IMPLEMENTATION GUIDELINES & QUALITY PROCESSES

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INTRODUCTION

Your Name ?

Designation?

Your Company Name?

Education Details?

Total Telecom Experience ?

Expectation from this training ?

Training Schedule

Day	Time	DESCRIPTION OF TOPIC	Participants	Name of Trainer
Day 1	10: 00AM-11: 00AM	Environment, Health & Safety	Team Leaders	
	11: 00AM-11: 15AM	SOP	Team Leaders	
	11:15AM-11:30AM	**Break for Tea**		
	11:30AM- 1:30PM	Huawei BTS(GSM, CDMA) & Node-B Product Overview	Team Leaders	
	13:30PM-14:30PM	**Lunch Break**		
	14:30PM-15:00PM	Installation Site Requirements	Team Leaders	
	15:00PM- 15:30PM	Unpacking & Open case Inspection and Short Shipment Material Delivery at Site & Escalation Matrix	Team Leaders	
	15:30PM- 16:00PM	GSM BTS3900,BTS3900A and DBS3900 /CDMA-DBS3900 Installation Process	Team Leaders	
	16:00PM – 16:15PM	**Break for Tea**		
	16:15PM-19:00PM	GSM BTS3900,BTS3900A and DBS3900 /CDMA-DBS3900 Installation Process	Team Leaders	

Training Schedule

Day	Time	DESCRIPTION OF TOPIC	Participants	Name of Trainer
Day 2	10: 00AM-10: 45AM	Node B installation process	Team Leaders	
	10:45AM-11:30AM	Cabling principle and guideline for BTS		
	11:30AM- 11:45PM	Break for Tea	Team Leaders	
	11:45PM-13:30PM	Antenna Feeder line Installation	Team Leaders	
	13:30PM- 14:30PM	**Lunch Break**		
	14:30PM- 16:30PM	RTN 600 and 900 Series product overview	Team Leaders	
	16:30PM – 16:45PM	**Break for Tea**		
	16:45PM-19:00PM	MW Commissioning	Team Leaders	

Day	Time	DESCRIPTION OF TOPIC	Participants	Name of Trainer
Day 3	10: 00AM-11: 15AM	RTN 600 and 900 installation process	Team Leaders	
	11:15AM-11:30AM	**Break for Tea**		
	11:30AM- 13:00PM	Quality Process	Team Leaders	
	13:00PM- 2:00PM	**Lunch Break**		
	2:15PM- 3:45PM	Written Exam & Personal assessment	Team Leaders	

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Implementation Guidelines & Quality Processes

ENVIRONMENT, HEALTH & SAFETY

Before you Start –Site Safety Requirement

Before starting work on site be sure that:-

- You have the appropriate training for the tasks you will perform.
- You have the appropriate personel protective equipment (PPE) for the task.
- You check all tools and PPE before use.
- You complete a Pre start safety briefing/ Site specific risk assessment before you start your job.
- You have your ID Card with you.
- You understand the safety signs used on site.
- You understand what to do in the case of an emergency.

Accidents & Incidents -Emergency Response

In case of incident:-

Contact your Huawei supervisor immediately.

Only qualified First Aiders are allowed to render first aid to casualties. This is to prevent further complication to the injured.

DO NOT move an accident victim unless they are in danger of further injury.

If you need a profesional help, call immediately.

Accidents & Incidents-Reporting

Accident / Incident occurred

↓

Provide First Aid

↓

Inform your Site Manager immediately

Incident : A work-related event in which an injury or ill health (regardless of severity) or fatality occurred, or could have occurred.

Accident : An incident which has given rise to injury, ill health or fatality.

Reporting is important to evaluate the root causes of the incident/accident and taking corrective/ preventive actions in order to prevent the occurance of the same or smillar incidents/accidents again.

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Safety Signs

Make sure you understand the signs used on site

- Stop and Prohibition signs
  - Circle: white background with red borders and cross bar; black symbol



- Caution (warning) signs
  - Triangle: yellow background with black border; black symbol




- Emergency information signs
  - Rectangle: green background; white symbol


- Mandatory signs
  - Circle: blue background; white symbol




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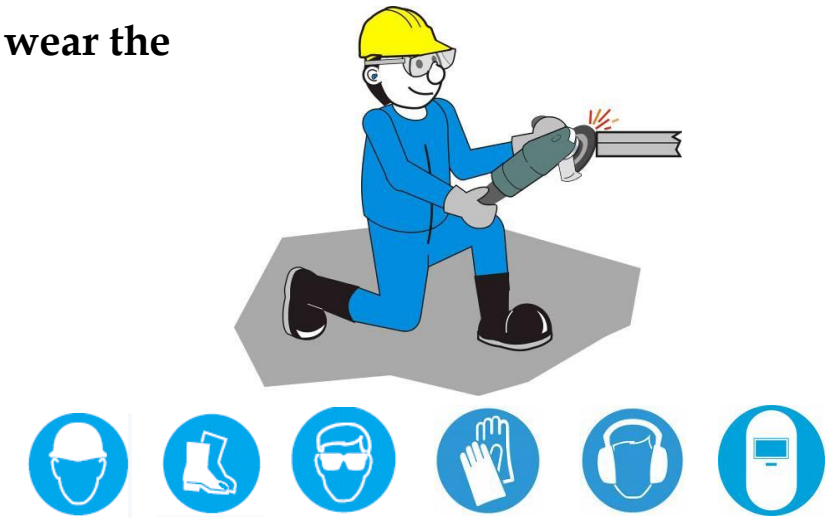
Personal Protective Equipments

Ensure that you have the following items before you start work on site:-

- ❑ Safety helmet
- ❑ Site pass
- ❑ Safety harness (when working at height)
- ❑ Safety shoes/boots

When welding, grinding, or any other operations, always wear the specified PPE associated to that particular job:-

- ❑ Eye protection
- ❑ Ear protection
- ❑ Protective gloves



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Personal Protective Equipments

- Always wear good condition personal protective equipment (PPE).
- Always ensure it is correctly fitted.
- Always wear PPE appropriate to the job and the assessed hazards.

Head protection
EN 397
(or equivalent)

Ear protection
EN 397
(or equivalent)

Eye protection
EN 166
(or equivalent)

Face protection
EN 166
(or equivalent)

Hand protection
EN 420 / EN 407 / EN 388
(or equivalent)

Foot protection
EN-ISO 20345
(or equivalent)

- Damaged PPE does NOT provide full protection.
- Get your damaged PPE replaced.

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Personal Protective Equipments- Safety Footwear

- Wearing the correct safety footwear prevents/minimises foot injuries.
- Safety footwear should conform to ENISO 20345-1 / EN345 (or equivalent)
- Risks must be assessed to identify the appropriate protection features that are required.
- No casual shoes, sandals or slippers are allowed in the worksite.

Footwear MUST be appropriate for the identified hazards

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Personal Protective Equipments
Safety Harness and Lanyards

- Wear and anchor your safety harness when working at height, near openings and edges.
- Only full safety harnesses are allowed, safety belts are prohibited.
- Safety harnesses should conform to EN 358, EN361, EN813 (or equivalent)

- Two ended lanyard will be attached to the safety harness during working at height.
- Lanyards standard should conform to EN 354, EN 362 (or equivalent)

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Manual Handling

"Manual Handling" means any activity requiring the use of force exerted by a person to lift, lower, push, pull, carry or otherwise move, hold or restrain a person, animal or thing.

Examples of manual handling activities:

Key Questions

- How Big is it?
- How much does it weigh?
- Can I move this comfortably or do I need assistance

Lift S.M.A.R.T	
S	Size up the load
M	Move close to the load
A	Always bend your knees
R	Raise the object using your legs
T	Turn by moving your feet

Remember if it can be moved in another way – Do not lift it.

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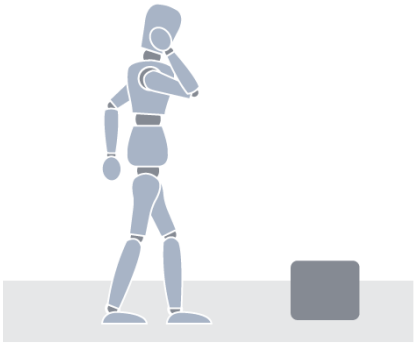
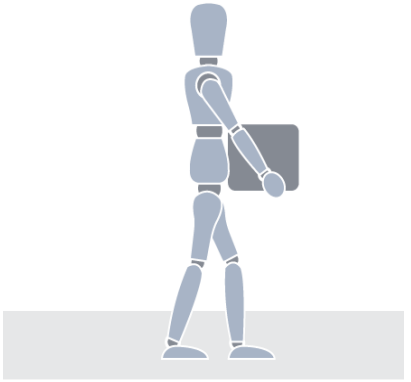
Manual Handling



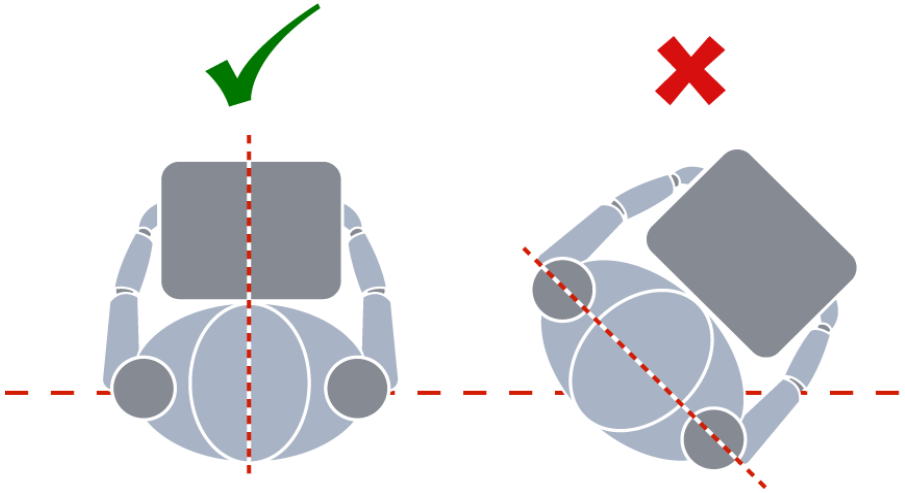
Think before manual handling

Adopt a stable position

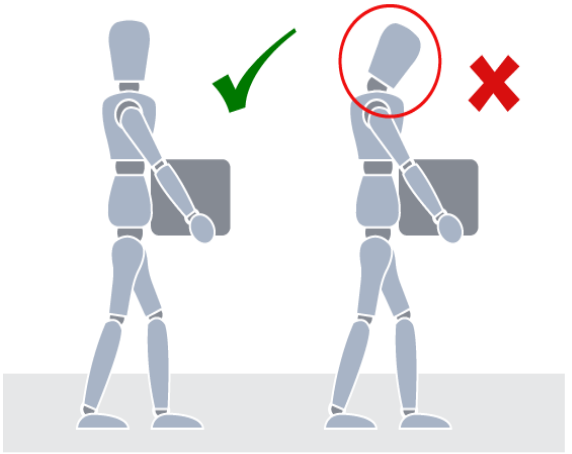
Adopt the correct posture - lift through the legs, not the back



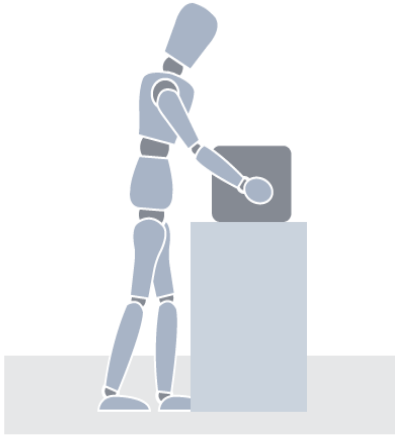
Carry close to the body



Do not twist or bend while carrying heavy objects



Keep head straight when walking



Put object down first then adjust its position

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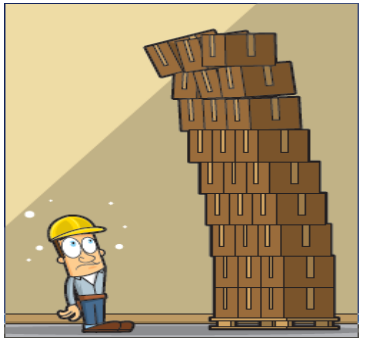
Safe Stacking On Site

Unsafe stacking can cause injuries as a result of collapse, or when materials have to be taken from stacks. Safe stacking not only reduces risk, but also enhances site efficiency.

Only stack materials in designated areas. Make sure that escape routes, doorways and walkways are not obstructed.

Stack on level, firm surfaces and use packing where appropriate. Never stack materials higher than three times the base width.



Make sure you wear suitable protective clothing such as gloves and safety boots, and use handling accessories as required.

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Working at Height

Working at height means work in any place where, if precautions were not taken, a person could fall down and injure themselves.

If you:

- work above ground level.
- could fall from an edge, throgh an opening or fragile surface.
- could fall from ground level into an opening in a floor or hole in a ground;

You will be working at height, because you can fall from one level to another level.

Fall prevention protection is required for any work where there is the potential to fall a distance of 2m or more.

Wear and anchor your safety harness when working at height, near openings and edges. Use only a safety harness (safety belts are prohibited).

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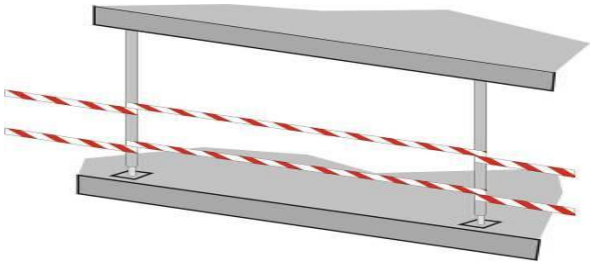
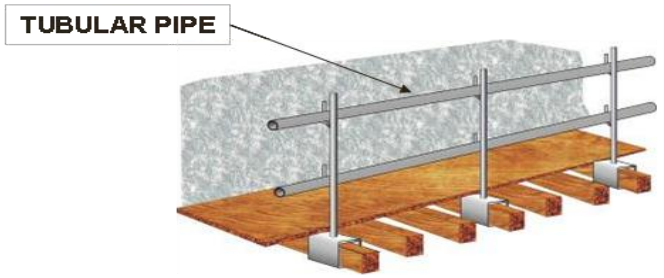
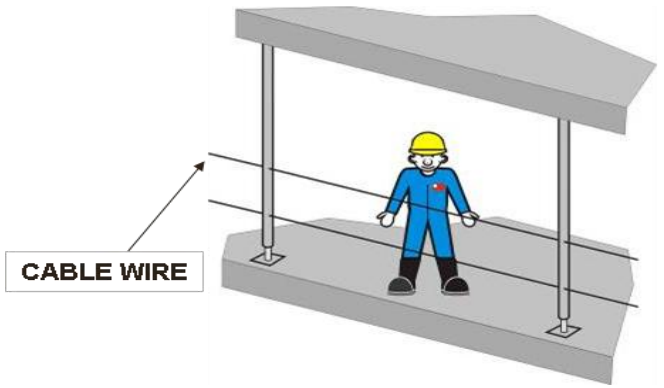
Working at Height-Barricades

Do not used tape or ropes as barricades.



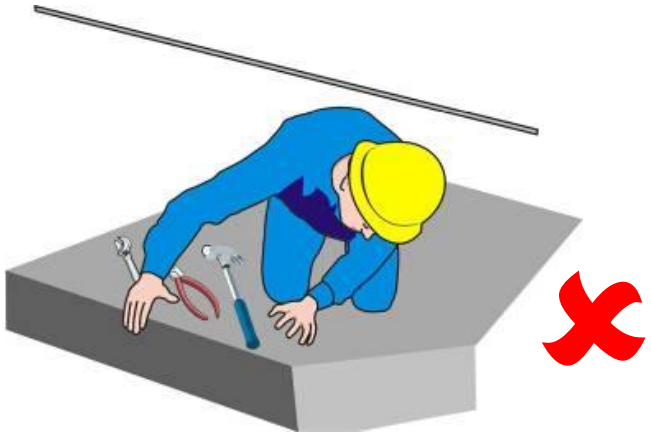




Only cable, tubular pipes and other rigid materials which are able to withstand 100 kg/f are allowed to be used as barricades.

Appropriate barricades will prevent site personnel from falling off the edge or through openings.

Working at Height-On the Edge



- Tools are not to be placed near the edge.
- Keep them in a tool box and away from the edge.

- When working near edges or openings, ENSURE that you are anchored to a lifeline.





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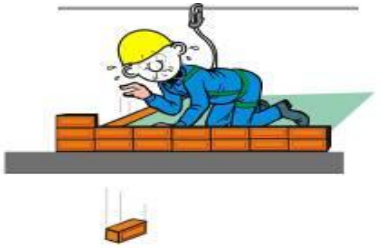
Working at Height-On the Edge



- When working at height, ensure that the area below is clear.
- Barricade the affected area to prevent entry.
- Station a watchman, and put up a appropriate warning signs.

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Working at Height-Working On Tower





Be sure that:-

- You never climb a tower alone, there must always be a watchman with you.
- You check your harness prior to use and wear your safety harness while climbing.
- Secure yourself with two lanyards from two different points.
- Carry your hand tools in a bag.
- Never climb a tower when it's rainy or too windy.

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Working at Height-Ladder Safety

Don't Forget:

- Only one person on a ladder at a time.
- Face the ladder while climbing up or down and hold the side rails with both hands.
- Carry tools up or down on a belt or with a rope or hoist, not in your hands.
- Maintain 3-point contact while climbing the ladder: 2 hands and one foot in transition.

- When using a ladder ensure that it is secured in place to prevent the ladder slipping or moving while in use.
- Always inspect the ladder before use, do not use damaged or broken ladders.
- "Home made" ladders are NOT ALLOWED.

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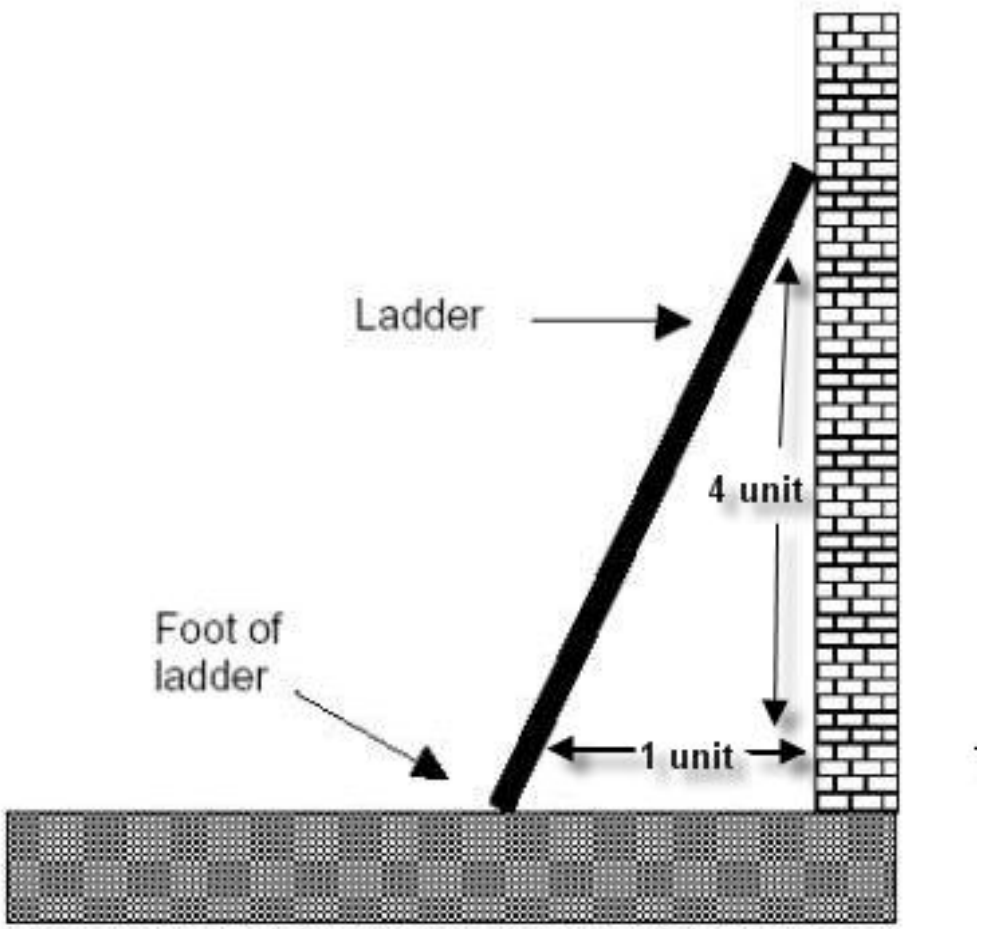
Working at Height-Ladder Safety

- Leaning Ladders in Use
- Short duration work (max. 30 minutes)
- Light work (up to 10 kg).
- Ladder angle 75 degree - 1 in 4 rule (1 unit out for every 4 units up).
- Always grip the ladder when climbing.
- Do not overeach.
- Do not work off the top three rugs – this provides a handhold.
- Ensure the ladder is secure.

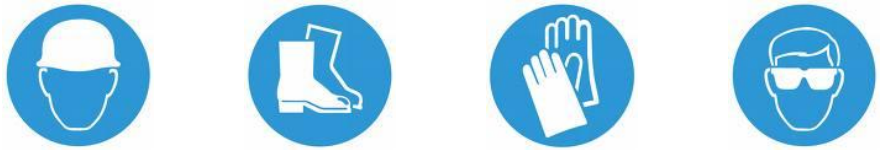


Machinery/ Equipment Safety-Hand Tools

Employees who use hand and power tools and who are exposed to the hazards of falling, flying, abrasive and splashing objects, or exposed to harmful dusts, fumes, mists, vapors, or gases must be provided with the particular personal protection equipment necessary to protect them from the hazard.

Hazards involved in the use of tools can be minimised by following five basic safety rules;

- Keep all tools in good condition with regular maintenance.
- Use the right tool for the job.
- Examine each tool for damage before use.
- Operate according to the manufacturer's instructions.
- Provide and use the proper Personal Protective Equipment (PPE).



Machinery/ Equipment Safety-Power Tools

When using power tools , take the general precautions below:

- Never carry a tool by the cord or hose.
- Use appropriate PPE.
- Never yank the cord or the hose to disconnect it from the socket.
- Keep cords and hoses away from heat, oil and sharp edges.
- Disconnect tools when not in use, before servicing and when changing accessories such as blades, bits or cutters.
- All observers should be kept at a safe distance away from the work area.
- Secure work with clamps or a vise, freeing both hands o operate the tool.
- Avoid accidental starting. DO NOThold a finger on the switch button while carrying a plugged-in tool
- Tools should be maintaned with care.
- Follow instructions in the user's manual for lubricating and changing accessories.
- Be sure to keep good footing and maintain good balance.
- All portable electric tools that are damaged shall be removed from use.

Machinery/ Equipment Safety

- Do not tamper with or remove safety guards.
- Do not use the equipment / machinery if there is no safety guard.
- Only use equipment for which you have been trained.

House Keeping

Safety starts with good Housekeeping

Poor housekeeping produces trip hazards.

Remove all protruding nails or bend them over.

Do not dispose of your unwanted materials from a height.

Keep your work area clean

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House Keeping

- Do not leave open holes unprotected.
- Report to your safety department immediately to have it covered.

Electrical Safety-Safety Procedure

- Inspect all electrical equipment and wires before use.
- Ensure electrical equipment and cords are tagged.
- Use protective equipment such as rubber gloves or boots.
- Inspect portable equipment, including extension cords, before each use and replace anything that's defective or damaged.
- Be sure electric plugs match their receptacles; never alter a plug.
- Never use a metal ladder around live electricity.
- Only qualified electrical workers shall repair or install electrical utilities and equipment.

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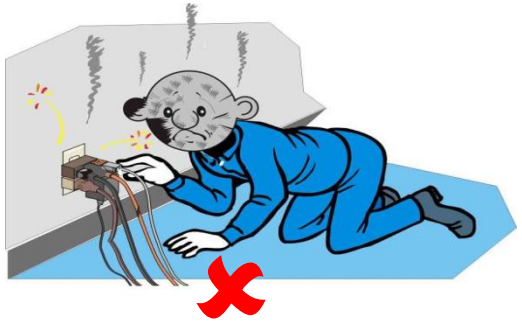
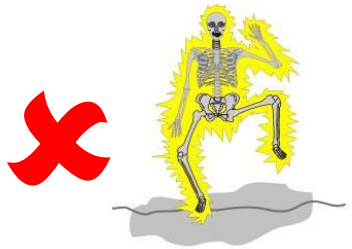
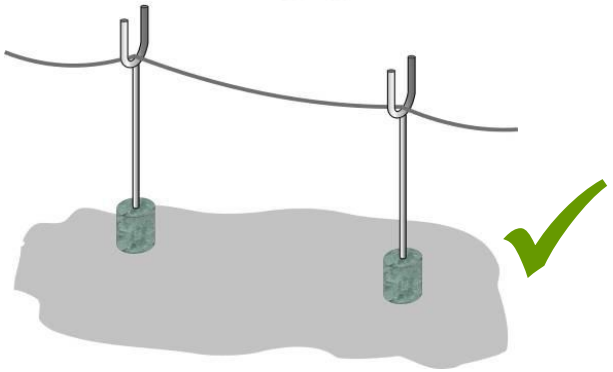
Electrical Safety

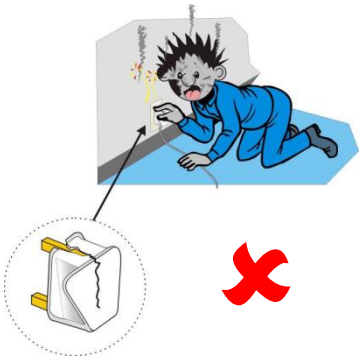
- Do not overload power sockets.







- Never use damaged electrical appliances, exchange them with your immediate supervisor.



- Do not lay electrical cables on the ground.
- Use insulated cable supports.

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Fire Safety-Fire Rules

If You discover a fire or suspect a fire

- Raise the ALARM and initiate an evacuation
- Call for the Fire Service
- Evacuate to the assembly point
- ONLY IF it is SAFE to do so attempt to extinguish the fire.
  - Always position yourself with an exit or means of escape at your back before you attempt to use an extinguisher to put out a fire.

- Leave IMMEDIATELY on hearing the alarm or if instructed to leave the area.

Never Fight a Fire

- IF YOUR INSTINCTS TELL YOU NOT TO.
- If you don't know what is burning.
- If the fire is spreading rapidly .
- That is producing a large amount of smoke .
- If you don't have adequate or appropriate equipment.

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Fire Safety-Fire Extinguishers Classification

Fire extinguishers are classified by the type fires on which they may be used

Wood, Paper, Plastic, Cloth

Flammable Liquids, Grease, Gas

Electrical

Make sure you have the right type of Fire extinguishers

Extinguisher	Class A	Class B	Class C
Water Extinguisher	Yes	No	No
CO2 Extinguisher	No	Yes	Yes
ABC Extinguisher	Yes	Yes	Yes

Never fight a fire if your instincts tell you not to.

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Fire Safety-How to Use Fire Extinguisher

Most fire extinguishers operate using the P.A.S.S. technique:

PASS = Pull - Aim - Squeeze – Sweep

PULL

- Pull the pin. This will also break the tamper seal.

AIM

- Aim low, pointing the extinguisher nozzle (or its horn or hose) at the base of the fire.

SQUEEZE

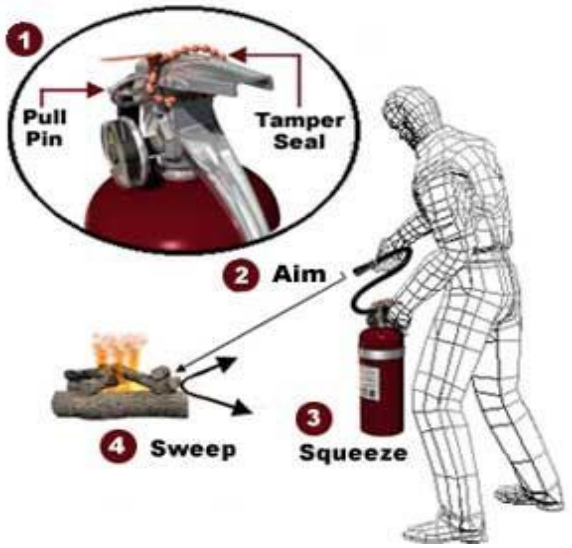
- Squeeze the handle to release the extinguishing agent.

SWEEP

- Sweep from side to side at the base of the fire until it appears to be out.
- Watch the area. If the fire re-ignites, repeat steps.

If you have the slightest doubt about your ability to fight a fire

....EVACUATE IMMEDIATELY!



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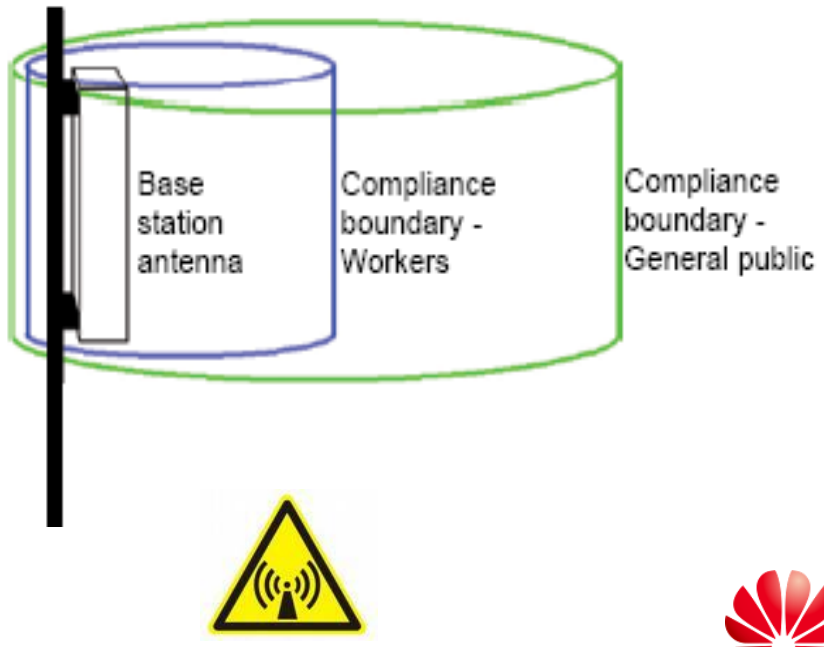
RF Safety-Compliance Boundary/ Exclusion Zone

Effects of RF Exposure

- Tissue heating (effects vary with exposed body area).
- Skin sensation - ONLY from EXTREMELY high exposure.
- RF burns from touching an energised source.
- Electric shock from induced currents.
- Areas which are intended to be accessed by the general public will not exceed the RF limits for either the general public or workers.
- At outdoor base station sites the RF limits will not be exceeded at ground level for either the general public or workers.

Compliance Boundary

- In principle, RF levels decrease rapidly when a person moves further away from the source e.g. a transmitting antenna.
- The distance at which the RF level is always below the RF limit is called the Compliance Boundary.



Exclusion Zone

- The region inside the Compliance Boundary is often called the Exclusion Zone.

RF Safety-General Procedure for Antenna Site

- Assume all antennas are active, all personnel entering the site must be authorised and obey all posted signs, warnings and instructions.
- Prior to arrival or before approaching transmitting antennas, be sure you aware of and understand the compliance boundaries and the locations of the antennas.
- If there is a need to climb masts/towers or work within 5 metres of a roof top antenna a site safety briefing is required before starting work.
- If it is necessary to work within the compliance boundary, follow the procedure for requesting the antenna to be powered down.
- Never disconnect RF cables or connectors associated with a operating antenna since this may result in an RF burn through direct contact with RF conductors.
- Damaged cabling and connectors can be unwanted sources of RF exposure – report all such cases.
- In addition to RF cabling, some base stations may have fibre-optic distribution systems. Workers shall follow the specific rules dealing with optical emissions.
- Without further analysis, personnel with active medical devices should not enter areas above the general public limits .
- Always follow the manufactures installation and operating instructions.

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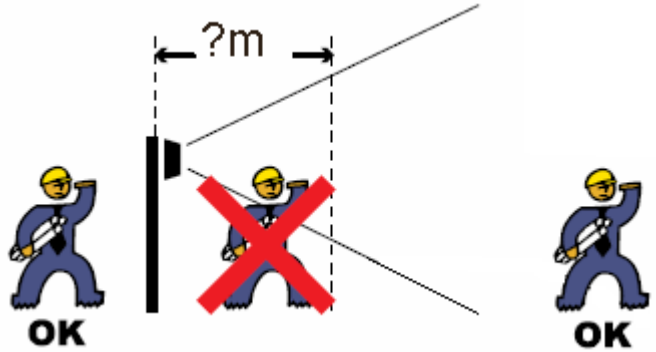
RF Safety-RF Warning Labels

Be sure you understand the Compliance Boundary / Exclusion Zones before you start work.



Remember signs may vary or may not be present.

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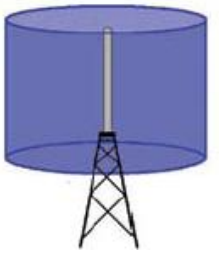
RF Safety-Type of Antenna

Omni-directional coverage
These antennas radiate RF energy equally in all directions in the horizontal plane.

The antenna input power is typically 10 – 80 watts, and the compliance boundary for a worker typically extends 0.1 – 1.5 meters from the antenna.

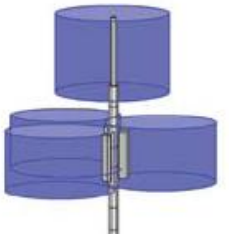



Sector coverage
These antennas restrict most of their radiated RF energy to a narrow angular sector in their forward direction (typically 60 to 20 degrees in the horizontal plane, typically 8 to 4 degrees in the vertical plane).

The antenna input power is typically 10 – 80 watts, and the compliance boundary for a worker extends typically 0.2 – 3 meters from the front face of the antenna .


Antenna farms (or clusters)
Antennas are often grouped together on masts .
The combination illustrated here is that of an omni-directional antenna mounted above a cluster of 3 sector antennas.

In the case that multiple antennas are present on a site, whenever an additional antenna is installed, the compliance boundary of each antenna should be evaluated again, taking into account the additional exposure of the newly installed antenna.

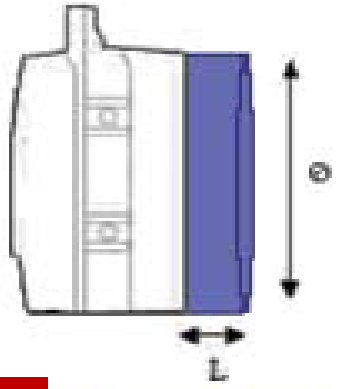




RF Safety-Type of Antenna

Radio relay (Microwave / fixed point-to-point link)

These antennas concentrate their RF energy into a narrow beam in the forward direction. Since the power levels are typically low, less than 1 watt, the safety distances in this forward direction (L) are often small (in centimetres) and in many cases there is no need of any safety distance for occupational exposure .

Areas above, below and to the sides of the antenna, as well as the area behind the antenna, are normally safe at even shorter distances.



The Compliance Boundary for safe working around antennas is shown in BLUE - Seek clarification before approaching antenna or working within 5m

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Emergency Contact Number

Police _____

Medical _____

Fire _____

Last and not least, whatever job you do, do it safely.

Your family needs you!!!

Remember -
Think Safety, Work Safely

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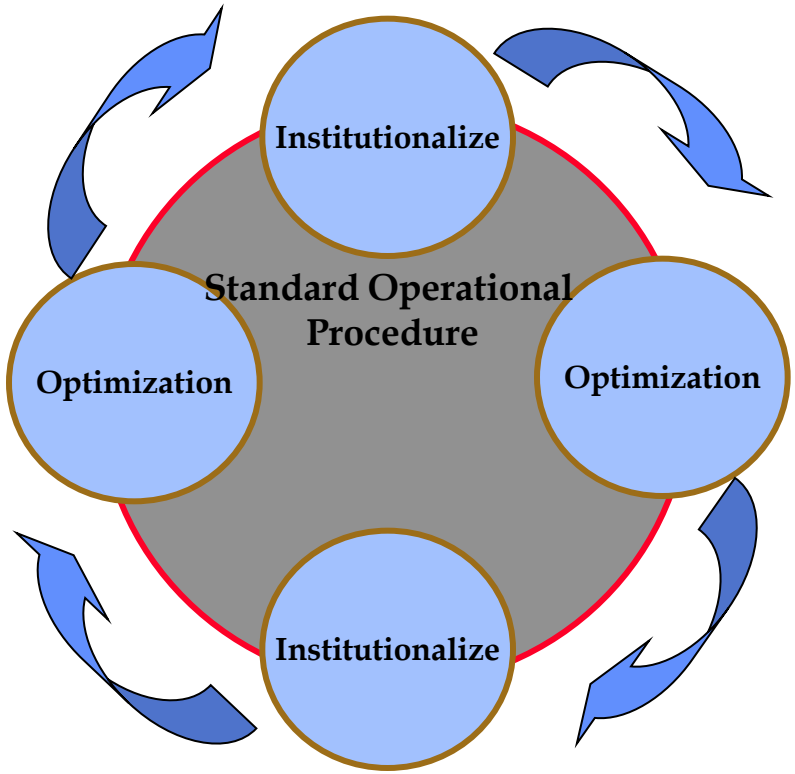
Approach to Standard Operational Procedure (SOP)

What is SoP?

A Standard Operational Procedure fractionalizes & Quantizes the key procedures and key points in an operation process , to institutionalize & regularly recurring work processes and reach to the optimum state process through continuous improvement.

Establishing Standard operational process/procedure in a work is most essential to create Stable & consistent performance/result.

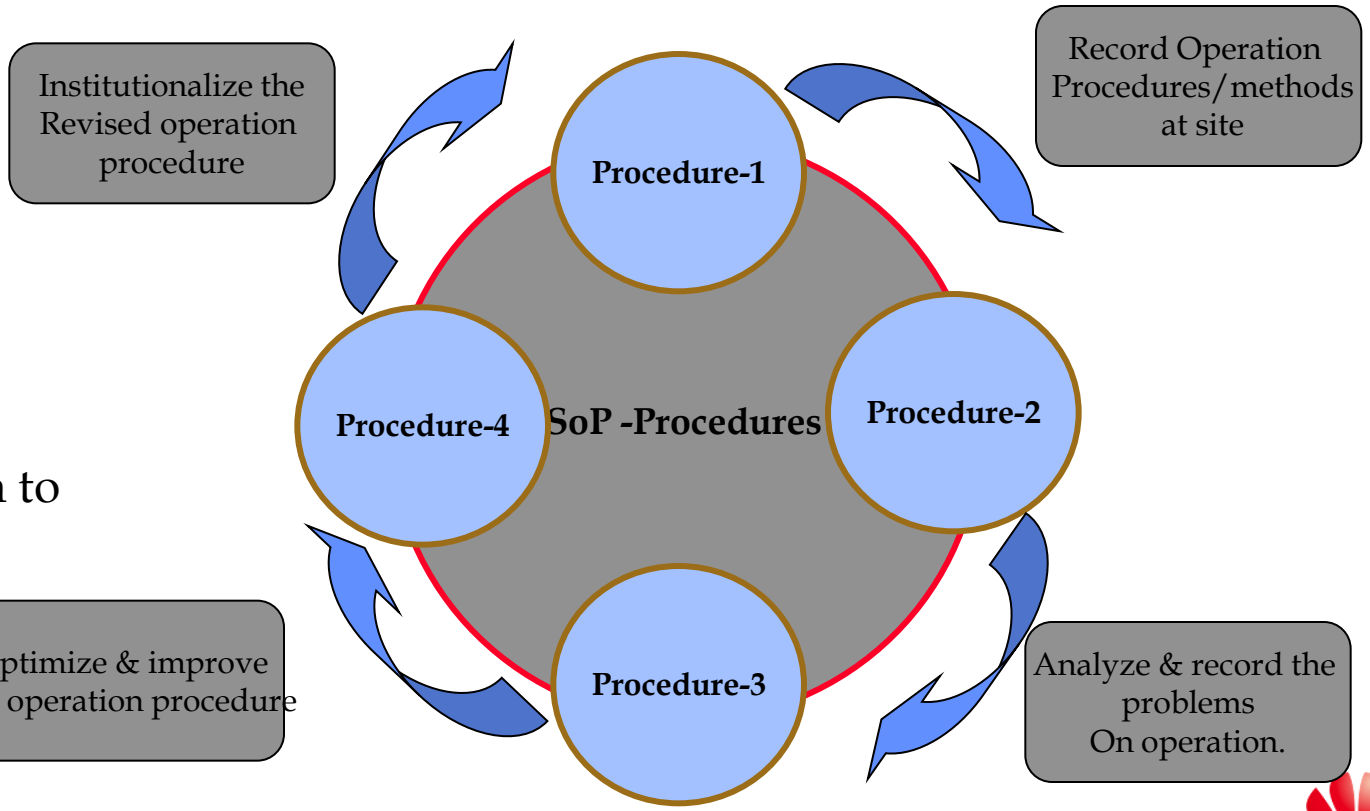
Standardizing of procedure/process is the basis for making continuous improvement , increasing efficiency, reducing cost & improving Quality.



Rules of SoP (3/4/5 Rules)

Three Focuses-
The Standard Operational Procedure focuses on the standardization, institutionalization, & continuous improvement of the operation activities.
The operation activities are site preparation, site design,CW ,Equipment installation, material delivery & site acceptance.
The above focuses are to reduce man-hour base line, deliver consistent quality, & reduce Site delivery cost.

Four procedures-



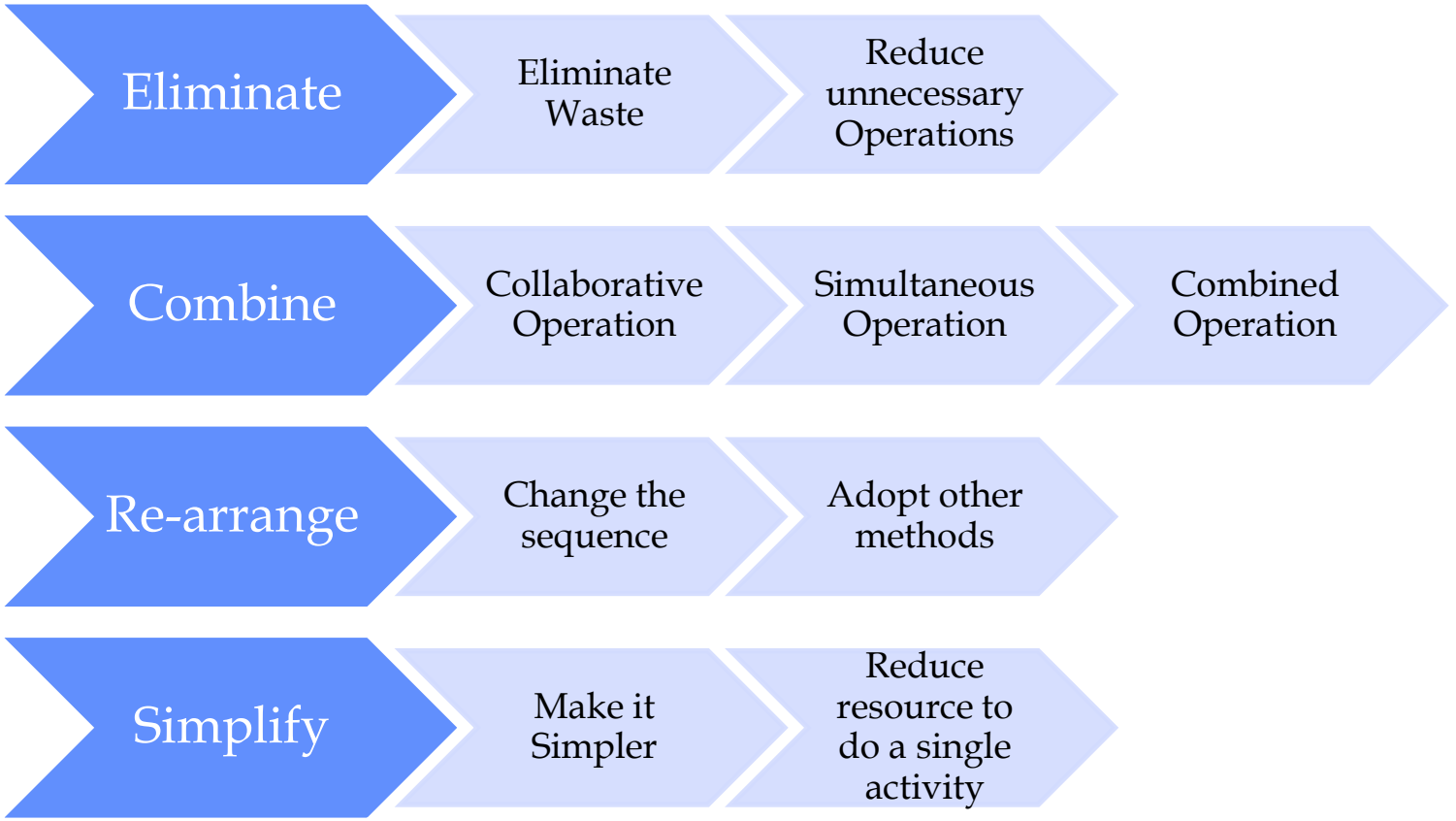
Man-hour baseline-
Total Resource x duration to Complete a activity.

Record Operation Procedure/Method

Identify & Record the following during site visit,

- Corrections
- Overproduction
- Multiple travels
- Resource to act a single activity
- Waiting for activity
- Inventory
- Improper processing

Optimize & improve the operation



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Huawei BTS-GSM & Node-B Product Overview

Huawei BTS-GSM, CDMA & Node-B Cabinet Appearance

BTS3900 Cabinet

The Capacity of the BTS3900 is represented by the number of carriers & that of cells.

- Single cabinet can be configured with maximum 6 DRFU/GRFU.
- Single cabinet can serve upto 6 sectors.
- The maximum carriers with DRFU is 12 with single cabinet & 36 carriers with single site.
- The maximum carriers with GRFU is 36 with single cabinet & 72 carriers with single site.
- Cabinet size-600mm(W)x450mm(d)x900mm(h)
- Base Size-600mm(w)x420mm(d)x40mm(h).
- The Cabinet can support 3 types of input power supply,i.e. -48VDC,+24VDC & 230V/AC .

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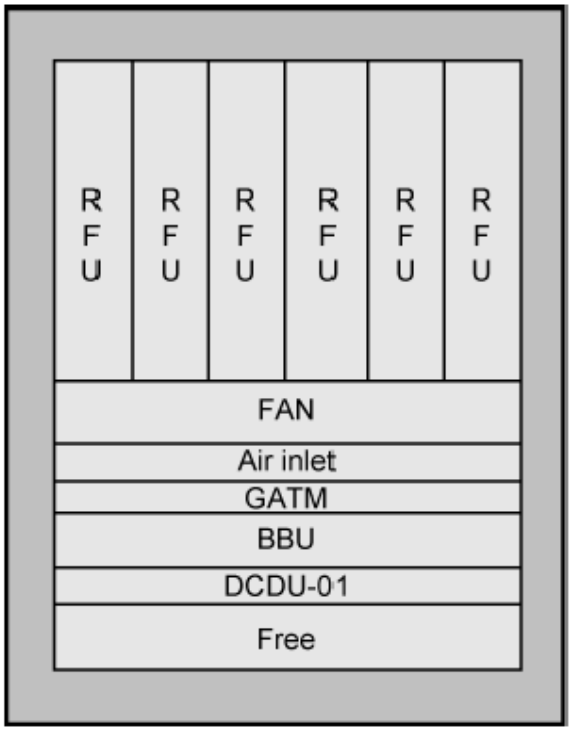
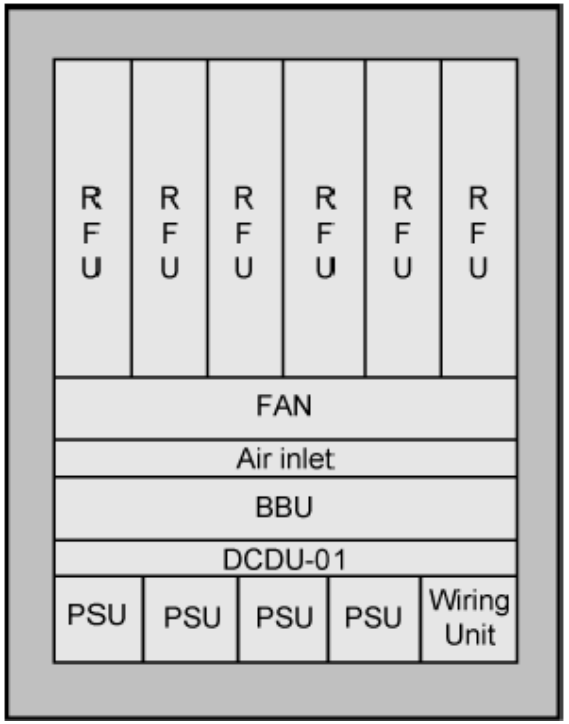
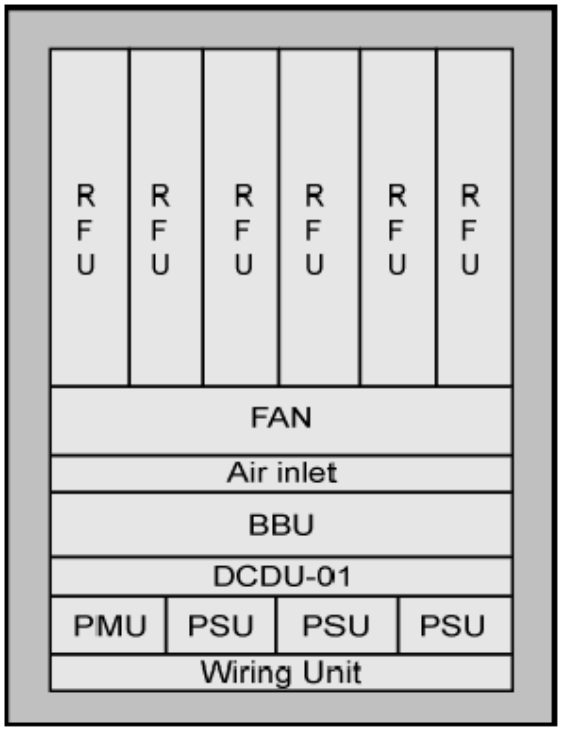
BTS3900-GSM Typical Configuration



CONFIGURATION WITH -48 VDC INPUT SUPPLY



CONFIGURATION WITH +24 VDC INPUT SUPPLY



CONFIGURATION WITH 230VAC INPUT SUPPLY

Weight of Empty ID BTS Cabinet is 57 Kgs.
Weight of BTS cabinet with full configuration is 132 Kgs.

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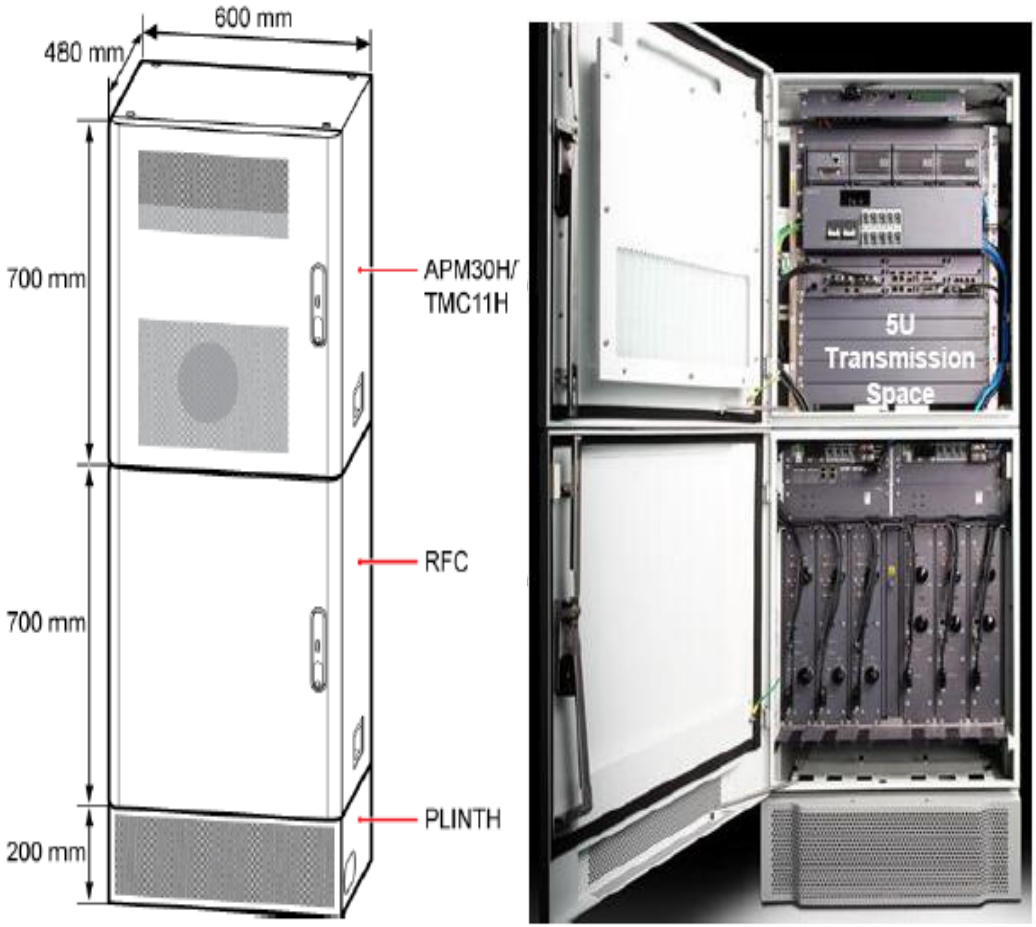
BTS3900A Equipment Cabinet



The Capacity of the BTS3900A is represented by the number of carriers & that of cells.

- Single cabinet can be configured with maximum 6 DRFU/GRFU.
- Single cabinet can serve upto 6 sectors.
- The maximum carriers with DRFU is 12 with single cabinet & 36 carriers with single site.
- The maximum carriers with GRFU is 36 with single cabinet & 72 carriers with single site.
- The upper cabinet is an AC-APM30H/+24VDC Power Cabinet/-48VDC-TMC11H Transmission cabinet.
- The Lower Cabinet is RF cabinet.
- In APM30H is 5HU & in TMC11H cabinet is 11HU space is available for customer equipments.
- Cabinet size including base-600m(W)x480mm(d)x1600mm(h)
- The Cabinet can support 3 types of input power supply,i.e. -48VDC,+24VDC & 230V/AC .

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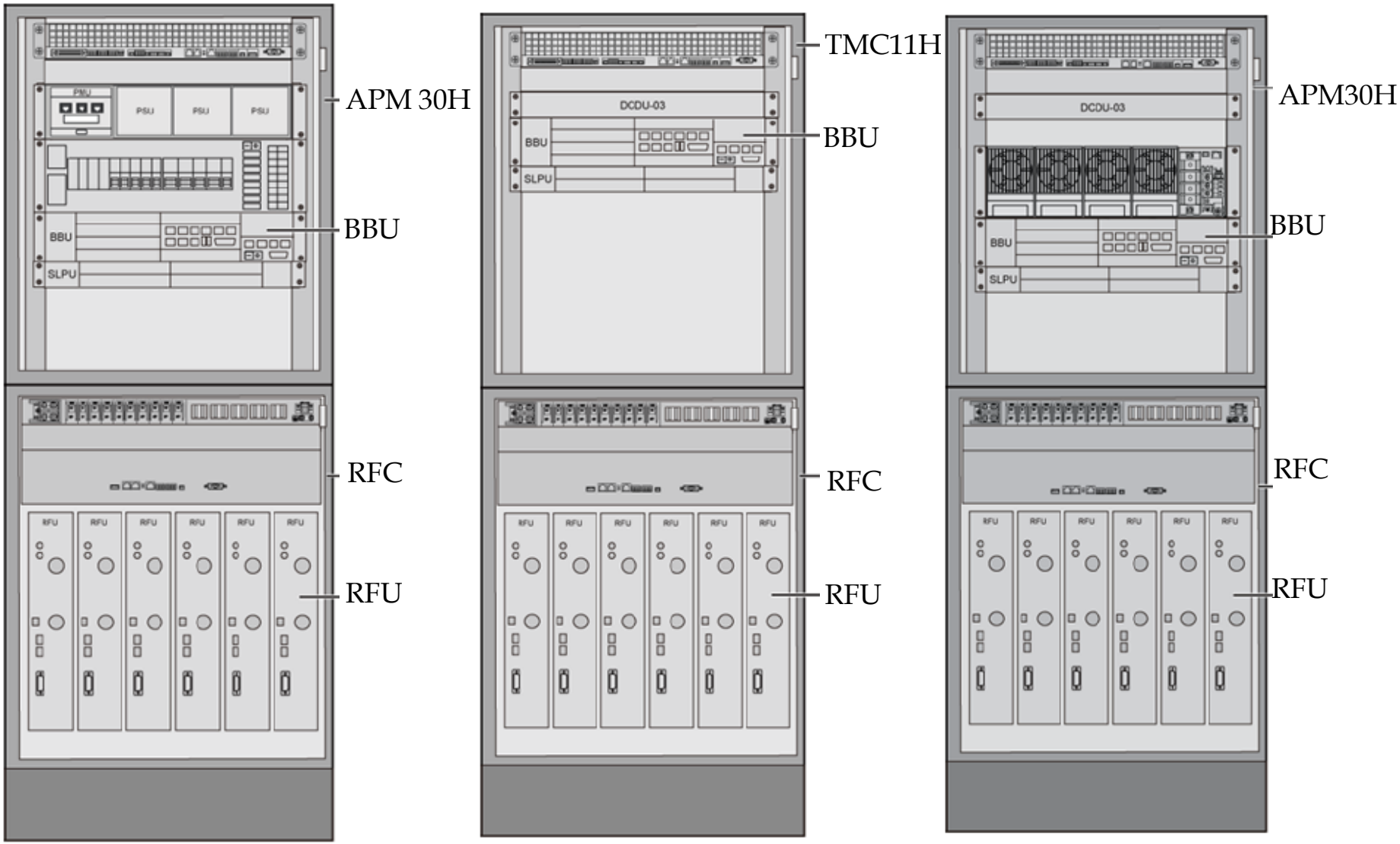
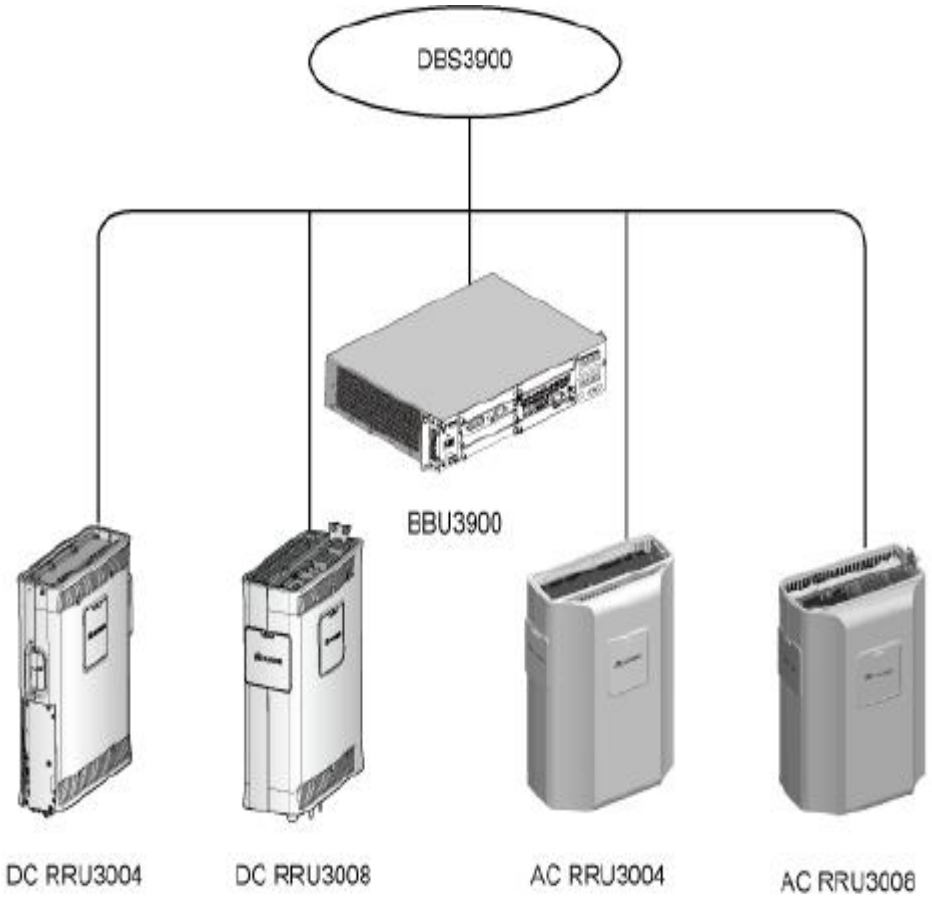
BTS3900A –GSM Typical Configuration



DBS3900-GSM



The functional modules of the DBS3900 consists of the

- BBU3900 & the RRU's
- The RRU's are categorized into two types,i.e. DC RRU & AC RRU.
- The RRU3004 is an Outdoor remote radio unit & it supports 2 carriers.
- The RRU3008 is and outdoor remote radio unit & supports more than two carriers.

