NOKIA

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

Removing and Replacing UltraSite EDGE BTS Units

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1 Summary of changes in Removing and Replacing UltraSite EDGE BTS Units

The following changes have taken place in the *Removing and Replacing UltraSite EDGE BTS Units* document:

- Warnings and cautions relocated from the beginning of the document in applicable procedures.
- The following sections removed:
  - *Overview of installing units*
  - *Handling and unpacking units*
  - *Connecting the antistatic wrist strap*
  - *Installing units with ejectors*
  - *Using handles in unit installation*
  - *Storage and disposal of units*

  These sections can be found in the *Installing and Cabling UltraSite EDGE Units* document.
- Illustrations added in section *Replacing a common backplane*

2 Preparing to replace units

Summary

Note

Before installing replacement units, ensure that the new units are the same type and version as those being removed.

Steps

1. **Ensure the required tools are available.**

   For detailed information on the required tools, see *Tools requirements*.

2. **Remove replacement units from packaging.**

3. **Connect anti-static wrist strap, if required.**

Caution

Always use an ESD wrist strap when handling units labelled with the ESD sign. Labelled units are sensitive to electrostatic discharge.

4. **Review torque requirements.**

   Ensure the proper tools are available for compliance with the torque values prior to installing the units. For detailed information on the torque requirements, see *Torque settings*.

3 Overview of replacing GSM/EDGE units

3.1 Removing GSM/EDGE unit cables

Steps

1. **Check the unit's cable configuration.**
2. **Disconnect the unit's cables.**
3. **Ensure that the cables do not become entangled when you slide the unit out of the cabinet.**

3.2 Overview of removing GSM/EDGE units

Before you start

Warning

Unit-mounting fasteners may be nickel-plated. Personnel who are sensitive to nickel should wear protective gloves when handling units.

Caution

Always use an ESD wrist strap when handling units labelled with the ESD sign. Labelled units are sensitive to electrostatic discharge.

Summary

Note

If installing replacement units, ensure that the new units are the same type and version as those being removed.

Steps

1. **Connect the antistatic wrist strap to the BTS.**
2. **Remove GSM/EDGE unit cables.**
3. **Remove Bias Tee (BPxx) unit from the BTS.**
4. **Remove PWSx unit from the BTS.**
5. **Remove VXxx unit from the BTS.**

Note

Remove the VXxx unit cables before moving the unit.

6. **Remove BB2x unit from the BTS.**
7. **Remove BOIx unit from the BTS.**
8. **Remove M2xA or M6xA unit from the BTS.**
9. **Remove TSxx unit from the BTS.**
10. **Remove DU2A unit from the BTS.**
11. **Remove DVxx unit from the BTS.**
12. **Remove RTxx unit from the BTS.**
13. **Remove WCxA unit from the BTS.**

3.3 Overview of installing GSM/EDGE units

Before you start

Ensure that the site is ready for unit installation.

Warning

Risk of electric shock. Always install the earthing (grounding) cable before installing the units. See the earthing (grounding) cabling instructions.

Summary

The GSM/EDGE unit positions in the cabinet are pre-determined. You can launch the Site Hardware Configuration Manager from the SiteWizard to check the configuration.

Warning

Electrical hazards exist while installing DVxx cables to the RFU backplane of a powered Nokia BTS. Hold the cable being connected clear of all conductive surfaces during installation.

Caution

The Mini Outdoor cabinet does not contain dust filters. Protect all unused connectors and slots in the outdoor cabinet with connector caps and sealing units.

Note

When installing a unit within the cabinet, make sure that the unit is properly secured with mounting screws so that the unit stays in place and is adequately earthed (grounded).

Tip

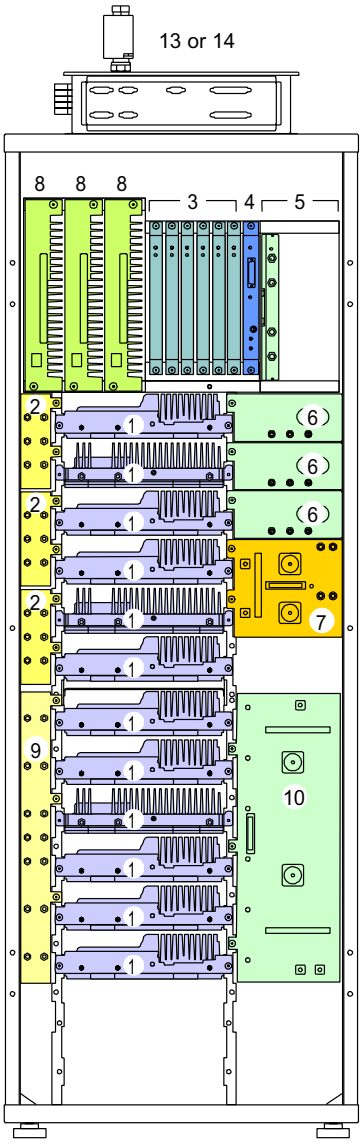
The online help provides information on using SiteWizard, Nokia BTS Manager, and Site Hardware Configuration Manager.

Tip

You can use the PWSA, PWSB, and PWSC units in either cabinet.

Tip

Install the DVxx cable to the RFU backplane before you install the Transceiver RF unit in the cabinet.



UltraSite cabinet core

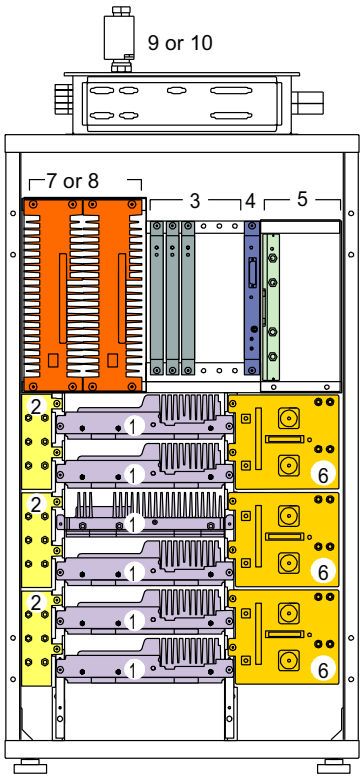
DN03459836

Figure 1. Unit positions in the BTS

1	Transceiver unit (TSxx)
2	2-way Receiver Multicoupler unit (M2xA)
3	Transceiver Baseband unit (BB2x)

4	Base Operations and Interfaces unit (BOIx)
5	Transmission unit (VXxx)
6	Wideband Combiner unit (WCxA/WCxT)
7	Dual Variable Gain Duplex Filter unit (DVxx)
8	DC/DC Power Supply unit (PWSB)
9	6-way Receiver Multicoupler unit (M6xA)
10	Remote Tune Combiner unit (RTxx)
11	AC/DC Power Supply unit (PWSA)
12	DC/DC Power supply unit (PWSC)
13	Bias Tee unit (BPxx)[1]
14	Dual Band Diplex Filter unit (DU2A)[1]

[1]Items 13 and 14 are not plug-in units.



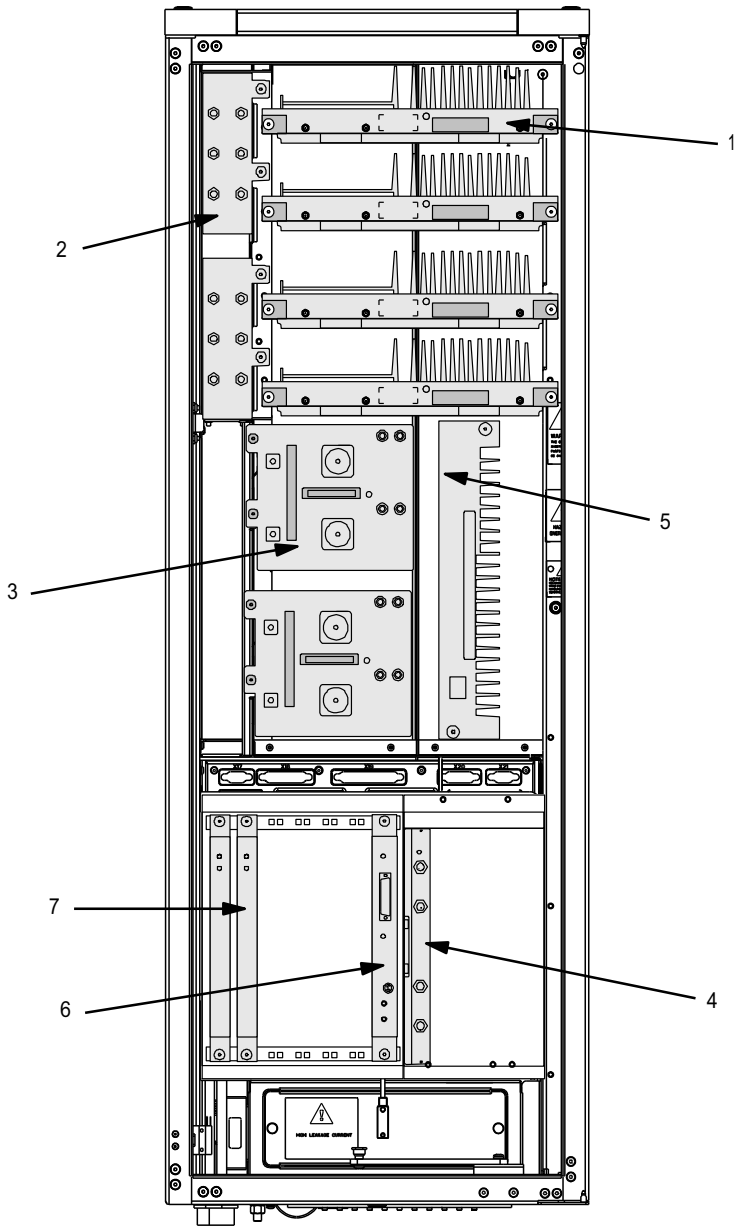
UltraSite MIDI cabinet core

DN05129855

1	Transceiver unit (TSxx)
2	2-way Receiver Multicoupler unit (M2xA)
3	Transceiver Baseband unit (BB2x)
4	Base Operations and Interfaces unit (BOIx)
5	Transmission unit (VXxx)
6	Dual Variable Gain Duplex Filter unit (DVxx)
7	AC/DC Power Supply unit (PWSA)
8	DC/DC Power Supply unit (PWSC)
9	Bias Tee unit (BPxx)[1]
10	Dual Band Diplex Filter unit (DU2A)[1]

[1]Items 9 and 10 are not plug-in units.

Figure 2. Unit positions in the Midi BTS



ID #	Description
1	Transceiver unit (TSxx)
2	2-way Receiver Multicoupler unit (M2xA)
3	Dual Variable Gain Duplex Filter Unit (DVxx)

ID #	Description
4	Transmission unit (VXxx)
5	Power Supply Unit (PWSx)
6	Base Operations and Interfaces unit (BOIx)
7	Transceiver Baseband unit (BB2x)

Figure 3. Unit positions in Mini outdoor BTS

Steps

1. **Install a Wideband Combiner (WCxA/WCxT) unit (not applicable in Mini outdoor).**
2. **Install a Remote Tune Combiner (RTxx) unit (not applicable in Mini outdoor).**
3. **Install a Dual Variable Gain Duplex Filter (DVxx) unit.**
4. **Install a Dual Band Diplex Filter (DU2A) unit (not applicable in Mini outdoor).**
5. **Install a Transceiver (TSxx) unit.**
6. **Install a Receiver Multicoupler (M2xA or M6xA) unit.**
7. **Install a Base Operations and Interfaces (BOIx) unit.**
8. **Install a Transceiver Baseband (BB2x) unit.**
9. **Install a Transmission unit.**
10. **Install a Power Supply (PWSx) unit.**
11. *If* you are installing units to an indoor cabinet,

    Then

    See Installing a Bias Tee (BPxx) unit in an indoor BTS antenna box.
12. *If* you are installing units to an outdoor cabinet,

    Then

See Installing a Bias Tee (BPxx) unit inside an outdoor BTS antenna box, or Installing a Bias Tee (BPxx) unit outside an outdoor BTS antenna box.

4 Replacing a Wideband Combiner (WCxA) unit

4.1 Replacing a Wideband Combiner (WCxA) unit

Steps

1. **Remove the faulty WCxA unit from the BTS.**

   See *Removing a Wideband Combiner (WCxA) unit* for detailed information.

2. **Install the new WCxA unit in the BTS.**

   See *Installing a Wideband Combiner (WCxA) unit* for detailed information.

3. **Unblock the TRXs associated with the WCxA unit.**

4. **Make a test call on the TRXs.**

5. **Leave the site.**

4.2 Removing a Wideband Combiner (WCxA) unit

Steps

1. **Block the TRXs associated with the WCxA unit either locally or from the BSC.**

   Block the TRXs associated with the WCxA unit to be removed either locally with Nokia BTS Manager or request TRX lock from the BSC.

2. **Check the unit cable configuration.**

3. **Disconnect the unit cables.**

4. **Loosen the unit retaining screws with a T20 Torx driver.**

5. **Remove the WCxA unit.**

4.3 Installing a Wideband Combiner (WCxA) unit

Summary

UltraSite EDGE BTS cabinet holds a maximum of nine Wideband Combiner (WCxA) units. In Mini Outdoor cabinet, the WCxA unit is not in use.

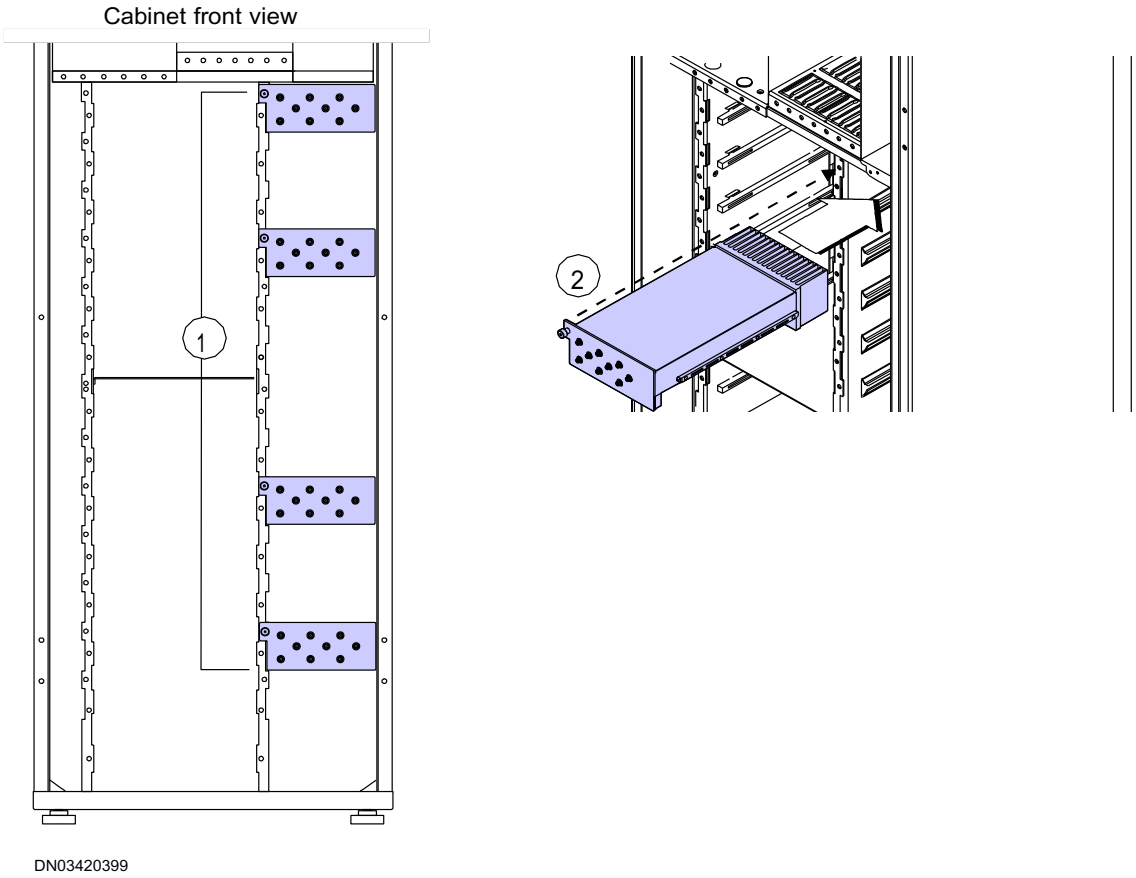


Figure 4. WCxA unit installation

1	WCxA
2	WCxA

Steps

1. **Use the handles on the front of the unit to slide the unit into the cabinet core.**

2. **Tighten the unit retaining screw.**

3. **Repeat the previous steps for each additional WCxA unit.**

4. **Connect the unit cables.**

5. **Unblock the BCF either locally using Nokia BTS Manager or from the BSC.**

6. **Make a test call on the TRXs.**

5 Replacing a Triple Wideband Combiner (WCxT) unit

5.1 Replacing a Triple Wideband Combiner (WCxT) unit

Steps

1. **Remove the faulty WCxT unit from the BTS.**

   See *Removing a Triple Wideband Combiner (WCxT) unit* for detailed instructions.

2. **Install the new WCxT unit in the BTS.**

   See *Installing a Triple Wideband Combiner (WCxT) unit* for detailed instructions.

3. **Unblock the TRXs associated with the WCxT unit.**

4. **Make a test call on the TRXs.**

5. **Leave the site.**

5.2 Removing a Triple Wideband Combiner (WCxT) unit

Steps

1. **Block the TRXs associated with the WCxT unit either locally or from the BSC.**

   Block the TRXs associated with the WCxT unit to be removed either locally with Nokia BTS Manager or request TRX lock from the BSC.

2. **Check the unit cable configuration.**

3. **Disconnect the unit cables.**

4. **Loosen the unit retaining screws with a T20 Torx driver.**

5. **Remove the WCxT unit.**

5.3 Installing a Triple Wideband Combiner (WCxT) unit

Summary

UltraSite EDGE BTS cabinet holds a maximum of four WCxT units. The following figure shows the WCxT units in slots 1, 4, 9, and 12. In Mini outdoor cabinet, the unit is not in use.

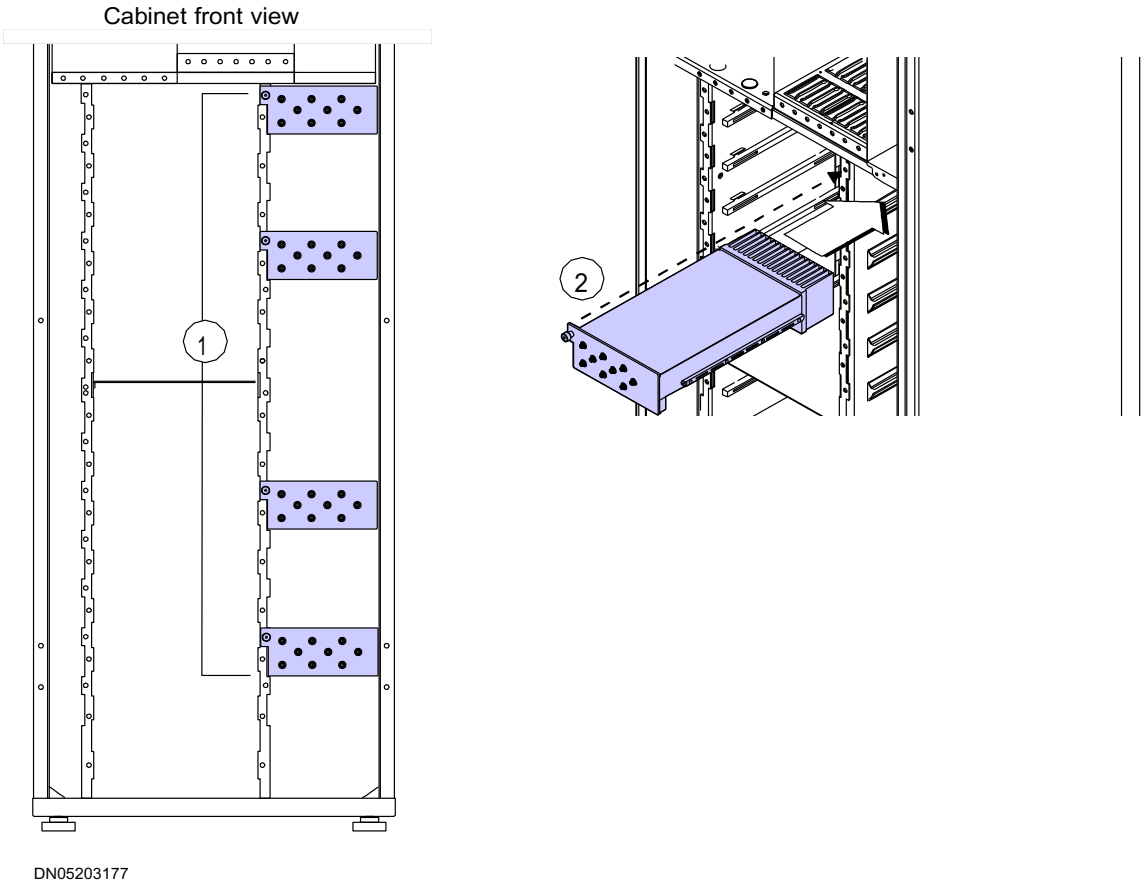


Figure 5. WCxT unit installation

1	WCxT
2	WCxT

Steps

1. **Use the tightening screw on the front of the unit to slide the unit into the cabinet core.**

2. **Tighten the unit retaining screw.**

3. **Repeat steps 1 and 2 for each additional WCxT unit.**

4. **Connect the unit cables.**

5. **Unblock the BCF either locally using Nokia BTS Manager or from the BSC.**

6. **Make a test call on the TRXs.**

6 Replacing a Remote Tune Combiner (RTxx) unit

6.1 Replacing a Remote Tune Combiner (RTxx) unit

Summary

Note

To prevent traffic interruption, Nokia recommends that you do not perform Hot insertion of RTxx units following the replacement of RTxx units.

Steps

1. **Remove the faulty RTxx unit from the BTS.**

   See *Removing a Remote Tune Combiner (RTxx) unit* for detailed instructions.

2. **Install the new RTxx unit in the BTS.**

   See *Installing a Remote Tune Combiner (RTxx) unit* for detailed instructions.

3. **Switch the Power Supply (PWSx) unit to ON.**

4. **Unblock the BCF either locally or from the BSC.**

   Unblock the BCF locally with Nokia BTS Manager, or request BCF unlock from the BSC.

5. **Make a test call on the TRXs.**

6. **Leave the site.**

6.2 Removing a Remote Tune Combiner (RTxx) unit

Summary

Note

To prevent traffic interruption following the replacement of RTxx units, it is recommended that you do not perform Hot insertion of RTxx units.

Steps

1. **Notify the appropriate personnel and block the BCF either locally or from the BSC.**

   Block the BCF locally with Nokia BTS Manager or request BCF lock from the BSC.

2. **Switch the PWSx units to standby mode.**

3. **Check the unit cable configuration.**

4. **Disconnect the unit cables.**

5. **Loosen the unit retaining screws with a T20 Torx driver.**

6. **Remove the RTxx unit.**

6.3 Installing a Remote Tune Combiner (RTxx) unit

Summary

In UltraSite EDGE BTS, two slots are available for RTxx units (upper and lower). The (RTxx) unit is not in use in Mini Outdoor cabinet.

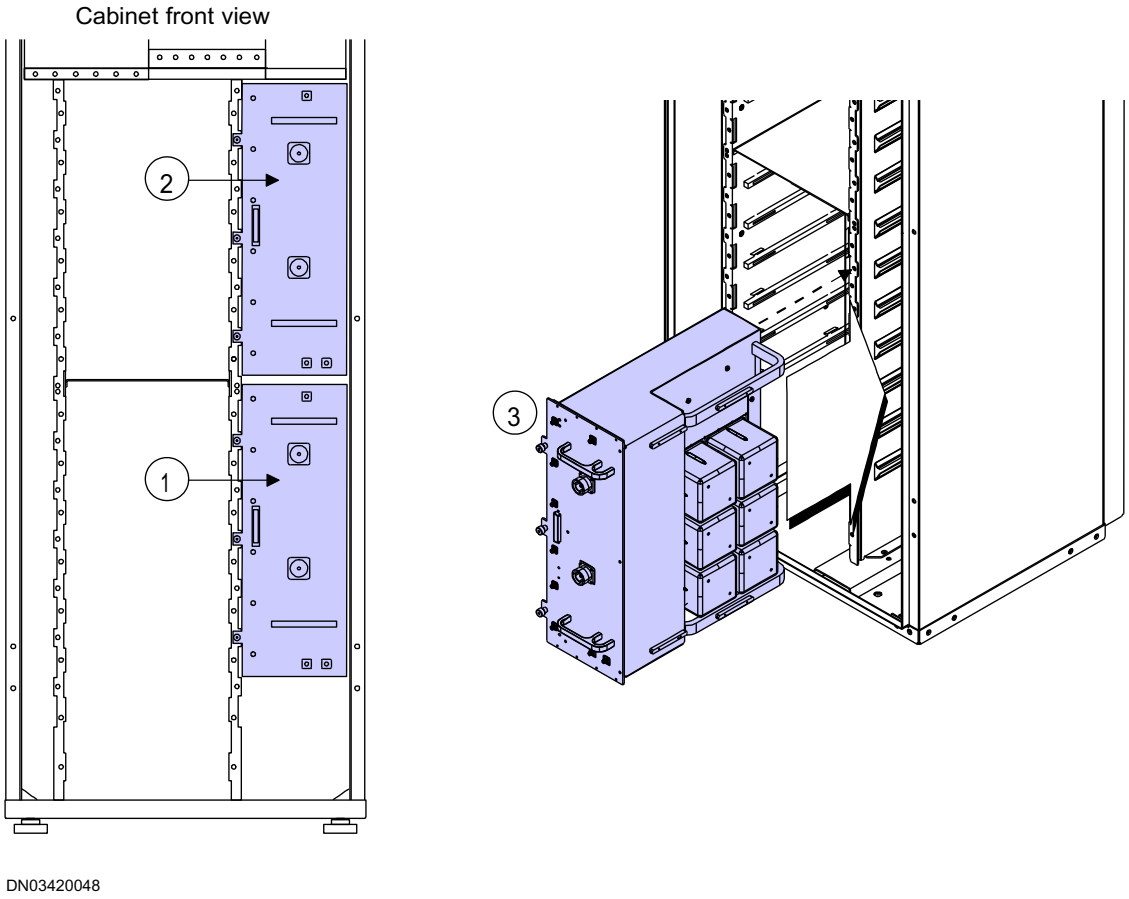


Figure 6. RTxx unit installation

1	RTxx #2
2	RTxx #1
3	RTxx

Steps

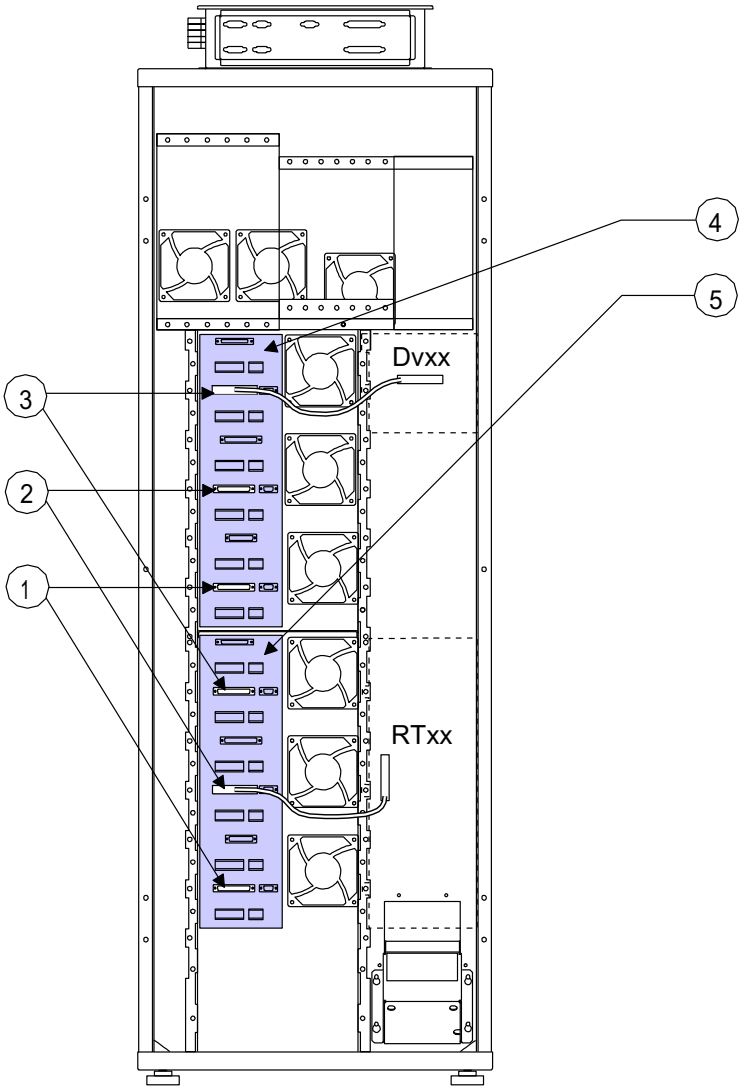
1. **Align the top and bottom RTxx unit guides with those on the rack.**
2. **Use the handles on the front of the unit to slide the unit into the cabinet.**
3. **Check that the rear connectors are fully engaged.**

4. **Tighten the unit retaining screws.**

5. **Connect the RTxx cable from the X14 connector on the RFU backplane to the RTxx unit.**

Note

You can only connect the RTxx cable to the centre D-37 connector on each RFU backplane, as shown in the following figure.



