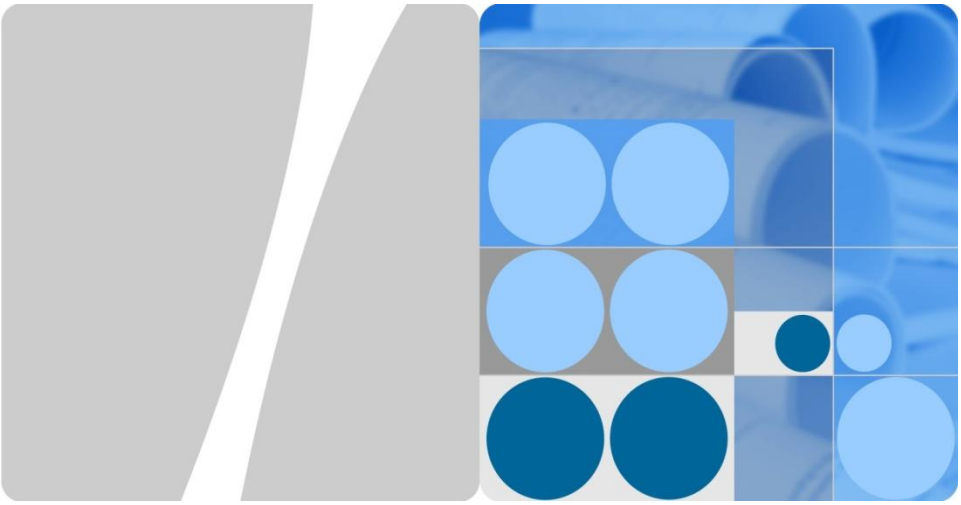

RTN XMC ODU V200

Quick Installation Guide

Issue: 05
Part Number: 31506440
Date : 2017-09-15

HUAWEI TECHNOLOGIES CO., LTD.

HUAWEI

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About This Document

Overview

This document is intended to provide guidelines for hardware quick installation.

Product Version

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

Product Name	Product Version
RTN XMC ODU V200	V200R001

NOTE

The functions of Fixed Service (FS) for this device are restricted to use and put into service due to the need for a spectrum license and/or the conditions attached to authorisation for the use of frequencies within all European Union countries (BE / BG / CZ / DK / DE / EE / IE / EL / ES / FR / HR / IT / CY / LV / LT / LU / HU / MT / NL / AT / PL / PT / RO / SI / SK / FI / SE / UK).

Contents

NOTE

This document is intended to provide guidelines for hardware quick installation.

DANGER

Thunderstorm

Do not perform operations on towers or poles with high voltage and AC power during thunderstorms.

DANGER

Working at Heights

When working at heights, be careful about objects falling down from a height.

DANGER

Hoisting Heavy Objects

When heavy objects are hoisted, do not stand or walk under the boom or the objects.

CAUTION

Microwave

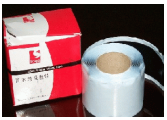
High power radio-frequency signals are harmful to human body. Do not stay too close to the antenna in the emitting direction of the antenna when the microwave communication equipment is working. When installing or maintaining an antenna on the tower or pole installed with more than one antenna, avoid the strong radiation from the other antennas.

CAUTION

IF Cable

Before installing or removing an IF cable, turn off the ODU power switch.

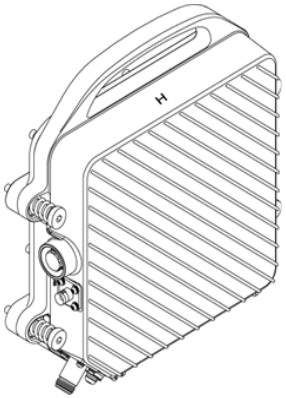
Installation Tools

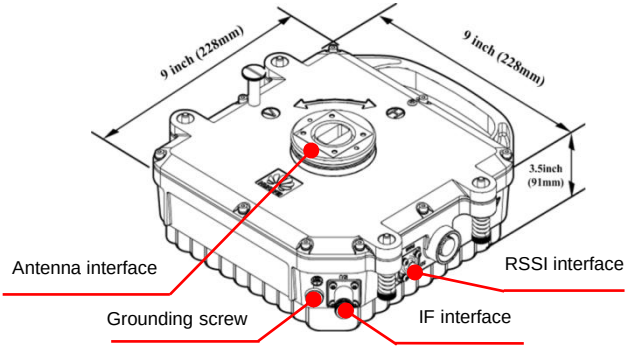
 Tape measure	 Level carpenters	 Philips Screwdriver	 Flat-head Screwdriver	 Ladder
 Adjustable Wrenches	 Bayonet Wrench	 Socket Wrench	 Torque Wrench	 Allen Wrench
 Pliers	 Needle-nose Pliers	 Diagonal Cutters	 Cable Cutter	 Claw Hammer
 Utility Knife	 File	 Multimeter	 Waterproof Insulation Tape	 PVC Tape
 Antistatic Gloves	 Marker Pen	 Lifting Hook	 Lifting Rope	 Compass

Installing the ODU

Components of the ODU

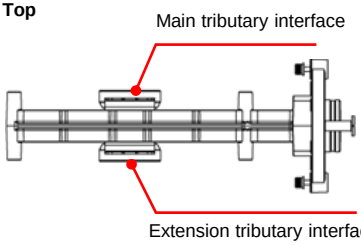
a Appearance and Interfaces of the ODU



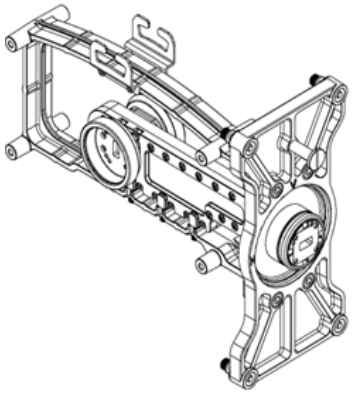


b Appearance and Interfaces of the Hybrid Coupler

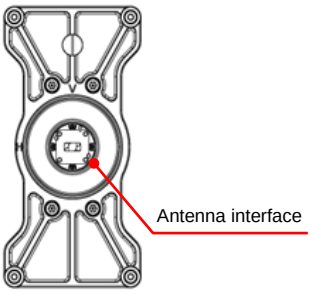
Top



Interface Name	Interface Label
Main tributary interface	MAIN
Extension tributary interface	STD BY

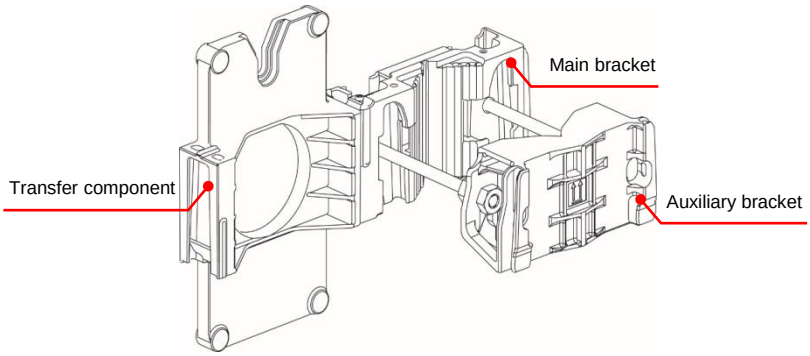


Front

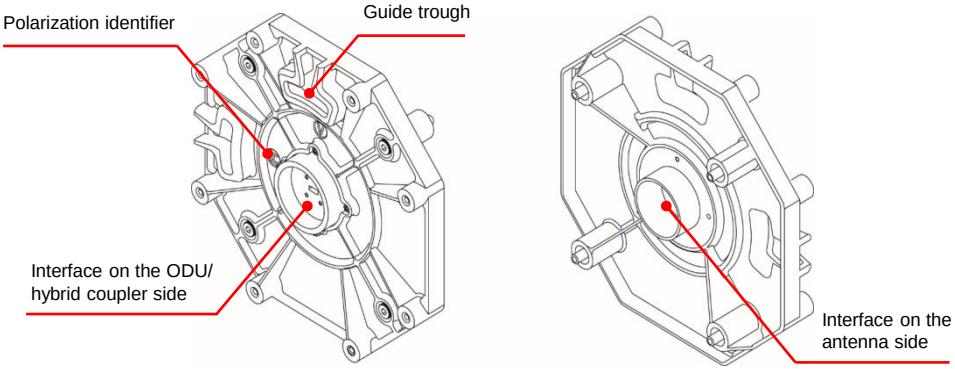


Components of the ODU

c Appearance of the ODU Separate Mounting Bracket



d Appearance of the Antenna Adapter

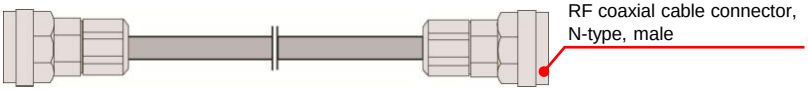


Components of the ODU

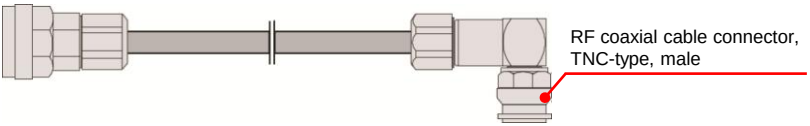
e Appearance of the Flexible Waveguide

f Cables

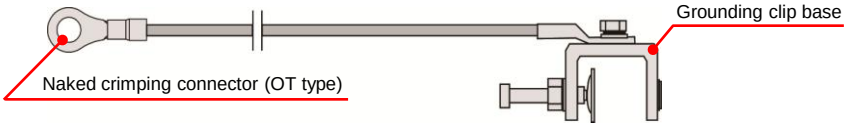
RG-8U cable or 1/2-inch cable



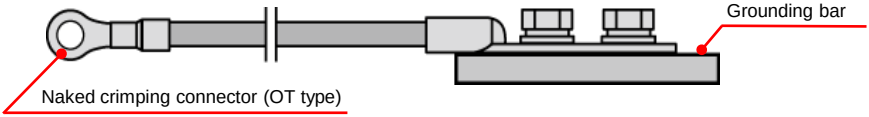
5D cable



PGND cable of the ODU



PGND cable of the ODU(NA)

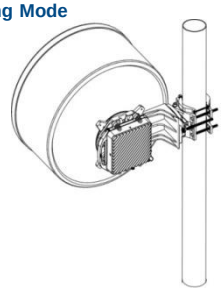


Installing the ODU

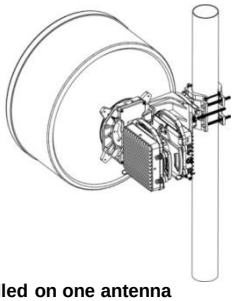
Installation Scenarios

a Installing the ODU on a Single-Polarized Antenna

1. Direct Mounting Mode

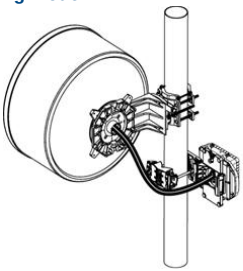


One ODU installed on one antenna

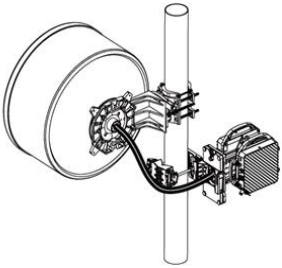


Two ODUs installed on one antenna

2. Separate Mounting Mode



One ODU installed on one antenna

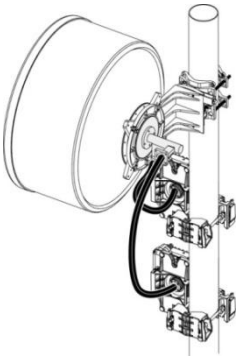


Two ODUs installed on one antenna

⚠ CAUTION

Use a hybrid coupler adaptive to the XMC ODU if two ODUs are configured with only one antenna installed in direct-mounting mode.