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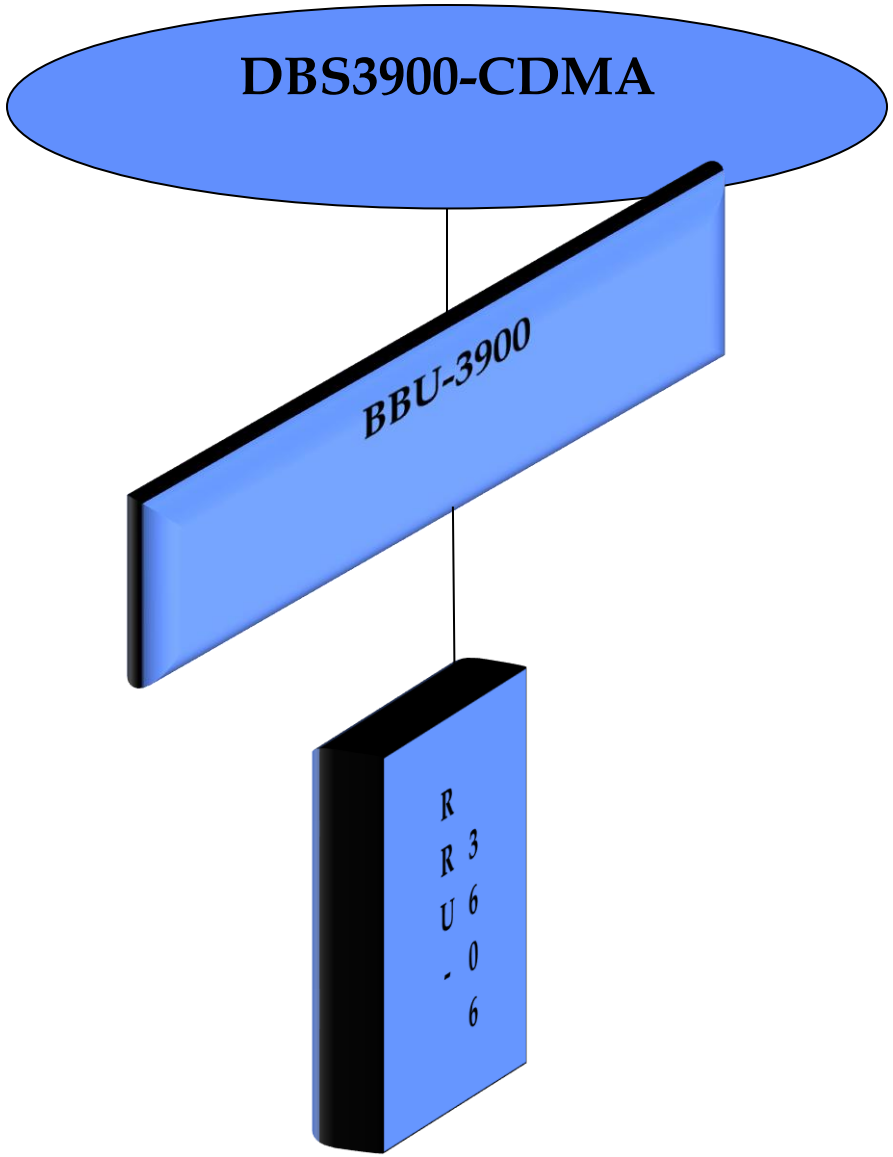
DBS3900-CDMA



The functional modules of the DBS3900 consists of the

- BBU3900 & the RRU's
- The RRU's are categorized into two types, i.e. DC RRU & AC RRU.
- The RRU3606 is an Outdoor remote radio unit.

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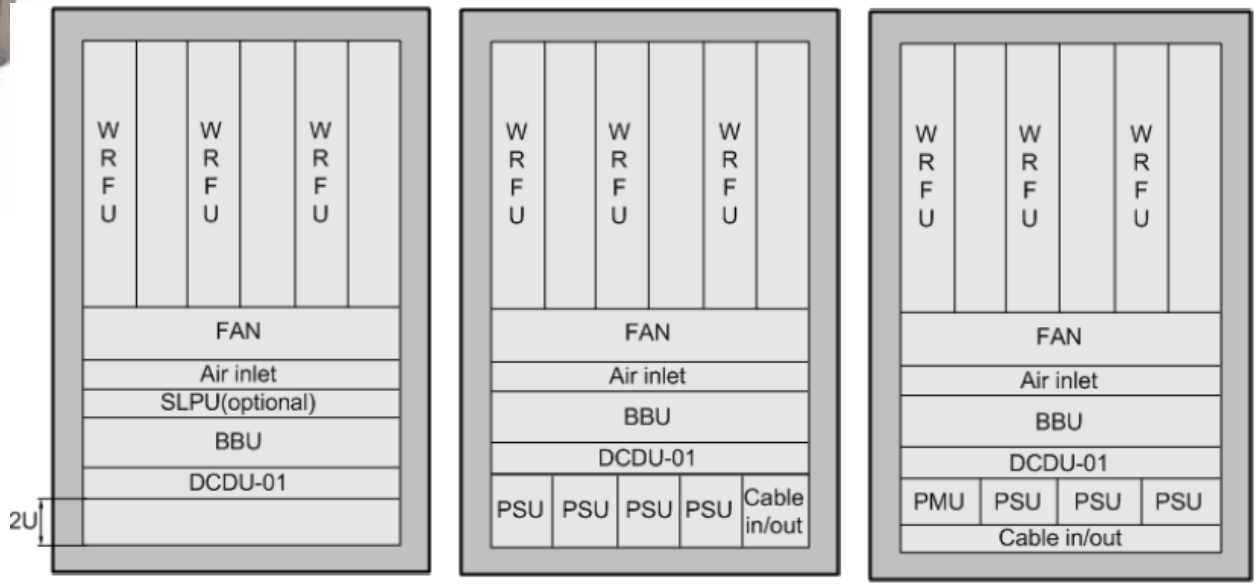
BTS3900-Node-B Cabinet Appearances

The Cabinet structure for both GSM & Node-B is same for GSM & Node-B. The difference to BTS3900 –GSM is only hardwares/Modules.



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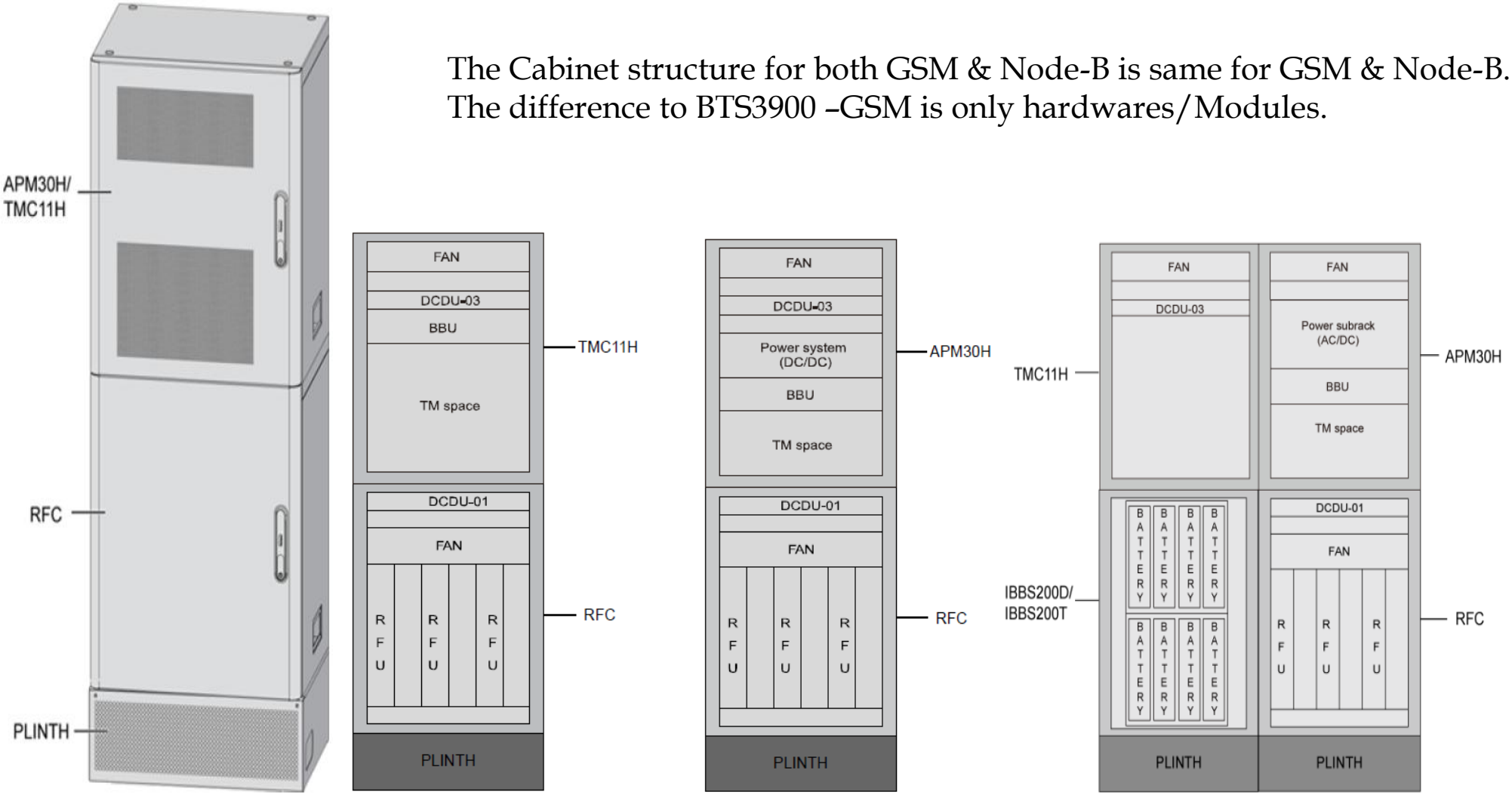
BTS3900A-Node-B Cabinet Appearances

The Cabinet structure for both GSM & Node-B is same for GSM & Node-B. The difference to BTS3900 –GSM is only hardwares/Modules.



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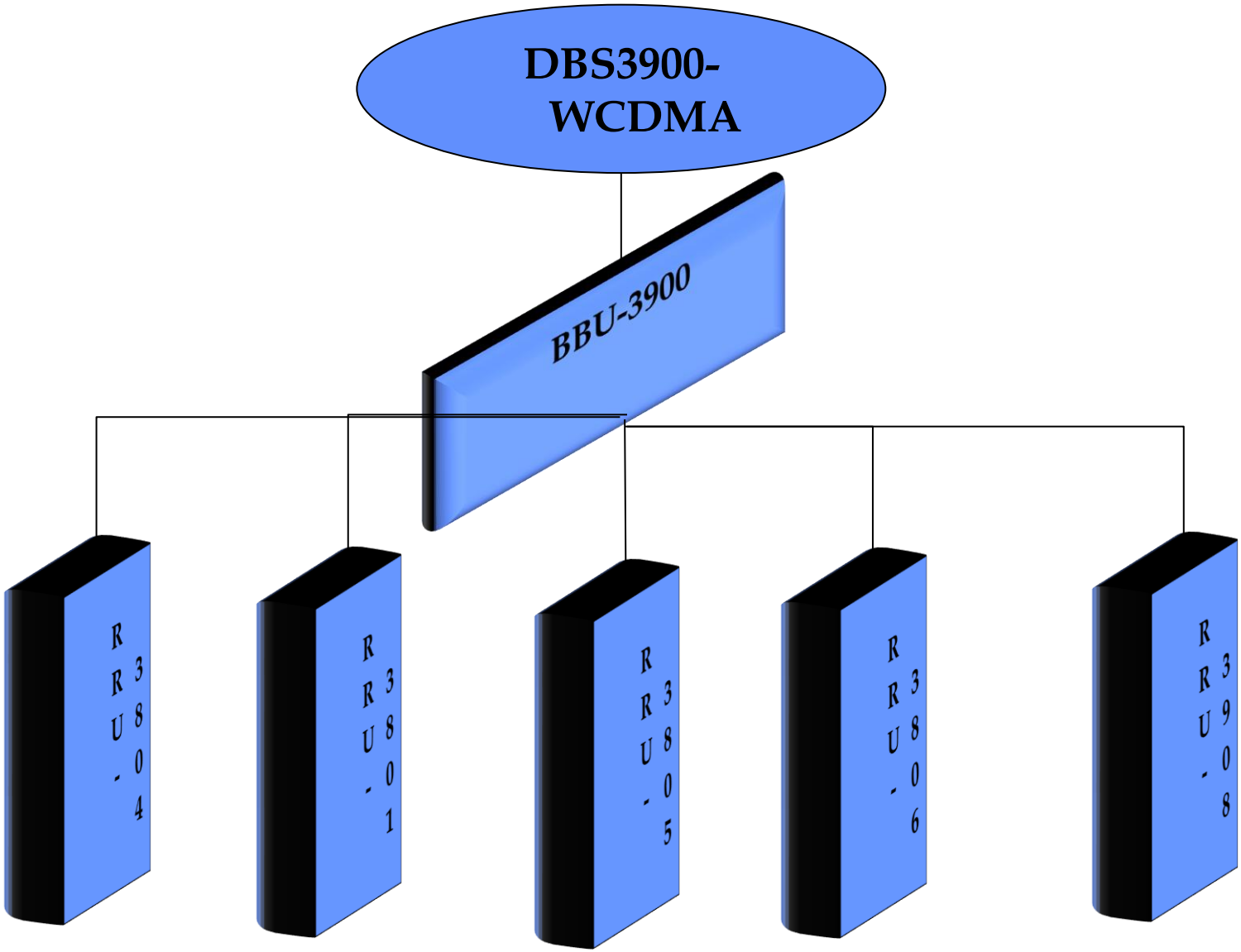
DBS3900-Node-B



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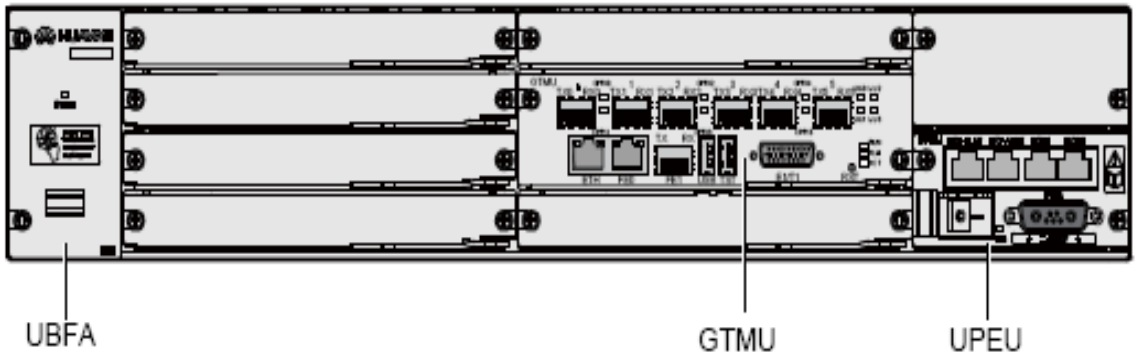
Hardware / Module Description

BBU-BTS3900/3900A/DBS3900-GSM



1 HU = 44.45mm

The BBU3900-GSM performs the following functions;

- Providing physical ports for the communication between the BTS & BSC.
- Providing CPRI ports for communication between the BBU & RFU's.
- Providing the USB port for downloading the BTS software.
- Providing the OM channel for connection to LMT/M2000.
- Processing uplink & downlink data.
- Providing system clocks.
- External alarms.

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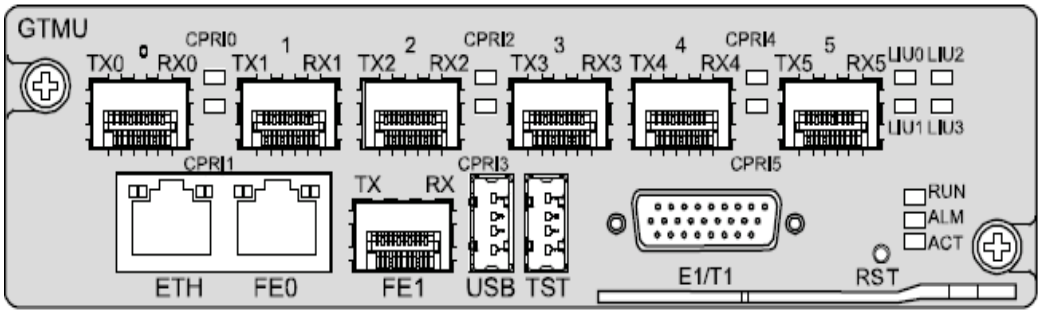
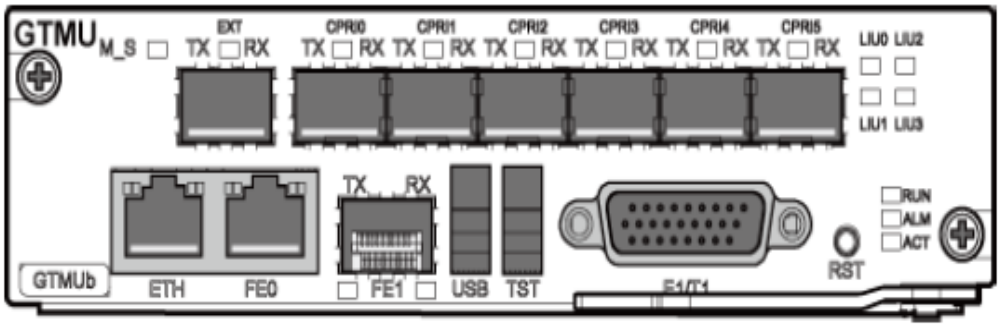
GTMU Panel-BTS3900/3900A/DBS3900-GSM

GSM Transmission, Timing & Management Unit of BBU (GTMU)



GTMU



GTMUb

The GTMU Performs the following functions

- Controlling ,maintaining and operating the BTS.
- Providing fault management ,configuration management ,performance management & Security Management.
- Monitoring the fan module & the power supply modules.
- Distributing & managing BTS clock signals.
- Providing clock output for testing.
- Providing the Ethernet port for local maintenance.
- Providing four routes of E1 transmission.
- The GTMUb supports interconnected BBUs.

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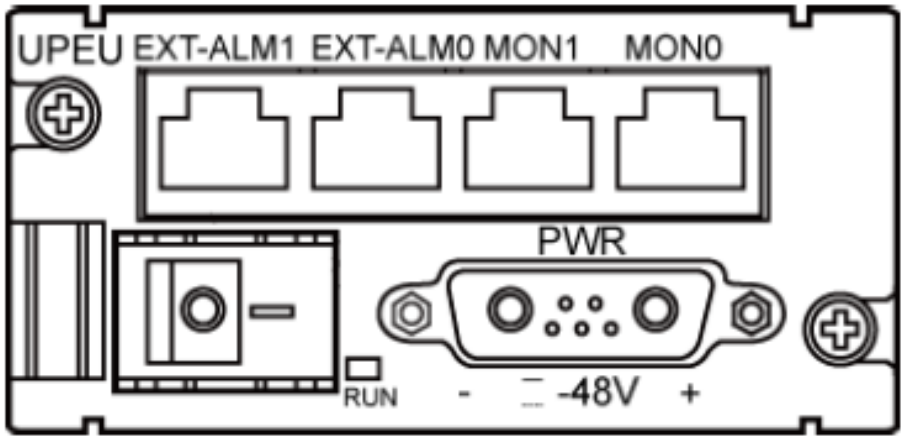
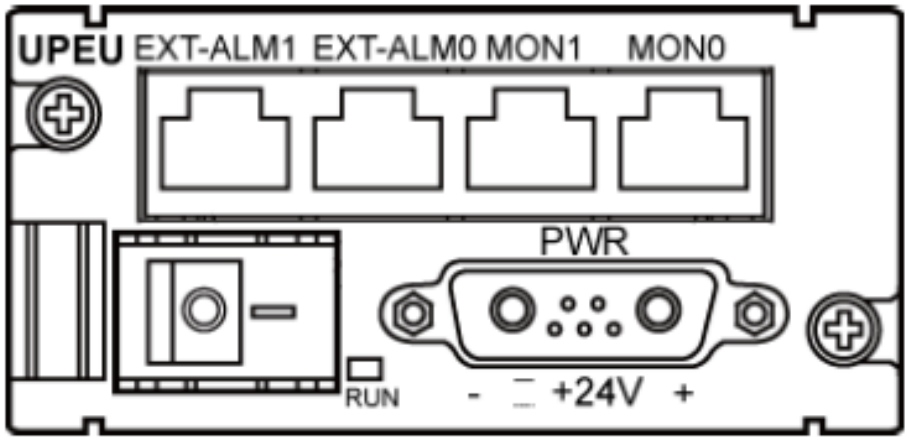
UPEU Panel-BTS3900/3900A/DBS3900-GSM,CDMA & NODE-B



UPEUA



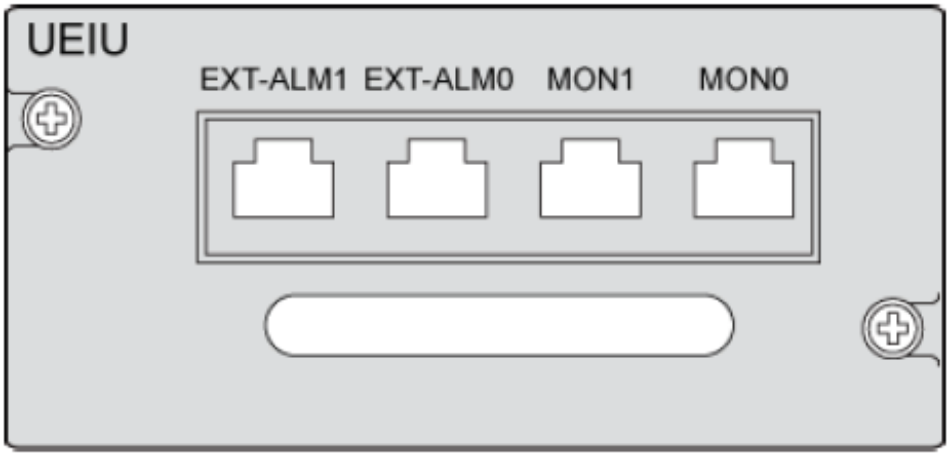
UPEUB

Universal Power and Environment Interface Unit (UPEU) board of the BBU 3900 .
It is Mandatory board of the BBU3900 that converts -48VDC to +12VDC/ Converts +24VDC to +12VDC.

Functions are as below,

- Converting -48VDC/+24VDC to +12VDC that is applicable to the boards.
- Providing two ports with each transmitting one RS485 and another two ports with each transmitting four dry contact signals.
- Providing reverse connection protection for power cable connectors.

UEIU Panel-BTS3900/3900A/DBS3900-GSM,CDMA & NODE-B



Label	Connector Type	Quantity	Description
MON0	RJ45	1	One RS485 signal
MON1	RJ45	1	One RS485 signal
EXT-ALM0	RJ45	1	Four dry contact signals
EXT-ALM1	RJ45	1	Four dry contact signals

Universal Environment Interface Unit (UEIU) board of the BBU 3900 .
The UEIU transmits monitoring signals and alarm signals from external devices to the main control and transmission unit.

Functions are as below,

- ❑Providing two ports with each transmitting one RS485 Signal.
- ❑Providing two ports with each transmitting four dry contact signals.
- ❑Transmits monitoring signals and alarm signals from external devices to the main control and transmission unit.

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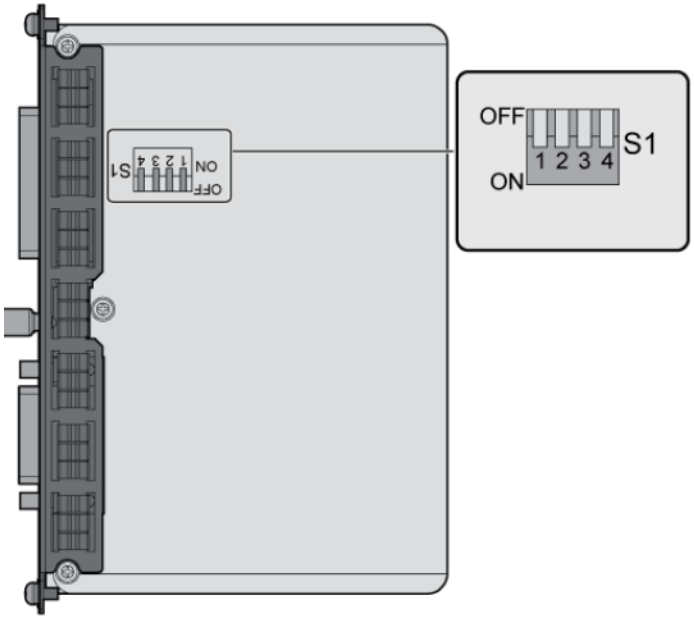
BBU3900 Modules (GTMU,UELP,UFLP) Interfaces

Module/Sub module Name	Label on Connector	Connector Type	Description
UELP	INSIDE	DB25 Female	Transmits 4 E1/T1 between UELP & GTMU
UELP	OUTSIDE	DB26 Female	Transmits 4 E1/T1 between BBU & BSC
GTMU	CPRI0-CPRI5	SFP Female	Transmits the optical & electrical signal between GTMU and DRFU/GRFU
GTMU	E1/T1	DB26 Female	Transmits E1/T1 between GTMU & UELP / between GTMU & BSC
UFLP	FE0	RJ45	Connect the BBU to a routing devices in the equipment room through the Ethernet cable to transmit network information.
UFLP	FE1	DLC	Connect the BBU to a routing devices in the equipment room through the Ethernet cable to transmit network information.
UEIU	MON0	RJ45	RS485 Signal
UEIU	MON1	RJ45	RS485 Signal
UEIU	EXT-ALM0	RJ45	Four dry contact signals
UEIU	EXT-ALM1	RJ45	Four dry contact signals
UPEU	MON0	RJ45	Transmits one RS485 environment monitoring Signal
UPEU	MON1	RJ45	Transmits one RS485 environment monitoring Signal
UPEU	EXT-ALM0	RJ45	Four dry contact signals
UPEU	EXT-ALM1	RJ45	Four dry contact signals
UPEU	PWR	3V3	24V/48VDC input

UELP Panel-BTS3900/3900A/DBS3900-GSM,CDMA&NODE-B

Label	Connector Type
INSIDE	DB25
OUTSIDE	DB26

Universal E1/T1 lightening protection unit (UELP) is a universal E1/T1 surge protection unit. The UELP optionally installed in the SLPU or BBU.Each UELP provides surge protection for four E1s/T1s.



DIP Switch	DIP Status				Description
	1	2	3	4	
S1	ON	ON	ON	ON	75-ohm E1 cable
	OFF	OFF	OFF	OFF	120-ohm E1 cable or 100-ohm T1 cable

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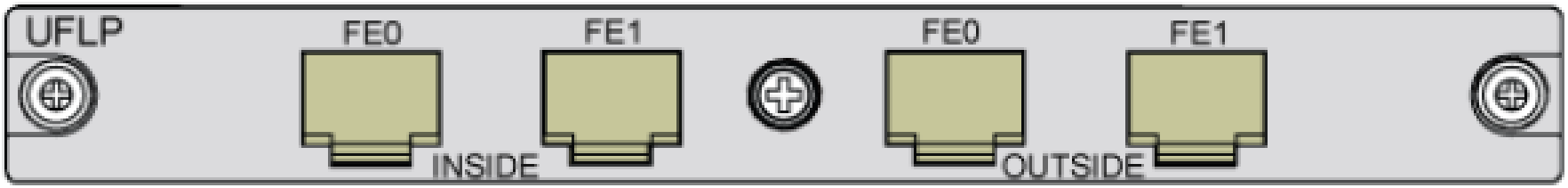
UFLP Panel-BTS3900/3900A/DBS3900-GSM,CDMA & NODE-B



Universal FE lightening protection unit (UFLP) board is optionally installed in the SLPU or BBU3900. Each UFLP supports 2-Way FE Surge Protection.

Port Location	Label	Quantity
INSIDE side	FE0, FE1	2
OUTSIDE side	FE0, FE1	2

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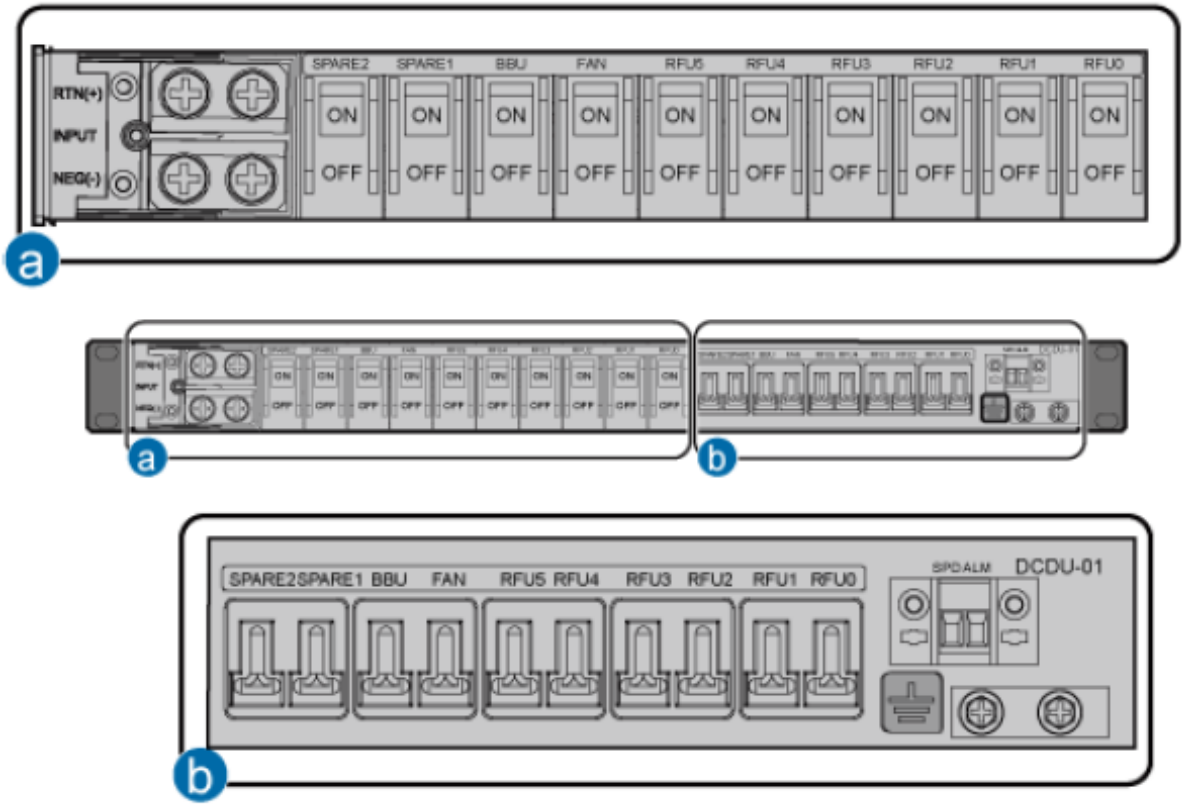
DCDU-01 Unit



Function of DCDU-01 are as below;

Supporting one -48VDC input and 10 nos. of -48VDC outputs.

The 10 Nos. of -48VDC outputs are

- 1x25A output to the spare-1 port.
- 9x12A output to the other-9 ports.

Supplying power to the BBU,RFU's Fan Unit and customer equipments in the cabinet.

Providing surge protection of 10KA in differential mode and 15Ka in common mode and providing dry contacts for surge protection failure.

Name	Label	Description
Power input wiring terminals	NEG(-)	Low level input wiring terminal for the DCDU-01
	RTN(+)	High level input wiring terminal for the DCDU-01

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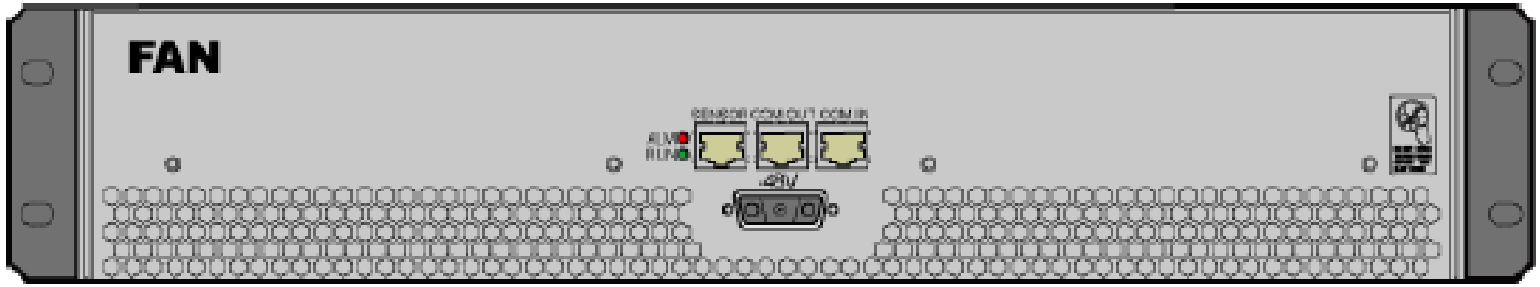
FAN Unit



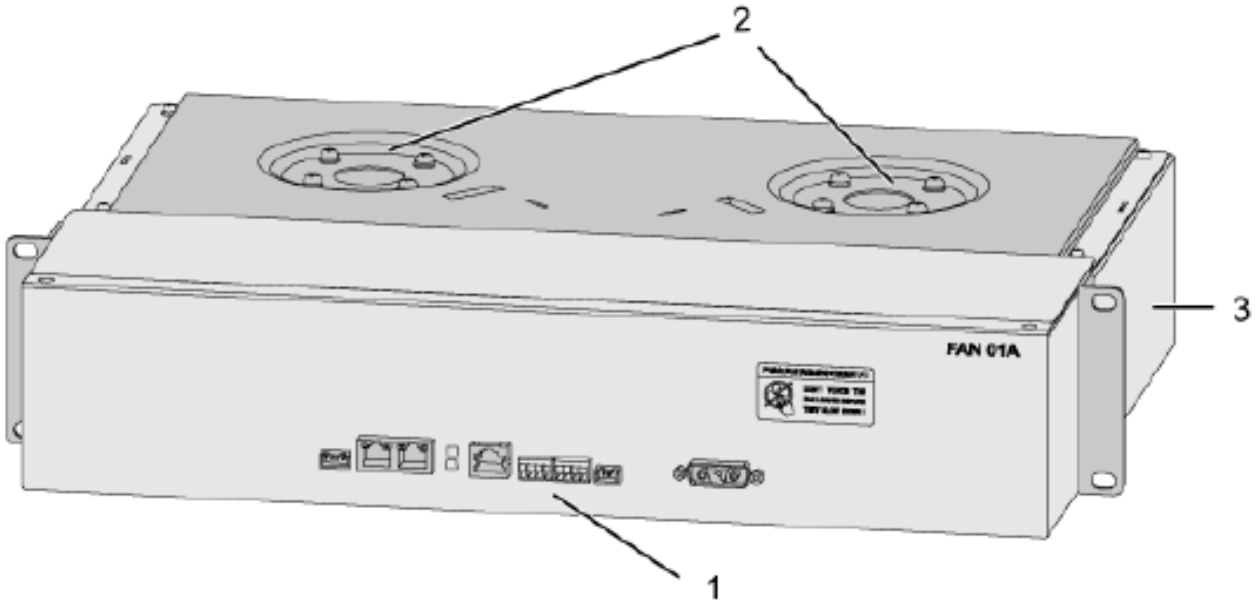
The FAN Unit has following functions,

- ❑Ventilating the cabinet and dissipating the heat in the cabinet.
- ❑Supporting temperature detection.
- ❑Supporting two modes of fan speed adjustment ,based on the temperature or controlled by the main control unit.
- ❑Stopping the fans when the ambient temperature is low.

Fan Unit	Label on Connector	Connector Type	Description
Power Supply Socket	48VDC	3V3	Input -48VDC to Fan Unit
Temperature Sensor	Sensor	RJ45	Connecting to ELU (Electronic label unit).
Communication Port	COM-OUT	RJ45	Connecting to lower level cascaded Fan unit
	COM-IN	RJ45	Connecting BBU / upper level cascaded Fan unit.

Fan Box In BTS 3900A-RF Cabinet

The Fan Box in RFC is consists of Fan sub rack ,Fans & CMUA



1. CMUA
2. FANS
3. FAN SUB RACK

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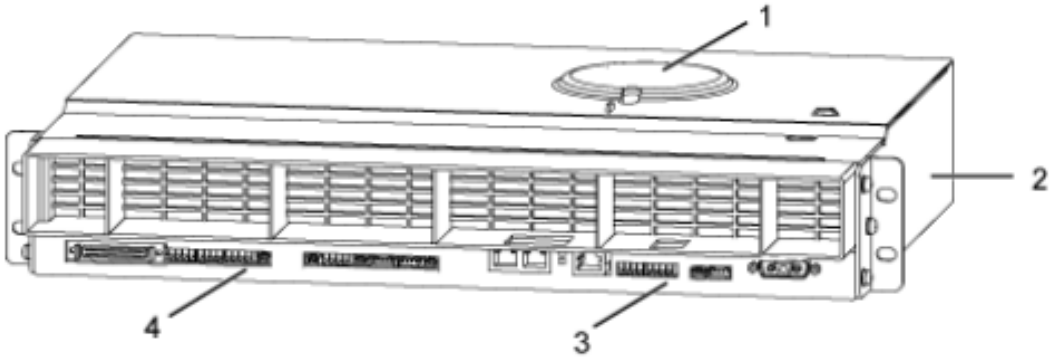
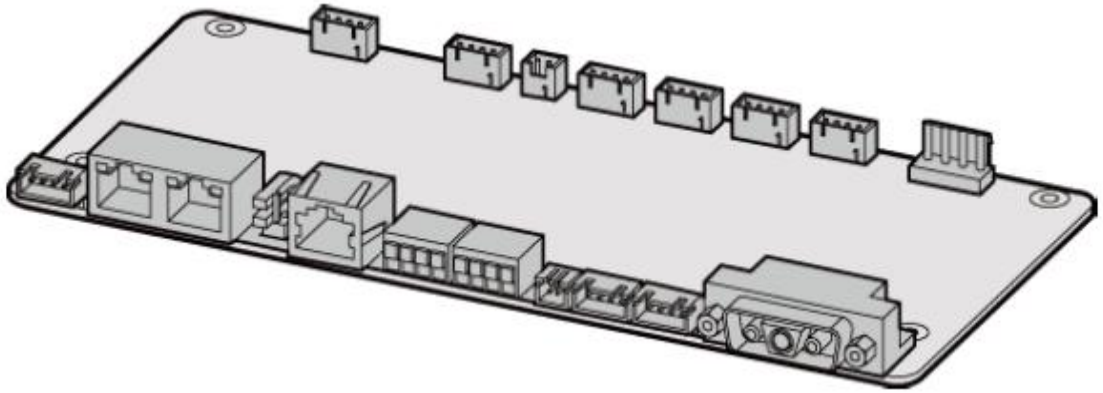
Fan Box In BTS 3900A-APM30H & TMC11H Cabinet

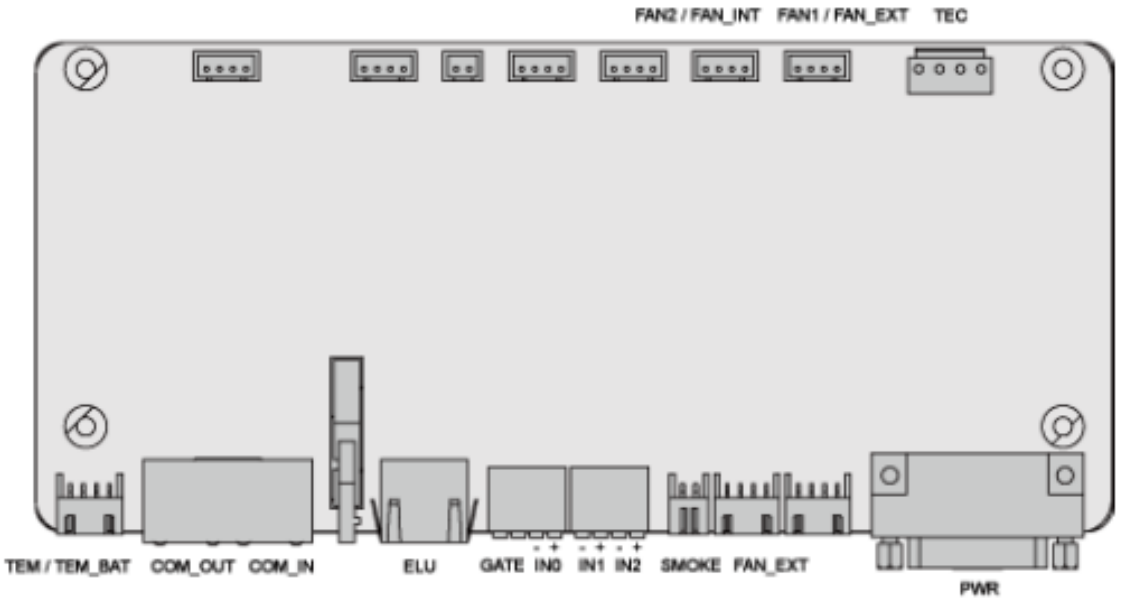


(1) Fan (2) Fan subrack (3) CMUA (4) HPMI

The fan box consists of the fan subrack, fans, HPMI, and CMUA.

CMUA (Central Monitoring Unit ,Type-A)-APM30H/ TMC11





The CMUA has the following functions:

Adjusts and controls temperature of the cabinet in different temperature control modes.

Reserves a port for three Boolean inputs and detects Boolean alarms in the cabinet. The remote detection, however, is not supported.

Provides a port for the RJ-45 connector to enable electronic label and cabinet type detection.

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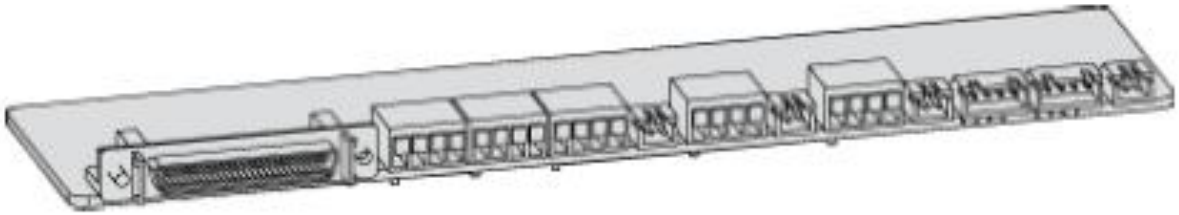
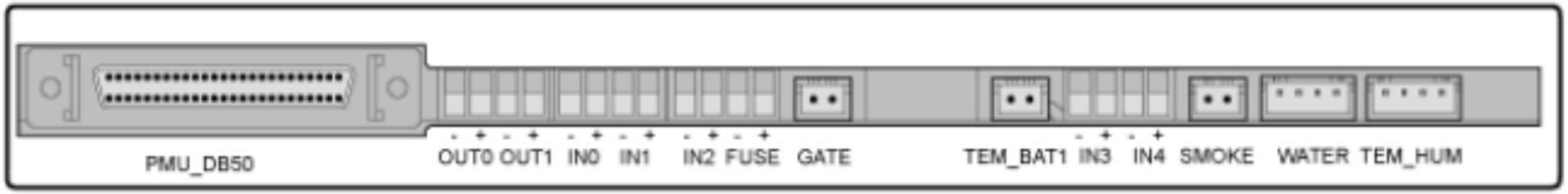
Hert Power Monitoring Interface unit (HPMI)-APM30H/ TMC11H

The Hert Power Monitoring Interface unit (HPMI) provides input and output ports for alarm signals.





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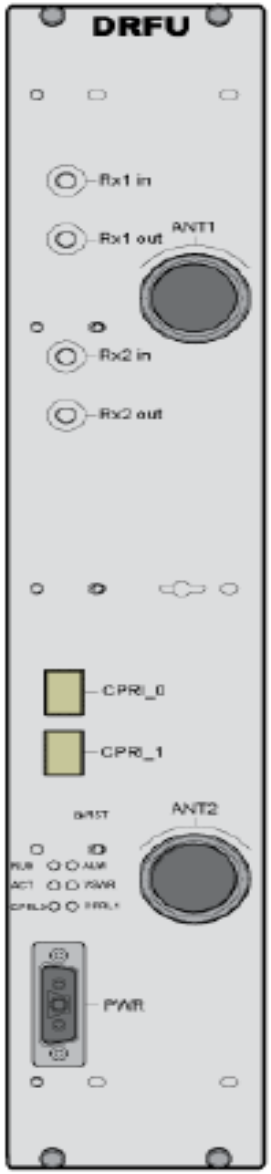
DRFU (Double Radio Frequency Unit)-BTS3900-GSM



The DRFU handles modulation and demodulation between baseband signals and RF signals, Data processing and combining distribution.

The DRFU performs the following functions,

- ❑It modulates baseband signals to GSM RF signals by using direct frequency conversion in the transmit channel. After amplifying or combining the RF signals ,the DRFU sends the signals to the antenna for transmission.
- ❑It receives RF signals from the antenna and down-converts the RF signals to IF signals. After amplifying analog to digital converting ,digital down converting matched filtering and performing automatic gain (AGC) ,the DRFU sends the signals to the BBU for further processing.
- ❑It performs power control.
- ❑It support frequency domain reflectometer (FDR) enables accurate standing wave detection.
- ❑It performs reverse power detection.
- ❑It supports frequency synthesis and loop testing.
- ❑It generates the CPRI clock, recovers the CPRI clock of lost synchronization and detects alarms.

GRFU (GSM Radio Frequency Unit)-BTS3900-GSM

The GRFU handles modulation and demodulation between baseband signals and RF signals, data Processing and combining distribution.

The GRFU has the following functions,

- Implements the frequency conversion technique in the transmit channel, modulates the baseband signals to GSM RF signals, sends the signals to the antenna foe transmission through the duplex filter after filtering ,amplifying and combining the RF signals. The combining can be performed as required.
- Receives RF signals from the antenna and performs down conversion ,amplification, analog to digital conversion ,digital down conversion ,matched filtering and automatic gain control (AGC), and then transmits the signals to the BBU for further processing.
- Provides power control and voltage standing wave ratio detection.
- Provides reverse power detection.
- Generates the CPRI clock, recovers the CPRI clock of lost synchronization and detects alarms.

Note-
When the DRFU is configured , the maximum cell configuration is 444 & when GRFU are configured the maximum cell configuration of a single cabinet is 12/12/12

GATM (GSM Antenna & TMA Control Module)

The GSM Antenna and TMA control module (GATM) is a modules that controls the antenna and TMA. The GATM is optional and is optionally installed in the power cabinet or transmission cabinet when the DRFU Module is configured.

The GATM has the following functions,

- ❑Controlling the RET antenna.
- ❑Supplying power to the TMA.
- ❑Reporting the RET control alarm signals.
- ❑Monitoring the current from the feeder.
- ❑Not support common TMA and RET antenna at the same time.

Port	Connector	Function
ANT0 to ANT5	SMA female connector	Providing power for the RET antenna and transmitting control signals for the RET antenna
COM1	RJ45 connector	Connecting to the BBU
COM2	RJ45 connector	Providing the extended RS485 port to be cascaded with other devices
-48 V	3V3 power connector	Receiving the -48 V power input

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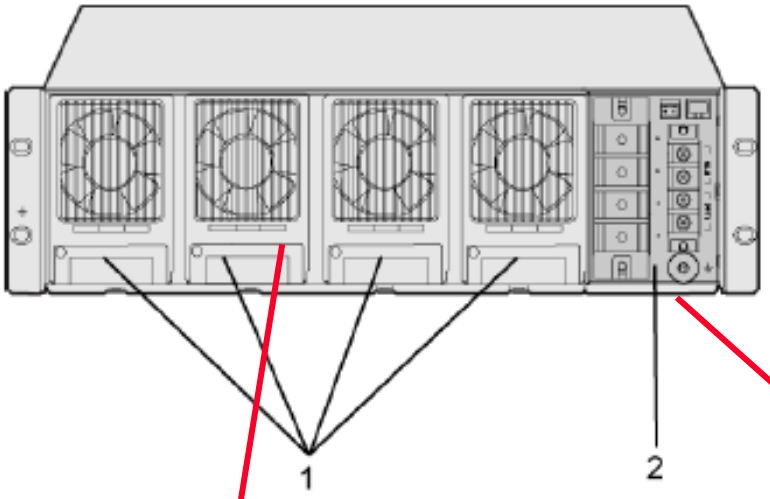
DC/DC Power System (+24VDC TO -48VDC)-APM30H

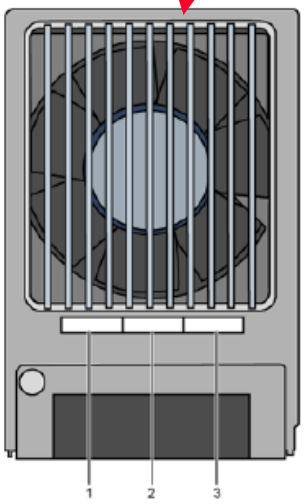


(1) PSUs (DC/DC)

(2) Power subrack (+24 V)

Function of DC to DC Converter is as follows;

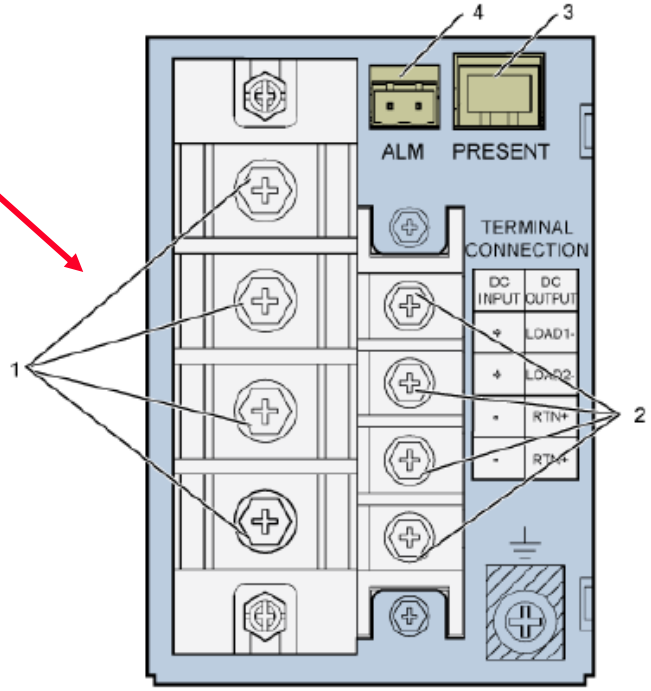
- ❑Converting +24VDC power into -48VDC power and leading the -48VDC power into the DCDU.
- ❑Monitoring the unit and reporting alarms related to PSU faults (such as output over voltage ,no output and fan faults) ,alarms Related to PSU protection (such as over-temperature protection, And input over voltage /under voltage protection) ,and PSU out of Position alarm, if any.



(1) Power LED

(2) Protection LED

(3) Fault LED



(1) Power input wiring terminals

(2) Power output wiring terminals

(3) PRESENT port

(4) ALM port

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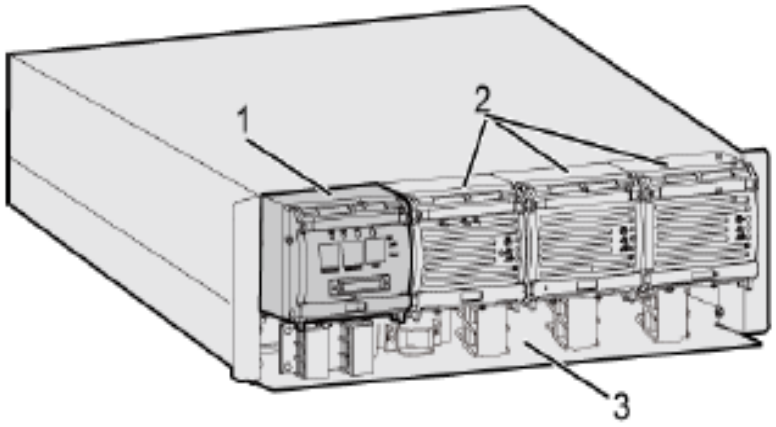
AC TO DC Power Modules –APM30H

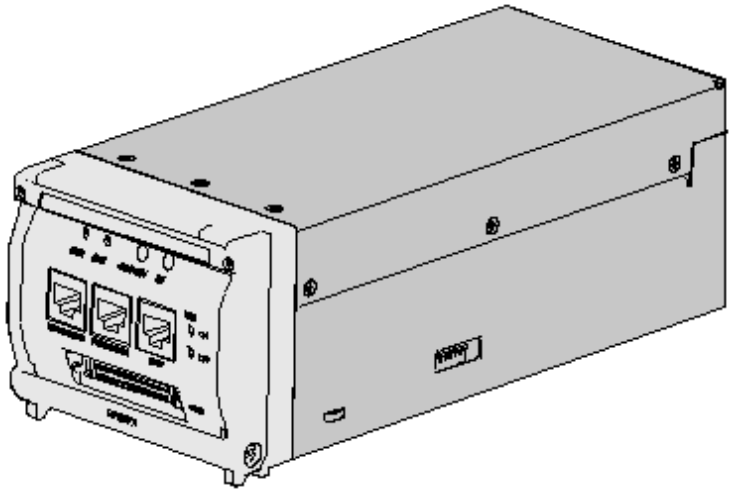


(1) PMU

(2) PSUs (AC/DC)

(3) Power subrack (220 V)

Output Power of Each PSU is 1620 Watts.



The PMU has the following functions,

- ❑Communicating with the BBU or cascaded through an RS232/RS422 serial port.
- ❑Managing the power system and charge /discharge of battery.
- ❑Detecting and reporting water damage alarm,smoke,door & customized Boolean values.
- ❑Reporting the ambient temperature ,ambient humidity, battery temperature and customized analog values.
- ❑Monitoring power distribution ,reporting related alarms and reporting dry contact alarms.

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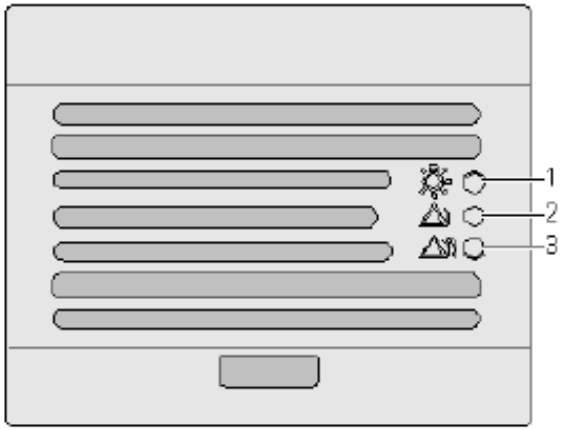
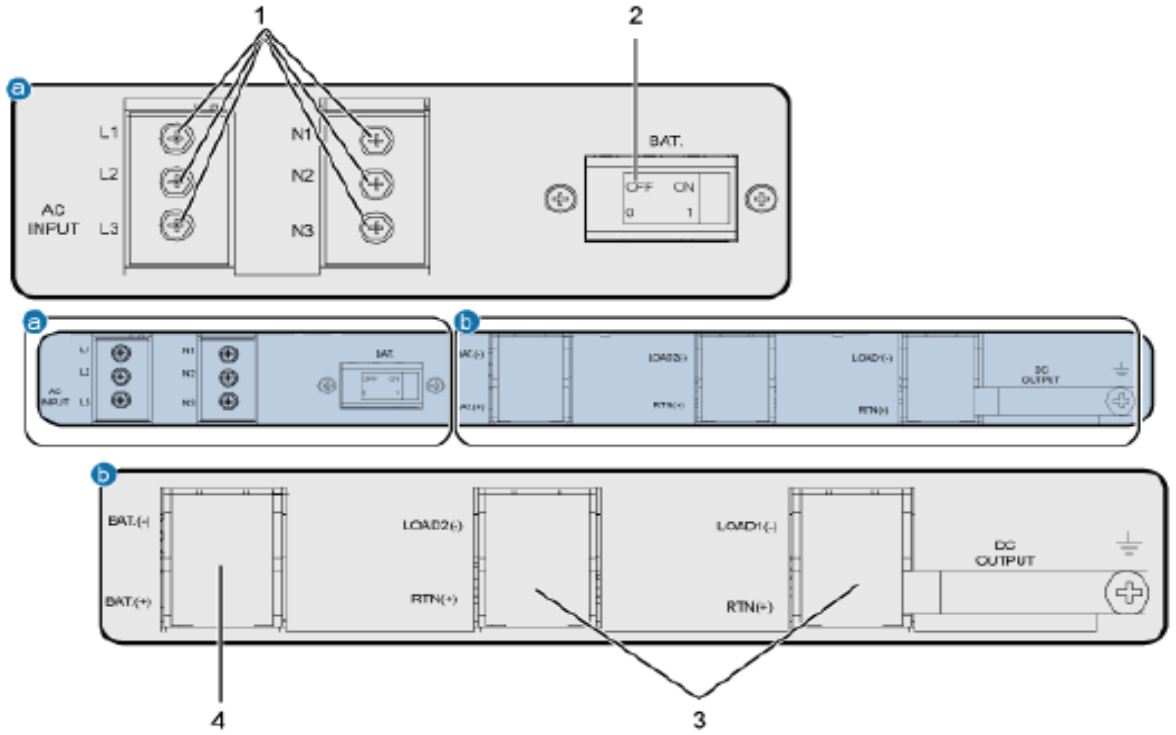
PSU (AC/DC) & POWER SUBRACK



(1) Power LED

(2) Protection LED

(3) Fault LED



(1) Power input wiring terminals

(2) Power switch of the batteries

(3) Power output wiring terminals

(4) Wiring terminal for batteries

- ❑Converting 220VAC to -48VDC.
- ❑Supplying -48VDC power to the DCDU.
- ❑Monitoring the unit and reporting alarms related to PSU faults, Such as output overvoltage,No output, fan faults etc.).
- ❑Alarms related to PSU protection ,such as over temperature protection, Input over voltage /under voltage etc.
- ❑PSU out of position alarm if any.

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PDU (Power Distribution Unit in APM30H)-VerA

SN	Description
1	AC wiring terminals • In the case of the dual-live 110 V AC input, use L2. • In the case of the single-phase 220 V/three-phase 220 V AC input, use N1 and N2.
2	AC wiring terminals • In the case of the dual-live 110 V AC input, use L1. • In the case of the single-phase 220 V/three-phase 220 V AC input, use L1, L2, and L3.
3	AC output wiring terminals (Lout1 and Lout2)
4	AC output wiring terminals (Nout1 and Nout2)
5	AC input MCB
6	AC output MCB (controlling the power supply to the heating film or heaters)
7	DC output MCBs (SW0-SW9)
8	DC output wiring terminals (LOAD0-LOAD9)

The PDU is used to perform the AC & DC power Distribution.

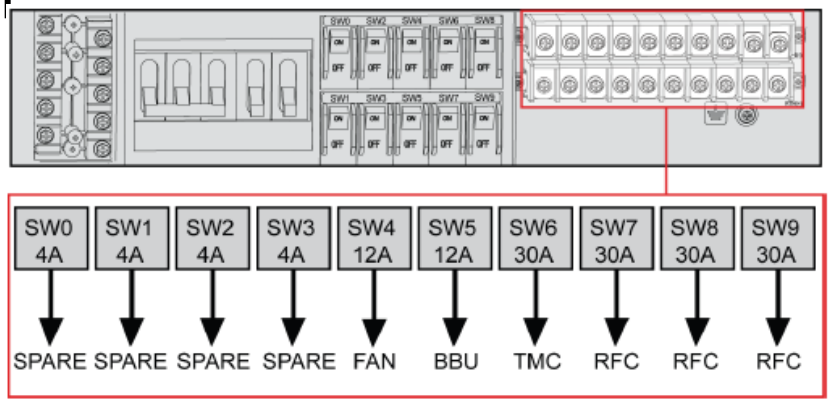
The AC distribution of the PDU are Used as follows;

❑Supplying two AC outputs with the maximum current of 10A to the heaters of the power cabinet and the heating Film of the battery cabinet.

❑Reporting the surge protection alarms of the AC input.

The DC distribution function of PDU are;

❑Providing 10 Nos. of DC Output.
❑Reporting Surge protection alarm of DC outputs.



