BTS3900A(Ver.B)

Installation Guide

HUAWEI TECHNOLOGIES CO., LTD.

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About This Document

Overview

This document describes installation of the BTS3900A (Ver.B) (referred to as the BTS3900A in this document) cabinet, boards, modules, and cables. It also provides checklists for hardware installation.

Product Version

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

Product Name	Product Version
BTS3900A WCDMA	V200R013C01
BTS3900A LTE	V100R004
BTS3900A GSM	V100R013C01
BTS3900A	V100R004C01

Intended Audience

This document is intended for:

- Base station installation engineers

Organization

1 Changes in the BTS3900A (Ver.B) Installation Guide

This chapter describes the changes in the *BTS3900A (Ver.B) Installation Guide*.

2 Preparing for Installation

This section describes the tools and meters that need to be available before the installation. It also describes the skills and qualifications that the installation engineers must possess.

3 Information About the Installation

The BTS3900A supports combinations and configurations of different types of cabinet. You need to familiarize yourself with the related information and clearance requirements before the cabinet installation.

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 Installation Procedure

The installation procedure for the BTS3900A involves installing the base, the cabinet, the optional modules, and the cables, checking the installation, performing the power-on check, and doing some subsequent operations.

7 Checking the Installed Cables and Modules

The internal modules and cables are installed in the BTS3900A cabinet before delivery. You need to check whether the modules and cables work properly on site.

8 Installing the Base

This section describes the procedure and precautions for installing a base on the concrete floor.

9 Installing the Cabinet

When installing the BTS3900A cabinet on site, select an appropriate method based on the outdoor conditions.

10 Installing the 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.

11 Installing Optional Modules

This chapter describes the installation of optional modules and the connection between the optional modules and the external devices.

12 Installing the Cables

The BTS3900A cabinet is delivered with boards installed, and the internal cables are already installed. Therefore, only the external cables and cables for the optional modules need to be installed on site.

13 Installation Checklist

After the cabinets and devices are all installed, you need to check the installation items, installation environment, and cable-related items.

14 Performing the Power-On Check

Before the cabinets start working, you need to check the power-on status of the cabinets.

15 Subsequent Operations

After the base station is installed and checked, you need to obtain the ESN, seal the cable outlet of the base, and then repair the damaged paint.

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**.
Italic	Book titles are in *italics*.
Courier New	Examples of information displayed on the screen are in Courier New.

Command Conventions

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

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

GUI Conventions

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

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

Keyboard Operations

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

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.

Contents

1 Changes in the BTS3900A (Ver.B) Installation Guide

This chapter describes the changes in the *BTS3900A (Ver.B) Installation Guide*.

01 (2011-10-25)

This is the first official release.

2 Preparing for Installation

About This Chapter

This section describes the tools and meters that need to be available before the installation. It also describes the skills and qualifications that the installation engineers must possess.

2.1 Preparing Tools and Meters
This section describes the tools and meters that are required before installation.
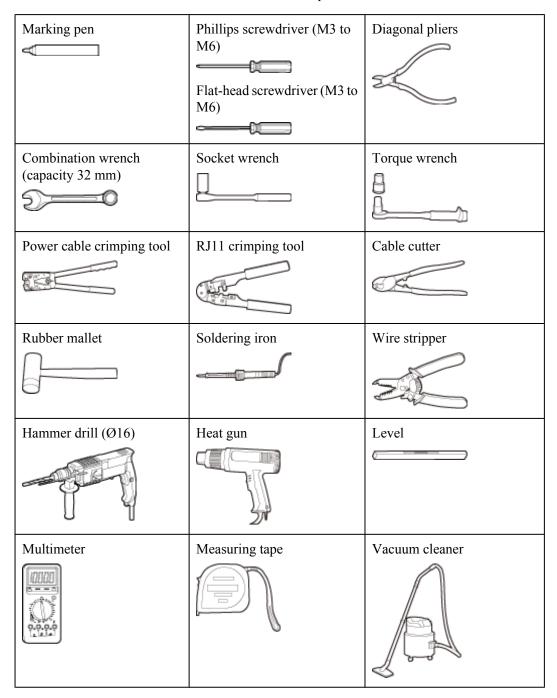
2.2 Skills and Requirements for Onsite Personnel
Onsite personnel must be qualified and trained. Before performing any operation, onsite personnel must be familiar with correct operation methods and safety precautions.

2.1 Preparing Tools and Meters

This section describes the tools and meters that are required before installation.

Marking pen	Phillips screwdriver (M3 to M6) Flat-head screwdriver (M3 to M6)	Diagonal pliers
Combination wrench (capacity 32 mm)	Socket wrench	Torque wrench
Power cable crimping tool	RJ11 crimping tool	Cable cutter
Rubber mallet	Soldering iron	Wire stripper
Hammer drill (Ø16)	Heat gun	Level
Multimeter	Measuring tape	Vacuum cleaner

2.2 Skills and Requirements for Onsite Personnel

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

Before the installation, pay attention to the following items:

- The customer's technical engineers must be trained by Huawei and be familiar with the proper installation and operation methods.

- The number of onsite personnel depends on the engineering schedule and installation environment. Generally, only three to five onsite personnel are necessary.

3 Information About the Installation

About This Chapter

The BTS3900A supports combinations and configurations of different types of cabinet. You need to familiarize yourself with the related information and clearance requirements before the cabinet installation.

3.1 Configuration of the BTS3900A Cabinet

To meet requirements in different outdoor environments, multiple cabinets with different functions are provided by Huawei for distributed macro base stations. The Advanced Power module with heat exchanger (APM30H) and Radio Frequency Cabinet (RFC) provides space and surge protection and enables power distribution and heat dissipation for the BBU3900 and RFU. The Integrated Battery Backup System with direct ventilation (IBBS200D) and Integrated Battery Backup System with TEC cooler (IBBS200T) provides long-duration backup power for a base station. The Transmission Cabinet of 11 U high with heat exchanger (TMC11H) provides space for customer equipment.

3.2 Application Scenario of the BTS3900A Cabinet

Multiple cabinets can be configured and installed for the BTS3900A to meet the requirements of different RFU configurations, backup power capacity, and transmission space. In addition, different configurations of cabinets can be used for the BTS3900A in the 110 V AC/220 V AC power supply scenario and -48 V DC power supply scenario.

3.3 Installation Clearance Requirements for the BTS3900A

The BTS3900A supports three installation modes: single cabinet installation, combined cabinet installation, and stack cabinet installation.

3.1 Configuration of the BTS3900A Cabinet

To meet requirements in different outdoor environments, multiple cabinets with different functions are provided by Huawei for distributed macro base stations. The Advanced Power module with heat exchanger (APM30H) and Radio Frequency Cabinet (RFC) provides space and surge protection and enables power distribution and heat dissipation for the BBU3900 and RFU. The Integrated Battery Backup System with direct ventilation (IBBS200D) and Integrated Battery Backup System with TEC cooler (IBBS200T) provides long-duration backup power for a base station. The Transmission Cabinet of 11 U high with heat exchanger (TMC11H) provides space for customer equipment.

Configurations of the APM30H

Besides the installation space of the BBU3900, the APM30H also provides installation space of 5 U for customer equipment, for example, the EMUA, heater, and Service Outlet Unit (SOU), which are optional.

Figure 3-1 shows the exterior and configurations of the APM30H.

Figure 3-1 Exterior and configurations of the APM30H

NOTE

The GATM, if needed, is installed at the position of the EMUA in **Figure 3-1**. When a single site is configured with two GATMs, the EMUA is installed below the two GATMs.

Table 3-1 describes the configurations.

Table 3-1 Configurations of the APM30H

No.	Module/ Board	Optional/ Mandatory	Maximum Number of Boards or Modules Configured in a Single Cabinet	Description
1	Fan box	Mandatory	1	The fan box is configured with the fan, Hert Power Monitoring Interface unit (HPMI), and Central Monitoring Unit type A (CMUA). It is used to dissipate heat in the cabinet.
2	SLPU	Mandatory	2	The Signal Lightning Protection Unit (SLPU) is installed in the top 1 U space of the cabinet, providing protection for trunk signals as a mandatory component. The SLPU is configured with the Universal E1/T1 Lightning Protection unit (UELP) or Universal FE Lightning Protection unit (UFLP). The SLPU is an optional component, which is used to protect monitoring signals, is installed in the 1 U space below the BBU. It contains two Universal Signal Lightning Protection unit 2 boards (USLP2 boards).
3	PSU (AC/ DC)	Mandatory	3	The power supply unit (PSU) converts 110 V/220 V AC power into -48 V DC power.
4	EPS subrack	Mandatory	1	The EPS provides functions of AC and DC power distribution for the cabinet. There are two types of EPSs, which are used in 110 V AC and 220 V AC power supply scenarios.
5	BBU3900	Mandatory	1	The BBU3900 processes the baseband signals and enables interaction between the base station and the BSC or RNC.

No.	Module/ Board	Optional/ Mandatory	Maximum Number of Boards or Modules Configured in a Single Cabinet	Description
6	EMUA	Optional	1	The Environment Monitoring Unit (EMUA) monitors the internal environment of the cabinet and reports related alarms. The EMUA must be configured when 16 Boolean alarm inputs are required. It is installed in the 1 U space below the BBU.
7	PMU	Mandatory	1	The Power Monitoring Unit (PMU) provides the functions of power system and storage battery management, power monitoring, and alarm reporting.
8	Heater	Optional	1	A heater is an optional component. It ensures that the customer equipment in the cabinet works in a proper temperature scope when the surrounding temperature is low. It is installed in the 1 U space at the bottom of the cabinet. If both the heater and SOU are configured, the heater is installed in the 1 U space above the SOU.
9	SOU	Optional	1	The SOU is an optional component. It transfers AC power supply to the customer equipment and is installed in the 1 U space at the bottom of the cabinet.

Configurations of the RFC

Figure 3-2 shows the exterior and configurations of the RFC.

Figure 3-2 Exterior and configurations of the RFC

Table 3-2 describes the configurations.

Table 3-2 Configurations of the RFC
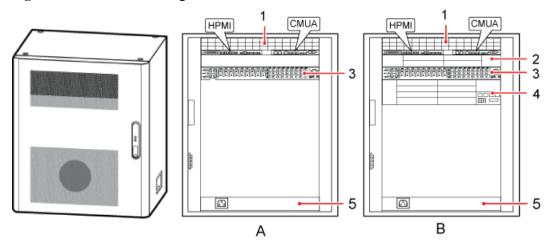
No.	Module/ Board	Optional/ Mandatory	Maximum Number of Boards or Modules Configured in a Single Cabinet	Description
1	DCDU-01	Mandatory	1	The Direct Current Distribution Unit-01 (DCDU-01) is a DC power distribution unit supplying power to each component in the RFC.
2	Fan box	Mandatory	1	The fan box is configured with the fan and CMUA. The fan dissipates heat in the cabinet, and the CMUA provides the functions of the temperature control, Boolean alarm detection, and ELU identification of the cabinet.
3	RFU	Mandatory	6	The RFU, a Radio Frequency Unit, performs the functions such as modulation and demodulation between baseband signals and RF signals, data processing, and signal combination and division.

Configurations of the TMC11H

There are two types of TMC11Hs:

- TMC11H providing space for the transmission equipment, as shown in **A** of **Figure 3-3**
- TMC11H configured with the BBU3900 in the -48 V DC power supply scenario, as shown in **B** of **Figure 3-3**

Figure 3-3 Exterior and configurations of the TMC11H

Table 3-3 describes the configurations.

Table 3-3 Configurations of the TMC11H

| No.	Module/ Board	Optional/ Mandatory	Maximum Number of Boards or Modules Configured in a Single Cabinet	Description
1	Fan box	Mandatory	1	The fan box is configured with the fan, HPMI, and CMUA, dissipating heat in the cabinet.
2	SLPU	Mandatory	2	The SLPU is installed in the top 1 U space of the cabinet, providing protection for trunk signals as a mandatory component. The SLPU is configured with the UELP or UFLP. To protect monitoring signals, an SLPU configured with two USLP2s may be configured, which is installed in the 1 U space under the BBU,

No.	Module/ Board	Optional/ Mandatory	Maximum Number of Boards or Modules Configured in a Single Cabinet	Description
3	DCDU-03	Mandatory	1	The Direct Current Distribution Unit-03 (DCDU-03) supplies power to each component in the TMC11H. The DCDU-03 is of 1 U high.
4	BBU3900	Mandatory	1	The BBU3900 processes the baseband signals and enables interaction between the base station and the BSC or RNC.
5	Heater	Optional	1	A heater is an optional component. It ensures that the customer equipment in the cabinet works in a proper temperature scope when the surrounding temperature is low. It is installed in the 1 U space at the bottom of the cabinet.

Configurations of the IBBS200D

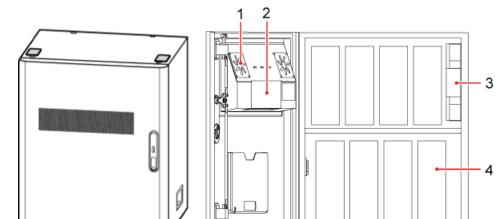Figure 3-4 shows the exterior and configurations of the IBBS200D.

Figure 3-4 Exterior and configurations of the IBBS200D

Table 3-4 describes the configurations.

Table 3-4 Configurations of the IBBS200D

No.	Module/ Board	Optional/ Mandatory	Maximum Number of Boards or Modules Configured in a Single Cabinet	Description
1	Fan	Mandatory	2	The FAN is installed on the front door of the cabinet, dissipating heat in the cabinet.
2	CMUA	Mandatory	1	The CMUA provides functions of temperature control, Boolean alarm detection, and ELU identification of the cabinet.
3	Power distribution box	Mandatory	1	The power distribution box is installed on the upper right of the cabinet, transferring and distributing power to the TEC or fan and to the storage batteries.
4	Storage battery	Mandatory	8	The storage battery provides long-duration backup power for a base station.

Configurations of the IBBS200T

Figure 3-5 shows the exterior and configurations of the IBBS200T.
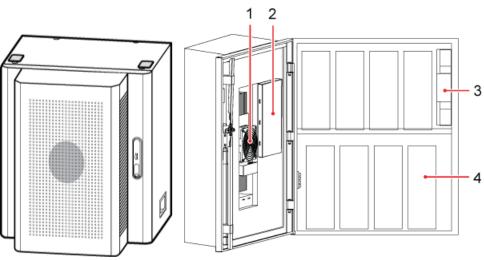
Figure 3-5 Exterior and configurations of the IBBS200T

Table 3-5 describes the configurations.

Table 3-5 Configurations of the IBBS200T

No.	Module/ Board	Optional/ Mandatory	Maximum Number of Boards or Modules Configured in a Single Cabinet	Description
1	TEC	Mandatory	1	The TEC is installed in the protecting hood for the TEC on the front door of the cabinet. The TEC consists of the TEC module, inner air circulation fan, outer air circulation fan, heat-dissipation piece, and monitoring board.
2	CMUA	Mandatory	1	The CMUA provides functions of temperature control, Boolean alarm detection, and ELU identification of the cabinet.
3	Power distribution box	Mandatory	1	The power distribution box is installed on the upper right of the cabinet, transferring and distributing power to the TEC or fan and to the storage batteries.
4	Storage battery	Mandatory	8	The storage battery provides long-duration backup power for a base station.

3.2 Application Scenario of the BTS3900A Cabinet

Multiple cabinets can be configured and installed for the BTS3900A to meet the requirements of different RFU configurations, backup power capacity, and transmission space. In addition, different configurations of cabinets can be used for the BTS3900A in the 110 V AC/220 V AC power supply scenario and -48 V DC power supply scenario.

Requirements of Customer Equipment Specifications

Customer equipment to be installed in a Huawei cabinet must satisfy the following requirements:

- Dimension requirements (as shown in **Figure 3-6**):
  - The customer equipment must be 19-inch wide, which is the width of the standard equipment.
  - The maximum depth of the customer equipment is 280 mm if the equipment supports natural ventilation or has air vents on the right and left; the maximum depth of the customer equipment is 250 mm if the equipment has air vents in the front and back.
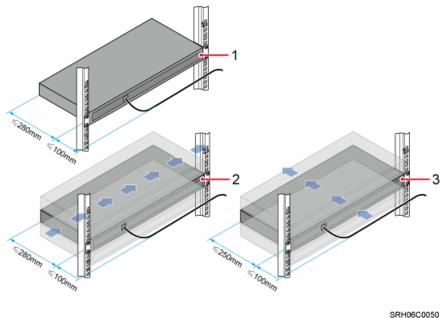 - A maximum cabling pace in front of the panel is 100 mm.

- Requirement for air vents:
  - If the customer equipment has built-in fans, the fans must have air vents on the right and left or on the front and back so that wind blows from left to right or from front to back.
  - If the customer equipment support natural ventilation, a minimum of 1 U slot must be reserved above and below the slot respectively for dissipation.
- Requirement for temperature
  - In areas where the highest temperature is or is below 40°C, the customer must be able to function properly at -10°C temperature or even lower temperature and at 55°C or even higher temperature.
  - In areas where the highest temperature is above 40°C, the customer must be able to function properly at -10°C temperature or even lower temperature and at 60°C or even higher temperature.

Figure 3-6 Requirements of customer equipment dimension and ventilation

| (1) Customer equipment with natural ventilation | (2) Customer equipment with air vents on the right and left | (3) Customer equipment with air vents on the front and back |

Cabinet Configuration Principles

- A single BTS3900A can be configured with a maximum of 12 RFUs. That is, more than 12 RFUs must be configured in different BTS3900As.
- A single BTS3900A can be configured with a maximum of two cabinet assemblies, and a cabinet assembly must be installed side by side with a default distance of 40 mm. A cabinet assembly consists of one APM30H and one RFC.
- A single APM30H can be used with a maximum of one RFC and with a maximum of two IBBS200Ds/IBBS200Ts.
- The RFC can be stacked only under the APM30H/TMC11H.

- The IBBS200D/IBBS200T can be stacked only with the IBBS200D/IBBS200T or TMC11H. When the IBBS200D/IBBS200T is stacked with the TMC11H, the TMC11H is stacked on the IBBS200D/IBBS200T.

- If auxiliary cabinets such as the IBBS200D/IBBS200T or TMC11H are required during an initial site construction, the auxiliary cabinets are positioned on the left, and the primary cabinet is positioned on the right. If both the battery cabinet and the TMC are required, the battery cabinet is positioned on the left of the main cabinet, and the TMC is stacked on the battery cabinet or positioned on the left of the battery cabinet.

- Space must be reserved during an initial site construction for future capacity expansion. In the capacity expansion scenario, the original cabinets are not relocated while new cabinets are added only from left to right. In a special scenario, new cabinets can be added from right to left.

- A single APM30H+RFC cabinet group supports only one BBU. A triple-mode base station is configured with two BBUs. The second BBU must be configured in the second APM30H +RFC cabinet group. These principles are applied to a new or expansion scenario.

110 V AC/220 V AC Power Supply Scenario

If 6 to 12 RFUs must be configured for a new site, two APM30Hs must be configured.

Figure 3-7 shows the configurations of the cabinets with different TRX configurations if backup power is not required.
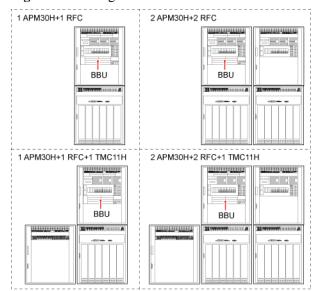
Figure 3-7 Configurations of the cabinets without backup power

Figure 3-8 shows the configurations of the cabinets with different TRX configurations if 0.5 h/ 2 h backup power is required.
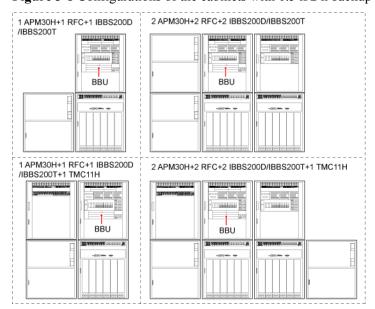
Figure 3-8 Configurations of the cabinets with 0.5 h/2 h backup power

Figure 3-9 shows the configurations of the cabinets with different TRX configurations if 4 h/6 h/8 h backup power is required.

