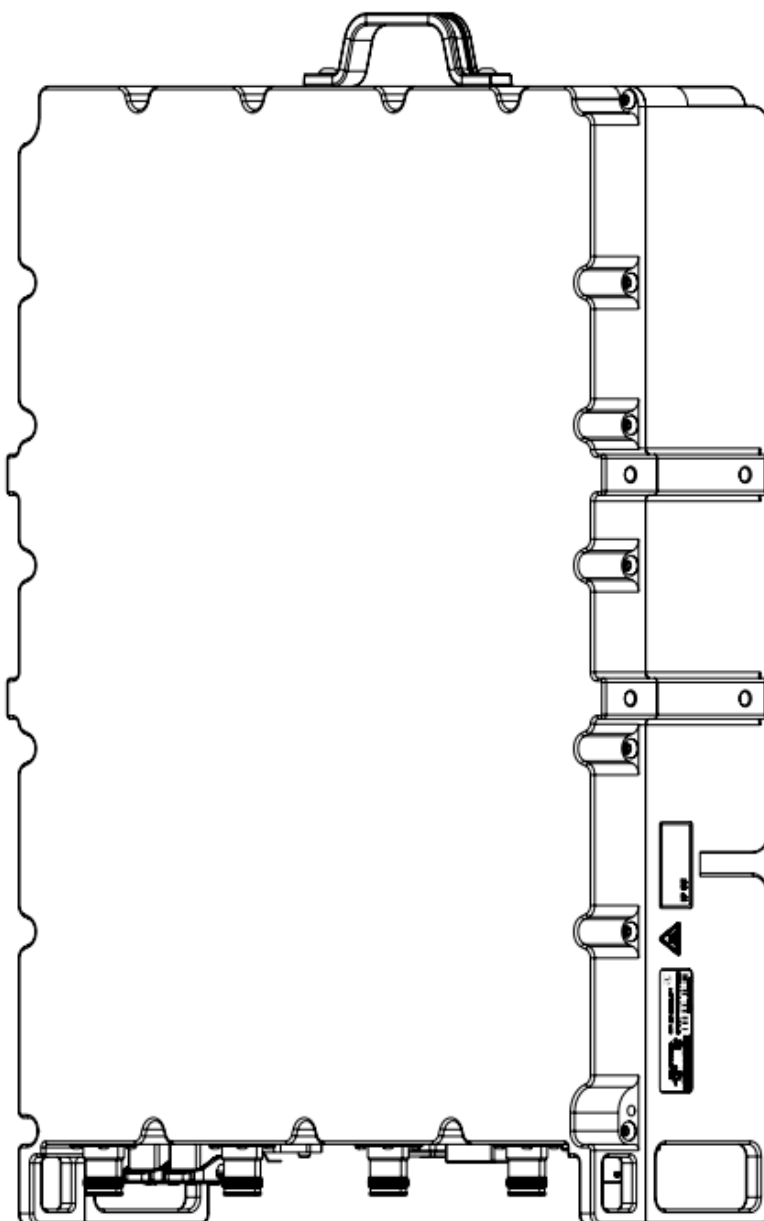




Radio Installation Guide

MR44MOA

Version: February 2023



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Introduction

Document description

This document describes installation of the Mavenir Micro Remote Radio Unit and is intended for approved installation personnel.

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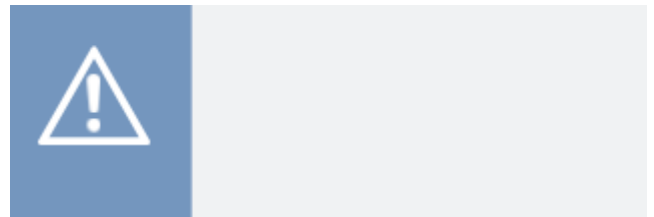
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About the product

Product description

The product is a Macro Remote Radio Unit for wireless networks. The product has 5G NR technology and operates as a radio transceiver that connects to an operator at Network Operations Centre.

Symbols in the manual

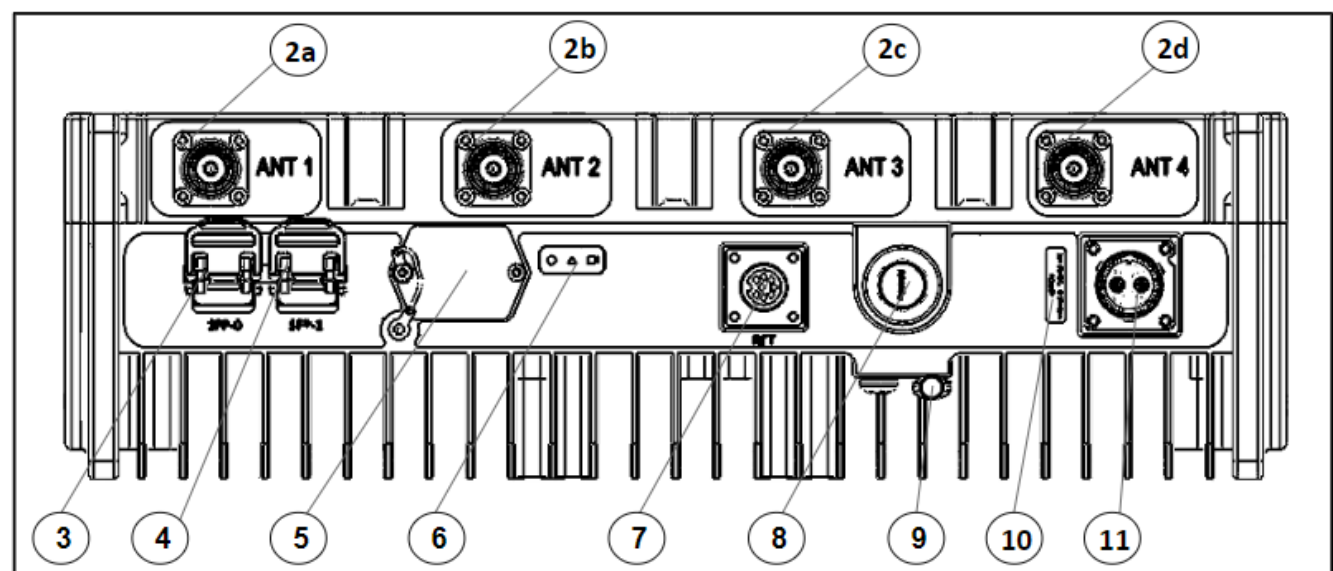
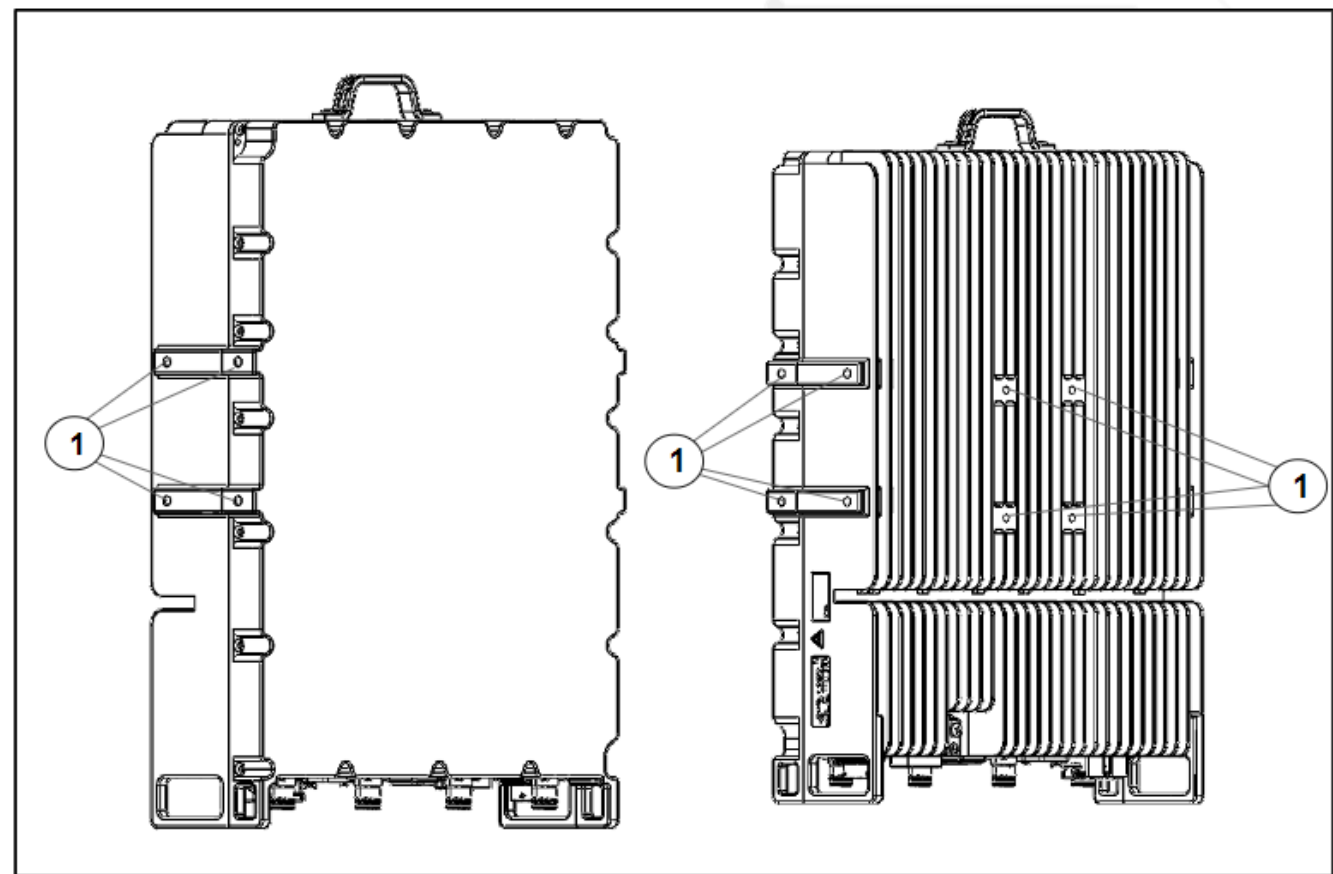


Note

Information that is necessary in a given situation.