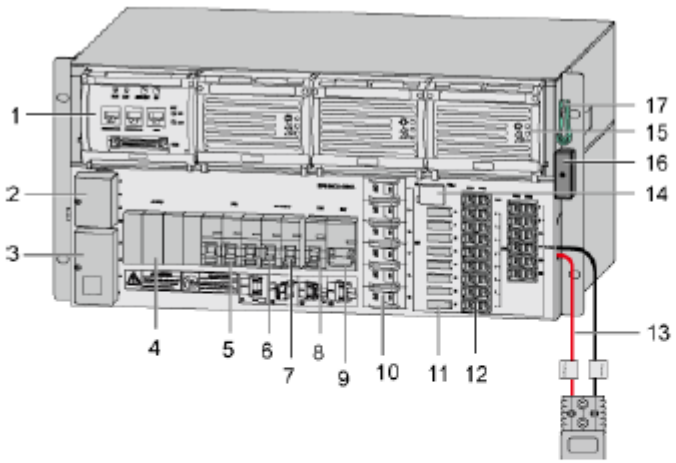
PDU (Power Distribution Unit in APM30H),VerA

Type	Name	AC Input	Short Circuiting Mode
1-Phase/3-Phase AC distribution Unit (for distributed Base Station)	PDU-01	1-Phase, 220VAC	AC Input : L1,L2 & L3 are short-circuited. N1 & N2 are short-circuited.
			AC Output : L1out & L2out are not short circuited but N1out & N2out are short circuited.
		3-Phase, 220 VAC	AC Input : L1,L2 & L3 are not short-circuited. N1 & N2 are short-circuited.
			AC Output : L1out & L2out are not short circuited but N1out & N2out are short circuited.
Dual Live AC distribution unit (for distributed Base Station)	PDU-02	Dual Live 110VAC	AC Input : L1 Side are short circuited & ,L2 Side are short circuited.
			AC Output : L1out & L2out are short circuited. N1out & N2out are short circuited.
1-Phase/3-Phase AC distribution Unit (for Separated Base Station)	PDU-03	1-Phase, 220VAC	Same as 1-Phase/3-Phase AC distribution Unit (for distributed Base Station)
		3-Phase, 220 VAC	
Dual Live AC distribution unit (for separated Base Station)	PDU-04	Dual Live 110VAC	Same as dual live AC distribution Unit (for distributed Base Station)

PDU (Power Distribution Unit in APM30H)-Ver-A

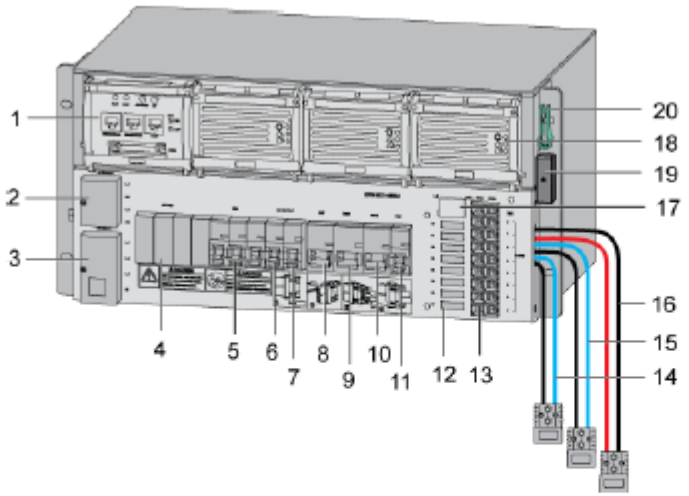
Application Scenario	DC Output	DC Power Supply to…	DC Output terminal	MCB/Fuse	MCB/Fuse Qty	Remarks
Distributed Base Station	Six LLVD Output	RRU	LOAD4 to LOAD9	20A	6	Six 20 A MCBs control six DC outputs respectively to supply power to six RRUs.
	Four BLVD Outputs	BBU	LOAD3	12A	1	One 12 A MCB controls one DC output to supply power to the BBU.
		FAN	LOAD2	12A	1	One 12 A MCB controls one DC output to supply power to the fans.
		Transmission Devices	LOAD0 to LOAD1	4A	2	Two 4 A MCBs control two DC outputs to supply power to the transmission devices.
Separated base station	Four LLVD Outputs	RFU	LOAD7 to LOAD9	30A	3	Three 30 A MCBs control three DC outputs respectively to supply power to the RF cabinet. Each MCB supports three RFUs.
		Reserved Output	LOAD6	30A	1	One 30 A MCB DC output is reserved.
	Six LLVD Output	BBU	LOAD5	12A	1	One 12 A MCB controls one DC output to supply power to the BBU.
		FAN	LOAD4	12A	1	One 12 A MCB controls one DC output to supply power to the fans.
		Transmission Devices	LOAD0 to LOAD3	4A	4	Four 4 A MCBs control two DC outputs to supply power to the transmission devices.

EPS Subrack in APM30H Cabinet(Ver B)



(1) PMU	(2) AC OUTPUT	(3) AC INPUT	(4) AC surge protector
(5) PSU circuit breaker	(6) AC OUT1 circuit breaker	(7) AC OUT2 circuit breaker	(8) TMC circuit breaker
(9) Battery circuit breaker	(10) Circuit breaker	(11) Fuse	(12) DC output terminal
(13) Output terminal for the batteries	(14) Lithium battery control switch	(15) PSU	(16) Spare part box containing fuses
(17) Extraction tool	-	-	-

EPS Subrack in Distributed base station



(1) PMU	(2) AC OUTPUT	(3) AC INPUT	(4) AC surge protector
(5) PSU circuit breaker	(6) AC OUT1 circuit breaker	(7) AC OUT2 circuit breaker	(8) Battery circuit breaker
(9) TMC circuit breaker	(10) RFC1 circuit breaker	(11) RFC2 circuit breaker	(12) Fuse
(13) DC output terminal	(14) Output terminal for RFC1	(15) Output terminal for RFC2	(16) Output terminal for the batteries
(17) Lithium battery control switch	(18) PSU	(19) Spare part box containing fuses	(20) Extraction tool

EPS Subrack in Separated base station

EPS Subrack

- It provides 2 AC outputs, one for service outlet & other is for junction box.
- Reporting the AC input surge protection alarms.
- Provides 16/12A DC outputs for the distributed base station/macro base stations.

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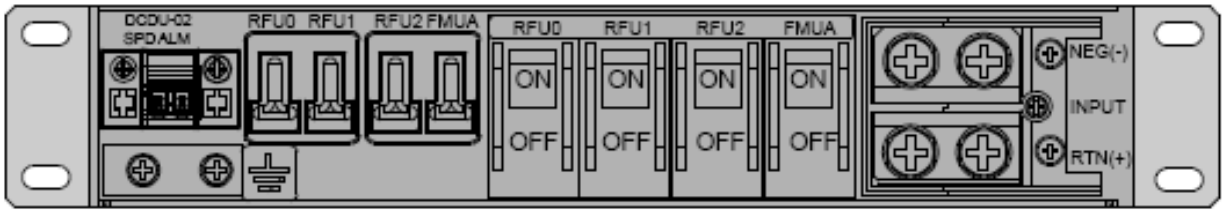
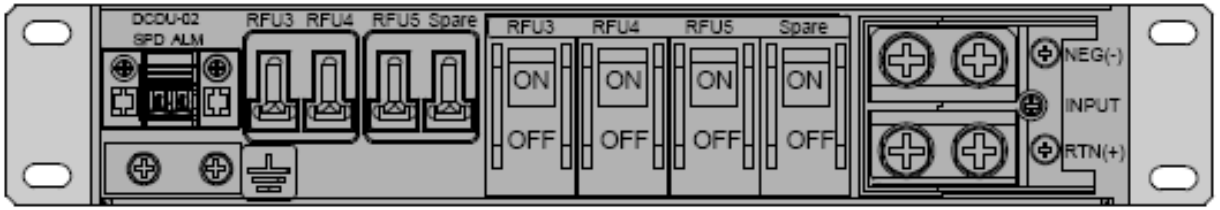
DC Distribution in AMP30H ,Ver-B,EPS Subrack

Application Scenario	DC Power Supply to…	DC Output terminal	MCB/Fuse	MCB/Fuse Qty
Distributed Base Station	RRU	LOAD8 to LOAD13	20A	6
	TMC	TMC	25A	1
	FAN	LOAD0	15A	1
	IBBS	LOAD3	15A	1
	Transmission Devices	LOAD4 to LOAD7	5A	4
	Battery		100A	1
	BBU	LOAD1 & LOAD2	15A	2
Separated base station	RFC		80A	2
	TMC	TMC	25A	1
	FAN	LOAD0	15A	1
	BBU	LOAD1 & LOAD2	15A	2
	IBBS	LOAD3	15A	1
	Battery		100A	1
	Transmission Devices	LOAD4 to LOAD7	5A	4

DCDU-02 in RFC



LEFTSIDE



RIGHTSIDE

Function of DCDU-02 are as below,

- **Receives -48VDC power input.**
- **Supplies 04 ,-48VDC power outputs to boards & modules in the cabinet.**
- **Provides surge protection.**

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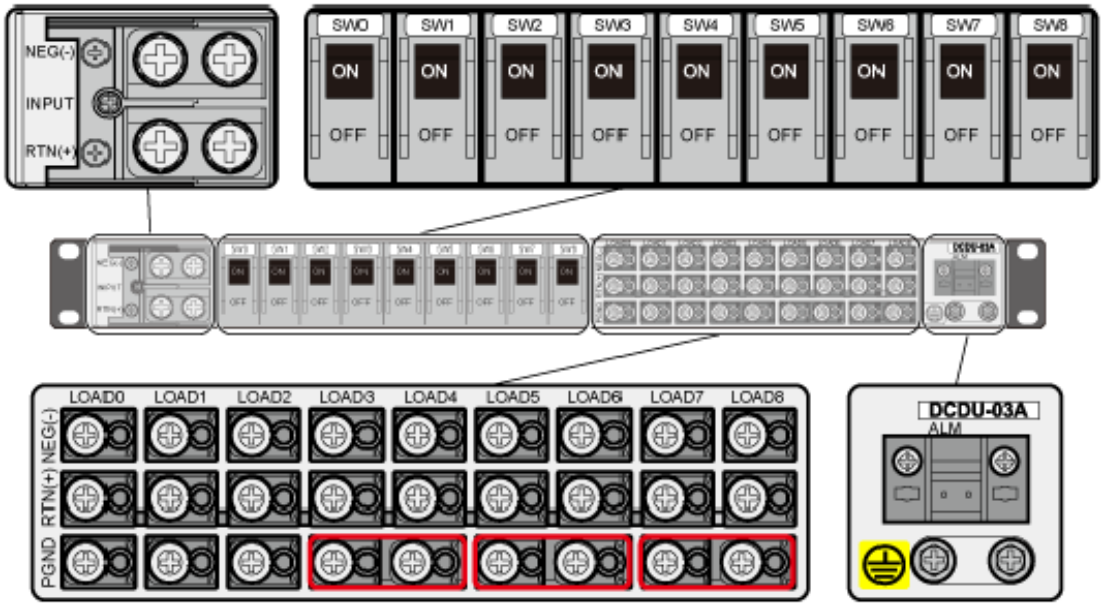
DCDU-03 in TMC11 Cabinet



DCDU Type	DC O/P Terminal	Power Consumption Devices	MCB Rating	MCB Qty	Application Scenarion
DCDU-03A	LOAD-0	Temperature Control System	12A	1	Transmission Cabinet
	LOAD-1 to LOAD-8	Transmission system of the operator	4A	8	
DCDU-03B	LOAD-0	RRU	20A	6	GSM Distributed system
	LOAD-1 to LOAD-8	BBU & Transmission system of the operator	12A	3	
DCDU-03C	LOAD-0 & LOAD-5	Transmission system of the operator & Fan	12A	6	Separated macro base station in the -48 V DC Power supply/ Transmission cabinet
	LOAD-6	BBU	12A	1	
	LOAD-7 & 8	Transmission system of the operator & Fan	6A	2	

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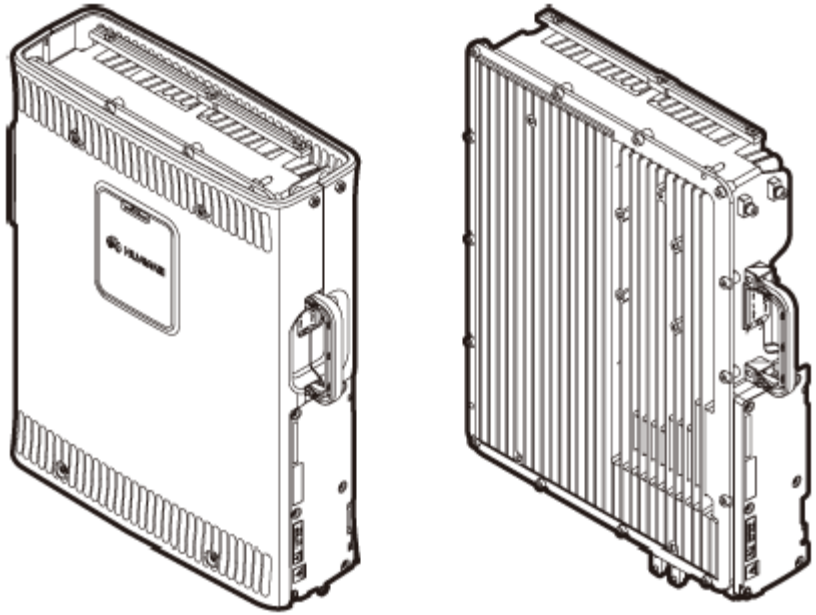
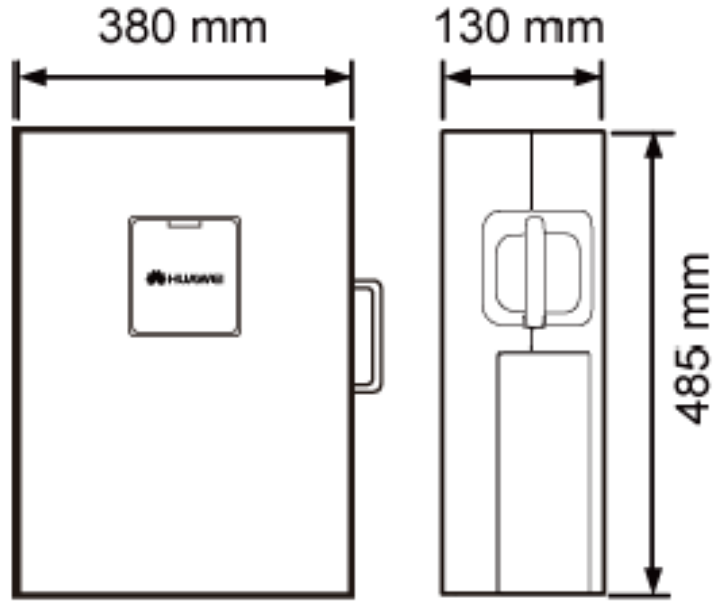
DCDU-03 in TMC11 Cabinet

DCDU Type	DC O/P Terminal	Power Consumption Devices	MCB Rating	MCB Qty	Application Scenarion
DCDU-03D	LOAD-0 & LOAD-1	3 RFU Module	30A	2	GSM Separated system
	LOAD-2 & LOAD-3	BBU	12A	2	
	LOAD-4 to LOAD-7	Transmission system of the operator	12A	4	
	LOAD-8	Temperature Control System	6A	1	

DC-RRU3004 Module In DBS3900



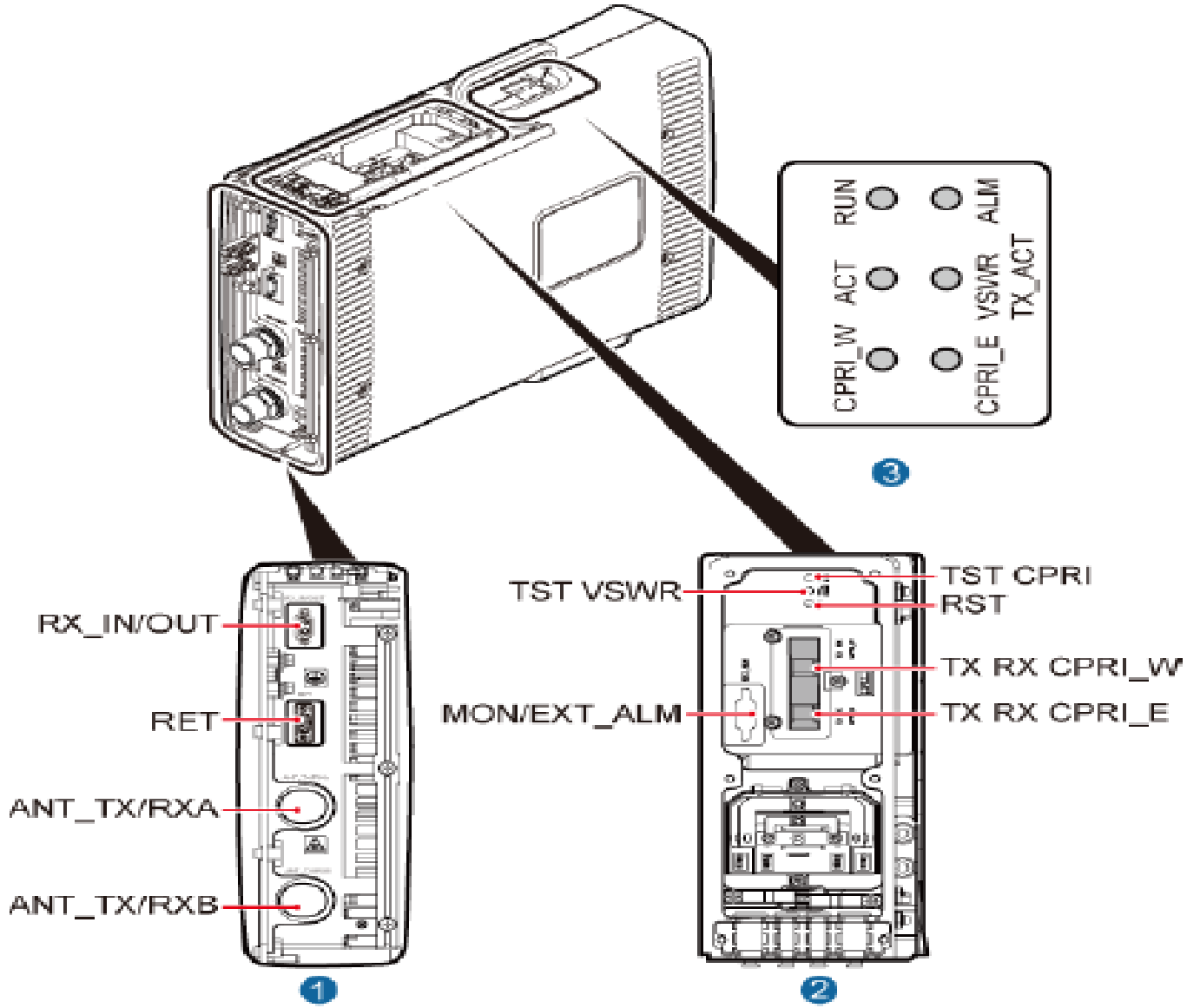


RRU 3004(DC)

SIZE OF DC RRU 3004 MODULE IS ,- 380(W)x 130(D) x485 (H) mm.

HUAWEI

Panels On DC-RRU3004 Module in DBS3900



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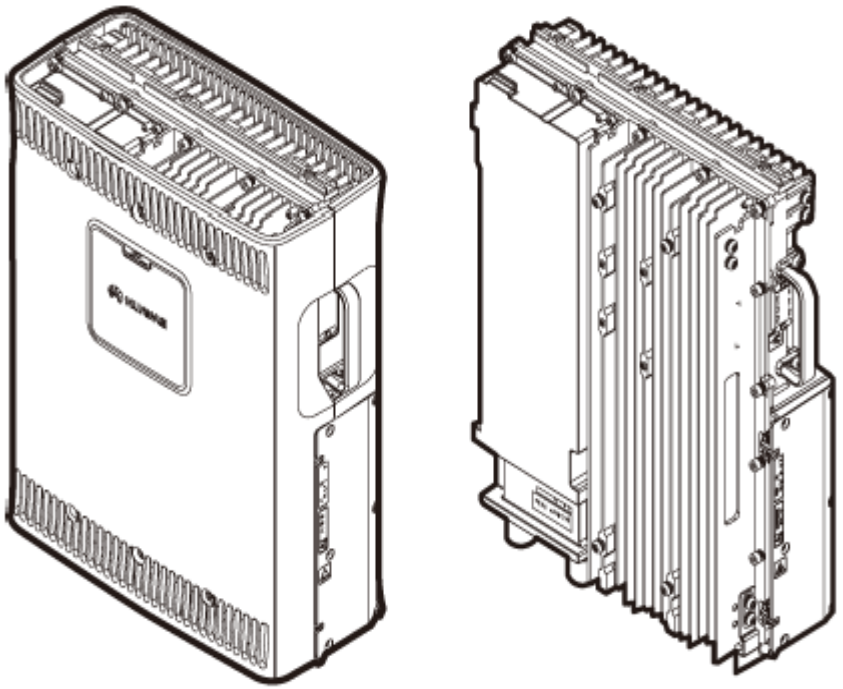
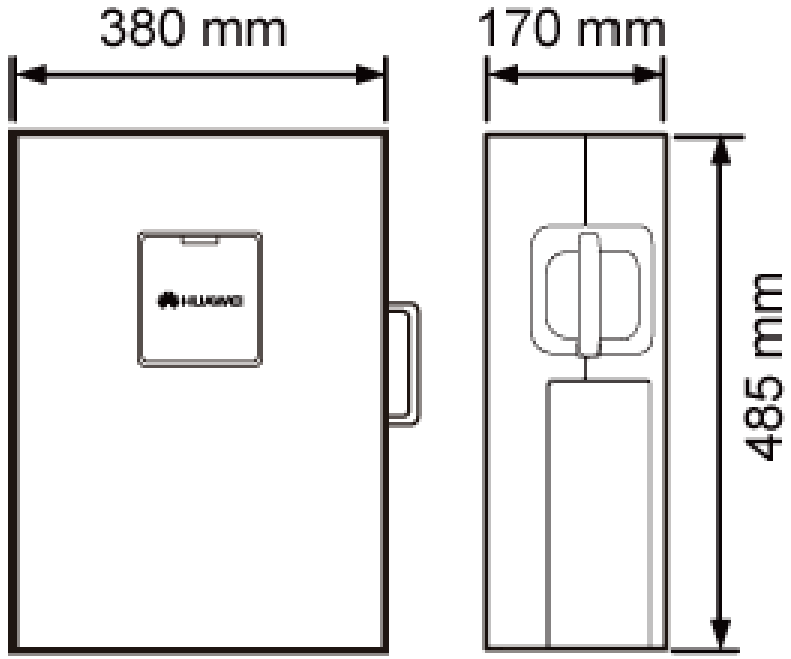
DC-RRU3008,V1 Module in DBS3900



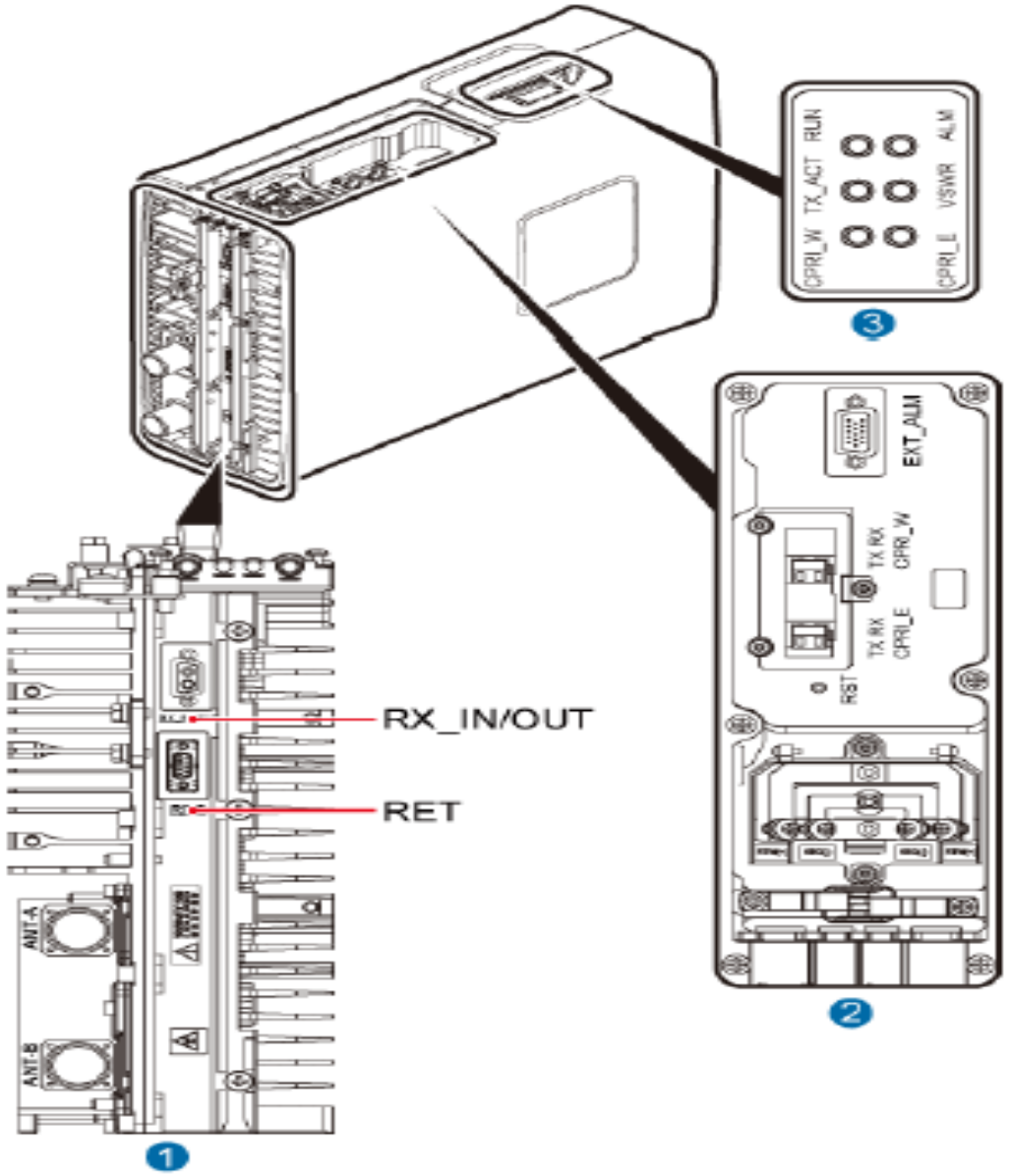


RRU 3008(DC)V1

SIZE OF DC RRU 3008 MODULE IS ,- 380(W)x 170(D) x485 (H) mm.

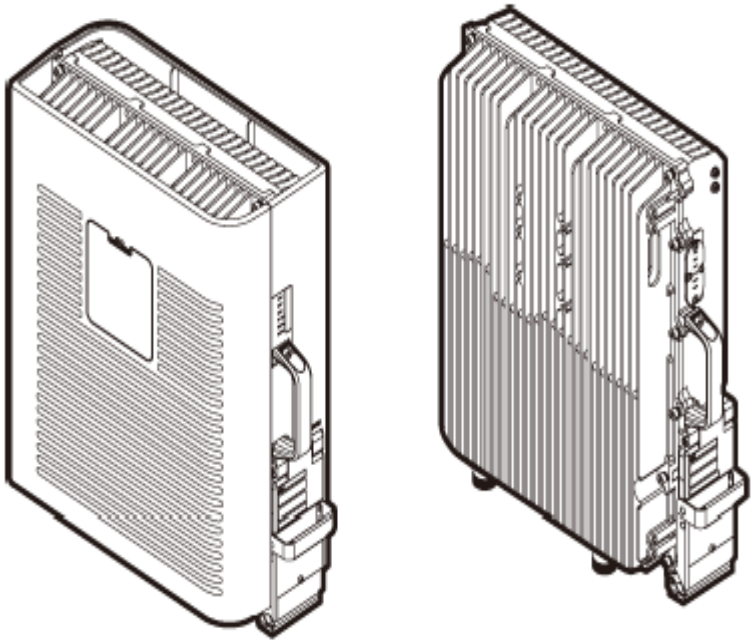
HUAWEI

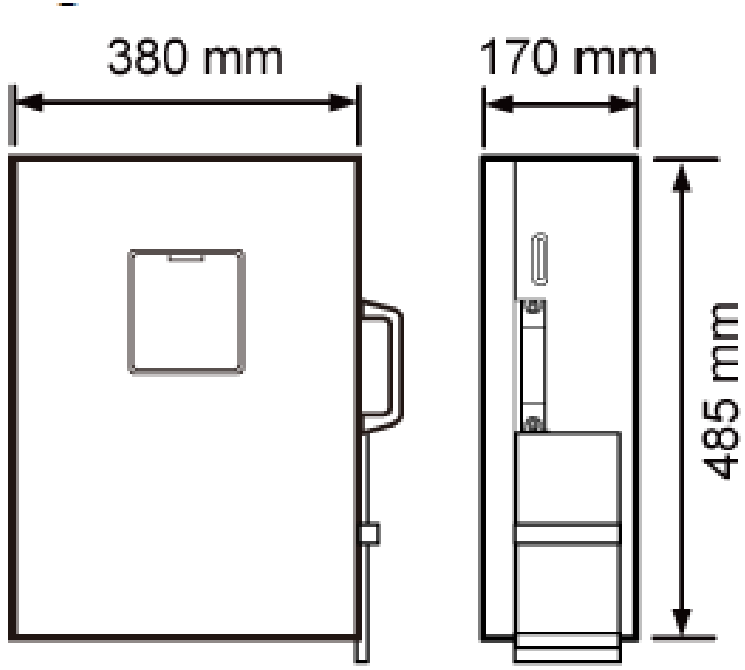
Panels on DC-RRU3008,V1 Module in DBS3900



HUAWEI

DC-RRU3008,V2 Module in DBS3900



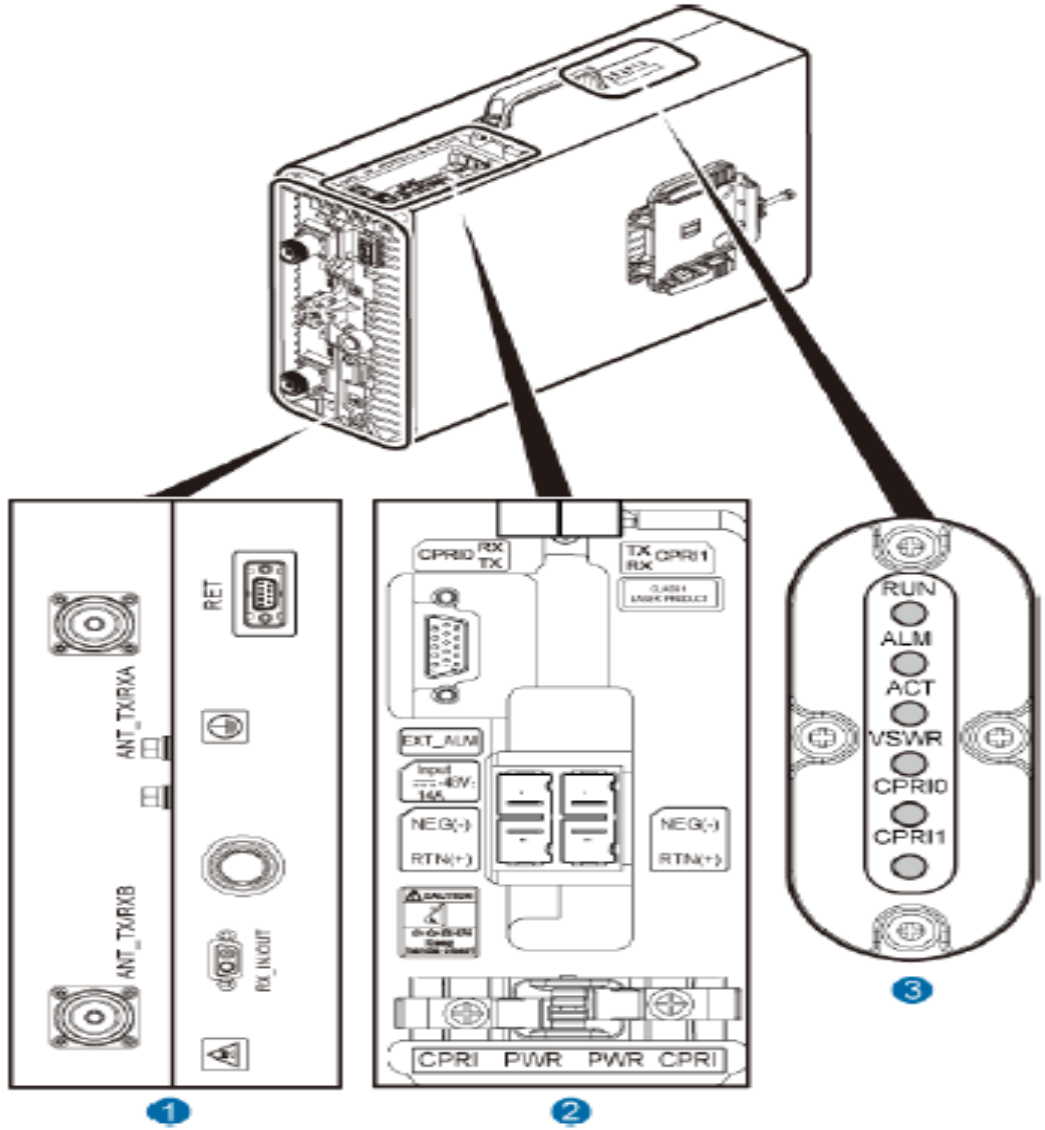


RRU 3008(DC)V2

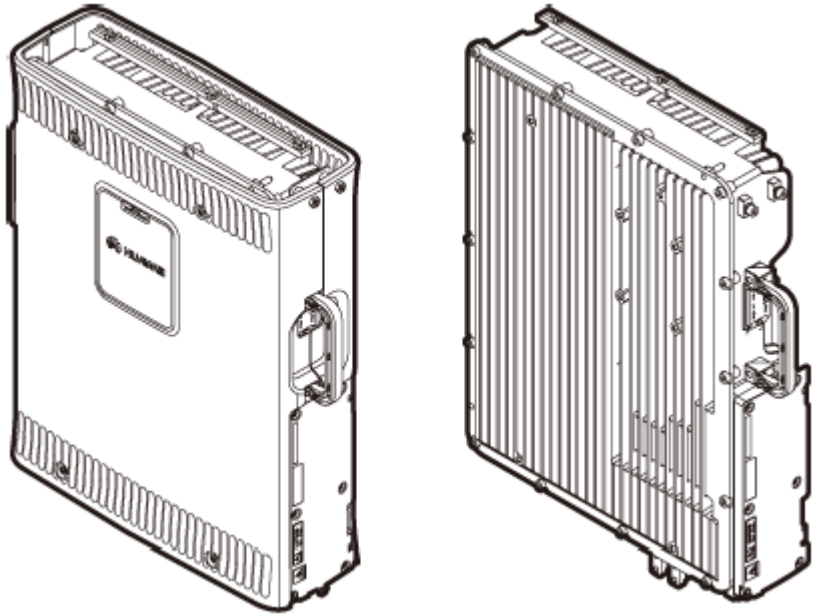
SIZE OF DC RRU 3008 MODULE IS ,- 380(W)x 170(D) x485 (H) mm.

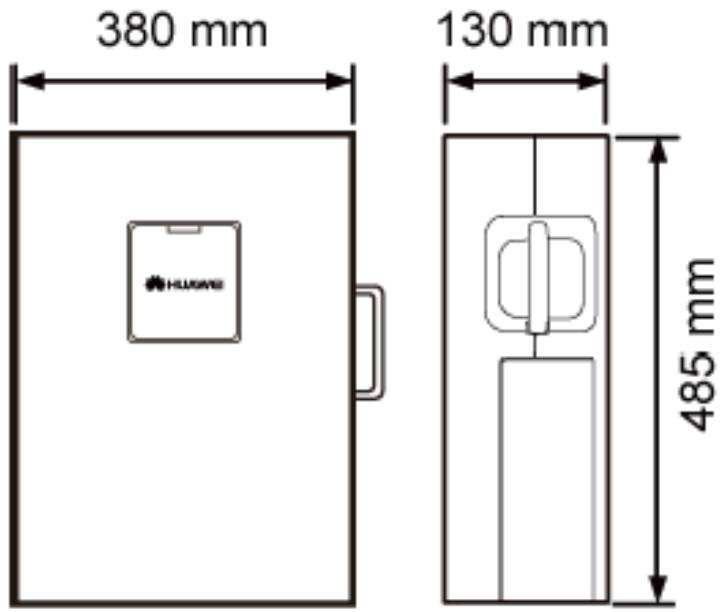
HUAWEI

Panels on DC-RRU3008,V2 Module in DBS3900



RRU 3004(AC) Module In DBS3900



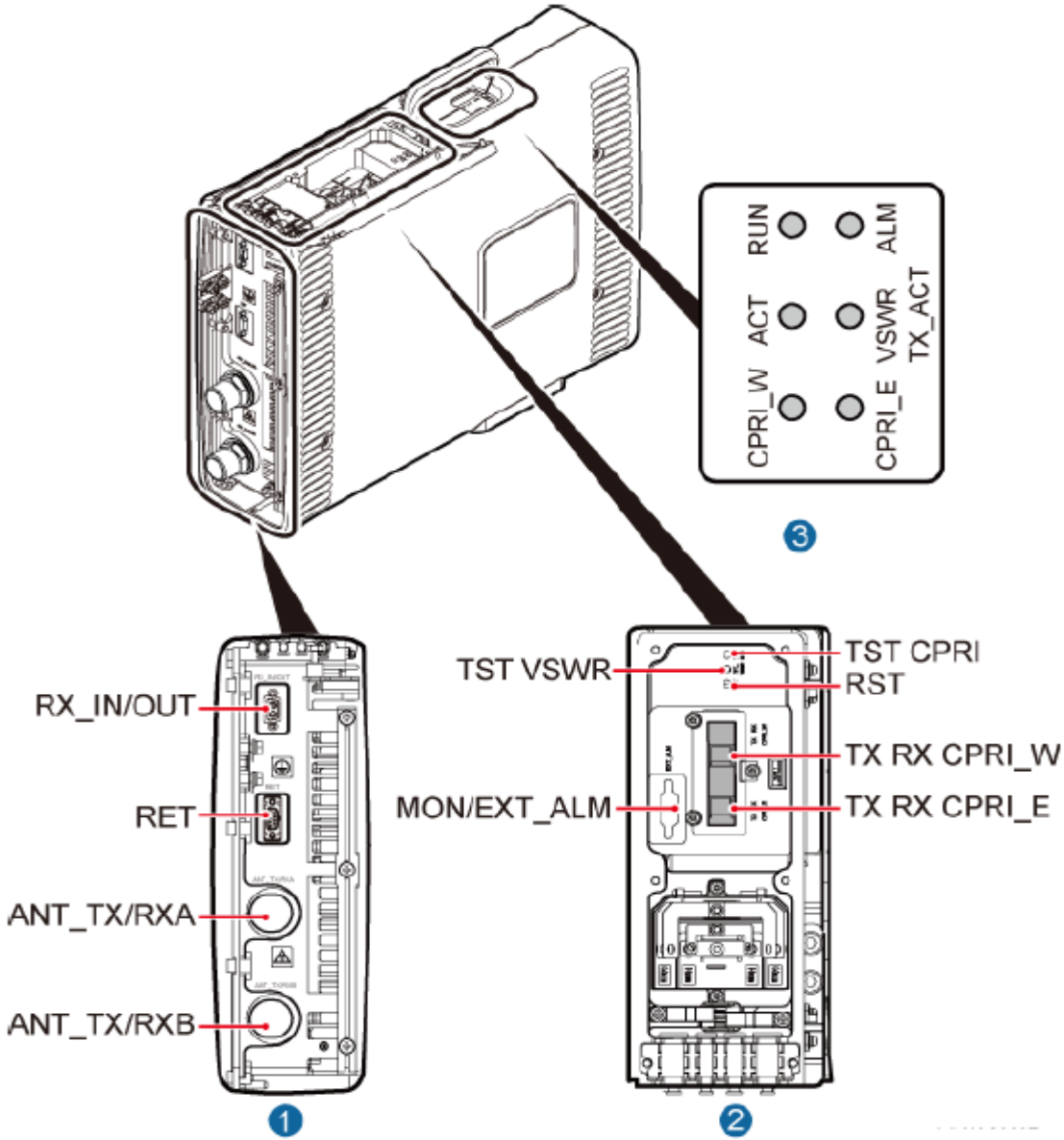


RRU 3004(AC)

SIZE OF DC RRU 3004 MODULE IS ,- 380(W)x 210(D) x485 (H) mm.

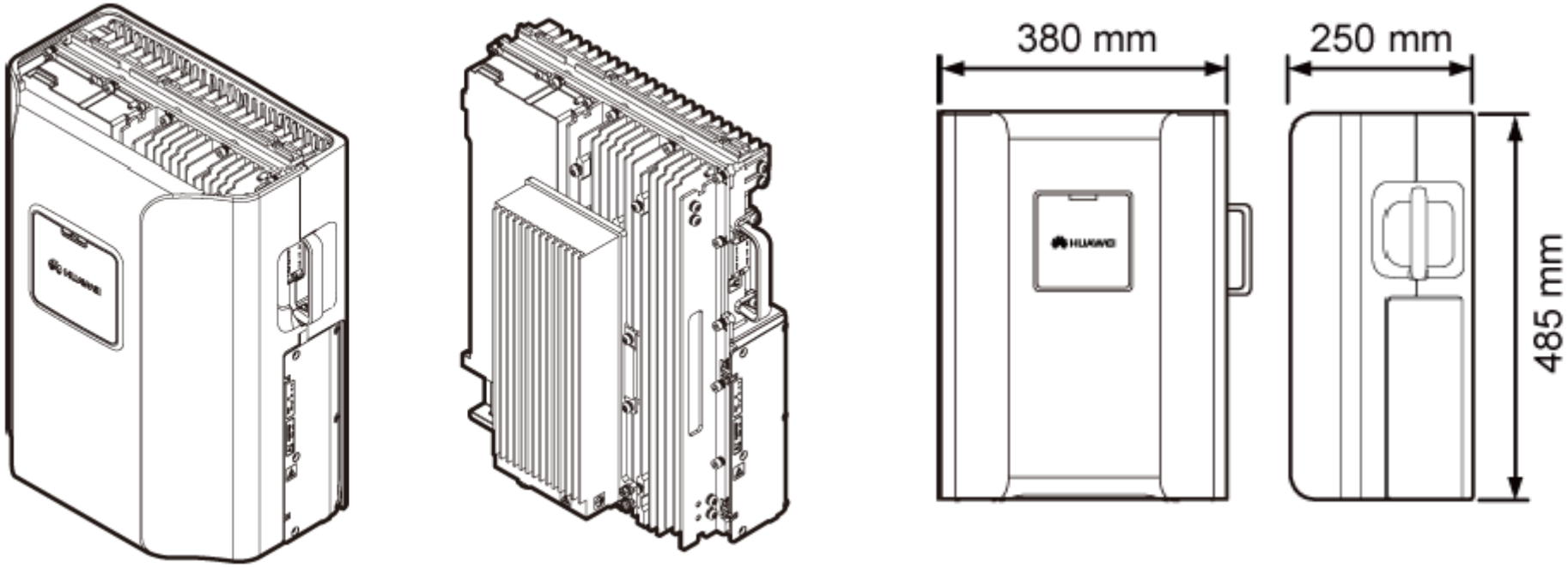
HUAWEI

Panels On RRU3004(AC) Module in DBS3900



HUAWEI

RRU 3008(AC)V1 Module In DBS3900

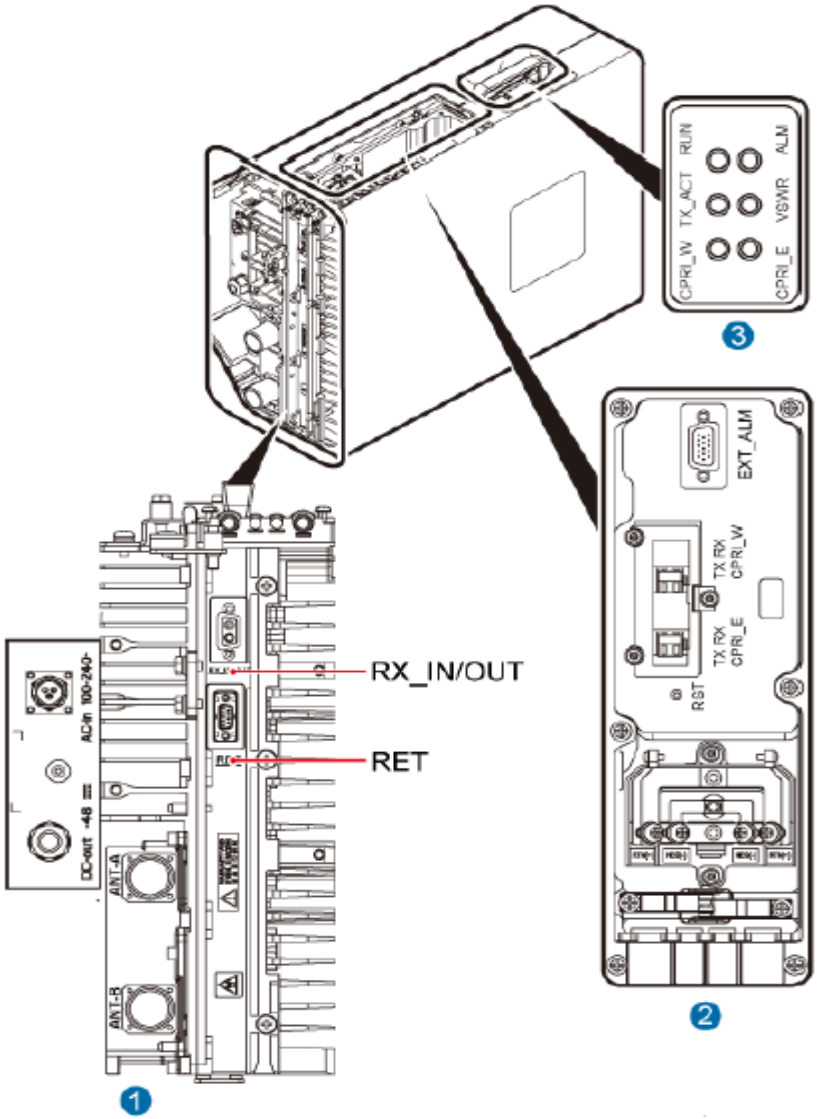


RRU 3008(AC)V1

SIZE OF DC RRU 3008 MODULE IS ,- 380(W)x 250(D) x485 (H) mm.

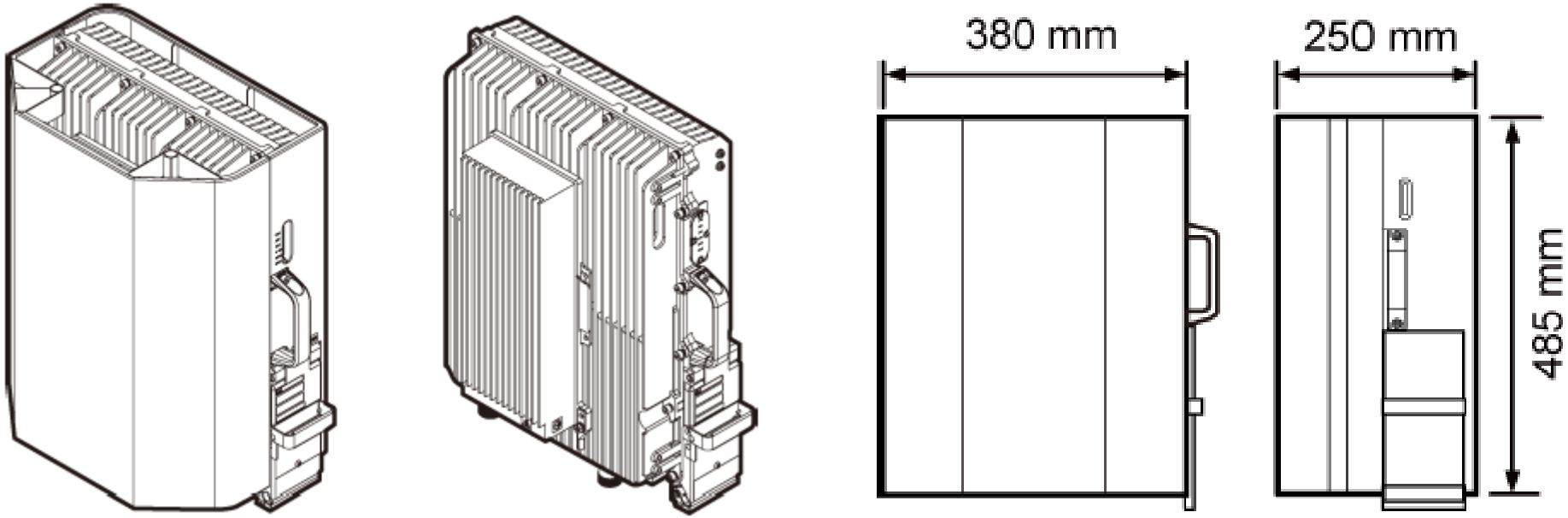
HUAWEI

Panels On RRU3008(AC)V1 Module in DBS3900



HUAWEI

RRU 3008(AC)V2 Module In DBS3900

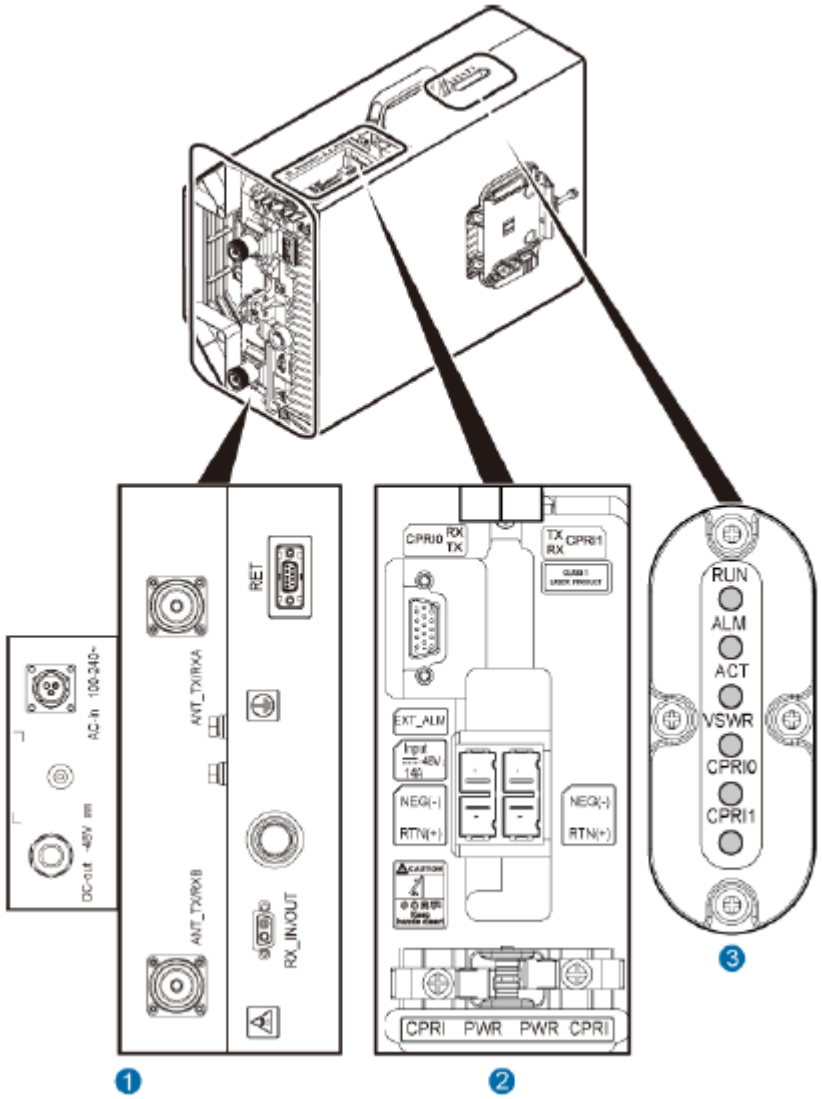


RRU 3008(AC)V2

SIZE OF DC RRU 3008 MODULE IS ,- 380(W)x 250(D) x485 (H) mm.

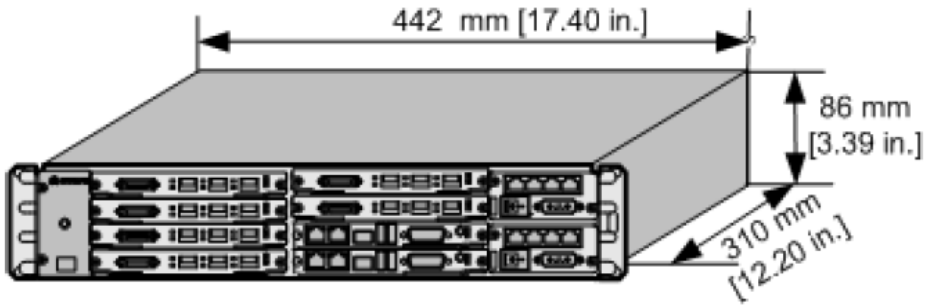
HUAWEI

Panels On RRU3008(AC)V2 Module in DBS3900



HUAWEI

BBU3900 –CDMA



FAN	HCPM/HECM 0	HCPM/HECM/UTRP/UELP/UFLP 4	UPEU/UEIU 0
	HCPM/HECM/USCU 1	HCPM/HECM/UTRP/UELP/UFLP/USCU 5	
	HCPM/HECM/USCU 2	CMPT/USCU 6	UPEU 1
	HCPM/HECM/UBRI 3	CMPT 7	

The BBU3900 performs the following functions:

• Providing external ports
– Providing the Abis interface and processing Abis interface protocols
– Interfacing with the RF subsystem and processing the Um physical layer and common channel MAC layer protocols
– Interfacing with the transmission system through the E1/T1/FE ports on the transmission board for connection with the BSC equipment, and providing connection with the RF module through SFP ports on the channel processing board

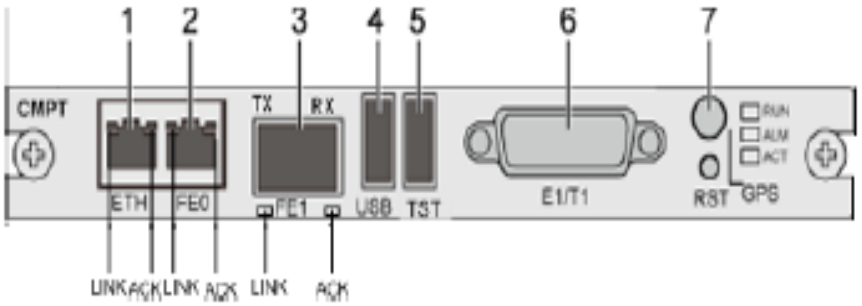
• Modulating and demodulating baseband data, coding and decoding CDMA channels

• Providing clock signals for system synchronization

• Implementing resource management, operation and maintenance, and environment monitoring for the system

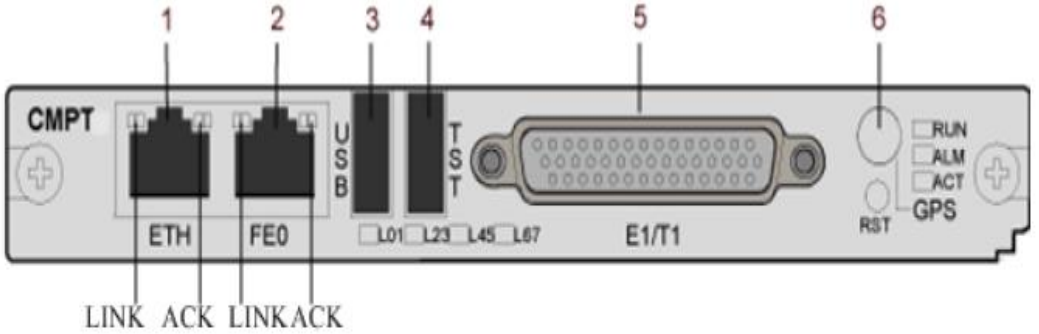
Boards & Modules of BBU3900(CMPT) –CDMA

CDMA Main Processing &Transmission Unit



(1) ETH port (2) FE0 port (3) FE1 port (4) USB port

(5) TST port (6) E1/T1 port (7) GPS port



(1) ETH port (2) FE0 port (3) USB port (4) TST port

(5) E1/T1 port (6) GPS port

Function of CMPT Module

- It processes and transmits data between the BTS and the BSC, controls and manages the entire BTS, and provides clock signals for the BTS system.
- There are two types of CMPT: CMPT (4 E1) and CMPT (8E1)

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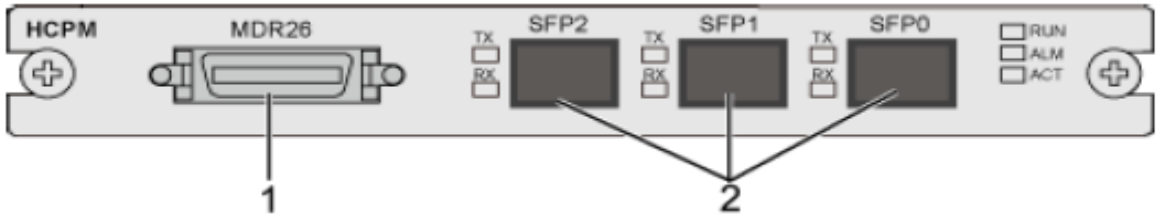
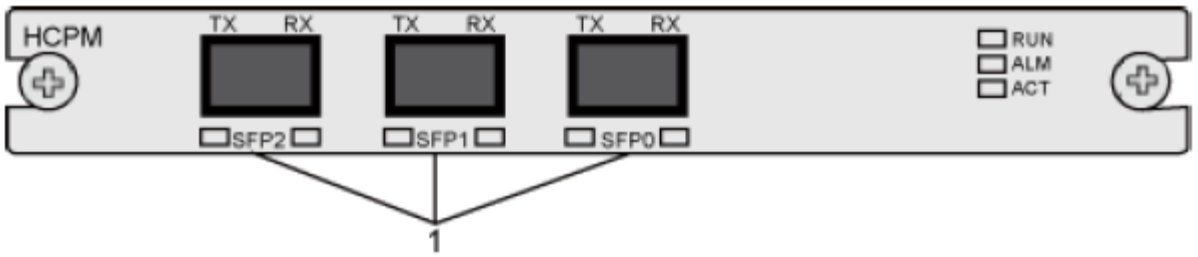
Boards & Modules of BBU3900(HCPM) –CDMA

HERT Channel Processing Module



(1) MDR26 port (2) SFP port

QCU1HCPM panel



(1) SFP port

QCU3HCPM panel

Function of HCPM Module

- It processes the CDMA2000 1X service data on forward and reverse channels.
- The HCPM can be categorized into QCU1HCPM and QCU3HCPM.

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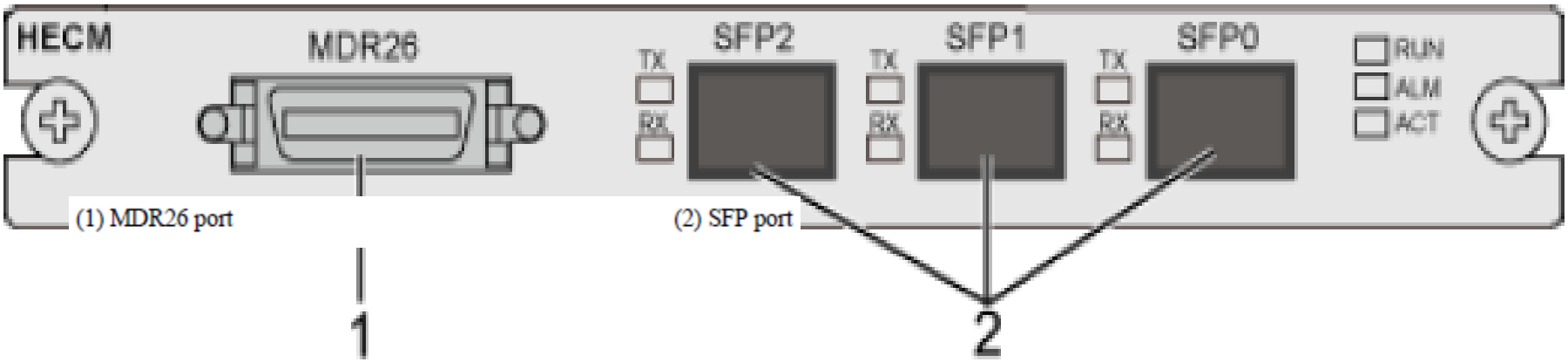
Boards & Modules of BBU3900(HECM) –CDMA

HERT Enhance Channel Processing Module



The HECM has the following functions;

- It processes the CDMA2000 EV-DO service data on forward and reverse channels.

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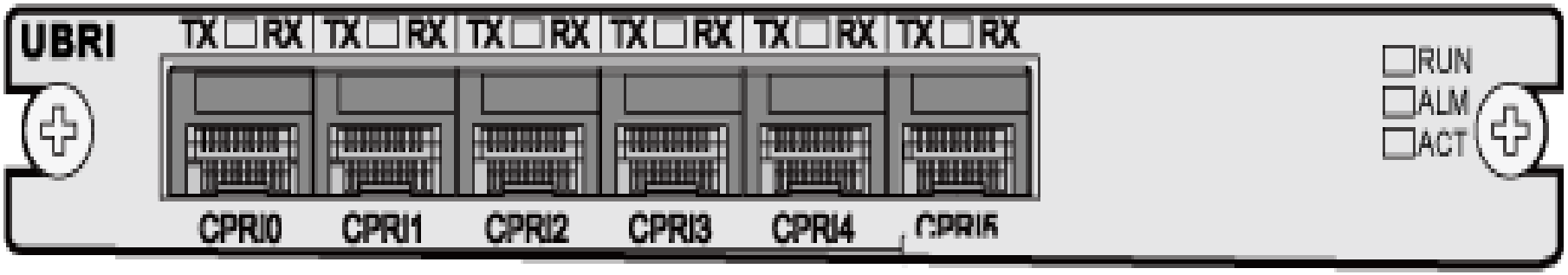
Boards & Modules of BBU3900(UBRI) –CDMA

Universal Baseband Radio Interface Unit



CPRI port

Function of UBRI Module

- It implements the functions of PN sharing, 1X resource pool, and convergence and distribution of baseband data.

