Installing and Cabling Nokia AirScale Core Unit ASOE, ASOG, and ASOH

DN277714775

Issue 16

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Rel. (2024-09-03 11:53:48)

Operating Documentation, Issue: 16

Nokia is committed to diversity and inclusion. We are continuously reviewing our customer documentation and consulting with standards bodies to ensure that terminology is inclusive and aligned with the industry. Our future customer documentation will be updated accordingly.

Important Notice on Product Safety

This product may present safety risks due to laser, electricity, heat, and other sources of danger.

Only trained and qualified personnel may install, operate, maintain or otherwise handle this product and only after having carefully read the safety information applicable to this product.

The safety information is provided in the Safety Information section in the "Legal, Safety and Environmental Information" part of this document or documentation set.

Table of Contents

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List of Tables

Summary of changes

A list of changes between document issues. You can navigate through the respective changed topics.

Changes between issues 14 (2024-04-24) and 15 (2024-04-24)

AMJK compatibility list and installation pre-requirements

- AMED has been added.

Installing ASOE, ASOG, or ASOH on a pole using AMJK and AMED

- Section has been added.

Installing ASOE, ASOG, or ASOH on a wall using AMJK and AMED

- Section has been added.

Changes between issues 13 (2024-03-14) and 14 (2024-03-15)

AMJK compatibility list and installation pre-requirements

- AWHNA, AWHQ3, and AWMFIA have been added.

Changes between issues 12A (2024-03-06) and 13 (2024-03-14)

AMJK compatibility list and installation pre-requirements

- AWHNB has been added.

1. Environmental and safety requirements

Only qualified personnel are allowed to install, operate, and maintain this product. Always read the safety information first.

⚠ DANGER!

Hot parts.

Risk of burns when handling hot parts.

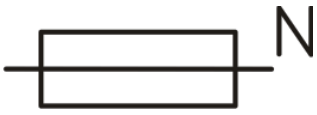
Wait at least half an hour after switching off before handling the parts.

⚠ WARNING!

Risk of RF exposure

Keep away from children. Install in a restricted access location.

Table 1: Safety symbols

Symbol	Explanation
	Caution Double pole/neutral fusing
	Warning Hot surface, do not touch
	Electric shock hazard
	RF hazard

2. Unpacking the delivery

Check the contents of the delivery, unpack the product, and recycle the packaging before proceeding to the installation.

Before you start

Unpack and carefully check the delivery before the installation to make sure that all the required items were delivered and are undamaged.

Notice:

Electrostatic discharge (ESD) might damage the modules. Wear an ESD wrist strap or use a corresponding method when handling the modules.

Notice:

Installing and commissioning of BTS products must be performed by an expert familiar with electronic devices to avoid damage caused by improper handling.

Procedure

1 Carefully check the contents of the delivery.

2 Remove the items from the package.

3 Make sure that the delivery is complete and undamaged.

4 Recycle the packaging material.

5 Proceed to the module installation procedure.

2.1 Contents of ASOE delivery

List of items of the ASOE delivery

Figure 1: Contents of ASOE delivery

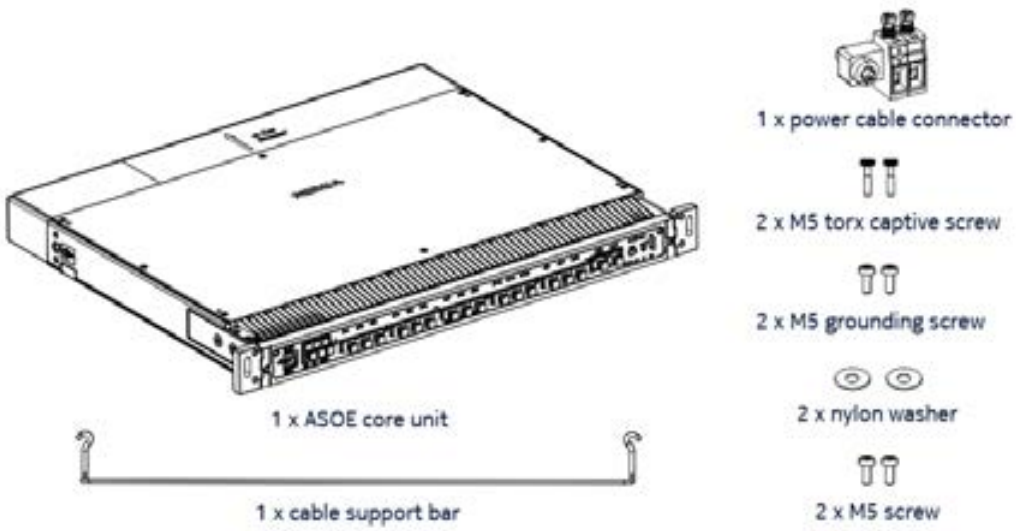


Table 2: ASOE delivery

Delivery	Code	Content
ASOE	475587A	1 x ASOE core unit
Cable support bar*	837909	1 x cable support bar
Site bag	092497A	1 x power cable connector
		2 x M5 captive screw (Torx T25 bit)
		2 x M5 grounding screw (Torx T25 bit)
		2 x nylon washer
		2 x M5 screw* (Torx T25 bit)

*Cable support bar with mounting screws is included in the ASOE delivery starting from ASOE version 103.

2.2 Contents of ASOG delivery

List of items of the ASOG delivery

Figure 2: Contents of ASOG delivery

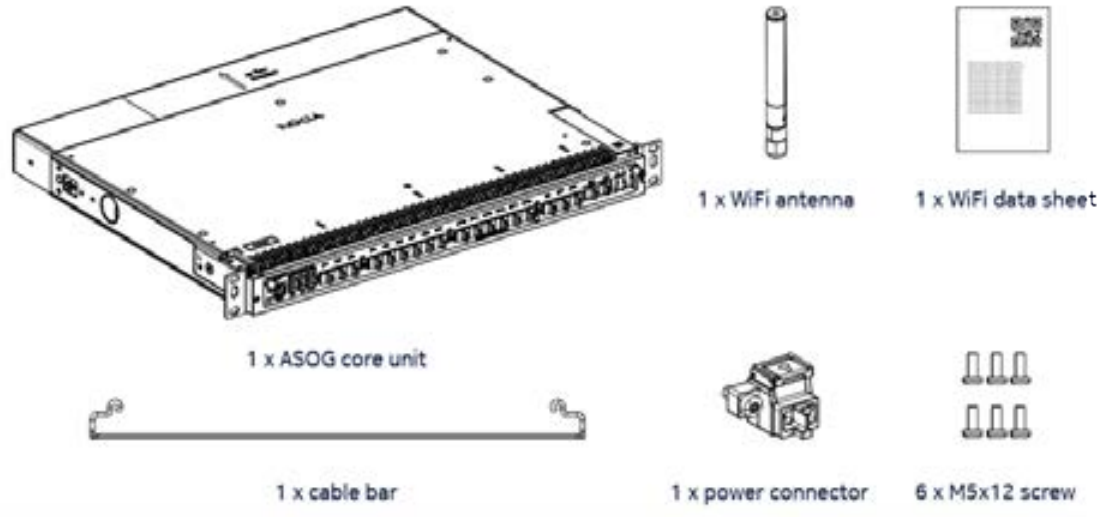


Table 3: ASOG delivery

Delivery	Code	Content
ASOG	476254A	1 x ASOG core unit
Cable support bar	838893	1 x cable support bar
WiFi datasheet envelope	094364A	1 x WiFi datasheet
Site bag	094379A	1 x WiFi antenna
		6 x M5x12 screw (Torx T25 bit)
		1 x power connector

2.3 Contents of ASOH delivery

List of items of the ASOH delivery

Figure 3: Contents of ASOH delivery

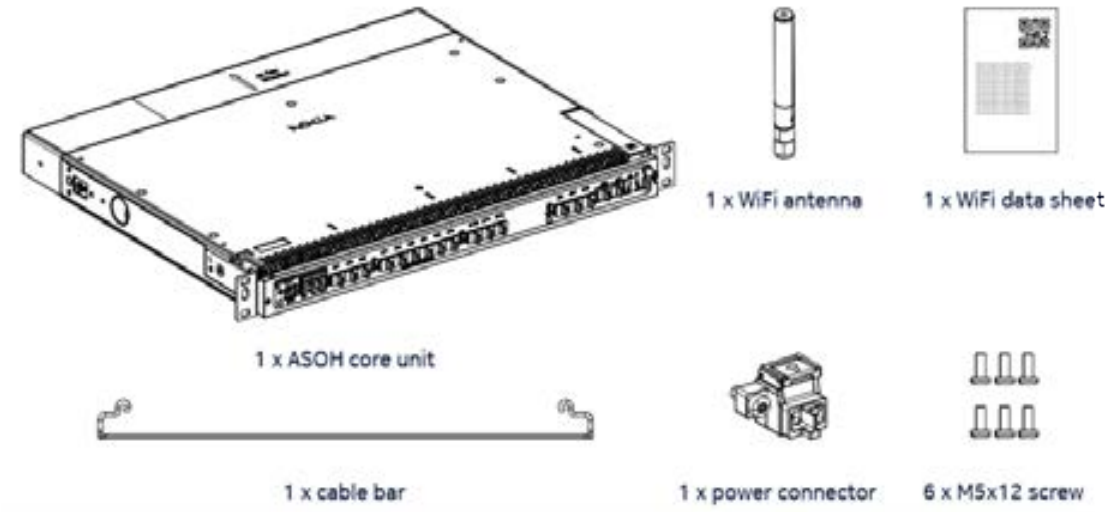


Table 4: ASOH delivery

Delivery	Code	Content
ASOH	476255A	1 x ASOH core unit
Cable support bar	838893	1 x cable support bar
WiFi datasheet envelope	094364A	1 x WiFi datasheet
Site bag	094379A	1 x WiFi antenna
		6 x M5x12 screw (Torx T25 bit)
		1 x power connector

2.4 Contents of AMHC external heater for ASOG delivery

List of items of the AMHC delivery

Figure 4: Contents of AMHC delivery

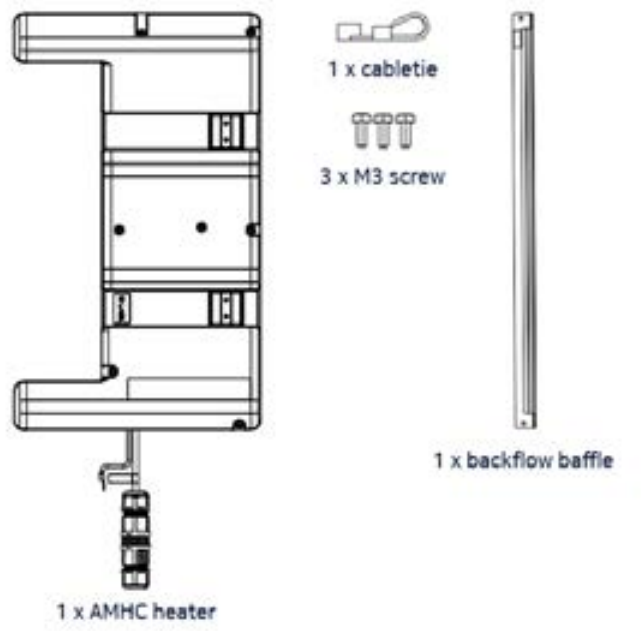


Table 5: AMHC delivery

Delivery	Code	Content
AMHC external heater for ASOG	476445A	1 x AMHC heater
		1 x cable tie
		3 x M3 screw (Torx T10 bit)
		1 x backflow baffle

2.5 Contents of AMJA outdoor cable entry delivery

List of items of the AMJA delivery

Figure 5: Contents of AMJA delivery

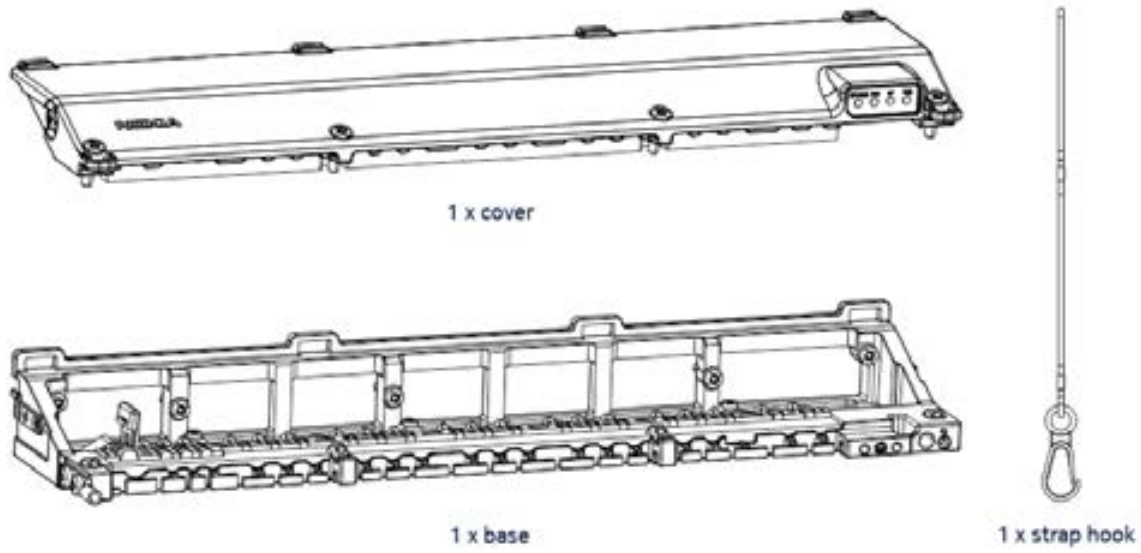


Table 6: AMJA delivery

Delivery	Code	Content
AMJA outdoor cable entry	475815A	1 x cover
		1 x base
		1 x strap hook
		1 site bag (30 x cable tie)

2.6 Contents of AMJJ outdoor cable entry delivery

List of items of the AMJJ delivery

Figure 6: Contents of AMJJ delivery

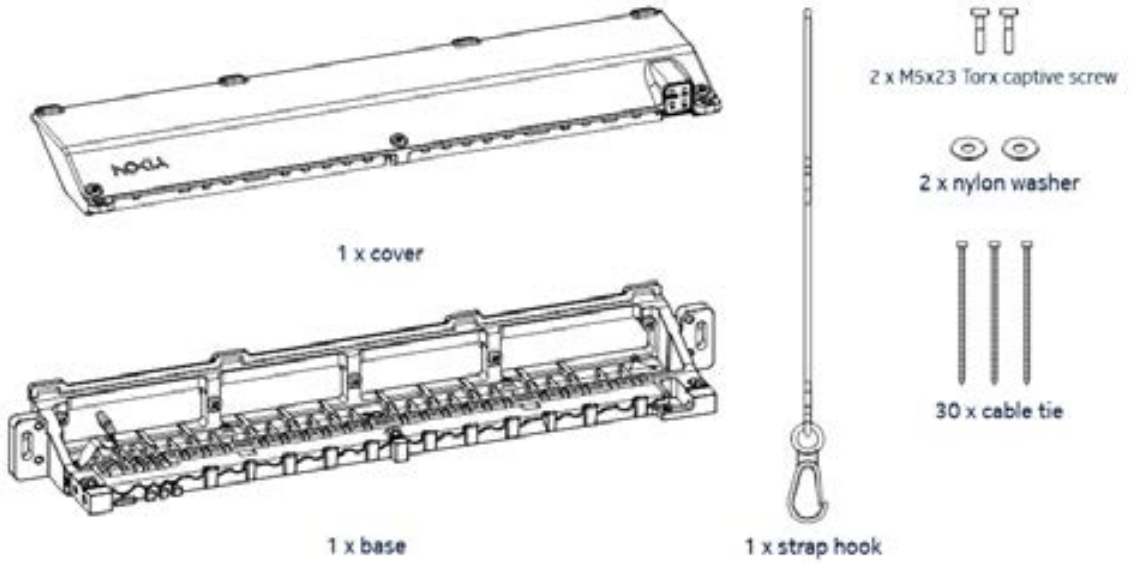


Table 7: AMJJ delivery

Delivery	Code	Content
AMJJ outdoor cable entry	476407A	1 x cover
		1 x base
		1 x strap hook
		2 x M5x23 captive screw (Torx T25 bit)
		2 x nylon washer
		30 x cable tie

2.7 Contents of AMJB rack installation kit delivery

List of items of the AMJB delivery

Figure 7: Contents of AMJB delivery

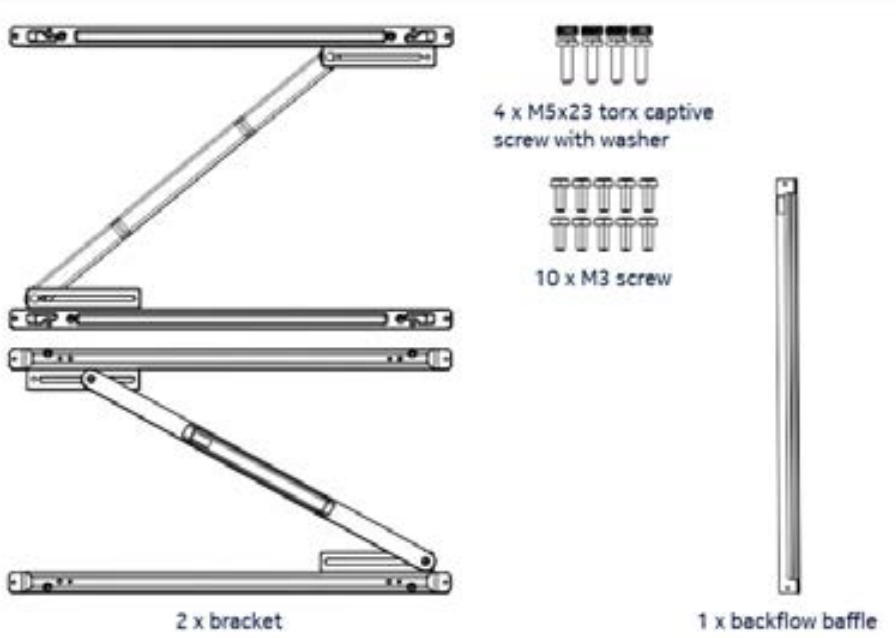


Table 8: AMJB delivery

Delivery	Code	Content
AMJB rack installation kit	475880A	2 x bracket
		1 x backflow baffle
		10 x M3 screw (Torx T10 bit)
		4 x M5x23 captive screw with washer[1] (Torx T25 bit)

[1] Screws will be included starting from the AMJB version 102 delivery.

2.8 Contents of AMJC wall and pole mount kit delivery

List of items of the AMJA delivery

Figure 8: Contents of AMJC delivery

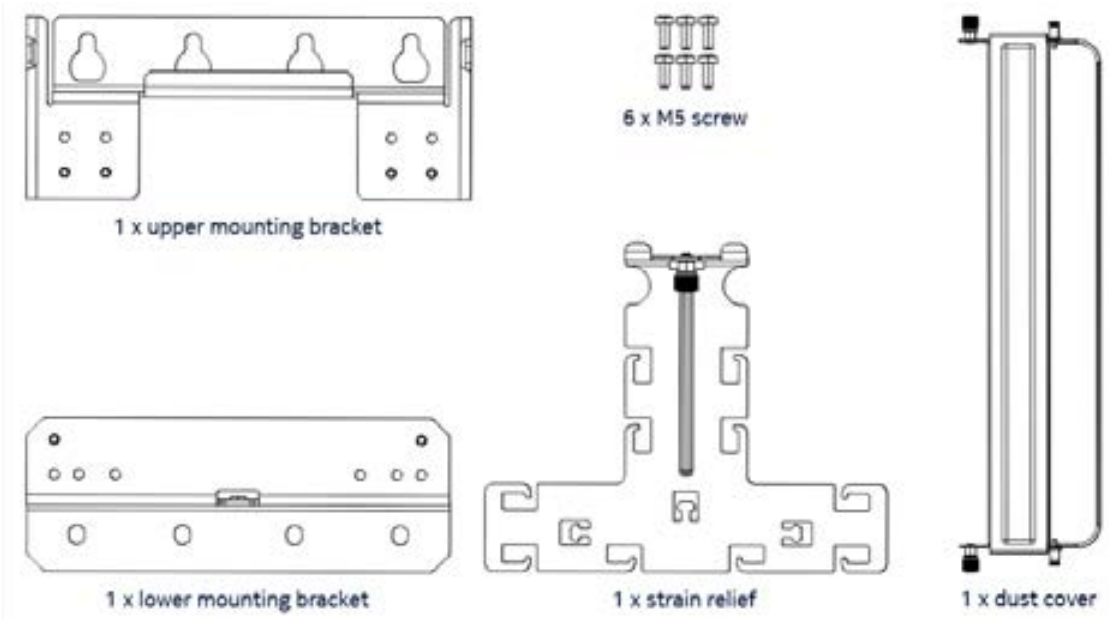


Table 9: AMJC delivery

Delivery	Code	Content
AMJC wall and pole mount kit	475881A	1 x upper mounting bracket
		1 x lower mounting bracket
		1 x strain relief
		6 x M5 screw (Torx T25 bit)
		1 x dust cover

2.9 Contents of AMJD rail mount kit delivery

List of items of the AMJD delivery

Figure 9: Contents of AMJD delivery

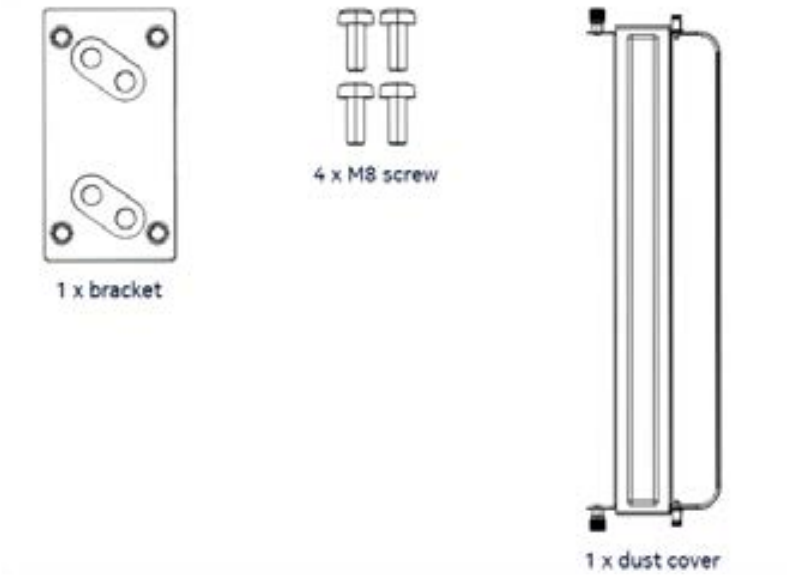


Table 10: AMJD delivery

Delivery	Code	Content
AMJD rail mount kit	475882A	1 x bracket
		4 x M8 screw (Torx T45 bit)
		1 x dust cover

2.10 Contents of AMJK piggyback mounting kit delivery

List of items of the AMJK delivery

Figure 10: Contents of AMJK delivery

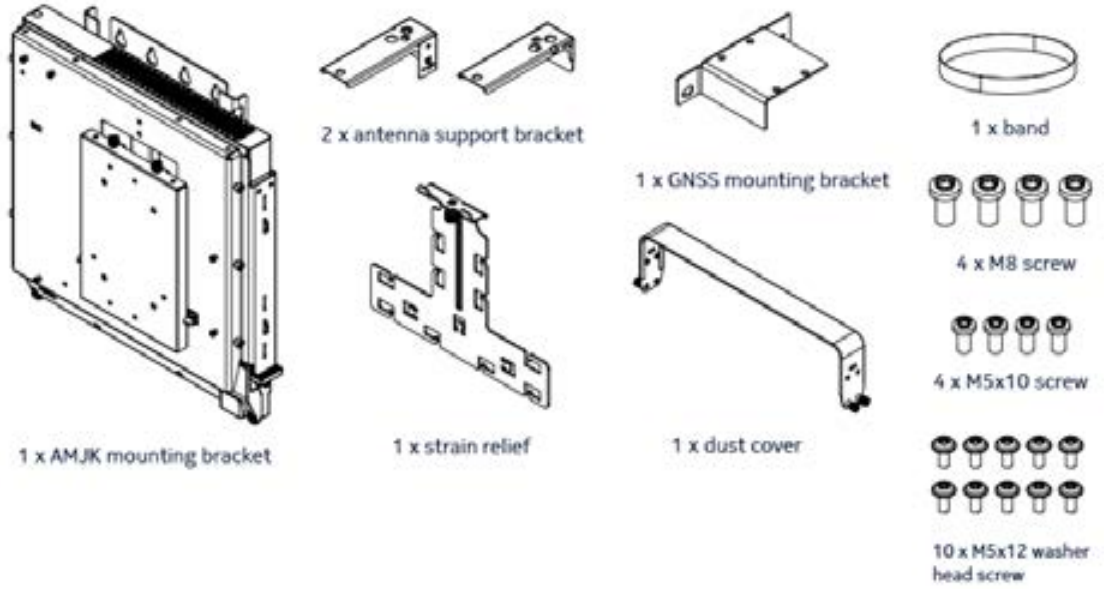


Table 11: AMJK delivery

Delivery	Code	Content
AMJK piggyback mounting kit	476408A	1 x AMJK mounting bracket 5 x M5x10 screw (Torx bit T25) and 1 x mRRH mounting bracket pre-installed
		1 x dust cover
		2 x antenna support bracket (left and right)
		1 x GNSS mounting bracket
		1 x strain relief
		1 x band
		4 x M8 screw (13 mm socket)
		10 x M5x12 washer head screw (Torx T25 bit)*
		4 x M5x10 screw (Torx T25 bit)

*Six screws are needed for attaching ASOE, ASOG, or ASOH to AMJK, and four for attaching a micro remote radio head (mRRH) to AMJK.

3. ASOE, ASOG, and ASOH lifting points

You can use one of the three lifting points, depending on your installation case.

Figures in this section show ASOE, but the lifting points are applicable to ASOG and ASOH as well.

See the following table and figures for reference.

Table 12: ASOE, ASOG, and ASOH lifting points

Installation case	Lifting point
ASOE with AMJA on a wall or pole	Dust cover or AMJC wall mount bracket
ASOG or ASOH with AMJJ on a wall or pole	
ASOE with AMJA on a rail	Dust cover
ASOG or ASOH with AMJJ on a rail	
ASOE, ASOG, or ASOH inside a 3U casing on a wall or pole	AMJA or AMJJ-integrated hole

Notice:

Make sure dust cover captive screws are tightened before lifting.

Figure 11: Dust cover lifting point

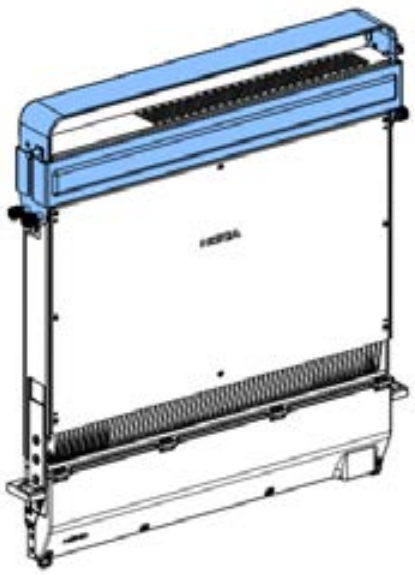
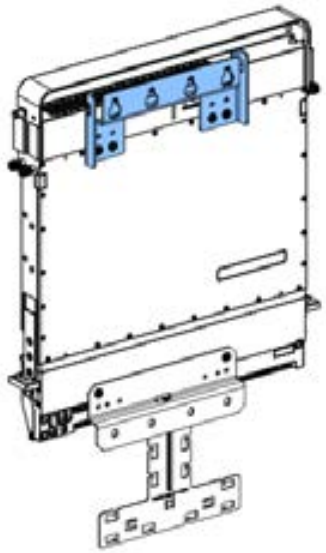


Figure 12: AMJC wall mount bracket lifting point



Notice:

Always make sure that the AMJA or AMJJ lid is tightened before lifting. If a strap hook is attached to the AMJA or AMJJ-integrated lifting hole, remove the hook before lifting and re-attach it after.

Figure 13: AMJA-integrated hole

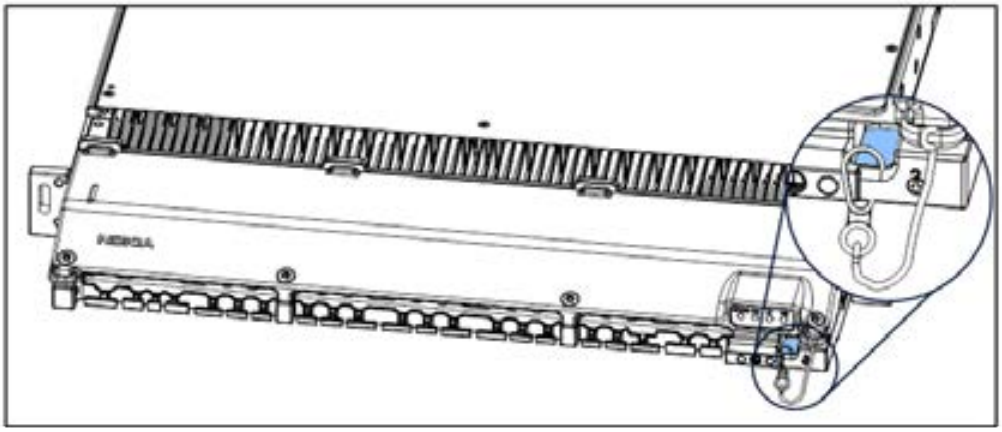
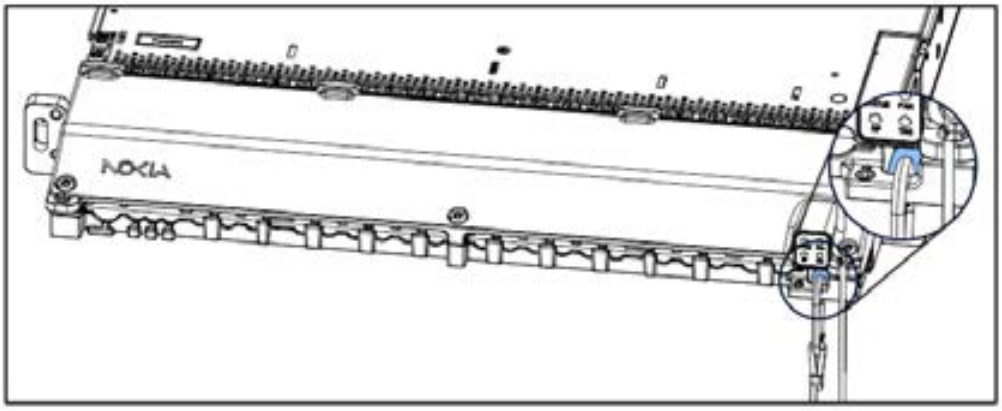


Figure 14: AMJJ-integrated hole



4. ASOE, ASOG, and ASOH minimum clearances

The minimum clearances around ASOE, ASOG, or ASOH are required for proper airflow and maintenance access.

Figures in this section show ASOE, but the minimum clearances are applicable to ASOG or ASOH as well.

Figure 15: Standalone minimum clearances for vertical installation

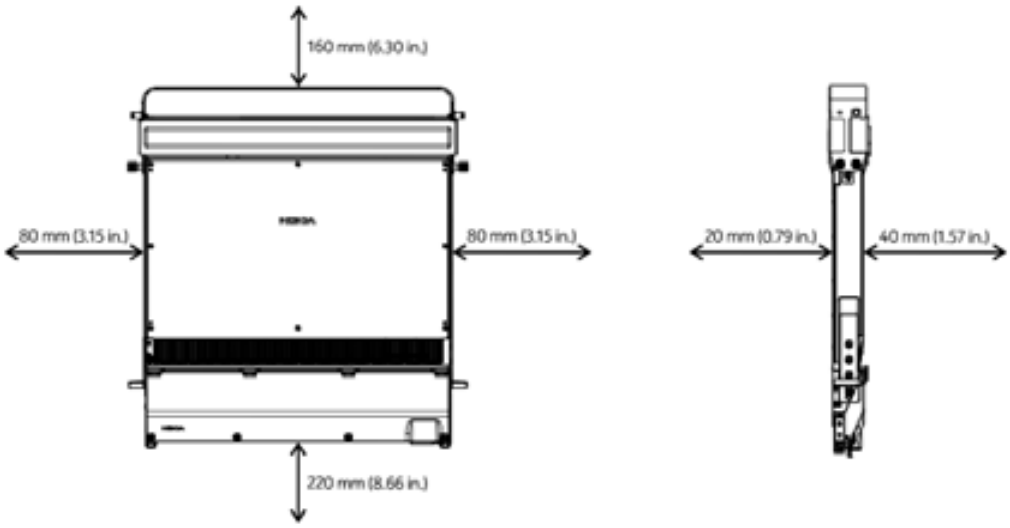


Table 13: Standalone minimum clearances for vertical installation

Side	Clearance
Left and right	80 mm (3.15 in.)
Front	40 mm (1.57 in.)
Back	20 mm (0.79 in.)
Top	160 mm (6.30 in.)
Bottom	220 mm (8.66 in.)

Figure 16: Core unit in EMHA or EMHH minimum clearances

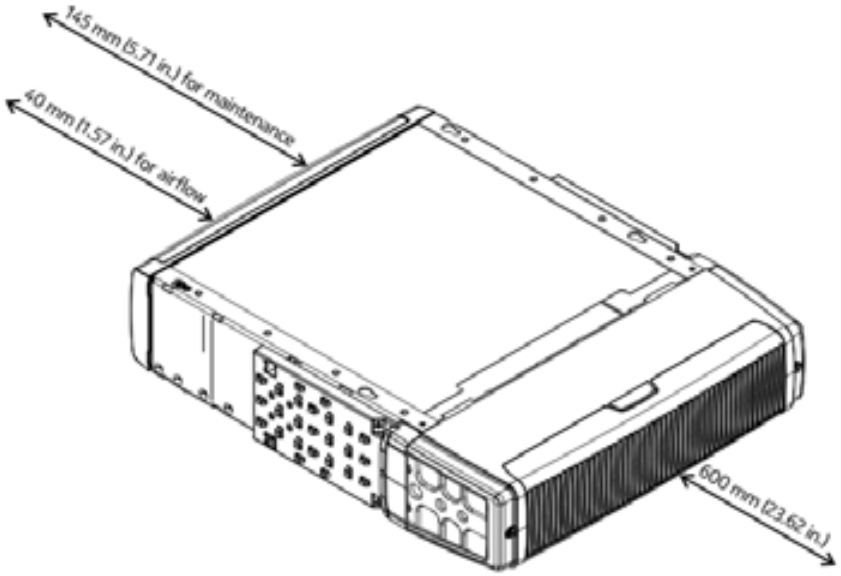


Table 14: Core unit in EMHA or EMHH minimum clearances

Side	Clearance
Front	600 mm (23.62 in.)
Back	145 mm (5.71 in.) for maintenance 40 mm (1.57 in.) for airflow

Figure 17: Core unit in indoor rack or cabinet minimum clearances

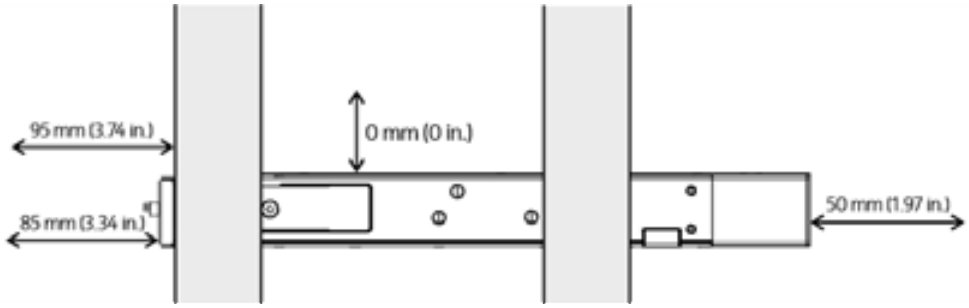


Table 15: Core unit in indoor rack or cabinet minimum clearances

Side	Clearance
Front (rack)	95 mm (3.74 in.)
Front (hanger)	85 mm (3.35 in.)
Top	0 mm (0 in.)
Rear	50 mm (1.97 in.)

Figure 18: Core unit in outdoor rack or cabinet minimum clearances

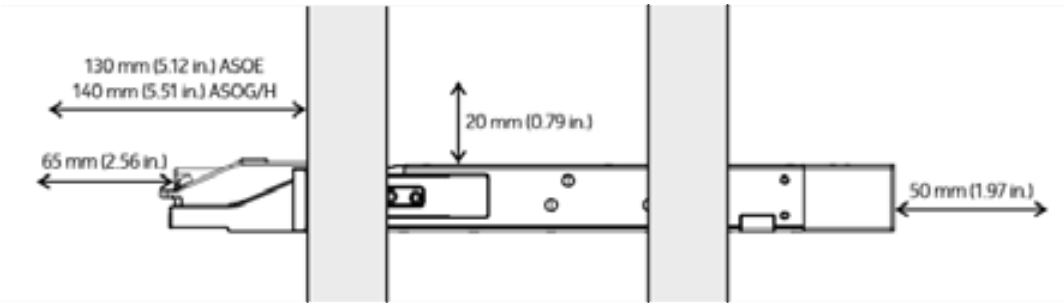


Table 16: Core unit in outdoor rack or cabinet minimum clearances

Side	Clearance
Front (rack)	ASOE: 130 mm (5.12 in.) ASOG or ASOH: 140 mm (5.51 in.)
Front (hanger)	65 mm (2.56 in.)
Top	20 mm (0.79 in.)
Rear	50 mm (1.97 in.)

5. AMJK compatibility list and installation pre-requirements

Use AMJK piggyback mounting kit to attach a micro remote radio head, and other optional items to ASOE, ASOG, or ASOH.

Table 17: AMJK compatibility list

Hardware type	Compatible hardware
Micro remote radio heads (mRRHs)	AHCE, AHEJ, AHFB, AHGB, AHHA, AHIB, AWHHD, AWHHF, AWHHI, AWHHJ, AWHKB, AWHNA, AWHNB, AWHQ2, AWHQ3, AWHQE, AWHQG, AWHQF, AWHQN, AWHQM, AWHQU, AWHQV, AWHTA, AWMFIA, AZQC, AZQD, AZQR
AirScale mmWave radio (ASMR)	AWEUA/B, AWEUC/D, AWEWA/B, AWGUC/D
GNSS receivers	AYGD, AYGE[1]
AC-DC power units	APAA, APAH[2]
Mounting kits	AMEB, AMED, FPKA, FPKC

[1] Only AYGD can be installed directly on AMJK. AYGE is installed directly on a pole.

[2] You can install only one.

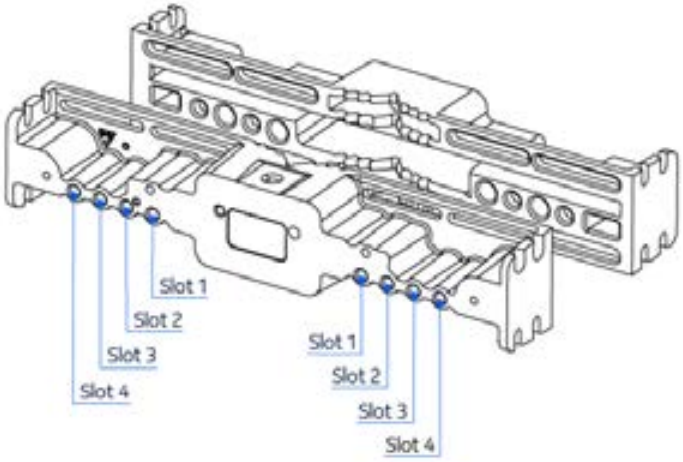
Before installing ASOE, ASOG, or ASOH and AMJK on site, install a compatible micro AC PSU and micro integrated antenna on the mRRH as instructed in *Installing and Cabling Nokia AirScale Micro Remote Radio Heads* or *Installing and Cabling AWHxx AirScale Micro Remote Radio Heads*.

6. FPKC screw length for optimum pole mounting compatibility

You can install radio units (RUs) on a pole with a diameter 60–295 mm (2.36–11.61 in.) or 60–300 mm (2.36–11.81 in.) using an FPKC pole mounting kit.

FPKC pole mount screws installation slots

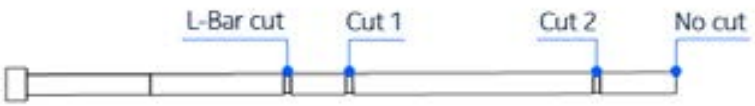
Figure 19: FPKC pole mount screws installation slots



FPKC v101

You may need to cut M10x315 mm pole mount screws to installation-specific lengths for pole installation in the field.

Figure 20: Cut location of M10x315 mm pole mount screws



There are four different lengths of a screw available and four places for the screw in FPKC.

When attaching FPKC to poles, use the shortest possible bolts and holes whose distance is the closest to the pole diameter.

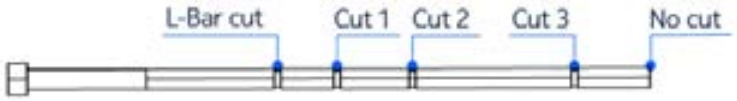
Table 18: Pole diameter related to cut location and installation slot for optimum pole mounting (v101)

Cut location	Slot 1	Slot 2	Slot 3	Slot 4
L-Bar cut – 125 mm (4.92 in.)	60–69 mm (2.36–2.72 in.)	N/A	N/A	N/A
Cut 1 – 155 mm (6.10 in.)	70–102 mm (2.75–4.02 in.)	103–140 mm (4.05–5.51 in.)	N/A	N/A
Cut 2 – 275 mm (10.82 in.)	N/A	141–179 mm (5.55–7.05 in.)[1)]	180–218 mm (7.09–8.58 in.)	219–256 mm (8.62–10.08 in.)
No cut – 315 mm (12.4 in.)	N/A	N/A	N/A	257–295 mm (10.12–11.61 in.)

FPKC v202

You may need to cut M10x320 mm pole mount screws to installation-specific lengths for pole installation in the field.

Figure 21: Cut location of M10x320 mm pole mount screws



There are five different lengths of a screw available and four places for the screw in FPKC.

When attaching FPKC to poles, use the shortest possible bolts and holes whose distance is the closest to the pole diameter.

Table 19: Pole diameter related to cut location and installation slot for optimum pole mounting (v202)

Cut location	Slot 1	Slot 2	Slot 3	Slot 4
L-Bar cut – 135 mm (5.31 in.)	60–80 mm (2.36–3.15 in.)	N/A	N/A	N/A
Cut 1 – 165 mm (6.5 in.)	81–112 mm (3.19–4.41 in.)	113–150 mm (4.45–5.90 in.)	N/A	N/A
Cut 2 – 205 mm (8.07 in.)	N/A	151–189 mm (5.94–7.44 in.)	N/A	N/A
Cut 3 – 285 mm (11.22 in.)	N/A	N/A	190–228 mm (7.48–8.98 in.)	229–266 mm (9.02–10.47 in.)
No cut – 320 mm (12.6 in.)	N/A	N/A	N/A	267–300 mm (10.51–11.81 in.)

[1)] A fixing bolt with a pole diameter of 141–179 mm (5.55–7.05 in.) exceeds the FPKC bracket. It means that you need to cut the bolt to fix AMRC or EMHA/H to both sides.

7. ASOE reset and service buttons

Functionality of ASOE reset and service buttons

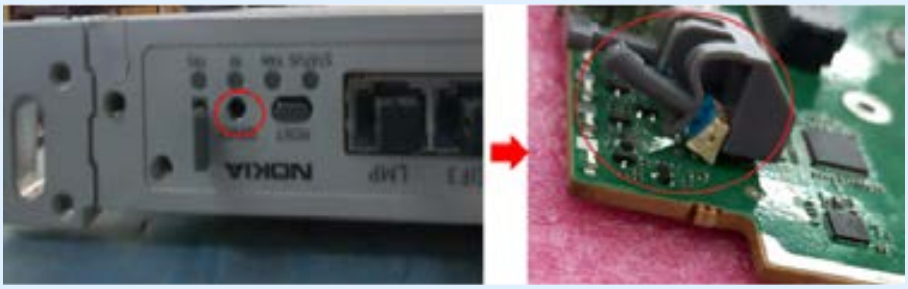
Figure 22: ASOE reset and service buttons

Reset button

Notice:

Lightly press the reset or service button with a pen or screwdriver until you see the status LED change. Do not press too hard as it may damage the unit.

Figure 23: Damaged button example



Pressing the reset button for less than five seconds resets ASOE and, therefore, the BTS. ASOE reboots into the active software (the same as the running software in the nominal scenario before the reset button was pressed).

Pressing the reset button for more than five seconds results in a reset of ASOE and therefore of the BTS. ASOE reboots into the active software (this is the same as the running SW in the nominal scenario before the reset button was pressed). Commissioning data is cleared, but parameters related to security are kept. The BTS must be recommissioned.

A reset is required to apply new commissioning information.

Service button

> **Note:**
>
> Operation of this button is subject to software support. Please check the corresponding software release documentation for information on any specific handling instructions and restrictions regarding the service button.

Pressing the service button resets ASOE and, therefore, the BTS. ASOE reboots to fail-safe software (fail-safe boot). The fail-safe boot mode allows ASOE to boot in case the nominal software of the unit is non-responsive.

8. Installation tools

List of necessary installation tools when installing ASOE, ASOG, or ASOH

Figure 24: Installation tools

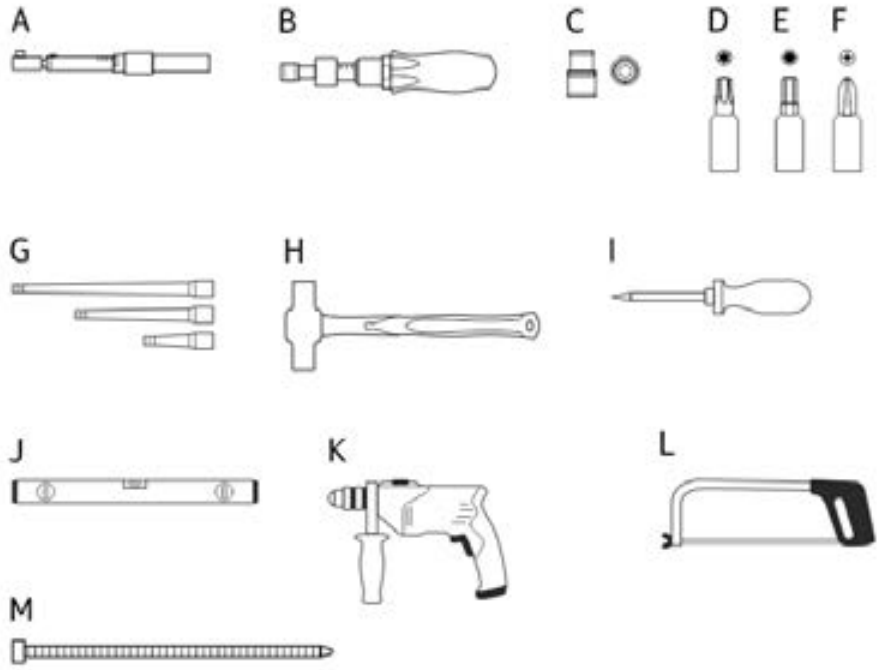


Table 20: Installation tools

Letter	Tool	Type/Description
A	Torque wrench	capable of 2–50 Nm (1.4–125 ft-lb.)
B	Torque screwdriver	capable of 0.5–5.6 Nm (4.4–50 in-lb.)
C	Socket	13 mm
D	Torx bit	T10, T25, T45
E	Hex bit	8 mm
F	Philips bit	PH1
G	Square drive socket extension set	6 in. (150 mm), 12 in. (300 mm)
H	Rubber hammer	-
I	Long screwdriver	Flat-head and torx T25 (at least 160 mm)
J	Level	-
K	Drilling equipment	Drill: 8 mm, 12 mm
L	Saw	-
M	Cable ties	-

9. Pre-installing optional items

Pre-installing optional items for different installation cases

9.1 Installing AMHC external heater

Use AMHC external heater for ASOG to extend the ASOG minimum operational temperature from –15°C (5°F) to –40°C (–40°F).

Before you start

Install the AMJJ cable entry as instructed in Installing AMJJ outdoor cable entry.

Equipment preconditions

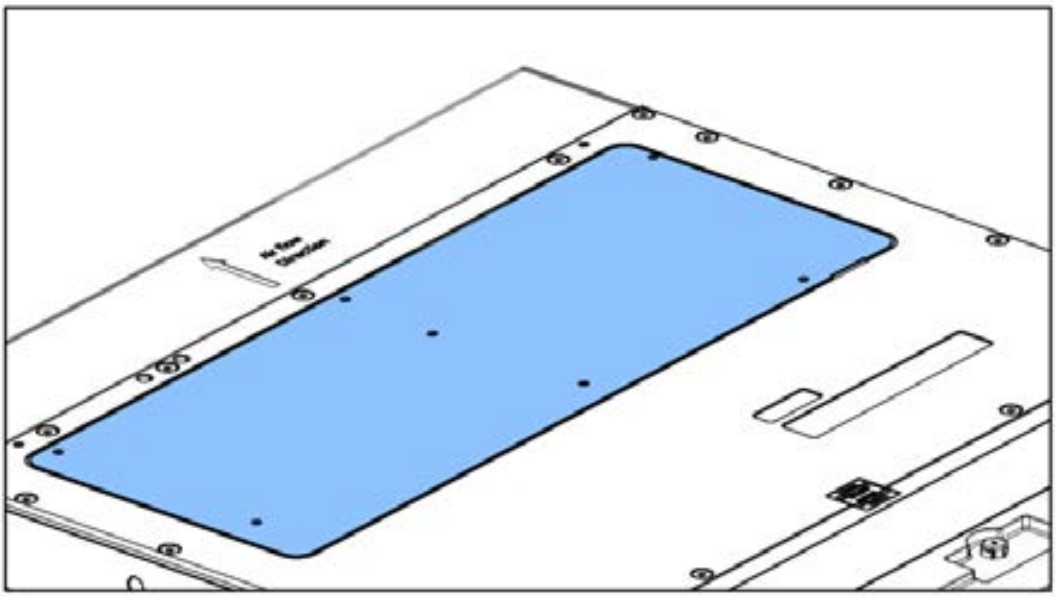
You need the following:

- ☐ AMHC external heater for ASOG (476445A)
- ☐ Tools:
  - ☐ Torque screwdriver
  - ☐ Torx bit T10
  - ☐ Soft cloth
  - ☐ Isopropyl alcohol

Procedure

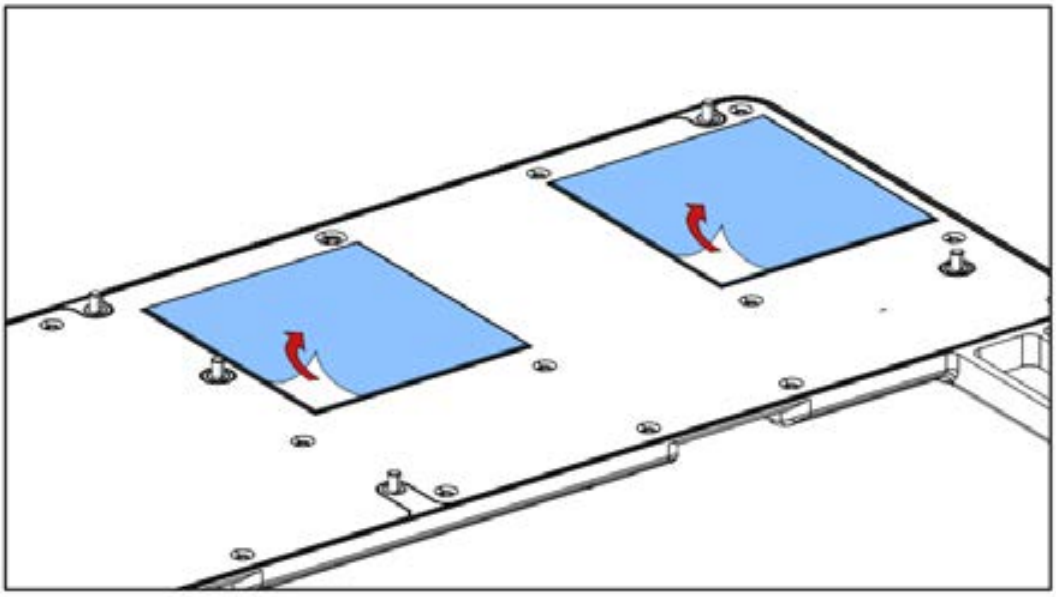
1 Clean the AMHC mounting surface on ASOG using a soft cloth and isopropyl alcohol

Figure 25: Cleaning the AMHC mounting surface



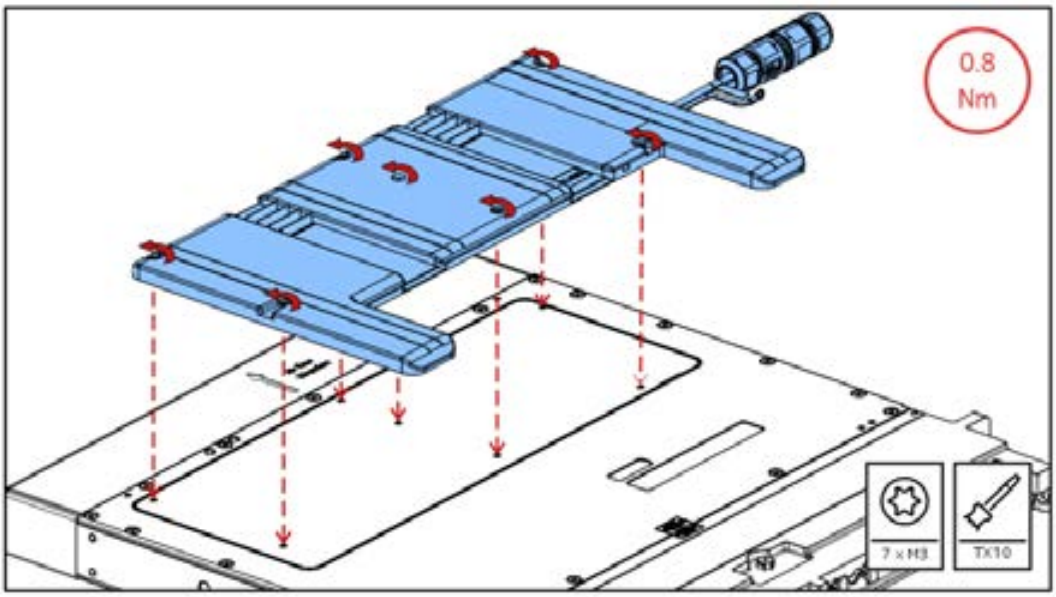
2 Peel off the protection film from thermal pads on the bottom of AMHC.

Figure 26: Peeling off the protection film from thermal pads



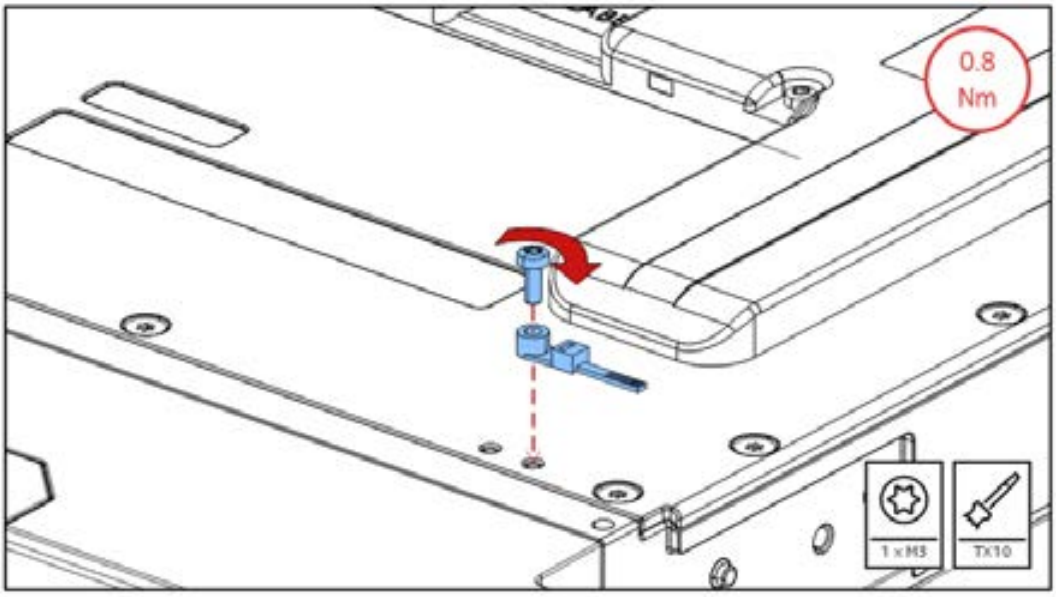
3 Attach AMHC to ASOG and tighten the seven M7 captive screws to 0.8 Nm (7.1 in-lb.)

Figure 27: Attaching AMHC to ASOG



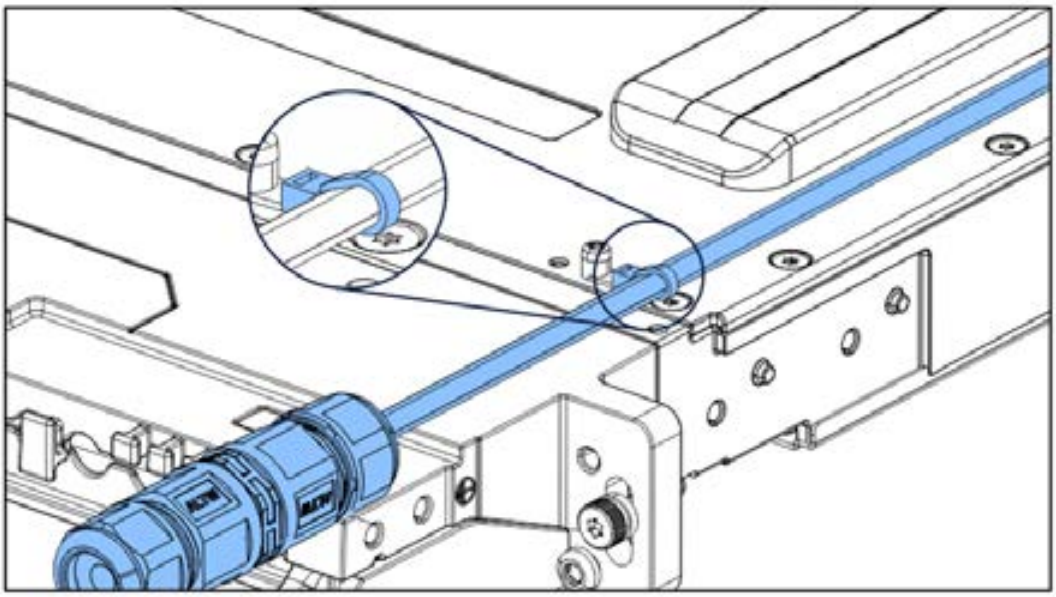
4 Attach the cable tie to ASOG and tighten the M3 screw to 0.8 Nm (7.1 in-lb.)

Figure 28: Attaching the cable tie to ASOG



5 Route the AMHC cable along the edge of ASOG and secure it with the cable tie.

Figure 29: Routing the AMHC cable



9.2 Installing AMJA outdoor cable entry

Use AMJA outdoor cable entry (475815A) for ASOE outdoor installation scenarios.

Equipment preconditions

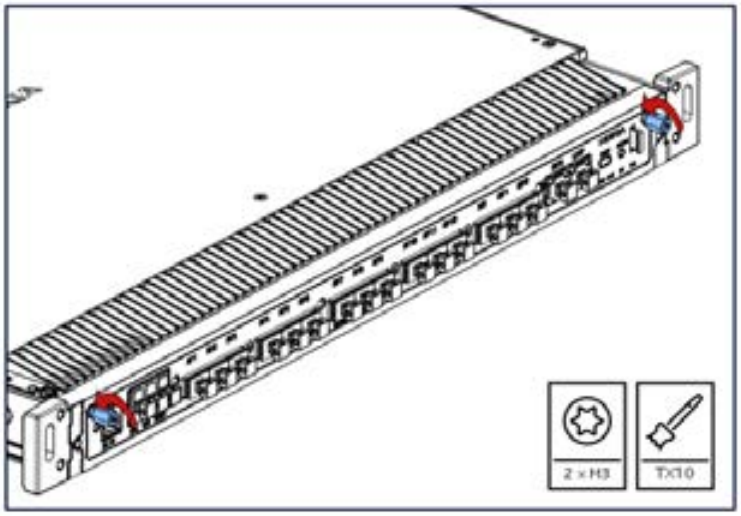
You need the following:

- ☐ AMJA outdoor cable entry (475815A)
- ☐ Tools:
  - ☐ Torque screwdriver
  - ☐ Torx bit T10, T25

Procedure

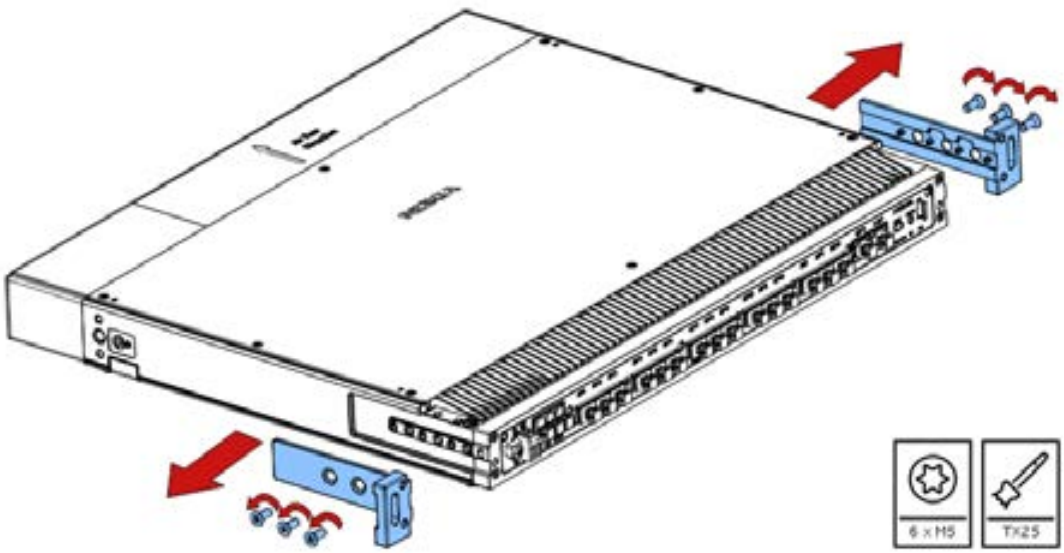
1 Remove the two front protection pins.

Figure 30: Removing the two protection pins



2 Unscrew the six M5 screws to remove both side hangers.

Figure 31: Removing hangers

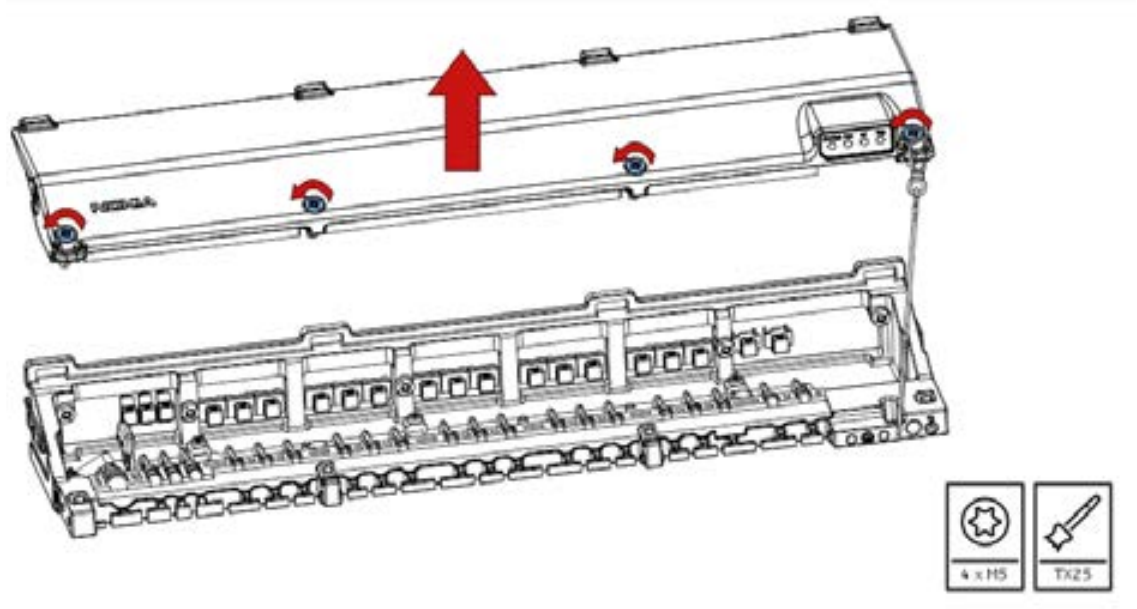


3 Loosen the four M5 captive screws to remove the cover.

Notice:

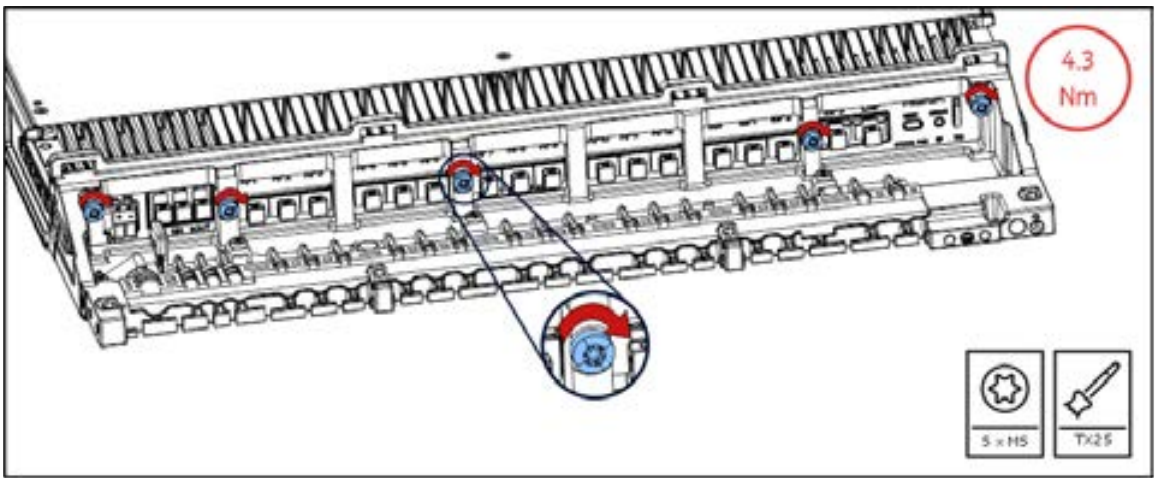
When removing the AMJA cover, always carefully lower it until it hangs on the maintenance strap. Do not let it drop freely.

Figure 32: Removing the cover



4 Fix AMJA to ASOE and tighten the five M5 captive screws to 4.3 Nm (38.1 in-lb.).

Figure 33: Fixing AMJA base to ASOE

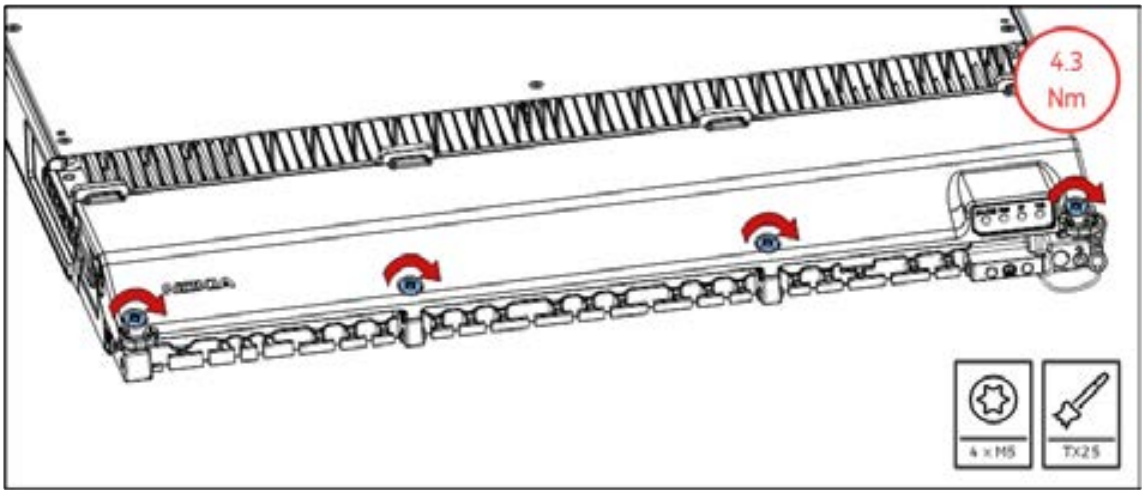


5 Assemble the AMJA cover and tighten the four M5 captive screws to 4.3 Nm (38.1 in-lb.).

Tip:

You can assemble the cover after the installation and cabling is completed. See Cabling ASOE, ASOG, or ASOH for more information about cabling.