UltraSite cabinet core

DN03419022

1	X23
2	X14
3	X5
4	Upper RFU backplane
5	Lower RFU backplane

Figure 7. Installation of DVxx or RTxx power supply cables to the RFU backplane

6. Repeat steps 1 - 5 for each additional RTxx unit.

7 Replacing a Dual Variable Gain Duplex Filter (DVxx) unit

7.1 Replacing a Dual Variable Gain Duplex Filter (DVxx) unit

Steps

1. **Remove the faulty DVxx unit from the BTS.**

   See *Removing a Dual Variable Gain Duplex Filter (DVxx) unit* for detailed instructions.

2. **Install the new DVxx unit in the BTS.**

   See *Installing a Dual Variable Gain Duplex Filter (DVxx) unit* for detailed instructions.

3. **Switch the Power Supply (PWSx) units to ON.**

4. **Unblock the BCF either locally or from the BSC.**

   Unblock the BCF locally with Nokia BTS Manager or request BCF unlock from the BSC.

5. **Make a test call to the associated TRXs.**

6. **Leave the site.**

7.2 Removing a Dual Variable Gain Duplex Filter (DVxx) unit

Summary

Note

To prevent traffic interruption following the replacement of DVxx units, it is recommended that you do not perform Hot insertion of DVxx units.

Steps

1. **Notify the appropriate personnel and block the BCF either locally or from the BSC.**

   Block the BCF locally with Nokia BTS Manager or request BCF lock from the BSC.

2. **Switch the PWSx units to standby mode.**

3. **Note the unit cable configuration.**

4. **Disconnect the unit cables.**

5. **Loosen the unit retaining screws with a T20 Torx driver.**

6. **Remove the DVxx unit.**

7.3 Installing a Dual Variable Gain Duplex Filter (DVxx) unit

Summary

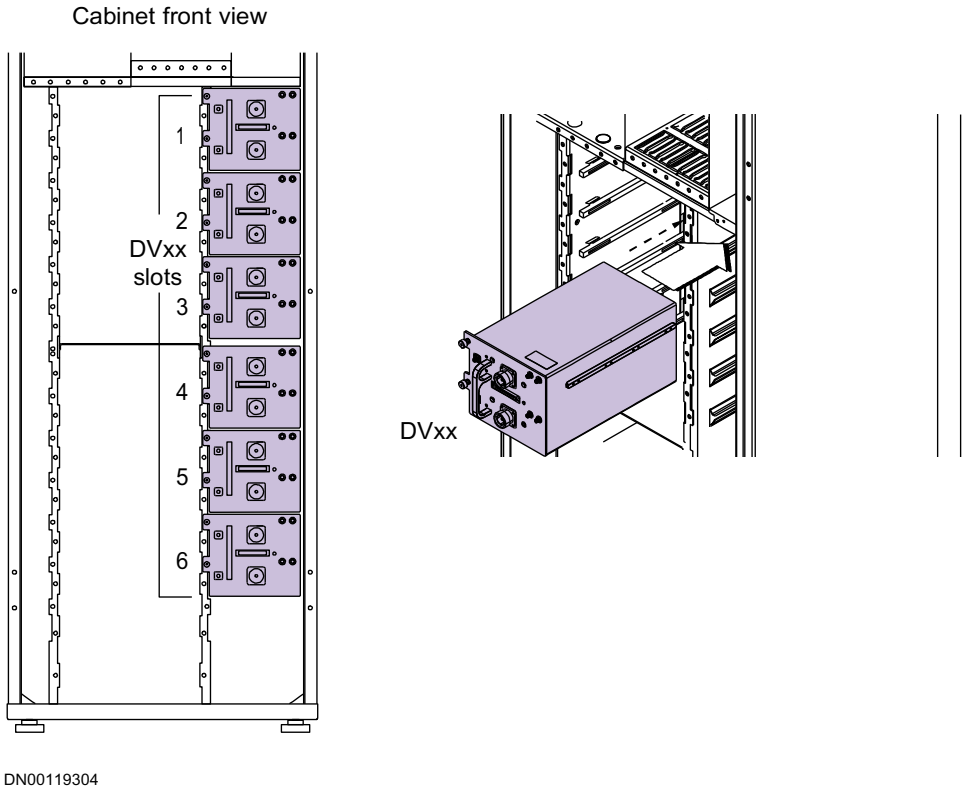


Figure 8. DVxx unit installation

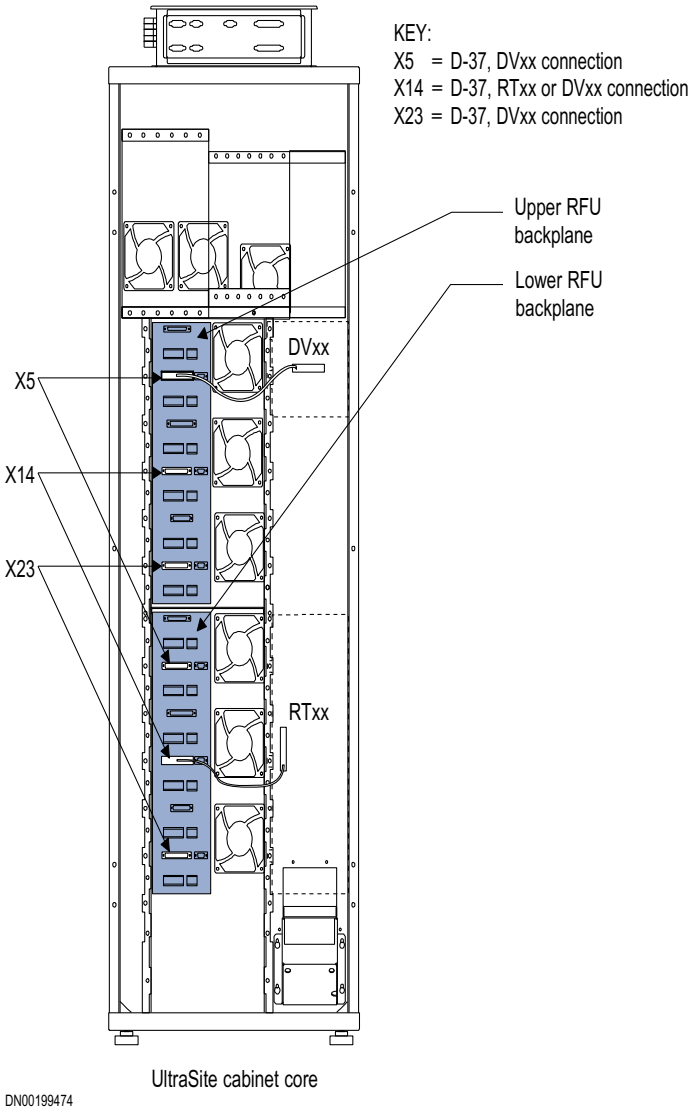


Figure 9. Installation of DVxx or RTxx power supply cables to the RFU backplane

The cabinet provides slots for up to six DVxx units, three in the upper and three in the lower right area of the cabinet.

The Mini Outdoor cabinet provides only two slots for DVxx units. See *Overview of installing GSM/EDGE units* for DVxx unit positions in the Mini Outdoor cabinet.

Steps

1. **Align the top and bottom RTxx unit (DVxx unit in Mini Outdoor) guides with those on the rack.**
2. **Use the handle on the front of the unit to slide the unit into the cabinet.**
3. **Check that the rear connectors are fully engaged.**
4. **Tighten the unit retaining screws.**
5. **Remove the connector cap from the backplane.**
6. **Connect the DVxx cable from the X14 connector on the RFU backplane to the DVxx unit.**
7. **Repeat steps 1 - 6 for each additional DVxx unit.**

8 Replacing a Dual Band Diplex Filter (DU2A) unit

8.1 Replacing a Dual Band Diplex Filter (DU2A) unit

Steps

1. **Remove the faulty DU2A unit from the BTS.**

   See *Removing a Dual Band Diplex Filter (DU2A) unit* for detailed instructions.

2. **Install the new DU2A unit in the BTS.**

   See *Installing a Dual Band Diplex Filter (DU2A) unit* for detailed instructions.

3. **Power ON the BTS.**

4. **Unblock the BCF either locally or from the BSC.**

   Unblock the BCF locally with Nokia BTS Manager or request BCF unlock from the BSC.

5. **Make a test call on the associated TRXs.**

6. **Leave the site.**

8.2 Removing a Dual Band Diplex Filter (DU2A) unit

Summary

The DU2A unit is mounted on top of the BTS cabinet.

Steps

1. Block the base control function (BCF) locally or from the BCS.

Block the BCF locally with Nokia BTS Manager or request BCF lock from the BSC.

2. Power down the BTS.

3. Remove DU2A units from the outside of the indoor cabinet antenna box.

a. On top of the antenna box, loosen the antenna cable from the DU2A unit.
b. Remove the DU2A unit from the antenna connectors.
c. Repeat steps a and b for additional DU2A units.

4. Remove DU2A units from inside the indoor cabinet antenna box.

a. Remove the antenna box cover.
b. Loosen and remove the site antenna cable(s) from the DU2A unit.
c. Remove the four screws that secure the pass-through plate on the antenna box.
d. Remove the connector from the pass-through plate.
e. Remove the DU2A unit from inside the antenna box.
f. Repeat steps a through e for additional DU2A units.
g. Replace the antenna box cover.

5. Remove DU2A from the outdoor cabinet antenna box.

a. Remove the antenna box cover.
b. Loosen the site antenna cable(s) from the DU2A unit.
c. Remove the four screws that secure the pass-through plate on the antenna box.
d. Remove the connector from the pass-through plate.
e. Remove the DU2A unit from the antenna box.
f. Repeat steps b through e for each additional DU2A unit.
g. Replace the antenna box cover.

8.3 Installing a Dual Band Diplex Filter (DU2A) unit

Summary

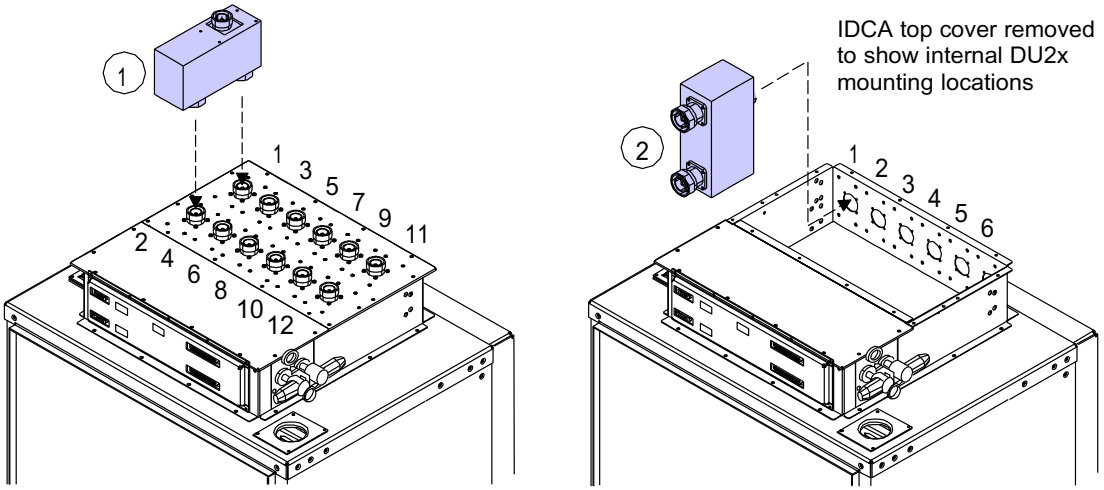


Figure 10. DU2A unit installation in Indoor cabinet

1	DU2x
2	DU2x

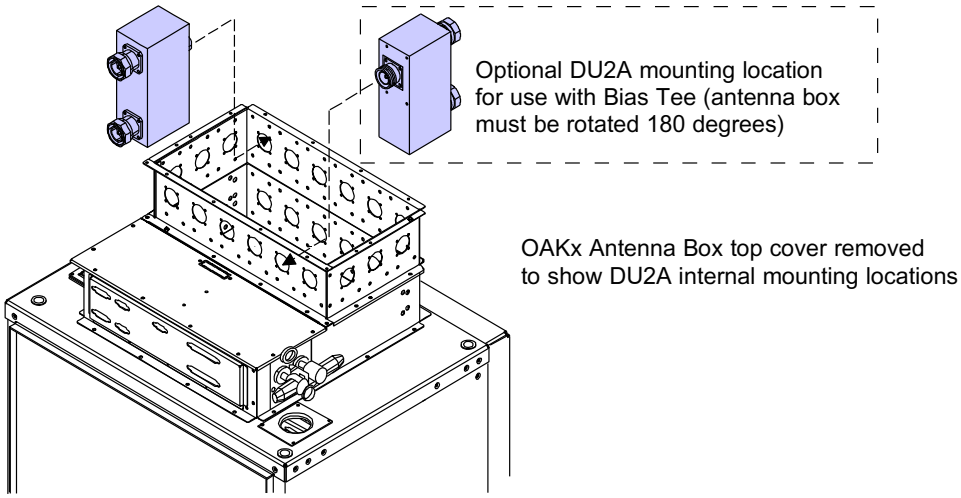


Figure 11. DU2A unit installation in Outdoor cabinet

You can install up to six DU2A units to the inside of the ODCA antenna box, or to the inside or outside of the IDCA antenna box, depending on your space requirements.

Steps

1. Install the DU2A unit to the outside of the IDCA antenna box.

a. Mount the DU2A unit to the antenna connectors on top of the antenna box.

b. Tighten the antenna cable to the DU2A unit.

c. Repeat steps a and b for additional DU2A units.

2. Install the DU2A unit inside the IDCA antenna box.

a. Remove the antenna box cover.

b. Mount the DU2A unit to the inside of the antenna box.

c. Insert the four retaining screws into the DU2A unit through the screw holes in the antenna box.

d. Tighten the site antenna cable(s) to the DU2A unit.

e. Repeat steps a - d for each additional DU2A unit.

f. Replace the antenna box cover.

3. Install the DU2A to an ODCA cabinet.

a. Remove the antenna box cover.
b. Mount the DU2A unit to the rear of the antenna box.
c. Insert the four retaining screws into the DU2A unit through the screw holes in the antenna box.
d. Tighten the site antenna cable(s) to the DU2A unit.
e. Repeat steps a - d for each additional DU2A unit.
f. Replace the antenna box cover.

9 Replacing a Transceiver (TSxx) unit

9.1 Replacing a Transceiver (TSxx) unit

Summary

Note

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

Note

Over-tightening causes stress on the connectors. Make sure a gap of 1.0 to 3.0 mm (0.04 to 0.12 in.) exists between the front flange of the unit and the cabinet when tightened.

Note

If you want to run the TRX test locally, the TRX must be blocked during the test. If you want to run the TRX test remotely, you must do it after you unblock the site.

Note

GSM 1900 TRX (TSPA) has been removed from the product portfolio. Take this into consideration when carrying out maintenance activities and replacing units.

The replacement unit for a TSPA is the TSPB.

Steps

1. **Notify BSC personnel before you remove or add units to Nokia UltraSite EDGE BTS.**

2. **Remove the faulty TSxx unit from the BTS.**

   See *Removing a Transceiver (TSxx) unit* for detailed instructions.

3. **Unpack the replacement TSxx unit from its protective package and check for damage.**

   Pay special attention to backside connectors and front RF connectors when checking the unit.

4. **Inspect the cabinet RFU backplane connectors.**

   Check the connectors with a hand lamp for any visual damage, such as bent pins, debris around the connector pins, misaligned pins, or any other abnormalities. If you need to clean up the RFU backplane connectors:

   a. Cut off the power to the BTS cabinet from the mains DC power breaker and batteries.
   b. Use compressed air to clean up the RFU connectors.
   c. Once you have cleaned up the RFU connectors, reconnect the power to the BTS cabinet.

5. **Install the new TSxx unit in the BTS.**

   See *Installing a Transceiver (TSxx) unit* for detailed instructions.

   If power problem, for instance short-circuit, occurs, follow the steps below. Otherwise, proceed to step 6.

a. Quickly remove the TSxx unit.
b. Cut off the power feed to the cabinet from the mains AC or DC breaker and the batteries.
c. Close the cabinet door, leave the site, and follow the incident from a safe distance. Act according to local procedures in case of a fire.

6. **Run the TSxx test from Nokia BTS Manager.**

7. **Use Nokia BTS Manager to unblock the TRXs associated with the TSxx unit.**

   If the TRX is locked from the BSC, NMS/2000 or NetAct, unlock from the BSC, NMS/2000 or Net Act (in this case, the reset is automatic).

8. **Make a test call on the TRXs.**

   If the TSxx LED is green when you make a test call, the new TSxx unit is operational. If the LED is yellow or red, check the alarms and run the TSxx test from the BSC, NMS/2000 or NetAct.

9. **Leave the site.**

9.2 Removing a Transceiver (TSxx) unit

Steps

1. **Before you touch the assembly, discharge to ground any electrostatic charges that may have accumulated by touching the ground stud with your bare hand.**

2. **Use a grounding wrist strap to remain discharged.**

   See *Connecting the antistatic wrist strap* for instructions.

3. **Block the TRX associated with the TSxx unit.**

   Use Nokia BTS Manager or request TRX lock from the BSC.

4. **Check the TSxx unit cable configuration.**

5. **Disconnect the TSxx unit cables.**

6. **Loosen the unit retaining screws with a T20 Torx driver.**

7. **Remove the TSxx unit.**

   The backplane connector is fragile. When removing a plug-in unit, pull it straight out of the backplane with no upward force.

9.3 Installing a Transceiver (TSxx) unit

Before you start

Before you start the installation, remove the connector caps prefitted in the Mini Outdoor cabinet.

Summary

Caution

The connector pins are fragile. Use minimum force to avoid breaking any connector pins.

Caution

The cabinet does not contain dust filters. Protect all unused connectors and slots in the outdoor cabinet with connector caps and sealing units.

Note

A connector cap is only necessary for outdoor installations.

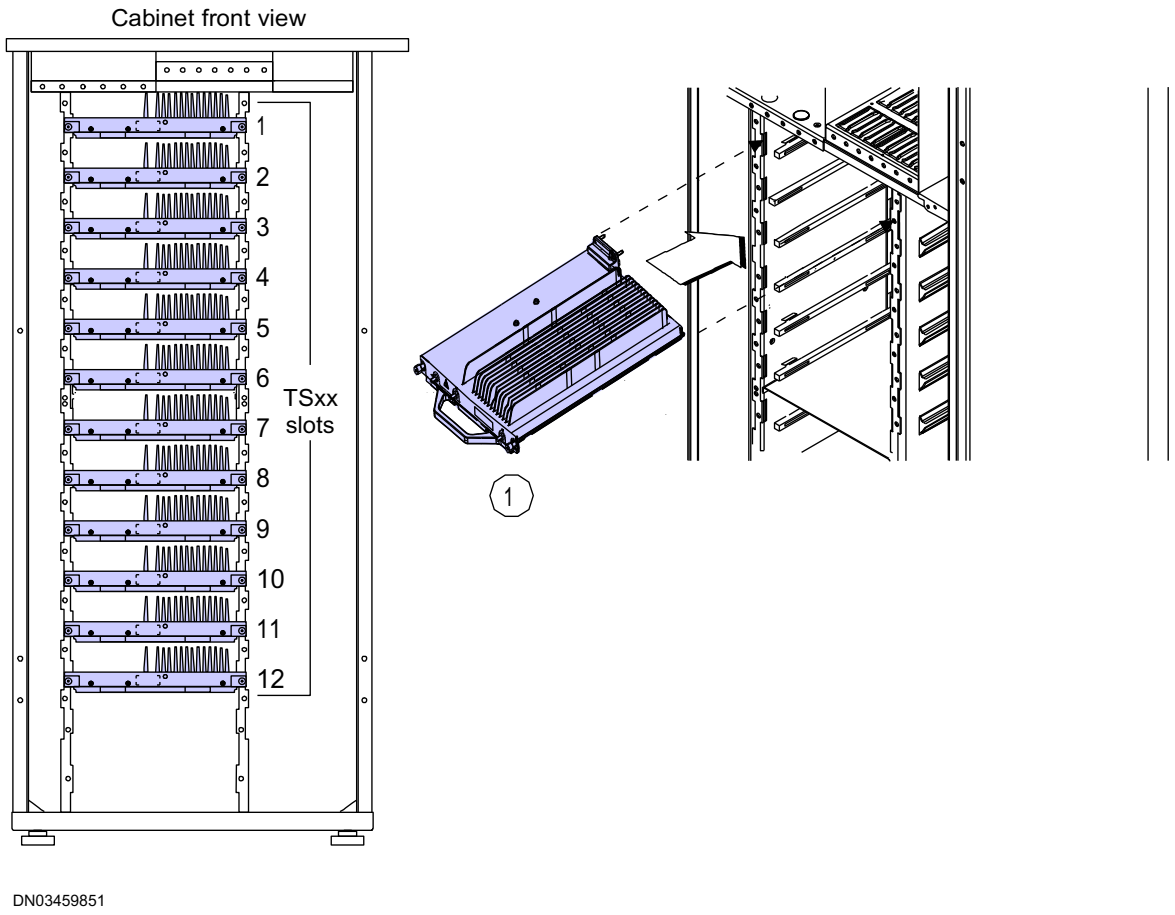


Figure 12. TSxx unit installation

1	TSxx

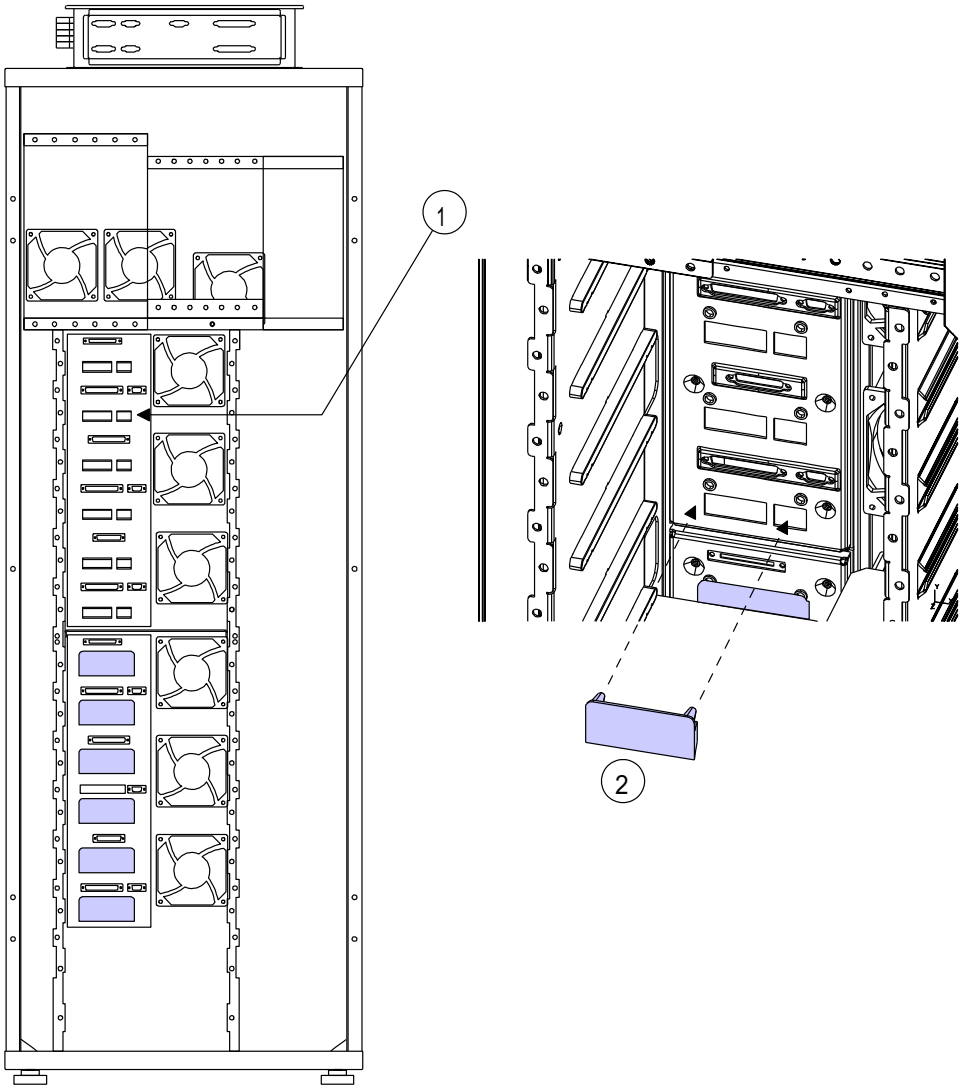


Figure 13. TSxx connector cap installation

1	TSxx connector (12 places per cabinet)
2	TSxx connector cap

The TSxx unit consists of one transmitter, one main receiver, and one diversity receiver. The slots in the middle of the cabinet can hold up to 12 TSxx units from top to bottom.

The Mini Outdoor cabinet provides only four slots for TSxx units. See *Overview of installing GSM/EDGE units* for TSxx unit positions in the Mini Outdoor cabinet.

