

HUAWEI

Airbridge BTS3606&3606A CDMA Base Station
Installation Manual – BTS3606 Cabinet Installation

V200R001

Airbridge BTS3606&3606A CDMA Base Station Installation Manual

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About This Manual

Release Notes

This manual applies to Airbridge BTS3606 CDMA Base Station V200R001.

Related Manuals

The related manuals are listed in the following table.

Manual	Content
Airbridge BTS3606&3606A CDMA Base Station Technical Manual	Covers the system description, system architecture and principles, interface protocols, and services flows of the BTS3606/BTS3606A.
Airbridge BTS3606&3606A CDMA Base Station Installation Manual	Covers the hardware installation, software installation and commissioning, and installation reference for the BTS3606/BTS3606A.
Airbridge BTS3606&3606A CDMA Base Station Data Configuration Manual	Introduces the data configuration tasks and configuration procedures of the BTS3606/BTS3606A.
Airbridge BTS3606&3606A CDMA Base Station Maintenance Manual	Introduces the routine/emergency maintenance, troubleshooting, and part replacement procedures as well as common operations involved in the BTS3606/BTS3606A maintenance.

Organization

The manual introduces the installation procedures of the Airbridge BTS3606 CDMA Base Station. It is divided into six chapters:

Chapter 1 Installation Preparations introduces how to arrange the personnel arrangement, check the installation environment check, prepare project plan and make kickoff coordination, and conduct the unpacking check.

Chapter 2 Installing Cabinet Assemblies introduces how to install different cabinet assemblies including lower support, support, and U-bar support.

Chapter 3 Installing Cabinet and Cabinet Equipment introduces how to install the BTS3606 cabinet and the combined cabinet, how to install/remove the cabinet doors, and how to install the boards/modules.

Chapter 4 Installing Cables introduces the categories of cables installed on site, cable distribution methods, and procedures of connecting various cables in BTS3606 cabinet.

Chapter 5 Installing Digital Distribution Frame covers the physical features of the 75Ω and 120Ω DDF and usage description.

Chapter 6 Checking Cabinet Installation provides the installation checklists after the installation of cabinet equipment is completed.

Intended Audience

The manual is intended for the following readers:

- Installation engineers and technicians
- Operation and maintenance personnel

Conventions

The manual uses the following conventions:

I. General conventions

Convention	Description
Arial	Normal paragraphs are in Arial.
Boldface	Headings are in Boldface .
Courier New	Terminal Display is in Courier New.

II. Command conventions

Convention	Description
Boldface	The keywords of a command line are in Boldface .
<i>italic</i>	Command arguments are in <i>italic</i> .
[]	Items (keywords or arguments) in square brackets [] are optional.
{ x y ... }	Alternative items are grouped in braces and separated by vertical bars. One is selected.

Convention	Description
[x y ...]	Optional alternative items are grouped in square brackets and separated by vertical bars. One or none is selected.
{ x y ... } *	Alternative items are grouped in braces and separated by vertical bars. A minimum of one or a maximum of all can be selected.
[x y ...] *	Optional alternative items are grouped in square brackets and separated by vertical bars. Many or none can be selected.
#	A line starting with the # sign is comments.

III. GUI conventions

Convention	Description
< >	Button names are inside angle brackets. For example, click the <OK> button.
[]	Window names, menu items, data table and field names are inside square brackets. For example, pop up the [New User] window.
/	Multi-level menus are separated by forward slashes. For example, [File/Create/Folder].

IV. Keyboard operation

Format	Description
<Key>	Press the key with the key name inside angle brackets. For example, <Enter>, <Tab>, <Backspace>, or <A>.
<Key1+Key2>	Press the keys concurrently. For example, <Ctrl+Alt+A> means the three keys should be pressed concurrently.
<Key1, Key2>	Press the keys in turn. For example, <Alt, A> means the two keys should be pressed in turn.

V. Mouse operation

Action	Description
Select	Press and hold the primary mouse button (left mouse button by default).
Click	Select and release the primary mouse button without moving the pointer.

Action	Description
Double-Click	Press the primary mouse button twice continuously and quickly without moving the pointer.
Drag	Press and hold the primary mouse button and move the pointer to a certain position.

VI. Symbols

Eye-catching symbols are also used in the manual to highlight the points worthy of special attention during the operation. They are defined as follows:



Caution, Warning, Danger: Means reader be extremely careful during the operation.



Note, Comment, Tip, Knowhow, Thought: Means a complementary description.

Environmental Protection

This product has been designed to comply with the requirements on environmental protection. For the proper storage, use and disposal of this product, national laws and regulations must be observed.

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Chapter 1 Installation Preparations

This chapter introduces the preparations before BTS3606 installation from the following aspects:

- Project Files
- Tools and Instruments
- Installation Conditions
- Unpacking

1.1 Project Files

Table 1-1 lists the project files relative to the hardware installation.

Table 1-1 Project files

File type	File name	Description
Instruction files for the project installation	Network Planning, Equipment room Layout, Detailed Construction Drawing, and Cable Routing Drawing	The customer must provide the copies of these documents to the equipment supplier before the equipment shipment.
	Site Survey Report	It is filled in by the supplier engineer on site.
	Engineering Design	Huawei engineers make this design based on the configuration at each office, which is shipped together with the equipment.
Product manuals	Airbridge BTS3606&3606A CDMA Base Station Installation Manual	Shipped together with the equipment.
Other project files	Contract	Shipped together with the equipment.
	Equipment Configuration List	
	Delivery List	

1.2 Tools and Instruments

Table 1-2 lists the tools and instruments needed for the installation.

Table 1-2 Tools and instruments

General tools	Measuring and marking instruments	Long tape, ruler (1 m), marker, powder marker, pencil
	Drilling tools	One percussion drill, some matched drill bits, one cleaner
	Clamping tools	Flathead screwdrivers: M3 – M6 Cross screwdrivers: M3 – M6 Adjustable wrenches Socket wrenches: M6, M8, M12, M14, M17, and M19 Double offset ring spanner: M6, M8, M12, M14, M17, and M19
	Pliers	Sharp-nose pliers, diagonal pliers, pliers, hand-held electric drill, file, handsaw, crowbar, and rubber hammer
	Auxiliary tools	Brush, nipper, paper knife, bellows, electric irons, solder wire, fork, and ladders
Special tools	Earth resistance tester, ESD-preventive wrist strap, ESD-preventive gloves, cable peeler, crimping pliers, RJ-45 connector crimping pliers, optical connector, and wire punchdown tool	
Instruments	Universal meter, 500 V megaohm meter (for testing the insulation resistance), BER tester, and optical power meter	

Note:

The equipment supplier provides the tool list and consults to the customer to specify the tool provider. The wire punchdown tool is delivered along with the cabinet.
Check the meters to ensure that they are qualified for use.

1.3 Installation Conditions

The project supervisor must do the following:

- Check the construction conditions.
- Fill out the Installation Environment Checklist.
- Sign the Kickoff Agreement with the customer if all conditions are ready.
- Formulate the Project Installation Plan.

If the installation is not prepared as required, fill out the Onsite Work Liaison Form to declare the reason for kickoff postpone.

If the customer needs immediate kickoff, require the time when the installation will be prepared.

1.3.1 Construction Conditions of the Equipment Room

Check the following items:

- Area and height of the equipment room
- Load bearing
- Doors
- Windows
- Walls
- Wiring trenches/troughs

If any item fails to meet the requirements, ask the customer to reconstruct to eliminate potential troubles for future work.

1.3.2 Environment Conditions of the Equipment Room

Check the following items according to the design requirements:

- The room illumination meets the requirements for equipment maintenance, and whether the daily lighting, standby lighting and emergency lighting systems are completely available.
- The water supply and drainage system meets the requirements for normal water supply and fire fighting.
- The air-conditioning and ventilation system is capable of maintaining proper temperature and humidity conditions in the room.
- Effective anti-static measures have been taken.
- Adequate fire-fighting equipment is available in the equipment room.
- The design of the equipment room meets the earthquake-proof/anti-shock requirements. The floor in the equipment room must be firm enough for fixing cabinets securely.
- The lightning protection measures have been taken in the equipment room.

1.3.3 Load-bearing Capacity of the Equipment Room

When installing the equipment inside a building, you must invite an architectural engineer to check the load-bearing capacity of the building from the following aspects:

- Weight of the equipment
- Floor space of the equipment
- Location to install the equipment
- Structure of the building

If the load-bearing capacity of the building cannot meet the requirements, reinforce the building.

1.3.4 Power Supply Conditions of the Equipment Room

For more details about the power supply requirements for the equipment room, see Airbridge BTS3606&3606A CDMA Base Station Installation Manual – Installation Reference.

1.3.5 Grounding Conditions

Satisfactory grounding is the basic requirement for the stable operation of the equipment, and is the primary precaution of the access network against thunder strokes or interference. Carefully check the grounding condition of the installation site and ensure satisfactory grounding according to actual requirements.

1.3.6 Auxiliary Equipment

The auxiliary devices in this section refer to those that must be ready to use before BTS installation, including:

- Sealing window of feeders
- Indoor grounding bar
- Cabling rack
- Transmission cables or devices for the peer end

Specifically, check the auxiliary devices as follows:

- The sealing window, indoor grounding bar, or cabling rack is installed.
- Enough cabling holes are available on the sealing window.
- The grounding bar can meet the grounding requirements of the BTS, or enough grounding terminals are available.
- The cabling rack can meet the wiring requirements for the BTS.
- The transmission devices at the peer end are commissioned and ready for use.
- The transmission cables at the peer end are laid down and ready for use.

If there are devices that cannot meet the requirements, it is advised for the customer to make improvements or reinstall the devices meeting the specified requirements.

1.4 Unpacking

This section describes the requirements and procedures of unpacking wooden cases and cartons.

1.4.1 Unpacking Requirements

After the project begins, the project supervisor must check the products together with the customer.

Check the following points:

- The total number of products is consistent with the packing list attached to the packing case.
- The arrival place is the installation site.
- The packing case is in good condition.
- The cabinet is placed upside down.

If the outer package is damaged or soaked; or the equipment is soaked and becomes rusty, stop unpacking and find the cause. Feed back the situation to the local Huawei Representative Office.

 Note:

To protect the equipment and find out the cause, move the unpacked equipment indoor for proper storage, and take a photo for the storage site, rusty or corroded equipment, packing cases, and packaging materials. Keep these photos and store the unpacked packing cases and packaging materials.

If the outer package is in good condition, follow the procedure below to unpack and check the equipment:

- 1) Unpack the case labeled "contains Packing List", and take out the Packing List. Check the case according to the Packing List.
- 2) If shortage and miscarriage occur, fill in the Cargo Shortage and Miscarriage Report.
- 3) If cargo damage occurs, fill in the Cargo Replacement Application Form.
- 4) Sign the Packing List together with the customer.

 Caution:

When transporting and moving equipment, components, or parts, avoid them from colliding with doors, walls, or shelves.

Never touch the uncoated surface of equipment, parts, or components with sweat soaked or dirty gloves.

1.4.2 Unpacking Wooden Case



Caution:

Do not put the wooden case upside down. Otherwise, the equipment will suffer severe damages.

Wooden cases are generally used to pack heavy objects like racks, batteries, and so on. A rack is usually packed with wooden boards, steel edges, tongues and foamed angle wraps.

It is recommended to move the packing case into or near the equipment room (if possible) to avoid damage to the cabinet during the transportation. The unpacking procedure is as follows:

- 1) Insert one end of the ejector lever into a hole of the tongue on the cover of the wooden case.
- 2) Turn the ejector lever to straighten the tongue, as shown in Figure 1-1. You can also use a screwdriver or a hammer to handle the tongue.

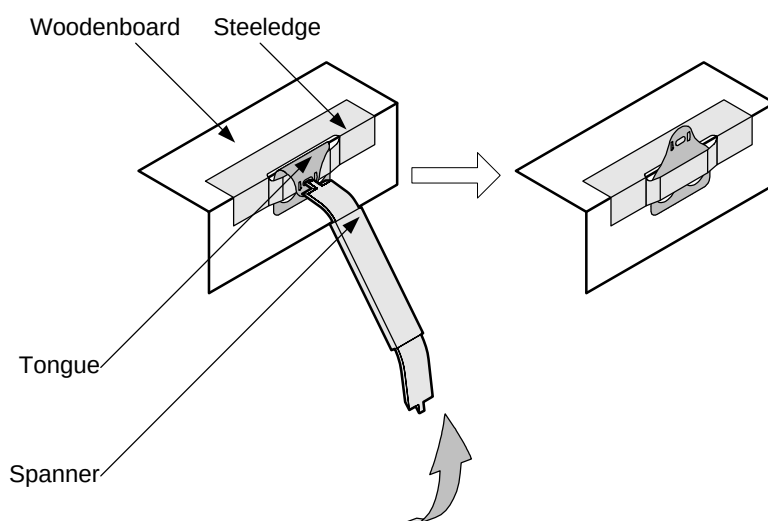


Figure 1-1 Straightening the tongues

- 3) After straightening all the tongues on the cover, remove the cover, as shown in Figure 1-2.

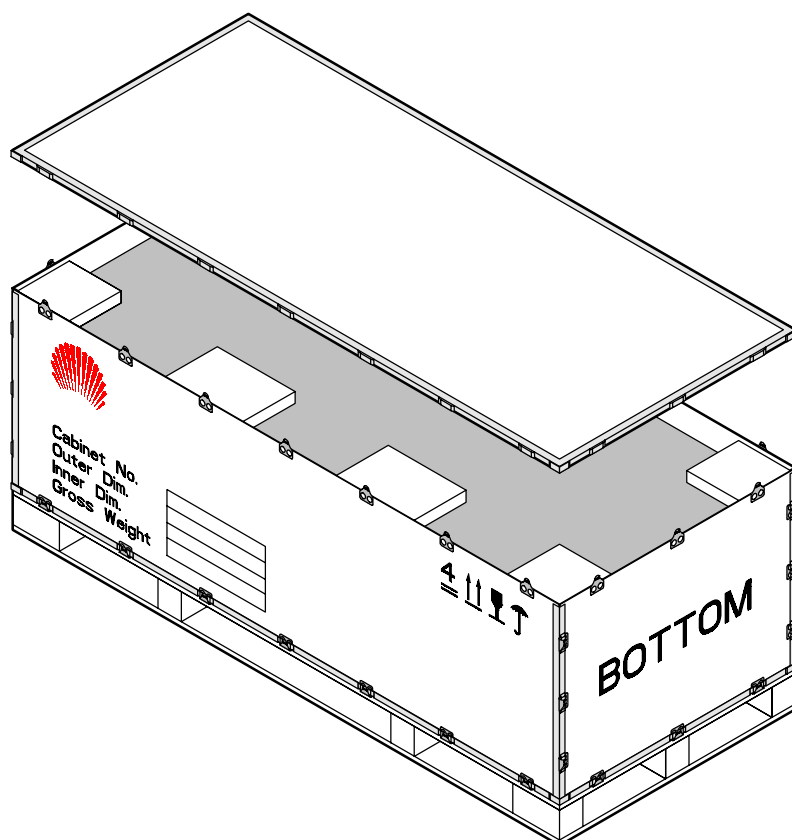


Figure 1-2 Removing the cover

- 4) Straighten all the tongues that join the wooden boards around the wooden case and remove the wooden boards, as shown in Figure 1-3.

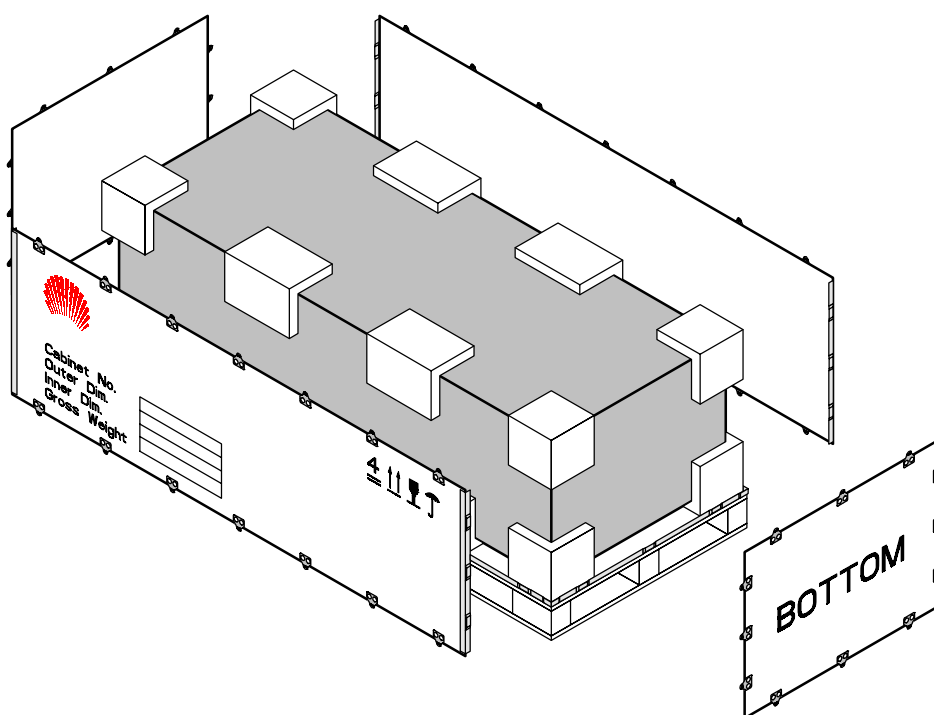


Figure 1-3 Removing all left wooden boards

- 5) Unpack other cases in the same way.

When handling the cabinet, hold on the solid places such as the upper cable rack or bone frame. Do not use too much force on places with poor rigidity, such as cable supports, cable fixing beams, to avoid any damage to the cabinet or any accident.

Remove the lining board of the rack at the place where the cabinet is to be installed. Otherwise, boards and signal cables may be damaged in the conveyance.

1.4.3 Unpacking Carton

Cartons are usually used to pack cables, circuit boards and terminal devices. During transportation, these circuit boards are usually put in anti-static bags. When unpacking the circuit boards, you need to take anti-static measures to avoid any damage to these boards.

Meanwhile, pay attention to the temperature and humidity of the environment. To keep the anti-static bag dry, you need to put desiccant in the bags so that it can absorb moisture in the bags. After transporting the equipment to a place with higher temperature and humidity, do not unpack it immediately until 30 minutes later. Otherwise, moisture will condense on the surface of the equipment, causing damage to it.

To open a carton, do as follows:

- 1) Check the types and quantity of boards inside the carton according to labels.

- 2) Cut the straps using diagonal pliers.
- 3) Cut the tapes along the seams of the carton cover using a knife. To avoid damaging equipment inside, do not apply too much force.
- 4) Open the carton and take out the foam materials.
- 5) View the labels of boards, and check whether the number of boards is consistent with what is specified on the label of the carton. Then, take out the boards.
- 6) Check the number and type of boards against the Packing List, and then accept them.

Figure 1-4 shows the carton packed with boards.

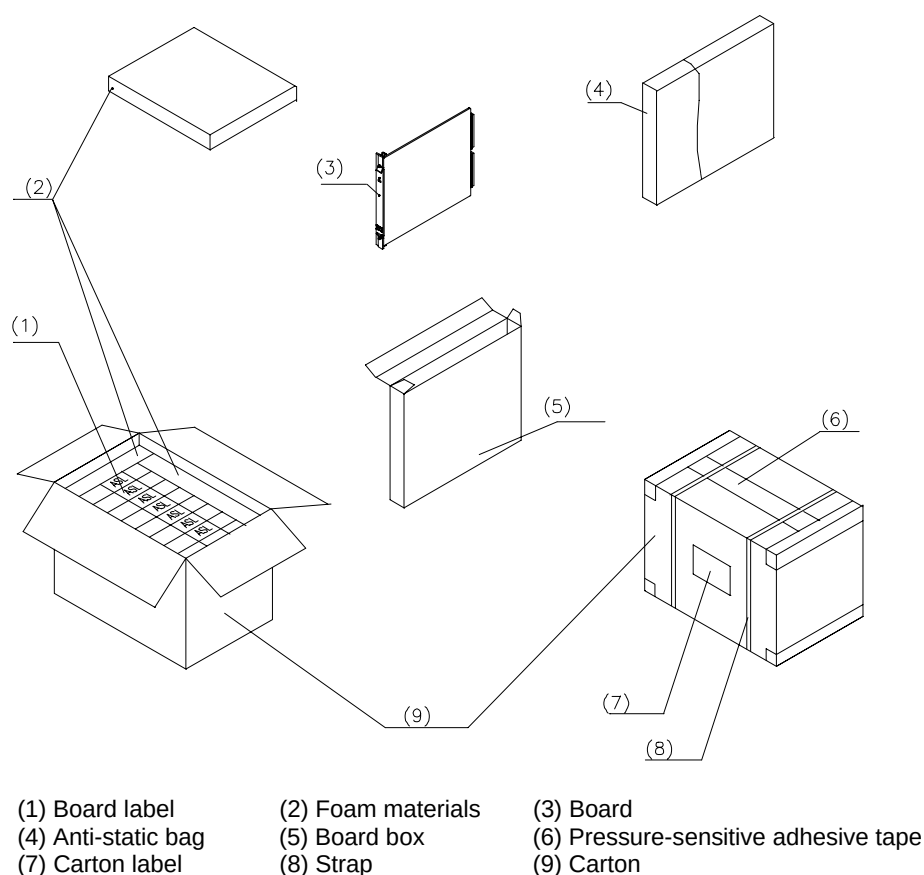


Figure 1-4 The carton packed with boards

Chapter 2 Installing Cabinet Assemblies

This chapter introduces how to install cabinet assemblies on the cement floor and antistatic floor. The last section also explains how to install cabinet assemblies on the cement floor without sufficient bearing capacity.

