

RRU

Hardware Maintenance Guide

Issue 16
Date 2015-03-23

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About This Document

Purpose

This document describes routine maintenance procedures for an RRU such as equipment maintenance and power-on and power-off operations. It also explains how to replace the RRU and optical modules.

The RRUs involved in this document are the RRUs in SingleRAN, GSM, UMTS, LTE FDD, and LTE TDD modes.



NOTE

If LTE is used rather than LTE FDD or LTE TDD in this document, the LTE mode can be the LTE FDD mode or LTE TDD mode. If eNodeB is used rather than eNodeB FDD or eNodeB TDD in this document, the eNodeB can be an eNodeB FDD or a eNodeB TDD.

Product Versions

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

Product Name	Solution Version	Product Version
DBS3900	SRAN6.0 and later versions	V100R004C00 and later versions
	GBSS13.0 and later versions	V100R013C00 and later versions
	RAN13.0 and later versions	V200R013C00 and later versions
	eRAN2.1 and later versions	V100R003C00 and later versions
	eRAN2.1 TDD and later versions	V100R003C00 and later versions

Intended Audience

This document is intended for:

- System engineers
- Site maintenance personnel

Organization

[1 Changes in RRU Hardware Maintenance Guide](#)

This chapter describes the changes in *RRU Hardware Maintenance Guide*.

[2 Preventative Maintenance Items for an RRU](#)

Preventative maintenance improves the reliability of the RRU. You are advised to perform scheduled maintenance yearly.

[3 Powering On and Off an RRU](#)

After an RRU is powered on, check the status of RRU indicators and voltage. Before the RRU is powered off, follow the normal power-off or emergent power-off procedure as required.

[4 Replacing an RRU](#)

This chapter describes the procedures and precautions for replacing a common RRU, replacing a blade RRU, and replacing a non-blade RRU with a blade RRU by reusing mounting kits. Replacing an RRU interrupts all the services carried by the RRU and causes alarms.

[5 Replacing an Optical Module](#)

An optical module implements optical-electrical conversion, enabling optical transmission between an RRU and other devices. You must disconnect optical fibers from an optical module before replacing the optical module. Disconnecting the optical fibers interrupts the transmission of CPRI signals.




[6 Adding RRUs](#)



This chapter describes the procedure and precautions for adding RRUs with different exteriors on a pole.

Conventions

Symbol Conventions

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

Symbol	Description
 DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Symbol	Description
 NOTICE	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.
 NOTE	Calls attention to important information, best practices and tips. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

General Conventions

Convention	Description
Times New Roman	Normal paragraphs are in Times New Roman.
Boldface	Names of files, directories, folders, and users are in boldface . For example, log in as user root .
<i>Italic</i>	Book titles are in <i>italics</i> .
Courier New	Terminal display is in Courier New.

Command Conventions

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

GUI Conventions

Convention	Description
Boldface	Buttons, menus, parameters, tabs, windows, 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 Operation

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 Operation

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 RRU Hardware Maintenance Guide

This chapter describes the changes in *RRU Hardware Maintenance Guide*.

16 (2015-03-23)

This is the sixteenth commercial release.

Compared with issue 15 (2015-02-10), this issue does not include any new information.

Compared with issue 15 (2015-02-10), this issue includes the following change:

Topic	Change Description
3.2 Powering Off an RRU	Added the procedure of checking whether the power-off operation succeeds.
4.2.1 Replacing an RRU Using a Mounting Kit for a Common RRU 4.2.2 Replacing an RRU Using a Mounting Kit for a Blade RRU	Added the procedure and caution.

Compared with issue 15 (2015-02-10), no information is deleted from this issue.

15 (2015-02-10)

This is the fifteenth commercial release.

Compared with issue 14 (2015-01-30), this issue does not include any new information.

Compared with issue 14 (2015-01-30), this issue includes the following change:

Topic	Change Description
4.4 Replacing a Non-Blade RRU with a Blade RRU	Modified the context and procedure of replacing a Non-Blade RRU with a Blade RRU.

Compared with issue 14 (2015-01-30), no information is deleted from this issue.

14 (2015-01-30)

This is the fourteenth commercial release.

Compared with issue 13 (2014-11-10), this issue does not include any new information.

Compared with issue 13 (2014-11-10), this issue includes the following change:

Topic	Change Description
4.4 Replacing a Non-Blade RRU with a Blade RRU	Modified the context and procedure of replacing a Non-Blade RRU with a Blade RRU.

Compared with issue 13 (2014-11-10), no information is deleted from this issue.

13 (2014-11-10)

This is the thirteen commercial release.

Compared with issue 12 (2014-10-20), this issue does not include any new information.

Compared with issue 12 (2014-10-20), this issue includes the following change:

Topic	Change Description
4.4 Replacing a Non-Blade RRU with a Blade RRU	Modified the context and procedure of replacing a Non-Blade RRU with a Blade RRU.

Compared with issue 12 (2014-10-20), no information is deleted from this issue.

12 (2014-10-20)

This is the twelfth commercial release.

Compared with issue 11 (2014-08-20), this issue does not include any new information.

Compared with issue 11 (2014-08-20), this issue includes the following change:

Topic	Change Description
4.4 Replacing a Non-Blade RRU with a Blade RRU	Added the figure of waterproofing a connector of the alarm cable.

Compared with issue 11 (2014-08-20), no information is deleted from this issue.

11 (2014-08-20)

This is the eleventh commercial release.

Compared with issue 10 (2014-01-20), this issue does not include any new information.

Compared with issue 10 (2014-01-20), this issue includes the following change:

Topic	Change Description
4.5 Replacing Blade RRUs in the ICR and Adding Blade RRUs to the ICR	Added the description that the 18 L blade RRU does not support the indoor centralized installation.

Compared with issue 10 (2014-01-20), no information is deleted from this issue.

10 (2014-01-20)

This is the tenth commercial release.

Compared with issue 09 (2013-09-26), this issue does not include any new information.

Compared with issue 09 (2013-09-26), this issue includes the following change:

Topic	Change Description
4.1 Preparations Before Replacement	Added the information about U2000.
4.6 Operations After Replacement	
6 Adding RRUs	

Compared with issue 09 (2013-09-26), no information is deleted from this issue.

09 (2013-09-26)

This is the ninth commercial release.

Compared with issue 08 (2013-07-30), this issue includes the following new information:

[4.5 Replacing Blade RRUs in the ICR and Adding Blade RRUs to the ICR.](#)

Compared with issue 08 (2013-07-30), this issue includes the following change:

Topic	Change Description
5 Replacing an Optical Module	Optimized the description of the function that the optical modules are hot-swappable.

Compared with issue 08 (2013-07-30), no information is deleted from this issue.

08 (2013-07-30)

This is the eighth commercial release.

Compared with issue 07 (2013-05-30), this issue includes the following new information:

- [4.1 Preparations Before Replacement](#)
- [4.4 Replacing a Non-Blade RRU with a Blade RRU](#)
- [4.6 Operations After Replacement](#)
- [6 Adding RRUs](#)

Compared with issue 07 (2013-05-30), this issue includes the following changes:

Topic	Change Description
4.2.1 Replacing an RRU Using a Mounting Kit for a Common RRU	Added the scenario where attachment plate B for a common RRU is installed together with mounting kit A for a common RRU and the figure showing the scenario.
4.2.1 Replacing an RRU Using a Mounting Kit for a Common RRU	Changed preparations before replacement to 4.1 Preparations Before Replacement and operations after replacement to 4.6 Operations After Replacement .
4.2.2 Replacing an RRU Using a Mounting Kit for a Blade RRU	

Compared with issue 07 (2013-05-30), no information is deleted from this issue.

07 (2013-05-30)

This is the seventh commercial release.

Compared with issue 06 (2013-04-28), this issue includes the following change:

Topic	Change Description
5 Replacing an Optical Module	Changed the description "An optical module is hot-swappable if the CPRI port is not changed." to "An optical module or a CPRI fiber optic cable cannot be inserted into or removed from this CPRI port when the power supply is connected."

Compared with issue 06 (2013-04-28), no information is deleted from or included in this issue.

06 (2013-04-28)

This is the sixth commercial release.

Compared with issue 05 (2012-12-30), this issue includes the following changes:

Topic	Change Description
4.2.1 Replacing an RRU Using a Mounting Kit for a Common RRU	Added the description of replacing an RRU using a mounting kit for a common RRU.
5 Replacing an Optical Module	Added the steps of powering on and off an

Topic	Change Description
	RRU.

Compared with issue 05 (2012-12-30), no information is deleted from or included in this issue.

05 (2012-12-30)

This is the fifth commercial release.

Compared with issue 04 (2012-09-15), this issue includes the following new information:

- [4.2.2 Replacing an RRU Using a Mounting Kit for a Blade RRU](#)

Compared with issue 04 (2012-09-15), this issue includes the following changes:

Topic	Change Description
3.1 Powering On an RRU	Optimized the contents in these sections.
3.2 Powering Off an RRU	
4.2.1 Replacing an RRU Using a Mounting Kit for a Common RRU	Modified the title and added the information of RRU mounting kits.

Compared with issue 04 (2012-09-15), no information is deleted from this issue.

04 (2012-09-15)

This is the fourth commercial release.

Compared with issue 03 (2012-07-20), this issue does not include any new information.

Compared with issue 03 (2012-07-20), this issue includes the following change:

Topic	Change Description
4.2.1 Replacing an RRU Using a Mounting Kit for a Common RRU	Optimized the contents in these sections.
5 Replacing an Optical Module	

Compared with issue 03 (2012-07-20), no information is deleted from this issue.

03 (2012-07-20)

This is the third commercial release.

Compared with issue 02 (2012-02-10), this issue does not include any new information.

Compared with issue 02 (2012-02-10), this issue includes the following change:

Topic	Change Description
4.2.1 Replacing an RRU Using a Mounting Kit for a Common RRU	Optimized the contents in this section.

Compared with issue 02 (2012-02-10), no information is deleted from this issue.

02 (2012-02-10)

This is the second commercial release.

Compared with issue 01 (2011-11-30), this issue does not include any new information.

Compared with issue 01 (2011-11-30), this issue includes the following change:

Topic	Change Description
5 Replacing an Optical Module	Added the steps of querying the type of a faulty optical module.

Compared with issue 01 (2011-11-30), no information is deleted from this issue.

01 (2011-11-30)

This is the first commercial release.

This release incorporates the following documents to *RRU Hardware Maintenance Guide*.

- RRU3201 Hardware Maintenance Guide
- RRU3203 Hardware Maintenance Guide
- RRU3220 Hardware Maintenance Guide
- RRU3222 Hardware Maintenance Guide
- RRU3808 Hardware Maintenance Guide
- RRU3221 Hardware Maintenance Guide
- RRU3240 Hardware Maintenance Guide
- RRU3004 (DC) Hardware Maintenance Guide
- RRU3004 (AC) Hardware Maintenance Guide
- RRU3008 (AC) V1 Hardware Maintenance Guide
- RRU3008 (AC) V2 Hardware Maintenance Guide
- RRU3008 (DC) V1 Hardware Maintenance Guide
- RRU3008 (DC) V2 Hardware Maintenance Guide
- RRU3908 (AC) V1 Hardware Maintenance Guide
- RRU3908 (AC) V2 Hardware Maintenance Guide
- RRU3908 (DC) V1 Hardware Maintenance Guide
- RRU3908 (DC) V2 Hardware Maintenance Guide
- RRU3804&RRU3901E&3806 Hardware Maintenance Guide
- RRU3804&RRU3901E&3806 (AC) Hardware Maintenance Guide

- RRU3805 Hardware Maintenance Guide
- RRU3808 Hardware Maintenance Guide
- RRU3828 Hardware Maintenance Guide
- RRU3928 Hardware Maintenance Guide
- RRU3929 Hardware Maintenance Guide

2 Preventative Maintenance Items for an RRU

Preventative maintenance improves the reliability of the RRU. You are advised to perform scheduled maintenance yearly.



DANGER

When working at heights, the maintenance personnel need to exercise caution to avoid falling of objects, which may cause injuries or death. In addition, the maintenance personnel must always wear helmets in the working area and avoid dangerous areas.

The items in the following checklist are not mandatory but strongly recommended. [Table 2-1](#) lists the preventative maintenance items for an RRU.