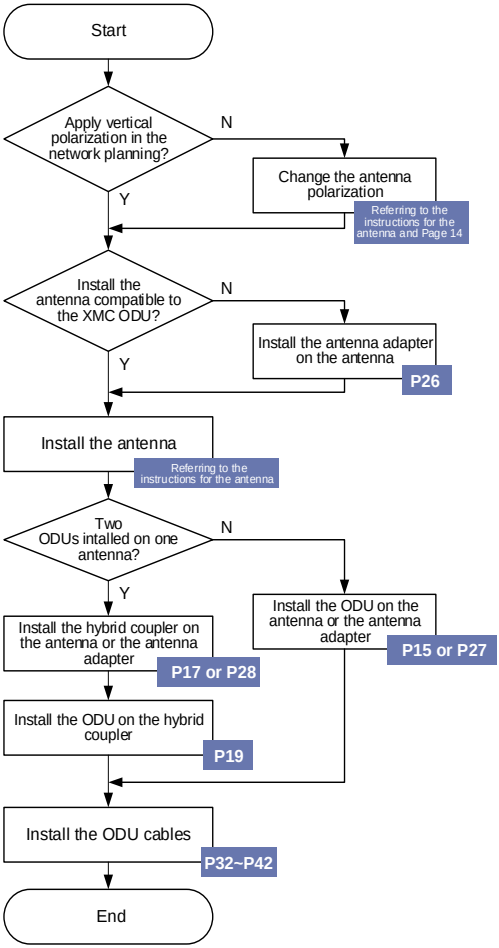
b Installing the ODU on a Dual-Polarized Antenna



Installation Procedure

a Installing the ODU on a Single-Polarized Antenna

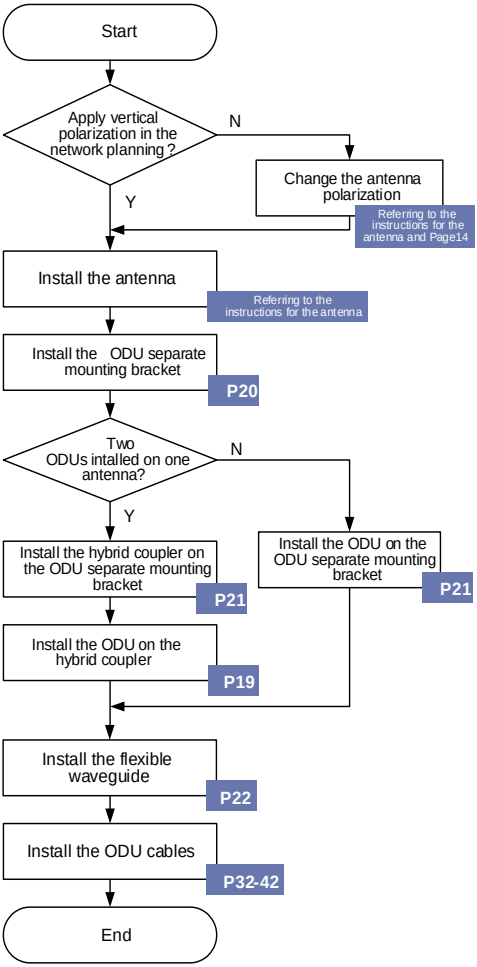
Direct Mounting Mode



Installation Procedure

a Installing the ODU on a Single-Polarized Antenna

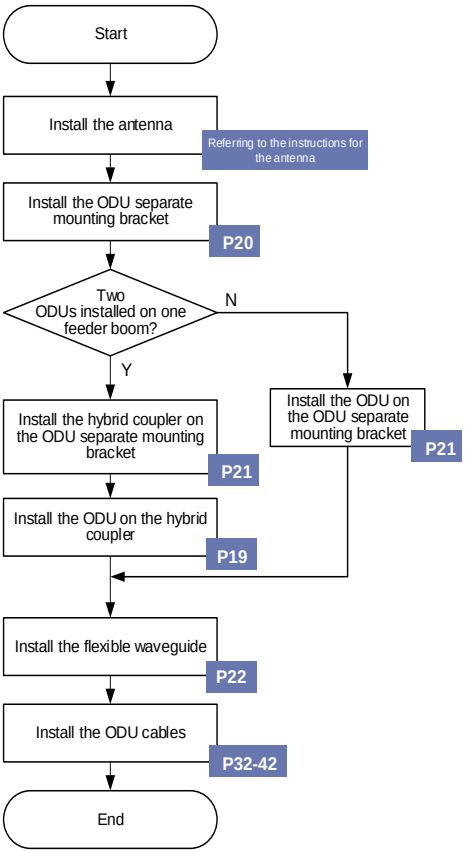
Separate Mounting Mode



Installation Procedure

b Installing the ODU on a Dual-Polarized Antenna

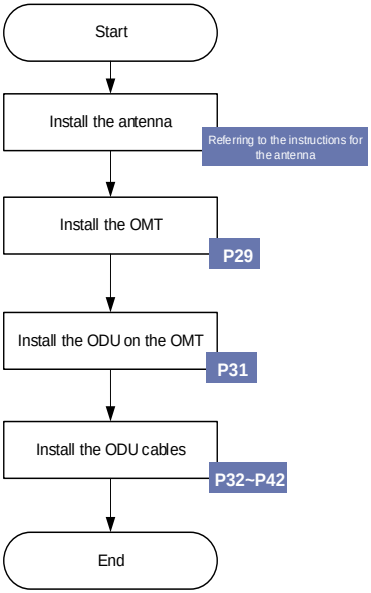
Separate Mounting Mode



Installation Procedure

b Installing the ODU on a Dual-Polarized Antenna

Direct Mounting Mode



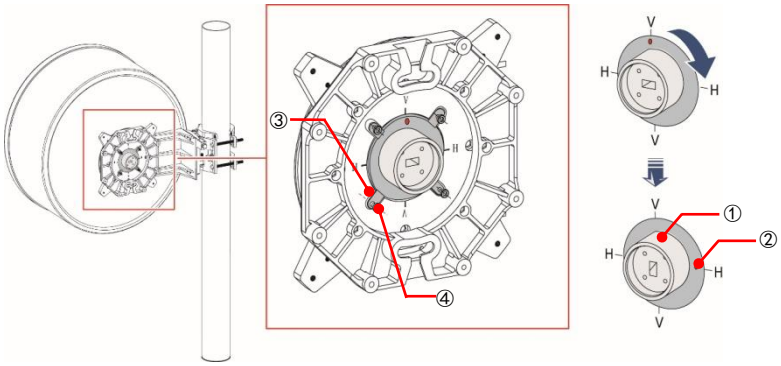
CAUTION

- **Do not install the ODU under harsh weather conditions, such as windy, rainy, or stormy weather.**
- **After the ODU is unpacked or powered off, it must be powered on within 24 hours to avoid moisture accumulation in it.**
- **Do not damage the coating when you install or replace an ODU.**
- **In case of operating in the sea or around the coast area (within 3.7 km from coastline) or 3 km away from inland pollution sources (including coal mines, metallurgic plant, thermal power plant , and chemical plant), measure must be taken for the ODU against salt damage. Please contact HUAWEI for the countermeasure.**

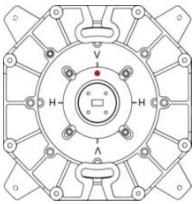
Changing Polarization Direction of the Antenna

CAUTION

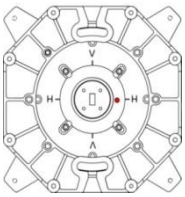
- The antennas are available in multiple types. This procedure for changing the antenna polarization direction is provided for reference only. In actual installation, follow the instructions delivered with the antenna.
- By default, the antenna applies vertical polarization. If the antenna requires horizontal polarization in the network plan, the polarization direction of the antenna should be changed.



1. Loosen the fastening screw ④ on feed boom ③ so that the feed boom can rotate freely.
2. Rotate the feed boom ① 90 degrees in a clockwise direction or an anticlockwise direction to ensure that the red polarization identifier on the feed boom is aligned with the H identification line.
3. Adjust feed boom ① to align the four feed booms tabs ③ with the holes in the feed boom, and then tighten fastening screw ④ on the feed boom.



Single-polarized antenna-vertically polarized



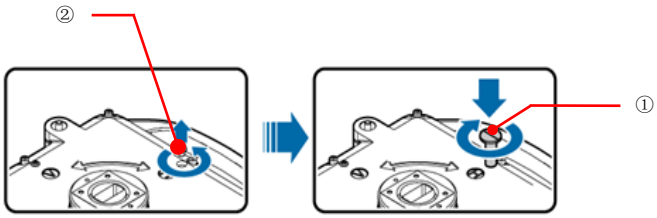
Single-polarized antenna-horizontally polarized

Dual-polarized antenna-the feed boom on the left is vertically polarized

Dual-polarized antenna-the feed boom on the left is horizontally polarized

Installing the ODU on the Antenna

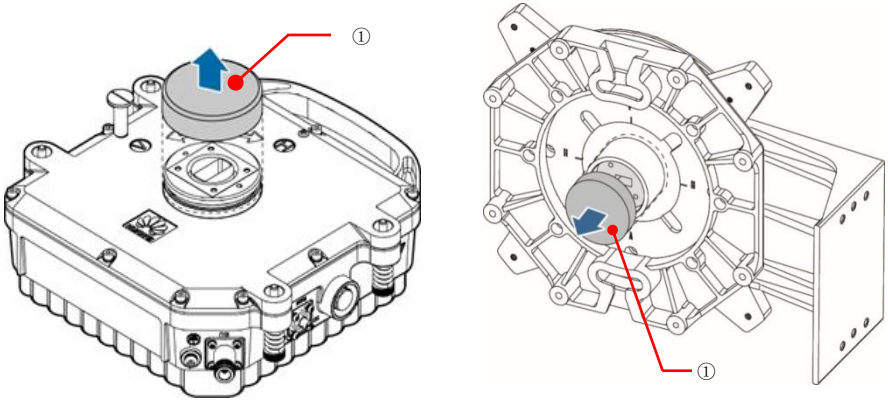
1. Observe the position of the ODU guide pin . It is attached to the inner side of the ODU handle by default. When the antenna is installed in horizontally polarized mode, secure guide pin ① to identifier H. Before securing the guide pin, you should screw out the plastic screw ② at identifier H. When the antenna is installed in vertically polarized mode, secure guide pin ① to identifier V. Before securing the guide pin, you should screw out the plastic screw ② at identifier V. The following describes how to install the guide pin for horizontal-polarized antennas.



NOTE

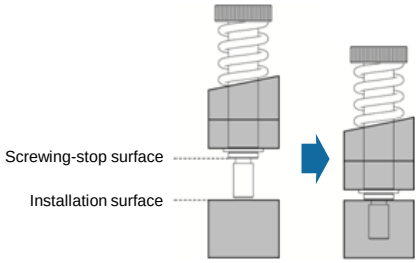
- The guide pin is used together with the guide through to facilitate the installation of the ODU.
- Apply anti-seize grease to the screws on the guide pin.

2. Remove the dust-proof caps ① from the antenna port of the ODU and the antenna feed boom.

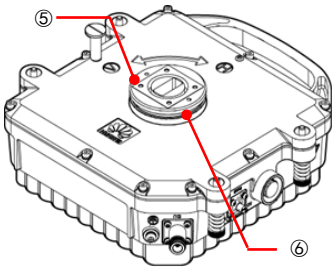


Installing the ODU on the Antenna

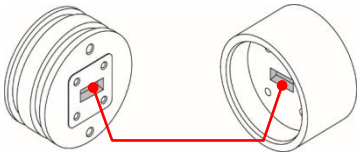
3. Installing the ODU on the Antenna
 3.1. Apply lubricant on gasket ⑥ of the antenna interface on the ODU. (Note: Do not apply lubricant on end face ⑤.)
 3.2. Apply anti-seize grease to the four M6 captive screws ① on the ODU.
 3.3. Lift the ODU to slide guide pin ② of the ODU into guide trough③ facing the antenna direction.
 3.4. Install the ODU on the antenna and ensure that the IF interface ④ of the ODU faces downwards.
 3.5. Screw the four M6 captive screws ① on the ODU part way in and then tighten them cornerwise in sequence.



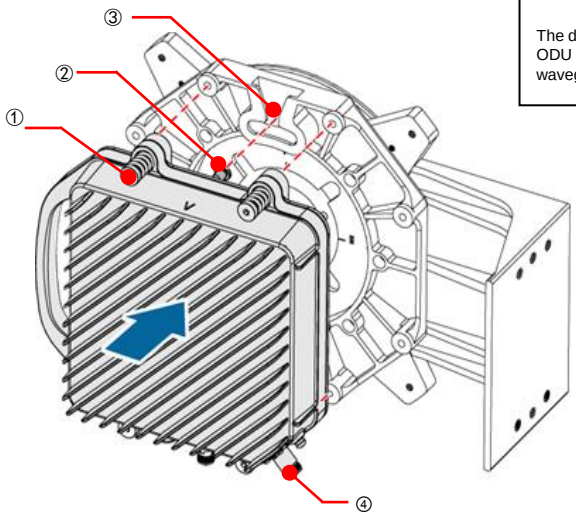
If the screwing-stop surface of the captive screw is in complete contact with the installation surface of the bolt holes, it indicates that the screws are tightened.



