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Security Level:

Installation Guide to the BTS3900B GSM Outdoor Solution in Peru

(For internal use only)

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Rev. History

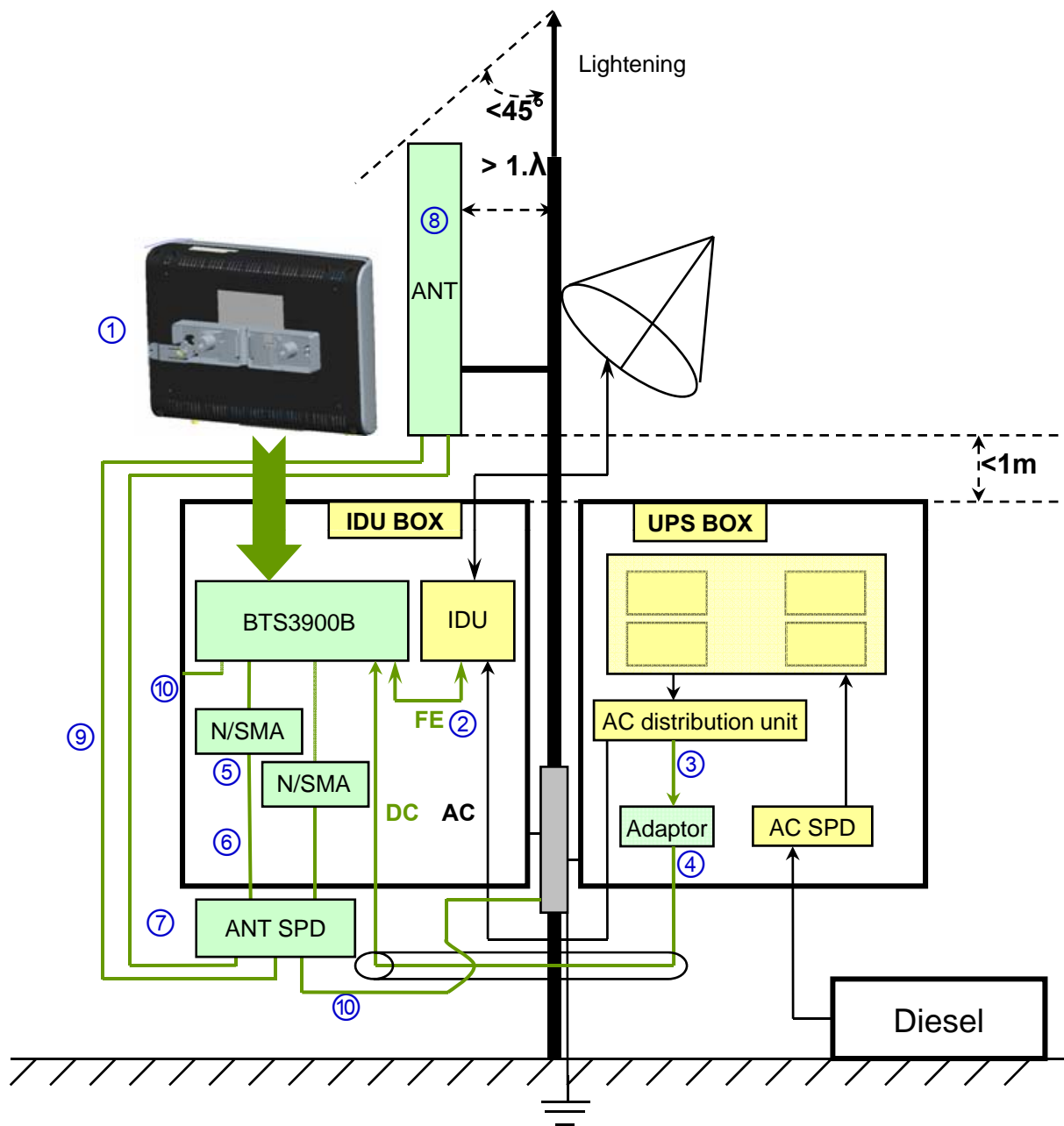
REV.	Relate	Date	Author	Checked by
Rev.0.1	initial version	06/08/2009	Zhuling	Qianliyun/Houjianmin/Wu jiancheng
Rev.0.2	Update according to comments	06/09/2009	Zhuling	Zhouguojin/Zhangxiwen/ Qianliyun/Shulinfeng/Maj ie/Yangxinglei/Fangyake
Rev.0.3	Update according to comments	06/11/2009	Zhuling	Liujie/Liuhaifeng
Rev.0.4	Update according to comments from marketing	06/19/2009	Zhuling	Zhouguojin/Zhangxiwen/ Qianliyun/Shulinfeng/Maj ie/Yangxinglei/Fangyake/ Liujie/Liuhaifeng
Rev.0.5	Add "Please remove the sheet metal..."	06/27/2009	Zhuling	