Steps

1. **Insert the TSxx unit into a free slot.**
2. **Push the TSxx unit into the RFU backplane carefully but promptly and without hesitation.**
3. **Tighten the retaining screws to 1.0 Nm (0.74 ft lb) with a T20 Torx driver.**
4. **Repeat steps 1, 2 and 3 for each additional TSxx unit.**
5. **Connect TSxx cables.**
6. **Place one connector cap on each unused connector slot (outdoor cabinet only).**

10 Replacing a Receiver Multicoupler (M2xA or M6xA) unit

10.1 Replacing a Receiver Multicoupler (M2xA or M6xA) unit

Steps

1. **Remove the faulty M2xA or M6xA unit from the BTS.**

   See *Removing a Receiver Multicoupler (M2xA or M6xA) unit* for detailed instructions.

2. **Install the new M2xA or M6xA unit in the BTS.**

   See *Installing a Receiver Multicoupler (M2xA or M6xA) unit* for detailed instructions.

3. **Power on the BTS.**

4. **Unblock the TRXs associated with the M2xA or M6xA unit.**

5. **Make a test call on the TRXs.**

6. **Leave the site.**

10.2 Removing a Receiver Multicoupler (M2xA or M6xA) unit

Steps

1. **Block the TRXs associated with the M2xA or M6xA locally or from the BSC.**

Block the TRXs associated with the M2xA or M6xA to be removed with Nokia BTS Manager or request TRX lock from the BSC.

2. **Note the unit cable configuration.**

3. **Disconnect the unit cables.**

4. **Loosen the unit retaining screws with a T20 Torx driver.**

5. **Remove the M2xA or M6xA unit.**

10.3 Installing a Receiver Multicoupler (M2xA or M6xA) unit

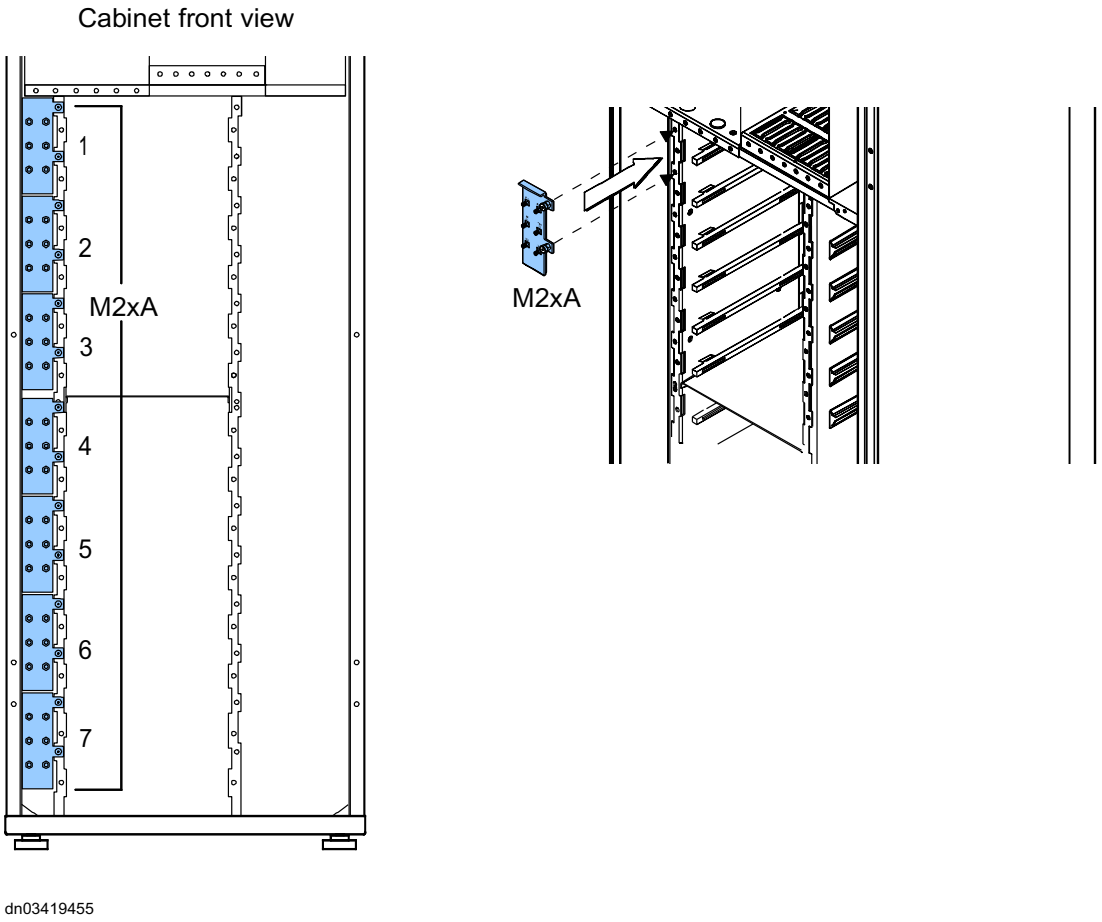
Summary

UltraSite EDGE BTS cabinet core holds up to seven M2xA units or two M6xA units (on the left side).

The Mini Outdoor cabinet provides two slots for M2xA units. See Figure *Unit positions in Mini Outdoor cabinet* in section *Overview of installing GSM/EDGE units* for M2xA unit positions in the Mini Outdoor cabinet.

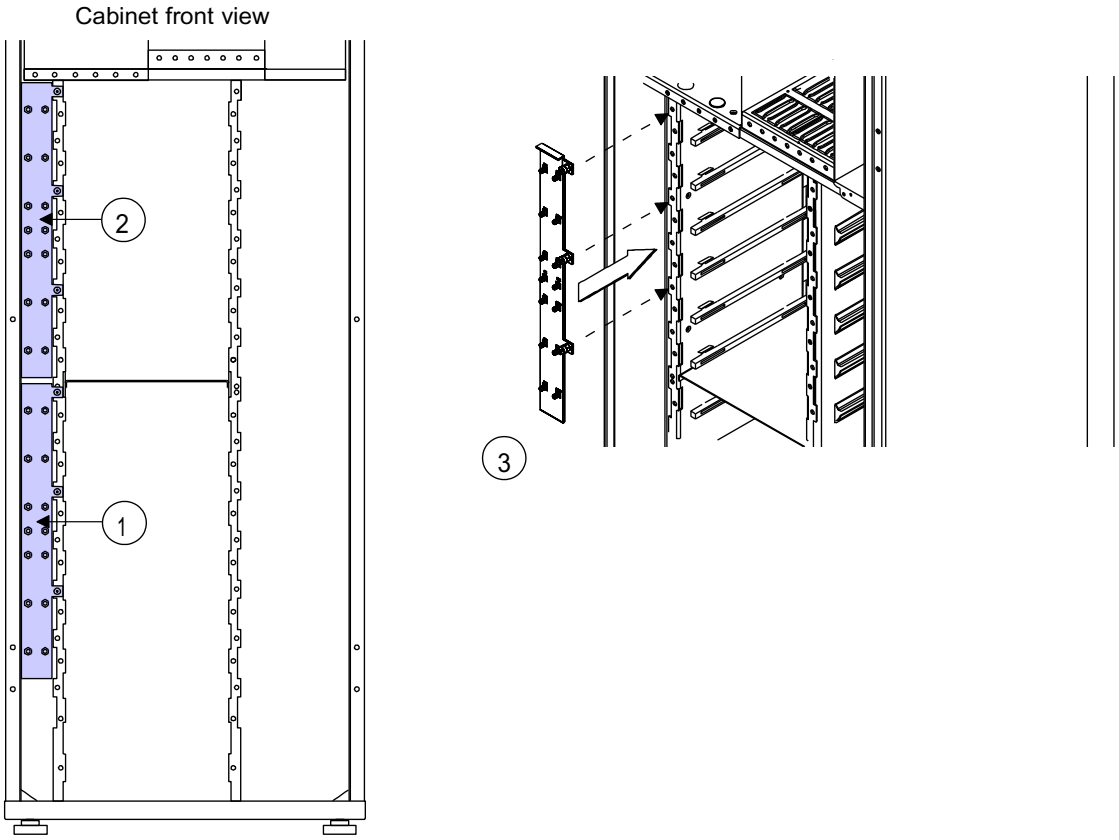
Note

M6xA unit cannot be fitted in Mini Outdoor cabinet.



1	M2xA

Figure 14. M2xA unit installation



1	M6xA #2
2	M6xA #1
3	M6xA

Figure 15. M6xA unit installation

Steps

1. **Mount the unit in the left front area of the cabinet.**
2. **Tighten the unit retaining screws.**
3. **Repeat steps 1 and 2 for each additional M2xA or M6xA unit.**

11 Replacing a Base Operations and Interfaces (BOIx) unit

11.1 Replacing a Base Operations and Interfaces (BOIx) unit

Summary

Note

Over tightening causes stress on the connectors. Make sure a gap of 1.0 to 3.0 mm (0.04 to 0.12 in) exists between the front flange of the unit and the cabinet when tightened.

Steps

1. **Remove the faulty BOIx unit from the BTS.**

   See *Removing a Base Operations and Interfaces (BOIx) unit* for detailed instructions.

2. **Install the new BOIx unit in the BTS.**

   See *Installing a Base Operations and Interfaces (BOIx) unit* for detailed instructions.

3. **Power ON the BTS.**

4. **Unblock the TRXs associated with the BOIx unit.**

5. **Make a test call on the TRXs.**

6. **Leave the site.**

11.2 Removing a Base Operations and Interfaces (BOIx) unit

Steps

1. **Block the base control function (BCF) locally or from the BSC.**

   Block the BCF locally with Nokia BTS Manager or request BCF lock from the BSC.

2. **Loosen the upper and lower retaining screws on the unit.**

3. **Remove the BOIx unit.**

11.3 Installing a Base Operations and Interfaces (BOIx) unit

Before you start

See *Overview of installing GSM/EDGE units* for BOIx unit position in the Mini Outdoor cabinet. In the Mini outdoor cabinet, there is a metal plate preinstalled in the cabinet to cover the BOIx unit. When the unit is installed to the cabinet, reinstall the plate. Cable ties holding the BOIx cable must not be removed.

Summary

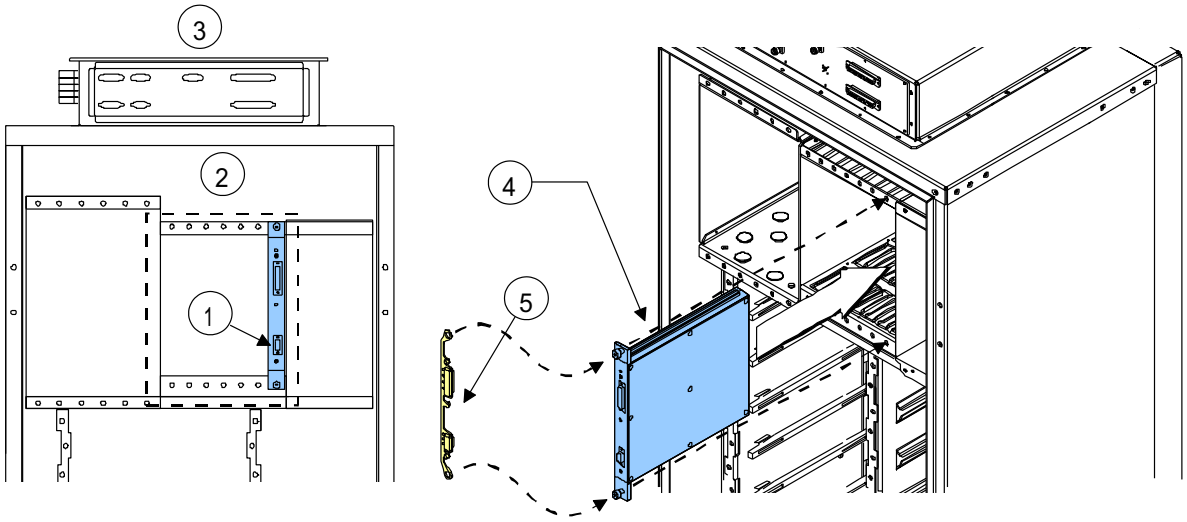


Figure 16. BOIx unit installation

1	BOIx
2	Common rack area
3	Cabinet front view
4	BOIx
5	Rubber cover

Steps

1. Insert the BOIx unit into the far right slot of the common rack area of the cabinet (bottom left in the Mini Outdoor cabinet).

Warning

Ensure that the Faraday cage surrounding the FXC cards is not removed (or that it is replaced if already removed) before removing the BOIA card.

2. **Attach a rubber cover to the BOIx unit (not applicable to Mini outdoor cabinet).**

3. **Tighten the retaining screws.**

12 Replacing a Transceiver Baseband (BB2x) unit

12.1 Replacing a Transceiver Baseband (BB2x) unit

Summary

Note

Over tightening causes stress on the connectors. Make sure a gap of 1.0 to 3.0 mm (0.04 to 0.12 in) exists between the front flange of the unit and the cabinet when tightened.

Note

If you want to run the TRX test locally, the TRX must be blocked during the test. If you want to run the TRX test remotely, you must do it after you unblock the site.

Steps

1. **Remove the faulty BB2x unit from the BTS.**

   See *Removing a Transceiver Baseband (BB2x) unit* for detailed instructions.

2. **Install the new BB2x unit in the BTS.**

   See *Installing a Transceiver Baseband (BB2x) unit* for detailed instructions.

3. **Power on the BTS.**

4. **Unblock the TRXs associated with the BB2x unit.**

5. **Make a test call on the TRXs.**

6. **Leave the site.**

12.2 Removing a Transceiver Baseband (BB2x) unit

Steps

1. **Block the TRXs associated with the BB2x.**

   Block the TRXs locally with Nokia BTS Manager or request BCF lock from the BSC.

2. **Loosen the upper and lower unit retaining screws.**

3. **Remove the faulty BB2x unit.**

12.3 Installing a Transceiver Baseband (BB2x) unit

Purpose

The BB2x unit consists of two independent baseband modules. Each module functions with its respective TSxx unit. The cabinet provides slots from left to right for up to six BB2x units.

The Mini Outdoor cabinet provides only two slots for BB2xx units. See *Overview of installing GSM/EDGE units* for BB2xx unit positions in the Mini Outdoor cabinet.

Before you start

Caution

Always use an ESD wrist strap when handling units labelled with the ESD sign. Labelled units are sensitive to electrostatic discharge.

Note

The far right slot of the common subrack area in the Mini Outdoor cabinet is reserved for installation of a BOIx unit. Do not install BB2x unit into this slot.

Note

BB2x units can be in any position when flexible cross-connects are used. You must install them from left to right in sequential order when the flexible cross-connects are not used.

Note

A dummy unit is required for each unused BB2x slot in an OAKx.

Summary

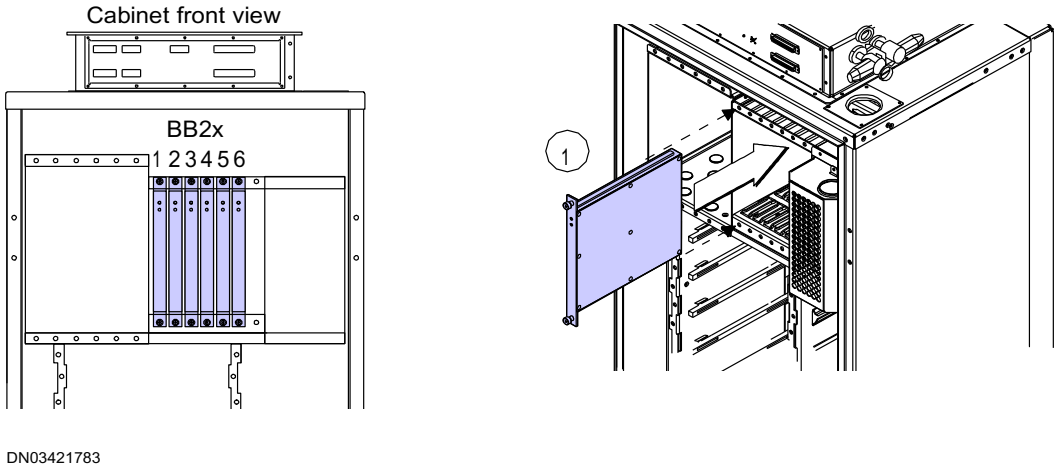


Figure 17. BB2x unit installation

1	BB2x

Steps

1. **Remove the BB2x unit from its protective package and check for visible damage.**
2. **Insert the BB2x unit into an unused slot.**
3. **Tighten the retaining screws to 1.0 Nm (0.74 ft lb) with a T20 Torx driver.**
4. **Repeat steps 1 - 3 for each additional BB2x unit.**
5. **Install dummy BB2x units, if required.**

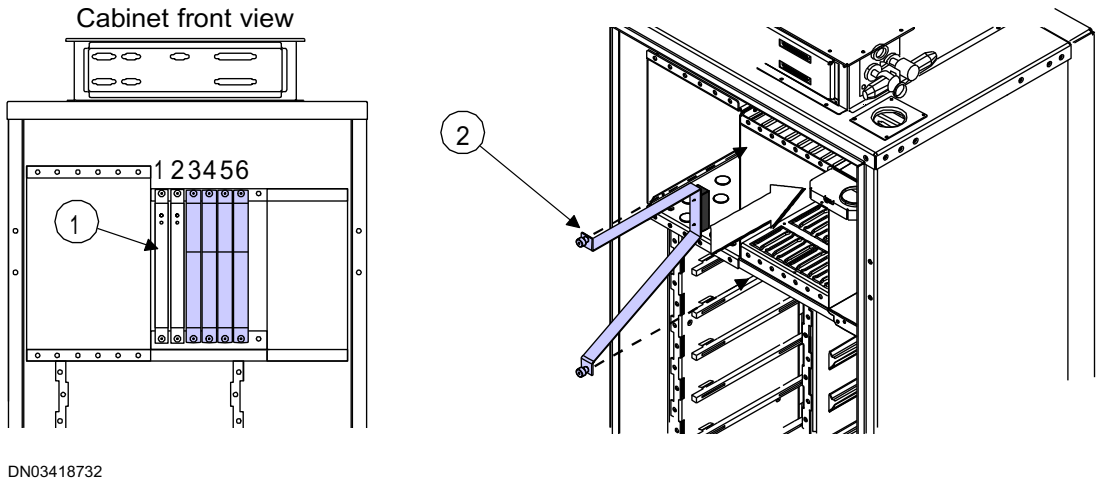


Figure 18. Dummy BB2x unit installation

1	BB2x
2	Dummy BB2x unit

a. Unpack the dummy BB2x unit from its protective package and check for visible damage.
b. Insert the dummy unit into the unused slot.
c. Tighten the unit retaining screws with a T20 Torx driver.
d. Repeat steps a - c for additional unused slots.

6. **Recycle the packing material.**

13 Replacing a Transmission (VXxx) unit

13.1 Overview of replacing transmission units

Summary

The following table shows whether it is possible to physically replace the FXC transmission unit when the power is on, whether traffic is affected by the replacement, and whether UltraSite BTS Hub or MetroHub Manager is needed when changing units.

Table 1. Replacing units

Unit	Hot insert/ remove possible	Traffic affected	Manager needed	Note
New FXC unit	Yes	No	Yes	
Replaced FXC unit	Yes	Yes	Yes	

Note

If a master unit is removed, all traffic going through the node is cut.

If a slave unit is removed, only the traffic going through that particular unit is cut.

Note

If a FXC unit is replaced with a FXC unit of a different type (e.g. replacing FXC E1/T1 with FXC RRI), all cross-connections stored on the master unit (DNCU) for the replaced unit are automatically deleted.

Note

If the master unit is replaced, pure SDH-SDH cross-connections will remain working. Also, direct cross-connections from Flexbus 1 to Flexbus 2 on a slave FXC RRI unit will remain working.

You can:

Steps

1. **Replace a transmission unit with a unit of the same type**

   Or

   Replace a transmission unit with a unit of a different type

13.2 Removing transmission unit (VXxx) cables

Summary

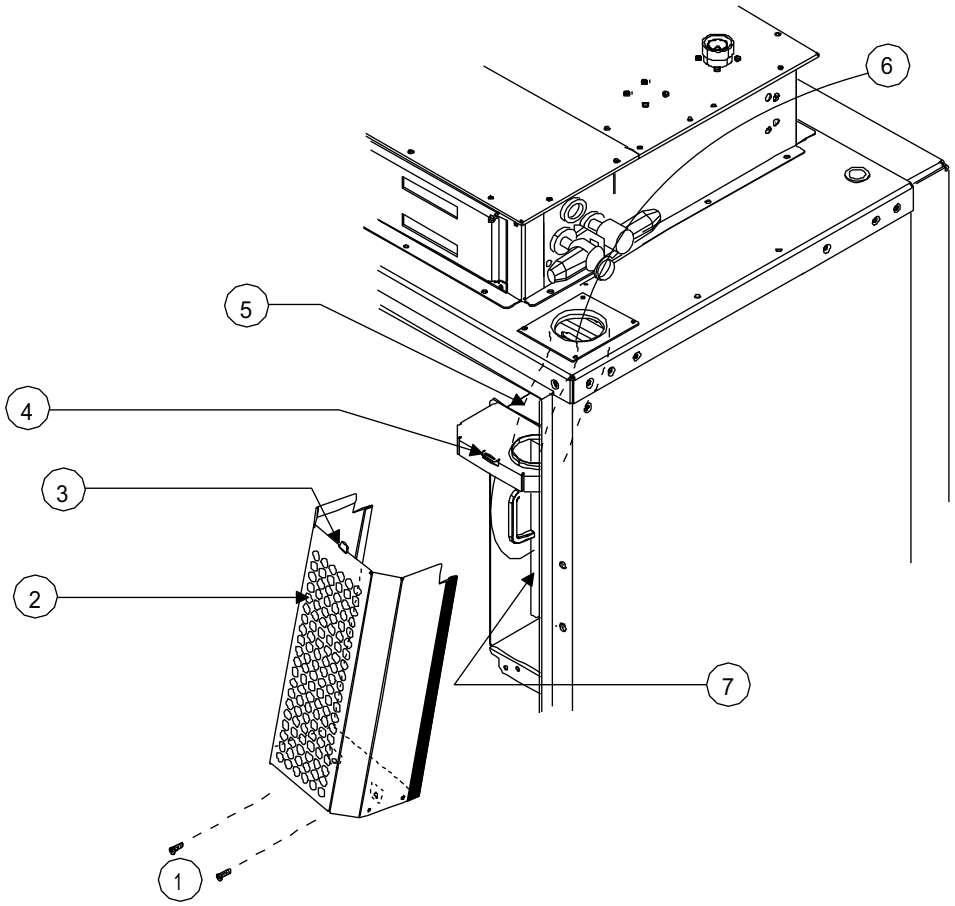


Figure 19. Route of the Abis cable with VXxx unit cover removed from the IDCA cabinet

Steps

1. **Power down the BTS.**
2. **Turn the main power breaker OFF.**
3. *If* you are removing the Abis cable,

   Then

Disconnect the Abis cable and pull it through the EMC sleeve.

4. *If* you are removing the cable from the radio transmission unit,

   Then

   Perform the following steps:
   a. Loosen the connector nut.
   b. Remove the RX/TX Flexbus cable from the TNC connector on the FXC RRI transmission unit.

5. *If* you are removing the cable from the wireline transmission unit,

   Then

   Perform the following steps:
   a. Loosen the connector nut.
   b. Remove the TX/RX cable from the front of the unit.

6. *If* you are removing the cable from the FXC STM-1 transmission unit,

   Then

   Perform the following steps:
   a. Remove (slide) the weather cover from the LC connector.
   b. Remove the protective caps from the LC connector plugs.
   c. Remove the TX cable from the upper port.
   d. Remove the RX cable from the lower port.

13.3 Replacing a transmission unit with a unit of the same type

Purpose

If a transmission unit is faulty, you can replace it with another unit of the same type by removing the faulty unit and then inserting a replacement unit.

After this, use the *Restore Backup Settings* feature to update the settings of the replaced unit into the new unit from the previously saved backup file.

If the backup file, node offline file, or site configuration file does not correspond to the current settings, you must manually reconfigure the settings.

Note

If the replacement unit has been used previously, it must be set to factory defaults.

Note

The *Restore Backup Settings* feature requires that the equipping of the transmission units in UltraSite BTS Hub or MetroHub Manager matches the node file. You cannot add or remove units while using the *Restore Backup Settings* feature.

Steps

1. **Make a backup file as described in Saving node information in a file.**

   This step must be performed independently, if a slave or a master unit is replaced.

2. To replace a slave unit (other than slot 1 unit)

Steps

a. Remove the unit without uninstalling it logically.

b. Insert the new unit.

The cross-connections and other node settings related to the unit you want to replace are not removed.

c. Check unit software version.

All units within a cabinet must have the same software version. If there is a version mismatch, this is indicated by a blue border in the equipment view and a 221 Version mismatch alarm. Upgrade the software version, if necessary. See *Downloading FXC transmission unit software*.

d. Reset the unit to factory default settings.

Select **Maintenance → Resets**.

This step can be omitted if it is certain that the unit is in factory-default state. If the factory reset is performed, ensure that only the unit, not the node, is reset.

e. If you replaced an FXC RRI unit and there are outdoor units installed, power Flexbus on now.

f. Restore backup settings.

For instructions, see *Restoring backup settings from a file*.

Select only the unit to which the settings should be sent.

3. To replace a master unit (slot 1 unit)

Steps

a. Uninstall the transmission unit logically with the manager if not broken.

b. Remove the unit.

c. Insert the new unit.

Further information

All node settings are saved in the master unit, and thus the node settings as well as the master unit settings must be restored from the backup file.

d. Disconnect and reconnect the node manager (unless the default speed, 9600, is used).

e. Install all the units logically.

f. Check unit software version.

All units within a cabinet must have the same software version. If there is a version mismatch, this is indicated by a blue border in the equipment view and a 221 Version mismatch alarm. Upgrade the software version, if necessary. See *Downloading FXC unit software*.

g. Reset the node to factory default settings by selecting Maintenance → Resets...

h. If you replaced an FXC RRI unit and there are outdoor units installed, power Flexbus on now.

i. Restore backup settings.

For instructions, see *Restoring backup settings from a file*.

Select **Select all** so that all settings are sent.

13.4 Replacing a transmission unit with a unit of a different type

Before you start

Note

If you replace a transmission unit with a unit of a different type, all settings and cross-connections are lost.

Steps

1. In the manager, connect to a node or open a node file.

2. Point to the unit to be replaced and click the right mouse button to access the Equipment window pop-up menu.

3. Select the Uninstall Unit pop-up menu command.

The uninstalled unit can no longer be used.

4. Physically remove the uninstalled unit.

5. Physically install the new unit.

Physically install the new unit as follows:

a. Slide the unit into the slot. A units can be installed in any slot, with the exception of the following:
   - Both FXC STM-1 and FXC Bridge must be installed for SDH functionality. Install them side by side, with the FXC Bridge unit on the left, if possible.
   - Do not install an FXC STM-1 unit in the first slot, as the FXC STM-1 does not support node master functionality.
   - Do not install more than one FXC STM-1 unit, or more than one FXC Bridge unit.

b. Press the unit carefully against the backplane.

c. Fix and tighten the unit retaining screws with a T10 Torx screwdriver.

6. Disconnect and reconnect the node manager.

7. Click the right mouse button to access the Equipment window pop-up menu.

8. Select the Install Unit pop-up menu command.

9. Check the settings of the unit.

When you installed the unit in step 8, the unit manager menu appeared in the main menu bar (for instance, **FXC STM-1**). Check the settings of the unit through the unit manager menu.

