RRU3931E

V100R011C10

Installation Guide

Issue	**Draft A**
Date	**2016-03-30**

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1 RRU3931E Installation Guide

Introduction

This document describes how to install a RRU3931E in different scenarios and provides the hardware installation checklist as a reference.

Product Version

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

Product Name	Solution Version	Product Version
RRU3931E	● SRAN11.1 and later versions ● RAN18.1 and later versions ● eRAN11.1 and later versions	V100R011C10 and later versions

Intended Audience

This document is intended for:

● RRU3931E installation engineers

● System engineers

● Site maintenance engineers

Organization

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This section describes the changes in *RRU3931E Hardware Description*.

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This section describes the preparations for installation. Before starting the installation, you must get the installation environment ready, obtain the required reference documents, tools, and instruments, and familiarize yourself with the skills required.

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

1.4 Obtaining the SN1.4 Obtaining the SN

This section describes how to obtain the serial number (SN) of a RRU3931E. Before installing the RRU3931E, record its SN for future use during commissioning.

1.5 Installation Process1.5 Installation Process

This section describes the process for installing a RRU3931E. The process includes:

- Installing a RRU3931E
- Installing cables
- Checking the hardware installation
- Performing a power-on check

1.6 Installing a RRU3931E1.6 Installing a RRU3931E

This section describes the procedure and precautions for installing a RRU3931E.

1.7 Installing Cables1.7 Installing Cables

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This section describes the procedure and precautions for adjusting the installation angles of a RRU3931E.

1.9 Checking the Hardware Installation1.9 Checking the Hardware Installation

This section describes how to check the hardware installation after a RRU3931E is installed.

1.10 Performing a Power-On Check1.10 Performing a Power-On Check

This section describes the procedure for performing a power-on check on a RRU3931E.

1.11 References1.11 References

This section describes reference information and common operations involved during installation.

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1.6 Installing a RRU3931E

This section describes the procedure and precautions for installing a RRU3931E.

1.7 Installing Cables

This section describes the procedure and precautions for installing cables.

1.8 (Optional)Replacing the Internal Antenna with External Antennas

This section describes how to replace the RRU3931E internal antenna with external antennas.

1.9 Checking the Hardware Installation

This section describes how to check the hardware installation after a RRU3931E is installed.

1.10 Performing a Power-On Check

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1.2 Installation Preparations

This section describes the preparations for installation. Before starting the installation, you must get the installation environment ready, obtain the required reference documents, tools, and instruments, and familiarize yourself with the skills required.

1.2.1 Installation Environment

Before starting the installation, ensure that the power supply equipment, transmission equipment, and related matching equipment are ready.

Precautions for Site Selection

- Do not install a RRU3931E near an interference source, such as a broadcast and television tower, high and low-voltage substation, high-voltage tower, high-power radio transmitter, and radar station.

- For the sake of surge protection, the mounting height of a RRU3931E should not be greater than 10 m. Do not install a RRU3931E along a highway or railway or on the mountain top, tower, standalone pole in a suburban area or open field, or standalone rooftop in a non-urban area.

Requirements for the Upper-level Circuit Breaker

Slow-blow fuses of the gL (DIN VDE)/gG (IEC) class in accordance with IEC60269-1 are recommended. Fuses of the same specifications must be configured for L and N wires for the sake of O&M security.

Type C bipolar circuit breakers in accordance with IEC60934 are recommended. Circuit breakers must be configured for L and N wires for the sake of O&M security.

Table 1-1 describes the recommended specifications.

Table 1-1 Requirements on the upper-level circuit breakers and power cables

Power Supply	Current of the Upper-level AC Circuit Breakers (or Fuses)	Cross-Sectional Area of the Input Power Cable
220 V AC single-phase	- Minimum value: 5 A - Recommended value: 16 A	1.5 mm^2 to 2.5 mm^2
110 V AC dual-live-wire		

Power Supply	Current of the Upper-level AC Circuit Breakers (or Fuses)	Cross-Sectional Area of the Input Power Cable
110 V AC single-phase	● Maximum value: 20 A	

📖**NOTE**

- The requirements provided in the preceding table are based on the peak power of a RRU3931E and do not represent power consumption when the RRU3931E is running.

- Minimum value: Ensures that a RRU3931E can work normally under normal circumstances. However, lightning strikes or abnormal voltage fluctuations may trip the circuit breaker or melt the fuse.

- Recommended value: Ensures that a RRU3931E can work normally under normal circumstances and that the circuit breaker does not trip in the event of lightning strikes or abnormal voltage fluctuations.

- Maximum value: Indicates the maximum rated current allowed in the product design.

Requirements for Surge Protection and Grounding

Huawei by default uses a three-core power cable to connect a RRU3931E and external power supply equipment. The power supply side must ensure that the PE wire of the three-core power cable can be properly grounded. In outdoor installation scenarios or outdoor cabling scenarios, PGND cables must be used to guarantee the surge protection and grounding for the ground terminals of the mounting kits.

Requirements for power supply

During installation, power off the RRU3931E.

1.2.2 Reference Documents
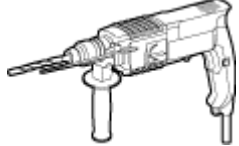
This section describes reference documents required for installation.
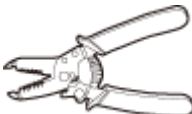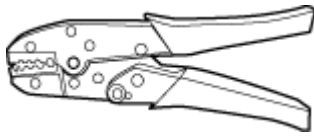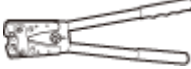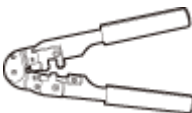
Before starting the installation, you must be familiar with the following reference documents:

- Safety Information
- RRU3931E Hardware Description

1.2.3 Tools and Instruments

Before starting the installation, prepare the following tools and instruments.

Marker (diameter ≤ 10 mm)	Hammer drill (Ø12 bore)	Rubber mallet

Level	Torque screwdriver	Torque wrench
	Phillips (M3, M4) Flat-head (M6, M8)	
Cable cutter	Wire stripper	COAX crimping tool
Crimping tool for power cables	RJ45 crimping tool	Diagonal pliers
Heat gun	Utility knife	Multimeter
ESD gloves	Vacuum cleaner	Measuring tape

1.2.4 Skills and Requirements for Installation Personnel

Installation personnel must be qualified, trained, and familiar with correct operation methods and safety precautions before performing any operations.

Before starting 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 engineering methods.

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

1.2.5 Installation Scenarios

The RRU3931E can be installed on a pole or a wall.

Pole-mounted Installation

A RRU3931E can be installed on a pole with a diameter of 60 mm to 381 mm.

Figure 1-1 illustrates a pole-mounted RRU3931E.

Figure 1-1 Pole-mounted installation
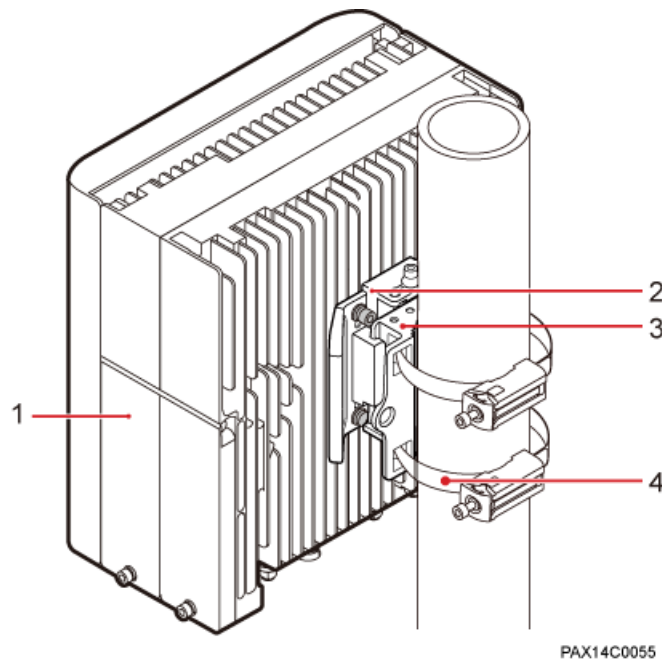
(1) RRU3931E	(2) Attachment plate	(3) Mounting bracket	(4) Steel belt

Wall-mounted Installation

In wall-mounted installation scenarios, note the following:

- The wall has a capacity of bearing at least four times the weight of the RRU3931E to be installed without damage.
- Expansion bolts must be torqued to 28 N·m to ensure the bolts work properly without causing cracks on the wall.

Figure 1-2 illustrates a wall-mounted RRU3931E.

Figure 1-2 Wall-mounted installation
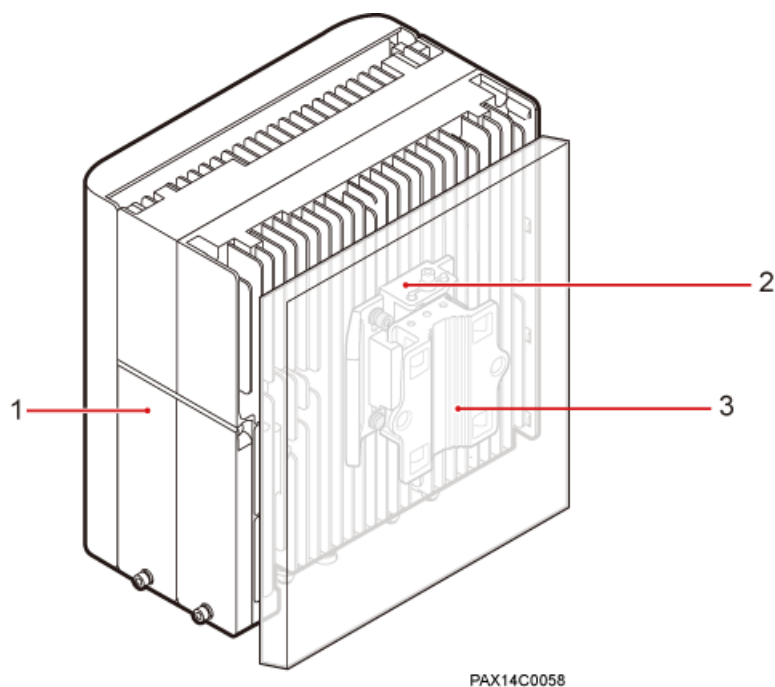
(1) RRU3931E	(2) Attachment plate	(3) Mounting bracket

1.2.6 Installation Clearance Requirements

This section describes the clearance requirements for installing a RRU3931E on a pole or wall.

Figure 1-3 shows the recommended installation clearances around a RRU3931E.

Figure 1-3 Recommended installation clearances around a RRU3931E
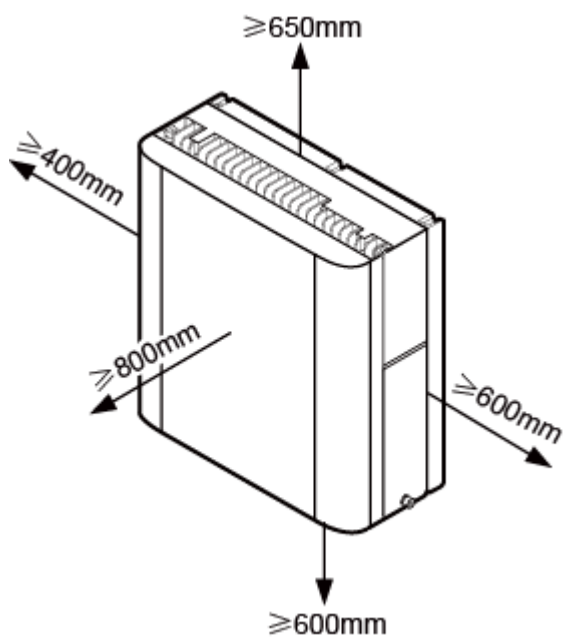
Figure 1-4 shows the minimum installation clearances around a RRU3931E.

Figure 1-4 Minimum installation clearances around a RRU3931E
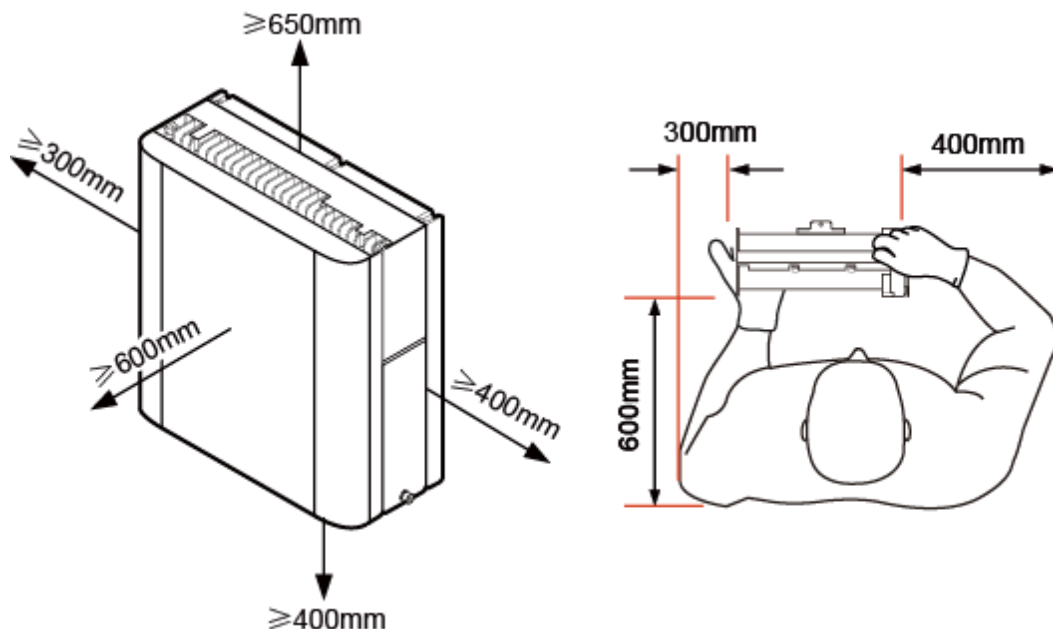
1.3 Unpacking Inspection

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

Prerequisites

!\ **NOTICE**

After a RRU3931E is unpacked, power it on within 24 hours. If the RRU3931E is powered off for maintenance, restore power to it within 24 hours.

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 packing case against 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 contact the local Huawei office.

Step 2 Check the exterior of each packing case.

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

Step 3 Check the type and quantity of the equipment in each packing case against the packing list.

If...	Then...
The type and quantity tallies with 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*.
There is damaged shipment	Fill in and submit the *Article Replacement Report*.

⚠ **NOTICE**

To protect the equipment from damage, keep the unpacked equipment and packing materials indoors. To help find out the cause of any damage in the future, take photos of the storeroom, rusted or eroded equipment, packing cases, and packing materials, and then file the photos.