Table 2-1 Preventative maintenance items for an RRU

No.	Item
1	All RRUs are properly installed and in good condition.
2	The cable seals at the entry points of the cabinet are in good condition.
3	All ground cables are properly grounded.
4	All RF cables are free from wear, cuts, cracks, or other damage.
5	All RF cable connectors are sealed properly.
6	All RF cable conduits are in good condition.
7	All power cables are free from wear, cuts, cracks, or other damage.
8	All power cable connectors are in good condition.
9	All power cable conduits are in good condition.
10	All shield layers of power cables are in good condition.
11	All power cables are in good condition.

No.	Item
12	All CPRI optical fibers are free from wear, cuts, cracks, or other damage.
13	All screws are tightened on the cover plate of the maintenance cavity.
14	All RET cables (optional) are free from wear, cuts, cracks, or other damage.
15	All RET cable (optional) connectors are sealed properly.
16	All alarm cables (optional) are installed and free from any damage.
17	All monitoring cables (optional) are installed and free from any damage.

If any of the requirements in the checklist is not met, perform the following corrective actions.

1. Tighten all connections.
2. Report the problems to the supervisor so that the qualified engineers can be assigned to maintain the parts on the tower.

3 Powering On and Off an RRU

About This Chapter

After an RRU is powered on, check the status of RRU indicators and voltage. Before the RRU is powered off, follow the normal power-off or emergent power-off procedure as required.

3.1 Powering On an RRU

This section describes how to power on an RRU. Observe the indicators on the RRU to check the running status.

3.2 Powering Off an RRU

An RRU can be powered off in two ways: normal power-off and emergency power-off. You need to perform a normal power-off in scenarios such as an equipment swap or foreseeable regional blackout, and you need to perform an emergency power-off in emergencies such as a fire, smoke, or water damage in the equipment room.

3.1 Powering On an RRU

This section describes how to power on an RRU. Observe the indicators on the RRU to check the running status.

Prerequisites

- The RRU hardware is installed and RRU cable connections are secure.
- The input voltage of a DC RRU ranges from -36 V DC to -57 V DC.
- The input voltage of an AC RRU ranges from 100 V AC to 240 V AC.

Context



NOTICE

After unpacking an RRU, you must power on it within 24 hours. If you power off the RRU for maintenance, you must restore power to the RRU within 24 hours.

Procedure

- Step 1** On the power equipment for the RRU, set the corresponding circuit breaker to ON or insert a corresponding EPC connector.



DANGER

Do not look into the optical module without eye protection after the RRU is powered on.

- Step 2** Wait 3 to 5 minutes, and then check the status of the indicators on the RRU. For details, see section "RRU Indicators" in the hardware description of the corresponding RRU.



NOTE

If RRUs are cascaded, check the status of all RRU indicators.

- Step 3** Take corresponding actions based on the status of the indicators.

If...	Then...
The RRU is working properly	End the power-on check task.
The RRU is faulty	On the power equipment for the RRU, set the corresponding circuit breaker to OFF or remove the corresponding EPC connector. Rectify the fault, and then go to Step 1 .

----End

3.2 Powering Off an RRU

An RRU can be powered off in two ways: normal power-off and emergency power-off. You need to perform a normal power-off in scenarios such as an equipment swap or foreseeable regional blackout, and you need to perform an emergency power-off in emergencies such as a fire, smoke, or water damage in the equipment room.

Procedure

- Normal power-off



NOTE

If RRUs are cascaded, services carried on the lower-level RRU may be interrupted during the replacement of the upper-level RRU.

1. On the power equipment for the RRU, set the corresponding circuit breaker to OFF or remove the corresponding EPC connector.
- Emergency power-off



NOTICE

Emergency power-off may damage the RRU. Therefore, do not perform an emergency power-off in normal cases.

1. Shut off the external input power of the power equipment for the RRU.
2. If time permits, on the power equipment for the RRU, set the corresponding circuit breaker to OFF or remove the corresponding EPC connector.
- **Optional:** Perform the following operations to check whether the power-off operation succeeds for AC RRUs:
 1. Use an electroprobe or multimeter to check whether the equipment shell is energized. If it is, the power-off operation fails. In this case, perform the power-off operation again.
 2. Use a multimeter to check whether the equipment port voltage is 0. If it is not, the equipment fails to be powered off. In this case, perform the power-off operation again.

----End

4 Replacing an RRU

About This Chapter

This chapter describes the procedures and precautions for replacing a common RRU, replacing a blade RRU, and replacing a non-blade RRU with a blade RRU by reusing mounting kits. Replacing an RRU interrupts all the services carried by the RRU and causes alarms.

4.1 Preparations Before Replacement

This section describes preparations before an RRU is replaced, including disabling the maximum output power locking, blocking the RRUs, and powering off the RRUs.

4.2 Replacing an RRU Using Assembled Mounting Kits

Assembled mounting kits are different for common RRUs and blade RRUs.

4.3 Replacing an RRU Using Non-assembled Mounting Kits

This section describes procedures and precautions for replacing an RRU using non-assembled mounting kits.

4.4 Replacing a Non-Blade RRU with a Blade RRU

This section describes the procedure and precautions for replacing a non-blade RRU with a blade RRU.

4.5 Replacing Blade RRUs in the ICR and Adding Blade RRUs to the ICR

This section describes procedures for replacing non-blade RRUs in the indoor centralized rack (ICR) with blade RRUs and adding blade RRUs to the ICR.

4.6 Operations After Replacement

This section describes operations to be performed after an RRU is replaced, including setting the maximum output power locking, unblocking an RRU, powering on an RRU, and handling a faulty RRU.

4.1 Preparations Before Replacement

This section describes preparations before an RRU is replaced, including disabling the maximum output power locking, blocking the RRUs, and powering off the RRUs.

Prerequisites

- The test UE communicates with the base station properly.
- The types of faulty RRUs are confirmed and the method of confirming is as follows:
 - If RRUs can be queried online, log in to the LMT and run the MML command to query the electronic labels of the RRUs. The types of RRUs to be replaced can be determined according to the values of **Type** and **Description** in the command output.
 - On the GSM side, run the **DSP BTSELABEL** command.
 - On the UMTS side, if NodeB V100R013 or a later version is used, run the **LST BRDINFO** command.
 - On the UMTS side, if NodeB V200R012 is used, run the **DSP BRDINFO** command.
 - On the UMTS side, if NodeB V200R013 or a later version is used, run the **DSP BRDMFRINFO** command.
 - On the LTE side, run the **DSP BRDMFRINFO** command.
 - If RRUs cannot be queried online, query the information about the RRUs offline on the network management system (M2000/U2000).

Procedure

Step 1 Optional: If a functional RRU is to be replaced, disable its maximum output power locking for TX channels before storing it in the spare parts inventory.



NOTE

- If a faulty RRU is to be replaced, its maximum output power locking does not need to be disabled. Then, go to [Step 2](#).
 - The following RRUs do not support maximum output power locking for TX channels: RRU3201, RRU3203, RRU3222, RRU3004 (DC), RRU3004 (AC), RRU3008 (DC) V1, RRU3008 (AC) V1, RRU3008 (DC) V2, RRU3008 (AC) V2, RRU3801E (DC), RRU3801E (AC), RRU3804 (DC), RRU3804 (AC), RRU3805, RRU3806 (DC), RRU3806 (AC), RRU3808, RRU3908 (DC) V1, RRU3908 (AC) V1, RRU3908 (DC) V2, RRU3908 (AC) V2, RRU3232, RRU3251, RRU3252(DC), RRU3256(DC), RRU3252(AC), and RRU3253.
1. Check the maximum output power locking for TX channels of the new RRU.
 - On the UMTS or LTE side, log in to the LMT and run the **DSP RRU** command to query the hardware maximum output power of the TX channels of the RRU.
 - On the GSM side, log in to the SMT. In the left pane of the **Site Maintenance Terminal System** window, click **Site**. In the right pane of the window, double-click **Lock RXU Traffic Capability**. In the displayed **Lock RXU Traffic Capability** window, click the **Query Config** tab. On the displayed tab page, select the target RRU.
 - On the GSM side, log in to the LMT. Enter **DSP BTSBRD** in the **Command Input** text box and click **Assist**. Set **Information Type** to **RUNPARA**, **Index Type** to **BYID** or **BYNAME**, **Board Type** to **RXU**, **RXU Board Index Type** to an appropriate value, and click **Exec**. In the command execution output, view the parameters **Hardware Maximum Output Power of the TX Channel** and **Maximum Output Power of the TX Channel**.

If...	Then...
The maximum output power locking is enabled for TX channels	Go to Step 1.2 .
The maximum output power locking is disabled for TX channels	Go to Step 2 .

2. Set the maximum output power of the TX channels of the RRU to 0 to disable the maximum output power locking.
 - On the UMTS or LTE side, log in to the LMT and run the **LOC RRUTC** command to disable the maximum output power locking for TX channels of the RRU.
 - On the GSM side, log in to the SMT. In the left pane of the **Site Maintenance Terminal System** window, click **Site**. In the right pane of the window, double-click **Lock RXU Traffic Capability**. In the displayed **Lock RXU Traffic Capability** window, click the **Config** tab. On the displayed tab page, select the target RRU.
 - On the GSM side, log in to the LMT. Enter **LOC BTSRXUTC** in the **Command Input** box and click **Assist** to disable the maximum output power locking. Then, Click **Exec**.



NOTE

- If there is more than one RRU, perform the operation on each RRU.
- If RRUs are cascaded, set the maximum output power from the lowest-level RRU to reduce the impact on upper-level RRUs.

Step 2 Instruct the network management system (M2000/U2000) administrator to block the RRU.

- On the UMTS side, log in to the LMT and run the **BLK BRD** command to block the RRU.
- On the LTE side, log in to the LMT and run the **BLK BRD** command to block the RRU.
- On the GSM side, log in to the BSC LMT and run the **SET GTRXADMSTAT** command with the parameter **ADMSTAT** set to **LOCK** to block the carriers of the RRU.

Step 3 Power off the RRU according to the instructions in [3.2 Powering Off an RRU](#).

----End

4.2 Replacing an RRU Using Assembled Mounting Kits

Assembled mounting kits are different for common RRUs and blade RRUs.

4.2.1 Replacing an RRU Using a Mounting Kit for a Common RRU

This section describes the procedure and precautions for replacing an RRU using a mounting kit for a common RRU.

Prerequisites

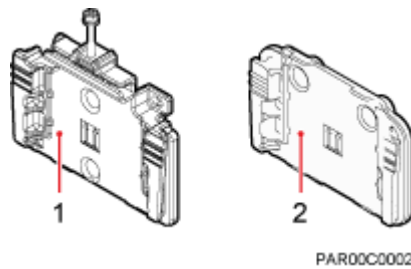
- The operations in [4.1 Preparations Before Replacement](#) have been performed.
- The following tools and materials are available: ESD gloves, M4 and M6 Phillips screwdrivers, waterproof tape, and PVC insulation tape.
- The number and type of RRUs to be replaced are confirmed, and new RRUs are available.

Context

- RRUs and attachment plates in this section are only for reference. The actual RRUs and attachment plates may be different.

- This section describes the procedure for replacing an RRU by reusing a mounting kit. For how to replace an RRU by using a new mounting kit, see a related RRU installation guide.
- RRUs are in the same type after the replacement but their attachment plates may be different.
- [Figure 4-1](#) shows two kinds of attachment plates for a common RRU.

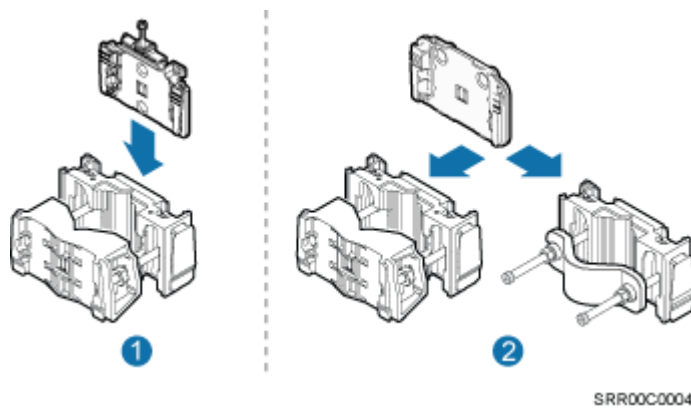
Figure 4-1 Attachment plate for a common RRU



(1) Attachment plate A for a common RRU (2) Attachment plate B for a common RRU

- An attachment plate for a common RRU is used during the replacement. Attachment plate A for a common RRU can only be installed together with mounting kit A for a common RRU, and attachment plate B for a common RRU can be installed together with mounting kit A or B for a common RRU, as shown in [Figure 4-2](#).

