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Nokia UltraSite EDGE BTS, Rel. CX5, Product Documentation, v.1

Installing and Cabling UltraSite EDGE BTS Cabinet

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Contents

1 Summary of changes in Installing and Cabling the UltraSite EDGE BTS Cabinet

The following changes have taken place in the *Installing and Cabling the UltraSite EDGE BTS Cabinet* document:

- The following sections including information on Mini Outdoor BTS added:
  - Mini Outdoor cabinet transportation package
  - Contents of the pole mounting kit delivery (optional)
  - Contents of the floor mounting kit delivery (optional)
  - Contents of the security lock delivery (optional)
  - Overview of installing the Mini outdoor cabinet
  - Positioning the Mini outdoor cabinet
  - Mounting the Mini outdoor cabinet on a pole
  - Mounting the Mini outdoor cabinet on a wall
  - Mounting the Mini outdoor cabinet on a plinth
  - Installing the optional security lock in the Mini outdoor cabinet
  - Connecting grounding cables to Mini Outdoor
  - Connecting -48 VDC power cables to Mini Outdoor
  - Connecting +24 VDC power cables to Mini Outdoor
  - Connecting AC power cables to Mini Outdoor
  - Connecting external antenna cables to the Midi outdoor cabinet
  - Installing external alarm cables to the Mini Outdoor cabinet

2 Planning and preparing an UltraSite EDGE BTS installation

2.1 Overview of planning a BTS installation

Before you start

Note

Site requirements for the indoor cabinet can vary depending on the country of installation and the operator.

Summary

Planning for the installation of a BTS, whether at a new or existing site, requires familiarising yourself with all site requirements and technical aspects of the BTS and its units.

Steps

1. **Review the configuration options.**
2. **Review the technical aspects of the BTS.**
3. **Review the technical aspects of the units.**
4. **Review and complete the planning checklist.**
5. **Plan the site.**
   - Review the required storage conditions.
   - Review the required transportation conditions.
   - Review the required safety distance.
   - Review the required operating conditions.

- Review the required space for indoor installation.
- Review the required space for outdoor installation.
- Review the required grounding (earthing).
- Review the required cabinet base for indoor installation.
- Review the required cabinet base for outdoor installation.
- Review the required tools.

6. Review the required torque settings.

7. Review the compatibility between HW and SW.

8. Review the compatibility between BTS, BSC, NetAct, SiteWizard, and LMU SW.

9. Review the compatibility between new features of BTS SW CX5 and other network elements.

10. Review the power requirements.

11. Review the RF properties.

- 800 MHz BTS
- 900 MHz BTS
- 1800 MHz BTS
- 1900 MHz BTS

12. Review the physical properties.

13. Review the acoustic sound parameters.

14. Plan the cabinet installation.

15. Plan the internal configuration.

16. Plan for specific BTS installation.

- Installation at a new site
- Installation at an existing site
- Installation with WCDMA upgrade
- Installation of upgrade from GSM to GSM/EDGE

17. Plan cabling.

18. Plan for commissioning new BTS.

2.2 Planning checklist

Table 1. Planning checklist

Check	Expected outcome	Check mark
Plan the site preparation for installation	Site preparation checklist for installation complete	
Plan the cabinet installation	Cabinet installation plan complete	
Plan the internal configuration	Internal configuration plan complete	
Prepare to install the BTS	Plan for installation preparation complete	
Plan the installation at a new site	Plan for installation at a new site complete	
Plan the installation at an existing site	Plan for installation at an existing site complete	
Plan for WCDMA upgrade installation	Plan for WCDMA upgrade installation	
Plan for upgrade to include EDGE capability	Plan for upgrade to include EDGE capability complete	

2.3 Site preparation checklist

Check	Check mark
Verify site layout.	
Verify cable routes.	
Ensure necessary ventilation for equipment room.	
Ensure any required heater and/or air conditioner units are installed and operational where the BTS is installed.	
Ensure external connections for the cabinet are available:	
• site grounding point	
• mains power (AC or DC according to the site)	
• transmission connection point	
Ensure the installation site is secure and accessible.	
Calculate the space requirements.	

Check	Check mark
Measure and calculate safety distances.	
Ensure installation tools and lifting equipment are available.	
Install adequate lighting.	
Prepare entry holes for feeder and power cables.	
Ensure the walls and floors are painted or covered.	
Ensure the base meets the following requirements:	
• supports one fully installed BTS to a maximum of 1000 lb	
• uses treated concrete or I-beam and angle bar construction for air quality	
Unpack and inspect the BTS delivery.	
Store UltraSite EDGE BTS in the delivery package until the site construction work is complete and the site is clean and dry.	
Ensure all required installation documentation is available on site.	
Ensure installation and operation of AC power distribution box.	

2.4 Checklist for cabinet installation

Table 2. Installation checklist

Check	Check mark
Complete site planning	
Plan cabinet configurations (combining options)	
Prepare site for installation and complete site survey	
Ensure proper installation tools and equipment are on site	
Unpack and inspect cabinet delivery contents for visible damage	
Prepare the base for the cabinet	
Lift and mount the cabinet to the base using one of the mounting options	

Table 2. Installation checklist (cont.)

Check	Check mark
Inspect the cabinet to ensure it is level	
Install the cabinet	
Install bridge kit for inter-cabinet cable routing (optional)	
Prepare the BTS for cabling	
Cable the BTS	
Connect grounding cables	
Connect AC power	
Connect DC power	
Install units	
Cable the units	
Configure cabinets to support combining options	
Synchronise cabinets	
Power on the new BTS site	
Commission the BTS	

2.5 Unpacking and inspecting the cabinet delivery

Before you start

Caution

Risk of damage to the bottom interface connectors. When unpacking or installing the cabinet, do not stand the cabinet on its base as this damages the base interface connectors.

Note

If any contents of the delivery are damaged or missing, immediately report these findings to your local Nokia representative.

Note

A dummy plinth is provided in the Mini Outdoor packaging.

Steps

1. **Lift the core assembly from the delivery package.**
2. **Remove the cardboard and plastic wrap, if present, from the assembly.**
3. **Remove the desiccant packs, if present.**
4. **Inspect the assembly for visible damage.**
5. **Unpack the unit from its protective package and check for damage.**
6. **Carefully check the contents of the delivery.**
7. **Use the packing list to check the completeness of the delivery.**
8. **Store the packing list in the site folder.**
9. **Recycle the packing material.**

2.6 Checking the installation site

Summary

The installation team supervisor is responsible for checking the site prior to installing the BTS.

Steps

1. **Ensure that each team member has the necessary tools, installation materials, and user manual.**
2. **Check the delivery against the packing list.**
3. **Place the list in the site folder.**
4. **Complete the installation checklist including the signature and date.**
5. **Complete the necessary Site Deficiency reports.**

6. **Complete the necessary Fault reports.**
7. **Inform the Installation Manager/Site Manager of work progress.**
8. **Complete the certificate of completion and place it in the site folder.**

2.7 Overview of planning an internal configuration

Steps

1. **Define BTS configuration.**
2. **Evaluate system and performance requirements.**
3. **Review technical aspects of the BTS.**
4. **Review technical aspects of the BTS units.**
5. **Determine requirements for any upgrade.**
   - GSM to GSM/EDGE
   - EDGE to WCDMA
6. **Review the commissioning procedures.**
7. **Order units required to meet your system and performance objectives.**

2.8 Planning for an upgrade to include EDGE capability

Steps

1. **Evaluate the impact of the upgrade.**
2. **Review the upgrade requirements.**
3. **Determine the internal configuration.**
4. **Plan cabling.**
5. **Plan for commissioning GSM/EDGE upgrade in BTS.**
6. **Order GSM/EDGE units required for the upgrade.**

3 Delivery contents for BTS installation and cabling

3.1 Indoor cabinet transportation package

All indoor cabinet components are pre-installed, including the six ATCA internal cables.

Table 3. Delivery content of indoor cabinet transportation package

Components	Quantity	Check
Cabinet	1	
Roof assembly	1	

Note

Anchor bolts, washers, and nuts for mounting the cabinet are not included in the indoor cabinet transportation package.

3.2 Midi indoor IDCC cabinet transportation package

All indoor IDCC cabinet components are pre-installed, including the six ATCA internal cables.

Table 4. Delivery content of BTS IDCC transportation package

Components	Quantity	Check
Cabinet	1	

Table 4. Delivery content of BTS IDCC transportation package (cont.)

Components	Quantity	Check
Roof assembly	1	

Note

Anchor bolts, washers, and nuts for mounting the cabinet are not included in the IDCC transportation package.

3.3 Outdoor ODCA cabinet transportation package

All outdoor cabinet components are pre-installed, including the six ATCA internal cables and a cable entry kit (OEKA).

Table 5. Delivery content of outdoor cabinet ODCA transportation package

Components	Quantity	Check
Cabinet	1	
DC filter terminal cover with two M4 screws	1	
TRX connector covers	11	
Mounting hole template	1	

3.4 Outdoor ODCF cabinet transportation package

All outdoor cabinet components, except the filter kit, are pre-installed, including the six ATCA internal cables and a cable entry kit (OEKA).

Table 6. Delivery content of outdoor cabinet ODFC transportation package

Components	Quantity	Check
Cabinet	1	
DC filter terminal cover with two M4 screws	1	

Table 6. Delivery content of outdoor cabinet ODFC transportation package (cont.)

Components	Quantity	Check
TRX connector covers	11	
Mounting hole template	1	
Filter kit	1	

3.5 Midi outdoor ODCC cabinet transportation package

All Midi ODCC cabinet components are pre-installed, including the six ATCA internal cables and a cable entry kit (OEKA).

Table 7. Delivery content of Midi BTS ODCC transportation package

Midi ODCC component	Quantity	Check
Cabinet	1	
DC filter terminal cover with two M4 screws	1	
TRX connector covers	5	
Mounting hole template	1	
Rubber boots	2	

3.6 Mini outdoor cabinet ODCM transportation package

The cabinet delivery contains the following items presented in the table below.

Table 8. Delivery content of Mini Outdoor cabinet transportation package

Item	Quantity
Cabinet	1 pc
TRX connector covers	3 pcs
Wall mounting bracket	1 pc

3.7 Outdoor bridge kit (OBKx) transportation package

Table 9. OBKA/B transportation package component list

Part	Quantity	Check
Bridge	1	
Bridge support	1	
Bridge cover	1	
Screws (M5)	4	

Note

The OBKA is used with the full-size outdoor cabinet. The OBKB is used with the Midi outdoor cabinet.

3.8 Outdoor filter kit (ODFA) transportation package

Table 10. ODFA transportation package component list

Part	Quantity	Check
Filter roll	8	
Trim fasteners	32	

Note

The kit comes with eight filter rolls. However, you only need four filter rolls for the Midi outdoor cabinet.

3.9 Outdoor extreme filter kit (OEFA) transportation package

Table 11. OEFA transportation package component list

Part	Quantity	Check
Frame air filter combined	1	
Extended screw	6	
Hole plug	6	
Top gasket	2	
Air filter module	1	
Back wall air filter	1	
Cover back wall	1	
Cross bar	3	
Allen screw (M8 x 90)	6	
Screw (M5 x 10)	6	

3.10 Outdoor cabinet co-siting kit (OCTU) transportation package

Table 12. OCTU component list

Part	Quantity	Check
Co-siting wall	1	
Co-siting cable entry	1	

3.11 Optional lifting handle kit (WLHA) transportation package

The WLHA transportation package can be installed on a BTS cabinet for horizontal and vertical (staircase) lifting.

Check the contents of the WLHA in the following table.

Table 13. Delivery content of the WLHA

WLHA components	Quantity	Check
Adapter plate	4	
Handle	4	
Mounting screws (M5x12)	16	

Note

You only need two handles for horizontal lifting with the Midi cabinet. In addition, vertical lifting is not available for the Midi cabinet.

3.12 Contents of the pole mounting kit for Mini Outdoor delivery

Table 14. Pole mounting kit delivery

Item	Quantity
M12 x 405 mm bolt	4 pcs
M12 x 300 mm bolt	4 pcs
M12 x 210 mm bolt	4 pcs
M8 shouldered bolt	4 pcs
M6 x 16 mm screw	8 pcs
M6 spring washer	8 pcs
M12 plain washer	8 pcs
M8 plain washer	4 pcs
M8 nut	8 pcs
M12 spring washer	4 pcs
M12 nut	4 pcs
Pole mounting bracket	4 pcs
Fixing plate	2 pcs

3.13 Contents of the floor mounting kit for Mini Outdoor delivery

The Mini Outdoor cabinet can be mounted onto a horizontal surface with a floor mounting kit. See the following table for delivery contents of the floor mounting kit.

Table 15. Contents of the floor mounting kit for Mini Outdoor delivery

Item	Quantity
Plinth	1 pc
Cabinet mounting bolts	6 pcs

3.14 Contents of the security lock delivery (optional)

The cabinet can be fitted with a security lock. The delivery contains the following items:

Table 16. Security lock delivery

Item	Quantity
Lock body	1 pc
Lock plate	1 pc
Lock latch	1 pc
Nut	1 pc

Table 17. Security key delivery

Item	Quantity
Security key	1 pc

3.15 SXCA transportation package

Table 18. Delivery content of SXCA transportation package

Part	Quantity	Check
SXCA kit	1 ea.	
RF Cable assembly (part of SXCA kit)	2 ea.	

Note

The SXCA kit is a customer specific item created for various BTS configurations. Contact your local Nokia representative for ordering information.

4 Installing the indoor IDCA or Midi indoor IDCC cabinet

4.1 Positioning the indoor cabinet

Summary

Warning

Empty cabinet cores are heavy. Use a lifting device when moving a cabinet core.

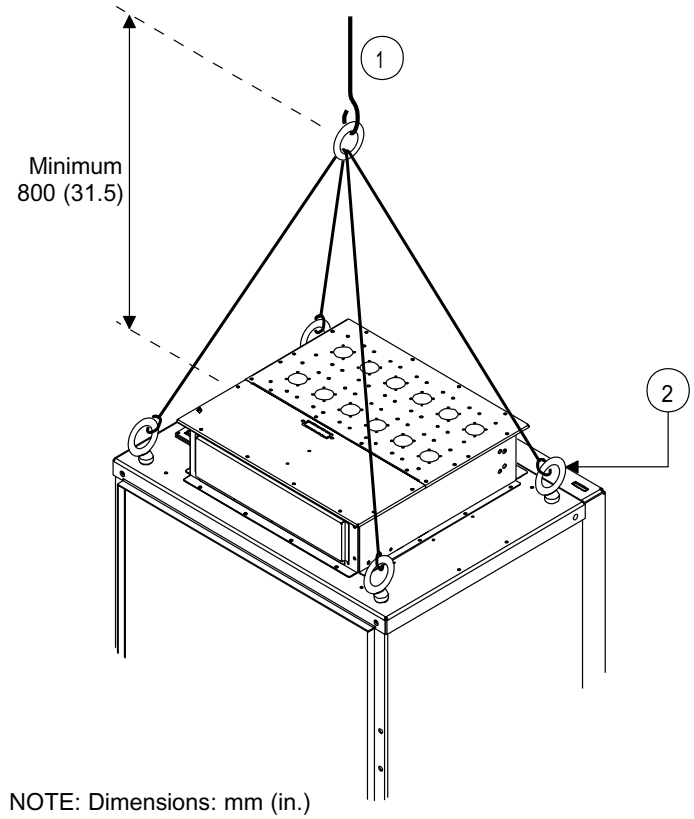
Warning

When lifting or positioning a cabinet, loose components may fall out. Do not tilt the cabinet forwards.

Note

The recommended M12 (1/2 in.) lifting eye bolts and anchor bolts are not included in the delivery package.

If you use a mechanical lifting device, it is recommended to use lifting eye bolts. Use all four lifting points on the cabinet top. The lifting points support the weight of an empty cabinet core.



1	Lifting device
2	Lifting eye bolts (4 places)

Figure 1. Lifting the cabinet

Steps

1. **Screw one M12 (1/2 in.) lifting eye bolt into each corner of the cabinet core.**

2. **Attach the lifting ropes to the lifting eye bolts, as shown in figure above.**

3. **Carefully lift the cabinet.**

4. **Position the cabinet in place.**

5. **Bolt the cabinet into position.**

6. **Remove the ropes and lifting eye bolts, or lifting handles.**

Further information

The Lifting Handle Kit (WLHA) can be installed on the cabinet for horizontal and vertical (staircase) lifting. For more information, see *Installing the optional lifting handle kit (WLHA) of the indoor cabinet*.

4.2 Installing the optional lifting handle kit (WLHA) of the indoor cabinet

Summary

The WLHA can be installed on a BTS cabinet for horizontal and vertical (staircase) lifting. For horizontal lifting, the handles are installed on the sides of the cabinet. For vertical lifting, the handles are installed at the top and bottom of the cabinet using adapter plates and the cabinet feet.

Note

Vertical lifting is not available for the Midi cabinet.

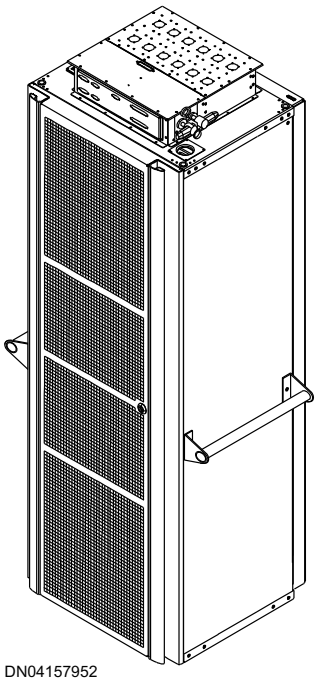


Figure 2. Lifting handles for horizontal lifting

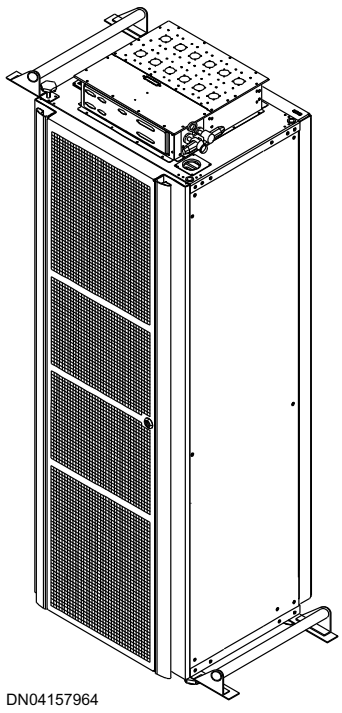


Figure 3. Lifting handles for vertical lifting

Steps

1. *If* you are installing the lifting handles for horizontal lifting,

   Then

   Perform the following steps.

   a. Install each handle in the middle of each cabinet side using the M5 screws provided in the WLHA.

   b. To lift the cabinet, have each person hold a handle using both hands.

2. *If* you are installing the lifting handles for vertical lifting,

   Then

   Perform the following steps.

a. Position the adapter plates under the handles so that the large M12 holes are facing inside and the M5 holes are lined up.
b. Connect the adapter plates to the handles using the M5 screws provided in the WLHA.
c. Remove the cabinet feet.
d. Position a handle on either side at the top of the cabinet so that the empty M12 holes on the adapter plates are lined up with the empty M12 holes on the side of the cabinet.
e. Install the handles using two of the cabinet feet as M12 bolts.
f. Position the other handle on the bottom side opposite of where the top handle was installed. The empty M12 holes on the adapter plates should be lined up with the empty M12 holes on the bottom of the cabinet.
g. Install the handles using the cabinet feet as M12 bolts.
h. To lift the cabinet, have one person hold the top handle with both hands. Tilt the cabinet back, while the other person holds the bottom handle with both hands.
i. Once the cabinet is at the site, remove the lifting handles and re-install the levelling feet.

4.3 Preparing the base for installation of the indoor cabinet

Before you start

Note

The cabinet must be mounted to the floor using one of the following options:

- If you are not installing in an earthquake zone, mount the cabinet to the floor using one anchor bolt.
- If you are installing in an earthquake zone, mount the cabinet to the floor using four anchor bolts.

Caution

If the installation site is in an area affected by seismic activity, follow the earthquake mounting instructions and any instructions specific to that particular country.

Summary

Note

The diameter of the anchor hole in the cabinet floor is 13 mm (0.5 in). The anchor bolt size is M10 or M12.

Note

You can mark anchor hole locations through the floor with the cabinet in place or use a cardboard template. To make the template, trace the outline of the cabinet bottom including the anchor holes.

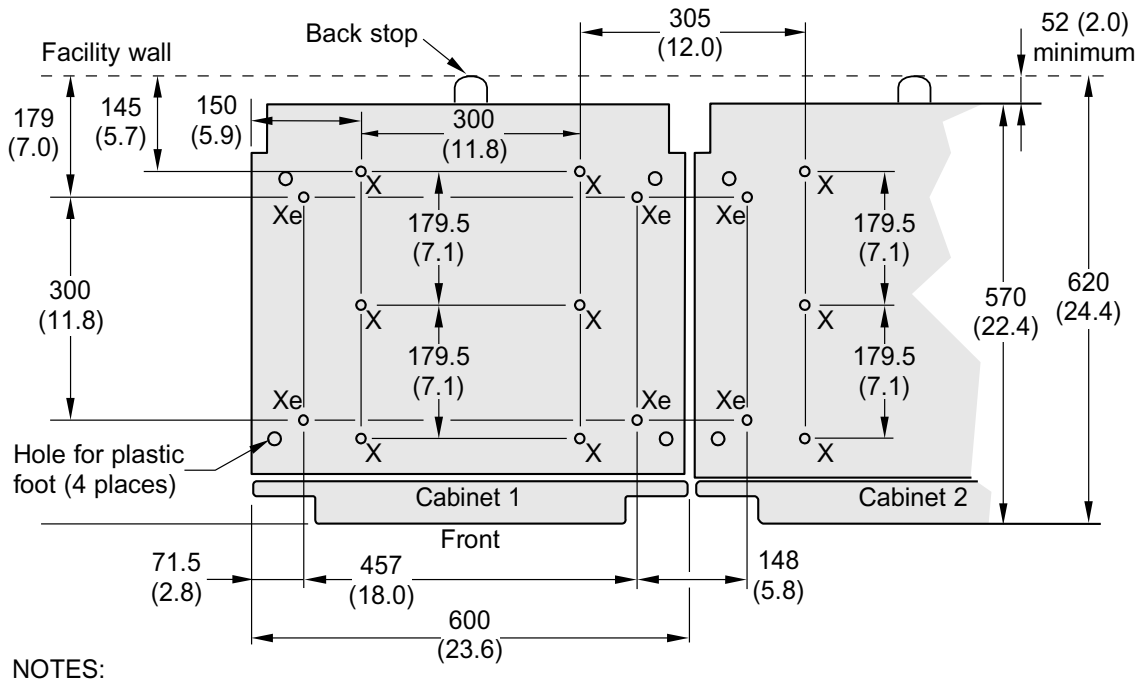


Figure 4. Dimensions and anchor holes in the base for indoor cabinets

Steps

1. Lift the cabinet into place.

Caution

Risk of damage to the back stop. When lifting the cabinet and placing it on the ground, be careful not to damage the back stop at the lower rear of the cabinet.

Caution

To ensure proper cooling, pay attention to the indoor cabinet back clearance. The recommended back clearance of 52 mm (2.0 in.) ensures proper air intake for the unit cooling fans.

2. **Position the cabinet backstop outward.**

3. **Mark the base using one anchor hole (non-earthquake zone) or four anchor holes (earthquake zone).**

4. **Move the cabinet off the base, if necessary.**

5. **Drill the anchor hole as marked on the base and clear any debris.**

4.4 Attaching the indoor cabinet to the base

Summary

Warning

Base transceiver station (BTS) cabinets have sharp edges. Take care when working with or near the BTS.

Note

The diameter of the anchor hole in the cabinet floor is 13 mm (0.5 in.). The anchor bolt size is M10 or M12.

Note

You can mark anchor hole locations through the floor with the cabinet in place or use a cardboard template. To make the template, trace the outline of the cabinet bottom including the anchor holes.

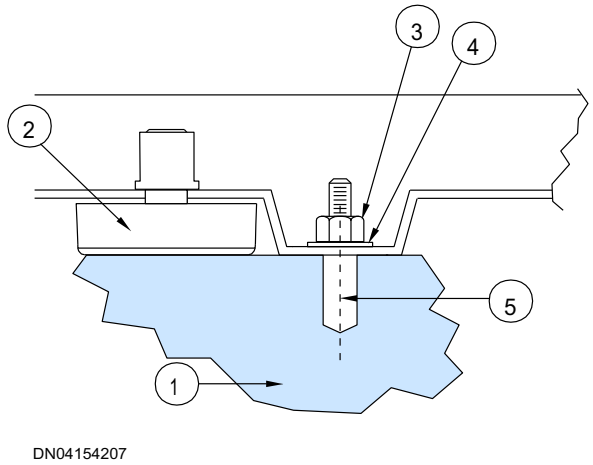


Figure 5. Anchoring the indoor cabinet to the base

1	Mounting base
2	Adjustable foot
3	M10 or M12 nut
4	Washer
5	M10 or M12 anchor bolt

Steps

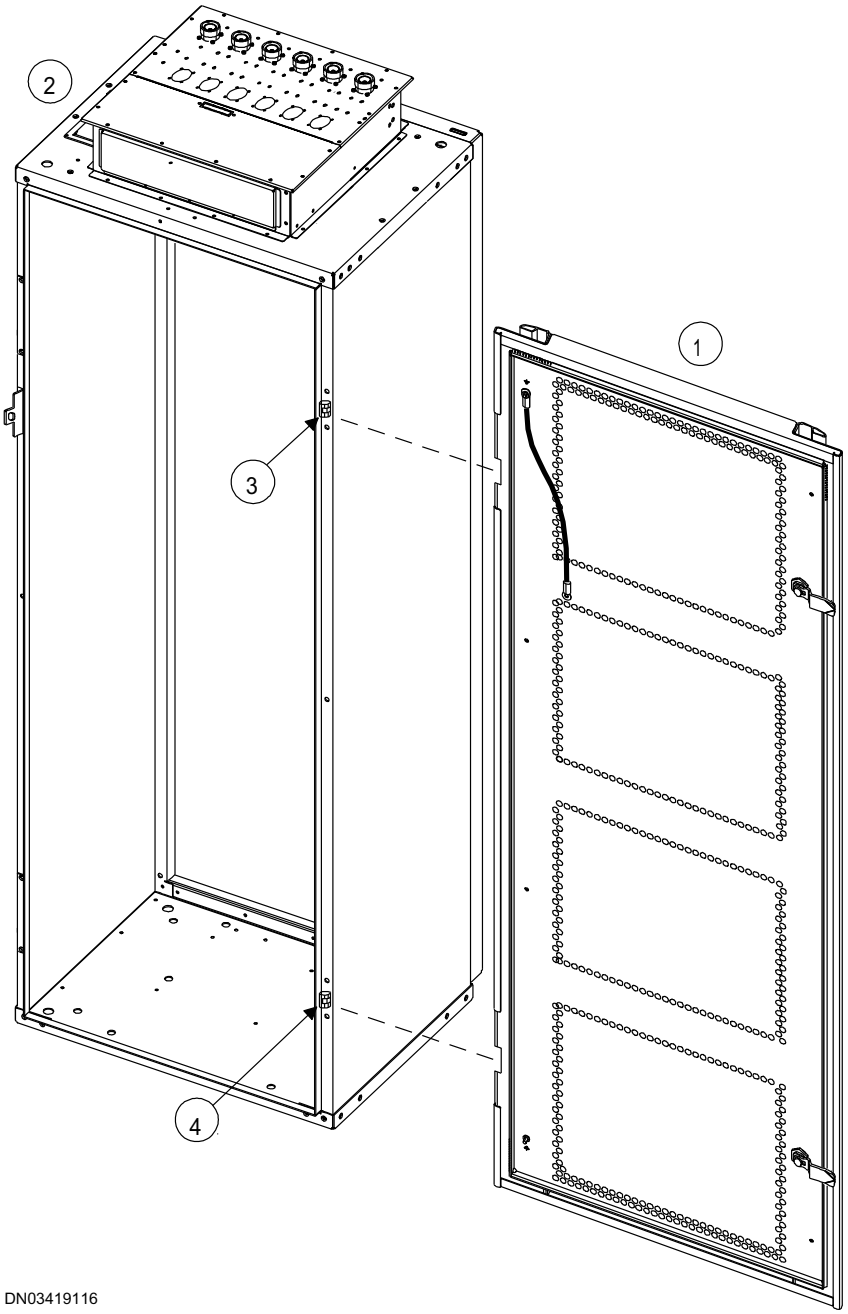
1. **Insert and secure the anchor bolt(s) in the anchor hole(s).**
2. **Lift the cabinet into place over the anchor bolt(s).**
3. **Use a level and adjust the cabinet.**
4. **Install a 30 mm flat washer on the anchor bolt and secure it with a nut.**

Caution

Do not overtighten the bolts. Make sure the bolts are tightened evenly, or it can damage the cabinet.