Cabinet assemblies include:

- Lower support, used for the installation on cement floor
- A600 support, used for installation on antistatic floor
- U-bar support, used for the installation on cement floor without sufficient bearing capacity

Figure 2-1 shows how to select the support according to environments.

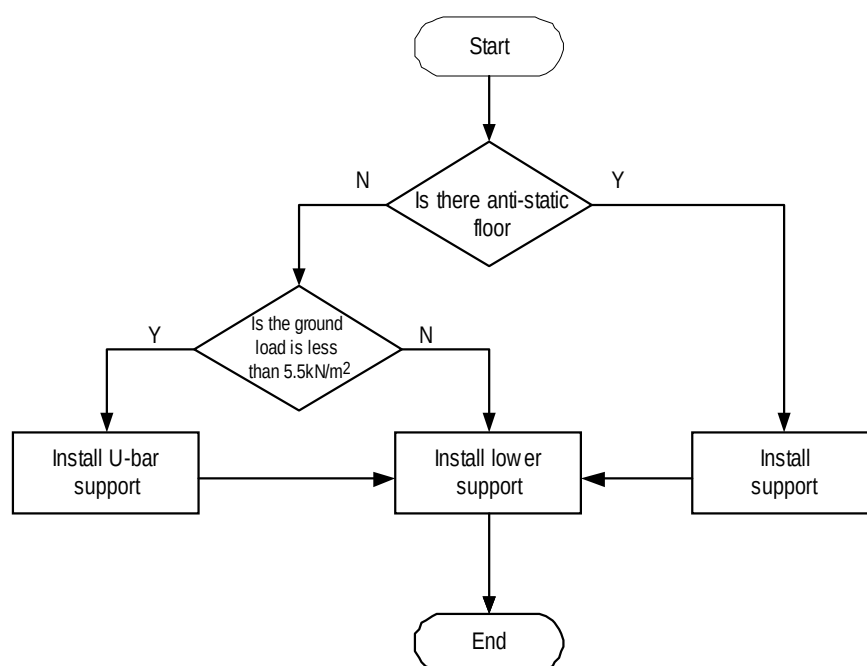


Figure 2-1 Selecting assemblies for installation

2.1 Introduction to Cabinet Assemblies

This section introduces the following information of the lower support, A600 support, and U-bar support:

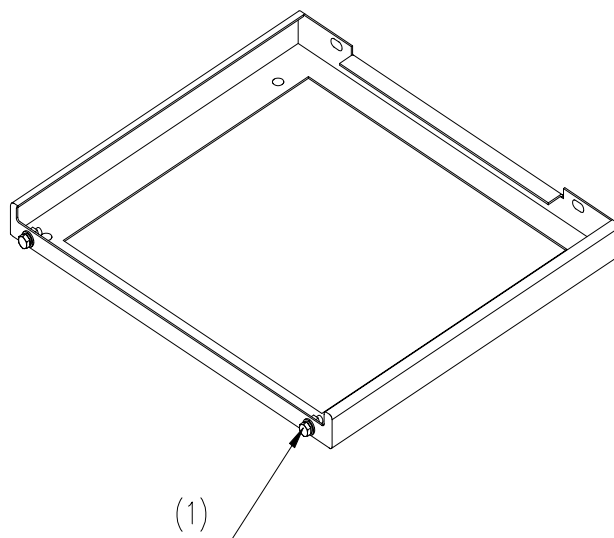
- Outline
- Assemblies

- Installation method
- Quantity

2.1.1 Lower Support

I. Outline

Figure 2-2 shows the outline of the lower support.



(1) Fastening bolt

Figure 2-2 Lower support

II. Assemblies

None.

III. Installation Method

The lower support is located between the cabinet and the cement floor. It is installed in different ways depending on the installation environment. For details, see the description of installation procedures.

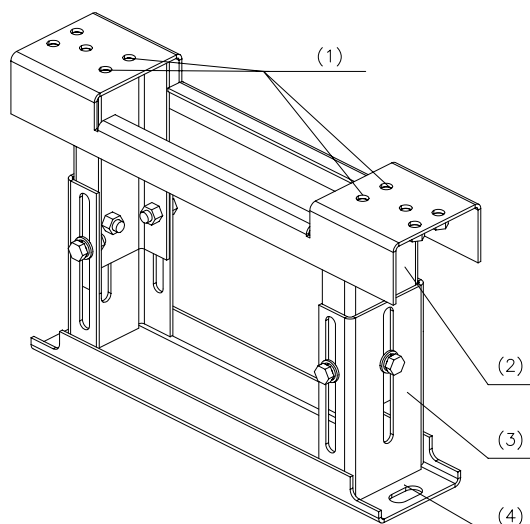
IV. Quantity

One lower support is needed for each cabinet.

2.1.2 A600 Support

I. Outline

Figure 2-3 shows the outline of A600 series support.



- (1) Connecting hole (2) Upper support
(3) Lower support (4) Installation hole

Figure 2-3 A600 series support

II. Assemblies

A600 series includes four types of assemblies: three height-adjustable types and one height-fixed type. Table 2-1 lists the ranges of the adjustable height.

Table 2-1 Height of A600 series supports assemblies

Assemblies	Range of height
I	195 mm – 230 mm (7.7 in. – 9 in.)
II	231 mm – 300 mm (9 in. – 12 in.)
III	301 mm – 445 mm (12 in. – 17.5 in.)
IV	Customized according to the floor height. Minimum height: 140 mm (5.5 in.)

 Note:

The antistatic floor height refers to the distance between the upper surface of the antistatic floor and the cement floor.

The heights of A600 series support assemblies I, II, and III can be adjusted steplessly within their adjustable ranges. You can adjust the heights by moving the upper and lower supports.

Type IV assembly is a height-fixed support. It is suitable for ultra-high or ultra-low antistatic floors. But the floor cannot be lower than 140 mm (5.5 in.).

III. Installation Method

Install the support in the floor-bracketing mode. That is, bracket the floor between the cabinet and the support, and then run the bolts through the antistatic floor to fix the cabinet and the support. In this way, the cabinet can be firmly fixed and supported.

IV. Quantity

Two supports are needed for each cabinet.

2.2 U-bar Support

I. Outline

The U-bar support is a big base made on the site. The recommended material for the support is the 14b-3000 type of GB707-88 hot-rolled U-bar.

Figure 2-4 shows the outline of the U-bar support.

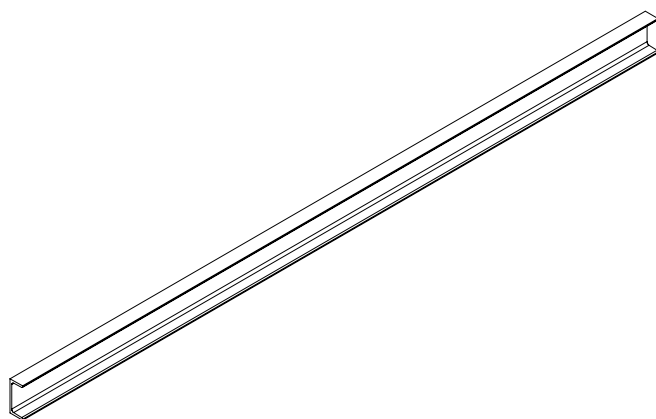


Figure 2-4 U-bar support

II. Assemblies

None.

III. Installation Method

You need to prepare the U-bar support on the site. For the specific method, see section 2.6 “Installing Assemblies on Cement Floor with Poor Bearing Capacity”.

IV. Length

Determine the length of the U-bar support as needed.

2.3 Cabinet Layout Principle

The principle of cabinet layout is as follows:

- The space between the cabinet back and the wall must be greater than 0.6m (24 in.).
- The cabinet side can be installed against the wall.
- The path with the width no less than 0.8m (32 in.) must be reserved in front of the cabinet.
- The cabinet must be positioned as close as possible to the feeder window to reduce the length of the feeder cable.

It is recommended to lay three BTS cabinets in a row, as shown in Figure 2-5, one as the main cabinet, the rest as auxiliaries.

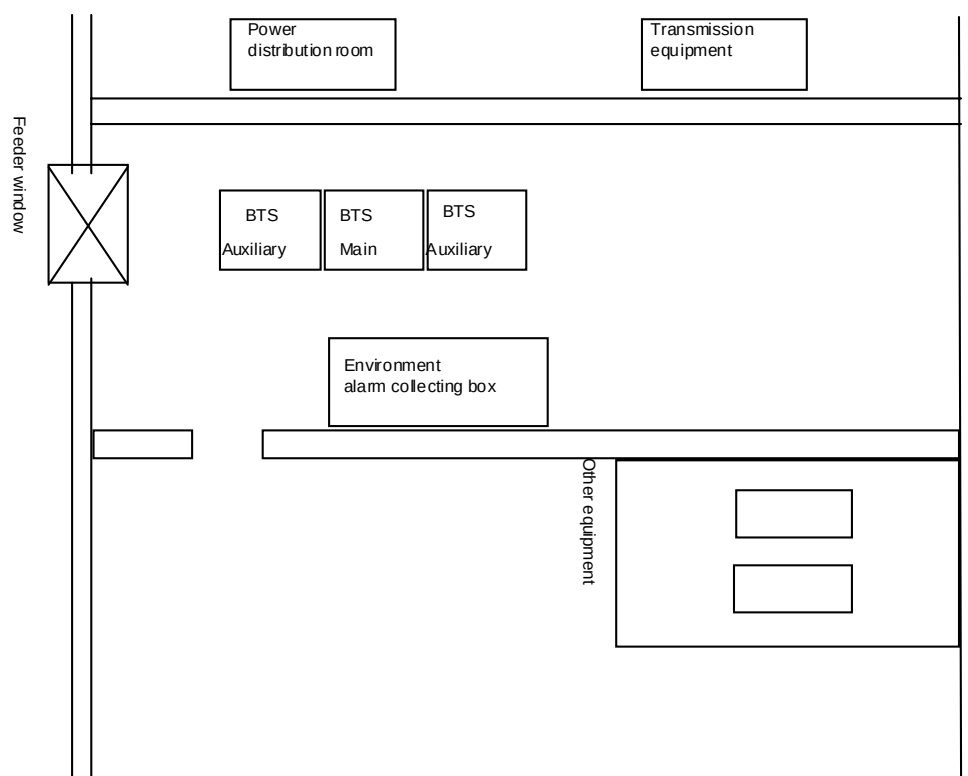


Figure 2-5 Layout of the equipment room

2.4 Installing Assemblies on Cement Floor

This section details the procedures of installing lower supports on the cement floor.

2.4.1 Installation Flowchart

Figure 2-6 shows how to install the cabinet assemblies (lower support) on the cement floor.

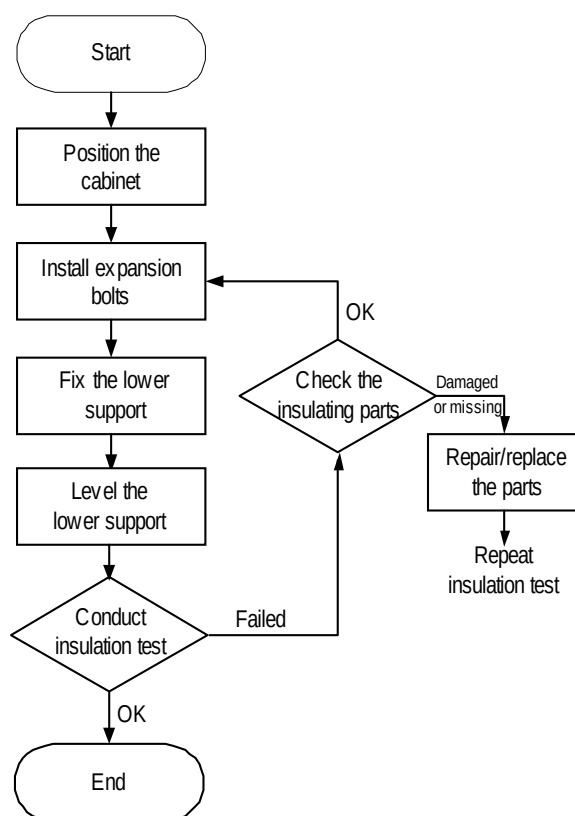


Figure 2-6 Installation flowchart of the lower support on cement floor

2.4.2 Installation Procedure

To install lower supports on the cement floor, proceed as follows:

I. Positioning the Cabinet

To position the cabinet, proceed as follows:

- 1) Determine the installation position of the cabinet according to the positioning dimensions specified in the project design and construction blueprint.
- 2) Place the lower support on the floor according to the cabinet layout.
- 3) Mark the positions of four connecting holes of the cabinet (Each cabinet has four connecting holes).

II. Drilling Holes and Installing Expansion Bolts



Caution:

- The depth of the hole must range from 52 mm (2 in.) to 60 mm (2.4 in.) (the length of the expansion tube plus that of the drill bit). Otherwise, the expansion bolt cannot be fastened.
 - All holes must have the same depth. Before measuring the hole depth, remove the dust inside the hole to measure the net depth.
 - If the floor is too hard and smooth to settle the drill bit, punch a pit with a chisel to help positioning the hole.
 - Make sure that the expansion tube is completely buried in the ground lest.
 - Feed the guiding rib on the nut into the guiding slot of the tube first. Otherwise, the expansion bolt can not be properly installed and secured.
-

To drill a hole and install the expansion bolt, proceed as follows:

- 1) Use the M12 expansion bolt and $\phi 16$ bit.
- 2) Hold the drill stock firmly with two hands, and keep the drill bit vertical to the ground to drill a hole.
- 3) Clean the dust with a vacuum cleaner when drilling.
- 4) Take off the M12×70 bolt, spring washer, plain washer, and insulating washer, as shown in Figure 2-7.

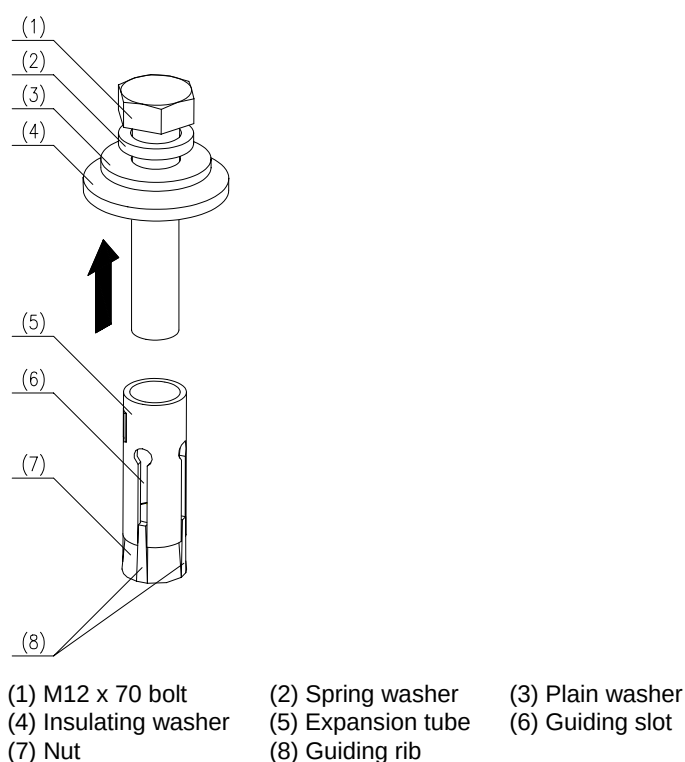


Figure 2-7 Disassembling an expansion bolt

- 5) Feed the tube and the nut into the hole vertically and make sure that the guiding rib on the nut meets the guiding slot of the tube, as shown in Figure 2-8.
- 6) Hammer the tube until it is completely buried in the ground.

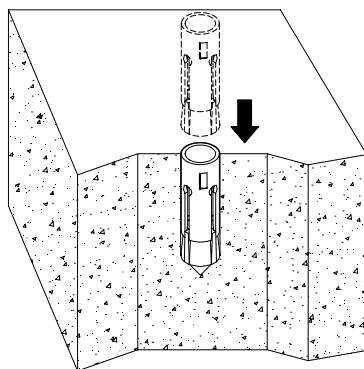


Figure 2-8 Installing an expansion bolt

III. Fixing the Lower Support

To fix the lower support, proceed as follows:

- 1) Place the insulating plate and the lower support in turn aligning with the four expansion bolts.

- 2) Place in turn the spring washer, plain washer, and insulating covering onto the four M12×60 bolts.
- 3) Lead the bolts through the lower support.
- 4) Diagonally fasten them to a 45 N·m (400 in·lb), as shown in Figure 2-9.

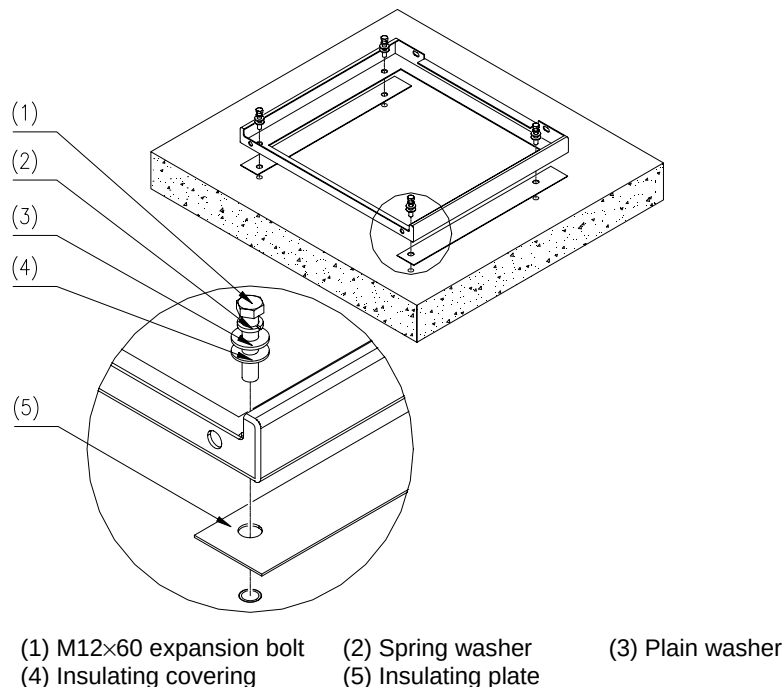


Figure 2-9 Installing the lower support

IV. Leveling the Lower Support

To level the lower support, proceed as follows:

- 1) Place a level bar in vertical direction on the top-plane of the lower support.
- 2) Check the levelness of the lower support.
- 3) When an error occurs, adjust the levelness by adding gaskets beneath the lower support, as shown in Figure 2-10.