Overviews

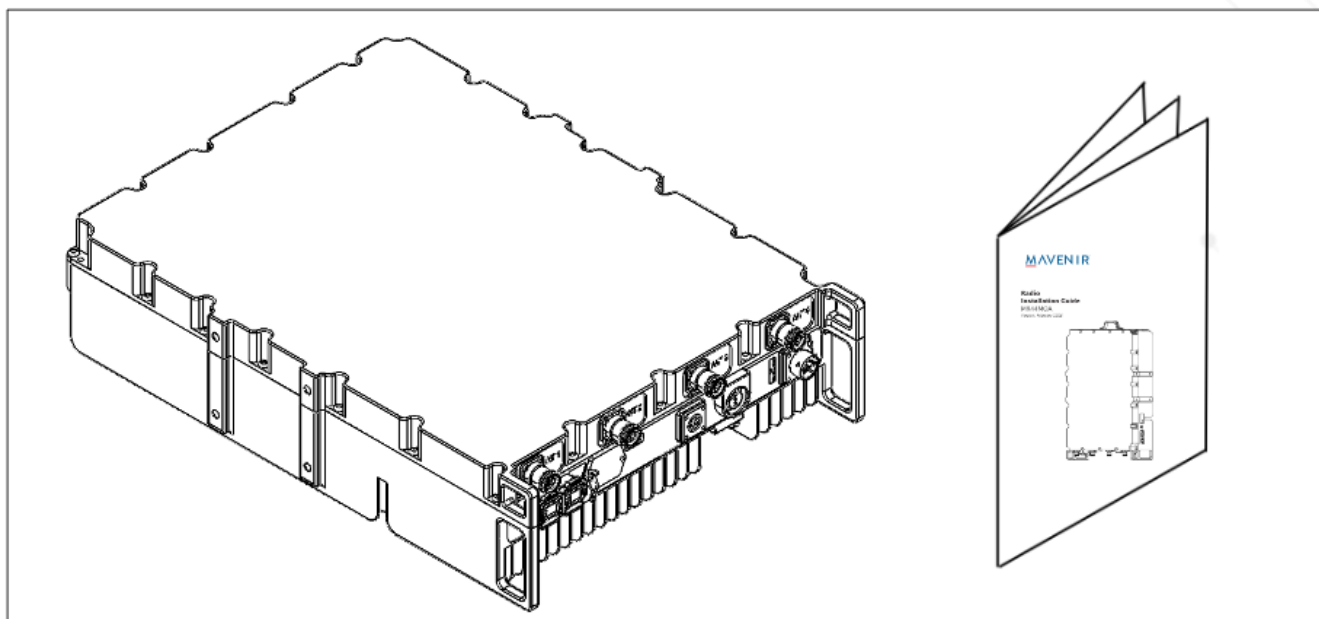
Product overview



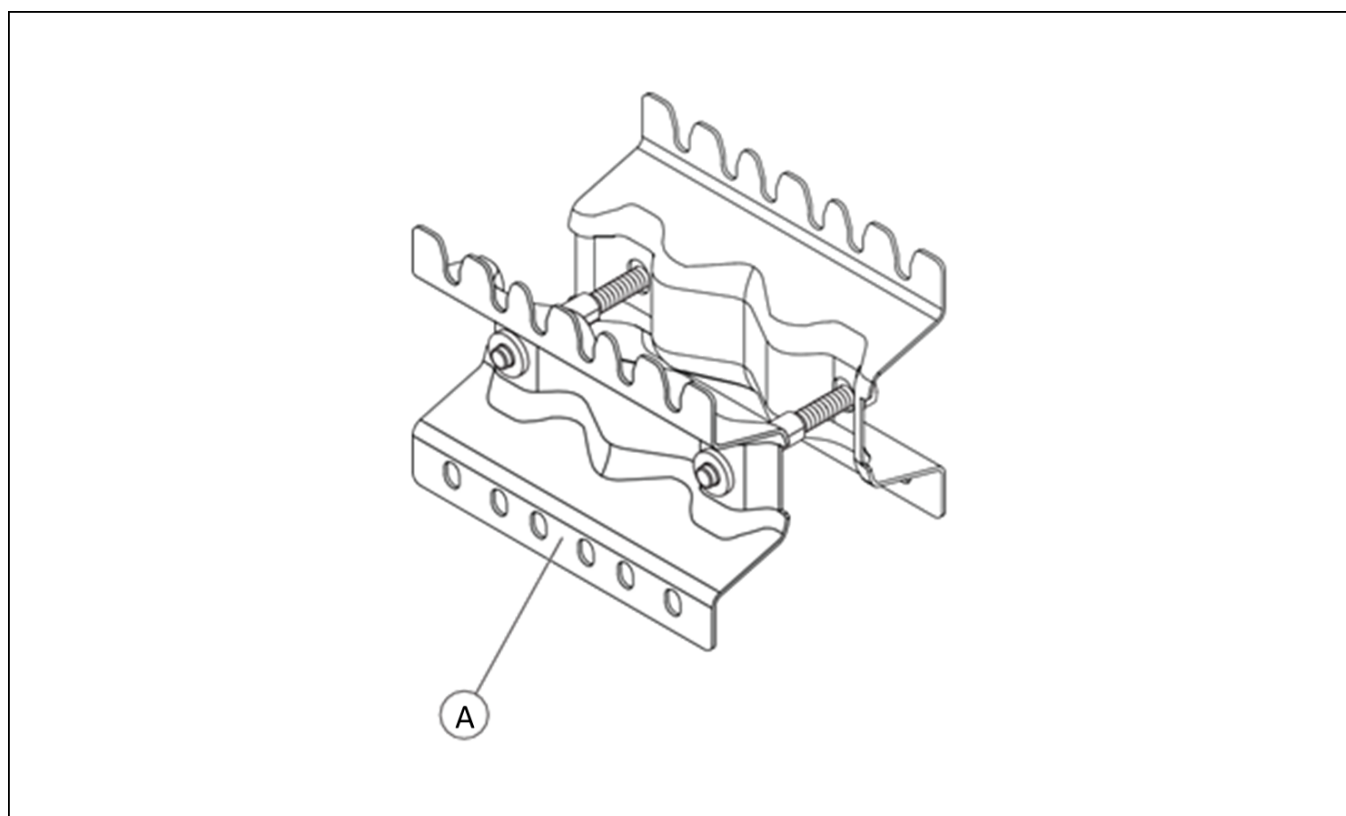
Interface panel overview

1.Attachment holes	8. Air Vent
2. 4.3-10 antenna ports (a, b, c, d) Female type	9. Earth Cable Connector
3. SFP0 (In use)	10. Power Label
4. SFP1 (Reserved - Not in use)	11. Power Connector
5. Maintenance ports cover (Do not remove the cover.)	
6. LED indicator	
7. RET Connector	

In the box

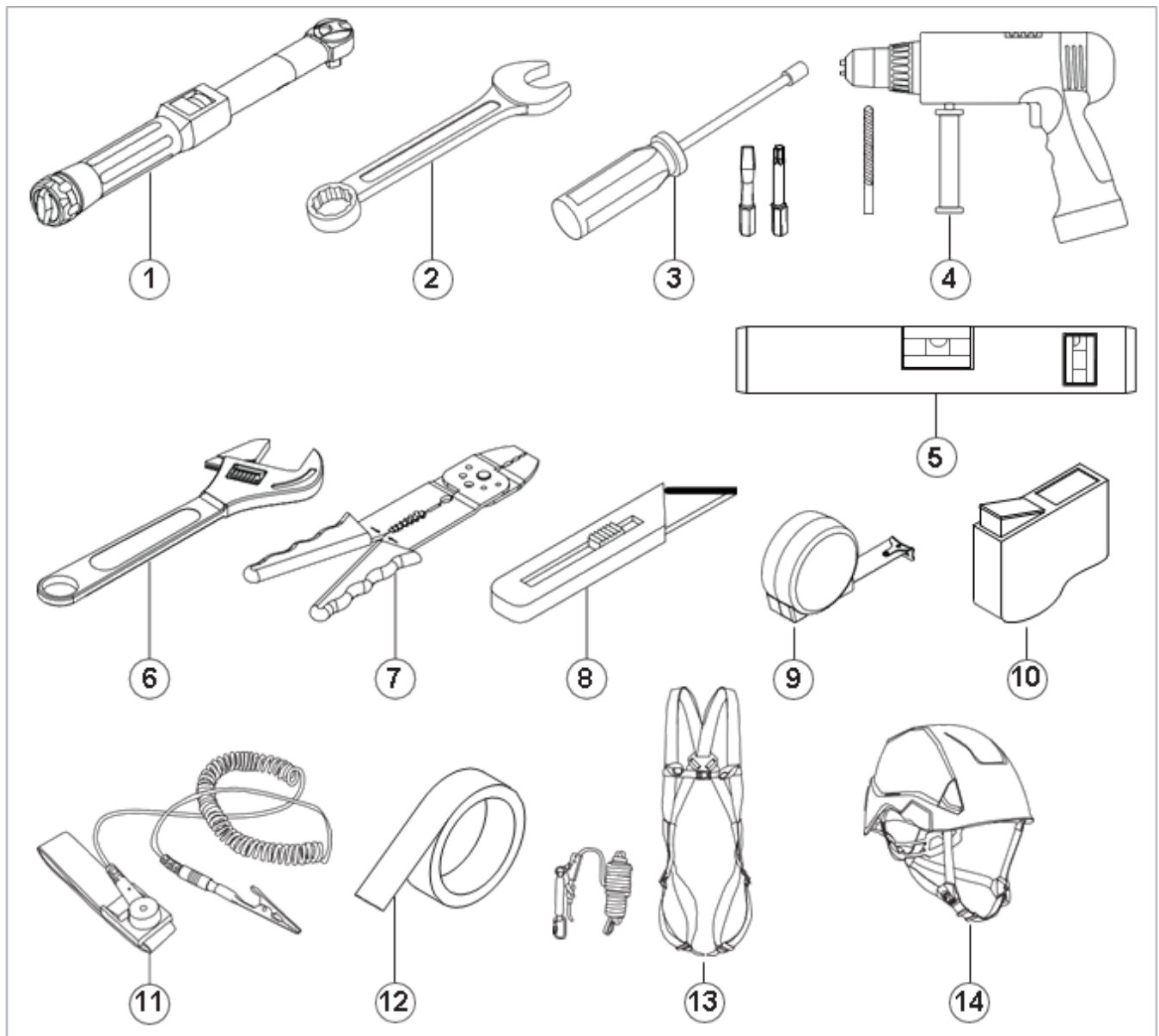


Brackets suitable for MR44MOA



Pos.	MPN (Manufacturer part Number)	MIN	Max no. of radio units mounted at the same time
A	6030	400-00125-01	2

Tools needed



Item	Tools	Used for
1	Torque wrench M6 8Nm, Torx T30	Mounting bracket
	Torque wrench M6 8 Nm, socket 10 mm	Mounting bracket
2	Wrench - 10 mm, 13 mm, 16 mm, 18 mm hex key	Miscellaneous
3	Screwdrivers (Flat and Torx)	Miscellaneous
4	Power drill	Drilling holes in walls
5	Level bar	Attach the bracket to a wall
6	Adjustable wrench	Miscellaneous
7	Wire stripper	Cables
8	Knife	Miscellaneous
9	Steel tape measure	Miscellaneous
10	Optical connection cleaner	SFP cable
11	ESD Wrist Strap	Handling cables
12	Tape	Miscellaneous
13	Safety harness	Climbing
14	Safety helmet	Site safety

Accessories

Accessories	Mavenir Part No.	Manufacturer and P/N	Qty
Wall and Pole Bracket Options	400-00125-01	MAFI 6030	1
External Optical connector	10/25 Gbps SFP. To be selected from Mavenir approved list of SFPs		1
SFP Boot Plug Kit	125-00024-01	Radiall OCTI117500	1
External Power Connector		Amphenol 10-761296-Z2S /Jonhon DY4T1402SNS2-04	1
External RET Connector		Amphenol C091 31H008 101 4 U	1

Safety

General safety

- Make sure that the workers know all installation methods and safety precautions before they start work.
- Before you install the product, you must first know all the components of the device and know how to do the installation.
- Before you start the installation, put up warning signs
- Before working on equipment that is connected to power, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals.
- Read the installation manual carefully and understand the instructions before you install the product.
- The information in this installation manual is not a replacement for professional knowledge and experience. If you do not feel safe in the situation that you are in, stop the installation. Turn to your Network Operation Centre.
- The product can be hot. Wait for the unit to cool down before you do maintenance work. Always use protective gloves.
- Do not install the product if you are tired, while under the influence of alcohol or drugs, medicine or anything that could have a negative effect on your vision, alertness, coordination or judgment.
- Hazardous voltages can be present when the system is in operation. Use caution when you remove or install the product.
- Observe all local and national electrical, environmental and workplace codes.