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1. Background

- In Peru, the BTS3900B need to be used outdoors. After negotiation with the customer, the BTS3900B and its auxiliary devices can be installed in the IDU cabinet of the customer to meet the special requirements for outdoor use.
- The installation of the BTS3900B main equipment and the cable connection must be specially processed on site because of the restrictions on installation scenarios.
- This guide focuses on the double-carrier configuration. In the case of single-carrier configuration, the number of lightning arresters and related RF cables must be reduced by half.



- ① BTS3900B main equipment and installation parts
- ② Ethernet cable
- ③ AC power cable
- ④ Power adapter
- ⑤ N/SMA adapter
- ⑥ RF jumper (from the BTS3900B to the lightning arrester)
- ⑦ Lightning arrester
- ⑧ Antenna
- ⑨ RF jumper (from the lightning arrester to the antenna)
- ⑩ Grounding cable

Notes:

- The humidity of the working environment where the BTS3900B is installed must be 5%–95%.
- As shown in the left figure, the devices and cables in green are provided by Huawei and other devices and cables are provided by the customer.



2. Description of Installation Items

2.1 List of Materials

Materials on the list without specified suppliers are provided by Huawei headquarters.

SN	Item Name	BOM Code	Item Description	No.	Remarks
1	BTS3900B main equipment	02317362	□Function Module, BTS3900B, GM5M2PBTS, BTS3900B 850 MHz	1	
2	Ethernet cable	04060419	Single Cable, Straight Through Cable, 1 m, MP8-I, CC4P0.5GY, MP8-I	1	
3	AC power cable	04044497	External Power Cable, America Power Cable 125 V 10 A, 2 m, 2 x 0.8 mm ² , Black, PASM, 18NISPT-1(2C), C7SF	1	
4	Power adapter	02130794	Primary Power, 5degC, 40degC, 90 V, 264 V, 12 VDC/2.9 A, AC/DC Power Module	1	
5	N/SMA adapter	14040412	Coaxial Connector, N/SMA, 50 ohm, Straight Adapter, N (female)/SMA (male)	2	In the case of single-carrier configuration, the number of items is reduced by half.
6	RF jumper (from the BTS3900B to the SPD)	04042458	Single Cable, N50AM-III, COA X 50-4.7/1.9B, DIN50SM-I, 2.2 m, Antenna Jumper, BTS3012A	2	
7	Lightning arrester	19020051	Feeder Lightning Arrester, Current Flow 8KA/Residual Voltage, DIN-50M/DIN-50F, 300 W, 800–960 MHz	2	
8	Antenna		(Purchased at the local market or shared the external antenna of the BTS3900B)	1	Determined by on-site technical personnel

