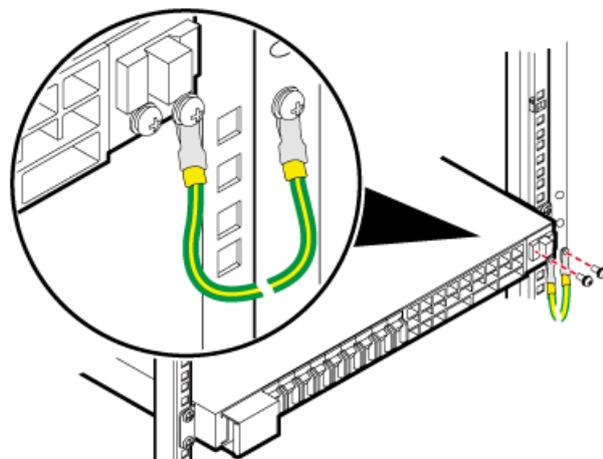
Procedure

Step 1 Prepare a DCDU-03B PGND cable.

1. Cut the cable to the required length based on the actual cable route.
2. Add an OT terminal to each end of the cable. For details, see *Assembling the OT Terminal and the Power Cable*.

Step 2 Install the DCDU-03B PGND cable.

Connect one end of the DCDU-03B PGND cable to the ground terminal on the DCDU-03B, and then connect the other end to the ground screw on the 19-inch rack, as shown in [Figure 12-11](#).

Figure 12-11 Installing a DCDU-03B PGND cable

Step 3 Label the installed cables. For details, see *Labeling Power Cables*.

----End

12.4.3 Installing Power Cables

When a DBS3900 is deployed indoors with DC power supply, power cables such as a DCDU-03B power cable, BBU power cable, and RRU power cables must be installed.

Installing a DCDU-03B Power Cable

A DCDU-03B power cable feeds power into a DCDU-03B.

Context

Only -48 V DC power can be supplied to a DCDU-03B. [Table 12-3](#) lists the specifications of a DCDU-03B power cable.

Table 12-3 Specifications of a DCDU-03B power cable

Cable		One End	The Other End	Description
-48 V DC DCDU-03B power cable	RTN(+) wire	OT terminal (M6, 16 mm ²)	Depending on the external equipment	Black
	NEG(-) wire	OT terminal (M6, 16 mm ²)	Depending on the external equipment	Blue

 **NOTE**

The colors and structures of cables vary according to countries and areas. If the cables are purchased locally, the colors and structures of the cables may be different.

Procedure

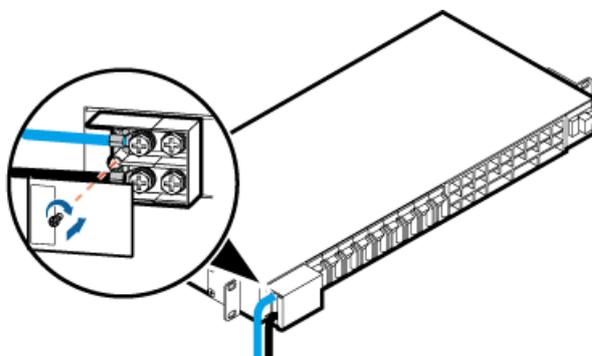
Step 1 Prepare a DCDU-03B power cable.

1. Cut the cable to the required length based on the actual cable route.
2. Add an OT terminal to each end of the cable. For details, see [Assembling the OT Terminal and the Power Cable](#).

Step 2 Install the DCDU-03B power cable, as shown in [Figure 12-12](#).

1. Link the OT terminals at one end of the DCDU-03B power cable to the wiring terminals labeled NEG(-) and RTN(+) on the DCDU-03B.
2. Link the OT terminals at the other end to external power equipment.

Figure 12-12 Installing a DCDU-03B power cable



Step 3 Route the cable by referring to [12.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 4 Label the installed cables. For details, see [Attaching a Cable-Tying Label](#).

---End

Installing a BBU Power Cable

A BBU power cable feeds power into a BBU.

Context

- In the triple mode scenario, two BBUs are required. A second BBU power cable is installed in the same manner as the first BBU power cable.
- [Table 12-4](#) lists the specifications for a BBU power cable when a DCDU-03B supplies power.

Table 12-4 Specifications of a BBU power cable

Cable		One End	The Other End	Description
BBU power cable	RTN(+) wire	3V3 power connector	OT terminals bent by 90° (M4, 6 mm ²)	Black
	NEG(-) wire		OT terminals bent by 90° (M4, 6 mm ²)	Blue

NOTE

The colors and structures of cables vary according to countries and areas. If the cables are purchased locally, the colors and structures of the cables may be different.

Procedure

Step 1 Add OT terminals to a BBU power cable. For details, see [Assembling the OT Terminal and the Power Cable](#).

NOTE

A 3V3 power connector is added to one end of a BBU power cable, and you only need to add OT terminals to the other end onsite.

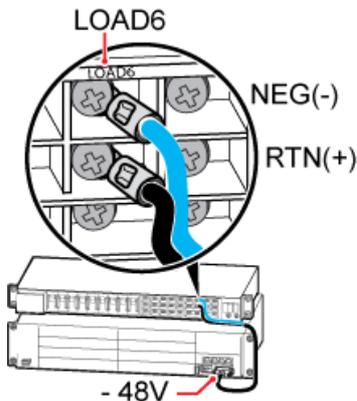
Step 2 Install the BBU power cable, as shown in [Figure 12-13](#).

1. Link the 3V3 power connector at one end of the BBU power cable to the -48 V port on the UPEU in the BBU, and then tighten the screw on the connector until the tightening torque reaches 0.25 N·m.
2. Link the OT terminals on the blue and black wires at the other end to the wiring terminals labeled NEG(-) and RTN(+) near the LOAD6 label on the DCDU-03B respectively.

NOTE

A BBU power cable must be connected to each UPEU if two UPEUs are installed in the BBU. The 3V3 power connector at one end of each BBU power cable is connected to the -48V port on each UPEU in the BBU, and the easy power receptacle (pressfit type) connectors at the other end are connected to the LOAD6 and LOAD7 ports on the DCDU-03B, respectively.

Figure 12-13 Installing a BBU power cable



Step 3 Route the cable by referring to [12.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 4 Label the installed cables. For details, see Attaching an L-Shaped Label.

---End

Installing an RRU Power Cable

An RRU power cable feeds power to an RRU from a DCDU-03B when the DCDU-03B is configured.

Context

[Table 12-5](#) lists the specifications of RRU power cables when a DCDU-03B supplies power.

Table 12-5 Specifications of RRU power cables

Cable		One End	The Other End	Remarks
RRU power cable	RTN(+) wire	OT terminals bent by 90° [M4, 3.3 mm ² (12 AWG)]	OT terminal [M4, 3.3 mm ² (12 AWG)]	North American standard Black
	NEG(-) wire	OT terminals bent by 90° [M4, 3.3 mm ² (12 AWG)]	OT terminal [M4, 3.3 mm ² (12 AWG)]	North American standard Blue

Cable		One End	The Other End	Remarks
	Shield layer	OT terminals bent by 90° [M4]		Heat shrink tubing Black
RRU power cable	RTN(+) wire	OT terminals bent by 90° (M4, 4 mm ²)	OT terminal (M4, 4 mm ²)	European standard Brown
	NEG(-) wire	OT terminals bent by 90° (M4, 4 mm ²)	OT terminal (M4, 4 mm ²)	European standard Blue
	Shield layer	OT terminals bent by 90° [M4]		Heat shrink tubing Black
RRU power cable	RTN(+) wire	OT terminals bent by 90° (M4, 4 mm ²)	Easy power receptacle (pressfit type) connector	
	NEG(-) wire	OT terminals bent by 90° (M4, 4 mm ²)		

 **NOTE**

The colors and structures of cables vary according to countries and areas. If the cables are purchased locally, the colors and structures of the cables may be different.

Procedure

Step 1 Prepare an RRU power cable.

- Cut the cable to the required length based on the actual cable route.
- Add OT terminals to the blue, black (or brown) wires and shield layer of the RRU power cable at the DCDU-03B end, as shown in Adding OT Terminals to the DC RRU Power Cable on the DCDU Side.
- Add OT terminals or an easy power receptacle (pressfit type) connector to the other end of the RRU power cable according to the type of power supply socket on the RRU.
 - Add an OT terminal. For details, see the related RRU Installation Guide.
 - Add an easy power receptacle (pressfit type) connector. For details, see the related RRU Installation Guide.

Step 2 Install the RRU power cable, as shown in [Figure 11-17](#).

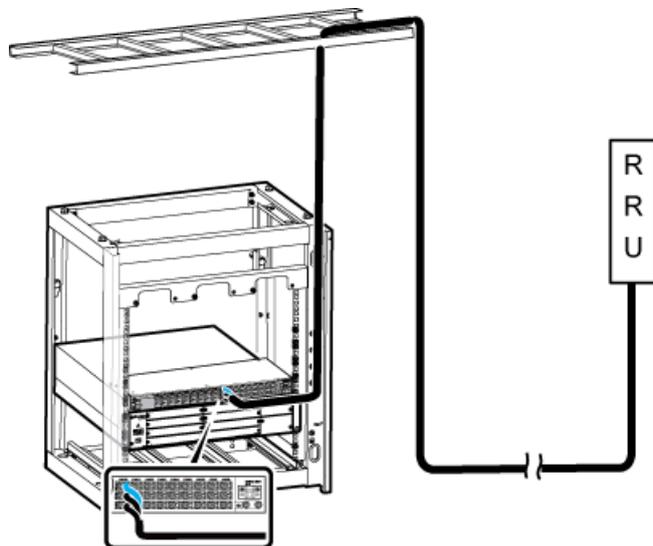
- Link the OT terminals on the blue, black (or brown) wires and shield layer of the RRU power cable to the wiring terminals labeled NEG(-), RTN(+) and PGND near the LOAD0 label on the DCDU-03B respectively.

 **NOTE**

A DCDU-03B supplies power to a maximum of six RRUs, and an RRU power cable can be connected to any of the wiring terminals labeled LOAD0 to LOAD5 on the DCDU-03B.

2. Connect the blue and black (or brown) wires at the other end to the wiring terminals labeled NEG(-) and RTN(+) in the cabling cavity of the RRU respectively.

Figure 12-14 Installing an RRU power cable



Step 3 Route the cable by referring to [12.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 4 Label the installed cables by referring to Attaching a Sign Plate Label.

----End

12.4.4 Installing Transmission Cables

When a DBS3900 is deployed indoors with DC power supply, transmission cables such as E1/T1 cables, FE/GE cables, and FE/GE optical cables must be installed based on onsite requirements.

Context

 **NOTE**

Install the transmission cables based on the connections of transmission cables. For details, see the *BBU3900 Hardware Description* Transmission Cable Connections.

Installing an E1/T1 Cable

An E1/T1 cable transmits E1/T1 signals between a BBU and external transmission equipment when a DBS3900 is deployed indoors.

Prerequisite



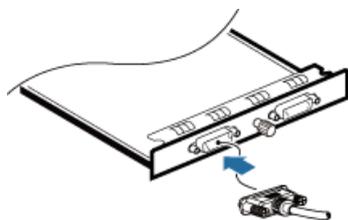
WARNING

Before soldering the connectors to the E1/T1 cable, ensure that both ends of the E1 cable are disconnected from any devices. In addition, all the connectors are soldered to the E1 cable during the same session.

Procedure

- Step 1** Link the DB26 male connector of the E1/T1 cable to the port labeled E1/T1 on the UTRP, GTMU, or WMPT, as shown in [Figure 12-15](#).

Figure 12-15



CIA02C4001

- Step 2** Route the cables by referring to [12.4.1 Cabling Requirements](#), and then use cable ties to bind the cables.
- Step 3** Label the installed cables by referring to Attaching an L-Shaped Label.

----End

Installing a FE/GE Cable

A FE/GE cable transmits baseband signals between a BBU and external transmission equipment when a DBS3900 is deployed indoors.

Procedure

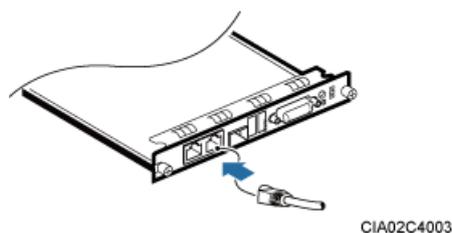
- Step 1** Connect one end of a FE/GE cable to the port labeled FE0 on the GTMU or WMPT in a BBU, as shown in [Figure 12-16](#).



NOTE

You must use a shielded straight-through FE/GE cable.

Figure 12-16 Installing a FE/GE cable



Step 2 Route the cables by referring to [12.4.1 Cabling Requirements](#), and then use cable ties to bind the cables.

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

---End

Installing a FE/GE Optical Cable

This section describes the procedure and precautions to be taken for installing a FE/GE optical cable.

Context

- The single-mode optical module is labeled "SM" and multi-mode optical module is labeled "MM".
- If the puller of an optical module is blue, the module is a single-mode optical module. If the puller of an optical module is black or grey, the module is a multi-mode optical module.
- The optical module to be installed must have a matching rate with the corresponding CPRI port.



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.

NOTE

When an LTE only base station uses FE/GE transmission, FE/GE optical cables are usually used for data transmission. The following description is based on the configuration of an LTE only base station.

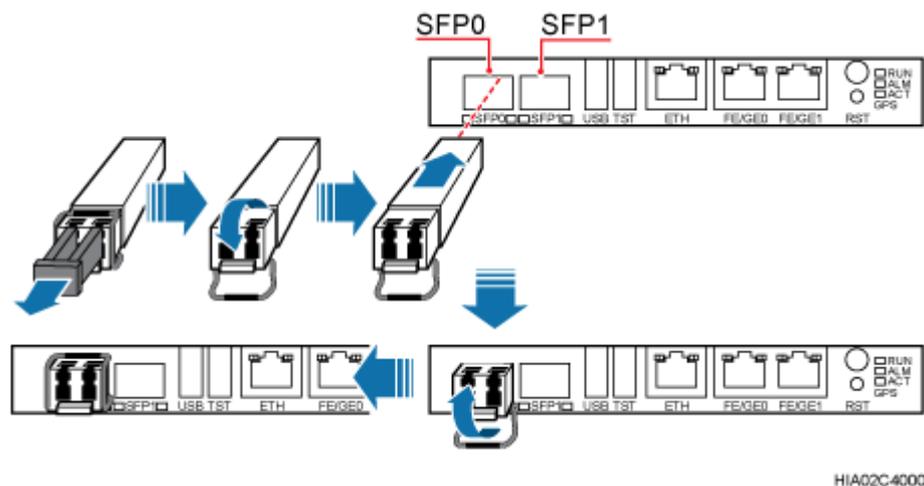
SFP0 and FE/GE0 ports on an LMPT are used for one GE input. Therefore, they cannot be used simultaneously.

SFP1 and FE/GE1 ports on an LMPT are used for another GE input. Therefore, they cannot be used simultaneously.

Procedure

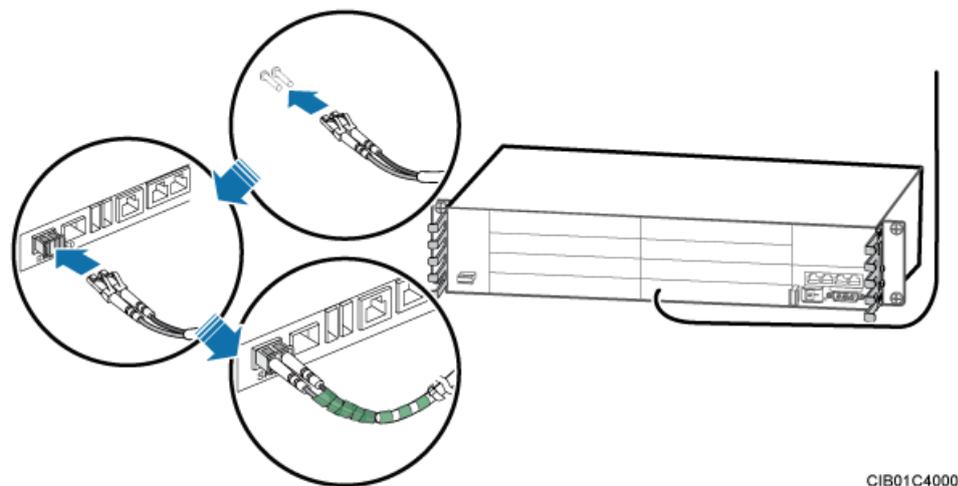
Step 1 Turn the puller of an optical module outwards, and then insert the optical module into the SFP0 or SFP1 port on the LMPT, as shown in [Figure 12-17](#).

Figure 12-17 Installing an optical module



Step 2 Insert a FE/GE optical cable into the optical module, as shown in [Figure 12-18](#).

Figure 12-18 Installing a FE/GE optical cable



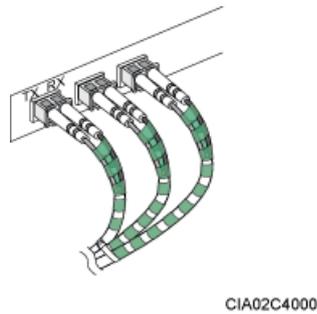
Step 3 Route the FE/GE optical cable along the cable trough on the right of the cabinet, and then use cable ties to bind the cable.

Step 4 Route the cable by referring to [12.4.1 Cabling Requirements](#).

Step 5 Attach labels on the optical cable. For details, see Attaching a Sign Plate Label.

Step 6 Coil the optical fiber with winding plastic tape at the end connected to the BBU. The tape is coiled between the optical connector and the first cable tie on the cabinet, as shown in [Figure 12-19](#).

Figure 12-19 Coiling the optical fiber with winding plastic tape



----End

12.4.5 (Optional) Installing a Monitoring Signal Cable for the EMUA

A monitoring signal cable for the EMUA transmits monitoring signals from an EMUA to a BBU.

Context

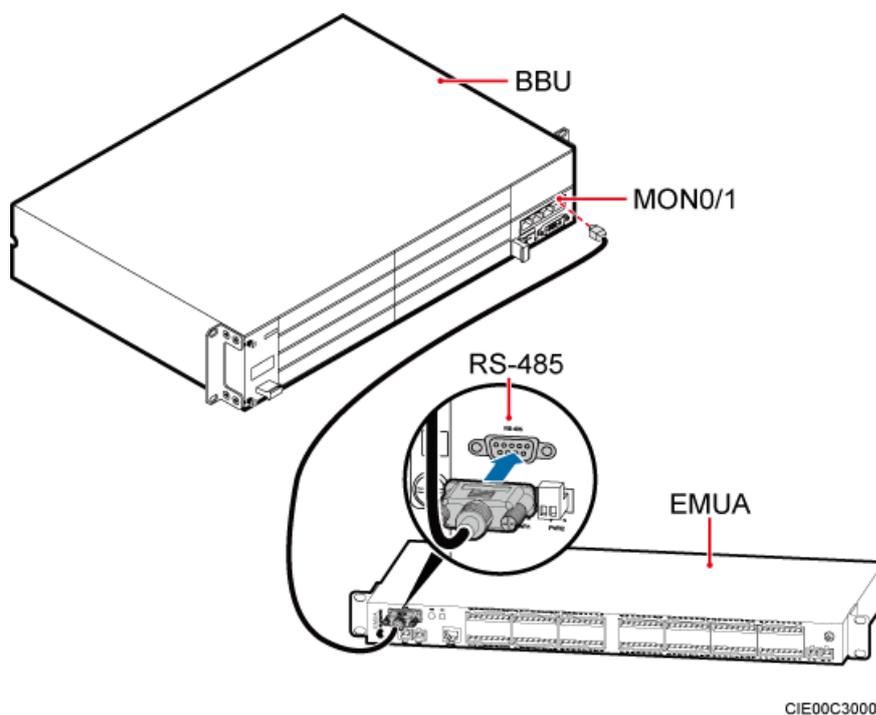
A BBU provides ports for a maximum of four Boolean inputs and four RS485 inputs. If the number of Boolean inputs or RS485 inputs exceeds the specifications, an EMU or EMUA must be configured. For details, see BBU Monitoring Port and Monitoring Schemes of the APM30 or APM30H (Ver.A).

Procedure

Step 1 Install a monitoring signal cable for the EMUA, as shown in [Figure 12-20](#).

1. Link the RJ45 connector at one end of the monitoring signal cable to the MON0/MON1 port on the UPEU in the BBU.
2. Link the DB9 male connector at the other end to the EMUA.

Figure 12-20 Installing a monitoring signal cable for the EMUA



Step 2 Route the cable by referring to [12.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 3 Label the installed cables. For details, see Attaching an L-Shaped Label.

---End

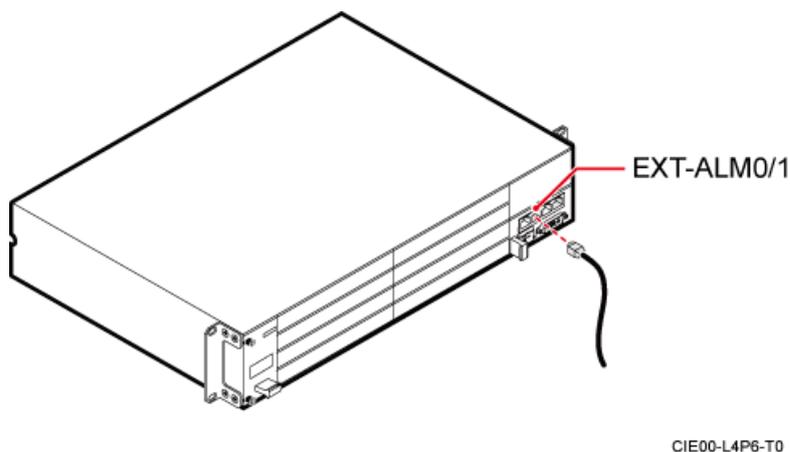
12.4.6 Installing a BBU Alarm Cable

A BBU alarm cable transmits alarm signals from external alarm equipment to a BBU.

Procedure

- Step 1** Install a BBU alarm cable, as shown in [Figure 12-21](#). For details about a BBU alarm cable, see BBU Alarm Cable.
1. Link the RJ45 connector at one end of the BBU alarm cable to the port labeled EXT-ALM0/EXT-ALM1 on the UPEU in the BBU.
 2. Link the RJ45 connector at the other end to external alarm equipment.

Figure 12-21 Installing a BBU alarm cable



Step 2 Route the cable by referring to [12.4.1 Cabling Requirements](#), and then use cable ties to bind the cable.

Step 3 Label the installed cables. For details, see Attaching an L-Shaped Label.

----End

12.4.7 Installing a CPRI Optical Cable

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

Context

- The single-mode optical module is labeled "SM" and multi-mode optical module is labeled "MM".
- If the puller of an optical module is blue, the module is a single-mode optical module. If the puller of an optical module is black or grey, the module is a multi-mode optical module.
- The optical module to be installed must have a matching rate with the corresponding CPRI port.



CAUTION

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

Procedure

Step 1 Install an optical module, as shown in [Figure 12-22](#).

1. Turn the puller on the optical module outwards.

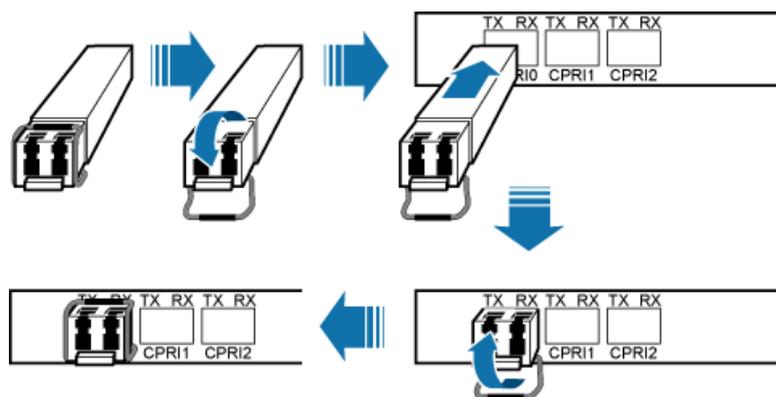
2. Insert the optical module into the CPRI port on the GTMU, WBBPb, WBBPd, or LBBP, and then insert the optical module of the same type⁽¹⁾ into the CPRI_W or CPRI0 port on an RRU.

 **NOTE**

(1) The optical modules with the same label are of the same type.

3. Turn the puller on the optical module inwards.

Figure 12-22 Installing an optical module



Step 2 Install an CPRI optical cable, as shown in [Figure 12-23](#).

 **NOTE**

For details about the connections of the CPRI optical cables, see the *BBU3900 Hardware Description* CPRI Cable Connections.

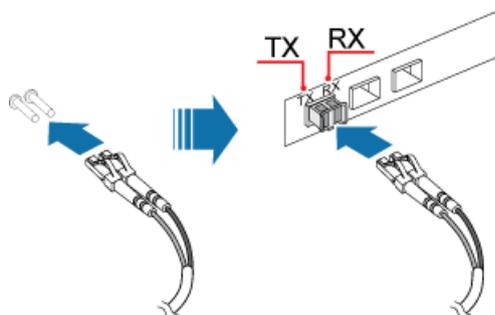
1. Remove the dustproof caps from the connectors of the optical cable.
2. Insert the DLC connectors labeled 2A and 2B at one end of the CPRI optical cable into the optical module on the GTMU, WBBPb, WBBPd, or LBBP, and then insert the DLC connectors labeled 1A and 1B at the other end into the optical module on the RRU.



CAUTION

If both ends of the optical cable are the LC connectors, the TX and RX ports on the BBU are respectively connected to the TX and RX ports on the RRU.

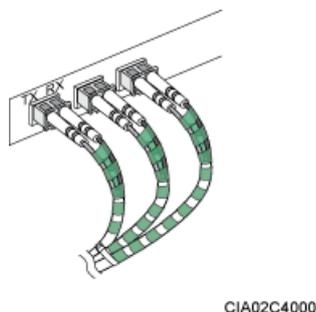
Figure 12-23 Installing a CPRI optical cable



Step 3 Route the CPRI optical cable along the left of the cabinet, and then lead it out of the cabinet from the cable hole on the left of the bottom. For details, see [12.4.1 Cabling Requirements](#).

- Step 4** Attach labels on the optical cable. For details, see Attaching a Sign Plate Label.
- Step 5** Coil the optical fiber with winding plastic tape at the end connected to the BBU. The tape is coiled between the optical connector and the first cable tie on the cabinet, as shown in [Figure 12-24](#).

Figure 12-24 Coiling the optical fiber with winding plastic tape



----End

12.5 Installation Checklist

Check the installation items, installation environment, and cable-related items after the cabinets and devices are all installed.

Cabinet Installation Checklist

[Table 12-6](#) describes the cabinet installation checklist.

Table 12-6 Cabinet installation checklist

No.	Item
1	The installation position of the cabinet strictly complies with the engineering design.
2	In the wall-mounted scenario, the holes of the mounting ears are well aligned with the holes of the expansion bolt assemblies. In addition, the mounting ears are secured on the wall evenly and steadily.
3	In the metal-pole-mounted scenario, the supports for the metal pole are secure on the floor.
4	If the cabinet is installed on the floor, the base is securely installed.
5	Either the horizontal error or vertical error of the cabinet is less than 3 mm.
6	All the bolts, especially those for electrical connections, are tight. Both the spring washer and the flat washer are installed in the correct sequence.
7	The cabinet is neat and clean.
8	The paint on the surface is intact. If any paint is damaged, you must apply touch-up paint to avoid erosion.

No.	Item
9	Filler panels are installed in the space reserved for customer equipment.
10	The cabinet door can be easily opened or closed, the lock works properly, and the gag lever post is secure.
11	All labels, tags, and nameplates are correct, legible, and complete.

Cabinet Installation Environment Checklist

[Table 12-7](#) describes the cabinet installation environment checklist.

Table 12-7 Cabinet installation environment checklist

No.	Item
1	There are no fingerprints or other smears on the surface of the cabinet.
2	There are no excessive straps or adhesive tape on the cables.
3	No tapes, tails of cable ties, paper, or packing bags are left around the cabinet.
4	All the items around the cabinet are neat, clean, and intact.

Electrical Connection Checklist

[Table 12-8](#) describes the electric connection checklist of the cabinet.

Table 12-8 Electric connection checklist of the cabinet

No.	Item
1	All self-made PGND cables are copper-based with the proper wire diameters. No breaking device such as switch and fuse is allowed for the electric connection of the grounding system. No short circuit is allowed.
2	The PGND cable is securely connected and the AC lead-in cable and cables in the cabinet are correctly connected according to the electrical design of the power system. The screws are tightened. In addition, the inputs or outputs are not short-circuited.
3	The redundant part of the power cable or PGND cable is stripped off rather than coiled.
4	The terminals at both ends of the power cable or PGND cable are securely soldered or crimped.
5	The bare wires and the terminal handles at the wiring terminals are coated with heat-shrinkable tubes.
6	The flat washer and the spring washer are well mounted on all OT terminals.

No.	Item
7	The exterior of the battery is intact without any scratch, dent, or crack.
8	The shell of the battery is clean without any leakage trace.
9	The wiring post on the battery stands properly without any damage, and the post is not covered with any acidic substances.
10	The pressure relief valve of the battery is not transformed, and no liquid leaks.
11	The power cables for the batteries are connected to the positive and negative polarities correctly.
12	The voltage of the battery is normal. <ul style="list-style-type: none"> ● The voltage of a 2 V battery cell ranges from 1.8 V to 2.35 V. ● The voltage of a 12 V battery cell ranges from 10.8 V to 14.1 V. ● The total voltage of the batteries ranges from 43.2 V to 56.4 V.
13	The fans work properly. <ul style="list-style-type: none"> ● The fan in the IBBS200D rotates in a low speed in a normal situation. ● The outer air circulation fan in the IBBS200T stops in a normal situation (with the ambient temperature of lower than 30°C), and the inner air circulation fan rotates in a high speed. ● The outer air circulation fan in the APM30H stops in a normal situation (with the ambient temperature of lower than 35°C), and the inner air circulation fan rotates in a low speed.
14	The MCBs for the batteries are set to OFF.

Cable Installation Checklist

[Table 12-9](#) describes the cable installation checklist.

Table 12-9 Cable installation checklist

No.	Item
1	All cables are connected securely and reliably. Pay special attention to the communication cable connections and cable connections at the bottom of the cabinet.
2	The cables are neatly and tightly bound. The cable ties are evenly spaced and face the same direction.
3	Different types of cable, such as the power cable, ground cable, feeder, optical cable, E1/T1 cable, and FE cable are separately bound.
4	The cable layout facilitates maintenance and future capacity expansion.
5	All the labels at both ends of the cables are legible.

No.	Item
6	The extra length of the indoor cable ties is cut, and the cut surfaces are smooth without sharp edges. The extra length of 3 mm to 5mm of the outdoor cable ties is reserved when the cable ties are cut.
7	The idle port that no cable is connected to is properly protected.
8	The connectors of the RF cables are fixed in position to avoid false connection that may cause an abnormal voltage standing wave ratio (VSWR).

BBU Hardware Installation Checklist

[Table 12-10](#) describes the BBU hardware installation checklist.

Table 12-10 BBU hardware installation checklist

No.	Item
1	All self-made PGND cables are copper-based with the proper wire diameters. No switch, fuse, or similar object is allowed for the electrical connection of the grounding system. No short circuit is allowed. Only one OT terminal of the PGND cable can be connected to each terminal on the ground bar.
2	The redundant part of the power cable or PGND cable is stripped off rather than coiled.
3	The terminals at both ends of the power cable or PGND cable are securely soldered or crimped.
4	The bare wires at the terminals and terminal handles are covered with heat-shrinkable tubes.
5	The flat washer and spring washer are well mounted on all OT terminals, and the OT terminals are intact and contact the wiring terminals properly.
6	All the cables, including those on the bottom of the cabinet, are securely connected.
7	The cables are neatly and tightly bound. The cable ties are evenly spaced and face the same direction.
8	The power cable, PGND cable, feeder, optical cable, and the E1/T1/FE cable are bound separately with spacing of more than 30 mm.
9	The cable layout facilitates maintenance and future capacity expansion, and the bending radius of the cable meets the requirements.
10	Legible labels are attached to both ends of all cables.
11	The extra length of the indoor cable ties is cut, and the cut surfaces are smooth without sharp edges. The extra length of 3 mm to 5 mm of the outdoor cable ties is reserved when the cable ties are cut.
12	The unused ports are properly protected.

12.6 Power-On Check

Before a DBS3900 starts operating, you must check the power-on status of the cabinet and components in it.



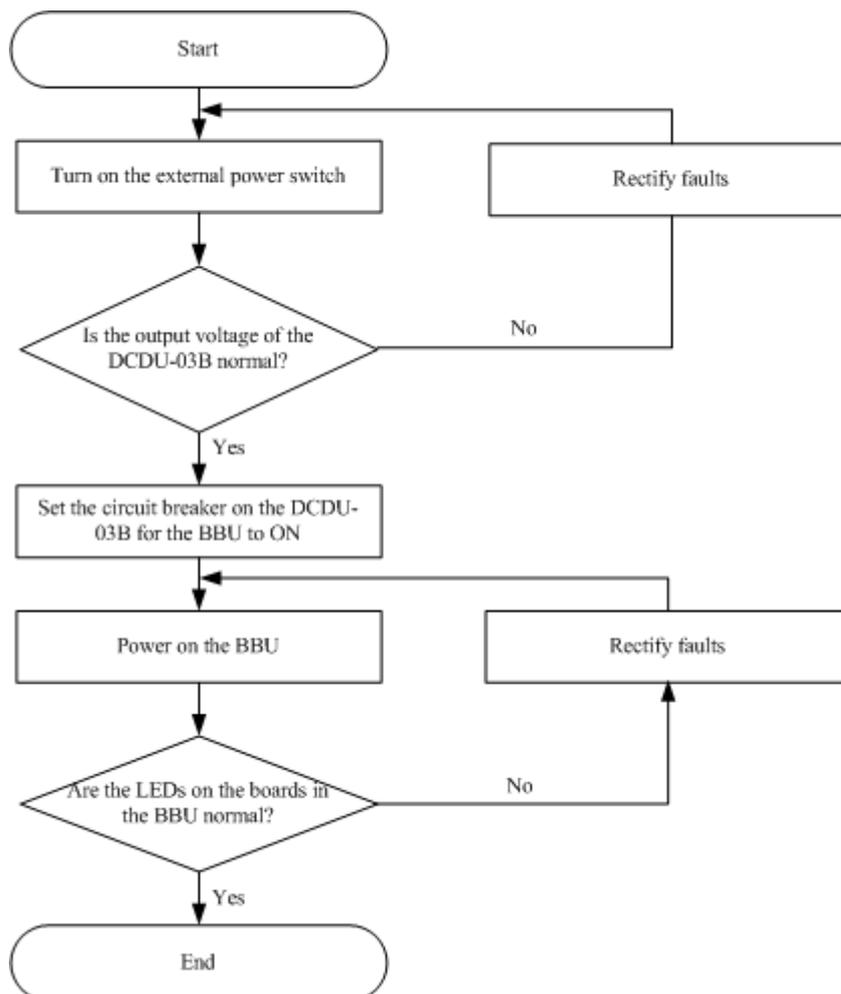
CAUTION

The DBS3900 must be powered on within seven days after it is unpacked, and the period for which the DBS3900 remains powered-off during maintenance must not exceed 48 hours.