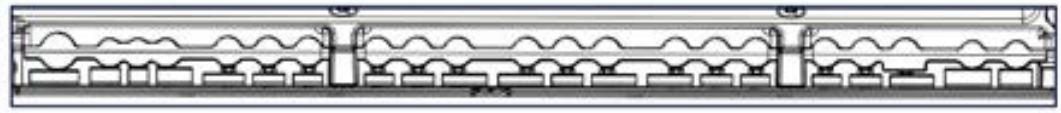
Figure 34: Assembling the cover



Notice:

After tightening the screws make sure there is no gap between both parts.

Figure 35: No gap example



6 Install both side hangers and tighten the six M5 screws to 4.3 Nm (38.1 in-lb.).

Note:

The position of side hangers depends on the installation case. For FCOA and other outdoor cabinets, place the hanger at the front. For EMHH casing and ASOE only installation, place the hangers in the middle (default position when AMJA is equipped). For installations without AMJA, leave the hangers in the back position.

Figure 36: Side hanger position

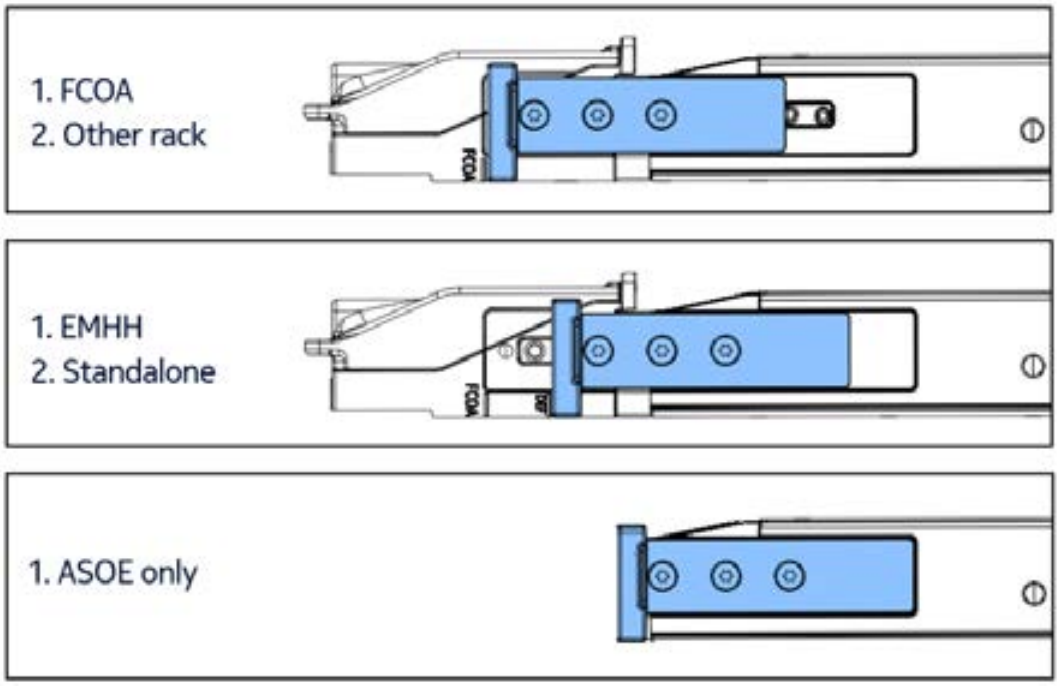
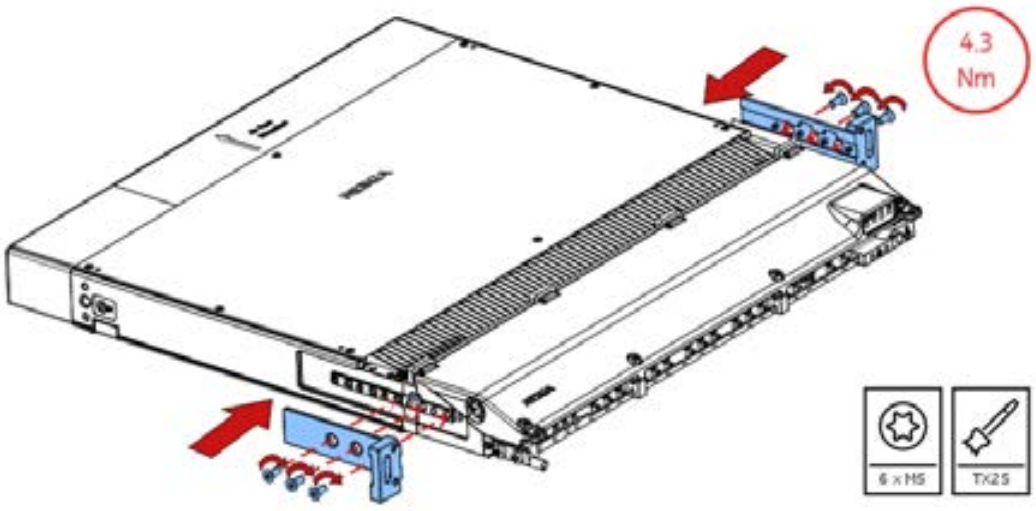


Figure 37: Installing both hangers



Postrequisites

To see the installation of AMJA outdoor cable entry onto ASOE, go to *Single RAN/Videos/Installing SM*.

> **Note:**
> The video serves as a procedure overview only. For full instructions, always refer to the installation manual.

9.3 Installing AMJB rack installation kit

Use the AMJB rack installation kit (475880A) for installing ASOE, ASOG, or ASOH in a rack, cabinet, or casing.

Before you start

You can install an ASOE, ASOG, or ASOH core unit in an indoor 19-inch rack or FCIA cabinet without any specific rack installation kit. In such a case, a second core unit (or other equipment) can be stacked directly above the first one, and each occupies 1U height in the rack (2U for two core units). This is the default installation option.

You can use the AMJB rack installation kit when increased clearance is required between the core unit and other hardware installed above it (for example, a second core unit or other equipment). With AMJB, each core unit uses 1.5U height (3U for two core units). Additional clearance is required when the grounding cable connected to the core unit has a diameter of more than 6 mm or when more space is needed for cable management.

> **Note:**
> You can install the AMJB rack installation kit in multiple ways depending on the installation case. See the table below for proper AMJB installation.

The instructions below show ASOE but are also applicable to ASOG and ASOH.

Equipment preconditions

You need the following:

- ☐ AMJB rack installation kit (475880A)
- ☐ Tools:
  - ☐ Torque screwdriver
  - ☐ Torx bit T10

Before you start

Table 21: AMJB installation cases

Installation case	AMJB on bottom	AMJB on top	Second AMJB on top	Backflow baffle
Single core unit in EMHA/EMHH casing	Yes	Yes	No	No
Two core units in EMHA/EMHH casing	Yes (on the bottom unit)	Yes (on the bottom unit)	No	Yes (on top of the upper unit (back))
Single core unit without AMJA/AMJJ in a 19-inch rack or a cabinet	No	No	No	No
Two core units without AMJA/AMJJ in a 19-inch rack or cabinet	No	No[1]	No[1]	No
Single core unit with AMJA/AMJJ in a rack or cabinet	No	Optional[2]	Optional[2]	No
Two core units with AMJA/AMJJ in a rack or cabinet	No	Yes (on the bottom unit)	Yes (on the bottom unit)	Yes (on top of the upper unit (front))

[1] You can use AMJB on the bottom core unit for easier cable management and when the ground cable is over 6 mm^2.

[2] If you can keep at least 0.5U gap on top of the core unit for AMJA or AMJJ and airflow, you can omit AMJB.

If possible, use the latest version of the AMJB kit.

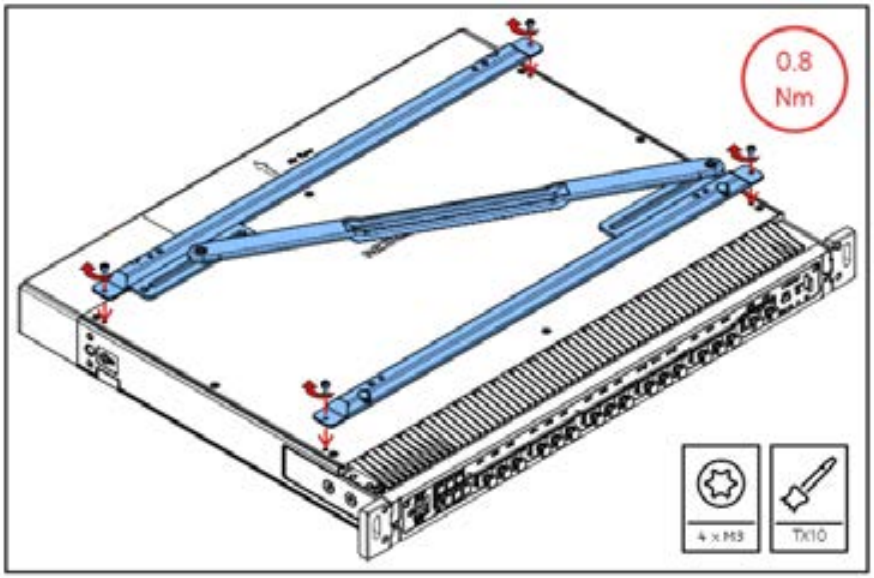
Procedure

1 Fix one or two AMJB brackets depending on the installation case and tighten the M3 screws to 0.8 Nm (7.1 in-lb.).

Select from the available options

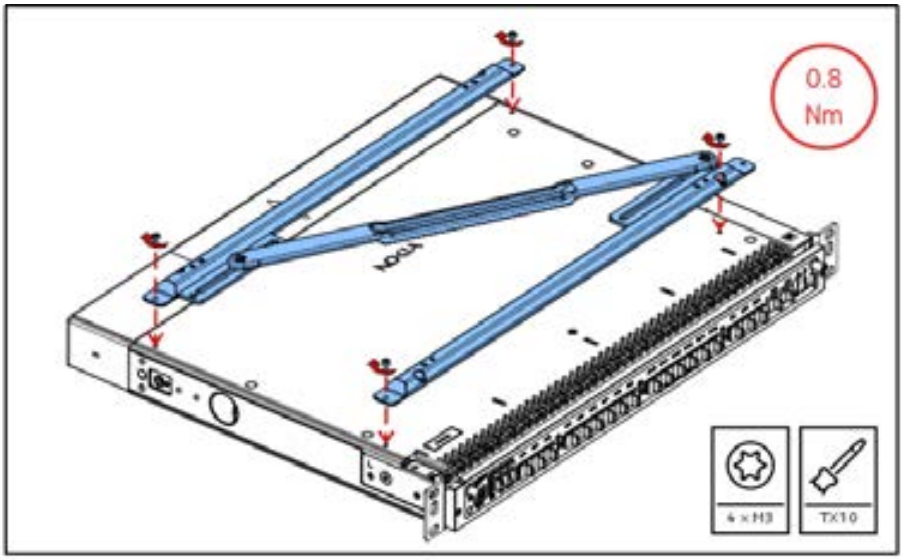
- Installing AMJB on top (ASOE)

  Figure 38: Installing AMJB on top (ASOE)



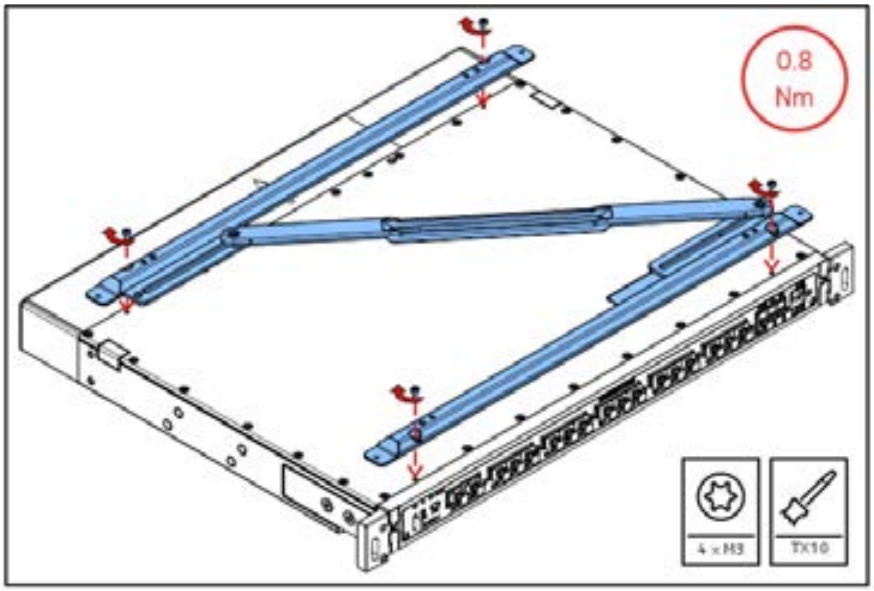
- Installing AMJB on top (ASOG and ASOH)

Figure 39: Installing AMJB on top (ASOG and ASOH)



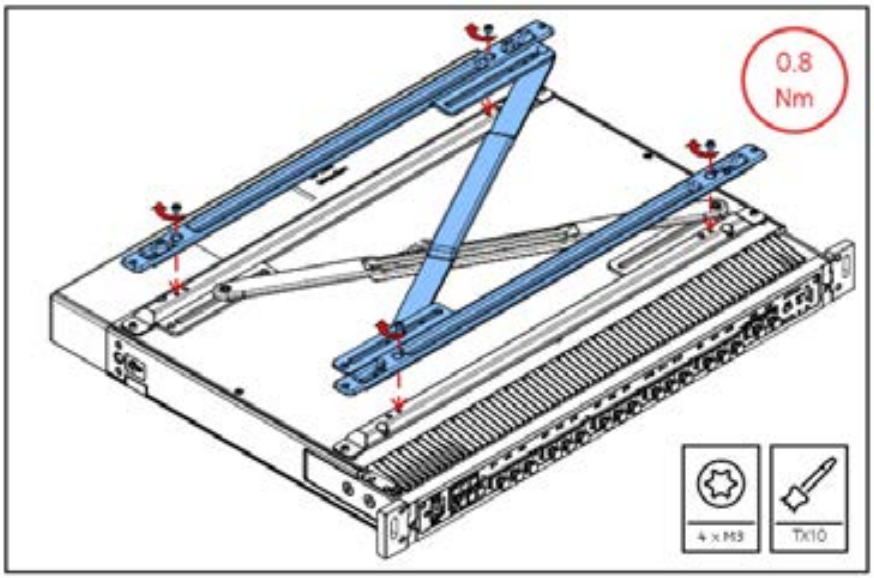
- Installing AMJB on bottom (ASOE, ASOG, and ASOH)

  Figure 40: Installing AMJB on bottom (ASOE, ASOG, and ASOH)



- Installing second AMJB on top (ASOE, ASOG, and ASOH)

Figure 41: Installing second AMJB on top (ASOE, ASOG, and ASOH)



2 Install the backflow baffle on top of the upper core unit and tighten the two M3 screws to 0.8 Nm (7.1 in-lb.).

Note:

- For an EMHA or EMHH casing, install the backflow baffle at the back of the upper core unit. For installation in a rack or cabinet, install it at the front.
- Backflow baffle front face direction is different for rack and 3U casing installation. Make sure to fix it to the core unit correctly.

  Figure 42: Backflow baffle front face

Figure 43: Installing the backflow baffle for EMHA or EMHH (ASOE)

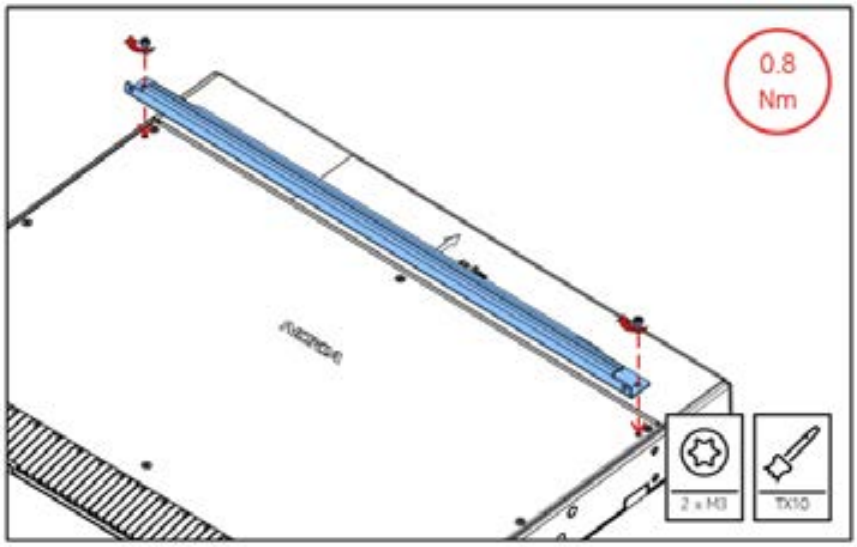


Figure 44: Installing the backflow baffle for EMHA or EMHH (ASOG and ASOH)

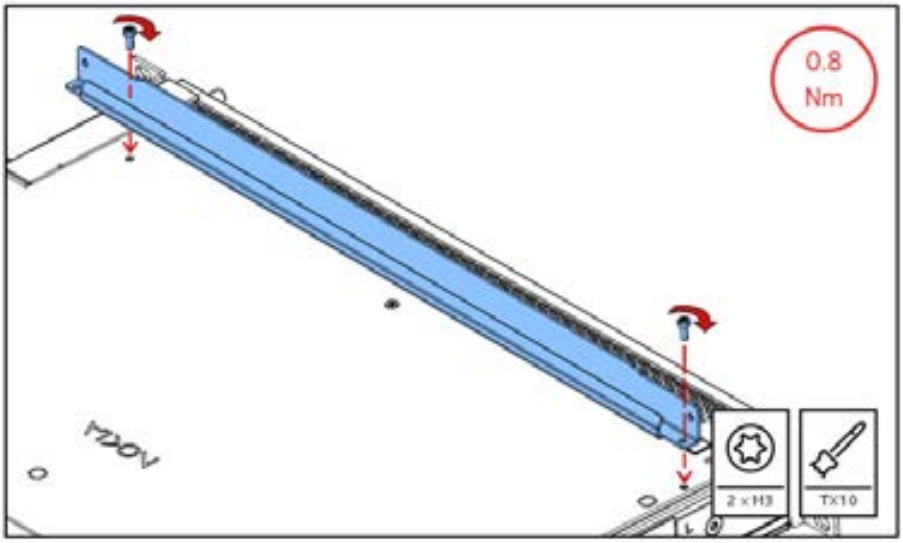
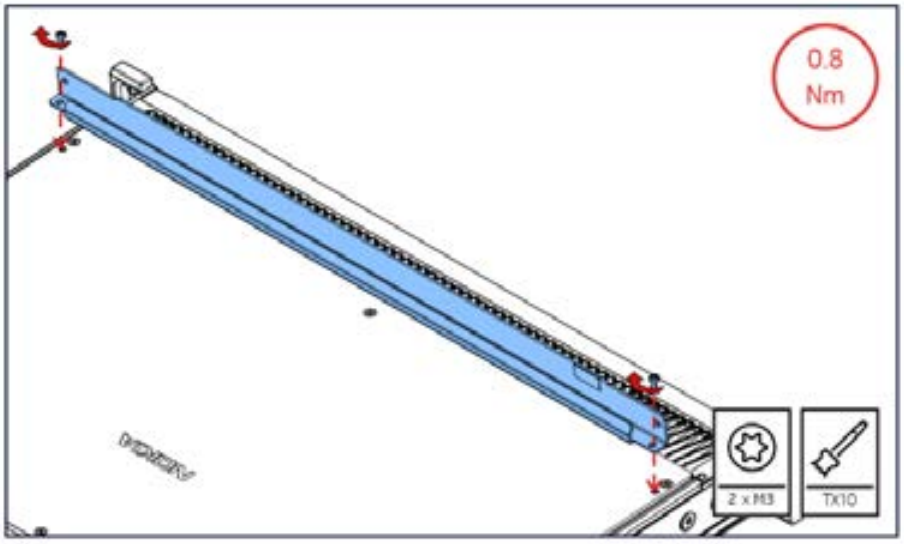


Figure 45: Installing the backflow baffle for rack or cabinet (ASOE, ASOG, or ASOH)



Postrequisites

To see the installation of AMJK rack installation kit onto ASOE, go to *Single RAN/Videos/Installing SM*.

Note:

The video serves as a procedure overview only. For full instructions always refer to the installation manual.

9.4 Installing AMJC wall and pole mount kit

Use the AMJC wall and pole mount kit (475881A) when installing ASOE, ASOG, or ASOH on a wall or pole without 3U casing.

Before you start

These instructions show ASOE, but they are applicable to ASOG and ASOH as well.

Install dust cover as instructed in Installing dust cover.

Equipment preconditions

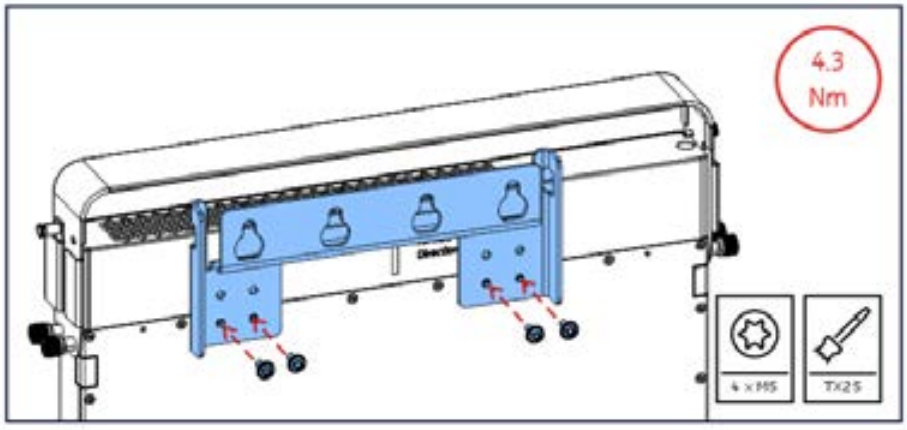
You need the following:

- ☐ AMJC wall and pole mount kit (475881A)
- ☐ Tools:
  - ☐ Torque screwdriver
  - ☐ Torx bit T25

Procedure

1 Fix the upper mounting bracket to the core unit and tighten the four M5 screws to 4.3 Nm (38.1 in-lb.).

Figure 46: Installing the upper bracket

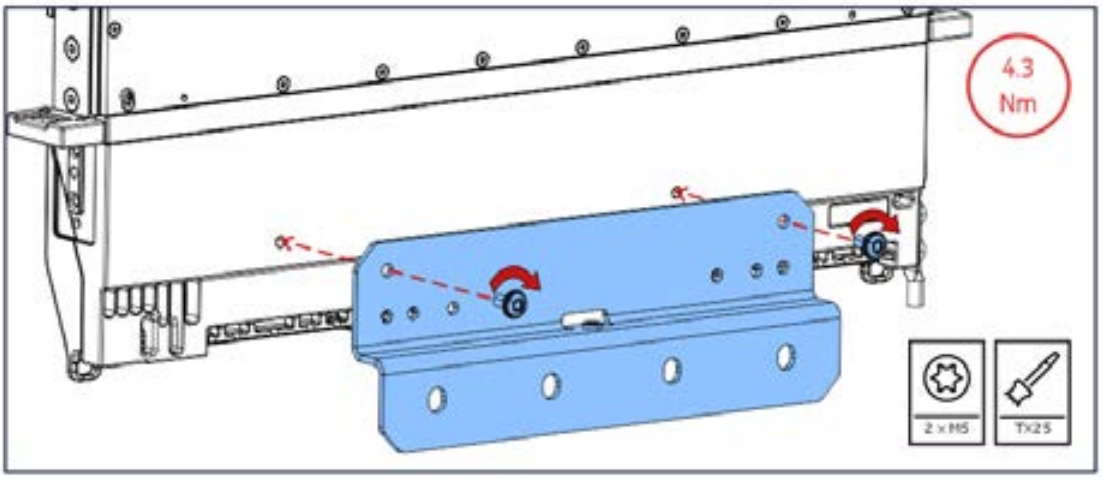


2 Fix the lower mounting bracket to the core unit bottom side and tighten the two M5 screws to 4.3 Nm (38.1 in-lb.).

Select from the available options

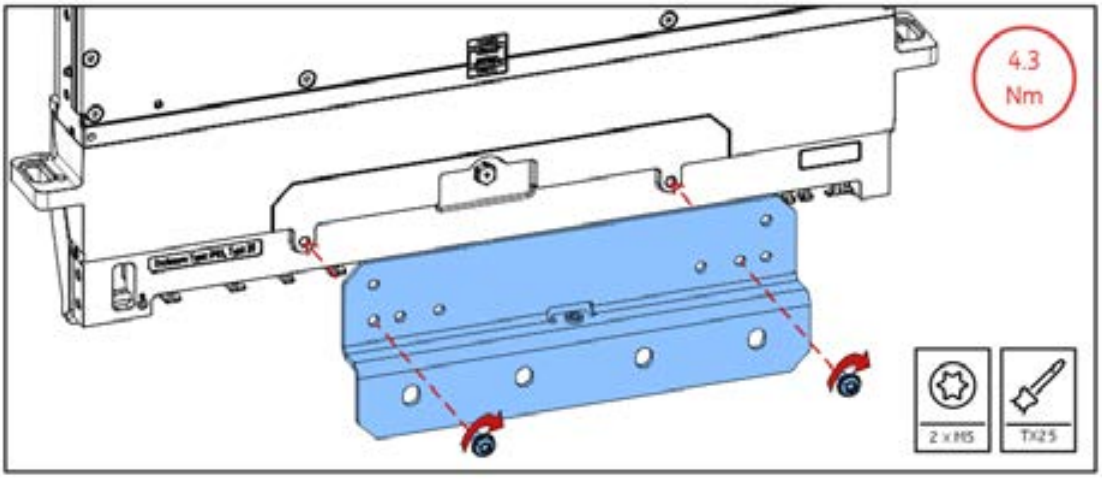
- ASOE

Figure 47: Installing the lower bracket (ASOE)



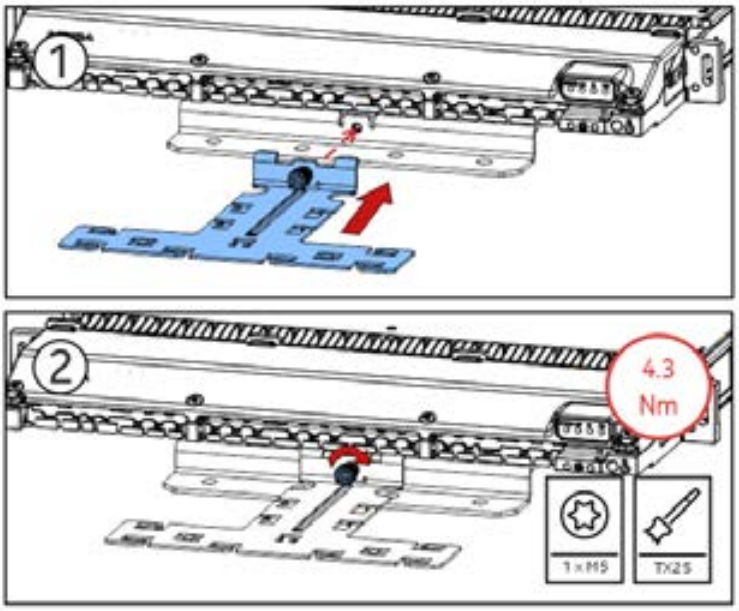
- ASOG or ASOH

  Figure 48: Installing the lower bracket (ASOG or ASOH)



3 Attach the strain relief bracket and tighten the M5 captive screw to 4.3 Nm (38.1 in-lb.).

Figure 49: Attaching the strain relief bracket



9.5 Installing AMJD rail mount kit and AMRA one-clip bracket

Use the AMJD rail mount kit (475882A) with AMRA one-clip bracket (474580A) for ASOE, ASOG, or ASOH rail installation scenarios.

Before you start

These instructions show ASOE, but they are applicable to ASOG and ASOH as well.

Install dust cover as instructed in Installing dust cover.

Equipment preconditions

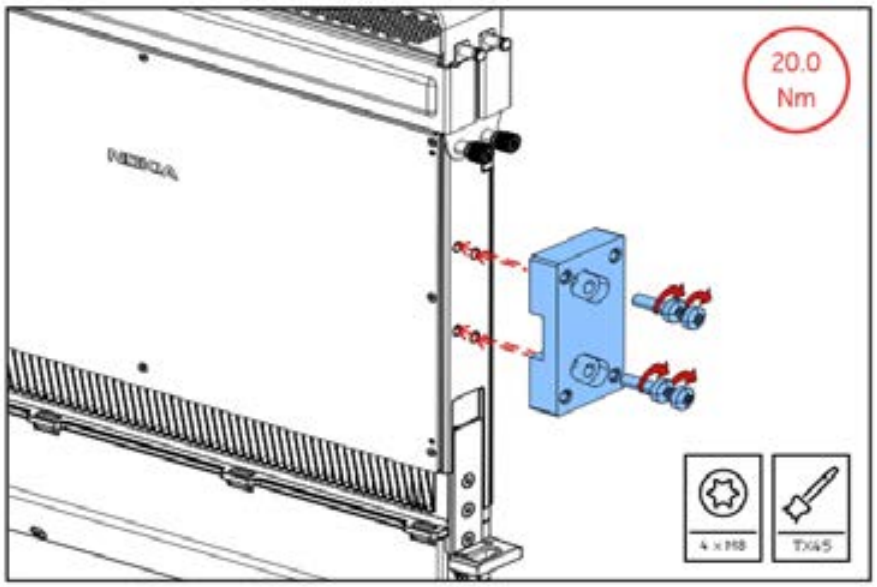
You need the following:

- ☐ AMJD wall mount kit (475882A)
- ☐ AMRA one-clip bracket (474580A)
- ☐ Tools:
  - ☐ Torque wrench
  - ☐ Torx bit T45

Procedure

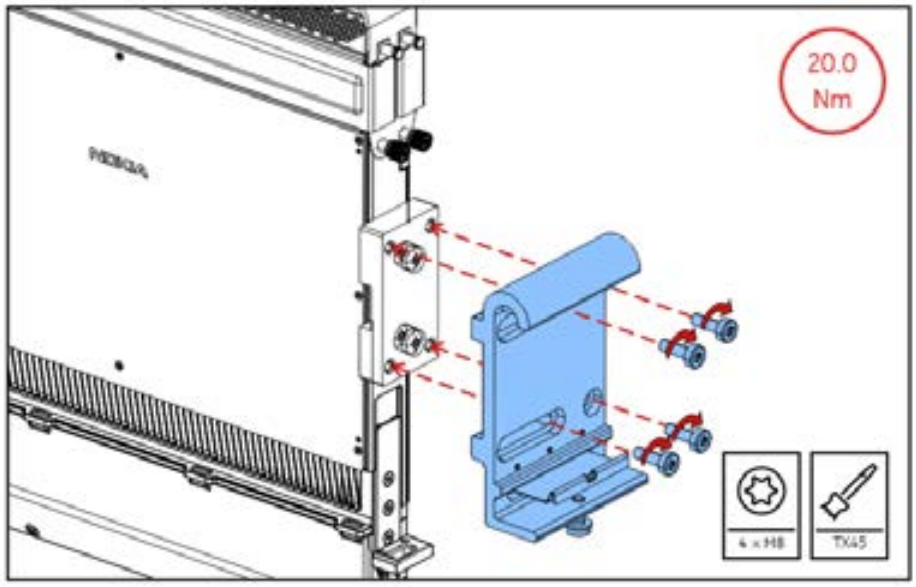
1 Fix the rail mount bracket to the core unit and tighten the four M8 screws to 20 Nm (14.8 ft -lb.).

Figure 50: Installing the AMJD bracket



2 Attach the AMRA one-clip bracket and tighten the four M8 screws to 20 Nm (14.8 ft-lb.).

Figure 51: Installing the AMRA bracket



Postrequisites

To see the installation of AMJD rail mount kit and AMRA one-clip bracket onto ASOE, go to *Single RAN/Videos/Installing SM*.

> **Note:**
> The video serves as a procedure overview only. For full instructions always refer to the installation manual.

9.6 Installing AMJK piggyback mounting kit

Pre-install the AMJK elements to prepare the whole assembly for a pole or wall installation.

Before you start

- These instructions show ASOE, but they are applicable to ASOG and ASOH as well.
- Install the AMJA (for ASOE) or AMJJ (for ASOG or ASOH) cable entry as instructed in Installing AMJA outdoor cable entry or Installing AMJJ outdoor cable entry.
- Figures in this procedure show a micro remote radio head (mRRH) with APAH and a micro integrated antenna already pre-installed. You can install them before or after pre-installing the mRRH bracket. For the respective installation instructions, see *Installing and Cabling Nokia AirScale Micro Remote Radio Heads* or *Installing and Cabling AWHxx AirScale Micro Remote Radio Heads*.
- For the list of the supported mRRHs, optional items, and mounting kits, see AMJK compatibility list and installation pre-requirements.
- The following instructions show how to install an AYGD GNSS receiver on AMJK. The AYGE GNSS receiver is installed directly on a pole. For installation details, see *Installing Optional Global Navigation Satellite System Units*.

Equipment preconditions

You need the following:

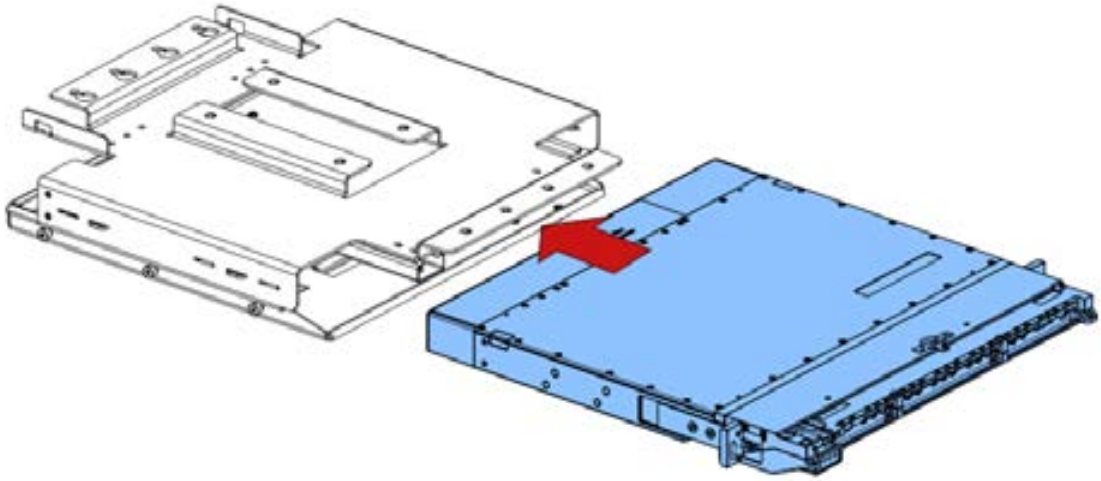
- ☐ AMJK piggyback mounting kit (476408A)
- ☐ APAA AirScale AC-DC power unit 760 W (473936A) or APAH AirScale micro 500 W AC PSU (475043A)

- ☐ Supported mRRH
- ☐ (Optional) AYGD GNSS dual band receiver (475646A)
- ☐ Tools:
  - ☐ Torque screwdriver
  - ☐ Torx bit T10, T25
  - ☐ Security Torx bit T20

Procedure

1 Slide the core unit into the AMJK mounting bracket.

Figure 52: Sliding the core unit into the bracket

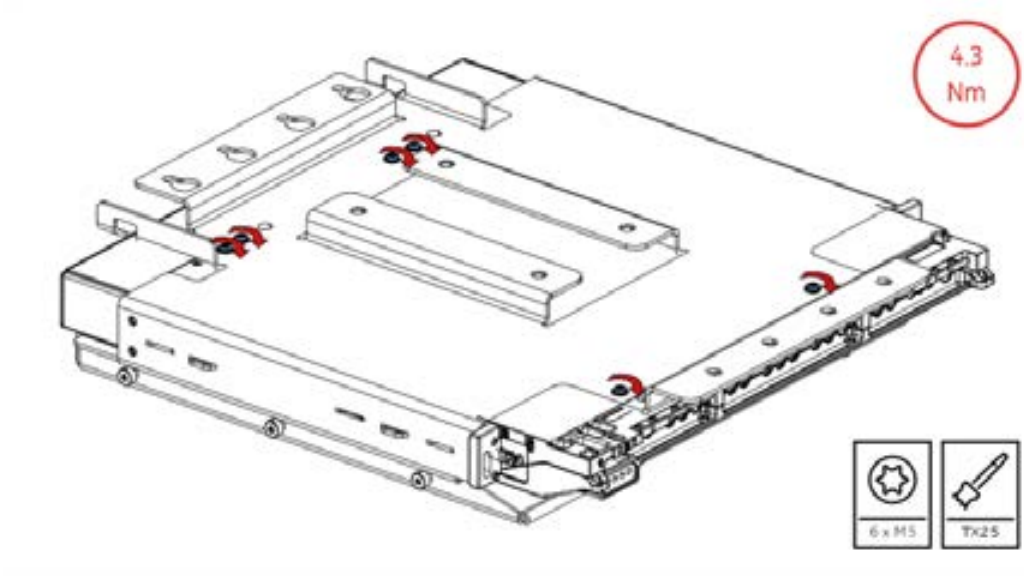


2 Tighten the six washer head M5x12 screws to 4.3 Nm (38.1 in-lb.).

Select from the available options

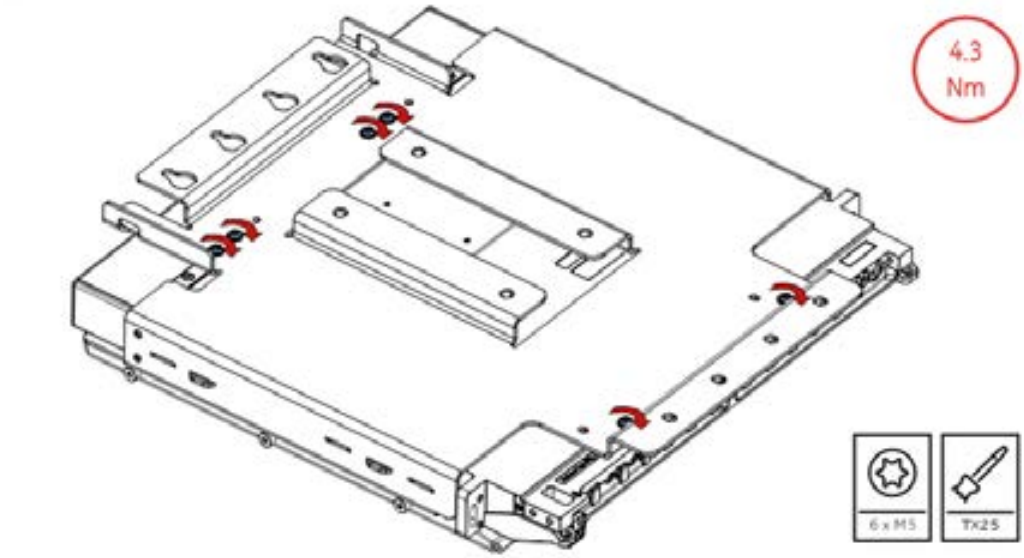
- ASOE

Figure 53: Tightening the screws (ASOE)



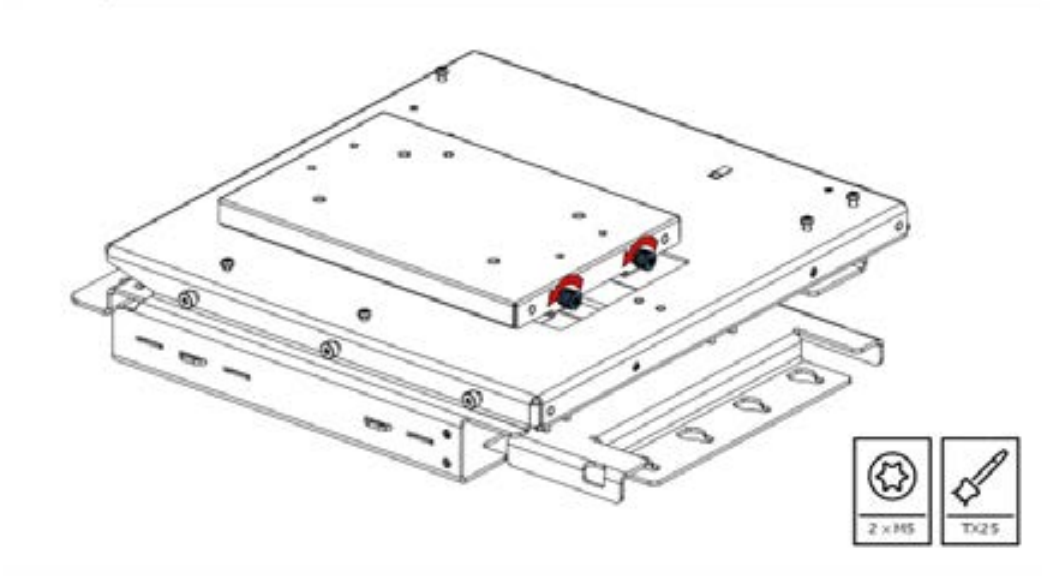
- ASOG/ASOH

Figure 54: Tightening the screws (ASOG or ASOH)



3 Loosen the two M5 captive screws to remove the mRRH bracket from AMJK.

Figure 55: Removing the mRRH bracket

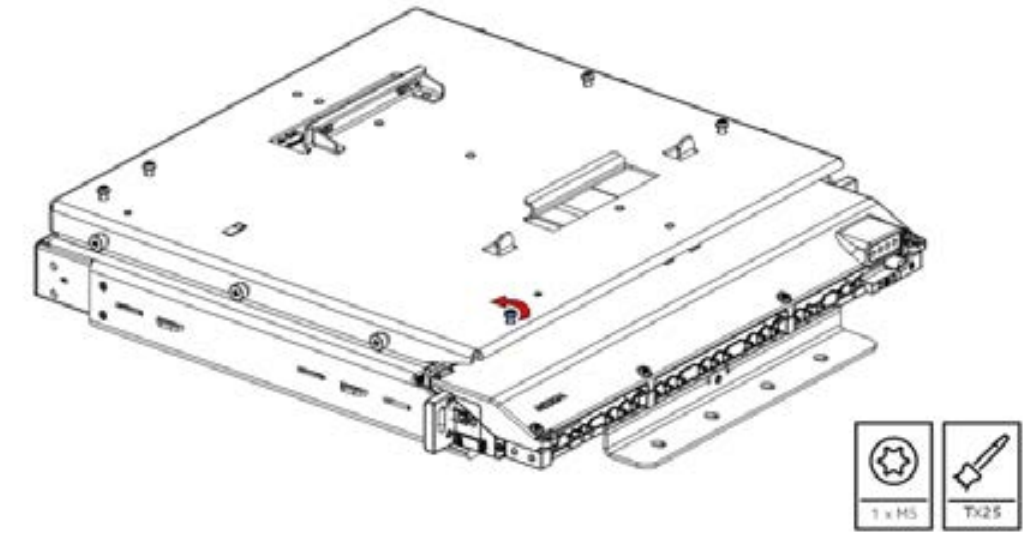


4 Install APAA on AMJK.

> **Note:**
> Skip this step if you're using APAH.

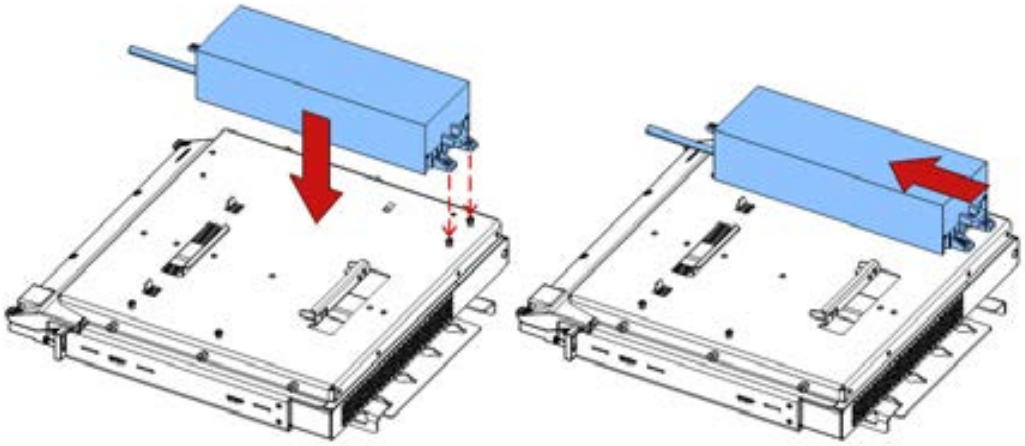
4.1 Remove the M5x10 screw.

Figure 56: Removing the M5x10 screw



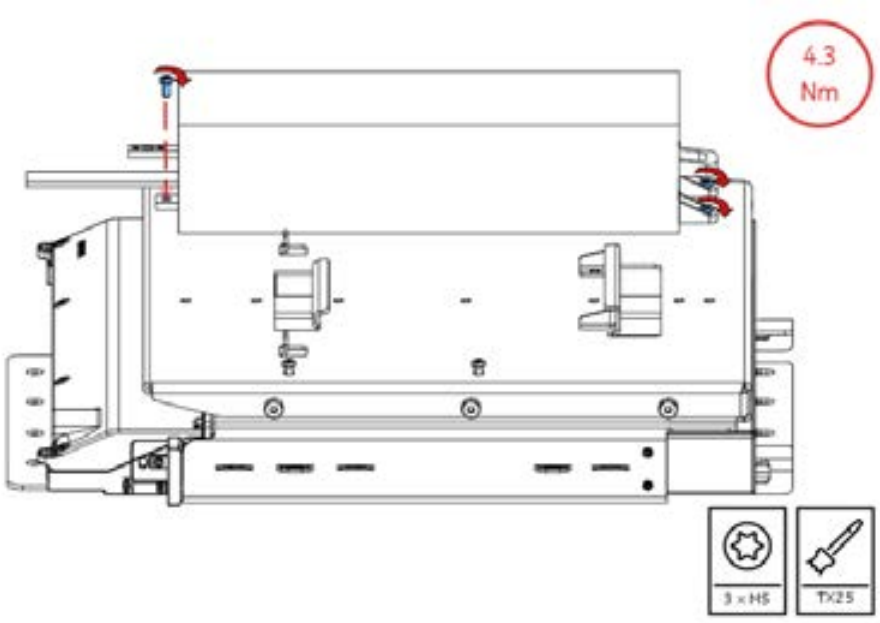
4.2 Fix APAA to AMJK and slide it downward.

Figure 57: Fixing APAA to AMJK



4.3 Tighten the three M5x10 screws to 4.3 Nm (38.1 in-lb.).

Figure 58: Tightening the screws



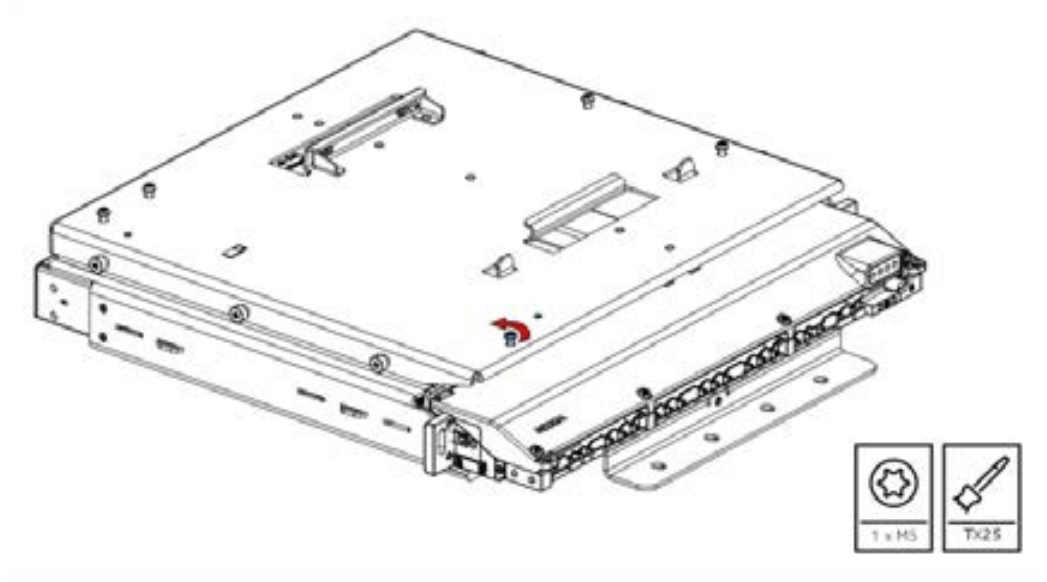
5 Install APAH on AMJK.

Note:

Skip this step if you're using APAA.

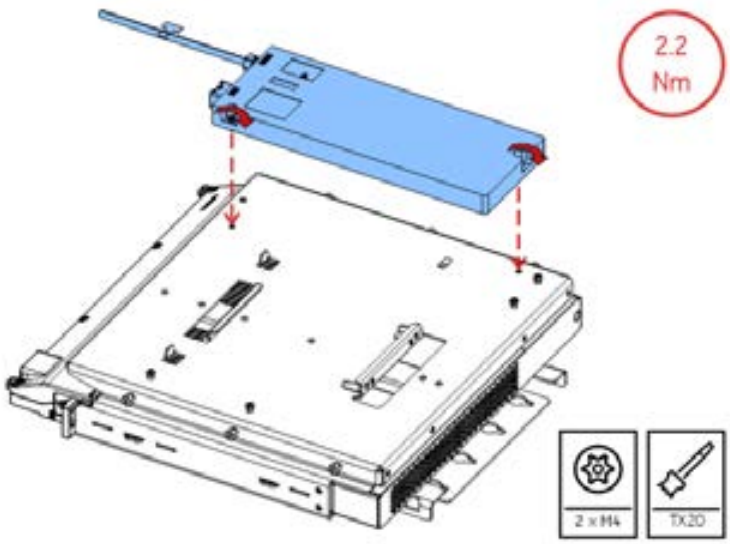
5.1 Remove the M5x10 screw.

Figure 59: Removing the M5x10 screw



5.2 Fix APAH to AMJK and tighten the two M4 security captive screws to 2.2 Nm (19.5 in -lb.).

Figure 60: Fixing APAA to AMJK



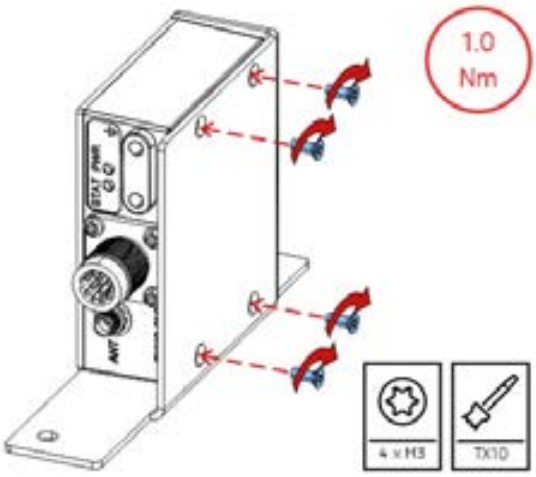
6 Fix AYGD to AMJK.

Note:

This step is optional. Skip it if you're using AYGE.

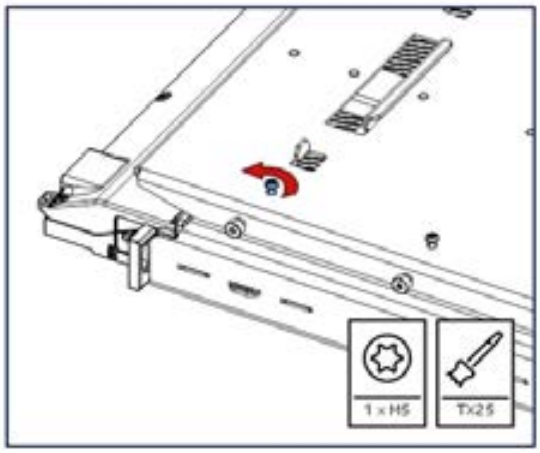
6.1 Fix the AYGD module to the GNSS bracket and tighten the four M3 screws to 1 Nm (8.9 in-lb.).

Figure 61: Fixing the GNSS module to the bracket



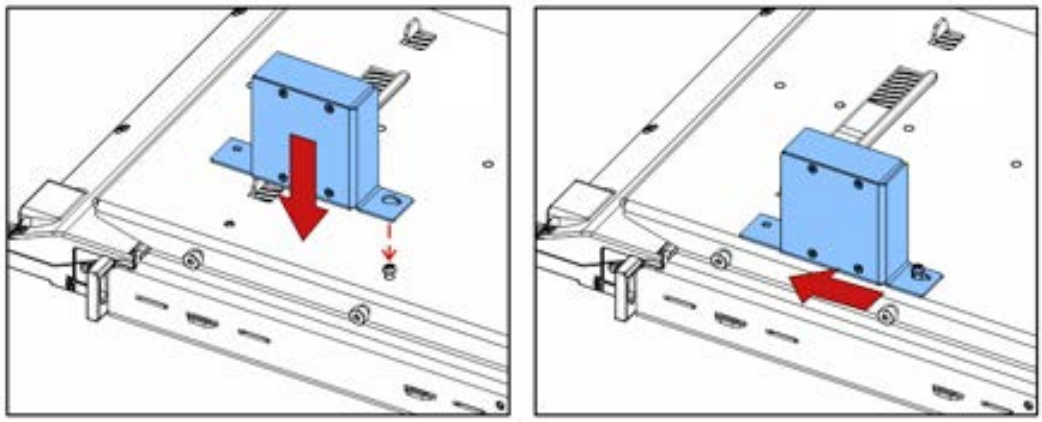
6.2 Remove the M5x10 screw from AMJK.

Figure 62: Removing the M5x10 screw



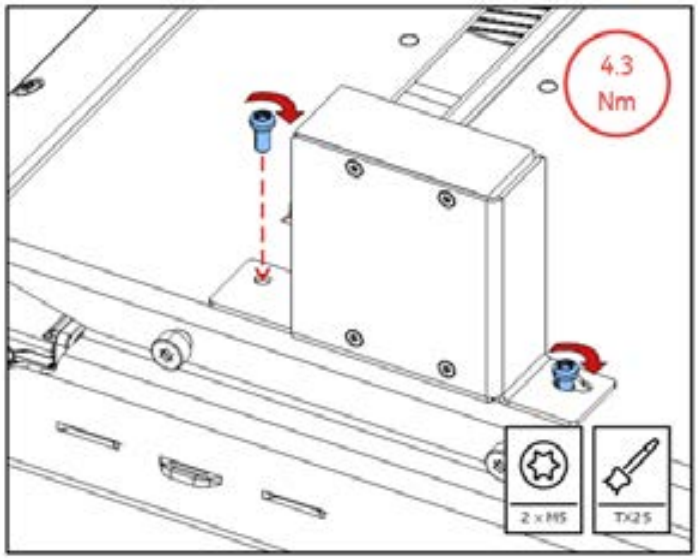
6.3 Fix AYGD to AMJK and slide it downward.

Figure 63: Fixing AYGD to AMJK



6.4 Tighten the two M5x10 screws to 4.3 Nm (38.1 in-lb.).

Figure 64: Tightening the M5x10 screws



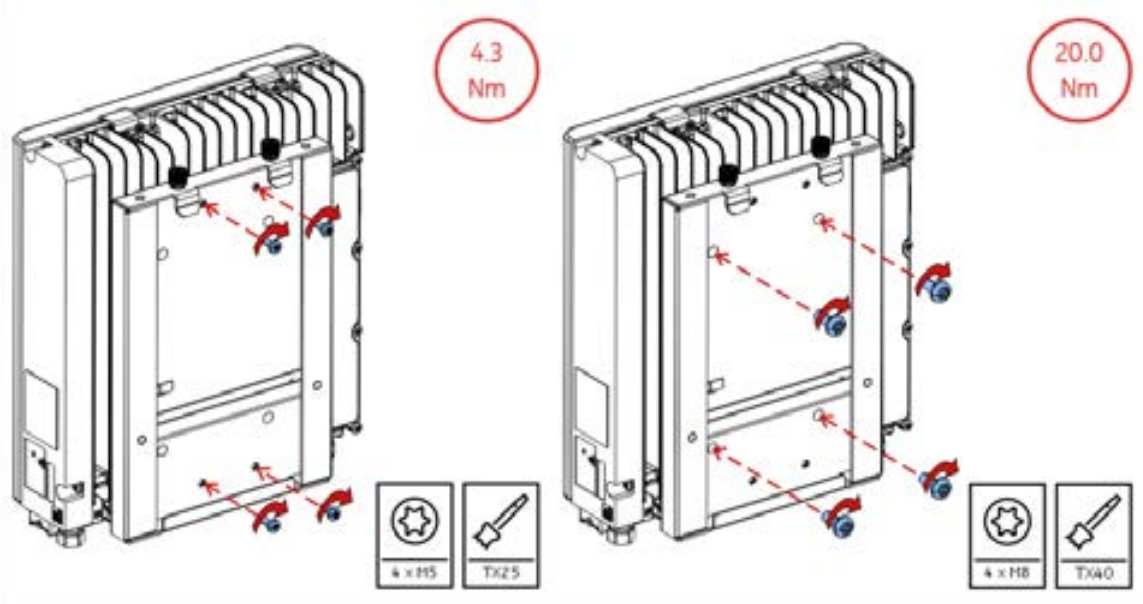
7 Fix the mRRH bracket to the mRRH and tighten the four M5x12 washer head screws to 4.3 Nm (38.1 in-lb.) or M8 screws to 20 Nm (14.8 ft-lb.) depending on the mRRH model.

Note:

Use M8 screws for AWEUA/B, AWEUC/D, and AWEWA/B.

Make sure to install the bracket as shown in the figure below, with the two M5 captive screws facing up.

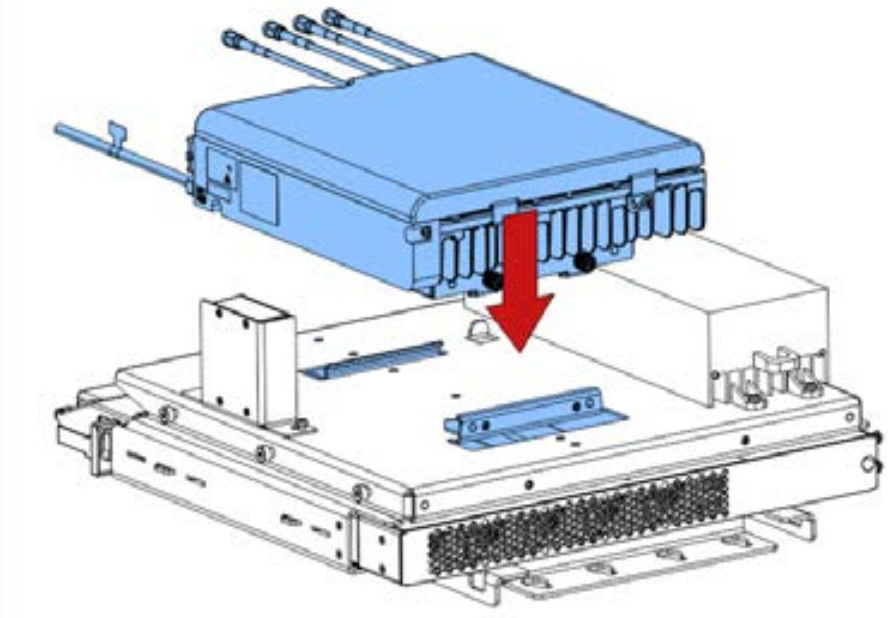
Figure 65: Fixing the bracket to the mRRH



8 Install the mRRH onto AMJK.

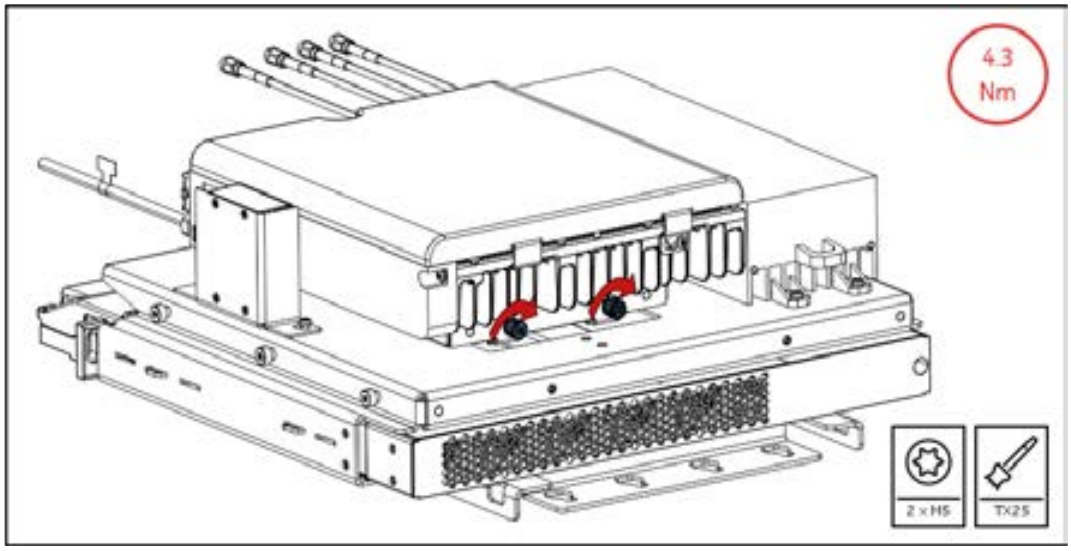
8.1 Fix the mRRH to AMJK.

Figure 66: Fixing the mRRH to AMJK



8.2 Tighten the two M5 captive screws to 4.3 Nm (38.1 in-lb.).

Figure 67: Tightening the M5 captive screws



9.7 Installing AMJJ outdoor cable entry

Use the AMJJ outdoor cable entry (476407A) for ASOG or ASOH outdoor installation scenarios.

Equipment preconditions

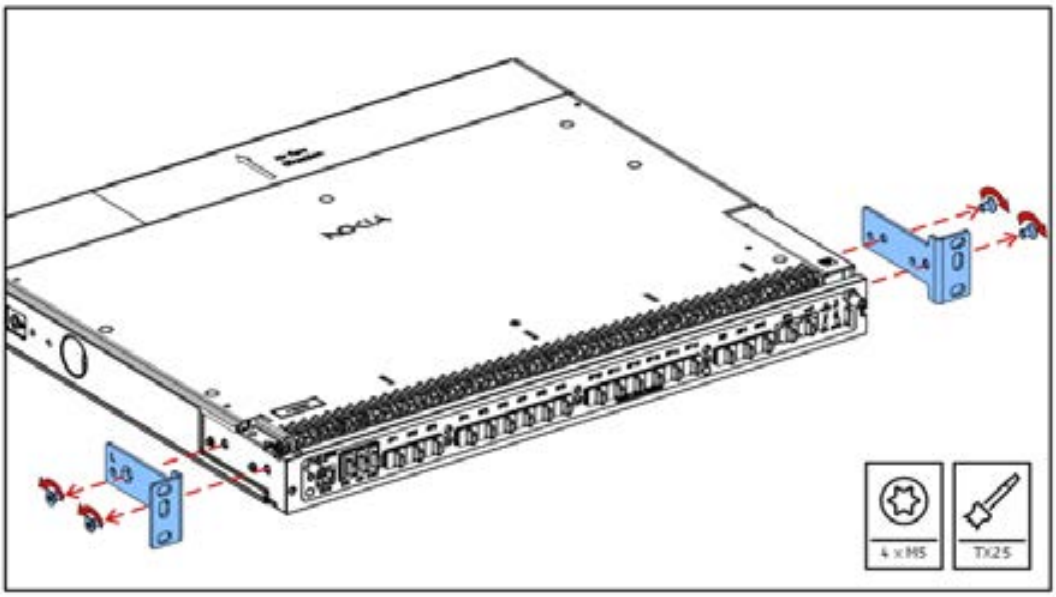
You need the following:

- ☐ AMJJ outdoor cable entry (476407A)
- ☐ Tools:
  - ☐ Torque screwdriver
  - ☐ Torx bit T25

Procedure

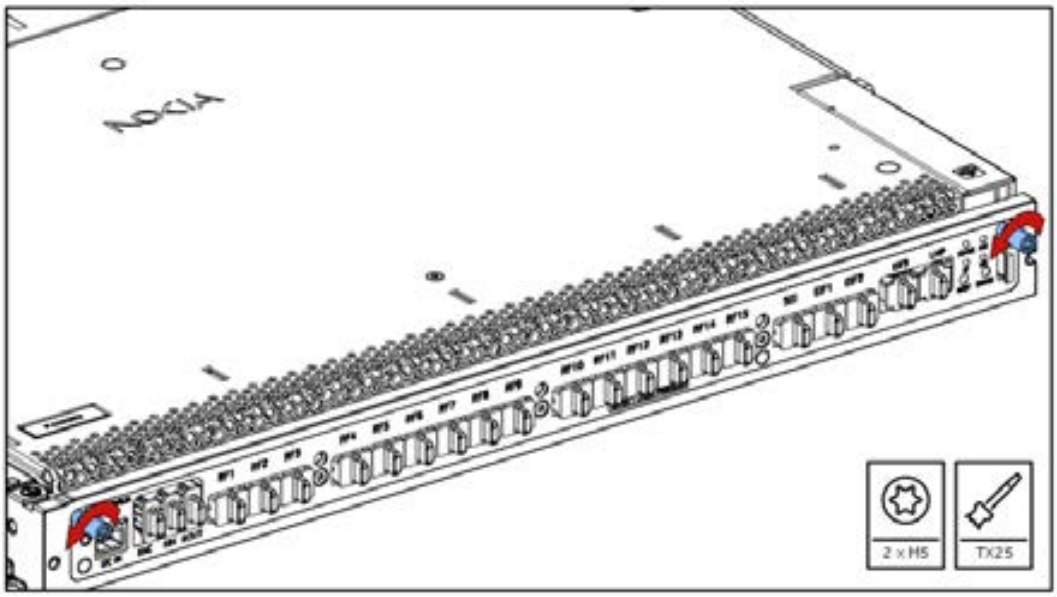
1 Unscrew the four M5 screws to remove both side hangers.

Figure 68: Removing the side hangers



2 Remove the two front protection pins.

Figure 69: Removing the front protection pins



3 Loosen the three M5 captive screws to remove the AMJJ cover.

Notice:

When removing the AMJJ cover, always carefully lower it until it hangs on the maintenance strap. Do not let it drop freely.

