BTS3900A GSM
Installation Guide

HUAWEI TECHNOLOGIES Co., Ltd.

HUAWEI

Content

Safety Information

Following All Safety Precautions

Before any operation, read the instructions and precautions in this document carefully to minimize the possibility of accidents.
The Danger, Caution, and Note items in the documents do not cover all the safety precautions that must be followed. They only provide the generic safety precautions for operations.

Complying with the Local Safety Regulations

When operating the device, comply with the local safety regulations. The safety precautions provided in the documents are supplementary. You must comply with the local safety regulations.

Qualified Personnel Only

The personnel in charge of installation and maintenance must be trained and master the correct operating methods and safety precautions before beginning work.

Symbols

DANGER	*This symbol indicates that casualty or serious accident may occur if you ignore the safety instruction.*
CAUTION	*This symbol indicates that serious or major injury may occur if you ignore the safety instruction.*
NOTE	*This symbol indicates that the operation may be easier if you pay attention to the safety* instruction.

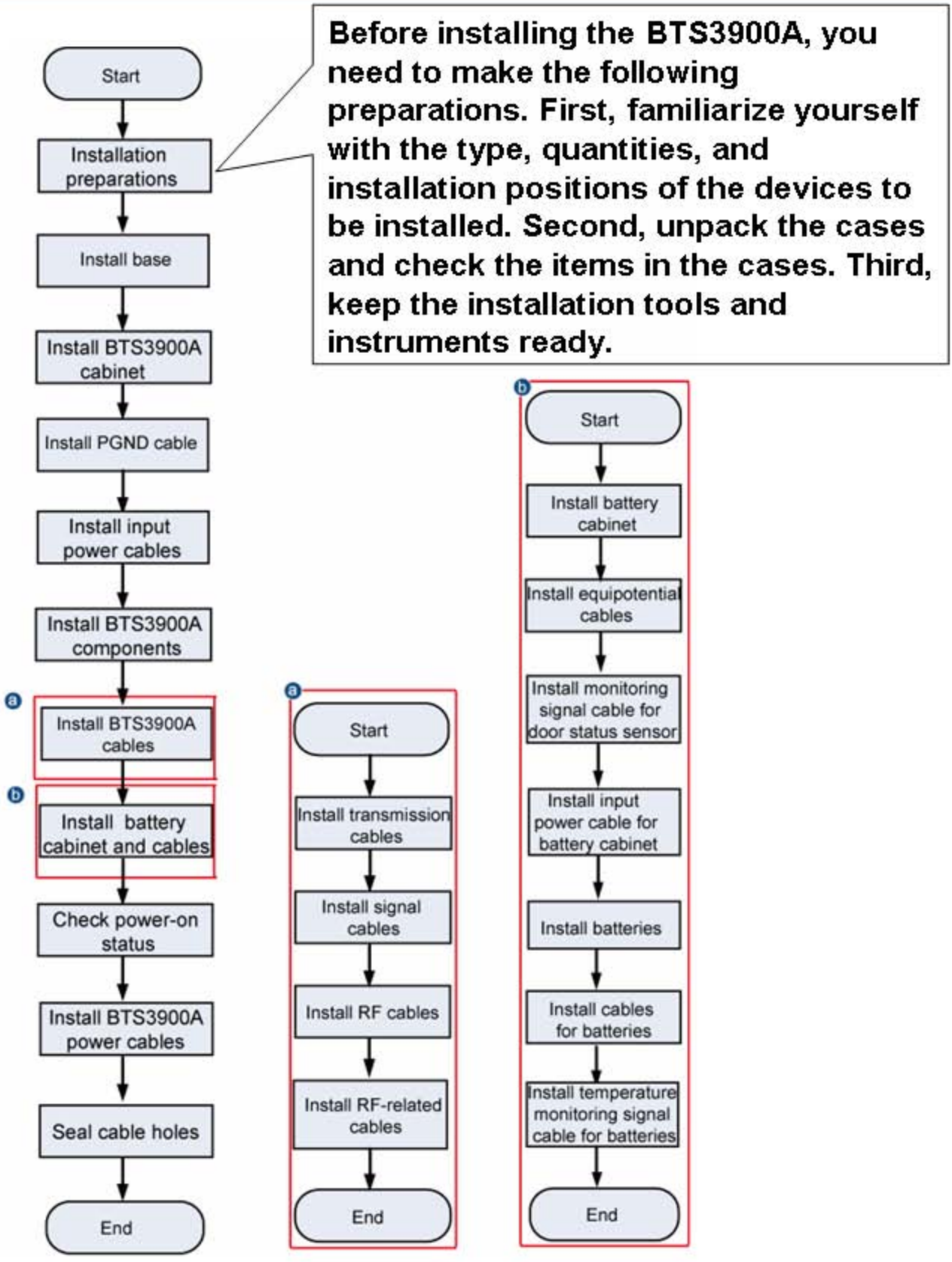
Safety of Personnel

- The high voltage power supply provides power for running the system. Direct contact with the high voltage power supply or contact through damp objects may result in fatal danger.
- Non-standard and improper high voltage operations may result in fire and electric shock.
- In a thunderstorm, do not perform operations on high voltage and AC power supply facilities or on a steel tower and mast.
- Ground the device before powering on the device. Otherwise, the personnel and device are in danger.
- Power off the device before performing operations on the power supply equipment.
- High power radio-frequency signals are harmful to human body. Before installing or maintaining an antenna on a steel tower or mast with a large number of transmitter antennas, the operator should coordinate with all parties to ensure that the transmitter antennas are shut down.
- When handling optical fibers, do not stand close to, or look into the optical fiber outlet with unaided eyes.
- Protect yourself when drilling holes. Flying dust may hurt your eyes or you may inhale the dust.
- Power off the batteries before connecting the cables to the batteries. Otherwise, casualties may occur.
- When working at a height, be cautious about falling objects.

Device Safety

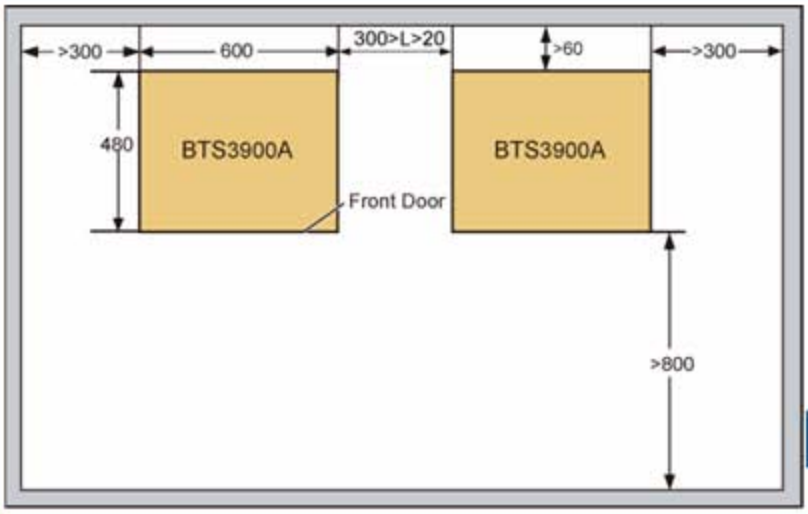
- Check the electrical connection of the device before operation and ensure that the device is reliably grounded.
- The static electricity generated by the human body may damage the electrostatic sensitive components on the circuit board, such as the large-scale integrated circuit (LIC). Wear an ESD wrist strap or ESD gloves when performing the operation.
- When working on batteries, take measures to prevent short circuits in the batteries and electrolyte spill/loss. The electrolyte may erode metal and boards, or even cause rust of the equipment or short circuits in the boards.
- The BTS3900A must be powered on within one week after installation.

1 BTS3900A Installation Procedure



2 Preparations for the Installation

 Long measuring tape	 Phillips screwdriver (M3~M6)	 Flat-head screwdriver (M3~M6)
 Wrench	 Socket wrench	 Percussion drill
 ESD wrist strap	 Vacuum cleaner	 Cable peeler
 Torque wrench	 Marking pen	 Level bar
 Claw hammer	 RJ-45 crimping pliers	 Multimeter
 Power cable crimping pliers	 Wire cutter	 ESD gloves



NOTE

The space requirements for installing cabinets in side-by-side mode are the same as those for installing the optional auxiliary devices.

The unit of all dimensions is mm.

3 Installing the Base

1. Casting a Concrete Plinth

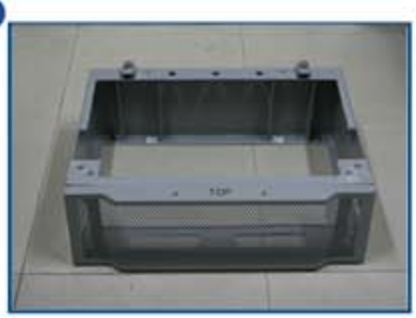
Cast the concrete plinth based on the space requirements.

NOTE

The height of the concrete plinth must meet the flood protection requirement in the local area. The concrete plinth should be at least 200 mm higher than the ground surface so that the cabinet can be protected from entry of water in case of heavy rain or flood.

2. Positioning the Base (Single Cabinet Size)

1



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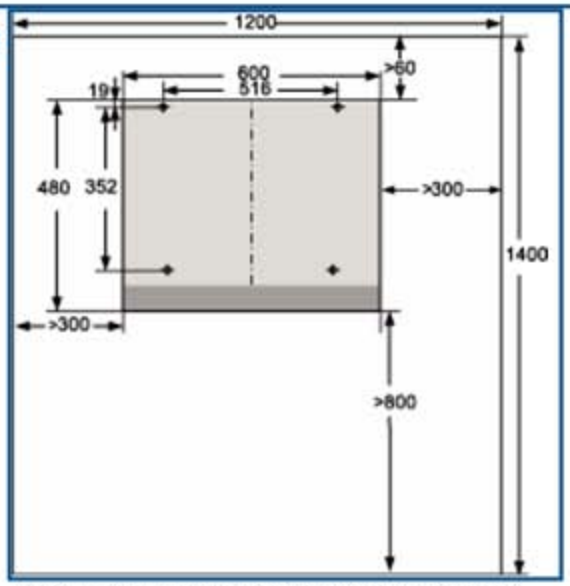


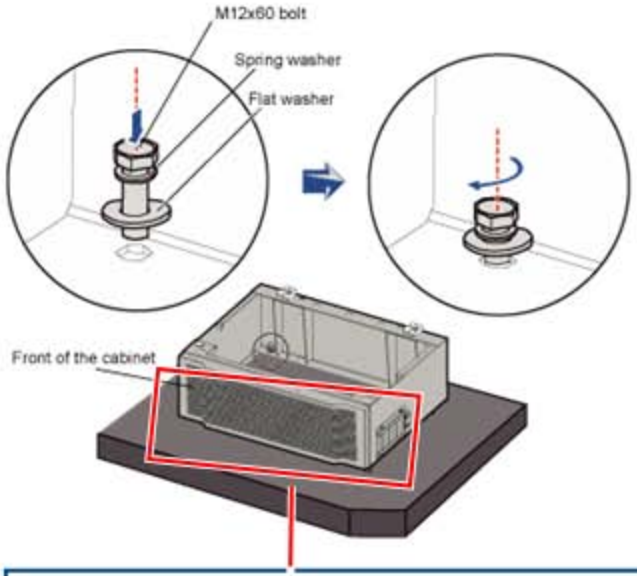
The unit of all dimensions is mm.

CAUTION

When installing the base, you must ensure that the position of the base meets the space requirements of the cabinet and that the base direction is correct.

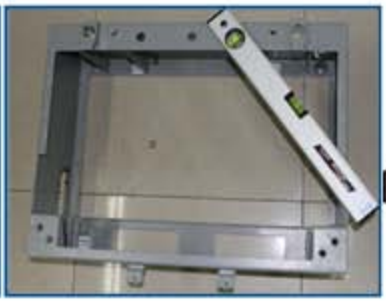
3. Drilling Holes and Installing Expansion Bolt Assemblies

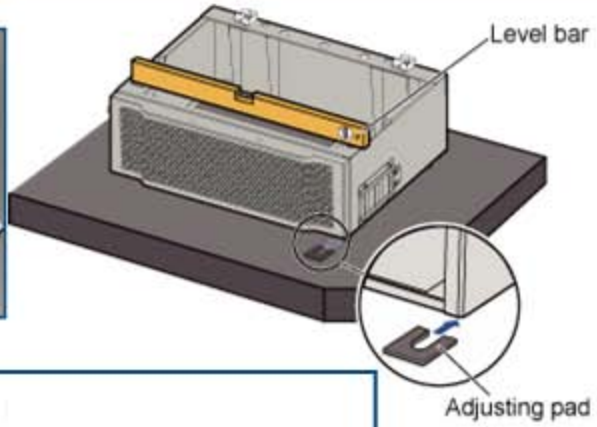
4. Fixing the Base



Before fixing the base, remove the base panel on the front door side.

5. Leveling the Base





NOTE

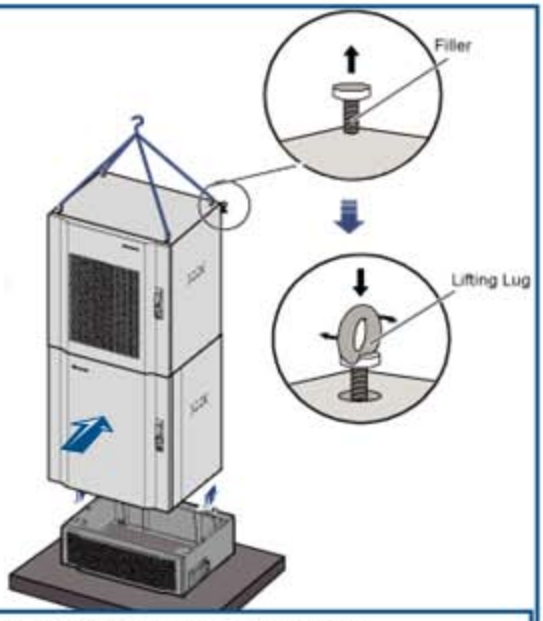
Place a level bar on the top plane of the base in the latitudinal and longitudinal directions. Then, check whether the bubble in the level bar is in the middle. If the bubble is not in the middle of the level bar, you can loosen the bolts on the base and then add adjusting pads under the base to achieve levelness of the base.

6. Installing the Second Base

Repeat Step 3 through Step 5 to install the second base. Before the installation, remove the barrier bars at the cable holes on both the left and right sides of the first base and those at the cable hole on the right side of the second base.

4 Installing the BTS3900A Cabinet

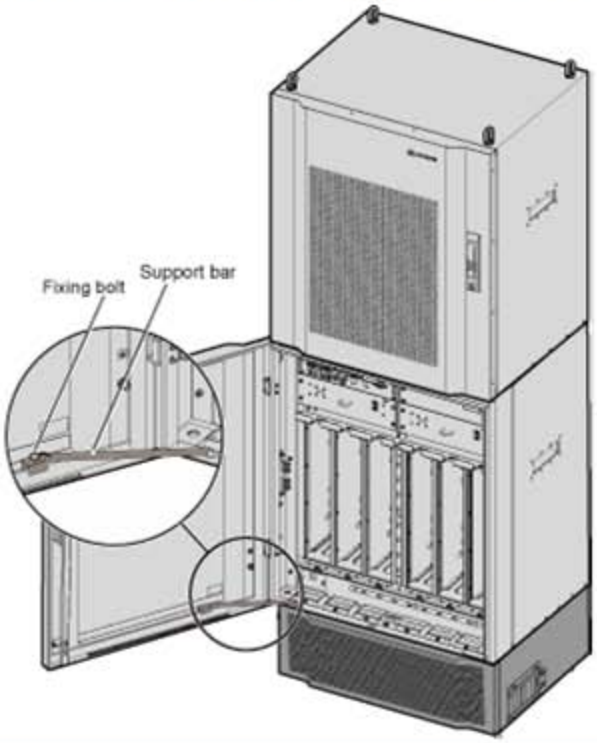
a Placing the Cabinet



If the machine for lifting the cabinet is unavailable on site, you should move the cabinet manually. Place the cabinet on the base. Then, push the cabinet in front of the base to ensure that the installation block on the base is in complete contact with the installation block at the lower enclosure in the cabinet.