----End

1.4 Obtaining the SN

This section describes how to obtain the serial number (SN) of a RRU3931E. Before installing the RRU3931E, record its SN for future use during commissioning.

Context

The SN uniquely identifies a device and is required during commissioning. The SN label of a RRU3931E is attached to the surface of the RRU3931E.

Procedure

Step 1 Remove the backup SN label from the surface of the RRU3931E. See **Figure 1-5**

📖**NOTE**

Before removing the backup SN label, photograph it.

Figure 1-5 Removing the SN label
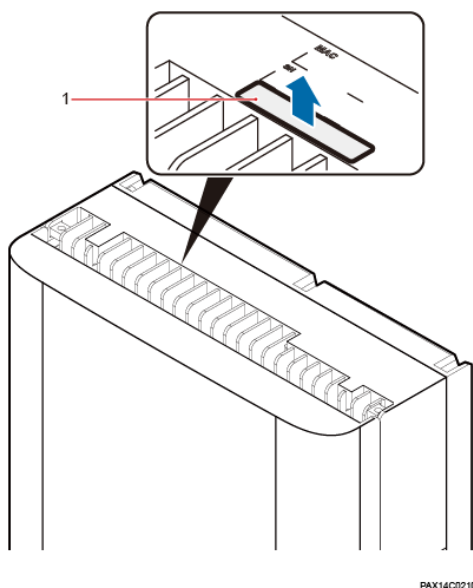
(1) Backup SN label	-

Step 2 Record the SN by using the template described in section **1.11.7 SN Collection Template**, and report it to the RRU3931E commissioning personnel.

----End

1.5 Installation Process

This section describes the process for installing a RRU3931E.

The process includes:

- Installing a RRU3931E

- Installing cables

- Checking the hardware installation

- Performing a power-on check

Figure 1-6 outlines the process for installing a RRU3931E.

Figure 1-6 Process for installing a RRU3931E
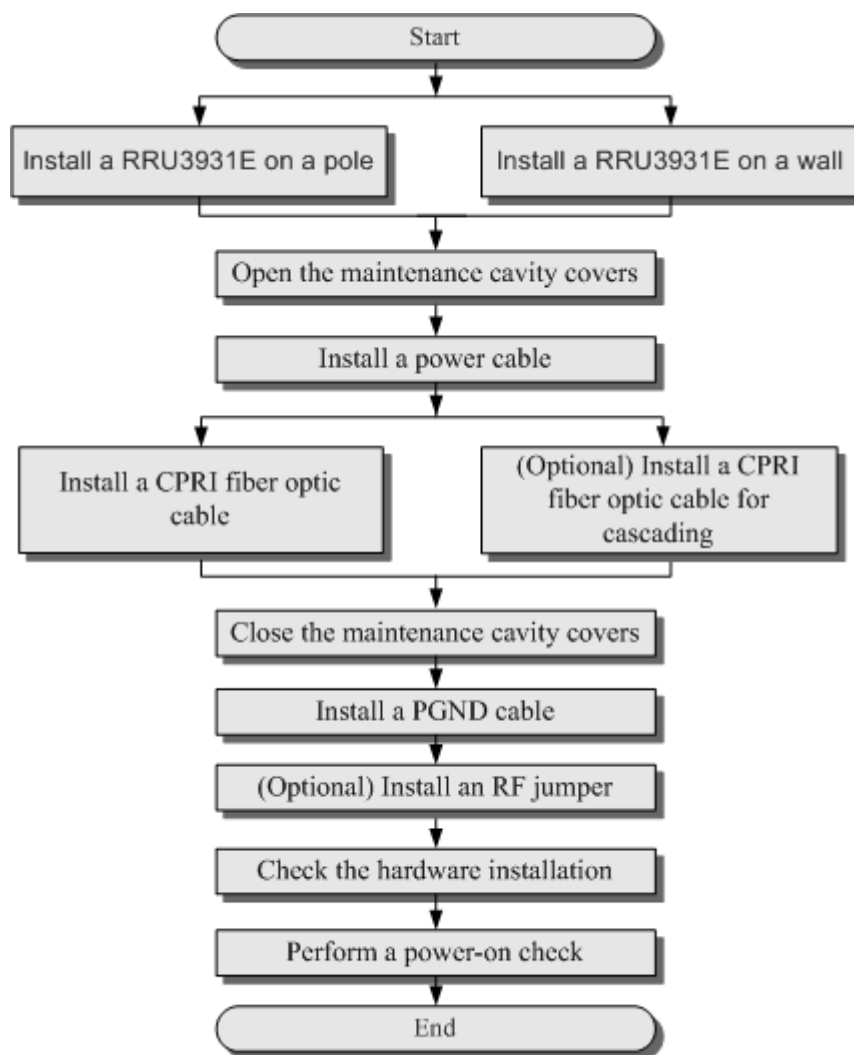
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1.6 Installing a RRU3931E

This section describes the procedure and precautions for installing a RRU3931E.

1.6.1 Mounting Kits

This section describes the kits for mounting a RRU3931E on a pole or wall.

Slim Attachment Plate

Figure 1-7 shows the appearance of a slim attachment plate.

Figure 1-7 Slim attachment plate
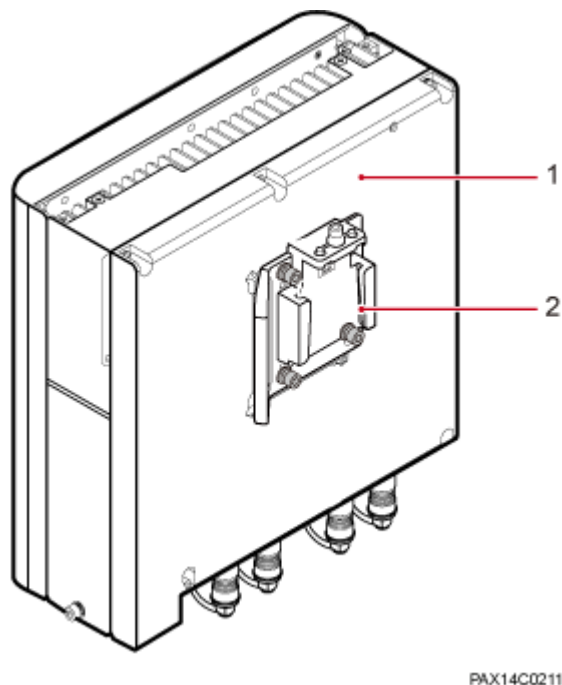
PAX14C0211

(1) RRU3931E	(2) Slim attachment plate

Mounting Bracket

Figure 1-8 shows the appearance of a Mounting bracket.

Figure 1-8 Mounting bracket
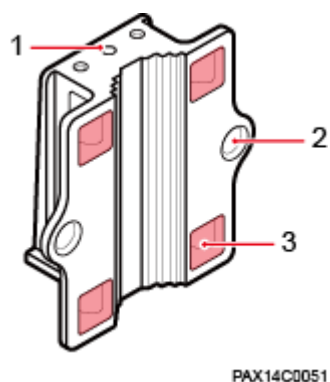
PAX14C0051

(1) Hole for a fastening screw	(2) Mounting hole for an expansion bolt	(3) Mounting hole for a steel belt

1.6.2 Installing a RRU3931E on a Pole

This section describes the procedure and precautions for installing a RRU3931E on a pole.

Procedure

Step 1 Route two steel belts separately through the up and down mounting holes on the Mounting bracket, but do not route the steel belts through the buckles. See **Figure 1-9**.

Figure 1-9 Routing steel belts

PAX14C0053
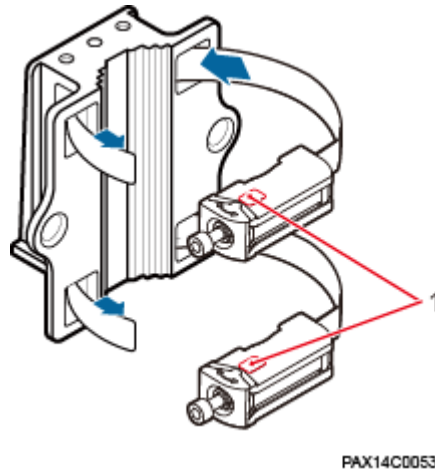
(1) Visible window

◻NOTE

Before installing a steel belt, check the rotation axis from the visible window. If the rotation axis is not connected to the end of the bolt, loose the bolt and adjust the rotation axis to the end of the bolt. The position of the rotation axis is shown in **Figure 1-11**.

Step 2 Fit the Mounting bracket onto the target pole. See **Figure 1-10**.

Figure 1-10 Fitting the Mounting bracket onto the target pole

PAX14C0054
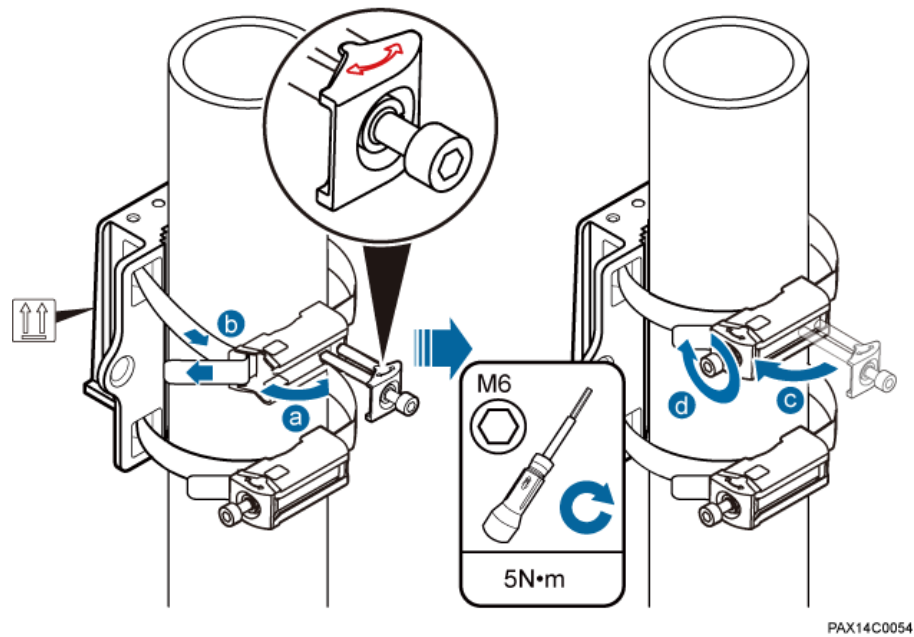
📖**NOTE**

> Redundant steel belts must be bound.

1. Open the bolt on each steel belt according to the arrow direction on the mounting base, and ensure that the rotation axis is connected to the end of the bolt, as shown in **Figure 1-11**.

Figure 1-11 Position of the rotation axis
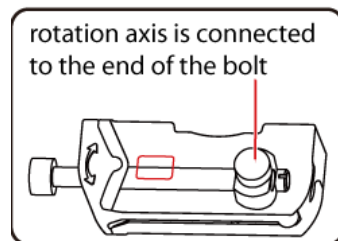
2. Partially tighten each steel belt with the force not less than 50 N, bend it by 180°, and press the steel belt at turns firmly. See **Figure 1-12**.

Figure 1-12 Tighten steel belts

PAX14C0051
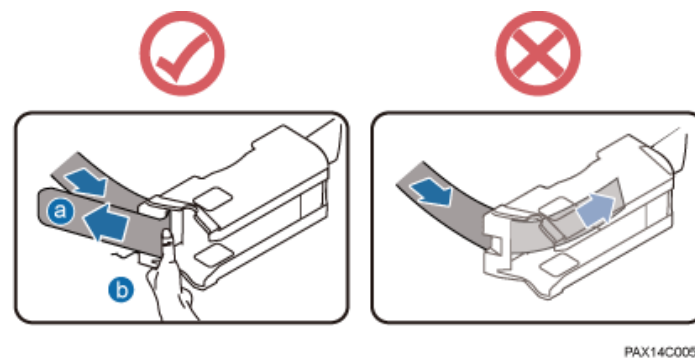
3. Restore the bolt in position on the mounting base of the steel belt. See **Figure 1-13**.

Figure 1-13 Restoring the bolt in position on the mounting base
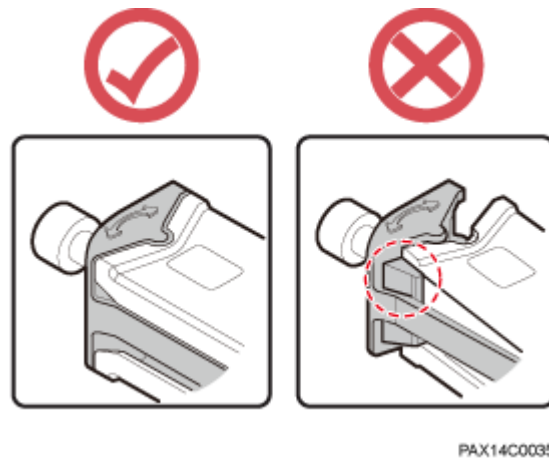
4. Use an M6 hex key screwdriver to torque the bolts to 7 N·m.

Check the steel belt installation status from the visible window. If the rotation axis is close to the end of the bolt, remove the steel belt and fasten it again. See **Figure 1-13**.

Figure 1-14 Check the rotation axis status
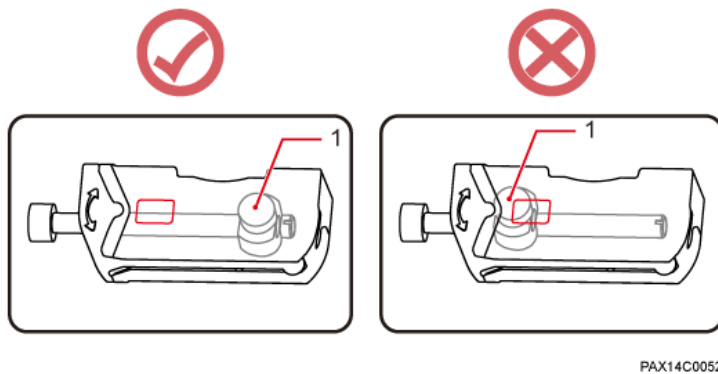
(1) Rotation axis

Step 3 Fit the RRU3931E onto the Mounting bracket, and use an M6 hex key screwdriver to torque the screw to 5 N·m. See **Figure 1-15**.