Apply lubricant on gasket ⑥ .
Do not apply lubricant on end face ⑤.



The direction of the waveguide cavity of the ODU must be the same as that of the waveguide cavity of the antenna feeder.



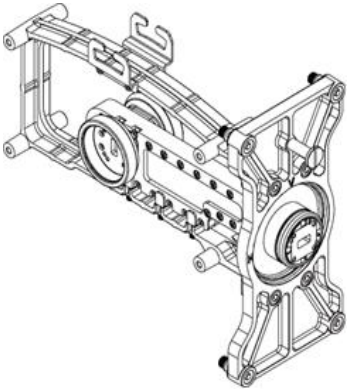
Installing the Hybrid Coupler on the Antenna

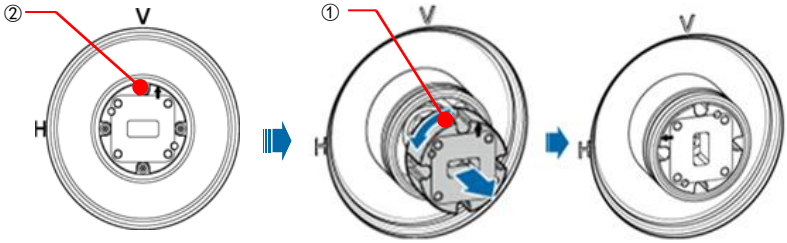
a Changing the Polarization Direction of the Hybrid Coupler

⚠ CAUTION

- The hybrid coupler is available in multiple types. This procedure for changing the polarization direction of the hybrid coupler is provided for reference only. In actual installation, follow the instructions delivered with the hybrid coupler.
- By default, the hybrid coupler applies vertical polarization. If horizontal polarization is required, change the polarization direction of the hybrid coupler antenna port.
- When adjusting the polarization direction of the hybrid coupler , ensure the seal washer is correctly installed and intact.

1. Loosen the four hex socket screws ② and remove the polarizer ①. Note: Ensure that the seal washer does not fall off during this procedure.
2. Align the arrow (↑) on the polarizer ① with the letter H on the antenna by rotating the polarizer ① .
3. Check whether the seal washer is correctly installed and intact before installing the polarizer. Then, install the polarizer ① and tighten the four hex socket screws ② .

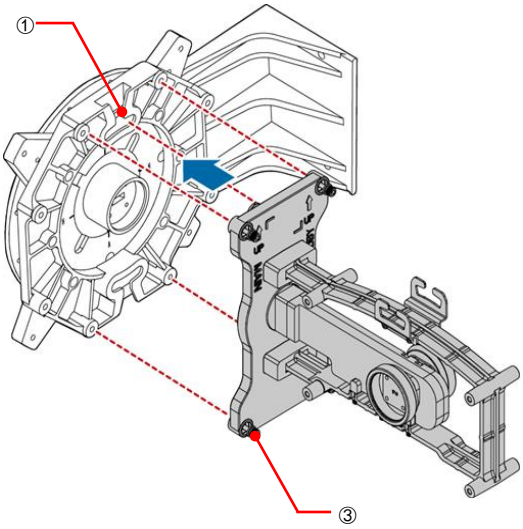




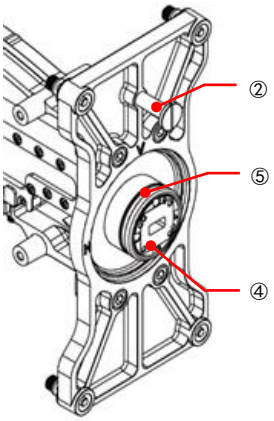
Installing the Hybrid Coupler on the Antenna

b Installing the Hybrid coupler on the Antenna

1. Apply lubricant on gasket ⑤ of the antenna interface of the hybrid coupler. (Note: End face ④ should not be applied with lubricant.)
2. Apply anti-seize grease to the four M6 captive screws ③ of the hybrid coupler.
3. Slide guide pin ② of the hybrid coupler into guide trough ①, and then install the hybrid coupler onto the antenna.
4. Screw the four M6 captive screws ③ of the hybrid coupler part way in and then tighten them cornerwise.



Apply lubricant on gasket ⑤ . Do not apply lubricant on end face ④.



The direction of the waveguide cavity of the antenna feeder must be the same as that of the waveguide cavity on the antenna interface of the hybrid coupler.

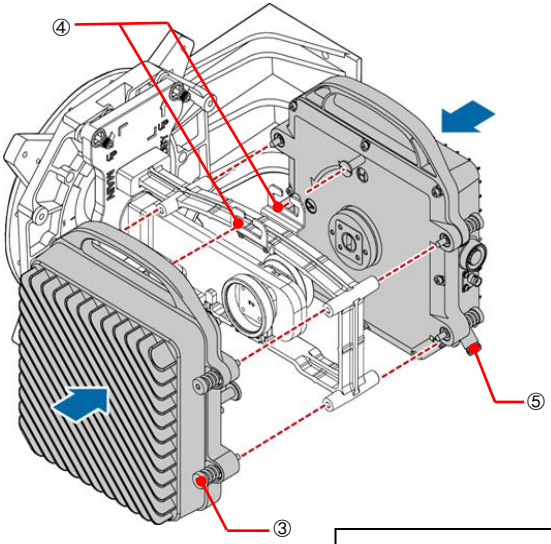
Installing the ODU

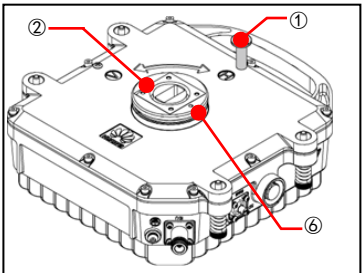
Installing the ODU on the Hybrid Coupler

1. Replace guide pin position ① of the ODU and ensure that it is located at indicator H. Apply anti-seize grease to the screws on the guide pin.
2 Apply lubricant on gasket ⑥ of the antenna interface of the ODU. (Note: End face ② should not be applied with lubricant.)
3. Apply anti-seize grease to the four M6 captive screws ③ of the ODU.
4. Slide guide pin ① of the ODU into guide trough ④ of the hybrid coupler, and then install the ODU onto the hybrid coupler. Ensure that the IF interface ⑤ of the ODU faces downwards.
5. Screw the four M6 captive screws ③ of the ODU part way in and then them cornerwise.

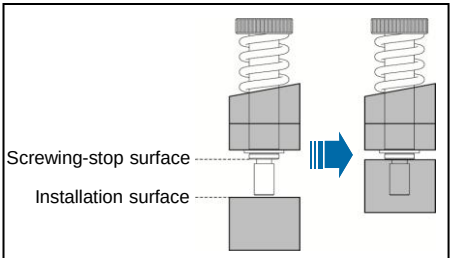
⚠ CAUTION

Two ODU interfaces are available on the hybrid coupler. The main ODU must be installed on the MAIN interface of the hybrid coupler and the standby ODU must be installed on the STD BY interface of the hybrid coupler.





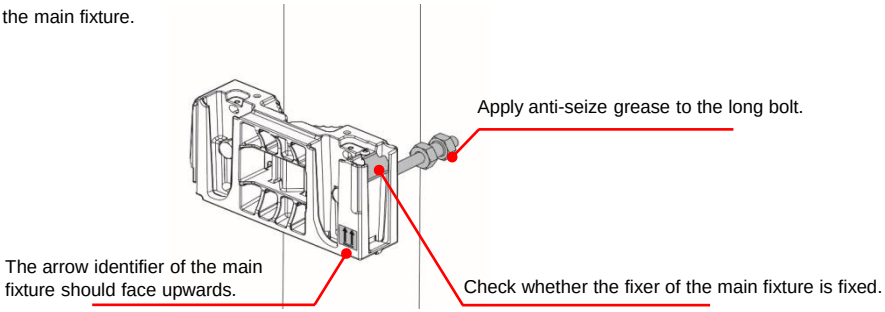
Apply lubricant on gasket ⑥ .
Do not apply lubricant on end face ②.



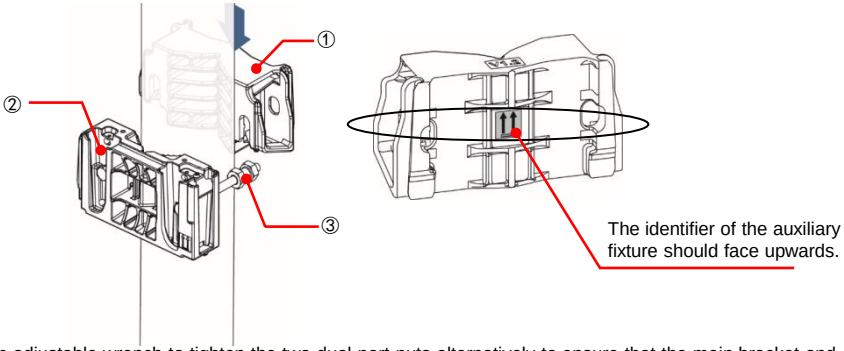
If the screwing-stop surface of the captive screw is in complete contact with the installation surface of the bolt holes, it indicates that the screws are tightened.

Installing the ODU Separate Mounting Bracket on the Pole

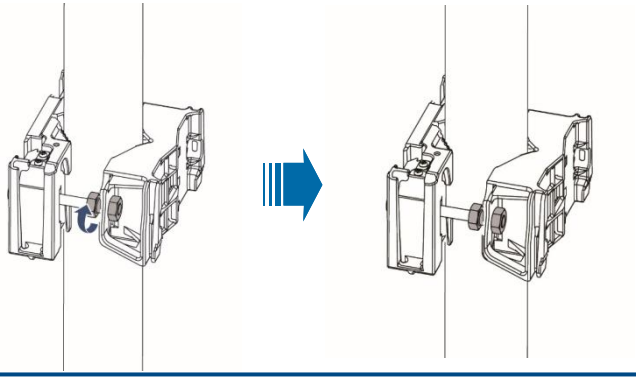
1. Install the main fixture.



2. Slide the auxiliary bracket downwards ① between the dual-port nuts ③ of the main bracket ②.If you hear a click sound, it indicates that the auxiliary bracket is fixed securely.



3. Use an adjustable wrench to tighten the two dual-port nuts alternatively to ensure that the main bracket and auxiliary bracket are securely mounted on the pole.

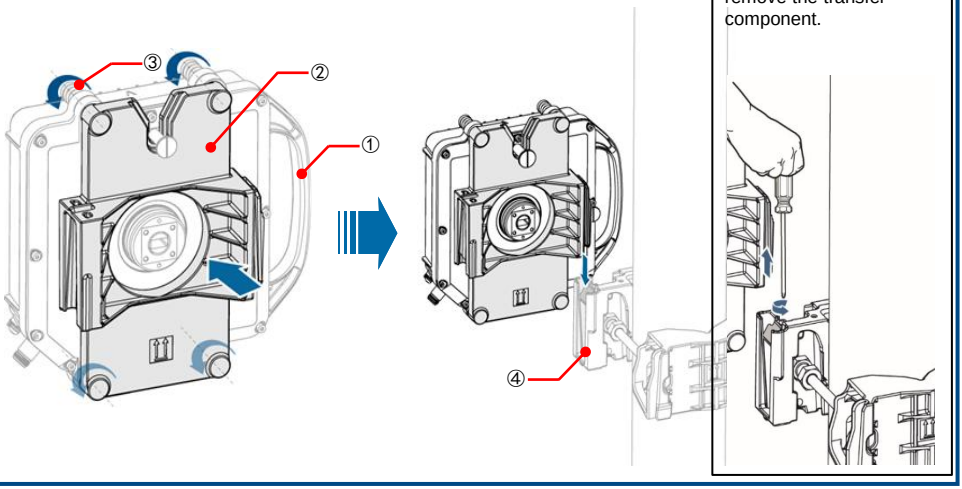


Installing the ODU

Installing the ODU on the ODU Separate Mounting Bracket

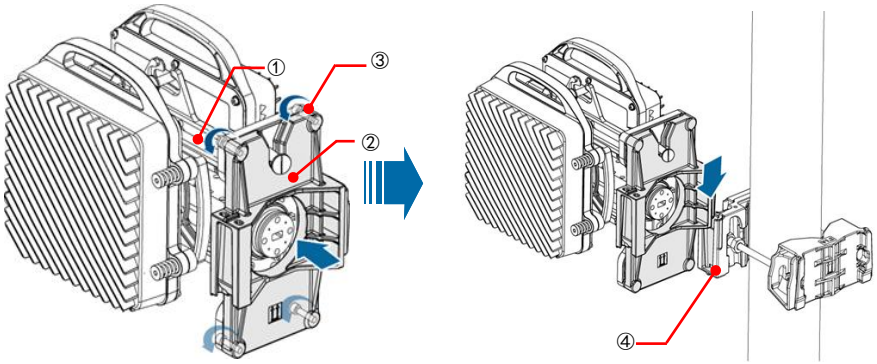
1. Install ODU ① on transfer component ② and then tighten the four screws ③.
2. Attach the transfer component which is installed with an ODU to main fixture ④. If you hear a click, it indicates that the transfer component is fixed securely.