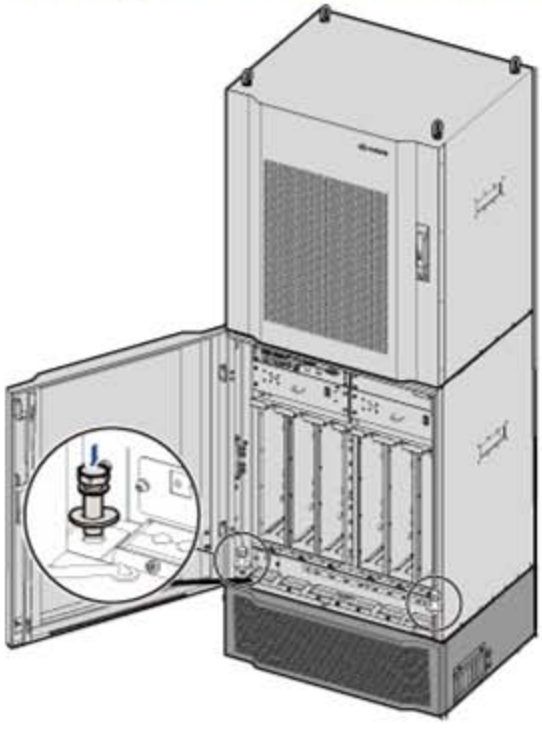
b Fixing the Cabinet

1. Fixing the Front Door of the Cabinet

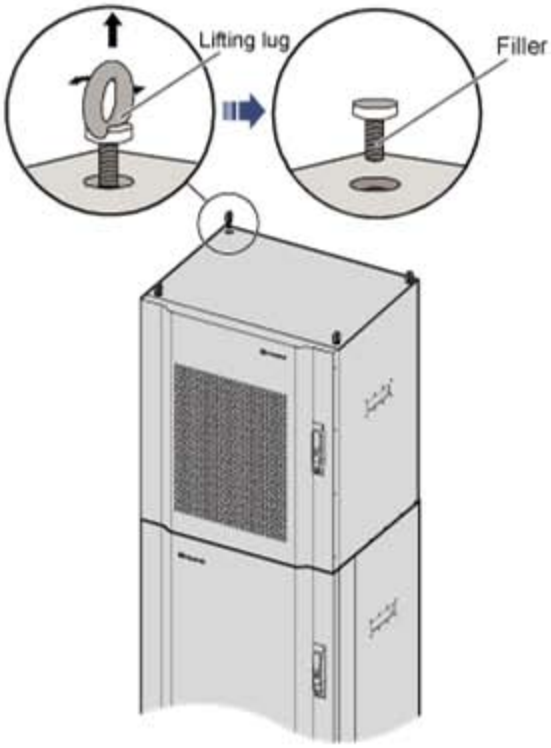


b Fixing the Cabinet

2. Fixing the Cabinet on the Base



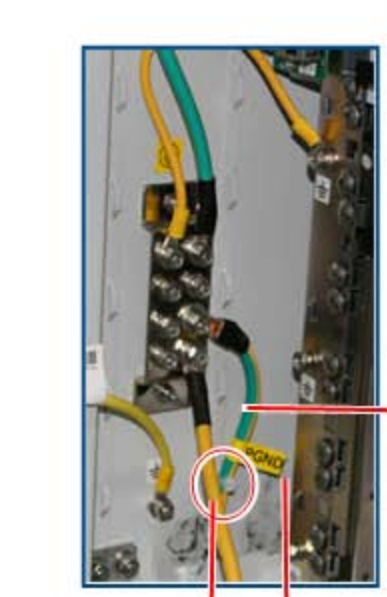
c Removing the Lifting Lugs



5 Installing the PGND Cable

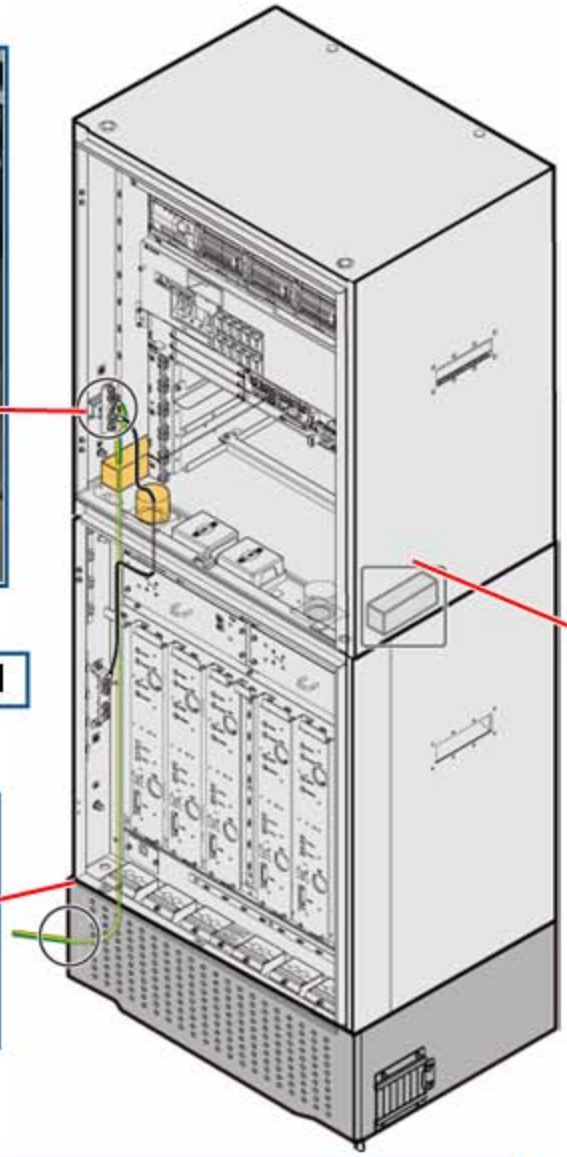
CAUTION

Before the power-on check, ensure that all the MCBs are set to OFF.



Cable tie

Label



The cable troughs of the RF cabinet are located between the outer and inner shells of the cabinet and placed on the left and right sides of the cabinet. The cable trough on the left is for the cabling of the PGND cable, equipotential cables, and AC power cables. The cable trough on the right is for the cabling of the power cables of the transmission cabinet, battery cables, and E1 cables.

The OT terminals (14170020) of the PGND cable should be made on site.

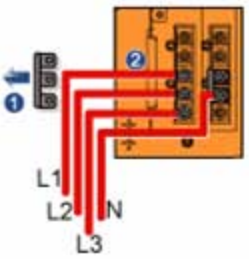
6 Installing the Input Power Cables

Making a power cable

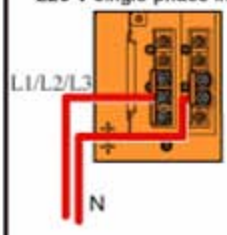
OT terminals: 14170017 (single-phase) and 14170005 (three-phase)

Power inputs

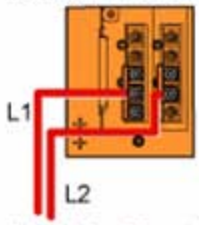
220 V 3-phase input



220 V single-phase input

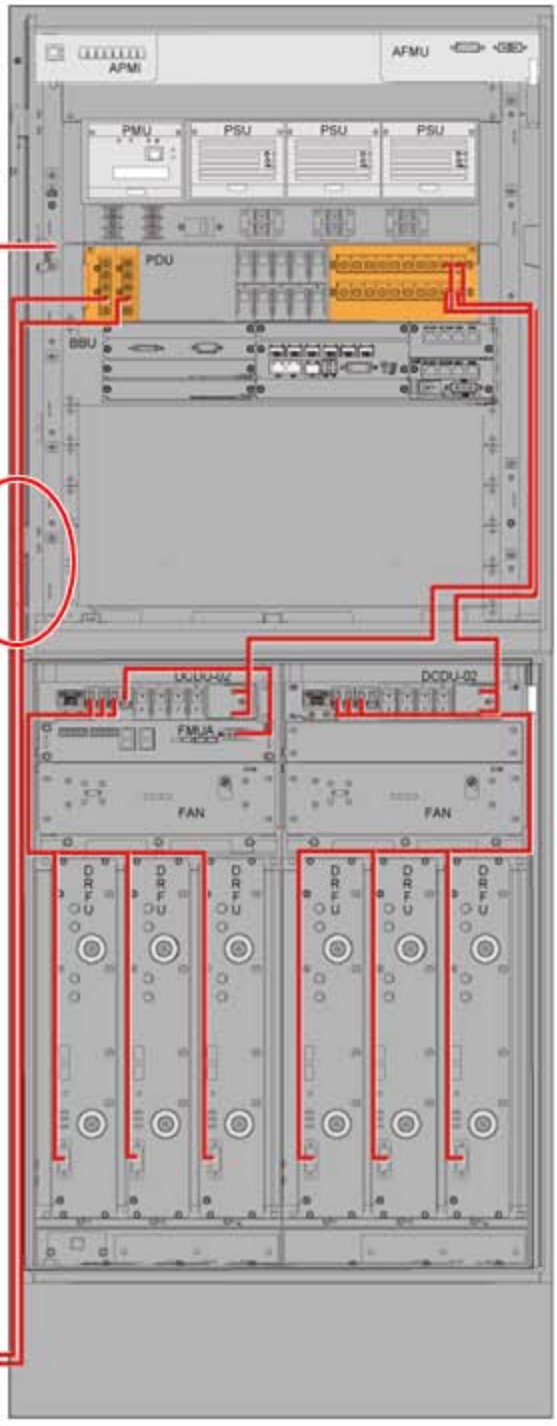


110 V dual-wire AC input

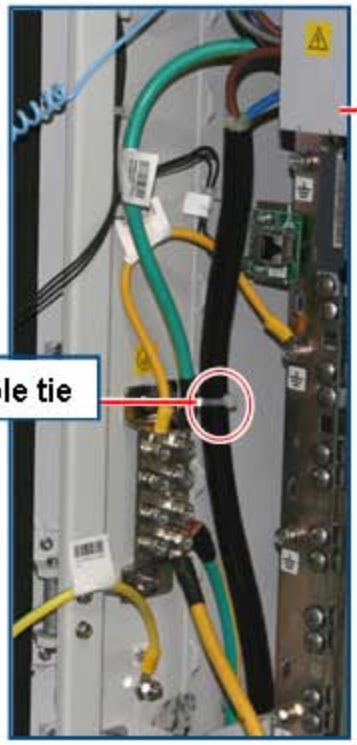


This PDU is different from the one which is used for 220 V AC input.

Label



Cable tie



PVC corrugated pipes

NOTE

Based on the requirements of the electric power grid, a power distribution box that has single-phase AC power input or three-phase AC power input is required.

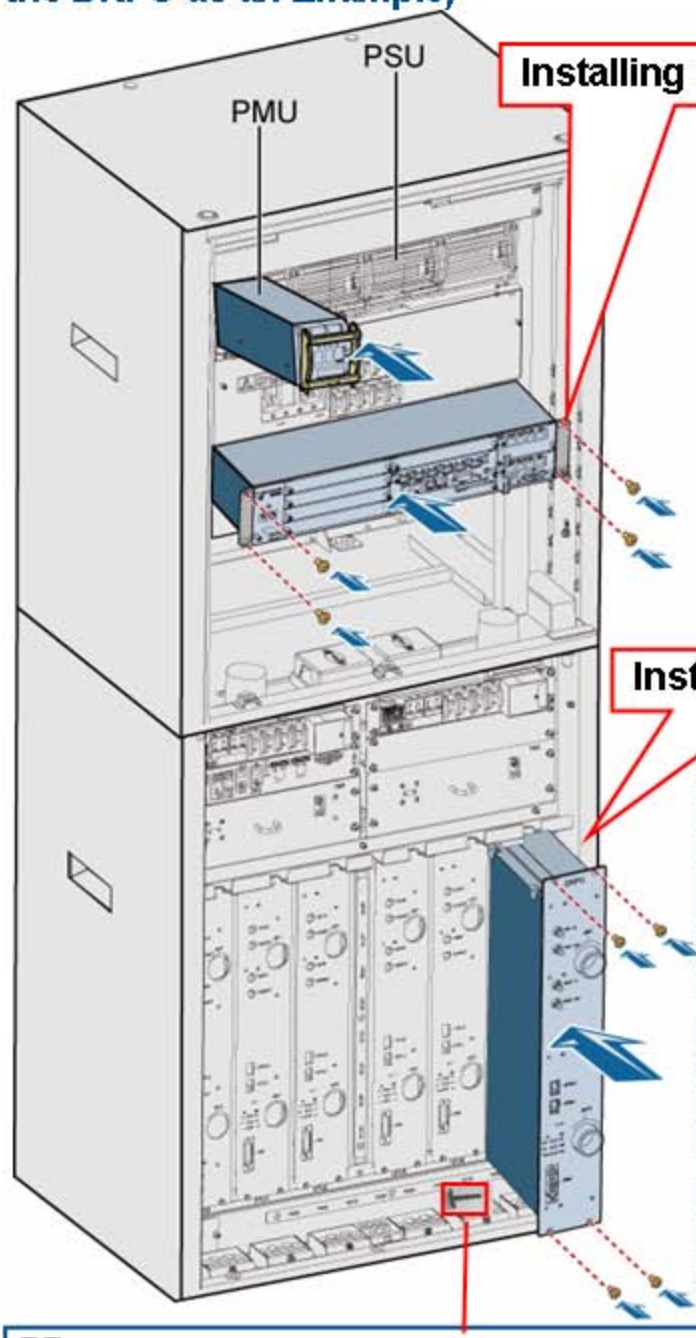
The rated current value of the AC miniature circuit breaker (MCB) for the single-phase power distribution box must be greater than or equal to 30 A.

The rated current value of the AC MCB for the three-phase power distribution box must be greater than or equal to 16 A.

7 Installing the BTS3900A Components

1. Installing the BBU3900
2. Installing a DRFU/GRFU (Taking the DRFU as an Example)

Before installing the BBU, install the mounting ears at both sides reversely.



When the DRFU is configured in the cabinet, you need to configure the GATM if the RET antenna or Tower Mounted Amplifier is selected. The GRFU integrates the function of controlling the RET antenna and TMA. Therefore, you do not need to configure the GATM when configuring the GRFU.

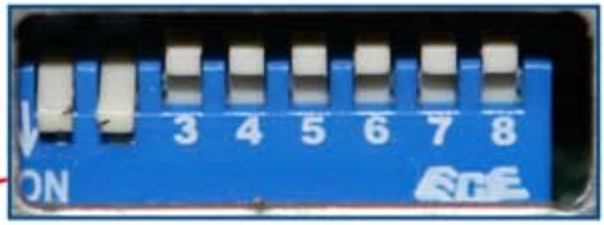
NOTE

The standard handle is bound to the air inlet at the RF cabinet bottom and is used to pull out the RFU during the maintenance. Bind the standard handle to the original position after the operation.

CAUTION

Before installing modules and cables, you must disconnect the external power. Take proper ESD protection measures, for example, wear an ESD wrist strap or a pair of ESD gloves, to prevent electrostatic damage to the boards, modules, or electronic components.

3. Installing the PMU/PSU and Cables



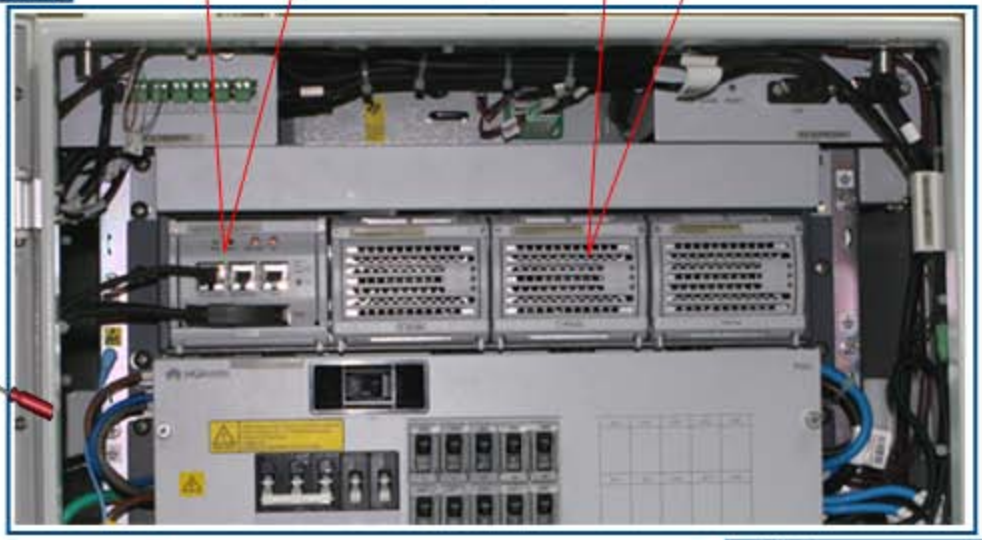
NOTE

If one PMU is configured, bit 1 and bit 2 of the DIP switch is set to ON and the other bits are set to OFF. If two PMUs are configured and two monitoring signals of the PMUs are connected to the MON0 or MON1 port on the UPEU/UEIU panel on the BBU, the settings of the DIP switch on the first PMU is the same as that when a single PMU is configured; bit 3 of the DIP switch on the second PMU is set to ON, and the other bits are set to OFF.If one monitoring signal is connected to the MON0 port and the other signal is connected to the MON1 port, the settings of the DIP switches on the PMUs can be the same. For details, see the settings of a single PMU.

