RRU3008
Installation Guide

HUAWEI TECHNOLOGIES Co., Ltd.

HUAWEI

Safety Information

Following All Safety Precautions

Before any operation, read the instructions and precautions in this document carefully to minimize the possibility of accidents.
The Danger, Caution, and Note items in the documents do not cover all the safety precautions that must be followed. They only provide the generic safety precautions for operations.

When operating Huawei products and equipment, you must comply with safety precautions and special safety instructions related to corresponding equipment provided by Huawei. The safety precautions in the document are related to only Huawei products. Huawei is not liable for any consequence that results from the violation of universal regulations for safety operations and safety codes on design, production, and equipment use.

Complying with the Local Safety Regulations

When operating the device, comply with the local safety regulations. The safety precautions provided in the documents are supplementary. You must comply with the local safety regulations.

Qualified Personnel Only

The personnel in charge of installation and maintenance must be trained and master the correct operating methods and safety precautions before beginning work.

Symbols

DANGER	*This symbol indicates that casualty or serious accident may occur if you ignore the safety instruction.*
CAUTION	*This symbol indicates that serious or major injury may occur if you ignore the safety instruction.*
NOTE:	*This symbol indicates that the operation may be easier if you pay attention to the safety* instruction.

Safety of Personnel

- The high voltage power supply provides power for running the system. Direct contact with the high voltage power supply or contact through damp objects may result in fatal danger.
- Non-standard and improper high voltage operations may result in fire and electric shock.
- In a thunderstorm, do not perform operations on high voltage and AC power supply facilities or on a steel tower and mast.
- Ground the device before powering on the device. Otherwise, the personnel and device are in danger.
- Power off the device before performing operations on the power supply equipment.
- High power radio-frequency signals are harmful to human body. Before installing or maintaining an antenna on a steel tower or mast with a large number of transmitter antennas, the operator should coordinate with all parties to ensure that the transmitter antennas are shut down.
- When handling optical fibers, do not stand close to, or look into the optical fiber outlet with unaided eyes.
- Protect yourself when drilling holes. Flying dust may hurt your eyes or you may inhale the dust.
- Power off the batteries before connecting the cables to the batteries. Otherwise, casualties may occur.
- When working at a height, be cautious about falling objects.

Device Safety

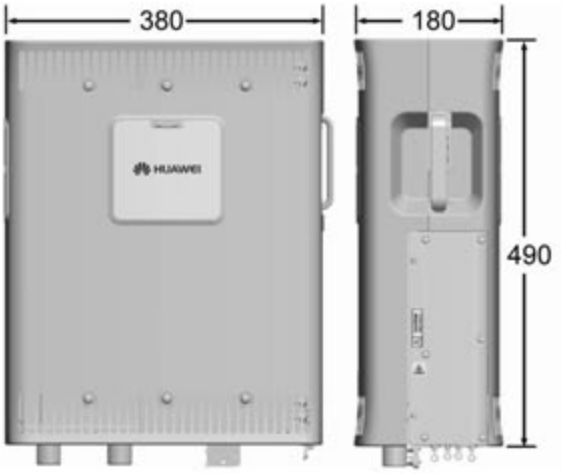
- Check the electrical connection of the device before operation and ensure that the device is reliably grounded.
- The static electricity generated by the human body may damage the electrostatic sensitive components on the circuit board, such as the large-scale integrated circuit (LIC). Wear an ESD wrist strap or ESD gloves when performing the operation.
- When working on batteries, take measures to prevent short circuits in the batteries and electrolyte spill/loss. The electrolyte may erode metal and boards, or even cause rust of the equipment or short circuits in the boards.

Installation Tools

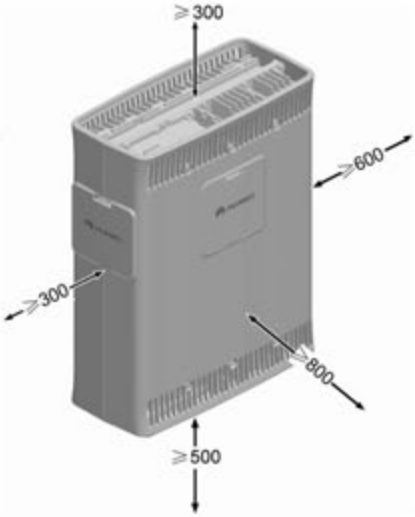
 Percussion drill（Ø14）	 ESD gloves	 Vacuum cleaner
 Heat gun	 Cross screwdriver（M3~M6）	 Straight screwdriver（M3~M6）
 Claw hammer	 Knife	 Cable peeler
 Power cable crimping pliers	 Wire cutter	 Adjustable wrench (with the diameter of at least 32 mm)
 Level bar	 Torque screwdriver	 Combination wrench （21mm~21mm）for pole installation （17mm~17mm）for wall installation
 Multimeter	 Marking pen (with the diameter of no more than 10 mm)	 Long measuring tape

Space Requirements (Unit: mm)

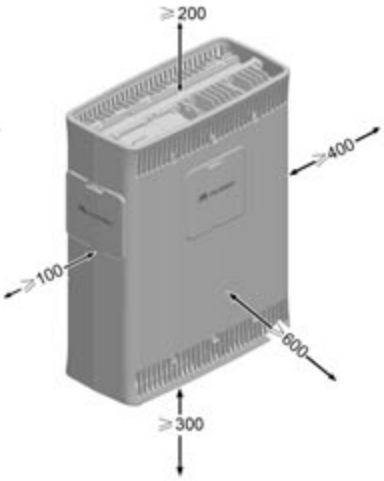
1. RRU Dimensions



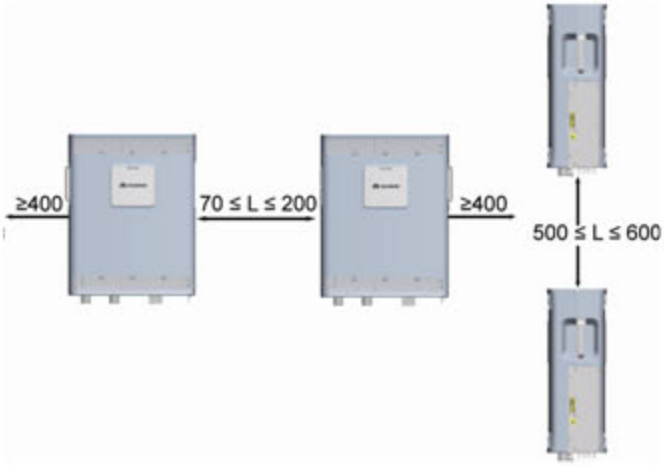
2. Recommended Clearance for a Single RRU



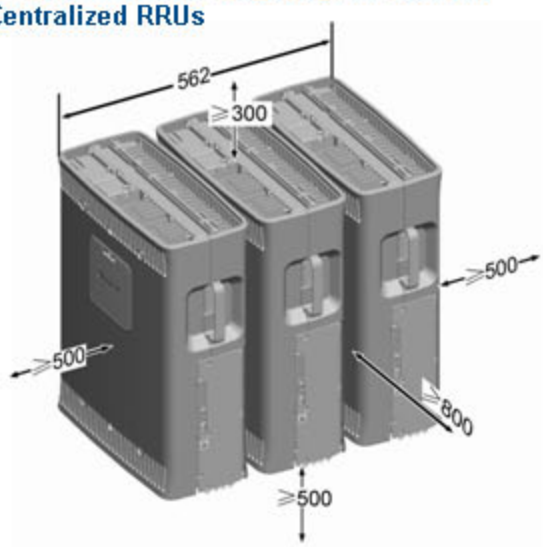
3. Minimum Clearance for a Single RRU



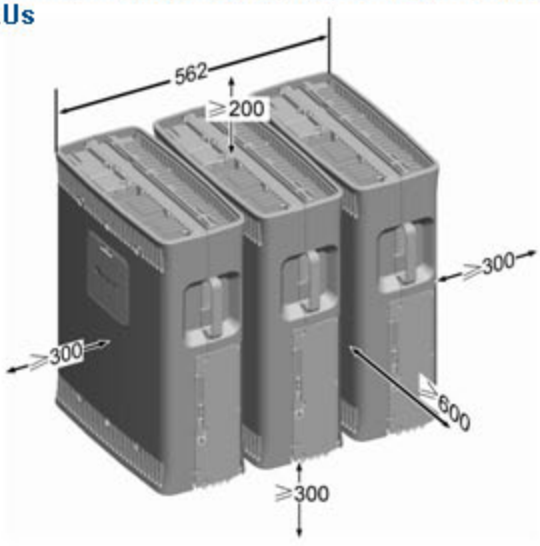
4. Clearance for Two Combined RRUs



5. Recommended Clearance for Multiple Centralized RRUs



6. Minimum Clearance for Multiple Centralized RRUs



Installation Modes

On a metal pole
(at the back)

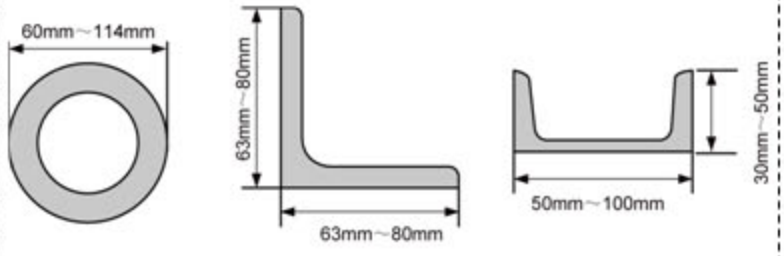
On a metal pole
(at the side)

On a wall
(at the back)

On a wall
(at the side)

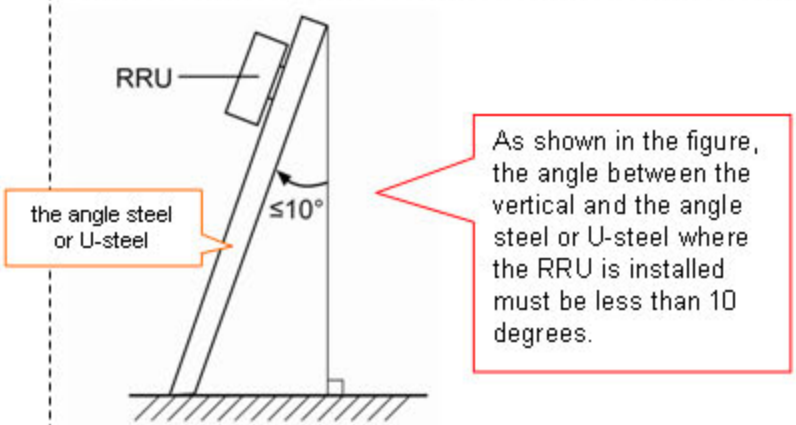
On an angle steel

The following figure describes the specifications for the metal pole, angle steel, and U-steel where the RRU is installed.



Metal pole | Angle steel | U-steel

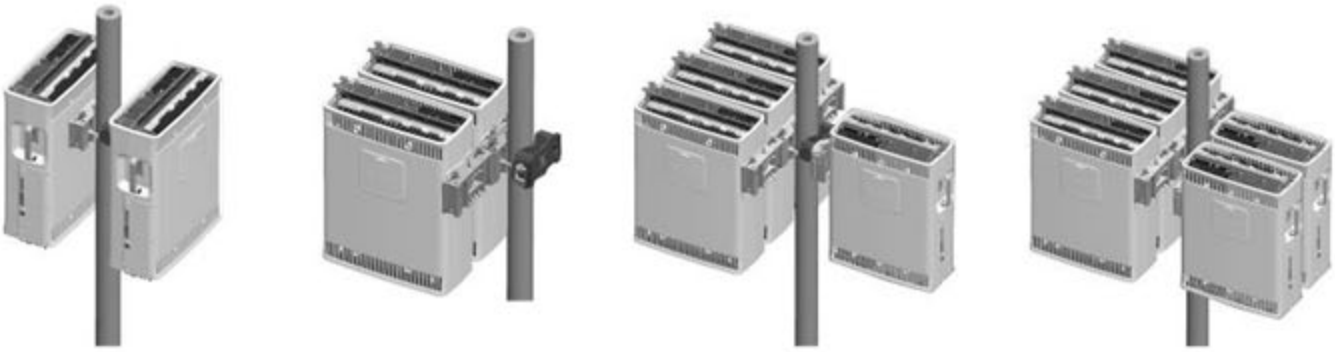
On a U-steel

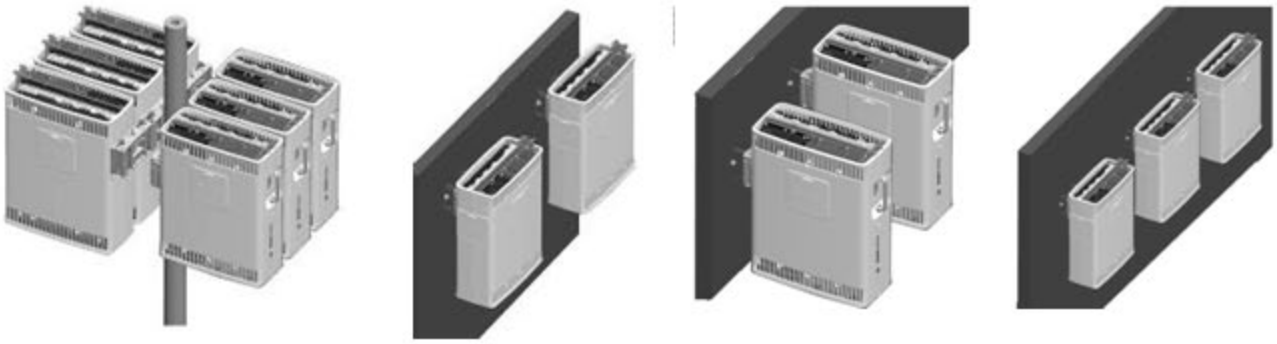


Only one RRU can be installed on a U-steel or angle steel at the back.