Figure 3-9 Configurations of the cabinets with 4 h/6 h/8 h backup power

-48 V DC Power Supply Scenario

Figure 3-10 shows the configurations of cabinets with different TRX configurations in the -48 V DC power supply scenario.
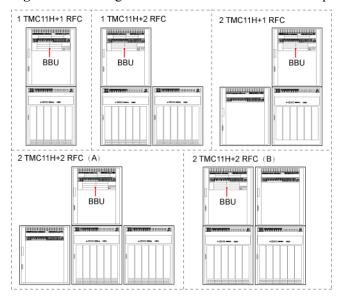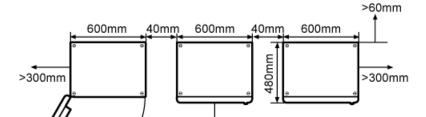
Figure 3-10 Configurations of cabinets with -48 V DC power supply

3.3 Installation Clearance Requirements for the BTS3900A

The BTS3900A supports three installation modes: single cabinet installation, combined cabinet installation, and stack cabinet installation.

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 3-11 shows the installation clearance requirements for the cabinet.

Figure 3-11 Cabinet installation clearance requirements (plan view)

☐ **NOTE**

The type of the cabinet in **Figure 3-11** can be RFC, TMC11H, or IBBS200D. The installation clearance requirements for the IBBS200T are the same as those shown in **Figure 3-11**. The plan view of the IBBS200T, however, is different from that of other cabinets. Therefore, the installation clearance requirements for the IBBS200T are not described.

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 *Packing List* with the customer.
There is any shipment shortage or wrong shipment	Fill in and submit the *Cargo Shortage and Mishandling Report*.
Articles are damaged.	Fill in and submit the *Article Replacement Report*.

![warning icon] **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)
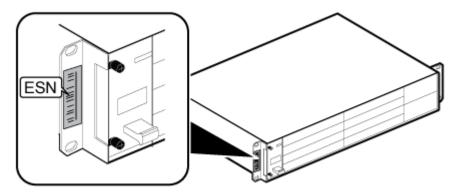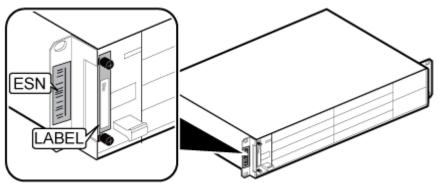
Figure 5-2 Obtaining the ESN (2)

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

----End

6 Installation Procedure

The installation procedure for the BTS3900A involves installing the base, the cabinet, the optional modules, and the cables, checking the installation, performing the power-on check, and doing some subsequent operations.

Figure 6-1 shows the installation procedure for the BTS3900A.
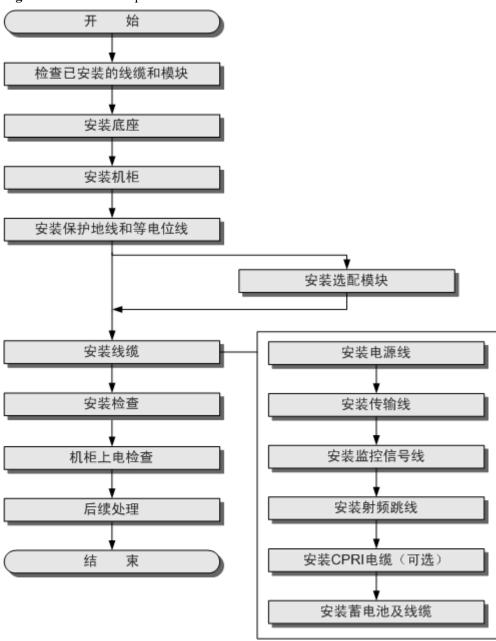
Figure 6-1 Installation procedure

7 Checking the Installed Cables and Modules

About This Chapter

The internal modules and cables are installed in the BTS3900A cabinet before delivery. You need to check whether the modules and cables work properly on site.

7.1 Checking the BTS3900A (AC) Cabinet
The internal modules and cables are installed in the BTS3900A (AC) cabinet before delivery. You need to check whether the modules and cables are securely installed on site.

7.2 Checking the BTS3900A (-48 V DC) Cabinet
The internal modules and cables are installed in the BTS3900A (-48 V DC) cabinet before delivery. You need to check whether the modules and cables are securely installed on site.

7.1 Checking the BTS3900A (AC) Cabinet

The internal modules and cables are installed in the BTS3900A (AC) cabinet before delivery. You need to check whether the modules and cables are securely installed on site.

Checklist for the Installed Modules

Check whether the modules are securely installed in the cabinet and whether the screws are tight.

Checklist for the Installed Cables

Check whether the equipotential cables in the cabinet are securely installed and the power cables are properly installed by referring to **Figure 7-1** and **Table 7-1**, and check whether the screws are tight.
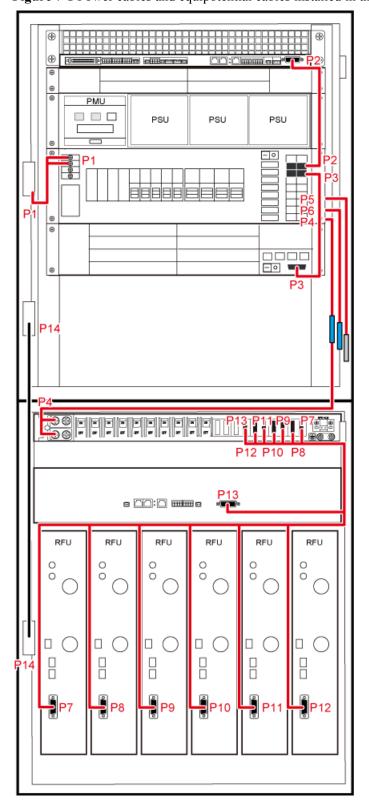
Figure 7-1 Power cables and equipotential cables installed in the BTS3900A (AC) cabinet

Table 7-1 Power cables and equipotential cable installed in the BTS3900A (AC) cabinet

No.	Cable	One End		The Other End	
		Connector	Installation Position	Connector	Installation Position
P1	Input power cable for the junction box	OT terminal	EPS/AC OUTPUT/L1 and N1	OT terminal	Junction box/L and N
P2	Power cable for the fan box in the APM30H	Easy power receptacle (pressfit type) connector	EPS/LOAD0	3V3 power connector	Fan box in the APM30H/PWR
P3	Power cable for the BBU	Easy power receptacle (pressfit type) connector	EPS/LOAD1	3V3 power connector	BBU/UPEU/ PWR
P4	Input power cable for the RFC	Power series 120 connector (blue)	EPS/Power series 120 connector (blue)	OT terminal	DCDU-01/ INPUT/RTN(+) and NEG(-)
P5	Power cable for the IBBS200D/ IBBS200T	Power series 120 connector (grey)	EPS	OT terminal	Reserved for the IBBS200D/ IBBS200T
P6	Input power cable for the RFC	Power series 120 connector (blue)	EPS	OT terminal	Reserved for the RFC
P7 to P12	Power cable for the RFU	Parallel terminal	DCDU-01/ RFU0 to RFU5	3V3 power connector	RFU0 to RFU5/ PWR
P13	Power cable for the fan box in the RFC	Parallel terminal	DCDU-01/FAN	3V3 power connector	Fan box in the RFC/PWR
P14	Equipotential cable between the APM30H and the RFC	OT terminal	APM30H/ Ground bar	OT terminal	RFC/Ground bar

Check whether the signal cables are properly and securely installed in the cabinet by referring to **Figure 7-2** and **Table 7-2**.
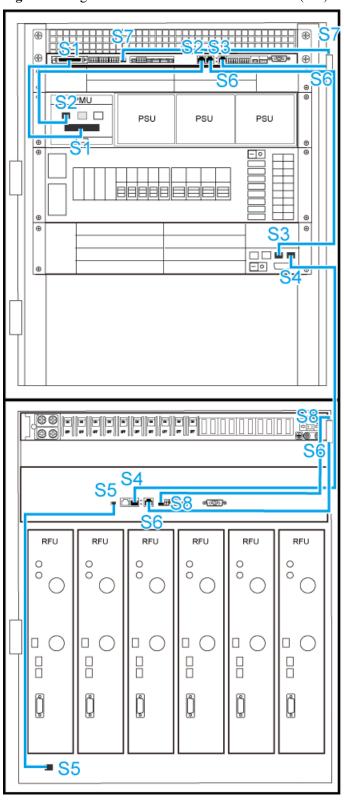
Figure 7-2 Signal cables installed in the BTS3900A (AC) cabinet

Table 7-2 Signal cables installed in the BTS3900A (AC) cabinet

No.	Cable	One End		The Other End	
		Connector	**Installation Position**	**Connector**	**Installation Position**
S1	Environment monitoring signal cable	DB50 male connector	PMU/COM	DB50 male connector	Fan box in the APM30H/ HPMI/ PMU_DB50
S2	Monitoring signal transfer cable	RJ-45 connector	PMU/ COM_IN	RJ-45 connector	Fan box in the APM30H/ CMUA/ COM_OUT
S3	Monitoring signal cable between the BBU and the CMUA in the APM30H	RJ-45 connector	CMUA/ COM_IN	RJ-45 connector	BBU/UPEU/ MON1
S4	Monitoring signal cable between the BBU and the CMUA in the RFC	RJ-45 connector	CMUA/ COM_IN	RJ-45 connector	BBU/UPEU/ MON0
S5	Temperature monitoring signal cable for the RFC	4-pin connector	Fan box in the RFC/ CMUA/ TEM	Temperature sensor	Air inlet at the bottom of the RFC
S6	Signal cable for the ELU	RJ-45 connector	ELU	RJ-45 connector	Fan box in the APM30H or in the RFC/CMUA/ ELU
S7	Monitoring signal cable for the door status sensor in the APM30H	2-pin connector	Fan box in the APM30H/ HPMI/ GATE	Bare wire	Door status sensor in the APM30H
S8	Monitoring signal cable for the door status sensor	Cord end terminal	Fan box in the RFC/ CMUA/ GATE	Bare wire	Door status sensor in the RFC

Check whether the transmission cables are correctly and securely installed in the cabinet by referring to **Table 7-3**.

☐ **NOTE**

For the transmission cable routing in various RATs and transmission modes, see section Transmission Cable Connections in the *BTS3900A (Ver.B) Hardware Description*.

Table 7-3 Transmission cables installed in the BTS3900A

No.	Cable	One End		The Other End	
		Connector	Installation Position	Connector	Installation Position
E1	E1/T1 surge protection transfer cable	DB26 connector	BBU/GTMU/E1	DB25 connector	SLPU/UELP/ INSIDE
E2	E1/T1 surge protection transfer cable	DB26 connector	BBU/WMPT/E1	DB25 connector	SLPU/UELP/ INSIDE
FE1	FE/GE surge protection transfer cable	RJ-45 connector	BBU/GTMU/FE0	RJ-45 connector	SLPU/UFLP/ INSIDE (FE0)
FE2	FE/GE surge protection transfer cable	RJ-45 connector	BBU/WMPT/FE0	RJ-45 connector	SLPU/UFLP/ INSIDE (FE0)
FE3	Interconnection cable between the FE optical ports	LC connector	BBU/GTMU/FE1	LC connector	BBU/WMPT/FE1
FE4	Interconnection cable between the FE electrical ports	RJ-45 connector	BBU/GTMU/FE0	RJ-45 connector	BBU/WMPT/FE0

Check and ensure the secure connections of the CPRI cables, which are installed inside the cabinets based on different configurations of the cabinets before delivery. For details about how to remove and insert the CPRI cable, see Inserting and Removing CPRI Cables.

7.2 Checking the BTS3900A (-48 V DC) Cabinet

The internal modules and cables are installed in the BTS3900A (-48 V DC) cabinet before delivery. You need to check whether the modules and cables are securely installed on site.

Checklist for the Installed Modules

Check whether the modules are securely installed in the cabinet and whether the screws are tight.

Checklist for the Installed Cables

Check whether the equipotential cables in the cabinet are securely installed and the power cables are properly installed by referring to **Figure 7-3** and **Table 7-4**, and check whether the screws are tight.
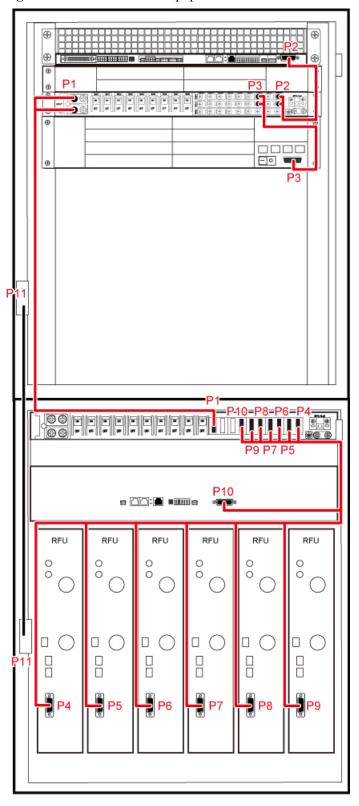
Figure 7-3 Power cables and equipotential cables installed in the BTS3900A (-48 V DC) cabinet

Table 7-4 Power cables and equipotential cable installed in the BTS3900A (-48 V DC) cabinet

No.	Cable	One End		The Other End	
		Connector	Installation Position	Connector	Installation Position
P1	Input power cable for the TMC11H	Parallel terminal	DCDU-01/ SPARE2	OT terminal	DCDU-03/ INPUT/RTN (+) and NEG (-)
P2	Power cable for the fan box in the TMC11H	OT terminal	DCDU-03/ LOAD8	3V3 power connector	Fan box in the TMC11H/ PWR
P3	Power cable for the BBU	OT terminal	DCDU-03/ LOAD6/RTN (+) and NEG (-)	3V3 power connector	BBU/UPEU/ PWR
P4 to P9	Power cable for the RFU	Parallel terminal	DCDU-01/ RFU0 to RFU5	3V3 power connector	RFU0 to RFU5/PWR
P10	Power cable for the fan box in the RFC	Parallel terminal	DCDU-01/ FAN	3V3 power connector	Fan box in the RFC/PWR
P11	Equipotential cable between the TMC11H and the RFC	OT terminal	TMC11H/ Ground bar	OT terminal	RFC/Ground bar

Check whether the signal cables are properly and securely installed in the cabinet by referring to **Figure 7-4** and **Table 7-5**.
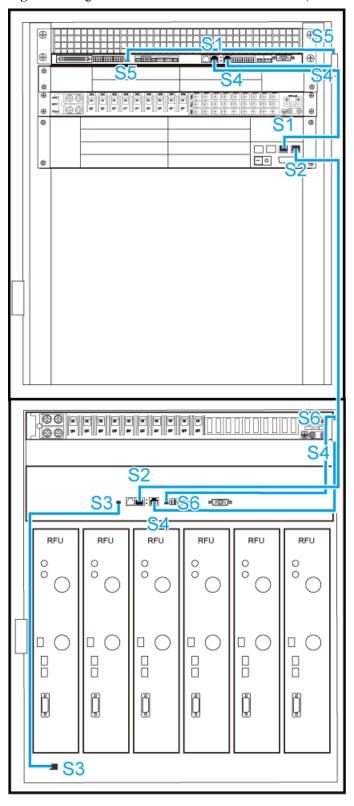
Figure 7-4 Signal cables installed in the BTS3900A (-48 V DC) cabinet

Table 7-5 Signal cables installed in the BTS3900A (-48 V DC) cabinet

No.	Cable	One End		The Other End	
		Connector	Installation Position	Connector	Installation Position
S1	Monitoring signal cable between the BBU and the CMUA in the APM30H	RJ-45 connector	CMUA/ COM_IN	RJ-45 connector	BBU/UPEU/ MON1
S2	Monitoring signal cable between the BBU and the CMUA in the RFC	RJ-45 connector	CMUA/ COM_IN	RJ-45 connector	BBU/UPEU/ MON0
S3	Temperature monitoring signal cable for the RFC	4-pin connector	Fan box in the RFC/CMUA/ TEM	Temperature sensor	Air inlet at the bottom of the RFC
S4	Signal cable for the ELU	RJ-45 connector	ELU	RJ-45 connector	Fan box in the APM30H or in the RFC/ CMUA/ELU
S5	Monitoring signal cable for the door status sensor in the APM30H	2-pin connector	Fan box in the APM30H/ HPMI/GATE	Bare wire	Door status sensor in the APM30H
S6	Monitoring signal cable for the door status sensor	Cord end terminal	Fan box in the RFC/CMUA/ GATE	Bare wire	Door status sensor in the RFC

Check whether the transmission cables are correctly and securely installed in the cabinet by referring to **Table 7-6**.

◻ **NOTE**

For the transmission cable routing in various RATs and transmission modes, see section Transmission Cable Connections in the *BTS3900A (Ver.B) Hardware Description*.

Table 7-6 Transmission cables installed in the BTS3900A

No.	Cable	One End		The Other End	
		Connector	Installation Position	Connector	Installation Position
E1	E1/T1 surge protection transfer cable	DB26 connector	BBU/GTMU/E1	DB25 connector	SLPU/UELP/ INSIDE
E2	E1/T1 surge protection transfer cable	DB26 connector	BBU/WMPT/E1	DB25 connector	SLPU/UELP/ INSIDE
FE1	FE/GE surge protection transfer cable	RJ-45 connector	BBU/GTMU/FE0	RJ-45 connector	SLPU/UFLP/ INSIDE (FE0)
FE2	FE/GE surge protection transfer cable	RJ-45 connector	BBU/WMPT/FE0	RJ-45 connector	SLPU/UFLP/ INSIDE (FE0)
FE3	Interconnection cable between the FE optical ports	LC connector	BBU/GTMU/FE1	LC connector	BBU/WMPT/FE1
FE4	Interconnection cable between the FE electrical ports	RJ-45 connector	BBU/GTMU/FE0	RJ-45 connector	BBU/WMPT/FE0

Check and ensure the secure connections of the CPRI cables, which are installed inside the cabinets based on different configurations of the cabinets before delivery. For details about how to remove and insert the CPRI cable, see Inserting and Removing CPRI Cables.

8 Installing the Base

This section describes the procedure and precautions for installing a base on the concrete floor.

Procedure

Step 1 Pour a concrete pad.

> 📖 **NOTE**
>
> - The height of the concrete pad must meet the heat dissipation and waterproofing requirements of the cabinet.
> - The concrete pad must be at least 200 mm above the floor.
> - The horizontal error of the poured concrete pad must be less than 5 mm.

Step 2 Align the base.

1. Determine the position for installing the cabinet according to the engineering design and **3.3 Installation Clearance Requirements for the BTS3900A**.

2. On the concrete pad, mark holes to determine the installation position of the base, as shown in **Figure 8-1**.
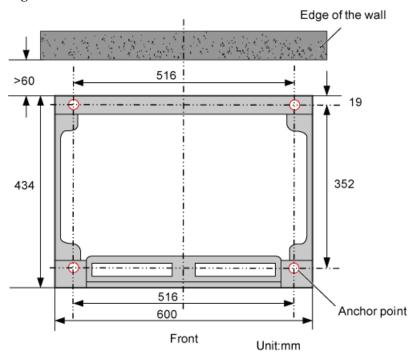
Figure 8-1 Installation holes of the base

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

Step 3 Drill holes at the anchor points, and then install the expansion bolt assemblies, as shown in **Figure 8-2**.

Figure 8-2 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.

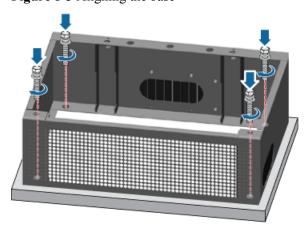5. Remove the bolt, spring washer, and flat washer counterclockwise.

⚠ **CAUTION**

After dismantling the expansion bolt assembly, ensure that the top of the expansion tube is on the same level as the floor.
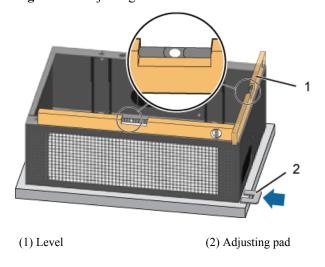
Step 4 Align the base, and then install the bolt with the spring washer and flat washer, as shown in **Figure 8-3**.
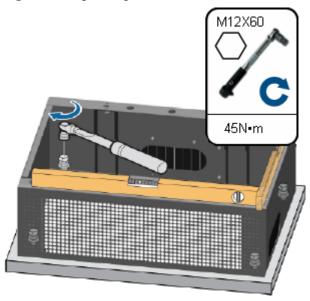
Figure 8-3 Aligning the base

Step 5 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 8-4**.
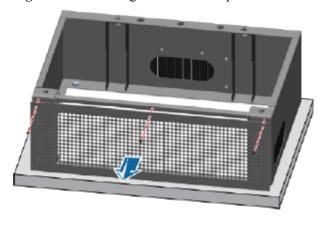
Figure 8-4 Adjusting the base level

(1) Level   (2) Adjusting pad

Step 6 Use a torque wrench to tighten the bolts with the tightening torque of 45 N·m, as shown in **Figure 8-5**.
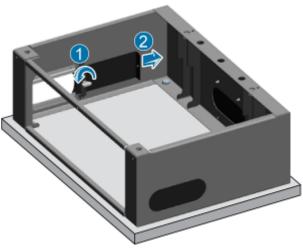
Figure 8-5 Tightening the bolts

Step 7 Loosen the three screws on the front cover plate of the base, and then remove the front cover plate, as shown in **Figure 8-6**.
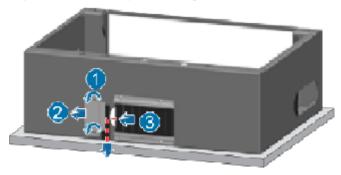
Figure 8-6 Removing the front cover plate

Step 8 Remove the baffle plate from either side of the base (by taking the left side as an example), as shown in **Figure 8-7**.