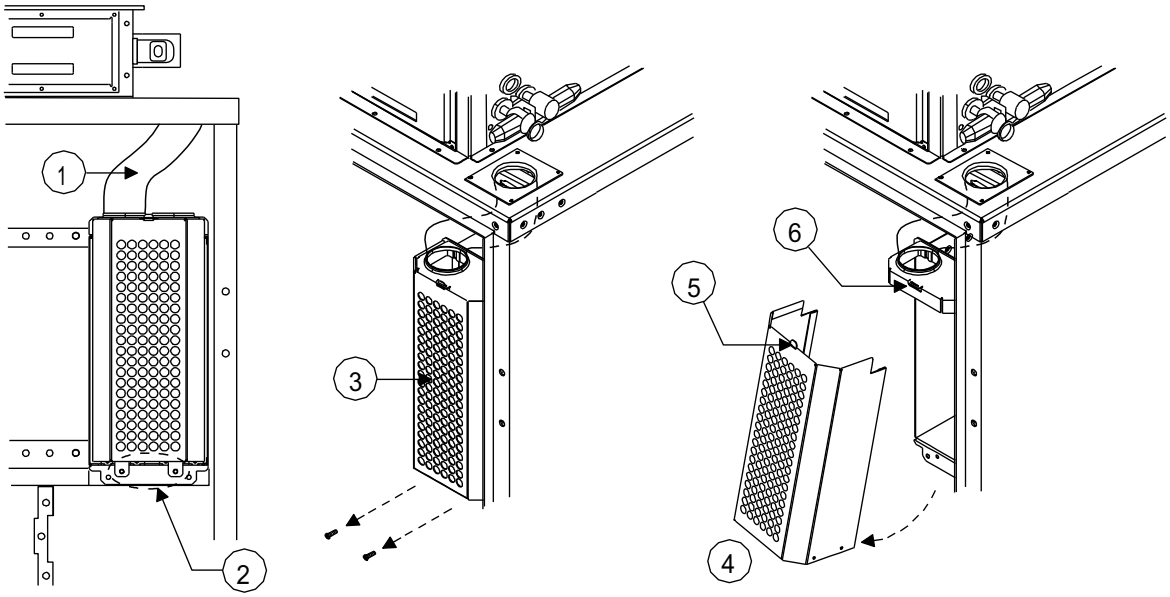
Expected outcome

The new unit is ready for use.

13.5 Removing a Transmission (VXxx) unit

Summary

Indoor cabinet front view



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1	Cable sleeve
2	Screws (2x)
3	Transmission unit cover
4	Transmission unit cover, removed
5	Tab
6	Slot

Figure 20. Transmission unit cover removal

Steps

1. Block the base control function (BCF) locally or from the BSC.

Block the BCF locally with Nokia BTS Manager or request BCF lock from the BSC.

2. If required, save the node file before removing the unit to save the settings.

a. Connect to the transmission node locally with Nokia UltraSite BTS Hub Manager software. The software unit starts and connects to the node.
b. Click each unit once in the **Equipment** window so that the information is read and can be saved.
c. Choose **Save As** from the **File** menu and specify a name and location for the node file.
d. Quit Nokia UltraSite BTS Hub Manager.

3. **Remove the two screws from the Transmission unit cover.**

4. **Pull the bottom of the Transmission unit cover away from the EMC Shield box while you pull down to release the tab.**

   Set the cover aside until you reconnect the interface cables.

5. **Disconnect the Transmission unit cables.**

6. **Loosen the upper and lower retaining screws of the unit with a T10 Torx driver.**

7. **Uninstall the unit logically so that all the unit settings are removed from the node.**

8. **Remove the Transmission unit by pulling the unit out from the front.**

9. **Open the retaining screws of the unit with a T10 Torx driver and remove the unit physically.**

Note

When removing power system units, first remove the power supply unit (DSUx) in the left slot and then remove the power interface panel (DIPx). This order makes it easier to remove the units.

13.6 Installing a Transmission (VXxx) unit

Summary

The upper right cabinet holds up to four VXxx units. The unit positions are 1 to 4 from left to right.

See *Overview of installing GSM/EDGE units* for VXxx unit positions in the Mini Outdoor cabinet.

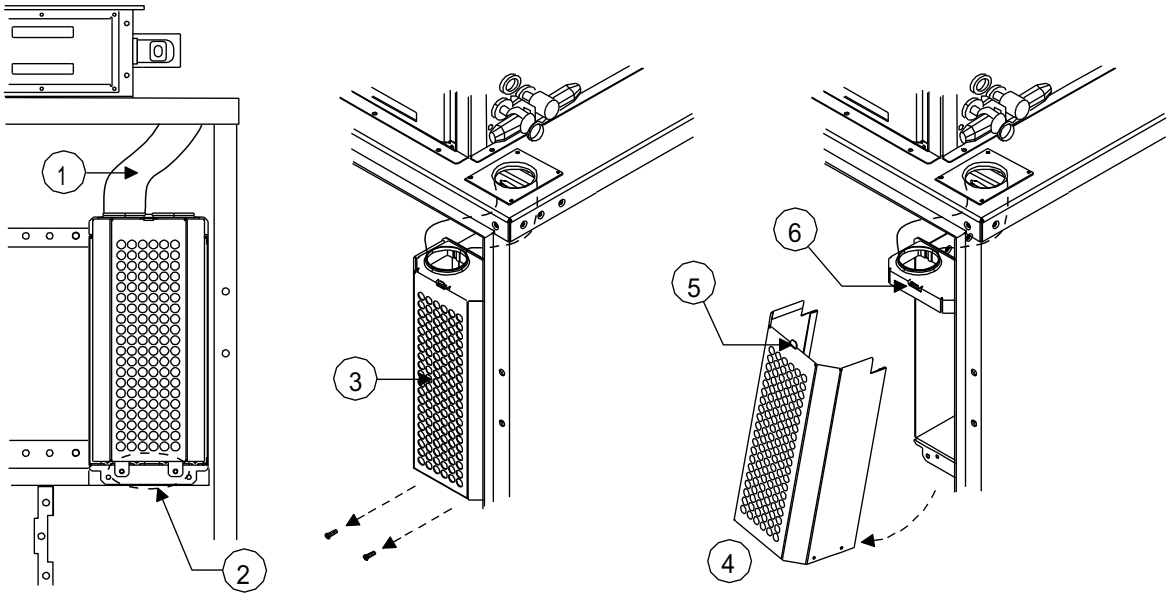
You can install only one FC E1/T1 transmission unit per cabinet, and you must use slot 1 (far left). You can install up to four FXC transmission units, but you must install one of the units in slot 1. The other units can be installed in any slot, with the exception of the following:

- Both FXC STM-1 and FXC Bridge must be installed for the intended SDH functionality. If there is no FXC Bridge present, the FXC STM-1 unit will be limited in operation.

  Install the FXC STM-1 and FXC Bridge units side by side with the FXC Bridge unit on the left, if possible.
- Do not install an FXC STM-1 unit in the first slot, as the FXC STM-1 does not support node master functionality.
- Do not install more than one FXC STM-1 unit or more than one FXC Bridge unit.

The indoor cabinet has only one EMC sock.

Indoor cabinet front view



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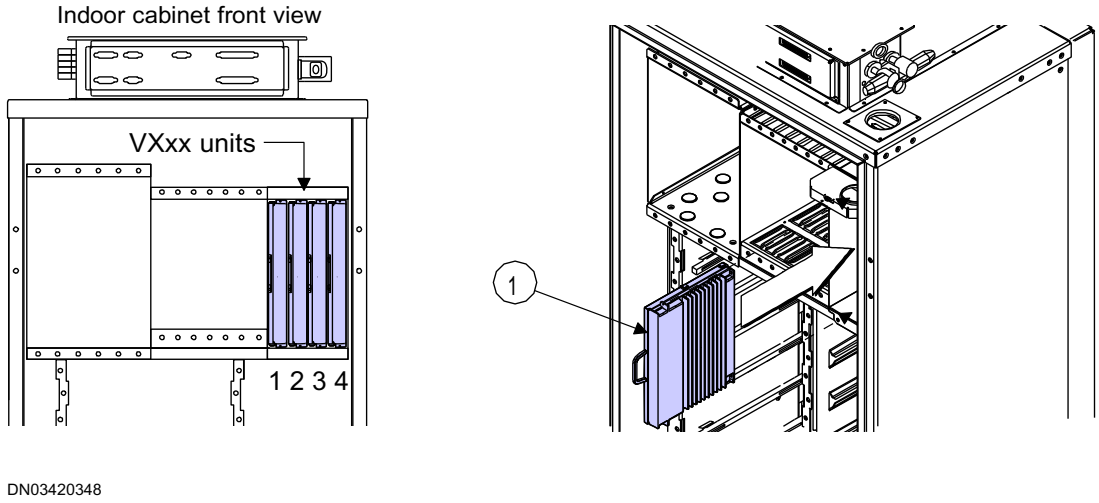
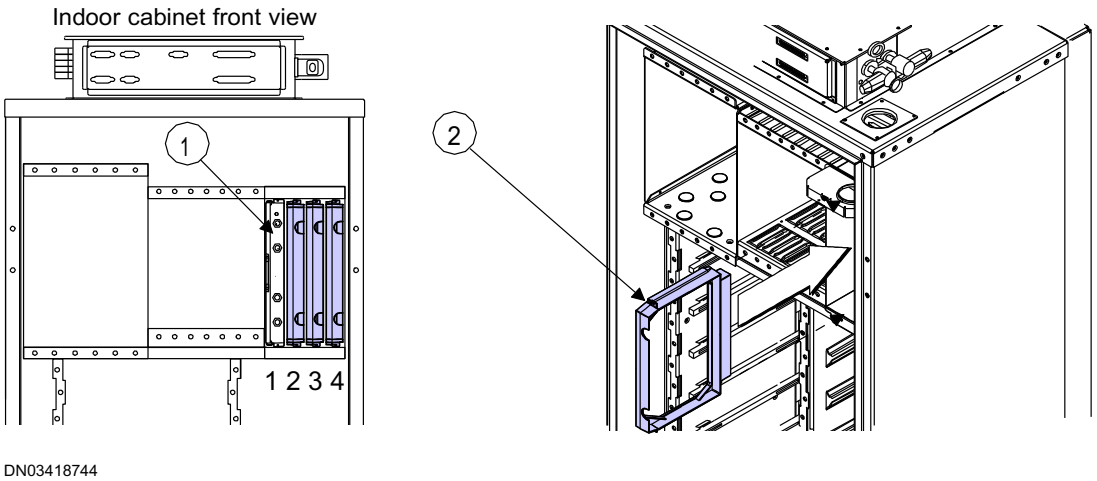
1	Cable sleeve
2	Screws
3	Transmission unit cover
4	Transmission unit cover, removed Screws
5	Tab
6	Slot

Figure 21. Removing VXxx unit cover from UltraSite EDGE BTS cabinet



1	VXxx unit

Figure 22. VXxx unit installation in UltraSite EDGE BTS cabinet



1	VXxx unit
2	VXxx unit Dummy transmission unit

Figure 23. Dummy Transmission unit installation

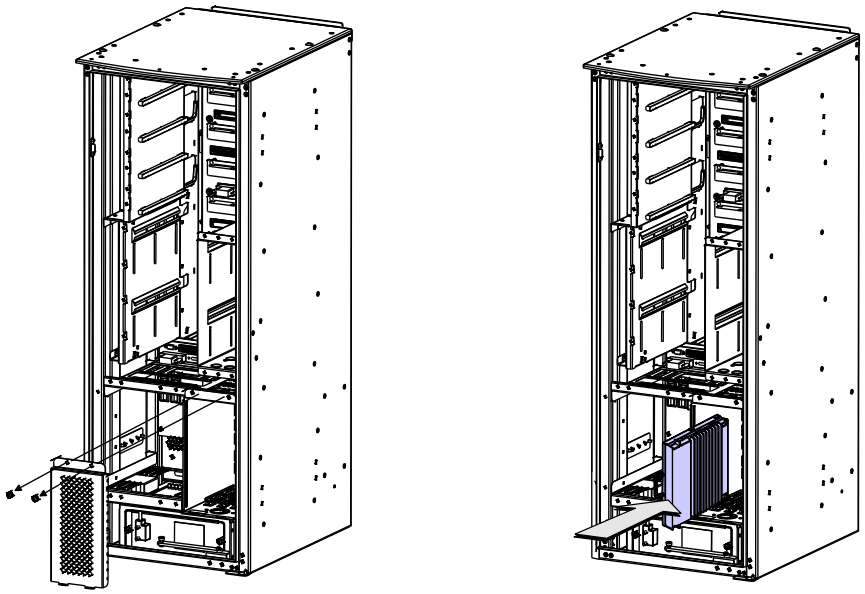


Figure 24. Removing VXxx unit cover and installing VXxx unit in Mini Outdoor cabinet

Steps

1. **Remove the VXxx unit cover.**
   a. Remove the two screws from the VXxx unit box.
   b. Pull out the bottom of the VXxx unit cover while pulling down to disengage the tab.
   c. Remove the cover and set aside until after you route the interface cables.

2. **Install VXxx units.**

Caution

The backplanes and connectors are fragile. Do not force the transmission (VXxx) unit into position during installation. Gently tilt the rear of the transmission (VXxx) unit up to engage the backplane connector.

---

   a. Insert the VXxx unit into the cabinet.
   b. Tighten the retaining screws.
   c. Repeat steps a and b for each additional VXxx unit.

3. **Install dummy VXxx unit.**
   a. Insert the dummy unit into an unused slot.
   b. Tighten the two retaining screws.
   c. Repeat steps a and b for each additional dummy VXxx unit.
   d. Recycle the packing material.

4. **Install VXxx unit box cover.**
   a. After you route the interface cables, place the cover on the VXxx unit box.
   b. Insert and tighten the two screws until the cover is flush on the VXxx unit box.

14 Replacing a Power Supply (PWSx) unit

14.1 Replacing a Power Supply (PWSx) unit

Summary

Note

Removing all PWSA/PWSB units from a BTS drops all traffic from the BTS and affects other BTSs chained or connected to the same transmission node. If one PWSx unit is defective but working, install the new PWSx unit in the open slot. Power it on before you remove the faulty PWSx to prevent interruption of service.

Steps

1. **Remove the faulty PWSx unit from the BTS.**

   See *Removing a Power Supply (PWSx) unit* for detailed instructions.

2. **Install the new PWSx unit in the BTS.**

   See *Installing a Power Supply (PWSx) unit* for detailed instructions.

3. **Cable a DC filter module to the PWSC unit.**

4. **Power on the BTS.**

5. **Leave the site.**

14.2 Removing a Power Supply (PWSx) unit

Summary

Note

Removing all PWSx units from a BTS drops all traffic from the BTS and affects other BTSs chained or connected to the same transmission node.

Steps

1. **To remove PWSA/PWSB units, perform the following steps:**
   a. Turn the PWSA/PWSB unit to be removed to the stand by mode.
   b. Loosen the PWSx unit retaining screws with a T20 Torx driver.
   c. Remove the PWSA/PWSB unit from the cabinet.

2. **To remove PWSC units, perform the following steps:**
   a. Notify the appropriate personnel and block the BCF.
      You can block the BCF either locally, using Nokia BTS Manager, or request BCF lock from the BSC.
   b. Switch the PWSC units to stand by mode.
   c. Switch the mains power breaker off.
   d. Remove the protective rubber boots from the power input cable terminals and remove the cables from the front of the PWSC.
   e. Loosen the PWSC unit retaining screws with a T20 Torx driver.
   f. Remove the PWSC unit from the cabinet.

14.3 Installing a Power Supply (PWSx) unit

Summary

You can install two PWSA or PWSC units or three PWSB units into the BTS cabinet. PWSA and PWSC units are fully redundant in installations of six TSxx units or less.

See *Overview of installing GSM/EDGE units* for PWSx unit positions in the Mini Outdoor cabinet.

Steps

1. **Move backplane connectors for PWSA or PWSC installation (not applicable when installing units in Mini Outdoor cabinet).**

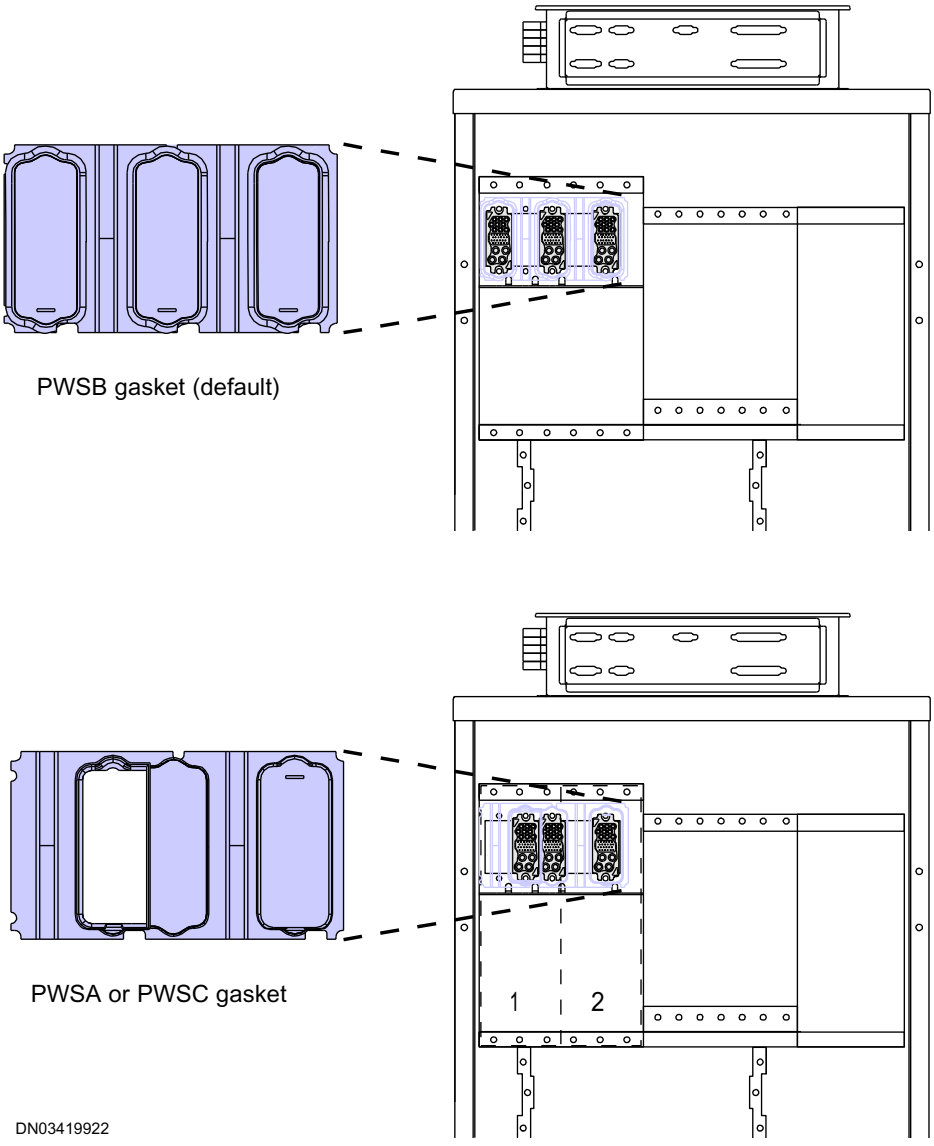


Figure 25. PWSA, PWSB, and PWSC gasket installation

Note

Gaskets only apply to outdoor installations.

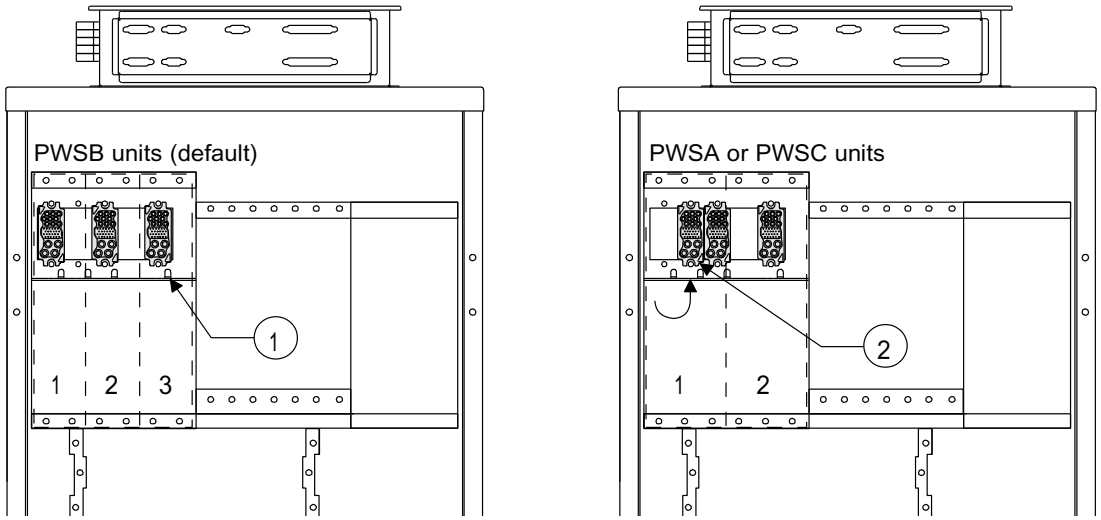


Figure 26. Moving the backplane connector to install the PWSA or PWSC

1	Hole for PWSx locating pin (four places)
2	Relocated connector

a. Remove the default PWSB gasket from the connector.
b. Remove the two screws that secure the far left connector to the backplane.
c. Slide the connector to the right and align it with the screw holes.
d. Replace the two screws.
e. Install the PWSA gasket.

2. Install AC or DC power supply units.

Warning

Danger of lethal voltages! Make sure that the mains power breaker is off before repositioning the backplane connectors of the PWSx power-supply unit.

Caution

Do not insert PWSx units if the power supply switch is in the ON position.

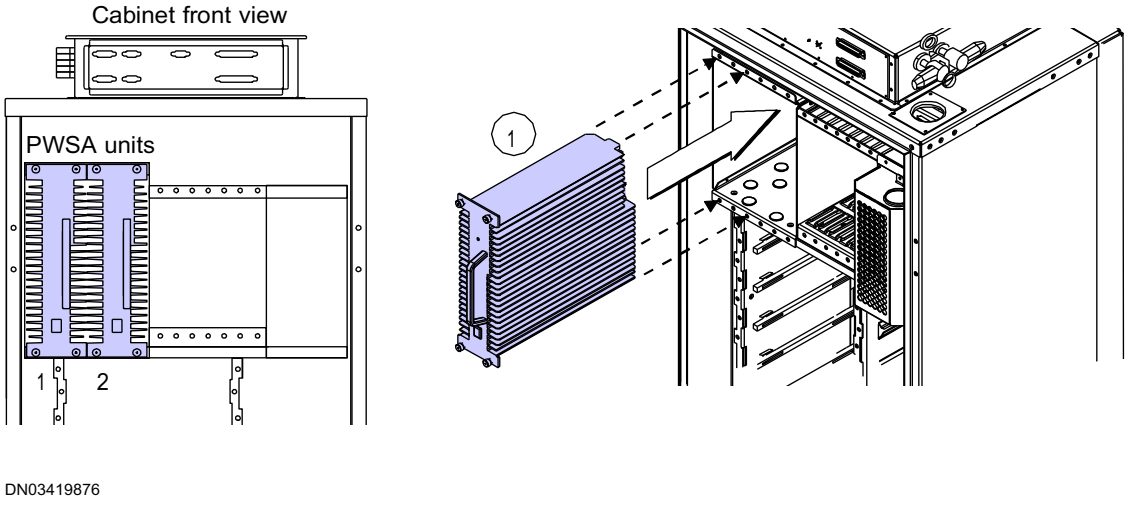


Figure 27. PWSA unit installation

1	PWSA

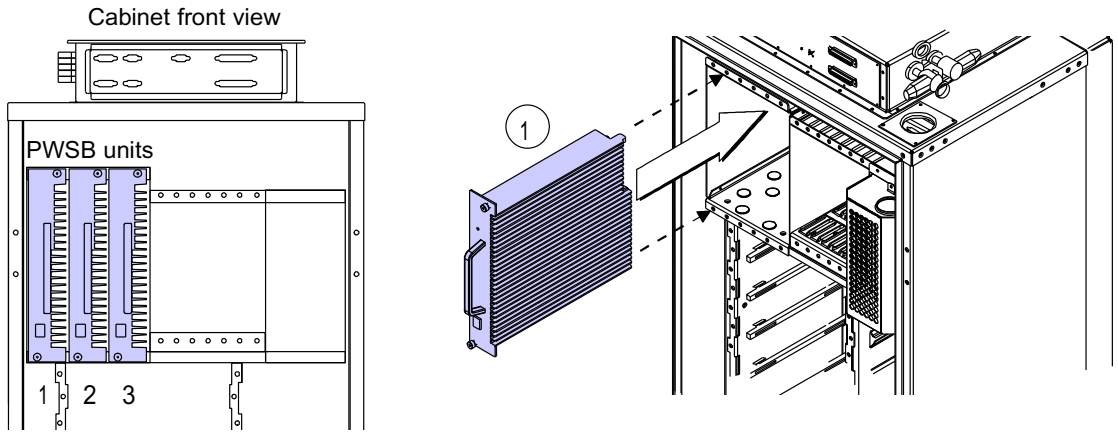


Figure 28. PWSB unit installation

1	PWSB

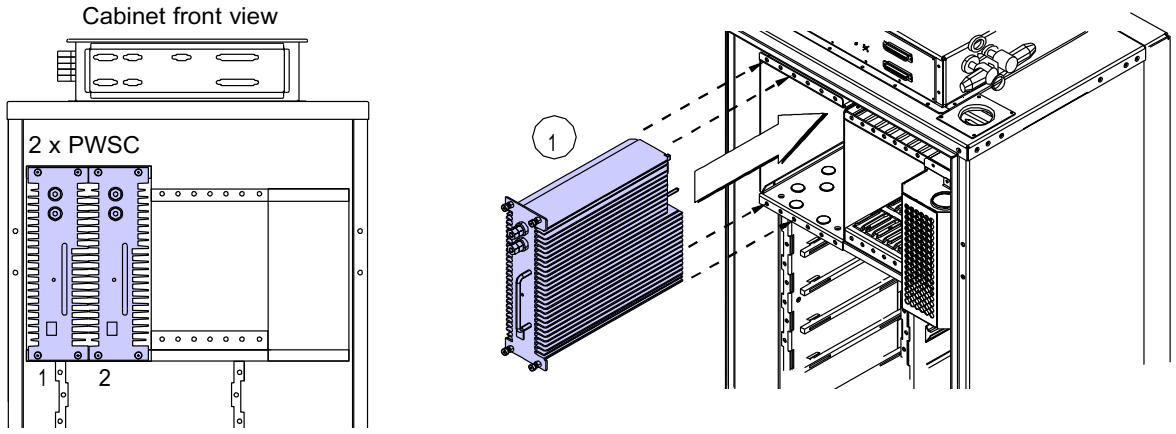


Figure 29. PWSC unit installation

1	PWSC

Note

The default -48 VDC Filter module is replaced with +24 VDC Filter module (DCFB) for PWSC unit installation.

a. Ensure that the power supply switch of the PWSx unit is in STAND BY position.

b. Slide the PWSx unit into the top left area of the cabinet (middle right area in the Mini Outdoor cabinet). Ensure that the locating pins are within the cabinet locating holes.

