Installing Flexi Cabinet for Outdoor (FCOA)

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Contents

1 Overview of installing FCOA

Purpose

This is an overview of how to install Nokia Flexi Cabinet for Outdoor (FCOA).

Before you start

Check that you have the needed installation tools available. See *Installation tools and torque values.*

Warning

If performing installation or maintenance procedures on a BTS, make sure that all transmitters in the area are switched off.

Warning

Do not go any closer to a live antenna than the compliance boundary. The radio frequency energy generated by the antenna poses a serious health risk.

Steps

1. **Check that the site meets the installation requirements.**

   For more information, see *Requirements for Installation and Operation*.

2. **Locate the site pack in the bottom right corner of the cabinet.**

3. **Remove the cabinet roof, if needed.**

4. **If required, lift the cabinet to the installation location.**

5. **Anchor the cabinet on the base.**

6. **Change the door opening direction, if needed.**

7. **Install the security lock, if needed.**

8. **Prepare the cabinet cable entries.**

9. **Route the grounding cable and ground the cabinet.**

10. **Install the air filter (FCFA), if needed.**

11. **Installing Flexi System External Alarm (FSEB)**

12. **Install the Site Support Module (FCSA) and Integrated Battery Backup (MIBBU), if needed.**

13. **Install the heat detector (FCDA), if needed.**

Further information

Next, install the modules inside the cabinet, and route and install the cables. For instructions, see *Creating FCOA Configurations.*

2 Removing the FCOA cabinet roof

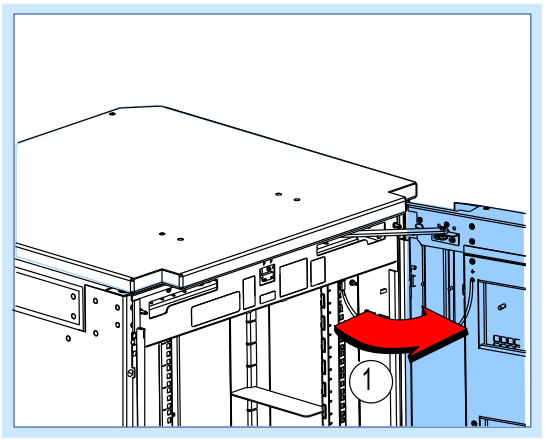
Purpose

The cabinet roof is removed for certain tasks, such as lifting the cabinet, routing the cabinet external cabling through the roof, installing the air filter, changing the door handedness, or installing the Flexi System External Alarm or Flexi System External OVP.

Summary

Steps

1. Open the door.



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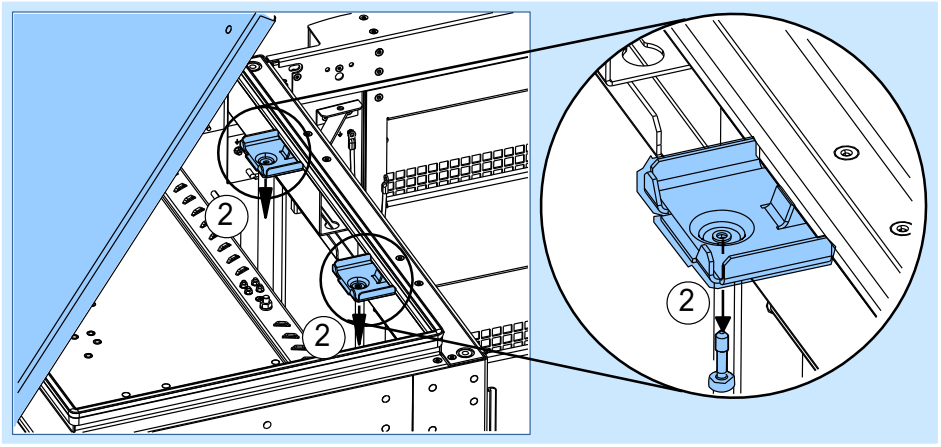
2. Remove the screws behind the front plate.



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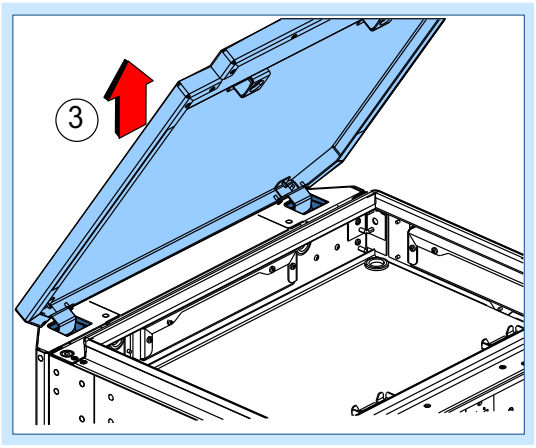
3. Remove the roof.



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3 Lifting the FCOA

Purpose

Follow these instructions when the cabinet must be lifted to the desired installation location.

An empty cabinet weighs max. 80 kg. It can be lifted by a sufficient number of personnel using the lifting handles (WLHA lifting handle kit 469554A). Lifting eye bolts are not included in the delivery. They can be ordered separately (466289A).

A fully equipped cabinet must be lifted with a crane.

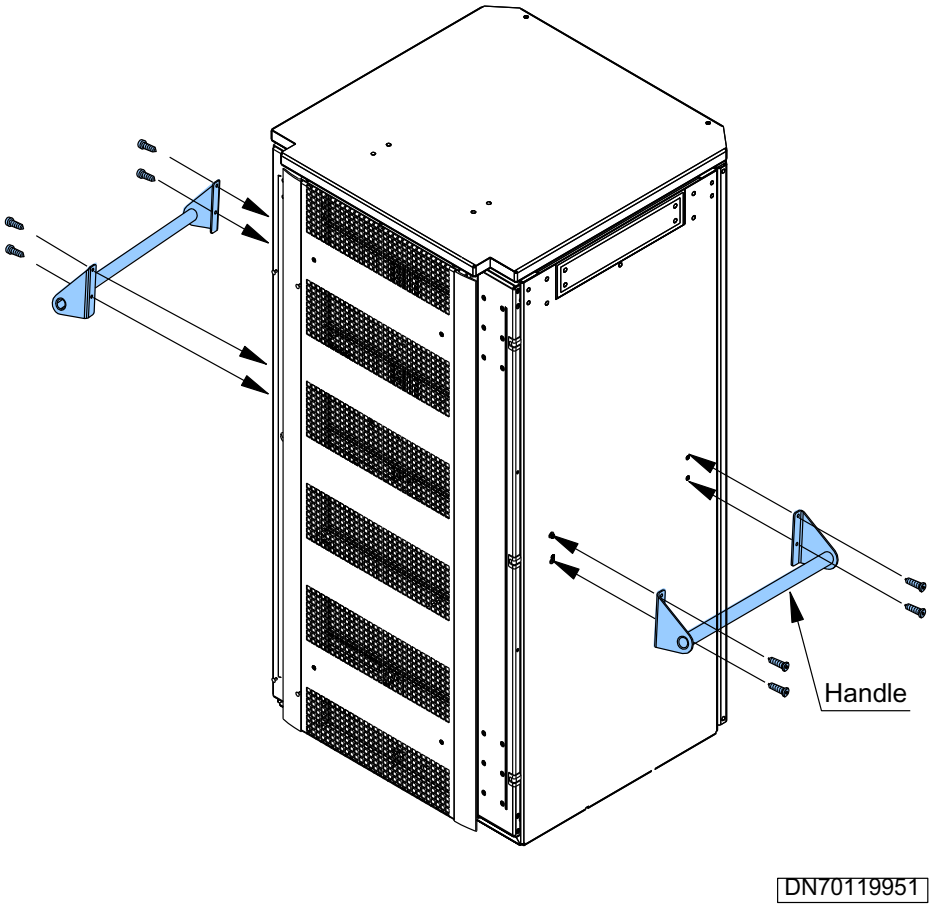

Figure 1. Lifting handles

Summary

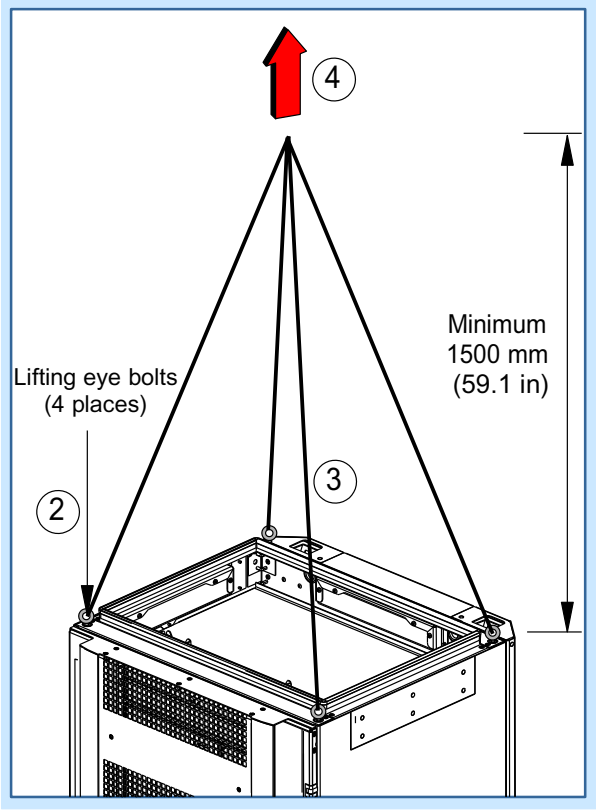

Figure 2. Lifting the cabinet

Warning

Follow the local safety regulations when lifting the cabinet.

Steps

1. **Remove the cabinet roof.**
2. **Attach the 4 x M12 lifting eye bolts to the attachment points.**
3. **Attach the hoisting belt or rope to the lifting eye bolts.**

Make sure that the hoisting belt or rope loop is min.1500 mm (59.1 in.) high to avoid bending the equipment.

! Caution

A fully equipped cabinet is heavy. Make sure that the hoisting belt or rope is sufficiently strong.

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4. **Lift the cabinet carefully to the desired installation location.**
5. **Mount the cabinet.**
6. **Remove the lifting equipment.**
7. **Install the roof.**

4 Installing the cabinet

4.1 Anchoring the FCOA

Purpose

The cabinet must be anchored to the base if there is any risk of it toppling in areas with an earthquake risk, for example.

Before you start

The site is prepared and ready.

When raining, some water may enter the cabinet through the door and back wall. It is important that the water can exit via the holes on the cabinet floor. If the cabinet is exposed to rain, it must be installed at least 20...50 mm off the ground by using, for example, an I-beam rail, metal grating or C-bars.

Summary

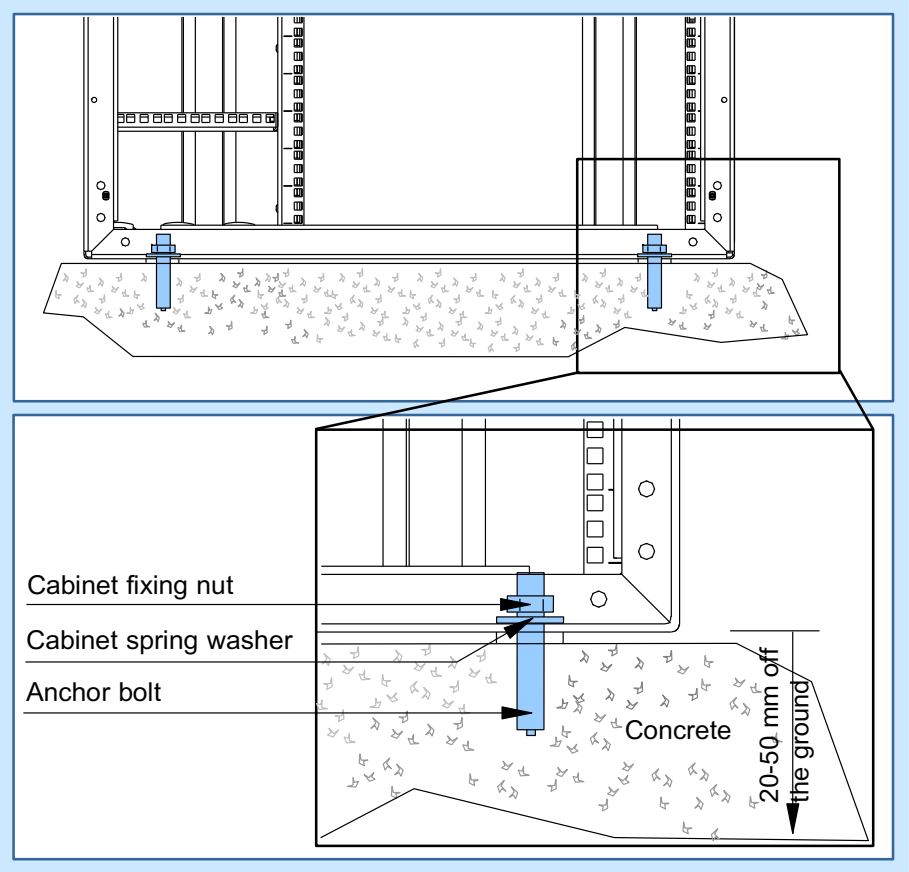


Figure 3. Anchoring the cabinet

Steps

1. Drill the anchoring bolt holes on the base.

See the drilling template in the packing.

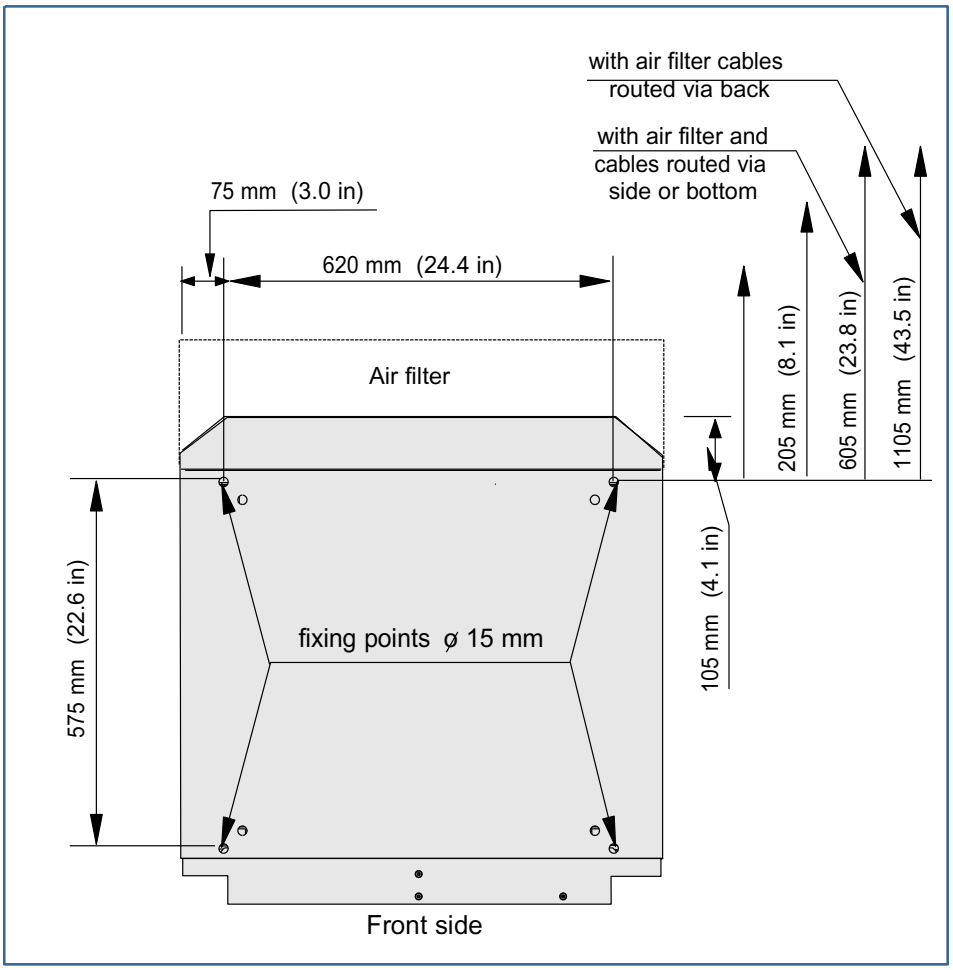


Figure 4. Anchoring bolt locations

2. **Attach the anchoring bolts to the base.**
3. **Position the cabinet on the anchoring bolts.**
4. **Fix the nuts on the anchoring bolts.**
5. **Check that the cabinet is level.**
6. **Tighten the nuts to 49 Nm.**

4.2 Changing the opening direction of the FCOA door

Purpose

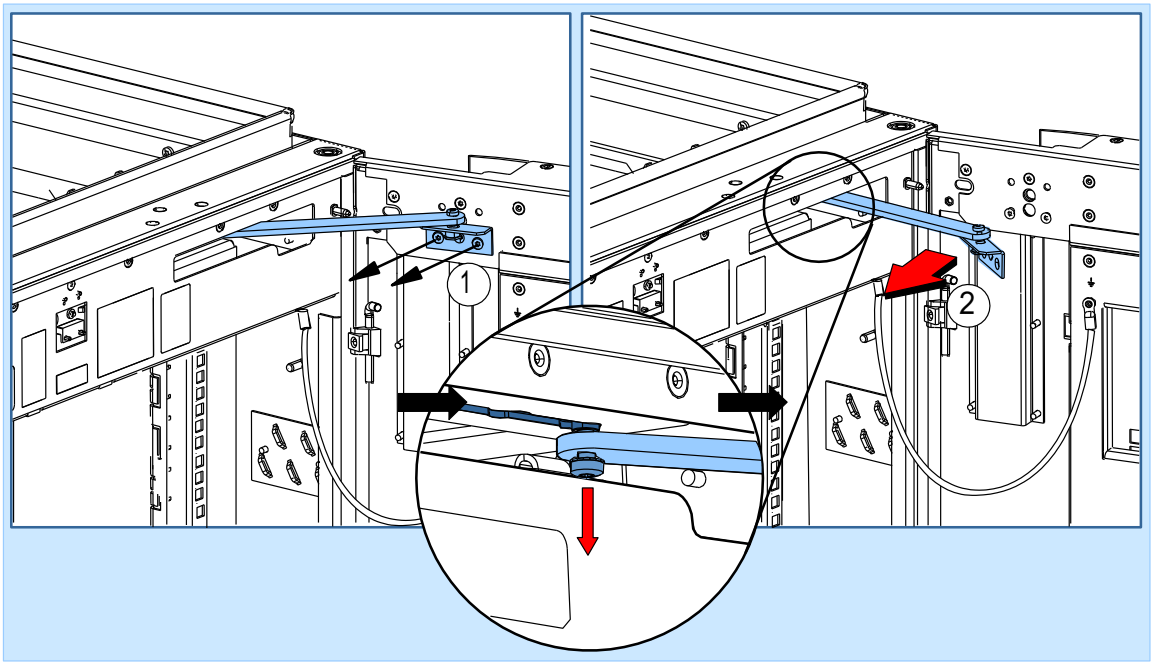
The door opening direction can be changed.

Tip

If the cabinet installation location has limited space, change the door handedness before taking the cabinet to the location.

Steps

1. **Detach the wind stopper from the door (two screws).**



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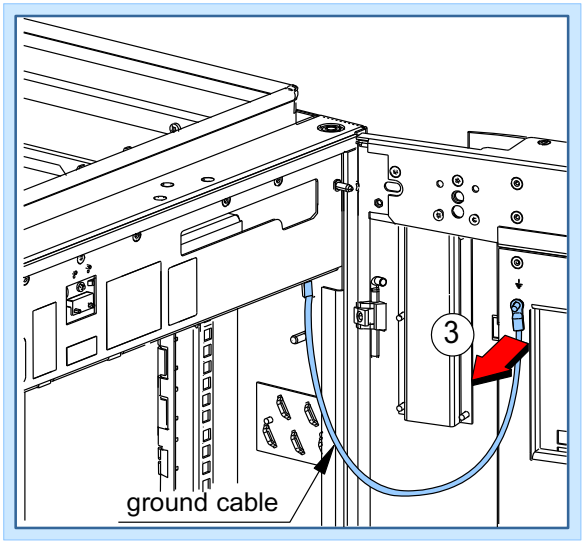
2. **Detach the wind stopper from the cabinet by moving it to the left first.**

3. **Detach the grounding cable from the door.**



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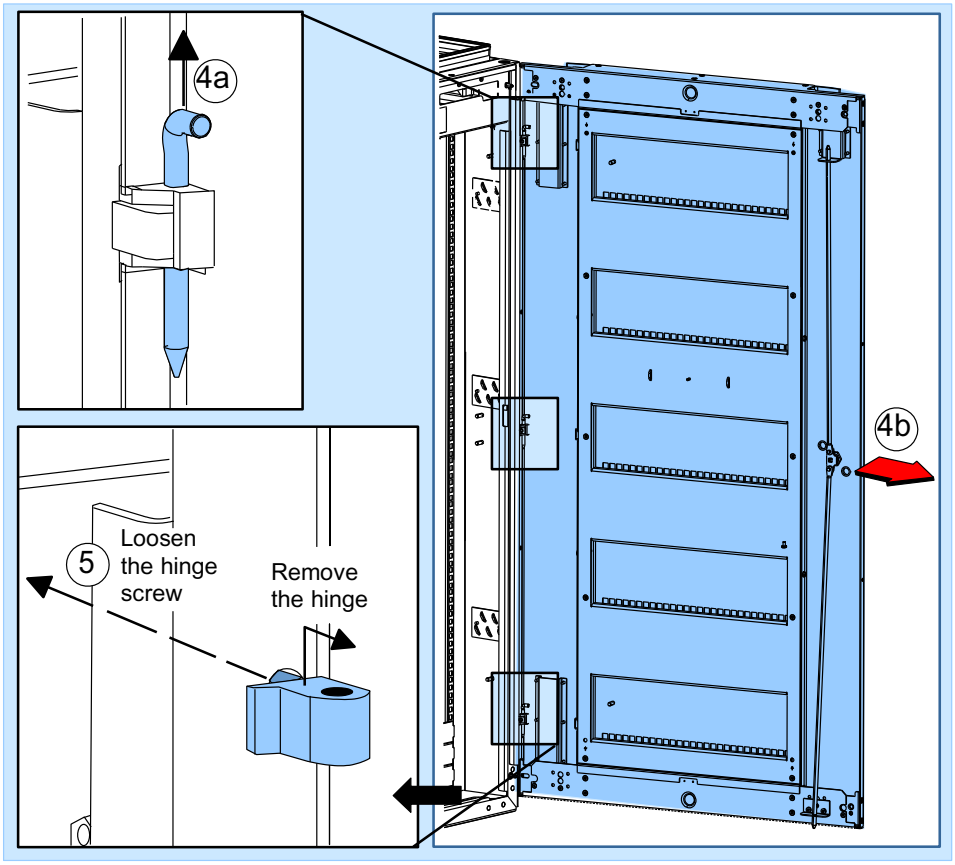
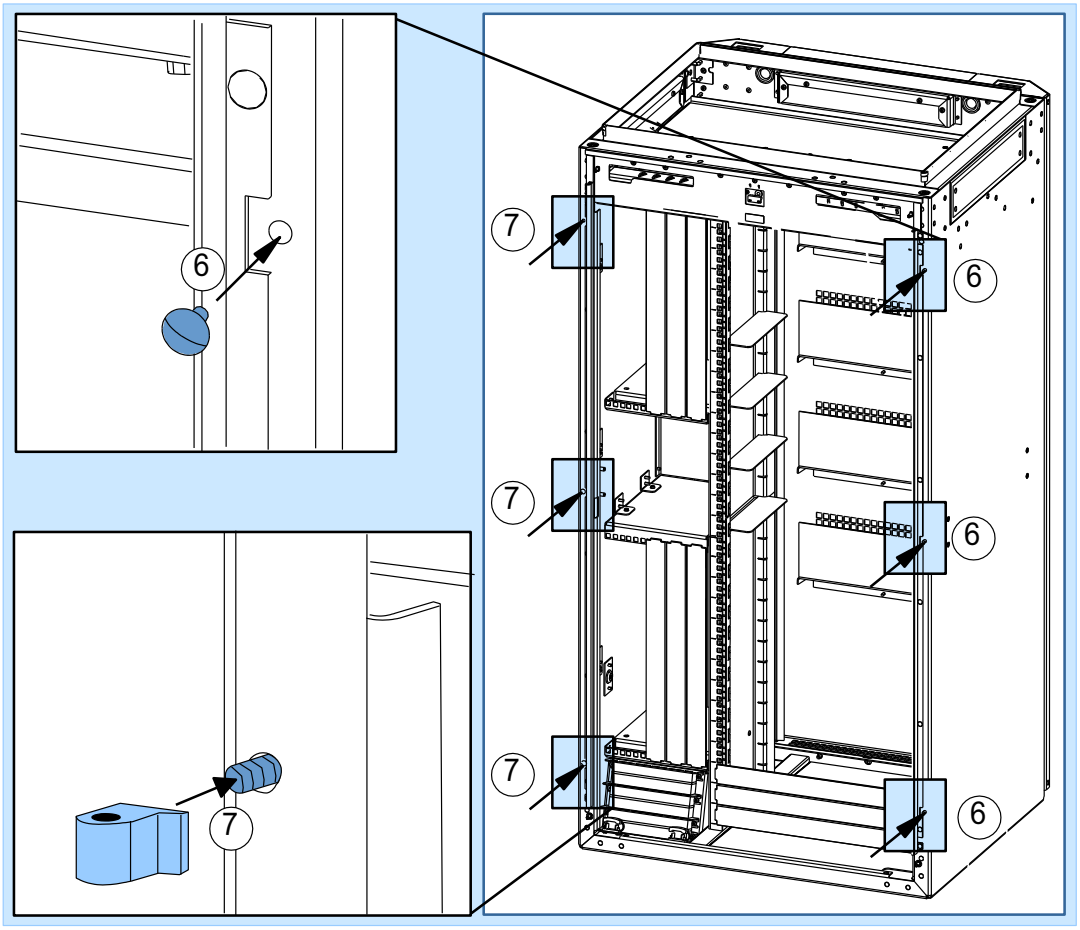
4. Remove the hinge pins (3 pcs) and detach the door.