Power-On Check in the AC Power Supply Scenario

Figure 12-25 shows the power-on check when a DBS3900 is deployed in the DC power supply scenario.

Figure 12-25 Power-on check in the DC power supply scenario



LED Status and Output Voltage Check

- The DC output voltage of a DCDCU-03B ranges from -43.2 V DC to -57 V DC.
- The normal status of the LEDs on a GTMU, WMPT, WBBP, LMPT, LBBP, and UTRP is as follows:
 - RUN LED: on for 1s and off for 1s
 - ALM LED: off
 - ACT LED: on
- RUN LED on the UPEU: on
- STATE LED on the FAN unit: blinking green slowly (on for 1s and off for 1s)

13 Indoor Scenario (BBU Installed in an IMB03)

About This Chapter

This chapter describes the procedures for installing an IMB03, components in it, and related cables when a DBS3900 is deployed indoors and the BBU is installed in the IMB03.

[13.1 Dimensions and Installation Clearance Requirements](#)

This section describes the dimensions and installation clearance requirements of the IMB03.

[13.2 Installation Process](#)

This section describes the process of installing the IMB03.

[13.3 Installing the IMB03](#)

This section describes the procedures for installing the IMB03 on the wall and IFS06.

[13.4 Installing Devices in the IMB03](#)

This section describes the procedures for installing the BBU and power device in the IMB03. The power device can be the DCDCU or AC/DC power device.

[13.5 Installing IMB03 Cables](#)

This section describes cable connections and the process of installing cables.

[13.6 IMB03 Hardware Installation Checklist](#)

After the IMB03 is installed, you must check the hardware installation.

[13.7 Power-On Check](#)

Before a DBS3900 starts operating, you must check the power-on status of the cabinet and components in it.

[13.8 Installing the Cover Plate for the IMB03](#)

This section describes the procedure for installing the cover plate for the IMB03.

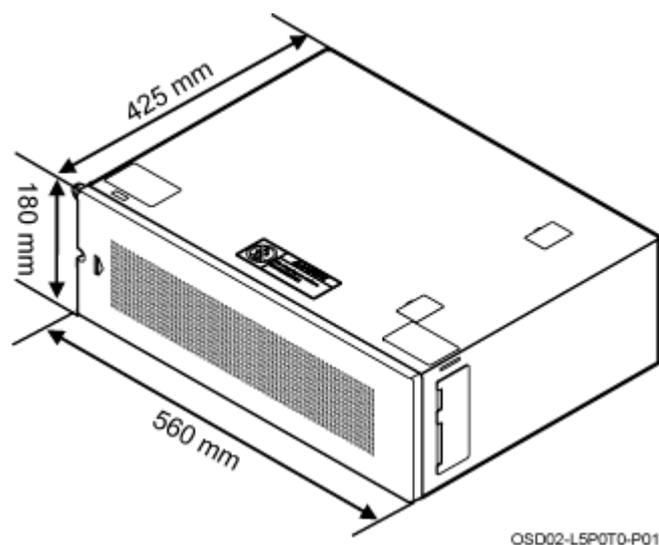
13.1 Dimensions and Installation Clearance Requirements

This section describes the dimensions and installation clearance requirements of the IMB03.

Dimensions

Figure 13-1 shows the dimensions of the IMB03.

Figure 13-1 Dimensions of the IMB03



Installation Clearance Requirements

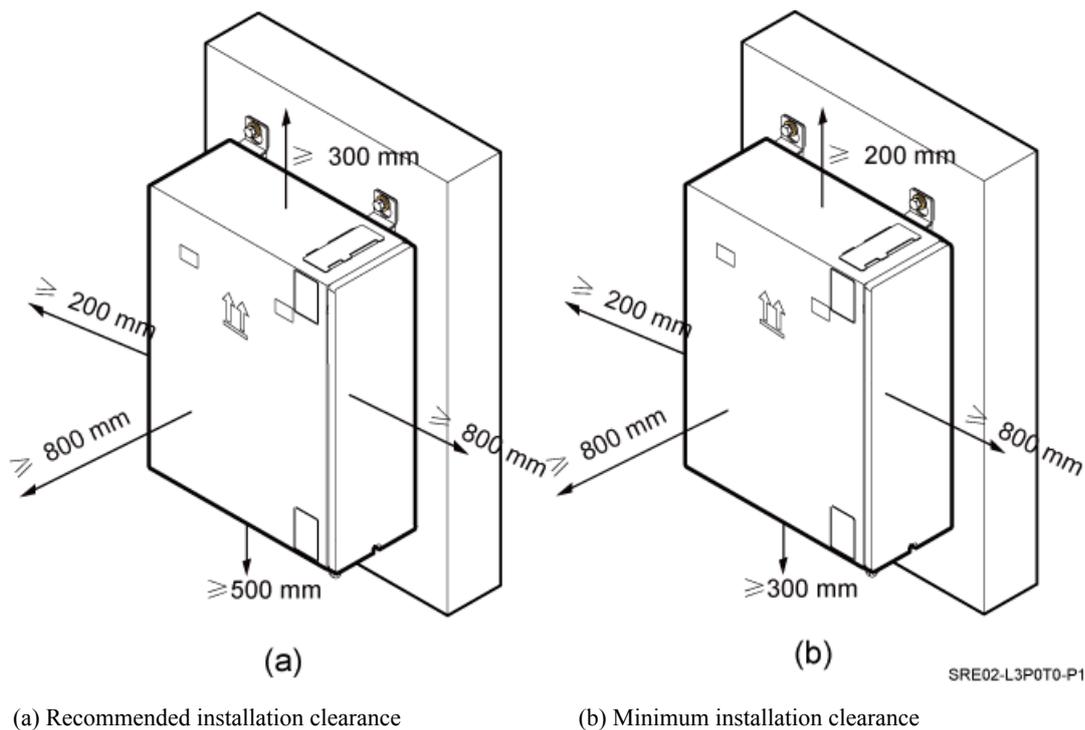
13.1.1 Installation Clearance Requirements for the IMB03 Mounted on the Wall

This section describes the recommended clearance and minimum clearance for the IMB03 mounted on the wall.

Installation Clearance Requirements for the IMB03 Right-Side-Mounted on the Wall

Figure 13-2 shows the installation clearance requirements for the IMB03 right-side-mounted on the wall.

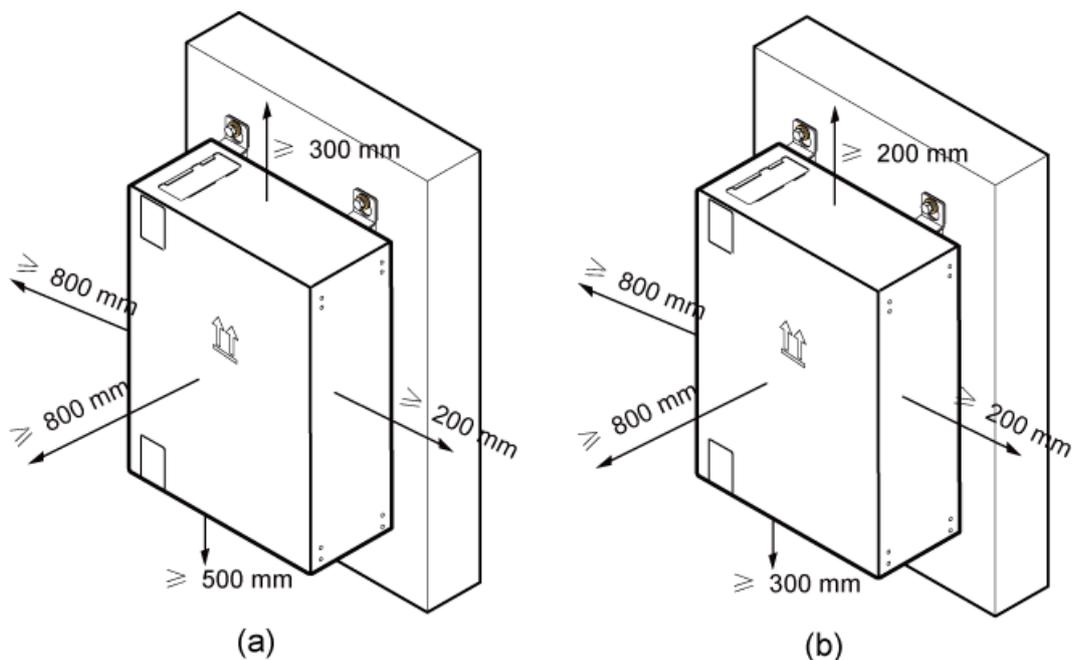
Figure 13-2 Installation clearance requirements for the IMB03 right-side-mounted on the wall



Installation Clearance Requirements for the IMB03 Left-Side-Mounted on the Wall

Figure 13-3 shows the installation clearance requirements for the IMB03 left-side-mounted on the wall.

Figure 13-3 Installation clearance requirements for the IMB03 left-side-mounted on the wall



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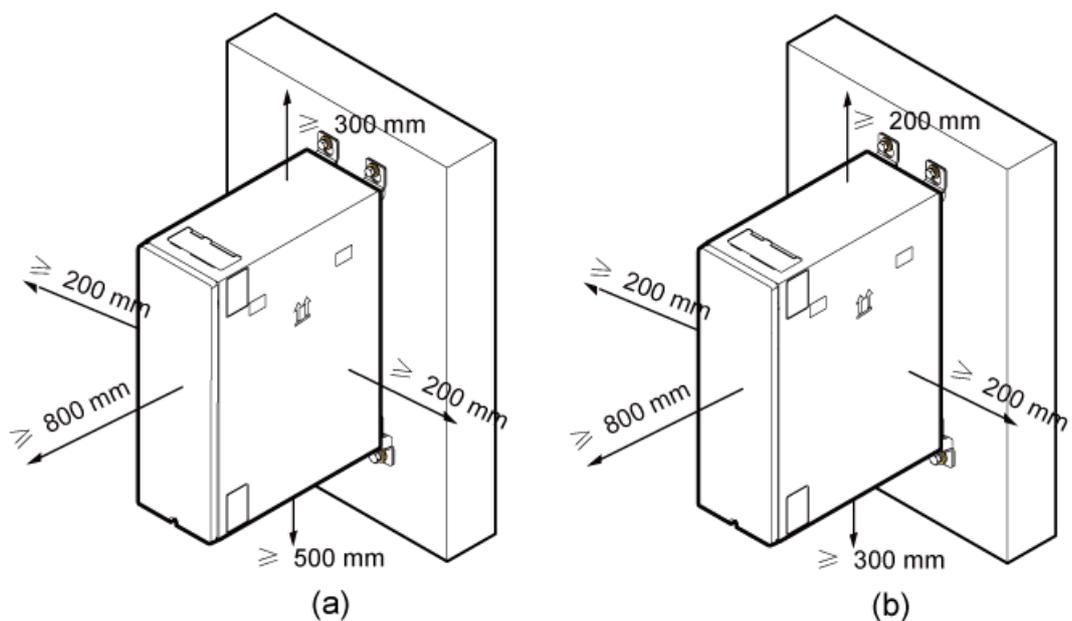
(a) Recommended installation clearance

(b) Minimum installation clearance

Installation Clearance Requirements for the IMB03 Back-Mounted on the Wall

Figure 13-4 shows the installation clearance requirements for the IMB03 back-mounted on the wall.

Figure 13-4 Installation clearance requirements for the IMB03 back-mounted on the wall



SRE02-L3P0T0-P13

(a) Recommended installation clearance

(b) Minimum installation clearance

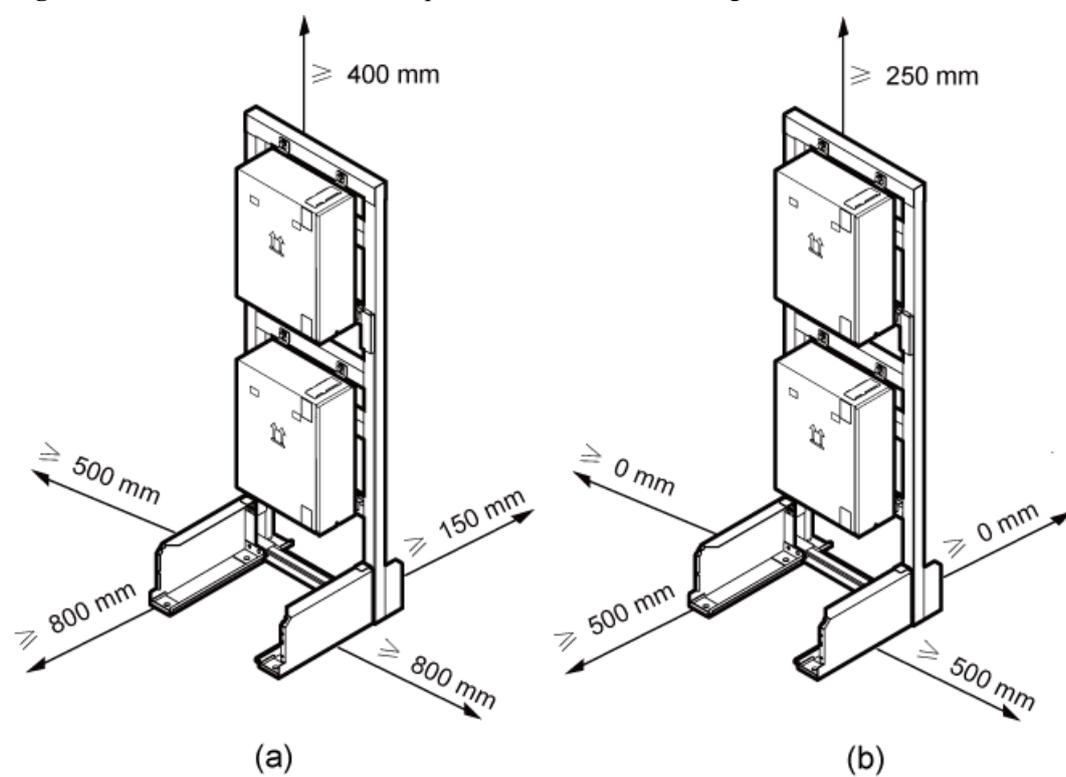
13.1.2 Installation Clearance Requirements for the IMB03 Mounted on the IFS06

This section describes the recommended clearance and minimum clearance for the IMB03 mounted on the IFS06.

Installation Clearance Requirements for the IMB03 Right-Side-Mounted on the IFS06

Figure 13-5 shows the installation clearance requirements for the IMB03 right-side-mounted on the IFS06.

Figure 13-5 Installation clearance requirements for the IMB03 right-side-mounted on the IFS06



(a) Recommended installation clearance

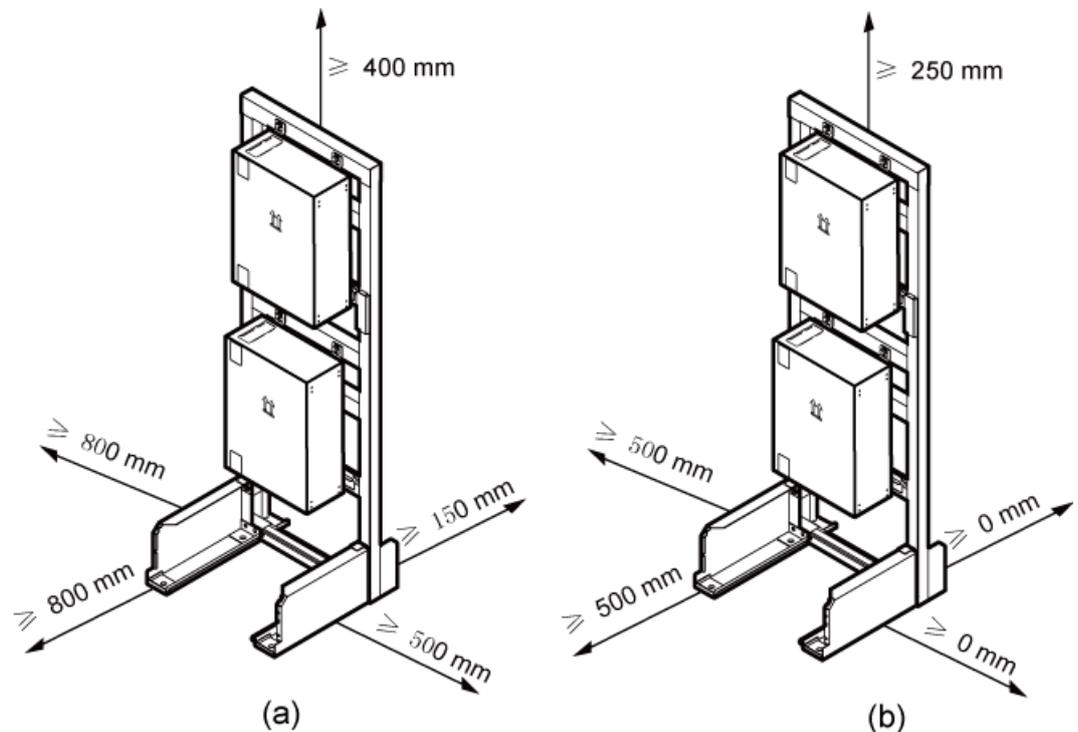
(b) Minimum installation clearance

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Installation Clearance Requirements for the IMB03 Left-Side-Mounted on the IFS06

Figure 13-6 shows the installation clearance requirements for the IMB03 left-side-mounted on the IFS06.

Figure 13-6 Installation clearance requirements for the IMB03 left-side-mounted on the IFS06



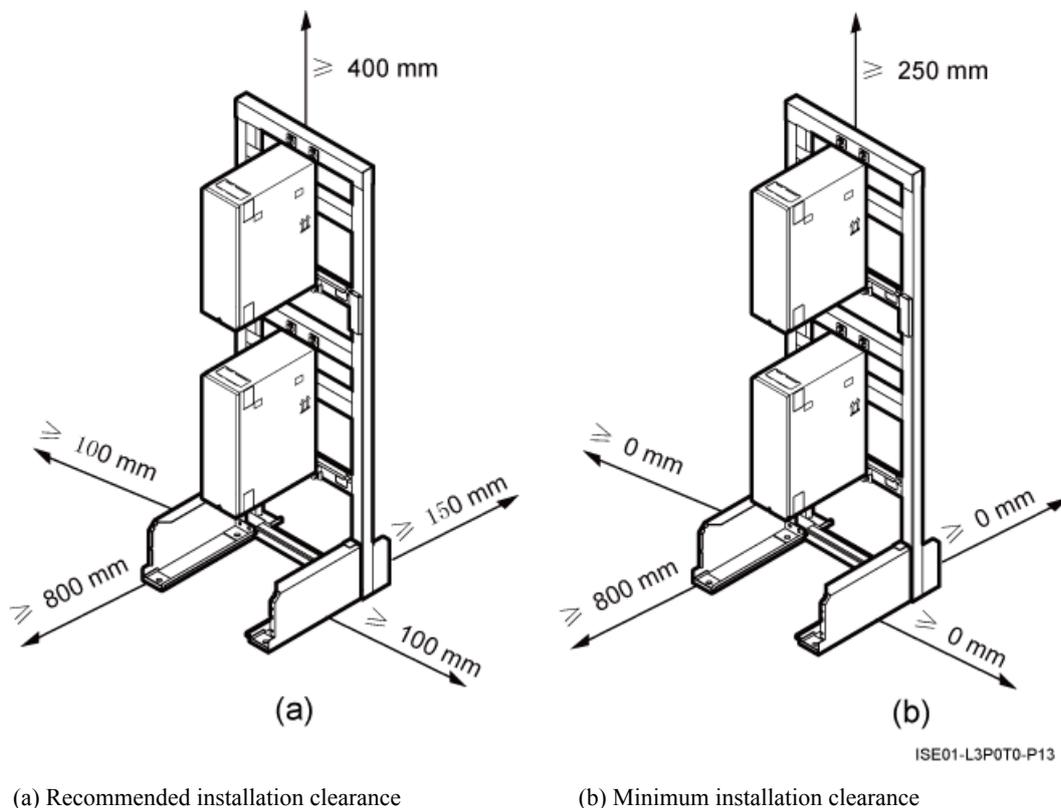
(a) Recommended installation clearance

(b) Minimum installation clearance

Installation Clearance Requirements for the IMB03 Back-Mounted on the IFS06

Figure 13-7 shows the installation clearance requirements for the IMB03 back-mounted on the IFS06.

Figure 13-7 Installation clearance requirements for the IMB03 back-mounted on the IFS06

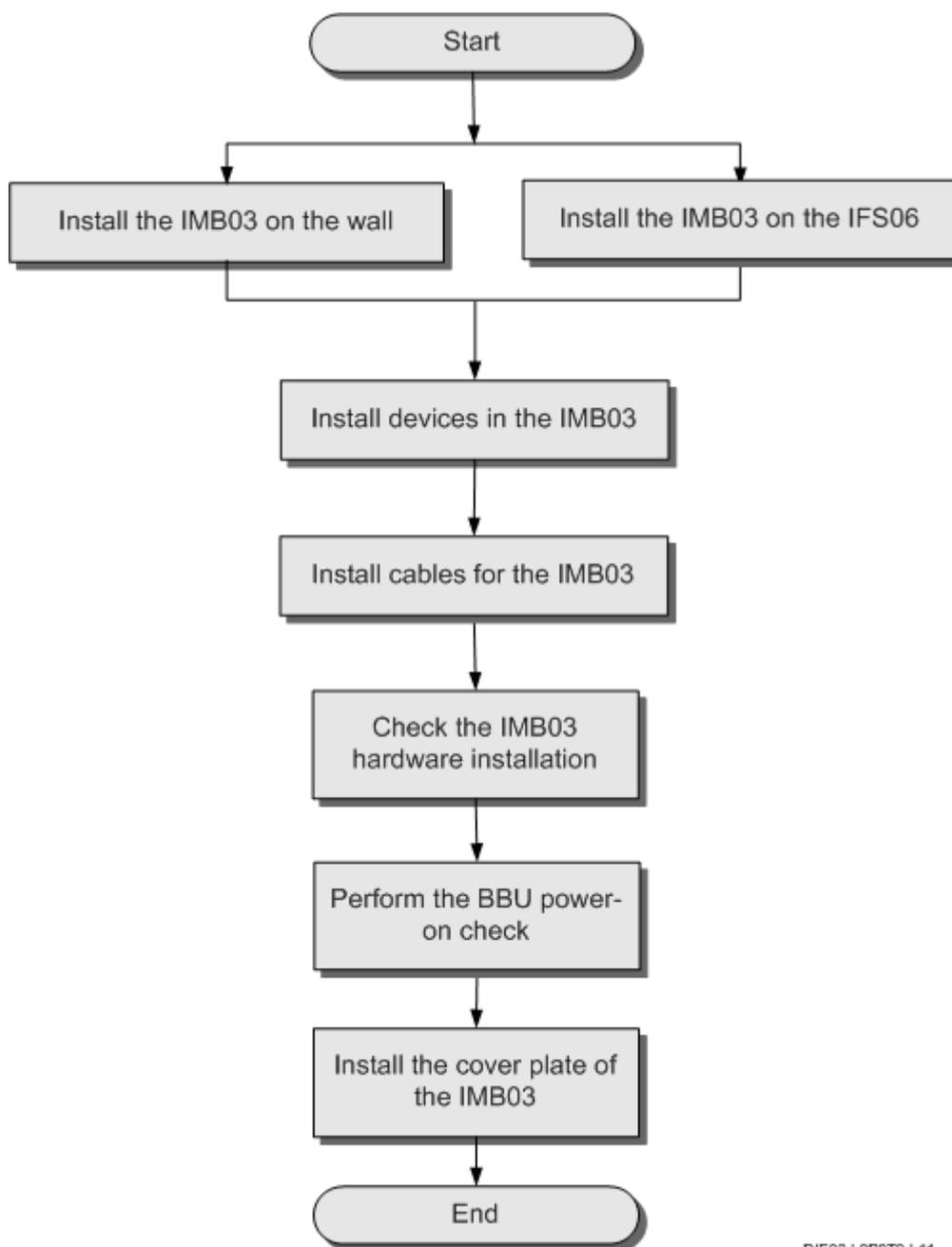


13.2 Installation Process

This section describes the process of installing the IMB03.

Figure 13-8 shows the installation process.

Figure 13-8 Process of installing the IMB03



DIE02-L0P0T0-L11

NOTE

This document describes the scenario where the IMB03 is installed on the wall or IFS06 and the RRU is installed remotely. For details about the installation of the RRU, see the RRU installation guide.

13.3 Installing the IMB03

This section describes the procedures for installing the IMB03 on the wall and IFS06.

13.3.1 Installing the IMB03 on the Wall

The IMB03 can be side-mounted or back-mounted on the wall.

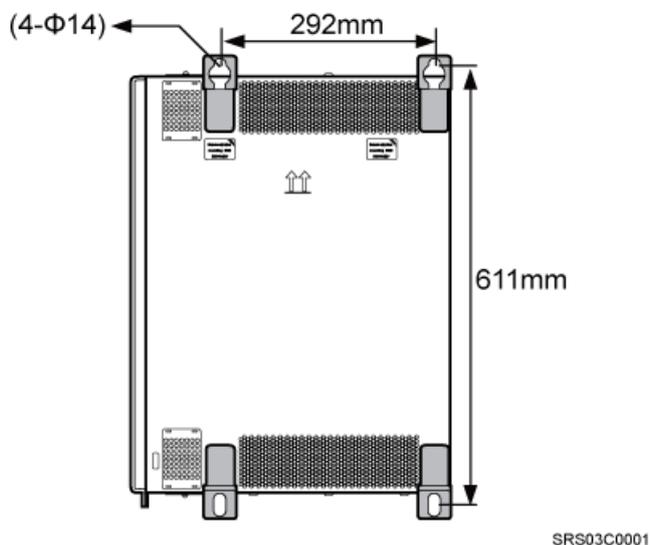
Installing the IMB03 on the Wall (Side-Mounted)

This section describes the installation procedure of the IMB03 side-mounted on the wall.

Context

The diameters of the holes on the mounting ears for attaching a back plate on a wall are 14 mm. The horizontal inter-hole spacing of the two upper mounting ears is 292 mm, and the vertical spacing between the holes of the upper and lower mounting ears is 611 mm.

Figure 13-9 Spacing between the holes of the mounting ears



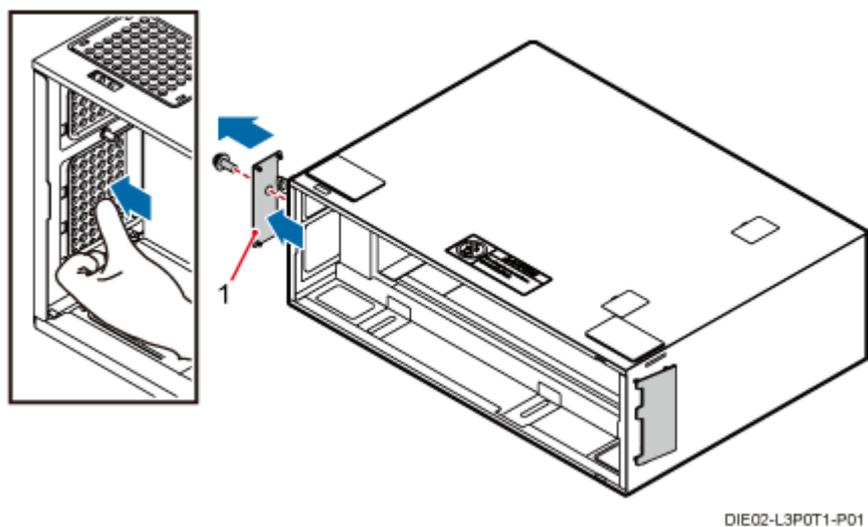
NOTE

The installation procedure of the IMB03 left-side-mounted on the wall is the same as the procedure of the IMB03 right-side-mounted on the wall. The following description is based on the IMB03 right-side-mounted on the wall.

Procedure

Step 1 Remove the protection plate from the bottom of the IMB03, as shown in [Figure 13-10](#).

Figure 13-10 Removing the protection plate



(1) Protection plate

NOTE

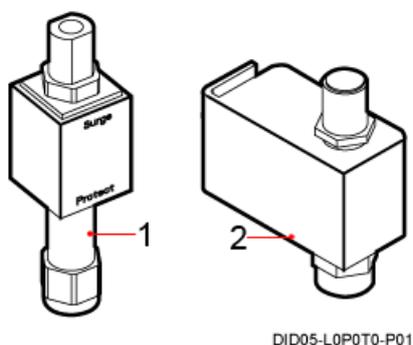
After all cables are routed, cut parts of the protection plate to seal cable holes if there is spare space in the cable holes.

Step 2 Install the GPS surge protector.

NOTE

The GPS surge protector is optional. The IMB03 can be configured with two types of GPS surge protector, as shown in the following figure. If a GPS surge protector is required, install the GPS surge protector prior to the IMB03.

Figure 13-11 GPS surge protector



(1) GPS surge protector type A

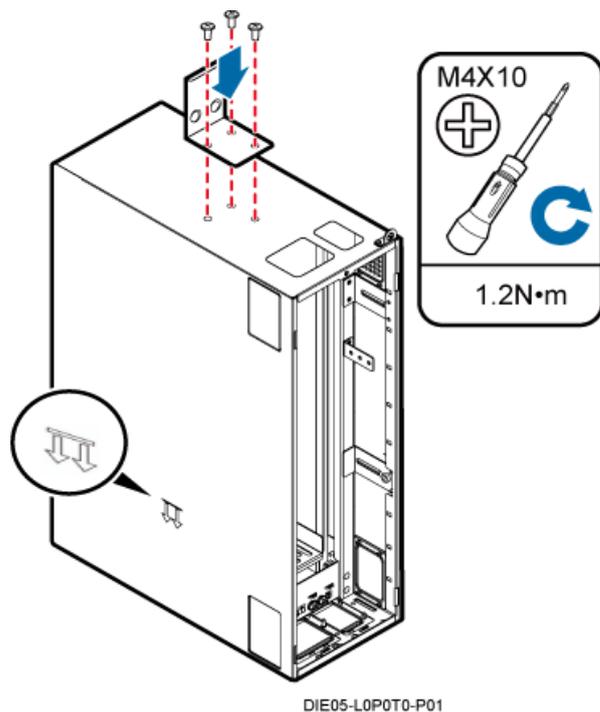
(2) GPS surge protector type B

NOTE

The PGND cable is not required for the GPS surge protector type A.

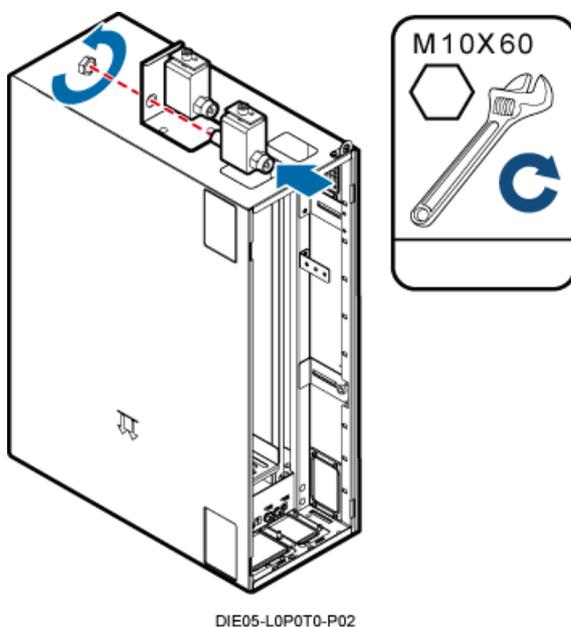
1. Install the adapting piece for the GPS surge protector on the bottom of the IMB03, as shown in [Figure 13-12](#).

Figure 13-12 Installing the adapting piece for the GPS surge protector



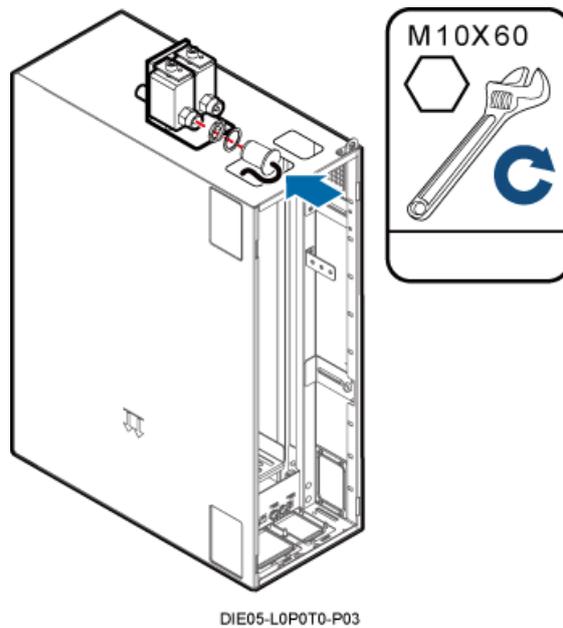
2. Secure the GPS surge protector to the adapting piece. That is, pre-tighten the GPS surge protector with hands, and then use an adjustable wrench to tighten it, as shown in **Figure 13-13**.