Figure 1-15 Fitting a RRU3931E onto a Mounting bracket
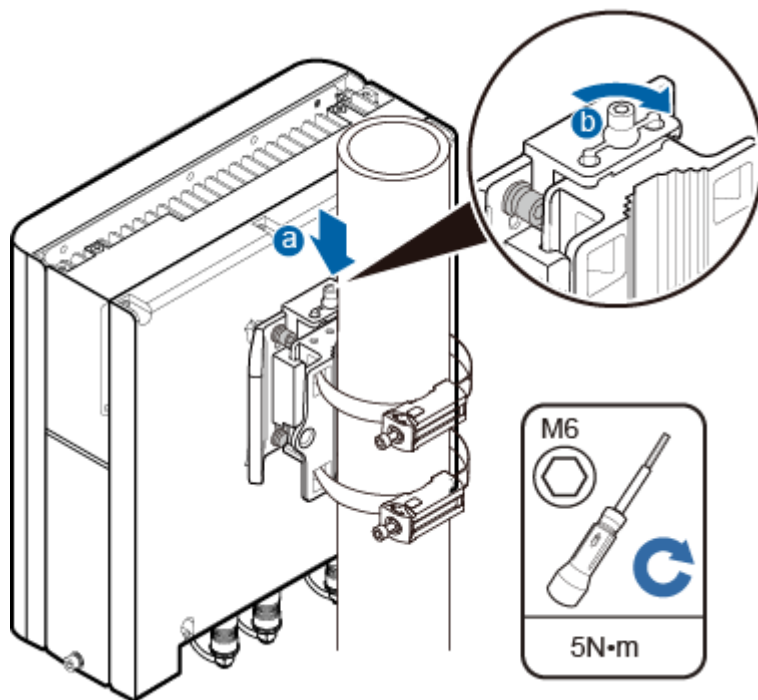
⚠ **NOTICE**

Gently take and fit the RRU3931E onto the Mounting bracket.

----**End**

1.6.3 Installing a RRU3931E on a Wall

This section describes the procedure and precautions for installing a RRU3931E on a wall.

Procedure

Step 1 Place the Mounting bracket against the wall, use a level to verify that the mounting bracket is placed horizontally, and use a marker to mark anchor points. See **Figure 1-16**.

Figure 1-16 Marking anchor points

PAX14C0056
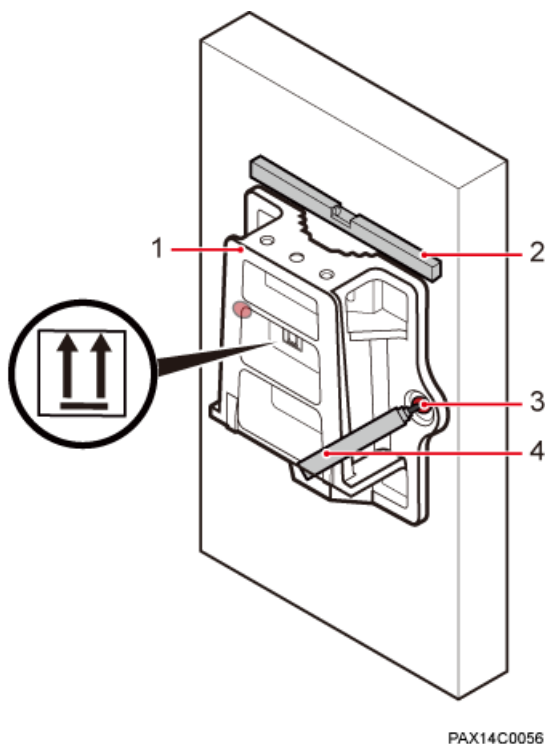
(1) Mounting bracket	(2) Level	(3) Mounting holes	(4) Marker

⚠ **NOTICE**

To prevent inhalation or eye contact with dust, take adequate preventive measures when drilling holes.

Step 2 Drill holes at the anchor points, and install expansion bolts. See **Figure 1-17**.

Figure 1-17 Drilling holes and installing expansion bolts
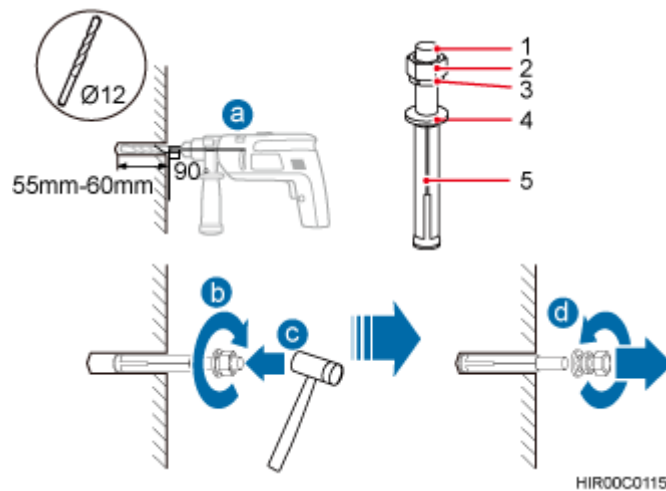
(1) M10x80 expansion bolt	(2) Nut	(3) Spring washer	(4) Flat washer	(5) Expansion sleeve

1. Use a hammer drill with Φ12 bore to drill holes vertically at the marked anchor points. Ensure that the holes have the same depth ranging from 55 mm to 60 mm.

2. Use a vacuum cleaner to clear the dust from inside and around the holes, and measure the inter-hole spacing. If the spacing is too wide or too narrow, relocate positions and drill holes again.

3. Partially tighten an expansion bolt and vertically insert it into each hole.

4. Use a rubber mallet to hit the expansion bolts until the entire expansion sleeve is in each hole.

5. Remove the M10×80 bolt, nut, spring washer, and flat washer in sequence.

⚠ NOTICE

Level the front of each expansion sleeve with the wall after disassembling an expansion bolt. Otherwise, the mounting bracket will not be securely installed on the wall.

Step 3 Fit the Mounting bracket onto the wall through the four expansion bolts, and use an M10 socket wrench to torque the four expansion bolts to 28 N·m. See **Figure 1-18**.

Figure 1-18 Fitting a Mounting bracket onto the wall
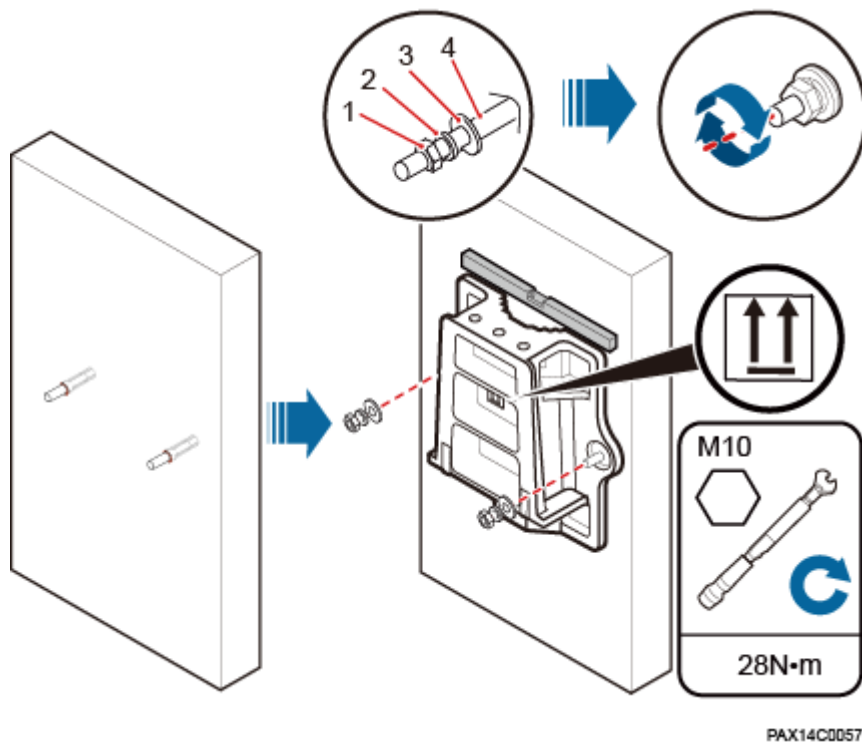
(1) Nut	(2) Spring washer	(3) Flat washer	(4) Swell fixture

Step 4 Fit the RRU3931E onto the Mounting bracket, and use an M6 hex key screwdriver to torque the screw to 5 N·m. See **Figure 1-19**.

Figure 1-19 Fitting a RRU3931E onto a Mounting bracket
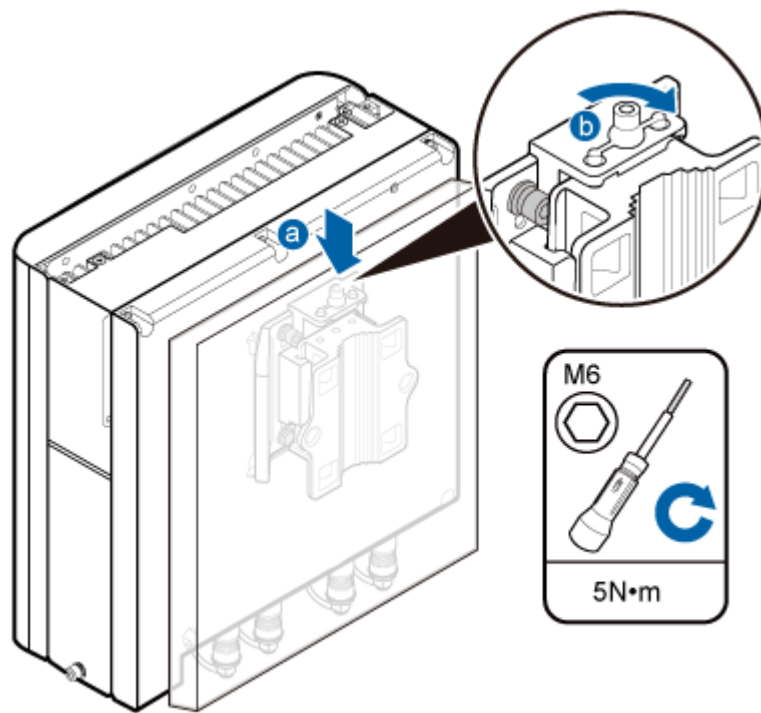
PAX14C0213

⚠ NOTICE

The narrow space of the RRU3931E toward the wall allows you only to fit the RRU3931E onto the Mounting bracket in barehanded way, instead of using the attachment plate hander. Do gently in the whole process.

----End

1.7 Installing Cables

This section describes the procedure and precautions for installing cables.

1.7.1 Cabling Requirements

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

NOTE

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

General Cabling Requirements

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

- The bending radius of a 7/8" feeder must be greater than 250 mm, and the bending radius of a 5/4" feeder must be greater than 380 mm.

- The bending radius of a 1/4" jumper must be greater than 35 mm. The bending radius of a super-flexible 1/2" jumper must be greater than 50 mm, and the bending radius of an ordinary 1/2" jumper must be greater than 127 mm.

- The bending radius of a power cable or PGND cable must be at least five times its diameter.

- The bending radius of a fiber optic cable must be at least 20 times its diameter.

- The bending radius of a signal cable must be at least five times its diameter.

The cables must be bound as follows:

- Cables must be bound tightly and neatly. The sheaths of cables must not be damaged.

- Cable ties must face the same direction, and those at the same horizontal line must be in a straight line. The excess of cable ties must be cut off.

- Labels or nameplates must be attached to the cables after they are installed.

The cables must be routed as follows:

- Cables of different types must be routed separately in an untangled and orderly fashion.

- Cables of different types must be parallel to each other or separated by using dedicated separators.

- Cables must be routed away from sharp objects or wall burrs. If these positions are inevitable, cables must be protected with protection pipes.

- Cables must be routed away from heat sources, or heat-insulation materials must be added between cables and heat sources.

- Sufficient slack must be provided in cables at turns or the position close to a device, facilitating cable and device maintenance. The recommended slack is 0.1 m.

- AC power cables and PGND cables must be tubed when routed.

- Drip loops must be reserved for cable layout at connection points and thru-wall points indoors/outdoors.

- All cables cannot be routed overhead. Cables laid out outdoors should be buried in the ground.

Special Cabling Requirements

Power cables must be routed as follows:

- Multiple power cables must be bound when routed.

- Power cables must be installed in the positions specified in engineering design documents.

- If the length of power cables is insufficient, the power cables must be replaced instead of adding connectors or soldering joints to lengthen the cables.

- Cabling activities require strict organization and coordination, and are allowed only when qualified personnel and communication facilities are available.

- Cables must be routed in an untangled and orderly fashion.

- AC power cables must be tubed when routed.

PGND cables must be routed as follows:

- PGND cables for a RRU3931E must be connected to the same ground bar.
- PGND cables must be buried in the ground or routed indoors. They must not be routed overhead before they are led into the equipment room.
- The exterior of a coaxial wire and the shield layer of a shielded cable must have proper electrical contact with the metal surface of the equipment to which they are connected.
- PGND cables and signal cables must be bound separately in an untangled and orderly fashion. A certain distance must be reserved between them to prevent mutual interference.
- Fuses or switches must not be installed on PGND cables.
- Other devices must not be used for electrical connections of PGND cables.
- All the metal parts in the housing of the RRU3931E must be reliably connected to the ground terminal.
- PGND cables must be tubed when routed.

  Signal cables must be routed as follows:

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

Fiber optic cables must be routed as follows:

- A minimum of three qualified and trained personnel are required to route fiber optic cables.
- The operating temperature of fiber optic cables ranges from -40ºC to +60ºC. If the current temperature is out of the range, additional protection measures must be taken or the cable routing must be changed.
- Cables must be routed in an untangled and orderly fashion.
- Fiber optic cables must not be bound at turns.
- Fiber optic cables cannot be stretched with too much force or stepped on, and they must be far away from sharp objects. Heavy objects cannot be placed on fiber optic cables.
- When fiber optic cables are routed, the excess of the cables must be coiled around special devices, such as a fiber coiler.
- Fiber optic cables must be coiled gently and must not be bent in a forcible manner.
- Vacant optical connectors must be covered with dustproof caps.
- Fiber optic cables cannot be squeezed by a cabinet door when routed through a cabinet.
- When routed on the tower platform, the fiber optic cables must be laid out along the guardrail within the shortest distance.
- When routed close to a device on the tower, the fiber optic cables must be secured to the guard rail or pole with cable clips. The RRU3931E must not be far away from the position for securing the fiber optic cables.
- The excess of the fiber optic cables must be coiled and secured on the tower.

1.7.2 Cable Connections

This section describes the connections of the canles.

Figure 1-20 shows the cable connections for a RRU3931E.