Safety instructions for installation

- Do not keep the product outdoors or remove the product from the box before you do the installation.
- Stay alert, monitor what you are doing and use common sense when you install the product. A moment of inattention may result in serious personal injury.
- A fall hazard is present when installation of this equipment requires working on towers, poles or at elevated work sites. All personnel who perform tower work or work at elevation must be qualified to perform this type of work.
- Do not install the product during bad weather.
- When you do work at a high location, make sure your tools are safe and do not fall. A tool that falls can cause injury or death.
- When you drill holes, you must put on approved protection equipment to keep out the dust from your eyes and lungs.

Electrical safety

- Do not touch uninsulated wiring or terminals unless the power to the lines have been disconnected at the source. Use an approved voltage meter to make sure that there is no power.
- To prevent electrical shock, never remove the cover or disassemble the equipment. There are no user serviceable components in the product.
- Risk of electrical shock or short circuit if the safety instructions are not obeyed.
- Only use approved cables when you install the product.
- Grounding and circuit integrity is vital to a safe operating environment. Grounding conductors must be in place before installing the equipment. Never operate equipment when the grounding or bonding conductor has been removed.
- When you install the power cable of the product, you must first connect the cable to the product and then to the power device. If you install the cable the other way around, it can cause damage to the device or personal injury.

Federal Communication Commission Certified:

This equipment is tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

These equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If these equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio/TV technician for help.

FCC Caution:

To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

FCC Radiation Exposure Statement:

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. These equipment should be installed and operated with a minimum distance of 212 centimeters between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

These devices comply with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. These devices may not cause harmful interference
2. These devices must accept any interference received, including interference that may cause undesired operation

Personal protective equipment

Use the personal protective equipment that follow during installation and commissioning:

- Approved head protection
- Protective shoes
- Protective gloves
- Approved safety straps for work on high locations.
- High visibility vest



Maintenance

- Special training is necessary for all servicing and repair work of the product.
- Maintenance port remains for design Debug and should not be used on site. Do not open.

Labels on the product

Description	Label
Hot surface. Warning for hot surfaces. Keep hands and feet away. Risk of burn.	
Warranty Security Label	
Unit Label	
IP 65 Label	
Power Label	

Storage - Before installation

- Keep the product in the original packaging.
- Keep the product indoors in a clean, dry, and frost-free location.
- Make sure that there is no risk of fire in the storage location.

To install the product

Skills and requirements for personnel

Installation and commissioning personnel must fulfill local and national regulations.

To transport the product to the installation site

- Keep the product in the original packaging.
- Use straps or other equipment to fasten the product if it is necessary. Make sure that the product cannot move.
- Make sure that the transportation is dry and free from dust, frost, or static electricity.

To unpack the product

1. Examine the original packaging for damages.
2. Carefully remove the product from the original packaging. Make sure that no sharp edges can damage the product.
3. Make sure that no parts are missing.
4. Make sure that no parts of the product are damaged.

Minimum clearance distance

The illustration below shows the minimum clearance distance between the radio and other objects.

To do before the installation

- Make sure that the site is prepared according to the Customer Site documentation.
- Make sure that the power supply for the radio is installed and tested on site.
- Make sure that the grounding system is installed and tested.
- Make sure that a main switch/circuit breaker with an external fuse is installed and tested.

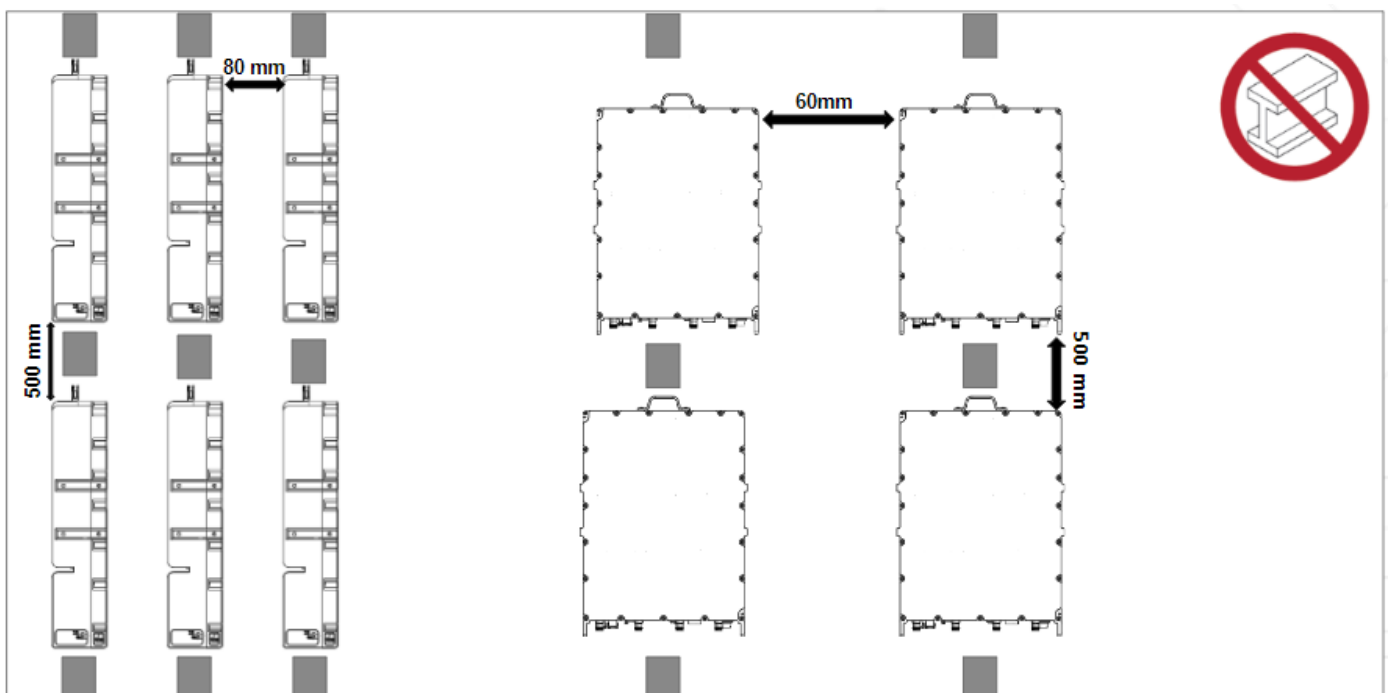
Cables

- If you mount the unit on a hollow pole, thread the cables inside the pole. Make sure that a civil engineer or a structural engineer approves the cable route.
- If you mount the unit on a solid pole, attach the cables to the outside of the pole using metal straps. Make sure that a civil engineer or a structural engineer approves the cable route.
- A civil engineer or structural engineer must approve the attachment method if you mount the unit on a wall.

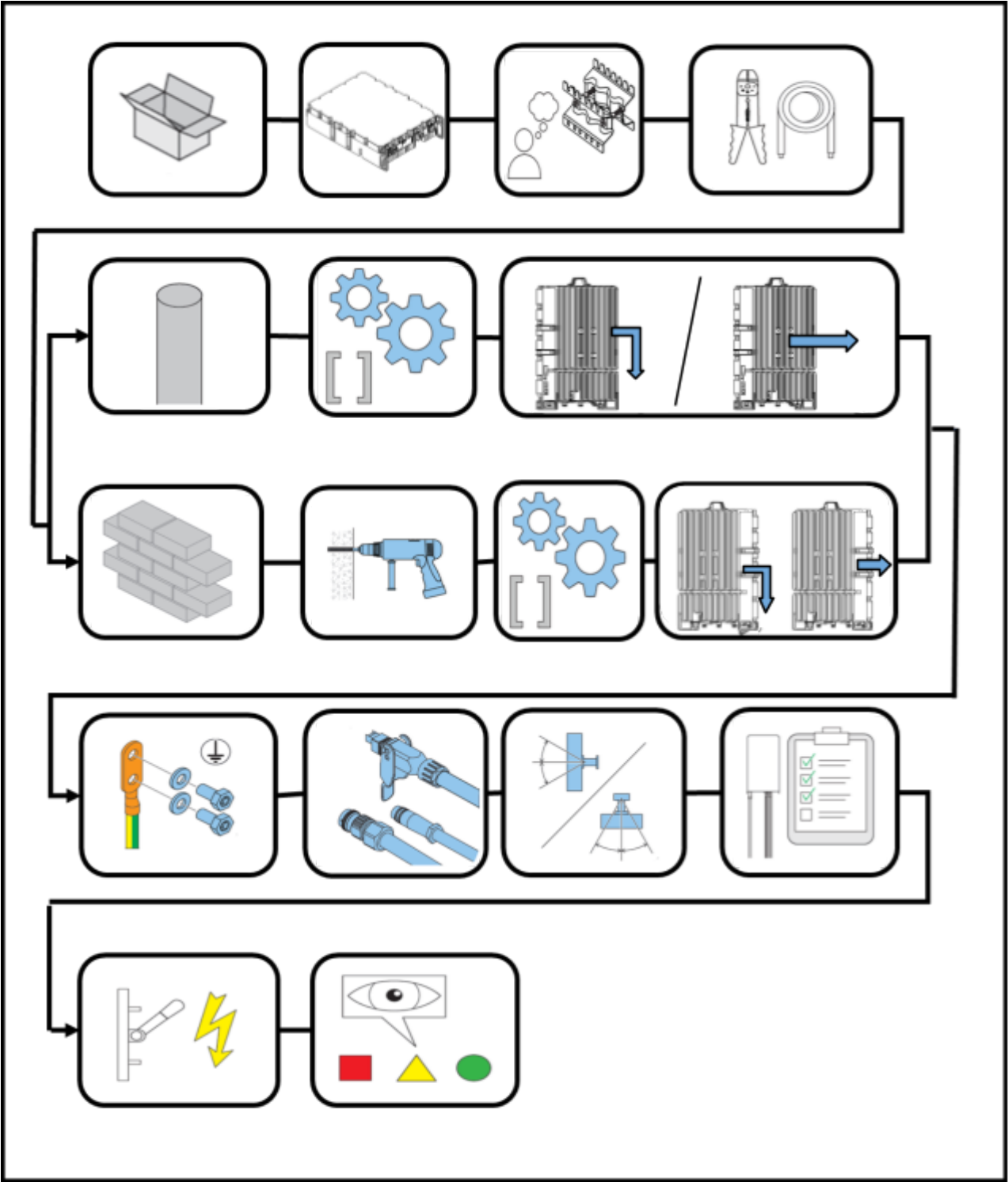
Environment requirement

Make sure that you avoid the following when you install the product.

- Heat source (caused by heat radiation, reflection, ventilation system outlets, etc.)
- Equipment generating electromagnetic field.
- Metal surfaces or objects (ladders, poles, railing, etc). Metal barriers will reduce the coverage area and performance of the radio. Make sure that there are no metal objects in the space: $\pm 30^\circ$ at vertical direction and $\pm 60^\circ$ in horizontal direction.