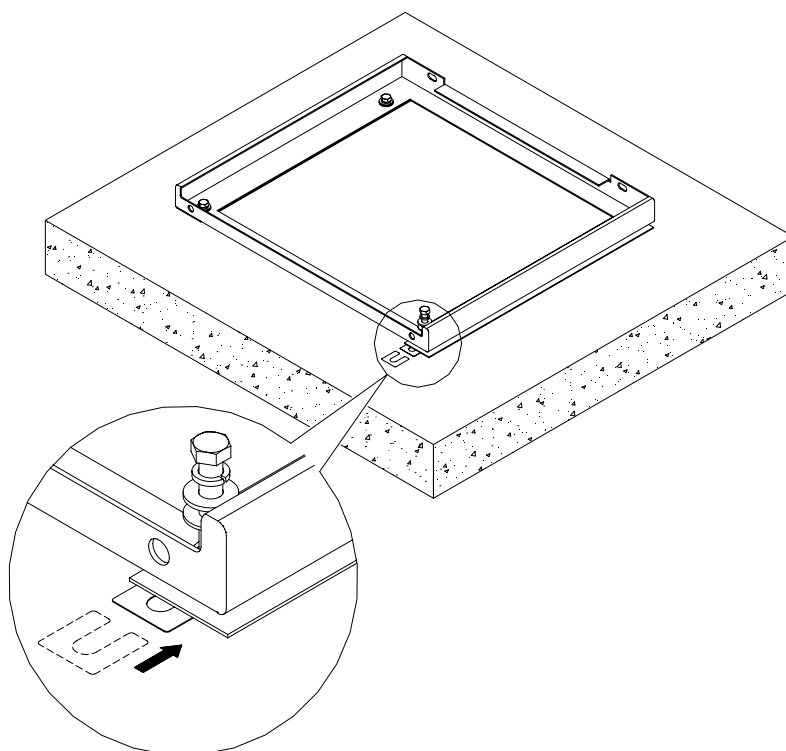


Figure 2-10 Leveling the lower support

V. Conducting Insulation Test

To conduct an insulation test, proceed as follows:

- 1) Set the multimeter to " $M\Omega$ ".
- 2) Connect the two probes to the paint-free place of the base and the expansion bolt.
- 3) If the resistance is larger than $5 M\Omega$, the insulation is properly done. The installation ends here. Otherwise, go to step 4.
- 4) Check whether any insulating covering or insulating washer is missing or damaged. If any, replace with new parts and then conduct the insulation test again. Otherwise, reinstall the expansion bolts and conduct the insulation test.

2.5 Installing Assemblies on Antistatic Floor

This section details the procedures of installing lower supports and A600 supports on the antistatic floor.

2.5.1 Installation Flowchart

Figure 2-11 shows how to install cabinet assemblies (support and lower support) on the antistatic floor.

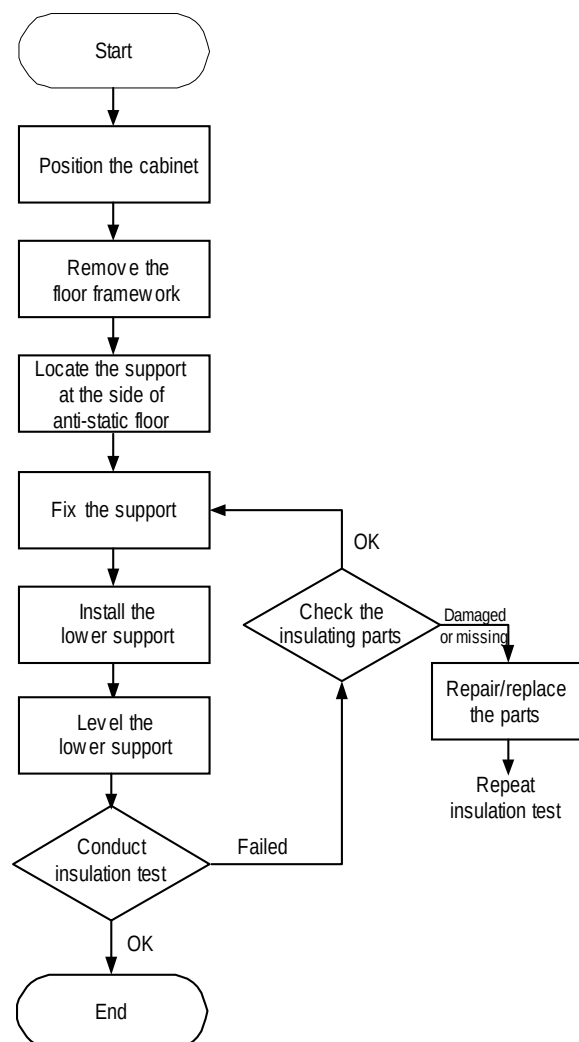


Figure 2-11 Installation flowchart of support and lower support on antistatic floor

2.5.2 Installation Procedure

The following describes the procedure of installing assemblies on the antistatic floor.

I. Positioning the Cabinet and Removing the Floor



Caution:

- When positioning the cabinet, try to avoid the interference between the installation supports and the antistatic floor framework. Keep the framework intact.
 - If the interference is unavoidable, remove the floor framework at the place where the interference occurs during the installation. Align the first cabinet with the floor edge.
-

To position the cabinet and remove the floor framework, proceed as follows:

- 1) Determine the installation position of the cabinet according to the positioning dimensions specified in the project design and construction blueprint.
- 2) Place the lower support on the floor according to the cabinet layout.
- 3) Mark the positions of four connecting holes of the cabinet (Each cabinet has four connecting holes).
- 4) Remove the lower support.
- 5) Use the $\phi 20$ bit to drill holes through the marked places. See section 2.4.2 II. "Drilling Holes and Installing Expansion Bolts" for details.
- 6) Remove the antistatic floor for installation using a special tool (for example, panel lifter).
- 7) Remove strutting pieces for the antistatic floor.

II. Locating the Support at the Side of Antistatic Floor



Note:

Install the support according to Figure 2-12. Align the connecting holes at the outer side of the support with the floor holes to prevent the support extruding out of the cabinet.

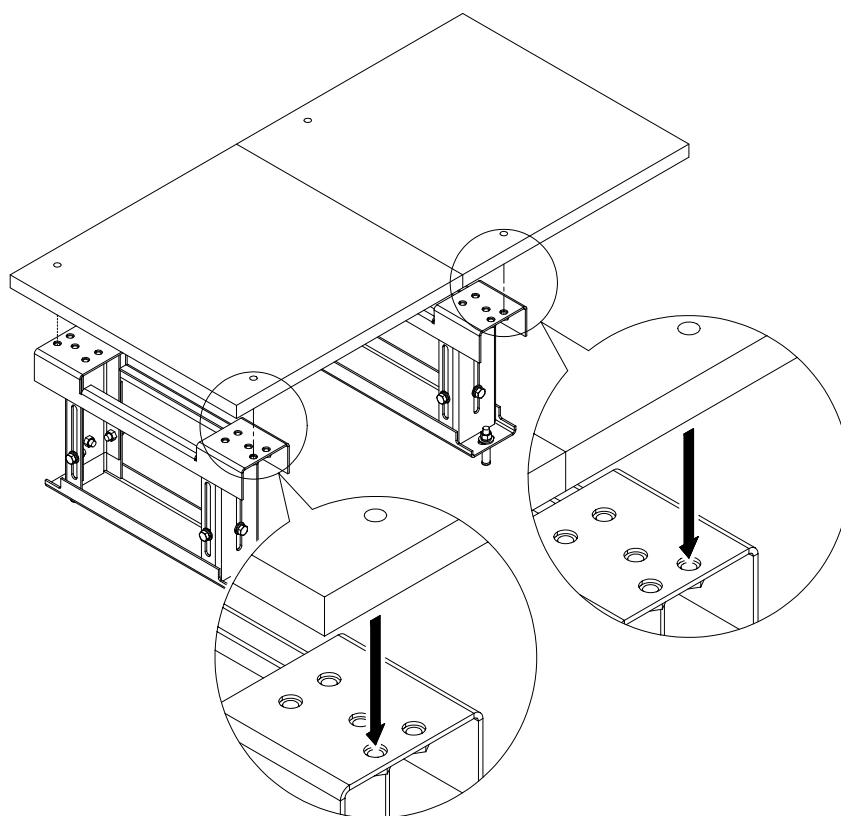


Figure 2-12 Connection between support connecting holes and floor holes

III. To locate the support at the side of antistatic floor, proceed as follows:

- 1) Place the support below the antistatic floor.
- 2) Align the connecting holes of the support with the holes on the antistatic floor.
- 3) Take the installation hole of the support as the template. Mark positions for the expansion bolts on the concrete floor.
- 4) Use a $\Phi 16$ drill bit to drill holes at the marked places. Details about the drilling are available in section 2.4.2 I. "Positioning the Cabinet".
- 5) Install expansion bolts by following the instructions in section 2.4.2 II. "Drilling Holes and Installing Expansion Bolts".
- 6) Finely adjust the height-locking bolts on the upper support until they do not slip down by themselves.
- 7) Put the support back to its installation position. Run the expansion bolt through the installation hole of the support.

IV. Fixing Support

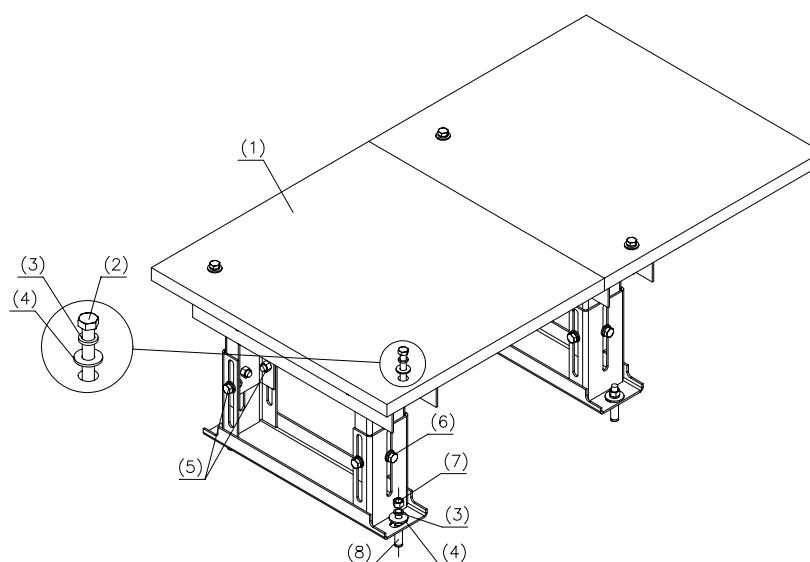


Caution:

Fasten the three bolt sets in the following order: Anchor bolt for the floor → expansion bolt → height-lock bolt (first in the middle, then on both sides)

To fix the support, proceed as follows:

- 1) Align the holes on the antistatic floor with the connecting holes of the support.
- 2) Tighten M12×70 bolts from top to bottom.
- 3) Install the plain washer, spring washer, and insulating covering, as shown in Figure 2-13.



- | | | |
|------------------------------------|------------------------------------|-----------------------------|
| (1) Antistatic floor | (2) M12×70 bolt | (3) $\phi 12$ spring washer |
| (4) $\phi 12$ plain washer | (5) Height-lock bolts (both sides) | |
| (6) Height-lock bolt (middle) | (7) M12 nut | |
| (8) M12×80 exploded expansion bolt | | |

Figure 2-13 The position of anchor bolts

- 4) Gently knock the support with a rubber hammer to adjust the height so that the antistatic floor falls on its original place on the framework. Make sure that the upper plane presses against the antistatic floor.
- 5) Tighten the anchor bolts on the antistatic floor.
- 6) Make the expansion bolts cross fastened to 45 N·m (400 in·lb) with a torque wrench one by one to reduce the stress between the bolts and the support.
- 7) Tighten the height-lock bolts to 45 N·m (400 in·lb) with a torque wrench. First tighten the bolts in the middle, and then those on both sides.

Figure 2-13 shows the position of anchor bolts.

V. Installing the Lower Support

To install the lower support, proceed as follows:

- 1) Remove four bolts and one gasket that connect the antistatic floor and the support.
- 2) Place the insulating plate and the lower support in turn.
- 3) Level the sections of the subrack in both the longitude and latitude directions with a level bar, and make sure the level vial is in the middle.
 - If the error is small, adjust the levelness by striking the joint between the lower support and the support with a rubber hammer while measuring.
 - If the error is big, add gaskets between the lower support and the insulating plate to adjust the levelness.
- 4) Place in turn the spring washer, plain washer, and insulating covering onto the four bolts.
- 5) Lead the bolts through the lower support.
- 6) Diagonally fasten them to 45 N-m (400 in-lb) with a torque wrench.

Note:

Install the insulating plate, insulating covering, and the plain washer as shown in Figure 2-14. Make sure the cabinet is insulated from the earth.

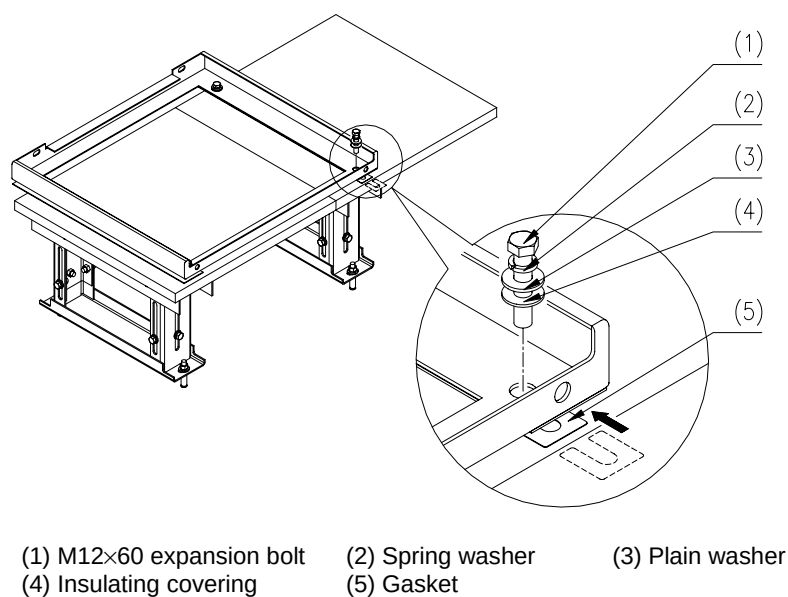


Figure 2-14 Installing the lower support

VI. Leveling the lower support

See section 2.4.2 IV. “Leveling the Lower Support”.

VII. Conducting insulation test

See section 2.4.2 V. “Conducting Insulation Test”.

2.6 Installing Assemblies on Cement Floor with Poor Bearing Capacity

This section details the procedures of installing lower support and U-bar support on cement floor of insufficient bearing capacity.

2.6.1 Installation Flowchart

Figure 2-15 shows how to install cabinet assemblies (U-bar support and lower support) on the cement floor with insufficient bearing capacity.

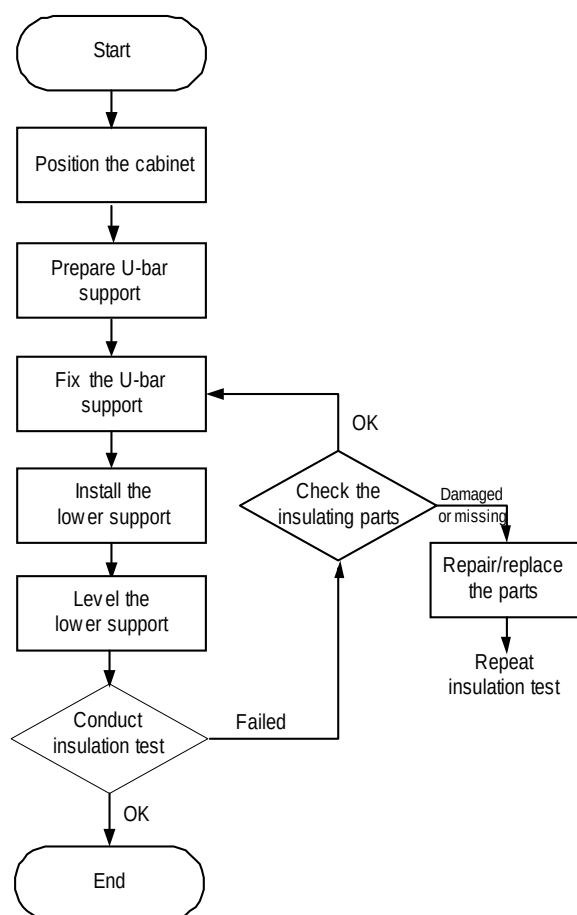


Figure 2-15 Installation flowchart on cement floor without sufficient bearing capacity

2.6.2 Installation Procedure

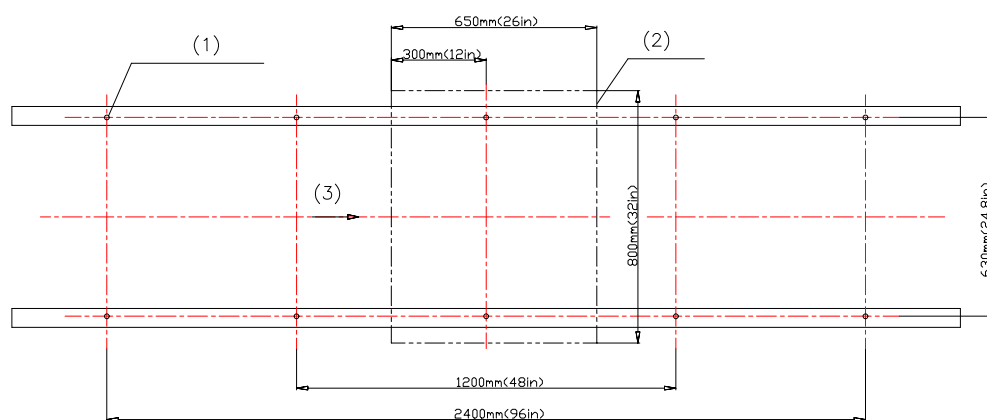
The following describes the procedure of installing assemblies on the cement floor with poor bearing capacity.

I. Positioning the Cabinet

To position the cabinet, proceed as follows:

- 1) Determine the installation position of the cabinet according to the positioning dimensions specified in the project design and construction blueprint.
- 2) Position the U-bar support according to the cabinet layout.
- 3) Measure off several points with a measuring tape.
- 4) Draw two straight parallel benchmark lines with a marker. The spacing between the two straight lines is 630 mm (24.8 in.).
- 5) Determine the position of the first hole for the U-bar support on the two lines according to the design requirement. Take this hole as the benchmark point to mark the rest installation holes of the support one by one.

- 6) Re-measure the lines to confirm the accuracy of each hole. Figure 2-16 illustrates the positions of installation holes for U-bar supports.



- (1) M12 expansion bolt (2) Outline of the cabinet (3) Front face of the cabinet

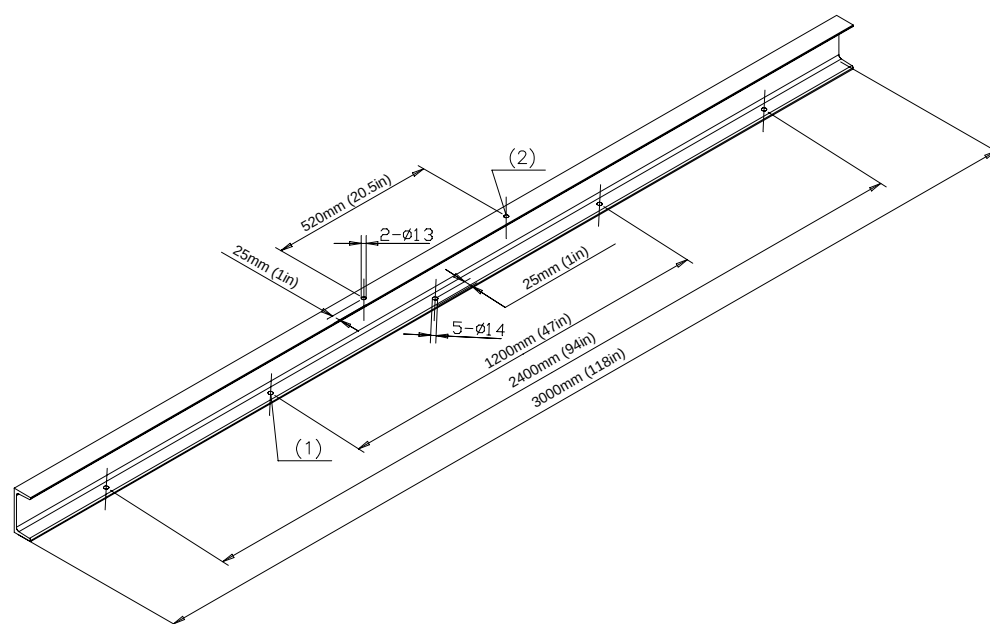
Figure 2-16 Installation hole positions of U-bar supports

- 7) Place the lower support on the floor according to the cabinet layout.
- 8) Mark the positions of four connecting holes of the cabinet (each cabinet has four connecting holes) on the floor under the lower support.
- 9) Remove the lower support.
- 10) Use the $\phi 20$ bit to drill holes through the marked places.

II. Preparing U-bar Support

To prepare the U-bar support, proceed as follows:

- 1) Drill installation holes for the cabinet and fixing holes on the U-bar, as shown in Figure 2-16 and Figure 2-17.