Figure 13-13 Installing the GPS surge protector



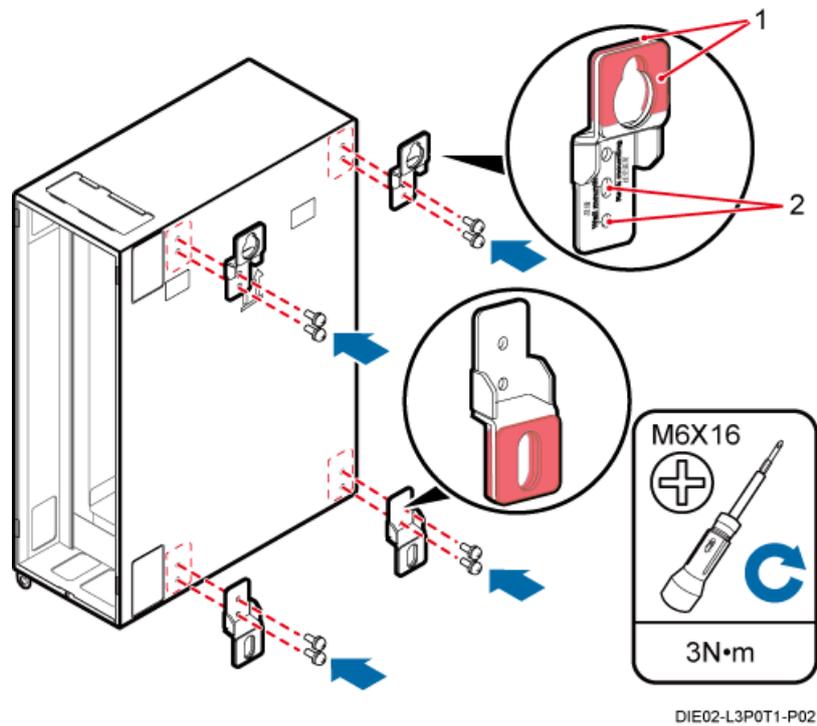
3. Install the GPS clock signal cable on the GPS surge protector, as shown in **Figure 13-14**.

Figure 13-14 Installing the GPS clock signal cable on the GPS surge protector



Step 3 Install the mounting ears on the IMB03, as shown in **Figure 13-15**.

Figure 13-15 Installing mounting ears



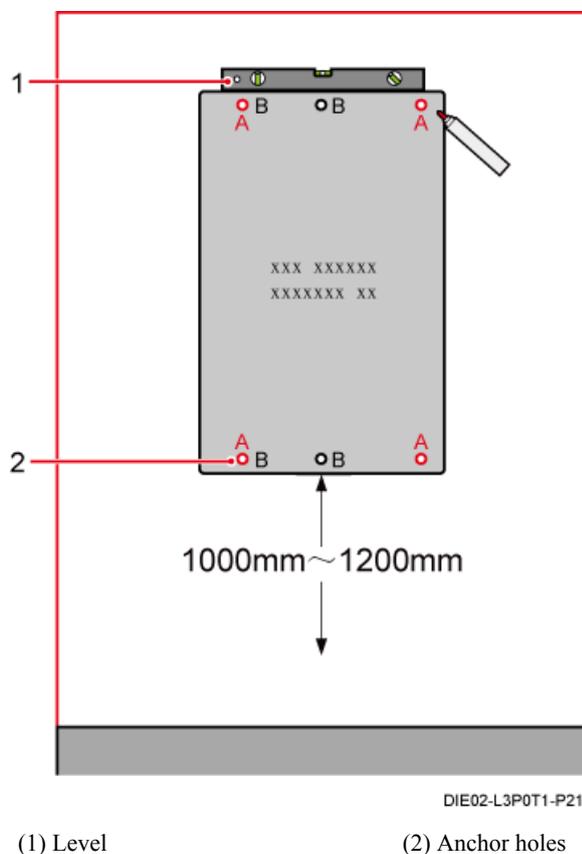
(1) Insulation washer

(2) Installation positions for bolts

Step 4 Use a level to check that the two anchor holes on the marking template are on a horizontal plane, place the marking template against the wall, and then use a marker to mark anchor points, as shown in **Figure 13-16**.

Holes marked "A" are used as anchor points. The distance between the marking plate and the ground is 1000-1200 mm.

Figure 13-16 Marking anchor points

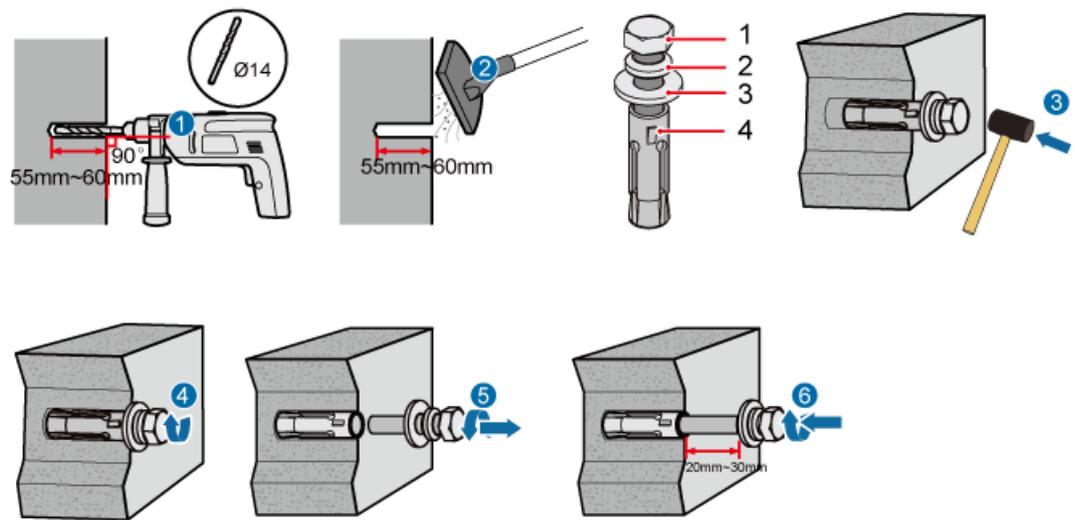


 **CAUTION**

The bolts in the wall must bear a stress of a minimum of 1.25 kN.

Step 5 Drill holes at the anchor points, and then install expansion bolt assemblies, as shown in [Figure 13-17](#).

Figure 13-17 Drilling holes at the anchor points and installing expansion bolt assemblies



DIE02-L3P0T1-P22

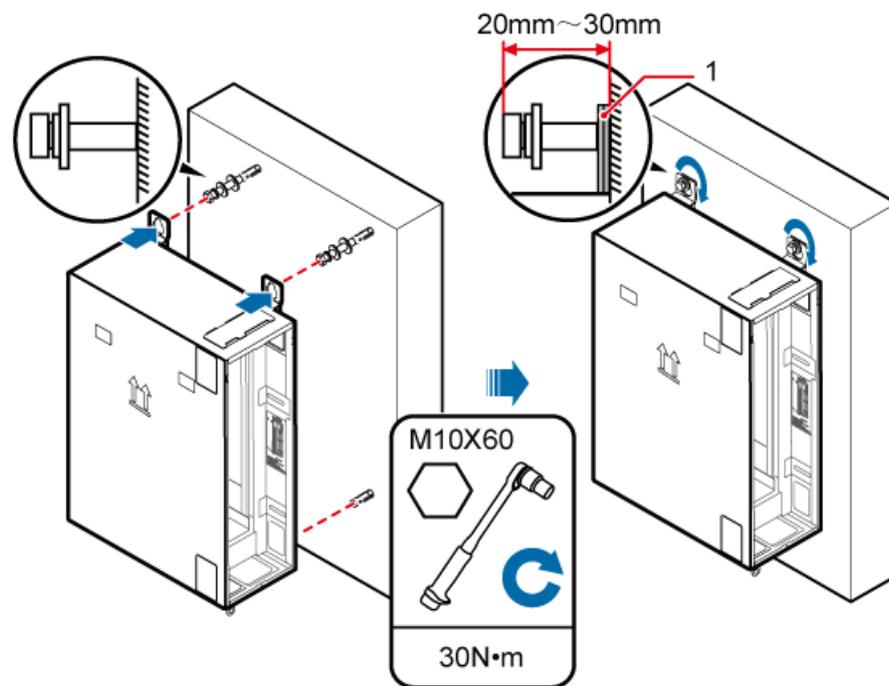
- (1) M10x60 bolt (2) Spring washer 10 (3) Flat washer 10 (4) Expansion tube

Step 6 Place the IMB03 onto the two bolts at the upper anchor points, and then use a torque wrench to pre-tighten the two bolts until a 20-30 mm length of each bolt is reserved out of the wall, as shown in **Figure 13-18**.

TIP

Tighten the two bolts at the lower anchor points prior to the bolts at the upper anchor points, and ensure that the subrack is vertical.

Figure 13-18 Pre-tightening the bolts at the upper anchor points

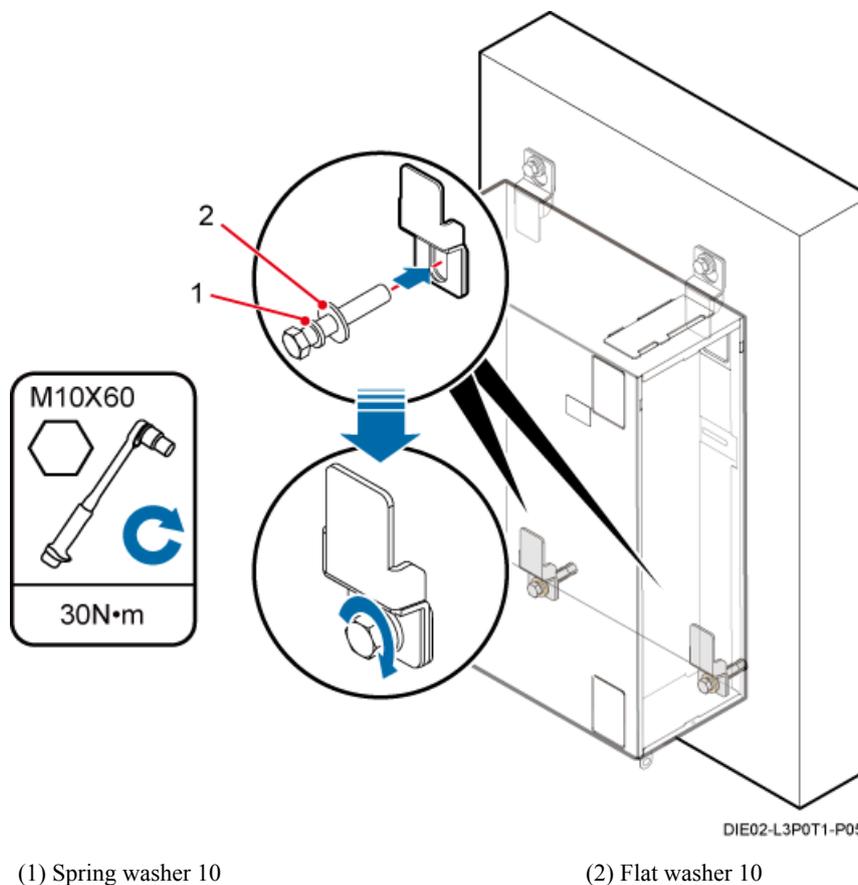


DIE02-L3P0T1-P04

- (1) Mounting ears on the IMB03

Step 7 Align the mounting ears at the lower part of the IMB03 with the anchor holes, and then use a torque wrench to tighten the bolts, as shown in **Figure 13-19**.

Figure 13-19 Tightening the bolts at the lower part of the IMB03



---End

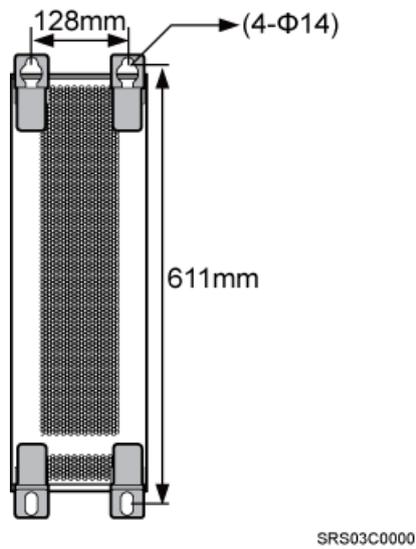
Installing the IMB03 on the Wall (Back-Mounted)

This section describes the installation procedure of IMB03 back-mounted on the wall.

Context

The diameters of the holes on the mounting ears for attaching a back plate on a wall are 14 mm. The horizontal inter-hole spacing of the two upper mounting ears is 128 mm, and the vertical spacing between the holes of the upper and lower mounting ears is 611 mm.

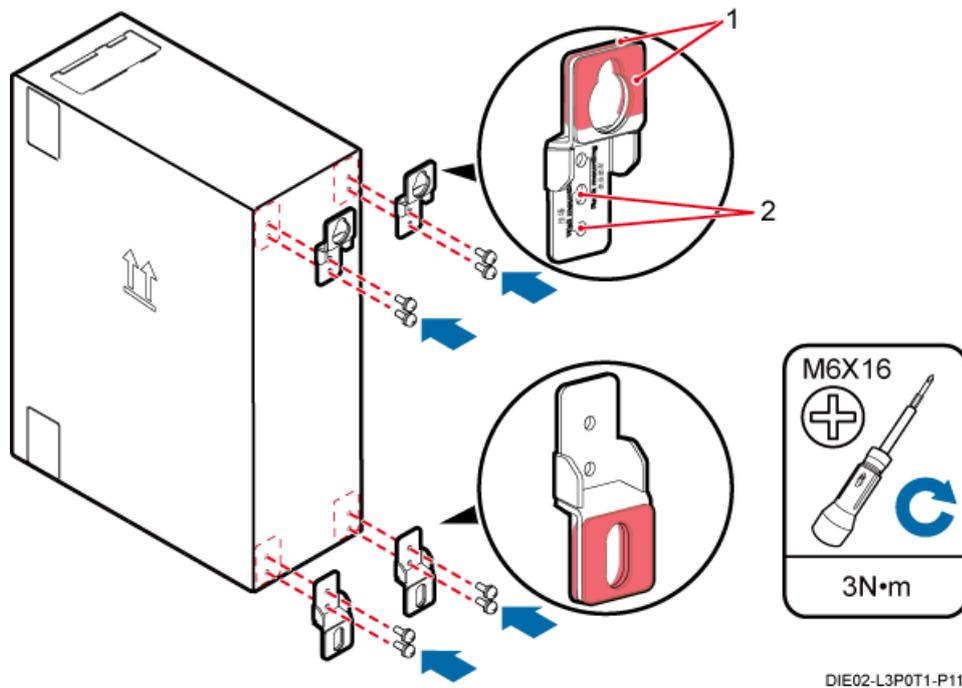
Figure 13-20 Spacing between the holes of the mounting ears



Procedure

- Step 1** Remove the protection plate from the bottom of the IMB03, as shown in [Installing the IMB03 on the Wall \(Side-Mounted\)](#).
- Step 2** Install the GPS surge protector, as shown in [Installing the IMB03 on the Wall \(Side-Mounted\)](#).
- Step 3** Install the mounting ears on the IMB03, as shown in [Figure 13-21](#).

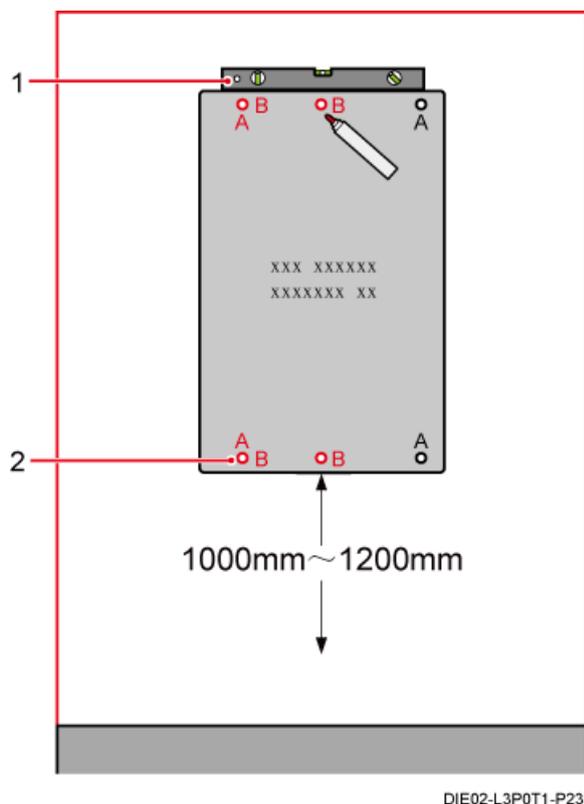
Figure 13-21 Installing mounting ears



- Step 4** Use a level to check that the two anchor holes on the marking template are on a horizontal plane, place the marking template against the wall, and then use a marker to mark anchor points, as shown in [Figure 13-22](#).

Holes marked "B" are used as anchor points. The distance between the marking plate and the ground is 1000-1200 mm.

Figure 13-22 Marking anchor points



(1) Level

(2) Anchor holes



CAUTION

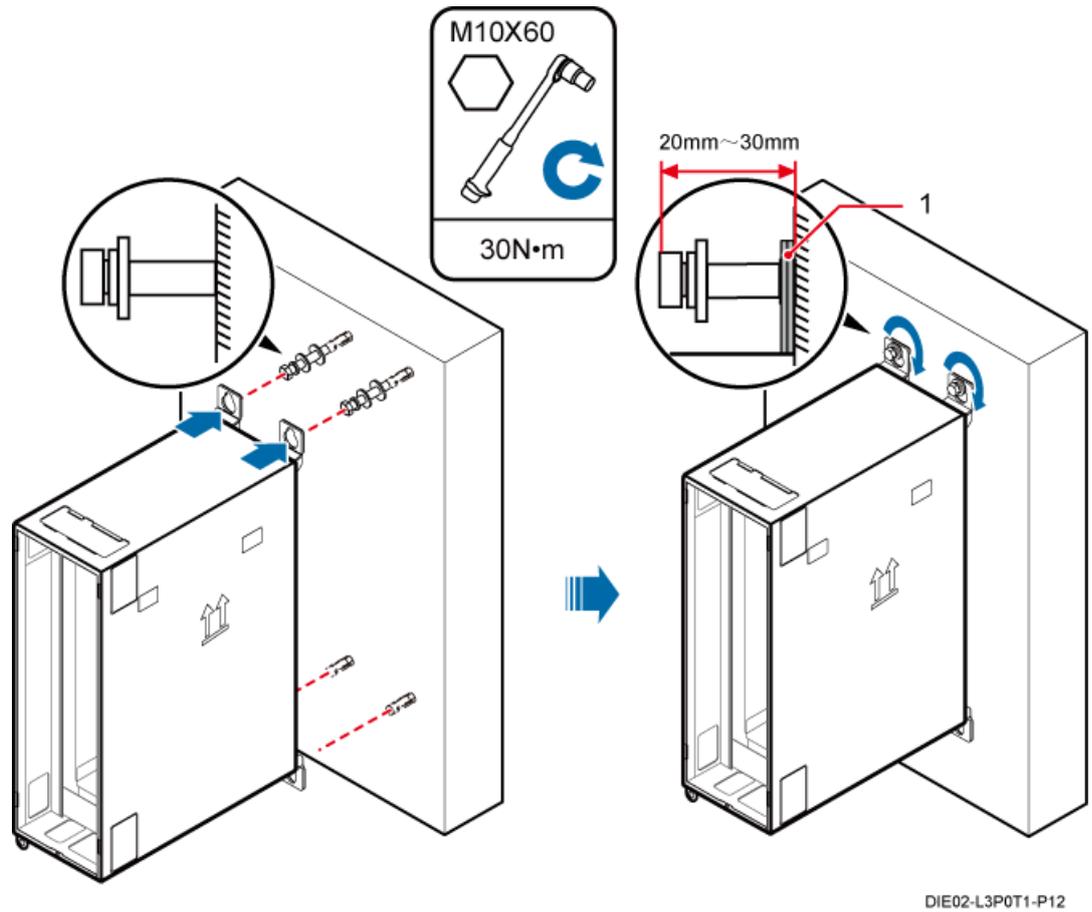
The bolts in the wall must bear a stress of a minimum of 1.25 kN.

- Step 5** Drill holes at the anchor points, and then install expansion bolt assemblies, as shown in [Installing the IMB03 on the Wall \(Side-Mounted\)](#).
- Step 6** Place the IMB03 onto the two bolts at the upper anchor points, and then use a torque wrench to pre-tighten the two bolts until a 20-30 mm length of each bolt is reserved out of the wall, as shown in [Figure 13-23](#).

TIP

Tighten the two bolts at the lower anchor points prior to the bolts at the upper anchor points, and ensure that the subrack is vertical.

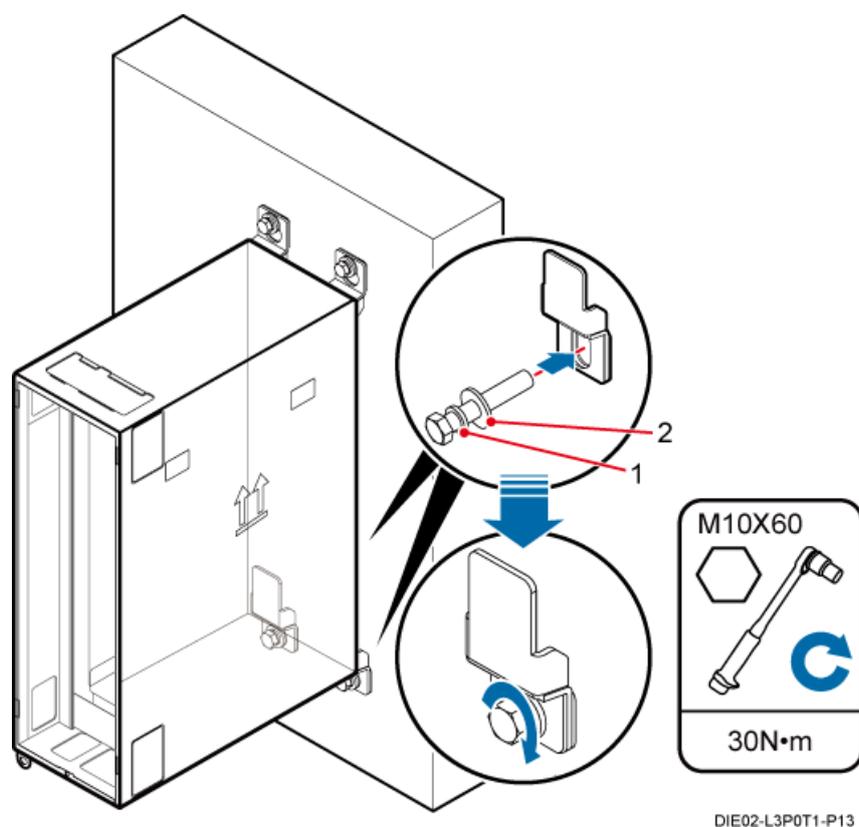
Figure 13-23 Pre-tightening the bolts at the upper anchor points



(1) Mounting ears on the IMB03

Step 7 Align the mounting ears at the lower part of the IMB03 with the anchor holes, and then use a torque wrench to tighten the bolts, as shown in [Figure 13-24](#).

Figure 13-24 Tightening the bolts at the lower part of the IMB03



(1) Spring washer 10

(2) Flat washer 10

---End

13.3.2 Installing the IMB03 on the IFS06

This section describes the procedure for installing the IMB03 on the IFS06. One or two IMB03s can be installed on the IFS06. When two IMB03s must be installed on the IFS06, you are advised to install the lower IMB03 prior to the upper IMB03. The procedures for installing the two IMB03s are the same. The following description is based on the installation procedure of the upper IMB03 on the IFS06.

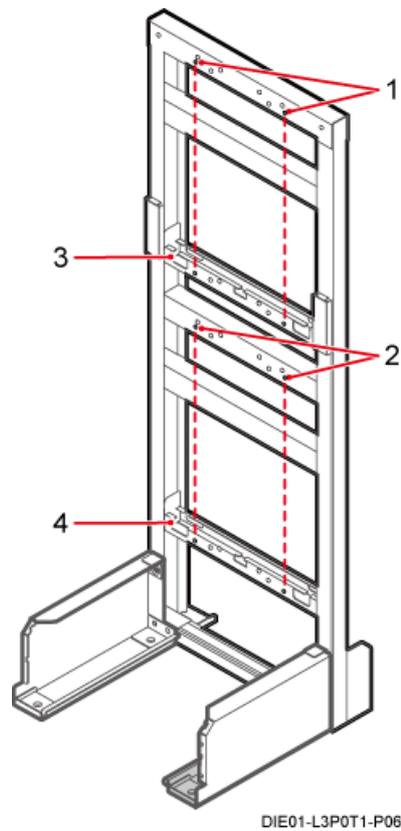
Installing the IMB03 on the IFS06 (Side-Mounted)

This section describes the installation procedure of the IMB03 side-mounted on the IFS06. The side-mounted mode can be classified into left-side-mounted mode and right-side-mounted mode. The installation procedure of the IMB03 left-side-mounted on the IFS06 is the same as the procedure of the IMB03 right-side-mounted on the IFS06. The following description is based on the IMB03 right-side-mounted on the IFS06.

Context

One or two IMB03s can be installed on the IFS06, as shown in [Figure 13-25](#). To install the lower IMB03, move down the lower adjusting beam to the middle position. To install the upper IMB03, move down the upper adjusting beam to the middle position, as shown in [Figure 13-27](#).

Figure 13-25 Installing the IMB03 on the IFS06 (side-mounted)

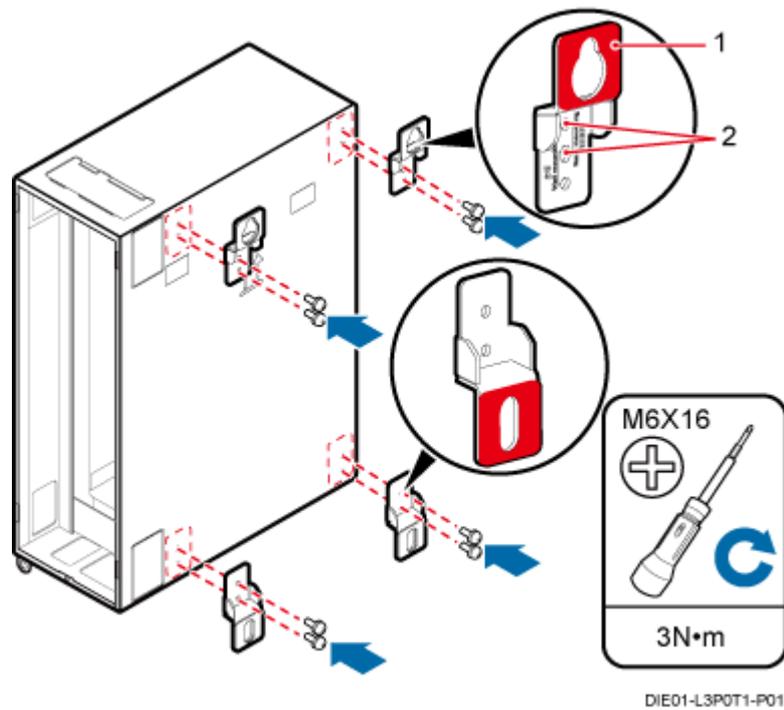


(1) Anchor holes for the upper IMB03 (2) Anchor holes for the lower IMB03 (3) Upper adjusting beam (4) Lower adjusting beam

Procedure

- Step 1** Remove the protection plate from the bottom of the IMB03, as shown in [Installing the IMB03 on the Wall \(Side-Mounted\)](#).
- Step 2** Install the GPS surge protector, as shown in [Installing the IMB03 on the Wall \(Side-Mounted\)](#).
- Step 3** Install the mounting ears on the IMB03, as shown in [Figure 13-26](#).

Figure 13-26 Installing mounting ears

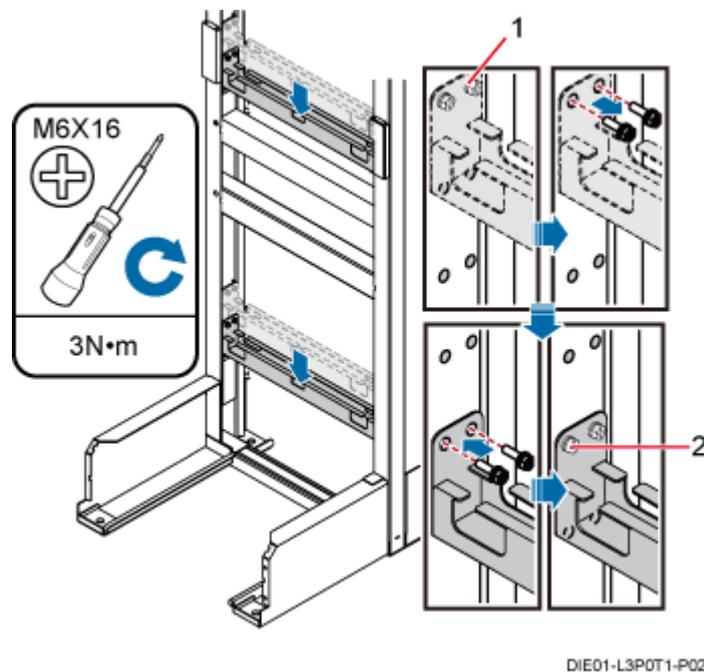


(1) Insulation washer

(2) Installation positions for bolts

Step 4 Move down the upper adjusting beam to the middle position, as shown in [Figure 13-27](#).

Figure 13-27 Moving down the adjusting beam

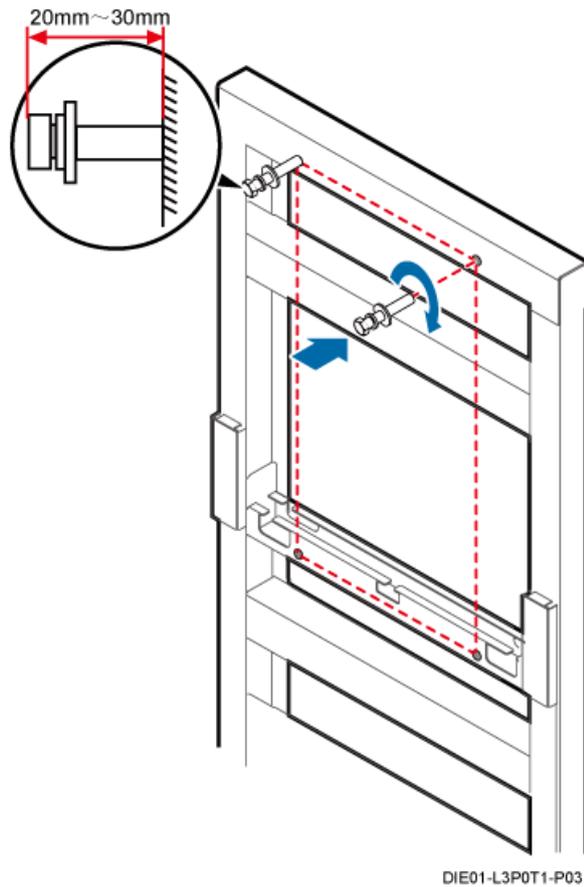


(1) Default position for the adjusting beam

(2) Position for the adjusting beam with the IMB03 installed

Step 5 Insert two M10x30 bolts into the two anchor holes on the upper part of the IFS06, and leave a 20-30 mm length out of the holes, as shown in [Figure 13-28](#).

Figure 13-28 Inserting bolts at the upper anchor points

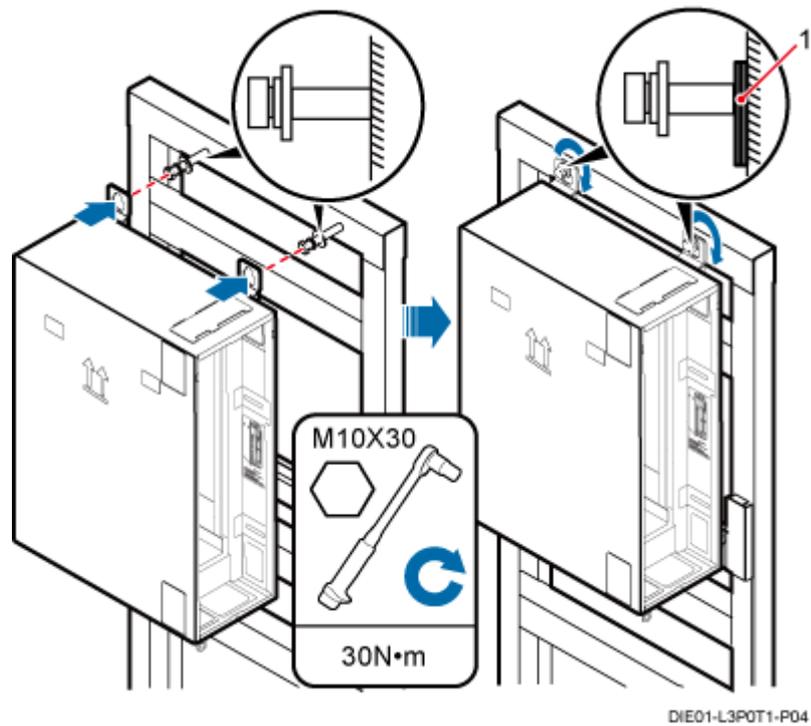


Step 6 Place the IMB03 onto the two bolts at the upper anchor points, and then use a torque wrench to pre-tighten the two bolts, as shown in [Figure 13-29](#).

TIP

Tighten the two bolts at the lower anchor points prior to the bolts at the upper anchor points, and ensure that the subrack is vertical.

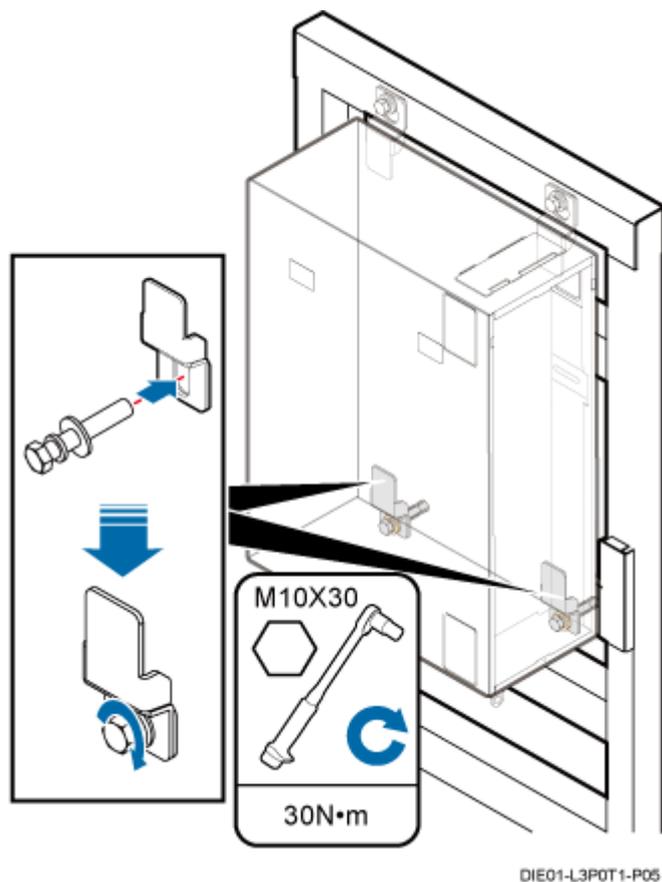
Figure 13-29 Pre-tightening the bolts at the upper anchor points



(1) Mounting ears on the IMB03

Step 7 Align the mounting ears at the lower part of the IMB03 with the anchor holes, and then use a torque wrench to tighten the bolts, as shown in [Figure 13-30](#).