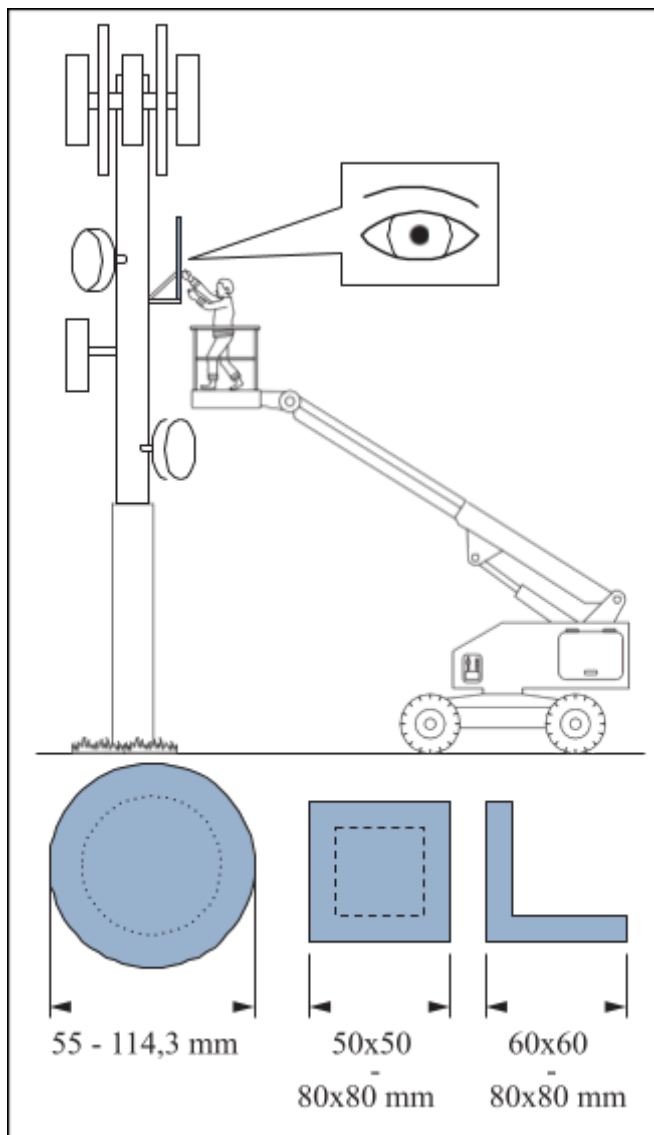


Installation process

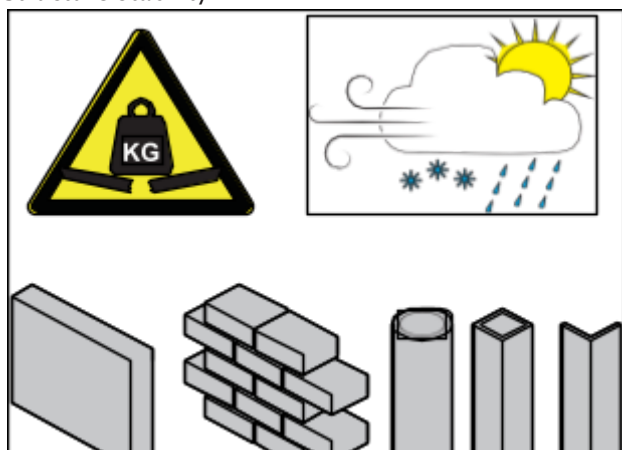


Installation requirements

Pole width



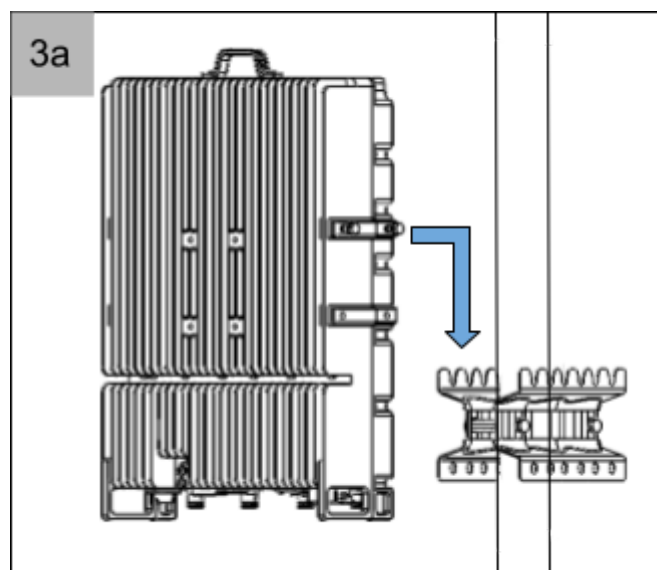
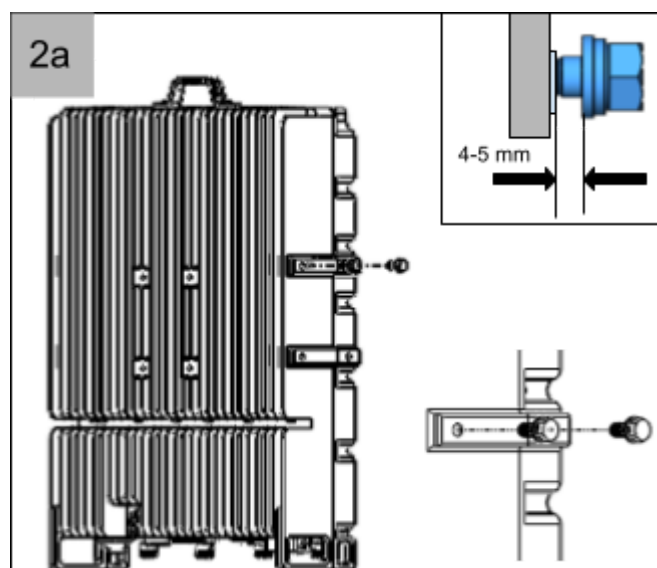
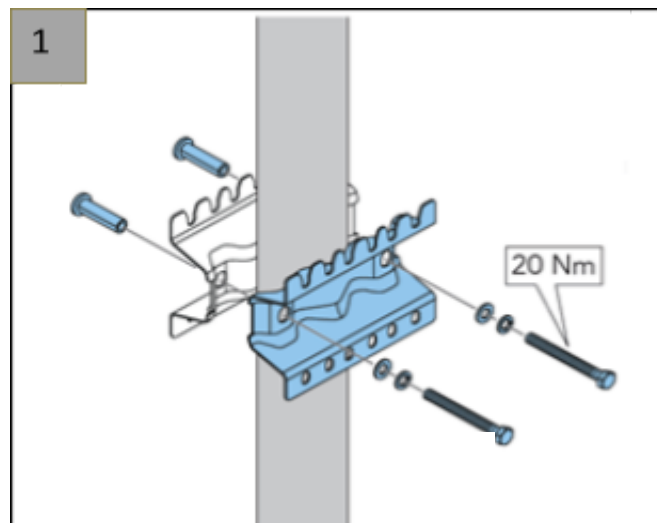
Note: Use a Cherry picker if no ladder is available
Structure stability

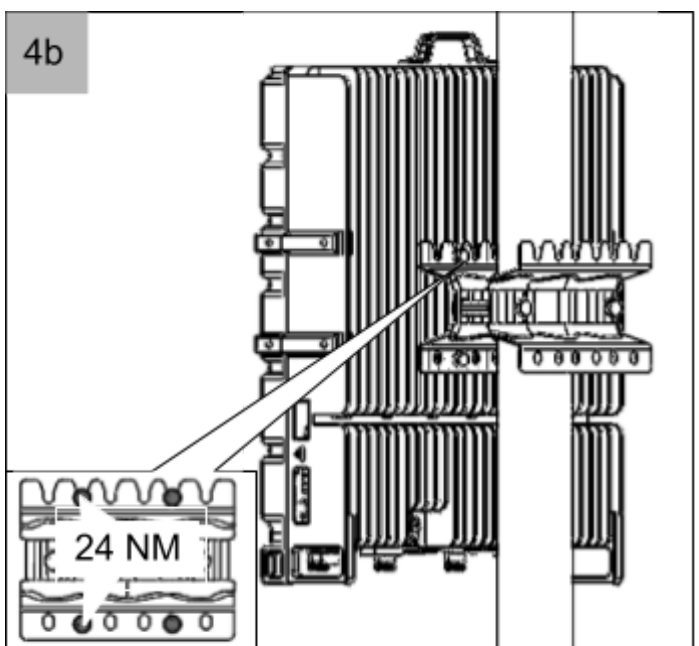
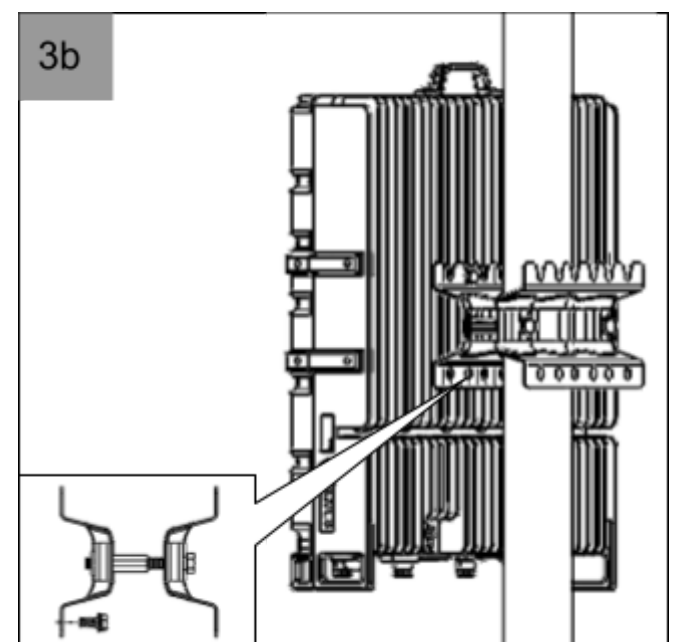
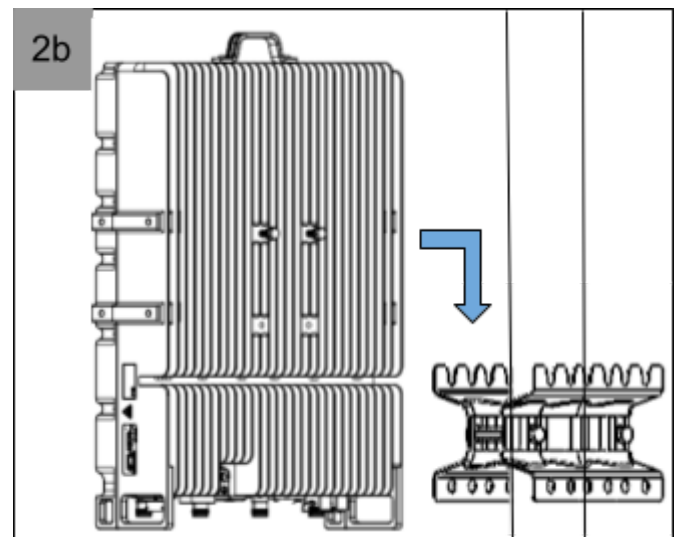
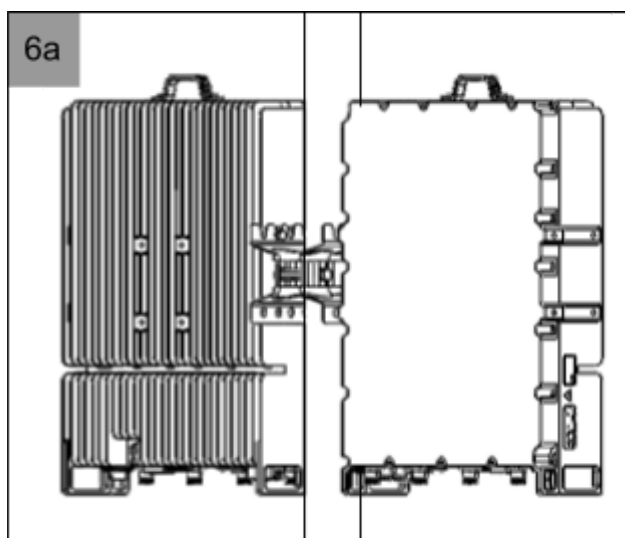
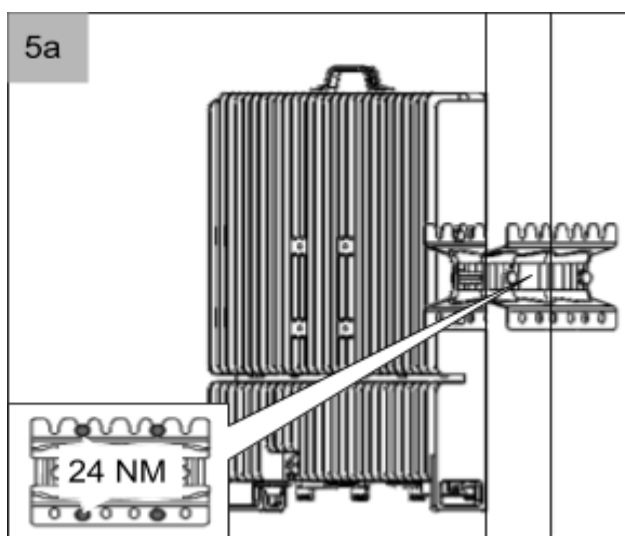
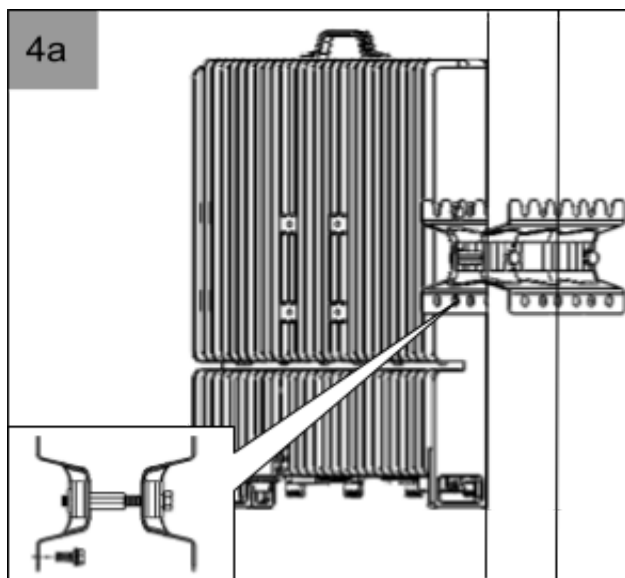