(1) U-bar fixing hole

(2) Installation hole of the base

Figure 2-17 Drilling holes on U-bar support

- 2) Remove all burrs and sharp edges.
- 3) Paint the whole support with rustproof coat and top-coat. The color of the coat must be the same as or similar to that of the cabinet.

III. Fixing the U-bar Support

To fix the U-bar support, proceed as follows:

- 1) Install expansion bolts by following the instructions in section 2.4.2 II. "Drilling Holes and Installing Expansion Bolts".
- 2) Place the U-bar support onto the installation position aligning the installation holes with U-bar fixing holes.
- 3) Fasten the nuts one by one, as shown in Figure 2-18.

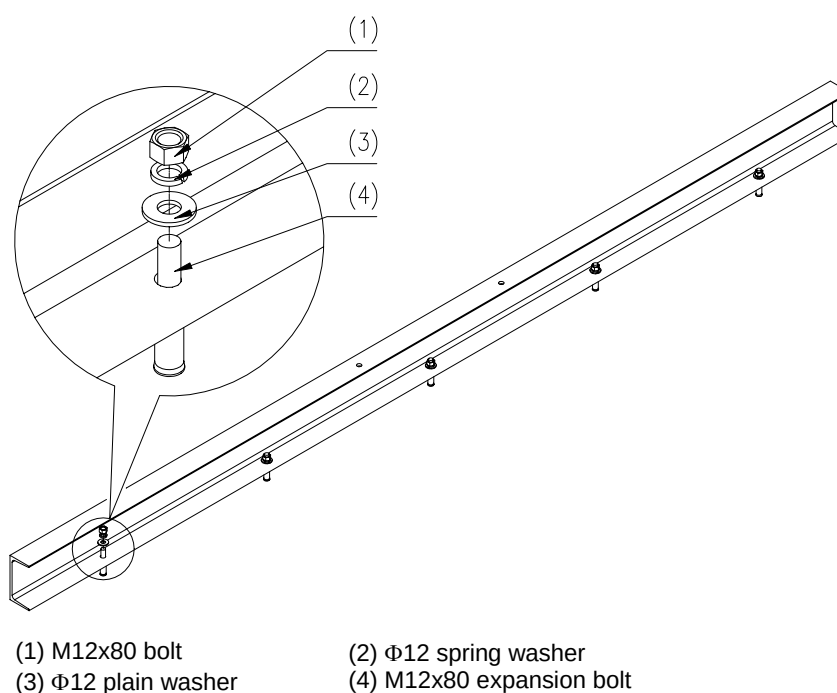


Figure 2-18 Installing the U-bar support

- 4) Cross-fasten the nuts of the lower support one by one to reduce the stress between the bolts and the lower support.
- 5) Place the insulating plate and the lower support on the U-bar support. Align the four holes in the insulating plate and lower support with those in the upper plane of the U-bar support.
- 6) Put the spring washer, plain washer, and insulating covering on the M12×45 bolt one by one. See Figure 2-19.

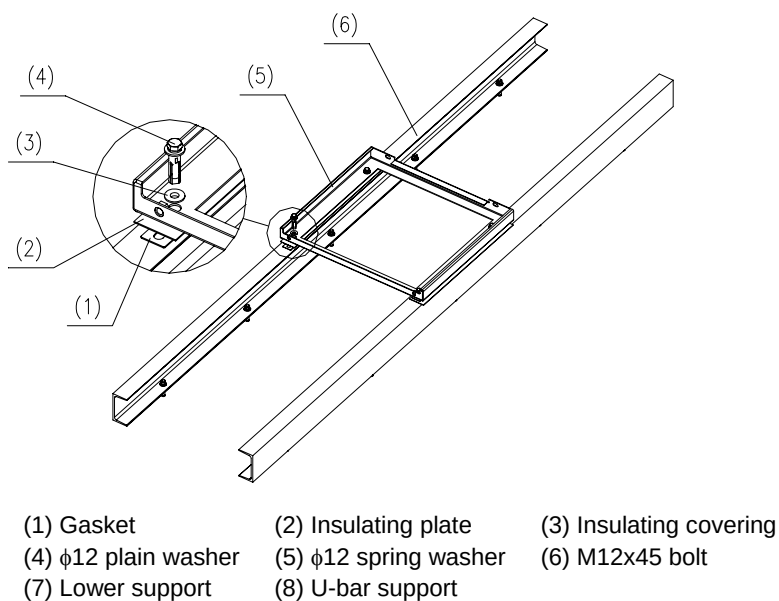


Figure 2-19 Installing the lower support

- 7) Place the bolts with fixed fittings into the four holes and tighten them slightly.
- 8) Make sure the support is level and then cross-fasten the bolts of the lower support to 45 N-m (400 in-lb) with a torque wrench.

IV. Leveling the Lower Support

See section 2.4.2 IV. “Leveling the Lower Support”.

V. Conducting Insulation Test

See section 2.4.2 V. “Conducting Insulation Test”.

Chapter 3 Installing Cabinet and Cabinet Equipment

This chapter introduces the procedures of installing and fixing BTS3606 cabinets and the equipment in cabinets.

3.1 Installing Cabinet

To install a BTS3606 cabinet, proceed as follows:

- 1) Lift the cabinet onto the lower support and align the upper support with the lower support.
- 2) Push the upper support into the lower support.
- 3) Tighten the bolts at the front face of the cabinet.
- 4) Mount the cover.
- 5) Tighten the bolts on the cover.

Figure 3-1 shows how to install a BTS3606 cabinet on the cement floor.

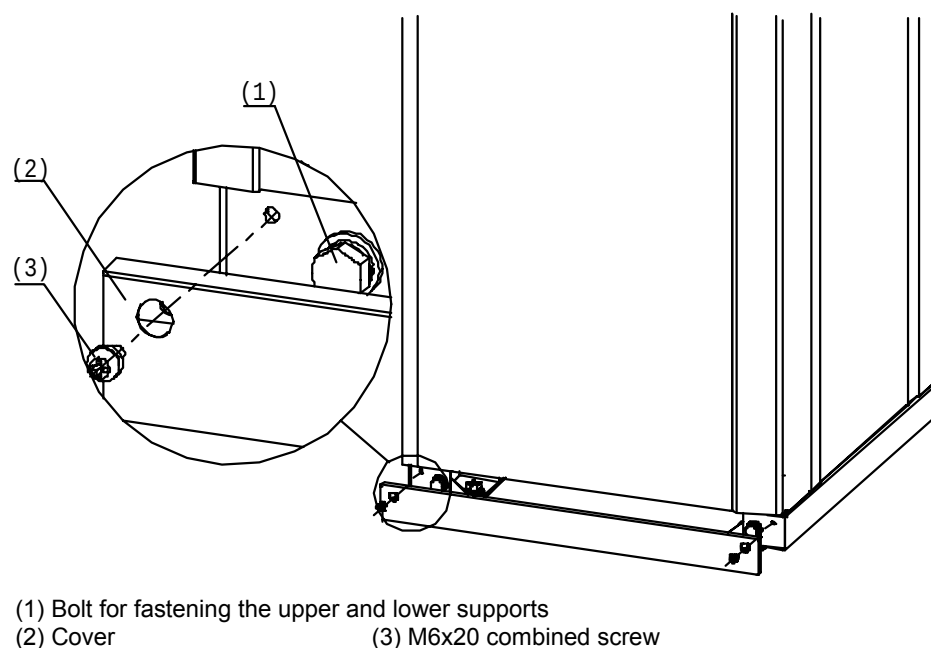
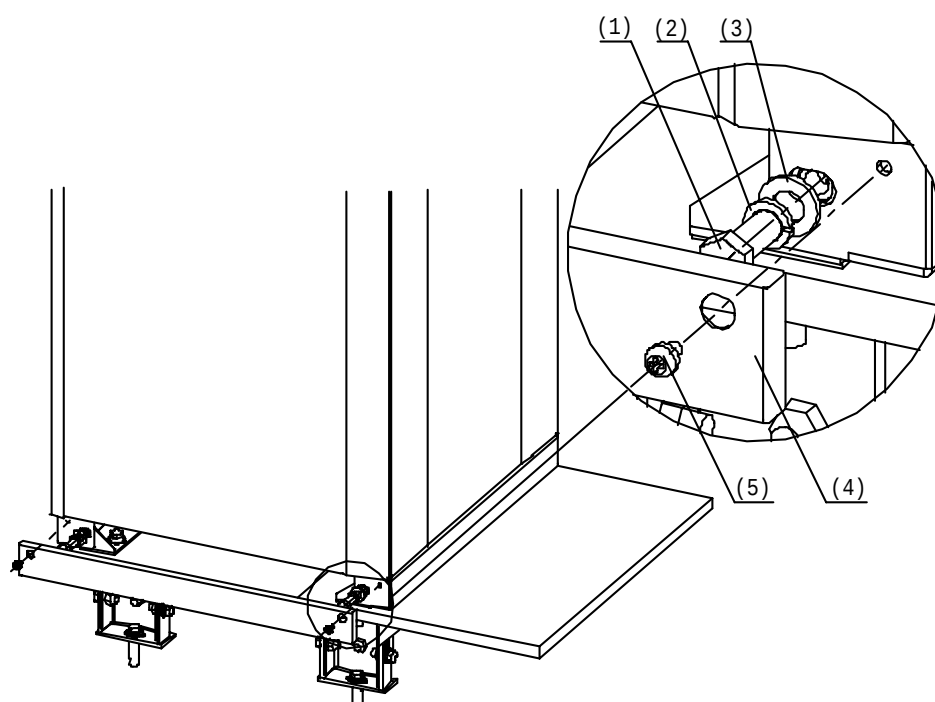


Figure 3-1 Installing a cabinet on the cement floor

Figure 3-2 shows how to install a BTS3606 cabinet on the antistatic floor.



(1) M12x30 bolt

(2) Φ12 spring washer

(3) Φ12 plain washer

(4) Cover

(5) M6x20 combined screw

Figure 3-2 Installing a cabinet on the antistatic floor

Figure 3-3 shows how to install a BTS3606 cabinet on the floor without sufficient bearing capacity.

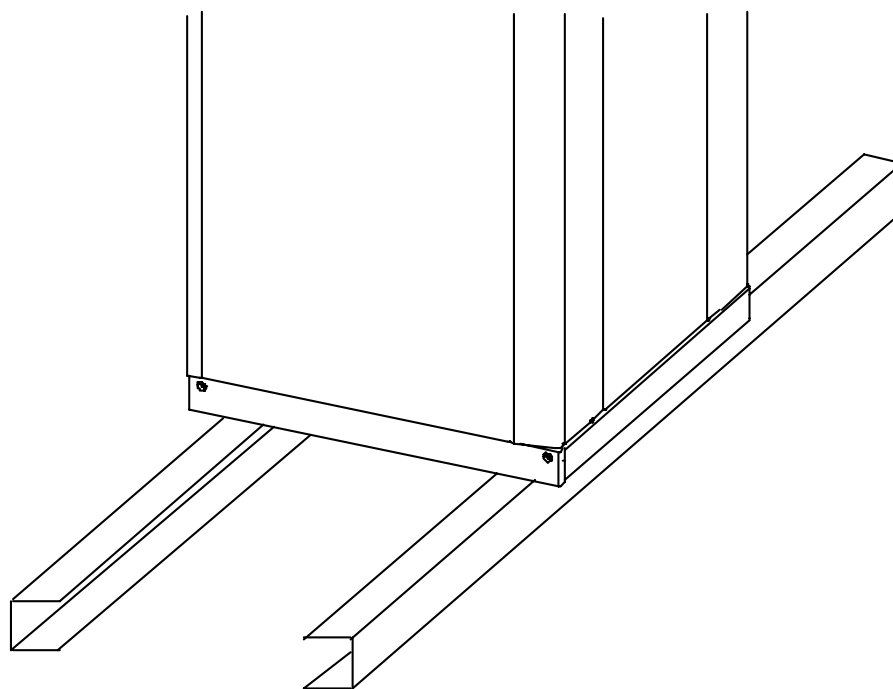


Figure 3-3 Installing a cabinet on the floor without sufficient bearing capacity

3.2 Installing or Removing Cabinet Doors

The following provides the procedures of installing cabinet doors. To remove cabinet doors, do it in a reverse order.

3.2.1 Installing or Removing Rear Doors

To install the rear door, proceed as follows:

- 1) Align the rear door with the positioning pin on the lower part at the back of the cabinet.
- 2) Mount and fix six captive screws on the rear door, as shown in Figure 3-4.

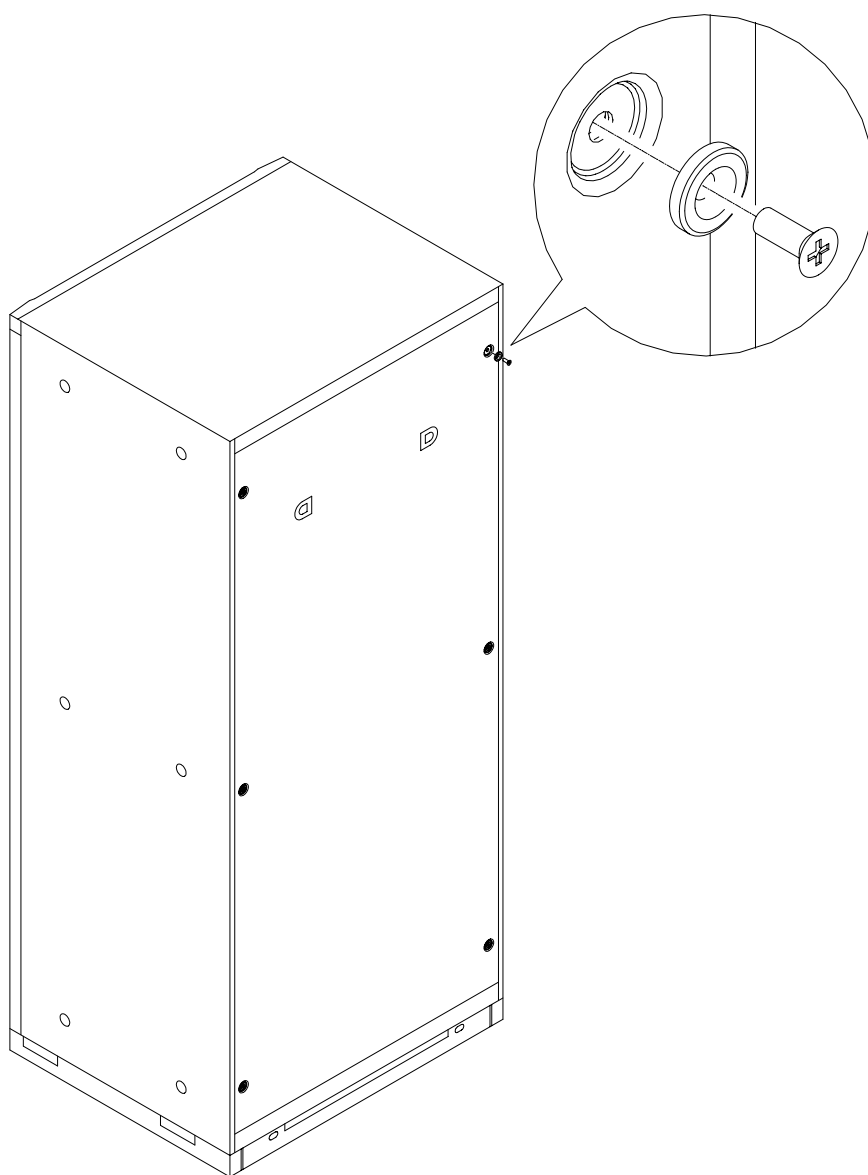


Figure 3-4 The position of captive screws

3.2.2 Installing or Removing Side Doors

To install the side door, proceed as follows:

- 1) Align the side door with the positioning pin on one side of the cabinet.
- 2) Install the six captive screws on the side door.

Note:

Be careful of the protection grounding cables when installing or removing the side doors.

3.2.3 Installing or Removing Left-Front and Right-Front Doors

The following describes the installation of the left-front door, and the installation of the right-front door is same with it.

To install the left-front door, proceed as follows:

- 1) Remove the positioning pin base on the top of the cabinet. (The positioning pin on the top of the cabinet is fixed on the positioning pin base.)
- 2) Align the left-front door with the positioning pin on the left bottom of the front cabinet.
- 3) Match the positioning hole on the lower part of the left-front door with the positioning pin on the front part of the cabinet base.
- 4) Insert the positioning pin previously removed to the positioning hole on the upper part of the front door.
- 5) Fix the positioning pin base.

3.3 BTS3606 Cabinet Configuration

Figure 3-5 shows the BTS3606 cabinet configuration in the full configuration.

When the BTS3606 supports multi-channel configuration, the slots of the CTRMs are configured with the CMTRs, and the slots of the CHPAs are configured with the CMPAs.

The slots of the CCPMs in Figure 3-5 can also accommodate the CECM.

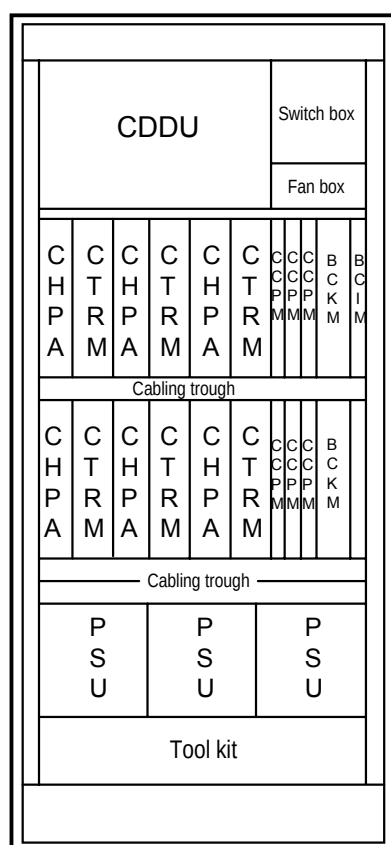


Figure 3-5 BTS3606 cabinet configuration

3.4 Installing Boards in Baseband Subrack

Baseband boards include BCIM, BCKM, and CCPM/CECM. This section explains installation of boards in the baseband subrack and the attentions must be paid during the operation.

Note:

The slot for the channel processing board is marked as “CEM”, that is, channel element module. Either the CCPM or the CECM can reside on this slot.

3.4.1 Precautions

Pay attention to the following points:

- Before installing boards and modules, check whether the DIP switches (if any) on the backplane and the boards are correctly set according to the silk screen printed on the boards.

- If a dummy panel is on the slot, loose the bolts and remove the dummy panel before installing the board.
- Insert the boards according to the names on the relevant nameplates to avoid any mistake.
- Do not touch the printed circuit board (PCB) and other components on the board, except jumpers and DIP switches.
- Insert the board vertically and gently lest the pins and components on the backplane be damaged.
- Insert the grounding plug of the antistatic wrist strap into the antistatic jack on the side door post of the cabinet.

3.4.2 Installation Procedure

To install the boards in the baseband subrack, proceed as follows:

- 1) Make sure the subracks are clean.
- 2) Wear an antistatic wrist strap and ground it by inserting its grounding plug to the antistatic jack on the side door post of the cabinet.
- 3) Check whether there are any bent, missing or broken pins on the backplane.
 - If any pin is tilted, straighten it using sharp-nose pliers in the case of emergency.
 - If any pin is missing or broken, replace the backplane.
- 4) Make sure the ejector levers on the front panel are in the state as shown in Figure 3-6.

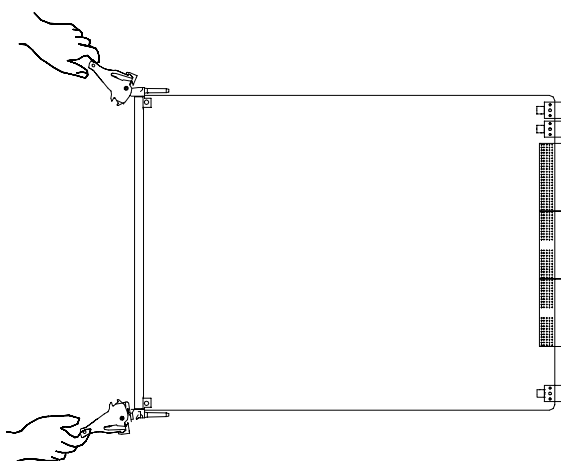


Figure 3-6 Installing a board (1)

- 5) Hold the upper ejector lever on the front panel with one hand and uplift the board with the other.
- 6) Put the board on the right guide rail.
- 7) Hold the two ejector levers and insert the board along the guide rail gently until it is fully engaged.

- 8) Turn the two ejector levers towards the middle of the panel to fix the board, as shown in Figure 3-7.