Figure 13-30 Tightening the bolts at the lower part of the IMB03



---End

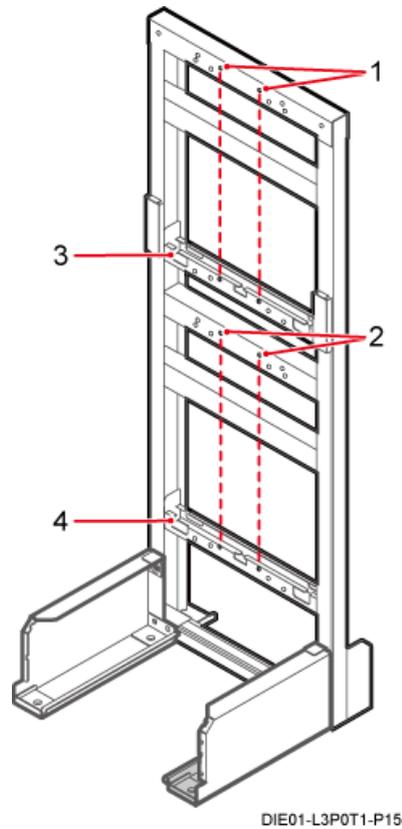
Installing the IMB03 on the IFS06 (Back-Mounted)

This section describes the installation procedure of the IMB03 back-mounted on the IFS06.

Context

One or two IMB03s can be installed on the IFS06, as shown in [Figure 13-31](#). To install the lower IMB03, move down the lower adjusting beam to the middle position. To install the upper IMB03, move down the upper adjusting beam to the middle position, as shown in [Figure 13-33](#).

Figure 13-31 Installing the IMB03 on the IFS06 (back-mounted)

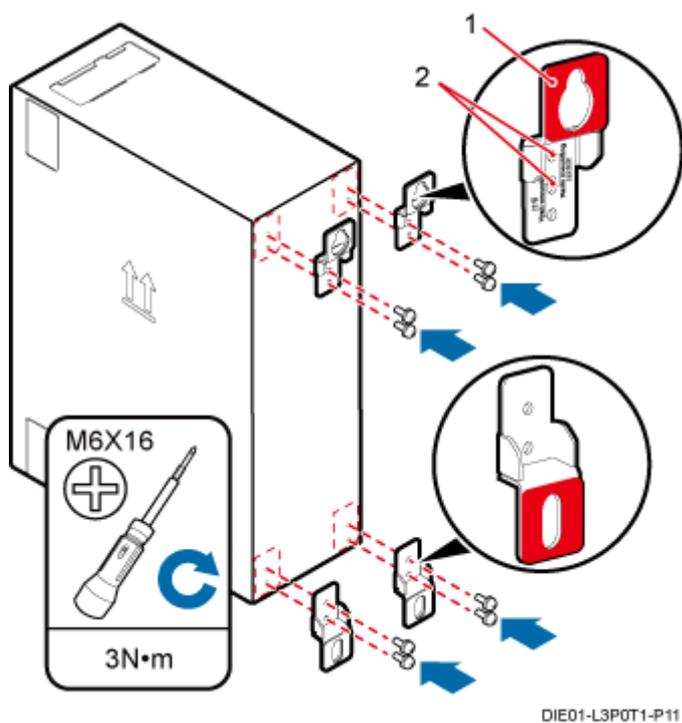


- (1) Anchor holes for the upper IMB03 (2) Anchor holes for the lower IMB03 (3) Upper adjusting beam (4) Lower adjusting beam

Procedure

- Step 1** Remove the protection plate from the bottom of the IMB03, as shown in [Installing the IMB03 on the Wall \(Side-Mounted\)](#).
- Step 2** Install the GPS surge protector, as shown in [Installing the IMB03 on the Wall \(Side-Mounted\)](#).
- Step 3** Install the mounting ears on the IMB03, as shown in [Figure 13-32](#).

Figure 13-32 Installing mounting ears

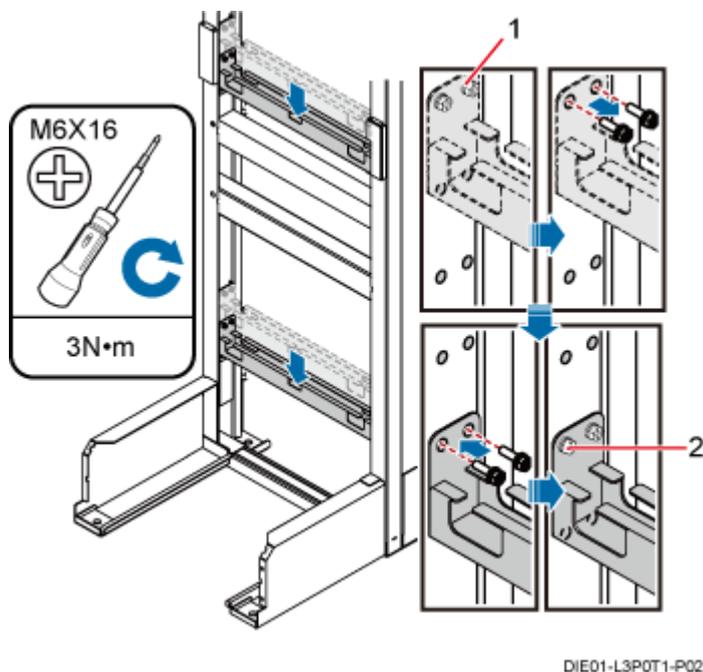


(1) Insulation washer

(2) Installation positions for bolts

Step 4 Move down the upper adjusting beam to the middle position, as shown in [Figure 13-33](#).

Figure 13-33 Moving down the adjusting beam

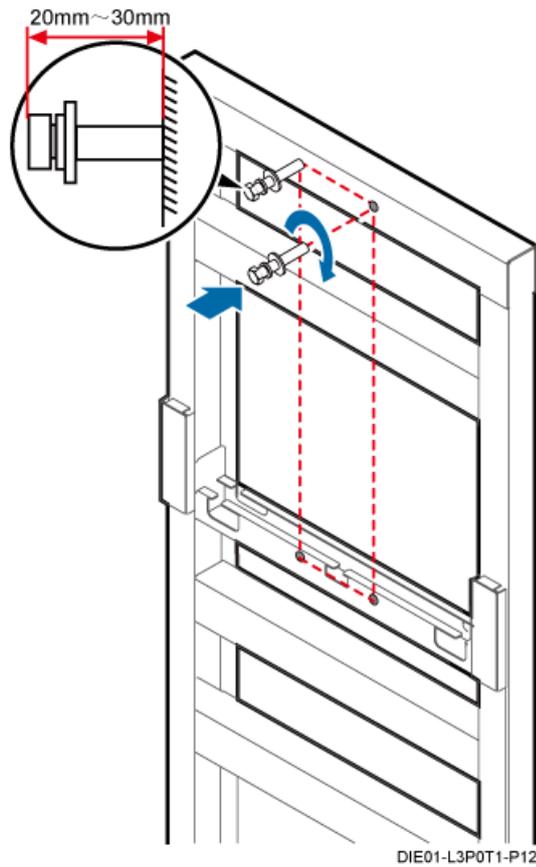


(1) Default position for the adjusting beam

(2) Position for the adjusting beam with the IMB03 installed

Step 5 Insert two M10x30 bolts into the two anchor holes on the upper part of the IFS06, and leave a 20-30 mm length out of the holes, as shown in [Figure 13-34](#).

Figure 13-34 Inserting bolts at the upper anchor points

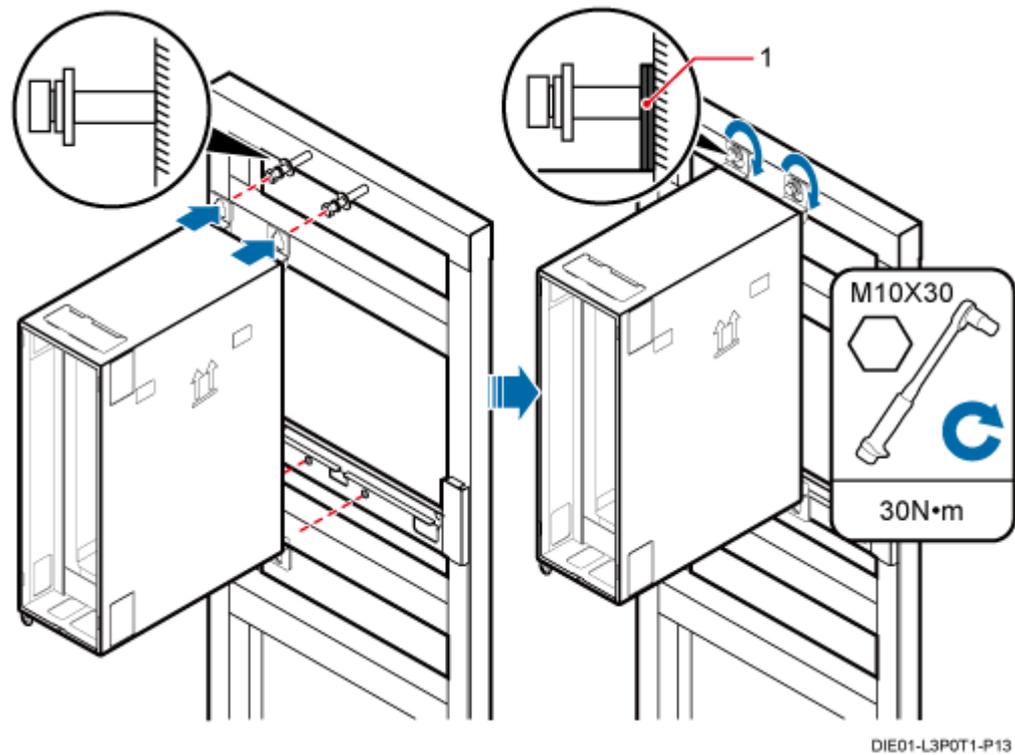


Step 6 Place the IMB03 onto the two bolts at the upper anchor points, and then use a torque wrench to pre-tighten the two bolts, as shown in [Figure 13-35](#).

TIP

Tighten the two bolts at the lower anchor points prior to the bolts at the upper anchor points, and ensure that the subrack is vertical.

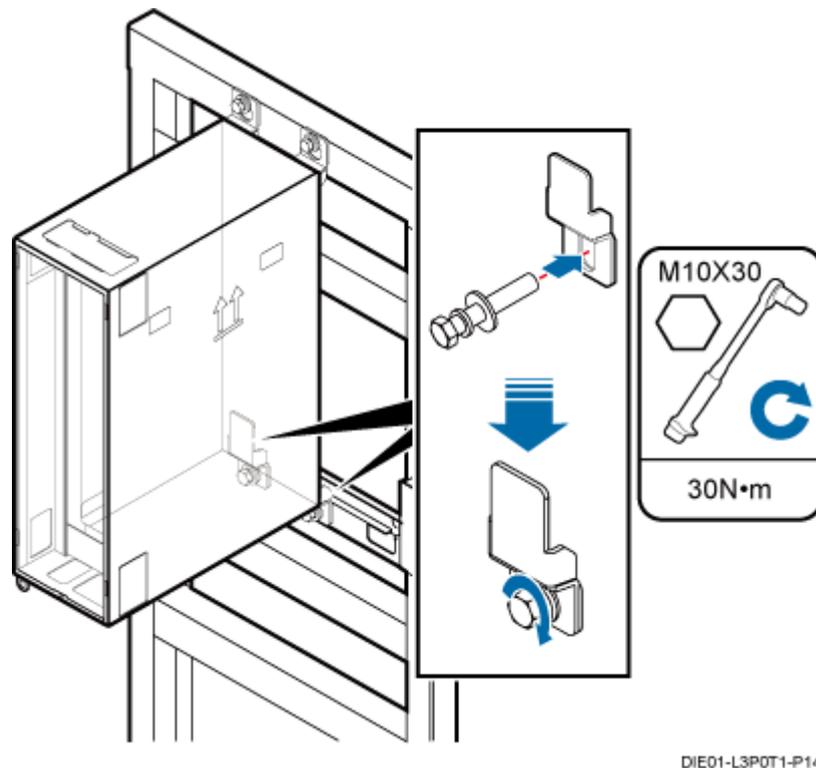
Figure 13-35 Pre-tightening the bolts at the upper anchor points



(1) Mounting ears on the IMB03

Step 7 Align the mounting ears at the lower part of the IMB03 with the anchor holes, and then use a torque wrench to tighten the bolts, as shown in [Figure 13-36](#).

Figure 13-36 Tightening the bolts at the lower part of the IMB03



---End

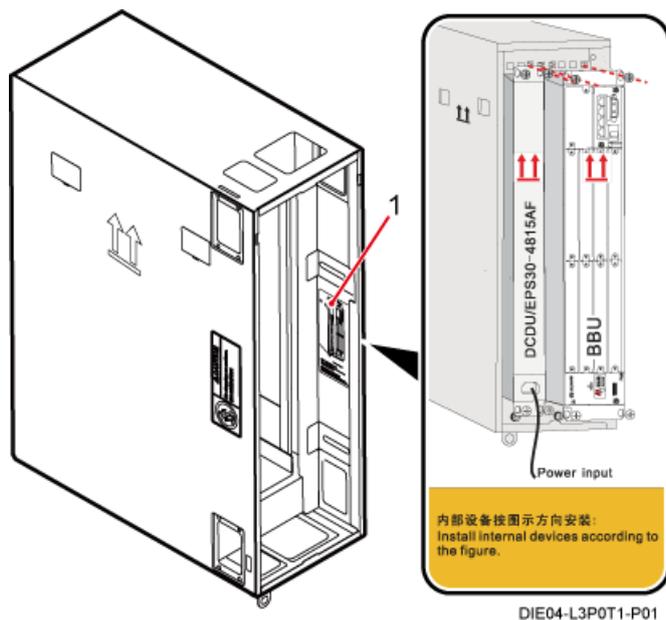
13.4 Installing Devices in the IMB03

This section describes the procedures for installing the BBU and power device in the IMB03. The power device can be the DCDU or AC/DC power device.

Context

The slot assignment label for the BBU and power device is attached to the side of the IMB03, as shown in [Figure 13-37](#). The slot assignment label helps onsite installation engineers to determine the installation positions for the BBU and power device.

Figure 13-37 Slot assignment label



(1) Slot assignment label

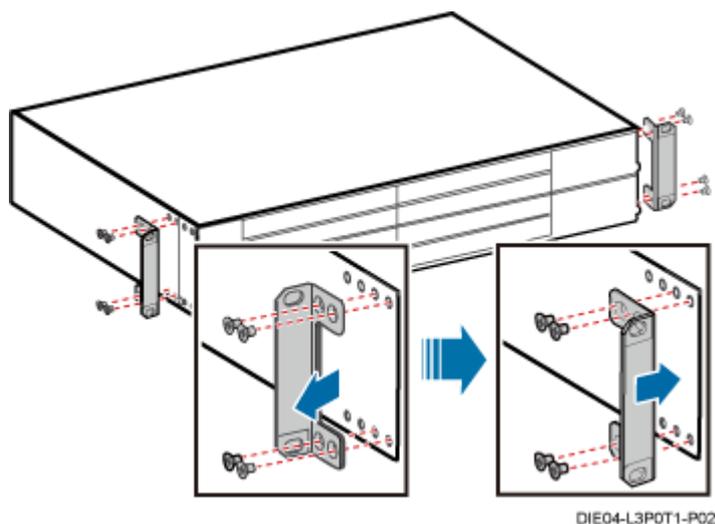
13.4.1 Installing the BBU

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

Procedure

Step 1 Install the mounting ears on both sides of the BBU reversely, as shown in [Figure 13-38](#).

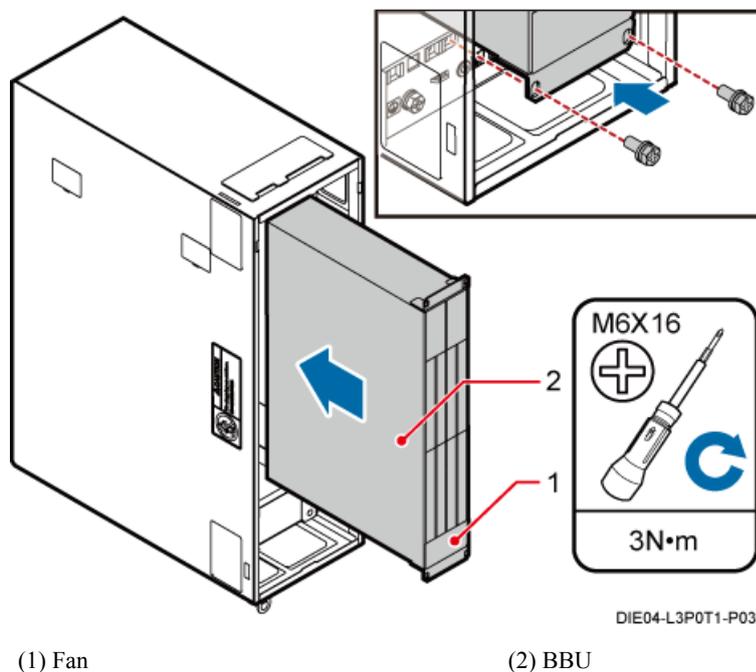
Figure 13-38 Installing mounting ears reversely



Step 2 Slide the BBU into the corresponding slot according to the installation slot label.

Step 3 Use a Phillips screwdriver to tighten the four M6x16 bolts on the panel, as shown in [Figure 13-39](#).

Figure 13-39 Installing the BBU



CAUTION

Ensure that the fan unit of the BBU is at the bottom of the BBU.

---End

13.4.2 Installing the Power Device

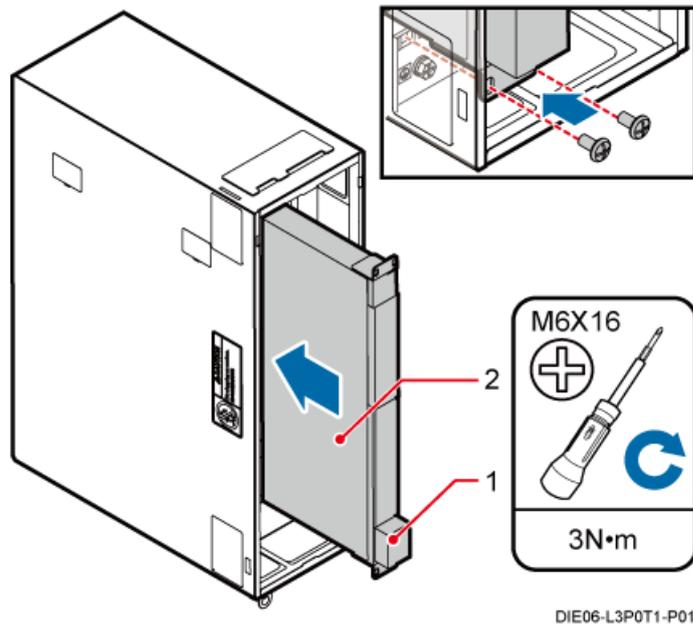
This section describes the procedure for installing the power device in the IMB03. The power device in the IMB03 can be the DCDCU or AC/DC power device. The procedures for installing them are the same. The following description is based on the installation procedure of the DCDCU.

Procedure

Step 1 Slide the DCDCU into the corresponding slot according to the installation slot label.

Step 2 Use a Phillips screwdriver to tighten the four M6x16 bolts on the panel, as shown in [Figure 13-40](#).

Figure 13-40 Installing the DCDU



(1) External Input Power Interface

(2) DCDU

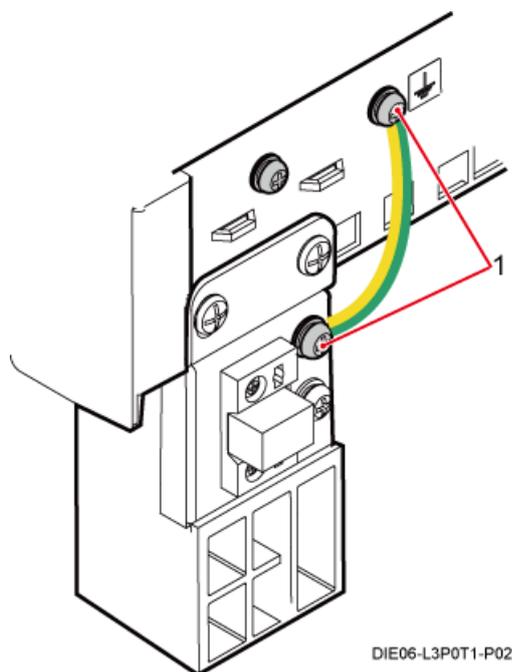


CAUTION

Ensure that the port for external power input is at the bottom of the DCDU.

Step 3 Install the PGND cable for the DCDU, as shown in [Figure 13-41](#).

Figure 13-41 Installing the PGND cable



(1) OT terminal (M4)

----End

13.5 Installing IMB03 Cables

This section describes cable connections and the process of installing cables.

NOTE

In the DC power supply scenario, a BBU power cable must be connected to each UPEU if two UPEUs are installed in the BBU. The 3V3 power connector at one end of each BBU power cable is connected to the -48V port on each UPEU in the BBU, and the easy power receptacle (pressfit type) connectors at the other end are connected to the LOAD6 and LOAD7 ports on the DCDCU-03B, respectively.

13.5.1 Cabling Requirements

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

NOTE

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

General Cabling Requirements

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

- The bending radius of the 7/8" feeder must be more than 250 mm (9.84 in.), and the bending radius of the 5/4" feeder must be more than 380 mm (14.96 in.).
- The bending radius of the 1/4" jumper must be more than 35 mm (1.38 in.). The bending radius of the super-flexible 1/2" jumper must be more than 50 mm (1.97 in.), and the bending radius of the ordinary 1/2" jumper must be more than 127 mm (5 in.).

- The bending radius of the power cable or PGND cable must be at least five times the diameter of the cable.
- The bending radius of a fiber optic cable is at least 20 times the diameter of the fiber optic cable.
- The bending radius of the E1/T1 cable must be at least five times the diameter of the cable.
- The bending radius of the signal cable must be at least five times the diameter of the cable.

The cables must be bound as follows:

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

The cables must be routed as follows:

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

Special Cabling Requirements

Cabling requirements for power cables are as follows:

- -48 V power cables must be bound together.
- +24 V power cables must be bound together.
- Power cables, transmission cables, and signal cables are routed separately.
- Multiple power cables must be bound when routed.
- Power cables must be installed in the position specified in engineering design documents.
- If the length of power cables is insufficient, replace the cables rather than adding connectors or soldering joints to lengthen the cables.

Cabling requirements for PGND cables are as follows:

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

Cabling requirements for E1 cables are as follows:

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

Cabling requirements for fiber optic cables are as follows:

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

13.5.2 Cable Installation Process

This section describes the process of installing IMB03 cables.

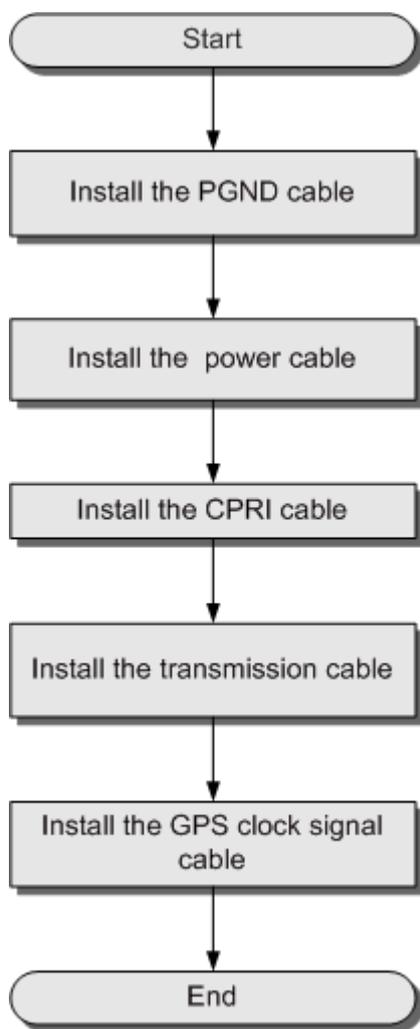
 **NOTE**

The E1/T1 cable or FE/GE cable is used according to the actual requirements on site on the transmission cable.

Process of Installing IMB03 Cables

[Figure 13-42](#) shows the cable installation process.

Figure 13-42 Process of installing IMB03 cables



ICE02-L0P0T0-L11



CAUTION

- You must prepare cables according to actual cable routes during the installation.
- Attach engineering labels to both ends of each cable after the cable is installed.

13.5.3 Cable Connections for the IMB03 in the GSM+UMTS Scenario

This section describes the cable connections for the IMB03 in the GSM+UMTS scenario.

NOTE

In the indoor GU base station, the transmission mode includes co-transmission mode, separate transmission mode and route backup transmission mode, see Transmission Cable Connections in the Indoor GSM+UMTS Base Station in Co-Transmission Mode, Transmission Cable Connections in the Indoor GSM+UMTS Base Station in Separate Transmission Mode and Transmission Cable Connections in the Indoor GSM+UMTS Base Station in Route Backup Transmission Mode. The following description is based on the co-transmission mode.

Figure 13-43 Cable connections in the DC power supply scenario

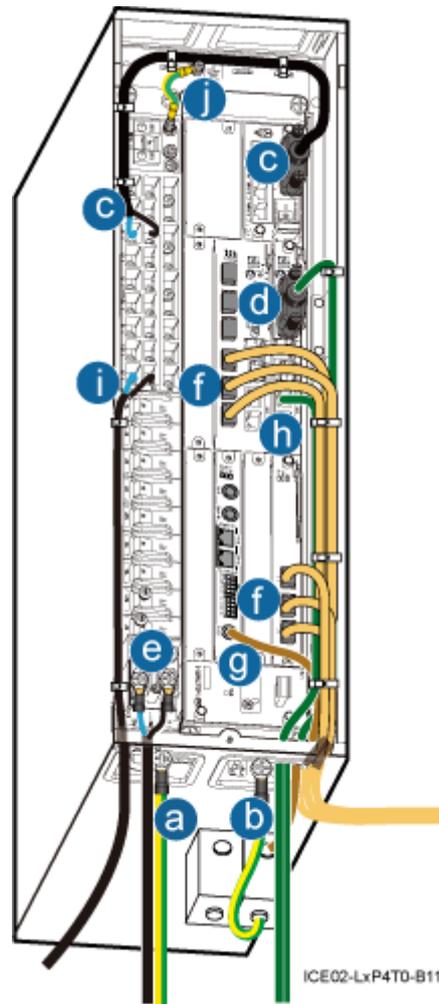
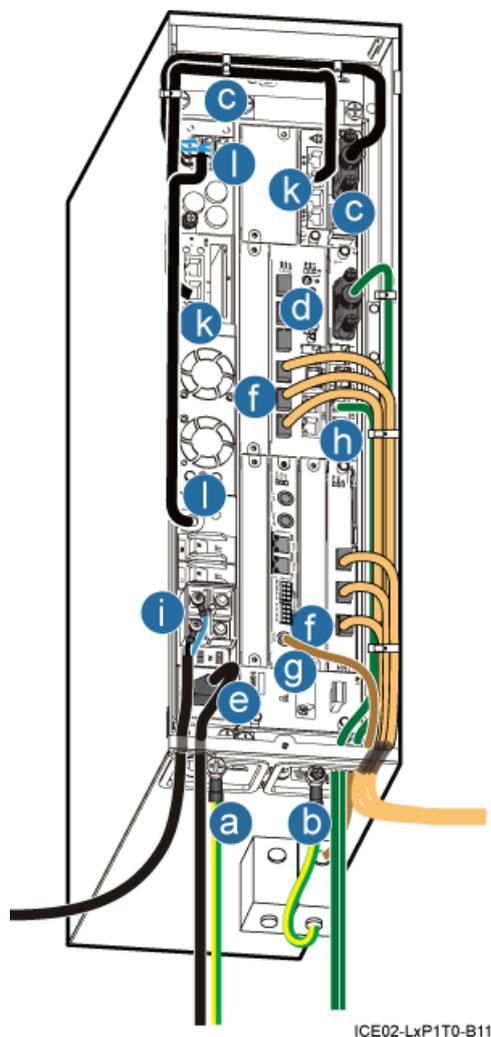


Figure 13-44 Cable connections in the AC power supply scenario



CAUTION

- You may need to prepare cables according to actual cable routes during the cable installations.
- Attach engineering labels to both ends of the cable after each cable is installed.
- When routing the power cable and PGND cable on the bottom of the IMB03, ensure that the holes for heat dissipation are not covered.
- When the IMB03 is installed on the wall, the distance between the E1/T1 cable and the GPS clock signal cable must be not less than 10 mm. [Figure 13-45](#) shows cable routes.

Figure 13-45 Routes of the E1/T1 cable and GPS clock signal cable

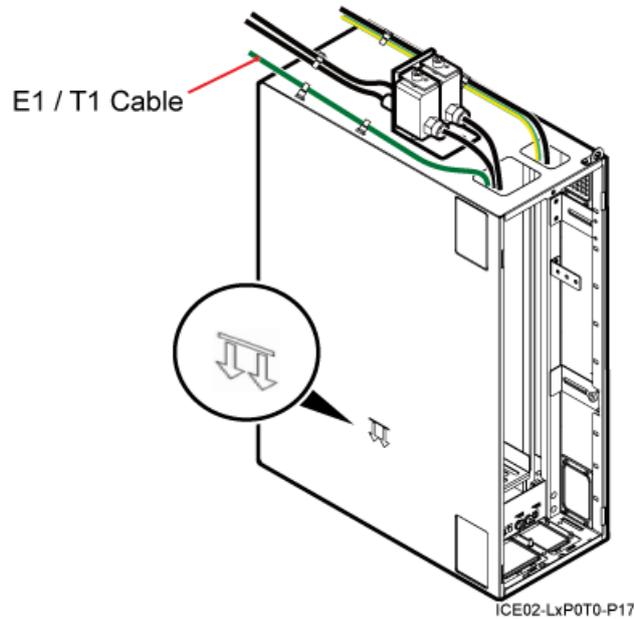


Table 13-1 Cable list

S N	Cable	Connector	Installation Position
a	PGND cable for the IMB03	OT terminal (16 mm ² , M6)	Ground terminal in the IMB03
		Connector added on site	The nearest wiring terminal on the ground bar
b	PGND cable for the GPS surge protector	OT terminal (6 mm ² , M8)	Ground terminal on the GPS surge protector
		OT terminal (6 mm ² , M4)	Ground terminal in the IMB03
c	BBU power cable (in the DC power supply scenario)	3V3 power connector	Power supply port on the UPEU
		OT terminal (1.5 mm ² , M4)	LOAD6 port on the DCDU-03B
	BBU power cable (in the AC power supply scenario)	3V3 power connector	Power supply port on the UPEU
		H4 connector	LOAD1 port on the AC/DC power device
d	E1/T1 cable	DB26 connector	E1/T1 port on the WMPT or GTMU
		Connector added on site	External transmission equipment

S N	Cable	Connector	Installation Position
e	Input power cable (in the DC power supply scenario)	OT terminal (16 mm ² , M6)	Wiring terminal labeled NEG for the blue wire of the input power cable on the DCDU-03B Wiring terminal labeled RTN for the black wire of the input power cable on the DCDU-03B
		Connector added on site	Corresponding wiring terminal on the external DC power distribution device
	Input power cable (in the AC power supply scenario)	C13 connector	AC INPUT terminal on the AC/DC power device
		Connector satisfying the actual requirement	AC socket or Power Distribution Frame (PDF) of the customer
f	CPRI Optical Cable	DLC connector	CPRI port on the WBBP or GTMU
			CPRI_W or CPRI0 port on the RRU
g	GPS clock signal cable	SMA male connector	GPS port on the USCU
		N-type connector	GPS surge protector
h	FE/GE cable	RJ-45 connector	FE0 port on the WMPT or LMPT
			External transmission equipment
i	Power cable for the DC RRU	Easy power receptacle (pressfit type) connector	NEG(-) and RTN(+) ports on the RRU
		OT terminal (M4, 3.3 mm ² , complying with the North American standard)	
		OT terminal (M4, 4 mm ² , complying with the European standard)	
		Easy power receptacle (pressfit type) connector	Power device
		OT terminal (M4, 3.3 mm ² , complying with the North American standard)	LOAD0 to LOAD5 ports on the EPS LOAD0 to LOAD5 ports on the DCDU
		OT terminal (M4, 4 mm ² , complying with the European standard)	LOAD4 to LOAD9 ports on the PDU
j	PGND cable for the DCDU	OT terminal (6 mm ² , M4)	Ground terminal on the DCDU-03B

S N	Cable	Connector	Installation Position
			Ground terminal in the IMB03
k	Monitoring signal cable for the AC/DC power system	RJ-45 connector	MON1 port on the UPEU RS232/RS485
l	PDU power cable	H4 connector	LOAD2 port on the AC/DC power device

13.5.4 Cable Connections for the IMB03 in the GSM+LTE Scenario

This section describes the cable connections for the IMB03 in the GSM+LTE scenario.

NOTE

In the indoor GL base station, the transmission mode includes co-transmission mode, separate transmission mode and route backup transmission mode, see Transmission Cable Connections in the Indoor GSM+LTE Base Station in Co-Transmission Mode, Transmission Cable Connections in the Indoor GSM+LTE Base Station in Separate Transmission Mode and Transmission Cable Connections in the Indoor GSM+LTE Base Station in Route Backup Transmission Mode. The following description is based on the separate transmission.