Note: Make sure that the structure that the unit will be mounted on can support the weight of the unit at all environmental conditions.

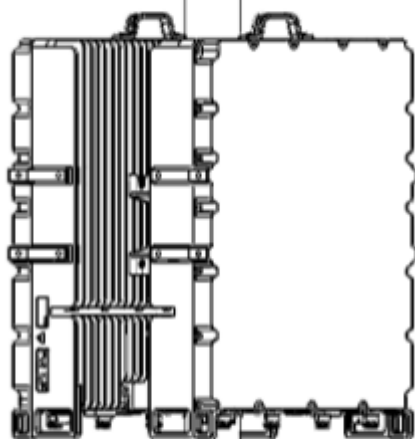
To install the radio on a pole with 6030

The radio can be mounted in portrait or book mode.





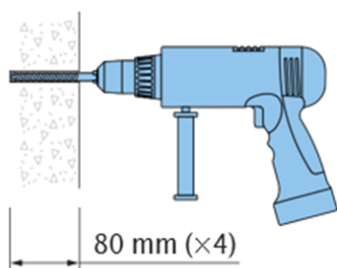
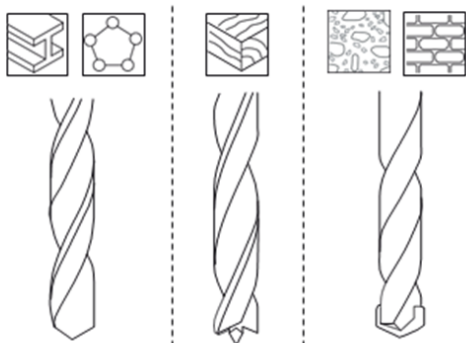
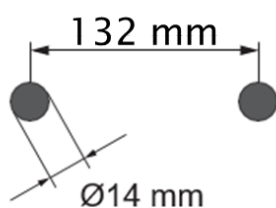
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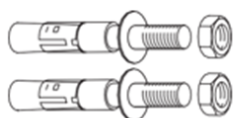
To install the radio on a wall with 6030

The radio can be mounted in portrait or book mode

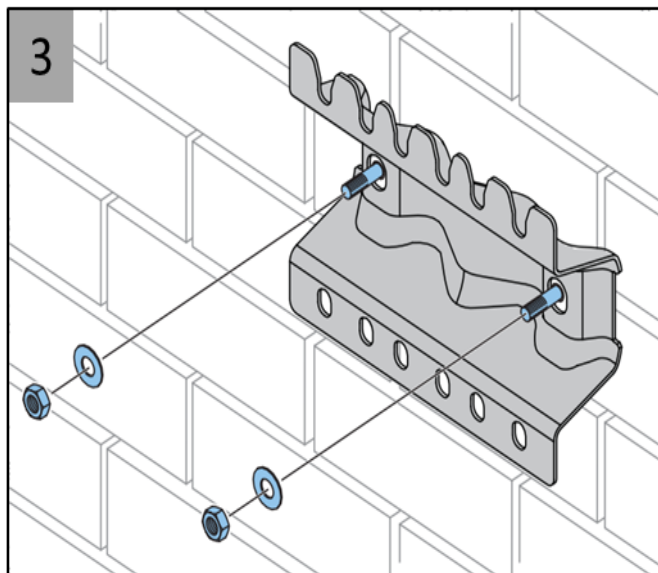
1



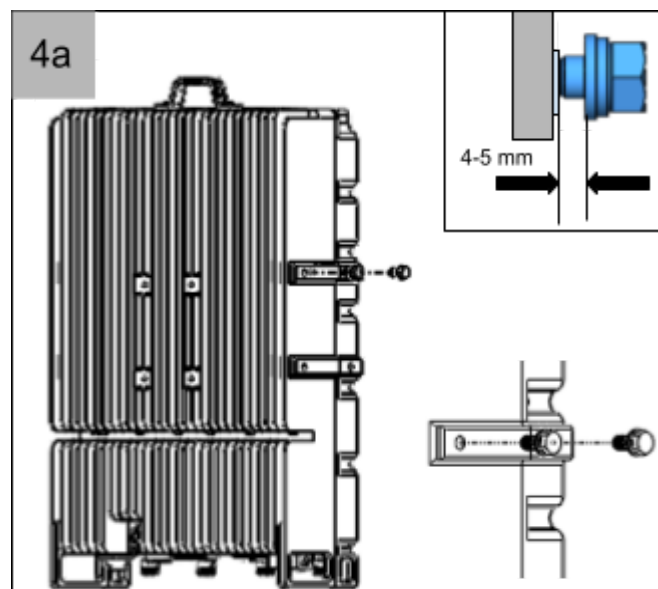
Ø14×80 mm(×2)



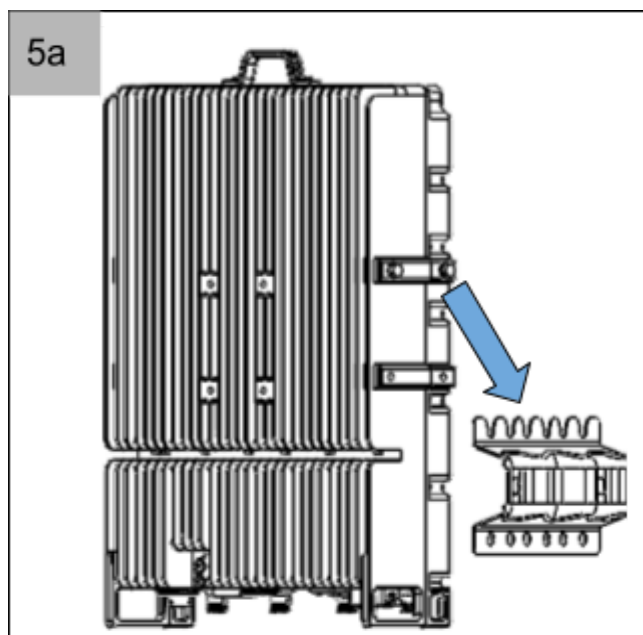
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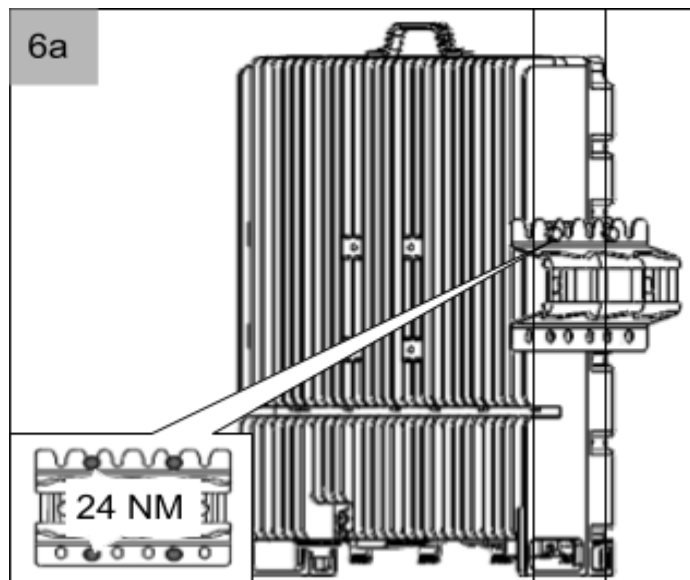
4a