Ports on the BBU3900 –CDMA

Ports on Mandatory Boards

Board	Port	Quantity	Function
CMPT (4E1)	E1/T1	1	Transmission port connected to the BSC. Each port provides four E1/T1 links.
	FE0	1	Transmission port connected to the BSC. Each port provides one FE link. FE electrical port, supporting cable connection
	FE1	1	Transmission port connected to the BSC. Each port provides one FE link.FE optical port, supporting optical cables
	USB	1	Reserved
	TST	1	Clock test port
	ETH	1	Commissioning port, used for local maintenance
	GPS	1	Used for GPS signal input
CMPT (8E1)	E1/T1	1	Transmission port connected to the BSC. Each port provides eight E1/T1 links.
	FE0	1	Transmission port connected to the BSC. Each port provides one FE link.FE electrical port, supporting cable connection
	USB	1	Reserved
	TST	1	Clock test port
	ETH	1	Commissioning port, used for local maintenance
	GPS	1	Used for GPS signal input
HCPM/ HECM	SFP	3	CPRI port, used for connecting the RF unit
UPEU	Power	1	Used for DC power input
	MON0	1	Each port providesm monitoring function for one RS485 link. There are totally two RS485 links.
	MON1	1	
	EXT-ALM0	1	Each port provides connections for four links of dry contact alarm signals. There are totally eight links of dry contact alarm signals.
	EXT-ALM1	1	

RRU3606-CDMA

DC RRU3606

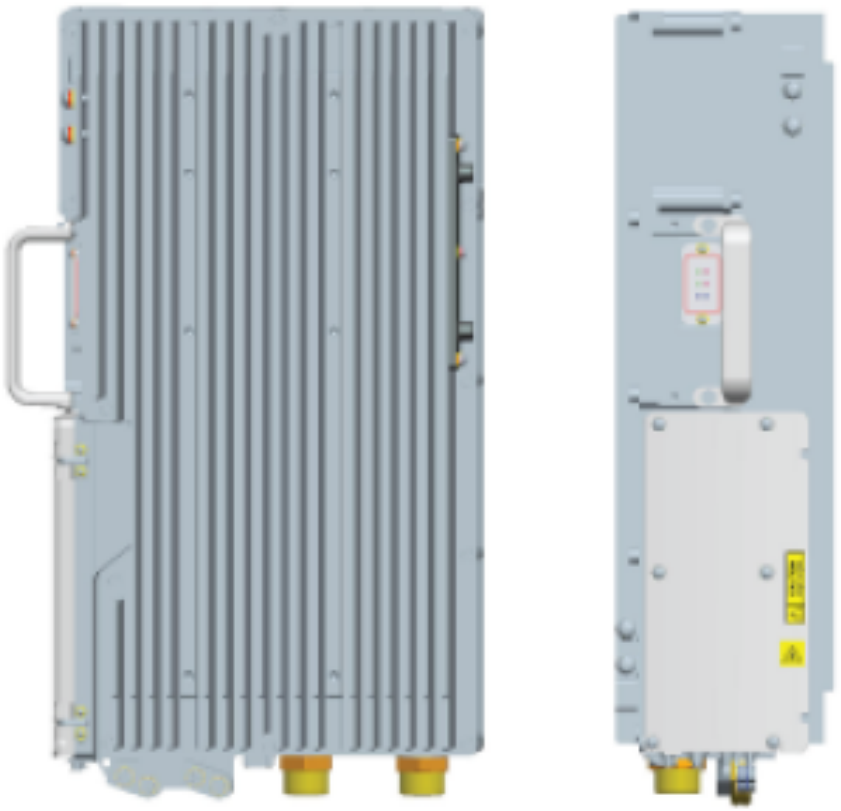
Dimensions (height x width x depth)	**Dimensions of the RRU that works in the 800 MHz AB and 450 MHz bands:** 485 mm (19.10 in.) x 285 mm (11.22 in.) x 200 mm (7.87 in.) (with the shell) 480 mm (18.90 in.) x 270 mm (10.63 in.) x 170 mm (6.69 in.) (without the shell) **Dimensions of the RRU that works in other bands:** 485 mm (19.10 in.) x 285 mm (11.22 in.) x 170 mm (6.69 in.) (with the shell) 480 mm (18.90 in.) x 270 mm (10.63 in.) x 140 mm (5.51 in.) (without the shell)

AC RRU3606

Dimensions (height x width x depth)	485 mm [19.21 in.] x 285 mm [11.02 in.] x 250 mm [9.84 in.] (with a shell)

A single RRU3606 supports a maximum of eight carriers

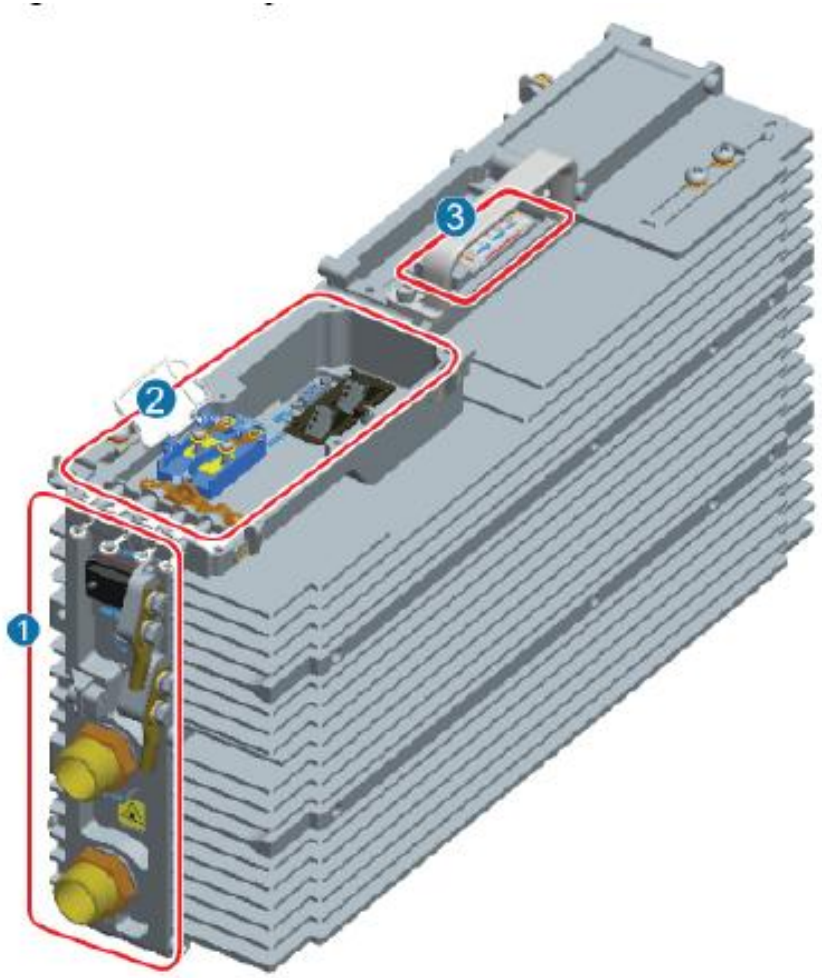
DC RRU3606 -CDMA



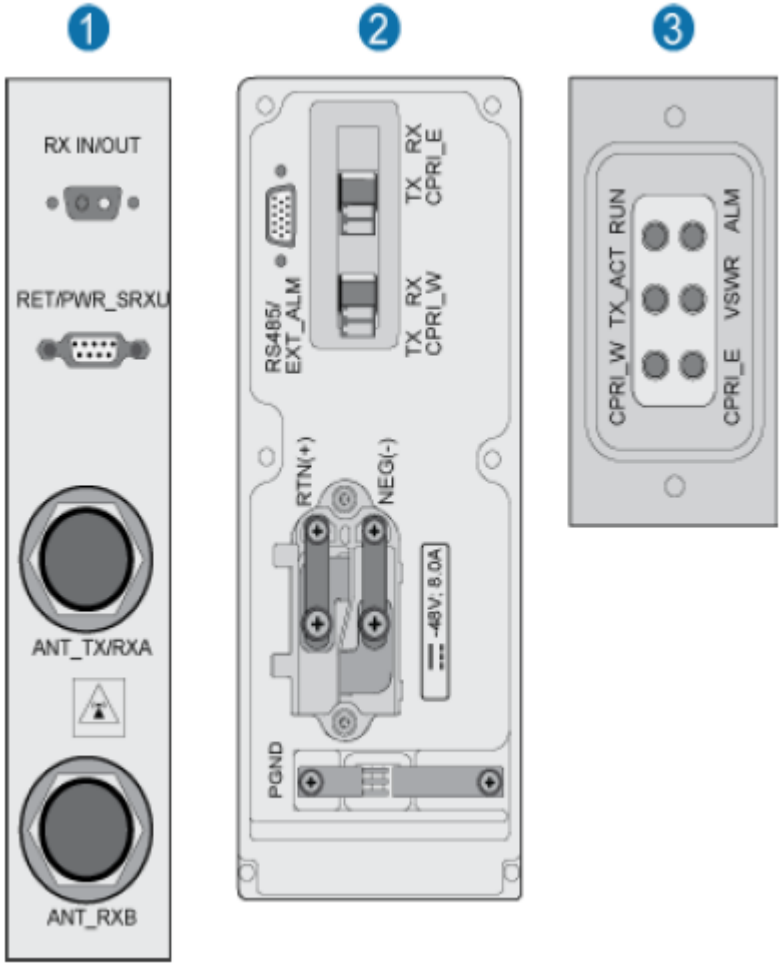
RRU3606 (without a shell)

RRU3606 (with a shell)

Panel Position of DC RRU3606-CDMA



(1) Panel at the bottom (2) Panel for the cabling cavity (3) Panel for the indicators



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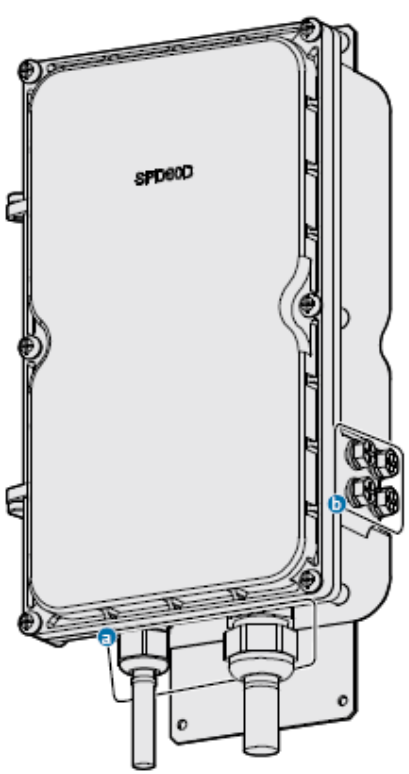
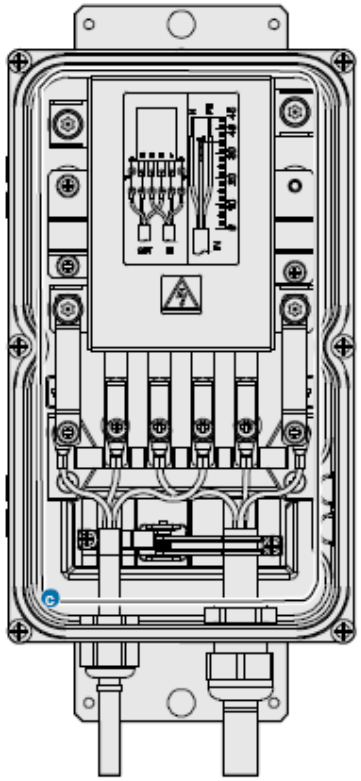
Physical ports of the DC RRU3606-CDMA

Port Type	Port Name	Port Description	Quantity	Connector Type
Power port	RTN(+) or RTN(+)0	-48 V DC power port	1	Screw
	NEG(-) or NEG(-)0			
Transmission port	CPRI_E	CPRI port for the connection with the lower-level CPRI port	1	SFP port
	CPRI_W	CPRI port for the connection with the BBU or the upper-level RRU	1	SFP port
Alarm port	RS485/ EXT_ALM	RS485 signal port (one signal input)	1	DB15 connector
Grounding port	-	Grounding screw	4	Screw
RF port	ANT_TX/ RXA	TX/main RX port	1	DIN-type, cylindrical, and waterproof connector
	ANT_RXB	Diversity receive port	1	DIN-type, cylindrical, and waterproof connector
	RX_IN/ OUT	Port for main receive signals sharing with other RRUs	1	2W2 connector
Port for communications with the RET antenna	RET/ PWR_SRXU	Port for communications with the RET antenna	1	DB9 connector

AC Surge Protection Box –Incase of AC RRU





Item	Description
Depth (mm) x width (mm) x height (mm)	200 x 110 x 75
Installation mode	On the pole, on the wall, and assembled installation
Surge protection class	Differential mode/common mode (10/350 us) : 15 kA

Item	Label	Description
(a) Bottom panel	IN	AC power supply socket
	OUT	Port for protection power outputs
(b) Side panel	-	Port for connection to the external PGND cable
	-	Port for the RRU PGND cable
(c) Cabling cavity panel	L/L'	Wiring post
	N/N'	
	GND	

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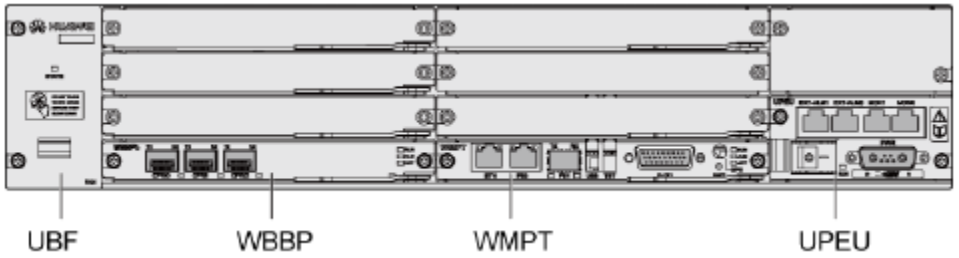
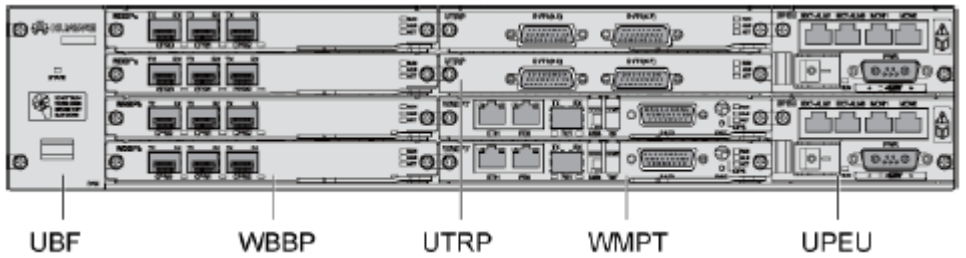
BBU3900 –NODE-B





The BBU3900-WCDMA performs the following functions;

- Providing physical ports for the communication between the Node-B & RNC.
- Providing CPRI ports for communication between the BBU & RFU's.
- Providing the USB port for downloading the BTS software.
- Providing the OM channel for connection to LMT/M2000.
- Processing uplink & downlink data.
- Providing system clocks.
- External alarms.

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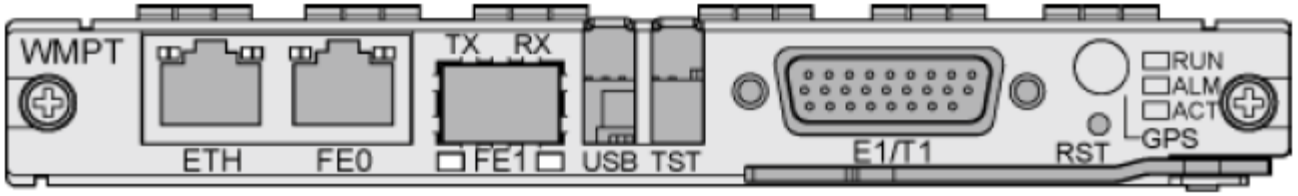
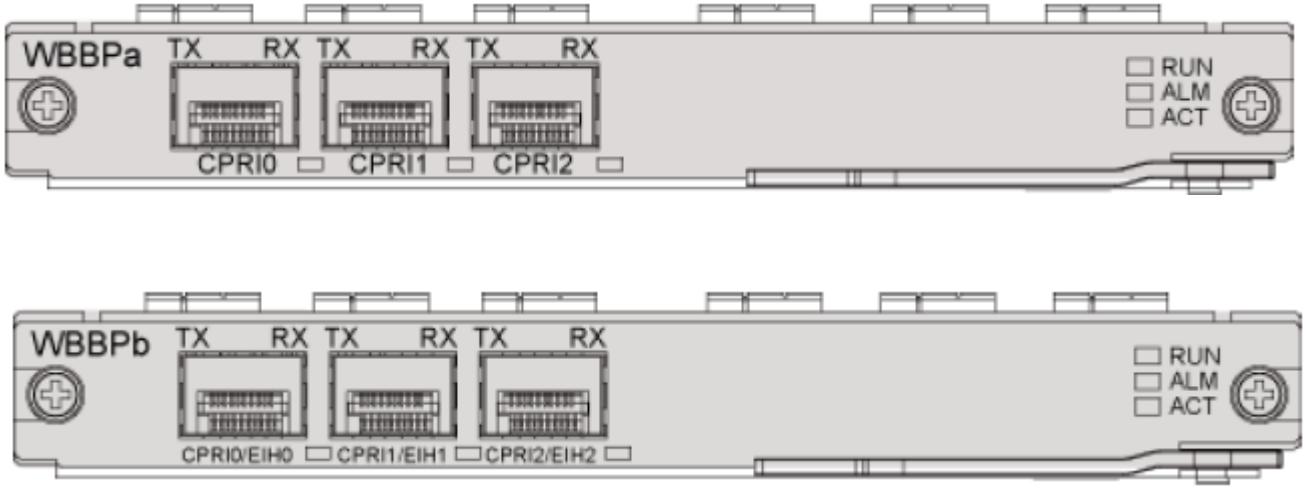
Boards & Modules of BBU3900(WMPT) –NODE-B



Function of WMPT Module

- Providing O&M functions such as configuration ,equipment management, performance monitoring, signaling processing & active/standby switchover.
- Providing reference clock.
- Providing the USB port one of which facilitate automatic Node-B upgraded when a USB disk is inserted during software installation & data configuration.
- Providing the OM channel for connection to LMT/M2000.
- Providing 4 E1/T1 which supports ATM & IP protocols.
- Providing the reference clocks.
- Providing FE electrical port & one FE optical port which supports the IP protocol.

Boards & Modules of BBU3900(WBBP) –NODE-B



Function of WBBP Module

- Providing the CPRI interface for communication between the BBU & the RRU's/RFU's and supporting the CPRI interfaces in 1+1 back-up mode.
- Processing uplink & downlink baseband signals.
- WBBPa /WBBPb1/WBBPb2 supports 3 cells
- WBBPb3 /WBBPb4 supports 6 cells

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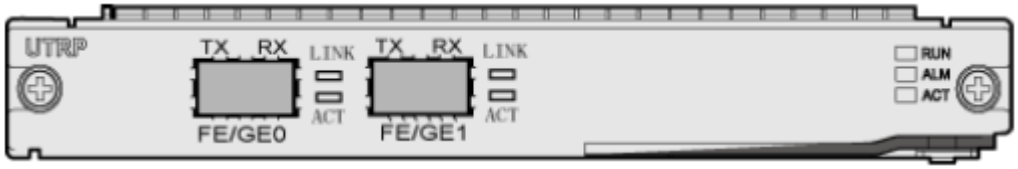
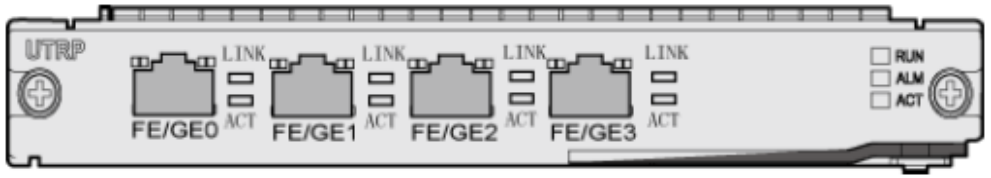
Boards & Modules of BBU3900(UTRP) –NODE-B

This describes the Universal Transmission Processing unit (UTRP) board. As the transmission extension board of the BBU3900, the UTRP provides eight E1s/T1s, one unchannelized STM-1/OC-3 port, four electrical ports, or two optical ports.

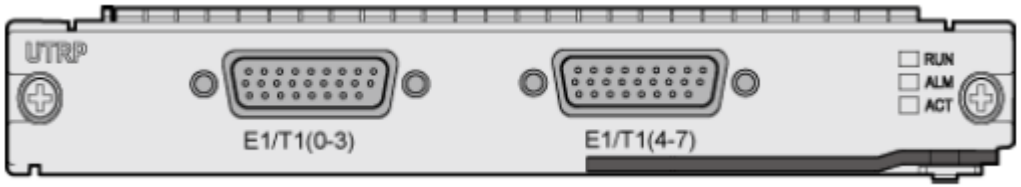
Panel of the UTRP2 supporting two optical ports



Panel of the UTRP supporting four electrical ports



Panel of the UTRP3 and UTRP4 supporting eight E1s/T1s



Panel of the UTRP6 supporting one STM-1

The UTRP has the following functions;

- The UTRP2 provides two 100M/1000M Ethernet optical ports, performs functions of the MAC layer, receives and transmits data on Ethernet links, and analyzes the MAC address.
- The UTRP3 provides eight E1s/T1s and performs inverse multiplexing and demultiplexing on a single ATM cell flow on the eight E1/T1 links.
- The UTRP4 provides eight E1s/T1s, frames and deframes HDLC frames, and allocates and controls the 256 HDLC timeslot channels.
- The UTRP6 supports one unchannelized STM-1/OC-3 port.
- The UTRP9 provides four 10M/100M/1000M Ethernet electrical ports and performs the functions of the MAC layer and physical layer.
- The cold backup is supported.

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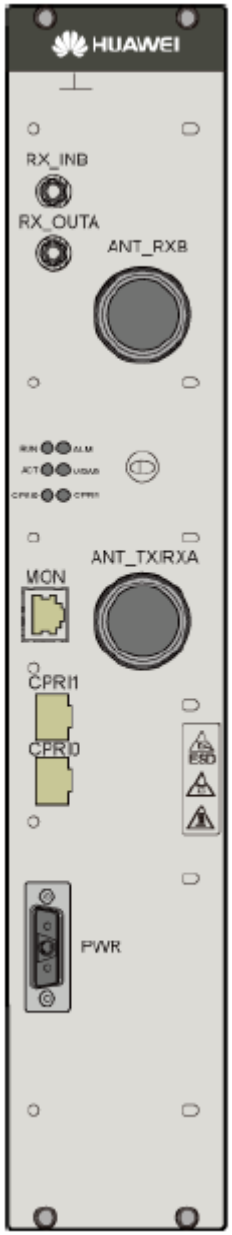
Modules of Node-B(WRFU)



Function of WRFU Module

- The direct frequency conversion technique, which is directly implemented in the transmit channel, modulates the baseband signals to WCDMA RF signals. After being filtered and amplified, the RF signals are transmitted to the antenna for transmission through the duplex filter.
- The Uplink RF signals received from the antenna go through down-conversion, amplification, analog to digital conversion, digital down conversion, matched filtering, automatic gain control-AGC .Then they are sent to BBU.
- Power control & VSWR detection.
- Reverse power detection.
- Frequency synthesis & loopback test.
- Generation of CPRI clock, recovery of the CPRI clock of lost synchronization & alarm detection.

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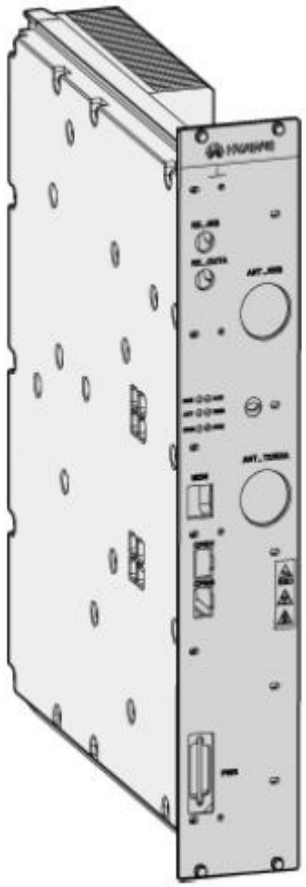
Modules of Node-B(MRFU)



Function of MRFU Module

- The direct frequency conversion technique, which is directly implemented in the transmit channel, modulates the baseband signals to WCDMA RF signals. After being filtered and amplified, the RF signals are transmitted to the antenna for transmission through the duplex filter.
- The Uplink RF signals received from the antenna go through down-conversion, amplification, analog to digital conversion, digital down conversion, matched filtering, automatic gain control-AGC .Then they are sent to BBU.
- Power control & VSWR detection.
- Reverse power detection.
- Frequency synthesis & loopback test.
- Generation of CPRI clock, recovery of the CPRI clock of lost synchronization & alarm detection.

RRU3801C-NODE-B

Function of RRU3801C Module

- Forward & Processes RF signals between BBU and the antenna system.
- Receives RF signals from antenna system, down converts the signals to IF signals,& then transmits them to the BBU or the macro Node-B after amplification, analog to digital conversion, digital down conversion ,matched filtering & digital automatic gain control.
- Receives downlink baseband signals from the BBU or the macro Node-B, forward data received from its cascaded RRU,performs filtering & digital to analog conversion, and up-converts RF signals to the TX band.
- Multiplexes RX & TX signals over RF channels, which enables the RX signals and TX signals to share the same antenna path.

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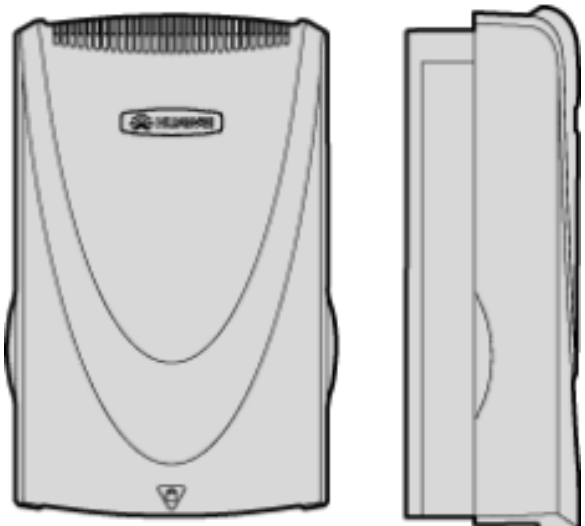
RRU3804-NODE-B



Function of RRU3804 Module

- Forward & Processes RF signals between BBU and the antenna system.
- Receives RF signals from antenna system, down converts the signals to IF signals,& then transmits them to the BBU or the macro Node-B after amplification, analog to digital conversion, digital down conversion ,matched filtering & digital automatic gain control.
- Receives downlink baseband signals from the BBU or the macro Node-B, forward data received from its cascaded RRU,performs filtering & digital to analog conversion, and up-converts RF signals to the TX band.
- Multiplexes RX & TX signals over RF channels, which enables the RX signals and X signals to share the same antenna path.

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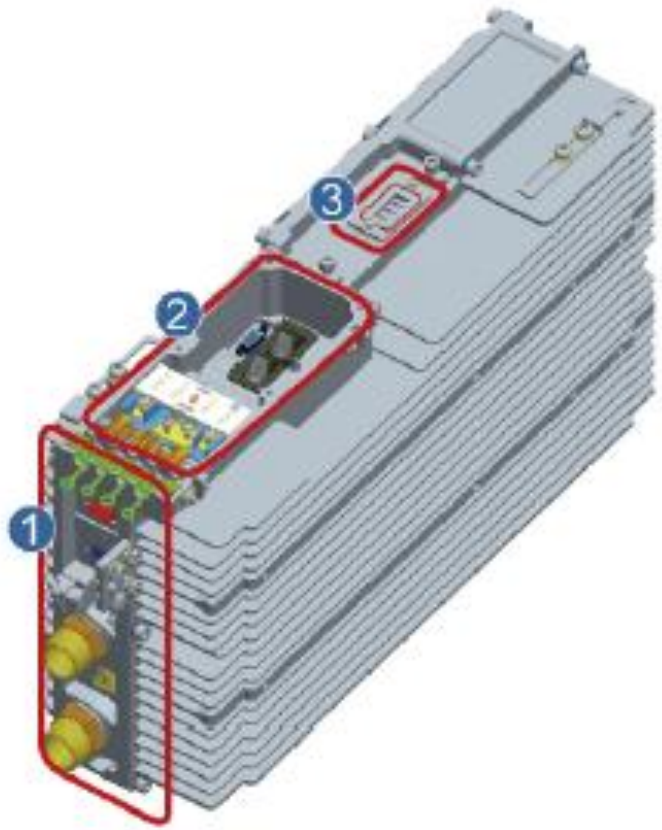
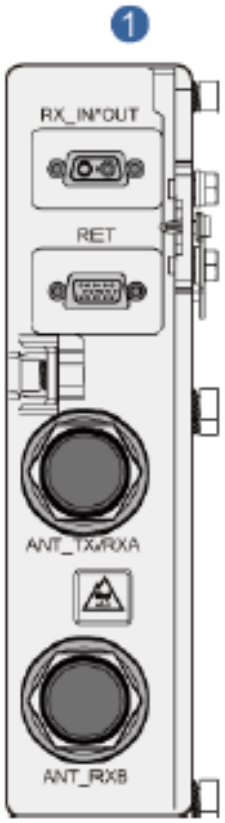
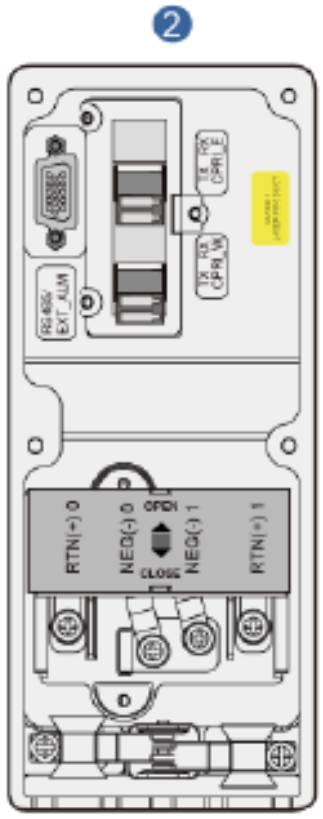
RRU3804/3801/3806 RRU Panel-Node-B







RRU3804 Vs RRU3801C-NODE-B

Configuration	Number of WBBPs	Number of RRU3804s (No TX Diversity)
3 x 1	1	3
3 x 2	2	3
3 x 3	3	3
3 x 4	4	3

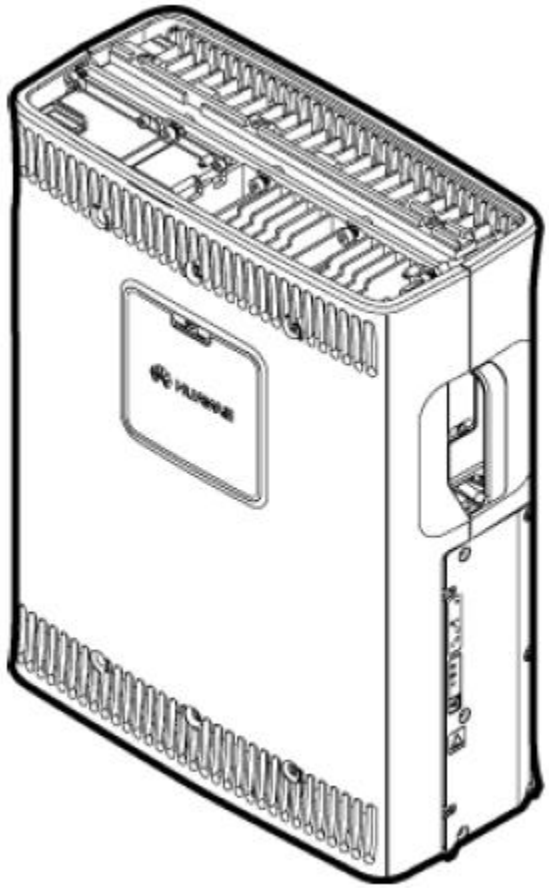
Configuration	Number of WBBPs	Number of RRU3801Cs (No TX Diversity)
3 x 1	1	3
3 x 2	2	3
3 x 3	3	6
3 x 4	4	6

RRU3805-Node-B

The functions of the RRU3805 are as follows;

One RRU3805 module supports four carriers.

❑Providing CPRI ports for communication with the BBU3900.
❑The uplink RF signals received from the antenna go through down-conversion ,amplification, analog-to-digital conversion, matched filtering, Digital Automatic Gain Control(DAGC),and then are sent to the BBU3900 or macro BTS for further processing.
❑The RRU receives downlink baseband signals from the BBU or the macro NodeB, forwards data received from its cascaded RRU, performs filtering and digital-to-analog conversion, and up-converts RF signals to the transmitting frequency band.
❑Power control and Voltage Standing Wave Ration (VSWR) detection.
❑Enabling frequency synthesis.
❑Generation and recovery of the clock circuitry at the CPRI interface, and the alarm detection .



RRU3908-Node-B

The functions of the RRU3908 are as follows;

❑The single RRU3908 module supports six carriers when working in GSM mode and GSM+UMTS dual mode, and four carries in UMTS mode.

❑The RRU3908 provides the CPRI port for data communication with the BBU3900.

❑When working in GSM mode, the RRU3908 adopts the direct frequency conversion technique, which is directly implemented in the transmit channel. The RRU3908 modulates the baseband signals into GSM RF signals. After being filtered and amplified, the RF signals are sent to the antenna for transmission, through the duplexer in the RF front-end unit.

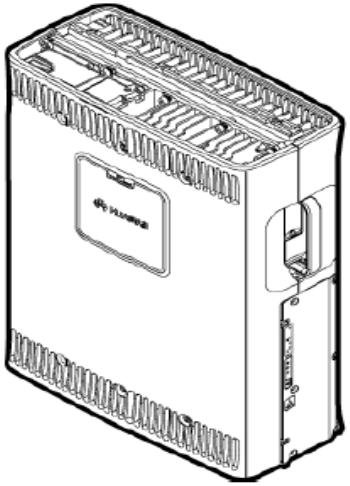
❑When working in UMTS mode, the RRU3908 directly sends the baseband signal to the antenna for transmission, through the duplexer in the RF front-end unit.

❑The RRU3908 processes the uplink RF signals received from the antenna through down-conversion, amplification, analog-to-digital conversion, digital down-conversion, matched filtering, Automatic Gain Control (AGC), and then transmits the signals to the BBU3900 for further processing.

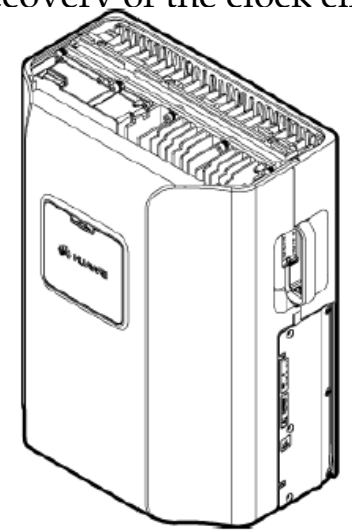
❑The RRU3908 supports power control and Voltage Standing Wave Ratio (VSWR) detection.

❑The RRU3908 supports frequency synthesis.

❑The RRU3908 supports the generation and recovery of the clock circuitry, and alarm detection on the CPRI port.



DC RRU3908



AC RRU3908

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Pre-Installation Site Survey (RFI) & Proposed Equipments Plan

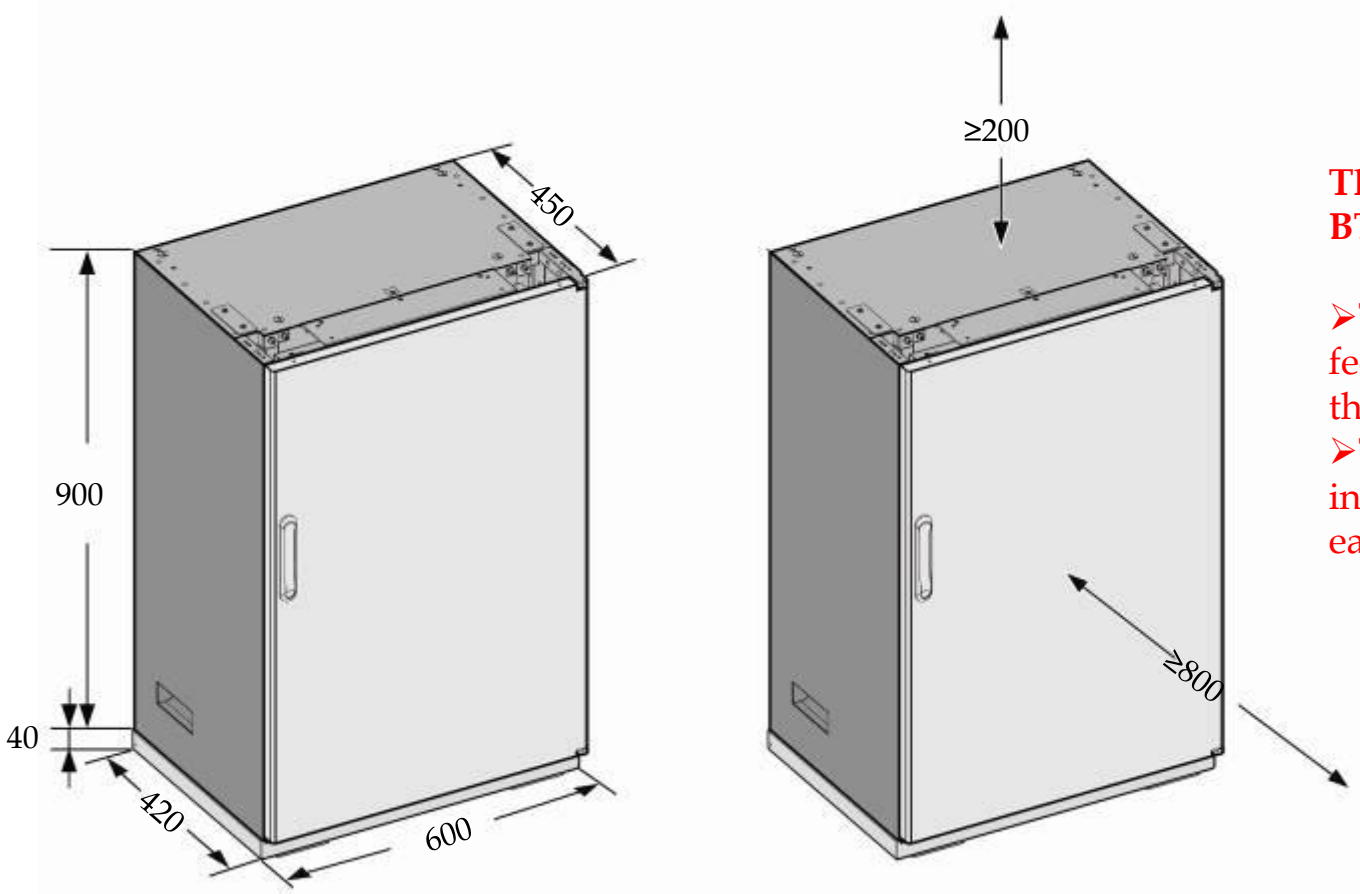
Infrastructure Requirements

Basic Infrastructure required for BTS implementation

- Space for ID BTS ,IDU /OD Cabinets or any third party supplied cabinet for equipments with recommended clearances inside equipment room/shelter or outside.
- Tower with GSM & MW antenna mounts at required RND/TND height & Azimuth.
- Cable Tray for routing of RF feeders & IF cable on tower as well as from tower to Shelter/equipment location.
- LA installed & connected to main grounding system.
- Aviation Lamp & operational.
- Grounding network & all equipments (DG, Shelter,AC/DC power system ,Tower etc) are connected to main grounding system.
- IGB & EGB installed & connected to main grounding network.
- E/A (DG Sets) with required capacity.
- Air-Conditioning inside shelter/room.
- DC Power as per requirements & MCB/fuses for proposed equipments of required capacity.
- Cable Tray inside shelter.
- Feeder entry for 6x7/8" RF cable , & 2x1/2" IF Cable on existing entry plate or space for new entry plate.
- Fire Fighting system (Sensor/detectors) with fire extinguisher.

Clearance for installing BTS

Clearance Required For BTS3900 (ID)



The layout requirements for the BTS3900 cabinets are as follows:

- The cabinets are as close to the feeder window as possible so that the feeders can be saved in length.
- The cabinets are installed in a row in the same equipment room for easy cabling.

The clearance requirements for the BTS3900 cabinets are as follows:

- The cabinet can be installed with its back against the wall.
- The cabinet can be installed with one side against the wall.
- At least 800 mm in front of the cabinet should be reserved for maintenance.
- At least 200 mm on top of the cabinet should be reserved for cabling.

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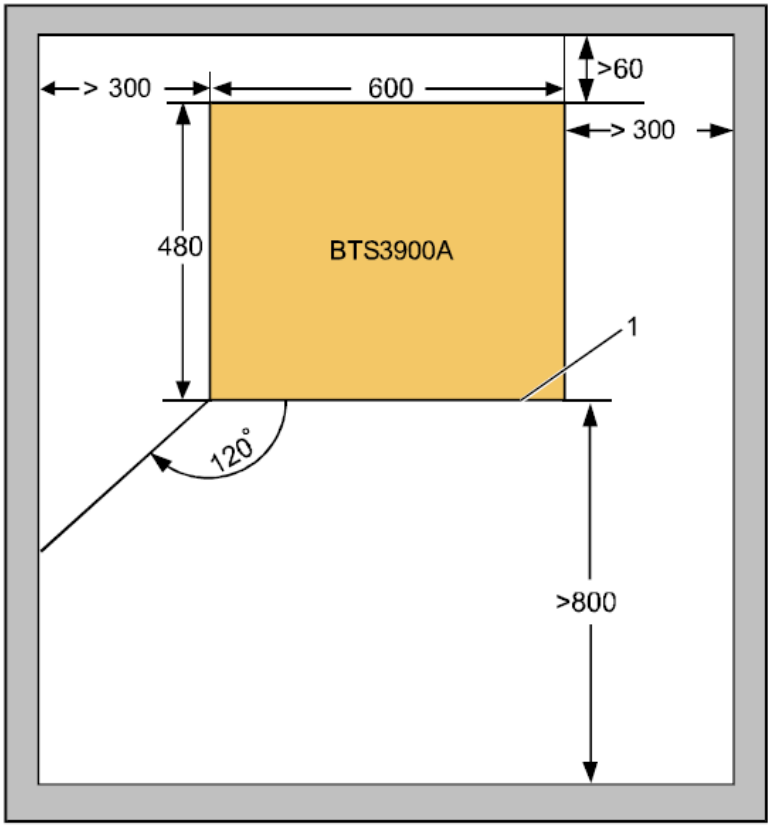
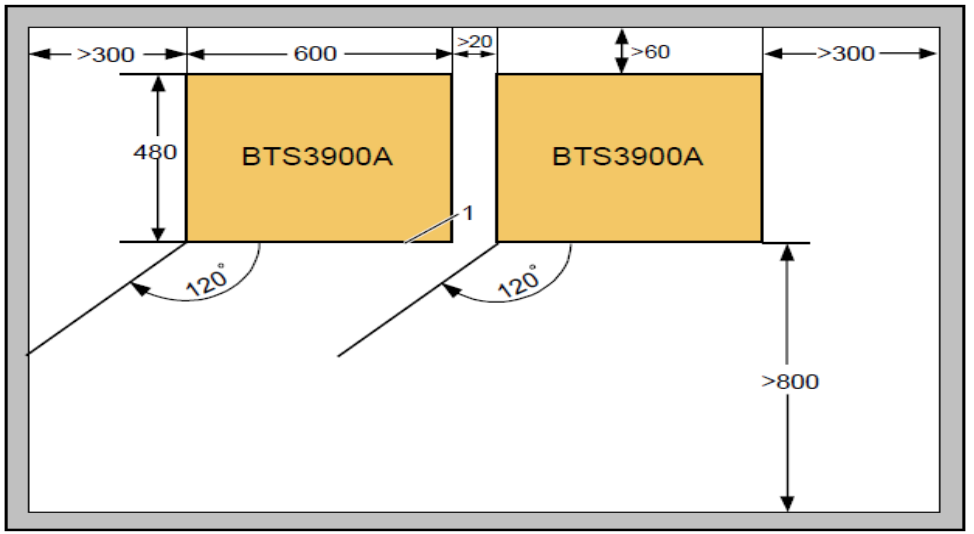
Clearance Required For BTS3900A



- When a single BTS3900A cabinet is installed against the wall, it is recommended that the space between the rear of the cabinet and the wall be greater than 60 mm.
- When two BTS3900A cabinets are installed side by side, it is recommended that the space between the sides of the two cabinets and the wall be greater than 300 mm.
- When two BTS3900A cabinets are installed side by side and against the wall, the space between the sides of the cabinets be greater than 20 mm.
- When the BTS3900A cabinet is installed with the left side against the wall, the space between the left side and the wall be greater than 300 mm.
- The BTS3900A cabinet cannot be installed against the corners of the wall.



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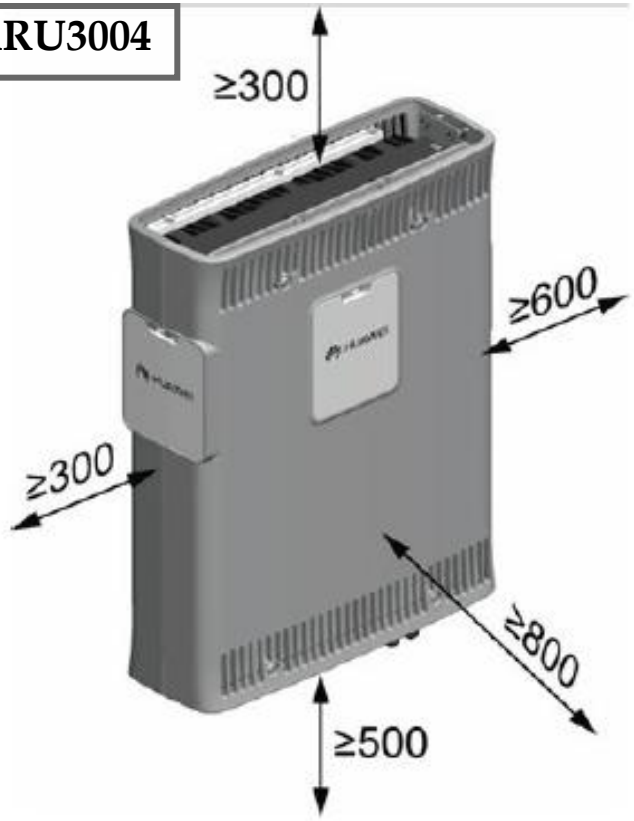
Clearance Required For RRU's in DBS3900

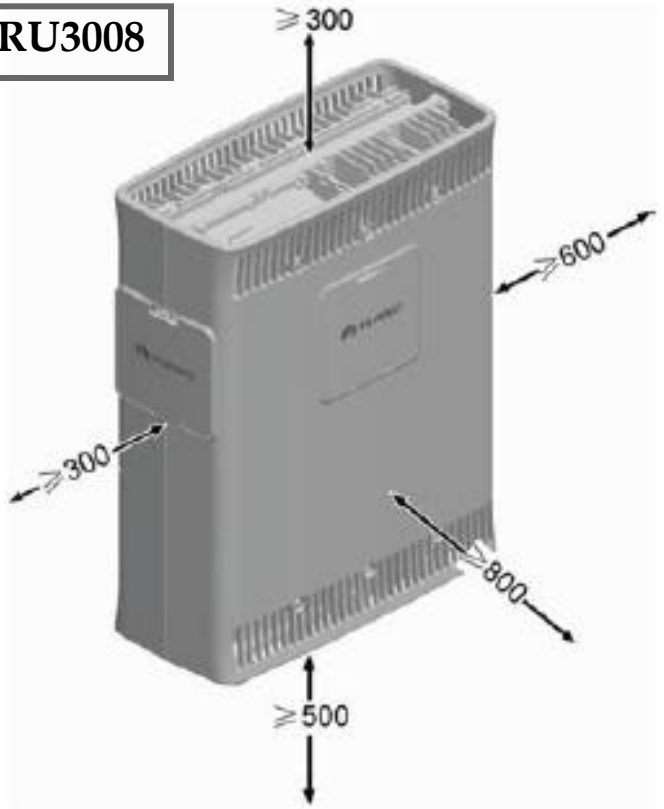
RRU3004



The recommended clearances requirements of RRU3004 are,

- ❑300mm above the equipments.
- ❑500mm under the equipments for cabling.
- ❑800mm in front of the equipments for maintenance.
- ❑300mm on the left of the equipment for maintenance.
- ❑600mm on the right of the equipment for maintenance.

RRU3008



The recommended Clearances requirements of RRU3008 are,

- ❑300mm above the equipments.
- ❑500mm under the equipments for cabling.
- ❑800mm in front of the equipments for maintenance.
- ❑300mm on the left of the equipment for maintenance.
- ❑600mm on the right of the equipment for maintenance.

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RRU Installation Requirements

INSTALLATING RRU ON POLE,

For the steel pole with the diameter ranging from 60 mm to 76 mm, the RRU should be flush mounted on the pole. Such steel pole can be mounted with a maximum of two RRUs.
l If more than two RRUs are installed on one steel pole, the diameter of the steel pole should be within 76 mm to 114 mm. Such steel pole can be mounted with a maximum of six RRUs.

INSTALLATING RRU ON WALL,

For single RRU ,the pulling force would be 1.25KN,hence the wall Should be capable of bearing the above pulling force.

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Power Requirements

Power Requirements

@ 23 Deg. Centigrade

Sl. No.	Product	Frequency	Configuration	Operating Voltage	Typical power consumption in watts	Max Power consumption in watts
1	BTS 3900	900MHz	S222	48VDC	750	1050
2	BTS 3900	900MHz	S444	48VDC	1140/1000	2000/1360
3	BTS 3900	1800MHz	S222	48VDC	740	1030
4	BTS 3900	1800MHz	S444	48VDC	1130/1060	1960/1360
5	BTS3900A	900MHz	S222	220 V AC single phase: 176V AC to 290 V AC	800	1100
6	BTS3900A	900MHz	S444	220 V AC single phase: 176V AC to 290 V AC	1200	1560
7	BTS3900E	900MHz/1800MHz	S600	48VDC	100/110	140/130
8	BTS3900E	900MHz/1800MHz	S600	220 V AC single phase: 176V AC to 290 V AC	100/110	150/130
9	BTS3900E	900MHz/1800MHz	S333	48VDC	360/420	510/570
10	BTS3900E	900MHz/1800MHz	S333	220 V AC single phase: 176V AC to 290 V AC	420/420	570/540
11	BTS3900B	900MHz/1800MHz		48VDC	20	30
12	BTS3900L					
13	BTS3900-WCDMA	2100MHz	3x4	48VDC	1020	1330
14	BTS3900A-WCDMA	2100MHz	3x4	48VDC	1220	1580
15	DBS3900-(BBU+ 3801C)WCDMA	2100MHz	3x2	48VDC	680	830
16	DBS3900-(BBU+ 3804)WCDMA	2100MHz	3x3	48VDC	710	970
17	BTS3012AE	900MHz	S222	196V-240VAC	980	1280
18	BTS3012AE	900MHz	S444	196V-240VAC	1550	2100
19	BTS3012	900MHz	S444	48VDC	950	1850
20	BTS3012	1800MHz	S444	48VDC	1000	2050

Power (DC) Cable Requirements ,w.r.t distance

-48VDC INPUT @ 23 Deg. Centigrade

Power Consumption in Kw	Current in Cables @48VDC	Cross-sectional area of cables Recommended (Voltage drop=0.8VDC) Distance from SMPS/DCDB to Equipment								
		5Mtrs	10Mtrs	15Mtrs	20Mtrs	25Mtrs	30Mtrs	35Mtrs	40Mtrs	50Mtrs
1	21	4	6	10	10	16	16	25	25	25
2	42	6	10	16	25	25	35	35	50	50
3	63	10	16	25	35	35	50	50	70	70
4	83	10	25	35	35	50	70	70	95	95
5	104	16	25	35	50	70	70	95	95	120

Recommended Power Cables for BTS

Sl. No.	Product	Operating Voltage	Recommended Power Cable from DCDB/ACDB to BTS	Remarks	Colour Code of Cable
1	BTS 3900	48VDC	16 Sq..mm. Copper Flexible Cable	DC Power Cable (Positive & Negative)	Blue-Negative Black-Positive
2	BTS 3900	24VDC	25Sq.mm Copper Flexible Cable	DC Power Cable (Positive & Negative)	Red-Positive Black-Gnd.
3	BTS3900A	220 V AC single phase: 176 V AC to 290 V AC	3x 6Sq.mm Copper Flexible Cable	AC Power Cable (L ,Neutral &PE),Input Power Cable to APM30H	
4	BTS3012AE	220 V AC single phase: 176 V AC to 290 V AC	3x 16Sq.mm Copper Flexible Cable	AC Power Cable (L , Neutral & PE)	
5	BTS 3012AE	48VDC	25Sq.mm Copper Flexible Cable	DC Power Cable (Positive & Negative)	Blue-Negative Black-Positive
6	BTS 3012AE	24VDC	35Sq.mm Copper Flexible Cable	DC Power Cable (Positive & Negative)	Red-Positive Black-Gnd.
7	BTS3012	48VDC	25 Sq.mm Copper Flexible Cable	DC Power Cable (Positive & Negative)	Blue-Negative Black-Positive
8	BTS3012	24VDC	35Sq.mm Copper Flexible Cable	DC Power Cable (Positive & Negative)	Red-Positive Black-Gnd.

Recommended MCB/Fuse Required for BTS

BTS Type	AC/DC	48/24/230	From	To	MCB/Fuse Rating
BTS3900	DC	48	Power Plant	DCDU	63A,1Pole
BTS3900	DC	24	Power Plant	Power Subrack (DC/DC PSU)	160A ,1-Pole
BTS3900	AC	230	ACDB/PIU	Power Subrack (AC/DC PSU)	32A , 2-Pole
BTS3900A	DC	48	Power Plant	DCDU-01 in RFC/DCDU-03 in TMC11	100A,1Pole/63A,1Pole
BTS3900A	DC	24	Power Plant	Power Sub rack (DC/DC PSU) inside APM30H	160A ,1-Pole
BTS3900A	AC	230	ACDB/PIU	Power Sub rack (AC/DC PSU) inside APM30H/PDU in APM30H	50A , 2P/32A,2P
DBS3900	DC	48	DCDU (APM30)	RRU (S2 to S4)	20A,1-Pole
DBS3900	AC	230	PDU	RRU (S2 to S4)	20A,1-Pole
BTS3012	DC	48	Power Plant	BTS3012 Input terminal at top of BTS	80A ,1-Pole
BTS3012	DC	24	Power Plant	BTS3012 Input terminal at top of BTS	160A ,1-Pole
BTS3012 AE	DC	48	Power Plant	DC Power Subsystem	80A ,1-Pole
BTS3012 AE	DC	24	Power Plant	DC Power Subsystem	160A ,1-Pole
BTS3012AE	AC	230	External power interface	AC Power Subsystem	32A , 2-Pole

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Pre-Installation Site Survey & Checklist (RFI)

After site handed over & before going for survey ,following are the details to be carried along with survey checklist,

- ❑ Hard Copy of Checklist.
- ❑ Measuring Tape (15Mtrs.).
- ❑ Compass.
- ❑ Digital Camera
- ❑ Ball Pen/Pencil, Scale.
- ❑ TND/RND & Site Configuration Details for the site.
- ❑ Site Details (Name, Address etc), Site access details, Owner /Guard name /Contact details.
- ❑ Site Key.
- ❑ Digital Multimeter

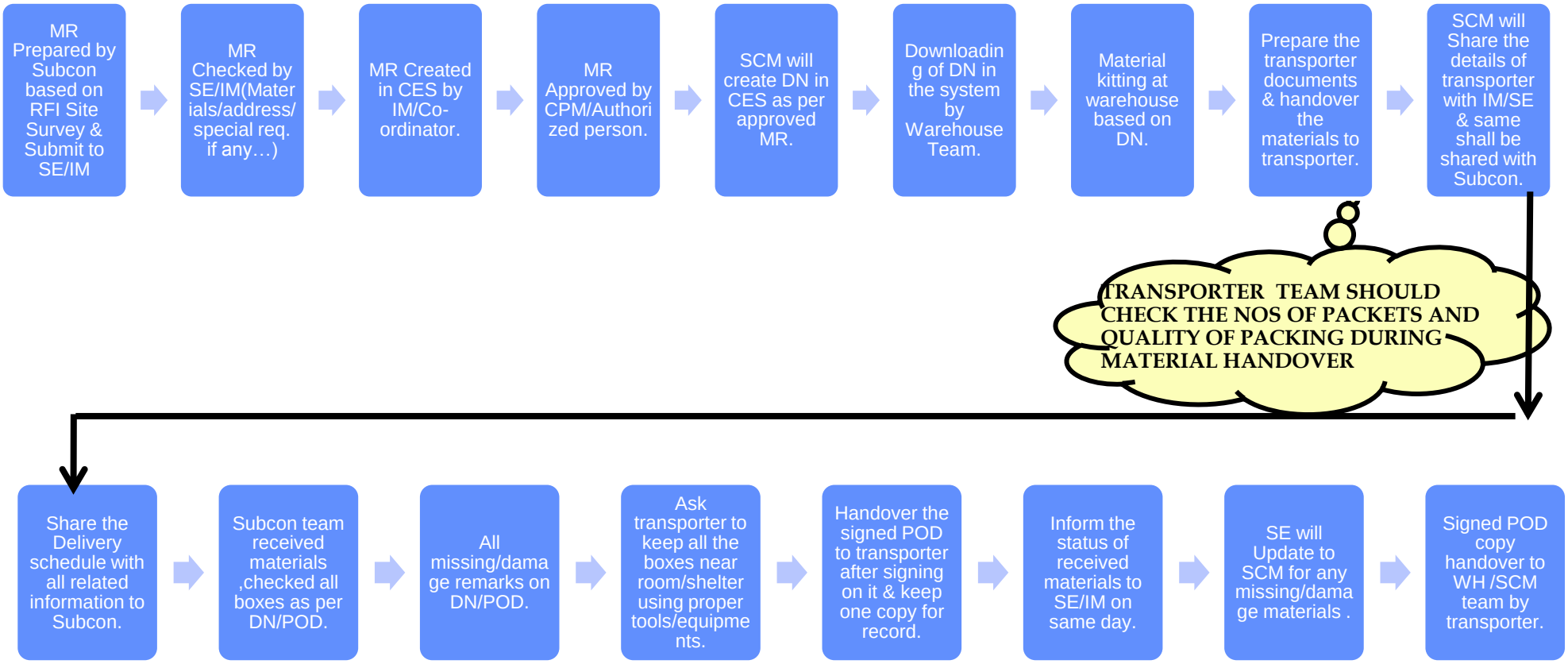
The pre installation site survey is required to identify/check the site for feasibility (Infra Requirements, Environmental suitability & Security etc.) with respect to implementation of Telecom equipments (BTS,MW-PDH/SDH Hops , RF Antenna & Feeder line, Battery & SMPS etc).

The Survey is required for Installation Material /Auxiliary Material estimation.
The Survey is required for preparation of Proposed layout Plan for equipments.

The standard Checklist can be used during pre-installation site survey & listing out the additional requirements along with proposed Equipments Layout Plan, Installation Material estimation sheet, Site Photographs etc.

MR Creation & Delivery Procedure

MR Format to be filled after Site Survey for Request of Installation Materials.
There are few Inst Materials whose Requirements are fixed as per site type (ID/OD etc.).
There are few Inst Materials which are site specific,i.e Variable (Power Cables,Grounding,Feeders,Clamps and Antenna type.).
Installation can be started once all the requested materials are received at site.



OPENCASE INSPECTION/UNPACKING

Material Delivery, Lifting,& Open Case Inspection (Installation on Same Day)

After Receiving the Installation materials at site ,following needs to be ensure,

- ❑ No of Boxes as per listed in POD paper, if any discrepancies observed ,mention in POD.
- ❑ Check of visible damages to the boxes if any. (mention in POD)
- ❑ Check of any sign ,that the boxes are opened during transportation.
- ❑ Keep the boxes in safe/dry place with right direction.
- ❑ Keep one copy of MRN during material receiving.
- ❑ Use Proper tool for lifting the Boxes to the equipment Room (must be identified during RFI survey.
- ❑ Use Proper tools for opening of Boxes.
- ❑ Open the Boxes and count the HW as per site requirements/configurations and are as per packing list.
- ❑ Open the auxiliary material box and match with MRN.
- ❑ Record the Short shipment materials (Hardware/Installation Materials) & immediately communicate the Local Site Engineer/IM. (Record in Site Folder).
- ❑ Request for delivery of Short shipment materials ASAP before start of implementation.
- ❑ If everything is ok ,start the installation.
- ❑ Keep the packing list for site folder

Unpacking , Opencase Inspection (Installation on Next Day)

Unpacking of Equipments & Installation Materials.

- Check again the boxes nos. as per POD .(if any box found missing ,communicate immediately to IM & Site Engineer)
- Unpack the equipment, and then check the total number of goods in the packing case according to the attached packing list and whether the packing cases are in good condition ?
- Unpack the packing case and then check the type & number of equipment in the cases according to the packing list.
- Packing list should be signed by subcon engineer , whoever is verifying & must be kept in good condition for site folder.
- If found any discrepancies (Packing list Vs actual in cases) ,must be informed to responsible Huawei Engineers.