Figure 1-20 RRU3931E cable connections

PAX14C0214
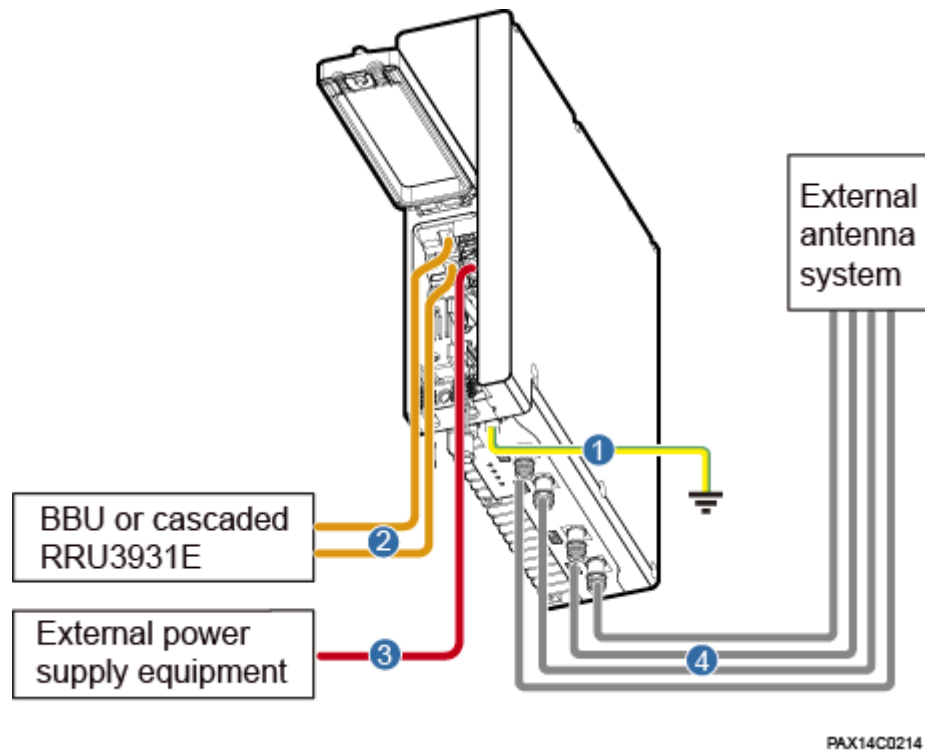
(1) PGND cable	(2) CPRI fiber optic cable	(3) Power cable	(4) RF Jumper

☐**NOTE**

When routing cables from a maintenance cavity, observe the following:

● Route the power cable through the cable hole on the upper-layer rubber strip

● Route the other cables (except power cables) through cable holes on the lower-layer rubber strip preferentially

● Route cables through cable holes on the same side of ports, and do not cross cables.

1.7.3 Opening the Maintenance Cavity Covers

This section describes the procedure and precautions for opening the maintenance cavity covers of a RRU3931E.

Procedure

Step 1 Use an M6 hex key screwdriver to loosen the captive screw on both the maintenance cavity covers. Open the maintenance cavity covers.

Figure 1-21 shows the maintenance cavity structure.

Figure 1-21 Maintenance cavity structure
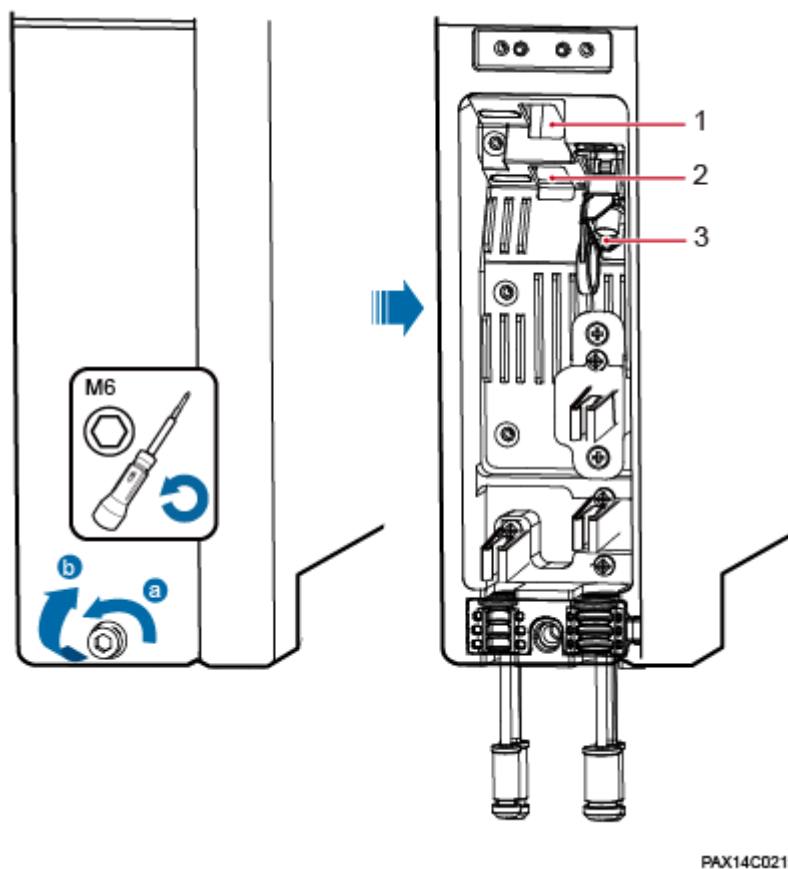
(1) CPRI1	(2) CPRI0	(3) PWR

Step 2 Remove the waterproof blocks for the cables to be installed.

----End

1.7.4 Installing a Power Cable

This section describes the procedure and precautions for installing a power cable for a RRU3931E. The power cable connects the RRU3931E and external power supply equipment.

Context

Table 1-2 lists the specifications of a power cable.

Table 1-2 Power cable specifications

Cable		Color	One End	The Other End	Remarks
Input power cable for a RRU3931E	L	Brown	AC-EPC1 connector	Depends on the external power supply equipment.	Black jacket
	N	Blue			
	PE	Yellow and green			

☐**NOTE**

The color and structure of a power cable varies with countries and regions. A locally purchased power cable must be a pure copper outdoor three-core cable that has a cross-sectional area of 1.5 mm^2 to 2.5 mm^2 and a maximum outer diameter of 8.9 mm to 10.2 mm and complies with local specifications.

Procedure

Step 1 Make a power cable.

- Cut the cable to a length suitable for the actual cable route.

- Add a cord end terminal to one end of the cable by following instructions provided in section **1.11.4 Assembling a Tool-less Female Connector (Pressfit Type) and a Power Cable1.11.4 Assembling a Tool-less Female Connector (Pressfit Type) and a Power Cable**. At the other end, add a terminal that matches the external power supply equipment.

Step 2 Installing the power cable. Connect the terminal of the power cable to the PWR port on the RRU3931E. See **Figure 1-22**.

Figure 1-22 Installing a power cable
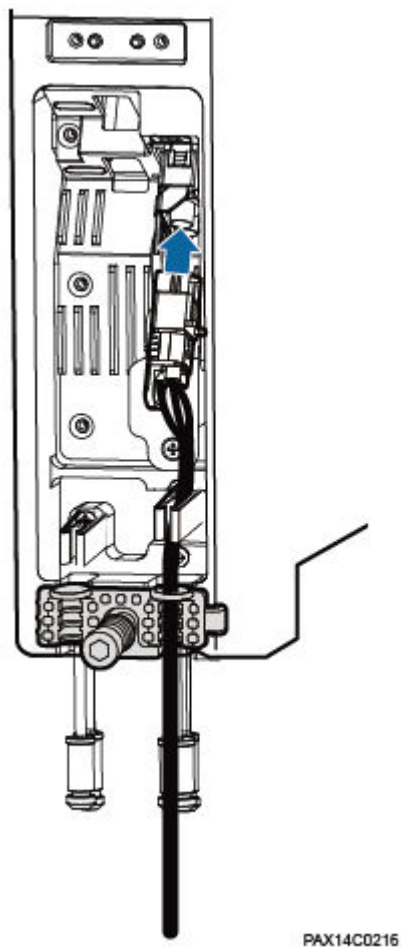
PAX14C0216

----End

Follow-up Procedure

1. Route the cable by following instructions provided in section **1.7.1 Cabling Requirements**"**1.7.1 Cabling Requirements**" and then use cable ties to bind the cable.

2. Attach labels to the installed cables by following instructions in **1.11.6 Attaching a Sign Plate Label**.

1.7.5 Installing an CPRI Fiber Optic Cable

This section describes the procedure and precautions for installing an CPRI fiber optic cable.

Context

● The single-mode optical modules to be installed must match the data rate at the optical ports.

● Do not twist, bend, stretch, or squeeze fiber optic cables during installation.

● The cable route depends on actual requirements.

⚠ **NOTICE**

Long-time exposure to the air causes performance exceptions on an optical module. Therefore, optical modules must be connected to fiber optic cables within 20 minutes after being unpacked.

Procedure

Step 1 Remove the dustproof cap from the CPRI0 or CPRI1 port. Keep the cap secure.

Step 2 Insert an optical module into the CPRI0 or CPRI1 port, and remove the dustproof cap from the optical module.

Step 3 Remove the dustproof cap from the optical fiber connector, tidy the optical fibers, and insert the DLC connector into the optical module. See **Figure 1-23**.

Figure 1-23 Installing a fiber optic cable
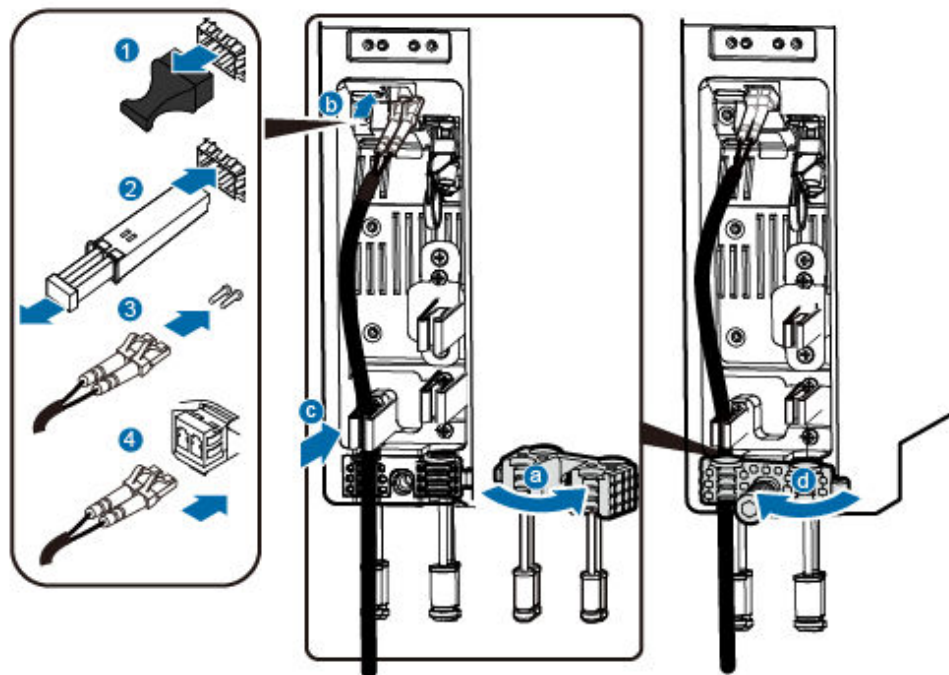
PAX14C0217

----End

Follow-up Procedure

1. Route the cable by following instructions provided in section **1.7.1 Cabling Requirements**"**1.7.1 Cabling Requirements**" and then use cable ties to bind the cable.

2. Attach labels to the installed cables by following instructions in **1.11.6 Attaching a Sign Plate Label**.

1.7.6 (Optional) Installing an CPRI Fiber Optic Cable for Cascading

This section describes the procedure and precautions for installing an CPRI fiber optic cable used for cascading two RRU3931Es.

Context

- The single-mode optical modules to be installed must match the data rate at the optical ports.
- Do not twist, bend, stretch, or squeeze fiber optic cables during installation.
- The cable route depends on actual requirements.

⚠ NOTICE

Long-time exposure to the air causes performance exceptions on an optical module. Therefore, optical modules must be connected to fiber optic cables within 20 minutes after being unpacked.

Procedure

Step 1 For both RRU3931Es, remove the dustproof cap from the CPRI0 or CPRI1 port. Keep the cap secure.

Step 2 For both RRU3931Es, insert an optical module into the CPRI0 or CPRI1 port, and remove the dustproof cap from the optical module.

Step 3 Remove the dustproof cap from the optical fiber connector, tidy the optical fibers, and insert the DLC connector into the optical module. See **Figure 1-24**.

Figure 1-24 Installing a fiber optic cable for cascading
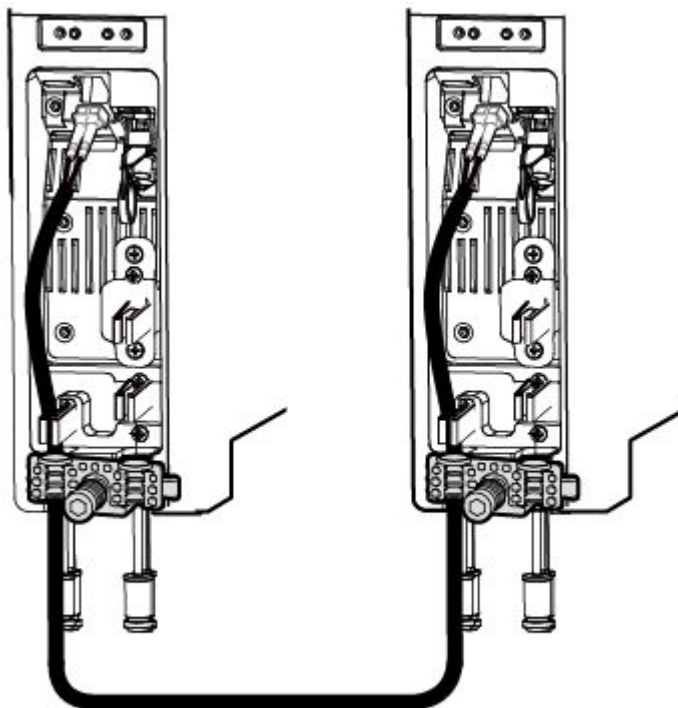
PAX14C0224

----End

Follow-up Procedure

1. Route the cable by following instructions provided in section **1.7.1 Cabling Requirements**"**1.7.1 Cabling Requirements**" and then use cable ties to bind the cable.

2. Attach labels to the installed cables by following instructions in **1.11.6 Attaching a Sign Plate Label**.

1.7.7 Closing the Maintenance Cavity Covers

This section describes the procedure and precautions for closing the maintenance cavity covers of a RRU3931E.

Procedure

Step 1 Insert waterproof blocks into vacant cable troughs in both the cabling holes. See **Figure 1-25**.

