NOKIA

DX 200

BSC3i S10.5

Installing BSC3i

Site Documents

BSC3018_P

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Summary of changes

Changes between document issues are cumulative. Therefore, the latest document issue contains all changes made to previous issues.

Changes made between issues 2–0 and 1a-0

Most figures have been replaced with their latest versions.

Installation overview

Cabling Instructions for i-series Network Elements, Site Documents, *Product Catalog*, and *Configuration Manual* have been removed from section *Documents needed for installation*.

Unpacking and checking the equipment

The following changes have been made in this chapter:

Work Instructions document has been replaced with *Installation Work Check List, BSC3i Installation*.

Step 5, Make the needed additional holes in raised floors and correct the installation floor plan. has been added to section *Checking the installation site*.

Parts of the construction mounted at the factory

Figure *Cabinet BSCC (IC209-A)* has been updated.

Preparing the cabinet for installation

The following changes have been made in this chapter:

Step 'Check the door grounding cable (see the figures below); if it is connected, disconnect one end of the cable (preferably the door end)' has been added.

Two figures: *Disconnecting the door grounding cable at the front side of the cabinet* and *Disconnecting the door grounding cable at the rear side of the cabinet* have been added.

Installing the cabinet on floor rails

Notes have been added to steps 7 and 10 in section *Installing the floor rails*. In step 7 wedge anchors have been specified. In step 10, 100 ohm has been changed to 100 kohm.

Step 'Insert a top plate on top of the rail for each cabinet attachment piece.' has been removed from section *Installing the Floor Rail Installation Set*.

Table *Parts for installing cabinets on floor rails* has been updated.

Connecting the station power supply in BSC3i

'A= BSC3i with SCC (raised floor installation)' and 'B= BSC3i without SCC' have been added under Figure: Connecting power supply cables.

Attaching identification stickers and marking labels on BSC3i cabinet (BSCC)

The following sentences have been removed:

'Stickers indicating the subassemblies installed in the cabinet when system expansions made, which are added on a base sticker attached at the factory (not shown in the figure).'

'Note that the cabinet identification and positioning labels in the figure below are examples; the texts are different in labels for different cabinet types or cabinets of the same type installed in different positions.'

Installing the internal cables

The *Cabling Lists* document has been replaced with *Intracabinet Cables, BSC3i* in sections *Cabling lists for the internal cables* and *Power supply devices in the cabinet*.

Installing and replacing Fan Trays in BSC3i

The *Cabling Lists* document has been replaced with *Intracabinet Cables, BSC3i* in section *Connect cables into the FTRB*.

Equipping the cartridges with plug-in units in BSC3i

AS7-B has been removed from step 2 in section *Preliminary checks before the installation*.

The procedure in section *Mounting the WDU (Hard Disk drive with HPDU-A)* has been updated. Figure *Installing the WDU (Hard Disk Drive and HDPU-A)* has also been changed.

TRM9A has been replaced with TRM9B in table *Wiring connector types for the BSC3i network elements*.

A note has been added to section *Installing the plug-in units in the cartridges*.

Cabling to environment

AC25-S plug-in has been replaced with AC25-A plug-in in section *X.25 interfaces from BSC3i (AC25-A) to Modem*.

A= BSC3i with SCC (raised floor installation) and B= BSC3i without SCC have been added to figure *Grounding the E1, T1 trunk cables and X.25 cables at the CPGO panels* in section *Grounding the metal sheaths of E1, T1 and X.25 cables*.

A note has been added below figures *SMB/50 E1 trunk cable connectors of the ET2E-C and ET2E-SC plug-in units* and *RJ48C connectors of the ET2A plug-in unit*.

Figures have been updated.

New figure: Peripheral cables; CNM for VDU and CNP for printer LPT.

Installing the External Alarm Unit (EXAU)

Figure *Use CNDC cable* corrected.

Step 10 has been added to section *Mounting the EXAU*.

Finishing off the BSC3i network element installation

Steps 5 and 6 have been added to section *Finishing off the installation*.

Figures *Connecting the door grounding cable at the front side of the cabinet* and *Connecting the door grounding cable at the rear side of the cabinet* have been added.

Changes made between issues 1a-0 and 1–0

Online modifications.

Issue 1–0

This is the firs issue of *Installing BSC3i*.

1 About the installation of the BSC3i network element

Installing BSC3i is the hardware installation procedure for the Nokia GSM/EDGE BSC3i network element. It provides you with instructions for efficiently accomplishing each step in the installation process, from the preparatory procedures on up to the point when the network element is ready for commissioning.

1.1 How to use this manual

This manual provides the following information:

- introduction to installation including the tools needed and preparations in the equipment room
- unpacking and checking the equipment
- preparing the cabinets for installation
- installing the cabinets, including the top structures and cabinet ends
- grounding the cabinets
- connecting the power supply cables
- adding marking and warning labels
- installing internal cables
- installing and replacing the Fran Trays
- installing the plug-in units
- installing the external cables
- installing the External Alarm Unit
- finishing off the network element installation.

1.2 Where to find more

For information on the power distribution, site requirements, cabling and dimensioning principles of the BSC3i network element, see the *Engineering Descriptions* manuals.

For information on the actual delivery of the exchange, see the *Site Documents*.

1.3 Typographic conventions

The following table presents the conventions used in the DX 200 manuals.

Table 1. Typographic conventions.

Emphasised font	Indicates a reference to a manual, chapter or section, for example: See section *How to use this manual* Indicates a word or phrase that is emphasised, for example: term referring to *both* versions

1.4 Product names used in this manual

Note that the product names in this manual are normally without the variant designation, which may be B or S. For example, AS7 is used instead of AS7-B.

1.5 Customer information exhibits

Information exhibit for FCC Rule Part 15

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of the equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Caution

Any modifications to this device not expressly authorized by Nokia could void the user's authority to operate this device.

The FCC label is located outside of the front part of the cabinet, above the left door, on the dark gray plate.

Information exhibit for FCC Rule Part 68

This equipment complies with Part 68 of the FCC Rules. The FCC Part 68 label is located on the front panel of the ET2A plug in unit.

The label contains the FCC registration number and the ringer equivalence number (REN) for this equipment, when applicable. The serial number of the ET2A plug-in unit can also be found on the other label, on the ET2A front panel. The following information is provided:

- Service Order Code
- T1 Line 6.0F
- Facility Interface Code (FIC) The code depends on the card configuration.
- T1 Line 04DU9-BN T1/SF/No Line Power
- 04DU9-DN T1/SF/B8ZS/No Line Power
- 04DU9-1KN T1/ESF/No Line Power
- 04DU9-1SN T1/ESF/B8ZS/No Line Power
- Ringer Equivalence Number (REN)
- T1 Line N/A
- USOC Connectors
- T1 Line RJ48C

1.6 A Format for the Industry Canada Ringer Equivalence Number Notice

The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above condition may not prevent degradation of service in some situations.

Repairs to some certified equipment should be made by an authorized maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the ground connections of the power utility, telephone lines and internal metallic water pipe system, are connected together. This precaution may be particularly important in rural areas.

Caution

Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

1.7 Your comments

We are always interested to know whether our manuals provide the information you need. If you have any comments about this document or any other Nokia manual, please pass them on to your local Nokia sales representative.

2 Installation overview

Installation overview provides the installation group with the fundamentals of the installation procedure. It gives an overview of the steps to be taken, and lists all of the necessary references and tools to be used. Also included are conversion tables for metric and imperial units, and the cabinet dimensions.

2.1 Installation procedure

Listed below are the work phases for installing the cabinet and cartridge mechanics, in the order they should be performed:

- checking the installation site; unpacking and checking the equipment
- checking parts mounted at the factory
- preparing cabinets for installation
- installing the cabinet on own own feet
- installing the cabinet on floor rails
- installing SCC
- grounding the cabinet
- connecting station power supply
- attaching stickers and labels
- installing the internal cables
- installing and replacing Fan Trays
- creating temporary ESD protected area
- equipping the cartridges with plug-in units
- cabling to environment

- installing the External Alarm Unit
- finishing off.

Requirement specifications for external cables of BSC3i (M98) equipment is provided in the Appendix.

2.2 Documents needed for installation

All documentation should be read through prior to the installation itself, in order to become familiar with the necessary steps. The following documents are needed for installation:

- *Unpacking the i-series Cabinets, Site Documents*
- *Equipment list, Site Documents*
- *Intracabinet and intercabinet cabling lists, Site Documents*
- *Hardware type list (Despatch Note), Site Documents*
- *Jumper setting instructions, Site Documents*
- *Packing lists*
- *Engineering Descriptions*
- *Cabling of trunk lines, Site Documents*.

The following documents are also needed when system expansions are made:

- *Commissioning Manual*
- *SW/HW product revisions in the system release*
- *Customer specific software control list*, *Release Binder*
- I*nstructions for replacing plug-in units*, *Maintenance Manual*

WARNING

For safety reasons, the installation of the Nokia DX 200 network elements must be carried out by at least two qualified persons who have the basic skills to operate and maintain the DX 200 equipment. The installers must also be familiar with the installation tools and competent in using them.

Because of the heavy weight of the cabinets, additional personnel or lifting equipment may be needed when the cabinets are moved, unpacked or lined up, depending on the local regulations.

Caution

Any modifications to this device not expressly authorized by Nokia could void the user's authority to operate this device.

2.3 Tools needed for installation

Tools needed for installation are listed in the table below.

Table 2. Tools needed for installation.

Name	Note
Pocket tape measure 3 m	
Wire stripping knife	
Hammer drill	For floor rail installations only
Drill bit 12 mm	For floor rail installations only
Spirir level	
Cable Stripper	
Coaxial Cable Stripper	
Würth Open-ended Spanner 8"	
Allen Key Set, Ball Head 9 pcs	
VDE sidecutters 140 mm	
Screwdriver set: flathead, crosshead	

Table 2. Tools needed for installation. (Continued)

Name	Note
Multimeter Fluke 23	
Grounding Wrist Belt	CS 77559.01
Antistatic Bed	CS 77559.02

In addition to the tools listed above, 1.5 m (5”) high safety ladders are needed at the installation site.

2.4 Conversion factors

The following conversion factors should be used when installing Nokia's DX 200 and associated equipment, see the table below.

Table 3. Conversion factors.

Metric		American
1 kilogram (kg)	=	2.2046 lb
1 meter (m)	=	3.2808 ft
2.54 centimeters (cm)	=	1 inch

The following table can be used for converting decimals to fractions, where the first column gives the number of inches in decimals and the second column contains the corresponding number of inches in fractional form. The third column gives the number of feet in decimals, and the fourth column gives the corresponding number inches in fractional form.

Table 4. Conversions from decimals to fractions.

Decimals (inches)	Fractions (Inches)		Decimals (feet)	Fractions (Inches)
.1250	1/8		.1	1 13/64
.2500	1/4		.2	2 13/32
.3750	3/8		.3	4 39/64
.4370	7/16		.4	5 51/64
.5	1/2		.5	6
.6250	5/8		.6	7 13/64
.6875	11/16		.7	8 13/32
.8125	13/16		.8	9 39/64
.8750	7/8		.9	10 51/64
1.0	1		1.0	12

Note

For the purposes of installation and construction, an allowance of 1/16th of an inch is tolerated between the physical conditions found on any particular site and the Blue Print drawings provided with the installation instructions. Also, an allowance of 1/16th of an inch will be permitted when converting directly from metric measurement to the imperial standard feet and inches.

3 Unpacking and checking the equipment

Note

Use the check list in *Installation Work Check List, BSC3i Installation* for recording your progress in the installation work. Once you have finished with a procedure, mark it immediately as completed in the list.

Before you begin with the actual installation, check the installation site and its facilities, and unpack and inspect the equipment following the steps in this section. This way you can minimize the risk of any failure which might delay the completion of the installation, commissioning or integration of the network element.

3.1 Checking the installation site

Ensure that the equipment room is prepared so that it complies with the requirements in the instructions of Installation Site Requirements for BSC and TCSM2 following the steps below.

Steps

1. Ensure that all basic work such as installation of lighting, fire extinguishing and air conditioning equipment has been completed.
2. Check against the floor plan for the site that all cable shelves and gratings separate from the equipment itself are ready.
3. Ensure that the station power supply system has been properly installed and that it is ready for use.
4. Ensure that the ventilation equipment has been properly installed and that the temperature in the equipment room is within the limits allowed for the DX 200 equipment.

5. Make the needed additional holes in raised floors and correct the installation floor plan.

6. Ensure that the premises are properly cleaned.

7. If you find any defects in the site itself or the facilities, notify the party responsible and ensure that corrective actions will be taken immediately.

8. Finally, cover the gangways in the equipment room with protective material for the duration of the installation work.

3.2 Unpacking and checking the equipment

The cabinet of the DX 200 BSC3i network element is transported in shipping containers of their own in a horizontal position. The equipment to be installed at the site, that is, side plates are transported in separate containers, as well as the plug-in units, external cables and wiring connectors.

Caution

When removed form the transportation containers, the equipment must be kept in a place which fulfils the environmental requirements for stationary use, as stated in Installation Site Requirements for BSC and TCSM2.

Steps

1. Visually check the shipping containers for any external damage.

   Record any damage you find in the containers.

2. Unpack the cabinet frames following the specific unpacking instructions delivered with the shipment in the *Site Documents* binder.

   After unpacking, either place the cabinets standing up or leave them lying in a horizontal position on the bases of their containers.

3. Unpack the containers for side plates, cable conduits, plug-in units and cables.

   After unpacking, keep the components in their inner packages until the actual installation. Keep the transport packages of the peripheral devices, especially those of the disk drives, in storage for service transportation.

4. Visually check the equipment for any external or internal damage.

Record any damage you find in the equipment.

5. Check that the delivery includes everything on the *Packing list*.

   Record any deficiencies.

6. If there are any problems with the shipment, notify the Nokia Customer Service Center in your area immediately.

4 Parts of the construction mounted at the factory

This section presents *Cabinet parts installed at the factory* and *Cabinet stickers*.

4.1 Cabinet parts installed at the factory

The BSC3i cabinet, the BSCC, is installed in the cabinet IC209-A. Listed in table below and shown in the figure below are the components of the IC209-A.

Table 5. Cabinet components.

Product name	C-number
IC209-A, Cabinet Frame	C100432
CS9-A, Cartridge Shelf	C70910
CSS1, Cable Supporting Shelf for ET4C-B cartridges	C101156
CSS9, Cable Supporting Shelf	C70919
DLH209, Left Door	C70924
DRH209, Right Door	C70909
PDFU-A, Power Distribution Fuse Unit	C100606
PSCG3-B, Power Supply Connector Group	C103140
FTRB, Fan Trays	C100600
COCC, Cover for Cable Conduit	C104592
CSS9, Cable Support	C70919
SCP, Side Cover Plate	C71030

Indoor cabinet
IC209-A

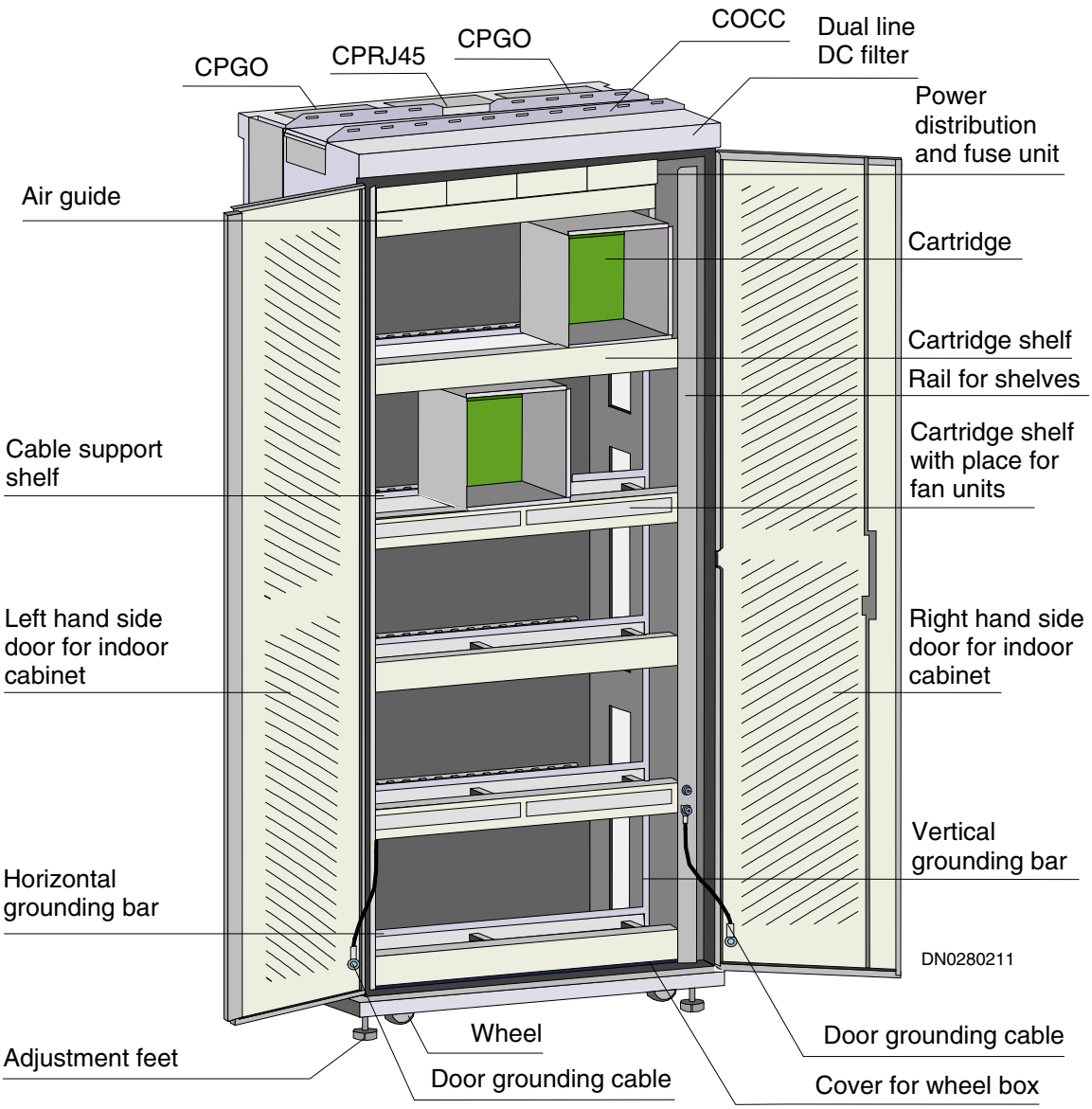


Figure 1. Cabinet BSCC (IC209-A).

Listed in the table below are the cartridge types used in the cabinet.

Table 6. Cartridge types used in the BSC3i network element.

Product name	C-number	Number in use
CC3C-A	C8938	2...7
CC4C-A	C8939	2
CM2C-A	C103260	1
CLOC-B	C104222	1
ET4C-B	C104300	2
SW1C-C	C104596	2

4.2 Cabinet stickers

The warning and other stickers attached to the cabinet at the factory are shown in the two figures below. The latter figure shows the labels at the top part of the cabinet behind the doors, while all other labels are shown in the first figure.

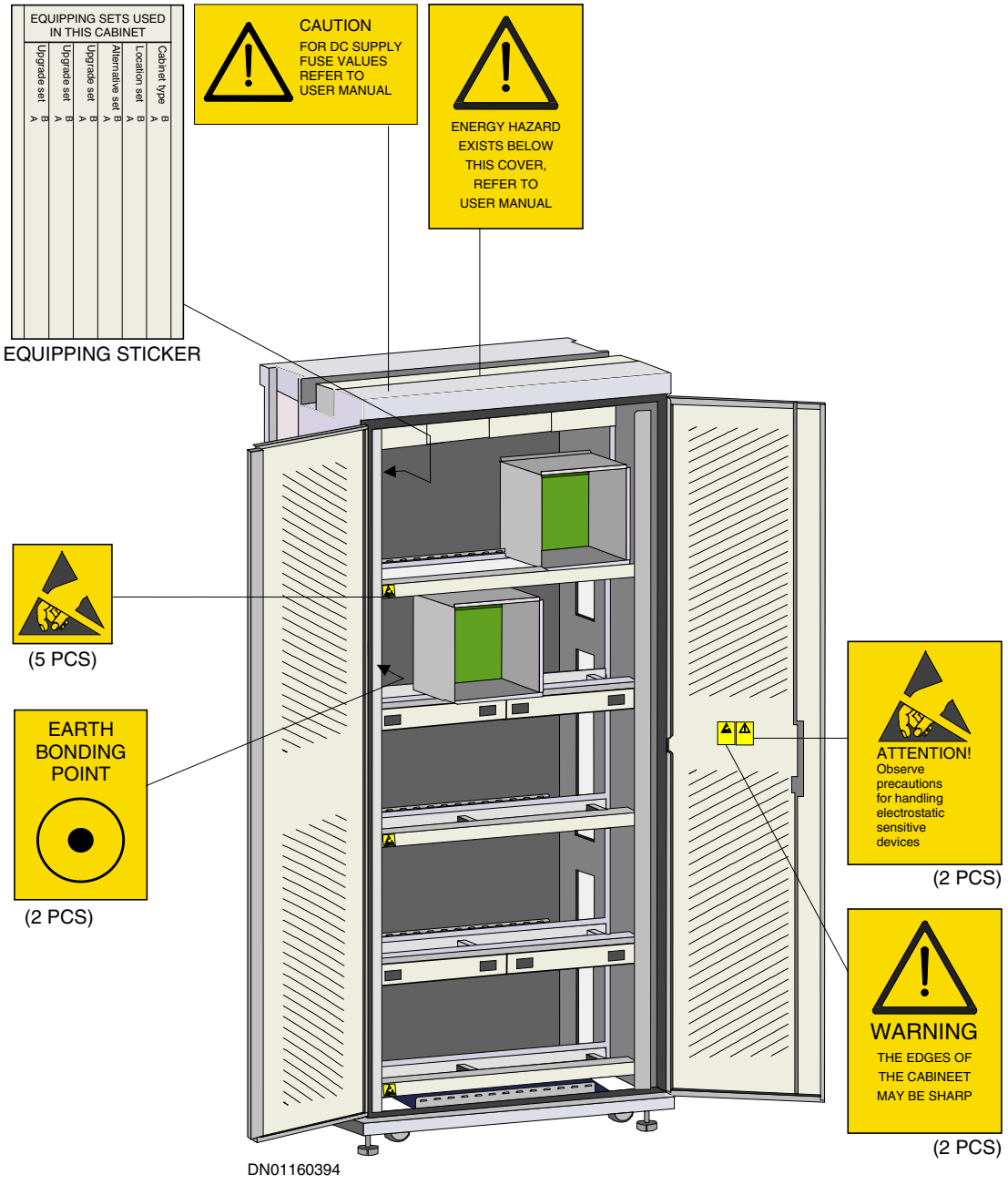


Figure 2. Placement of the all labels in the cabinet, except for those at the top part behind the doors

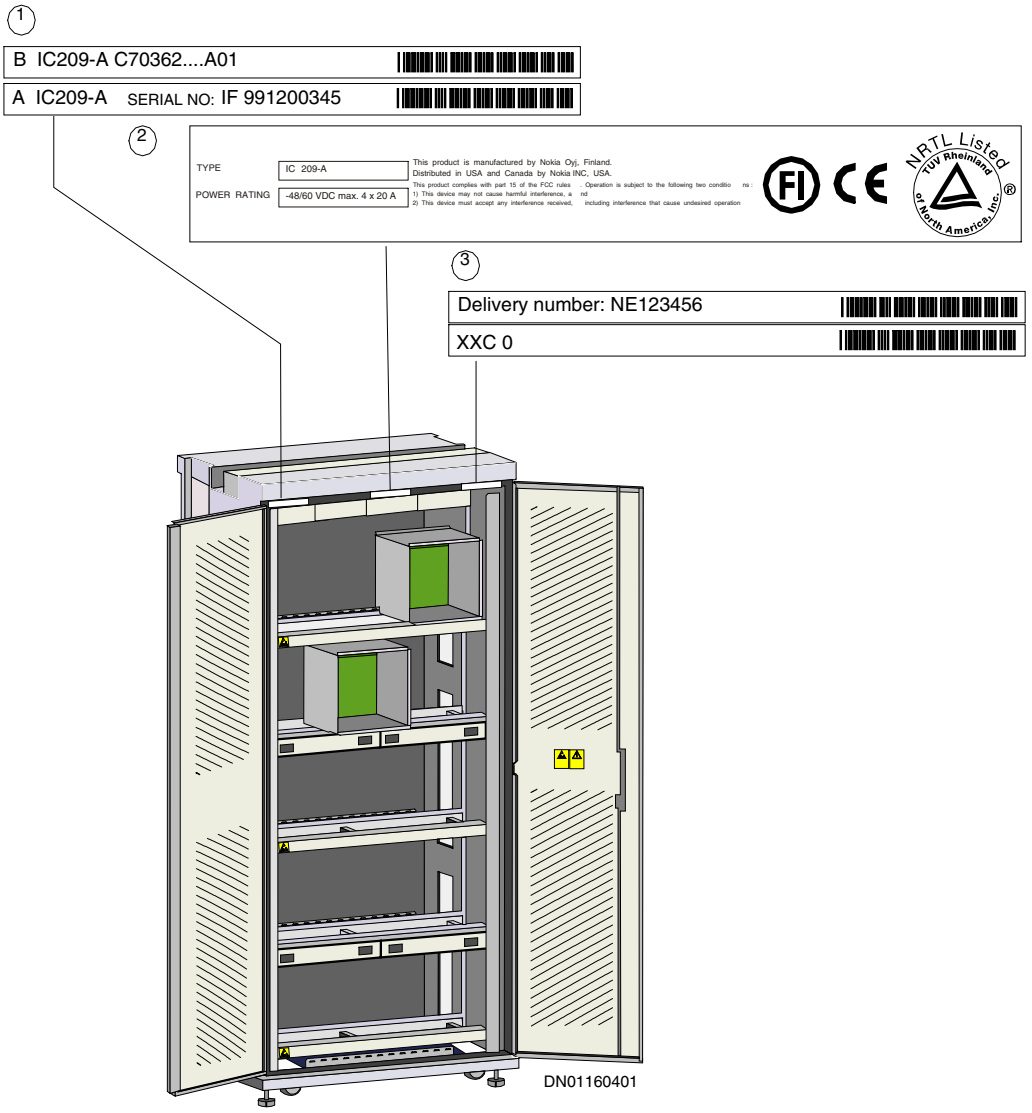


Figure 3. Placement of the labels at the top part of the cabinet, behind the doors

5 Preparing the cabinet for installation

In most instances, the cabinet comes with its doors attached. It is, however, possible to dismantle the doors before installing the cabinet, thus allowing the installation personnel more room to operate.