4.5 Repositioning the indoor cabinet door

Summary



1	Cabinet door

2	Cabinet core
3	Hinge (2 places)
4	Hinge pin (2 places)

Figure 6. Repositioning the indoor cabinet door

Note

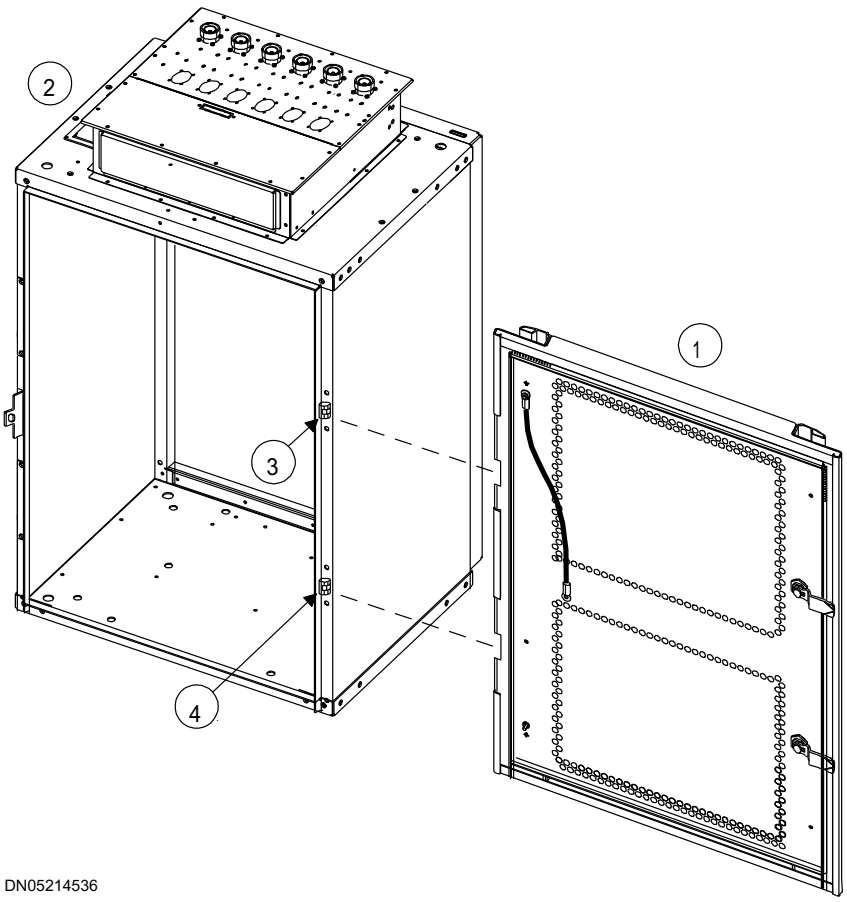
If required, remove and install the door lock-plate on the opposite side of the cabinet.

Steps

1. **Remove the door.**
2. **Remove the hinges.**
3. **Rotate the hinges 180°.**
4. **Install the hinges on the opposite side of the cabinet.**
5. **Install the door lock-plate on the opposite side of the cabinet.**
6. **Flip the door end-to-end.**
7. **Install the door in the new position.**
8. **Re-install the door ground strap.**

4.6 Repositioning the Midi indoor IDCC cabinet door

Summary



1	Cabinet door
2	Cabinet core
3	Hinge (2 places)
4	Hinge pin (2 places)

Figure 7. Repositioning the IDCC door

Note

If required, remove and install the door lock-plate on the opposite side of the cabinet.

Steps

1. **Remove the door.**
2. **Remove the hinges.**
3. **Rotate the hinges 180°.**
4. **Install the hinges on the opposite side of the cabinet.**
5. **Install the door lock-plate on the opposite side of the cabinet.**
6. **Flip the door end-to-end.**
7. **Install the door in the new position.**
8. **Re-install the door ground strap.**

5 Installing the outdoor ODCA/ODCF or Midi outdoor ODCC cabinet

5.1 Positioning the outdoor cabinet

Summary

Warning

Empty cabinet cores are heavy. Use a lifting device when moving a cabinet core.

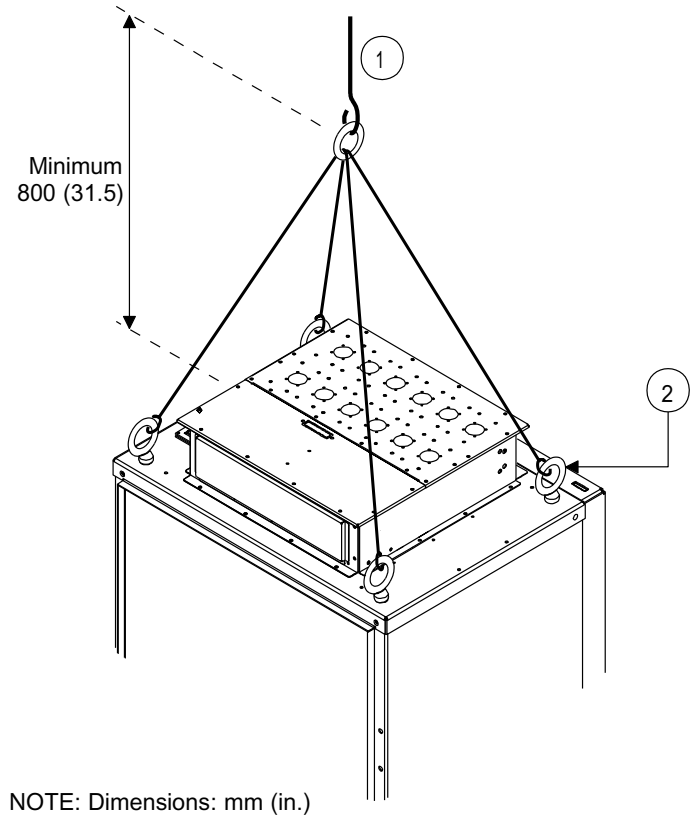
Warning

When lifting or positioning a cabinet, loose components may fall out. Do not tilt the cabinet forwards.

Note

The recommended M12 (1/2 in.) lifting eye bolts and anchor bolts are not included in the delivery package.

If you use a mechanical lifting device, Nokia recommends that you use lifting eye bolts. Use all four lifting points on the cabinet top. The lifting points support the weight of an empty cabinet core.



1	Lifting device
2	Lifting eye bolts (4 places)

Figure 8. Lifting the cabinet

Steps

1. **Remove the roof support assembly.**
2. **Screw one M12 (1/2 in.) lifting eye bolt into each corner of the cabinet core.**
3. **Attach the lifting ropes to the lifting eye bolts, as shown in figure above.**
4. **Carefully lift the cabinet.**

5. **Position the cabinet in place.**

6. **Bolt the cabinet into position.**

7. **Remove the ropes and lifting eye bolts, or lifting handles.**

Further information

The Lifting Handle Kit (WLHA) can be installed on the cabinet for horizontal and vertical (staircase) lifting. For more information, see *Installing the optional lifting handle kit (WLHA) of the outdoor cabinet*.

5.2 Installing the optional lifting handle kit (WLHA) of the outdoor cabinet

Summary

The WLHA can be installed on a BTS outdoor cabinet for horizontal and vertical (staircase) lifting. For horizontal lifting, the handles are installed on the sides of the cabinet. For vertical lifting, the handles are installed at the top and bottom of the cabinet using adapter plates and the cabinet feet.

Note

Vertical lifting is not available for the Midi cabinet.

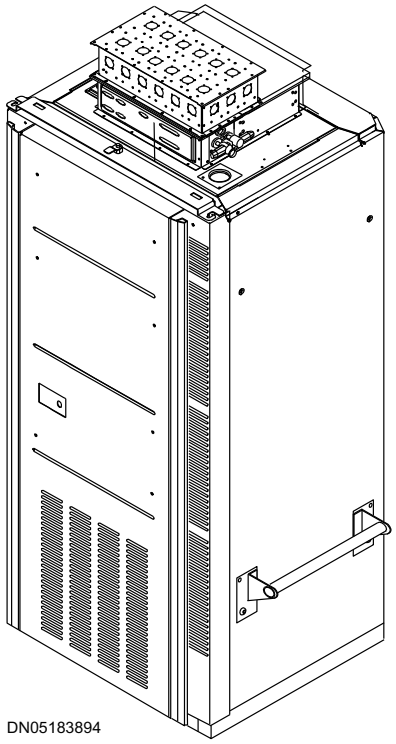


Figure 9. Lifting handles for horizontal lifting

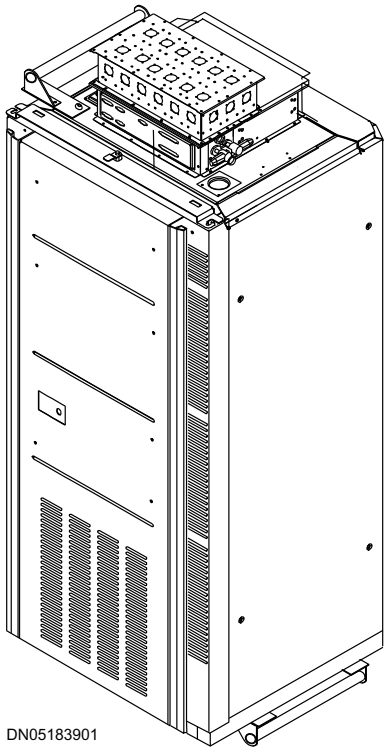


Figure 10. Lifting handles for vertical lifting

Steps

1. *If* you are installing the lifting handles for horizontal lifting,

   Then

   Perform the following steps.

   a. Install a handle on each side of the cabinet (as shown in the figure) using the M5 screws provided in the WLHA.

   b. To lift the cabinet, have each person hold a handle using both hands.

2. *If* you are installing the lifting handles for vertical lifting,

   Then

   Perform the following steps.

a. Position the adapter plates under the handles so that the large M12 holes are facing inside, and the M5 holes are lined up.
b. Connect the adapter plates to the handles using the M5 screws provided in the Lifting Handle Kit (WLHA).
c. Position a handle on either side at the top of the cabinet so that the empty M12 holes on the adapter plates are lined up with the empty M12 holes on the side of the cabinet.
d. Install the top handle using two of the roof mounting bolts.
e. Position the other handle on the bottom side opposite of where the top handle was installed. The empty M12 holes on the adapter plates should be lined up with the empty M12 holes on the bottom of the cabinet.
f. Install the handle using M12 bolts and nuts.
g. To lift the cabinet, have one person hold the top handle with both hands. Tilt the cabinet back, while the other person holds the bottom handle with both hands.
h. Once the cabinet is at the site, remove the lifting handles.

5.3 Preparing the base for installation of the outdoor cabinet

Summary

This section describes how to prepare a concrete base for outdoor cabinet installation. If you will be using metal frames as the base, refer to the manufacturer's instructions for information on how to prepare the metal frames for installation.

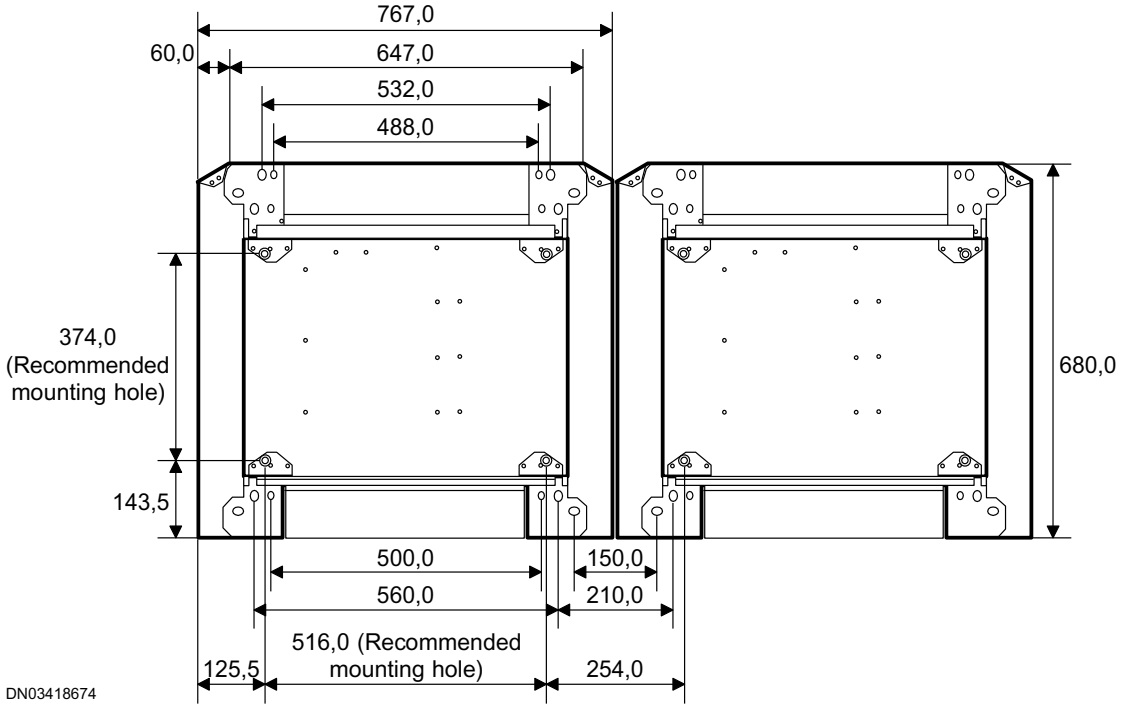


Figure 11. Dimensions and anchor holes for outdoor cabinets

Note

The recommended holes are required to meet the NEBS GR-63-CORE/NEBS 2000 Zone 4 earthquake requirements.

Steps

1. **Ensure that the mounting base is strong enough to withstand the weight of the BTS cabinet.**
2. **Position the cabinet on the base according to the site plan.**
3. **Mark the base through the four anchor holes of the cabinet or use the cardboard mounting hole template provided with the cabinet.**
4. **Mark an outline of the cabinet on the base to help you reposition the cabinet over the anchor holes after drilling.**

If you are installing more than one cabinet, ensure that the distance between the cabinet mounting bolts is the proper distance. If co-siting with another UltraSite cabinet, the dimensions specified in the figure are the same.

5. **Remove the cabinet from the base before drilling anchor holes.**

6. **Drill the anchor holes in the base, and then carefully remove any debris.**

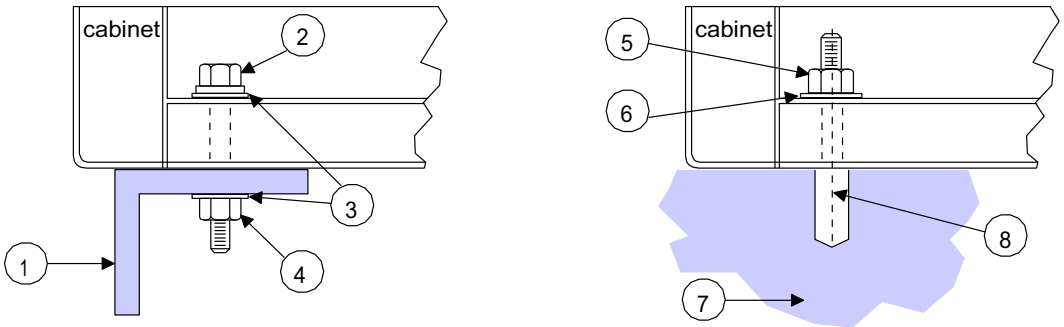
5.4 Attaching the outdoor cabinet to the base

Summary

The outdoor cabinet can be installed on a concrete base or metal frame.

Note

The cabinet delivery does not contain shims or cabinet-to-base installation hardware. To order site-specific materials, contact your local Nokia representative.



NOTE: The recommended bolt length is 60 mm (2.36 in.)

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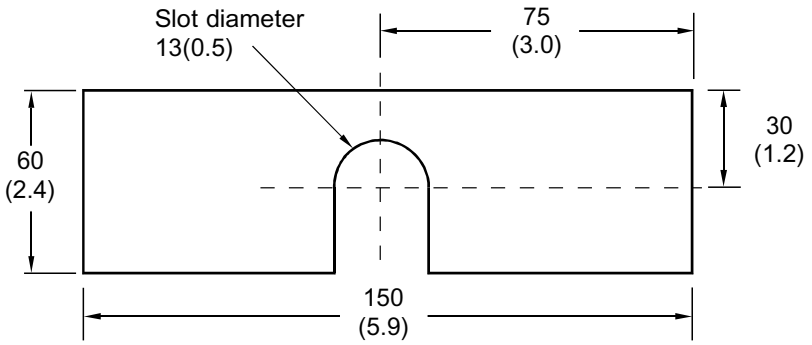
Figure 12. Anchoring the cabinet to the base

Note

1-4 identify the components for attaching to a metal frame. 5-8 identify the components for attaching to a concrete base.

1	Metal frame
2	M10 or M12 bolt
3	Washers
4	M10 or M12 nut
5	M10 or M12 nut
6	Washers
7	Concrete base
8	M10 or M12 anchor bolt



NOTE: Dimensions mm (in.)

Figure 13. Recommended shim dimensions

Steps

1. Place the cabinet on the base over the anchor holes.

2. Check if the cabinet is level and install shims, if required.

3. Depending on the type of base, perform one of the following:

- For a concrete base, install the anchor bolts and secure the cabinet to the base with four washers and nuts.
- For metal frame installation, secure the cabinet to the frame with four bolts, eight washers, and four nuts.

4. **Tighten the nuts.**

Caution

Do not overtighten the bolts. Make sure the bolts are tightened evenly, or it can damage the cabinet.

5.5 Repositioning the outdoor ODCA/ODCF or Midi outdoor ODCC cabinet door

Summary

You can install the outdoor cabinet door in a right or left opening orientation.

Caution

Cables may be damaged if they are caught between the door and the doorframe. Use the doorstop to hold the door open. When you close the door, ensure that the cables are not caught.

Warning

The cabinet door is heavy. At least two people are needed to remove the cabinet door.

Steps

1. **Remove the grounding cable.**
2. **Remove the fan power cable.**
3. **Remove the door hinge lock plate.**

4. **Tap out the upper and lower hinge pins from the inside with a hammer and long-handle screwdriver.**

5. **Lift up on the door to disengage it. Lay the door down with the inside of the door facing up.**

6. **Lift the door to re-position the door on the opposite side of the cabinet.**

7. **Lift the door again to engage the upper hinge pin of the door in the slot at the top of the door frame.**

8. **Insert the hinge pins in the opposite side of the door and gently tap into place, ensuring the pins are fully seated.**

9. **Install the door hinge lock plate.**

10. **Remove the door stay from the bottom of the door and install it in the opposite side attachment hole.**

11. **Install the grounding cable.**

12. **Install the fan power cable.**

5.6 Installing the ODCF cabinet filter kit

Steps

1. **Fix M5 x 10 screws (8 pcs) to the ODCF cabinet.**

   Leave the screws about 4 mm loose.

2. **Fix the ODCF filter frame to the ODCF cabinet by placing the holes over the screws.**

   Tighten the screws to the torque of 2.5 - 3 Nm.

3. **Install the air filter into the filter frame.**

4. **Fix the cross bars (3 pcs) to the filter frame with screws (6 pcs).**

5. **Fix the screws (6 pcs) to the filter frame.**

   Do not tighten the screws. Leave the screws about 4 mm open.

6. Fix the back wall cover to the filter frame by placing holes over screws.

Tighten the screws to the torque of 2.5 - 3 Nm.

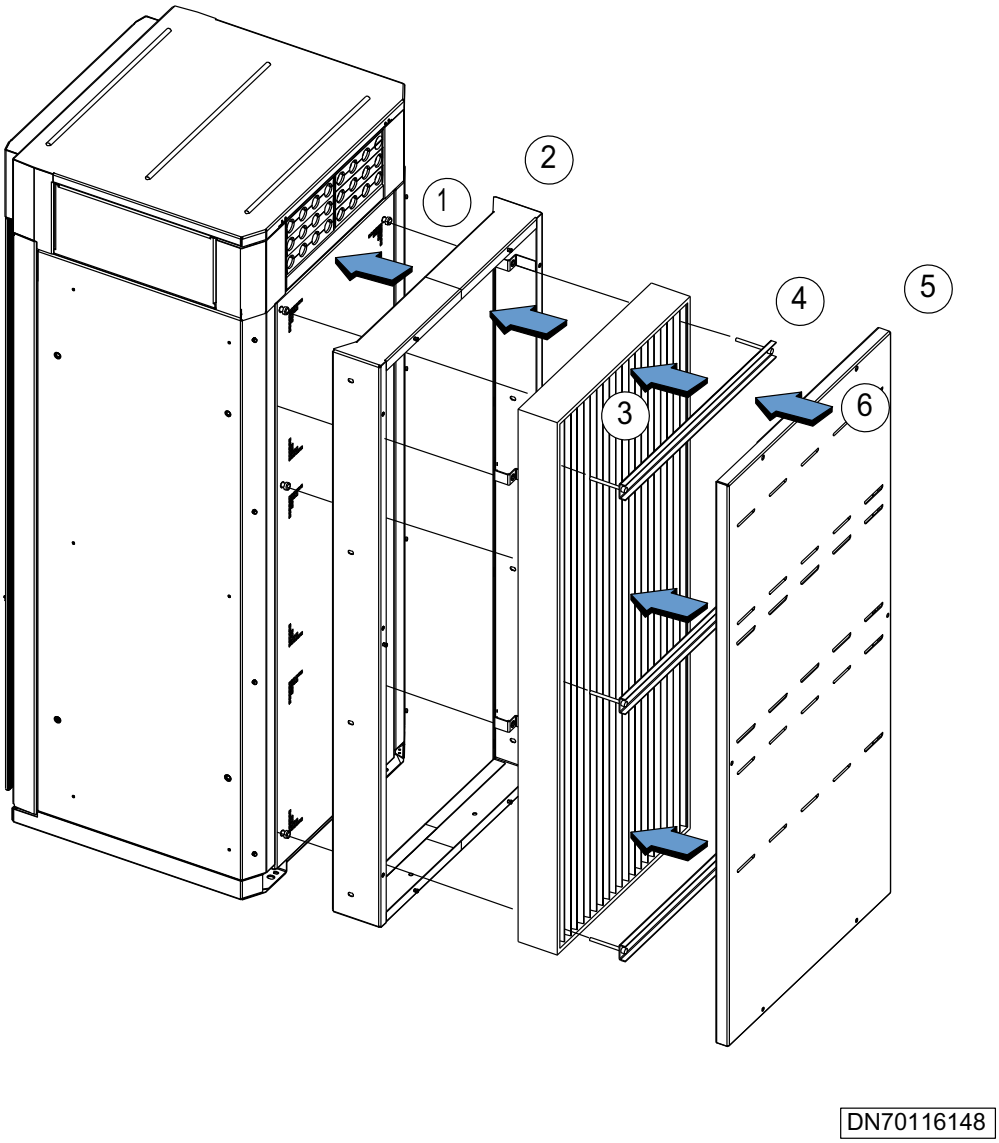


Figure 14. Installing the ODCF cabinet filter kit

6 Installing optional kits for the outdoor ODCA/ODCF or Midi outdoor ODCC cabinet

6.1 Installing the outdoor filter kit (ODFA)

Summary

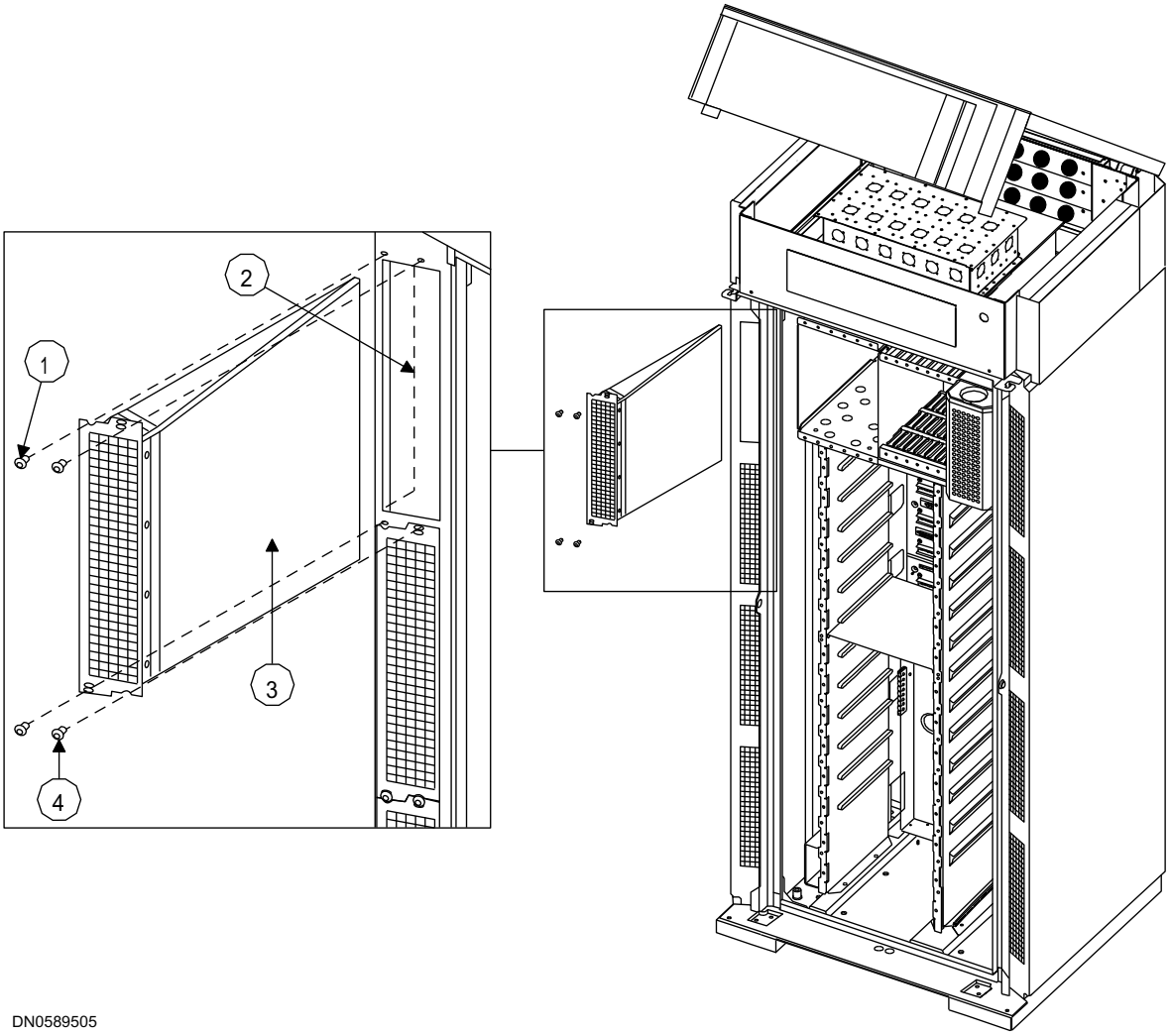
Dust filters can be installed in the BTS outdoor cabinet (full-size and Midi) and NUSS.

Note

OAKB 469095 version 101 is not designed to be compatible with ODFA.

Note

The kit comes with eight filter rolls. However, you only need four filter rolls when installing in the Midi outdoor cabinet.



1	Push fastener clip
2	Dust filter slot
3	ODFA
4	Push fastener clip

Figure 15. Installing the ODFA

Steps

1. Remove the door.

Warning

The cabinet door is heavy. At least two people are needed to remove the cabinet door.

2. **Remove the door frame.**

3. **Use a pair of shears to cut and remove the punched hole pattern covering each dust filter slot.**

   Make sure that the opening is smooth and no spines are left. You may be required to remove some of the acoustic foam before inserting the ODFA.

4. **Slide each dust filter kit into place.**

5. **Insert the push fastener clips to secure each filter kit, as illustrated.**

Tip

After the filters are installed in the cabinet, it is recommended that you open the filter bag by sticking a blunt bar through the front opening of each filter. Be careful not to pierce the bag.

6. **Install the door frame.**

7. **Install the door.**

6.2 Installing the outdoor extreme filter kit (OEFA)

Before you start

The outdoor extreme filter kit (OEFA) can be installed to outdoor cabinets with OAKA, OAKB, and NUSS.

Steps

1. **Remove the roof cover.**

2. **Remove the roof frame.**

3. **Lift off the cabinet back wall.**

4. **Remove the M5 torx screws (6 pcs).**

5. **Install the top gasket (25x560x3 mm) on top of the back wall, the centre in a horizontal direction.**

   If you have NUSS, cut the first gasket to 466 mm length and place it between the side wall edges. Note the 12 mm gap between the gasket and the top corner. Then, install the full length 560 mm gasket on top of the first installed gasket, centre in a horizontal direction.