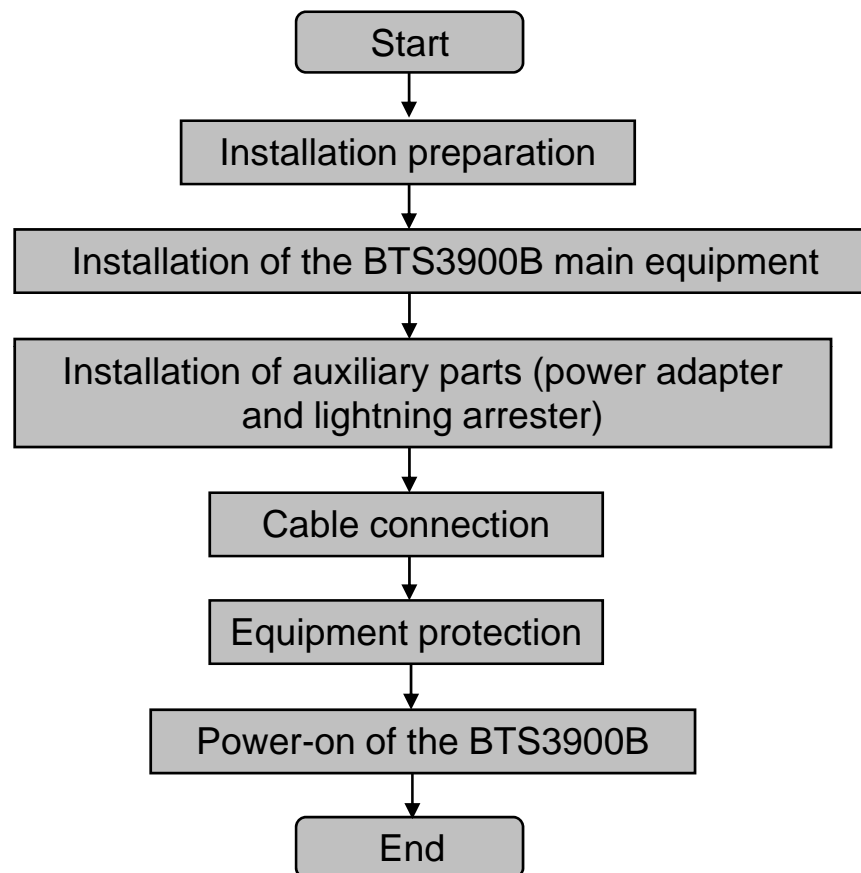
SN	Item Name	BOM Code	Item Description	No.	Remarks
9	RF jumper (from the SPD to the antenna)	04044575	Single Cable, Antenna Jumper, 2.2 m, 7/16DIN50SF-I, COAX50-4.7/1.9B, DIN50SM-I, BTS3606A	2	This RF jumper is used when the antenna is purchased at the local market. In the case of single-carrier configuration, the number of RF jumpers is reduced by half.
	RF jumper (from the SPD to the external antenna)	04040140	Single Cable, RF Cable, 0.7 m, N50AM-VI, COAX50-4.7/1.9B, 7/16DIN50SF-I, BTS312	2	This RF jumper is used when the external antenna of the BTS3900B is shared. In the case of single-carrier configuration, the number of RF jumpers is reduced by half.
	N/SMA adapter	14040173	Coaxial Connector, N/SMA Conversion, 50 ohm, Jack, Jack, Flange Installation, Silver Electroplating	2	
10	Grounding cable	25030191	Wire, 450/750 V, 227 IEC 02 (RV) 6 mm ² , Yellow And Green, 44 A	10m	Prepared on site
	Grounding OT terminal	14170013	Naked Crimping Terminal, OT, 6 mm ² , M8, Tin Plating, Insulated Ring Terminal, 12–10 AWG, yellow	6	
	Grounding OT terminal	14170023	Naked Crimping Terminal, OT, 6 mm ² , M6, Tin Plating, Insulated Ring Terminal, 12–10 AWG, yellow	4	Prepared on site and purchased at the local market
11	BTS3900B installation part	99041PLK	Engineering Installation Kit, DKBA4.070.1120MX, Installation Kit For Pico BTS, Pico BTS, Mount On The Wall	1	
12	BTS3900B installation screw	26010530	Cross Recessed Pan Head Screw, Spring Lock Washer and Plain Washer Assemblies, M4 x 16, Zinc Electroplating, iridescent yellow, GB9074.4-88	2	
13	BTS3900B installation nut	26010380	Hexagon Nut, Type 1, Grades A And B, M4, Zinc Electroplating, Iridescent Yellow, GB6170-86	2	
14	USB disk	06010161	□Storage, USB disk, 1 GB/USB2.0, Chinese & English Document	0.17	

SN	Item Name	BOM Code	Item Description	No.	Remarks
15	Grounding cable fastening screw	26010634	Cross Recessed Pan Head Screw, Spring Lock Washer and Plain Washer Assemblies, GB9074.4-88, M8 x 20, Stainless	6	
16	Lightning arrester fastening screw	26010617	Cross Recessed Pan Head Screw, Spring Lock Washer and Plain Washer Assemblies, GB/9074-4-88, M4 x 10, stainless steel, For 450 Antenna	4	In case of single-carrier configuration, the number of items is reduced by one half.
17	Waterproof insulation tape	30070011	DKBA0.480.0497, Waterproof Adhesive Tape , 50 mm x 1.65 mm x 3.0 m	/	 Purchased at the local market
18	PVC tape	21101239	DKBA0.480.0393, Insulating Adhesive PVC Tape, Scapa 2705, 19 mm x 0.18 mm x 20 m, Black, Environment Temperature Scope -10degC-105degC	/	 Purchased at the local market
19	Sealing clay	21101341	DKBA0.480.0713, Sealing Mud, Common, 0.5 kg	/	Purchased at the local market
20	Antirust paint	/	/	/	Purchased at the local market based on the painting of the cabinet of the customer
21	Cable tie	21100015	Nonmetal Parts, DKBA0.480.0457-GT 150I, Wire Strip, 150 x 3.6 mm, Weight 18.2 kg	/	Purchased at the local market
22	Corrugated pipe	/	/	/	Provided by the customer