Figure 8-7 Removing the baffle plate

Step 9 Remove the baffle plate from the back of the base, as shown in **Figure 8-8**.

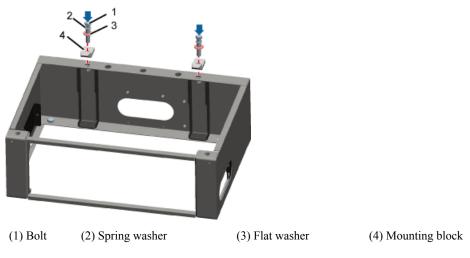**Figure 8-8** Removing the baffle plate from the back

Step 10 If an RFC needs to be installed on the base, the mounting blocks need to be fixed on the base, as shown in **Figure 8-9**.

☐ **NOTE**

The mounting blocks are placed in the accessory package of the RFC.

Figure 8-9 Fixing the mounting blocks

(1) Bolt	(2) Spring washer	(3) Flat washer	(4) Mounting block

----End

9 Installing the Cabinet

About This Chapter

When installing the BTS3900A cabinet on site, select an appropriate method based on the outdoor conditions.

9.1 Installing a Cabinet on the Base

This section describes the procedure and precautions for installing a cabinet of the BTS3900A on a base.

9.2 Installing Cabinets in Stack Mode

The BTS3900A cabinets can be stacked as follows: the APM30H/TMC11H is stacked on the RFC, the TMC11H is stacked on the IBBS200D/IBBS200T, or two IBBS200Ds/IBBS200Ts are stacked.

9.1 Installing a Cabinet on the Base

This section describes the procedure and precautions for installing a cabinet of the BTS3900A on a base.
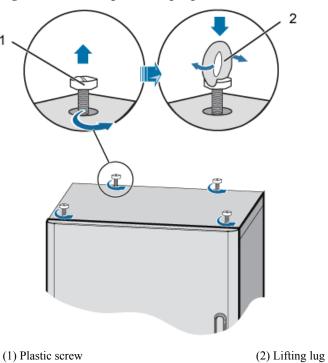
Procedure

- Installing the BTS3900A on the base
    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 9-1**.

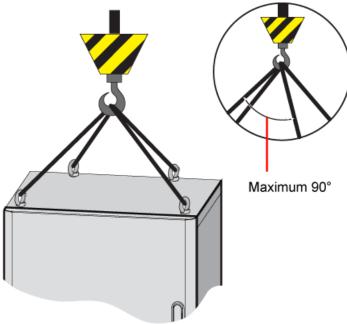---

⚠ **CAUTION**

Reserve the plastic screws for later use.

Figure 9-1 Installing the lifting lugs

| (1) Plastic screw | (2) Lifting lug |

2. Install ropes on the lifting lugs, and then lift the cabinet, as shown in **Figure 9-2**.

Figure 9-2 Installing the ropes

3. Lift the cabinet onto the base, and then align the cabinet with the base, as shown in **Figure 9-3**.

⚠ **WARNING**

Two installers are required for lifting the cabinet.
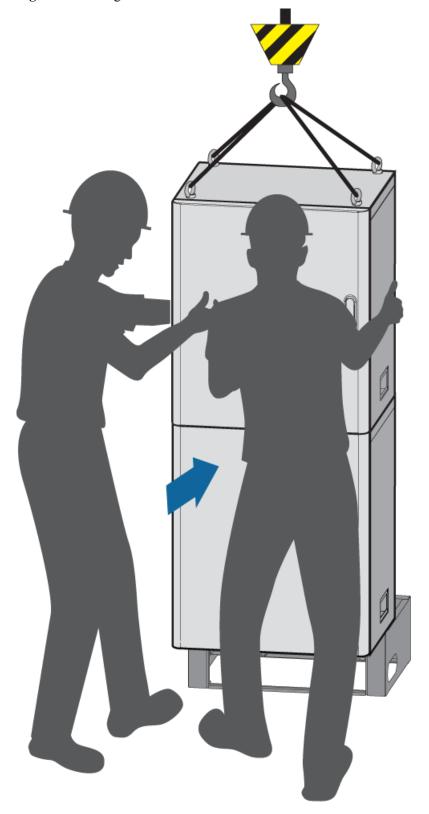
Figure 9-3 Lifting the cabinet onto the base
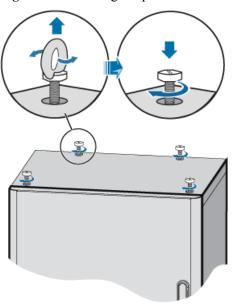
4.   Remove the ropes and lifting lugs, and then install the plastic screws, as shown in
     Figure 9-4.

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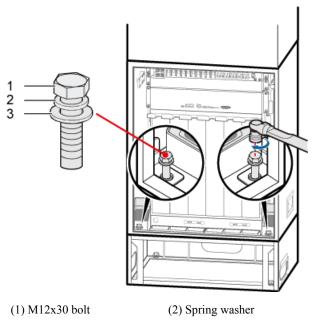
Before installing the rubber screws, clean the mounting holes to prevent entry of metal bits.

Figure 9-4 Installing the plastic screws

5. Use two M12x30 bolts to secure the cabinet on the base, and then use a torque wrench to tighten the bolts, as shown in **Figure 9-5**.

Figure 9-5 Securing the BTS3900A on the base
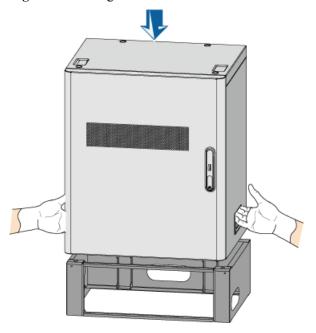
| (1) M12x30 bolt | (2) Spring washer | (3) Flat washer |

- Installing the TMC11H/IBBS200D/IBBS200T on the base

  📖 **NOTE**

 - The description of the procedure is based on the IBBS200D.
  - If the TMC11H/IBBS200D/IBBS200T is not required for the base station, skip the following procedure.

  1. Lift the cabinet onto the base, and then align the cabinet with the base, as shown in **Figure 9-6**.

  Figure 9-6 Lifting the IBBS200D onto the base

  2. Use four M12x30 bolts to secure the cabinet on the base, as shown in **Figure 9-7**.
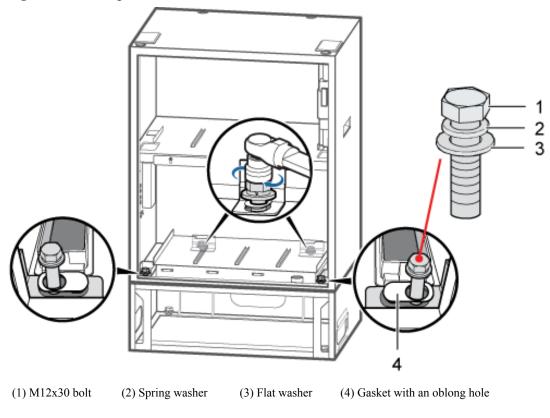
Figure 9-7 Securing the IBBS200D on the base
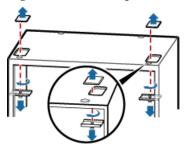
(1) M12x30 bolt	(2) Spring washer	(3) Flat washer	(4) Gasket with an oblong hole

----End

9.2 Installing Cabinets in Stack Mode

The BTS3900A cabinets can be stacked as follows: the APM30H/TMC11H is stacked on the RFC, the TMC11H is stacked on the IBBS200D/IBBS200T, or two IBBS200Ds/IBBS200Ts are stacked.

Procedure
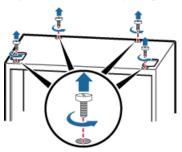
Step 1 Install the lower cabinet on the base by referring to **9.1 Installing a Cabinet on the Base**.

Step 2 Remove the cover plates for cable holes from the top of the lower cabinet, as shown in **Figure 9-8**.

Figure 9-8 Removing the cover plates for cable holes
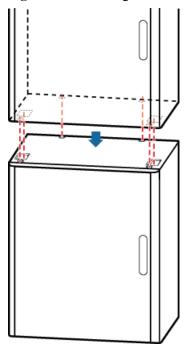
Step 3 Remove the four plastic screws from the top of the lower cabinet, as shown in **Figure 9-9**.

Figure 9-9 Removing the plastic screws
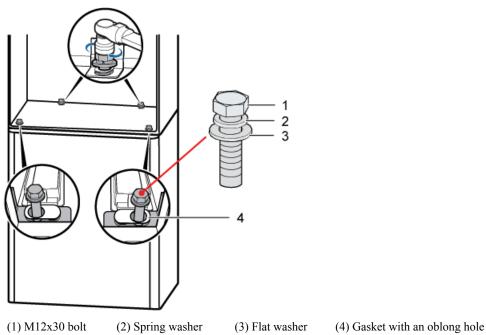
Step 4 Stack the cabinets and ensure that the mounting holes in the upper and lower cabinets are aligned, as shown in **Figure 9-10**.

Figure 9-10 Stacking the cabinet

Step 5 Use a torque wrench to tighten the four M12x30 bolts in the cabinet, as shown in **Figure 9-11**.

Figure 9-11 Tightening the bolts

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

----End

10 Installing the 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

Principles for grounding the outdoor system:

- Equi-potential cables are used to connect the upper cabinets and the lower cabinets.
- Equi-potential cables are used to connect the lower cabinets to the RFC.
- The RFC is connected to the general grounding bar through the PGND cable.

Table 10-1 describes the specifications of the PGND cable and equi-potential cable.

Table 10-1 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

This document is based on the following two scenarios.

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.
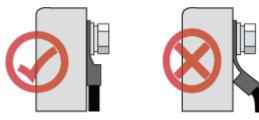
Step 2 Install the PGND cable.

1. Connect one end of the PGND cable to the grounding bar on the inner panel of the RFC, and then use spring washers and screws to fix the OT terminals of the PGND cable, as shown in **Figure 10-2**.

   📖 **NOTE**

   When installing the PGND cable, keep the crimping tube of the OT terminal in the direction shown in **Figure 10-1**.

   Figure 10-1 Installing the OT terminal in the correct manner

2. Connect the other end of the PGND cable to the external grounding copper bar, as shown in **Figure 10-2**.

Figure 10-2 Installing the PGND cable

Step 3 Install the equi-potential cable.

Determine the installation position of the equi-potential cable in each cabinet, as shown in **Figure 10-3** and **Figure 10-4**. For details, see **Step 2**.

Figure 10-3 Installing the equi-potential cable (scenario 1)

Figure 10-4 Installing the equi-potential cable (scenario 2)

Step 4 Route the cable by referring to **12.1 Cabling Requirements**, and then use cable ties to bind the cable.

Step 5 Attach labels to the installed cable. For details, see Attaching a Sign Plate Label.
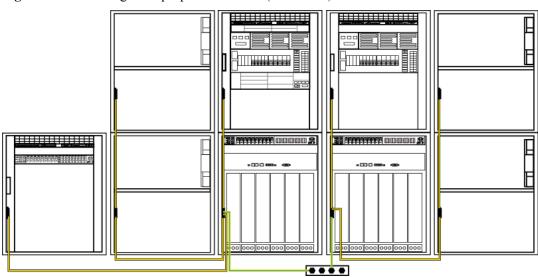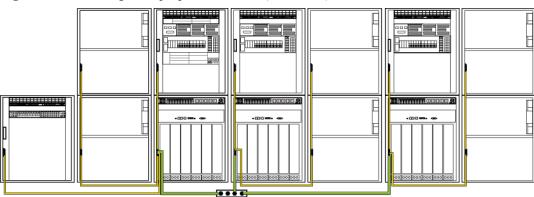
----End

11 Installing Optional Modules

About This Chapter

This chapter describes the installation of optional modules and the connection between the optional modules and the external devices.

11.1 Installing the SLPU
The SLPU can work as a protection unit of trunk signals or monitoring signals. This section describes the procedure for installing the SLPU that is used to protect monitoring signals. The SLPU used to protect monitoring signals is installed below the BBU, occupying a 1 U space.

11.2 Installing the EMUA
This section describes the installation of the EMUA in various scenarios and the cable connection between the EMUA and the external devices.

11.3 (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.

11.4 (Optional) Installing the GPS Surge Protector
This section describes the procedure and precautions for installing the GPS surge protector and related cables.

11.5 Installing the DDF
The Digital Distribution Frame (DDF) cable distribution includes the distribution of alarm cables and E1/T1 cables. The cabling principle for alarm cables is left cable inlet and left cable outlet. The cabling principle for E1/T1 cables is right cable inlet and right cable outlet. The cabling principle for all cables is top cable inlet and bottom cable outlet.

11.6 Replacing the Fuse
When certain power equipment, which has high current requirements, is connected to a DC output port on the EPS subrack, the fuse on the port need to be replaced if it cannot meet the high-current requirement. Replacing the fuse that controls the port for supplying power to the BBU disrupts all the services carried by the base station.

11.1 Installing the SLPU

The SLPU can work as a protection unit of trunk signals or monitoring signals. This section describes the procedure for installing the SLPU that is used to protect monitoring signals. The SLPU used to protect monitoring signals is installed below the BBU, occupying a 1 U space.

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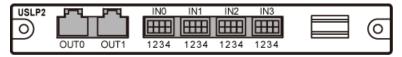
The tools, such as a screwdriver and a pair of ESD gloves, are available.

Context
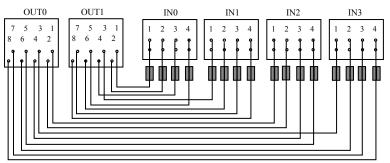
The SLPU that is used to protect monitoring signals is configured with two Universal Signal Lightning Protection unit type 2 (USLP2s) before delivery. **Figure 11-1** shows the panel of the USLP2.

Figure 11-1 The panel of the USLP2

Figure 11-2 shows the mapping relationship between the pins in the input and output ports on the USLP2.

Figure 11-2 Mapping relationship between the pins in the input and output ports on the USLP2

Table 11-1 lists the mapping relationship between the pins in the input and output ports on the USLP2.

Table 11-1 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	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 11-2 lists the SLPU-related cables.
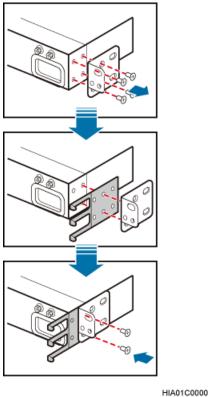
Table 11-2 SLPU-related cables

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 11-3**.
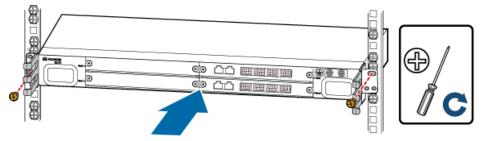
Figure 11-3 Installing cable racks

HIA01C0000

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 11-4**.

Figure 11-4 Installing the SLPU

Step 3 Install the surge protection transfer cable for monitoring signals, as shown in **Figure 11-5**.
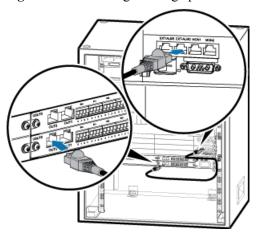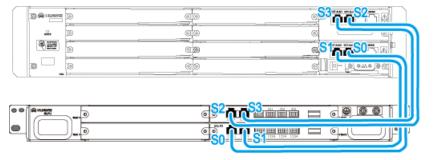
Figure 11-5 Installing the surge protection transfer cable for monitoring signals
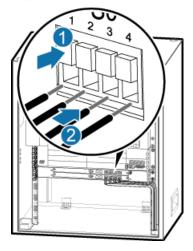
1. Connect one end of the cable to the OUT0 port on the USLP2 in slot 3 of the SLPU.
2. Connect the other end of the cable to the EXT_ALM0 port on the UPEU in the BBU.
3. Connect the other three surge protection transfer cables for monitoring signals by referring to **Figure 11-6**.

Figure 11-6 Connections of surge protection cables for monitoring signals

Step 4 Install the external dry-contact monitoring signal cables, as shown in **Figure 11-7**.

Figure 11-7 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 **12.1 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

11.2 Installing the EMUA

This section describes the installation of the EMUA in various scenarios and the cable connection between the EMUA and the external devices.

11.2.1 Installing the EMUA in the APM30H

This section describes the installation of the EMUA when the APM30H is used and also describes the cable connection between the EMUA and the external devices. The EMUA can be installed in the reserved space of the 1 U-high APM30H cabinet.

Prerequisite

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

Context

Table 11-3 describes the cables related to the EMUA.

Table 11-3 Cables related to the EMUA
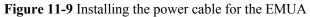
Cable List		One End	The Other End	Remarks
Power cable for the EMUA	RTN(+) cable	Easy power receptacle (pressfit type) connector	Cord end terminal	Black
	NEG(-) cable		Cord end terminal	Blue
EMUA monitoring signal cable		DB9 male connector	RJ45 connector	Black

Procedure
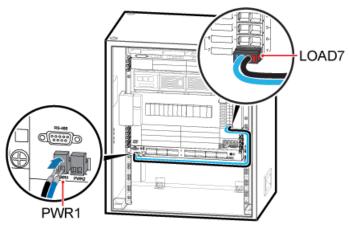
Step 1 Use four screws to install the EMUA in the APM30H cabinet, as shown in **Figure 11-8**.

Figure 11-8 Installing the EMUA in the cabinet

Step 2 **Figure 11-9** shows the connection of the power cable for the EMUA.

Figure 11-9 Installing the power cable for the EMUA

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 tool-less female power connector (pressfit type) 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 11-10** shows the connection of the EMUA monitoring signal cable.

Figure 11-10 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 **12.1 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

11.2.2 Installing the EMUA in the TMC11H

This section describes the installation of the EMUA when the TMC11H is used and the cable connection between the EMUA and the external devices. The EMUA can be installed in the reserved space of the 1 U-high TMC11H cabinet.

Prerequisite

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

Context

Table 11-4 describes the cables related to the EMUA.

Table 11-4 Cables related to the EMUA
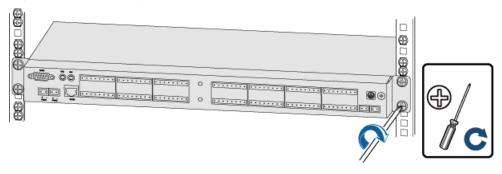
Cable List		One End	The Other End	Remarks
Power cable for the EMUA	RTN(+) cable	M4 OT terminal	Cord end terminal	Black, 1.5 mm^2, two wires in black and blue
	NEG(-) cable	M4 OT terminal	Cord end terminal	

| Cable List	One End	The Other End	Remarks
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 11-11**.

Figure 11-11 Installing the EMUA in the cabinet

Step 2 **Figure 11-12** shows the connection of the power cable for the EMUA.
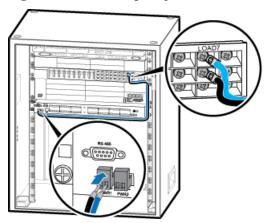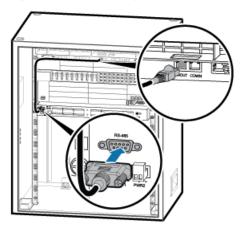
Figure 11-12 Installing the power cable for the EMUA

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 DCDU-03.

Step 3 **Figure 11-13** shows the connection of the EMUA monitoring signal cable.
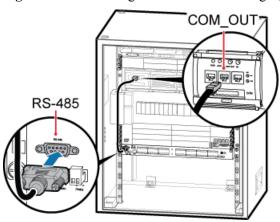
Figure 11-13 Installing the EMUA monitoring signal cable

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 CMUA in the cabinet.