6. **Install the frame air filter in place.**

7. **Secure the frame air filter by using extended screws supplied with the kit (6 pcs).**

8. **Push the hole plugs (6 pcs) in place covering the extended screw mounting holes.**

9. **Install the back wall air filter.**

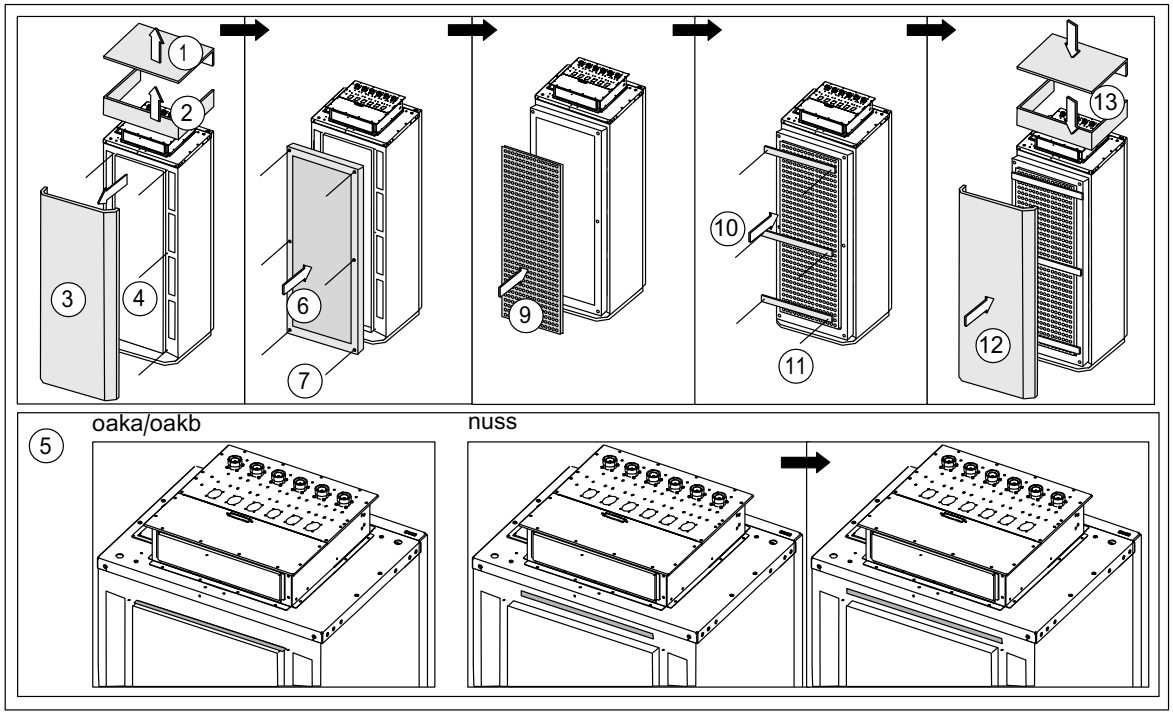
10. **Lift the air filter module on top of the back wall air filter.**

    Centre the frame air filter in a horizontal direction. Secure the air filter module using cross bars (3 pcs) and Allen screws (6 pcs).

11. **Pre-install the M5 x 10 Torx screws to the back wall air filter (6 pcs).**

12. **Lift the back wall cover on pre-installed screws, lower it on place, and secure with the pre-installed screws.**

13. **Reinstall the roof frame and the roof cover.**



6.3 Installing the outdoor bridge kit

Summary

The bridge kit provides a protected channel for inter-cabinet cables routed between adjoining BTS outdoor cabinets.

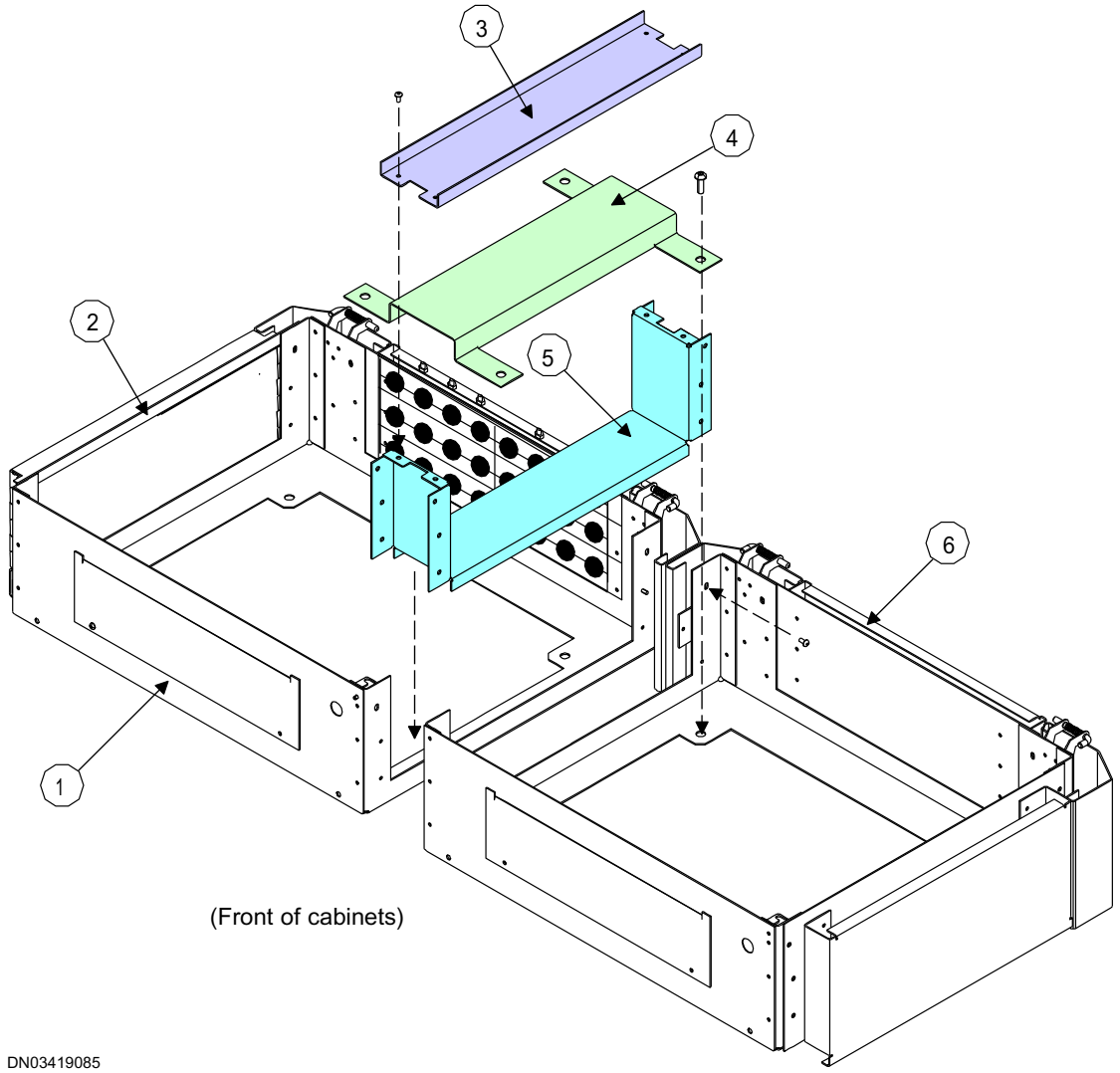


Figure 16. Installing the bridge kit

1	Roof support
2	Cable entry
3	Bridge cover
4	Bridge support
5	Bridge
6	Dummy cable entry

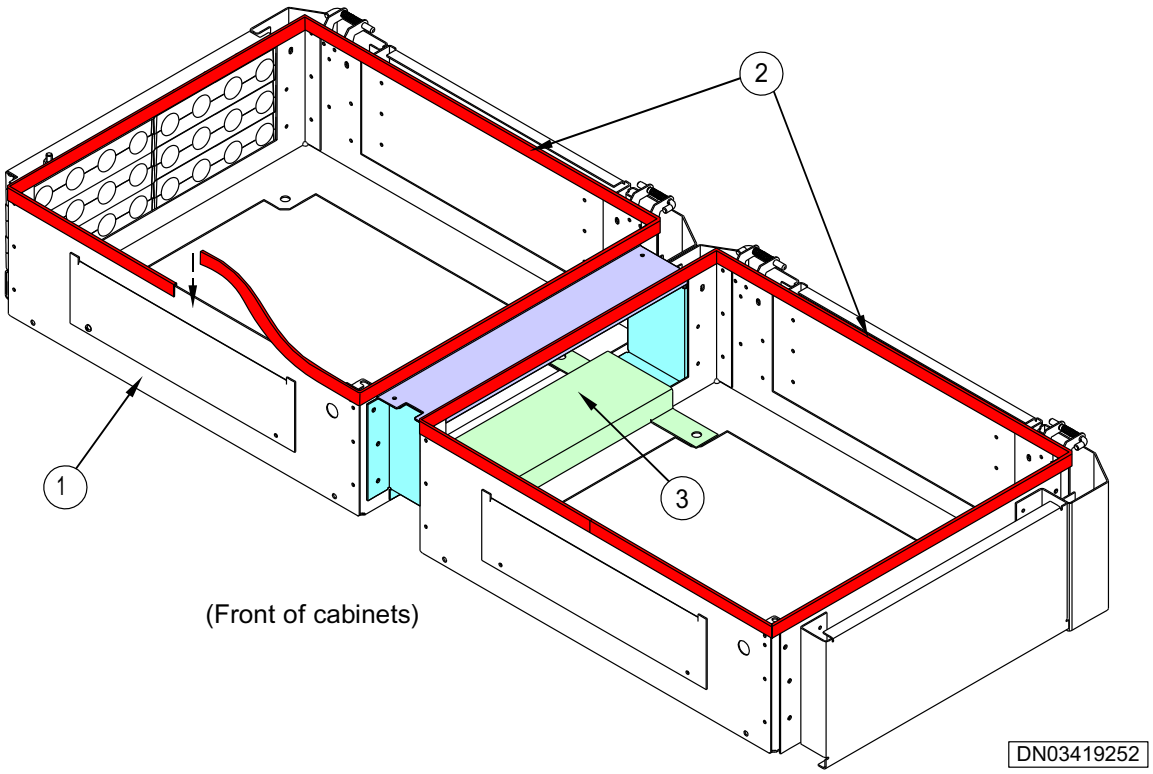


Figure 17. Installing the rubber gasket strip

1	Roof support
2	Rubber gasket strip applied along top edge of roof support
3	Bridge assembly

Steps

1. **Remove the roof from both cabinets.**

2. **On both cabinets, remove the rubber gasket strip from the top edge of the roof support walls.**

3. **Remove adjacent dummy cable entry panels from both roof support assemblies (M5) screws (three on each panel end).**

4. **Position the bridge and secure with the M5 screws removed in the previous step.**

5. **Remove four M12 screws from the adjacent sides of the roof assembly.**

6. **Position the bridge support and secure with the four M12 screws.**

Note

Route cables before you install the bridge cover.

---

7. **Position the bridge cover and secure with four M5 screws.**

8. **Replace the rubber gasket strip on the top edge of the roof support walls.**

9. **Install the roof on both cabinets.**

6.4 Installing the Midi outdoor bridge kit

Summary

The Midi bridge kit provides a protected channel for inter-cabinet cables routed between adjoining BTS outdoor cabinets.

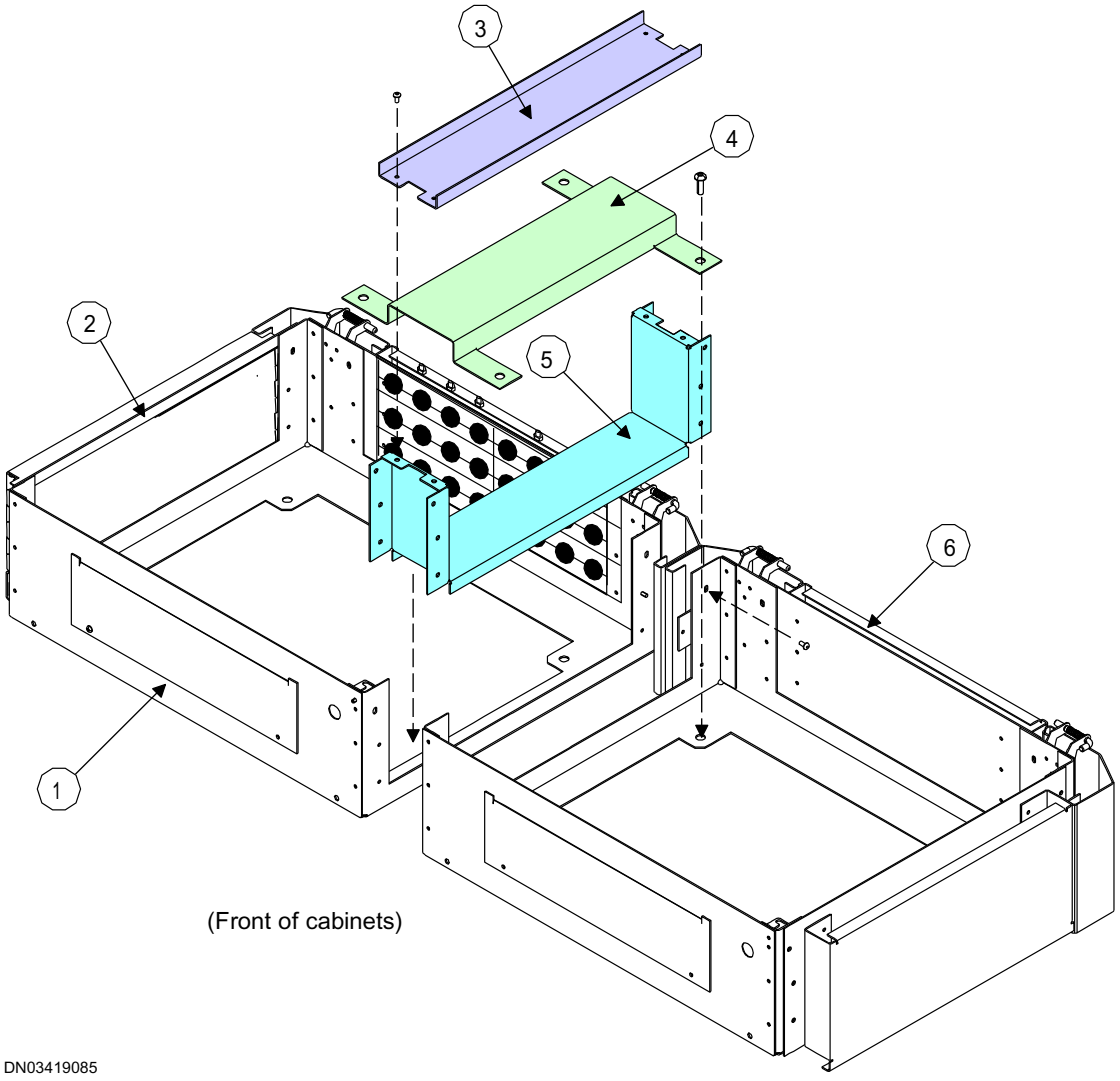


Figure 18. Installing the Midi bridge kit (OBKB)

1	Roof support
2	Cable entry
3	Bridge cover
4	Bridge support
5	Bridge
6	Dummy cable entry

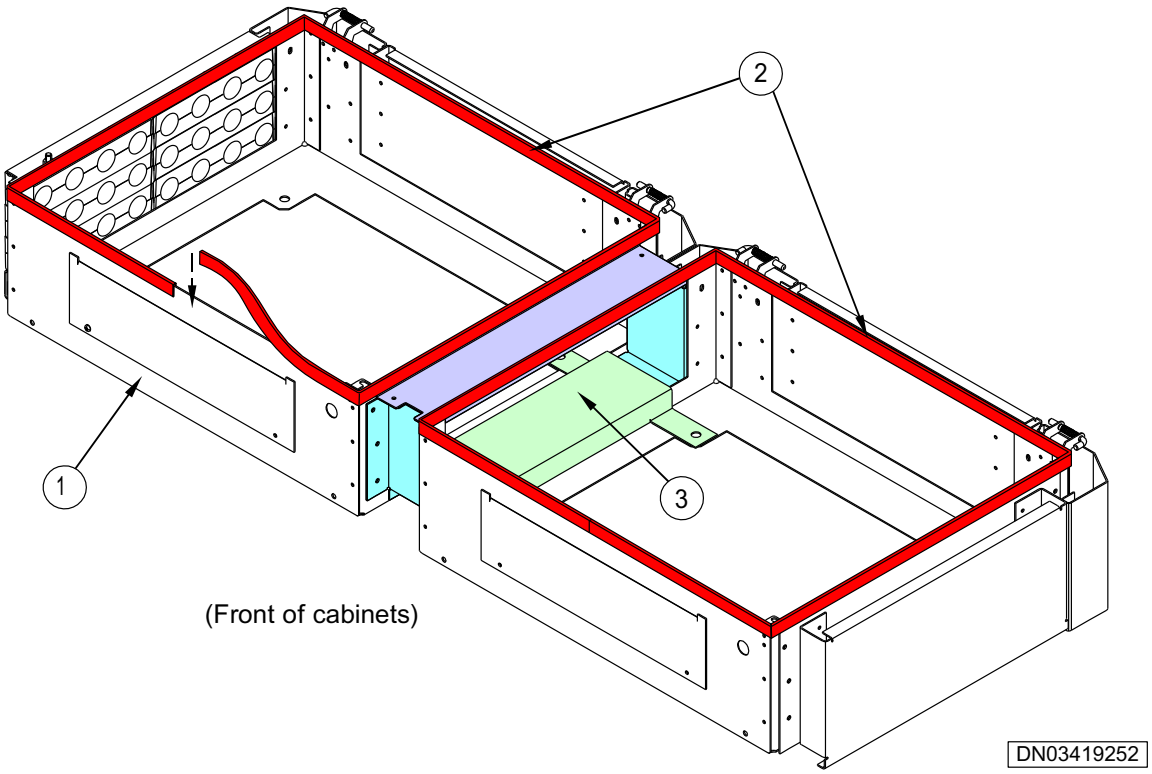


Figure 19. Installing the rubber gasket strip

1	Roof support
2	Rubber gasket strip applied along top edge of roof support
3	Bridge assembly

Steps

1. **Remove the roof from both cabinets.**

2. **On both cabinets, remove the rubber gasket strip from the top edge of the roof support walls.**

3. **Remove adjacent dummy cable entry panels from both roof support assemblies (M5) screws (three on each panel end).**

4. **Position the bridge and secure with the M5 screws removed in the previous step.**

5. **Remove four M12 screws from the adjacent sides of the roof assembly.**

6. **Position the bridge support and secure with the four M12 screws.**

Note

Route cables before you install the bridge cover.

7. **Position the bridge cover and secure with four M5 screws.**

8. **Replace the rubber gasket strip on the top edge of the roof support walls.**

9. **Install the roof on both cabinets.**

6.5 Installing the outdoor cabinet co-siting wall

Summary

Note

When only sync and/or DC power cables run between cabinets, the cabinets do not need to be adjacent. This section only applies to installations of adjacent cabinets. For non-adjacent cabinets, route sync and backup power cables through the normal cable entry assembly.

The outdoor cabinet co-siting wall replaces one of the standard ODCA/ODCF side walls and provides a new co-siting cable entry for the roof assembly.

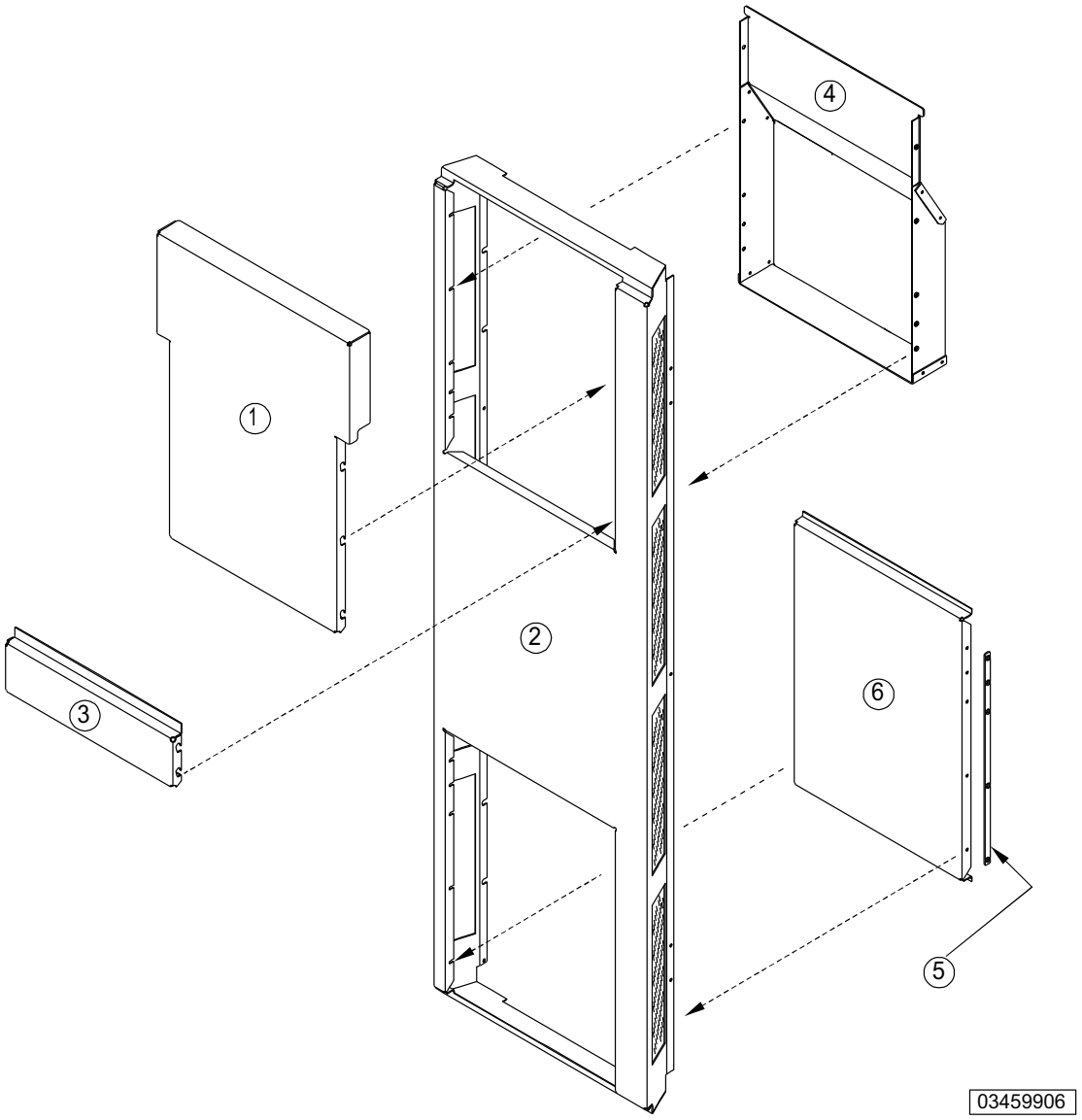


Figure 20. Co-siting Side Wall

1	Cover
2	Side wall
3	Trim panel
4	Channel
5	Thread bar (2 places)

6	Dummy panel

Steps

1. Remove the roof cover.

2. Remove the roof support assembly.

3. Disconnect the door fan.

4. Disconnect the door grounding strap.

5. Remove the door.

6. Remove the door frame.

7. Remove the side wall (left or right) that will be replaced with the co-siting wall.

8. *If* your site plan positions the Citytalk adjacent to the UltraSite's right side,

   Then

   Modify the co-siting wall for mounting on the right.

   a. Loosen the screws that secure the channel to the side wall.
   b. Slide the channel out of the slots on the side flanges.
   c. Loosen the screws that secure the dummy panel and thread bars to the side wall. Ensure that the thread bars remain attached.
   d. Slide the dummy panel with the thread bars out of the slots on the side flanges.
   e. Interchange the positions of the channel and dummy panel on the side wall.
   f. Slide the channel into the slots on the side flanges and tighten the screws to secure the channel.
   g. Slide the dummy panel with the thread bars into the slots on the side flanges and tighten the screws to secure the dummy panel and thread bars.
   h. Flip the modified panel end-over-end for mounting on the right side of the BTS core.

9. Install the co-siting side wall.

10. Install the door frame.

11. Install the roof support.

12. **Install the door.**

13. **Re-connect the door grounding strap.**

14. **Re-connect the door fan.**

15. **Install the door lock.**

6.6 Installing the co-siting cable entry block

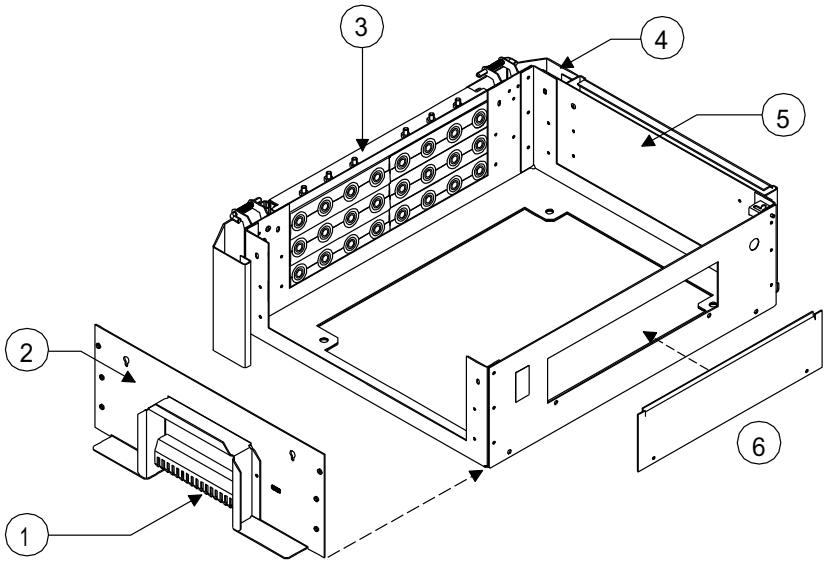
Before you start

Ensure that the site is ready for installation of optional kits.

Note

UltraSite co-siting cable entry mounts on the side adjacent to the Citytalk cabinet. If the Citytalk is located to the left of the UltraSite, the dummy cable entry on the left side must be moved to the right side of the roof assembly before you install the cable entry.

Summary



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1	Wiring tie-down points
2	Co-siting cable entry
3	Cable entry block
4	Roof support
5	Dummy cable entry
6	External interface cover panel

Figure 21. Roof assembly

Steps

1. **Remove the rubber seal from the roof support assembly.**
2. **Remove the six screws that secure the dummy cable entry to the roof support assembly.**

   The dummy cable entry is the one being replaced by the co-siting cable entry.
3. **Remove the dummy cable entry that is being replaced.**
4. **Insert the co-siting cable entry on the side of the roof assembly.**
5. **Align the mounting holes of the co-siting cable entry with the mounting holes in the roof support assembly.**
6. **Replace the six screws and tighten the co-siting cable entry into position in the roof support assembly.**
7. **Replace the rubber seal on the roof support assembly.**

7 Installing the Mini outdoor cabinet

7.1 Overview of installing the Mini outdoor cabinet

Before you start

Note

Only properly trained and authorised personnel may perform installation operations on any Nokia base transceiver station (BTS).

Summary

Check that:

- The site is prepared for installation. See *Site preparation checklist*.
- The proper installation tools are available. See *Tools requirements*.

Warning

Base transceiver station (BTS) cabinets have sharp edges. Take care when working with or near the BTS.

Caution

Risk of damage to bottom interface connectors. When unpacking or installing the cabinet, do not stand the cabinet on its base as this damages the base interface connectors.

Note

Configuring the base transceiver station (BTS) for +24 VDC power supply and/or optional heater requires access to the back of the cabinet. Configure the BTS before mounting the cabinet in a position where rear access is difficult.

Steps

1. **Complete installation preparations including installation of any options.**

Warning

Risk of personal injury. Wear the necessary protective gear, such as gloves and safety glasses, when drilling.

2. **Lift and mount the cabinet using one of the mounting options.**

Warning

When lifting or positioning a cabinet, loose components may fall out. Do not tilt the cabinet forwards.

3. **Install any optional kits.**
4. **Cable the BTS.**
5. **Install the units.**
6. **Cable the units.**
7. **Power on the BTS site.**
8. **Commission the BTS.**

7.2 Positioning the Mini Outdoor cabinet

Purpose

Follow these instructions to lift the BTS to the desired installation location.

Before you start

Warning

The cabinets are heavy. Additional personnel or lifting equipment may be needed when the cabinets are moved, unpacked, or lined up. In addition, follow any local regulations applicable to the installation.