Figure 4-2 Scenarios where an attachment plate for a common RRU is installed together with a mounting kit for a common RRU



(1) Scenario of attachment plate A for a common RRU

(2) Scenarios of attachment plate B for a common RRU

Procedure

Step 1 Wear ESD gloves.



NOTICE

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

Step 2 Use an M4 Phillips screwdriver to loosen the screws on the cover plate of the RRU cabling cavity. Then open the cover plate.



NOTE

Pre-loosen all screws before loosening them. This way, the screws are not damaged, and the maintenance cavity is easy to be opened.

Step 3 Record cable connections on the panel of a board to be replaced.

Step 4 Disconnect all cables from the cabling cavity and bottom panel in the sequence of power cables first and ground cables at last.

Step 5 Use an M4 Phillips screwdriver to loosen the captive screws on the two hoist clamps of the main bracket, as shown in [Figure 4-3](#) and [Figure 4-4](#).

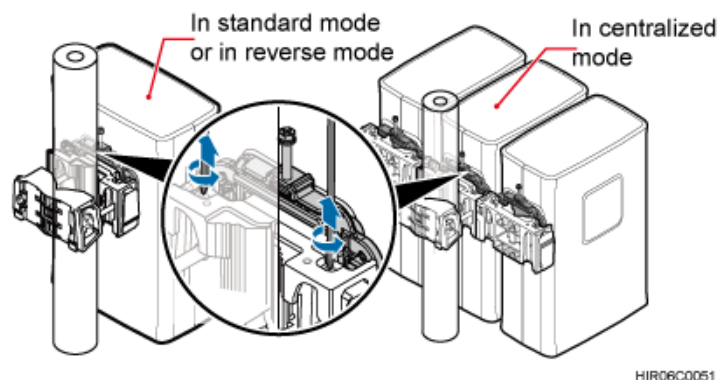


NOTE

If an RRU is installed in centralized mode, the RRU can be removed without removing the two RRUs on its right and left sides. The procedure is the same as that for removing a single RRU.

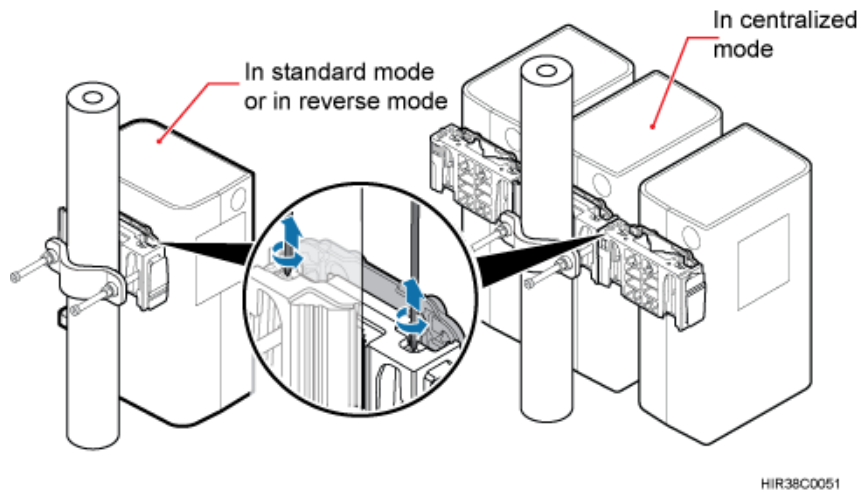
- **Replacing an RRU Using Mounting Kit A for a Common RRU**

Figure 4-3 Loosening captive screws on the main bracket (1)



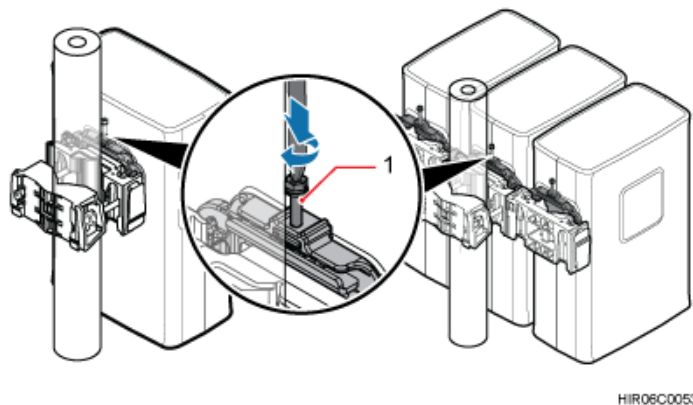
- **Replacing an RRU Using Mounting Kit B for a Common RRU**

Figure 4-4 Loosening captive screws on the main bracket (2)



Step 6 Optional: When attachment plate A for a common RRU is used, use an M6 Phillips screwdriver to loosen the screw only for removing the RRU on the attachment plate to loosen the connection between the attachment plate and the main bracket, as shown in [Figure 4-5](#).

Figure 4-5 Loosening the screw only for removing the RRU on the attachment plate

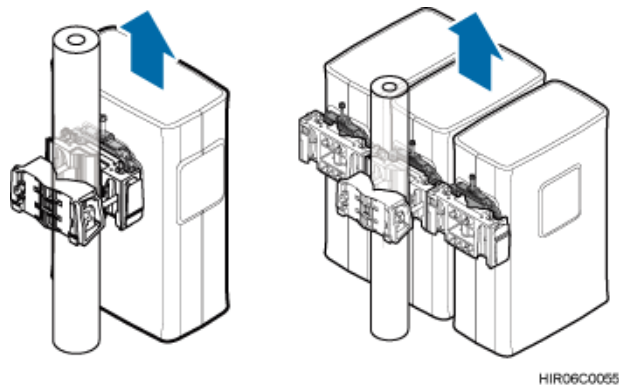


(1) Screw only for removing the RRU

Step 7 Raise the bottom of the RRU to remove it, as shown in [Figure 4-6](#) and [Figure 4-7](#).

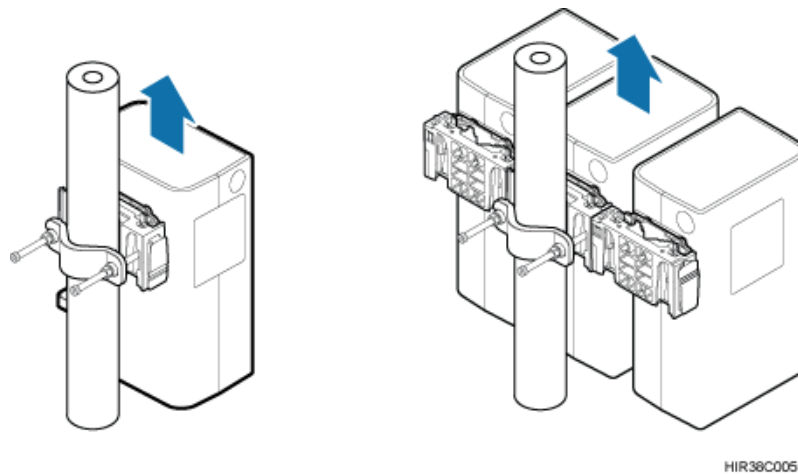
- **Replacing an RRU Using Mounting Kit A for a Common RRU**

Figure 4-6 Raising the bottom of the RRU (1)



- **Replacing an RRU Using Mounting Kit B for a Common RRU**

Figure 4-7 Raising the bottom of the RRU (2)



NOTICE

When removing the RRU, hold the RRU handle with one hand and raise the bottom of the RRU with the other hand.

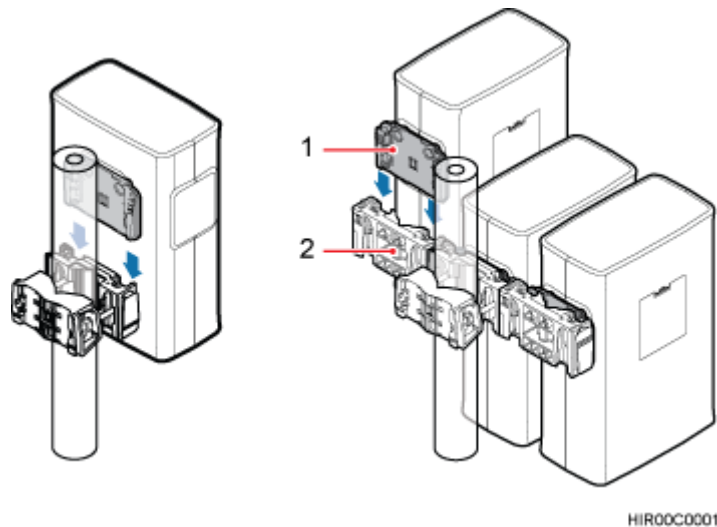
- Step 8** Use an M4 torque screwdriver to tighten the captive screws on the two hoist clamps of the main bracket to 1.4 N·m (12.39 lbf in.).
- Step 9** When an RRU attachment plate matches its mounting kit, install a new RRU by referring to a related RRU installation guide. [Figure 4-8](#) shows the scenario where attachment plate B for a common RRU is installed together with mounting kit A for a common RRU.



NOTE

Attachment plate A for a common RRU matches mounting kit A for a common RRU, and attachment plate B for a common RRU matches mounting kit B for a common RRU.

Figure 4-8 Scenario where attachment plate B for a common RRU is installed together with mounting kit A for a common RRU



(1) Attachment plate B for a common RRU (2) Mounting kit A for a common RRU

Step 10 Reconnect all required cables, waterproof the connectors on the RF jumpers, and ensure that vacant cable troughs in the cabling cavity are blocked by waterproof blocks.

Step 11 Close the cover plate of the RRU cabling cavity. Then use an M4 torque screwdriver to tighten the screws on the cover plate of the RRU cabling cavity.

----End

4.2.2 Replacing an RRU Using a Mounting Kit for a Blade RRU

This section describes the procedure and precautions for replacing an RRU using a mounting kit for a blade RRU.

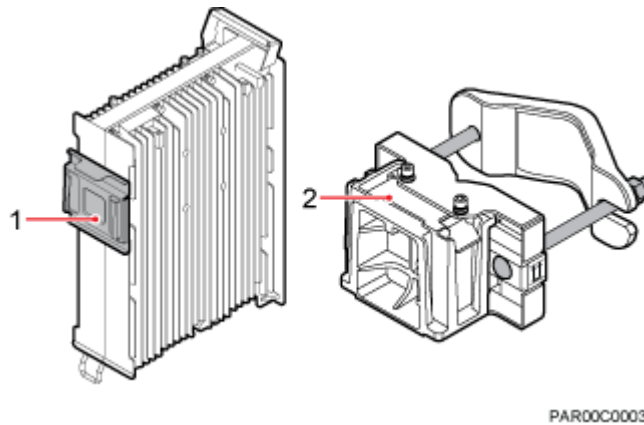
Prerequisites

- The operations in [4.1 Preparations Before Replacement](#) have been performed.
- The following tools and materials are available: ESD gloves, an M5 Phillips screwdriver, an M6 inner hexagon torque screwdriver, waterproof tape, and PVC insulation tape.
- The number and type of RRUs to be replaced are confirmed, and new RRUs are available.

Context

- RRUs and attachment plates in this section are only for reference. The actual RRUs and attachment plates may be different.
- This section describes the procedure for replacing an RRU by reusing a mounting kit. For how to replace an RRU by using a new mounting kit, see a related RRU installation guide.
- The RRU attachment plate varies with the RRU type before and after the replacement.
- [Figure 4-9](#) shows an attachment plate and a mounting kit for a blade RRU.

Figure 4-9 Attachment plate and mounting kit for a 12 L blade RRU



(1) Attachment plate for a blade RRU

Mounting kit for a blade RRU

Procedure

Step 1 Wear ESD gloves.



NOTICE

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

Step 2 Use an M5 Phillips screwdriver to loosen the screws on the cover plate of the RRU cabling cavity. Then open the cover plate.