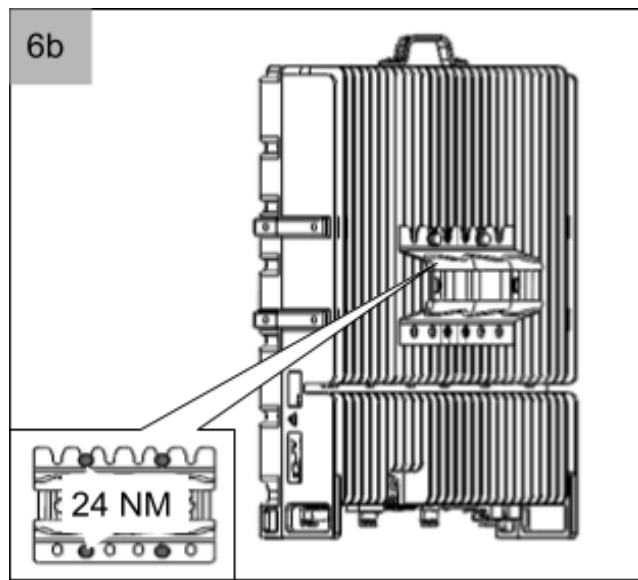
5a



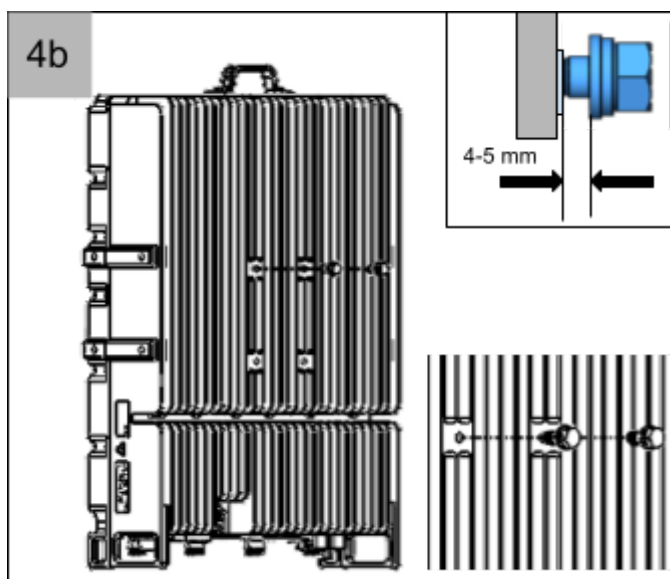
6a



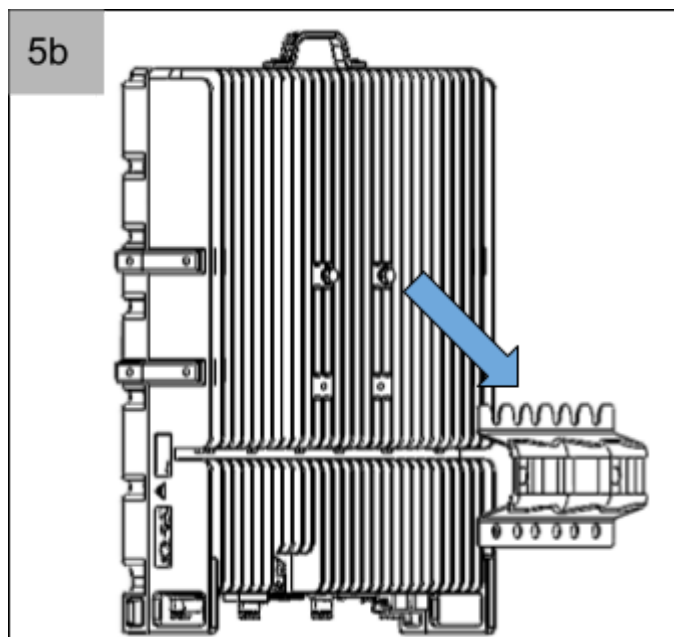
6b



4b

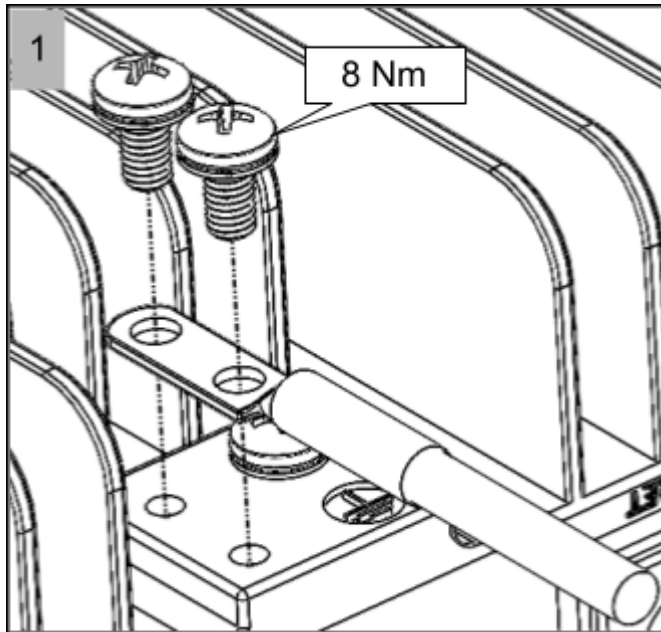


5b



Installation of the cables

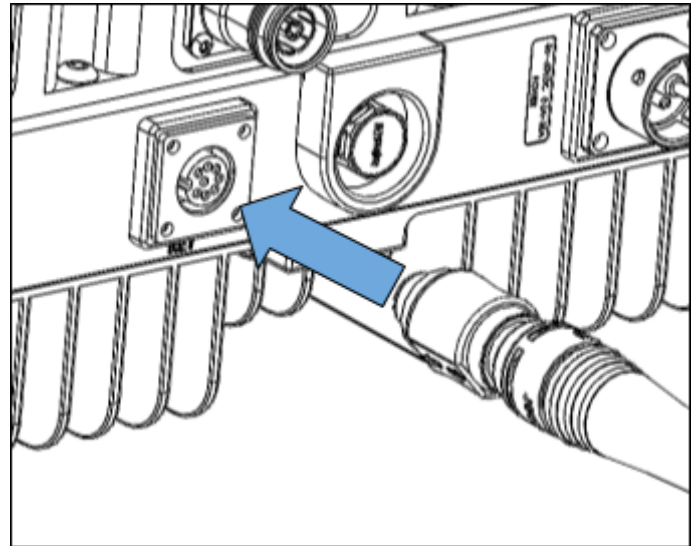
To install the earth cable



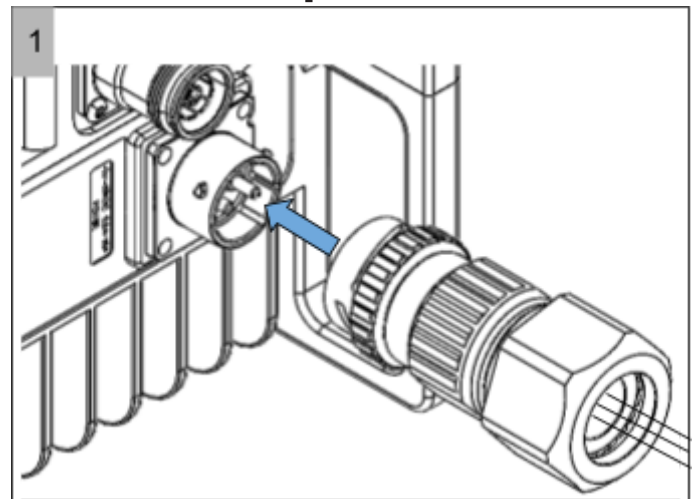
Note: The grounding cable size should be greater than 25 square millimeters and the terminal should satisfy 96h neutral salt fog test.



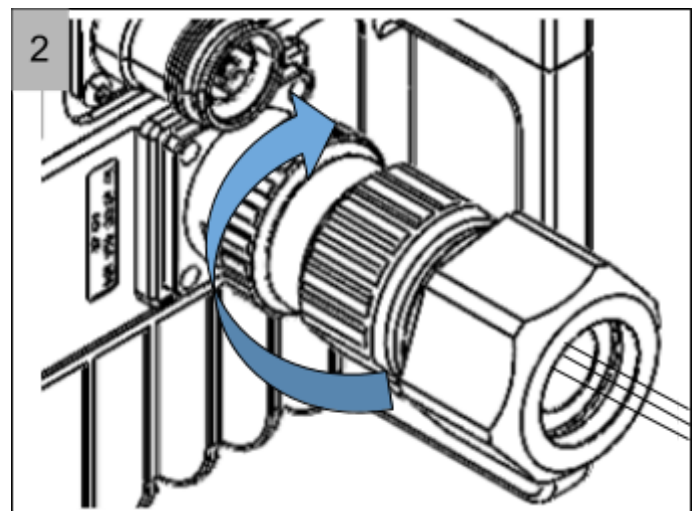
To install the RET cable



To install the power cable

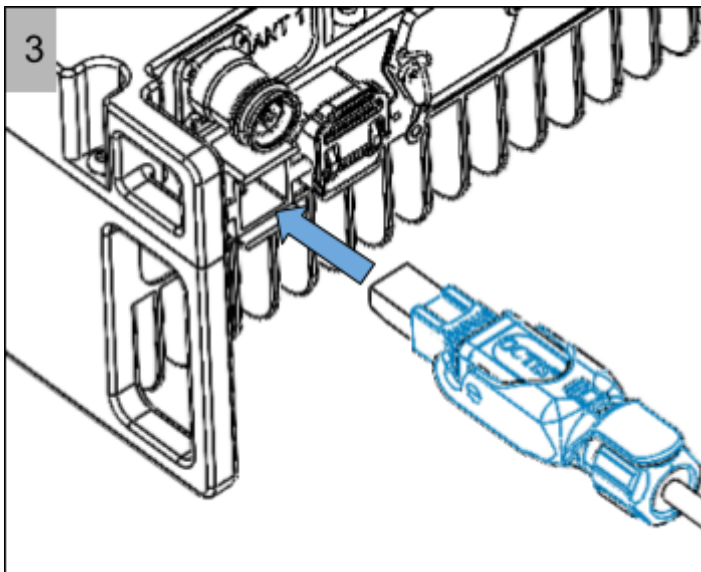
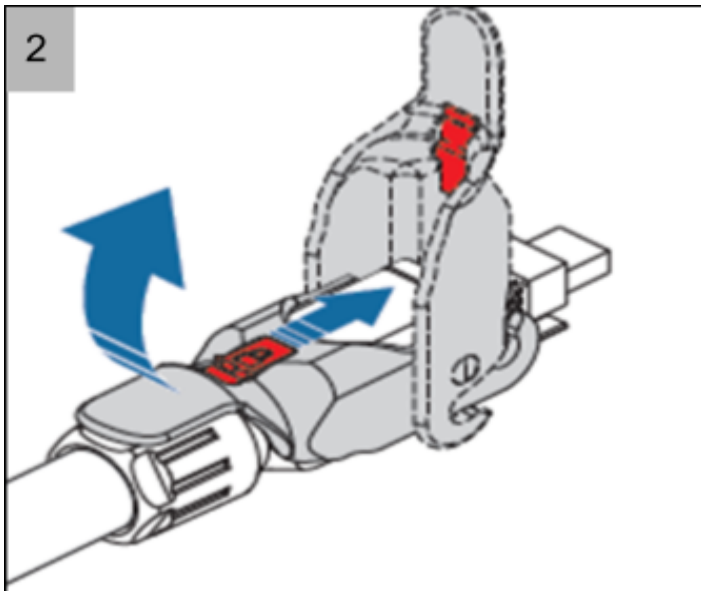
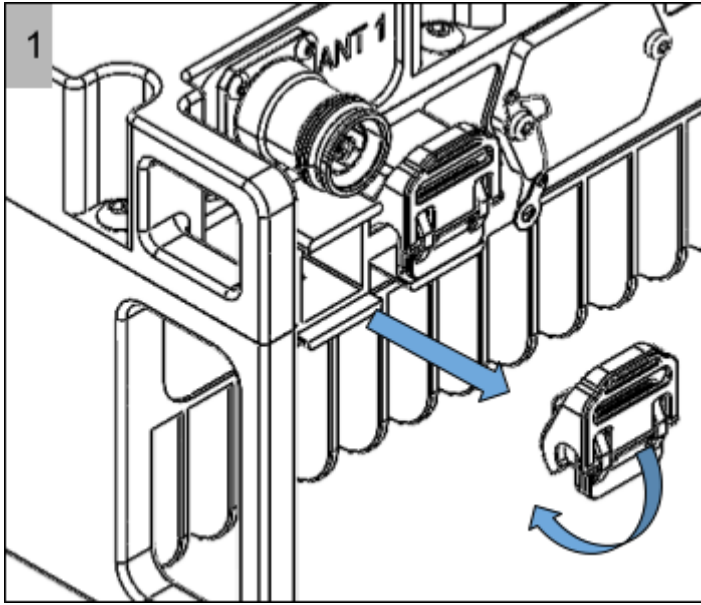


Note: Make sure that the keys on the cable match the grooves on the contact. (Fit A to A, B to B and C to C.)