Figure 13-46 Cable connections in the DC power supply scenario

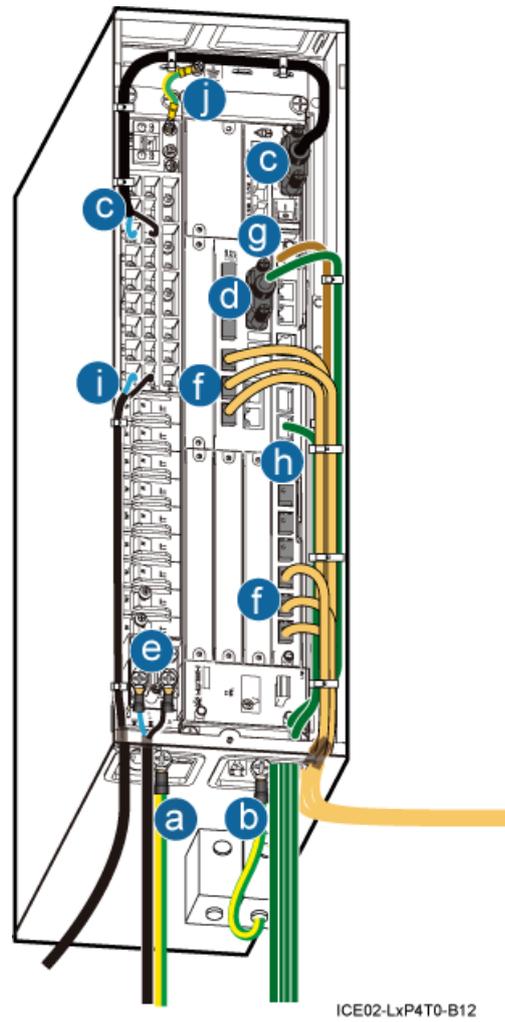
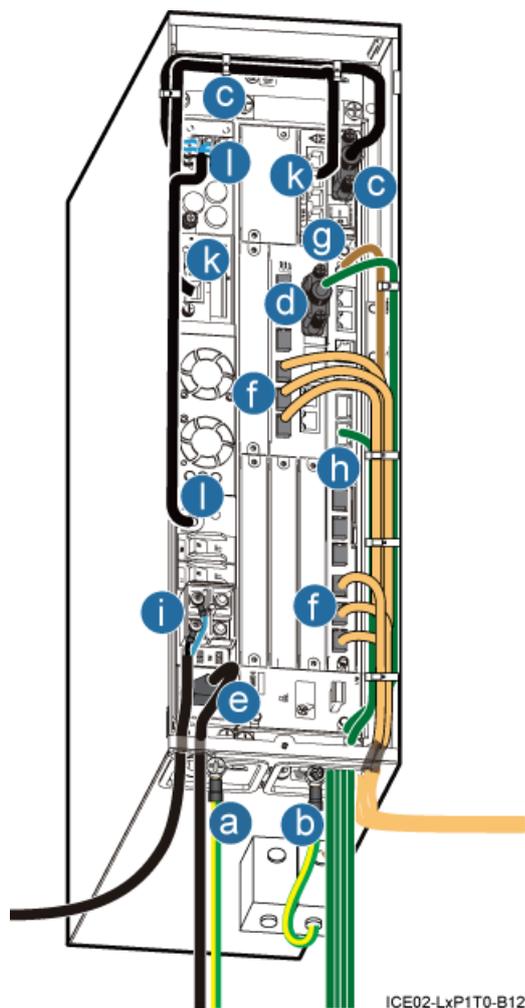


Figure 13-47 Cable connections in the AC power supply scenario



CAUTION

- You may need to prepare cables according to actual cable routes during the cable installations.
- Attach engineering labels to both ends of the cable after each cable is installed.
- When routing the power cable and PGND cable on the bottom of the IMB03, ensure that the holes for heat dissipation are not covered.
- When the IMB03 is installed on the wall, the distance between the E1/T1 cable and the GPS clock signal cable must be not less than 10 mm. [Figure 13-48](#) shows cable routes.

Figure 13-48 Routes of the E1/T1 cable and GPS clock signal cable

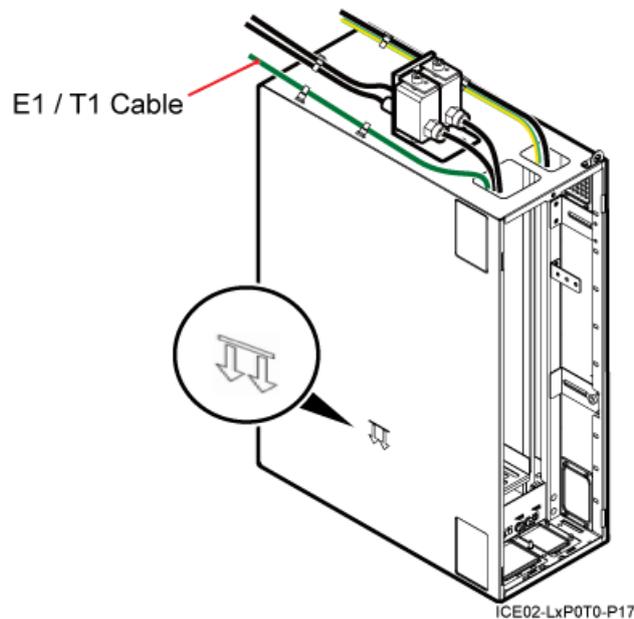


Table 13-2 Cable list

S N	Cable	Connector	Installation Position
a	PGND cable for the IMB03	OT terminal (16 mm ² , M6)	Ground terminal in the IMB03
		Connector added on site	The nearest wiring terminal on the ground bar
b	PGND cable for the GPS surge protector	OT terminal (6 mm ² , M8)	Ground terminal on the GPS surge protector
		OT terminal (6 mm ² , M4)	Ground terminal in the IMB03
c	BBU power cable (in the DC power supply scenario)	3V3 power connector	Power supply port on the UPEU
		OT terminal (1.5 mm ² , M4)	LOAD6 port on the DCDU-03B
	BBU power cable (in the AC power supply scenario)	3V3 power connector	Power supply port on the UPEU
		H4 connector	LOAD1 port on the AC/DC power device
d	E1/T1 cable	DB26 connector	E1/T1 port on the GTMU
		Connector added on site	External transmission equipment
e	Input power cable (in the DC power supply scenario)	OT terminal (16 mm ² , M6)	Wiring terminal labeled NEG for the blue wire of the input power cable on the DCDU-03B Wiring terminal labeled RTN for the black wire of the input power cable on the DCDU-03B

S N	Cable	Connector	Installation Position
	Input power cable (in the AC power supply scenario)	Connector added on site	Corresponding wiring terminal on the external DC power distribution device
		C13 connector	AC INPUT terminal on the AC/DC power device
		Connector satisfying the actual requirement	AC socket or Power Distribution Frame (PDF) of the customer
f	CPRI Optical Cable	DLC connector	CPRI port on the LBBP or GTMU
			CPRI_W or CPRI0 port on the RRU
g	GPS clock signal cable	SMA male connector	GPS port on the LMPT
		N-type connector	GPS surge protector
h	FE/GE optical cable	LC connector	FE1 port on the LMPT or GTMU
		LC connector	External transmission equipment
		FC connector SC connector	
i	Power cable for the DC RRU	Easy power receptacle (pressfit type) connector	NEG(-) and RTN(+) ports on the RRU
		OT terminal (M4, 3.3 mm ² , complying with the North American standard)	
		OT terminal (M4, 4 mm ² , complying with the European standard)	
	Power cable for the AC RRU	Easy power receptacle (pressfit type) connector	Power device
		OT terminal (M4, 3.3 mm ² , complying with the North American standard)	LOAD0 to LOAD5 ports on the EPS
		OT terminal (M4, 4 mm ² , complying with the European standard)	LOAD0 to LOAD5 ports on the DCDU LOAD4 to LOAD9 ports on the PDU
		Round 3-pin connector	AC-in port on the AC RRU
		OT terminal	AC surge protection box
		Connector added on site	Power device

S N	Cable	Connector	Installation Position
j	PGND cable for the DCDU	OT terminal (6 mm ² , M4)	Ground terminal on the DCDU-03B
			Ground terminal in the IMB03
k	Monitoring signal cable for the AC/DC power system	RJ-45 connector	MON1 port on the UPEU
			RS232/RS485
l	PDU power cable	H4 connector	LOAD2 port on the AC/DC power device

13.5.5 Cable Connections for the IMB03 in the UMTS+LTE Scenario

This section describes the cable connections for the IMB03 in the UMTS+LTE scenario.

 **NOTE**

In the indoor UL base station, the transmission mode includes co-transmission mode, separate transmission mode, route backup transmission mode and hybrid transmission mode, see Transmission Cable Connection in the Indoor UMTS+LTE Base Station in Co-Transmission Mode, Transmission Cable Connection in the Indoor UMTS+LTE Base Station in Separate Transmission Mode, Transmission Cable Connection in the Indoor UMTS+LTE Base Station in Route Backup Transmission Mode and Transmission Cable Connection in the Indoor UMTS+LTE Base Station in Hybrid Transmission Mode. The following description is based on the separate transmission mode.

Figure 13-49 Cable connections in the DC power supply scenario

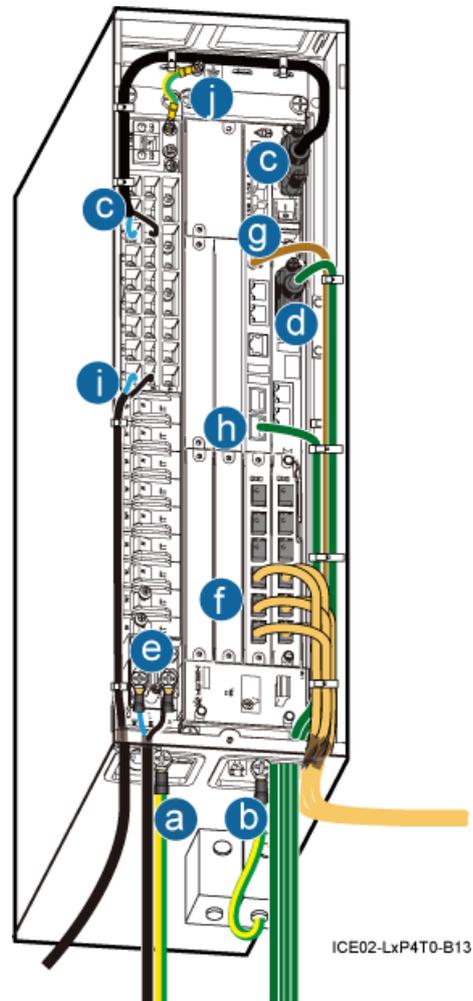
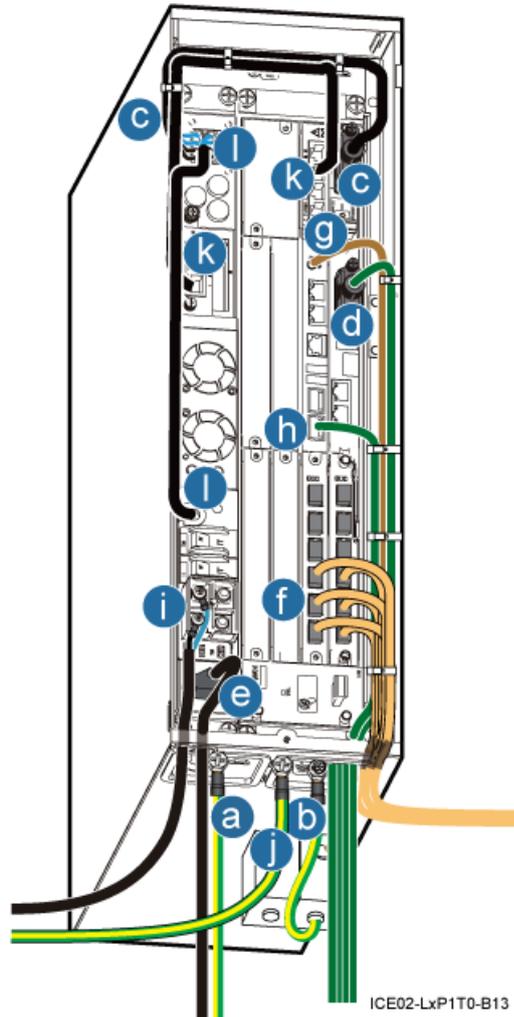


Figure 13-50 Cable connections in the AC power supply scenario



CAUTION

- You may need to prepare cables according to actual cable routes during the cable installations.
- Attach engineering labels to both ends of the cable after each cable is installed.
- When routing the power cable and PGND cable on the bottom of the IMB03, ensure that the holes for heat dissipation are not covered.
- When the IMB03 is installed on the wall, the distance between the E1/T1 cable and the GPS clock signal cable must be not less than 10 mm. **Figure 13-51** shows cable routes.

Figure 13-51 Routes of the E1/T1 cable and GPS clock signal cable

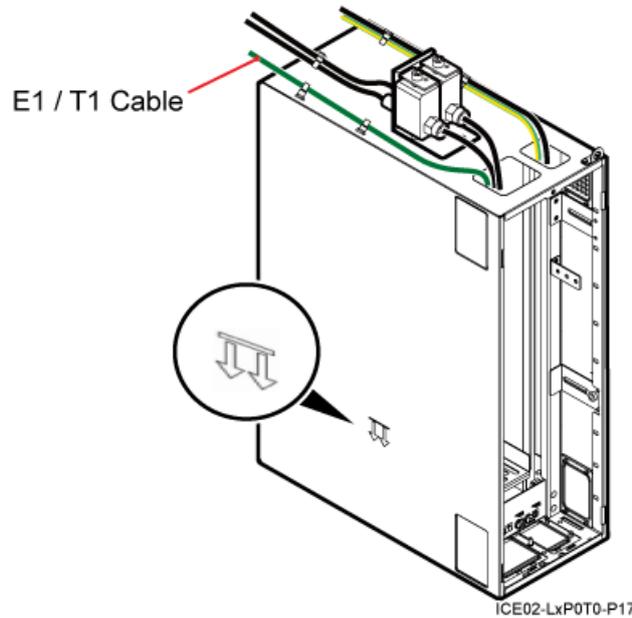


Table 13-3 Cable list

S N	Cable	Connector	Installation Position
a	PGND cable for the IMB03	OT terminal (16 mm ² , M6)	Ground terminal in the IMB03
		Connector added on site	The nearest wiring terminal on the ground bar
b	PGND cable for the GPS surge protector	OT terminal (6 mm ² , M8)	Ground terminal on the GPS surge protector
		OT terminal (6 mm ² , M4)	Ground terminal in the IMB03
c	BBU power cable (in the DC power supply scenario)	3V3 power connector	Power supply port on the UPEU
		OT terminal (1.5 mm ² , M4)	LOAD6 port on the DCDU-03B
	BBU power cable (in the AC power supply scenario)	3V3 power connector	Power supply port on the UPEU
		H4 connector	LOAD1 port on the AC/DC power device
d	E1/T1 cable	DB26 connector	E1/T1 port on the WMPT
		Connector added on site	External transmission equipment
e	Input power cable (in the DC power supply scenario)	OT terminal (16 mm ² , M6)	Wiring terminal labeled NEG for the blue wire of the input power cable on the DCDU-03B Wiring terminal labeled RTN for the black wire of the input power cable on the DCDU-03B

S N	Cable	Connector	Installation Position
	Input power cable (in the AC power supply scenario)	Connector added on site	Corresponding wiring terminal on the external DC power distribution device
		C13 connector	AC INPUT terminal on the AC/DC power device
		Connector satisfying the actual requirement	AC socket or Power Distribution Frame (PDF) of the customer
f	CPRI Optical Cable	DLC connector	CPRI port on the WBBP or LMPT
			CPRI_W or CPRI0 port on the RRU
g	GPS clock signal cable	SMA male connector	GPS port on the LMPT
		N-type connector	GPS surge protector
h	FE/GE optical cable	LC connector	FE1 port on the WMPT or LMPT
		LC connector	External transmission equipment
		FC connector SC connector	
i	Power cable for the DC RRU	Easy power receptacle (pressfit type) connector	NEG(-) and RTN(+) ports on the RRU
		OT terminal (M4, 3.3 mm ² , complying with the North American standard)	
		OT terminal (M4, 4 mm ² , complying with the European standard)	
	Power cable for the AC RRU	Easy power receptacle (pressfit type) connector	Power device
		OT terminal (M4, 3.3 mm ² , complying with the North American standard)	LOAD0 to LOAD5 ports on the EPS
		OT terminal (M4, 4 mm ² , complying with the European standard)	LOAD0 to LOAD5 ports on the DCDU LOAD4 to LOAD9 ports on the PDU
		Round 3-pin connector	AC-in port on the AC RRU
		OT terminal	AC surge protection box
		Connector added on site	Power device

S N	Cable	Connector	Installation Position
j	PGND cable for the DCDU	OT terminal (6 mm ² , M4)	Ground terminal on the DCDU-03B Ground terminal in the IMB03
k	Monitoring signal cable for the AC/DC power system	RJ-45 connector	MON1 port on the UPEU RS232/RS485
l	PDU power cable	H4 connector	LOAD2 port on the AC/DC power device

13.5.6 Cable Connections for the IMB03 in the LTE Only Scenario

This section describes the cable connections for the IMB03 in the LTE only scenario.

Figure 13-52 Cable connections in the DC power supply scenario

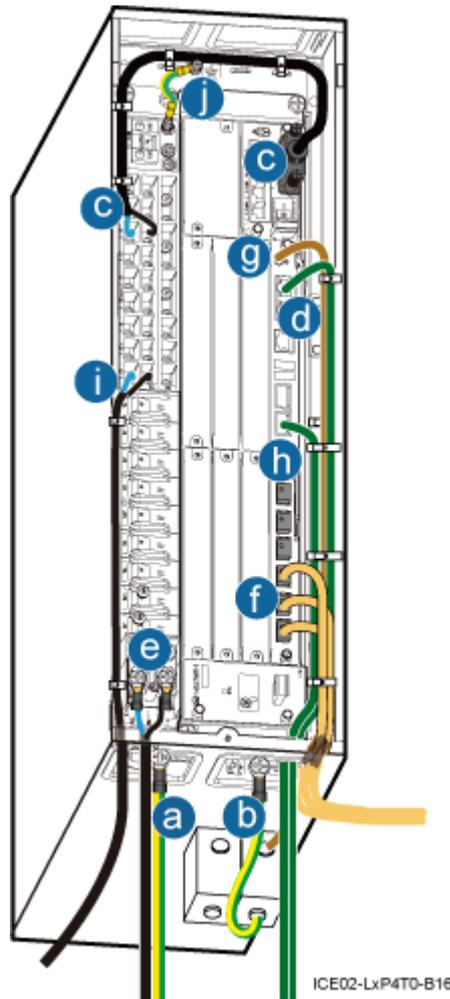
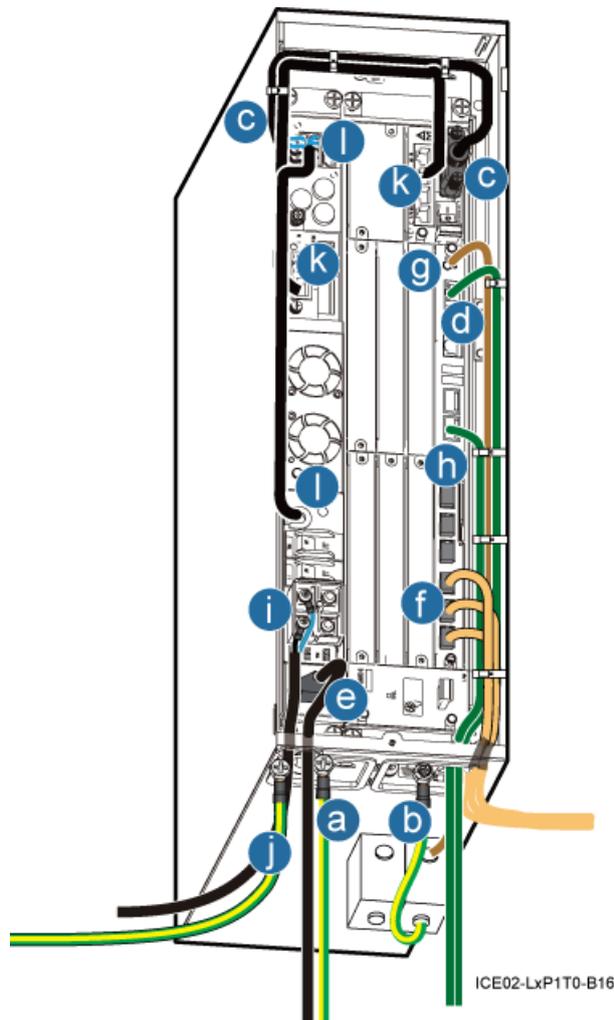


Figure 13-53 Cable connections in the AC power supply scenario



CAUTION

- You may need to prepare cables according to actual cable routes during the cable installations.
- Attach engineering labels to both ends of the cable after each cable is installed.
- When routing the power cable and PGND cable on the bottom of the IMB03, ensure that the holes for heat dissipation are not covered.

Table 13-4 Cable list

S N	Cable	Connector	Installation Position
a	PGND cable for the IMB03	OT terminal (16 mm ² , M6)	Ground terminal in the IMB03
		Connector added on site	The nearest wiring terminal on the ground bar

S N	Cable	Connector	Installation Position
b	PGND cable for the GPS surge protector	OT terminal (6 mm ² , M8)	Ground terminal on the GPS surge protector
		OT terminal (6 mm ² , M4)	Ground terminal in the IMB03
c	BBU power cable (in the DC power supply scenario)	3V3 power connector	Power supply port on the UPEU
		OT terminal (1.5 mm ² , M4)	LOAD6 port on the DCDU-03B
	BBU power cable (in the AC power supply scenario)	3V3 power connector	Power supply port on the UPEU
		H4 connector	LOAD1 port on the AC/DC power device
d	FE/GE cable	RJ-45 connector	FE0 port on the LMPT
			External transmission equipment
e	Input power cable (in the DC power supply scenario)	OT terminal (16 mm ² , M6)	Wiring terminal labeled NEG for the blue wire of the input power cable on the DCDU-03B Wiring terminal labeled RTN for the black wire of the input power cable on the DCDU-03B
		Connector added on site	Corresponding wiring terminal on the external DC power distribution device
	Input power cable (in the AC power supply scenario)	C13 connector	AC INPUT terminal on the AC/DC power device
		Connector satisfying the actual requirement	AC socket or Power Distribution Frame (PDF) of the customer
f	CPRI Optical Cable	DLC connector	CPRI port on the LBBP
			CPRI_W or CPRI0 port on the RRU
g	GPS clock signal cable	SMA male connector	GPS port on the LMPT
		N-type connector	GPS surge protector
h	FE/GE optical cable	LC connector	FE1 port on the LMPT
		LC connector	External transmission equipment
		FC connector SC connector	

S N	Cable	Connector	Installation Position
i	Power cable for the DC RRU	Easy power receptacle (pressfit type) connector OT terminal (M4, 3.3 mm ² , complying with the North American standard) OT terminal (M4, 4 mm ² , complying with the European standard)	NEG(-) and RTN(+) ports on the RRU
		Easy power receptacle (pressfit type) connector OT terminal (M4, 3.3 mm ² , complying with the North American standard) OT terminal (M4, 4 mm ² , complying with the European standard)	Power device LOAD0 to LOAD5 ports on the EPS LOAD0 to LOAD5 ports on the DCDU LOAD4 to LOAD9 ports on the PDU
	Power cable for the AC RRU	Round 3-pin connector	AC-in port on the AC RRU
		OT terminal	AC surge protection box
		Connector added on site	Power device
	j	PGND cable for the DCDU	OT terminal (6 mm ² , M4)
Ground terminal in the IMB03			
k	Monitoring signal cable for the AC/DC power system	RJ-45 connector	MON1 port on the UPEU
			RS232/RS485
l	PDU power cable	H4 connector	LOAD2 port on the AC/DC power device

13.5.7 Cable Connections for the IMB03 in the GSM Only Scenario

This section describes the cable connections for the IMB03 in the GSM only scenario.

Figure 13-54 Cable connections in the DC power supply scenario

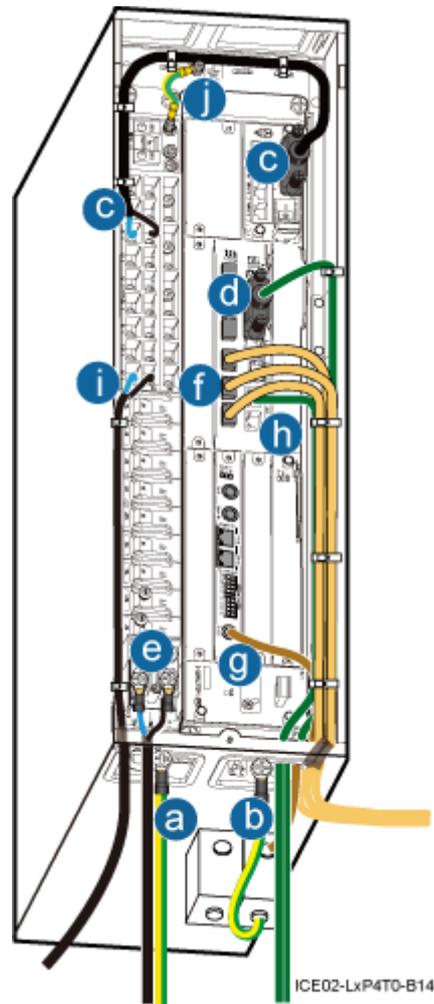
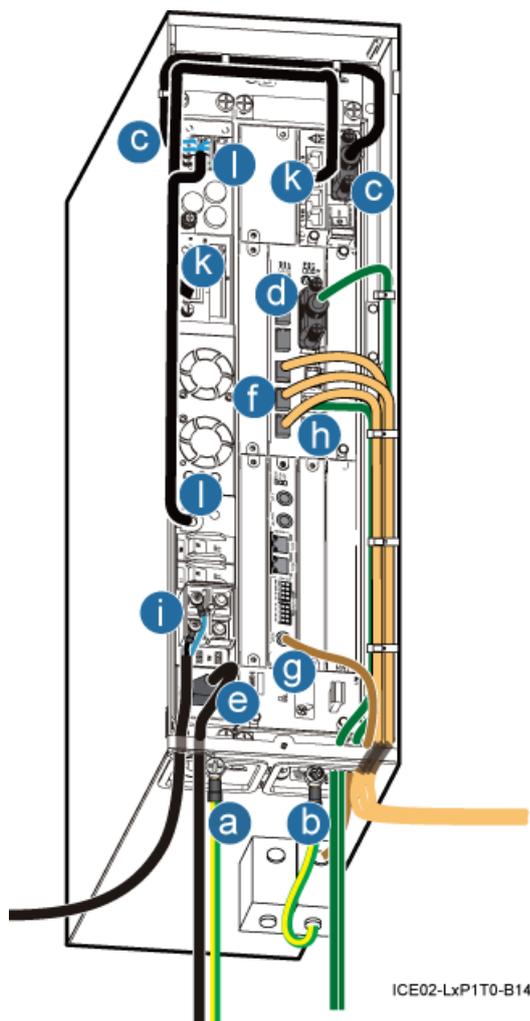


Figure 13-55 Cable connections in the AC power supply scenario



CAUTION

- You may need to prepare cables according to actual cable routes during the cable installations.
- Attach engineering labels to both ends of the cable after each cable is installed.
- When routing the power cable and PGND cable on the bottom of the IMB03, ensure that the holes for heat dissipation are not covered.
- When the IMB03 is installed on the wall, the distance between the E1/T1 cable and the GPS clock signal cable must be not less than 10 mm. [Figure 13-56](#) shows cable routes.

Figure 13-56 Routes of the E1/T1 cable and GPS clock signal cable

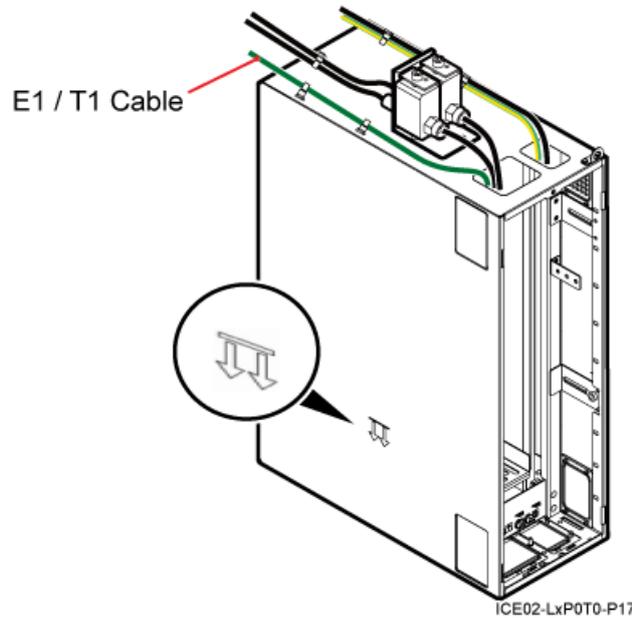


Table 13-5 Cable list

S N	Cable	Connector	Installation Position
a	PGND cable for the IMB03	OT terminal (16 mm ² , M6)	Ground terminal in the IMB03
		Connector added on site	The nearest wiring terminal on the ground bar
b	PGND cable for the GPS surge protector	OT terminal (6 mm ² , M8)	Ground terminal on the GPS surge protector
		OT terminal (6 mm ² , M4)	Ground terminal in the IMB03
c	BBU power cable (in the DC power supply scenario)	3V3 power connector	Power supply port on the UPEU
		OT terminal (1.5 mm ² , M4)	LOAD6 port on the DCDU-03B
	BBU power cable (in the AC power supply scenario)	3V3 power connector	Power supply port on the UPEU
		H4 connector	LOAD1 port on the AC/DC power device
d	E1/T1 cable	DB26 connector	E1/T1 port on the GTMU
		Connector added on site	External transmission equipment
e	Input power cable (in the DC power supply scenario)	OT terminal (16 mm ² , M6)	Wiring terminal labeled NEG for the blue wire of the input power cable on the DCDU-03B Wiring terminal labeled RTN for the black wire of the input power cable on the DCDU-03B

S N	Cable	Connector	Installation Position
		Connector added on site	Corresponding wiring terminal on the external DC power distribution device
	Input power cable (in the AC power supply scenario)	C13 connector	AC INPUT terminal on the AC/DC power device
		Connector satisfying the actual requirement	AC socket or Power Distribution Frame (PDF) of the customer
f	CPRI Optical Cable	DLC connector	CPRI port on the GTMU
			CPRI_W or CPRI0 port on the RRU
g	GPS clock signal cable	SMA male connector	GPS port on the LMPT
		N-type connector	GPS surge protector
h	FE/GE cable	RJ-45 connector	FE0 port on the GTMU
			External transmission equipment
i	Power cable for the DC RRU	Easy power receptacle (pressfit type) connector OT terminal (M4, 3.3 mm ² , complying with the North American standard) OT terminal (M4, 4 mm ² , complying with the European standard)	NEG(-) and RTN(+) ports on the RRU
			Power device LOAD0 to LOAD5 ports on the EPS LOAD0 to LOAD5 ports on the DCDU LOAD4 to LOAD9 ports on the PDU
j	PGND cable for the DCDU	OT terminal (6 mm ² , M4)	Ground terminal on the DCDU-03B
			Ground terminal in the IMB03
k	Monitoring signal cable for the AC/DC power system	RJ-45 connector	MON1 port on the UPEU
			RS232/RS485
l	PDU power cable	H4 connector	LOAD2 port on the AC/DC power device

13.5.8 Cable Connections for the IMB03 in the UMTS Only Scenario

This section describes the cable connections for the IMB03 in the UMTS only scenario.

Figure 13-57 Cable connections in the DC power supply scenario

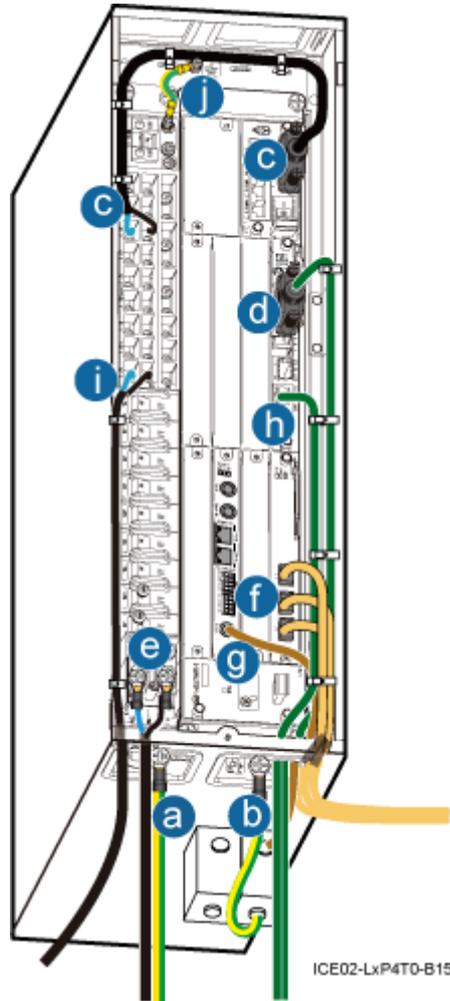
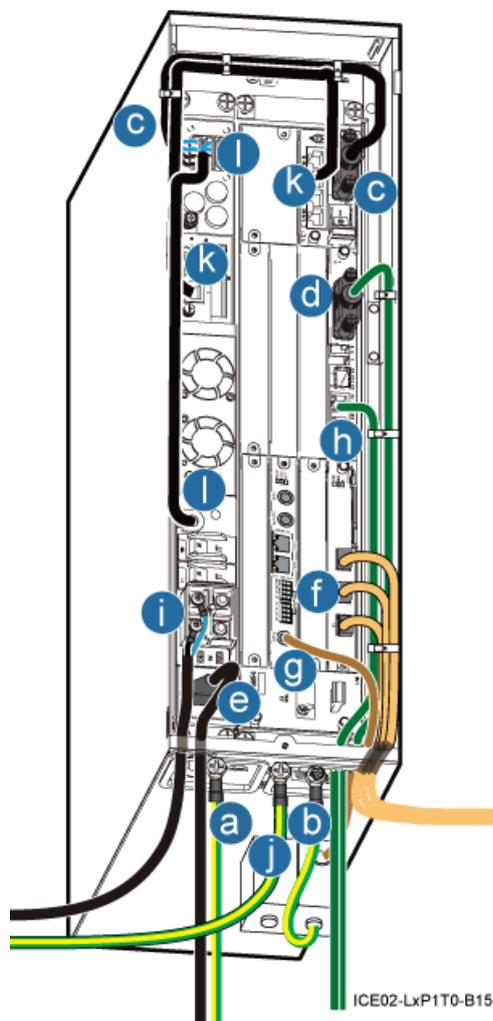


Figure 13-58 Cable connections in the AC power supply scenario



CAUTION

- You may need to prepare cables according to actual cable routes during the cable installations.
- Attach engineering labels to both ends of the cable after each cable is installed.
- When routing the power cable and PGND cable on the bottom of the IMB03, ensure that the holes for heat dissipation are not covered.
- When the IMB03 is installed on the wall, the distance between the E1/T1 cable and the GPS clock signal cable must be not less than 10 mm. [Figure 13-59](#) shows cable routes.