You can loosen the screw on the mounting slot to remove the transfer component.



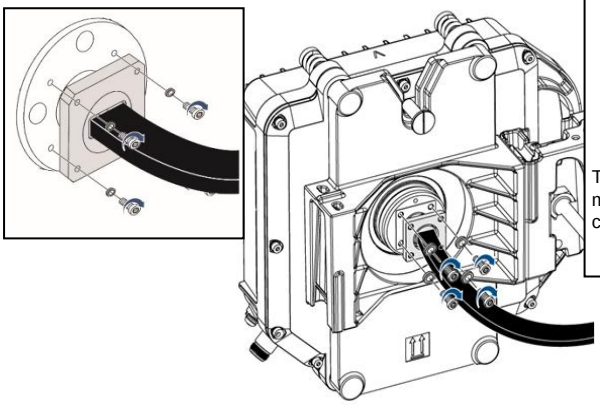
Installing the Hybrid Coupler on the ODU Separate Mounting Bracket

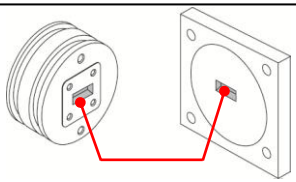
1. Install hybrid coupler ① on the transfer component ② and then tighten the four screws ③
2. Clamp transfer component ② which is installed with a hybrid coupler to main fixture ④ by sliding dog ears downward into fixer. If you hear a click , it indicates that the transfer component is fixed securely.



Installing the Flexible Waveguide

Fix one end of the flexible waveguide to the flange interface of the ODU/hybrid coupler and the other end to the flange interface of the antenna. The direction of the flexible waveguide should be consistent with that of the ODU/hybrid coupler/antenna. Use the fixture to fix the flexible waveguide.

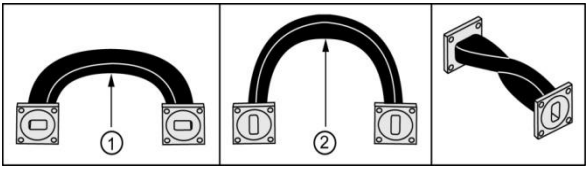




The direction of waveguide cavity of the ODU must be the same as that of the waveguide cavity of the flexible waveguide.

CAUTION

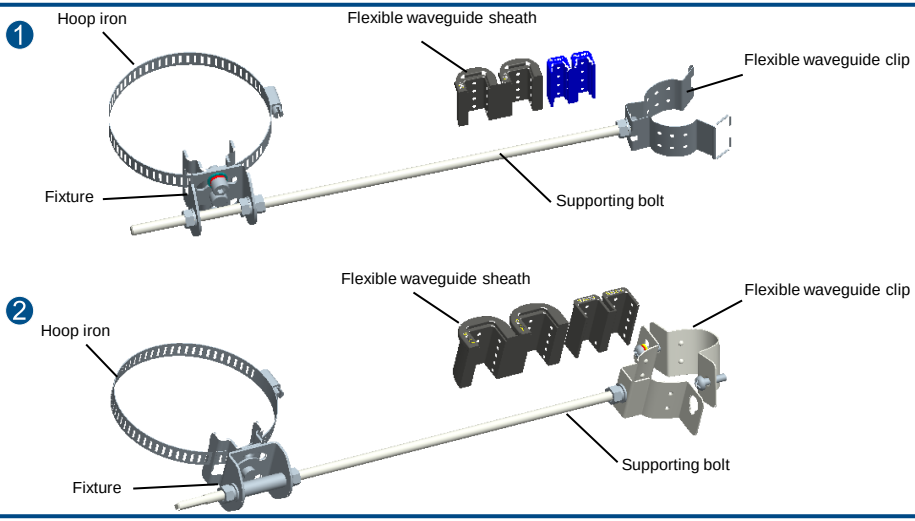
- Waterproof the connectors between the flexible waveguide and the ODU/hybrid coupler/antenna by referring to page 48.
- The flexible waveguide are available in multiple types. This procedure for installing the flexible waveguide is provided for reference only. In actual installation, follow the instructions delivered with the flexible waveguide.
- The flexible waveguide can be bent only within its maximum twist angle and at the larger area side. The E-bend radius and H-bend radius cannot be smaller than the minimum bending radius.
- To ensure that the flexible waveguide is installed securely and steadily, it is recommended that three sets of fixture be installed for each flexible waveguide. Fix the flexible waveguide at the two ends and in the middle with the fixtures. For detailed installation position and methods, see instructions delivered with the flexible waveguide.



Frequency Band	Minimum H-bend radius ①	Minimum E-bend radius ②	Maximum Twist Degree
6 GHz	204 mm (8.0 inch)	102 mm (4.0 inch)	214°/m (65°/ft)
7/8 GHz	152 mm (6.0 inch)	76 mm (3.0 inch)	264°/m (80°/ft)
11 GHz	127 mm (5.0 inch)	64 mm (2.5 inch)	310°/m (95°/ft)
13 GHz	115 mm (4.5 inch)	64 mm (2.5 inch)	360°/m (110°/ft)
15 GHz	102 mm (4.0 inch)	52 mm (2.0 inch)	445°/m (135°/ft)
18/23/26/28/32/38/42 GHz	76 mm (3.0 inch)	38 mm (1.5 inch)	510°/m (155°/ft)

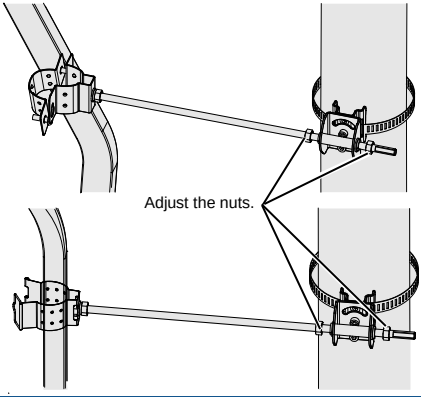
Installing Guide for the Flexible Waveguide Fixture

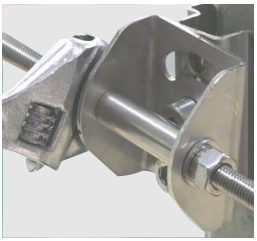
a Components of the Flexible Waveguide Fixture



b Fixing the Flexible Waveguide Fixture on the Pole

Fix the flexible waveguide fixture on the pole by using a hoop iron, and then adjust the length of the bolt according to the position of the flexible waveguide.

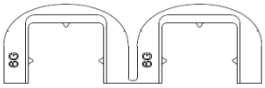


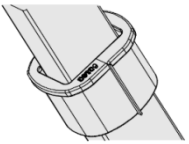


Installing Guide for the Flexible Waveguide Fixture

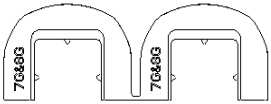
C Fixing the Flexible Waveguide

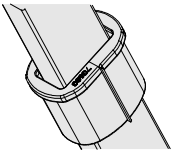
1. When fixing the 6G flexible waveguide, use the 6G flexible waveguide sheath.



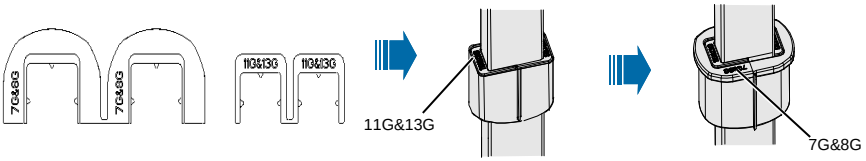


2. When fixing the 7G&8G flexible waveguide, use the 7G&8G flexible waveguide sheath.

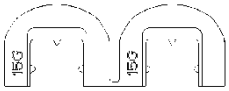


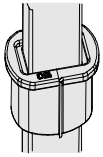


3. When fixing the 11G&13G flexible waveguide, use both the 7G&8G flexible waveguide sheath and 11G&13G flexible waveguide sheath. Place the flexible waveguide in the 11G&13G flexible waveguide sheath, and then place the 7G&8G flexible waveguide sheath in the 11G&13G flexible waveguide sheath.

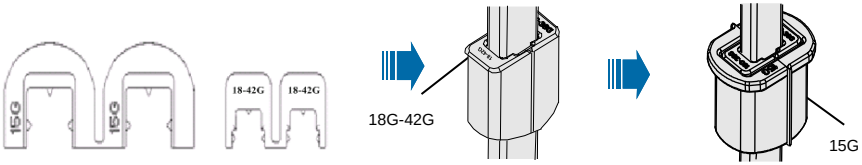


4. When fixing the 15G flexible waveguide, use the 15G flexible waveguide sheath.





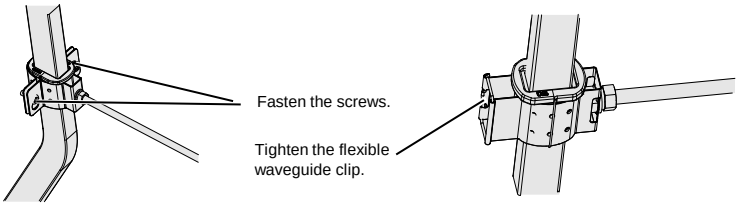
5. When fixing the 18G-42G flexible waveguide, use both the 15G flexible waveguide sheath and 18G-42G flexible waveguide sheath. Place the flexible waveguide in the 18G-42G flexible waveguide sheath, and then place the 15G flexible waveguide sheath in the 18G-42G flexible waveguide sheath.



Installing Guide for the Flexible Waveguide Fixture

c Fixing the Flexible Waveguide

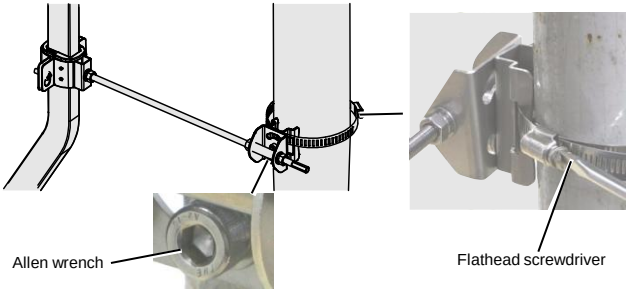
6 Fix the flexible waveguide in the fixture securely.



NOTE

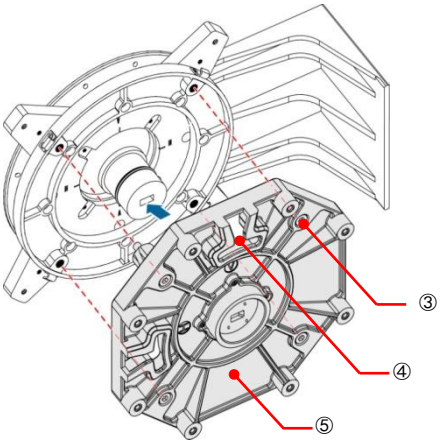
When installing a 0.9 m long flexible waveguide, you need to use a flexible waveguide clip, evenly divide the flexible waveguide into two sections, and then install the two sections in proper positions.
When installing a 1.2 m long flexible waveguide or 1.8 m long flexible waveguide, you need to use two flexible waveguide clips, evenly divide the flexible waveguide into three sections, and then install the three sections in proper positions.