The parts whose installation is described in this section are listed in the table below.

Table 7. Parts needed for preparing the cabinets.

Item	Manufacture Code
IC209-A cabinet	C100432
Left door (2 pcs per cabinet)	C70924
Right door (2 pcs per cabinet)	C70909

Removing the doors from the cabinets for the duration of the installation allows you more room to operate and easier access to the cabinets. The steps are illustrated in the figure below. To remove a door, do the following:

Steps

1. Check the door grounding cable (see the figures below); if it is connected, disconnect one end of the cable (preferably the door end).

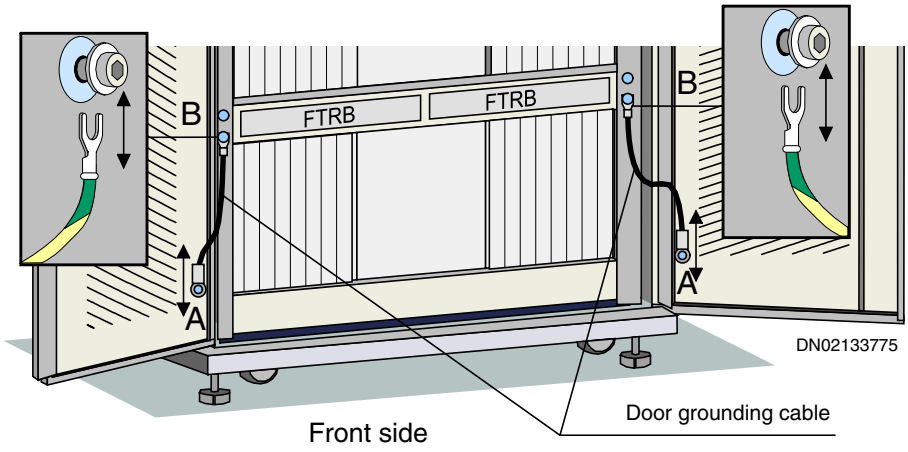


Figure 4. Disconnecting the door grounding cable at the front side of the cabinet.

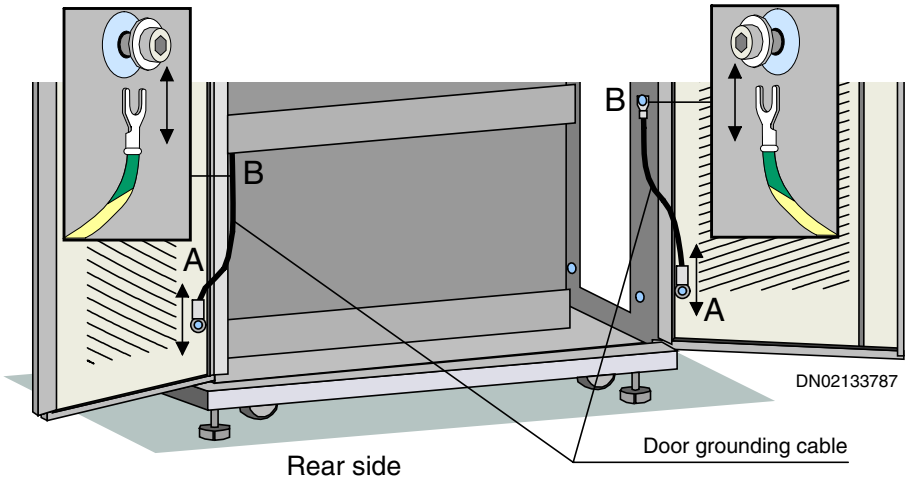


Figure 5. Disconnecting the door grounding cable at the rear side of the cabinet.

2. Push the latch of the middle hinge of the door downwards using a screwdriver (A1).

3. Turn the latch into the slot (A2) to free the door from the hinge.

4. Push the latch of the top hinge of the door downwards using a screwdriver (A1).

5. Turn the latch into the slot (B2) to free the door from the hinge.
6. Tilt the upper part of the door away from the cabinet on the lower hinge.
7. Lift the door off.

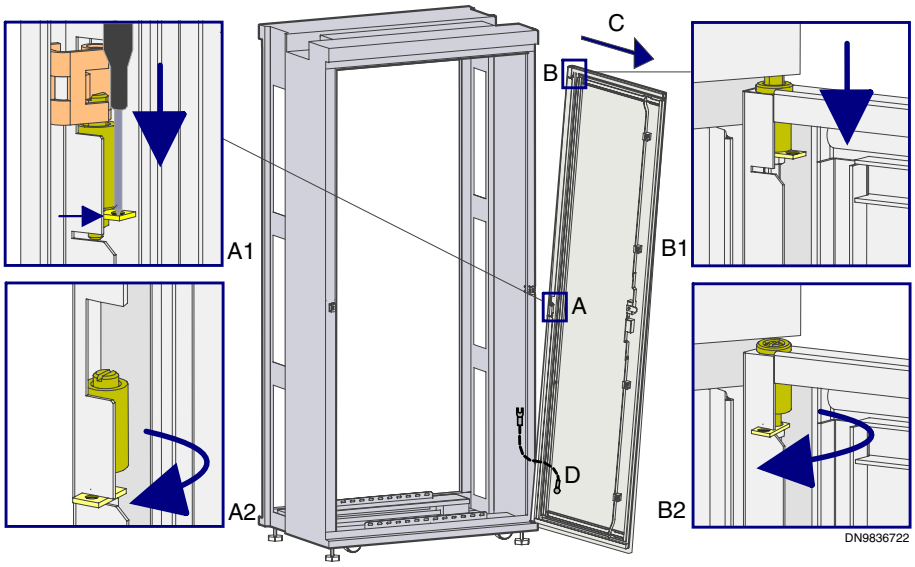


Figure 6. Removing a cabinet door. The details show the steps detailed above.

6 Installing the cabinet on its own feet

Note

If you are going to install the cabinets on floor rails, skip this chapter over and continue from the next one, *Installing the cabinets on floor rails*.

This section describes how the cabinet (IC209-A, C100432) with side cover plates (SCP, C71030) is installed on its own feet.

6.1 Installing the cabinet

For free-standing installations, the cabinets do not need any installation accessories.

Steps

1. Adjust all four feet of all the cabinets to an initial height of about 50 mm (2 in) by turning them.

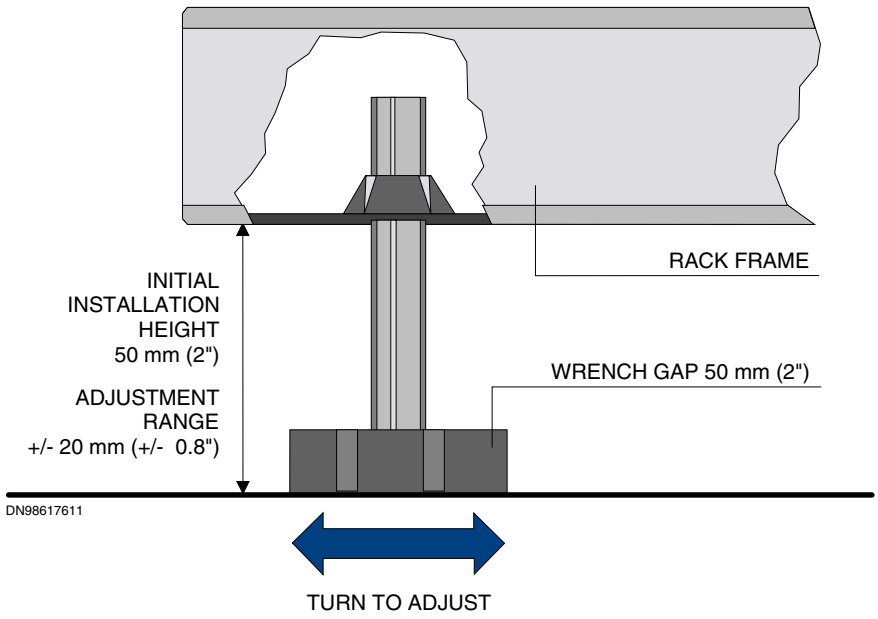


Figure 7. Adjusting a cabinet foot

2. Place the cabinet to its final place according to the floor plan for the exchange.

3. Level off the cabinet in the width and depth direction using a spirit level as a reference.

   Adjust each cabinet horizontally in the width and depth direction using a spirit level, so that it is level within the adjustment range of the feet (±20 mm or ±0.8 in).

4. If there are two or more network elements (BSCC cabinets) to be installed, repeat steps 1 to 3.

5. Attach the cabinets firmly to one another, but do not use any bolts for attachment.

7 Installing the cabinet on floor rails

Note

If you are going to install (or have already installed) the cabinet on its own feet, you can skip this chapter over and continue from the next one, *Grounding the cabinet*.

This section describes how the cabinet is installed on floor rails. The procedure comprises the following phases:

- installing the rails
- installing the cabinet support bars
- preparing the cabinet for installation
- mounting the cabinet on the rails.

The parts whose installation is described in this section are listed in the table below.

Table 8. Parts for installing cabinets on floor rails

Item	Nokia Code
IC209-A, cabinet	C100432
Floor rail, as needed, e.g. 900 mm, 2 pcs	CS 73349.02
Fasteners for rails, 2 pcs per cabinet	CS 73217.04 (4 Wedge anchors M6x25 with acc.), or M10 Wedge anchors where required.
Floor Rail Installation Set, 1 pc per cabinet, includes two cabinet support bars for each cabinet, their attachment parts	CS 73222.20 IS209 Rail fixing (Optional: CS 73222.21 IR209 Ramp)

7.1 Installing the floor rails

The rails are delivered cut to length (900 mm, or 354 in). The distance from the center line of the floor rail to the front edge of the frame is 78 mm (3.1 in). The length of the rail should equal the length of the cabinet row minus 10 mm (0.4 in). An allowance of 1 mm (0.04 in) is permitted in all distance directions. The positioning of the cabinets on the rails and the rails themselves are shown in the figures that follow.

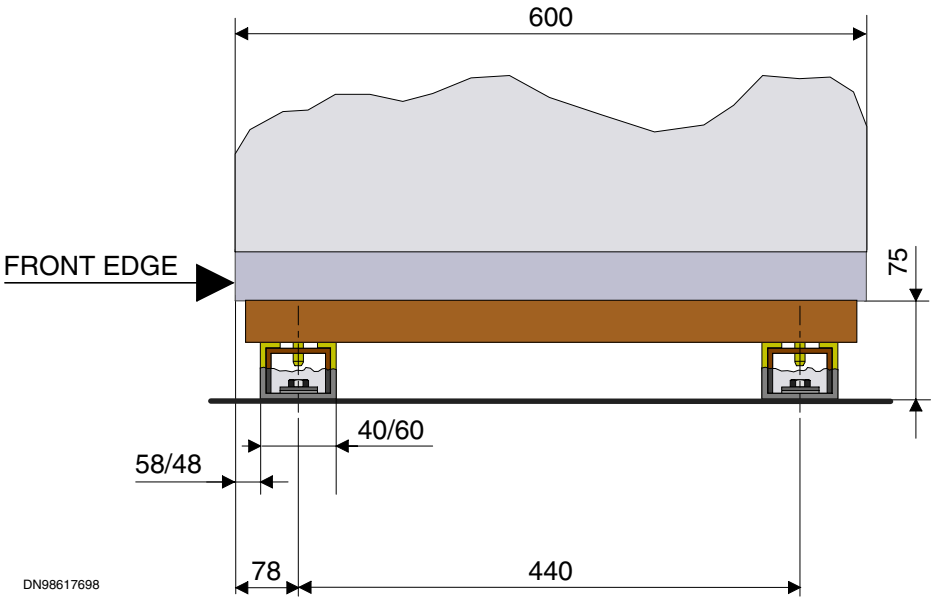


Figure 8. Positioning of a cabinet on floor rails

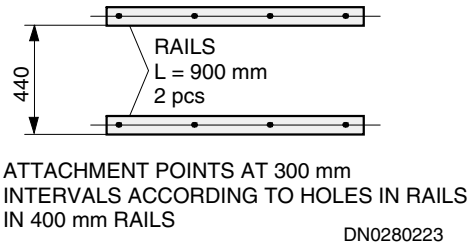


Figure 9. Distances of the floor rails

Install the rails following the steps below, using the figure which follows as a reference.

Steps

1. Determine the insertion points on the floor for the attachment screws for the first rail. Both in normal installations and in earthquake installations, the intervals are c. 300 mm (1 ft).

   See the figures above.

2. Drill the holes for the screws.

   When drilling holes in the floor, vacuum the dust off simultaneously beside the drill bit.

3. Lodge a wedge anchor in each hole.

4. Repeat the steps above for the other rail.

5. Place the rails where you are going to install them.

6. Level the rails off by inserting 0.5 mm (0.02 in), 1.0 mm (0.04 in) or 2.0 mm (0.08 in) shims between the floor and the rails.

   Use a spirit level to check that each rail is level as such, and that the two rails are level in relation to one another.

7. Mount the insulation tube in the first hole, followed by the insulation washer, the washer cad and the attachment screw.

Note

Here the grounding methods referred to are IBN (Insulated Bonding Network) and CBN (Common Bonding network). In the IBN installation, the installation rails should be insulated from the floor structures, but in the CBN installation no insulation is needed.

   For wooden floors, use lag screws (6 x 50), and for concrete floors, wedge anchors (M10, DOKKA 8.8 bolt with RAWL M10 anchor or respective) for fastening.

   Screw in the screw loosely.

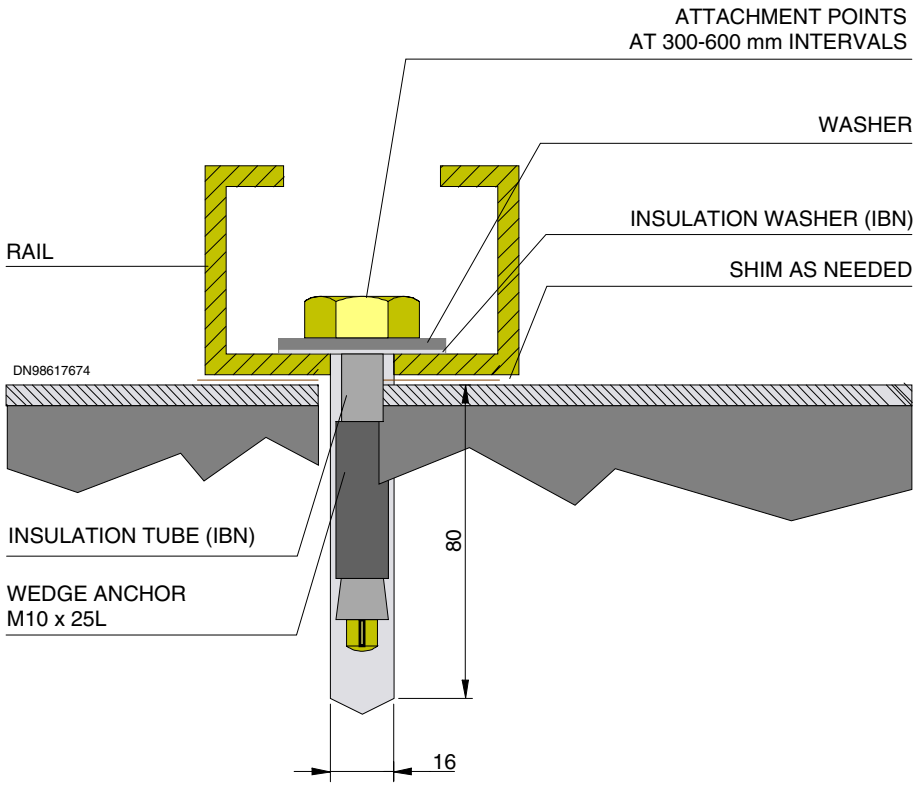


Figure 10. Rail and related parts

8. Repeat the two previous steps to all attachment points for each rail.

9. After attaching all screws, tighten them.

10. Check that the attachment screws are not electrically connected to the rail.

Note

In IBN installations only.

Measure the total leak resistance of all floor rails to the main grounding busbar using an ohmmeter. The resistance must be 100 kΩ at minimum.

If the resistance is lower than 100 kΩ, locate the screw causing the leakage and take the appropriate steps to insulate it.

7.2 Installing the Floor Rail Installation Set

The cabinet is attached to the rails by means of specific Floor Rail Installation Set, and it contains the items listed in the table below.

Table 9. Parts of Floor Rail Installation Set

Item	Amount
Cabinet attachment piece	4 pcs.
Support bar	2 pcs.
Hex bolt for attaching cabinet, M10x40	4 pcs.
Washer, 10.5 mm	4 pcs.

Steps

1. Insert the cabinet attachment pieces inside the floor rails (four pieces per cabinet, two in each rail), with the hollow shank pointing upwards.

   Arrange the attachment pieces in pairs, so that for each piece in one rail there is counterpart in the other rail at a corresponding position.

2. Place the support bars crosswise to the rails, each bar on pair of cabinet attachment pieces.

3. Move the support bars to approximately their final positions lengthwise on the rails.

   For one cabinet you need two support bars, which you should at this stage place c. 55 cm (22 in) away from each other.

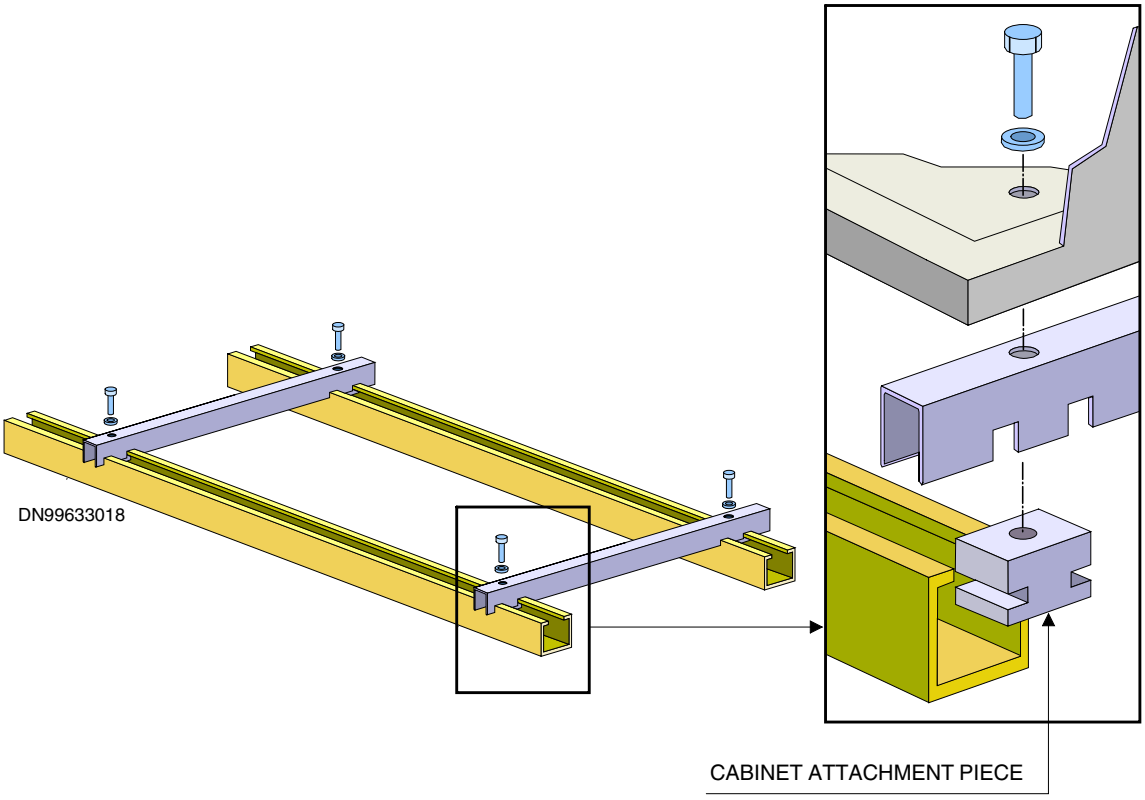


Figure 11. Installing the cabinet support bars

7.3 Mounting the cabinet on the rails

Steps

1. Removing the feet from the cabinet.

   To remove a foot, turn it anti-clockwise until it is detached from the cabinet.

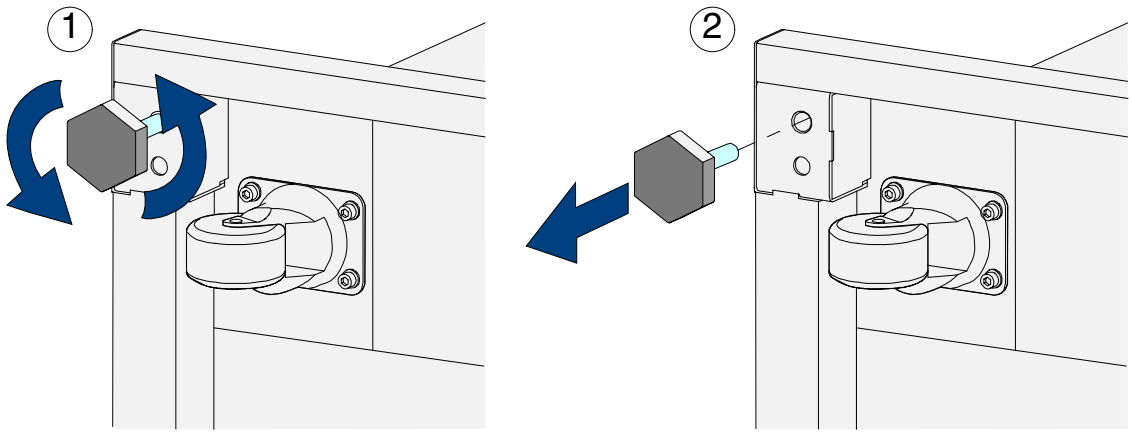


Figure 12. Removing a foot from a cabinet

2. Place the installation ramp in front of the rail, between the support bars for the first cabinet in the row.

   See the figure below.

3. Press the support bars against the sides of the ramp.

   This guides the bars to correct positions. See the figure below.

4. Roll the cabinet along the ramp onto the support bars.

   See the figure below.

5. Loosely attach the cabinet to the attachment pieces using M10x40 hex bolts.

   See the figure below.

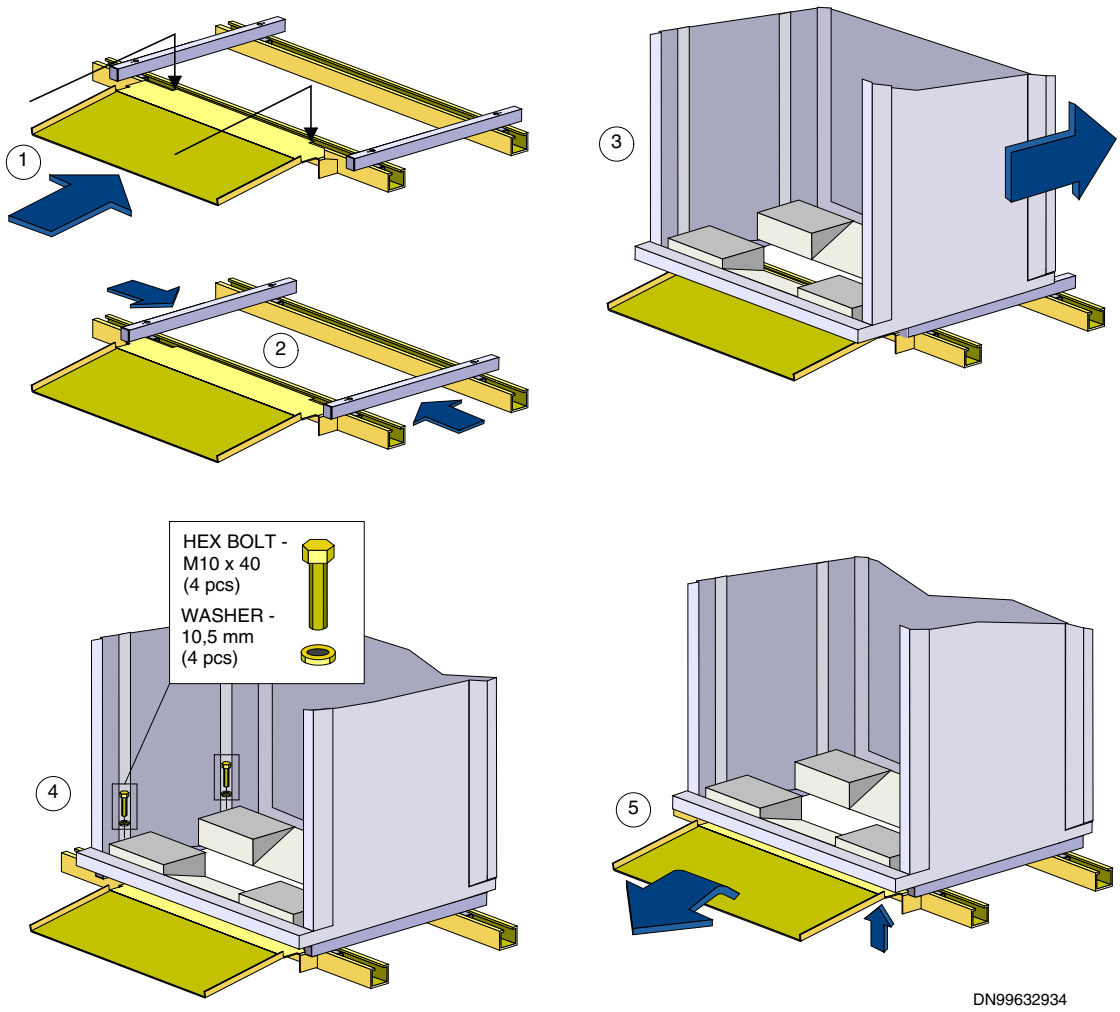


Figure 13. Placing the ramp and positioning the first cabinet

6. Push the cabinet sideways along the rails to its final position.

   When placed correctly, the left wall of the cabinet reaches approximately 5 mm (0.2 in) over the ends of the rails.