Figure 13-59 Routes of the E1/T1 cable and GPS clock signal cable

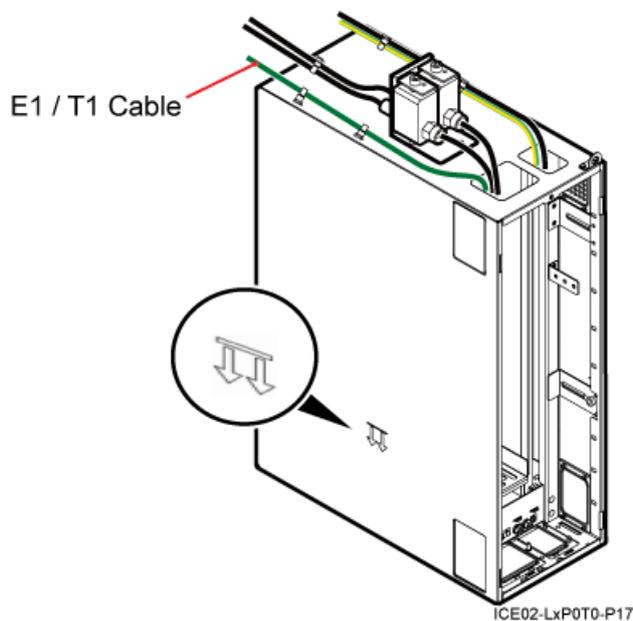


Table 13-6 Cable list

S N	Cable	Connector	Installation Position
a	PGND cable for the IMB03	OT terminal (16 mm ² , M6)	Ground terminal in the IMB03
		Connector added on site	The nearest wiring terminal on the ground bar
b	PGND cable for the GPS surge protector	OT terminal (6 mm ² , M8)	Ground terminal on the GPS surge protector
		OT terminal (6 mm ² , M4)	Ground terminal in the IMB03
c	BBU power cable (in the DC power supply scenario)	3V3 power connector	Power supply port on the UPEU
		OT terminal (1.5 mm ² , M4)	LOAD6 port on the DCDU-03B
	BBU power cable (in the AC power supply scenario)	3V3 power connector	Power supply port on the UPEU
		H4 connector	LOAD1 port on the AC/DC power device
d	E1/T1 cable	DB26 connector	E1/T1 port on the WMPT
		Connector added on site	External transmission equipment
e	Input power cable (in the DC power supply scenario)	OT terminal (16 mm ² , M6)	Wiring terminal labeled NEG for the blue wire of the input power cable on the DCDU-03B Wiring terminal labeled RTN for the black wire of the input power cable on the DCDU-03B

S N	Cable	Connector	Installation Position
	Input power cable (in the AC power supply scenario)	Connector added on site	Corresponding wiring terminal on the external DC power distribution device
		C13 connector	AC INPUT terminal on the AC/DC power device
		Connector satisfying the actual requirement	AC socket or Power Distribution Frame (PDF) of the customer
f	CPRI Optical Cable	DLC connector	CPRI port on the WBBP
			CPRI_W or CPRI0 port on the RRU
g	GPS clock signal cable	SMA male connector	GPS port on the LMPT
		N-type connector	GPS surge protector
h	FE/GE cable	RJ-45 connector	FE0 port on the WMPT
			External transmission equipment
i	Power cable for the DC RRU	Easy power receptacle (pressfit type) connector OT terminal (M4, 3.3 mm ² , complying with the North American standard) OT terminal (M4, 4 mm ² , complying with the European standard)	NEG(-) and RTN(+) ports on the RRU
			Power device LOAD0 to LOAD5 ports on the EPS LOAD0 to LOAD5 ports on the DCDU LOAD4 to LOAD9 ports on the PDU
	Power cable for the AC RRU	Round 3-pin connector	AC-in port on the AC RRU
		OT terminal	AC surge protection box
		Connector added on site	Power device
	j	PGND cable for the DCDU	OT terminal (6 mm ² , M4)
Ground terminal in the IMB03			

SN	Cable	Connector	Installation Position
k	Monitoring signal cable for the AC/DC power system	RJ-45 connector	MON1 port on the UPEU RS232/RS485
l	PDU power cable	H4 connector	LOAD2 port on the AC/DC power device

13.6 IMB03 Hardware Installation Checklist

After the IMB03 is installed, you must check the hardware installation.

Table 13-7 provides the checklist for hardware installation.

Table 13-7 Checklist for hardware installation

SN	Item
1	The position for each equipment conforms to the engineering design and meets the space requirement. Sufficient space is reserved for equipment maintenance.
2	The IMB03, BBU, and auxiliary devices are securely installed, and all the bolts are tightened.
3	The DIP switch on the BBU is correctly set.
4	All the power cables and PGND cables are not short-circuited or reversely connected. In addition, no damaged or broken parts exist.
5	There are no connectors or joints on the power cable or PGND cable.
6	The lugs at both ends of the power cable or the PGND cable are securely soldered or crimped.
7	The bare wire and OT terminal at the wiring terminal are tightly wrapped with the insulation tape or heat-shrinkable tube.
8	The working grounding and protection grounding of the base station and the surge protection grounding of the building share one group of grounding conductors.
9	The connector of the signal cable is intact, and no damaged or broken parts exist on the cable.
10	The distance between the bundled fiber and the BBU panel is between 40 mm and 70 mm.
11	Labels are correct, legible, and complete on both ends of each cable.

13.7 Power-On Check

Before a DBS3900 starts operating, you must check the power-on status of the cabinet and components in it.



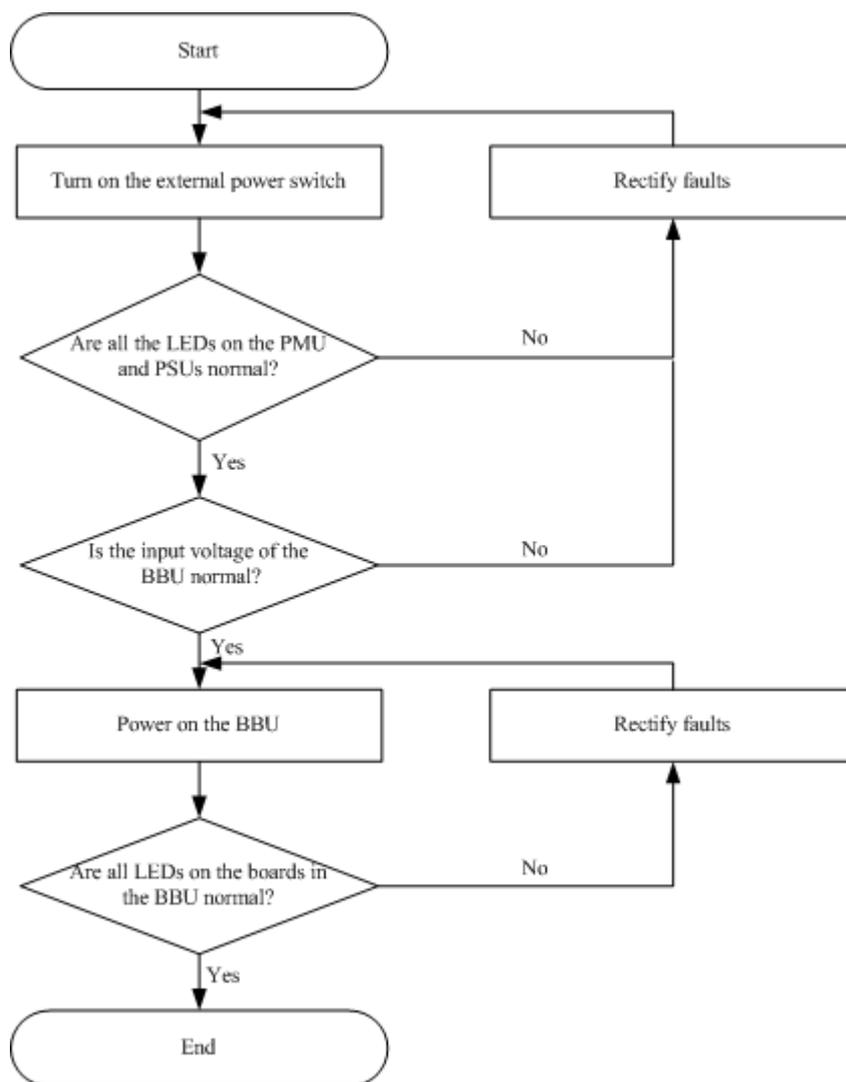
CAUTION

The DBS3900 must be powered on within seven days after it is unpacked, and the period for which the DBS3900 remains powered-off during maintenance must not exceed 48 hours.

Power-On Check in the AC Power Supply Scenario

Figure 13-60 shows the power-on check when a DBS3900 is deployed in the AC power supply scenario.

Figure 13-60 Power-on check in the AC power supply scenario



DID11-L0P1-T1L12

LED Status and Output Voltage Check

- The normal status of the LEDs on a PMU is as follows:
RUN LED: blinking
ALM LED: off
- The normal status of the LEDs on a PSU is as follows:
Power LED: steady green
Protection LED: off
Fault LED: off
- The normal status of the LEDs on a GTMU, WMPT, WBBP, LMPT, LBBP, and UTRP is as follows:
 - RUN LED: on for 1s and off for 1s

- ALM LED: off
- ACT LED: on
- RUN LED on the UPEU: on
- STATE LED on the FAN unit: blinking green slowly (on for 1s and off for 1s)

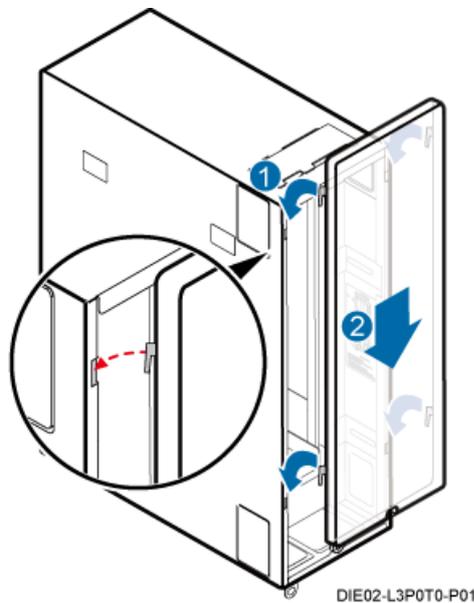
13.8 Installing the Cover Plate for the IMB03

This section describes the procedure for installing the cover plate for the IMB03.

Procedure

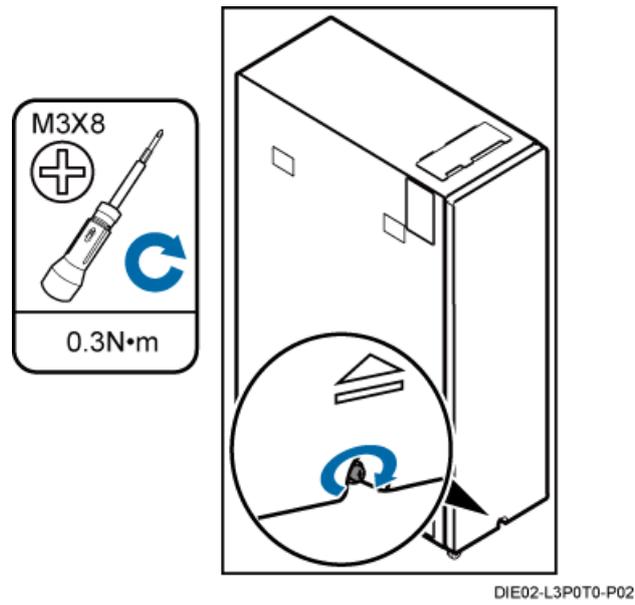
Step 1 Fit the tabs on the cover plate into the slots in the IMB03, as shown in [Figure 13-61](#).

Figure 13-61 Installing the cover plate



Step 2 Tighten the M3×8 bolt on the bottom of the cover plate for the IMB03 to 0.3 N·m using a Phillips torque screwdriver, as shown in [Figure 13-62](#).

Figure 13-62 Securing the cover plate



----End

14 Indoor Scenario with DC Power Supply (BBU Installed Indoors and RRU Powered Outdoors)

About This Chapter

In this scenario, a DBS3900 is deployed indoors with DC power supply. The installation of the BBU is not described in this scenario. An APM30H is installed outdoors, supplying power to and monitoring only RRUs.

[14.1 Installation Process](#)

When a DBS3900 is deployed indoors with DC power supply, the BBU is installed indoors, and RRUs obtain outdoor power supply, you must install a cabinet, components in it, and related cables.

[14.2 Installing a Cabinet](#)

Based on different installation scenarios, an APM30H, TMC11H, IBBS200D, or IBBS200T can be installed on a concrete floor or a metal pole. In addition, installation in stack mode is also supported.

[14.3 Installing PGND Cables](#)

A PGND cable connects the ground bar in a cabinet to an external ground bar, ensuring proper grounding of the cabinet.

[14.4 Installing Components](#)

When a DBS3900 is deployed outdoors with AC power supply, and the BBU is installed indoors, you must install the SLPU and USLP2s in an outdoor APM30H.

[14.5 Installing Cables](#)

This section describes the procedures and precautions to be taken for installing power cables and monitoring signal cables when a DBS3900 is deployed indoors with DC power supply, the BBU is installed indoors, and the RRUs obtain outdoor power supply.

[14.6 Installation Checklist](#)

Check the installation items, installation environment, and cable-related items after the cabinets and devices are all installed.

[14.7 Power-On Check](#)

Before a DBS3900 starts operating, you must check the power-on status of the cabinet and components in it.

[14.8 Subsequent Operations](#)

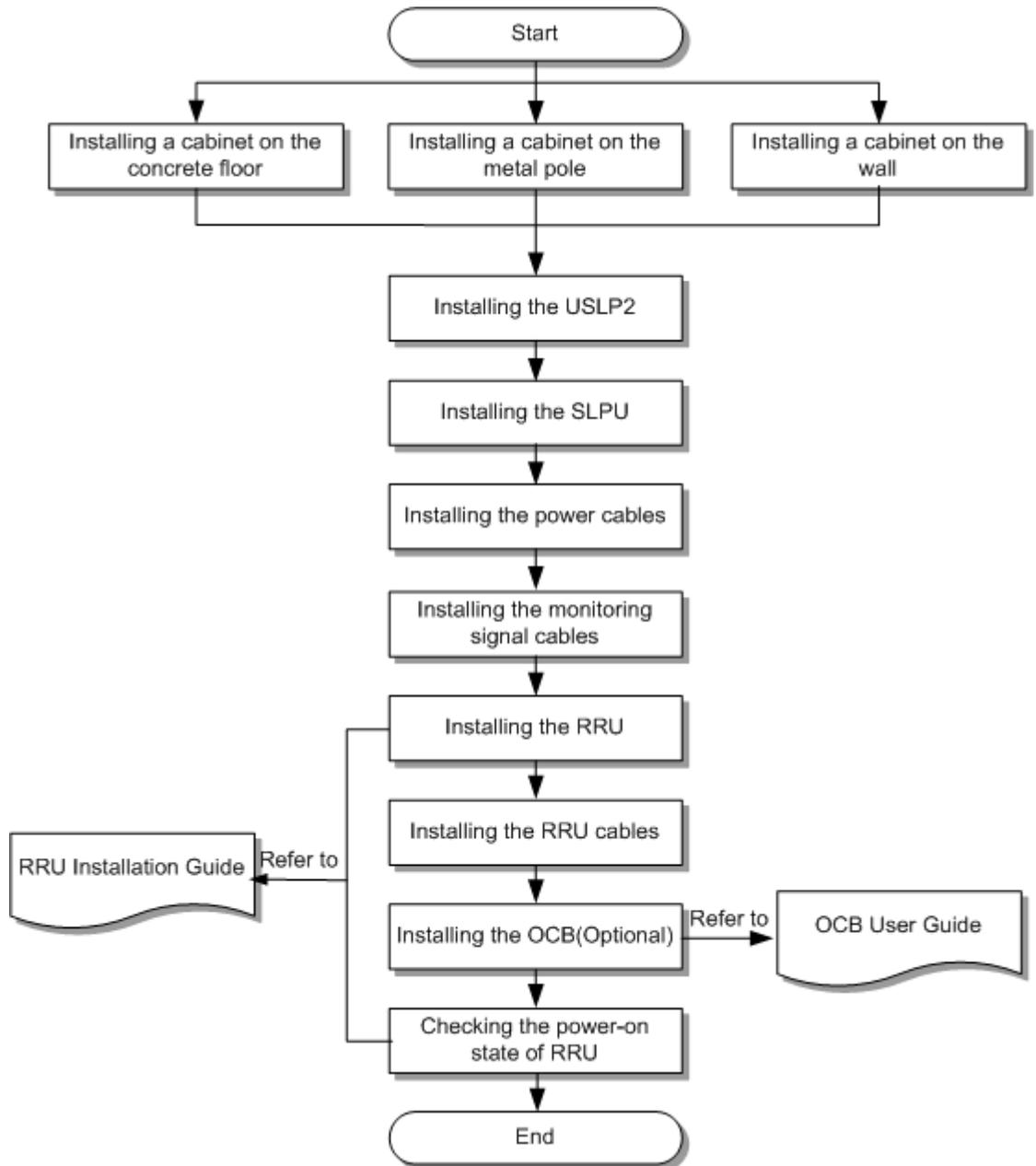
You must perform subsequent operations after installing a base station and checking related hardware installation.

14.1 Installation Process

When a DBS3900 is deployed indoors with DC power supply, the BBU is installed indoors, and RRUs obtain outdoor power supply, you must install a cabinet, components in it, and related cables.

Figure 14-1 shows the installation process.

Figure 14-1 Installation process



 NOTE

- The procedure for installing an RRU is not described in this document. For details about how to install an RRU, see the associated RRU installation guide according to the RRU model.
- The Outdoor Cable Conversion Box (OCB) is an optional component, which is used to connect cables with different cross-sectional areas. For details about an OCB, see the *OCB User Guide*.

14.2 Installing a Cabinet

Based on different installation scenarios, an APM30H, TMC11H, IBBS200D, or IBBS200T can be installed on a concrete floor or a metal pole. In addition, installation in stack mode is also supported.

14.2.1 Installing a Cabinet on a Concrete Floor

You must install a base on a concrete floor before installing an APM30H, TMC11H, IBBS200D, or IBBS200T on the base. You can stack another cabinet on the installed cabinet as required.

Installing a Base

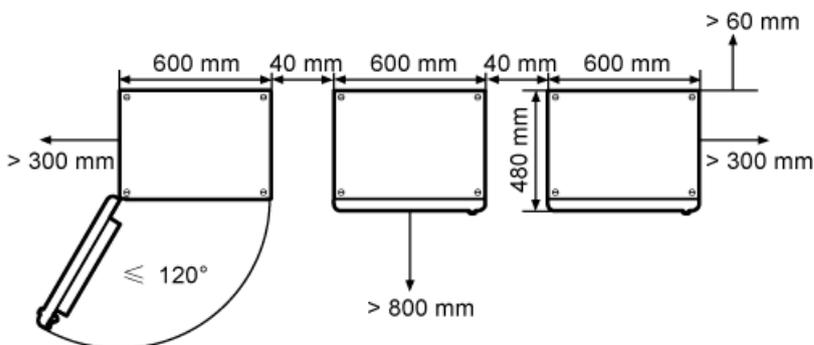
This section describes the procedure and precautions to be taken for installing a base on a concrete floor. You must install a base on a concrete floor before installing an APM30H, TMC11H, IBBS200D, or IBBS200T on the base.

Context

- An APM30H, TMC11H, IBBS200D, or IBBS200T can be installed independently, side by side, or in stack mode. Different types of cabinet must be installed in compliance with cabinet configuration principles. For details about cabinet configuration principles and installation positions, see the associated cabinet configurations.
- When two cabinets are combined, the minimum distance between the cabinets is 40 mm, and the maximum distance between the cabinets is 150 mm. If the Noise Reduction Module (NRM) is installed, the distance between the cabinets is 150 mm.

Figure 14-2 shows the cabinet installation clearance.

Figure 14-2 Cabinet installation clearance (plan view)

 NOTE

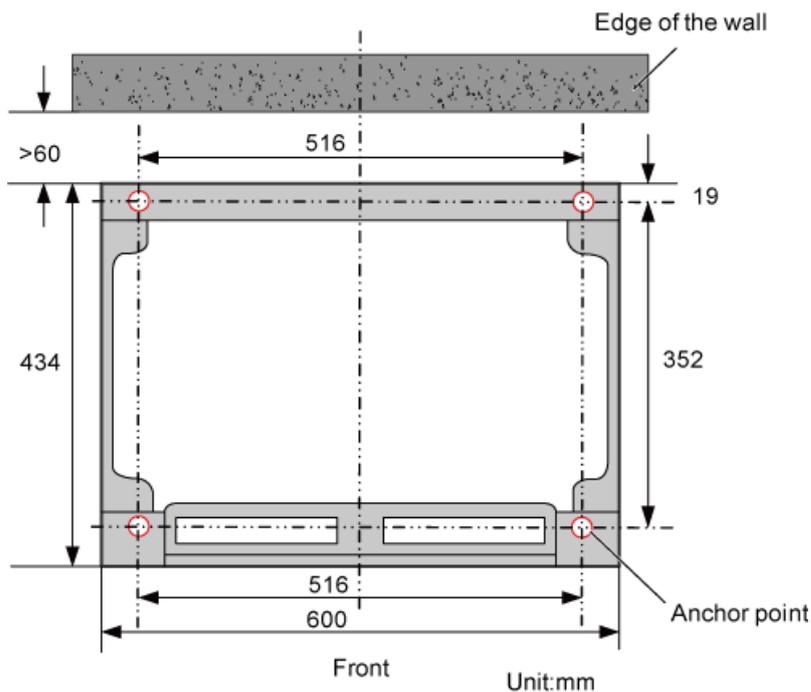
The type of cabinet in **Figure 14-2** can be APM30H, TMC11H, or IBBS200D.

Procedure

Step 1 Determine the position for installing a base.

1. According to the engineering drawing and installation clearance requirements, determine the position for installing a cabinet.
2. On the concrete pad, mark holes to determine the installation position of the base, as shown in [Figure 14-3](#).

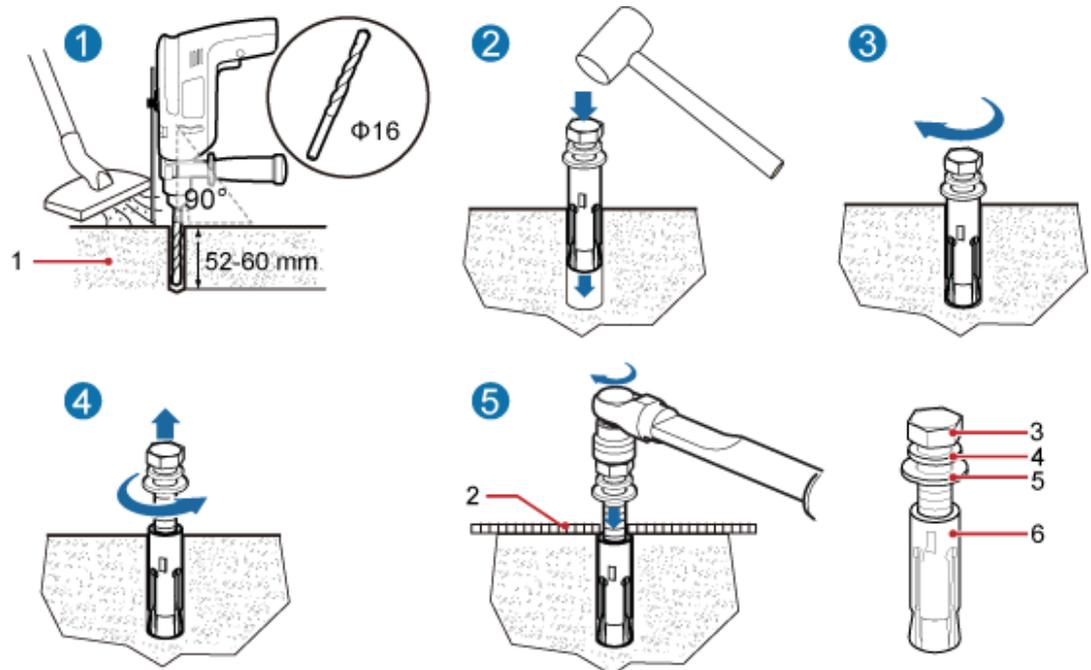
Figure 14-3 Installation holes of the base



3. After marking all the holes, use the measuring tape to check whether the distances between the holes are accurate.

Step 2 Drill holes at the anchor points, and then install the expansion bolt assemblies, as shown in [Figure 14-4](#).

Figure 14-4 Drilling holes on the concrete pad



(1) Concrete pad (2) Base of the cabinet (3) M12x60 bolt (4) Spring washer (5) Flat washer (6) Expansion tube

1. Use a hammer drill with bit 16 to drill holes at the anchor points, and ensure that the depth of each hole ranges from 52 mm to 60 mm.



CAUTION

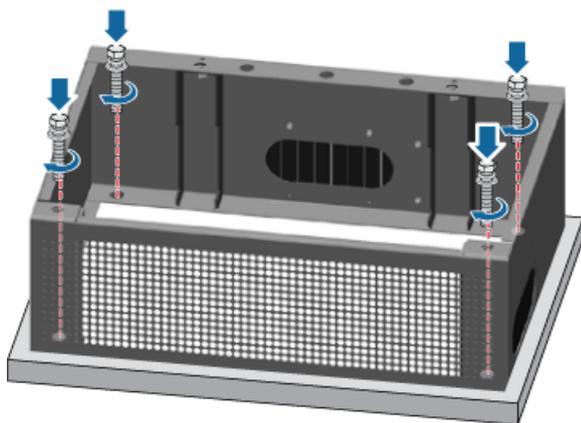
- Do not drill holes through the holes in the base by using a hammer drill. Drilling holes through the holes in the base may damage the paint on the base.
 - Take proper safety measures to protect your eyes and respiratory tract against the dust before drilling holes.
2. Use a vacuum cleaner to clear the dust inside and around the holes. If the inter-hole spacing is too wide or too narrow, locate and drill holes again.
 3. Slightly tighten the expansion bolt, and then put the expansion bolt assembly into the hole vertically.
 4. Use a rubber mallet to hammer the expansion bolt until the expansion tube is buried into the hole, and then tighten the bolt.
 5. Remove the bolt, spring washer, and flat washer counterclockwise.

 **CAUTION**

After dismantling the expansion bolt assembly, ensure that the top of the expansion tube is on the same level as the floor.

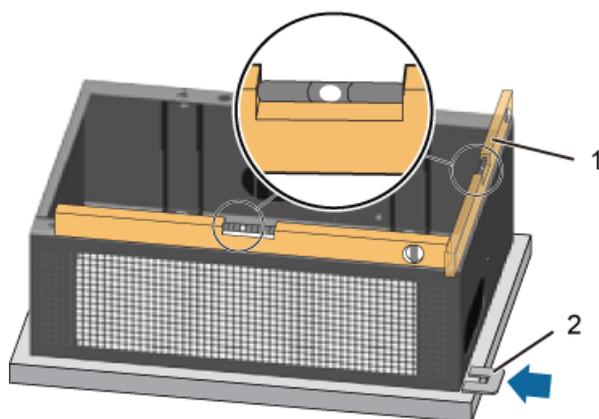
Step 3 Align the base, and then install the bolt with the spring washer and flat washer, as shown in [Figure 14-5](#).

Figure 14-5 Aligning the base



Step 4 Use a level to check the base level. If the base is not level, use adjusting pads to adjust the base level, as shown in [Figure 14-6](#).

Figure 14-6 Adjusting the base level

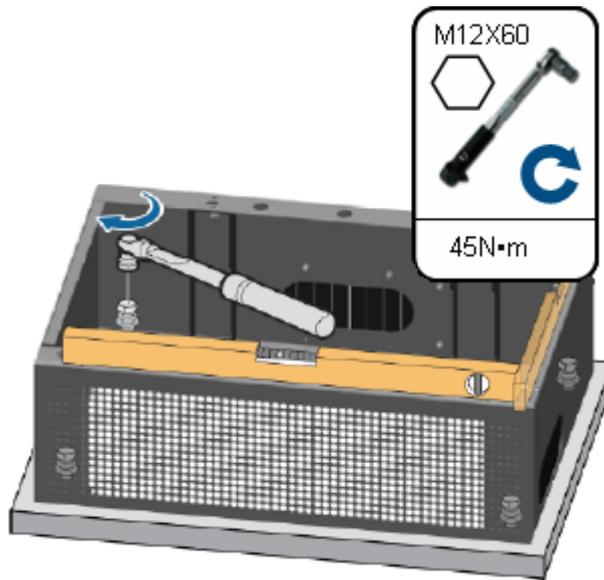


(1) Level

(2) Adjusting pad

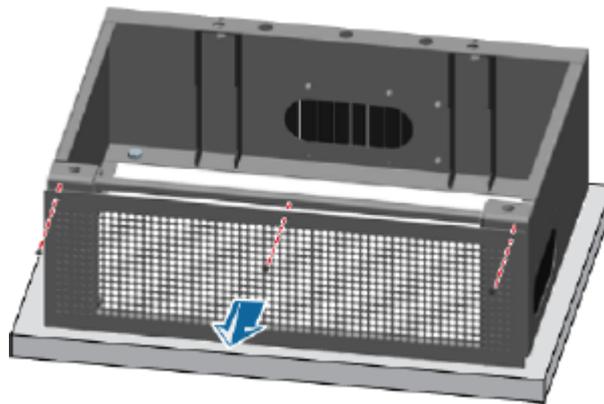
Step 5 Use a torque wrench to tighten the bolts with the tightening torque of 45 N·m, as shown in [Figure 14-7](#).

Figure 14-7 Tightening the bolts



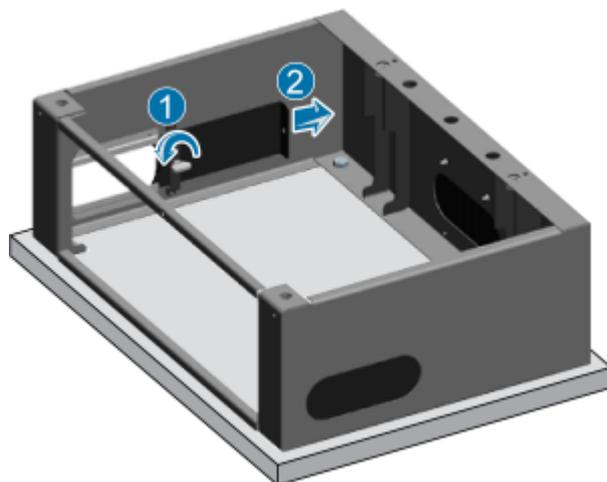
Step 6 Loosen the three screws on the front cover plate of the base, and then remove the front cover plate, as shown in [Figure 14-8](#).

Figure 14-8 Removing the front cover plate



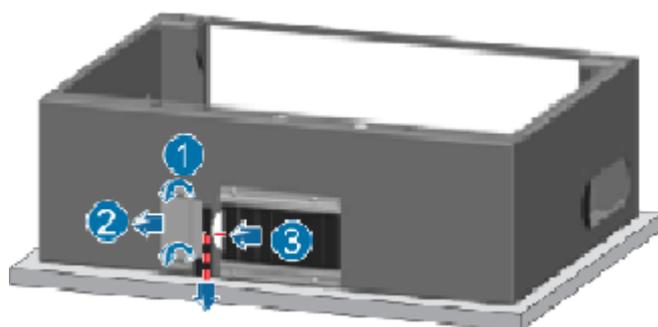
Step 7 Remove the baffle plate from either side of the base (by taking the left side as an example), as shown in [Figure 14-9](#).

Figure 14-9 Removing the baffle plate



Step 8 Remove the baffle plate from the back of the base, as shown in [Figure 14-10](#).

Figure 14-10 Removing the baffle plate from the back



---End

Installing a Cabinet on a Base

This section describes the procedure and precautions to be taken for installing a cabinet on a base after the base is installed on the concrete floor.

Context



NOTE

The following figures are based on the IBBS200D. The procedure for installing the APM30H, TMC11H, or IBBS200T is the same as that for installing the IBBS200D.

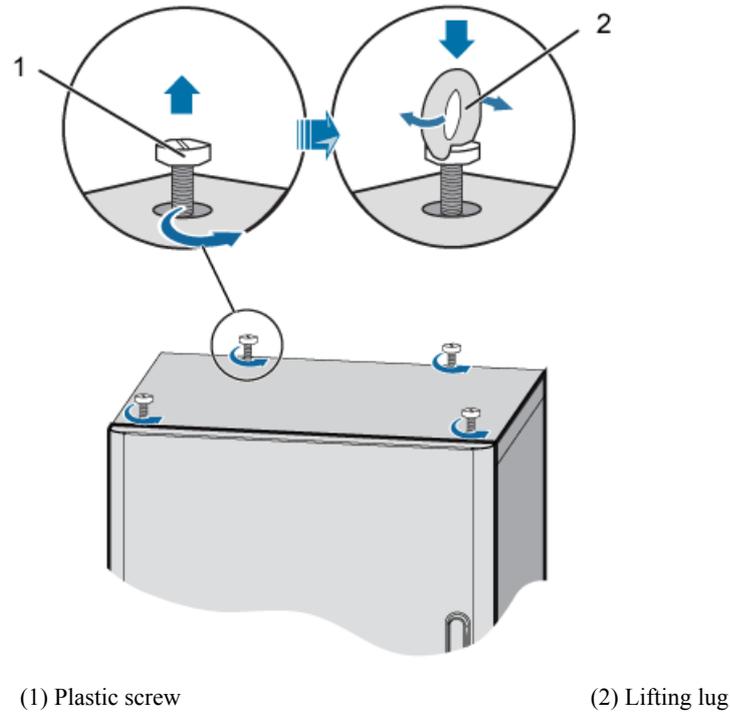
Procedure

Step 1 Remove the four plastic screws from the top of the cabinet, and then install the lifting lugs in the corresponding holes, as shown in Figure 1.