Step 4 Route the cables by referring to **12.1 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

11.3 (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 11-14**. If an SOU is installed in the cabinet, an AC heater must be installed above the SOU, as shown in **Figure 11-15**.

Figure 11-14 Position for installing an AC heater (1)

PAH06C0001
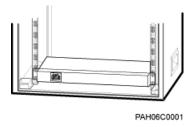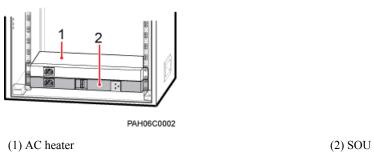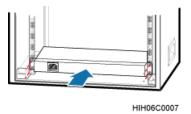
Figure 11-15 Position for installing an AC heater (2)

PAH06C0002

(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 11-16**.

Figure 11-16 Installing an AC heater

HIH06C0007

Step 2 Install a power cable for the heater, as shown in **Figure 11-18**.

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 11-17** .
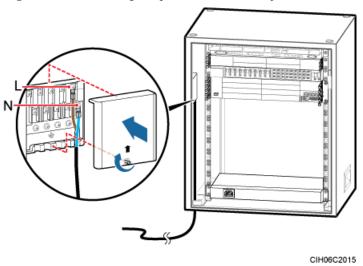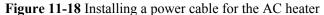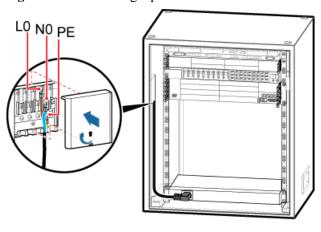
Figure 11-17 Installing the power cable for the junction box in the TMC11H

CIH06C2015

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 11-18 Installing a power cable for the AC heater

CIH06C2016

Step 3 Route and bind the cables. For details, see **12.1 Cabling Requirements**.

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

----End

11.4 (Optional) Installing the GPS Surge Protector

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

Context
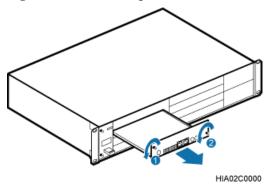
📖 **NOTE**

> 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 11-19**.

Figure 11-19 Removing the USCU.

HIA02C0000

Step 2   Install a satellite receiver on the USCU, as shown in **Figure 11-20**.

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 11-20**
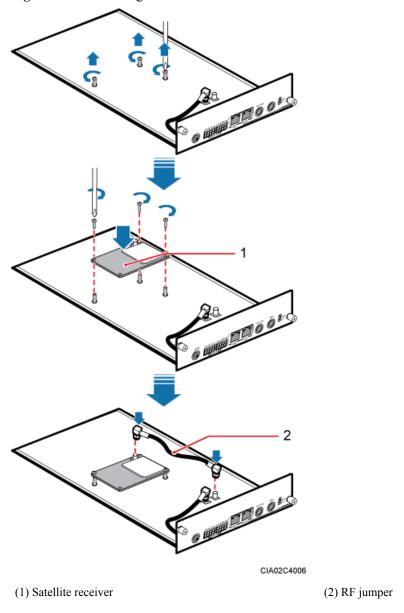
Figure 11-20 Installing the satellite receiver on the USCU

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 11-21**.
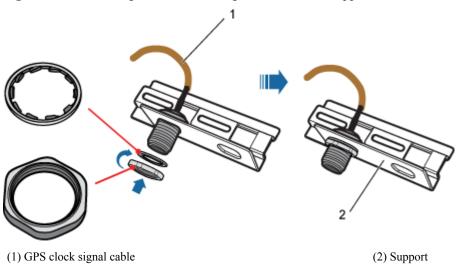
Figure 11-21 Installing the GPS clock signal cable on the support

| (1) GPS clock signal cable | (2) Support |

Step 5 Install the support on the left of the cabinet, as shown in **Figure 11-22**.
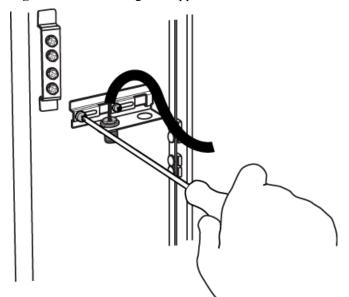
Figure 11-22 Installing the support on the cabinet

Step 6 Connect the GPS clock signal cable to the GPS port on the USCU, as shown in **Figure 11-23**.
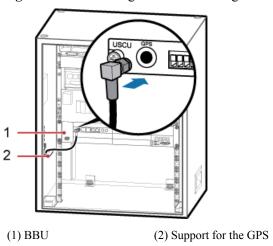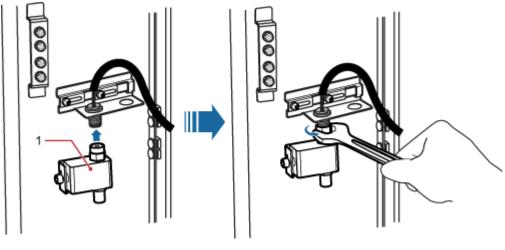
Figure 11-23 Installing the GPS clock signal cable on the USCU

(1) BBU   (2) Support for the GPS

Step 7 Install the GPS surge protector, as shown in **Figure 11-24**.

Figure 11-24 Installing the GPS surge protector

(1) 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 11-25**.
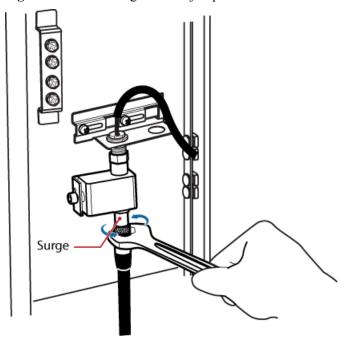
Figure 11-25 Installing the GPS jumper

Step 9 Route the cable by referring to **12.1 Cabling Requirements**.

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

----End

11.5 Installing the DDF

The Digital Distribution Frame (DDF) cable distribution includes the distribution of alarm cables and E1/T1 cables. The cabling principle for alarm cables is left cable inlet and left cable outlet. The cabling principle for E1/T1 cables is right cable inlet and right cable outlet. The cabling principle for all cables is top cable inlet and bottom cable outlet.

Prerequisite

The tools and materials, such as an IDC tool , a screwdriver, and a DDF, are ready.

Context

- The 1 U DDF can be installed in the reserved space in the 19-inch cabinet.
- On the digital modules: a, b and s indicate the following positions:
  - a and b indicate the terminating positions of signal cables.
  - s indicates the terminating position of protection grounding cables.

Procedure

Step 1 Connect the twisted pair cables at the side of the DDF. Connect the other end of the twisted pair cables to BBU.

1. Insert the exposed wires of the twisted pair cables into the corresponding digital modules according to the colors or labels of the wires.

2. Use the IDC tool to install the wires of the twisted pair cables to the terminating position of the digital modules, as shown in **Figure 11-26**.

Step 2 Connect the twisted pair cables at the side of the DDF. Connect the other end of the twisted pair cables to the peer equipment.

1. Insert the exposed wires of the twisted pair cables into the corresponding digital modules according to the colors or labels of the wires.

2. Use the IDC tool to install the wires of the twisted pair cables to the terminating position of the digital modules, as shown in **Figure 11-26**.

Step 3 Arrange the cables on DDF, as shown in **Figure 11-26**.
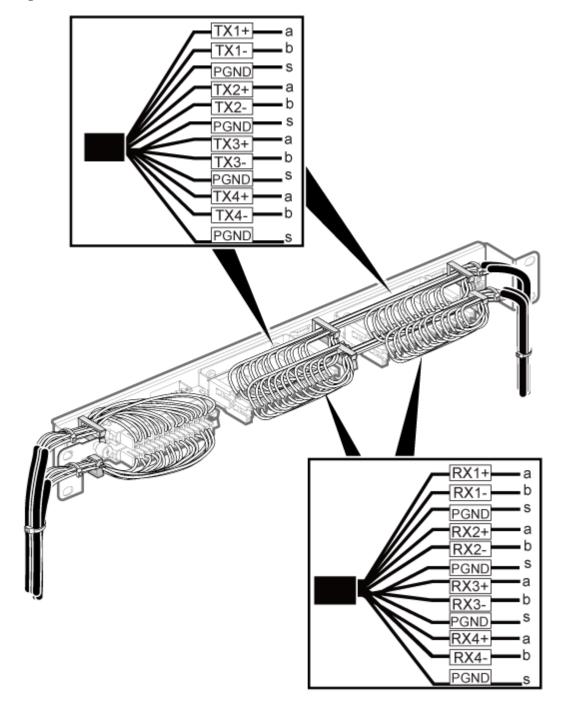
Figure 11-26 DDF cable distribution effect

📖 **NOTE**
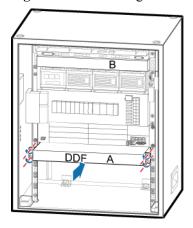
- When DDF cable distribution is complete, ensure that the unexposed part is outside the DDF box.
- When the cables on both sides of the DDF box are connected, the wire connection order depends on the actual situation and ensures that wires in the same color are connected, as shown in **Figure 11-26**.

Step 4 Check whether floating nuts are configured on both sides of the 19-inch subrack. If not, install the floating nuts delivered with the DDF on both sides of the 19-inch subrack.

Step 5 Align the DDF with the subrack, slide it into the subrack, and tighten the screws on both sides of the DDF, as shown in **Figure 11-27**.

📖 **NOTE**

> The DDF is preferably installed in the position labeled A in the figure. If the space is limited, you can install it in the position labeled B in the figure.

Figure 11-27 Installing the DDF in the APM30H

----End

11.6 Replacing the Fuse

When certain power equipment, which has high current requirements, is connected to a DC output port on the EPS subrack, the fuse on the port need to be replaced if it cannot meet the high-current requirement. Replacing the fuse that controls the port for supplying power to the BBU disrupts all the services carried by the base station.

Prerequisite

● The tools and materials, such as an ESD wrist strap or a pair of ESD gloves, new fuse, ESD box or bag, and key to the cabinet door, are ready.

● The quantity and model of the faulty fuses are confirmed, and new fuses of the same quantity and model are ready.

● The authorized personnel are permitted to enter the site. The required keys are available.

Context

● **Figure 11-28** shows the installation position of the fuse and spare fuse box in the EPS subrack.

Figure 11-28 Installation position of the fuse and spare fuse box

(1) Extraction tool	(2) Spare fuse box	(3) Fuse

● The fuse is hot-swappable.

⚠ **CAUTION**

The specifications of the fuse vary according to the ambient temperature. For details on the derating of the fuse, see the general specifications of the fuse. If the fuse works at a normal temperature of 25°C, the operating current cannot be greater than 75% of its rated current.

Procedure

Step 1 Wear an ESD wrist strap or a pair of ESD gloves.

⚠ **CAUTION**

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

Step 2 Take the extraction tool out of the mounting ear on the right side of the EPS subrack.

Figure 11-29 shows the exterior and position of the extraction tool.
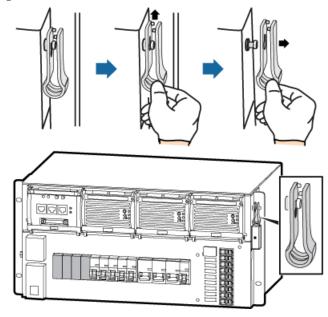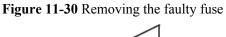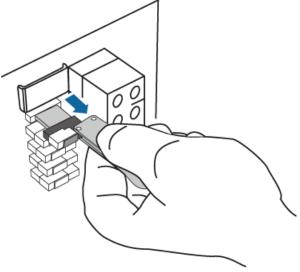
Figure 11-29 Position of the extraction tool in the cabinet

Step 3 Use the extraction tool to remove the faulty fuse, as shown in **Figure 11-30**.

Figure 11-30 Removing the faulty fuse

Step 4 Place the faulty fuse into an ESD box or bag.

Step 5 Take the fuse from the spare fuse box, as shown in **Figure 11-31**.

Figure 11-31 Taking the spare fuse

Step 6 Insert the new fuse into the corresponding port.

Step 7 Set the circuit breaker for the new fuse to ON and check the running status of the related modules to determine whether the fuse works properly.

Step 8 Take off the ESD wrist strap or gloves, and then pack up all the tools.

----End

Follow-up Procedure

- Place the replaced component into the ESD box or bag. Then, place the ESD box or bag into a carton padded with foam or into the packing box of the new component.
- Fill in the fault form with the details of the replaced component.

12 Installing the Cables

About This Chapter

The BTS3900A cabinet is delivered with boards installed, and the internal cables are already installed. Therefore, only the external cables and cables for the optional modules need to be installed on site.

Context

📖 **NOTE**

Contact Huawei engineers for confirmation if you encounter the following situations:

- You need to use the cables and connectors prepared by customers.
- You need to cut the fixed-length cable to a specific length.

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

12.2 Installing the Cable Outlet Module for the Cabinet
You must lead the cables through the cable outlet modules at both sides of the bottom of the cabinet for effective sealing during the cable installation.

12.3 Installing the Power Cable
This section describes the procedure and precautions for installing the external input power cable.

12.4 Installing the Transmission Cables
The E1/T1 cable or FE/GE cable can be used for data transmission according to the transmission mode of the base station. Only one transmission mode can be supported by the base station working in the GSM standard, and two transmission modes can be supported by the base station working in the UMTS standard.

12.5 Installing the Monitoring Signal Cables
The BTS3900A cabinet is delivered with boards installed, and the signal cables in the cabinet are already installed. The cross-cabinet monitoring signal cables need to be installed on site.

12.6 Installing the RF Jumper
The RF jumper connects the RFU to the antenna system for signal exchange between the NodeB and the antenna system.

12.7 Installing the CPRI Cable (Optional)

The CPRI cable between RF module and the BBU is used to transmit the CPRI signals between the RF module and the BBU.

12.8 (Optional) Installing Inter-BBU Signal Cable

Install inter-BBU signal cable with a DLC connector at both ends for interconnecting optical ports onsite when a triple-mode base station is configured as GU (BBU0)+L(G) (BBU1) or GL (BBU0)+U(G) (BBU1).

12.9 Installing the Batteries and Related Cables

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

12.1 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.

12.2 Installing the Cable Outlet Module for the Cabinet
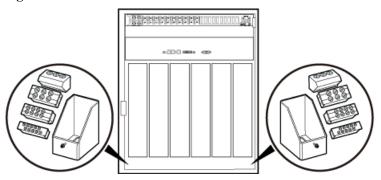
You must lead the cables through the cable outlet modules at both sides of the bottom of the cabinet for effective sealing during the cable installation.

Context

Cable module of RFC

There is a cable module at each side of the RFC, as shown in **Figure 12-1**.
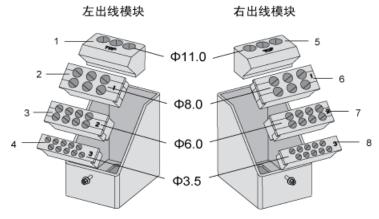
Figure 12-1 Cable outlet modules in the RFC

☐ **NOTE**

Figure 12-2 shows the exterior of the cable outlet modules of the RFC.

Figure 12-2 Exterior of the cable outlet modules of the RFC
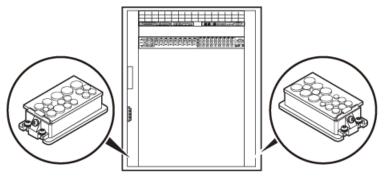
(1) Cable holes for the AC input power cables and GPS clock signal cables

(5) Cable hole for Boolean alarm signal cables

(2) Cable hole for the microwave IF cable and diesel generator monitoring cable

(6) Cable hole for E1/T1 cables and storage battery power cables

(3) AC output power cables, PGND cables, and DC input power cables

(7) Cable hole for RS485 signal cables

(4) Cable holes for CPRI cables and Bias-Tee feeders

(8) Cable holes for CPRI cables, Bias-Tee feeders, and DC output power cables (of the TMC and IBBS's FAN/TEC)

Cable module of TMC11H

There is a cable outlet module at both left and right sides of each TMC11H cabinet or IBBS200D/IBS200T, as shown in **Figure 12-3**.

Figure 12-3 Cable outlet module of the TMC11H cabinet
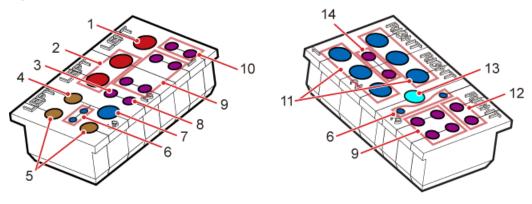
PAH06C0060

🕮 **NOTE**

Figure 12-4 shows the exterior of the cable outlet modules of the TMC11H.

Figure 12-4 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

☐ **NOTE**
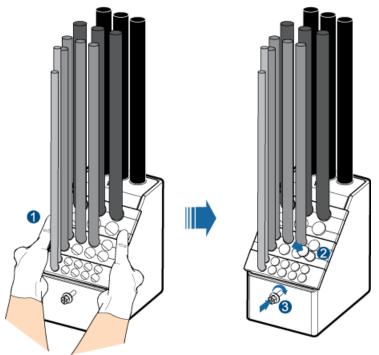
- When the TMC11H or APM30H is stacked on the RFC, the installation of the cable module in the TMC11H or APM30H is not required.
- When two IBBS200Ds or two IBBS200Ts are stacked, the installation of the cable module in the upper cabinet is not required.

Procedure

Step 1 Lead cables with different cross-section areas through the holes of the cable module based on the aperture, and then insert the cable module into the cable hole of the cabinet.

The following description is based on the installation of the cable outlet module for the RFC, as shown in **Figure 12-5**.

Figure 12-5 Installing the cable module of RFC

⚠ **CAUTION**

Lead the cable through the cable hole with an aperture matching the cross-sectional area of the cable in order that the sealing is effective, as shown in **Figure 12-6**.

Figure 12-6 Leading the cable through the cable outlet module

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

12.3 Installing the Power Cable

This section describes the procedure and precautions for installing the external input power cable.

Context

The BTS3900A cabinet is delivered with boards installed, and the power cables in the cabinet are already installed. The external input power cables need to be installed on site.

📖 **NOTE**

> The color and appearance of the power cable is for reference only. The actual cables may differ from what are shown in the figures.

12.3.1 Installing the Power Cable in the Cabinet with AC Power Supply

This section describes the procedure and precautions for installing the power cable of each cabinet in AC power supply scenario. The external power cables are often purchased on the local market. The color of the power cables must be subject to local laws or regulations.

Installing the Input Power Cable for the APM30H

The input power cable for the APM30H is used to connect the external power equipment and input wiring terminals on the EPS, feeding external power into the BTS3900A cabinets.

Prerequisite

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

- The PGND cable is installed.

Context

The power supply to the BTS3900A can be 220 V AC three-phase, 220 V AC single-phase, and 110 V dual-live-wire power. **Table 12-1** describes the input power cables for the APM30H delivered by default in different power supply scenarios.

Table 12-1 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 input power cable for the APM30H, as shown in **Figure 12-7**, **Figure 12-8**, and **Figure 12-9**.

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 12-7 Installing the APM30H's 220 V AC three-phase power cable on the EPS

CIH06C2052

(1) Short-circuiting bar	(2) L1 wire	(3) L2 wire
(4) L3 wire	(5) N wire	(6) PE wire

Figure 12-8 Installing the APM30H's 220 V AC single-phase power cable on the EPS

CIH06C2050

(1) L wire   (2) PE wire   (3) N wire
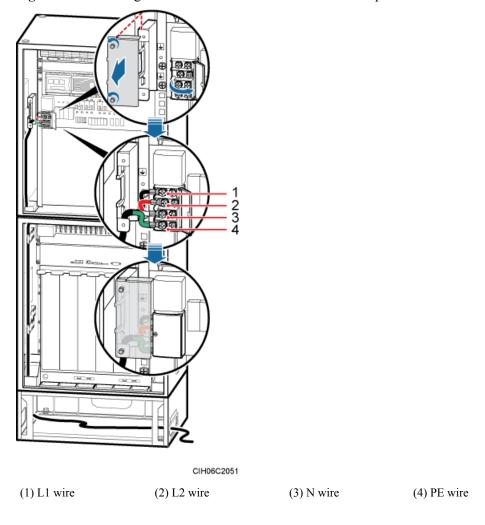
Figure 12-9 Installing the APM30H's 110 V AC dual-live-wire power cable on the EPS

CIH06C2051

(1) L1 wire	(2) L2 wire	(3) N wire	(4) PE wire

Step 3 Route the cable by referring to **12.1 Cabling Requirements**, and then use cable ties to bind the cable.

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

----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.
- The equipotential cables are installed.