5. **Remove the hinge screws (3 pcs) and hinges from the cabinet.**

6. **Remove the plastic plugs and install them on the other side of the cabinet.**



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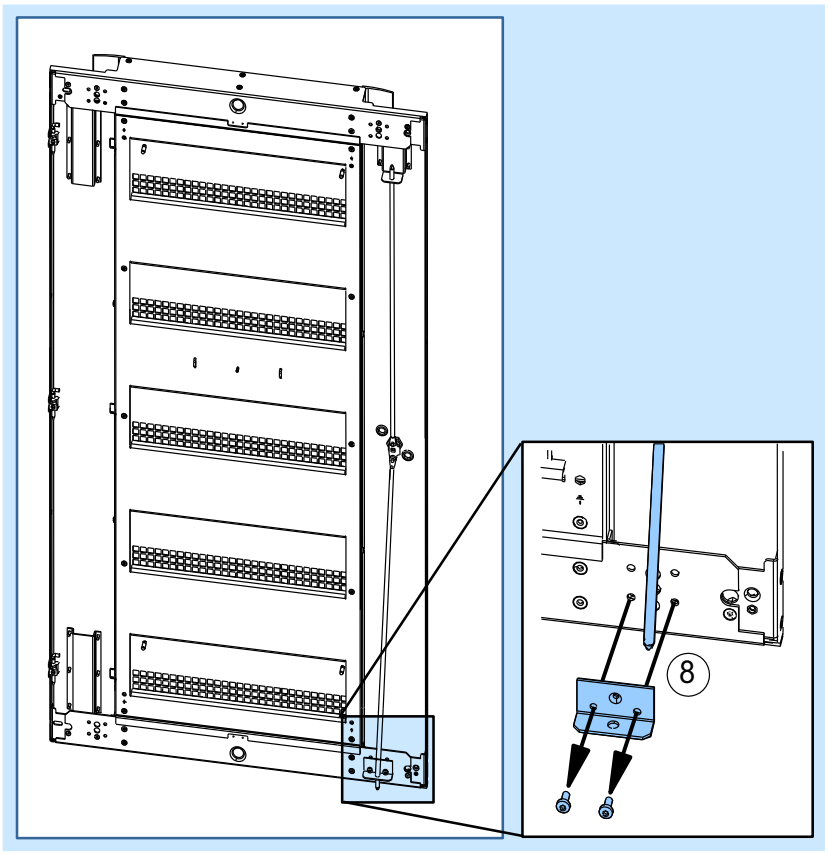
7. **Move the hinges to the new location in the cabinet.**

8. **Detach the locking rod guide plate.**



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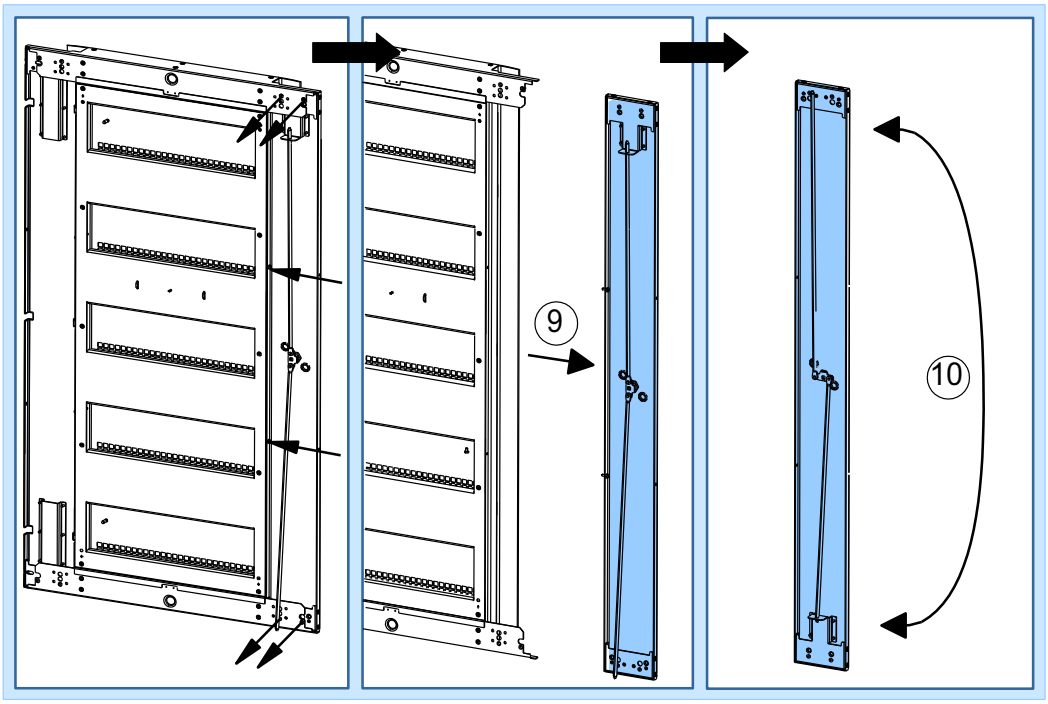
9. Detach the door side plate (lock side).



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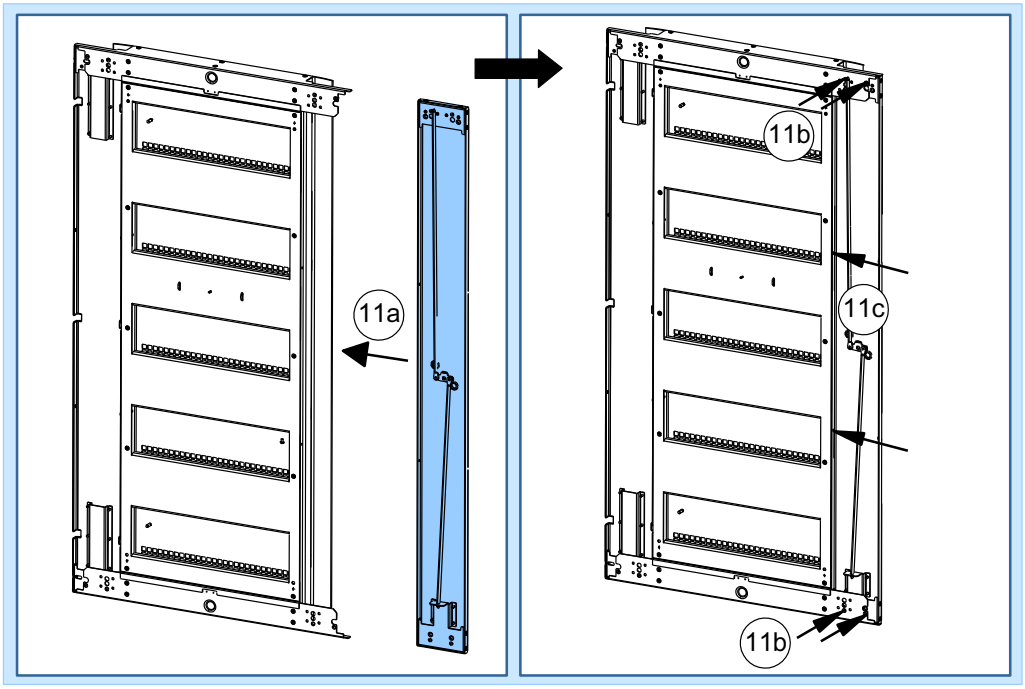
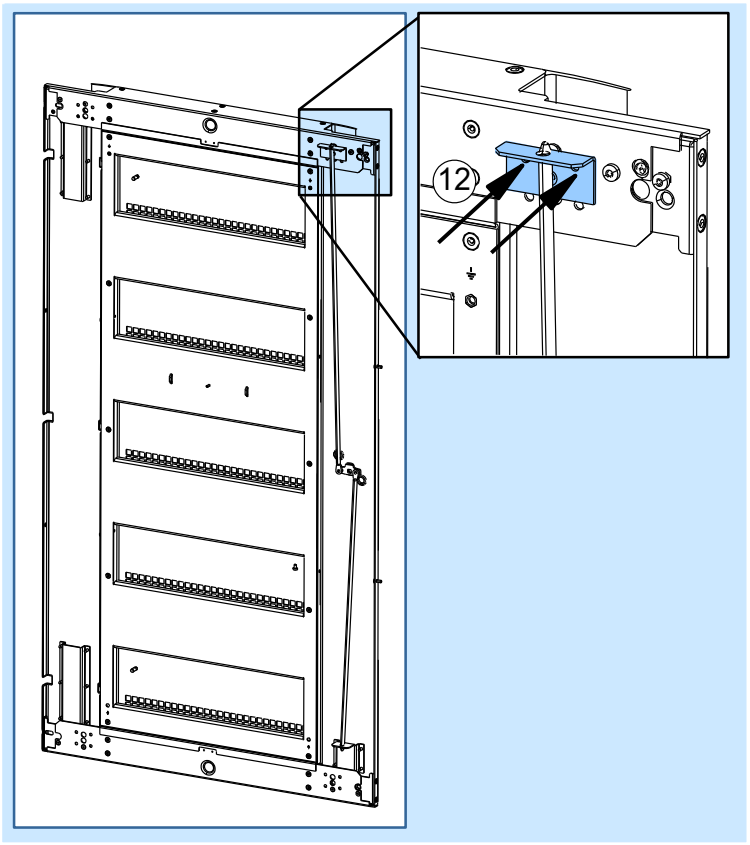
10. Flip the door side plate 180 degrees (upside down).

11. Attach the door side plate back in its place.

Fix with six screws. Tighten the two top screws first, then the two bottom ones, and lastly the two screws in the middle.



12. Thread the guide plate to the locking rod and attach it to the door.



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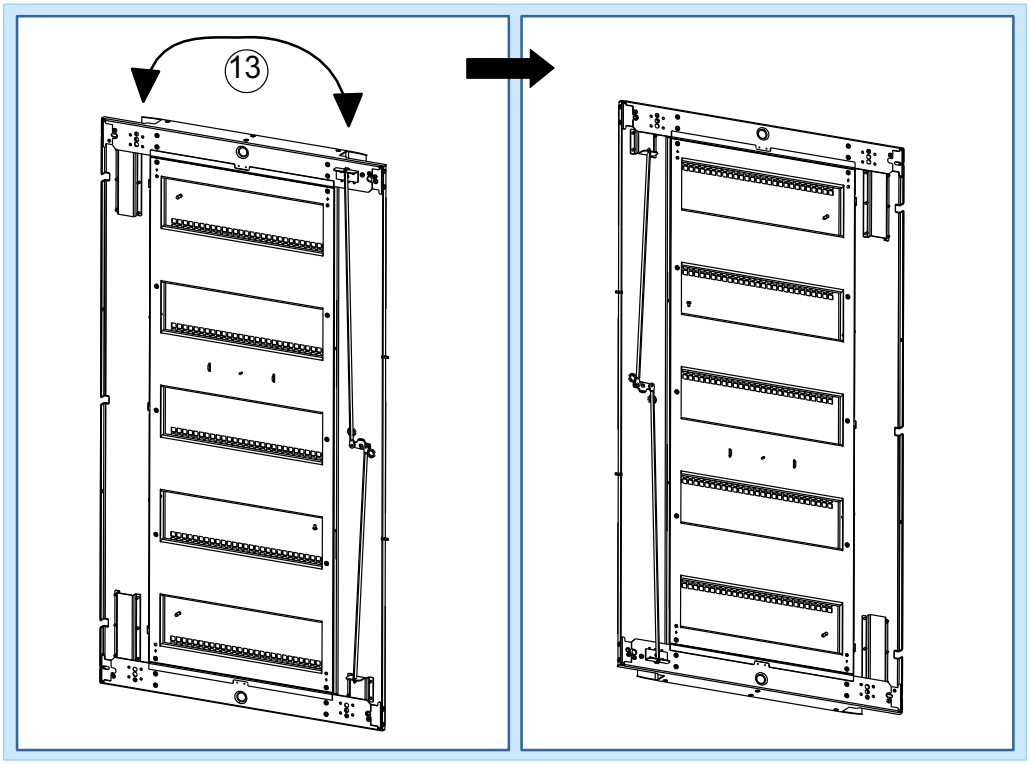
13. Flip the door 180 degrees (upside down).



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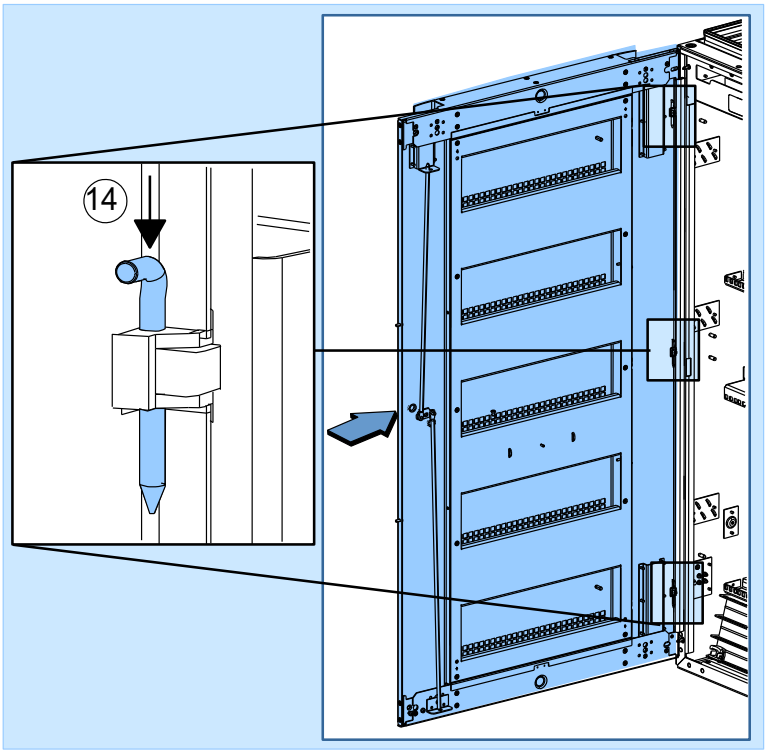
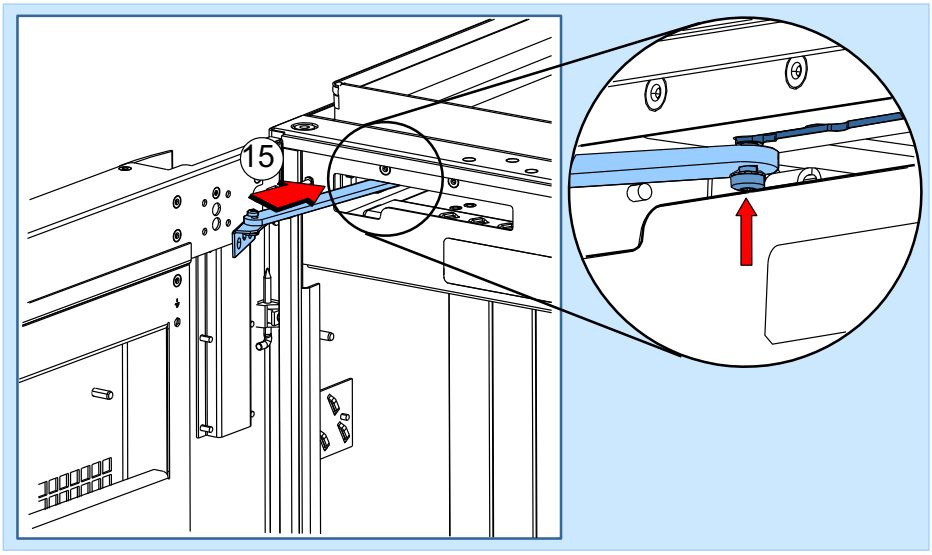
14. Install the door to the cabinet using the hinge pins.

Push the hinge pins at least halfway down the hinge slots.



15. Thread the wind stopper to the guiding slot in the cabinet.



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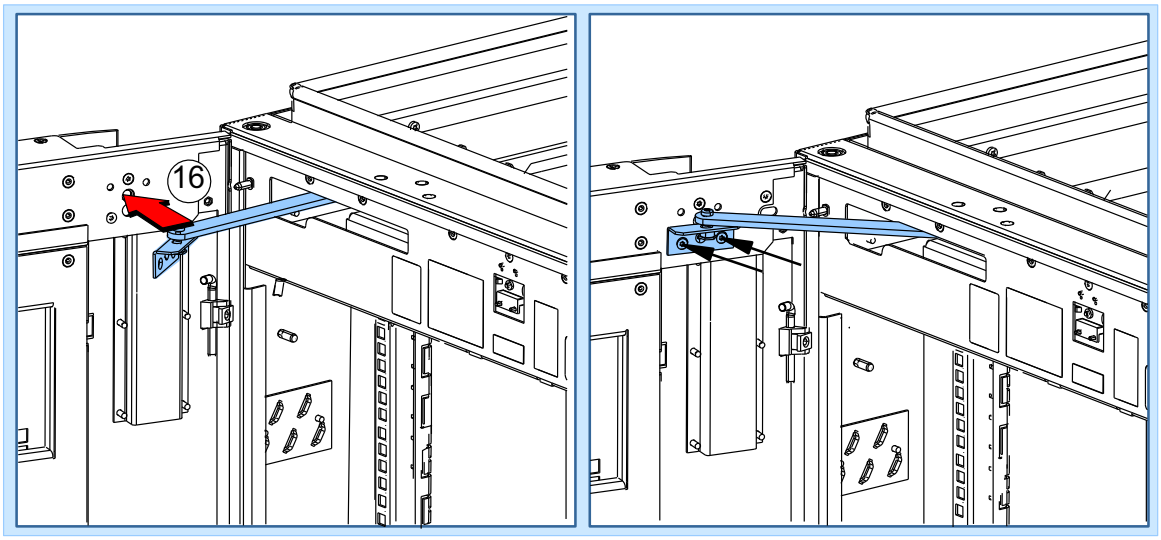
16. Attach the wind stopper to the door.



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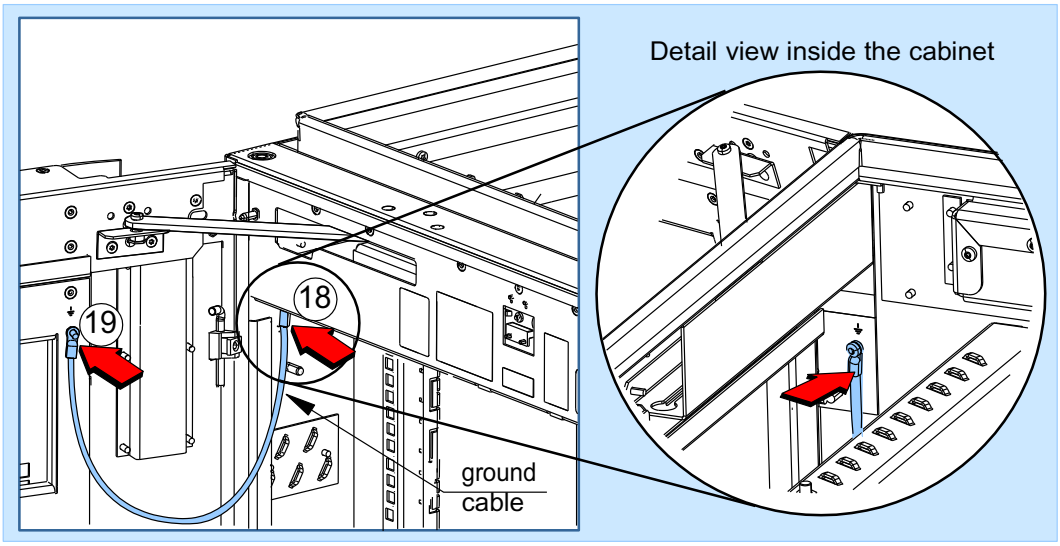
17. Detach the grounding cable from the cabinet.



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18. **Attach the grounding cable to the new location in the cabinet.**

19. **Attach the grounding cable to the door.**

20. **Move the magnetic proximity sensor magnet part from the bottom of the door to the top.**
    a. Detach the two M3 screws.
    b. Flip the detached part 180 degrees.
    c. Move the magnet part to its new location and fix with the two M3 screws.

4.3 Installing the FCOA security lock

Purpose

An optional customer-specific lock can be installed on the cabinet door to prevent unauthorised personnel from accessing the cabinet. The lock installation is either a right-hand or left-hand installation depending on the handedness of the cabinet door.

Summary

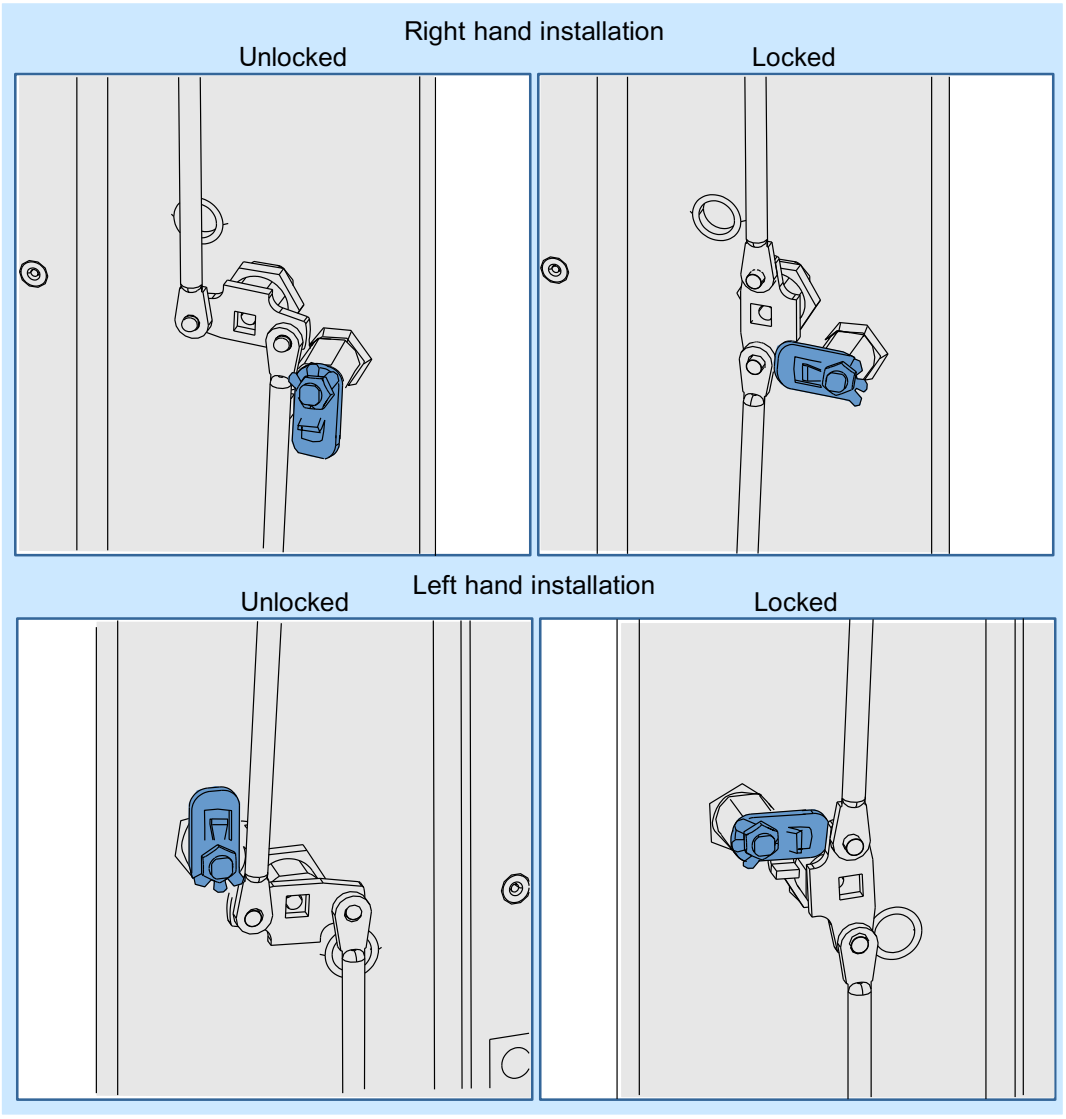
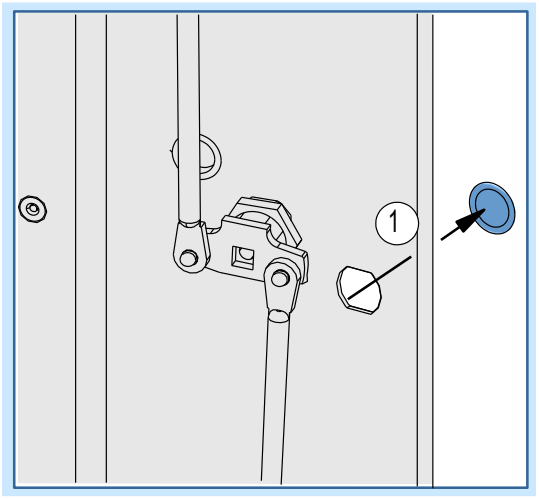


Figure 5. Installing the security lock

Steps

1. Remove one of the rubber plugs.



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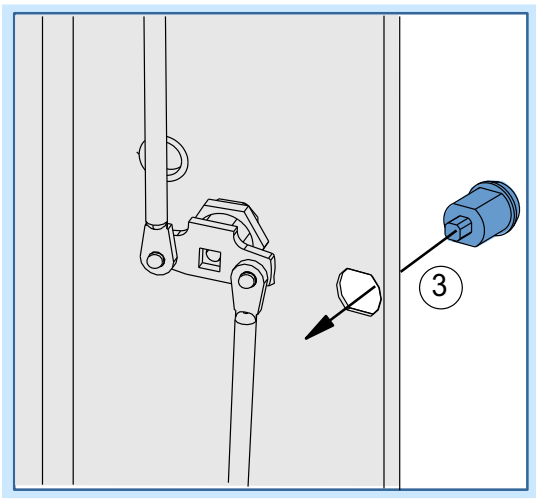
2. Remove the generic security lock latch from the lock.

3. Take the security lock latch from the site pack.



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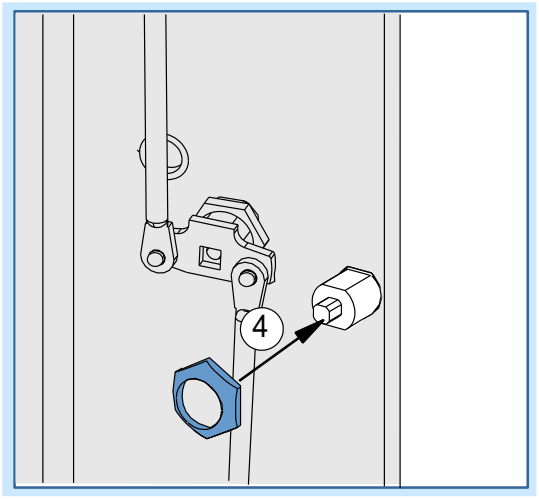
4. Fit the security lock on the cabinet door.



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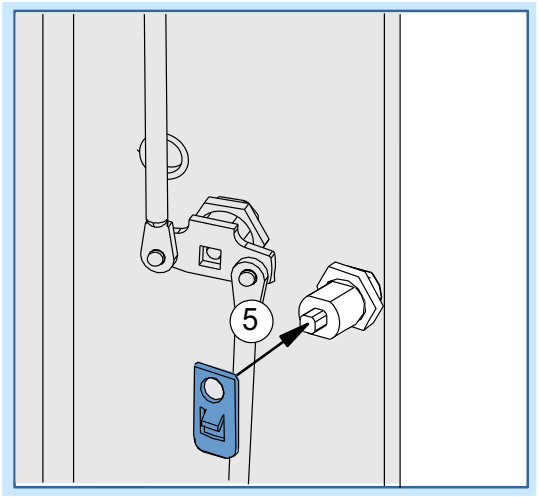
5. Secure the security lock in its place with a nut.



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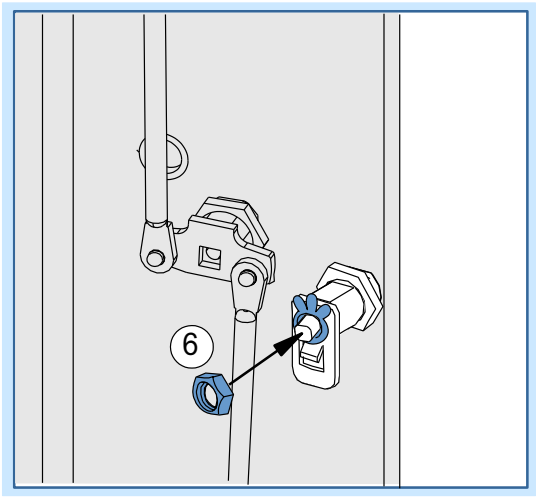
6. Attach the security lock latch to the lock.



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7. Secure the lock latch with a nut.

8. Fix a rubber plug into the empty hole.

9. Test the security lock.

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

In a left-hand installation, test the lock by turning the key clockwise and make sure that the latch is pointing upwards.

5 Grounding the FCOA

Before you start

The grounding cable is not included in the delivery.

Caution

Follow the local safety regulations when grounding the cabinet.