Note

Ensure that the locating pin for the power supply connector engages with the locating hole in the rack.

c. Tighten the PWSx retaining screws.

d. Repeat steps a - c for each additional PWSx unit.

15 Replacing a Bias Tee (BPxx) unit

15.1 Replacing a Bias Tee (BPxx) unit

Steps

1. **Remove the faulty BPxx unit from the BTS.**

   See *Removing a Bias Tee unit* for detailed instructions.

2. *If* you are installing in the antenna box of an indoor cabinet

   Then

   see Installing a Bias Tee unit in an indoor BTS antenna box.

3. *If* you are installing inside the antenna box of an outdoor cabinet

   Then

   see Installing a Bias Tee unit inside an outdoor BTS antenna box.

4. *If* you are installing outside the antenna box of an outdoor cabinet

   Then

   see Installing a Bias Tee unit outside an outdoor BTS antenna box.

5. **Unblock the BCF either locally or from the BSC.**

   Unblock the BCF locally with Nokia BTS Manager or request BCF unlock from the BSC.

6. **Leave the site.**

15.2 Removing a Bias Tee (BPxx) unit

Steps

1. Block the Base control function (BCF) locally or from the BCS.

Block the BCF locally with Nokia BTS Manager or request BCF lock from the BSC.

2. Power down the BTS.

3. *If* you are removing the BPxx unit from the indoor cabinet antenna box,

Then

Remove the BPxx using the following steps:

a. On top of the cabinet, disconnect the power supply and antenna monitoring cables from the BPxx unit to the BPxx interface.
b. Loosen and disconnect the antenna box connector from the BPxx unit.
c. Disconnect the power supply and antenna monitoring cables from the BPxx unit.
d. Remove the antenna cable connectors from the BPxx unit.
e. Repeat steps a through d for additional BPxx units.

4. *If* you are removing the BPxx unit from inside the outdoor cabinet antenna box,

Then

remove the BPxx using the following steps:

a. Remove the 16 screws from the box cover and remove the cover.
b. Disconnect the power supply and optional VSWR antenna monitoring cables from the BPxx interface to the BPxx termination plate on the antenna box.
c. Loosen and disconnect the power supply and antenna monitoring cables from the BPxx interface to the BPxx termination plate.
d. Disconnect the power supply and optional VSWR antenna monitoring cables from the BPxx unit.
e. Remove the antenna cable connectors from the BPxx unit.
f. Repeat steps a through e for additional BPxx units.

5. *If* you are removing the BPxx unit from outside the outdoor cabinet antenna box,

Then

remove the BPxx using the following steps:

a. Disconnect the power supply and antenna monitoring cables from the BPxx unit to the BPxx interface.

b. Loosen and disconnect the BPxx unit from the connector.

c. Disconnect the power supply and antenna monitoring cables from the BPxx unit.

d. Remove the antenna cable connectors from the BPxx unit.

e. Repeat steps a through d for each additional BPxx unit.

15.3 Installing a Bias Tee (BPxx) unit in an indoor BTS antenna box

Summary

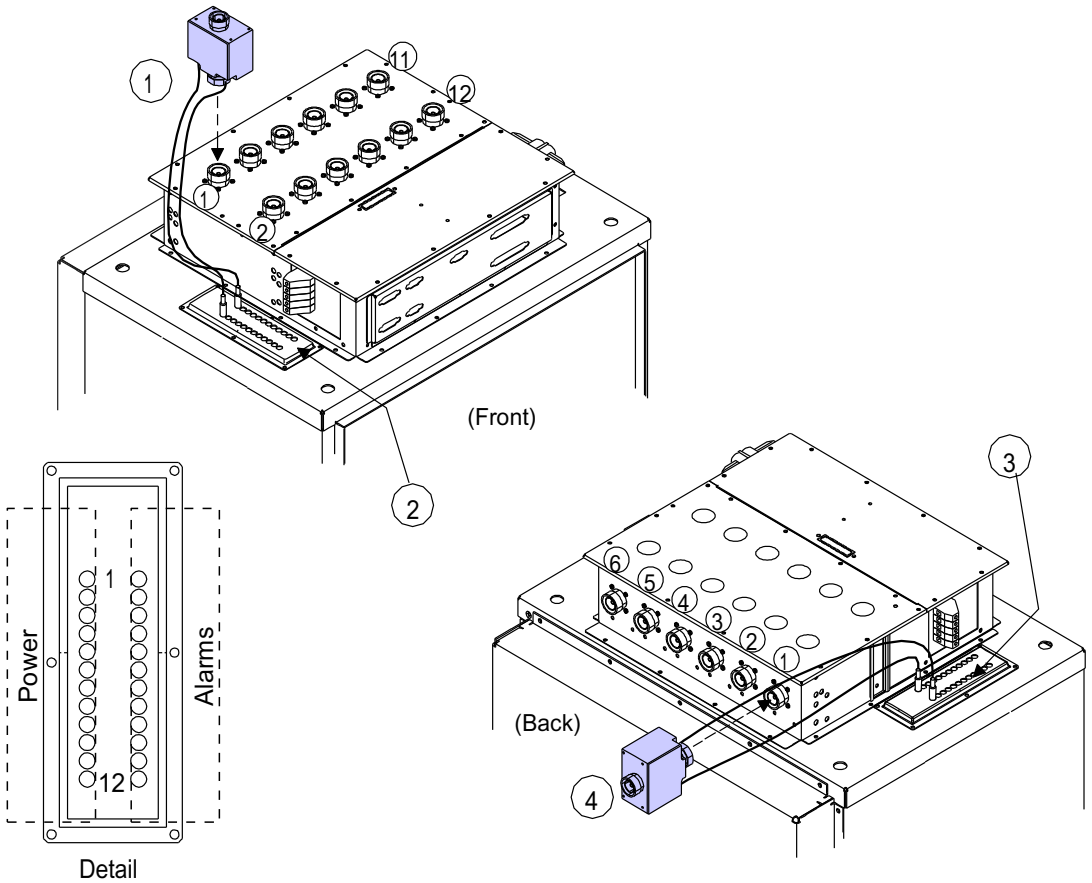


Figure 30. BPxx installation in Indoor cabinet

1	Bias Tee top mount
2	Bias Tee interface
3	Bias Tee interface

4	Bias Tee back mount

Steps

1. **Connect the power supply and antenna monitoring cables to the BPxx unit.**

2. **Install and tighten the BPxx unit to the antenna box connector to 25 Nm (18.44 ft-lb).**

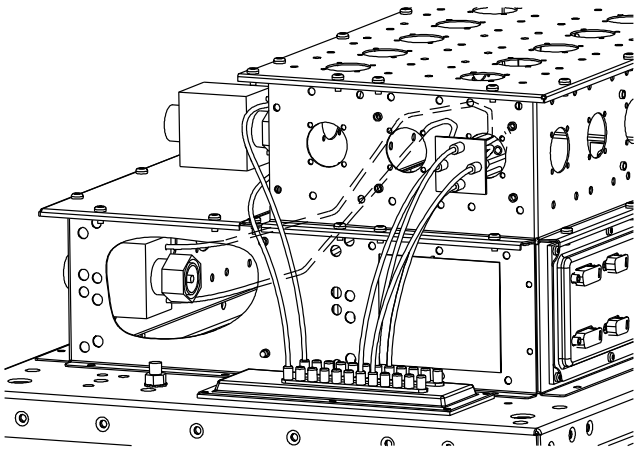
3. **Connect the power supply and antenna monitoring cables from the BPxx unit to the BPxx interface on top of the cabinet.**

4. **Repeat steps 1 - 3 for additional BPxx units.**

15.4 Installing a Bias Tee (BPxx) unit inside an outdoor BTS antenna box

Summary

If more than six Bias Tee units are required, the unit is installed inside the outdoor BTS antenna box.



DN70113727

Figure 31. Installing a Bias Tee (BPxx) unit inside an outdoor BTS antenna box

1	Bias Tee unit
2	Bias Tee termination plate
3	Bias Tee interface

Note

When installing the BPxx unit inside the outdoor cabinet, rotate the BPxx interface board by 180 degrees to complete the cabling inside the cabinet. If the AC filter module interferes, use an extra cable kit with termination plate.

Steps

1. **Connect the power supply with optional VSWR antenna monitoring cables to the BPxx unit.**

2. **Remove the desired antenna knock-out and install the BPxx termination plate to the antenna box.**

3. **Connect the power supply and antenna monitoring cables from the BPxx unit to the BPxx termination plate.**

4. **Install and tighten the BPxx unit to the antenna box connector.**

5. **Remove rubber connector shields.**

   For each BPxx interface connection used, remove the tips of the rubber connector shield by tearing or cutting them off.

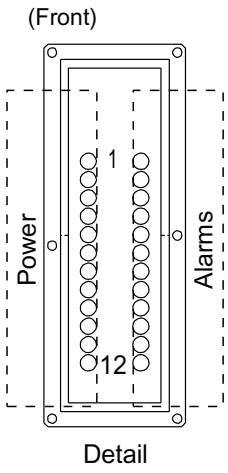
6. **Connect the cables.**

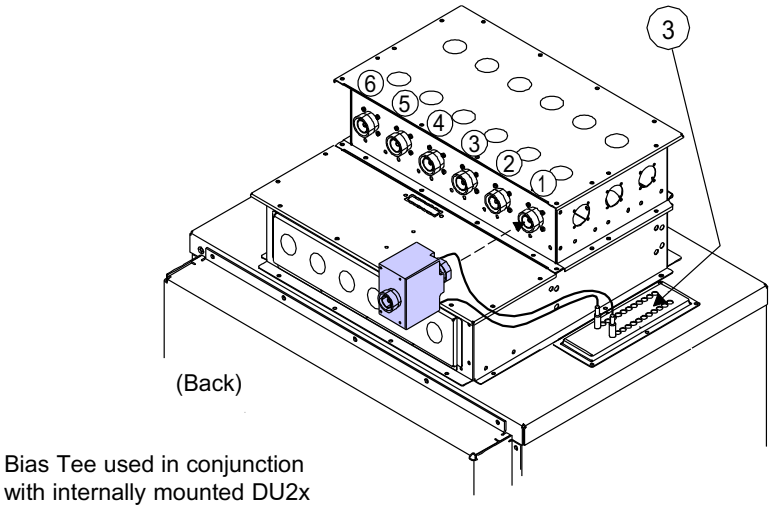
   Connect the power supply and optional VSWR antenna monitoring cables from the BPxx unit to the BPxx terminal plate on the antenna box.

7. **Repeat steps 1 - 6 for additional BPxx units.**

15.5 Installing a Bias Tee (BPxx) unit outside an outdoor BTS antenna box

Summary





Bias Tee used in conjunction
with internally mounted DU2x

NOTE: Numbers indicate antennas
and relevant Bias Tee interface locations

DN03418311

DN03418311

1	Bias Tee unit
2	Bias Tee termination plate
3	Bias Tee interface

Figure 32. BPxx installation in Outdoor cabinet

Steps

1. **Position the antenna box as required.**

2. **Connect the power supply and antenna monitoring cables from the BPxx unit to the BPxx interface on top of the cabinet.**

3. **Install and tighten the BPxx unit to the connector.**

4. **Remove rubber connector shields**

   For each BPxx interface connection used, remove the tips of the rubber connector shield by tearing or cutting them off.

5. **Connect the cables.**

   Connect the power supply and antenna monitoring cables from the BPxx unit to the BPxx interface.

6. **Repeat steps 2 through 5 for additional BPxx units.**

16 Replacing a faulty unit using hot insertion

16.1 Description of hot insertion

This section describes the features and benefits of hot insertion and its use.

Features and benefits of hot insertion

The hot insert feature allows you to remove and install BTS units without powering off the BTS. Use the hot insert feature to:

- Replace a faulty unit.
- Upgrade the BTS (non-hopping, RF hopping, or BB hopping).
- Install additional GSM hardware to increase the capacity of a GSM BTS.
- Install additional GSM/EDGE hardware to add EDGE capacity to a GSM BTS.
- Install additional GSM/EDGE hardware to increase the capacity of a GSM/EDGE BTS.

Using hot insertion

Hot insertion can be used with a BTS when you:

- Replace a faulty unit.
- Add TRXs to upgrade the BTS.

Note

These procedures apply to BTS software CX4.0-3 or later.

To avoid sparking when replacing plug-in units, it is recommended to turn off the mains breaker of the site before replacing the units.

Warning

When a plug-in unit is replaced with power on (hot insertion), sparks may occur in the plug-in unit rear connector.

If the connector area is contaminated, an external object exists on the connector, or the backplane/connector is damaged, a short circuit may develop to the connector area. If the mains breaker of the site is not able to break the fault current, this may result in overheating of the backplane. In extremely rare cases, fire may occur in the RFU backplane as a consequence of the overheating.

If fire occurs, close the cabinet door, switch off the mains breaker, and wait for the fire to extinguish at a safe distance (beware of possible smoke development). Make sure that the fire has completely extinguished before leaving the site unattended.

Hot Insert can be used with the following units:

- Transceiver Baseband unit, GSM (BB2A)
- Transceiver Baseband unit, GSM/EDGE (BB2E)
- Transceiver Baseband unit, GSM/EDGE (BB2F)
- Dual Variable Gain Duplex Filter unit (DVxx)
- Receiver Multicoupler unit - 2-way (M2xA)
- Receiver Multicoupler unit - 6-way (M6xA)
- Remote Tune Combiner (RTxx)
- Transceiver RF unit, GSM (TSxA)
- Transceiver RF unit, GSM/EDGE (TSxB)
- Wideband Combiner unit (WCxA)
- Power Supply unit (PWSx)

Note

Additional PWSx units can be hot inserted only when PWSx on/off switch is in off position when inserted.

Note

The BTS only supports the hot insertion feature for the units listed above.

16.2 Replacing a TSxx unit (non-hopping or RF hopping) using hot insertion

Summary

Note

This Hot Insert procedure is not recommended for use when replacing GSM hardware with GSM/EDGE hardware.

Steps

1. **Ensure the replacement TSxx unit is removed from the shipping container.**
2. **If using the BTS software CX4.0-3, ensure the Nokia BTS Manager is disconnected from the BTS.**
3. **Lock the affected TRX(s) at the BSC (ZERS).**
4. **Remove the TSxx unit from the BTS cabinet.**
5. **Install the replacement TSxx unit and re-connect cables.**
6. **Verify that the replaced TRX(s) have reached the Configuring state, which is indicated by the relevant BB2x unit LED(s) flashing yellow.**
7. **Unlock the TRXs at the BSC (ZERS).**
8. **Run the TRX tests for the replacement unit:**

a. If using the BTS software CX4.0-3, ensure the Nokia BTS Manager is disconnected from the BTS. Run the TRX test from the BSC (ZUBS, ZUBP).
b. If using the BTS software CX4.0-4 or later, run the TRX test either from Nokia BTS Manager or from the BSC.

16.3 Replacing a TSxx unit (BB hopping) using hot insertion

Summary

Note

This Hot Insert procedure is not recommended for use when replacing GSM hardware with GSM/EDGE hardware.

Steps

1. **Ensure the replacement TSxx unit is removed from the shipping container.**
2. **If using the BTS software CX4.0-3, ensure Nokia BTS Manager is disconnected from the BTS.**
3. **Lock the affected BTS sector at the BSC (ZEQS).**
4. **Remove the TSxx unit from the BTS cabinet.**
5. **Install the replacement TSxx unit and re-connect the cables.**
6. **Verify that the replacement TRX(s) have reached the Configuring state, which is indicated by the relevant BB2x unit LED(s) flashing yellow**
7. **Temporarily set the BTS sector to non-hopping mode to allow the TRX tests to be completed (ZEQE, HOP=N).**
8. **Temporarily set BTS sector to Cell Barred to prevent customer calls (ZEQF, BAR=Y).**
9. **Unlock the BTS sector at the BSC (ZEQS).**

10. **Run TRX tests for the replacement TSxx unit:**
    a. If using the BTS software CX4.0-3, ensure Nokia BTS Manager is disconnected from the BTS. Run the TRX test from the BSC (ZUBS, ZUBP).
    b. If using the BTS software CX4.0-4 or later, run the TRX test either from the Nokia BTS Manager or from the BSC.
11. **Lock the BTS sector at the BSC (ZEQS).**
12. **Set the BTS sector to BB hopping mode (ZEQE, HOP=BB).**
13. **Clear Cell Barred for the BTS sector (ZEQF, BAR=N).**
14. **Unlock the BTS sector at the BSC (ZEQS).**

16.4 Replacing a BB2x unit (non-hopping or RF hopping) using hot insertion

Summary

Note

This Hot Insert procedure is not recommended for use when replacing GSM hardware with GSM/EDGE hardware.

Steps

1. **Ensure the replacement BB2x unit is removed from the shipping container.**
2. **If using the BTS software CX4.0-3, ensure the Nokia BTS Manager is disconnected from the BTS.**
3. **Lock the affected TRX(s) at the BSC (ZERS).**
4. **Remove the BB2x unit from the BTS cabinet.**
5. **Install the replacement BB2x unit and re-connect cables.**
6. **Verify that the replaced TRX(s) have reached the Configuring state, which is indicated by the relevant BB2x unit LED(s) flashing yellow.**

7. **Unlock the TRXs at the BSC (ZERS).**

8. **Run the TRX tests for the replacement unit:**
   a. If using the BTS software CX4.0-3, ensure the Nokia BTS Manager is disconnected from the BTS. Run the TRX test from the BSC (ZUBS, ZUBP).
   b. If using the BTS software CX4.0-4 or later, run the TRX test either from Nokia BTS Manager or from the BSC.

16.5 Replacing a BB2x unit (BB hopping) using hot insertion

Summary

Note

This Hot Insert procedure is not recommended for use when replacing GSM hardware with GSM/EDGE hardware.

Steps

1. **Ensure the replacement BB2x unit is removed from the shipping container.**

2. **If using the BTS software CX4.0-3, ensure Nokia BTS Manager is disconnected from the BTS.**

3. **Lock the affected BTS sector at the BSC (ZEQS).**

4. **Remove the BB2x unit from the BTS cabinet.**

5. **Install the replacement BB2x unit and re-connect the cables.**

6. **Verify that the replacement TRX(s) have reached the Configuring state, which is indicated by the relevant BB2x unit LED(s) flashing yellow**

7. **Temporarily set the BTS sector to non-hopping mode to allow the TRX tests to be completed (ZEQE, HOP=N).**

8. **Temporarily set BTS sector to Cell Barred to prevent customer calls (ZEQF, BAR=Y).**

9. **Unlock the BTS sector at the BSC (ZEQS).**

10. **Run TRX tests for the replacement BB2x unit:**
    a. If using the BTS software CX4.0-3, ensure Nokia BTS Manager is disconnected from the BTS. Run the TRX test from the BSC (ZUBS, ZUBP).
    b. If using the BTS software CX4.0-4 or later, run the TRX test either from the Nokia BTS Manager or from the BSC.

11. **Lock the BTS sector at the BSC (ZEQS).**

12. **Set the BTS sector to BB hopping mode (ZEQE, HOP=BB).**

13. **Clear Cell Barred for the BTS sector (ZEQF, BAR=N).**

14. **Unlock the BTS sector at the BSC (ZEQS).**

16.6 Replacing a DVxx unit (non-hopping or RF hopping) using hot insertion

Steps

1. **Ensure the replacement DVxx unit is removed from the shipping container.**

2. **If using the BTS software CX4.0-3, ensure the Nokia BTS Manager is disconnected from the BTS.**

3. **Lock the TRXs associated with the affected unit at the BSC (ZERS).**

4. **Remove the DVxx unit from the BTS cabinet.**

5. **Install the replacement DVxx unit and re-connect the cables.**

6. **Unlock the TRXs at the BSC (ZERS).**

7. **Run the TRX tests for all TRXs connected to the replacement DVxx unit:**
    a. If using the BTS software CX4.0-3, ensure the Nokia BTS Manager is disconnected from the BTS. Run the TRX test from the BSC (ZUBS, ZUBP).
    b. If using the BTS software CX4.0-4 or later, run the TRX test either from the Nokia BTS Manager or from the BSC.

16.7 Replacing a DVxx (BB hopping) using hot insertion

Steps

1. **Ensure the replacement DVxx unit is removed from the shipping container.**
2. **If using the BTS software CX4.0-3, ensure Nokia BTS Manager is disconnected from the BTS.**
3. **Lock the affected BTS sector at the BSC (ZEQS).**
4. **Remove the DVxx unit from the BTS cabinet.**
5. **Install the replacement DVxx unit and re-connect the cables.**
6. **Temporarily set the BTS sector to non-hopping mode to allow the TRX tests to be completed (ZEQE, HOP=N).**
7. **Temporarily set the BTS sector to Cell Barred to prevent customer calls (ZEQF, BAR=Y).**
8. **Unlock the BTS sector at the BSC (ZEQS).**
9. **Run the TRX tests for all TRXs connected to the replacement DVxx unit:**
   a. If using the BTS software CX4.0-3, ensure Nokia BTS Manager is disconnected from the BTS. Run the TRX test from the BSC (ZUBS, ZUBP).
   b. If using the BTS software CX4.0-4 or later, run the TRX test either from Nokia BTS Manager or from the BSC.
10. **Lock the BTS sector at the BSC (ZEQS).**
11. **Set the BTS sector to BB hopping mode (ZEQE, HOP=BB).**
12. **Clear Cell Barred for the BTS sector (ZEQF, BAR=N).**
13. **Unlock the BTS sector at the BSC (ZEQS).**

16.8 Replacing an MxxA unit (non-hopping or RF hopping) using hot insertion

Steps

1. **Ensure the replacement MxxA unit is removed from the shipping container.**
2. **If using the BTS software CX4.0-3, ensure the Nokia BTS Manager is disconnected from the BTS.**
3. **Lock the TRXs associated with the affected unit at the BSC (ZERS).**
4. **Remove the MxxA unit from the BTS cabinet.**
5. **Install the replacement MxxA unit and re-connect the cables.**
6. **Unlock the TRXs at the BSC (ZERS).**
7. **Run the TRX tests for all TRXs connected to the replacement MxxA unit:**
   a. If using the BTS software CX4.0-3, ensure the Nokia BTS Manager is disconnected from the BTS. Run the TRX test from the BSC (ZUBS, ZUBP).
   b. If using the BTS software CX4.0-4 or later, run the TRX test either from the Nokia BTS Manager or from the BSC.

16.9 Replacing a MxxA unit (BB hopping) using hot insertion

Steps

1. **Ensure the replacement MxxA unit is removed from the shipping container.**
2. **If using the BTS software CX4.0-3, ensure Nokia BTS Manager is disconnected from the BTS.**
3. **Lock the affected BTS sector at the BSC (ZEQS).**
4. **Remove the MxxA unit from the BTS cabinet.**
5. **Install the replacement MxxA unit and re-connect the cables.**

6. **Temporarily set the BTS sector to non-hopping mode to allow the TRX tests to be completed (ZEQE, HOP=N).**

7. **Temporarily set the BTS sector to Cell Barred to prevent customer calls (ZEQF, BAR=Y).**

8. **Unlock the BTS sector at the BSC (ZEQS).**

9. **Run the TRX tests for all TRXs connected to the replacement MxxA unit:**
   a. If using the BTS software CX4.0-3, ensure Nokia BTS Manager is disconnected from the BTS. Run the TRX test from the BSC (ZUBS, ZUBP).
   b. If using the BTS software CX4.0-4 or later, run the TRX test either from Nokia BTS Manager or from the BSC.

10. **Lock the BTS sector at the BSC (ZEQS).**

11. **Set the BTS sector to BB hopping mode (ZEQE, HOP=BB).**

12. **Clear Cell Barred for the BTS sector (ZEQF, BAR=N).**

13. **Unlock the BTS sector at the BSC (ZEQS).**

16.10 Replacing a RTxx unit (non-hopping or RF hopping) using hot insertion

Steps

1. **Ensure the replacement RTxx unit is removed from the shipping container.**

2. **If using the BTS software CX4.0-3, ensure the Nokia BTS Manager is disconnected from the BTS.**

3. **Lock the TRXs associated with the affected unit at the BSC (ZERS).**

4. **Remove the RTxx unit from the BTS cabinet.**

5. **Install the replacement RTxx unit and re-connect the cables.**

6. **Unlock the TRXs at the BSC (ZERS).**

7. **Run the TRX tests for all TRXs connected to the replacement RTxx unit:**
   a. If using the BTS software CX4.0-3, ensure the Nokia BTS Manager is disconnected from the BTS. Run the TRX test from the BSC (ZUBS, ZUBP).
   b. If using the BTS software CX4.0-4 or later, run the TRX test either from the Nokia BTS Manager or from the BSC.

16.11 Replacing a RTxx unit (BB hopping) using hot insertion

Steps

1. **Ensure the replacement RTxx unit is removed from the shipping container.**
2. **If using the BTS software CX4.0-3, ensure Nokia BTS Manager is disconnected from the BTS.**
3. **Lock the affected BTS sector at the BSC (ZEQS).**
4. **Remove the RTxx unit from the BTS cabinet.**
5. **Install the replacement RTxx unit and re-connect the cables.**
6. **Temporarily set the BTS sector to non-hopping mode to allow the TRX tests to be completed (ZEQE, HOP=N).**
7. **Temporarily set the BTS sector to Cell Barred to prevent customer calls (ZEQF, BAR=Y).**
8. **Unlock the BTS sector at the BSC (ZEQS).**
9. **Run the TRX tests for all TRXs connected to the replacement RTxx unit:**
   a. If using the BTS software CX4.0-3, ensure Nokia BTS Manager is disconnected from the BTS. Run the TRX test from the BSC (ZUBS, ZUBP).
   b. If using the BTS software CX4.0-4 or later, run the TRX test either from Nokia BTS Manager or from the BSC.
10. **Lock the BTS sector at the BSC (ZEQS).**

11. **Set the BTS sector to BB hopping mode (ZEQE, HOP=BB).**

12. **Clear Cell Barred for the BTS sector (ZEQF, BAR=N).**

13. **Unlock the BTS sector at the BSC (ZEQS).**

16.12 Replacing a WCxA unit (non-hopping or RF hopping) using hot insertion

Steps

1. **Ensure the replacement WCxA unit is removed from the shipping container.**

2. **If using the BTS software CX4.0-3, ensure the Nokia BTS Manager is disconnected from the BTS.**

3. **Lock the TRXs associated with the affected unit at the BSC (ZERS).**

4. **Remove the WCxA unit from the BTS cabinet.**

5. **Install the replacement WCxA unit and re-connect the cables.**

6. **Unlock the TRXs at the BSC (ZERS).**

7. **Run the TRX tests for all TRXs connected to the replacement WCxA unit:**
   a. If using the BTS software CX4.0-3, ensure the Nokia BTS Manager is disconnected from the BTS. Run the TRX test from the BSC (ZUBS, ZUBP).
   b. If using the BTS software CX4.0-4 or later, run the TRX test either from the Nokia BTS Manager or from the BSC.

16.13 Replacing a WCxA unit (BB hopping) using hot insertion

Steps

1. **Ensure the replacement WCxA unit is removed from the shipping container.**

2. **If using the BTS software CX4.0-3, ensure Nokia BTS Manager is disconnected from the BTS.**

3. **Lock the affected BTS sector at the BSC (ZEQS).**

4. **Remove the WCxA unit from the BTS cabinet.**

5. **Install the replacement WCxA unit and re-connect the cables.**

6. **Temporarily set the BTS sector to non-hopping mode to allow the TRX tests to be completed (ZEQE, HOP=N).**

7. **Temporarily set the BTS sector to Cell Barred to prevent customer calls (ZEQF, BAR=Y).**

8. **Unlock the BTS sector at the BSC (ZEQS).**

9. **Run the TRX tests for all TRXs connected to the replacement WCxA unit:**
   a. If using the BTS software CX4.0-3, ensure Nokia BTS Manager is disconnected from the BTS. Run the TRX test from the BSC (ZUBS, ZUBP).
   b. If using the BTS software CX4.0-4 or later, run the TRX test either from Nokia BTS Manager or from the BSC.