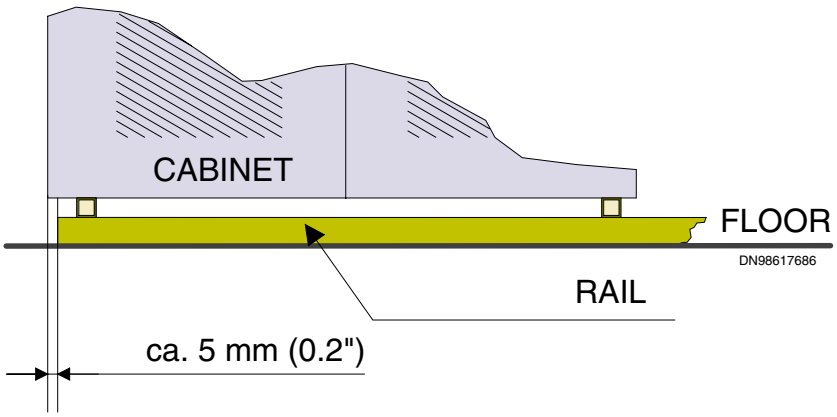


Figure 14. The cabinet in its final position, as seen from the front

8 Installing the Side Cable Conduit SCC in BSC3i

In equipment rooms with raised floor, the Side Cable Conduit (SCC) is used with the BSCC cabinet for cabling external cables. The SCC can be installed at either side of the cabinet.

8.1 Installing the Side Cable Conduit SCC at either side of the cabinet

Steps

1. Install two mounting brackets in the upper and lower holes of the cabinet using screws, washers and nuts.

   Note that the holes are different; seen from the front the left-hand side panel holes are plain holes, but on the right-hand side panel the holes are provided with nuts. For the left-hand side conduit installation use M8x20 screws, washers and M8 nuts. For the right-hand side conduit installation use M8x20 screws and washers.

2. Install the conduit panel on the mounting brackets using washers and screws.

   The conduit panel installation is similar for both ends of the cabinet. For the conduit panel installation use M6x12 screws and washers.

Note

Install and tie the cables entering the cabinet through the conduit before you install the conduit panel.

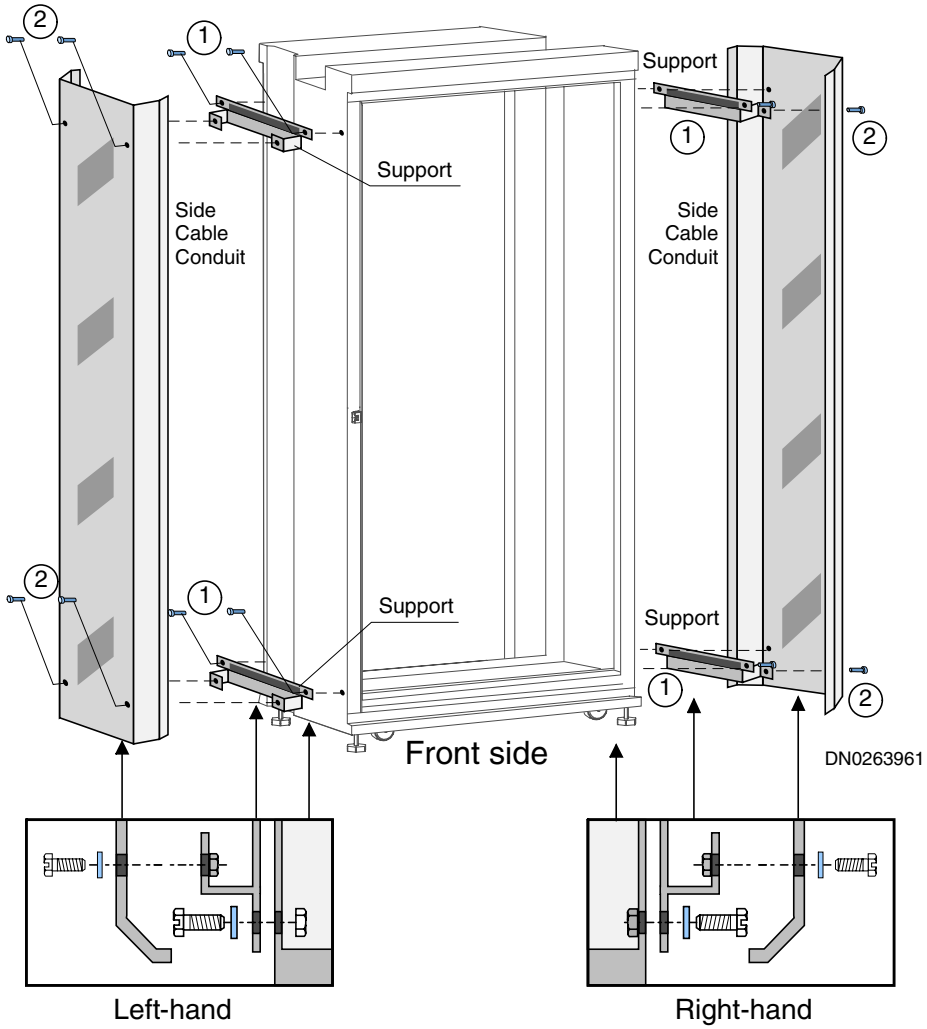


Figure 15. Installing the Side Cable Conduit SCC at either side of the BSCC cabinet.

9 Grounding the cabinet

This section describes how to ground the cabinet of the BSC3i network element. The grounding principles of the BSC3i are described in the *Installation Site Requirements for BSC and TCSM2* manual.

The figure below shows the grounding principle for the BSC3i network element. The ground connection is made using the main ground cable to the ground bar of the site (not included in the delivery). In the figure, installation without raised floor is presented on the left; installation with raised floor is presented on the right.

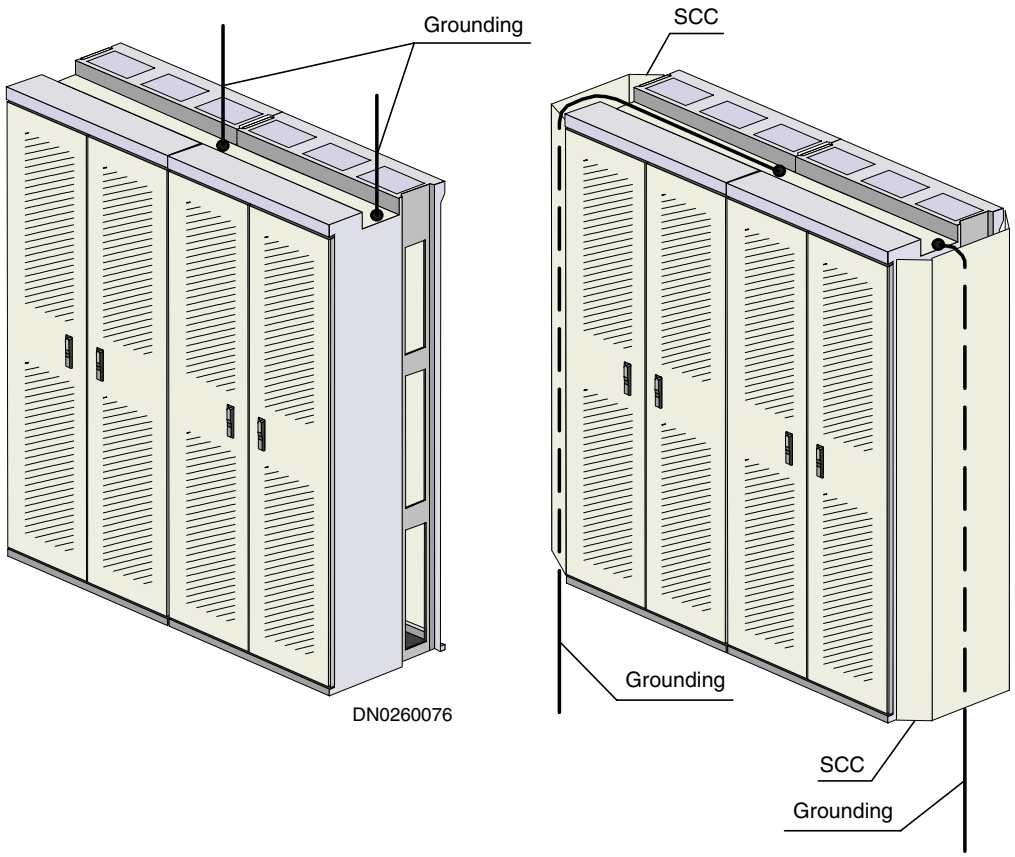


Figure 16. Grounding principle for two BSC3i network elements, front view.

Note

The network element BSC3i consists of one BSCC cabinet, which is an independent EMC entity, and therefore each cabinet is grounded separately.

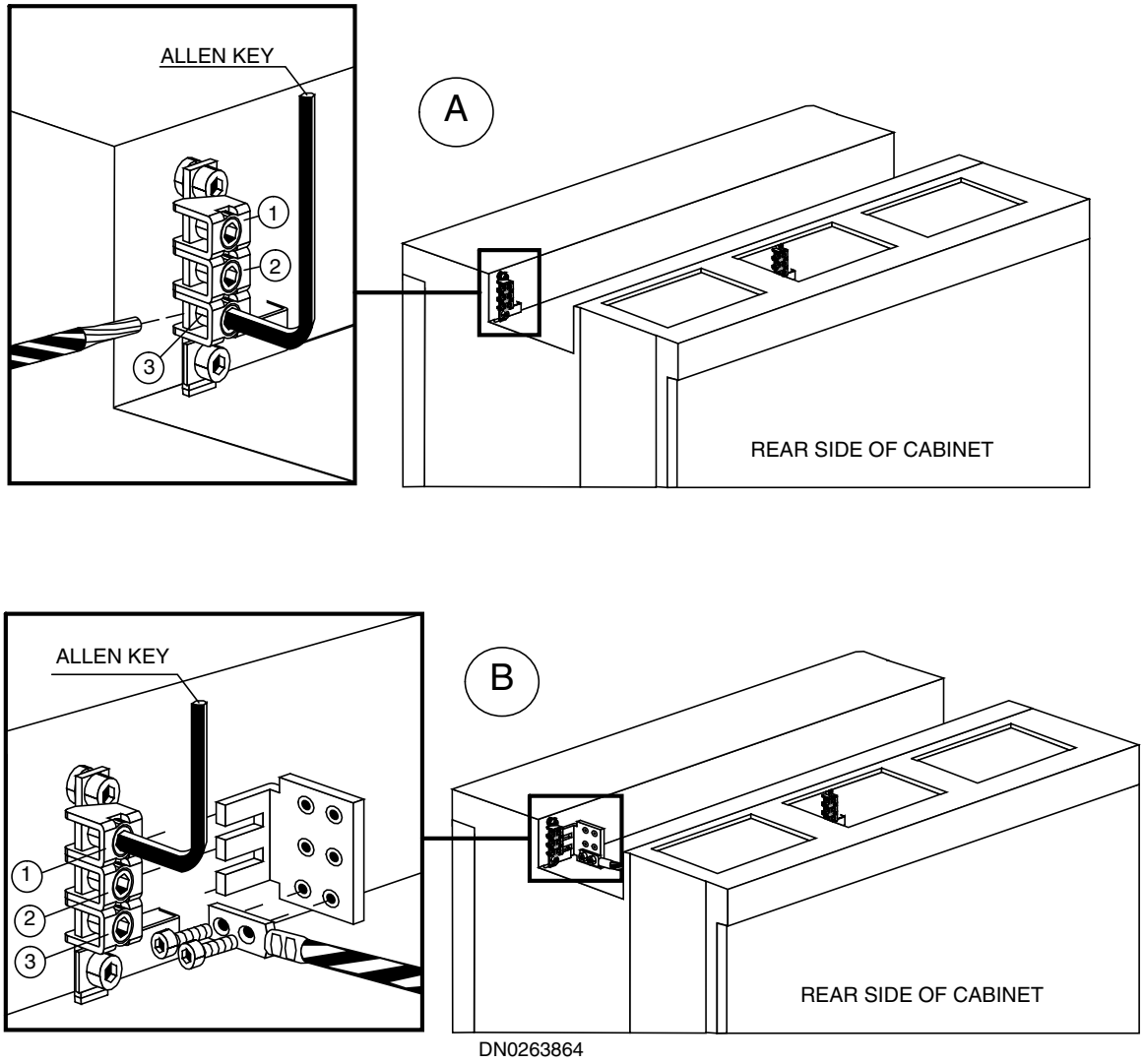


Figure 17. Connecting the grounding cable to the cabinet; (A) standard grounding (B) NEBS-compliant grounding.

Note

A NEBS-compliant grounding meets the following requirements:

- The grounding conductors shall be made of copper.
- Bare conductors shall be coated with anti-oxidant before being connected.

- Conductors of dissimilar metals shall not be intermixed.
- Unplated connectors, braided strap and bus bars shall be brought to a bright finish and coated with anti-oxidant before being connected.

9.1 Connecting the standard ground cable (A)

Steps

1. Install the main ground cable to the grounding connector.

   In the cabinet, the connector is located at the right-hand side end of the cable duct at the top of the cabinet (seen from the front). Loosen one of three allen screws (lowest is recommendable). Insert the cable to the slot. Secure the cable using an allen key.

2. Measure and cut a 25 mm^2 (AWG 4) cable which connects the network element to the main ground bar of the site (one cable per network element).

Note

In installations on a raised floor, the main ground cable is routed through the side cable conduit (SCC) onto the cable structures under the floor, and there on to the main ground bar of the site.

9.2 Connecting the ground cable with NEBS-compliant bracket (B)

Steps

1. Install the NEBS-compliant cable bracket (4) to the grounding connector

   In each cabinet, the connector is located at the right-hand side end of the cable duct at the top of the cabinet (seen from the front). Loosen all three allen screws. Insert the bracket into slots. Secure the bracket using an allen key.

2. Install the grounding lug (5), with a cable crimped to it, to the grounding bracket with two M6 hex socket screws.

3. Measure and cut a 25 mm^2 (AWG 4) cable which connects the network element to the main ground bar of the site (one cable per network element).

Note

In installations on a raised floor, the main ground cable is routed through the side cable conduit (SCC) onto the cable structures under the floor, and there on to the main ground bar of the site.

10 Connecting the station power supply in BSC3i

This section describes the external power supply cabling, that is, the cabling from the station power supply to the cabinet, and the Power Distribution Fuse Units (PDFU-A) inside the cabinet. The internal power supply cabling of the cabinet is discussed in section Installing the internal cables.

Before connecting the station power supply, the Earth comb panels (CPGO) must be installed in their places on top of the cabinet, on both sides of the Connector panel (CPRJ45), which is a factory installation. The BSCC (IC209-A) cabinet is equipped with the PSCG3-B connector group. The procedure and arrangement of power supply cables is presented below.

The cross section of the cables can vary from 16 mm^2 (AWG6) to 50 mm^2 (AWG1/0). The table below shows the maximum lengths for the cables in relation to their cross-sectional areas.

Table 10. Allowed cable lengths in relation to cross-sectional area.

Cross Sectional Area	Max. length
16 mm^2 (AWG 6)	15 m
25 mm^2 (AWG 4)	25 m
35 mm^2 (AWG 2)	35 m
50 mm^2 (AWG 1/0)	48 m

Note

The cables should meet the requirements of the UL 1459 standard and also the National Electrical Code ANSI/NFPA No.70.

10.1 Installing the CPGOs

The Earth comb panels (CPGO) is not installed at the factory. They are shipped separately and are therefore to be installed on the top of the BSCC cabinet at the site.

Steps

- Install the CPGOs

  Install the CPGOs in the holes on either side of the Connector panel (CPRJ45) with four allen screws as shown in the figure below.

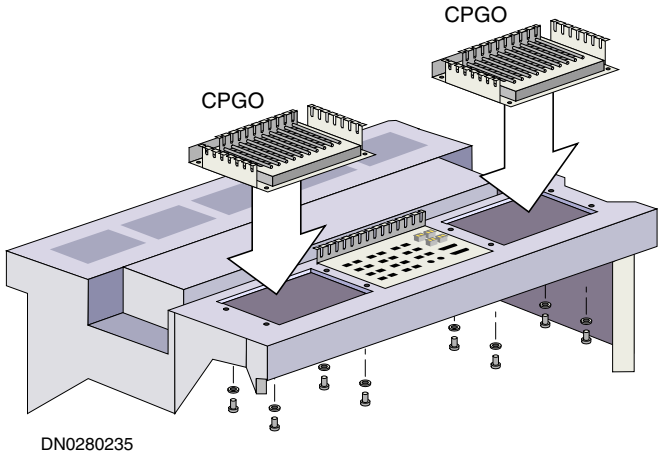


Figure 18. Installing the CPGOs

10.2 Connecting power supply cables on BSCC cabinet

For power feed from the station power supply equipment, two insulated, solid twin cables must be used for each cabinet.

(For further information on the power feed principles, please refer to the *Installation Site Requirements for BSC and TCSM2* manual.)

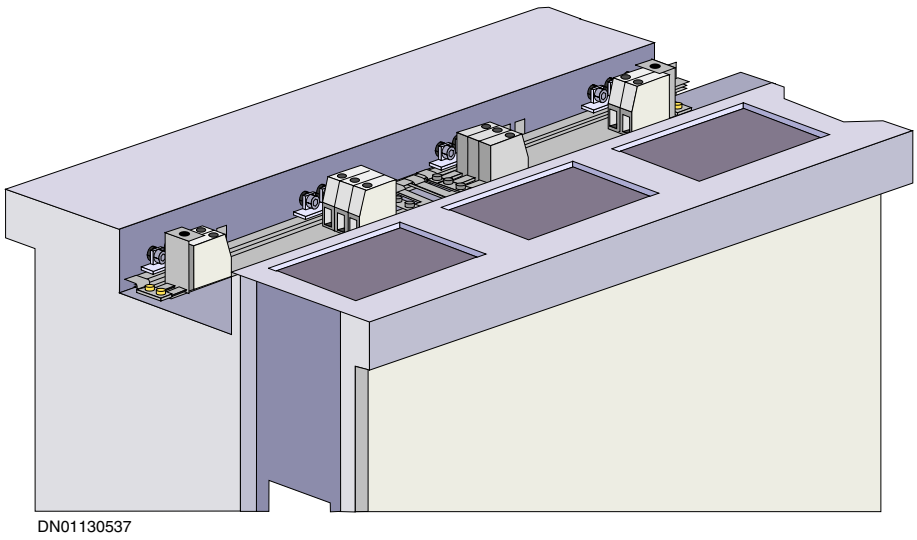


Figure 19. Power supply connector group (PSCG3-B) on top of the BSCC (IC209-A) cabinet.

Note

The CPGOs and the CPRJ45 are not shown in this figure.

The main supply cables from the rectifiers connect to the four power connector blocks (PSCG3-B) on the top structure of the cabinet. The connection procedure for the power supply cables is as follows:

Steps

- Connect the power supply cables coming from the station power supply to the screw connectors of PSCG3-B.

  Connect the (-UB) cables to screw connectors marked -UB 0 and -UB 1, and the (+UB) cables to screw connectors marked +UB as shown in the figures below.

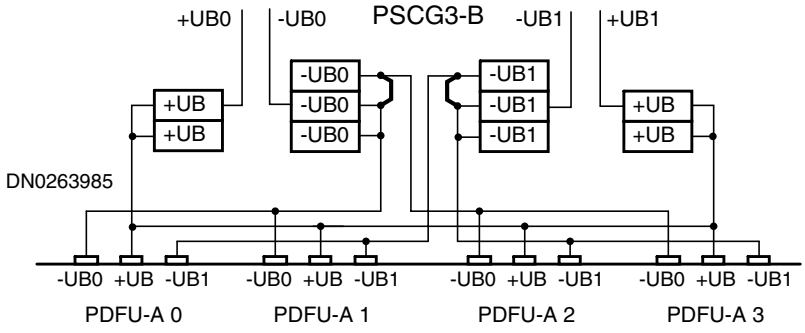
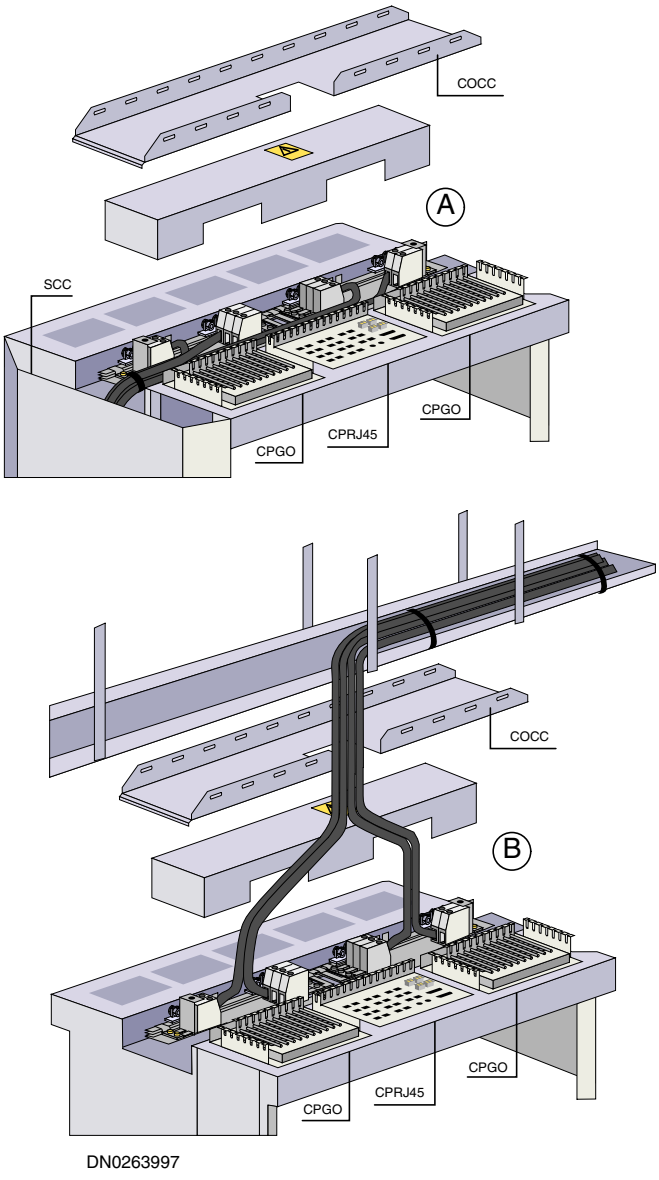


Figure 20. Connection diagram of the PSCG3-B



A= BSC3i with SCC (raised floor installation)

B= BSC3i without SCC

Figure 21. Connecting power supply cables

In the BSCC cabinets, check that the two jumpers of PSCG3-B have been removed at the factory, as shown in the figure below.

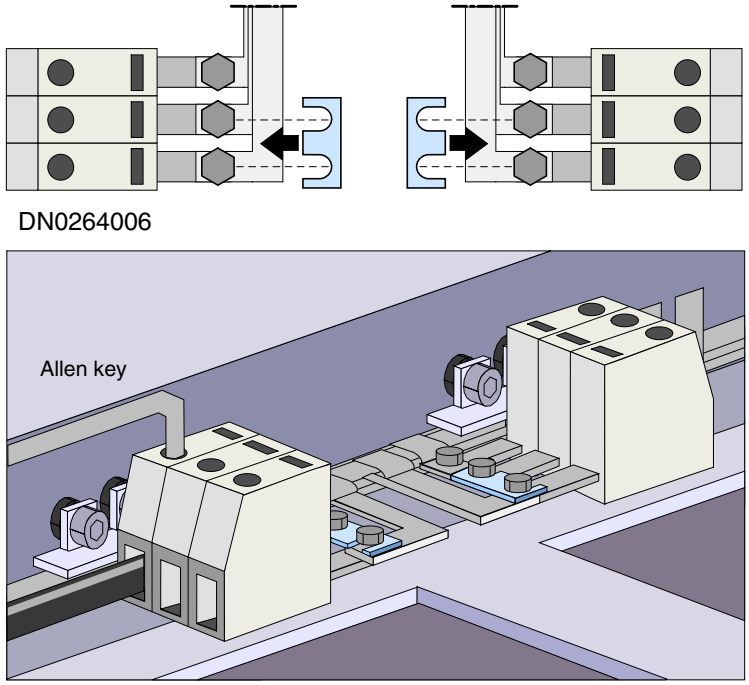


Figure 22. Jumpers of the PSCG3-B

For more information about connecting the cabinets to the station power supply, see section Power Supply in the *Installation Site Requirements for BSC and TCSM2*.

11 Attaching identification stickers and marking labels on BSC3i cabinet (BSCC)

Individual cabinets as well as other structures (for example, cables and cartridges) of the BSC3i network elements are provided with marking labels for easy identification. The cabinets also have warning labels in parts of the structures you should handle with caution, for example because of sharp edges in the structures or electrostatic sensitive circuitry in components.

This section describes how to attach those stickers and marking labels which have to be attached on the cabinets or filled in at the installation site. For information on the labels attached at the factory, please refer to Parts of the construction mounted at the factory.

As a general rule, the labels are attached at the factory. However, some labels may have to be attached at the installation site, depending on the delivery. These labels are delivered in separate bags. They are listed below and their positions are shown in the figures below.

- The network element identification stickers (number 1 in the figure; added already at the factory for cabinets of first deliveries).
- The cabinet identification and positioning stickers (number 2 in the figure).

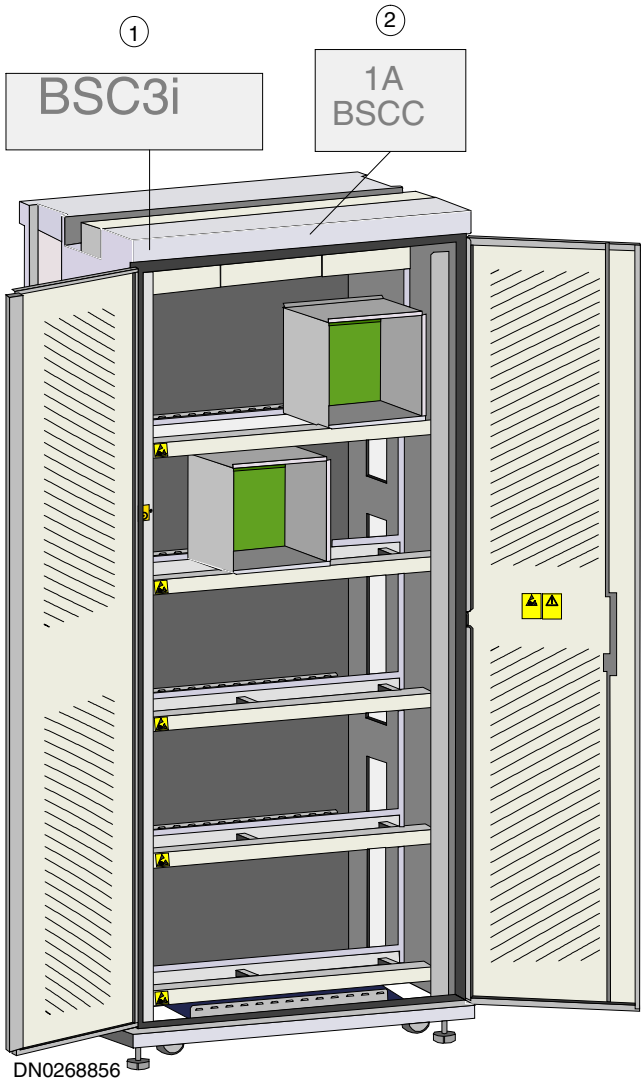


Figure 23. Labels to be added at the site (in first deliveries, label 1 is attached at the factory).