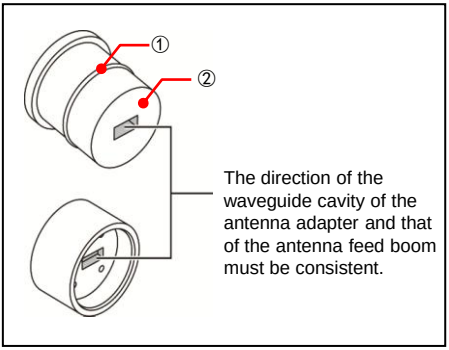
d Fastening the Screws and the adjusting nuts



Installing the Antenna Adapter on the Antenna

1. Apply lubricant on the gasket ① of the antenna feed boom. (Note: End face ② should not be applied with lubricant.)
2. Apply anti-seize grease to the four M6 captive screws ③ of the antenna adapter ⑤.
3. Install the antenna adapter onto the antenna. Keep the direction of the waveguide cavity consistent with that of the adapter and ensure that one of the guide troughs ④ should face upwards.
4. Screw the four M6 captive screws ③ of the ODU about 30% and tighten them cornerwise.

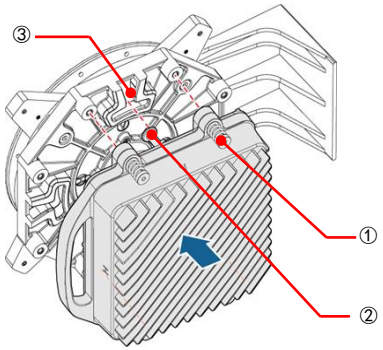


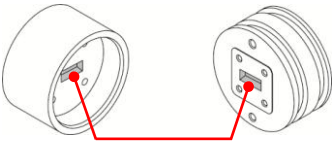


Installing the ODU

Installing the ODU on the Antenna Adapter

1. Apply lubricant on the gasket of the antenna interface of the ODU. For details ,see page 16.
2. Apply anti-seize grease to the four M6 captive screws ① of the ODU.
3. Slide the guide pin ② of the ODU into guide trough ③ of the antenna adapter. Install the ODU onto the antenna adapter and ensure that the IF interface of the ODU should face downwards.
4. Screw the four M6 captive screws ① about 30% and tighten them cornerwise.





The direction of waveguide cavity of the ODU must be the same as that of the waveguide cavity of the antenna adapter .

⚠ CAUTION

- Observe the guide pin position of the ODU . It is attached to the inner side of the ODU handle by default. When the antenna is installed in horizontally polarized mode, secure the guide pin to identifier H. For details, see page 15.
- If the screwing-stop surface of the captive screw on the ODU is in complete contact with the installation surface of the bolt holes on the antenna adapter, it indicates that the screws are tightened. For details, see page 16.

Installing the Hybrid coupler on the Antenna Adapter

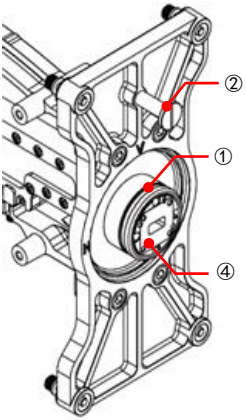
⚠ CAUTION

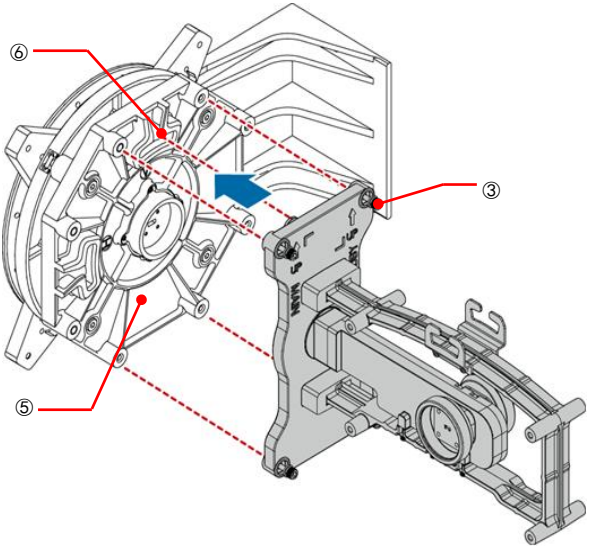
By default, the hybrid coupler applies vertical polarization. If horizontal polarization is required, change the polarization direction of the hybrid coupler. For details, see page 17.

1.Apply lubricant on gasket ① of the antenna interface of the hybrid coupler. (Note: End face ④ should not be applied with lubricant.)
2. Apply anti-seize grease to the four M6 captive screws ③ of the hybrid coupler.
3. Slide the guide pin ② of the hybrid coupler into guide trough ⑥ of the antenna adapter, and then install the hybrid coupler onto the antenna adapter ⑤.
4. Screw the four M6 captive screws ③ of the hybrid coupler about 30% and tighten them cornerwise.

The direction of the waveguide cavity on the antenna interface of the hybrid coupler must be the same as that of the waveguide cavity of the antenna adapter.

Apply lubricant on gasket ① . Do not apply lubricant on end face ④.





Installing the ODU

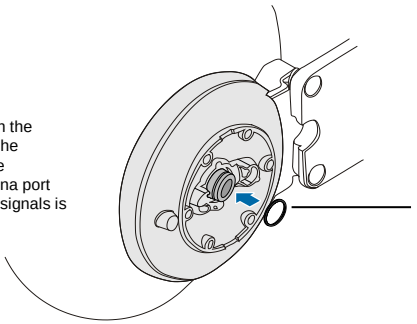
Installing the OMT

CAUTION

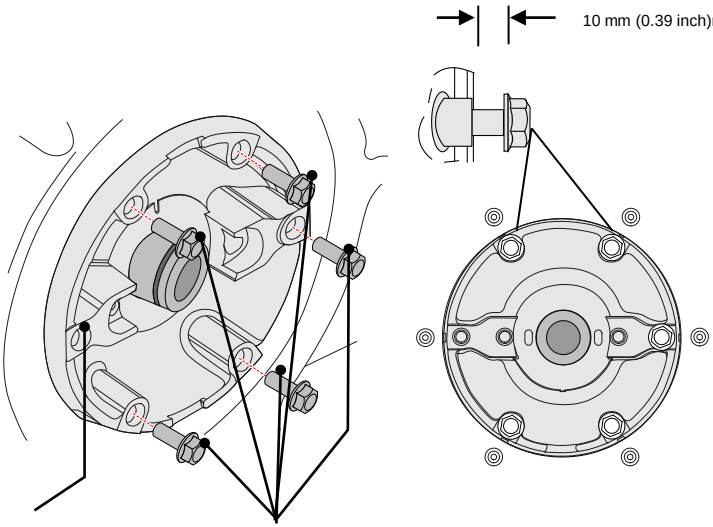
The OMT are available in multiple types. This procedure for installing the OMT is provided for reference only. In actual installation, follow the instructions packed with the OMT.

a Applying the appropriate lubricant

Apply the appropriate quantity of lubricant on the gasket of the feed boom and the surface of the waveguide near the gasket. Do not apply the lubricant on the internal surface of the antenna port on the ODU. Otherwise, the transmission of signals is affected.



b Installing the bolts



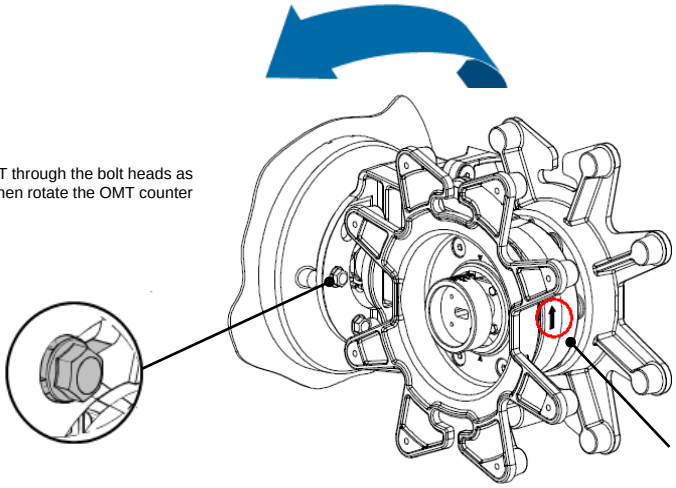
Reserve the hole.

Place the five M8 bolts into the holes, and expose each of the bolts for a length of 10 mm (0.39 inch).

Installing the OMT

c Installing the OMT

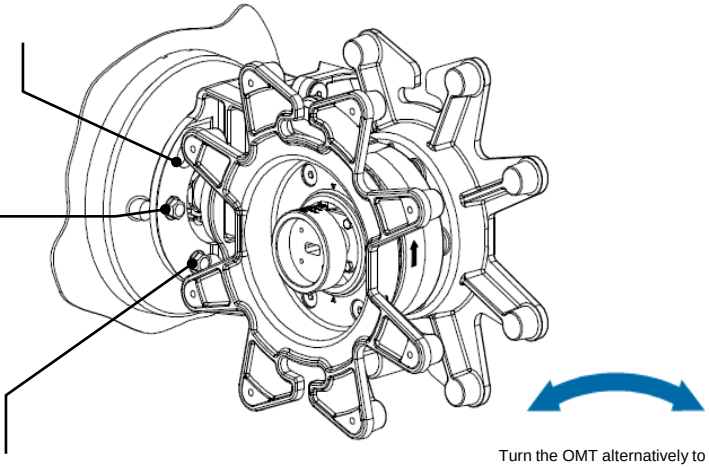
Lead the OMT through the bolt heads as shown, and then rotate the OMT counter clockwise.



Ensure that the OMT is in a correct direction.

d Tightening the bolts

1. Ensure that the OMT is in proper contact with the antenna.



2. Install the M8 bolts and tighten them using the spanner provided by the OMT vendor.

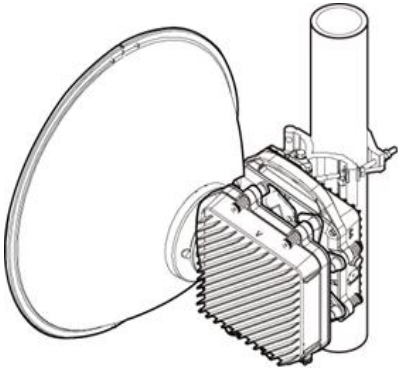
Turn the OMT alternatively to the left and right to align it.

3. Apply 18.7Nm(165. 51 lbf. in) ±5% force to tighten the bolts.

Installing the ODU on the OMT

CAUTION

Two ODU interfaces are available on the OMT. The vertically-polarized ODU must be connected to the interface marked with “V”, and the horizontally-polarized ODU must be connected to the interface marked with “H”.

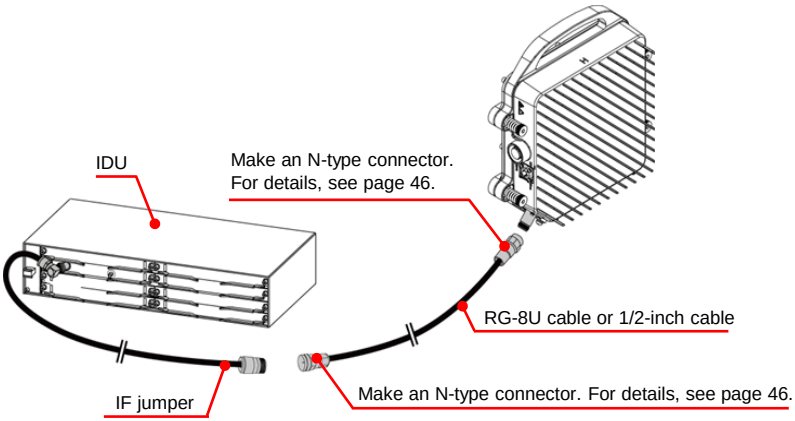


1. Place the O-ring of the feed boom onto the ODU interface on the OMT, apply proper lubricants to the surface of the O-ring and the surface of the waveguide close to the O-ring. Do not apply the lubricants on the front side of the feed boom. Otherwise, signal transmission is deteriorated.
2. Install the ODU onto the OMT according to the polarization indicator of the ODU. The IF port of the ODU should face downwards.
3. Screw the four M6 captive screws of the ODU part way in and then them cornerwise.

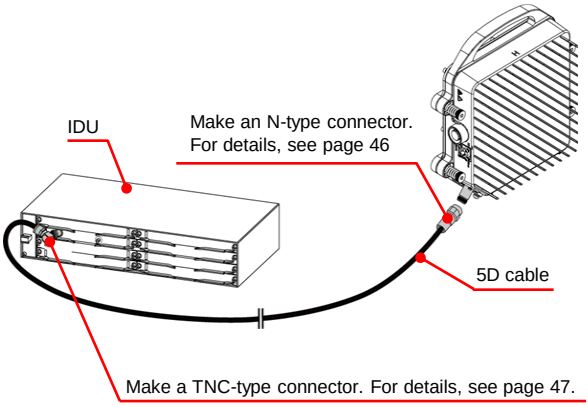
Installing IF Cable

a Making Connectors in Accordance with the IF Cable

Connect the RG-8U cable or 1/2-inch cable to the IDU through the IF jumper.