One power cabinet can only be configured with one PMU.

Installing a PMU

Installing PSUs



Installing the environment monitoring signal cable for the power cabinet

Installing the monitoring signal cable between the APMI and the PMU

NOTE

Before delivery, the environment monitoring signal cable for the power cabinet and the monitoring signal cable between the APMI and the PMU are routed on the left side of the cabinet.

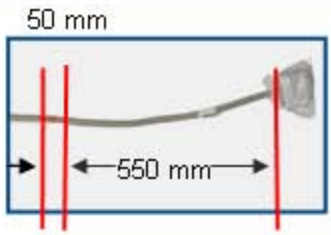
8 Installing the BTS3900A Cables

a Installing the Transmission Cables

1. Installing the E1 Transfer Cables

2. Installing the E1 Cables

3. Installing the CPRI Electrical Cables on the GTMU Side

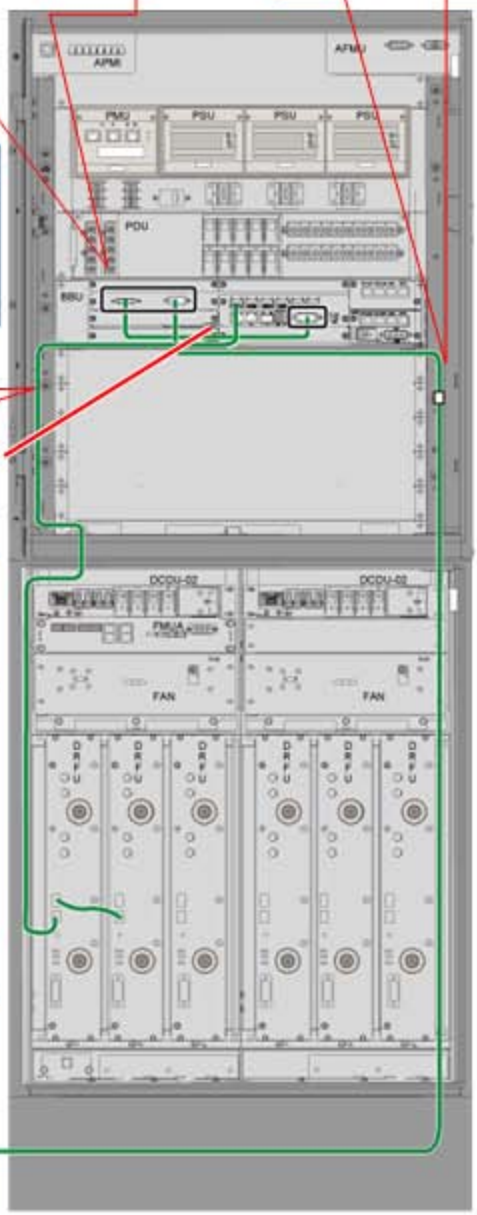


Installing an E1 transfer cable

Installing an E1 cable

Installing a CPRI electrical cable

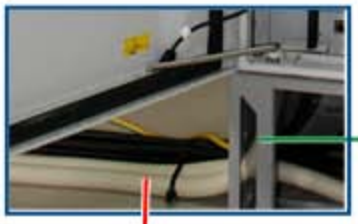
Label



Use cable ties to bind the accessory onto the cable trough on the right side of the cabinet.

NOTE

Install the CPRI electrical cables on only the GTMU side. After installing the jumpers, install the CPRI electrical cables on the RFU side.



PVC corrugated pipes

a Installing the Transmission Cables

Description of the BTS3900A transmission cables

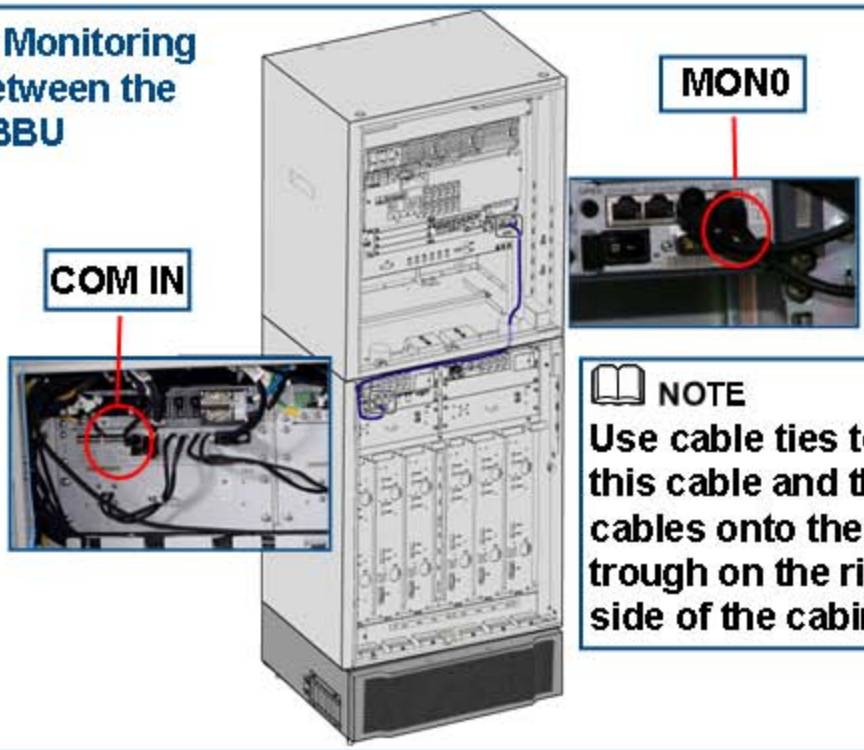
BOM	Cable Name	Appearance	Installation Position	Remarks
04120022 /04120025	E1 cable		One end is connected to the OUTSIDE port on the UELP or the E1/T1 port on the GTMU. The other end is connected to the corresponding auxiliary equipment.	Both ends of the cable should be connected on site.
04070027	E1 surge protection transfer cable		One end is connected to the INSIDE port on the UELP. The other end is connected to the E1/T1 port on the GTMU.	Both ends of the cable should be connected on site.
04050098	CPRI electrical cable		One end is connected to one of the ports CPRI0 through CPRI5 on the GTMU panel in the BBU. The other end is connected to the CPRI1 port on the DRFU panel or the CPRI0 port on the GRFU panel.	Both ends of the cable should be connected on site.
-	Signal cable between cascaded RFUs		One end is connected to the CPRI0 port on the upper-level DRFU panel. The other end is connected to the CPRI1 port on the lower-level DRFU panel.	Both ends of the cable should be connected on site.

NOTE

The CPRI electrical cable has two BOM codes: 04050098 (2 m) and 04050097 (1.5 m). The material delivered on site prevails. If the CRPI cable with a BOM code of 04050097 (1.5 m) is delivered to a site, you should use the cable to connect the BBU to the RFU0 to RFU2.

b Installing the Signal Cables

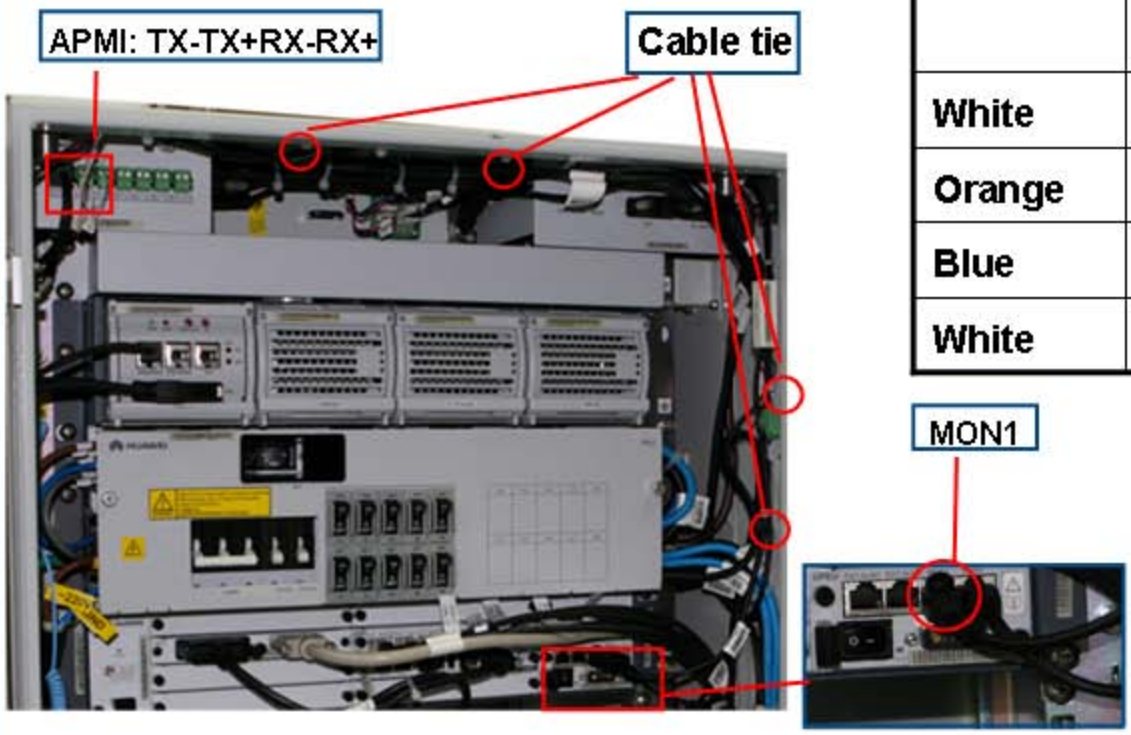
1. Installing the Monitoring Signal Cable Between the FMUA and the BBU



NOTE

Use cable ties to bind this cable and the E1 cables onto the cable trough on the right side of the cabinet.

2. Installing the Monitoring Signal Cable Between the APMI and the BBU



Color	Port on the APMI Panel
White	TX+
Orange	TX-
Blue	RX+
White	RX-

C Installing the RF Cables

Making jumpers

Color rings

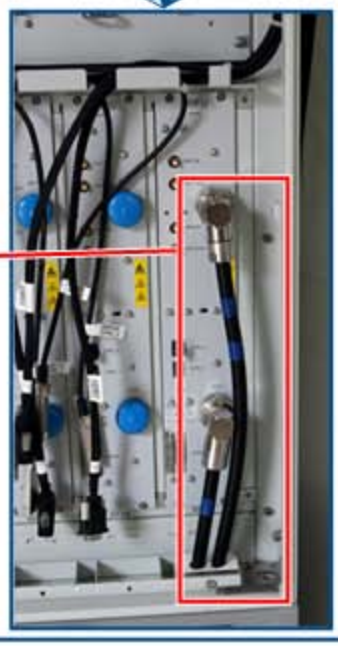
The DIN connectors should be added to the RF jumper on site. For the adding method, refer to the instruction guide packed in the DIN connector bag.

For the methods of attaching color rings, see Appendix A.

Note: When making the jumpers, leave them for proper length for capacity expansion.

Torque wrench S=32mm

The fastening torque is from 25 N·m to 35 N·m.



Installing two jumpers

c Installing the RF Cables

Description of the BTS3900A RF cables and related cables

BOM	Cable Name	Installation Position	Appearance
25070076	RF jumper	One end of the jumper is connected to the jumper connector on the feeder side. The DIN connector of the jumper is inserted into the ANT port on the RFU panel.	
99040SAR/99040SAS	Inter-RFU signal cable	One end is connected to the RX IN port on the panel of one RFU. The other end to the RX OUT port on the panel of another RFU.	

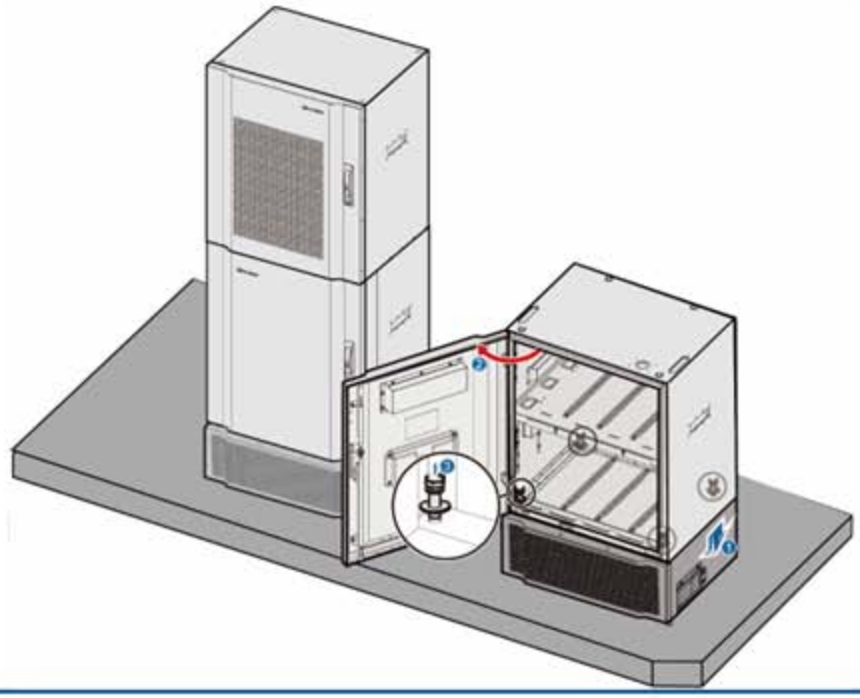
d Installing the RF-Related Cables

1. Installing Inter-RFU Signal Cables
2. Installing the CPRI Electrical Cables on the RFU Side

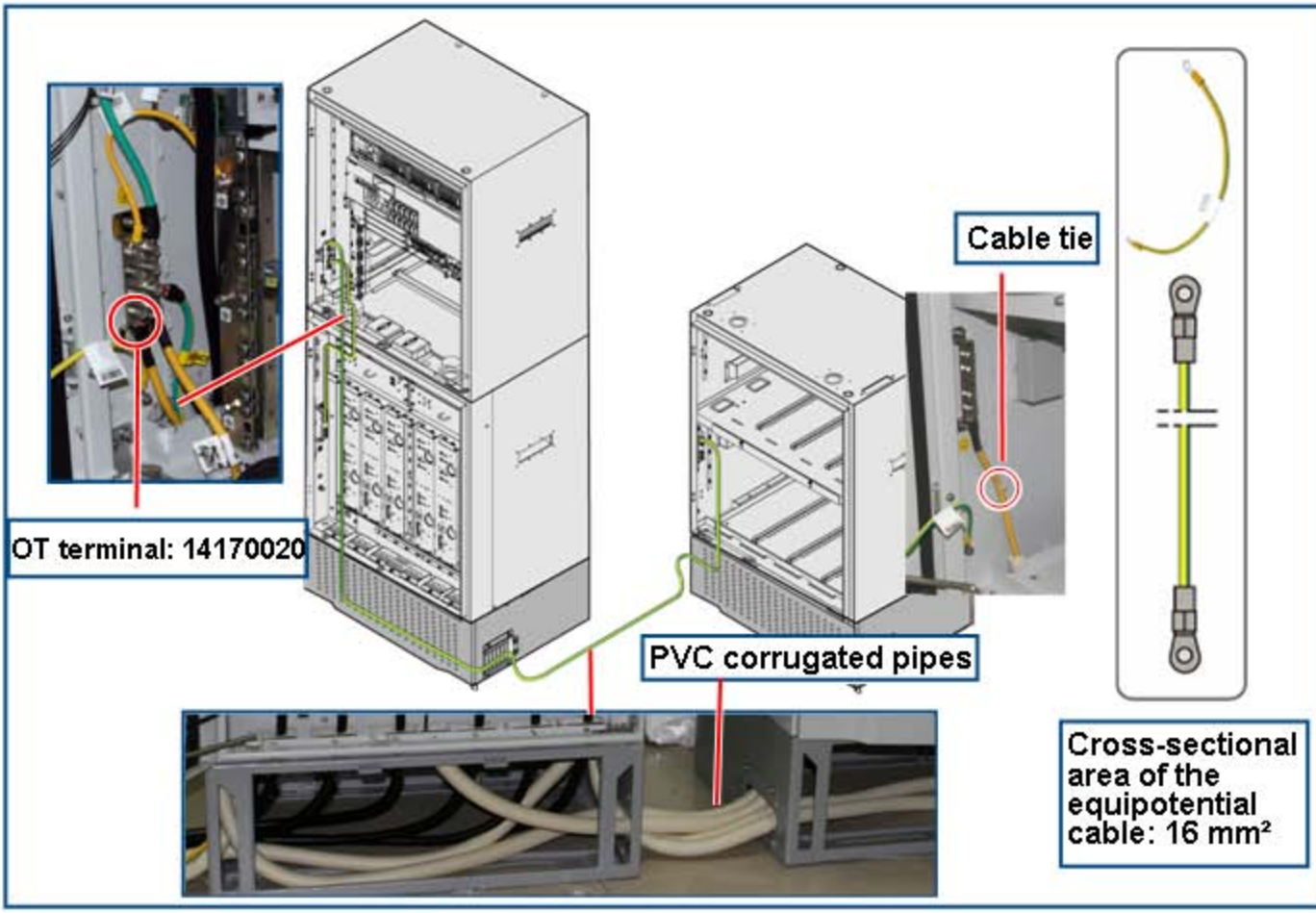
The CPRI electrical cable connections and routing are the same regardless of the RF cabinet configured with DRFUs or GRFUs.

