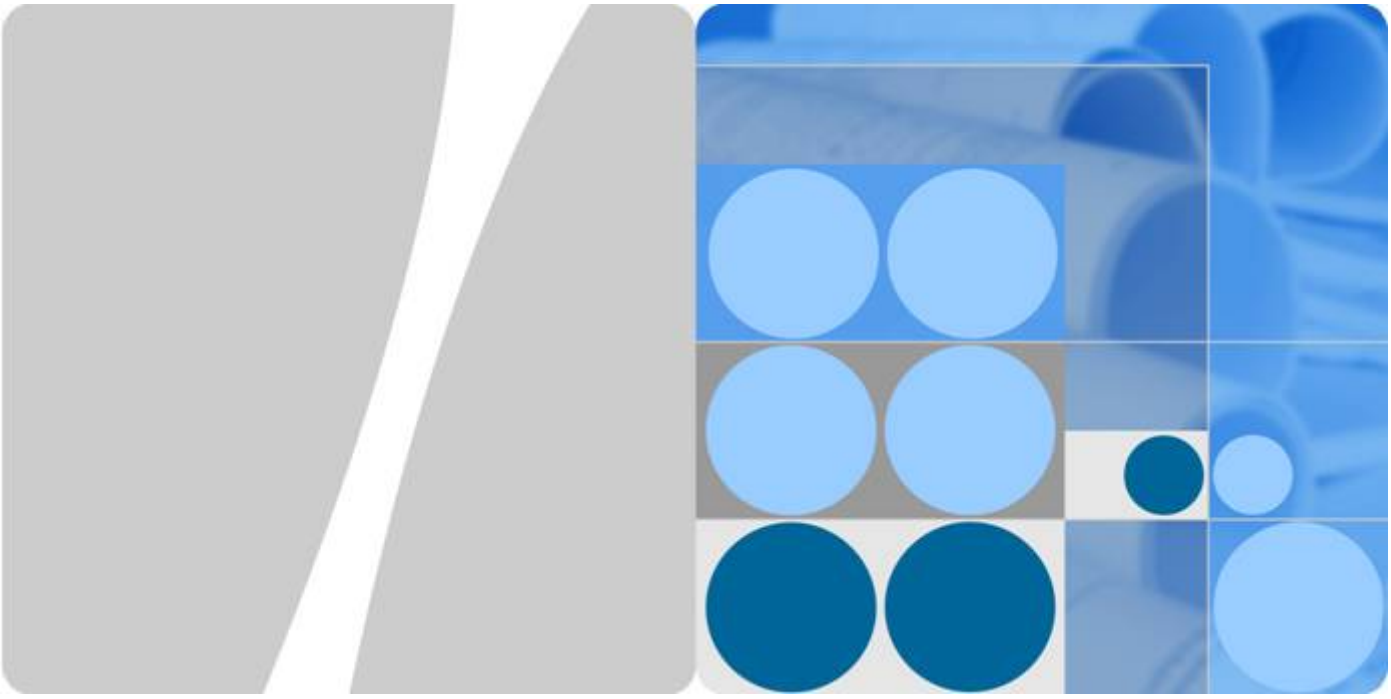

BTS3202E LTE

V100R004C00

Installation Guide

Issue Draft A

Date 2011-07-30

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About This Document

Purpose

This document describes the procedures for installing a BTS3202E in different scenarios. It also provides checklists for hardware installation.

Product Version

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

Product Name	Product Version
BTS3202E LTE (referred to as the BTS3202E in this document)	V100R004C00

Intended Audience

This document is intended for:

- Base station installation engineers

Organization

1 Changes in the BTS3202E LTE Installation Guide

This chapter describes the changes in the *BTS3202E LTE Installation Guide*.

2 Installation Preparations

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

3 Information About the Installation

This chapter describes the information that you must be familiar with before installing a BTS3202E, including the BTS3202E exterior, ports, installation options, physical supports, and installation clearance requirements.

4 Unpacking the Equipment

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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 Process

The BTS3902E installation process involves installing a BTS3902E and related cables, checking the BTS3902E hardware installation, and powering on the BTS3902E.

7 Installing a BTS3902E

This section describes the procedures for installing a BTS3902E. The BTS3902E can be installed on a pole, wall, or wood pole depending on the installation environment.

8 Installing an AC Surge Protection Box and Related Cables

This chapter describes the dimensions, installation clearance requirements, and installation options of an AC surge protection box. It also describes the procedure for installing the surge protection box. An AC surge protection box can be configured when a BTS3202E is installed outdoors.

9 Installing Cables

This chapter describes the procedure and precautions for installing the PGND cables, power cables, and transmission cables for a BTS3902E in various scenarios. Based on actual requirements, and it also describes how to install an optional monitoring signal cable as required.

10 Installing the Housing

This chapter describes the procedures for installing the upper housing and optional camouflage shell for a BTS3202E after the BTS3202E and related cables are installed.

11 Checking the BTS3202E Hardware Installation

This chapter describes how to check the hardware installation after a BTS3202E is installed.

12 Performing a Power-On Check on the BTS3202E

This chapter describes the procedure for performing a power-on check on the BTS3202E.

13 Appendix

This section describes the procedure for adding an easy power receptacle (pressfit type) connector.This section describes the procedure for adding OT terminals.This section describes the procedure for adding OT terminals to the surge protection box side of the power cable for the AC surge protection box.

Conventions

Symbol Conventions

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

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Symbol	Description
	Indicates a hazard with a high level of risk, which if not avoided, will result in death or serious injury.
	Indicates a hazard with a medium or low level of risk, which if not avoided, could result in minor or moderate injury.
	Indicates a potentially hazardous situation, which if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results.
	Indicates a tip that may help you solve a problem or save time.
	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.

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Convention	Description
{ x | y | ... }*	Optional items are grouped in braces and separated by vertical bars. A minimum of one item or a maximum of all items can be selected.
[x | y | ...]*	Optional items are grouped in brackets and separated by vertical bars. Several items or no item can be selected.

GUI Conventions

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

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

Keyboard Operations

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

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

Mouse Operations

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

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

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1 Changes in the BTS3202E LTE Installation Guide

This chapter describes the changes in the *BTS3202E LTE Installation Guide*.

Draft A (2011-07-30)

This is the draft.

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2 Installation Preparations

About This Chapter

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

2.1 Tools and Instruments
All required tools and instruments must be ready before the 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.

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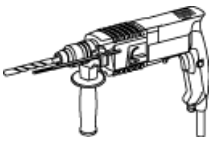
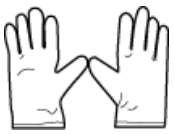
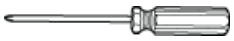
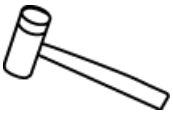
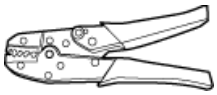
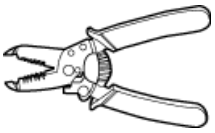
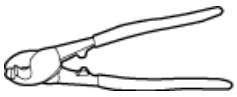
2.1 Tools and Instruments

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

Hammer drill (with a φ 12 bit, φ 14 bit, and φ 18 bit) 	Electrostatic discharge (ESD) gloves 	Vacuum cleaner
Heat gun	Phillips screwdriver (M3 to M6) 	Flat-head screwdriver (M3 to M6)
Rubber mallet 	COAX crimping tool 	Wire stripper 
Utility knife	Wire clippers 	Adjustable wrench (capacity ⩾ 32 mm [1.26 in.])
Level	Torque screwdriver 5 mm (0.2 in.) (M3 to M6) (M3 to M6)	Torque wrench Capacity: 17 mm (0.67 in.) or 21 mm (0.83 in.)
Combination wrench Capacity: 17 mm [0.67 in.] or 21 mm [0.83 in.]	Inner hexagon wrench	Measuring tape

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Multimeter	Marker (diameter ⩽ 10 mm [0.39 in.])	—

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.

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3 Information About the Installation

About This Chapter

This chapter describes the information that you must be familiar with before installing a BTS3202E, including the BTS3202E exterior, ports, installation options, physical supports, and installation clearance requirements.

3.1 BTS3202E Exterior
The BTS3202E has a modular design with its ports on the bottom.

3.2 BTS3202E Ports
The BTS3202E ports are on the bottom, and the indicators are in the indicator on the front.

3.3 BTS3202E Indicators
A BTS3202E has six indicators, which indicate the running status of the BTS3202E.

3.4 BTS3902E Installation Options
This section describes the BTS3902E installation options. A BTS3902E can be installed on a pole, wall, or wood pole.

3.5 Installation Clearance Requirements
This section describes the clearance requirements for installing a BTS3902E on a pole, wall, or wood pole.

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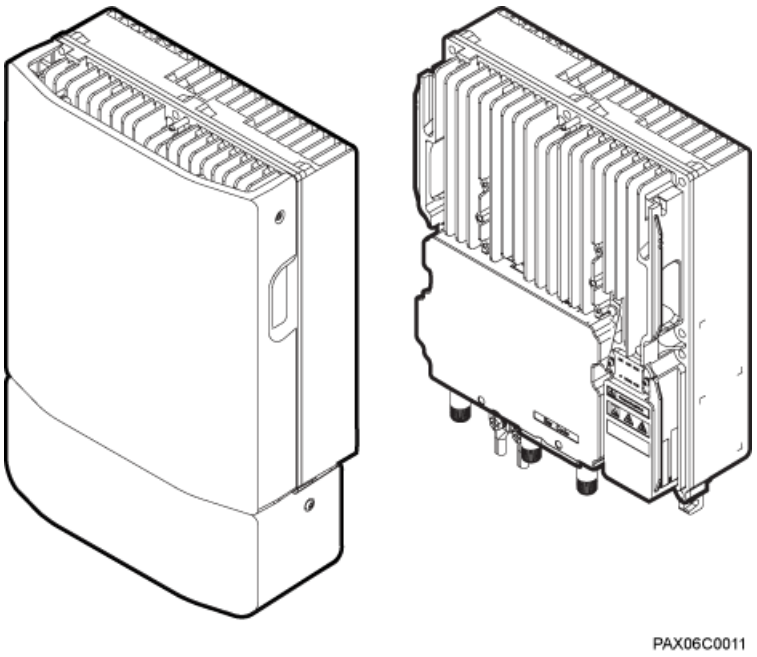
3.1 BTS3202E Exterior

The BTS3202E has a modular design with its ports on the bottom.

Figure 3-1 shows the BTS3202E. The BTS3202E on the left has a housing, and the BTS3202E on the right does not have a housing. The camouflage shell is optional.

Figure 3-1 BTS3202E



(1) Upper housing (2) Camouflage shell (3) BTS3202E

Figure 3-2 shows the dimensions of a BTS3202E without a housing, and **Figure 3-3**shows the dimensions of a BTS3202E with a housing.

Figure 3-2 Dimensions of a BTS3202E without a housing

NOTE

The figure shows the dimensions of the two types of BTS3202E.

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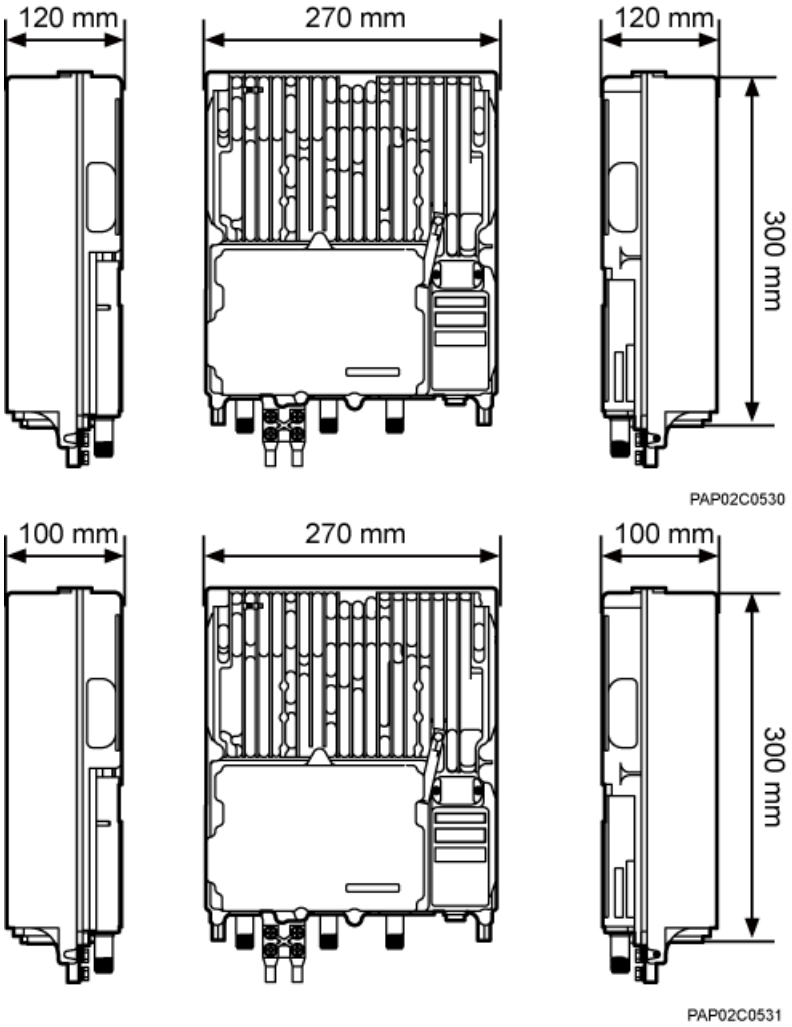

Figure 3-3 Dimensions of a BTS3202E with a housing and antennas

NOTE

The figure shows the dimensions of the two types of BTS3202E.

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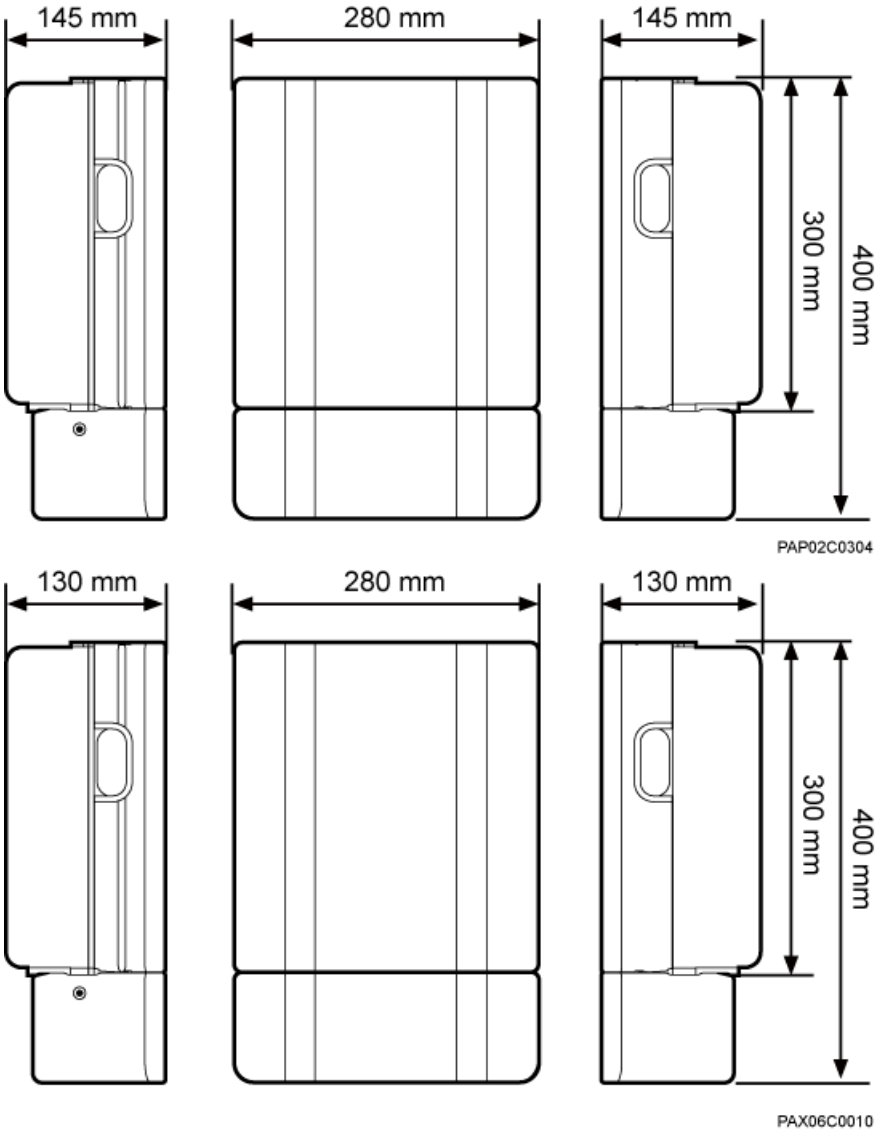

3.2 BTS3202E Ports

The BTS3202E ports are on the bottom, and the indicators are in the indicator on the front.

Figure 3-4 shows the positions of the BTS3202E ports and indicators.

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Figure 3-4 Positions of the BTS3202E ports and indicators

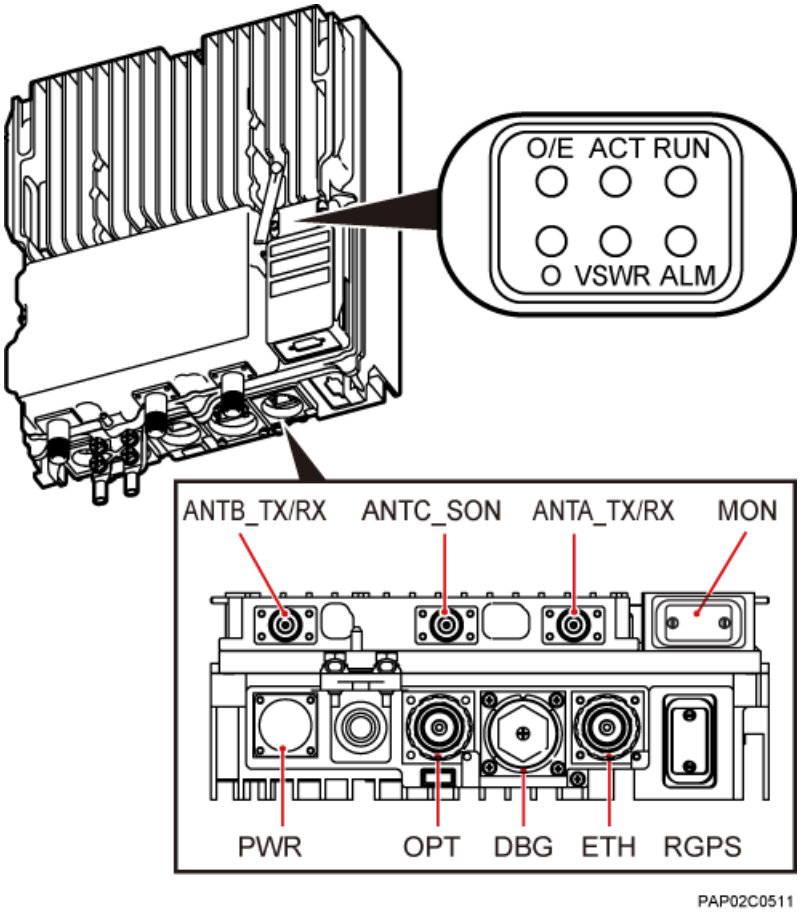

Table 3-1 describes the BTS3202E ports and indicators.

Table 3-1 BTS3202E ports and indicators

Item	Label	Description
Ports	ANTA_TX/RX	TX/RX port A
	ANTB_TX/RX	TX/RX port B
	ANTC_SON	SON antenna port
	ETH	FE/GE electrical port
	OPT	FE/GE optical port
	RGPS	RGPS port
	MON	Environment monitoring port for an RS485 input and four dry contact inputs.
	PWR	Power supply port

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Item	Label	Description
	DBG	Port for commissioning, clock test, or software upgrade
Indicators	RUN	For details, see BTS3202E Indicators.
	ALM	
	ACT	
	VSWR	
	O/E	
	O	

3.3 BTS3202E Indicators

A BTS3202E has six indicators, which indicate the running status of the BTS3202E.

For details about the indicator positions on the BTS3202E panel, see BTS3202E Ports.

Table 3-2 describes BTS3202E indicators.

Table 3-2 BTS3202E indicators

Indicator	Color	Status	Description
RUN	Green	Steady on	There is power supply, but the BTS3202E is faulty.
		Off	There is no power supply, or the BTS3202E is faulty.
		Blinking (on for 1s and off for 1s)	The BTS3202E is working properly.
		Blinking (on for 0.125s and off for 0.125s)	Software is being loaded to the BTS3202E, or the BTS3202E is not started.
ALM	Red	Steady on	Alarms are generated, and the BTS3202E must be replaced.
		Blinking (on for 1s and off for 1s)	Alarms are generated. The alarms may be caused by the faults on the related boards or ports. Therefore, the necessity for BTS3202E replacement is uncertain.
		Off	No alarm is generated.
ACT	Green	Steady on	The BTS3202E is working properly with TX channels enabled.

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Indicator	Color	Status	Description
		Blinking (on for 1s and off for 1s)	The BTS3202E is working properly with TX channels disabled.
VSWR	Red	Off	No VSWR alarm is generated.
		Blinking red (on for 1s and off for 1s)	VSWR alarms are generated on the ANTB_TX/RX port.
		Steady red	VSWR alarms are generated on the ANTA_TX/RX port.
		Blinking red (on for 0.125s and off for 0.125s)	VSWR alarms are generated on the ANTA_TX/RX and ANTB_TX/RX ports.
O/E	Green	Steady on	The ETH port is connected properly.
		Blinking (on for 0.125s and off for 0.125s)	The ETH port is transmitting or receiving data.
		Off	The ETH port is connected improperly.
O	Green	Steady on	The OPT port is connected properly.
		Blinking (on for 0.125s and off for 0.125s)	The OPT port is transmitting or receiving data.
		Off	The OPT port is connected improperly.

3.4 BTS3902E Installation Options

This section describes the BTS3902E installation options. A BTS3902E can be installed on a pole, wall, or wood pole.

Installing a BTS3902E on a Pole with the Diameter of 60 mm to 114 mm (2.36 in. to 4.49 in.)

Figure 3-5 shows the diameter of a pole for installing a BTS3902E.

CAUTION

- The recommended diameter is 80 mm (3.15 in.).

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Figure 3-5 Diameter of a pole

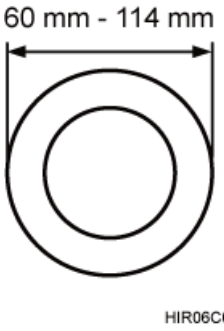
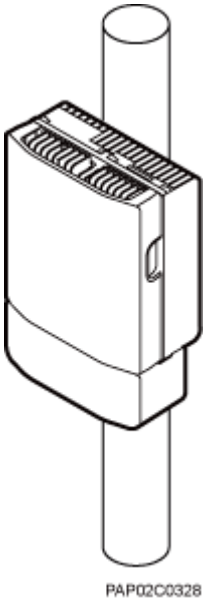


Figure 3-6 shows a BTS3902E installed on a pole.

Figure 3-6 BTS3902E installed on a pole



Installing a BTS3902E on a Pole with the Diameter of 114 mm to 400 mm (4.49 in. to 15.75 in.)

Figure 3-7 shows the diameter of a pole for installing a BTS3902E.

Figure 3-7 Diameter of a pole

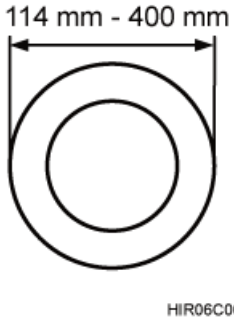


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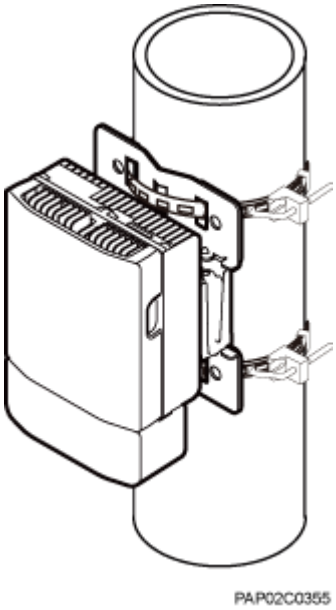
Figure 3-8 shows a BTS3902E installed on a pole.

Figure 3-8 BTS3902E installed on a pole



Installing a BTS3902E on a Wall

The wall on a BTS3902E is installed must meet the following requirements:

- When a single BTS3902E is installed, the wall has a capacity of bearing at least four times the weight of the BTS3902E.
- Expansion bolts must be tightened to 30 N·m (265.52 lbf·in.) to ensure the bolts work properly and the wall remains intact without cracks in it.

Figure 3-9 shows a BTS3902E installed on a wall.

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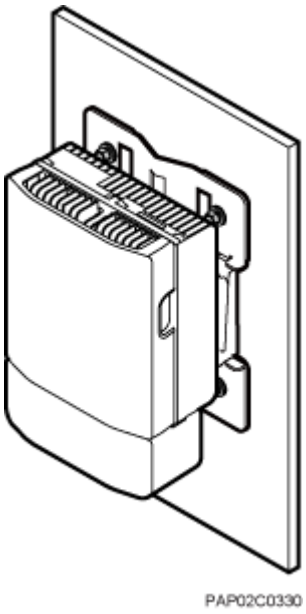
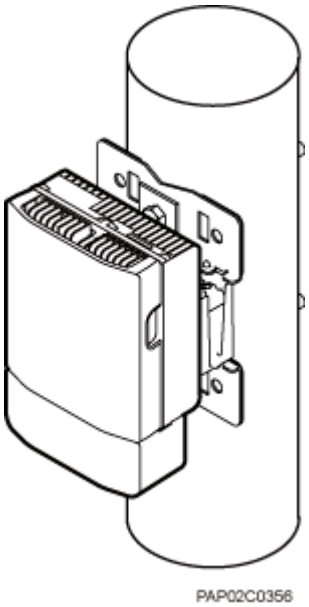
Figure 3-9 BTS3902E installed on a wall



Installing a BTS3902E on a Wood Pole

Figure 3-10 shows a BTS3902E installed on a wood pole.

Figure 3-10 BTS3902E installed on a wood pole



3.5 Installation Clearance Requirements

This section describes the clearance requirements for installing a BTS3902E on a pole, wall, or wood pole.

Figure 3-11 shows the recommended installation clearance for a single BTS3902E.

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Figure 3-11 Recommended installation clearance for a single BTS3902E

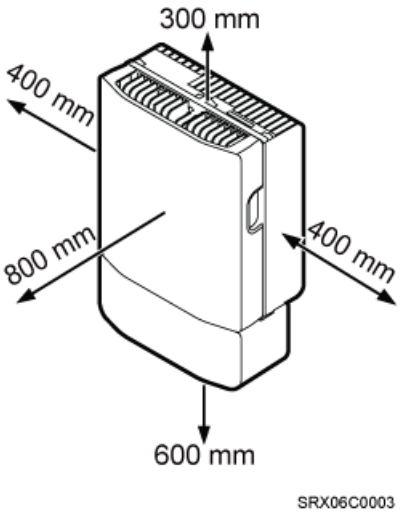

Figure 3-12 shows the minimum installation clearance for a single BTS3902E.