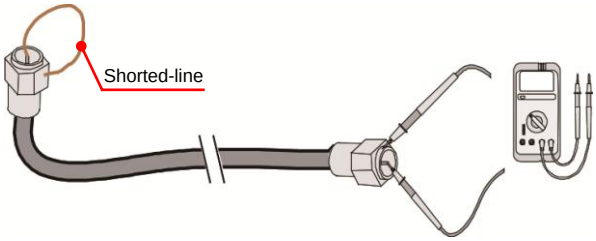
Connect the 5D cable to the IDU directly



Installing IF Cable

b Testing the Connectivity of the IF Cable

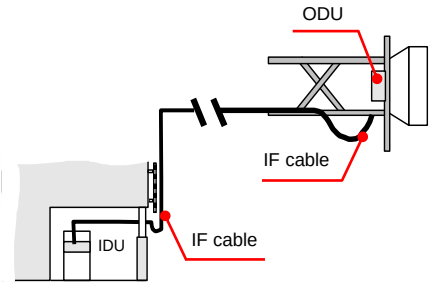
1. At one end of the IF cable, use a short-circuiting line to short circuit the internal and external conductors, and then use a multimeter to test the resistance. The resistance should be 0 ohms.
2. Remove the short-circuiting line, and use a multimeter to test the resistance between the internal conductor and the external conductor The resistance is infinite.

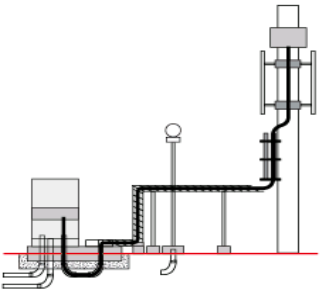


Installing IF Cable

c Routing the IF Cable - Making Waterproof Curves

1. Routing the IF Cable.





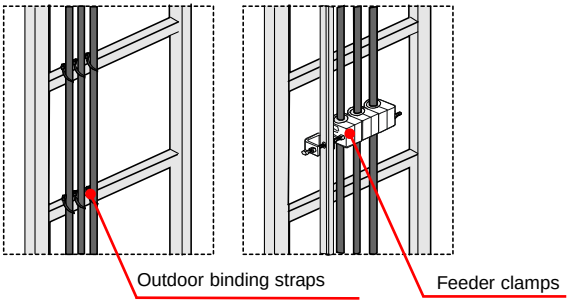
a The IF cable should be routed from top downwards and should be bound at the time of routing.

b The IF cable should be curved for waterproof consideration under the ODU and before entering the IDU room.

c The bending radius of the IF cable should be larger than 40 cm(15.7 inch).

d The IF cable should be bound by using outdoor cable ties or feeder clamps every one meter(3.28 ft).

2. Fixing the IF cable by using outdoor cable ties or feeder clamps.



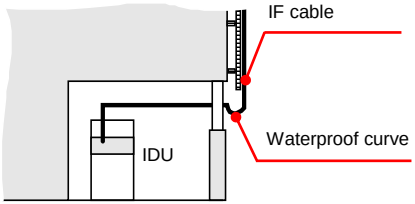
NOTE

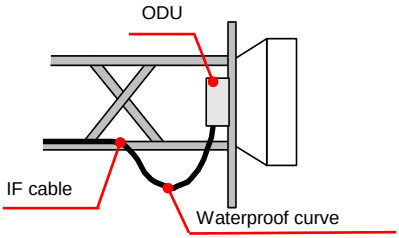
Cable straps may be fractured during installation or in specific environment. Fixing clips are recommended in harsh environment, such as high-temperature and dry, or extremely cold environment.

Installing IF Cable

Routing the IF Cable - Making Waterproof Curves

3. Making waterproof curves.

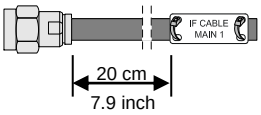




TIP

Coil the IF cable into a circle with a diameter of 0.6 m (1.97 ft) and bind it onto the mast after the IF cable passes the waterproof curve under the ODU for future adjustment of the antenna position.

4. Binding the labels of IF cables.

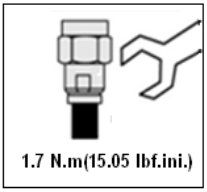


Installing IF Cable

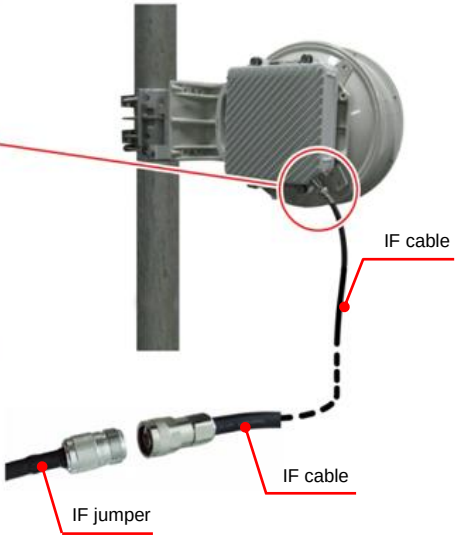
d Connecting the IDU and ODU When the Surge Protector Is not Installed

CAUTION

- Bind the IF cable first to prevent its type-N connector from being pulled.
- Make waterproof curves for the part of the IF cable below the ODU and the part of the IF cable outside the IDU room.



For the waterproofing, see page 48.



NOTE

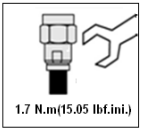
- If the RG-8U or 1/2–inch IF cable is used, an IF jumper is required to connect the IF cable and the IF interface of the IDU, both ends of the IF cable are terminated with type-N connectors. If the 5D IF cable is used, the 5D IF cable is directly connected to the IF interface of the IDU, One end of the IF cable is terminated with the type-N connector and is connected to the ODU. The other end of the IF cable is terminated with the TNC connector.
- If the equipment is configured with the IF 1+1 protection, the IF cable of the main ODU must be connected to the IF jumper of the working IF board, and the IF cable of the standby ODU must be connected to the IF jumper of the protection IF board.
- If the IF boards that provide the XPIC function are used, the IF cable of the ODU that applies the vertical polarization must be connected to the IF jumper of the IF board that processes vertically polarized waves, and the IF cable of the ODU that applies the horizontal polarization must be connected to the IF jumper of the IF board that processes horizontally polarized waves.

Installing IF Cable

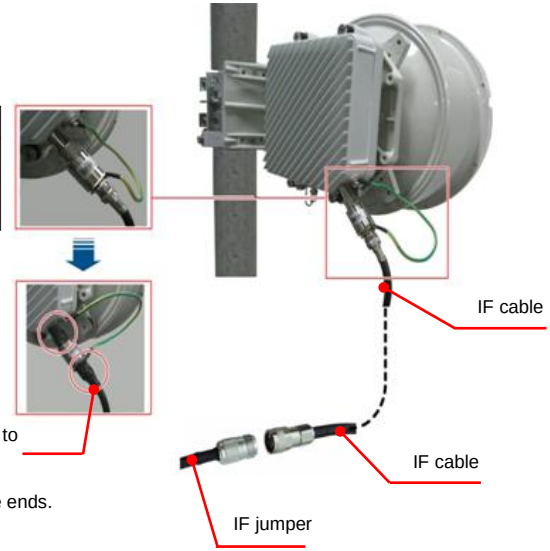
e Connecting the IDU and ODU When the Surge Protector Is Installed

CAUTION

- For the installation of the surge protector, see page 40.
- Bind the IF cable first to prevent its type-N connector from being pulled.
- Make waterproof curves for the part of the IF cable below the ODU and the part of the IF cable outside the IDU room.



For the waterproofing, see page 48.



If a right angle type-N connector is used to connect the surge protector to the ODU, waterproof the entire right angle type-N connector and the interfaces on both the ends.

NOTE

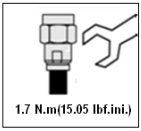
- If the RG-8U or 1/2–inch IF cable is used, an IF jumper is required to connect the IF cable and the IF interface of the IDU, both ends of the IF cable are terminated with type-N connectors. If the 5D IF cable is used, the 5D IF cable is directly connected to the IF interface of the IDU, One end of the IF cable is terminated with the type-N connector and is connected to the surge protector. The other end of the IF cable is terminated with the TNC connector.
- If the equipment is configured with the IF 1+1 protection, the IF cable of the main ODU must be connected to the IF jumper of the working IF board, and the IF cable of the standby ODU must be connected to the IF jumper of the protection IF board.
- If the IF boards that provide the XPIC function are used, the IF cable of the ODU that applies the vertical polarization must be connected to the IF jumper of the IF board that processes vertically polarized waves, and the IF cable of the ODU that applies the horizontal polarization must be connected to the IF jumper of the IF board that processes horizontally polarized waves.

Installing IF Cable

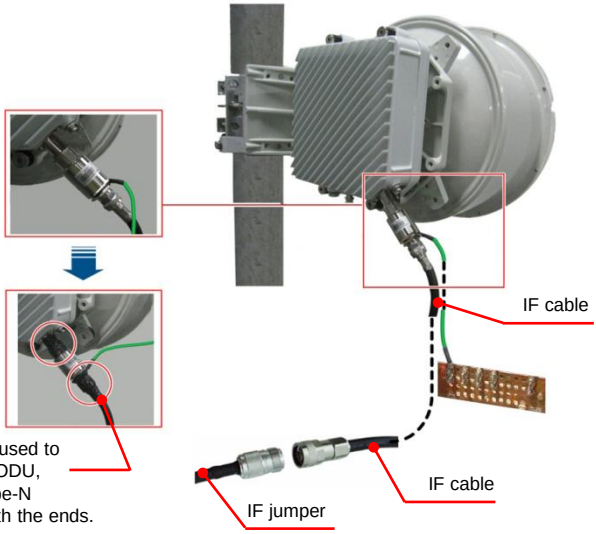
Connecting the IDU and ODU When the Surge Protector Is Installed(NA)

CAUTION

- For the installation of the surge protector, see page 40.
- Bind the IF cable first to prevent its type-N connector from being pulled.
- Make waterproof curves for the part of the IF cable below the ODU and the part of the IF cable outside the IDU room.



For the waterproofing, see page 48.



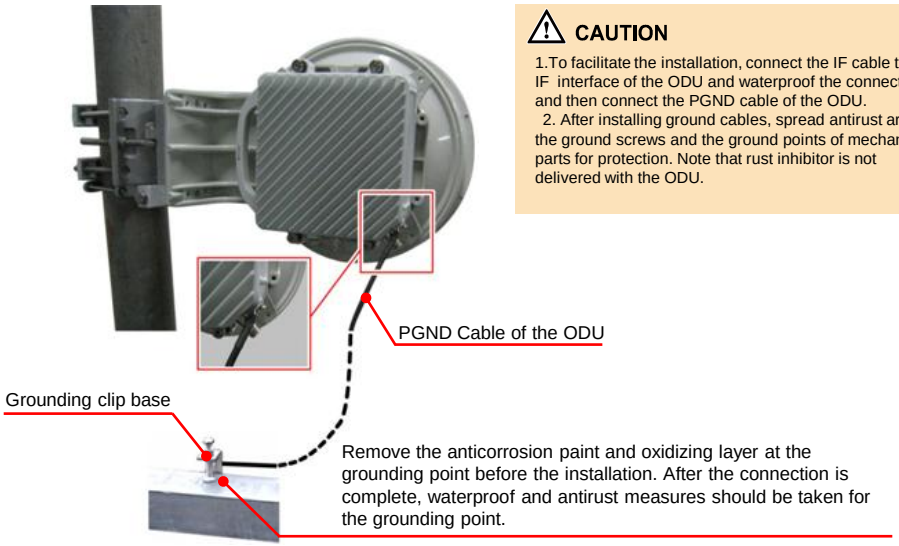
If a right angle type-N connector is used to connect the surge protector to the ODU, waterproof the entire right angle type-N connector and the interfaces on both the ends.