A single RRU can be lifted to the tower. For details, see page 27

Installation Modes





Warning: Three RRUs cannot be installed on a wall in centralized mode !

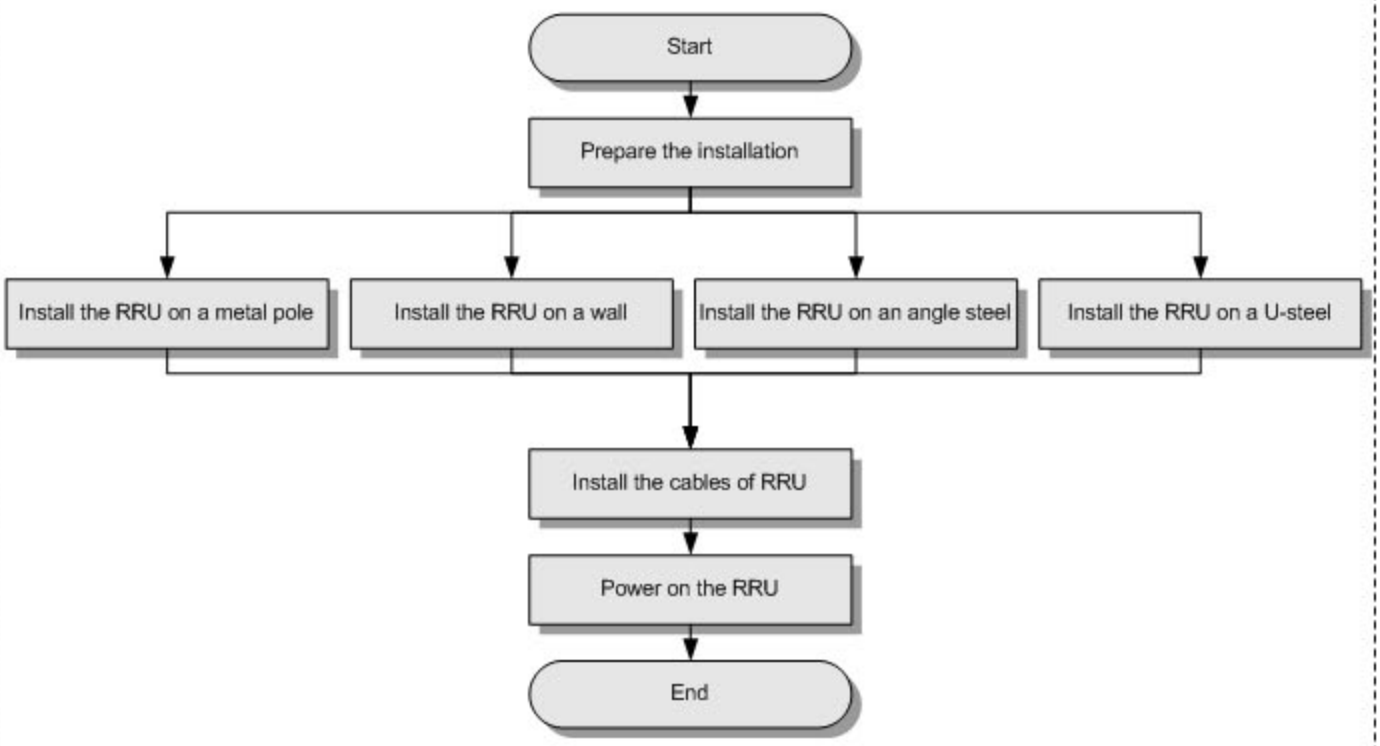
⚠ CAUTION

A maximum of two RRUs can be installed on a metal pole with the diameter of 60 mm to 76 mm, and the RRUs must be installed on the back.
When two RRUs are installed in centralized mode on a metal pole, the diameter of the pole must range from 76 mm to 114 mm.

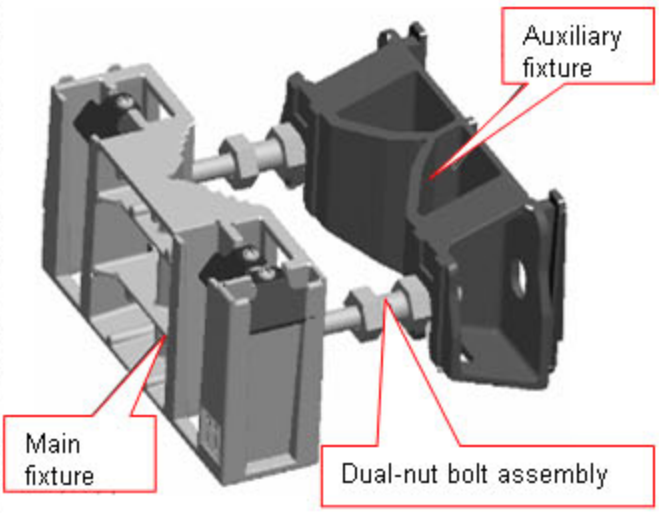
⚠ DANGER

When RRUs are installed on a wall, the specifications of the wall are as follows:
1. When a single RRU is installed on the wall at the back, the wall must have the load capacity of 1.25 kN bolt stress.
2. When a single RRU is installed on the wall at the side, the wall must have the load capacity of 2.0 kN bolt stress.
3. When three RRUs are installed on the wall at the side, the wall must have the load capacity of 6.0 kN bolt stress.

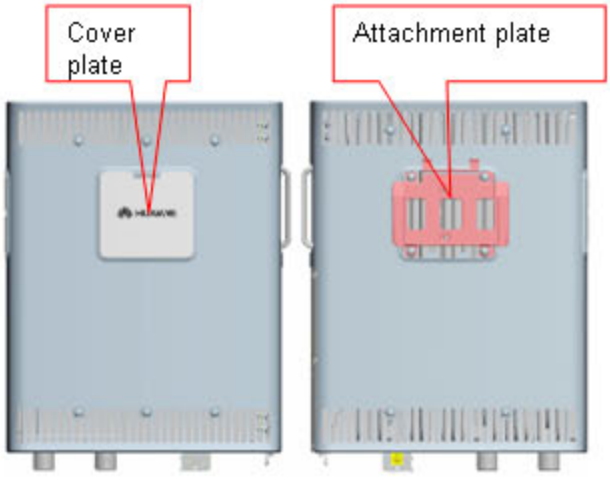
Installation Procedure



Preparing for the installation



Fixture assembly for installing the RRU



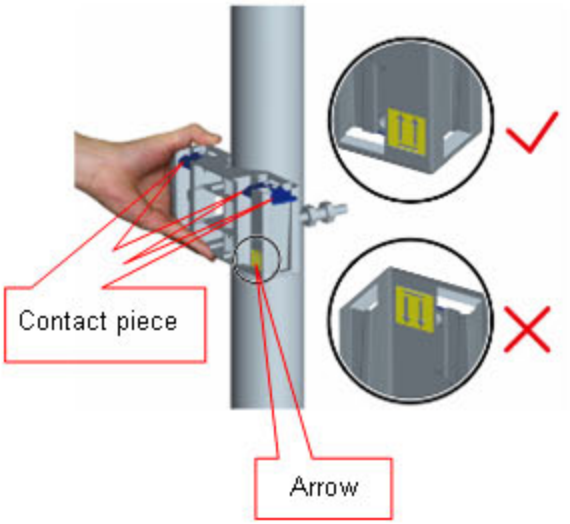
Front of the RRU

Back of the RRU

Installing the RRU on a Metal Pole

a Installing a Single RRU in Ordinary Mode

1. Install the main fixture.



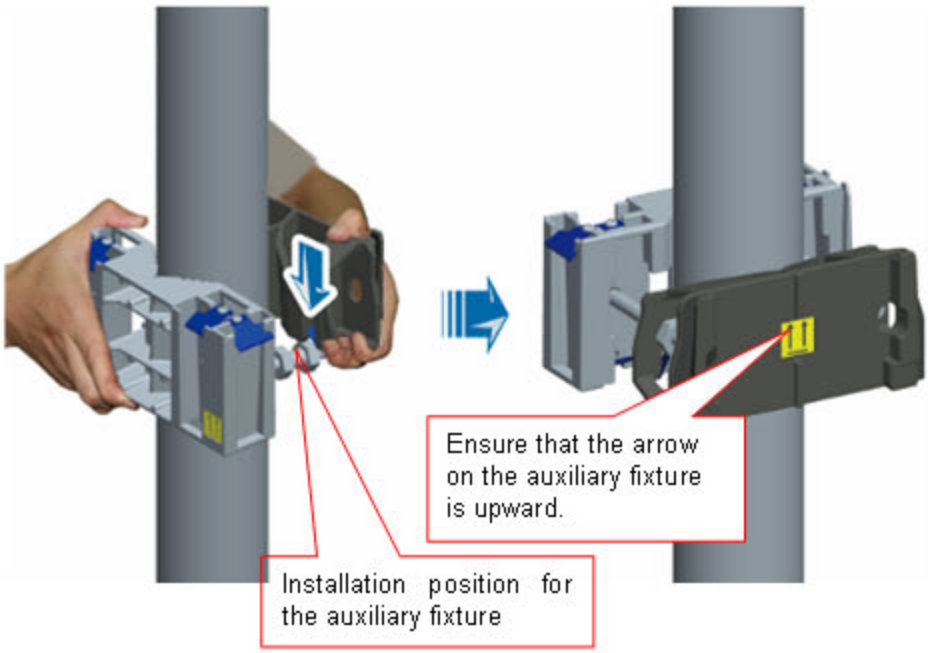
CAUTION

1. When installing the main fixture, ensure that the arrow on the main fixture is upward.
2. When installing the main fixture, ensure that the contact piece on the fixture is fixed.

NOTE

It is recommended that the bottom of the highest main fixture be 1200 mm to 1600 mm above the ground for easy maintenance.

2. Install the auxiliary fixture between the nuts of the dual-nut bolt assembly on the main fixture.



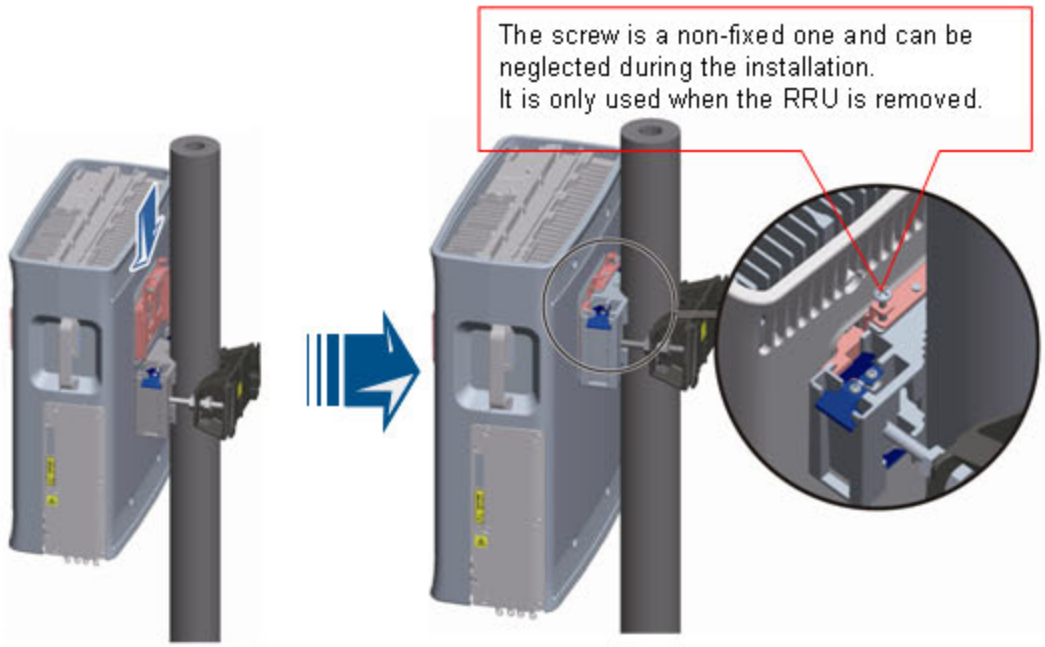
TIP: You may fit one end of the auxiliary fixture on one dual-nut bolt assembly and then the other end on the other dual-nut bolt assembly during the installation.

Installing the RRU on a Metal Pole

3. Use an adjustable wrench to tighten the nut until the fastening torque is 35 N•m to 40 N•m. In this way, the main and auxiliary fixtures are secured on the pole.

Fasten the two dual-nut bolt assemblies alternatively so that the main bracket and auxiliary bracket have the same spacing with each other at the two sides.

4. Install the RRU on the main fixture.



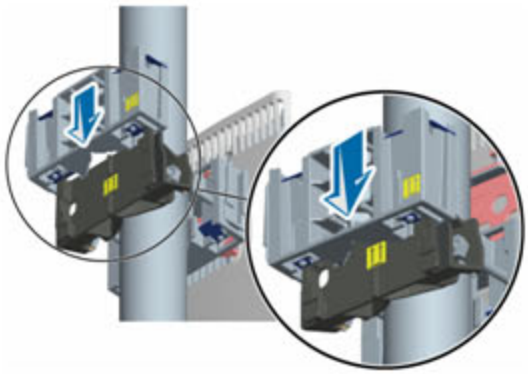
The RF port at the bottom of the RRU does not have load bearing capacity. Do not place the RRU on the ground on its bottom during the installation.