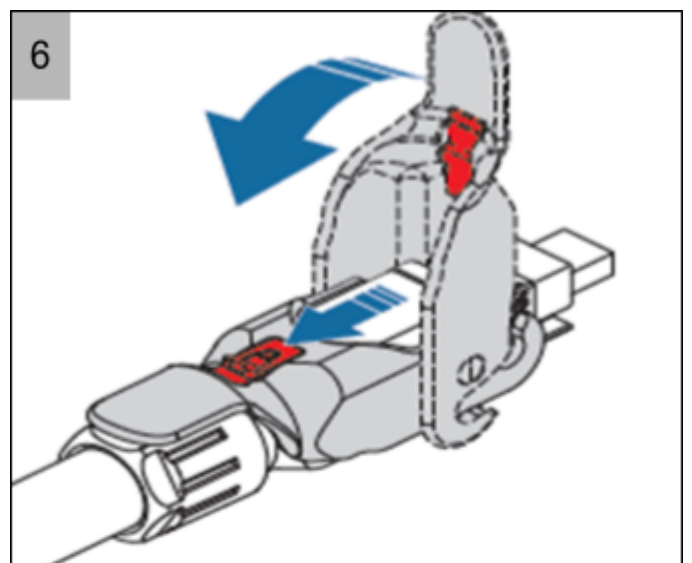
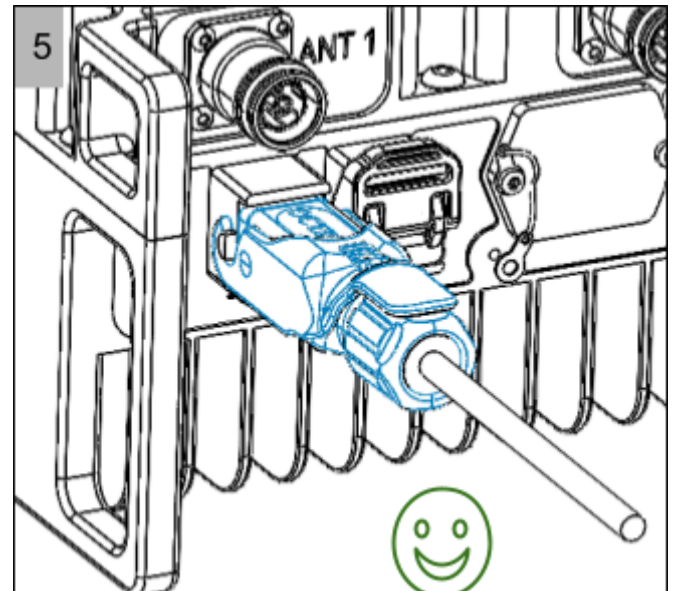
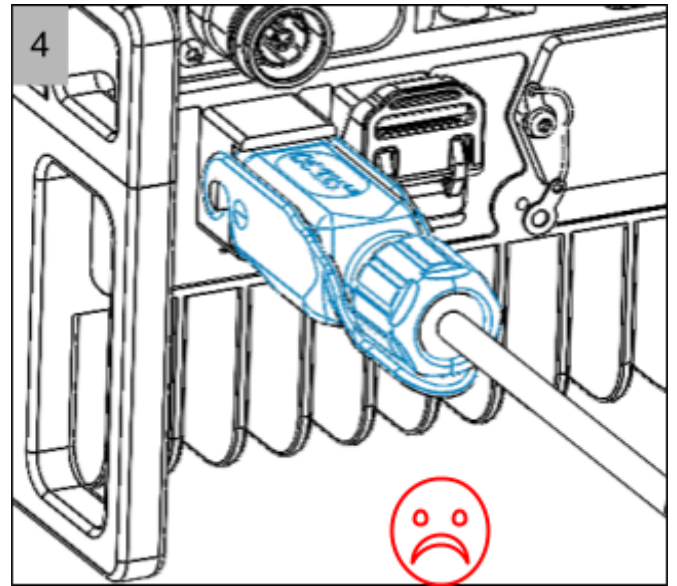


Note: Make sure that the connector is properly locked, to avoid bad connection and possible impact from rain or humidity.

To install the Octis cable (SFP0)

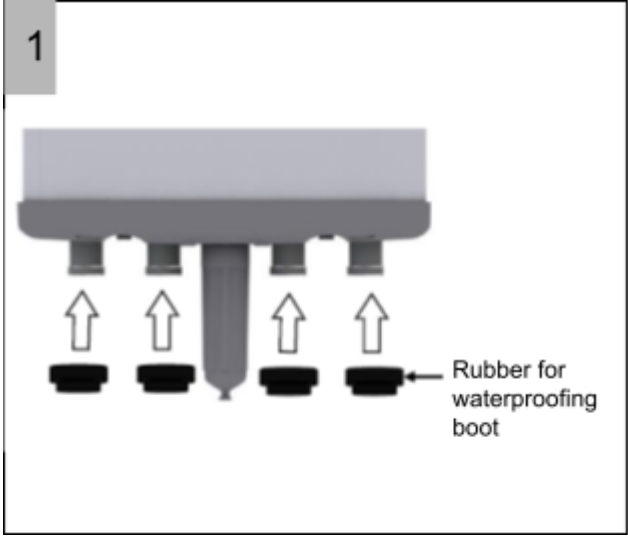


Note: Do not remove the cap from SFP1.

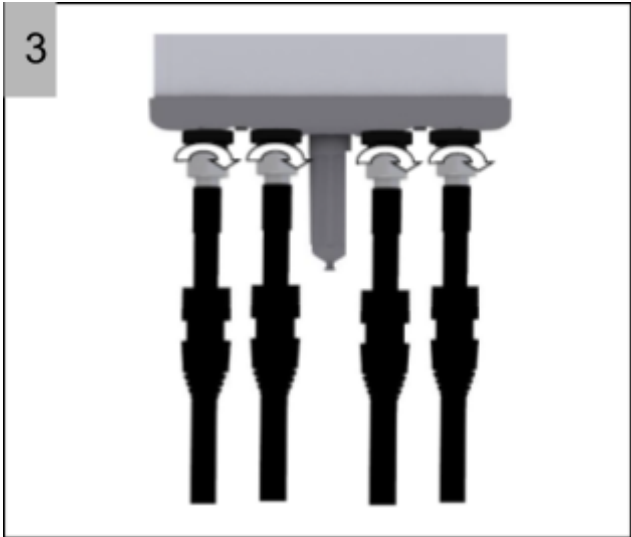
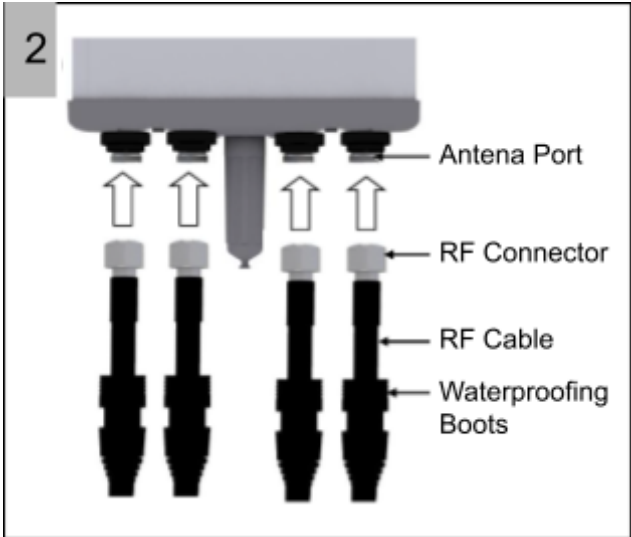


CAUTION: Make sure that a civil engineer or a structural engineer approves the cable route.

To install the Antenna cables

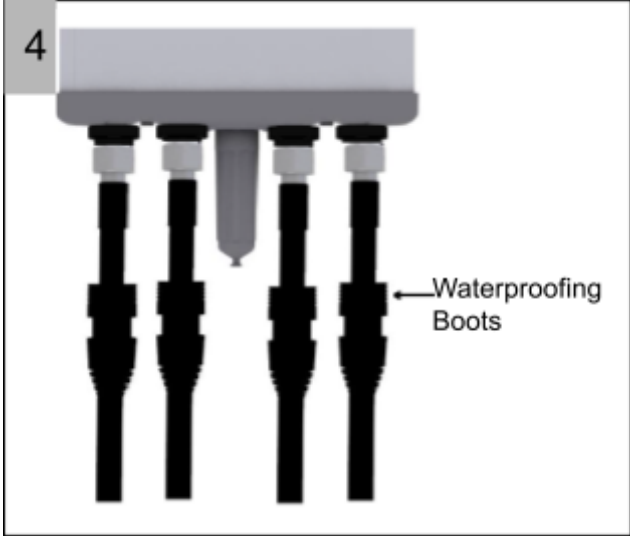


Note:Insert the rubber for waterproofing boot to the RF antenna ports.