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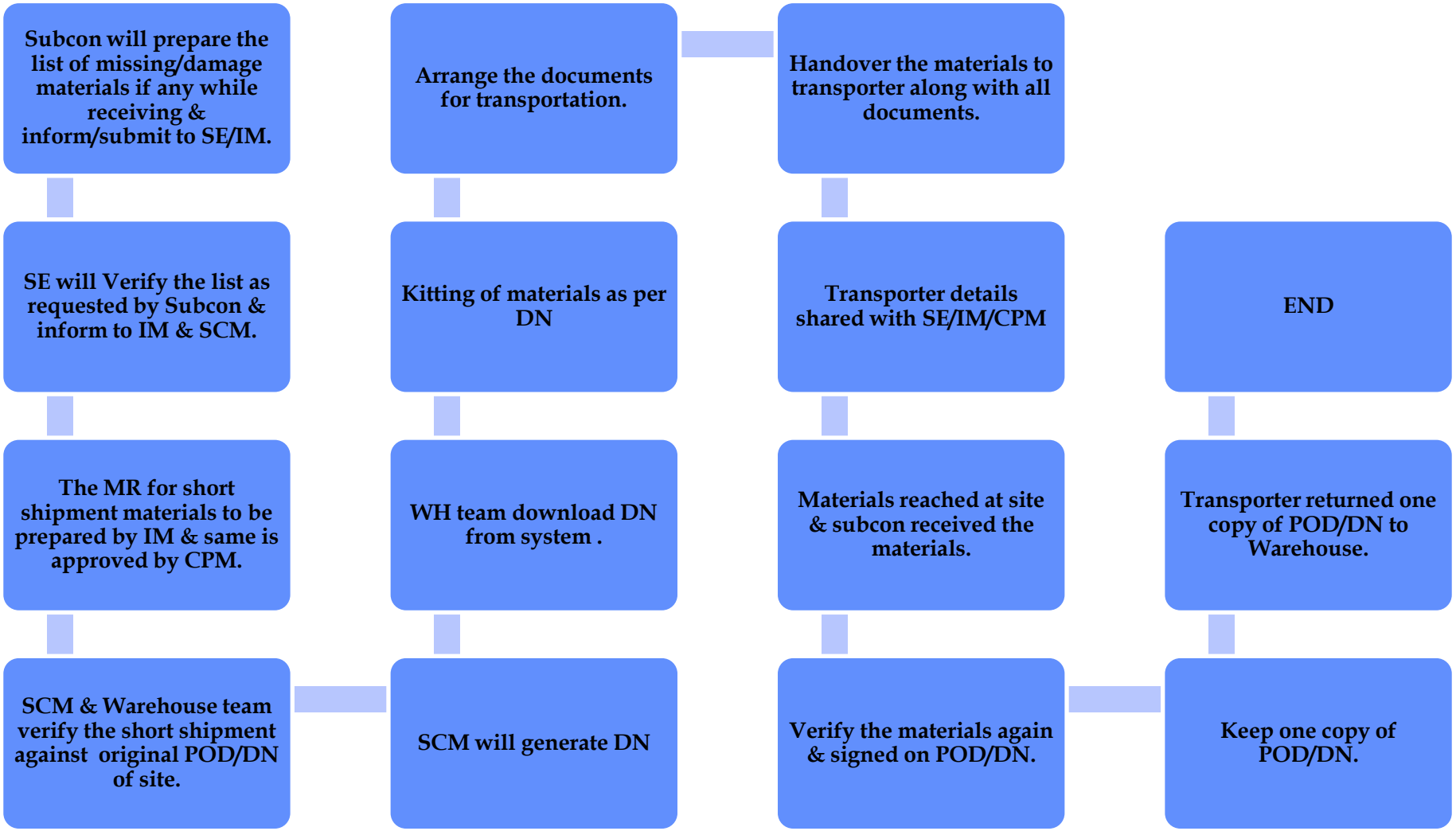
Short Shipment Material Delivery at Site & Escalation Matrix

MISSING/SHORT SHIPPED MATERIALS DELIVERY PROCEDURES



BTS Installation

TOOLS FOR BTS INSTALLATION

TOOLS REQUIRED FOR BTS INSTALLATION

					
Tape measure	Marking pen	Level bar	Percussion drill	Claw hammer	Socket wrench
					
Solid wrench	Adjustable wrench	Phillips screwdriver	Flat-head screwdriver	Diagonal pliers	Allen wrench
					
Punchdown tool	Wire cutter	File	Paper knife	Crimping pliers	Multimeter
					
Pulley	Lifting rope	Compass	Inclinometer	VSWR tester	Feeder punchdown tool

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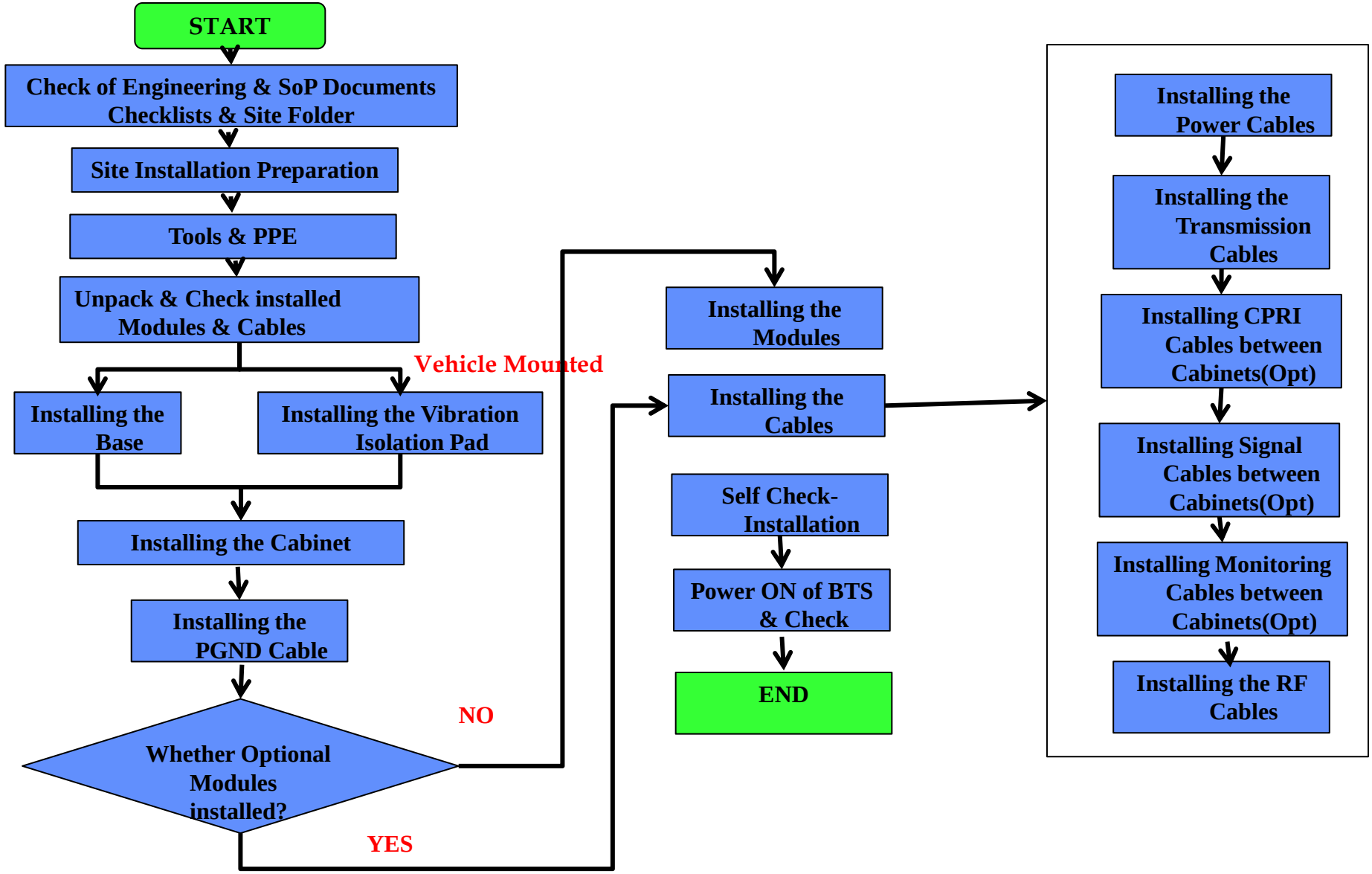
BTS 3900 Installation

Procedure -BTS 3900 Installation



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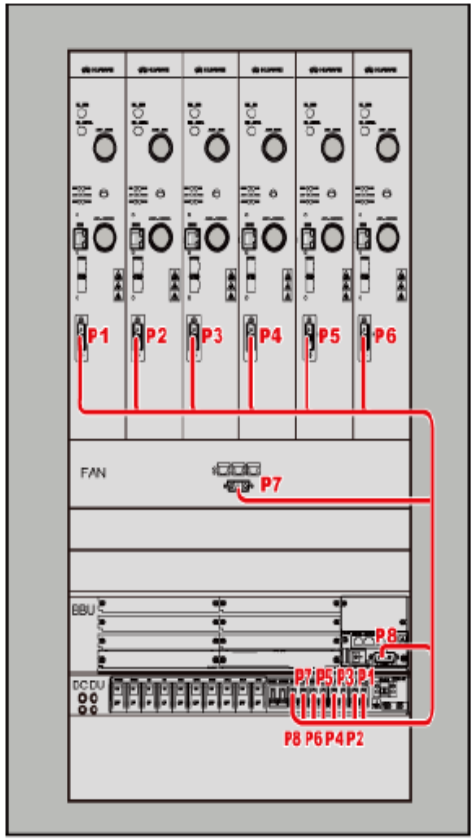
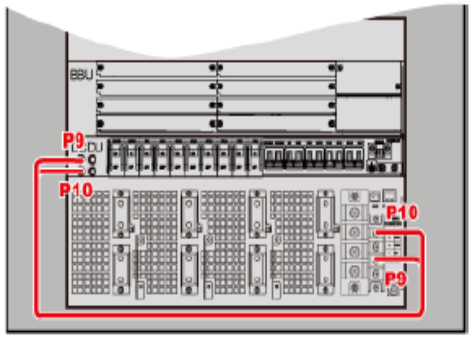
Checking of Installed Modules & Cables(-48VDC)



1



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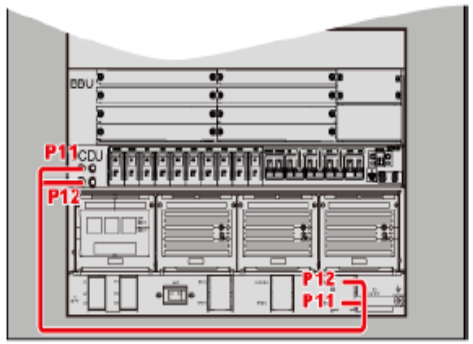

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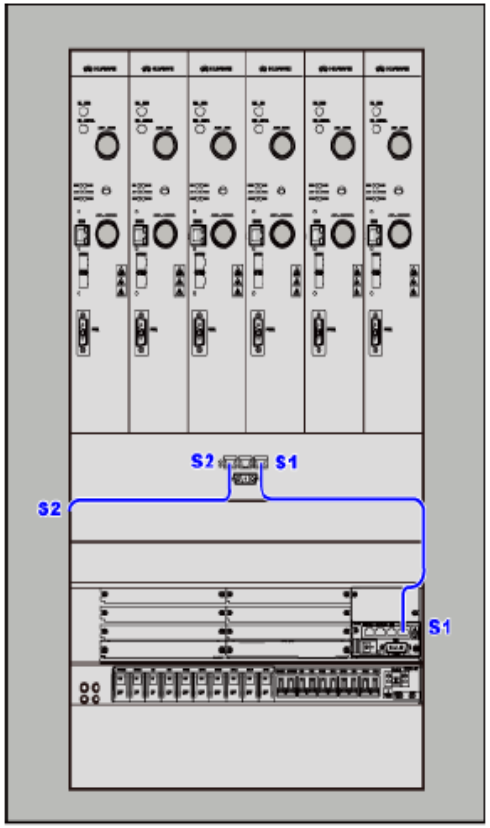

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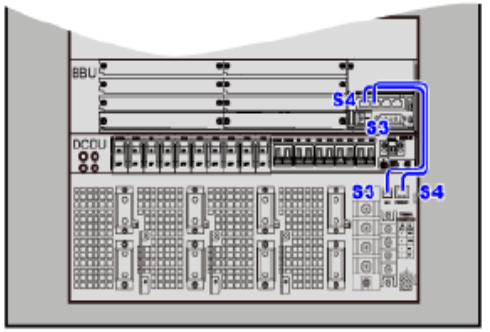

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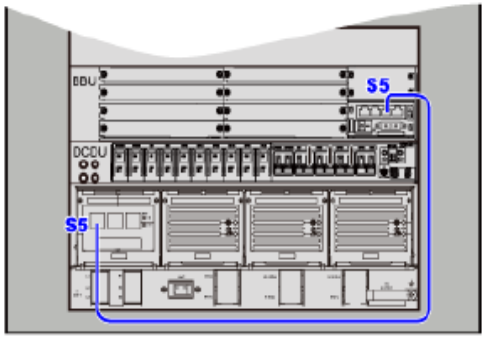

3

(1) -48 V cabinet (2) +24 V cabinet (3) AC cabinet

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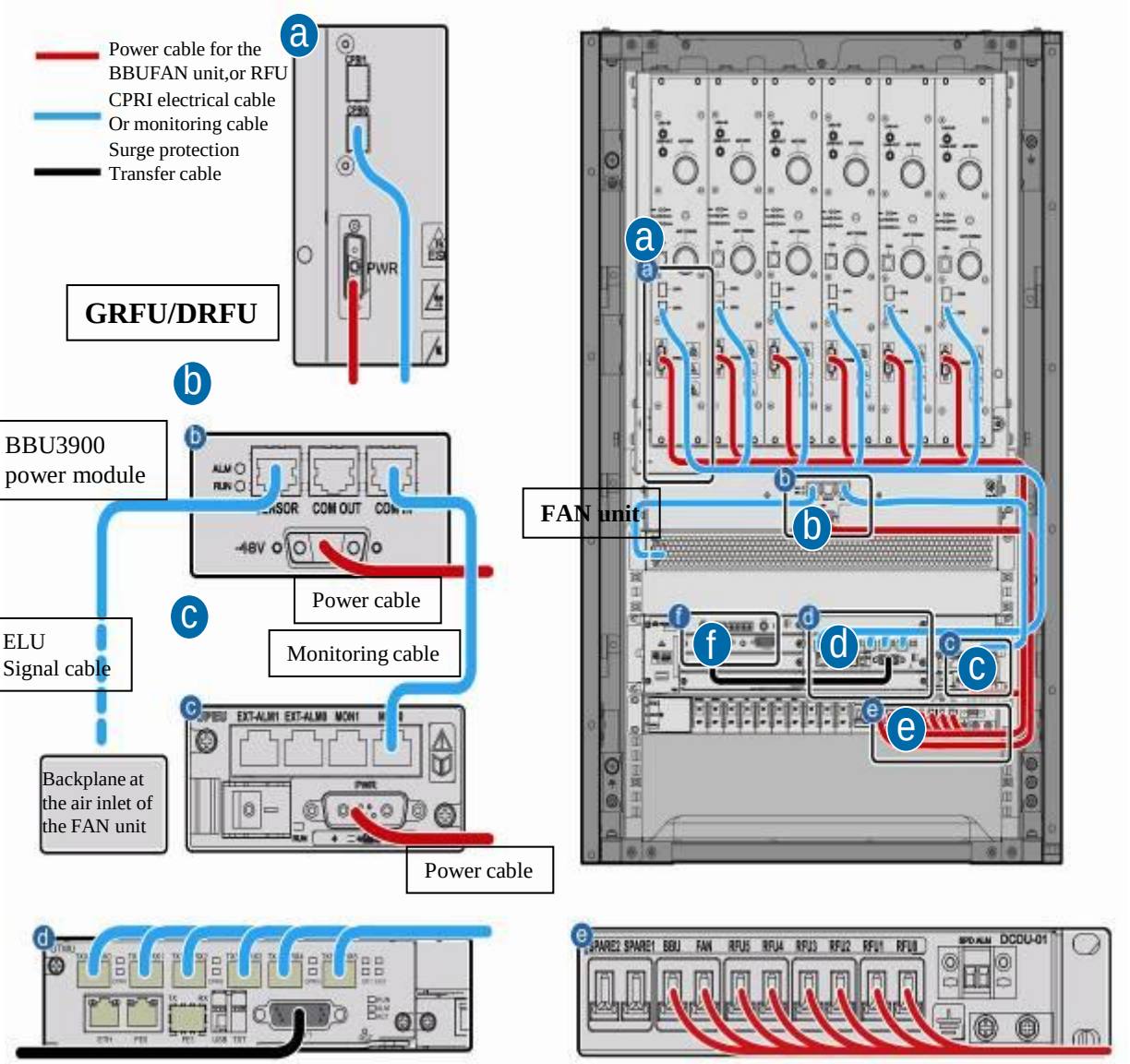
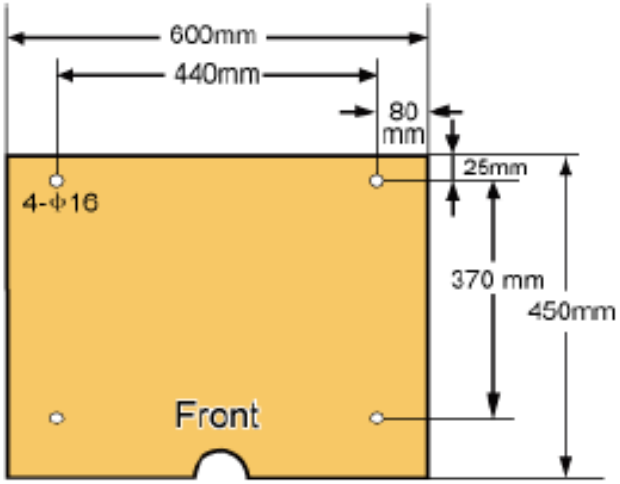
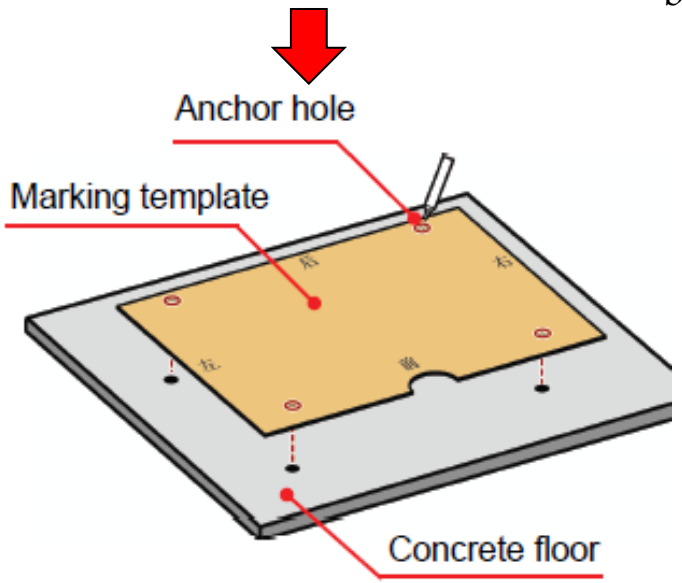
Checking The Internal Cables in BTS3900

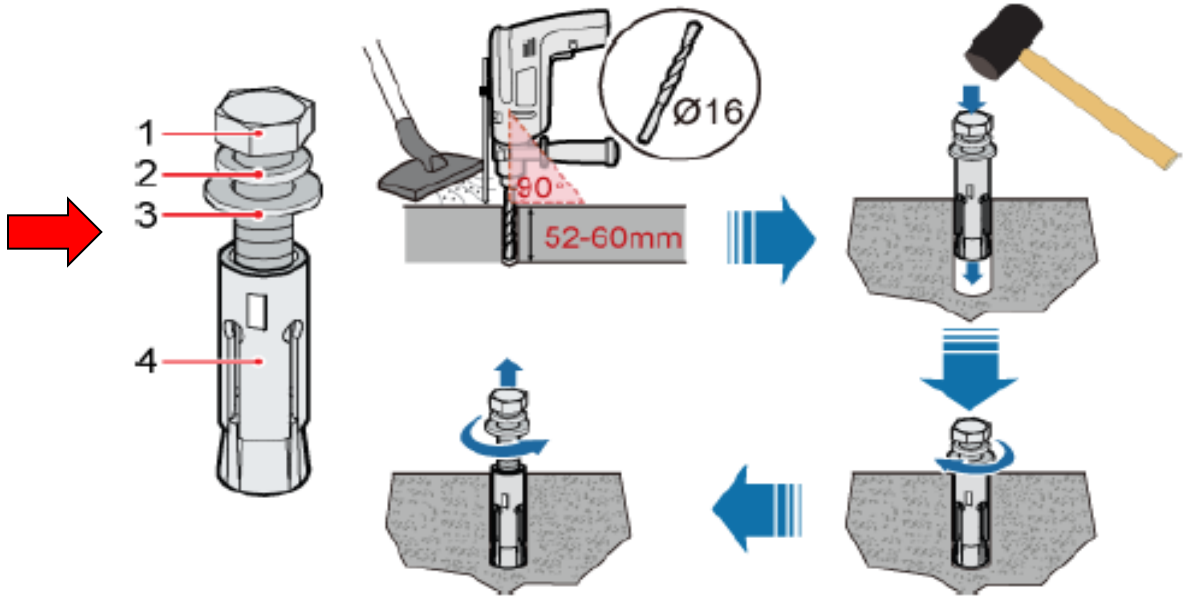


Marking the grouting Holes for Base



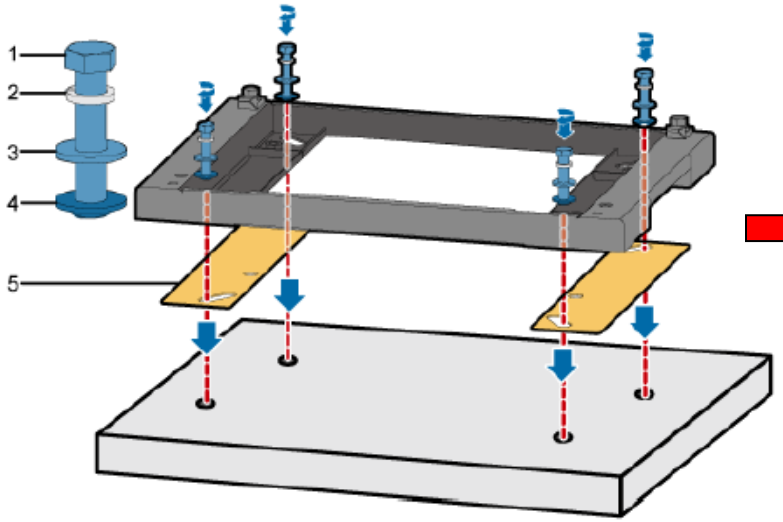
❑Determine the position of the cabinet by referring to the marking template.
❑Drill a hole at each anchor point, and then install the expansion bolt assembly.
❑Use the percussion drill with bit 16 to drill holes at the anchor points, and ensure that the depth of each hole ranges from 52 mm to 60 mm.
❑Use a vacuum cleaner to clear the dust inside and around the holes. If the inter-hole spacing is too wide or too narrow, locate and drill holes again.
❑Slightly tighten the expansion bolt, and then put the expansion bolt assembly into the hole vertically.
❑Use a rubber mallet to hammer the expansion bolt until the expansion tube is buried into the hole.
❑Remove the M12x60 bolt, spring washer, and flat washer from each expansion bolt assembly in sequence.

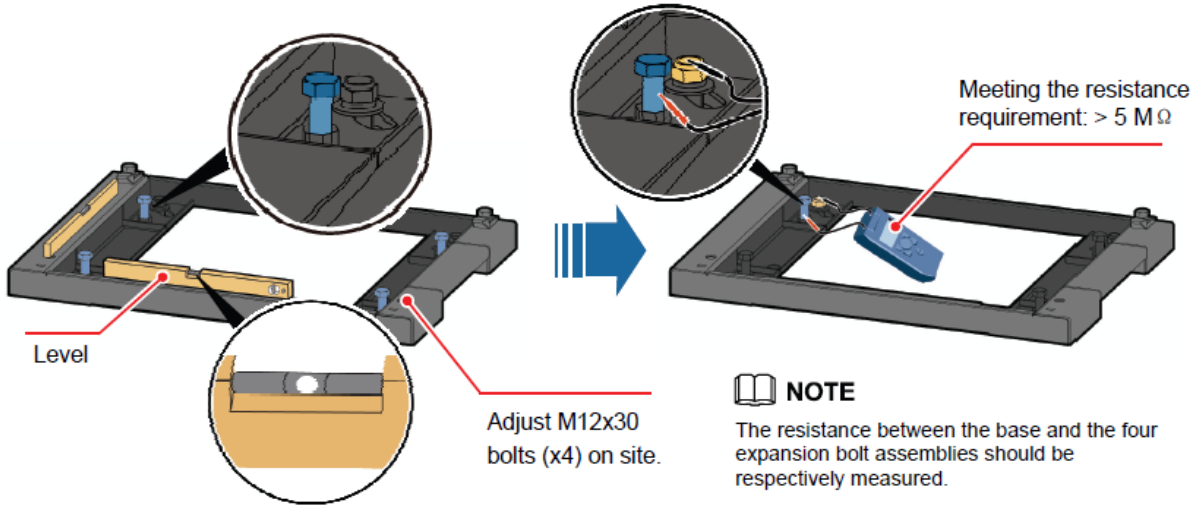




(1) M12x60 bolt (2) Spring washer (3) Flat washer (4) Expansion tube

Installing Base on Concrete Floor





(1) M12x60 bolt (2) Spring washer (3) Flat washer

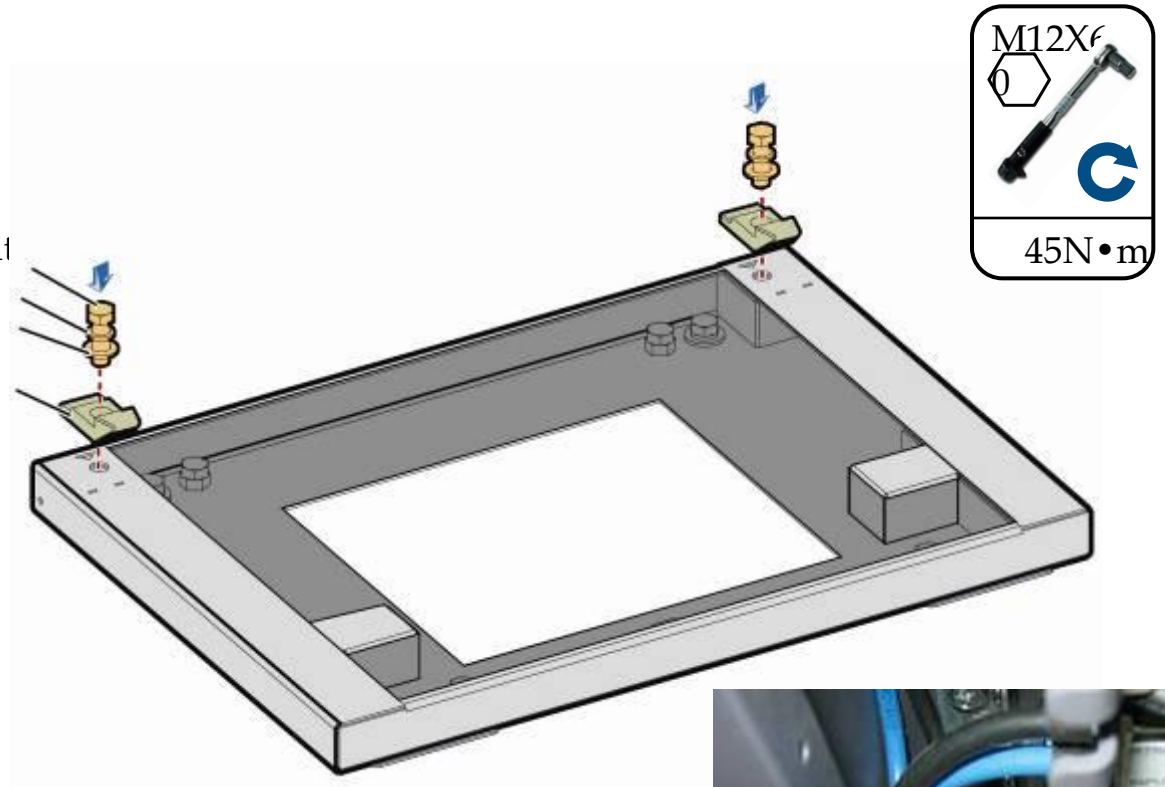
- Install the base and adjust the base level.
- Place the insulating spacer and the base on the floor, align the mounting holes in the base and in the insulating spacers with the holes of the expansion bolts in the floor, and then use four M12x60 bolts to secure the base.
- Check and adjust the base level.
- Place the level on the top plane of the base to check the base level.
- Use a level bar to check the levelness of the base, and then adjust the adjusting bolt until the base is horizontal.
- If the bubble in the level bar is in the middle, you can infer that the base is horizontal.
- The resistance between the base and the four expansion bolt assemblies should be respectively measured.
- If the resistance is less than 5 megohm, you can infer that the base and the earth are not insulated. In this case, you need to disassemble the expansion bolt and check whether the insulating washer is installed or damaged. If the insulating washer is not installed or damaged, install the washer again and adjust the levelness of the base.

Correct & Defective isolation Pad Installation

Defective Picture

Correct Picture

Installation of Fastening Blocks on Base



Wrongly anchored
The BTS base

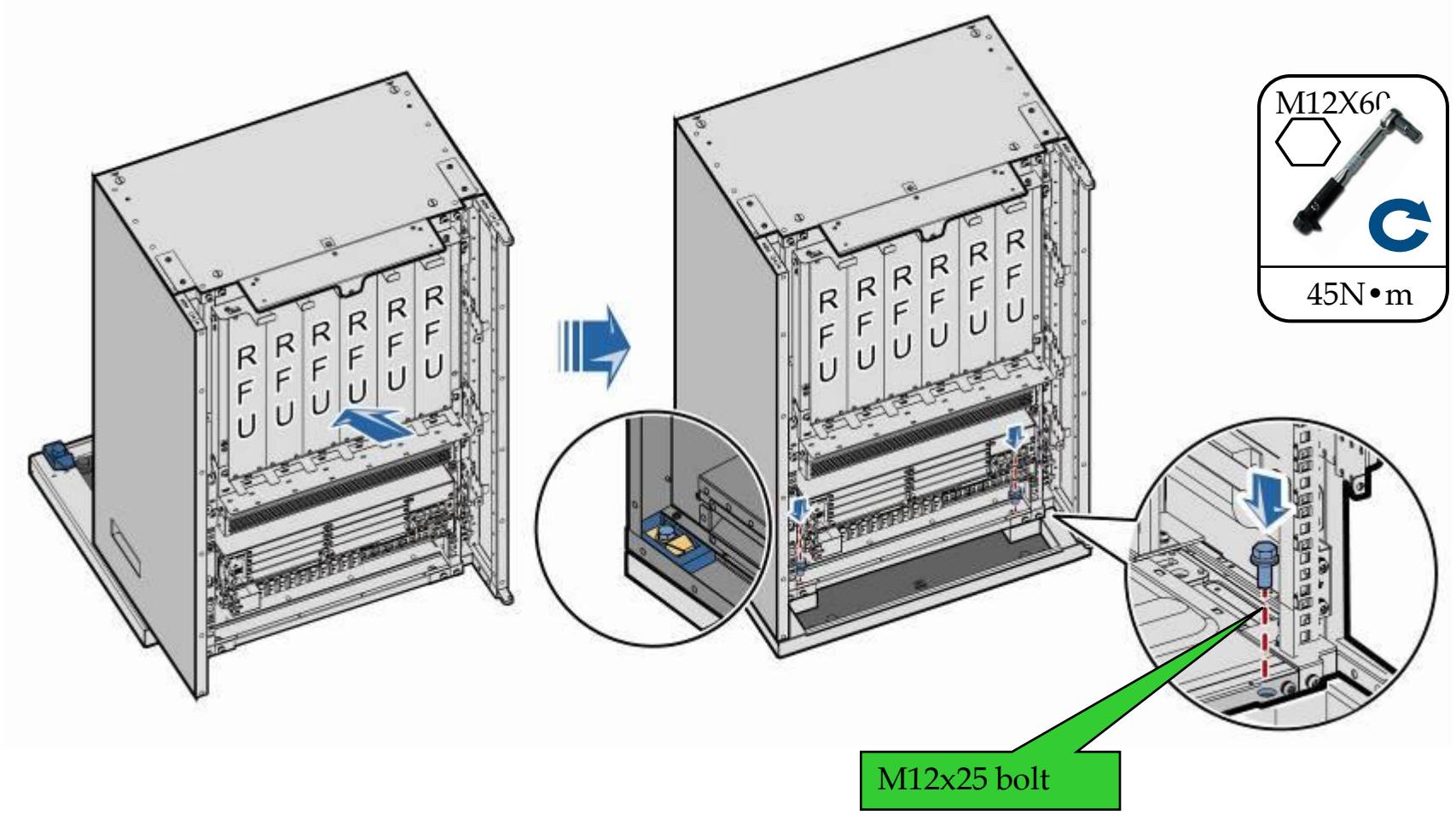
CAUTION

During the installation, discard the installation blocks delivered with the base and use installation blocks delivered with the cabinet.

Installation of Cabinet over Base

Cabinet Installation

- Lift the cabinet up to the base and push the cabinet until it is in position.
- Use a torque wrench to secure the cabinet on the base.
- During the installation, do not place any objects on the top of the cabinet. This prevents them from falling into the cabinet.



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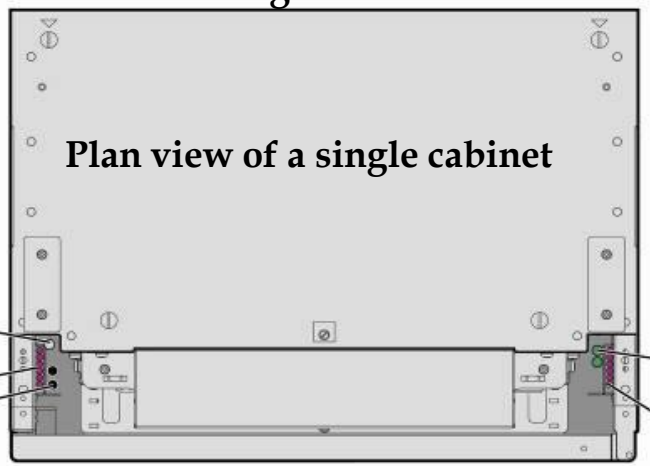
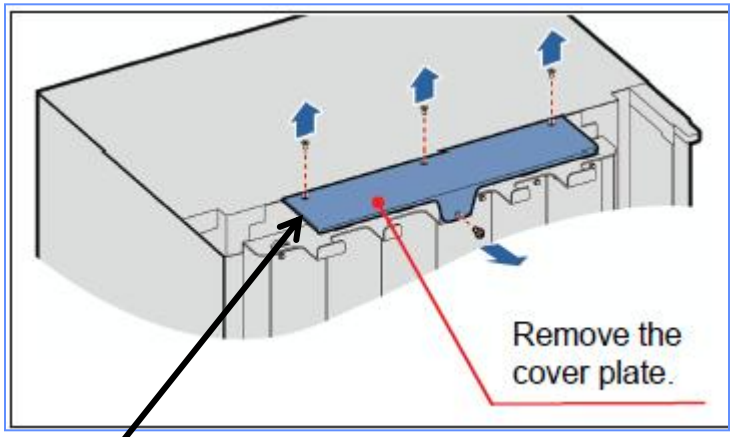
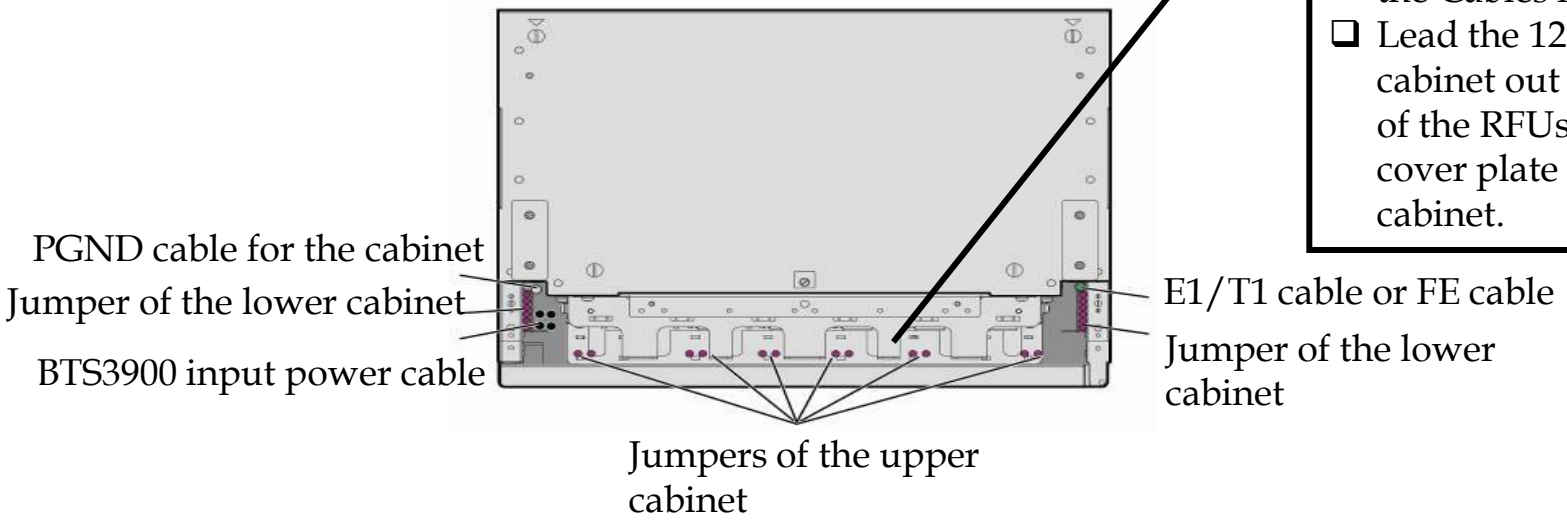
Cables Entry positions

Routing the Cables for a Single Cabinet





Plan view of the upper cabinet installed in stack mode



Procedure of Cable through to BTS,

- ❑ Route and bind the cables by using the method mentioned in "Routing the Cables for a Single Cabinet".
- ❑ Lead the 12 feeders of the upper cabinet out directly from the panels of the RFUs. In this case, remove the cover plate on the top of the upper cabinet.

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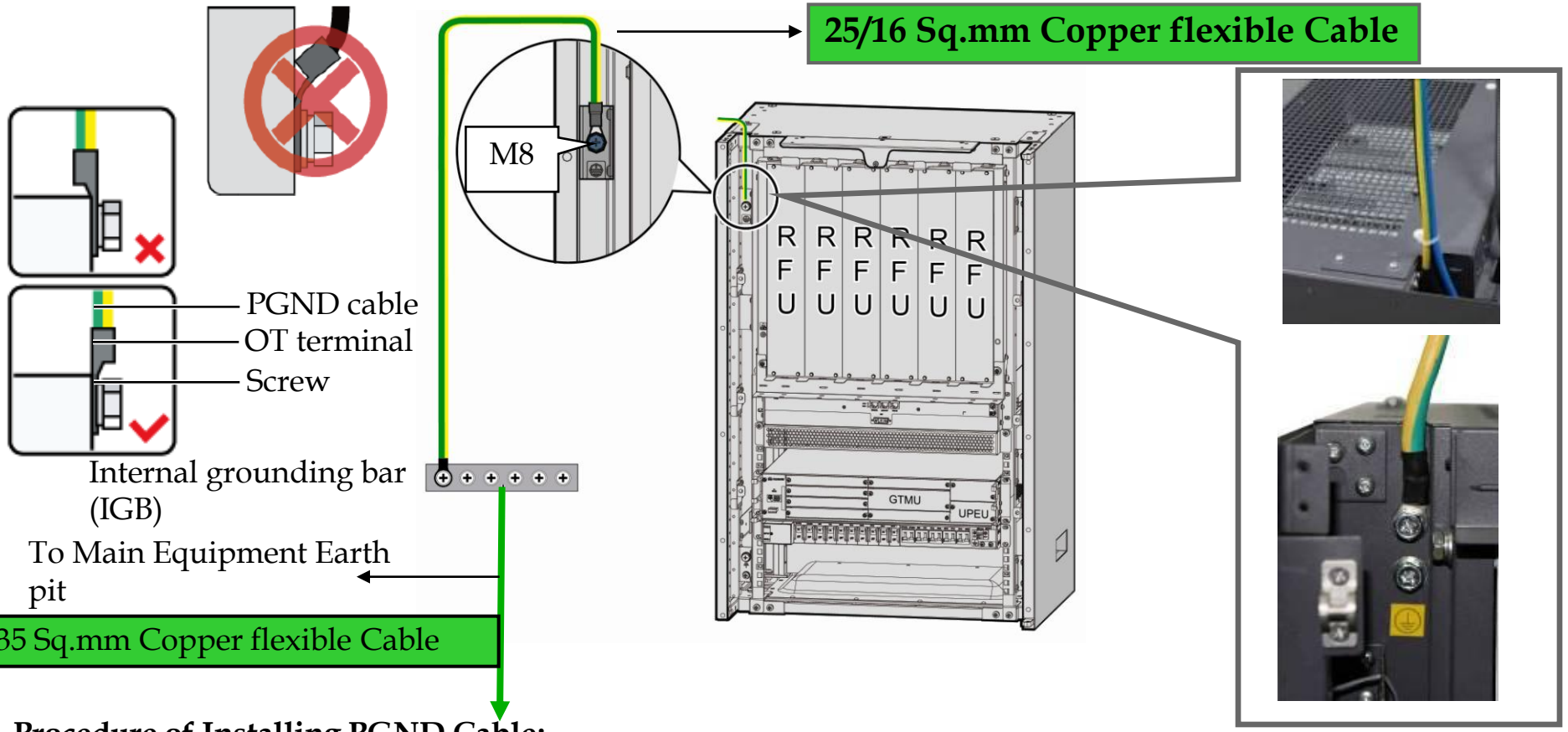
BTS Cabinet Grounding (PGND) –Incase of -48VDC I/P



Procedure of Installing PGND Cable;

- ❑Prepare the PGND cable & check the length first & then cut the cable.
- ❑Prepare the cable of proper length based on the actual cable route.
- ❑Add OT terminals to both ends of the cable & Correct OT terminals to be used with proper crimping tools.
- ❑Use a PGND cable with a cross-sectional area of 25/16 mm2 to connect the ground point on the -48 V cabinet to an external ground bar.
- ❑Use heat shrink/insulation tape on OT terminal & ensure no strands are visible.

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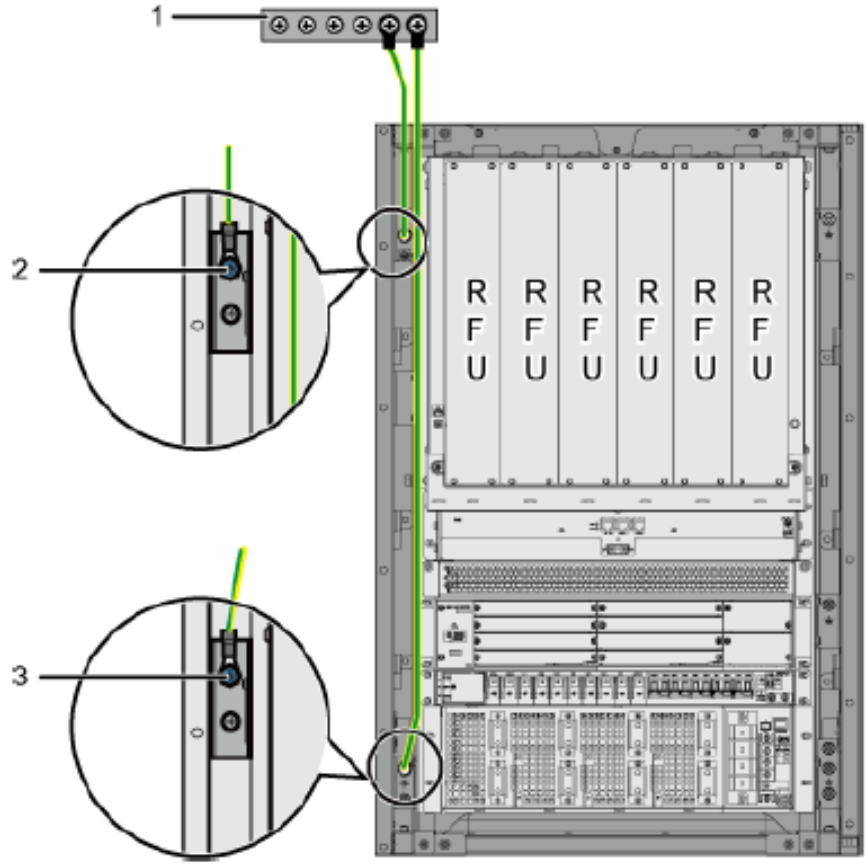
BTS Cabinet Grounding (PGND) –Incase of +24VDC/AC I/P

Procedure of installation of PGND cable in-case of 230VAC/ +24VDC input;

- ❑Use two PGND cables with a cross-sectional area of 25 mm2 to connect the ground point on the +24 V cabinet to the external ground bar.
- ❑Prepare the PGND cable & check the length first & then cut the cable.
- ❑Prepare the cable of proper length based on the actual cable route.
- ❑Add OT terminals to both ends of the cable & Correct OT terminals to be used with proper crimping tools.
- ❑Use heat shrink/insulation tape on OT terminal & ensure no strands are visible.



(1) External ground bar (2) OT terminal (M8) (3) OT terminal (M8)

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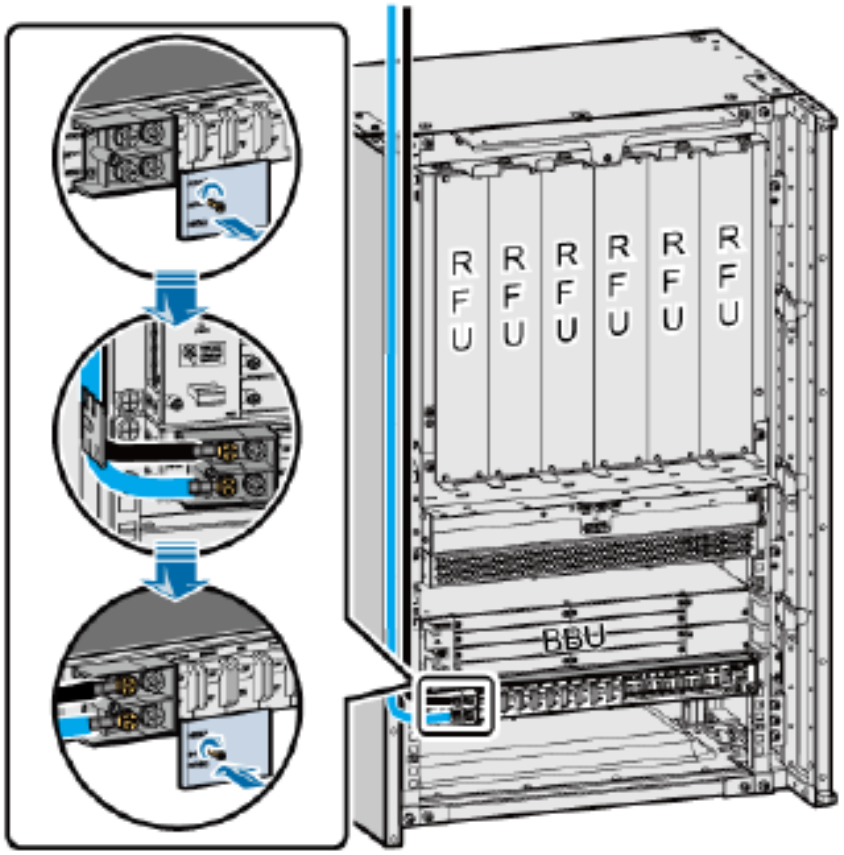
DC I/P Power Cabling (-48VDC)



Procedure of Power Cable Installation;

❑Measure the distance between the DCDU-01 and the external power equipment according to the actual cable route, and then prepare power cables of a proper length.
❑Reserve an extra length of 300 mm when preparing the input power cables. Thus, the power cables can be led out from the upper cabinet if two cabinets are stacked in the case of capacity expansion.
❑Make an M6 OT terminal at each end of the power cable. For details, see Assembling the OT Terminal and the Power Cable.
❑Remove the protecting hood from the terminal block of the DCDU-01.
❑Connect the blue cable to the wiring terminal labeled NEG(-) and black cable to the wiring terminal labeled RTN(+).
❑When two -48 V cabinets are stacked, the external power equipment supplies power to the upper and lower cabinets.
❑Use a screwdriver to tighten the screws on the wiring terminals.
❑ Install the protecting hood, and then use a screwdriver to tighten the screws.
❑Use right OT terminal .
❑Use heat shrink/insulation tape over terminals & ensure no strands are visible.

DC I/P Power Cabling (-48VDC)

Defective Picture

Correct Picture

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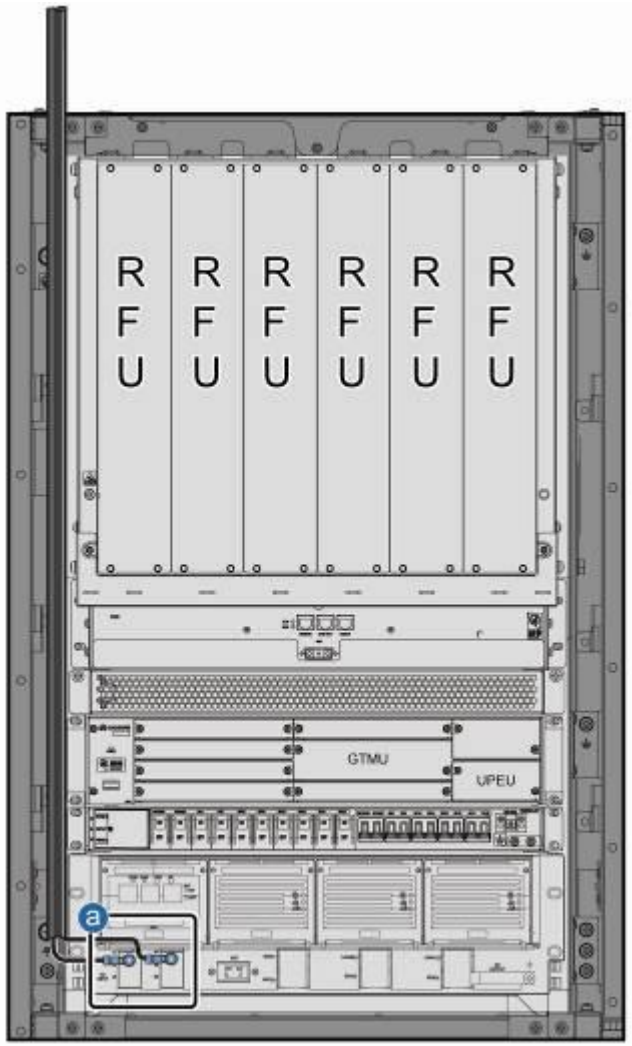
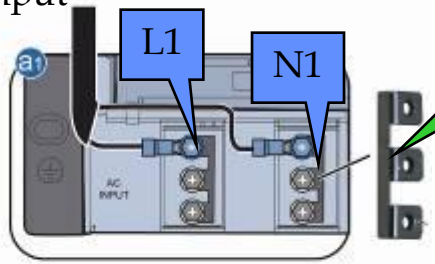
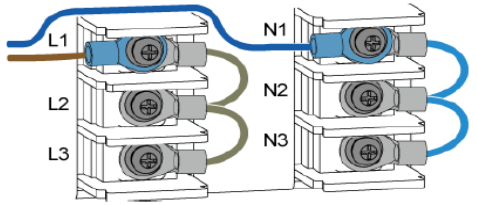
AC Power Cabling -BTS 3900 ,AC I/P



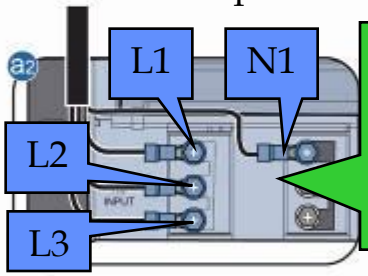
220 V AC single-phase input



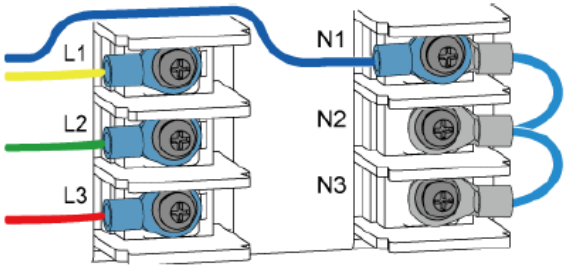
Short-circuiting strap for wiring terminals.



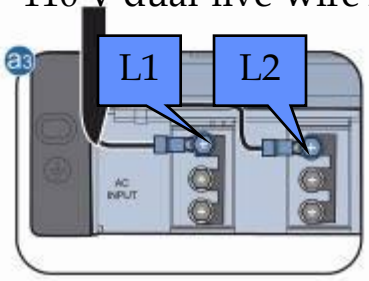
220 V AC three-phase input

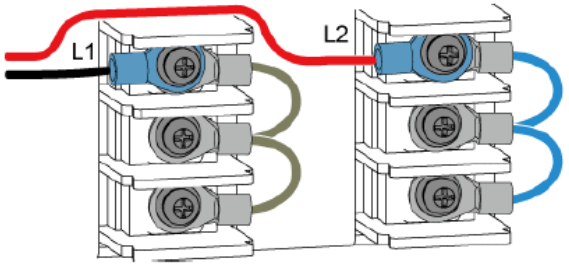


Short-circuiting strap for wiring terminals is removed.



110 V dual-live-wire input





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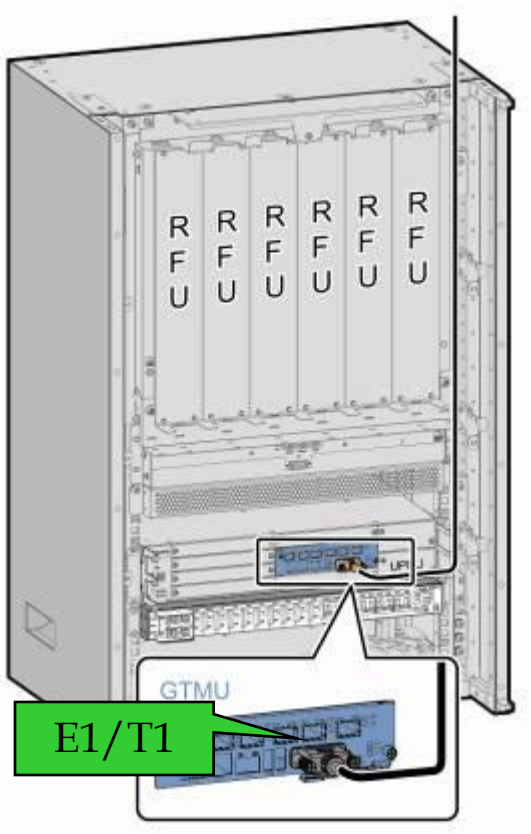
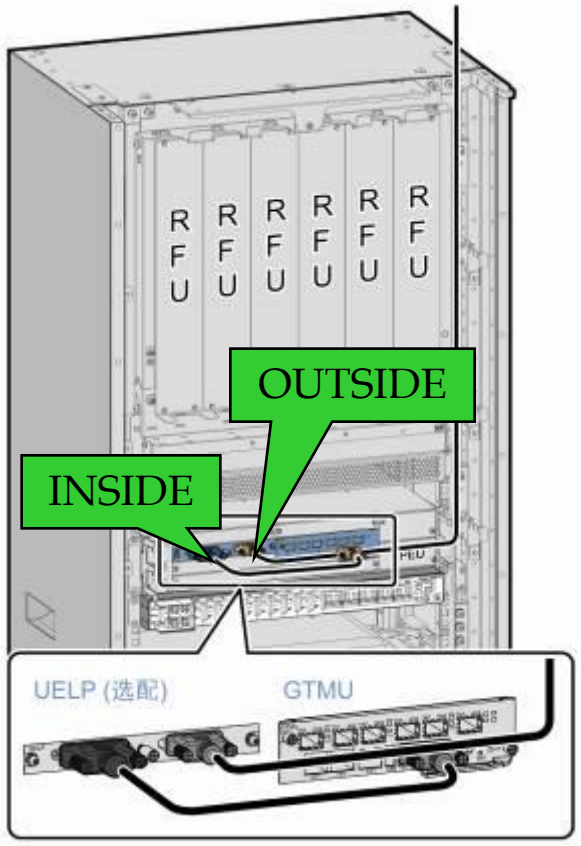
E1 Cabling in BTS3900

Connection of the E1 cable



Cable connections with the UELP configured



Prerequisite

Ensure that both ends of the E1 cable are disconnected. Then, weld connectors to the bare wires at one end of the E1 cable all at once.

Procedure

❑Install the E1/T1 cable.

❑If the UTRP is not configured, link the DB26 male connector of the E1/T1 cable to the port labeled E1/T1 on the GTMU.

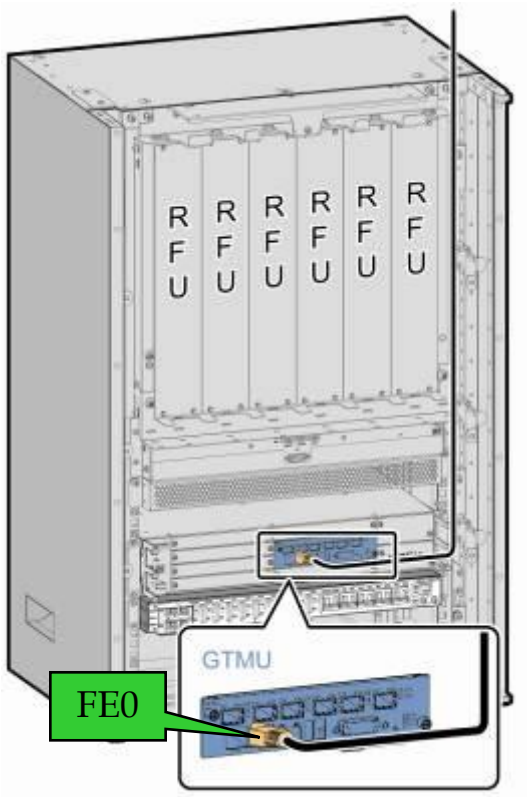
❑If the UTRP is configured, link the DB26 male connectors of the E1/T1 cables to the ports labeled E1/T1 on the GTMU and UTRP, and then tighten the screws.

❑Route the E1/T1 cable along the cable trough on the right of the cabinet, and then use cable ties to bind the cable.

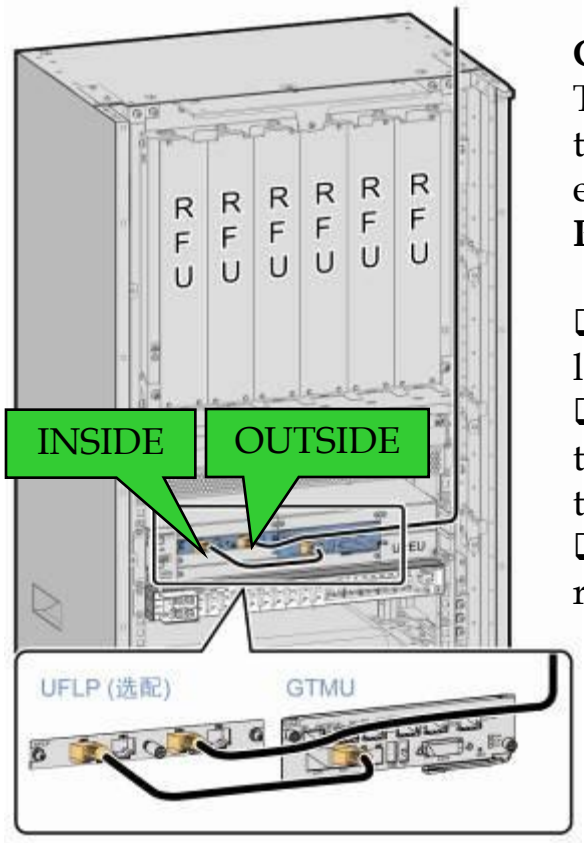
❑Attach labels to the installed cables by referring to Attaching an L-Shaped Label.

FE Cabling-BTS 3900

Connection of the FE cable



Cable connections with the UFLP configured



Context

The FE/GE cable is a shielded straight-through cable. It has an RJ-45 connector at each end.

Procedure

❑Connect the FE/GE cable to the port labeled FE0 on the GTMU.

❑Route the FE/GE cable along the cable trough on the right of the cabinet, and then use cable ties to bind the cable.

❑Attach labels to the installed cables by referring to Attaching an L-Shaped Label.