Summary

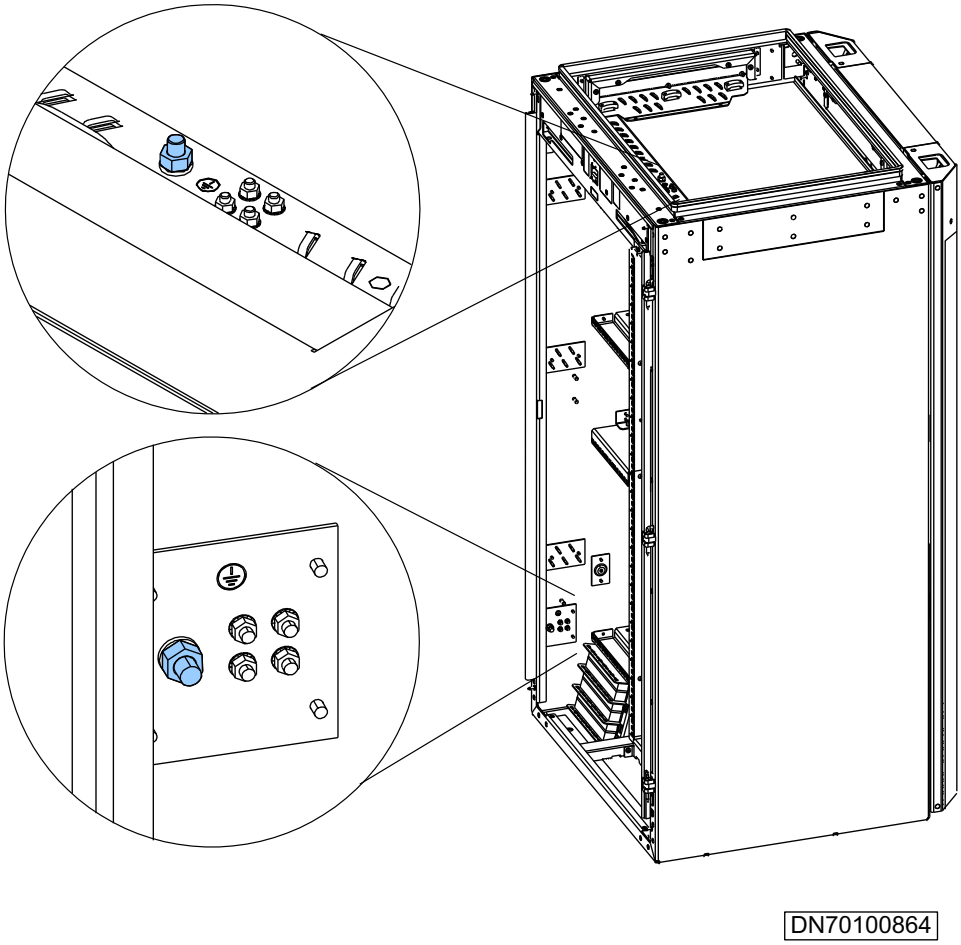


Figure 6. Site main grounding points in FCOA

Steps

1. **Make sure the grounding cable is fixed to the site grounding point.**
2. **Guide the cable through the cable entry.**
3. **Strip approx. 2 cm (0.79 in.) of the main ground cable.**
4. **Insert the stripped end of the cable into a cable shoe lug and crimp.**

5. Fit the lug to the grounding point in the cabinet and fix with a star washer and nut.

Tighten to 3 Nm (for M5) or 5 Nm (for M8).

Tip

M8 is recommended for main grounding.

Further information

The modules are grounded to the cabinet rack, and no separate module grounding cables are required.

6 Installing optional items

6.1 Installing air filter

Purpose

The optional air filter and wind breaker can be used when the environmental conditions require it.

Before you start

Remove the cabinet roof.

Remove the site bag on the top left corner of the air filter.

When unpacking the FCFA delivery, push the air filter back panel horizontally until it no longer moves freely. Then lift the plate upwards keeping it level.

Tip

It is recommended that the cabling be routed to the side or bottom when the air filter is used. If the cables are routed in the rear, antenna jumper cables must be disconnected.

Summary

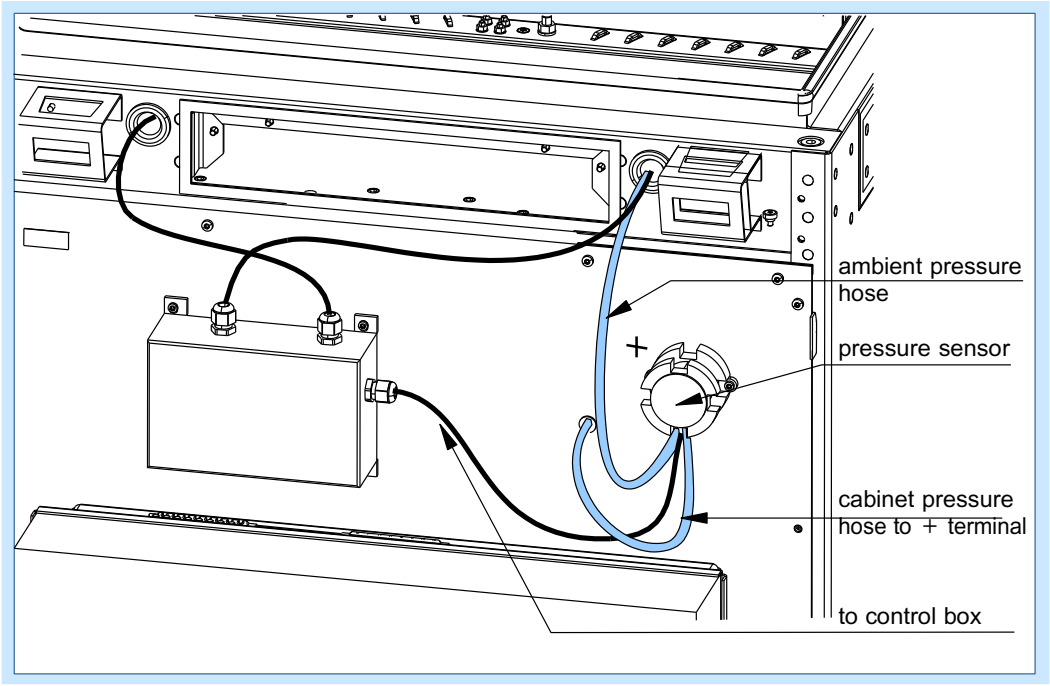
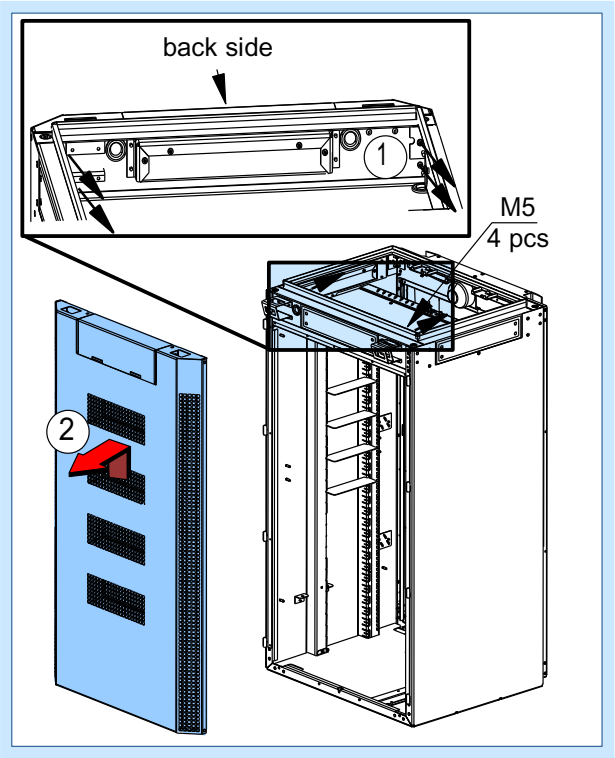


Figure 7. Air filter power supply cable (left-hand installation)

Steps

1. Remove the 4 x M5 screws inside the cabinet.

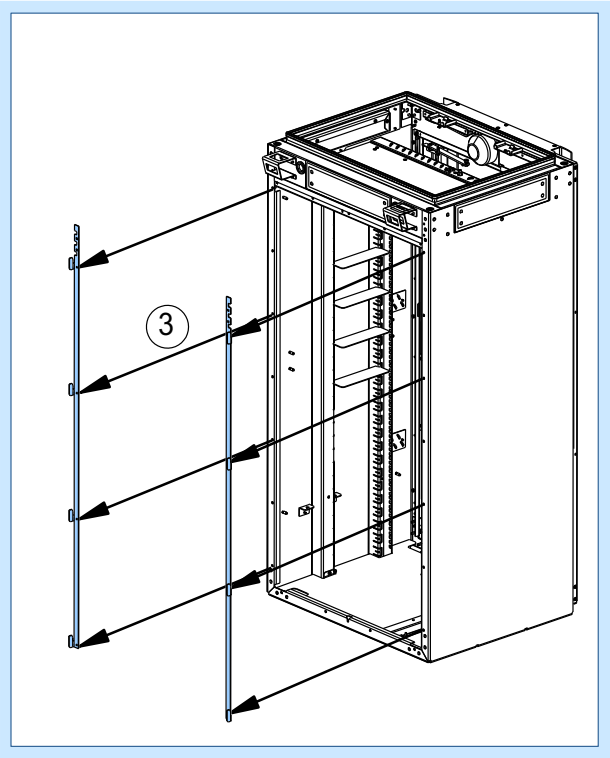


2. Remove the cabinet back panel.

Lift the back panel first upwards and then outwards.

3. Remove the two bars behind the cabinet.

Loosen the 4 x M5 screws from both sides and detach the bars.



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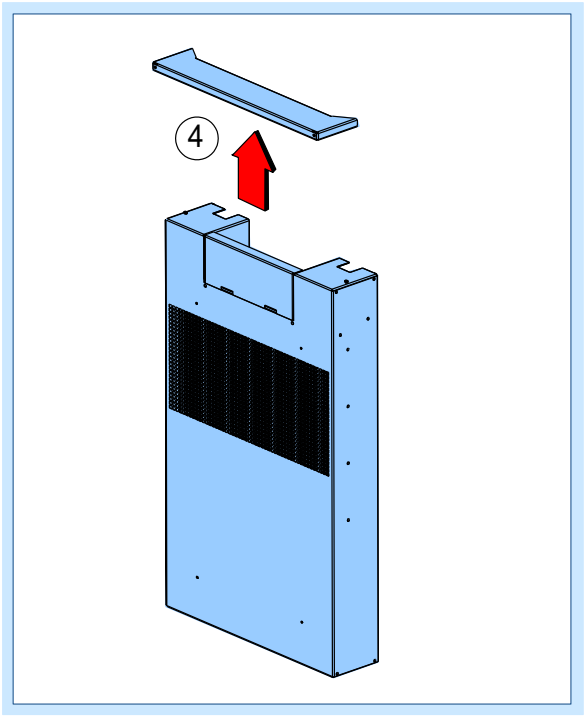
4. Remove the air filter roof.



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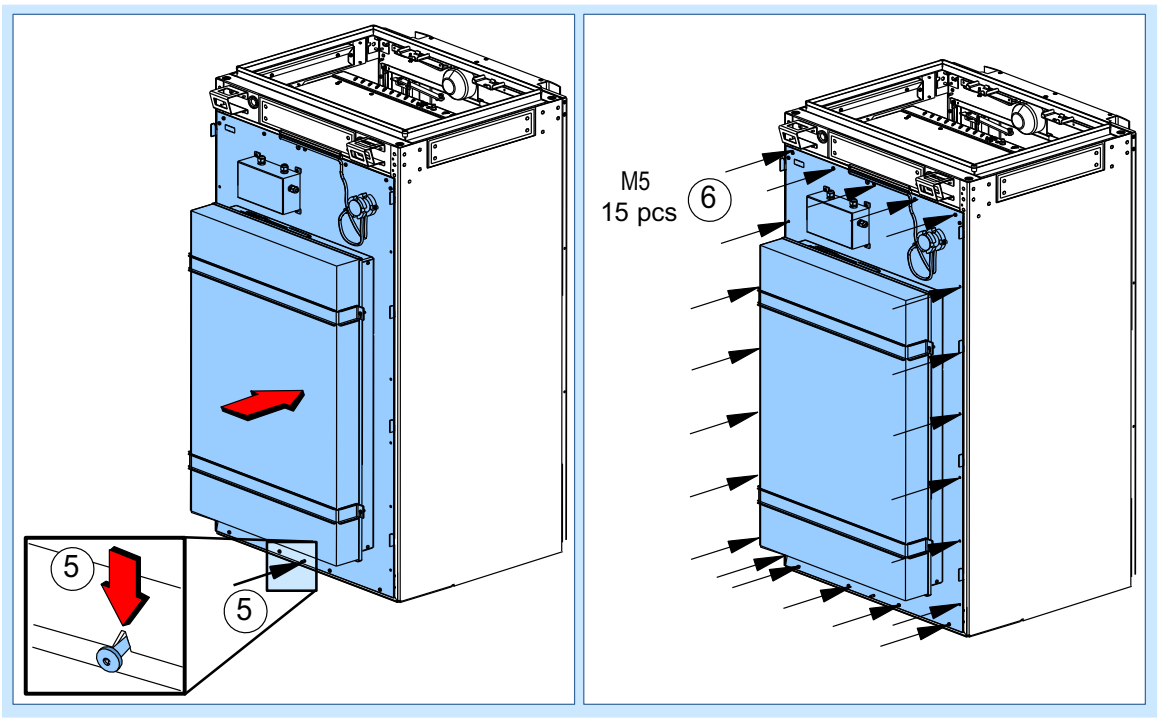
5. Fix the air filter in place with the guide pins (one at the top and one at the bottom of the air filter).



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6. **Fix the air filter on the cabinet with 4 x M5 on the roof and 22 x M5 screws at the back.**

   Fix the four screws on the roof first.

Tip

Use the screws from the detached bars in the previous step. In addition, use additional screws included in the air filter site pack.

7. **Open the control box.**

8. **Connect the alarm cable to the FSEB box.**

9. **Route the air filter fan power cable through a vacant bushing seal and connect it to the screw terminal on the control box printed circuit board.**

There are two alternatives. Either:

a. Connect the power cable (995083) from the System Module (Ext output).

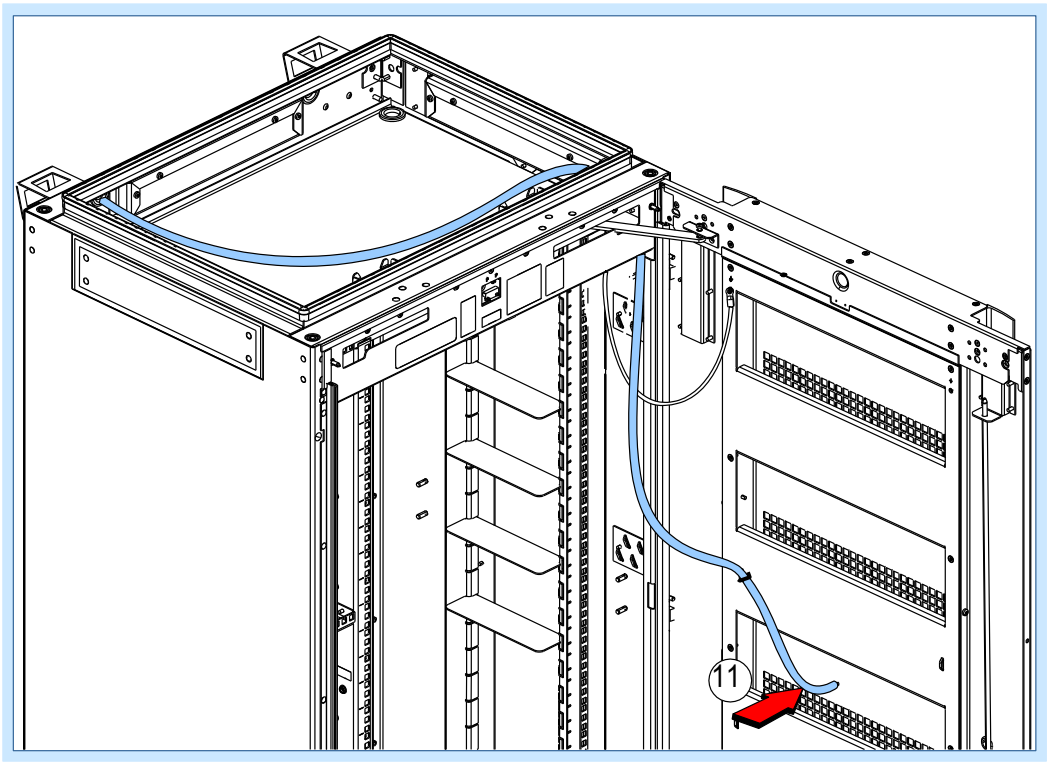
Or:

b. Attach the fuse into the FSEC box DIN rail and connect the power cable (995084).

Note

The FSEC is currently available for Flexi WCDMA BTS only.

10. Route the ambient pressure hose to the cabinet door.



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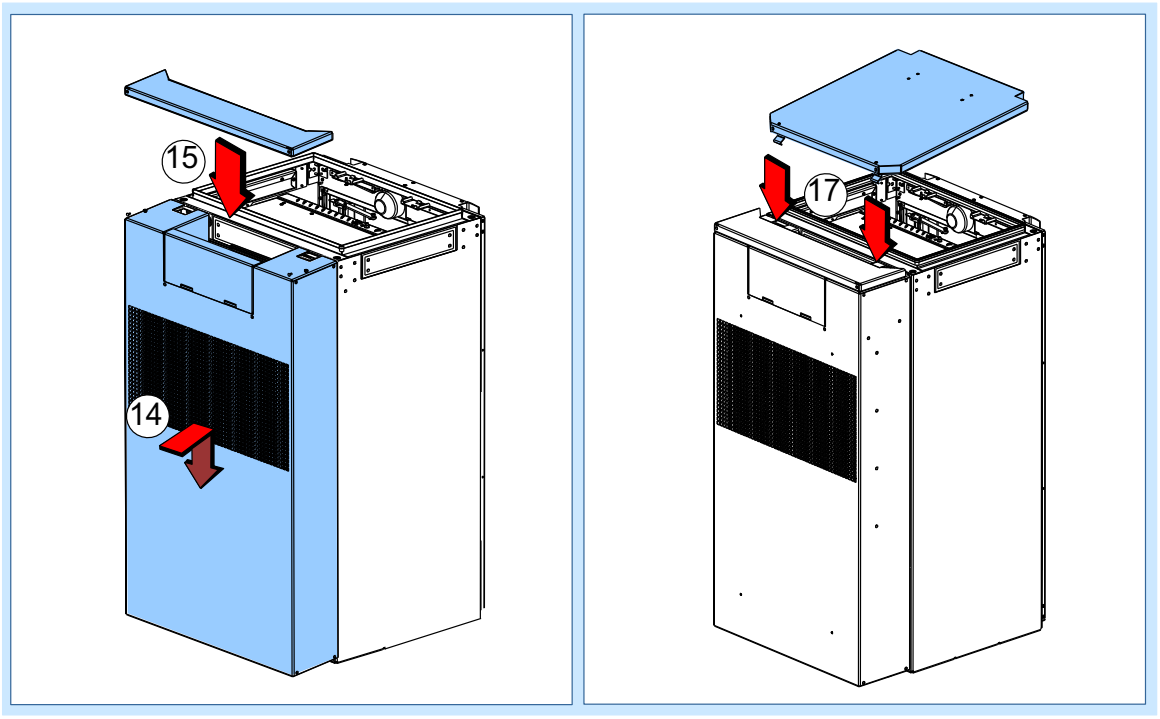
11. Install the control box back cover.

12. Fix the cables to the fixing points with cable ties.

13. Install the air filter back panel.



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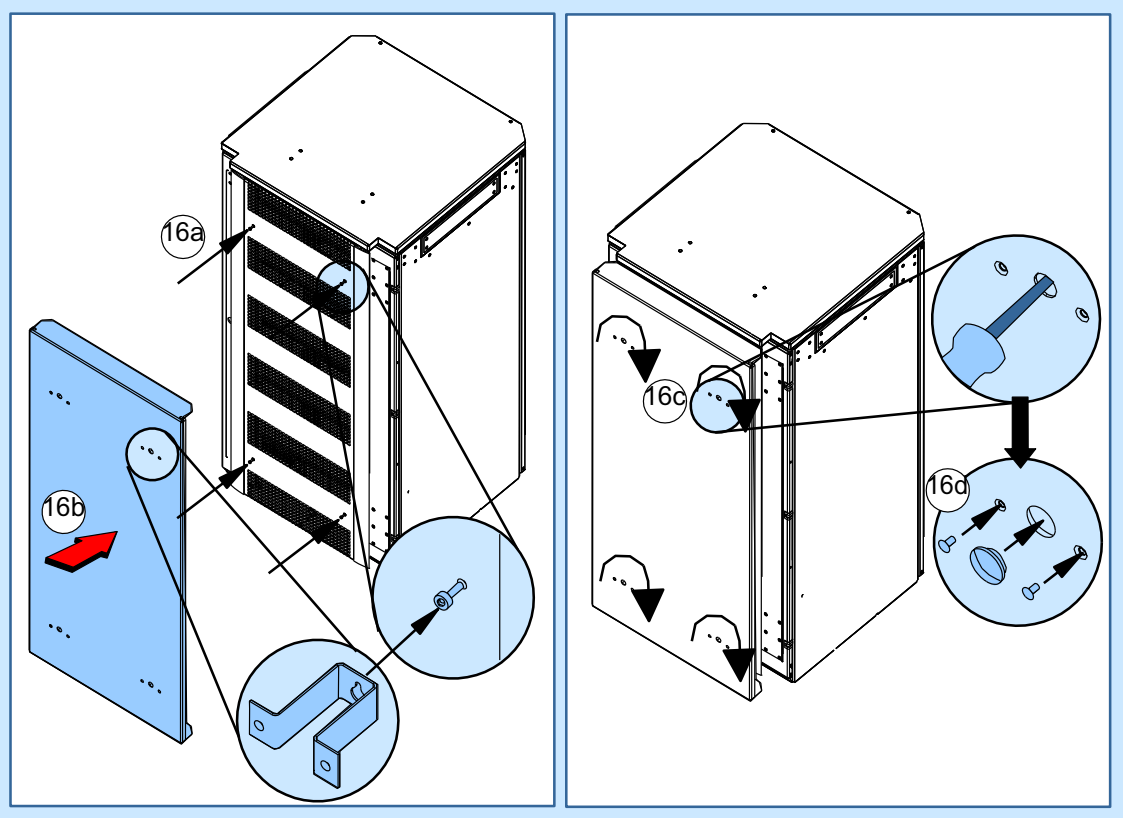
14. **Install the air filter roof.**

15. **Install the cable entry, if necessary.**

16. **Install the cabinet roof.**

17. **Install the wind breaker on the cabinet door, if necessary.**



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a. Fix four screws and washers on the cabinet door. Make sure the washers are placed the convex side outwards.
b. Install the wind breaker.
c. Tighten the screws.
d. Fix the rubber plugs in the wind breaker.

6.2 Installing Flexi System External Alarm (FSEB)

Purpose

The optional Flexi System External Alarm Module (FSEB) is used when up to 24 external alarm inputs and 6 control outputs need to be supported with Nokia Flexi EDGE BTS. The module also supports Flexi Cabinet Heat detector (FCDA).

The FSEB can be installed in following ways:

- On a wall (vertical or horizontal position)
- On a pole using brackets (horizontal or vertical position)
- On casing in pole, wall, or stack installations using brackets (horizontal or vertical position)
- On the FCIA or FCOA roof (horizontal position only)
- In City Talk cabinets, the FSEB can be installed on top of the stack (depending on working space) or outside of the cabinet. The box cannot be installed on the roof.

See also section *FSEB interface signals and connector pin assignments*.

Before you start

In pole or wall installation, locate the box in the proximity of the System Module. In wall installations, make sure that the mounting surface is flat.

In FCOA installations, use the fixing points on the cabinet roof.

Caution

Electrostatic discharge (ESD) may damage the equipment. Wear an ESD wrist strap when handling the external alarm connection box.

Note

When connecting the cables, make sure that the cable lead-ins that are not used are blocked.

Summary

The FSEB can be installed either horizontally (cable lead-ins on the side) or vertically (cable lead-ins facing downwards). See the following figures for the two installation options.

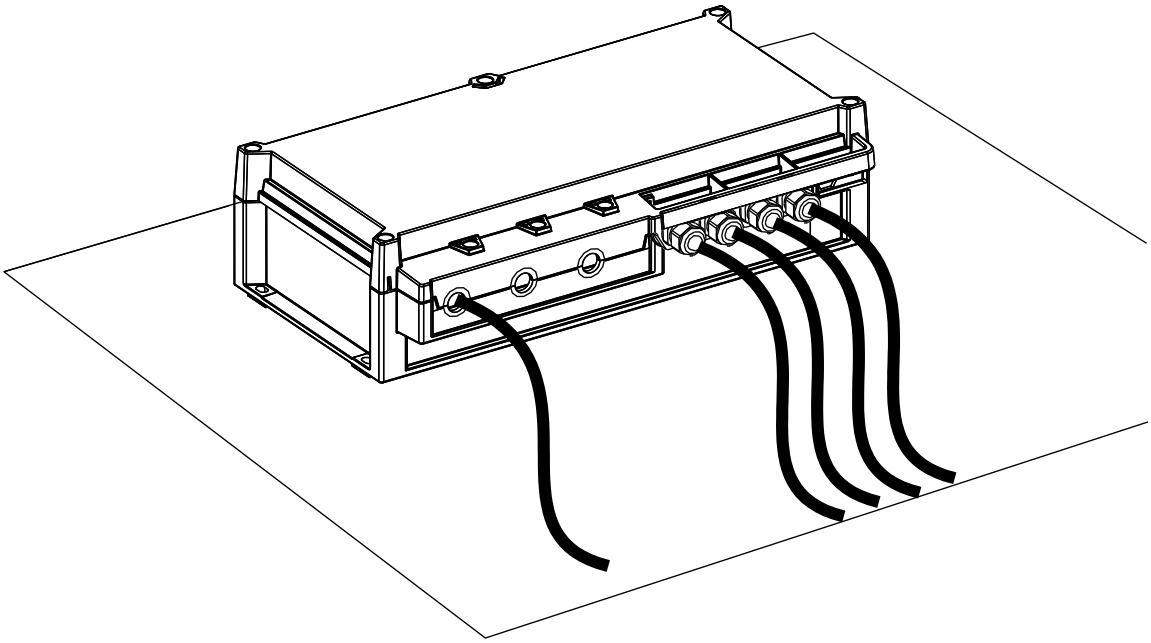

Figure 8. FSEB installed horizontally

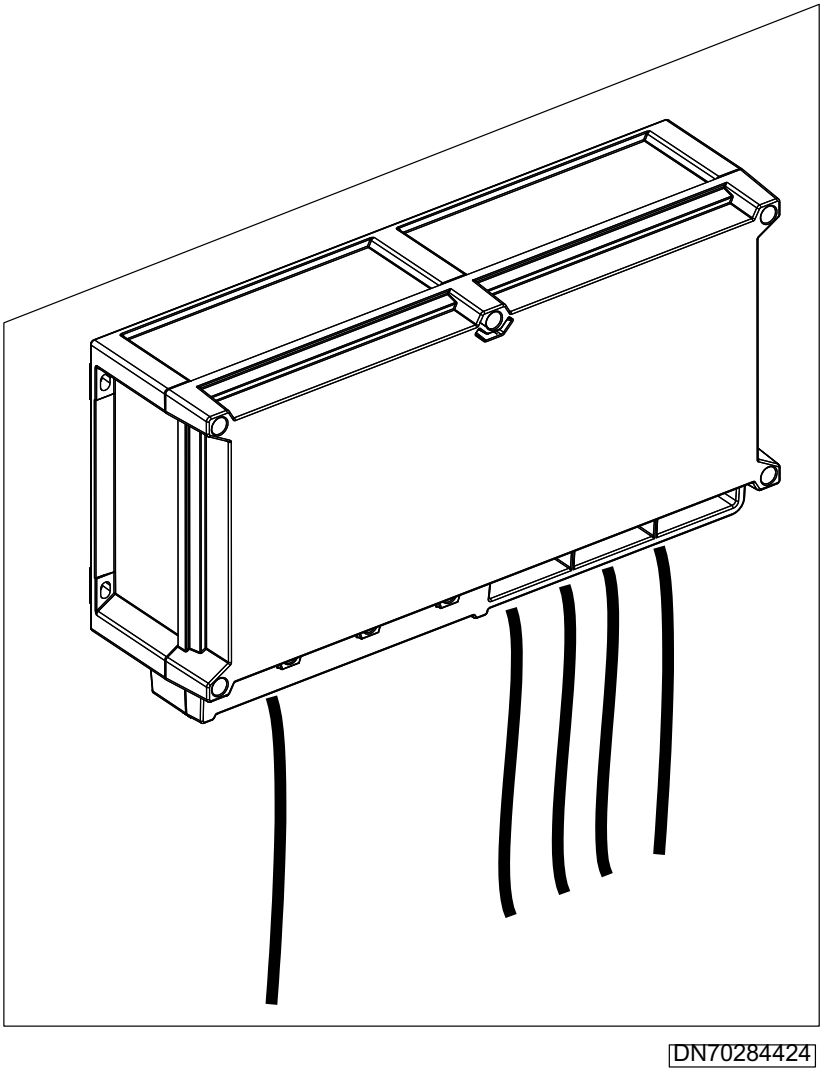

Figure 9. FSEB installed vertically

In outdoor installations, the cable lead-ins must be facing downwards to meet the IP55 standard.