Installing the RRU on a Metal Pole

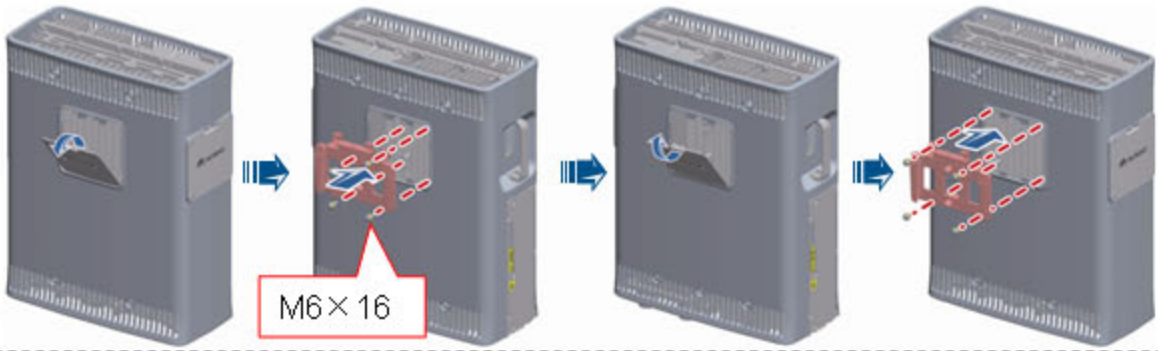
b Installing Two RRUs in Back-To-Back Mode

1. Install an RRU first. For details, see page 7 Installing a Single RRU in Ordinary Mode.

2. Install the main fixture of another RRU. Ensure that the main and auxiliary fixtures are perfectly fitted.

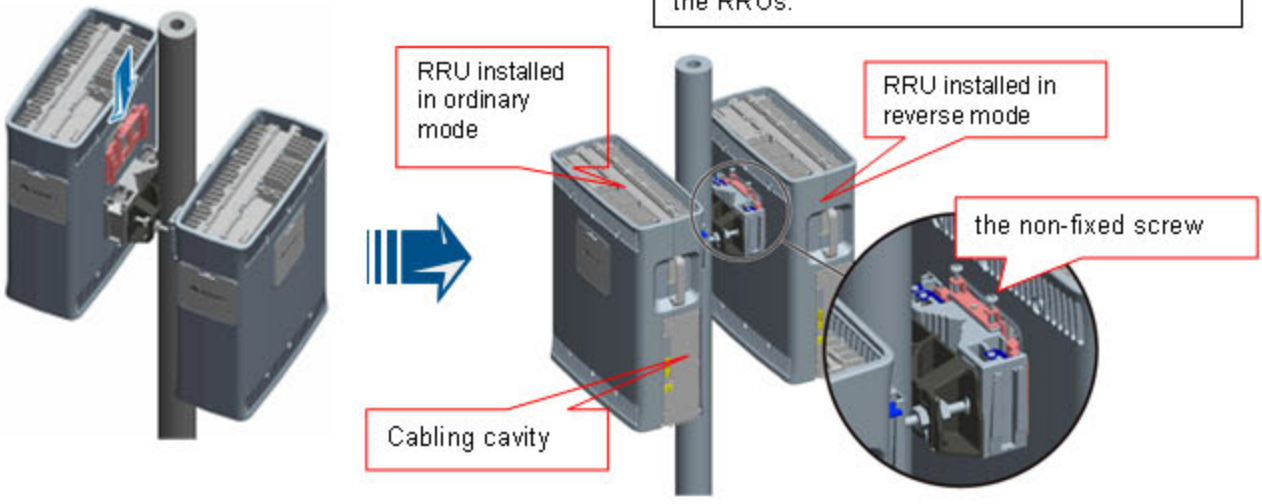


3. Reinstall the cover plate and attachment plate on the second RRU to interchange their positions.



4. Install the second RRU on the main fixture.

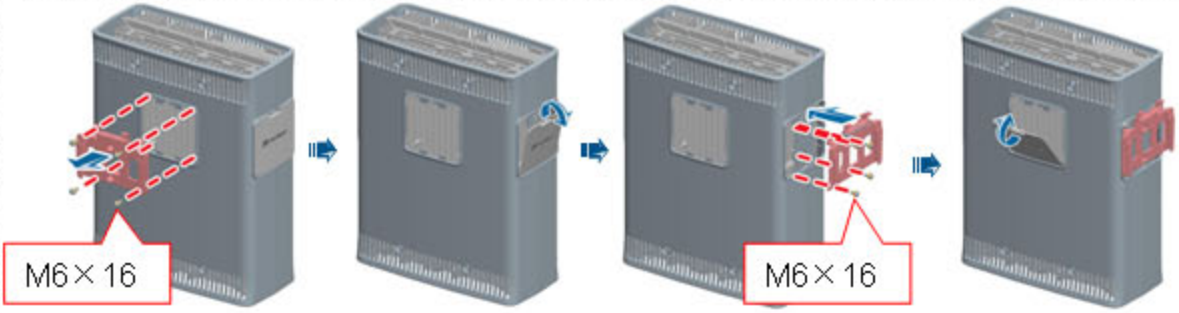
Ensure that the cabling cavities of the two RRUs face the same direction when installing the RRUs.



Installing the RRU on a Metal Pole

C Installing Multiple RRUs in Centralized Mode

1. Reinstall the attachment plate on the back and cover plate on one side by interchanging their positions.

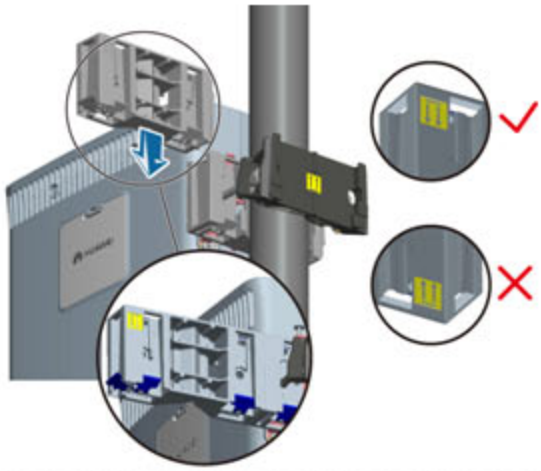


1. The RF port at the bottom of the RRU does not have load bearing capacity. Do not place the RRU on the ground on its bottom during the installation.
2. Place the RRU on the foam material or cardboard to prevent the RRU surface from scratches.

2. Install an RRU on a main fixture.

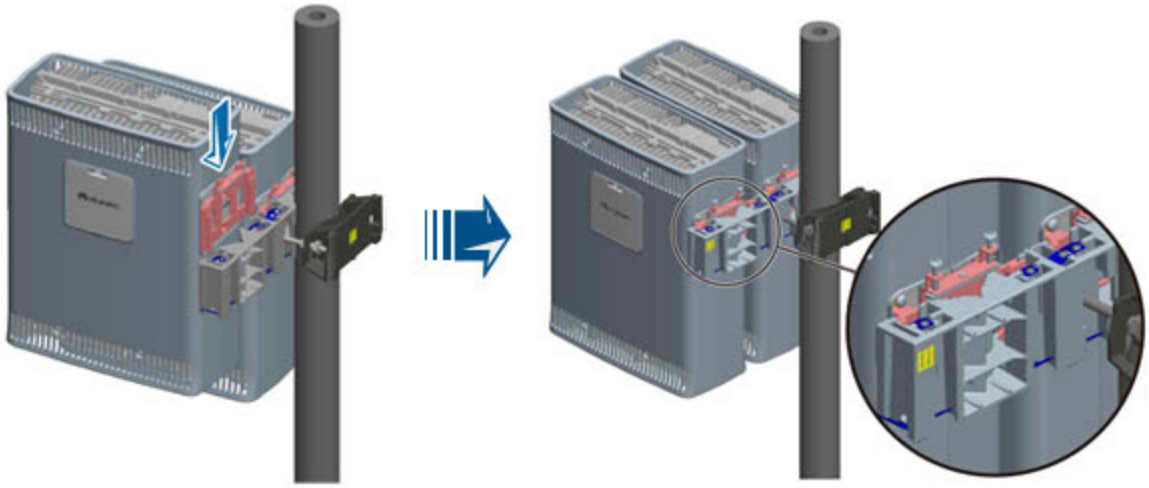
When a single RRU is installed on the metal pole, the installation at the side is not recommended.

3. Install another main fixture.



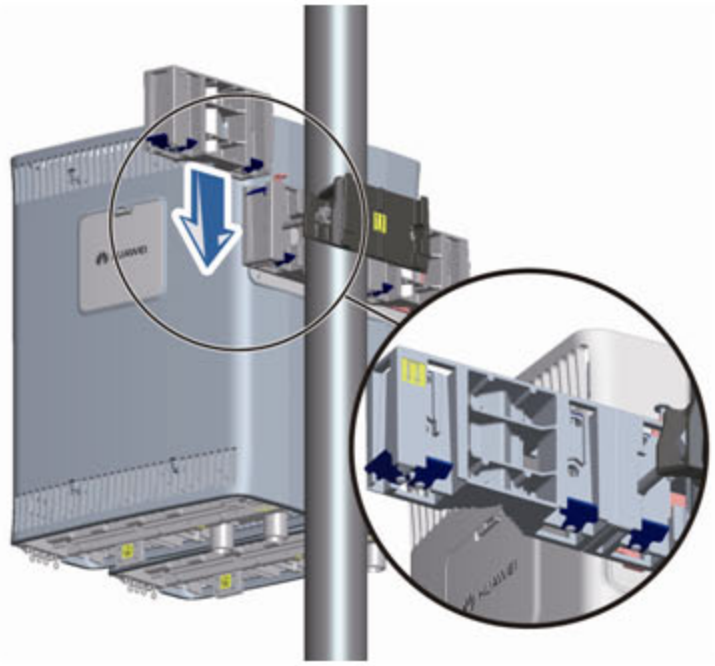
4. Install another RRU on the second main fixture.

When two RRUs are installed on the metal pole, the installation at the side is not recommended.

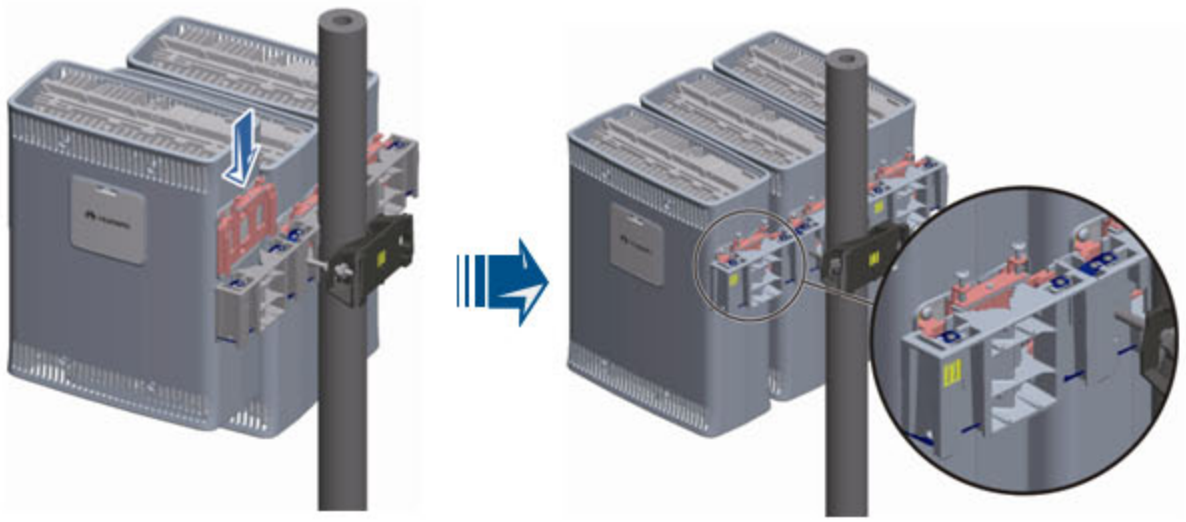


Installing the RRU on a Metal Pole

5. Install a third main fixture.

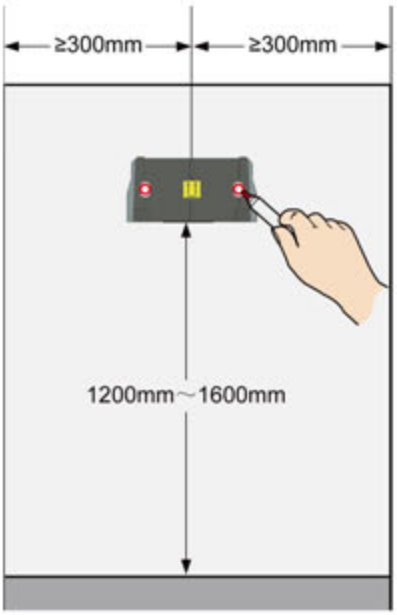


6. Install a third RRU on the third main fixture.

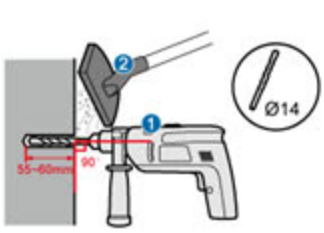


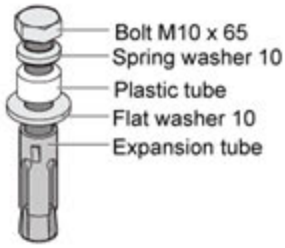
Installing the RRU on a Wall

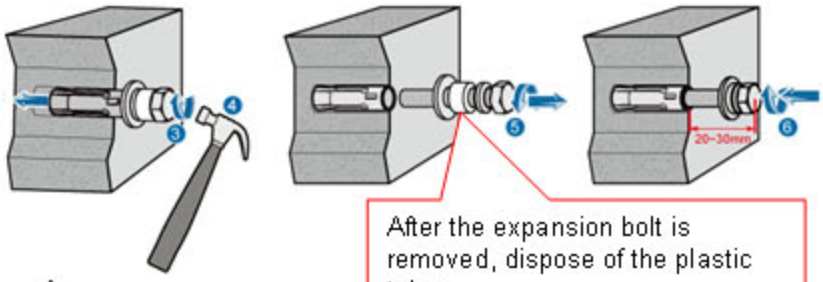
1. Place the auxiliary fixture on the wall at the installation position and then mark the anchor points by using a marking pen.