Figure 3-12 Minimum installation clearance for a single BTS3902E

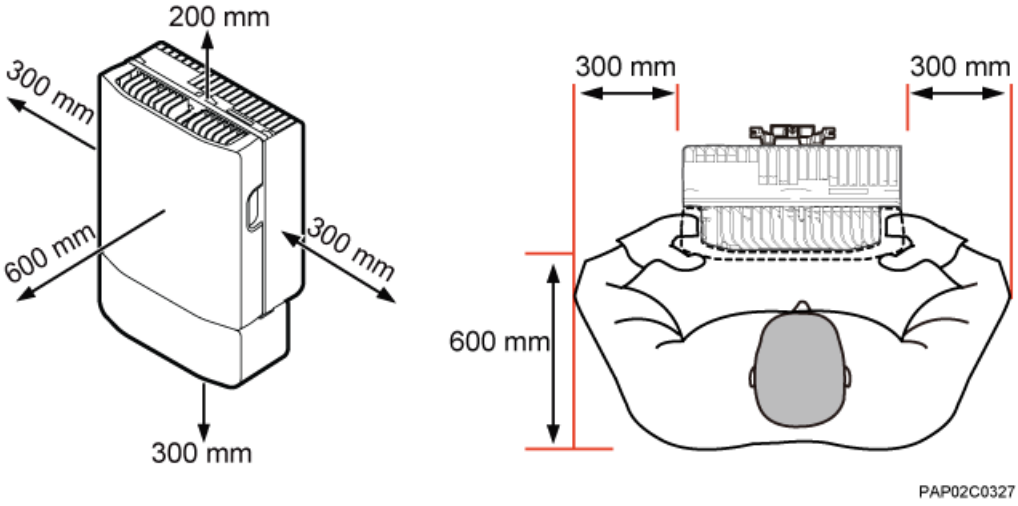

Figure 3-13 shows the recommended installation clearance for two BTS3902Es installed side by side.

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Figure 3-13 Recommended installation clearance for two BTS3902Es installed side by side

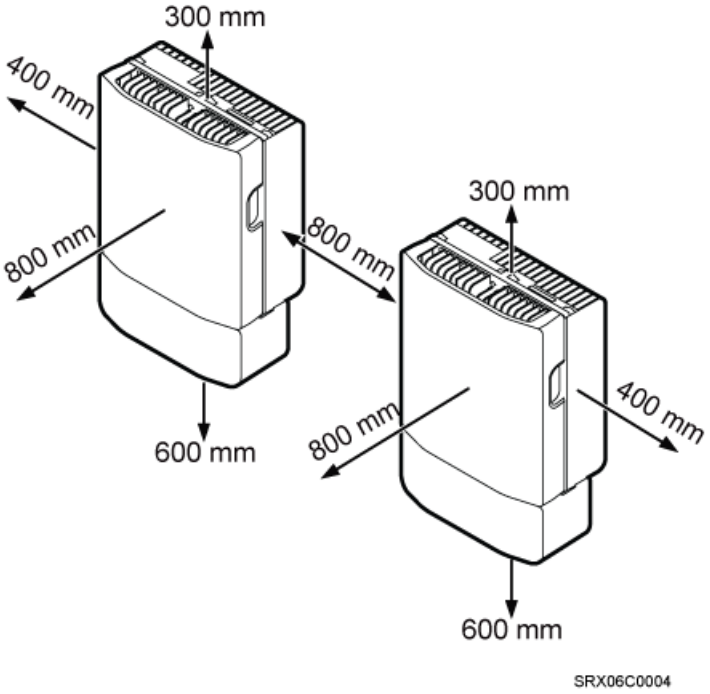

Figure 3-14 shows the minimum installation clearance for two BTS3902Es installed side by side.

Figure 3-14 Minimum installation clearance for two BTS3902Es installed side by side

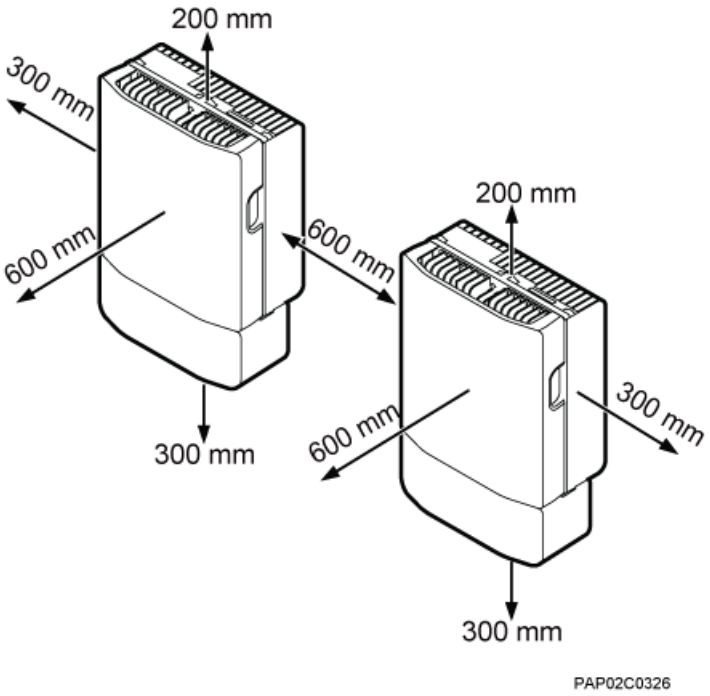

Figure 3-15 shows the recommended installation clearance for two BTS3902Es installed in a vertical line.

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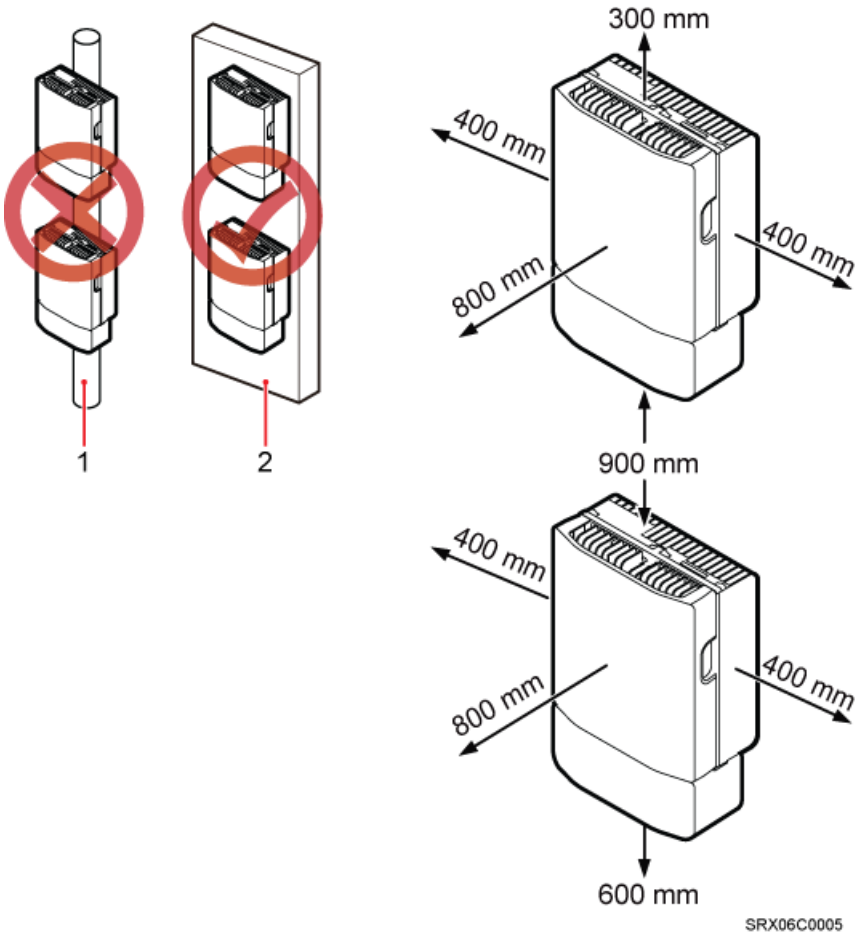
Figure 3-15 Recommended installation clearance for two BTS3902Es installed in a vertical line



(1) Pole (2) Wall

Figure 3-16 shows the minimum installation clearance for two BTS3902Es installed in a vertical line.

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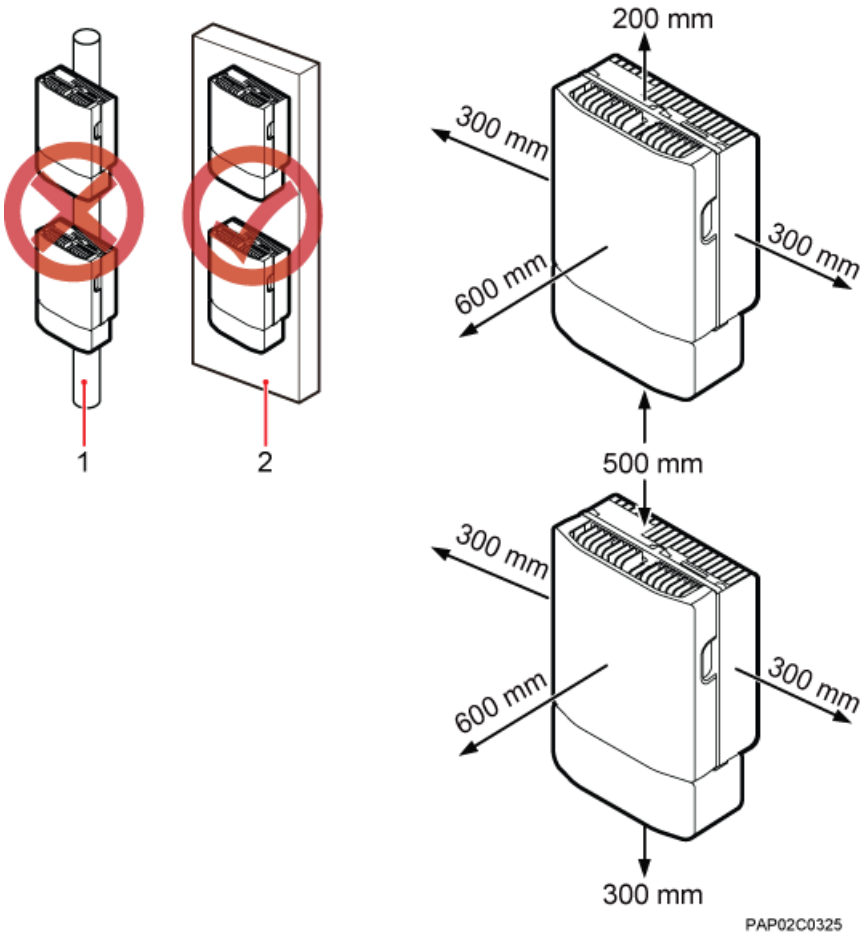
Figure 3-16 Minimum installation clearance for two BTS3902Es installed in a vertical line



(1) Pole (2) Wall

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4 Unpacking the Equipment

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

Context

NOTE

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

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

Procedure

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

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

Step 2 Check the exterior of the packing case.

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

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

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

WARNING

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

----End

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5 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 Use an M4 Phillips screwdriver to loosen the two captive screws on the housing, and then move the upper housing until it is stopped.

Step 2 Record the ESN on the BTS3202E.

- The ESN is printed on the label and BTS3202E. You must remove the label to record the site information on the side labeled Site on the label, as shown in **Figure 5-1**.

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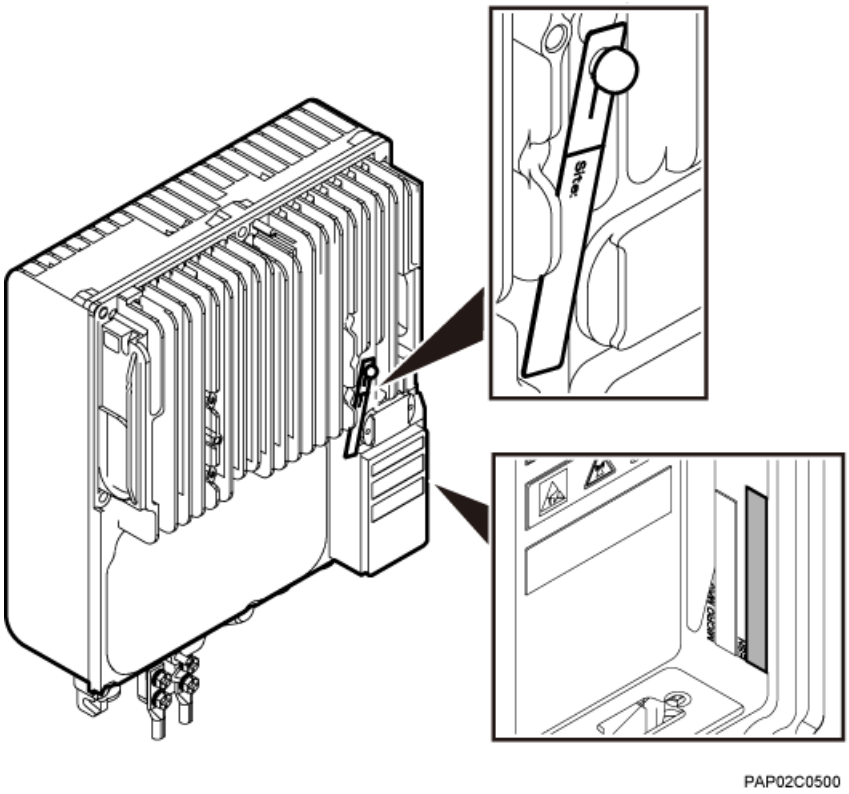
Figure 5-1 Obtaining the ESN



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

----End

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6 Installation Process

The BTS3902E installation process involves installing a BTS3902E and related cables, checking the BTS3902E hardware installation, and powering on the BTS3902E.

Figure 6-1 shows the process of installing a BTS3902E.

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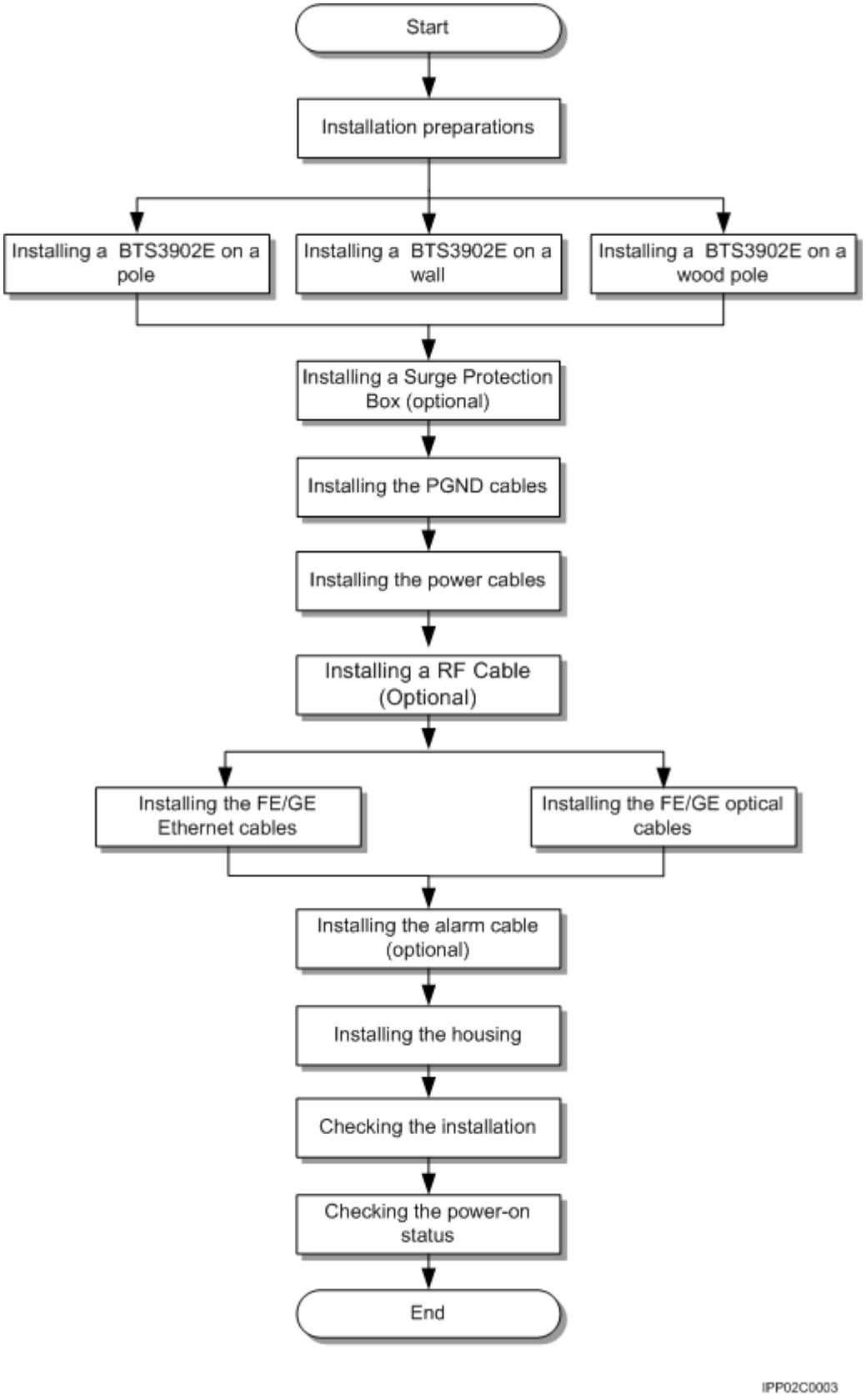
Figure 6-1 Process of installing the BTS3902E



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7 Installing a BTS3902E

About This Chapter

This section describes the procedures for installing a BTS3902E. The BTS3902E can be installed on a pole, wall, or wood pole depending on the installation environment.

7.1 Mounting Kits for Installing a BTS3202E
This section describes the brackets and attachment plate for installing a BTS3202E.

7.2 Installing a BTS3202E on a Pole with the Diameter of 60 mm to 114 mm (2.36 in. to 4.49 in.)
This section describes the procedure and precautions for installing a BTS3202E on a pole with the diameter of 60 mm to 114 mm (2.36 in. to 4.49 in.).

7.3 Installing a BTS3202E on a Pole with the Diameter of 114 mm to 400 mm (4.49 in. to 15.75 in.)
This section describes the procedure and precautions for installing a BTS3202E on a pole with the diameter of 114 mm to 400 mm (4.49 in. to 15.75 in.).

7.4 Installing a BTS3202E on a Wall
This section describes the procedure and precautions for installing a BTS3202E on a wall.

7.5 Installing a BTS3202E on a Wood Pole
This section describes the procedure and precautions for installing a BTS3202E on a wood pole.

7.6 Installing BTS3202Es on an IFS06
This section describes the procedure and precautions for installing BTS3202Es on an IFS06.

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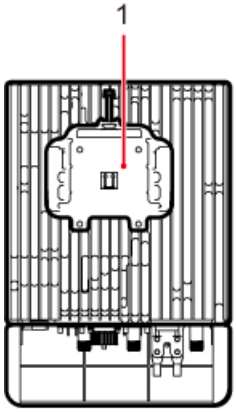
7.1 Mounting Kits for Installing a BTS3202E

This section describes the brackets and attachment plate for installing a BTS3202E.

Figure 7-1 shows the rear of a BTS3202E.

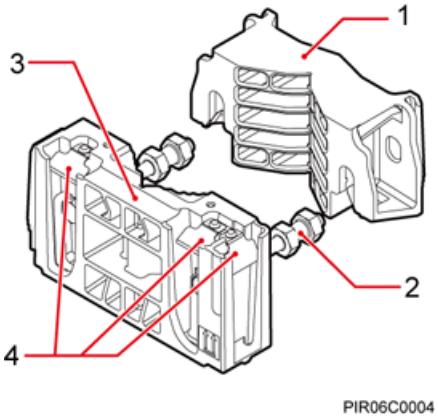
Figure 7-1 Rear of a BTS3202E



(1) Attachment plate

Figure 7-2 shows the mounting bracket assembly for installing a BTS3202E.

Figure 7-2 Mounting bracket assembly for installing a BTS3202E



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

Figure 7-3 shows the adapting plate assembly for installing a BTS3202E.

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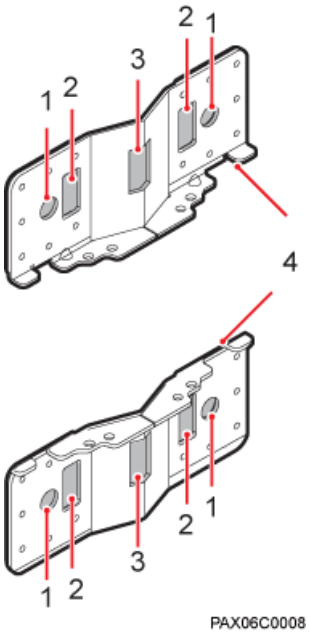
Figure 7-3 Adapting plate assembly for installing a BTS3202E



(1) Mounting hole group A (2) Mounting hole group B (3) Mounting hole group C (4) Adapting plates

7.2 Installing a BTS3202E on a Pole with the Diameter of 60 mm to 114 mm (2.36 in. to 4.49 in.)

This section describes the procedure and precautions for installing a BTS3202E on a pole with the diameter of 60 mm to 114 mm (2.36 in. to 4.49 in.).

Context

NOTE

It is recommended that the BTS3202E be installed 8000 mm to 15000 mm (315 in. to 590.6 in.) above the floor.

Procedure

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

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

Step 3 Install the bracket assembly on the pole, and then fit the other end of the auxiliary mounting bracket to the other dual-nut bolt assembly, as shown in **Figure 7-4**.

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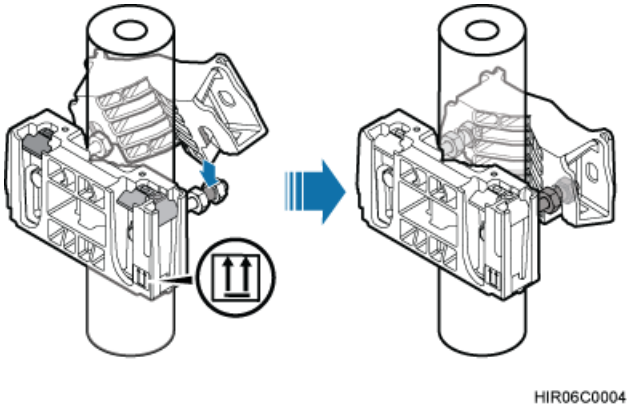
Figure 7-4 Installing the bracket assembly



NOTE

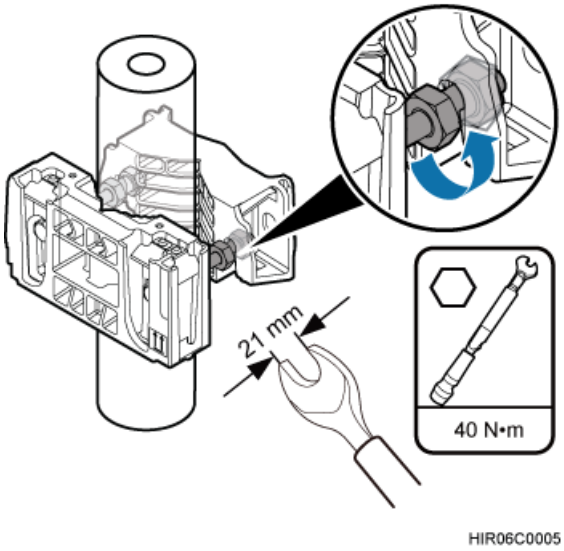
Verify that the arrow on the main mounting bracket is pointing up.

Step 4 Using a torque wrench, tighten the nuts to 40 N·m (354.03 lbf·in.) to secure the bracket assembly onto the pole, as shown in **Figure 7-5**.

CAUTION

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

Figure 7-5 Securing the bracket assembly onto the pole



Step 5 Install the BTS3202E on the main mounting bracket until the BTS3202E snaps shut, as shown in **Figure 7-6**.

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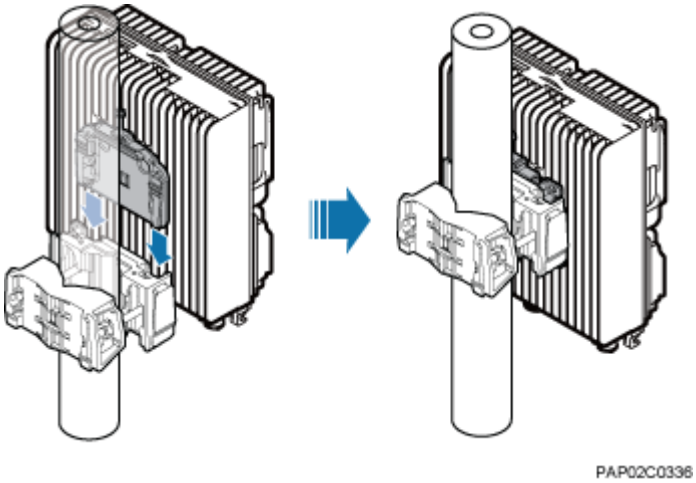
Figure 7-6 Installing the BTS3202E on the main mounting bracket



----End

7.3 Installing a BTS3202E on a Pole with the Diameter of 114 mm to 400 mm (4.49 in. to 15.75 in.)

This section describes the procedure and precautions for installing a BTS3202E on a pole with the diameter of 114 mm to 400 mm (4.49 in. to 15.75 in.).

Procedure

Step 1 Install two adapting plates on the top and bottom of the main mounting bracket. Tighten two M6x14 screws to 4.8 N·m (42.48 lbf·in.) to secure each of the plate, as shown in **Figure 7-7**.

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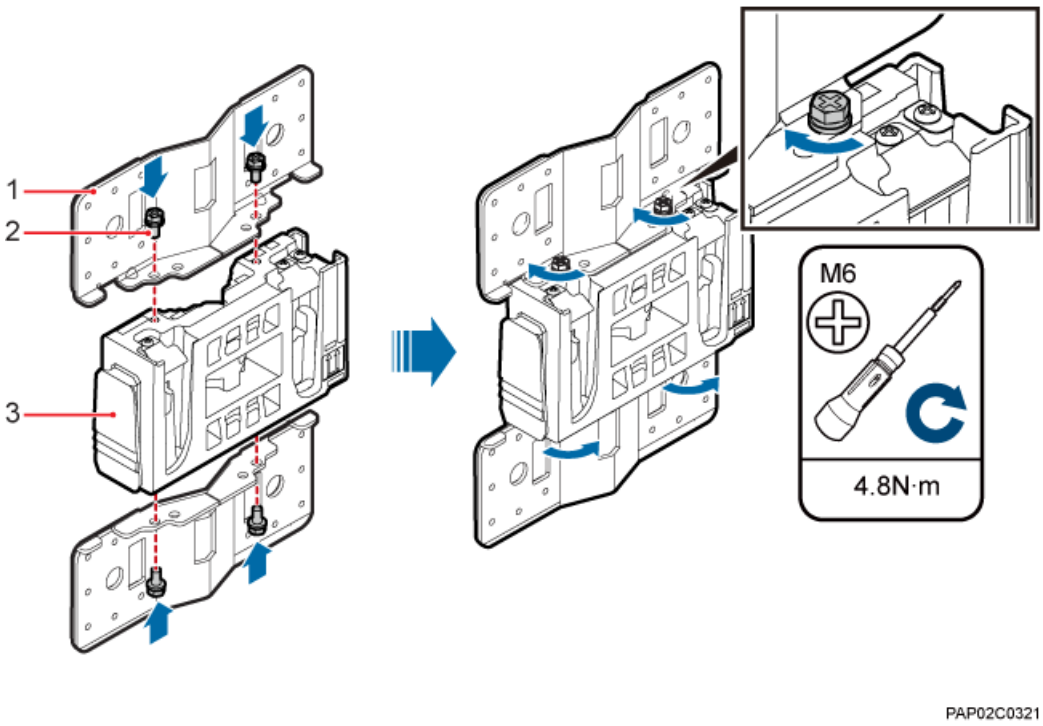
Figure 7-7 Installing the adapting plate assembly



(1) Adapting plate (2) Screw (3) Main mounting bracket

Step 2 Install two hose clamps through the mounting hole group B of the adapting plates, as shown in **Figure 7-8**.