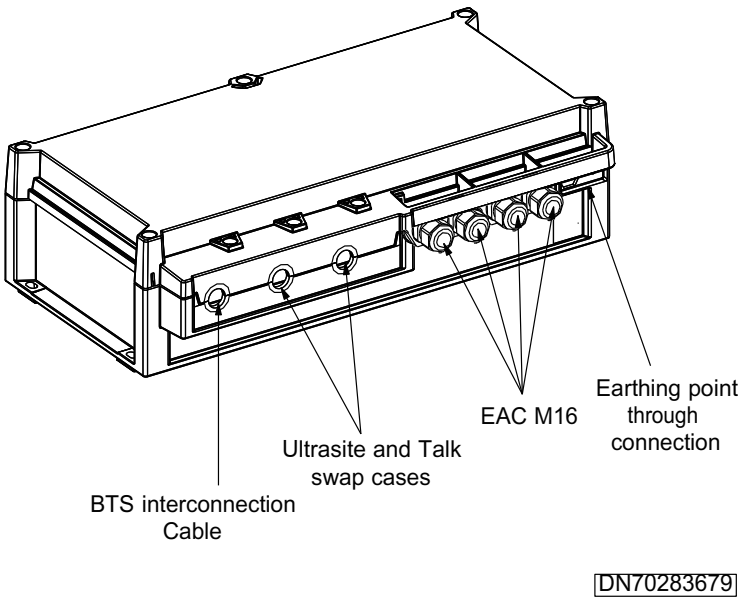

Figure 10. FSEB connectors

Steps

1. Install FSEB with four M5 screws using the fixing holes in the bottom of the box.

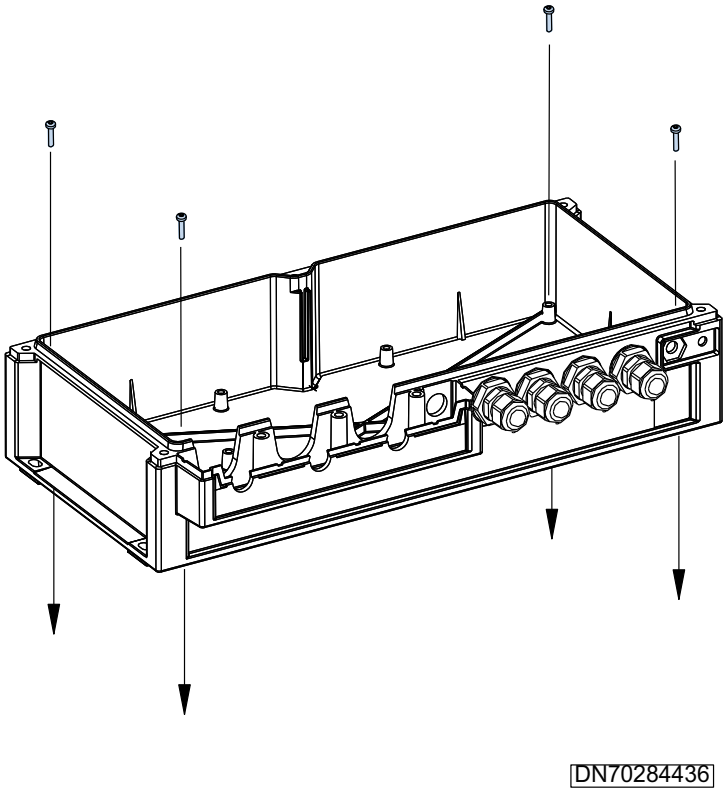

Figure 11. Install FSEB with four M5 screws

In stack, wall or pole installation, install the FSEB using the mounting brackets.

a. Attach the mounting brackets on top of the module and tighten with four M5 screws.

! Caution

To make sure the modules will not be damaged, do not use longer screws than M5 x 10.

---

b. To check where to mount the FSEB, see the FSEB text on the mounting bracket.

2. Connect the grounding cable to the grounding screw on the right side of the FSEB front plate.

Screw the nut tightly.

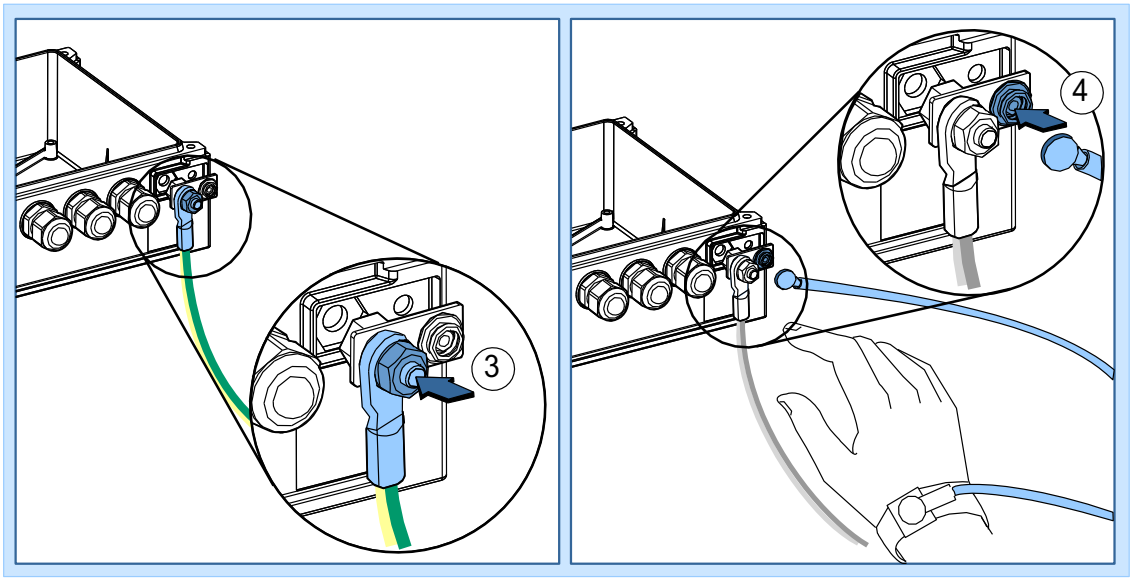

Figure 12. Connect the grounding cable

3. **Connect the ESD wrist strap first to your wrist and then to the grounding clip next to the grounding screw.**

Note

Make sure that jumper X1103 is set to GSM mode.

4. **Connect the external alarms cable (included in the FSEB delivery) from the FSEB to the System Module.**

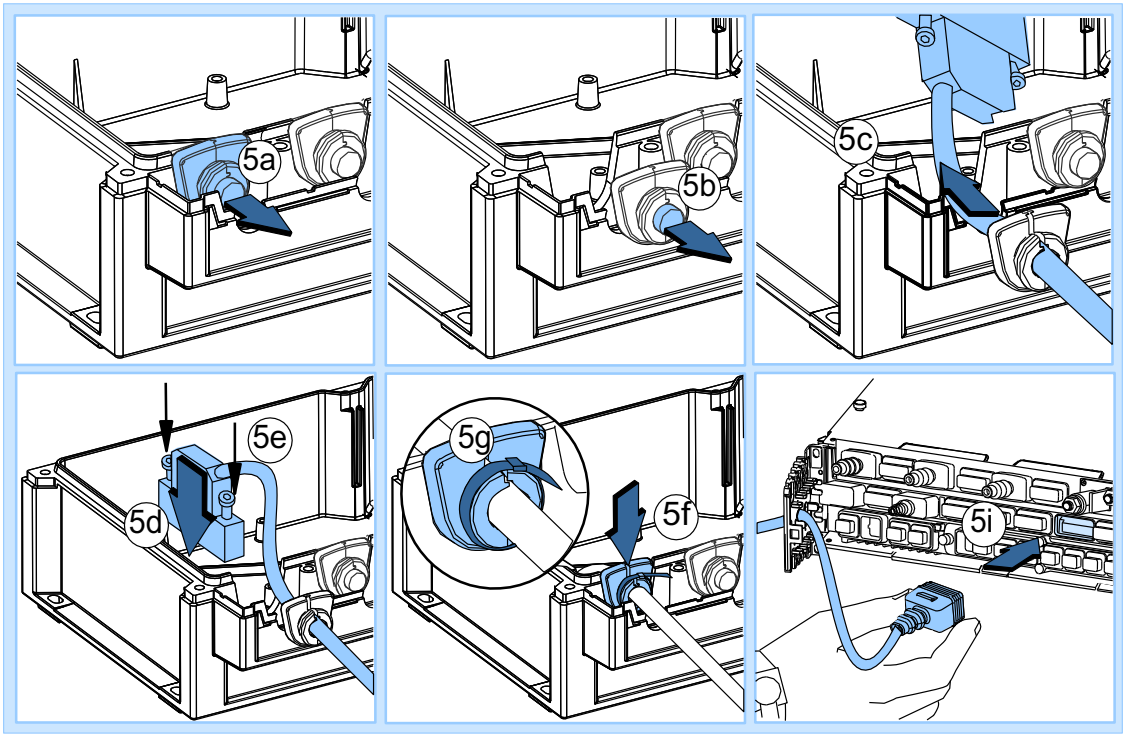

Figure 13. Connect the external alarms cable

a. Pull the left U-shaped cable gland from the FSEB box.
b. Remove the hole closing plug from the cable gland. If the plug is fixed with a cable tie, cut the cable tie first and remove it.
c. Insert the cable in the cable gland. The D-Sub plug must point to the inside of the box.
d. Connect the D-Sub plug to the leftmost D-Sub connector X1101 on the FSEB board.
e. Fix the connector fixing screws.
f. Insert the U-shaped cable gland to the front plate.
g. Insert the cable to the round rubber-seal in front of the U-shaped cable gland.
h. Fix the cable with a cable tie. Make sure that the U-gland fixes the cable tightly.
i. Remove the cover of the EAC connector on the System Module.

j. Insert the other end of the cable with the MDR-36 connector to the EAC connector of the System Module. Make sure that the MDR connector is firmly in place.

k. Push the connector cover over the MDR connector and seal the EAC connector at the System Module with this cover.

l. Route the cable between the FSEB and System Module and fix it with cable ties. The first fixing point must not be further away from the FSEB box than 0.5 m (1.6 ft).

5. If you are using an existing alarm cable with a 37-pole D-Sub connector, connect the cable with a D-Sub connector as follows:

Tip

These two alarm cables can be connected to the EACX-I and EACX-II connectors of the FSEB, respectively. Connect the UltraSite EDGE BTS or CityTalk BTS alarm cables (CS73113.01) 1-12 and 13-24 to EACX-I and EACX-II connectors. Pay attention to connect them to the right EACX connector, otherwise alarm number and alarm description will not match. After the installation configure the alarm and verify the condition using the Flexi EDGE BTS Element Manager.

a. Pull the right U-shaped cable gland from the FSEB box.

b. Cut the cable tie off the cable gland.

c. Remove the hole closing plug from the cable gland.

d. Insert the alarm cable in the cable gland. The D-Sub plug must point to the inside of the box.

e. Attach the D-Sub plug to the right 37-pole D-Sub connector X4101 (EACX-I port).

f. Fix the connector fixing screws.

g. Insert the U-shape cable gland to the front plate.

h. Insert the cable to the round rubber-seal in front of the U-shaped cable gland.

i. Fix the cable with a cable tie. Make sure that the U-gland fixes the cable tightly.

j. Route the cable and fix it with cable ties. The first fixing point must not be further away from the FSEB box than 0.5 m (1.6 ft).

6. If you are using the single alarm cables, connect them to the screw terminals as follows:

a. Insert the alarm cables in the FSEB box by using the cable glands on the right-side half of the FSEB box.
b. Tighten the cable gland nut.
c. Route the alarm cables and fix them with cable ties. The first fixing point must not be further away from the FSEB box than 0.5 m (1.6 ft).
d. Attach alarm lines EXT_AL1 to EXT_AL12 using screw terminal blocks X4106-X4109.
e. For each alarm input connect one wire to the GROUND screw terminal blocks X4107 or X4109 and connect one wire to the selected alarm input on screw terminal blocks X4106 or X4108. The alarm inputs are marked on the FSEB board with "EXT_AL6 ... EXT_AL1" on X4106 and "EXT_AL12 ... EXT_AL7" on X4108.

Note

If you use alarm inputs on the EACX-I port (D-Sub connector X4101), do not use the same alarm inputs on the screw terminals X4106 and X4108.

7. **If you are using the control output cables, connect them as follows:**
   a. Insert the control output cables in the FSEB box by using the cable glands on the right-side half of the box.
   b. Tighten the cable gland nut.
   c. Route the control cables and fix them with cable ties. The first fixing point must not be further away from the FSEB box than 0.5 m (1.6 ft).
   d. Attach the control lines EXT_CO1 to EXT_CO6 by using the screw terminal blocks X4104 and X4105.
   e. For each control output connect one wire to the +5V screw terminal block X4105 and one wire to the selected control output on screw terminal X4104. The control outputs are marked on the FSEB board with "EXT_CO6 ... EXT_CO1" on X4104.

Note

If you use control outputs on the EACX-I port (D-Sub connector X4101), do not use the same control outputs on the screw terminal X4104.

8. Install the heat detector to the FSEB (optional).

a. Connect the heat detector to the FSEB using a four-wire cable. Two wires are needed for heat detector power supply and two for the heat detector alarm connection.

b. Attach the four wires of the cable to the heat detector relay-base.

c. Insert the other end of the four wire cable through one cable gland at the right half of the FSEB box.

d. Tighten the cable gland nut.

e. Route the cable and fix it with cable ties. The first fixing point must not be further away from the FSEB box than 0.5 m (1.6 ft).

f. Attach the wire marked with + from the heat detector to the leftmost or rightmost opening of the screw terminal X4114.

g. Attach the wire marked with - from the heat detector to one of the four middle openings of the screw terminal X4114 marked with GND.

h. Attach the heat detector alarm wires to one of the alarm inputs "EXT_AL12 ... EXT_AL1".

9. Install the cover of the FSEB box and tighten the eight screws.

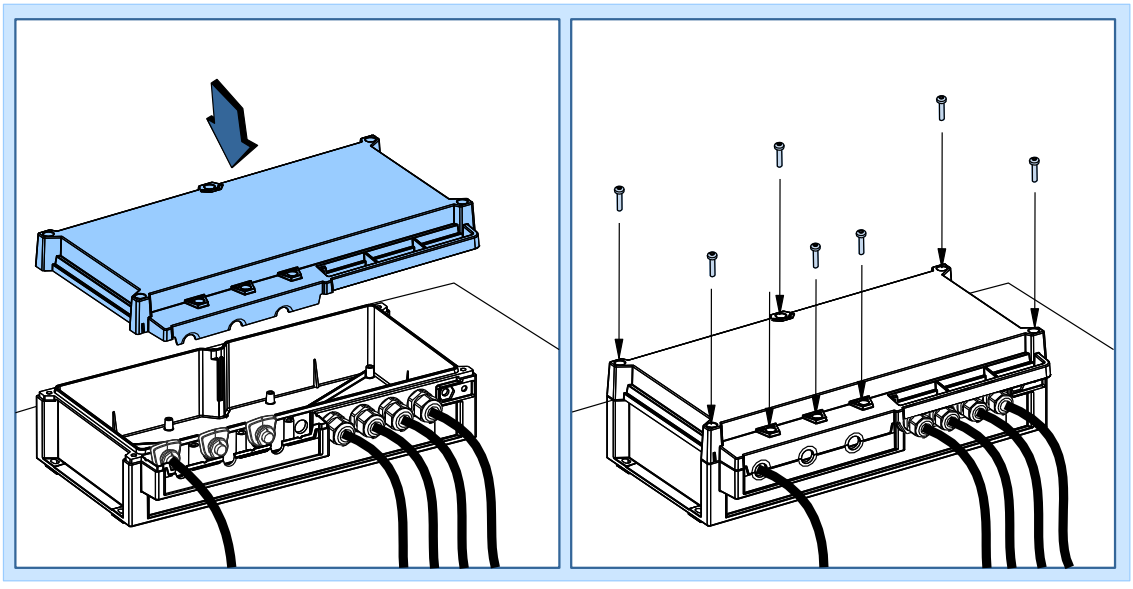

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Figure 14. Install the cover

6.3 Installing battery backup solutions

6.3.1 Disassembling the rack

Purpose

Before installing the site support, the lower part of the cabinet rack must be disassembled.

Summary

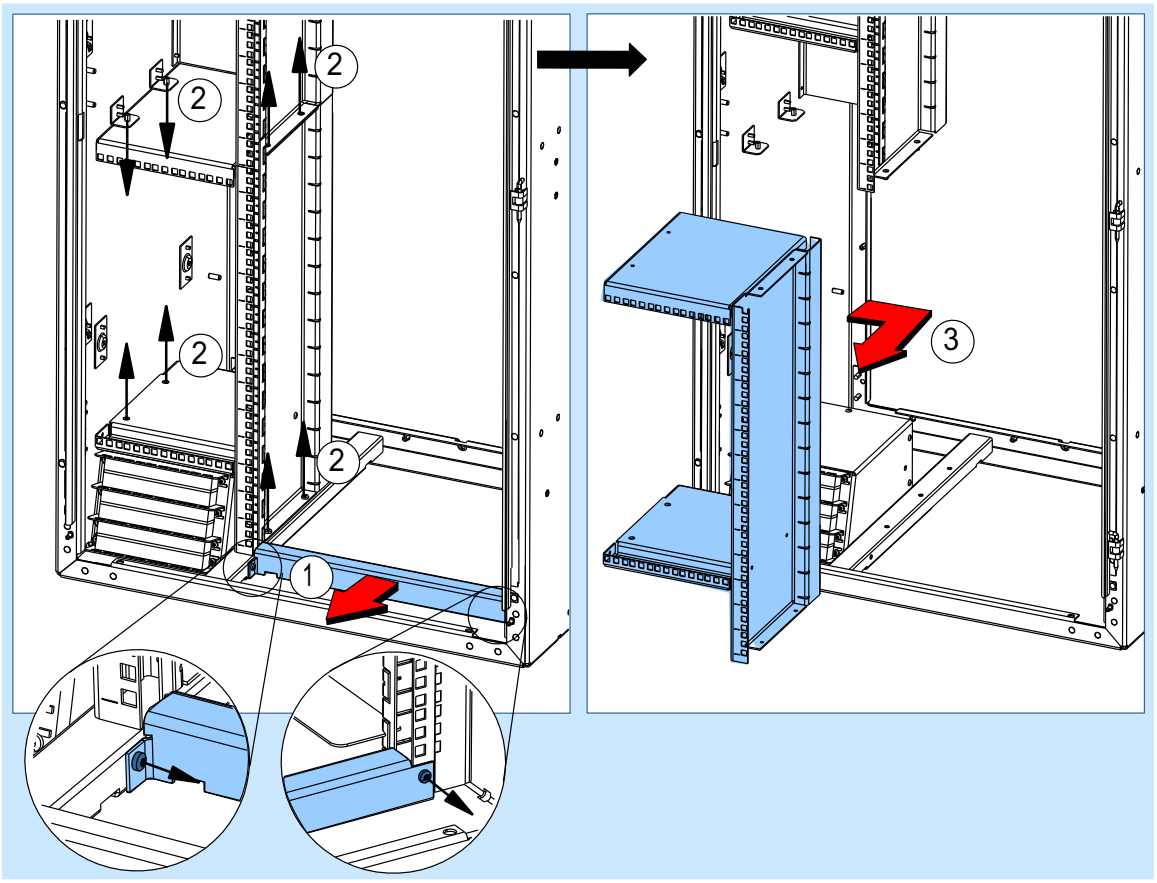


Figure 15. Disassembling the rack

Steps

1. **Remove the air guide plate (two screws).**
2. **Remove the screws (8 pcs).**

   See figure Disassembling the rack for a detailed screw location.

Tip

Save the screws for later use.

3. **Disassemble the two lower shelves and the vertical wall.**

Further information

Proceed to the Installing batteries section.

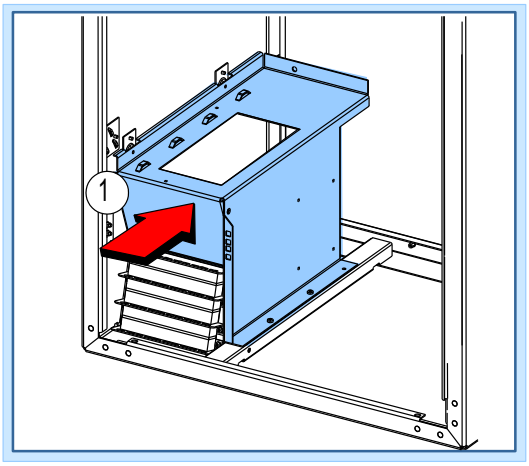
6.3.2 Installing batteries

Before you start

- Make sure that the outdoor cabinet is grounded to the site main ground.
- Install the PDU unit in the site support module.
- Disassemble the rack as instructed in the Disassembling the rack section.

Steps

1. **Install the mounting part to the left.**



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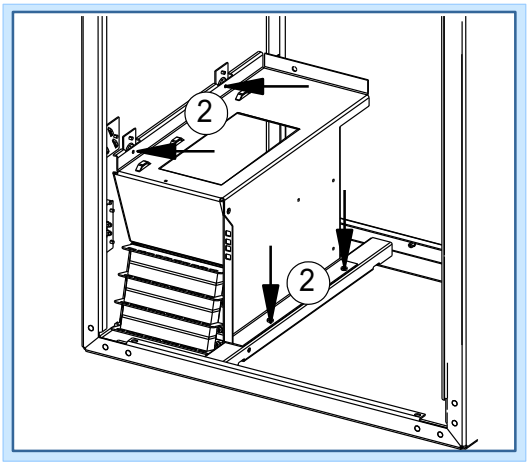
2. Fix with two screws on the wall (M5x8) and two screws on the floor (M5x12).



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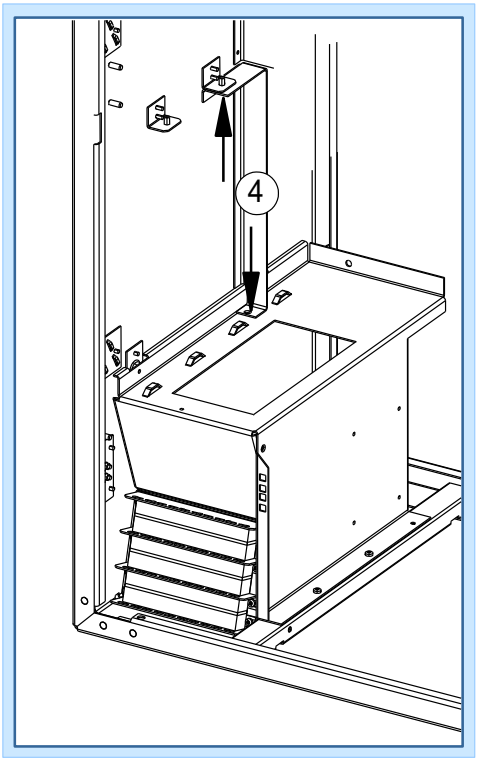
3. Install the air guide plate between the left mounting rack and the cabinet rack with two screws.



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4. Install the battery back fixing plate.

There are two possible installation locations depending on the size of the batteries.

- If you are using 92 Ah batteries, proceed as instructed in these instructions.
- If you are using 62 Ah batteries, remove the rail from the battery back fixing plate first.