NOTE

- If the RG-8U or 1/2–inch IF cable is used, an IF jumper is required to connect the IF cable and the IF interface of the IDU, both ends of the IF cable are terminated with type-N connectors. If the 5D IF cable is used, the 5D IF cable is directly connected to the IF interface of the IDU, One end of the IF cable is terminated with the type-N connector and is connected to the surge protector. The other end of the IF cable is terminated with the TNC connector.
- If the equipment is configured with the IF 1+1 protection, the IF cable of the main ODU must be connected to the IF jumper of the working IF board, and the IF cable of the standby ODU must be connected to the IF jumper of the protection IF board.
- If the IF boards that provide the XPIC function are used, the IF cable of the ODU that applies the vertical polarization must be connected to the IF jumper of the IF board that processes vertically polarized waves, and the IF cable of the ODU that applies the horizontal polarization must be connected to the IF jumper of the IF board that processes horizontally polarized waves.

Installing ODU Cables

Installing the PGND Cable of the ODU

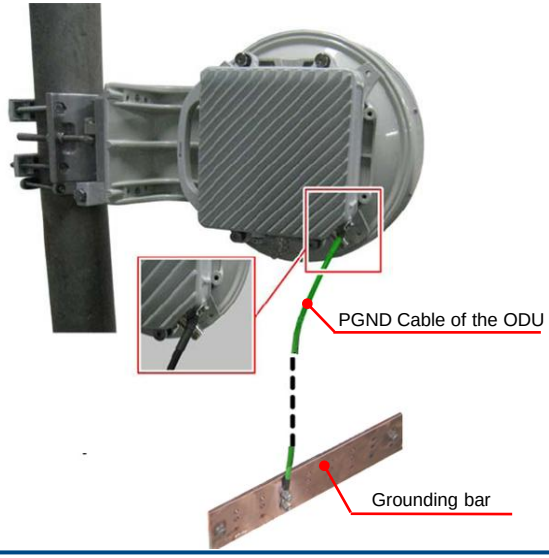


CAUTION

1.To facilitate the installation, connect the IF cable to the IF interface of the ODU and waterproof the connector, and then connect the PGND cable of the ODU.

2. After installing ground cables, spread antirust around the ground screws and the ground points of mechanical parts for protection. Note that rust inhibitor is not delivered with the ODU.

Installing the PGND Cable of the ODU(NA)

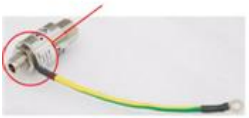


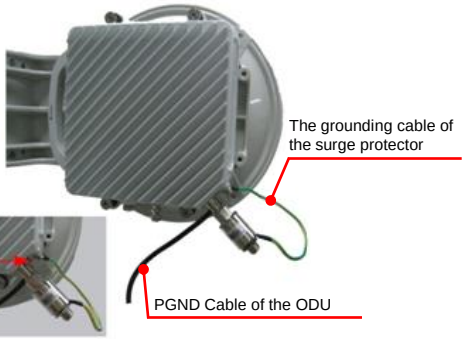
Installing the Surge Protector and Its PGND Cable (Optional)

NOTE

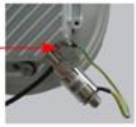
This operation is required only when the site needs to be configured with the surge protector.

Install the PGND cable of the surge protector to the "Surge" end of the surge protector and fasten it by using a nut and a spring washer.





Fix the grounding cable of the surge protector and the PGND cable of the ODU to the grounding screw of the ODU.



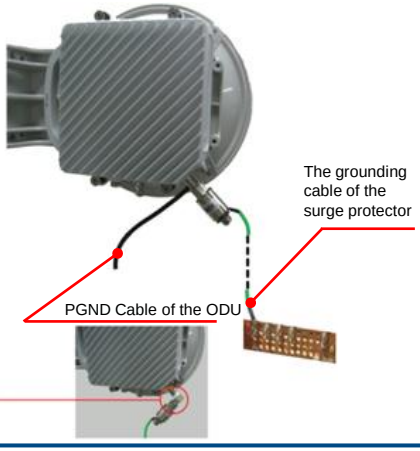
If the surge protector cannot be directly connected to the IF interface on the ODU due to the structural restriction of the antenna installation parts, attach a matching angle type-N adapter.

Installing the Surge Protector and Its PGND Cable (NA)

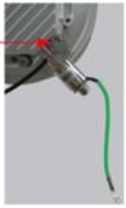
NOTE

This operation is required only when the site needs to be configured with the surge protector.

Install the PGND cable of the surge protector to the "Surge" end of the surge protector and fasten it by using a nut and a spring washer.



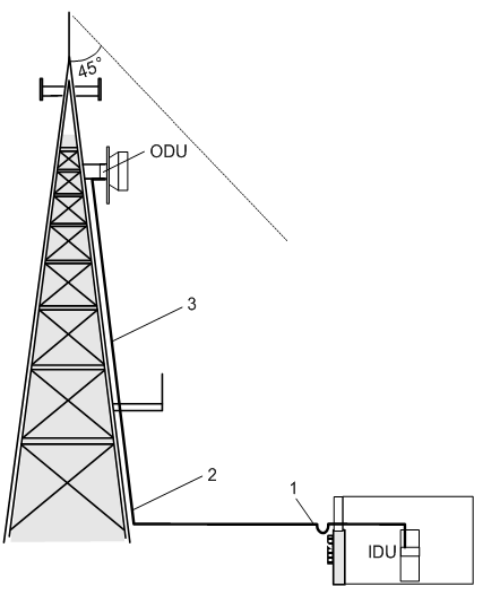
The PGND cable of the ODU to the grounding screw of the ODU.

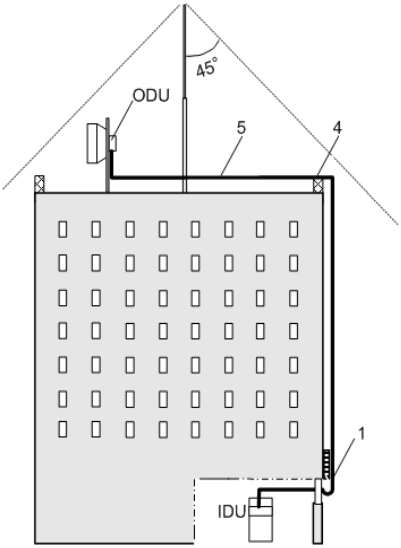


If the surge protector cannot be directly connected to the IF interface on the ODU due to the structural restriction of the antenna installation parts, attach a matching angle type-N adapter.

Grounding the IF Cable

a Grounding points of the IF cable





1. The place about 0.5 to 1 meter (1.64 ft to 3.28 ft) away from the cable entry of equipment room or outdoor cabinet
2. The place on the roof edge about one meter (3.28 ft) away from the turning point of the wiring ladder
3. Optional: The middle point of the cable (when the cable is longer than 60 meters(196.85 ft))
4. Optional: The place on the roof edge about one meter away from the turning point of the wiring ladder (when the horizontal portion of the cable on the roof-top is longer than 30 meters(98.42 ft))
5. Optional: The middle point of the horizontal portion of the cable (when the horizontal portion on the roof-top is longer than 60 meters (196.85 ft))

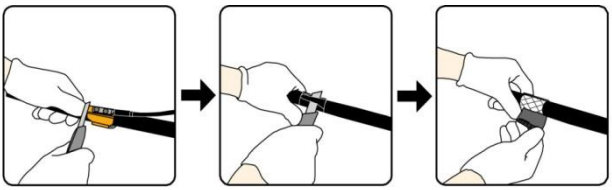
⚠ CAUTION

- The grounding point depends on the installation mode and the length of the IF cable. Generally, the IF cable should be grounded to a minimum of three points. When the IF cable is longer than 60 meters (196.85 ft), add a grounding point for every extra 30 meters(98.42 ft).
- As recommended in ITU K.56, the IF cable does not need to be separately grounded under the ODU,if the ODU is properly grounded. The IF cable is grounded through the ODU.

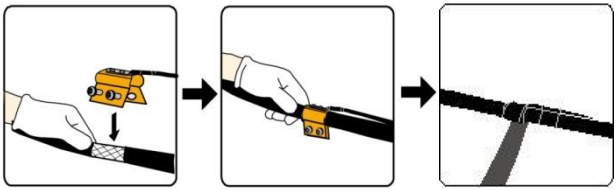
Grounding the IF Cable

b Grounding the IF Cable - Installing the Grounding Clip

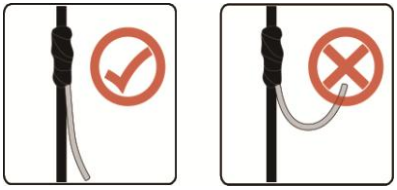
Selecting the installation position of the grounding clip and stripping off the IF cable sheath with electric knife without any damage to the shielding layer.



Fixing the grounding clip and waterproofing it. For the waterproofing, see page 48.



The angle resulting from the grounding wire of the clip and the IF cable should not be larger than 15 degrees. When the IF cable is vertically routed, the grounding wire of the clip should be led downwards.



NOTE

- The ground point at the bottom of the tower is connected to the ground using a U-shaped clamp.
- The ground point before being led indoors is fixed on the ground bar at the feeder window using OT terminals.

Installation Check

Items to be checked for the antenna, Hybrid Coupler, and ODU

Serial No.	Checking Requirement
1	The installation location and direction of the antenna should conform to the information in the engineering design document.
2	The antenna should be correctly installed (the side of the antenna with a wider shield should face upwards and that with a narrower shield should face downwards).
3	The logos of the antenna and comber should face upwards.
4	The antenna support should be correctly installed on the pole. The connection should withstand the weight and the force of the wind.
5	The four screws of the ODU should tightly engage with the antenna or the hybrid coupler.
6	The four screws of the hybrid coupler should tightly engage with the antenna or the hybrid coupler.
7	The antenna, hybrid coupler, and ODU should be in the protection range of the lightning rod (the protection angle of the lightning rod should be less than 45 degrees. In mountainous and thunder prone areas, the angle should be less than 30 degrees).

Items to be checked for Separate Mounting Components

Serial No.	Checking Requirement
1	The installation location and direction of the ODU separate mounting bracket should conform to the information in the engineering design document.
2	The ODU separate mounting bracket should be correctly installed on the pole. The connection should withstand the weight and the force of the wind.
3	The four screws of the flexible waveguide installed in separate mode hold the antenna feed boom tightly.
4	The flange of the flexible waveguide should be firmly and correctly connected to the antenna interface of the ODU and antenna feed boom.
5	The bending radius and twist degree of the flexible waveguide is within the allowed range.
6	The separate mounting components should be in the protection range of the lightning rod (the protection angle of the lightning rod should be less than 45 degrees. In mountainous and thunder prone areas, the angle should be less than 30 degrees).

Items to be checked for the ODU cables

Serial No.	Checking Requirement
1	All the outdoor connectors and the grounding clips of the IF cable should be waterproofed.
2	The connectors of the IF cable should be correctly made and tightly fixed.
3	The IF cable should not be broken or twisted. The braided shield of the cable should not be bare.
4	After being led out from the ODU, the IF cable should be curved for waterproof purposes.
5	Before entering the room, the IF cable should be curved for waterproof purposes and should be grounded.
6	The minimum bending radius of the IF cable should be more than 30 cm(11.8 inch).
7	The IF cable should be neatly routed without any overlapping or crossover.
8	When the IF cable is bound on the wiring ladder or the wiring frame, the spacing between cable ties should be about 1 m(3.28 ft).
9	Leave some slack before cutting cable ties.
10	The labels of the IF cable should be affixed based on the specifications. They should be neatly aligned and face the same direction.
11	The excess slack of the IF cable should be coiled into circles with a diameter not less than 60 cm(23.62 inch) and should be bound onto the pole or tower.
12	The grounding points of the IF cable should meet the specifications.
13	The IF cable should not bend within the range of about 0.5 m(1.64 ft) around the installation location of the grounding clip.
14	The grounding wire of the clip should be led downwards. The angle formed by the grounding wire of the clip and the IF cable should not be greater than 15 degrees.
15	The ODU grounding cable should be correctly connected.

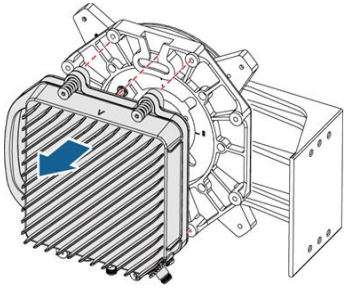
CAUTION

After the ODU is unpacked, it must be powered on within 24 hours to avoid moisture accumulation in it.