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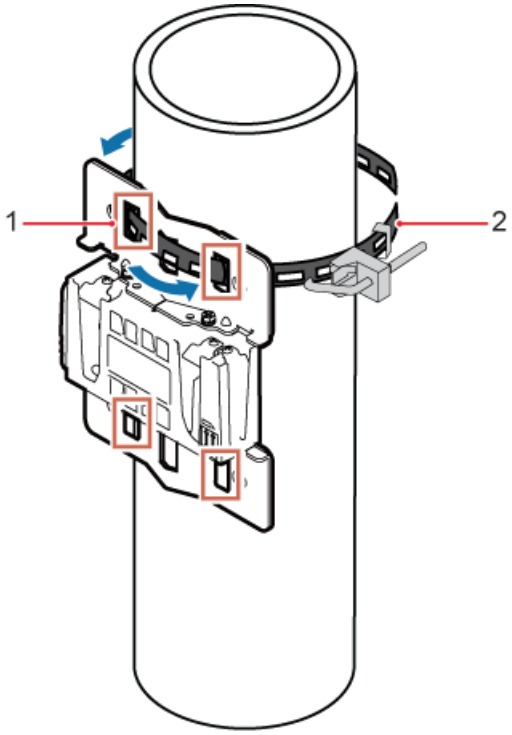
Figure 7-8 Installing the hose clamps



(1) Mounting hole group B (2) Hose clamp

Step 3 Install the securing piece, as shown in **Figure 7-9**.

1. Secure the hose clamp.
2. Use a level to check whether the adapting plate is on a horizontal plane.

NOTE

Secure the upper hose clamp before securing the lower clamp.

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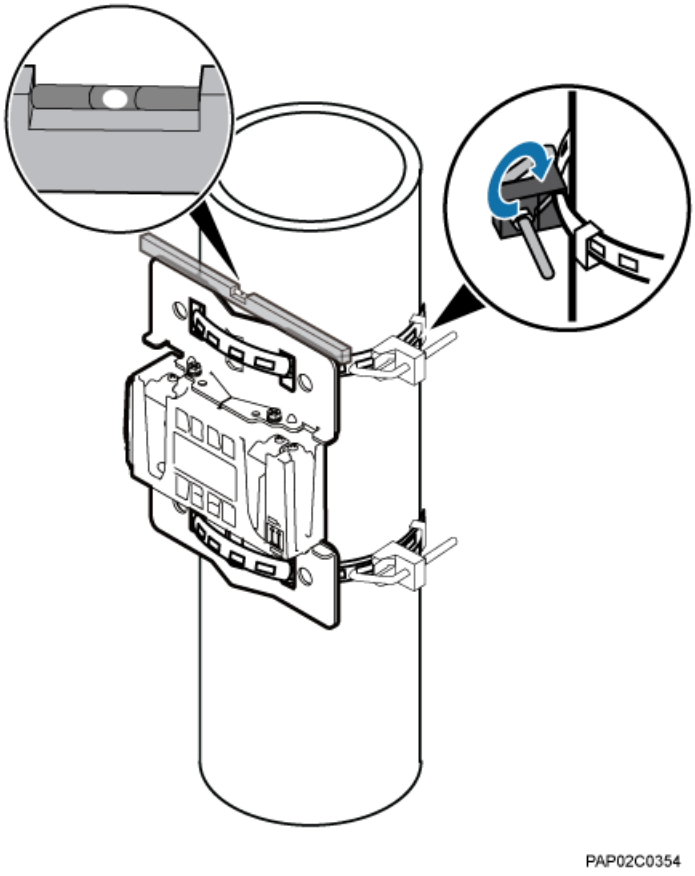
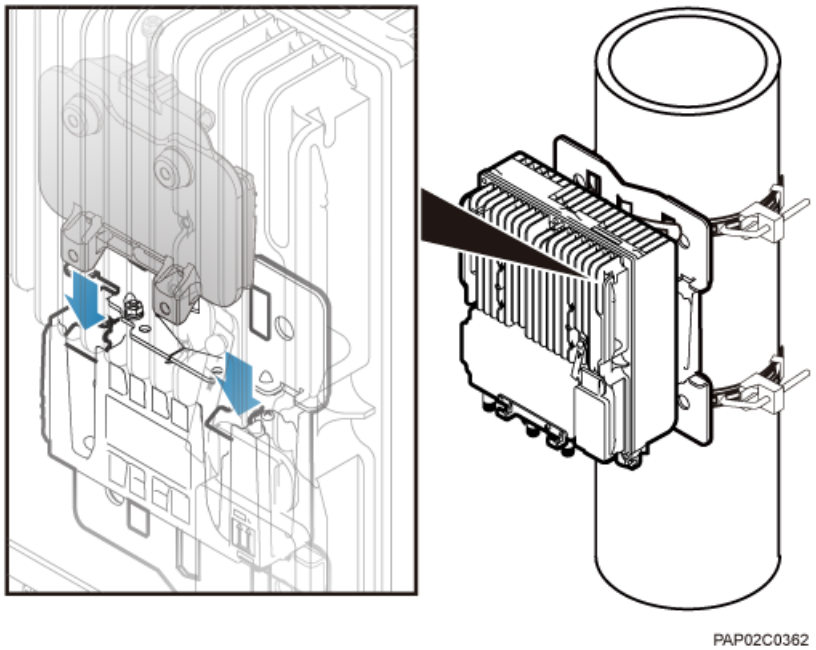
Figure 7-9 Securing the hose clamp



Step 4 Install the BTS3202E on the main mounting bracket until the BTS3202E snaps shut, as shown in **Figure 7-10**.

Figure 7-10 Installing the BTS3202E on the main mounting bracket



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----End

7.4 Installing a BTS3202E on a Wall

This section describes the procedure and precautions for installing a BTS3202E on a wall.

Context

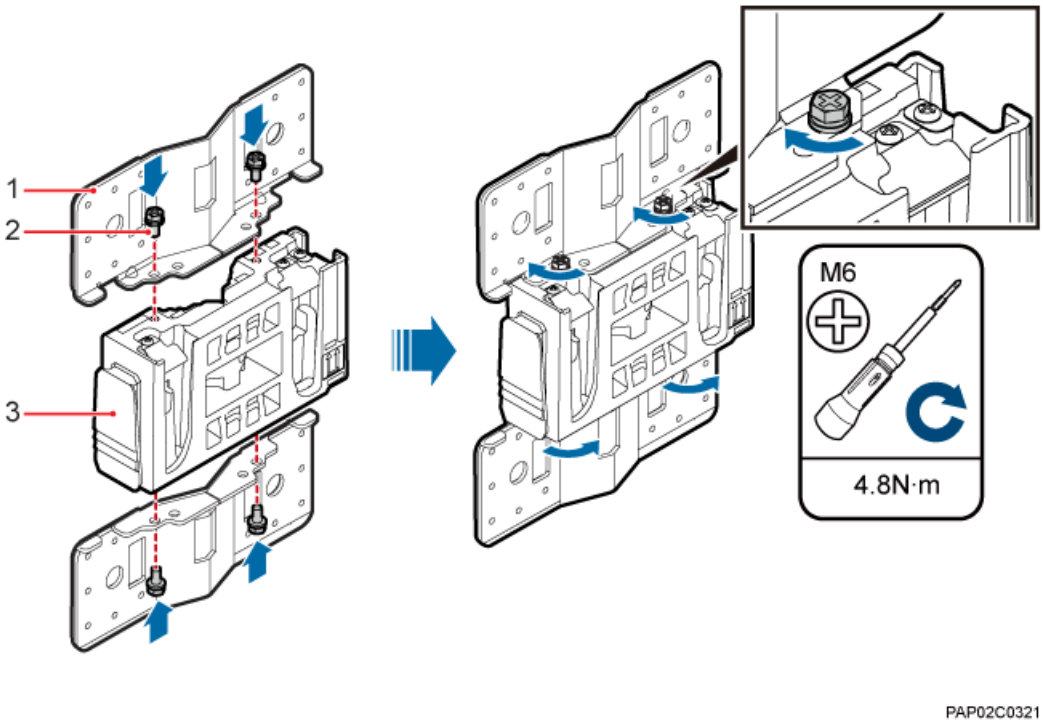
CAUTION

You must use adjustable torque tools to tighten all the screws and nuts to the requirements described in this document.

Procedure

Step 1 Install two adapting plates on the top and bottom of the main mounting bracket. Tighten two M6x14 screws to 4.8 N·m (42.48 lbf·in.) to secure each of the plate, as shown in **Figure 7-11**.

Figure 7-11 Installing the adapting plate assembly



(1) Adapting plate (2) Screw (3) Main mounting bracket

Step 2 Place the adapting plates against the wall, use a level to verify that the plates are horizontal, and then mark anchor points using a marker, as shown in **Figure 7-12**.

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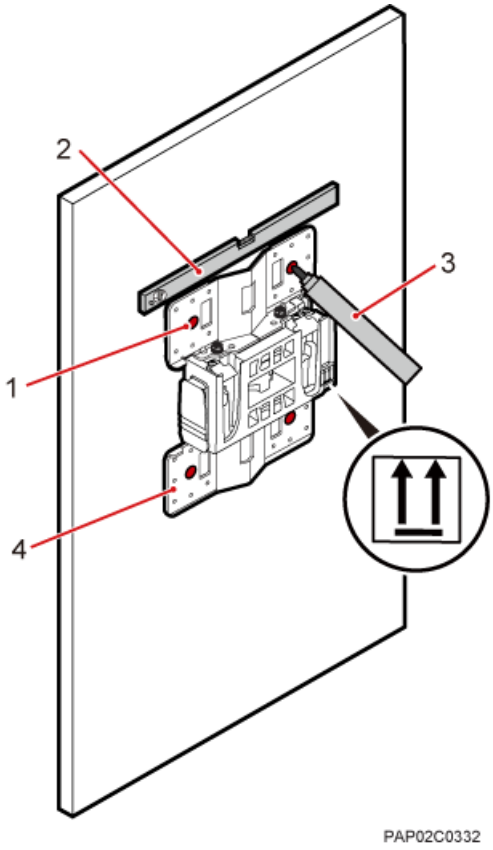
NOTE

It is recommended that the BTS3202E be installed 8000 mm to 15000 mm (315 in. to 590.6 in.) above the floor.

Figure 7-12 Marking the anchor points



(1) Mounting hole group A (2) Level (3) Marker (4) Adapting plate

Step 3 Drill holes at the anchor points, and then install expansion bolt assemblies, as shown in **Figure 7-13**.

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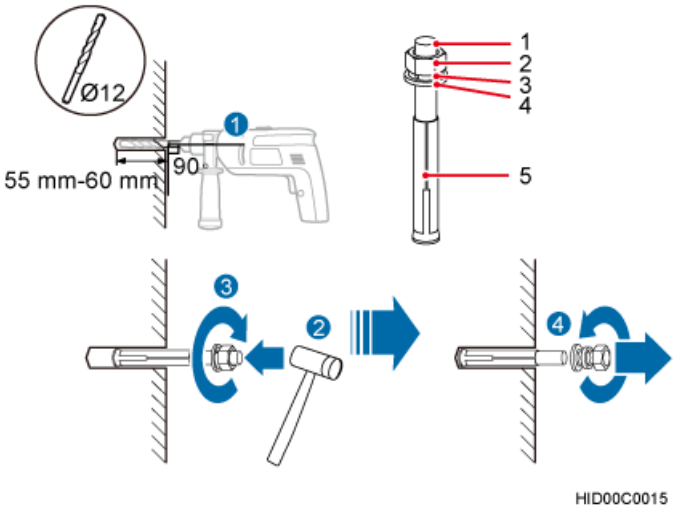
Figure 7-13 Drilling a hole and installing an expansion bolt assembly



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

1. Use a hammer drill with a φ12 bit to drill holes perpendicularly with the wall at the marked anchor points. Ensure that the depth of each hole ranges from 55 mm to 60 mm (2.17 in. to 2.36 in.).

WARNING

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

2. Use a vacuum cleaner to clear dust inside and around the holes, and then measure the inter-hole spacing. If the spacing is too wide or too narrow, drill holes again.
3. Tighten each expansion bolt slightly and place them perpendicularly into each hole.
4. Hit the expansion bolt using a rubber mallet to enable the expansion tube to completely enter the hole.
5. Remove the M10x80 bolt, spring washer, and flat washer from each expansion bolt assembly in sequence.

CAUTION

After disassembling an expansion bolt assembly, ensure that the top of the expansion tube is on the same level as the wall. Otherwise, the BTS3202E cannot be installed on the wall evenly and securely.

Step 4 Fit the mounting piece on the expansion bolt, and then use a combination wrench (17 mm [0.67 in.]) to tighten the expansion bolt to 25 N·m (221.27 lbf·in.), as shown in **Figure 7-14**.

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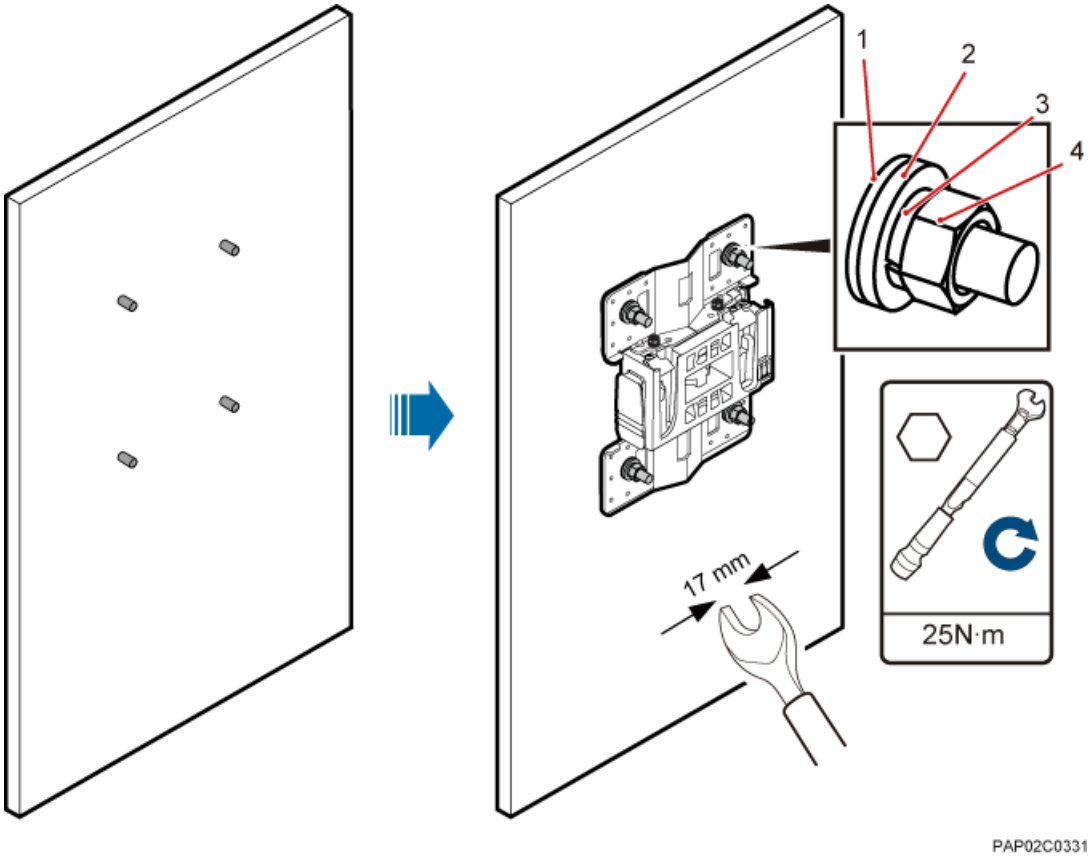
CAUTION

Ensure that the arrow on the main mounting bracket points upwards when installing the securing piece.

Figure 7-14 Fitting the mounting piece on the expansion bolt



(1) Insulation washer (2) Large flat washer (3) Spring washer (4) Nut

Step 5 Install the BTS3202E on the main mounting bracket until the BTS3202E snaps shut, as shown in **Figure 7-15**.

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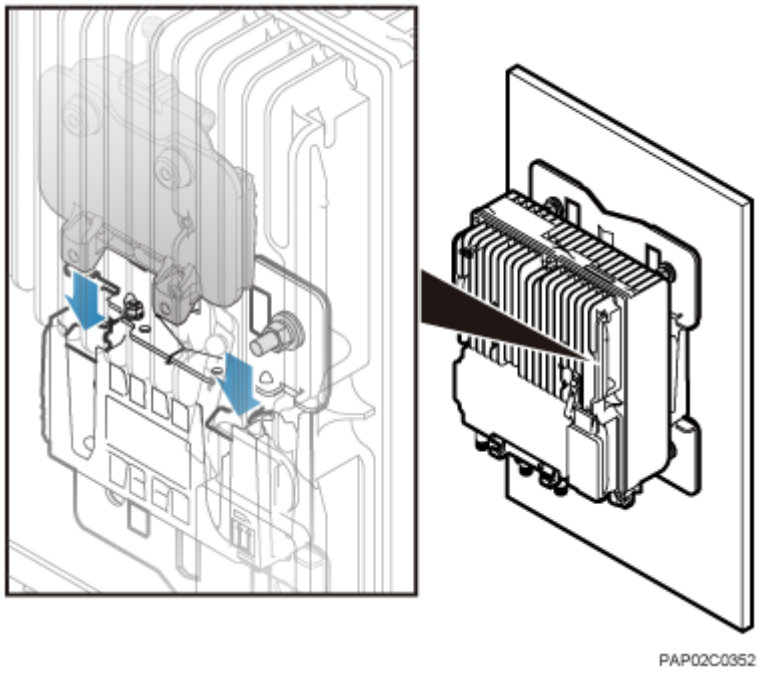
Figure 7-15 Installing the BTS3202E on the main mounting bracket



----End

7.5 Installing a BTS3202E on a Wood Pole

This section describes the procedure and precautions for installing a BTS3202E on a wood pole.

Procedure

Step 1 Drill two holes with the diameter of 18 mm (0.71 in.) on the middle axis of the wood pole, ensuring that the inter-hole spacing is 203 mm (7.99 in.), as shown in **Figure 7-16**.

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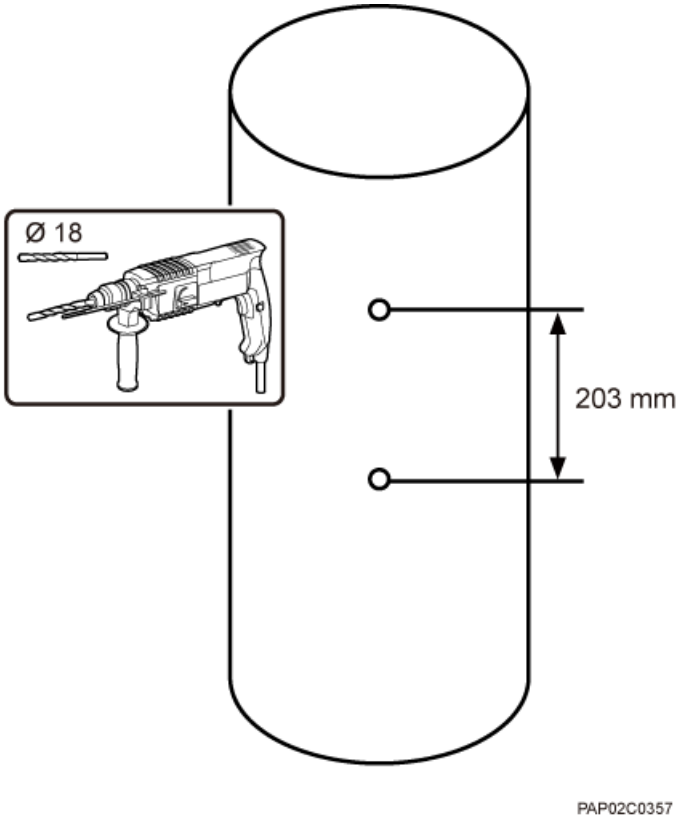
Figure 7-16 Drilling holes



Step 2 Install two adapting plates on the top and bottom of the main mounting bracket. Tighten two M6x14 screws to 4.8 N·m (42.48 lbf·in.) to secure each of the plate, as shown in **Figure 7-17**.

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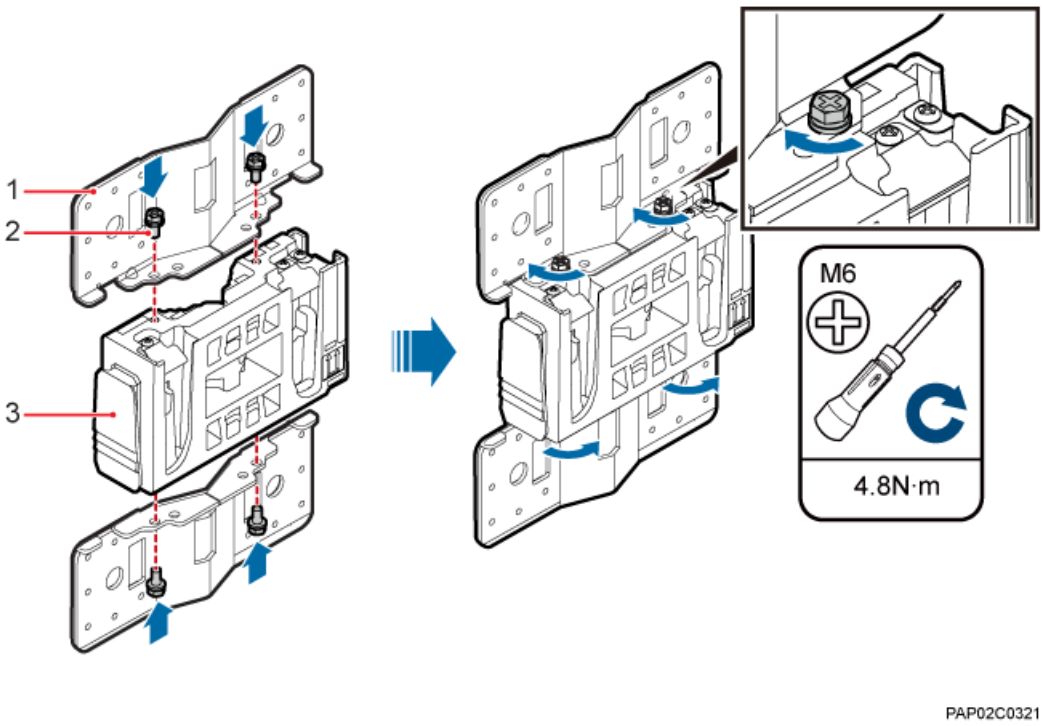
Figure 7-17 Installing the adapting plate assembly



(1) Adapting plate (2) Screw (3) Main mounting bracket

Step 3 Install the securing piece, as shown in **Figure 7-18**.

1. Align the mounting hole group C with the mounting holes in the wood pole.
2. Lead the two long M16 bolts with spacers through the upper and lower mounting holes.

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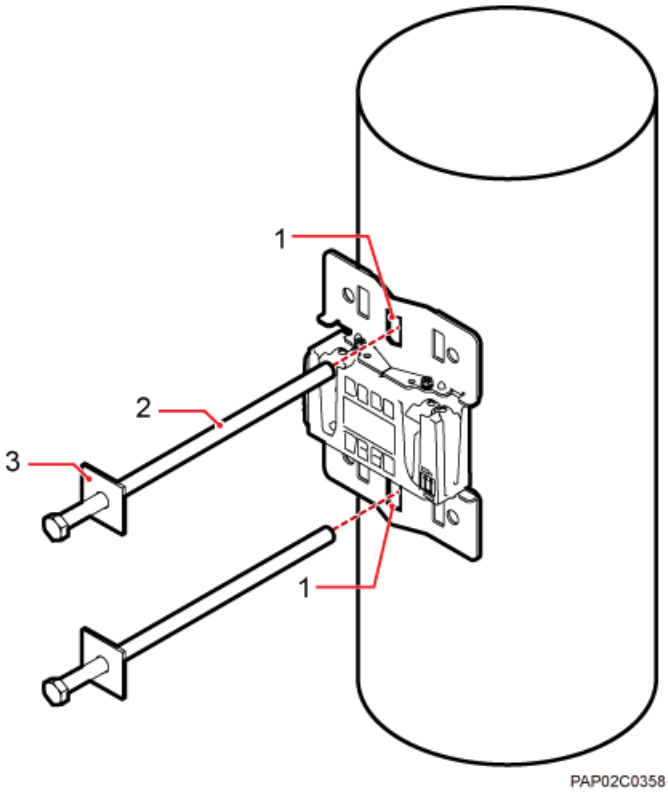
Figure 7-18 Securing the securing pieces



(1) Mounting hole group C (2) Bolt (3) Spacer

Step 4 Tighten the nuts to 80 N·m (708.06 lbf·in.), as shown in **Figure 7-19**.

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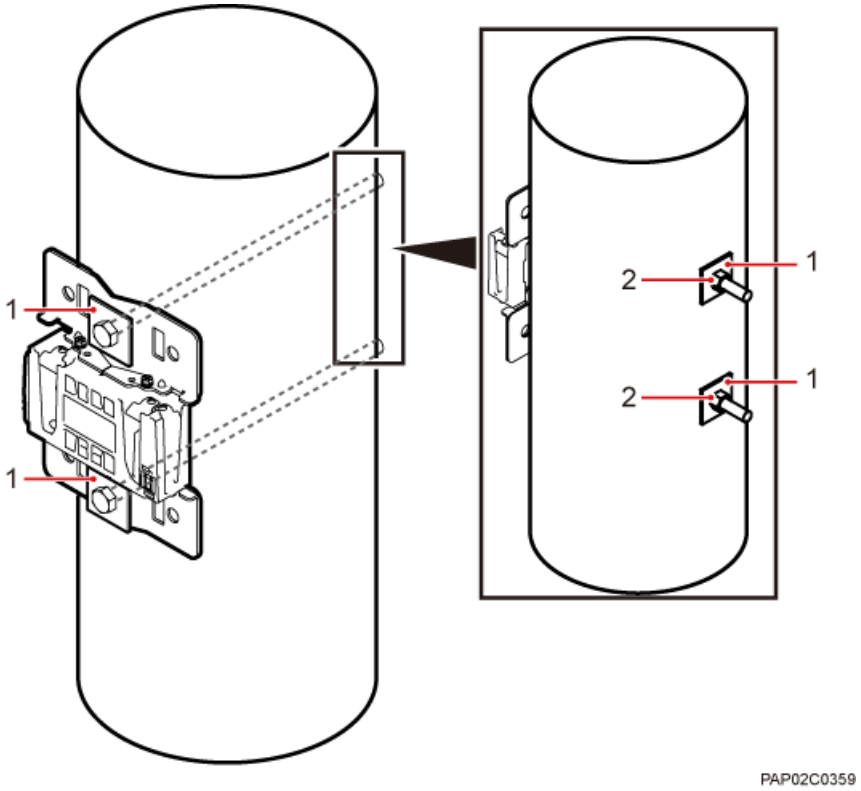
Figure 7-19 Tightening nuts



(1) Spacer (2) Nut

Step 5 Install the BTS3202E on the main mounting bracket until the BTS3202E snaps shut, as shown in **Figure 7-20**.

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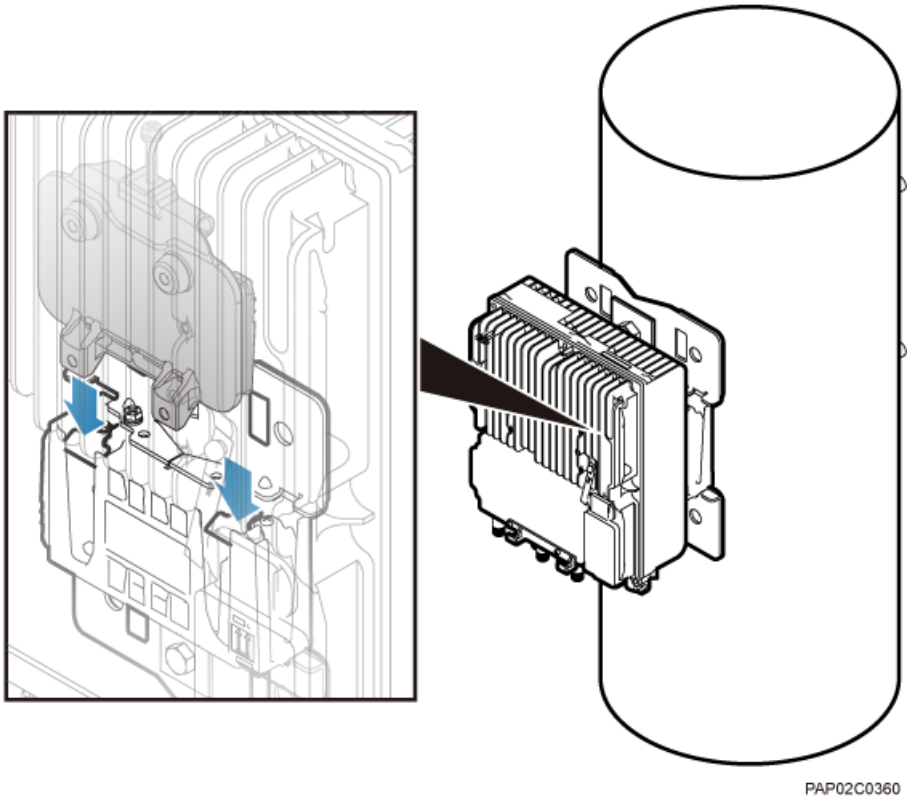
Figure 7-20 Installing the BTS3202E on the main mounting bracket



----End

7.6 Installing BTS3202Es on an IFS06

This section describes the procedure and precautions for installing BTS3202Es on an IFS06.