5. Fix with three screws.

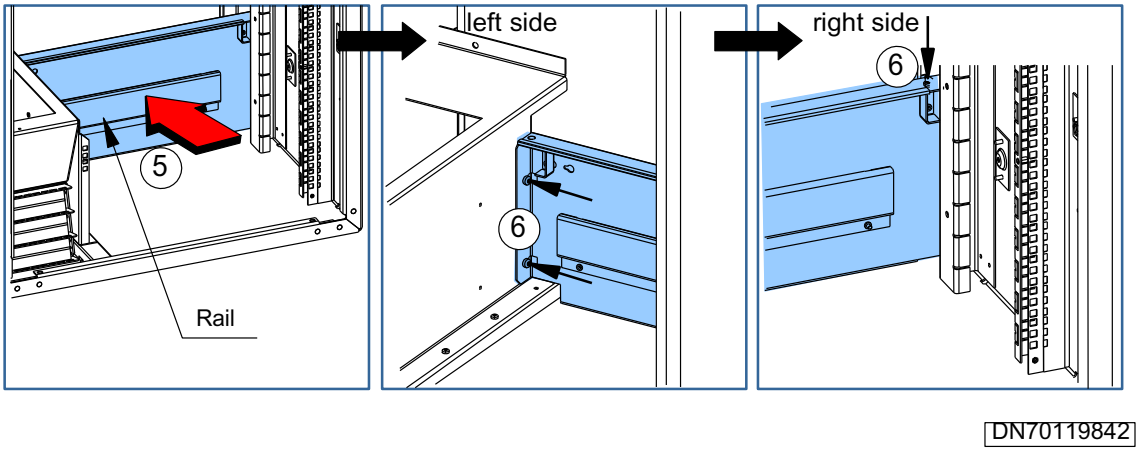


Figure 16. 92 Ah batteries

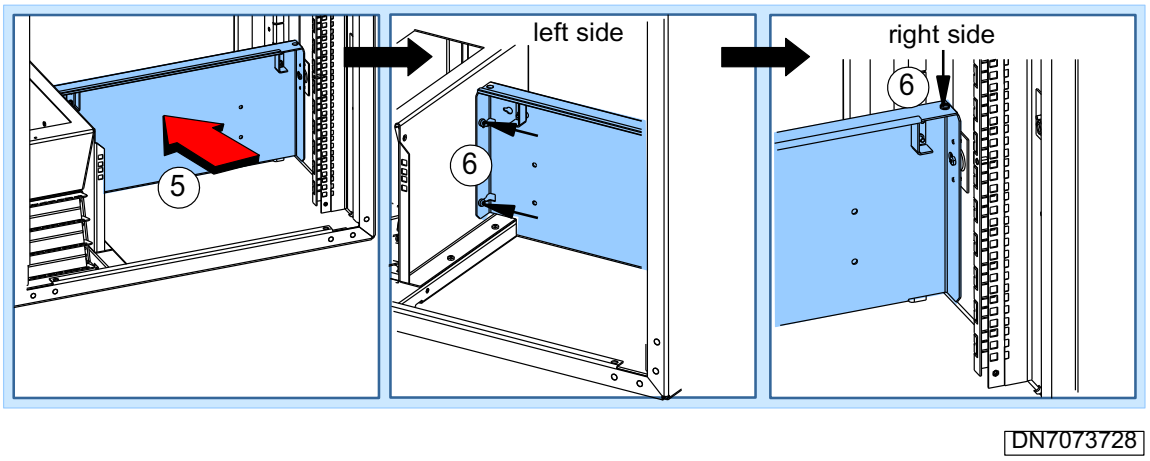


Figure 17. 62 Ah batteries

6. Move the battery support on the left to the location required by the size of the batteries.

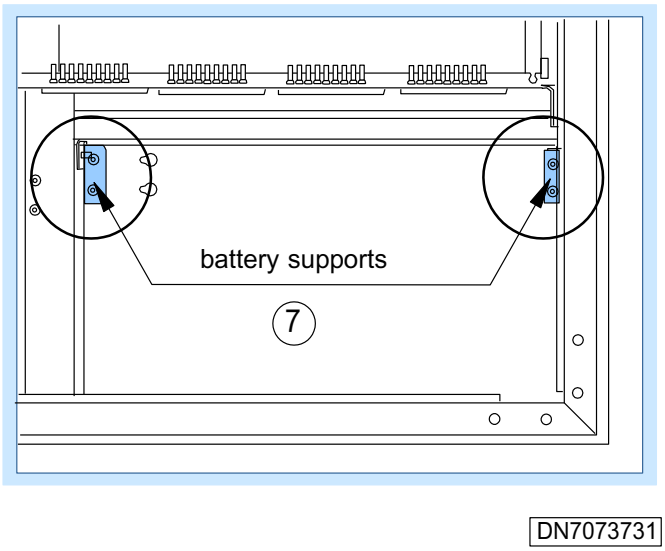


Figure 18. Locating the battery supports

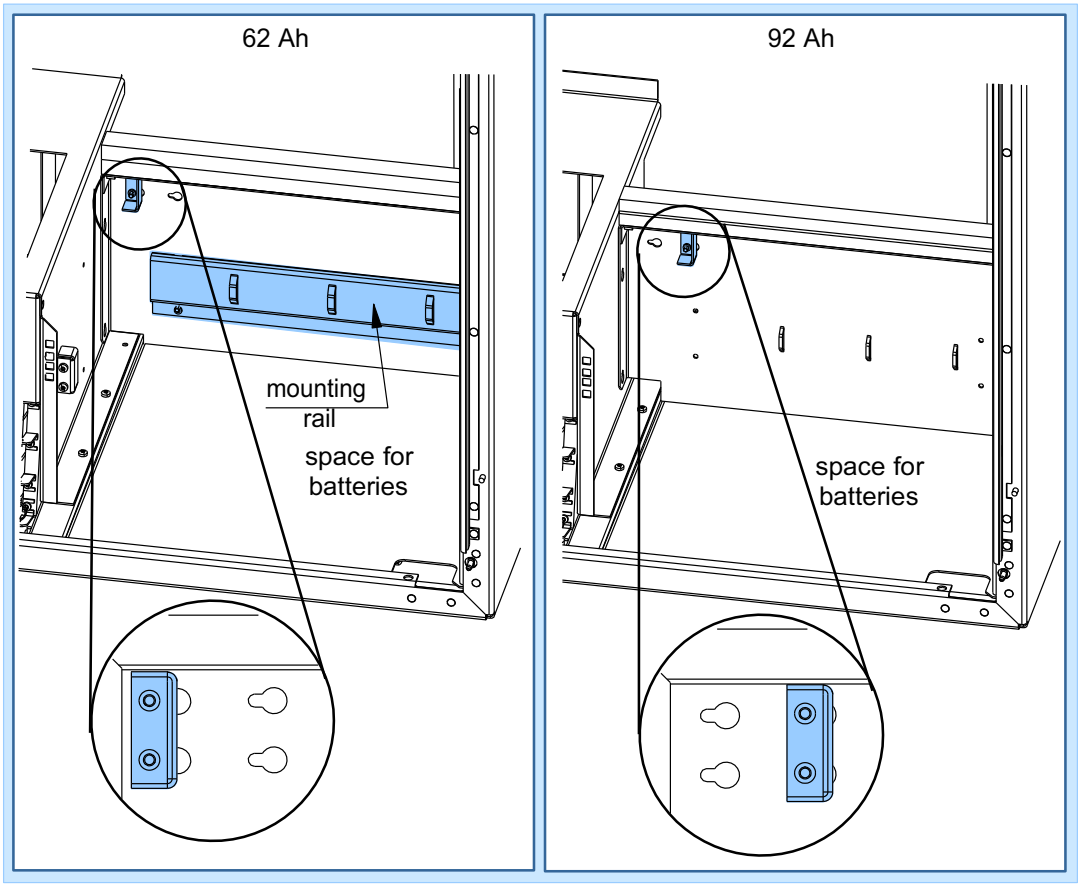
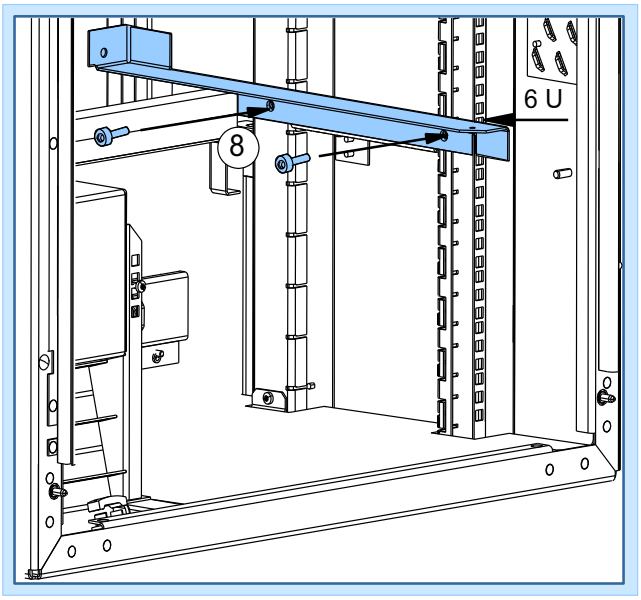


Figure 19. Principle of locating the battery supports

7. Pre-install two screws on the cabinet.

8. Install the mounting rail to the right. Fix with two screws.

See the following figure for a detailed location.



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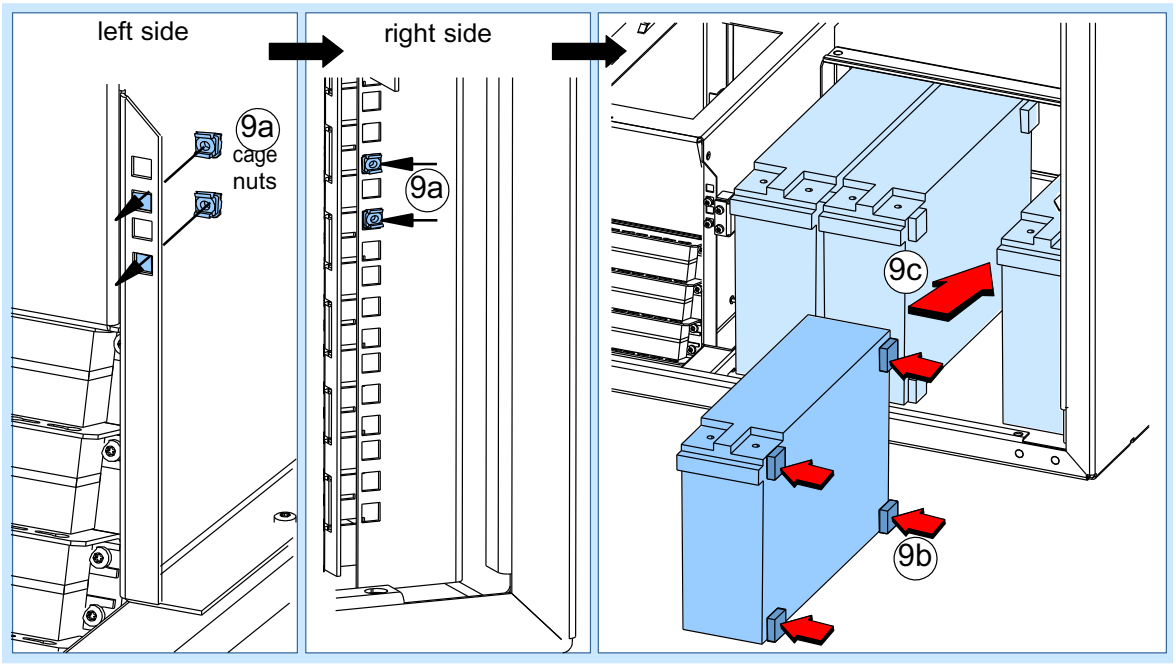
9. Install the batteries.

Use an isolated wrench.



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a. Fix 4 x cage nuts to the cabinet.
b. Fix rubber pads between batteries, four pads on the right side of each battery, one pad in each corner.
c. Place the batteries in the cabinet, starting from the left.
d. Fix with the battery front plate.

   If you are using 62 Ah batteries, remove the rail behind the battery front plate.
e. Connect the batteries in series and tighten the bolt.
f. Install the battery terminal covers.
g. Connect the Anderson cable (994955) to the batteries and tighten to 5 Nm.

   Make sure you install the rubber boots.

Expected outcome

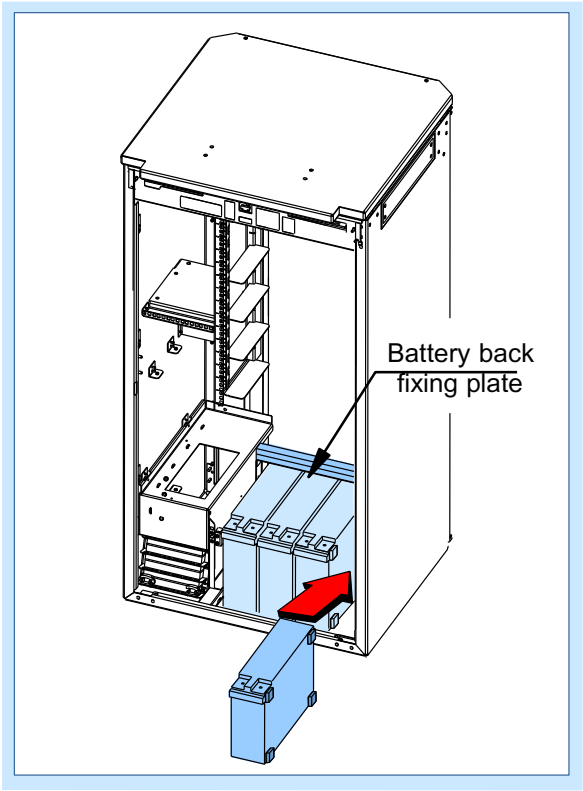


Figure 20. Principle of installing batteries

6.3.3 Installing the rectifier units (WPMB/WPMC)

Purpose

The PDU provides four slots for the rectifiers. Each of the PDU versions (WPUB/WPUC) has its own rectifier unit: WPMB/WPMC. Install the rectifier units as described in these instructions.

Before you start

Remove the dummy panels from the PDU.

Steps

1. Install the rectifier units.

Install the rectifier units in their places. Note that if the rectifier is the type that has the retaining hooks (WPMB), the hooks must be in an open position before fixing the unit in place. Use a small screwdriver in the holes in the upper left- and right-hand corners of the unit to release the hooks.

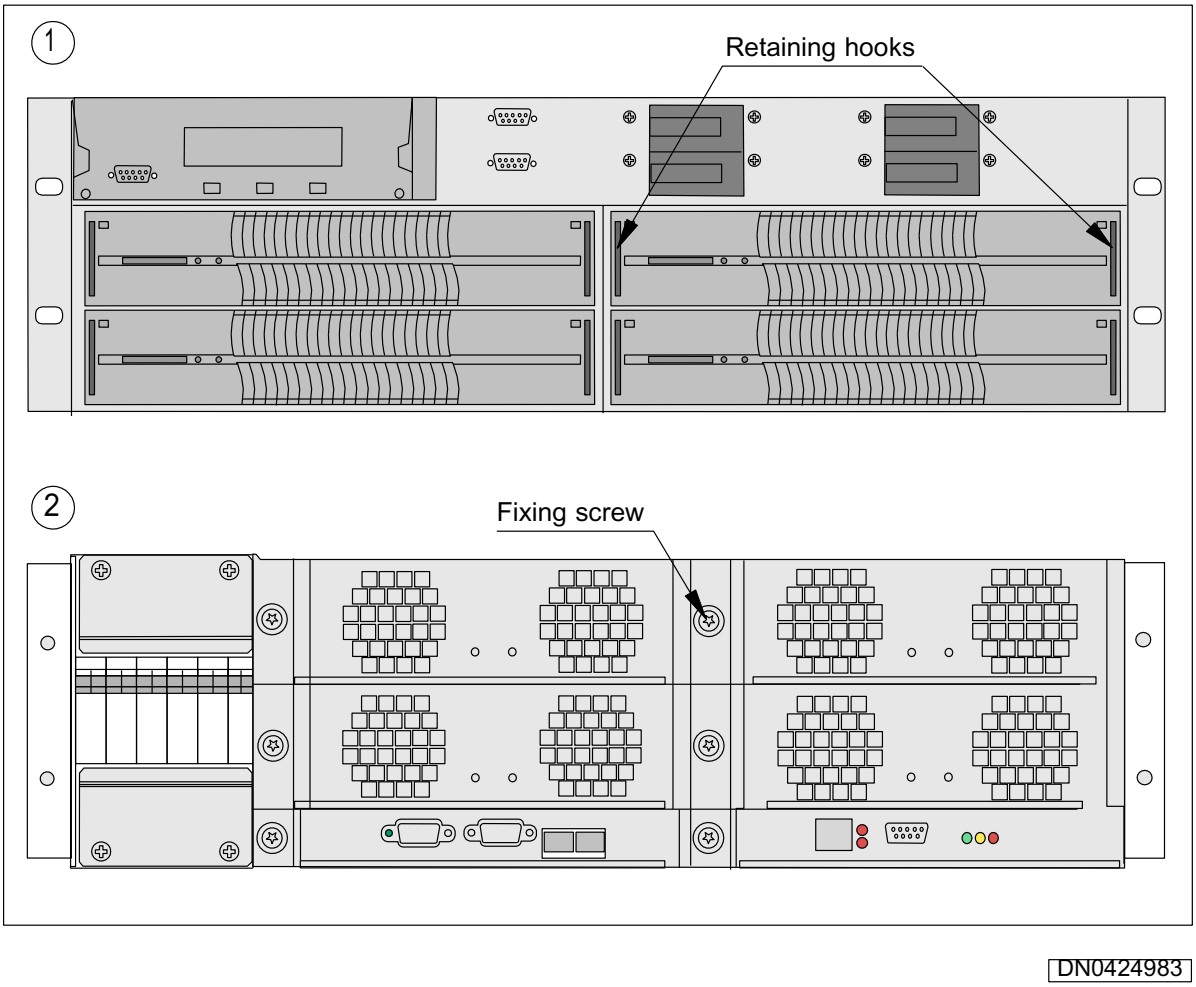


Figure 21. Installing the rectifiers, WPMB (top) and WPMC (bottom)

2. Secure the units.

When the unit is in place, tighten the knurled-head fixing screw or insert the retaining hooks in their slots, depending on the unit type used.

Caution

The retaining hooks are fragile. Do not carry the unit by the retaining hooks.

3. **Switch on the breakers on the PDU front panel.**

   Turn the breakers on the PDU front panel into the ON position.

Warning

Risk of electric shock. Do not switch on the breakers before the base transceiver station (BTS) installation is complete.

4. **Close the lid.**

6.3.4 Installing PDU and site support module

Purpose

The optional site support module (FCSA) can be used with the outdoor cabinet to provide long-term battery back-up time for the Flexi EDGE BTS, and a space for installing LTE units. The PDU (Power Distribution Unit, WPUB or WPUC) is utilised when a site support module is used. The WPUB or WBUC converts the AC power into DC power, which the base station uses.

The FCSA control card collects and converts alarms information from the fans, LTE units and MIBBU. The alarms are connected to EAC lines, which is done with the use of DIP switches on the board. The default settings are presented in the following table. If necessary, the routing of alarms can be changed by adjusting the DIP switches.

Table 1. Pin mapping of the D15 female alarm connector

Pin	Signal	Pin	Signal
1	INT_FAN_ALARM	9	MAINS#3
2	EXT_FAN_ALARM	10	ALARM_GND
3	TEMP_ALARM	11	ALARM_GND
4	LTE_POWER_ALARM	12	ALARM_GND
5	EXT_ALARM1 (default not connected)	13	ALARM_GND
6	EXT_ALARM2 (default not connected)	14	ALARM_GND
7	MAINS#1	15	ALARM_GND
8	MAINS#2		

Three alarm lines from the MIBBU are routed via the control card to EAC.

Table 2. Pin mapping of the D9 female alarm connector

Pin	Signal	Pin	Signal
1	MAINS#1	6	NC
2	MAINS#2	7	NC
3	MAINS#3	8	NC
4	NC	9	ALARM_GND
5	NC		

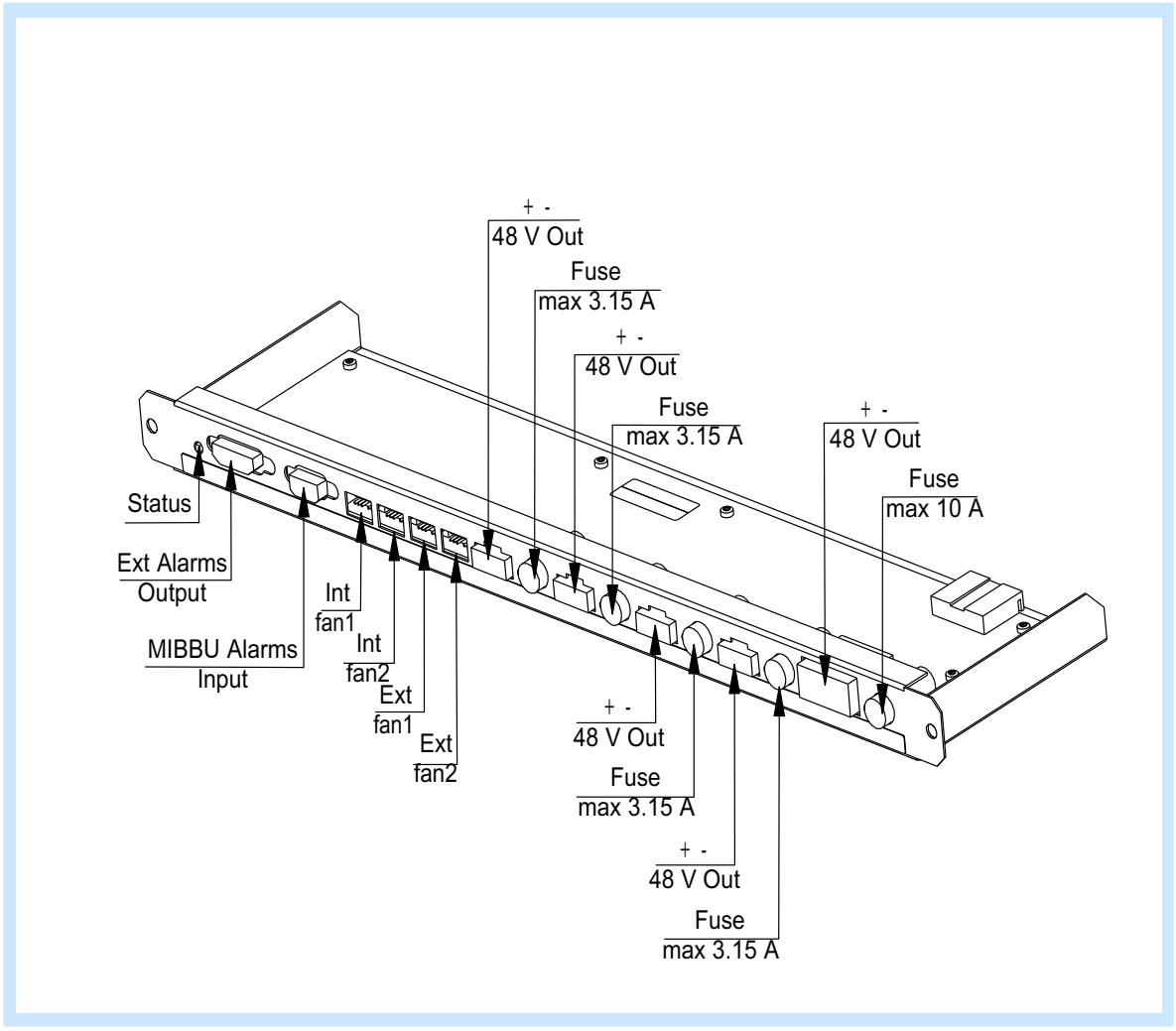


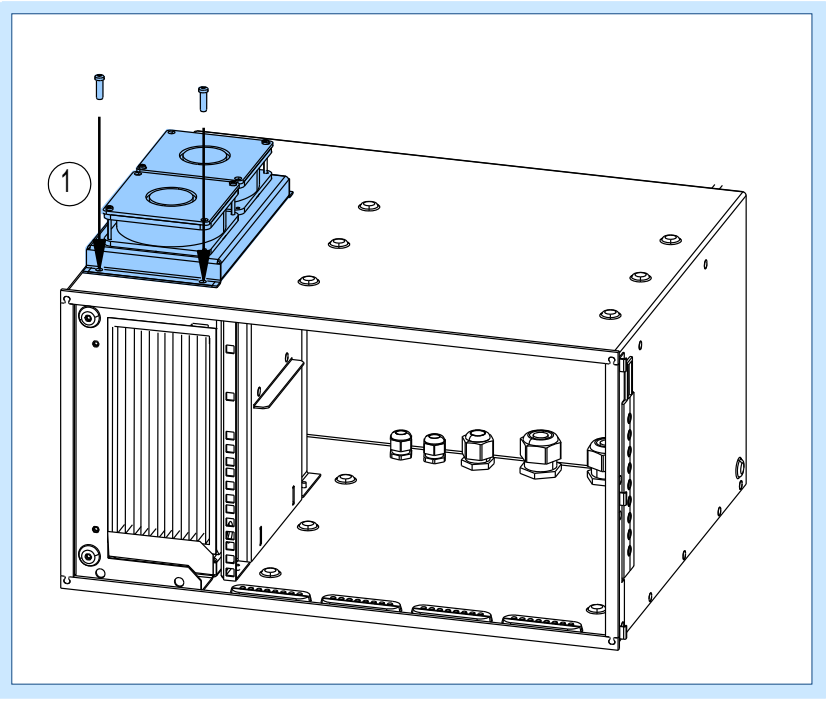
Figure 22. FCSA control card

Before you start

- Open the site support module and take out the installation parts.
- Check that the alarm polarity is correct. The default setting for the alarm polarity is Normally Open. If you need to change it, see Changing the alarm polarity for the WPUB unit or Changing the alarm polarity for the WPUC unit, depending on your base station setup. Remember also to change the Intelligent Shutdown polarity, if using it.

Steps

1. Fix the external fans on the site support module (FCSA) with four M5x16 screws.



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2. Remove covers from the bushing seals you are going to use.

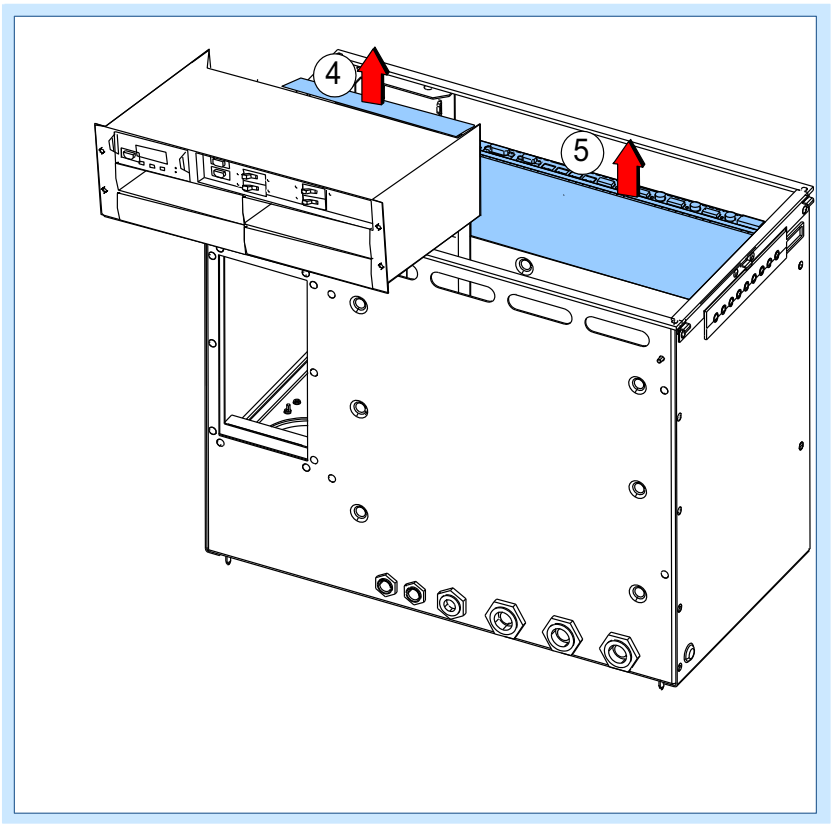
3. Place the FCSA module on its back. Take care not to damage the guide pins on the module.

4. Remove the plastic cover from the rear of the PDU.

The plastic cover shields the connectors from above. It needs to be removed before the cables can be attached to the PDU.

Caution

Risk of short circuit. Make sure that all the breakers on the power distribution unit (PDU) front panel are in the OFF position before you connect the cables.



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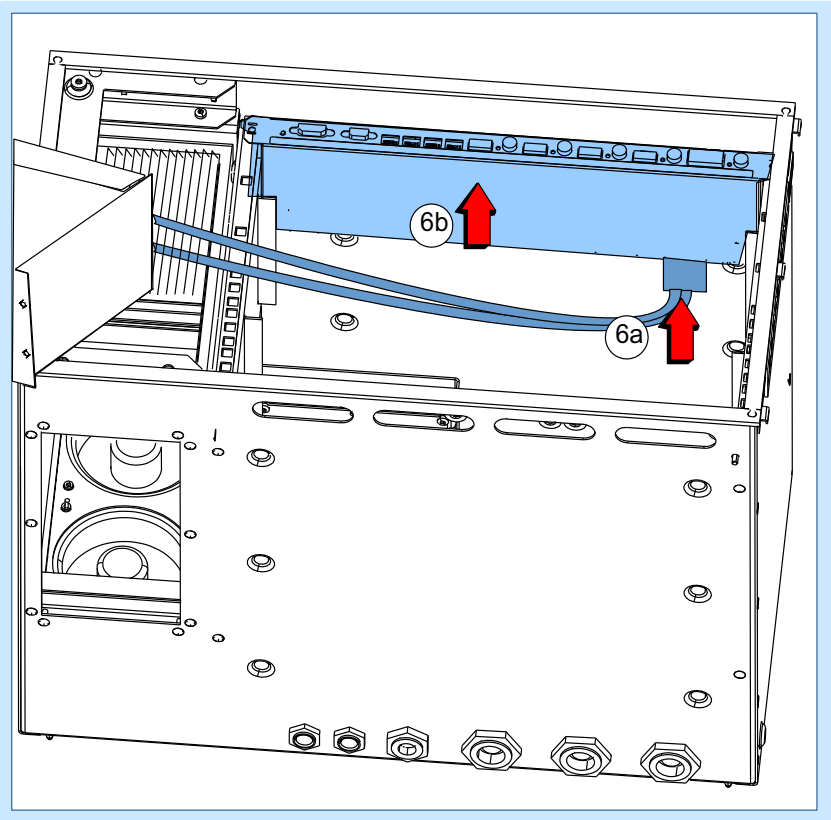
5. **Uninstall the FCSA control card.**

6. **Connect the cable (994953) behind the control card and reinstall the control card.**



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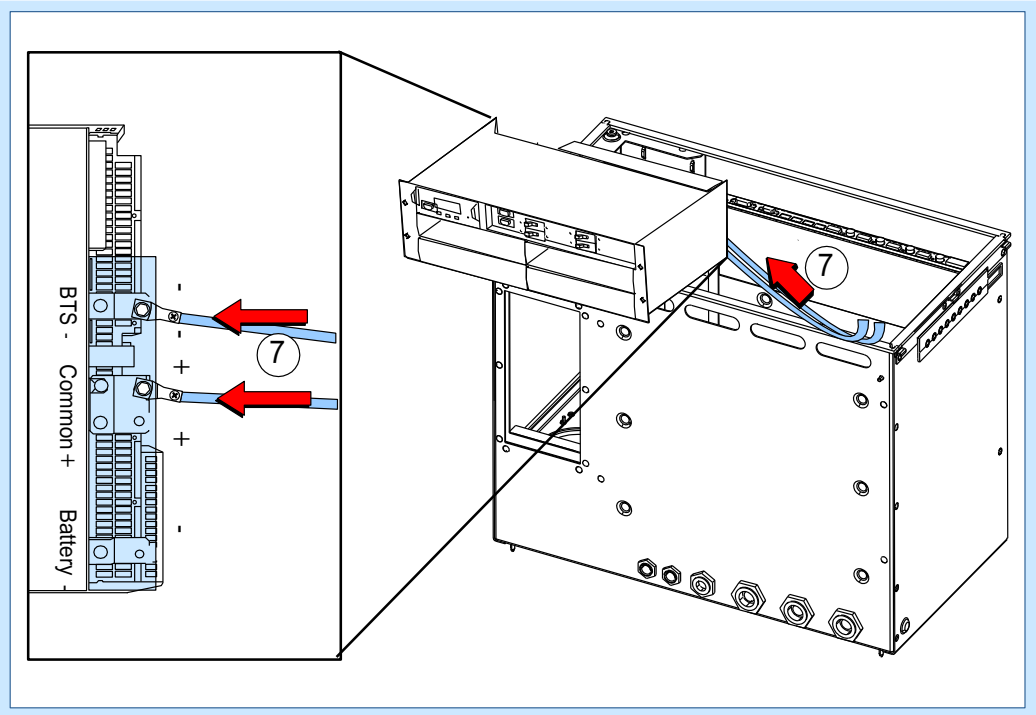
7. Connect the control card power feeding cable to the PDU.