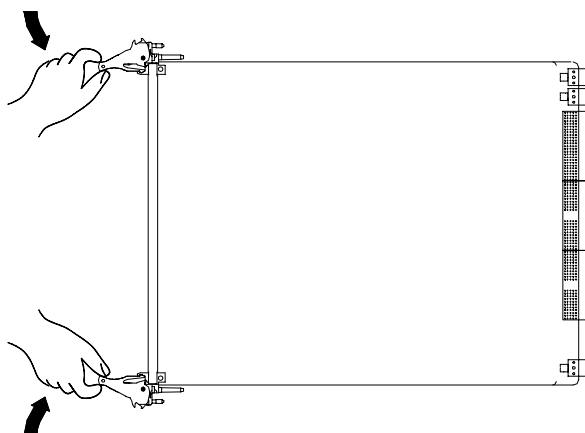


Figure 3-7 Installing a board (2)

- 9) Tighten the screws clockwise on the front panel, as shown in Figure 3-8.

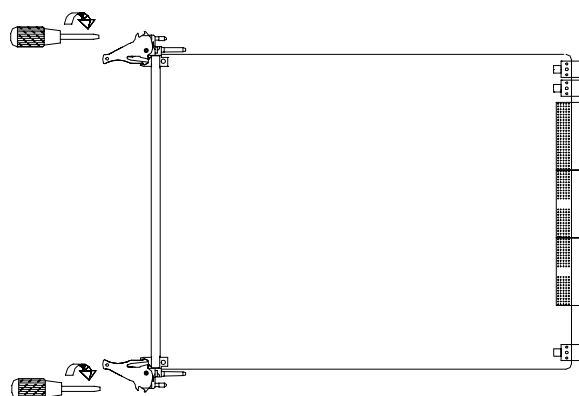


Figure 3-8 Installing a board (3)

3.5 Installing Modules in RF Subrack

RF modules include CTRM, CHPA, CMTR, CMPA, and CDDU. This section introduces the installation of modules in the RF subrack and precautions.

3.5.1 Precautions

The transmit and receive performance of the BTS may degrade if the CTRM/CMTR, CDDU, or other RF modules are fastened before being inserted in position.

3.5.2 Installation Procedure

To install a module in the RF subrack, proceed as follows:

- 1) Make sure the subrack is clean.

- 2) Wear an antistatic wrist strap and insert the grounding terminal of the wrist strap into the anti-static jack on the side door of the cabinet.
- 3) Align the RF module with the relevant subrack.
- 4) Insert the module gently along the guide rail until it is fully engaged.
- 5) Fasten all screws onto the panel one by one and ensure that the module panel is in full contact with the subrack.

 Note:

- The modules are removed in the reverse order of installing them.
 - CDDUs are installed from the top down, and they are not equipped with RF fans.
-

3.6 Installing Power Module

The BTS3606 power module is a DC/DC unit. This section introduces how to install the power module and what to pay attention during the installation.

3.6.1 Precautions

Pay attention to the following points during the installation:

- Insert or remove the boards according to the board names on the nameplates to avoid any mistake.
- Insert the boards with care to prevent damage to the pins on the backplane.
- Never tighten the captive screw with too much force. If necessary, reinstall the module and align the mounting holes in the module with those in the subrack.

3.6.2 Installation Procedure

To install the power module, proceed as follows:

- 1) Clean up the cabinet and the subrack.
- 2) Check whether there are any bent, missing or broken pins on the backplane (the side connected with the module).
 - If any pin is bent, straighten it.
 - If any pin is missing or broken, replace the backplane.
- 3) Wear the antistatic wrist strap and insert the grounding terminal of the wrist strap into the anti-static jack on the side door of the cabinet.
- 4) Remove the dummy panel.
- 5) Align the board with the corresponding guide rail according to the board name on the nameplate.
- 6) Insert the board along the corresponding guide rail until it is in position.
- 7) Tighten the four captive screws on the panel.

3.7 Installing Other Functional Modules

The installation procedure of other functional modules such as fan box is the same as that of RF modules. For details, see section 3.5.2 “Installation Procedure”.

 Note:

Normally, the fan box is installed upon delivery. No field installation of the fan box is required.

3.8 Installing Equipment in Extension Cabinet

When BTS3606 cabinets are combined, the slots for the BCKM and CCPM/CECM in the extension cabinet are configured with the TMCM and LECM. To install the TMCM and LECM, proceed as follows:

- Insert the TMCM into the slot of the BCKM in the upper half part of the combined subrack.
- Insert LECMs into the slots of the CCPM/CECM in the upper half part of the combined subrack from right to left. A maximum of three LECMs can be configured.

For instructions on the installation of modules and boards, see sections 3.1 to 3.7 .

Chapter 4 Installing Cables

This chapter introduces the types of cables to be installed, the procedures of installing cables, and related precautions.

Note:

Cables on the backplane of the cabinet are installed and checked before delivery. Thus, you do not need to install these cables on site. For details, see Airbridge BTS3606&3606A CDMA Base Station Hardware Description Manual. Installation of feeders is introduced separately in Airbridge BTS3606&3606A CDMA Base Station Installation Manual – Antenna & Feeder Installation.

4.1 Types and Functions of Cables to Be Installed on Site

Table 4-1 describes cables to be installed on site.

Table 4-1 Cables to be installed on site

Type	Description	Color	Specifications
RF cables	RF cables between CDDU/CHPA/CTRM.	Black	1/4 in. The two ends of a jumper are DIN connectors. The external connector is a DIN-female connector.
	RF cables between CDDU/CMPA/CMTR.	Black	1/4 in. The two ends of a RF cable are DIN connectors. The external connector is a DIN-female connector.
	Jumpers between the cable inlet of the cabinet and feeders	Black	1/2 in. The two ends of a jumper are DIN connectors.

Type	Description	Color	Specifications
Power cables	Two-phase power cables (110 V), including two live cables (L) and one neutral cable (N)	L: red N: black	L: The sectional area is 35 mm ² . N: The sectional area is 35 mm ² .
	Three-phase power cables (220 V), including three live cables (L) and one neutral cable (N)	L: red N: black	L: The sectional area is 16 mm ² . N: The sectional area is 25 mm ² .
	Single-phase power cables (220 V), including one live cable (L) and one neutral cable (N)	L: red N: black	L: The sectional area is 25 mm ² . N: The sectional area is 25 mm ² .
Grounding cables	PGND cables	Yellow-green	The sectional area is 25 mm ² .
Optical fibers for connecting the ODU	Single-mode optical fibers for connecting ODU3601Cs	Orange	2 x Φ 2 mm
E1/T1 cables	75 Ω E1	White	75 Ω coaxial cables
	120 Ω E1	White	120 Ω twisted pairs
	100 Ω T1	White	100 Ω twisted pairs
Cables connected with EAC	8-core shielded cables	White	The outer diameter is 5.6 mm. One end is a DB25PIN-male connector, and the other is a 9PIN-male connector.
Cables of combined cabinets	RS485 serial port cables	White	The outer diameter is 7 mm.
	Optical fibers	Orange	2 x Φ 2 mm
	RF cables of GPS	Black	1/4 in. The two ends of a jumper are DIN connectors. The external connector is a DIN-female connector.

Table 4-2 describes functions of the cables to be installed on site.

Table 4-2 Functions of cables

Type	Description
RF cables	RF cables include the GPS/GLONASS clock RF cables, RF cables connected to the CDDU, and jumpers for multi-channel configuration.
Grounding cables	Grounding cables include PGND cables of the cabinet and GND cables for cabling racks. Grounding cables for cabling racks include GND cables for indoor cabling racks and for outdoor cabling racks.
Power cables	The –48 V DC power is led to the terminal block on top of BTS3606 through the power cable to supply power for the whole BTS.
Optical fibers	Optical fibers connect the CCPM/CECM of the BTS baseband subrack and the MTRM of the soft site. Optical fibers of combined cabinets transmit signals between the basic cabinet and extension cabinet.
Transmission cables	A transmission cable is made up of E1/T1 trunks (Generally, a transmission cable contains four E1/T1 trunks). It provides trunk connection from BTS to the BSC or other BTSs.
Cables connected with EAC	Cables connecting the EAC and the BTS3606 cabinet include a data cable and a shared grounding cable. The EAC report environment alarm information collected to the BTS through the data cable. The EAC shares the same ground with the BTS through the shared grounding cable.
Cables of combined cabinets	RF cables and optical fibers connect the basic cabinet and extension cabinet when BTS3606 cabinets are combined to realize communication between them.

4.2 Installing RF Cables

The RF cables to be installed on site include:

- GPS/GLONASS clock RF cables
- RF cables between CDDU/CHPA/CTRM (single-channel)
- RF cables between CDDU/CMPA/CMTR (multi-channel)

4.2.1 Installing GPS/GLONASS Clock RF Cables

Note:

The BTS3606 is configured with two black flexible RF cables. One end of the RF cable is connected to the GPS/GLONASS feeder interface on top of the cabinet, and the other end is placed in the cable trough of the baseband subrack upon delivery and is to be connected to the front panel of BCKM in the baseband subrack during cable installation.

To install GPS/GLONASS clock RF cables, proceed as follows:

- 1) Check that the feeder is connected to the GPS connector on the top of the cabinet.
- 2) Select a cable marked with GPS_0.
- 3) Connect the cable to the ANT connector of the BCKM front panel.

If the BTS3606 is configured with two BCKM boards, each board must be configured with a set of GPS/GLONASS synchronization antenna feeder. In this case, connect cables to the ANT connectors on the BCKM front panel according to cables labels.

4.2.2 Installing RF Cables Between CDDU/CHPA/CTRM (Single-Channel)

The connection of RF cables varies with the configurations of RF modules. Table 4-3 provides the typical configuration of a single cabinet.

Table 4-3 Typical configuration of a single cabinet

Typical configuration	Quantity of CDDU	Quantity of CHPA	Diversity LNA status in CRRM	Quantity of CPCM
O(1)	1	1	Normal amplification	0
O(2)	1	2	Bypass	0
S(1/1/1)	3	3	Normal amplification	0
S(2/2/2/)	3	6	Bypass	0
O(1) power synthesis	1	2	Normal amplification	1
S(1/1/1) power synthesis	3	6	Normal amplification	3



Caution:

- Watch out for the sharp edges on the RF fan panel during the installation of RF cables lest it hurt your fingers.
- When installing the RF cable, connect unused connectors to matching load and secure them.

The following describes the connections of the RF cables in various typical configurations.

I. O(1) Configuration

The O(1) refers to an omni cell with one carrier. Figure 4-1 shows RF cable connections, indicated by blue lines.

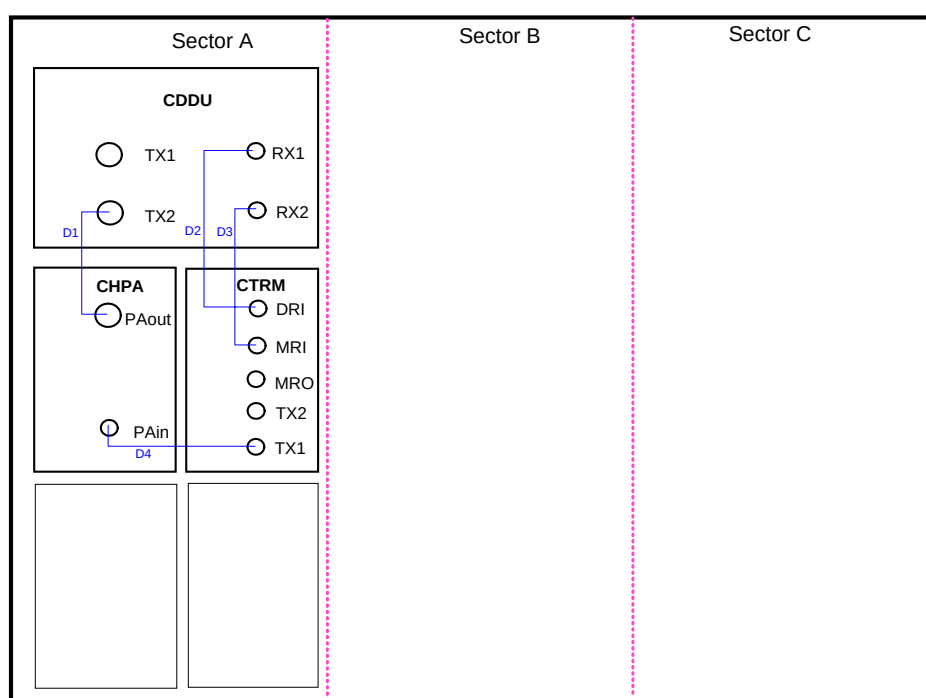


Figure 4-1 O(1) configuration

II. O(2) Configuration

The O(2) refers to an omni cell with two carriers. Figure 4-2 shows RF cable connections, indicated by blue lines.

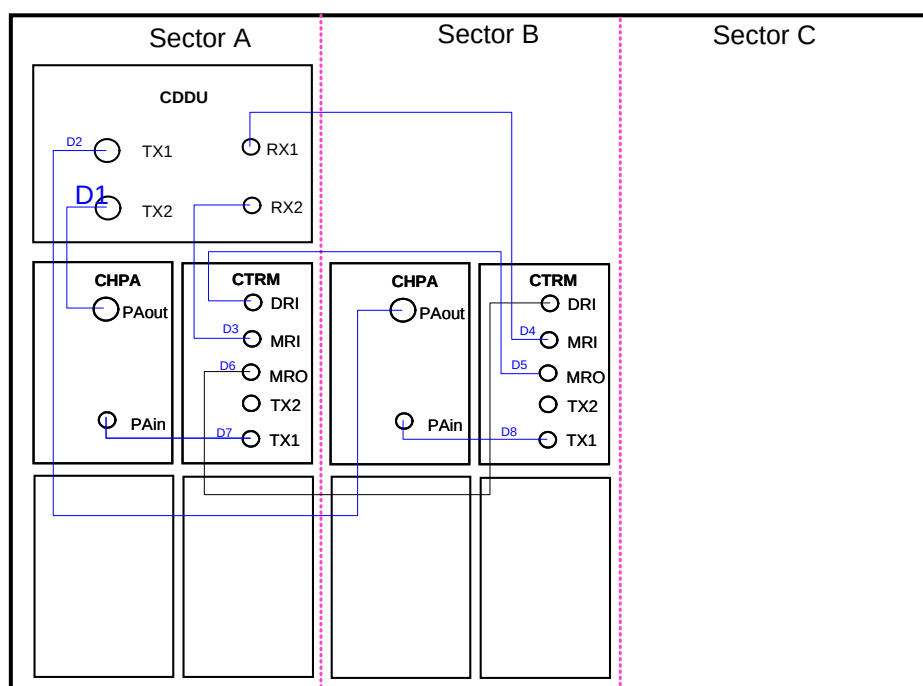


Figure 4-2 O(2) configuration

III. S(1/1/1) Configuration

The S(1/1/1) refers to the configuration of three sectors, each of which is configured with one carrier. Figure 4-3 shows RF cable connections, indicated by blue lines.

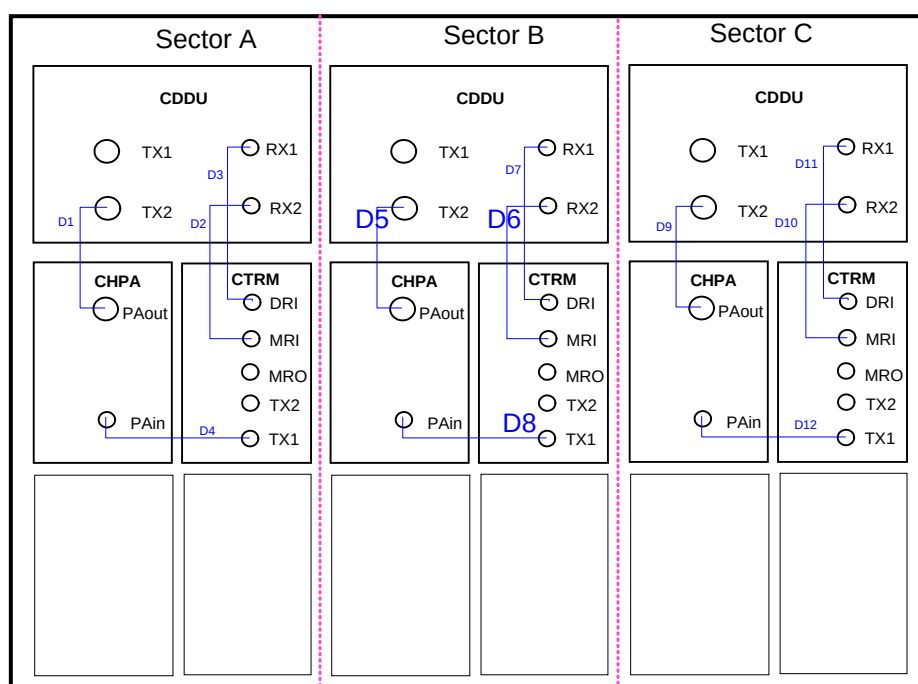


Figure 4-3 S(1/1/1) configuration

IV. S(2/2/2) Configuration

The S(2/2/2) refers to the configuration of three sectors, each of which is configured with two carriers. Figure 4-4 shows RF cable connections, indicated by blue lines.

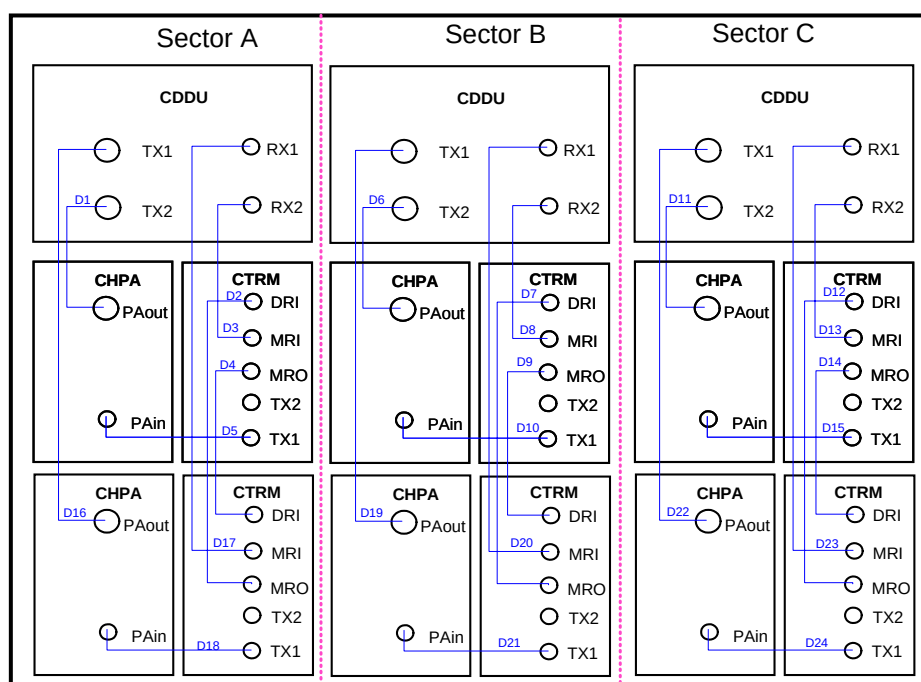


Figure 4-4 S(2/2/2) configuration

V. O(1) Power Synthesis



Caution:

When configuring the power synthesis function, use the RF cables supplied by the same manufacturer. In addition, the cables connecting CTRMs and CDDUs must be of the same length.

Figure 4-5 illustrates the connections of RF cables for the power synthesis in the case of O(1) configuration. The connections are indicated by blue lines.