9 Installing the Battery Cabinet and Cables

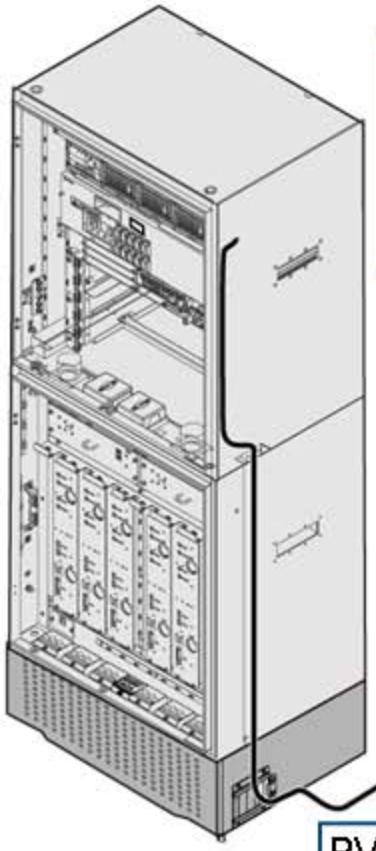
a Installing the Battery Cabinet



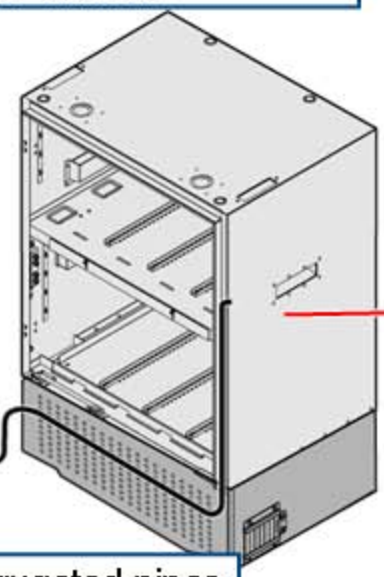
b Installing the Equipotential Cables



C Installing the Monitoring Signal Cable for the Door Status Sensor in the Battery Cabinet



NOTE
Use the input power cable for the battery cabinet to lead the monitoring signal cable for the door status sensor from the base to the power cabinet.

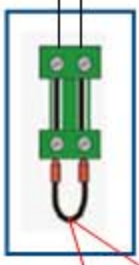


PVC corrugated pipes

1

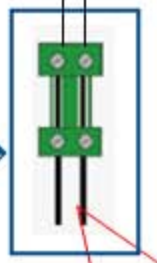
2

3



Door status sensor of the APM30 power cabinet

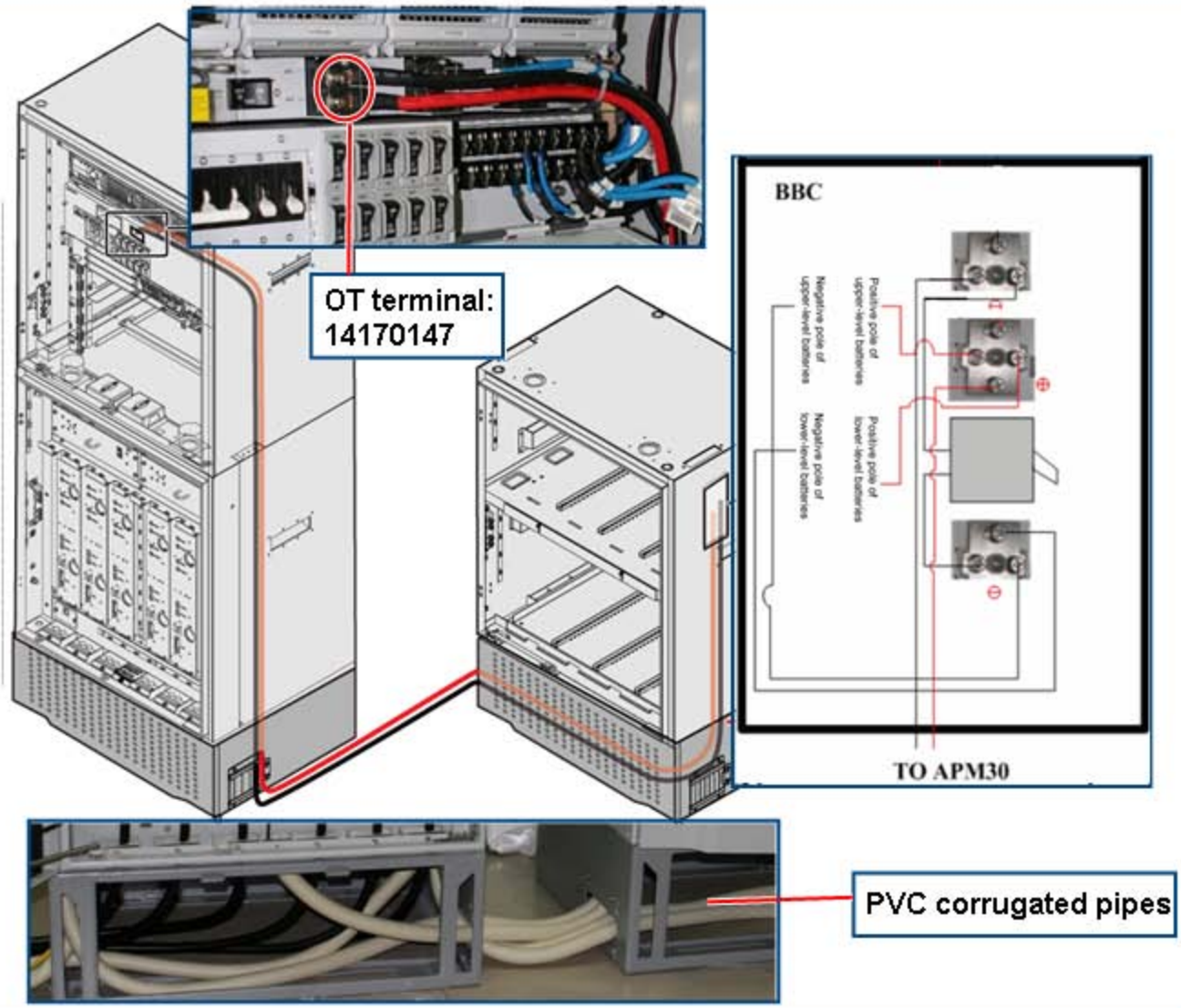
Remove and discard this short-circuiting cable.



Cascading the cables for the door status sensor from the battery cabinet

Note: Use cable ties to bind this cable and the other signal cables onto the cable trough on the right side of the cabinet.

d Installing the Input Power Cable for the Battery Cabinet

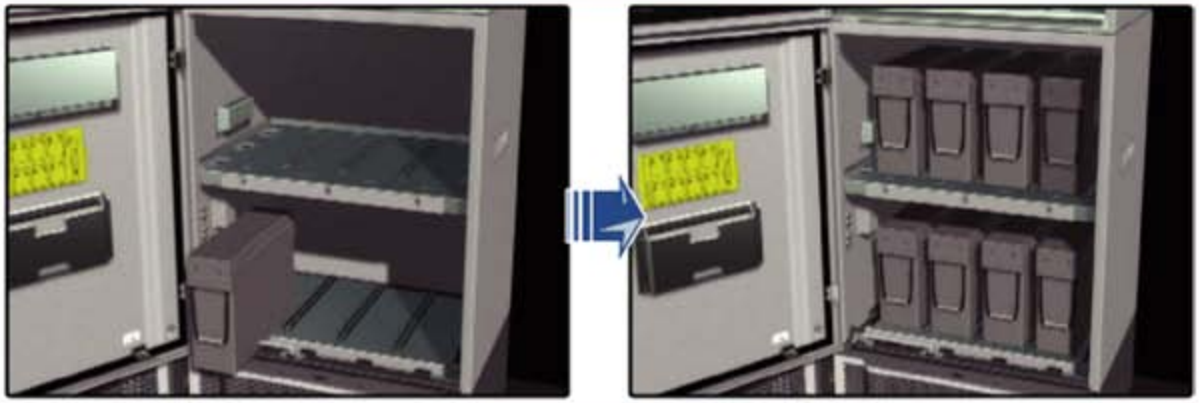


Based on the actual cabling route, obtain a power cable of a proper length. Then, add OT terminals to both ends of the cable.

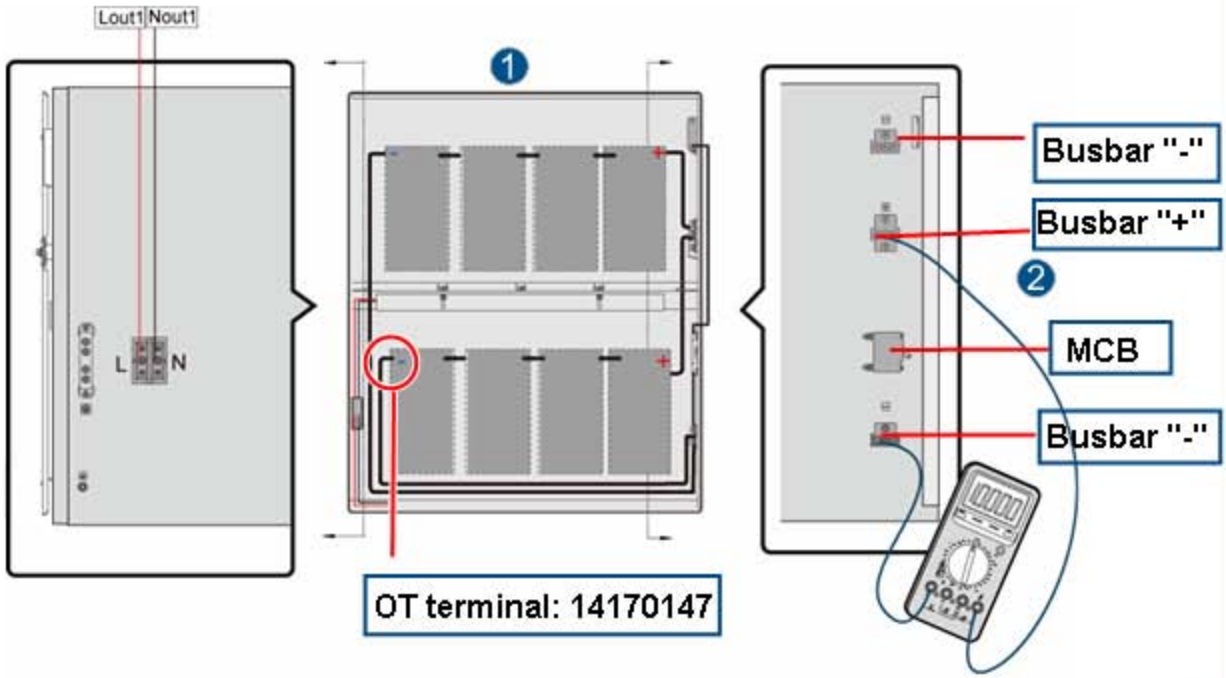
BOM	Cable Name	Appearance	Installation Position	Remarks
25030638 /25030719	Input power cable for the battery cabinet		One end is connected to the BAT(+) and BAT(-) terminals of the power subrack in the power cabinet. The other end is connected to the corresponding RTN(+) and -48V busbars in the battery cabinet.	Both ends of the cable should be connected on site.

e Installing the Batteries

You should use both hands to install the battery because it is heavy. When moving or placing the battery, you should handle it with care. The plastic housing of the batteries and the electrode wiring terminals must be kept intact during the installation.



f Installing the Cables for the Batteries

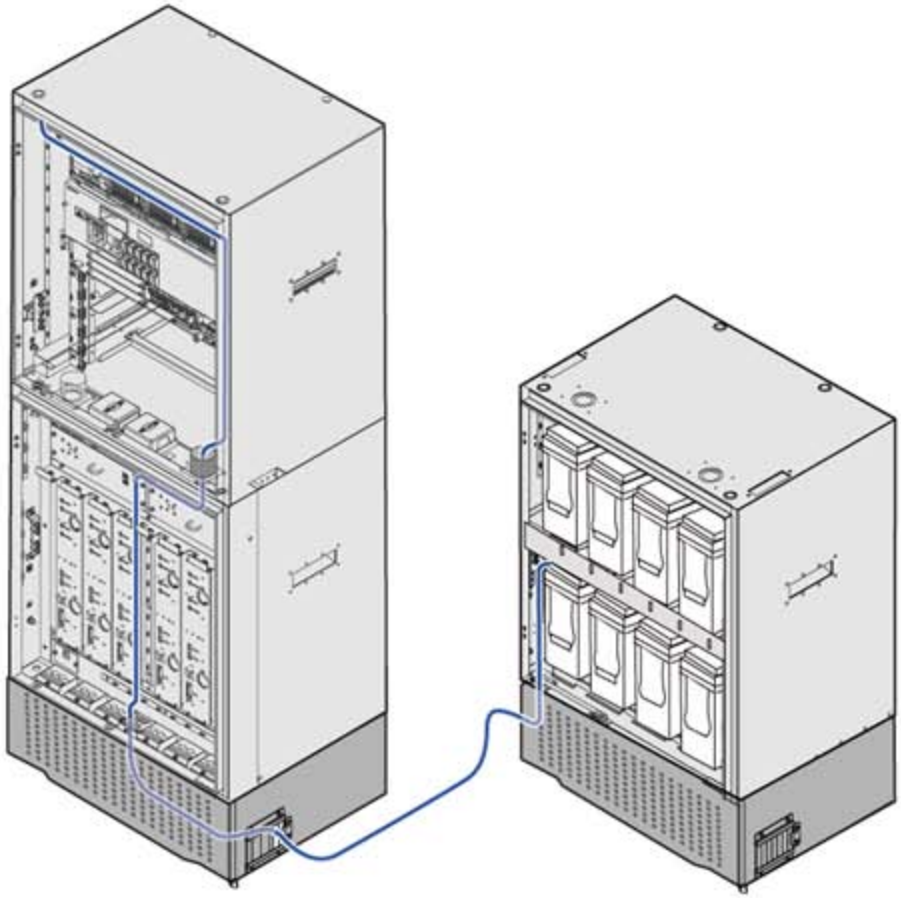


CAUTION

Before installing the battery, set the MCB BAT under the rectifier module to OFF to prevent heavy current output.