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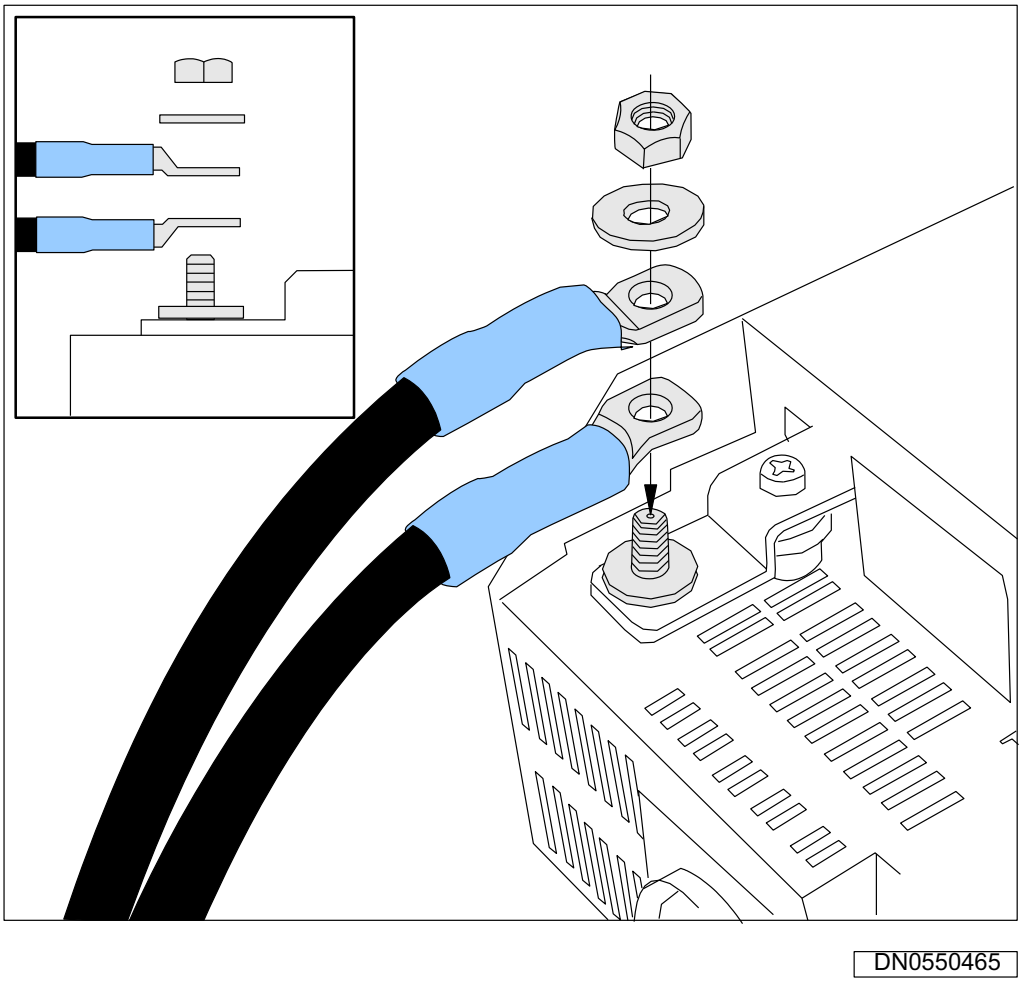


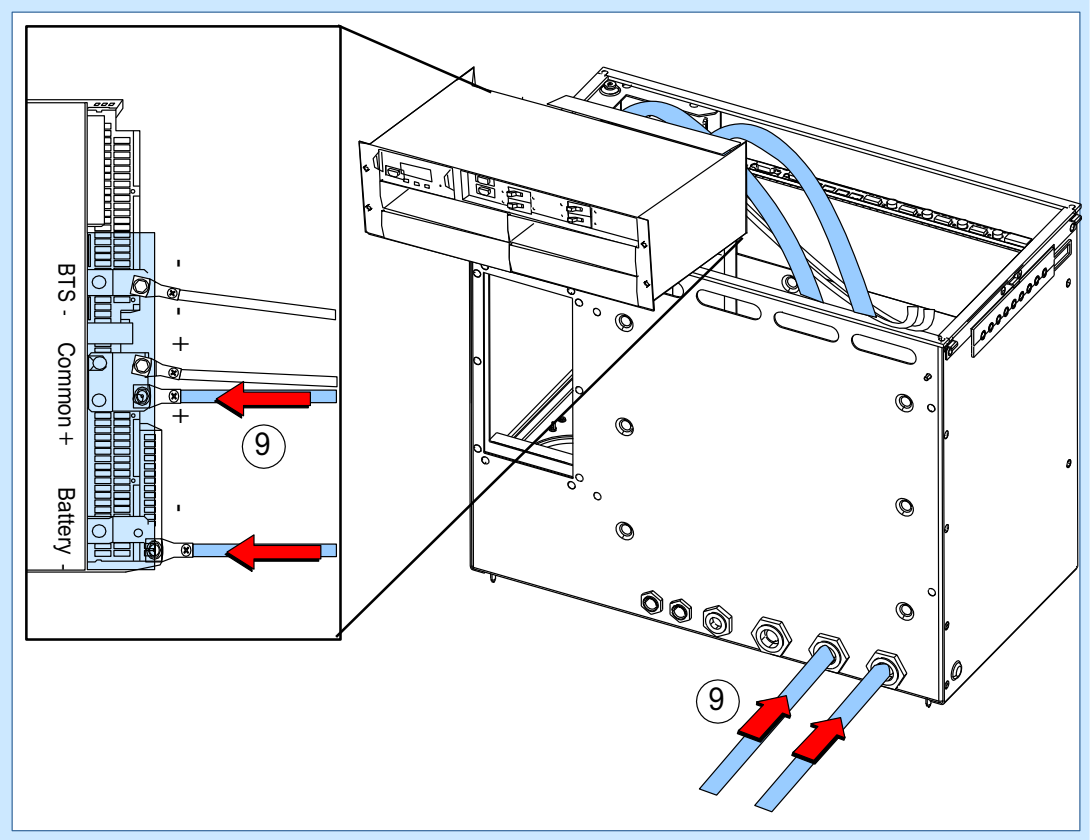
Figure 23. Principle of connecting the control card power feeding cable to PDU

In case the MIBBU is not used, power for the control card for FCSA is taken from the power terminals on the cabinet roof.

8. **Remove the cable ties that are holding the battery cables together.**

9. **Route the battery cables through the bushing seals in the back of the site support module.**

   Make sure the rubber parts remain in place when routing the cables. Do not tighten the bushing seals at this point.



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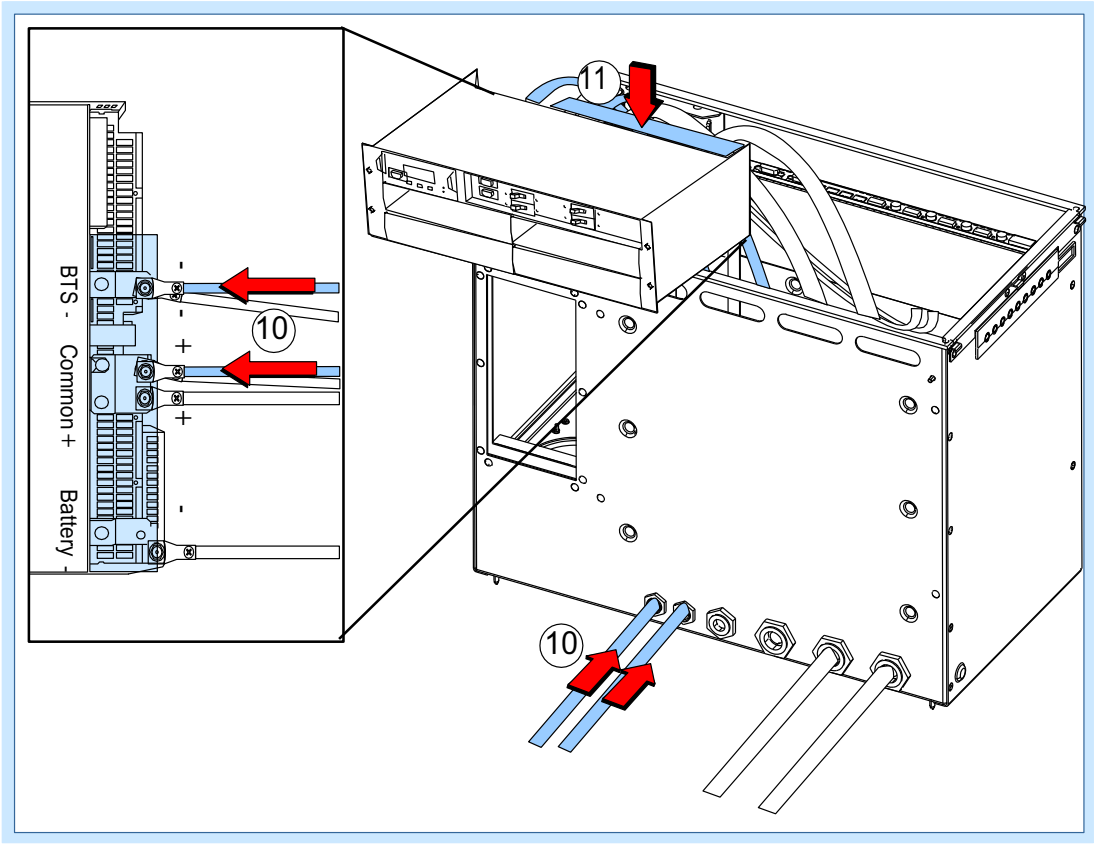
10. Attach the DC cables to the rear of the PDU.



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Top view WPUB cabling

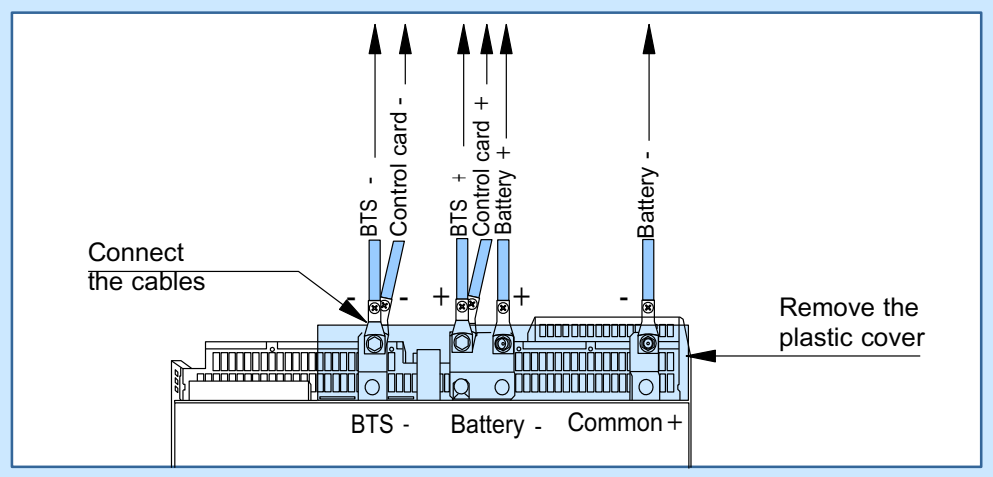


Figure 24. Connecting DC cables to PDU (WPUB)

Top view WPUC cabling

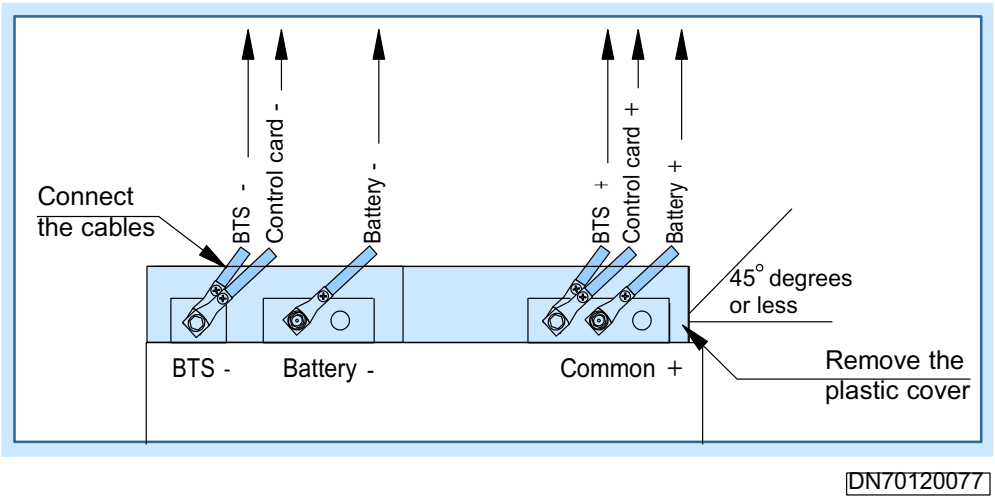
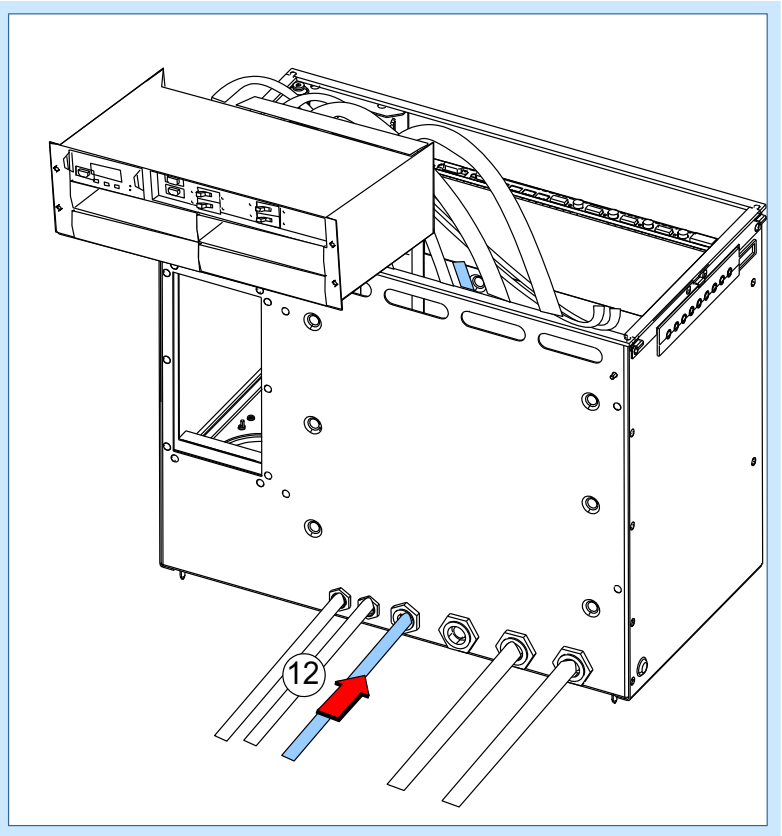


Figure 25. Connecting DC cables to PDU (WPUC)

11. Reinstall the plastic cover on the PDU.

12. Route the AC cable through the bushing seal in the rear of the FCSA.



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13. Connect the AC cable to the AC terminal plate.

See the following figures for AC cable connections.

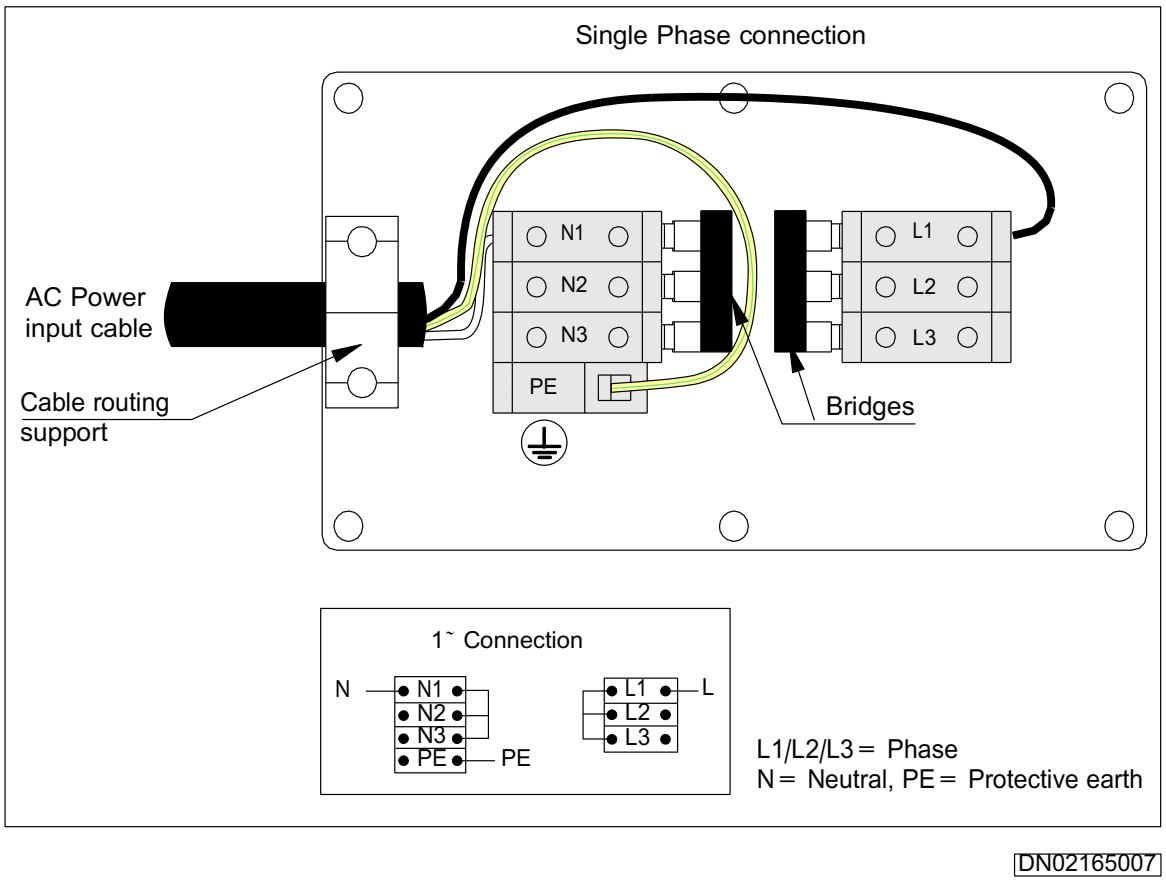


Figure 26. Single phase, 230 V AC

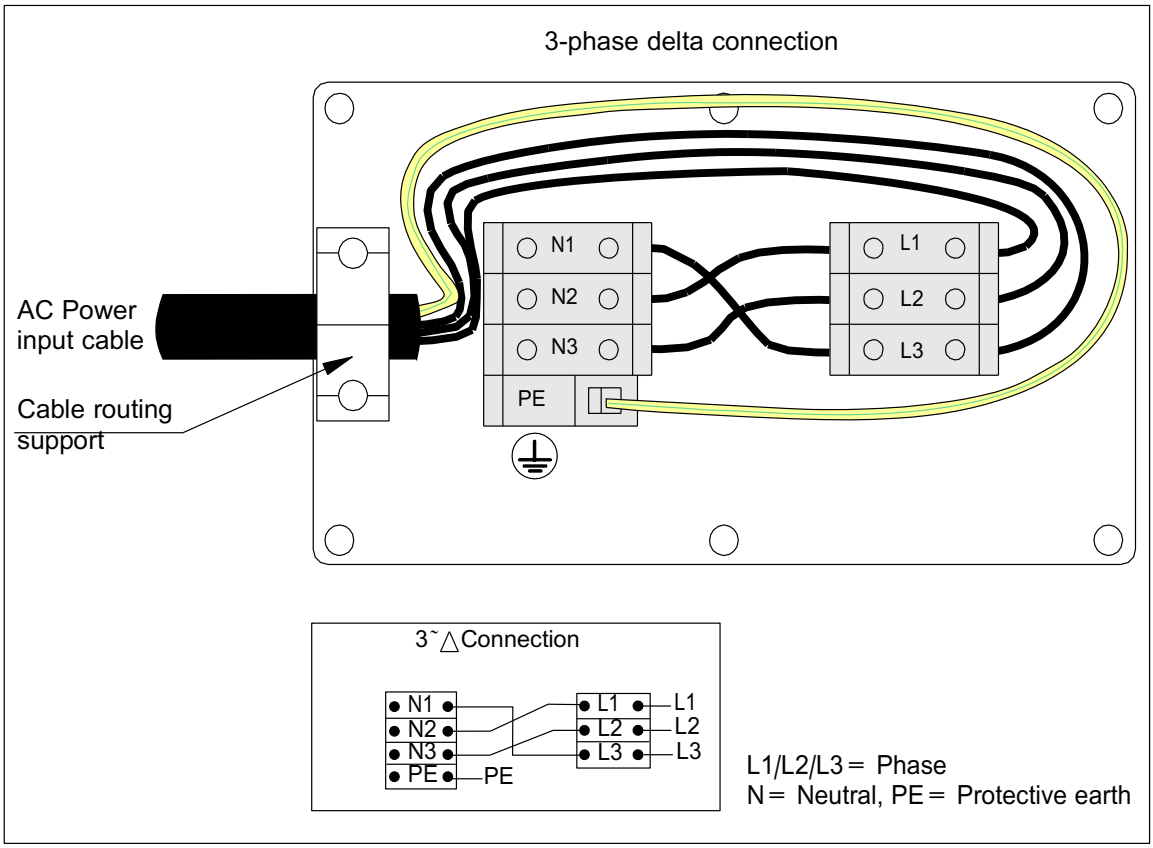


Figure 27. 3-phase (delta), base voltage 100-120 V AC

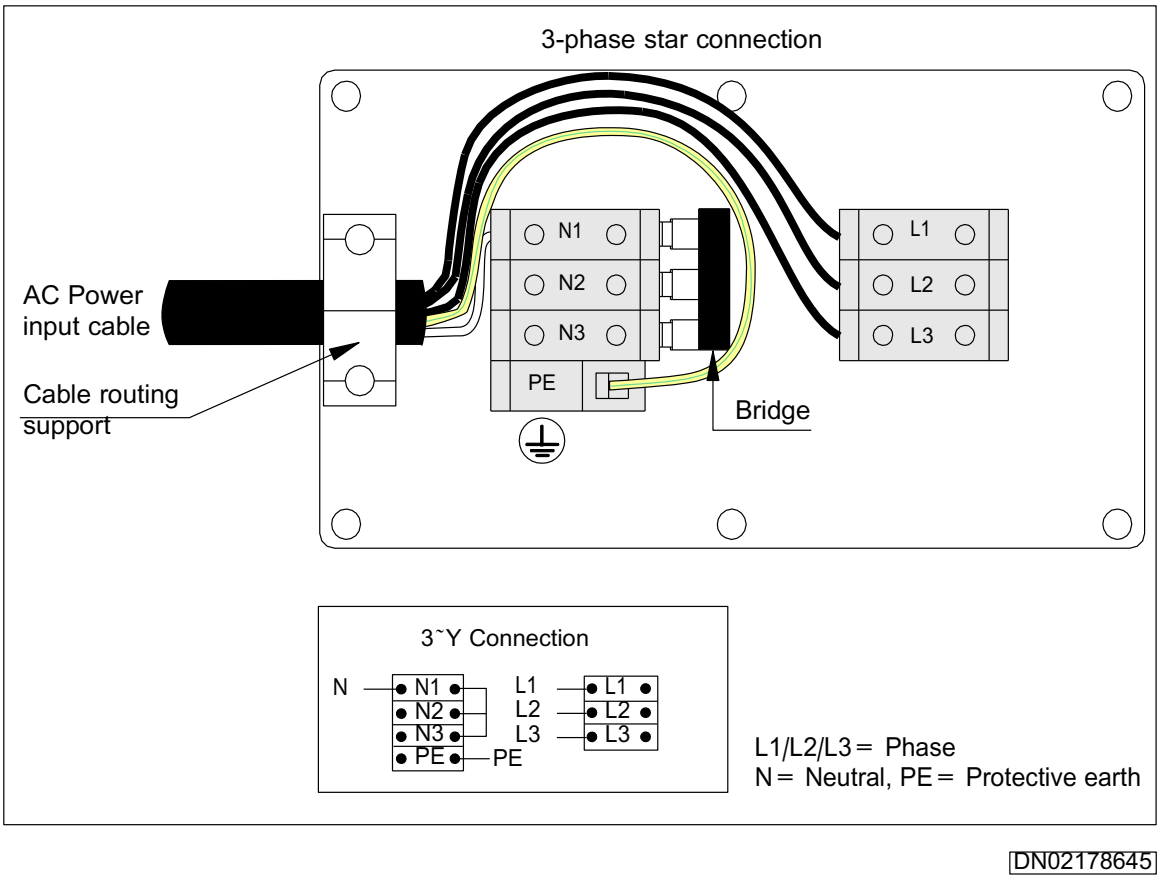


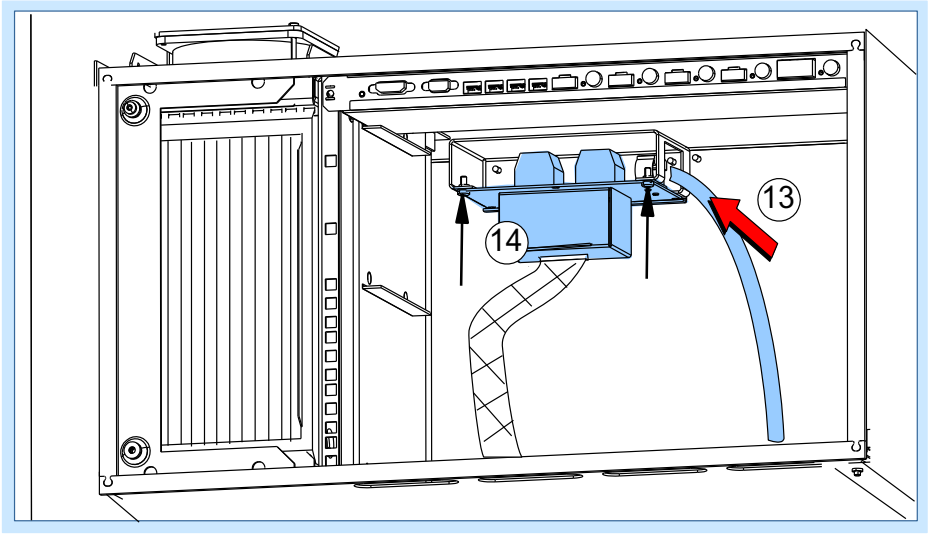
Figure 28. 3-phase (star), 230 V AC

14. Install the AC terminal plate on the FCSA.

The AC interface comes attached to the PDU with a sleeve. Install the AC terminal plate inside the brackets in the site support module:

a. Slide the rear edge of the AC interface in the bracket slots.

b. Fix the front edge on the bracket with two screws.