Figure 70: Loosening the AMJJ cover captive screws

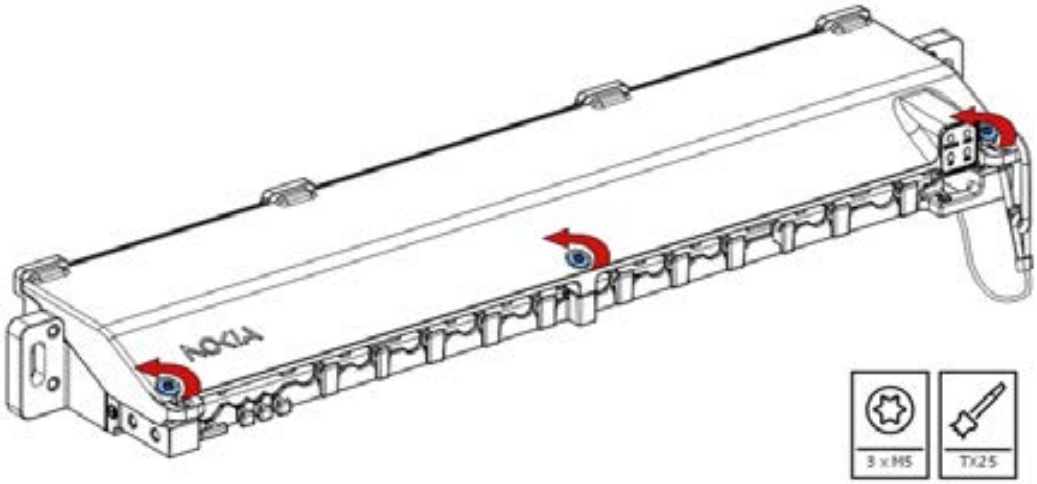
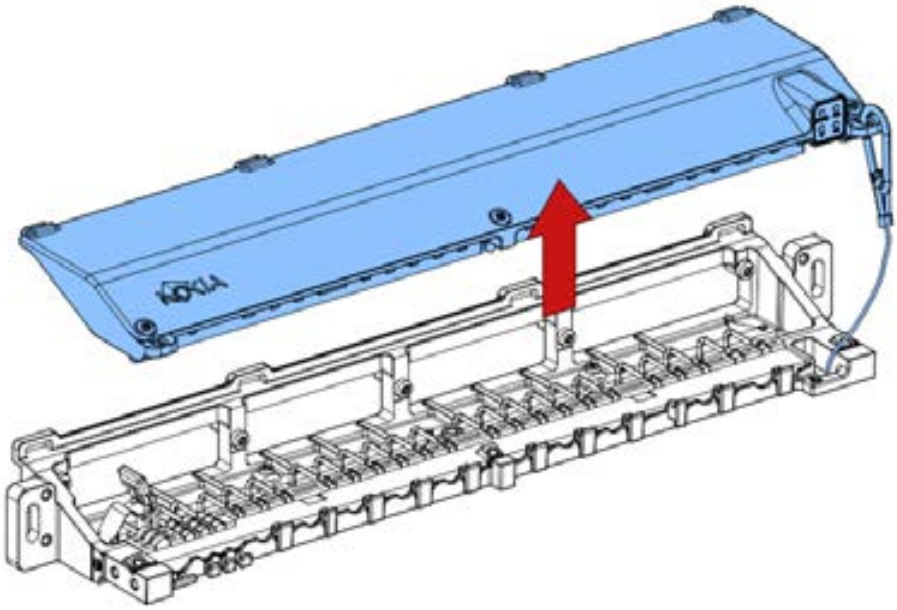


Figure 71: Removing the AMJJ cover



4 Attach the AMJJ base to ASOG or ASOH and tighten the five M5 captive screws to 4.3 Nm (38.1 in-lb.).

Figure 72: Attaching the AMJJ base to ASOG or ASOH

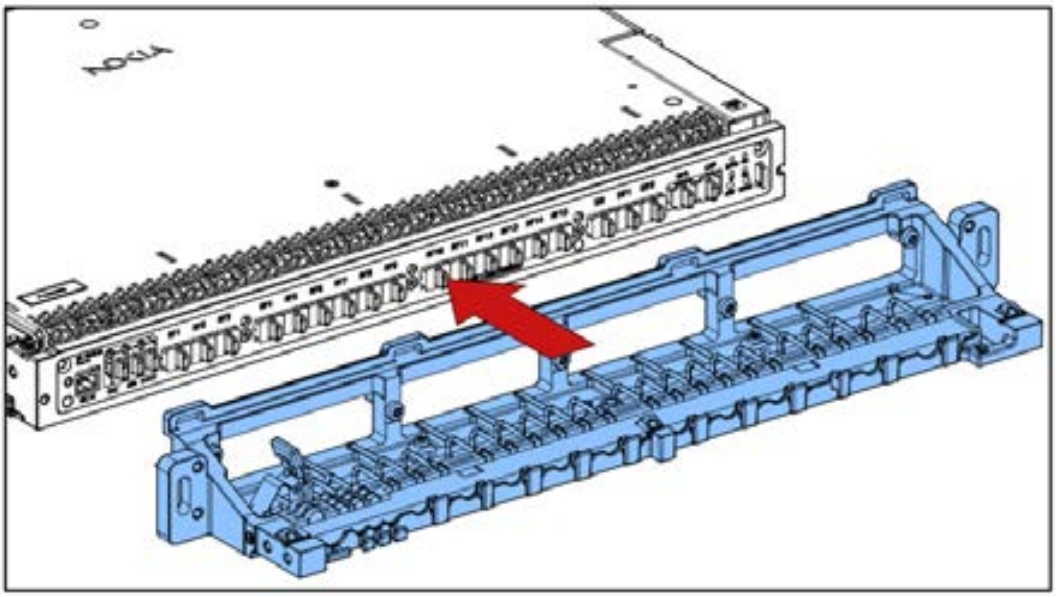
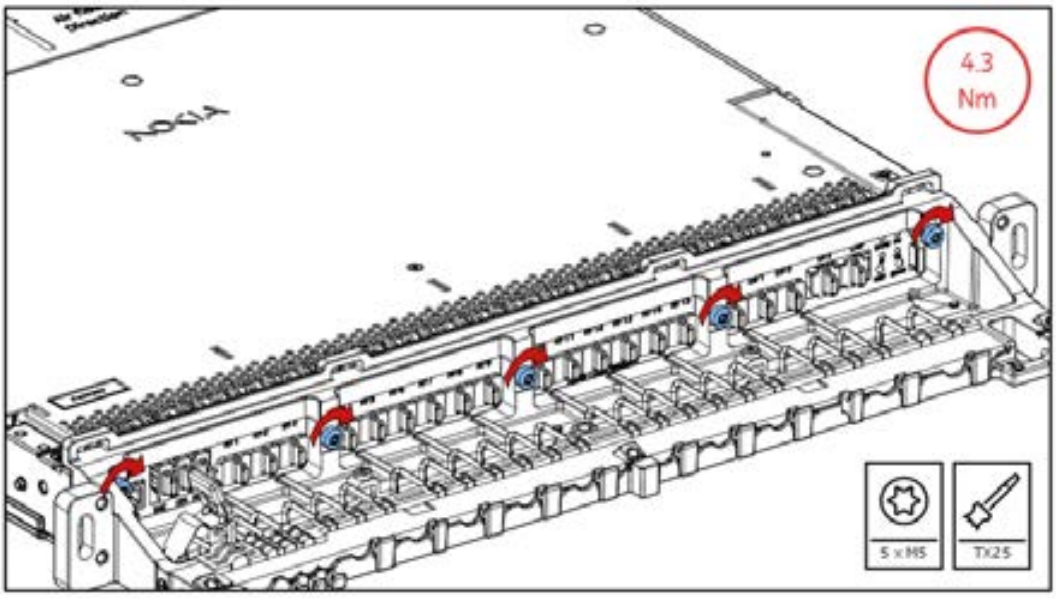


Figure 73: Tightening the AMJJ base screws

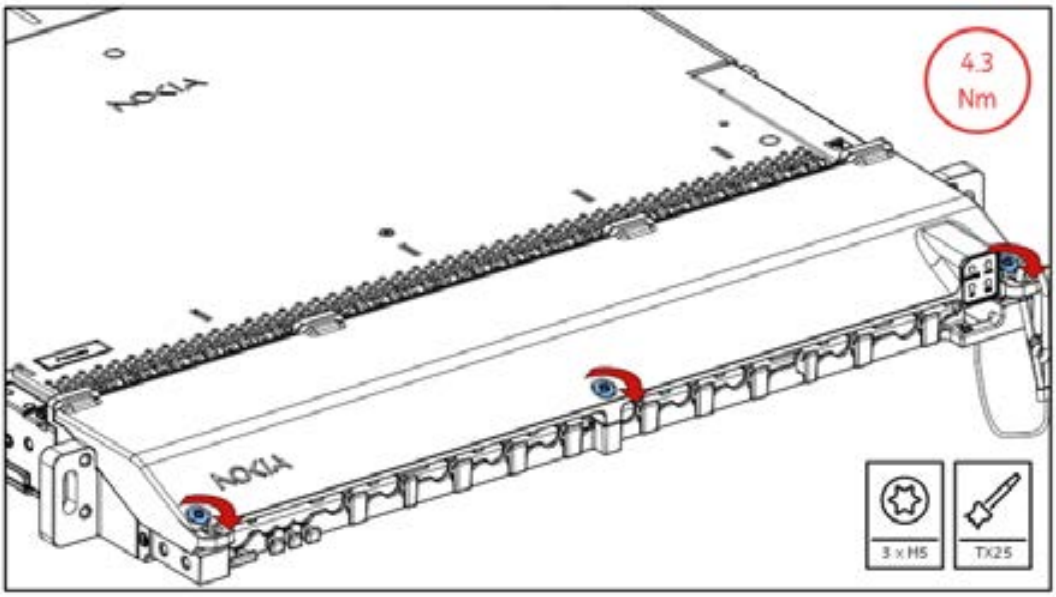


5 Attach the AMJA cover and tighten the three M5 captive screws to 4.3 Nm (38.1 in-lb.).

Tip:

You can assemble the cover after the installation and cabling is completed. See Cabling ASOE, ASOG, or ASOH for more information about cabling.

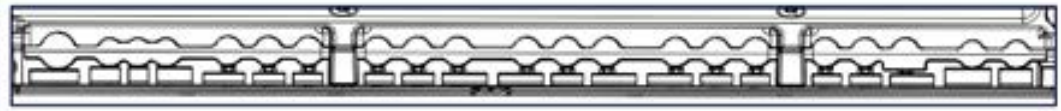
Figure 74: Attaching the AMJJ cover



Notice:

Make sure there is no gap between both parts after tightening the screws.

Figure 75: No gap example



9.8 Installing dust cover

The dust cover is necessary for ASOE, ASOG, or ASOH vertical installation cases outside of a rack, cabinet, or casing.

Before you start

Note:

There are two dust cover versions:

- With side protectors on both sides (included in AMJD delivery)
- With side protector on one side (included in AMJC delivery)

Figures in this section show the dust cover with one side protector, but the installation procedure is the same for both versions.

These instructions show ASOE, but they are applicable to ASOG and ASOH as well.

Equipment preconditions

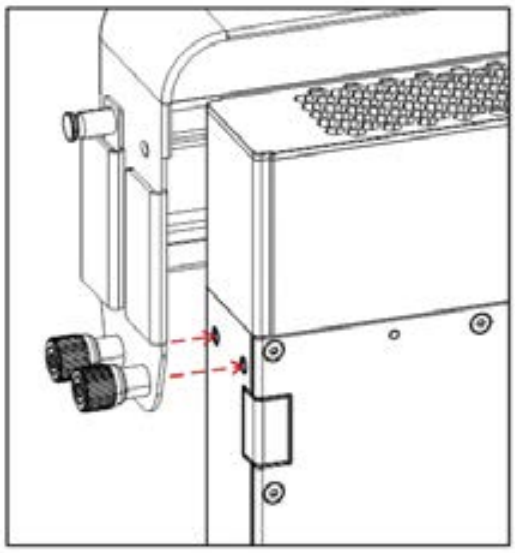
You need the following:

- ☐ Dust cover
- ☐ Tools:
  - ☐ Torque screwdriver
  - ☐ Torx bit T25

Procedure

1 Align the screws with the mounting holes at the top of the core unit.

Figure 76: Aligning the dust cover

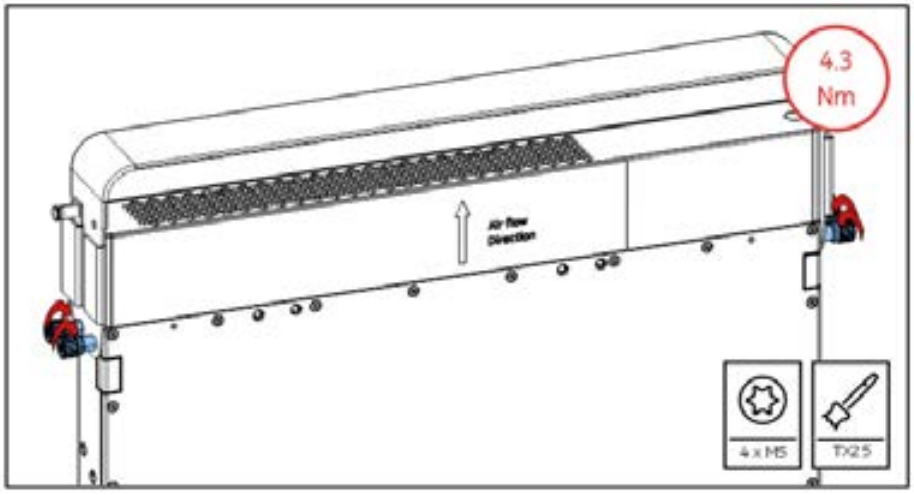


2 Tighten the four M5 captive screws to 4.3 Nm (38.1 in-lb.).

Notice:

Double-check if the dust cover captive screws are tightened to the correct torque value.

Figure 77: Tightening the four captive screws



Postrequisites

To see the installation of dust cover onto ASOE, go to *Single RAN/Videos/Installing SM*.

Note:

The video serves as a procedure overview only. For full instructions always refer to the installation manual.

9.9 Preparing fan tray for installation inside Flexi casing

Before installing ASOE, ASOG, or ASOH inside a Flexi casing, prepare the fan tray for future maintenance.

Before you start

These instructions show ASOE, but they are applicable to ASOG and ASOH as well.

Equipment preconditions

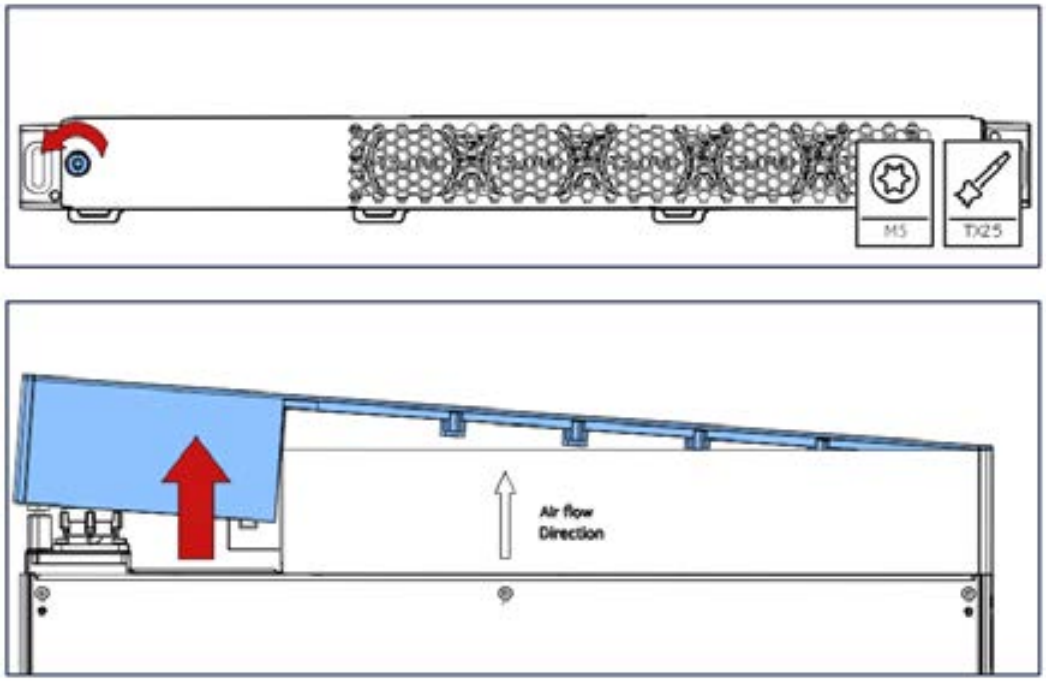
You need the following:

- ☐ Torque screwdriver
- ☐ Torx bit T25

Procedure

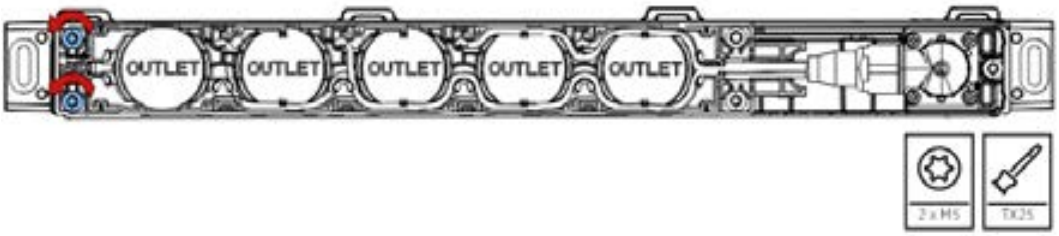
1 Unscrew the M5 screw to remove the fan cover.

Figure 78: Removing the cover



2 Loosen the two M5 captive screws behind the dust cover.

Figure 79: Loosening the two M5 captive screws



10. Pre-installing FMFA plinth for installation in Flexi casings

Installation inside 3U Flexi casings on a pole, wall, or floor requires pre-installation of the FMFA plinth.

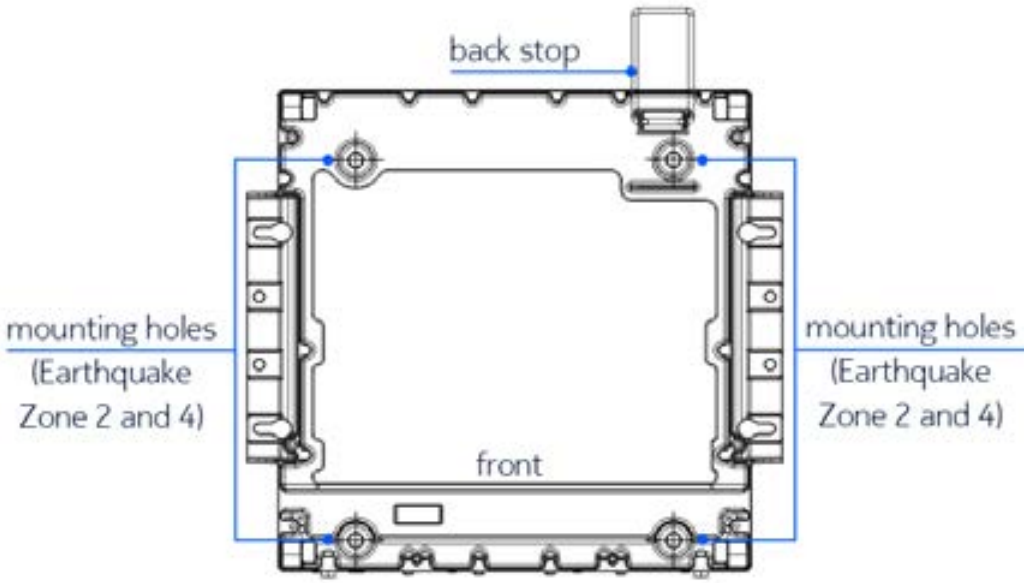
10.1 Anchoring FMFA plinth to a floor

Anchoring the FMFA plinth to a floor allows installing and stacking ASOE, ASOG, and ASOH core units in 3U casings.

Before you start

When choosing a location for the plinth, consider the required maintenance space.

Figure 80: Plinth anchoring points



Equipment preconditions

You need the following:

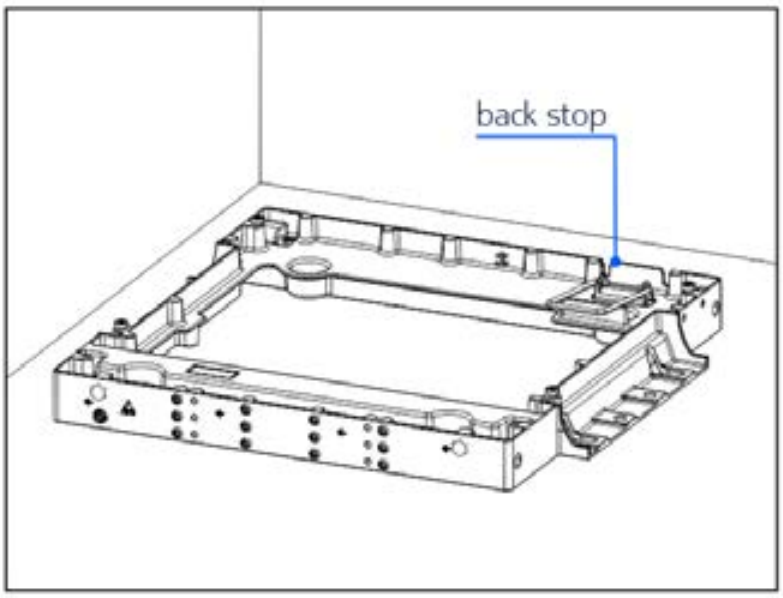
- ☐ FMFA Flexi mounting kit for floor, wall, and pole (470149A)
- ☐ Tools:

- ☐ 4 x M8 anchoring bolts
- ☐ Drill
- ☐ Percussion drill bit Φ12
- ☐ Torque wrench
- ☐ 13 mm socket

Procedure

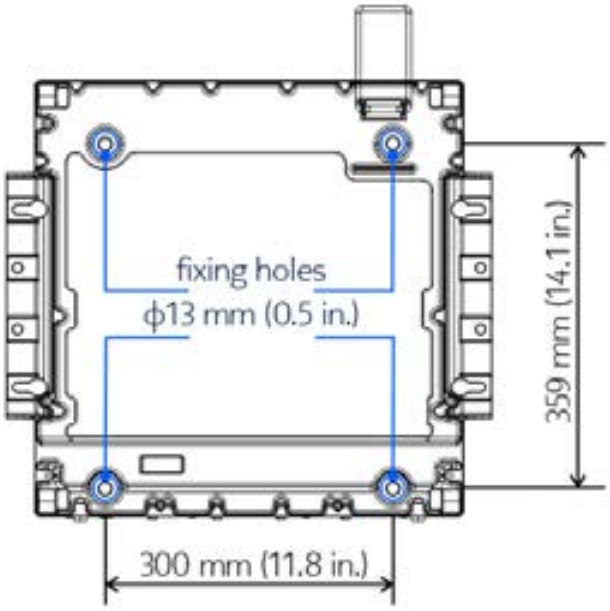
1 Place the plinth on the floor, with grounding points facing forward and the back stop against the wall if back access isn't required.

Figure 81: Plinth installation position



2 Mark the mounting holes locations on the floor and drill holes for anchoring bolts.

Figure 82: Drilling holes

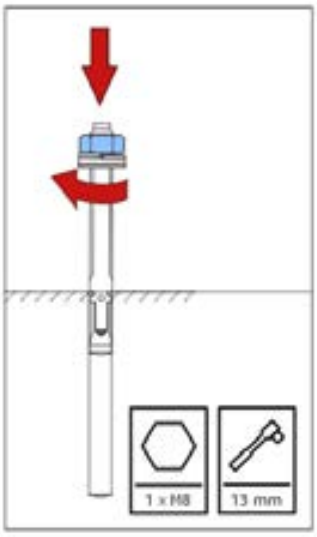


3 Install the anchoring bolts.

> **Note:**
> Always follow anchoring bolts manufacturer guidelines.

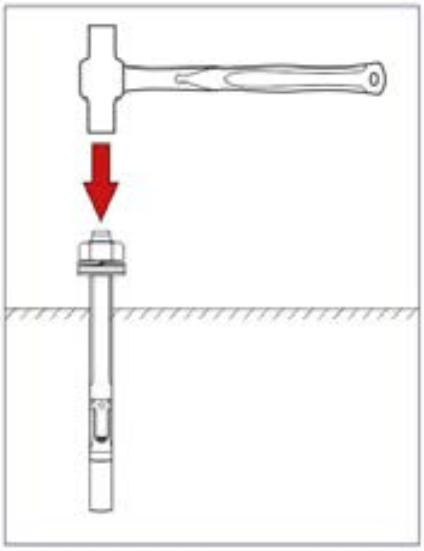
3.1 Slightly fasten the nut and insert the bolt into the hole.

Figure 83: Fastening the nut and inserting the bolt into the hole in the ground



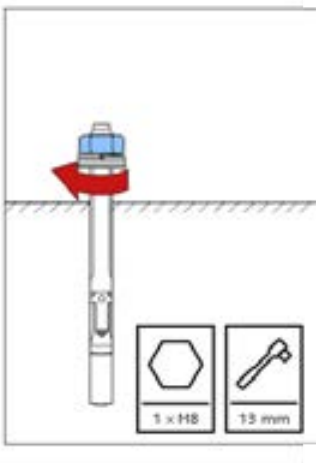
3.2 Hit the expansion bolt with a rubber hammer until the expansion sleeve is fully embedded.

Figure 84: Hammering the expansions bolt



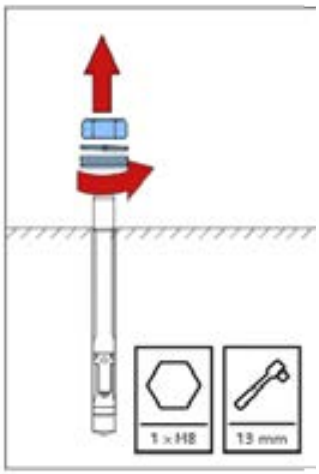
3.3 Tighten the expansion bolt until the expansion sleeve is fixed securely into the floor.

Figure 85: Tightening the expansion bolt



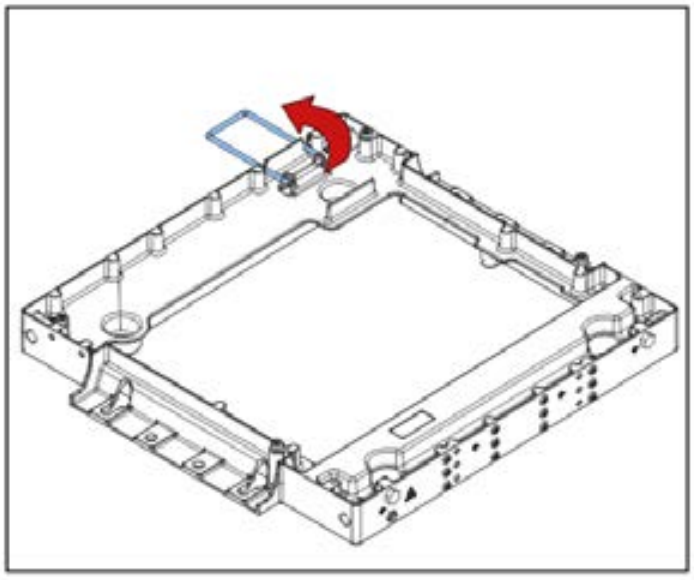
3.4 Remove the M8 nut, spring washer, plastic sleeve, and flat washer.

Figure 86: Removing the M8 nut, spring washer, plastic sleeve, and flat washer



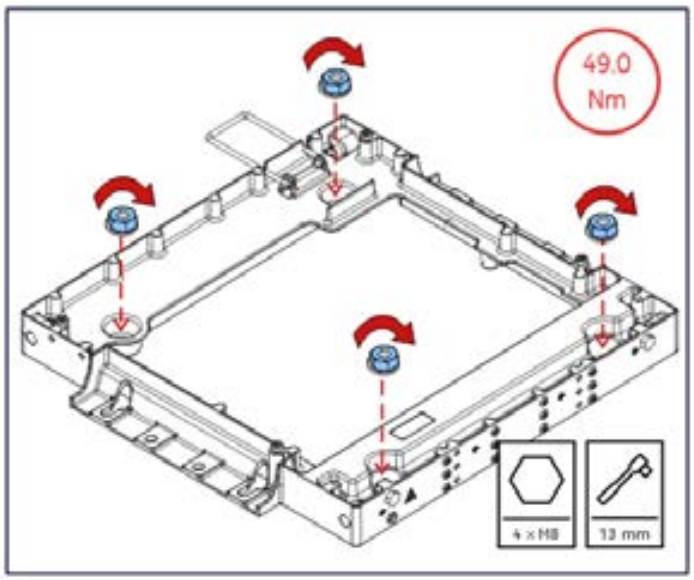
4 Turn the back stop.

Figure 87: Turning the back stop



5 Tighten the four M8 anchoring bolts with washers to 49.0 Nm (36.1 ft-lb.).

Figure 88: Tightening the anchoring bolts



10.2 Installing FMFA plinth on a wall

Installing FMFA plinth on a wall allows installation of ASOE, ASOG, and ASOH units in 3U casings.

Equipment preconditions

You need the following:

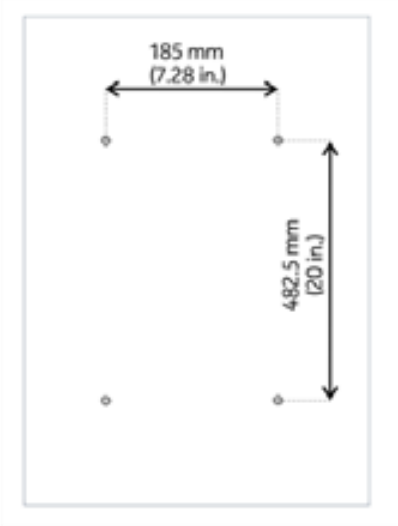
- ☐ FMFA Flexi mounting kit for floor, wall, and pole (470149A)
- ☐ Tools:
  - ☐ Drilling equipment
  - ☐ Torque wrench
  - ☐ 13 mm socket

Procedure

1 Mark the mounting screw locations on the wall and drill the holes.

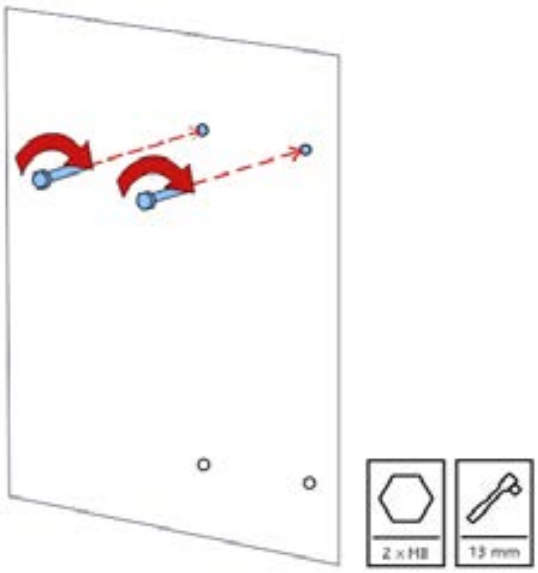
> **Tip:**
>
> You can use the FMFA plinth as a template.

Figure 89: Marking drilling holes



2 Fix the two upper mounting M8 screws halfway into the wall.

Figure 90: Fixing the M8 screws

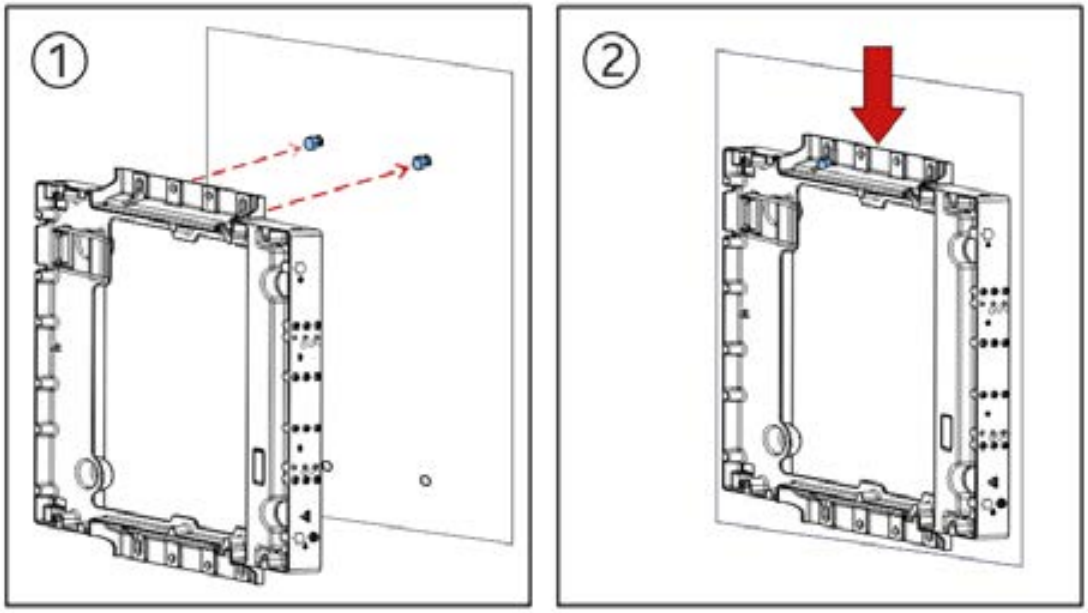


3 Hang the plinth on the mounting screws.

Note:

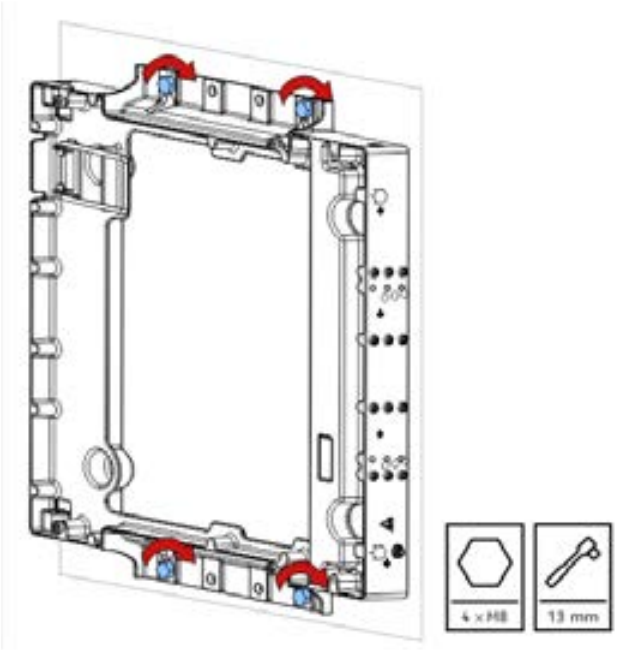
Make sure that the plinth is level.

Figure 91: Hanging the plinth



4 Tighten the four M8 screws to the torque value specified by the wall-mounting hardware manufacturer.

Figure 92: Tightening the screws



10.3 Mounting the FMFA plinth on a pole using FPKA

The FMFA plinth with FPKA pole mounting kit allows installation on a pole with a diameter between 30 mm (1.2 in.) and 120 mm (4.7 in.).

Equipment preconditions

You need the following:

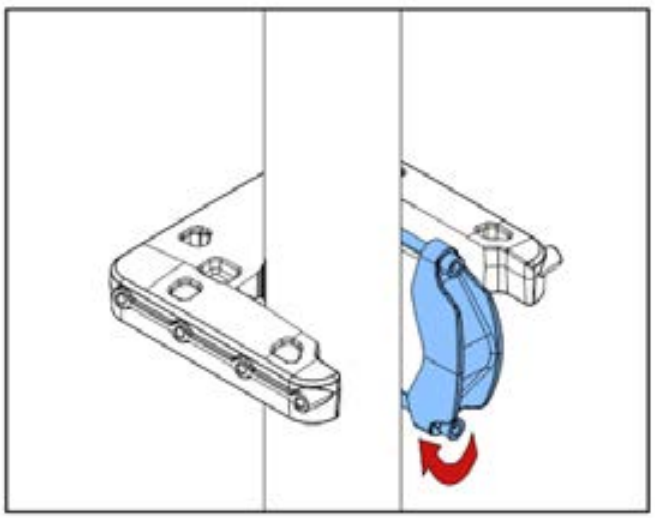
- ☐ 2 x FPKA Flexi pole mounting kit (471649A)
- ☐ FMFA Flexi mounting kit for floor, wall, and pole (470149A)
- ☐ Tools:
  - ☐ Torque wrench
  - ☐ 13 mm socket
  - ☐ 8 mm hex bit

Procedure

1 Install the upper mounting bracket (FPKA) on a pole.

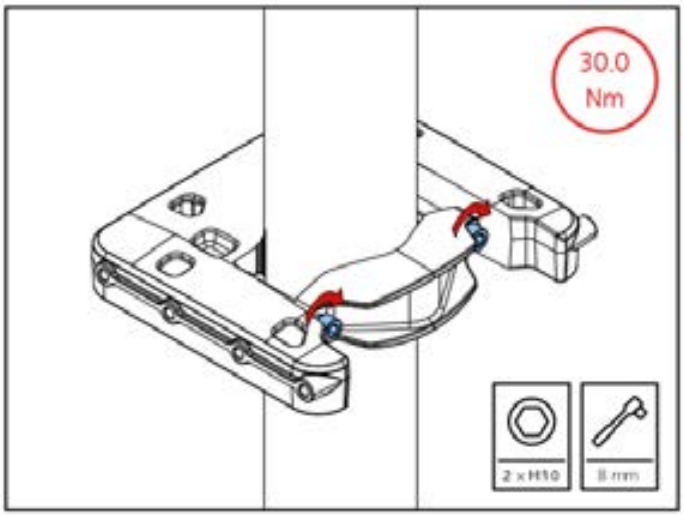
> **Note:**
> Make sure that the upper bracket is level.

Figure 93: Installing the upper FPKA onto a pole



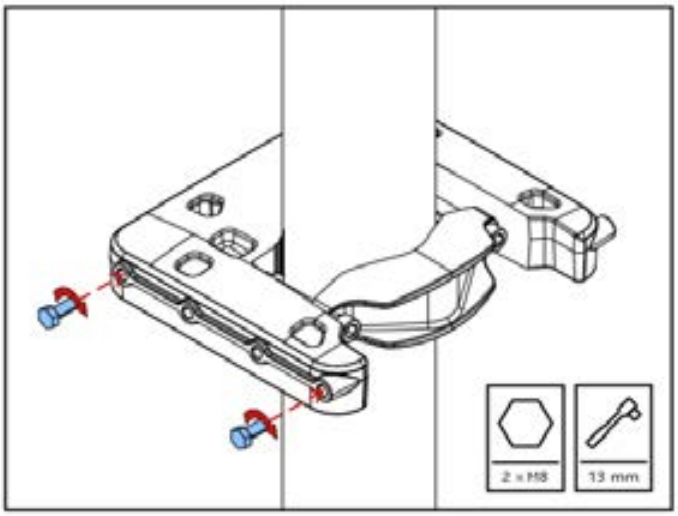
2 Tighten the two M10 screws to 30.0 Nm (22.1 ft-lb.).

Figure 94: Tightening bracket screws



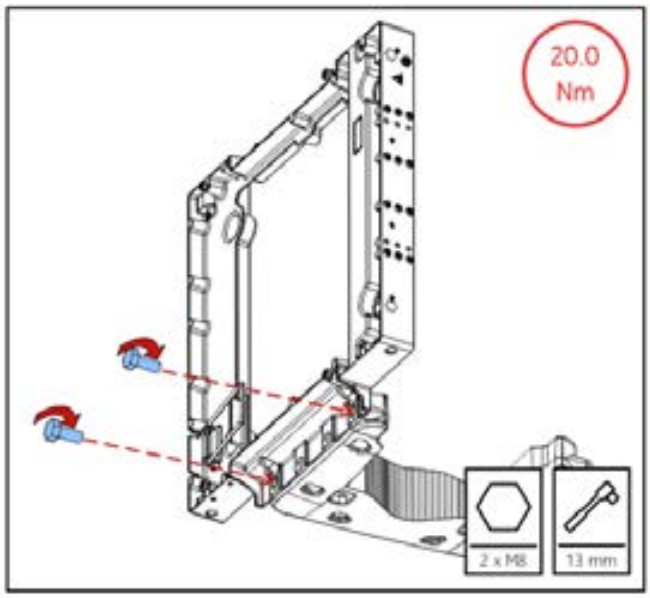
3 Tighten the two upper M8 screws halfway.

Figure 95: Tightening two upper screws



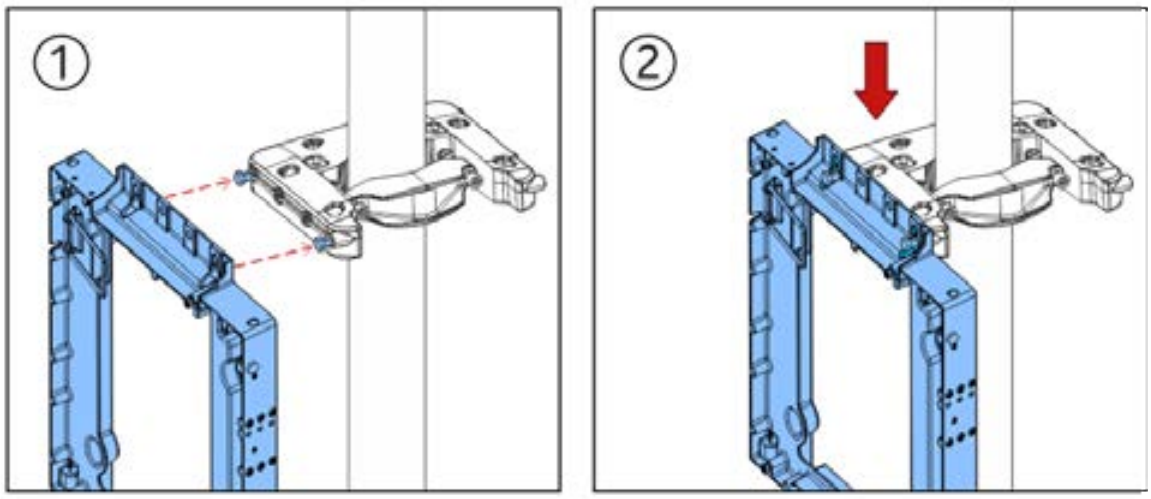
4 Fix the lower bracket to the plinth and tighten the two M8 screws to 20.0 Nm (14.8 ft-lb.).

Figure 96: Fixing the lower bracket



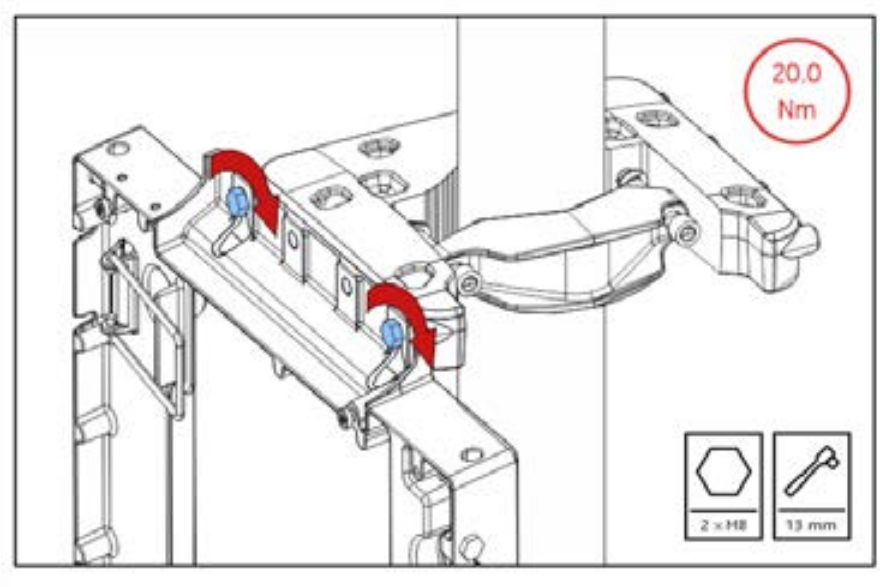
5 Hang the plinth on the upper FPKA bracket.

Figure 97: Hanging the plinth



6 Tighten the two upper M8 screws to 20.0 Nm (14.8 ft-lb.).

Figure 98: Tightening the upper screws

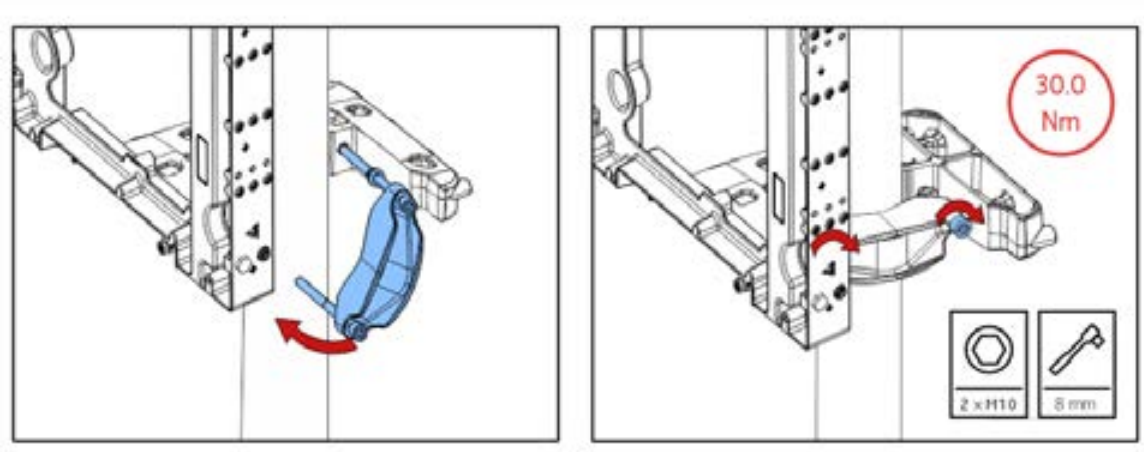


7 Install the lower mounting bracket onto the pole and tighten the mounting bracket screws to 30.0 Nm (22.1 ft-lb.).

Note:

Make sure that the pole mounting brackets are aligned and the plinth is level.

Figure 99: Tightening the lower bracket screws



10.4 Mounting the FMFA plinth on a pole using FPKC

The FMFA plinth with FPKC pole mounting kit allows installation on a pole with a diameter between 60 mm (2.4 in.) and 300 mm (11.81 in.).

Before you start

Choose the FPKC screw length based on the FPKC screw length for optimum pole mounting compatibility section.

Equipment preconditions

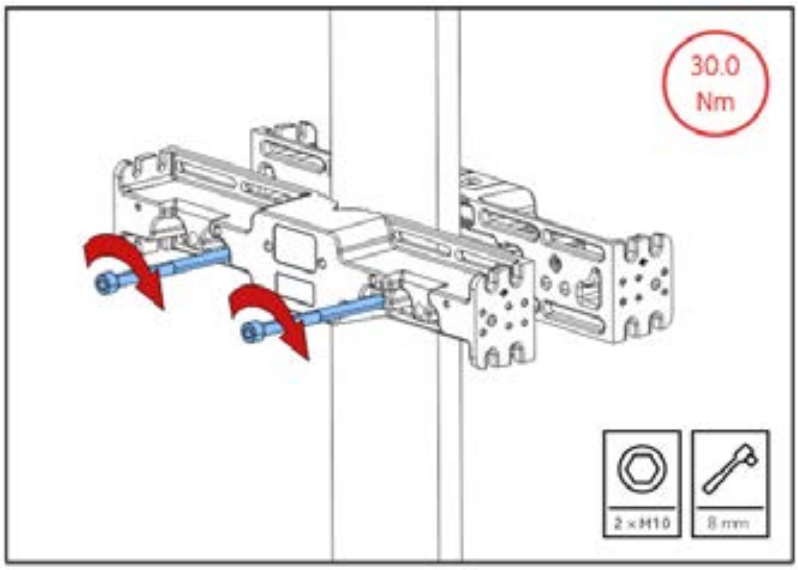
You need the following:

- ☐ 2 x FPKC Flexi pole mounting kit (472821A)
- ☐ FMFA Flexi mounting kit for floor, wall, and pole (470149A)
- ☐ Tools:
  - ☐ Torque wrench
  - ☐ 13 mm socket
  - ☐ 8 mm hex bit

Procedure

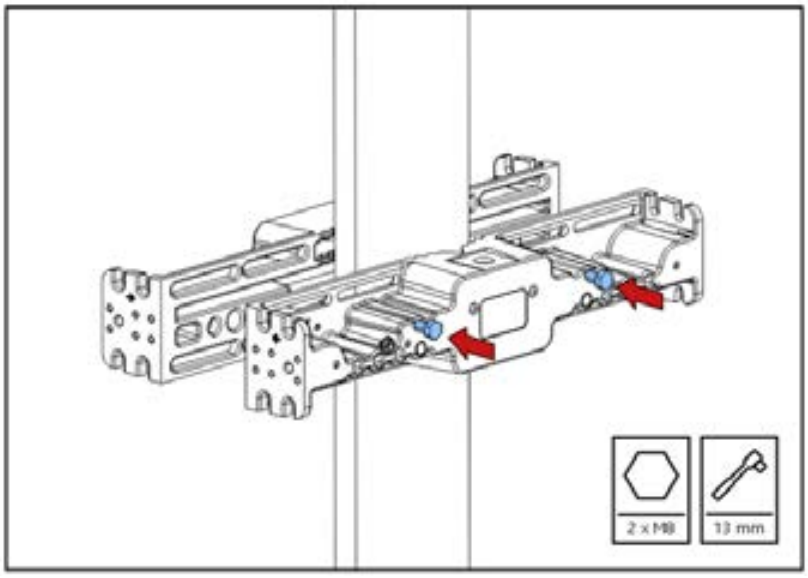
1 Fix the upper FPKC to a pole and tighten the two M10 screws to 30.0 Nm (22.1 ft-lb.).

Figure 100: Fixing the upper FPKC onto a pole



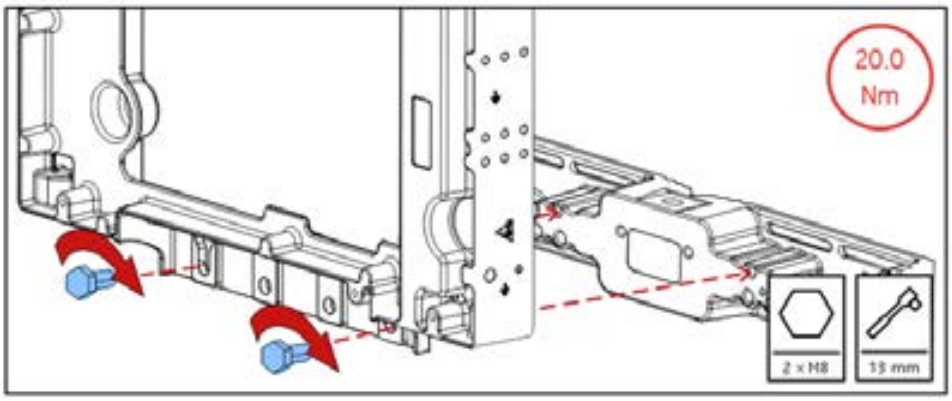
2 Tighten the two upper M8 screws halfway.

Figure 101: Tightening the two screws



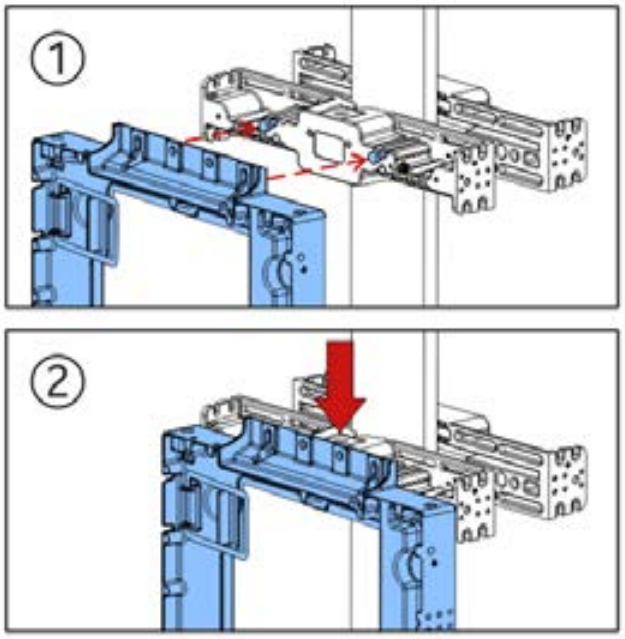
3 Fix the lower bracket to the plinth and tighten the two M8 screws to 20.0 Nm (14.8 ft-lb.).

Figure 102: Fixing the lower bracket



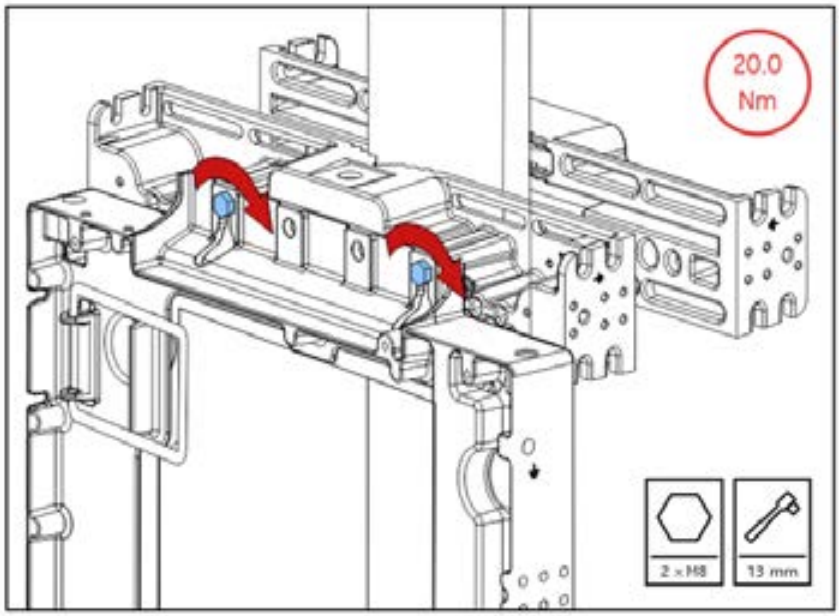
4 Hang the plinth on the two M8 screws.

Figure 103: Hanging the plinth



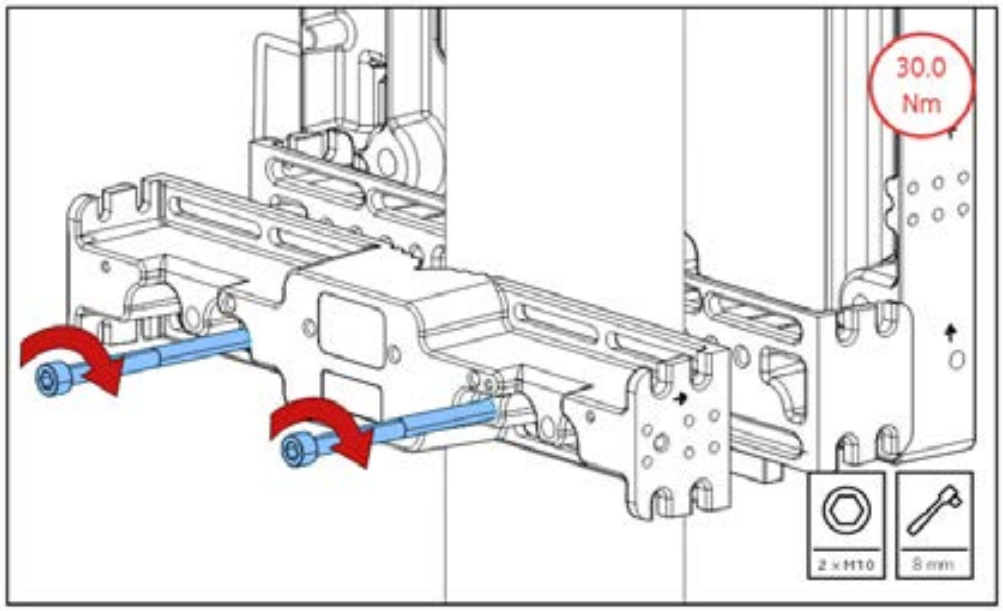
5 Tighten the upper M8 screws to 20.0 Nm (14.8 ft-lb.).

Figure 104: Tightening the upper screws



6 Fix and tighten the lower bracket M10 screws to 30.0 Nm (22.1 ft-lb.).

Figure 105: Tightening the lower bracket screws



11. Installing ASOE, ASOG, or ASOH in Flexi casings on a pole, wall, or floor

Installing ASOE, ASOG, or ASOH in a Flexi casing requires installation of the FMFA plinth.

11.1 Installing EMHA or EMHH casing on a floor

To install ASOE, ASOG, or ASOH on a floor, first fix the EMHA or EMHH casing to the FMFA plinth.

Before you start

Anchor the FMFA plinth to the floor as instructed in Anchoring FMFA plinth to a floor.

> **Note:**
> Fix the empty EMHA or EMHH casing to the FMFA plinth first, then proceed with installing and cabling the ASOE, ASOG, or ASOH core unit inside (starting from the bottom one).

Equipment preconditions

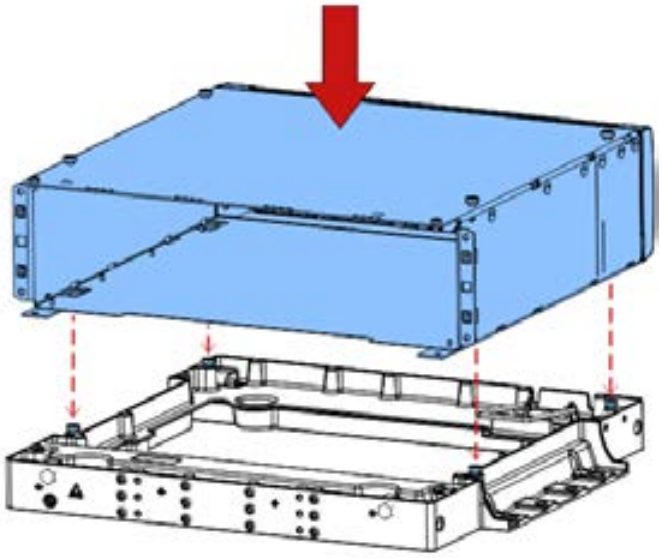
You need the following:

- ☐ EMHA Flexi module casing (470316A) or EMHH Flexi 3U casing (473187A)
- ☐ Tools:
  - ☐ Torque screwdriver
  - ☐ Torx bit T25

Procedure

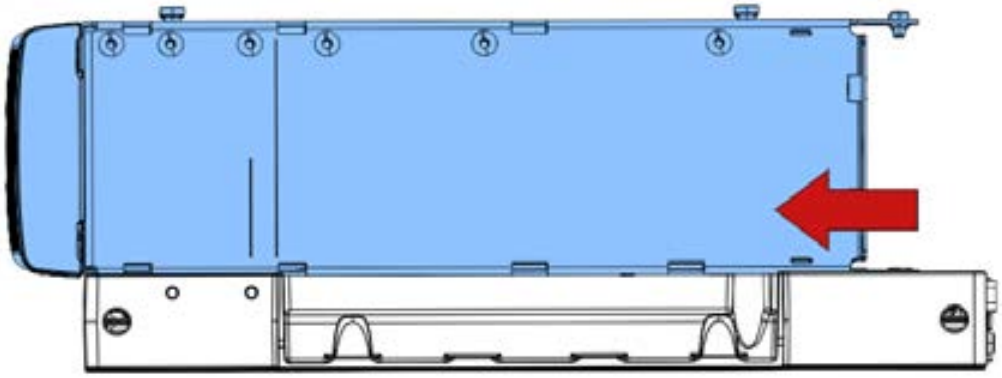
1 Align the holes on the casing bottom side with the fixing studs on the plinth.

Figure 106: Aligning the casing to the plinth



2 Push the casing back until it stops.

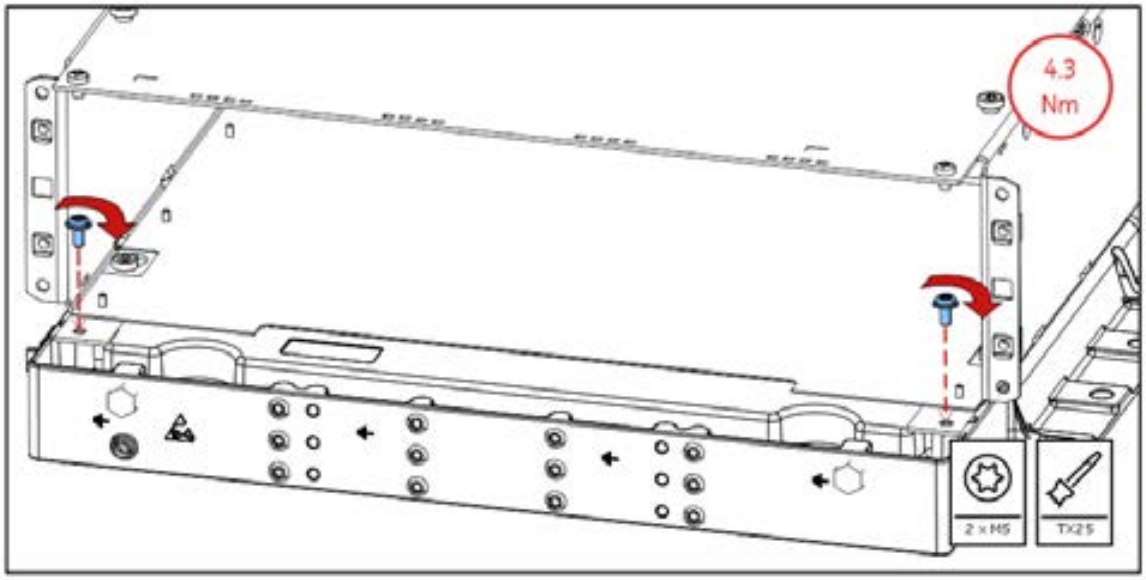
Figure 107: Securing the casing



3 Fix the casing to the plinth by tightening the two M5x12 screws to 4.3 Nm (38.1 in-lb.).

> **Note:**
>
> You can use the two M5x12 screws from the FMFA front panel.

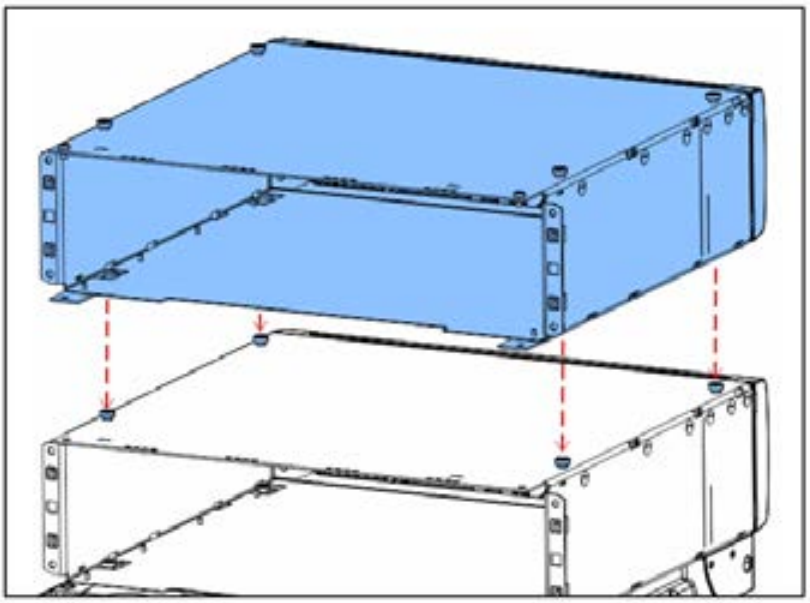
Figure 108: Fixing the casing to the plinth



4 Align the bottom holes on the second casing with the fixing studs on the first one.

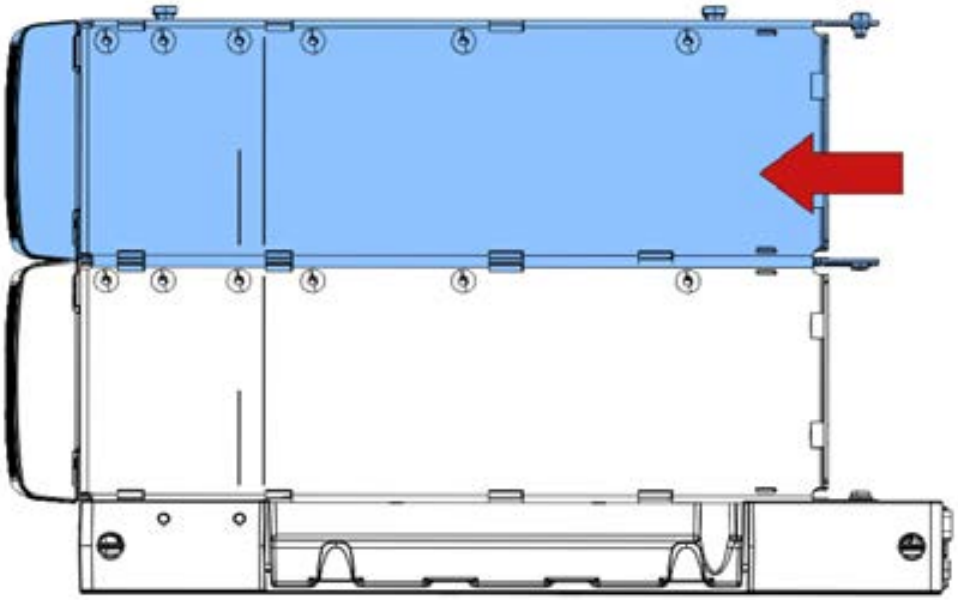
> **Note:**
>
> Proceed to step 7 if you install only one EMHH casing.

Figure 109: Aligning the second casing



5 Push the second casing back until it stops.

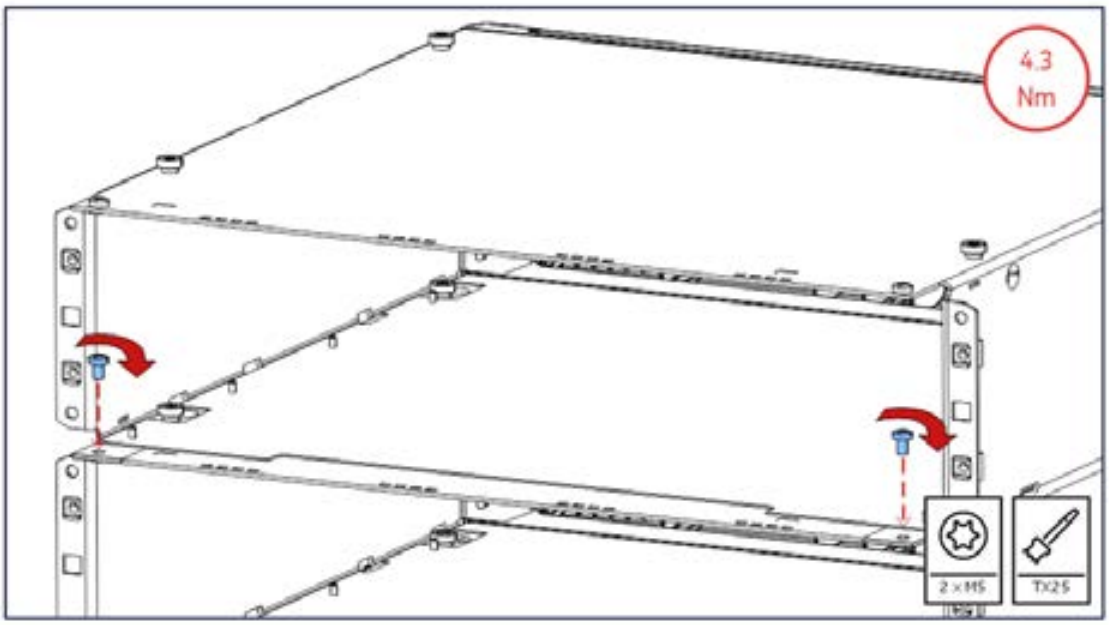
Figure 110: Securing the second casing



6 Install the second casing by tightening the two M5 screws to 4.3 Nm (38.1 in-lb.).

> **Note:**
>
> Use the two M5x8 screws from the EMHH or EMHA delivery.

Figure 111: Fixing the second casing



7 Install the ASOE, ASOG, or ASOH core unit as instructed in Installing ASOE, ASOG, or ASOH in EMHH casing.

11.2 Installing EMHA or EMHH casing onto plinth mounted on a pole or wall

To install several ASOE, ASOG, or ASOH core units on a pole or wall, first fix the EMHA or EMHH casing to the FMFA plinth.