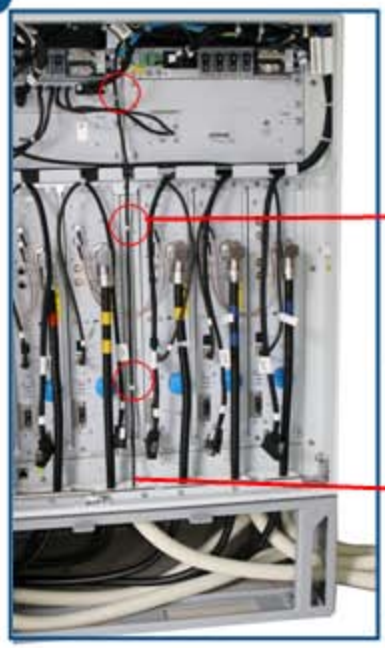
During the installation, short circuits must not exist between the positive and negative poles of the battery. The cover plate must be applied after cables are installed on the wiring terminal of the battery. This is to prevent the battery from being burned and to ensure your personal safety.

g Installing the Temperature Monitoring Signal Cable for the Batteries



2

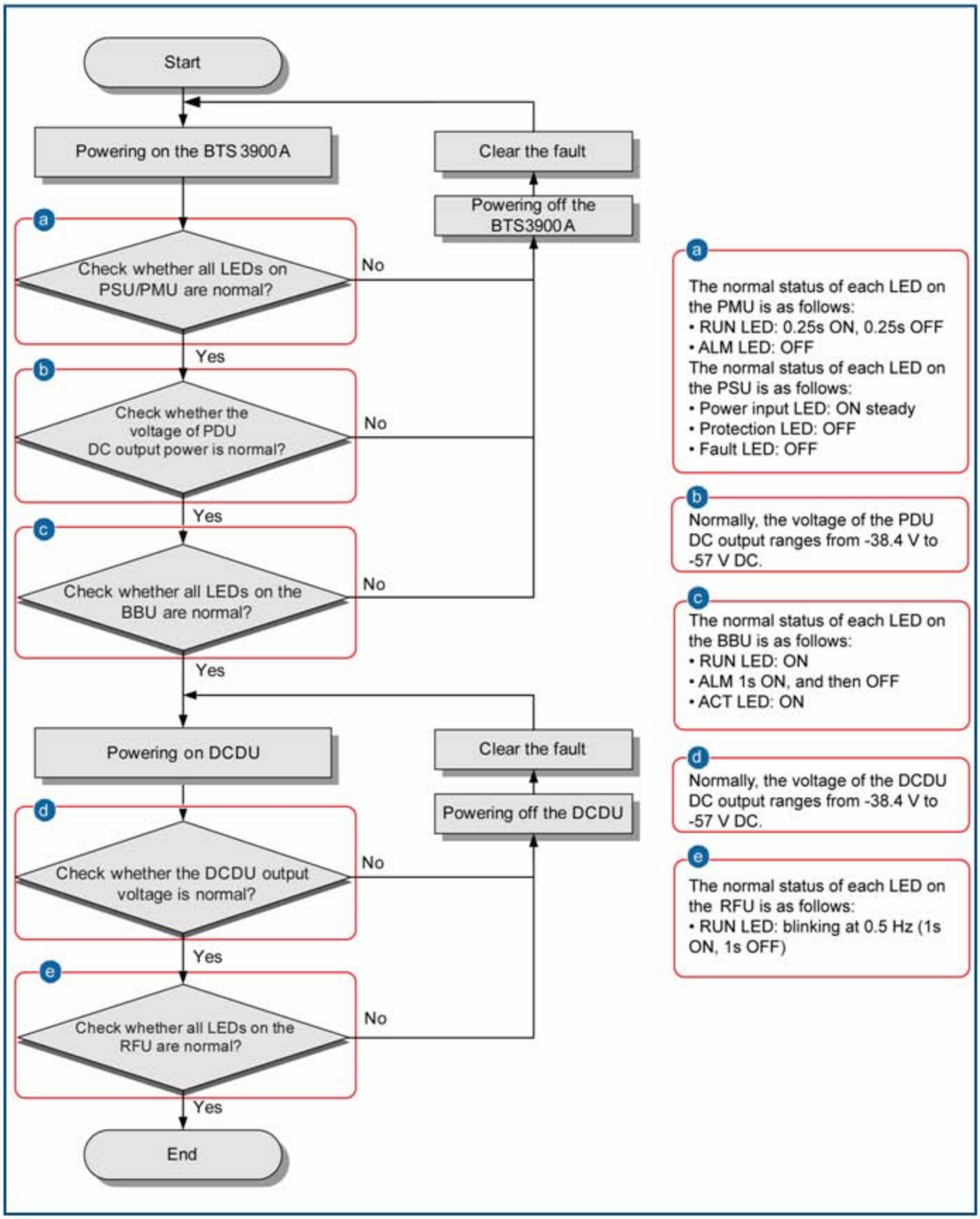
1



Cable tie

PVC corrugated pipes

10 Checking the Power-On Status



a

The normal status of each LED on the PMU is as follows:
- RUN LED: 0.25s ON, 0.25s OFF
- ALM LED: OFF

The normal status of each LED on the PSU is as follows:
- Power input LED: ON steady
- Protection LED: OFF
- Fault LED: OFF

b

Normally, the voltage of the PDU DC output ranges from -38.4 V to -57 V DC.

c

The normal status of each LED on the BBU is as follows:
- RUN LED: ON
- ALM 1s ON, and then OFF
- ACT LED: ON

d

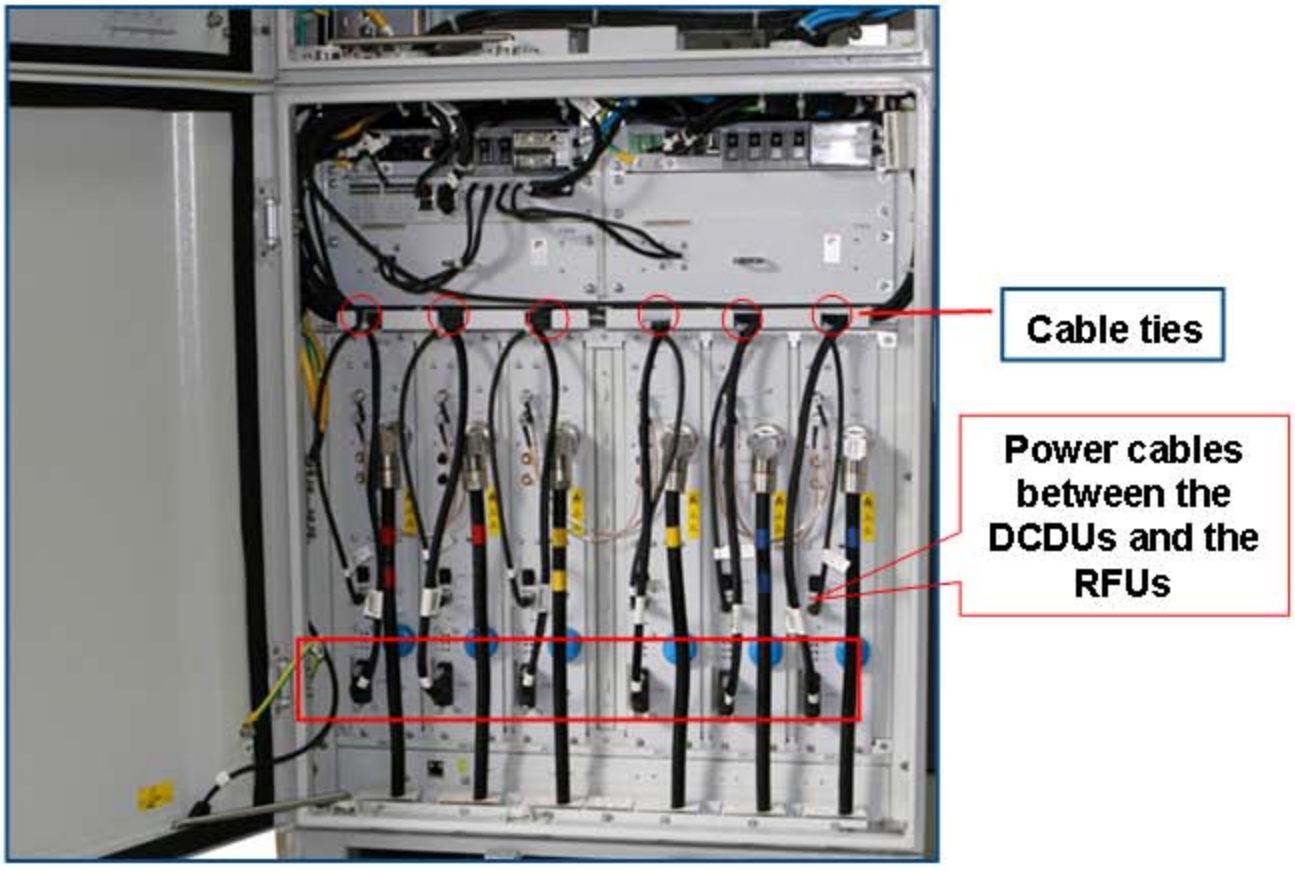
Normally, the voltage of the DCDU DC output ranges from -38.4 V to -57 V DC.

e

The normal status of each LED on the RFU is as follows:
- RUN LED: blinking at 0.5 Hz (1s ON, 1s OFF)

11 Installing the BTS3900A Power Cables

1. Installing the Power Cable Between the PDU and the BBU
2. Installing the Power Cables Between the DCDUs and the RFUs



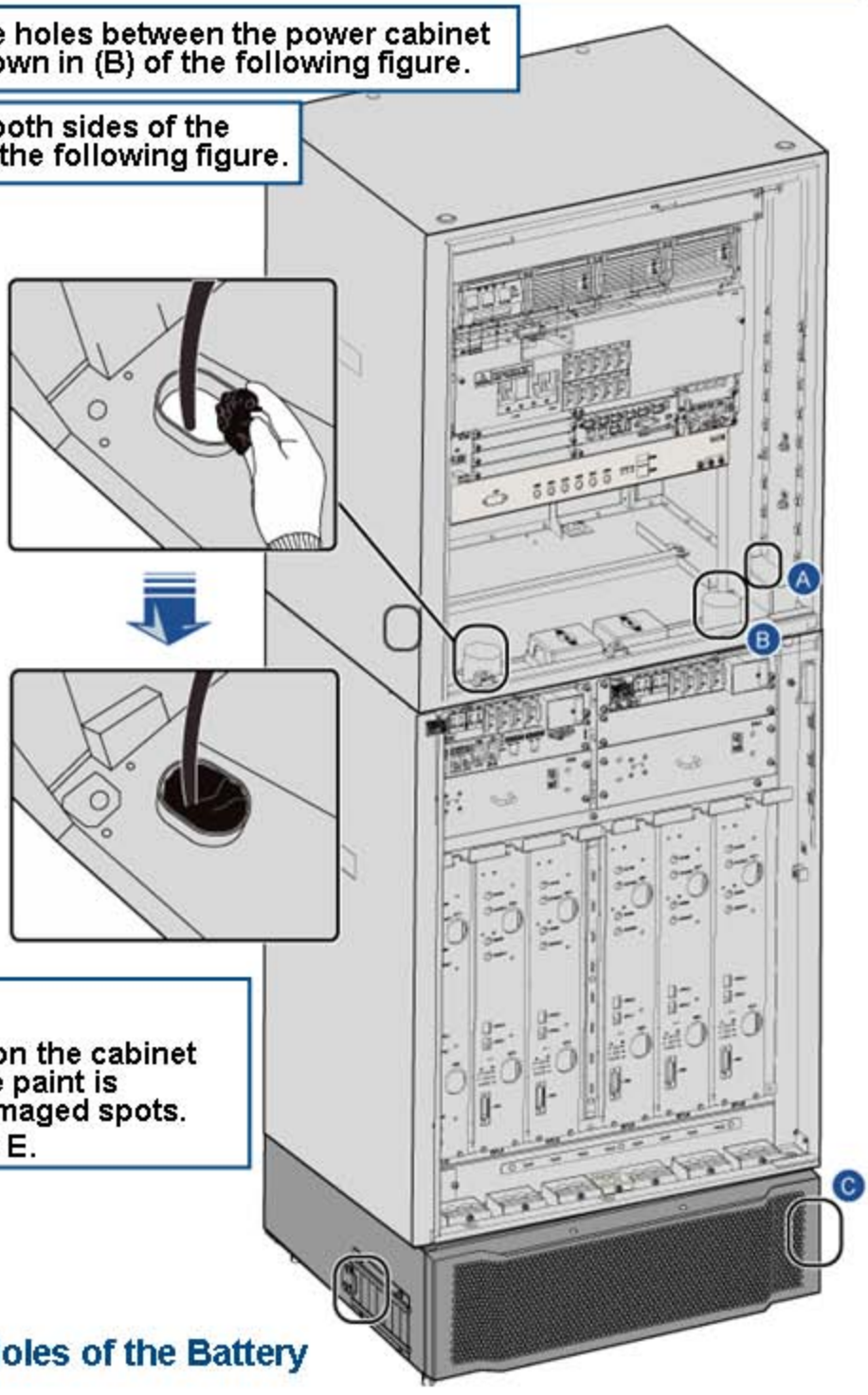
Description of the BTS3900A power cables

BOM	Cable Name	Appearance	Installation Position	Remarks
04150051	Power cable between the PDU and the BBU		One end is connected to the PDU DC output terminal LOAD5 (12 A). The OT terminal of the -48 V blue power cable is connected to NEG(-) and the OT terminal of the black GND cable is connected to RTN(+). The other end is connected to the PWR port on the UPEU in the BBU.	The cable is routed and one end of the cable is connected to the PDU before delivery.
04150030 (RFUs 2-5)/04150029 (RFUs 0-1)	Power cable between the DCDU and the RFU		One end is connected to the RFU socket on the DCDU-02 panel. The other end is connected to the PWR port on the RFU panel.	The cable is routed and one end of the cable is connected to the DCDU-02 before delivery.
04150059/04150060	Power cable between the PDU and the DCDU		One end is connected to NEG(-) and RTN(+) of PDU DC output terminals LOAD8 and LOAD9 (30 A). The other end is connected to NEG(-) and RTN(+) of the DCDU-02 in the RF cabinet.	Both ends of the cable are connected before delivery.

12 Sealing the Cable Holes

1. Sealing the Cable Holes of the BTS3900A Cabinet

1. Seal the cable inlets from the power cabinet to the cable troughs on both sides of the RF cabinet, as shown in (A) of the following figure.
2. Seal the two round cable holes between the power cabinet and the RF cabinet, as shown in (B) of the following figure.
3. Seal the cable holes on both sides of the base, as shown in (C) of the following figure.



NOTE

Check whether the paint on the cabinet surface is damaged. If the paint is damaged, re-paint the damaged spots. For details, see Appendix E.

2. Sealing the Cable Holes of the Battery Cabinet

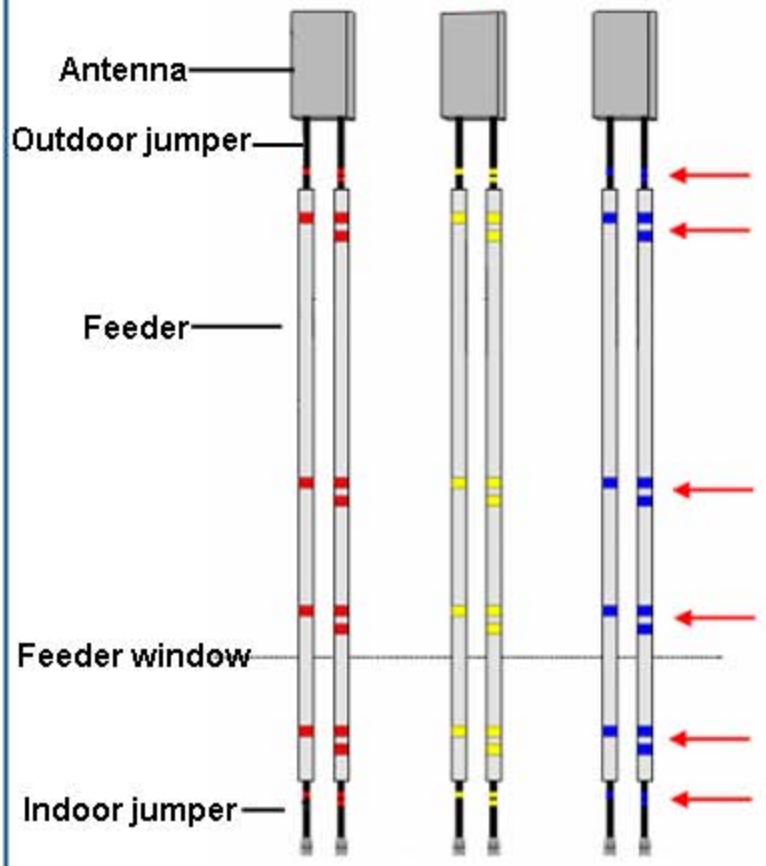
Seal the related cable holes according to actual cable routing. For details, see Sealing the Cable Holes of the BTS3900A Cabinet.

Appendix A Attaching Color Rings

NOTE

To distinguish sectors and RF channels, you can attach color rings of different colors and quantities to feeders and jumpers. Make plans before attaching color rings, and check the color rings after attaching them.

1 Positions of Color Rings



Positions:

1. 200 mm away from the connector of the outdoor jumper
2. 200 mm away from the outdoor connector of the feeder
3. Not more than 1 m away from where the feeder leaves the tower
4. 1 m away from the feeder window before the feeder is led into the room
5. 200 mm away from the indoor connector of the feeder
6. 200 mm away from the connector of the indoor jumper

2 Attaching Color Rings

NOTE

The attachment of color rings should follow the local standard. The color rings should be wrapped correctly and in the same direction. For each ring, two or three layers are required, and the upper layer should cover the lower layer. The spacing between two rings should be within the range of 10 mm to 15 mm.