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





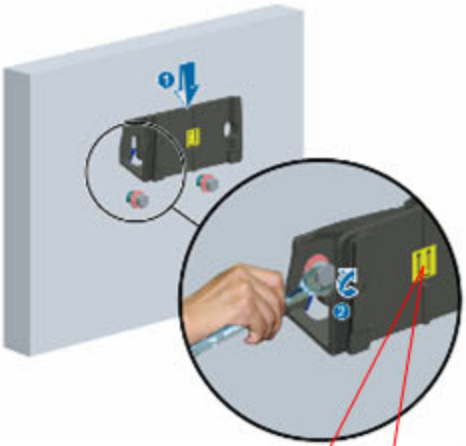


After the expansion bolt is removed, dispose of the plastic tube.

CAUTION

Do not hammer the bolt entirely into the expansion tube, and leave 20 mm to 30 mm of the bolt outside the wall.

3. Fit the auxiliary fixture on the expansion bolts downward, and then tighten the bolts by using a combination wrench (17 mm - 17 mm).



Ensure that the arrow on the auxiliary fixture is upward.

NOTE

It is recommended that the bottom of the auxiliary fixture be 1200 mm to 1600 mm above the ground.

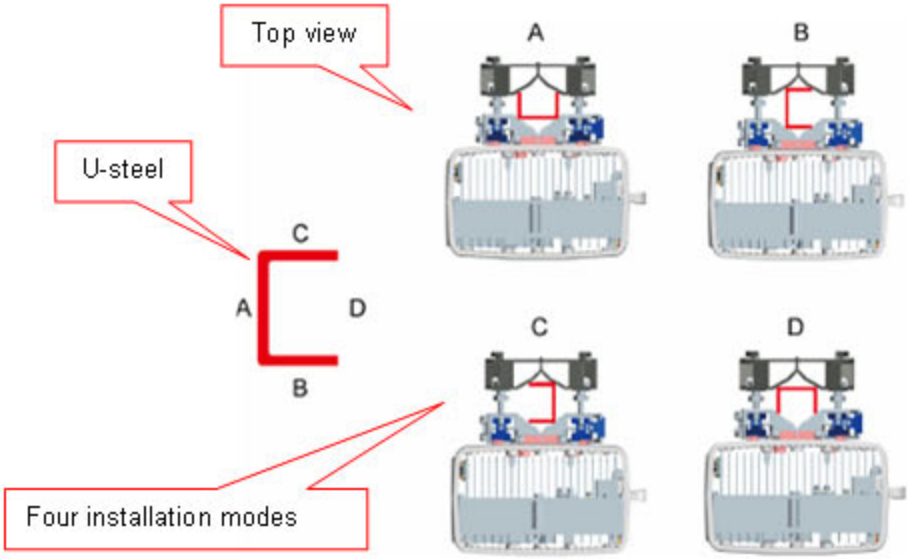
4. Install the main fixture.

5. Install the RRU.

On a wall (at the back)

On a wall (at the side)

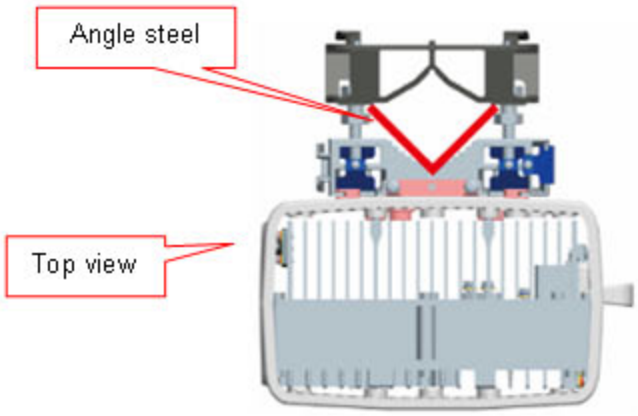
Installing the RRU on a U-Steel



The procedure for installing the RRU on a U-steel is the same as that on a metal pole.

Warning: Only one RRU can be installed on a U-steel at the back.

Installing the RRU on an Angle Steel



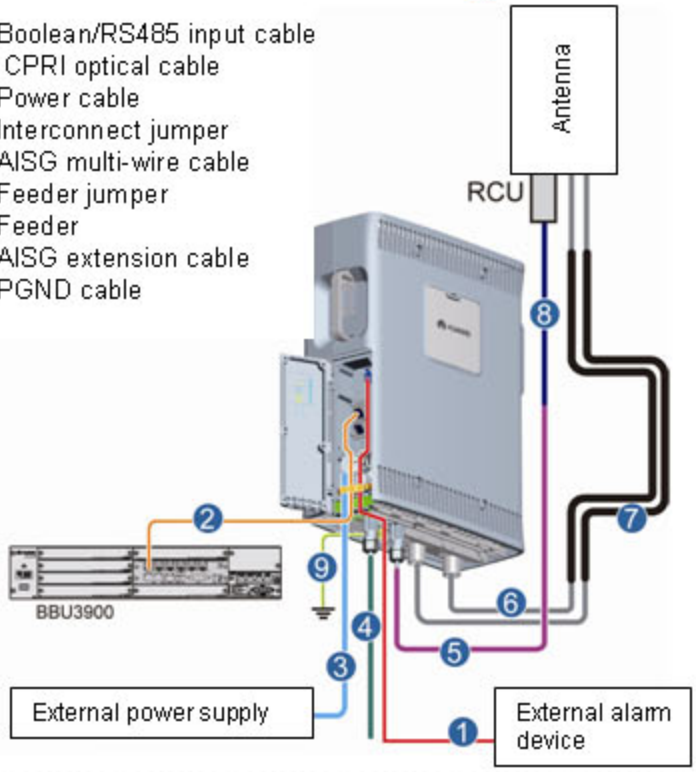
The procedure for installing the RRU on an angle steel is the same as that on a metal pole.

Warning: Only one RRU can be installed on an angle steel at the back.

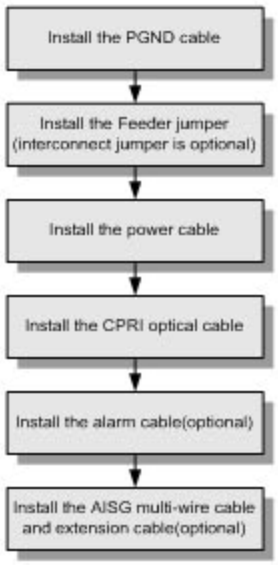
Installing the RRU Cables

A. Cable Connections of a Single RRU

①Boolean/RS485 input cable
② CPRI optical cable
③Power cable
④Interconnect jumper
⑤AISG multi-wire cable
⑥Feeder jumper
⑦Feeder
⑧AISG extension cable
⑨PGND cable



Sequence of Installing the Cables

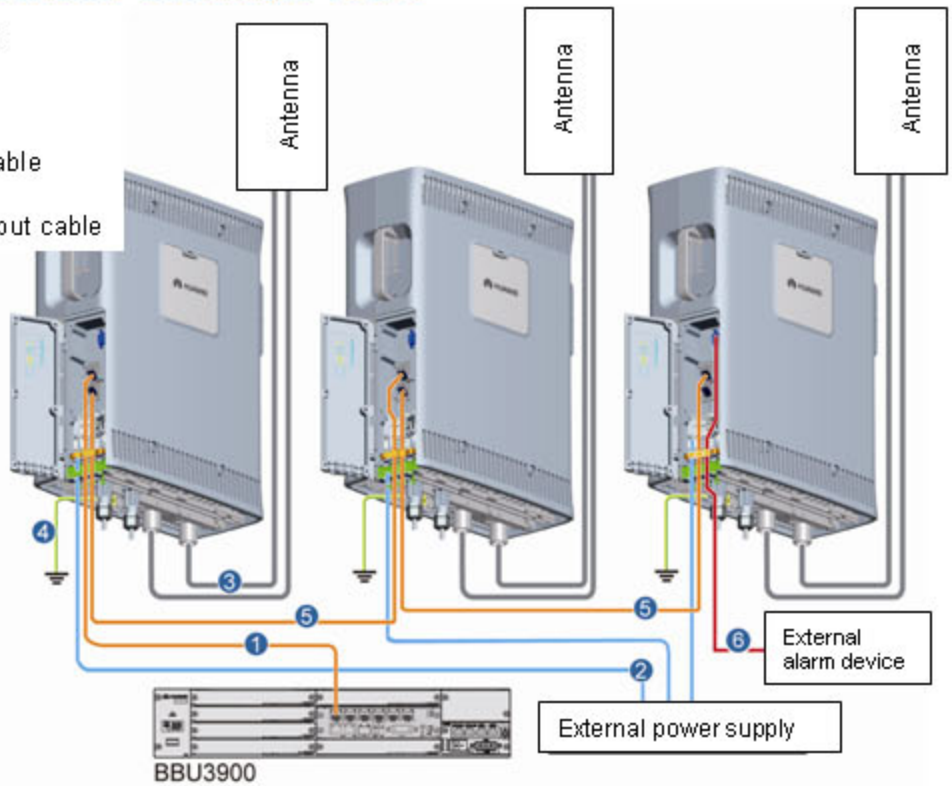


CAUTION

When a dual-polarized antenna is shared by two RRUs in the same sector, the two RRUs are connected through an inter-RRU jumper. The connections of three RRUs in the same sector are not supported.

B. Cable Connections of Multiple RRUs

①CPRI optical cable
② Power cable
③Feeder jumper
④PGND cable
⑤SFP high-speed cable for cascading
⑥Boolean/RS485 input cable



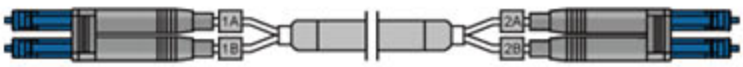
CAUTION

The RRU3008 does not support the cascading of power cables.

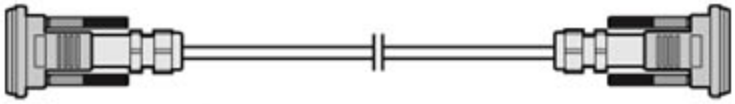
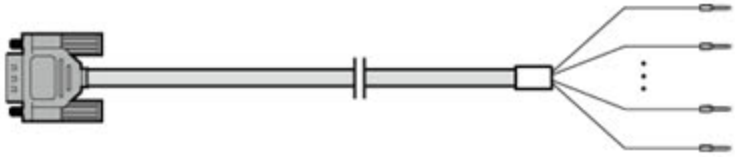
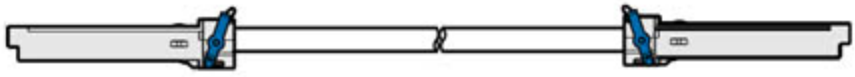
When two or more RRUs need to be cascaded in the same cell (or in the scenario for capacity expansion), the alarm cables need to be connected to the RRU in the lowest level for alarm reporting.

Installing the RRU Cables

C. Cable List

Cable	Connector Type	Connected to···
PGND cable	OT terminal	Grounding bolt on the RRU
	OT terminal	Nearest grounding bar
		
Antenna jumper	DIN male connector	Ports labeled ANT_TX/RXA and ANT_RXB on the RRU
	DIN male connector	Feeder or antenna
		
Power cable	Two OT terminals	The OT terminal on the blue wire is connected to the NEG(-) port on the cabling cavity of the RRU. The OT terminal on the black wire is connected to the RTN(+) port on the cabling cavity of the RRU
	Bare wire	External power supply
		
CPRI optical cable	DLC connector	Connect the fiber tails labeled 1A and 1B to the CPRI_W port on the RRU
	DLC connector	Connect the fiber tails labeled 2A and 2B to one of the CPRI0 to CPRI5 ports on the GTMU
		
AISG multi-wire cable	Waterproof DB9 connector	Port labeled RET/PWR_SRXU on the RRU
	Standard AISG female connector	Standard AISG male connector of the AISG extension cable or RCU
		

Installing the RRU Cables

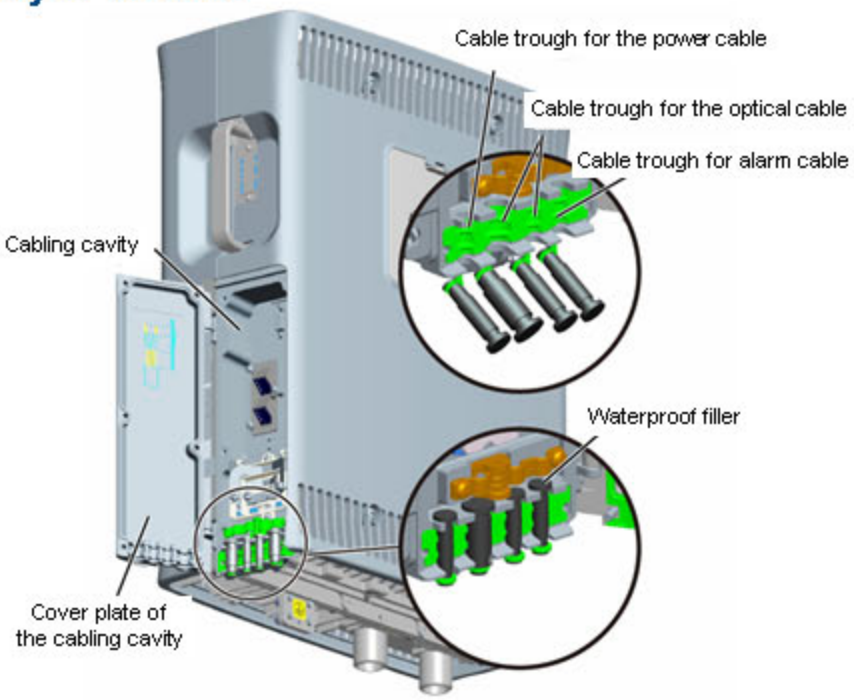
Cable	Connector Type	Connected to···
AISG extension cable	Standard AISG male connector	Standard AISG female connector of the AISG multi-wire cable
	Standard AISG female connector	Standard AISG male connector of the RCU
		
Interconnect jumper	2W2 connector	Port labeled RX_IN/OUT on the RRU
	2W2 connector	Port labeled RX_IN/OUT on the RRU
		
Alarm cable	DB15 male connector	Port labeled RS485/EXT_ALM in the RRU cabling cavity
	Eight cord end terminals	External alarm devices
		
SFP high-speed cable for cascading	SFP200 male connector	the CPRI_W port on the RRU
	SFP200 male connector	the CPRI_E port on the RRU
		

NOTE

Coil the extra length of a cable, and then connect the cable to the corresponding port according to actual installation scenario.