10. **Lock the BTS sector at the BSC (ZEQS).**

11. **Set the BTS sector to BB hopping mode (ZEQE, HOP=BB).**

12. **Clear Cell Barred for the BTS sector (ZEQF, BAR=N).**

13. **Unlock the BTS sector at the BSC (ZEQS).**

17 Replacing a -48 VDC filter module

17.1 Replacing a -48 VDC filter module

Steps

1. **Remove the faulty -48 VDC filter module from the BTS.**

   See *Removing a -48 VDC filter module* for detailed instructions.

2. **Install the new -48 VDC filter module in the BTS.**

   See *Installing a -48 VDC filter module* for detailed instructions.

3. **Power on the BTS.**

4. **Leave the site.**

17.2 Removing a -48 VDC filter module

Summary

The optional -48 VDC Filter module is required when installing -48 VDC power.

Steps

1. **Locate the existing -48 VDC filter module on the right side of the antenna box.**

2. **Disconnect the external DC power cables.**

3. **Unplug the internal power cables from terminal J5 inside the cabinet.**

4. **Loosen and remove the six T15 TX Star Tamper proof mounting screws that secure the filter module to the antenna box.**

5. Remove the unit from the cabinet.

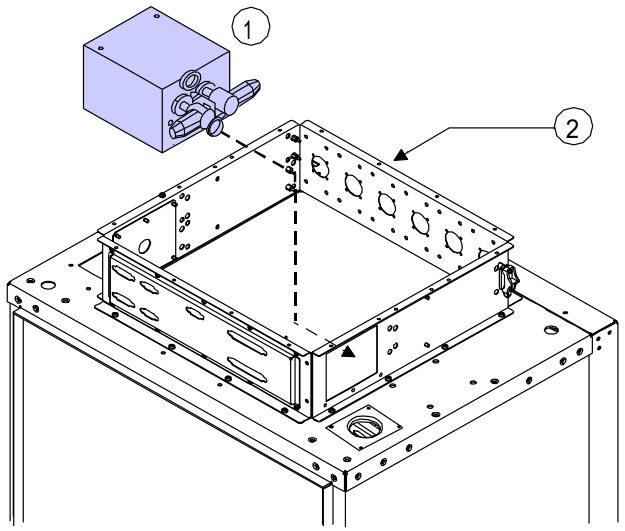
17.3 Installing a -48 VDC filter module

Summary

Note

If you are installing the HETA unit, install the AC filter unit in addition to any DC filter unit. The AC filter unit does not replace the DC filter unit.

The -48 VDC Filter module is pre-installed and required when installing -48 VDC power.



DN03418659

1	-48 VDC filter
2	Antenna box, top removed

Figure 33. -48 VDC Filter module installation

Steps

1. **Install the -48 VDC Filter module.**
   a. Remove the -48 VDC filter module from its protective package and check for visible damage.
   b. Insert the -48 VDC filter module into the opening on the right side of the antenna box where the original unit had been installed.
   c. Orient the positive (+) V 48 RTN terminal toward the top of the cabinet.
   d. Secure the -48 VDC filter module using mounting screws.
   e. Recycle the packing material.

2. **Connect -48 VDC Filter module cables to the power supply.**
   a. Locate the blue power cable on the -48 VDC filter module inside the cabinet and connect to the blue (-) J5 connector.
   b. Locate the black power cable on the -48 VDC filter module inside the cabinet and connect to the black (+) J5 connector.

18 Replacing a +24 VDC filter module

18.1 Replacing a +24 VDC filter module

Steps

1. **Remove the faulty +24 VDC filter module from the BTS.**

   See *Removing a +24 VDC filter module* for detailed instructions.

2. **Install the new +24 VDC filter module in the BTS.**

   See *Installing a +24 VDC filter module* for detailed instructions.

3. **Power on the BTS.**

4. **Leave the site.**

18.2 Removing a +24 VDC filter module

Summary

The optional +24 VDC Filter module (DCFB) is required when installing +24 VDC power.

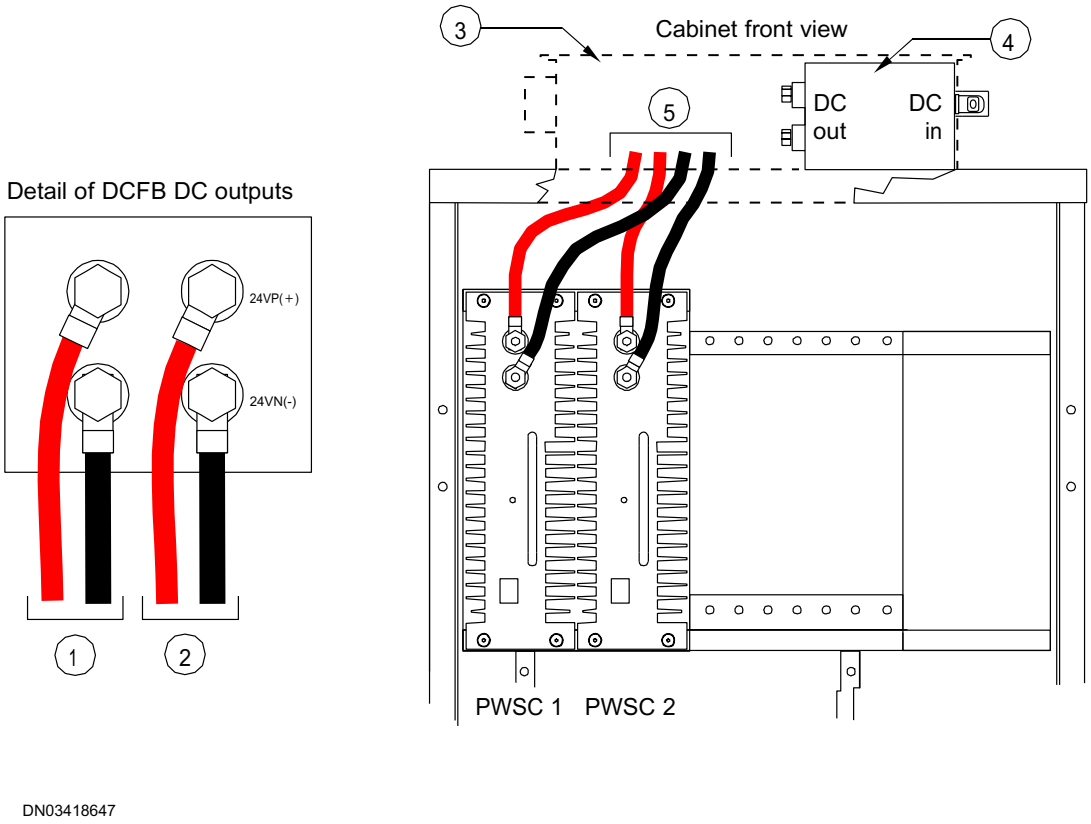
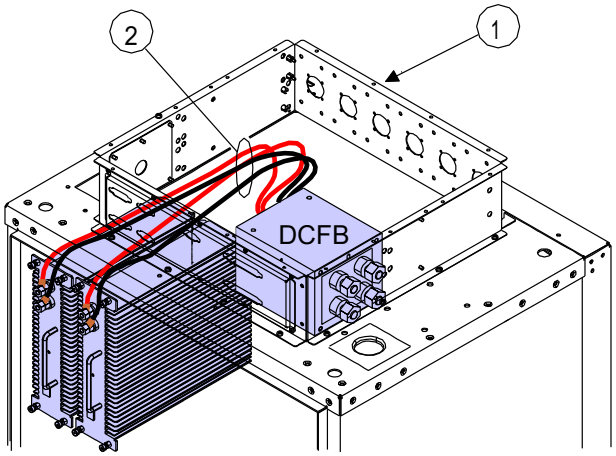


Figure 34. DCFB Filter module cable routing to PWSC

1	To PWSC 2
2	To PWSC 1
3	Antenna box
4	DCFB
5	To DCFB DC out



DN03419358

Figure 35. Internal Cabinet cable routing from DCFB to PWSC

1	Antenna box, top removed
2	Cable tie

Steps

1. **Remove rubber boots from the PWSC input power terminals and the DCFB output power terminals.**

2. **Remove the red power cable from the (+) input power terminal on the left PWSC unit, if installed.**

3. **Remove the black power cable from the (-) input power terminal on the left PWSC unit, if installed.**

4. **Remove the opposite ends of the red and black power cables from the left positive (+) and negative (-) output terminal pair on the DCFB filter module.**

5. **Repeat steps 1 through 4 for the right PWSC unit, if installed, using the right output terminal pair on the DCFB Filter module.**

6. **Locate the existing +24 VDC Filter module in the right side of the antenna box.**

7. **Remove any external DC cable that is connected to the input of the DCFB.**

8. **Loosen and remove the four M4 mounting screws in the centre and right-hand side holes of the DCFB filter module.**

9. **Remove the DCFB filter module from the opening on the right side of the antenna box.**

18.3 Installing a +24 VDC filter module

Before you start

Warning

Risk of electric shock. Ensure that the mains power supply is off before starting the installation of the AC filter unit, the DC filter unit, and the heater unit (HETA).

Note

The filter module in not in use in Mini Outdoor cabinet.

Summary

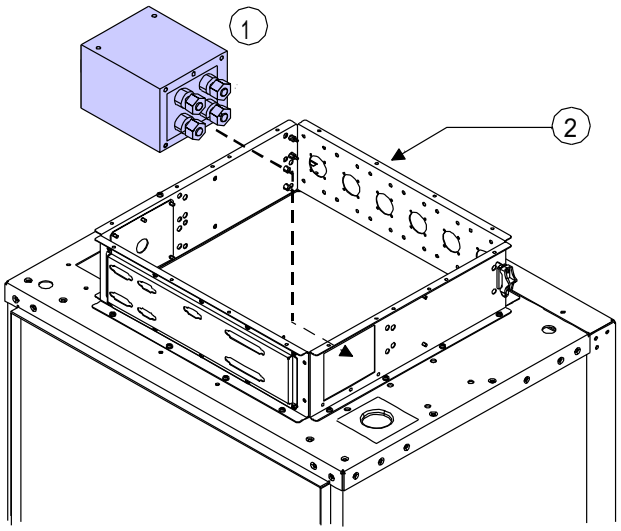


Figure 36. +24 VDC filter module installation

1	+24 VDC filter unit
2	Antenna box, top removed

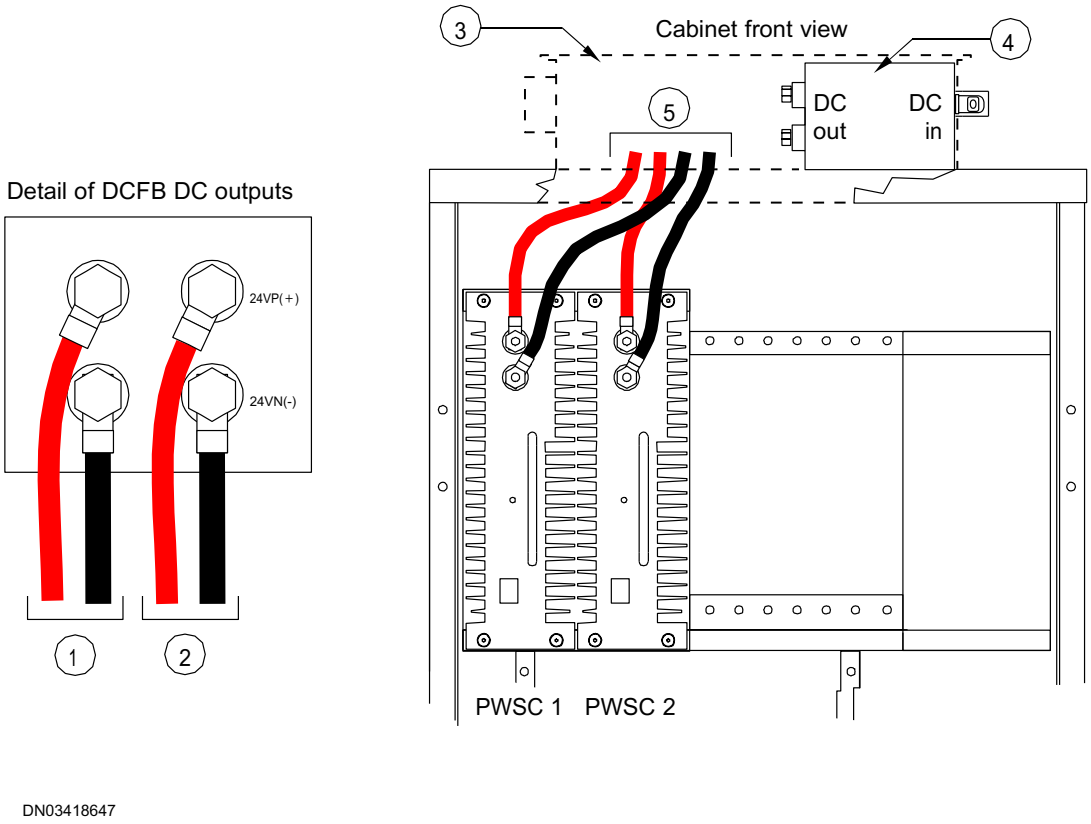


Figure 37. DCFB filter module cable routing to PWSC

1	To PWSC 2
2	To PWSC 1
3	Antenna box
4	DCFB
5	To DCFB DC out

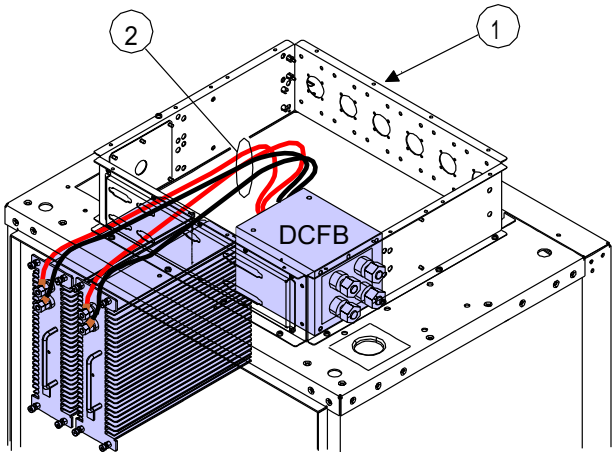


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Figure 38. Internal cabinet cable routing from DCFB to PWSC

1	Antenna box, top removed
2	Cable tie

The +24 VDC filter module (DCFB) is required when installing +24 VDC power.

Note

If you are installing the heater (HETA) unit, install the AC filter unit in addition to any DC filter unit. The AC filter unit does not replace the DC filter unit.

Steps

1. **Install the power cables on the filter.**
2. **Connect DCFB filter module cables to the power supply.**

Note

If you are using only one power supply, do not install the second set of cables.

a. Locate the red and black power cable assemblies included as part of the PWKA Installation Kit. One kit is provided for each PWSC power supply unit.
b. Remove the protective plastic covers from the applicable cable ends of the DCFB connection terminals.
   - If you are using one power supply, remove only one set of protective covers from the filter terminals.
   - If you are using two power supplies, remove all sets of protective covers from the filter terminals.
c. Attach the opposite ends of the red and black power cables to the left positive (+) and negative (-) output terminal pair on the DCFB filter module.
d. Install rubber boots in place over the DCFB output power terminals. Ensure that boots completely cover the terminals.

3. Install the DCFB filter module.

a. Insert the DCFB filter module into the opening on the right side of the antenna box where the original unit had been installed.

   Orient the positive (+) terminals toward the top of the cabinet.
b. Secure the DCFB filter module using four M4 mounting screws in the centre and right-side holes of the DCFB.

Note

The remaining mounting screws are installed following the connection of input power to the DCFB. The two front M4x8 screws and the two threaded studs are used to secure the protective cover over the DCFB power input connections.

4. Attach power cables to the power terminals.

a. Attach a red power cable to the (+) input power terminal on the left PWSC unit, if installed
b. Attach a black power cable to the (-) input power terminal on the left PWSC unit, if installed.
c. Install the rubber boots in place over the PWSC input power terminals. Ensure that the boots completely cover the terminals.

d. Repeat the previous steps for the right PWSC unit, if installed, using the right output terminal pair on the DCFB filter module.

e. Install a tie wrap at the back of the power supply subrack at approximately midway of the cables.

5. Recycle the packing material.

19 Replacing an AC filter module

19.1 Replacing an AC filter module

Steps

1. **Block the BCF.**

   Block the BCF either locally with BTS Manager or request BCF lock from the BSC.

2. **Power down the BTS.**

3. **Remove input power from the BTS by switching the mains power breaker off.**

4. **Remove the AC power cables from the AC Filter.**

5. **Remove the faulty AC filter module from the BTS.**

   See *Removing an AC filter module* for detailed instructions.

6. **Install the new AC Filter module in the BTS.**

   See *Installing an AC filter module* for detailed instructions.

7. **Re-connect AC power cables.**

8. **Power on the BTS.**

9. **Unblock the BCF.**

   Unblock the BCF either locally using Nokia BTS Manager or request BCF unlock from the BSC.

10. **Leave the site.**

19.2 Removing an AC filter module

Summary

Note

You need to have a separate plate for covering the hole where the AC filter is removed.

Steps

1. **Remove the antenna box top front cover.**
2. **Disconnect the AC supply cables from the AC filter unit terminals L1, L2, L3, N, and PE.**
3. **Disconnect the D37 connector inside the antenna box nearest to the AC filter unit.**
4. **Disconnect the AC filter output cables rubber boots CONN.1, CONN.2, and CONN.3.**
5. **Cut cable ties that lock AC cable connectors CONN.1, CONN.2, and CONN.3.**
6. **Disconnect the AC cable connectors CONN.1, CONN.2, CONN.3, and HEATER.**
7. **Loosen and remove the AC filter unit fixing screws (6 pieces).**
8. **Remove the disconnected AC filter unit.**
9. *If* you do not assemble and install a new AC filter unit

   Then

   Cover the AC filter hole with an AC filter cover. Order the cover via HWS. You can use the screws from the AC filter fixing.
10. **Assemble the busbar cable rubber boots.**

19.3 Installing an AC filter unit

Before you start

Warning

Risk of electric shock. Ensure that the mains power supply is off before starting the installation of the AC filter unit, the DC filter unit, and the heater unit (HETA).

Note

You can remove the integrated AC filter cover only once. You cannot reinstall the AC filter cover if it is removed.

Note

The filter unit is not in use in Mini Outdoor cabinet.

Summary

The AC filter unit is required when you install PWSA units.

Steps

1. **Install AC filter unit.**

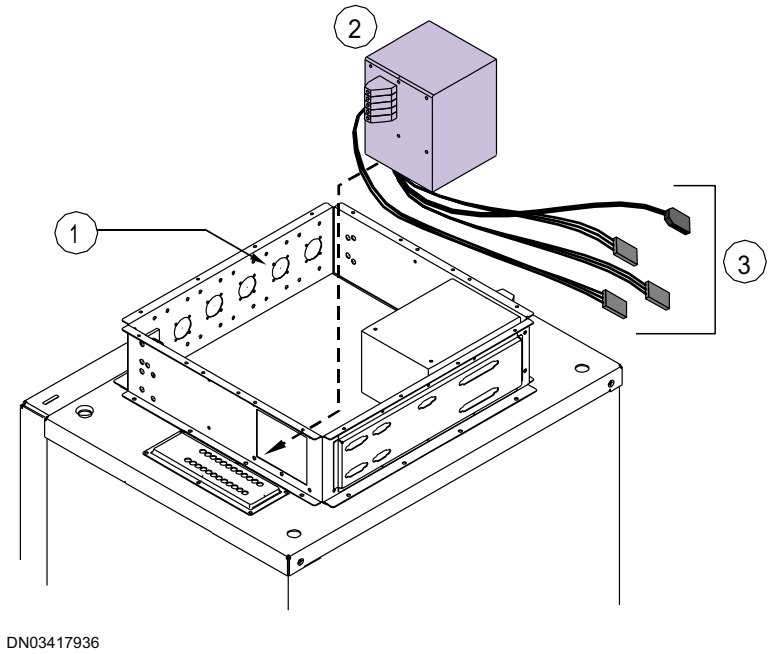


Figure 39. AC filter unit installation

1	Antenna box, top removed
2	AC filter unit
3	AC filter unit outputs

a. Remove the AC filter unit from its protective package and check for visible damage.

b. Loosen the finger screws securing the left most D-37 interconnect cable from the back of the interface unit and set them aside.

c. Remove the AC filter unit 'knock-out plate' on the external interface from the antenna connector box and discard the knock-out plate.

d. Insert the AC filter unit into the unused slot on the left side of the antenna box external interface.

e. Insert and tighten six fixing screws to secure the AC filter unit to the antenna box.

f. Connect the D-37 interconnect cable and secure the finger screws.

g. Recycle the packing material.

2. Route AC filter unit cables in the cabinet.

Warning

Danger of lethal voltages! Make sure that the mains power breaker is off before routing the AC filter unit cables.

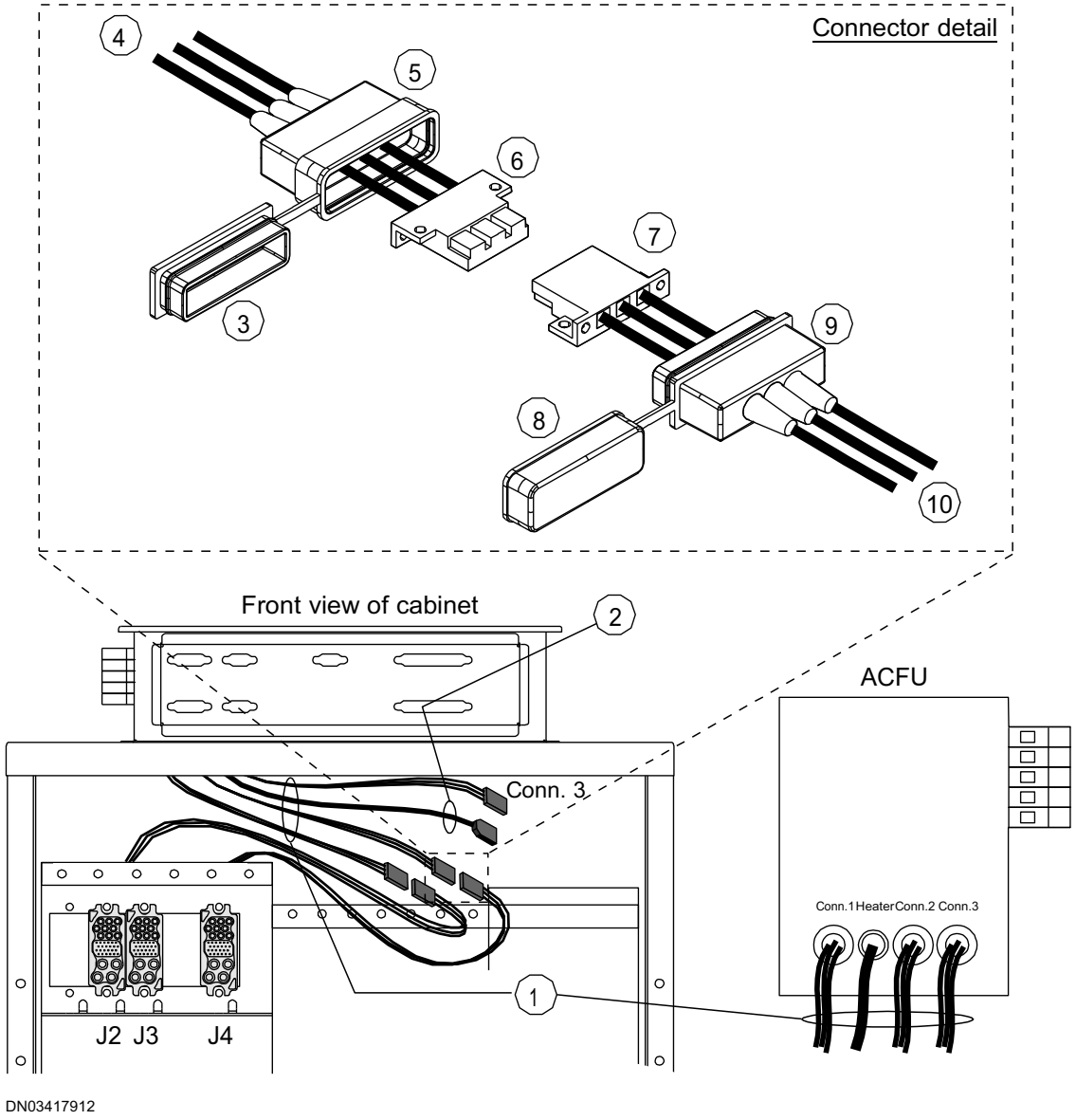


Figure 40. AC filter unit cable routing

1	ACFU Outputs
2	IEC receptacle (to optional HETA)
3	Rubber boot cover
4	From ACFU
5	Rubber boot
6	Power connector
7	Cabinet Connector J2A or J4A
8	Rubber boot cover
9	Rubber boot
10	To J2 or J4 (cabinet connectors)

a. Locate the output cables inside the cabinet that run from the AC filter unit and the cabinet core.

b. Open the rubber boot covers on each connector.

c. Attach the power connector within the rubber boot from the AC filter unit connector 1 to the J4A cabinet connector of the ADUx AC cable harness.

d. Depending on the connector ends, use a cable tie to secure the two connectors.