⚠ **CAUTION**

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

Figure 1-25 Checking that vacant cable troughs are properly waterproofed
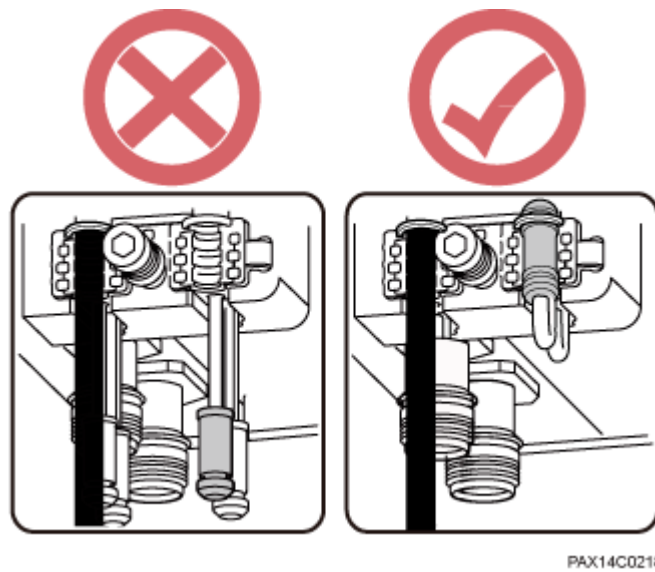
Step 2 Close the maintenance cavity covers of the RRU3931E. Use an M6 hex key screwdriver to torque the screws on the covers to 4.8 N·m. See **Figure 1-26**.

Figure 1-26 Closing the maintenance cavity covers
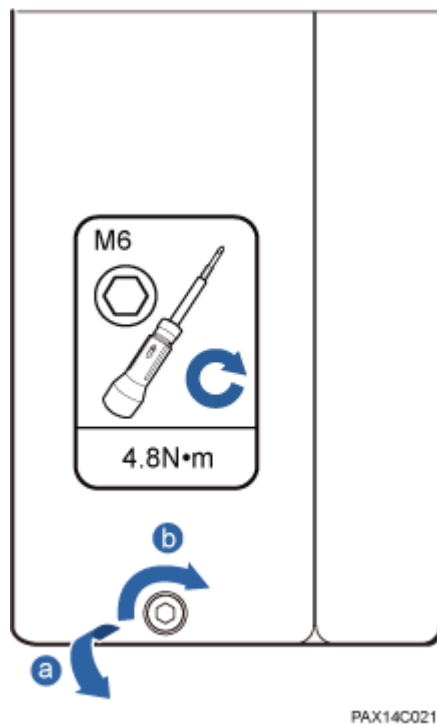
----**End**

1.7.8 Installing a PGND Cable

This section describes the procedure and precautions for installing a PGND cable.

Context

The length of a PGND cable must not exceed 30 m. When the required PGND cable is longer than 30 m, deploy the ground bar nearer the RRU3931E. **Table 1-3**

Table 1-3 PGND cable specifications

Cable	One End	The Other End	Color
PGND cable	OT terminal (M6, 6 mm^2)	OT terminal (M8, 6 mm^2)	Yellow and green

rocedure

Step 1 Make a PGND cable for the RRU3931E.

- Cut the cable to the required length based on the actual cable route.
- Add an OT terminal to each end of the PGND cable by following instructions provided in section "Assembling the OT Terminal and the Power Cable" of *Installation Reference*.

Step 2 Install the PGND cable.

Connect the M6 OT terminal at one end of the PGND cable to the ground terminal at the RRU3931E bottom and the M8 OT terminal at the other end to the external ground bar. See **Figure 1-27**.

Figure 1-27 Installing a PGND cable
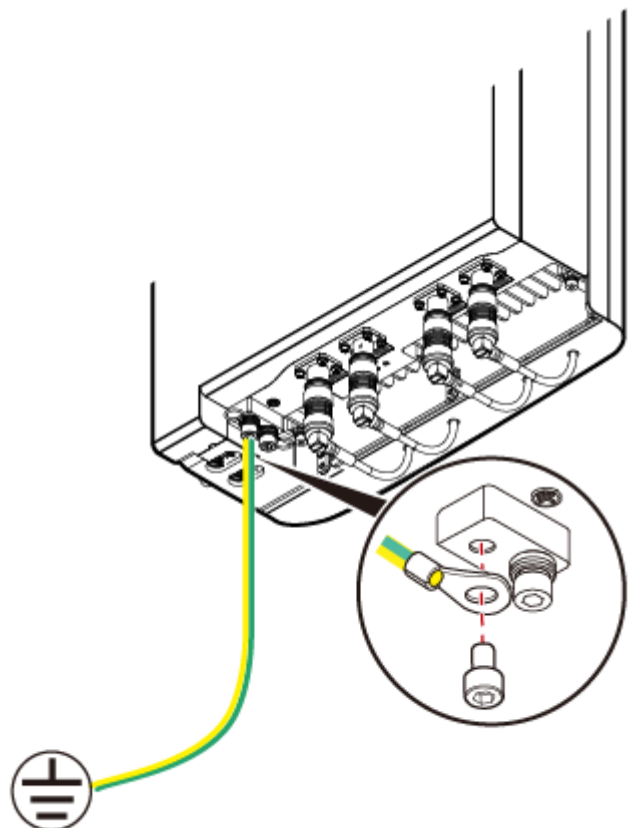
PAX14C0220

📖**NOTE**

> When installing the PGND cable, crimp OT terminals in correct positions. See **Figure 1-28**.

Figure 1-28 Crimping an OT terminal
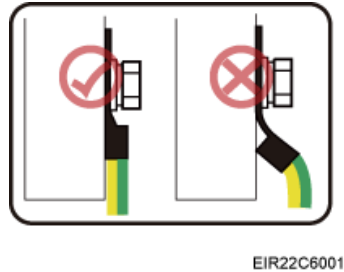
EIR22C6001

----End

Follow-up Procedure

1. Route the cable by following instructions provided in section **1.7.1 Cabling Requirements**"**1.7.1 Cabling Requirements**" and then use cable ties to bind the cable.

2. Attach labels to the installed cables by following instructions in **1.11.6 Attaching a Sign Plate Label**.

1.7.9 (Optional) Installing an RF Jumper

This section describes how to install an RF jumper for a RRU3931E. This operation is required when the RRU3931E uses an external antenna.

Context

- The cable route depends on actual requirements.

- The RRU3931E RF jumper can connect the RRU3931E and external antenna system, or connect the RRU3931E and GPS antenna system. The following section takes installing an RF jumper between the RRU3931E and external antenna system as an example.

  📖**NOTE**

  > It is good practice to use an RF jumper when installing the external antenna system for the RRU3931E. If the RRU3931E RF jumper is not used, install the antenna on the RRU3931E through the normal type N female connector, and waterproof the connector by following instructions provided in **Step 5**.

Procedure

Step 1 Remove the plastic waterproof cap from the RF port. See **Figure 1-29**.

Figure 1-29 Removing a waterproof cap
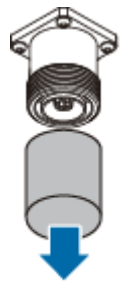
PAX14C0050

Step 2 Connect the Smart-type N male connector at one end of the RF jumper to the RF port on the RRU3931E.

When installing an RF jumper, hold tightly the metal part (in the red dotted circle in **Figure 1-30**) of the Smart-type N male connector and push the connector upwards. A slight crack will be heard when the connector is properly installed. See **Figure 1-30**.

Figure 1-30 Installing an RF jumper
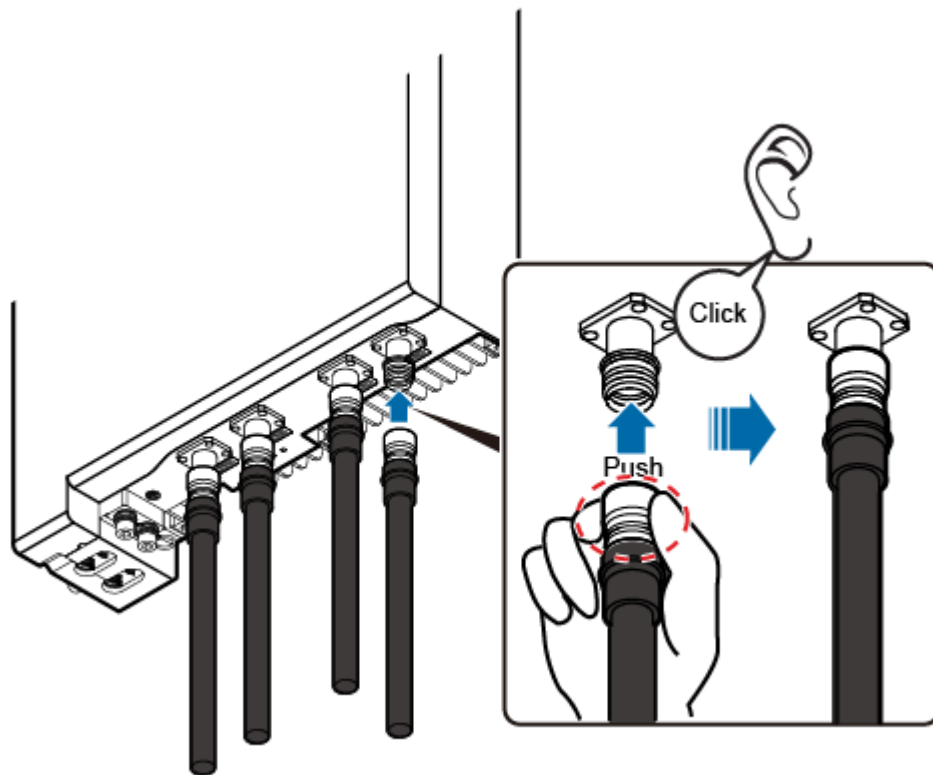
PAX14C0221

⚠ NOTICE

Do not exert force on the non-metal part, that is, the black part, as shown in **Figure 1-30**

Step 3 (Optional) If an RF port is not used, retain and waterproof the waterproof cap on the port.

Figure 1-31 Waterproofing a waterproof cap

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

1. Verify that waterproof caps are not removed.
2. Wrap a layer of PVC insulation tape around the connector from bottom up.
3. Tightly wrap three layers of waterproof tape around the connector, with the first layer from bottom up, the second layer from top down, and the third layer from bottom up.
4. Tightly wrap three layers of PVC insulation tape around the connector with the first layer from bottom up, the second layer from top down, and the third layer from bottom up.
5. Bundle cable ties 3 mm to 5 mm away from the end of insulating tape.

📖**NOTE**

● Before wrapping waterproof tape, stretch the tape evenly until the length of the tape is twice its original length.

● Do not stretch the PVC insulation tape before wrapping.

● Wrap each layer of tape around the connector tightly and neatly, and ensure that each layer of tape overlaps more than 50% of the preceding layer

● Ensure that the side with adhesive tape is covered on the wrapped tape.

● When cutting off the cable tie, reserve a surplus length of 3 mm to 5 mm.

Step 4 Connect the type N male connector at the other end of the RRU3931E RF jumper to the RF port on the external antenna system. See **Figure 1-32**.

Figure 1-32 Connecting an RF jumper to the external antenna system

Step 5 Wrap the connector of the RF jumper. See **Figure 1-33**.

Figure 1-33 Wrapping the connector of an RF jumper
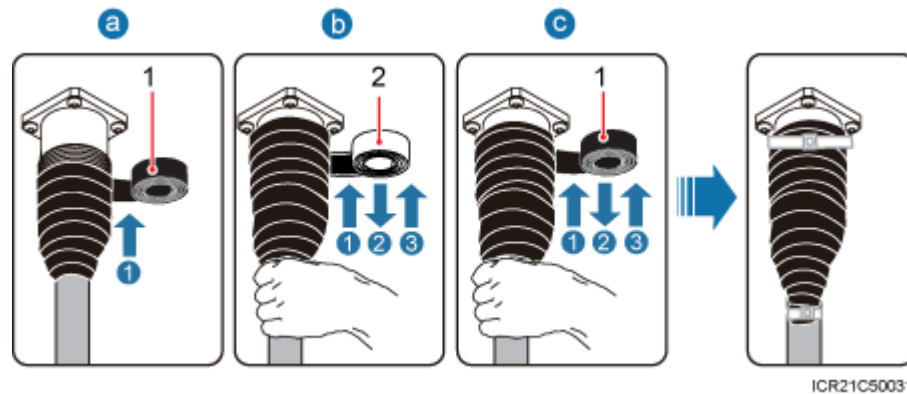
(1) PVC insulation tape	(2) Waterproof tape

1. Wrap a layer of PVC insulation tape around the connector from bottom up.
2. Tightly wrap three layers of waterproof tape around the connector, with the first layer from bottom up, the second layer from top down, and the third layer from bottom up.
3. Tightly wrap three layers of PVC insulation tape around the connector, with the first layer from bottom up, the second layer from top down, and the third layer from bottom up.
4. Bundle cable ties 3 mm to 5 mm away from the end of the PVC insulation tape.

☉**NOTE**

- Before wrapping waterproof tape, stretch the tape evenly until the length of the tape is twice its original length.
- Do not stretch the PVC insulation tape before wrapping.
- Wrap each layer of tape around the connector tightly and neatly, and ensure that each layer of tape overlaps more than 50% of the preceding layer
- Ensure that the side with adhesive tape is covered on the wrapped tape.
- When cutting off the cable tie, reserve a surplus length of 3 mm to 5 mm.

----End

Follow-up Procedure

1. Route the cable by following instructions provided in section **1.7.1 Cabling Requirements**"**1.7.1 Cabling Requirements**" and then use cable ties to bind the cable.
2. Attach labels to the installed cables by following instructions in **1.11.6 Attaching a Sign Plate Label**.

1.8 (Optional)Replacing the Internal Antenna with External Antennas

This section describes how to replace the RRU3931E internal antenna with external antennas.

Procedure

Step 1 Remove the RRU3931E antenna connector.

When removing a RRU3931E antenna connector, hold tightly the metal parts (red-marked parts in **Figure 1-34**) of the antenna terminals, and pull down the terminals.