11.1 Attaching the cabinet identification and positioning labels

The marking labels of the cabinets for the network element concerned are attached using a transfer foil. The sticker text is between a transfer foil and a base paper. The transfer foil helps to guide the text into the correct position on the door, and no other accessories are needed.

Steps

1. Clean the surface where the sticker is to be attached with spirits and let it dry.
2. Press the label against a hard, smooth surface so that the text is attached firmly to the transfer foil.
3. Detach the base paper from the sticker and transfer foil.
4. Place the transfer foil levelly in the position indicated by the figure above, starting from the right-hand edge.
5. Press the text firmly.
6. Remove the transfer foil by pulling it off at a 180° angle to the surface.
7. Remove any air bubbles from under the sticker by smooth rubbing motions.

   The text will be permanently attached within 24 hours.

11.2 Filling in labels at the installation site

Each cartridge in the exchange is provided with a marking label indicating e.g. the name of the cartridge or the functional unit it houses and the names of the plug-in units installed in the cartridge. Some of these labels may have to be filled in at the installation site. Examples of these labels are shown in the figure below.

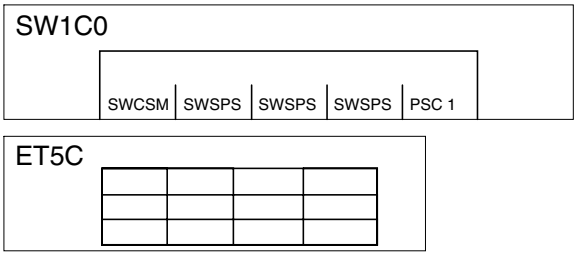


Figure 24. Identification labels mounted at the top of the ET5C and SW1C0 cartridges (example).

Steps

- Fill in the necessary information

12 Installing the internal cables

The internal or intracabinet cables of the BSC3i network element connect the functional units of the network element to one another or the functional units to the cabling panel CPRJ45 at the top of the cabinet. The internal cables are installed in the cabinets at the factory.

The actual cabling information of the BSC3i network element is presented in the network element-specific *Cabling Lists* delivered in the *BSC3i Site Documents* binder.

This section gives information on

- 12.1how to read the cabling lists
- 12.2power supply devices in the cabinet.

12.1 How to read the cabling lists

Cabling lists for the internal cables

Intracabinet Cables, BSC3i for the internal cables contains the following columns:

Equipping No.	CABLE FROM		CABLE TO				
	FU	Position	FU	Position	Type	Use	Note
BSCC_093	CLOC	1.6B 01R7	OMU	2.6B 07.2P	CHA014	SBUS	

Equipping No. column gives the sequential number of the cable and the name of the cabinet, under which the cable is listed. In the cable lists, each cable is listed only once, under one of the cabinets it connects to.

The two *FU* columns give the names of the functional units housed in the cartridges where the ends of the cable connect to, for example CLOC and OMU.

The two *Position* columns give the identification for the connectors in the cartridges where the ends of the cable connect to. The marking system is slightly different for the PCI and non-PCI cartridges. For a cable connector connecting to a PCI cartridge, the code is of the type "5.8B 01.2A", where:

- the first number (5) indicates the destination cartridge shelf for the cable
- the second number (8) indicates the cartridge the cable connects to
- the letter after the second number (B or F) shows whether the cable connects to the front (F) or rear (B) side of the cartridge. The front side connectors are on the front panels of the plug-in units and the back side connectors are on the motherboards of the cartridges
- the two numbers after the letter (01) indicate the placement of the connector where the cable connects to
- the last two characters (2A); a number (1 or 2) and a letter (A to X) indicate the point in the connector where the cable connects to.

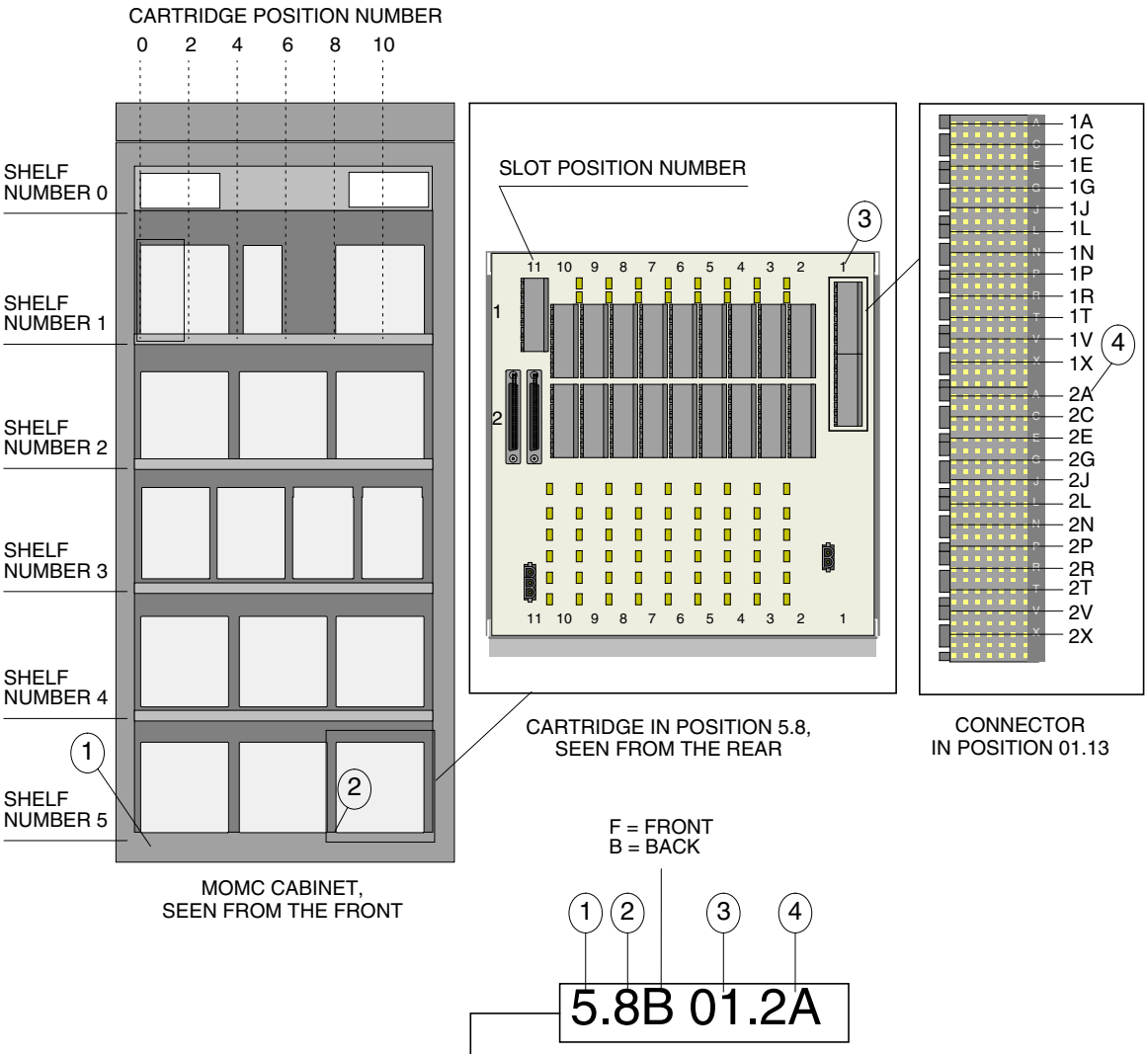
For a cable connector connecting to a non-PCI cartridge, the four last characters in the code are different; otherwise the code is similar. It is of the type "1.0B 02S7", where the four last characters read:

- the placement of the connector where the cable connects to is indicated by two numbers and a letter (02S)
- the point in the connector where the cable connects to is indicated by the last number (7).

Type column gives the type and the length of the cable (in decimeters, or if marked c, in centimeters), for example "CHA010" (a cable of CHA type, with a length of 100 cm).

Use column gives the type of the signal carried by cable, for example PCM.

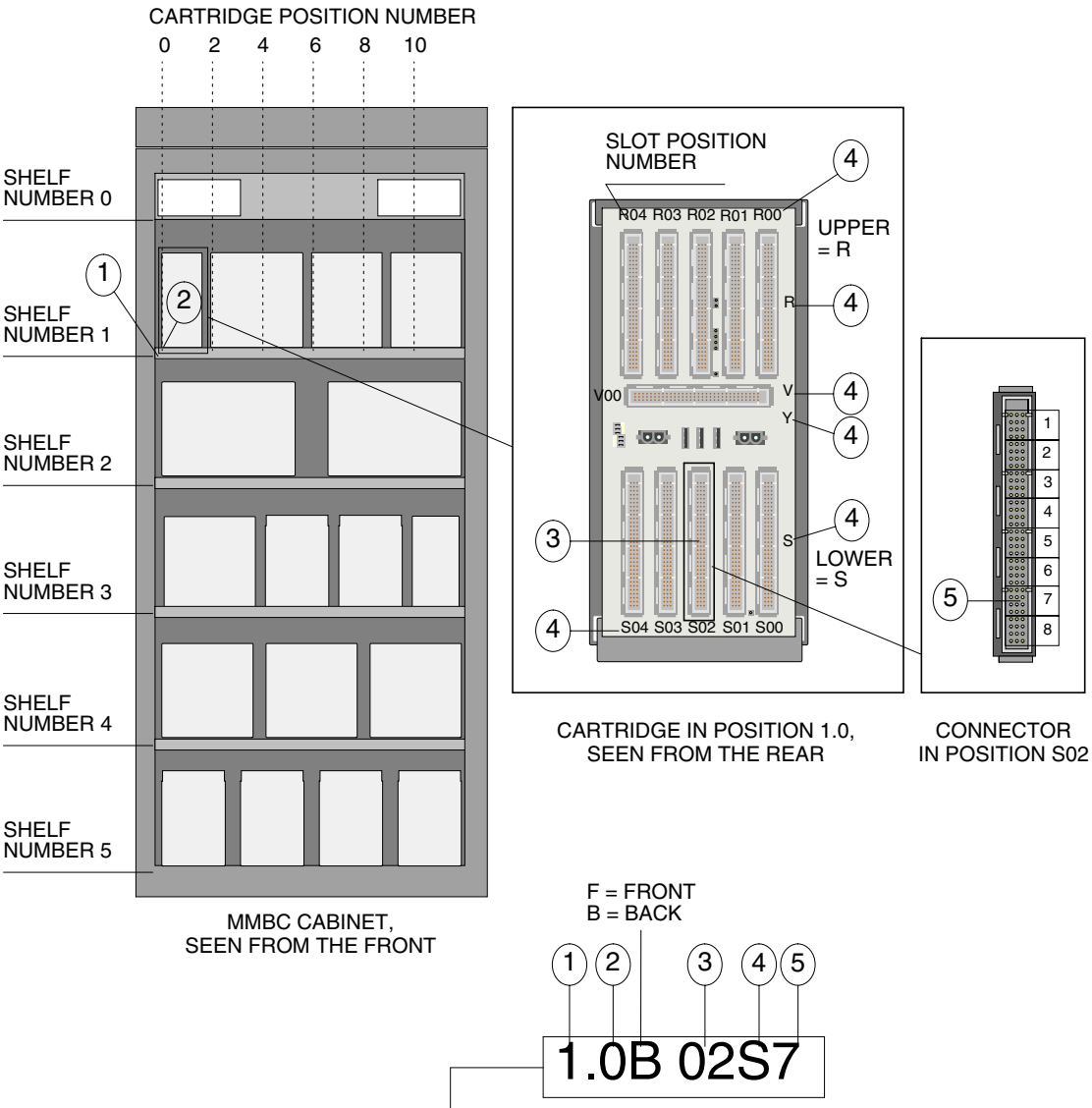
Note column gives the reference to a note at the end of the table.



DN98618525

Equipping	CABLE FROM			CABLE TO			
No.	FU	Connector	Cabinet	FU	Connector	Type	Usage
MOMC 0_151	BDCU 0	5.8B 01.2A	GSWC 0	GSW 0-0	1.0B 01R3	CHA062	PCM
MOMC 0_152	BDCU 0	5.8B 01.2N	GSWC 1	GSW 1-0	1.0B 01R3	CHA071	PCM

Figure 25. Information contained by the cabling lists (PCI cartridge), example.



DN98618537

No	Cabinet	FU	Connector	Cabinet	FU	Connector	Type	Use
MMBC_110	MMBC	CLBU	1.0B 02S7	MMBC	ET4C XX	3.10B 04S1	CFB015	AL/CLK
MMBC_111	MMBC	CLBU	1.0B 03S5	MMBC	ET4C XX	2.7B 16S3	CFB012	AL/CLK
MMBC_112	MMBC	CLBU	1.0B 02S5	MMBC	ET4C XX	2.0B 16S3	CFB016	AL/CLK

Figure 26. Information contained by the cabling lists (non-PCI cartridge), example.

Cable identification label

At both ends, each Intracabinet cable has a sticker which indicates one of the cabinets where the cable connects to and its sequential number. Each cable is also provided with a marking slip which indicates the type and function of the cable (for details, see the following figure).

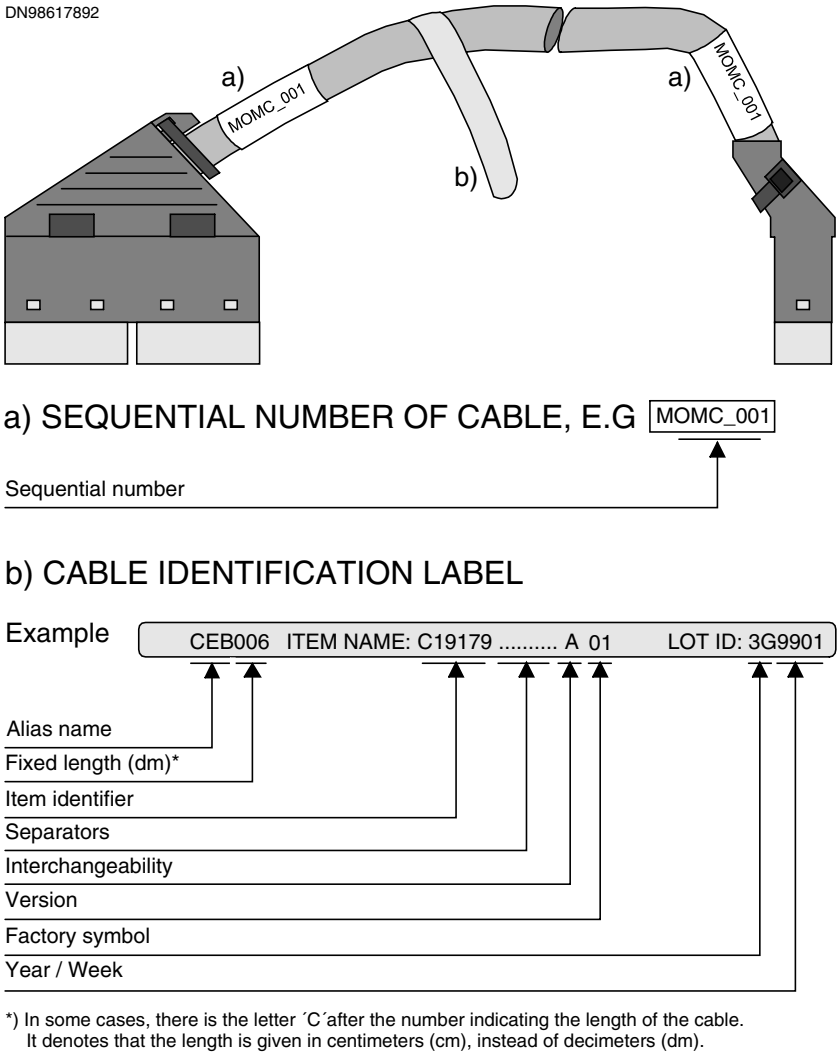


Figure 27. Information contained by the labels attached to the cables, example.

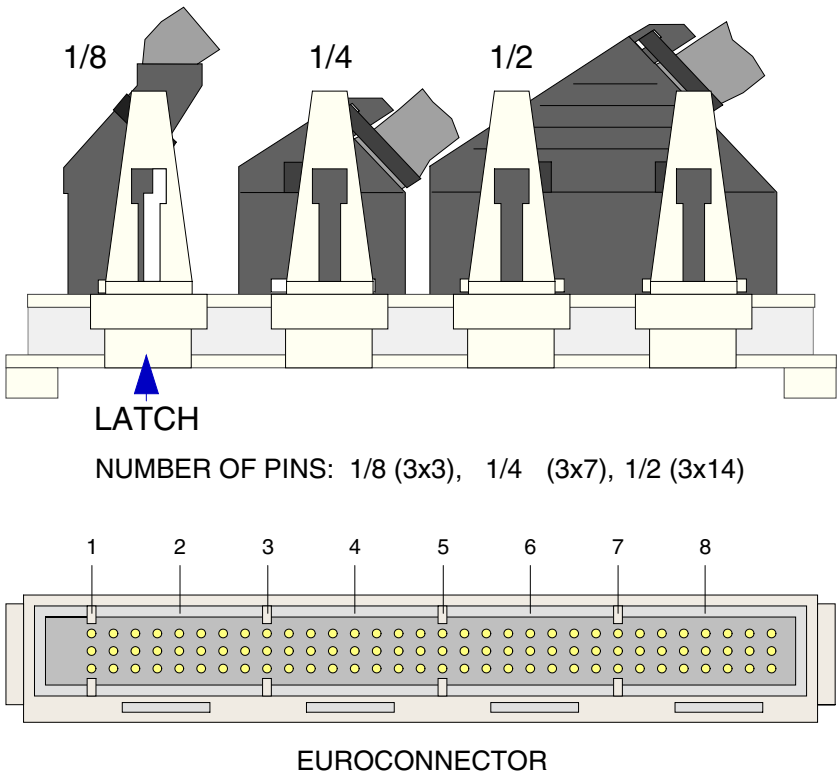


Figure 28. Equipping of the Euroconnector with 1/8, 1/4 and 1/2 connectors.

For more information on power supply devices in the cabinet, see the next section.

12.2 Power supply devices in the cabinet

The power distribution diagram is presented in the Engineering for BSC3i.

Each BSCC cabinet (IC209-A) of the BSC3i network element contains four Power Distribution and Fuse Units (PDFU-A).

The PDFU-As distribute power via eight fuses (F0 to F7) to the cartridges in the cabinet. The cartridges are cabled to to connectors (P0 to P7).

The actual power cabling of the BSC3i network element is presented in the network element-specific *Intracabinet Cables, BSC3i*.

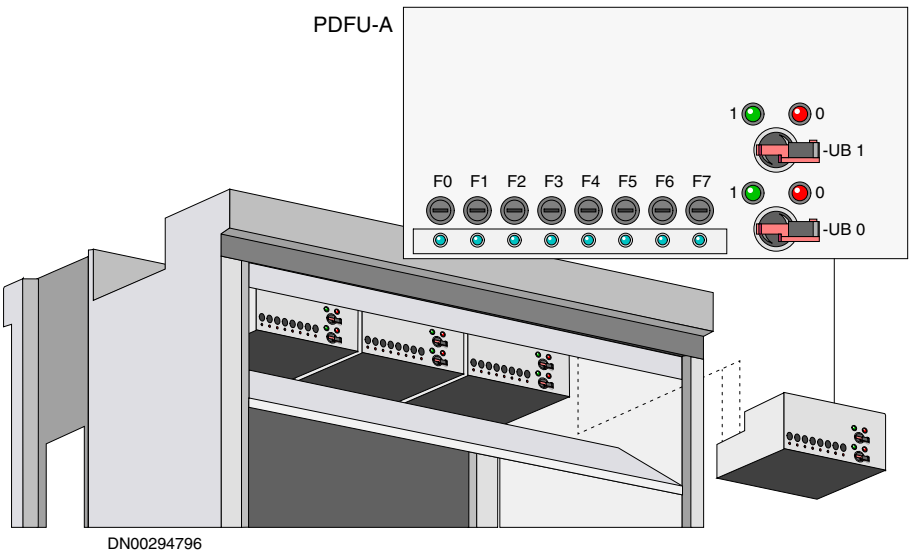


Figure 29. Front view of the PDFU-A.

13 Installing and replacing Fan Trays in BSC3i

The IC209-A cabinet contains four Fan Trays (FTRB) for forced cooling. These are located in special slots contained in shelves 2 and 4.

13.1 Installing a Fan Tray (FTRB)

Steps

1. Insert the FTRB into the shelf

   Slide the locks on the front of the FTRB towards each other and push the Fan Tray gently into its shelf (positions 2 and 4) until it clicks into place.

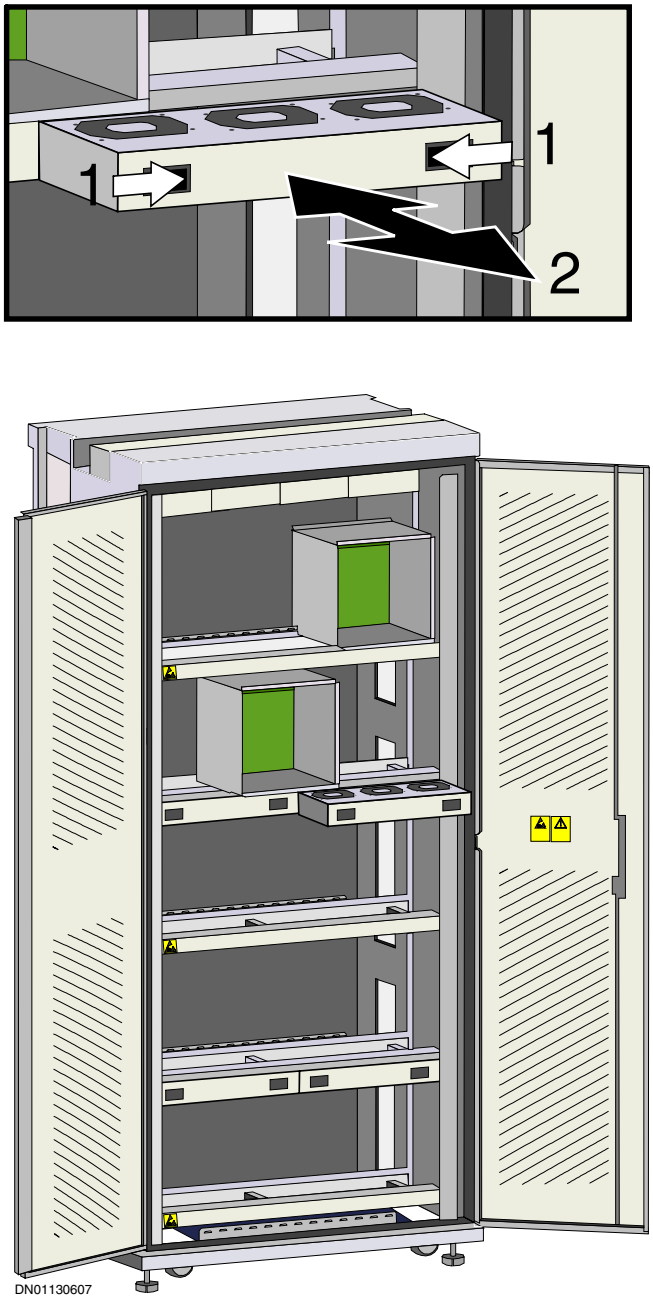


Figure 30. Inserting and removing FTRB

2. Connect cables into the FTRB

Connect the power cable from connector P7 in the corresponding PDFU-A to the back connector of the FTRB. See *Intracabinet Cables, BSC3i* for specific cabling information.

Connect Alarm cabling from CLOC-B to the back connector of the FTRB. See *Intracabinet Cables, BSC3i* for specific cabling information.

Connect grounding cable from the shelf to the FTRB.

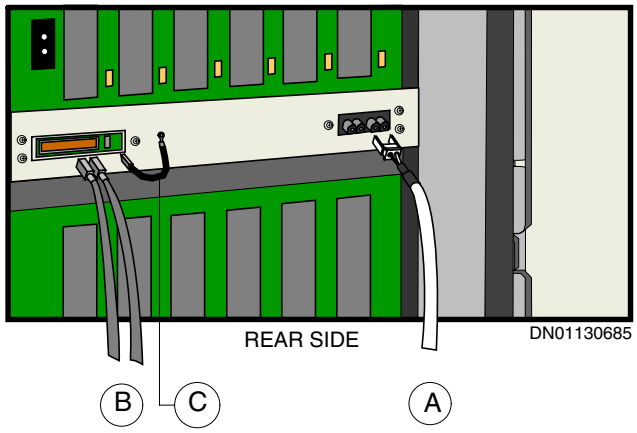


Figure 31. Rear connectors of FTRB.

Further information

If you need to remove the Fan Tray, see the instructions below.

13.2 Removing a Fan Tray

Steps

1. Remove cables from the FTRB

   Disconnect the power, alarm and grounding cables from the back connectors of the FTRB.

   See 31Rear connectors of FTRB above.

2. Remove the FTRB from its shelf

   Slide the locks on the front of the FTRB towards each other, and pull the FTRB out of its shelf.

   See 30Inserting and removing FTRB above.

14 Creating a temporary ESD protected area (EPA) for fieldwork

It is strongly recommended that the entire installation site be constructed according to EPA rules.

Handling electrostatic sensitive devices (ESDS) such as plug-in units outside the EPA is possible provided the following rules are adhered to.

The figure below and sections14.1 EPA working practices and 14.2Handling electrostatic sensitive devices (ESDs) give more detailed information.