NOTE

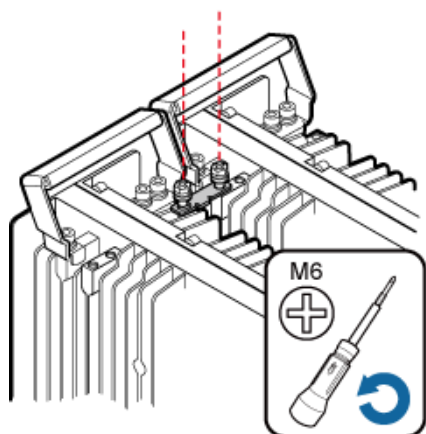
Pre-loosen all screws before loosening them. This way, the screws are not damaged, and the maintenance cavity is easy to be opened.

Step 3 Record all the cable connections on the panel of the module to be replaced.

Step 4 Disconnect all cables from the cabling cavity and bottom panel in the sequence of power cables first and ground cables at last.

Step 5 **Optional:** If an RRU installed in centralized mode is to be replaced, use an M6 Phillips screwdriver to loosen the two screws on the metal sheet, and remove the metal sheet, as shown in [Figure 4-10](#).

Figure 4-10 Removing the metal sheet from an RRU installed in centralized mode



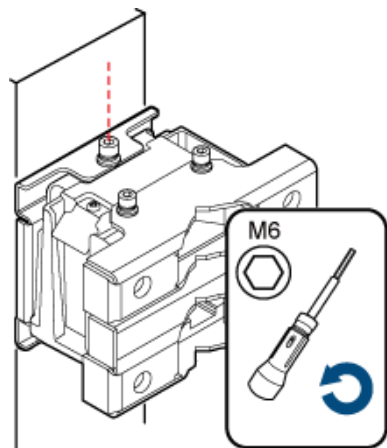
HIR42C0052

NOTE

If an RRU is installed in centralized mode, the RRU can be removed without removing the two RRUs on its right and left sides. The procedure is the same as that for removing a single RRU.

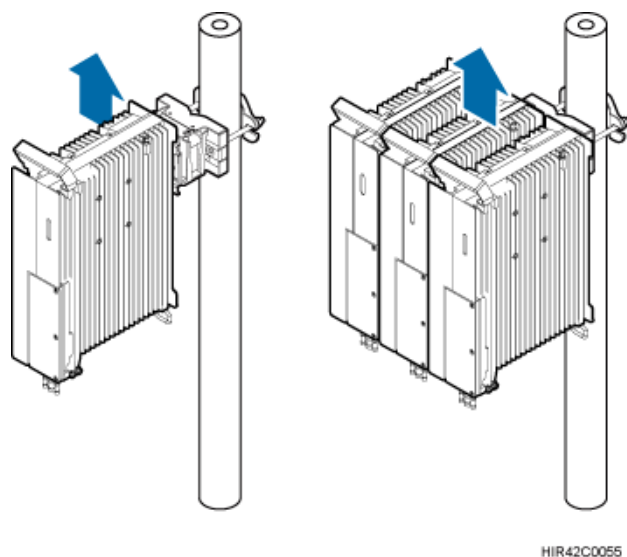
- Step 6** Use an inner hexagon torque screwdriver to loosen captive screws on the attachment plate for the RRU and on the top holes of the main bracket, as shown in [Figure 4-11](#). Then raise the bottom of the RRU to remove it, as shown in [Figure 4-12](#).

Figure 4-11 Loosening captive screws on the attachment plate



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Figure 4-12 Raising the bottom of the RRU



NOTICE

When removing the RRU, hold the RRU handle with one hand and raise the bottom of the RRU with the other hand.

- Step 7** Install a new RRU. For details, see *RRU Installation Guide*.
- Step 8** Reconnect all required cables, waterproof the connector on the RF jumper, and verify that vacant cable troughs in the cabling cavity are equipped by waterproof blocks.
- Step 9** Close the cover plate of the RRU cabling cavity. Then use an M5 torque screwdriver to tighten the screws on the cover plate of the RRU cabling cavity.

----End

4.3 Replacing an RRU Using Non-assembled Mounting Kits

This section describes procedures and precautions for replacing an RRU using non-assembled mounting kits.

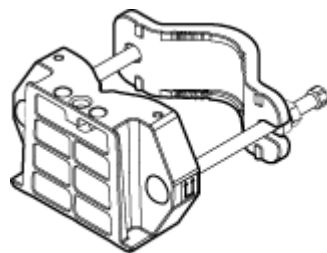
Prerequisites

- Preparations before powering off and replacing the RRU have been complete.
- The following tools and materials are available: ESD gloves, M4 phillips screwdriver, M6 hex screwdriver, M10 torque wrench, waterproof tape, and PVC insulation tape.
- The quantity of faulty RRU modules has been determined, and the same quantity of new RRU modules are ready.

Context

- The RRUs and conversion brackets are only for reference.
- The following figures use the blade RRU and non-blade RRU as an example to illustrate how to replace the RRU. Specific appearances are subject to site conditions.
- [Figure 4-13](#) shows the appearance of non-assembled mounting kits.

Figure 4-13 Appearance of non-assembled mounting kits



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Procedure

- Step 1** Wear a pair of ESD gloves.
- Step 2** Use an M4 phillips screwdriver for a non-blade RRU or an M5 phillips screwdriver for a blade RRU to loosen the screws on the cover plate of the cabling cavity and open the RRU cabling cavity.



NOTICE

Before loosening a screw, pre-loosen all screws. If the screws are damaged, it is difficult to open the maintenance cavity.

- Step 3** Record the position of the RRU cabling cavity and all cable connections at the bottom of the RRU.
- Step 4** Remove all cables in the RRU cabling cavity and at the RRU bottom in the sequence of power cables first and ground cables at last.
- Step 5** Use an M6 hex screwdriver to loosen the captive screw on the holes on the top of the RRU conversion bracket and main bracket, as shown in [Figure 4-14](#) for the blade RRU and [Figure 4-15](#) for the non-blade RRU.

Figure 4-14 Loosening screws on the conversion bracket (blade RRU)

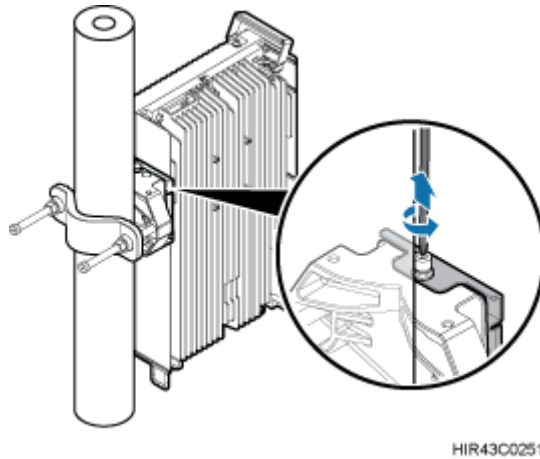
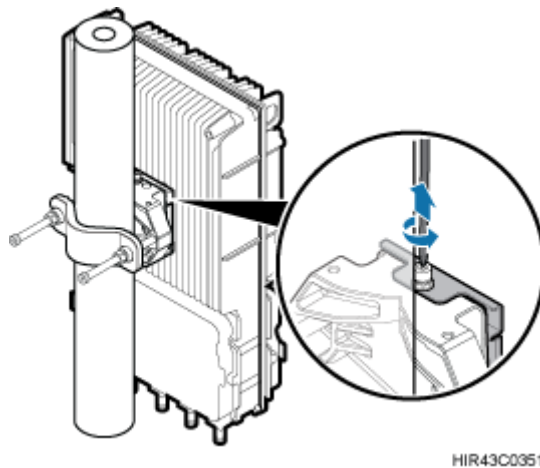
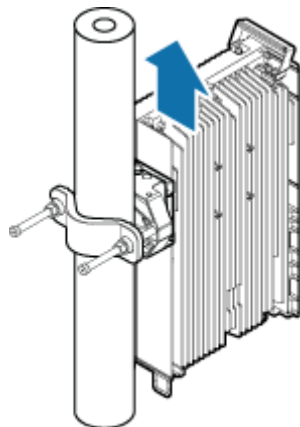


Figure 4-15 Loosening screws on the conversion bracket (non-blade RRU)



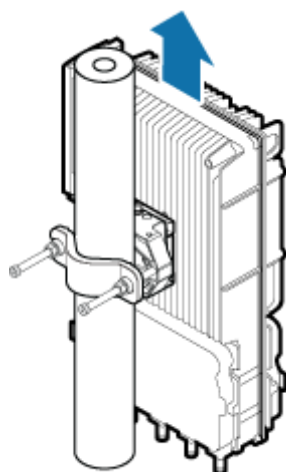
Step 6 Hold the RRU upwards to remove it from the attachment plate, as shown in [Figure 4-16](#) for the blade RRU and [Figure 4-17](#) for the non-blade RRU.

Figure 4-16 Holding the RRU upwards (blade RRU)



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Figure 4-17 Holding the RRU upwards (non-blade RRU)



HIR43C0355



NOTICE

When removing the RRU, hold the RRU handler with one hand and hold the RRU upwards with the other hand.

Step 7 Dispose of the removed RRU module properly.

Step 8 Install the new RRU and connect required cables by seeing the related RRU installation guide. Ensure that vacant cable troughs in the cabling cavity are equipped by waterproof blocks and RF cables are waterproofed.

----End

4.4 Replacing a Non-Blade RRU with a Blade RRU

This section describes the procedure and precautions for replacing a non-blade RRU with a blade RRU.

Prerequisites

- The operations in [4.1 Preparations Before Replacement](#) have been performed.
- The following tools and materials are available: ESD gloves, Phillips screwdrivers (M3 to M6), an M6 inner hexagon torque screwdriver, waterproof tape, and PVC insulation tape.
- The number and type of RRUs to be replaced are confirmed, and new RRUs are available.

Context

- RRUs and attachment plates in this section are only for reference. The actual RRUs and attachment plates may be different.
- [Table 4-1](#) shows the installation of the mounting kits and conversion bracket when non-blade RRUs are assembled. When non-blade RRUs are not assembled, the mounting kits and conversion bracket for blade RRUs are required for assist subsequent capacity expansion, as shown in [Table 4-1](#).

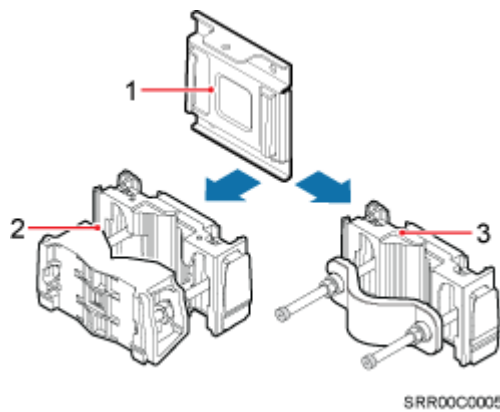
Table 4-1 Mounting kits and conversion bracket used for replacing non-blade RRUs with blade RRUs

Replacement Scenario	Position of the RRU to be Replaced	Mounting Kit Reused or Not	Conversion Bracket Reused or Not
Non-blade RRUs are assembled.	Middle	Reused	(Recommended) Reused For details about how to install blade RRUs, see (Recommended) Method 1: Reuse the conversion bracket
		Reused	Not reused For details about how to install blade RRUs, see Method 2: The conversion bracket is not reused
	At bot sides	Not reused	Not reused For details about how to install blade RRUs, see Replace the RRUs at the two sides

Replacement Scenario	Position of the RRU to be Replaced	Mounting Kit Reused or Not	Conversion Bracket Reused or Not
Non-blade RRUs are not assembled.	-	Not reused	Not reused

- This section describes the procedure for replacing an RRU by reusing a mounting kit. For how to replace an RRU by using a new mounting kit, see a related RRU installation guide.
- After the replacement, an attachment plate for a blade RRU can be installed together with mounting kit A or B for a common RRU, as shown in [Figure 4-18](#).

Figure 4-18 Scenario where an attachment plate for a blade RRU can be installed together with a mounting kit for a common RRU



(1) Attachment plate for a blade RRU

(2) Mounting kit A for a common RRU

(3) Mounting kit B for a common RRU

- The RRU mounting kit in the following figures is RRU mounting kit B.

Procedure

Step 1 Wear ESD gloves.