Context

Table 12-2 lists the power cables between the APM30H and the TMC11H.

Table 12-2 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 12-2**. For details, see Assembling the OT Terminal and the Power Cable and Assembling the tool-less female power connector (pressfit type) 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 12-10**.

📖 **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.
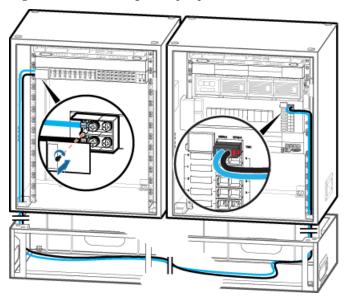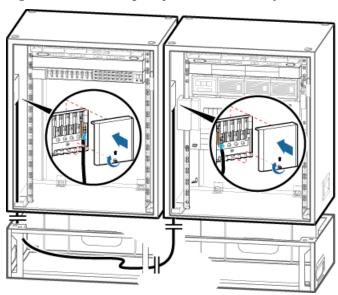
Figure 12-10 Installing the input power cable for the TMC11H

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 12-11**.

Figure 12-11 Installing the power cable for the junction box in the TMC11H

Step 4 Route the cable by referring to **12.1 Cabling Requirements**, and then use cable ties to bind the cable.

Step 5 Attach labels to the installed cable. For details, see Attaching a Sign Plate Label.

Step 6 Run each cable that leave the cabinet in a PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

----End

Installing the Power Cable Between the APM30H and the IBBS200D/IBBS200T (APM:IBBS=1:2)

The power cables between the APM30H and the IBBS200T are the power cable for the batteries, power cable for the fan in the IBBS200D, and power cable for the heating film in the IBBS200D. The power cables between the APM30H and the IBBS200T are the power cable for the batteries and power cable for the TEC cooler in the IBBS200T. The power cables feed power to the IBBS200D/IBBS200T and equipment in them from the APM30H. The power cables between the APM30H and the IBBS200D/IBBS200T are optional, which are delivered and used with the IBBS200D/IBBS200T.

Prerequisite

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

Context

The IBBS200D and IBBS200T are alternatives. That is, only one type of cabinet can be configured for the same site.

There are different proportions between the configured APM30Hs and the configured IBBS200Ds/IBBS200Ts. Therefore, two installation schemes are available for the power cables between the APM30H and the IBBS200D/IBBS200T. This section describes the procedure for installing the power cables between the APM30H and the IBBS200D/IBBS200T in case that the configuration proportion between them is 1:2.

Table 12-3 lists the power cables between the APM30H and the IBBS200D/IBBS200T.

Table 12-3 Power cables between the APM30H and the IBBS200D/IBBS200T

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

Cable	One End		The Other End	Remarks
the IBBS200D	NEG(-) wire		OT terminal (2.5 mm^2, M4)	Blue
Power cable for the cascaded fans in the IBBS200D	RTN(+) wire	OT terminal (2.5 mm^2, M4)	OT terminal (2.5 mm^2, M4)	Black
	NEG(-) wire	OT terminal (2.5 mm^2, M4)	OT terminal (2.5 mm^2, M4)	Blue
Power cable for the TEC cooler in the IBBS200T	RTN(+) wire	Easy power receptacle (pressfit type) connector	OT terminal (2.5 mm^2, M4)	Black
	NEG(-) wire		OT terminal (2.5 mm^2, M4)	Blue
Power cable for the heating film in the IBBS200D	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 power cable for the batteries, power cable for the fan in the IBBS200D or power cable for the TEC cooler in the IBBS200T, and power cable for the heating film in the IBBS200D based on the type of the battery cabinet configured at the site.

1. Prepare the cable of proper length based on the actual cable route.

2. Add a corresponding connector to each end of the power cables for the batteries, for the fan in the IBBS200D or for the TEC cooler in the IBBS200T, and for the heating film in the IBBS200D according to **Table 12-3**. For details, see Assembling the Power Series 120 Connector and the Power Cable, Assembling the tool-less female power connector (pressfit type) and the Power Cable, and Assembling the OT Terminal and the Power Cable.

Step 2 Install the power cable for the batteries.

1. Link the power series 120 connector at one end of the power cable for the batteries to the power supply terminal for the batteries on the right of the EPS in the APM30H, and then link the OT terminal at the other end to the RTN(+) and NEG(-) wiring terminals near the BAT label in the power distribution box in the lower IBBS200D/IBBS200T, as shown in **Figure 12-12**.

Figure 12-12 Installing the power cable for the batteries

2. Connect one end of the power cable for the cascaded batteries to the RTN(+) and NEG(-) wiring terminals near the BAT label in the power distribution box in the upper IBBS200D/ IBBS200T, and then connect the other end to the RTN(+) and NEG(-) wiring terminals near the BAT label in the power distribution box in the lower IBBS200D/IBBS200T, as shown in **Figure 12-12**.

Step 3 Install the power cable for the fan in the IBBS200D. If the IBBS200D is not configured, skip this step.

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 in the APM30H, and then link the OT terminal at the other end to the RTN(+) and NEG(-) wiring terminals near the TEC/FAN label in the power distribution box in the lower IBBS200D, as shown in **Figure 12-13**.
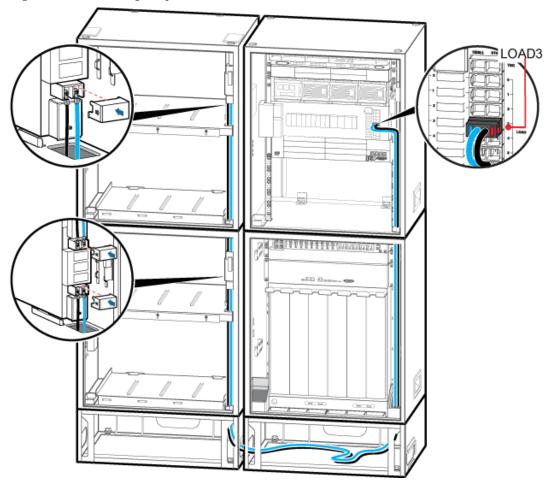
Figure 12-13 Installing the power cable for the fan in the IBBS200D

2. Link the OT terminal at one end of the power cable for the cascaded fans in the IBBS200D to the RTN(+) and NEG(-) wiring terminals near the TEC/FAN label in the power distribution box in the upper IBBS200D/IBBS200T, and then link the OT terminal at the other end to the RTN(+) and NEG(-) wiring terminals near the TEC/FAN label in the power distribution box in the lower IBBS200D, as shown in **Figure 12-13**.
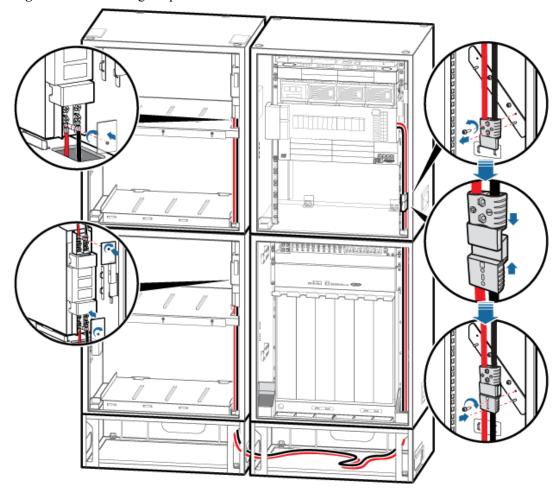
Step 4 Install the power cable for the heating film in the IBBS200D. If the IBBS200D is not configured, skip this step.

1. Link the OT terminal at one end of the power cable for the heating film of the upper IBBS200D to the L1 and N1 terminals in the junction box on the left of the APM30H, and then link the OT terminal at the other end to the L and N terminals in the junction box on the left of the corresponding IBBS200D for the heating film, as shown in **Figure 12-14**.
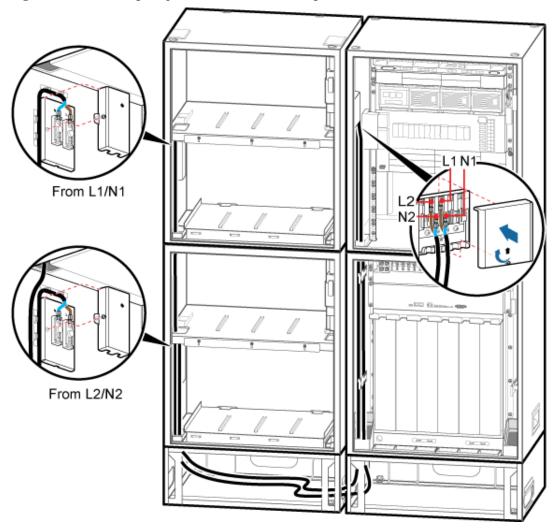
Figure 12-14 Installing the power cable for the heating film in the IBBS200D

2. Link the OT terminal at one end of the power cable for the heating film of the lower IBBS200D to the L2 and N2 terminals in the junction box on the left of the APM30H, and then link the OT terminal at the other end to the L and N terminals in the junction box on the left of the corresponding IBBS200D for the heating film, as shown in **Figure 12-14**.

⚠ **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 as shown in **Figure 12-15**.

● 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 12-15 Improper installation of the power cable for the heating film near the junction box in the IBBS200D

Step 5 Install the power cable for the TEC cooler in the IBBS200T. If the IBBS200T is not configured, skip this step.

1. Link the easy power receptacle (pressfit type) connector at one end of the power cable for the TEC cooler in the upper IBBS200T to the DC output terminal labeled LOAD2 on the right of the EPS in the APM30H, and then link the OT terminal at the other end to the RTN (+) and NEG(-) wiring terminals near the TEC/FAN label in the power distribution box in the corresponding IBBS200T, as shown in **Figure 12-16**.

   📖 **NOTE**

   If the LOAD2 terminal is used, the LOAD4 terminal is recommended. In this case, the fuse for the LOAD4 terminal needs to be replaced for the MCB requirement of the IBBS. For details about the replacement, see **11.6 Replacing the Fuse**.
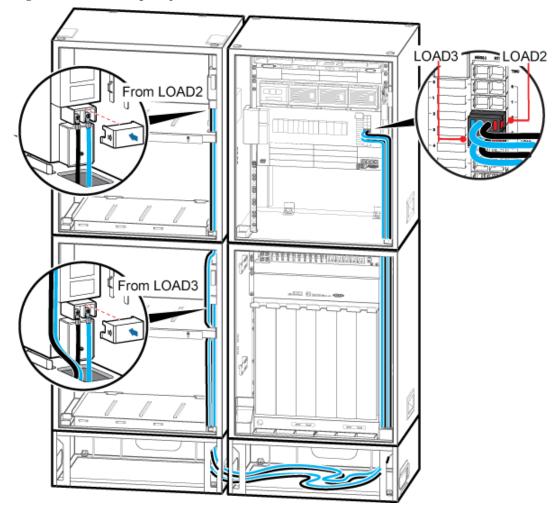
Figure 12-16 Installing the power cable for the TEC cooler in the IBBS200T

2. Link the easy power receptacle (pressfit type) connector at one end of the power cable for the TEC cooler in the lower IBBS200T to the DC output terminal labeled LOAD3 on the right of the EPS in the APM30H, and then link the OT terminal at the other end to the RTN (+) and NEG(-) wiring terminals near the TEC/FAN label in the power distribution box in the corresponding IBBS200T, as shown in **Figure 12-13**.

Step 6 Route the cable by referring to **12.1 Cabling Requirements**, and then use cable ties to bind the cable.

Step 7 Attach labels to the installed cable. For details, see Attaching a Sign Plate Label.

Step 8 Run each cable that leave the cabinet in a PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

----End

Installing the Power Cable Between the APM30H and the IBBS200D/IBBS200T (APM:IBBS=1:1)

The power cables between the APM30H and the IBBS200T are the power cable for the batteries, power cable for the fan in the IBBS200D, and power cable for the heating film in the IBBS200D.

The power cables between the APM30H and the IBBS200T are the power cable for the batteries and power cable for the TEC cooler in the IBBS200T. The power cables feed power to the IBBS200D/IBBS200T and equipment in them from the APM30H. The power cables between the APM30H and the IBBS200D/IBBS200T are optional, which are delivered and used with the IBBS200D/IBBS200T.

Prerequisite

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

Context

The IBBS200D and IBBS200T are alternatives. That is, only one type of cabinet can be configured for the same site.

There are different proportions between the configured APM30Hs and the configured IBBS200Ds/IBBS200Ts. Therefore, two installation schemes are available for the power cables between the APM30H and the IBBS200D/IBBS200T. This section describes the procedure for installing the power cables between the APM30H and the IBBS200D/IBBS200T in case that the configuration proportion between them is 1:1.

Table 12-4 lists the power cables between the APM30H and the IBBS200D/IBBS200T.

Table 12-4 Power cables between the APM30H and the IBBS200D/IBBS200T

Cable		One End	The Other End	Remarks
Power cable for the batteries	RTN(+) wire	Power series 120 connector	OT terminal (16 mm^2, M6)	Red
	NEG(-) wire		OT terminal (16 mm^2, M6)	Black
Power cable for the fan in the IBBS200D	RTN(+) wire	Easy power receptacle (pressfit type) connector	OT terminal (2.5 mm^2, M4)	Black
	NEG(-) wire		OT terminal (2.5 mm^2, M4)	Blue
Power cable for the TEC cooler in the IBBS200T	RTN(+) wire	Easy power receptacle (pressfit type) connector	OT terminal (2.5 mm^2, M4)	Black
	NEG(-) wire		OT terminal (2.5 mm^2, M4)	Blue
Power cable for the heating	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)

Cable		One End	The Other End	Remarks
film in the IBBS200D	N wire	OT terminal (1.5 mm^2, M4)	OT terminal (1.5 mm^2, M4)	

Procedure

Step 1 Prepare the power cable for the batteries, power cable for the fan in the IBBS200D or power cable for the TEC cooler in the IBBS200T, and power cable for the heating film in the IBBS200D based on the type of the battery cabinet configured at the site.

1. Prepare the cable of proper length based on the actual cable route.

2. Add a corresponding connector to each end of the power cables for the batteries, for the fan in the IBBS200D or for the TEC cooler in the IBBS200T, and for the heating film in the IBBS200D according to **Table 12-4**. For details, see Assembling the Power Series 120 Connector and the Power Cable, Assembling the tool-less female power connector (pressfit type) and the Power Cable, and Assembling the OT Terminal and the Power Cable.

Step 2 Install the power cable for the batteries.

1. Link the power series 120 connector at one end of the power cable for the batteries in the lower IBBS200D/IBBS200T to the power supply terminal on the right of the primary APM30H configured with the BBU, and then link the OT terminal at the other end to the RTN(+) and NEG(-) wiring terminals near the BAT label in the power distribution box in the lower IBBS200D/IBBS200T, as shown in **Figure 12-17**.
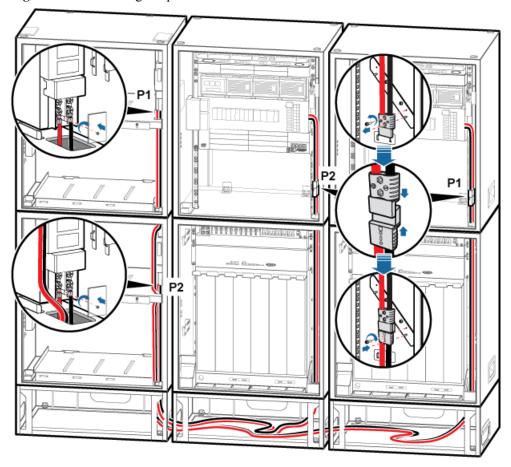
Figure 12-17 Installing the power cable for the batteries

2. Link the power series 120 connector at one end of the power cable for the batteries in the upper IBBS200D/IBBS200T to the power supply terminal for the batteries on the right of the secondary APM30H not configured with the BBU, and then link the OT terminal at the other end to the RTN(+) and NEG(-) wiring terminals near the BAT label in the power distribution box in the upper IBBS200D/IBBS200T, as shown in **Figure 12-17**.

Step 3 Install the power cable for the fan in the IBBS200D. If the IBBS200D is not configured, skip this step.

1. Link the easy power receptacle (pressfit type) connector at one end of the power cable for the fan in the lower IBBS200D to the DC output terminal labeled LOAD3 on the right of the EPS in the primary APM30H, and then link the OT terminal at the other end to the RTN (+) and NEG(-) wiring terminals near the TEC/FAN label in the power distribution box in the lower IBBS200D, as shown in **Figure 12-18**.
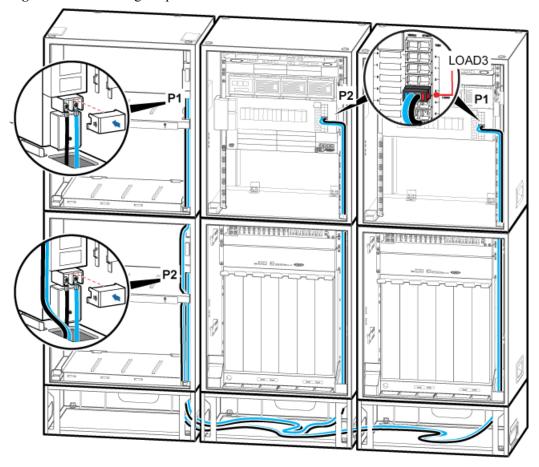
Figure 12-18 Installing the power cable for the fan in the IBBS200D

2. Link the easy power receptacle (pressfit type) connector at one end of the power cable for the fan in the upper IBBS200D to the DC output terminal labeled LOAD3 on the right of the EPS in the secondary APM30H, and then link the OT terminal at the other end to the RTN(+) and NEG(-) wiring terminals near the TEC/FAN label in the power distribution box in the upper IBBS200D, as shown in **Figure 12-18**.

Step 4 Install the power cable for the heating film in the IBBS200D. If the IBBS200D is not configured, skip this step.

1. Link the OT terminal at one end of the power cable for the heating film of the lower IBBS200D to the L2 and N2 terminals in the junction box on the left of the primary APM30H, and then link the OT terminal at the other end to the L and N terminals in the junction box on the left of the corresponding IBBS200D for the heating film, as shown in **Figure 12-19**.
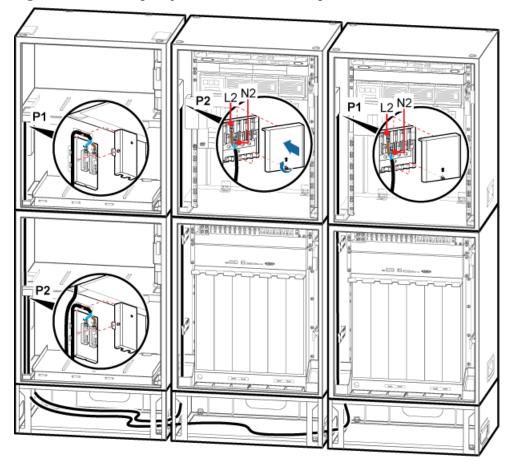
Figure 12-19 Installing the power cable for the heating film in the IBBS200D

2. Link the OT terminal at one end of the power cable for the heating film of the upper IBBS200D to the L2 and N2 terminals in the junction box on the left of the secondary APM30H, and then link the OT terminal at the other end to the L and N terminals in the junction box on the left of the corresponding IBBS200D for the heating film, as shown in **Figure 12-19**.

⚠ **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 as shown in **Figure 12-20**.

● 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 12-20 Improper installation of the power cable for the heating film near the junction box in the IBBS200D

Step 5 Install the power cable for the TEC cooler in the IBBS200T. If the IBBS200T is not configured, skip this step.

1. Link the easy power receptacle (pressfit type) connector at one end of the power cable for the TEC cooler in the lower IBBS200T to the DC output terminal labeled LOAD3 on the right of the EPS in the primary APM30H, and then link the OT terminal at the other end to the RTN(+) and NEG(-) wiring terminals near the TEC/FAN label in the power distribution box in the corresponding IBBS200T, as shown in **Figure 12-18**.

Figure 12-21 Installing the power cable for the TEC cooler in the IBBS200T

2. Link the easy power receptacle (pressfit type) connector at one end of the power cable for the TEC cooler in the upper IBBS200T to the DC output terminal labeled LOAD3 on the

right of the EPS in the secondary APM30H, and then link the OT terminal at the other end to the RTN(+) and NEG(-) wiring terminals near the TEC/FAN label in the power distribution box in the corresponding IBBS200T, as shown in **Figure 12-21**.

Step 6 Route the cable by referring to **12.1 Cabling Requirements**, and then use cable ties to bind the cable.