3 Color Ring Schemes

Typical Scheme

Sector	Main	Diversity
1	Two red rings	One red ring
2	Two yellow rings	One yellow ring
3	Two blue rings	One blue ring

Other Schemes

If two antennas of one antenna system serve the same site, the color rings attached to the other antenna should follow the scheme listed in the following table.

Sector	Main (Antenna 2)	Diversity (Antenna 2)
1	Four red rings	Three red rings
2	Four yellow rings	Three yellow rings
3	Four blue rings	Three blue rings

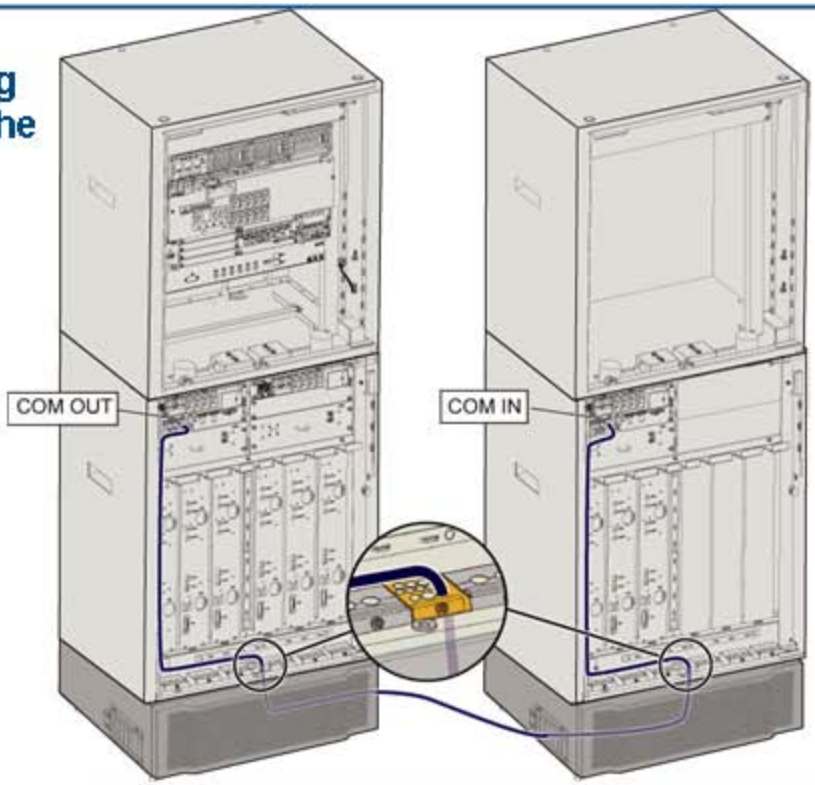
If two antenna systems serve the same site, the color rings attached to the other antenna system should follow the scheme listed in the following table.

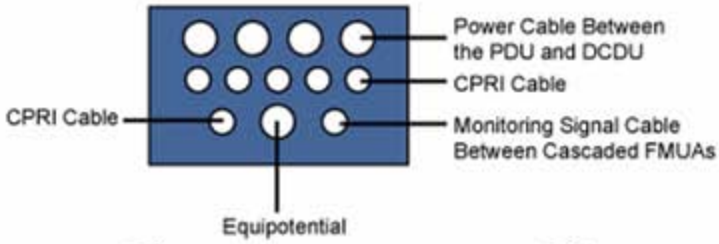
Sector	Main (Antenna System 2)	Diversity (Antenna System 2)
1	One white ring + two red rings	One white ring + one red ring
2	One white ring + two yellow rings	One white ring + one yellow ring
3	One white ring + two blue rings	One white ring + one blue ring

NOTE

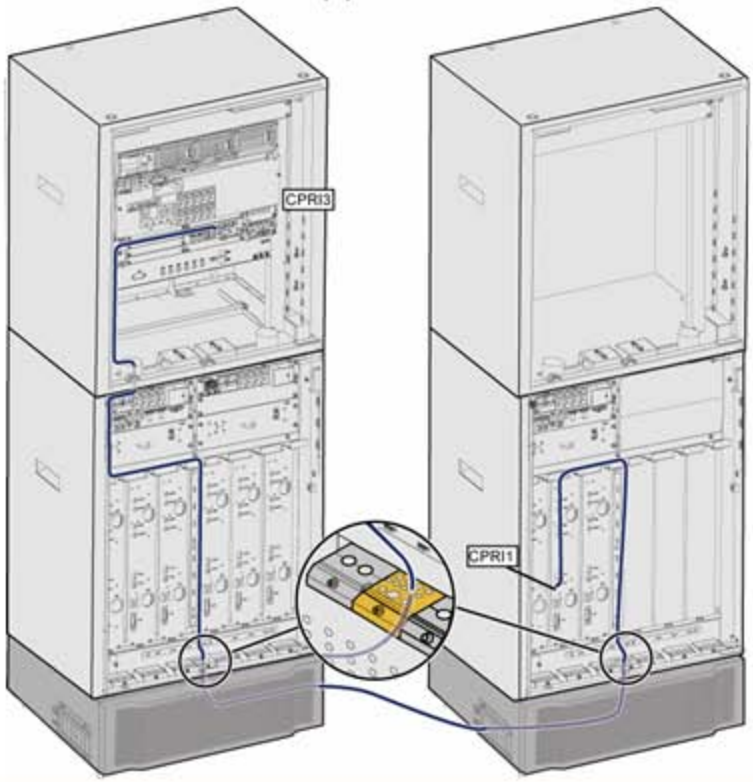
If an antenna system serves six sectors, the colors of the rings for sectors 4, 5, and 6 are purple, orange, and green respectively.

Installing the Monitoring Signal Cable Between the Cascaded FMUAs



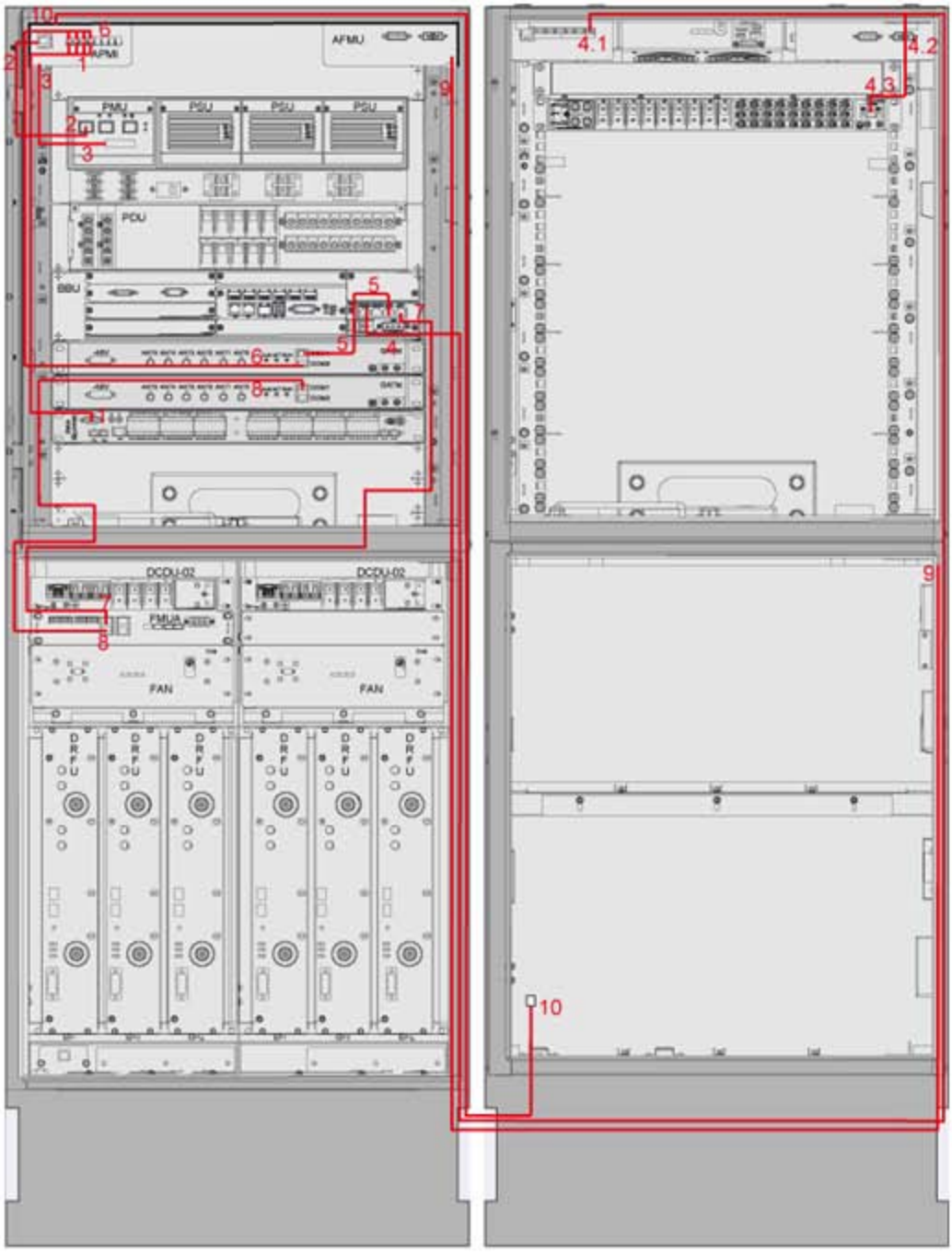


Installing the CPRI Electrical Cables



Appendix C BTS3900A-Related Configuration Monitoring Information

a BTS3900A+TMC+BBC Monitoring Scheme

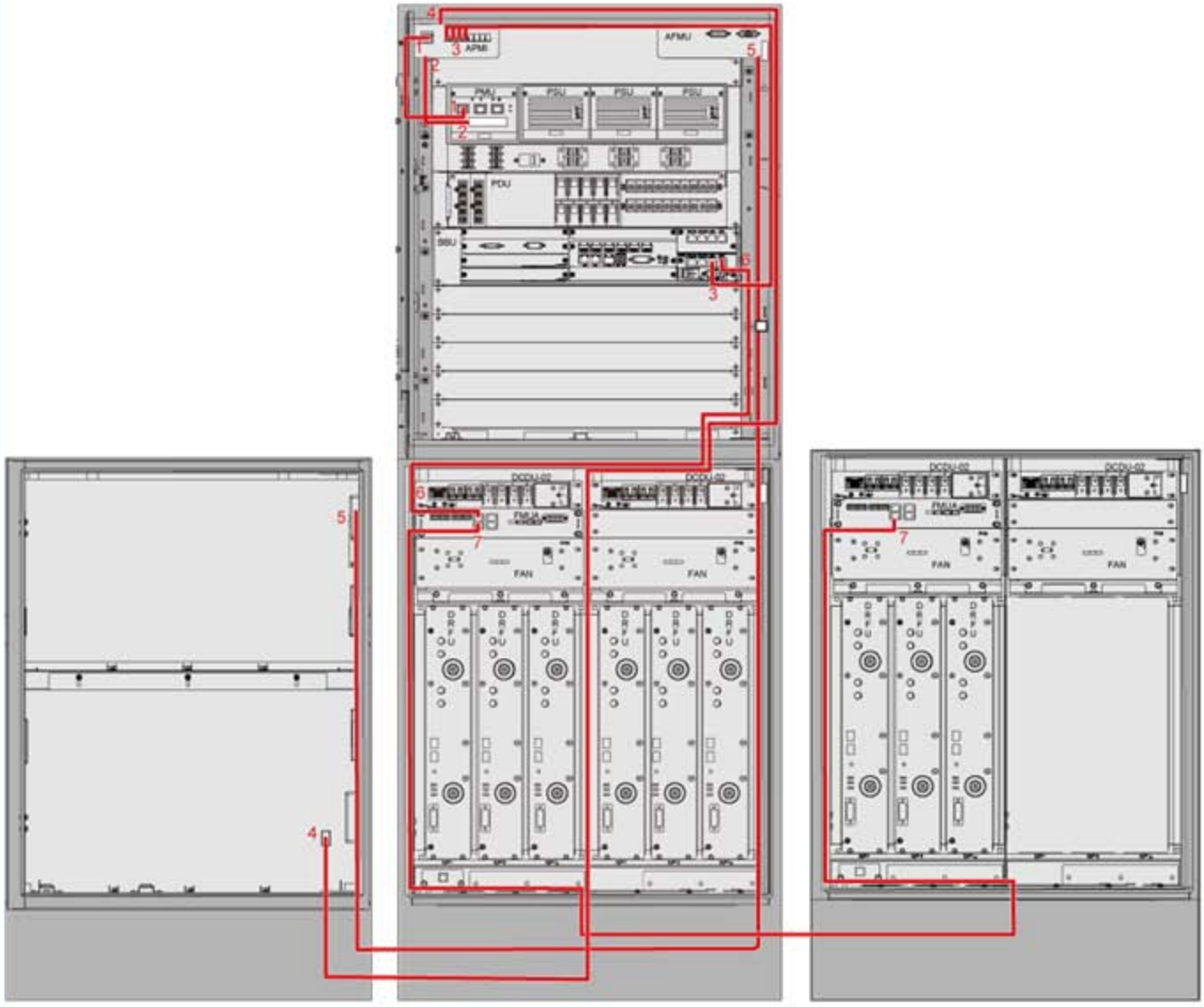


a BTS3900A+TMC+BBC Monitoring Scheme

Monitoring description

SN	Cable Name	Description
1	Monitoring Signal Cable for the EMUA	One end is connected to the RS485 port on the EMUA. The other end is connected to the TX-TX+ and RX-RX+ ports on the APMI panel.
2	Monitoring signal cable between the PMU and the APMI	One end is connected to the RS232/RS422 port on the PMU panel. The other end is connected to the RS422 port on the APMI.
3	Environment monitoring signal cable for the power cabinet	One end is connected to the COM port on the PMU panel. The other end is connected to the J1 port on the APMI panel.
4	Monitoring signal cable for the transmission cabinet	One end is connected to the EXT_ALM1 port on the BBU. The other end is connected to the alarm port for the door status sensor, alarm port for the temperature-regulating unit, and alarm port for the DC power distribution box in the APM30 transmission cabinet.
5	Monitoring signal cable for the GATM	One end is connected to the COM1 port on the GATM panel. The other end is connected to the MON1 port on the panel of the lower right power slot in the BBU.
6	Monitoring signal cable between the APMI and the BBU	One end is connected to the TX-TX+ and RX-RX+ ports on the APMI panel. The other end is connected to the COM2 port on the first GATM panel.
7	Monitoring signal cable between the FMUA and the BBU	One end is connected to the COM IN port on the FMUA panel. The other end is connected to the MON0 port on the BBU panel.
8	Monitoring signal cable for the GATM	One end is connected to the COM1 port on the GATM panel. The other end is connected to the COM OUT port on the FMUA panel.
9	Monitoring signal cable for the door status sensor in the battery cabinet	One end is connected to the door alarm wiring terminal of the APM30 battery cabinet. The other end is connected to the door alarm wiring terminal block of the APM30 power cabinet.
10	Temperature alarm signal cable for the battery cabinet	One end is connected to the BAT_TEM1 port on the APMI panel. The other end is connected to the left wiring terminal of the battery in the battery cabinet.