2.2 List of Tools

 <p>Marker</p>	 <p>Phillips screwdriver</p>	 <p>Hammer drill (Ø6)</p>
 <p>Wrench</p>	 <p>Knife</p>	 <p>Wire stripper</p>
 <p>Crimping tool</p>	 <p>Diagonal pliers</p>	 <p>Wire clipper</p>
 <p>Level</p>	 <p>Measuring tape</p>	 <p>Needle-nose pliers</p>

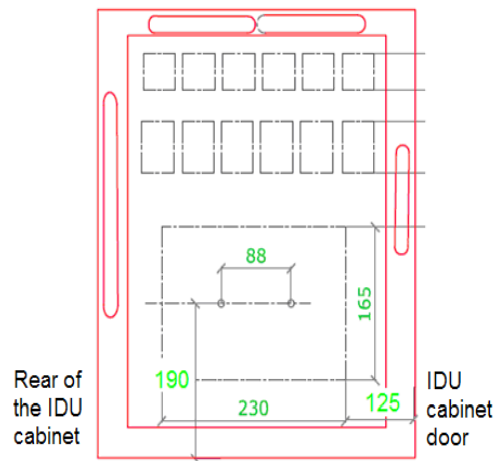
3. Installation Steps



4. Installation Guide to the BTS3900B Main Equipment

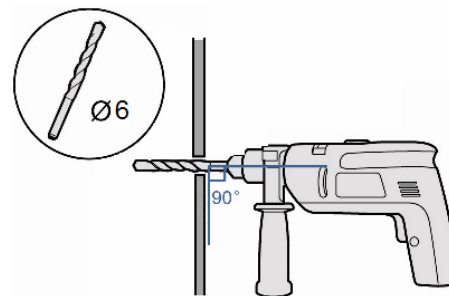
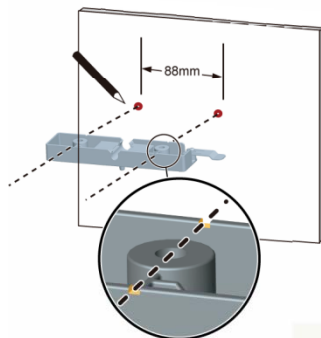
4.1 Requirements for the BTS3900B Installation Space

- □ For easy cabling, the BTS3900B main equipment must be installed upside down on the baffle plate that is located in the middle of the IDU cabinet.
- The requirements for the installation space are as follows:
There is a clear spacing of at least 100 mm on the right side of the BTS3900B for easy plugging or unplugging the USB disk.
There is a clear spacing of at least 50 mm on the left side of the BTS3900B for easy installation.
There is a clear spacing of at least 100 mm at the bottom of the BTS3900B for easy cabling.
- Recommended installation hole locations are as shown in the following figure.

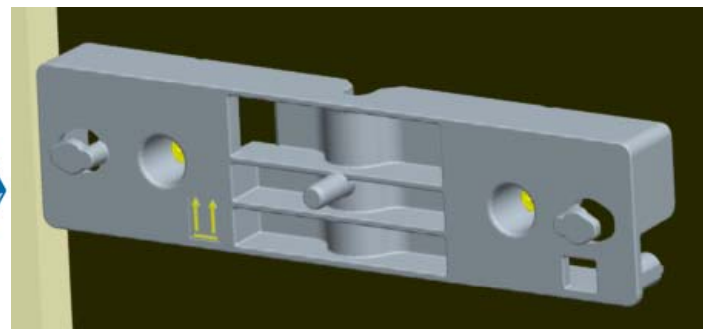
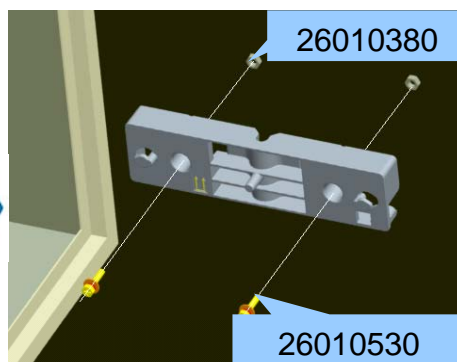


4.2 Installation Steps

- Step 1: Open the IDU cabinet and pull out the baffle plate in the middle of the cabinet. Then, drill two installation holes in the baffle plate based on the requirements for installation space. The installation holes must be coated with antirust paint before use.