DN70155284

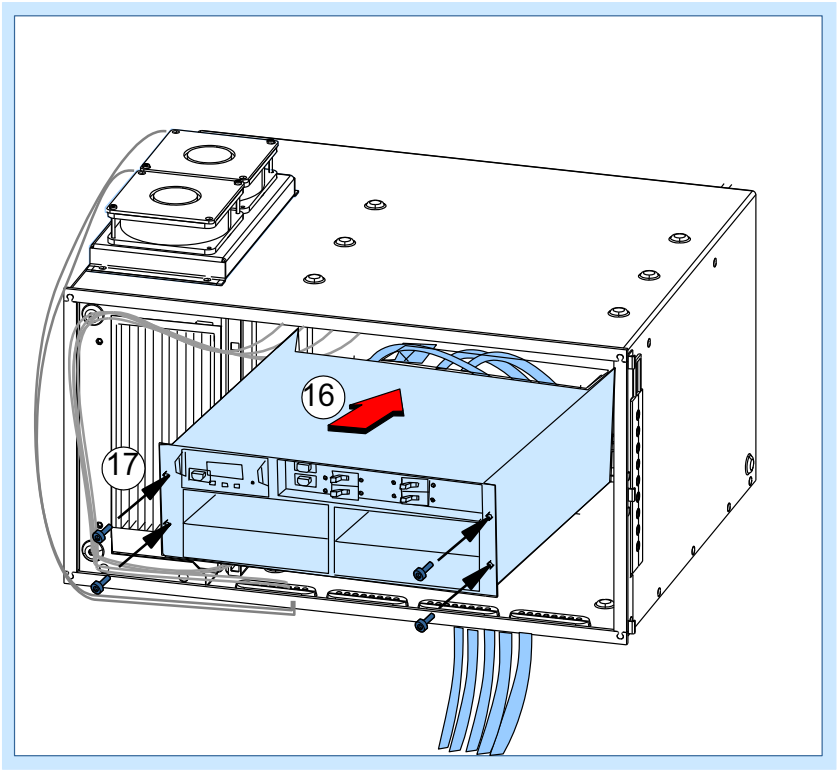
15. *If* you are using the WPUB unit

    Then

    connect the thermal sensor cable to the back of the PDU.

16. **Install the PDU.**

    Slide the PDU unit inside the site support module. Fix with four M5 screws.

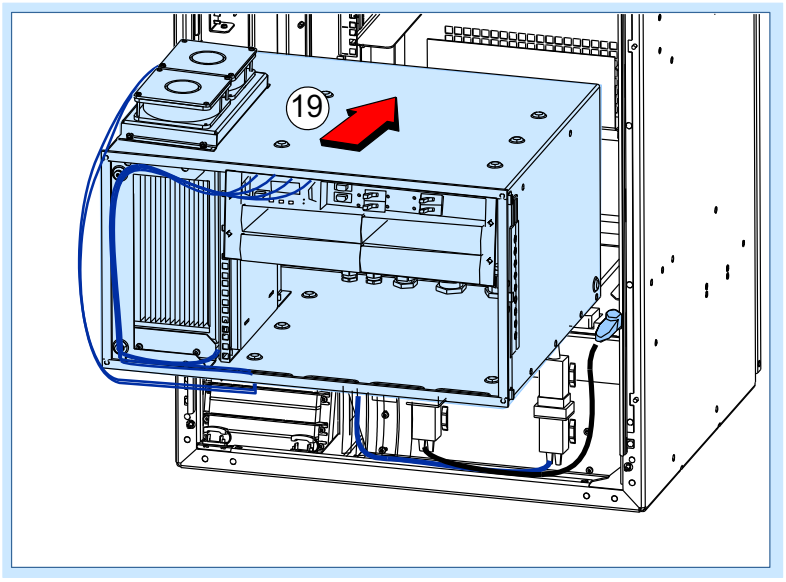


DN70155518

17. **Tighten the bushing seals.**
    - PG13.5 to 2.5 Nm
    - PG21 and PG29 to 5 Nm
18. *If* you are using the WPUC unit

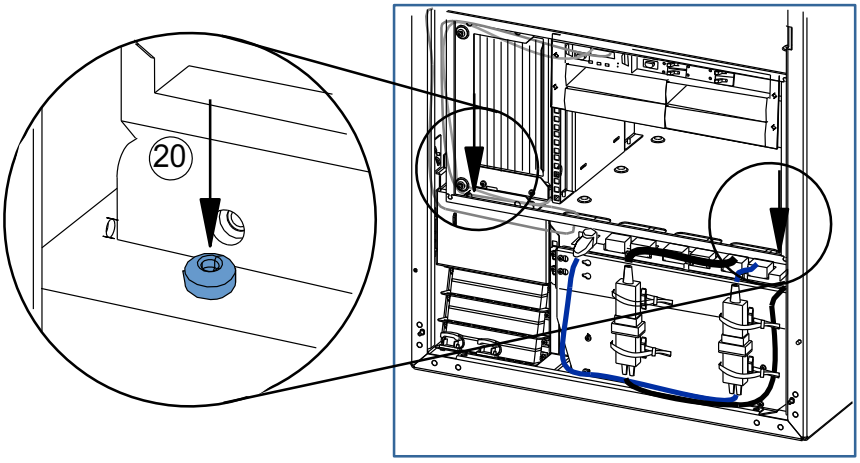
    Then

    connect the battery thermal sensor cable to the front panel of the PDU.
19. **Align the site support module (with the PDU unit) with the guiding pins in the back of the cabinet. Install the site support module.**



DN70155296

20. Fix the site support module to the cabinet with two screws.



DN70119878

21. Fix the Anderson cables to the battery front plate with cable ties so that they cross each other.

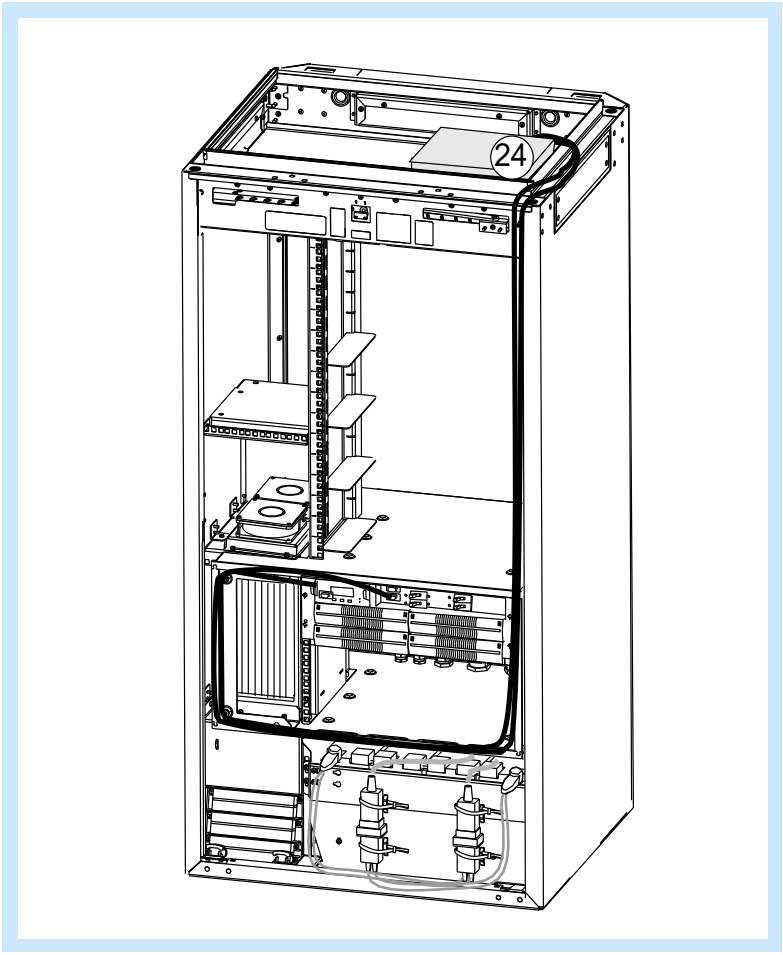
22. Route the thermal sensor cable and push the rubber plug in place.

23. Connect the site support fan cables to the Int fan and Ext fan connectors on the FCSA control card.

Route the cables through the site support module cable entries. Push the rubber plug through the cable entry to seal the entry point. Fix the fan cables to the cabinet with cable ties.

24. Connect the alarm cable from the Ext Alarms Output connector on the FCSA control card to the external alarms connector located in the FSEB box (if used) on the cabinet roof.

Route the alarm cable through the cable entries on the side of the site support module sloping downwards. Once the cable is outside the site support module, make a loop and route the cable to the cabinet roof.



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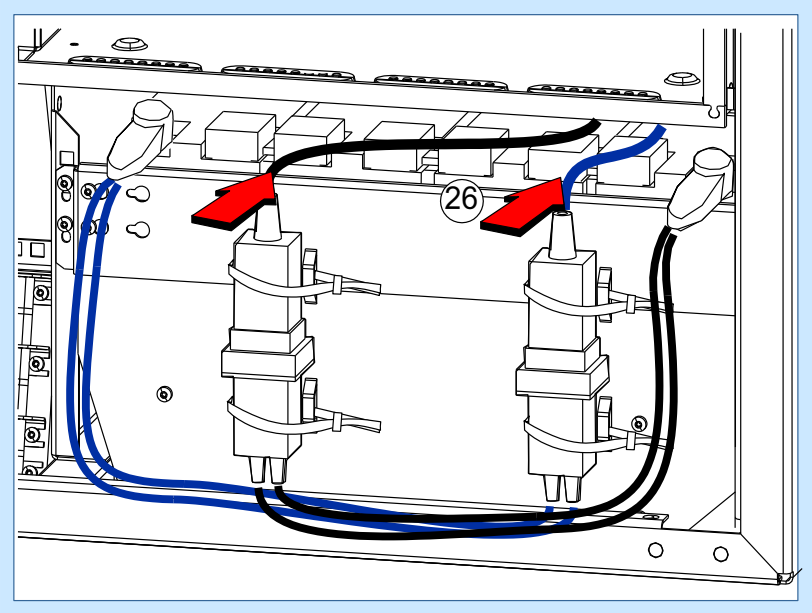
25. Connect the alarm cable from the EAC connector on the PDU to the MIBBU Alarms Input connector on the FCSA control card.

Fix with cable ties.

There are three alarm lines from the MIBBU unit routed via the control card to the FSEB. If additional alarms from the MIBBU are needed, a separate cable between the MIBBU and FSEB is required.

26. Connect the battery cable connector from the PDU to the battery cable connector from the batteries.



DN70100525

6.3.5 Changing the alarm polarity of the WPUB unit

Before you start

The EAC alarm polarity can be set to two states, Normally Open or Normally Closed.

The Normally Open state means that the galvanic EAC alarm circuit loop is open and electric current is not flowing through it. The corresponding EAC alarm is activated if the EAC alarm circuit loop is closed.

The Normally Closed state means that the galvanic EAC alarm circuit loop is closed and electric current is flowing through it. The corresponding EAC alarm is activated if the EAC alarm circuit loop is opened.

The default alarm polarity is Normally Open. Make sure that you set the EAC alarm polarity correspondingly during BTS commissioning.

Steps

1. **To change the polarity for alarm relay output from the Normally Open state to the Normally Closed state, connect the wires according to the following table and figure *Changing the alarm polarity of the WPUB unit*, option B.**

Table 3. CON 5 Relays for the Normally Closed state

Pin no.	Name	Connect to
19	REL6 NC	Not in use
20	REL6 NO	D-sub female pin 6
21	REL6 COM	Link to pin 36 on this connector
22	REL5 NC	Not in use
23	REL5 NO	D-sub male pin 5
24	REL5 COM	Link to pin 36 on this connector
25	REL4 NC	Not in use
26	REL4 NO	D-sub male pin 4
27	REL4 COM	Link to pin 36 on this connector
28	REL3 NC	Not in use
29	REL3 NO	D-sub male pin 3
30	REL3 COM	Link to pin 36 on this connector
31	REL2 NC	Not in use
32	REL2 NO	D-sub male pin 2
33	REL2 COM	Link to pin 36 on this connector

Table 3. CON 5 Relays for the Normally Closed state (cont.)

Pin no.	Name	Connect to
34	REL1 NC	Not in use
35	REL1 NO	D-sub male pin 1
36	REL1 COM	Common + link to above

Tip

If necessary, use a screwdriver to remove the CON5 connector from the WPUB before changing the polarity. Reinstall the CON5 connector after the polarity has been changed.

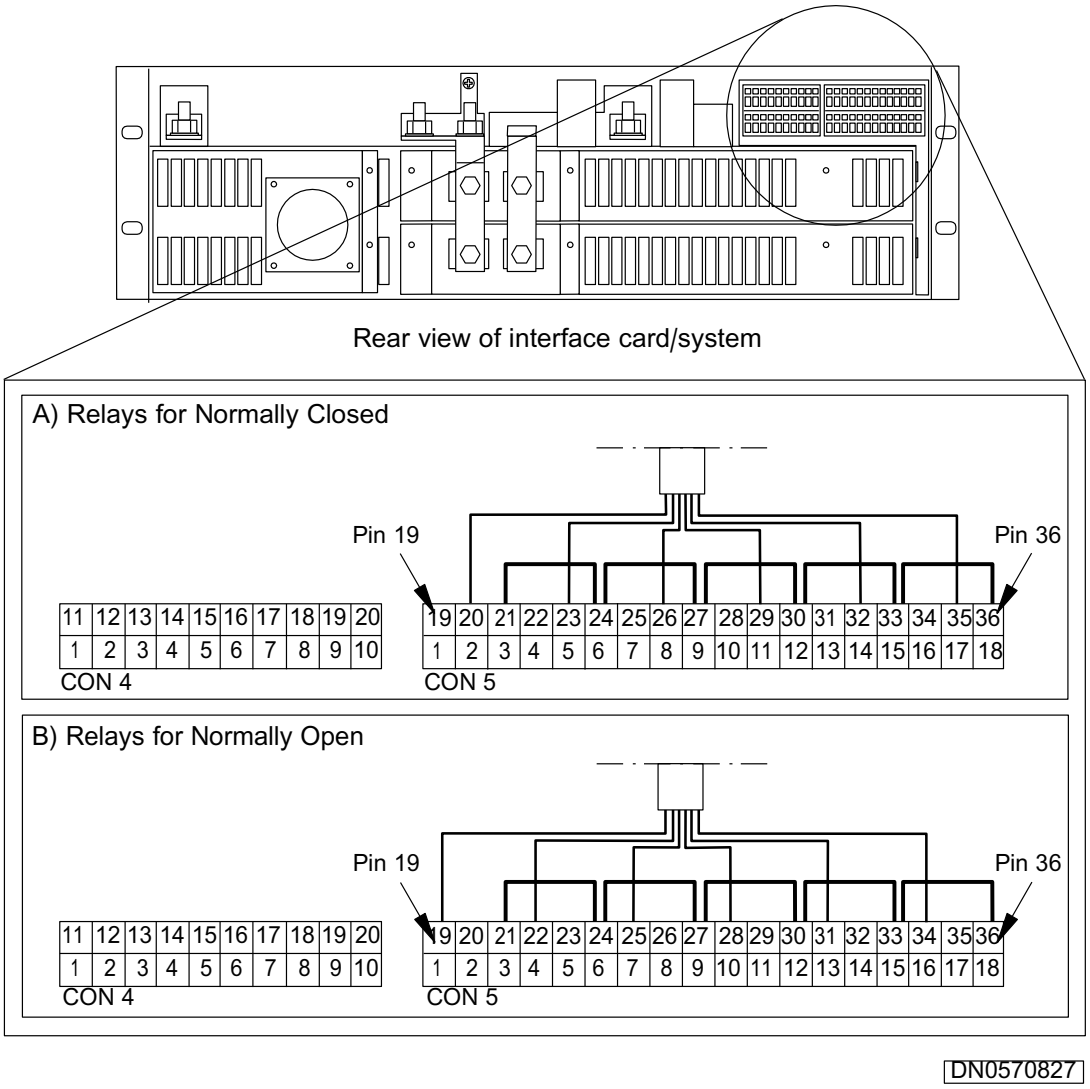


Figure 29. Changing the alarm polarity of the WPUB unit

2. To change the polarity for alarm relay output back from the Normally Closed state to the Normally Open state, connect the wires according to the following table and figure *Changing the alarm polarity of the WPUB unit*, option A.

Table 4. CON 5 relays for the Normally Open state

Pin no.	Name	Connect to
19	REL6 NC	D-sub male pin 6
20	REL6 NO	Not in use
21	REL6 COM	Link to pin 36 on this connector
22	REL5 NC	D-sub male pin 5
23	REL5 NO	Not in use
24	REL5 COM	Link to pin 36 on this connector
25	REL4 NC	D-sub male pin 4
26	REL4 NO	Not in use
27	REL4 COM	Link to pin 36 on this connector
28	REL3 NC	D-sub male pin 3
29	REL3 NO	Not in use
30	REL3 COM	Link to pin 36 on this connector
31	REL2 NC	D-sub male pin 2
32	REL2 NO	Not in use
33	REL2 COM	Link to pin 36 on this connector
34	REL1 NC	D-sub male pin 1
35	REL1 NO	Not in use
36	REL1 COM	D-sub male pin 9 + link to above

Tip

If necessary, use a screwdriver to remove the CON5 connector from the WPUB before changing the polarity. Reinstall the CON5 connector after the polarity has been changed.

6.3.6 Changing the alarm polarity of the WPUC unit

Before you start

There are eight galvanic isolated alarm contacts for remote supervision of the alarms. Each alarm contact represents different alarm conditions. Alarm relay coils are powered during normal operation. All alarm relays will give an alarm with no AC or DC power connected to the system.

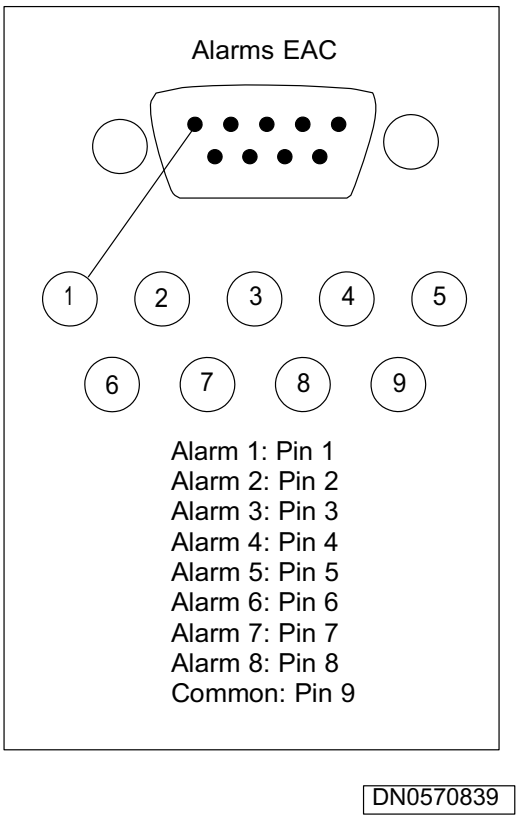


Figure 30. Alarm connection, 9-pin D-sub

Tip

If changing the polarity is needed, it is recommended to do this before installing the WPUC unit into the FCIA.

Caution

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

Steps

1. **Loosen the fixing screw and pull out the alarm interface unit using the handle.**

2. **Use JP8 for setting the alarm relays to closed on alarm or open on alarm.**

   The jumper mounted between pins 1 and 2 on the jumpers (default) means closed on alarm for the corresponding relay.

   The jumper mounted between pins 2 and 3 on the jumpers means open on alarm for the corresponding relay.

   The jumper numbers correspond to the relay numbering (for instance, JP5 to RL5).

   Note that when the jumpers are mounted between pins 1 and 2, the alarm polarity is Normally Open. When the jumpers are mounted between pins 2 and 3, the alarm polarity is Normally Closed.

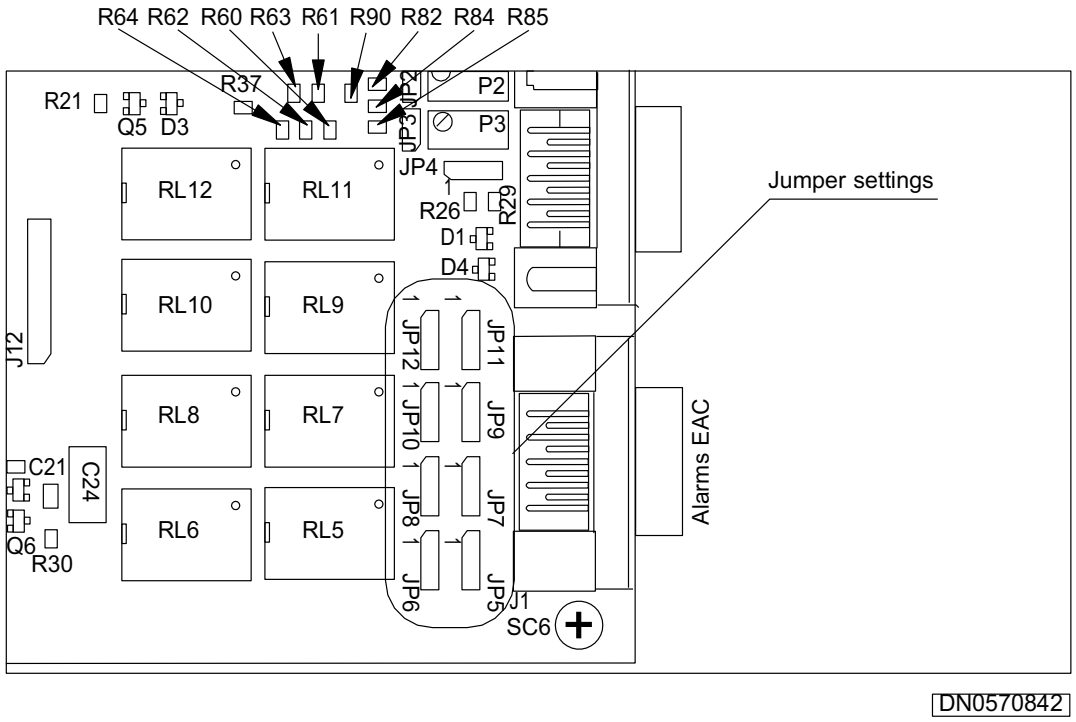


Figure 31. Alarm interface unit from above

3. Reinstall the alarm interface unit.

6.4 Installing heat detector

Before you start

Check that the cabinet roof has been removed. Remove the plastic cover from the heat detector before installing it.

When using the heat detector, the FSEB box is needed.

Summary

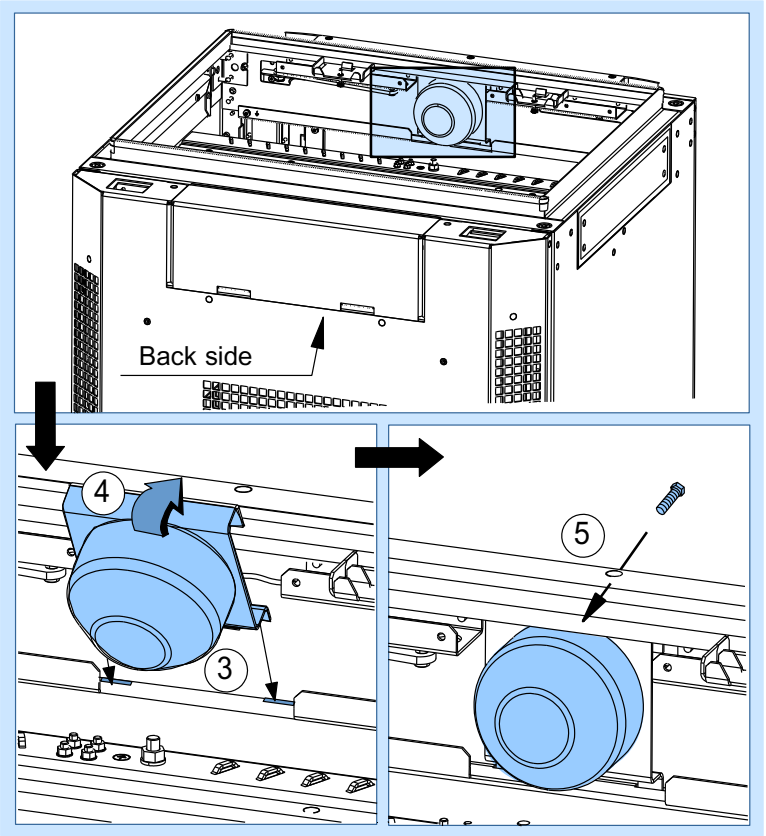


Figure 32. Installing heat detector

Steps

1. **Strip the heat detector cable as needed.**
2. **Make the power and alarm connections.**
3. **Slide the notches in the heat detector back plate in the slots on the cabinet roof.**
4. **Turn the heat detector in an upright position.**
5. **Fix with one M5 screw.**

6. Fix the cable with cable ties.

7 Checklist for installing FCOA

Work phase	Checked
Delivery is complete and undamaged.	
Cabinet is anchored.	
Cabinet is grounded.	
Site Support Module (FCSA) and Integrated Battery Backup (IBBU) are installed (if applicable).	
Air filter is installed (if applicable).	
Heat detector is installed (if applicable).	
Cabinet security lock is installed (if applicable).	

Appendix A Contents of delivery

A.1 Contents of the System Module (ESMA) delivery

Table 5. Nokia Flexi EDGE System Module (ESMA) delivery contents

Description	Product code	Quantity
EDGE System Module (ESMA):	470246A	1
• M5 screws		4
• AWG 4 (25 mm^2) connector rubber boots		2
• Cage nuts		4

A.2 Contents of the Dual TRX Module (EXxA) delivery

Table 6. Nokia Flexi EDGE Dual TRX Module (EXxA) delivery contents

Description	Product code	Quantity
EDGE Dual TRX Module (EXxA):		1
• EDGE Dual TRX Module 800 MHz (EXTA)	470214A	
• EDGE Dual TRX Module 900 MHz (EXGA)	470215A	
• EDGE Dual TRX Module 1800 MHz (EXDA)	470216A	
• EDGE Dual TRX Module 1900 MHz (EXPA)	470217A	
Dual TRX Module Cable Set:	083309A	1
• Power cable 1188 mm (46.8 in.)	• 994940	1
• Bus cable 1054 mm (41.5 in.)	• 994938	1
• RF cable 172 mm (6.8 in.)	• 994931	4
M5 screws		4
Cage nuts		4

A.3 Contents of the Dual Duplexer Module (ERxA) delivery

Table 7. Nokia Flexi EDGE Dual Duplexer Module (ERxA) delivery contents

Description	Product code	Quantity
EDGE Dual Duplexer Module (ERxA):		1
• EDGE Dual Duplexer Module 800 MHz (ERTA)	• 470249A	
• EDGE Dual Duplexer Module 900 MHz (ERGA)	• 470250A	
• EDGE Dual Duplexer Module 900 MHz SB-J (ERJA)	• 470251A	
• EDGE Dual Duplexer Module 900 MHz SB-H (ERHA)	• 470252A	
• EDGE Dual Duplexer Module 1800 MHz (ERDA)	• 470253A	
• EDGE Dual Duplexer Module 1900 MHz (ERPA)	• 470254A	
M5 screws		2
Cage nuts		2

A.4 Contents of the Wideband Combiner Sub-module (EWxx) delivery

Table 8. Nokia Flexi EDGE Wideband Combiner Sub-module (EWxA) delivery contents

Description	Product code	Quantity
EDGE Wideband Combiner Sub-module (EWxA):		1
• EDGE Wideband Combiner Sub-module 800/900 MHz (EWGA)	470255A	
• EDGE Wideband Combiner Sub-module 1800 MHz (EWDA)	470256A	
• EDGE Wideband Combiner Sub-module 1900 MHz (EWPA)	470257A	
Wideband Combiner Sub-module Cable Set:	083256A	1
• RF cable 275 mm (10.8 in.)	• 994933	1
• DP cable 203 mm (8.0 in.)	• 994969	1
Screw (pre-installed)		1

Table 9. Nokia Flexi EDGE Wideband Combiner Sub-module (EWxB) delivery contents

Description	Product code	Quantity
EDGE Wideband Combiner Sub-module (EWxB):		1
• EDGE Wideband Combiner Sub-module 800/900 MHz (EWGB)	471492A	
• EDGE Wideband Combiner Sub-module 1800 MHz (EWDB)	471493A	
• EDGE Wideband Combiner Sub-module 1900 MHz (EWPB)	471494A	
Wideband Combiner Sub-module Cable Set:	083256A	1
• RF cable 275 mm (10.8 in.)	• 994933	1
• DP cable 203 mm (8.0 in.)	• 994969	1
Screw (pre-installed)		1

A.5 Contents of the Remote Tune Combiner (ECxA) delivery

Table 10. Nokia Flexi EDGE Remote Tune Combiner (Cavity Combiner) Module (ECxA) delivery contents

Description	Product code	Quantity
EDGE Remote Tune Combiner (Cavity Combiner) Module (ECxA):		1
• EDGE Remote Tune Combiner (Cavity Combiner) Module 1800 MHz (ECDA)	470260A	
• EDGE Remote Tune Combiner (Cavity Combiner) Module 900 MHz (ECGA)	470258A	
• EDGE Remote Tune Combiner (Cavity Combiner) Module 900 MHz-J (ECJA)	470259A	
Remote Tune Combiner Cable Set:	083257	1
• Power cable 1188 mm (46.8 in.)	• 994940	1
• Bus cable 1054 mm (41.5 in.)	• 994938	1
• RF cable 275 mm (10.8 in.)	• 994933	8
M5 screws		4
Cage nuts		4

A.6 Contents of the Power Module (FPMA) delivery

The FPMA Power Module is an optional item that has to be ordered separately, when needed.