b BTS3900A+RFC+BBC Monitoring Scheme



b BTS3900A+RFC+BBC Monitoring Scheme

Monitoring description

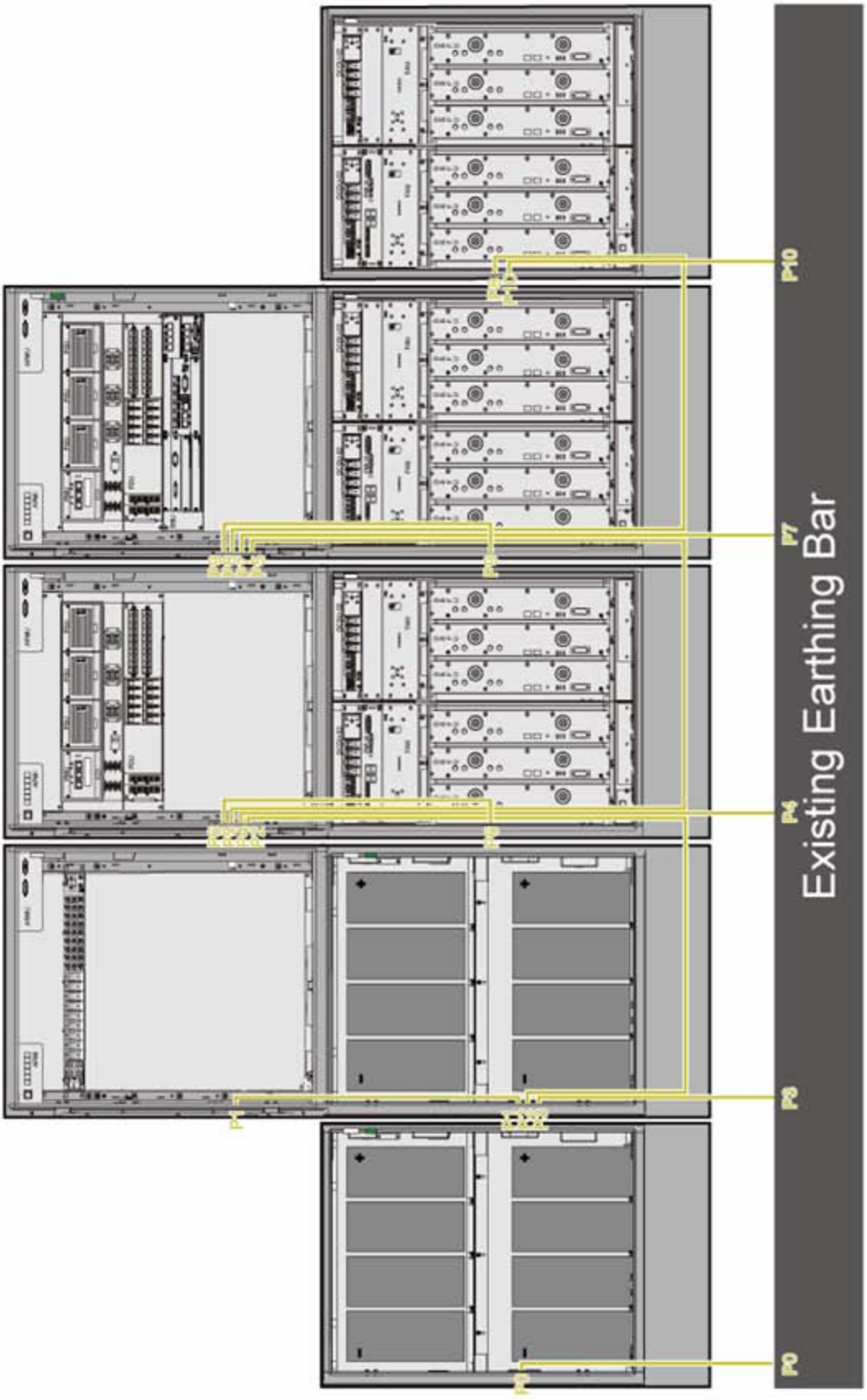
SN	Cable Name	Description
1	Monitoring signal cable between the PMU and the APMI	One end is connected to the RS232/RS422 port on the PMU panel. The other end is connected to the RS422 port on the APMI.
2	Environment monitoring signal cable for the power cabinet	One end is connected to the COM port on the PMU panel. The other end is connected to the J1 port on the APMI panel.
3	Monitoring signal cable between the APMI and the BBU	One end is connected to the TX-TX+ and RX-RX+ ports on the APMI panel. The other end is connected to the MON1 port on the BBU panel.
4	Temperature alarm signal cable for the battery cabinet	One end is connected to the BAT_TEM1 port on the APMI panel. The other end is connected to the left wiring terminal of the battery in the battery cabinet.
5	Monitoring signal cable for the door status sensor in the battery cabinet	One end is connected to the door alarm wiring terminal of the APM30 battery cabinet. The other end is connected to the door alarm wiring terminal block of the APM30 power cabinet.
6	Monitoring signal cable between the FMUA and the BBU	One end is connected to the COM IN port on the FMUA panel. The other end is connected to the MON0 port on the BBU panel.
7	Monitoring signal cable between the cascaded FMUAs	One end is connected to the COM OUT port on the panel of the upper-level FMUA. The other end is connected to the COM IN port on the panel of the lower-level FMUA.

Appendix D Signal Cables

SN	BOM	Cable Name	Appearance
1	04080028	Monitoring signal cable for the door status sensor in the power cabinet	
2	04090221	Monitoring signal cable for the door status sensor in the battery cabinet	
3	04080035	Environment monitoring signal cable for the power cabinet	
4	04070025	Monitoring signal cable between the PMU and the APMI Monitoring signal cable for the GATM Temperature monitoring signal cable for the FMUA	
5	04080029	Monitoring signal cable between the APMI and the BBU	
6	04080037	Monitoring signal cable for the transmission cabinet	
7	04070023	Monitoring signal cable between the FMUA and the BBU	
8	04070026	Monitoring signal cable between the cascaded FMUAs	
9	-	Temperature alarm signal cable for the batteries	
10	04080038	Monitoring signal cable for the EMUA	

Appendix E Configuration of Three Cabinets

a Grounding Scheme of Three Cabinets

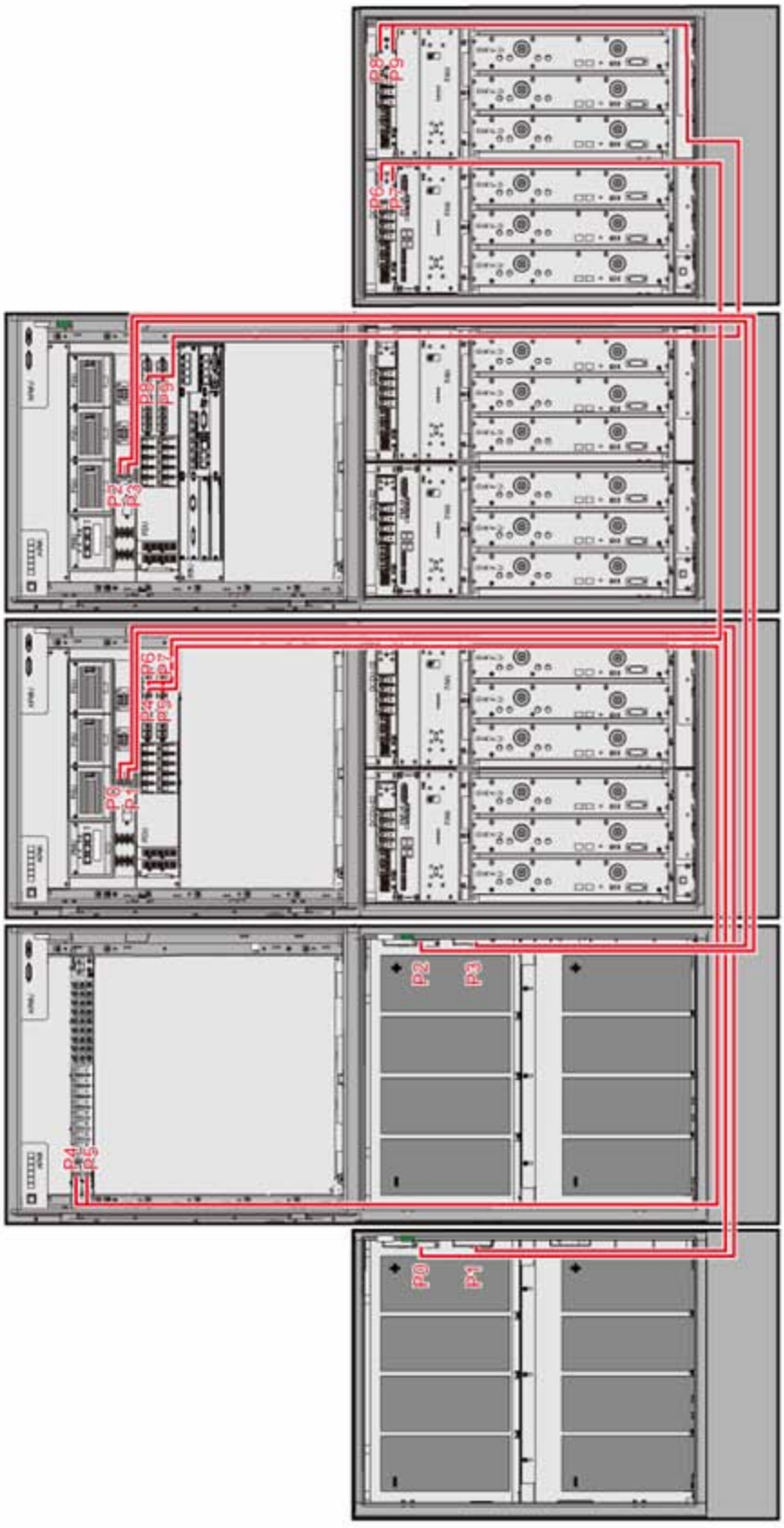


a Grounding Scheme of Three Cabinets

Grounding

No.	Cable	Description	
		From	To
P0 and P3	PGND cable for the battery cabinet	The grounding bar inside the battery cabinet	The grounding bar outside the cabinet
P1	PGND cable for the transmission cabinet	The grounding bar inside the transmission cabinet	The grounding bar outside the cabinet
P2	Equipotential cable between the power cabinet and the battery cabinet	The grounding bar inside the power cabinet	The grounding bar inside the battery cabinet
P4 and P7	PGND cable for the power cabinet	The grounding bar inside the battery cabinet	The grounding bar outside the cabinet
P5	Equipotential cable between power cabinets	The grounding bar inside the power cabinet	The grounding bar inside the neighboring power cabinet
P6, P9, and P10	Equipotential cable between the power cabinet and the RF cabinet	The grounding bar inside the power cabinet	The grounding bar inside the RF cabinet
P8	PGND cable for the RF cabinet	The grounding bar inside the RF cabinet	The grounding copper bar outside the cabinet

b Power Distribution Scheme of Three Cabinets

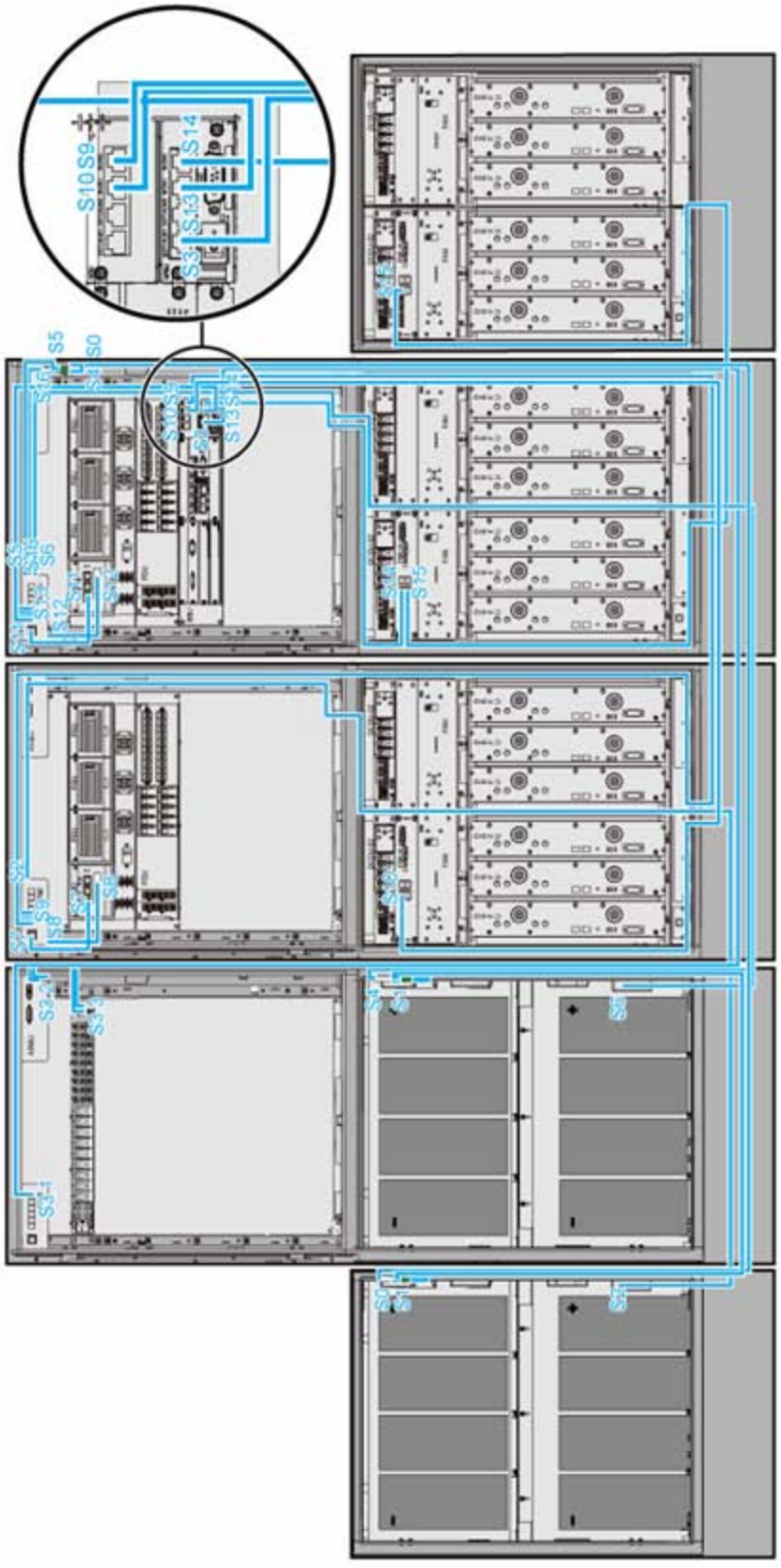


b Power Distribution Scheme of Three Cabinets

Power Distribution

No.	Cable Name	Description	
		From	To
P0 to P3	Input power cable for the battery cabinet	The **BAT(+)** and **BAT(-)** wiring terminals on the power subrack in the power cabinet	The corresponding **RTN(+)** and -48V busbars in the battery cabinet
P4 and P5	Input power cable for the transmission cabinet	The **RTN(+)** and **NEG(-)** terminals of the **LOAD6** on the PDU in the power cabinet	The **RTN(+)** and **NEG(-)** terminals on the DCDU-03A module in the transmission cabinet
P6 to P9	Input power cable for the RF cabinet	The **NEG(-)** and **RTN(+)** terminals of the **LOAD7** (30 A) on the PDU	The corresponding **NEG(-)** and **RTN(+)** terminals on the DCDU-02 module in the right part of the cabinet.