Warning

Risk of damage to personnel or equipment. Ensure that the units are installed and the cabinet door is closed if lifting the cabinet with units inside.

Note

The lifting eye bolts do not come with the base transceiver station (BTS) delivery. To order lifting eye bolts, contact your local Nokia representative.

Note

Configuring the base transceiver station (BTS) for +24 VDC power supply and/or optional heater requires access to the back of the cabinet. Configure the BTS before mounting the cabinet in a position where back access is difficult.

Steps

1. **Remove the protective plugs from the lifting eye bolt holes.**

   Store the protective plugs in a safe place if the lifting eye bolts are to be removed from the BTS at the end of installation.

2. **Attach the lifting eye bolts to the attachment points.**

3. Attach the hoisting belt or rope to the lifting eye bolts.

Attach the belt/rope so that the angle between the belt and the cabinet roof is a minimum of 60 degrees.

4. Lift the cabinet carefully to the desired installation height.

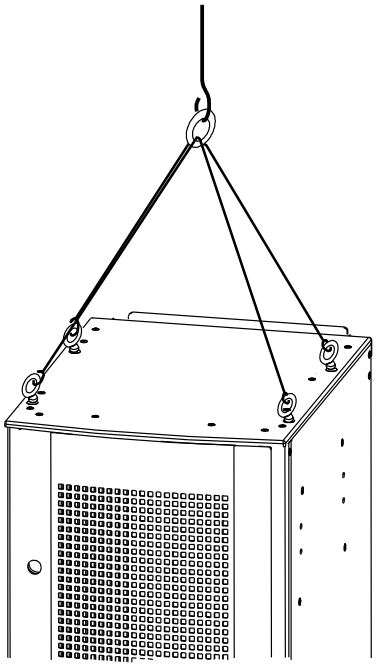

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Figure 22. Lifting the Mini Outdoor cabinet

5. Mount the cabinet.

For detailed instructions on wall, pole and plinth installation, see *Mounting the Mini outdoor cabinet on a pole*, *Mounting the Mini outdoor cabinet on a wall*, and *Mounting the Mini outdoor cabinet on a plinth*.

6. Remove the lifting equipment.

7. Re-insert the protective plugs if the lifting eye bolts have been removed.

7.3 Mounting the Mini outdoor cabinet on a pole

Purpose

The Nokia UltraSite EDGE BTS Mini Outdoor can be installed on a pole 60-300 mm (2.4-11.8 in.) in diameter with a pole mounting kit. Follow this procedure to mount the cabinet on a pole.

Before you start

There are 3 different lengths of bolts available. When attaching the brackets to the pole, use the appropriate sized bolt for the diameter of the pole. See the following table for more details.

Table 19. Bolt lengths in relation to pole diameter

Pole diameter	Bolt length
60-210 mm	210 mm
120-200 mm	300 mm
200-300 mm	405 mm

Steps

1. Attach fixing plates to the cabinet.

Use a 5 mm Hex key. Fix 4 screws and 4 washers to each plate.

As the cabinet may be mounted on either the left or right hand side, fix the wall plates on the appropriate side. Ensure the plates are correctly orientated so that the shorter part of the plate points towards the outer edges of the cabinet.

See the figure below for fixing hole positions in the cabinet.

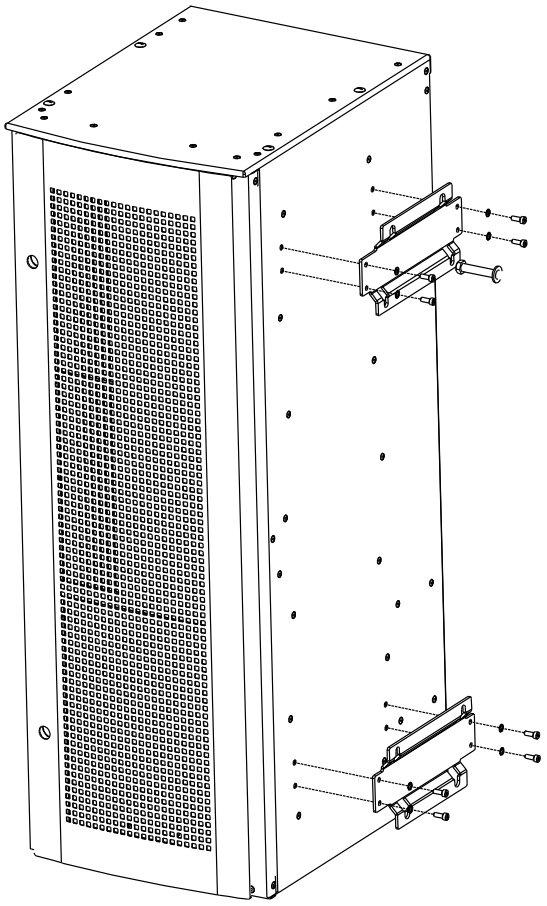

Figure 23. Attaching fixing plates to the cabinet

2. Attach two shouldered bolts to each of the pole mounting brackets.

Use a washer between each bolt and mounting bracket. Secure each bolt with two M8 nuts behind the mounting bracket. See the figure below.

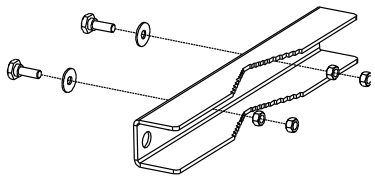

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Figure 24. Attaching bolts to pole mounting brackets

3. Feed a pair of the appropriate length pole mounting bolts through the upper pole mounting brackets.

Use a washer between the head of the bolt and the bracket. Place the assembly against the pole in the position required for the upper mounting bracket.

4. Slip another bracket, without shouldered bolts, over the end of the bolts, followed by a plain washer, a spring washer, and lastly an M12 nut, on the end of each bolt.

Tighten the assembly to the appropriate torque.

! Caution

Risk of damage to cabinet and units. The pole mounting bolts must be properly tightened to prevent them from loosening.

See the figure below.

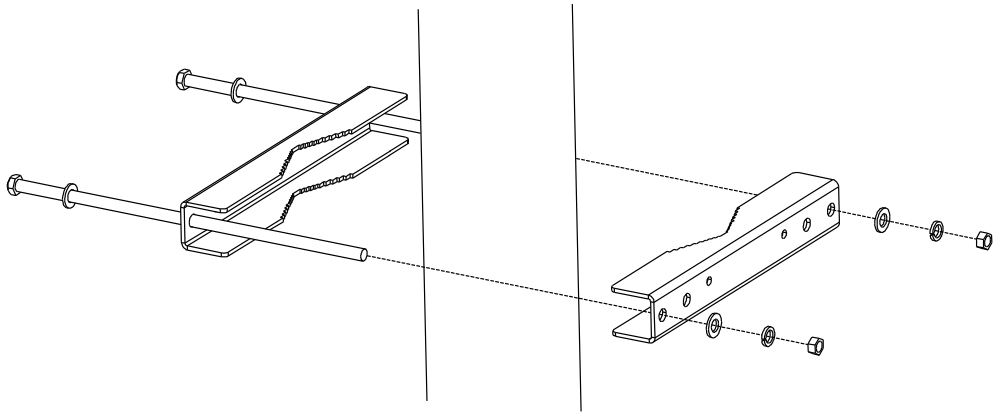

Figure 25. Attaching pole mounting brackets to pole

5. Repeat steps 3 and 4 for the lower mounting bracket.

Only tighten the M12 nuts finger tight, so that the position of the lower mounting bracket on the pole can be adjusted.

6. Lift the cabinet to the pole either manually or by hoisting it with a hoisting belt or a rope.

For more information, see *Positioning the Mini Outdoor cabinet*.

7. Fit the cabinet over the shouldered bolts in the upper pole mounting bracket.

8. Adjust the position of the lower mounting bracket.

Make sure that the heads of the shouldered bolts in the lower pole mounting bracket are located in the bottom slots of the lower cabinet fixing plate.

9. Tighten the nuts on the lower pole mounting bracket through bolts to the appropriate torque.

Caution

Risk of damage to cabinet and units. The pole mounting bolts must be properly tightened to prevent them from loosening.

Expected outcome

See the following figure for a completed pole installation.

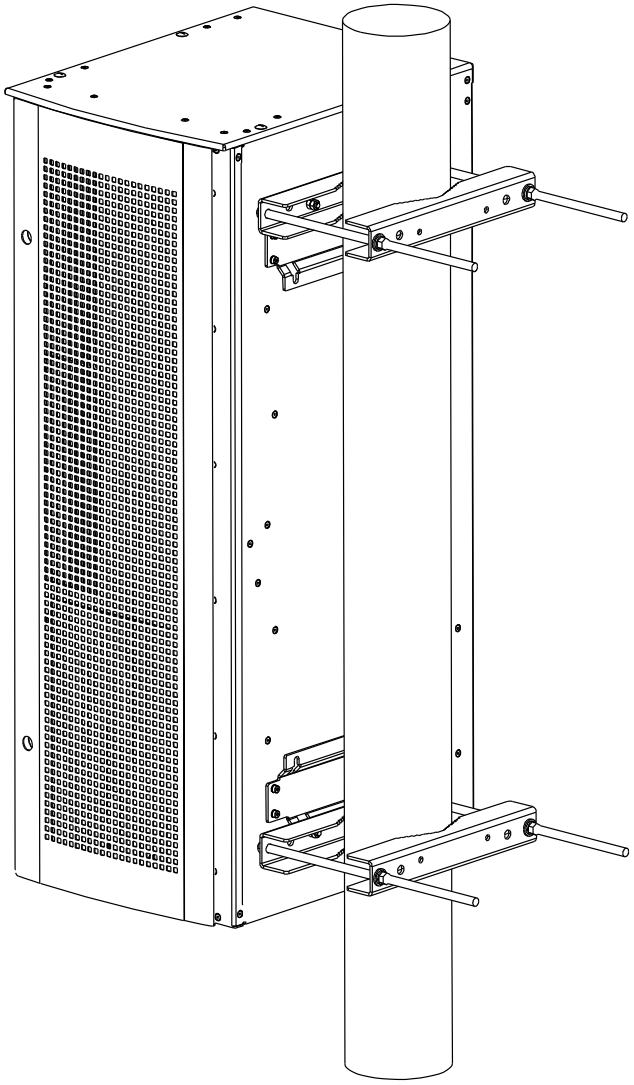

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Figure 26. Completed pole mounting installation

7.4 Mounting the Mini outdoor cabinet on a wall

Purpose

The Nokia UltraSite EDGE BTS Mini Outdoor can be attached to a wall using appropriate fixings. Follow this procedure to mount the cabinet on a wall.

Before you start

The anchor screws must be M10 size stainless steel, with a minimum tensile strength of 800 N/mm^2. Make sure that the mounting surface is even, so that the cabinet does not become twisted when mounted to it.

Steps

1. Attach fixing plates to the cabinet.

Use a 6 mm hex key. Use 4 screws and 4 washers to fix each plate. See the figure below for fixing hole positions in the cabinet.

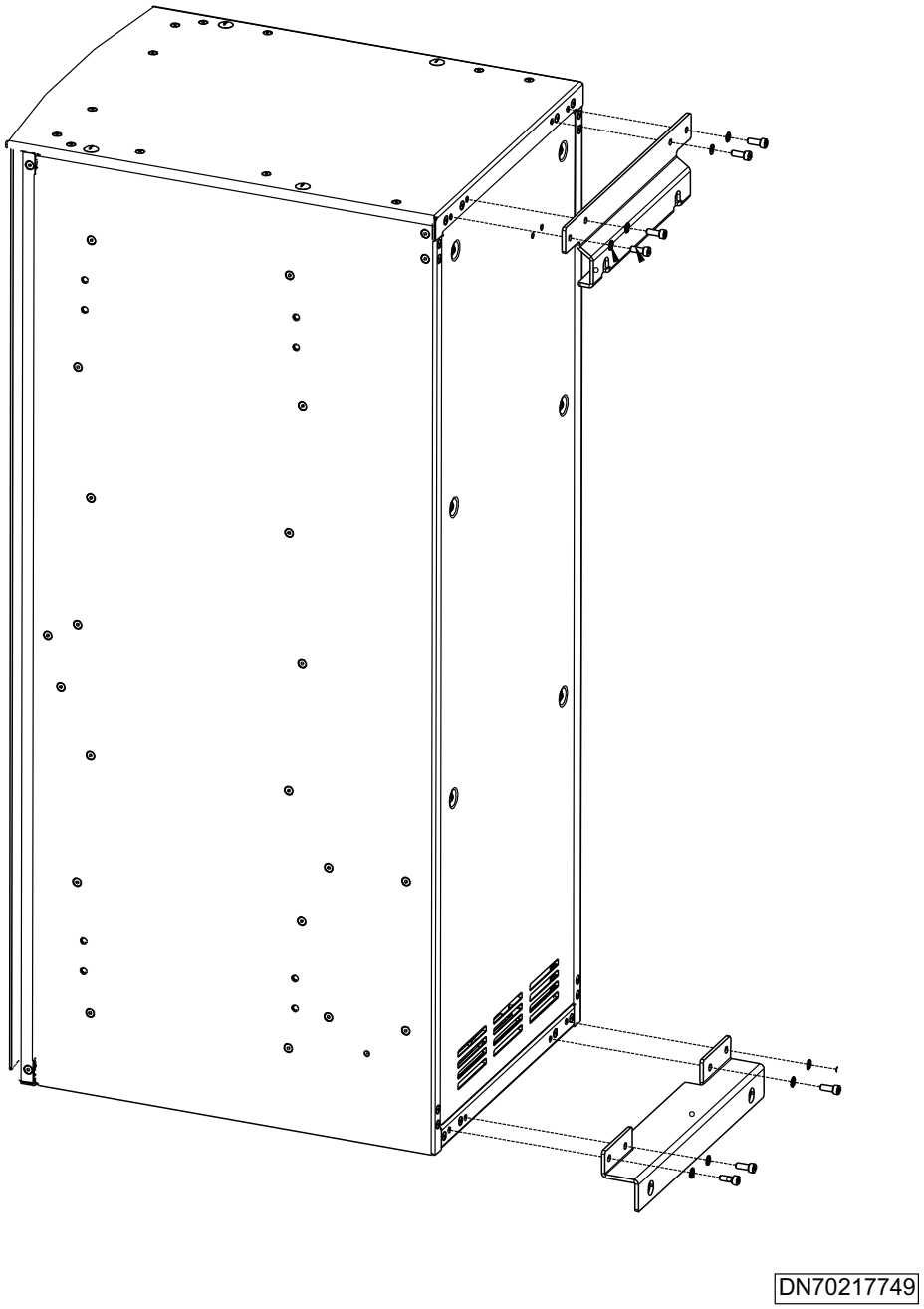


Figure 27. Attaching fixing plates to the cabinet in wall mounting

2. Mark the mounting bolt locations on the wall.

See the figure below for dimensions.

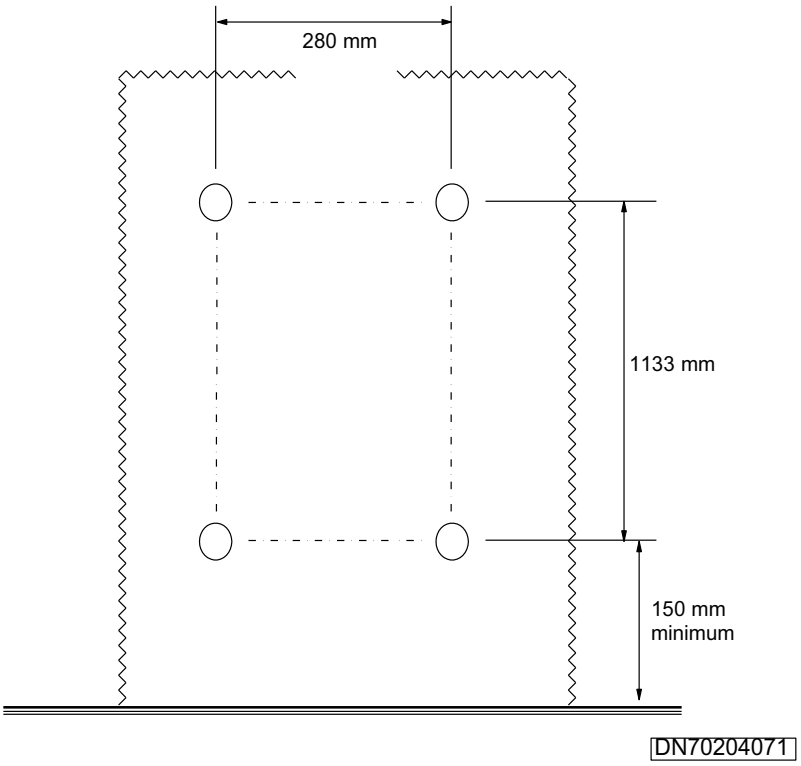


Figure 28. Dimensions for wall mounting bracket fixings

3. Drill the holes for the mounting bolts.

Warning

Risk of personal injury. Wear the necessary protective gear, such as gloves and safety glasses, when drilling.

4. Attach two shouldered bolts to the wall mounting bracket.

Use a washer between the bolts and the bracket and two M8 nuts behind the mounting bracket to retain each bolt.

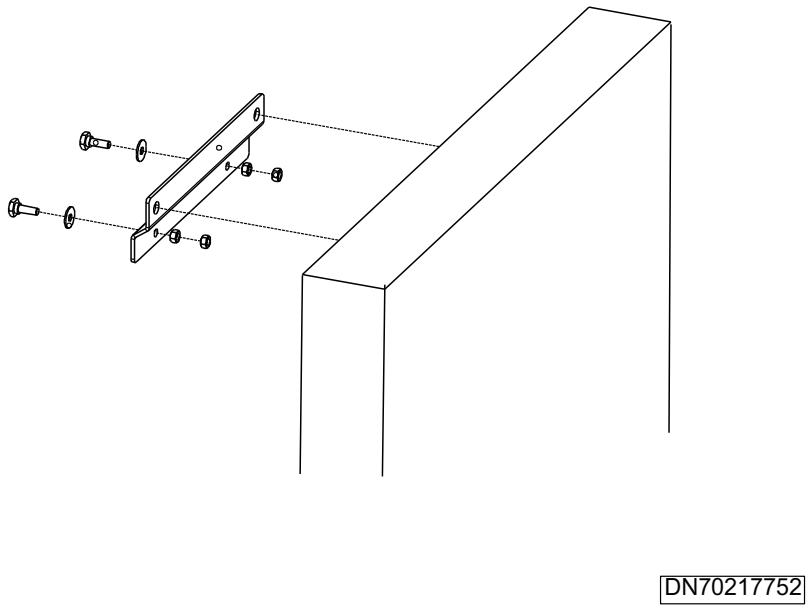


Figure 29. Attaching bolts to wall mounting bracket

5. Attach the mounting bracket to the wall using the mounting bolts.

Ensure that the bracket is correctly orientated so that the shouldered bolts are protruding from the lower half of the bracket. Also, make sure that the bracket is level.

6. Lift the cabinet into position on the mounting bracket.

Hook the slots in the cabinet wall plate over the shouldered bolts on the upper mounting bracket.

Warning

The cabinets are heavy. Additional personnel or lifting equipment may be needed when the cabinets are moved, unpacked, or lined up. In addition, follow any local regulations applicable to the installation.

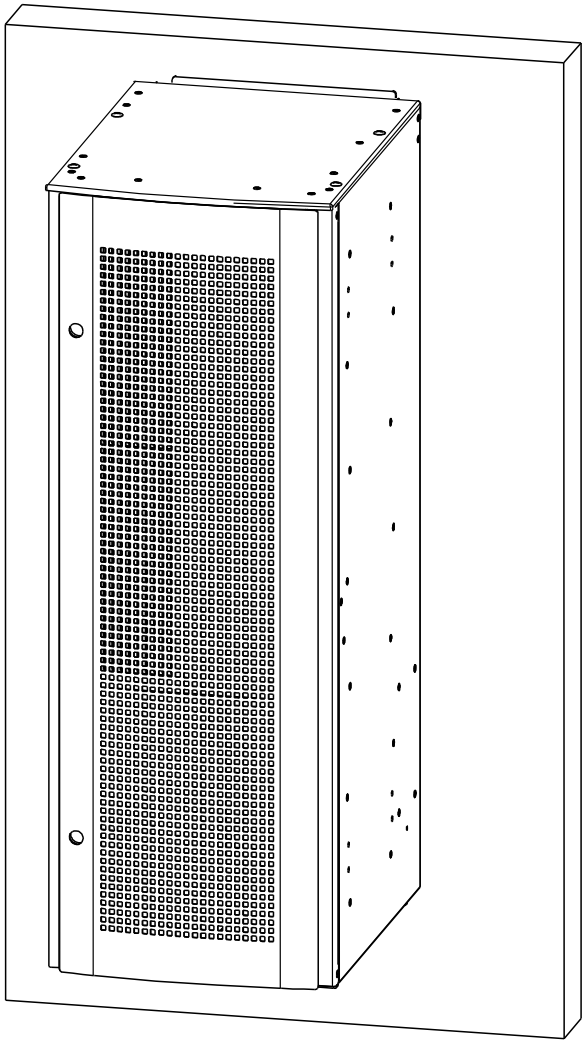
---

7. Ensure the cabinet is level.

8. Bolt the cabinet to the wall using two fixing bolts through the lower fixing plate.

Expected outcome

See the following figure for a completed wall installation.



DN70217764

Figure 30. Completed wall installation

7.5 Mounting the Mini outdoor cabinet on a plinth

Purpose

The Nokia UltraSite EDGE BTS Mini Outdoor can be attached to a plinth using appropriate fixings. Follow this procedure to mount the cabinet on a plinth.

Before you start

Tip

Make sure that you leave 210 mm maintenance space in the rear of the cabinet.

Tip

Connect external cabling in the cabinet bottom before you lift the cabinet on a plinth.

Steps

1. **Mark the mounting bolt locations on the floor.**

   See figure *Dimensions for floor mounting holes* below for dimensions.

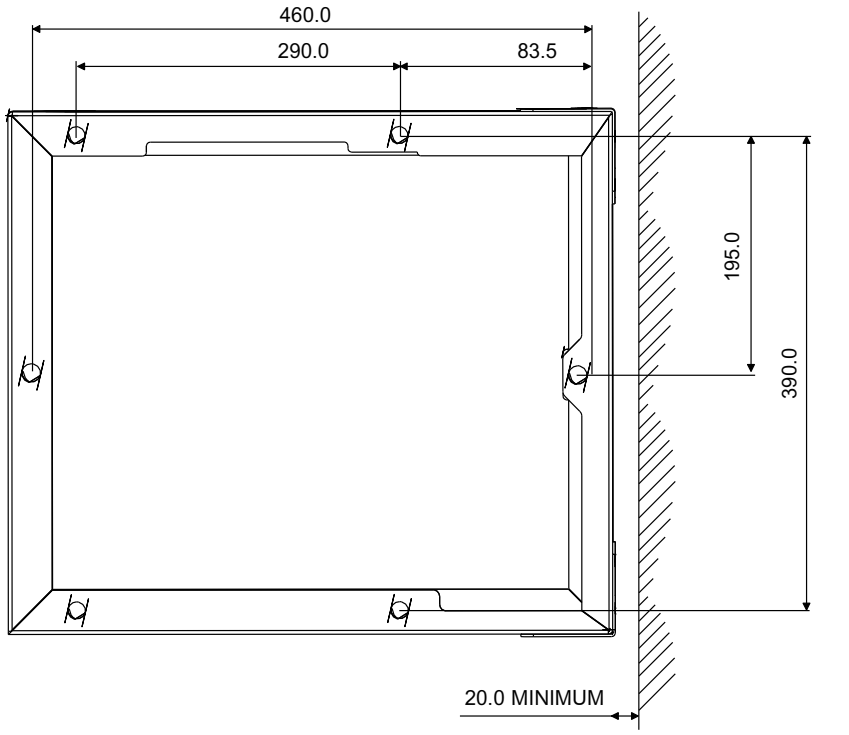


Figure 31. Dimensions for floor mounting holes

2. Drill the holes for the mounting bolts.

Warning

Risk of personal injury. Wear the necessary protective gear, such as gloves and safety glasses, when drilling.

3. Fix the plinth to the floor.

Use a spirit level to ensure that the plinth is level on all axes.

4. Lift the cabinet into position on the mounting brackets.

Use appropriate mechanical aids to lift the cabinet if needed. For more information on lifting the cabinet, see *Positioning the Mini Outdoor cabinet*.

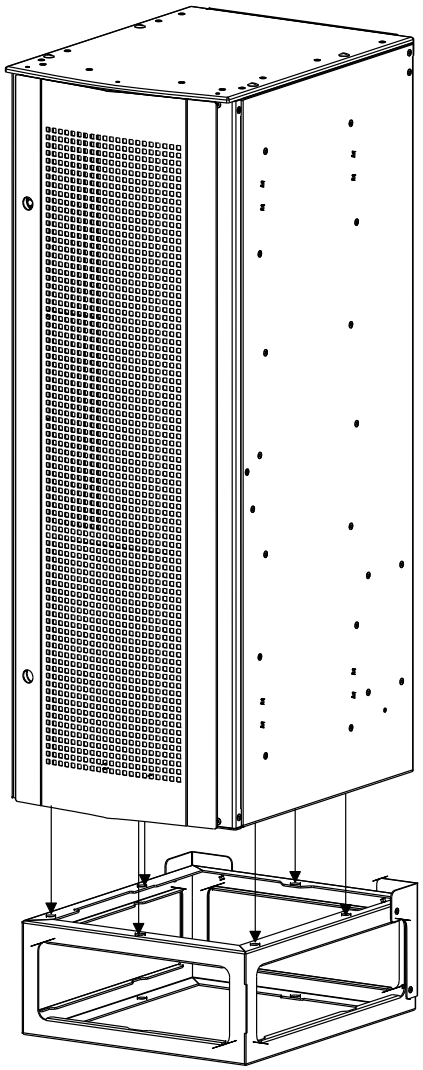
Warning

The cabinets are heavy. Additional personnel or lifting equipment may be needed when the cabinets are moved, unpacked, or lined up. In addition, follow any local regulations applicable to the installation.

---

5. Fix the cabinet to the plinth.

Use appropriate bolts (6 pcs) to fix the cabinet to the plinth. Ensure that the cabinet is level after tightening the bolts.



DN70250013

Figure 32. Mounting the Mini outdoor cabinet on a plinth

8 Installing optional items for the outdoor Mini cabinet

8.1 Installing the optional security lock in the Mini outdoor cabinet

Steps

1. **Take the Mini Outdoor specific security lock body and plate from the site pack.**

2. **Remove the external door trim panel.**

   Use a T20 Torx driver. There are four screws fixing the side flange of the trim to the door.

3. **Remove the triangle key lock from the upper of the two lock positions.**

   Disconnect the lock pawl from the barrel using a 10 mm A/F spanner. Unscrew the lock barrel retaining nut using a 27 mm A/F socket or similar device.

4. **Remove the lock bracket by unscrewing the four retaining screws.**

   Use a T10 torx driver. Retain the screws for re-use.

5. **Feed the barrel of the security lock through the smaller cut out in the lock bracket and slip the locking plate over the lock barrel.**

   Ensure that you push the security lock properly against the sealing foam to correctly secure the lock barrel with the locking plate. Ensure that the position of the lock pawl is correct.

If the lock pawl position needs adjusting, loosen the brass nut on the end of the lock inner barrel and move the pawl to the correct position. Re-tighten the nut and bend the appropriate washer tab to prevent further movement of the nut.

6. **Screw the sub-assembly back into place on the rear of the door using the four screws.**

   Use a T10 Torx driver.

7. **Unscrew the retaining bracket from the side of the cabinet opposite the lock.**

   Use a T20 Torx driver.

8. **Refit the retaining bracket upside down.**

9. **Test the security lock.**

   Test the lock by turning the key in the lock. Check that the latch moves correctly and that the door can be locked.

10. **Reinstall the door trim panel.**

    Install the four screws fixing the side flange of the trim to the door.

9 Overview of cabling

9.1 External interfaces

9.1.1 External hardware interfaces of BTS 800, 900, 1800, and 1900

Table 20. External hardware interfaces

Interface	Value	Connector Type
TX/RX antenna	6 (standard) + 6 (optional)* *Not available on Midi cabinet	7/16 (DIN) female flange mount
AC Power input	184 to 276 VAC	Phoenix clamp Screw latch 0.5-16 mm
DC Power input	+20 to +32 VDC	Terminal stud (+24 VDC) Terminal lugs 10 mm
DC Power input	-36 to -60 VDC	Terminal stud (-48 VDC) Terminal lugs 10 mm
Grounding (earthing)		Three grounding alternatives: • One M8 bolt (Europe) • Two M5 bolts using a two-hole ground lug (US and Canada) • One M8 bolt and one M8 stud using a two-hole ground lug (+24 VDC)
ESD stud		ESD snap
External alarms and controls	• TTL/open collector • 24 external alarms • 6 controls	D-37 pin (female)

Table 20. External hardware interfaces (cont.)