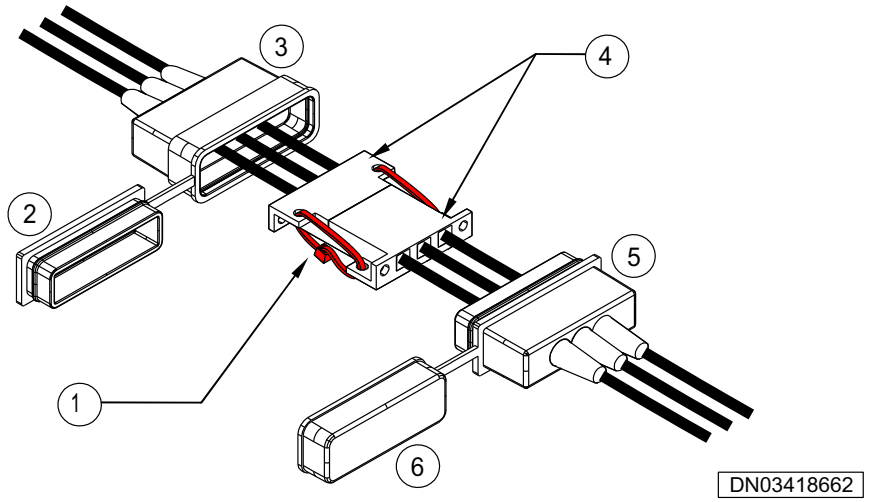
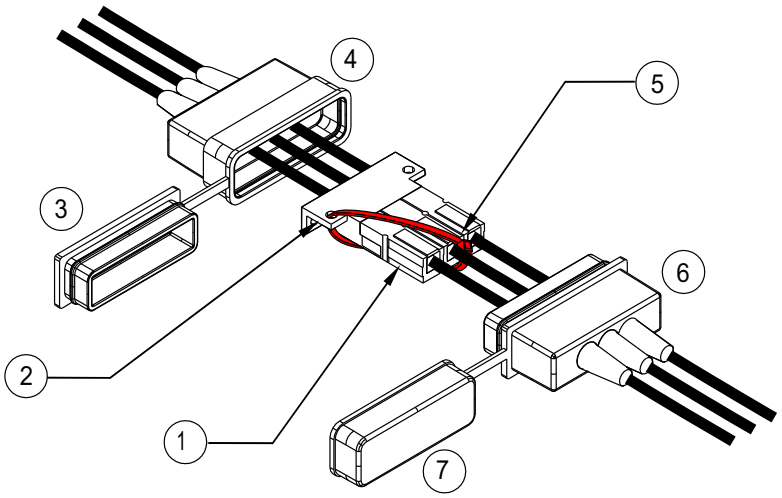


Figure 41. Default AC filter unit cable tie installation

1	Cable tie, two places (trim cable tie mid-way between connectors)

2	Rubber boot cover
3	Rubber boot
4	Power connectors
5	Rubber boot
6	Rubber boot cover

ALTERNATE 1



ALTERNATE 2

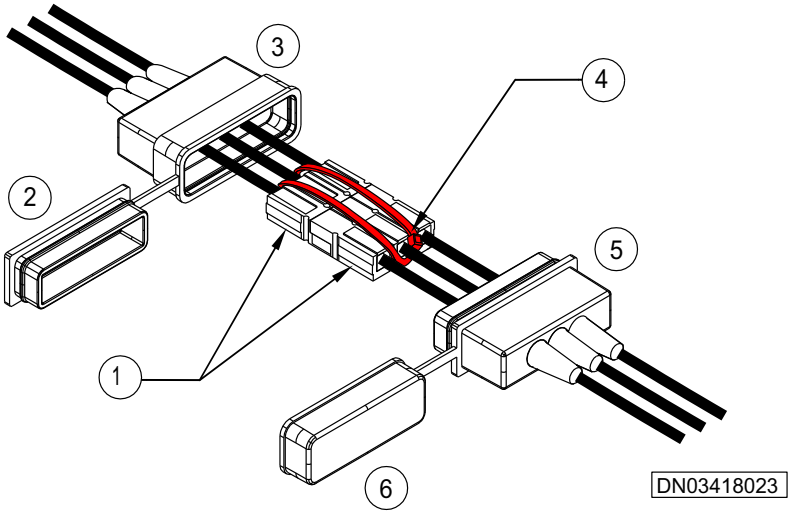


Figure 42. Alternate cable tie installations

	Alternate 1	Alternate 2

1	Type 2 power connector	Type 2 power connectors
2	Type 1 power connector	Rubber boot cover
3	Rubber boot cover	Rubber boot
4	Rubber boot	Cable tie, (trim cable tie between cables)
5	Cable tie, (trim cable tie between cables)	Rubber boot
6	Rubber boot	Rubber boot cover
7	Rubber boot cover	N/A

e. Secure the rubber boot covers.

f. Repeat the previous steps for connector 2 from the AC filter unit to the J2A cabinet connector.

g. Connect the Heater connector to the (optional) HETA unit cable, if present.

3. Insert and tighten the twelve fixing screws to secure the top front cover.

20 Replacing a GSM/EDGE unit cooling fan

20.1 Replacing a unit cooling fan

Steps

1. **Remove any units required to access the faulty cooling fan.**
2. **Remove the faulty unit cooling fan from the BTS.**
3. **Insert the new fan into the cabinet and align with the screw holes.**
4. **Insert and tighten the four retaining screws in the corners of the fan box with a T15 Torx driver.**
5. **Connect the power/signal cable for the fan.**
6. **Reinstall any units removed to facilitate fan replacement.**
7. **Leave the site.**

20.2 Removing a unit cooling fan

Before you start

Warning

Risk of personal injury. When replacing fans within the BTS, the new fans may start operating when the power/signal cable is connected.

Summary

Eleven unit cooling fans in the UltraSite EDGE BTS cabinet maintain proper airflow to the Power Supply units, common unit and transmission area, transceivers, and RF filter units. Four screws secure each fan to the cabinet core and two finger screws with moulded connectors secure the power/signal cable.

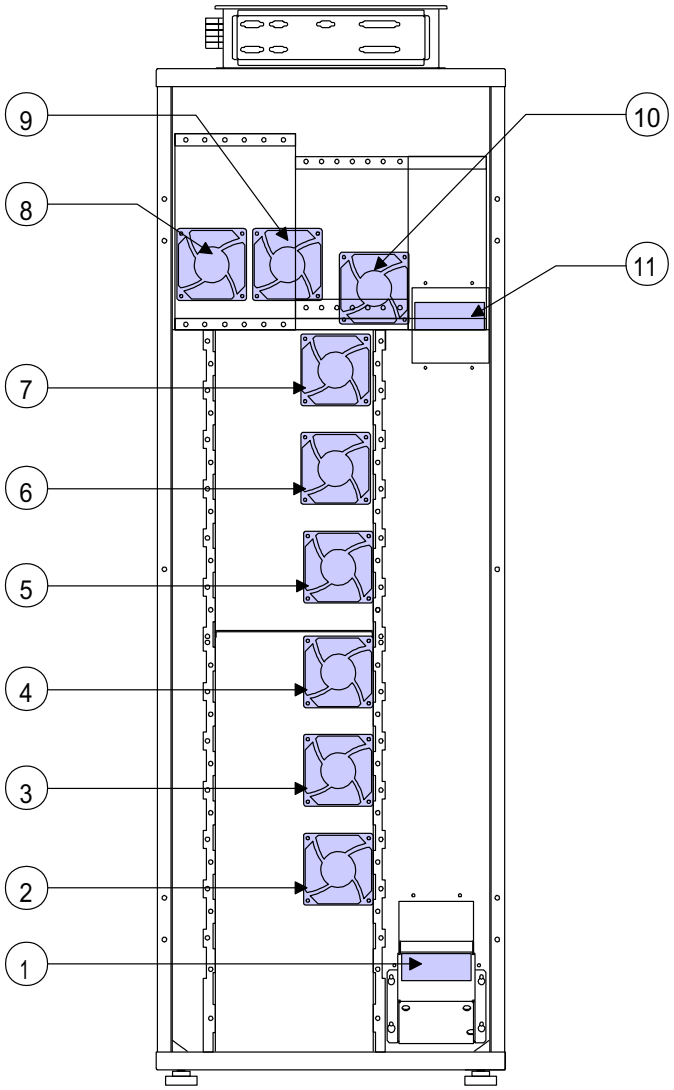


Figure 43. Unit cooling fan locations

1	RF Filter fan 2, horizontal mount
2	TSxx fan 6
3	TSxx fan 5
4	TSxx fan 4
5	TSxx fan 3
6	TSxx fan 2
7	TSxx fan 1
8	Power fan, 1*
9	Power fan, 2
10	Common units fan
11	RF Filter fan 1, horizontal mount

Steps

1. **Notify the appropriate personnel and block the BCF either locally using Nokia BTS Manager or request BCF lock from the BSC.**
2. **Switch the Power Supply units to standby mode.**
3. **Carefully remove the Power Supply units.**
4. **Disconnect the power/signal cable for the fan.**
5. **Remove the four securing screws in the fan box with a T15 Torx driver.**
6. **Remove the fan unit.**

21 Replacing a cabinet cooling fan

21.1 Replacing a cabinet cooling fan

Steps

1. **Remove the faulty cabinet cooling fan from the BTS.**

2. **Install the new cabinet cooling fan in the BTS.**
   a. Insert the new cabinet fan into the cabinet fan box.
   b. Replace the four T25 screws to secure the cabinet fan assembly.
   c. Route the power/alarm cable through the cable clips and replace the cable tie.

Caution

The power/alarm cable will be damaged if it is not properly cable tied.

   d. Route the cable through the guide in the cabinet fan cover and replace the T25 screws to secure the cabinet fan cover.
   e. Connect the power/alarm cable for the fan.

3. **Leave the site.**

21.2 Removing a cabinet cooling fan

Summary

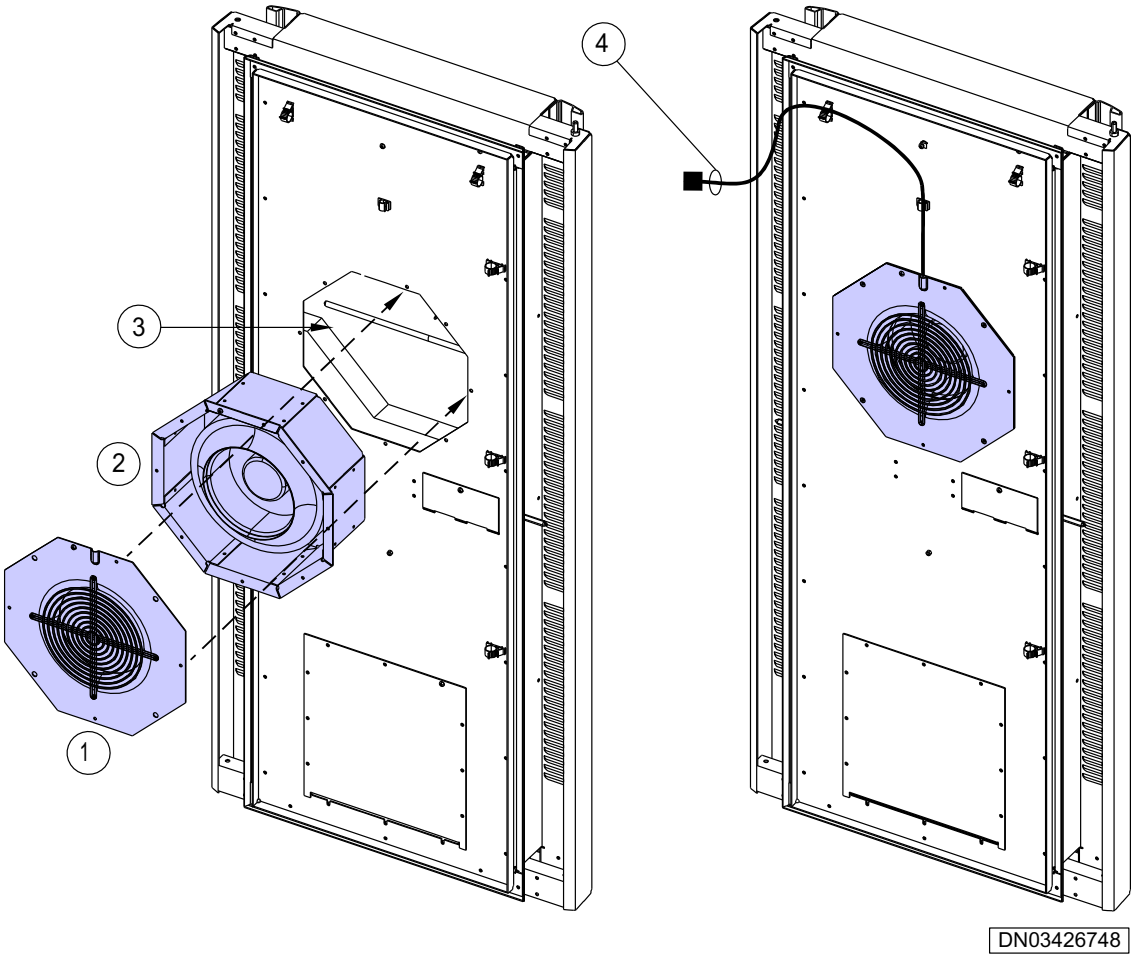


Figure 44. Cabinet cooling fan removal

1	Cabinet fan cover, with finger guard
2	Cabinet fan assembly
3	Location for cabinet fan
4	Wiring to fan power and control door switch

Steps

1. **Open the cabinet door to access the cabinet fan assembly.**

2. **Disconnect the power/alarm cable for the fan and disconnect the cable from the cable clips.**

3. **Remove the five T25 screws that secure the cabinet fan cover to the door and set the cover aside.**

Warning

Risk of personal injury. Ensure that the fan has stopped rotating before removing the cabinet fan cover.

4. **Remove the cable from the cable clip inside the fan box and cut the cable tie.**

5. **Remove the four remaining T25 screws on the back side of the box to remove the cabinet fan.**

22 Replacing a GSM/EDGE heater (HETA) unit

22.1 Replacing a GSM/EDGE heater (HETA) unit

Steps

1. **Remove the faulty HETA unit from the BTS.**

   See *Removing a GSM/EDGE heater (HETA) unit* for detailed instructions.

2. **Install the new HETA unit in the BTS.**

   See *Installing a GSM/EDGE heater (HETA) unit* for detailed instructions.

3. **Leave the site.**

22.2 Removing a GSM/EDGE heater (HETA) unit

Summary

Note

If you are installing the HETA unit, install the AC filter unit in addition to any DC filter unit. The AC filter unit does not replace the DC filter unit.

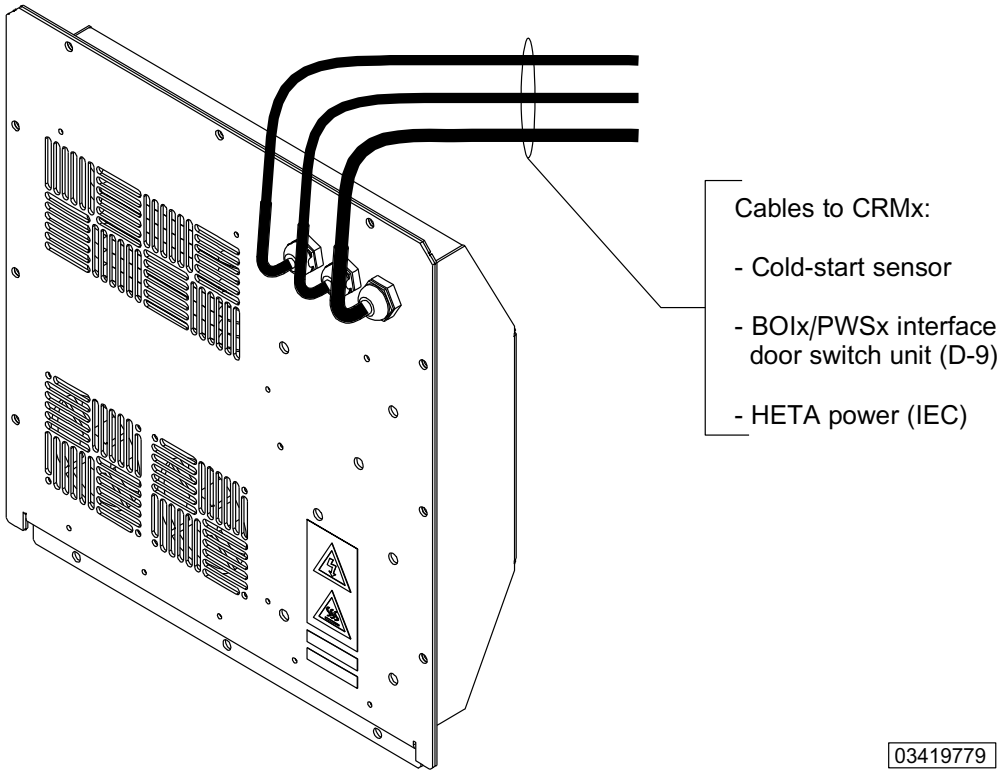


Figure 45. HETA unit cables

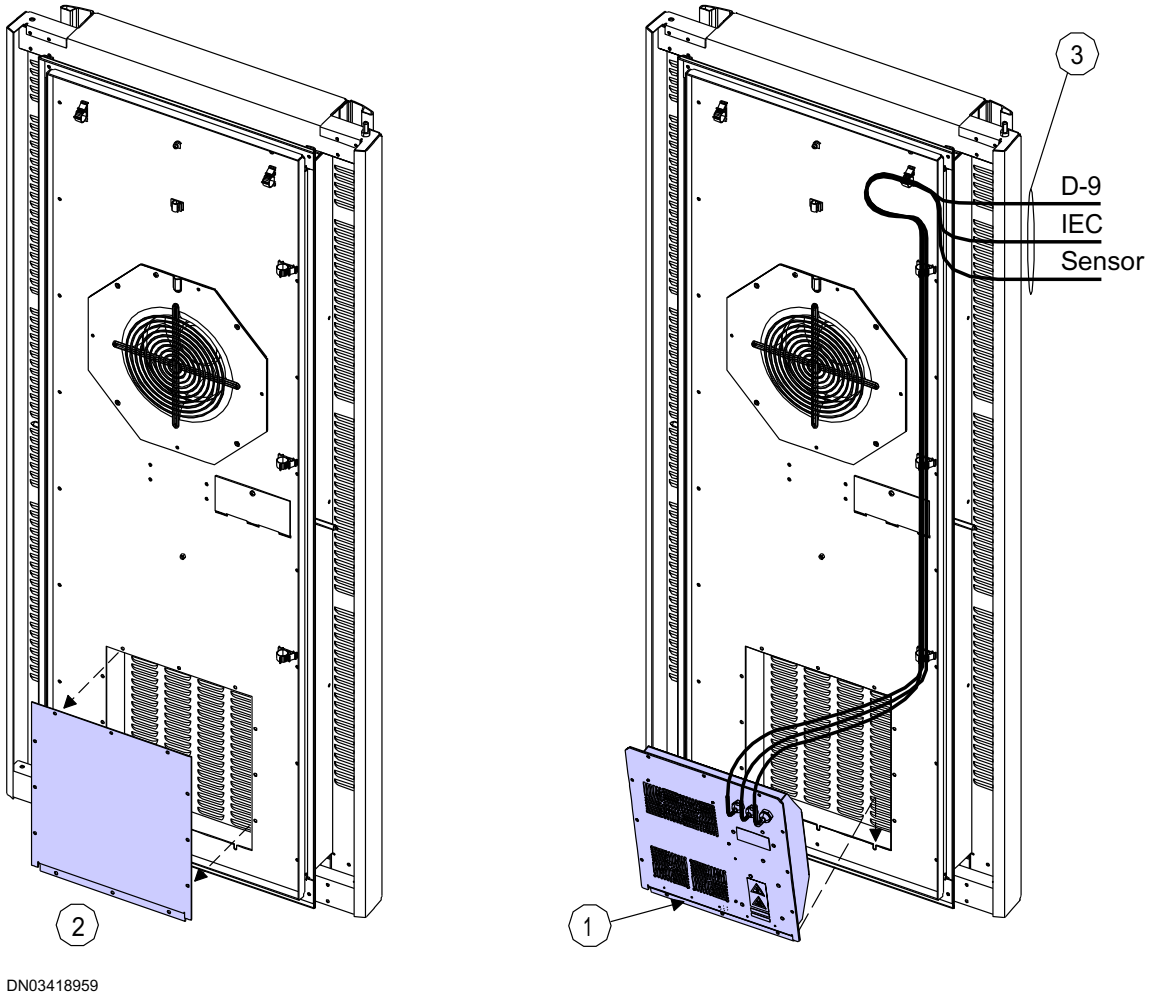


Figure 46. HETA mounted in ODCA door

1	HETA unit
2	Cover (when HETA unit not used)
3	Wiring to HETA power and control

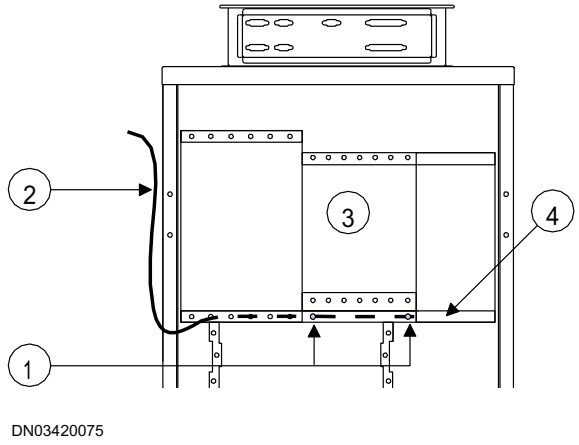


Figure 47. Sensor cable installation

1	Cold-start sensor cable from door mounted HETA unit
2	Cold-start sensor cable from door mounted HETA unit
3	Upper rack
4	Front flange

Steps

1. **Disconnect the HETA signalling interface from the door switch box.**
2. **Remove the cold-start temperature sensor cable from the cabinet.**
3. **Disconnect the AC power cable for the HETA.**
4. **Cut any cable ties and remove the cables from the support clips.**
5. **Unscrew the 12 T25 mounting screws.**
6. **Remove the HETA unit.**

22.3 Installing a GSM/EDGE heater (HETA) unit

Before you start

Warning

Risk of electric shock. Ensure that the mains power supply is off before starting the installation of the AC filter unit, the DC filter unit, and the heater unit (HETA).

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.

Note

You can remove the integrated AC filter cover only once. You cannot replace the AC filter cover if it is removed.

Summary

The HETA unit is optional in the outdoor cabinet door (full-size and Midi).

Note

If you install the HETA unit in the Midi cabinet door, it is installed in the same lower area of the door as the full-size cabinet.

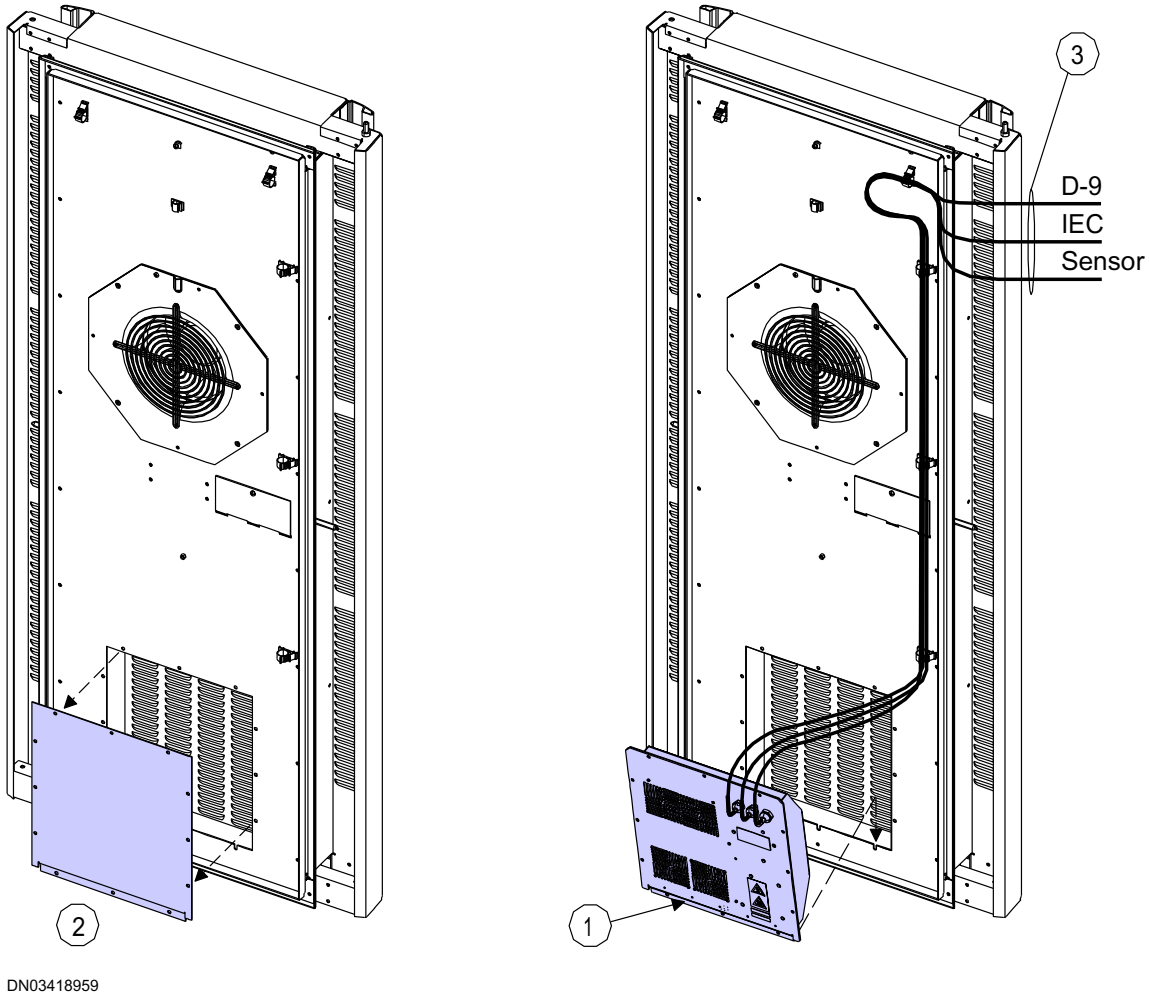


Figure 48. HETA unit installation in left-hand outdoor cabinet door

1	Installing the bottom of HETA unit (first step)
2	Cover plate
3	Wiring to HETA power and control for left hand door

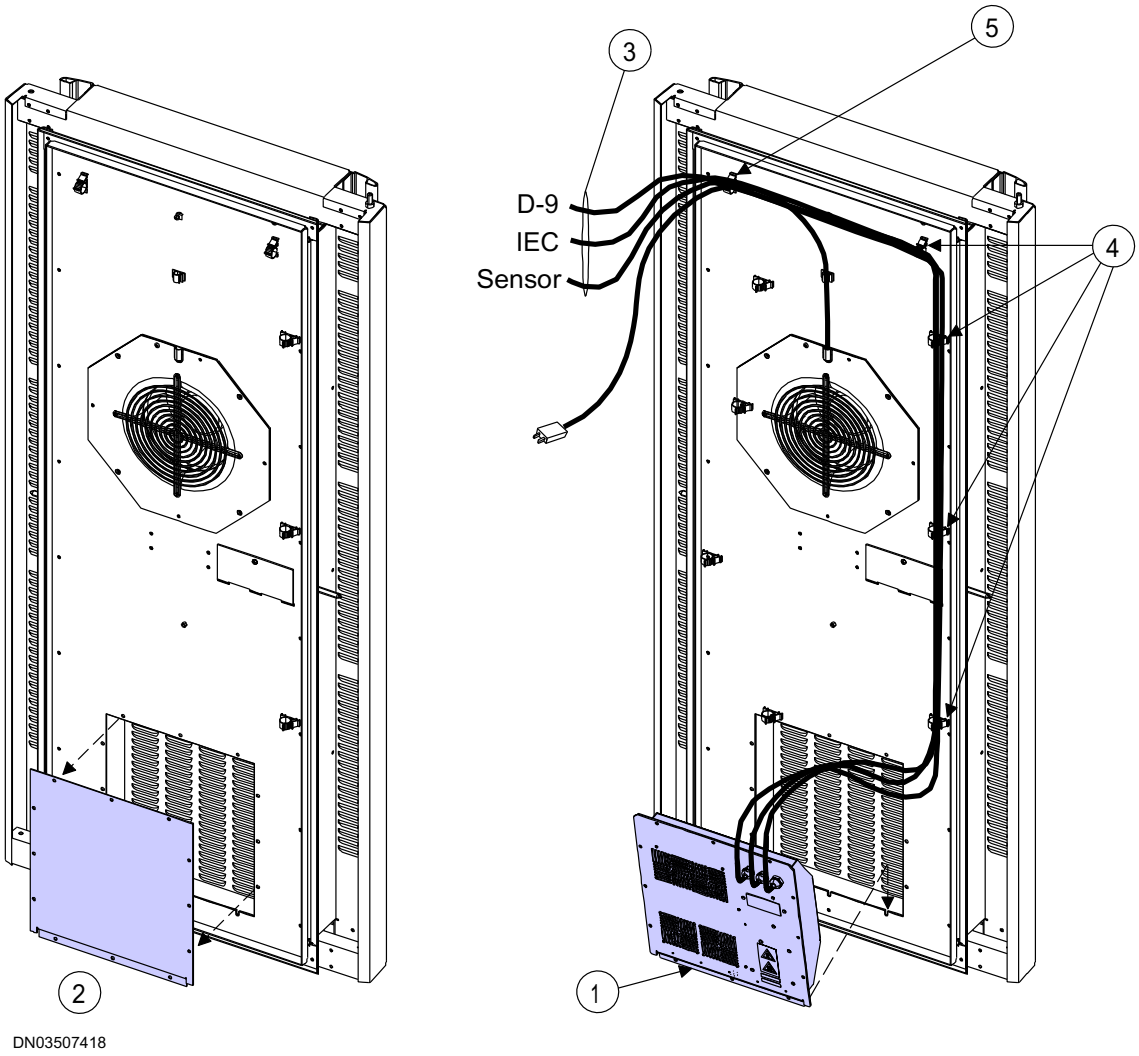


Figure 49. HETA unit installation in right-hand outdoor cabinet door

1	Installing the bottom of HETA unit (first step)
2	Cover plate
3	Wiring to HETA power and control for right hand door
4	Cable clamp
5	Cable clamp

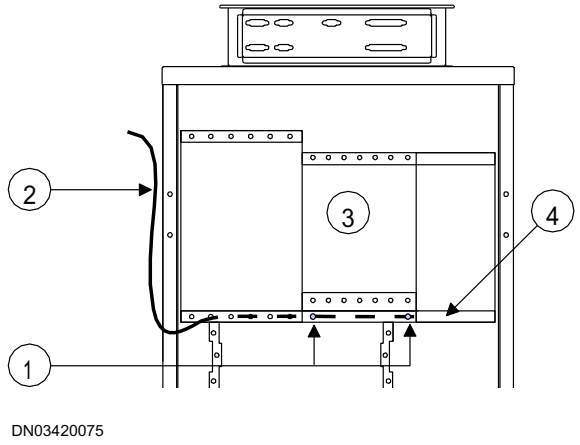


Figure 50. Sensor cable installation for left-hand door

1	Routing cable behind front flange of upper rack and securing with plastic cable clamps
2	Sensor cable from left hand door mounted HETA unit (Note)
3	Upper rack
4	Front flange

Note

If the door is on the right hand side, the sensor cable will come from the right hand side door mounted HETA unit.