7.6.1 Assembling the IFS06

This chapter describes the procedure for assembling the IFS06.

Procedure

Step 1 Use four M12x30 bolt assemblies to secure the rear feet to the main frame, as shown in **Figure 7-21**.

NOTE

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

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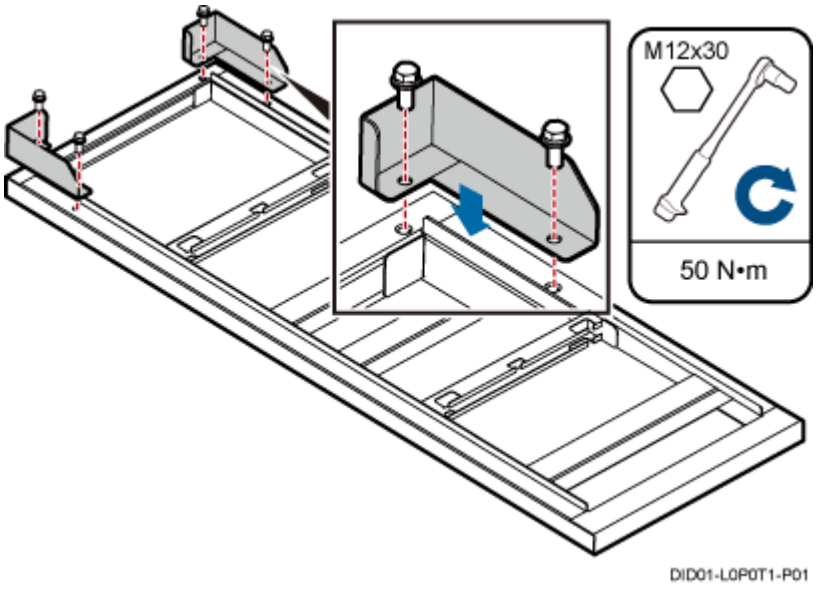
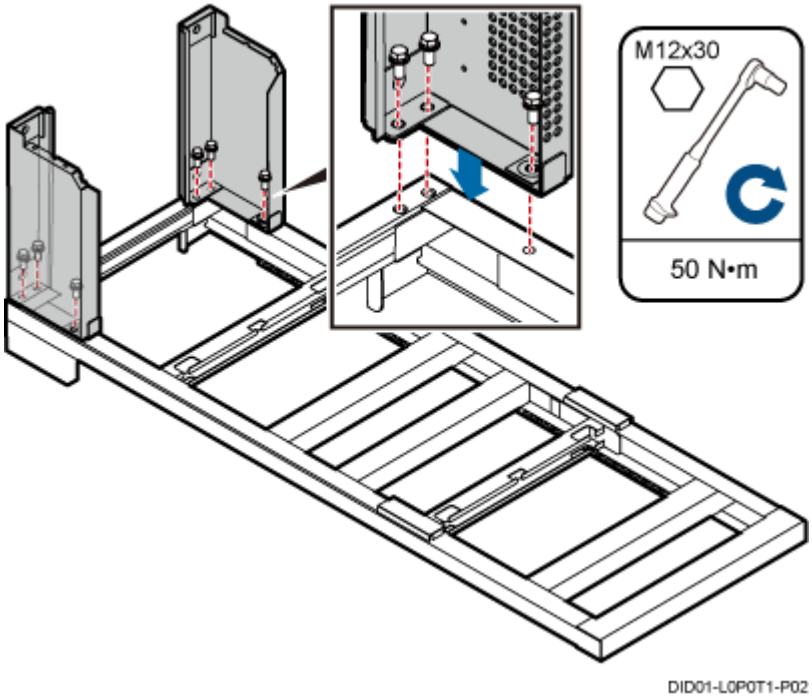
Figure 7-21 Installing the rear feet



Step 2 Rotate the IFS06 by 180°, and then use six M12x30 bolt assemblies to secure the front feet to the main frame, as shown in **Figure 7-22**.

Figure 7-22 Installing the front feet



Step 3 Move down the adjustable beam from the 2 m high position to the 1.8 m high position, as shown in **Figure 7-23**.

NOTE

In the height-restricted scenario, move the adjustable beam to the 1.8 m high position. In the height-unrestricted scenario, skip the step.

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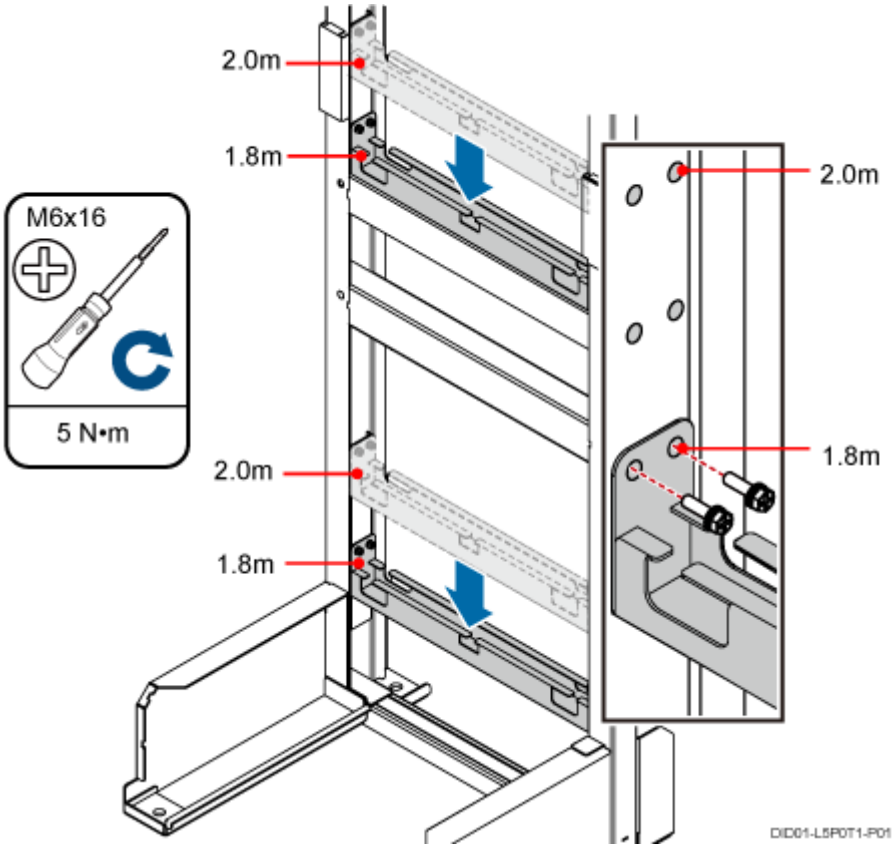
Figure 7-23 Moving down the adjustable beam



Step 4 Fit the tabs of the cable rack into the corresponding slots on the columns of the IFS06, as shown in **Figure 7-24**.

Figure 7-24 Installing the cable rack

NOTE

In the height-unrestricted scenario, fit the tabs of the cable rack into the slots for the height-unrestricted scenario. In the height-restricted scenario, fit the tabs of the cable rack into the slots for the height-restricted scenario.

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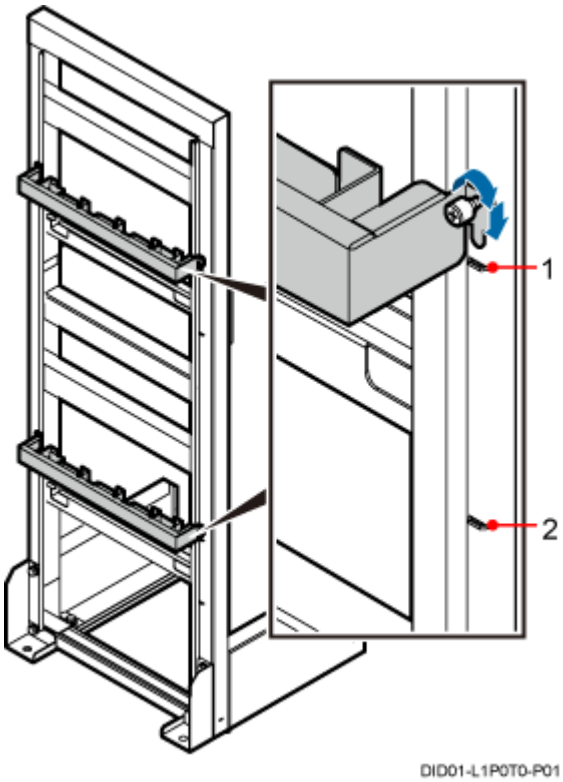

(1) Slot for installing the cable rack in the height-unrestricted scenario

(2) Slot for installing the cable rack in the height-restricted scenario

----End

7.6.2 Installing the IFS06

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

Installing the IFS06 on the Concrete Floor

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

Procedure

Step 1 Place the marking template on the horizontal floor, and then use a marker to mark four anchor points, as shown in **Figure 7-25**.

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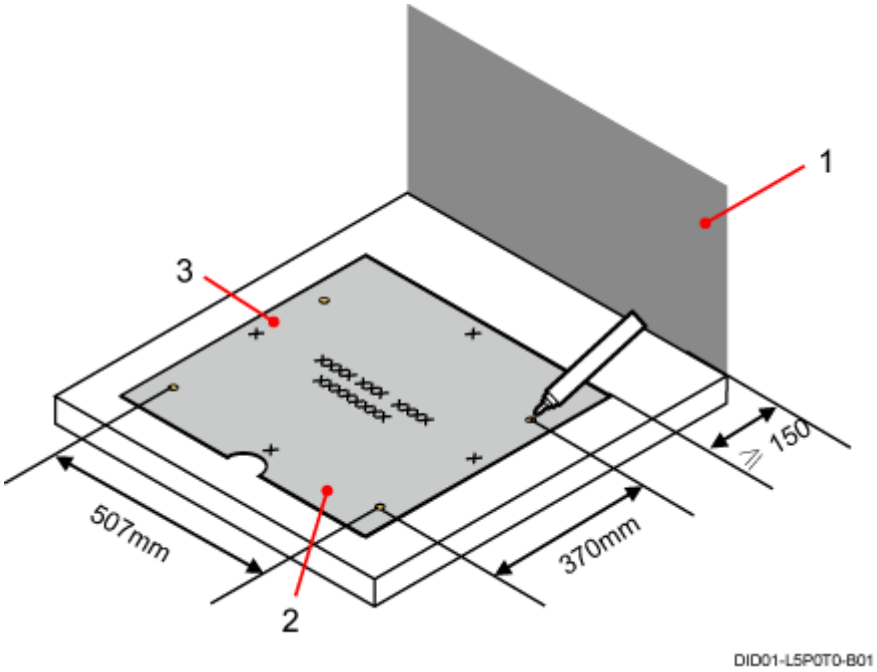
Figure 7-25 Marking anchor points



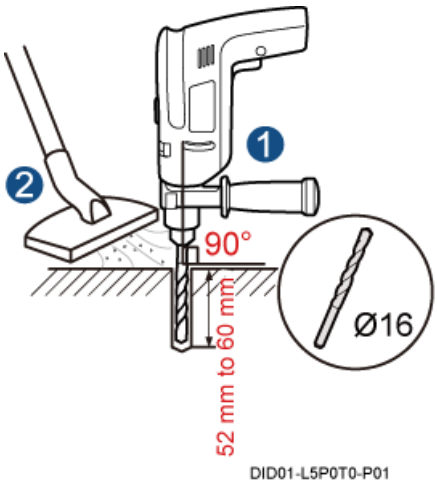
(1) Wall (2) Front (3) Left

Step 2 Drill holes at the anchor points and install the expansion bolt assemblies.

1. Use a hammer drill with bit 16 to drill holes at the marked anchor points. Ensure that the depth of each hole ranges from 52 mm to 60 mm, as shown in **Figure 7-26**.

   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.

Figure 7-26 Drilling holes



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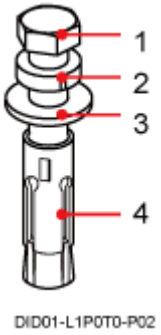
CAUTION

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

2. Assemble the expansion bolt assembly by referring to **Figure 7-27**, slightly tighten the expansion bolt, and then insert it into the hole vertically.

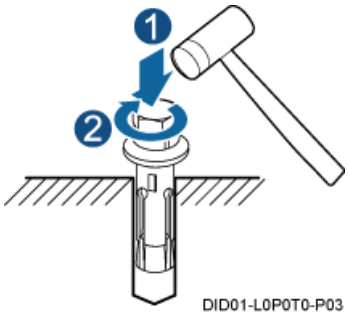
Figure 7-27 Assembling an expansion bolt



(1) M12x60 bolt (2) Spring washer 12 (3) Flat washer 12 (4) Expansion tube

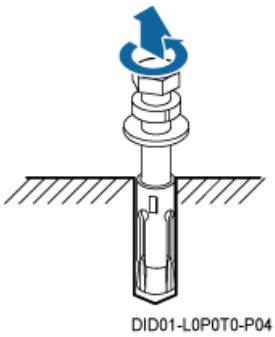
3. Use a rubber mallet to hammer the expansion bolt until the expansion tube is buried into the hole, and then use a torque wrench to tighten the M12x60 bolt until the tightening torque reaches 45 N·m, as shown in **Figure 7-28**.

Figure 7-28 Installing an expansion bolt



4. Remove the M12x60 bolt, spring washer, and flat washer from each expansion bolt assembly in sequence, as shown in **Figure 7-29**.

Figure 7-29 Removing a bolt



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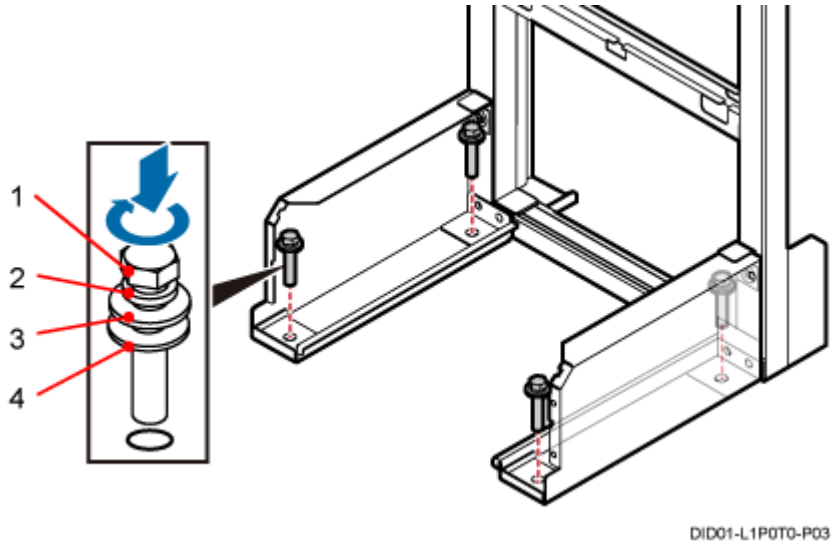
Step 3 Install the bolts in the corresponding mounting holes on the IFS06, as shown in **Figure 7-30**.

Figure 7-30 Installing the bolts



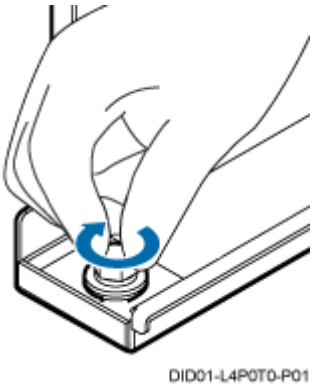
(1) M12x60 bolt (2) Spring washer (3) Flat washer (4) Insulation washer

1. Place the IFS06 in the position for installation, and then align the mounting holes on the IFS06 with the anchor points on the floor.
2. Lead each bolt through the spring washer, flat washer, and insulation washer in sequence, and then install the bolt in the mounting hole on the IFS06.
3. Install the bolt into the expansion tube.

Step 4 Use a level to check whether the feet of the IFS06 are on a horizontal plane. If not, add adjusting pads to ensure that the feet of the IFS06 are on a horizontal plane.

1. Pre-tighten the bolts, as shown in **Figure 7-31**.

Figure 7-31 Pre-tightening the bolts



2. Use a level to check whether the feet and bottom beam of the IFS06 are on a horizontal plane, as shown in **Figure 7-32**.

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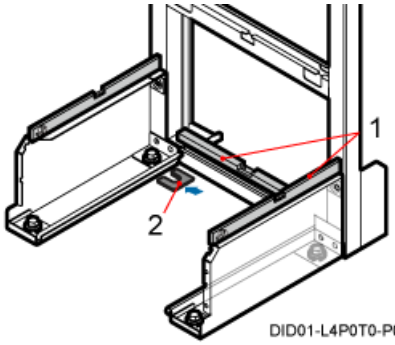
Figure 7-32 Checking and adjusting the level of the IFS06



(1) Level (2) Adjusting pad

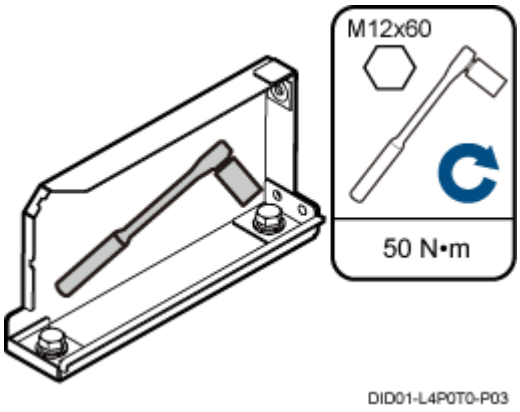
3. Add adjusting pads to ensure that the feet and bottom beam of the IFS06 are on a horizontal plane, as shown in **Figure 7-32**.

   NOTE

   The adjusting pads must be added at the expansion bolt assemblies.

4. Tightening the bolts using a socket wrench, as shown in **Figure 7-33**.

Figure 7-33 Tightening the bolts



----End

Installing the IFS06 on the ESD Floor

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

Context

Figure 7-34 shows the support for installing the ESD floor, which is classified into support with adjustable height (I) and support with fixed height (II). The installation process of two supports is the same, and the following descriptions are based on the support with adjustable height (I).

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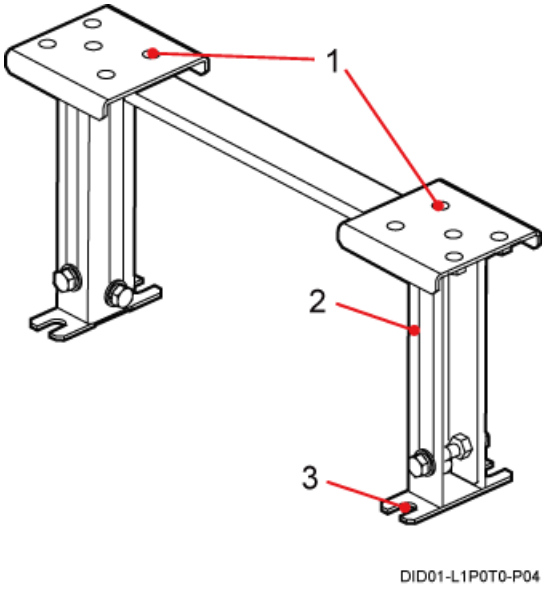
Figure 7-34 Support for installing the ESD floor



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

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

Type	Height of the ESD Floor
I	296 mm to 495 mm
II	At least 120 mm, depending on the actual floor height

Procedure

Step 1 Place the marking template on the ESD floor, and then use a marker to mark four anchor points, as shown in **Figure 7-35**.

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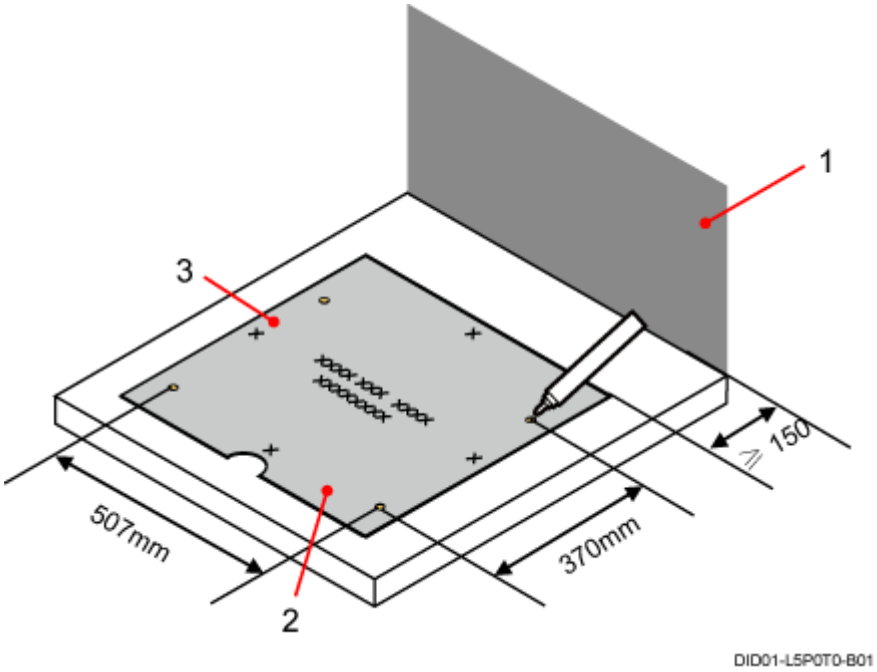
Figure 7-35 Marking anchor points

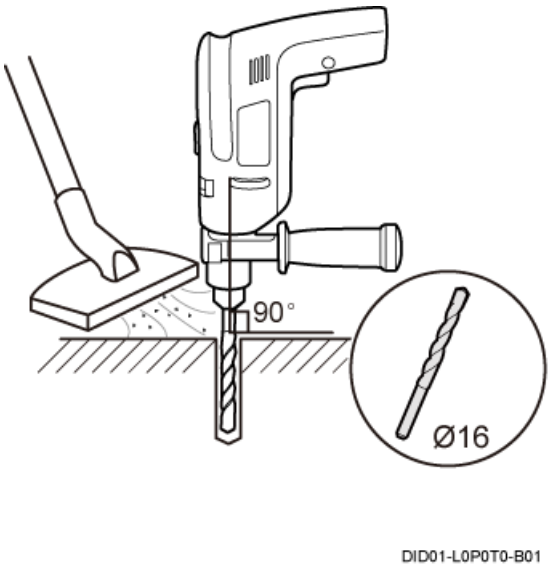


(1) Wall (2) Front (3) Left

Step 2 Drill holes on the ESD floor, as shown in **Figure 7-36**. Ensure that the hammer drill penetrates the ESD floor.

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.

Figure 7-36 Drilling holes



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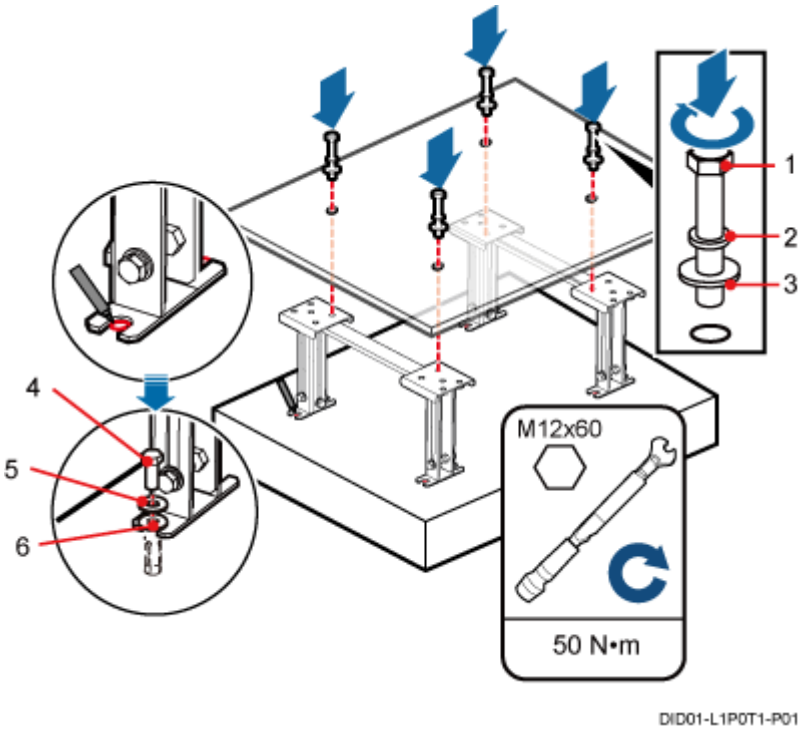
CAUTION

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

Step 3 Install the support for installing the ESD floor, as shown in **Figure 7-37**.

Figure 7-37 Installing the support



(1) M12x70 bolt (2, 5) Spring washer 12 (3,6) Flat washer 12 (4) M12x60 bolt

1. Mark the positions of the mounting hole for the concrete floor on the concrete floor, drill holes in the positions, and then install the expansion bolt assemblies.
2. Place the support under the ESD floor, and then use M12x70 bolts to temporarily secure the support.

   NOTE

   The height locking bolts are delivered with the support for installing the ESD floor.

   When tightening the height locking bolts, you should tighten the bolts in the middle before tightening the bolts on both sides.

Step 4 Remove the bolts that you use in **Step 3** to temporarily secure the support for installing the ESD floor, as shown in **Figure 7-38**.

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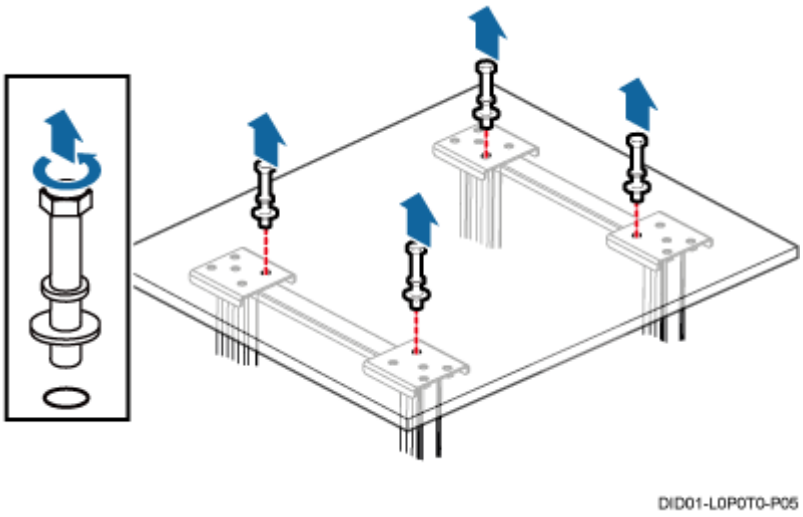
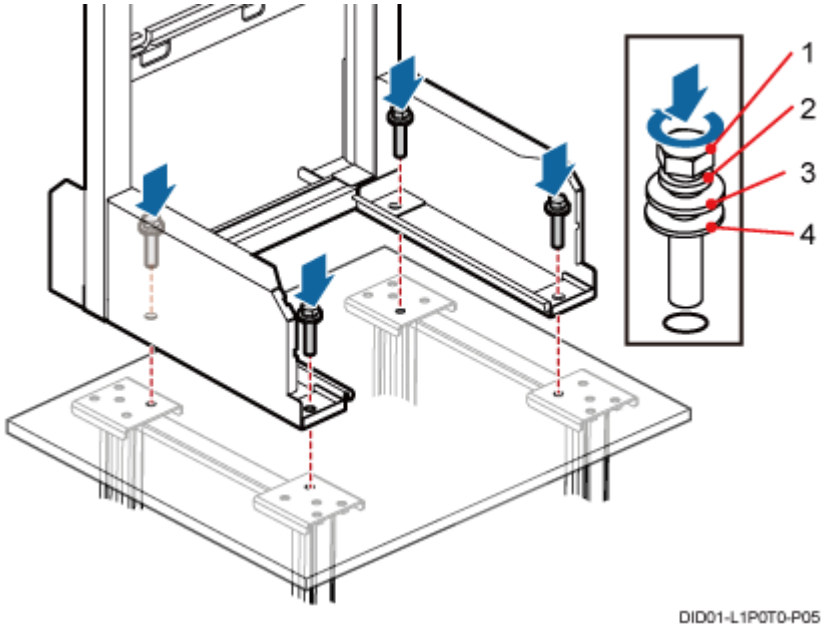
Figure 7-38 Removing the bolts



Step 5 Install the IFS06 on the ESD Floor, as shown in **Figure 7-39**.