Interface	Value	Connector Type
Frame number, frame clock, mains and Support alarm input	RS-485	D-15 pin (female)
Frame number, frame clock, mains and Support alarm output	RS-485	D-15 pin (female)
E1/T1	2 Mbit/s (E1) or 1.5 Mbit/s (T1) PCM	TQ for 120 Ω E1 TQ for 100 Ω T1 BT 43 for 75 Ω E1
FXC STM-1	ITU-T G.957; L-1.1 long-haul, 1310nm	LC Duplex
RRI	RRI Flexbus Radiolink I/O and power output (55 VDC)	TNC
Q1 interface	RS-485	D-9 pin (female)
LMP for BTS Manager/ SiteWizard	RS-232	D-9 pin (female)
13 MHz test clock		50 Ω SMB (female)
Test FCLK		50 Ω SMB (female)
Test/monitor interface		D-25 (female)

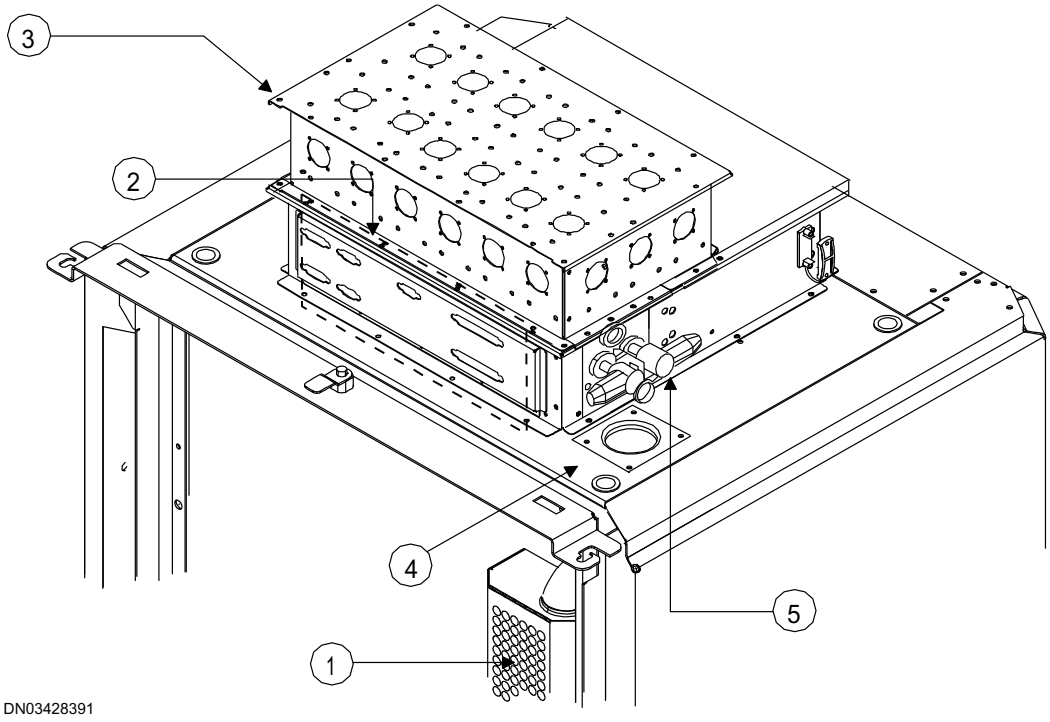
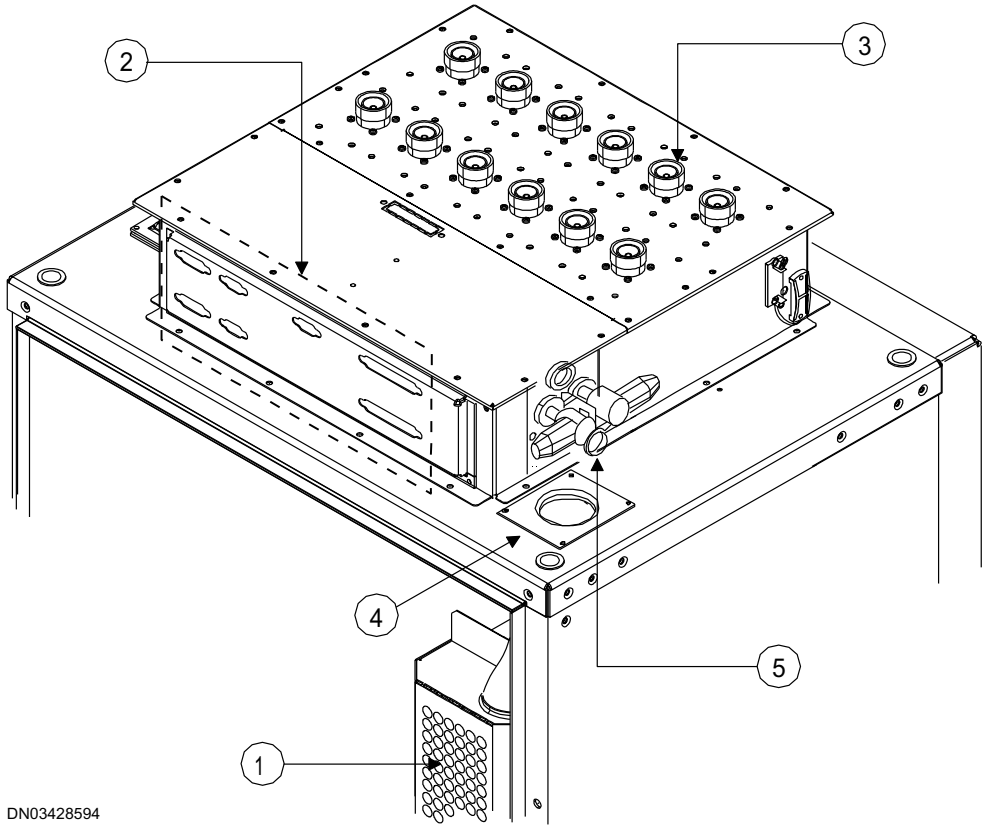


Figure 33. Outdoor cabinet interfaces

1	Transmission units cover
2	Interface Module (IFM)
3	Antenna box extension
4	Abis interface access to Transmission unit
5	DC Power input - right side (optional AC Power input - left side)



1	Transmission unit cover
2	Interface Module (IFM)
3	12 TX/RX antennas
4	Abis interface access to transmission unit
5	DC power input - right side (optional AC power input - left side)

Figure 34. Indoor cabinet interfaces

9.1.2 Front-mounted interface module board interfaces

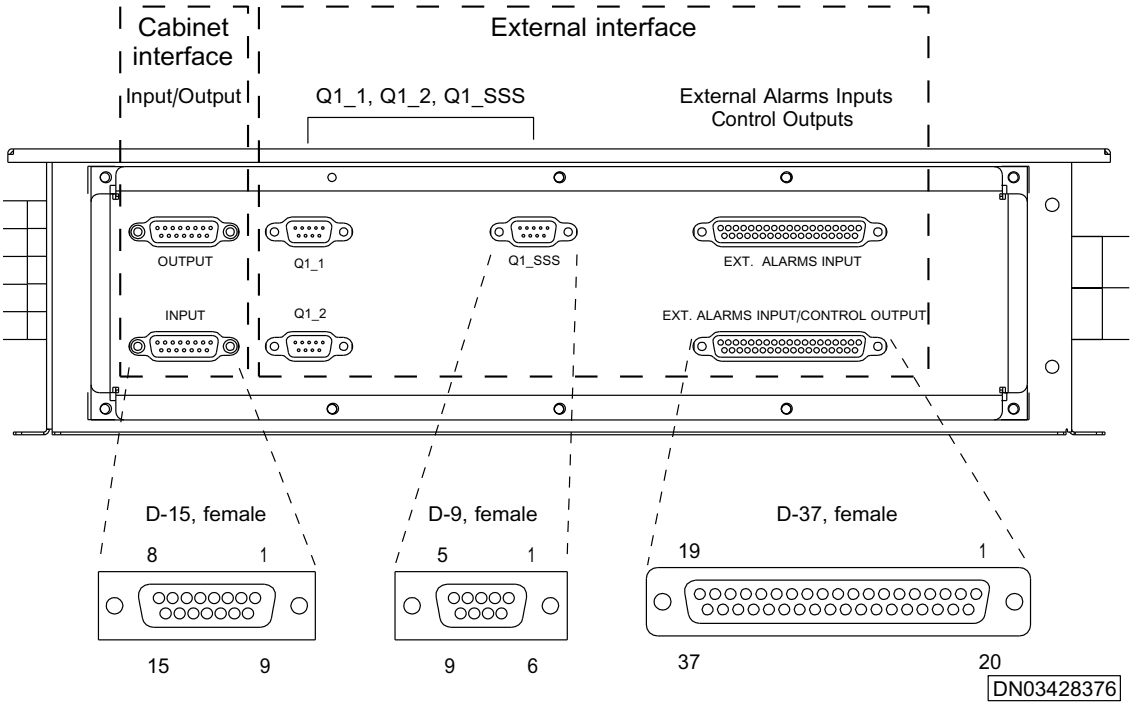


Figure 35. IFM board (front-mounted connectors)

Table 21. Front-mounted connectors

Interface	Reference designator	Connector type
Cabinet output	X2	D-15 (female)
Cabinet input	X1	D-15 (female)
Q1-1	X3	D-9 (female)
Q1-2	X4	D-9 (female)
Q1-SSS	X7	D-9 (female)
External alarm input	X8	D-37 (female)
External alarm input/control output	X9	D-37 (female)

Pin configurations

Table 22. Cabinet output pin configuration

Pin	Signal	Pin	Signal	Pin	Signal
1	FCKP	2	FCKN	3	FNP
4	FNN	5	MAINS_ALARM_O UTP	6	MAINS_ALARM_O UTN
7	RLY	8	RELAY	9	SSS_CON_OUTP
10	SSS_CON_OUTN	11	CBL_C_OUT	12	GND
13	Not used	14	Not used	15	Not used

Table 23. Cabinet input pin configuration

Pin	Signal	Pin	Signal	Pin	Signal
1	FCKP	2	FCKN	3	FNP
4	FNN	5	MAINS_ALARM_IN P	6	MAINS_ALARM_IN N
7	RLY	8	GND	9	SSS_CON_INP
10	SSS_CON_INN	11	CBL_C_IN	12	GND
13	V48N	14	V48RTN	15	Not used

Table 24. Q1_1 pin configuration

Pin	Signal	Pin	Signal	Pin	Signal
1	Q1_EXTD_1P	2	Not used	3	GND
4	Not used	5	Q1_EXTU_1P	6	Q1_EXTD_1N
7	Not used	8	Not used	9	Q1_EXTU_1N

Table 25. Q1_2 pin configuration

Pin	Signal	Pin	Signal	Pin	Signal
1	Q1_EXTD_2 P	2	Not used	3	GND
4	Not used	5	Q1_EXTU_2 P	6	Q1_EXTD_2 N
7	Not used	8	Not used	9	Q1_EXTU_2 N

Table 26. Q1_SSS pin configuration

Pin	Signal	Pin	Signal	Pin	Signal
1	Q1_SSS_UP	2	Not used	3	GND
4	Not used	5	Q1_SSS_DP	6	Q1_SSS_U N
7	Not used	8	Not used	9	Q1_SSS_D N

Table 27. External alarm pin configuration

Pin	Signal	Pin	Signal	Pin	Signal
1	EXT_AL13	2	EXT_AL14	3	EXT_AL15
4	EXT_AL16	5	EXT_AL17	6	EXT_AL18
7	EXT_AL19	8	EXT_AL20	9	EXT_AL21
10	EXT_AL22	11	EXT_AL23	12	EXT_AL24
13	Not used	14	Not used	15	Not used
16	Not used	17	Not used	18	Not used
19	GND	20	GND	21	GND
22	GND	23	GND	24	GND
25	GND	26	GND	27	GND
28	GND	29	GND	30	GND
31	Not used	32	Not used	33	Not used
34	Not used	35	Not used	36	Not used

Table 27. External alarm pin configuration (cont.)

Pin	Signal	Pin	Signal	Pin	Signal
37	Not used				

Table 28. External alarm input/control output pin configuration

Pin	Signal	Pin	Signal	Pin	Signal
1	EXT_CO1	2	EXT_CO2	3	EXT_CO3
4	EXT_CO4	5	EXT_CO5	6	EXT_CO6
7	EXT_AL1	8	EXT_AL2	9	EXT_AL3
10	EXT_AL4	11	EXT_AL5	12	EXT_AL6
13	EXT_AL7	14	EXT_AL8	15	EXT_AL9
16	EXT_AL10	17	EXT_AL11	18	EXT_AL12
19	GND	20	V5P	21	V5P
22	V5P	23	V5P	24	V5P
25	V5P	26	GND	27	GND
28	GND	29	GND	30	GND
31	GND	32	GND	33	GND
34	GND	35	GND	36	GND
37	GND				

9.1.3 Rear-mounted interface module board interfaces

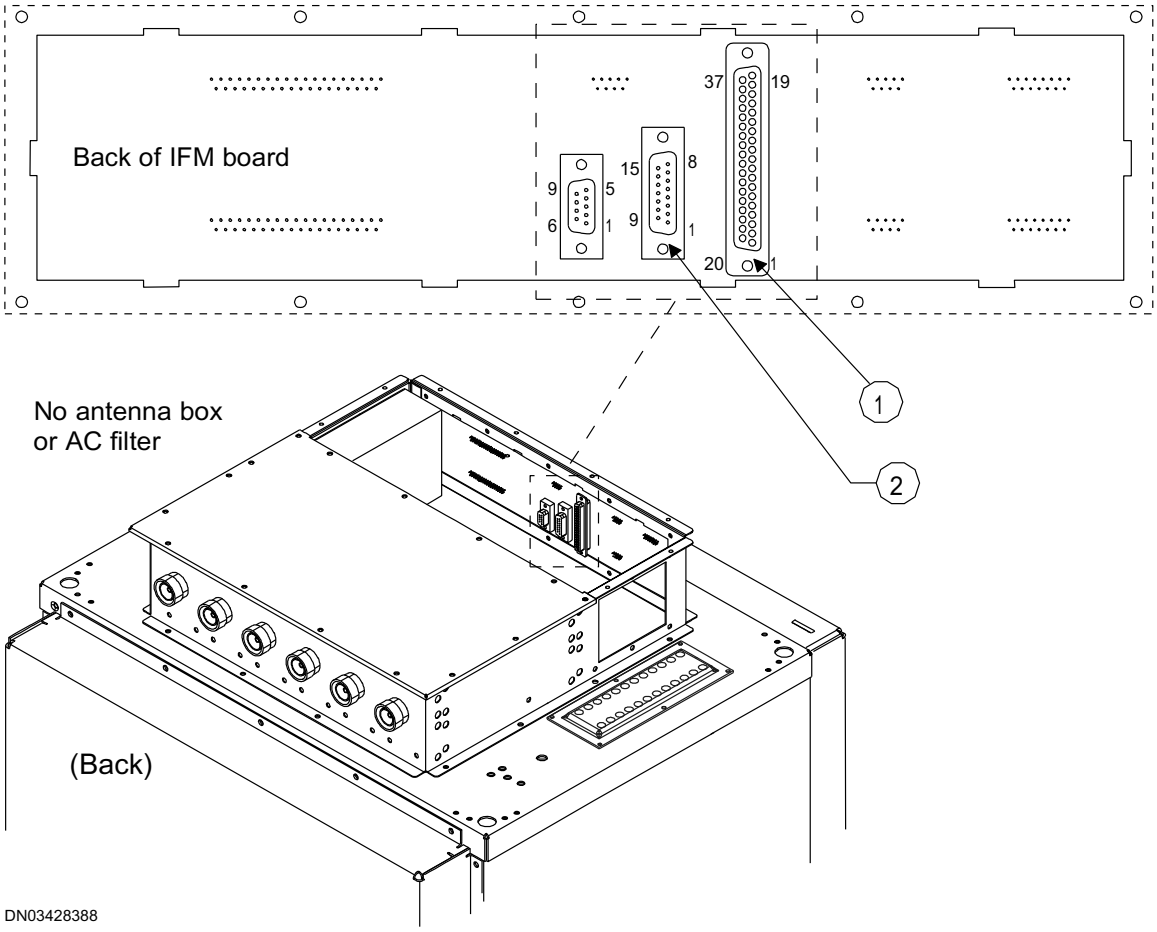


Figure 36. IFM board (rear-mounted connectors)

1	Common backplane interface
2	Bias Tee interface

Table 29. Rear-mounted connectors

Interface	Reference designator	Connector type
Common backplane	X5	D-37 (female)
Bias Tee interface module	X6	D-15 (female)

Pin configurations

Table 30. Common backplane pin configuration

Pin	Signal	Pin	Signal	Pin	Signal
1	ECO12CD	2	GND	3	ECO12CC
4	GND	5	Q1_SSS_UP	6	Q1_SSS_UN
7	Q1_SSS_DP	8	Q1_SSS_DN	9	EXT_FCKP
10	EXT_FCKN	11	Not used	12	Not used
13	Q1EXTU	14	GND	15	Q1EXTD
16	GND	17	V5P	18	GND
19	Not used	20	V5P	21	GND
22	EXT_FNP	23	EXT_FNN	24	V3P
25	GND	26	V3P	27	GND
28	V5P	29	GND	30	V48N
31	V48RTN	32	Not used	33	Not used
34	Not used	35	Not used	36	Not used
37	Not used				

Table 31. Bias Tee Interface Module pin configuration

Pin	Signal	Pin	Signal	Pin	Signal
1	VSWR1	2	VSWR2	3	VSWR3
4	VSWR4	5	VSWR5	6	VSWR6
7	VSWR7	8	VSWR8	9	VSWR9
10	VSWR10	11	VSWR11	12	VSWR12
13	Not used	14	Not used	15	Not used

9.2 Overview of cabling

Before you start

Note

To allow for adequate clearance when using Bias Tee (BPxx) units, the connectors of the units must be installed prior to securing the antenna box to the cabinet core. Install BPxx units in accordance with *Installing a Bias Tee (BPxx) unit in the BTS*.

Note

Nokia recommends using outdoor-rated cables for the outdoor cabinets (ODCA).

Summary

The cable sets are delivered with the units when the configuration is ordered from the factory. All cables are identified by the cable code and the cable label. During commissioning, the code and label information can be stored into a file in the BTS.

Rotate and relocate the cabinet interfaces of the BTS, as required. Depending on the site configuration, you can route antenna feeder cables to the left, right, or back of the cabinet, as required.

Steps

1. **Rotate the antenna box (optional).**
2. **Prepare the BTS for cabling (outdoor only).**
3. **Connect grounding cables.**
4. **Connect AC power cables (optional).**
5. **Connect DC power cables.**
6. **Connect external antenna cables.**
7. **Cable GSM/EDGE units.**

8. **Prepare site support for installation of the BTS co-site with Talk-family BTS (optional).**

9. **Connect synchronisation cables.**

10 Preparing the outdoor ODCA/ODCF and Midi outdoor ODCC for cabling

10.1 Preparing the cable entry blocks

Before you start

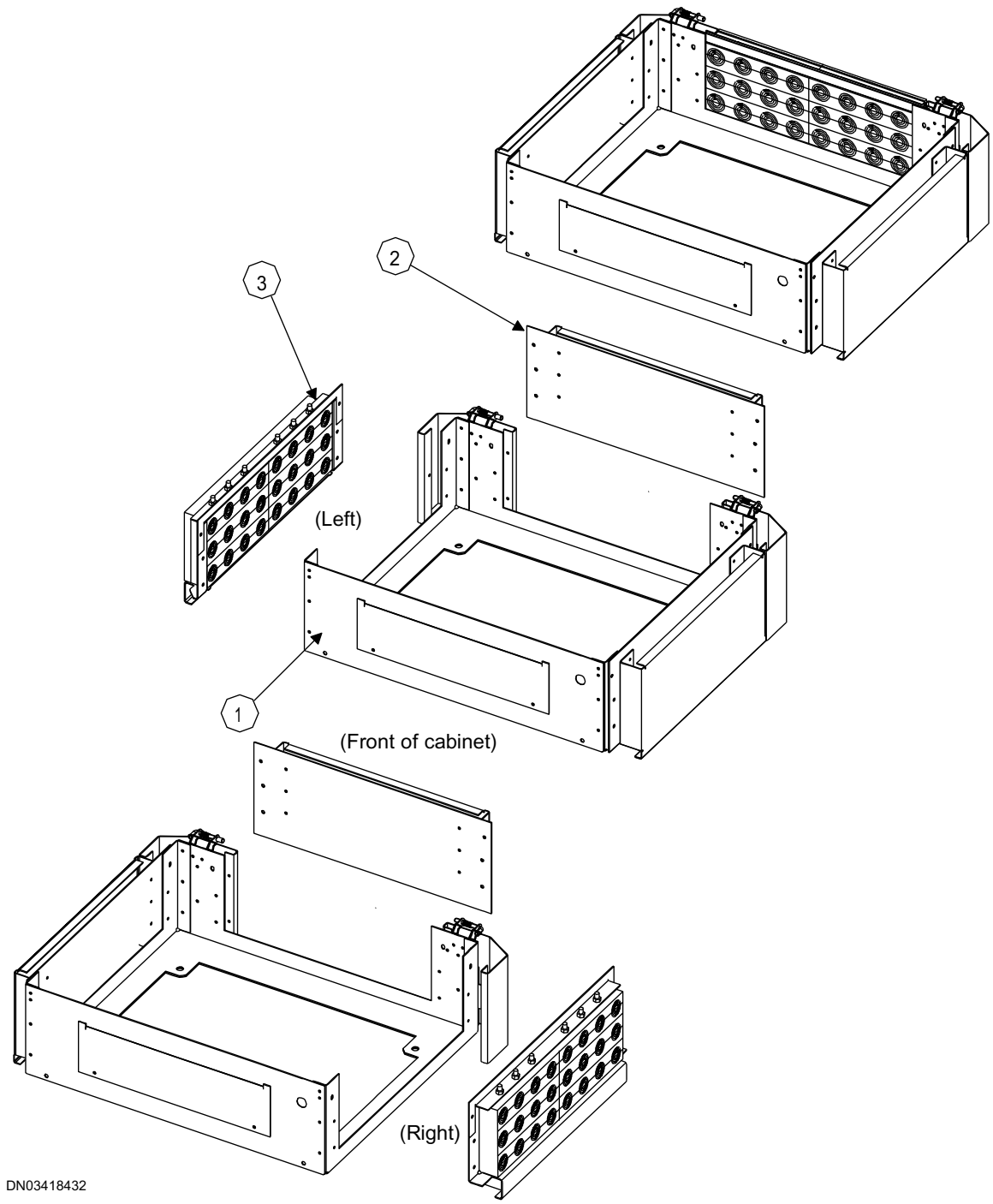
This procedure is optional. The outdoor cabinet comes with the cable entry blocks pre-installed in the back of the roof support assembly. This procedure is only required if you need to:

- Move the cable entry blocks to the left or right side of the cabinet
- Install extra cable entry blocks

Summary

The cable entry blocks are used to route antenna, power, ground, transmission, and other external cables to the cabinet. The blocks are made of elastic material and accommodate various cable diameters.

The Cable Entry Kit can be installed to the left, back or right of the outdoor cabinet. The back is the "default" location.



1	Roof support assembly
2	Dummy cable entry

3	Cable entry block

Figure 37. Cable entry block installation options

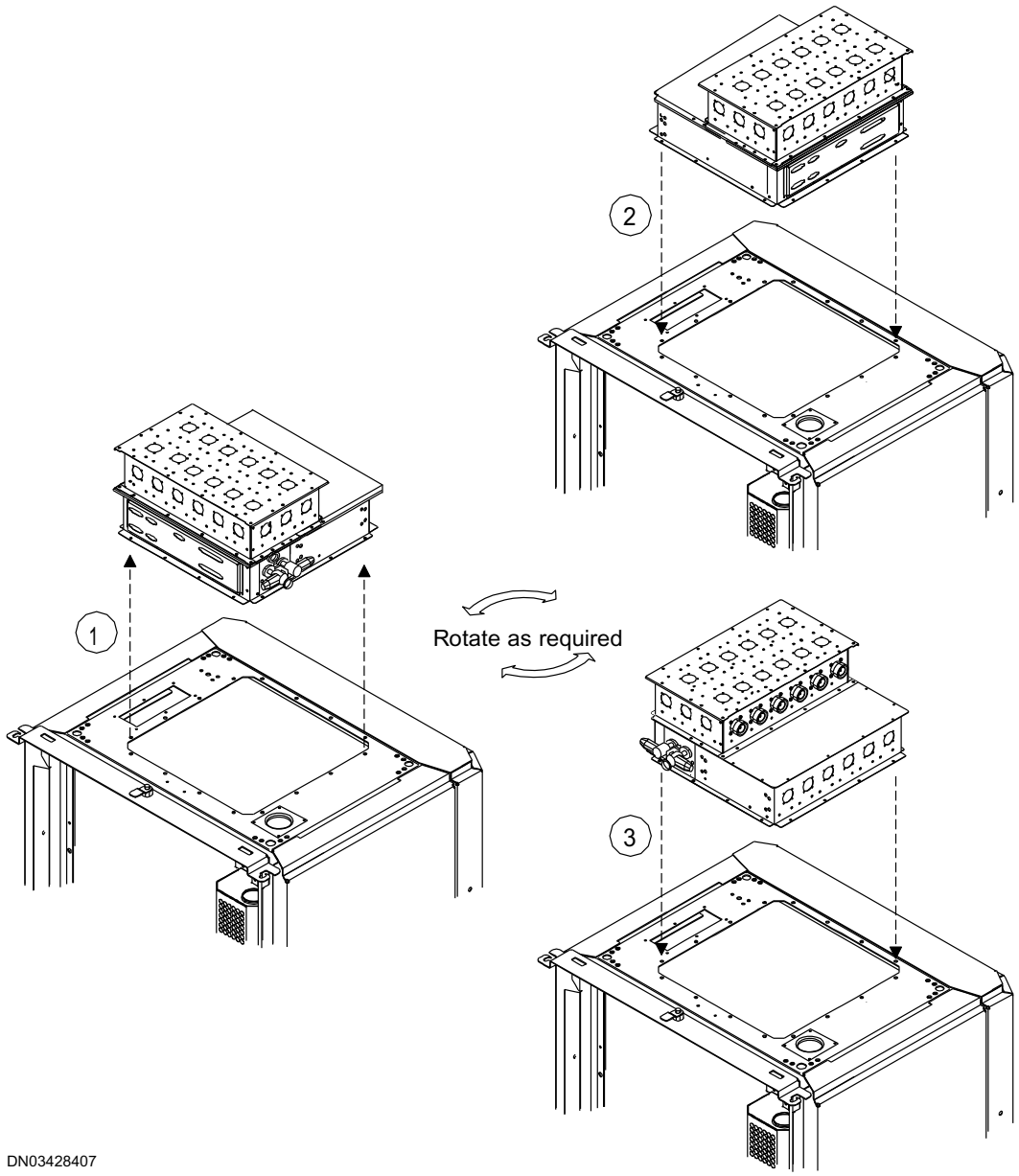
Steps

1. **Remove the rubber seal from the roof support assembly.**
2. **Remove the six screws that secure the dummy cable entry to the roof support assembly.**

   The dummy cable entry is the one being replaced by the cable entry block.
3. **Remove the dummy cable entry that is being replaced.**
4. **Remove the cable entry block and insert it in the new location (where the dummy cable entry was previously located).**
5. **Align the mounting holes of the cable entry assembly with the mounting holes in the roof support assembly.**
6. **Replace the six screws and then tighten the cable entry block into position in the roof support assembly.**
7. **Replace the rubber seal on the roof support assembly.**

10.2 Rotating the antenna box

Summary



1	Remove antenna box
2	Re-install antenna box

Figure 38. Rotating the antenna box

Steps

1. **Remove the 16 screws around the antenna box.**

2. **Lift the antenna box and rotate the box 90° clockwise or counterclockwise, as required.**

Warning

Be careful not to damage the antenna cables when rotating the antenna box.