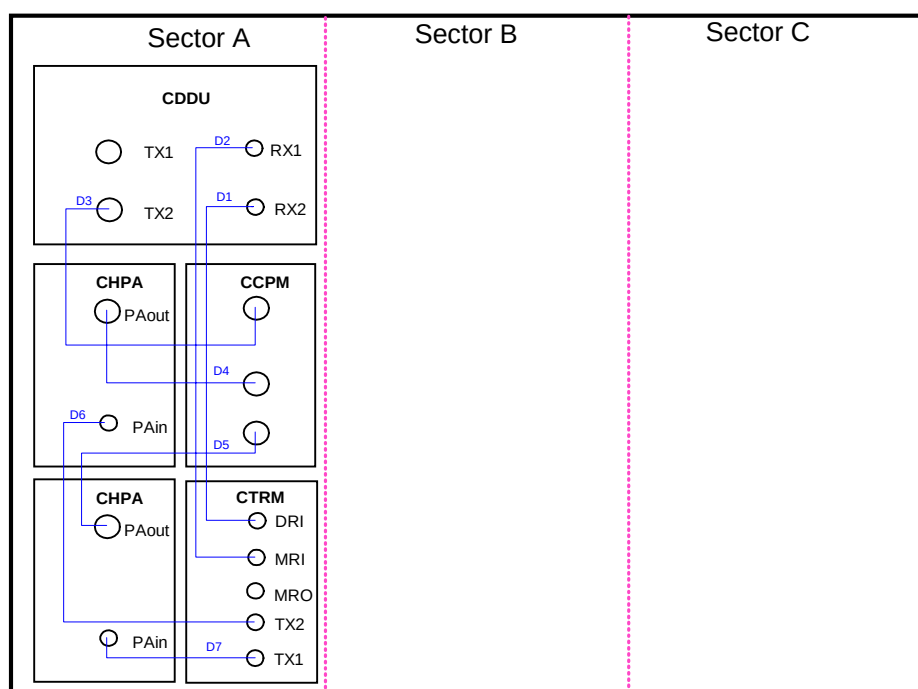


Figure 4-5 O(1) power synthesis

VI. S(1/1/1) Power Synthesis

Figure 4-6 illustrates the connections of RF cables for the power synthesis in the case of S(1/1/1) configuration. The connections are indicated by blue lines.

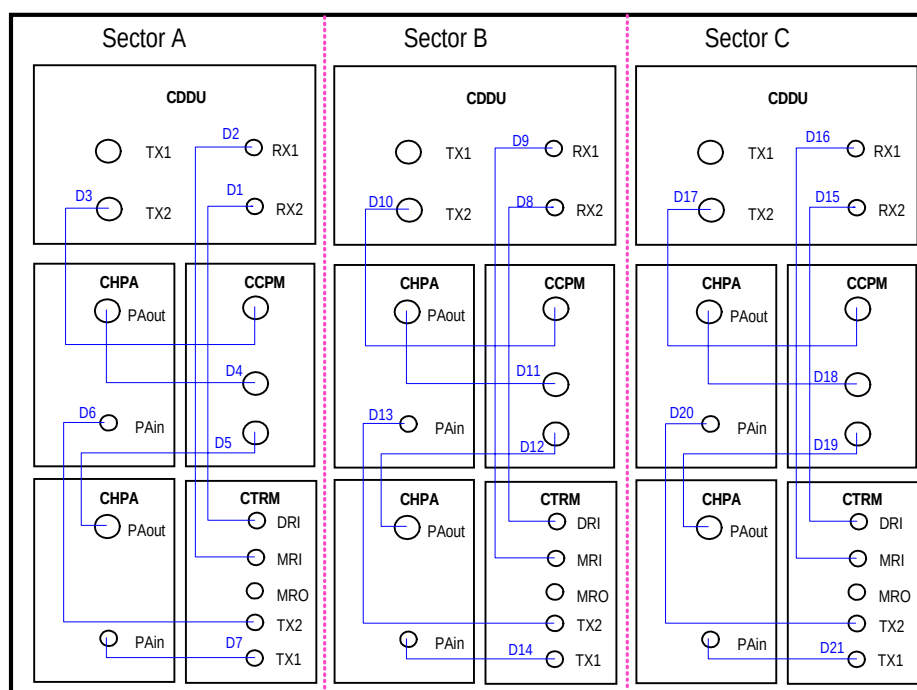


Figure 4-6 S(1/1/1) power synthesis

4.2.3 Installing RF Cables Between CDDU/CHPA/CMTR (Multi-Channel)

When the BTS3606 supports the multi-channel mode, the slots of the CHPAs are configured with the CMPAs, and the slots of the CTRMs with the CMTRs.

Note:

The BTS3606 in the multi-channel mode does not support the power synthesis function.

The following describes the connections of the RF cables in various typical configurations.

I. O(1) Configuration

The O(1) refers to an omni cell with one carrier. Figure 4-7 shows RF cable connections, indicated by blue lines.

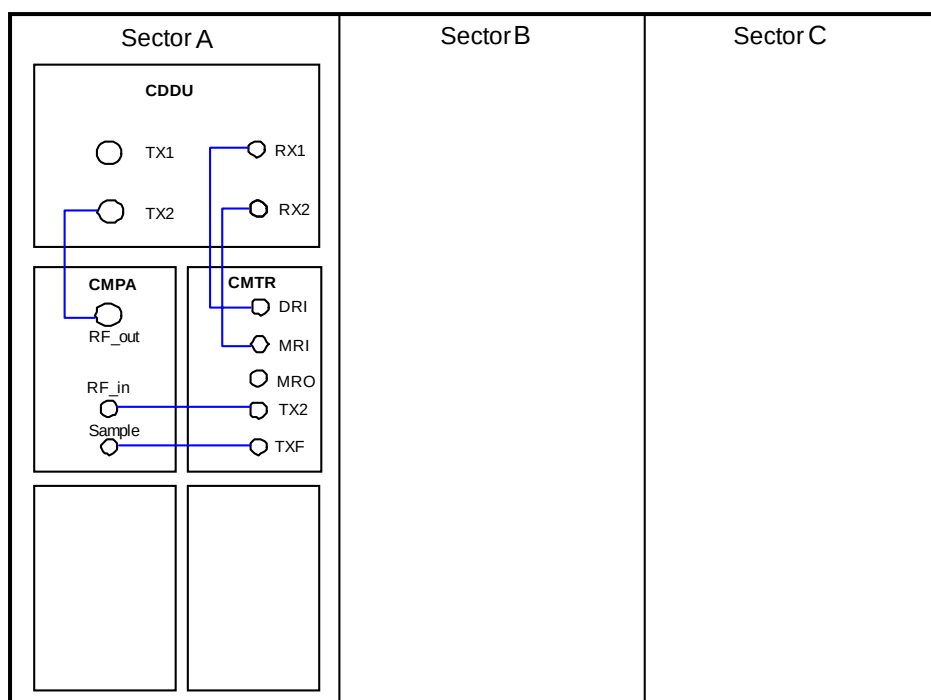


Figure 4-7 O(1) configuration

II. O(2) Configuration

The O(2) refers to an omni cell with two carriers. Figure 4-8 shows RF cable connections, indicated by blue lines.

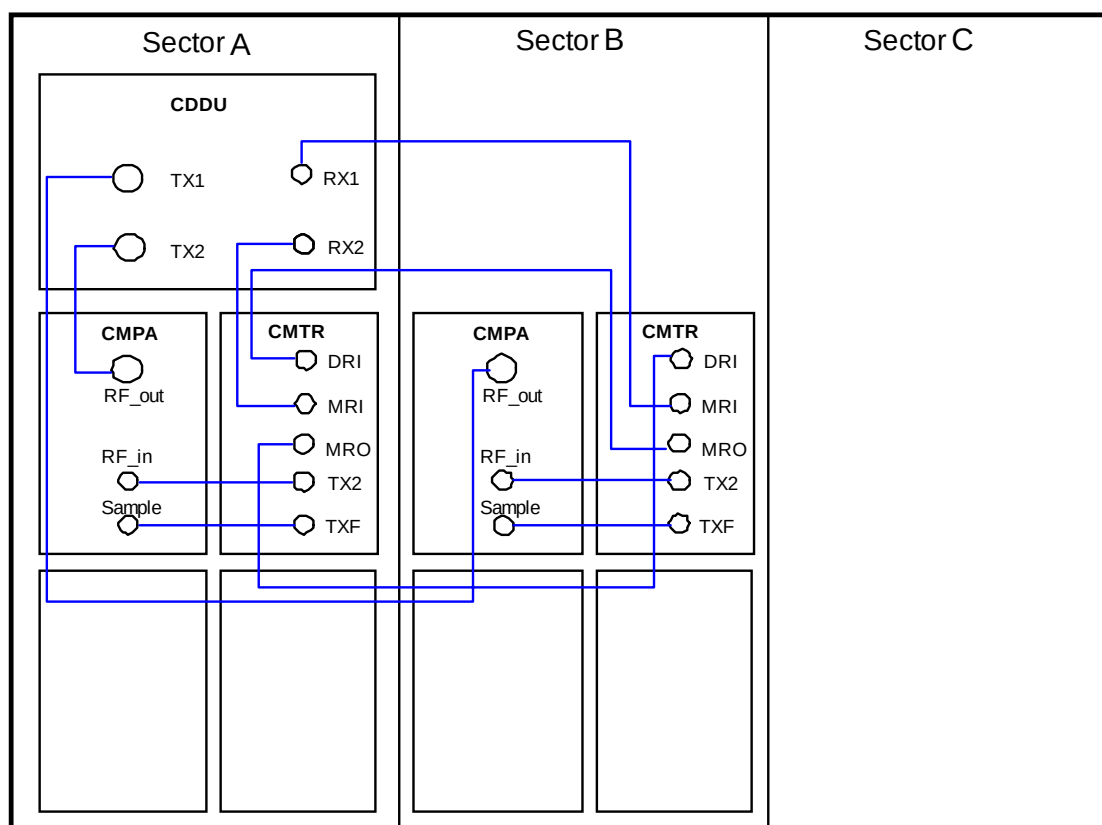


Figure 4-8 O(2) configuration

III. S(1/1/1), Low-Power S(2/2/2), and Low-Power S(3/3/3) Configurations

Figure 4-9 shows RF cable connections for the S(1/1/1) configuration, indicated by blue lines. RF cable connections for the low-power S(2/2/2) configuration and low-power S(3/3/3) are the same as that for S(1/1/1) configuration, but the settings of software parameters are different.

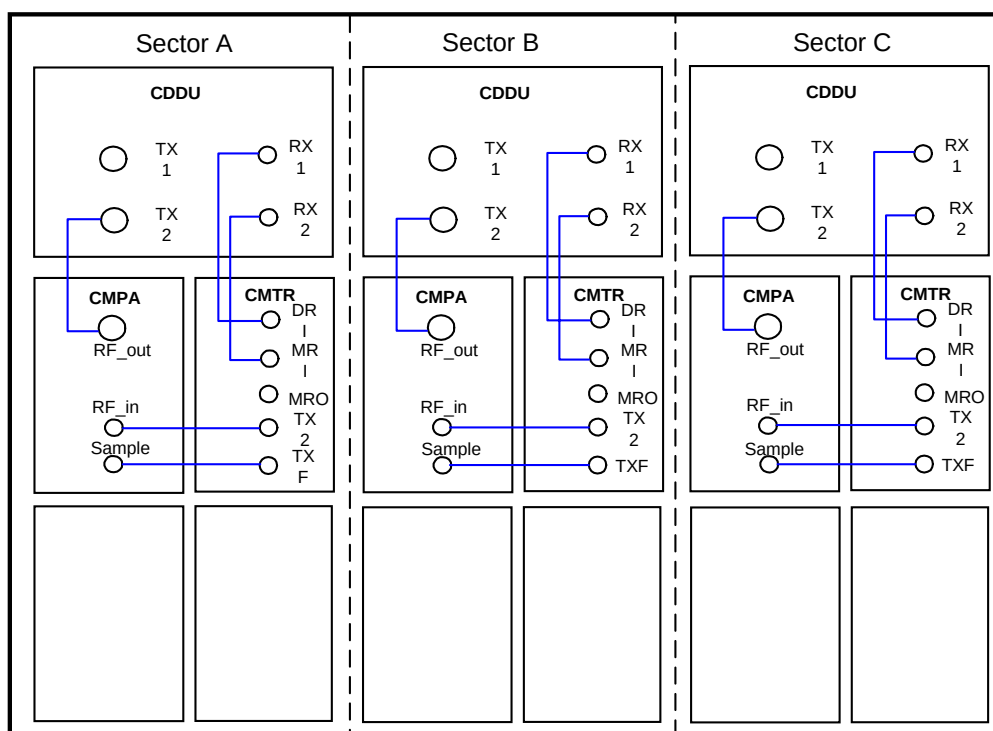


Figure 4-9 S(1/1/1), Low-Power S(2/2/2), and Low-Power S(3/3/3) configuration

IV. High-Power S(2/2/2), High-Power S(3/3/3), S(4/4/4), S(5/5/5), and S(6/6/6) Configurations

Figure 4-10 shows RF cable connections for the high-power S(2/2/2) configuration, indicated by blue lines. RF cable connections for the rest configurations are the same as that for the high-power S(2/2/2) configuration, but the settings of software parameters are different.

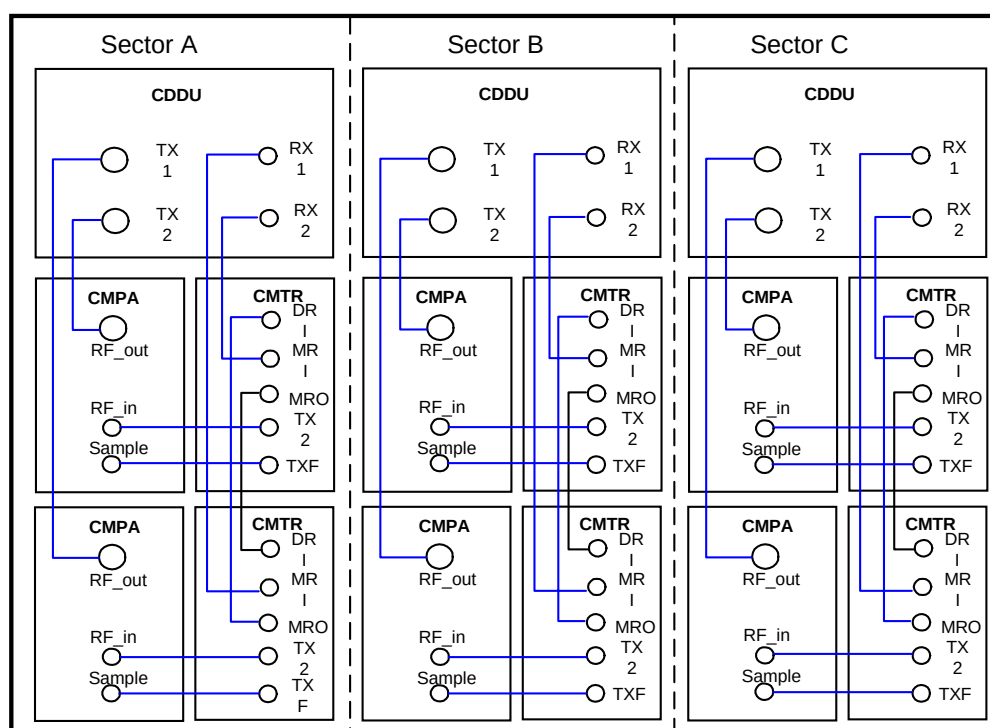


Figure 4-10 High-Power S(2/2/2), High-Power S(3/3/3), S(4/4/4), S(5/5/5), and S(6/6/6) configuration

4.3 Installing Power Cables

The installation procedures of power cables include:

- Preparing power cables
- Connecting power cables
- Routing power cables



Caution:

For the 24 V power input, the voltage drop of the cable from the 24 V power supply system to the power input port of the BTS3606 must be less than or equal to 0.5 V.

4.3.1 Preparing Power Cables

This section lists the required tools and introduces the procedure of preparing power cables.

I. Tools

The following tools are required: tape, wire nipper, paper knife, hydraulic pliers, insulating tapes, soldering iron, and solder wire.

II. Procedure

To prepare power cables, proceed as follows:

- 1) According to the cabling route of power cables and grounding cables, measure the distance from the input port of the lightning arrester to the binding post of the power distribution box.
- 2) Cut cables according to the distance measured. The cables must be a bit longer than the distance measured so that it will not be too taut when routed.
- 3) Cut the insulating cover of each cable head with the paper knife. The length of the removed cover must be equal to that of the cable lug.
- 4) Tighten the lug with hydraulic pliers.
- 5) Coat the lug and the naked cable with insulating tape, as shown in Figure 4-11. Do not expose lugs and naked cables.

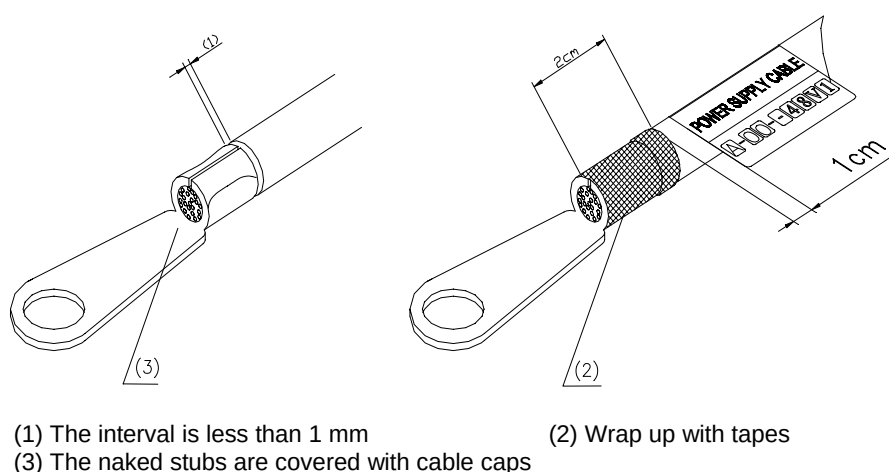


Figure 4-11 Preparing lugs

4.3.2 Connecting Power Cables

This section introduces the connecting procedure of various power cables.

I. Connecting –48 V Power Cable (Blue) to the Cabinet

To connect a –48 V power cable to the cabinet, proceed as follows:

- 1) Remove the covers on the EMI filter and the power input terminal block by using a screwdriver.

- 2) Put the cold-pressed terminal of the –48V power cable through the cable-bundling strip beside the terminal block.
- 3) Loosen the screw in the small round hole (such as –48V connecting hole) on the power input side of the terminal block using a flat-head screwdriver.
- 4) Insert the cold-pressed terminal of the –48V power cable into –48V connecting hole of the terminal block.
- 5) Tighten the screw in the –48V connecting hole using a flat-head screwdriver (that is, reverse the step 3 above) and fix the power cable to the terminal block.
- 6) Bind power cables to the cable-bundling strip using cable ties.

II. Connecting Power Grounding Cables (Black) to the Cabinet

To connect power grounding cables to the cabinet, proceed as follows:

- 1) Insert the cold-pressed terminal of a power grounding cable (35 mm² black cable) to the GND terminal on the terminal block of power input on the top of the cabinet, as shown in Figure 4-12.

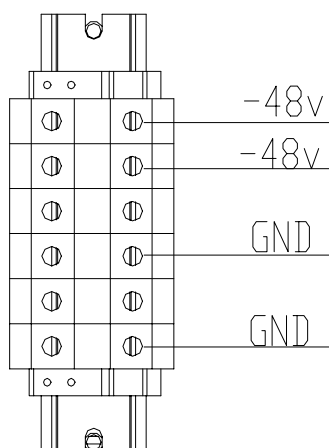


Figure 4-12 Installing power cables

- 2) Connect the cables by referring to I. Connecting –48 V Power Cable (Blue) to the Cabinet.
- 3) Route the blue cables and black cables along the cable rack in order.
- 4) Connect the other end of the cable to the corresponding binding post of the power distribution cabinet.

III. Connecting Power Cables to the Power Distribution Cabinet

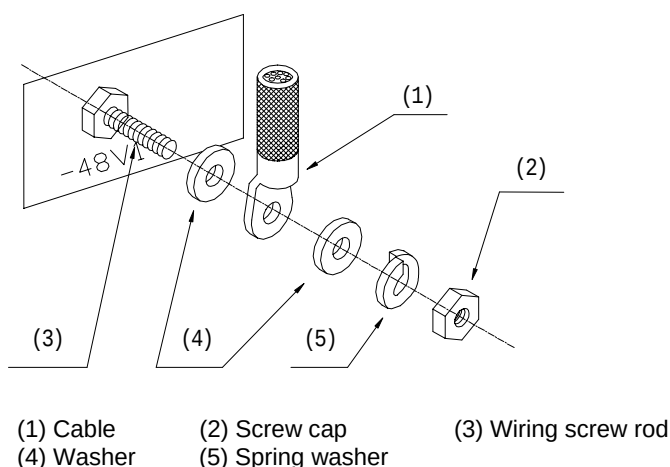


Caution:

- If the power supply is on during the operation, do not touch the binding posts with the adjustable wrench or the screwdriver. Make sure to wrap the wrench with insulating tape.
- The installation of all lugs is the same.

To connect the power cable to the power distribution cabinet, proceed as follows:

- 1) Connect the OT terminal of the power cable to the corresponding binding post on the power distribution cabinet.
- 2) Add common washers and spring washers, as shown in Figure 4-13.