NOTICE

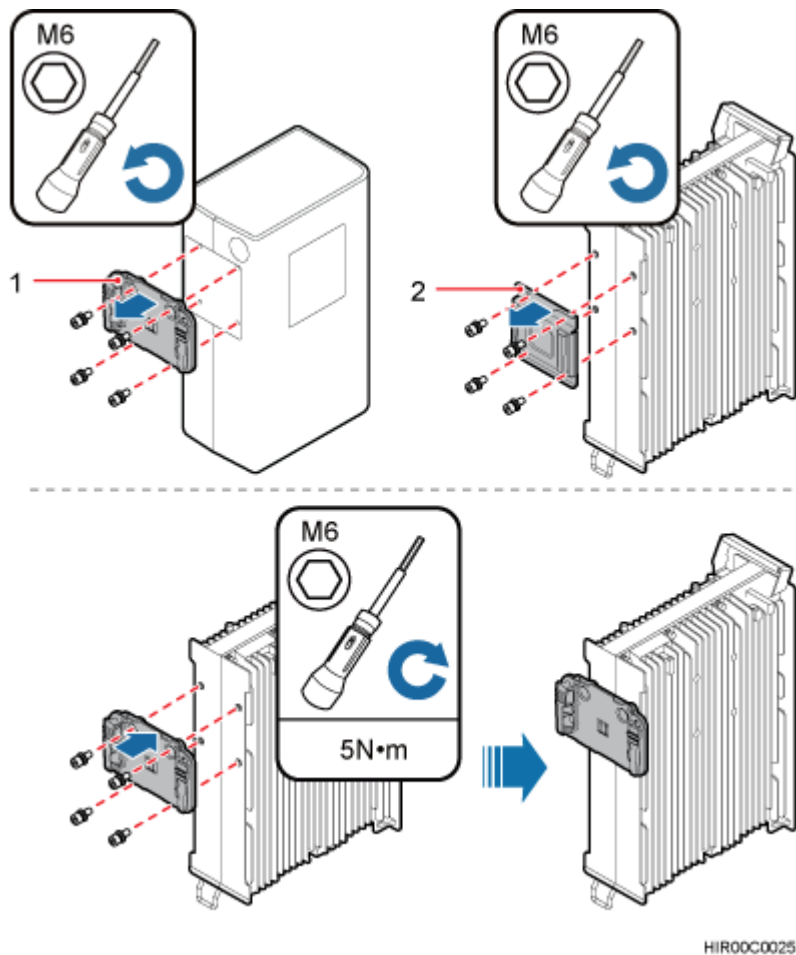
Take proper ESD protection measures, for example, wear ESD gloves, to prevent electrostatic damage to the boards, modules, or electronic components.

Step 2 Remove cables for a faulty RRU and then remove RRU according to steps [Step 1](#) to [Step 8](#) in [4.2.1 Replacing an RRU Using a Mounting Kit for a Common RRU](#).

Step 3 Install the blade RRU.

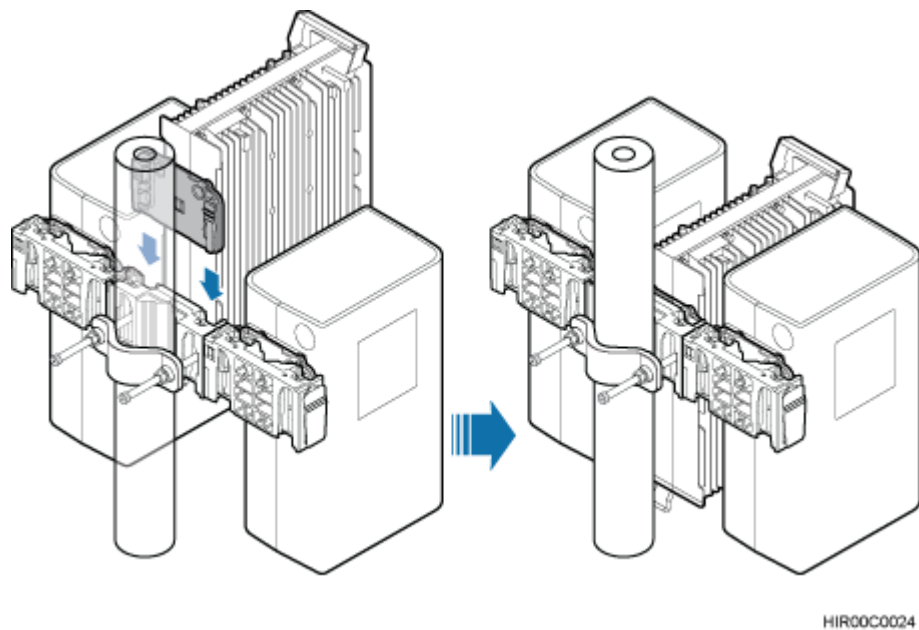
- Replace the RRU in the middle.
 - (Recommended) Method 1: Reuse the conversion bracket.
- 1. Remove conversion brackets of the faulty RRU and blade RRU and install the conversion bracket of the faulty RRU on the side of the blade RRU, as shown in [Figure 4-19](#).

Figure 4-19 Reusing the conversion bracket



2. Install the blade RRU on the general main bracket, as shown in [Figure 4-20](#).

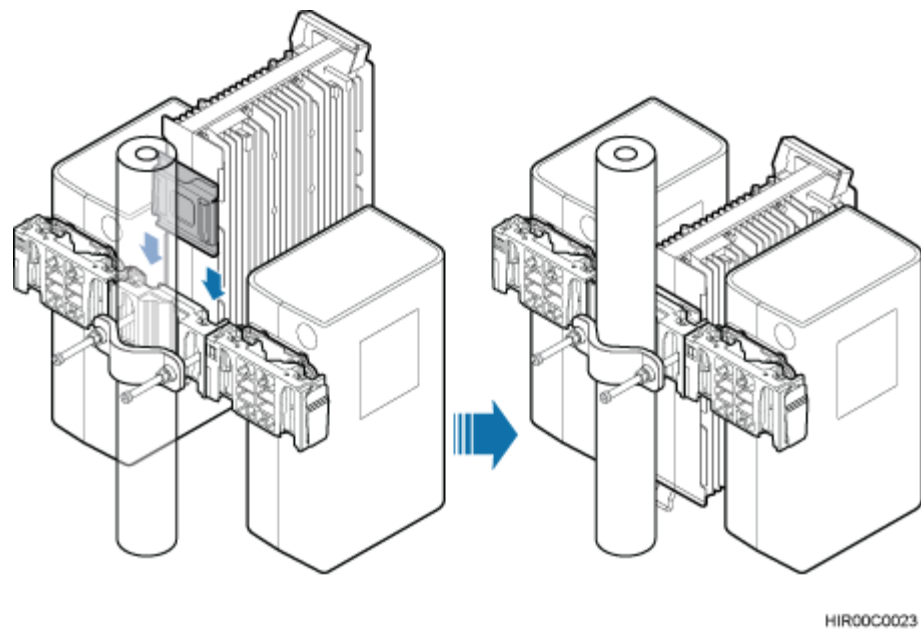
Figure 4-20 Installing the blade RRU on the general RRU main bracket (conversion bracket reused)



- Method 2: The conversion bracket is not reused.

Directly install the blade RRU on the general RRU main bracket, as shown in [Figure 4-21](#).

Figure 4-21 Installing the blade RRU on the general RRU main bracket (conversion bracket not reused)



- Replace the RRUs at the two sides.

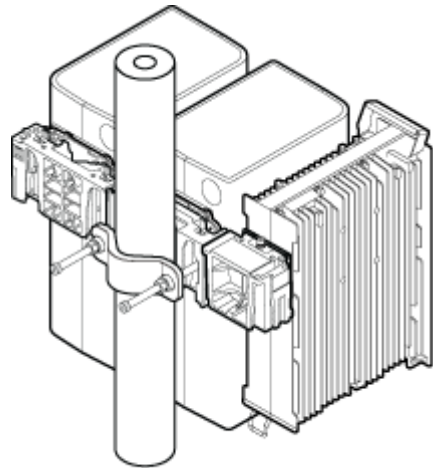
Remove the general mounting brackets of the faulty RRUs and install blade RRUs and mounting kits by following the steps provided in the installation guide of the corresponding RRU, as shown in [Figure 4-22](#).



NOTE

The following figure shows how to replace the RRU on the right.

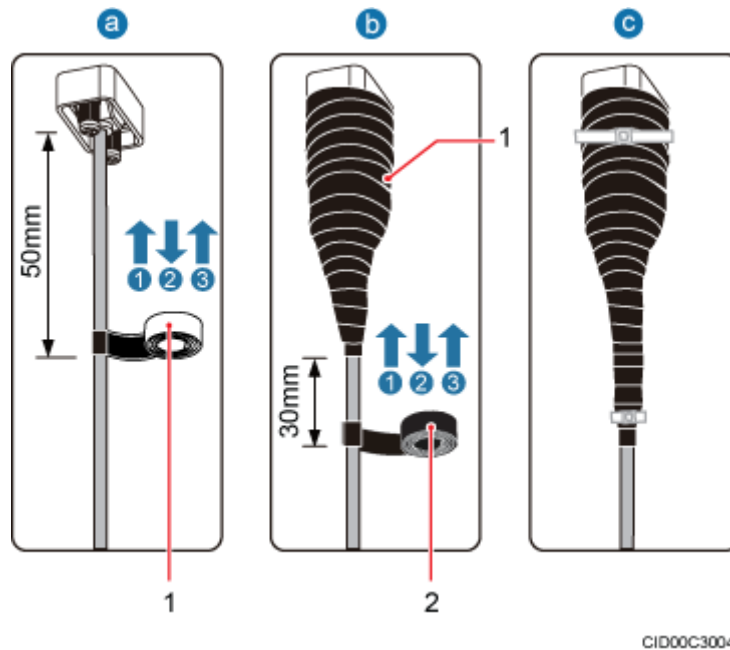
Figure 4-22 Installing board RRUs (replacing RRUs at two sides)



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- Step 4** Install all cables for the blade RRU by referring to the section "Installing RRU Cables" in a related RRU installation guide.
- Step 5** Waterproof the ports for the RRU RF jumper by referring to the section "Installing an RRU RF Jumper" in a related RRU installation guide.
- Step 6** Waterproof the ports for the alarm cable by referring to [Figure 4-23](#).

Figure 4-23 Waterproofing a connector of the alarm cable



(1) Waterproof tape	(2) PVC insulation tape
---------------------	-------------------------

NOTE

- Before the replacement, ports for the alarm cables of a common RRU are positioned in the RRU cabling cavity. After the replacement, ports for the alarm cables of a blade RRU are positioned at the bottom of the RRU, and the ports need to be waterproofed.
- 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 when wrapping it.
- Wrap each layer of tape around the connector tightly and neatly, and ensure that each layer of tape overlaps more than 50% of the lower layer.
- Ensure that the adhesive surface of the tape overlaps the lower layer.
- Leave an extra length of 3 mm (0.12 in.) to 5 mm (0.20 in.) when cutting off the extra part of the cable ties.

1. Wrap three layers of waterproof tape on a connector, first from bottom up, then from top down, and finally from bottom up. Start wrapping the connector at a position 50 mm (1.97 in.) away from the bottom of the connector to the top of the connector, first from bottom up, then from top down, and finally from bottom up. Cut off the redundant tape after three layers are wrapped. Wrap each layer of tape around the connector tightly.
2. Wrap three layers of PVC insulation tape. Start the wrapping at a position 30 mm (1.18 in.) away below the bottom of the waterproof tape to the top of the connector, first from bottom up, then from top down, and finally from bottom up. Cut off the redundant tape after three layers are wrapped. Wrap each layer of tape around the connector tightly.
3. Bind cable ties to the cables at a position 3 mm (0.118 in.) to 5 mm (0.197 in.) away from one end of the PVC insulation tape.

Step 7 Ensure that vacant cable troughs in the cabling cavity are blocked by waterproof blocks. Close the cover plate of the RRU cabling cavity, and use an M5 torque screwdriver to tighten the screws on the cover plate.

----End

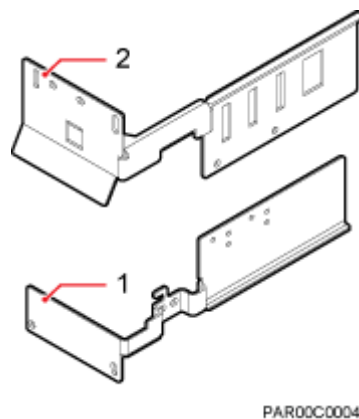
4.5 Replacing Blade RRUs in the ICR and Adding Blade RRUs to the ICR

This section describes procedures for replacing non-blade RRUs in the indoor centralized rack (ICR) with blade RRUs and adding blade RRUs to the ICR.