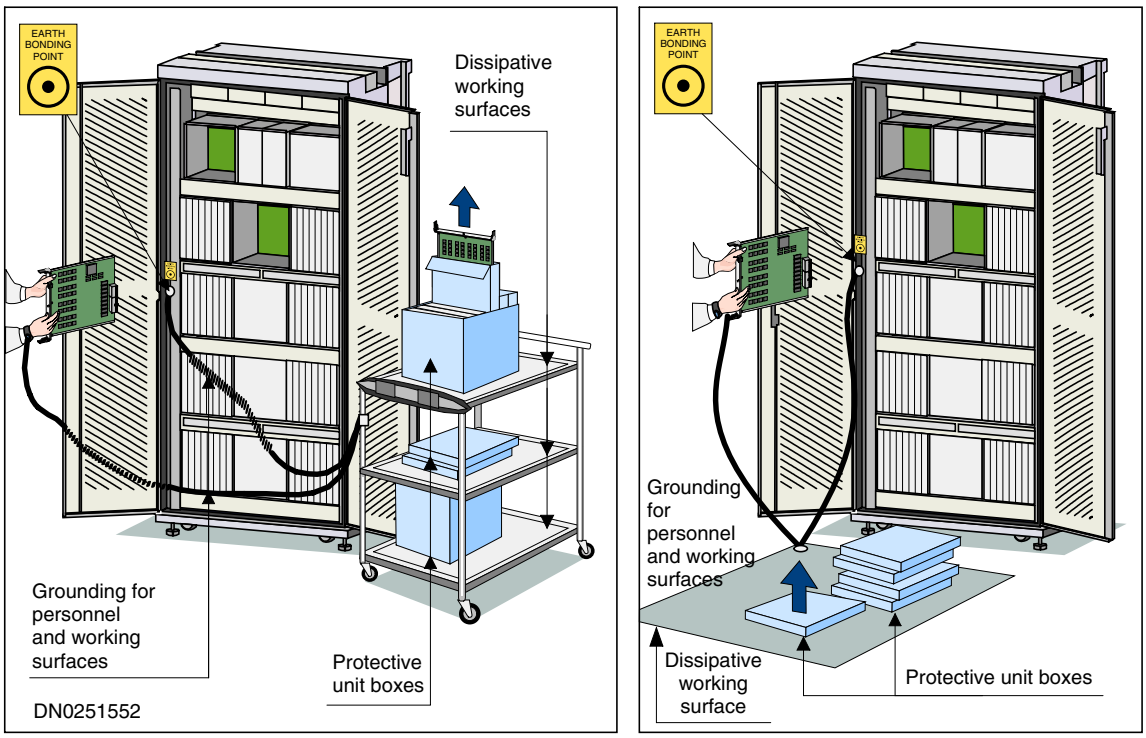


Figure 32. The proper handling of electrostatic sensitive devices during fieldwork

14.1 EPA working practices

Personal protective measures

Eating, drinking, smoking, changing clothes and using greasy hand creams is prohibited in the EPA. Long hair must be covered or tied so that it will not cause an ESD risk. Personnel carrying out the work must ensure that they are using dissipative or low-charging materials.

Garments

No one should move in the EPA without protective clothing. Jackets are to be kept buttoned and sleeves and/or collar must have skin contact, unless grounding is achieved through a separate grounding connector. Visitors must be provided with dissipative jackets and footwear or ground straps for their own footwear.

Footwear and ESD wrist straps

Dissipative footwear should be worn in areas with dissipative floor coating. There is no need for a wrist strap if the person's primary grounding can be achieved through the combination of floor and footwear (and/or seating). However, a wrist strap is always necessary in the handling of ultra-sensitive ESDS (damage threshold less than 100 V).

14.2 Handling electrostatic sensitive devices (ESDs)

ESDS are stored and transported from one work stage to another in dissipative, shielding or conductive packages. The components are kept in their original packages as long as possible. The packages can only be opened within an EPA. At working locations, discrete components are to be stored in conductive boxes or IC tubes.

When handling plug-in units, it is important not to touch the components, soldering pads or connector pins. The unit should be held only from the front panel or from the sides of the plug-in unit. Stacking the units is forbidden.

ESDS found to be faulty must be handled in the same way as other ESDS, so that an appropriate defect analysis can be carried out.

Shielding packages must be used for all ESDS moved outside the EPA.

15 Equipping the cartridges with plug-in units in BSC3i

This section describes the installation procedure for the plug-in units. It consists of the following phases:

- It is strongly recommended that the entire site be an ESD protected area (EPA). If this is not the case, create a temporary EPA according to the rules given in section *Creating a temporary ESD protected area (EPA) for fielwork*.
- preliminary checks of the units and the power supply lines to the cabinets
- fitting of the Magneto-Optical Disk and Hard Disks with installation adapters
- installation of the plug-in units in the cartridges.

This section provides information on preliminary checks before the installation, fitting the Storage Device plug-in units with installation adapters, and installing the plug-in units in the cartridges.

15.1 Preliminary checks before the installation

Prior to plug-in unit installation, check that the power supply lines to the PDFU-As in each cabinet have the correct voltages. Check also the following details in the plug-in units and cartridges, to ensure that their settings match the system level required, and that they are correct for the application they will be installed in:

- PROM versions of the plug-in units
- interchangeability codes of the plug-in units
- jumper connectors on the plug-in units
- jumper and wiring connectors on the cartridges (only in connection with system expansions).

The instructions for performing these steps are given in the sections below.

Steps

1. Check the power inputs to the cabinets

   Measure the input voltages to the PDFU-As and check that they are within the appropriate voltage range. Check also that the supply lines have correct polarities. Turn on the power switches in all the PDFU-As after you have found the values for each supply line correct.

2. Check the PROM versions of the plug-in units

   Check that the plug-in units of the types listed below have the correct PROM names and versions. The locations of the PROMs in the units are shown in the appropriate document in the *Release Binder*.

   - AC25-A
   - CL3TG
   - ET2E-S, ET2E-SC, ET2A
   - SWCOP-A.

3. Check the interchangeability codes of the plug-in units

   Check against the *Hardware Revisions List* that all plug-in units have the correct interchangeability codes. In the plug-in units, the interchangeability codes are shown in the identification stickers, which also contain barcodes for electronic registration, as well as the names and versions of the units for identification. Register the barcodes in the units at the same time, if possible; this will ease up the registration work later on. The placement of and the information contained by the identification stickers are shown in the figure below.

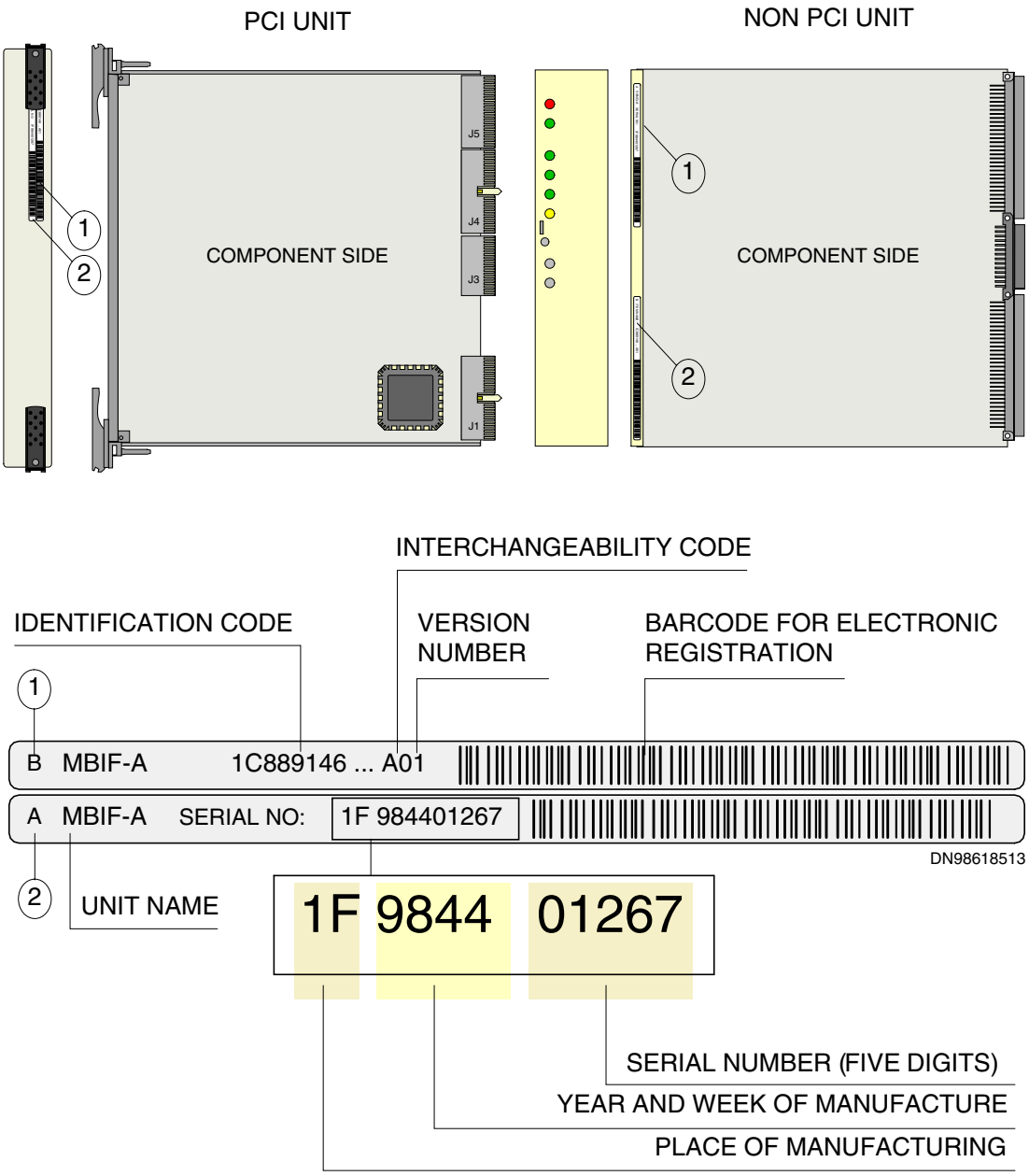


Figure 33. Positions of the plug-in unit identification labels and the information contained by them, example.

4. Check the jumper settings and wirings

The BSC3i network elements are delivered from the factory with correct hardware settings made. The settings must be checked at the site only when system expansions are made, either at the installation or commissioning phase.

Check the jumper connectors on plug-in units The jumper settings of the plug-in units are described in *Jumper Settings of the Plug-in Units*, which is delivered in the *Documentation Set* and *Site Documents* binder. The jumper settings of the plug-in units can also be found in the *Plug-in Unit Description* of the unit concerned.

Check the jumper and wiring connectors on cartridges The jumper settings of the cartridges are described in *Jumper Settings of the Cartridges* , and the required wiring connectors and their positions in the *Equipment List*. Both documents are delivered in the *Site Documents* binder. The wiring connector types and their functions are listed in the table below. They are illustrated in the two figures that follow.

Table 11. Wiring connector types for the BSC3i network elements.

Connector	Number in Figure	Type	Use
CSADR0/1/2	1	4-row Hard Metric	CG signal selection
PCMCxA	2	25-row Hard Metric	PCM cross connector
MBADRxx	1	4-row Hard Metric	Message bus address
SCSIT-A/-V	5	68-pin connector	SCSI bus terminator
TRM9B	4	25–row Hard Metric	Message bus terminator
SBCON1A	3	25-row Hard Metric	SWCOP connector

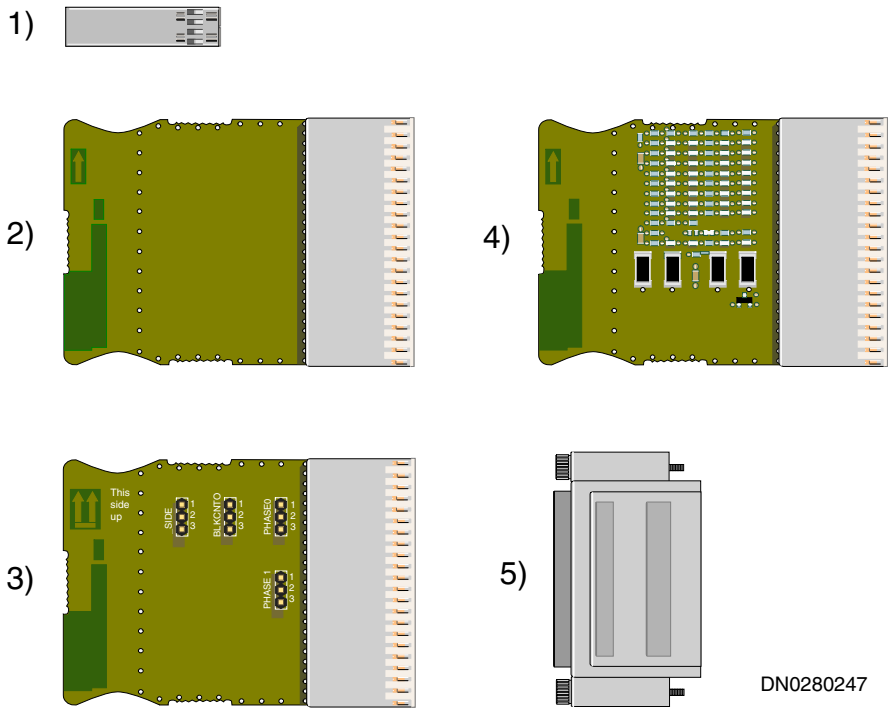


Figure 34. Wiring connector types for the BSC3i

15.2 Fitting the Storage Device plug-in units with installation adapters

In the BSC3i, the Magneto-Optical Disk Drive and Hard Disk Drives are installed in the CM2C-C cartridge (Computer and Mass memory Cartridge). The two storage device plug-in units are installed using installation adapters (ODPU-A for Magneto-Optical Disk and HDPU-A for Hard Disk) before mounting them to the cartridge.

15.2.1 Mounting the WDU (Hard Disk drive with HPDU-A)

Before connecting the Hard (Winchester) Disk Unit (WDU) to the CM2C-C cartridge, connect the Hard Disk Drive (WDW18-S / WDW36) first to the Hard Disk Plug-in Unit (HDPU-A) according to the following instructions:

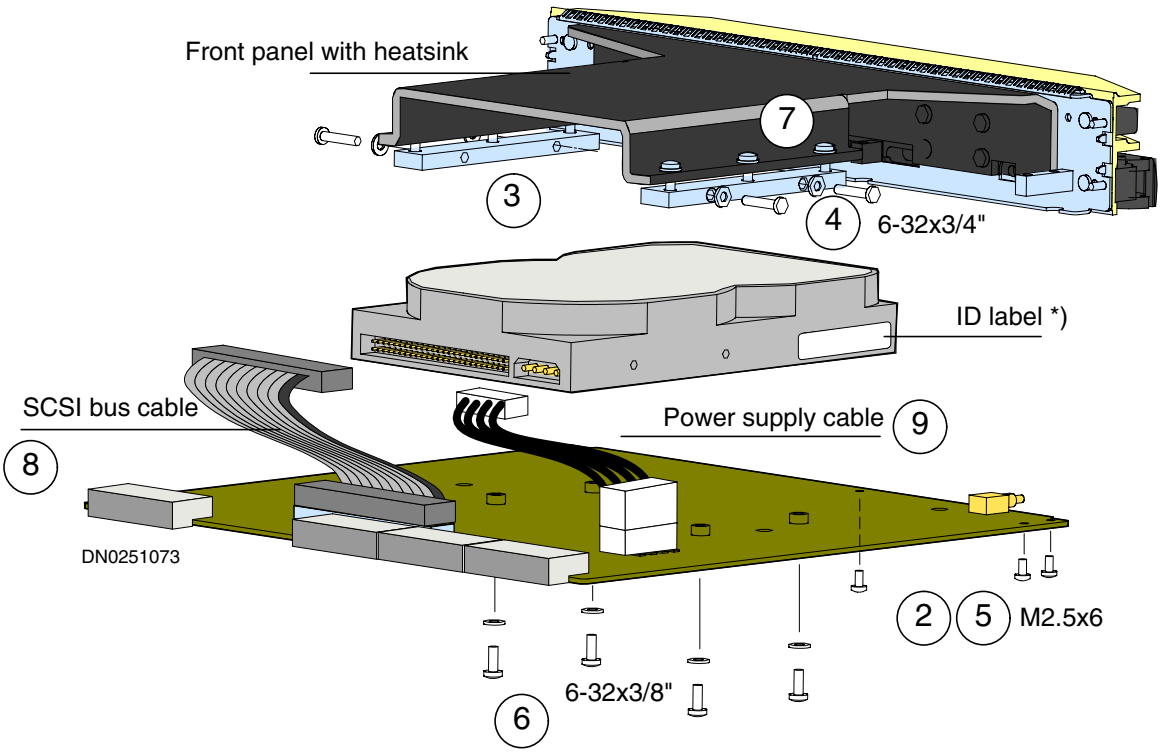


Figure 35. Installing the WDU (Hard Disk Drive and HDPU-A)

Steps

1. Check that the jumper settings in the Hard Disk drive (WDW18-S, WDW36) are correct

   Check the jumpers according to the *Jumper Settings of the plug-in units* where the product name is used.

2. Detach the front panel of HDPU-A from the circuit board by removing the five screws (M2.5x6).

3. Check that an elastomer sheet has been attached to the bottom of the front panel's heatsink at the factory.

4. Attach the Hard Disk drive to the front panel's heatsink through the side plates using four screws.

The four screws (6-32x3/4") and four washers (A4) are included in the delivery.

5. Reattach the front panel to the HDPU-A circuit board with the five screws (M2.5x6).

6. Fasten the Hard Disk drive to the circuit board of the HDPU-A using the four screws and washers provided.

   The four screws (6-32x3/8" and four washers (A4) are included in the delivery.

7. Tighten the six screws on the front panel's heatsink in order to secure the Hard Disk drive firmly in its place.

8. Connect the SCSI bus cable to the Hard Disk drive.

9. Connect the power supply cable to the Hard Disk drive.

10. Insert the HDPU-A into the proper unit slot in the cartridge.

    See the *Equipment lists* delivered in the *Site Documents* binder for the proper installation position.

15.2.2 Mounting the FDU (Magneto Optical Disk drive with ODPU-A)

Before connecting the Magneto Optical Disk Drive Unit (FDU) to the CM2C-C cartridge, connect the Magneto Optical Disk Drive (MO91) first to the Optical Device Plug-in Unit (ODPU-A) according to the following instructions:

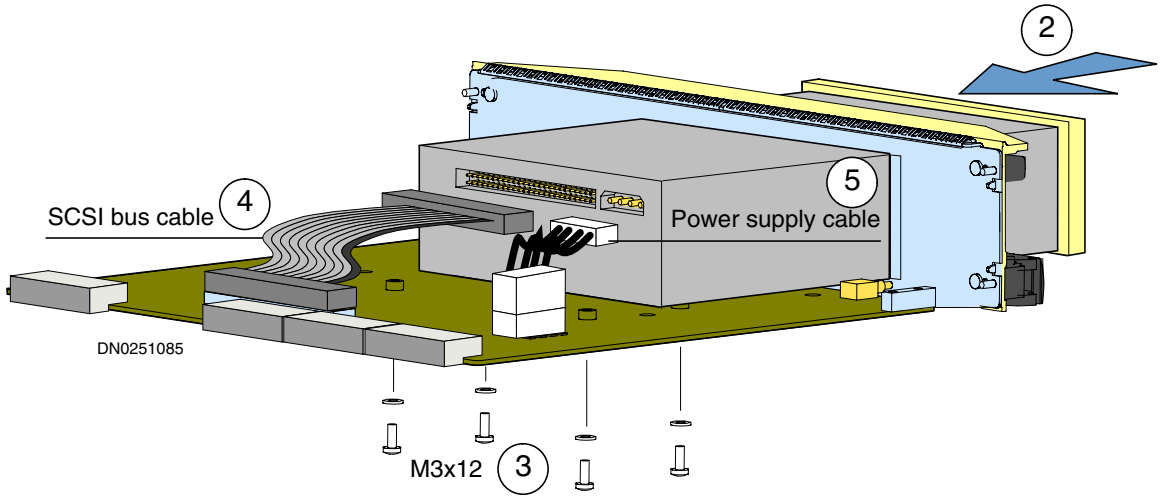


Figure 36. Installing the FDU (Magneto Optical Disk Drive and ODPU-A)

Steps

1. Check that the jumper and optional switch settings in the Magneto Optical Disk Drive MO91 are correct.

   Check the jumper and optional switch settings according to the Jumper Settings of the Plug-in Units.

2. Insert the MO91 into the ODPU-A.

3. Fasten the MO91 to the ODPU-A using the four (M3x12) screws and washers (A3) provided.

4. Install the SCSI bus cable (A) so that the colour stripe on the cable are connected to pin 1 in the bus connector (J6).

5. Install the power supply cable (B).

6. Insert the ODPU-A into the proper unit slot in the cartridge.

   See the *Equipment lists* delivered in the *Site Documents* binder for the proper installation position.

15.2.3 Mounting procedure for other units

Steps

1. Install the power supply unit (PSC6-A) in slot 1 and secure it with the front panel screws.

   When installing the power supply plug-in units, ensure that the power switch is in the position "OFF". For instructions, see Installing the plug-in units in the cartridges

2. Install the other plug-in units in the cartridge.

   For instructions, see Installing the plug-in units in the cartridges

15.3 Installing the plug-in units in the cartridges

The installation positions for the plug-in units are given in the *Equipment Lists* delivered in the *Site Documents* binder. For instructions on how to read the Equipment List, BSC3i, refer to the following sections.

Caution

All plug-in units and especially the cPCI plug-in units are very sensitive to rough treatment. Handle the units with care at all installation phases.

Caution

Electrostatic discharge and incorrect installation and uninstallation can damage circuits or shorten their lifetime. To ensure proper functioning of the plug-in units during their usual lifetime, take the following precautions before handling them.

- Before touching integrated circuits, ensure that you are working in an electrostatic free environment. Wear an ESD wrist strap or use another corresponding method to discharge static electricity from your body.
- Ensure that each plug-in unit is only used in a subrack and slot designed for it. Placement of a unit in a wrong slot may cause damage to the unit after power-up.
- In case of a power supply or other malfunction in the unit, refer to the *Plug-in Unit Description* of the unit concerned.
- Before installing the Power Supply plug-in units (PSCx-x), ensure that the power switch is in the "OFF" position. Leaving the switch to the "ON" position may result in damage to the equipment.

Install the plug-in units in the appropriate positions in the cartridges following the steps below. During the installation, wear an ESD wrist strap. When installing the PCI plug-in units, use the handles on the unit's front panel.

Note

If all slots are not equipped in a cartridge, a front panel with shim plate (SHIM4T) is installed in the empty slots; if all CC3C-A cartidges housing the BCSU functional unit are not equipped, a coverplate (COP48T) is installed instead.

Steps

1. Bring the plug-in units in their packages close to the cabinets and place them on an ESD-protected surface.

2. Connect your ESD wrist strap to the earth bonding point in the cabinet you are working on.

3. If the cartridge has a separate power supply unit (PSCx-x), install it first:

    1. Push the power supply plug-in unit gently all the way to its proper position in the cartridge. Ensure that the power switch is in “OFF” position.

    2. Check the power connections to the cartridge by turning the power switch to “ON” position.

        If the green light on the unit's front panel is lit, the connections work properly. If the red light is lit, the connections work but the unit or the motherboard of the cartridge is faulty. If no light is lit, there is no power input to the cartridge. In that case, turn the switch to “OFF” position, check the appropriate fuse in the PDFU unit and the power cabling inside the cabinet, and try again.

    3. Once you have finished with checking the connections, turn the switch back to “OFF” position.

4. Install the other plug-in units in the cartridge, but leave them unconnected, with their connectors c. 1 cm (0.5 in) away from the connectors of the cartridge.

5. Repeat the steps above to all plug-in units in the exchange.

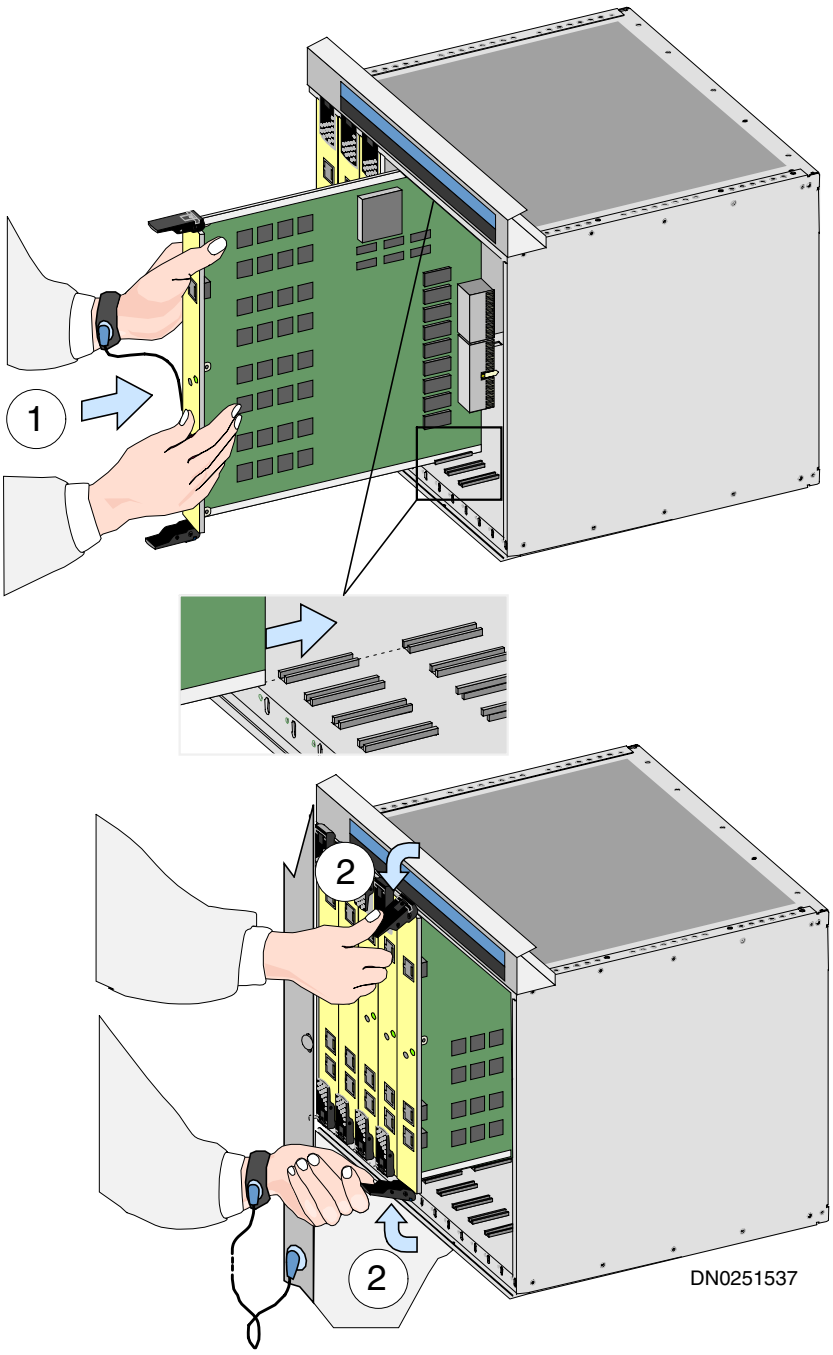


Figure 37. Installing a plug-in unit.