Steps

1. **Remove the HETA unit from its protective package and check for visible damage.**

Note

Do not open a faulty HETA unit. Return a faulty unit to Nokia Service.

2. **Remove the cover plate from the outdoor cabinet door and store for future installation if the HETA unit is removed.**

Note

The cover plate maintains the airflow in the cabinet if the HETA unit is removed from the outdoor cabinet door.

3. **Insert the bottom of the HETA unit into the outdoor cabinet door.**

4. **Tilt the top of the HETA unit into the outdoor cabinet door.**

5. **Tighten the mounting screws.**

6. **Connect the HETA control interface (adjacent to the cabinet fan connection) to the door switch box.**

7. **Connect the HETA unit to the AC Power Supply (IEC plug located behind the AC Filter module).**

8. *If* the door is on the left hand side,

   Then

   Route the sensor cable from the left hand side door mounted HETA unit.

   Else

   Route the sensor cable from the right hand side door mounted HETA unit.

9. **Route the sensor cable behind the front flange of the upper rack.**

10. **Secure the sensor cable to the front flange with plastic cable clamps.**

11. **Secure the cables within the appropriate cable clamps on the outdoor cabinet door.**

Note

The HETA power cable is 230 VAC. Route cables between the door and the cabinet so that it prevents damage to the cables during door opening and closing.

23 Replacing a common backplane

23.1 Replacing a common backplane

Before you start

Verify that the cabinet AC or DC power supply is turned off from power units. Check also that the battery circuit breaker is in OFF position.

Steps

1. **Remove the faulty common backplane from the BTS.**

   See *Removing a common backplane* for detailed instructions.

2. **Install the new common backplane to the BTS.**

   See *Installing a common backplane* for detailed instructions.

3. **Turn on the BTS power. Ensure that the battery power is turned on.**

4. **Leave the site.**

23.2 Removing a common backplane

Before you start

Before you start replacing the common backplane, verify that the cabinet AC or DC power supply is turned off from the power units. Check also that the battery circuit breaker is in OFF position.

Steps

1. **Shut down the BTS and turn off the power.**

Ensure that the batteries do not supply power to the BTS cabinet.

2. **Remove the transmission rack front cover.**

   Disassemble transmission rack front cover screws (2 pcs) and remove the cover. Use a TORX 20 screw driver.

3. **Disassemble the transmission unit cables.**

   Loosen the front cover support part fixing screws (2 pcs). Use a TORX 20 screw driver. Disassemble the transmission unit cables. Remember to mark the cables before the disassembly.

4. **Remove the transmission rack front cover support part.**

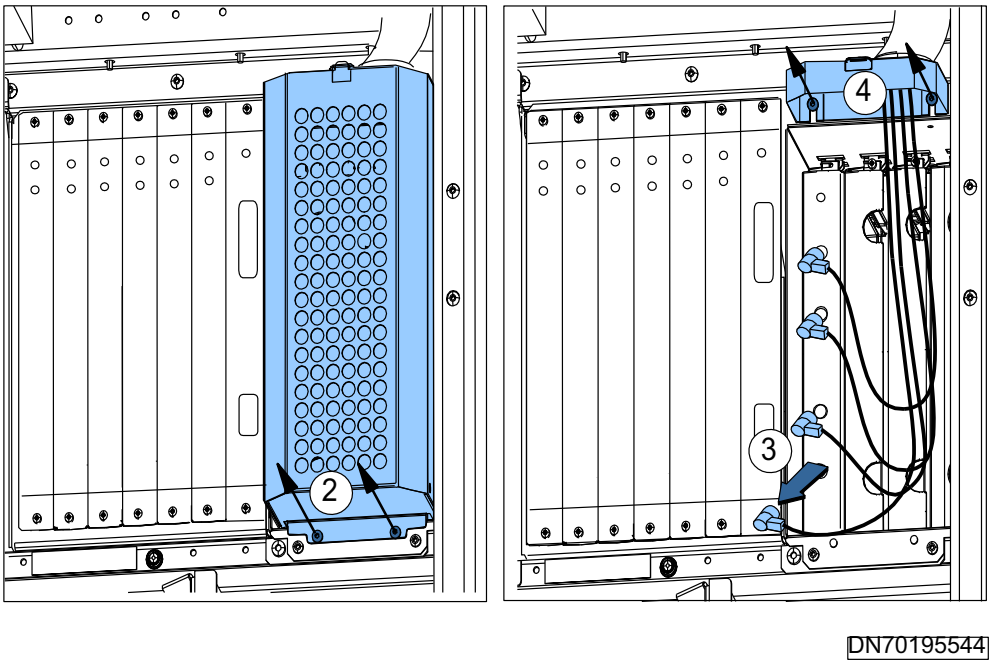


Figure 51. Removing the transmission rack front cover, transmission unit cables and transmission rack front cover support part

5. **Remove BB2 units and BOI unit from the common rack.**

   Disassemble BB2 and BOI unit fixing screws. Use a TORX 20 screw driver.

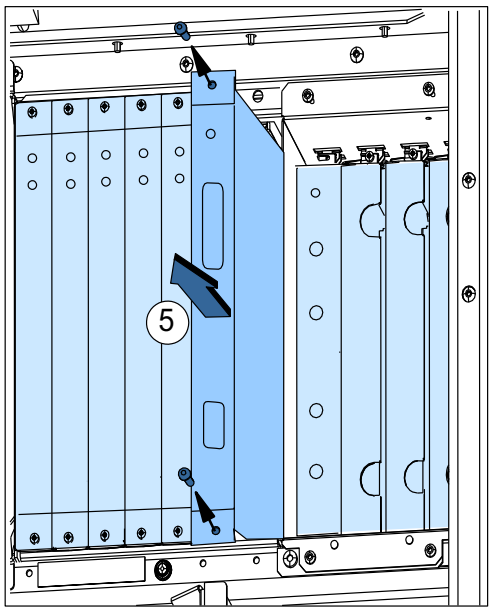


Figure 52. Removing units from the common rack

6. Remove the transmission rack.

Disassemble the transmission rack fixing screws (4 pcs). Use a TORX screw driver.

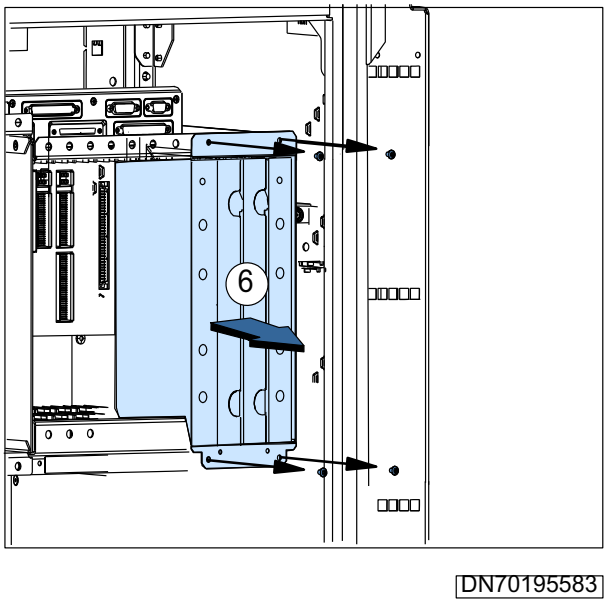


Figure 53. Removing the transmission rack

7. Disassemble common back plane cables.

Remove the following cables:

- Connector X17 (D9 from busbar)
- Connector X18 (Power supply from busbar)
- Connector X19 (Power supply from busbar)
- Connector X20 (D15 from the door sensor, only in outdoor cabinets)
- Connector X21 (D9 fan connector)
- Connector X25 (D37 from interface board)
- Connector X24 (SCSI from the lower RFU board)
- Connector X23 (SCSI from the upper RFU board)
- Connector X22 (D15 fan connector)

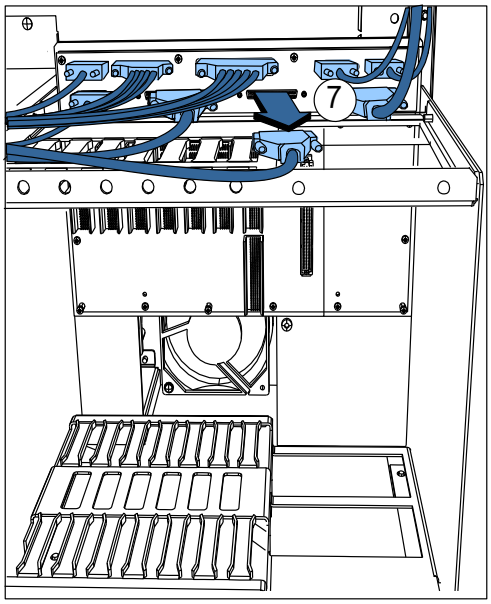


Figure 54. Removing the common backplane cables

8. Remove common backplane front cover.

Disassembly common backplane front cover fixing screws (7 pcs). Use a TORX 10 screw driver. In outdoor cabinets, you need to remove the other connector gasket before removing the front cover.

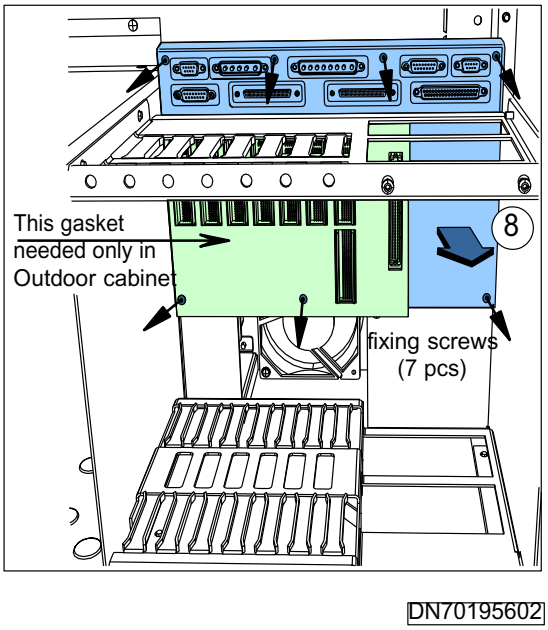


Figure 55. Removing the common backplane front cover

9. Remove the common backplane connector gasket (in outdoor cabinets).

Remove the other common backplane connector gasket.

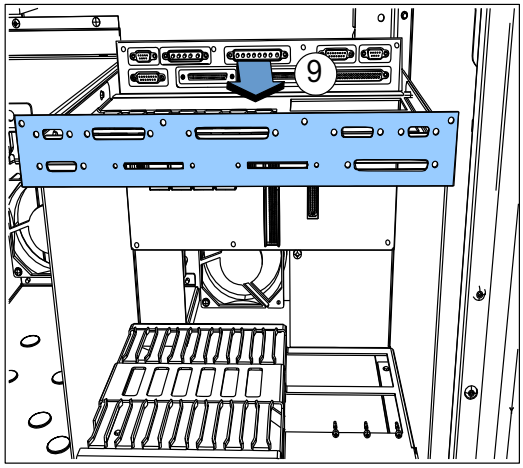


Figure 56. Removing the common backplane connector gasket

10. Remove the common backplane.

Remove the common back plane fixing screws (11 pcs). Use a TORX 10 screw driver. Remove also common backplane standoff screws (7 pcs). Use a 5 mm torque wrench for the standoff screws.

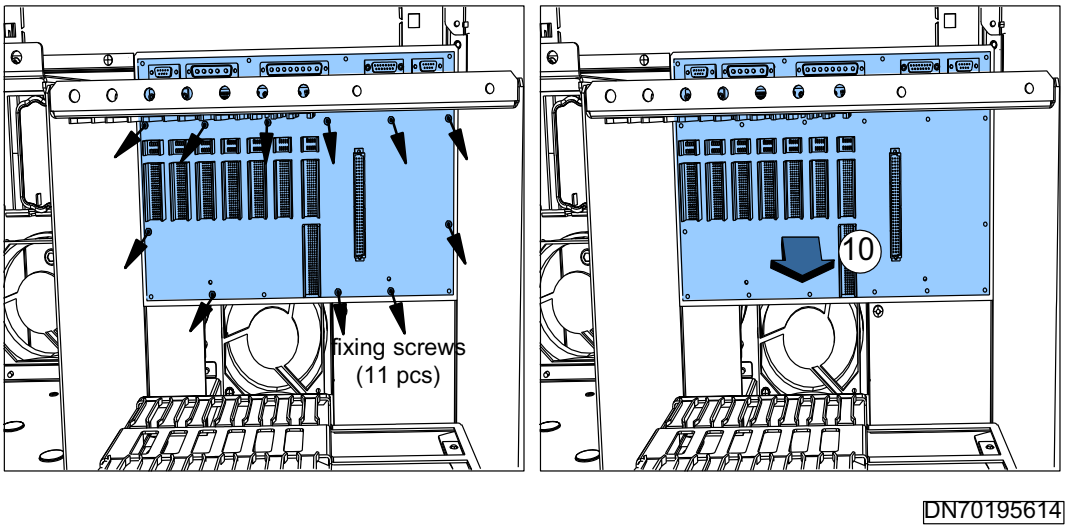


Figure 57. Removing the common backplane

23.3 Installing a common backplane

Before you start

Check the new common backplane for damage:

- Check that all BB2 unit connector pins (6 pcs) are undamaged.
- Check that BOI unit connector pins are undamaged.
- Check the new common backplane version and serial number. The new backplane module may include an additional serial number sticker which replaces the earlier serial number sticker in the backplane front cover.

Steps

1. Install the common backplane to the common rack.

Fix the common backplane fixing screws (code 6151936) M3x8 (11 pcs). Use a TORX 10 screw driver.

Fix the common backplane fixing standoff screws (7 pcs.) Use a 5 mm torque wrench. The fixing torque for all screws is 0.7 - 1.0 Nm.

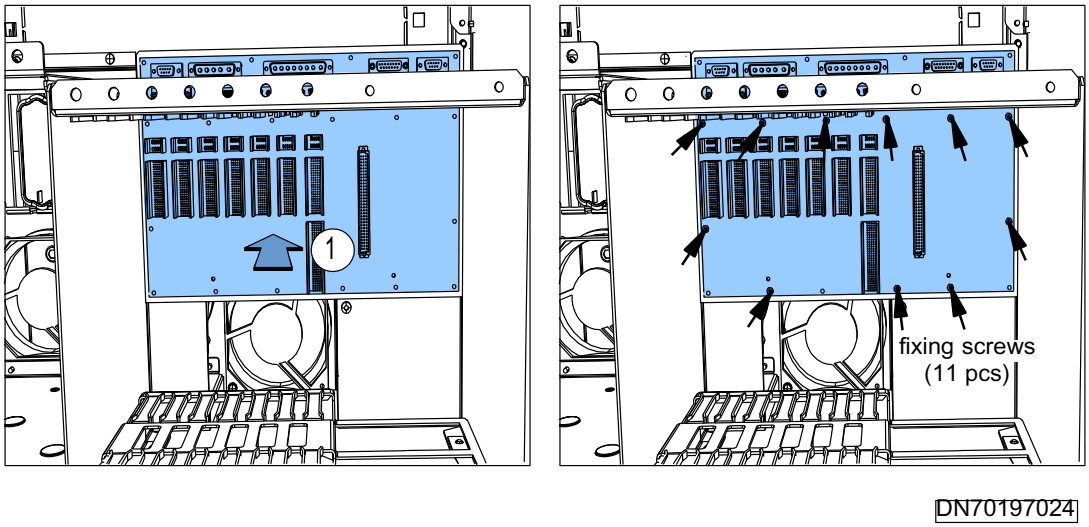


Figure 58. Installing the common backplane

2. Install the common backplane connector gasket (in outdoor cabinets).

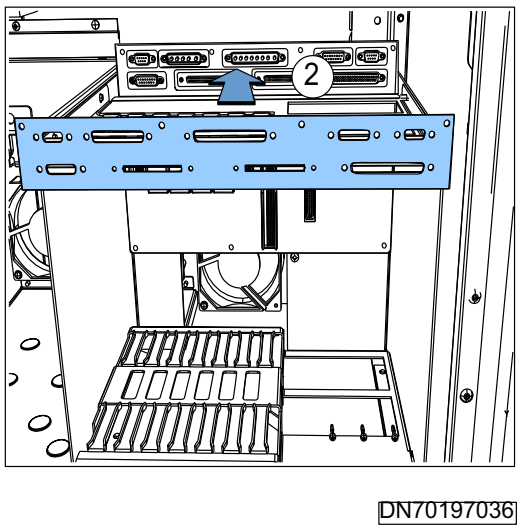


Figure 59. Installing the common backplane connector gasket

3. Install the common backplane front cover.

Install the common backplane front cover in place with M3 x 6 fixing screws (7 pcs). Use a TORX 10 screw driver. In outdoor cabinets, you need to install the other connector gasket after installing the front cover.

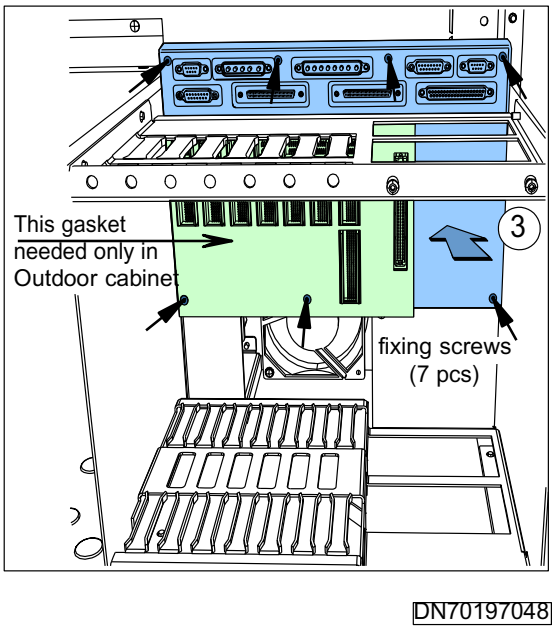


Figure 60. Installing the common backplane front cover

4. Install the common backplane cables.

Check that all connectors are clean and that all pins are undamaged.

Install the following cables:

- Connector X17 (D9 to busbar)
- Connector X18 (Power supply to busbar)
- Connector X19 (Power supply to busbar)
- Connector X20 (D15 to the door sensor, only in outdoor cabinets)
- Connector X21 (D9 fan connector)
- Connector X25 (D37 to the interface board)
- Connector X24 (SCSI to the lower RFU board)
- Connector X23 (SCSI to the upper RFU board)
- Connector X22 (D15 fan connector)

The torque for the finger screws is 0.2 - 0.3 Nm.

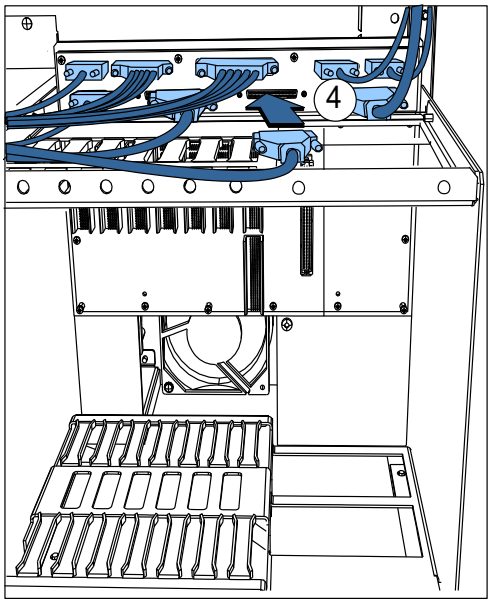


Figure 61. Installing the common backplane cables

5. Install the transmission rack inside the common rack.

Check that the transmission backplane connector is undamaged.

Fix the transmission rack upper fixing screws M4x8 (2 pcs). Leave the screws approximately 3 mm open. Fix the transmission rack lower fixing screws M4x8 (2 pcs). Use a TORX 20 screw driver. The fixing torque is 1.2 - 1.6 Nm.

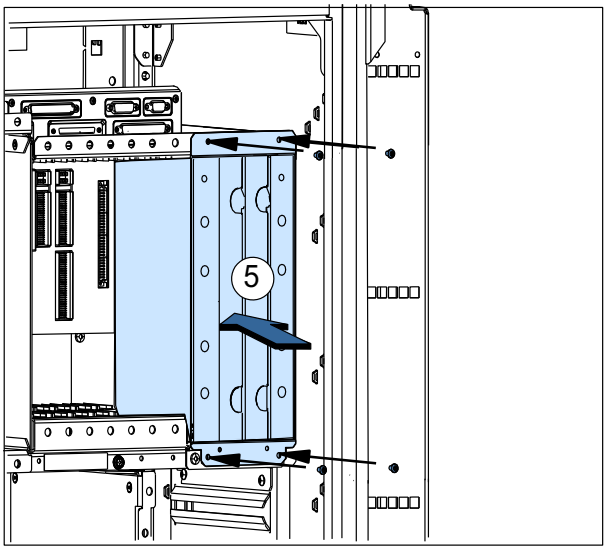


Figure 62. Installing the transmission rack

6. Install BB2 units and BOI unit to the common rack.

Fix the unit finger screws. Use a TORX 20 screw driver. The fixing torque is 0.7 - 1.0 Nm.

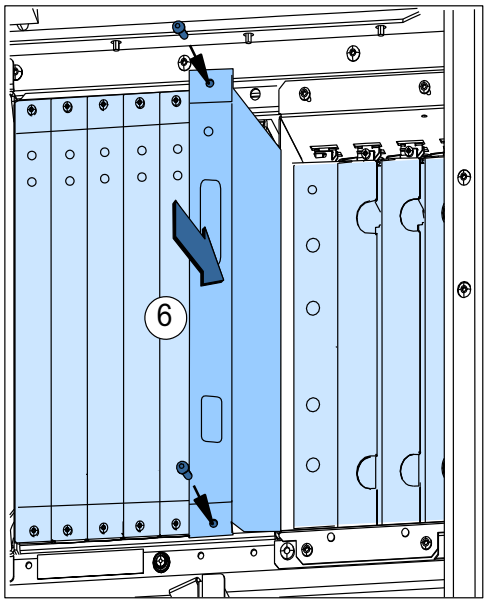


Figure 63. Installing units to the common rack

7. Install the transmission rack front cover support part.

Tighten the front cover support part fixing screws M4x8 (2 pcs). Use a TORX 20 screw driver. The fixing torque is 1.2 - 1.6 Nm.

8. Fix the transmission unit cables in place

Check that the cables are in the same order as when removing them. Dummy units on the empty slots are needed only in outdoor cabinets.

9. Install the transmission rack front cover.

Install the transmission rack front cover fixing screws M4x8 (2 pcs). Use a TORX 20 screw driver. The fixing torque is 1.2 - 1.6 Nm.

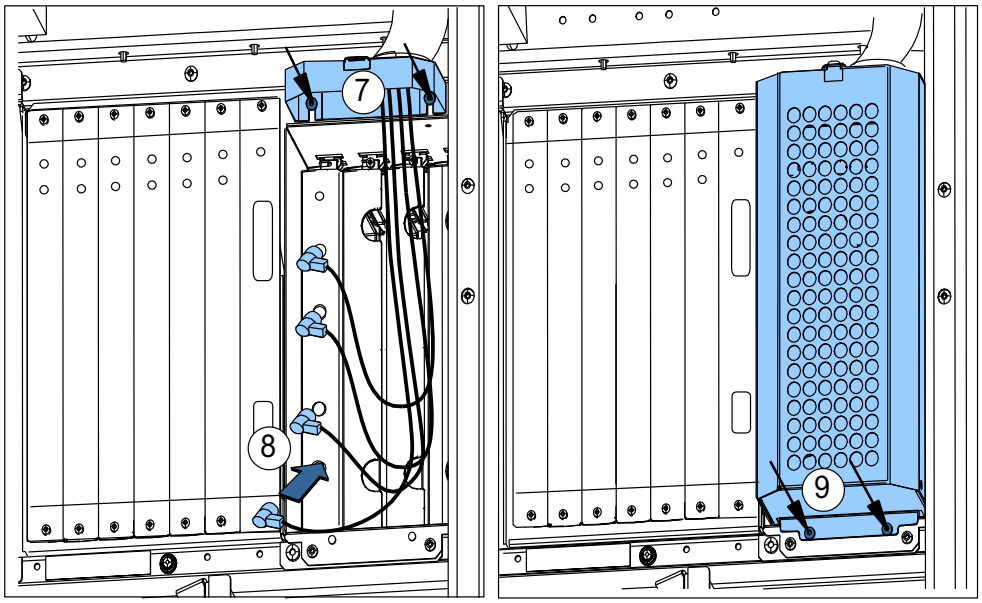


Figure 64. Installing the transmission rack front cover, transmission unit cables and transmission rack front cover support part

10. Check that all cables are properly connected and tightened.

11. Turn on the BTS power.

Ensure that the batteries are turned on.

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