 **CAUTION**

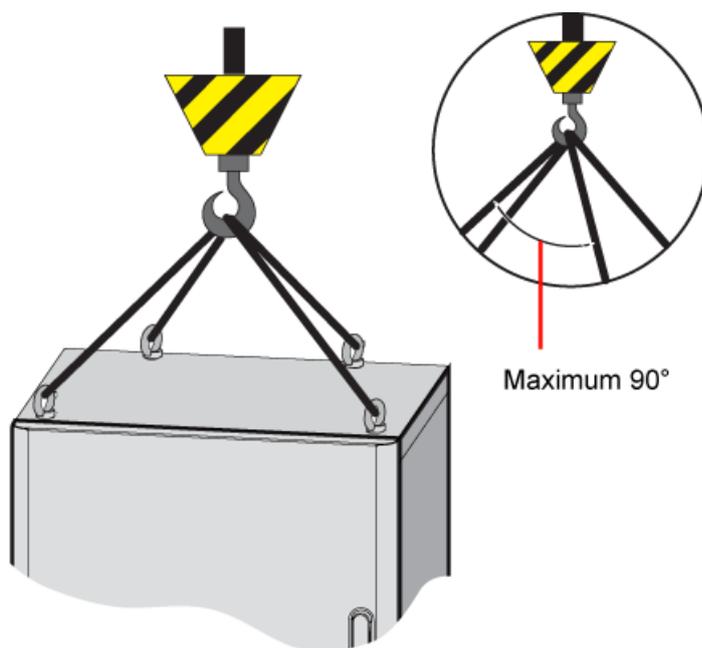
Reserve the plastic screws for later use.

Figure 14-11 Installing the lifting lugs



Step 2 Install ropes on the lifting lugs, and then lift the cabinet, as shown in Figure 2.

Figure 14-12 Installing the ropes



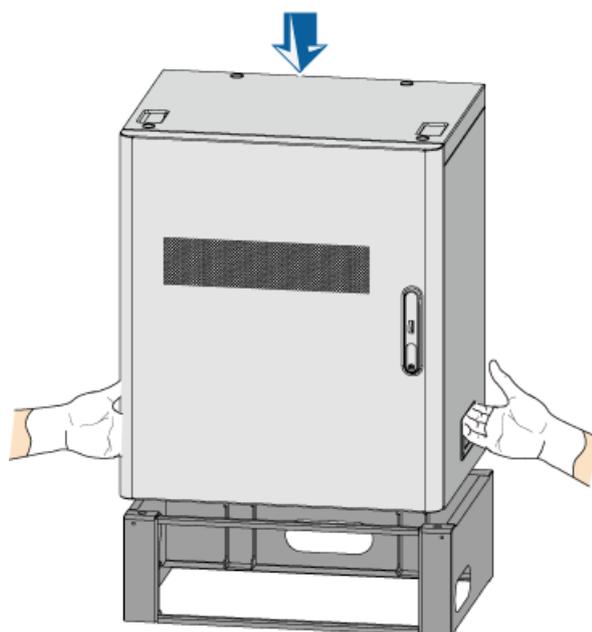
Step 3 Lift the cabinet onto the base, and then gently push the cabinet to align the cabinet with the base, as shown in [Figure 14-13](#).



WARNING

At least two installation engineers are required for lifting the cabinet.

Figure 14-13 Lifting a cabinet onto a base

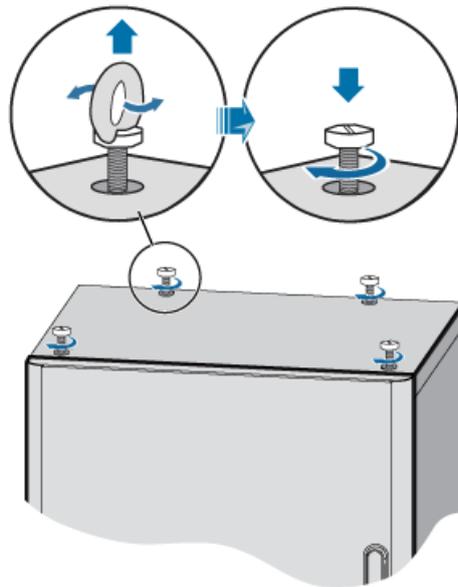


Step 4 Remove the ropes and lifting lugs, and then install the plastic screws, as shown in Figure 4.



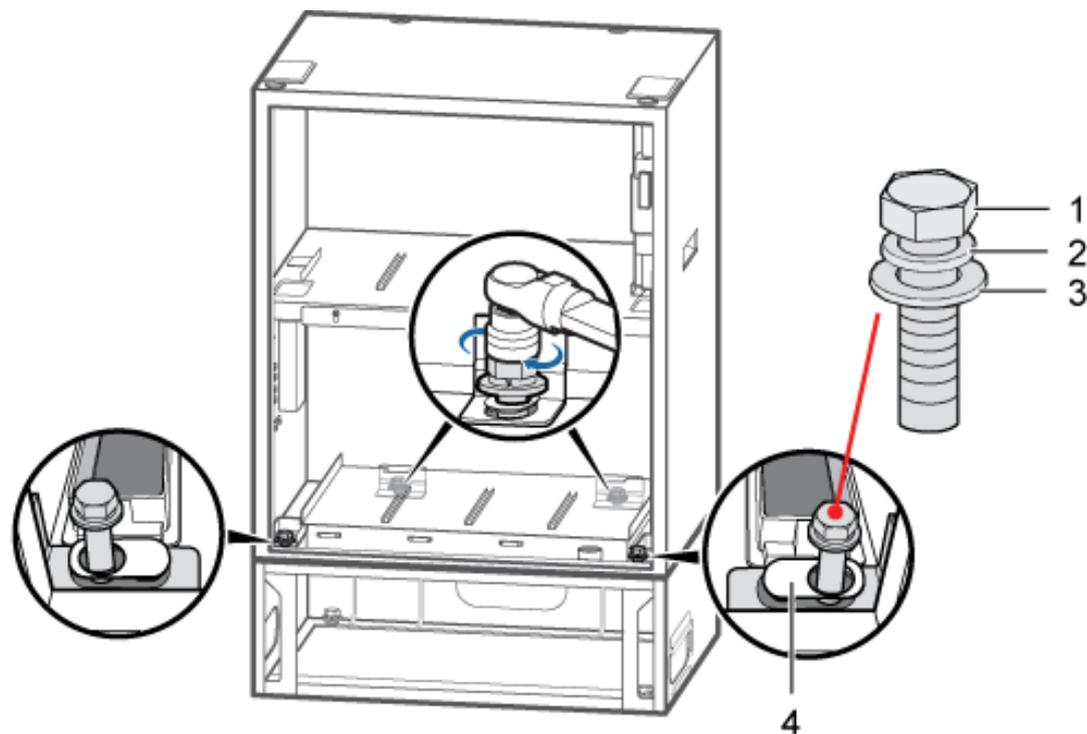
Before installing the rubber screws, clean the mounting holes to prevent entry of metal bits.

Figure 14-14 Installing the plastic screws



Step 5 Use four M12x30 bolts to secure the cabinet on the base, as shown in Figure 7.

Figure 14-15 Securing the IBBS200D on the base



- (1) M12x30 bolt (2) Spring washer (3) Flat washer (4) Gasket with an oblong hole

---End

14.2.2 Installing a Cabinet on a Metal Pole

This section describes the procedure and precautions to be taken for installing a cabinet on a metal pole. An APM30H or TMC11H can be installed on a metal pole.

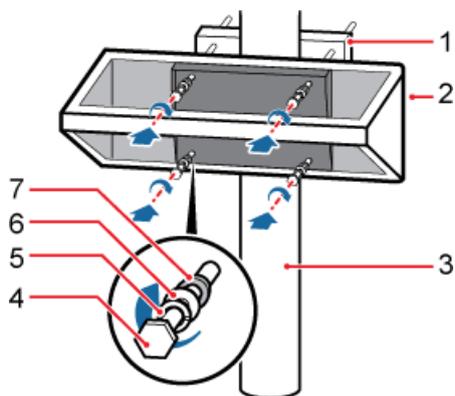
Procedure

Step 1 Use four M12×60 bolts to secure a trapezoidal rack at a proper height of a metal pole, as shown in [Figure 14-16](#).

NOTE

- The cabinet cannot be installed at a height of more than 10,000 mm.
- The diameter of a metal pole must range from 60 mm to 114 mm.

Figure 14-16 Installing a trapezoidal rack

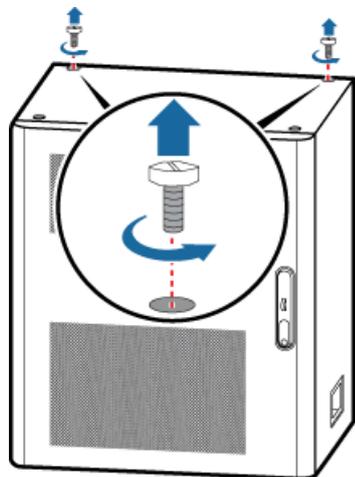


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- | | | |
|-----------------------|----------------------|-----------------|
| (1) Adapting piece | (2) Trapezoidal rack | (3) Metal pole |
| (4) Bolt | (5) Spring washer | (6) Flat washer |
| (7) Waterproof gasket | | |

Step 2 Remove the two plastic screws that are near the back of the cabinet from the top of the cabinet, as shown in [Figure 14-17](#).

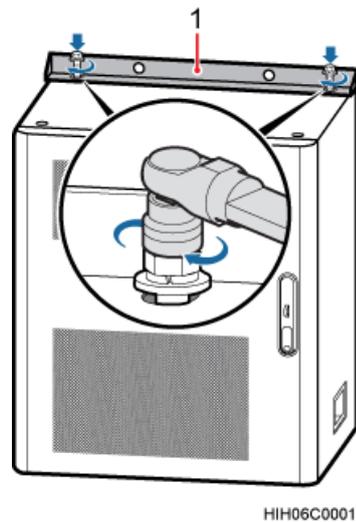
Figure 14-17 Removing plastic screws



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Step 3 Install a fastening bar on the top of the cabinet, and then use a socket wrench to tighten the two M12×30 bolts, as shown in [Figure 14-18](#).

Figure 14-18 Installing a fastening bar



(1) Fastening bar

Step 4 Lift the cabinet onto the trapezoidal rack, use four M12×30 bolts to secure the cabinet on the trapezoidal rack, and then use a socket wrench to tighten the bolts, as shown in [Figure 14-20](#).



CAUTION

Do not move the cover plates for the round cable holes to avoid entry of water into the cabinet. [Figure 14-19](#) shows the positions of the cover plates for the round cable holes.

Figure 14-19 Positions of the cover plates for the round cable holes

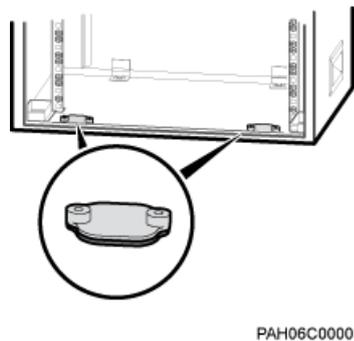
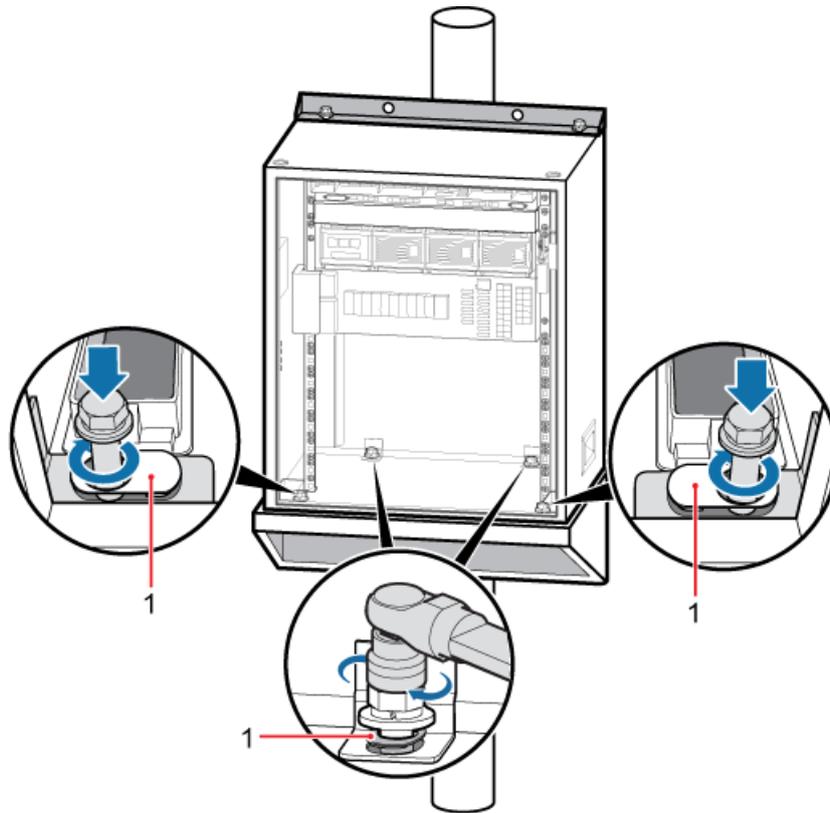


Figure 14-20 Installing a cabinet



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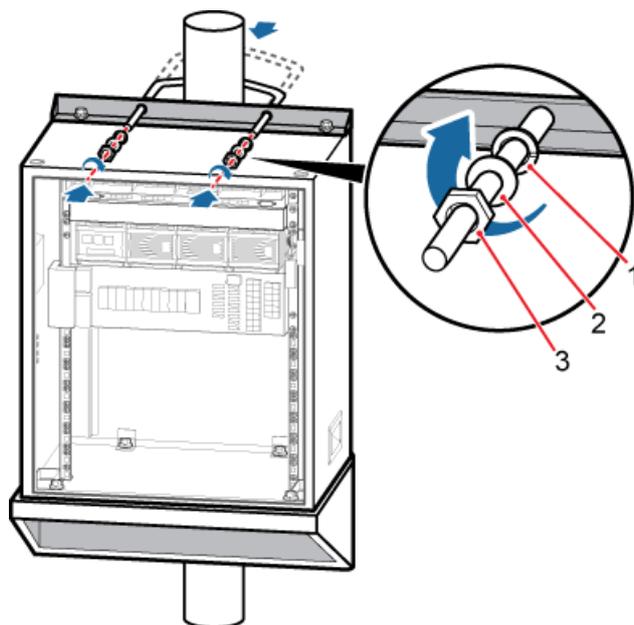
(1) Gasket with an oblong hole

Step 5 Lead the U-shaped piece through the holes on the fastening bar installed on the top of the cabinet, as shown in [Figure 14-21](#).

NOTE

When a cabinet is installed on a metal pole, grease must be applied. For details, see [14.8.3 Applying Grease](#).

Figure 14-21 Installing a U-shaped piece



HIH06C0003

(1) Flat washer

(2) Spring washer

(3) Nut

---End

14.2.3 Installing a Cabinet on a Wall

This section describes the procedure and precautions to be taken for installing a cabinet on a wall. An APM30H or TMC11H can be installed on a wall.

Context

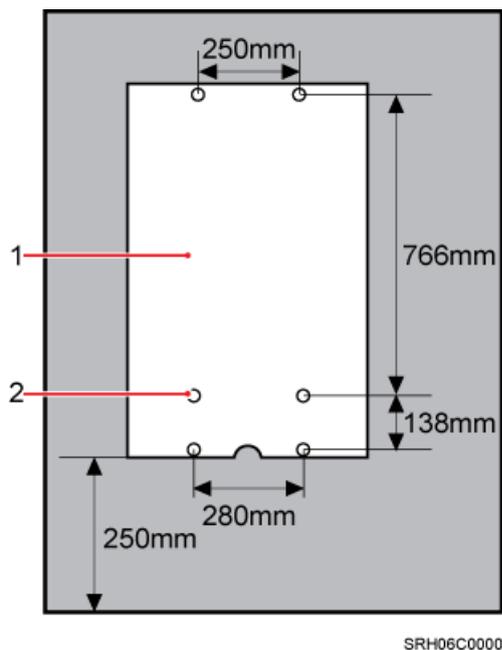
 **NOTE**

- The cabinet cannot be installed at a height of more than 10,000 mm.

Procedure

- Step 1** Press a marking template against the wall, and then mark six mounting holes based on the marking template, as shown in [Figure 14-22](#).

Figure 14-22 Marking mounting holes

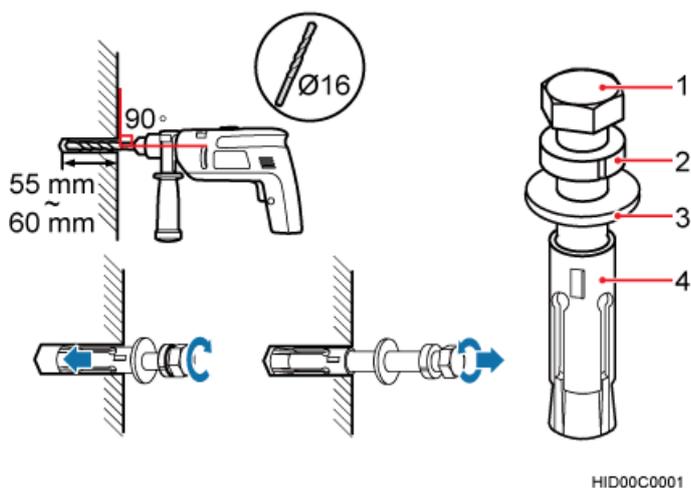


(1) Marking template

(2) Mounting holes

Step 2 Drill holes at the anchor points, and then install expansion bolt assemblies, as shown in [Figure 14-23](#).

Figure 14-23 Installing an expansion bolt



(1) Bolt

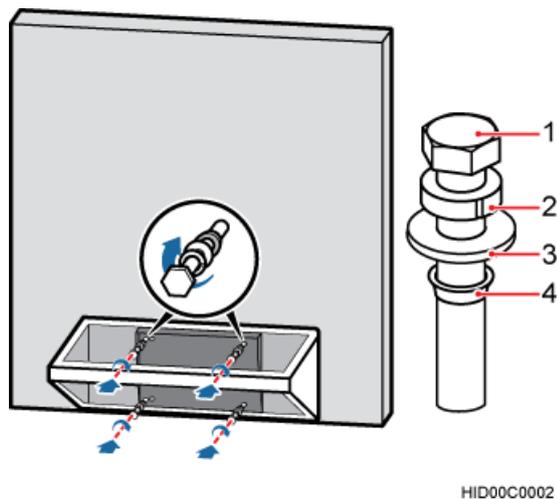
(2) Spring washer

(3) Flat washer

(4) Expansion tube

Step 3 Align the holes on the trapezoidal rack with the four lower mounting holes on the wall, and then use four M12×30 bolts to secure the trapezoidal rack, as shown in [Figure 14-24](#).

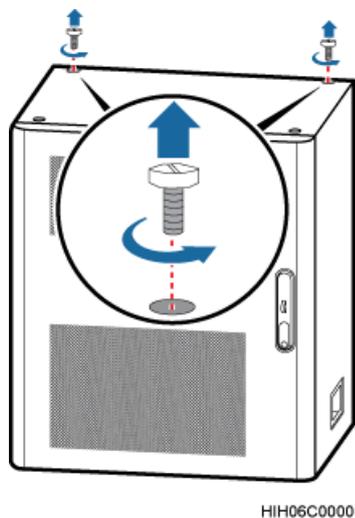
Figure 14-24 Installing a trapezoidal rack



- (1) M12x60 bolt (2) Spring washer (3) Flat washer (4) Waterproof gasket.

Step 4 Remove the two plastic screws that are near the back of the cabinet from the top of the cabinet, as shown in [Figure 14-25](#).

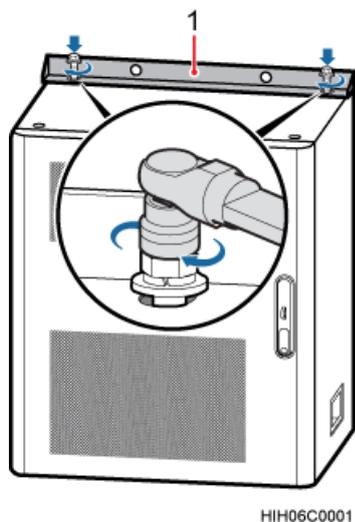
Figure 14-25 Removing plastic screws



- (1) Plastic screw

Step 5 Install a fastening bar on the top of the cabinet, and then use a socket wrench to tighten the two bolts, as shown in [Figure 14-26](#).

Figure 14-26 Installing a fastening bar



(1) Fastening bar

Step 6 Lift the cabinet onto the trapezoidal rack, use four M12×30 bolts to secure the cabinet on the trapezoidal rack, and then use a socket wrench to tighten the bolts, as shown in [Figure 14-28](#).



CAUTION

Do not move the cover plates for the round cable holes to avoid entry of water into the cabinet. [Figure 14-27](#) shows the positions of the cover plates for the round cable holes.

Figure 14-27 Positions of the cover plates for the round cable holes

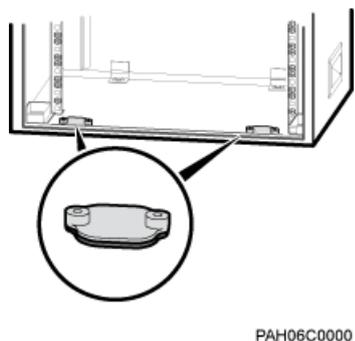
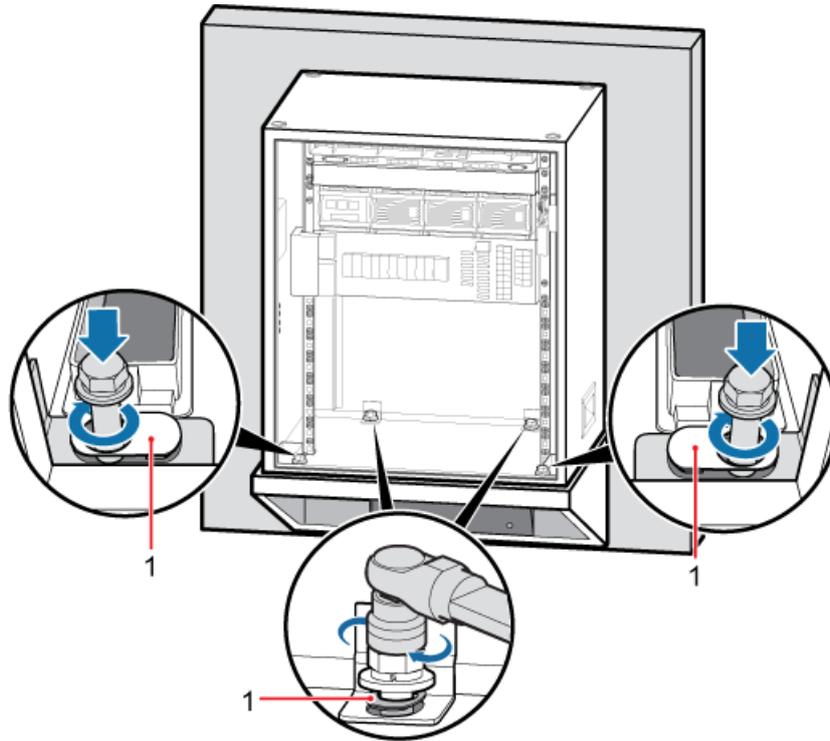


Figure 14-28 Installing a cabinet



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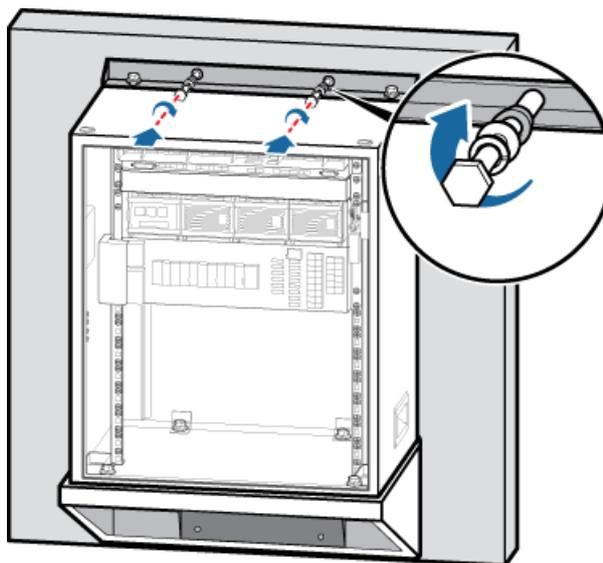
(1) Gasket with an oblong hole

Step 7 Use two bolts to secure the fastening bar on the wall, as shown in [Figure 14-29](#).

NOTE

When a cabinet is installed on the wall, grease must be applied. For details, see [14.8.3 Applying Grease](#).

Figure 14-29 Securing a fastening bar



HIH06C0005

---End

14.3 Installing PGND Cables

A PGND cable connects the ground bar in a cabinet to an external ground bar, ensuring proper grounding of the cabinet.

Prerequisite

The tools, such as a Phillips screwdriver, a cable cutter, and a multi-purpose crimping tool, are ready.

Context

Table 14-1 lists the specifications of a PGND cable.

Table 14-1 Specifications of a PGND cable

Cable	One End	The Other End	Description
PGND cable	OT terminal (M6, 16 mm ²)	OT terminal (M6, 16 mm ²)	Green and yellow

Procedure

Step 1 Prepare the PGND cable and equi-potential cable.

1. Prepare the cable of proper length based on the actual cable route.
2. Add OT terminals to both ends of the cable. For details, see *Assembling the OT Terminal and the Power Cable*.

Step 2 Install a PGND cable.

1. Connect one end of the PGND cable to the ground bar on the inner side of the cabinet under the APM30H, use a spring washer and a bolt to secure the OT terminal on the cable, and then connect the other end to the external ground bar, as shown in **Figure 14-31**.

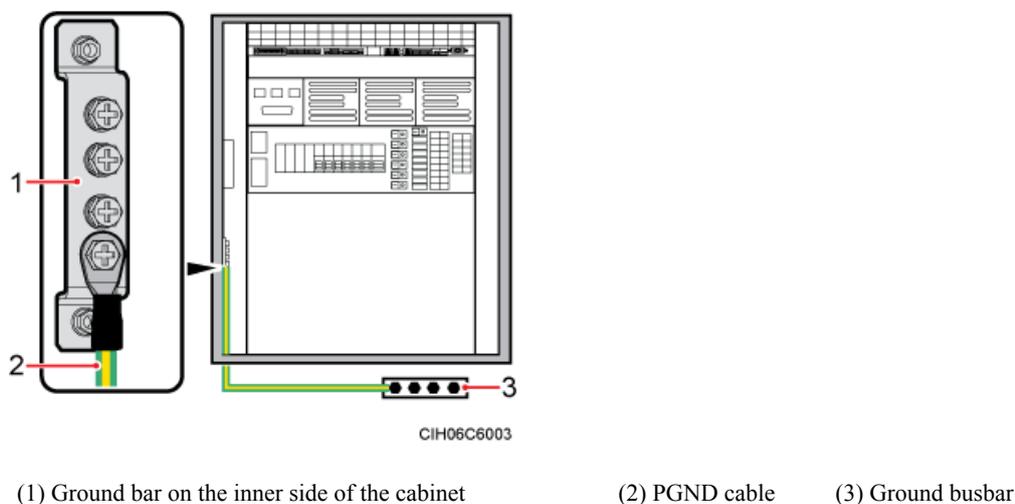
 **NOTE**

When installing the PGND cable, keep the crimping tube of the OT terminal in the direction shown in **Figure 14-30**.

Figure 14-30 Installing the OT terminal in the correct manner



Figure 14-31 Installing PGND Cables



Step 3 Route and bind the cables. For details, see [13.5.1 Cabling Requirements](#).

Step 4 Label the installed cables. For details, see [Attaching a Cable-Tying Label](#).

Step 5 Run each cable that leaves the cabinet in a PVC corrugated pipe, and then tie the pipe to the cable hole on the cabinet.

----End

14.4 Installing Components

When a DBS3900 is deployed outdoors with AC power supply, and the BBU is installed indoors, you must install the SLPU and USLP2s in an outdoor APM30H.

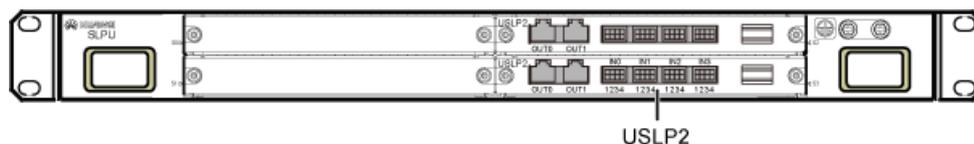
14.4.1 Installing a USLP2

A USLP2 is installed in an SLPU, providing surge protection for RRU monitoring signals.

Context

Two USLP2s are installed in slots 2 and 3 of an SLPU, as shown in [Figure 14-32](#).

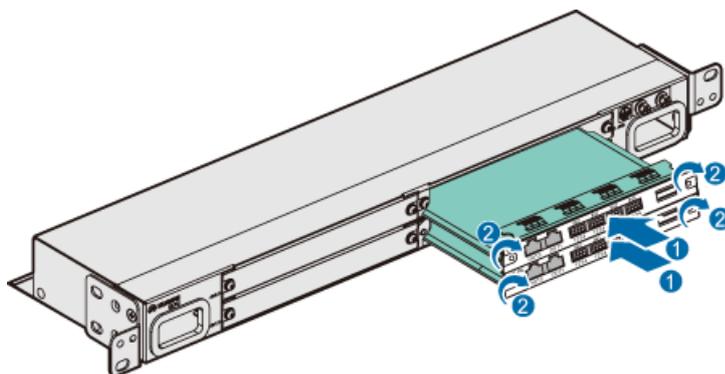
Figure 14-32 Position for installing USLP2s



Procedure

- Step 1** Remove bolts from the filler panels on slots 2 and 3, and then remove the filler panels.
- Step 2** Install the USLP2s in slots 2 and 3, and then tighten the screws on both sides of the panels until the tightening torque reaches 0.6 N·m, as shown in **Figure 14-33**.

Figure 14-33 Installing USLP2s



----End

14.4.2 Installing an SLPU

To protect monitoring signals, an SLPU may be configured, which is installed the 1 U space directly under the EPS.

Prerequisite

The tools, such as a screwdriver and a pair of ESD gloves, are available.

Context

The SLPU that is used to protect monitoring signals is configured with two Universal Signal Lightning Protection units-type 2 (USLP2s). **Figure 14-34** shows the panel of a USLP2.

Figure 14-34 Panel of a USLP2

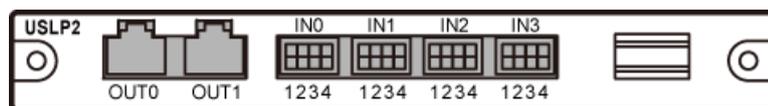


Figure 14-35 shows the mapping relationship between the pins in the input and output ports on the USLP2.

Figure 14-35 Mapping relationship between the pins in the input and output ports on the USLP2

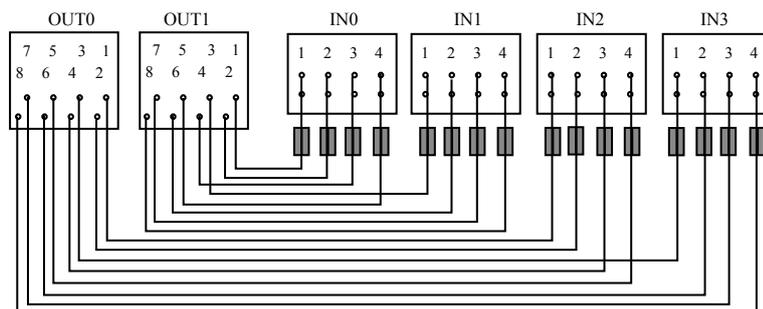


Table 14-2 lists the mapping relationship between the pins in the input and output ports on the USLP2.

Table 14-2 Mapping relationship between the pins in the input and output ports on the USLP2

Input		Output	
Label	Pin	Label	Pin
IN0	IN0.1	OUT1	OUT1.1
	IN0.2		OUT1.2
	IN0.3		OUT1.4
	IN0.4		OUT1.5
IN1	IN1.1		OUT1.3
	IN1.2		OUT1.6
	IN1.3		OUT1.7
	IN1.4		OUT1.8
IN2	IN2.1	OUT0	OUT0.1
	IN2.2		OUT0.2
	IN2.3		OUT0.4
	IN2.4		OUT0.5
IN3	IN3.1		OUT0.3
	IN3.2		OUT0.6
	IN3.3		OUT0.7
	IN3.4		OUT0.8

Table 14-3 lists the SLPU-related cables.

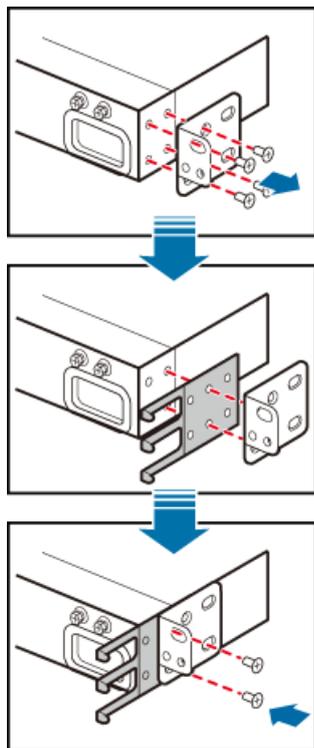
Table 14-3 SLPU-related cables

Cable	One End	The Other End	Remarks
Surge protection transfer cable for monitoring signals	RJ45 connector	RJ45 connector	Grey shielded straight-through cable
External dry-contact monitoring signal cable	Bare wire	Depending on the external equipment	-

Procedure

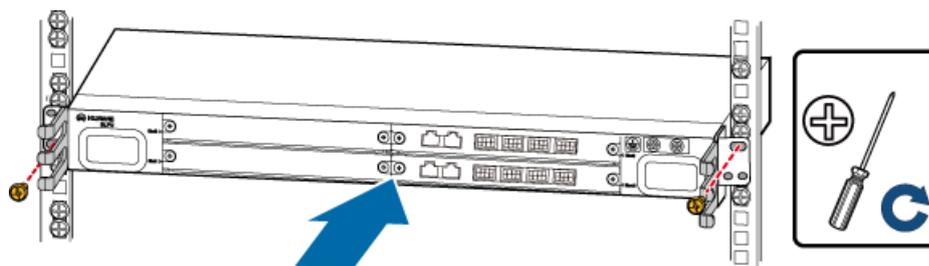
- Step 1** Install cable racks on both sides of the SLPU and ensure that the mounting ears are on the same plane as the SLPU panel, as shown in [Figure 14-36](#).

Figure 14-36 Installing cable racks



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- Step 2** Slide the SLPU into the cabinet, and then use the screwdriver to tighten the two screws on the mounting ears of the SLPU, as shown in [Figure 14-37](#).