The Power Module delivery contains the following items:

- Power Module (FPMA) with internal AC and DC cabling and cable support plates
- 2 x Power Module cable entries (identical to EMHA cable entries)
- Alarm cable to the System Module
- 2 x cable clamps
- 4 x M5 screws for fixing cable entries to the casing
- 4 x K30 screws for the cable clamps
- 2 x M5 screws for fixing the casing to another casing or plinth
- 10 x cable ties

See the following figure for more information on the delivery contents.

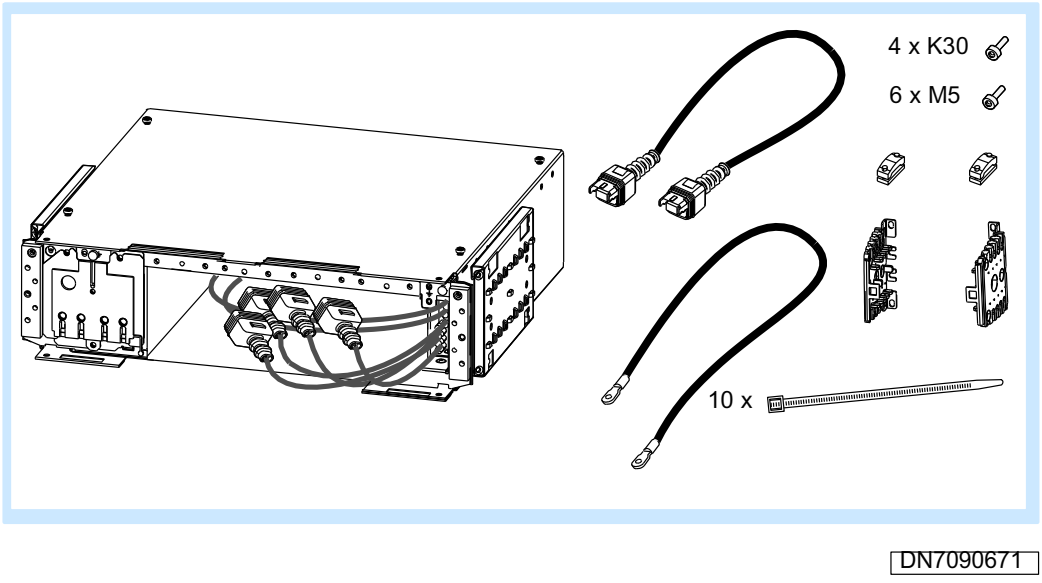


Figure 33. Delivery contents of the FPMA

A.6.1 Contents of the power AC/DC sub-module (FPAA) delivery

The FPAA power sub-module is an optional item that has to be ordered separately, when needed.

The FPAA power sub-module delivery contains the following items:

- Power sub-module (FPAA) with two RJ-45 connector seal caps installed
- Alarm cable
- 2 x M5 screws for fixing the FPAA to FPMA

See the following figure for more information on the delivery contents.

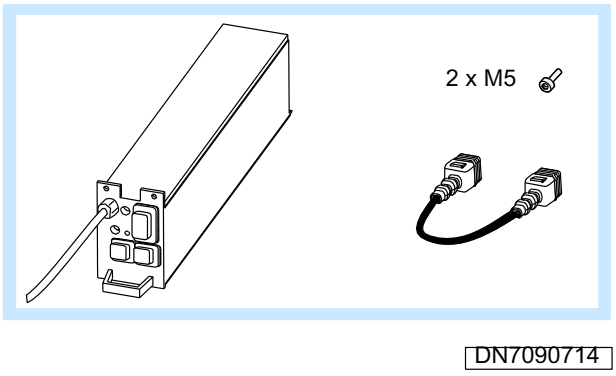


Figure 34. Delivery contents of the FPAA

A.6.2 Contents of the power battery sub-module (FPBA) delivery

The FPBA power battery sub-module is an optional item that has to be ordered separately, when needed.

The FPBA power sub-module delivery contains the following items:

- Power battery sub-module (FPBA) with two RJ-45 connector seal caps installed
- Alarm cable
- 2 x M5 screws for fixing the FPBA to FPMA

See the following figure for more information on the delivery contents.

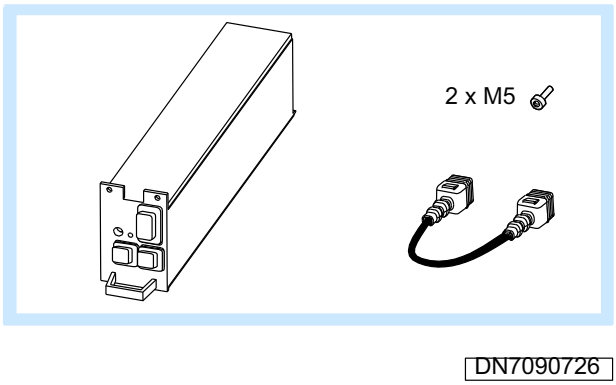


Figure 35. Delivery contents of the FPBA

A.7 Contents of the 24V Power Module (FPDA) delivery

The 24V Power Module (FPDA) is an optional item that has to be ordered separately, when needed.

The 24V Power Module (FPDA) delivery contains the following items:

- DC/DC converter core pre-installed inside a 2U casing with cable support plates and with two RJ-45 connector seal caps installed
- 2 x cable entries
- 2 x DC output power cables
- Alarm cable
- 4 x AWG 4 (25 mm^2) connector single rubber boot
- 2 x AWG 4 (25 mm^2) connector double rubber boot
- 4 x M5 screws for fixing cable entries to the casing and 2 x M5 screws for fixing the casings to each other
- 2 x cable clamps
- 4 x K30 screws for cable clamps

See the following figure for more information on the delivery contents.

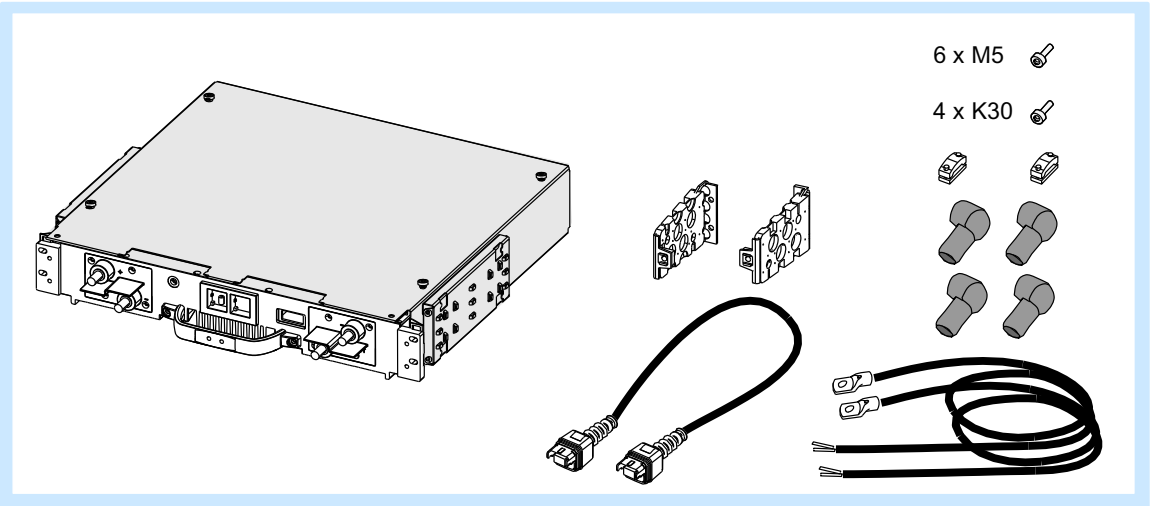


Figure 36. Delivery contents of the FPDA delivery

A.8 Contents of the System Extension Module (ESEA) delivery

Table 11. Nokia Flexi EDGE System Extension Module (ESEA) delivery contents

Description	Product code	Quantity
EDGE System Extension Module (ESEA)	470330A	1
ESEA Cable Set:	083296	1
• Bus cables 1554 mm (61.2 in.)	994939	2
M5 screws	-	4
Cage nuts	-	4

A.9 Contents of the Flexi System External Alarm Module (FSEB)

Table 12. Nokia Flexi System External Alarm Module (FSEB) delivery contents

Description	Product code	Quantity
Flexi System External Alarm Module (FSEB):	471424A	1
• D37 Cable Assembly		1
• Cable tie, PER31		3
• Grounding cable		1

A.10 Contents of the transmission interface E1 sub-module (FIEA) delivery

Table 13. Flexi transmission interface E1 asymmetrical sub-module (FIEA) delivery contents

Description	Product code	Quantity
Flexi transmission interface E1 asymmetrical sub-module (FIEA):	470247A	1
• Screws (pre-installed)		4

A.11 Contents of the transmission interface Flexbus sub-module (FIFA) delivery

Table 14. Flexi transmission interface Flexbus sub-module (FIFA) delivery contents

Description	Product code	Quantity
Flexi transmission interface Flexbus sub-module (FIFA):	471007A	1
• Screws (pre-installed)		4

A.12 Contents of the transmission interface E1/T1 sub-module (FIPA) delivery

Table 15. Flexi transmission interface E1/T1 symmetrical sub-module (FIPA) delivery contents

Description	Product code	Quantity
Flexi transmission interface E1/T1 symmetrical sub-module (FIPA):	470248A	1
• Screws (pre-installed)		4

A.13 Contents of the Upgrade Cable Kit (EUCA) delivery

Table 16. Nokia Flexi EDGE Upgrade Cable Kit (EUCA) delivery contents

Description	Product code	Quantity
EDGE Upgrade Cable Kit (EUCA):	470265A	1
• RF cable 1300 mm (51.2 in.)	• 994936	3

A.14 Contents of the transmission cable deliveries (FTCx)

Table 17. FTCA/FTCB transmission cable deliveries (used with the E1/T1 transmission sub-module FIPA)

Description	Product code	Quantity
FTCA OD Cable RJ48C – TQ-M/0 120 ohm 5 m (16.4 ft)	470312A	1
FTCB OD Cable RJ48C 120ohm 15 m (49.2 ft)	470309A	1

Table 18. FTCD/FTCE transmission cable deliveries (used with the E1 transmission sub-module FIEA)

Description	Product code	Quantity
FTCD OD Cable SMB-F/0 - BT43-F/0 75 ohm 5 m (16.4 ft)	470313A	1
FTCE OD Cable SMB-F/0 75 ohm 15 m (49.2 ft)	470310A	1

Table 19. FTCJ transmission delivery (used with the Flexibus transmission sub-module FIFA

Description	Product code	Quantity
FTCJ OD Cable TNC-F/0-TNC-M/0 2.5 m (8.2 ft)	471391A	1

A.15 Contents of the LMP cable delivery (ELCA)

Table 20. LMP cable delivery (ELCA)

Description	Product code	Quantity
LMP cable 50 m (164.0 ft), ELCA	471370A	1

A.16 Contents of the synchronisation cable deliveries (ESxA)

Table 21. Synchronisation cable deliveries (ESUA/ESFA/ESLA)

Description	Product code	Quantity
ESUA synchronisation cable for Flexi Ultra 12 m (39.4 ft)	471372A	1
ESFA synchronisation cable for Flexi 12 m (39.4 ft)	471371A	1
ESLA synchronisation LMU Cable 2 m (6.6 ft)	471377A	1

A.17 Contents of the Q1 cable delivery (EQCA)

Table 22. Q1 cable delivery (EQCA)

Description	Product code	Quantity
EQCA Q1 Cable 3.01 m (9.9 ft)	471384A	1

Appendix B Installation tools and torque values

B.1 FCOA installation tools and equipment

This section lists the installation tools and equipment.

Table 23. Tools for installation

Installation tools
Allen key: 5 mm (0.20 in.)
ESD wrist strap and cable
TORX screwdriver set: T10, T20, T25
Screwdriver slotted for power input connections
Wrench 13 mm (0.51 in.)
Folding knife
Monkey wrench
Side cutters
Torque wrench for antenna cables: Open spanner end with bended shank 32mm@25 Nm (DIN 7-16 connector)
Socket or open ended spanner set: 11 mm (0.43 in.), 13 mm (0.51 in.), 17 mm (0.67 in.), 18 mm (0.71 in.)
Open ended spanner 22 mm or tongs
Lint-free swab or wipe and 99% alcohol for cleaning optical connectors
Cable ties for routing cables
Tape measure
Flashlight, pocket lamp or torch
Hammer drill
Marker pen or comparable tool
Pliers

B.2 Torque values

Nokia strongly recommends that you tighten to the following torque values. These values assume the use of a lubricated bolt or fastener. Use these values unless stated otherwise.

The torque wrench is presented in the following figure.

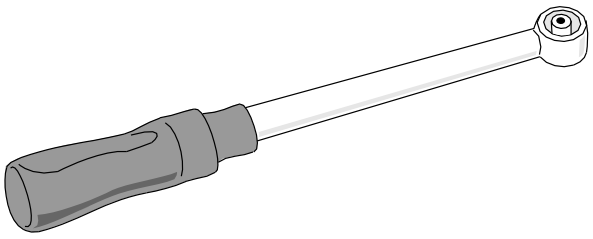


Figure 37. Torque wrench

Table 24. Torque values for the BTS

Bolt/Screw type	Size	Usage	Torque
TORX screw, thumb	M4	Transmission submodules (FIFA, FIEA, FIPA)	2.5 Nm (1.8 ft-lb)
TORX screw, thumb	M4	Wide-band Combiner Sub-module (EWxx)	2.0 - 2.5 Nm (1.5 - 1.8 ft-lb)
TORX screw, pan head	M4	Fan plate assembly	1.2 - 1.6 Nm (0.9 - 1.2 ft-lb)
TORX screw, thumb	M5	Mounting modules on rack or casings (EXxA, ERxA, ESMA, ECxA, FPDA, FPMA)	3.0 Nm (2.2 ft-lb)
TORX screw, thumb	M5	Front covers	2.0 - 2.5 Nm (1.5 - 1.8 ft-lb)
TORX screw, pan head	M5	Cable entry, module/FCIA grounding, locking casings, rear covers, FPAA, FPBA, FPMA AC terminal cover	2.0 - 2.5 Nm (1.5 - 1.8 ft-lb)
Nut	M5	FCOA grounding	3.7 Nm (2.7 ft-lb)
TORX screw, pan head	M8	FCIA grounding	8.0 - 10.0 Nm (5.9 - 7.37 ft lb)

Table 24. Torque values for the BTS (cont.)

Bolt/Screw type	Size	Usage	Torque
Nut	M8	FCOA grounding	8.0 - 10.0 Nm (5.9 - 7.37 ft lb)
DC Power terminal nut	M10	ESMA, FPDA DC power terminals	10.0 - 14.0 Nm (7.0 ft lb - 9.8 ft lb)
Hexagon head screw	M10	Cabinet/plinth fixing (not included in Flexi EDGE delivery)	40.0 Nm (29.0 ft-lb)
Nut	M10	Cabinet/plinth fixing (not included in Flexi EDGE delivery)	40.0 Nm (29.0 ft-lb)
Hexagon head screw	M12	Cabinet/plinth fixing (not included in Flexi EDGE delivery)	49.0 Nm (36.1 ft-lb)
Nut	M12	Cabinet/plinth fixing (not included in Flexi EDGE delivery)	49.0 Nm (36.1 ft-lb)
Antenna connector	7/16"	Antenna jumper cables (not inlcuded in Flexi EDGE delivery)	25 Nm (18.5 ft lb)

Appendix C FSEB interface signals and connector pin assignments

C.1 FSEB interface signals and connector pin assignments

C.1.1 EAC interface

The EAC interface is an interface on the System Module of the BTS and cannot be found on the Flexi System External Alarm (FSEB) itself.

EAC interface signals

Table 25. EAC interface signals

Signal	Function	Technology	Direction
EXT_CO1	External Control 1	TTL	Output, open col.
EXT_CO2	External Control 2	TTL	Output, open col.
EXT_CO3	External Control 3	TTL	Output, open col.
EXT_CO4	External Control 4	TTL	Output, open col.
EXT_CO5	External Control 5	TTL	Output, open col.
EXT_CO6	External Control 6	TTL	Output, open col.
EXT_AL1	External Alarm 1	TTL	Input
EXT_AL2	External Alarm 2	TTL	Input
EXT_AL3	External Alarm 3	TTL	Input
EXT_AL4	External Alarm 4	TTL	Input
EXT_AL5	External Alarm 5	TTL	Input
EXT_AL6	External Alarm 6	TTL	Input
EXT_AL7	External Alarm 7	TTL	Input
EXT_AL8	External Alarm 8	TTL	Input
EXT_AL9	External Alarm 9	TTL	Input
EXT_AL10	External Alarm 10	TTL	Input
EXT_AL11	External Alarm 11	TTL	Input
EXT_AL12	External Alarm 12	TTL	Input
GND	Chassis Ground	-	-
+5V	Power Supply	Power	-
CAN_L	CAN low signal	CAN	IO
CAN_H	CAN high signal	CAN	IO

EAC connector pin assignment

Table 26. EAC connector pin assignment

Signal	Pin	Pin	Signal
EXT_CO1	1	19	+5V/150mA
EXT_CO2	2	20	+5V/150mA
EXT_CO3	3	21	+5V/150mA
EXT_CO4	4	22	+5V/150mA
EXT_CO5	5	23	CAN_L
EXT_CO6	6	24	CAN_H
EXT_AL1	7	25	GND
EXT_AL2	8	26	GND
EXT_AL3	9	27	GND
EXT_AL4	10	28	GND
EXT_AL5	11	29	GND
EXT_AL6	12	30	GND
EXT_AL7	13	31	GND
EXT_AL8	14	32	GND
EXT_AL9	15	33	GND
EXT_AL10	16	34	GND
EXT_AL11	17	35	GND
EXT_AL12	18	36	GND

C.1.2 EACX interface

EACX interface signals

Table 27. EACX interface signals

Signal	Function	Technology	Direction
EXT_CO1	External Control 1	TTL	Output
EXT_CO2	External Control 2	TTL	Output
EXT_CO3	External Control 3	TTL	Output

Table 27. EACX interface signals (cont.)

Signal	Function	Technology	Direction
EXT_CO4	External Control 4	TTL	Output
EXT_CO5	External Control 5	TTL	Output
EXT_CO6	External Control 6	TTL	Output
EXT_AL1	External Alarm 1	TTL	Input
EXT_AL2	External Alarm 2	TTL	Input
EXT_AL3	External Alarm 3	TTL	Input
EXT_AL4	External Alarm 4	TTL	Input
EXT_AL5	External Alarm 5	TTL	Input
EXT_AL6	External Alarm 6	TTL	Input
EXT_AL7	External Alarm 7	TTL	Input
EXT_AL8	External Alarm 8	TTL	Input
EXT_AL9	External Alarm 9	TTL	Input
EXT_AL10	External Alarm 10	TTL	Input
EXT_AL11	External Alarm 11	TTL	Input
EXT_AL12	External Alarm 12	TTL	Input
EXT_AL13	External Alarm 13	TTL	Input
EXT_AL14	External Alarm 14	TTL	Input
EXT_AL15	External Alarm 15	TTL	Input
EXT_AL16	External Alarm 16	TTL	Input
EXT_AL17	External Alarm 17	TTL	Input
EXT_AL18	External Alarm 18	TTL	Input
EXT_AL19	External Alarm 19	TTL	Input
EXT_AL20	External Alarm 20	TTL	Input
EXT_AL21	External Alarm 21	TTL	Input
EXT_AL22	External Alarm 22	TTL	Input
EXT_AL23	External Alarm 23	TTL	Input
EXT_AL24	External Alarm 24	TTL	Input
GND	Chassis Ground	-	-
+5V	External Supply	Power	-

EACX-S interface signals and screw terminal pin assignment

Table 28. EACX-S interface signals and screw terminal pin assignment

Pin	Signal	Screw terminal	Pin	Signal	Screw terminal
1	EXT_CO1	Connector X4104 pin1	31	+5V	Connector X4105 pin1
2	EXT_CO2	Connector X4104 pin 2	32	+5V	Connector X4105 pin 2
3	EXT_CO3	Connector X4104 pin 3	33	+5V	Connector X4105 pin 3
4	EXT_CO4	Connector X4104 pin 4	34	+5V	Connector X4105 pin 4
5	EXT_CO5	Connector X4104 pin 5	35	+5V	Connector X4105 pin 5
6	EXT_CO6	Connector X4104 pin 6	36	+5V	Connector X4105 pin 6
7	EXT_AL1	Connector X4106 pin1	37	GND	Connector X4107 pin1
8	EXT_AL2	Connector X4106 pin 2	38	GND	Connector X4107 pin 2
9	EXT_AL3	Connector X4106 pin 3	39	GND	Connector X4107 pin 3
10	EXT_AL4	Connector X4106 pin 4	40	GND	Connector X4107 pin 4
11	EXT_AL5	Connector X4106 pin 5	41	GND	Connector X4107 pin 5
12	EXT_AL6	Connector X4106 pin 6	42	GND	Connector X4107 pin 6
13	EXT_AL7	Connector X4108 pin1	43	GND	Connector X4109 pin1
14	EXT_AL8	Connector X4108 pin 2	44	GND	Connector X4109 pin 2
15	EXT_AL9	Connector X4108 pin 3	45	GND	Connector X4109 pin 3
16	EXT_AL10	Connector X4108 pin 4	46	GND	Connector X4109 pin 4
17	EXT_AL11	Connector X4108 pin 5	47	GND	Connector X4109 pin 5
18	EXT_AL12	Connector X4108 pin 6	48	GND	Connector X4109 pin 6
19	EXT_AL13	Connector X4110 pin1	49	GND	Connector X4111 pin1

Table 28. EACX-S interface signals and screw terminal pin assignment (cont.)

Pin	Signal	Screw terminal	Pin	Signal	Screw terminal
20	EXT_AL14	Connector X4110 pin 2	50	GND	Connector X4111 pin 2
21	EXT_AL15	Connector X4110 pin 3	51	GND	Connector X4111 pin 3
22	EXT_AL16	Connector X4110 pin 4	52	GND	Connector X4111 pin 4
23	EXT_AL17	Connector X4110 pin 5	53	GND	Connector X4111 pin 5
24	EXT_AL18	Connector X4110 pin 6	54	GND	Connector X4111 pin 6
25	EXT_AL19	Connector X4112 pin1	55	GND	Connector X4113 pin1
26	EXT_AL20	Connector X4112 pin 2	56	GND	Connector X4113 pin 2
27	EXT_AL21	Connector X4112 pin 3	57	GND	Connector X4113 pin 3
28	EXT_AL22	Connector X4112 pin 4	58	GND	Connector X4113 pin 4
29	EXT_AL23	Connector X4112 pin 5	59	GND	Connector X4113 pin 5
30	EXT_AL24	Connector X4112 pin 6	60	GND	Connector X4113 pin 6

EACX connector I pin assignment

Table 29. EACX connector I pin assignment (Sub-D37)

Signal	Pin	Pin	Signal
EXT_CO1	1	19	GND
EXT_CO2	2	20	+5V/30mA
EXT_CO3	3	21	+5V/30mA
EXT_CO4	4	22	+5V/30mA
EXT_CO5	5	23	+5V/30mA
EXT_CO6	6	24	+5V/30mA
EXT_AL1	7	25	+5V/30mA
EXT_AL2	8	26	GND

Table 29. EACX connector I pin assignment (Sub-D37) (cont.)

Signal	Pin	Pin	Signal
EXT_AL3	9	27	GND
EXT_AL4	10	28	GND
EXT_AL5	11	29	GND
EXT_AL6	12	30	GND
EXT_AL7	13	31	GND
EXT_AL8	14	32	GND
EXT_AL9	15	33	GND
EXT_AL10	16	34	GND
EXT_AL11	17	35	GND
EXT_AL12	18	36	GND
-	-	37	GND

EACX connector II pin assignment

Table 30. EACX connector II pin assignment (Sub-D37)

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

Table 30. EACX connector II pin assignment (Sub-D37) (cont.)

Signal	Pin	Pin	Signal
Not used	16	34	Not used
Not used	17	35	Not used
Not used	18	36	Not used
		37	Not used

C.1.3 ESM interface

ESM interface signals

Table 31. ESM interface signals

Signal	Function	Technology	Direction
EXT_CO1	External Control 1	TTL	Input
EXT_CO2	External Control 2	TTL	Input
EXT_CO3	External Control 3	TTL	Input
EXT_CO4	External Control 4	TTL	Input
EXT_CO5	External Control 5	TTL	Input
EXT_CO6	External Control 6	TTL	Input
EXT_AL1	External Alarm 1	TTL	Output
EXT_AL2	External Alarm 2	TTL	Output
EXT_AL3	External Alarm 3	TTL	Output
EXT_AL4	External Alarm 4	TTL	Output
EXT_AL5	External Alarm 5	TTL	Output
EXT_AL6	External Alarm 6	TTL	Output
EXT_AL7	External Alarm 7	TTL	Output
EXT_AL8	External Alarm 8	TTL	Output
EXT_AL9	External Alarm 9	TTL	Output
EXT_AL10	External Alarm 10	TTL	Output
EXT_AL11	External Alarm 11	TTL	Output
EXT_AL12	External Alarm 12	TTL	Output
GND	Chassis Ground	-	Output
+5V	External Supply	Power	-

Table 31. ESM interface signals (cont.)

Signal	Function	Technology	Direction
CAN_L	CAN low signal		IO
CAN_H	CAN high signal		IO

ESM connector pin assignment

Table 32. ESM connector pin assignment

Signal	Pin	Pin	Signal
EXT_CO1	1	19	+5V/150mA
EXT_CO2	2	20	+5V/150mA
EXT_CO3	3	21	+5V/150mA
EXT_CO4	4	22	+5V/150mA
EXT_CO5	5	23	CAN_L
EXT_CO6	6	24	CAN_H
EXT_AL1	7	25	GND
EXT_AL2	8	26	GND
EXT_AL3	9	27	GND
EXT_AL4	10	28	GND
EXT_AL5	11	29	GND
EXT_AL6	12	30	GND
EXT_AL7	13	31	GND
EXT_AL8	14	32	GND
EXT_AL9	15	33	GND
EXT_AL10	16	34	GND
EXT_AL11	17	35	GND
EXT_AL12	18	36	GND
-	-	37	Not used

C.1.4 Heat detector power supply interface

Table 33. Heat detector power screw terminal X4114 pin assignment

Pin	Signal
1	+8.55V ... +11.5V
2	Ground
3	Ground
4	Ground
5	Ground
6	+8.55V ... +11.5V