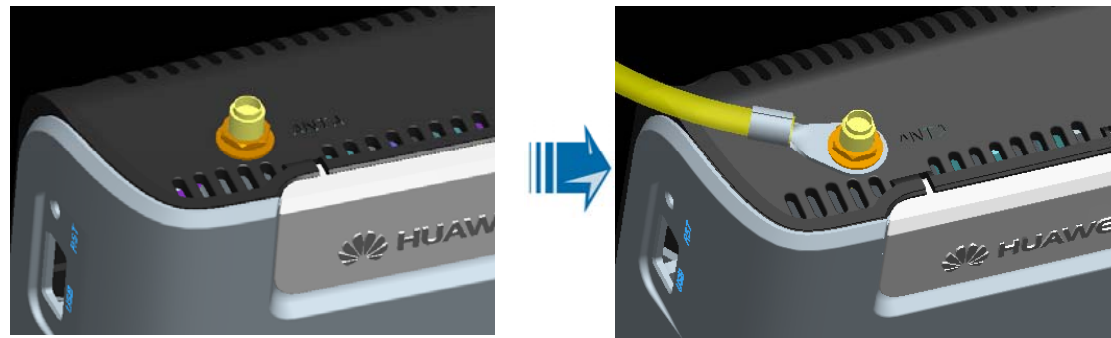
- Step 2: Fasten the Pico module installation part of the installation component (99041PLK) by using two pieces of M4 x 16 screws (26010530) and two pieces of M4 nuts (26010380). (Please remove the sheet metal on the installation part before use)



- Step 3: Remove the external antenna of the BTS3900B.

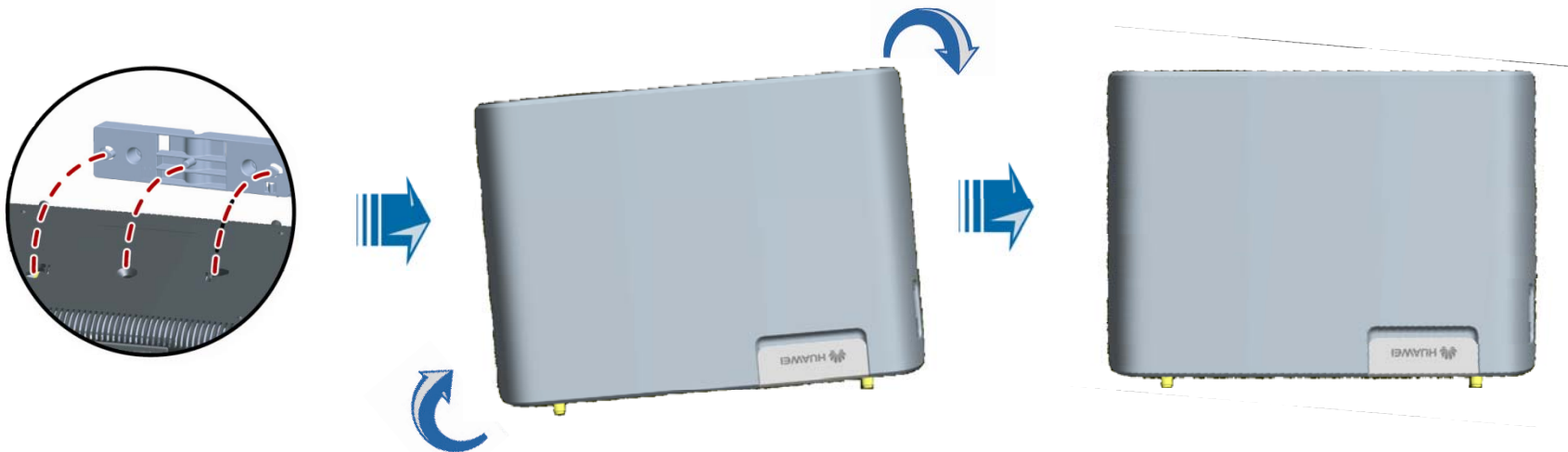


- Step 4: Remove the SMA fastening part (the golden part in the following figure) at the ANTA location by using needle-nose pliers and connect the OT terminal (M6) of the grounding cable. Then, fasten the SMA fastening part again.



- Step 5: Install the BTS3900B upside down on the installation part.

Align the installation holes on the shell of the BTS3900B with the hooks of the installation part. Then, hold both sides of the BTS3900B with hands and rotate it clockwise. After the installation is complete, you can hear a click.