Replacing the ODU

Replacing the ODU on the antenna

1. Loosen the four M6 captive screws of the ODU cornerwise.
2. Remove the ODU.
3. For details about the installation procedure of the ODU, see page 15.



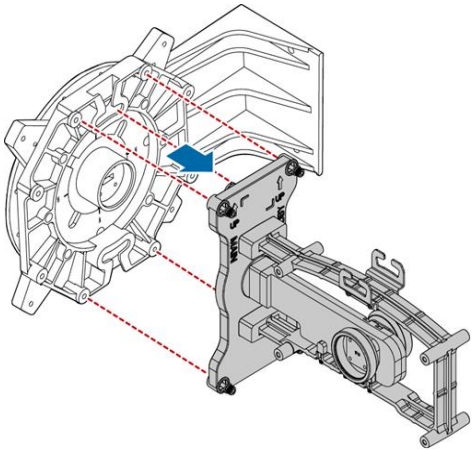
NOTE

Here describes the method for replacing the ODU on the antenna, which is similar to the methods for replacing the ODU on other components.

Replacing the Hybrid coupler

Replacing the Hybrid coupler on the Antenna

1. Remove the ODU on the hybrid coupler. For details, see Replacing the ODU on the antenna on page 45.
2. Loosen the four M6 captive screws of the hybrid coupler cornerwise.
3. Remove the hybrid coupler.
4. For details about the installation of the hybrid coupler, see page 17.

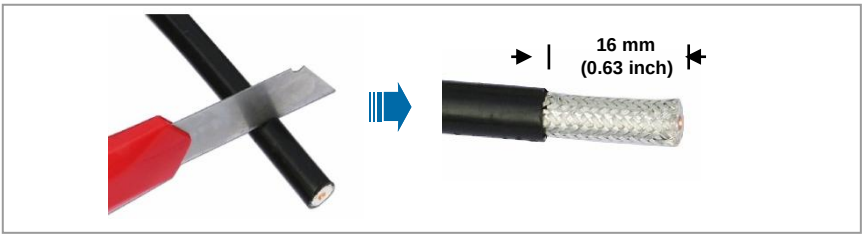


NOTE

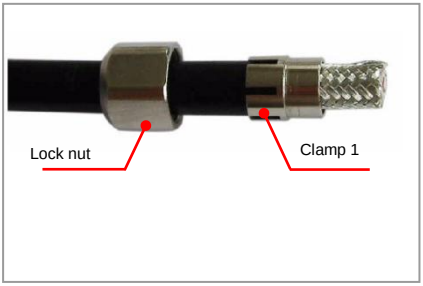
Here describes the method for replacing the hybrid coupler on the antenna, which is similar to the methods for replacing the hybrid coupler on other components.

Terminating the IF Cable with the N Connectors

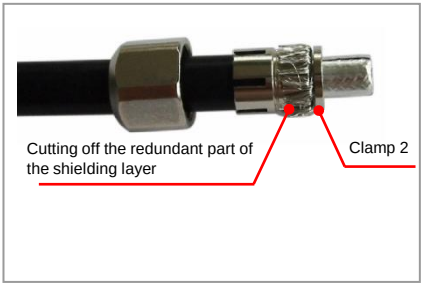
1. Stripping off the cable sheath



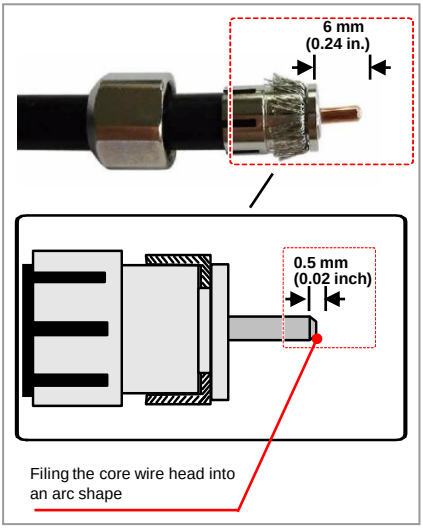
2. Gliding the lock nut and clamp 1



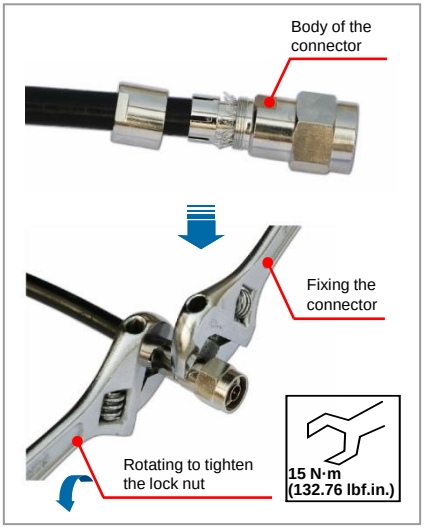
3. Folding back the braided shield to cover clamp 1, and binding the braided shield by using clamp 2



4. Stripping off the dielectric insulating layer

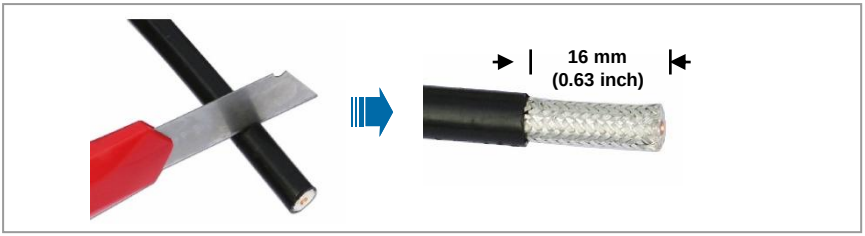


5. Installing the body of the connector

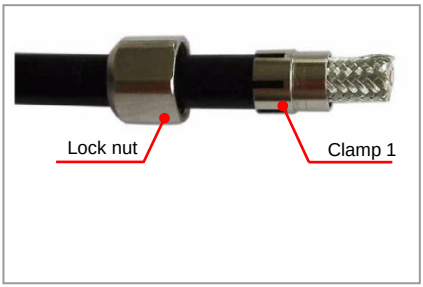


Terminating the IF Cable with the TNC Connectors

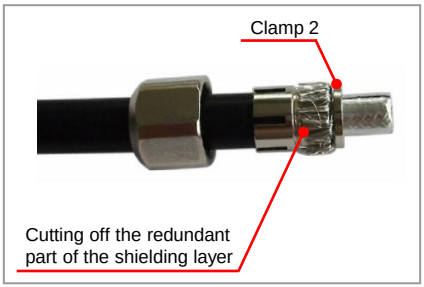
1. Stripping off the cable sheath



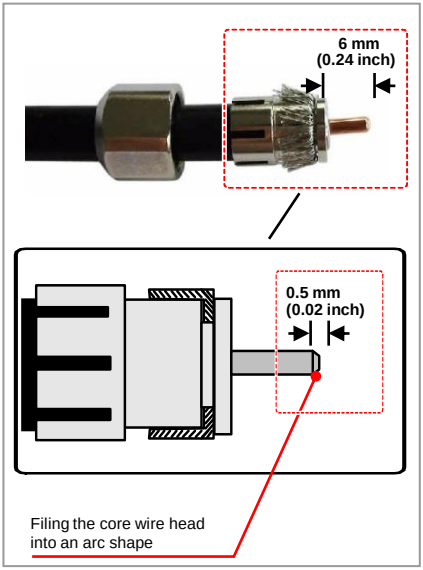
2. Gliding the lock nut and clamp 1 over the cable



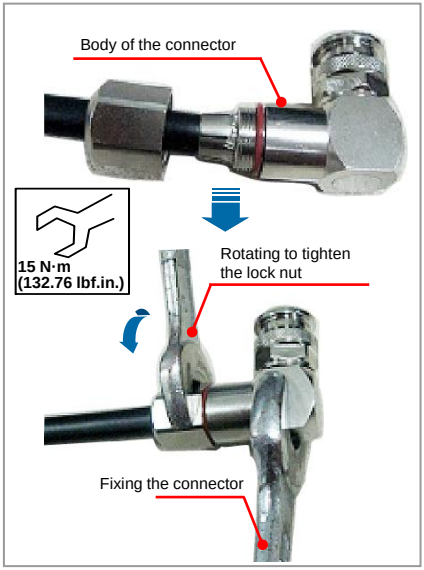
3. Folding back the braided shield to cover clamp 1, and binding the braided shield by using clamp 2



4. Stripping off the dielectric insulating layer

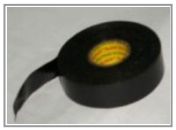


5. Installing the body of the connector

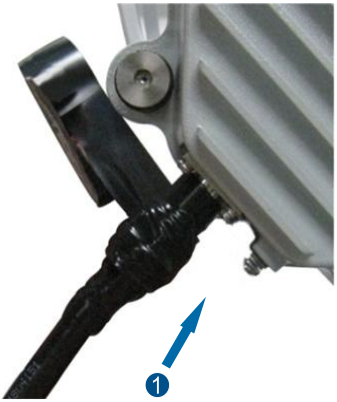


Waterproofing Outdoor Connectors

1. Wrapping one layer of PVC tape

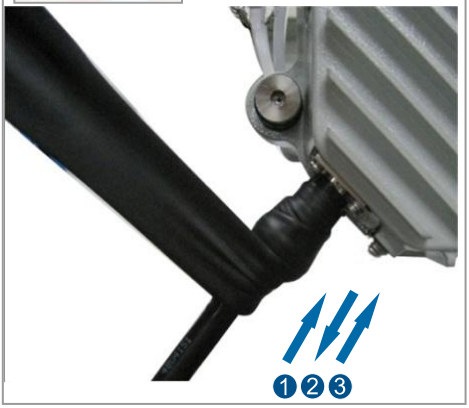


PVC tape



2. Wrapping three layers of waterproof insulation tape

Waterproof insulation tape



3. Wrapping three layers of PVC tape over the waterproof insulation tape

PVC tape

4. Using the outdoor bundling strap to bind the PVC tape tight at both ends

Cut off the extra cable strap after the PVC tape is tightened.

BNC Voltage (for RSSI) and Receive Signal Level Look Up Table

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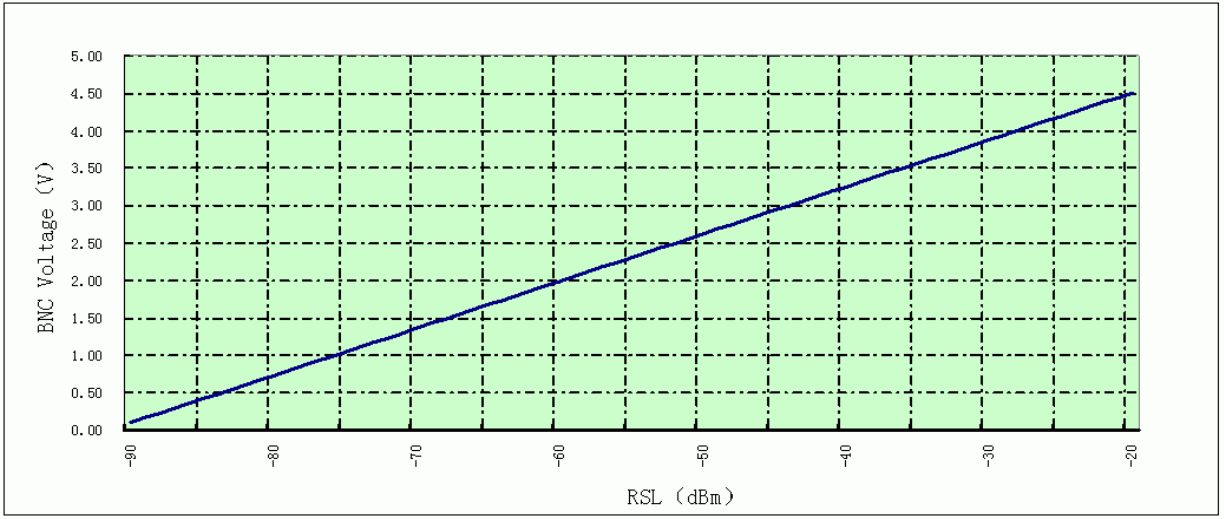
Part Number: 31070169 Issue: 01 Date: 2010-01-21

RSL(dBm)	-20	-25	-30	-35	-40	-45	-50	-55	-60	-65	-70	-75	-80	-85	-90
BNC Voltage(V)	4.50	4.19	3.87	3.56	3.24	2.93	2.61	2.30	1.99	1.67	1.36	1.04	0.73	0.41	0.10



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