(1) Cable (2) Screw cap (3) Wiring screw rod
(4) Washer (5) Spring washer

Figure 4-13 Fixing the power cable

- 3) Fix the lugs.
 - When several OT terminals of power cables must be connected to a binding post, the lugs must not be overlapped. Connect them in a cross manner or back-to-back mode, as shown in Figure 4-14.
 - If overlapping cannot be avoided, bend the lugs at an angle of 45 degrees or 90 degrees and put the bigger lug under the smaller one, as shown in Figure 4-14.

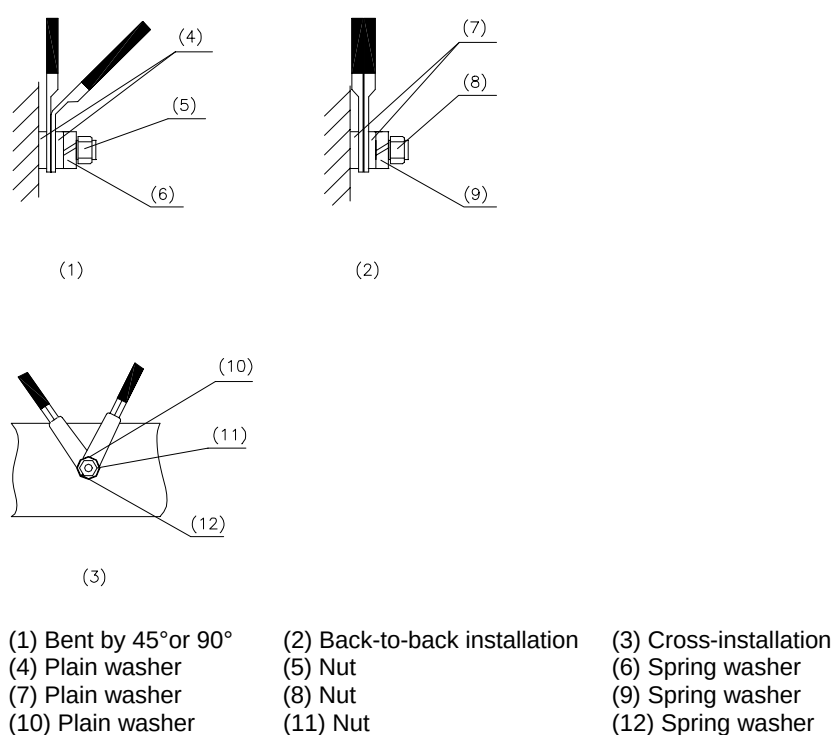
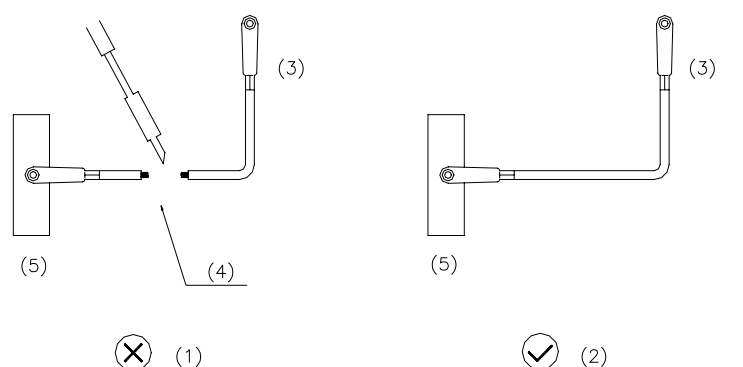


Figure 4-14 Cross-connection of power cables

4.3.3 Routing Power Cables

Route power cables according to the principles below:

- Bind the –48 V power cable and the GND cable together.
- Separate the power cables from other cables. Never bind them with other cables.
- Measure the accurate distance from the connecting terminal of the power input to the power distribution box before cabling.
- Make sure the cables are long enough and preserve redundant length. If the cables are not long enough, stop distributing and use new ones. It is prohibited to make tie-in or welding points on the cables, as shown in Figure 4-15.



(1) Wrong (2) Correct (3) To BTS
(4) Weld (5) Grounding copper bar or power copper bar

Figure 4-15 Wrong operation versus correct operation

4.4 Installing Cabinet Protection Grounding Cables

Both ends of the protection grounding cable for the cabinet are OT terminals (also called lugs). Figure 4-16 shows the outlook of the protection grounding cable.



Figure 4-16 Outlook of the protection grounding cables of the cabinet

4.4.1 Preparing Cabinet Protection Grounding Cables

The two wiring terminals of the protection grounding cable are made on site. The method to prepare them is the same as that of the power cables. See section 4.3.1 "Preparing Power Cables".

Determine the length of the grounding cables according to their actual cabling path, that is, the route from the binding post of BTS3606 cabinet to the wiring holes of the grounding protection bar of the cabinet.

4.4.2 Connecting Cabinet Protection Grounding Cables

To connect the cable, proceed as follows:

- 1) Connect one OT terminal of the cabinet protection grounding cable to PE grounding bar on top of the BTS3606 cabinet
- 2) Route the cable along the cable rack

- 3) Connect the other end to the corresponding hole of the protection grounding bar in the cabinet.

4.4.3 Distributing Protection Grounding Cables for Cabinets

The protection grounding cable for cabinet is distributed in the same way as the power cable is. See section 4.3.3 , “Routing Power Cables”.

4.5 Installing Optical Fibers

When the BTS3606 connects to the ODU3601C, you need to install the optical fibers.

4.5.1 Distribution Principle of Optical Fibers

Observe the following principles when distributing and binding optical fibers:

- Do not bend an optical fiber to a right angle upon distribution. Make it round with a diameter of no less than 8 cm. Optical fiber pairs must be bound in order.
- The optical fibers between cabinets can be distributed through the cabling rack, or directly on the top of the cabinet for the consideration of a nice appearance.
- Keep the redundant optical fibers in the fiber management tray. Do not twist and mix fibers; otherwise, it is difficult to identify them.
- Optical fibers must be distributed according to specific conditions and bound properly. Those fixed onto the beam must be bound with the interval of 150 mm.
- Corrugated plastic tubes must be added to protect the fibers when they are led out of the cabling rack.

4.5.2 Installing Optical Fibers to ODU3601C

When BTS3606 is connected with ODU3601C, optical fibers are led out from CCPMs to the MTRM of ODU3601C.

4.5.3 Installing Optical Fibers of Combined Cabinets

For details, see 4.8.2 "Installing Optical Fiber".

4.6 Installing E1/T1 Trunks

This section introduces the DB25 connectors of E1/T1 trunks on cabinet top and the installation procedure of E1/T1 trunks.

4.6.1 Introduction to E1/T1 Trunks

The E1/T1 trunks are used to connect the E1 lightning protection board and transmission interface box. Figure 4-17 shows the 75 Ω coaxial E1/T1 trunks.

Note:

The appearance of the 120 Ω E1/T1 trunk is the same with that of the 75 Ω E1/T1 trunk.

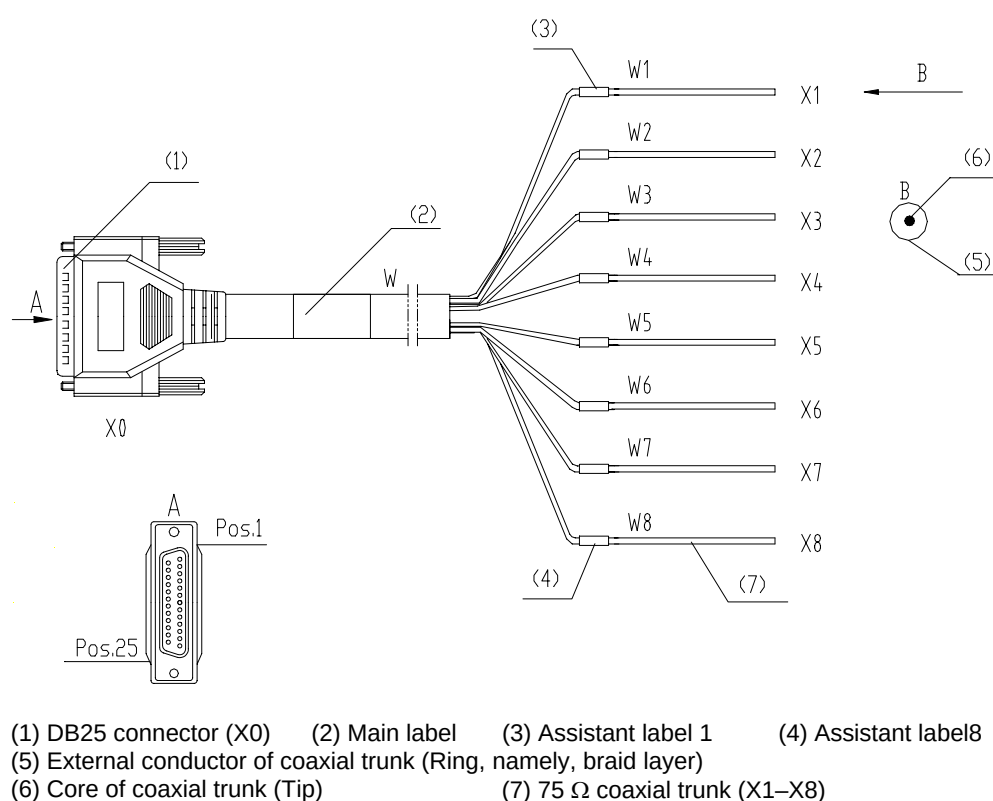


Figure 4-17 75 Ω E1/T1 trunks

When installing E1/T1 trunks, pay attention to the correspondence between the E1 cable and DB25 connector. Table 4-4 describes the correspondence between the E1 cable and DB25 connector.

Table 4-4 Correspondence between the E1 cable and DB25 connector

Cable	No.	Initial PIN	End PIN	Label	Remarks
W1	1	X0.24	X1.Tip	CHAN 0 TX	CHAN 0
		X0.25	X1.Ring		
W2	2	X0.13	X2.Tip	CHAN 0 RX	
		X0.12	X2.Ring		
W3	3	X0.11	X3.Tip	CHAN 1 TX	CHAN 1
		X0.10	X3.Ring		
W4	4	X0.9	X4.Tip	CHAN 1 RX	
		X0.8	X4.Ring		
W5	5	X0.7	X5.Tip	CHAN 2 TX	CHAN 2
		X0.6	X5.Ring		
W6	6	X0.5	X6.Tip	CHAN 2 RX	
		X0. 4	X6.Ring		
W7	7	X0.3	X7.Tip	CHAN 3 TX	CHAN 3
		X0.2	X7.Ring		
W8	8	X0.14	X8.Tip	CHAN 3 RX	
		X0.15	X8.Ring		

4.6.2 Introduction to DB25 Connectors

There are four external DB25 connectors on the E1 lightning protection board on the cabinet top. Each connector can connect four E1 cables.

The four DB25 connectors are numbered E1_0, E1_1, E1_2, and E1_3 from the front to the back.

E1_0 and E1_1 correspond to the BCIM in Slot 0, and E1_2, E1_3 to the BCIM in Slot 1.

4.6.3 Installation Procedure

To install E1/T1 trunks, proceed as follows:

- 1) Determine the number of DB25 connectors according to the number of T1/T1 trunks configured.
 - Select E1_0 if there are not more than four trunks.

- Select E1_0, E1_1, and E1_2 if there are more than four but less than twelve trunks.
- 2) Lead E1/T1 trunks from DB25 connector on E1 lightning protection board to the cable ladder on top of the cabinet.
 - 3) Route them to the digital distribution frame (DDF) along the cable ladder.
 - 4) Bundle the trunks as required.

 Note:

- An E1/T1 trunk is composed of two coaxial cables. Generally, four E1/T1 cables form a transmission cable that connects E1 lightning protection board on the top of the cabinet through DB25 connector. Pay attention to the installation sequence and avoid cross-connection when connecting coaxial cables on the DB25 connector.
 - Multiple BTSs can form star, chain, or tree topology. In this case, connect E1/T1 trunks according to configurations of the software. For details, see related engineering documents.
-

4.7 Installing EAC Cables

This section introduces the following contents:

- Connecting Power Cables to the Top of the BTS3606 Cabinet
- Connecting Data Cable
- Connecting Shared Grounding Cable
- Setting User-Defined Extended Port

For other cable connections and settings of the EAC, see the documentation delivered with the EAC.

4.7.1 Connecting Power Cables to the Top of the BTS3606 Cabinet

Figure 4-18 shows the wiring terminal of a power cable of the EAC.

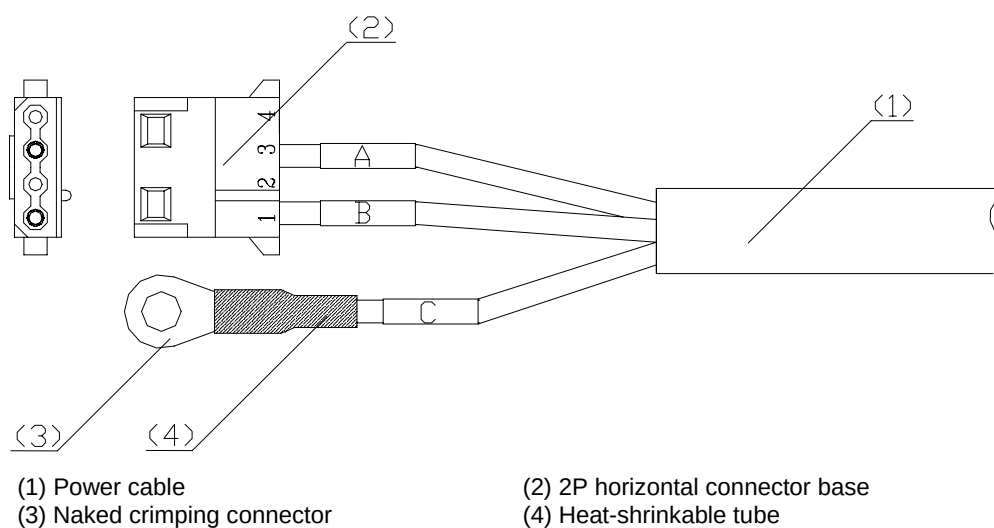


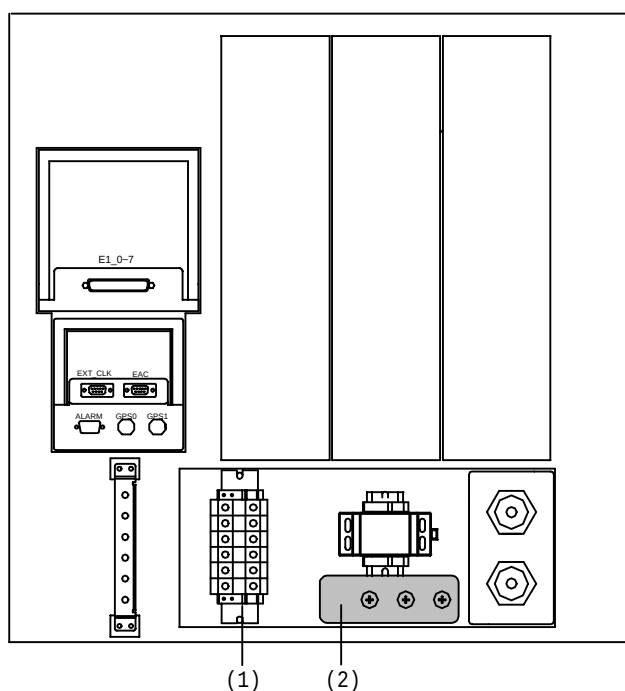
Figure 4-18 Structure of an EAC power cable

Note:

The letters A, B, C as shown in Figure 4-18 are not cable labels. They are used for the convenience of installation description.

To connect power cables, proceed as follows:

- 1) Connect the OT terminal of cable C (yellow green) as shown in Figure 4-18 to the grounding screw of the PE grounding bar as shown in Figure 4-19



(1) Wiring terminal (2) PE grounding bar

Figure 4-19 Position of the PE grounding bar

- 2) Remove the 2P horizontal connector base as shown in Figure 4-18.
- 3) Strip the shielding layer at the ends of cable A and cable B as shown in Figure 4-18 for 1.5 cm till cable cores are exposed.
- 4) Insert the naked cable cores to the –48 V cable connection hole and GND cable connection hole respectively at the top of the cabinet, as show in Figure 4-20.
 - Cable A (The label is blue, marked with P–): Connected to the –48 V cable connection hole.
 - Cable B (The label is red, marked with P+): Connected to the GND cable connection hole.
- 5) Tighten the screws on the wiring terminals.

4.7.2 Connecting Data Cable

To connect a data cable, proceed as follows:

- 1) Connect the 25-pin connector of the data cable to the EAC.
- 2) Connect the 9-pin connector of the data cable to DB9 socket marked as "EAC" on the compact-BTS serial port lightningproof module (CSLM) on the top of the BTS3606 cabinet.

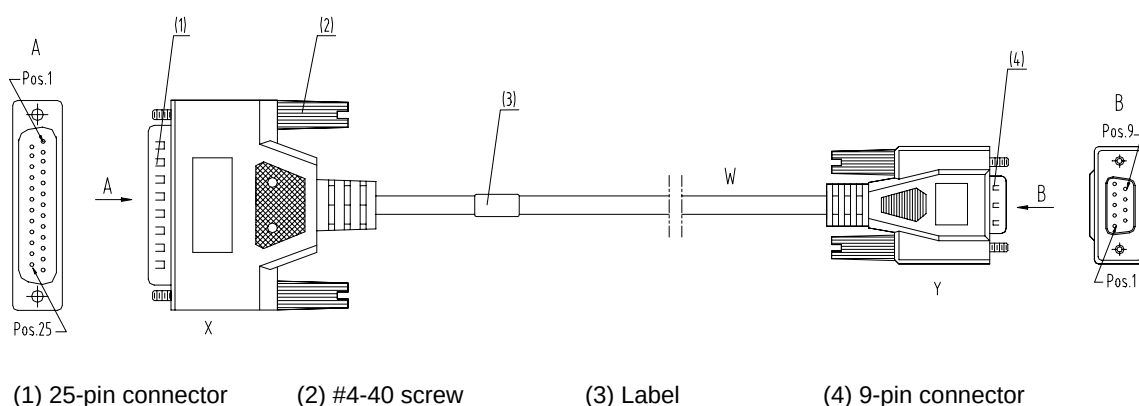


Figure 4-20 Structure of the EAC data cable

4.7.3 Connecting Shared Grounding Cable

To connect the shared grounding cable, proceed as follows:

- 1) Connect one end of the cable to the working ground of the EAC.
- 2) Connect the other end of the cable to the PE grounding copper bar on the top of the cabinet, as shown in Figure 4-21.

In this way, the EAC can share the same grounding with the BTS equipment.

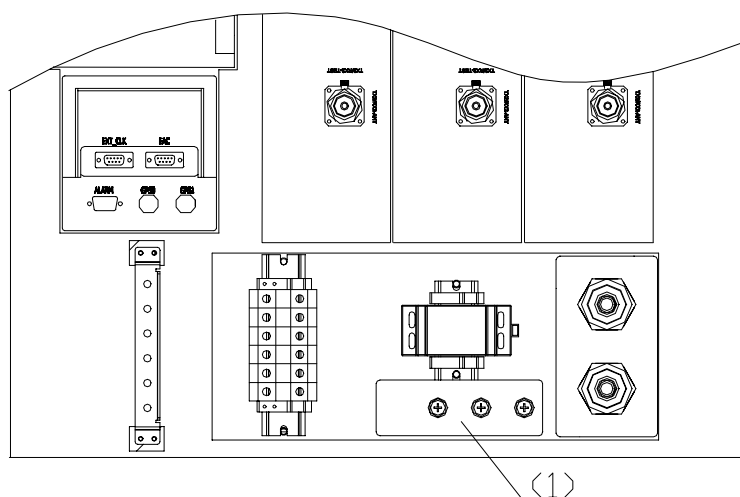


Figure 4-21 Top sectional view of the cabinet

4.7.4 Setting User-Defined Extended Port

You can define the EAC extended port and query the setting.

I. Setting EAC Extended Port

To set the EAC extended port, proceed as follows:

- 1) Start the Service Maintenance System or run the Telnet.
- 2) Enter the command **SET CBTSEACEXTALM** in the command input box.
- 3) Press <Enter>.
- 4) Enter the information including the BTS Name, BTS ID, and IO ID (extended port number).
- 5) Select the Operate Mode.
- 6) Enter the alarm information if the Operate Mode is set to DEF.
- 7) Press F9 to execute the command.