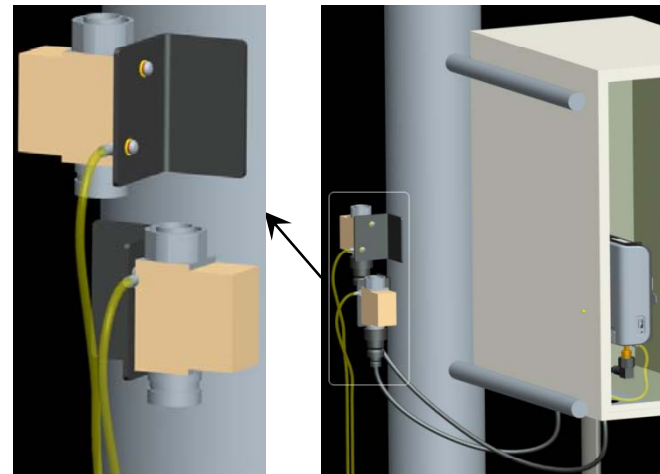
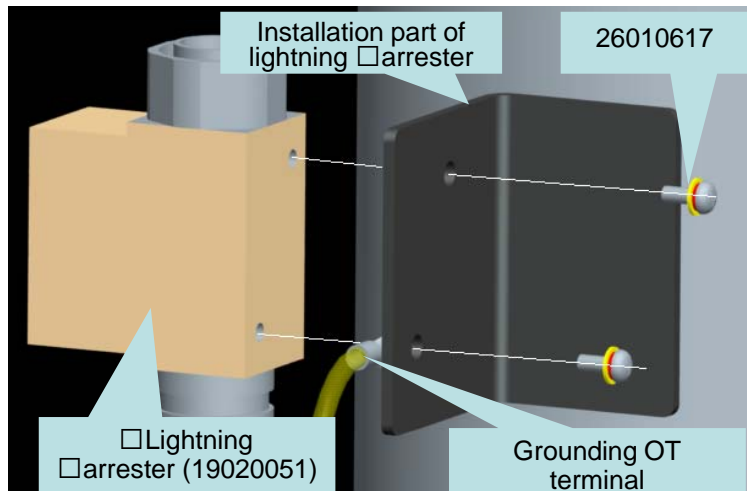


- The installation of the BTS3900B main equipment is complete.

5. Installation of Auxiliary Parts and Cable Connection

5.1 Installation of the Lightning Arrester

- Step 1: Align the grounding installation holes of the lightning arrester (SPD, 19020051), the installation holes in the installation part, and the fastening holes in the grounding cable OT terminal.
- Step 2: Fasten two pieces of M4 screws (26010617) by using a Phillips screwdriver. The installation of lightning arrester is complete.
- Notes:
 1. The installation part of the lightning arrester is provided by the customer, and the fastening location must be adjacent to the BTS3900B main equipment.
 2. For easy cabling, it is recommended to fasten two lightning arresters at both sides of the installation part. The actual installation depends on the structure of the installation part provided by the customer.
 3. The grounding cable OT terminal must be located between the lightning arrester and the installation part.
□The recommended crimping locations are shown in the following figure. Easy cabling must be considered in the selection of actual crimping locations.








Recommended crimping locations of lightning arresters

5.2 Installation of □the Power Adapter

1. The power adapter (02130794) is horizontally placed in the UPS cabinet of the customer and does not need to be fastened.
2. For easy observation of the power status of the BTS3900B, it is recommended that the power adapter is placed with the side carrying the indicator upwards.

5.3 Cable Connection

Cable	Connector	Connects to...	Remarks
Power cable (02130794)	PA male connector	AC busbar (UPS cabinet)	
	C7 female connector	Power adapter (UPS cabinet)	
DC input cable (comes with the power cable 02130794)	4PIN connector	PWR port of the device	
	The other end connects to the power adapter.		
Ethernet cable (04060419)	RJ45 connector	FE/GE port of the BTS3900B	
	RJ45 connector	IDU of the customer	
N/SMA adapter (14040412)	SMA connector (male)	SMA connector of the BTS3900B main equipment	
	N connector (female)	N connector (male) of the RF jumper (04042458)	
RF jumper (04042458)	N connector (male)	N connector (female) of the N/SMA adapter	The part of this RF jumper that is exposed outside the cabinet must be short enough.
	DIN connector (male)	SPD OUT terminal	
RF jumper (04044575)	DIN connector (female)	SPD IN terminal	Used when the antenna is purchased at the local market
	DIN connector (male)	Antenna (purchased at the local market)	