Figure 1-34 Removing the antenna connector
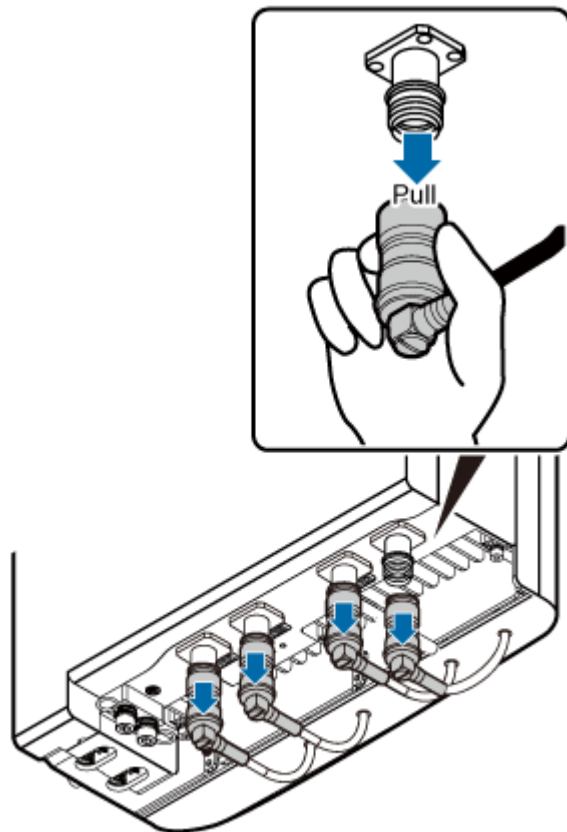
Step 2 Remove the screws from the antenna.

1. Use an M4 hex key to loosen the three M4x14 screws at the bottom of the RRU3931E.
2. Push the RRU3931E antenna downwards, as shown in **Figure 1-35**.

Figure 1-35 Removing screws
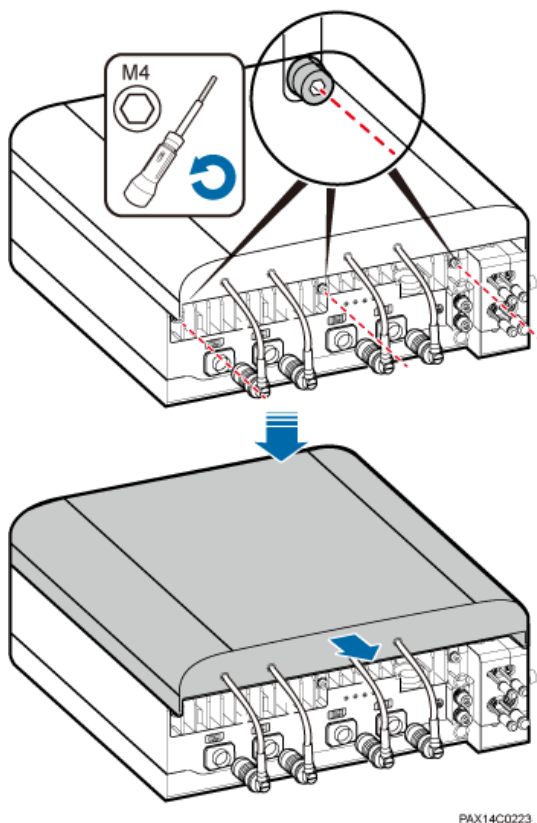
Step 3 Connect the Smart-type N male connector at one end of the RF jumper to the RF port on the RRU3931E.

When installing an RF jumper, hold tightly the metal part (in the red dotted circle in **Figure 1-36**) of the Smart-type N male connector and push the connector upwards. A slight crack will be heard when the connector is properly installed. See **Figure 1-36**.

Figure 1-36 Installing an RF jumper

PAX14C0221
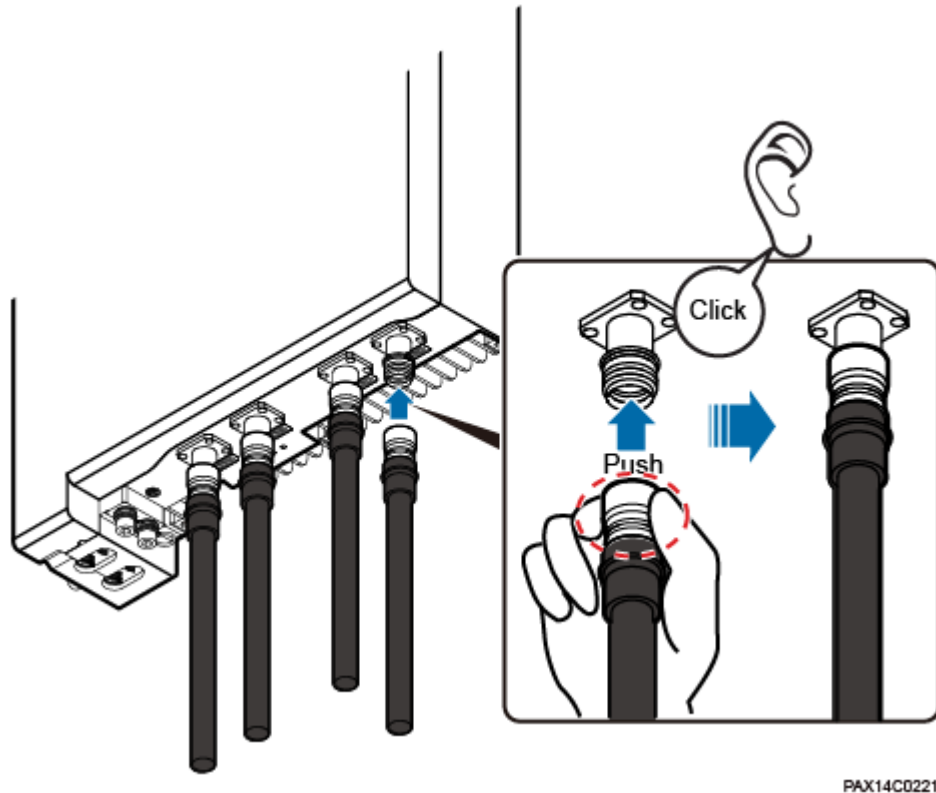
⚠ **NOTICE**

Do not exert force on the non-metal part, that is, the black part, as shown in **Figure 1-36**

Step 4 (Optional) If an RF port is not used, retain and waterproof the waterproof cap on the port.

Figure 1-37 Waterproofing a waterproof cap

ICR21C50081

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

1. Verify that waterproof caps are not removed.

2. Wrap a layer of PVC insulation tape around the connector from bottom up.

3. Tightly wrap three layers of waterproof tape around the connector, with the first layer from bottom up, the second layer from top down, and the third layer from bottom up.

4. Tightly wrap three layers of PVC insulation tape around the connector with the first layer from bottom up, the second layer from top down, and the third layer from bottom up.

5. Bundle cable ties 3 mm to 5 mm away from the end of insulating tape.

□**NOTE**

- Before wrapping waterproof tape, stretch the tape evenly until the length of the tape is twice its original length.

- Do not stretch the PVC insulation tape before wrapping.

- Wrap each layer of tape around the connector tightly and neatly, and ensure that each layer of tape overlaps more than 50% of the preceding layer

- Ensure that the side with adhesive tape is covered on the wrapped tape.

- When cutting off the cable tie, reserve a surplus length of 3 mm to 5 mm.

Step 5 (Optional) If a normal type N female connector is used for the antenna to be installed, perform **Step 4** to **Step 5**.

Step 6 (Optional) If the DIN-type female connector is used for the antenna to be installed, perform the following steps:

1. Connect the DIN male and N female connector to the RF port of the external antenna system.
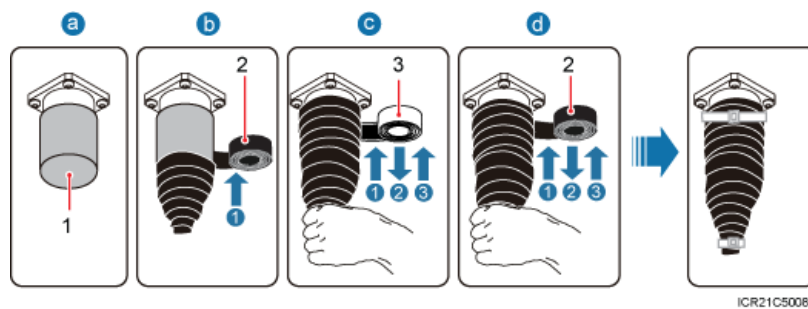
2. Connect the type N male connector at one end of the RF jumper of the RRU3931E to the DIN male and N female connector.

3. Waterproof the port connecting the DIN male and N female connector and the external antenna system and the port connecting the RF jumper of the RRU3931E and the DIN male and N female connector. See **Figure 1-38**.

Figure 1-38 Waterproofing the ports

(1) PVC insulation tape	(2) Waterproof tape

a. Wrap a layer of PVC insulation tape around the connector from bottom up.

b. Tightly wrap three layers of waterproof tape around the connector, with the first layer from bottom up, the second layer from top down, and the third layer from bottom up.

c. Tightly wrap three layers of PVC insulation tape around the connector, with the first layer from bottom up, the second layer from top down, and the third layer from bottom up.

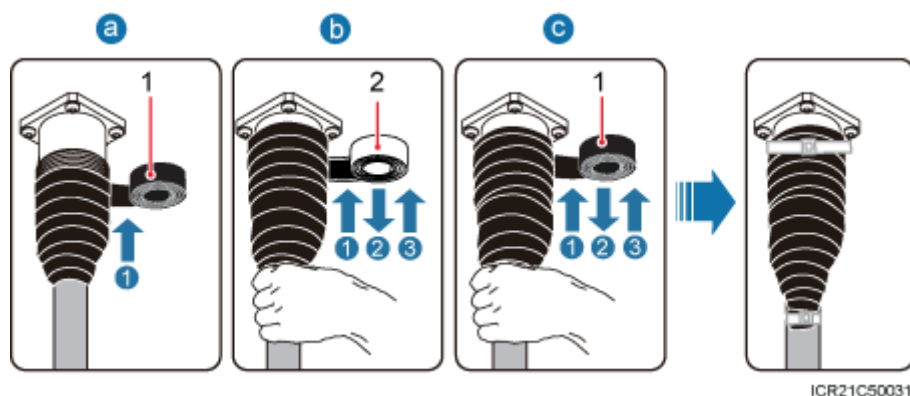d. Bundle cable ties 3 mm to 5 mm away from the end of the PVC insulation tape.

🕮 **NOTE**

– Before wrapping waterproof tape, stretch the tape evenly until the length of the tape is twice its original length.

– Do not stretch the PVC insulation tape before wrapping.

– Wrap each layer of tape around the connector tightly and neatly, and ensure that each layer of tape overlaps more than 50% of the preceding layer

– Ensure that the side with adhesive tape is covered on the wrapped tape.

– When cutting off the cable tie, reserve a surplus length of 3 mm to 5 mm.

----End

Follow-up Procedure

Route the cable by following instructions provided in section

1.7.1 Cabling Requirements, and then use cable ties to bind the cable.

1.9 Checking the Hardware Installation

This section describes how to check the hardware installation after a RRU3931E is installed.

Table 1-4 provides the checklist for the RRU3931E hardware installation.

Table 1-4 RRU3931E hardware installation checklist

SN	Item
1	The installation position conforms to the engineering drawing and meets the clearance requirements. Sufficient space is reserved for equipment maintenance.
2	The RRU3931E is securely installed, and the screws are tightened.
3	In wall-mounted scenarios, the mounting holes on the mounting bracket are well aligned with those of the expansion bolts. In addition, the mounting bracket is secured on the wall evenly and steadily.
4	In pole-mounted scenarios, the mounting bracket is secured on the pole.
5	The angle adjustment error of the RRU3931E is less than 3° in the horizontal direction and is not more than 3° in the vertical direction.
6	Vacant cable troughs in both maintenance cavities are covered with waterproof blocks, and the maintenance cavity covers are fastened.

| SN	Item
7	None of power cables and PGND cables are short-circuited, reversely connected, damaged, or broken.
8	Power cables and PGND cables are separately bound from other cables.
9	All modules are connected using equipotential cables and then connected to the closest ground bar by using PGND cables.
10	The connectors of each signal cable are intact and securely linked, and these cables are not damaged or broken.
11	Labels are correct, legible, and complete at both ends of each cable.

1.10 Performing a Power-On Check

This section describes the procedure for performing a power-on check on a RRU3931E.

Context

Figure 1-39 shows the RRU3931E power-on check procedure.

Figure 1-39 Power-on check
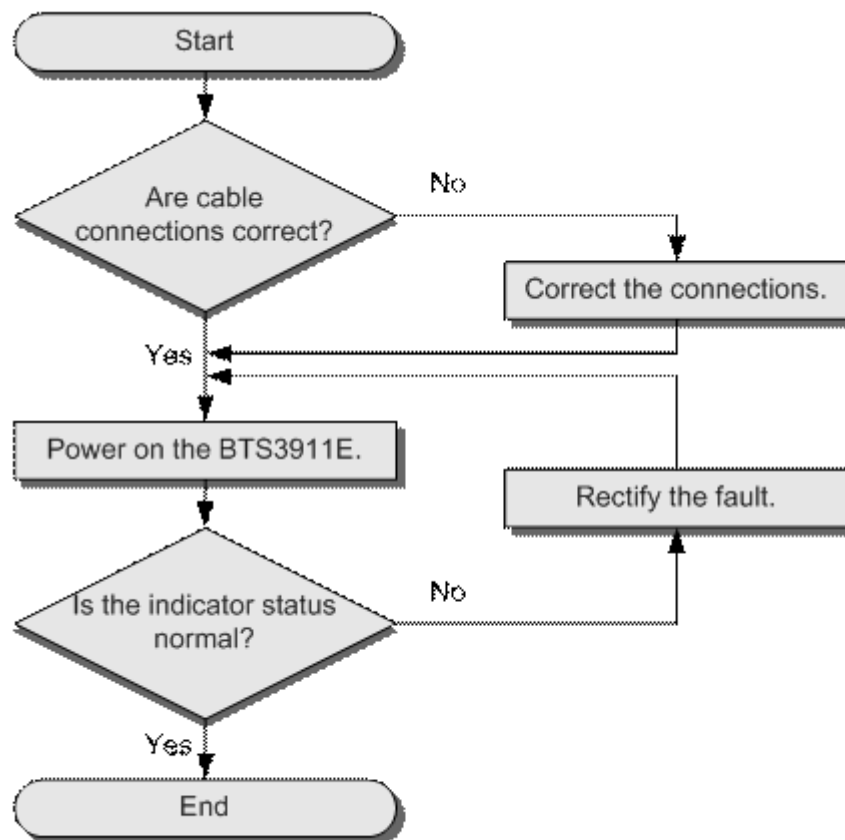
Procedure

Step 1 Check that the cables are correctly connected.

Step 2 Check that the input voltage of the RRU3931E is 110 V AC to 240 V AC, and the frequency ranges from 50 Hz to 60 Hz.

Step 3 Power on the RRU3931E. Wait 3 to 5 minutes and then observe the indicator status of the RRU3931E. If the RUN indicator blinks (on for 1s and off for 1s) and the ALM indicator is off, the RRU3931E is working properly.