3. **Align the antenna box with the 16 mounting holes.**

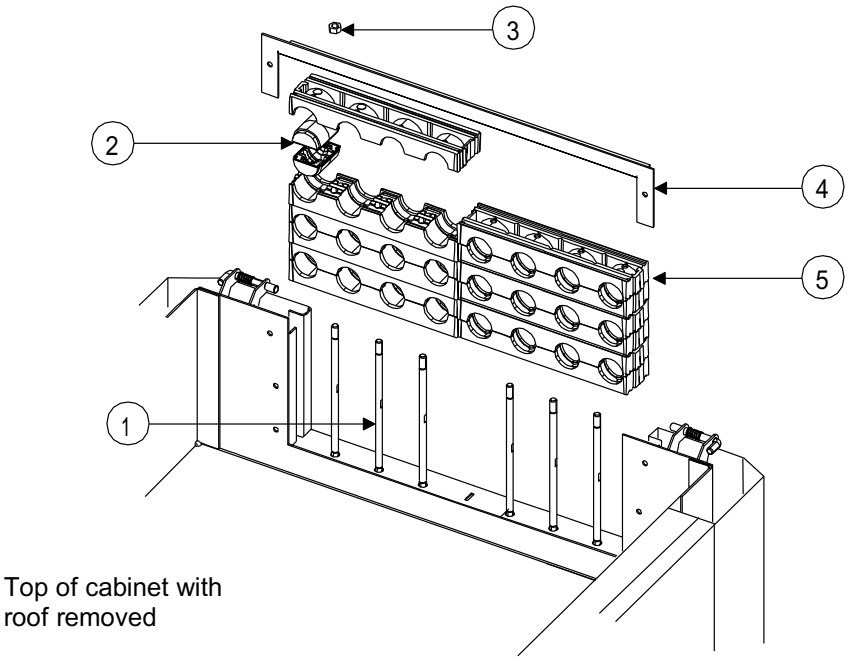
4. **Install the screws in the 16 mounting holes and tighten them until the antenna box is secured to the cabinet core.**

10.3 Preparing cable routing

Summary

Antenna, power, ground, transmission, and all other external interfaces are routed through the cable entry blocks in the outdoor cabinet.

Use the following figure as a guide to locate the Cable Entry Kit components referenced in this procedure.



1	Captive bolt (6 pcs)
2	Cable bushing (24 pairs)
3	Nut (6 pcs)
4	Cable entry bracket
5	Cable entry block (6 pairs)

Figure 39. Cable entry kit components

Steps

1. **Remove the rubber seal from the roof support assembly.**

2. **Remove the two screws that secure the cable entry bracket to the roof support assembly.**

3. **Remove the six nuts from the exposed ends of the captive bolts.**

4. **Remove the cable entry bracket from the top of the six cable entry block captive bolts.**

5. **Remove the cable entry blocks as required.**

Modify the bushing to feed cables through the desired cable entry holes.

Tip

When removing bushing material from the cable entry block bushings, ensure the remaining bushing material forms a tight seal around the entire circumference of the cable.

6. **Repeat steps 4 and 5 for additional cable entries.**
7. **Route the antenna, power, ground, and signal cables.**
8. **Replace the cable entry blocks over the cables.**
9. **Slide the cable entry bracket over the top cable entry block and align it with the captive bolts.**
10. **Replace and tighten the six nuts over the exposed ends of the captive bolts.**
11. **Replace the two screws that secure the cable entry bracket to the roof support assembly.**
12. **Ensure that the cable entry bracket is level with the roof support assembly.**
13. **Replace the rubber seal on the roof support assembly.**

11 Connecting grounding cables to the BTS

11.1 Connecting the grounding cable for a standard installation

Before you start

If the grounding cable must be routed through the entry kit, then route it before starting this procedure.

Summary

The BTS cabinet has two grounding options:

- Standard
- NEBS

For a standard installation, use an 8 mm (0.31 in.) single-hole lug. For a NEBS installation, use a 5 mm (0.2 in.) or 6 mm (0.24 in.) two-hole lug.

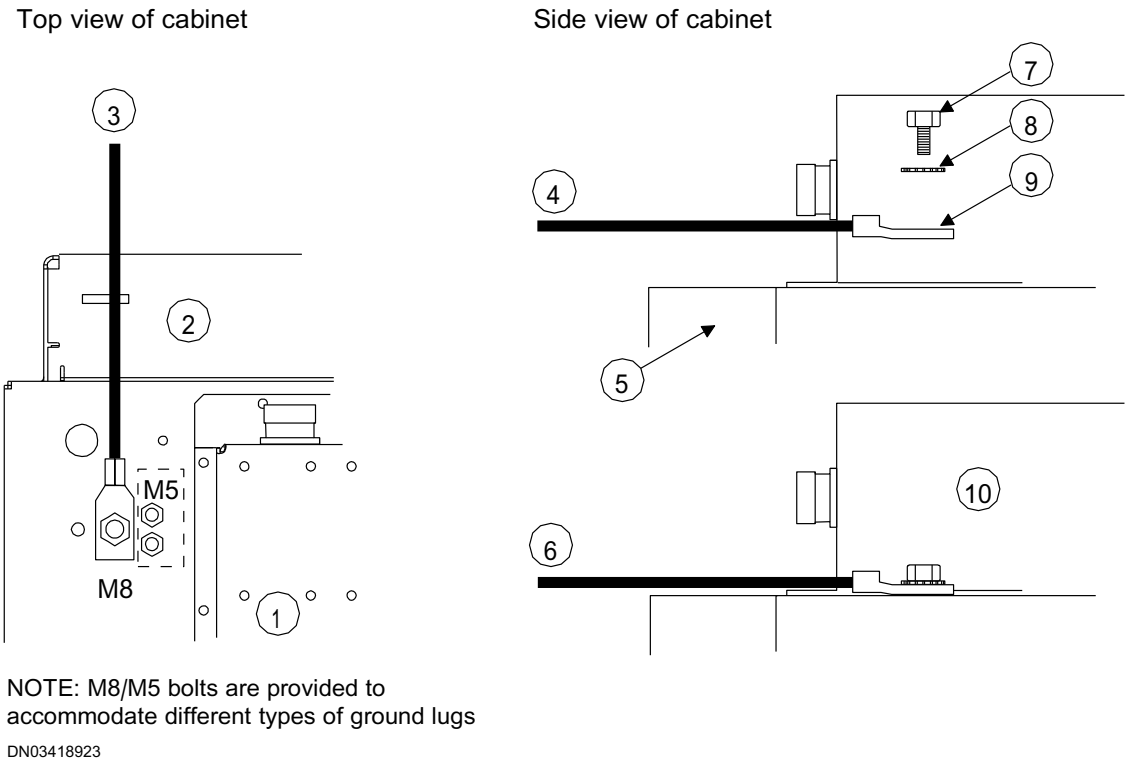


Figure 40. Grounding the cabinet in a standard installation

1	Antenna box
2	Back wall
3	Cabinet grounding cable
4	Cabinet grounding cable
5	Back wall
6	Cabinet grounding cable
7	Bolt
8	Star washer
9	Ground lug
10	Antenna box

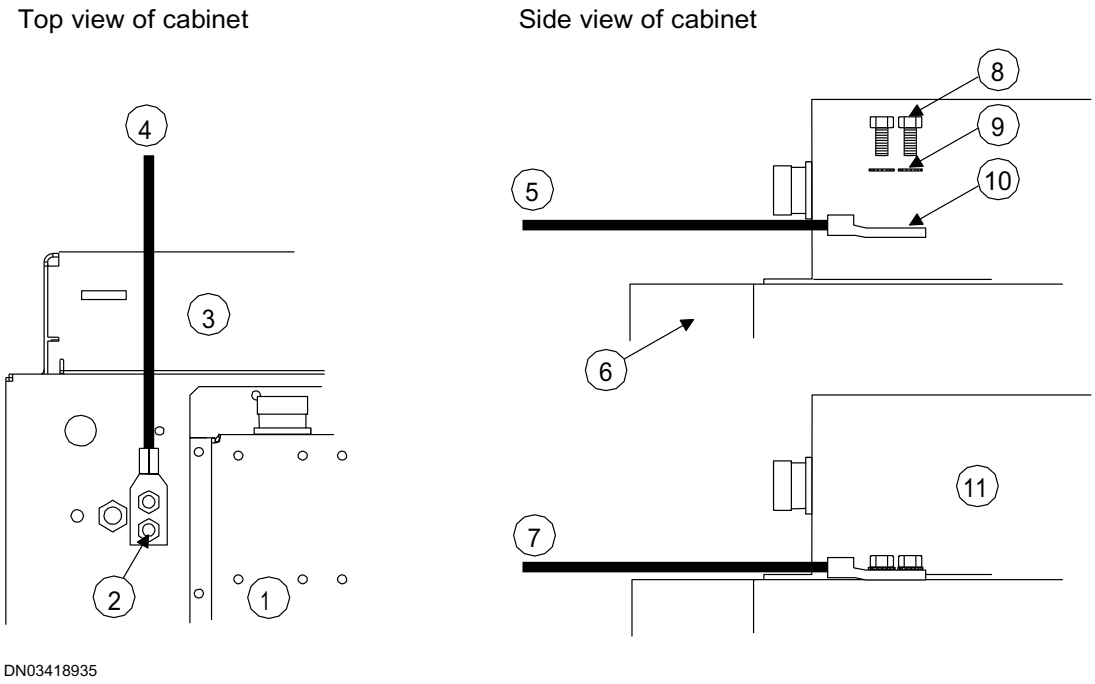


Figure 41. Grounding the cabinet in a NEBS installation

1	Antenna box
2	M5 (2 places)
3	Back wall
4	Cabinet grounding cable
5	Cabinet grounding cable
6	Back wall
7	Cabinet grounding cable
8	Bolt
9	Star washer
10	Ground lug
11	Antenna box

Steps

1. At the top left of the cabinet, unscrew the grounding bolt(s).

2. Strip about 2 cm (0.75 in.) off from the main grounding cable.

3. *If* this is a NEBS installation,

   Then

   Perform the following tasks:

   a. Use an emery cloth or other suitable method to bring the mating surfaces of all unplated ground studs to a bright finish.

   b. Coat the exposed ground cable conductor with antioxidant.

4. Insert the stripped end of the cable into a cable shoe lug and crimp it.

5. Fit the grounding bolt and star washer through the lug end of the grounding cable.

6. Tighten the bolt to the appropriate torque setting.

11.2 Connecting the grounding cable for a Network Equipment Building Systems (NEBS) installation

Summary

Note

For NEBS installations, use a two-hole compression lug to connect the ground conductor to the two M5 cabinet ground studs.

Note

When making ground connections to the BTS, do not intermix conductors of dissimilar metals.

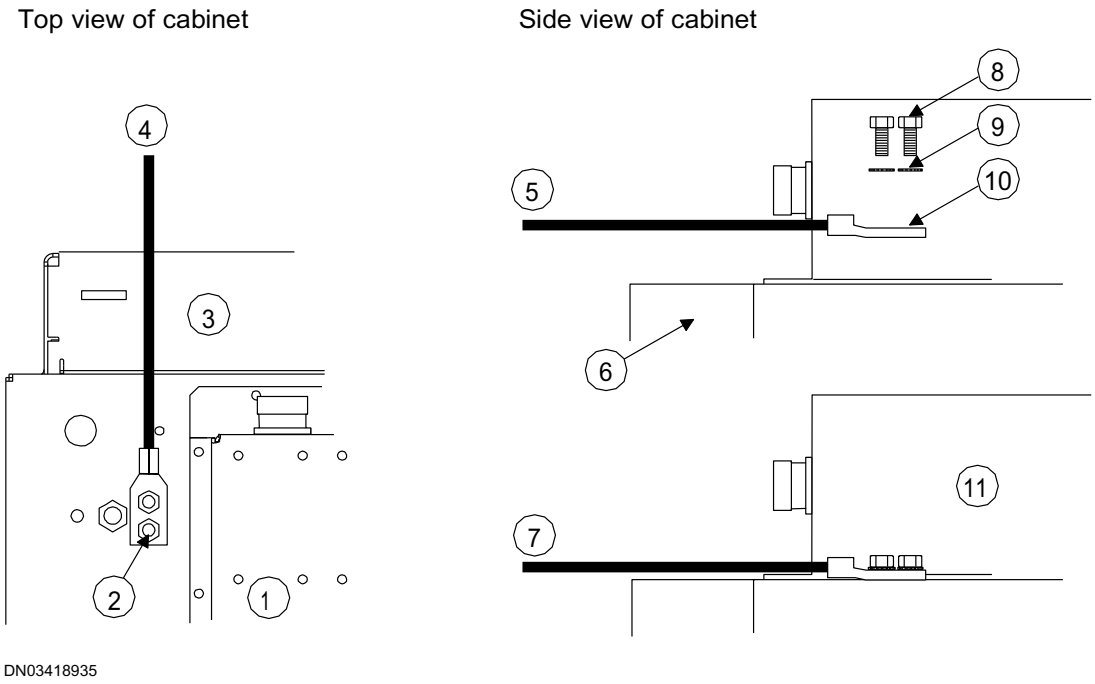


Figure 42. Grounding (earthing) the cabinet in NEBS compliant installations

1	Antenna box
2	M5 (2 places)
3	Back wall
4	Cabinet grounding cable
5	Cabinet grounding cable
6	Back wall
7	Cabinet grounding cable
8	Bolt
9	Star washer
10	Ground lug
11	Antenna box

Steps

1. At the top left of the cabinet, unscrew the grounding bolt(s).

2. **Strip about 2 cm (0.75 in.) off from the main grounding cable.**

3. **Using emery cloth or other suitable method, bring the mating surfaces of all unplated ground connections to a bright finish.**

4. **Coat the exposed grounding cable conductor with antioxidant.**

5. **Insert the stripped end of the cable into a cable shoe lug and crimp it.**

6. **Fit the grounding bolt and star washer through the lug end of the grounding cable.**

7. **Tighten the bolt to the appropriate torque setting.**

11.3 Connecting grounding cables to Mini outdoor

Before you start

The cable cross-section dimensions must meet national, state, and local regulations. For connecting grounding cables, use an 8 mm (0.31 in.) single-hole lug or a two-hole lug PE connector of 5 mm (0.2 in.) or 6 mm (0.24 in.).

Steps

1. **Unscrew the nut(s) from the ground connection on the underside of the cabinet.**

2. **Strip about 2 cm (0.75 in.) off from the main grounding cable.**

3. **Insert the stripped end of the cable into a suitably sized cable shoe lug and crimp it.**

4. **Fit the lug end of the grounding cable over the ground connection(s).**

5. **Install the star washer(s) and tighten the grounding nut(s) on the grounding cable stud(s).**

   For torque values, see *Torque settings*.

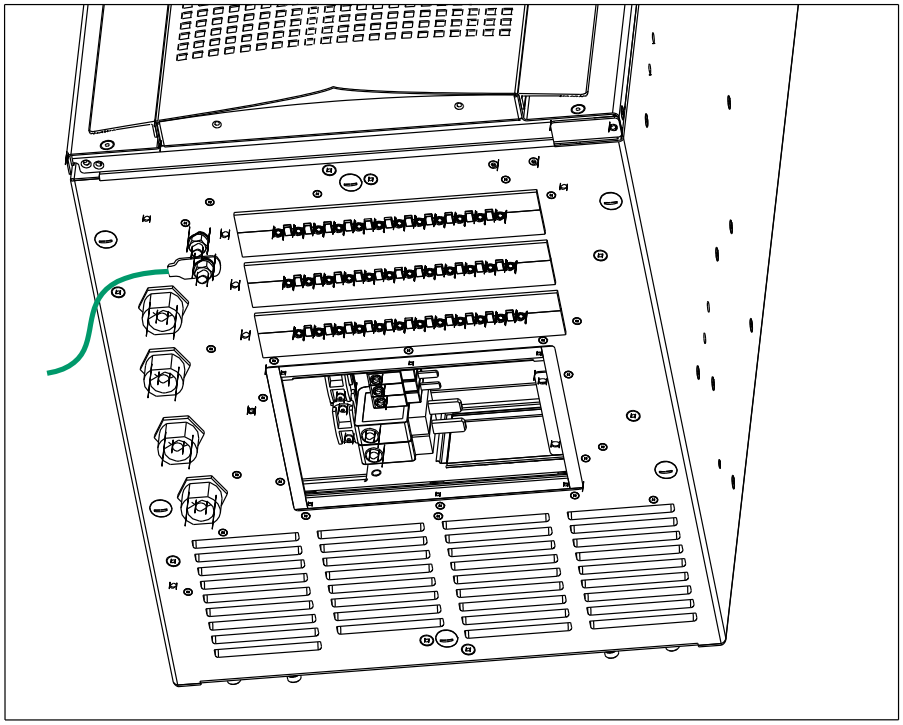


Figure 43. Connecting grounding cable to Mini outdoor BTS

12 Connecting VDC power to the BTS

12.1 Overview of connecting DC power cables

Summary

For the maximum current, see *Power requirements for -48 VDC* and *Power requirements for +24 VDC* .

Note

Depending on the position of the antenna box, you may need to remove the dummy cable entry panel adjacent to the power connector or remove the screws securing the antenna box to the cabinet and lift the antenna box to access the connector screws.

Steps

1. **Connect -48 VDC power cables to the BTS. or**
2. **Connect +24 VDC power cables to the BTS.**

12.2 Connecting -48 VDC power cables

Before you start

Note

When routing power cables, follow all applicable national, state, and local regulations.

If the power cables must be routed through the cable entry kit, then route the cables before starting this procedure.

Summary

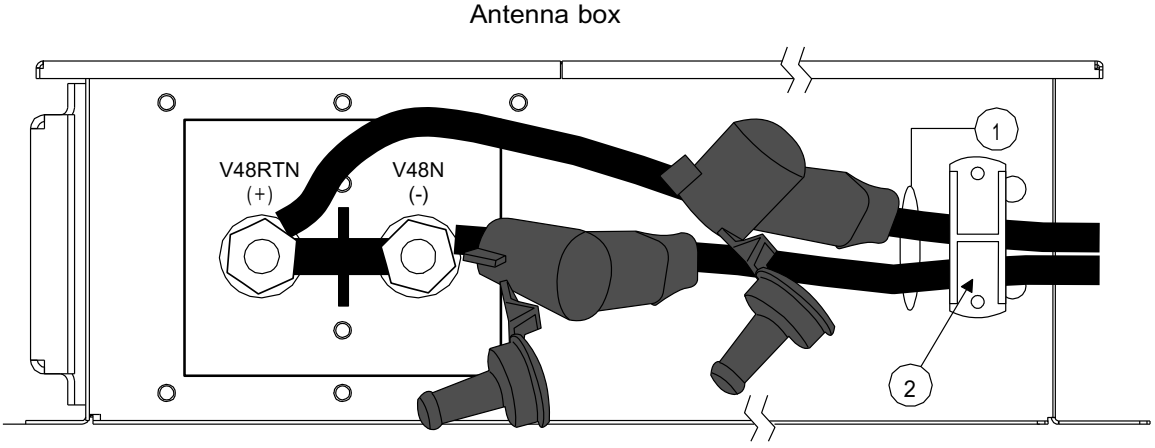
Note

The DC filter module terminals come with #2 cable lugs. A crimping tool is required to connect the lugs to the DC filter cables.

Note

The maximum recommended length of a -48 VDC cable is 100 feet with a voltage drop of 1.5V

The -48 VDC power supply operates from an input range of -36 to -60 VDC; -48 VDC is nominal. The maximum cross section of the cable connecting to the Filter module -48 VDC terminal block is 50 mm^2 (flexible stranded 1/0 AWG). The minimum cable cross section is 33.6 mm^2 (flexible stranded #2 AWG).



DN03418589

1	DC Power input cable
2	Strain relief

Figure 44. Connecting -48 VDC power to the BTS

Steps

1. **Ensure that the cabinet is properly grounded and that the main power breaker is OFF.**

Warning

Danger of lethal voltages! When connecting power cables, there is a risk of electric shock. Make sure that the site power is off and that the cabinet is properly earthed (grounded).

---

2. **Remove the black rubber boots and disconnect the cable lugs from the terminals.**

3. **Loosen the screws on the strain relief on the antenna box and remove the top of the strain relief.**

4. **Route the cables over the strain relief.**

Warning

Damage to cabinet components or personnel can occur if the power cable is not secure. Ensure that the power cable is secure within the strain relief.

---

5. **Pull each DC cable through a rubber boot.**

6. **Strip about 2 cm (.8 in) of insulation from the (+) and (-) DC cables.**

7. **Insert the stripped end of each cable into a cable lug and crimp.**

8. **Connect the blue (-) crimped wire to the (-) V 48N connector pole and tighten the nut.**

9. **Connect the black (+) crimped wire to the (-) V 48N connector pole and tighten the nut.**

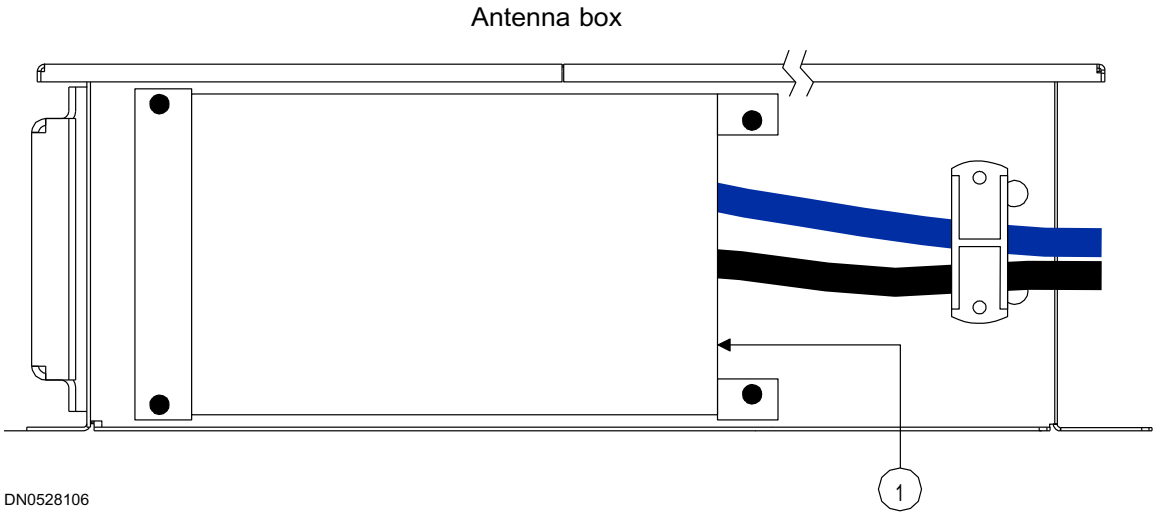
10. **Torque the nuts (max 14 Nm).**

11. **Pull the black rubber boots over the lugs.**

12. **Replace the top of the strain relief and tighten the screws to secure the cable.**

13. **Tie-wrap any loose cables.**

14. **Install the terminal cover using the four M4 screws.**



1	Terminal cover

Figure 45. Installing the terminal cover (optional)

12.3 Connecting -48 VDC power cables to Mini Outdoor

Before you start

Warning

Damage to cabinet components or personnel can occur if the power cable is not secure. Ensure that the power cable is secure within the strain relief.

Caution

If the DC power cables are reversed during installation, a fuse will blow open in the transceiver unit (TSxA). Before you connect the power cables, check their polarity with a multimeter.

Note

The maximum recommended length of a -48 VDC cable is 75 metres with a voltage drop of 1.5V.

The -48 VDC power supply operates from an input range of -36 to -60 VDC; -48 VDC is nominal. The maximum cross section of the cable connecting to the filter module -48 VDC terminal block is 33.6 mm^2 (flexible stranded #2 AWG). The minimum cable cross section is 13.3 mm^2 (flexible stranded #6 AWG). Due to the small size of the Mini outdoor cable entry area, the following DC cable sizes are recommended to make installation as easy as possible:

Table 32. DC cable sizes for Mini outdoor cabinet

Maximum cable length	Minimum cable gauge
30 m (100 ft)	6 AWG
75 m (246 ft)	4 AWG

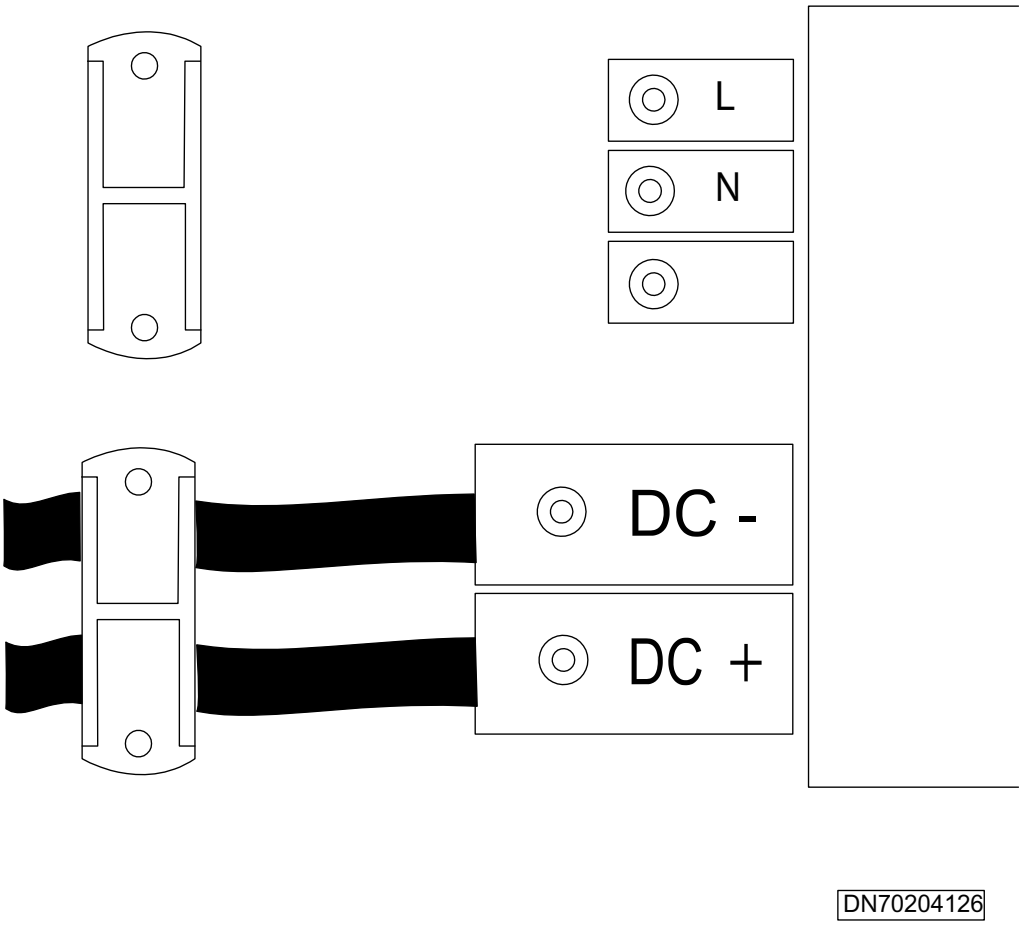
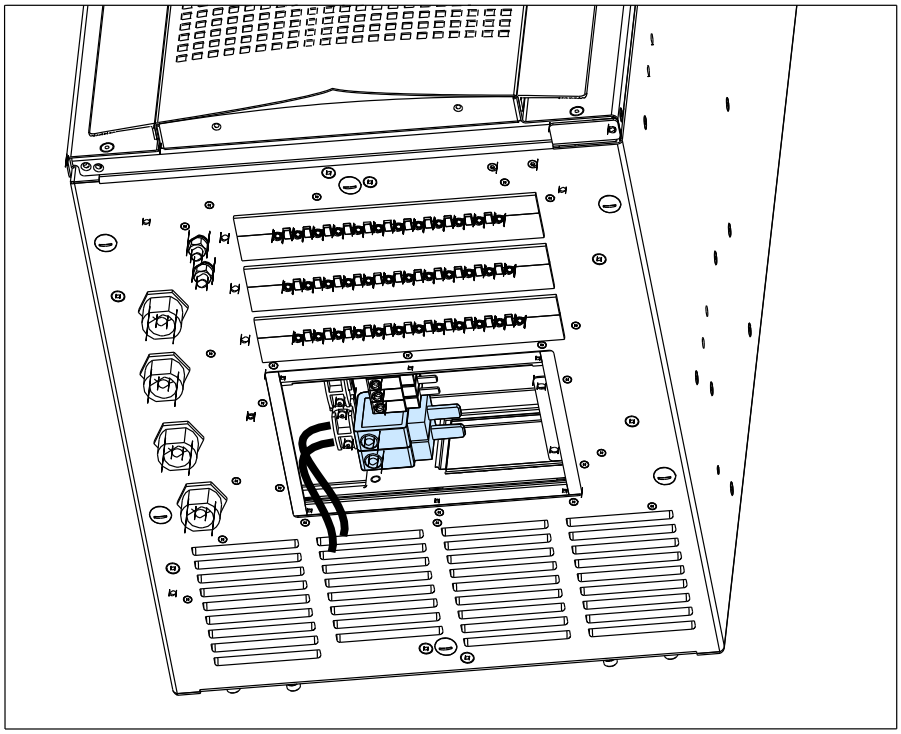


Figure 46. Connecting -48 VDC power to the Mini outdoor BTS



DN70238697

Figure 47. Routing -48 VDC power cables

Steps

1. **Unscrew the cover plate located on the supply terminals on the bottom panel of the cabinet .**

2. **Route the power cable through the gland on the cover plate and then the cable clamp.**

3. **Strip about 13 mm (0.5 in.) of insulation from each of the two exposed wires.**

4. **To open the DC+ and DC- connector terminals, turn the screws anti-clockwise.**

   Use a 5 mm A/F Allen key.