Cable	Connector	Connects to...	Remarks
RF cable (04040140)	DIN connector (straight female)	<input type="checkbox"/> IN terminal of the lightning <input type="checkbox"/> arrester	Used when the external antenna of the BTS3900B is shared
	N connector (elbow male)	N connector of the N/SMA adapter	
N/SMA adapter (14040173)	N connector (female)	RF cable (04040140)	
	SMA connector (male)	External antenna of the BTS3900B	
Grounding cable 1	OT terminal (M8)	Grounding installation hole of the lightning arrester	Prepared on site 
	OT terminal (M8)	Grounding busbar of the customer	
Grounding cable 2	OT terminal (M6)	BTS3900B main equipment	
	OT terminal (M6)	<input type="checkbox"/> Grounding point of the IDU inside the cabinet	
Grounding cable 3	/	Grounding point of the IDU outside the cabinet	Provided by the customer
	/	Grounding busbar of the customer	
Grounding cable 4	/	Grounding point of the UPS in the cabinet	Provided by the customer
	/	Grounding busbar of the customer	

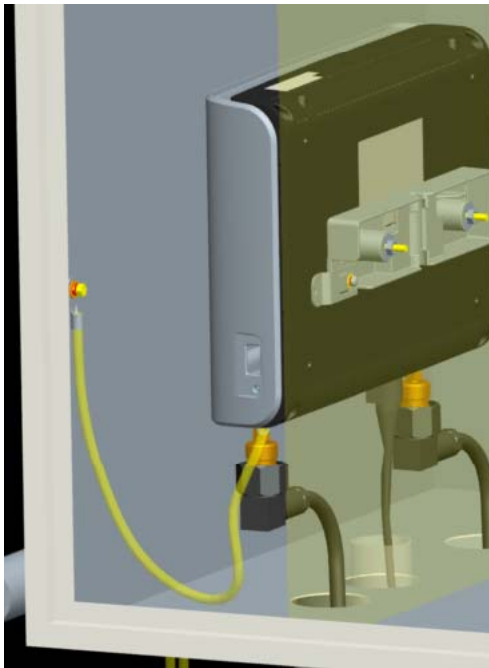
Note:

If the size of cabling holes at the bottom part of the cabinet does not meet the cabling requirements, the cabling holes must be widened on site.

6. Equipment Protection

6.1 Grounding

- The BTS3900B main equipment and the IDU must be short-circuited through the grounding cable (M6) at the grounding point in the cabinet. The grounding cable of the BTS3900B must be shorter than 0.5 m (shorter than 0.3 m is better).
- The lightning arrester must be connected to the grounding busbar of the customer through the grounding cable (M8), which must be short enough.



Grounding of the BTS3900B



Grounding of lightning arrester

6.2 Refinishing Paint

- Locations to be refinished: All mechanical parts whose surface painting is damaged during on-site engineering installation must be refinished.

The locations to be refinished include without limitation the installation holes of the BTS3900B in the baffle plate of the cabinet and the widened cabling holes at the bottom of the cabinet.

- Operation requirements:

Do not touch with bare hands the metal surfaces without painting to prevent the sweat from corroding the metal. Wipe stains such as dust and fingerprint from the equipment with a clean rag. When touching metal surfaces without painting, wear clean gloves, fingertips, or apply clean partitions.

- Operation steps:

1. □Rubdown: Rub down the damaged areas with crocus paper to remove stains or rusts.
2. Cleaning: Wipe the rubbed areas or the areas to be refinished with clean cotton cloths to remove stains and dusts.
3. □□Refinishing paint: Select the correct refinishing paint based on the color of the original coating, and then apply the refinishing paint evenly to the damaged areas until the damaged marks are not exposed. The paint film must be thin and even, and cannot be in the shape of liquid drop. Ensure that the refinished surfaces are smooth.
4. □Drying: The refinished surfaces must be placed in ambient temperature for about 30 minutes before subsequent operations.

6.3 Protection of Cables

6.3.1 Waterproof and Sealing of Outdoor Cable Connectors

- Locations to be sealed:

Includes without limitation the DIN connectors on IN/OUT terminals of lightning arresters and the DIN connectors of RF jumpers and antennas.