Before you start

For wall installation, install the FMFA plinth on a wall as instructed in Installing FMFA plinth on a wall.

For pole installation, install the FMFA plinth on a pole as instructed in Mounting the FMFA plinth on a pole using FPKA or Mounting the FMFA plinth on a pole using FPKC.

Note:

Fix the empty EMHA or EMHH casing to FMFA plinth first, then proceed with installing and cabling the ASOE, ASOG, or ASOH core unit inside.

Note:

Figures in this procedure show FMFA plinth installed on a wall, but this procedure is the same for pole and wall installation cases.

Equipment preconditions

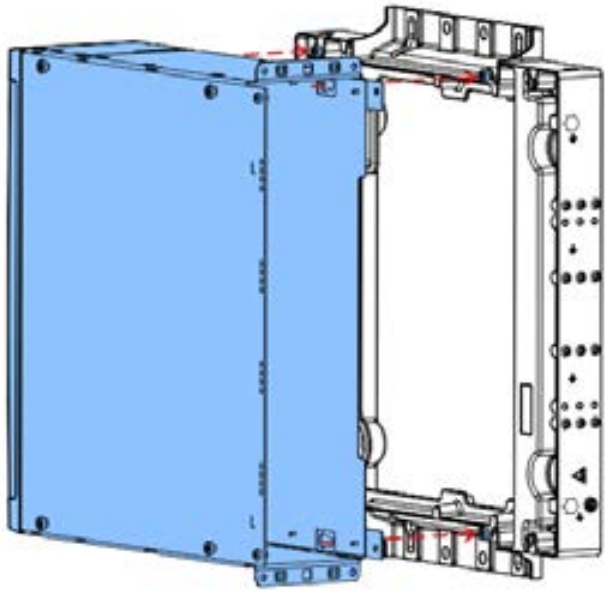
You need the following:

- ☐ EMHA Flexi module casing (470316A) or EMHH Flexi 3U casing (473187A)
- ☐ Tools:
  - ☐ Torque screwdriver
  - ☐ Torx bit T25

Procedure

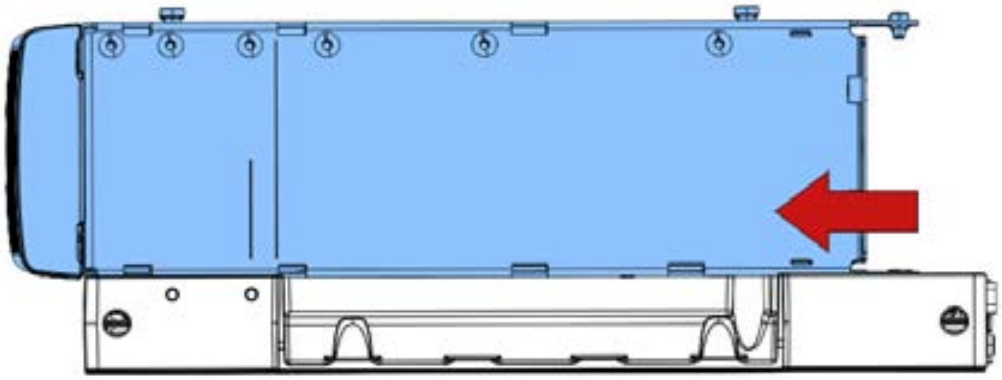
1 Align the holes on the bottom sie of the casing with the fixing studs on the plinth.

Figure 112: Aligning the casing with the plinth



2 Push the casing back until it stops.

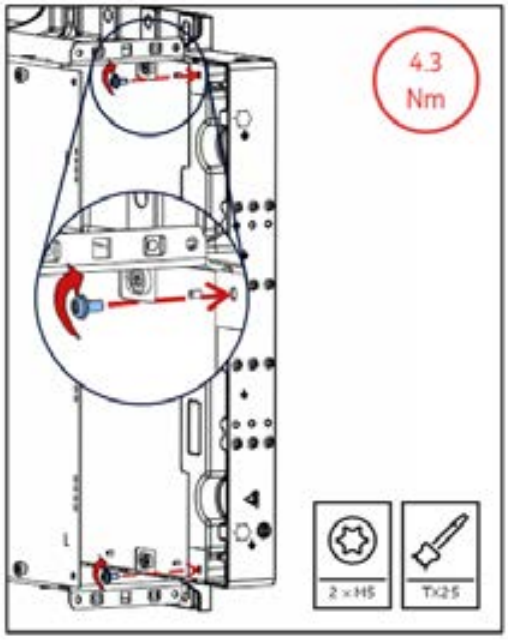
Figure 113: Securing the casing



3 Fix the casing to the plinth by tightening the two M5x12 screws to 4.3 Nm (38.1 in-lb.).

> **Note:**
>
> You can use the two M5x12 screws from the FMFA front panel.

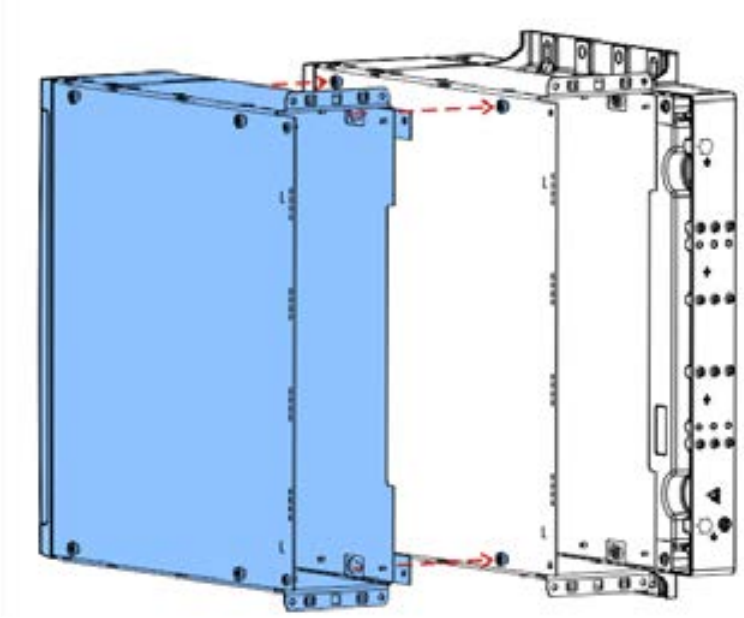
Figure 114: Fixing the casing to the plinth



4 Align the bottom holes on the second casing with the fixing studs on the first casing.

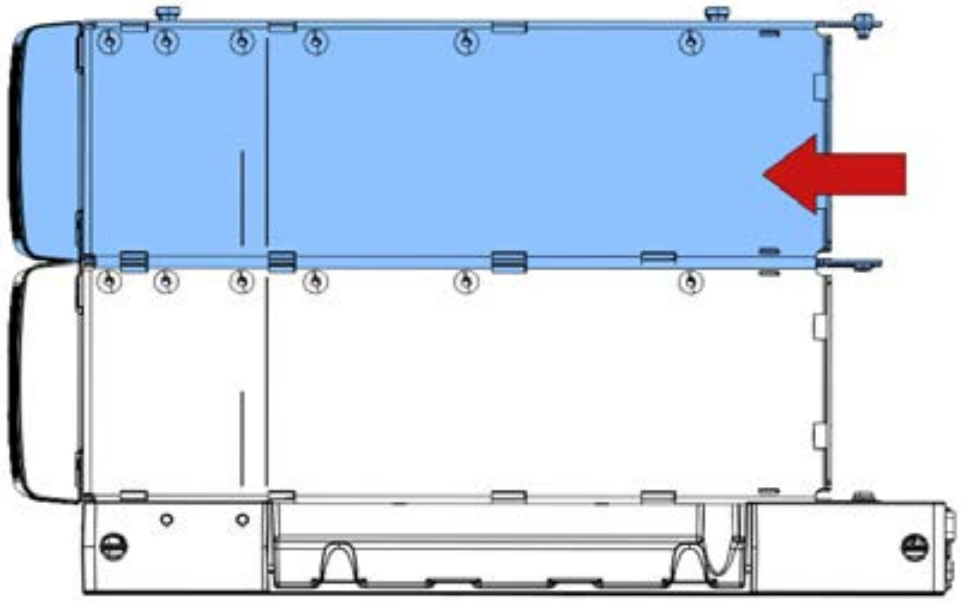
> **Note:**
>
> Proceed to step 7 if you install only one EMHH casing.

Figure 115: Aligning the second casing



5 Push the second casing back until it stops.

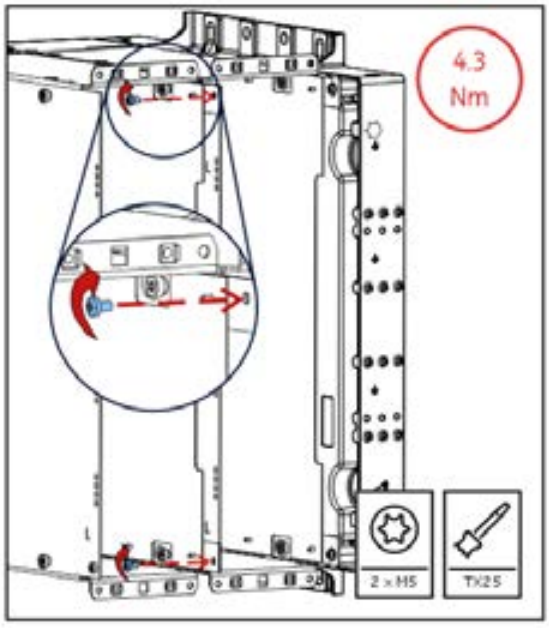
Figure 116: Securing the second casing



6 Fix the second casing by tightening the two M5x8 screws to 4.3 Nm (38.1 in-lb.).

> **Note:**
> Use the two M5x8 screws from the EMHH or EMHA delivery.

Figure 117: Fixing the second casing



7 Install the ASOE, ASOG, or ASOH core unit as instructed in Installing ASOE, ASOG, or ASOH in EMHH casing.

11.3 Installing ASOE, ASOG, or ASOH in EMHA casing

You can use the EMHA casing for indoor installation cases of single or multiple ASOE, ASOG, or ASOH core units.

Before you start

- These instructions show ASOE, but they are applicable to ASOG and ASOH as well.
- Install the AMJB rack installation kit as instructed in Installing AMJB rack installation kit.
- Prepare the fan tray for installation inside a Flexi casing as instructed in Preparing fan tray for installation inside Flexi casing.

Equipment preconditions

You need the following:

- ☐ EMHA Flexi module casing (470316A)
- ☐ Tools:
  - ☐ Torque screwdriver
  - ☐ Torx bit T25
  - ☐ Flat-head screwdriver

Procedure

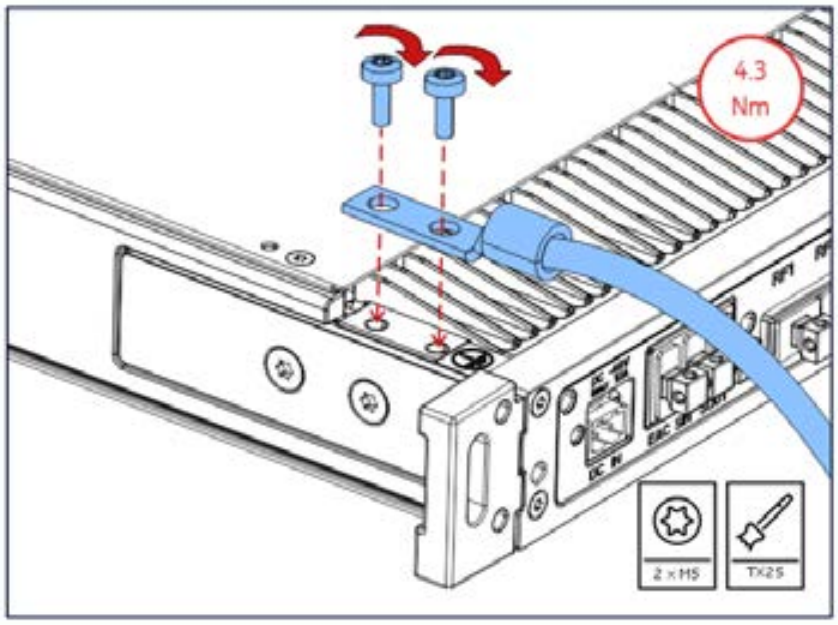
1 Connect the grounding cable and tighten the two M5 screws to 4.3 Nm (38.1 in-lb.).

If you're installing two core units, connect the grounding cable to both.

Select from the available options

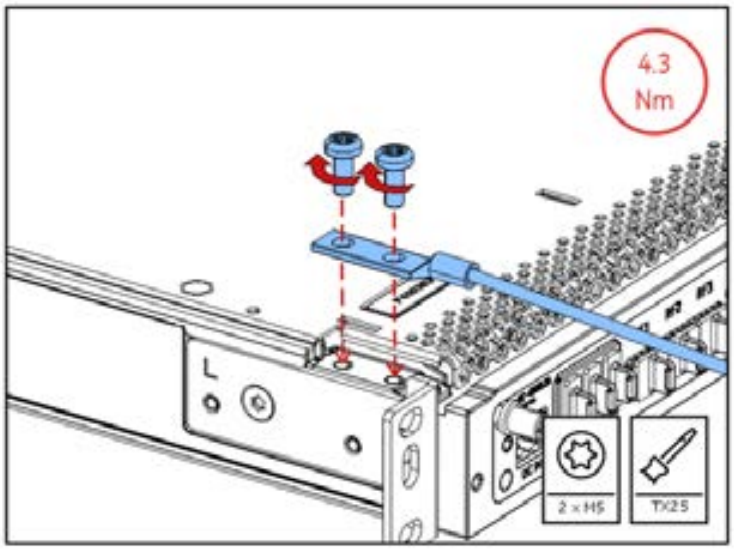
- ASOE

Figure 118: Connecting the grounding cable to ASOE



- ASOG/H

  Figure 119: Connecting the grounding cable to ASOG/H

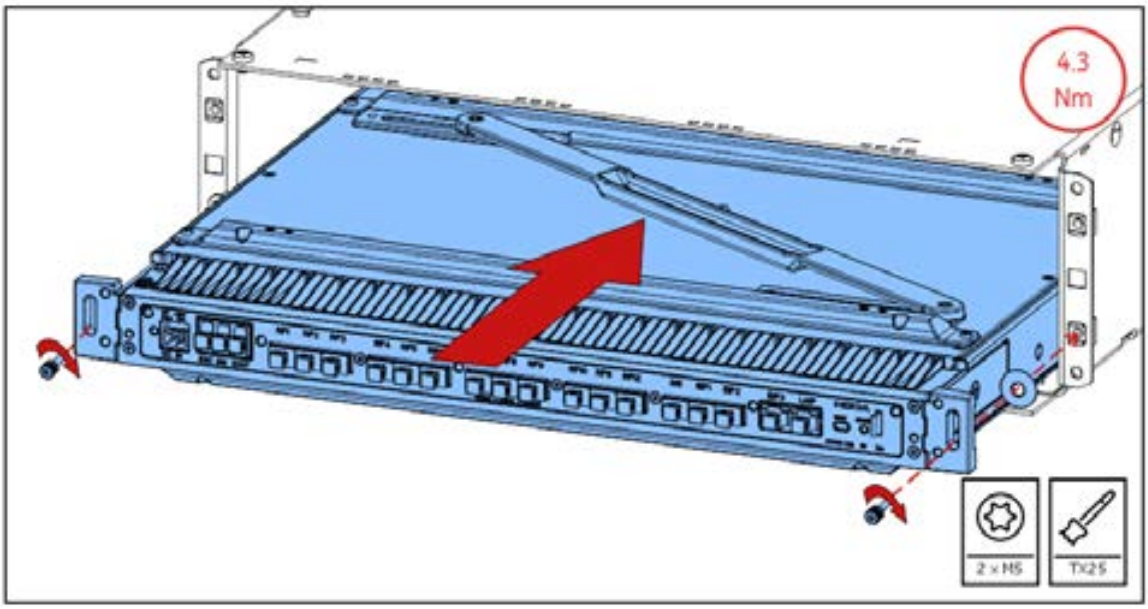


2 Insert the lower core unit into the casing and tighten the two M5 Torx captive screws to 4.3 Nm (38.1 in-lb.).

Note:

Use the M5 Torx captive screws with washers from the AMJB delivery.

Figure 120: Inserting the lower core unit



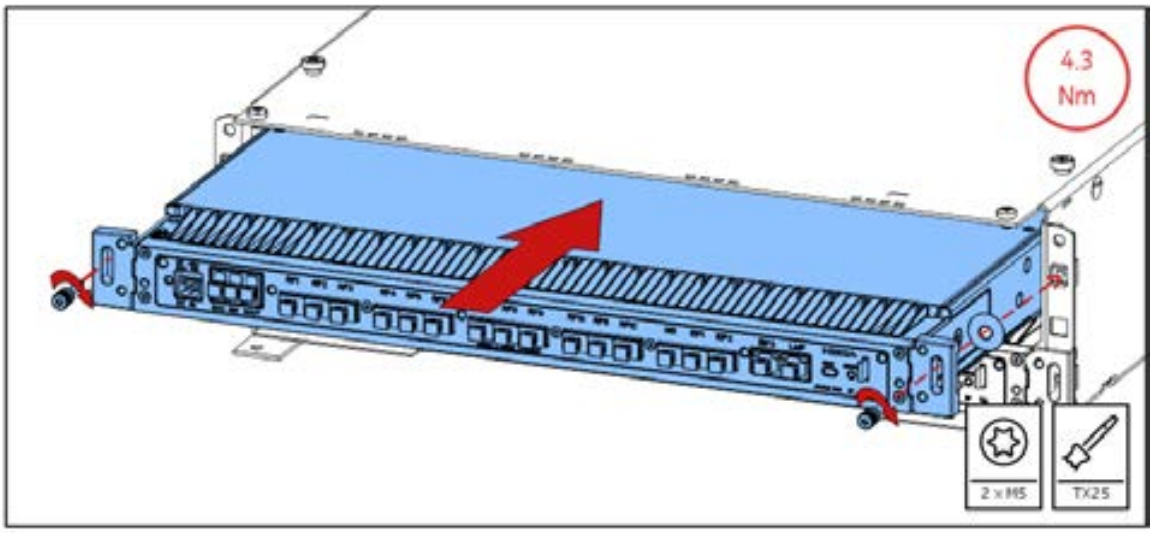
3 Insert the upper core unit into the casing and tighten the two M5 Torx captive screws to 4.3 Nm (38.1 in-lb.).

> **Note:**
> Use the M5 Torx captive screws with washers from the AMJB delivery.

Skip this step if you're installing only one core unit.

In vertical installations, first push the lower core unit to the side and then insert the second core unit. Otherwise, it may be blocked and not go fully inside.

Figure 121: Inserting the upper core unit



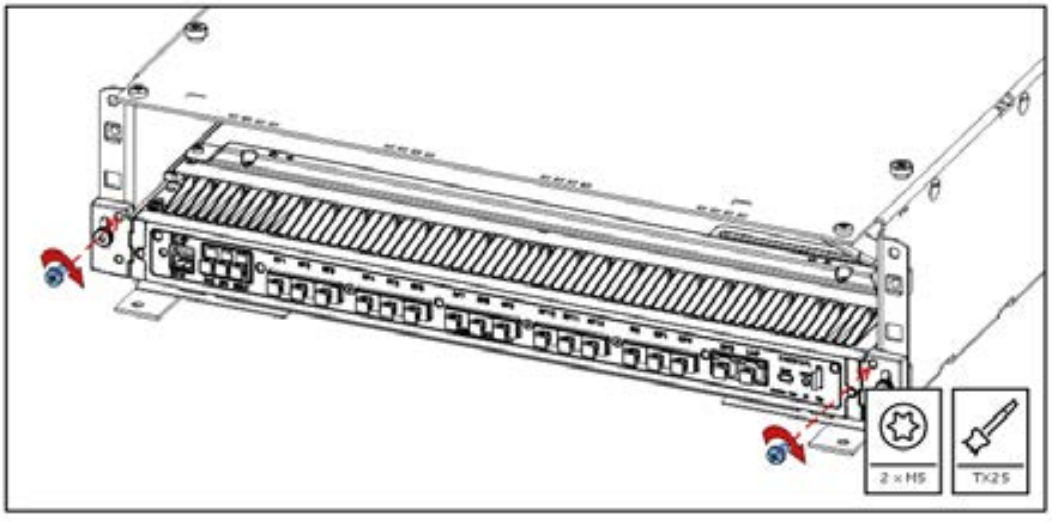
4 Install two FMCA cable entries (single core unit).

Skip this step if you're installing two core units.

4.1 Tighten the two M5 screws halfway in.

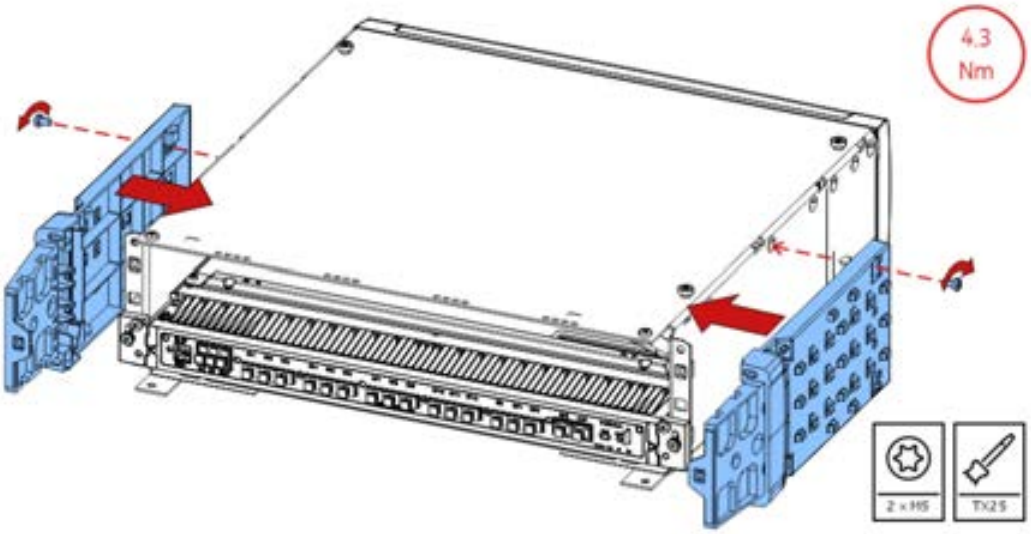
Skip this step for ASOG or ASOH.

Figure 122: Tightening the M5 screws halfway in



4.2 Fix both cable entries to the casing and tighten the two M5 screws to 4.3 Nm (38.1 in -lb.).

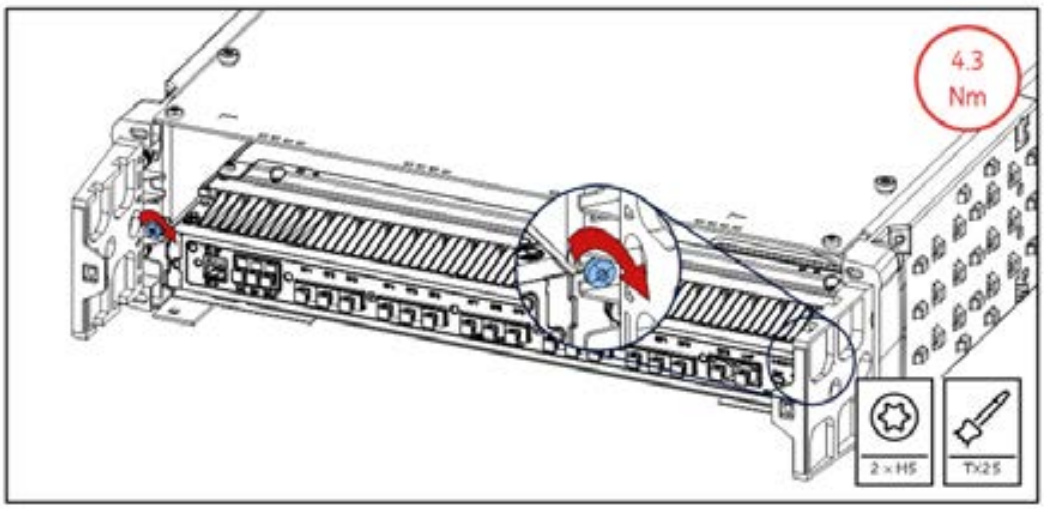
Figure 123: Installing the cable entries



4.3 Tighten the two M5 screws to 4.3 Nm (38.1 in-lb.).

Skip this step for ASOG or ASOH.

Figure 124: Tightening the M5 screws



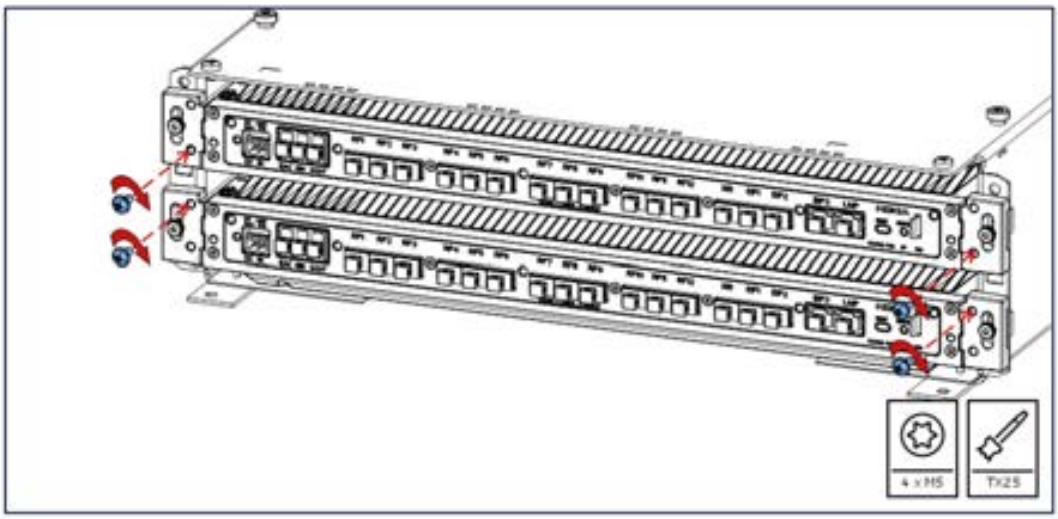
5 Install two FMCA cable entries (two core units).

Skip this step if you're installing one core unit.

5.1 Tighten the four M5 screws halfway in.

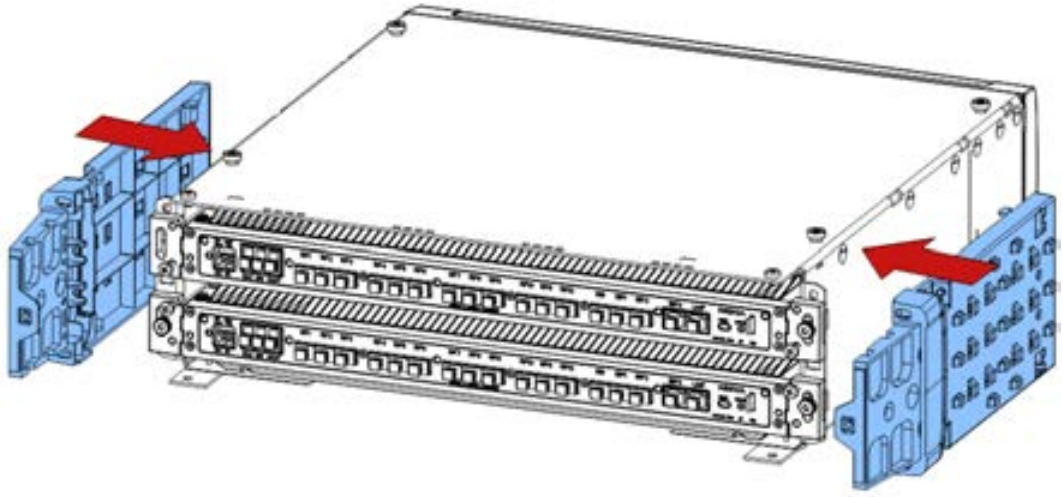
Skip this step for ASOG or ASOH.

Figure 125: Tightening the four M5 screws halfway in



5.2 Fix both cable entries to the casing.

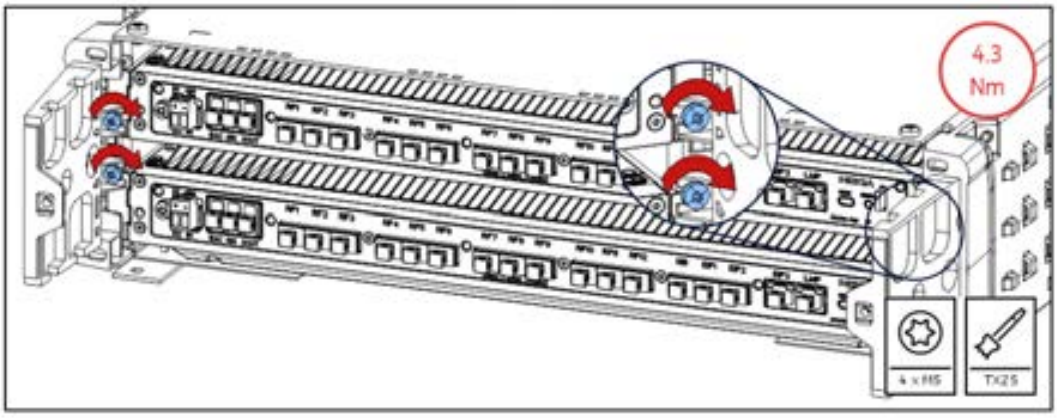
Figure 126: Fixing the cable entries



5.3 Tighten the four M5 screws to 4.3 Nm (38.1 in-lb.).

Skip this step for ASOG or ASOH.

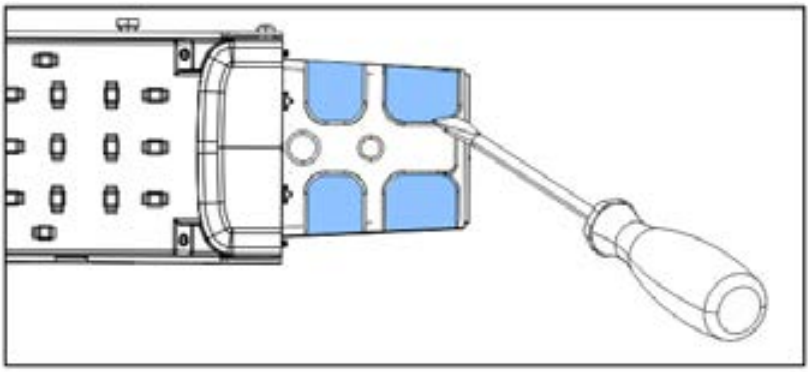
Figure 127: Tightening the M5 screws



6 Tear holes in the rubber to route the cables.

> **Tip:**
>
> Use a flat-head screwdriver or knife.

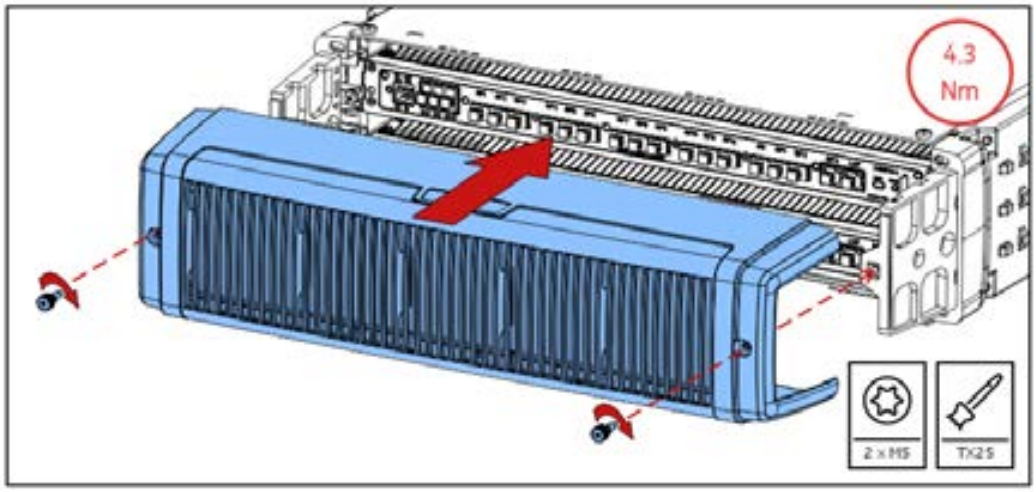
Figure 128: Tearing holes to route the cables



7 Connect the cables as described in Cabling ASOE, ASOG, or ASOH.

8 Install the front cover and tighten the two M5 screws to 4.3 Nm (38.1 in-lb.).

Figure 129: Installing the front cover



11.4 Installing ASOE, ASOG, or ASOH in EMHH casing

You can use the EMHH casing for outdoor or indoor installation cases of single or multiple ASOE, ASOG, or ASOH core units.

Before you start

- These instructions show ASOE, but they are applicable to ASOG and ASOH as well.
- For outdoor installation, install the AMJA (for ASOE) or AMJJ (for ASOG/H) cable entry as instructed in Installing AMJA outdoor cable entry or Installing AMJJ outdoor cable entry.
- Install the AMJB rack installation kit as instructed in Installing AMJB rack installation kit.
- Prepare the fan tray for installation inside a Flexi casing as instructed in Preparing fan tray for installation inside Flexi casing.
- If necessary, install the AMHC heater for ASOG as instructed in Installing AMHC external heater.

Note:

Figures in this procedure show ASOE with AMJA. For indoor installation, AMJA (for ASOE) or AMJJ (for ASOG or ASOG) isn't required.

Equipment preconditions

You need the following:

- ☐ EMHH Flexi module casing (473187A)
- ☐ Tools:
  - ☐ Torque screwdriver
  - ☐ Torx bit T25
  - ☐ 160 mm (6.30 in.) long Torx bit T25
  - ☐ Flat-head screwdriver

Procedure

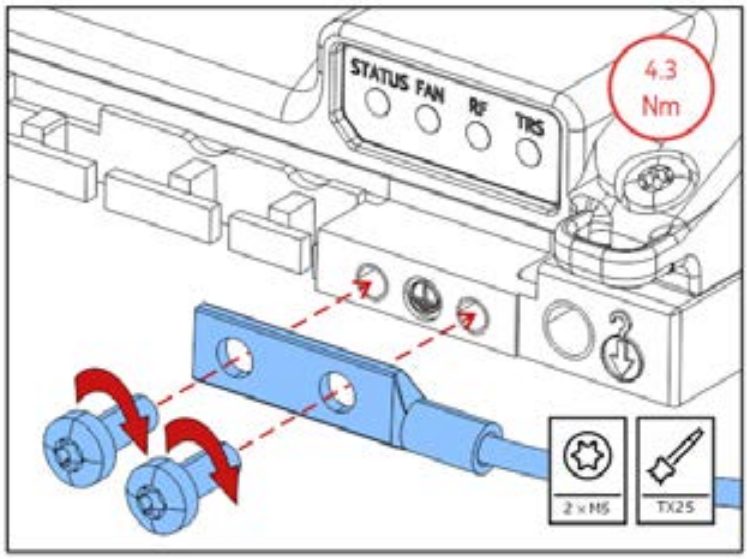
1 Connect the grounding cable and tighten the two M5 screws to 4.3 Nm (38.1 in-lb.).

> **Note:**
> When installing two core units, connect the grounding cable to both. For installation inside EMHH casing, use the front (for ASOE) or side (for ASOG or ASOH) grounding point for easier cable management.

Select from the available options

- ASOE

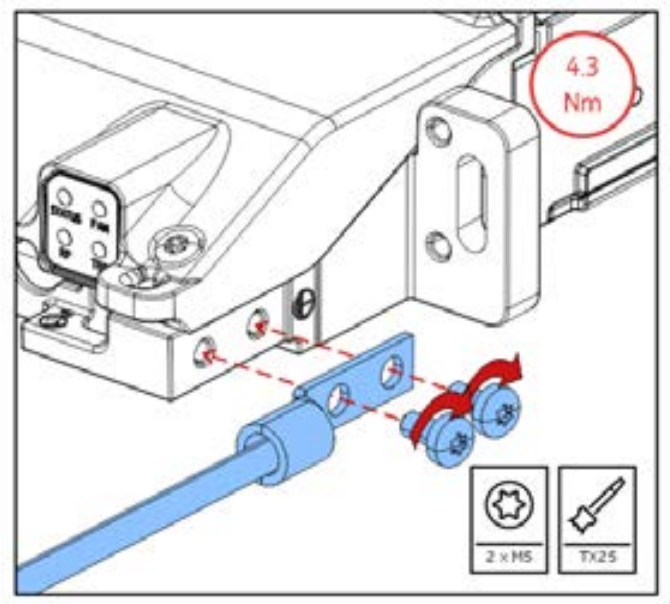
  Figure 130: Front grounding point with AMJA



- ASOG/H

  You can use the grounding point on either the left or right side of AMJJ.

Figure 131: Side grounding point with AMJJ

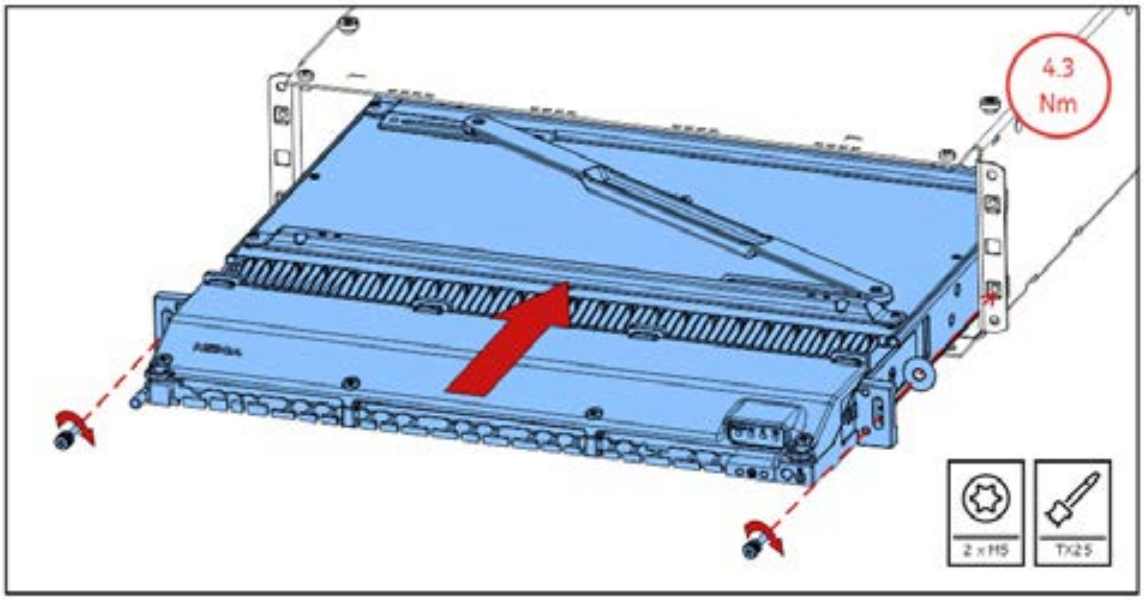


2 Insert the lower core unit and tighten the two M5 Torx captive screws to 4.3 Nm (38.1 in-lb.).

Note:

- Use the M5 Torx captive screws with washers from the AMJB delivery.
- Make sure you push the lower core unit all the way inside the casing before inserting the top unit.

Figure 132: Inserting the lower core unit



3 Connect the cables as described in Cabling ASOE, ASOG, or ASOH.

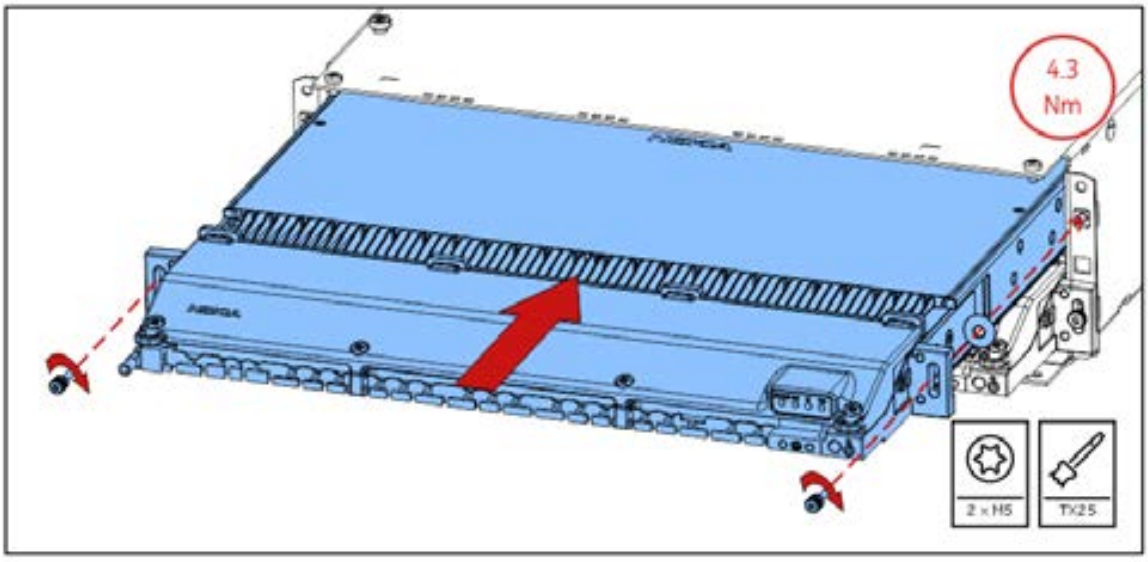
4 Insert the upper core unit and tighten the two M5 Torx captive screws to 4.3 Nm (38.1 in-lb.).

> **Note:**
> Use the M5 Torx captive screws with washers from the AMJB delivery.

Skip this step if you're installing only one core unit.

In vertical installations, first push the lower core unit to the side and then insert the second core unit. Otherwise, it may be blocked and not go fully inside.

Figure 133: Inserting the upper core unit

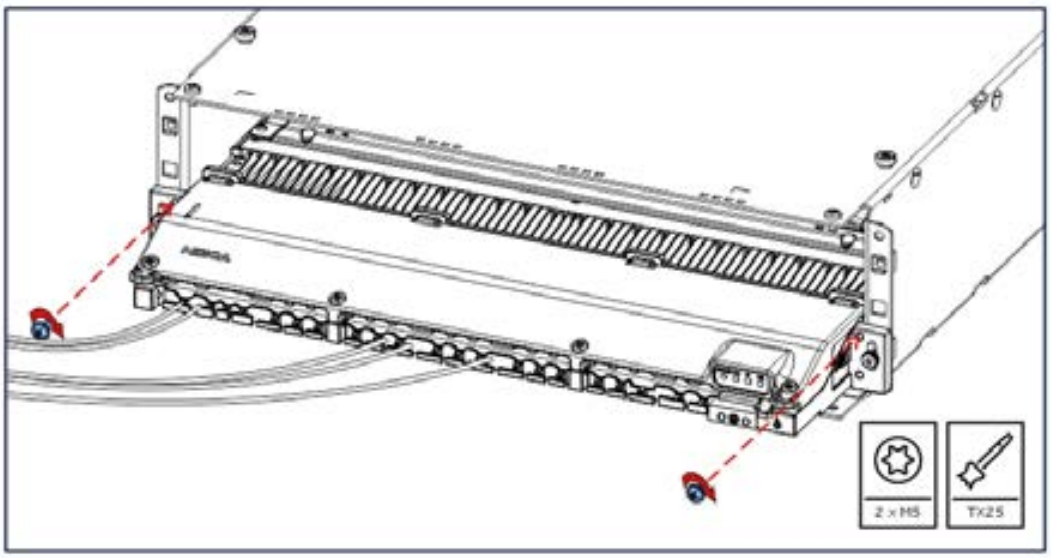


5 Connect the cables as described in Cabling ASOE, ASOG, or ASOH.

6 Install two FMCH cable entries (single core unit).

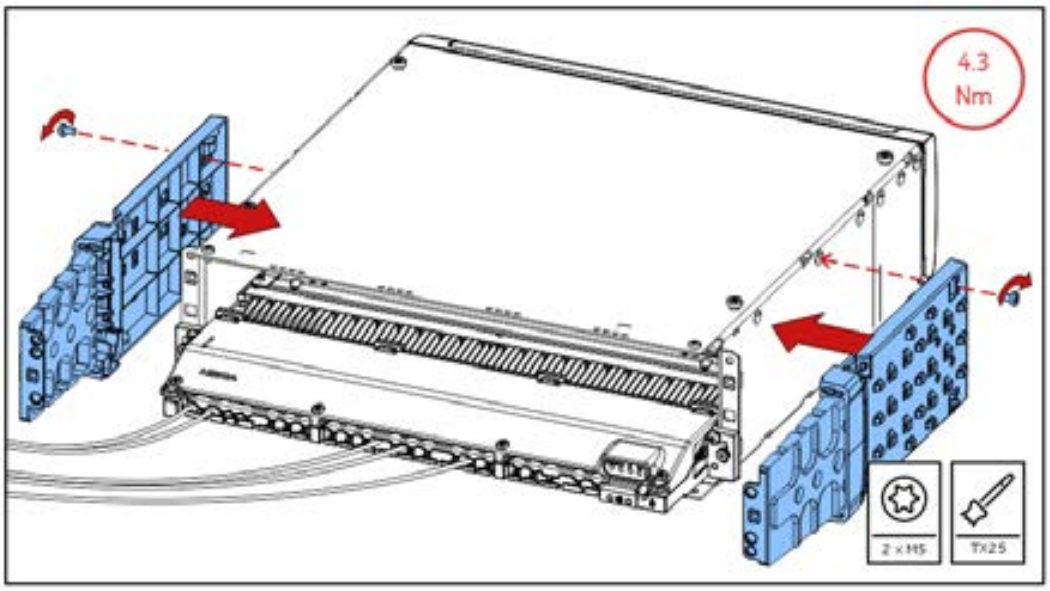
6.1 Tighten the two M5 screws halfway in.

Figure 134: Tightening the M5 screws halfway in



6.2 Fix both cable entries to the casing and tighten the two M5 screws to 4.3 Nm (38.1 in -lb.).

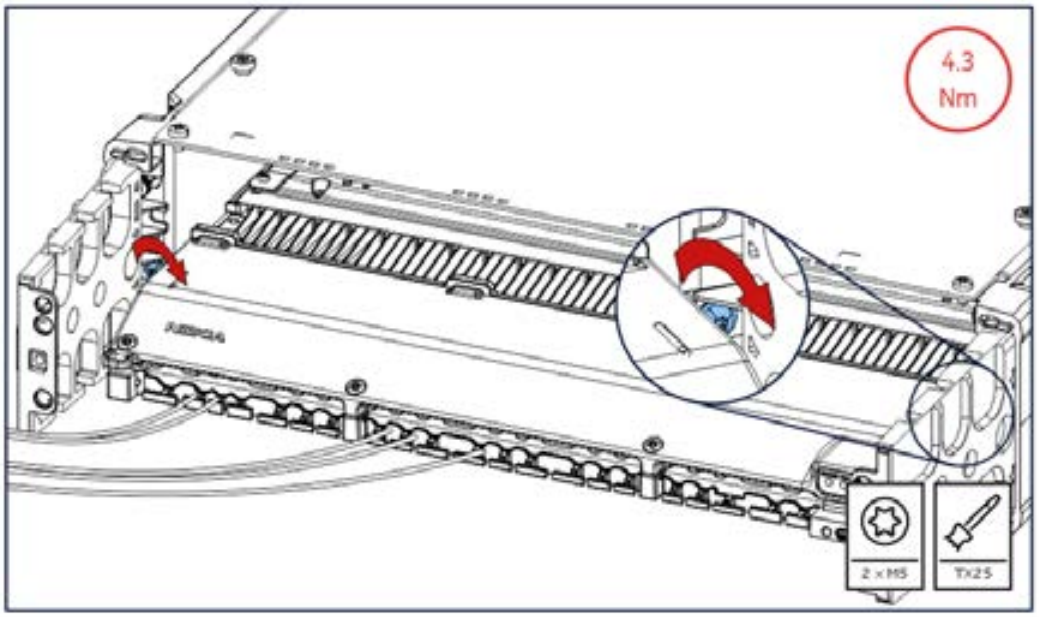
Figure 135: Installing the cable entries



6.3 Tighten the two M5 screws to 4.3 Nm (38.1 in-lb.).

> **Note:**
> You need at least a 160 mm (6.30 in.) long bit is needed to reach these screws.

Figure 136: Tightening the M5 screws

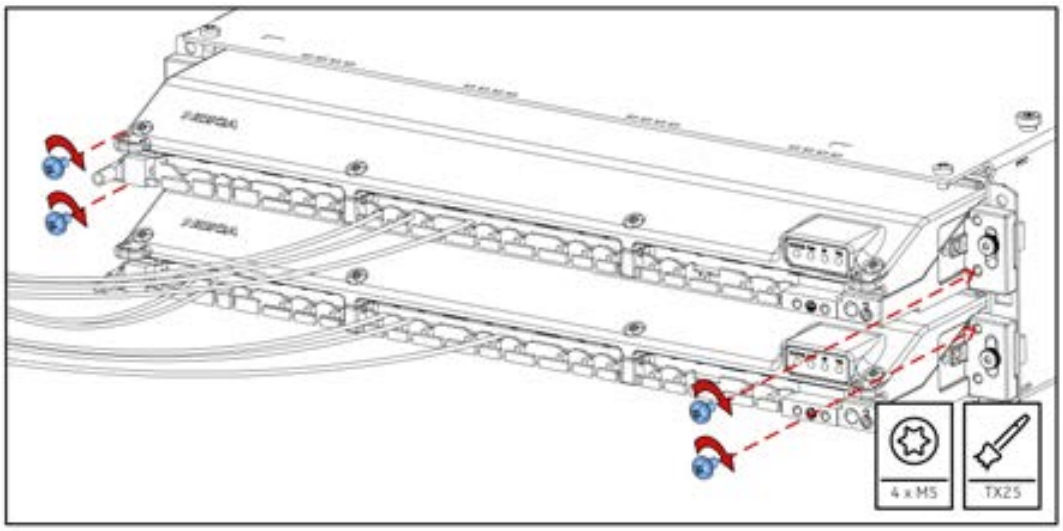


7 Install two FMCH cable entries (two core units).

Skip this step if you're installing one core unit.

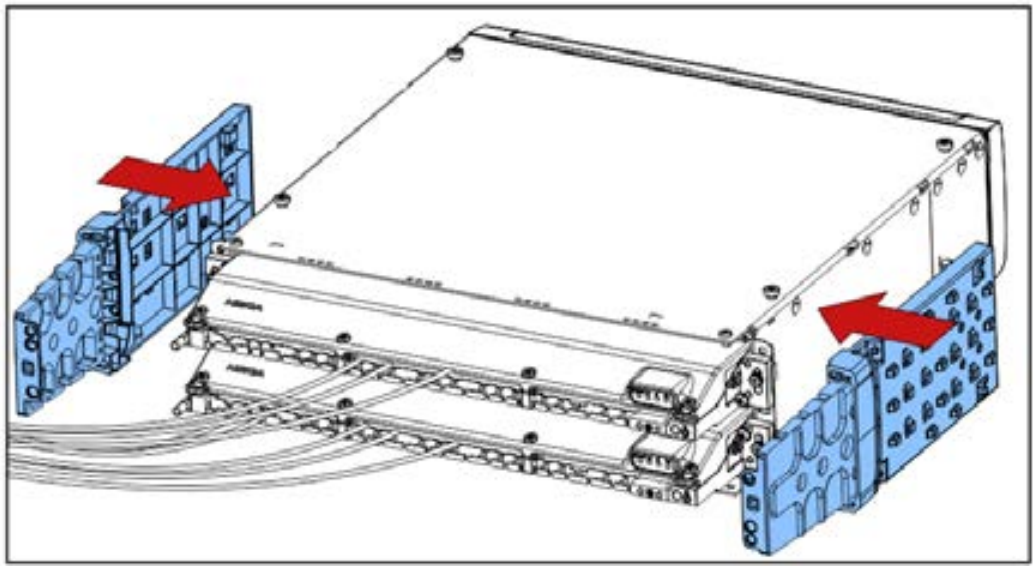
7.1 Tighten the four M5 screws halfway in.

Figure 137: Tightening the M5 screws halfway in



7.2 Fix both cable entries to the casing.

Figure 138: Fixing the cable entries

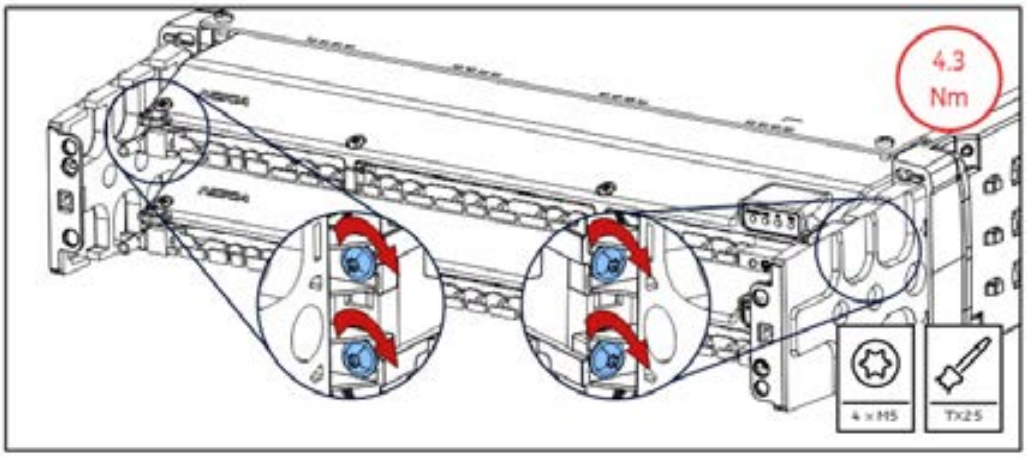


7.3 Tighten the four M5 screws to 4.3 Nm (38.1 in-lb.).

Note:

You need at least a 160 mm (6.30 in.) long bit is needed to reach these screws.

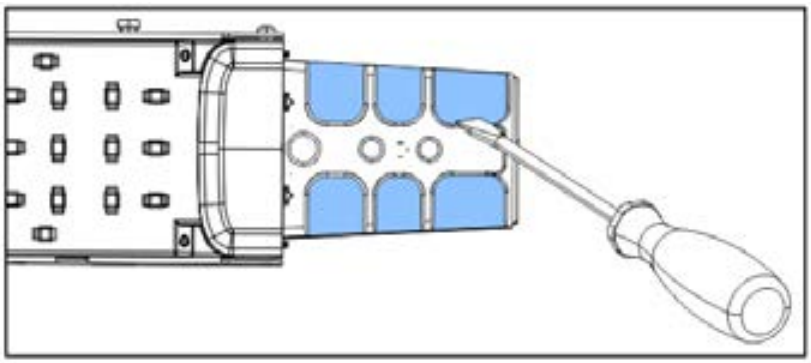
Figure 139: Tightening the M5 screws



8 Tear holes in the rubber to route the cables.

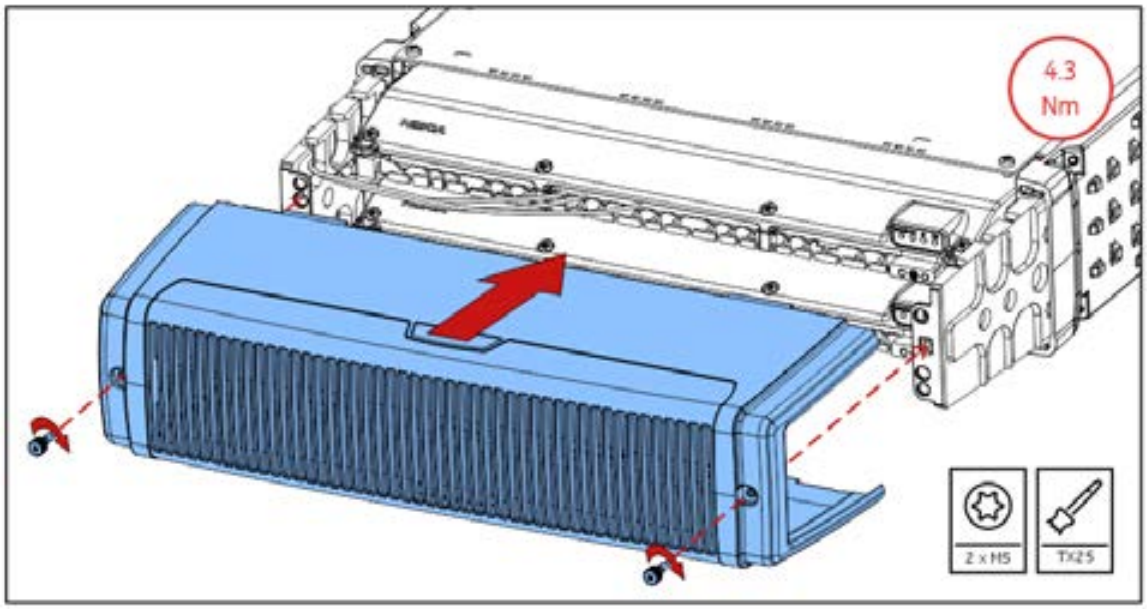
> **Tip:**
>
> Use a flat-head screwdriver or knife.

Figure 140: Tearing holes to route the cables



9 Install the front cover and tighten the two M5 screws to 4.3 Nm (38.1 in-lb.).

Figure 141: Installing the front cover



Postrequisites

To see the installation of ASOE into the EMHH casing, go to *Single RAN/Videos/Installing SM*.

Note:

The video serves as a procedure overview only. For full instructions, always refer to the installation manual.

12. Installing ASOE, ASOG, or ASOH on a pole

You can install ASOE, ASOG, or ASOH on a pole using on of the supported mounting brackets.

12.1 Installing ASOE, ASOG, or ASOH on a pole using FPKA

The FPKA pole mounting kit allows book-mount installation on a pole with a diameter between 30 mm (1.18 in.) and 120 mm (4.72 in.).

Before you start

- These instructions show ASOE, but they are applicable to ASOG and ASOH as well.
- Install the AMJA (for ASOE) or AMJJ (for ASOG or ASOH) cable entry as instructed in Installing AMJA outdoor cable entry or Installing AMJJ outdoor cable entry.
- Install the AMJC wall and pole mount kit as instructed in Installing AMJC wall and pole mount kit.
- Install the dust cover as instructed in Installing dust cover.

Equipment preconditions

You need the following:

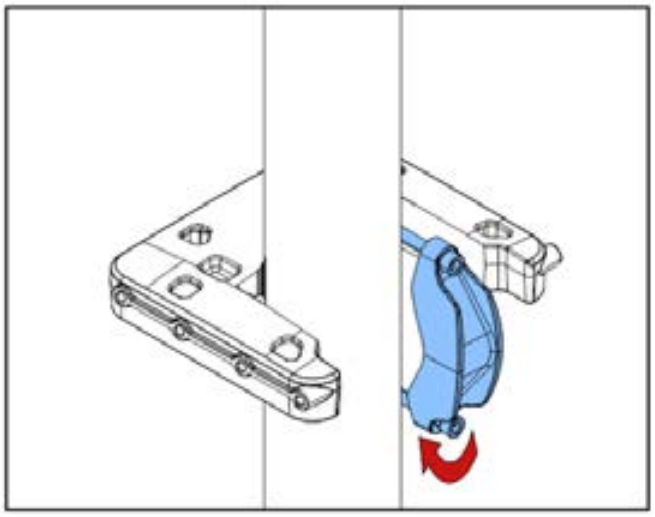
- ☐ 2 x FPKA Flexi pole mounting kit (471649A)
- ☐ Tools:
  - ☐ Torque wrench
  - ☐ 13 mm socket
  - ☐ 8 mm hex bit

Procedure

1 Install the upper mounting bracket (FPKA) on a pole.

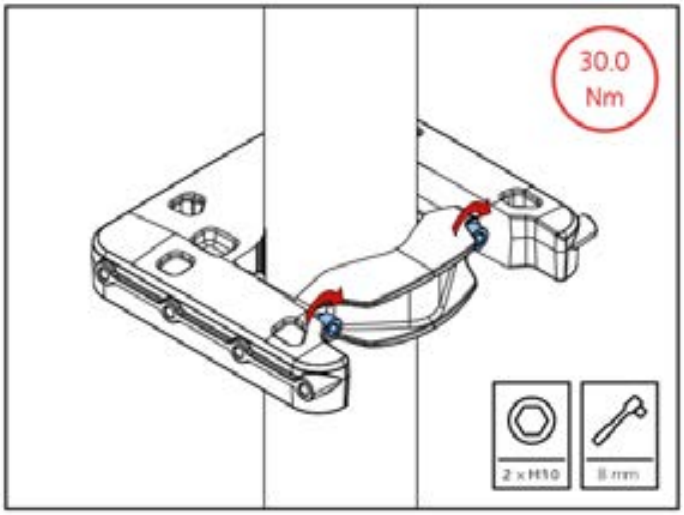
> **Note:**
> Make sure that the upper bracket is level.

Figure 142: Fixing the upper FPKA onto a pole



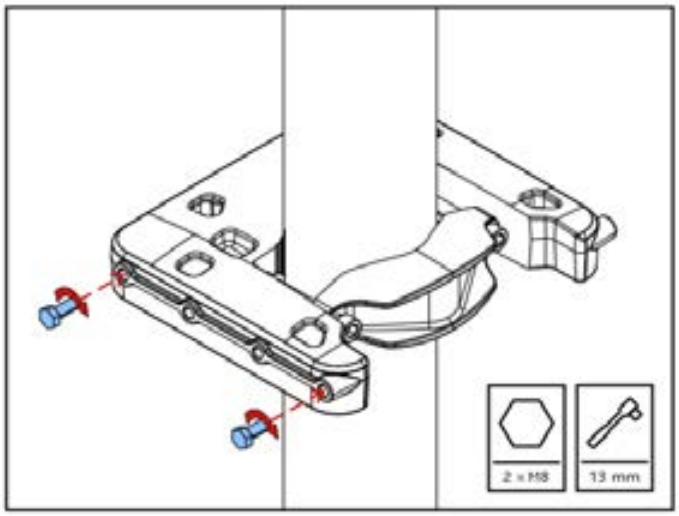
2 Tighten the two M10 screws to 30.0 Nm (22.1 ft-lb.).

Figure 143: Tightening bracket screws



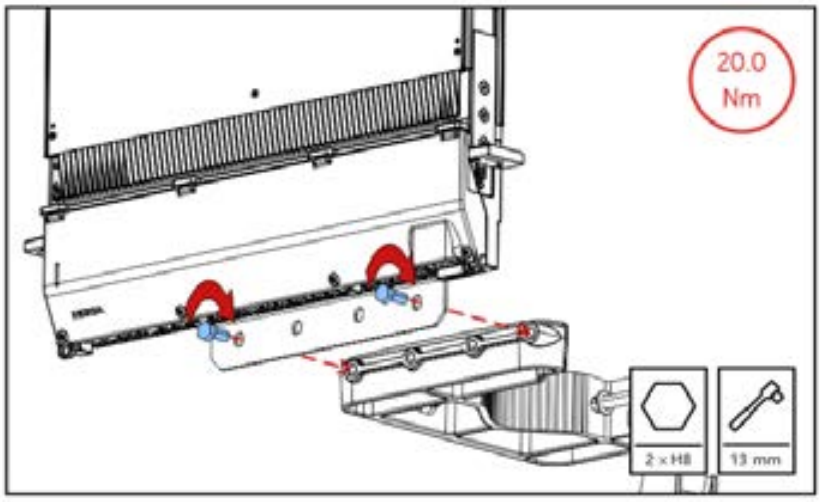
3 Tighten the two upper M8 screws halfway.

Figure 144: Tightening two upper screws



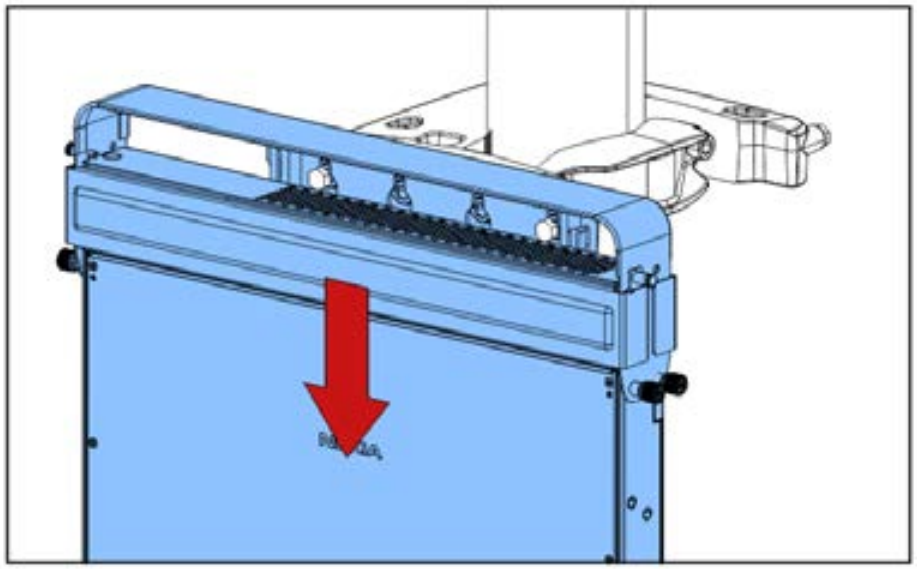
4 Fix the lower pole mounting bracket (FPKA) to the bottom AMJC bracket and tighten the two M8 screws to 20.0 Nm (14.8 ft-lb.).

Figure 145: Fixing the lower FPKA to AMJC



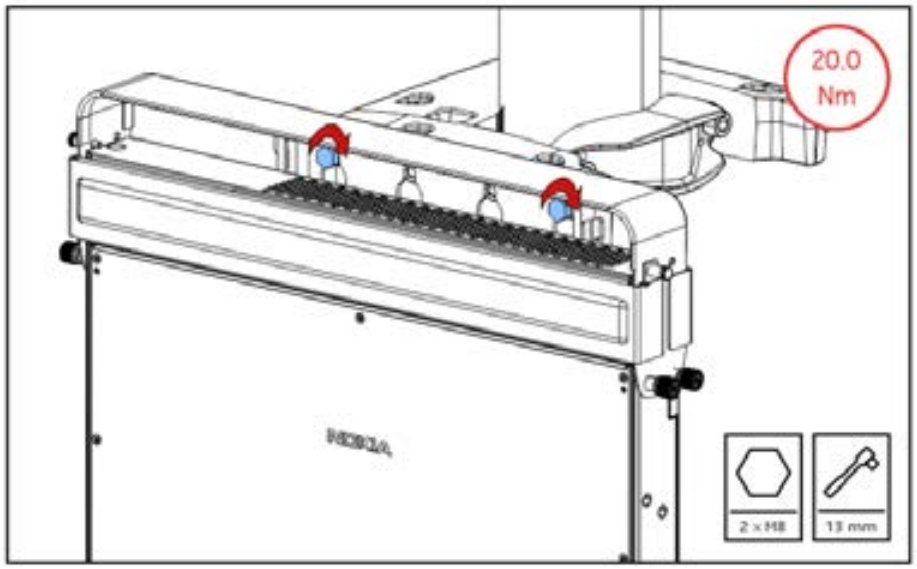
5 Hang the core unit on the upper M8 screws.