5. **Insert the blue wire into the DC - terminal and then turn the screw clockwise until the connection is tight.**

6. **Insert the black wire into the DC +terminal and then turn the screw clockwise until the connection is tight.**

7. **To secure the power cable, tighten the screws on the cable clamp.**

   For more information on torque settings, see *Torque settings*.

8. **Reinstall the cover plate over the connector terminals and tighten the screws.**

12.4 Connecting +24 VDC power cables

Summary

Note

When routing power cables, follow all applicable national, state, and local regulations.

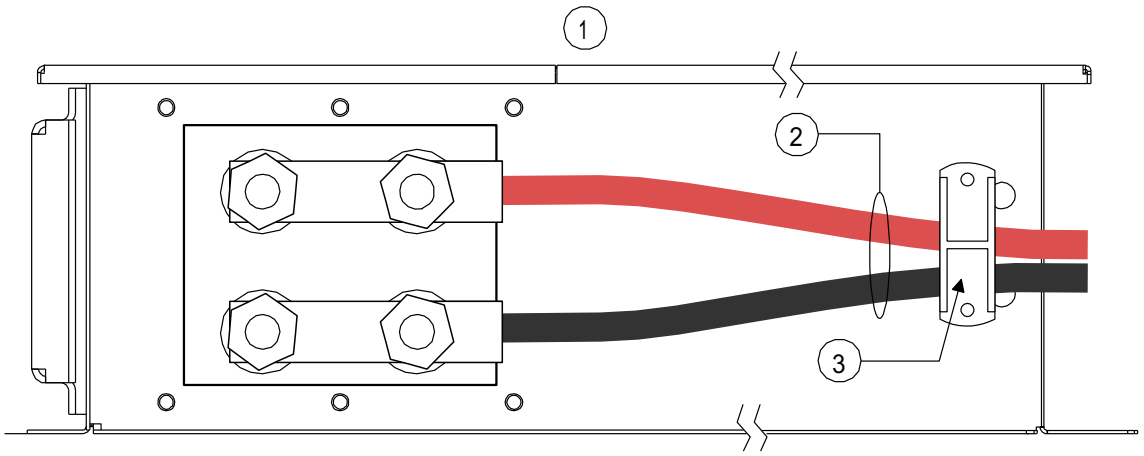
Note

The +24 VDC (DCFB) Filter unit is optional equipment. You must remove the default -48 VDC Filter unit from the antenna box and install the +24 VDC Filter unit. To place an order, contact your local Nokia representative.

Note

The NEMA two-hole compression lugs that are required for power connections, and all required additional hardware, are included as part of the FIKA Installation Kit.

The +24 VDC power supply operates from an input range of +20 to +32 VDC. The +24 VDC power supply is nominal. The recommended cable for connecting to the +24 VDC Filter unit terminals is flexible 95 mm^2 (3/0 AWG), type CSA TEW or UL Style 1015.



1	Antenna box
2	DC power input cables
3	Strain relief

Figure 48. Connecting +24 VDC power to the BTS

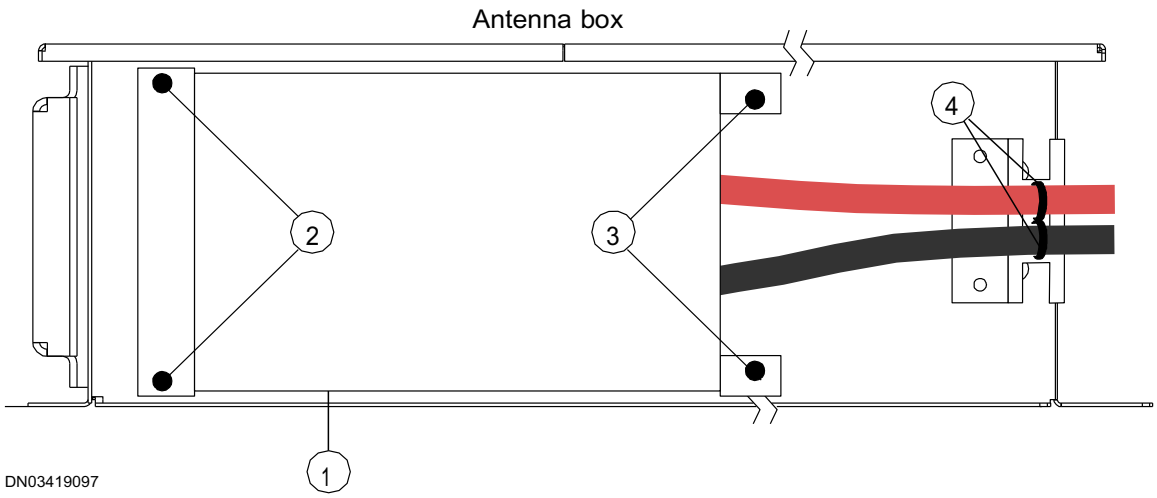


Figure 49. Installing the +24 VDC Filter unit terminal cover

1	Terminal Cover
2	M4x12 Screws
3	M4 Nuts
4	Tie Wraps

Steps

1. **Ensure that the cabinet is properly grounded and that the mains power breaker is OFF.**

Warning

Danger of lethal voltages! When connecting power cables, there is a risk of electric shock. Make sure that the site power is off and that the cabinet is properly earthed (grounded).

---

2. **Remove the existing plastic strain relief bracket, located to the rear of the DCFB, from the antenna box.**

3. **Position the new strain relief bracket supplied using two M4x8 screws and M4 washers as shown in the *Connecting +24 VDC power to the BTS* figure.**

   Insert screws from the inside of the antenna box and secure them into the threaded holes in the bracket.

4. **Locate the +24 VDC power input cables.**

5. **Route the cables over the strain relief.**

Warning

Damage to cabinet components or personnel can occur if the power cable is not secure. Ensure that the power cable is secure within the strain relief.

---

6. **Strip about 2 cm (.8 in.) of the power cables.**

7. **Using emory cloth or other suitable method, bring the mating surfaces of all unplated power connections to a bright finish.**

8. **Coat the exposed power cable conductors with antioxidant.**

9. **Insert the stripped end of each cable into a two-hole compression lug and crimp.**

10. **Install the +24VP(+) cable lug.**

    Remove the nuts from the +24VP(+) threaded studs of the DCFB. Install the red +24VP(+) cable lug on studs and loosely secure with removed nuts.

11. **Install the +24VN(-) cable lug.**

    Remove the nuts from the +24VN(-) threaded studs of the DCFB. Install the black +24VN(-) cable lug on the studs and loosely secure with removed nuts.

12. **Torque the four installed nuts.**

13. **Secure the cable to the strain relief bracket with tie wrap included in the Installation Kit.**

14. **Install the terminal cover using four M4x8 mounting screws included in the Installation Kit.**

15. **Using tie-wrap or lacing cord, tie the positive and negative power cables together every meter (3 ft) along the length.**

12.5 Connecting +24 VDC power cables to Mini Outdoor

Before you start

Warning

Risk of personal injury. Do not touch the fans.

Caution

If the DC power cables are reversed during installation, a fuse will blow open in the transceiver unit (TSxA). Before you connect the power cables, check their polarity with a multimeter.

Note

The maximum recommended length of a + 24 VDC cable is 30 metres with a voltage drop of 1.5V.

The +24 VDC power supply operates from an input range of +20 to +32 VDC; +24 VDC is nominal. The maximum cross section of the cable connecting to the filter module +24 VDC terminal block is 33.6 mm^2 (flexible stranded #2 AWG). The minimum cable cross section is 13.3 mm^2 (flexible stranded #6 AWG). Due to the small size of the Mini outdoor cable entry area, the following DC cable size is recommended to make installation as easy as possible:

Table 33. DC cable size for Mini outdoor cabinet

Maximum cable length	Minimum cable gauge
30 m (100 ft)	4 AWG

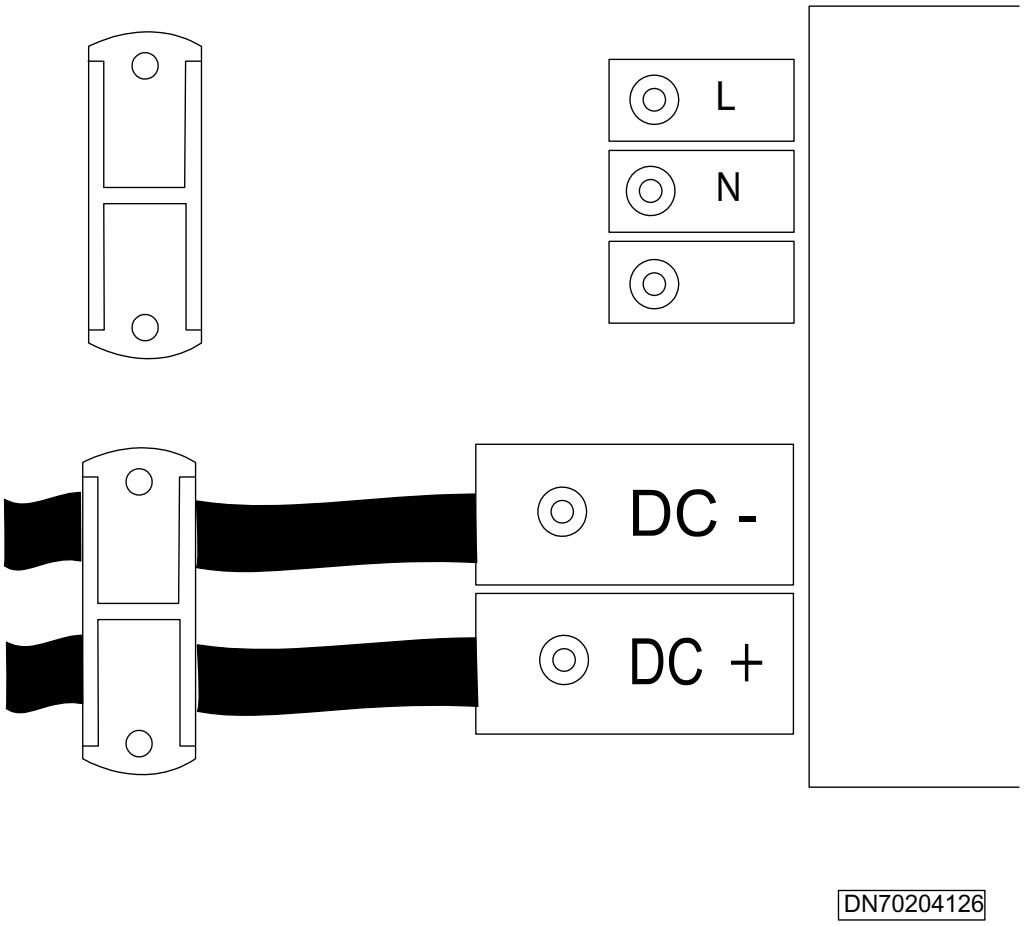


Figure 50. Connecting +24 VDC power cables

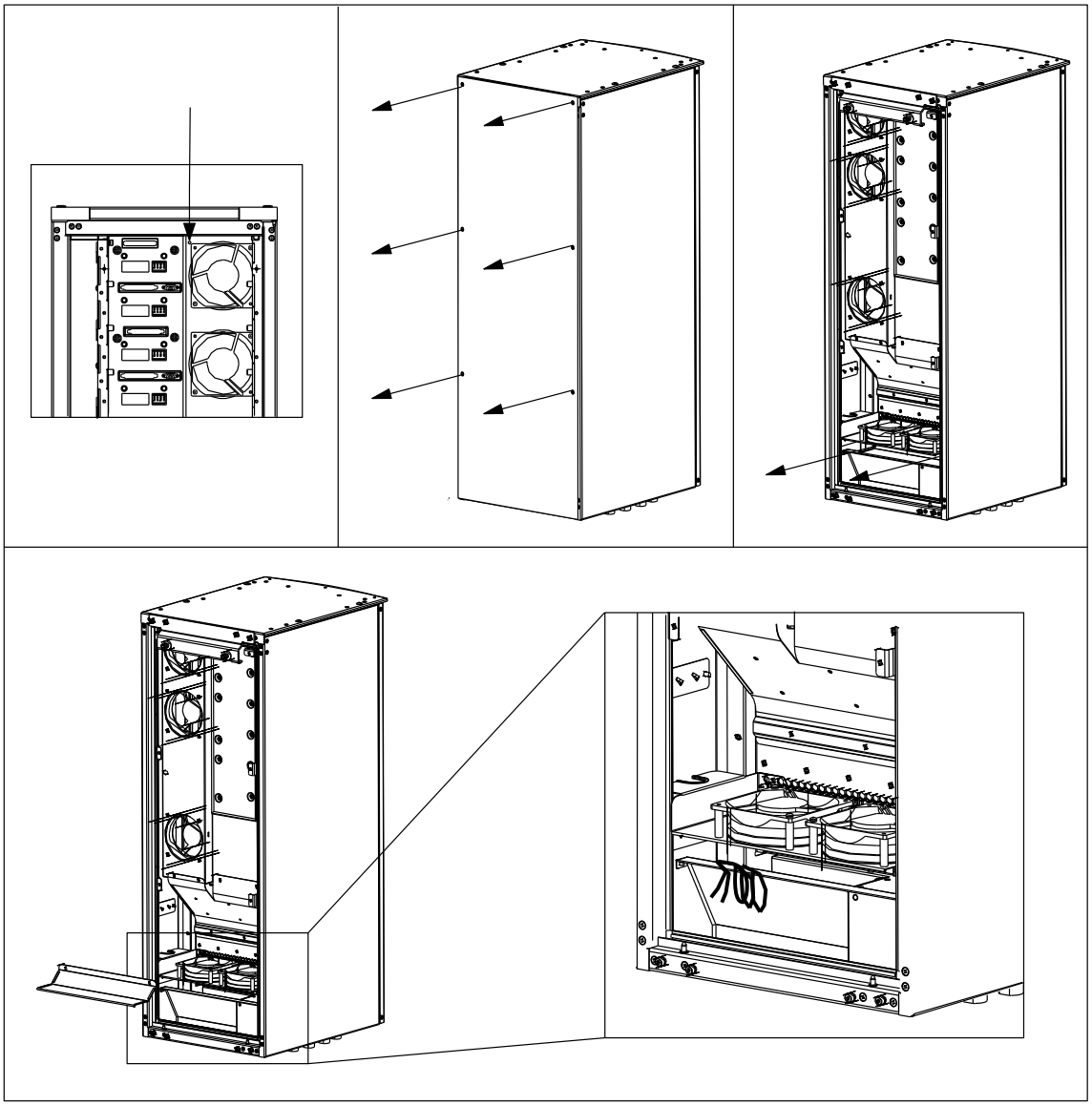


Figure 51. Connecting +24 VDC power

Steps

1. **Ensure that the cabinet is properly grounded and the main power breaker is off.**

2. **Cut the outer sheath each of the DC power cables to expose the internal wires.**

3. **Unscrew the cover plate located on the supply terminals on the bottom panel of the cabinet .**

4. **Route the power cable through the gland on the cover plate and then through the cable clamp.**

5. **Strip about 13 mm (0.5 in.) of insulation from each of the two exposed wires.**

6. **To open the DC+ and DC- connector terminals, turn the screws anti-clockwise.**

   Use a Pozi screwdriver.

7. **Insert the black wire into the DC - terminal and then turn the screw clockwise until the connection is tight.**

8. **Insert the red wire into the DC + terminal and then turn the screw clockwise until the connection is tight.**

9. **Reinstall the top of the cable clamp and tighten the screws to secure the cables.**

   For more information on torque settings, see *Torque settings*.

10. **Tie-wrap any loose cables.**

11. **Reinstall the cover plate over the connector terminals and tighten the screws.**

12. **Remove the rear panel of the cabinet.**

    Open the cabinet door and unscrew the screw holding the rear panel at the top of the cabinet. Then, unscrew the six screws on the rear panel of the cabinet. Gently push a screwdriver through the middle hole of the rear panel to release it.

13. **Remove the four screws retaining the fan plate.**

    Use a T20 Torx driver.

14. **Remove the two screws securing the baffle plate to the fan plate.**

Use a T15 Torx driver. After removing the screws, bend the baffle plate upwards to view the power supply cabling.

15. Disconnect the power supply leads on the outside of the filter box.

16. Connect the +24V cables.

Connect the +24V cable connector to +DC connector and -24V to -DC connector.

17. Reinstall the baffle plate and fan tray.

Refitting is the reverse procedure of removal.

18. Reinstall the rear panel.

First install the fixing screw inside the cabinet. Then install the rear panel with 6 screws.

19. Connect the power cables to the front of the power supply unit (PWSC).

13 Connecting AC power to the BTS

13.1 Overview of connecting AC power cables

Summary

The AC terminal block is rated to accept cable from 10 to 16 mm^2. The recommended cross sectional area of cable connecting to the AC terminal block is 13.3 mm^2 (flexible stranded #6 AWG).

Note

The AC Filter unit and the insertion bridge are optional equipment and are installed on the opposite side of the antenna box. However, the AC Filter unit must be installed first for AC power installations. The default -48 VDC Filter unit can be removed from the antenna box, if desired.

Note

Depending on the position of the antenna box, you may need to remove the dummy cable entry panel adjacent to the power connector to access the connector screws. As an alternative, you can remove the screws securing the antenna box to the cabinet core and lift the antenna box to access the connector screws.

Steps

1. *If* connecting single-phase AC power to the BTS in the USA and Canada,

   Then

   See Connecting single-phase AC power in the USA and Canada.

2. *If* connecting single-phase AC power to the BTS in Europe,

   Then

   See Connecting single-phase AC power in Europe.

3. *If* connecting three-phase AC power to the BTS in Europe,

   Then

   See Connecting three-phase AC power in Europe.

4. *If* connecting AC power to Mini outdoor BTS

   Then

   See Connecting single-phase AC power to BTS Mini Outdoor.

13.2 Connecting single-phase AC power in the USA and Canada

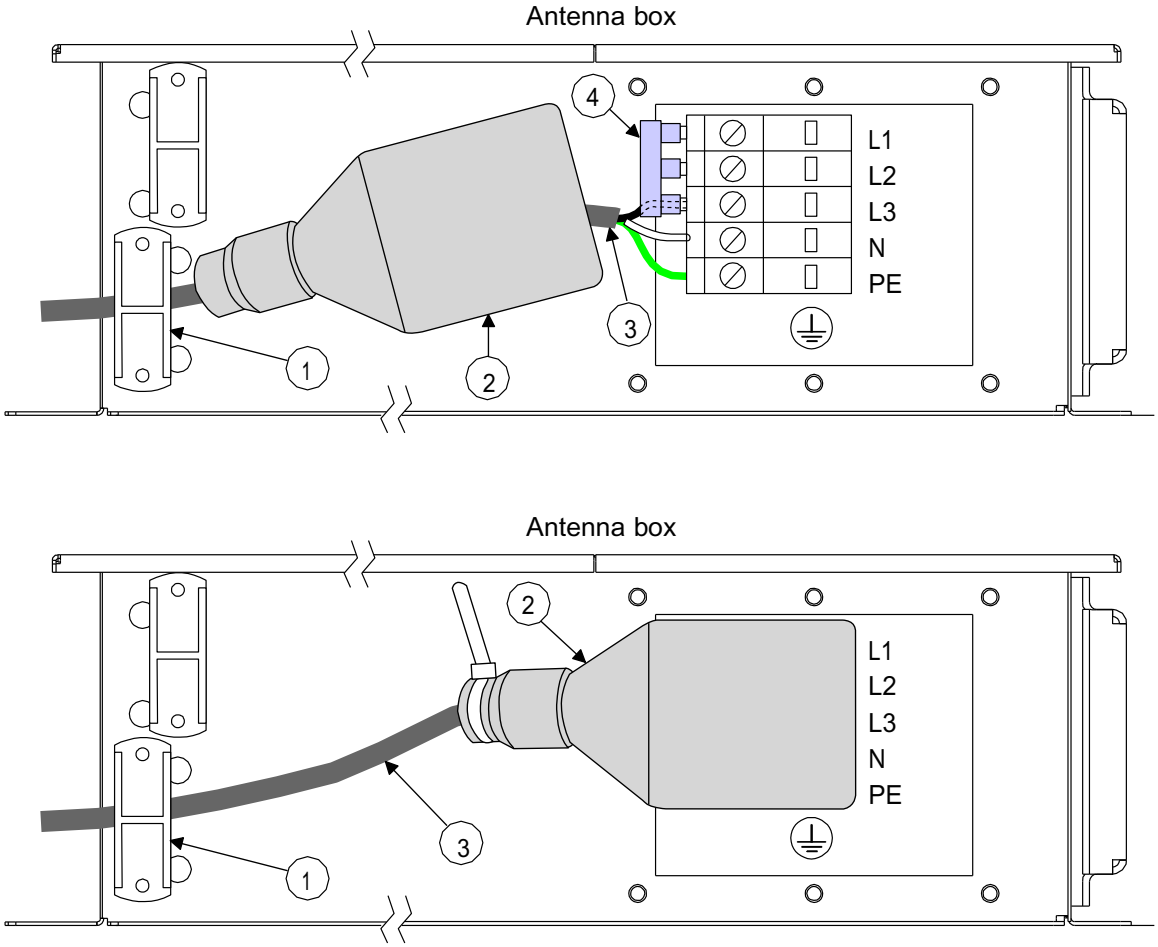
Before you start

Note

Place rubber covers on any DC cables and terminals that are not being used.

You can disconnect power from the DC filter by disconnecting the two colour-coded J5 cables from the busbar to the DC filter output terminals inside the antenna box.

Summary



NOTE: Power input wiring must adhere to local codes.
L1, L2, L3 (Shorted), N = Neutral, PE = Ground

DN03418592

Figure 52. Connecting single-phase AC power to the BTS

1	Strain relief
2	Rubber boot
3	AC Power input cable
4	Insertion bridge
5	Tie-wrap

Steps

1. **Verify that the cabinet is properly grounded and that the mains power breaker is off.**
2. **Cut the outer sheath of the AC power cable to expose the three internal wires.**
3. **Route the power cable through the strain relief on the antenna box.**
4. **Route the cable through the opening of the rubber boot.**
5. **Strip about 13 mm (0.5 in.) of insulation from each of the three exposed wires.**
6. **Turn the screws to the left to open the L1, L2, L3, N, and PE Phoenix/ Schaffner connector terminals.**
7. **Insert the ground wire into the PE connector and then turn the screw to the right to close the connector.**
8. **Insert the insertion bridge into L1, L2, and L3 and then turn the screws to the right to close the L1 and L2 connectors.**
9. **Insert one live wire into the L3 connector and then turn the screw to the right to close the connector.**
10. **Insert the second live wire into the N connector and then turn the screw to the right to close the connector.**
11. **Tighten the screws on the strain relief to secure the power cable.**
12. **Pull the black rubber boot over the connector terminals.**
13. **Tie-wrap the base of the rubber boot to the cable.**

13.3 Connecting single-phase AC power in Europe

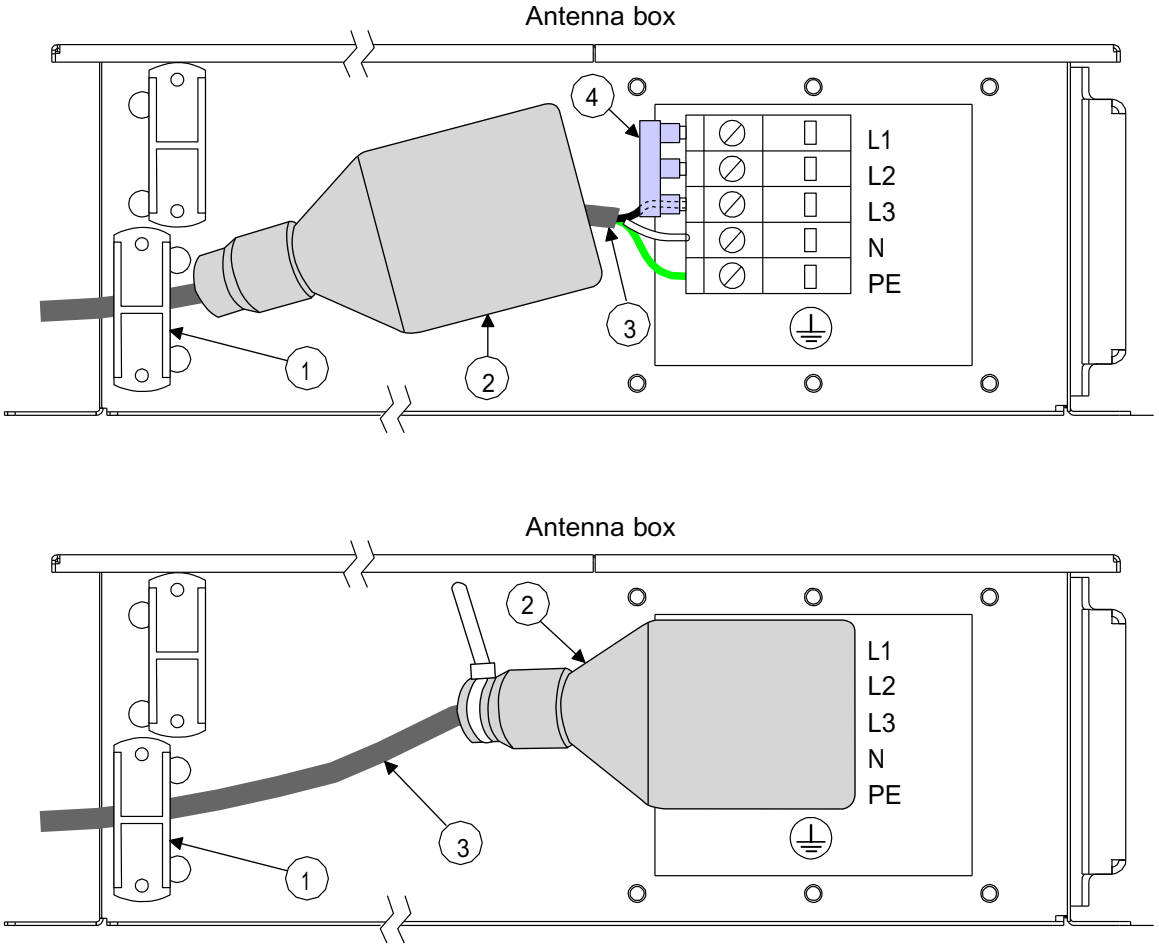
Before you start

Note

Place rubber covers on any DC cables and terminals that are not being used.

You can disconnect power from the DC filter by disconnecting the two colour-coded J5 cables from the busbar to the DC filter output terminals inside the antenna box.