Installing the RRU Cables

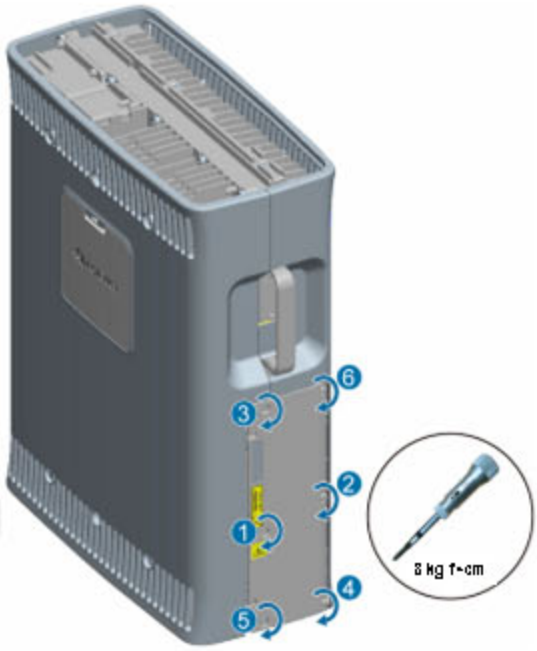
D. Cabling Cavity of the RRU



E. Opening and Closing the Cover Plate of the RRU Cabling Cavity

① Open the cover plate of the RRU cabling cavity.

② Close the cover plated of the RRU cabling cavity.

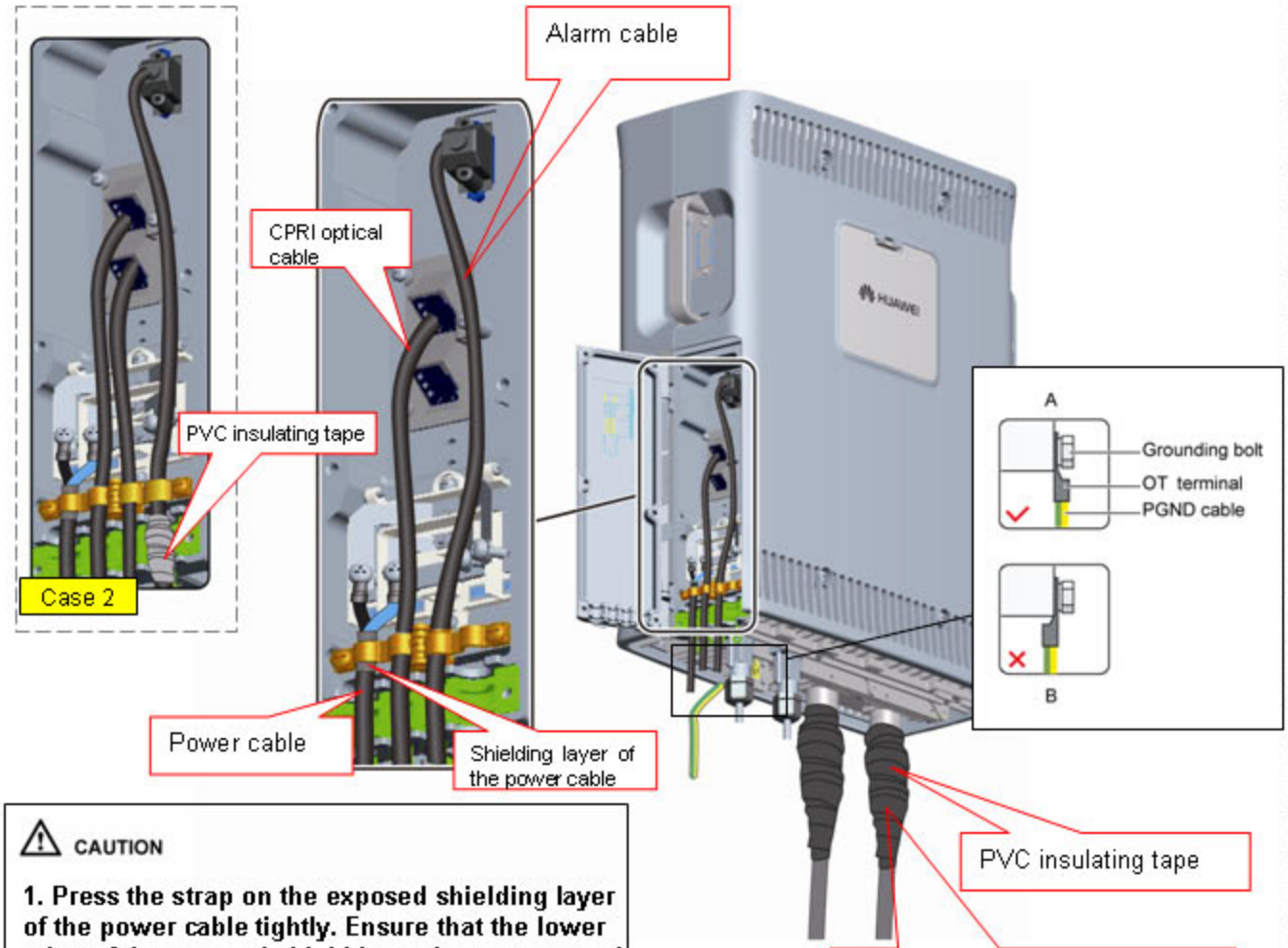


⚠ CAUTION

1. The screw on the cover plate is tightened until the fastening torque is 8 kgf•cm.
2. The screws on the cover plate are tightened in the order shown in the preceding figure.

Installing the RRU Cables

F. Cable Connections of RRU



CAUTION

1. Press the strap on the exposed shielding layer of the power cable tightly. Ensure that the lower edge of the exposed shield layer does not exceed the position shown in the figure.
2. The shielding layer of the other end of the power cable should be grounded.
3. When the alarm cable is connected, ensure that the shielding layer of the alarm cable on the RRU side is exposed and that the shielding layer is tightly pressed by the strap.
4. The alarm cable is preferably led out of the RRU from the narrower cable trough in the middle of the cabling cavity. If the cable trough is used by the CPRI optical cable, the alarm cable is led from the wider cable trough near the middle one. In this case, the alarm cable must be wrapped with 10 to 17 layers of waterproof tape so that the diameter of the cable reaches 10 mm to 12 mm.
5. To avoid sharp bending, the optical cable must be pressed by the strap next to the power cable during the optical cable installation.

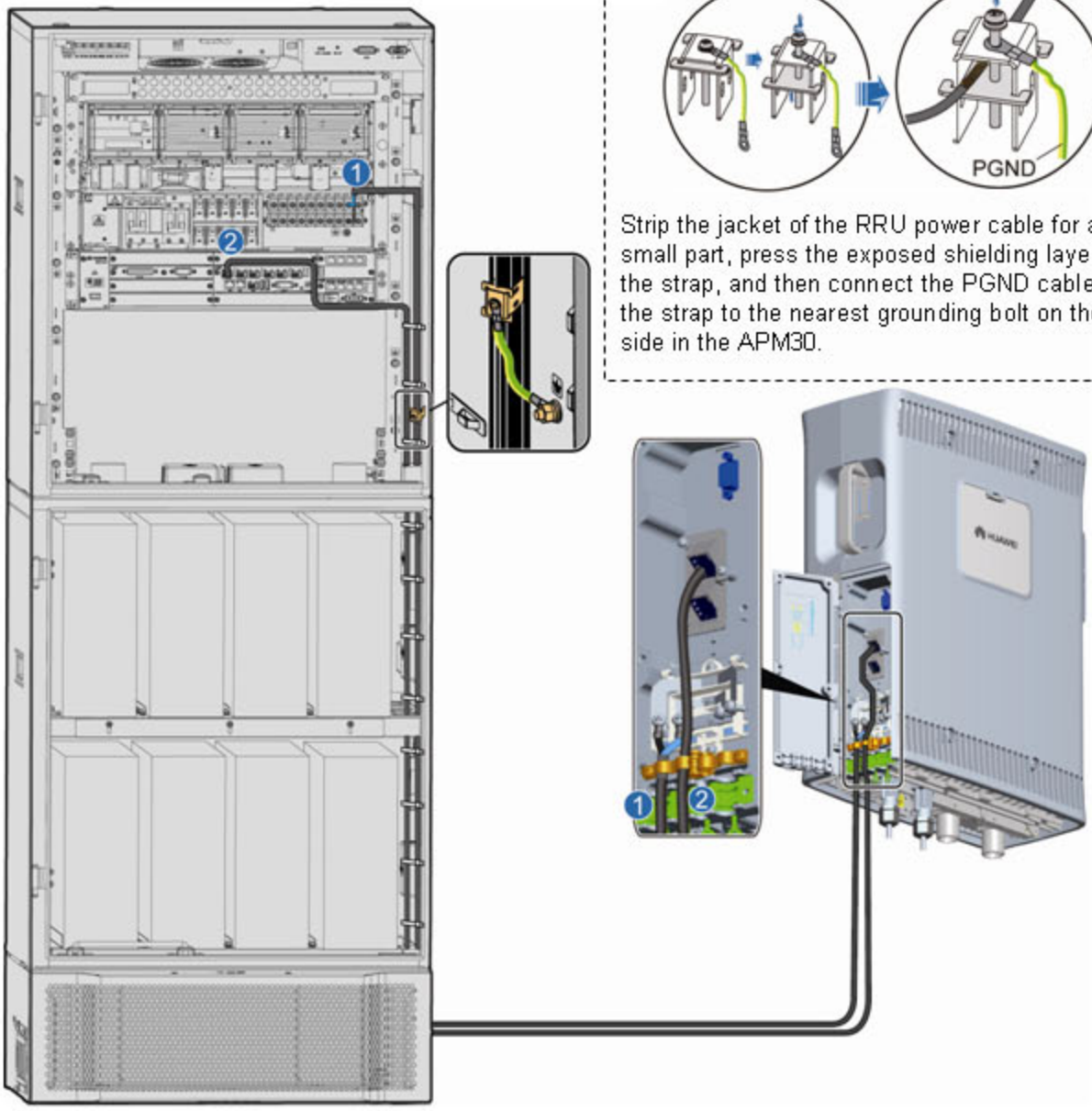
NOTE

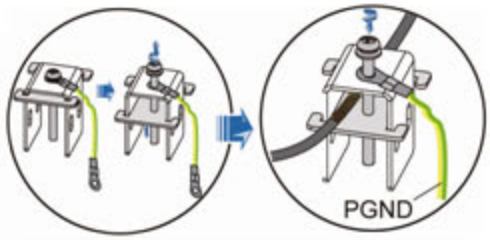
The tape is wrapped spirally upwards, downwards, and then upwards again in three layers. For every two adjacent tape layers, the tape on the upper layer overlaps about half the width of the tape on the lower layer.

For details on how to add the OT terminals to the power cable, see page 29

Installing the RRU Cables

1. RRU+APM30/APM30H





Strip the jacket of the RRU power cable for a small part, press the exposed shielding layer on the strap, and then connect the PGND cable on the strap to the nearest grounding bolt on the side in the APM30.