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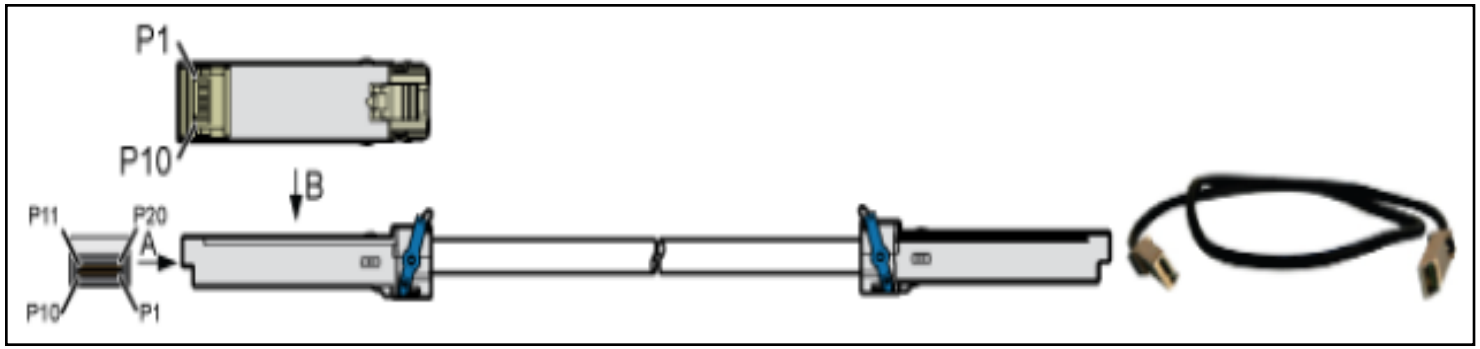
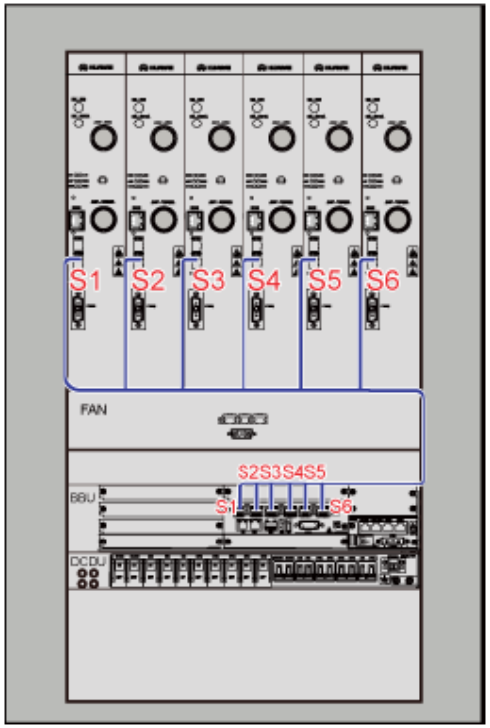
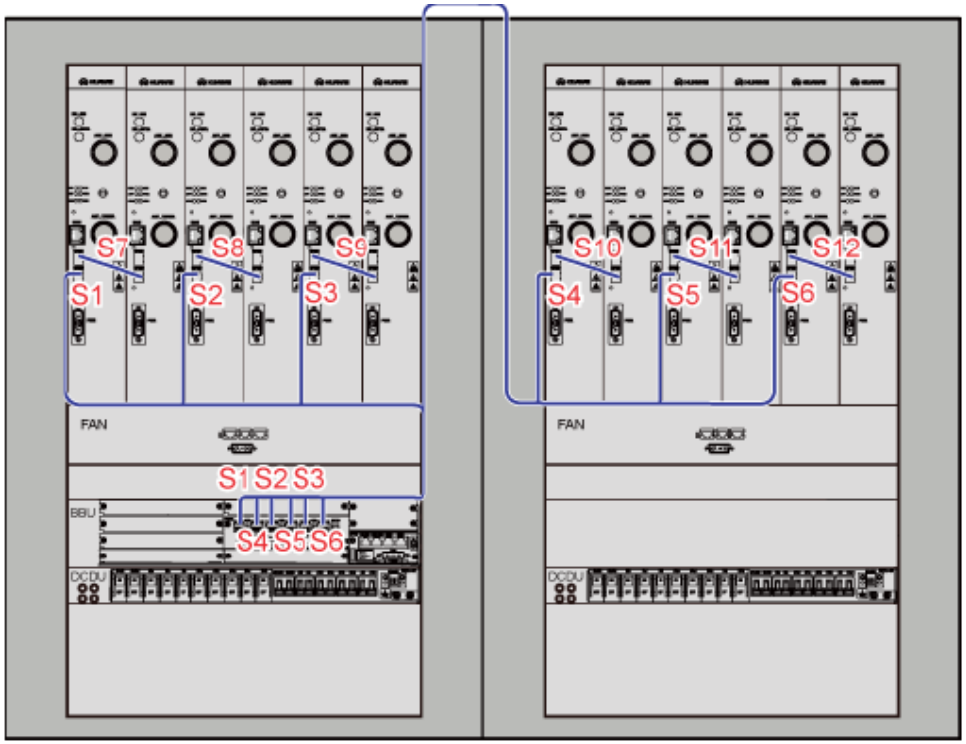
CPRI Cabling- BTS 3900



CPRI Electrical cable used for high speed communication between BBU3900 & RFU's. The CPRI high speed transmission cable that has SFP200 male connector at both ends.





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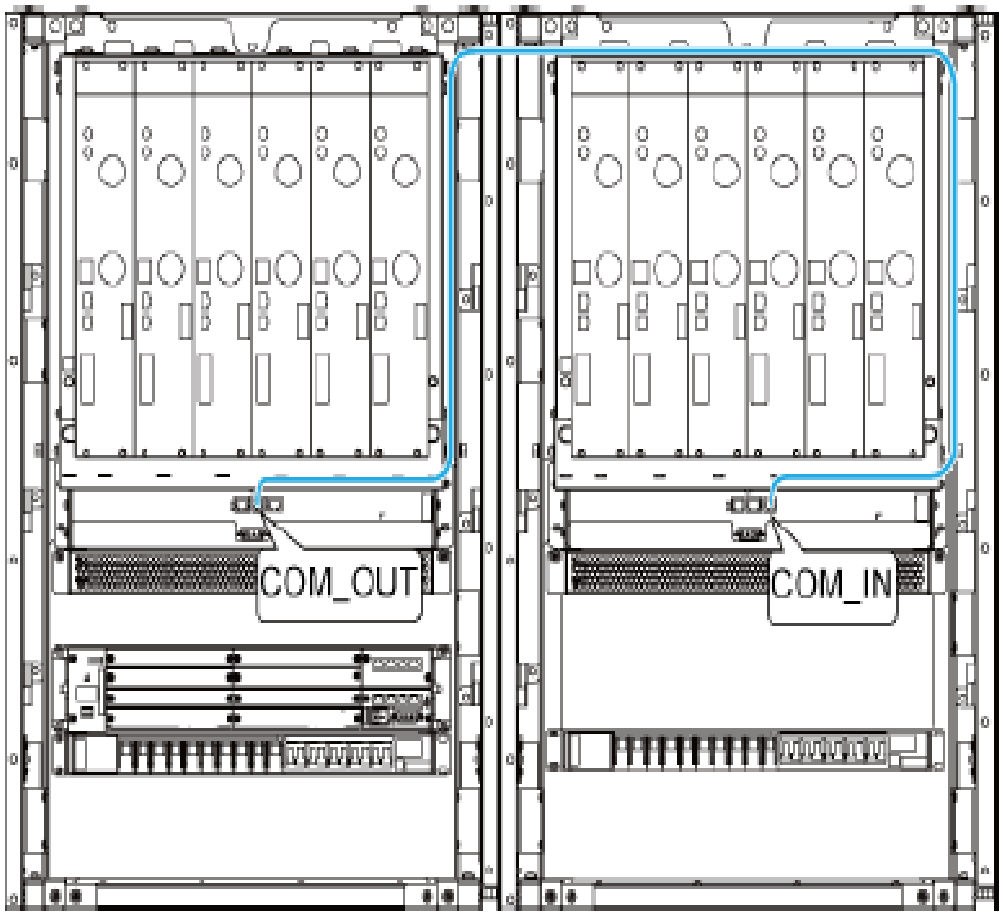
Monitoring Signal Cabling (2 Cabinet ,side by side)



Install the cascading signal cable for the fan units in the scenario of cabinet combination.

Installing Two Cabinets Side-by- Side.
The primary cabinet is positioned on the left, and the secondary cabinet is positioned on the right. Connect one end of the cascading signal cable to the COM_OUT port on the primary cabinet, and connect the other end of the cascading signal cable to the COM_IN port on the secondary cabinet.

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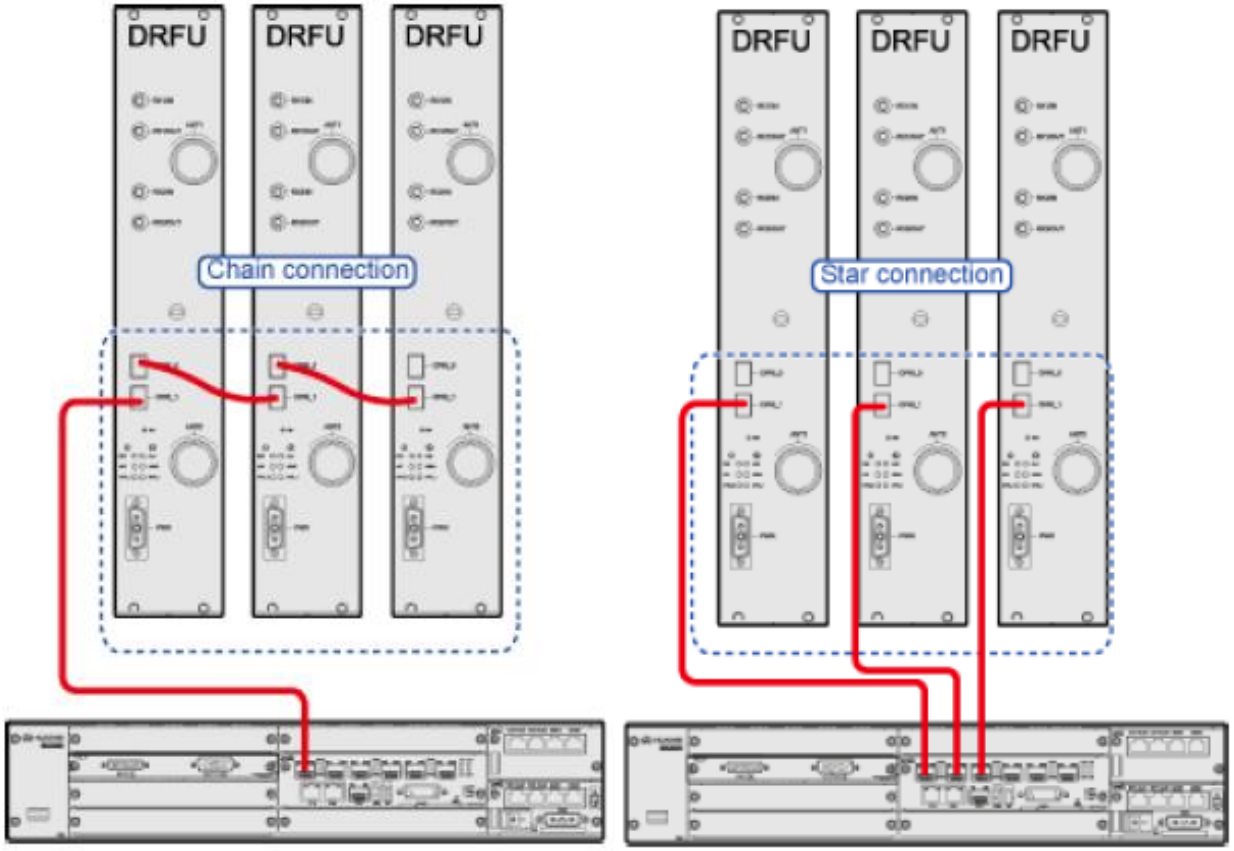
CPRI Cabling- BTS 3900



Topology	Application Scenario
Star	Supports the minimum configuration scenarios
Chain	Supports the maximum configuration scenarios

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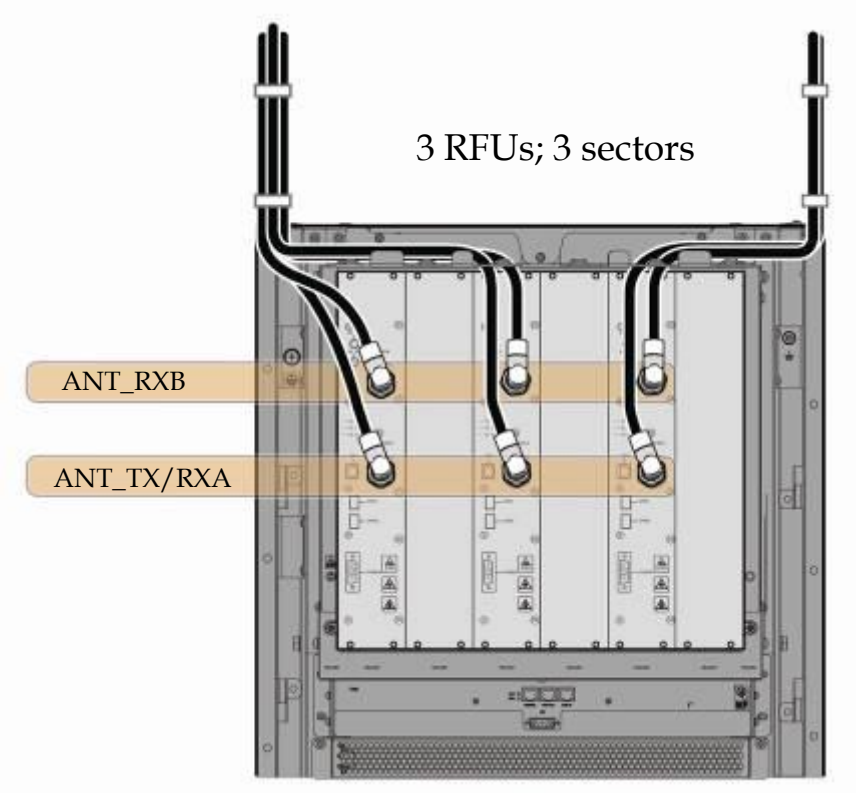
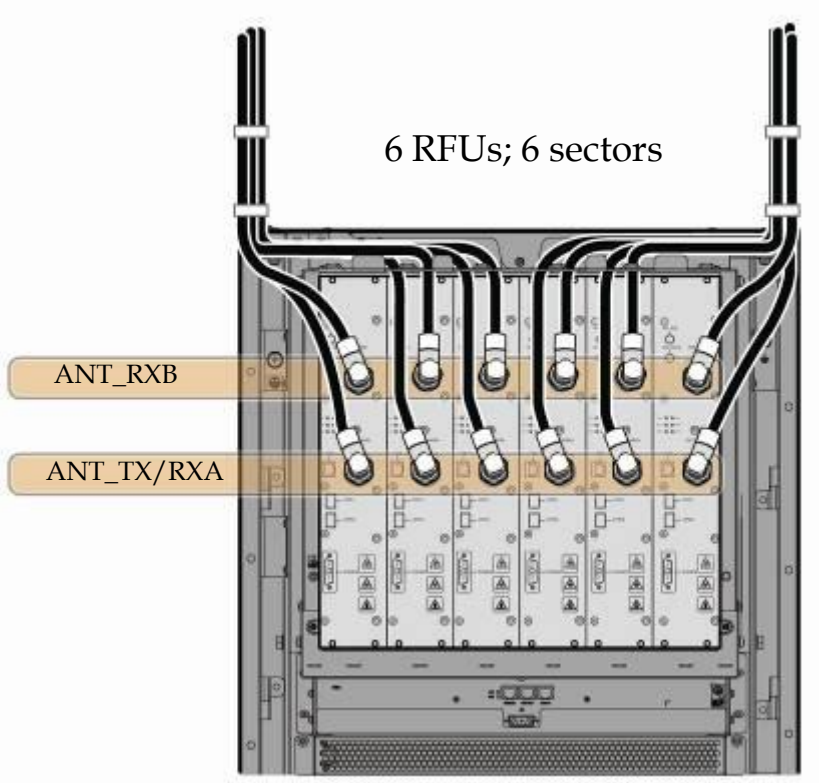
RF Jumper Cabling-BTS 3900





⚠ CAUTION

- The installation sequence is from top to bottom and from both sides to the middle.
- When bending the RF jumpers, do not damage the jackets of the jumpers.

- To facilitate future capacity expansion by stacking cabinets, ensure that an extra length of 300 mm is reserved for each jumper.
- If a single cabinet is installed, the RF jumpers are routed along the left and right cable troughs.
- When adding a DIN connector, use a wrench to tighten it until the fastening torque is 25 N•m to 35 N•m.
- The connectors of the jumpers should be properly added and securely linked to the modules.
- The requirement for bending radius of the 1/2-inch super-flexible jumper is more than 50 mm.

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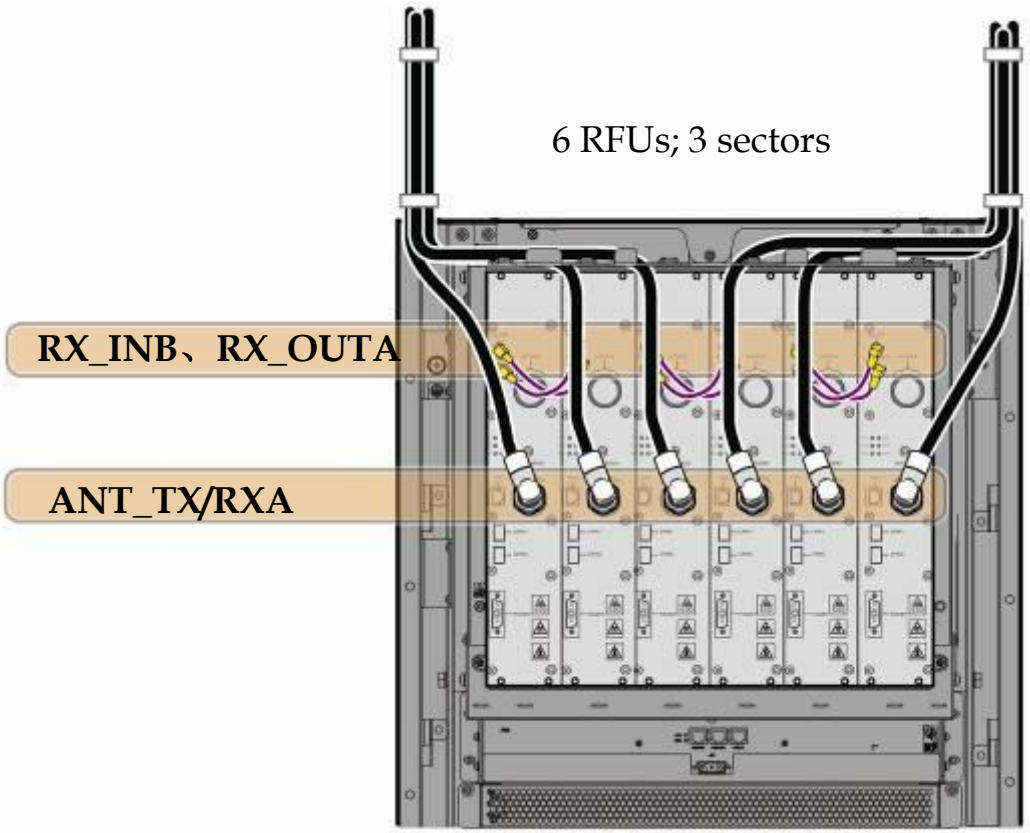
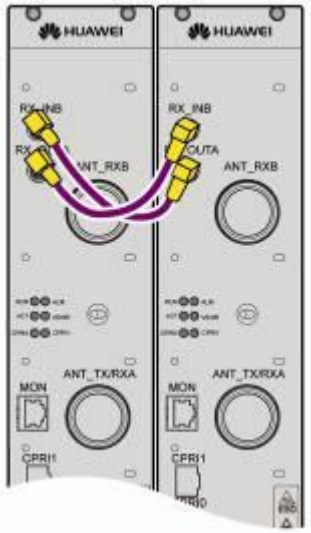
RF Jumper Cabling- BTS 3900



Interconnections of cables at the RX_INB and RX_OUTA ports



RFU	From	To
RFU0&1	RFU0：RX_INB	RFU1：RX_OUTA
	RFU0：RX_OUTA	RFU1：RX_INB
RFU2&3	RFU2：RX_INB	RFU3：RX_OUTA
	RFU2：RX_OUTA	RFU3：RX_INB
RFU4&5	RFU4：RX_INB	RFU5：RX_OUTA
	RFU4：RX_OUTA	RFU5：RX_INB

⚠ CAUTION

When bending the RF jumpers, do not damage the jackets of the jumpers.

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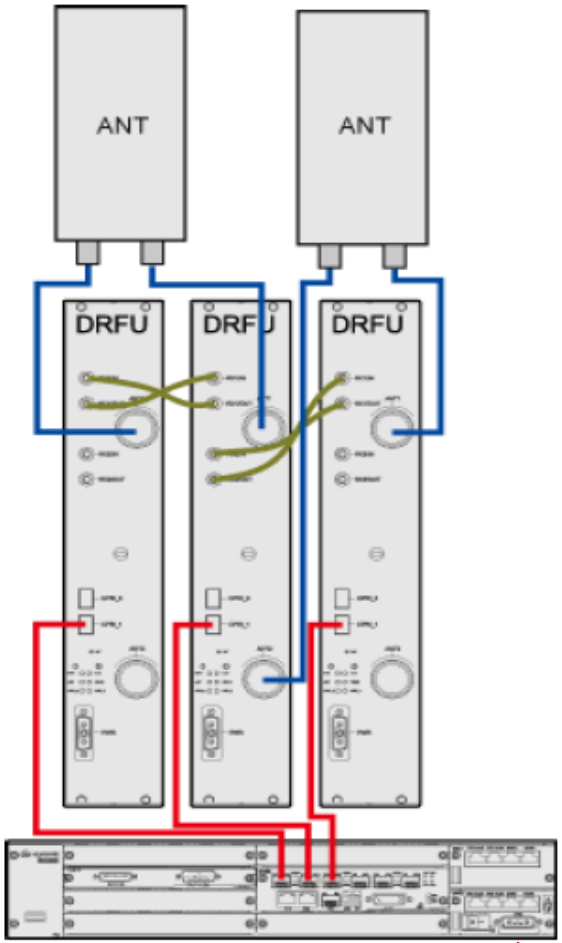
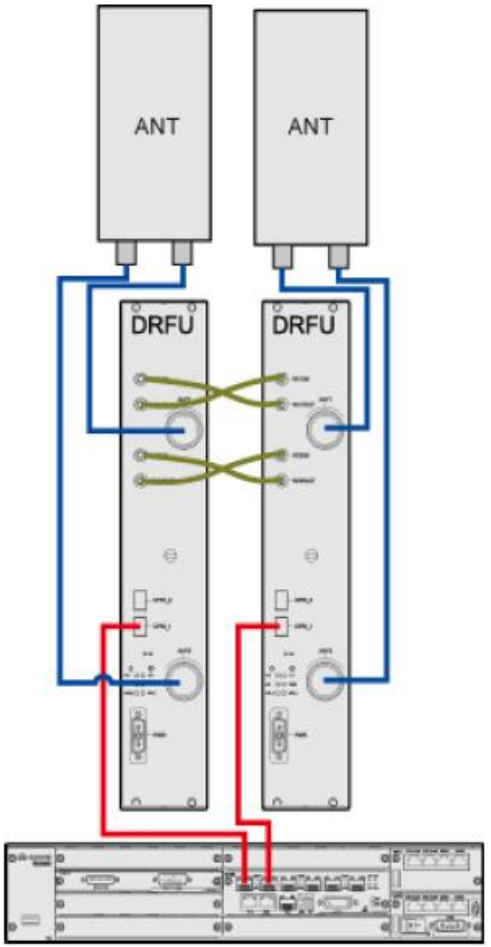
RF Jumper Cabling- BTS 3900

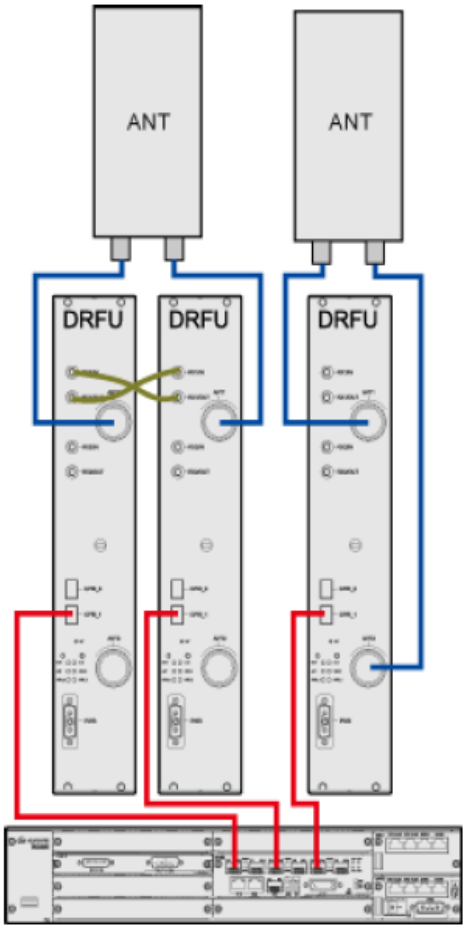
(3/3 CONFIG.)



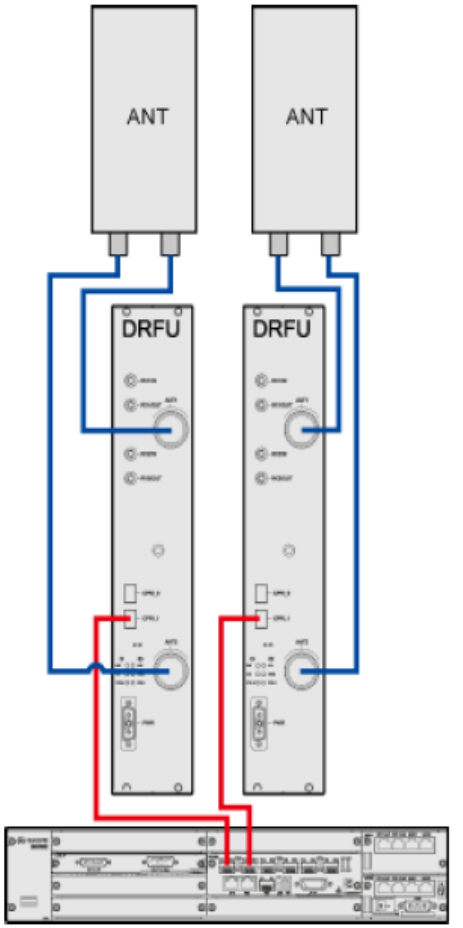
(4/4 CONFIG.)



(6/6 CONFIG.)



(2/2 CONFIG.)



RF jumper

CPRI signal cable

RF jumper between the cascaded RFUs

BBU

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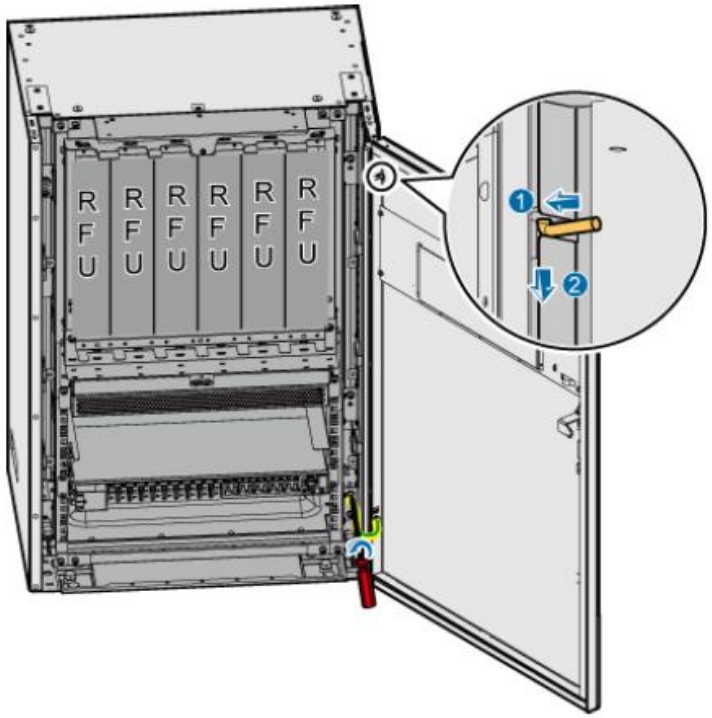
Cabinet Door Installation & It's Grounding

Removing the Cabinet Door

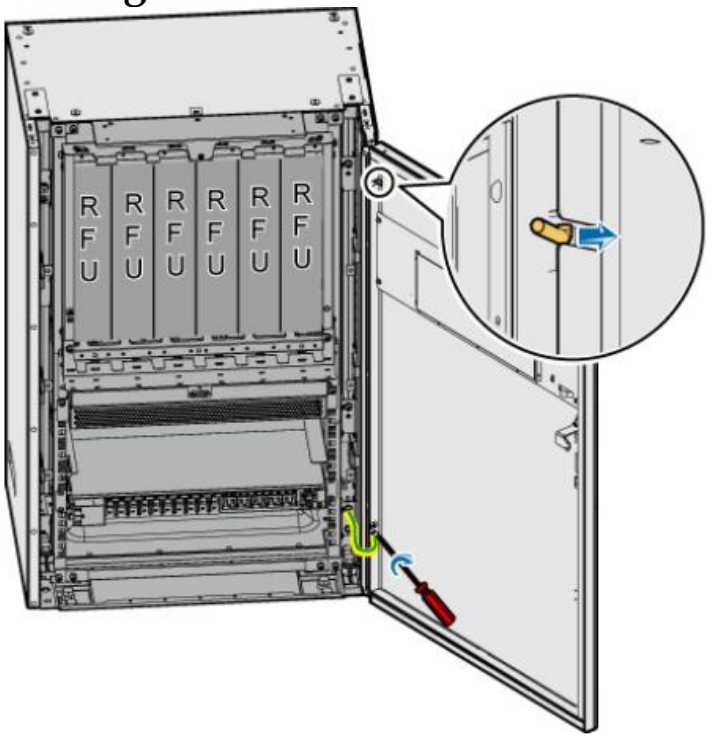


Remove the equipotential cable from the lower part of the cabinet door. After that, rotate the spring pin counter clockwise by 90 degrees and press the pin to remove the cabinet door.

CAUTION

When removing the cabinet door, make sure that it does not fall off suddenly and hurt operators.

Installing the Cabinet Door



After the spring pin is rotated towards the installation hole, rotate it clockwise until it is tight against the cabinet door.

NOTE

After the cabinet door is installed, install the equipotential cable for the cabinet door.

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Choosing MCB for BTS

Defective Picture

Correct Picture

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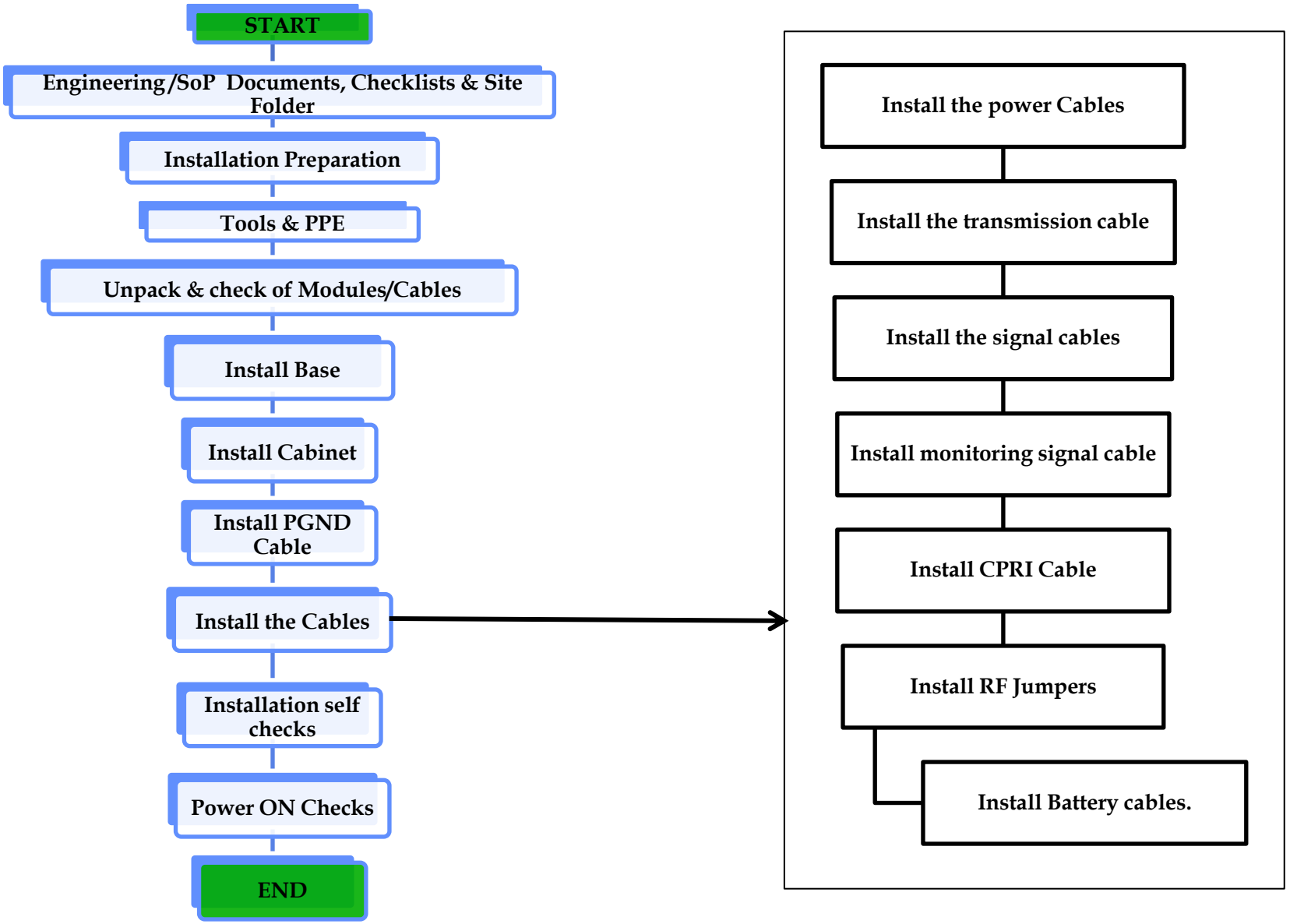
BTS3900A INSTALLATION

Procedure-BTS 3900A Installation



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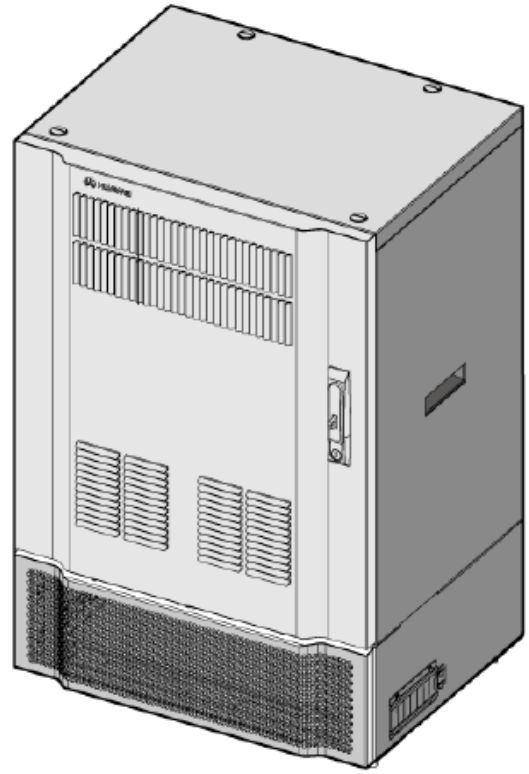
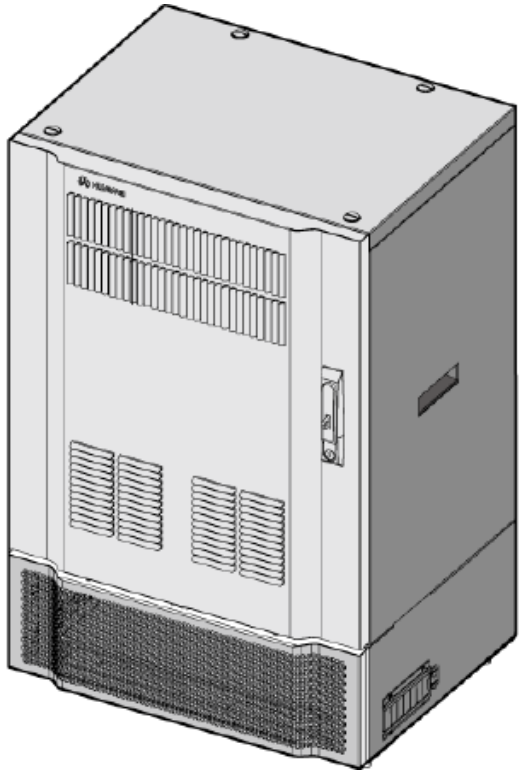
Cabinet Appearance (BTS3900A)

Note-

- The APM30H Provides an auxiliary solution to the outdoor applications of Huawei wireless Products. It supplies DC power & backup power to the distributed or separated base station in
- Outdoor scenario. It can also provide space for installing BBU & transmission devices.
- The APM30H can work with the distributed or separated base stations, meeting the Requirements in different scenarios.





Note-

The TMC11H has the following features in terms of its structure,

- According to different applications scenario, the TMC11H can be configured with DCDU-03A,DCDU-03B,DCDU-03C or DCDU-03D.
- The DCDU-03 provides 9 Nos. of O/P & reports surge protection alarms.
- The TMC11H provides 11U space for user equipments.

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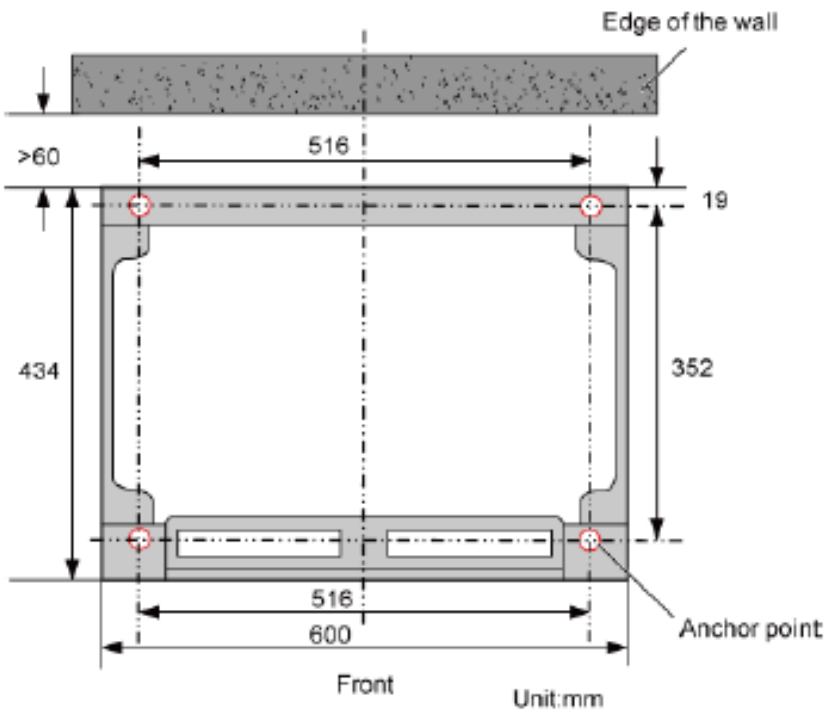
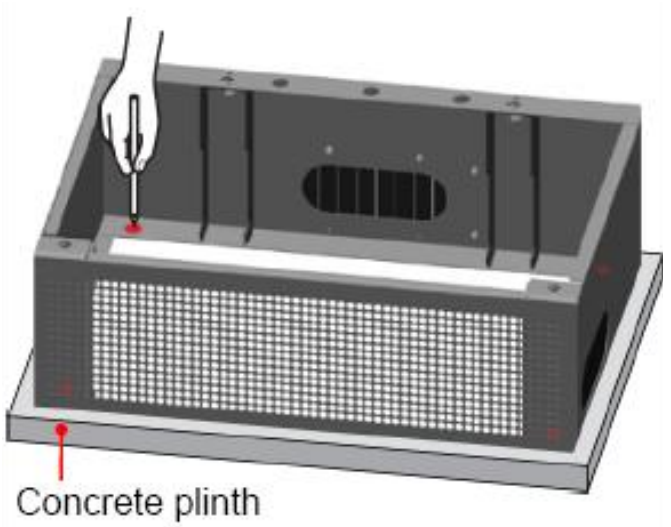
Installation Of Base



Procedure of Positioning,

- ❑ Determine the position for installing the cabinet according to the approved Layout Plan.
- ❑ On the concrete pad, mark holes to determine the installation position of the base.
- ❑ After marking all the holes, use the measuring tape to check whether the distances between the holes are accurate.



Pre-requisite of Concrete Plinth,

- ❑ The height of the concrete pad must meet the heat dissipation and waterproofing requirements of the cabinet.
- ❑ The concrete pad must be at least 200 mm above the floor.
- ❑ The horizontal error of the poured concrete pad must be less than 5 mm.

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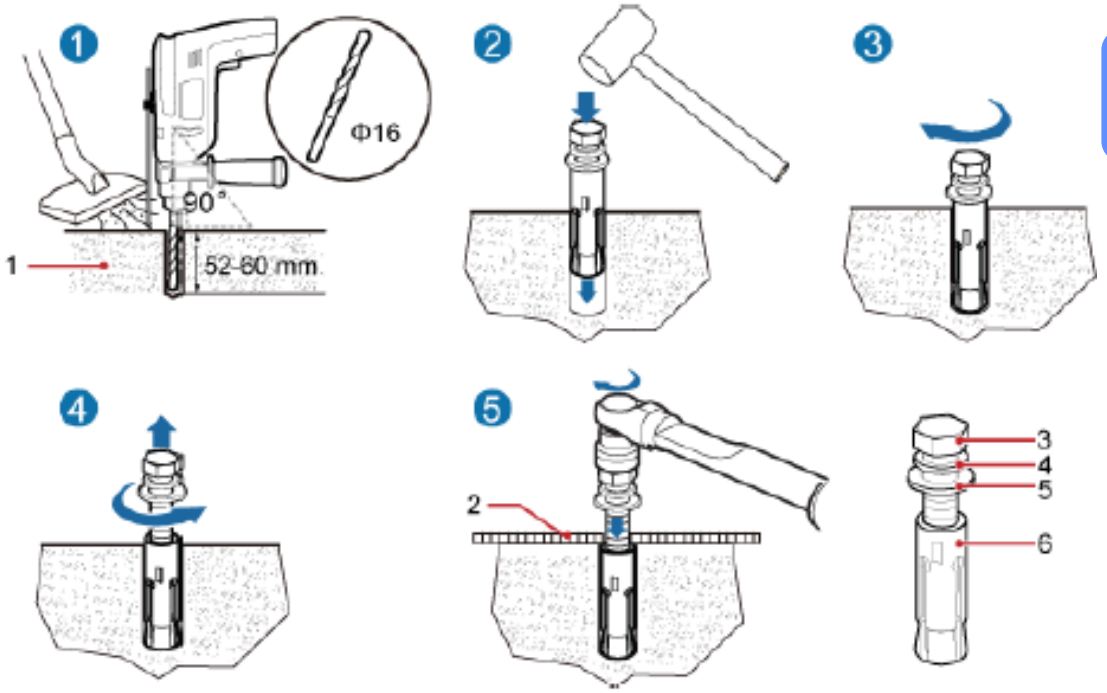
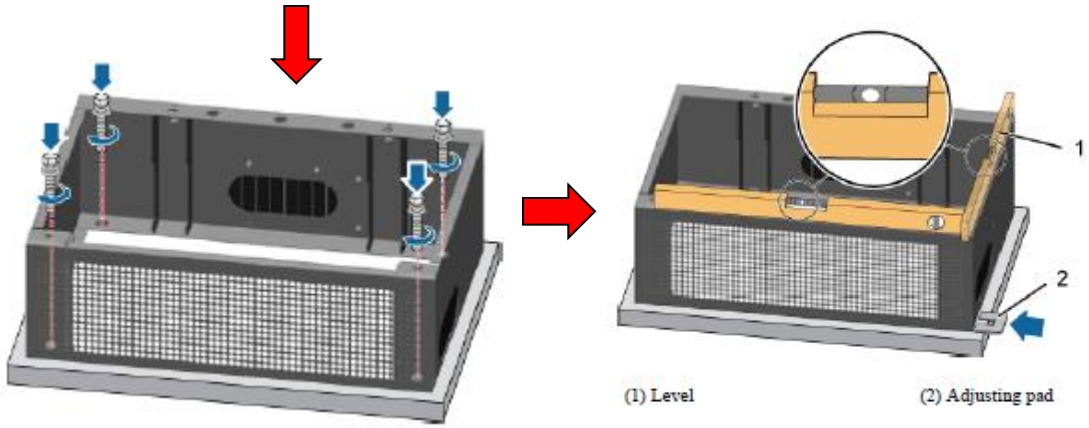
Installation Of Base



(1) Concrete pad (2) Base of the cabinet (3) M12x60 bolt (4) Spring washer (5) Flat washer (6) Expansion tube



(1) Level (2) Adjusting pad

Drilling the Hole for fasteners

- Use Hammer drill with M16 bit to drill holes at the anchor points & ensure that the depth of each holes ranges from 52mm to 60mm.
- Don't drill holes through the holes in the base by using hammer drill. Drilling holes through the holes in the base may damages the paint on the base.
- Take proper safety measures to protect eyes & respiratory system against dust before drilling.
- Use vacuum cleaner to clear the dust inside & around holes. If the inner hole spacing is too wide /narrow ,locate & drill holes again.
- Slightly tighten the expansion bolt, and then put the expansion bolt assembly into the hole vertically.
- Use a rubber mallet to hammer the expansion bolt until the expansion tube is buried into the hole, and then tighten the bolt.
- Remove the bolt, spring washer, and flat washer counterclockwise.
- After dismantling the expansion bolt assembly, ensure that the top of the expansion tube is on the same level as the floor.
- Align the base, and then install the bolt with the spring washer and flat washer.
- Use a level to check the base level. If the base is not level, use adjusting pads to adjust the base level.

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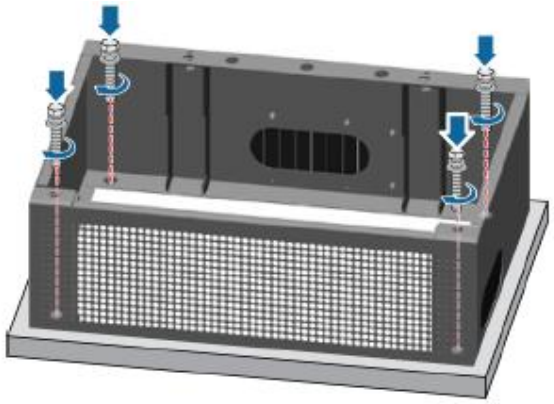
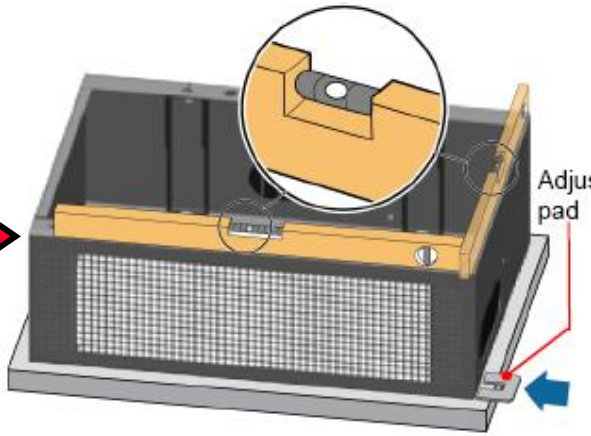
Installation of Base of BTS3900A

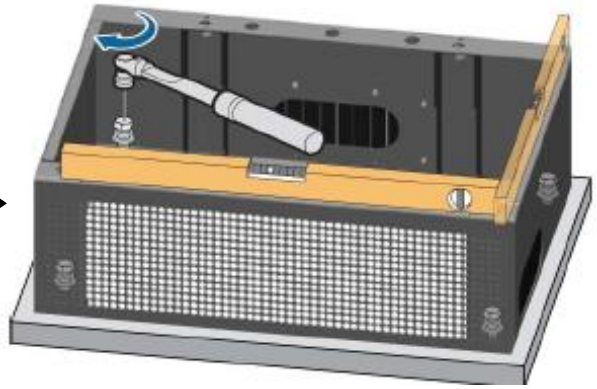
4-ALIGN BASE & INSTALL BOLT WITH SPRING & FLAT WASHER



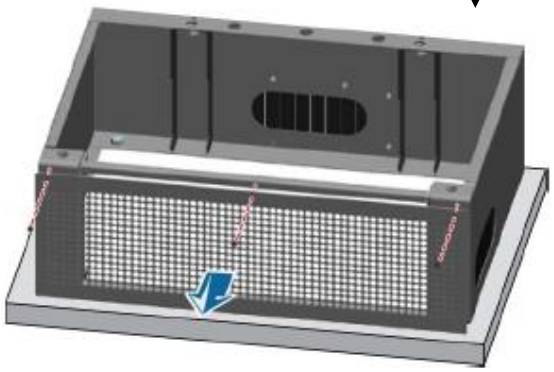
5- CHECK THE BASE LEVEL



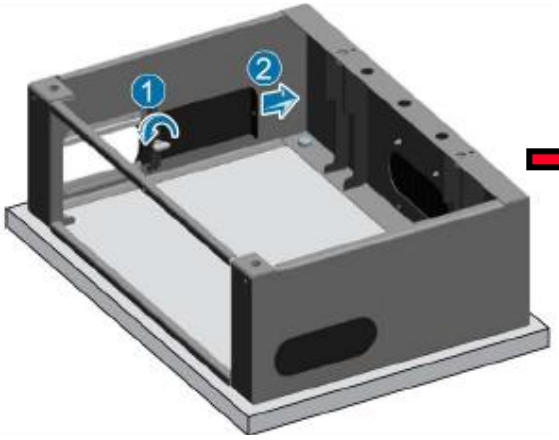
6- TIGHTEN THE BOLT USING TORQUE WRENCH



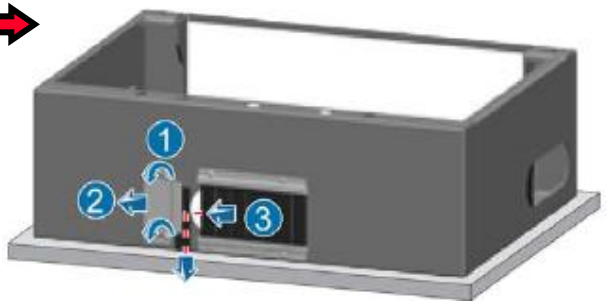
7-REMOVE COVER PLATE



8-REMOVE BAFFLE PLATE FROM BOTH SIDE OF BASE



9-REMOVE BAFFLE PLATE FROM BACK SIDE OF BASE



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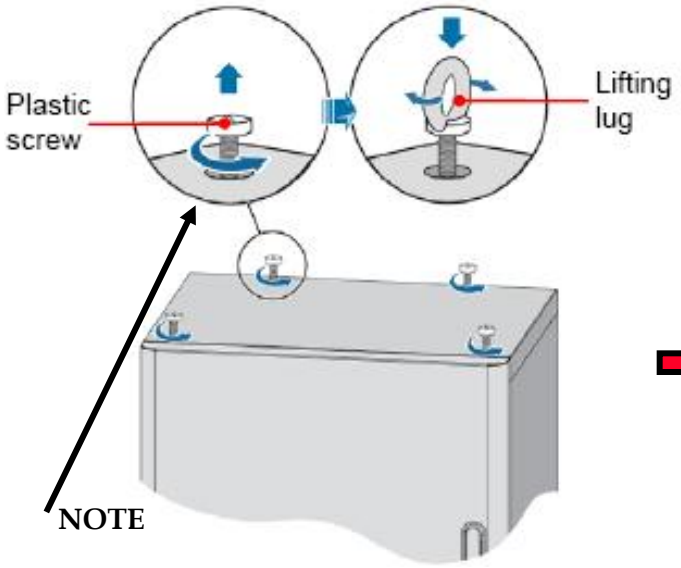
Installation of Cabinet-BTS3900A (Option-1)

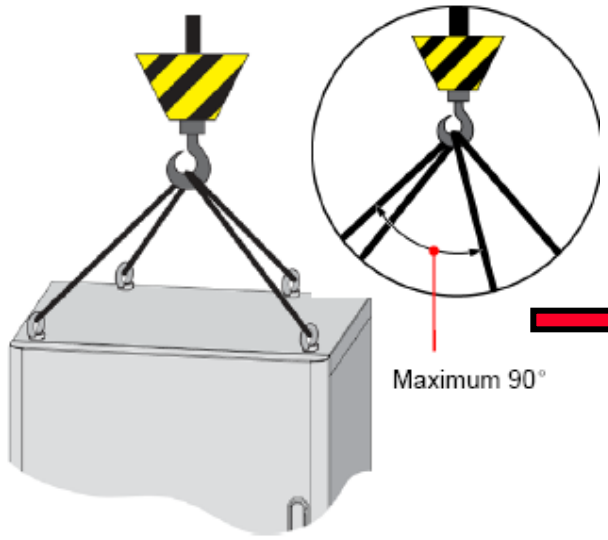
INSTALL THE LIFTING HOOK



NOTE

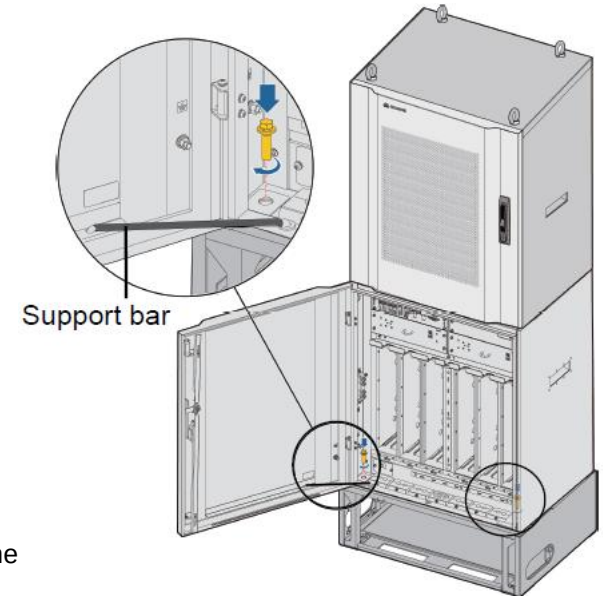
DON'T DAMAGE PLASTIC SCREWS,KEEP THEM FOR USE

INSTALL THE ROPES

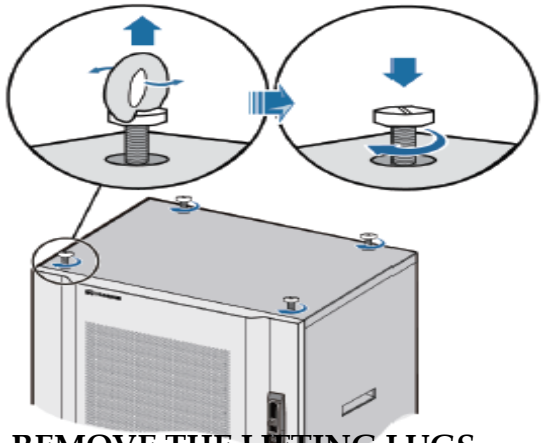


MOVE THE CABINET ON BASE

FIX THE CABINET ON BASE



REMOVE THE LIFTING LUGS



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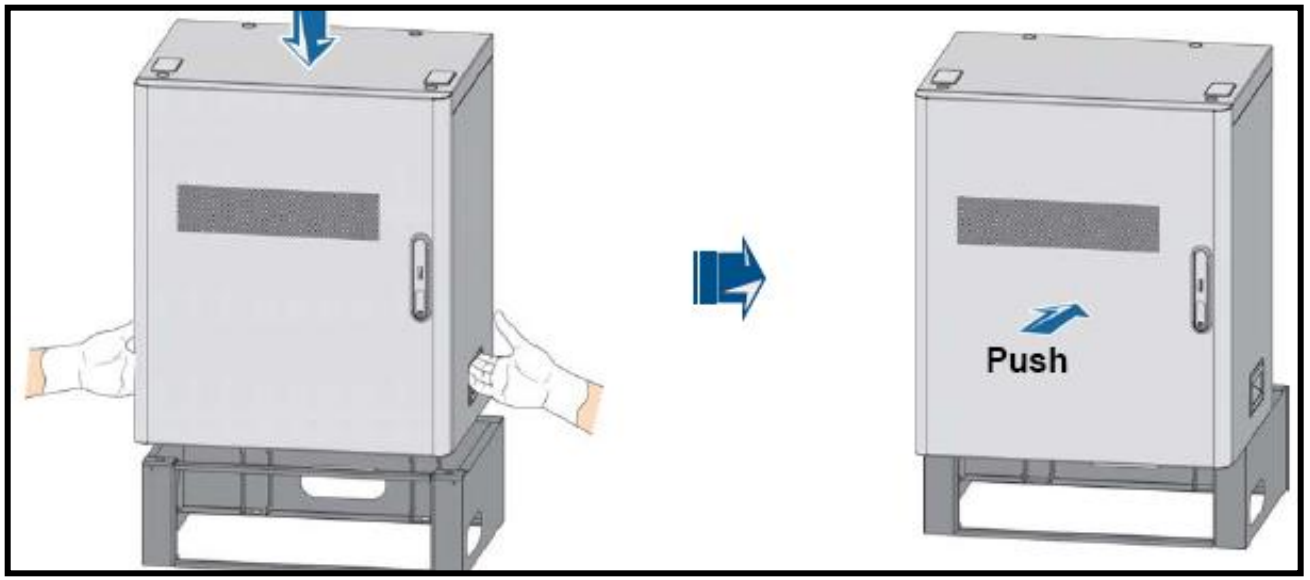
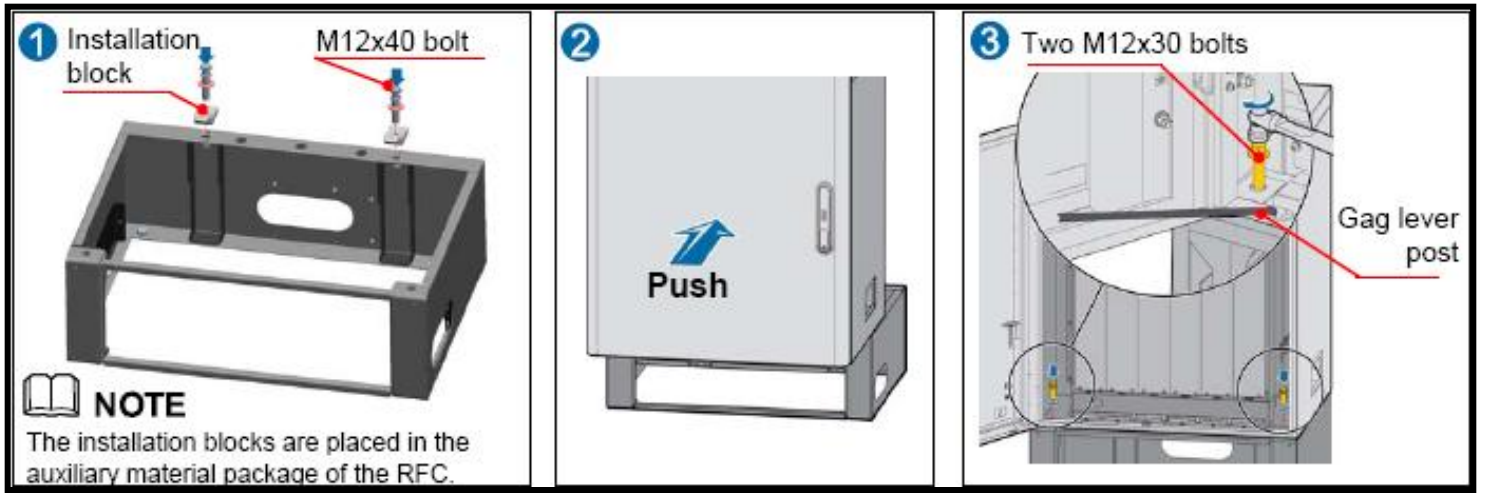
Installation of Cabinet-BTS3900A (Stacking)