Summary



NOTE: Power input wiring must adhere to local codes.
L1, L2, L3 (Shorted), N = Neutral, PE = Ground

DN03418592

Figure 53. Connecting single-phase AC power to the BTS

1	Strain relief
2	Rubber boot
3	AC Power input cable
4	Insertion bridge
5	Tie-wrap

Steps

1. **Ensure that the cabinet is properly grounded and that the mains power breaker is OFF.**
2. **Cut the outer sheath of the AC power cable to expose the three internal wires.**
3. **Route the power cable through the strain relief on the antenna box.**
4. **Route the cable through the opening of the rubber boot.**
5. **Strip about 13 mm (0.5 in.) of insulation from each of the three exposed wires.**
6. **To open the L1, L2, L3, N, and PE Phoenix/Schaffner connector terminals, turn the screws to the left.**
7. **Insert the ground wire into the PE connector and then turn the screw to the right to close the connector.**
8. **Insert the shorting bar into L1, L2, and L3, and then turn the screws to the right to close the L1 and L2 connectors.**
9. **Insert the live wire into the L3 connector and then turn the screw to the right to close the connector.**
10. **Insert the neutral wire into the N connector and then turn the screw to the right to close the connector.**
11. **To secure the power cable, tighten the screws on the strain relief.**
12. **Pull the black rubber boot over the connector terminals.**
13. **Tie-wrap the base of the rubber boot to the cable.**

13.4 Connecting three-phase AC power in Europe

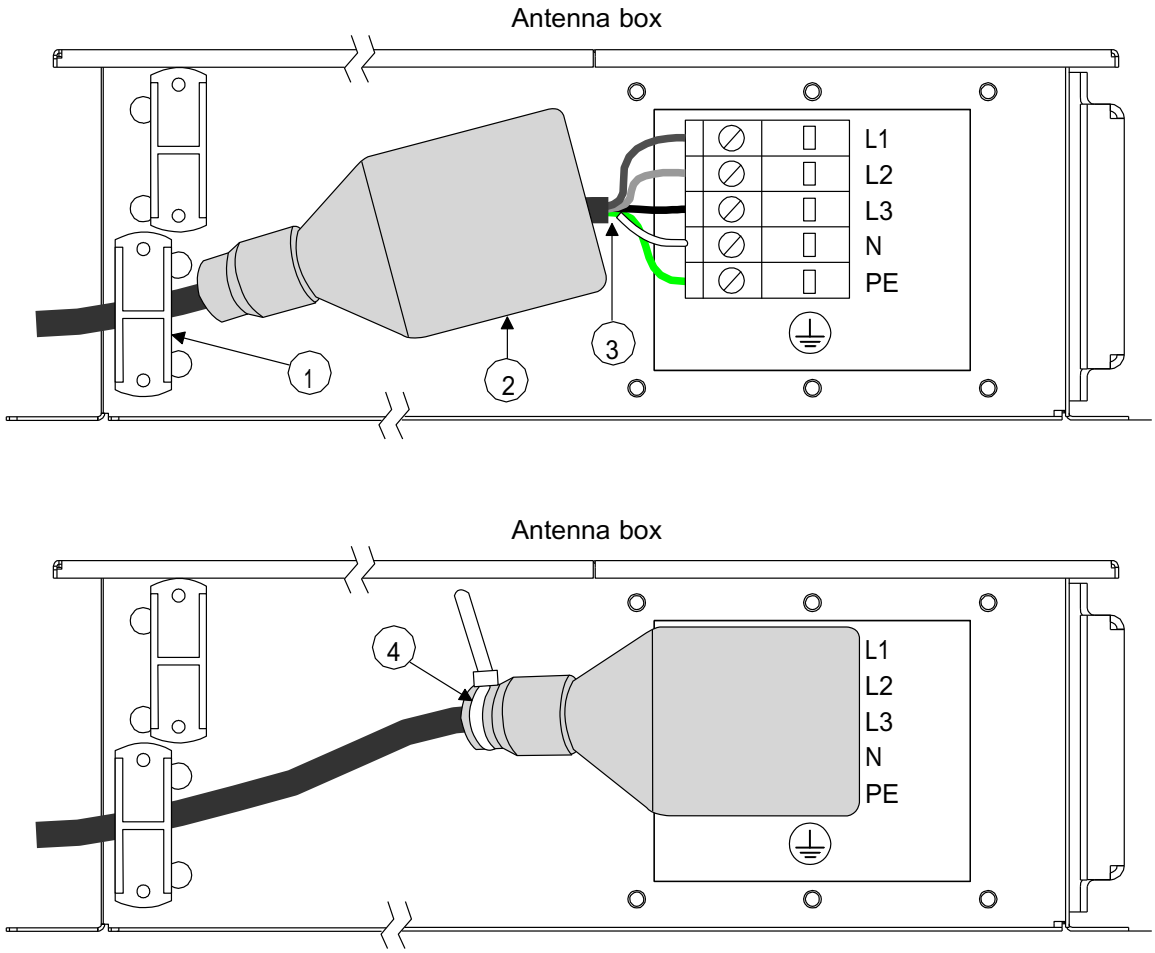
Before you start

Note

Place rubber covers on any DC cables and terminals that are not being used.

You can disconnect power from the DC filter by disconnecting the two colour-coded J5 cables from the busbar to the DC filter output terminals inside the antenna box.

Summary



NOTE: Power input wiring must adhere to local codes.
L1 = Phase 1, L2 = Phase 2, L3 = Phase 3,
N = Neutral, PE = Ground

DN03418608

1	Strain relief
2	Rubber boot
3	AC Power input cable
4	Tie-wrap

Figure 54. Connecting three-phase AC power to the BTS

Steps

1. **Ensure that the cabinet is properly grounded and that the mains power breaker is OFF.**
2. **Cut the outer sheath of the AC power cable to expose the five internal wires.**
3. **Route the power cable through the strain relief on the antenna box.**
4. **Route the cable through the opening of the rubber boot.**
5. **Strip about 13 mm (0.5 in.) of insulation from each of the five exposed wires.**
6. **To open the L1, L2, L3, N, and PE Phoenix/Schaffner connector terminals, turn the screws to the left.**
7. **Insert the ground wire into the PE connector and then turn the screw to the right to close the connector.**
8. **Insert the neutral wire into the N connector and then turn the screw to the right to close the connector.**
9. **Insert the three live wires into the L1, L2, and L3 connectors and then turn each connector screw to the right to close the connectors.**
10. **To secure the power cable, tighten the screws on the strain relief.**
11. **Pull the black rubber boot over the connector terminals.**
12. **Tie-wrap the base of the rubber boot to the cable.**

13.5 Connecting single-phase AC power to BTS Mini Outdoor

Before you start

Warning

Damage to cabinet components or personnel can occur if the power cable is not secure. Ensure that the power cable is secure within the strain relief.

Warning

Risk of electric shock. The protective insulating shield is required to be installed over the terminal block in all AC installations in the cabinet. Ensure it is reinstalled after making electrical connections.

Warning

Risk of electric shock. When the mains power breaker is switched on, the terminals on the filter are live. Make sure that the cover is replaced before switching the mains power on.

Note

The maximum inner conductor size for the AC cables is 20 mm^2.

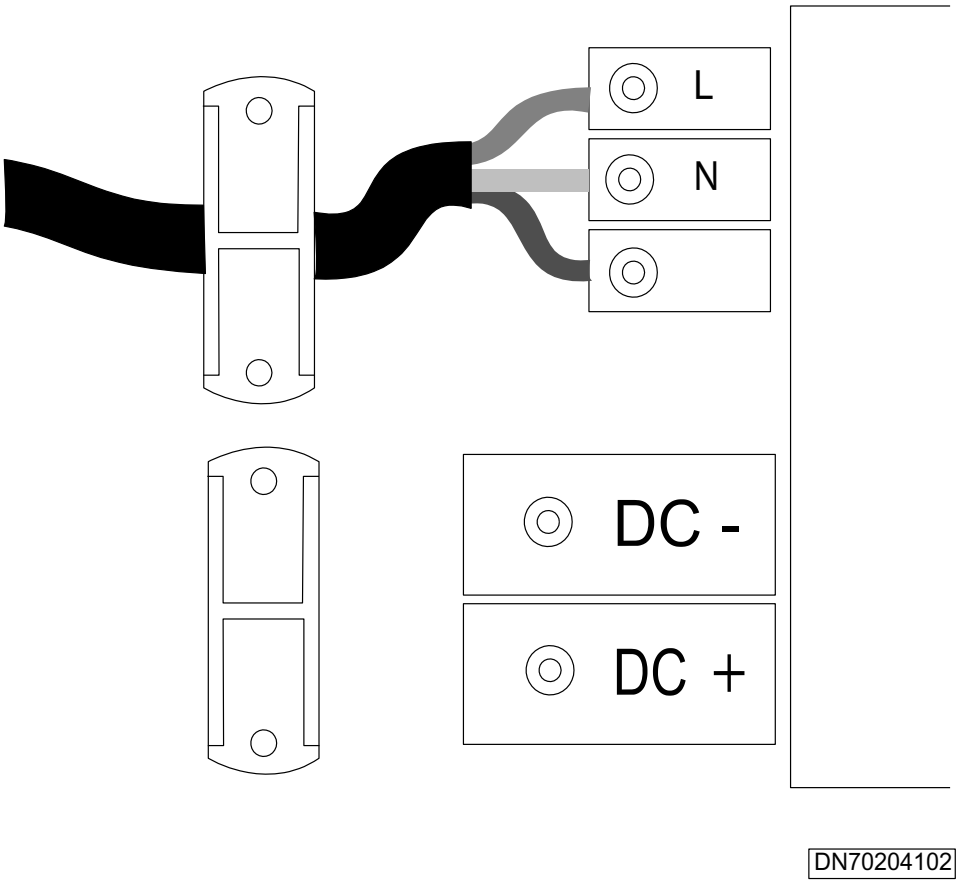


Figure 55. Connecting single-phase AC power to the BTS

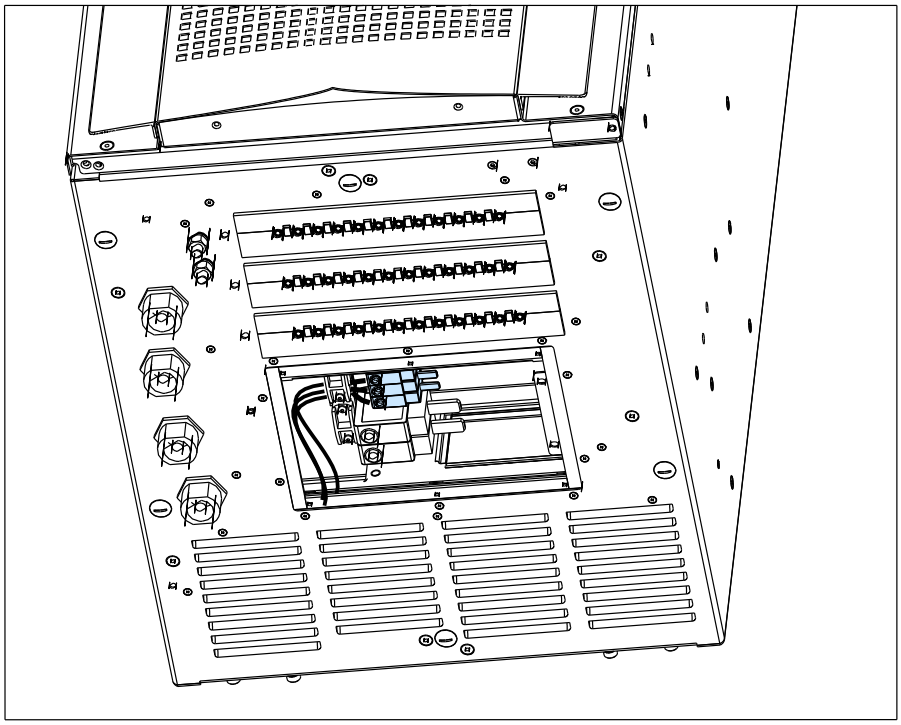


Figure 56. Routing AC power cables

Steps

1. **Ensure that the cabinet is properly grounded and that the mains power breaker is off.**

2. **Cut the outer sheath of the AC power cable to expose the three internal wires.**

3. **Unscrew the cover plate located on the supply terminals on the bottom panel of the cabinet .**

   The cover plate is attached with six T20 Torx screws.

4. **Route the power cable through the gland on the cover plate and then the cable clamp.**

5. **Strip about 13 mm (0.5 in.) of insulation from each of the three exposed wires.**

6. **To open the L, N, and PE connector terminals, turn the screws anti-clockwise using a posidrive screwdriver.**

7. **Insert the ground wire into the PE connector and then turn the screw clockwise until the connection is tight.**

8. **Insert the live wire into the L connector and then turn the screw clockwise until the connection is tight.**

9. **Insert the neutral wire into the N connector and then turn the screw clockwise until the connection is tight.**

10. **To secure the power cable, tighten the screws on the cable clamp.**

    For more information on torque settings, see *Torque settings*.

11. **Reinstall the cover plate over the connector terminals and tighten the screws.**

14 Connecting antenna cables to the BTS

14.1 Installing external antenna cables to the indoor cabinet

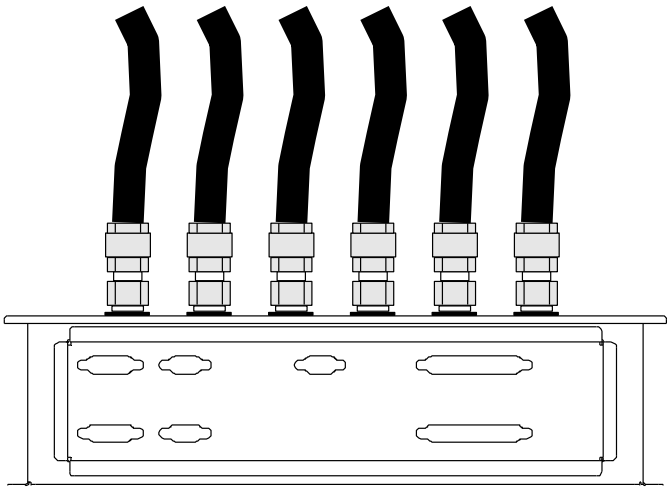
Before you start

Note

If the ready-fitted ATCA cable kit is moved to a new location on top of the cabinet, the open holes should be covered with metal plates cut off for the new holes. Conductive tape can be used for fixing the plates in place.

Steps

1. **Connect each external antenna cable to the end of the internal antenna (ATCA) cables outside of the antenna box.**



DN04118267

Figure 57. Connecting external antenna cables

2. Tighten each 7/16 in. connector using a torque wrench.

14.2 Connecting external antenna cables to the BTS outdoor cabinet

Before you start

Ensure that the site is ready for antenna cable installation.

The external antenna cables must be routed through the cable entry kit before starting this procedure.

Note

The cabinet has six pre-installed internal antenna (ATCA) cables. If your configuration requires more than six antenna cables, then you will need to install extra ATCA cables.

Summary

For more information on antenna systems, see *Nokia UltraSite EDGE Antenna product documentation.*

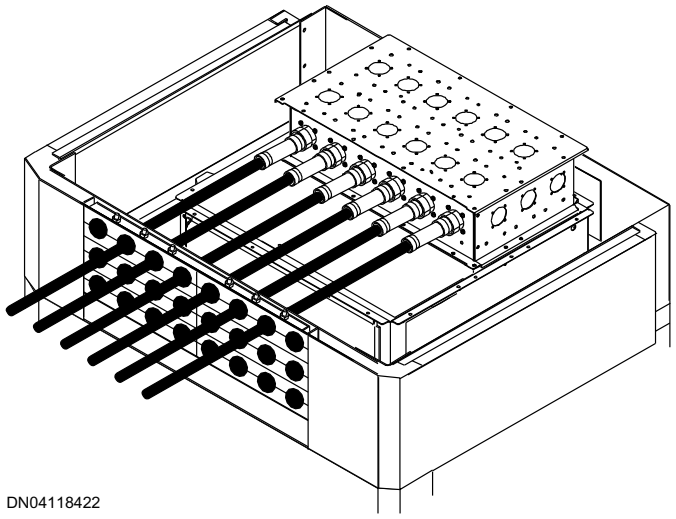


Figure 58. Connecting external feeder cables to the outdoor cabinet

Steps

1. **Make sure the external antenna cables are routed through the cable entry kit.**

2. **Connect the external antenna cables to the end of the internal antenna cables.**

Note

If Bias Tee (BPxx) units or Dual Band Diplex Filter (DU2A) units are required for the site, then the external antenna cable connects to those units.

14.3 Installing extra internal antenna cables in BTS outdoor cabinet

Before you start

The BTS cabinet comes with six pre-installed internal antenna (ATCA) cables. This procedure is optional and only necessary if the configuration requires additional ATCA cables.

The internal antenna cables (ATCA) connect to the DVxx or RTxx units inside the cabinet. It is recommended that you install the DVxx or RTxx units before starting this procedure.

Summary

For more information on antenna systems, see *Nokia UltraSite EDGE Antenna product documentation*.

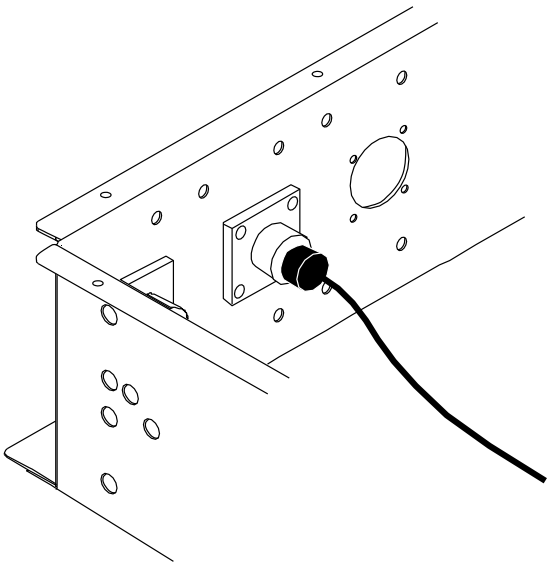


Figure 59. Installing internal antenna cable

Steps

1. **Remove the knockout covering the opening on the antenna box at the top of the cabinet.**

2. **Remove the protective covering, circular washer, and hexagon nut from the antenna cable.**

3. **Install the square washer on the straight end of the antenna cable with the four small protrusions facing upwards.**

4. **Route the straight end of the antenna cable through the opening on the antenna box. Make sure the protrusions on the square washer line up with the four small holes around the opening.**

5. **Install the circular washer and hexagon nut on the exposed end of the antenna outside of the antenna box to secure the antenna cable.**

6. **When using DU2x or Bias Tee inside the antenna box, antenna cables connect to DU2x or Bias Tee.**

7. **Route antenna cables behind the power supply filters, EMC sock, and down along the right side of the cabinet.**

8. **Connect the antenna cables to the DVxx (or RTxx) units inside the cabinet.**

9. **Secure or tie all antenna cables to the cable retainer plates located in the right side of the cabinet.**

10. **Stow antenna cable excess length behind the transmission (VXxx) unit in the top right area of the cabinet.**

Note

The minimum antenna cable bend radius is 25 mm (1.0 in.).

14.4 Connecting external antenna cables to the Mini outdoor cabinet

Before you start

Caution

Overbending the feeder cables and jumper cables damages the cables and can detach or damage the connectors. If the cabinet is mounted on a plinth, do not bend the feeder cables or jumper cables to a radius smaller than the minimum radius of 35 mm (1.38 in.)

Ensure that the site is ready for antenna jumper cable installation.

Steps

1. **Remove the protective plugs from the antenna cable connectors.**

2. **Connect each external antenna cable to the appropriate 7-16 connection on the bottom panel of the cabinet.**

   See the following figure for antenna connector numbering.

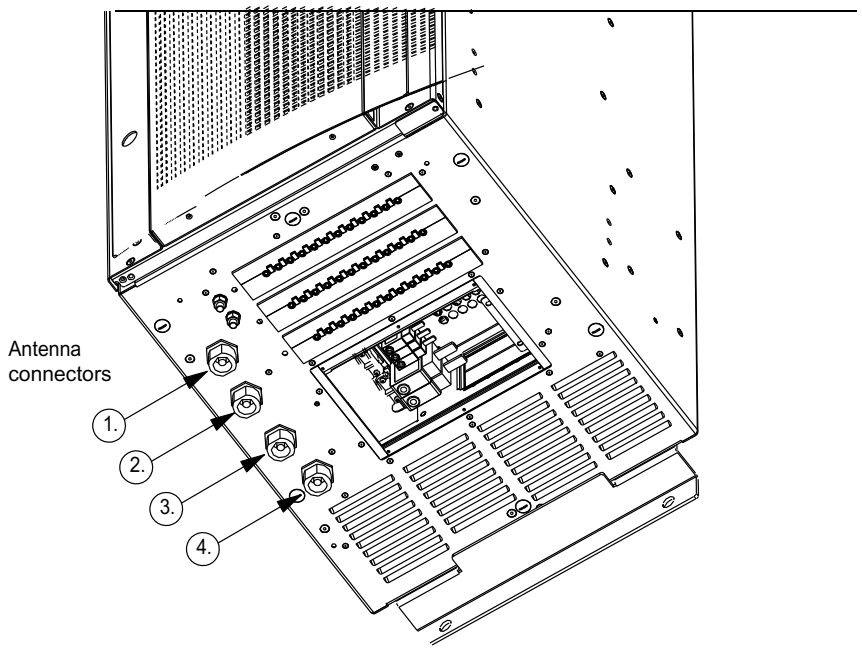


Figure 60. Antenna connector numbering

3. Tighten each 7/16 in. connector using a torque wrench.

For more information on torques recommendations, see *Torque settings*.

15 Installing external alarm cables to the Mini Outdoor cabinet

Before you start

Ensure that the site is ready for external alarm cable installation, see *Site preparation checklist*.

Steps

1. **Route the external alarm cabling through the cable entry block and connect it to the appropriate connectors on the interface panel within the EMC enclosure.**

   See the figure below for pin out of connections on the interface panel.

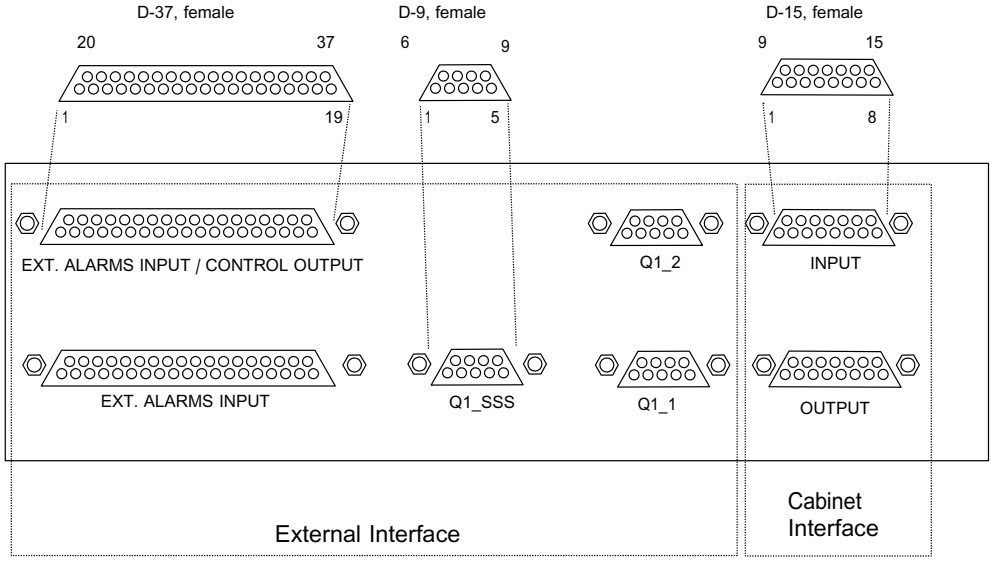


Figure 61. Pin-out of connections on interface panel

2. Ensure that the screw locks are tightened and alarm cables are a tight fit within cable entry block.

See the table below for the pin-outs for the external alarm connections.

Table 34. External alarm pin configuration

Pin	Signal	Pin	Signal	Pin	Signal
1	EXT_AL13	2	EXT_AL14	3	EXT_AL15
4	EXT_AL16	5	EXT_AL17	6	EXT_AL18
7	EXT_AL19	8	EXT_AL20	9	EXT_AL21
10	EXT_AL22	11	EXT_AL23	12	EXT_AL24
13	Not used	14	Not used	15	Not used

Table 34. External alarm pin configuration (cont.)

Pin	Signal	Pin	Signal	Pin	Signal
16	Not used	17	Not used	18	Not used
19	GND	20	GND	21	GND
22	GND	23	GND	24	GND
25	GND	26	GND	27	GND
28	GND	29	GND	30	GND
31	Not used	32	Not used	33	Not used
34	Not used	35	Not used	36	Not used
37	Not used				

Table 35. External alarm input/control output pin configuration

Pin	Signal	Pin	Signal	Pin	Signal
1	EXT_CO1	2	EXT_CO2	3	EXT_CO3
4	EXT_CO4	5	EXT_CO5	6	EXT_CO6
7	EXT_AL1	8	EXT_AL2	9	EXT_AL3
10	EXT_AL4	11	EXT_AL5	12	EXT_AL6
13	EXT_AL7	14	EXT_AL8	15	EXT_AL9
16	EXT_AL10	17	EXT_AL11	18	EXT_AL12
19	GND	20	V5P	21	V5P
22	V5P	23	V5P	24	V5P
25	V5P	26	GND	27	GND
28	GND	29	GND	30	GND
31	GND	32	GND	33	GND
34	GND	35	GND	36	GND
37	GND				

16 Connecting synchronisation cables to the BTS

Summary

The first cabinet in the synchronisation chain serves as the master. All other cabinets are slaves.

Note

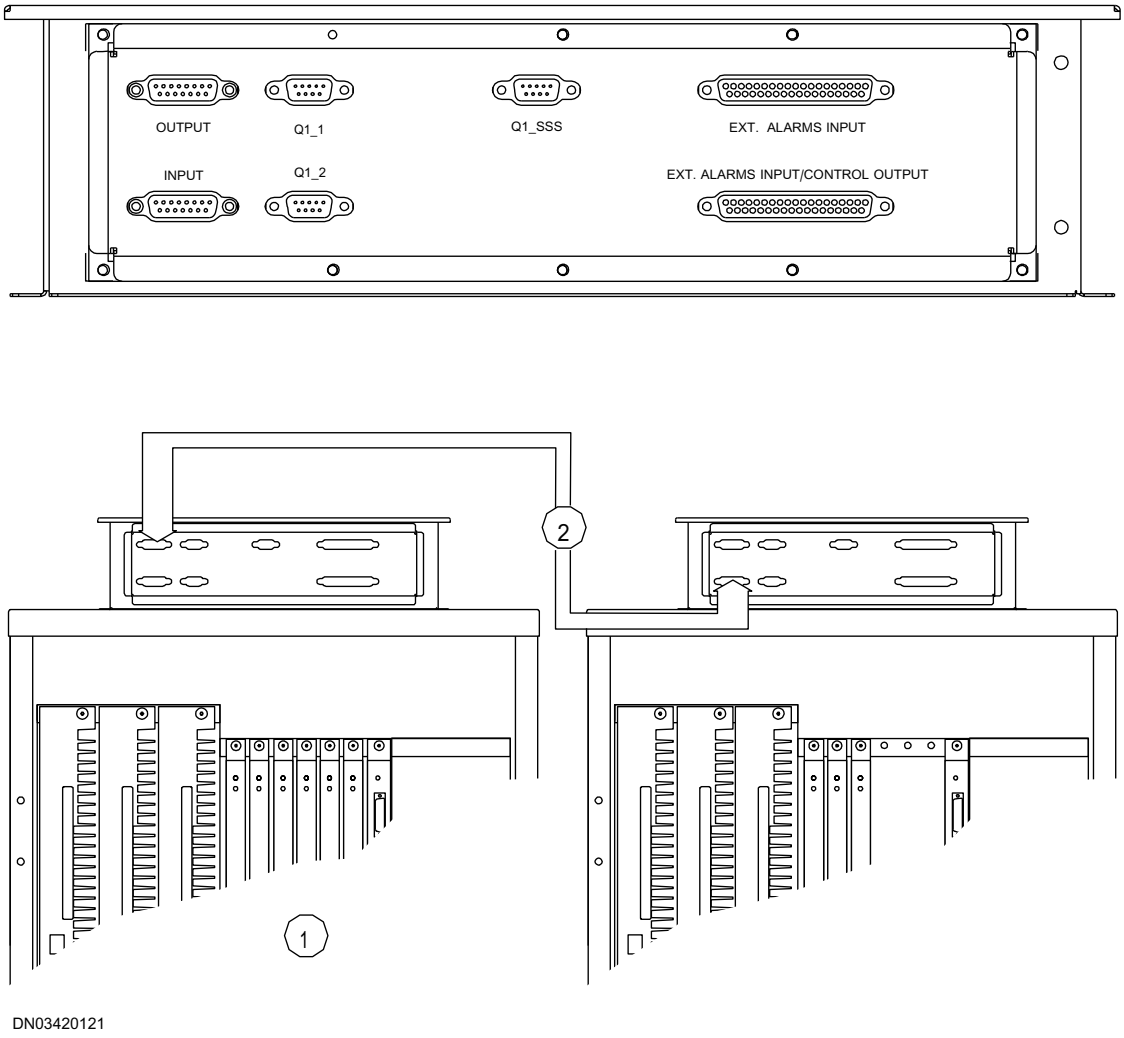
The maximum length of synchronisation cables allowed from the first to the last cabinet is 100 m (300 ft).

Note

The maximum number of cabinets that can be chained together is nine, including the master.

Note

If cabinets are using the bridge kit, route the synchronisation cables through the internal channel.



1	Master cabinet
2	Synchronisation cable

Figure 62. Synchronising multiple cabinets

Steps

1. Plug the synchronisation cable of the master cabinet into the connector labelled OUTPUT.

2. **Plug the other end of the synchronisation cable into the destination cabinet connector labelled INPUT.**

3. **If required, repeat steps 1 and 2 to chain additional slave cabinets.**

Related Topics

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Instructions

Overview of cabling GSM/EDGE units of UltraSite EDGE BTS

Reference

Tools requirements for UltraSite EDGE BTS

External HW interfaces of UltraSite EDGE BTS

Overview of connecting DC power cables

Instructions

Connecting -48 VDC power cables

Connecting -48 VDC power cables to Mini Outdoor

Connecting +24 VDC power cables

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Descriptions

PWSx unit technical description

Overview of connecting AC power cables

Reference

Power requirements for AC