Step 7 Attach labels to the installed cable. For details, see Attaching a Sign Plate Label.

Step 8 Run each cable that leave the cabinet in a PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

----End

12.3.2 Installing the Power Cable for the -48 V Cabinet

This section describes the procedures and precautions for installing the power cables for the cabinets in the -48 V DC power supply scenario.

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 12-5 lists the power cables for the -48 V cabinet.

Table 12-5 Power cables for the -48 V cabinet

Cable	One End		The Other End	Remarks
Input power cable for the RFC (supplied with power from external equipment)	RTN(+) wire	OT terminal (16 mm^2, M6)	According to the external equipment	Black
	NEG(-) wire	OT terminal (16 mm^2, M6)	According to the external equipment	Red
Input power cable for the TMC11 H (supplied with power	RTN(+) wire	OT terminal (2.5 mm^2, M6)	Parallel terminal	Black

Cable	One End		The Other End	Remarks
from the RFC)	NEG(-) wire	OT terminal (2.5 mm², M6)		Blue
Input power cable for the TMC11H (supplied with power from the external equipment)	RTN(+) wire	OT terminal (4 mm², M6)	According to the external equipment	Black
	NEG(-) wire	OT terminal (4 mm², M6)	According to the external equipment	Blue

📖 **NOTE**

In the -48 V DC power supply scenario, the RFC can obtain the power only from the external equipment. The TMC11H, however, can obtain power from the external power equipment or from the RFC. If the TMC11H obtains power from the RFC, the total power consumption of the TMC11H cannot exceed 800 W.

Procedure

Step 1 Prepare the input power cables for the RFC and 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 RFC and power cable for the TMC11H according to **Table 12-5**. For details, see Assembling the OT Terminal and the Power Cable.

Step 2 Link the OT terminal at one end of the input power cable for the RFC to the input wiring terminal on the DCDU-01, tighten the screw, and then connect the other end to the external equipment, as shown in **Figure 12-22**.

📖 **NOTE**

Before installing the power cables, remove the protecting hood from the DC input wiring terminal block on the DCDU-01. After the cables are installed, reinstall the protecting hood.
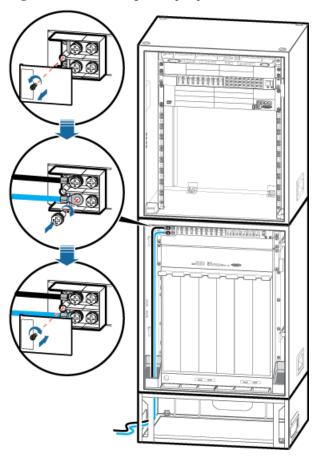
Figure 12-22 Installing the input power cable for the RFC
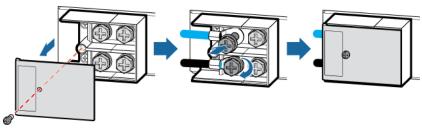
Step 3 Install the input power cable for the TMC11H.

1. If the TMC11H obtains power from the external equipment, install the cable by referring to **Step 2**.

2. If the TMC11H obtains power from the RFC, link the parallel terminal at one end of the power cable to the DC output terminal labeled SPARE2 on the DCDU-01 in the RFC, and then link the OT terminal at the other end to the DC input wiring terminal on the DCDU-03 in the TMC11H, as shown in **Figure 12-23**.

📕 **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 12-23 Installing the input power cable for the TMC11H on the DCDU-03

Step 4 Route the cable by referring to **12.1 Cabling Requirements**, and then use cable ties to bind the cable.

Step 5 Attach labels to the installed cable. For details, see Attaching a Sign Plate Label.

Step 6 Run each cable that leave the cabinet in a PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

----End

12.4 Installing the Transmission Cables

The E1/T1 cable or FE/GE cable can be used for data transmission according to the transmission mode of the base station. Only one transmission mode can be supported by the base station working in the GSM standard, and two transmission modes can be supported by the base station working in the UMTS standard.

12.4.1 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 12-24** or **Figure 12-25**.

Procedure

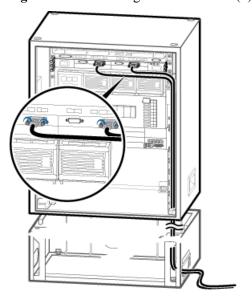**Step 1** Connect one end of the E1/T1 cable to the OUTSIDE port on the UELP, as shown in **Figure 12-24** or **Figure 12-25**.

🕮 **NOTE**

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

Figure 12-24 Installing the E1/T1 cable (1)

Figure 12-25 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 **12.1 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

12.4.2 Installing the FE/GE Cable

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

Procedure
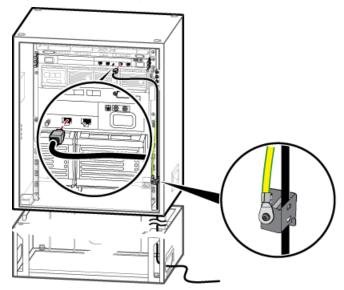
Step 1 Connect one end of the FE/GE cable to the FE0 or FE1 port near the OUTSIDE label on the UFLP, as shown in **Figure 12-26** or **Figure 12-27**.

📖 **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 12-26**.

Figure 12-26 Installing the FE/GE cable (1)

Figure 12-27 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 12-28**.

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.
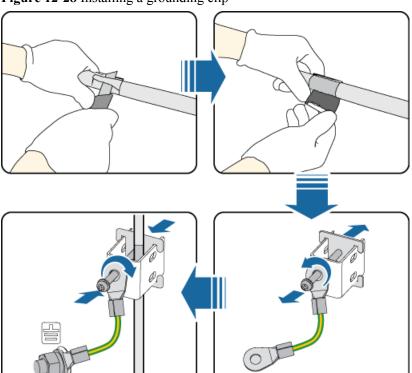
Figure 12-28 Installing a grounding clip

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 **12.1 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

12.4.3 Installing the FE/GE Optical Cable

This section describes the procedure and precautions to be taken for installing an 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.

📖 **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 an FE/GE optical cable in an APM30H.

⚠ **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.
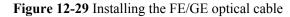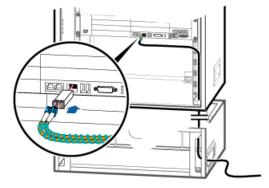
Procedure

Step 1 Insert an optical module into the corresponding FE/GE optical port, as shown in **Figure 12-29**.

📖 **NOTE**

For details about how to connect the FE/GE optical cable, see Transmission Cable Connections.

Step 2 Insert one end of the FE/GE optical cable into the optical module, as shown in **Figure 12-29**.

Figure 12-29 Installing the FE/GE optical cable

📖 **NOTE**

> Wrap winding plastic tape on the FE/GE optical cable to protect fibers.

Step 3 Lead the other end of the FE/GE optical 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 cable trough on the right of the cabinet, and then use cable ties to bind the cable.

Step 5 Route the cable by referring to **12.1 Cabling Requirements**.

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

----End

12.5 Installing the Monitoring Signal Cables

The BTS3900A cabinet is delivered with boards installed, and the signal cables in the cabinet are already installed. The cross-cabinet monitoring signal cables need to be installed on site.

12.5.1 Installing the Monitoring Signal Cables for AC-Type Cabinet

This section describes the procedure and precautions for installing cross-cabinet monitoring signal cables in various AC power supply scenarios.

Scenario: 1 RFC+1 APM30H

If a site is configured with one RFC and one APM30H, the monitoring cables are installed before the equipment is delivered. If one more RFC and one more APM30H are configured, two monitoring cables are required for connections between cabinets on site.

Context

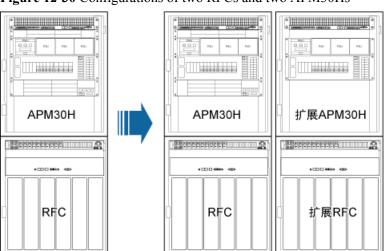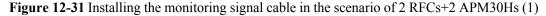**Figure 12-30** shows the configurations of two RFCs and two APM30Hs.

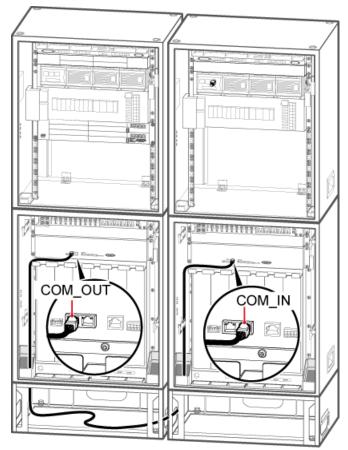**Figure 12-30** Configurations of two RFCs and two APM30Hs

📖 **NOTE**

Two BBUs are configured in a triple-mode base station. The new BBU is installed in the extension APM30H cabinet, and it does not have monitoring functions. For details about monitoring principles, see Monitoring Principles for the Cabinets.

Procedure

Step 1 Install the monitoring signal cable between the cascaded CMUAs between the RFC and the extension RFC. Connect one end of the cable to the COM_OUT port on the CMUA in the fan box of the RFC and the other end to the COM_IN port on the CMUA in the fan box of the extension RFC, as shown in **Figure 12-31**.

Figure 12-31 Installing the monitoring signal cable in the scenario of 2 RFCs+2 APM30Hs (1)

Step 2 Install the monitoring signal cable between the CMUA and the BBU. Connect one end of the cable to the MON0 port on the UEIU in the BBU in the APM30H and the other end to the COM_IN port on the CMUA in the fan box of the extension APM30H, as shown in **Figure 12-32**.

Figure 12-32 Installing the monitoring signal cable in the scenario of 2 RFCs+2 APM30Hs (2)

Step 3 Attach labels to the installed cables. For details, see Attaching an L-Shaped Label.

Step 4 Run each cable that leave the cabinet in a PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

----End

Scenario: 1 RFC+1 APM30H+1 IBBS200Ds/IBBS200T

If a site is configured with one RFC, one APM30H, and one IBBS200D/IBBS200T, one monitoring signal cable between the IBBS200D/IBBS200T the TMC11H is required on site.

Procedure

Step 1 Install the monitoring signal cable for the batteries between the IBBS200D/IBBS200T and the APM30H. Connect one end of the cable to the COM_IN port on the CMUA on the cabinet door of the IBBS200D/IBBS200T and the other end to the COM_485 port on the PMU in the APM30H, as shown in **Figure 12-33**.
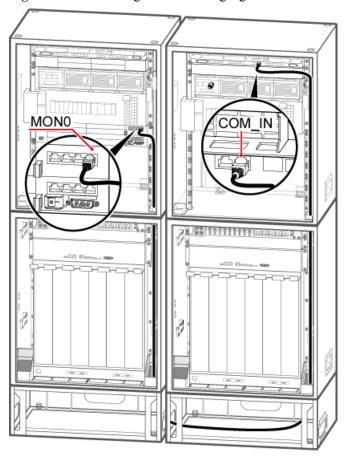
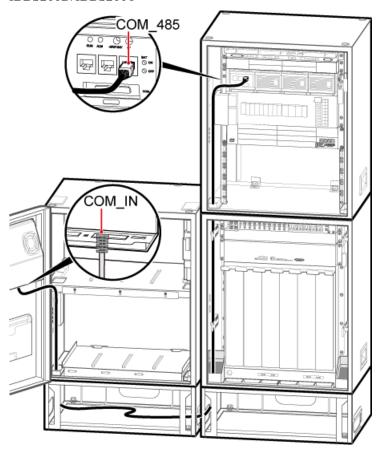**Figure 12-33** Installing the monitoring signal cable in the scenario of 1 RFC+1 APM30H+1 IBBS200D/IBBS200T

Step 2 Attach labels to the installed cables. For details, see Attaching an L-Shaped Label.

Step 3 Run each cable that leave the cabinet in a PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

Step 4 If two RFCs, two APM30Hs, and two IBBS200Ds/IBBS200Ts are configured on site, three more monitoring signal cables are required. **Figure 12-34** shows the configurations of the cabinets.
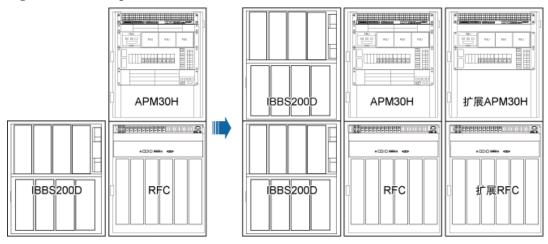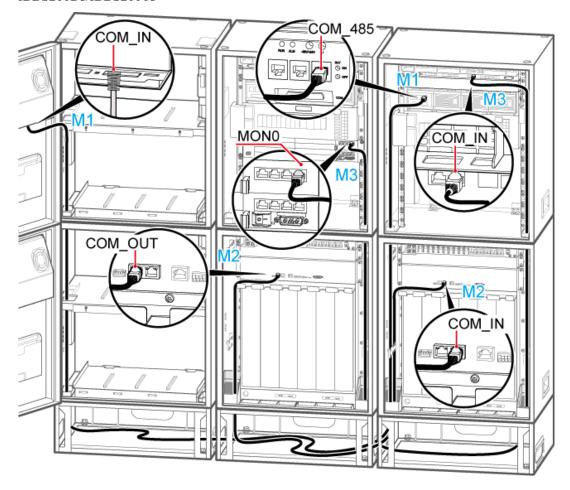
Figure 12-34 Configurations of two RFCs, two APM30Hs, and two IBBS200Ds/IBBS200Ts

❏ NOTE

Two BBUs are configured in a triple-mode base station. The new BBU is installed in the extension APM30H cabinet, and it does not have monitoring functions. For details about monitoring principles, see Monitoring Principles for the Cabinets.

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

Figure 12-35 Installing the monitoring signal cable in the scenario of 2 RFCs+2 APM30Hs+2 IBBS200Ds/IBBS200Ts

2. Install the monitoring signal cable between the RFC and the extension RFC. Connect one end of the cable to the COM_OUT port on the CMUA in the fan box of the RFC and the other end to the COM_IN port on the CMUA in the fan box of the extension RFC, as shown in **Figure 12-33**.

3. Install the monitoring signal cable between the CMUA and the BBU between the APM30H and the extension APM30H. Connect one end of the cable to the MON0 port on the UEIU in the BBU in the APM30H and the other end to the COM_IN port on the CMUA on the cabinet door of the extension APM30H, as shown in **Figure 12-35**.

4. Attach labels to the installed cables. For details, see Attaching an L-Shaped Label.

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

----End
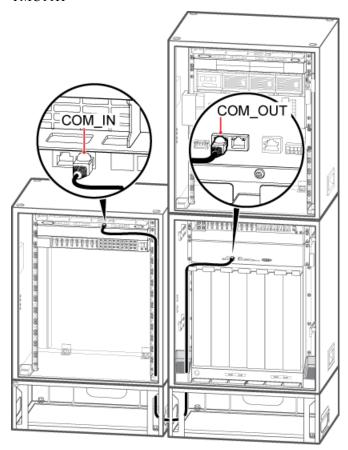
Scenario: 1 RFC+1 APM30H+1 TMC11H

If a site is configured with one RFC, one APM30H, and one TMC11H, one monitoring signal cable between the TMC11H and the RFC is required on site.

Procedure

Step 1 Install the monitoring signal cable between the cascaded CMUAs between the TMC11H and the RFC. Connect one end of the cable to the COM_IN port on the CMUA in the fan box of the TMC11H and the other end to the COM_OUT port on the CMUA in the fan box of the RFC, as shown in **Figure 12-37**.

Figure 12-36 Installing the monitoring signal cable in the scenario of 1 RFC+1 APM30H+1 TMC11H

Step 2 Attach labels to the installed cables. For details, see Attaching an L-Shaped Label.

Step 3 Run each cable that leave the cabinet in a PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

Step 4 If two RFCs, two APM30Hs, and one TMC11H are configured on site, two more monitoring signal cables are required. **Figure 12-37** shows the configurations of the cabinets.
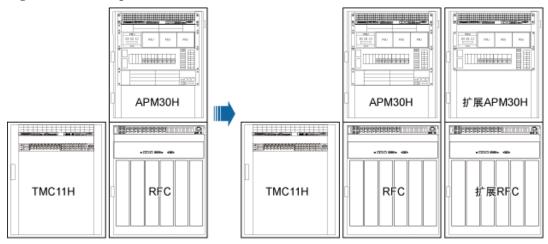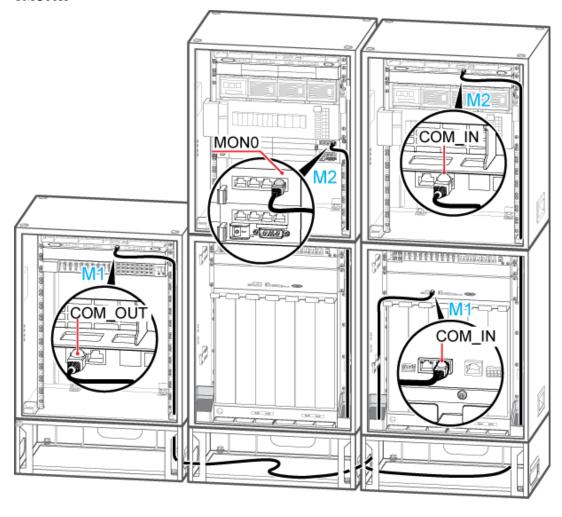
Figure 12-37 Configurations of two RFCs, two APM30Hs, and one TMC11H

NOTE

Two BBUs are configured in a triple-mode base station. The new BBU is installed in the extension APM30H cabinet, and it does not have monitoring functions. For details about monitoring principles, see Monitoring Principles for the Cabinets.

1. Install the monitoring signal cable between the cascaded CMUAs between the TMC11H and the extension RFC. Connect one end of the cable to the COM_OUT port on the CMUA in the fan box of the TMC11H and the other end to the COM_IN port on the CMUA in the fan box of the extension RFC, as shown in **Figure 12-36**.

Figure 12-38 Installing the monitoring signal cable in the scenario of 2 RFCs+2 APM30Hs+1 TMC11H

2. Install the monitoring signal cable between the CMUA and the BBU between the APM30H and the extension APM30H. Connect one end of the cable to the MON0 port on the UEIU in the BBU in the APM30H and the other end to the COM_IN port on the CMUA on the cabinet door of the extension APM30H, as shown in **Figure 12-38**.

3. Attach labels to the installed cables. For details, see Attaching an L-Shaped Label.

4. Run each cable that leave the cabinet in a PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

    ----End

Scenario: 1 RFC+1 APM30H+1 IBBS200Ds/IBBS200T+1 TMC11H
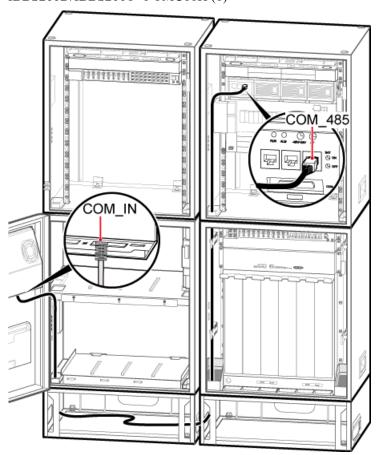
If a site is configured with one RFC, one APM30H, one IBBS200D/IBBS200T, and one TMC11H, two monitoring signal cables are required on site.

Procedure

Step 1 Install the monitoring signal cable for the batteries between the IBBS200D/IBBS200T and the APM30H. Connect one end of the cable to the COM_IN port on the CMUA on the cabinet door

of the IBBS200D/IBBS200T and the other end to the COM_485 port on the PMU in the
APM30H, as shown in **Figure 12-39**.

Figure 12-39 Installing the monitoring signal cable in the scenario of 1 RFC+1 APM30H+1
IBBS200D/IBBS200T+1 TMC11H (1)

Step 2 Install the monitoring signal cable between the cascaded CMUAs between the TMC11H and
the RFC. Connect one end of the cable to the COM_IN port on the CMUA in the fan box of the
TMC11H and the other end to the COM_OUT port on the CMUA in the fan box of the RFC, as
shown in **Figure 12-41**.

Figure 12-40 Installing the monitoring signal cable in the scenario of 1 RFC+1 APM30H+1 IBBS200D/IBBS200T+1 TMC11H (2)

Step 3 Attach labels to the installed cables. For details, see Attaching an L-Shaped Label.

Step 4 Run each cable that leave the cabinet in a PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

Step 5 If two RFCs, two APM30Hs, two IBBS200Ds/IBBS200Ts, and one TMC11H are configured on site, three more monitoring signal cables are required. **Figure 12-41** shows the configurations of the cabinets.