C Monitoring Scheme of Three Cabinets

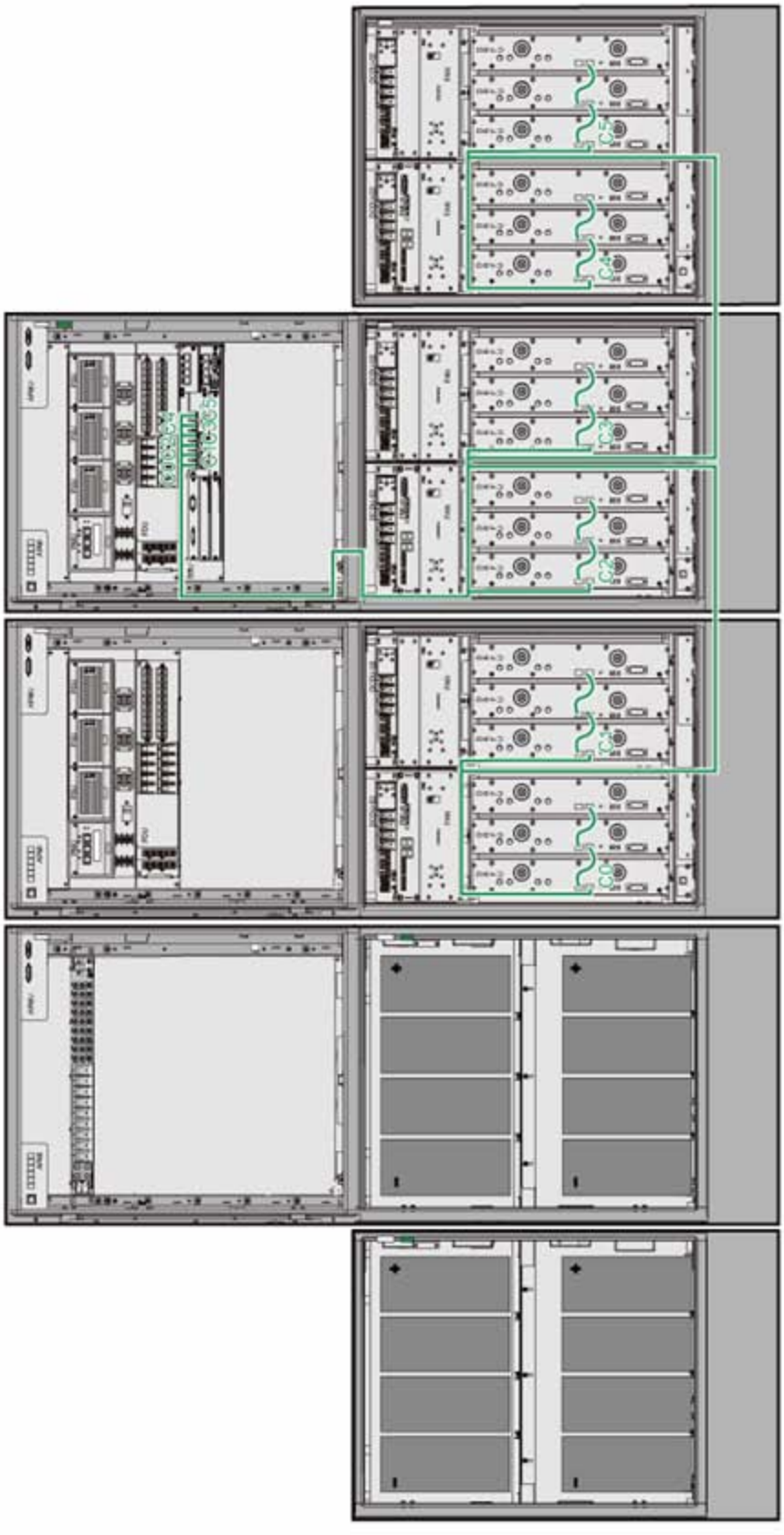


C Monitoring Scheme of Three Cabinets

Monitoring

No.	Cable Name	Description	
		From	To
S0, S1, and S4	Monitoring signal cable for the door status sensor in the battery cabinet	The wiring terminal block for door alarms of the APM30 battery cabinet	The door alarm wiring terminal block of the APM30 battery cabinet\ power cabinet
S2, and S6	Temperature monitoring signal cable for the batteries	The **BAT_TEM1** port on the APMI panel	The right wiring terminal of the battery in the battery cabinet
S3	Monitoring signal cable for the transmission cabinet	The **EXT_ALM1** port on the BBU panel	The alarm port for the door status sensor, alarm port for the temperature-regulating unit, and alarm port for the DC power distribution box in the APM30 transmission cabinet
S5 and S16	Monitoring signal cable for the door status sensor in the power cabinet	The APMI panel	The door status sensor at the right side of the cabinet
S7 and S11	Monitoring signal cable between the PMU and the APMI	The **RS232/RS422** port on the PMU panel	The **RS422** port on the APMI panel
S8 and S12	Environment monitoring signal cable for the power cabinet	The **COM** port on the PMU panel	The **J1** port on the APMI panel
S9 and S13	Monitoring signal cable between the APMI and the BBU	The **TX-TX+** port and **RX-RX+** port on the APMI panel	The **MON0** or the **MON1** port on the BBU panel
S10 and S14	Monitoring signal cable between the FMUA and the BBU	The **COM IN** port on the FMUA panel	The **MON0** port on the BBU panel
S15	Monitoring signal cable between the cascaded FMUA	The upper-level **COM OUT** port on the FMUA panel	The lower-level **COM IN** port on the FMUA panel

d Transmission Scheme of Three Cabinets



Appendix F Installation Guide of the Bias-Tee

Bias-Tee in the BTS3900A cabinet

Port for the Bias-Tee and RET control signals

Connecting one of the ports from ANT0 to ANT5 on the GATM.

1

2

The power cables for the RFU and the CPRI cables are installed.

3

Lower DIN Connector

DC/OOK Port

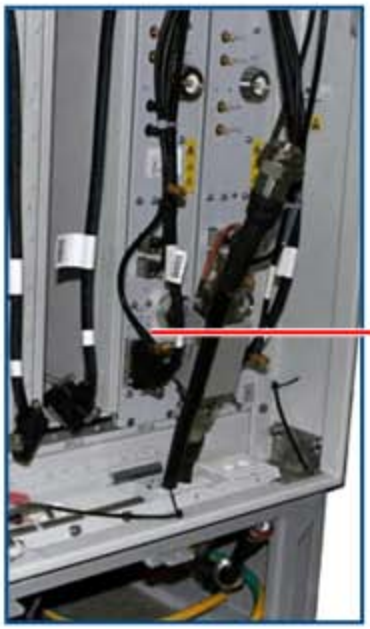
Bias-Tee

Side view of the Bias-Tee

DC/OOK Port

Pay attention to the direction of the DC/OOK port on the Bias-Tee .

4



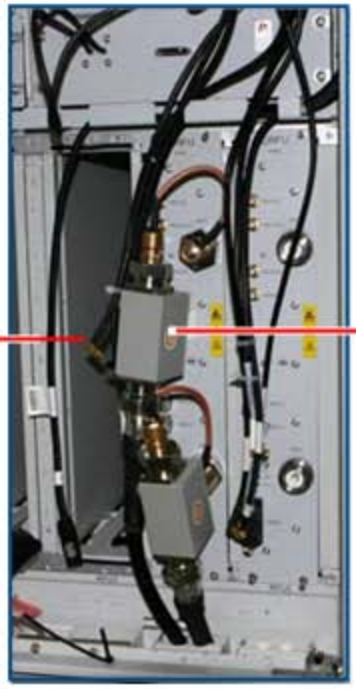
SMA Power Cable

5

Transfer Cable

Upper DIN Connector

6



7

8

Appendix G Repair Paint

Code of color samples

Object	Color Name	Code of Color Samples	International Color Code
Cabinet (including the APM30, RFC, TMC, and BBC)	RAL7035	YB026	RAL7035
Base	3010 Light Grey	YB030	Pontone 422U

Operation description

1 Polishing
In the case that damaged area is stained or there is rust on the materials, the following step must be applied: Fine sand paper should be applied to polish the damaged area in order to remove the stain or rust.

2 Cleaning
Clean cotton cloth can be used to rub the stain or dust on the surface of the area to be polished or repaired.

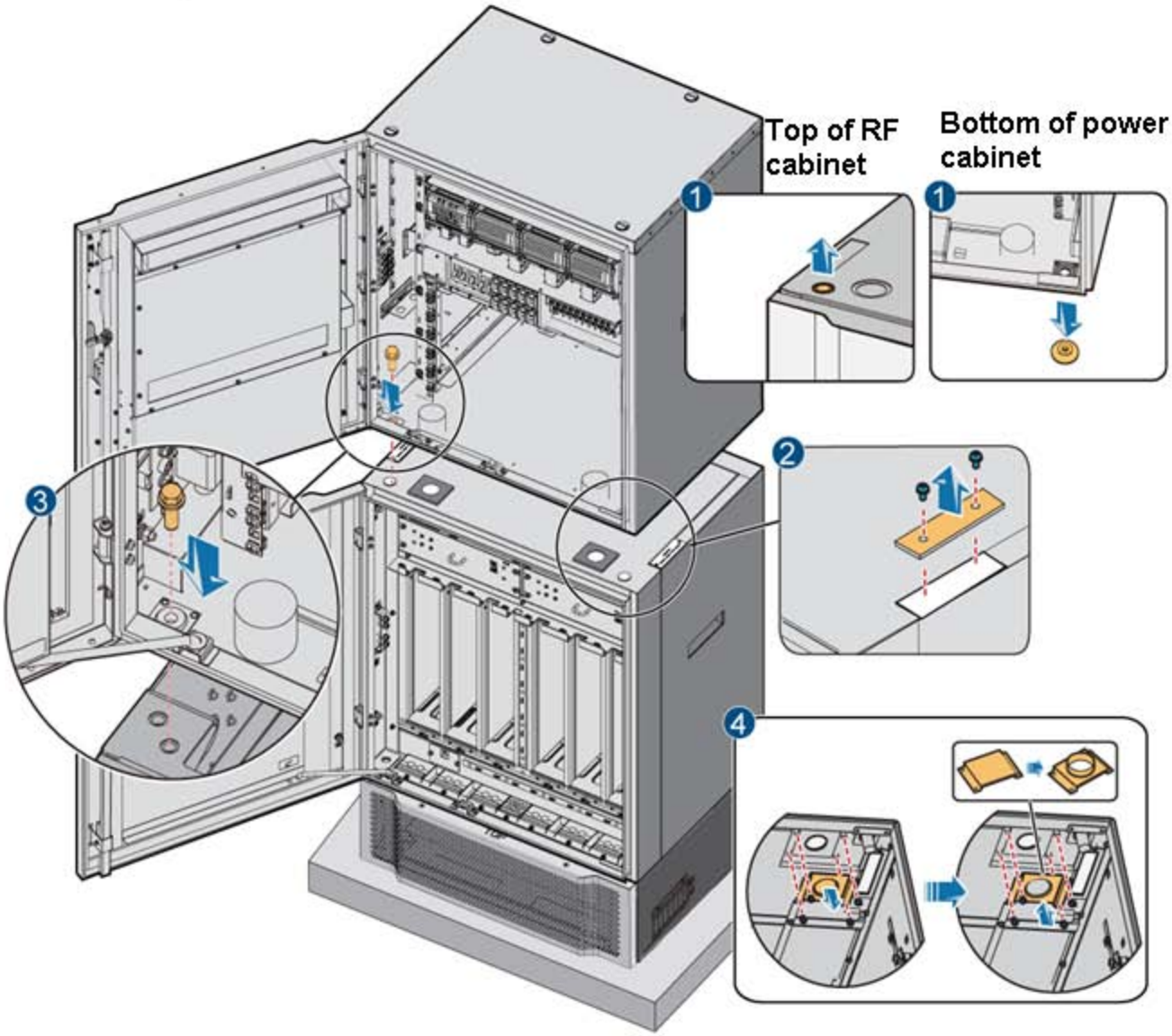
3 Paint repair
Brushing paint of corresponding color should be applied according to the original coating. Prior to the repair, the paint should be well shaken. After that, use the small brush inside the bottle to absorb paint and evenly spread on the damaged area till the scratch/damage is covered. Note that the paint coating applied should be as thin as possible. It is prohibited that the paint coating reveals drops. The surface should be kept smooth.

4 Drying
The surface of the repair paint should be placed in indoor temperature for 30 minutes. After that, subsequent operations can proceed.

5 Quality requirements
The color of the surface of the repair area should be consistent with that of the surrounding areas of the repair area, without obvious edges and bulge. The scratch/damage should be covered properly. There should not be dropped paint.

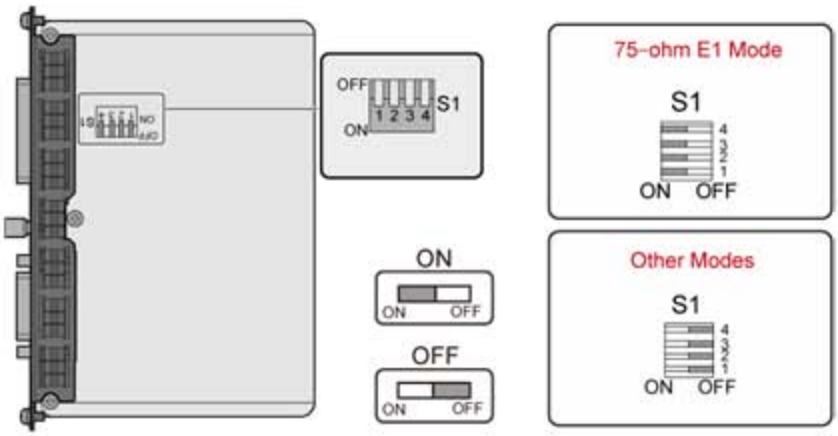
Appendix H Stacking the Power cabinet on the RF cabinet

1. Remove the rubber plugs.
2. Remove the rectangular fillers.
3. Replace the original cover plates with cabling cover plates.
4. Fix the power cabinet.

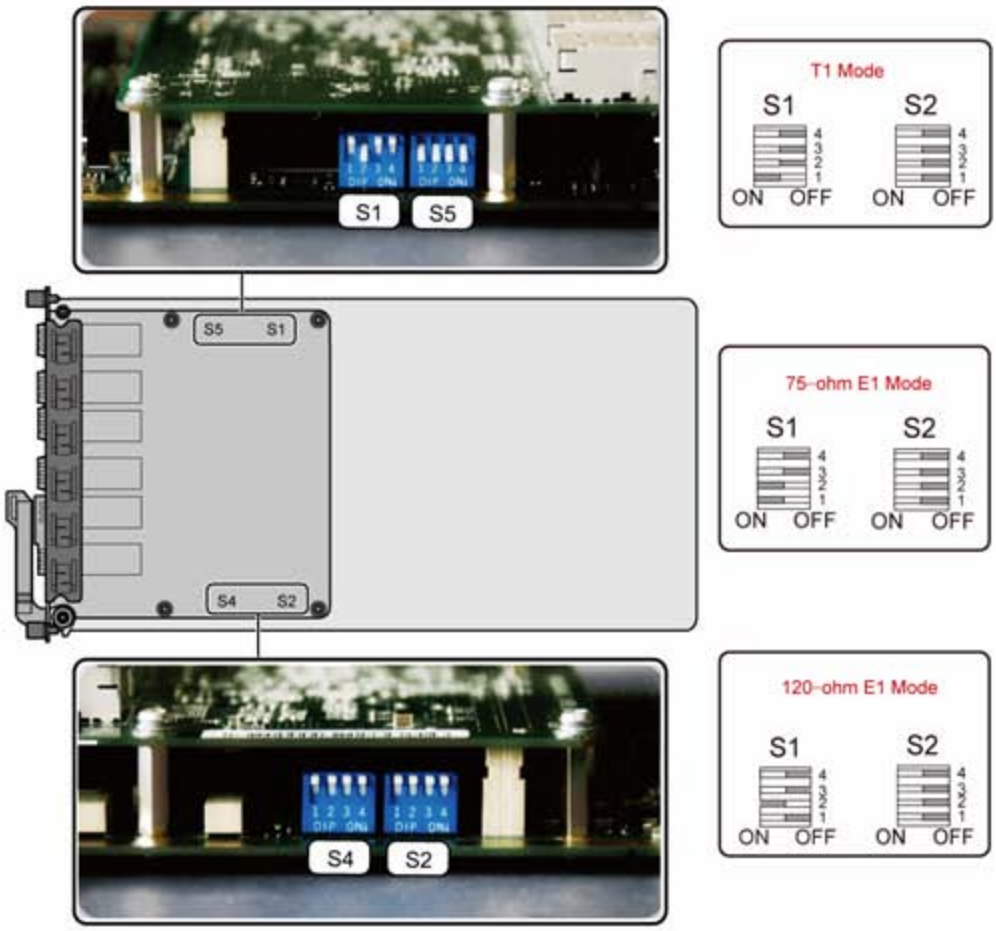


Appendix I Setting of the DIP Switches on the GTMU and UELP

- DIP switches on the UELP



- DIP switches on the GTMU



In 75-ohm E1 mode, all bits of S2 are set to OFF by default (balanced mode). Only when the four E1s receiving links become faulty, all bits of S2 are set to ON (unbalanced mode) to clear the link errors. In 120-ohm E1 mode, all bits of S2 keep OFF without additional settings.

Five DIP switches are available on the GTMU. At present, four of them are used and S3 is reserved. Each DIP switch has four bits. There is one DIP switch on the UELP. The DIP switch is used for selecting the matched impedance of the E1/T1 port. The following table describes the DIP status of S1 and S2.

Board	DIP Switch	DIP Status				Description
		1	2	3	4	
GTMU	S1	ON	ON	OFF	OFF	E1 75-ohm mode
		OFF	ON	OFF	OFF	E1 120-ohm mode
	S2	ON	ON	ON	ON	Unbalanced mode
		OFF	OFF	OFF	OFF	Balanced mode
UELP	S1	ON	ON	ON	ON	Unbalanced mode
	S2	OFF	OFF	OFF	OFF	Balanced mode

Whether to enable the E1 bypass function depends on the actual requirements. You can enable or disable the E1 bypass function by setting S4 and S5 on the GTMU.

Board	DIP Switch	DIP Status				Description
		1	2	3	4	
GTMU	S4	ON	ON	ON	ON	The E1 link can be bypassed.
		OFF	OFF	OFF	OFF	The E1 link cannot be bypassed.
	S5	ON	ON	ON	ON	The E1 link cannot be bypassed.
		OFF	ON	ON	OFF	The E1 link of the Level 1 cascaded BTS can be bypassed.
		ON	OFF	ON	OFF	The E1 link of the Level 2 cascaded BTS can be bypassed.
		OFF	OFF	ON	OFF	The E1 link of the Level 3 cascaded BTS can be bypassed.
		ON	ON	OFF	OFF	The E1 link of the Level 4 cascaded BTS can be bypassed.
		OFF	ON	OFF	OFF	The E1 link of the Level 5 cascaded BTS can be bypassed.

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