How to read the equipment lists

The *Equipment Lists* for the network elements contain the following columns listed below and shown in the figure below.

Position	ID	Name	FU	Use	Note

The information in the *Position* column is in the form, for example "5.8 F06", where

- the first number (5) indicates the shelve where the destination cartridge of the plug-in unit is located.
- the second number (8) indicates the horizontal co-ordinate of the destination cartridge on the shelf. The co-ordinate is always an even number between and including 0 and 10.
- the three last characters (F06) indicate the slot in the cartridge where the plug-in unit is installed in. The slots are marked with two numbers in an increasing order, starting from 01 or 00.

Column *Identification (ID)* shows the identification code of the cabinet, cartridge, plug-in unit or accessory.

Column *Name* shows the abbreviated name of the HW product for the identification code in the previous column.

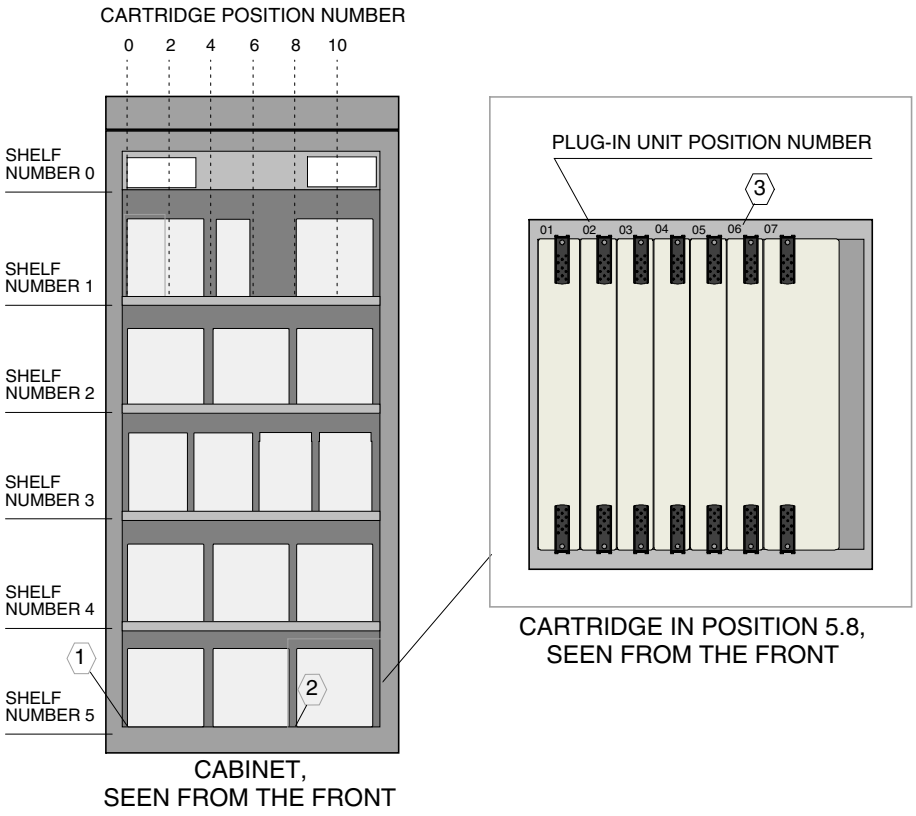
Column *FU (Functional Unit)* shows the name and index number of the Functional Unit equipped into the cartridge in this particular position.

Column *Use* gives additional information concerning the use of functional units or individual products installed.

Column *Notes* includes additional information, for example, the positioning of the terminators required.

Note

The *Equipment List* always describes the maximal Functional Unit configuration of a network element and plug-in unit configuration of a cartridge.



F = FRONT B = BACK DN98618501

1	Position	ID	Name	FU	Use	Note
5.8		C8938	CC3C-A	BDCU 0		
2						
	F01	C8953	PSC6-A		Power Supply	
	F02					
	F03	C8944 / C8951	AC25-A / AS7-A		X.25 Interface; or G.703 Interface	
	F04	C8944 / C8951	AC25-A / AS7-A		X.25 Interface; or G.703 Interface	
	F05	C8944 / C8951	AC25-A / AS7-A		X.25 Interface; or G.703 Interface	
	F06 3	C8944 / C8951	AC25-A / AS7-A		X.25 Interface; or G.703 Interface	
	F07	C8944 / C8951	AC25-A / AS7-A		X.25 Interface; or G.703 Interface	

Figure 38. Installing plug-in units according to an equipment list, example.

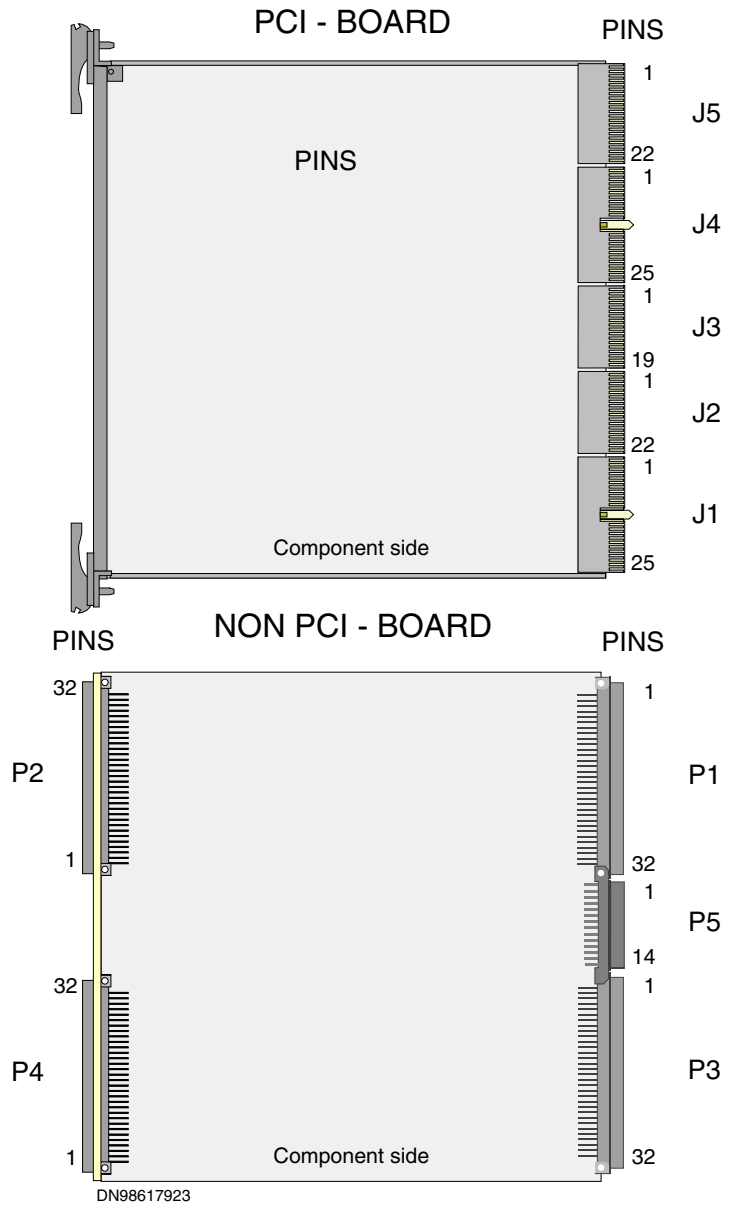


Figure 39. Numbering of the plug-in unit connectors.

16 Cabling to environment

This section describes the positions and routing of the external cabling inside the BSC3i cabinet, that is cabling from cabinet to environment through the digital distribution frame (DDF). More information on cabling is available in the instructions of *Engineering for BSC3i*.

List of external cables inside the BSCC cabinet

The station (outgoing external) cables inside the BSC3i cabinet include:

- Trunk cables (E1/T1) from the ET2 plug-in units, front connectors
- Alarm cables from the CPRJ45 panel
- External synchronization cable(s) from the CPRJ45 panel
- Ethernet (LAN) cable from the CPRJ45 panel
- Cables for X.25 connections (NMS - BSC3i) from the AC25-A plug-in units, rear connecots
  - V.35 cable from BSC3i to Modem (CLRC020)
  - X.21 cable from BSC3i to Modem (CLTC020)
  - V.24 cable from BSC3i to Modem (CLSC020).

Requirement specifications for external cables of BSC3i (M98) equipment is provided in the Appendix.

16.1 Routing of external cables to environment

Trunk cables (E1/T1 from ET2s to environment) and X.25 interface cables (CLRC020, CLTC020, CLSC020 from AC25-A to environment) are routed via the grounding elements (earth comb) of the panels (CPGO.) All other external cables are routed via the Connector panel (CPRJ45). The figure below shows the general routing principle according to which the cables are connected to the front connectors of the plug-in units (ET2s) and to the backplane of the plug-in units (AC25-A).

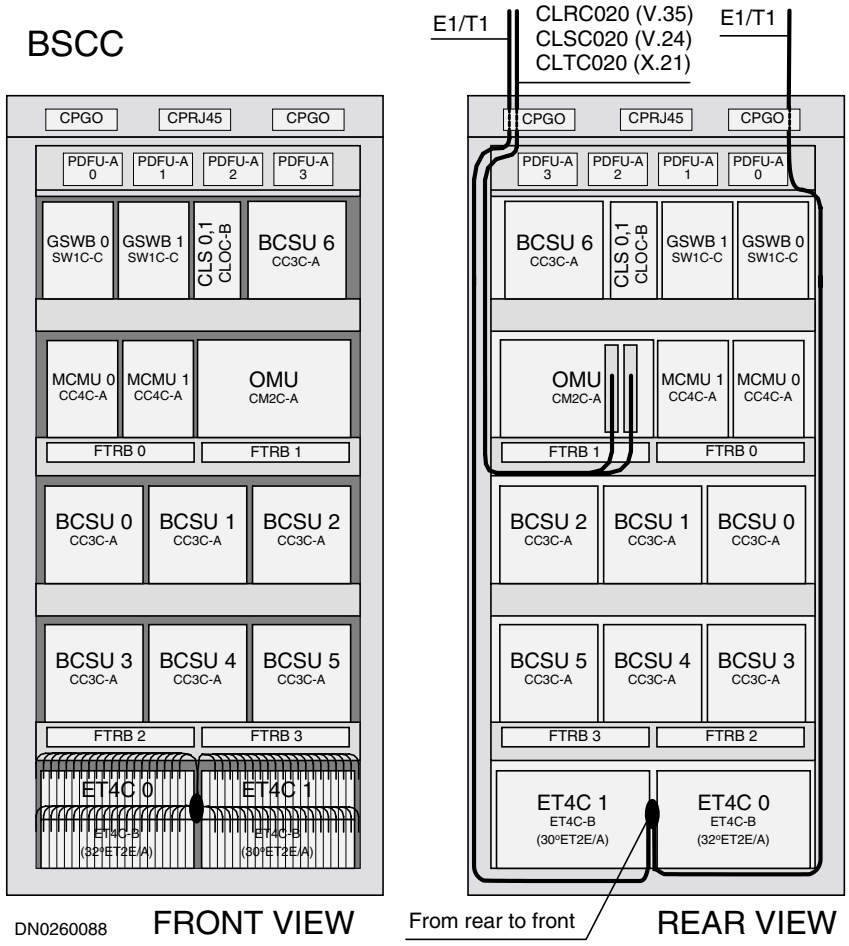
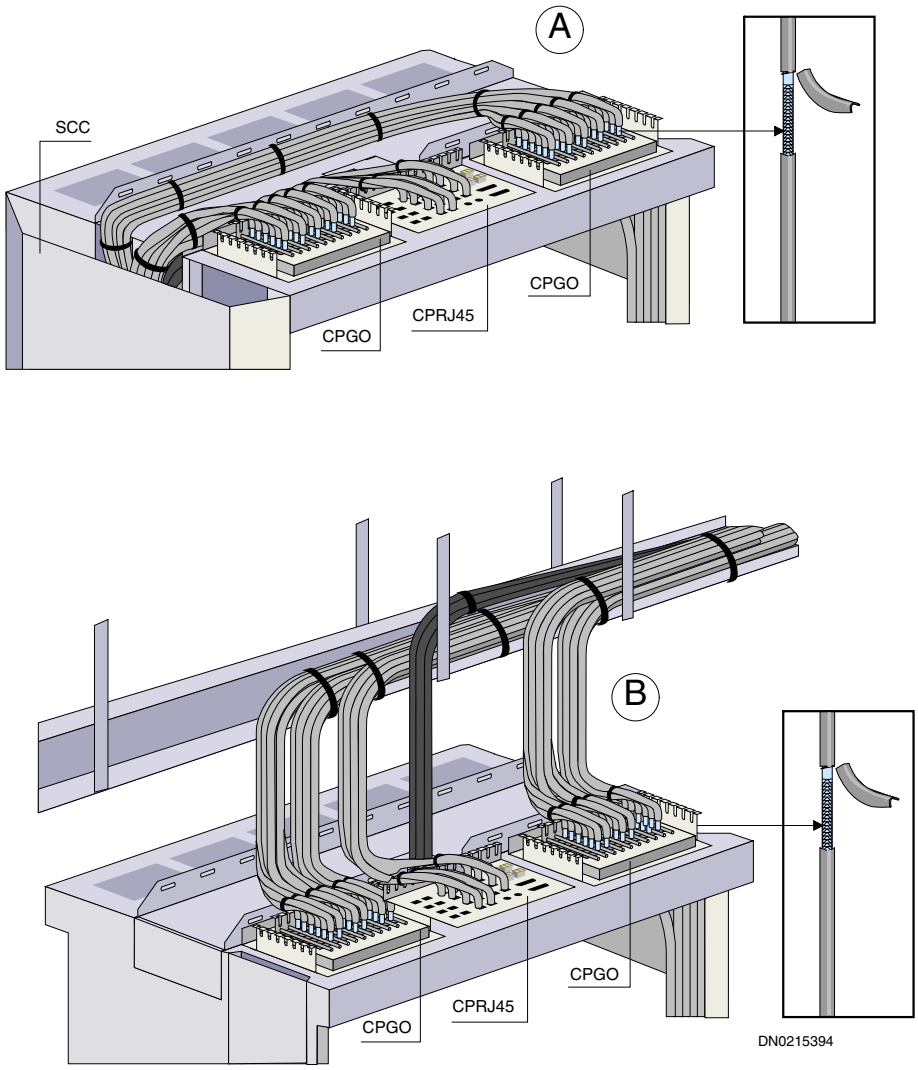


Figure 40. Recommended route for external cables within the BSCC cabinet

16.2 Grounding the metal sheaths of E1, T1 and X.25 cables

The E1 and T1 trunk cables and X.25 interface cables are grounded at the grounding elements (earth comb) of the CPGO panels. All other external cables are grounded at the Connector panel (CPRJ45).

The metal sheaths (aluminium or copper) of all the external station cables from the ET2s and AC25-Ss leaving the BSC3i are grounded to the top of the BSCC cabinet at the grounding elements of CPGO panels (see Figure below).



A= BSC3i with SCC (raised floor installation)

B= BSC3i without SCC

Figure 41. Grounding the E1, T1 trunk cables and X.25 cables at the CPGO

panels.

The metal sheath of each cable is stripped for about 40 mm or 1.57 in and the stripped part is inserted into a slot in the grounding element after a conductive sealing strip (10 x 15 mm or 0.39 in x 0.59 in) designed for the purpose has been placed at the bottom of the slot. A maximum of three cables can be placed in one slot. A sealing is always inserted at both sides of the cable.

When the slots have been filled as evenly as possible, that is, with the same amount of cable, the adjustment plate can be locked with two screws and thus press the sealings tighter. The plate is designed so that its edge presses the cables and the sealing strips tightly together. In case there are only a few cables running to the environment, some more sealing strip is added to achieve proper tightness.

The power supply cables are not grounded in any way and they are connected to the power connector at the top of the cabinet.

16.3 E1 (PCM) trunk interfaces (balanced)

The balanced (symmetrical) PCM trunk circuit E1 interfaces are cabled from the front connector (Euroconnectors) of the ETSI ET2 plug-in unit by using, for example, the pair-protected CPK cable. The cable has four connectors that can be connected to two ETSI ET2 plug-in units, which means four PCM interfaces. The branches of the cable are marked, and the "1" branches are connected to the first plug-in unit.

Table 12. E1 (PCM) balanced trunk cable (CPK type).

Cable type:	KLVMAAM 8x(2x0.4+0.4)+0.4 (Nokia type: CPK)
Cable connector:	Euroconnector C3x7 female IDC AWG26-24 casing for 1/4 Euroconnector

The group sheath of the cable must be grounded at the grounding element of the CPGO panel. The sheath should be grounded at the exchange end only.

Table 13. Pin configuration of one 1/4 Euroconnector connected to the E1 (PCM) trunk cable CPK.

Connection of conductors	Pin	Signal	Colour	Pairs of the cable
Incoming E1 (PCM) transfer direction	b2 b3 a3	RISxB RISxA SG0	White Blue Screen	Odd cable pair (1,3,5,7)
Outgoing E1 (PCM) transfer direction	b5 b6 a6	TISxB TISxA TSG0	White Blue Screen	Even cable pair (2,4,6,8)

x = Interface 0 or 1

Pin configuration of *one* 1/4 Euroconnector connected to the E1 (PCM) trunk cable CPK, see the figure below.

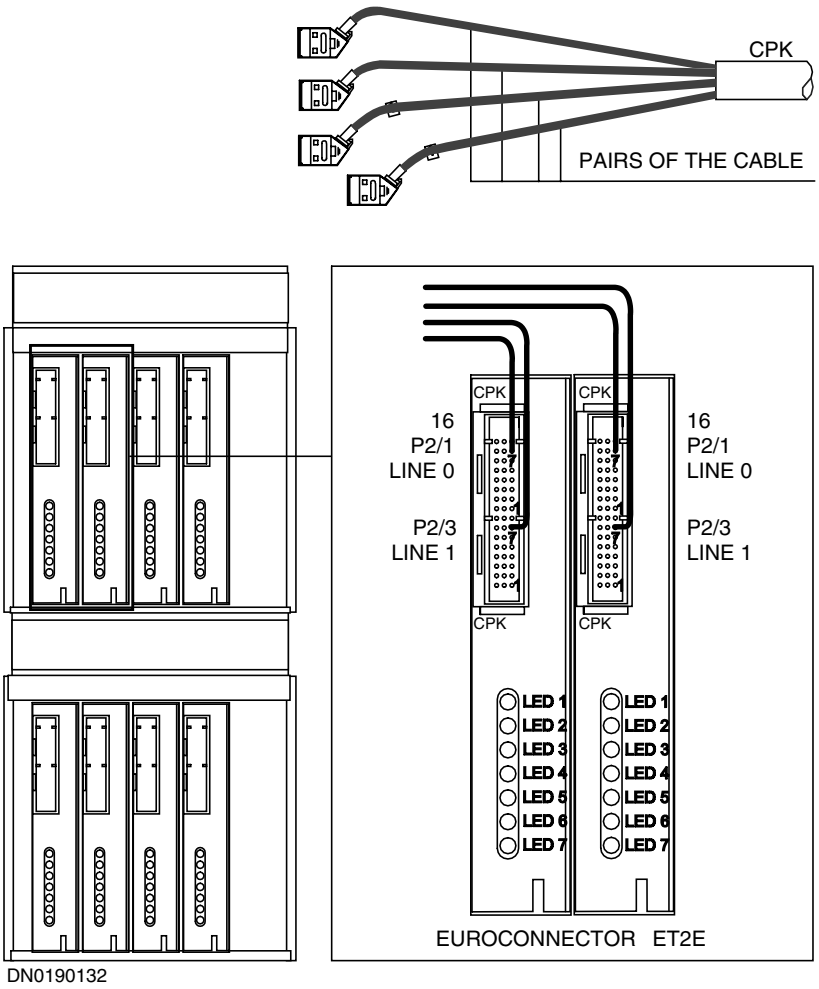


Figure 42. Construction of multipair cable and orientation of two 1/4 Euroconnectors when mounted on an ETSI ET2 plug-in unit

16.4 E1 (PCM) coaxial trunk interfaces (unbalanced)

The unbalanced (asymmetrical) PCM trunk circuit E1 interfaces are cabled by using coaxial cable and SMB connectors from the front connectors of the ETSI ET2 plug-in units.

Connecting the cables of a multicoaxial cable to two ETSI ET2 units (see the table below)

Table 14. Connecting the cables of a multicoaxial cable to two ETSI ET2 units.

Direction	Interface	Cables
Outgoing	Tx	Odd cables (1, 3, 5, 7)
Incoming	Rx	Even cables (2, 4, 6, 8)

The front panels and the trunk cable connectors of the ET2E-C and ET2E-SC are shown in the figure below.

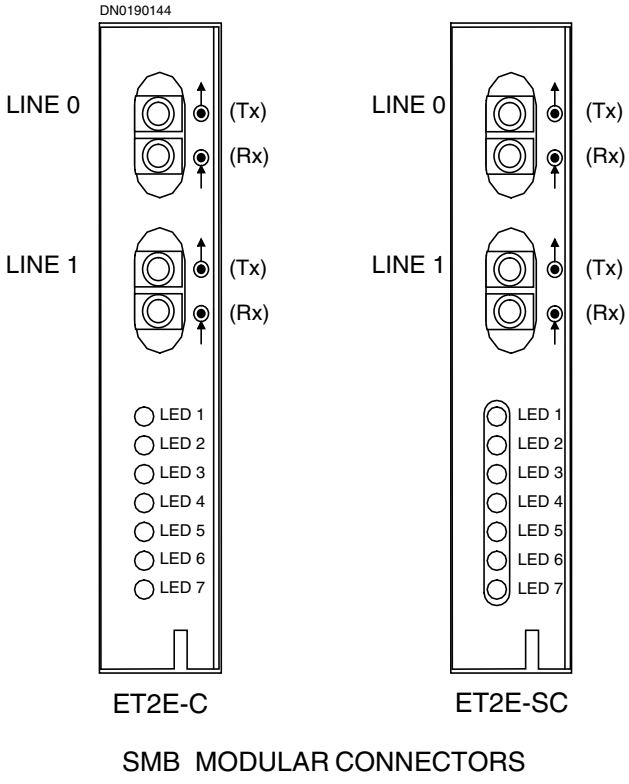


Figure 43. SMB/50 E1 trunk cable connectors of the ET2E-C and ET2E-SC plug-in units

Note

In the future, the ET2E-T and ET2E-TC plug-in units will replace the current ET2E-C and ET2E-SC plug-in units.

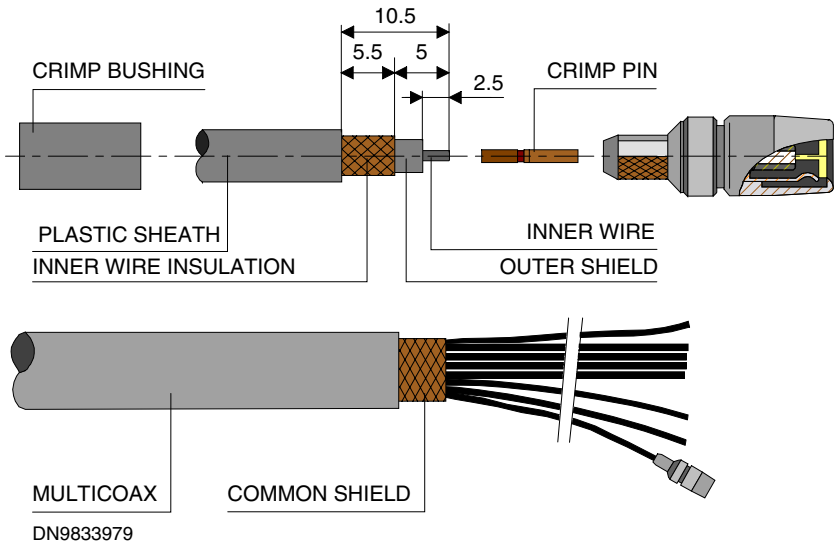


Figure 44. Connecting the coaxial cable to the SMB connector, and the structure of multicoaxial cable (4/8 cable type)

Grounding the cables

Multicoaxial cable is recommended, and only the common shield must be grounded at the grounding element (CPGO) of the cabinet. The DDF end connectors depend on the type of DDF used. The coaxial cables are marked using marking rings provided for cable diameters 3.25 to 4.5 mm so that the cable of the outgoing transmission direction only is provided with the horizontal co-ordinate number of the plug-in unit.

Removing the cables with coaxial connectors

To make easier and safer the removal of the cables with straight coaxial connectors an extractor tool SMBCT2 is available. The order code of a plastic bag with two tools. (See the figure below.)

Note

During the removal and installation, an ESD wrist strap must be worn.

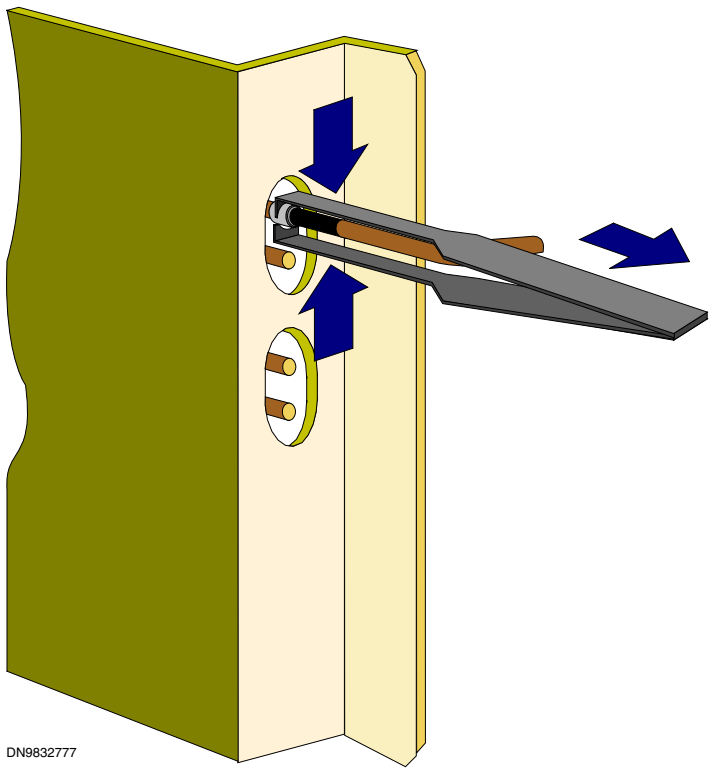


Figure 45. Removing the cables with coaxial connectors.