- Operation steps:

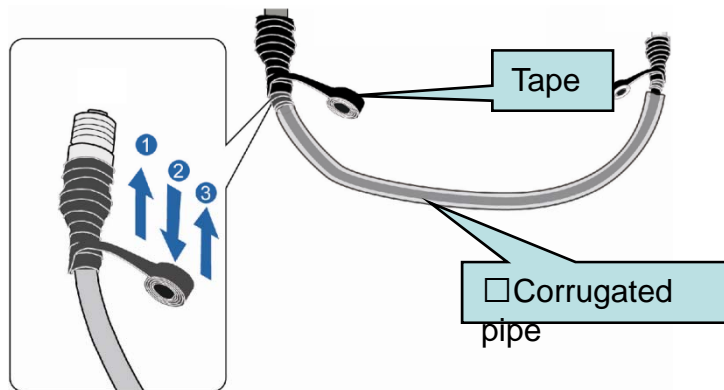
1. Remove stains on cable ports, such as dusts and oil pollution.
2. Unwind the waterproof insulation tape and remove the release paper. Then, paste one end of the tape at the location 2–5 cm below the cable port.
3. □ Stretch the tape until the tape width becomes $1/2$ – $3/4$ of the original width. □ Then, wind the tape so that each upper layer overlaps about $1/2$ of the lower layer.
4. After the tape is wound to the location 2–5 cm above the cable port, repeat the operation from up to bottom, and then from bottom to up for three times totally.
5. Press the tape after it is wound to ensure that middle layers are firmly pasted without air gaps.
6. □ Apply PVC tape over the outer layer of the wound waterproof insulation tape to prevent abrasion and aging. The PVC tape is wound in the same way as the waterproof insulation tape.



Cable connector after waterproof and sealing

6.3.2 Protection of Outdoor □Cables

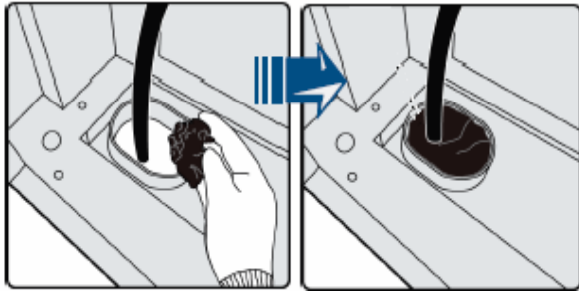
- Inter-cabinet cables and outdoor grounding cables must be protected with corrugated pipes.
The locations to be protected include without limitation DC input cables and grounding cables.
- Operation steps:
 1. □ Pass the cables to be protected through corrugated pipes.
 2. Seal both ends of the corrugated pipe with waterproof insulation tape, and then apply the PVC tape over the waterproof insulation tape.The tape winding method is the same as that described on the previous page.



6.3.3 Protection of Cabling Holes at the Bottom of the Cabinet

- Cabling holes at the bottom of the cabinet must be protected against water by using a PG connector or sealing clay.
- The locations to be protected include without limitation:
The leading-out holes of DC input cables in the UPS cabinet, the leading-in holes of DC input cables in the IDU cabinet, and the leading-out holes of RF jumpers in the IDU cabinet.

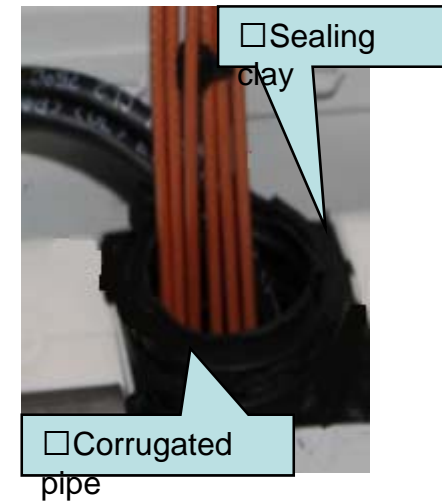
Take sealing clay as an example:



Leading-out hole of the RF jumper



Leading-out hole of the DC input cable



7. Power-On of the BTS3900B

- Power on the BTS3900B by connecting the PA male connector of the power adapter to the AC busbar. After the BTS3900B powered on, check whether the BTS3900B is powered on properly by observing the indicator.
- Open the indicator cover on the BTS3900B before observing the indicator.



LED	Color	Status	Explanation
PWR	Green	On	The power supply works properly.
		Off	There is no power supply or the BTS3900B is faulty.
RUN/ALM	Red and green	Green, blinking once every two seconds	The BTS3900B is running properly.
		Green, blinking four times per second	The BTS3900B is loading the software or does not start to work.
		Red, on	An alarm is reported. The BTS3900B should be replaced.
		Red, blinking once every two seconds	An alarm is reported. Solve the problem according to alarm signal.
LINK	Green	On	The FE port is properly connected.
		Green, blinking four times per second	Data is transmitted and received at the FE port.
		Off	The FE port is not connected.

Thank you

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