Figure 7-39 Install the IFS06.



(1) M12x70 bolt (2) Spring washer (3) Flat washer (4) Insulating washer

Step 6 Use a level to check whether the feet of the ICR are on a horizontal plane. If not, add adjusting pads to ensure that the feet of the ICR are on a horizontal plane.

1. Pre-tighten the bolts, as shown in **Figure 7-40**.

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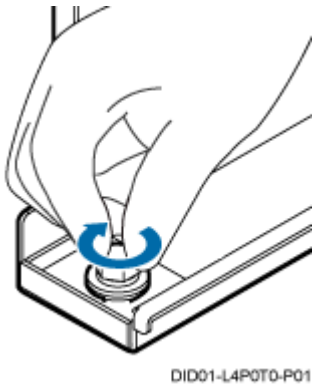
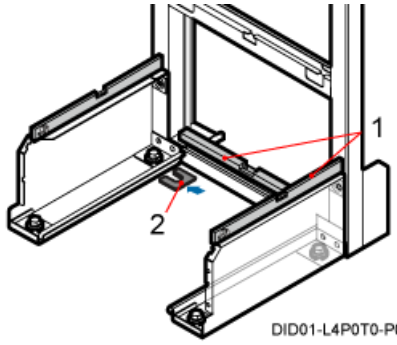
Figure 7-40 Pre-tightening the bolts



2. Use a level to check whether the feet and bottom beam of the ICR are on a horizontal plane, as shown in **Figure 7-41**.

Figure 7-41 Checking and adjusting the level of the ICR



(1) Level (2) Adjusting pad

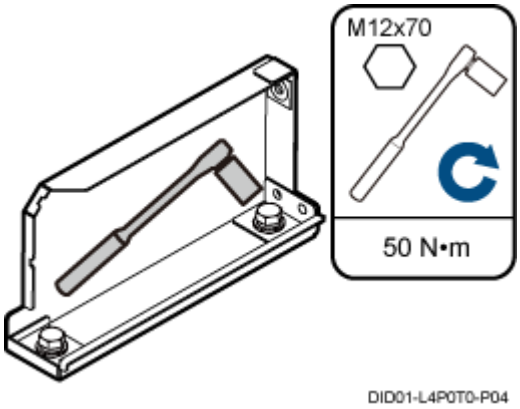
3. Add adjusting pads to ensure that the feet and bottom beam of the ICR are on a horizontal plane, as shown in **Figure 7-41**.

NOTE

The adjusting pads should be added at the expansion bolt assemblies.

4. Tightening the bolts using a socket wrench, as shown in **Figure 7-42**.

Figure 7-42 Tightening the bolts



----End

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7.6.3 Installing a Main Bracket

This section describes the procedure for installing a main bracket.

Context

NOTE

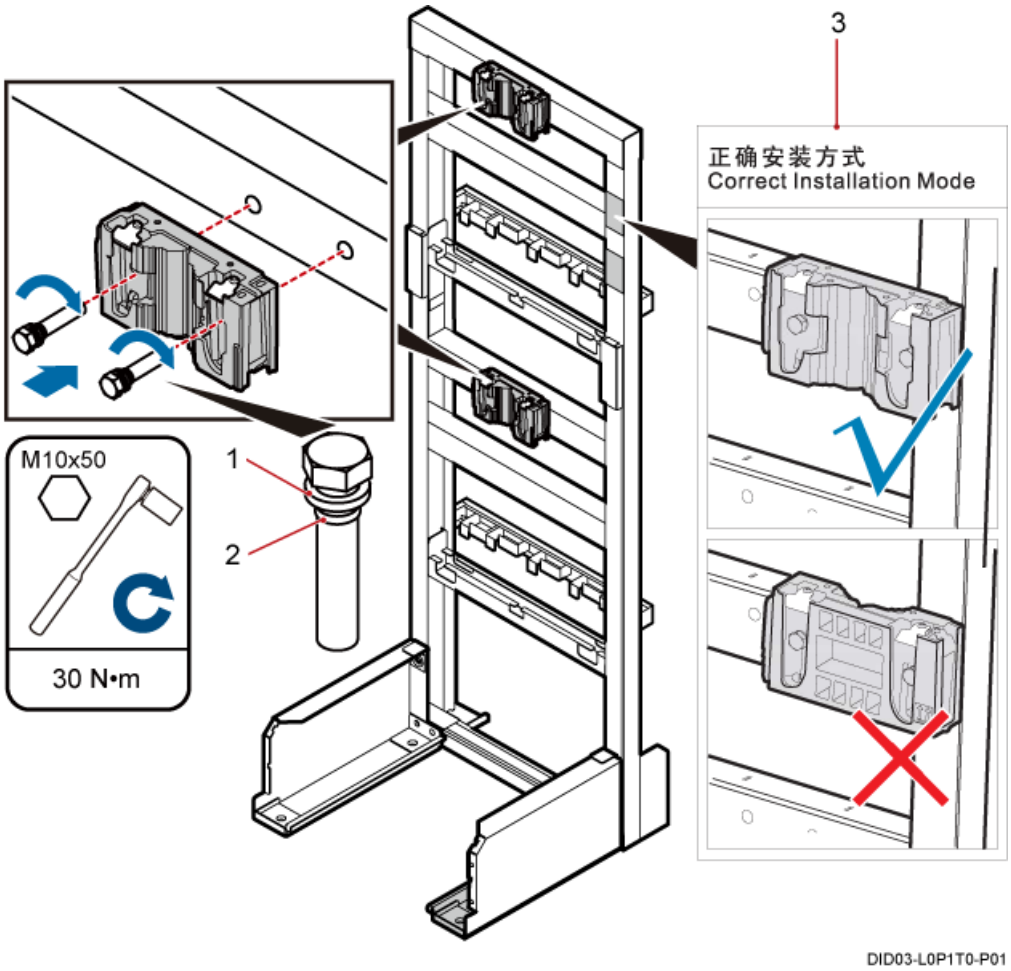
- Install BTS3202Es in the sequence from bottom to top and from left to right.
- The contact pieces on the main bracket are locked before RRUs are mounted.
- Rubber washers are easily pressed or broken.
- If the installation clearance is insufficient, BTS3202Es must be first mounted on the side where there is the least space.

Procedure

- Height-unrestricted scenario

  In the height-unrestricted scenario, main brackets are installed on beam 1 and beam 3, as shown in **Figure 7-43**. For details about how to install a main bracket, see the label on an IFS06.

Figure 7-43 Installing main brackets in the height-unrestricted scenario



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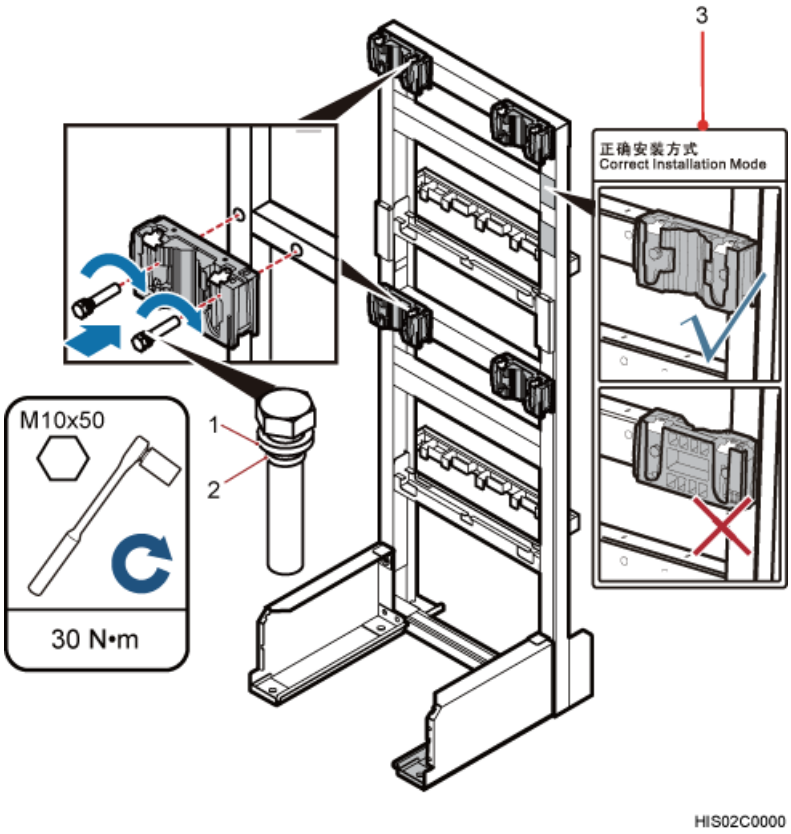

(1) Spring washer (2) Rubber washer (3) Label

- Height-restricted scenario

  In the height-restricted scenario, main brackets are installed on beam 2 and beam 4, as shown in **Figure 7-44**. For details about how to install a main bracket, see the label on an IFS06.

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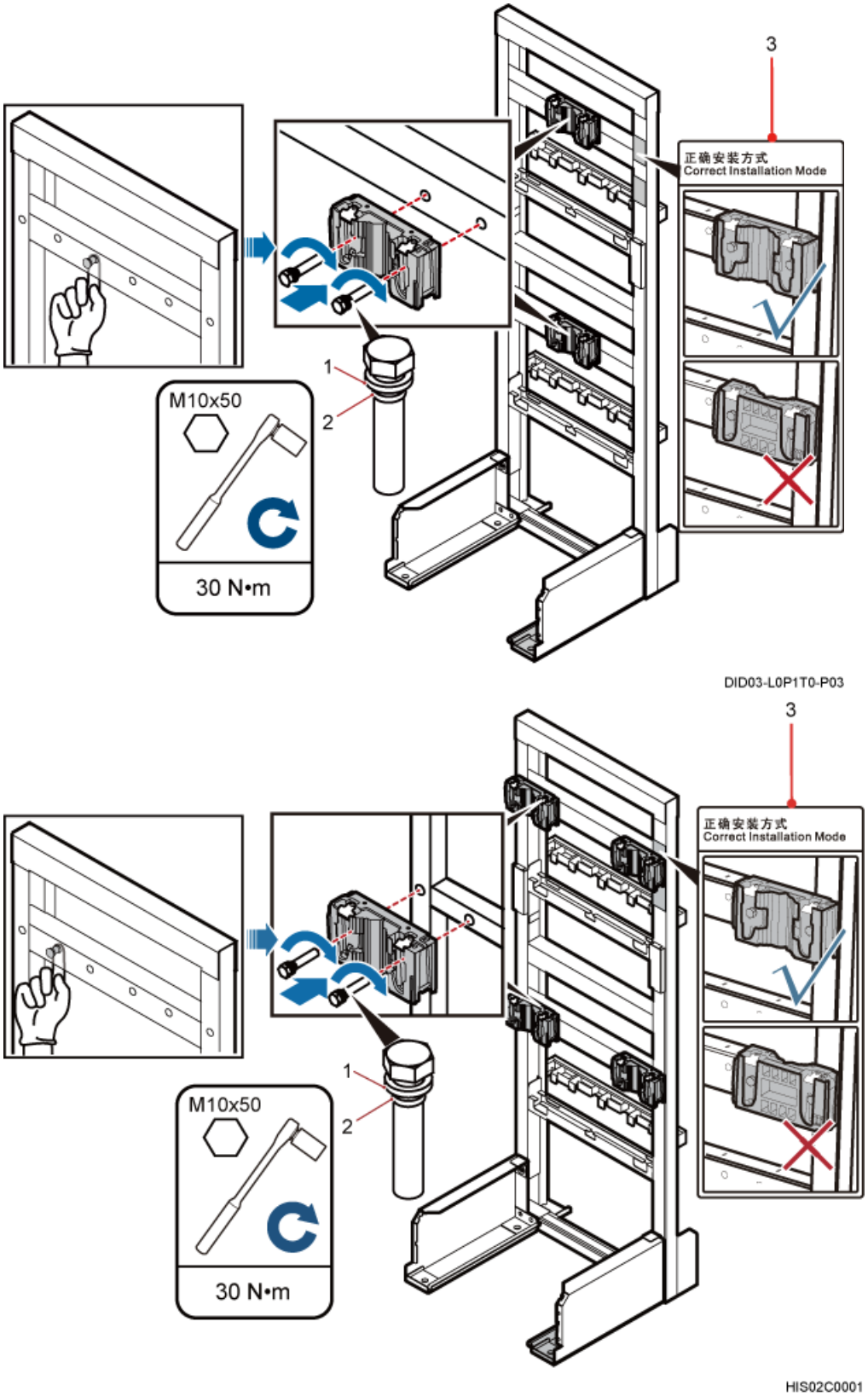
Figure 7-44 Installing main brackets in the height-restricted scenario



(1) Spring washer (2) Rubber washer (3) Label

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----End

7.6.4 Installing an IFS06 PGND Cable

A PGND cable connects a ground screw on an IFS06 to the onsite ground bar to ensure proper grounding of the IFS06.

Context

Table 7-1 lists the specifications of a PGND cable.

Table 7-1 Specifications of a PGND cable

Cable	One End	The Other End	Remarks
PGND cable	OT terminal (M8)	OT terminal (M8)	Green and yellow cable (16 mm^2)

NOTE

The cable route depends on actual requirements.

Procedure

Step 1 Connect one end of the PGND cable to the ground terminal of the ground bar on the IFS06 and the other end to an external ground bar, as shown in Figure 7-45.

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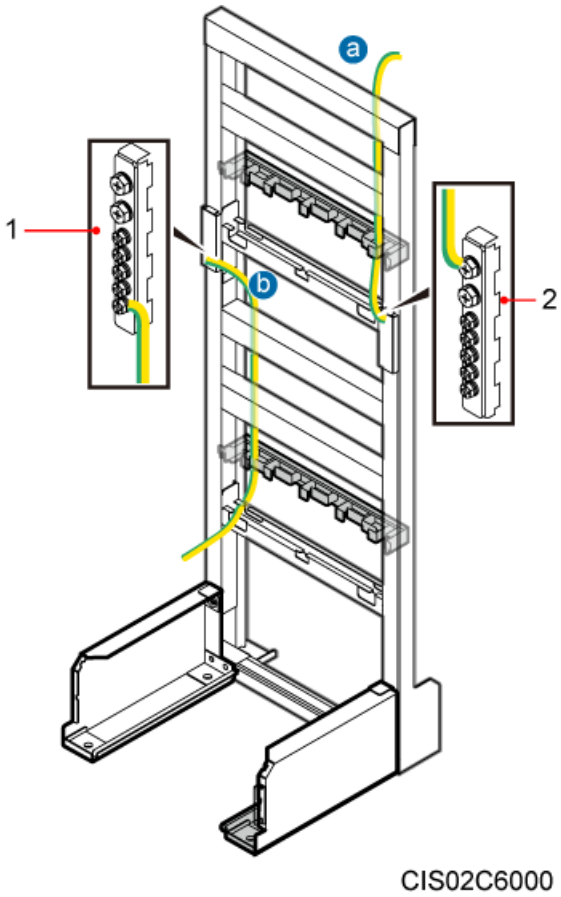
Figure 7-45 Installing a PGND cable

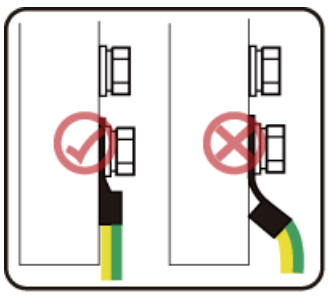


(1) Ground bar 1 (2) Ground bar 2

NOTE

When installing the PGND cable, tightly press the OT terminal in the correct direction, as shown in **Figure 7-46**.

Figure 7-46 Installing an OT terminal in the correct manner



Step 2 Route the cable by referring to Cabling Requirements, and then use cable ties to bind the cable.

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

----End

7.6.5 Installing BTS3202Es

This section describes the procedures for installing BTS3202Es.

Context

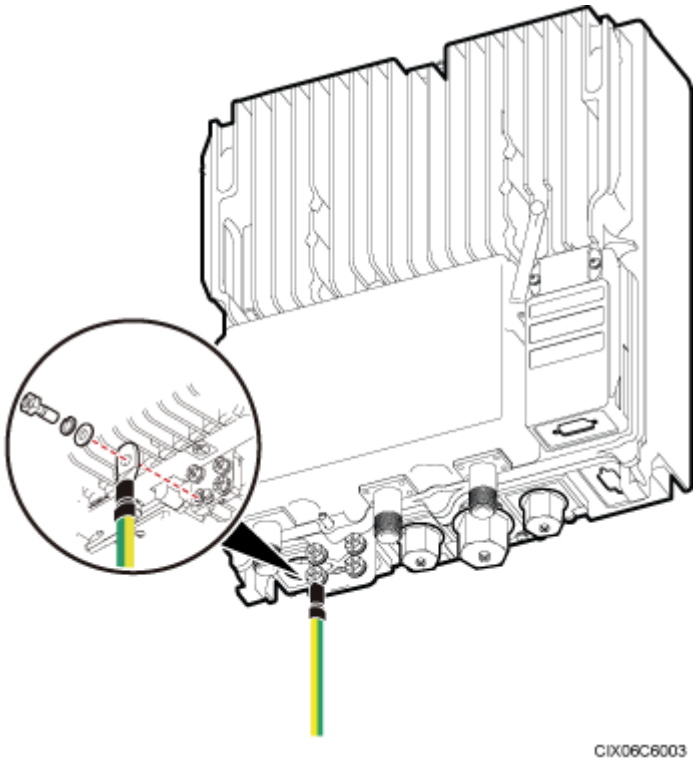
NOTE

- Place a foam pad or cardboard under a BTS3202E to protect the housing from any damage.
- Do not stand a BTS3202E on a floor because the load-bearing capacity of a BTS3202E at the bottom is low.

Procedure

Step 1 Link the M6 OT terminal at one end of the BTS3202E PGND cable to the ground terminal for the BTS3202E, and leave the other end idle, as shown in **Figure 7-47**.

Figure 7-47 Connecting the BTS3202E PGND cable to the ground terminal



Step 2 Install the BTS3202E on the main bracket, as shown in **Figure 7-48**.

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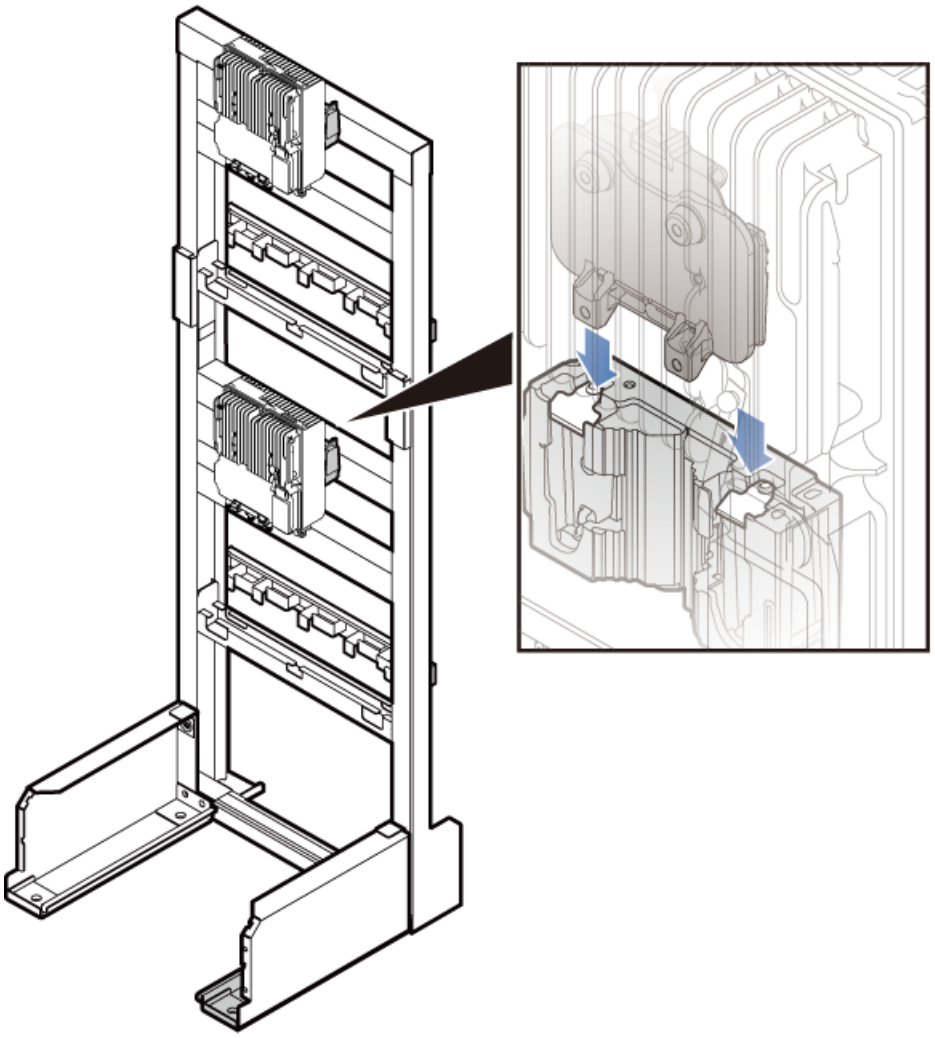
Figure 7-48 Installing the BTS3202E on the main bracket



NOTE

Install lower-level BTS3202Es before installing upper-level BTS3202Es.

----End

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8 Installing an AC Surge Protection Box and Related Cables

About This Chapter

This chapter describes the dimensions, installation clearance requirements, and installation options of an AC surge protection box. It also describes the procedure for installing the surge protection box. An AC surge protection box can be configured when a BTS3202E is installed outdoors.

8.1 Dimensions and Installation Clearance Requirements of an AC Surge Protection Box
This section describes the dimensions and installation clearance requirements for an AC surge protection box.

8.2 Installation Options of an AC Surge Protection Box
This section describes installation options of an AC surge protection box. An AC surge protection box can be installed on a pole, wall, or wood pole.

8.3 Installing an AC Surge Protection Box
This section describes the procedure for installing an AC surge protection box.

8.4 Installing Cables for an AC Surge Protection Box
This section describes the procedure for installing cables for an AC surge protection box.

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8.1 Dimensions and Installation Clearance Requirements of an AC Surge Protection Box

This section describes the dimensions and installation clearance requirements for an AC surge protection box.

Figure 8-1 shows the dimensions of an AC surge protection box.

Figure 8-1 Dimensions of an AC surge protection box

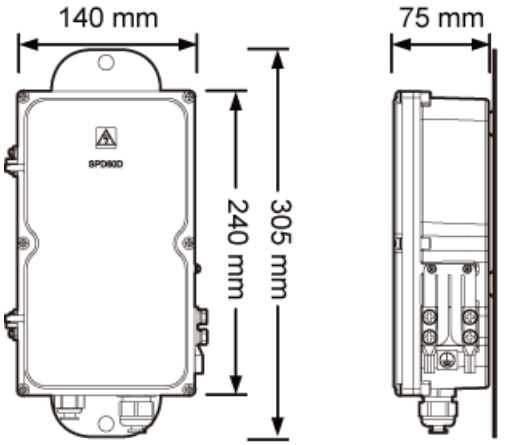

Figure 8-2 shows the recommended installation clearance for an AC surge protection box.

Figure 8-2 Recommended installation clearance for an AC surge protection box

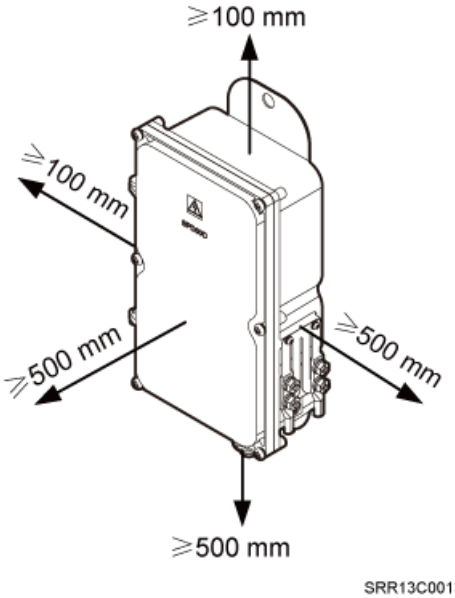

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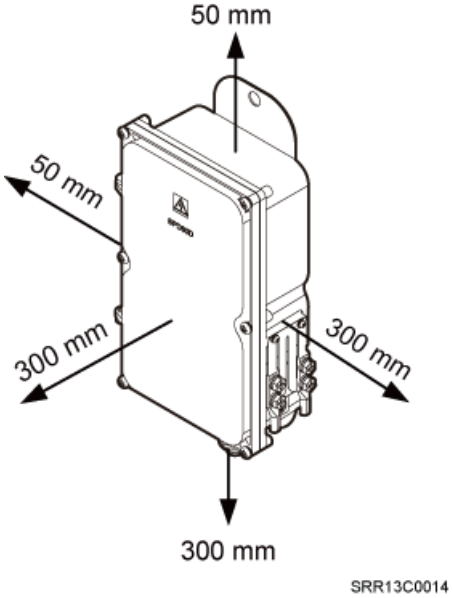
Figure 8-3 shows the minimum installation clearance for an AC surge protection box.

Figure 8-3 Minimum installation clearance for an AC surge protection box



8.2 Installation Options of an AC Surge Protection Box

This section describes installation options of an AC surge protection box. An AC surge protection box can be installed on a pole, wall, or wood pole.

Installing an AC Surge Protection Box on a Pole with the Diameter of 60 mm to 114 mm (2.36 in. to 4.49 in.)

Figure 8-4 shows the diameter of a pole for installing an AC surge protection box.

Figure 8-4 Diameter of a pole

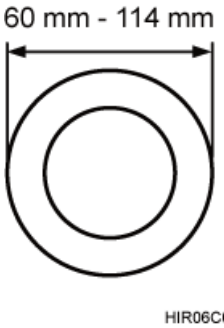


Figure 8-5 shows an AC surge protection box installed on a pole.

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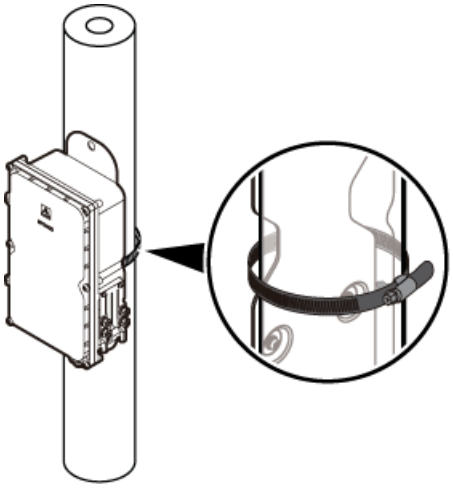
Figure 8-5 AC surge protection box installed on a pole



Installing an AC Surge Protection Box on a Pole with the Diameter of 114 mm to 400 mm (4.49 in. to 15.75 in.)