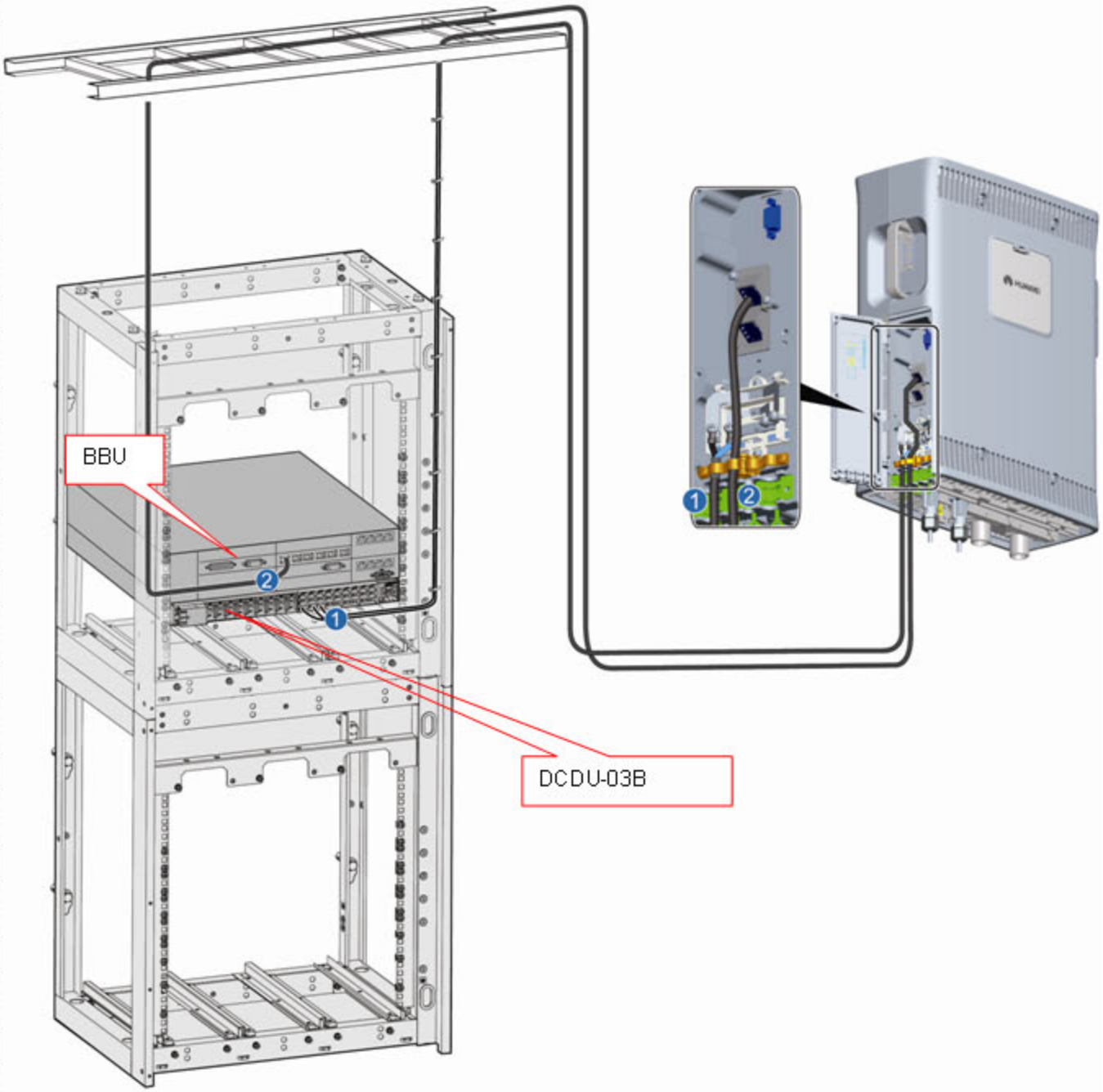
(1) RRU power cable	(2) CPRI optical cable

NOTE

1. The RRU power cable is connected to one of the LOAD4 to LOAD9 terminals of the PDU.
2. To avoid sharp bending, the optical cable must be pressed by the strap next to the power cable during the optical cable installation.

Installing the RRU Cables

2. RRU+19-Inch Stand



(1) RRU power cable	(2) CPRI optical cable

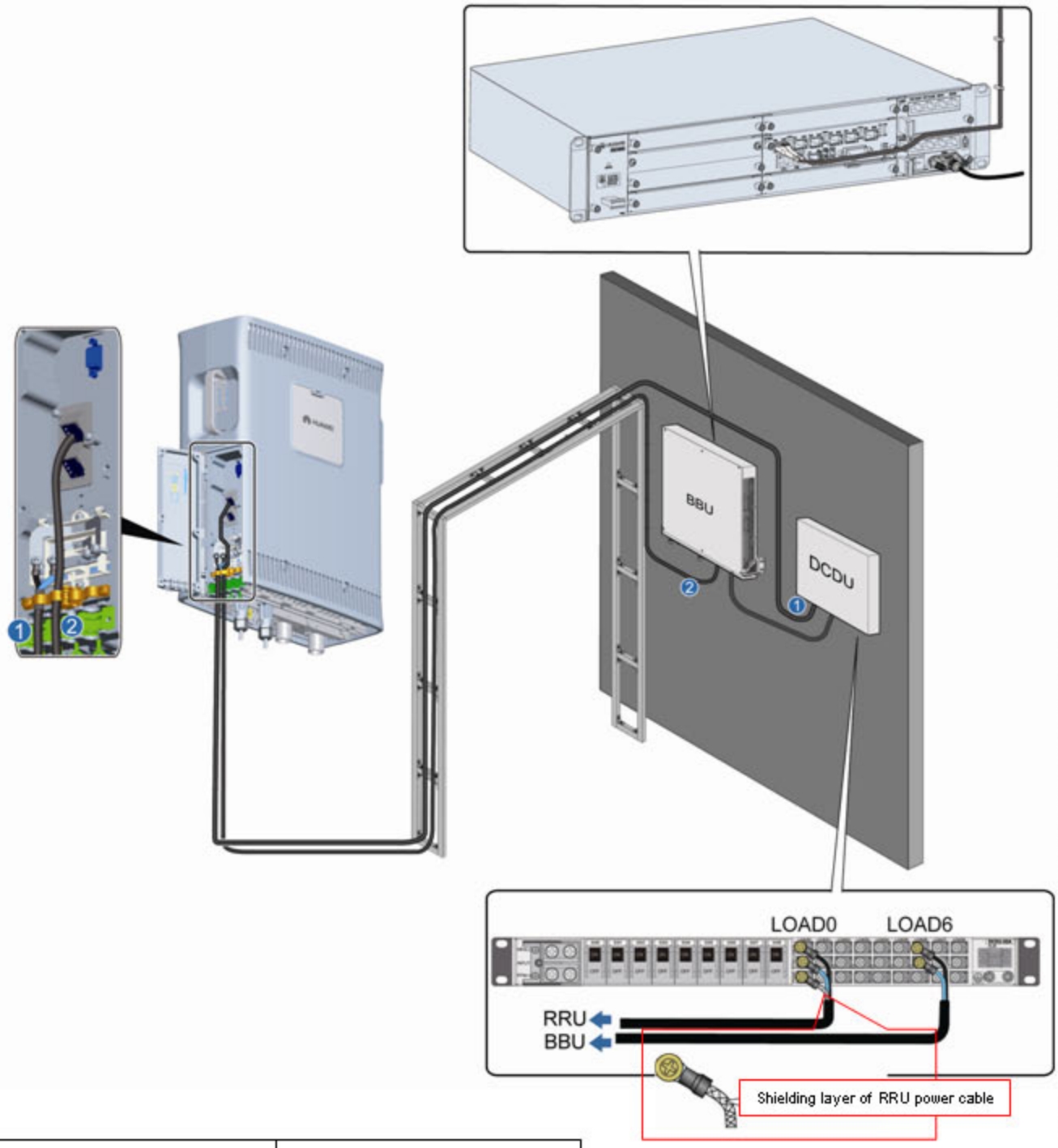
NOTE

1. The RRU power cable is connected to one of the LOAD0 to LOAD3 terminals of the DCDU-03B.

2. When connecting the RRU power cable to the DCDU-03B, you must add an OT terminal to the shielding layer. Then, fix the OT terminal to the corresponding GND terminal of the DCDU-03B. For details on how to add an OT terminal, see page 29.

Installing the RRU Cables

3. RRU+Wall-Mounted BBU

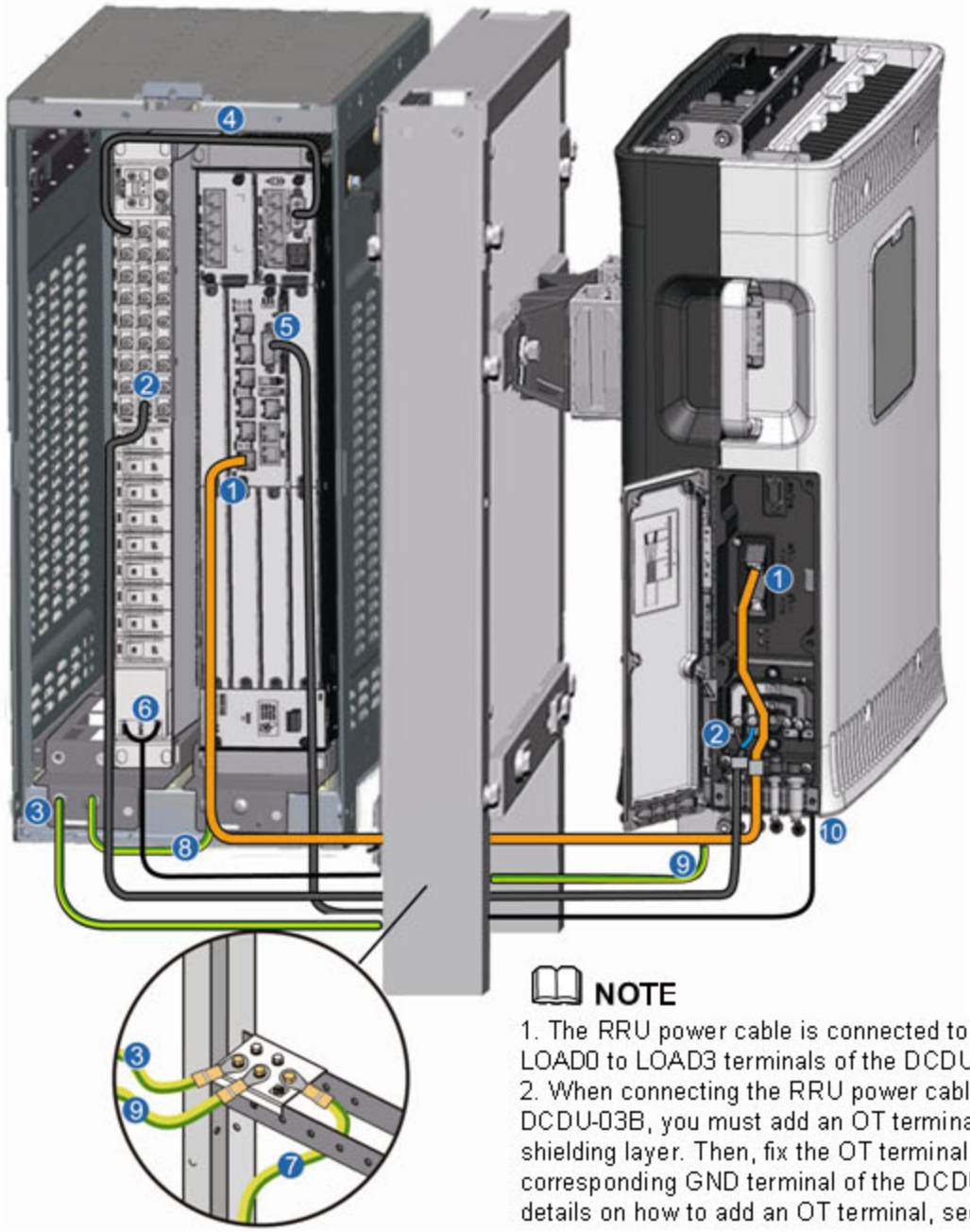


(1) RRU power cable	(2) CPRI optical cable

NOTE

1. The RRU power cable is connected to one of the LOAD0 to LOAD3 terminals of the DCDU-03B.
2. When connecting the RRU power cable to the DCDU-03B, you must add an OT terminal to the shielding layer. Then, fix the OT terminal to the corresponding GND terminal of the DCDU-03B. For details on how to add an OT terminal, see page 29.