Note:Connect the cables to the RF antenna ports

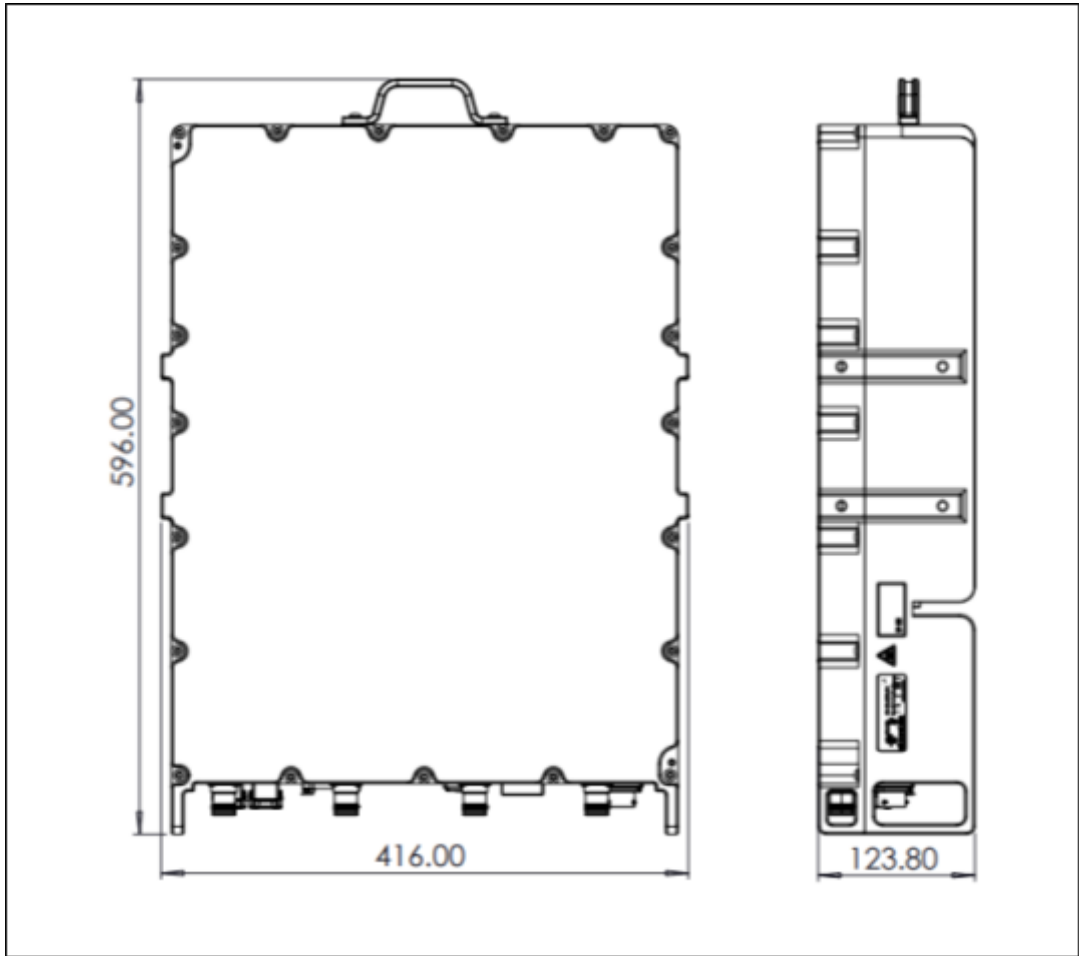
Note:After connecting the connector push the waterproofing boots up to the connector connection.



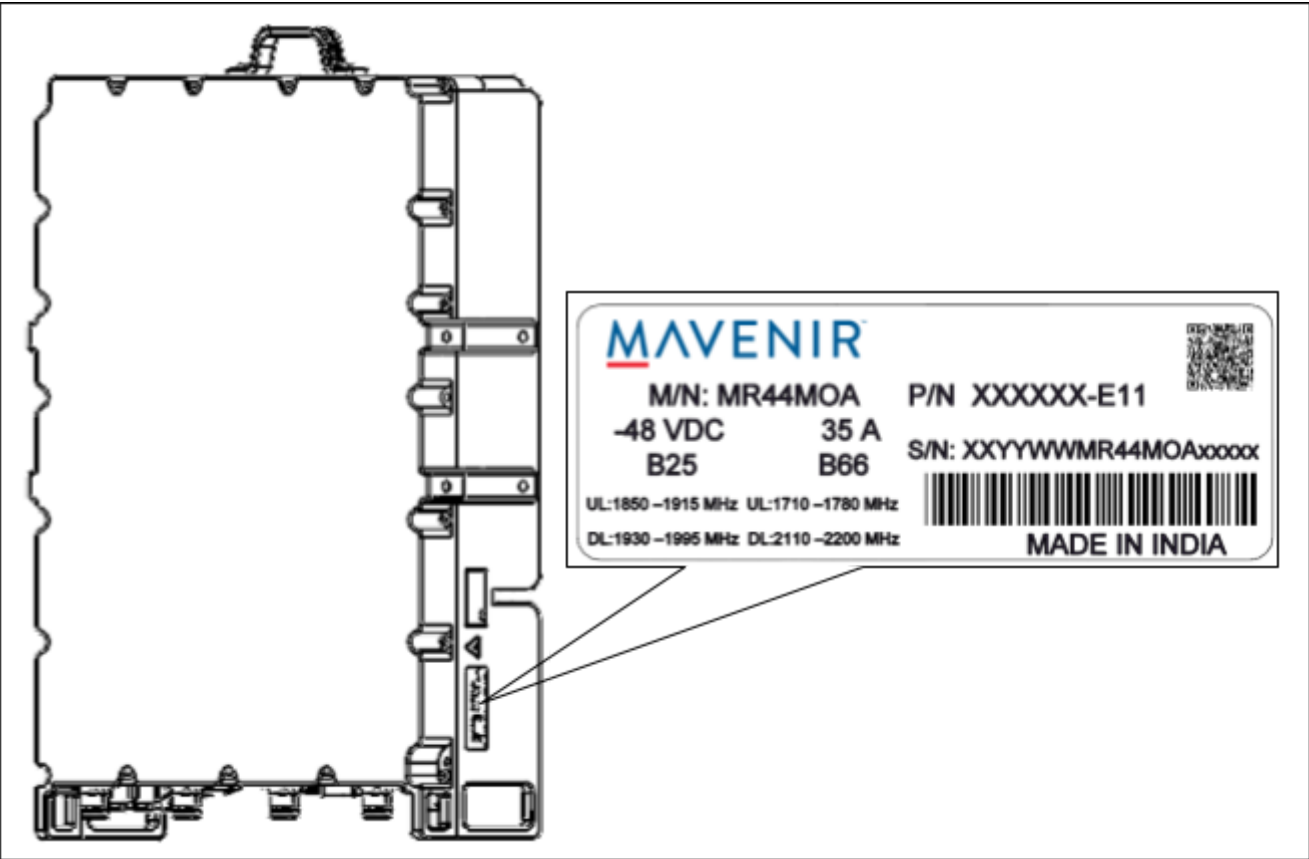
Disposal

Follow local or national regulations when you dispose of the product.

Dimensions



Type plate



To verify the radio installation on site

Examine the grounding system

No	Item	YES	N/A
1	Is the grounding system installed as specified?		
2	Is the radio grounding installed and connected to site Main Earthing Terminal?		
3	Is the ground cable area enough for copper cable, or equivalent?		
4	Is the Radio System grounded? Are the washers in place and the nuts tightened?		
5	Are the ground lugs, terminals, and cable lugs correctly crimped?		
6	Is there an untrapped ground cable longer than 1 m?		
7	Are there damage to the insulation of the cables?		
8	Are the equipment undamaged and free from contamination?		
9	Is the protective ground in the power supply box connected to the Main Earthing Terminal of the site?		

Examine the radio

No	Item	YES	N/A
1	Is the radio installed as specified?		
2	Is the radio clean and undamaged?		
3	Is the radio properly aligned horizontally and vertically?		
4	Are the equipment labeled as required (as specified in the Customer Site Documentation)?		
5	Are protective covers, dust caps, or terminations plugs installed on unused ports?		
6	Are the antenna cables routed correctly and undamaged?		
7	Are the antenna cables tightened correctly?		
8	Is the RET cable routed correctly and undamaged?		
9	Is the RET cable tightened?		

Examine the power system

No	Item	YES	N/A
1	Is the radio installed as specified?		
2	Radio is terminated in the correct positions and labeled?		
3	Is the ground cable tightened?		
4	Are the power sockets secure and correctly attached to the radio?		

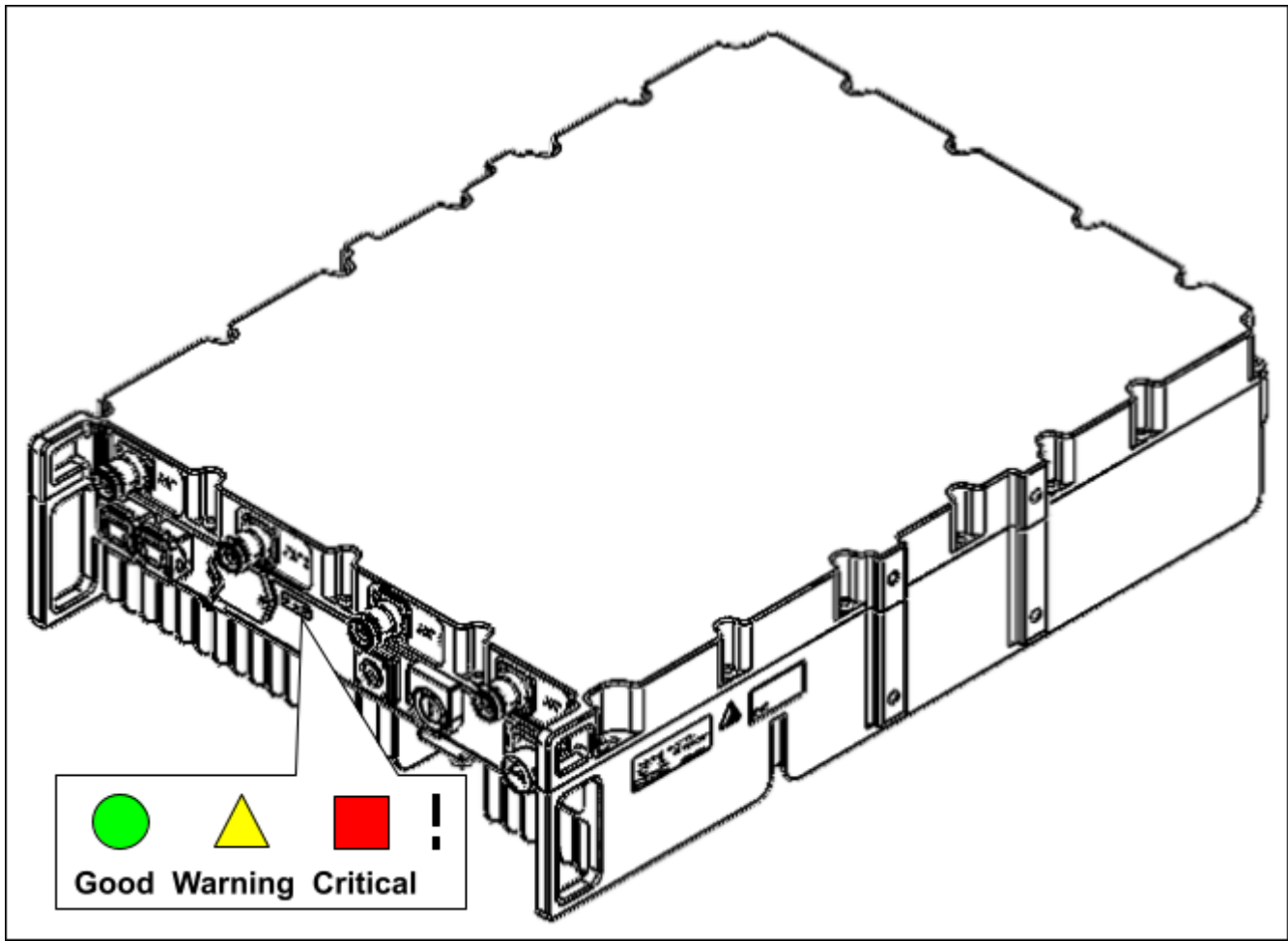
Power up the radio

Make sure the radio is grounded according to instructions. Switch on the external power to the radio on both power feeds.

Note: Products not connected to ground risk damage from overvoltage or overcurrent. Always ground products according to instructions.

Examine the radio after power up

Once the power has been switched on, the radio is loaded with the specific software. Optical LED indicators show the status of the radio.



Refer to the Operating manual for explanations of the LED indicator.



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February 2023