LIFTING THE CABINET MANUALLY ON BASE

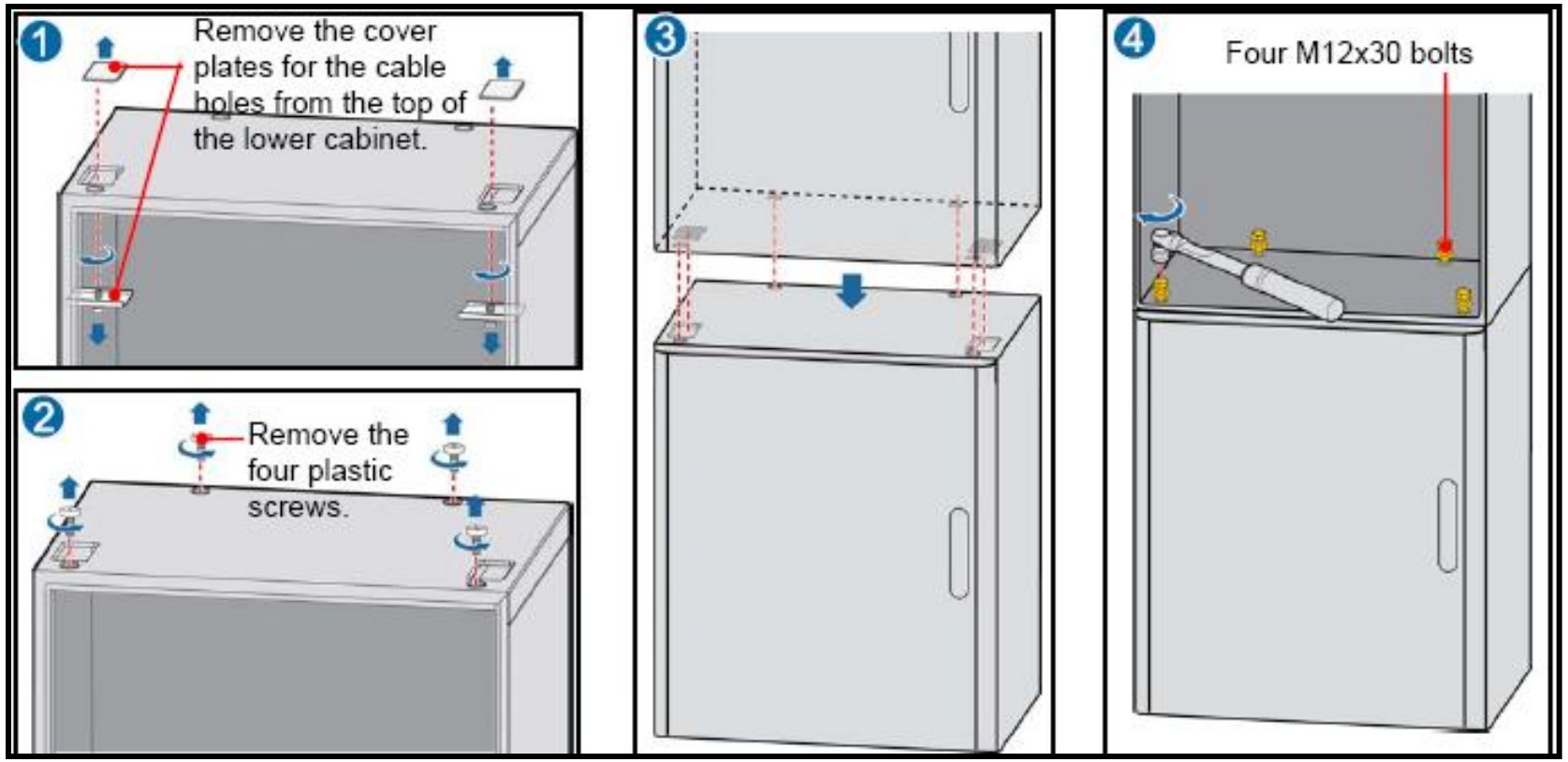


SECURING CABINET ON BASE

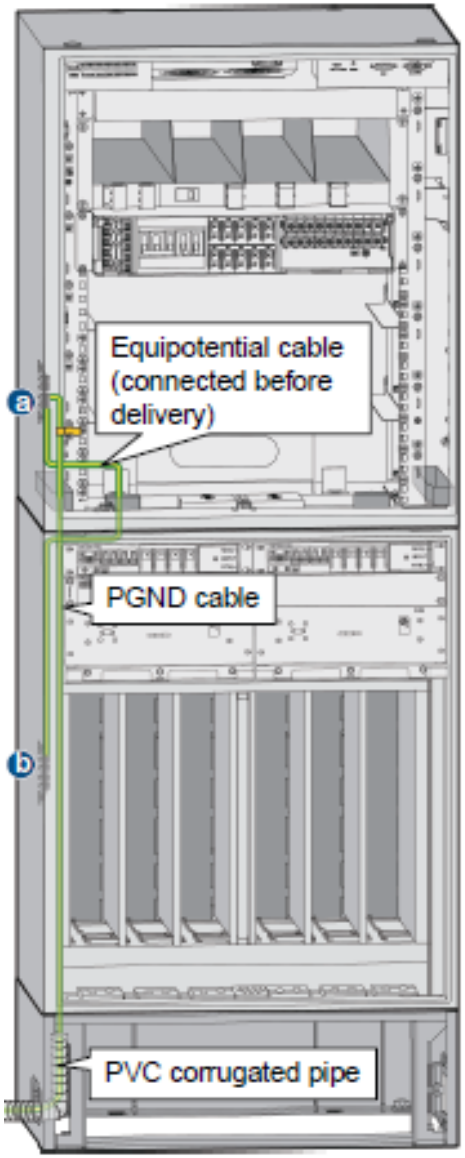


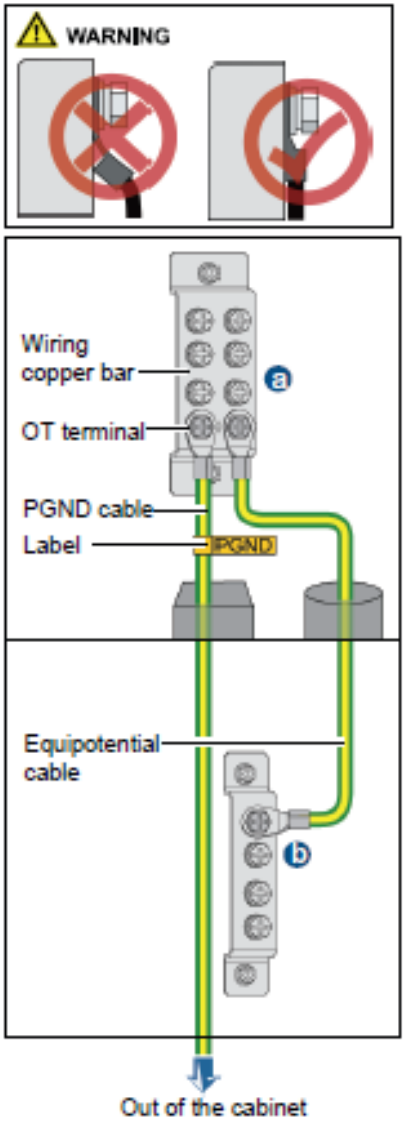
Stacking of Cabinets-BTS3900A (Option-2)

STACKING SECOND CABINET ABOVE THE FIRST



PGND & Equipotential grounding-BTS3900A

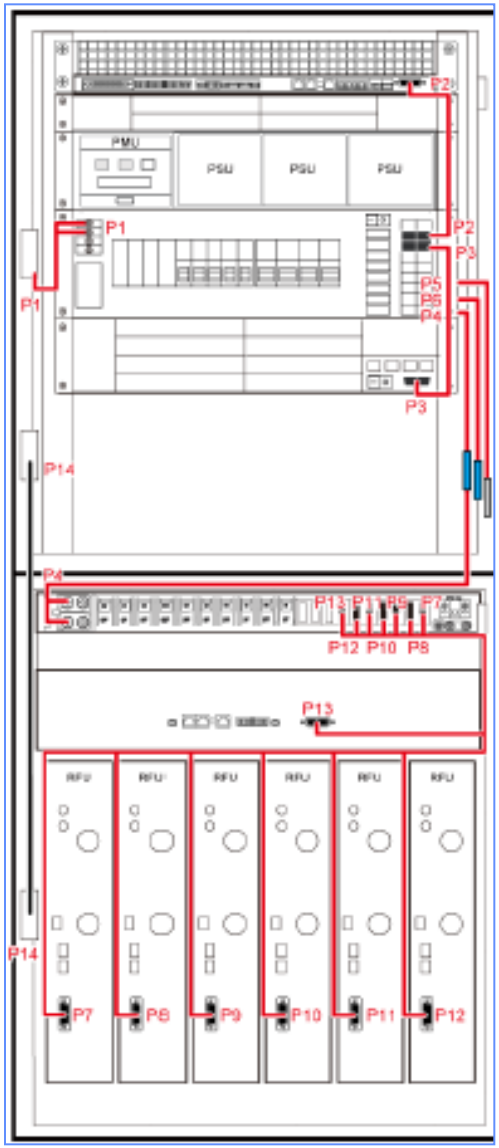




HUAWEI

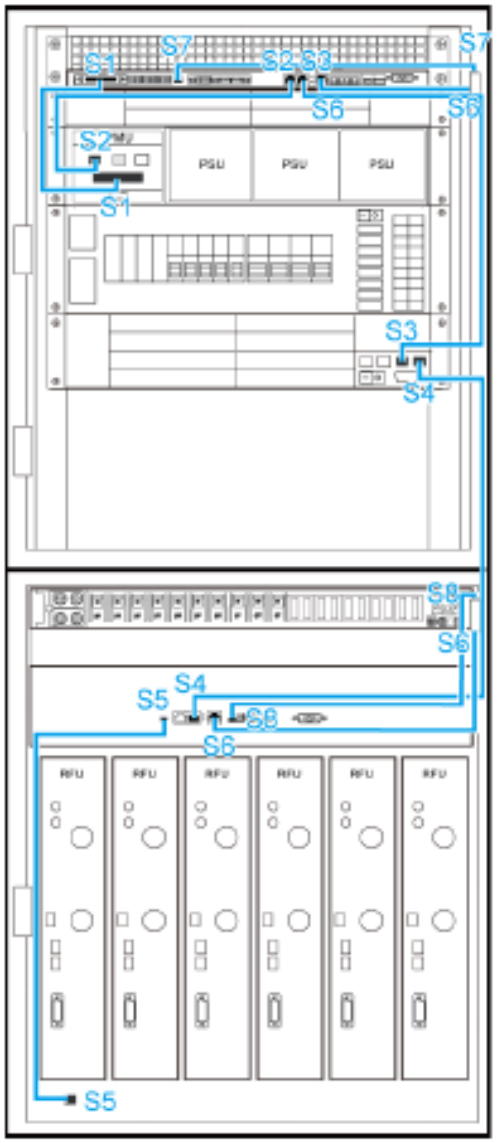
Checking the internal Cables-BTS3900A+APM30H

After unpacking the cabinet , check the internal cables as per below pics for BTS3900A + APM30H,VerB

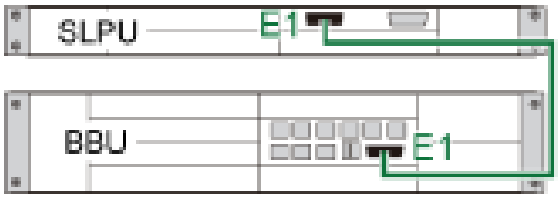


Signal Cable

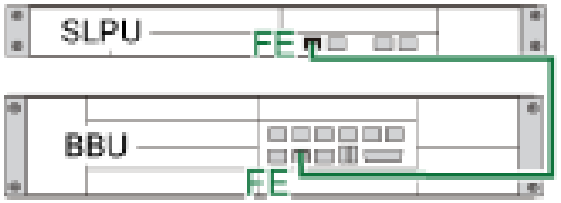
Power Cable



E1/T1 Transmission Mode



FE/GE Transmission Mode



HUAWEI

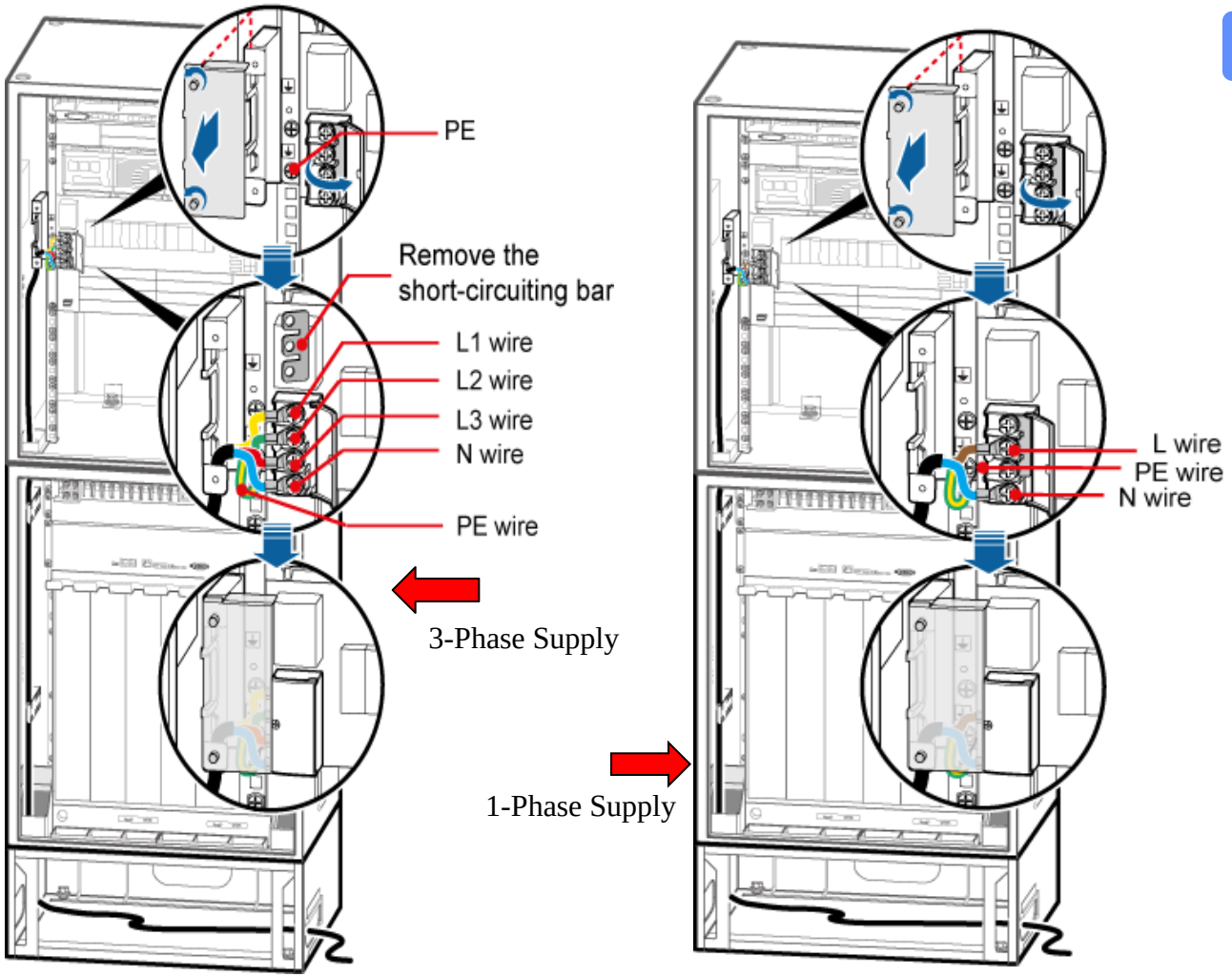
Checking the internal Cables-BTS3900A+APM30H

No.	Cable	One End		The Other End	
		Connector	Installation Position	Connector	Installation Position
P1	Input power cable for the junction box	OT terminal	EPS/AC OUTPUT/L1 and N1	OT terminal	Junction box/L and N
P2	Power cable for the fan box in the APM30H	Easy power receptacle (pressfit type) connector	EPS/LOAD0	3V3 power connector	Fan box in the APM30H/PWR
P3	Power cable for the BBU	Easy power receptacle (pressfit type) connector	EPS/LOAD1	3V3 power connector	BBU/UPEU/ PWR
P4	Input power cable for the RFC	Power series 120 connector (blue)	EPS/Power series 120 connector (blue)	OT terminal	DCDU-01/ INPUT/RTN(+) and NEG(-)
P5	Power cable for the IBBS200D/ IBBS200T	Power series 120 connector (grey)	EPS	OT terminal	Reserved for the IBBS200D/ IBBS200T
P6	Input power cable for the RFC	Power series 120 connector (blue)	EPS	OT terminal	Reserved for the RFC
P7 to P12	Power cable for the RFU	Parallel terminal	DCDU-01/ RFU0 to RFU5	3V3 power connector	RFU0 to RFU5/ PWR
P13	Power cable for the fan box in the RFC	Parallel terminal	DCDU-01/FAN	3V3 power connector	Fan box in the RFC/PWR
P14	Equipotential cable between the APM30H and the RFC	OT terminal	APM30H/ Ground bar	OT terminal	RFC/Ground bar

No.	Cable	One End		The Other End	
		Connector	Installation Position	Connector	Installation Position
S1	Environment monitoring signal cable	DB50 male connector	PMU/COM	DB50 male connector	Fan box in the APM30H/ HPMI/ PMU_DB50
S2	Monitoring signal transfer cable	RJ-45 connector	PMU/ COM_IN	RJ-45 connector	Fan box in the APM30H/ CMUA/ COM_OUT
S3	Monitoring signal cable between the BBU and the CMUA in the APM30H	RJ-45 connector	CMUA/ COM_IN	RJ-45 connector	BBU/UPEU/ MON1
S4	Monitoring signal cable between the BBU and the CMUA in the RFC	RJ-45 connector	CMUA/ COM_IN	RJ-45 connector	BBU/UPEU/ MON0
S5	Temperature monitoring signal cable for the RFC	4-pin connector	Fan box in the RFC/ CMUA/ TEM	Temperature sensor	Air inlet at the bottom of the RFC
S6	Signal cable for the ELU	RJ-45 connector	ELU	RJ-45 connector	Fan box in the APM30H or in the RFC/CMUA/ ELU
S7	Monitoring signal cable for the door status sensor in the APM30H	2-pin connector	Fan box in the APM30H/ HPMI/ GATE	Bare wire	Door status sensor in the APM30H
S8	Monitoring signal cable for the door status sensor	Cord end terminal	Fan box in the RFC/ CMUA/ GATE	Bare wire	Door status sensor in the RFC

HUAWEI

AC I/P Power Cabling (Incase of APM30H,VerA)

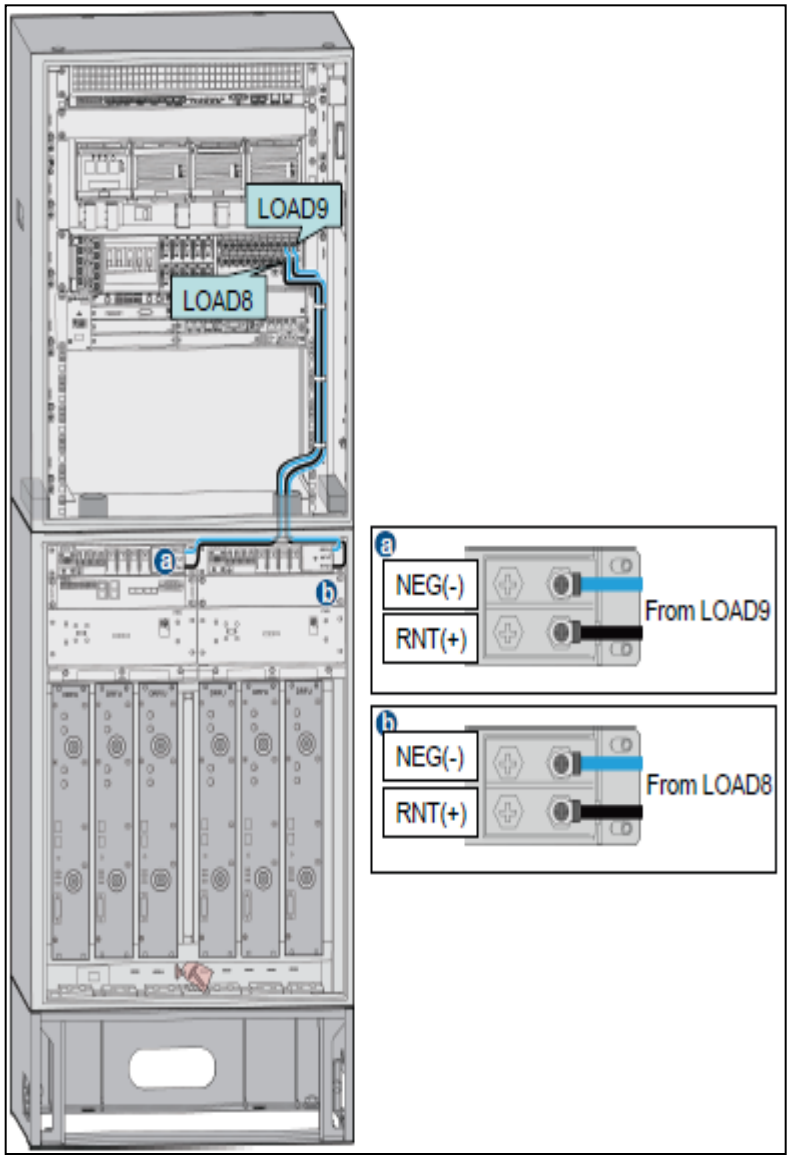


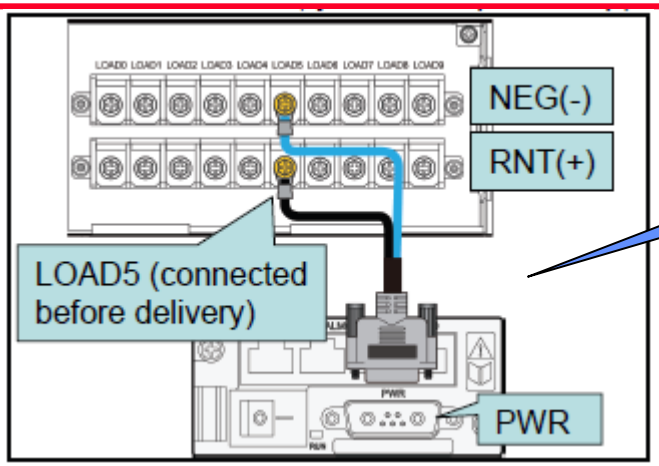
AC I/P Power cabling to APM30H

- Use Temporary Labels to the Cable before cut/Laying.
- Check rating of cable (3-Core/5 Core & Sq.mm) before installation.
- Remove the shorting strip ,incase of 3-Phase input supply.
- Check the rating of Fuse/MCB at mains.
- If length is insufficient ,then replace the cable with longer length (avoid joints on power cable).
- Use proper lugs & crimp with cable.
- Run each cable that leaves the cabinet in the PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.
- Label the installed cables by referring to Attaching a Sign Plate Label.
- The bending radius of the power cable or PGND cable must be at least five times the diameter of the cable.
- The cable ties must face the same direction, and those at the same horizontal line must be in a straight line. Extra length of cable ties must be cut.

HUAWEI

DC Power Cabling (Incase of APM30H,VerA)

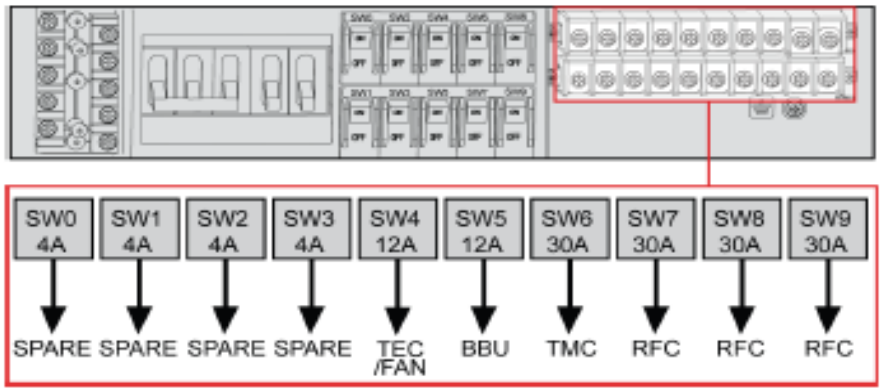




DC Cabling for BBU

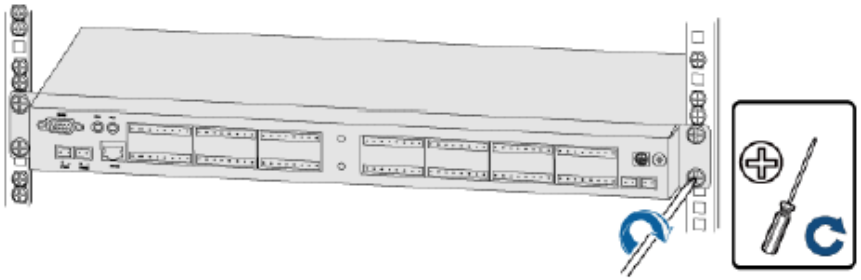
DC Power cabling BBU & RFC

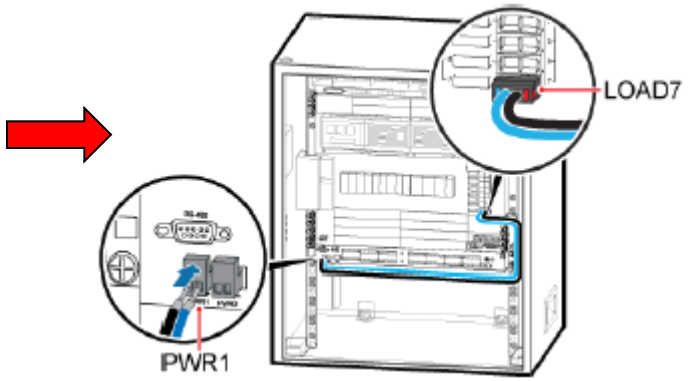
- Skip BBU Power Cabling if it has already done from factory.



HUAWEI

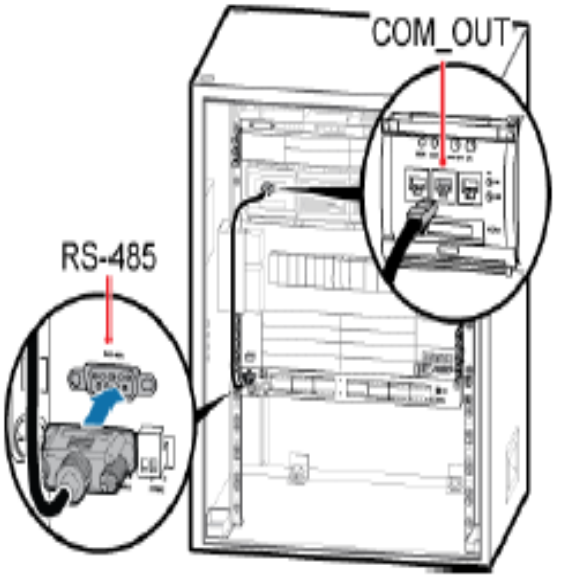
Installation of Optional Modules-EMUA





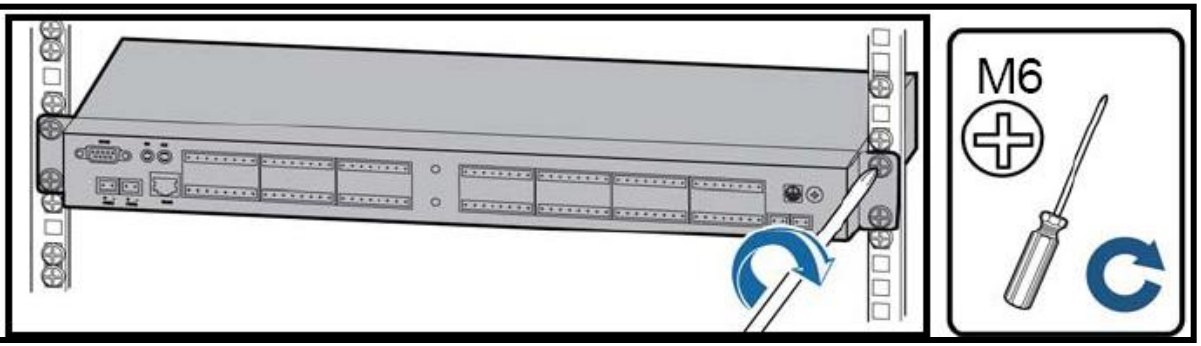
Installation of EMUA incase of AMP30H

- Install the EMUA inside APM30H Cabinet.
- Connect the EMUA to the grounding bus bar near to EMUA.
- Assembling the Cord End Terminal and the Power Cable and Assembling the Easy Power Receptacle (Pressfit Type) Connector and the Power Cable.
- Connect the cord end terminal at one end of the power cable to the transfer terminal of the wiring terminal labeled **PWR1 of the EMUA power cable.**
- Connect the easy power receptacle (press fit type) connector at the other end of the power cable to the DC output terminal on the EPS labeled **LOAD7 in the cabinet.**
- Connect the DB9 male connector at one end of the signal cable to the wiring terminal labeled **RS-485 in left of the EMUA panel.**
- Connect the RJ-45 connector at the other end of the signal cable to **COM_OUT of the** PMU in the cabinet



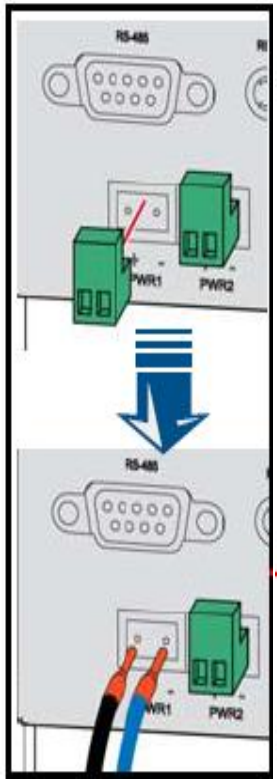
HUAWEI

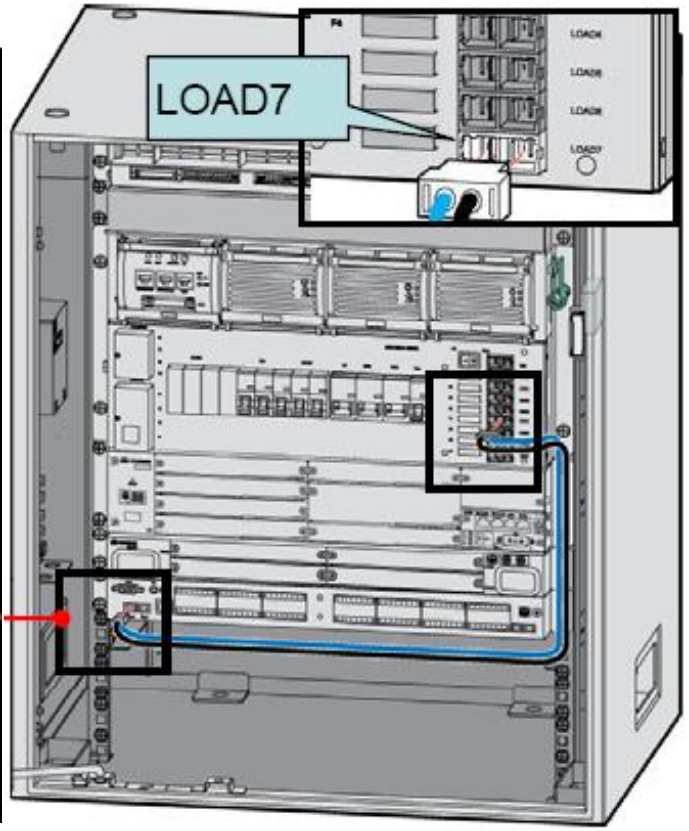
Installation of EMUA & its Cabling-APM30H,VerB

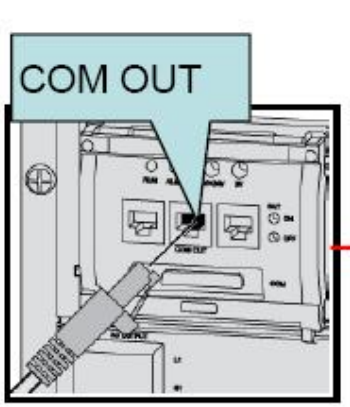


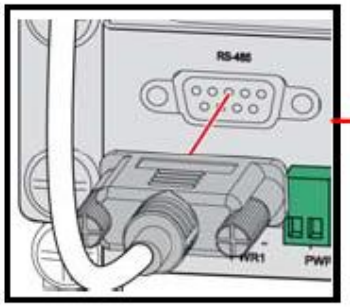
Procedure of Installing EMUA,

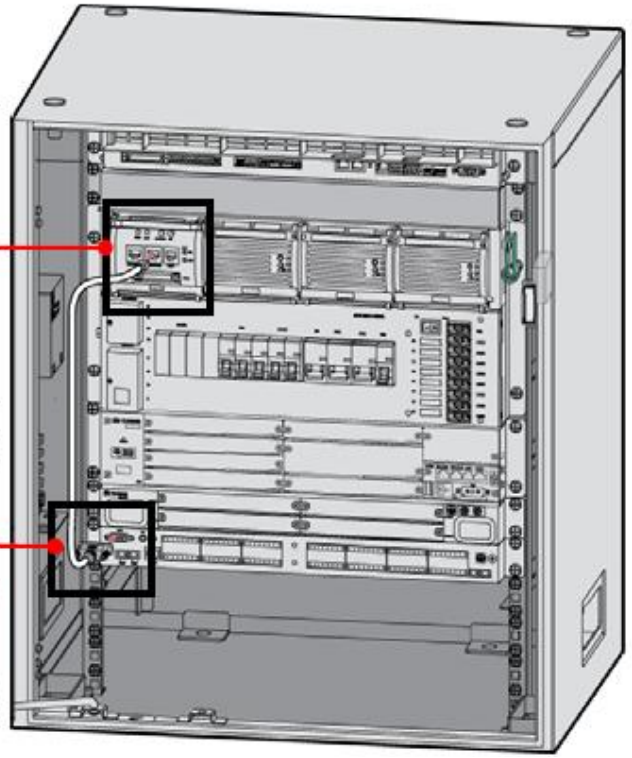
- ❑ Unpack & Install EMUA inside AMP30H Cabinet.
- ❑ Install Power Cable for EMUA.(DCDU to EMUA)
- ❑ Install Signal Cable for EMUA (PMU to EMUA).







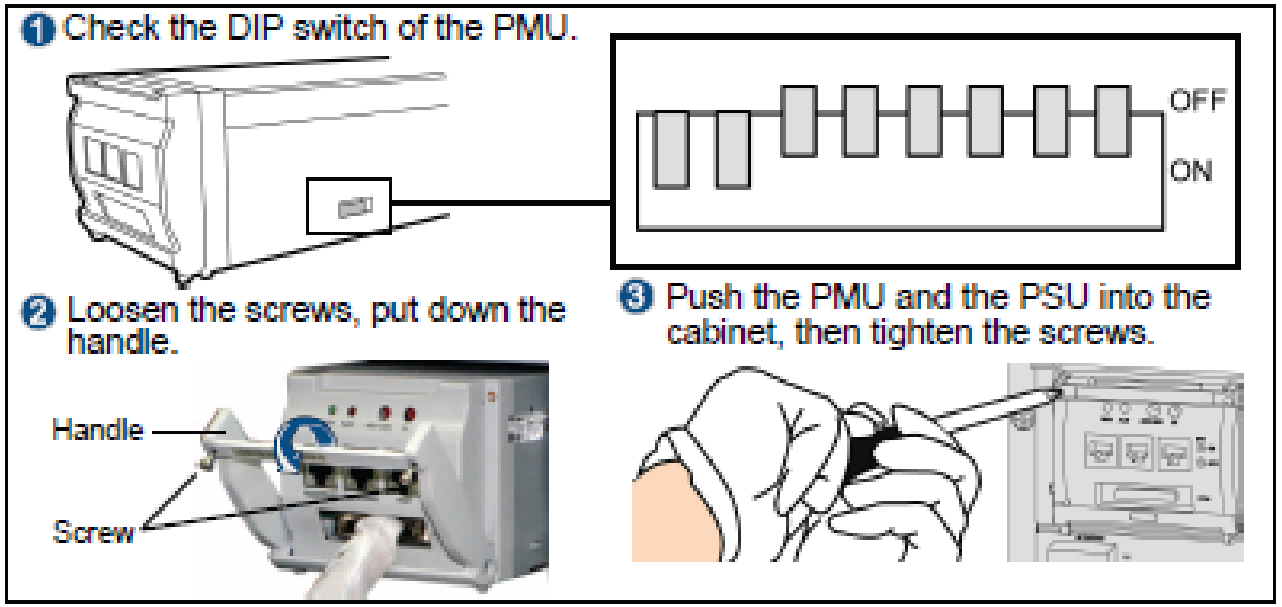




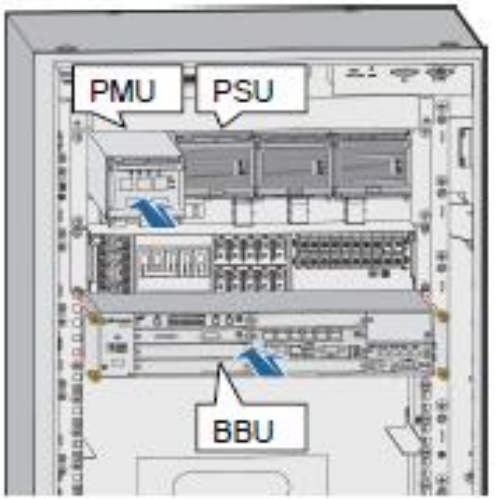
HUAWEI

INSTALLING PMU & PSU'S AND BBU3900

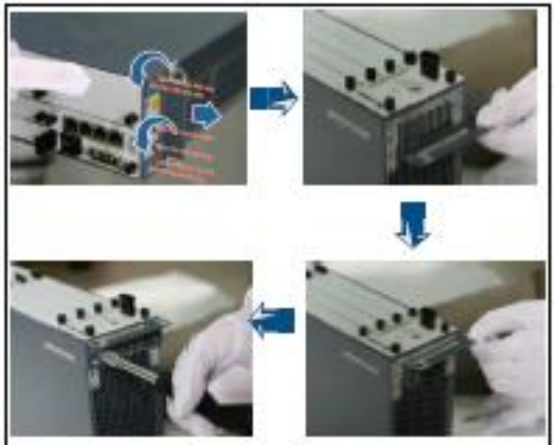
INSTALL THE PMU & PSU



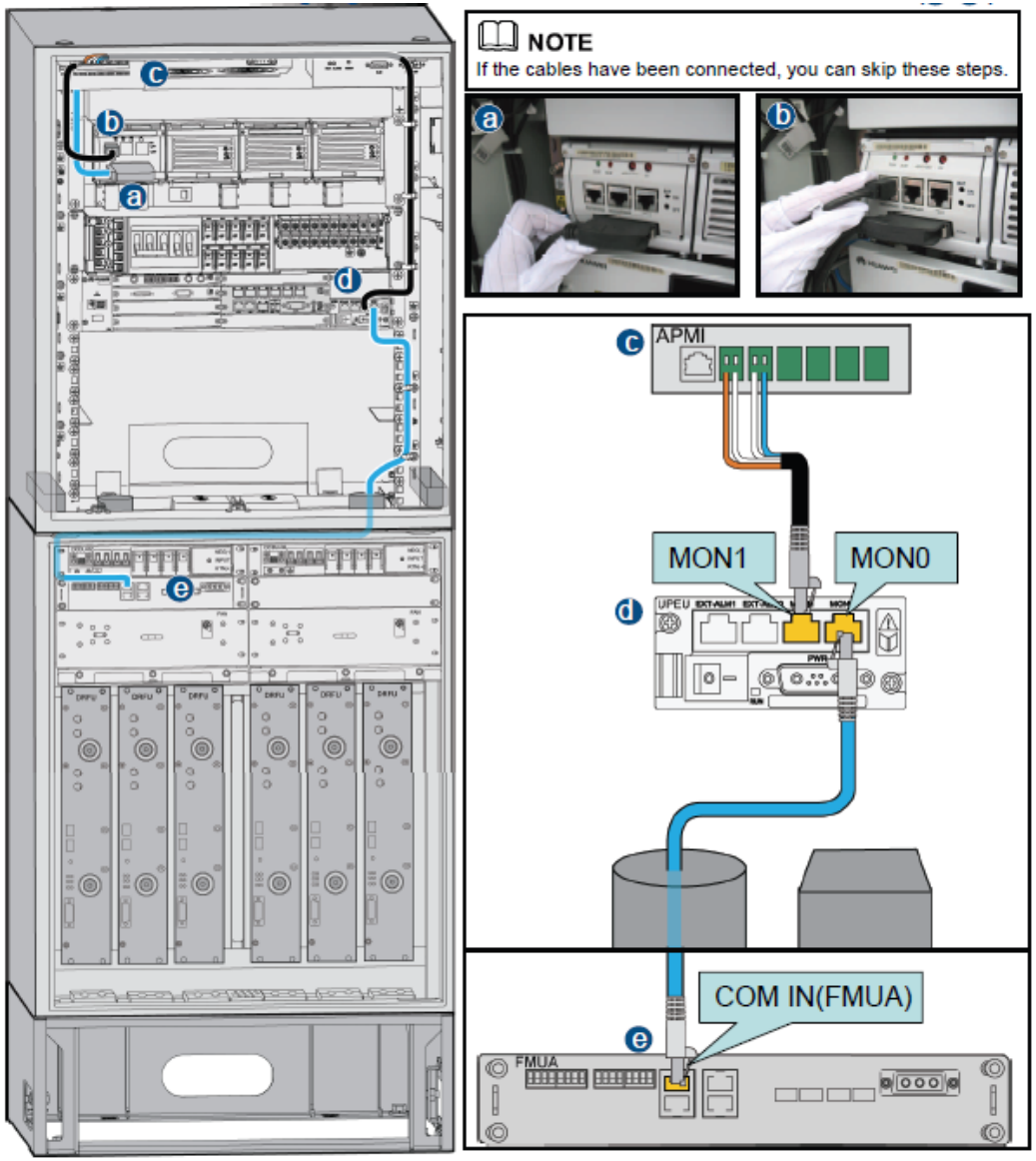
INSTALL THE BBU



❑Before installing modules and cables, you must disconnect the external power.
❑Take proper ESD protection measures, for example, wearing an ESD wrist or a pair of ESD gloves, to prevent electrostatic damage to the boards, modules, or electronic components.
❑Install the mounting ears on the two sides of the BBU reversely, and remove the grounding screw on the right side.
❑Push the BBU case into the cabinet.



Monitoring Signal Cabling(APM30H,VerA)

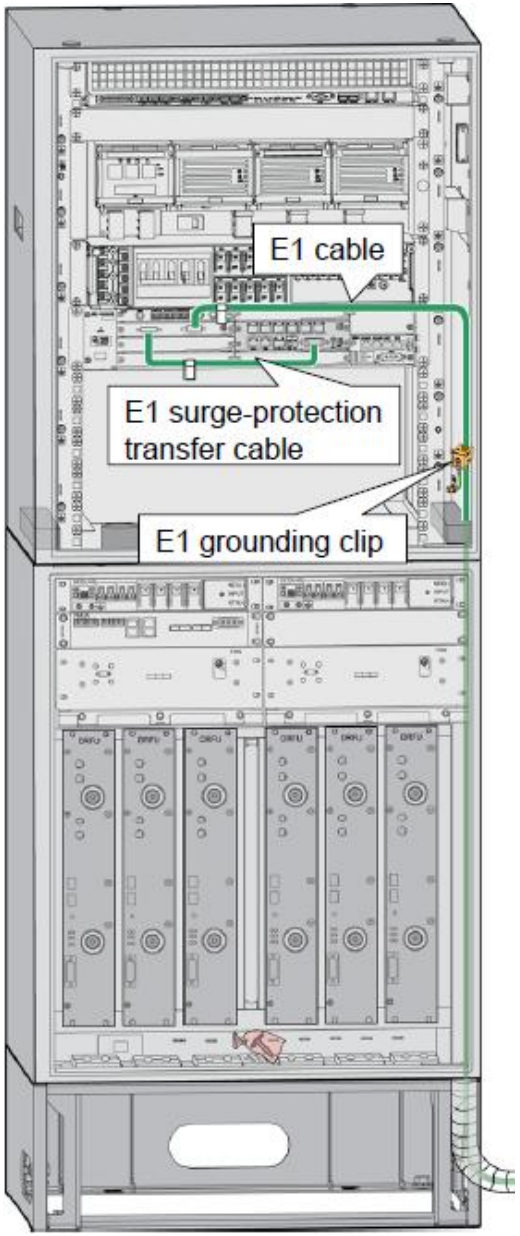


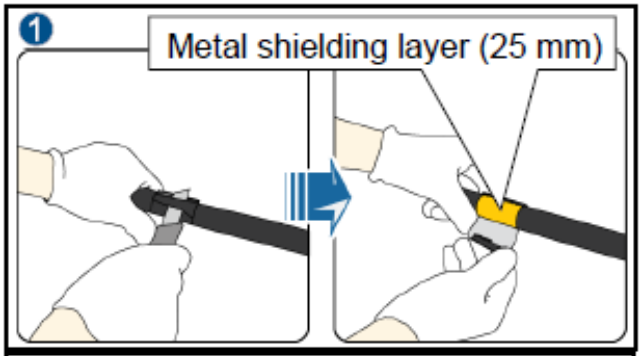
Monitoring Signal Cabling

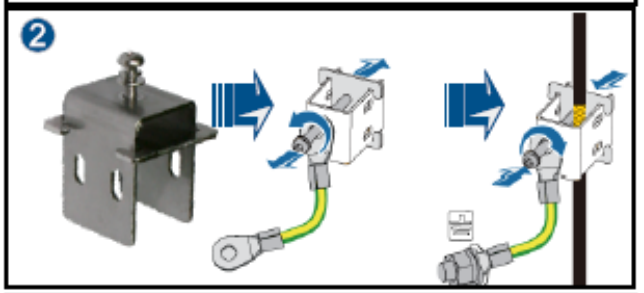
- Skip this if already installed from factory, only needs to be checked.

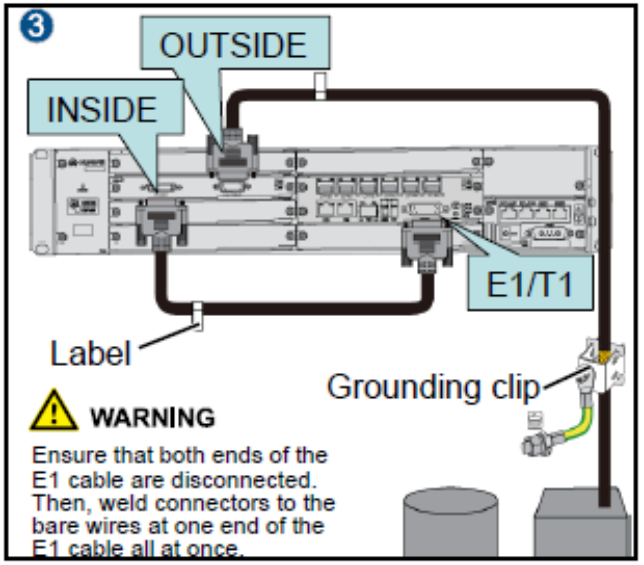
HUAWEI

Installing E1 Cable (APM30H,VerA)





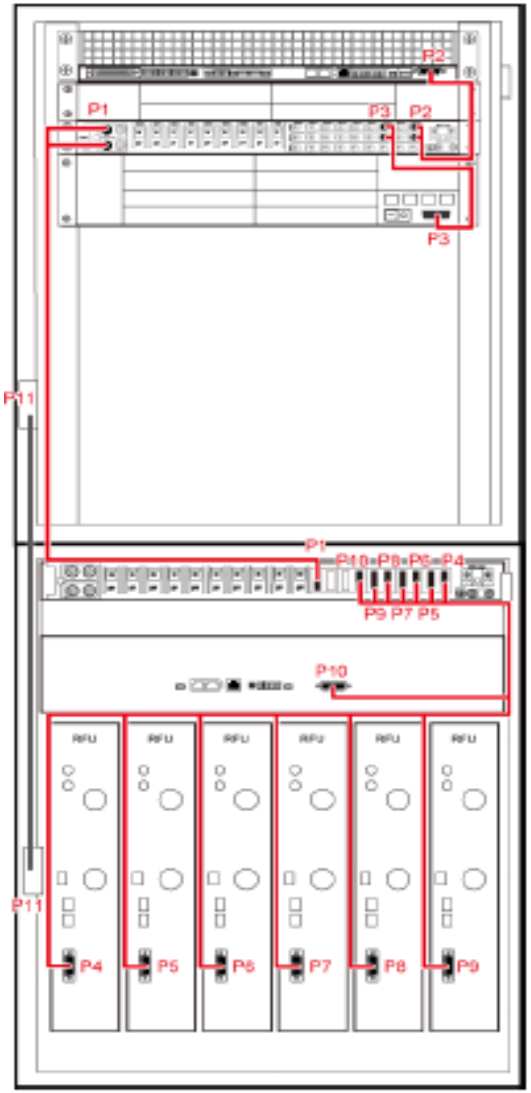




HUAWEI

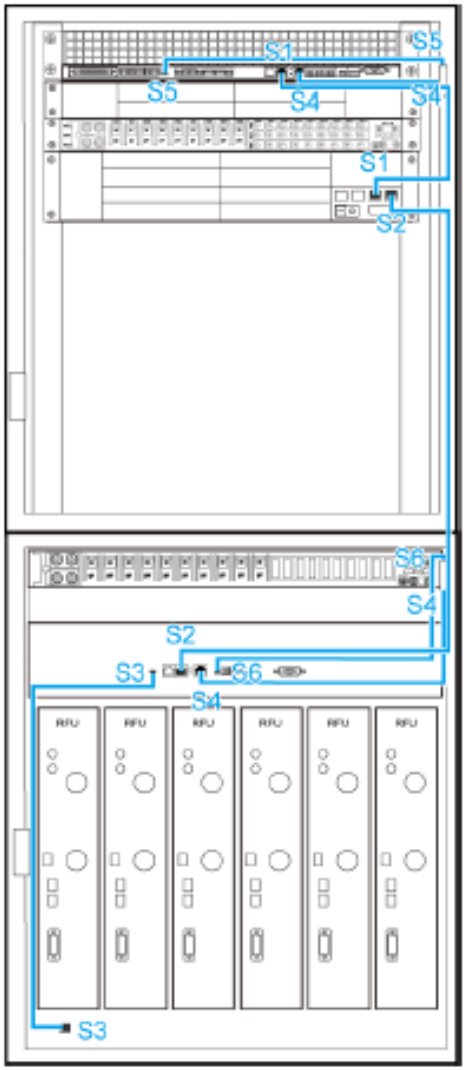
Checking the internal Cables-BTS3900A+TMC11H

After unpacking the cabinet , check the internal cables as per below pics for BTS3900A + TMC11H,Ver B

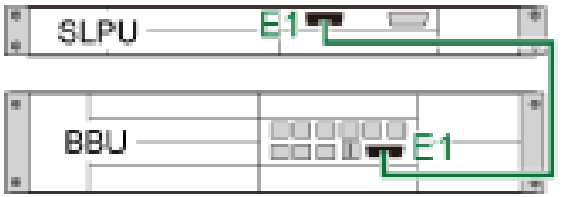


Signal Cable

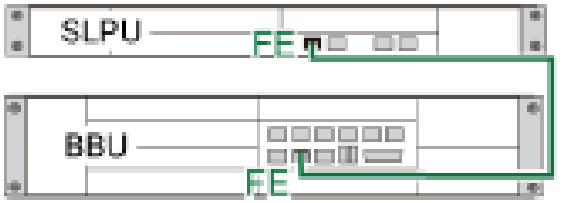
Power Cable



E1/T1 Transmission Mode



FE/GE Transmission Mode



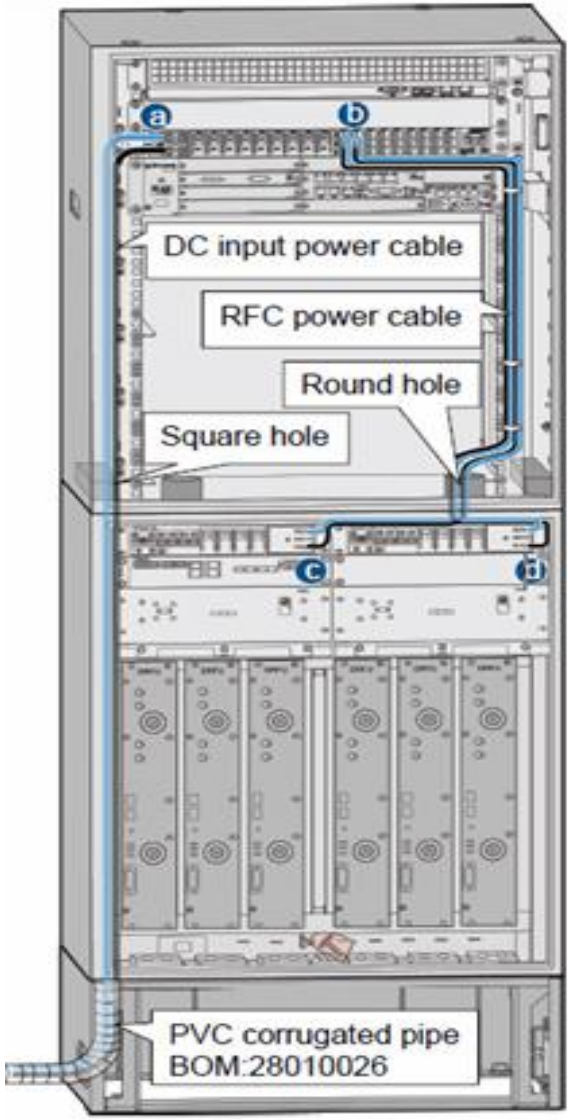
HUAWEI

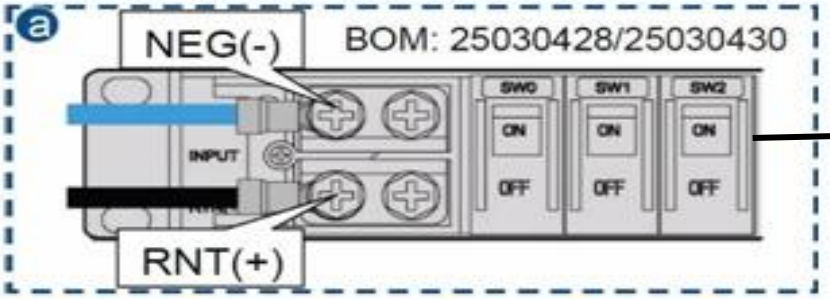
Checking the internal Cables-BTS3900A+TMC11H

No.	Cable	One End		The Other End	
		Connector	Installation Position	Connector	Installation Position
P1	Input power cable for the RFC	Parallel terminal	DCDU-01/ SPARE2	OT terminal	DCDU-03/ INPUT/RTN (+) and NEG (-)
P2	Power cable for the fan box in the TMC11H	OT terminal	DCDU-03/ LOAD8	3V3 power connector	Fan box in the TMC11H/ PWR
P3	Power cable for the BBU	OT terminal	DCDU-03/ LOAD6/RTN (+) and NEG (-)	3V3 power connector	BBU/UPEU/ PWR
P4 to P9	Power cable for the RFU	Parallel terminal	DCDU-01/ RFU0 to RFU5	3V3 power connector	RFU0 to RFU5/PWR
P10	Power cable for the fan box in the RFC	Parallel terminal	DCDU-01/ FAN	3V3 power connector	Fan box in the RFC/PWR
P11	Equipotential cable between the TMC11H and the RFC	OT terminal	TMC11H/ Ground bar	OT terminal	RFC/Ground bar

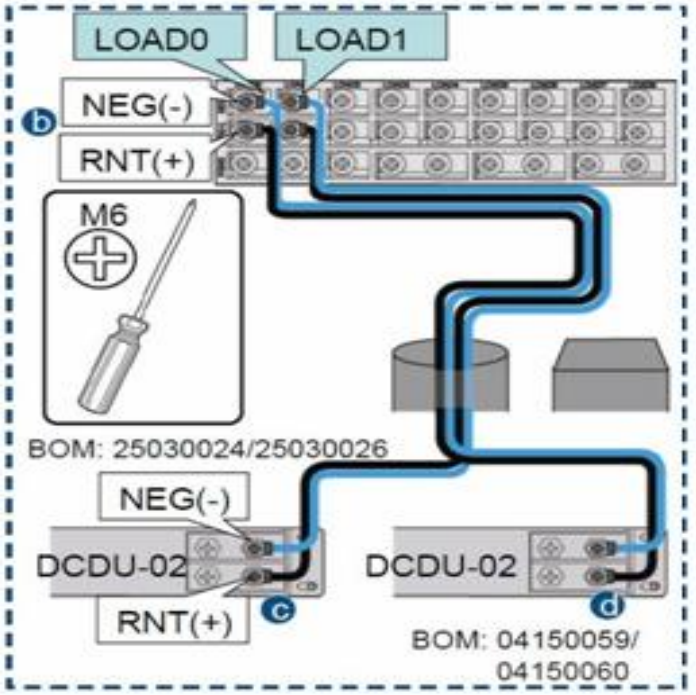
No.	Cable	One End		The Other End	
		Connector	Installation Position	Connector	Installation Position
S1	Monitoring signal cable between the BBU and the CMUA in the APM30H	RJ-45 connector	CMUA/ COM_IN	RJ-45 connector	BBU/UPEU/ MON1
S2	Monitoring signal cable between the BBU and the CMUA in the RFC	RJ-45 connector	CMUA/ COM_IN	RJ-45 connector	BBU/UPEU/ MON0
S3	Temperature monitoring signal cable for the RFC	4-pin connector	Fan box in the RFC/CMUA/ TEM	Temperature sensor	Air inlet at the bottom of the RFC
S4	Signal cable for the ELU	RJ-45 connector	ELU	RJ-45 connector	Fan box in the APM30H or in the RFC/ CMUA/ELU
S5	Monitoring signal cable for the door status sensor in the APM30H	2-pin connector	Fan box in the APM30H/ HPMI/GATE	Bare wire	Door status sensor in the APM30H
S6	Monitoring signal cable for the door status sensor	Cord end terminal	Fan box in the RFC/CMUA/ GATE	Bare wire	Door status sensor in the RFC

DC Power Cabling (Incase of TMC11H,Ver A)





DCDU-03

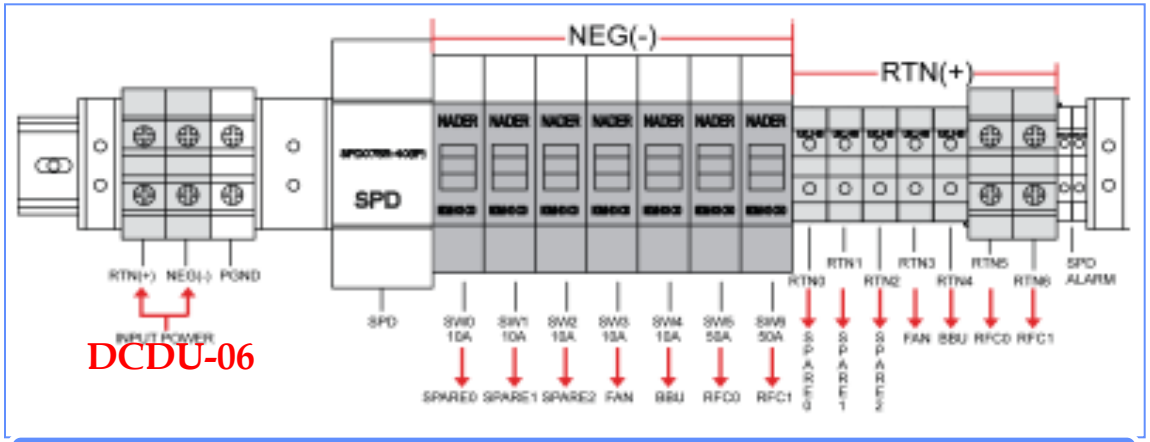


Procedure of DC Cabling,

- ❑ APM30/TMC11 CABINET WITH DC SCENARIO.
- ❑ KEEP PROPER DISTANCES BETWEEN SIGNAL & POWER CABLES.
- ❑ 6 Sq.mm copper cable shall be used between DCDU-03 to DCDU-02.
- ❑ -48VDC Input to DCDU-03 ,the cable specs is 16Sq.mm Copper flexible.