Figure 146: Hanging the core unit



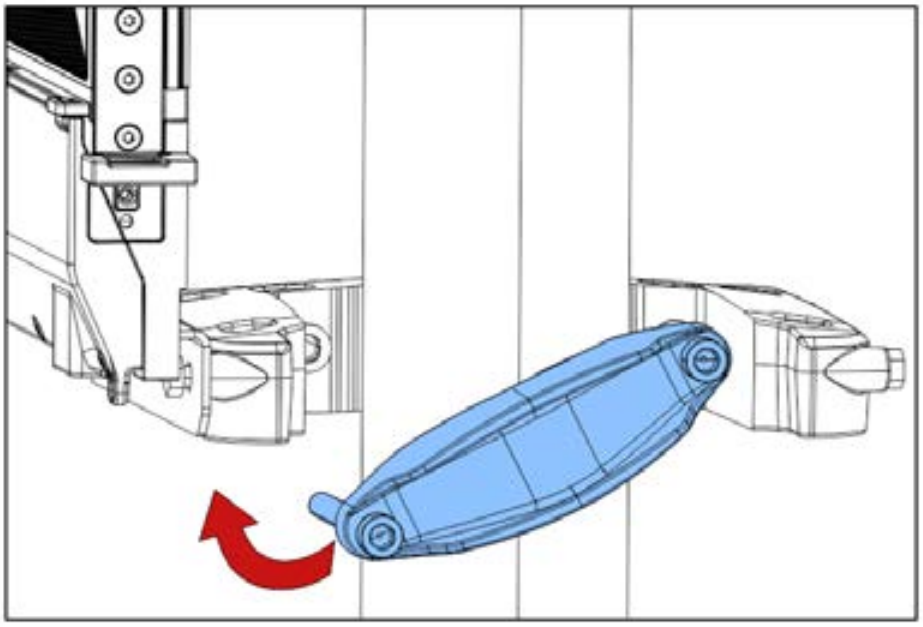
6 Tighten the two upper M8 screws to 20.0 Nm (14.8 ft-lb.).

Figure 147: Tightening the upper screws



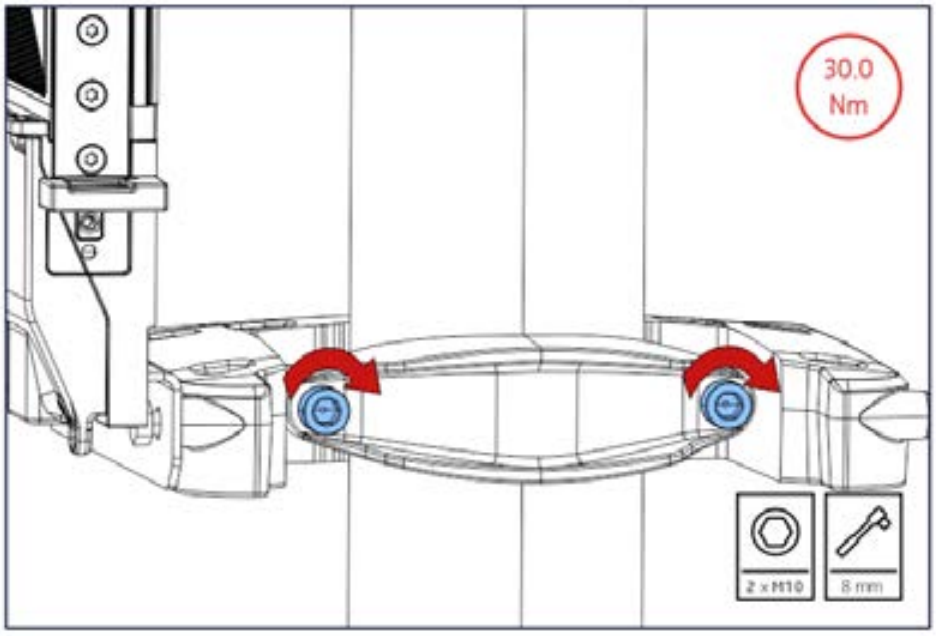
7 Fix the lower mounting bracket (FPKA) onto a pole.

Figure 148: Fixing the lower bracket



8 Tighten the two M10 bracket screws to 30 Nm (22.1 ft-lb.).

Figure 149: Tightening the lower bracket screws



12.2 Installing ASOE, ASOG, or ASOH on a pole using FPKC

The FPKC pole mounting kit allows installation on a pole with a diameter between 60 mm (2.36 in.) and 300 mm (11.81 in.).

Before you start

- These instructions show ASOE, but they are applicable to ASOG and ASOH as well.
- Install the AMJA (for ASOE) or AMJJ (for ASOG or ASOH) cable entry as instructed in Installing AMJA outdoor cable entry or Installing AMJJ outdoor cable entry.
- Install the AMJC wall and pole mount kit as instructed in Installing AMJC wall and pole mount kit.
- Install the dust cover as instructed in Installing dust cover.
- Choose the FPKC screw length based on the FPKC screw length for optimum pole mounting compatibility.

Equipment preconditions

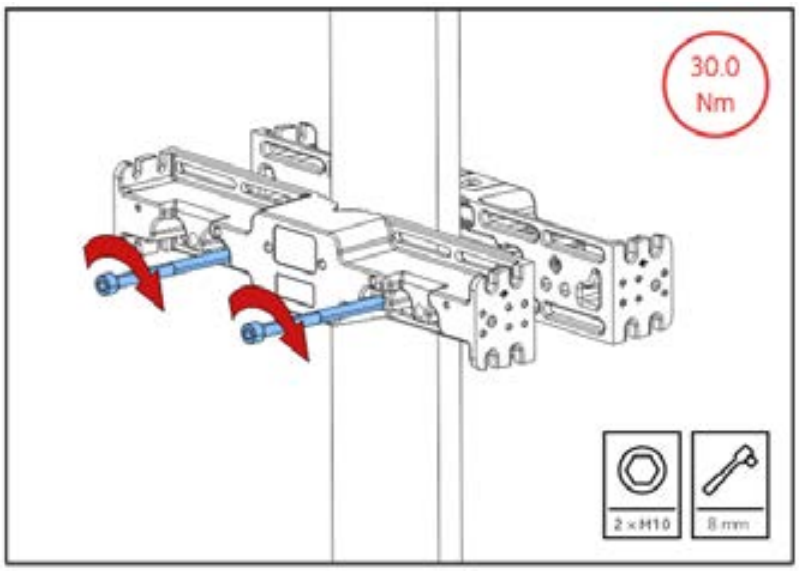
You need the following:

- ☐ 2 x FPKC Flexi pole mounting kit (472821A)
- ☐ Tools:
  - ☐ Torque wrench
  - ☐ 13 mm socket
  - ☐ 8 mm hex bit

Procedure

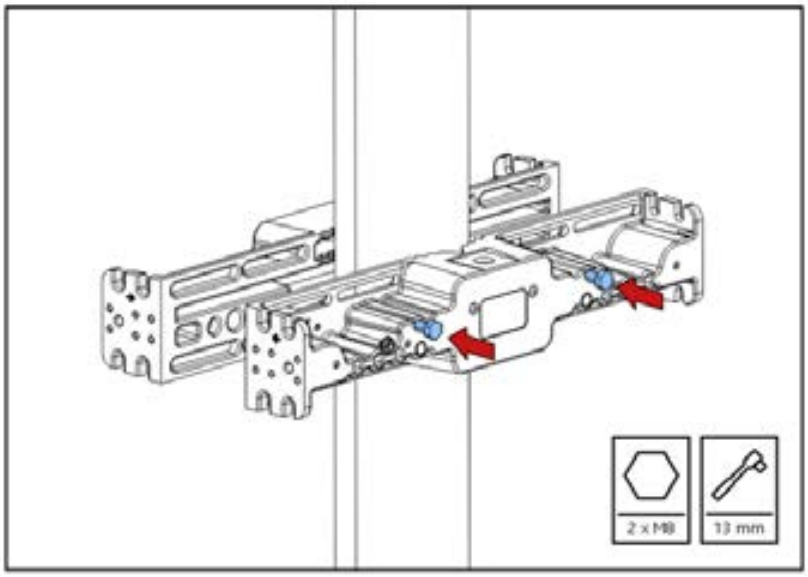
1 Fix the upper FPKC to a pole and tighten the two M10 screws to 30.0 Nm (22.1 ft-lb.).

Figure 150: Fixing the upper FPKC onto a pole



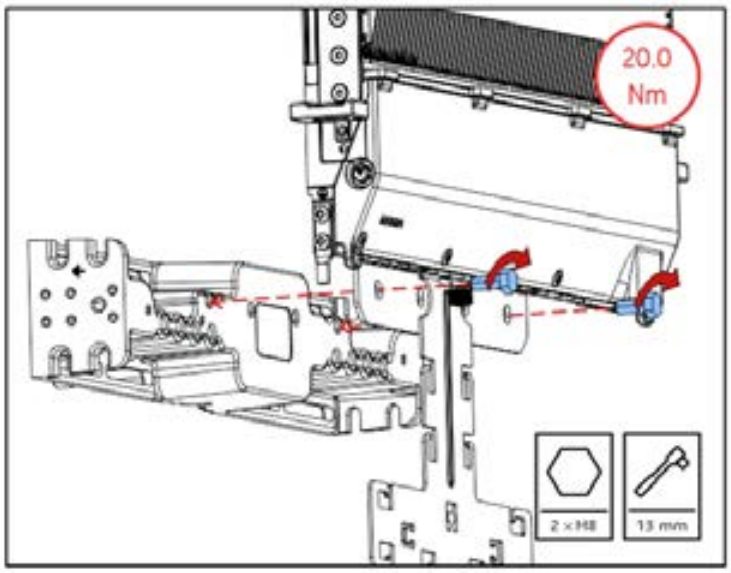
2 Tighten the two upper M8 screws halfway.

Figure 151: Tightening the two screws



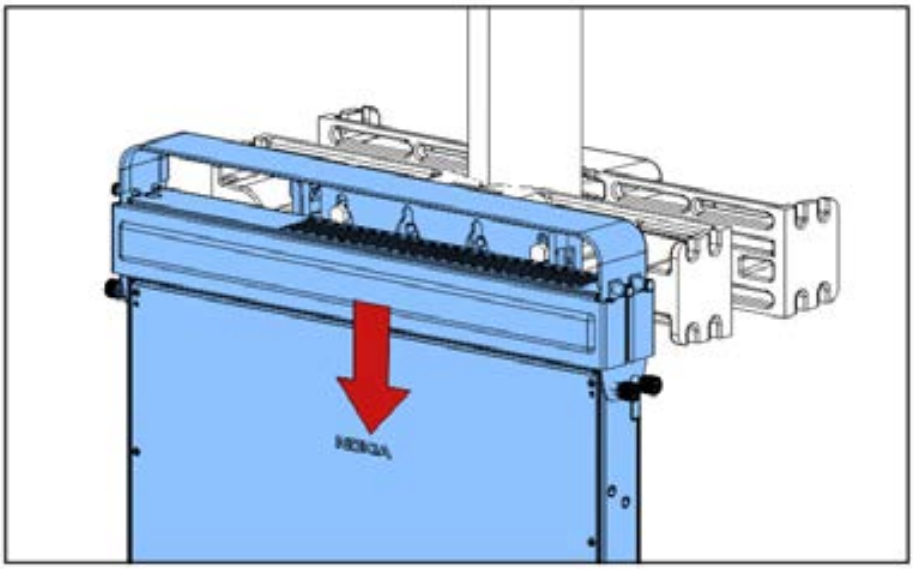
3 Fix the lower FPKC to the bottom bracket of AMJC and tighten the two M8 screws to 20.0 Nm (14.8 ft-lb.).

Figure 152: Fixing the lower bracket to AMJC



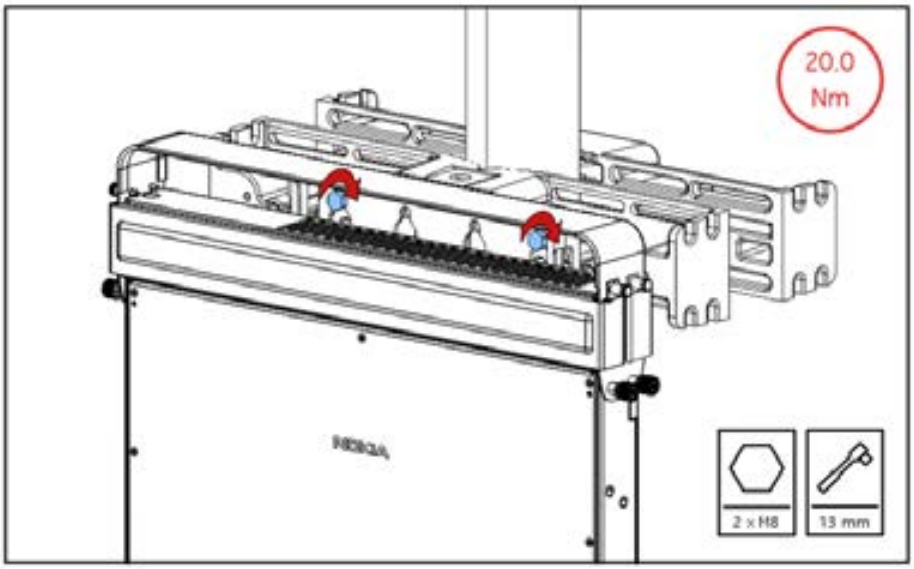
4 Hang the core unit on the two upper M8 screws.

Figure 153: Hanging the core unit



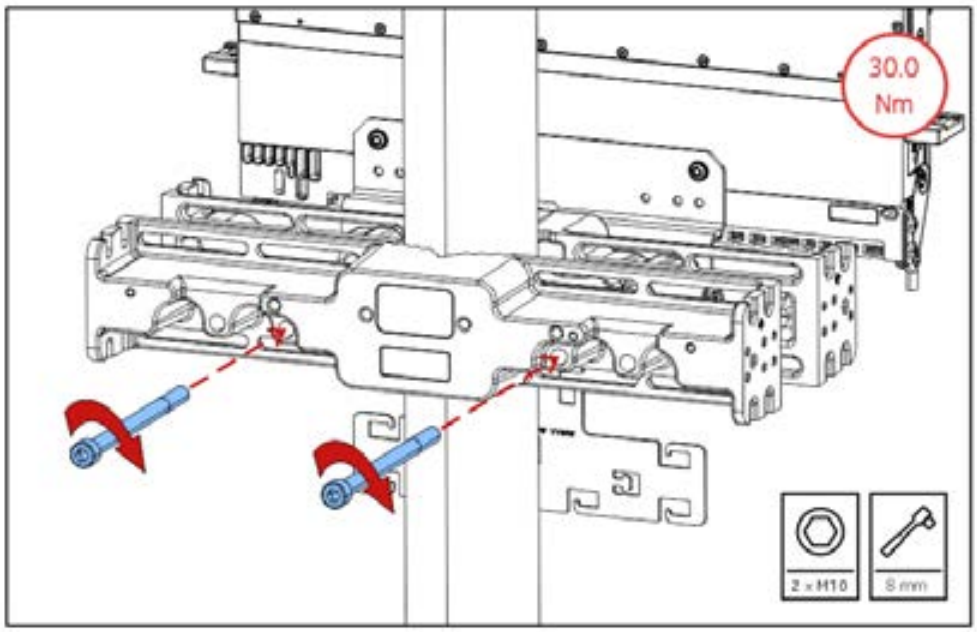
5 Tighten the two upper M8 screws to 20.0 Nm (14.8 ft-lb.).

Figure 154: Tightening the upper screws



6 Tighten the two M10 lower bracket screws to 30.0 Nm (22.1 ft-lb.).

Figure 155: Tightening the lower bracket screws



12.3 Installing ASOE, ASOG, or ASOH on a pole using one-clip rail with FPKA

The one-clip solution with the FPKA pole mounting kit allows book-mount installation on a pole with a diameter between 30 mm (1.18 in.) and 120 mm (4.72 in.).

Before you start

Notice:

- Do not install the AMRC one-clip rail on the sides of FPKA. Use only the middle position for AMRC installation.
- Only one AMRC rail can be installed on each pair of FPKA. The maximum load of a rail is 120 kg (264.6 lb.).
- For modules with AMRB or AMRD one-clip bracket installed on a pole with the AMRC rail, use eight M8 screws for rail fixing.

- These instructions show ASOE, but they are applicable to ASOG and ASOH as well.
- Install the AMJA (for ASOE) or AMJJ (for ASOG or ASOH) cable entry as instructed in Installing AMJA outdoor cable entry or Installing AMJJ outdoor cable entry.
- Install the AMJD rail mount kit and AMRA one-clip bracket as instructed in Installing AMJD rail mount kit and AMRA one-clip bracket.
- Install the dust cover as instructed in Installing dust cover.

Equipment preconditions

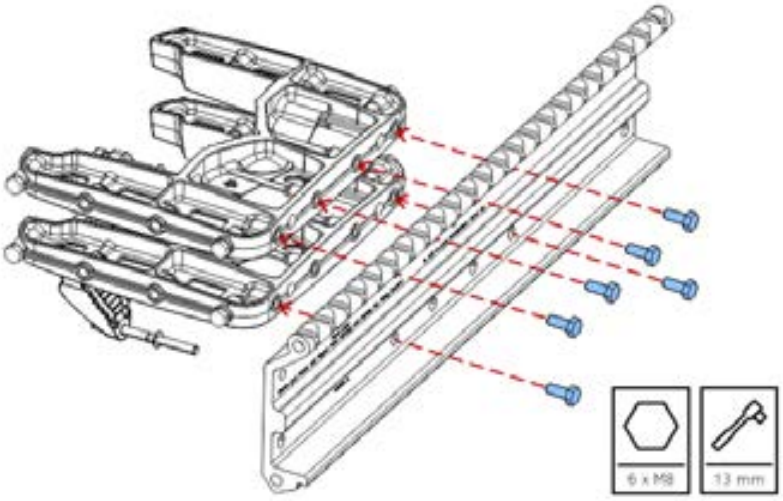
You need the following:

- ☐ 2 x FPKA Flexi pole mounting kit (471649A)
- ☐ AMRC one-clip rail (474583A)
- ☐ Tools:
  - ☐ Torque wrench
  - ☐ 13 mm socket
  - ☐ 8 mm hex bit
  - ☐ Torx bit T40

Procedure

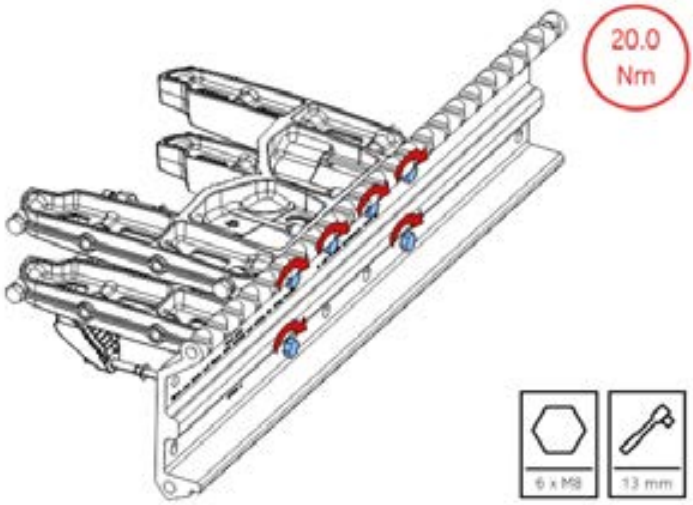
1 Fix the AMRC one-clip rail to the FPKA pole mounting kit.

Figure 156: Fixing the AMRC one-clip rail to FPKA



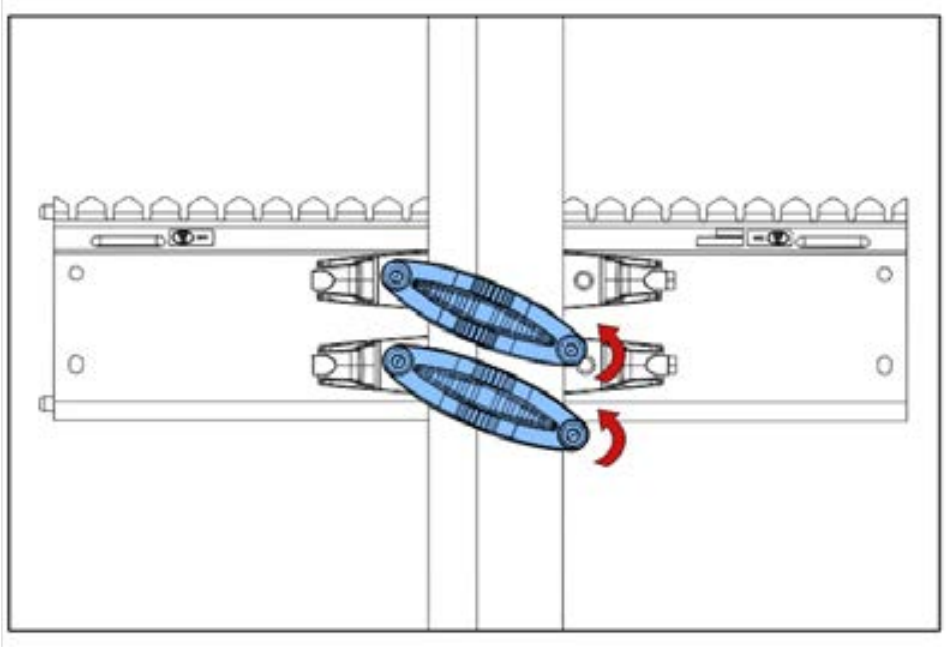
2 Tighten the six M8 screws to 20.0 Nm (14.8 ft-lb.).

Figure 157: Tightening the screws



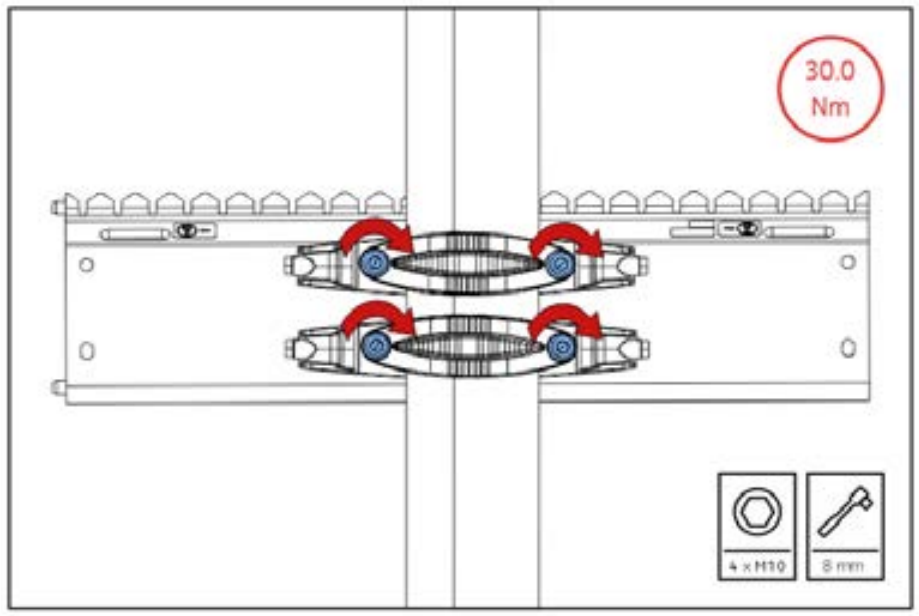
3 Fix the FPKA pole mounting kit onto a pole.

Figure 158: Fixing FPKA to a pole



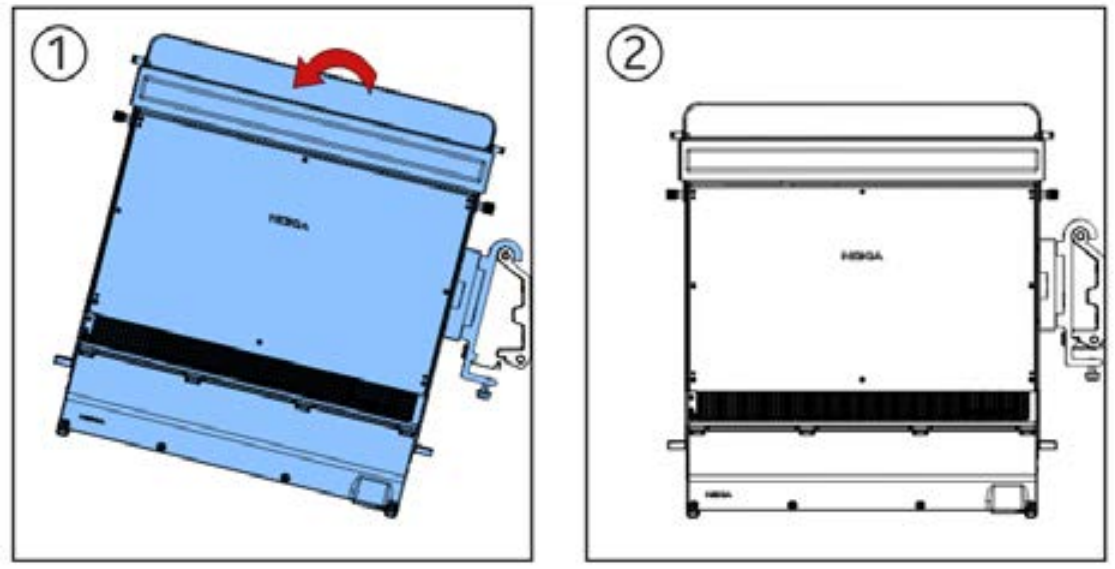
4 Tighten the four M10 screws to 30.0 Nm (22.1 ft-lb.).

Figure 159: Tightening the pole mounting screws



5 Lift and mount the unit on the one-clip rail.

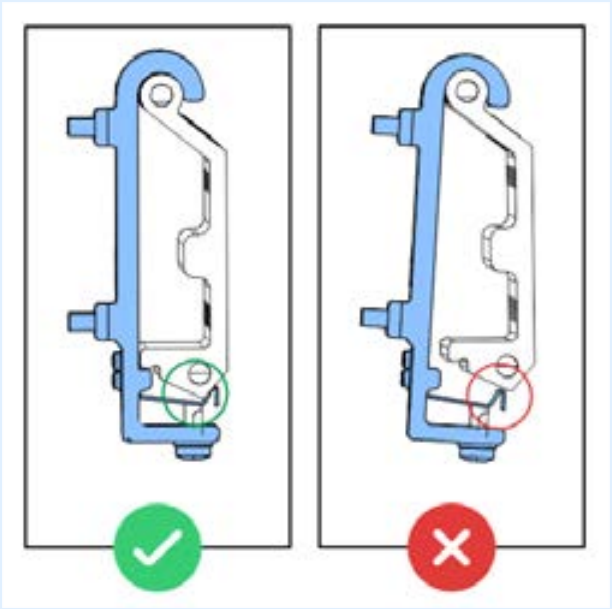
Figure 160: Mounting the unit



Note:

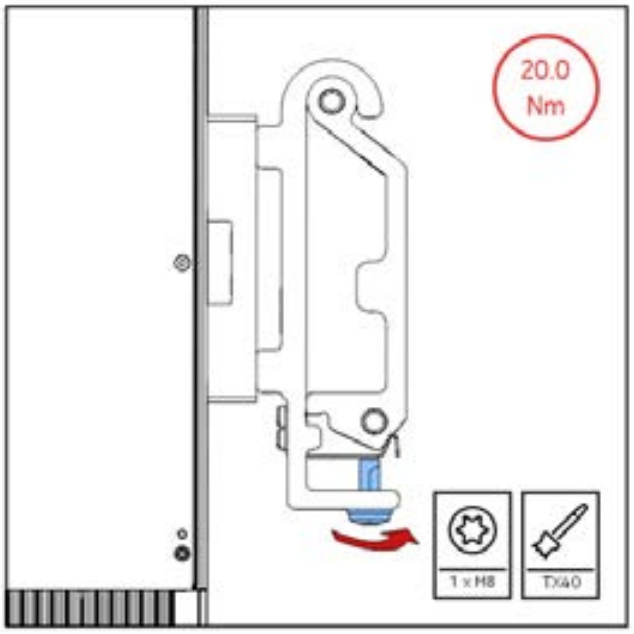
Check if the one-clip bracket spring position is correct after the assembly on the one -clip rail.

Figure 161: Correct one-clip bracket spring position



6 Tighten the one-clip bracket M8 screw to 20.0 Nm (14.8 ft-lb.).

Figure 162: Tightening the one-clip bracket screw



12.4 Installing ASOE, ASOG, or ASOH on a pole using one-clip rail with FPKC

The one-clip solution with the FPKC pole mounting kit allows book-mount installation on a pole with a diameter between 60 mm (2.36 in.) and 300 mm (11.81 in.).

Before you start

Notice:

- Only two AMRC rails can be installed on each pair of FPKCs. The maximum load of a single rail is 120 kg (264.5 lb).
- The upper FPKC mounting bracket needs to be installed as a mirror image of the lower FPKC bracket.
- For modules with the AMRB or AMRD one-clip bracket installed on a pole with the AMRC rail, use eight M8 screws for rail fixing.

- These instructions show ASOE, but they are applicable to ASOG and ASOH as well.
- Install the AMJA (for ASOE) or AMJJ (for ASOG or ASOH) cable entry as instructed in Installing

AMJA outdoor cable entry or Installing AMJJ outdoor cable entry.

- Install the AMJD rail mount kit and AMRA one-clip bracket as instructed in Installing AMJD rail mount kit and AMRA one-clip bracket.
- Install the dust cover as instructed in Installing dust cover.
- Choose the FPKC screw length based on the FPKC screw length for optimum pole mounting compatibility.

Equipment preconditions

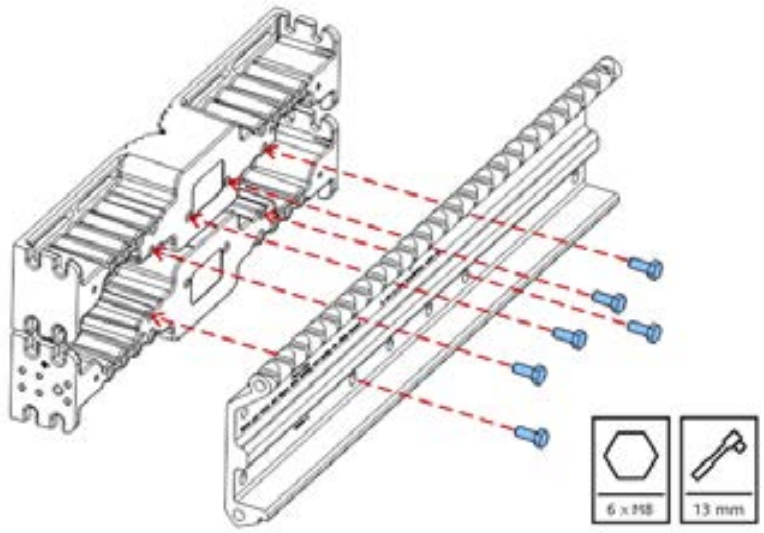
You need the following:

- ☐ 2 x FPKC Flexi pole mounting kit (472821A)
- ☐ AMRC one-clip rail (474583A)
- ☐ Tools:
  - ☐ Torque wrench
  - ☐ 13 mm socket
  - ☐ 8 mm hex bit
  - ☐ Torx bit T40

Procedure

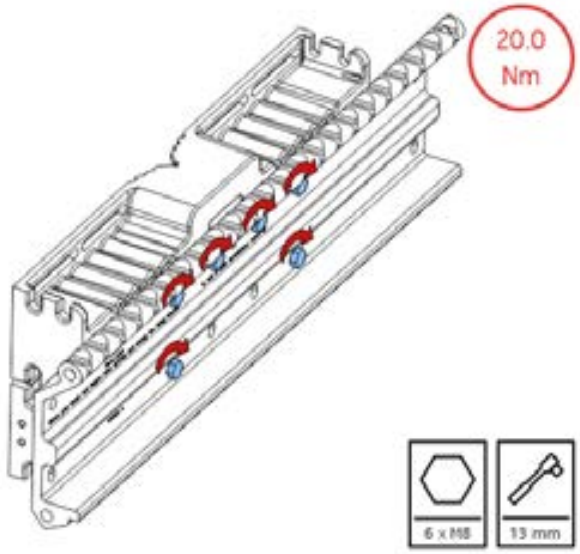
1 Fix the AMRC one-clip rail to the FPKC pole mounting kit.

Figure 163: Fixing the AMRC one-clip rail to FPKC



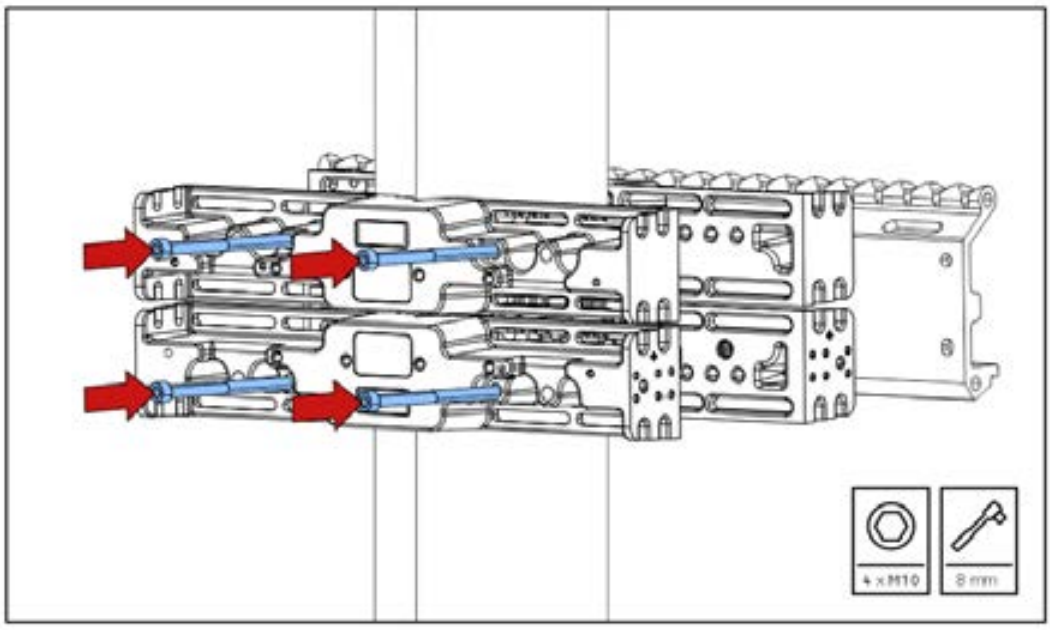
2 Tighten the six M8 screws to 20.0 Nm (14.8 ft-lb.).

Figure 164: Tightening the screws



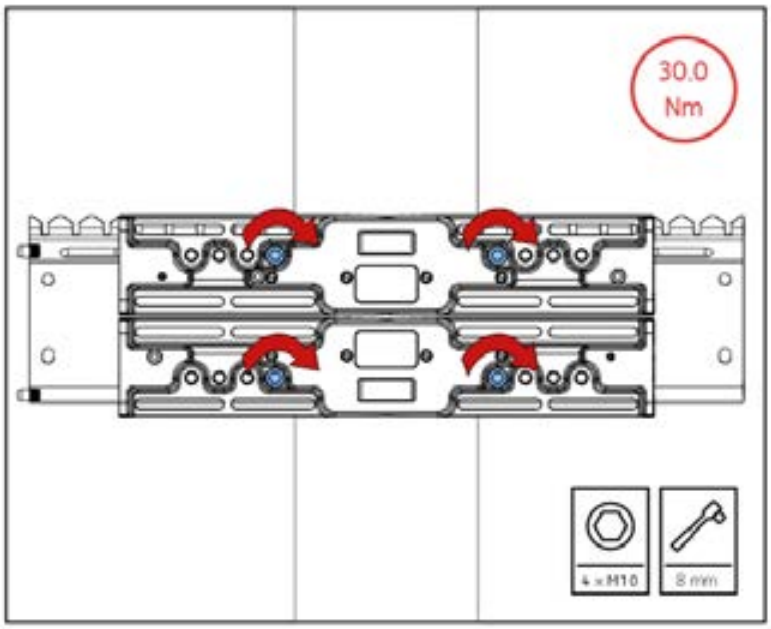
3 Fix the FPKC pole mounting kit onto a pole.

Figure 165: Fixing FPKC to a pole



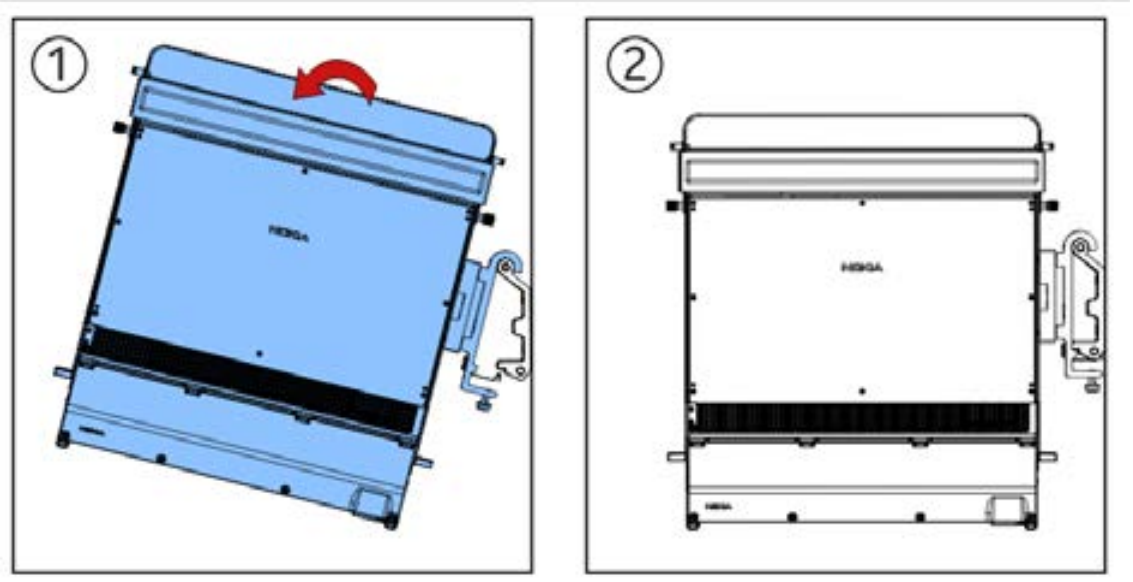
4 Tighten the four M10 pole mounting kit screws to 30.0 Nm (22.1 ft-lb.).

Figure 166: Tightening the pole mounting screws



5 Lift and mount the unit on the one-clip rail.

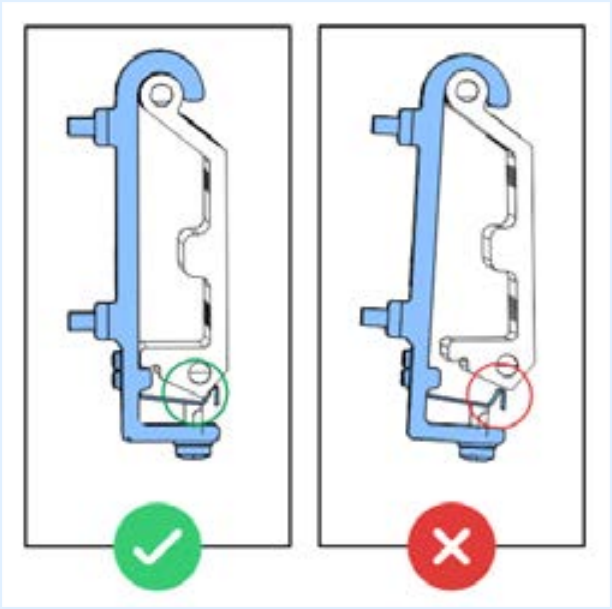
Figure 167: Mounting the unit



Note:

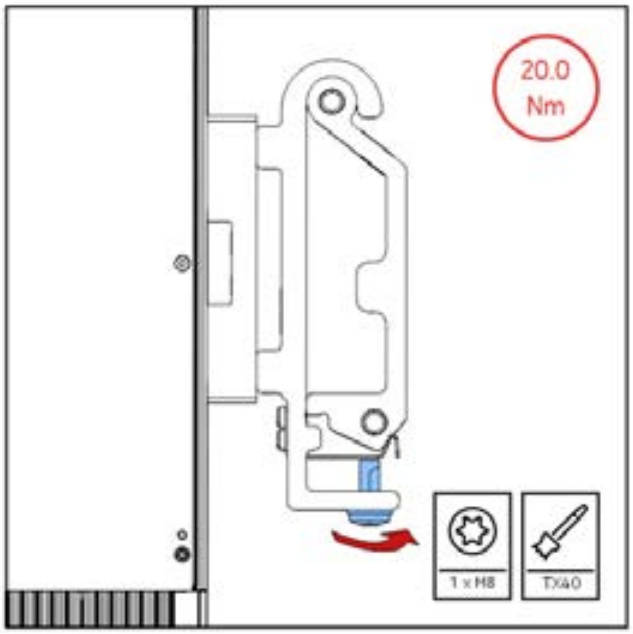
Check if the one-clip bracket spring position is correct after the assembly on the one -clip rail.

Figure 168: Correct one-clip bracket spring position



6 Tighten the one-clip bracket M8 screw to 20.0 Nm (14.8 ft-lb.).

Figure 169: Tightening the one-clip bracket screw



Postrequisites

To see the installation of ASOE on a pole using one-clip rail with FPKC, go to *Single RAN/Videos/Installing SM*.

> **Note:**
> The video serves as a procedure overview only. For full instructions, always refer to the installation manual.

12.5 Installing ASOE, ASOG, or ASOH on a pole using AMJK and AMEB

You can use AMEB to install ASOE, ASOG, or ASOH in AMJK on a pole with a diameter between 100–150 mm (3.94–5.91 in.).

Before you start

- These instructions show ASOE, but they are applicable to ASOG and ASOH as well.
- Install the AMJA (for ASOE) or AMJJ (for ASOG or ASOH) cable entry as instructed in Installing AMJA outdoor cable entry or Installing AMJJ outdoor cable entry.
- Install the AMJK elements as instructed in Installing AMJK piggyback mounting kit.
- For the list of the supported micro remote radio heads (mRRHs), optional items, and mounting kits, see AMJK compatibility list and installation pre-requirements.
- This installation instructions show AYGD pre-installed on AMJK. The AYGE GNSS receiver is installed directly on a pole. For installation details, see *Installing Optional Global Navigation Satellite System Units*.

> **Note:**
> The AMEB bracket (474923A) is no longer available for purchase. It has been replaced by the AMED bracket (475736A).

Equipment preconditions

You need the following:

- ☐ AMEB AirScale mmWave pole mount kit (474923A)
- ☐ AMJK piggyback mounting kit (476408A)
- ☐ (Optional) AYGD GNSS dual band receiver (475646A)
- ☐ Tools:
  - ☐ Torque screwdriver
  - ☐ Torque wrench
  - ☐ Torx bit T25
  - ☐ Flat-head bit
  - ☐ Socket 13 mm
  - ☐ Hex bit 6 mm
  - ☐ Rope

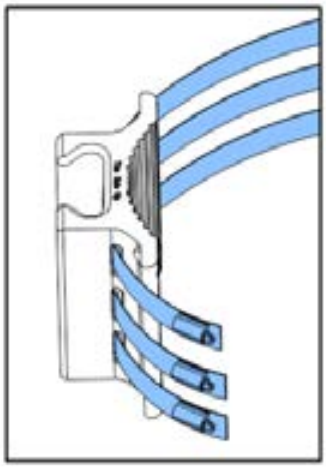
Procedure

1 Install the AMEB bracket on a pole.

1.1 Route the bands through the holes of the pole wedge bracket.

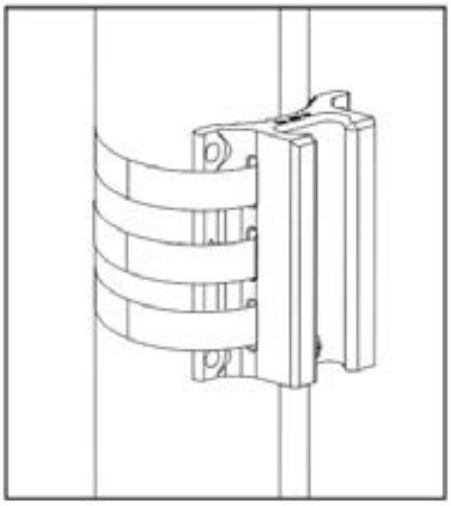
> **Note:**
> AMEB has to be installed with three bands. There are two bands in the AMEB delivery, so use additional band from AMJK delivery.

Figure 170: Routing the bands through the pole wedge bracket



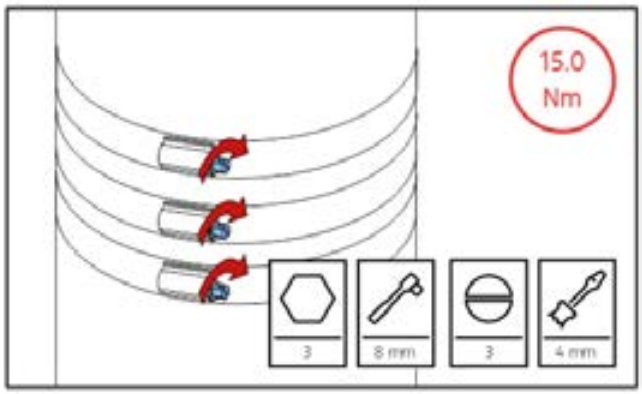
1.2 Place the bands and the bracket at the desired height.

Figure 171: Installing the bracket onto the pole



1.3 Tighten each band to 15 Nm (11.1 ft-lb.).

Figure 172: Tightening the band straps

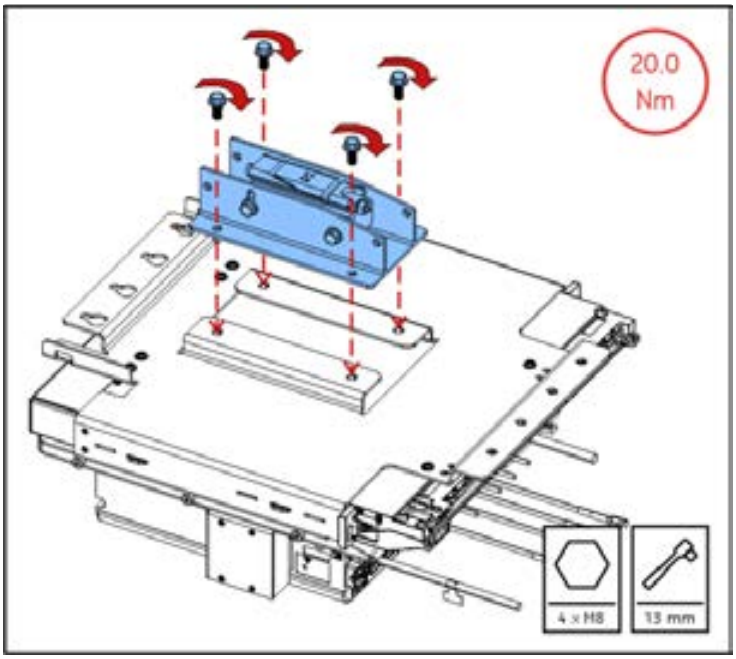


2 Fix the wedge bracket to AMJK and tighten the four M8 screws to 20.0 Nm (14.8 ft-lb.).

Notice:

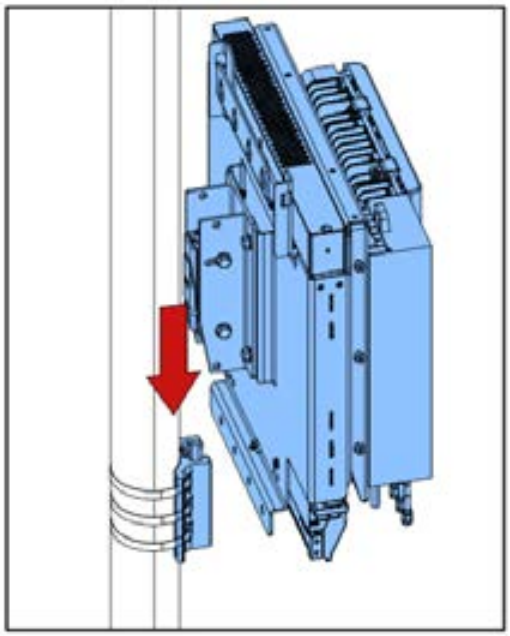
Carefully lay the assembly on a flat, clean surface to avoid damaging the equipment installed to AMJK.

Figure 173: Fixing the wedge bracket to AMJK



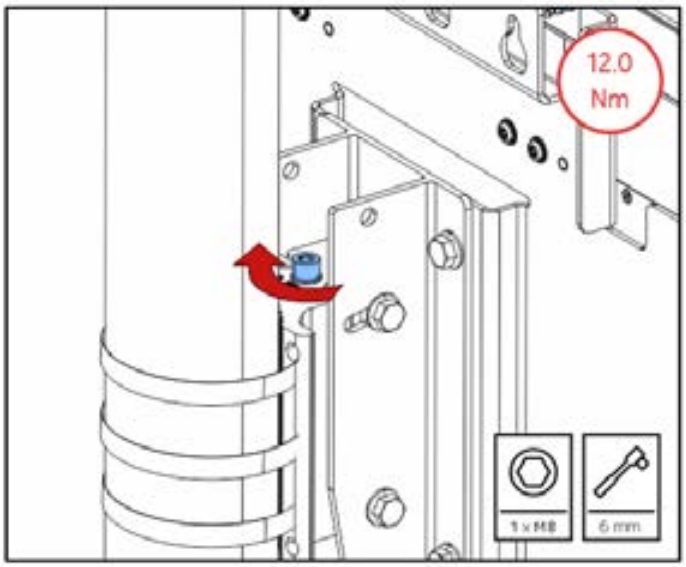
3 Lift and attach the assembly to the AMEB pole bracket.

Figure 174: Attaching the assembly to the AMEB pole bracket



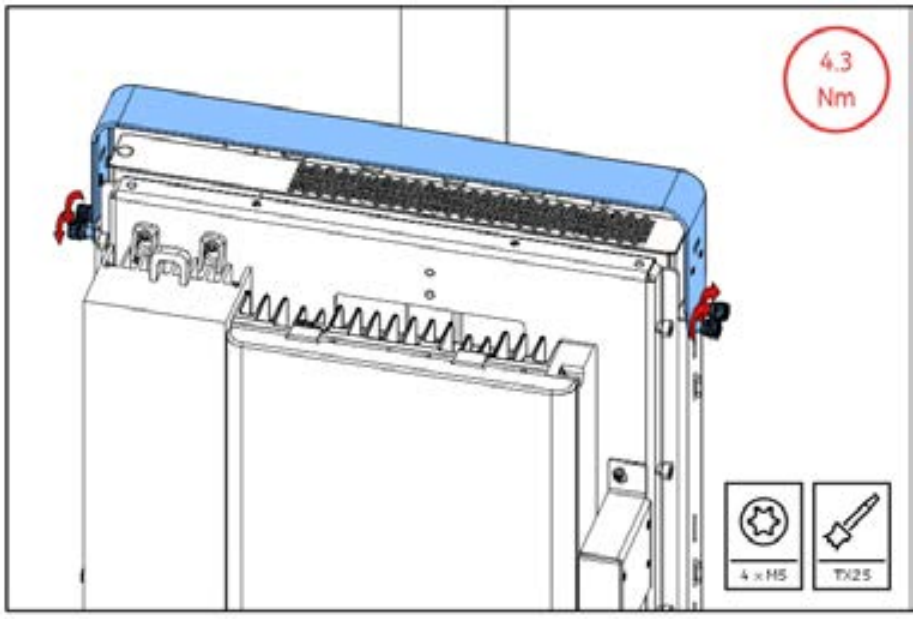
4 Tighten the M8 screw to 12.0 Nm (8.9 ft-lb.).

Figure 175: Tightening the M8 screw



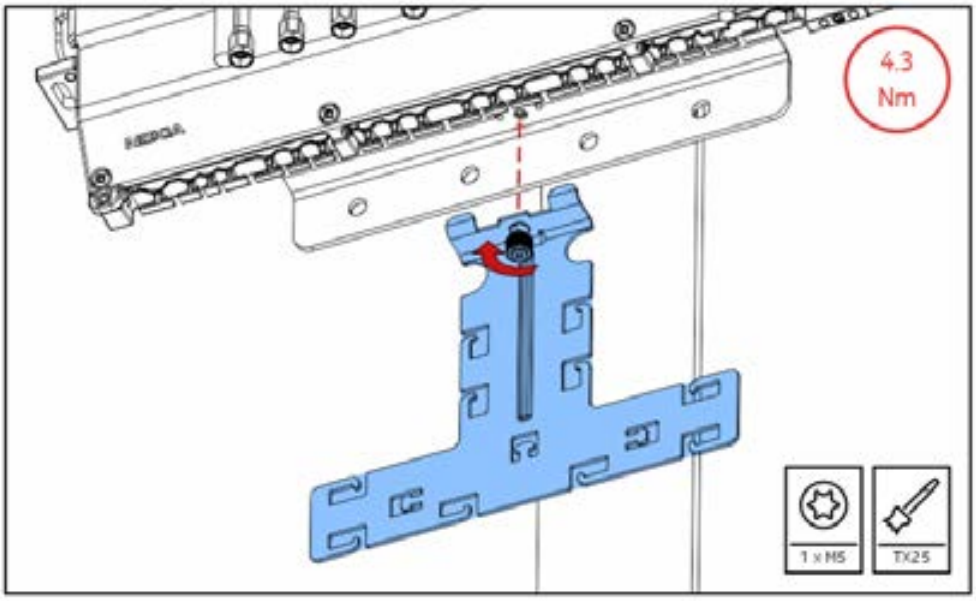
5 Fix the dust cover to the core unit and tighten the four M5 captive screws to 4.3 Nm (38.1 in -lb.).

Figure 176: Fixing the dust cover to the core unit



6 Fix the strain relief to AMJK and tighten the M5 captive screw to 4.3 Nm (38.1 in-lb.).

Figure 177: Installing the strain relief



Postrequisites

Proceed with cabling:

- For ASOE cabling instructions, see Cabling ASOE.
- For AYGD cabling instructions, see *Installing Optional Global Navigation Satellite System Units*.
- For AYGE cabling instructions, see *Installing Optional Global Navigation Satellite System Units*.
- For APAA cabling instructions, see *Installing Nokia AirScale BTS Fronthaul Solution Units*.
- For mRRH cabling instructions, see *Installing and Cabling Nokia AirScale Micro Remote Radio Heads* or *Installing and Cabling AWHxx AirScale Micro Remote Radio Heads*.

12.6 Installing ASOE, ASOG, or ASOH on a pole using AMJK and AMED

Use AMED to install ASOE, ASOG, or ASOH on a pole with a diameter of 100–150 mm (3.94–5.91 in.).

Before you start

- These instructions show ASOE, but they are applicable to ASOG and ASOH as well.
- Install the AMJA (for ASOE) or AMJJ (for ASOG or ASOH) cable entry as instructed in Installing AMJA outdoor cable entry or Installing AMJJ outdoor cable entry.
- Install the AMJK elements as instructed in Installing AMJK piggyback mounting kit.
- For the list of the supported micro remote radio heads (mRRHs), optional items, and mounting kits, see AMJK compatibility list and installation pre-requirements.
- This installation instructions show AYGD pre-installed on AMJK. The AYGE GNSS receiver is installed directly on a pole. For installation details, see *Installing Optional Global Navigation Satellite System Units*.
- For the AMED contents of delivery, see *AMED 20 deg tilt pole mount kit* in *Nokia BTS Optional Items Description*.

Equipment preconditions

You need the following:

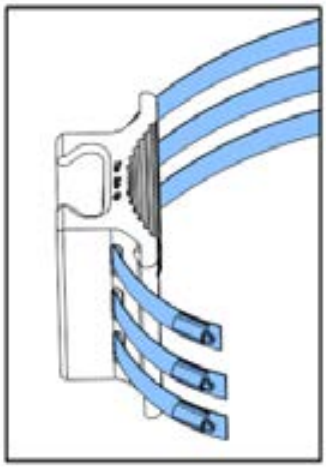
- ☐ AMED 20 deg tilt pole mount kit (475736A.102)
- ☐ AMJK piggyback mounting kit (476408A)
- ☐ Tools:
  - ☐ Torque screwdriver
  - ☐ Torque wrench
  - ☐ Flat-head bit 4 mm or 8 mm socket
  - ☐ Socket 13 mm
  - ☐ Hex bit 6 mm
  - ☐ Torx bit T25
  - ☐ Rope

Procedure

1 Install the AMED bracket on a pole.

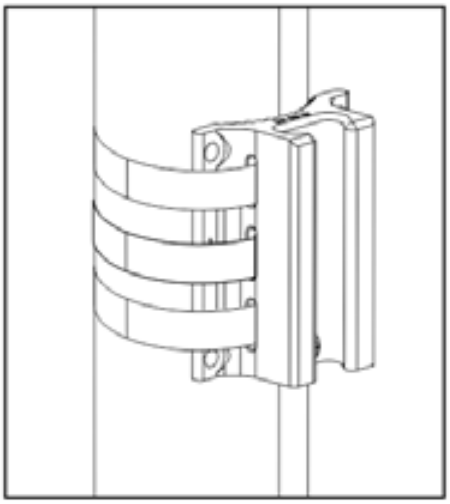
1.1 Route the bands through the holes of the pole wedge bracket.

Figure 178: Routing the bands through the pole wedge bracket



1.2 Place the bands and the bracket at the desired height.

Figure 179: Installing the bracket onto the pole

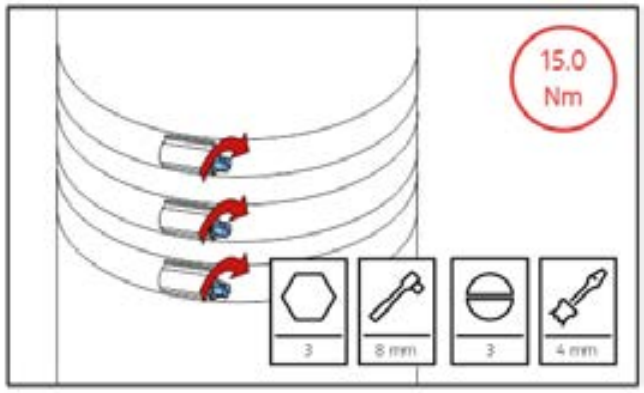


1.3 Tighten each band to 15.0 Nm (11.1 ft-lb.).

Tip:

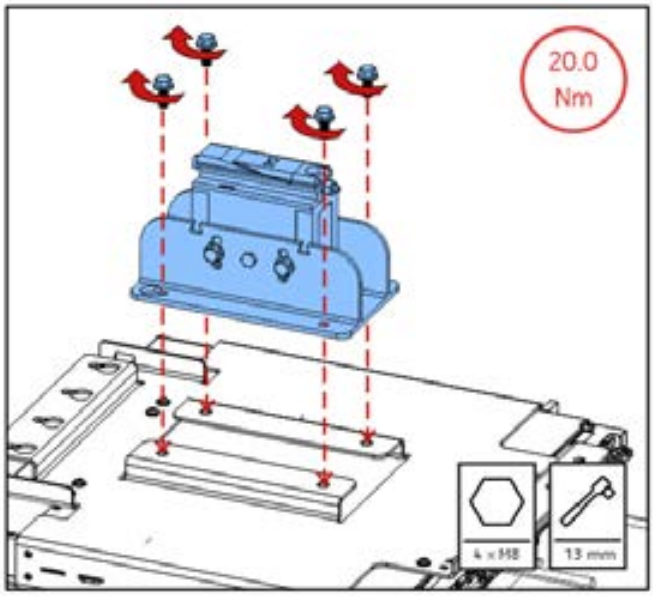
You can use a 4 mm flat-head bit or 8 mm socket.

Figure 180: Tightening the band straps



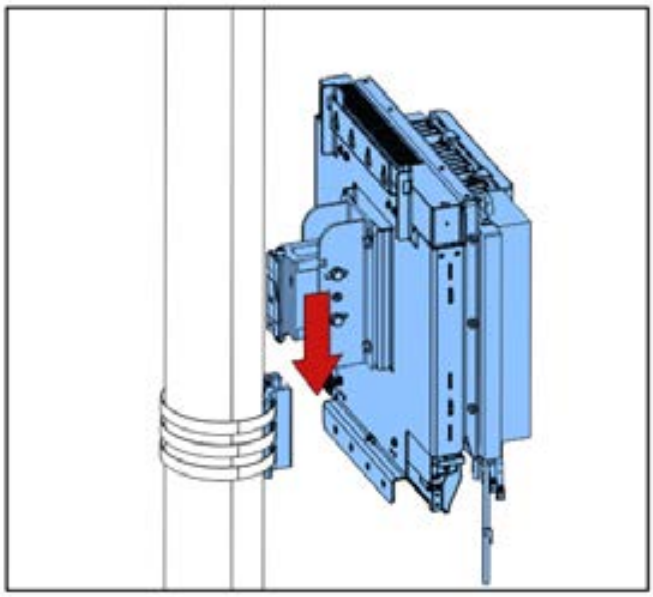
2 Fix the wedge bracket to AMJK and tighten the four M8 screws to 20.0 Nm (14.8 ft-lb.).

Figure 181: Attaching the wedge bracket to AMJK



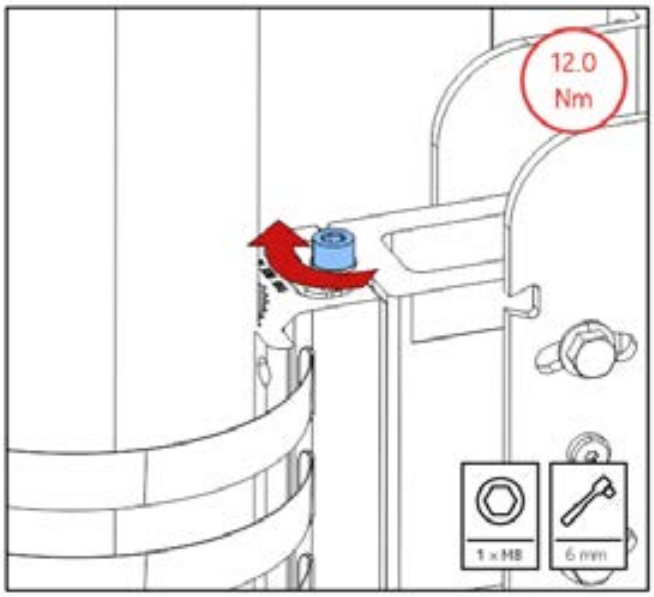
3 Lift and slide the assembly onto the AMED pole bracket.

Figure 182: Attaching the assembly to the AMED bracket



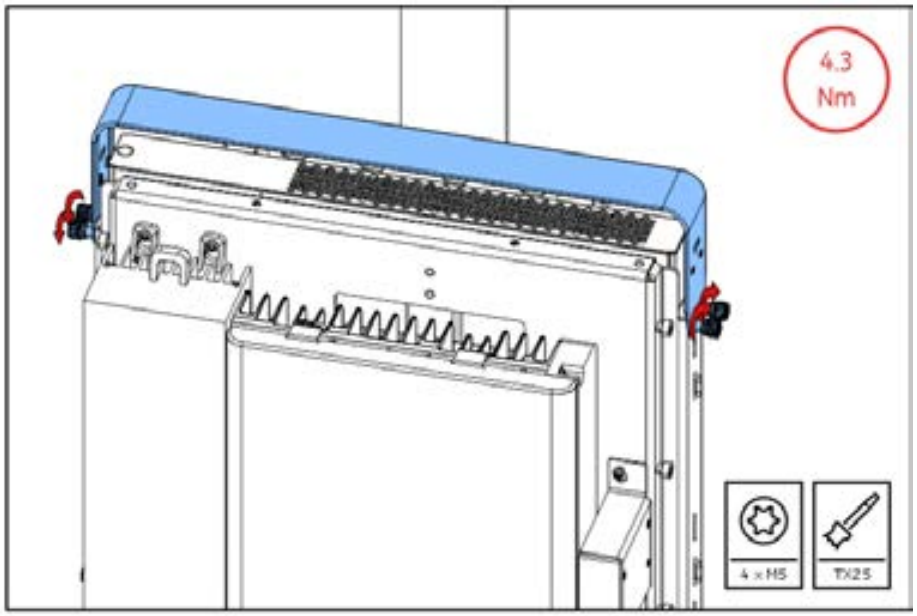
4 Tighten the M8 screw at the top of the wedge bracket to 12.0 Nm (8.9 ft-lb.).

Figure 183: Tightening the M8 screw



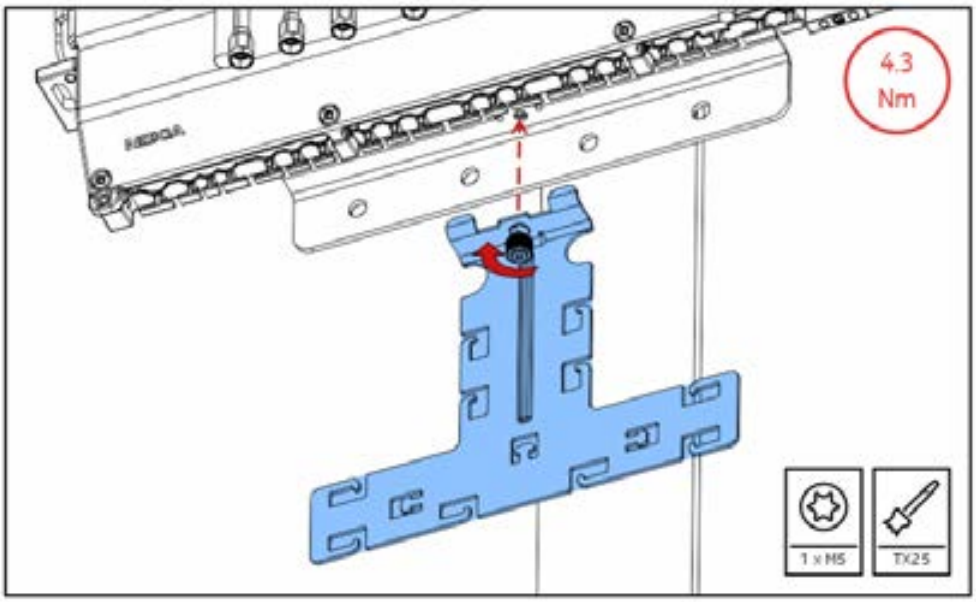
5 Fix the dust cover to the core unit and tighten the four M5 captive screws to 4.3 Nm (38.1 in -lb.).

Figure 184: Fixing the dust cover to the core unit



6 Fix the strain relief to AMJK and tighten the M5 captive screw to 4.3 Nm (38.1 in-lb.).

Figure 185: Installing the strain relief



Postrequisites

Proceed with cabling:

- For ASOE cabling instructions, see Cabling ASOE.
- For AYGD cabling instructions, see *Installing Optional Global Navigation Satellite System*

Units.

- For AYGE cabling instructions, see *Installing Optional Global Navigation Satellite System Units*.
- For APAA cabling instructions, see *Installing Nokia AirScale BTS Fronthaul Solution Units*.
- For mRRH cabling instructions, see *Installing and Cabling Nokia AirScale Micro Remote Radio Heads* or *Installing and Cabling AWHxx AirScale Micro Remote Radio Heads*.

For AMED tilting instructions, see *Adjusting the tilt of AMED bracket* in *Installing and Cabling AWMFIA Micro RRH.*

12.7 Installing ASOE, ASOG, or ASOH on a pole using AMJK and FPKA

You can use FPKA to install ASOE, ASOG, or ASOH in AMJK on a pole with a diameter between 30–120 mm (1.18–4.72 in.).

Before you start

- These instructions show ASOE, but they are applicable to ASOG and ASOH as well.
- Install the AMJA (for ASOE) or AMJJ (for ASOG or ASOH) cable entry as instructed in Installing AMJA outdoor cable entry or Installing AMJJ outdoor cable entry.
- Install the AMJK elements as instructed in Installing AMJK piggyback mounting kit.
- For the list of the supported micro remote radio heads (mRRHs), optional items, and mounting kits, see AMJK compatibility list and installation pre-requirements.
- This installation instructions show AYGD pre-installed on AMJK. The AYGE GNSS receiver is installed directly on a pole. For installation details, see *Installing Optional Global Navigation Satellite System Units*.