II. Querying EAC Extended Port

To query the setting of the EAC extended port, proceed as follows:

- 1) Start the Airbridge BTS3606 Maintenance System or run the Telnet.
- 2) Enter the command **DSP CBTSEACEXTALM** in the command input box.
- 3) Press <Enter>.
- 4) Enter the BTS Name and BTS ID.
- 5) Press <F9> to execute the command.

4.8 Installing Cables of Combined Cabinets

When BTS3606 cabinets are combined, you need to install RS485 serial port cables, optical fibers, and 10 MHz clock cables.

Note:

Before connecting cables of combined cabinets, check that the TCM is inserted into the slot of the BCKM at the upper half part of the combined subrack, and the LECM into the slot of the CTRM.

4.8.1 Installing RS485 Serial Port Cable

To install an RS485 serial port cable, proceed as follows:

- 1) Remove the rear door from the extension cabinet.
- 2) Remove the serial port cable from the DB26 socket on the upper/lower RF backplane.
- 3) Connect one end of the RS485 serial port cable to the DB26 socket on the upper RF backplane.

- ### 4.8.2 Installing Optical Fiber

The diagram illustrates a two-cabinet system. The **Basic cabinet** on the left contains a CDDU, a Switch box, a Fan box, and a row of modules including CHPA, CTRM, and CCCC. Below this is a Cable trough with more modules, including CCCC and BCKM. At the bottom are three PSU units and a Tool box. The **Extension cabinet** on the right contains a CDDU, a Switch box, a Fan box, and a row of modules including CHPA, CTRM, and LEEC. Below this is a Cable trough with more modules, including LEEC and TMC. At the bottom are three PSU units and a Tool box. An **Optical fiber port** is shown at the top, with a dashed blue line indicating the connection path between the two cabinets.

Figure 4-22 Connections of optical fibers between BTS3606 combined cabinets

- 1) Cut an optical fiber with the required length according to the cabling mode as shown in Figure 4-22 and note that a proper margin must be reserved.
- 2) Prepare the connectors of the optical fiber.
- 3) Connect one end of the optical fiber to LINK0 (optical interface 0) of the CCPM in slot 1 in the basic cabinet.
- 4) Lead the optical fiber along the right side of the basic cabinet to the optical fiber port on the top of the extension cabinet.
- 5) Lead out the optical fiber from the basic cabinet and then lead it through the optical fiber port of the extension cabinet.
- 6) Connect the other end of the optical fiber to LINK (an optical interface) of the LECM in slot 0.
- 7) Repeat the above steps to complete the connection of the following cables:

- The optical fiber between the CCPM in slot 3 in the basic cabinet and the LECM in slot 2 in the extension cabinet
- The optical fiber between the CCPM in slot 5 in the basic cabinet and the LECM in slot 4 in the extension cabinet

4.8.3 Installing GPS RF Cable

To install a GPS RF cable, proceed as follows:

- 1) Choose a cable with one end connected to the GPS_1 connector on the top of the basic cabinet. The cable is marked with GPS_1.
- 2) Connect the other end of the cable to the 10 M interface of the BCKM.
- 3) Measure the distance between the GPS_1 connectors of the basic and extension cabinets.
- 4) Cut the GPS RF cable as needed according to the measured distance.
- 5) Prepare the connectors of the GPS RF cable.

The two ends of the cable are connected to the GPS_1 connectors of the basic and extension cabinets respectively.

- 6) Choose a cable with one end connected to the GPS_1 connector on the top of the extension cabinet. The label of the cable is marked with GPS_1.
- 7) Connect the other end of the cable to the 10 M IN interface of the TMCM.

Chapter 5 Installing Digital Distribution Frame

The digital distribution frame (DDF) is an indoor transmission interface box. There are two types of DDF applicable to the BTS3606: 120 Ω DDF and 75 Ω DDF.

This chapter describes how to install and use these two types of DDF.

Note:

For structure, components, and specifications of the DDF, see Airbridge BTS3606&3606A CDMA Base Station Hardware Description Manual.

5.1 Installing the DDF

This section introduces the position of the DDF in the equipment room and the DDF installation procedure.

5.1.1 Position of DDF in the Equipment Room

Figure 5-1 shows the position of the DDF and connection of trunk cables.

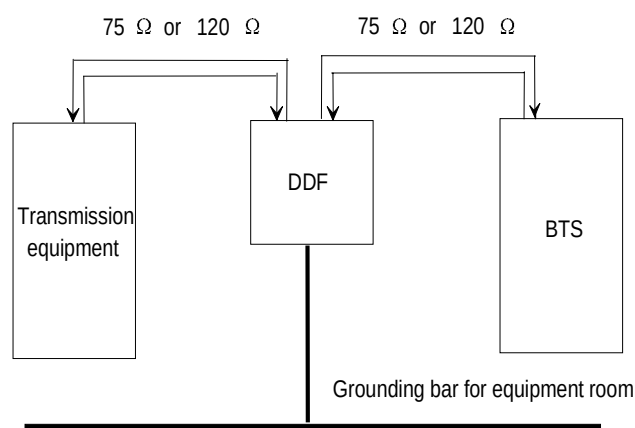


Figure 5-1 Position of DDF in the equipment room

5.1.2 Installation Procedure

To install the DDF, proceed as follows:

- 1) Determine the installation location for the DDF according to the engineering design for the equipment room.
- 2) Mark the position of the DDF according to its dimensions.
- 3) Determine the installation holes.
- 4) Drive the M8 expansion bolts into the three installation holes.
- 5) Hang the DDF onto the expansion bolts.
- 6) Tighten the expansion bolts with a screwdriver.

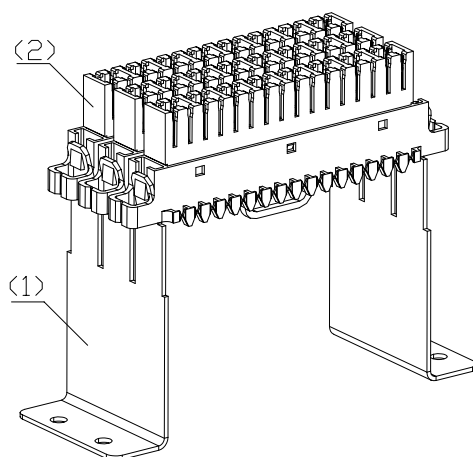
5.2 Using 75Ω DDF

The 75Ω DDF consists of 24-channel alarm extension connector, 75Ω DDF unit, and grounding busbar. This section describes how to install and use these components.

5.2.1 Installing 24-Channel Alarm Extension Connector

To install the 24-channel alarm extension connector, proceed as follows:

- 1) Unpack the 24-channel alarm extension connector.
- 2) Check if the component is complete according to the manifest.
- 3) Use bolts to fix the 24-channel alarm extension connector to the left side of the enclosure.
- 4) Bind the alarm cables coming in from one side of the enclosure to the cabling hole at the bottom of the 8-E1 module, as shown in Figure 5-2.



(1) Bracket (2) 8-E1 module

Figure 5-2 8-E1 module

- 5) Divide the alarm cables through the line separation tooth on the 8-E1 module.

- 6) Lead the alarm cables to the respective slots.
- 7) Clamp the cables to the bracket.
- 8) Route the alarm cables coming in from the other side of the enclosure through the cabling holes on both sides of the 8-E1 module and then to the respective slots.

 Note:

The identifier list of the 24-channel alarm extension connector is attached on the cover of the enclosure. Fill it as needed.

5.2.2 Using 75Ω DDF Unit

To use the 75Ω DDF unit, proceed as follows:

- 1) Remove the dust-proof cover of the coaxial connector.
- 2) Connect the corresponding incoming and outgoing cables into the coaxial connector.
- 3) Perform the loopback test for cables as needed.

5.2.3 Using the Grounding Busbar

To use the grounding busbar, proceed as follows:

- 1) Loose the bolt on the one end.
- 2) Loose the bolt on the other end.
- 3) Strip the ground cables.
- 4) Put them into the corresponding slots.
- 5) Fix the bolts on the two sides.
- 6) Fasten them by adjusting the bolts on their own slots.

5.3 Using 120Ω DDF

The 120Ω DDF consists of 24-channel alarm extension connector, 120Ω DDF unit, and grounding busbar. This section describes how to install and use these components.

5.3.1 Installing 24-Channel Alarm Extension Connector

The installation procedure is the same as that of the 75Ω DDF. For details, see the section 5.2.1 “Installing 24-Channel Alarm Extension Connector”.

5.3.2 Using 120Ω DDF Unit

To use the 120Ω DDF unit, proceed as follows:

- 1) Lead the cables into their corresponding cable-fixing troughs.
- 2) Fix them onto the units.
- 3) Remove the nameplate of the module and note the difference among the ends of a, b, and s. "s" stands for the grounding cable.
- 4) Fix the nameplate back to the position.
- 5) Fill the identifier list according to actual conditions.

 Note:

The identifier list of the 120Ω DDF unit is attached on the cover of the enclosure and fill it as needed.

5.3.3 Using the Grounding Busbar

The installation procedure is the same as that of the 75Ω DDF. For details, see section 5.2.3 “Using the Grounding Busbar”.

Chapter 6 Checking Cabinet Installation

Cabinet installation check is to review the indoor installation described in the previous chapters.

The following items must be checked:

- Cabinet equipment
- Cable distribution
- Environment of the equipment room
- Power-on operation
- Others

6.1 Checking Cabinet Equipment

Check the following items concerning the installation of cabinet equipment.

Table 6-1 Check items for cabinet equipment installation

Item	Requirement
1	The power cables, grounding cables, trunks, and RF cables are intact and there is no tie-in on them.
2	The RF cable connectors are installed in position. Poor connection will result in abnormal voltage standing wave ratio and affect the normal operation of the system.
3	The rack and base/support are firmly connected. The rack is stable after installation.
4	The connectors of the trunks are intact. They are made according to specifications and connected securely.
5	The cables are distributed in a way to facilitate maintenance and expansion.
6	Insulating materials are used to insulate the cabinet from the ground and the wall.
7	All the cabinet doors at the aisle are installed and aligned. The error is less than 5 mm (0.2 in.).
8	The space between adjacent bases is equal to or less than 3 mm (0.12 in.).
9	The vertical deviation of the cabinet is less than 3 mm (0.12 in.).
10	The cables from the combiner, the divider, and CDDU to the top of the cabinet run through the space on both sides of the cabinet.
11	Rigid cables are not cross-connected but properly stretched. They are bent neatly and orderly with certain margin at the bending parts

Item	Requirement
12	The transverse cables inside the rack are bound at the inner part of the cross rod, and the longitudinal cables inside the rack are bund along the cable trough at both sides.
13	All the cables between racks are through the holes at the edge of the cabinet and connected to the corresponding position.
14	The screws of the fan are fastened securely. The fan can be switched on or off normally. Its rotation is normal and the alarms can be reported normally.
15	The external antenna lightning arrester of the cabinet is correctly installed in accordance with the design, and the connection should be reliable and in order.
16	The cables made on site are firmly connected and in good contact. The naked part is wrapped in insulating tape or protection tube. The connectors of cables are firmly crimped.
17	The screws, fixing the cabinet or the base/support with the floor, are secured. The insulating materials, plain washers, spring washers, screws and bolts are installed in order.
18	When leveling the base by adjusting bolts, use washers to enlarge the stress surface area to avoid distortion of the base.
19	The upper surface of the antistatic floor in the equipment room is lower than the lower surface of the base so as not to affect heat dissipation of the base.
20	The mechanical parts of the cabinet are correctly installed.
21	The environment alarm collection cables connected to BTS are equipped with reliable lightning protection devices.
22	Cable labels are filled in and attached according to the specifications. The labels are neatly arranged in the same direction. They can be uniformly prepared as per the requirements of users for the convenience of query. It is recommended to attach labels 2cm (0.8 in.) away from the connector.
23	The cables are bundled neatly. The interval between cable ties are even. The cables are properly fastened. The direction of the cable ties are the same. All the cable ties are cut without sharp ends
24	PVC troughs are installed for the power cables and signal cables of the alarm box on the wall. Redundant cables are coiled up and placed under the floor of the alarm box or on the wiring ladder.
25	No part of the rack is distorted.
26	Dummy panels are installed for empty slots.
27	The boards can be inserted or removed smoothly. The screws (if any) on the panel of the board are properly fastened, and the spring wire is intact.

Item	Requirement
28	The jumpers on the cabling rack are routed by layer and by sector.
29	The alarm box is correctly installed according to the design. The panel is clean without obvious damage.
30	The idle ports on the combiner, divider, or CDDU are screwed with proper terminals. The unused terminals on top of the cabinet are protected by protection tubes from dirt and sundries.
31	Enough cables for connectors are reserved at the connecting points.
32	The rack is placed according to the design drawing.
33	The doors of the rack can be closed or opened smoothly.
34	There are no paint falling and collision damages on the cabinet. Otherwise, the cabinet must be painted once more.

6.2 Checking Cable Distribution

Check cable distribution after finishing the cabinet equipment check.

6.2.1 Power Cables and Grounding Cables

Check the following items concerning the installation of power cables and grounding cables.

Table 6-2 Check items for power cables and grounding cables installation

Item	Requirement
1	Grounding protection measures are taken for the cabinet.
2	Adjacent cabinets are connected with an equipotential cable.
3	All power cables and grounding cables are copper core cables. The cables are complete section of cables and there is no tie-in on them.
4	The grounding cables and power cables are connected correctly and firmly. Plain washers, spring washers and nuts of the grounding terminal are installed in order, and the nuts are fastened in position.
5	The copper lugs at both ends of the power cable and grounding cable are welded or crimped firmly.
6	Rust and dirt on the grounding terminals are removed before the terminals are connected. After the terminals are connected, antirust and anticorrosion measures are taken for them to ensure good contact.

Item	Requirement
7	The feeder from the tower top to the equipment room is grounded at least at three places. That is, 1 m (39 in.) away from the platform of the tower; 1m (39 in.) away from the outdoor cabling rack; and 1m (39 in.) away from the feeder window. The grounding cables are bundled firmly and waterproof measures are taken for them.
8	Power cables and grounding cables outside the cabinet are bundled separately from other cables.
9	Redundant part of power cables and grounding cables are removed instead of being coiled up.
10	The positive pole of the primary power supply is connected to the ground with the cross-section area defined in specifications.
11	The environment supervising device of BTS is firmly grounded.
12	Power cables and grounding cables are distributed to facilitate maintenance and expansion.
13	If the tower is higher than 60 m (197 ft.), a feeder grounding clip is added in the middle of the tower.
14	If the feeder from the tower is distributed on top of the building (or the cabling rack) for over 20 m (66 ft.), a lightning protection grounding clip is added on top of the building (or cabling rack).
15	The feeder grounding clip is fixed directly on the steel plate of the nearby tower. It is made in compliance with specifications and well connected. Antirust, anticorrosion and waterproof measures are taken for it.
16	The antenna feeder grounding cable on top of a building without the tower is connected to the lightning protection grounding grid on the top of the nearby building.
17	The front door of the cabinet is connected to the grounding bolt fixed on the door through a cable. The grounding cable of the doors of the cabinet is firmly connected.
18	The feeder is led into the room along the wall from the top of the building. If a cabling ladder is used, it is grounded.
19	The feeder grounding cable is routed from the top down. The angle between the cable and the feeder is 15 degrees as appropriate.
20	If GPS antenna is installed on the iron tower, there are two grounding points outdoors.
21	Labels are filled in and stuck on power cables and grounding cables tidily and their directions are the same. The labels can be uniformly made according to the requirement of the user. It is recommended that labels are stuck in places 2 cm (0.8 in.) away from the connector.
22	The intervals between the power cable, the grounding cable and the signal cable are more than 3 cm (0.12 in.).

Item	Requirement
23	The naked part and lugs of the power cable and the grounding cable are wrapped with protection tube or insulating tape. The copper-core wires are not exposed.
24	The power cable and the grounding cable are routed straight and bundled neatly.
25	The power cables and grounding cables provided by Huawei include -48 V power cables (blue cables), GND (BGND) cables (black or red cables), and PGND cables (yellow-green or yellow cables).

6.2.2 Other Cables

Check the following items concerning the installation of other cables.

Table 6-3 Check items for other cables installation

Item	Requirement
1	The GPS/GLONASS clock RF cables are correctly connected to the front panel of the BCKM.
2	The RF cables on the front panel of the CDDU are correctly connected.
3	The optical fibers between the CCPM and the soft BTS are correctly connected.
4	The cables and the connectors of the optical fibers are intact and clean. The optical fibers are direct. The labels are correct and stuck properly.
5	The trunk and the socket are connected appropriately.
6	When BTS3606 cabinets are combined, RS485 serial port cables, optical fibers, and GPS RF cables are connected properly. Cable connections comply with the specifications.

6.3 Checking Room Environment

Check the following items concerning the environment of the equipment room.

Table 6-4 Equipment room environment check items

Item	Requirement
1	The voltage and capacity of the DC power supply meet the long-term operation requirements of the equipment.
2	The Power Distribution Frame (PDF) and the output current-limiting protection of the primary power supply meet the requirements of the equipment.

Item	Requirement
3	The grounding resistance of BTS is less than five ohm, and the resistance is less than ten ohm in the areas where there are less than 20 days of thunderstorm in a year.
4	The outdoor grounding bar is led to the grounding grid through a reliable private path, and the core diameter of the grounding cable is in compliance with specifications.
5	The E1 cables are not routed overhead from the BTS. If it is, protection measures are taken for the overhead cables.
6	The earthquake-proof, lightning protection and bearing capacity meet the requirements for the long-term operation of the equipment.
7	The relevant parameters of AC power supply meet the requirements for the long-term operation of the equipment. There are lightning protection units for the AC power supply system, and they are securely connected with the ground.
8	The ambient temperature and the relative humidity of the equipment room meet the requirements for long-term operation of the equipment.
9	There are fireproof devices in the equipment room.
10	It is recommended the metal mechanical parts associated with BTS equipment are grounded.
11	The equipment room is far away from strong electrical field, intense magnetic field, strong electric wave and excessive heat source to meet the requirement in electromagnetic level.
12	The low-voltage power cables are buried and led into the mobile communication site.
13	When the power distribution transformer is in the communication site, its grounding grid must be combined with that of the equipment room into an integrated one.
14	The grounding grids of the iron tower and equipment room are combined into an integrated one.
15	The working ground, the protection ground of the communication equipment in the site, and the lightning protection ground of the building share one group of grounding body.

6.4 Power-on Check

Before switching on the primary power supply, use a multimeter to check the power supplies on top of the cabinet and the grounding wiring terminals. Make sure no short circuit exists.

6.4.1 Power-on Check of Power Modules

I. Procedure

To carry out the power-on check of power module, proceed as follows:

- 1) Make sure that all the power modules are well connected with the backplanes, and that other boards and modules (such as the CTRM and CHPA) are not inserted in the slots of the backplanes.
- 2) Make sure that the primary power supply of the rectifier is on.
- 3) Switch on the power module.

II. Requirements

Check the following items after the power module is switched on.

Table 6-5 Power-on check items of power modules

Item	Requirement
1	The output voltage of the secondary power supply is normal.
2	Indicators of all power modules are normal.
3	The output voltages of the power modules at the test point are stable and within the range. (If not, switch off the primary power supply, clear the fault, and power on again until they are normal.)

6.4.2 Power-on Check of Integrated Equipment

I. Procedure

To carry out the power-on check of the integrated equipment, proceed as follows:

- 1) Switch off all the power switches on the switch box and make sure all boards and modules are inserted in the slots of the backplanes.
- 2) Switch on the power switches one by one to power on the boards and modules.

II. Requirements

All boards and modules are running normally.

Switch off the power supply immediately if any fault occurs. Power on all the boards and modules again after the fault is cleared.

If all the boards and modules are normal, the preliminary check is passed.

6.5 Others

Check the following items in the end.

Table 6-6 Other check items after BTS3606 installation

Item	Requirement
1	Self filing check: The engineering supervisor does not submit self-test report on quality of the engineering hardware.
2	Self standard check: If the self-test score is two or more points less than the score given by Huawei, more points will be deducted.
3	Check whether the installation is performed according to: • Design document • Installation manual • Installation requirements that are accepted by the user before kickoff but do not meet the Huawei requirements
4	Gaps on the floor around the rack are blocked up. There are no cable ties, screws, and other sundries on the floor.
5	The equipment room is clean and neat. Sundries such as rejected packing boxes are cleared up. Spare parts after installation are stacked in order.
6	Boards are unpacked and plugged in accordance with the antistatic specifications.
7	Tools for installation are in compliance with antistatic requirements.
8	Signal cables for expansion are bundled or connected to the reserved position in the cabinet to facilitate expansion and maintenance.

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