16.5 T1 (PCM) trunk interfaces

The balanced T1 PCM trunk circuit interfaces are cabled from the front connector (RJ48C) of the ET2A plug-in unit by using the shielded cables.

The sheath of the cable is grounded at the grounding element of the CPGO panel.

The cable and the connector should meet the requirements of the UL 1459 standard or the National Electrical Code ANSI/NFPA No.70. The connector should also meet the requirements of the FCC Part 68.

The pin configuration of the T1 trunk cable connector is presented in the table below.

Table 15. T1 trunk cable connector, pin configuration.

Pin	Signal	Colour	Remarks
1	R1		Incoming direction
2	T1		Incoming direction
3			
4	R		Outgoing direction
5	T		Outgoing direction
6			
7			
8			

Connecting a PCM trunk cable to a connector is shown in the figure below.

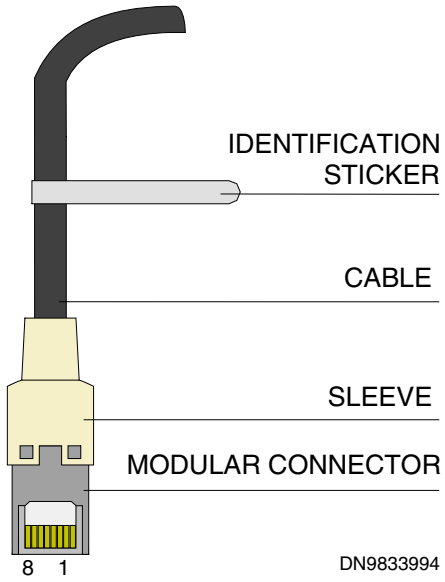


Figure 46. Connecting a PCM trunk cable to a RJ45 connector.

RJ48C connectors of the ET2A plug-in unit are shown in the figure below:

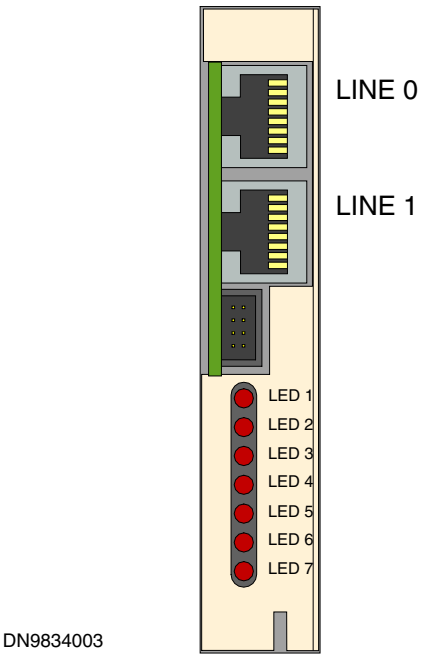


Figure 47. RJ48C connectors of the ET2A plug-in unit.

Note

In the future, the ET2A-T plug-in unit will replace the current ET2A plug-in unit.

16.6 Panel CPRJ45 with LAN, LPT/VDU, Sync and Alarm interfaces

The CPRJ45 is located in the middle hole on top of the BSCC cabinet. It provides interfaces for 100 Mbit/s and 1 Gbit/ LAN uplinks, LPTs and VDUs, incoming external synchronization signals and inputs and outputs for external alarms. Note that the 1 Gbit/ LAN uplink interface is not currently used.

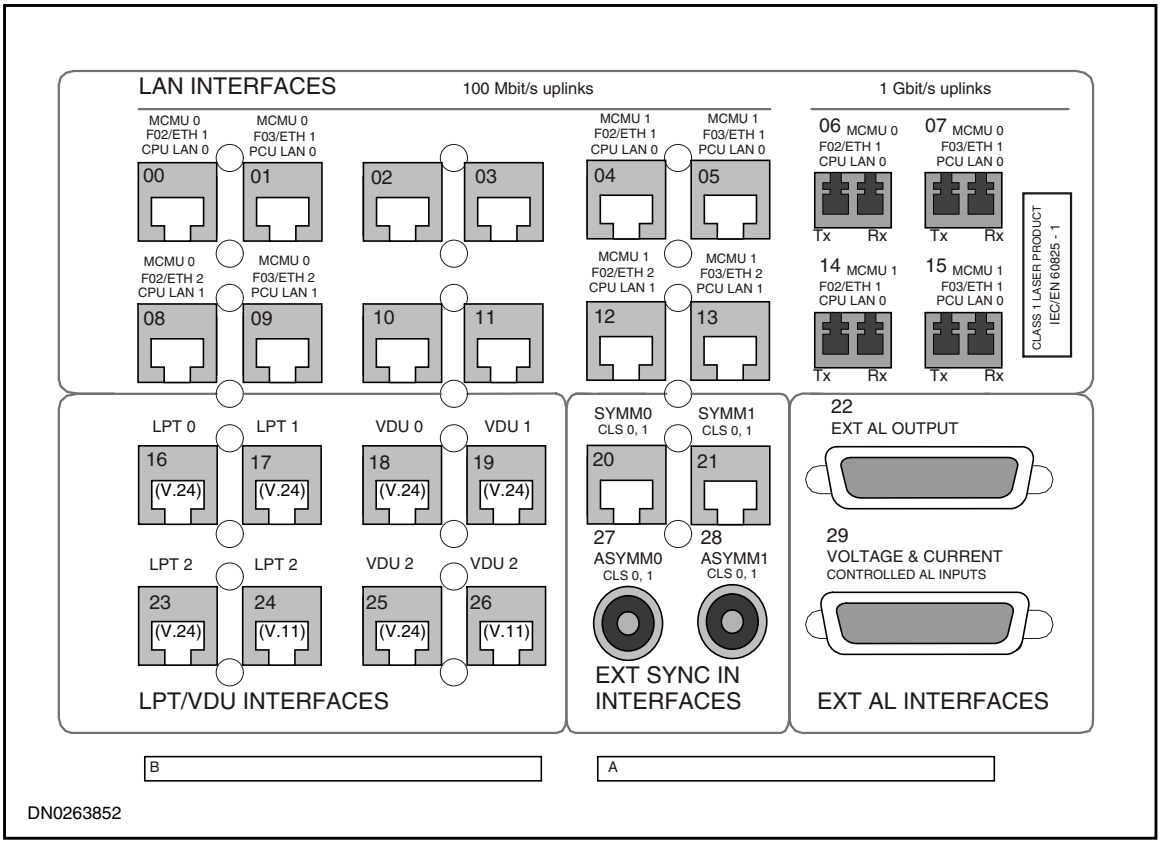


Figure 48. Panel CPRJ45 with LAN, LPT/VDU, Sync and Alarm interfaces.

The various interfaces are described in their own chapters below.

16.7 100 Mbit/s LAN cabling (LAN interfaces at CPRJ45)

The RJ45 connectors (00-05 and 08-13) in the Cabling panel CPRJ45 is reserved for 100 Mbit/s uplink LAN cabling for the BSCC cabinet.

The 100 Mbit/s uplink LAN interfaces (00, 01, 04, 05, 08, 09, 12, 13) in the CPRJ45 panel are cabled to the front connectors (ETHx) of ESB20 (PCU) plug-in units in MCMU 0 and 1 cartridges.

LAN connector

CNIX (cross-connected cable)

Connector type: RJ45 modular connector (8-pole)

Table 16. CNIX cable connector, pin configuration.

Connector 1	Connector 2	Signal at CPRJ4	Colour	Remarks
1	3	RX+	Orange/White	Receive (Rx)
2	6	RX-	White/Orange	Receive (Rx)
3	1	TX+	Green/White	Transmit (Tx)
6	2	TX-	White/Green	Transmit (Tx)

CNI (straight-connected cable)

Connector type: RJ45 modular connector (8-pole)

Table 17. CNI cable connector, pin configuration.

Pin	Signal	Colour	Remarks
1	TX+	Orange/White	Transmit positive (Tx)
2	TX-	White/Orange	Transmit negative (Tx)
3	RX+	Green/White	Receive positive (Rx)
4		Blue/White	
5		White/Blue	
6	RX-	Green/White	Receive negative (Rx)
7		Brown/White	
8		White/Brown	

Table 18. Recommended cable types for LAN cables (CNI and CNIX).

Cable type:	4 pairs, twisted, shielded (S-FTP), Cat. 5, AWG24/26
Cable connector:	Shielded RJ45 modular connector (8-pole), Cat. 5.

See Appendix

The LAN interfaces complying with the IEEE 802.3 standard for Ethernet serial interfaces are of 10 Base-T and 100 Base-TX.

The cables and the connectors should meet the requirements of the UL 1459 standard or the National Electrical Code ANSI/NFPA No.70. The connector should also meet the requirements of the FCC Part 68.

16.8 External alarm cabling (EX AL interfaces at CPRJ45)

The CPRJ45 panel panel accommodates one D25 connector (22) for external alarm outputs and one D25 connector (29) for voltage and current controlled alarm inputs. The CPRJ45 is located in the middle hole on top of the cabinet.

The HWAT-A contains 24 interfaces for incoming external alarms, 10 of them are brought to the panel; and 16 interfaces for outgoing external alarms, 12 of them are brought to the panel; and 6 interfaces for incoming current control alarms, 2 of them are brought to the panel. Pin configurations for connectors 22 and 29 providing the external alarms are listed in the table below.

The cable and the connector should meet the requirements of the UL 1459 standard or the National Electrical Code ANSI/NFPA No.70. The connector should also meet the requirements of the FCC Part 68.

The table below presents external alarm input and output signals at the CPRJ45 panel and the pin configuration of the CNDC alarm cable.

Table 19. Alarm signals at the CPRJ45 panel. Pin configuration of CNDC cable with D25 connectors.

Pin; Panel, CNDC	Connector 22 (External alarm output)	Connector 29 (Voltage and current controlled alarm inputs)	Colour, CNDC	Pair, CNDC
1	AEO0	AEI0	Blue/White	1
2	GND	GND	White/Blue	1
3	AEO1	AEI1	Orange/White	2
4	GND	GND	White/Orange	2
5	AEO2	AEI2	Green/White	3
6	GND	GND	White/Green	3
7	AEO3	AEI3	Brown/White	4
8	GND	GND	White/Brown	4

Table 19. Alarm signals at the CPRJ45 panel. Pin configuration of CNDC cable with D25 connectors. (Continued)

Pin; Panel, CNDC	Connector 22 (External alarm output)	Connector 29 (Voltage and current controlled alarm inputs)	Colour, CNDC	Pair, CNDC
9	AEO4	AEI4	Grey/White	5
10	GND	GND	White/Grey	5
11	AEO5	AEI5	Blue/Yellow	6
12	GND	GND	Yellow/Blue	6
13	AEO6	AEI6	Orange/Yellow	7
14	GND	GND	Yellow/Orange	7
15	AEO7	AEI7	Green/Yellow	8
16	GND	GND	Yellow/Green	8
17	AEO8	AEI8	Brown/Yellow	9
18	GND	GND	Yellow/Brown	9
19	AEO9	AEI9	Grey/Yellow	10
20	GND	GND	Yellow/Grey	10
21	AEO10	ALS0	Blue/Violet	11
22	GND	GND	Violet/Blue	11
23	AEO11	ALS1	Orange/Violet	12
24	GND	GND	Violet/Orange	12
25	-	-	-	-

AEO = External alarm output signal
AEI = Voltage controlled external alarm input signal
ALS = Current controlled alarm input signal
GND = Ground signal

Table 20. Recommended cable types for alarm cable CNDC.

Cable type:	12 pairs, twisted, shielded, cross section 0.4 mm^2, AWG26 (type: Milliflex G26/8, Filotex)
Cable connector:	25-pin D connector (male/female)

The External alarm unit (EXAU) is used for indicating six alarms with LED indicators and/or a buzzer. EXAU can be connected directly to the D25-connector 22 of the CPRJ45 panel using CNDC cable.

If Main distribution frame (MDF) or other cross-connection arrangement is used, external alarm outputs are first connected from EXAU to MDF and then from MDF to CPRJ45 using an appropriate length of CNDC cable without the D25-connector at the MDF end.

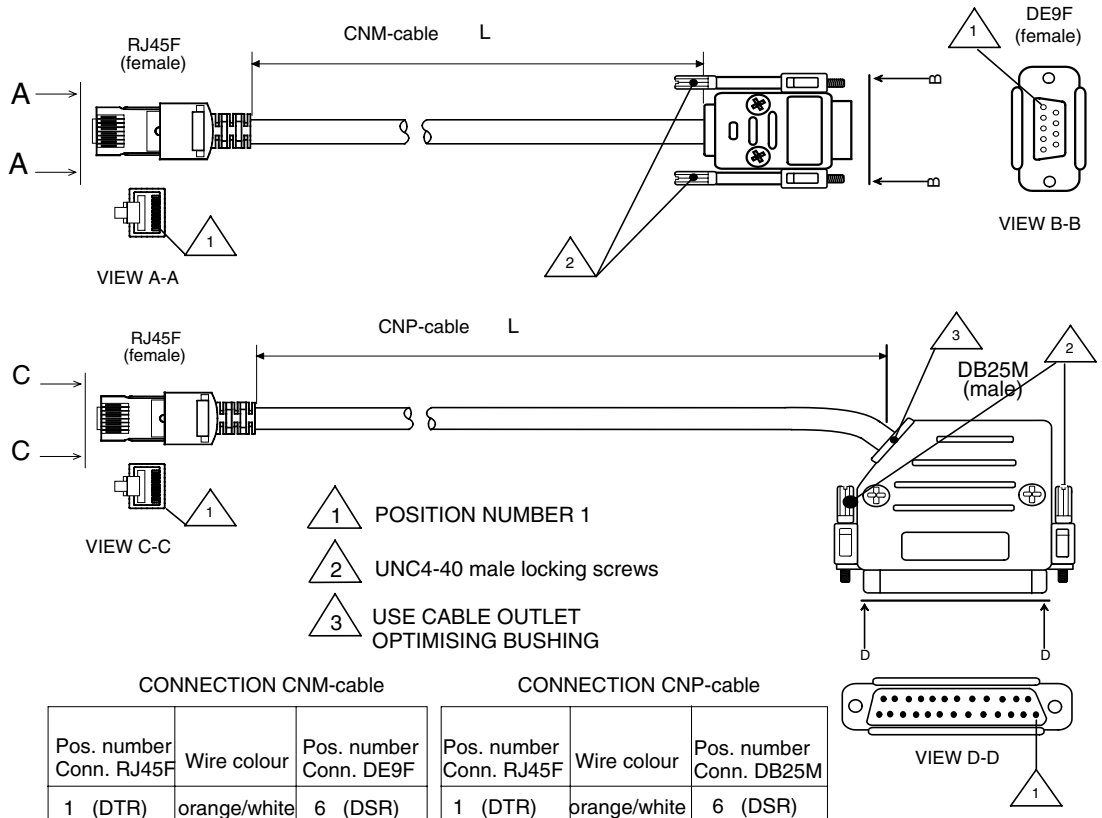
Note

Voltage controlled external alarm input signals and current controlled alarm input signals can also be connected to MDF using CNDC cable.

16.9 VDU/LPT peripheral cabling (LPT/VDU interfaces at CPRJ45)

The CPRJ45 panel accommodates four RJ45 connectors for VDU and LPT interfaces: ports 16, 17 and 23 for LPT0, LPT1 and LPT2 (all V.24) and port 24 for LPT2 (V.11); ports 18, 19 and 25 for VDU0, VDU1 and VDU2 (all V.24) and port 26 for VDU2 (V.11). Each connector provides access to one interface of visual display unit / PC or printer provided by the OMU (SERO-A).

The VDU can be connected to the CPRJ45 panel using the CNM cable, which is a CNI-type cable provided with an RJ45 connector and a D25 connector. The LPT printer can be connected to the CPRJ45 panel using the CNP cable, which is a CNI-type cable provided with an RJ45 connector and a D9 connector.



CONNECTION CNM-cable

Pos. number Conn. RJ45F	Wire colour	Pos. number Conn. DE9F
1 (DTR)	orange/white	6 (DSR)
2 (TxD)	orange	2 RxD
3 (GND)	white/green	5 (signal GND)
4 (GND)	blue	1 (GND)
5 (RxD)	white/blue	3 (TxD)
6 (DSR)	green	4 (DTR)
7 (CTS)	white/brown	7 (RTS)
8 (RTS)	brown	8 (CTS)
Conn. hood	shield	Conn. hood

CONNECTION CNP-cable

Pos. number Conn. RJ45F	Wire colour	Pos. number Conn. DB25M
1 (DTR)	orange/white	6 (DSR)
2 (TxD)	orange	3 (RxD)
3 (GND)	white/green	7 (signal GND)
4 (GND)	blue	1 (GND)
5 (RxD)	white/blue	2 (TxD)
6 (DSR)	green	20 (DTR)
7 (CTS)	white/brown	4 (RTS)
8 (RTS)	brown	5 (CTS)
Conn. hood	shield	Conn. hood

Figure 49. Peripheral cables; CNM for VDU and CNP for printer LPT.

Pin configurations for connectors (16...19 and 23...26) providing the VDU/LPT interfaces are listed in the table below.

Table 21. V.24/V.11 cable connector in the CPRJ45 panel, pin configuration.

Pin	Signal (V.24)	Signal (V.11)	Colour
1	DTR	TxD+	Orange/White
2	TxD	TxD-	White/Orange
3	GND	RxD+	Green/White
4	GND		Blue/White
5	RxD		White/Blue
6	DSR	RxD-	Green/White
7	CTS		Brown/White
8	RTS		White/Brown

Table 22. Recommended cable types for V.24/V.11 cables (CNI).

Cable type:	4 pairs, twisted, shielded (S-FTP), Cat. 5, AWG24/26
Cable connector:	Shielded RJ45 modular connector (8-pole), Cat. 5.

The cable and the connector should meet the requirements of the UL 1459 standard or the National Electrical Code ANSI/NFPA No.70. The connector should also meet the requirements of the FCC Part 68.

16.10 External synchronization cabling (EXT SYNC interfaces at CPRJ45)

The CPRJ45 panel accommodates two RJ45 connectors (20 SYMM0 and 21 SYMM1) for balanced (symmetric) synchronization interfaces, and two BNC connectors (27 ASYMM0 and 28 ASYMM1) for coaxial, unbalanced interfaces.

Pin configurations for connectors (20, 21) providing the balanced external synchronization interfaces are listed in the table below.

Table 23. Pin configuration for connectors 20 (SYMM0 CLS0,1) and 21 (SYMM1 CLS0,1), and colours for CNI cable connector.

Pin	Signal / conn 20	Signal / conn 21	Colour (CNI)	Remarks
1	FS1A	FS2A	Orange/White	Wire A of external frequency standard FS1 or FS2
2	FS1B	FS2B	White/Orange	Wire B of external frequency standard FS1 or FS2
3	-	-	Green/White	Receive positive (Rx)
4	-	-	Blue/White	
5	-	-	White/Blue	
6	-	-	Green/White	Receive negative (Rx)
7	-	-	Brown/White	
8	-	-	White/Brown	
Hood	RSG1	RSG2		Ground signal

Table 24. Recommended cable types for synchronization cables (CNI).

Cable type:	4 pairs, twisted, shielded (S-FTP), Cat. 5, AWG24/26
Cable connector:	Shielded RJ45 modular connector (8-pole), Cat. 5.

Table 25. Pin configuration for connectors 27 (ASYMM0 CLS0,1) and 28 (ASYMM1 CLS0,1).

Pin	Signal / Connector 27	Signal / Connector 28
Centre wire	FS1A	FS2A
Cable sheath	FS1B	FS2B

The cable and the connector should meet the requirements of the UL 1459 standard or the National Electrical Code ANSI/NFPA No.70. The connector should also meet the requirements of the FCC Part 68.

16.11 X.25 interfaces from BSC3i (AC25-A) to Modem

There are several possibilities for making the X.25 connection between the OSS (NMS) and BSC3i. The connection used depends on national standards and on the location of the network elements.

If a packet network is used, connections are made using V.35 or V.24 from the BSC3i to a modem. In practice, V.35 allows longer cables and fast transmission.

If the BSC3i and OSS (NMS) are co-located, X.21 is preferred.

The table below presents the different cables which are used to connect various X.25 interface cable types. These cables are routed out of the cabinet through the grounding elements and connected to the interface cable concerned. The cables must be grounded at the cabinet's grounding element.

Table 26. The X.25 interface locations for different interface types.

Interface plug-in unit	Interface type	Cable type
AC25-A	V.24	CLSC cable
	V.24 restricted	CLSC cable
	X.21	CLTC cable
	V.35	CLRC cable

The standard cables delivered with the BSC3i depend on the physical connection used. The connection is always duplicated for redundancy and the alternatives are:

- CLRC020 = V.35 cable from AC25-A plug-in unit to environment through the cabinet's grounding element. Length = 200 cm, 6.6 ft.
- CLSC020 = V.24 cable from AC25-A plug-in unit to environment through the cabinet's grounding element. Length = 200 cm, 6.6 ft.
- CLTC020 = X.21 cable from AC25-A plug in unit to environment through the cabinet's grounding element. Length = 200 cm, 6.6 ft.

Figures below show connections of cables which can be used to interconnect the BSC3i and NMS or a modem.

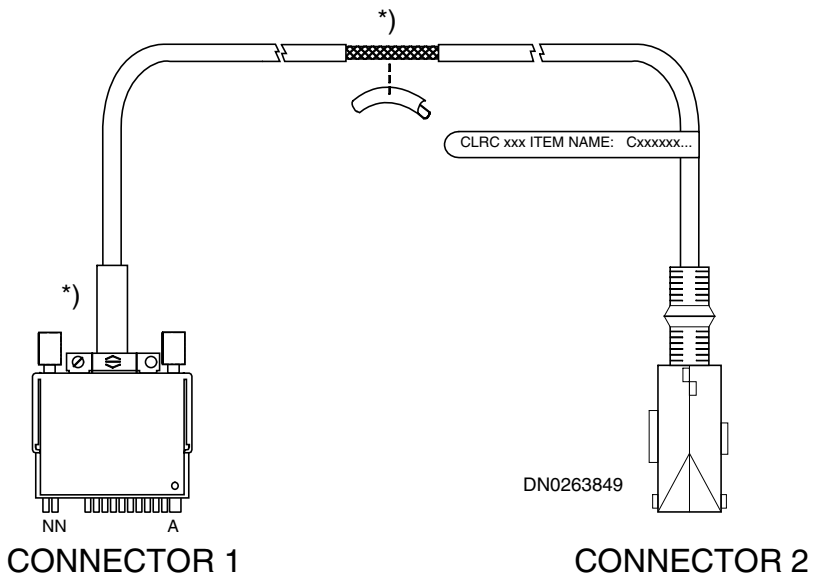
V.35 cable CLRC020 from BSC3i (AC25-A) to modem (DCE)

The V.35 cable CLRC020 for modem and its connections are shown in the figure and table below.

Table 27. Recommended cable types for V.35 cable CLRC020.

Cable type:	12 pairs (10 used), twisted, shielded, cross section 0.4 mm^2, AWG26 (type: Milliflex G26/12, Filotex)
Cable connector:	34-pin M block connector (female)

The cable and the connector should meet the requirements of the UL1459 standard or the National Electrical Code ANSI/NFPA No.70.



*) Grounded at panel CPGO by stripping the outer jacket

*) Grounded at panel CPGO by stripping the outer jacket

Figure 50. V.35 cable CLRC020.

Table 28. Connections of V.35 modem cable CLRC020, connectors 1 and 2 (female).

Pair	Wire	Connector 1	Connector 2	Signal
1	blue/white white/blue	P S	6A 6B	TXDA TXDB
2	white/orange orange/white	U W	7A 7B	EX_TXCA EX_TXCB
3	green/white white/green	- -	- -	- -
4	brown/white white/brown	AA Y	5B 5A	TXCB TXCA
5	white/grey grey/white	V X	5D 5E	RXCA RXCB
6	white/green green/white	R T	6D 6E	RXDA RXDB
7	black/orange orange/black	B E	4D 1A	GND DSR
8	green/black black/green	D F	1E 3E	CTS DCD
9	brown/black black/brown	C H	1B 3B	RTS DTR
10	black/blue blue/black	NN -	2B -	TI -
11	grey/black black/grey	L N	1C 1D	LL RL
12	orange/violet violet/orange	- -	- -	- -

- = not connected

Note

The cable sheath is in electric contact with the connector casing

Connect the V.35 cable to the CLRC020 cable which is routed out of the cabinet through the CPGO.

The cable CLRC020 must be grounded at the grounding element of the CPGO panel.

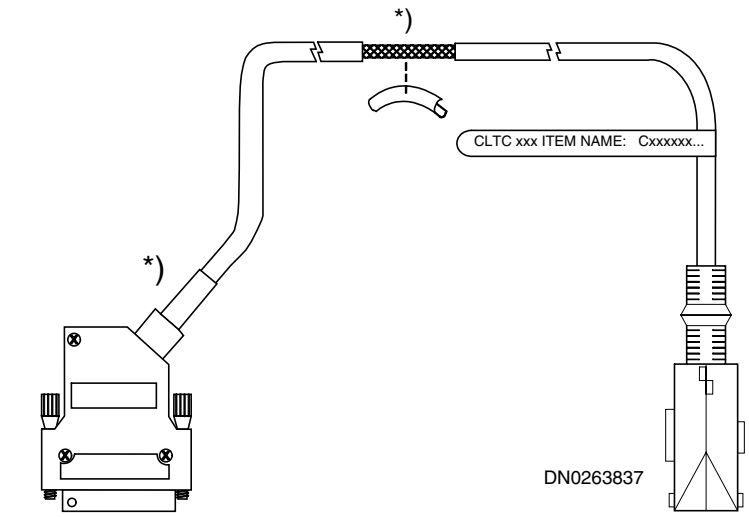
X.21 cable CLTC020 from BSC3i (AC25-A) to modem (DCE)

The X.21 cable CLTC020 for modem and its connections are shown in the figure and table below.

Table 29. Recommended cable types for X.21 cable CLTC020.