Equipment preconditions

You need the following:

- ☐ 2 x FPKA Flexi pole mounting kit (471649A)
- ☐ AMJK piggyback mounting kit (476408A)
- ☐ (Optional) AYGD GNSS dual band receiver (475646A)
- ☐ Tools:
  - ☐ Torque wrench

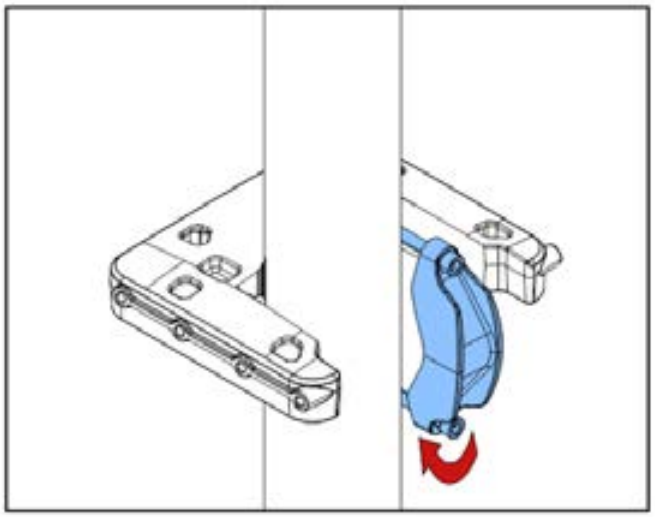
- ☐ Torque screwdriver
- ☐ Torx bit T25
- ☐ 13 mm socket
- ☐ Hex bit 8 mm
- ☐ Rope

Procedure

1 Fix the upper FPKA on a pole.

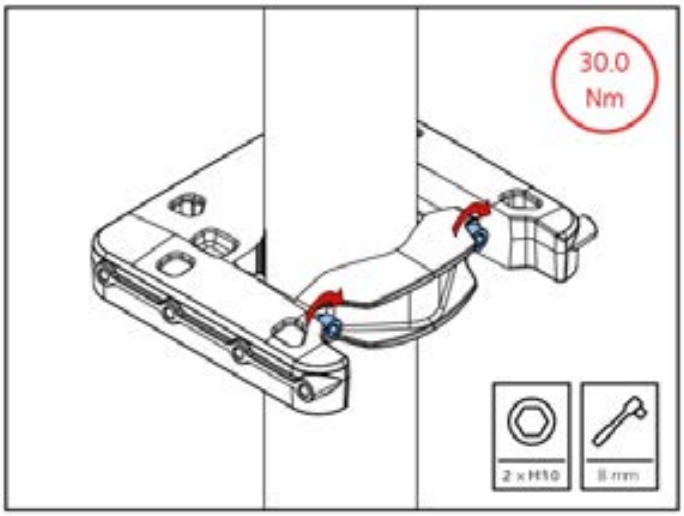
> **Note:**
>
> Make sure that the upper FPKA is leveled.

Figure 186: Fixing the upper FPKA onto a pole



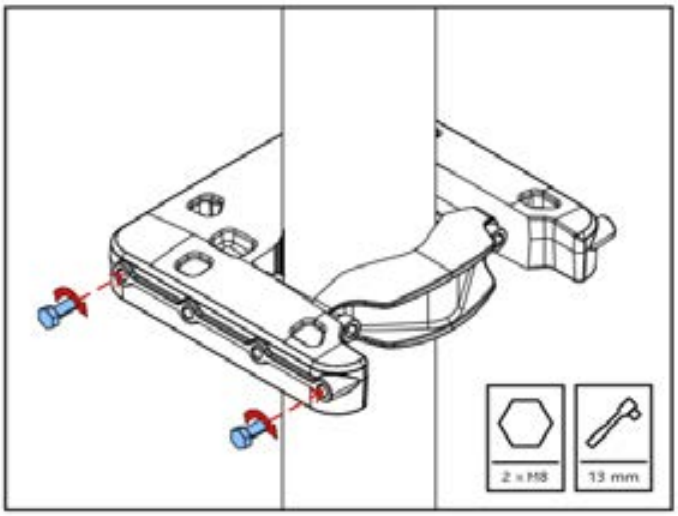
2 Tighten the two M10 screws to 30.0 Nm (22.1 ft-lb.).

Figure 187: Tightening the FPKA screws



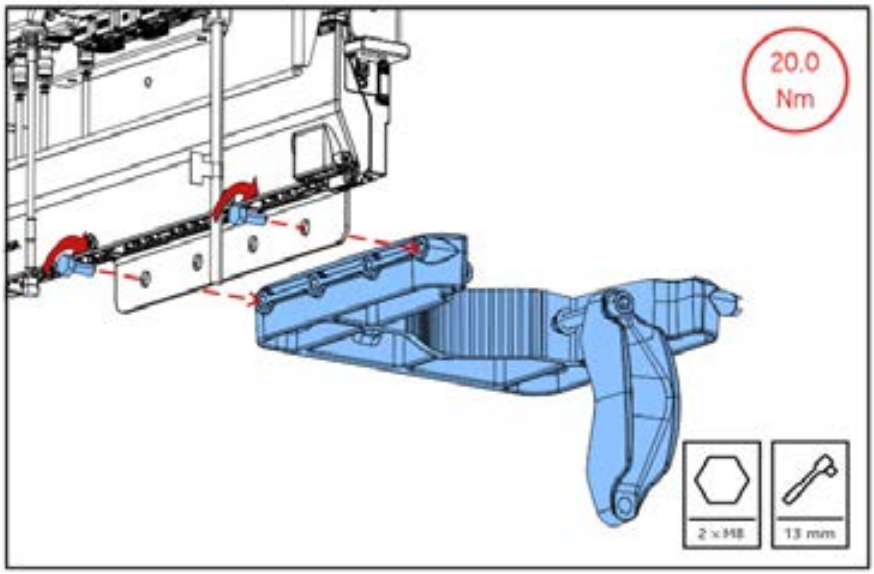
3 Tighten the two upper M8 screws halfway.

Figure 188: Tightening two upper screws



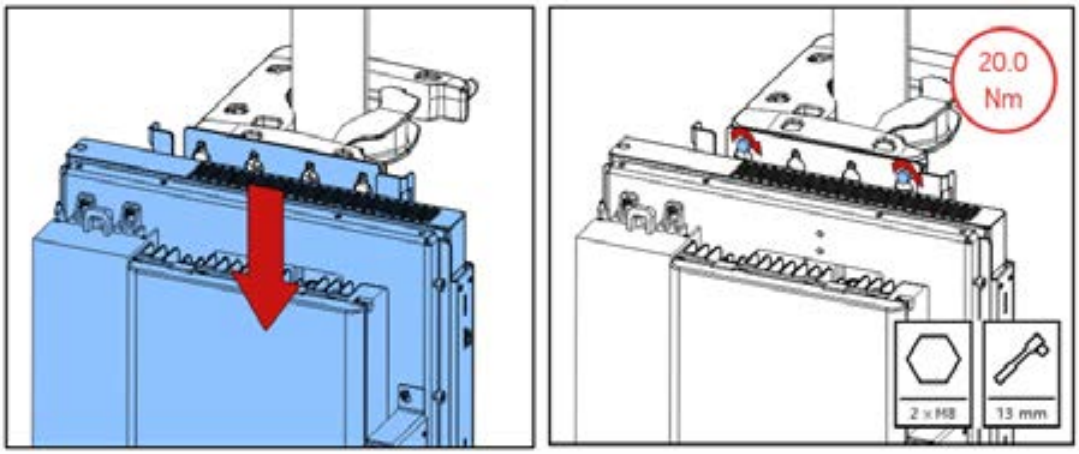
4 Fix the lower FPKA to the bottom bracket of AMJK and tighten the two M8 screws to 20.0 Nm (14.8 ft-lb.).

Figure 189: Fixing FPKA to AMJK



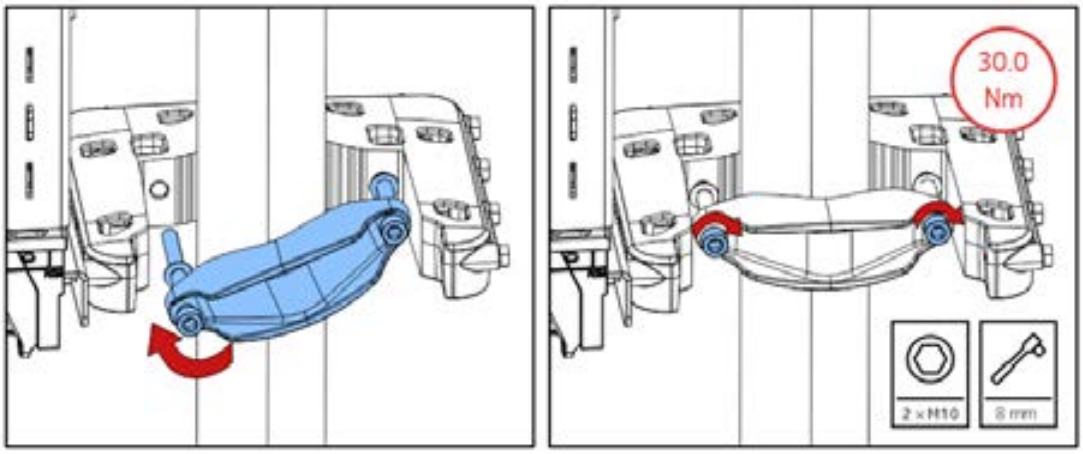
5 Hang the core unit on the upper FPKA and tighten the two M8 screws to 20.0 Nm (14.8 ft-lb.).

Figure 190: Hanging the core unit on FPKA



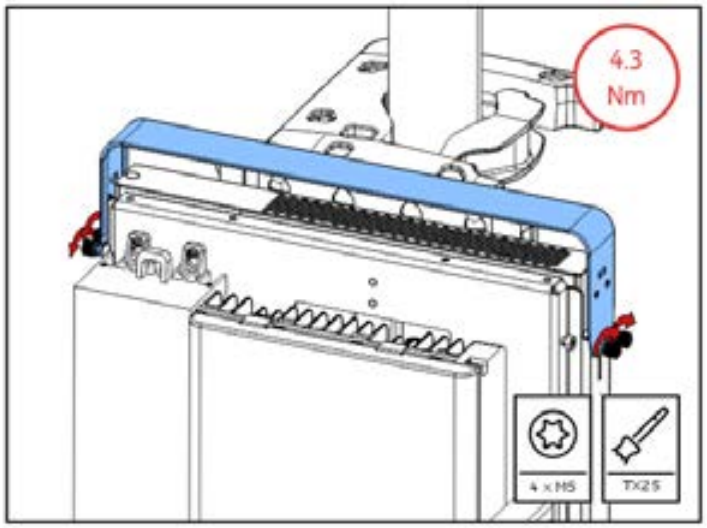
6 Fix the lower FPKA to the pole and tighten the two M10 screws to 30.0 Nm (22.1 ft-lb.).

Figure 191: Fixing the lower FPKA onto the pole



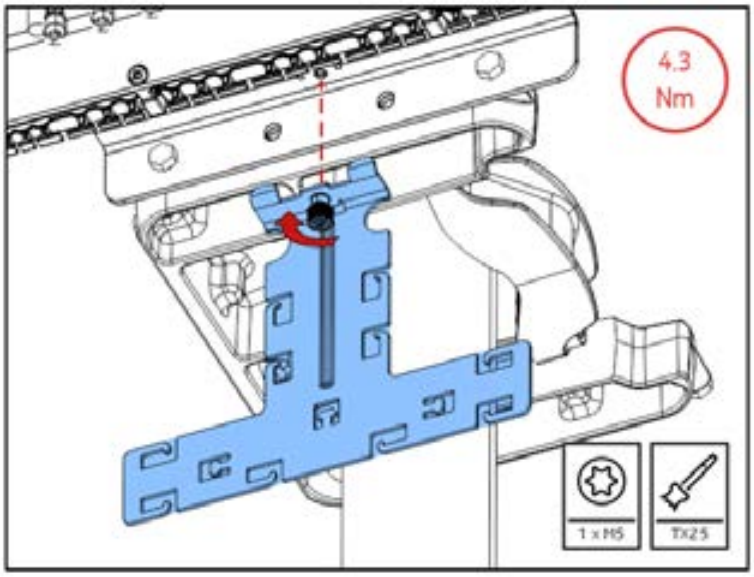
7 Fix the dust cover to the core unit and tighten the four M5 screws to 4.3 Nm (38.1 in-lb.).

Figure 192: Fixing the dust cover to the core unit



8 Fix the strain relief to AMJK and tighten the M5 captive screw to 4.3 Nm (38.1 in-lb.).

Figure 193: Installing the strain relief



Postrequisites

Proceed with cabling:

- For ASOE cabling instructions, see Cabling ASOE.
- For AYGD cabling instructions, see *Installing Optional Global Navigation Satellite System Units*.
- For AYGE cabling instructions, see *Installing Optional Global Navigation Satellite System Units*.
- For APAA cabling instructions, see *Installing Nokia AirScale BTS Fronthaul Solution Units*.
- For mRRH cabling instructions, see *Installing and Cabling Nokia AirScale Micro Remote Radio Heads* or *Installing and Cabling AWHxx AirScale Micro Remote Radio Heads*.

12.8 Installing ASOE, ASOG, or ASOH on a pole using AMJK and FPKC

You can use FPKC to install ASOE, ASOG, or ASOH in AMJK on a pole with a diameter between 60–300 mm (2.36–11.81 in.).

Before you start

- These instructions show ASOE, but they are applicable to ASOG and ASOH as well.
- Install the AMJA (for ASOE) or AMJJ (for ASOG or ASOH) cable entry as instructed in Installing AMJA outdoor cable entry or Installing AMJJ outdoor cable entry.
- Install the AMJK elements as instructed in Installing AMJK piggyback mounting kit.
- Choose the FPKC screw length based on the FPKC screw length for optimum pole mounting compatibility.
- For the list of the supported micro remote radio heads (mRRHs), optional items, and mounting kits, see AMJK compatibility list and installation pre-requirements.
- This installation instructions show AYGD pre-installed on AMJK. The AYGE GNSS receiver is installed directly on a pole. For installation details, see *Installing Optional Global Navigation Satellite System Units*.

Equipment preconditions

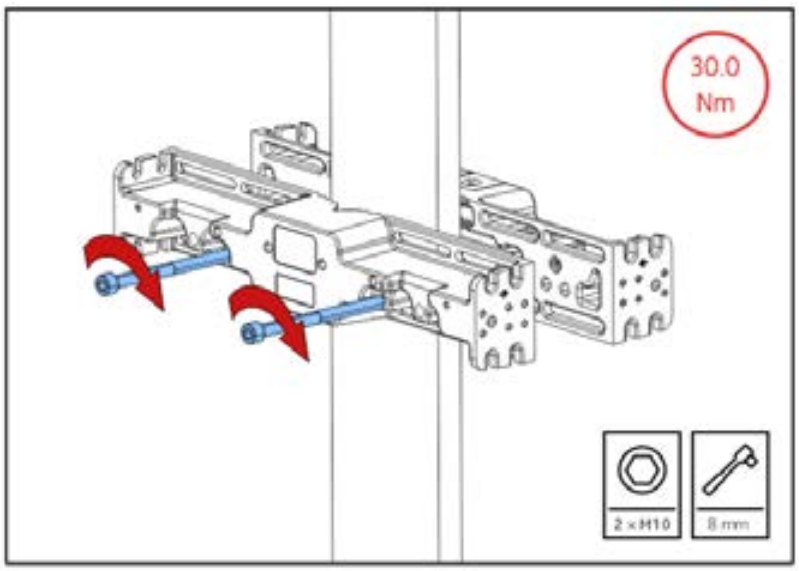
You need the following:

- ☐ 2 x FPKC Flexi pole mounting kit (472821A)
- ☐ AMJK piggyback mounting kit (476408A)
- ☐ (Optional) AYGD GNSS dual band receiver (475646A)
- ☐ Tools:
  - ☐ Torque wrench
  - ☐ Torque screwdriver
  - ☐ Torx bit T25
  - ☐ 13 mm socket
  - ☐ Hex bit 8 mm
  - ☐ Rope

Procedure

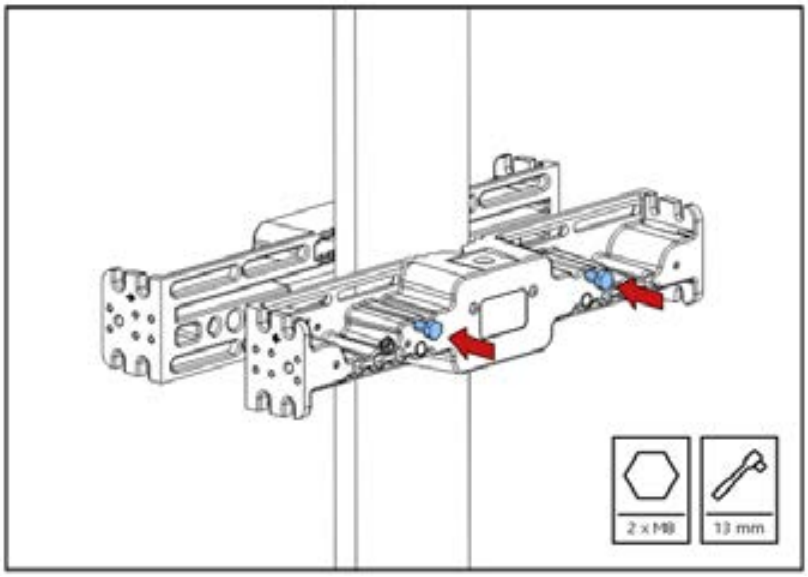
1 Fix the upper FPKC to a pole and tighten the two M10 screws to 30.0 Nm (22.1 ft-lb.).

Figure 194: Fixing the upper FPKC onto a pole



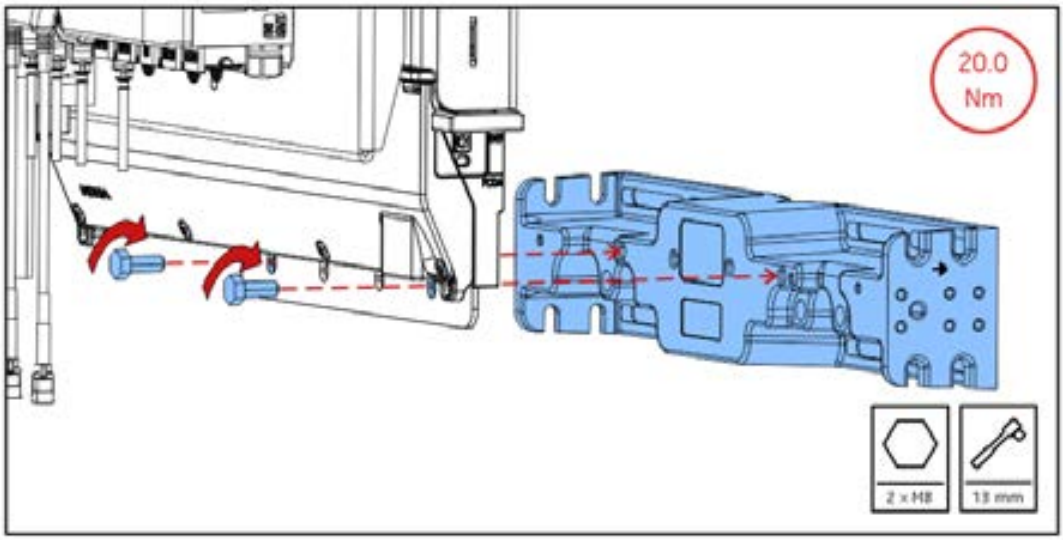
2 Tighten the two upper M8 screws halfway.

Figure 195: Tightening the two screws



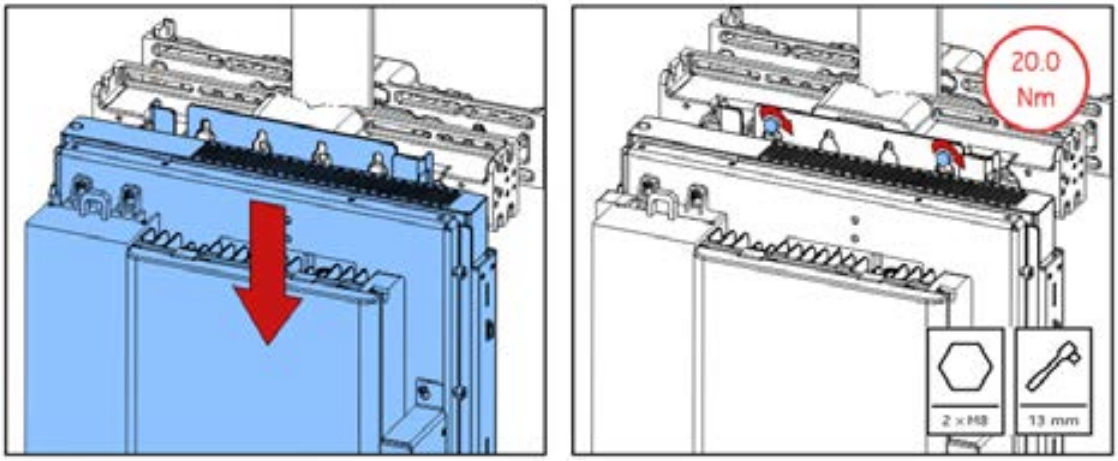
3 Fix the lower FPKC to AMJK and tighten the two M8 screws to 20.0 Nm (14.8 ft-lb.).

Figure 196: Installing the lower FPKC



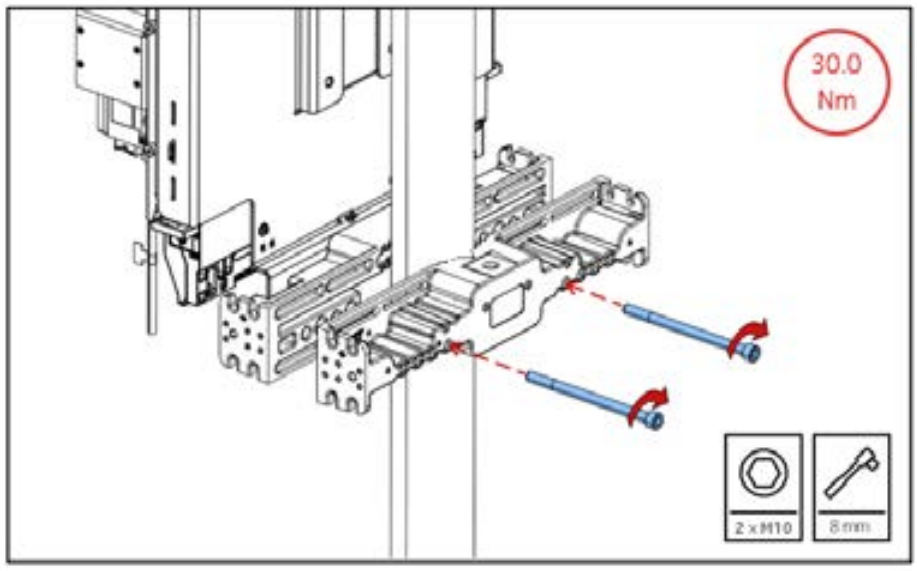
4 Hang the core unit on the upper FPKC and tighten the two M8 screws to 20.0 Nm (14.8 ft-lb.).

Figure 197: Hanging the core unit on the upper FPKC



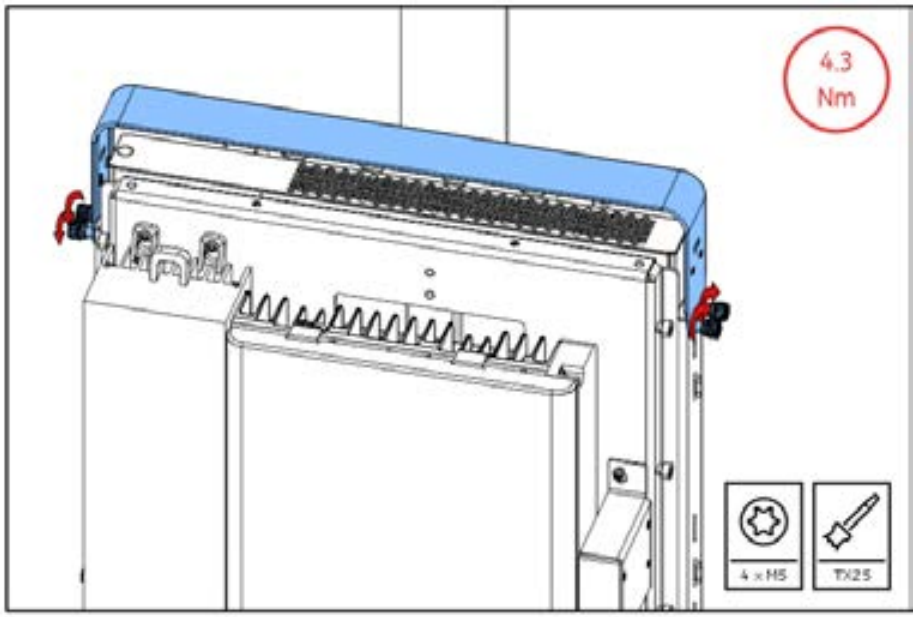
5 Tighten the two M10 lower FPKC screws to 30.0 Nm (22.1 ft-lb.).

Figure 198: Tightening the lower FPKC screws



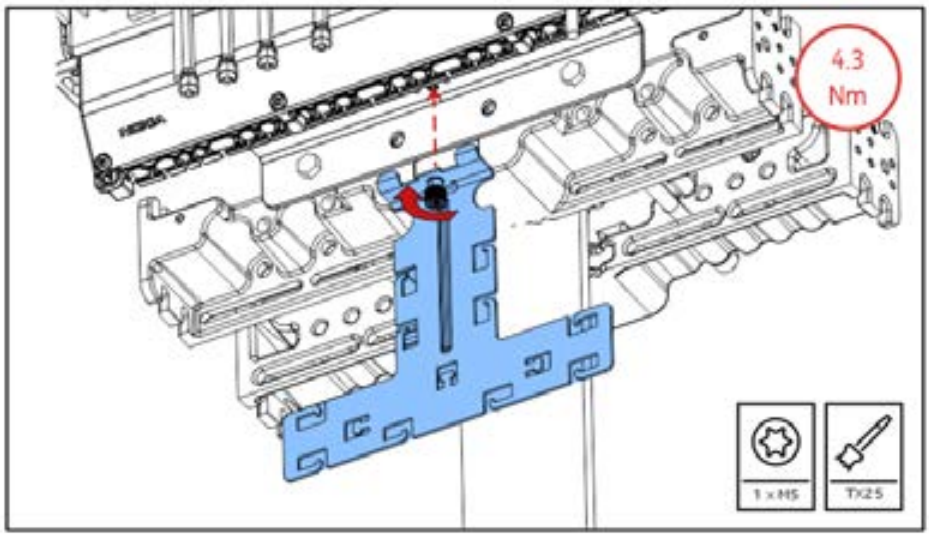
6 Fix the dust cover to the core unit and tighten the four M5 screws to 4.3 Nm (38.1 in-lb.).

Figure 199: Installing the dust cover



7 Fix the strain relief to AMJK and tighten the M5 captive screw to 4.3 Nm (38.1 in-lb.).

Figure 200: Installing the strain relief



Postrequisites

Proceed with cabling:

- For ASOE cabling instructions, see Cabling ASOE.
- For AYGD cabling instructions, see *Installing Optional Global Navigation Satellite System Units*.
- For AYGE cabling instructions, see *Installing Optional Global Navigation Satellite System Units*.
- For APAA cabling instructions, see *Installing Nokia AirScale BTS Fronthaul Solution Units*.
- For mRRH cabling instructions, see *Installing and Cabling Nokia AirScale Micro Remote Radio Heads* or *Installing and Cabling AWHxx AirScale Micro Remote Radio Heads*.

13. Installing ASOE, ASOG, or ASOH on a wall

You can install ASOE, ASOG, or ASOH on a wall using one of the supported installation brackets.

13.1 Installing ASOE, ASOG, or ASOH on a wall using AMJC

You can install ASOE, ASOG, or ASOH directly on the wall using the AMJC wall and pole mount kit (475881A).

Before you start

- These instructions show ASOE, but they are applicable to ASOG and ASOH as well.
- Install the AMJA (for ASOE) or AMJJ (for ASOG or ASOH) cable entry as instructed in Installing AMJA outdoor cable entry or Installing AMJJ outdoor cable entry.
- Install the AMJC wall and pole mount kit as instructed in Installing AMJC wall and pole mount kit.
- Install the dust cover as instructed in Installing dust cover.

Equipment preconditions

You need the following:

- ☐ Drill
- ☐ Level
- ☐ 4 x M8 screw
- ☐ Torque wrench
- ☐ 13 mm socket

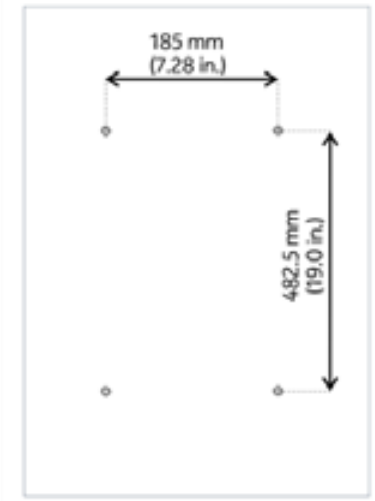
Procedure

1 Mark the mounting screw locations on the wall and drill the holes.

Tip:

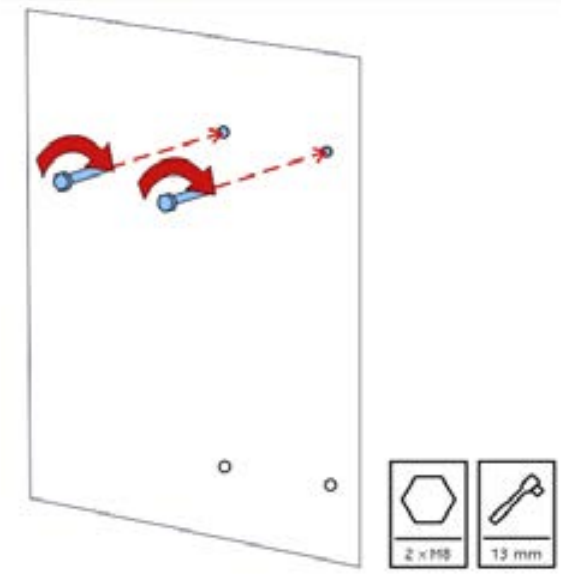
You can use the core unit as a template to drill the lower holes. See step 3 for more information.

Figure 201: Drilling the holes



2 Tighten the two upper mounting M8 screws halfway to the wall.

Figure 202: Fixing the screws



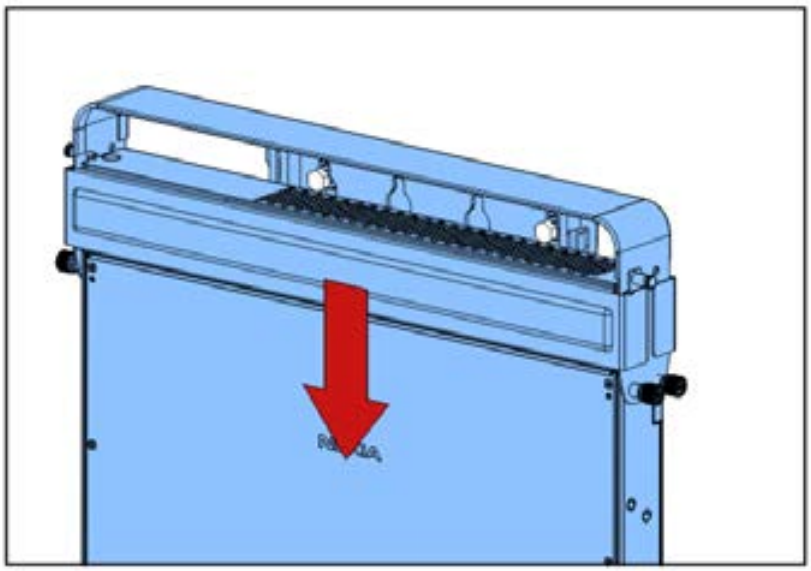
3 (Optional) Use the core unit as a template to drill the lower holes.

Skip this step if you already drilled all four holes.

3.1 Hang the core unit on the mounting screws.

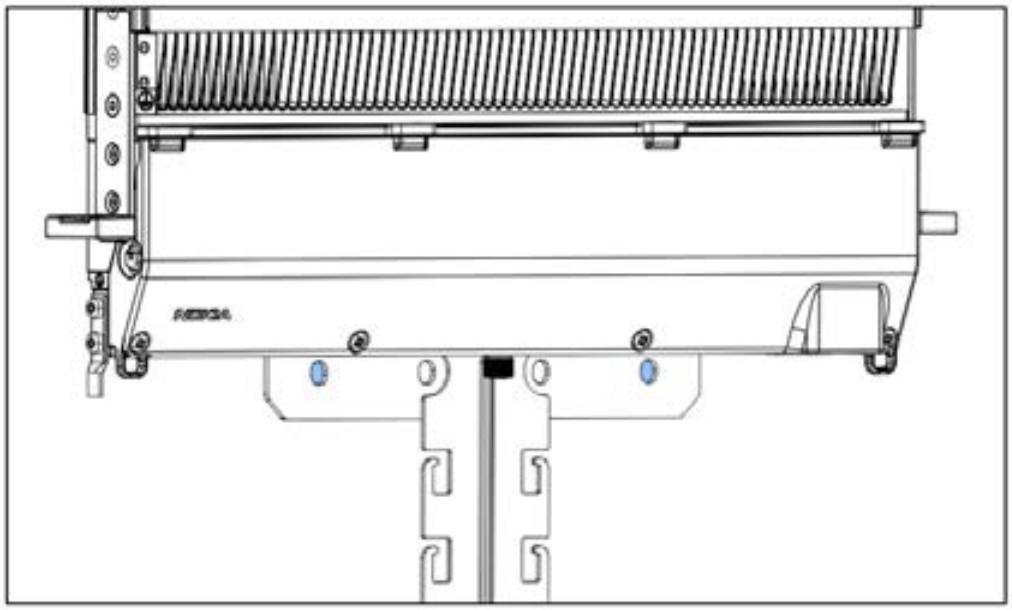
> **Note:**
>
> Do not tighten the screws.

Figure 203: Hanging the core unit



3.2 Mark the bottom mounting screws using lower AMJC bracket as a template.

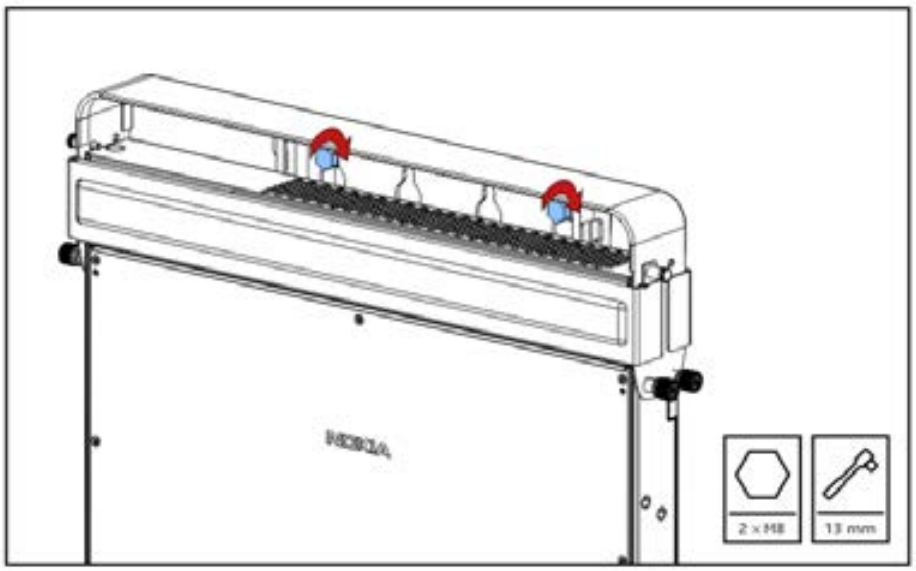
Figure 204: Marking the bottom drilling holes



3.3 Remove the core unit and drill the two holes.

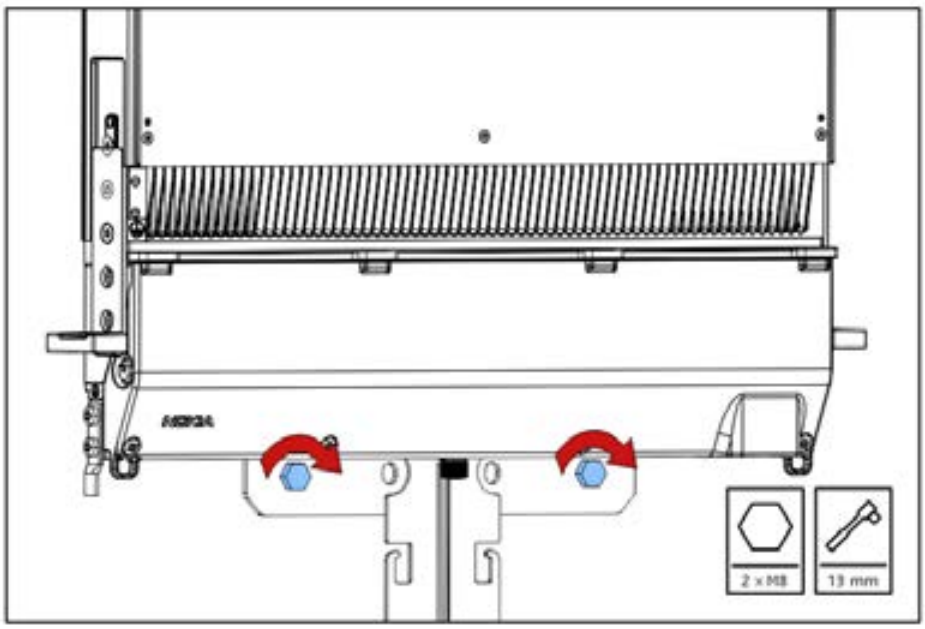
4 Hang the core unit and tighten the upper M8 screws to the torque value specified by the wall mounting hardware manufacturer.

Figure 205: Tightening the upper screws



5 Tighten the lower M8 screws to the torque value specified by the wall mounting hardware manufacturer.

Figure 206: Tightening the lower screws



6 Proceed with cabling as described in Cabling ASOE, ASOG, or ASOH.

13.2 Installing ASOE, ASOG, or ASOH on a wall using AMJK

You can install ASOE, ASOG, or ASOH core unit with AMJK directly on a wall.

Before you start

- These instructions show ASOE, but they are applicable to ASOG and ASOH as well.
- Install the AMJA (for ASOE) or AMJJ (for ASOG or ASOH) cable entry as instructed in Installing AMJA outdoor cable entry or Installing AMJJ outdoor cable entry.
- Install the AMJK elements as instructed in Installing AMJK piggyback mounting kit.
- For the list of the supported micro remote radio heads (mRRHs), optional items, and mounting kits, see AMJK compatibility list and installation pre-requirements.
- This installation instructions show AYGD pre-installed on AMJK. The AYGE GNSS receiver is installed directly on a pole. For installation details, see *Installing Optional Global Navigation Satellite System Units*.

Equipment preconditions

You need the following:

- ☐ AMJK piggyback mounting kit (476408A)
- ☐ (Optional) AYGD GNSS dual band receiver (475646A)
- ☐ Tools:
  - ☐ Drill
  - ☐ Level
  - ☐ 4 x M8 screw
  - ☐ Torque wrench
  - ☐ Torque screwdriver
  - ☐ Torx bit T25
  - ☐ 13 mm socket

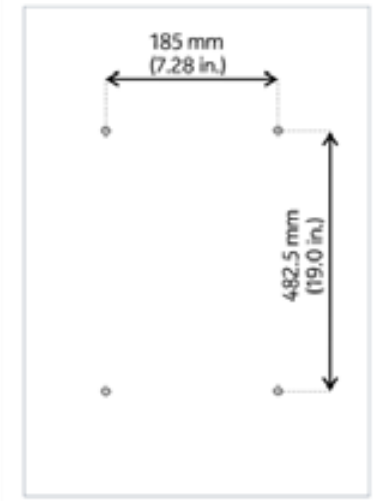
Procedure

1 Mark the mounting screw locations on the wall and drill the holes.

Tip:

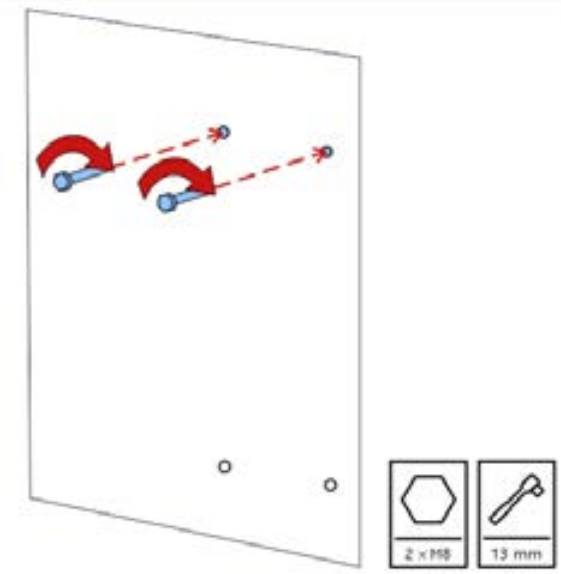
You can use the core unit as a template to drill the lower holes. See step 3 for more information.

Figure 207: Drilling the holes



2 Tighten the two upper mounting M8 screws halfway to the wall.

Figure 208: Fixing the screws

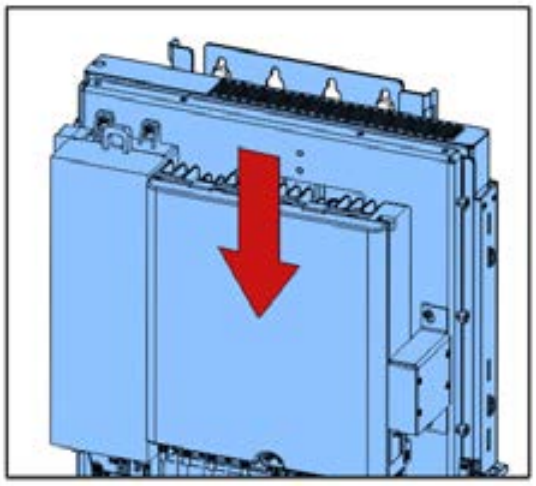


3 (Optional) Use the core unit as a template to drill the lower holes.

Skip this step if you already drilled all four holes.

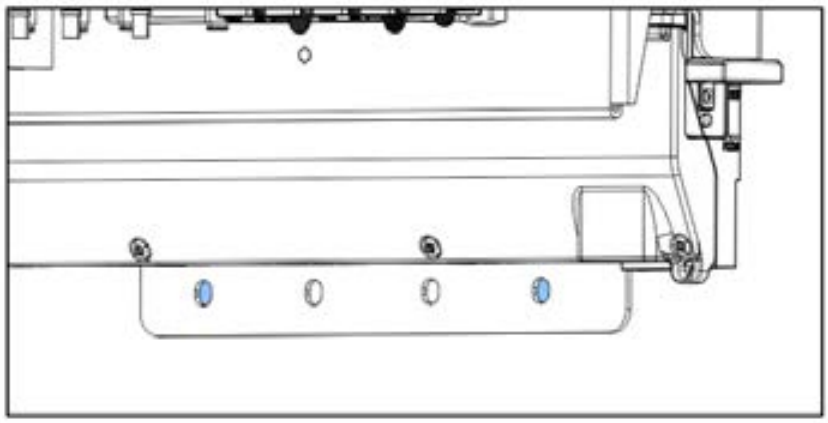
3.1 Hang the core unit on the mounting screws.

Figure 209: Hanging the core unit



3.2 Mark the bottom mounting holes using the lower AMJK mounting holes as a template.

Figure 210: Marking the bottom drilling holes



3.3 Remove AMJK and drill the two holes.

4 Hang AMJK with the core unit inside and tighten the upper and lower M8 screws to the torque value specified by the wall mounting hardware manufacturer.

Figure 211: Tightening the upper screws

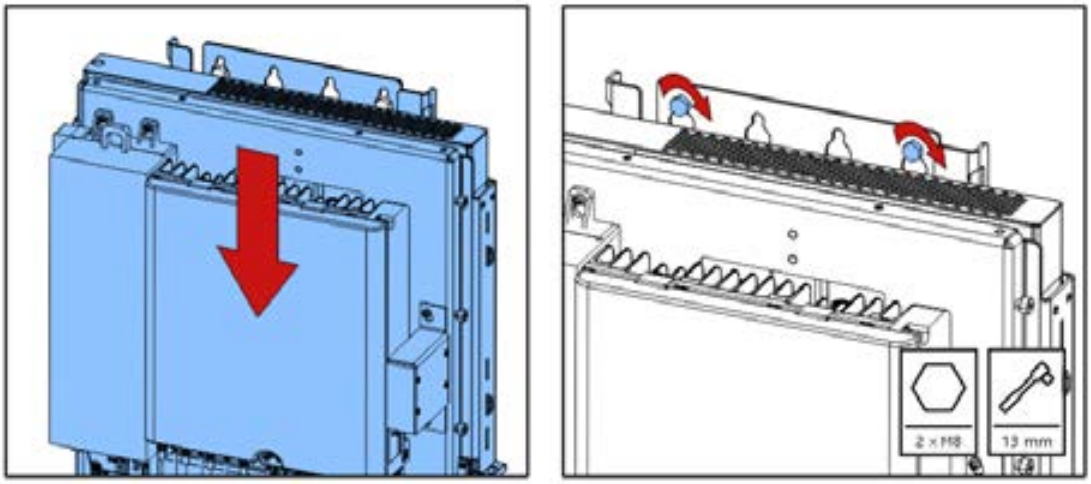
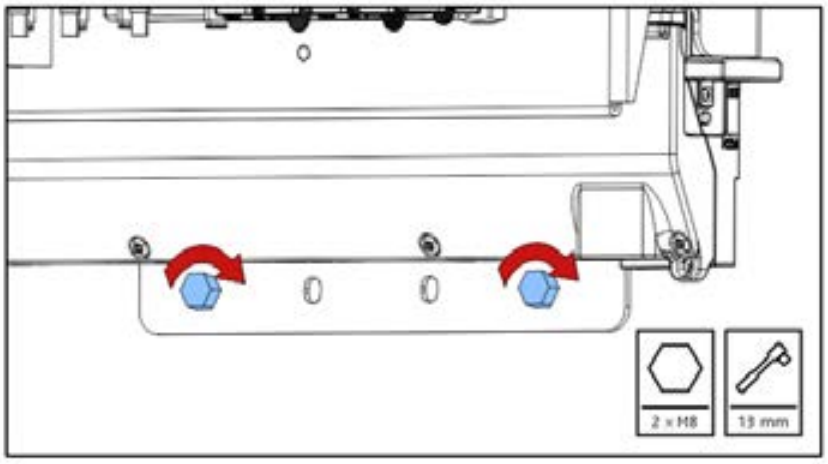
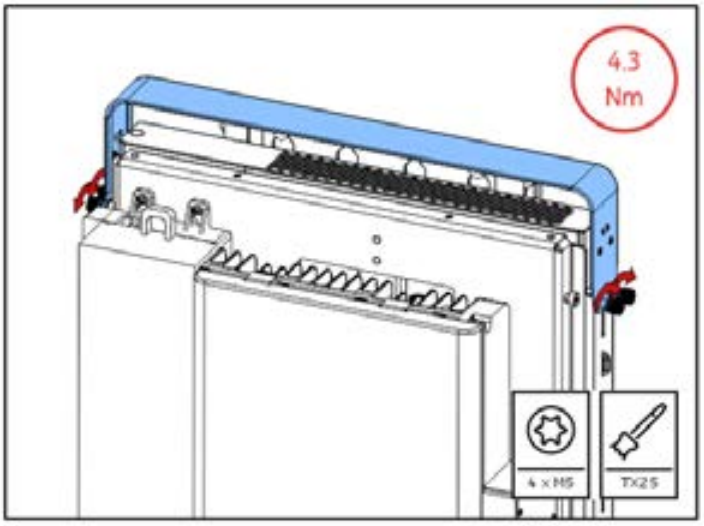


Figure 212: Tightening the bottom screws



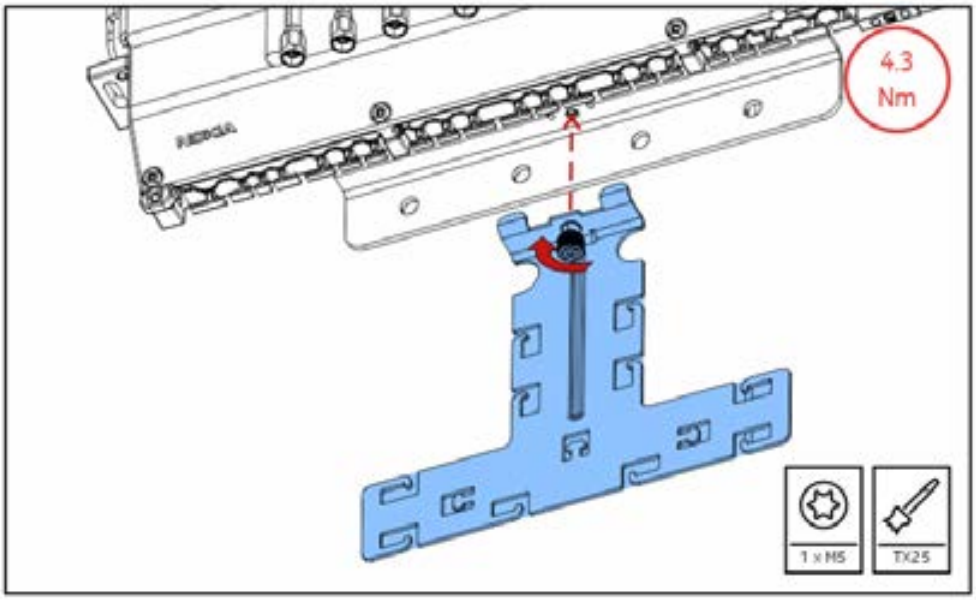
5 Fix the dust cover to the core unit and tighten the four M5 screws to 4.3 Nm (38.1 in-lb.).

Figure 213: Fixing the dust cover to the core unit



6 Fix the strain relief to AMJK and tighten the M5 captive screw to 4.3 Nm (38.1 in-lb.).

Figure 214: Installing the strain relief



Postrequisites

Proceed with cabling:

- For ASOE cabling instructions, see Cabling ASOE.
- For AYGD cabling instructions, see *Installing Optional Global Navigation Satellite System Units*.

- For AYGE cabling instructions, see *Installing Optional Global Navigation Satellite System Units*.
- For APAA cabling instructions, see *Installing Nokia AirScale BTS Fronthaul Solution Units*.
- For mRRH cabling instructions, see *Installing and Cabling Nokia AirScale Micro Remote Radio Heads* or *Installing and Cabling AWHxx AirScale Micro Remote Radio Heads*.

13.3 Installing ASOE, ASOG, or ASOH on a wall using AMJK and AMED

You can use AMED to install ASOE, ASOG, or ASOH on a wall. AMED enables down- and up-tilt installations of 0°–20°.

Before you start

- These instructions show ASOE, but they are applicable to ASOG and ASOH as well.
- Install the AMJA (for ASOE) or AMJJ (for ASOG/ASOH) cable entry as instructed in Installing AMJA outdoor cable entry or Installing AMJJ outdoor cable entry.
- Install the AMJK elements as instructed in Installing AMJK piggyback mounting kit.
- For the list of the supported micro remote radio heads (mRRHs), optional items, and mounting kits, see AMJK compatibility list and installation pre-requirements.
- This installation instructions show AYGD pre-installed on AMJK. The AYGE GNSS receiver is installed directly on a pole. For installation details, see *Installing Optional Global Navigation Satellite System Units*.
- For the AMED contents of delivery, see *AMED 20 deg tilt pole mount kit* in *Nokia BTS Optional Items Description*.

Before you start

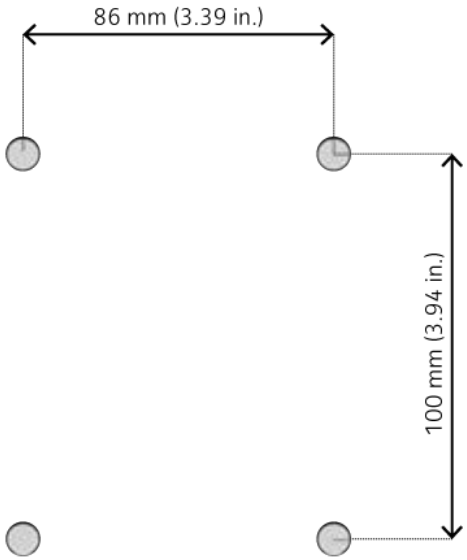
- ☐ AMED 20 deg tilt pole mount kit (475736A.102)
- ☐ Tools:
  - ☐ Torque wrench
  - ☐ Torque screwdriver
  - ☐ Power drill
  - ☐ Socket 13 mm
  - ☐ Hex bit 6 mm
  - ☐ Torx bit T25

☐ Rope

Procedure

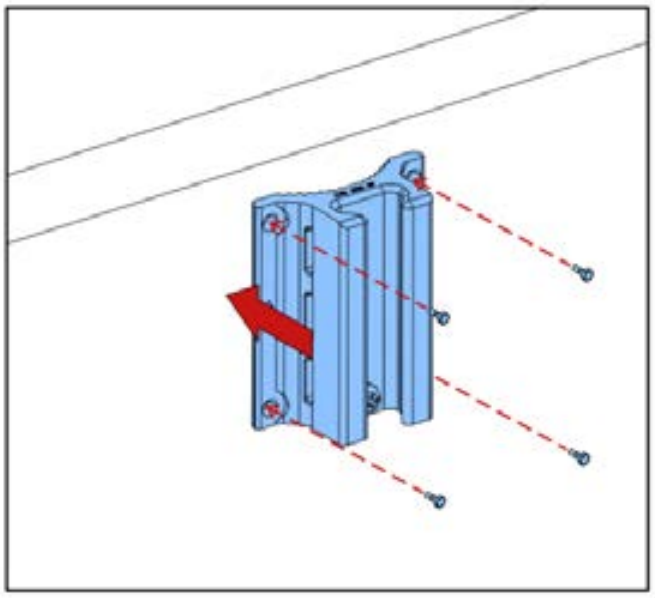
1 Drill four holes in the wall.

Figure 215: Spacing of wall holes for the wedge bracket



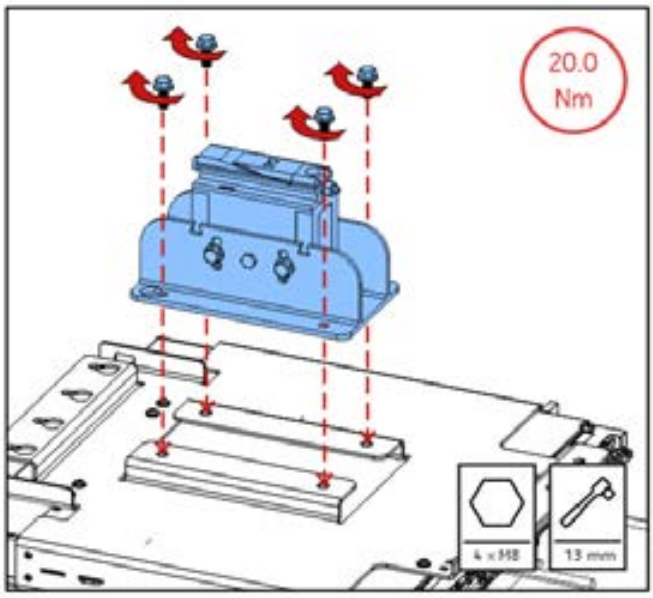
2 Attach the AMED bracket to the wall using four screws. Tighten the screws to the torque value specified by the wall-mounting hardware manufacturer.

Figure 216: Attaching the wedge bracket to a wall



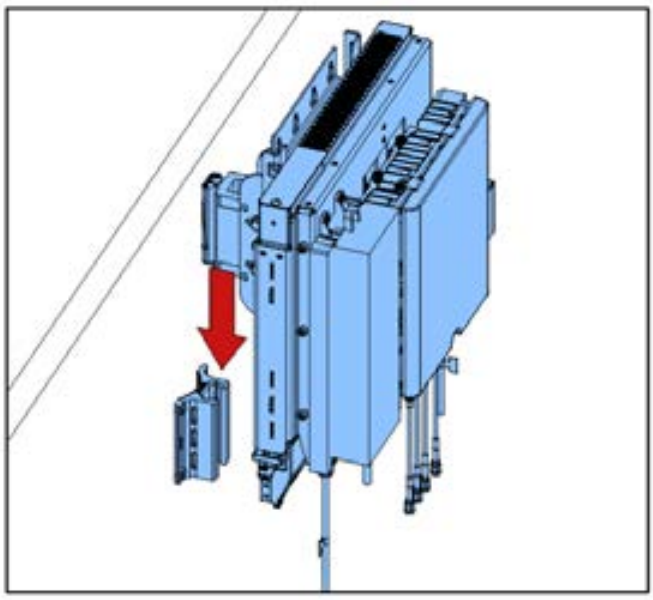
3 Fix the wedge bracket to AMJK and tighten the four M8 screws to 20.0 Nm (14.8 ft-lb.).

Figure 217: Attaching the wedge bracket to AMJK



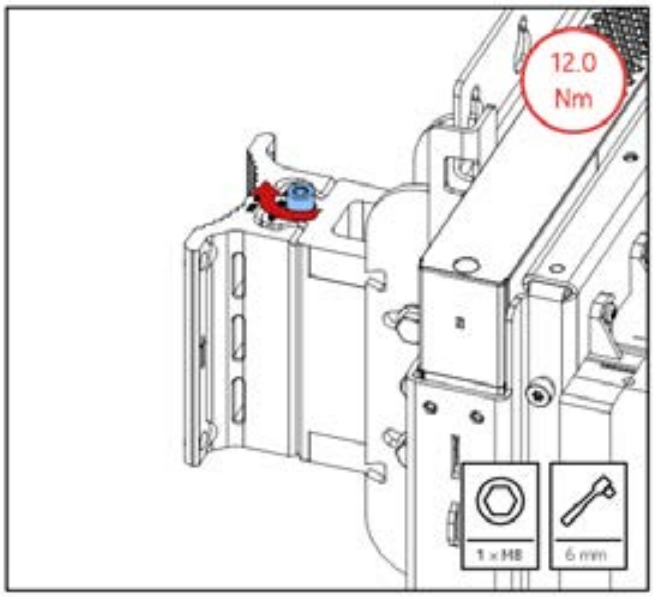
4 Lift and slide the assembly onto the AMED bracket.

Figure 218: Attaching the assembly to the AMED bracket



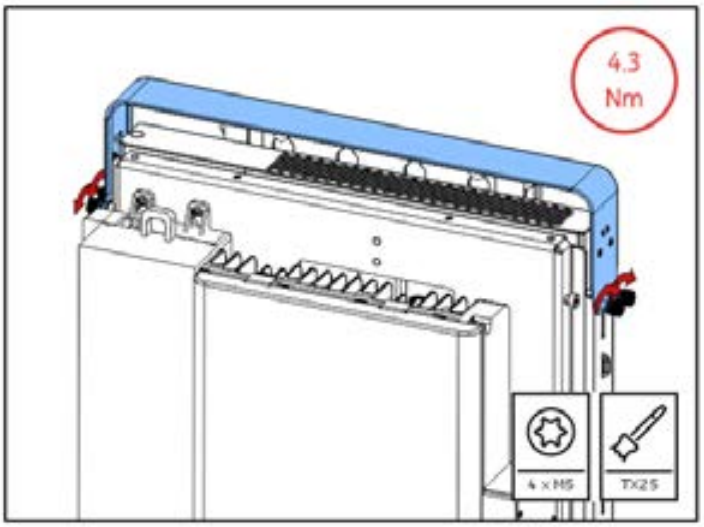
5 Tighten the M8 screw at the top of the wedge bracket to 12.0 Nm (8.9 ft-lb.).

Figure 219: Tightening the M8 screw



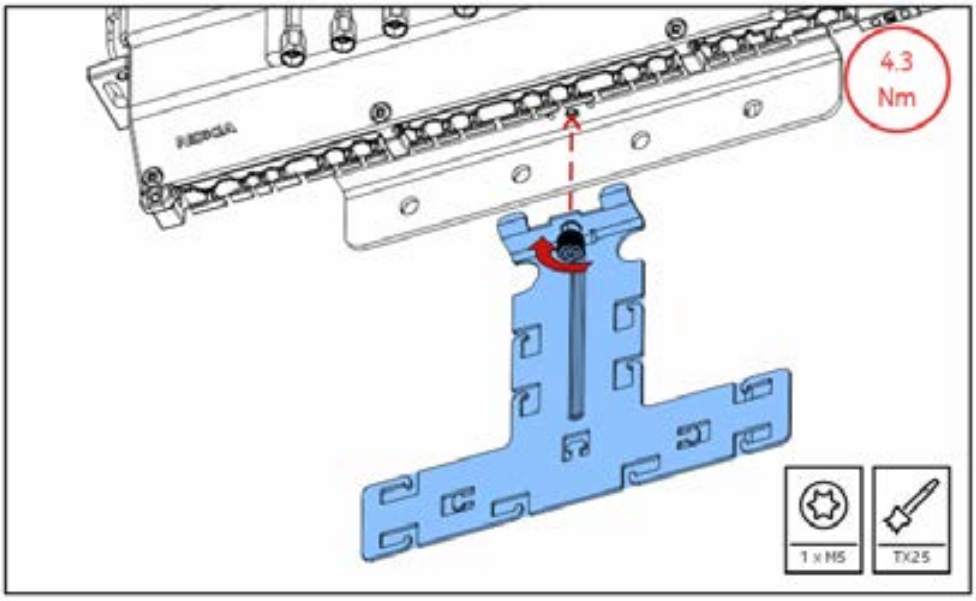
6 Fix the dust cover to the core unit and tighten the four M5 screws to 4.3 Nm (38.1 in-lb.).

Figure 220: Fixing the dust cover to the core unit



7 Fix the strain relief to AMJK and tighten the M5 captive screw to 4.3 Nm (38.1 in-lb.).

Figure 221: Installing the strain relief



Postrequisites

Proceed with cabling:

- For ASOE cabling instructions, see Cabling ASOE.
- For AYGD cabling instructions, see *Installing Optional Global Navigation Satellite System Units*.
- For AYGE cabling instructions, see *Installing Optional Global Navigation Satellite System Units*.
- For APAA cabling instructions, see *Installing Nokia AirScale BTS Fronthaul Solution Units*.
- For mRRH cabling instructions, see *Installing and Cabling Nokia AirScale Micro Remote Radio Heads* or *Installing and Cabling AWHxx AirScale Micro Remote Radio Heads*.

For AMED tilting instructions, see *Adjusting the tilt of AMED bracket* in *Installing and Cabling AWMFIA Micro RRH.*

13.4 Installing ASOE, ASOG, or ASOH on a wall using one-clip rail

You can install ASOE, ASOG, or ASOH with AMRA on a wall using the one-clip rail solution.

Before you start

⚠ WARNING!

Risk of injury!

Wall mounting hardware is required for each individual one-clip rail. Make sure the wall mounting hardware is appropriate for the wall material and weight. Make sure each one -clip rail is mounted on a secure spot on the wall. Follow the manufacturer's guidelines for spacing of wall mounting hardware. Wall mounting hardware cannot protrude beyond the recessed holes in the one-clip rail after installation. Verify wall mounting hardware before installation.

- Install the AMJD rail mount kit and AMRA one-clip bracket as instructed in Installing AMJD rail mount kit and AMRA one-clip bracket.
- For outdoor installation, install the AMJA (for ASOE) or AMJJ (for ASOG/H) cable entry as instructed in Installing AMJA outdoor cable entry or Installing AMJJ outdoor cable entry.
- Install the dust cover as instructed in Installing dust cover.

Note:

Wall-mounting hardware isn't included in the delivery.

Equipment preconditions

You need the following:

- ☐ AMRA one-clip rail (474583A)
- ☐ Tools:
  - ☐ Drill
  - ☐ Level
  - ☐ Torque wrench
  - ☐ 13 mm socket
  - ☐ Torx bit T40

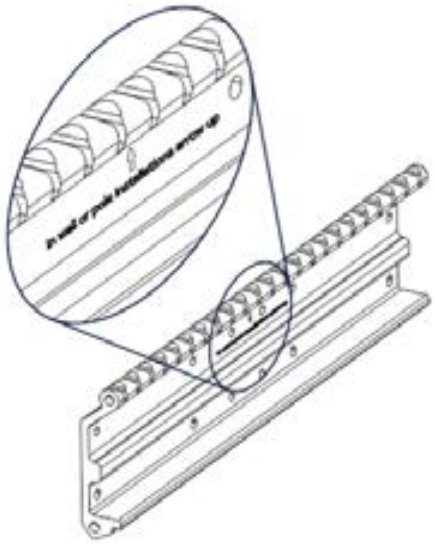
Procedure

1 Place the one-clip rail so that the arrow is pointing up.

Note:

Nokia recommends a flat surface for one-clip rail mounting. Installing the unit on an irregular surface using the one-clip rail can cause issues.

Figure 222: Correct orientation of the one-clip rail

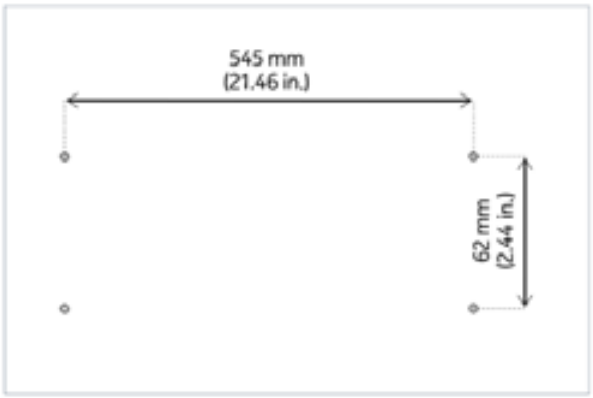


2 Mark the mounting hole locations on the wall and drill holes for the screws.

Tip:

Use the one-clip rail to mark the mounting hole locations.

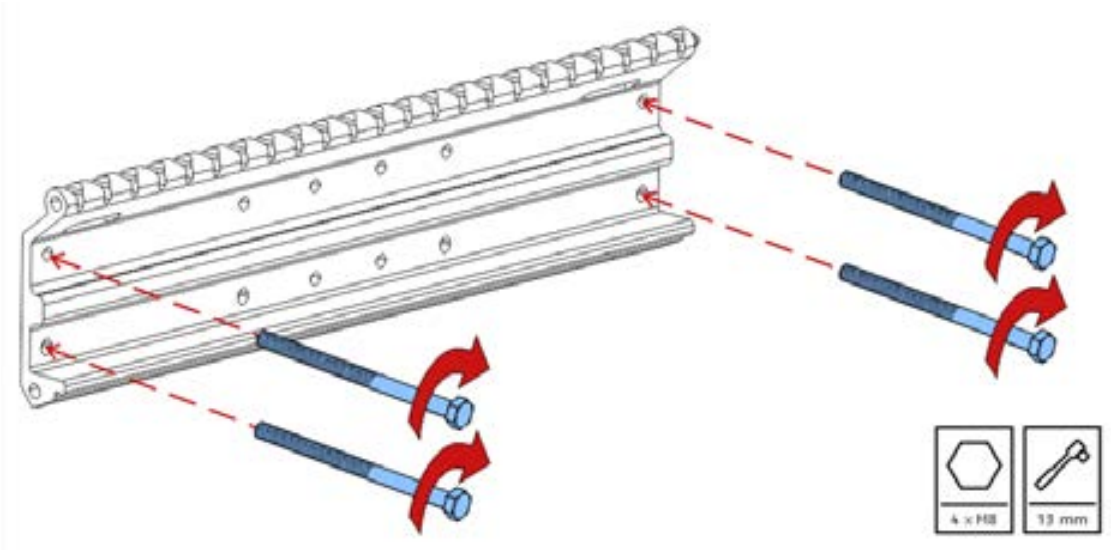
Figure 223: Drilling holes in the wall



3 Fix the one-clip rail to the wall using four M8 screws and tighten them to the torque value

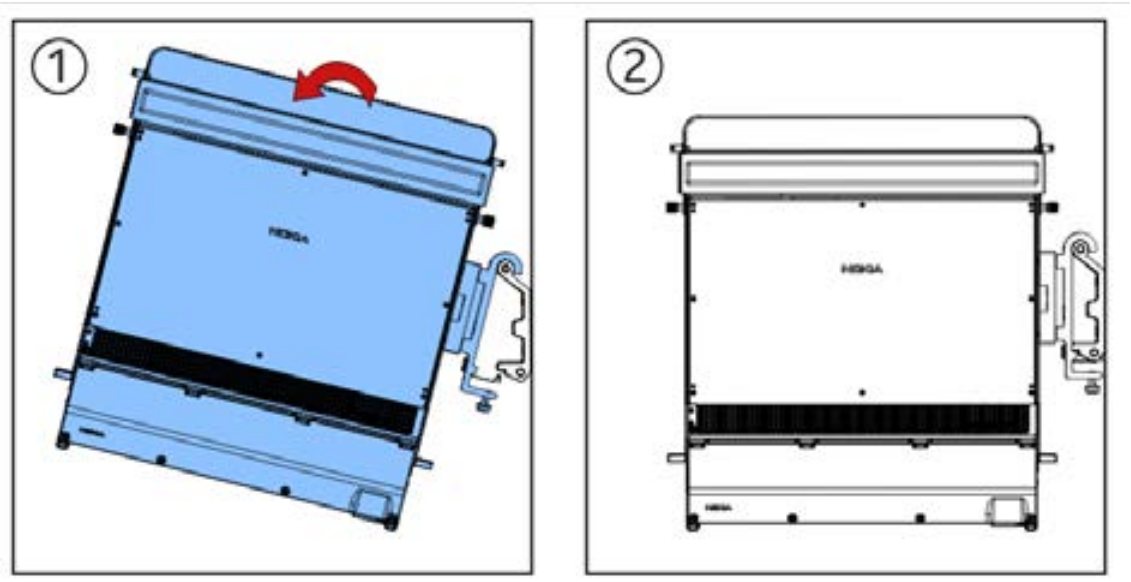
specified by the wall-mounting hardware manufacturer.