4. RRU+RRU3004 Rack (-48 V power supply)



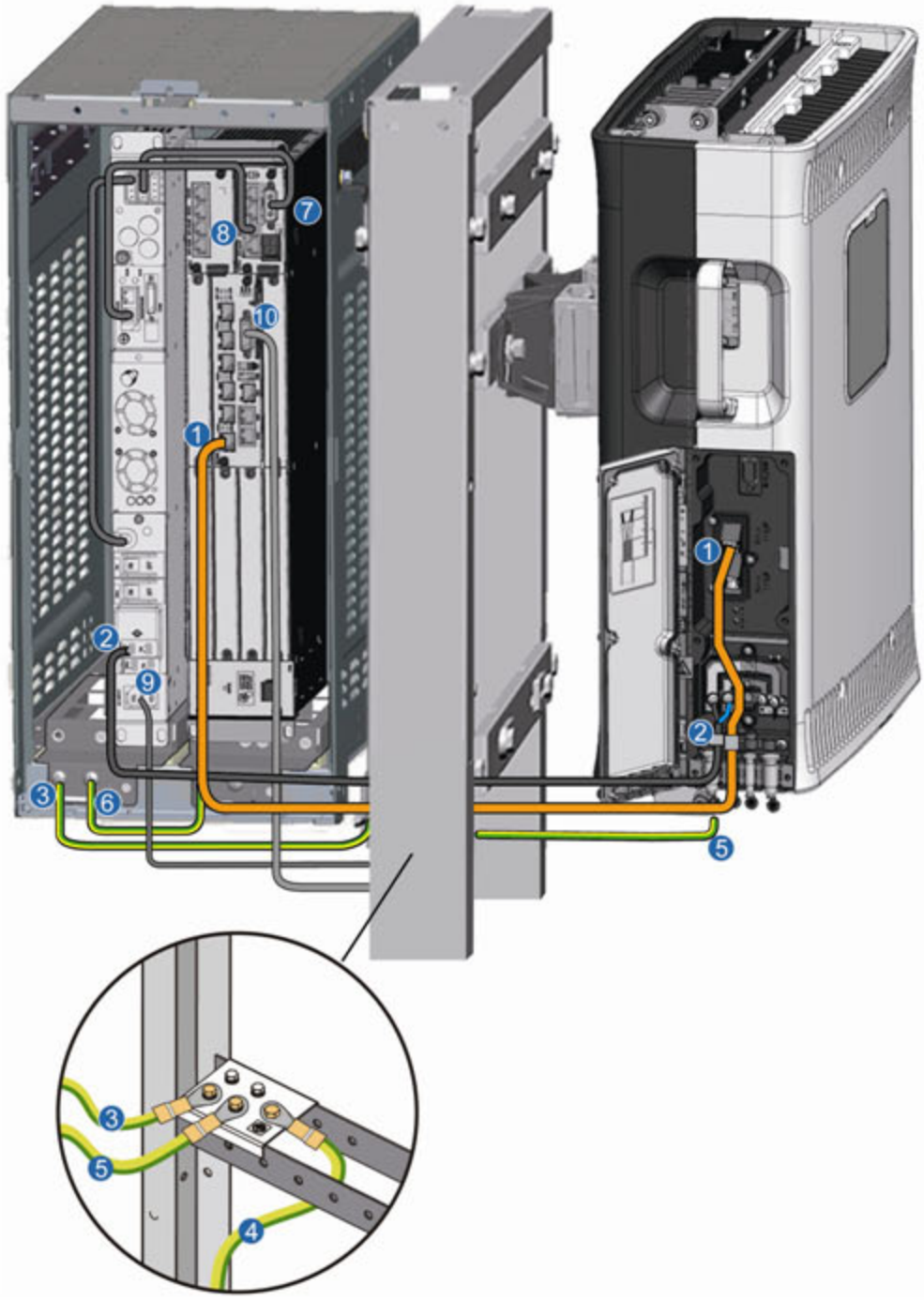
NOTE

1. The RRU power cable is connected to one of the LOAD0 to LOAD3 terminals of the DCDU-03B.
2. When connecting the RRU power cable to the DCDU-03B, you must add an OT terminal to the shielding layer. Then, fix the OT terminal to the corresponding GND terminal of the DCDU-03B. For details on how to add an OT terminal, see page 29.

(1) CPRI optical cable	(2) RRU power cable	(3) PGND cable of the DCDU	(4) BBU power cable
(5) E1 cable	(6) DCDU power cable	(7) External PGND cable	(8) Equipotential cable between the BBU and the DCDU
(9) PGND cable of the RRU	(10) RF jumper		

Installing the RRU Cables

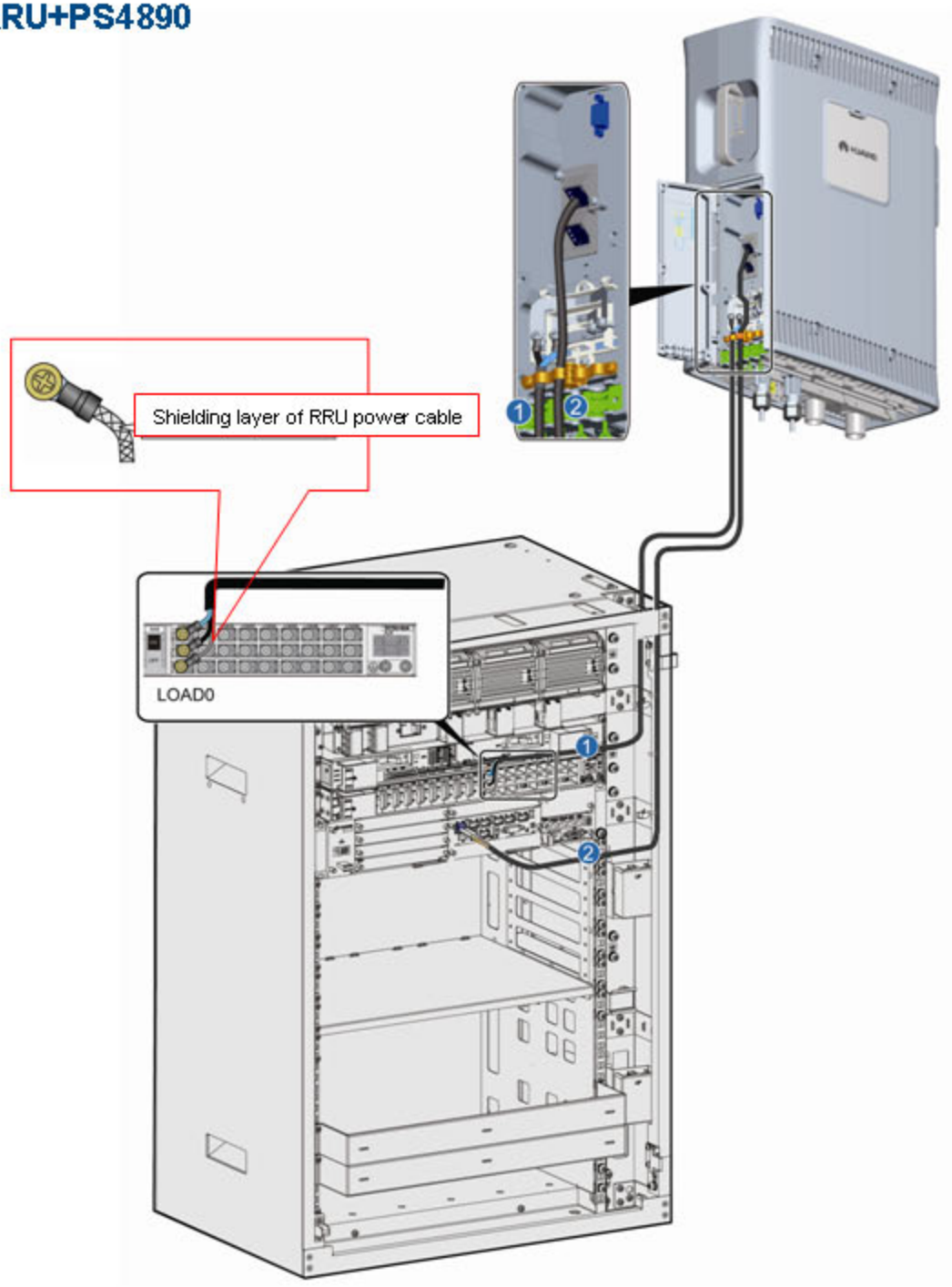
4. RRU+RRU3004 Rack (220 V power supply)



(1) CPRI optical cable	(2) RRU power cable	(3) PGND cable of the 4815	(4) External PGND cable
(5) PGND cable of the RRU	(6) Equipotential cable between the BBU and the 4815	(7) BBU power cable	(8) Monitoring signal cable between the 4815 and the BBU
(9) 4815 power cable	(10) E1 cable		

Installing the RRU Cables

5. RRU+PS4890



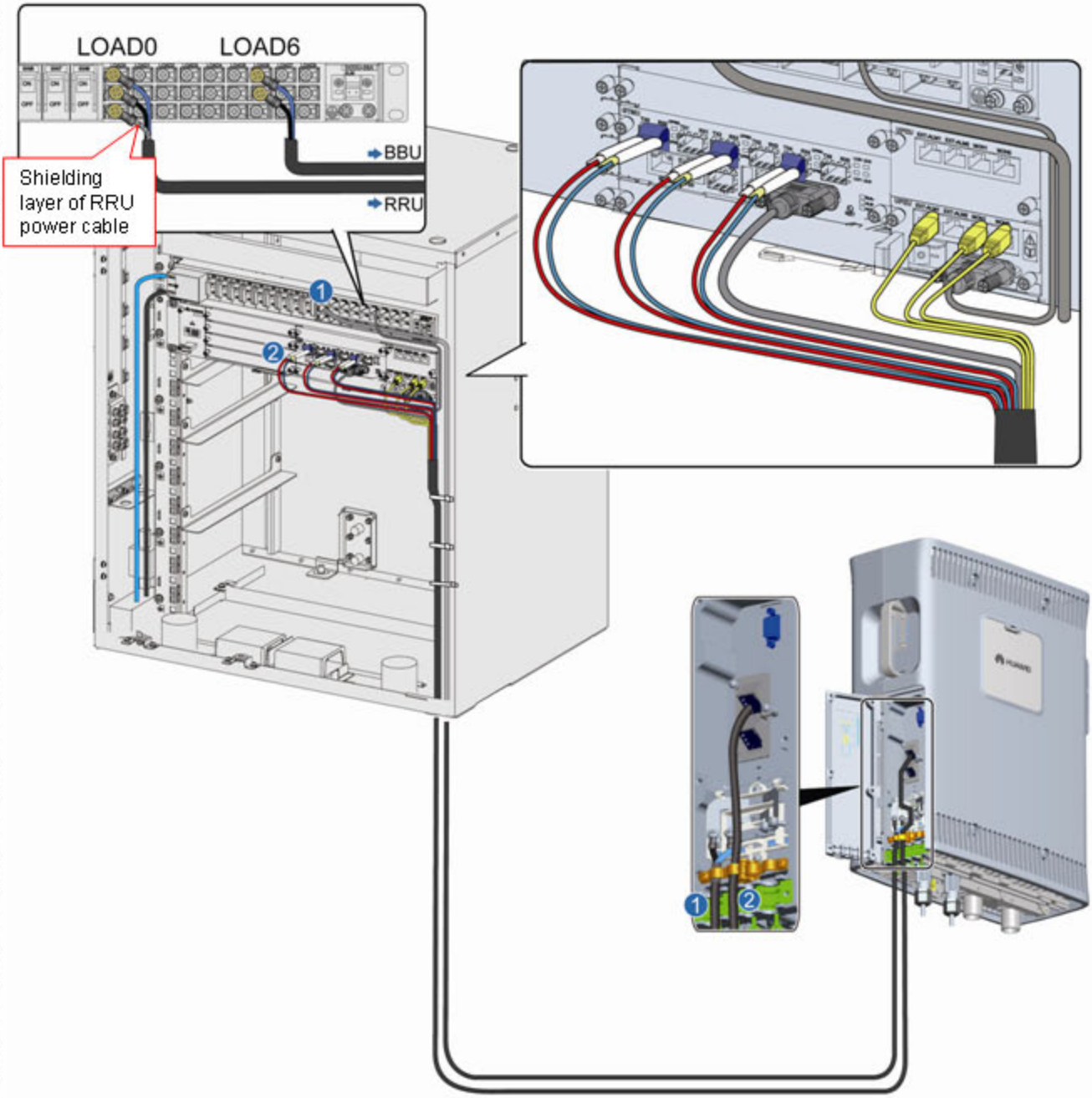
(1) RRU power cable	(2) CPRI optical cable

NOTE

1. The RRU power cable is connected to one of the LOAD0 to LOAD3 terminals of the DCDU-03B.
2. When connecting the RRU power cable to the DCDU-03B, you must add an OT terminal to the shielding layer. Then, fix the OT terminal to the corresponding GND terminal of the DCDU-03B. For details on how to add an OT terminal, see page 29.

Installing the RRU Cables

6. RRU+TMC



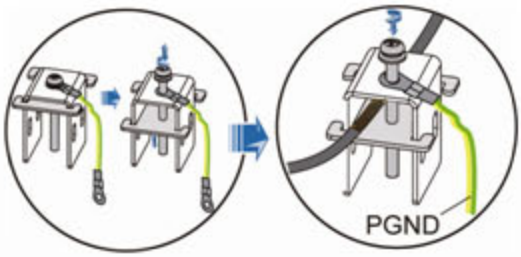
(1) RRU power cable	(2) CPRI optical cable