📖**NOTE**

- A RRU3931E takes about 3 minutes to complete the startup procedure, during which the indicator status is negligible.

- During a startup, a RRU3931E reads and writes the flash memory and therefore the indicators blinking quickly may blink irregularly for 1s to 2s, which does not affect services.

----End

1.11 References

This section describes reference information and common operations involved during installation.
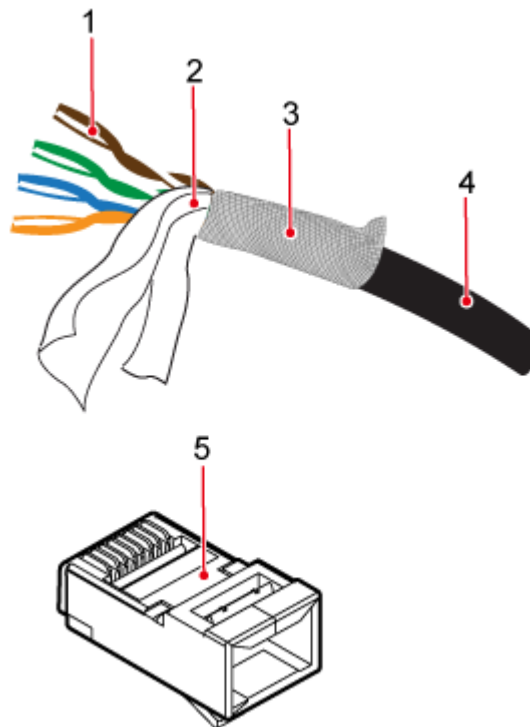
1.11.1 Assembling a Shielded RJ45 Connector and an Ethernet Cable

This section describes how to assemble a shielded RJ45 connector and an Ethernet cable. A straight-through cable is used as an example.

Context

Figure 1-40 shows the components of an RJ45 connector and an Ethernet cable.

Figure 1-40 Components of an RJ45 connector and an Ethernet cable

(1) Core wire	(2) Aluminum foil	(3) Braided layer
(4) Outer jacket	(5) RJ45 connector	-

Procedure

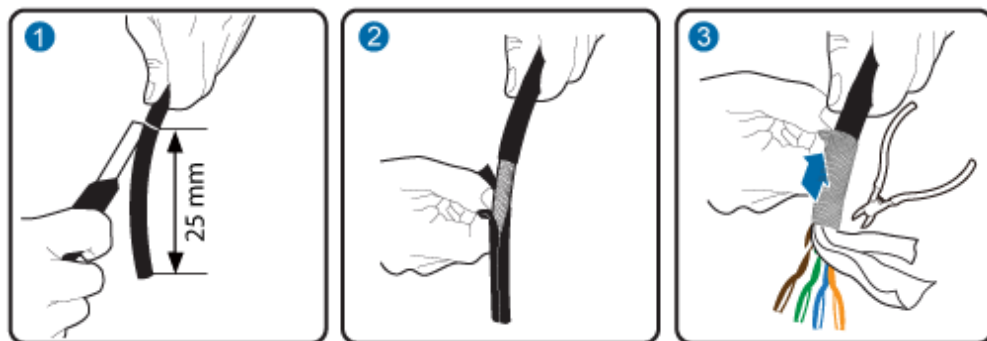**Step 1** Remove the outer jacket (25 mm) of the Ethernet cable, tip the braided layer outwards evenly, and cut off the aluminum foil and guard space. See **Figure 1-41**

⚠ **NOTICE**

● Do not damage the shield layer when removing the jacket.

● Do not damage the insulation layer of the Ethernet cable when removing the shield layer.

Figure 1-41 Removing the jacket of an Ethernet cable

Step 2 Sequence the twisted pair wires neatly by color, and cut the wire end evenly, with a remaining length of 16 mm. See **Figure 1-42**.

Figure 1-42 Arranging twisted pair wires
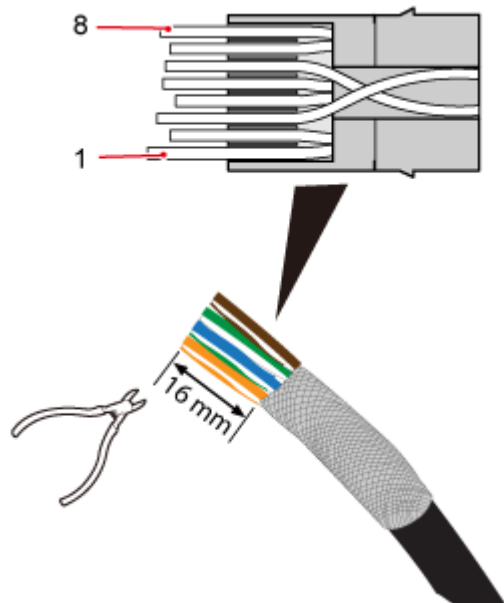
Table 1-5 Pin assignment

Pin SN	Wire Color
1	White and orange
2	Orange
3	White and green
4	Blue
5	White and blue
6	Green
7	White and brown
8	Brown

Step 3 Insert the sequenced twisted pair wires into the RJ45 connector. See **Figure 1-43**.

Figure 1-43 Inserting wires into the RJ45 connector
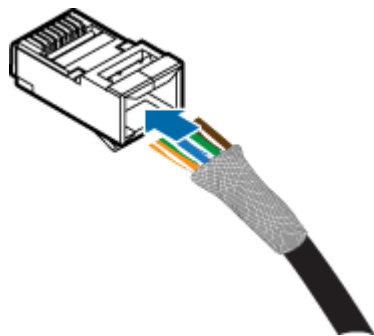
⚠ **NOTICE**

- When inserting the wires, ensure that the braided layer that was tipped outwards has inserted inside the connector.
- Observe the side or front of the RJ45 connector to ensure that the core wires are inserted to the bottom of the RJ45 connector.

Step 4 Use a crimping tool to crimp the connector. See **Figure 1-44**.

Figure 1-44 Crimping the connector
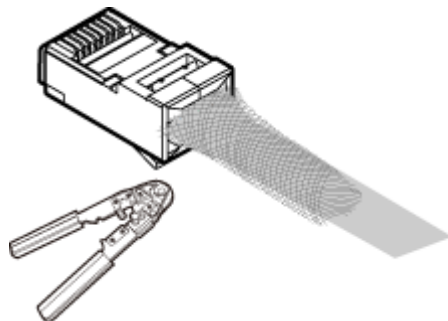
Step 5 Use a cable cutter to evenly cut off the protruding braided layer of the connector along the wire holder. See **Figure 1-45**

Figure 1-45 Cutting off the excess braided layer

----End

1.11.2 Checking the Appearance of Metal Contact Strips

This topic describes how to check the metal contact strips and how to check whether an assembled RJ45 connector is qualified.

Context

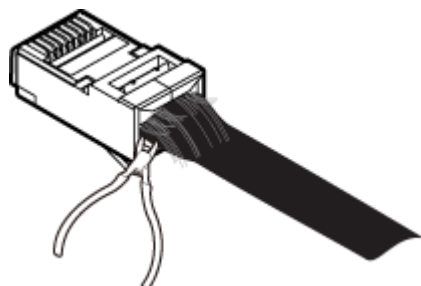- To ensure proper contact between the crimped parts and the core wires, the heights and sizes of the metal contact strips must be uniform and standard.

- The metal contact strips must be parallel to each other, with an offset less than 5°. The top margin of a strip must be parallel to the axis of the connector, with an offset less than 10°.

- To ensure expedite conduction, the surface of the metal contact strips must be clean.

- The metal contact strips must be in good contact with the RJ45 socket. The plastic septa must remain intact and must be aligned properly.

- The soldering edge of a metal contact strip must surpass the ends of the core wires. The ends of the core wires must be in contact with the edge of the RJ45 trough. In principle, the distance between them must be less than 0.5 mm (0.02 in.).

Procedure

Step 1 Hold the crimped connector, with the front side facing you, and check whether the metal contact strips are of the same height. In principle, the height is 6.02 mm (0.237 in.) ± 0.13 mm (0.005 in.). If a measuring tool is not available, you can compare the connector with a standard connector. **Figure 1-46** shows an unqualified piece, and **Figure 1-47** shows a qualified piece.

☍**NOTE**

All unqualified pieces must be crimped again.

Figure 1-46 Metal contact strips of different heights

**Figure 1-47** Metal contact strips of the same height

Step 2 Hold an RJ45 connector and turn it by 45°. Observe the top edges of the metal contact strips. **Figure 1-48** shows an unqualified piece.

Figure 1-48 Unparallel metal contact strips of different heights

Step 3 Check whether the metal contact strips are clean. If they are not clean and the dirt cannot be removed, replace it with a new RJ45 connector. **Figure 1-49** shows an unqualified piece.

Figure 1-49 Dirt on a metal contract strip
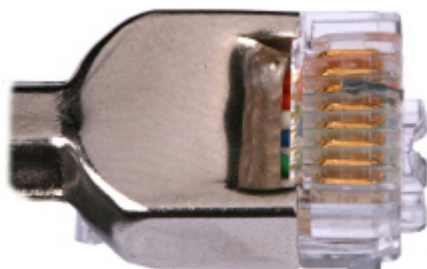
Step 4 Check whether the metal contact strips and the plastic septa are well aligned and intact. If a part is skewed and it cannot be fixed, replace it with a new RJ45 connector. **Figure 1-50** shows an unqualified piece.

Figure 1-50 Skew plastic septa
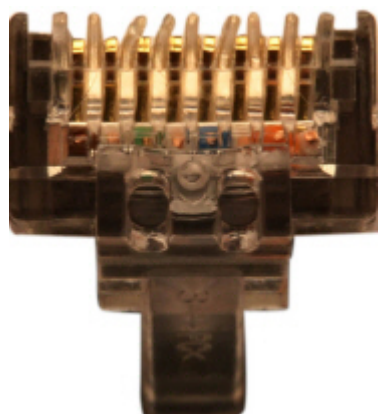
Step 5 Hold the connector, with the side facing towards you, and check whether you can see the cross-sections of the core wires. Ensure that the ends of the core wires are in good contact with the edge of the RJ45 trough, and that the soldering edg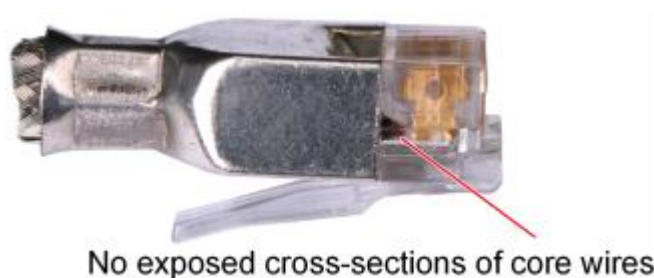e of a metal contact strip surpasses the ends of the core wires and is reliably crimped with the core wires. If not, replace it with a new RJ45 connector. **Figure 1-51** shows an unqualified piece.

Figure 1-51 Core wires not in good contact with the edge of the RJ45 trough

No exposed cross-sections of core wires

----End

1.11.3 Testing the Connection of Assembled Cables

This topic describes how to test an assembled Ethernet cable, thus ensuring that the connectors and wires at both ends are correctly connected. This topic illustrates how to test a straight-through cable.

Context

Huawei provides two types of Ethernet cables: straight-through cables and crossover cables.

● Straight-through cables are connected in a one-to-one manner. They are used to connect network adapters to equipment such as switches or hubs. **Table 1-6** lists the connections of core wires in a straight-through cable.

Table 1-6 Connections of core wires in a straight-through cable

RJ45 Connector 1	RJ45 Connector 2	Core Wire Color	Twisted or Not
2	2	Orange	Twisted

| RJ45 Connector 1	RJ45 Connector 2	Core Wire Color	Twisted or Not
1	1	Orange-White	
6	6	Green	Twisted
3	3	Green-White	
4	4	Blue	Twisted
5	5	Blue-White	
8	8	Brown	Twisted
7	7	Brown-White	

- Crossover cables are connected in a crossover manner. They are used to connect network adapters to equipment such as switches or hubs. **Table 1-7** lists the connections of core wires in a crossover cable.

Table 1-7 Connections of core wires in a straight crossover cable

RJ45 Connector 1	RJ45 Connector 2	Core Wire Color	Twisted or Not
6	2	Orange	Twisted
3	1	Orange-White	
2	6	Green	Twisted
1	3	Green-White	
4	4	Blue	Twisted
5	5	Blue-White	
8	8	Brown	Twisted
7	7	Brown-White	

Figure 1-52 shows the pins of an RJ45 connector.

Figure 1-52 Pins of an RJ45 connector
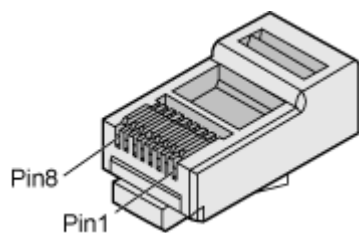
Procedure

Step 1 Feed both connectors of the cable into the ports of the cable tester.

Step 2 After the connectors are properly inserted, turn on the tester. If the indicators from 1 to G turn on simultaneously, you can infer that the pins work normally and the wires are correctly connected.

📖**NOTE**

> Turn the switch to the S position and check whether the indicators turn on simultaneously, as shown in **Figure 1-53**.

Figure 1-53 Testing the conduction and connections of wires

Step 3 Gently shake the connector and repeat **Step 2** to check whether the metal contact strips are in good contact with the core wires and Ethernet ports, as shown in **Figure 1-54**.

Figure 1-54 Checking the reliability

The procedure for testing a crossover cable is the same as that for testing a straight-through cable except for the sequence in which the indicators turn on. You need to refer to the wire connections of a crossover cable.

The Ethernet cable is qualified if the indicators turn on in the following sequence:

At the master (left) section of the tester, the indicators turn on in the sequence of 1-8-G. At the slave (right) section of the tester, the indicators turn on in the sequence of 3-6-1-4-5-2-7-8-G.

Otherwise, the Ethernet cable is unqualified.

📖**NOTE**

   If a tester is not available, you can use a multimeter to perform a simple test, as shown in **Figure 1-55**.