Figure 8-6 shows the diameter of a pole for installing an AC surge protection box.

Figure 8-6 Diameter of a pole

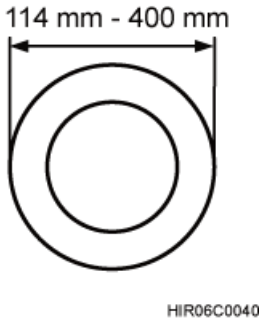


Figure 8-7 shows an AC surge protection box installed on a pole.

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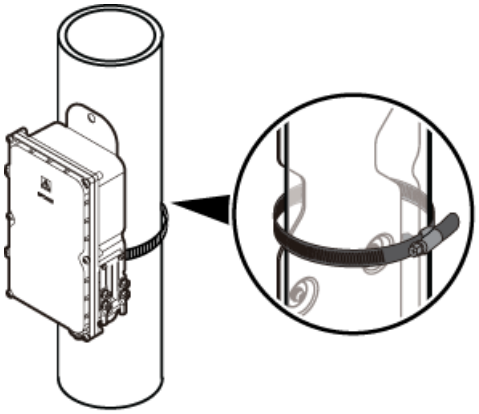
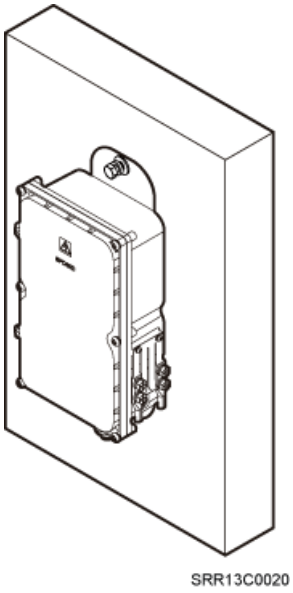
Figure 8-7 AC surge protection box installed on a pole



Installing an AC Surge Protection Box on a Wall

Figure 8-8 shows an AC surge protection box installed on a wall.

Figure 8-8 AC surge protection box installed on a wall



Installing an AC Surge Protection Box on a Wood Pole

Figure 8-9 shows an AC surge protection box installed on a wood pole.

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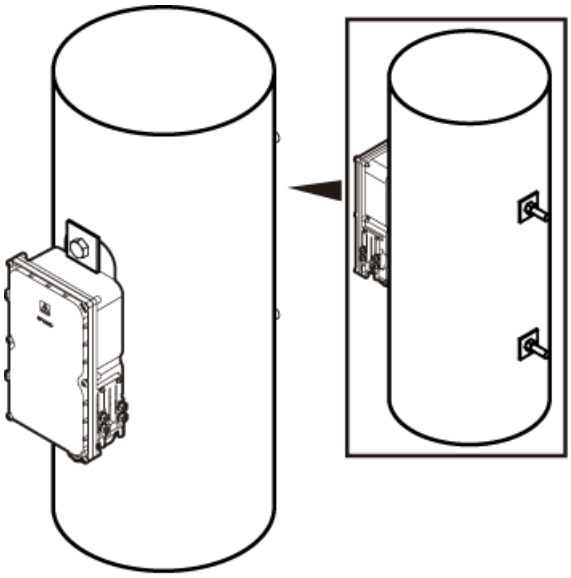
Figure 8-9 AC surge protection box installed on a wood pole



8.3 Installing an AC Surge Protection Box

This section describes the procedure for installing an AC surge protection box.

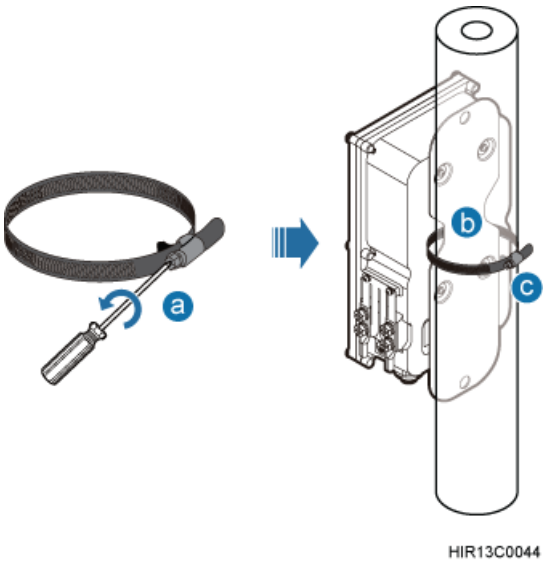
Procedure

- Install an AC surge protection box on a pole, as shown in **Figure 8-10**.

  NOTE

  - When the diameter of the pole ranges from 60 mm to 114 mm (2.36 in. to 4.49 in.), the hose clamps delivered with the AC surge protection box is used.
  - When the diameter of the pole ranges from 114 mm to 400 mm (4.49 in. to 15.75 in.), the hose clamps purchased locally is used.

Figure 8-10 Installing the AC surge protection box on a pole



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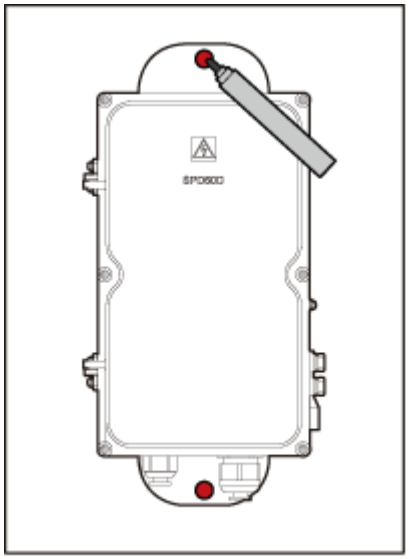
1. Loosen the hose clamp.
2. Lead the clamp through the gap between the rear mounting plate and the case of the AC surge protection box.
3. Install the hose clamp around the pole, and secure the clamp.

NOTE

If the diameter of the pole around which the clamp is installed is small, cut the extra part of the clamp.

- Install an AC surge protection box on a wall.
  1. Place the rear mounting plate of the AC surge protection box against the wall, use a level to verify that the plate is horizontal, and then mark anchor points using a marker, as shown in **Figure 8-11**.

     Figure 8-11 Marking the anchor points

  2. Use a hammer drill with a Ø14 bit to drill holes at the anchor points, and install expansion bolts, as shown in **Figure 8-12**.

     NOTE

     After disassembling the expansion bolt assemblies, discard the plastic tubes.

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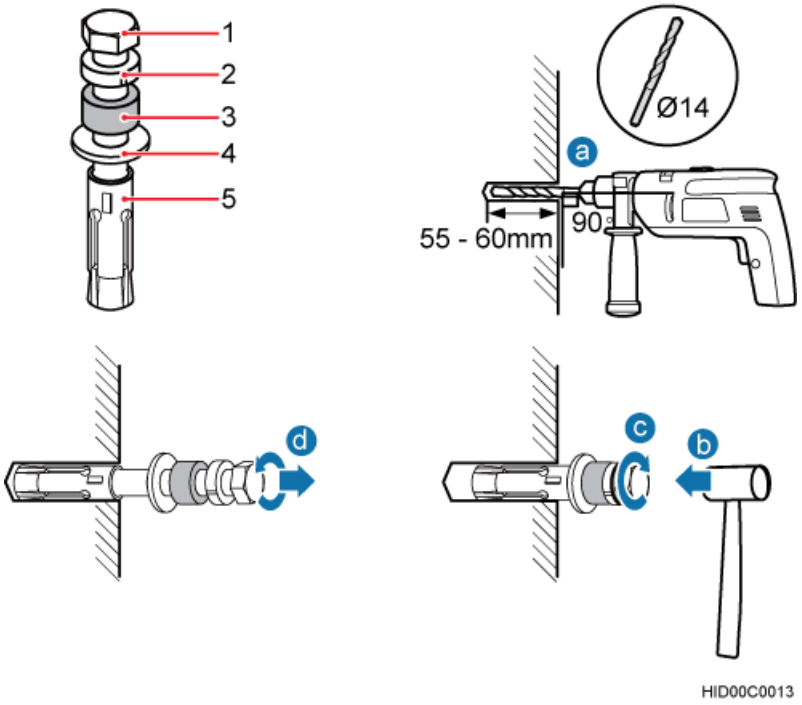
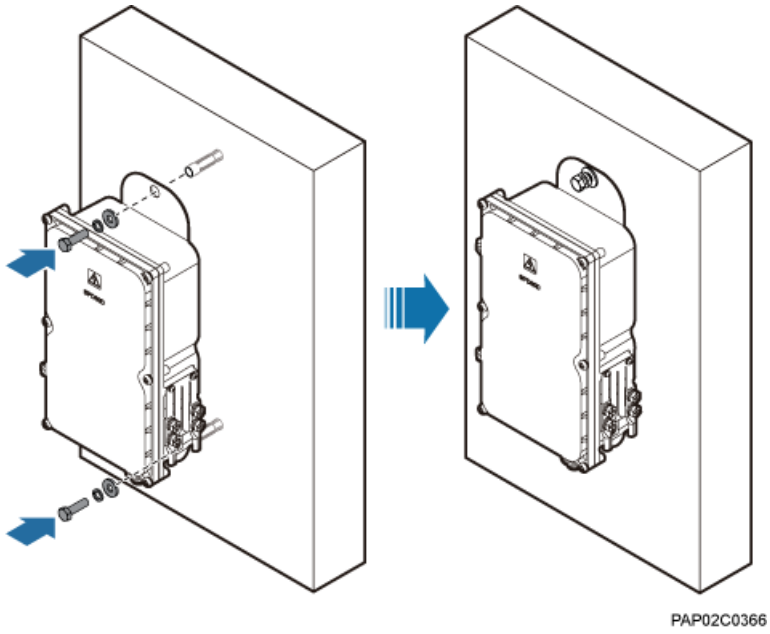
Figure 8-12 Installing an expansion bolt



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

3. Align the AC surge protection box with the holes in the wall, and tighten the expansion bolts to 30 N·m (265.52 lbf·in.), as shown in **Figure 8-13**.

Figure 8-13 Installing an AC surge protection box



- Install an AC surge protection box on a wood pole.

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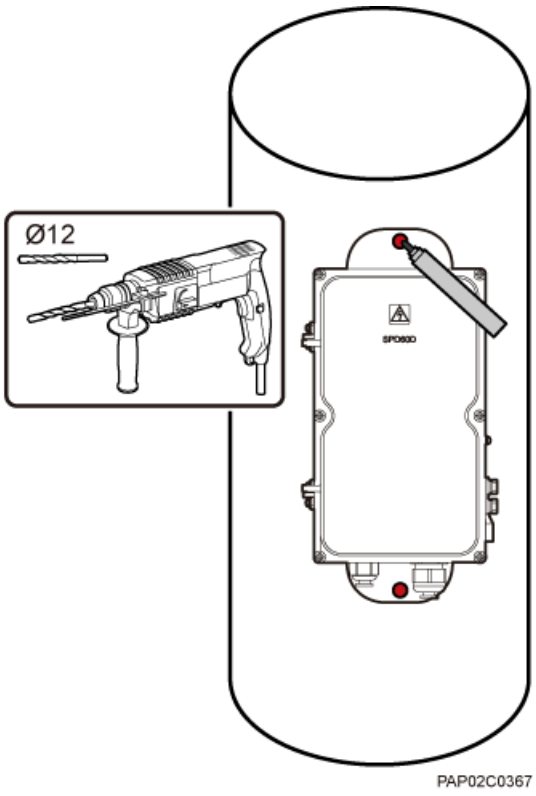
1. Place the rear mounting plate of the AC surge protection box against the wood pole, determine the anchor points on the middle axis, and then mark the anchor points.
2. Drill holes with the diameter of 12 mm (0.47 in.) at the anchor points through the wood pole, as shown in **Figure 8-14**.

Figure 8-14 Drilling holes



3. Align the AC surge protection box with the holes in the wood pole, lead the two long M10 bolts with spacers through the two mounting holes and holes, and then install the bolts on the wood pole, as shown in **Figure 8-15**.

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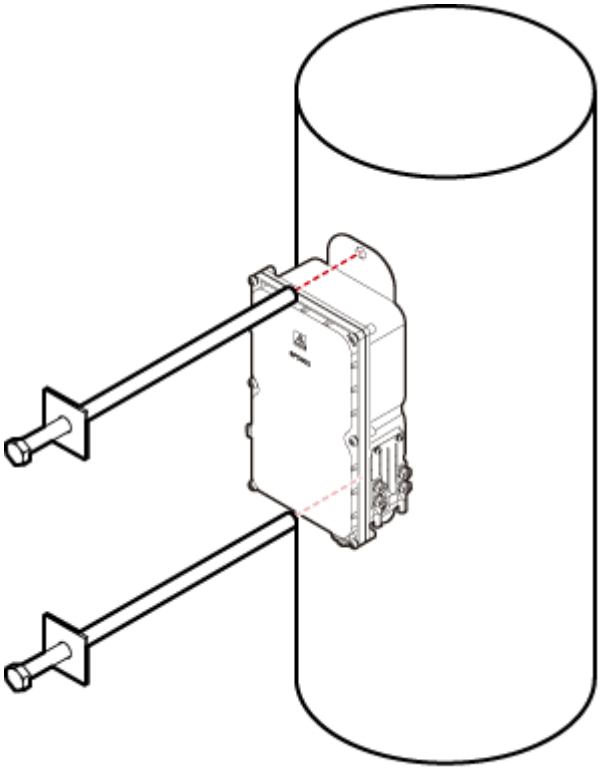
Figure 8-15 Installing the AC surge protection box on the wood pole



4. Tighten the nuts to 30 N·m (265.52 lbf·in.), as shown in **Figure 8-16**.

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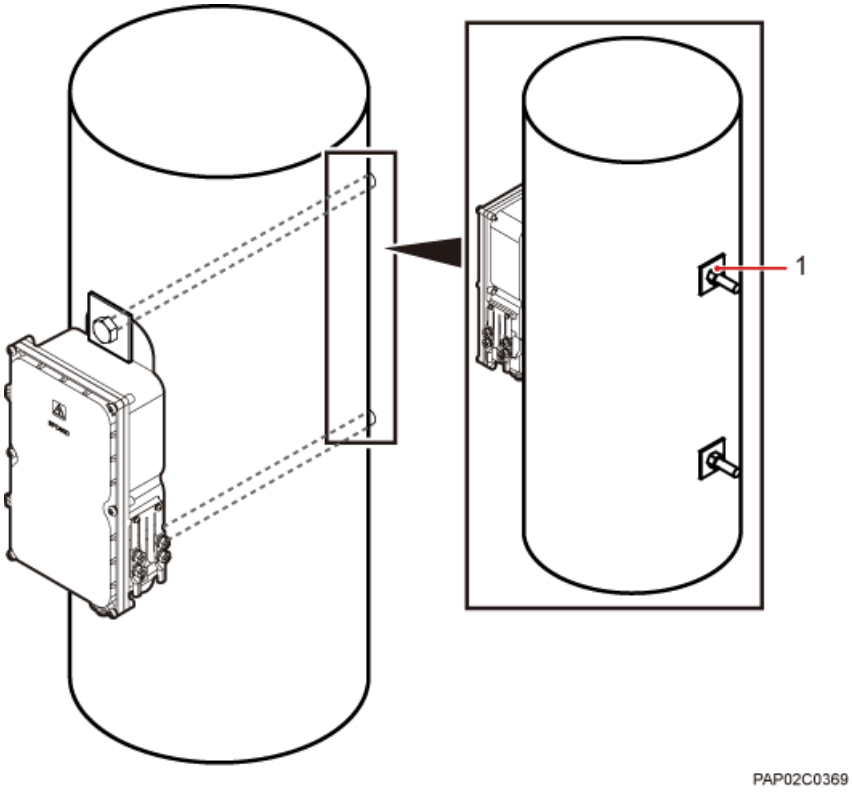
Figure 8-16 Tightening the nuts



(1) Nut

----End

8.4 Installing Cables for an AC Surge Protection Box

This section describes the procedure for installing cables for an AC surge protection box.

Prerequisite

Add OT terminals to the power cables for the AC surge protection box on the surge protection box side. For details, see Adding OT Terminals to the Power Cable Connected to the AC Surge Protection Box.

Procedure

Step 1 Loosen the screws on the AC surge protection box using the M4 Phillips screwdriver and open the cover plate. Then, remove the thread-lock sealing nut from the PG connector of the surge protection box, and store waterproof blocks properly, as shown in **Figure 8-17**.

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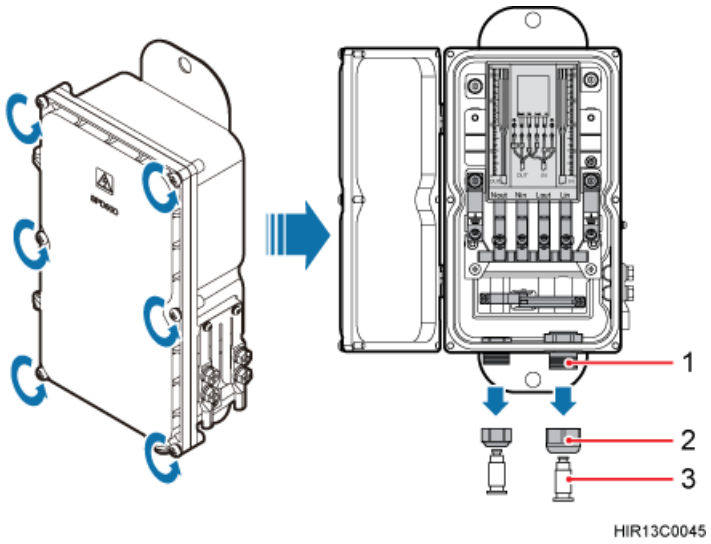
Figure 8-17 Opening the cover plate of the AC surge protection box



(1) PG connector (2) Thread-lock sealing nut of the PG connector (3) Waterproof block

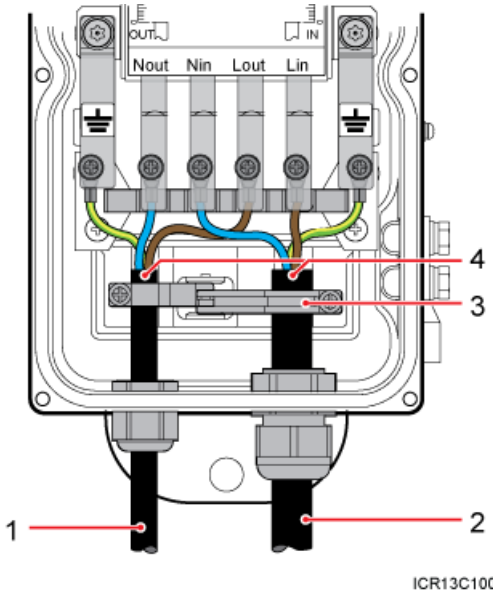
NOTE

Do not use the removed thread-lock sealing nut of the PG connector with the thread-lock sealing nuts on other surge protection boxes.

Step 2 Glide the thread-lock sealing nut and then the PG connector over the power cable.

Step 3 Connect the power cables to the AC surge protection box, as shown in **Figure 8-18**. The power cable on the left connects the BTS3202E and the AC surge protection box, and the power cable on the right connects the AC surge protection box and the external power device.

Figure 8-18 Cable connections of the AC surge protection box



(1) Power cable between the BTS3202E and the AC surge protection box (2) Power cable between the AC surge protection box and the external power device (3) Clip (4) Insulation layer

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1. Lead the power cable between the surge protection box and the external power device through the PG connector labeled IN. Connect the OT terminals of the brown, blue, and yellow/green core wires to the Lin, Nin, and GND ports on the surge protection box respectively.
2. Route the power cable between the BTS3202E and the AC surge protection box through the PG connector labeled OUT. Connect the OT terminals of the blue, brown, and green and yellow wires to the Nout, Lout, and GND ports in the AC surge protection box, respectively.
3. Tighten the thread-lock sealing nut, and then use a wrench to tighten the PG connector to ensure it is waterproofed properly.

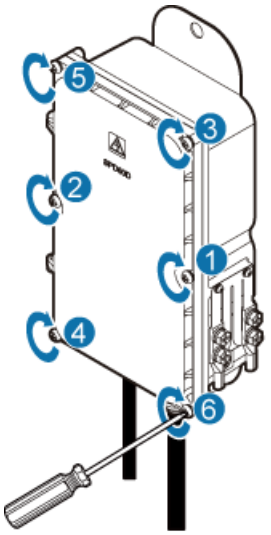
Step 4 Fasten the power cables using clips.

NOTE

Ensure that the insulation layer of each power cable is fastened using clips.

Step 5 Close the cover plate of the surge protection box and tighten the screw to 1.4 N·m (123.91 lbf.in.) using an M4 Phillips screwdriver, as shown in **Figure 8-19**.

Figure 8-19 Closing the cover plate of the AC surge protection box



Step 6 Wrap the joints of the corrugated pipe and power cables using waterproof tape and polyvinyl chloride (PVC) insulation tape, as shown in **Figure 8-20**. Wrap the joints using waterproof tape before using PVC insulation tape.

TIP

Wrap each connector with three layers of waterproof tape, from bottom up, then from top down, and finally from bottom up. Do not cut the tape until all the three layers of the tape are already wrapped. When wrapping tape, be sure that each layer of tape overlaps more than 50% of the preceding layer.

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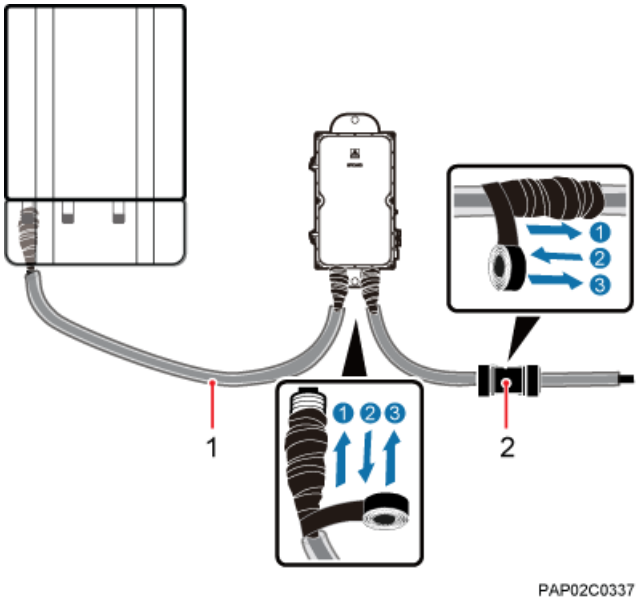
Figure 8-20 Securing AC power cables



(1) Corrugated pipe (2) Connector between corrugated pipes

Step 7 Bind the cables using cable ties at equal spacing of 30 cm (11.81 in.) and verify that the bend radius of the corrugated pipe is not less than 60 mm (2.36 in.).

Step 8 Install the PGND cable and equipotential cable, as shown in **Figure 8-21**.

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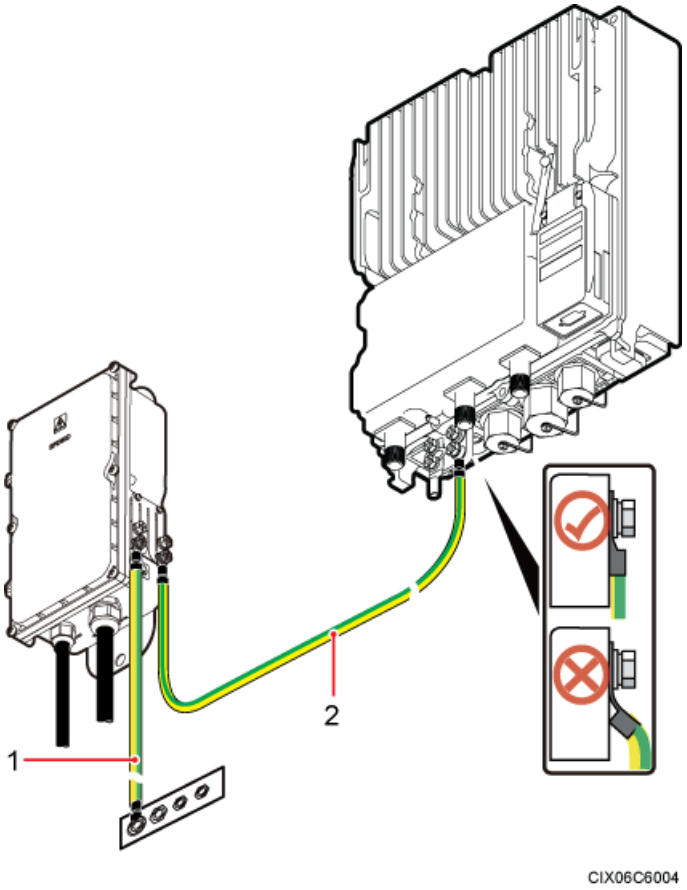
Figure 8-21 Installing the PGND cable and equipotential cable



(1) PGND cable (2) Equipotential cable

----End

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9 Installing Cables

About This Chapter

This chapter describes the procedure and precautions for installing the PGND cables, power cables, and transmission cables for a BTS3902E in various scenarios. Based on actual requirements, and it also describes how to install an optional monitoring signal cable as required.

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

9.2 Cable Connections
The cable connections of the BTS3202E vary depending on the BTS3202E port.

9.3 Installing a PGND Cable and Equipotential Cable
The protection ground (PGND) cable and equipotential cable must be installed based on actual requirements.

9.4 Installing a BTS3202E Power Cable
A BTS3202E power cable connects the BTS3202E to an external power device, feeding external power into the BTS3202E.

9.5 (Optional) Installing a BTS3202E RF Jumper
You must install a radio frequency (RF) jumper when a BTS3202E uses an external antenna.

9.6 Installing Transmission Cables
A fast Ethernet or gigabit Ethernet (FE/GE) cable or FE/GE fiber optic cable must be installed for BTS3202Es as required.

9.7 (Optional) Installing the Alarm Cable
This section describes the procedure for installing a BTS3202E alarm cable.

9.8 Installing the RGPS Signal Cable (Optional)
When the BTS3202E are installed outdoors, the RGPS signal cable between the BTS3202E and RGPS is used to synchronize clock signals.

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9.1 Cabling Requirements

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

NOTE

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

General Cabling Requirements

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 signal cable must be at least five times the diameter of the cable.

The cables must be bound as follows:

- 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 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:

- 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.

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- 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 fiber optic cables are as follows:

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

9.2 Cable Connections

The cable connections of the BTS3202E vary depending on the BTS3202E port.

Cable Connections of the BTS3202E

Figure 9-1 shows the cable connections of a single BTS3202E implementing transmission over an electrical port.