Figure 224: Mounting the one-clip rail to the wall



4 Lift and mount the unit on the one-clip rail.

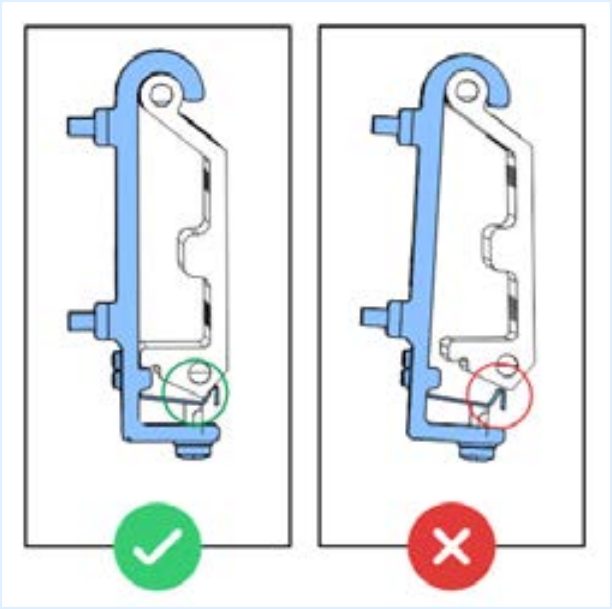
Figure 225: Mounting the unit



Note:

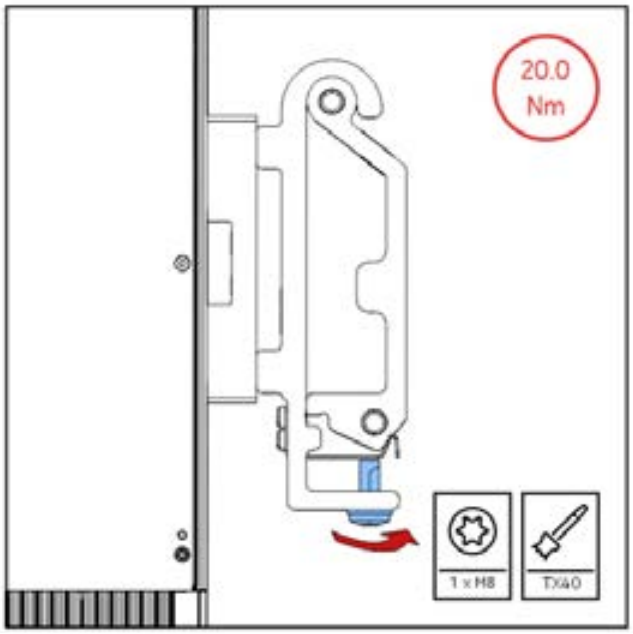
Check if the one-clip bracket spring position is correct after the assembly on the one -clip rail.

Figure 226: Correct one-clip bracket spring position



5 Tighten the one-clip bracket M8 screw to 20.0 Nm (14.8 ft-lb.).

Figure 227: Tightening the one-clip bracket screw



Postrequisites

To see the installation of ASOE on a wall using one-clip rail, go to *Single RAN/Videos/Installing SM*.

Note:

The video serves as a procedure overview only. For full instructions, always refer to the installation manual.

14. Installing ASOE, ASOG, or ASOH in a cabinet or rack

Using the AMJB rack installation kit, you can install ASOE, ASOG, or ASOH core unit in an outdoor or indoor cabinet or rack.

14.1 Installing ASOE, ASOG, or ASOH in ACOC

Installing ASOE, ASOG, or ASOH core units in ACOC doesn't require using the AMJA or AMJJ outdoor cable entry.

Before you start

The instructions below show how to install two core units, but they can be used for a single unit as well.

Install the AMJB rack installation kit as instructed in Installing AMJB rack installation kit if necessary.

Equipment preconditions

You need the following:

- ☐ Torque screwdriver
- ☐ Torx bit T25

Procedure

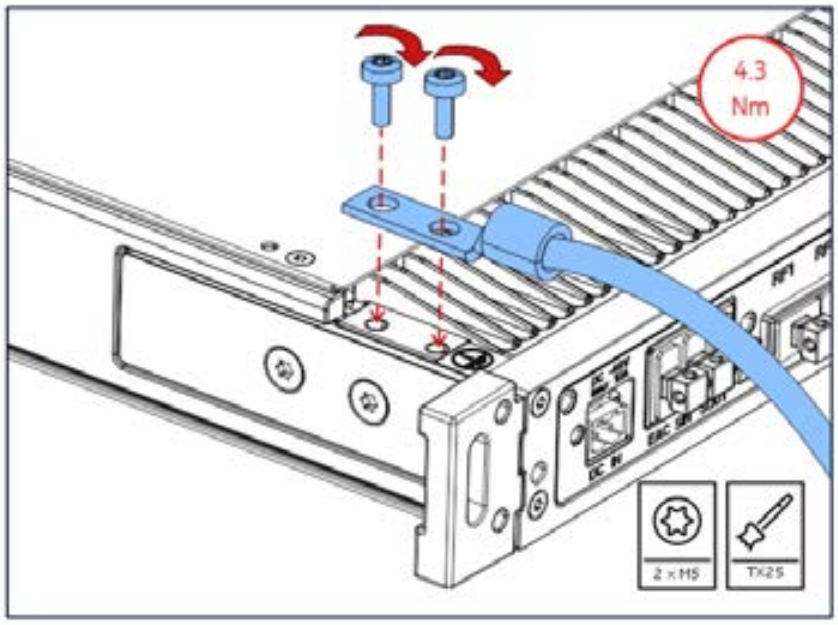
1 Connect the grounding cable and tighten the two M5 screws to 4.3 Nm (38.1 in-lb.).

If you're installing two core units, connect the grounding cable to both.

Select from the available options

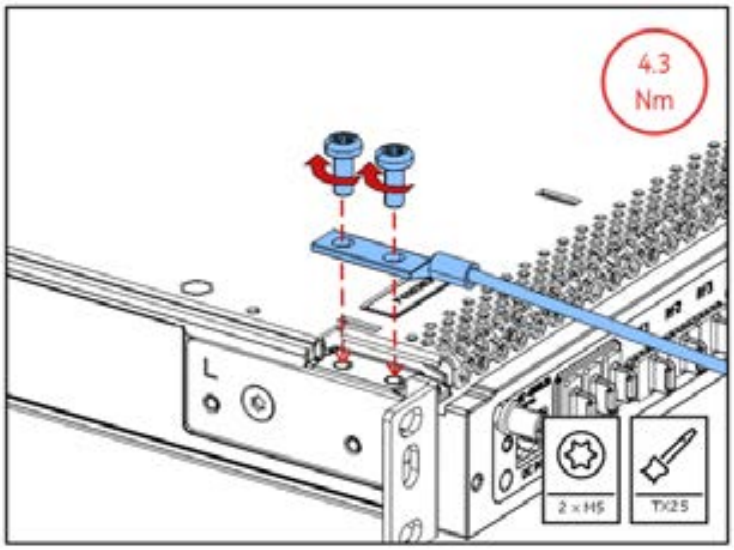
- ASOE

Figure 228: Connecting the grounding cable to ASOE



- ASOG/H

  Figure 229: Connecting the grounding cable to ASOG/H

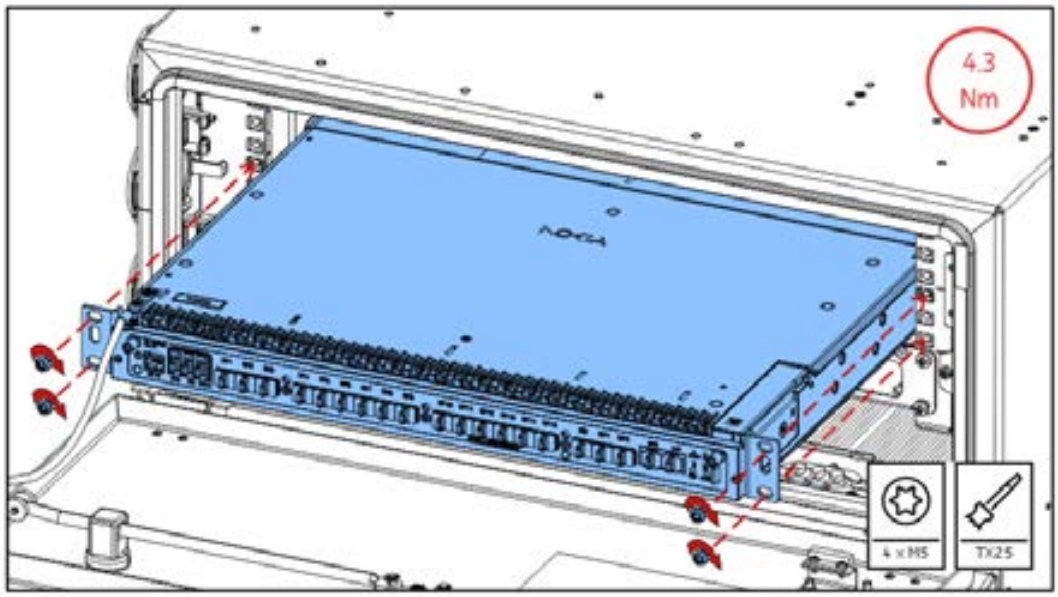


2 Insert the lower core unit into the cabinet and tighten the M5 screws to 4.3 Nm (38.1 in-lb.).

Select from the available options

- ASOE
- ASOG/H

Figure 230: Inserting the lower ASOG/H into ACOC

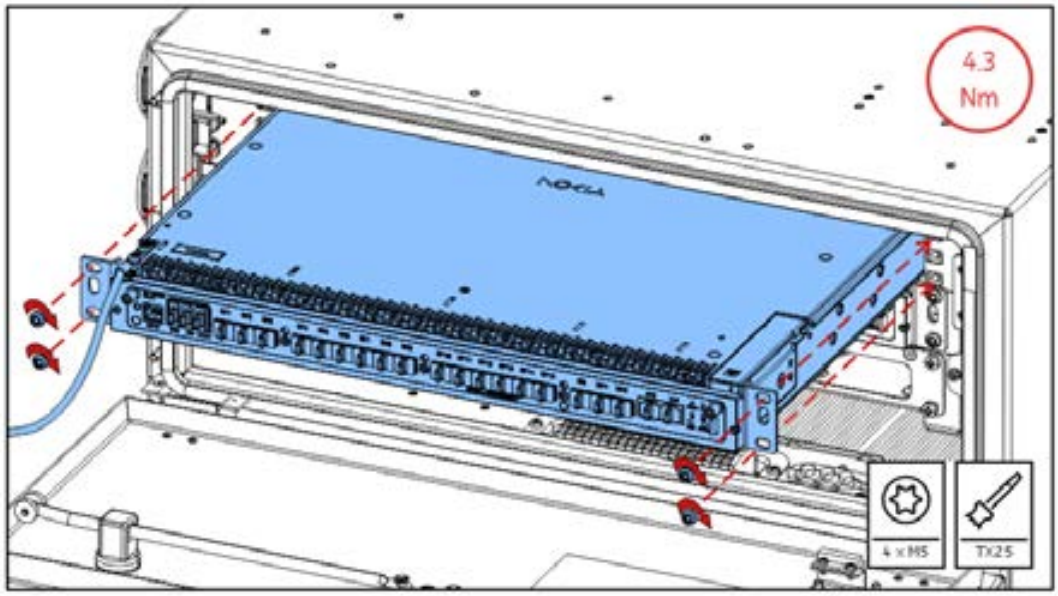


3 Insert the upper core unit into the cabinet and tighten the M5 screws to 4.3 Nm (38.1 in-lb.).

Select from the available options

- ASOE
- ASOG/H

Figure 231: Inserting the lower ASOG/H into ACOC



4 Connect the cables as described in Cabling ASOE, ASOG, or ASOH.

14.2 Installing ASOE, ASOG, or ASOH in FCIA or a rack

Installing ASOE, ASOG, or ASOH core units in an FCIA cabinet or rack doesn't require using the AMJA or AMJJ outdoor cable entry.

Before you start

Note:

- These instructions show how to install two core units in FCIA, but they can be used for a single unit in another indoor cabinet or rack as well.
- Make sure there is a tray or support rail under the core unit.
- You can use the AMJB rack installation kit as instructed in Installing AMJB rack installation kit if necessary.

Equipment preconditions

You need the following:

- ☐ Torque screwdriver
- ☐ Torx bit T25
- ☐ Cable ties

Procedure

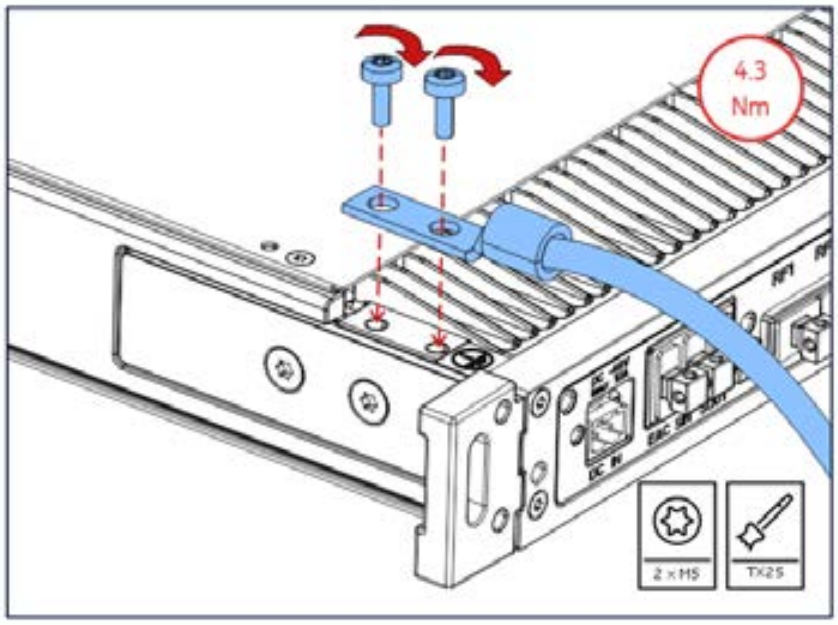
1 Connect the grounding cable and tighten the two M5 screws to 4.3 Nm (38.1 in-lb.).

If you're installing two core units, connect the grounding cable to both.

Select from the available options

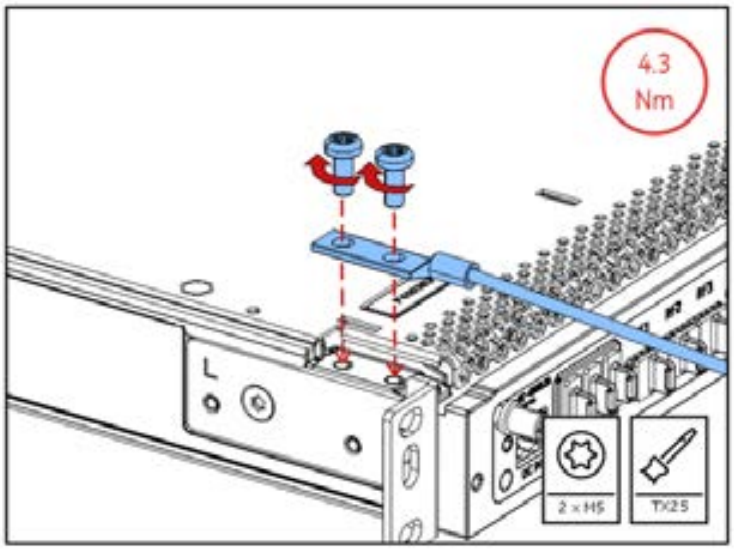
- ASOE

Figure 232: Connecting the grounding cable to ASOE



- ASOG/H

  Figure 233: Connecting the grounding cable to ASOG/H



2 Insert the lower core unit into the cabinet and tighten the M5 screws to 4.3 Nm (38.1 in-lb.).

Install the first core unit on the support rails included in the FCIA site bag (or another rack, if available).

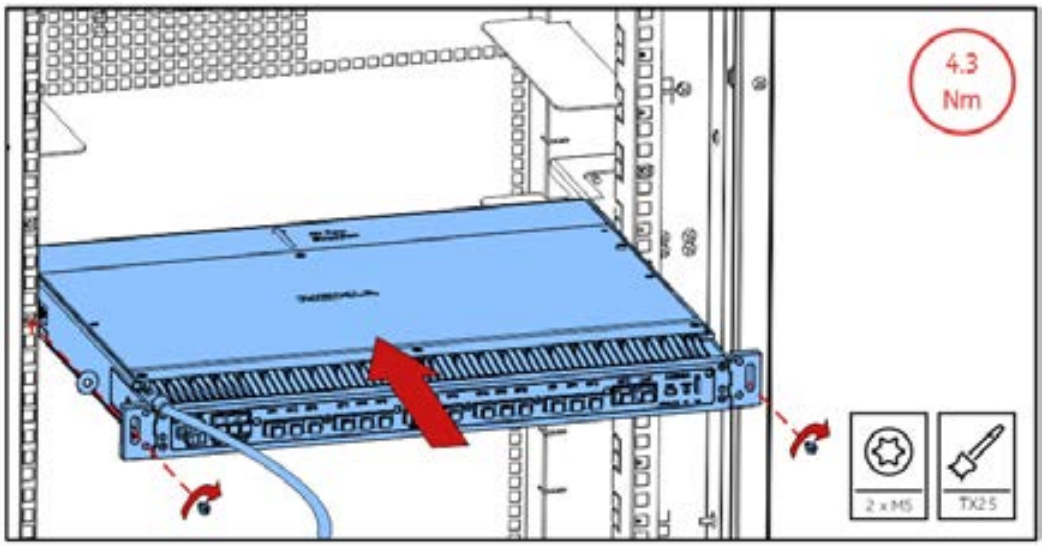
Select from the available options

- ASOE

Note:

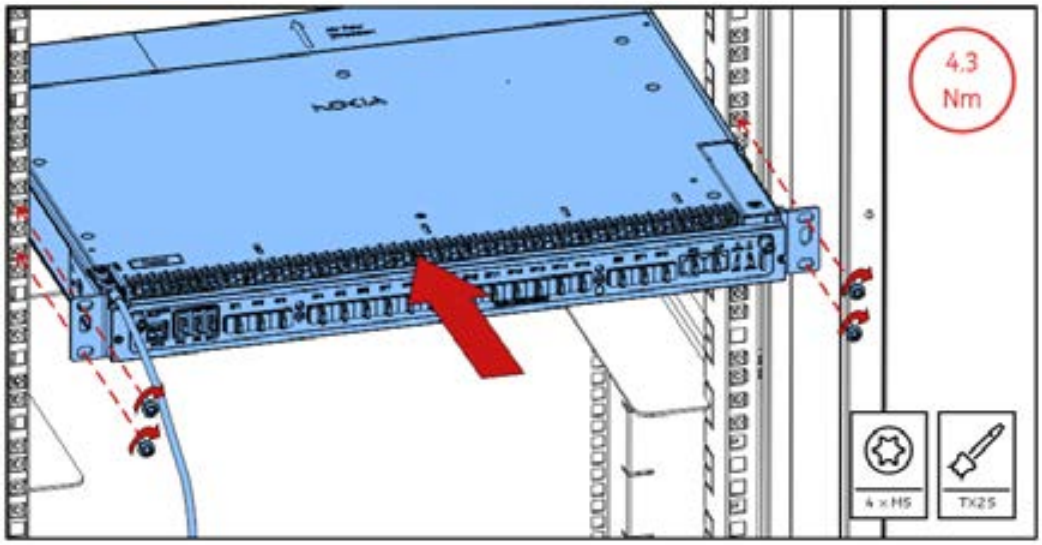
Fix the two screws and washers before inserting ASOE.

Figure 234: Inserting the lower ASOE



- ASOG/H

Figure 235: Inserting the lower ASOG/H



3 Insert the upper core unit into the cabinet and tighten the M5 screws to 4.3 Nm (38.1 in-lb.).

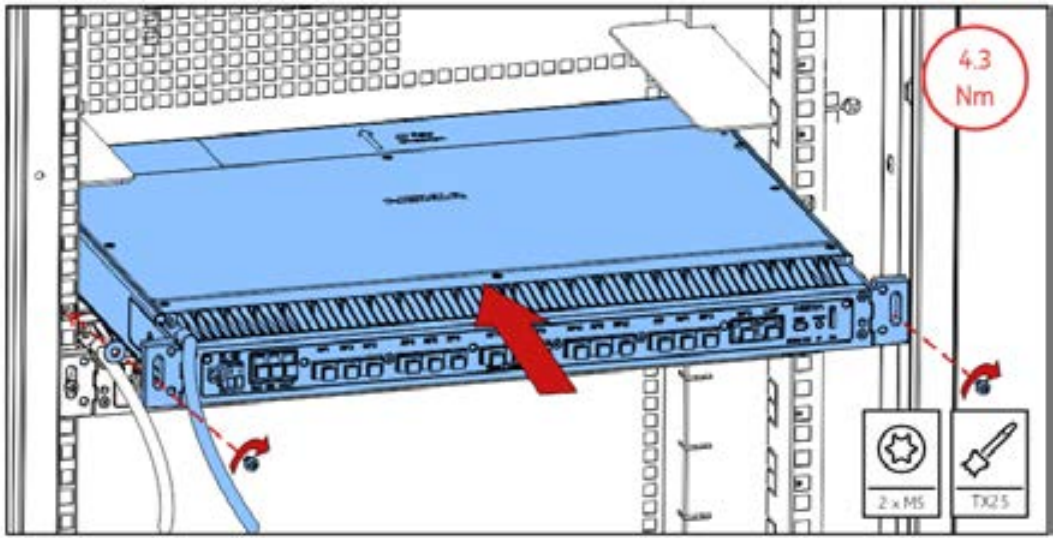
Select from the available options

- ASOE

Note:

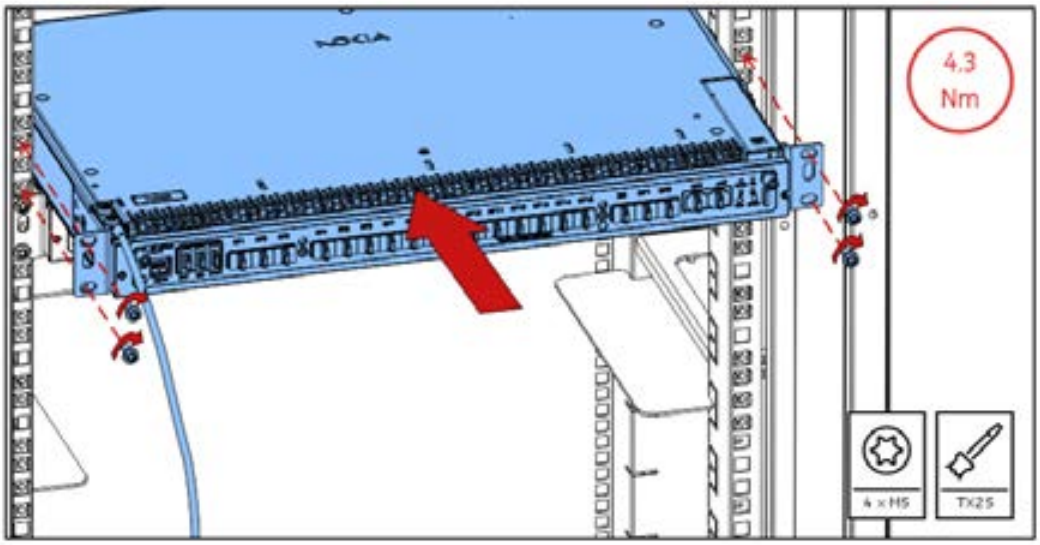
Fix the two screws and washers before inserting ASOE.

Figure 236: Inserting the upper ASOE



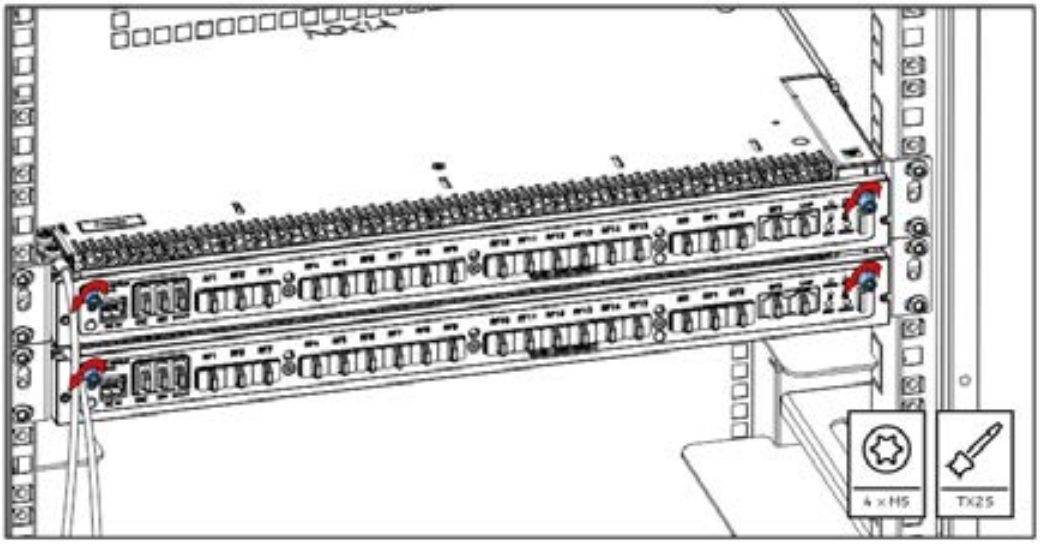
- ASOG/H

  Figure 237: Inserting the upper ASOG/H



4 (ASOG/H only) Remove the front protection pins.

Figure 238: Removing the ASOG/H protection pins



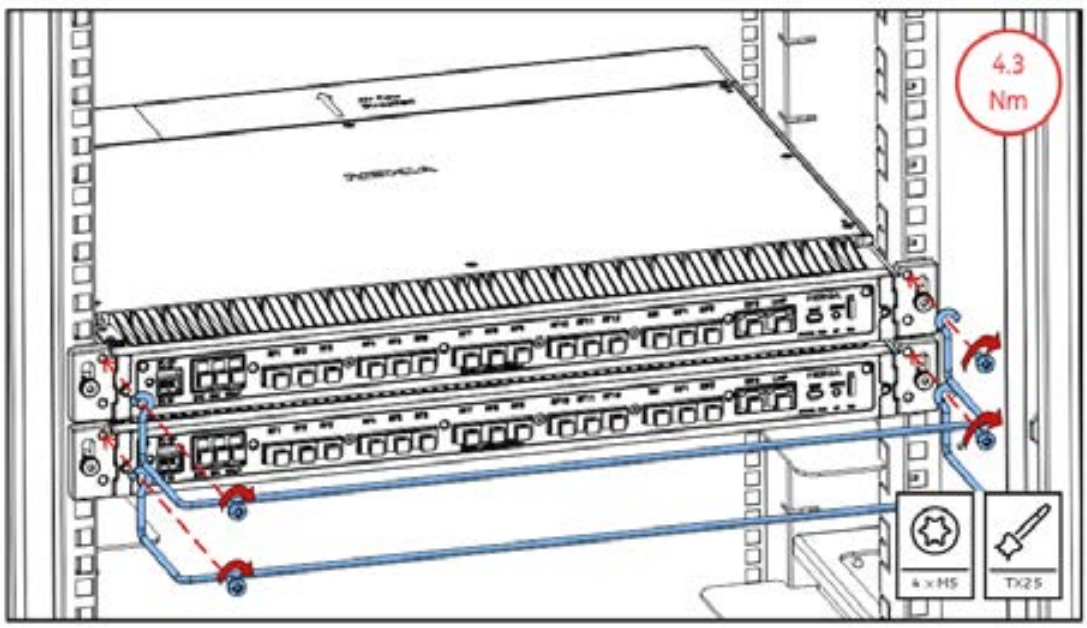
5 Fix the cable support bars to both units by tightening the four M5 screws to 4.3 Nm (38.1 in -lb.).

For ASOE, the cable support bar with mounting screws will be included in the delivery starting from ASOE version 103. For ASOG/H, use the protection pins removed in step 4 to attach the cable bar to the core unit.

Select from the available options

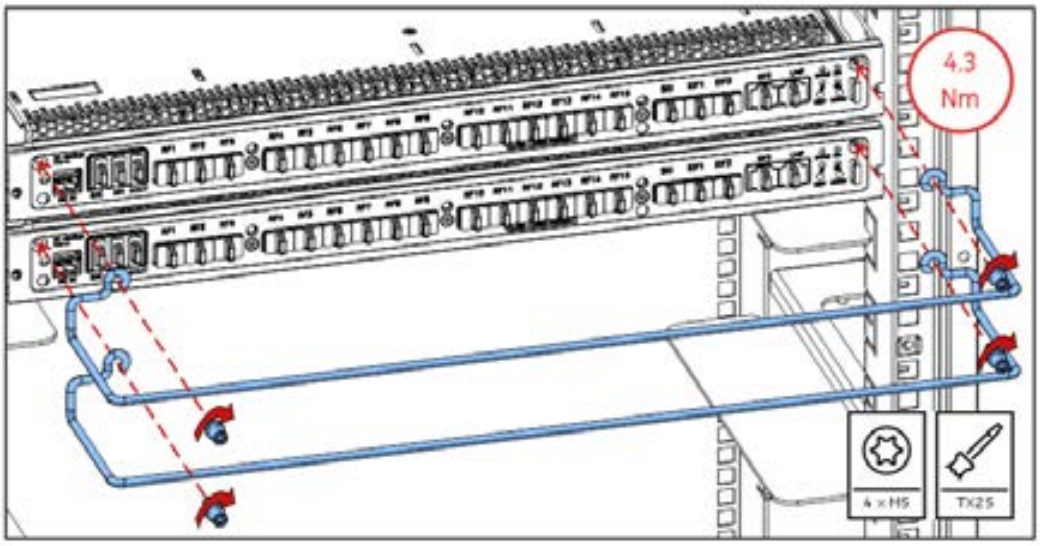
- ASOE

  Figure 239: Fixing cable support bars to ASOE



- ASOG/H

  Figure 240: Fixing cable support bars to ASOG/H



6 Connect the cables as described in Cabling ASOE.

You can use velcro cable ties to fix the cables to the cable support bar.

Postrequisites

To see the installation of ASOE in FCIA cabinet or a rack, go to *Single RAN/Videos/Installing SM*.

> **Note:**
> The video serves as a procedure overview only. For full instructions, always refer to the installation manual.

14.3 Installing ASOE, ASOG, or ASOH in FCOA

Install the AMJA or AMJJ outdoor cable entry when mounting an ASOE, ASOG, or ASOH core unit in the FCOA cabinet.

Before you start

- These instructions show ASOE, but they are applicable to ASOG and ASOH as well.
- Install the AMJA (for ASOE) or AMJJ (for ASOG or ASOH) cable entry as instructed in Installing AMJA outdoor cable entry or Installing AMJJ outdoor cable entry.
- The following instructions show how to install two core units, but they can be used for one unit as well. For two core units, install the AMJB rack installation kit as instructed in Installing AMJB rack installation kit.
- Make sure there is a tray or support rail behind the core unit

Equipment preconditions

You need the following:

- ☐ Torque screwdriver
- ☐ Torx bit T25

Procedure

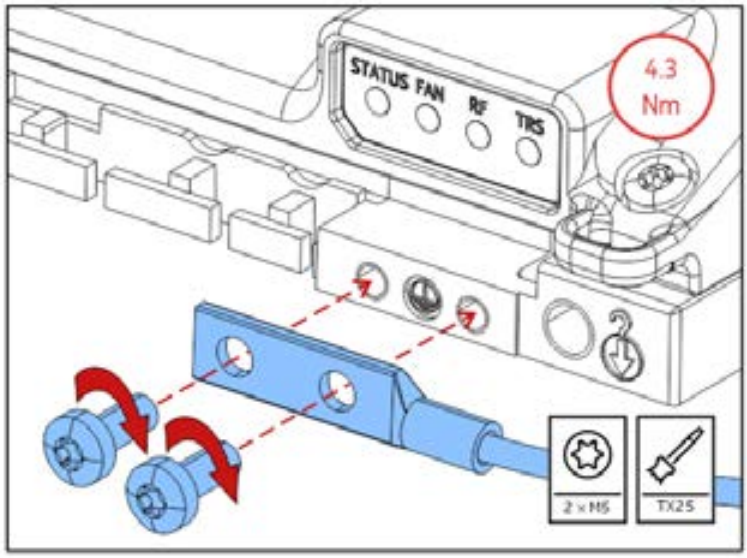
1 Fix the grounding cable and tighten the two M5 screws to 4.3 Nm (38.1 in-lb.).

When installing two core units, connect the grounding cable to both. Use the front (for ASOE) or side (for ASOG or ASOH) grounding point.

Select from the available options

- ASOE

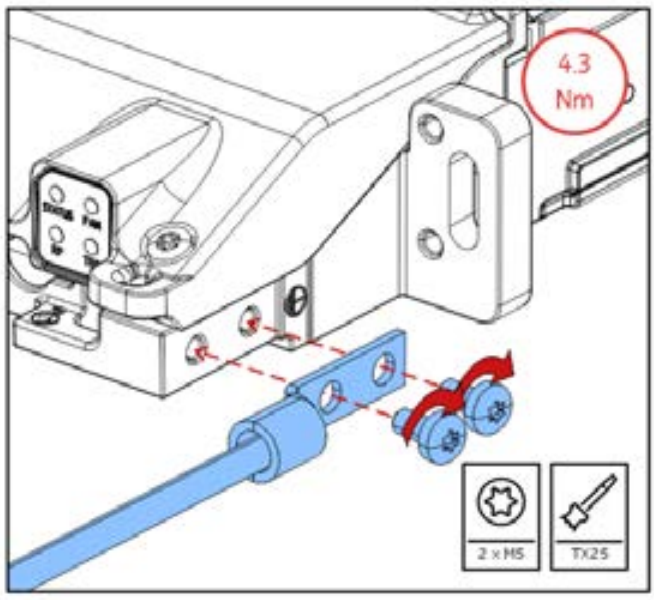
Figure 241: Front grounding point with AMJA



You can use the grounding point on either the left or right side of AMJJ.

- ASOG/H

Figure 242: Side grounding point with AMJJ

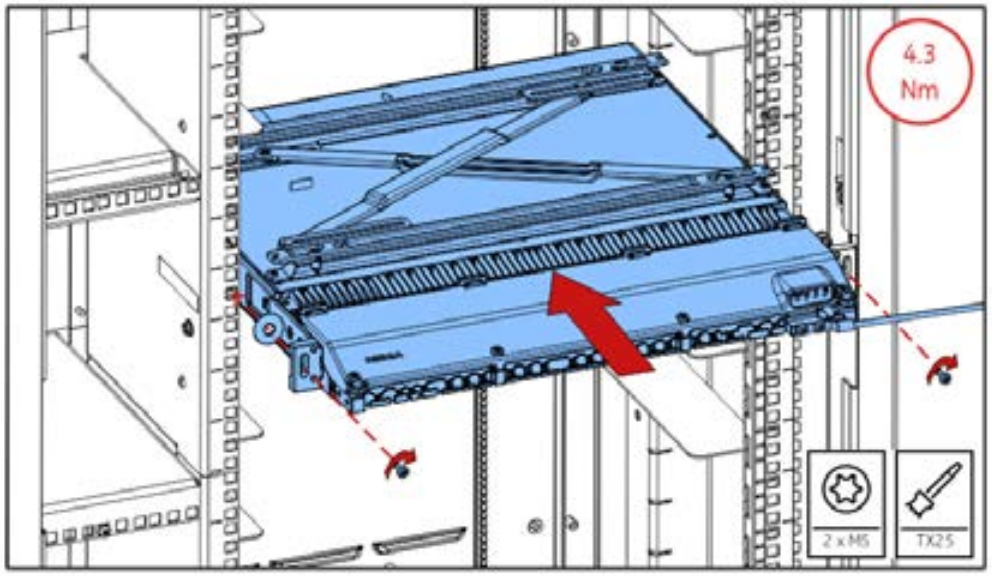


2 Insert the lower core unit into the cabinet and tighten the two M5 screws to 4.3 Nm (38.1 in -lb.).

Note:

For ASOE, fix the two screws and washers before inserting it inside.

Figure 243: Inserting the lower unit

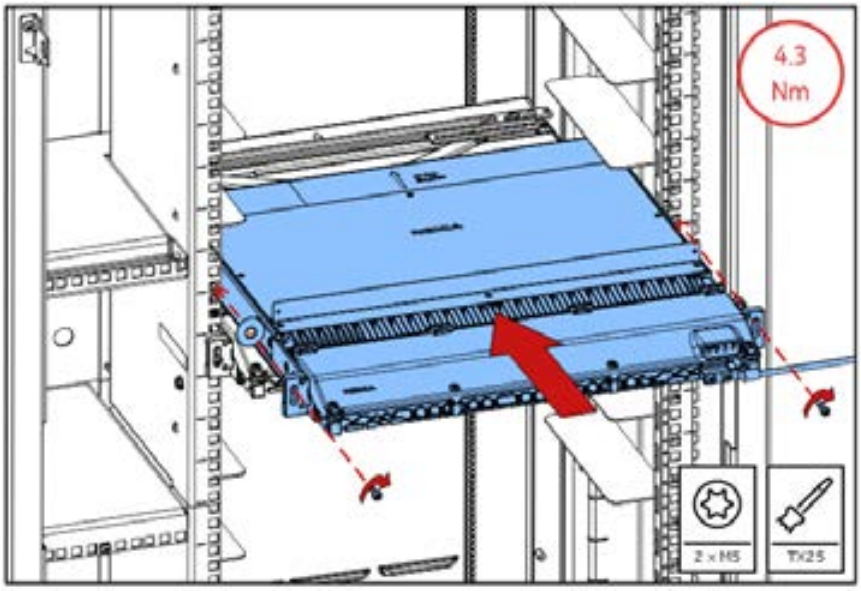


3 Insert the upper core unit into the cabinet and tighten the two M5 screws to 4.3 Nm (38.1 in -lb.).

Note:

For ASOE, fix the two screws and washers before inserting it inside.

Figure 244: Inserting the upper unit



4 Connect the cables as described in Cabling ASOE, ASOG, or ASOH

14.4 Installing ASOE, ASOG, or ASOH in FCOB

Installing ASOE, ASOG, or ASOH core units in FCOB doesn't require using the AMJA or AMJJ outdoor cable entry.

Before you start

The instructions below show how to install two core units, but they can be used for a single unit as well.

Install the AMJB rack installation kit as instructed in Installing AMJB rack installation kit if necessary.

Equipment preconditions

You need the following:

- ☐ Torque screwdriver
- ☐ Torx bit T25

Procedure

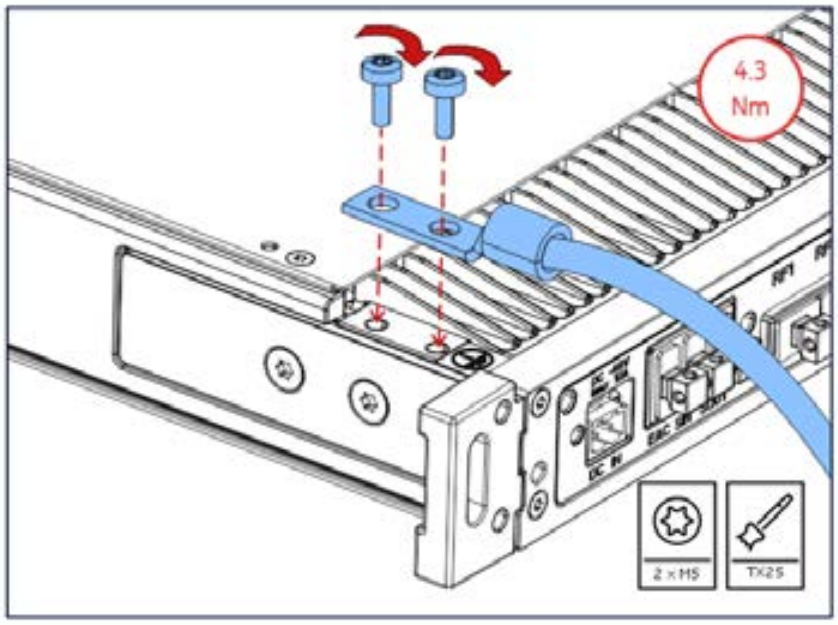
1 Connect the grounding cable and tighten the two M5 screws to 4.3 Nm (38.1 in-lb.).

If you're installing two core units, connect the grounding cable to both.

Select from the available options

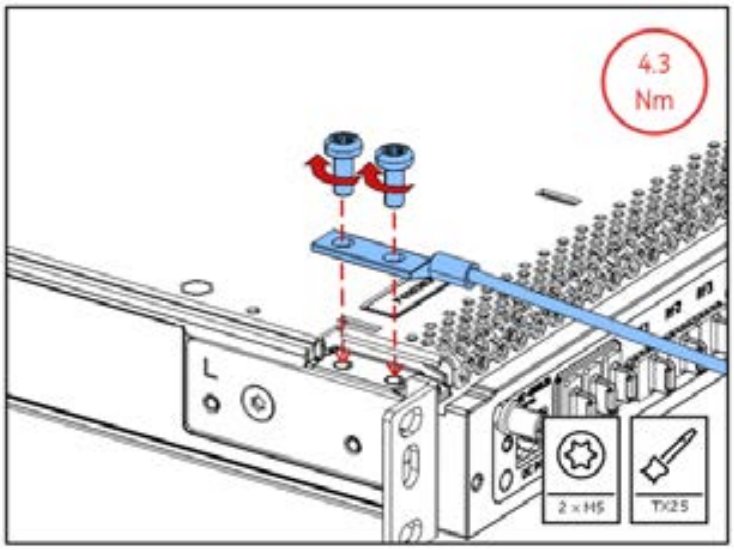
- ASOE

Figure 245: Connecting the grounding cable to ASOE



- ASOG/H

  Figure 246: Connecting the grounding cable to ASOG/H

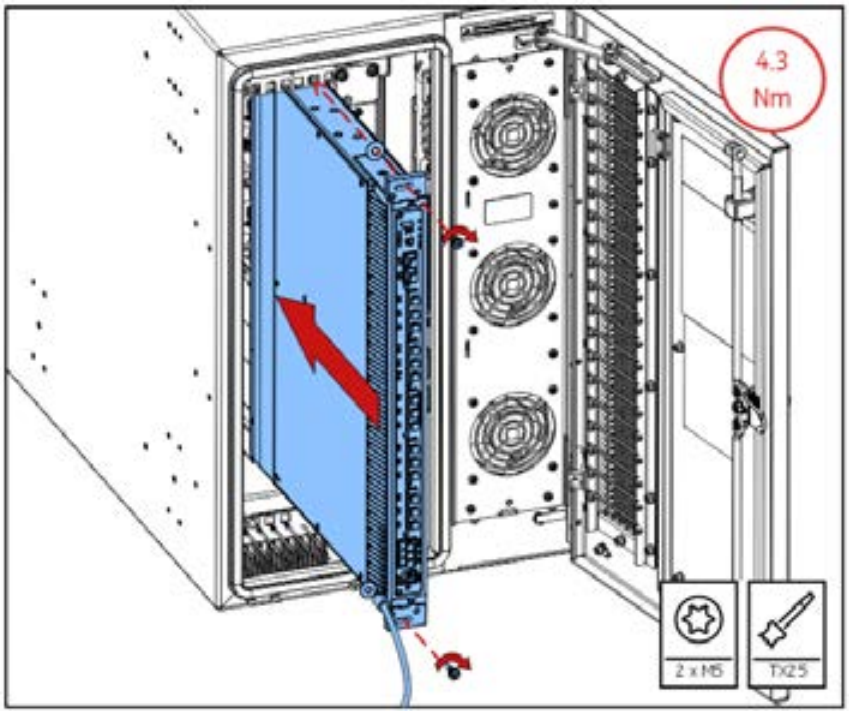


2 Insert the lower core unit into the cabinet and tighten the M5 screws to 4.3 Nm (38.1 in-lb.).

Select from the available options

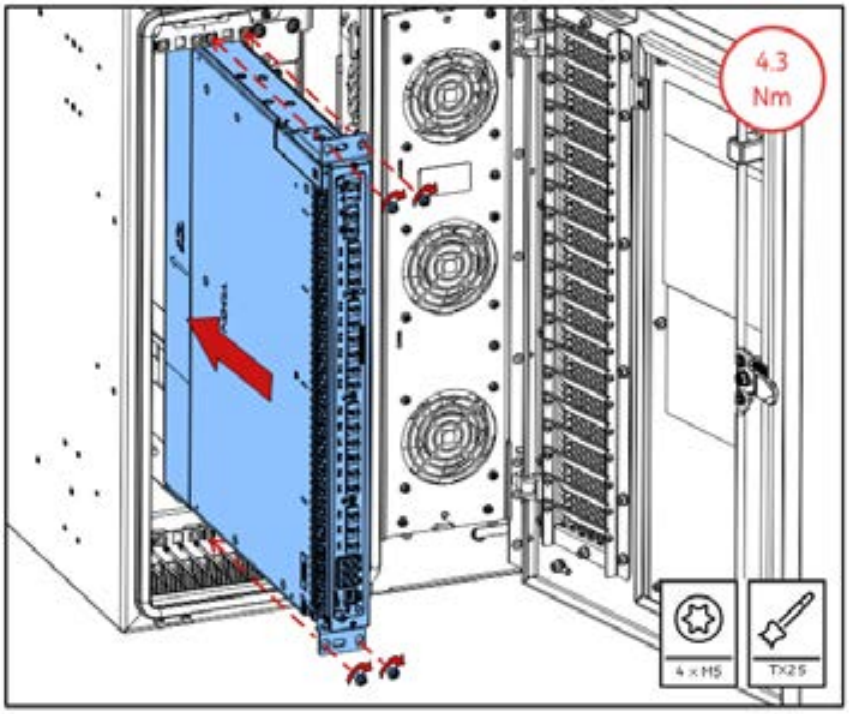
- ASOE

Figure 247: Inserting the lower ASOE into FCOB



- ASOG/H

  Figure 248: Inserting the lower ASOG/H into FCOB

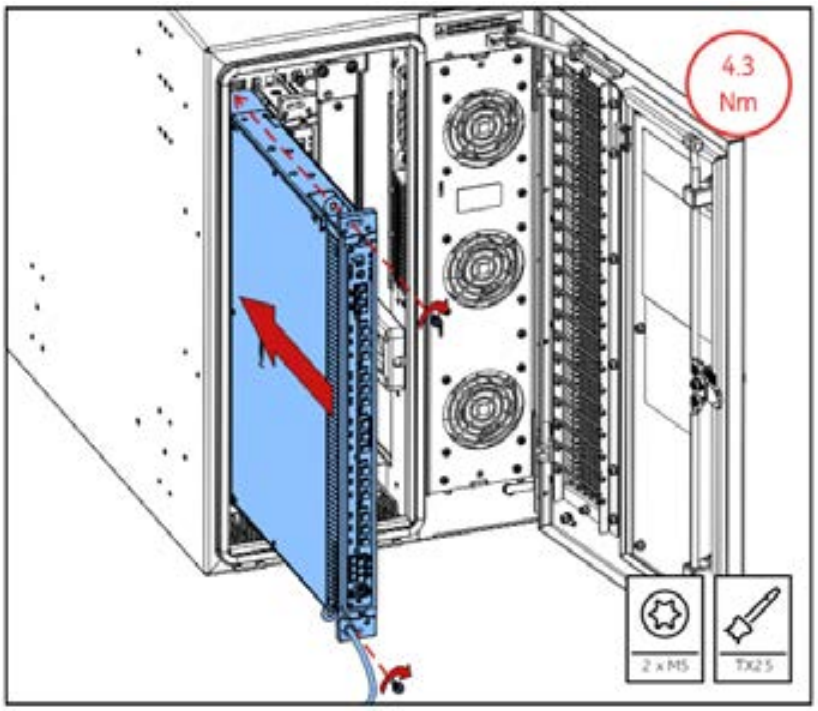


3 Insert the upper core unit into the cabinet and tighten the M5 screws to 4.3 Nm (38.1 in-lb.).

Select from the available options

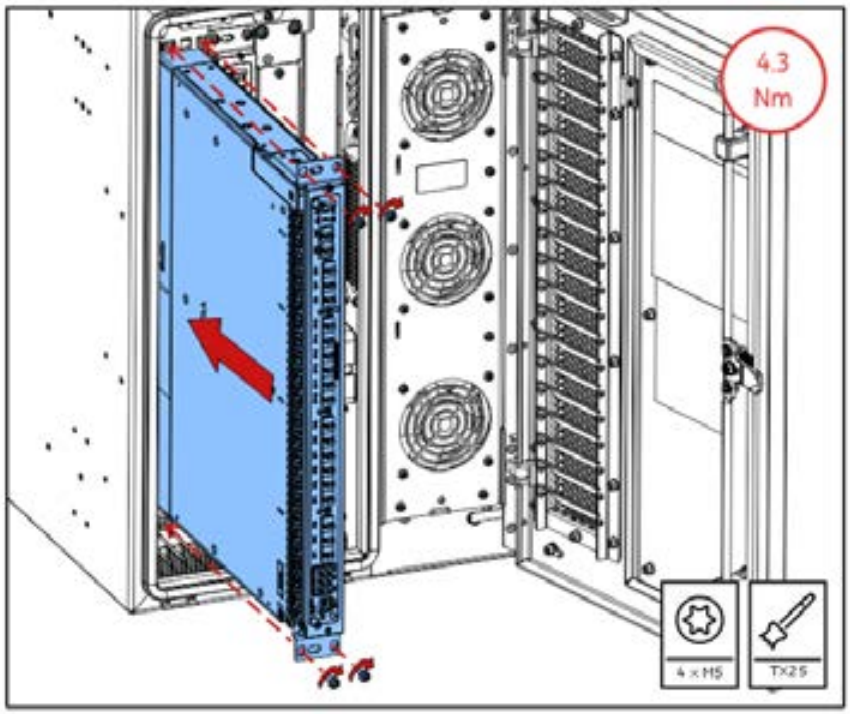
- ASOE

  Figure 249: Inserting the upper ASOE into FCOB



- ASOG/H

  Figure 250: Inserting the upper ASOG/H into FCOB



4 Connect the cables as described in Cabling ASOE, ASOG, or ASOH.

> **Tip:**
> You can use indoor instead of outdoor fiber cables if closing the FCOB door presses on the cables.

15. Cabling ASOE, ASOG, or ASOH

Cabling instructions may differ depending on installation cases.

To see the Cabling ASOE video go to *Single RAN/Videos/Installing SM*.

> **Note:**
> The video serves as a procedure overview only. For full instructions, always refer to the installation manual.

15.1 AMJA and AMJJ cable diameters

Make sure you use the proper cable diameter when using the AMJA (for ASOE) or AMJJ (for ASOG/H) outdoor cable entry.

> **Notice:**
> If you're using the AMJA (for ASOE) or AMJJ (for ASOG or ASOH) outdoor cable entry, ensure that you use round cables with an appropriate outer diameter (OD), as referenced in the table below. Using cables with a wrong OD or shape other than round may impact the ASOE or ASOG/ASOH IP sealing and damage the equipment. Nokia warranty does not cover such damage.

Figure 251: AMJA cables diameter (ASOE)

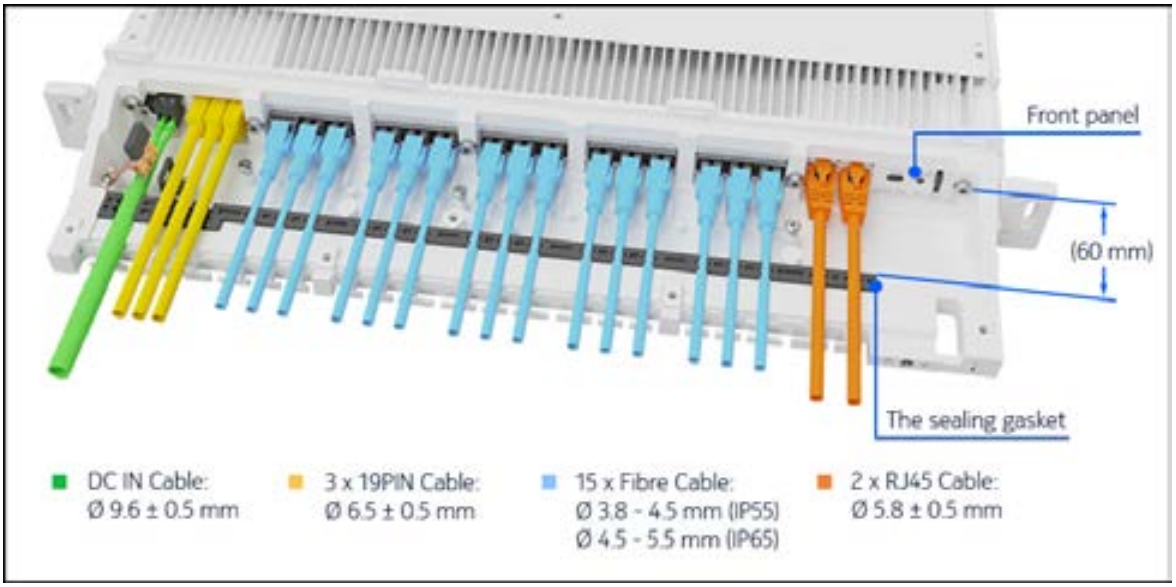


Figure 252: AMJJ cable diameters (ASOG)

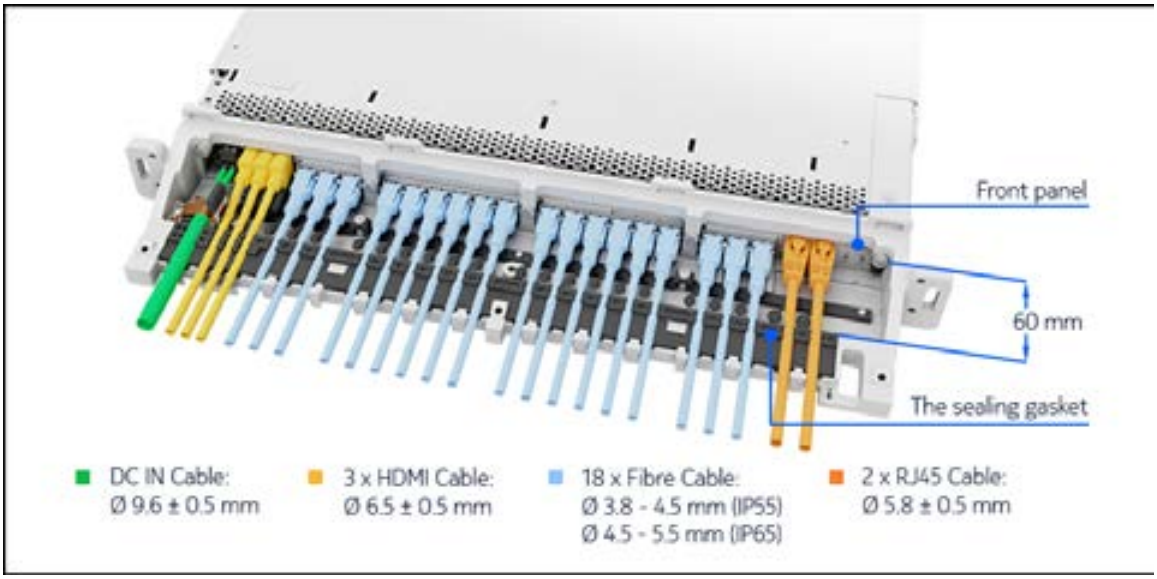


Figure 253: AMJJ cable diameters (ASOH)

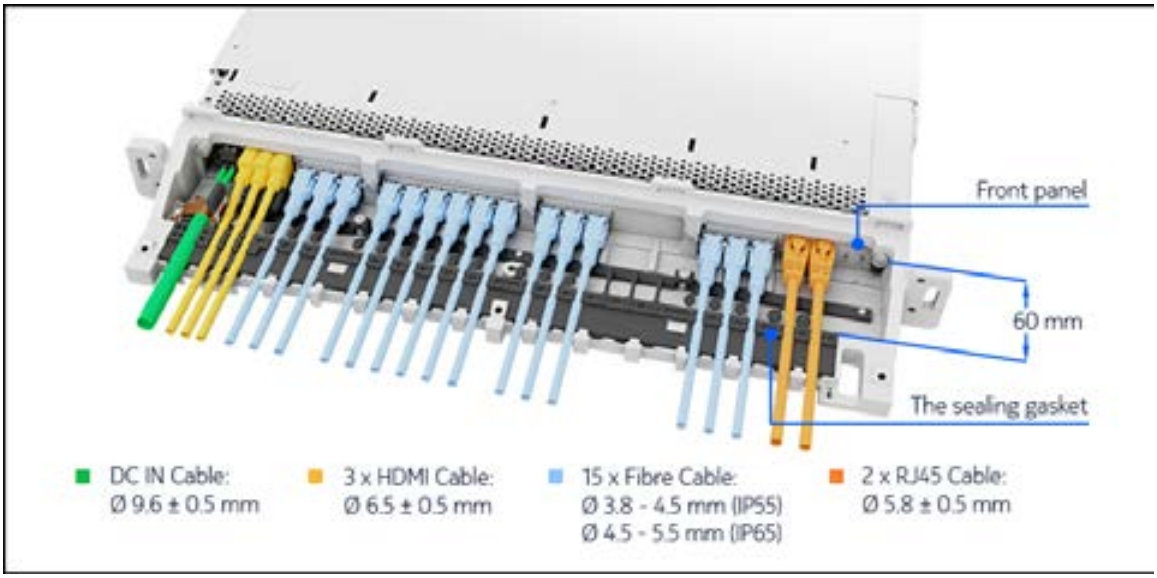


Table 22: AMJA and AMJJ cables diameter

Cable type	Outer diameter (OD)
DC	9.6 mm (0.38 in.) ± 0.5 mm (0.02 in.)[2)]
19PIN	6.5 mm (0.26 in.) ± 0.5 mm (0.02 in.)
Optical fiber	3.8 mm–4.5 mm (0.15–0.18 in.) (IP55) 5 mm (0.2 in.) ± 0.5 mm (0.02 in.) (IP65)
RJ45	5.8 mm (0.23 in.) ± 0.5 mm (0.02 in.)

[2)]For ASOE, the DC cable wire gage should be 2.5 mm^2–3.3 mm^2 (13–12 AWG). Nokia recommends using 2.5 mm^2 with ferrules.

For ASOG/H, the DC cable wire gage should be 2.5 mm^2–4 mm^2 (13–11 AWG). Nokia recommends using 2.9 mm^2 with ferrules.

15.2 Preparing for cabling with AMJA or AMJJ outdoor cable entry installed

If your installation scenario includes AMJA or AMJJ, remove the upper cover, connect, and secure all the necessary cables.

Equipment preconditions

You need the following:

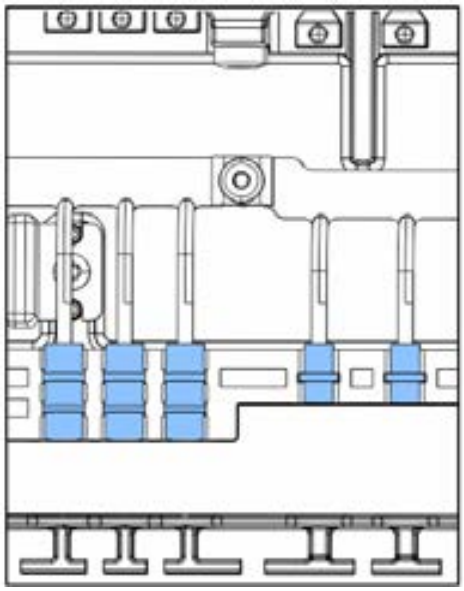
- ☐ Torque screwdriver
- ☐ Torx bit T25

Procedure

1 Attach AMJA or AMJJ to the core unit as instructed in Installing AMJA outdoor cable entry or Installing AMJJ outdoor cable entry. Do not install the cover until you connect all cables.

2 Remove and put aside the rubber plugs from the cable entries you will be using.

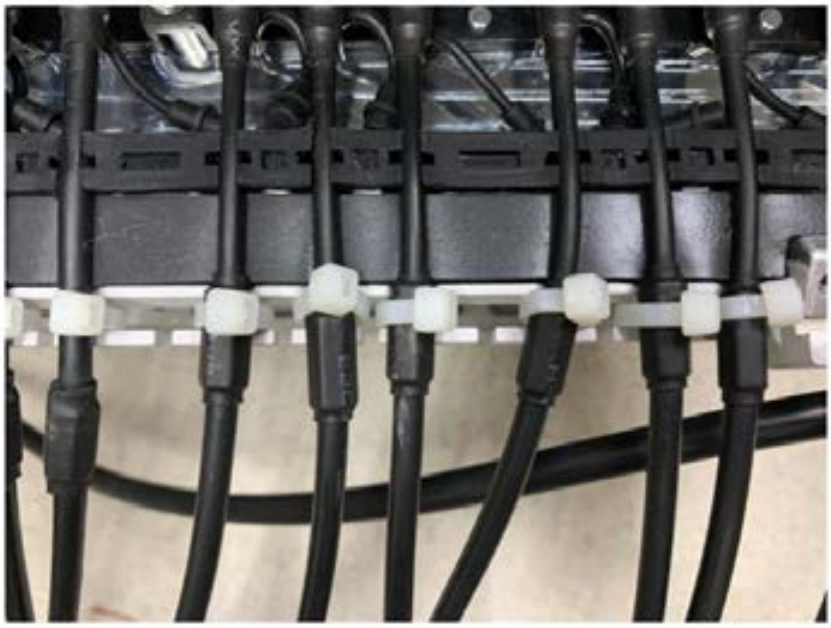
Figure 254: Removing plugs



3 Connect all the required cables as instructed in this section.

4 Make sure that all gasket holes have been sealed with either cables or plugs.

Figure 255: Proper cables placement



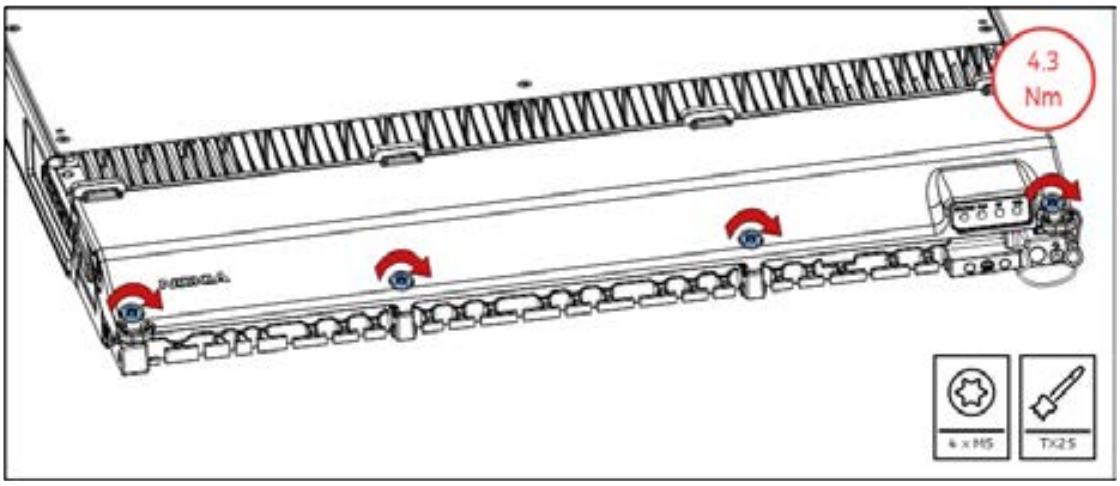
5 Assemble the cover and tighten the M5 captive screws to 4.3 Nm (38.1 in-lb.).

> **Notice:**
> After tightening the screws make sure there is no gap between both parts.

Select from the available options

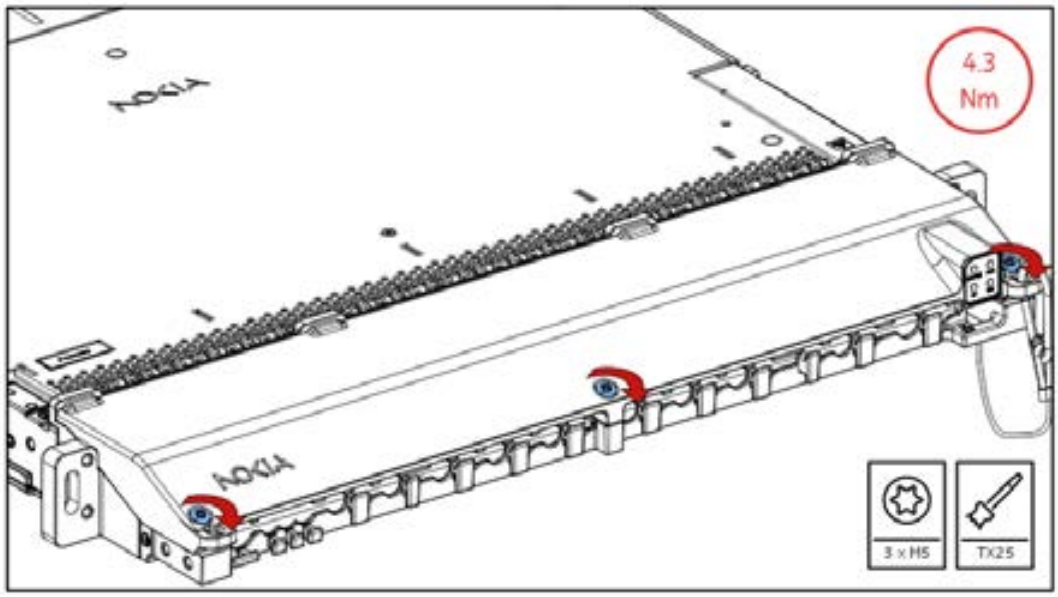
- ASOE

  Figure 256: Assembling the AMJA cover

- ASOG/H

Figure 257: Attaching the AMJJ cover



15.3 Preparing APAA and APAH to connect to ASOE, ASOG, or ASOH

To connect the APAA AirScale AC-DC power unit 760 W (473936A) or APAH AirScale micro 500 W AC power supply unit (PSU) (475043A) to an ASOE, ASOG, or ASOH core unit, you need to modify their cables. The AMJG power cable adapter (475985A) may be required.

Before you start

Both APAA and APAH require wire stripping to connect them to ASOE, ASOG, or ASOH. There are two APAH vendors (ABB and Vapel) that ship the units with different wire outer diameters, and version from ABB requires an additional AMJG adapter. APAA, apart from using AMJG, additionally requires cutting off the connector. See the following table for more information.

Table 23: APAA or APAH connection requirements

Power unit	Wire stripping	AMJG required	Additional comments
APAA	Yes	Yes	Cut off the connector leaving at least 50 cm (20 in.) of cable
APAH (ABB)	Yes	Yes	Wire diameter 7.6 mm (0.30 in.) ± 0.3 mm (0.01 in.)
APAH (Vapel)	Yes	No	Wire diameter 9.9 mm (0.39 in.)