Context

- This document applies to 12 L blade RRU. The 18 L blade RRU does not support the indoor centralized installation.
- The attachment plates for installing a blade RRU in an ICR must support RRU installation in a subrack. [Figure 4-24](#) shows the exteriors of attachment plates for installing an RRU in a subrack or installing a blade RRU in an ICR.

Figure 4-24 Attachment plates for installing an RRU in a subrack or installing a blade RRU in an ICR



- This section describes the procedure for maintaining an RRU in an ICR with a height of 10 U. The maintenance procedure is the same for RRUs in other ICRs, which do not include the INS12 because it cannot be used for installing RRUs.

Procedure

Step 1 Wear ESD gloves.



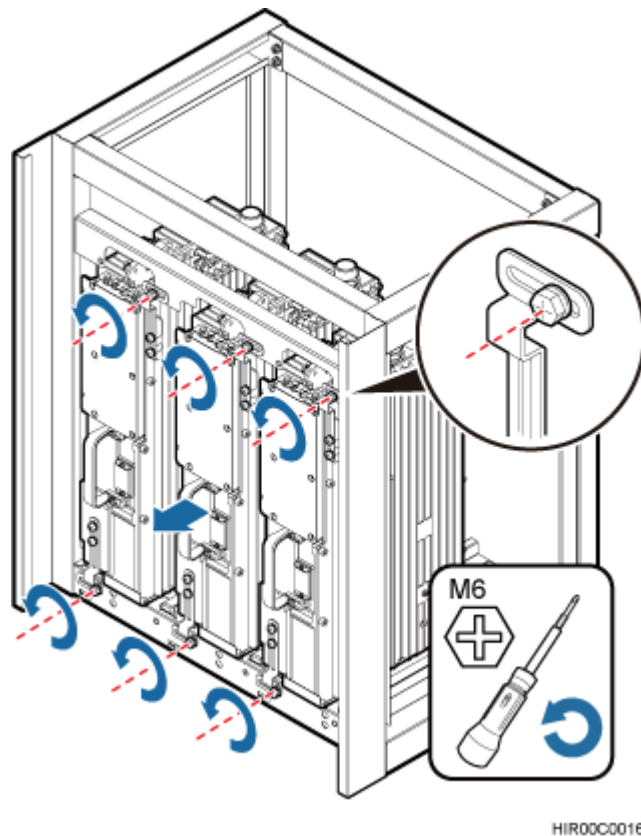
NOTICE

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

Step 2 Remove the non-blade RRU to be replaced.

1. Use an M6 Phillips screwdriver to loosen the upper and lower installation plates on the non-blade RRU to be replaced, as shown in [Figure 4-25](#).

Figure 4-25 Loosening the upper and lower installation plates

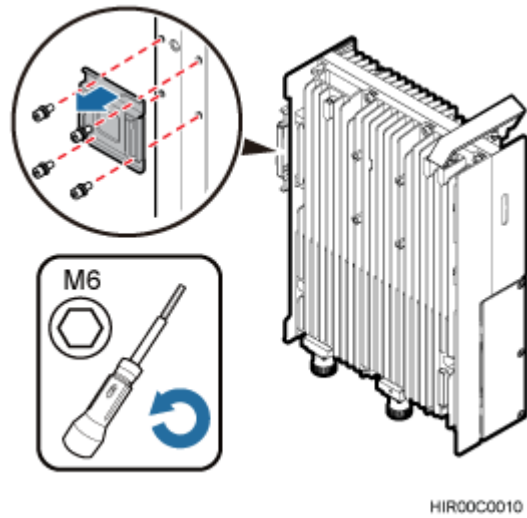


2. Pull the RRU to be replaced out of the ICR.

Step 3 Install the mounting brackets for the blade RRU.

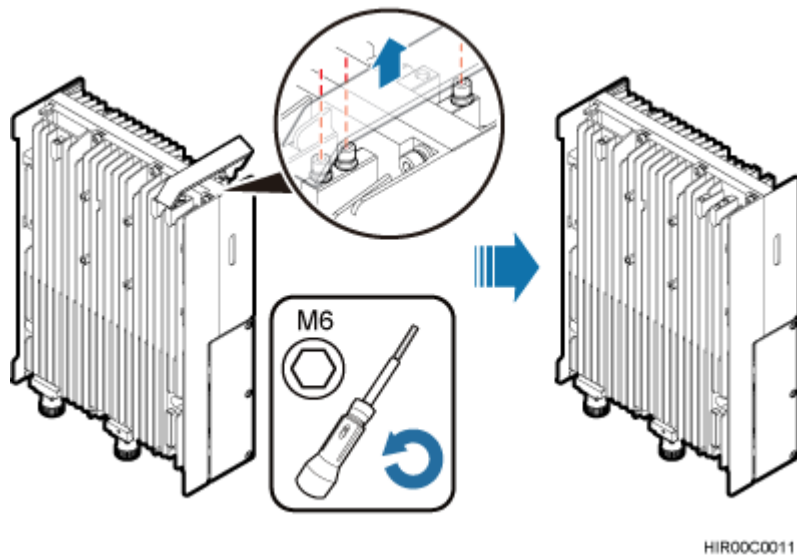
1. Remove the attachment plate from the rear of the RRU, as shown in [Figure 4-26](#).

Figure 4-26 Removing the attachment plate from the rear of the RRU



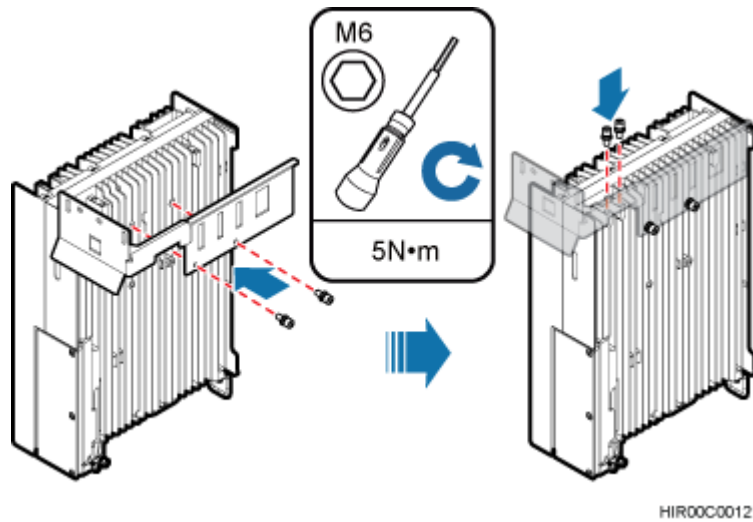
2. Remove the handle from the RRU, as shown in [Figure 4-27](#).

Figure 4-27 Removing the handle from the RRU



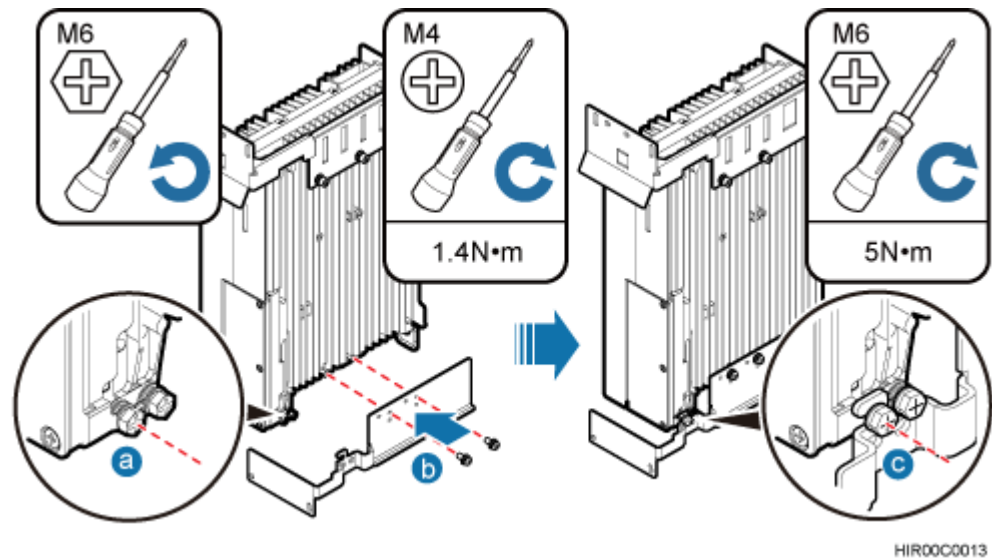
3. Take the upper and lower attachment plates for installing an RRU in a subrack or installing a blade RRU in an ICR out of the packing case.
4. Install the upper attachment plate on the upper part of the RRU, and use an M6 torque screwdriver to tighten the screws on the attachment plate to 5 N m (44.25 lbf in.), as shown in [Figure 4-28](#).

Figure 4-28 Installing the upper attachment plate on the upper part of the RRU



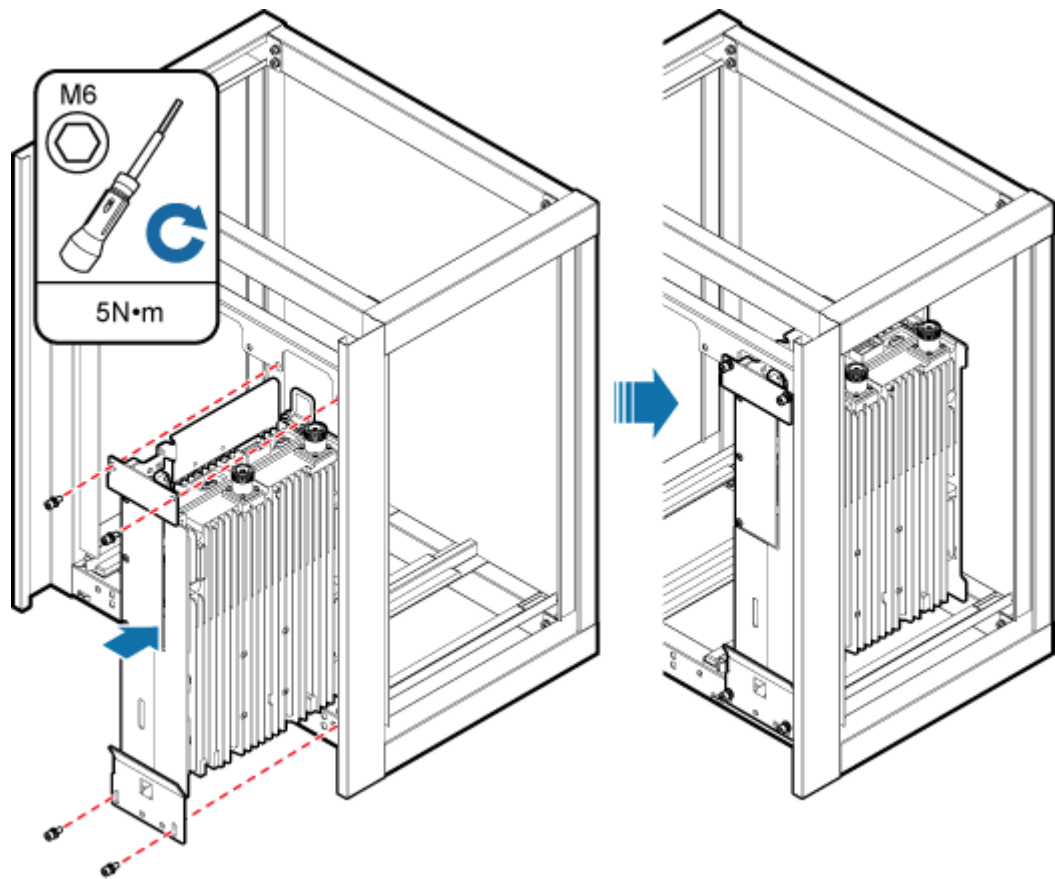
5. Install the lower attachment plate on the lower part of the RRU, as shown in [Figure 4-29](#).
 - a. Use an M6 Phillips screwdriver to remove the ground screw from the left side of the lower part of the RRU.
 - b. Use an M4 torque screwdriver to tighten the two screws on the lower attachment plate to 1.4 N m (812.39 lbf in.).
 - c. Install the removed ground screw into the original ground hole to secure the lower attachment plate.