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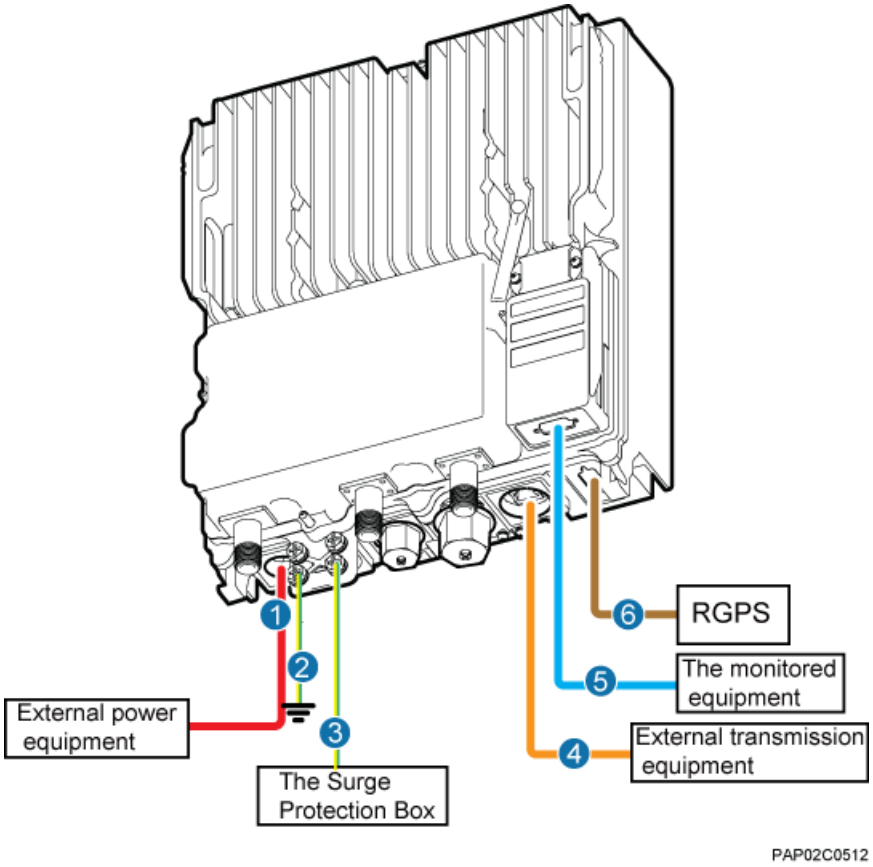
Figure 9-1 Cable connections of a single BTS3202E implementing transmission over an electrical port



(1) BTS3202E power cable (2) PGND cable (optional) (3) Equipotential cable (optional)

(4) Fast Ethernet or gigabit Ethernet (FE/GE) cable (5) BTS3202E monitoring signal cable (optional) (6) RGPS signal cable (optional)

Figure 9-2 shows the cable connections of a single BTS3202E implementing transmission over an optical port.

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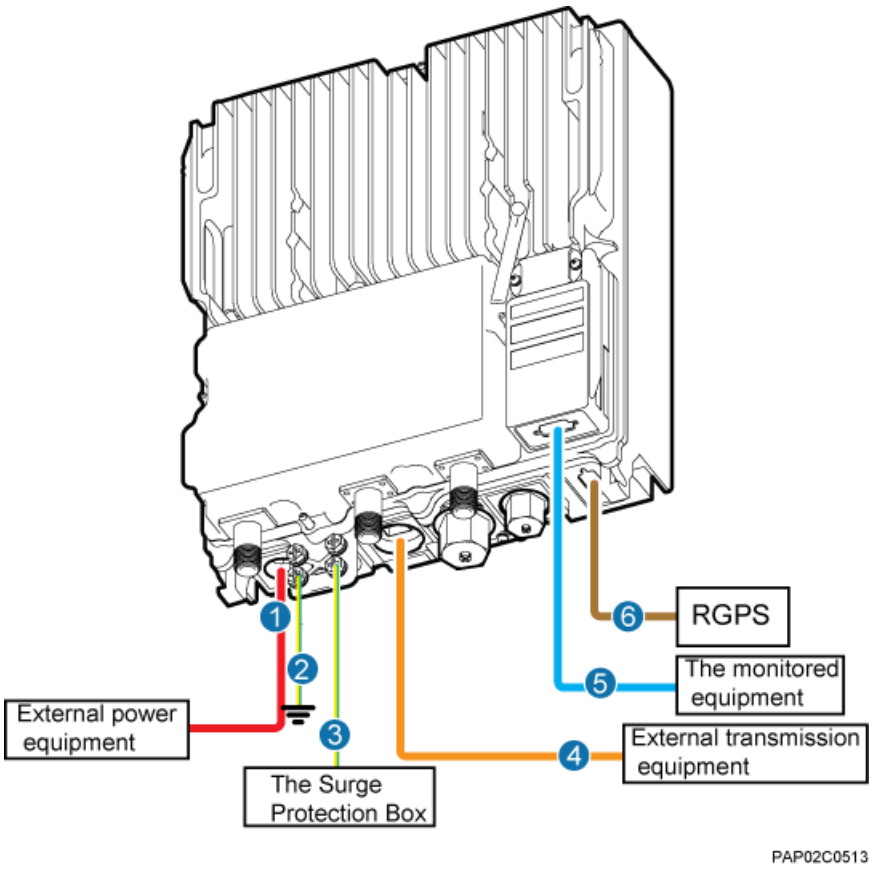
Figure 9-2 Cable connections of a single BTS3202E implementing transmission over an optical port



(1) BTS3202E power cable
(2) PGND cable (optional)
(3) Equipotential cable (optional)
(4) FE/GE fiber optic cable
(5) BTS3202E monitoring signal cable (optional)
(6) RGPS signal cable (optional)

9.3 Installing a PGND Cable and Equipotential Cable

The protection ground (PGND) cable and equipotential cable must be installed based on actual requirements.

Context

Table 9-1 lists the specifications of the PGND cable and equipotential cable.

Table 9-1 Specifications of the BTS3902E PGND cable and equipotential cable

Cable	One End	The Other End	Remarks
PGND cable	OT terminal (M6, 16 mm^2 [0.025 $in.^2$])	OT terminal (M6, 16 mm^2 [0.025 $in.^2$])	Green and yellow
Equipotential cable	OT terminal (M6, 16 mm^2 [0.025 $in.^2$])	OT terminal (M6, 16 mm^2 [0.025 $in.^2$])	Green and yellow

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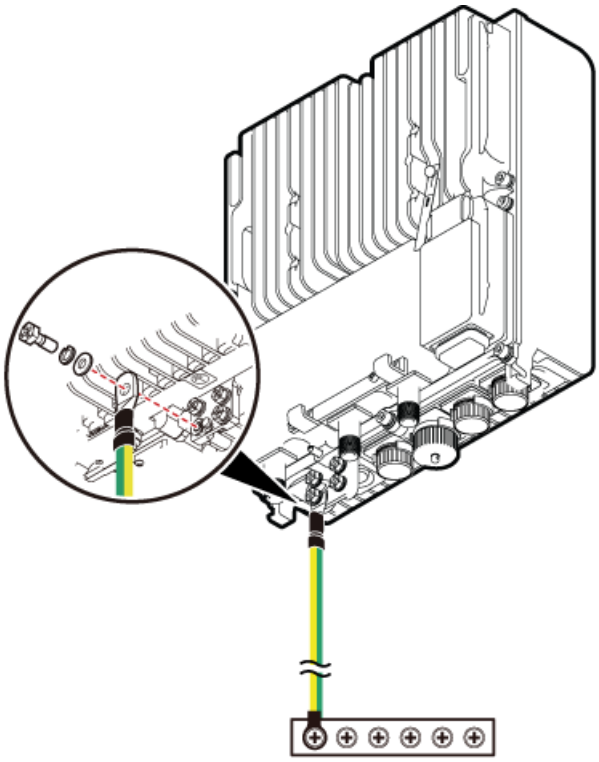
Procedure

- Install the PGND cable when no AC surge protection box is installed, as shown in **Figure 9-3**.

  1. Connect one end of the BTS3902E PGND terminal to the ground cable on the BTS3902E and the other end to the external ground bar.

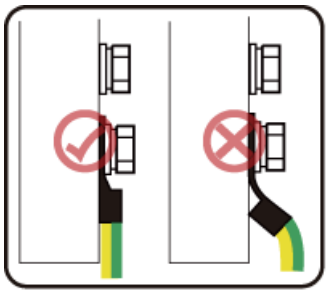
Figure 9-3 Installing the BTS3902E PGND cable



NOTE

When installing the PGND cable, tightly press the OT terminal in the correct direction, as shown in **Figure 9-4**.

Figure 9-4 Installing an OT terminal in the correct manner



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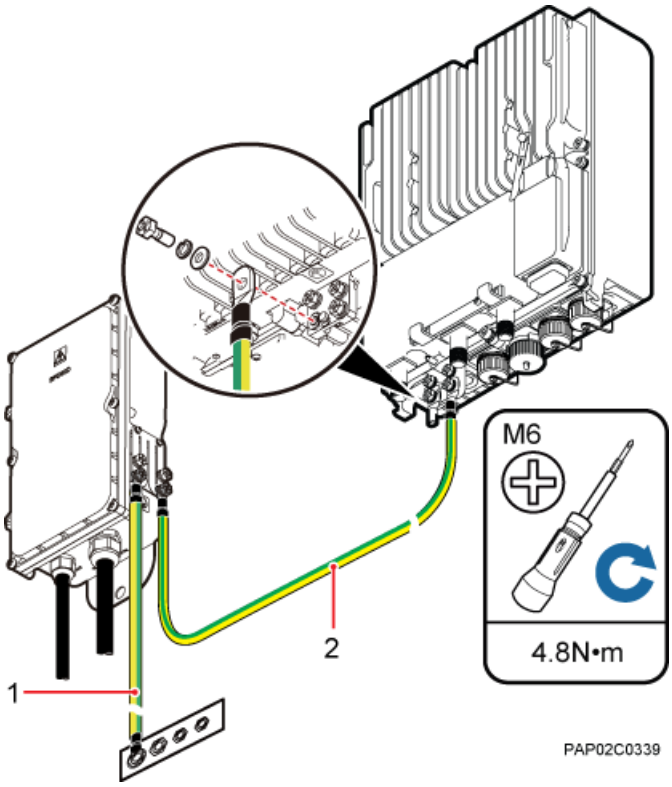
2. Route the cable by referring to Cabling Requirements, and then use cable ties to bind the cable.
3. Label the installed cable by referring to Attaching a Cable-Tying Label.

- Install the BTS3902E PGND cable and equipotential cable when an AC surge protection box is installed, as shown in **Figure 9-5**.
  1. Connect one end of the BTS3902E PGND cable to the ground terminal on the BTS3902E and the other end to the AC surge protection box.

Figure 9-5 Installing the PGND cable and equipotential cable

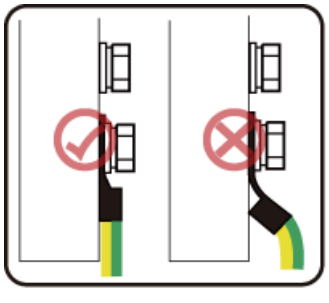


(1) PGND cable (2) Equipotential cable

NOTE

When installing the PGND cable, tightly press the OT terminal in the correct direction, as shown in **Figure 9-6**.

Figure 9-6 Installing an OT terminal in the correct manner



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2. Route the cable by referring to Cabling Requirements, and then use cable ties to bind the cable.
3. Label the installed cable by referring to Attaching a Cable-Tying Label.

----End

9.4 Installing a BTS3202E Power Cable

A BTS3202E power cable connects the BTS3202E to an external power device, feeding external power into the BTS3202E.

Prerequisite

- The tools, such as a Phillips screwdriver, a cable cutter, and a power cable crimping tool, are ready.
- The PGND cable and equipotential cable are installed.

Context

Table 9-2 lists the specifications of the BTS3202E power cable.

Table 9-2 Specifications of the BTS3202E power cable

Cable	One End	The Other End	Remarks
BTS3202E power cable	3-pin round straight female connector (1.5 mm^2 [0.0023 $in.^2$])	Depending on the external equipment	Black
Power cable between the BTS3202E and the AC surge protection box	3-pin round straight female connector (1.5 mm^2 [0.0023 $in.^2$])	OT terminal (M4, 1.5 mm^2 [0.0023 $in.^2$])	Black
Power cable between the surge protection box and the external power equipment	OT terminal (M4, 4 mm^2 [0.0023 $in.^2$])	Depending on the external equipment	Black

NOTE

The cable route depends on actual requirements.

Procedure

- Install the BTS3202E power cable in the AC power supply scenario when no AC surge protection box is configured, as shown in Figure 9-7.
  1. Link the 3-pin round straight female connector at one end of the BTS3202E power cable to the PWR port on the BTS3202E, and tighten the connector.
  2. Connect the other end to external power equipment.

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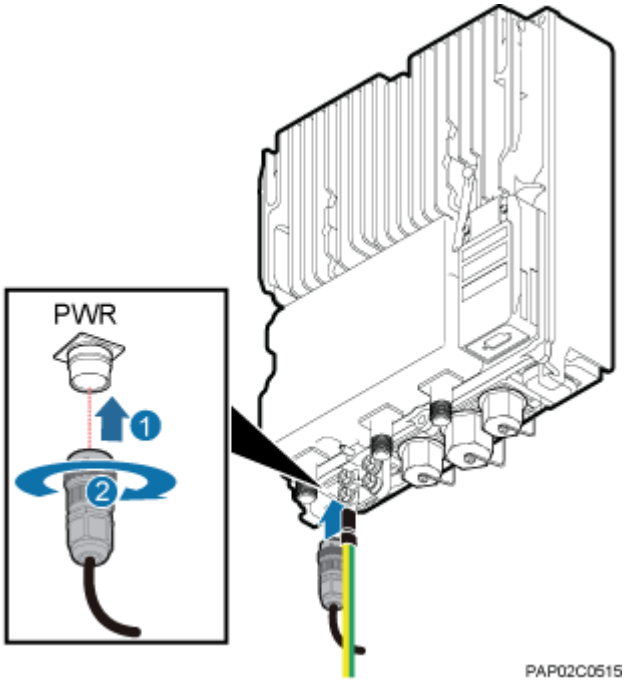
Figure 9-7 Connection of the power cable between the BTS3202E and power equipment



3. Route the cable by referring to Cabling Requirements, and then use cable ties to bind the cable.
4. Label the installed cable by referring to Attaching a Cable-Tying Label.

- Install the BTS3202E power cable in the AC power supply scenario when an AC surge protection box is configured, as shown in **Figure 9-8**.
  1. Link the 3-pin round straight female connector at one end of the power cable between the BTS3202E and the surge protection box to the PWR port on the BTS3202E, and tighten the connector.
  2. Connect the other end to the surge protection box

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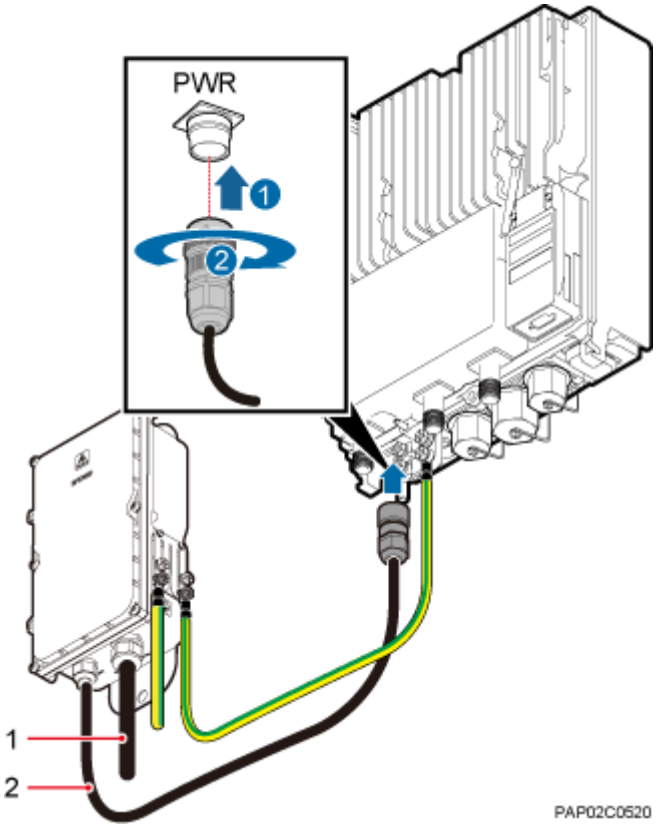
Figure 9-8 Connection of the BTS3202E power cable to the surge protection box



(1) Power cable between the surge protection box and external power equipment

(2) Power cable between the BTS3202E and the surge protection box

3. Connect one end of the power cable between the surge protection box and external power equipment to the surge protection box and the other end to external power equipment by referring to **8.4 Installing Cables for an AC Surge Protection Box**.
4. Route the cable by referring to Cabling Requirements, and then use cable ties to bind the cable.
5. Label the installed cable by referring to Attaching a Cable-Tying Label.

----End

9.5 (Optional) Installing a BTS3202E RF Jumper

You must install a radio frequency (RF) jumper when a BTS3202E uses an external antenna.

Context

NOTE

The cable route depends on actual requirements.

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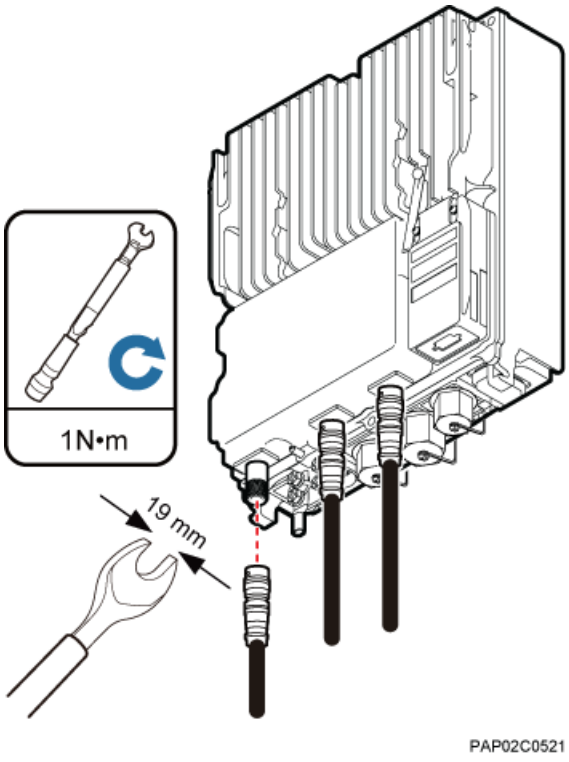
Procedure

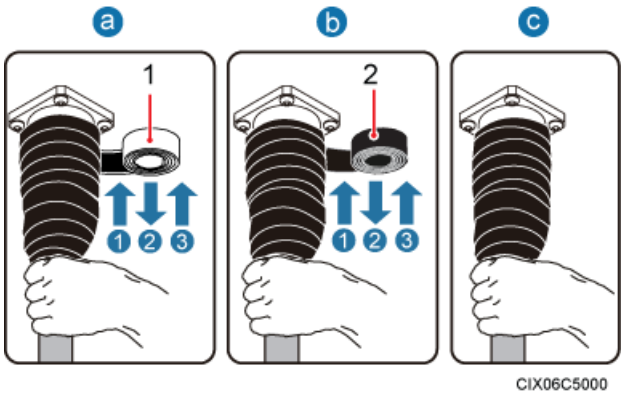
Step 1 Link the Type N connector at one end of the BTS3202E RF jumper to the ANT port, and connect the other end to an external antenna system, as shown in **Figure 9-9**.

Figure 9-9 Installing the BTS3202E RF jumper



Step 2 Wrap the connector of the BTS3202E RF jumper using tape, as shown in **Figure 9-10**.

Figure 9-10 Wrap the connector of the BTS3202E RF jumper



(1) Waterproof tape (2) PVC insulation tape

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NOTE

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

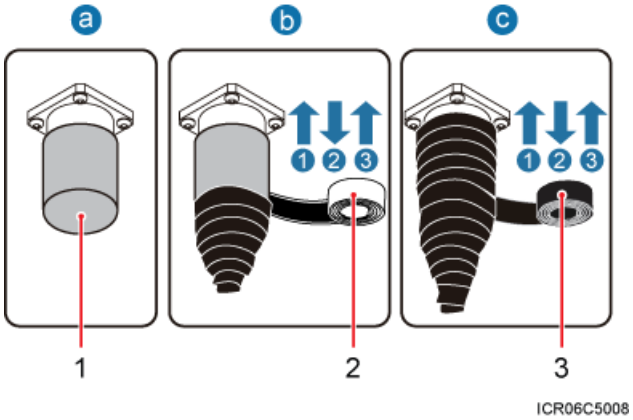
1. Wrap each connector with three layers of waterproof tape, from bottom up, then from top down, and finally from bottom up. Do not cut the tape until all the three layers of the tape are already wrapped. Wrap each layer of tape around the connector tightly.
2. Wrap each connector with three layers of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

Step 3 Check the dustproof caps on the antenna connectors. In outdoor scenarios, dustproof caps must be wrapped with tape, as shown in **Figure 9-11**.

CAUTION

Do not remove dustproof caps from vacant antenna connectors.

Figure 9-11 Waterproofing a dustproof cap



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

NOTE

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

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

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tape until all the three layers of the tape are already wrapped. Wrap each layer of tape around the connector tightly.

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

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

----End

9.6 Installing Transmission Cables

A fast Ethernet or gigabit Ethernet (FE/GE) cable or FE/GE fiber optic cable must be installed for BTS3202Es as required.

9.6.1 Installing an FE/GE Cable

This section describes the procedure and precautions for installing a fast Ethernet or gigabit Ethernet (FE/GE).

Context

NOTE

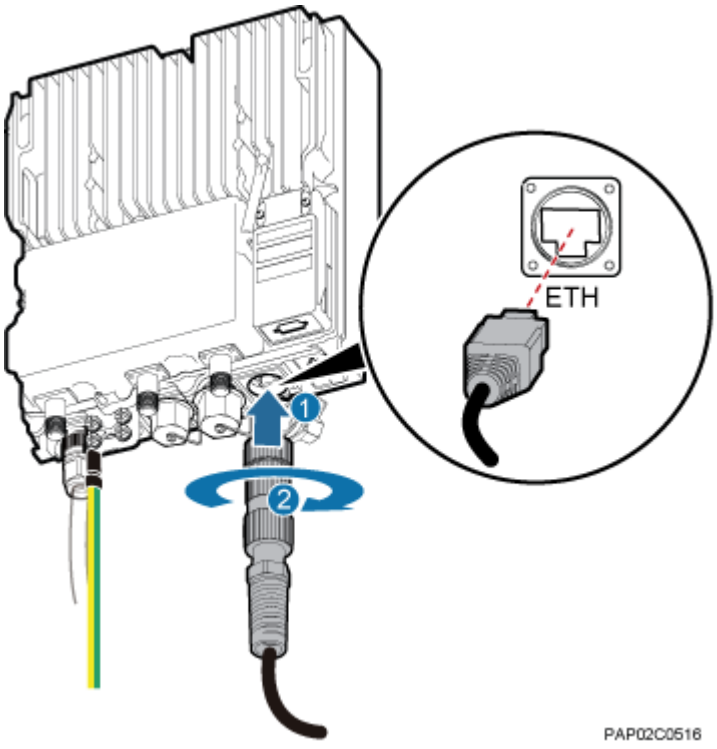
The cable route depends on actual requirements.

Procedure

Step 1 Remove the waterproof cap from the ETH port on the BTS3202E.

Step 2 Connect one end of the FE/GE cable to the ETH port on the BTS3202E, and tighten the round connector until it snaps shut, as shown in **Figure 9-12**.

Figure 9-12 Installing the FE/GE cable



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Step 3 Install a ground clip on the FE/GE cable by referring to **13.2 Installing a Ground Clip**.

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

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

----End

9.6.2 Installing an FE/GE Fiber Optic Cable

This section describes the procedure and precautions for installing a fast Ethernet or gigabit Ethernet (FE/GE) fiber optic cable.

Context

- The single-mode optical module to be installed must match the rate at the CPRI port.

CAUTION

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

NOTE

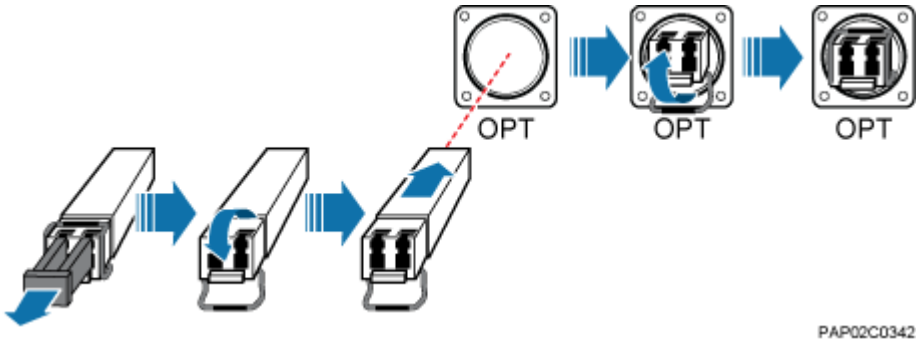
The cable route depends on actual requirements.

Procedure

Step 1 Remove the waterproof cap from the OPT port on the BTS3202E.

Step 2 Turn the puller of an optical module outwards and insert the optical module into the OPT port on the BTS3202E, as shown in **Figure 9-13**.

Figure 9-13 Installing the optical module



Step 3 Insert one end of the FE/GE fiber optic cable into the optical module, as shown in **Figure 9-14**.

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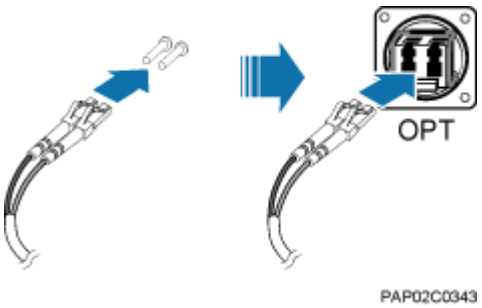
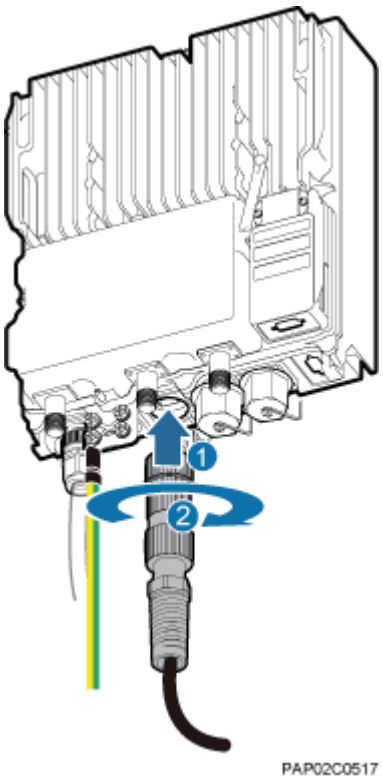
Figure 9-14 Installing the FE/GE fiber optic cable



Step 4 Tighten the round connector until it snaps shut, as shown in **Figure 9-15**.

Figure 9-15 Tightening the round connector



Step 5 Route the cable by referring to Cabling Requirements, and then use cable ties to bind the cable.

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

----End

9.7 (Optional) Installing the Alarm Cable

This section describes the procedure for installing a BTS3202E alarm cable.

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Context

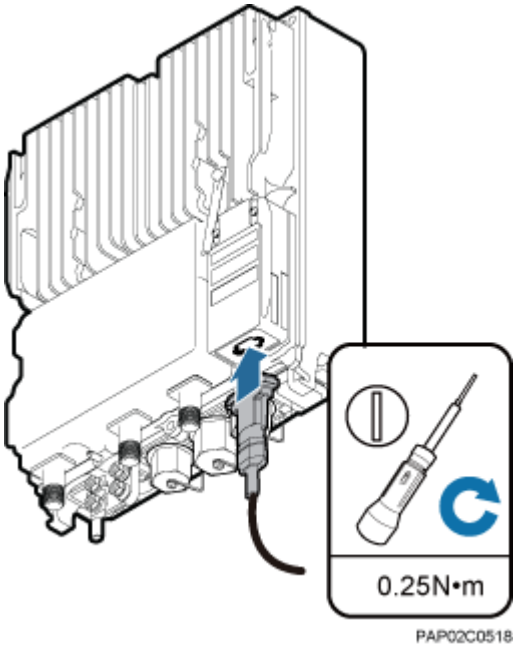
NOTE

The cable route depends on actual requirements.

Procedure

Step 1 Link the DB15 male connector at one end of the alarm cable to the MON port on the BTS3202E, and then tighten the screw on the connector to 0.25 N·m (2.21 lbf·in.), as shown in **Figure 9-16**.

Figure 9-16 Installing the alarm cable



Step 2 Route the cable by referring to Cabling Requirements, and then use cable ties to bind the cable.

Step 3 Label the installed cable by referring to Attaching a Sign Plate Label.

----End

9.8 Installing the RGPS Signal Cable (Optional)

When the BTS3202E are installed outdoors, the RGPS signal cable between the BTS3202E and RGPS is used to synchronize clock signals.