Equipment preconditions

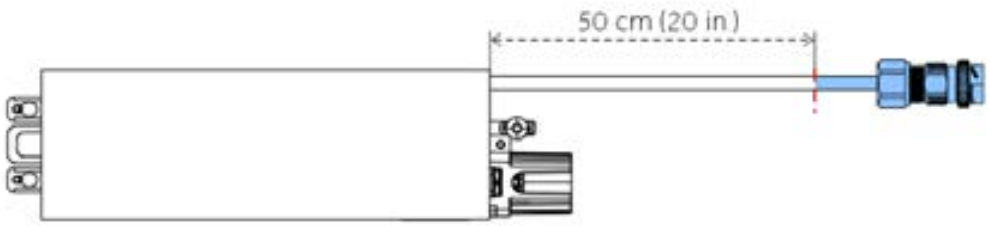
You need the following:

- ☐ APAA or APAH
- ☐ Wire strippers
- ☐ Scissors

Procedure

1 If you're using APAA, cut off the connector leaving at least 50 cm (20 in.) of the cable.

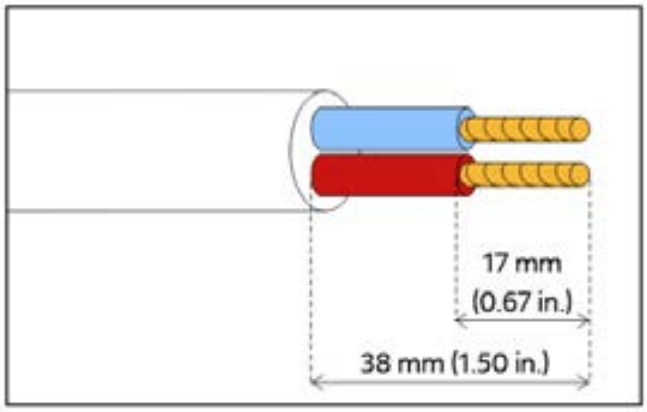
Figure 258: Cutting off the connector



2 Strip the end of the DC power cable.

2.1 APAA and APAH (ABB)

Figure 259: Stripping the cable

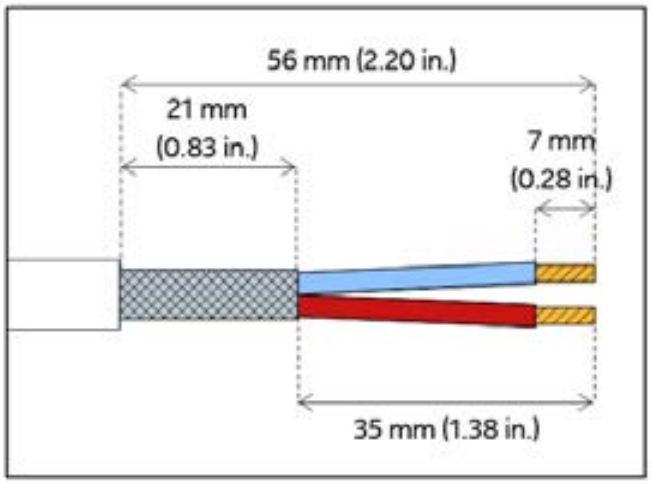


2.2 APAH (Vapel)

Select from the available options

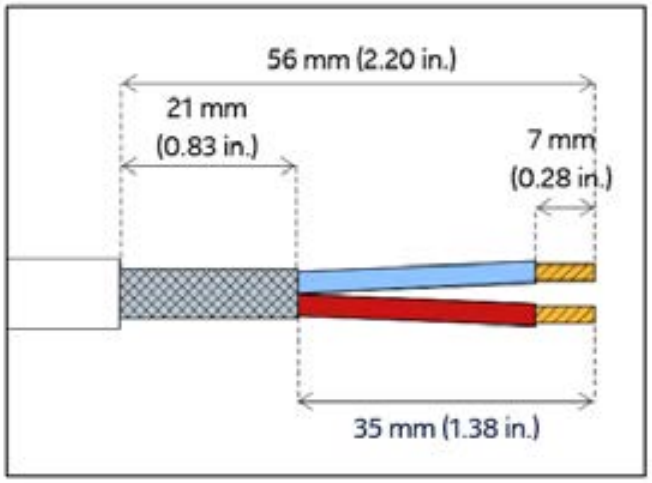
- ASOE

  Figure 260: Stripping the cable for ASOE



- ASOG/H

Figure 261: Stripping the cable for ASOG/H



3 Assemble the AMJG adapter if required.

For the AMJG assembly instructions, see *AMJG Power Cable Adapter (475985A) Installation Manual*.

15.4 Connecting grounding cable

Always connect the grounding cable first. Choose the grounding point depending on your installation scenario.

15.4.1 Connecting ASOE grounding cable

There are three grounding points depending on ASOE core unit installation case.

Before you start

Notice:

Electrostatic discharge (ESD) can damage the core units. Wear an ESD wrist strap or use a corresponding method when handling the unit.

Equipment preconditions

You need the following:

- ☐ Torque screwdriver
- ☐ Torx bit T25

Procedure

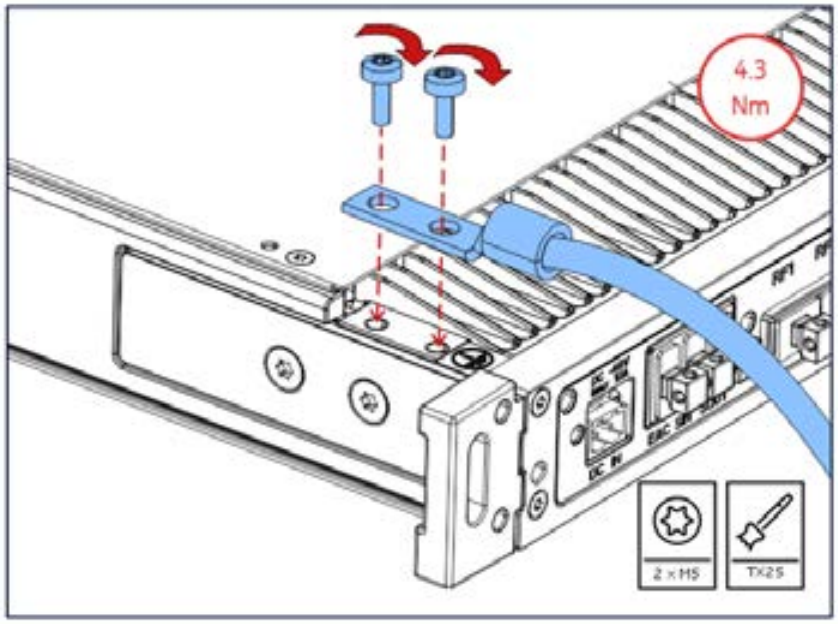
1 Connect the grounding cable and tighten the two M5 screws to 4.3 Nm (38.1 in-lb.).

> **Note:**
> There are two grounding points when using AMJA cable entry: front and side. For installation inside the EMHH casing, use the front grounding point for easier cable management.

Select from the available options

- ASOE without AMJA

  Figure 262: Grounding point without AMJA

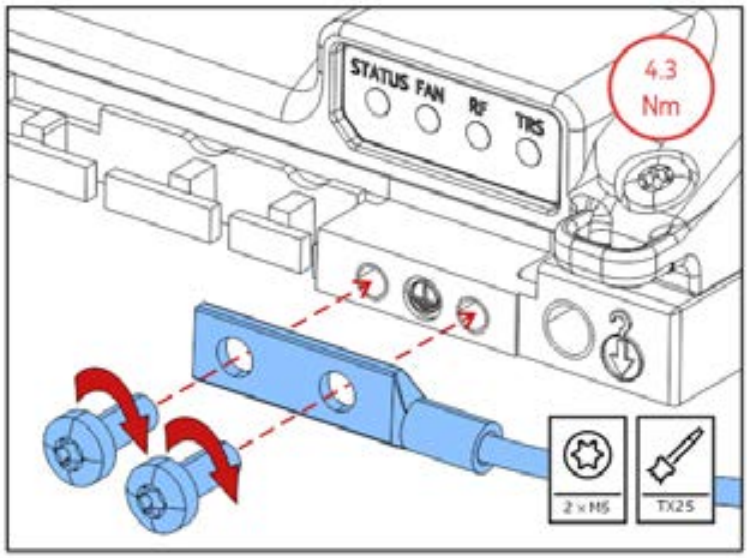


- ASOE with AMJA

Tip:

Use the front grounding point for installation inside EMHH or a rack/cabinet.

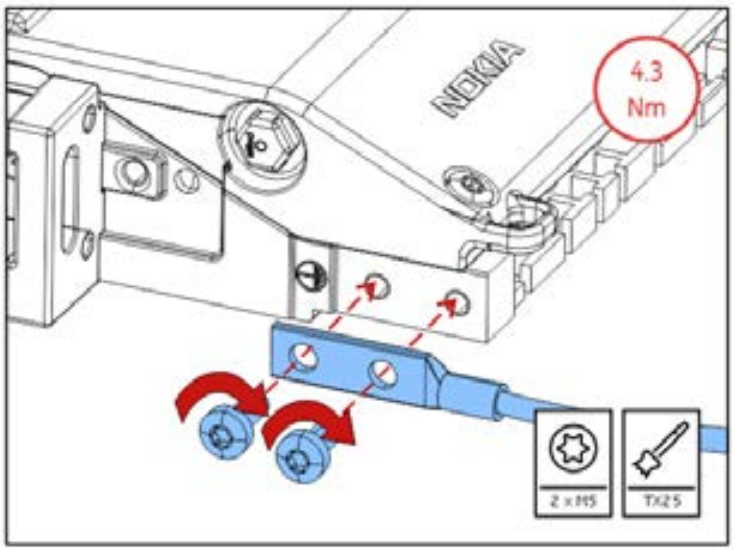
Figure 263: Front grounding point with AMJA



Tip:

Use the side grounding point for standalone installation.

Figure 264: Side grounding point with AMJA



15.4.2 Connecting ASOG or ASOH grounding cable

There are three grounding points depending on ASOG or ASOH core unit installation case.

Before you start

> **Notice:**
> Electrostatic discharge (ESD) can damage the core units. Wear an ESD wrist strap or use a corresponding method when handling the unit.

Equipment preconditions

You need the following:

- ☐ Torque screwdriver
- ☐ Torx bit T25

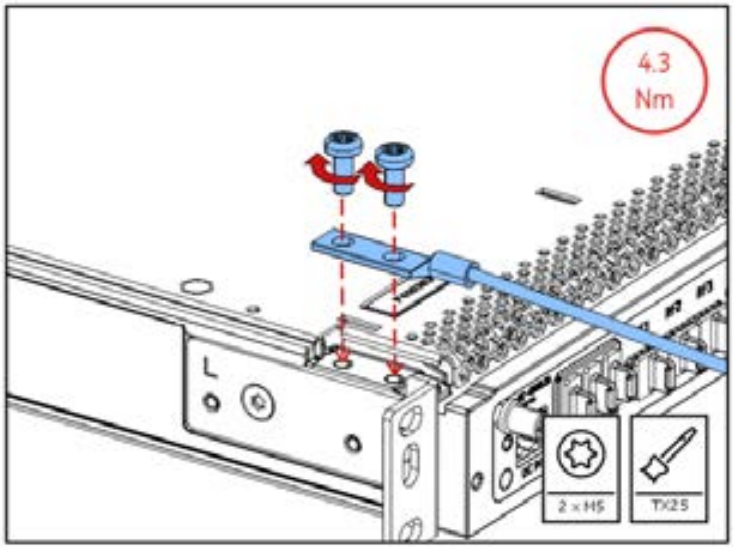
Procedure

1 Fix the grounding cable to the core unit by tightening the two M5 screws to 4.3 Nm (38.1 in -lb.).

Select from the available options

- ASOG/H without AMJJ

Figure 265: Connecting the grounding cable to ASOG/H



- ASOG/H with AMJJ

Figure 266: Right side grounding point with AMJJ

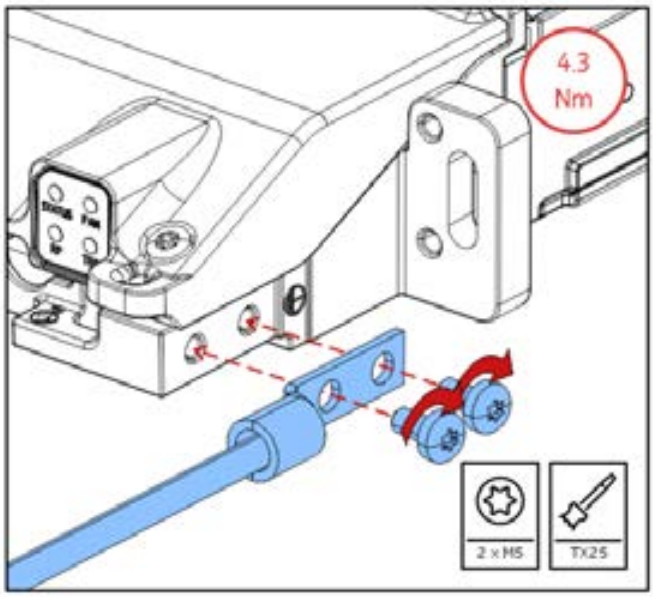
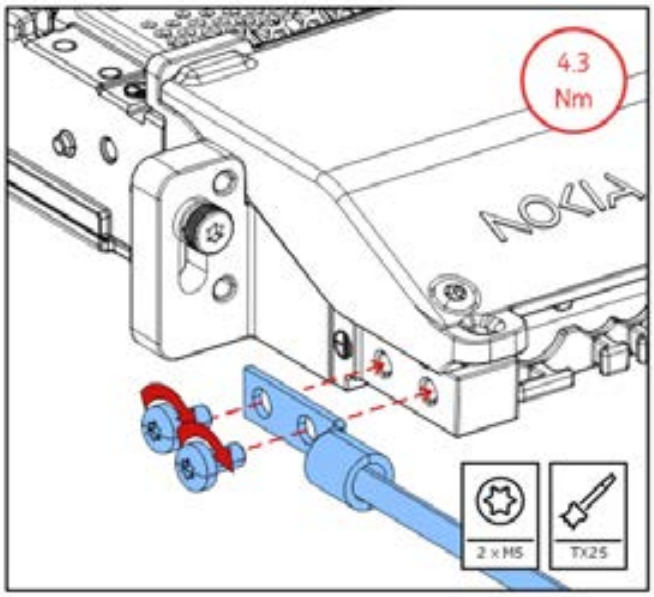


Figure:

Figure 267: Left side grounding point with AMJJ



15.5 Connecting DC cable

Proceed with installation with or without the AMJA or AMJJ outdoor cable entry.

15.5.1 Connecting ASOE DC cable without AMJA installed

You can use the optional AMJP power cable with the power connector assembled.

Before you start

> **Notice:**
> Electrostatic discharge (ESD) can damage the core units. Wear an ESD wrist strap or use a corresponding method when handling the unit.

> **Note:**
> The optional AMJP power cable comes with the power connector assembled.

Equipment preconditions

You need the following:

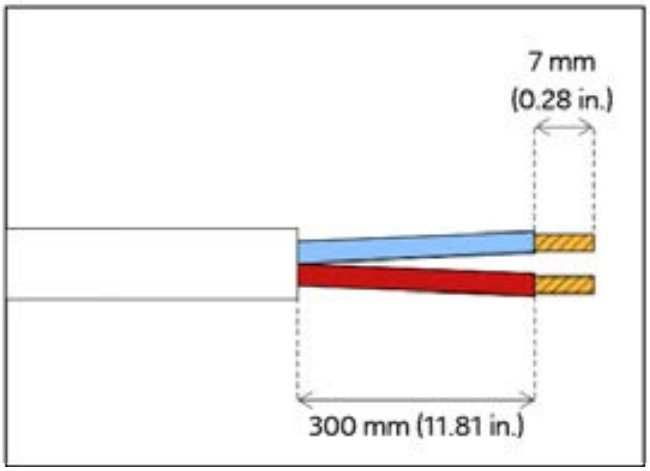
- ☐ Torque screwdriver
- ☐ Torx bit T10
- ☐ Philips bit PH1
- ☐ AMJP power cable (475883A) (optional)
- ☐ Clean box for protection caps

Procedure

1 Strip the ending of the DC power cable.

> **Note:**
> - Skip this step if you are using the optional AMJP power cable.
> - The DC cable wire gage should be 2.5 mm^2–3.3 mm^2 (13–12 AWG). Nokia recommends using 2.5 mm^2 with ferrules.

Figure 268: Stripping DC cable

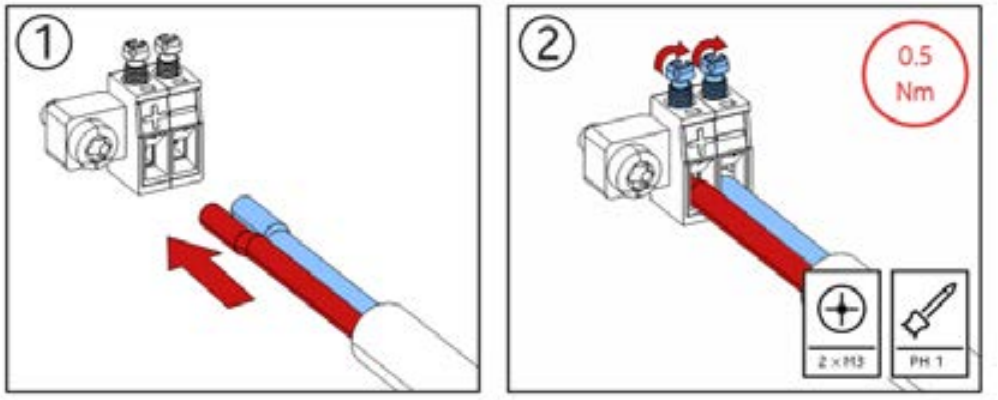


2 Insert the wires into the DC connector and tighten the two M3 screws to 0.5 Nm (4.4 in-lb.).

Note:

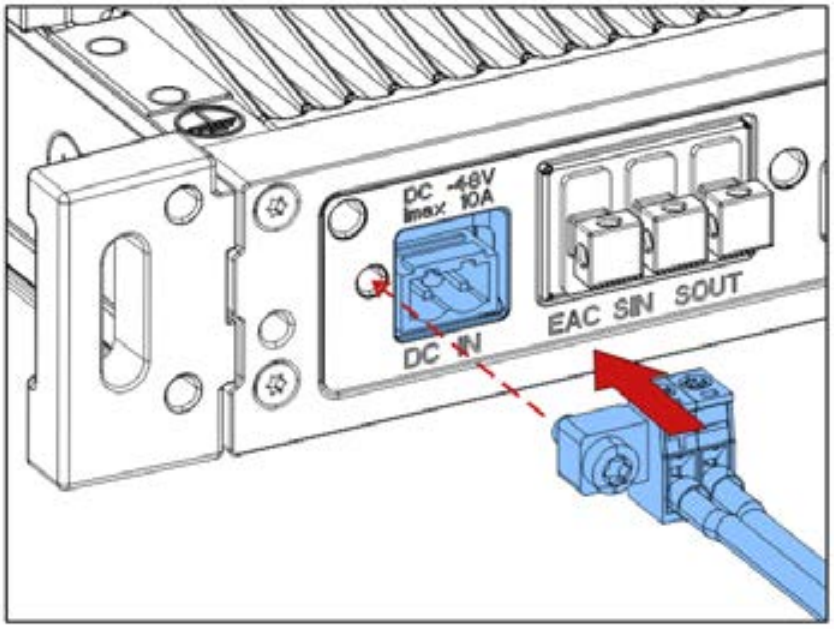
Skip this step if you are using the optional AMJP power cable.

Figure 269: Inserting the wires into the DC connector



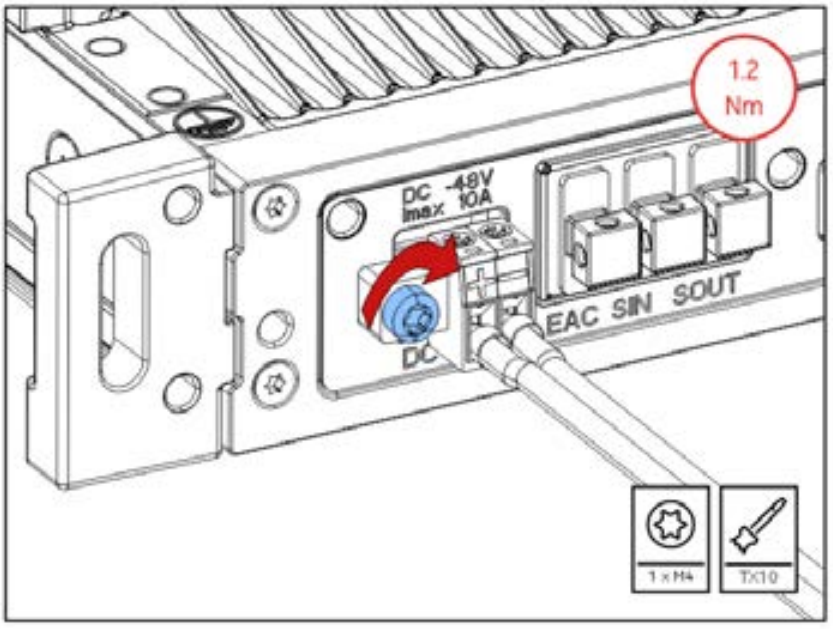
3 Insert the DC connector into the DC-IN slot in ASOE.

Figure 270: Inserting the connector



4 Tighten the screw to 1.2 Nm (10.6 in-lb.).

Figure 271: Tightening the connector screw



15.5.2 Connecting ASOG or ASOH DC cable without AMJA installed

You can use the optional AMJP power cable with the power connector assembled.

Before you start

> **Notice:**
>
> Electrostatic discharge (ESD) can damage the core units. Wear an ESD wrist strap or use a corresponding method when handling the unit.

> **Note:**
>
> The optional AMJP power cable comes with the power connector assembled.

Equipment preconditions

You need the following:

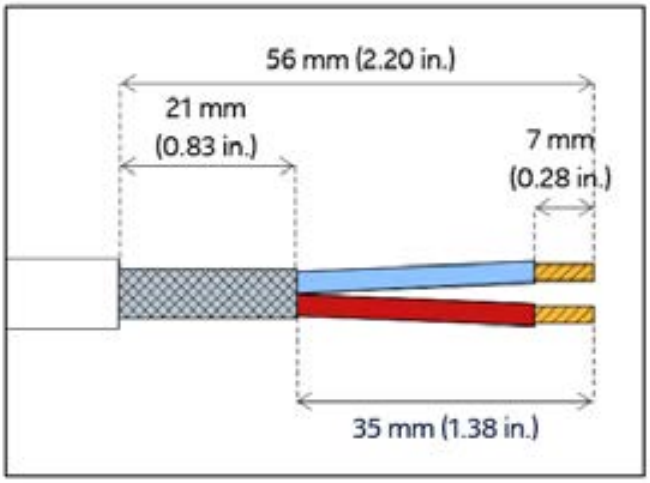
- ☐ Torque screwdriver
- ☐ Torx bit T10
- ☐ Philips bit PH1
- ☐ AMJP power cable (475883A) (optional)
- ☐ Clean box for protection caps

Procedure

1 Strip the end of the DC power cable.

> **Note:**
>
> - Skip this step if you are using optional AMJP power cable.
> - The DC cable wire gage should be 2.5 mm^2–4 mm^2 (13–11 AWG). Nokia recommends using 2.9 mm^2 with ferrules.

Figure 272: Stripping the cable

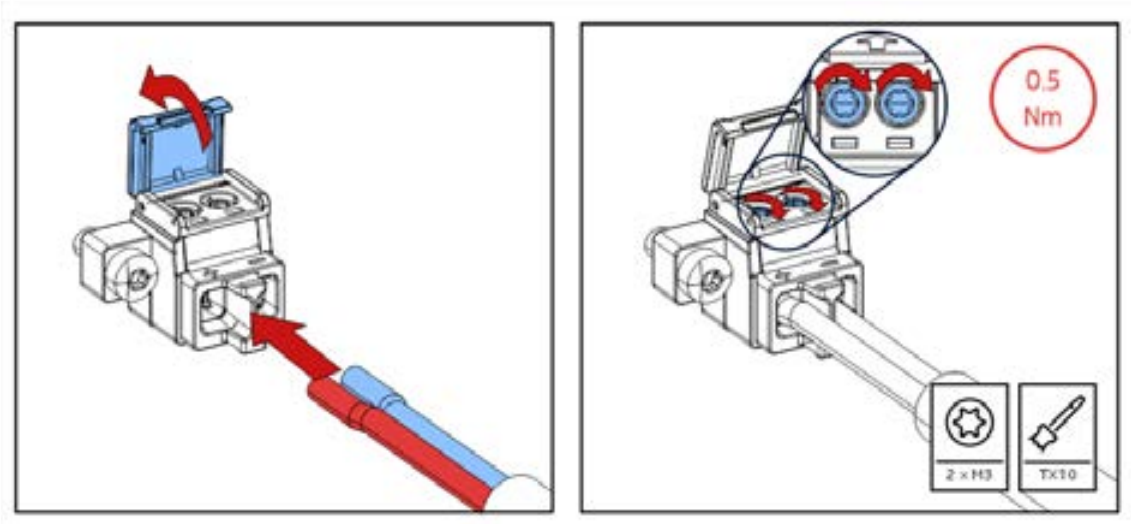


2 Insert the wires into the DC connector and tighten the two M3 screws to 0.5 Nm (4.4 in-lb.).

Note:

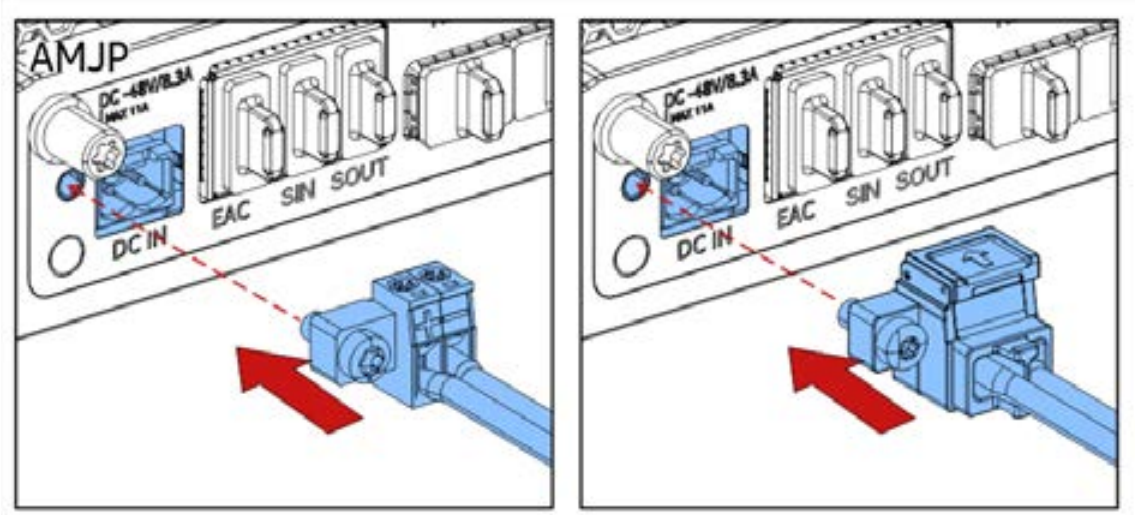
Skip this step if you are using the optional AMJP power cable.

Figure 273: Inserting the wires into the DC connector



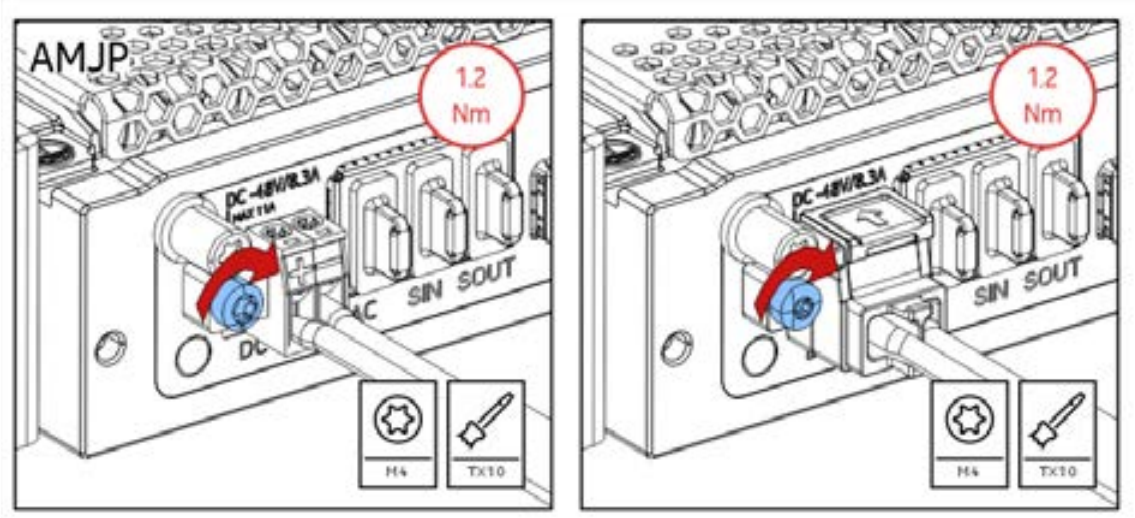
3 Insert the DC connector into the DC-IN slot.

Figure 274: Inserting the DC connector



4 Tighten the M4 screw to 1.2 Nm (10.6 in-lb.).

Figure 275: Tightening the M4 screw



15.5.3 Connecting ASOE DC cable with AMJA installed

You can use the optional AMJP power cable with the power connector assembled.

Before you start

Notice:

Electrostatic discharge (ESD) can damage the core units. Wear an ESD wrist strap or use a corresponding method when handling the unit.

Note:

The optional AMJP power cable comes with the power connector assembled.

Note:

You can use an optional AMJG power jumper cable to connect to the existing power cables and provide ingress protection. This way, you can reuse the existing power cables that aren't compatible with AMJA. The AMJG power cable comes with the power connector and IP-protected adapter assembled.

Equipment preconditions

You need the following:

- ☐ Torque screwdriver
- ☐ Torx bit T10
- ☐ Philips bit PH1
- ☐ AMJP power cable (475883A) (optional)
- ☐ Clean box for protection caps
- ☐ Cable ties

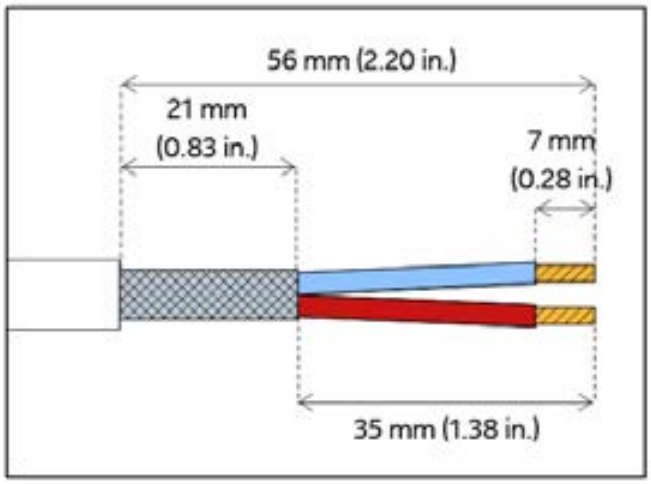
Procedure

1 Strip the end of the DC power cable.

Note:

- Skip this step if you are using optional AMJP power cable.
- The DC cable wire gage should be 2.5 mm^2–4 mm^2 (13–11 AWG). Nokia recommends using 2.9 mm^2 with ferrules.

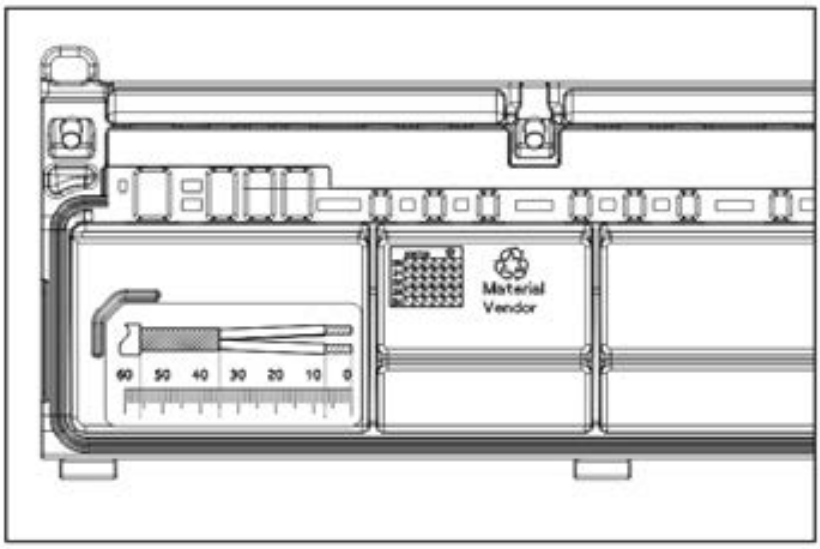
Figure 276: Stripping DC cable



Note:

You can use the template on the inside of the AMJA upper cover as a reference.

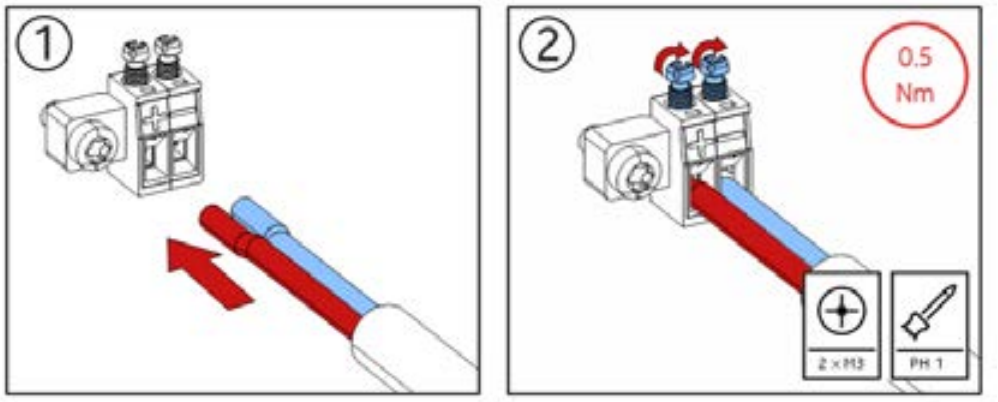
Figure 277: DC cable strip template



2 Insert the wires into the DC connector and tighten the two M3 screws to 0.5 Nm (4.4 in-lb.).

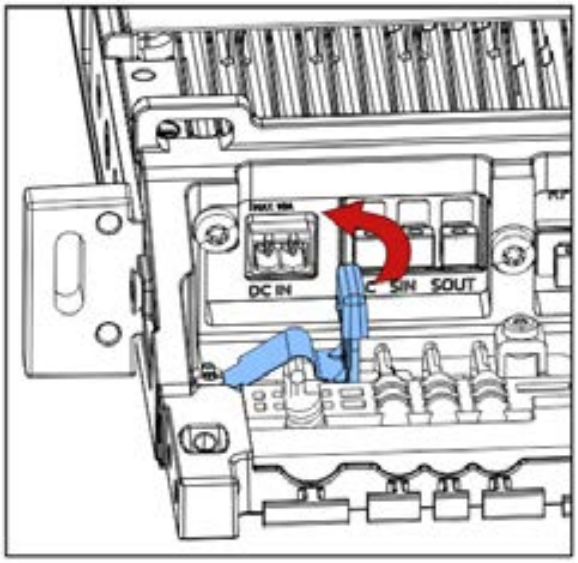
> **Note:**
> Skip this step if you are using the optional AMJP power cable.

Figure 278: Inserting the wires into the DC connector



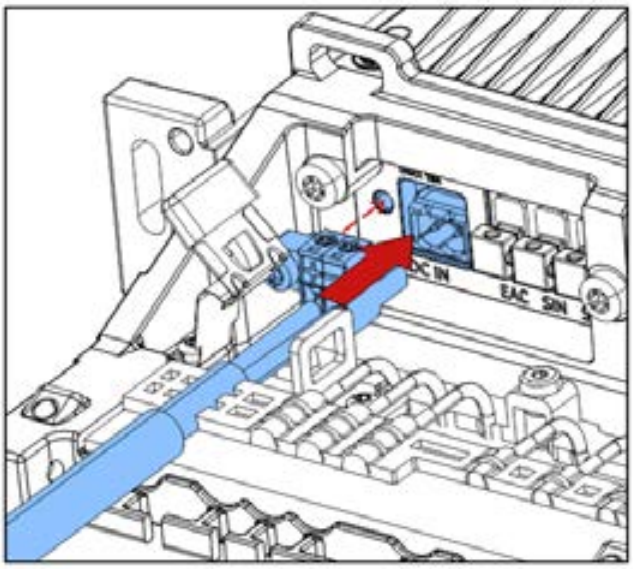
3 Lift the locking spring.

Figure 279: Liting the spring



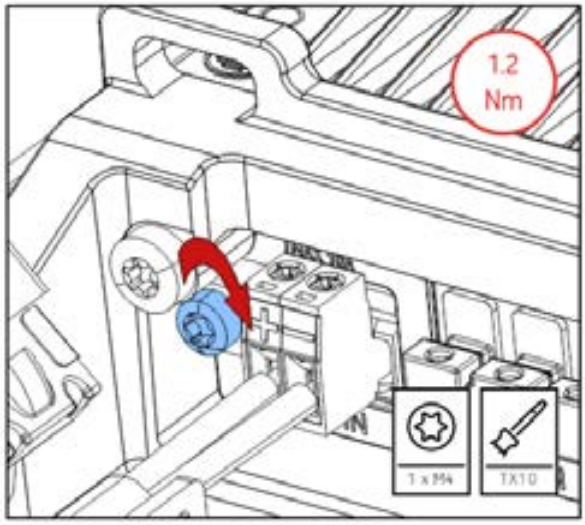
4 Insert the DC connector into the DC-IN slot in ASOE.

Figure 280: Inserting the DC connector



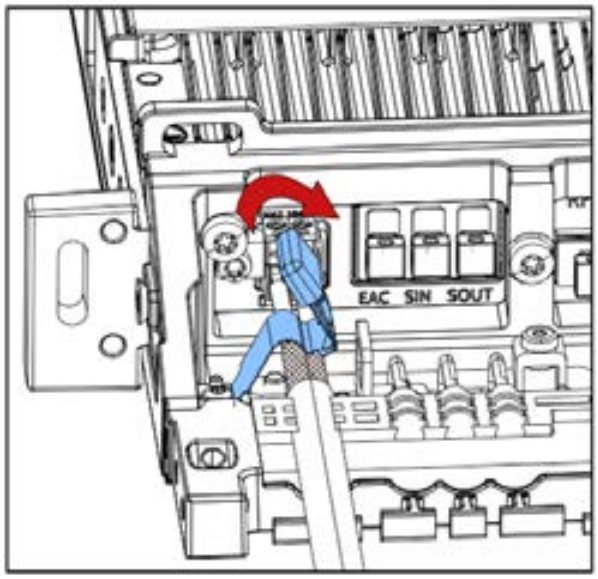
5 Tighten the screw to 1.2 Nm (10.6 in-lb.).

Figure 281: Tightening the screw



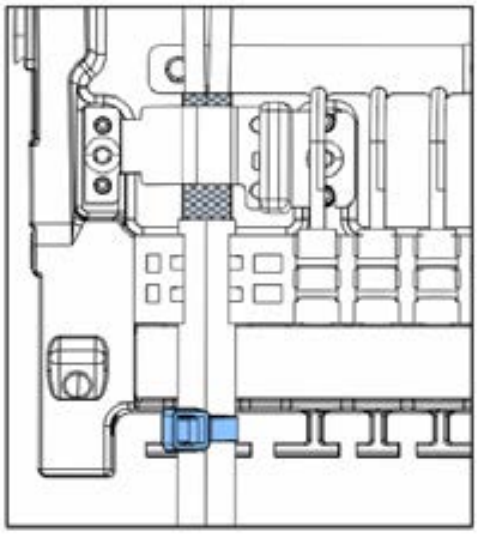
6 Lower the locking spring and lock it.

Figure 282: Lowering the spring



7 Secure the cable with cable ties.

Figure 283: Securing the cable



15.5.4 Connecting ASOG or ASOH DC cable with AMJA installed

You can use the optional AMJP power cable with the power connector assembled.

Before you start

Notice:

Electrostatic discharge (ESD) can damage the core units. Wear an ESD wrist strap or use a corresponding method when handling the unit.

Note:

The optional AMJP power cable comes with the power connector assembled.

Equipment preconditions

You need the following:

- ☐ Torque screwdriver
- ☐ Torx bit T10
- ☐ Philips bit PH1
- ☐ AMJP power cable (475883A) (optional)
- ☐ Clean box for protection caps

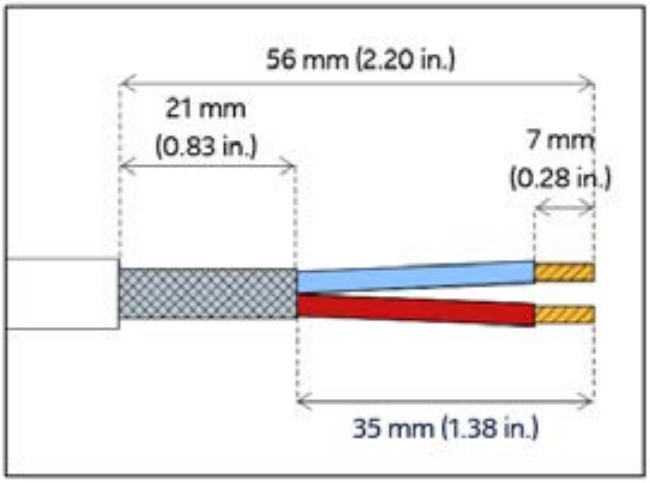
Procedure

1 Strip the end of the DC power cable.

Note:

- Skip this step if you are using optional AMJP power cable.
- The DC cable wire gage should be 2.5 mm^2–4 mm^2 (13–11 AWG). Nokia recommends using 2.9 mm^2 with ferrules.

Figure 284: Stripping the cable

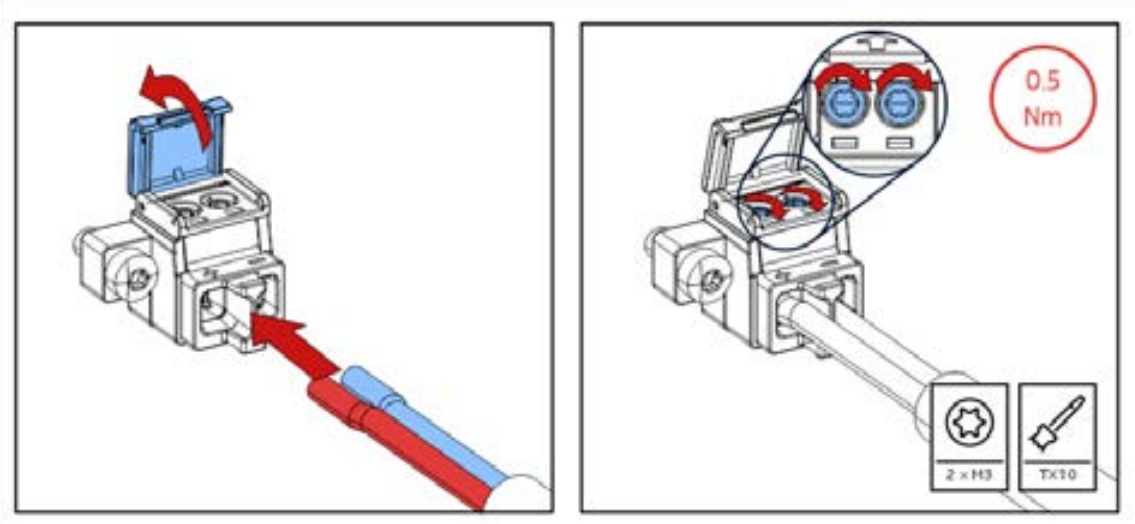


2 Insert the wires into the DC connector and tighten the two M3 screws to 0.5 Nm (4.4 in-lb.).

Note:

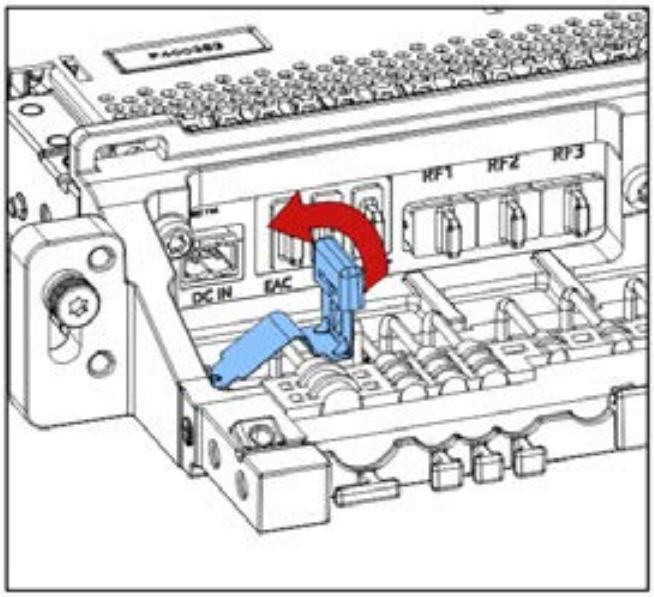
Skip this step if you are using the optional AMJP power cable.

Figure 285: Inserting the wires into the DC connector



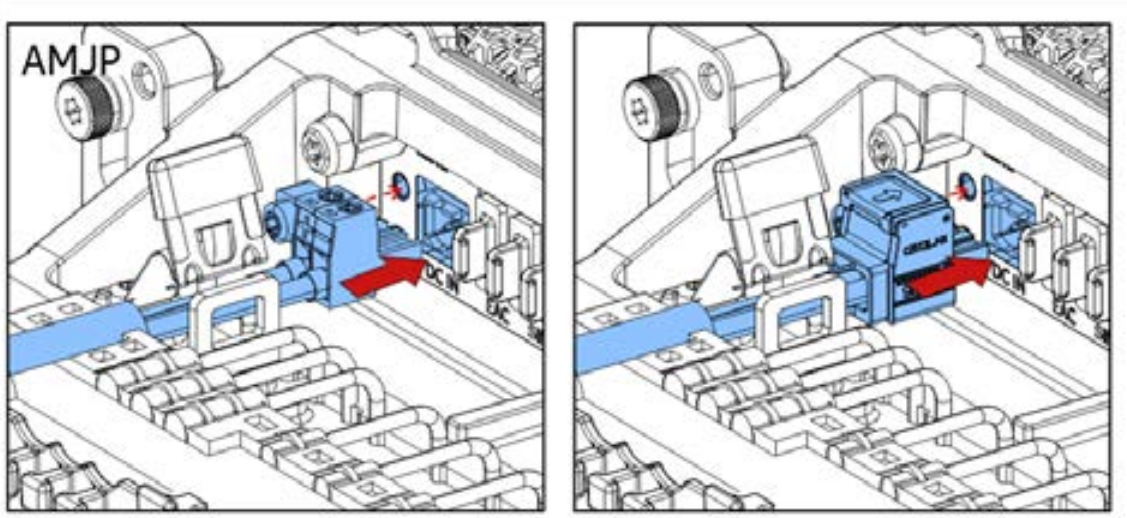
3 Lift the locking spring.

Figure 286: Lifting the locking spring



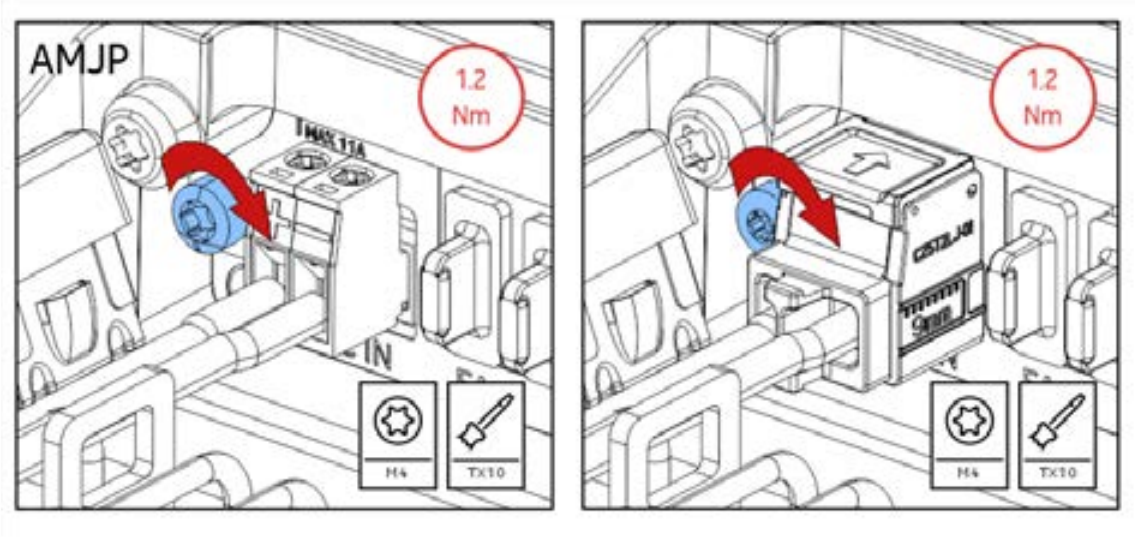
4 Insert the DC connector into the DC-IN slot.

Figure 287: Inserting the DC connector



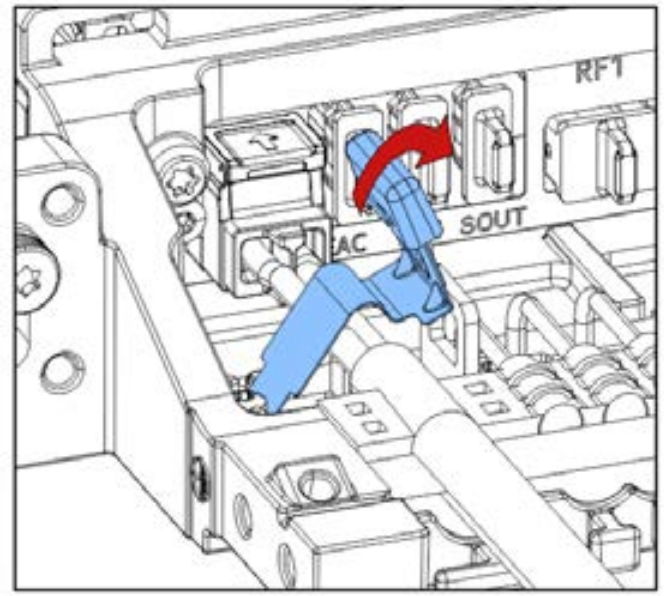
5 Tighten the M4 screw to 1.2 Nm (10.6 in-lb.).

Figure 288: Tightening the M4 screw



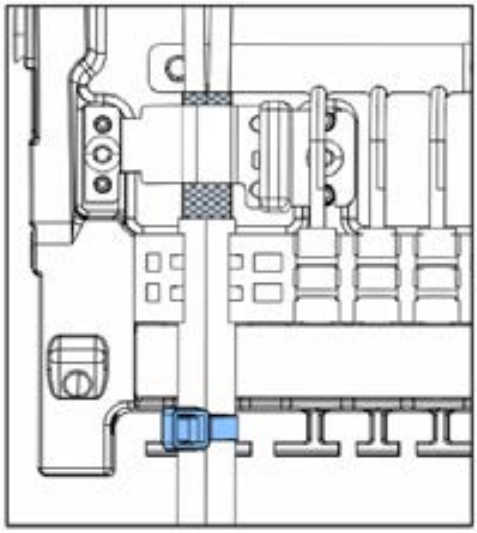
6 Close the locking spring.

Figure 289: Closing the locking spring



7 Secure the cable with cable ties.

Figure 290: Securing the cable



15.6 Connecting EAC and synchronization cables

Insert 19PIN cables to EAC, SIN, and SOUT connectors.

Before you start

> **Notice:**
> Electrostatic discharge (ESD) can damage the core units. Wear an ESD wrist strap or use a corresponding method when handling the unit.

These instructions show ASOE, but they are applicable to ASOG and ASOH as well.

Equipment preconditions

You need the following:

- ☐ Clean box for protection caps
- ☐ Cable ties (if AMJA or AMJJ is used)

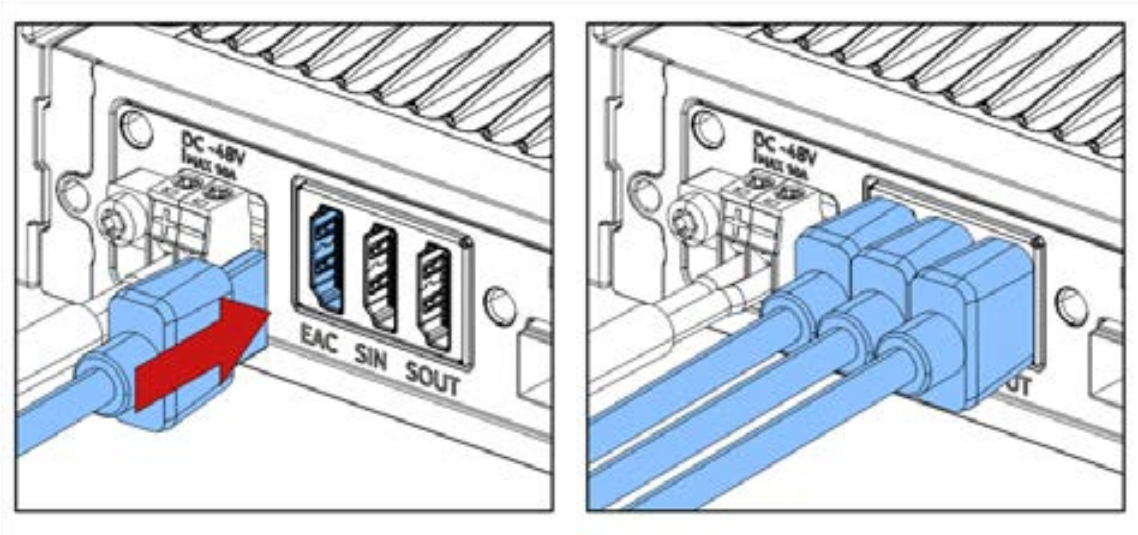
Procedure

1 Remove the protection caps from the EAC, SIN, and SOUT ports.

> **Tip:**
>
> Store the caps for future use.

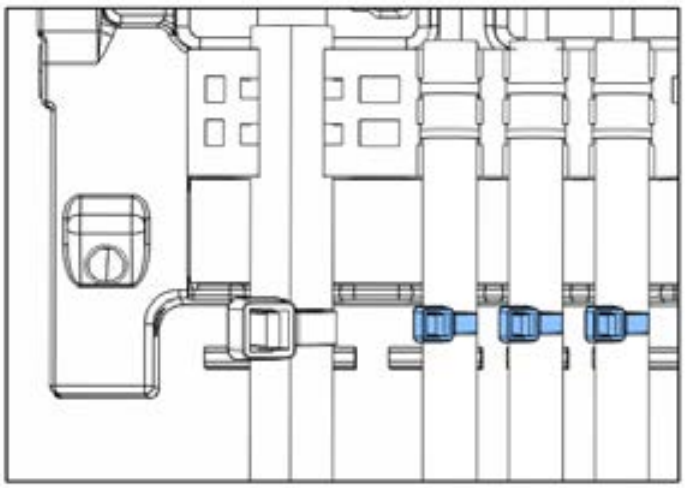
2 Insert a 19PIN cable into each port.

Figure 291: Inserting the 19PIN cables



3 Secure the cables with cable ties if using AMJA or AMJJ.

Figure 292: Securing the cables



15.7 Connecting SFPs and optical cables

Use SFPs provided by Nokia to avoid the risk of operational issues.

Before you start

⚠ WARNING!

Risk of eye damage caused by invisible laser beam.
Do not look directly into a transceiver and the end of the fiber cable.

Notice:

- Overbending the optical fiber cables damages the cables and can detach or damage the connectors. Do not bend optical fiber cables to a radius smaller than 50 mm (1.97 inches) for cables with a 5 mm (0.20 inches) diameter.
- Optical fibers are sensitive. The presence of contaminants lowers the mechanical strength of the optical fiber and might dampen the transmission of light in the fibers. Clean all optical fiber connectors before installation using an optical fiber connector cleaning kit.
- Use Nokia-provided SFPs to avoid the risk of operational issues.

Notice:

Electrostatic discharge (ESD) can damage the core units. Wear an ESD wrist strap or use a corresponding method when handling the unit.

Note:

Some optical cables are pre-bent. Make sure to route them in the respective direction.

You can use an optional AMJF fiber adapter with ATSA/ATMU jumper cable to connect to the existing pre-bended fiber cable.

These instructions show ASOE, but they are applicable to ASOG and ASOH as well.

Equipment preconditions

You need the following:

- ☐ Clean box for protection caps
- ☐ Cable ties (if AMJA or AMJJ is used)

Procedure

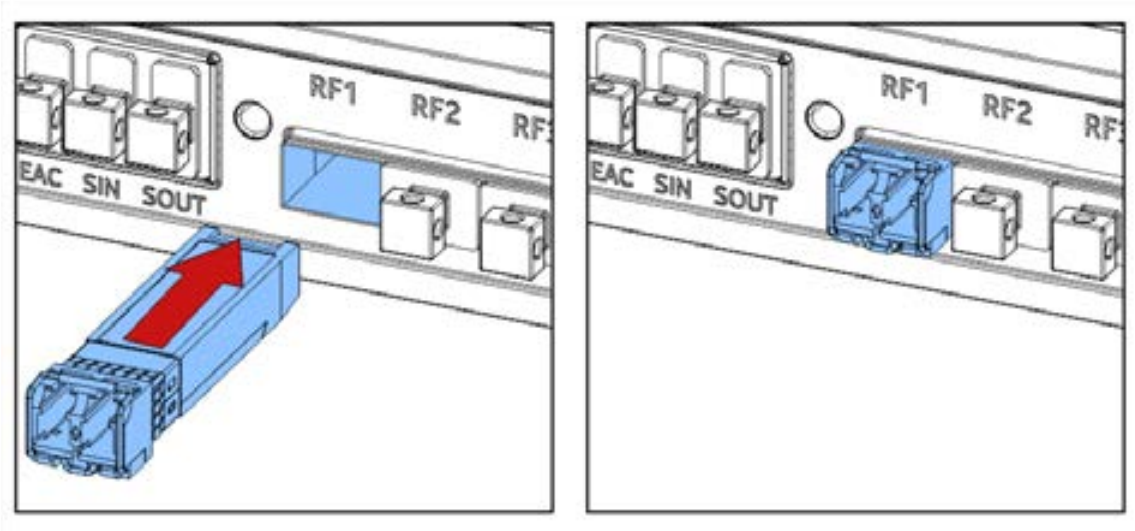
1 Remove the protection cap from the optical cable port.

> **Tip:**
>
> Store the cap for future use.

2 Insert the SFP.

> **Note:**
>
> The bail lever can remain closed when inserting the SFP. The top and bottom sides of the transceiver need to match the SM cage connector orientation.

Figure 293: Inserting the SFP

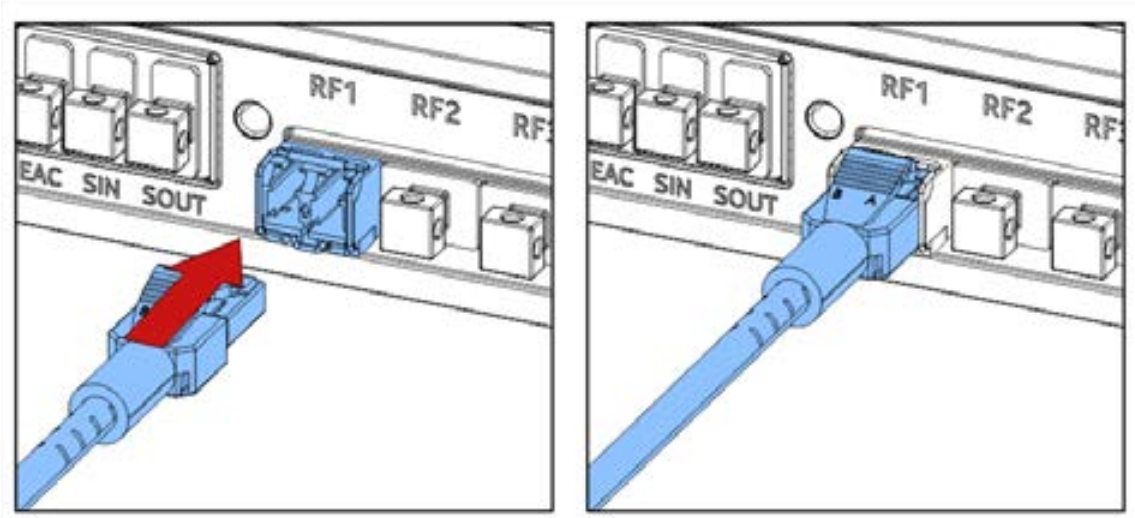


3 Insert the optical cable into the SFP.

Note:

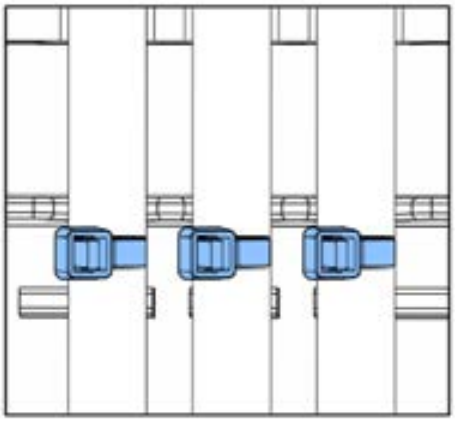
If you need to disconnect the fiber, make sure to first press on the release lock, and then pull out the delatched plug.

Figure 294: Inserting the optical cable into the SFP



4 Secure the cables with cable ties if using AMJA.

Figure 295: Securing the cables



15.8 Connecting LMP and backhaul cables

Insert an RJ-45 cable to LMP and EIF3 ports.

Before you start

> **Notice:**
> Electrostatic discharge (ESD) can damage the plug-in units. Wear an ESD wrist strap or use a corresponding method when handling the unit.

> **Notice:**
> Use a CAT5E cable or above for the EIF3/LMP port. The cable must be grounded at both ends. ASOE, ASOG, and ASOH support up to 50 m (164 ft.) long cable. For longer cables, use an external switch.

These instructions show ASOE, but they are applicable to ASOG and ASOH as well.

Equipment preconditions

You need the following:

- ☐ Clean box for protection caps
- ☐ Cable ties (if AMJA or AMJJ is used)

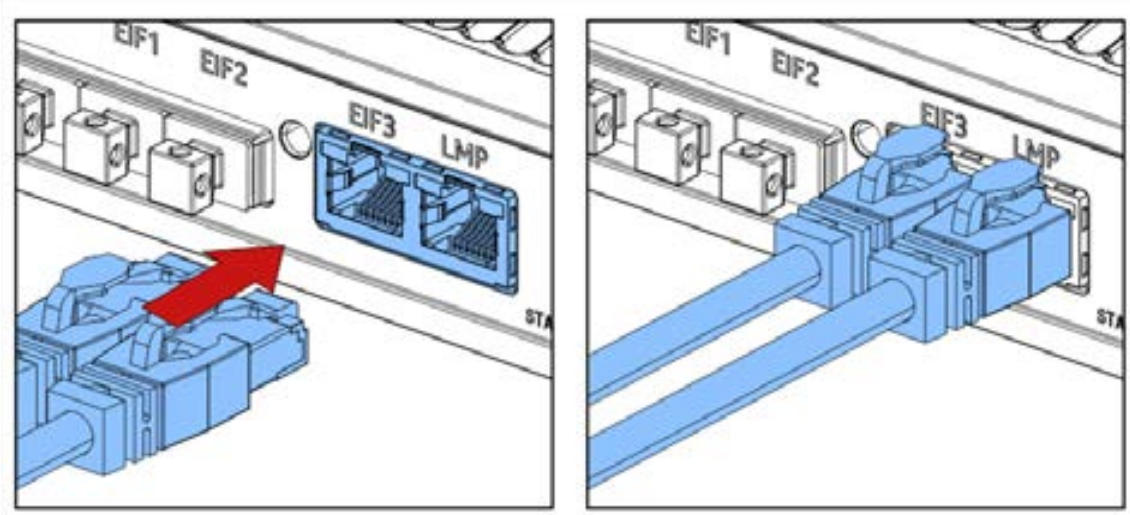
Procedure

1 Remove the protection caps from the LMP and EIF3 ports.

> **Tip:**
> Store the caps for future use.

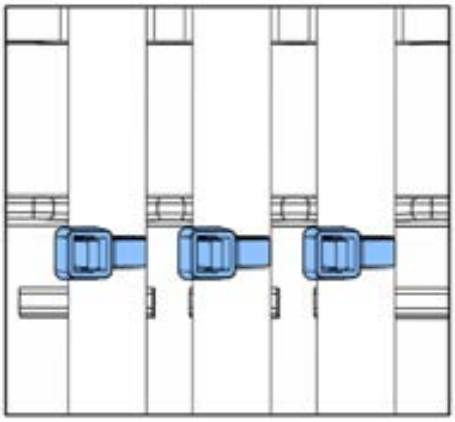
2 Insert the RJ-45 cables and push them until you hear a click.

Figure 296: Inserting the RJ45 cables



3 Secure the cables with cable ties if using AMJA or AMJJ.

Figure 297: Securing the cables



15.9 Connecting DAC cable

Connect the DAC cable to the SEI port if you want to chain two ASOE, ASOG, or ASOH core units or more.

Before you start

Notice:

Electrostatic discharge (ESD) can damage the plug-in units. Wear an ESD wrist strap or use a corresponding method when handling the unit.

These instructions show ASOE, but they are applicable to ASOG and ASOH as well.

Equipment preconditions

You need the following:

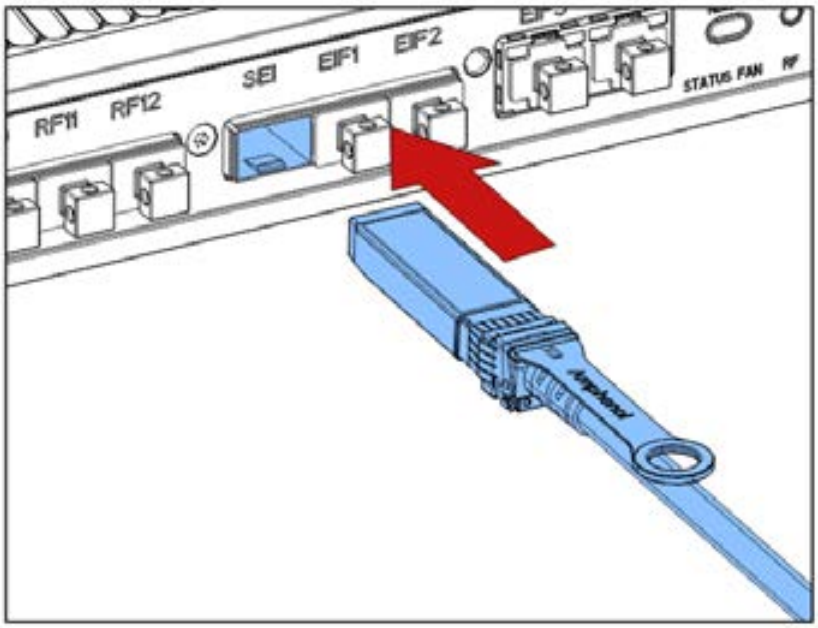
- ☐ ATBT SFP28 to SFP28 DAC cable (475879A)
- ☐ Clean box for protection caps
- ☐ Cable ties (if AMJA or AMJJ is used)

Procedure

1 Remove the protection cap from the SEI port.

2 Insert the DAC cable to both core units.

Figure 298: Inserting the DAC cable



3 Secure the cable with a cable tie if using AMJA or AMJJ.