Figure 4-29 Installing the lower attachment plate on the lower part of the RRU



Step 4 Turn the RRU with upper and lower attachment plates upside down, insert the RRU into the correct slot in an ICR, and tighten the four M6 screws on the RRU to 5 N m (44.25 lbf in.), as shown in [Figure 4-30](#).

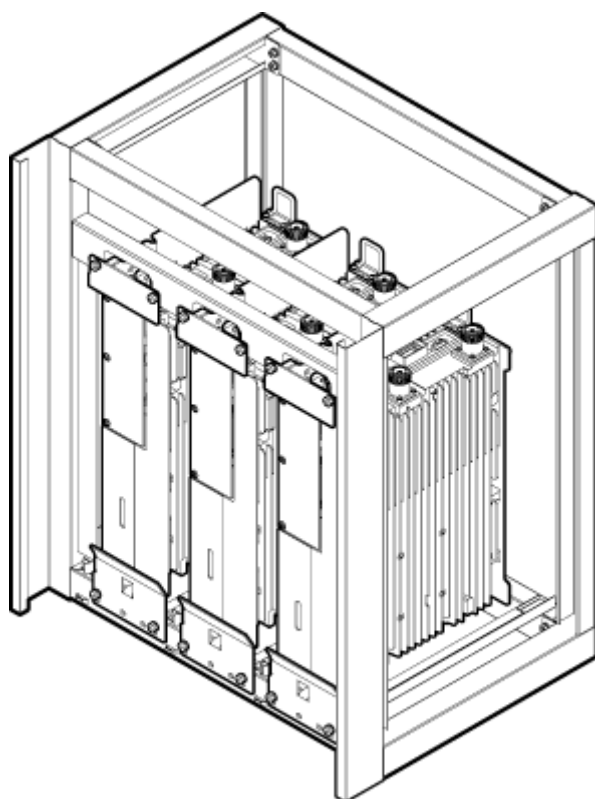
Figure 4-30 Installing the RRU in an ICR



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Step 5 Optional: Install the other two RRUs by referring to [Step 3](#) and [Step 4](#). An ICR can house a maximum of three RRUs. [Figure 4-31](#) shows an ICR housing three RRUs.

Figure 4-31 ICR housing three RRUs



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- Step 6** Reconnect all required cables for the new RRU, waterproof the connector on the RF jumper, and ensure that vacant cable troughs in the cabling cavity are equipped by waterproof blocks.

 **NOTE**

For details about cable connections, see the blade RRU installation guide. Cables can be reused according to onsite requirements.

- Step 7** Close the cover plate of the RRU cabling cavity, and use an M5 torque screwdriver to tighten the screws on the cover plate to 2 N·m (17.7 lbf·in.).

- Step 8** Take off the ESD gloves, and pack up all the tools.

----End

Follow-up Procedure

If a blade RRU is used to replace a non-blade RRU, properly store the removed non-blade RRU.


4.6 Operations After Replacement

This section describes operations to be performed after an RRU is replaced, including setting the maximum output power locking, unblocking an RRU, powering on an RRU, and handling a faulty RRU.

Prerequisites

An RRU has been replaced.

Procedure

- Step 1** Power on the RRU according to the instructions in [3.1 Powering On an RRU](#).
- Step 2** Check the operating status of the new RRU by observing the status of RRU indicators. When the RRU is working properly, the RUN indicator is blinking (on for 1s and off for 1s), and the ALM indicator is steady off.
- Step 3** **Optional:** Set the maximum output power locking for TX channels of the RRU.
- On the UMTS or LTE side, run the **LOC RRUTC** command to set the maximum output power of the RRU. Run the **RST BRD** command to reset the RRU. Run the **DSP TXBRANCH** command to check whether the maximum output power of each RRU is set successfully.
 - On the GSM side, log in to the SMT. In the left pane of the **Site Maintenance Terminal System** window, click **Site**. In the right pane of the window, double-click **Lock RXU Traffic Capability**. In the displayed **Lock RXU Traffic Capability** window, click the **Config** tab. On the displayed tab page, select the target RRU. Log in to the LMT and reset the RRU so that the configuration data takes effect.
 - On the GSM side, log in to the LMT. Enter **LOC BTSRXUTC** in the **Command Input** box and click **Assist** to set the maximum output power. Then, Click **Exec**. Run the **RST BTSBRD** command with **Reset Type** set to **SOFTWARE** to reset the RRU so that the configuration data takes effect.
-  **NOTE**
- If there is more than one RRU, perform the operation on each RRU.
 - If there is more than one RRU, reset each RRU.
 - If the configured maximum output power of the RRU exceeds its hardware capability, this configuration is invalid and the maximum output power of the RRU is the maximum output power supported by the RRU hardware.
- Step 4** Instruct the network management system (M2000/U2000) administrator to unblock the RRU.
- On the UMTS side, log in to the NodeB LMT and run the **UBL BRD** command to unblock the RRU.
 - On the LTE side, log in to the eNodeB LMT and run the **UBL BRD** command to unblock the RRU.
 - On the GSM side, log in to the BSC LMT and run the **SET GTRXADMSTAT** command with the parameter **ADMSTAT** set to **UNLOCK** to unblock the carriers of the RRU.
- Step 5** Take off the ESD gloves, and pack up all the tools.
- Step 6** Place the removed RRU into the ESD box or bag. Then, place the ESD box or bag into a foam-padded carton or the packing box of the new RRU.
- Step 7** Complete the fault form with detailed information about the replaced component.
- Step 8** Contact the local Huawei office to handle the faulty component.

----End

5 Replacing an Optical Module

An optical module implements optical-electrical conversion, enabling optical transmission between an RRU and other devices. You must disconnect optical fibers from an optical module before replacing the optical module. Disconnecting the optical fibers interrupts the transmission of CPRI signals.

Prerequisites

- Confirm the type of a faulty optical module and do as follows:
 - On the GSM side, run the **DSP BTSOPTMODULE** command on the BSC.
 - On the UMTS side, if NodeB V200R013 or a version before is used, run the **DSP OPTMODULE** command on the NodeB.
 - On the UMTS side, if NodeB V200R014 or a later version is used, run the **DSP SFP** command on the NodeB.
 - On the LTE side, run the **DSP SFP** command on the eNodeB.
 - Confirm the type of the faulty optical module according to the **Rate**, **Wavelength**, and **Transmission mode** fields in the query result and obtain an optical module of the same type. [Figure 5-1](#) shows the label on the optical module.

Figure 5-1 Label on the optical module



1

2

3

(1) Peak rate

(2) Wavelength

(3) Transmission mode

- If the software version does not support query of the type of the optical module by using an MML command, obtain all types of optical modules.
- If a fault in the optical module on the RRU side causes disconnection of the CPRI link, the MML command to query the type of the fault cannot be used. In this case, query the type of the corresponding optical module on the BBU side instead and obtain a new optical module of the same type. For the detailed querying method, see the *DBS3900 Site Maintenance Guide*.
- The following tools and materials are available: ESD gloves, M4 Phillips screwdrivers, and an ESD box or bag.

Context

- Optical modules are inserted into CPRI ports on an RRU.
- If the optical module, cable, or optical cable is removed and then connected to the same CPRI port of the RRU, the optical module, cable, or optical cable is hot swappable.
If the optical module, cable, or optical cable is removed and then connected to a different CPRI port of the RRU, the optical module, cable, or optical cable is still hot swappable, but you need to perform either of the following operations to manually reset the RRU to prevent service interruption.
 - For a NodeB, eNodeB, and eGBTS, run the **RST BRD** command to reset the RRU.
 - For a GBTS, run the **RST BTSBRD** command to reset the RRU.
- It takes about five minutes to replace an optical module on the RRU, which involves disconnecting optical fibers, removing the faulty optical module, inserting a new optical module, reconnecting the optical fibers, and waiting for CPRI links to resume.

Procedure

Step 1 Wear ESD gloves.



NOTICE

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

Step 2 Power off the RRU according to the instructions in [3.2 Powering Off an RRU](#).

Step 3 Loosen the screws on the cover plate of the RRU cabling cavity using an M4 Phillips screwdriver, and then open the cover plate.

Step 4 Record the connections of the optical module and optical fibers.

Step 5 Press the latch on the optical fiber connector, and then remove the connector from the faulty optical module.



CAUTION

Do not look into the optical fiber or optical module without eye protection after the optical fiber is removed from the optical module.

Step 6 Lower the puller on the faulty optical module, and then pull the puller until the optical module is removed from the RRU.

Step 7 Choose the optical module of the same type as the faulty optical module according to the label on the module. Install the new optical module into the RRU.



NOTE

The optical modules to be installed must match CPRI rates.

Step 8 Insert the optical fiber connector into the new optical module.

Step 9 Close the cabling cavity of the RRU and use an M4 Phillips screwdriver to tighten the screws on the cover plate for the cabling cavity.

Step 10 Power on the RRU according to the instructions in [3.1 Powering On an RRU](#).

Step 11 Check the operating status of the new RRU by observing the status of RRU indicators. When the RRU is working properly, the RUN indicator is blinking (on for 1s and off for 1s) and the ALM indicator is steady off.

Step 12 Take off the ESD gloves, and pack up all the tools.

----End

Follow-up Procedure

- Place the replaced optical module into the ESD box or bag. Then, place the ESD box or bag into a foam-padded carton or the packing box of the new module.
- Fill in the fault form with detailed information about the replaced module.
- Contact the local Huawei office to handle the faulty optical module.

6 Adding RRUs

This chapter describes the procedure and precautions for adding RRUs with different exteriors on a pole.

Prerequisites

The hoist clamp of the main bracket is secured properly.



NOTICE

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

Context

- A maximum of two, three, four, or six RRUs can be installed on a pole. When four or more than four RRUs are added on a pole, the RRUs are installed vertically at different levels and in different directions, and the length of the pole must be greater than or equal to 1.5 m (4.92 ft).
- Install RRUs with the same exterior by referring to the section "Installing Three or More RRUs" in a related RRU installation guide.
- This chapter describes the procedure for adding RRUs with different exteriors and uses the procedure for adding five blade RRUs to a non-blade RRU in a live network as an example.

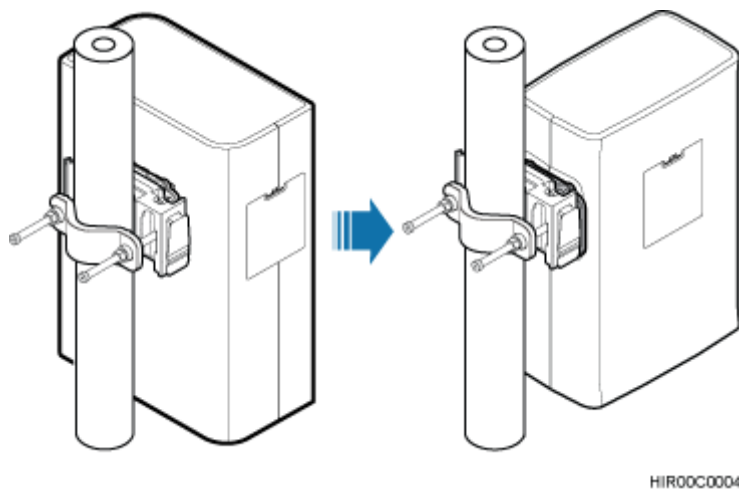
Procedure

Step 1 Optional: When the non-blade RRUs are installed in standard mode in the live network, change the standard mode to the side-mounted mode, as shown in [Figure 6-1](#).

1. Instruct the network management system (M2000/U2000) administrator to block the RRUs.
 - On the UMTS side, log in to the LMT and run the **BLK BRD** command to block the RRUs.
 - On the LTE side, log in to the LMT and run the **BLK BRD** command to block the RRUs.