Cable type:	8 pairs (6 used), twisted, shielded, cross section 0.4 mm^2, AWG26 (type: Milliflex G26/8, Filotex)
Cable connector:	15-pin D connector (female)

The cable and the connector should meet the requirements of the UL 1459 standard or the National Electrical Code ANSI/NFPA No.70.



*) Grounded at panel CPGO by stripping the outer jacket

Figure 51. X.21 cable CLTC020.

Table 30. Connections of V.21 modem cable CLTC020, connectors 1 and 2 (female).

Pair	Wire	Connector 1	Connector 2	Signal
1	blue/white white/blue	4 11	1D 1E	TA RB
2	white/orange orange/white	12 5	3B 3A	IB IA
3	green/white white/green	- 8	- 3D	- GND
4	brown/white white/brown	2 9	1A 1B	TA TB
5	white/grey grey/white	10 3	2E 2D	CB CA
6	blue/black black/blue	6 13	2A 2B	SA SB
7	black/orange orange/black	- -	- -	- -
8	green/black black/green	- -	- -	- -

- = not connected

Note

The cable sheath is in electric contact with the connector casing

Connect the X.21 cable to the CLTC020 cable which is routed out of the cabinet through the CPGO.

The cable CLTC020 must be grounded at the grounding element of the CPGO panel.

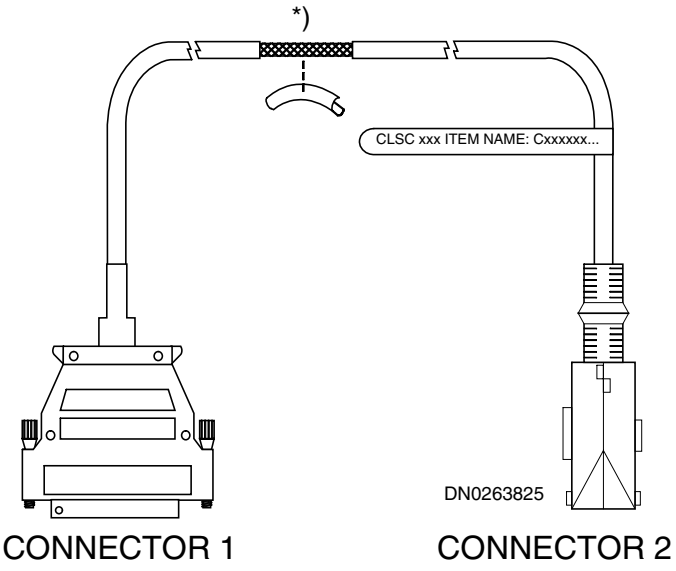
V.24 cable CLSC020 from BSC3i (AC25-A) to modem (DCE

The V.24 cable CLSC020 for modem and its connections are shown in the figure and table below.

Table 31. Recommended cable types for V.24 cables.

Cable type:	8 pairs (6 used), twisted, shielded, cross section 0.4 mm^2, AWG26 (type: Milliflex G26/8, Filotex)
Cable connector:	25-pin D connector (female)

The cable and the connector should meet the requirements of the UL 1459 standard or the National Electrical Code ANSI/NFPA No.70.



*) Grounded at panel CPGO by stripping the outer jacket

Figure 52. V.24 cable CLSC020.

Table 32. Connections of V.24 modem cable CLSC020, connectors 1 and 2 (female).

Pair	Wire	Connector 1	Connector 2	Signal
1	blue/white white/blue	15 17	3A 4E	TXC RXC
2	white/orange orange/white	7 6	4D 1A	GND DSR
3	green/white white/green	2 3	3D 4B	TXD RXD
4	brown/white white/brown	- 24	- 4A	- EX.TXC
5	white/grey grey/white	20 4	3B 1B	DTR RTS
6	blue/black black/blue	22 25	2A 2B	CI TI
7	black/orange orange/black	5 8	1E 3E	CTS DCD
8	green/black black/green	18 21	1C 1D	LL RL

- = not connected

Note

The cable sheath is in electric contact with the connector casing

Connect the V.24 cable to the CLSC020 cable which is routed out of the cabinet through the CPGO. The same cable can also be connected to the restricted V.24 interface.

The cable CLTC020 must be grounded at the grounding element of the CPGO panel.

17 Installing the External Alarm Unit (EXAU)

The BSC3i network elements can be equipped with an alarm unit to make the alarm monitoring more efficient. The External Alarm Unit (EXAU) is a small device controlled by the HWAT-A plug-in unit in the CM2C-A (OMU and mass memory) cartridge of the BSC3i cabinet. The EXAU indicates alarms from the network element with indicator lights and a buzzer.

EXAU is located in the control room of the sitel, and it is easy to install to all common wall materials.

The dimensions and installation options of the EXAU are presented in the figure below.

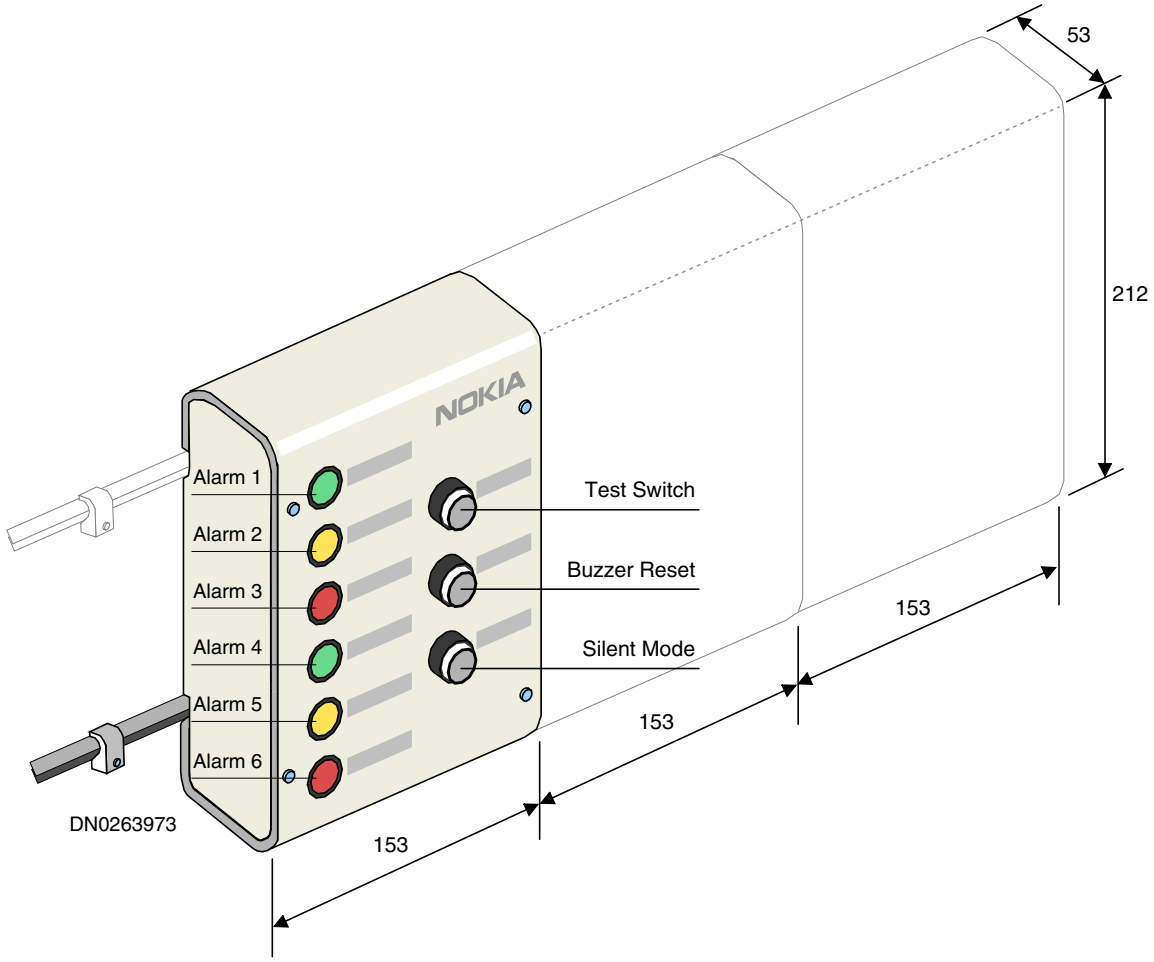


Figure 53. Dimensions and installation options of the EXAU.

The alarm unit, depicted in the figure below, contains six indicator lights and three buttons: test button (Test), resettable buzzer button (Buzzer Reset) and a button with which operation mode can be set (Silent Mode).

The EXAU is presented and the meanings of the indicator lights are explained in the figure and table below.

Table 33. Default colours of alarm signals. The order of colour caps can be changed as required.

Colour	Position	Alarm
Red	(1) uppermost	(AL00)
Yellow	(2)	(AL01)
Green	(3)	(AL02)
Red	(4)	(AL03)
Yellow	(5)	(AL04)
Green	(6) lowermost	(AL05)

For mounting the EXAU and connecting the alarm cable, see the instructions below.

17.1 Mounting the EXAU

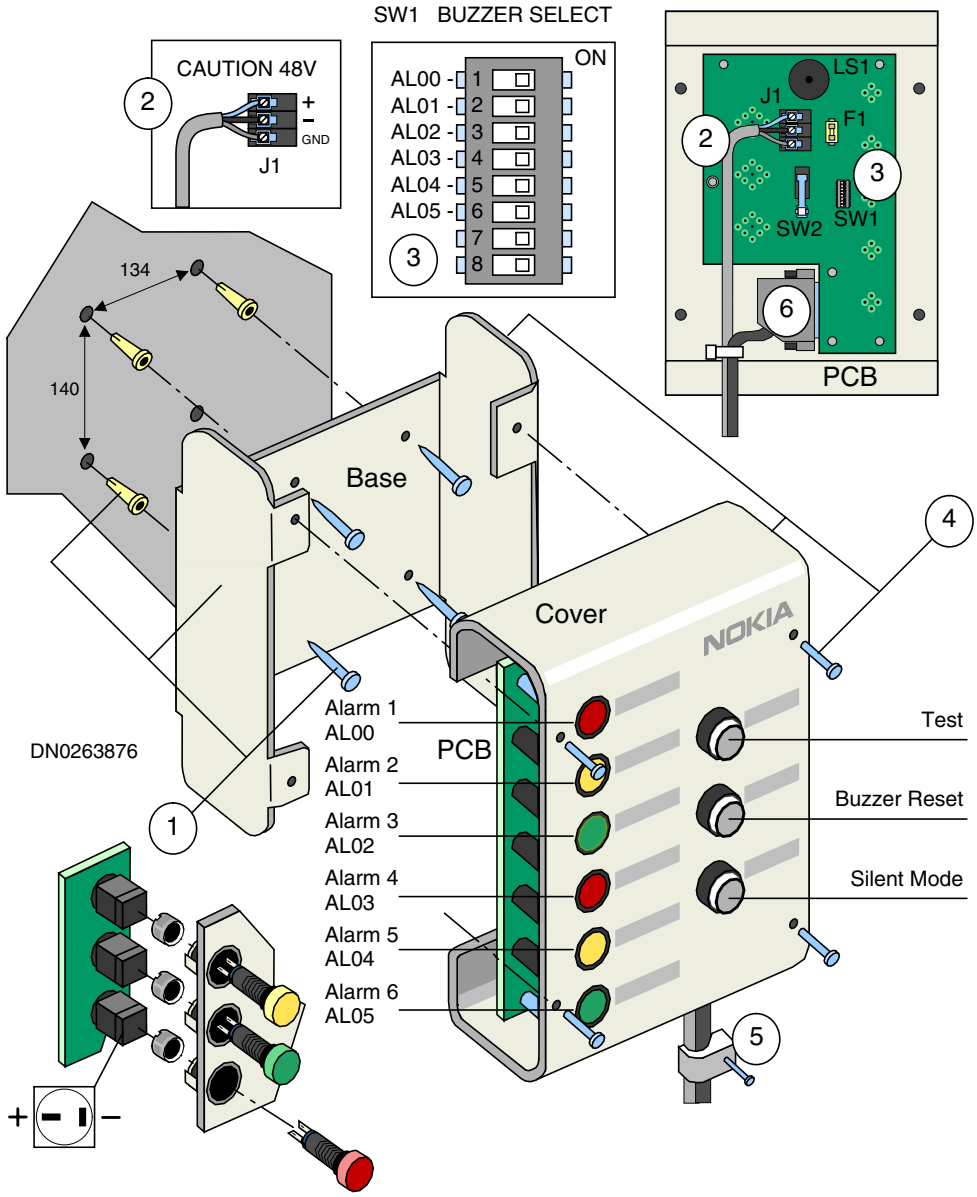


Figure 54. Installation of the EXAU; mounting on the wall, cabling, setting the buzzer jumpers.

Steps

1. Unscrew the four cover retaining screws and remove the cover from the alarm unit case, as shown in the figure above.

2. Drill four holes in the wall and insert a plastic plug (or a wedge anchor) into each hole (concrete wall). The distances for the holes are given in the figure.

3. Mount the alarm unit case on the wall using four screws (min. diameter 5.0 mm or 0.2 in, length 30.0 mm or 1.2 in), as shown in in the figure.

4. Connect the power supply cable (2) to the 48 V power supply terminal (+, – and GDN), as shown in the figure above.

5. Connect the (CNDC) alarm cable (6) to the D25 connector mounted on the board.

6. Check that the BUZZER SELECT jumper settings are as required (3).

   With the BUZZER SELECT jumpers on Switch SW1 the user can set the buzzer for each alarm (AL00 - AL05) ON or OFF.

7. Strap the alarm and power supply cables together using a cable tie, as shown in the figure above.

8. Affix the cover assembly to the alarm unit case with four screws (4).

9. Secure the alarm and power supply cables by screwing or nailing cable clips into the wall, with the first clip approximately 25.0 mm (1.0 in) above or below the alarm unit case (5).

   The alarm and power supply cables can enter the alarm unit box from above or below or lower or upper side depending on the installation.

10. Route the alarm supply and alarm cables to the environment.

17.2 Connecting the alarm cable

Steps

- Connect the alarm cable CNDC to the EXAU from the D25 connector 22 at the CPRJ45 panel at the BSCC cabinet, which is connected to the OMU cartridge (CM2C-A).

  The cable can be connected directly from the CPRJ45 panel (A) or through the digital distribution frame (DDF or cross connection) that connects the alarm cables coming from the network element.

  When the alarms are routed through the digital distribution frame (DDF) the CNDC cable is cut and the wires are connected to the cross connection.

Further information

The CNDC cable is available complete (lengths 5, 10, 20, 30 and 40 m). The maximum distance between the EXAU panel and the exchange equipment it is connected to is 200 m (650ft.).

The HWAT-A plug-in unit controls the EXAU.

The pin configuration and signals of CNDC cable are presented in section External alarm cabling.

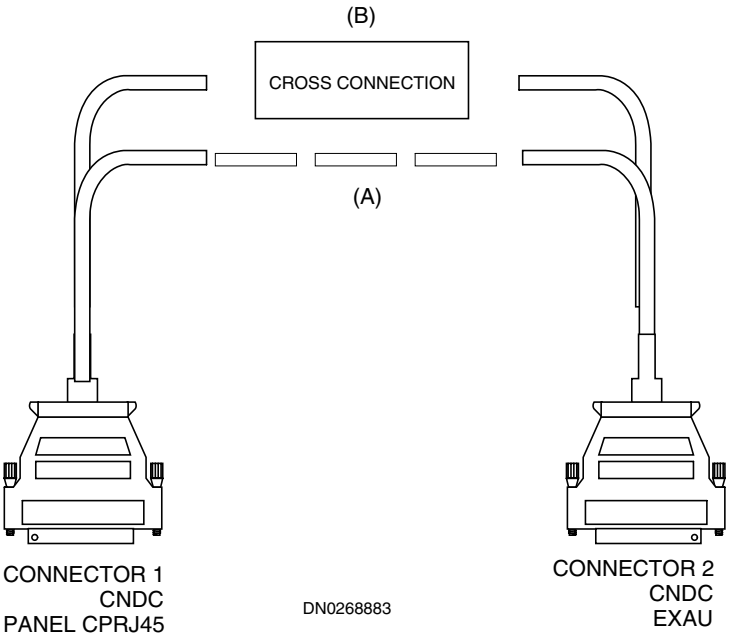


Figure 55. Use CNDC cable.

18 Finishing off the BSC3i network element installation

The last steps in the actual installation process are the final check of the installation and reinstallation of the doors, after which the network element is ready for commissioning.

18.1 Finishing off the installation

Steps

1. Verify against the *Installation Work Check List, BSC3i Installation* document that you have completed all the necessary steps for the installation.

   Visually check the installation.

2. Reinstall the doors

   To reinstall the doors into the cabinets, simply perform in a reversed order the steps you took when you dismantled them in the section Preparing the cabinets for installation.

   Make sure that all of the plug-in units and cables are installed inside the cabinet before reattaching the doors.

1. Lift the lower hinge of the door into place on the cabinet frame (A).

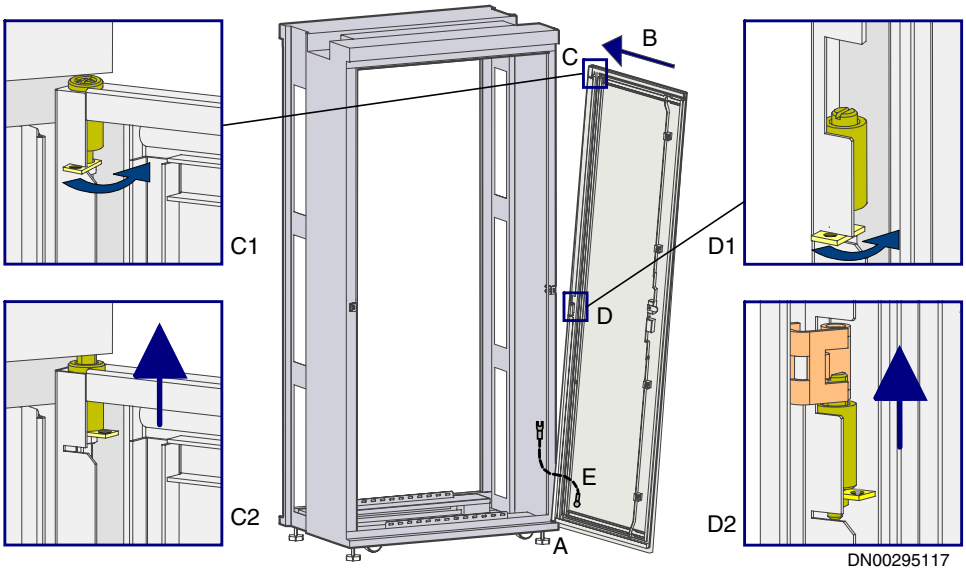


Figure 56. Reinstalling a cabinet door. The details show the steps detailed below.

2. Tilt the top part of the door into place in the cabinet frame (B).
3. Free the latch of the top hinge from the slot (C1 and C2) to lock the door into place.

   Verify that the hinge is securely inserted into the cabinet frame.
4. Free the latch of the middle hinge from the slot (D1 and D2).

   Verify that the hinge is securely inserted into the cabinet frame and that the door rotates freely on the hinges. Open and close the door a few times to verify that the door is not blocked by anything protruding from the cabinet.
5. Connect the door grounding cable at the front side as shown in the figure below.

   Insert the cable end (A) by pressing the connector to the lug at the door. Loosen the lower shelf (FTRB) screw, insert the cable shoe (B) under the washer of the screw and tighten the screw.

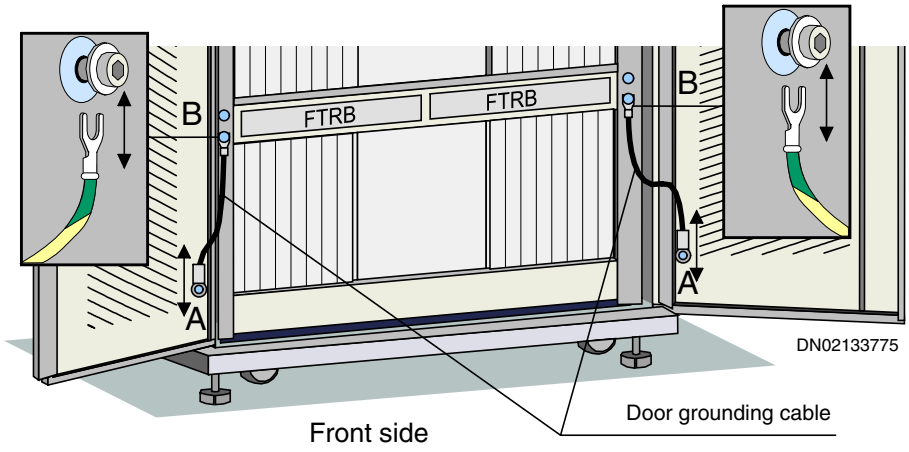


Figure 57. Connecting the door grounding cable at the front side of the cabinet.

6. Connect the door grounding cable at the rear side as shown in the figure below.

   Insert the cable end (A) by pressing the connector to the lug at the door. Loosen the second lowest screw at the side plate, insert the cable shoe (B) under the washer of the screw and tighten the screw.

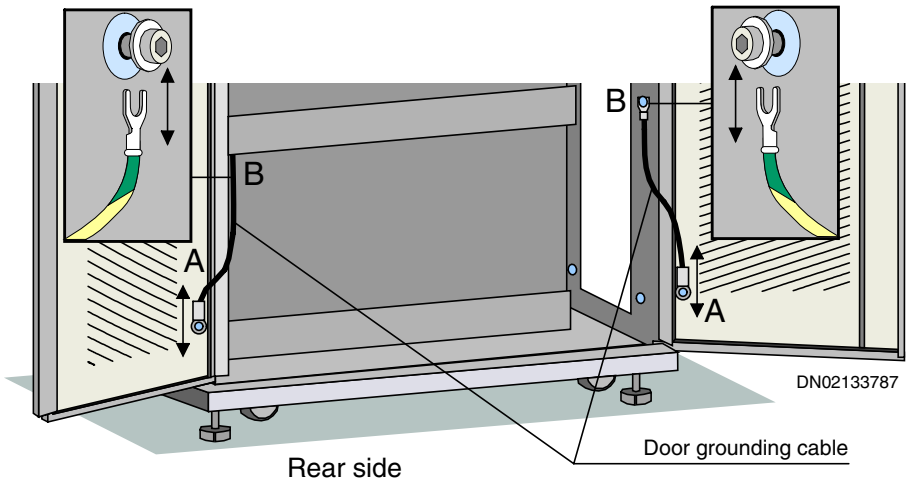


Figure 58. Connecting the door grounding cable at the rear side of the cabinet.

7. Repeat the same procedure for all doors.

3. Fill in the Installation Certificate of Completion form in the *Installation Work Check List* document

Appendix A. Requirement specifications for external cables of BSC3i (M98) equipment

A.1 General requirements for connectors and cable materials

Connectors:

- Connectors and hoods of the connectors must be shielded
- 1.25 mm, or 50 microinches (0.75 mm or 30 microinches, if 1.25 mm is not available) gold plating on the contacts
- UL94 V-0 materials

Cable material:

- Shielded construction, screening effectiveness > 60 dB at 1GHz
- AWG 26 conductors
- Continuous pair twisting on the twisted pair cables
- Operating temperature 0-80 °C
- VW-1 materials

Optional:

- Halogen free materials (IEC 332-1 or IEC 332-3)
- Grey colour (RAL 7036, if available)

A.2 Requirements for specified coaxial cable assemblies

A.2.1 E1 coaxial unbalanced PCM cable assembly

Cable:

- Multicoaxial cable (8 coax) with common braid
- Impedance 75 ± 3 ohm
- Max. attenuation < 9dB/100 m at 10 MHz
- Nominal capacitance: < 66 pF/m
- Conductor resistance: < 365 ohm/km

Connectors:

- Coaxial connectors: SMB/50 ohm/straight type

A.2.2 Unbalanced (coaxial) external synchronization cable assembly (CKB)

Cable:

- Coaxial (BT 3002)
- Impedance 75 ohm ± 4 ohm
- Attenuation: 4.4 dB/100 m at 5 MHz
- Capacitance: < 66 pF/m

Connectors:

- BNC type

A.3 Requirements for specified twisted pair cable assemblies

A.3.1 10Base-T/100 Base-TX LAN cable assemblies (CNI and cross-connected LAN cable)

Cable:

- S-FTP
- Category 5
- Meets EIA/TIA 568-A standard

Connectors:

- RJ-45

A.3.2 T1 balanced PCM cable assembly (CNIS)

Cable:

- Nominal impedance: 100 ± 15 ohm
- Attenuation: < 4 dB/100 m at 1 MHz
- Resistance: max.151 ohm/km at 20 °C
- Crosstalk attenuation: > 70 dB at 150 kHz

Connectors:

- RJ-45

A.3.3 Balanced external synchronization cable assembly (CNI)

Cable:

- S-FTP
- Category 5
- Meets EIA/TIA 568-A standard

Connectors:

- RJ-45

A.3.4 Current and Voltage-controlled alarm cable assembly (CNDC)

Cable:

- General requirements (Section 1.1)

Connectors:

- 25-pin D-subminiature connector at both ends of the cable

A.3.5 Electrical performance requirements for X.25 cable assemblies

Cable:

- Linear resistance of the conductor: 151 ohm/km, max. 20 °C
- Nominal impedance: 100 ± 15 ohm
- Attenuation: < 4 dB/100 m at 1 MHz
- Capacitance between cores: 60 pF/m nominal
- Phase delay time: 5.4 ms/km at 1 MHz
- Crosstalk attenuation: > 50 dB at 150 kHz

V.24 cable assemblies (CLSC)

Connectors:

- 25-pin D-subminiature connector
- 2HM connector

V.35 cable assembly (CLRC)

Connectors:

- V.35 connector
- 2HM connector

X.21 cable assemblies (CLTC)

Connectors:

- 15-pin D-subminiature connector
- 2HM connector

A.3.6 Electrical performance requirements for optical LC cable assemblies

Fibre cable material

- 62.5/125 um multi mode fibre
- Attenuation max. 3.8 dB / km at 850 nm wavelength
- Fibre cables must be provide with a common secondary overall jacket

Connectors

- LC, according to IEC 61754-20-4
- Mating durability for 200 reconnects, insertion loss change < 0.2 dB
- SPC finish
- Insertion loss max. 0.5 dB. According to IEC 874-1 method 6.
- Return loss min. > 20 dB
- Zirconia ferrule
- Dust caps included