Figure 12-41 Configurations of two RFCs, two APM30Hs, two IBBS200Ds/IBBS200Ts, and one TMC11H
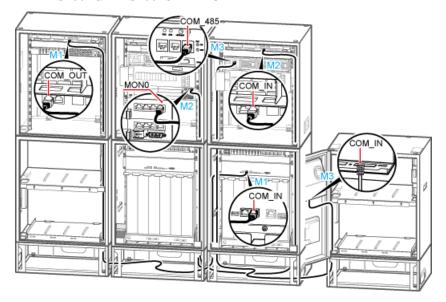
📖 **NOTE**

Two BBUs are configured in a triple-mode base station. The new BBU is installed in the extension APM30H cabinet, and it does not have monitoring functions. For details about monitoring principles, see Monitoring Principles for the Cabinets.

1. Install the monitoring signal cable between the cascaded CMUAs between the TMC11H and the extension RFC. Connect one end of the cable to the COM_OUT port on the CMUA in the fan box of the TMC11H and the other end to the COM_IN port on the CMUA in the fan box of the extension RFC, as shown in **Figure 12-39**.

Figure 12-42 Installing the monitoring signal cable in the scenario of 2 RFCs+2 APM30Hs +2 IBBS200Ds/IBBS200Ts+1 TMC11H

2. Install the monitoring signal cable between the CMUA and the BBU between the APM30H and the extension APM30H. Connect one end of the cable to the MON0 port on the UEIU in the BBU in the APM30H and the other end to the COM_IN port on the CMUA on the cabinet door of the extension APM30H, as shown in **Figure 12-42**.

3. Install the monitoring signal cable for the batteries between the extension APM30H and the extension IBBS200D/IBBS200T. Connect one end of the cable to the COM_485 port on the PMU in the extension APM30H and the other end to the COM_IN port on the CMUA on the cabinet door of the extension IBBS200D/IBBS200T, as shown in **Figure 12-42**.

4. Attach labels to the installed cables. For details, see Attaching an L-Shaped Label.

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

----End
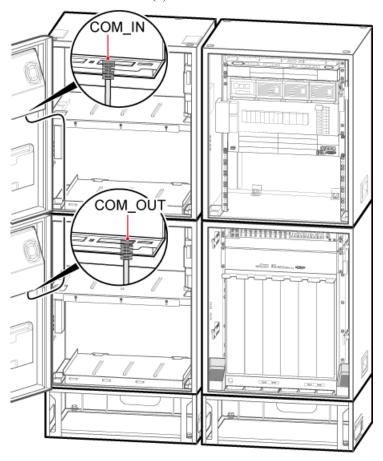
Scenario: 1 RFC+1 APM30H+2 IBBS200Ds/IBBS200Ts

If a site is configured with one RFC, one APM30H, and two IBBS200Ds/IBBS200Ts, two monitoring signal cables are required on site.
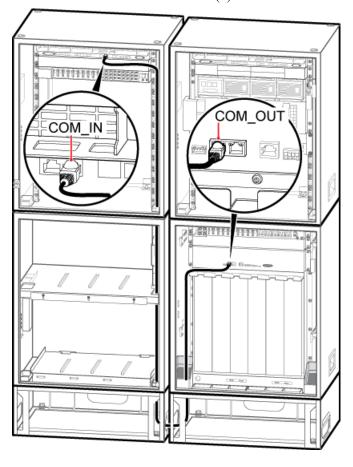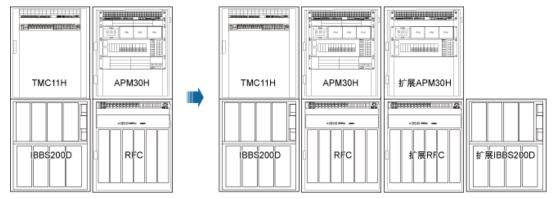
Procedure

Step 1 Install the monitoring signal cable between the cascaded CMUAs between the IBBS200D/IBBS200T and the IBBS200D/IBBS200T. Connect one end of the cable to the COM_IN port on the CMUA on the cabinet door of the upper IBBS200D/IBBS200T and the other end to the COM_OUT port on the CMUA on the cabinet door of the lower IBBS200D/IBBS200T, as shown in **Figure 12-43**.

Figure 12-43 Installing the monitoring signal cable in the scenario of 1 RFC+1 APM30H+2 IBBS200Ds/IBBS200Ts (1)

Step 2 Install the monitoring signal cable for the batteries between the IBBS200D/IBBS200T and the APM30H. Connect one end of the cable to the COM_IN port on the CMUA on the cabinet door of the lower IBBS200D/IBBS200T and the other end to the COM_485 port on the PMU in the APM30H, as shown in **Figure 12-44**.

Figure 12-44 Installing the monitoring signal cable in the scenario of 1 RFC+1 APM30H+2 IBBS200Ds/IBBS200Ts (2)

Step 3 Attach labels to the installed cables. For details, see Attaching an L-Shaped Label.

Step 4 Run each cable that leave the cabinet in a PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

Step 5 If two RFCs, two APM30Hs, and four IBBS200Ds/IBBS200Ts are configured on site, four more monitoring signal cables are required. **Figure 12-45** shows the configurations of the cabinets.
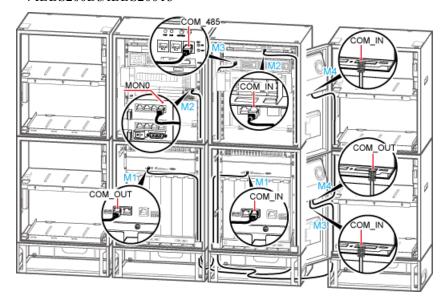
Figure 12-45 Configurations of two RFCs, two APM30Hs, and four IBBS200Ds/IBBS200Ts

📖 **NOTE**

Two BBUs are configured in a triple-mode base station. The new BBU is installed in the extension APM30H cabinet, and it does not have monitoring functions. For details about monitoring principles, see Monitoring Principles for the Cabinets.

1. Install the monitoring signal cable between between the RFC and the extension RFC. Connect one end of the cable to the COM_OUT port on the CMUA in the fan box of the RFC and the other end to the COM_IN port on the CMUA in the fan box of the extension RFC, as shown in **Figure 12-46**.

Figure 12-46 Installing the monitoring signal cable in the scenario of 2 RFCs+2 APM30Hs +4 IBBS200Ds/IBBS200Ts

2. Install the monitoring signal cable between the cascaded CMUAs between the APM30H and the extension APM30H. Connect one end of the cable to the MON0 port on the UEIU in the BBU in the APM30H and the other end to the COM_IN port on the CMUA in the fan box of the extension APM30H, as shown in **Figure 12-46**.

3. Install the monitoring signal cable for the batteries between the extension APM30H and the extension IBBS200D/IBBS200T. Connect one end of the cable to the COM_485 port on the PMU in the extension APM30H and the other end to the COM_IN port on the CMUA on the cabinet door of the lower extension IBBS200D/IBBS200T, as shown in **Figure 12-46**.

4. Install the monitoring signal cable between the cascaded CMUAs between the extension IBBS200D/IBBS200T and the extension IBBS200D/IBBS200T. Connect one end of the cable to the COM_IN port on the CMUA on the cabinet door of the upper extension IBBS200D/IBBS200T and the other end to the COM_OUT port on the CMUA on the cabinet door of the lower extension IBBS200D/IBBS200T, as shown in **Figure 12-46**.

5. Attach labels to the installed cables. For details, see Attaching an L-Shaped Label.

6. Run each cable that leave the cabinet in a PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

----End
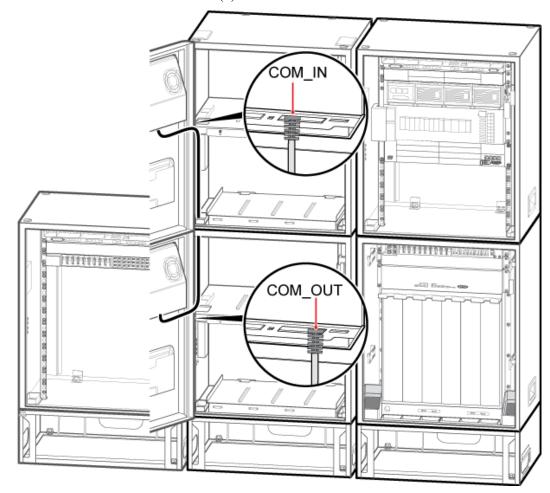
Scenario: 1 RFC+1 APM30H+2 IBBS200Ds/IBBS200Ts+1 TMC11H

If a site is configured with one RFC, one APM30H, two IBBS200Ds/IBBS200Ts, and one TMC11H, three monitoring signal cables are required on site.
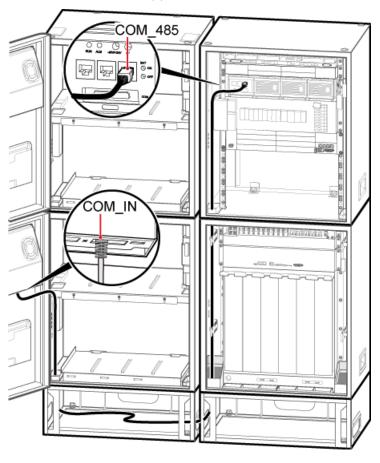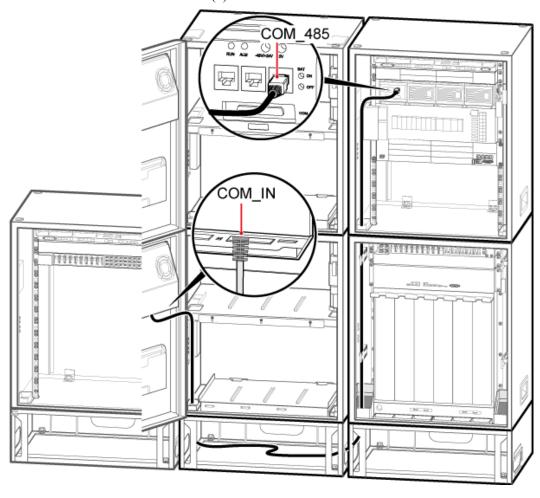
Procedure

Step 1 Install the monitoring signal cable between the cascaded CMUAs between the IBBS200D/ IBBS200T and the IBBS200D/IBBS200T. Connect one end of the cable to the COM_IN port on the CMUA on the cabinet door of the upper IBBS200D/IBBS200T and the other end to the COM_OUT port on the CMUA on the cabinet door of the lower IBBS200D/IBBS200T, as shown in **Figure 12-47**.

Figure 12-47 Installing the monitoring signal cable in the scenario of 1 RFC+1 APM30H+2 IBBS200Ds/IBBS200Ts+1 TMC11H (1)

Step 2 Install the monitoring signal cable for the batteries between the IBBS200D/IBBS200T and the APM30H. Connect one end of the cable to the COM_IN port on the CMUA on the cabinet door of the lower IBBS200D/IBBS200T and the other end to the COM_485 port on the PMU in the APM30H, as shown in **Figure 12-48**.

Figure 12-48 Installing the monitoring signal cable in the scenario of 1 RFC+1 APM30H+2 IBBS200Ds/IBBS200Ts+1 TMC11H (2)

Step 3 Install the monitoring signal cable between the cascaded CMUAs between the TMC11H and the RFC. Connect one end of the cable to the COM_IN port on the CMUA in the fan box of the TMC11H and the other end to the COM_OUT port on the CMUA in the fan box of the RFC, as shown in **Figure 12-49**.

Figure 12-49 Installing the monitoring signal cable in the scenario of 1 RFC+1 APM30H+2 IBBS200Ds/IBBS200Ts+1 TMC11H (3)

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

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

Step 6 If two RFCs, two APM30Hs, four IBBS200Ds/IBBS200Ts, and one TMC11H are configured on site, four more monitoring signal cables are required. **Figure 12-50** shows the configurations of the cabinets.

Figure 12-50 Configurations of two RFCs, two APM30Hs, four IBBS200Ds/IBBS200Ts, and one TMC11H
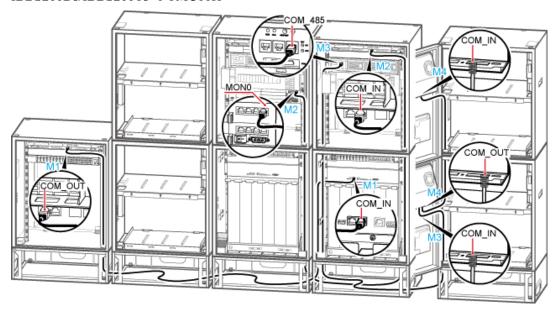
📖 **NOTE**

Two BBUs are configured in a triple-mode base station. The new BBU is installed in the extension APM30H cabinet, and it does not have monitoring functions. For details about monitoring principles, see Monitoring Principles for the Cabinets.

1. Install the monitoring signal cable between the cascaded CMUAs between the TMC11H and the extension RFC. Connect one end of the cable to the COM_OUT port on the CMUA in the fan box of the TMC11H and the other end to the COM_IN port on the CMUA in the fan box of the extension RFC, as shown in **Figure 12-51**.

Figure 12-51 Installing the monitoring signal cable in the scenario of 2 RFCs+2 APM30Hs+4 IBBS200Ds/IBBS200Ts+1 TMC11H
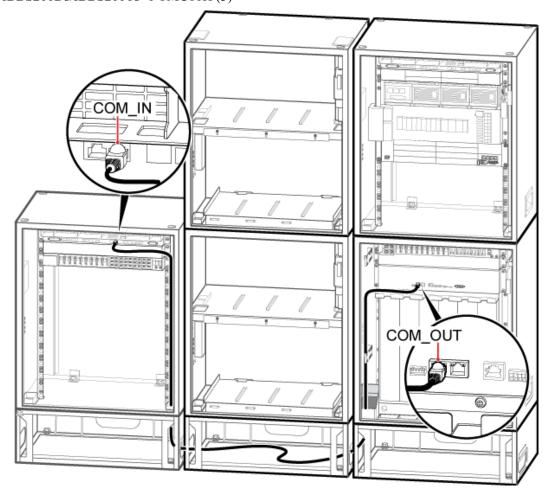

2. Install the monitoring signal cable between the CMUA and the BBU between the APM30H and the extension APM30H. Connect one end of the cable to the MON0 port on the UEIU in the BBU in the APM30H and the other end to the COM_IN port on the CMUA on the cabinet door of the extension APM30H, as shown in **Figure 12-51**.

3. Install the monitoring signal cable for the batteries between the extension APM30H and the extension IBBS200D/IBBS200T. Connect one end of the cable to the COM_485 port on the PMU in the extension APM30H and the other end to the COM_IN port on the CMUA on the cabinet door of the lower extension IBBS200D/IBBS200T, as shown in **Figure 12-51**.

4. Install the monitoring signal cable between the cascaded CMUAs between the extension IBBS200D/IBBS200T and the extension IBBS200D/IBBS200T. Connect one end of the cable to the COM_IN port on the CMUA on the cabinet door of the upper extension IBBS200D/IBBS200T and the other end to the COM_OUT port on the CMUA on the cabinet door of the lower extension IBBS200D/IBBS200T, as shown in **Figure 12-51**.

5. Attach labels to the installed cables. For details, see Attaching an L-Shaped Label.

6. Run each cable that leave the cabinet in a PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

----End

12.5.2 Installing the Monitoring Signal Cable for the -48 V DC Cabinet

This section describes the procedures and precautions for installing the monitoring signal cable between the cabinets based on -48 V DC power supply.

Scenario: 1 RFC+1 TMC11H

If a site is configured with one RFC and one TMC11H, the monitoring cables are installed before the equipment is delivered. If one more RFC is configured, one monitoring cable is required on site.

Context

Figure 12-52 shows the configurations of two RFCs and one TMC11H.

Figure 12-52 Configurations of two RFCs and one TMC11H

Procedure

Step 1 Install the monitoring signal cable between the cascaded CMUAs between the RFC and the extension RFC. Connect one end of the cable to the COM_OUT port on the CMUA in the fan box of the RFC and the other end to the COM_IN port on the CMUA in the fan box of the extension RFC, as shown in **Figure 12-53**.

Figure 12-53 Installing the monitoring signal cable in the scenario of 2 RFCs+1 TMC11H

Step 2 Attach labels to the installed cables. For details, see Attaching an L-Shaped Label.

Step 3 Run each cable that leave the cabinet in a PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

----End

Scenario: 1 RFC+2 TMC11Hs

If a site is configured with one RFC and two TMC11Hs, one monitoring signal cable is required on site.

Procedure

Step 1 Install the monitoring signal cable between the cascaded CMUAs between the RFC and the secondary TMC11H. Connect one end of the cable to the COM_OUT port on the CMUA in the fan box of the RFC and the other end to the COM_IN port on the CMUA in the fan box of the secondary TMC11H, as shown in **Figure 12-54**.

Figure 12-54 Installing the monitoring signal cable in the scenario of 1 RFC+2 TMC11Hs

Step 2 Attach labels to the installed cables. For details, see Attaching an L-Shaped Label.

Step 3 Run each cable that leave the cabinet in a PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

Step 4 If two RFCs and two TMC11Hs are configured on site, one more monitoring signal cable is required. **Figure 12-55** shows the configurations of the cabinets.
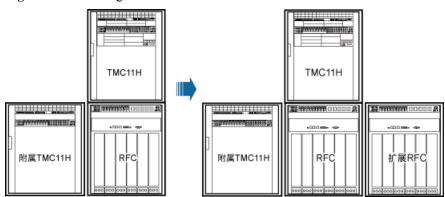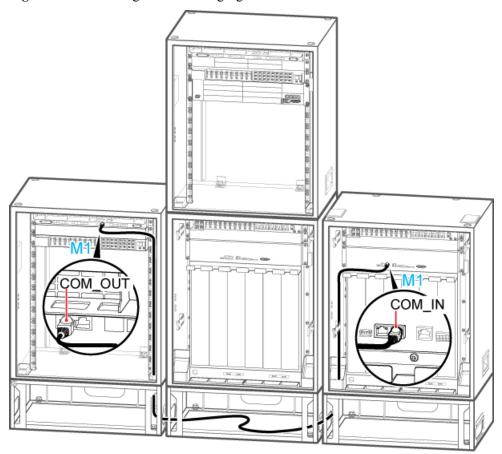
Figure 12-55 Configurations of two RFCs and two TMC11Hs

1. Install the monitoring signal cable between the cascaded CMUAs between the secondary TMC11H and the extension RFC. Connect one end of the cable to the COM_OUT port on the CMUA in the fan box of the secondary TMC11H and the other end to the COM_IN port on the CMUA in the fan box of the extension RFC, as shown in **Figure 12-55**.

Figure 12-56 Installing the monitoring signal cable in the scenario of 2 RFCs+2 TMC11Hs

2. Attach labels to the installed cables. For details, see Attaching an L-Shaped Label.

3. Run each cable that leave the cabinet in a PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

   ----End

Scenario: 2 RFCs+2 TMC11Hs
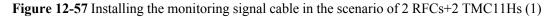
If a site is configured with two RFCs and two TMC11Hs, two monitoring signal cables are required on site.
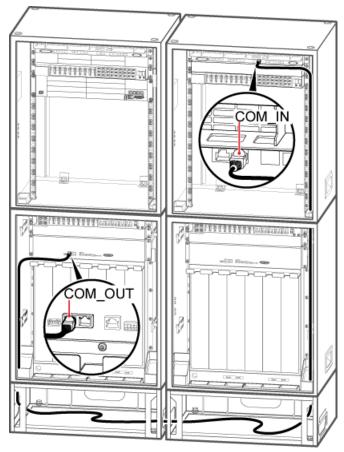
Context

Two BBUs are configured in a triple-mode base station. The new BBU is installed in the TMC11H cabinet at the right-hand side, and it does not have monitoring functions. For details about monitoring principles, see Monitoring Principles for the Cabinets.