NOTE

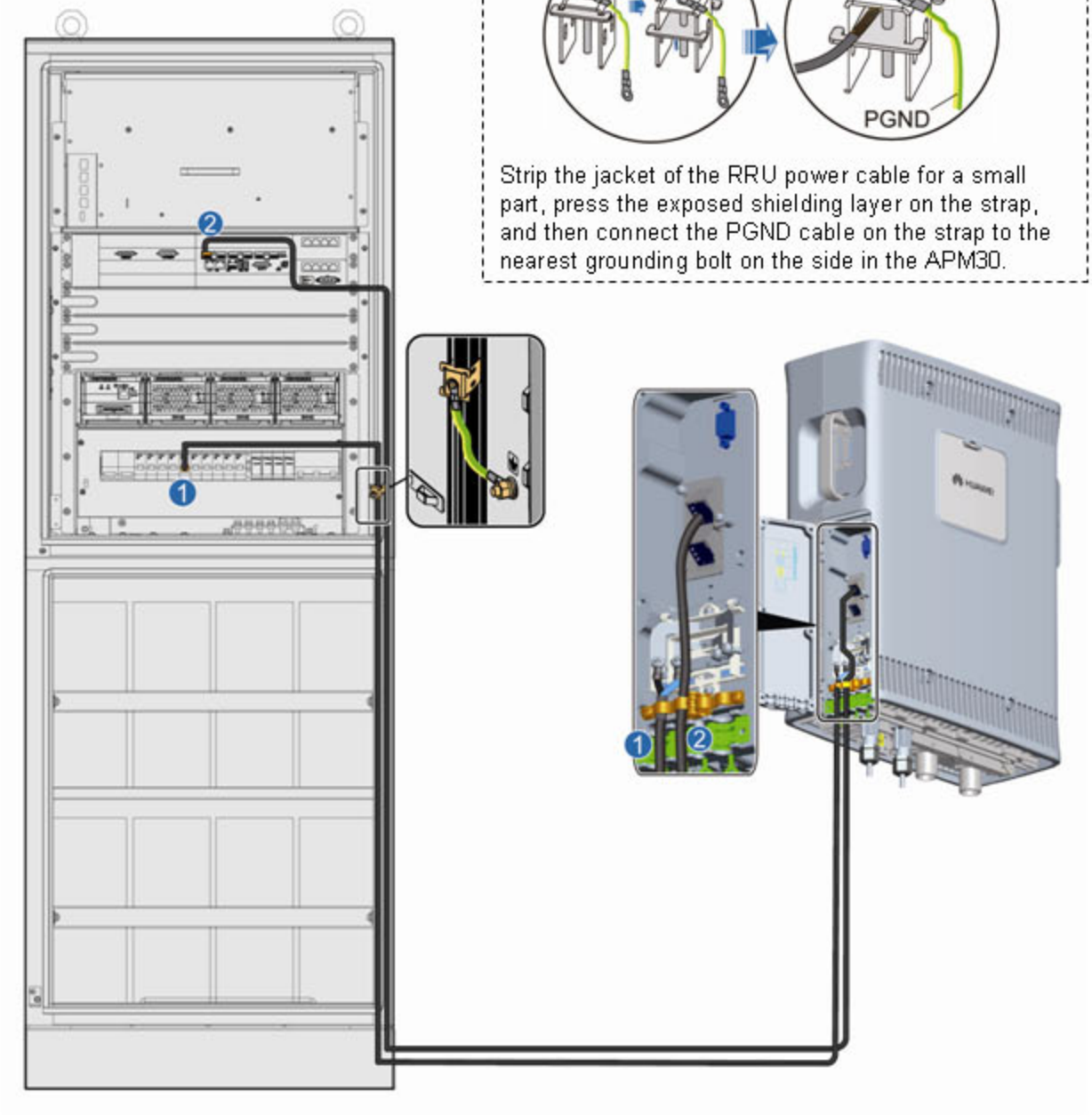
1. The RRU power cable is connected to one of the LOAD0 to LOAD3 terminals of the DCDU-03B.
2. When connecting the RRU power cable to the DCDU-03B, you must add an OT terminal to the shielding layer. Then, fix the OT terminal to the corresponding GND terminal of the DCDU-03B. For details on how to add an OT terminal, see page 29.

Installing the RRU Cables

7. RRU+APM200E



Strip the jacket of the RRU power cable for a small part, press the exposed shielding layer on the strap, and then connect the PGND cable on the strap to the nearest grounding bolt on the side in the APM30.

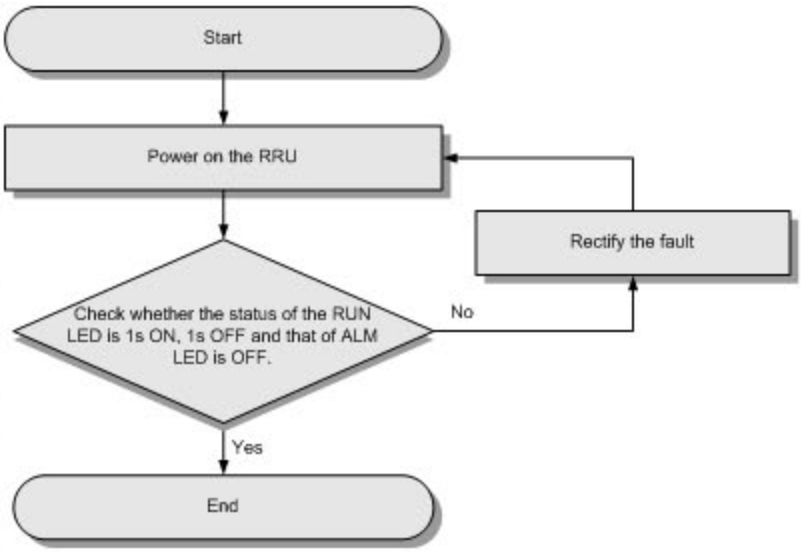


(1) RRU power cable	(2) CPRI optical cable

NOTE

1、 The RRU power cable is connected to the terminals corresponding to MCBs SW5 through SW10.
2、Strip the jacket of the RRU power cable for a small part, press the exposed shielding layer on the strap, and then connect the PGND cable on the strap to the nearest grounding bolt on the side in the APM200E.

Powering On the RRU



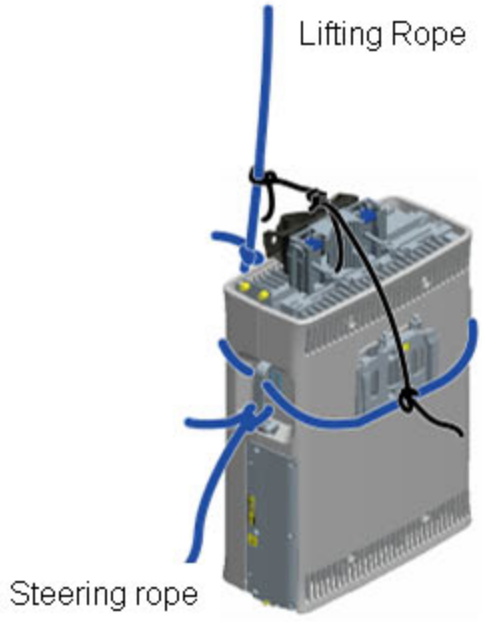
CAUTION

When the RRU is unpacked, it must be powered on within 24 hours. Each time the RRU is maintained after being put into use, the power-off duration cannot exceed 24 hours.

Reference

Binding the RRU and Installation Components

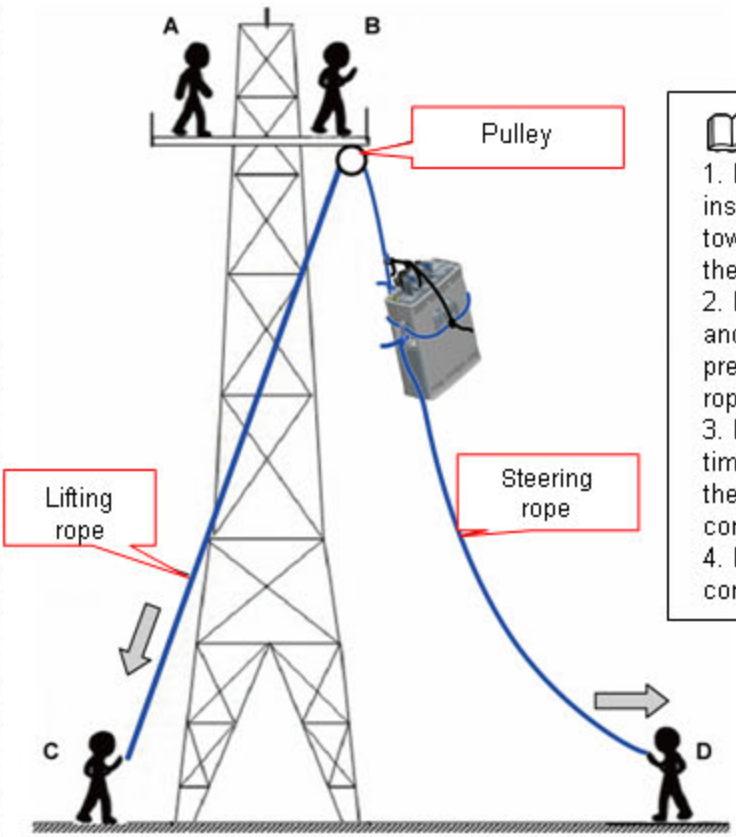
1. Bind one end of a rope to the installation components and the other end to the rope for binding the RRU.



CAUTION

When lifting the RRU and installation components to the tower, prevent the RRU from colliding with the tower.

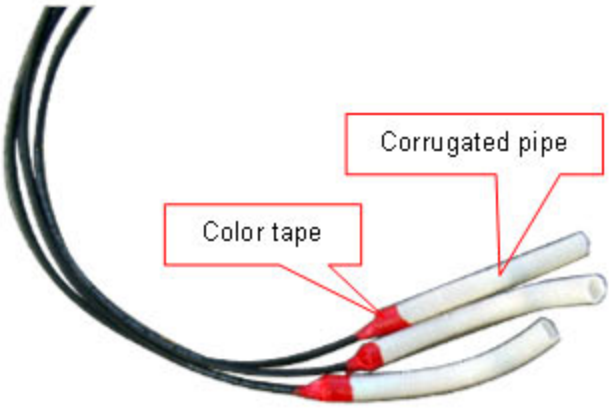
2. Lifting the RRU and Installation Components to the Tower



NOTE

1. Installers A and B climb onto the tower. Then, installer B fixes the pulley to the support of the tower platform and leads the lifting rope through the pulley.
2. Installer D uses a lifting rope to bind the RRU and installation components as shown in the preceding figure and then tie a knot in the steering rope at the handle of the RRU.
3. Installer C pulls the lifting rope, and at the same time, installer D pulls the steering rope away from the tower to prevent the RRU and installation components from colliding with the tower.
4. Installers A and B hold the RRU and installation components and untie the ropes.

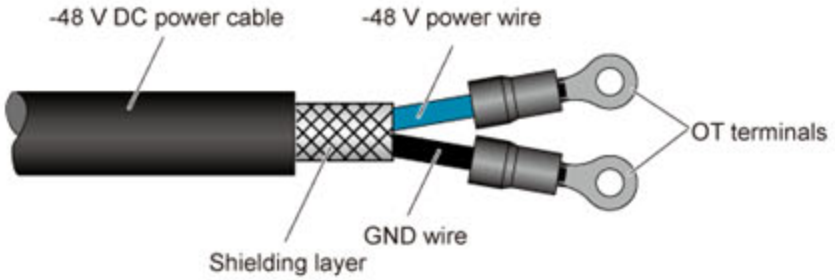
3. Lifting the CPRI Optical Cable up to the Tower

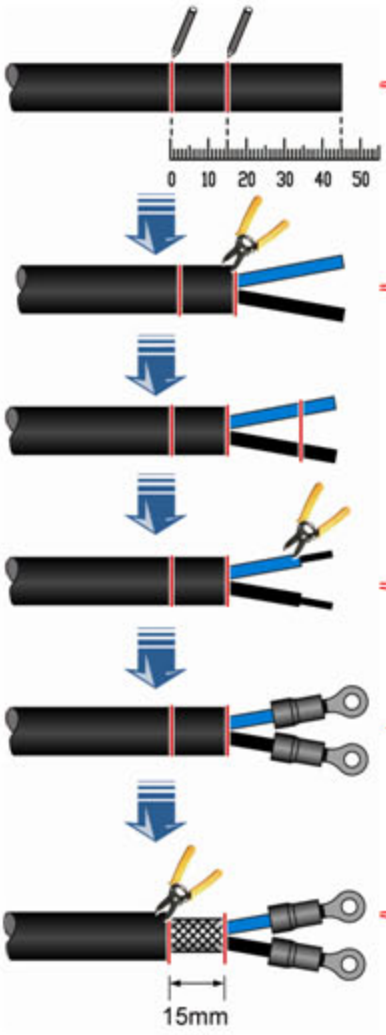


1. Cut off a 200 mm long corrugated pipe with the diameter of 25 mm.
2. Lead the fiber tails labeled 1A and 1B of the optical cable into the corrugated pipe by 160 mm.
3. Wrap up the corrugated pipe and optical cable with the color tape.
4. For the tower made of steel pipes, tie the black jacket to the corrugated pipe at the position 150 mm away from the color tape, and then lift the optical cable up to the tower.
5. For the tower made of angle steel girders, carry the optical cable onto the tower when climbing up to the tower.
6. After the optical cable is lifted up to the tower, remove the color tape and corrugated pipe before installing the optical cable.

Making OT Terminals by Using a Cable Peeler (Recommended)

Add two OT terminals to the end of the power cable connecting to the RRU.





Determine lengths of power cables for different operations according to the scales on the inner side of the cover plate of the cabling cavity.

Based on the determined length, remove the jacket and shielding layer off the power cable.

Remove the jacket of a specified length from each wire.

Add an OT terminal to each wire.

Strip a 15 mm jacket off the power cable to reveal the shielding layer of the power cable

NOTE

The assembling of OT terminals to the power cable must be complete before the RRU is installed on a metal pole.

Making OT Terminals at the Input End of the Power Cable by Using a Knife

1. Cut around the jacket of the power cable according to the measured length.
2. Poke the knife in the jacket of the power cable and cut the jacket along a line perpendicular to the round cut.
3. Strip the jacket off the power cable.

Warning: Do not damage the shielding layer of the power cable when cutting around the jacket.

Pin Assignment for the Wires of the RRU Alarm Cable

DB15 connector	Signal name of DB15 connector	Cord End Terminal	Wire Color	Wire Type	Label
X1.2	SWITCH_INPUT0+	X2	White/blue	Twisted pair	SWITCH_INPUT0+
X1.3	GND	X3	Blue		GND
X1.6	SWITCH_INPUT1+	X4	White/orange	Twisted pair	SWITCH_INPUT1+
X1.7	GND	X5	Orange		GND
X1.10	RX485_TX-	X6	White/ green	Twisted pair	APM RX-
X1.11	RX485_TX+	X7	Green		APM RX+
X1.13	RX485_RX-	X8	White/ brown	Twisted pair	APM TX-
X1.14	RX485_RX+	X9	Brown		APM TX+

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