Figure 1-55 Testing the connection of an Ethernet cable
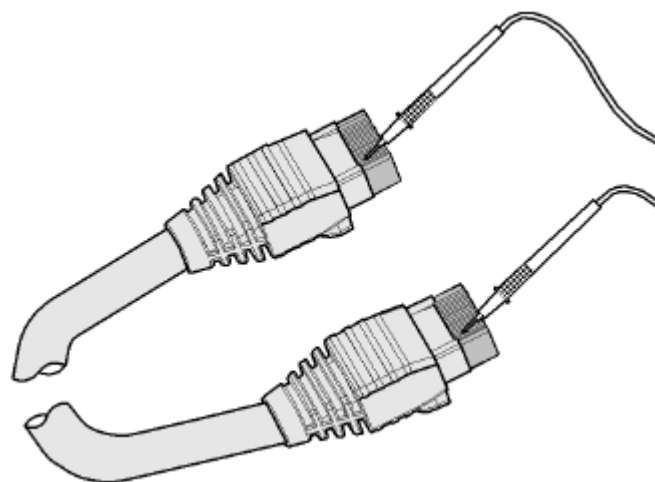
----End

1.11.4 Assembling a Tool-less Female Connector (Pressfit Type) and a Power Cable

This section describes the procedure for making a tool-less female connector (pressfit type) for a RRU3931E power cable.
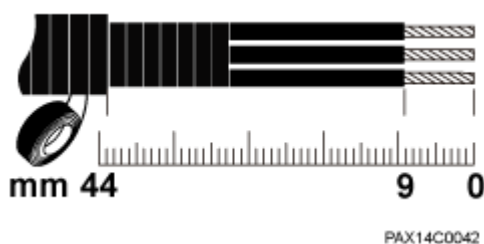
Context

⚠ **DANGER**

Strictly follow the procedure described herein to make a tool-less female connector (pressfit type). Any incompliance may cause damage to the RRU3931E or personal injuries.

Figure 1-56 shows the scale for making a power cable for the RRU3931E.

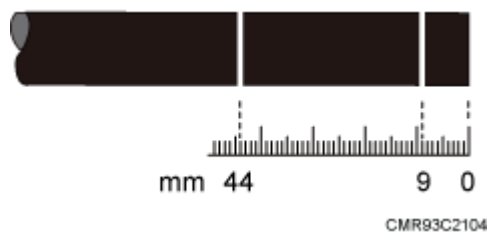**Figure 1-56** RRU3931E power cable-making scale

PAX14C0042

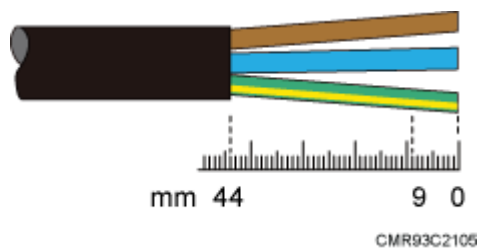| (1) RRU3931E power cable-making scale |
| --- |

Procedure

Step 1 Unwind the required length of the power cable for different operations based on the scale. See **Figure 1-57**

**Figure 1-57** Determining the power cable length

CMR93C2104

Step 2 Remove the outer jacket of the power cable. See **Figure 1-58**

**Figure 1-58** Removing the outer jacket of a cable

Step 3 Remove the outer jacket of each core wire. The length of the removed outer jacket must match the tool-less female connector (pressfit type). See **Figure 1-59**.

Figure 1-59 Removing the outer jacket of core wires
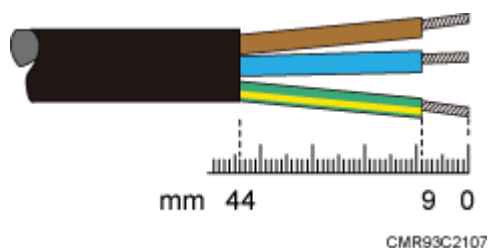
Step 4 Use PVC insulation tapes to wrap the outer jackets of the three core wires and the adjacent section of the AC power cable. See **Figure 1-60**.

Figure 1-60 Insulating a power cable
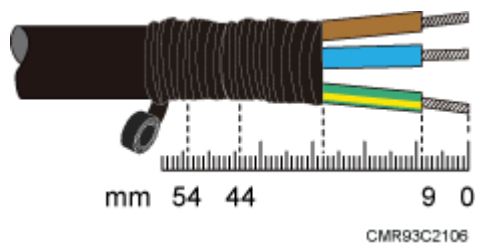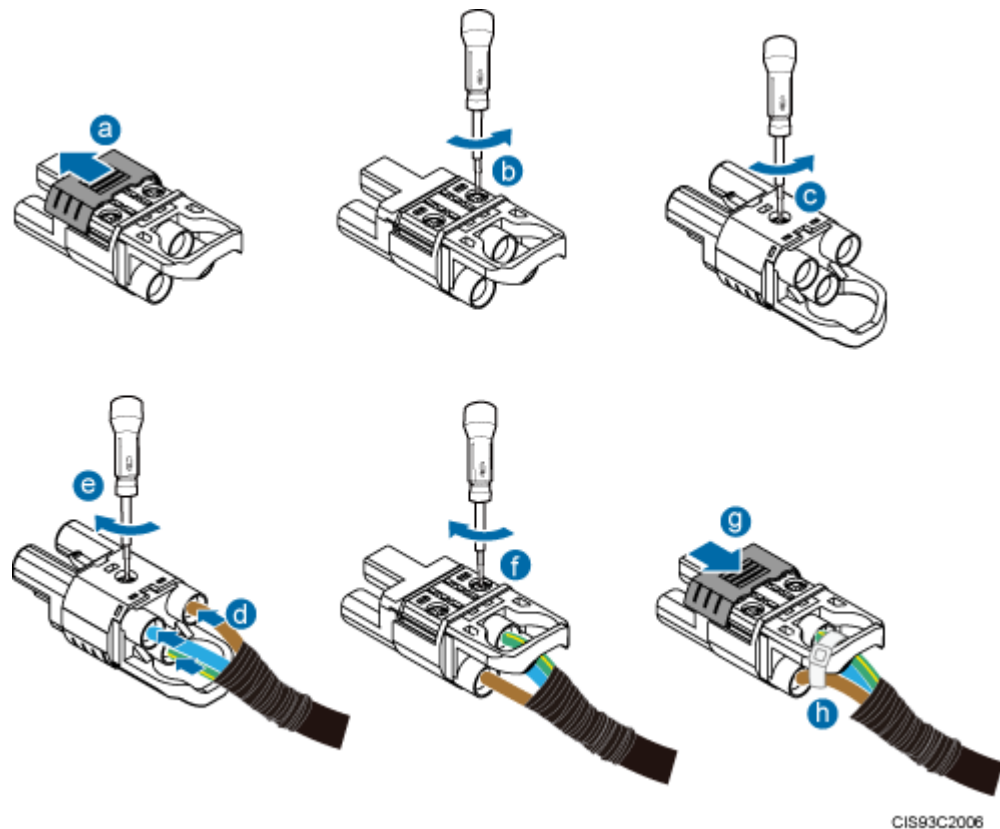

☐**NOTE**

> It is good practice to wrap the three core wires for 16 mm and the adjacent section of the AC power cable section for about 10 mm.

Step 5 Assemble a tool-less female connector (pressfit type) and the three core wires. See **Figure 1-61**.

Figure 1-61 Adding a tool-less female connector (pressfit type) to core wires

CIS93C2006

1. Push the sliding block on the connector outwards along the arrow direction.
2. Use an M3 Phillips torque screwdriver to loosen the two screws.
3. Use the M3 Phillips torque screwdriver to loosen the screw on the other side.
4. Insert the brown core wire into the L port, the blue core wire into the N port, and the yellowish green core wire to the PE port.

> ⚠ **DANGER**
>
> Ensure that the positive and negative wires of all power cables are correctly connected. Any incorrect power cable connection (such as reverse polarity connection) may cause damage to equipment or unexpected personal injuries.

5. Use the M3 Phillips torque screwdriver to torque the screw to 0.5 N·m.
6. Use the M3 Phillips torque screwdriver to torque the two screws on the other side to 0.5 N·m.
7. Push the sliding block back in position along the arrow direction.
8. Use cable ties to bind the core wires to the connector.

Step 6 Gently pull each core wire to check that the connections are secure. The core wires can remain fastened under external force of 30 N. Ensure that all copper wires are inserted into the wiring terminal sockets and no copper wire is exposed outside the connector.

----End

1.11.5 Small Cell Engineering Label

This section describes the content and presents the exterior of Small Cell engineering labels.

Label Content

The Small Cell engineering labels include the power label, ground label, alarm label, antenna system label, optical transmission label, FE/GE electrical port label, and GPS label.

The labels are printed before delivery. Therefore, writing or printing is not required on site. **Table 1-8** describes the content of engineering labels.

Table 1-8 Small Cell Engineering Label Content

| Label Content		Description	Corresponding port on the base station
Power label	Small Cellx PWR	Label for the BTSx power cable.	**PWR**
Ground label	Small Cell PGNDx	Label for the BTS ground cable or equipotential cable.	![ground symbol]
Alarm label	Small Cellx EXT-ALM	Label for the BTSx alarm cable.	**EXT-ALM**
	Small Cellx DBG	Label for the BTSx alarm cable.	**DBG**
Antenna system label	Small Cellx A_{R0}^{T0}, B_{R0}^{T0}, C_{R1}^{T1}, C_{R1}^{T1}	Label for the BTSx TX/RX antenna port.	A_{R0}^{T0}, B_{R0}^{T0}, C_{R1}^{T1}, C_{R1}^{T1}
Optical transmission label	Small Cellx FE/GE2	Label for the BTSx fiber optic cable.	**FE/GE2**
	Small Cellx FE/GE3		**FE/GE3**
FE/GE electrical port label	Small Cellx FE/GE0	Label for the BTSx Ethernet cable.	**FE/GE0**
	Small Cellx FE/GE1		**FE/GE1**
GPS label	Small Cellx GPS	Label for the BTSx GPS cable.	**GPS**

📖**NOTE**

● In the label content, **Small Cell** identifies a Huawei micro base station.

● For a single base station, only labels with Small Cell or Small Cell0 are used.

● For two base stations at the same site: If UMTS and LTE base stations are located at the same site, you are advised to label the UMTS base station as Small Cell0 and the LTE base station as Small Cell1. If two base stations work in the same mode, label the one directly connected to external devices as Small Cell0 and the cascaded one as Small Cell1.

Label Structure

Figure 1-62 shows the structure of a Small Cell engineering label.

Figure 1-62 Label structure
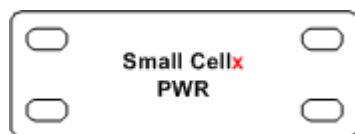
1.11.6 Attaching a Sign Plate Label

This section describes the procedures and precautions for attaching a sign plate label.

Context

● This section applies to Huawei sign plate labels. If other engineering labels in accordance with local standards are used on site, follow the local standards for attaching sign plate labels.

● A sign plate label is usually used for a power cable, ground label, signal cable, and antenna. This section uses **1.11.5 Small Cell Engineering Label** as an example.

Procedure

Step 1 Lead the cable ties through the holes of a label, and then bind the label to the cable, as shown in **Figure 1-63**. Ensure that the cable ties are led through the holes of the label in the same direction.

Figure 1-63 Binding the label
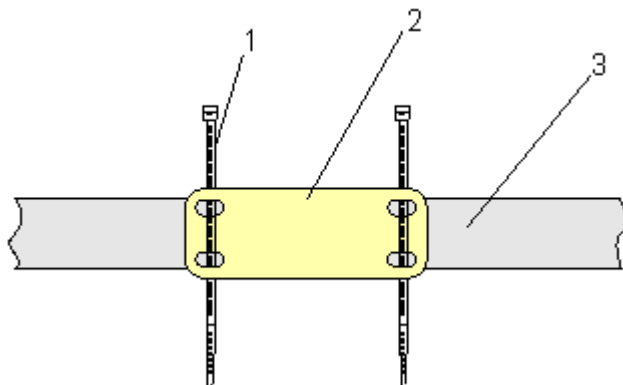
(1): Cable tie	(2): Label	(3): Cable

□ NOTE

> You should use an outdoor cable tie with a appropriate width in outdoor scenarios (the default is black cable tie with 3.6 mm or 0.14 in. width).

- The position for banding the label is recommended from 20 mm to 100 mm (0.79 in. to 3.94 in.) away from the cable connector. Ensure the front of the label facing you and not be covered.

- In case of both ports of the cable connected have different silkscreen, both ends of the cable should bind the port label on the two ends of cable. For example, in dual BTSs cascading scenarios, one end of the cascading FE/GE cable is connected to **LAN1** port on BTS0, and the other end connected to **WAN** port on BTS1. At this point, both ends of the cable should band two labels **Micro BTS0 LAN1** and **Micro BTS1 WAN**. As shown in **Figure 1-64**, the distance between the two labels is recommended from 10 mm to 20 mm (0.39 in. to 0.79 in.).

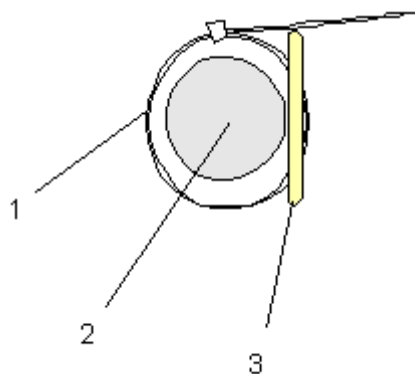**Figure 1-64** Positions for banding labels
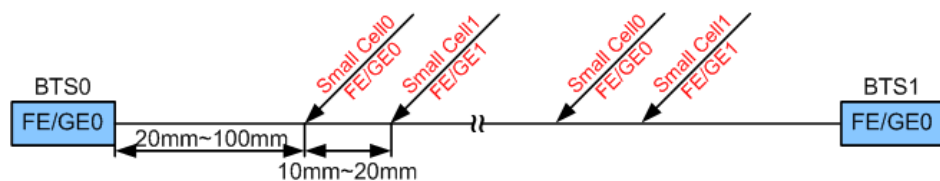
□ NOTE

> You may change the positions for attaching labels in actual situations. For example, you can bind a label where the cable is bent.

Step 2 Tighten the cable tie, securing the label on the cable, and then cut off the extra part of the cable tie, as shown in **Figure 1-65**.

Figure 1-65 Securing the label on the cable

(1): Cable tie	(2): Cable	(3): Label

📖**NOTE**

- When you bind a label, ensure that the side with characters faces outwards.
- Ensure that the labels are attached in an orderly and neat manner. When you cut a cable tie, keep a surplus length of 5 mm to 10 mm (0.20 in. to 0.39 in.).

----End

1.11.7 SN Collection Template

This section describes the SN collection template for RRU3931Es.

The SN collection template is used to record information of RRU3931Es at the initial installation stage to facilitate subsequent commissioning and maintenance. **Table 1-9**

Table 1-9 SN collection template

No.	Site Number	Site Name	Base Station SN	ODM04A SN	Location Information
Sample	*xx*	*RRU3931E*			*xx floor, xx building, xx mansion*
NOTE The SN collection template defines the radio network to access and is essential to engineering and subsequent maintenance, especially when multiple devices are installed at a short distance. Carefully maintain this template.					