Procedure

Step 1 Install the monitoring signal cable between the cascaded CMUAs between the RFC and the extension TMC11H. Connect one end of the cable to the COM_OUT port on the CMUA in the fan box of the RFC and the other end to the COM_IN port on the CMUA in the fan box of the extension TMC11H, as shown in **Figure 12-57**.
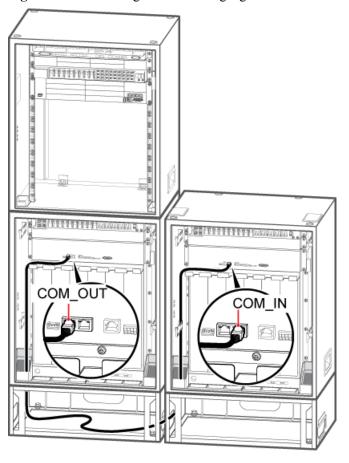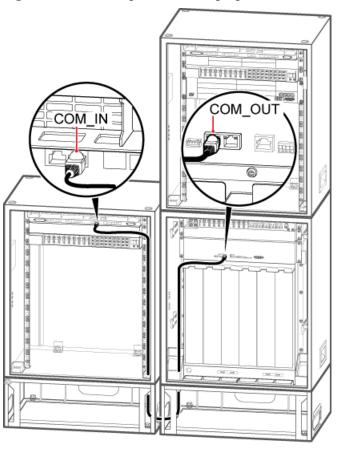
Figure 12-57 Installing the monitoring signal cable in the scenario of 2 RFCs+2 TMC11Hs (1)

Step 2 Install the monitoring signal cable between the cascaded CMUAs between the extension TMC11H and the extension RFC. Connect one end of the cable to the COM_OUT port on the CMUA in the fan box of the extension TMC11H and the other end to the COM_IN port on the CMUA in the fan box of the extension RFC, as shown in **Figure 12-58**.
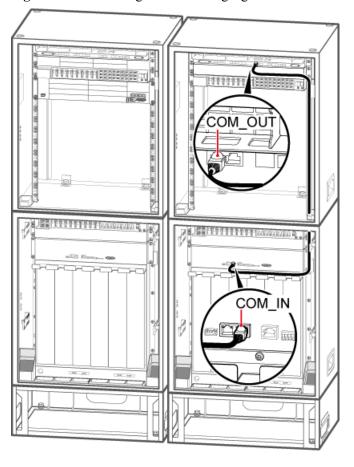
Figure 12-58 Installing the monitoring signal cable in the scenario of 2 RFCs+2 TMC11Hs (2)

Step 3 Attach labels to the installed cables. For details, see Attaching an L-Shaped Label.

Step 4 Run each cable that leave the cabinet in a PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

----End

12.6 Installing the RF Jumper

The RF jumper connects the RFU to the antenna system for signal exchange between the NodeB and the antenna system.

Prerequisite

The tools and materials, such as a cable cutter, PVC insulating tape, and a wrench or torque wrench, are ready.

Context
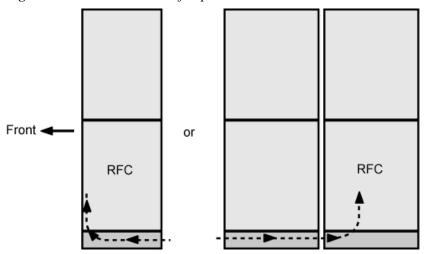
> ⚠️ **CAUTION**
>
> The RF jumpers must be connected securely to prevent RF signal leakage.

Procedure
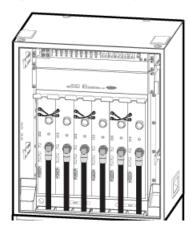
Step 1 Remove the screws from the cable hole at the bottom, and then remove the cable outlet module.

Step 2 Lead the RF jumper into the cabinet from the cable hole along a cable route shown in **Figure 12-59**, and then route the jumper by referring to **12.1 Cabling Requirements**.

Figure 12-59 Route of the RF jumper

Step 3 Install the RF jumper, as shown in **Figure 12-61** and **Figure 12-60**.
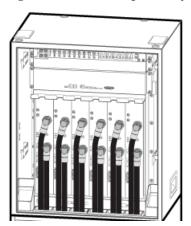
Figure 12-60 Installing the RF jumpers on the interconnected RFUs

📖 **NOTE**

The inter-RFU RF signal cables are already installed in the cabinet according to the site configurations before delivery. You only need to check whether the cables are properly connected on site.

Figure 12-61 Installing the RF jumpers on the RFUs that are not interconnected

1. Link the DIN connector of the jumper to the ANT port on the panel of the RFU.

2. Use a 32 mm wrench or torque wrench to fix the two DIN connectors from bottom to top. Ensure that the tightening torque reaches 25 N·m to 35 N·m.
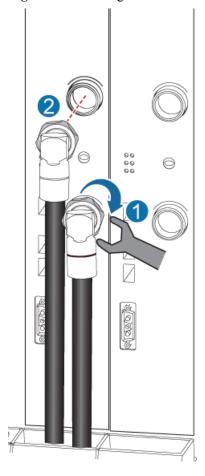
Figure 12-62 Fixing the DIN connector

Step 4 Seal the cable holes for RF jumpers, as shown in **Figure 12-63**.

1. Lead RF jumpers through corresponding cable holes, and then install the cable outlet module on the bottom of the cabinet.
2. Use rubber caps to seal the idle cable holes in the cable outlet module.
3. Insert the metal piece, and then tighten the screw.
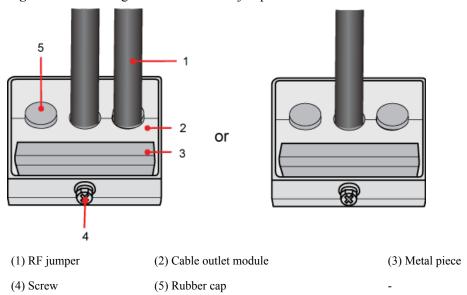
Figure 12-63 Sealing cable holes for RF jumpers

(1) RF jumper	(2) Cable outlet module	(3) Metal piece
(4) Screw	(5) Rubber cap	-

Step 5 Attach color rings to the RF jumper by referring to Attaching the Color Ring.

Step 6 Link the other end of the jumper to the connector of the feeder.

----End

12.7 Installing the CPRI Cable (Optional)

The CPRI cable between RF module and the BBU is used to transmit the CPRI signals between the RF module and the BBU.

Context

When the cabinet is delivered with boards, the CPRI cables inside the cabinet are installed at delivery. The CPRI cables between the cabinets must be installed on site.

For details about the connections of the CPRI cables, seeCPRI Cable Connections for a GSM Only Base Station, CPRI Cable Connections in the UMTS Only Base Station, CPRI Cable Connections in the LTE Only Base Station, CPRI Cable Connections in the GSM+UMTS Base Station, CPRI Cable Connections in the GSM+LTE Base Station, CPRI Cable Connections in the UMTS+LTE Base Station, CPRI Cable Connections for a GU+LO Base Station, CPRI Cable Connections for a GL+UO Base Station or CPRI Cable Connections for a UO+GL Base Station.

Procedure

Step 1 Remove the dustproof bag from the connector at each end of the CPRI cable.

Step 2 Insert the SFP connector at one end of the CPRI cable into the **CPRI** port on the board panel of the BBU.

☐ **NOTE**

For details about how to remove and insert the CPRI cable, see Inserting and Removing CPRI Cables.

Step 3 Route the other end of the CPRI cable out of the cabinet along the RF cable through the cable hole on the left of the power cabinet, and then route the CPRI cable into the RF cabinet. Then, route the CPRI cable to the corresponding RFU, as shown in **Figure 12-64**.
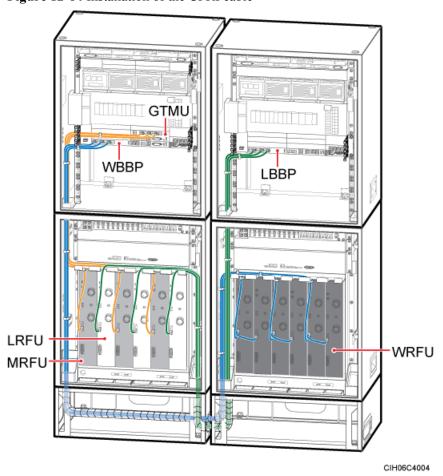
Figure 12-64 Installation of the CPRI cable

CIH06C4004

📖 **NOTE**
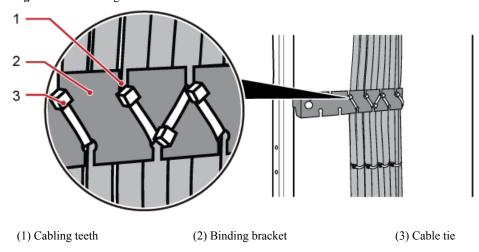
> As shown in Figure 1, the lines in yellow are cables already installed before delivery, and the lines in blue and green are cables that need to be installed on site.

Step 4 Insert the SFP connector at the other end of the CPRI cable into the **CPRI0** port on the RFU panel, as shown in **Figure 12-64**.

Step 5 Route the cables by referring to **12.1 Cabling Requirements** and use cable ties to bind the cables.

📖 **NOTE**

- If the CPRI cable is redundant, coil and tie the extra length of the cable on the top of the DCDU-01 in the RFC cabinet or in the base.
- Route the cable in strict compliance with **Figure 12-64**. The CPRI cable must be routed to the cable rack in the middle of the RFC before it is routed to the RFU.
- Bind the cable during the cable routing. Tie the cable on the binding bracket by leading the cable tie through the cable and upper and lower cabling teeth. Ensure that the heads of all the cable ties are outside the cabling teeth, as shown in **Figure 12-65**.

Figure 12-65 Binding CPRI cables

(1) Cabling teeth   (2) Binding bracket   (3) Cable tie

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

----End

12.8 (Optional) Installing Inter-BBU Signal Cable

Install inter-BBU signal cable with a DLC connector at both ends for interconnecting optical ports onsite when a triple-mode base station is configured as GU (BBU0)+L(G) (BBU1) or GL (BBU0)+U(G) (BBU1).

Context

A 10 m inter-BBU signal cable is recommended.

Procedure

Step 1 Install the inter-BBU signal cable on the BBU0 side, For details, see Installing Optical Modules and Cables.

1. Install an optical module to the port M0 on the universal inter-connection infrastructure unit (UCIU) on BBU0.

2. Insert the DLC connector at the end labeled 2A and 2B on the cable into the optical module.

Step 2 Route the cable through the cable hole on the right of the power cabinet, through the cable hole on the left of the RF cabinet, and then to the BBU1 in the extension power cabinet, as shown in **Figure 12-66** and **12.1 Cabling Requirements**.
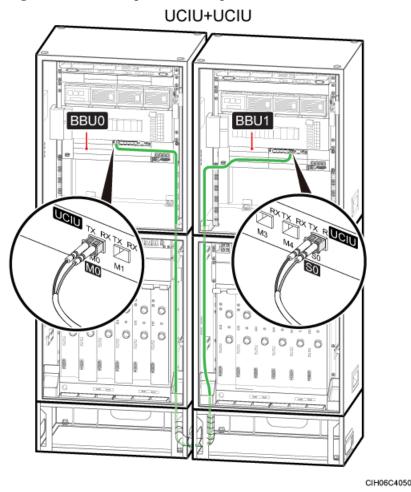
Figure 12-66 Installing Inter-BBU Signal Cable

CIH06C4050

Step 3 Install the cable on the BBU1 side, For details, see Installing Optical Modules and Cables.

1. Install the same type of optical module to the port S0 on the UCIU on BBU1.

   NOTE

   The optical modules with the same label are of the same type.

2. Insert one end of the DLC connector labeled 1A and 1B on the cable into the optical module.

> ⚠ **CAUTION**
>
> The TX and RX ports on one UCIU must be connected to the TX and RX ports, respectively.

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

----End

12.9 Installing the Batteries and Related Cables

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

Prerequisite

![Danger icon] **DANGER**

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 12-67**.

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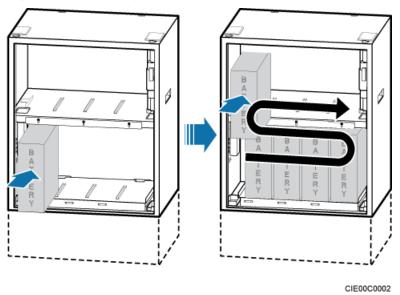
> The battery cell should be installed along the guide rails so that certain spacing is reserved between battery cells.

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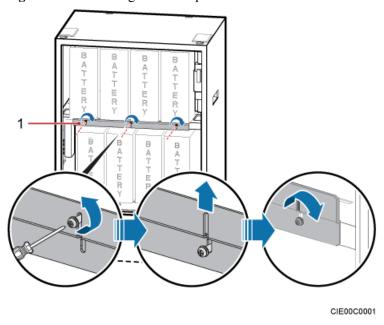
During the installation of the batteries, use insulated tools such as wrenches and screwdrivers, and do not reversely connect the positive and negative poles. Otherwise, the batteries may be burnt, and the installers may be injured.

Figure 12-67 Installing the batteries

CIE00C0002

Step 2 Securing the baffle plate, as shown in **Figure 12-68**.
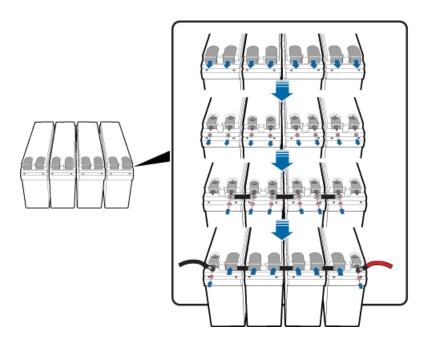
Figure 12-68 Securing the baffle plate

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 12-69**.
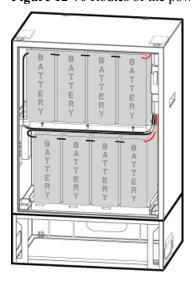
Figure 12-69 Installing the power cable for the batteries

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 12-70 shows the routes of the power cables in the battery cabinet.

Figure 12-70 Routes of the power cables for the batteries

----End

13 Installation Checklist

After the cabinets and devices are all installed, you need to check the installation items, installation environment, and cable-related items.

Checking the Cabinet Installation

Table 13-1 describes the cabinet installation checklist.

Table 13-1 Cabinet installation checklist

No.	Item
1	The installation position of the cabinet strictly complies with the engineering design.
2	The base is securely installed.
3	All the bolts, especially those for electrical connections, are tightened. Both the spring washer and the flat washer are installed in a correct sequence.
4	The cabinet is neat and clean.
5	The paint on the surface is satisfactory. The damaged paint is repaired. For details, see **15.2 Applying Touch-Up Paint**.
6	All labels, tags, and nameplates are correct, legible, and complete.

Installation Environment Checklist

Table 13-2 describes the installation environment checklist.

Table 13-2 Installation environment checklist

No.	Item
1	No redundant tapes or cable ties are left on the cables.
2	No tapes, tails of cable ties, paper, or packing bags are left around the cabinet.

No.	Item
3	The antirust powder on the cabinet door is removed.

Electrical Connection Checklist

Table 13-3 describes the electric connection checklist of the cabinet.

Table 13-3 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.
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. ● 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.

No.	Item
13	The fans work properly. ● 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 13-4 describes the cable installation checklist.

Table 13-4 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).

14 Performing the Power-On Check

Before the cabinets start working, you need to check the power-on status of the cabinets.

⚠ CAUTION

- The cabinets must be powered on in seven days after being unpacked, and the period of the power-off state of the cabinet cannot exceed 48 hours during maintenance.
- Ensure that the external power supply is normal before power on, and that all the MCBs in the cabinet are set to OFF.
- If the IBBS200D or IBBS200T is configured, you must set the circuit breakers for batteries to ON before turn on the external power switch. The circuit breakers for batteries are the circuit breaker labeled BAT on the EPS panel in the APM30H and that on the power distribution box in the IBBS200D or IBBS200T.

□ NOTE

- This chapter describes only the power-on check of the equipment.
- This power-on check described in this chapter is based on the AC power supply scenario. You can perform the power-on check in the DC power supply scenario by referring to the power-on check in the AC power supply scenario.

Figure 14-1 shows the power-on check procedure.
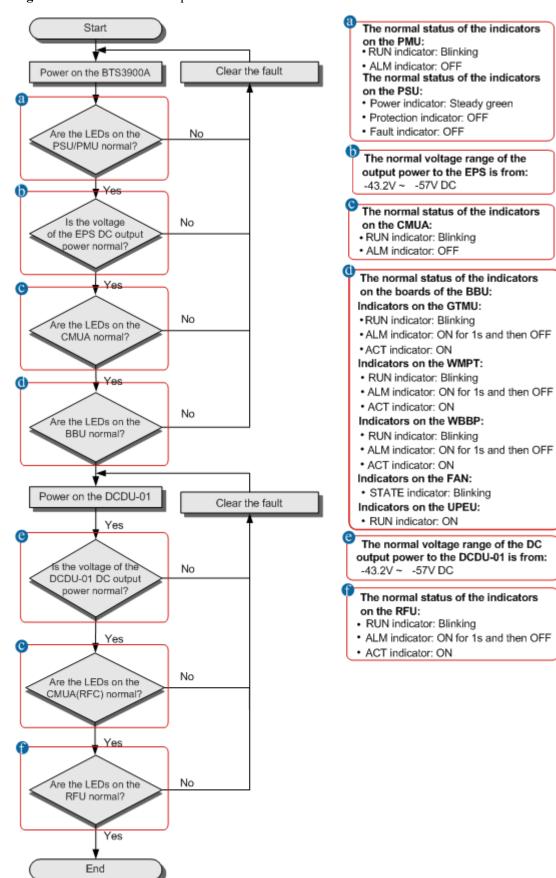
Figure 14-1 Power-on check procedure

The flowchart contains the following steps and decisions:

Start → Power on the BTS3900A

a. Are the LEDs on the PSU/PMU normal? — No → Clear the fault
b. Is the voltage of the EPS DC output power normal? — No → Clear the fault
c. Are the LEDs on the CMUA normal? — No → Clear the fault
d. Are the LEDs on the BBU normal? — No → Clear the fault

Power on the DCDU-01

e. Is the voltage of the DCDU-01 DC output power normal? — No → Clear the fault
c. Are the LEDs on the CMUA(RFC) normal? — No → Clear the fault
f. Are the LEDs on the RFU normal? — No → Clear the fault

End

Callouts:

a The normal status of the indicators on the PMU:
- RUN indicator: Blinking
- ALM indicator: OFF

The normal status of the indicators on the PSU:
- Power indicator: Steady green
- Protection indicator: OFF
- Fault indicator: OFF

b The normal voltage range of the output power to the EPS is from: -43.2V ~ -57V DC

c The normal status of the indicators on the CMUA:
- RUN indicator: Blinking
- ALM indicator: OFF

d The normal status of the indicators on the boards of the BBU:
Indicators on the GTMU:
- RUN indicator: Blinking
- ALM indicator: ON for 1s and then OFF
- ACT indicator: ON

Indicators on the WMPT:
- RUN indicator: Blinking
- ALM indicator: ON for 1s and then OFF
- ACT indicator: ON

Indicators on the WBBP:
- RUN indicator: Blinking
- ALM indicator: ON for 1s and then OFF
- ACT indicator: ON

Indicators on the FAN:
- STATE indicator: Blinking

Indicators on the UPEU:
- RUN indicator: ON

e The normal voltage range of the DC output power to the DCDU-01 is from: -43.2V ~ -57V DC

f The normal status of the indicators on the RFU:
- RUN indicator: Blinking
- ALM indicator: ON for 1s and then OFF
- ACT indicator: ON

> 📖 **NOTE**
>
> For details about how to check the DIP switches on the boards, see the *BTS3900A Hardware Description*.

15 Subsequent Operations

About This Chapter

After the base station is installed and checked, you need to obtain the ESN, seal the cable outlet of the base, and then repair the damaged paint.

15.1 Sealing the Cable Holes on the Base
After all the cables are installed, you need to seal the cable holes of the base.

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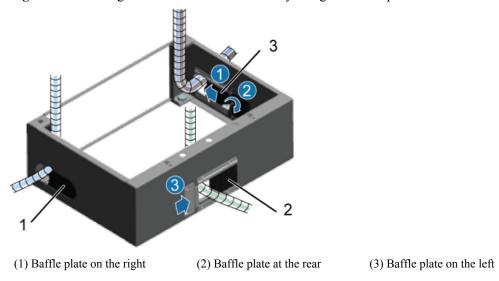The paint on the surface is intact. If any paint is damaged, you must apply touch-up paint to avoid erosion.

15.1 Sealing the Cable Holes on the Base

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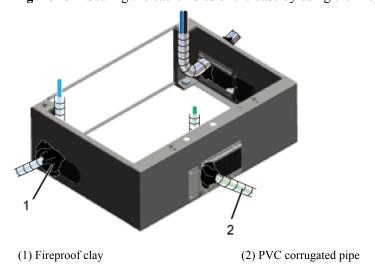
Procedure

Step 1 Use baffle plates to cover the idle cable holes, and then tighten screws on the plates, as shown in **Figure 15-1**.

Figure 15-1 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 15-2**.

Figure 15-2 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

15.2 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 15-1**.

Table 15-1 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

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