Figure 14-37 Installing the SLPU

----End

14.5 Installing Cables

This section describes the procedures and precautions to be taken for installing power cables and monitoring signal cables when a DBS3900 is deployed indoors with DC power supply, the BBU is installed indoors, and the RRUs obtain outdoor power supply.

14.5.1 Cabling Requirements

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

**NOTE**

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

General Cabling Requirements

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

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

The cables must be bound as follows:

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

- Labels or nameplates must be attached to the cables after they are installed.

The cables must be routed as follows:

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

Special Cabling Requirements

Cabling requirements for power cables are as follows:

- -48 V power cables must be bound together.
- +24 V power cables must be bound together.
- Power cables, transmission cables, and signal cables are routed separately.
- Multiple power cables must be bound when routed.
- Power cables must be installed in the position specified in engineering design documents.
- If the length of power cables is insufficient, replace the cables rather than adding connectors or soldering joints to lengthen the cables.

Cabling requirements for PGND cables are as follows:

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

Cabling requirements for E1 cables are as follows:

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

Cabling requirements for fiber optic cables are as follows:

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

14.5.2 Installing an Input Power Cable for the APM30H

An input power cable for the APM30H is used to connect the external power equipment to the EPS subrack, feeding external power into the APM30H.

Prerequisite

- The tools, such as a Phillips screwdriver, cable cutter, and multi-purpose crimping tool, are ready.
- The PGND cable is installed.

Context

The outdoor power supply to an APM30H can be 220 V AC three-phase, 220 V AC single-phase, or 110 V dual-live-wire power. Different input power cables are delivered for an APM30H in different power supply scenarios, as listed in [Table 14-4](#).

Table 14-4 Input power cables for the APM30H

Cable List	One End	The Other End	Remarks
220 V AC three-phase input power cable for the APM30H	OT terminal (M6, 4 mm ²)	Depending on the external equipment	Black, five wires in Brown, Black, Gray, blue, and green and yellow
220 V AC single-phase input power cable for the APM30H	OT terminal (M6, 6 mm ²)	Depending on the external equipment	Black, three wires in blue, brown, and green and yellow
110 V AC dual-live-wire input power cable for the APM30H	OT terminal (M6, 6 mm ²)	Depending on the external equipment	Black, four wires in black, red, white, and green

NOTE

The colors and structures of cables vary according to countries and areas. If the cables are purchased locally, the colors and structures of the cables may be different.

Procedure

Step 1 Prepare the input power cable for the APM30H.

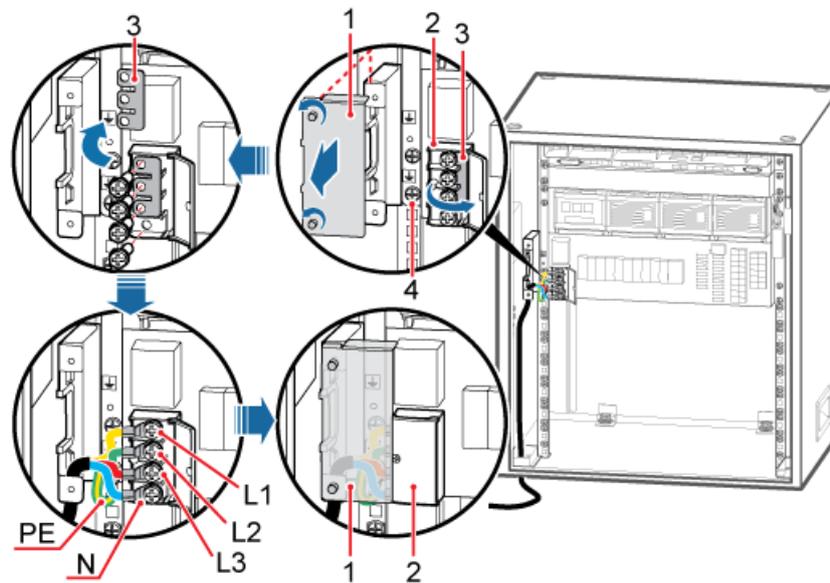
1. Cut the cable to the required length based on the actual cable route.
2. Add OT terminals to both ends of the cable. For details, see [Assembling the OT Terminal and the Power Cable](#).

Step 2 Install the power cable, as shown in [Figure 14-38](#), [Figure 14-39](#), and [Figure 14-40](#).

1. Use a Phillips screwdriver to remove the upper and lower screws from the AC baffle plate, and then remove the AC baffle plate.
2. Use a Phillips screwdriver to remove the screw from the protecting hood for the AC input wiring terminals, and then open the protecting hood.

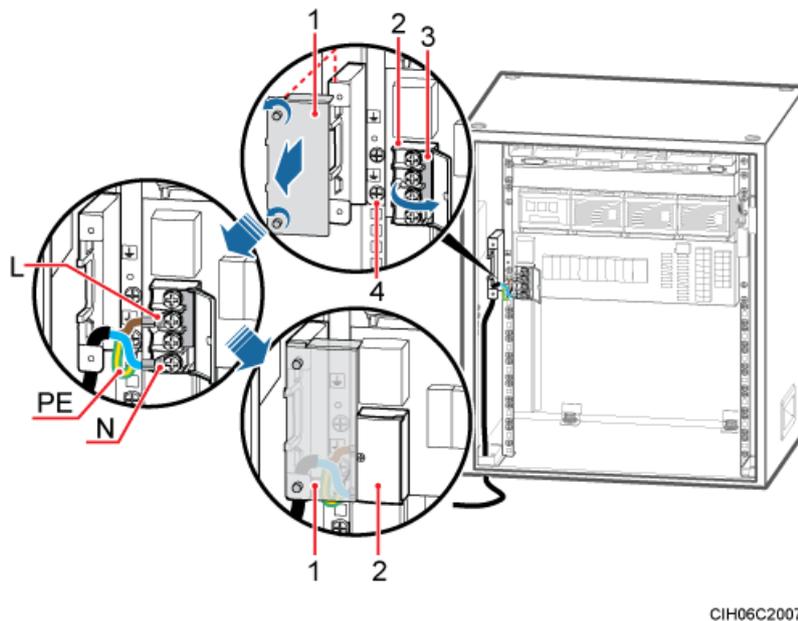
3. Remove the short-circuiting piece from the AC input L1, L2, and L3 terminals. Skip this step if the input power supply is 220 V single-phase or 110 V dual-live power.
4. Route the cable into the cabinet along the left side and connect each wire of the power cable to the corresponding terminal.
5. Reinstall the protecting hood for the AC input wiring terminals.
6. Reinstall the AC baffle plate.

Figure 14-38 Installing a 220 V AC three-phase input power cable for the APM30H on the EPS subrack



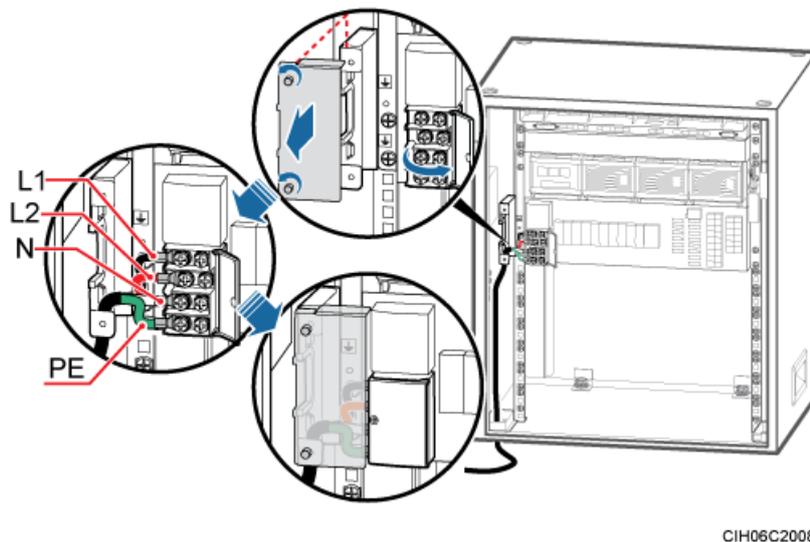
(1) Protecting hood for the AC input (2) AC power supply box (3) Short-circuiting bar (4) PE wiring terminal block

Figure 14-39 Installing a 220 V AC single-phase input power cable for the APM30H on the EPS subrack



- (1) AC baffle plate (2) AC power supply box (3) Short-circuiting bar (4) PE wiring terminal

Figure 14-40 Installing a 110 V dual-live-wire input power cable for the APM30H on the EPS subrack



- Step 3** Route the cable by referring to [13.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.
- Step 4** Label the installed cables by referring to Attaching a Sign Plate Label.

Step 5 Run each cable that leaves the cabinet in the PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

Step 6 Waterproof the connector.

---End

14.5.3 Installing an RRU Power Cable

An RRU power cable feeds power into an RRU from the EPS subrack if an APM30H supplies power to the RRU.

Prerequisite

- The tools, such as a Phillips screwdriver, cable cutter, and multi-purpose crimping tool, are ready.
- The PGND cable is installed.

Context

Table 14-5 lists the specifications of an RRU power cable when an EPS subrack supplies power.

Table 14-5 Specifications of RRU power cables

Cable		One End	The Other End	Remarks
RRU power cable	RTN(+) wire	Easy power receptacle (pressfit type) connector	OT terminal [M4, 3.3 mm ² (12 AWG)]	North American standard Black
	NEG(-) wire		OT terminal [M4, 3.3 mm ² (12 AWG)]	North American standard Blue
RRU power cable	RTN(+) wire	Easy power receptacle (pressfit type) connector	OT terminal (M4, 4 mm ²)	European standard Brown
	NEG(-) wire		OT terminal (M4, 4 mm ²)	European standard Blue
RRU power cable		Easy power receptacle (pressfit type) connector	Easy power receptacle (pressfit type) connector	

NOTE

The colors and structures of cables vary according to countries and areas. If the cables are purchased locally, the colors and structures of the cables may be different.

Procedure

Step 1 Prepare an RRU power cable.

1. Cut the cable to the required length based on the actual cable route.
2. Add an easy power receptacle (pressfit type) connector to one end of the RRU power cable. For details, see *Assembling the Easy Power Receptacle (Pressfit Type) Connector and the Power Cable*.
3. Add OT terminals or an easy power receptacle (pressfit type) connector to the other end of the RRU power cable according to the type of power supply socket on the RRU.
 - Add an OT terminal. For details, see the related RRU Installation Guide.
 - Add an easy power receptacle (pressfit type) connector. For details, see the related RRU Installation Guide.

Step 2 Install an RRU power cable, as shown in [Figure 14-41](#).

1. Link the easy power receptacle (pressfit type) connector at one end of the RRU power cable to the RRU0 port on the EPS subrack.

 **NOTE**

An EPS subrack supplies power to a maximum of six RRUs. Therefore, an RRU power cable can be connected to any of the RRU0 to RRU5 ports on the EPS subrack.

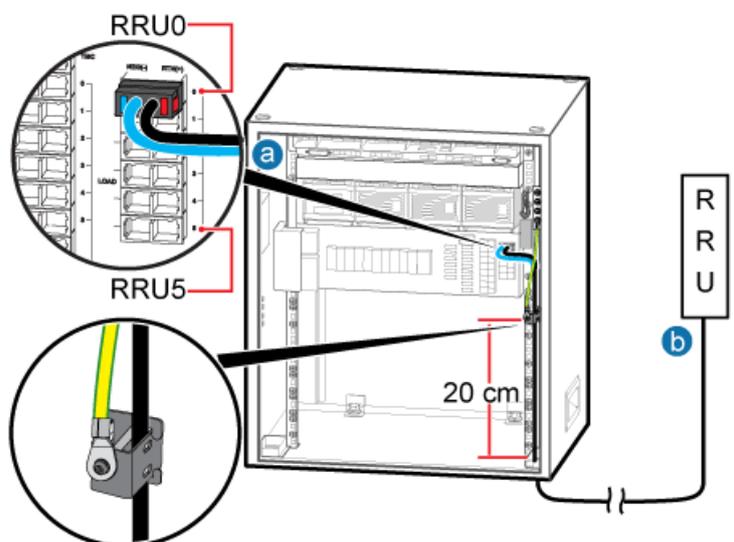


CAUTION

The blue and black wires on which the easy power receptacle (pressfit type) connector is added respectively correspond to the left and right ports on the EPS subrack.

2. If OT terminals are at the other end of the RRU power cable, respectively link the OT terminals on the blue and black (or brown) wires to the NEG(-) and RTN(+) wiring terminals in the cabling cavity of an RRU. If an easy power receptacle (pressfit type) connector is at the other end of the RRU power cable, respectively link the blue and black (or brown) wires to the NEG(-) and RTN(+) ports in the cabling cavity of an RRU.

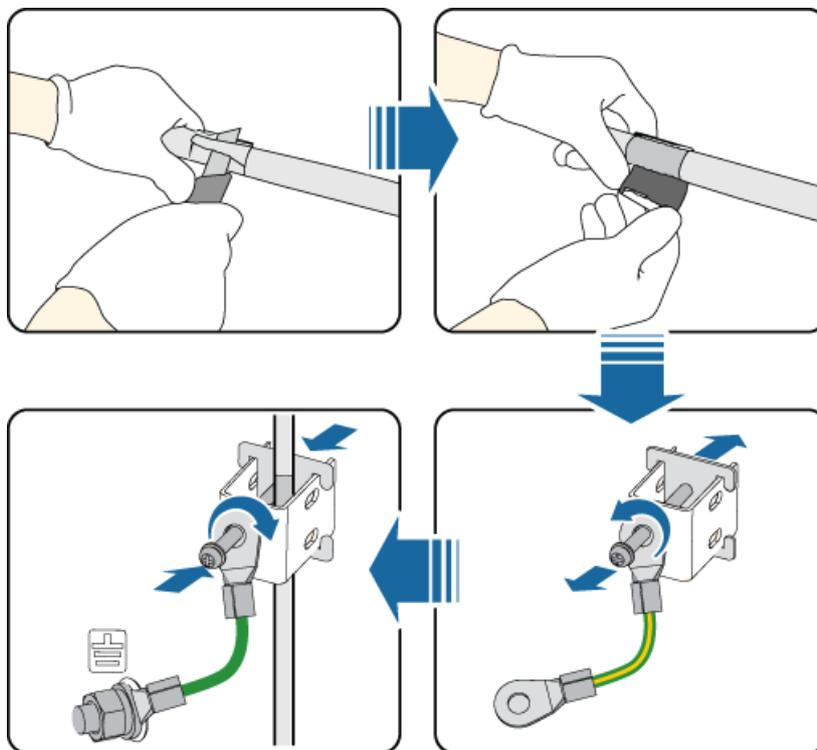
Figure 14-41 Installing an RRU power cable



CIH06C2000

- Step 3** In a position 20 cm away from the cable outlet module, strip the jacket for about 25 mm off the RRU power cable to expose the shield layer. Thread the cable through the ground clip to ensure full contact between the shield layer and the ground clip, and then tighten the M4 screws on the clip until the tightening torque reaches 1.2 N·m, as shown in [Figure 14-42](#).

Figure 14-42 Installing a grounding clip



- Step 4** Route the cable by referring to [13.5.1 Cabling Requirements](#), and then use cable ties to bind the cable.
- Step 5** Label the installed cables by referring to Attaching a Sign Plate Label.

----End

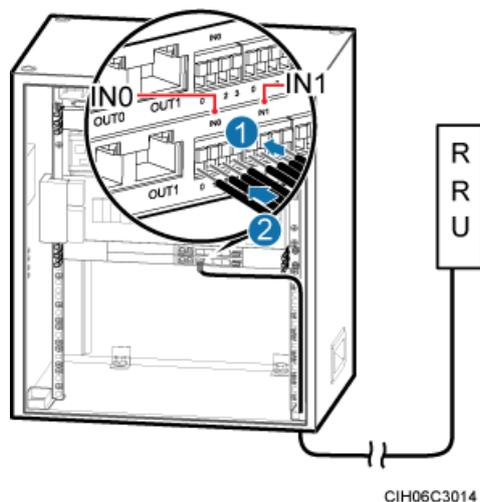
14.5.4 Installing a Monitoring Signal Cable for the RRU

A monitoring signal cable for the RRU connects an RRU to the APM30H, enabling the monitoring of the RRU.

Procedure

- Step 1** Install a monitoring signal cable for the RRU, as shown in [Figure 14-43](#).
1. Connect one end of the monitoring signal cable for the RRU to the EXT_ALM port on the RRU.
 2. Connect the other end to the IN0 and IN1 ports on the USLP2 in the SLPU in the APM30H.

Figure 14-43 Installing a monitoring signal cable for the RRU



Step 2 Route and bind the cables. For details, see [13.5.1 Cabling Requirements](#).

Step 3 Label the installed cables. For details, see Attaching an L-Shaped Label.

Step 4 Run each cable that leaves the cabinet in a PVC corrugated pipe, and then tie the pipe to the cable hole on the cabinet.

----End

14.5.5 Installing a Surge Protection Transfer Cable Between the CMUA and the SLPU

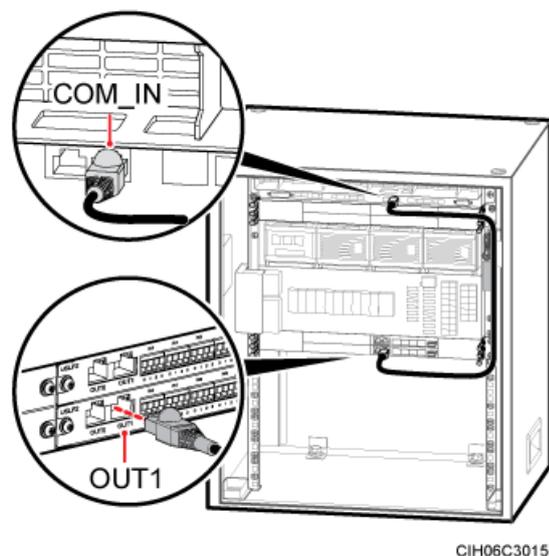
The surge protection transfer cable between the CMUA and the SLPU connects the CMUA to the USLP2, enabling surge protection of the monitoring signals.

Procedure

Step 1 Install the surge protection transfer cable between the CMUA and the SLPU, as shown in [Figure 14-44](#).

1. Connect one end of the surge protection transfer cable between the CMUA and the SLPU to the COM IN port on the CMUA.
2. Connect the other end to the OUT1 port on the USLP2 in the SLPU.

Figure 14-44 Installing the surge protection transfer cable between the CMUA and the SLPU



Step 2 Route and bind the cables. For details, see [13.5.1 Cabling Requirements](#).

Step 3 Label the installed cables. For details, see Attaching an L-Shaped Label.

---End

14.6 Installation Checklist

Check the installation items, installation environment, and cable-related items after the cabinets and devices are all installed.

Cabinet Installation Checklist

[Table 14-6](#) describes the cabinet installation checklist.

Table 14-6 Cabinet installation checklist

No.	Item
1	The installation position of the cabinet strictly complies with the engineering design.
2	In the wall-mounted scenario, the holes of the mounting ears are well aligned with the holes of the expansion bolt assemblies. In addition, the mounting ears are secured on the wall evenly and steadily.
3	In the metal-pole-mounted scenario, the supports for the metal pole are secure on the floor.
4	If the cabinet is installed on the floor, the base is securely installed.
5	Either the horizontal error or vertical error of the cabinet is less than 3 mm.
6	All the bolts, especially those for electrical connections, are tight. Both the spring washer and the flat washer are installed in the correct sequence.

No.	Item
7	The cabinet is neat and clean.
8	The paint on the surface is intact. If any paint is damaged, you must apply touch-up paint to avoid erosion.
9	Filler panels are installed in the space reserved for customer equipment.
10	The cabinet door can be easily opened or closed, the lock works properly, and the gag lever post is secure.
11	All labels, tags, and nameplates are correct, legible, and complete.

Cabinet Installation Environment Checklist

Table 14-7 describes the cabinet installation environment checklist.

Table 14-7 Cabinet installation environment checklist

No.	Item
1	There are no fingerprints or other smears on the surface of the cabinet.
2	There are no excessive straps or adhesive tape on the cables.
3	No tapes, tails of cable ties, paper, or packing bags are left around the cabinet.
4	All the items around the cabinet are neat, clean, and intact.

Electrical Connection Checklist

Table 14-8 describes the electric connection checklist of the cabinet.

Table 14-8 Electric connection checklist of the cabinet

No.	Item
1	All self-made PGND cables are copper-based with the proper wire diameters. No breaking device such as switch and fuse is allowed for the electric connection of the grounding system. No short circuit is allowed.
2	The PGND cable is securely connected and the AC lead-in cable and cables in the cabinet are correctly connected according to the electrical design of the power system. The screws are tightened. In addition, the inputs or outputs are not short-circuited.
3	The redundant part of the power cable or PGND cable is stripped off rather than coiled.
4	The terminals at both ends of the power cable or PGND cable are securely soldered or crimped.

No.	Item
5	The bare wires and the terminal handles at the wiring terminals are coated with heat-shrinkable tubes.
6	The flat washer and the spring washer are well mounted on all OT terminals.
7	The exterior of the battery is intact without any scratch, dent, or crack.
8	The shell of the battery is clean without any leakage trace.
9	The wiring post on the battery stands properly without any damage, and the post is not covered with any acidic substances.
10	The pressure relief valve of the battery is not transformed, and no liquid leaks.
11	The power cables for the batteries are connected to the positive and negative polarities correctly.
12	The voltage of the battery is normal. <ul style="list-style-type: none"> ● The voltage of a 2 V battery cell ranges from 1.8 V to 2.35 V. ● The voltage of a 12 V battery cell ranges from 10.8 V to 14.1 V. ● The total voltage of the batteries ranges from 43.2 V to 56.4 V.
13	The fans work properly. <ul style="list-style-type: none"> ● The fan in the IBBS200D rotates in a low speed in a normal situation. ● The outer air circulation fan in the IBBS200T stops in a normal situation (with the ambient temperature of lower than 30°C), and the inner air circulation fan rotates in a high speed. ● The outer air circulation fan in the APM30H stops in a normal situation (with the ambient temperature of lower than 35°C), and the inner air circulation fan rotates in a low speed.
14	The MCBs for the batteries are set to OFF.

Cable Installation Checklist

[Table 14-9](#) describes the cable installation checklist.

Table 14-9 Cable installation checklist

No.	Item
1	All cables are connected securely and reliably. Pay special attention to the communication cable connections and cable connections at the bottom of the cabinet.
2	The cables are neatly and tightly bound. The cable ties are evenly spaced and face the same direction.
3	Different types of cable, such as the power cable, ground cable, feeder, optical cable, E1/T1 cable, and FE cable are separately bound.

No.	Item
4	The cable layout facilitates maintenance and future capacity expansion.
5	All the labels at both ends of the cables are legible.
6	The extra length of the indoor cable ties is cut, and the cut surfaces are smooth without sharp edges. The extra length of 3 mm to 5mm of the outdoor cable ties is reserved when the cable ties are cut.
7	The idle port that no cable is connected to is properly protected.
8	The connectors of the RF cables are fixed in position to avoid false connection that may cause an abnormal voltage standing wave ratio (VSWR).

14.7 Power-On Check

Before a DBS3900 starts operating, you must check the power-on status of the cabinet and components in it.



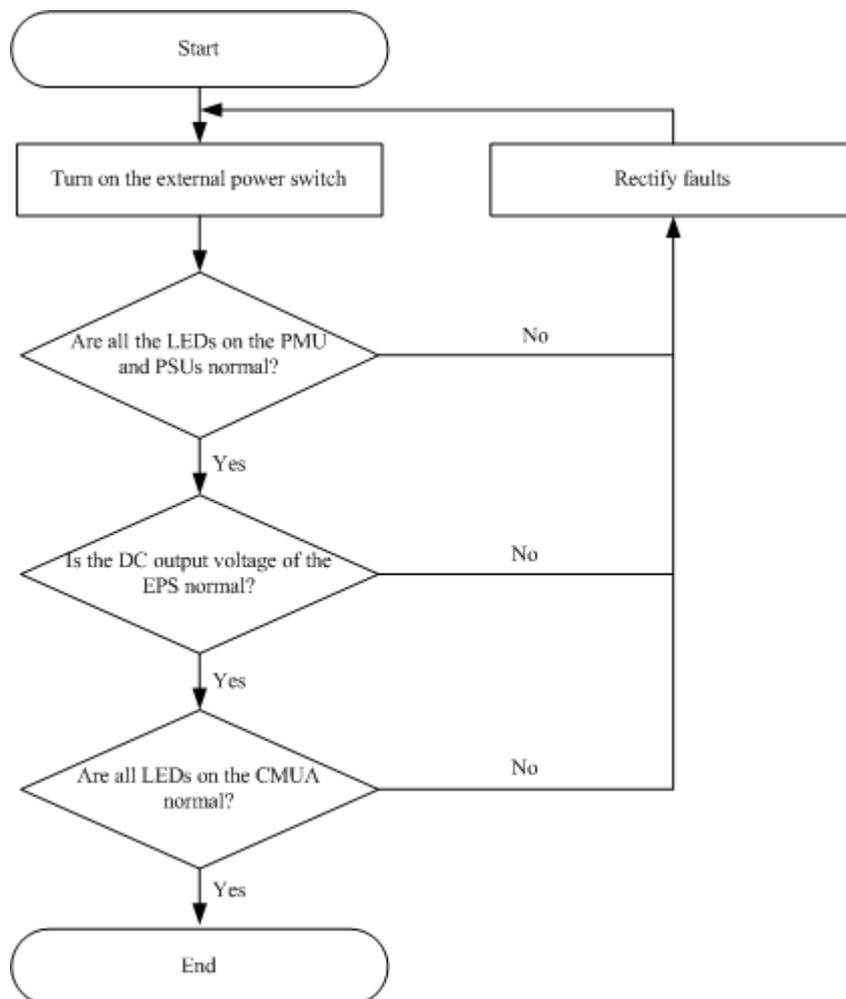
CAUTION

The DBS3900 must be powered on within seven days after it is unpacked, and the period for which the DBS3900 remains powered-off during maintenance must not exceed 48 hours.

Power-On Check in the Indoor Scenario with DC Power Supply (BBU Installed Indoors and RRU Powered Outdoors)

Figure 14-45 shows the power-on check when a DBS3900 is deployed indoors with DC power supply, the BBU is installed indoors, and the RRUs obtain outdoor power supply.

Figure 14-45 Power-on check in the indoor scenario with DC power supply (BBU installed indoors and RRU powered outdoors)



DID11-L0P1-T1L11

LED Status and Output Voltage Check

- The normal status of the LEDs on a PMU is as follows:
 RUN LED: blinking
 ALM LED: off
- The normal status of the LEDs on a PSU is as follows:
 Power LED: steady green
 Protection LED: off
 Fault LED: off
- The DC output voltage of an EPS ranges from -43.2 V DC to -57 V DC.
- The normal status of the LEDs on a CMUA is as follows:
 RUN LED: blinking
 ALM LED: off

14.8 Subsequent Operations

You must perform subsequent operations after installing a base station and checking related hardware installation.

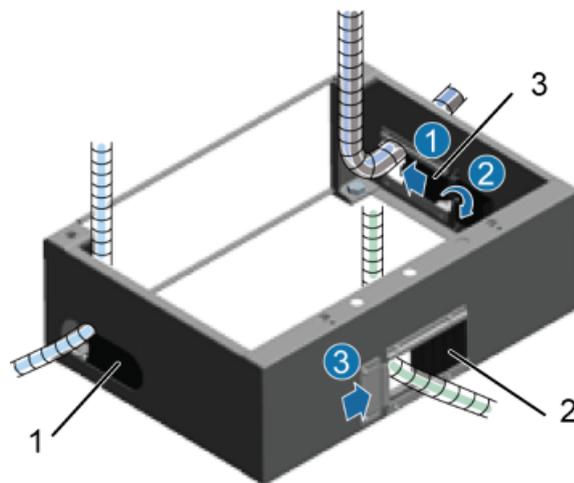
14.8.1 Sealing the Cable Holes on the Base

After all the cables are installed, you need to seal the cable holes of the base.

Procedure

- Step 1** Use baffle plates to cover the idle cable holes, and then tighten screws on the plates, as shown in [Figure 14-46](#).

Figure 14-46 Sealing the cable holes of the base by using the baffle plates



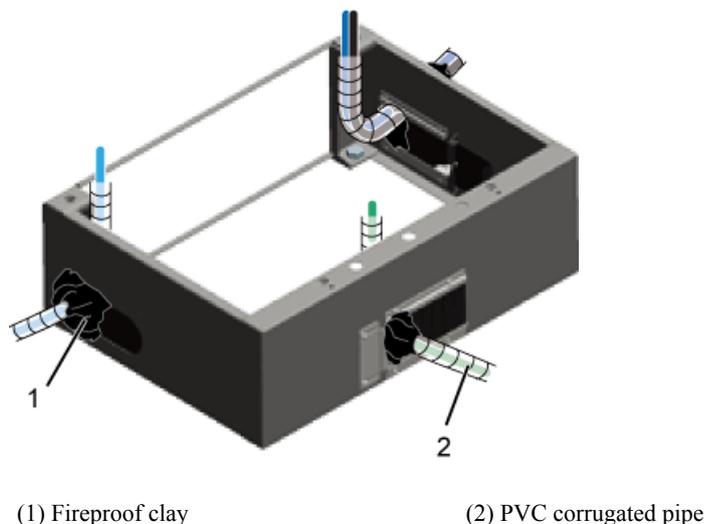
(1) Baffle plate on the right

(2) Baffle plate at the rear

(3) Baffle plate on the left

- Step 2** Use fireproof clay to seal the cable holes of the base, as shown in [Figure 14-47](#).

Figure 14-47 Sealing the cable holes of the base by using the fireproof clay



NOTE

Fireproof clay can be used only for sealing the cable outlet hole in the base. It cannot be used for sealing the cable outlet hole of the cabinet.

Step 3 Tighten the screws on the front baffle plate of the base.

----End

14.8.2 Applying Touch-Up Paint

The paint on the surface is intact. If any paint is damaged, you must apply touch-up paint to avoid erosion.

Prerequisite

Before applying touch-up paint, select the same color as the original coating, as listed in [Table 14-10](#).

Table 14-10 Code of color samples

Object	Color	Code of Huawei Color Sample	International Color Code
Cabinet (including the APM30H, RFC, TMC11H, IBBS200T, and IBBS200D)	RAL7035	YB026	RAL7035
Base	3010 Light gray	YB030	Pontone 422U

Procedure

- Step 1** If there are stains in the damaged area or rust on the material, use fine sandpaper to polish the damaged area to remove the stains or rust.
- Step 2** Use clean cotton cloth to remove the stains or dust from the surface of the area to be polished or repaired.
- Step 3** Shake the paint well, and then use a small brush inside the bottle to absorb paint and evenly spread the paint on the damaged area until the area is covered.



CAUTION

The paint coating should be as thin as possible. No drops are allowed on the paint coating, and the surface should be smooth.

- Step 4** Perform subsequent operations after the repaired paint coating is exposed in the air for 30 minutes.

 **NOTE**

The color of the repaired paint coating area should be consistent with that of the surrounding areas, without obvious edges and bulges, and the original damage should no longer be distinguishable. In addition, there should be no paint peeled off.

---End

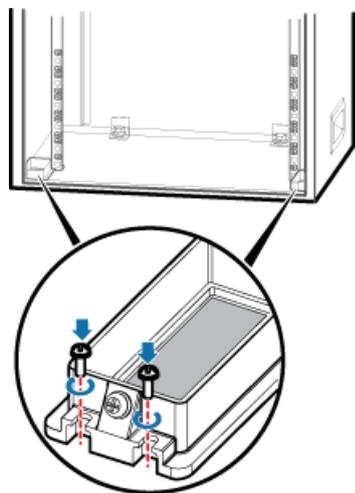
14.8.3 Applying Grease

When the APM30H and TMC11H are installed on a wall or metal pole, you must apply grease to the cable outlet module and the four screws for securing the cabinet to the trapezoidal rack.

Procedure

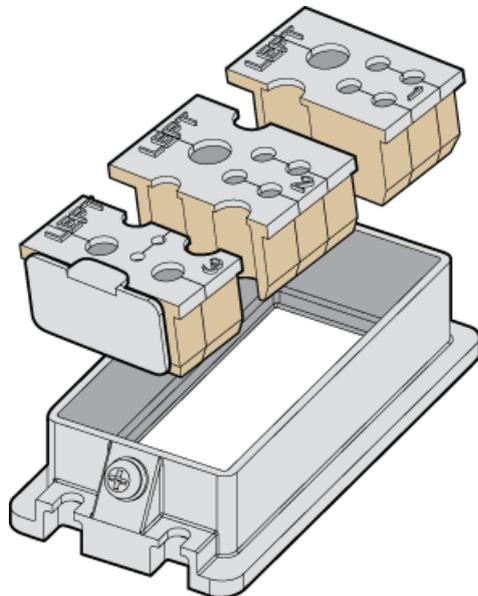
- Step 1** Install a cable outlet subrack on both sides at the bottom of a cabinet, as shown in [Figure 14-48](#).

Figure 14-48 Installing a cable outlet subrack



- Step 2** Apply delivered grease to the surfaces and gaps of the three cable outlet modules evenly, and then insert the modules into the cable outlet subrack, as shown in **Figure 14-49**.

Figure 14-49 Applying grease to cable outlet modules

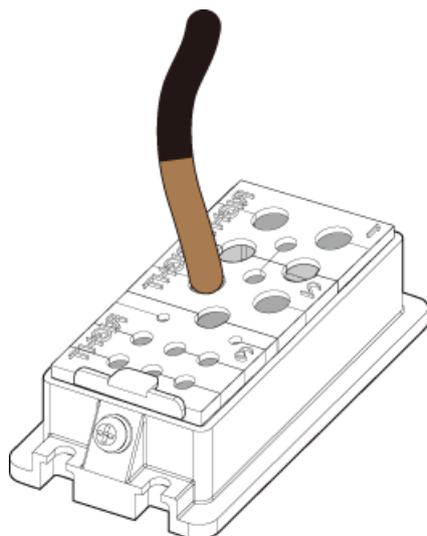


NOTE

When a cabinet is installed on a wall or metal pole, you must apply grease to the cable outlet module and the four screws for securing the cabinet to the trapezoidal rack.

- Step 3** Apply grease to the surfaces of the cables, and then route the cables through the cable outlet modules. Apply grease to the rubber caps evenly, and then insert the rubber caps into unused cable holes, as shown in **Figure 14-50**.

Figure 14-50 Applying grease to cables and rubber caps



----End