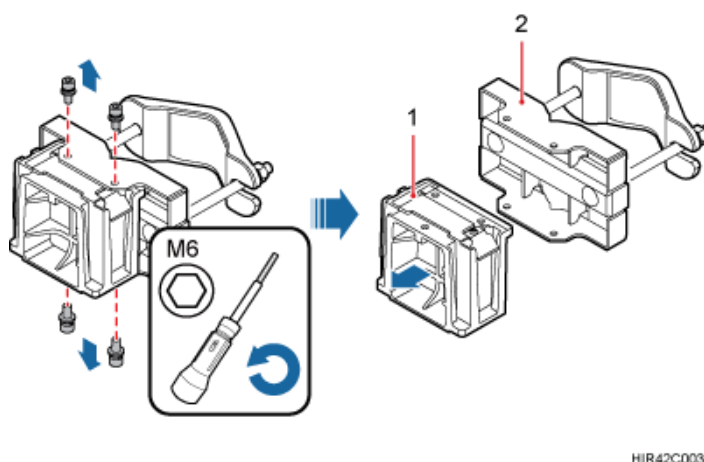
- On the GSM side, log in to the BSC LMT and run the **SET GTRXADMSTAT** command with the parameter **ADMSTAT** set to **LOCK** to block the carriers of the RRUs.
2. Power off the RRUs according to the instructions in [3.2 Powering Off an RRU](#).
 3. Remove the RRUs and their cables according to steps [Step 1](#) to [Step 8](#) in [4.2.1 Replacing an RRU Using a Mounting Kit for a Common RRU](#).
 4. Remove the attachment plate at the rear of the RRU and install it on one side of the RRU. Then install the RRU by referring to the section "Installing Three or More RRUs" in a related RRU installation guide.

Figure 6-1 Changing a non-blade RRU installation mode to side-mounted mode



- Step 2** Use an M6 inner hexagon screwdriver to remove the four inner hexagon screws from the pole installation bracket, and remove the main bracket for a blade RRU from the pole installation bracket, as shown in [Figure 6-2](#).

Figure 6-2 Removing the main bracket for a blade RRU



(1) Main bracket for a blade RRU

(2) Pole installation bracket for a blade RRU

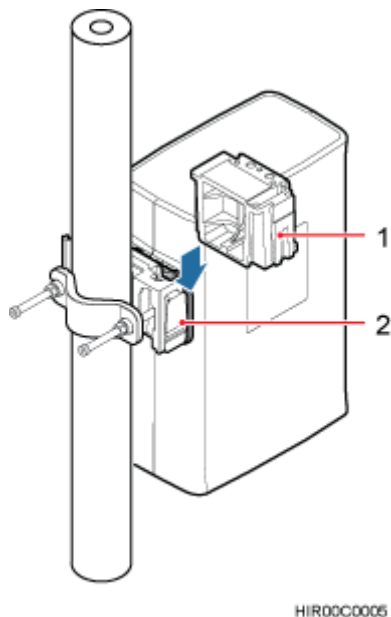
Step 3 Install the main bracket for a blade RRU on the main bracket of the mounting kit for a common RRU, as shown in [Figure 6-3](#).



NOTE

- The auxiliary bracket in the following figure is only for reference. The actual auxiliary bracket may be different.
- The opening ends of U-shaped slots on both sides of the main bracket for a blade RRU face downwards.

Figure 6-3 Installing the main bracket for a blade RRU

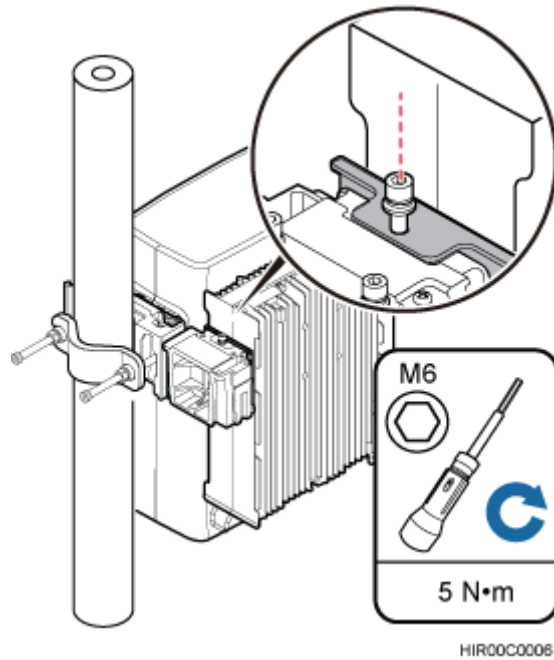


(1) Main bracket for a blade RRU

(2) Main bracket for a common RRU

Step 4 Attach a blade RRU to the main bracket for a blade RRU, and then use an inner hexagon torque screwdriver to tighten the captive screws into the holes of the attachment plate and main bracket to 5 N·m (44.25 lbf in.), as shown in [Figure 6-4](#).

Figure 6-4 Attaching a blade RRU



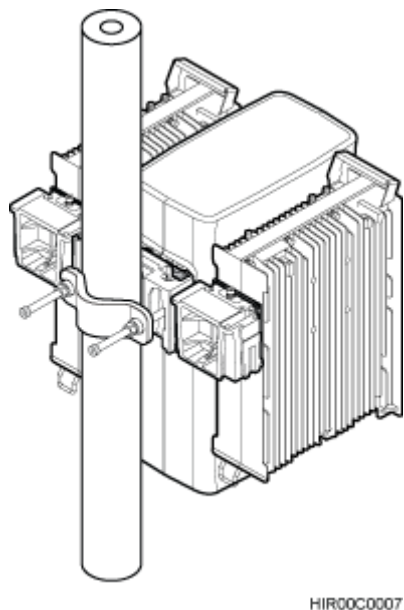
- Step 5** Repeat steps [Step 2](#) to [Step 4](#) to install a main bracket for a blade RRU or a blade RRU on the other side of the main bracket for a common RRU, as shown in [Figure 6-5](#).



NOTICE

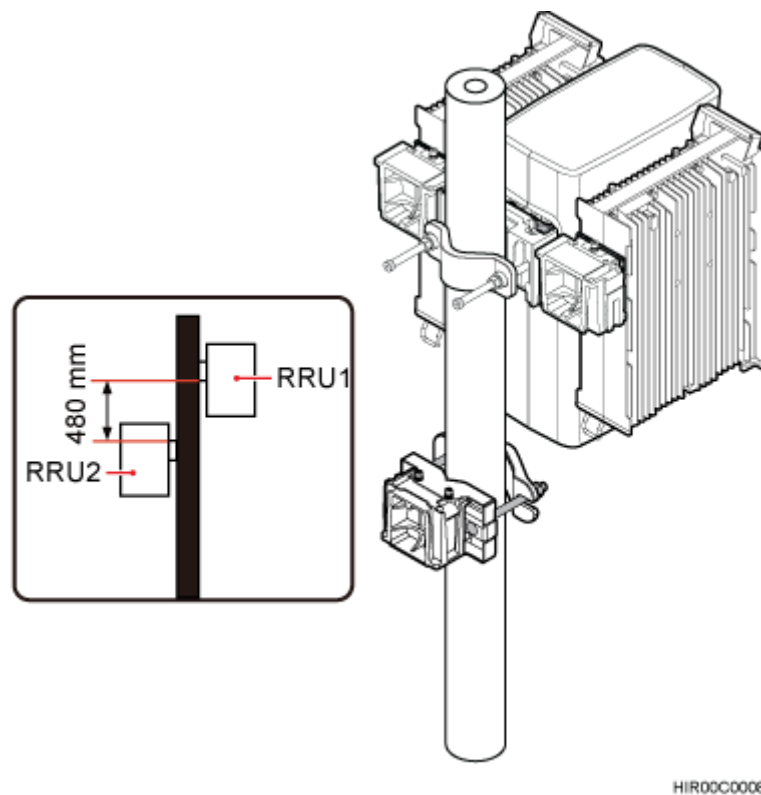
The opening ends of U-shaped slots on both sides of the main bracket for a blade RRU face downwards.

Figure 6-5 Installing the third RRU on the third main bracket



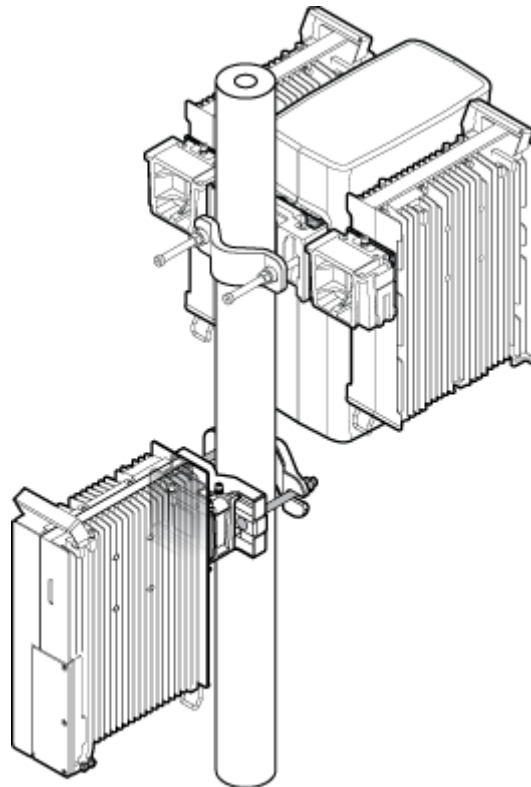
Step 6 Install the second RRU mounting kit at a position of at least 480 mm (18.90 in.) away from the top or bottom of the first RRU mounting kit, as shown in [Figure 6-6](#).

Figure 6-6 Installing the second mounting kit for a blade RRU



- Step 7** Attach a blade RRU to the fourth main bracket, and then use an inner hexagon torque screwdriver to tighten the captive screws into the holes of the attachment plate and main bracket to 5 N·m (44.25 lbf·in.), as shown in [Figure 6-7](#).

Figure 6-7 Installing a blade RRU on the fourth main bracket



HIR00C009

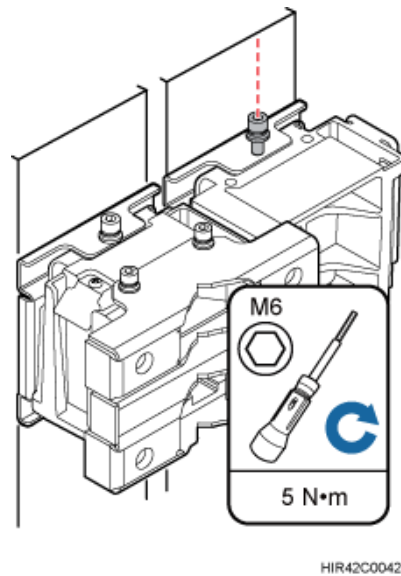
- Step 8** Install blade RRUs on both sides of the blade RRU according to the instructions in the section "Installing Three or More RRUs" in a related blade RRU installation guide.



NOTICE

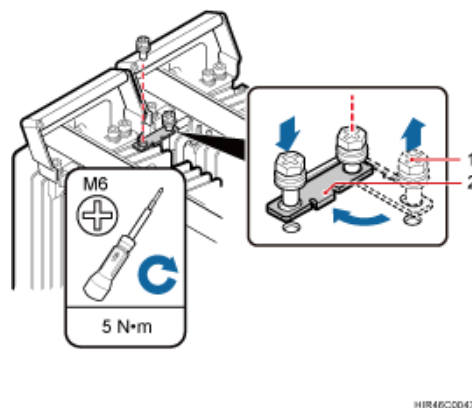
After installing each RRU on its main bracket, use an inner hexagon torque screwdriver to tighten the captive screw into the holes of the attachment plate and main bracket to 5 N·m (44.25 lbf·in.), as shown in [Figure 6-8](#).

Figure 6-8 Tightening the captive screws into the holes



Step 9 Install a metal sheet for two neighboring RRUs, as shown in [Figure 6-9](#).

Figure 6-9 Installing a metal sheet



(1) Screw

(2) Metal sheet

1. Use an M6 Phillips screwdriver to loosen the screw on the metal sheet farther from the handle of the first RRU and remove the screw.
2. Use an M6 Phillips screwdriver to slightly loosen the screw on the metal sheet closer to handle of the first RRU and move the metal sheet out. Then align the holes in the metal sheet with the holes at the top of the second RRU.
3. Insert the removed screws into the holes at the top of the second RRU and use an M6 torque screwdriver to tighten the screws to 5 N m (44.25 lbf in.).

Step 10 Install RRU cables and close the RRU cabling cavity according to the instructions in related RRU installation guides.

Step 11 Power off the RRU according to the instructions in [3.1 Powering On an RRU](#).

Step 12 Check the operating status of the new RRU by observing the status of RRU indicators. When the RRU is working properly, the RUN indicator is blinking (on for 1s and off for 1s), and the ALM indicator is steady off.

----End