Context

NOTE

The cable route depends on actual requirements.

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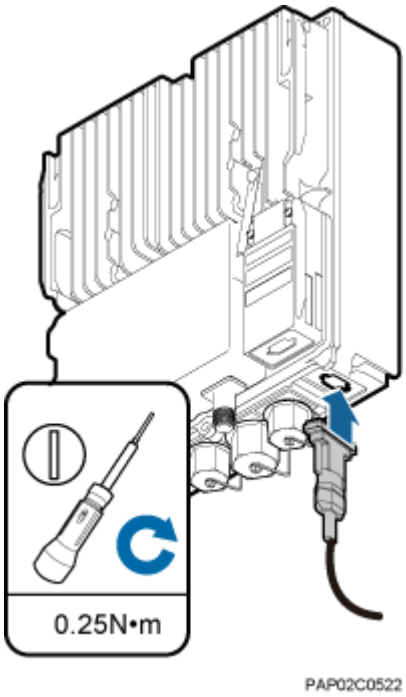
Procedure

Step 1 Link the DB15 female connector of the RGPS signal cable to the RGPS port on the BTS3202E, and then tighten the screw on the connector until the tightening torque reaches 0.25 N·m, as shown in **Figure 9-17**.

Figure 9-17 Installing the RGPS signal cable



Step 2 Route the cable by referring to Cabling Requirements, and then use cable ties to bind the cable.

Step 3 Label the installed cable by referring to Attaching a Sign Plate Label.

----End

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10 Installing the Housing

About This Chapter

This chapter describes the procedures for installing the upper housing and optional camouflage shell for a BTS3202E after the BTS3202E and related cables are installed.

Context

If the optional camouflage shell is required, the shell must be installed before the upper housing is installed, and the upper housing must be removed before the shell is removed.

10.1 (Optional) Installing a Camouflage Shell
This section describes how to install a camouflage shell for a BTS3202E as required.

10.2 Installing the Upper Housing
This section describes how to install the upper housing for a BTS3202E.

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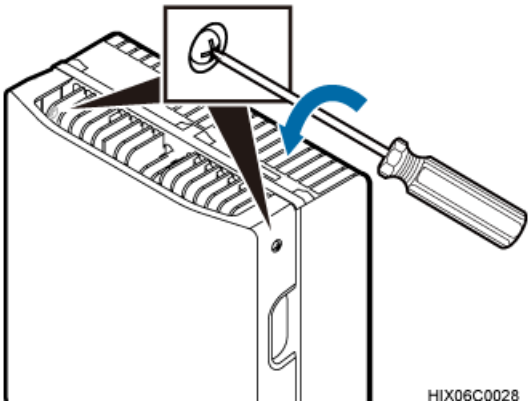
10.1 (Optional) Installing a Camouflage Shell

This section describes how to install a camouflage shell for a BTS3202E as required.

Procedure

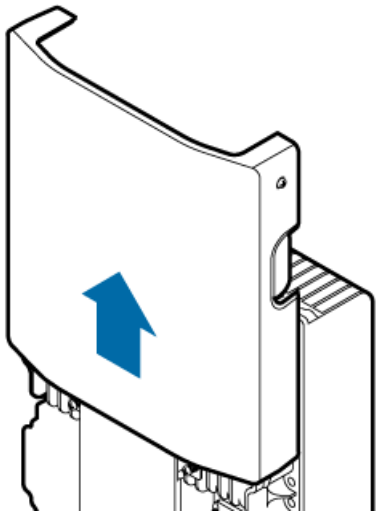
Step 1 Use an M4 Phillips screwdriver to loosen the two captive screws from the upper housing, as shown in **Figure 10-1**.

Figure 10-1 Loosening the screws from the housing



Step 2 Move the upper housing until it is stopped, as shown in **Figure 10-2**.

Figure 10-2 Moving the upper housing



Step 3 Install the slots on the camouflage shell to the tabs to secure the shell, as shown in **Figure 10-3**.

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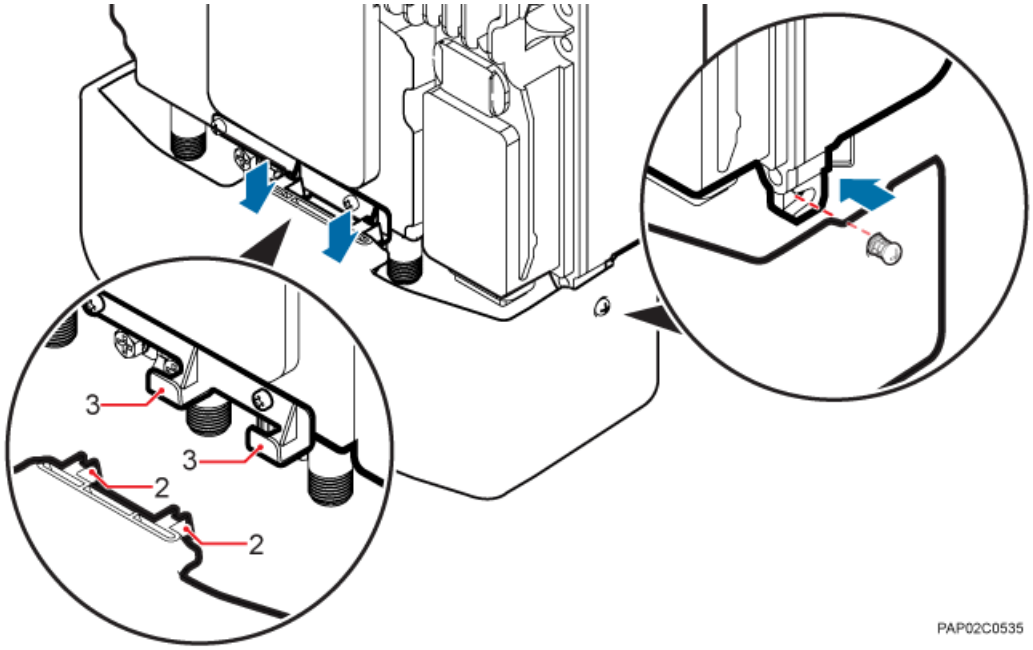
Figure 10-3 Installing the camouflage shell



(1) Camouflage shell (2) Slots (3) Tabs

Step 4 Use an M4 Phillips screwdriver to tighten the two captive screws to 1.2 N·m, as shown in **Figure 10-4**.

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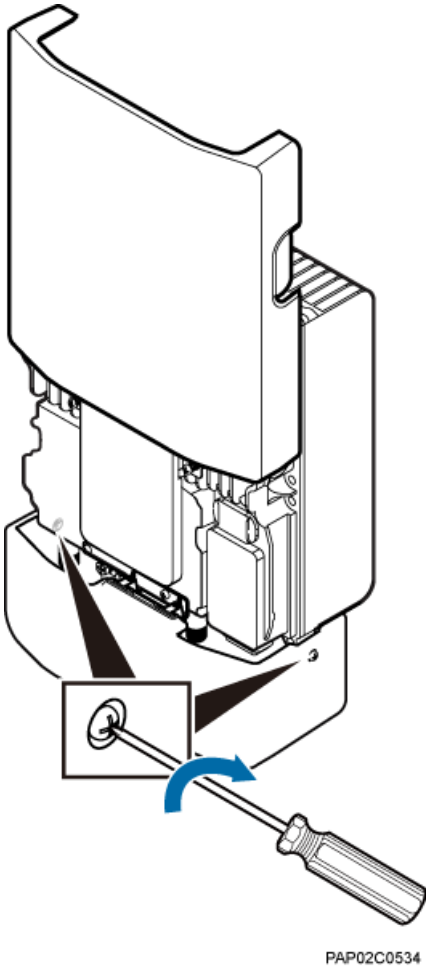
Figure 10-4 Tightening the screws



----End

10.2 Installing the Upper Housing

This section describes how to install the upper housing for a BTS3202E.

Context

NOTE

The camouflage shell is optional. Following uses the BTS3202E equipped with a camouflage shell as an example.

Procedure

Step 1 Close the housing, and use an M4 Phillips screwdriver to tighten the two captive screws to 1.2 N·m, as shown in **Figure 10-5**.

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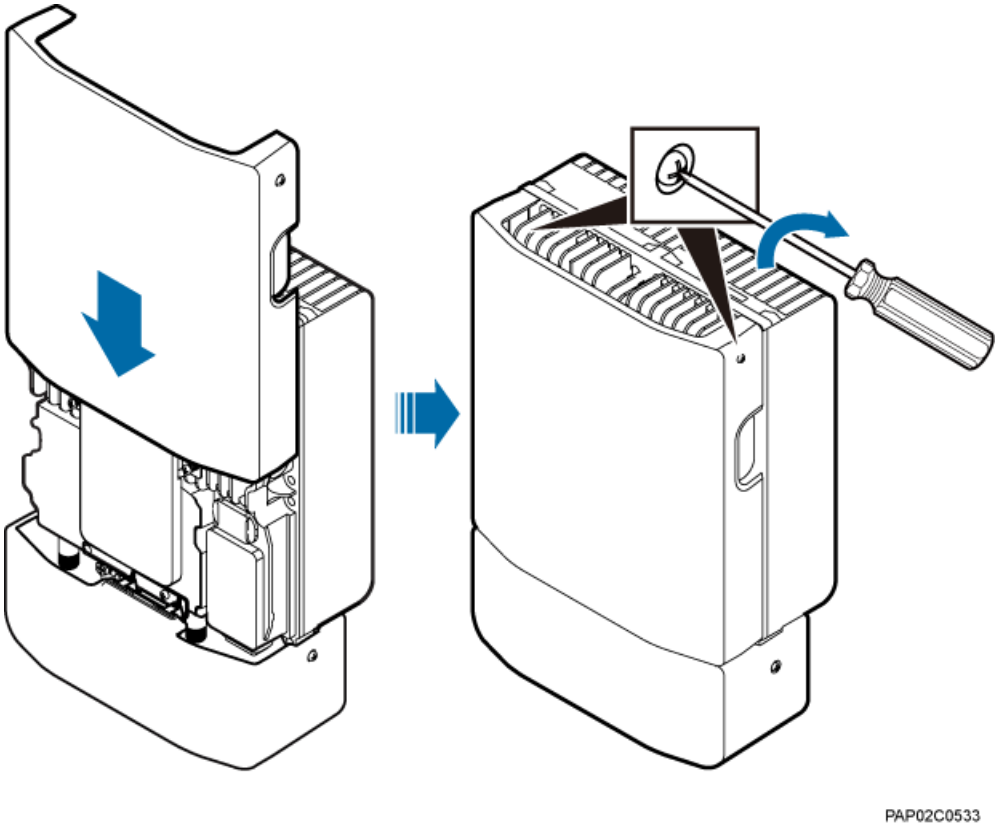
Figure 10-5 Closing the housing and tightening the screws



----End

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11 Checking the BTS3202E Hardware Installation

This chapter describes how to check the hardware installation after a BTS3202E is installed.

Table 11-1 provides the checklist for the BTS3202E hardware installation.

Table 11-1 Checklist for the BTS3202E Hardware Installation

SN	Item
1	The position for each device conforms to the engineering drawing and meets the space requirement. Sufficient space is reserved for equipment maintenance.
2	The BTS3202E is securely installed and the installed BTS3202E has a housing.
3	In the wall-mounted scenario, the holes of the mounting bracket are well aligned with the holes of the expansion bolt assemblies. In addition, the adapting plates are secured on the wall evenly and steadily.
4	In the pole-mounted scenario, the supports for the mounting brackets are secured on the pole.
5	The horizontal error of the BTS3202E is less than 3 mm (0.12 in.), and the vertical error is not more than 3 mm (0.12 in.).
6	The outdoor cables are properly installed. The vacant ports are covered with waterproof caps, and the caps are waterproofed.
7	None of power cables and PGND cables is short-circuited or reversely connected. In addition, these cables are not damaged or broken.
8	Power cables and PGND cables are separately bound from other cables.
9	All BTS3202E-related modules are connected to the closest ground bar using PGND cables.
10	The connectors of each signal cable are intact and securely linked, and these cables are not damaged or broken.

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SN	Item
11	Labels are correct, legible, and complete at both ends of each cable, feeder, and jumper.

Table 11-2 provides the checklist for the installation of an AC surge protection box.

Table 11-2 Checklist for the installation of an AC surge protection box

SN	Item
1	The PG connectors for routing cables on an AC surge protection box are securely installed.
2	The waterproof fillers on an AC surge protection box are not stripped or broken.
3	OT terminals are securely linked to the cables connecting to an AC surge protection box. Cable sheaths are not damaged, and the extra length of each cable is cut without sharp edges.
4	PG connectors are tightened, and waterproof rings are secured.
5	The six screws on the cabling cavity for an AC surge protection box are tightened properly.
6	The axis between the cover plate for and the case of an AC surge protection box is not broken, and the surface of the protection box is not scratched.
7	The cable connections for an AC surge protection box meet the requirements in the operation guide. The cover plate for the cabling cavity is closed after OT terminals are tightened.
8	An AC surge protection box is powered off before installation and maintenance.
9	The protection grounding of an AC surge protection box and the surge protection grounding of a building share one group of ground conductors.
10	An AC surge protection box must be installed or maintained in dry conditions.

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12 Performing a Power-On Check on the BTS3202E

This chapter describes the procedure for performing a power-on check on the BTS3202E.

CAUTION

After you unpack a BTS3202E, you must power it on within 24 hours. If you power off the BTS3202E for maintenance, you must restore power to it within 24 hours.

Figure 12-1 shows the BTS3202E power-on check procedure.

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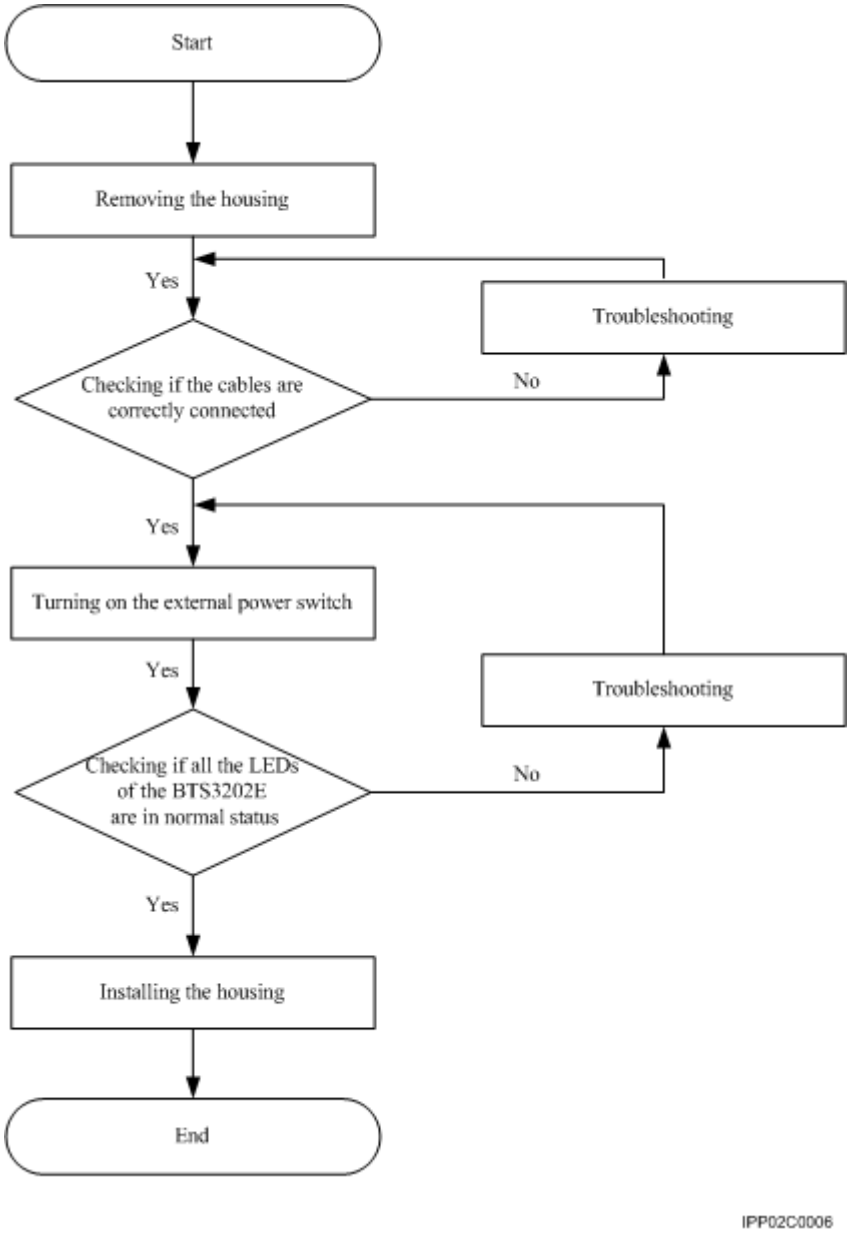
Figure 12-1 BTS3202E power-on check procedure



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13 Appendix

About This Chapter

This section describes the procedure for adding an easy power receptacle (pressfit type) connector.This section describes the procedure for adding OT terminals.This section describes the procedure for adding OT terminals to the surge protection box side of the power cable for the AC surge protection box.

13.1 Adding OT Terminals to the Power Cable Connected to the AC Surge Protection Box
This section describes the procedure for adding OT terminals to the power cable connected to the AC surge protection box.

13.2 Installing a Ground Clip
This section describes how to install a ground clip on a fast Ethernet or gigabit Ethernet (FE/GE) cable.

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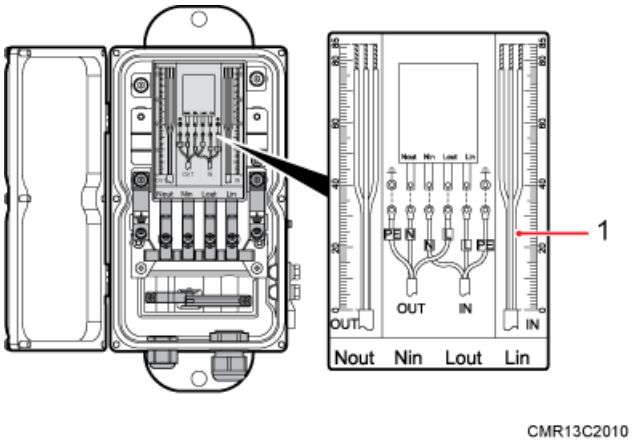
13.1 Adding OT Terminals to the Power Cable Connected to the AC Surge Protection Box

This section describes the procedure for adding OT terminals to the power cable connected to the AC surge protection box.

Context

Figure 13-1 shows the cable diagram on labels.

Figure 13-1 Cable diagram on labels



(1) Cable diagram on labels

Procedure

Step 1 Cut the cable to the required length based on the actual cable route.

Step 2 If the power cable is longer than or equal to 5 m (16.4 ft.), cut the corrugated pipe into multiple 5-meter-long pieces; if the cable is shorter than 5 m (16.4 ft.), cut the corrugated pipe based on the actual length of the power cable.

NOTE

Following is based on the power cable longer than or equal to 5 m (16.4 ft.).

Step 3 Lead the power cable through corrugated pipes, and add a connector between two corrugated pipes, as shown in Figure 13-2.

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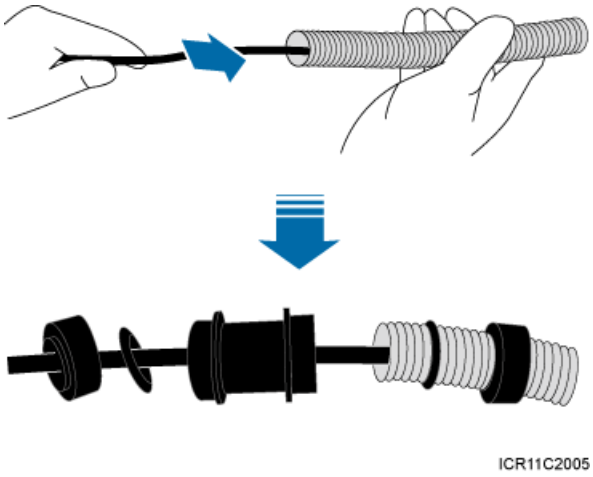
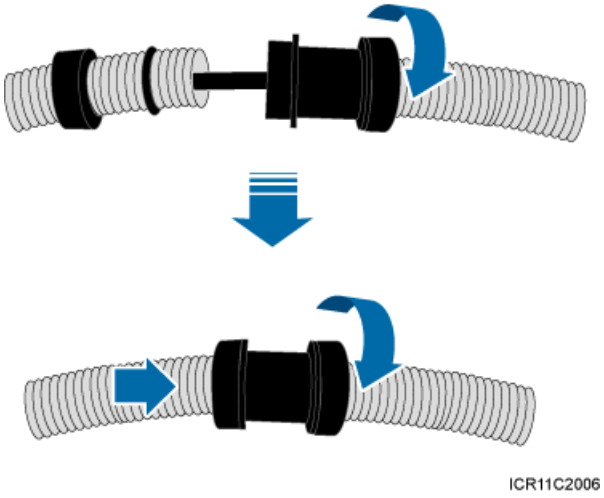
Figure 13-2 Leading the power cable through corrugated pipes



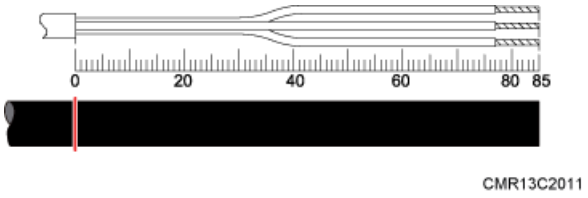
Step 4 Join the corrugated pipes, as shown in **Figure 13-3**.

Figure 13-3 Joining corrugated pipes



Step 5 Determine the length of the power cable for different operations based on the labels, as shown in **Figure 13-4**.

Figure 13-4 Determining the length of the power cable



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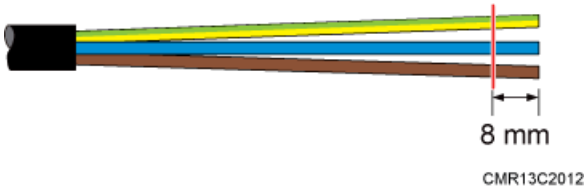
Step 6 Use a utility knife to strip the specified length of the sheath and shield layer off the power cable, as shown in **Figure 13-5**.

Figure 13-5 Stripping the specified length of the sheath and shield layer

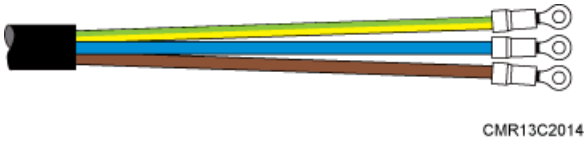


Step 7 Strip the sheath off each core wire, as shown in **Figure 13-6**.

Figure 13-6 Stripping the sheath off each core wire

Step 8 Add OT terminals to the three core wires, as shown in **Figure 13-7**.

Figure 13-7 Adding OT terminals



----End

13.2 Installing a Ground Clip

This section describes how to install a ground clip on a fast Ethernet or gigabit Ethernet (FE/GE) cable.

Procedure

Step 1 Determine the position for installing the ground clip on the cable based on the actual cable route.

Step 2 Use a utility knife to strip the sheath off the FE/GE cable for about 32 mm to expose the shield layer, as shown in **Figure 13-8**.

CAUTION

Do not damage the shield layer when stripping the sheath off the cable.

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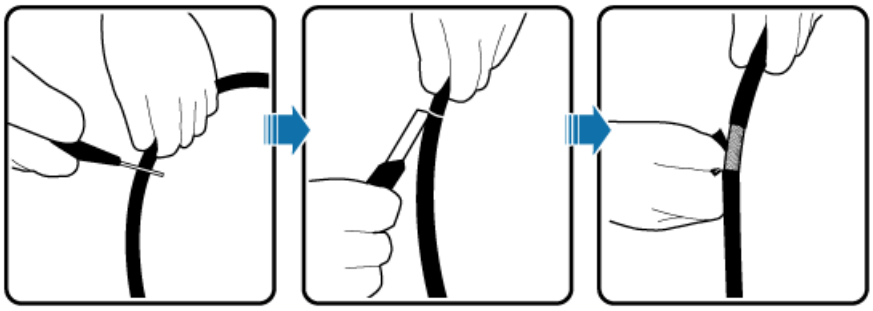
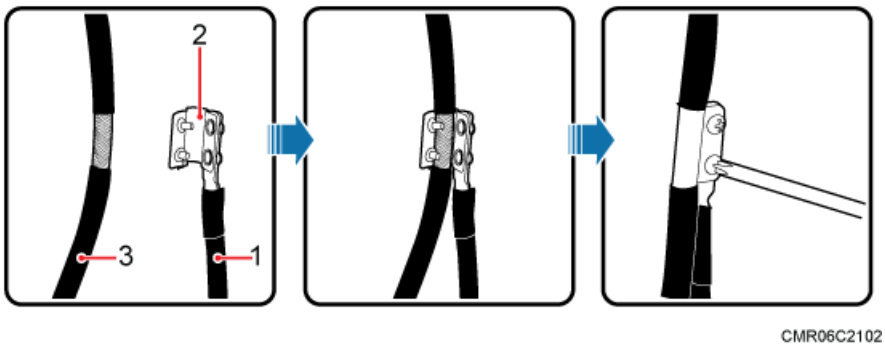
Figure 13-8 Stripping the sheath off the FE/GE cable



Step 3 Install the ground clip on the shield layer of the cable, and then use a screwdriver to tighten the screws on the ground clip, as shown in **Figure 13-9**.

Figure 13-9 Tightening the screws on a ground clip



(1) Ground cable (2) Ground clip (3) FE/GE cable

Step 4 Wrap three layers of waterproof tape and three layers of polyvinyl chloride (PVC) insulation tape at the ground clip.

CAUTION

- Wrap the tape around the clip from bottom up, then from top down, and finally from bottom up. Do not cut the tape until all the three layers of the tape are already wrapped. When wrapping tape, be sure that each layer of tape overlaps more than 50% of the preceding layer.
- The degree between the ground cable and the FE/GE cable is not greater than 15°. When the FE/GE cable is routed vertically, the ground cable must be routed downwards.

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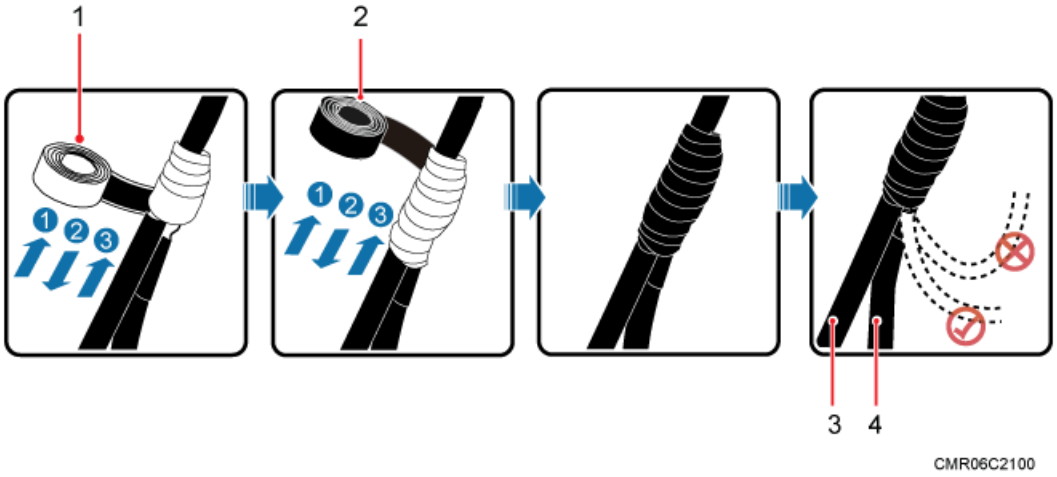
Figure 13-10 Wrapping waterproof tape and PVC insulation tape



(1) Waterproof tape (2) PVC insulation tape (3) FE/GE cable (4) Ground cable

Step 5 Connect the ground cable to an external ground bar.

----End

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