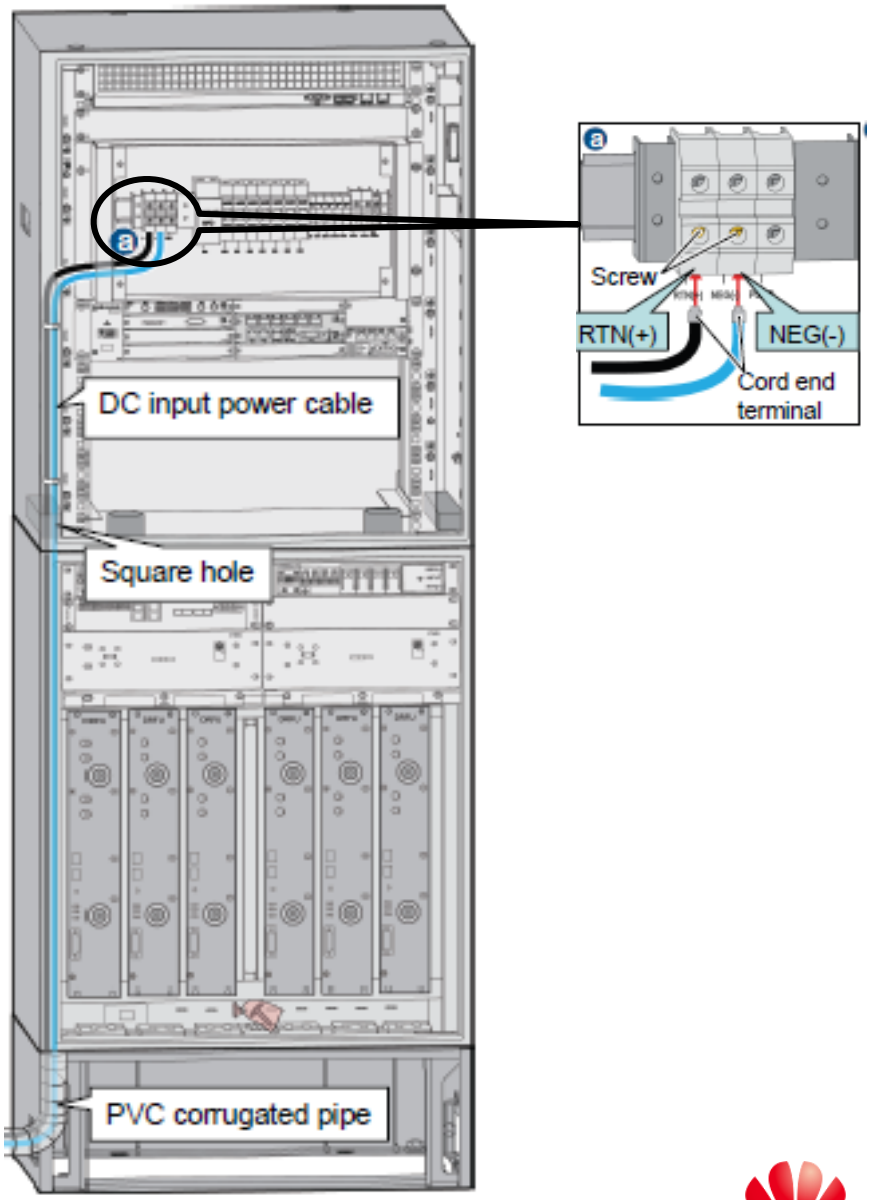
HUAWEI

DC Power Cabling (Incase of TMC11H,VerA)



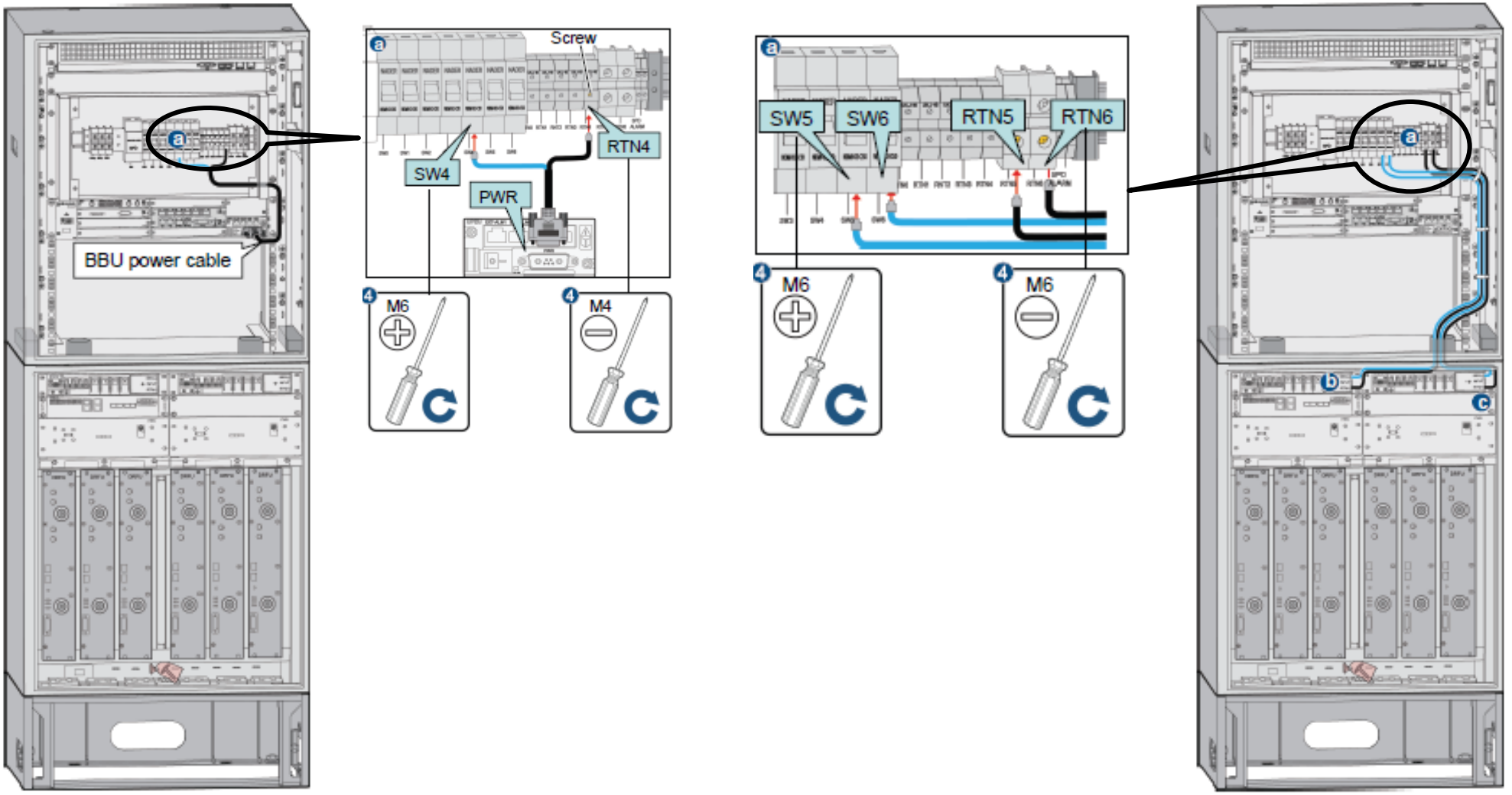
DC Power Cabling-TMC11 (DCDU-06)

- Before installing the cables, open the DCDU-06A by the four screws on the cover of the DCDU-06A.
- Use Temporary Labels to the Cable before cut/Laying.
- Finish installation of the cables, close the DCDU-06A.
- Make the cord end terminals on site.
- Connect the cables to the DCDU-06A.
- Check the rating of Fuse/MCB at mains.
- If length is insufficient ,then replace the cable with longer length (avoid joints on power cable).
- Use proper lugs & crimp with cable.
- Run each cable that leaves the cabinet in the PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.
- Label the installed cables by referring to Attaching a Sign Plate Label.
- The bending radius of the power cable or PGND cable must be at least five times the diameter of the cable.
- The MCB used for controlling the BTS is set at 80 A on the configuration interface of the PDB.
- The cross-sectional area of the DC input power cable is 16mm2, the length of the cable must be shorter than 15m.

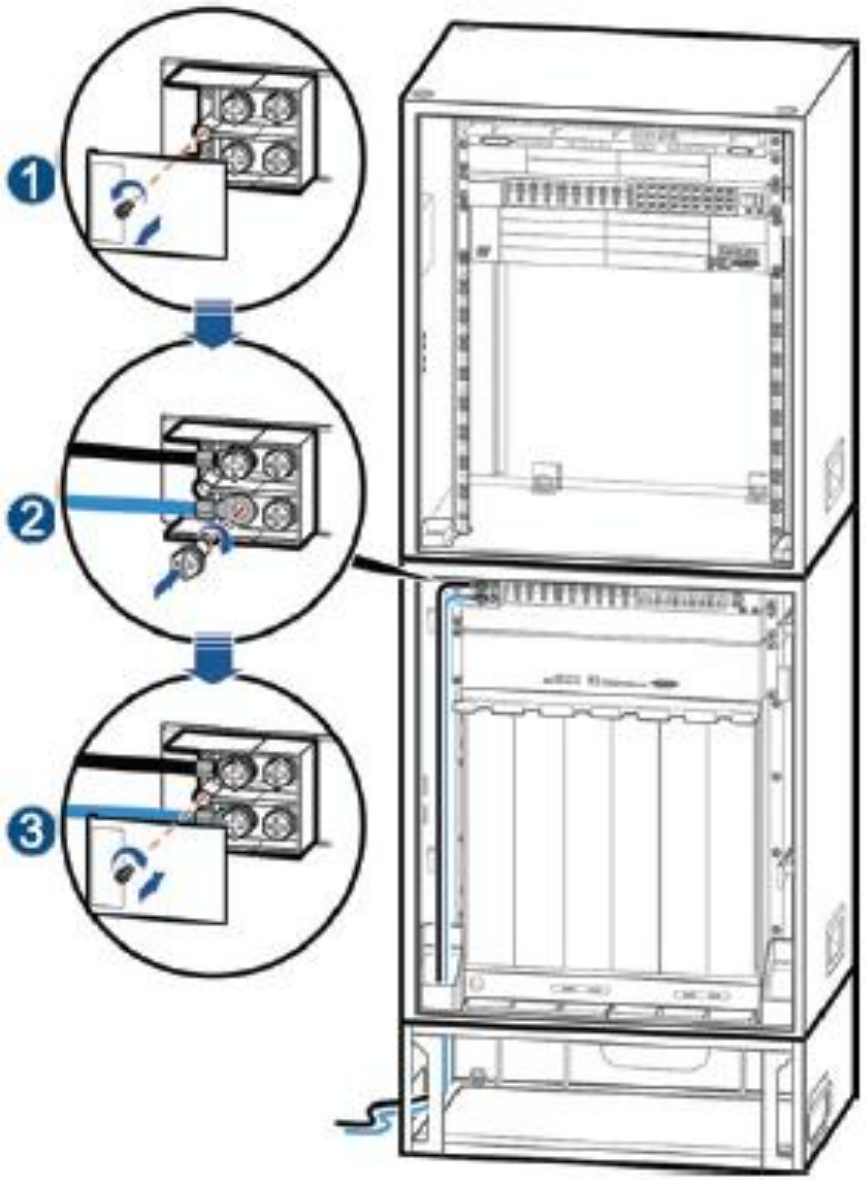


HUAWEI

DC Power Cabling –DCDU-06 to BBU & RFC



DC Power Cabling (Incase of TMC11H,Ver B)



Prepare the input power cables for the RFC and TMC11H.
1. Prepare the cable of proper length based on the actual cable route.
2. Add connectors to both ends of the input power cable for the RFC and power cable for the TMC11H .

Link the OT terminal at one end of the input power cable for the RFC to the input wiring terminal on the DCDU-01, tighten the screw, and then connect the other end to the external equipment.

NOTE
Before installing the power cables, remove the protecting hood from the DC input wiring terminal block on the DCDU-01. After the cables are installed, reinstall the protecting hood.

Install the input power cable for the TMC11H.
1. If the TMC11H obtains power from the external equipment, install the cable by referring to Step 2.
2. If the TMC11H obtains power from the RFC, link the parallel terminal at one end of the power cable to the DC output terminal labeled SPARE2 on the DCDU-01 in the RFC, and then link the OT terminal at the other end to the DC input wiring terminal on the DCDU-03 in the TMC11H.

Route the cable as per Cabling Requirements, and then use cable ties to bind the cable.

Attach labels to the installed cable.

Run each cable that leave the cabinet in a PVC corrugated pipe, and then tie the pipe to the cable hole in the cabinet.

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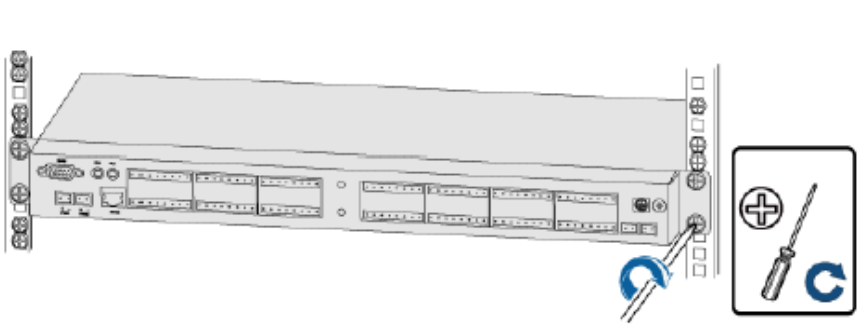
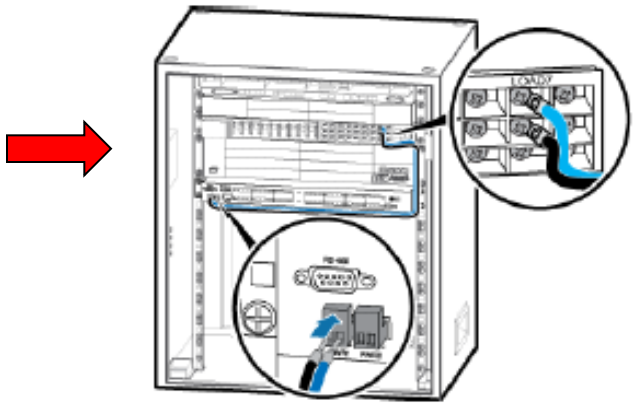
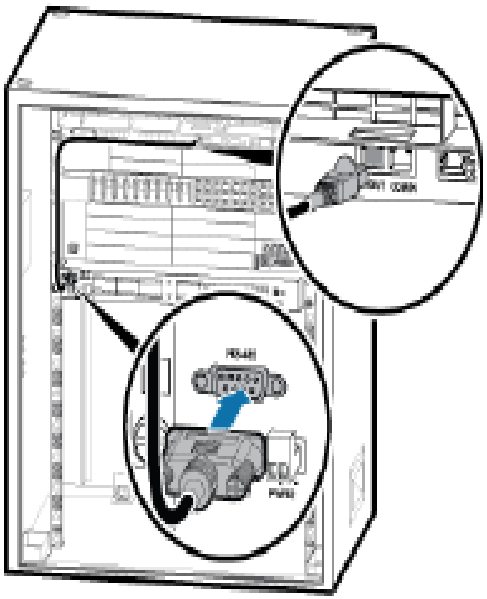
Installation of Optional Modules-EMUA in TMC11H



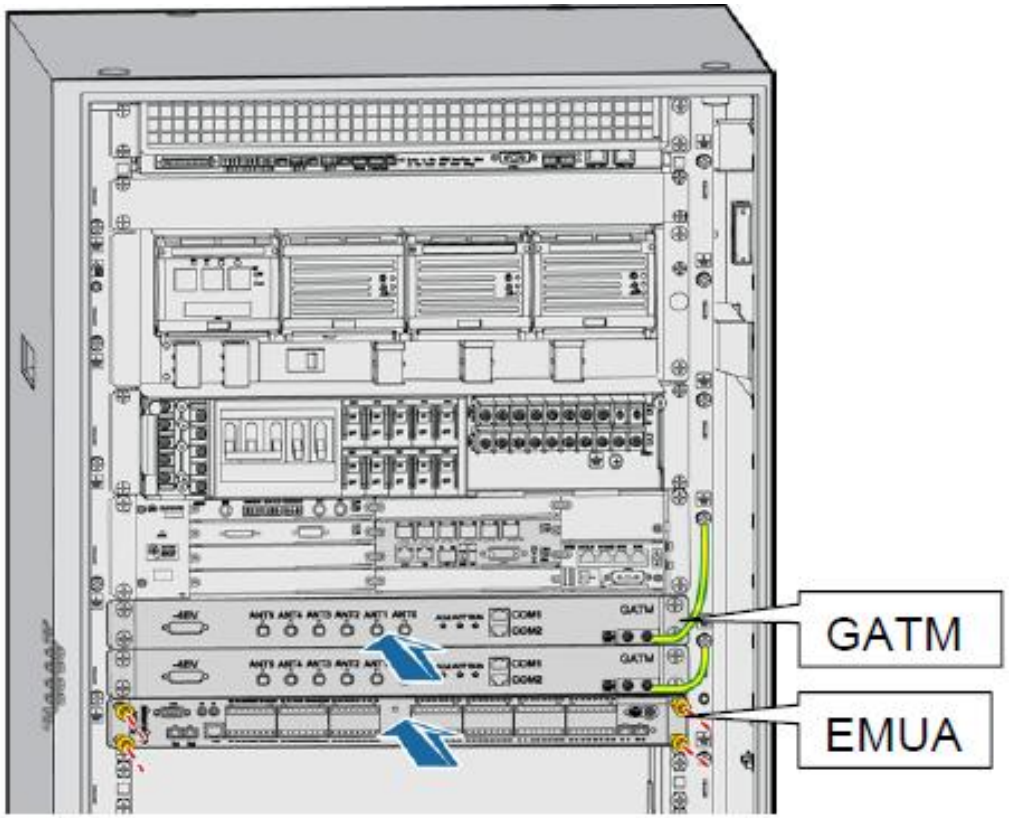




Installation of EMUA incase of TMC11H

- Install the EMUA inside TMC11 Cabinet.
- Connect the EMUA to the grounding bus bar near to EMUA.
- Install corresponding connectors on both ends of the power cable.
- Connect the cord end terminal at one end of the power cable to the transfer terminal of the wiring terminal labeled **PWR1 of the EMUA power cable.**
- Connect the OT terminal at the other end of the power cable to the DC output terminal
- labeled LOAD7 on the DCDU-03.
- Connect the DB9 male connector at one end of the signal cable to the wiring terminal labeled RS-485 in left of the EMUA panel.
- Connect the RJ-45 connector at the other end of the signal cable to COM OUT of the CMUA in the cabinet.

EMUA & its Grounding

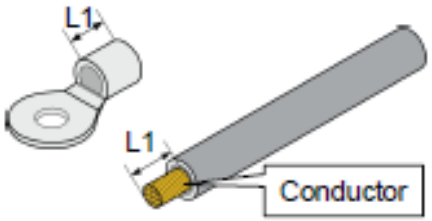


Preparing OT Terminal

1. Material: OT terminal, Heat-shrinkable tube, Cable

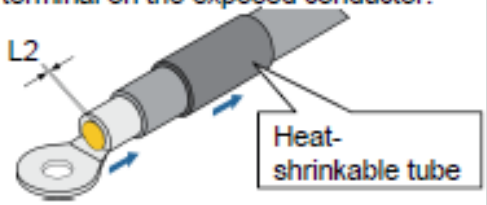
2. Make the OT terminal

❶ Strip the jacket of the cable.



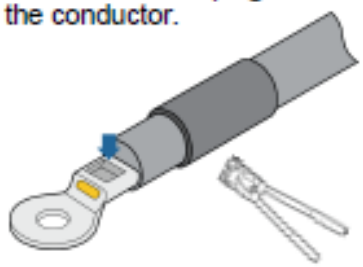
CAUTION
When stripping the jacket off the cable, do not damage the metal conductor of the cable.

❷ Lead the cable through the heat-shrinkable tube and place the OT terminal on the exposed conductor.

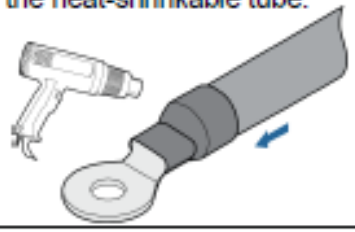


NOTE
- The OT terminal should contact the end of the insulated jacket of the cable.
- After you place the OT terminal on the conductor closely to the end of the jacket, ensure that the L2 part which sticks out of the bare crimping terminal should be not longer than 2 mm.

❸ Use the crimping tool to press the end of the bare crimping terminal on the conductor.

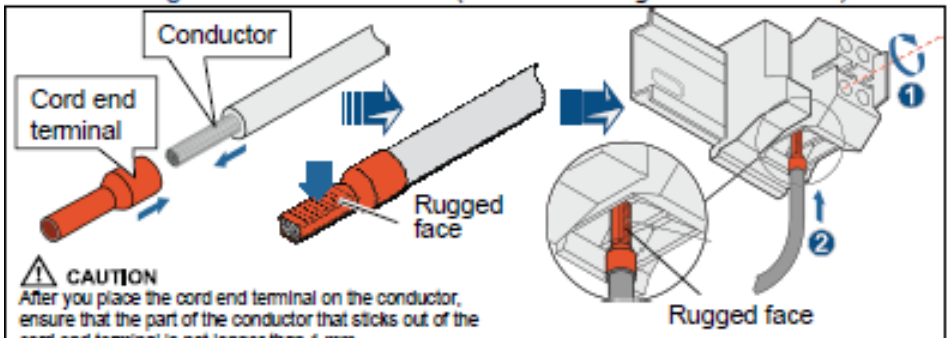


❹ Install the heat-shrinkable tube.



1. Material: Cord end terminal, Cable

2. Assembling the cord end terminal (See Assembling the OT terminal.)



CAUTION
After you place the cord end terminal on the conductor, ensure that the part of the conductor that sticks out of the cord end terminal is not longer than 1 mm.

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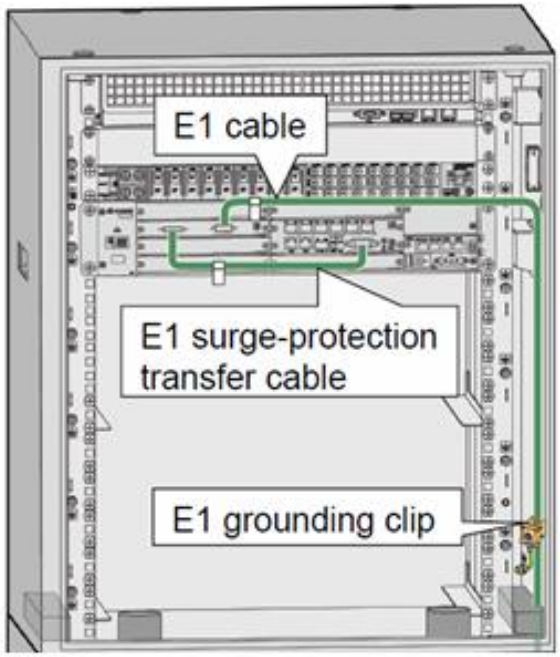
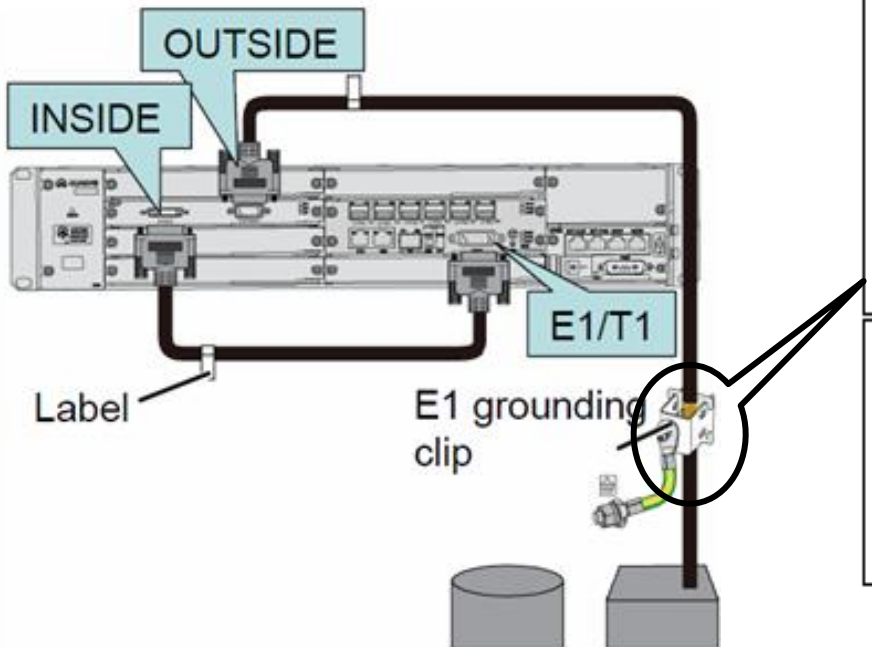
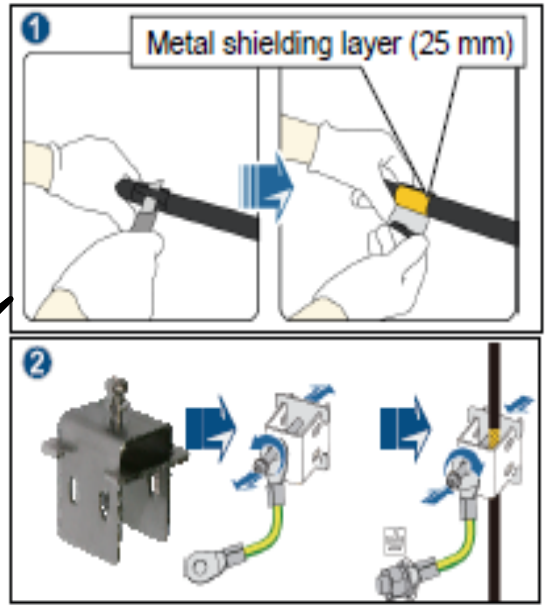
E1 & Surge Protection Cables installation







E1/T1 Cabling

- Connect the E1/T1 cable to the OUTSIDE port on the UELP in the cabinet.
- Lead the other end of the E1/T1 cable out of the cabinet through the cable holes at the bottom along the right of the cabinet.
- The bending radius of the E1/T1 cable must be at least five times the diameter of the cable.
- Different types of cables must be separately routed and cannot be entangled.
- The cables must be bound tightly and neatly. The sheaths of the cables must not be damaged.
- The cable ties must face the same direction, and those at the same horizontal line must be in a straight line. Extra length of cable ties must be cut.
- Labels or nameplates must be attached to the cables after they are installed.
- Different types of cables must be separately routed with a minimum space of 30 mm between every two cables.

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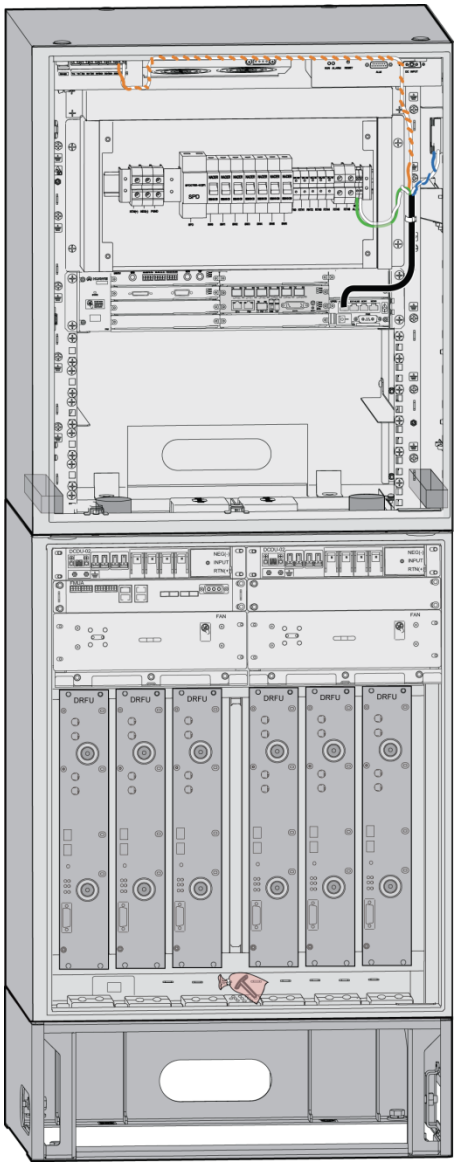
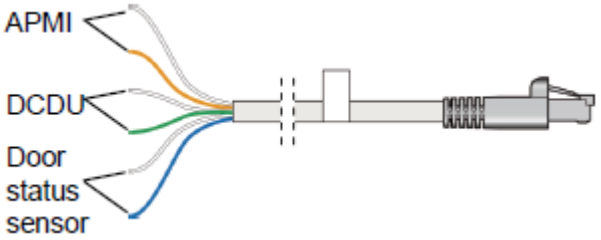
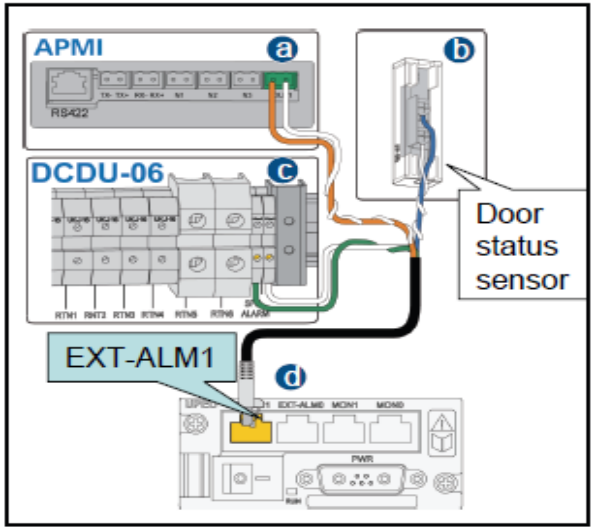
Monitoring Signal Cabling(TMC11H,VerA)





Wire	Connet to	
white	Alarm wiring terminal to the APMI (ⓐ)	OUT1+
orange		OUT1-
white	Surge-protection alarm wiring terminal to the DCDU-06A (ⓒ)	Right
green		Left
white	Wiring terminal of the door status sensor (ⓑ)	
blue		



Monitoring Signal Cabling

- Skip this if already installed from factory, only needs to be checked.

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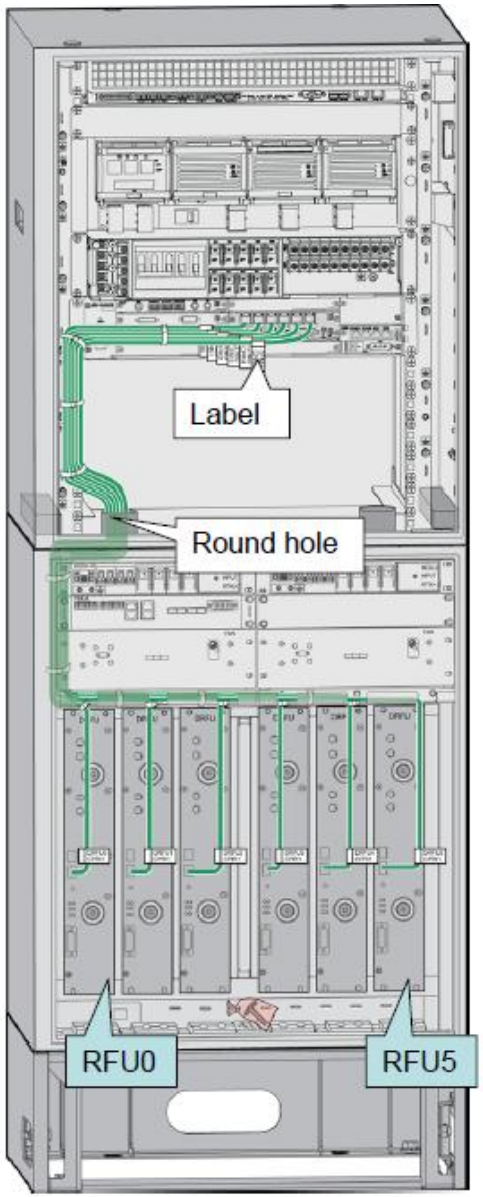
Installing CPRI Cable

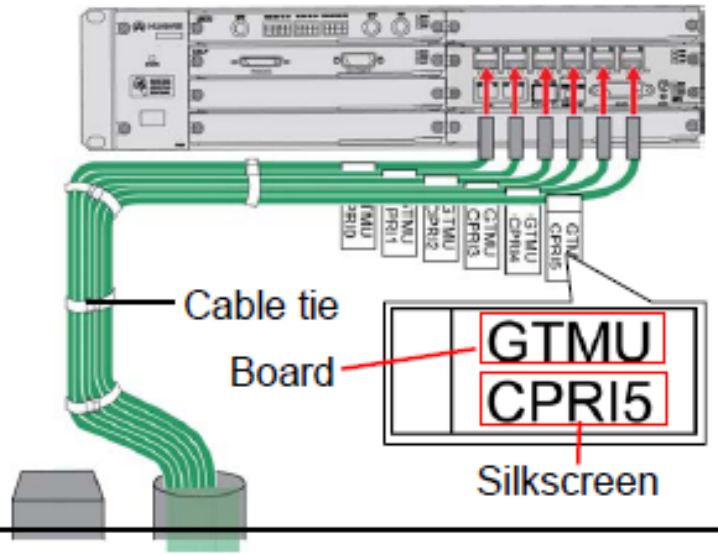


1. Attach labels to the CPRI cables.
2. Connect one end of the CPRI cable to the GTMU (see Appendix e, page 38).
3. Route the CPRI cables through the round cable hole on the left side, and keep each of the CPRI cables lay beside the consistent RFU.

NOTE

- The silkscreen on the CPRI output port on the GTMU (CPRI0 to CPRI5) is consistent with the RFU ID (RFU0 to RFU5)
- The CPRI cables should be neatly and tightly bound when the CPRI cables are routed.

Label=board +silkscreen



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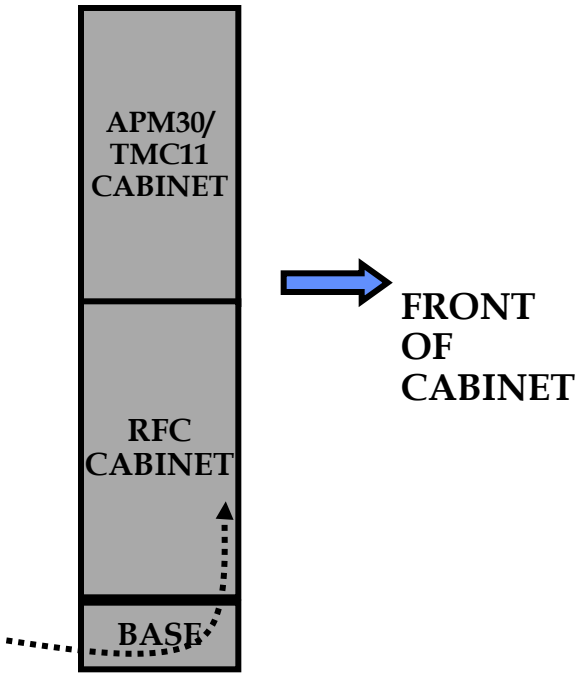
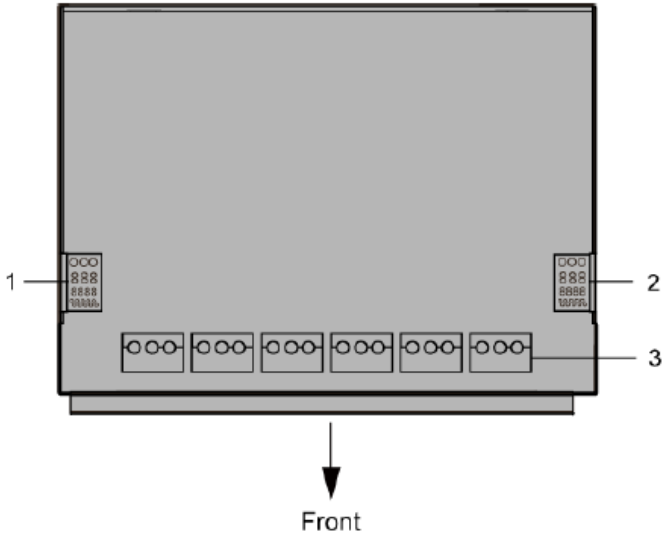
Installation of RF Jumpers through Cable Holes



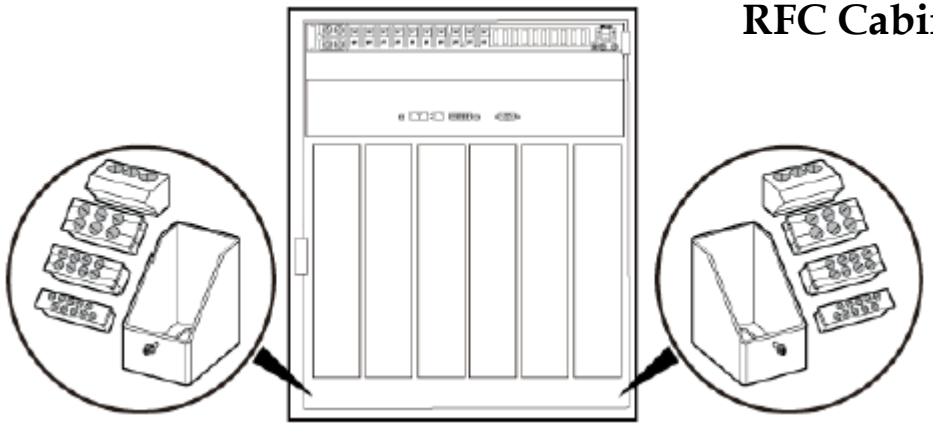
Procedure of RF jumper routing inside cabinet,

- When leading the RF jumpers through the cable hole at bottom of the cabinet into the cabinet, ensure that the DIN Male elbow connector is perpendicular to the DRFU/GRFU's.
- During the installation , don't rotate the DIN male elbow connector. This may cause damage to the connector.
- The bending radius of the feeders should be --- For 7/8" coaxial Cable- >120mm. , for 5/4" Coaxial Cable >380mm.
- The bending radius of the Jumpers should be --- For 1/4" coaxial Cable- >35mm. , for 1/2" Coaxial Cable (super flex) >50mm. & for ½" Coaxial Cable (flexible)->127mm

External Cables entry holes & its position

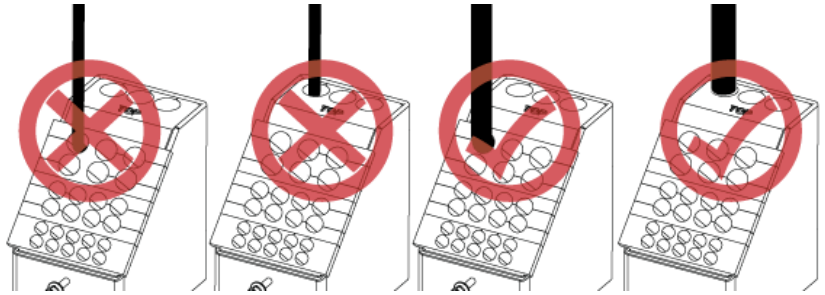


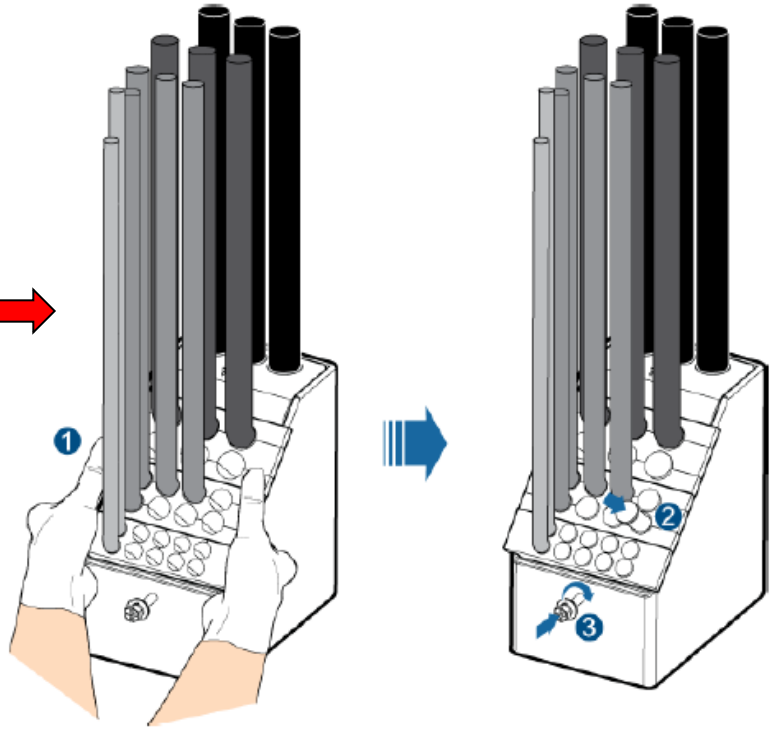
RFC Cabinet



Installation Procedure

- Lead cables with different cross-section areas through the holes of the cable module based on the aperture, and then insert the cable module into the cable hole of the cabinet.
- Use rubber caps to seal the idle cable holes.
- Tighten the screws in the front of the cable module to fix the module.





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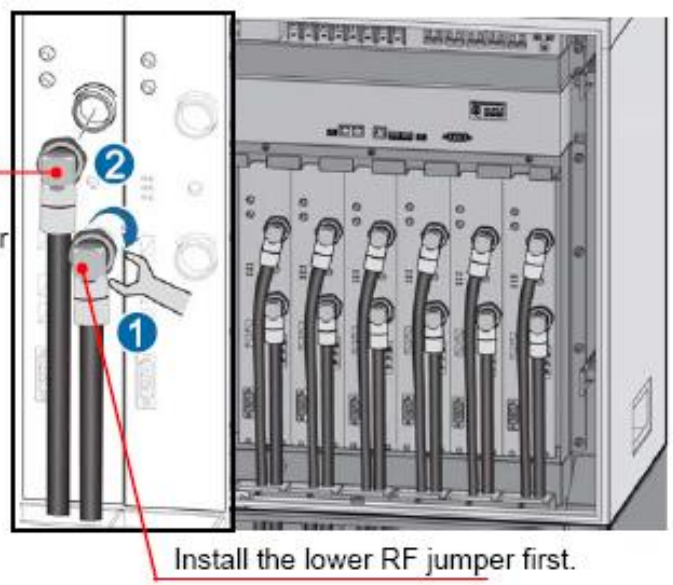
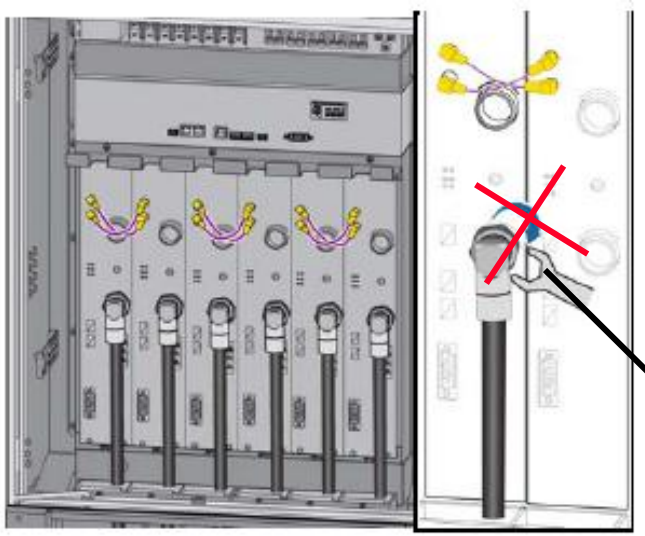
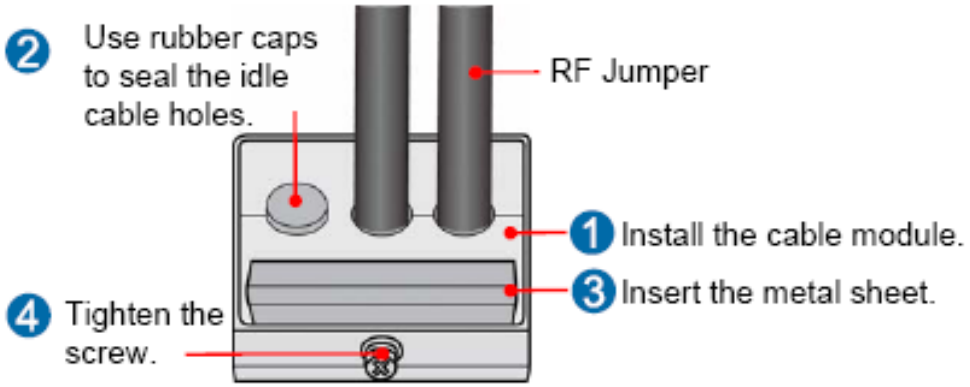
Installation of RF Jumpers



or



Don't Use any tools for tightening The Din Connectors at Equipment End, only Hand tight is recommended.



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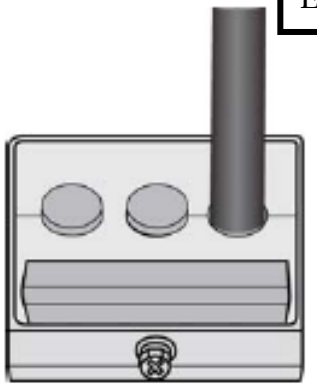

CABLE MODULE FOR RF JUMPERS

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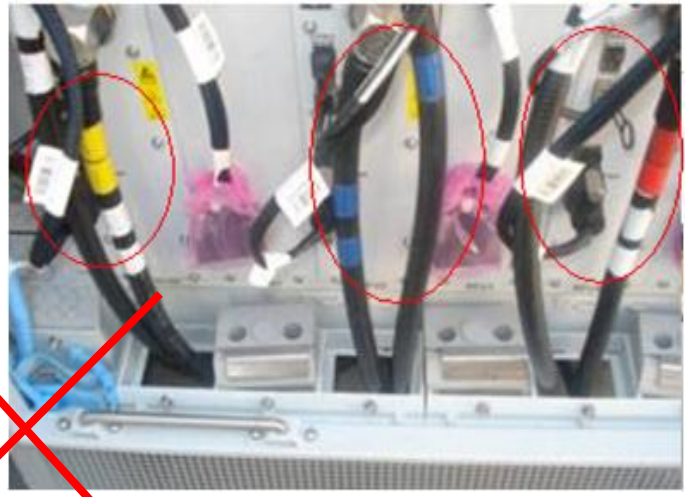
Few Wrong Installation of Jumper Cables



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Wrong Installation of Jumper Cables

Defective Picture

Correct Picture

Wrong Installation of Cables inside cabinet

Defective Picture

Correct Picture

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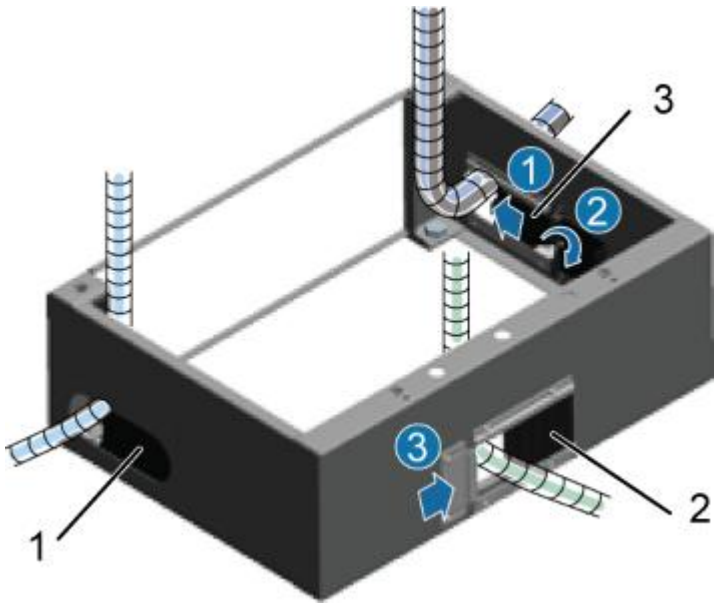
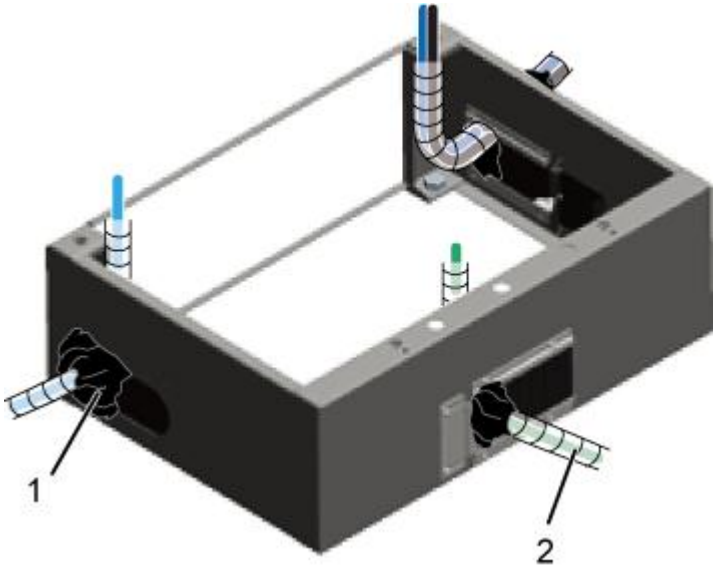
Sealing the Cable Holes of the Base





Sealing of Cable entries at Base

- 1/2/3 are baffle plates at right/back/left side of base as shown in fig-1.
- Use baffle plates to cover the idle cable holes, and then tighten screws on the plates as per fig-1.
- Use fireproof clay to seal the cable holes of the base if fig-2.
- Tighten the screws on the front baffle plate of the base.

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Cabling outside the cabinet

Defective Picture

Correct Picture

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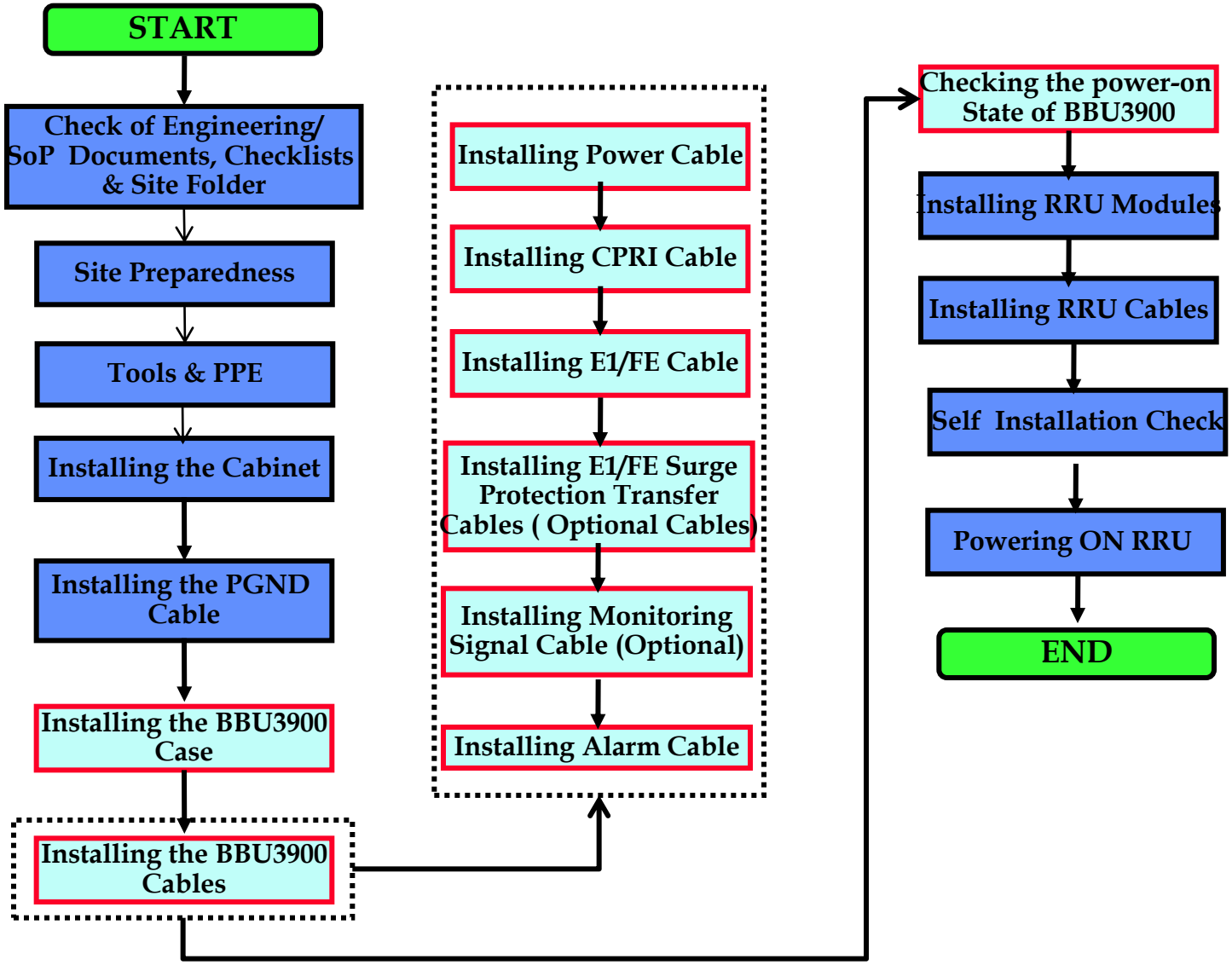
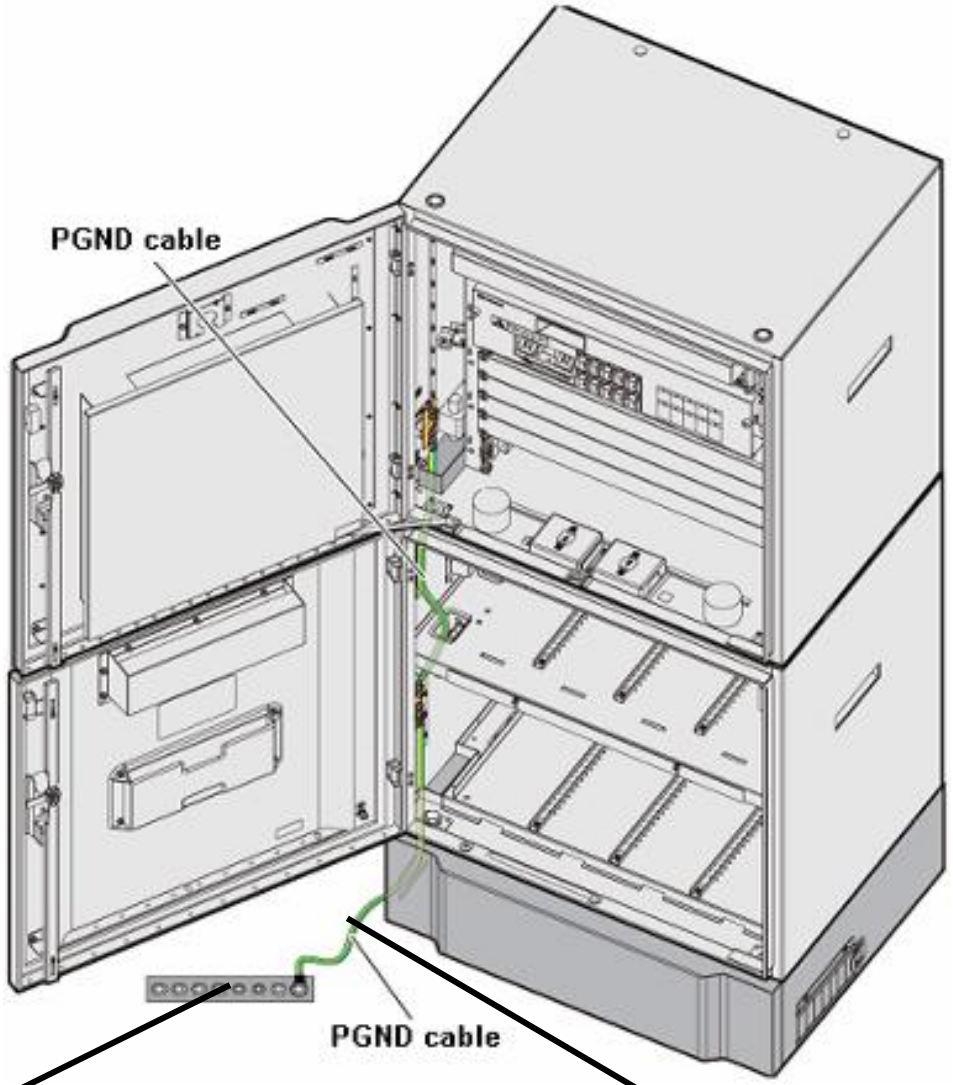
DBS3900 BTS INSTALLATION

Installation Of DBS3900 (BBU+ APM30H+RRU)-Scenario-1



PGND Cable Installation for APM30H Cabinet



PROCEDURE-

- ❑ USE RIGHT LUGS WITH PROPER CRIMPTING TOOL.
- ❑ PGND CABLE SHOULD BE OF 25/16 SQ.MM COPPER FLEXIBLE CABLE.
- ❑ TIGHTEN PROPERLY BOTH AT BUS BAR & EQUIPMENT ENDS.

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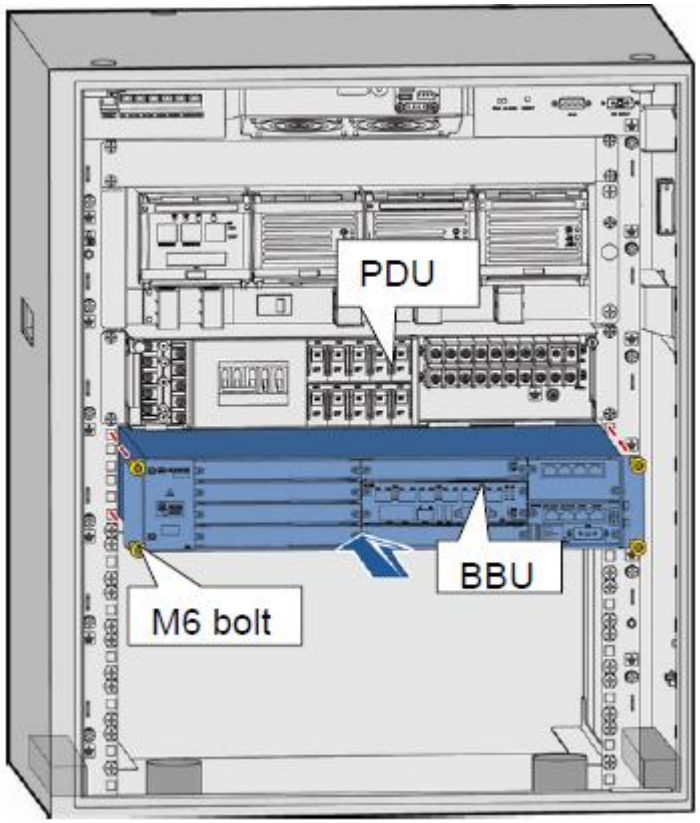
Installation Of BBU3900 In APM30H Cabinet



BBU3900 Installation in APM30H Cabinet

- Install BBU mounting ears at both side of BBU reversely.
- Slide BBU case inside the cabinet.

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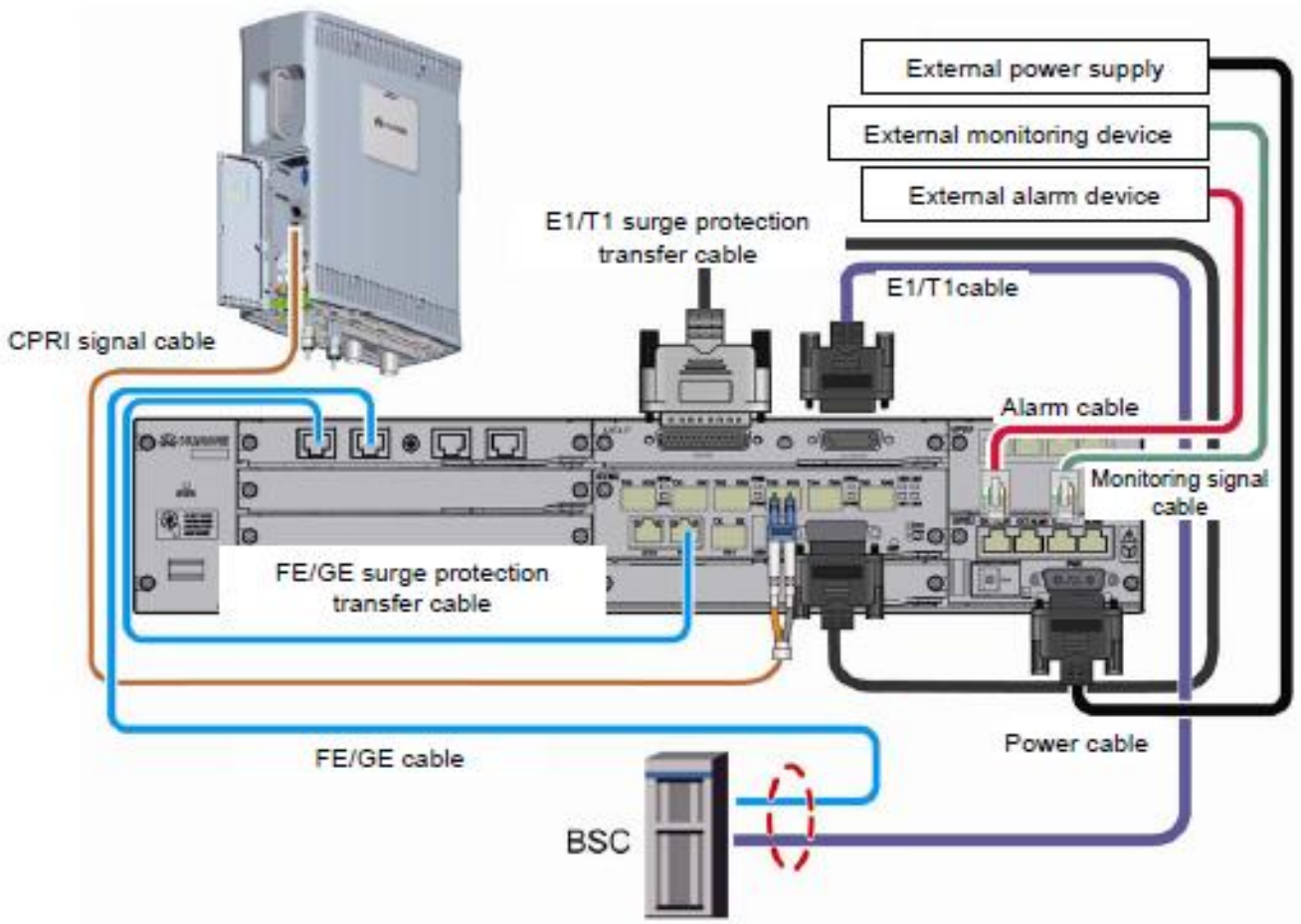
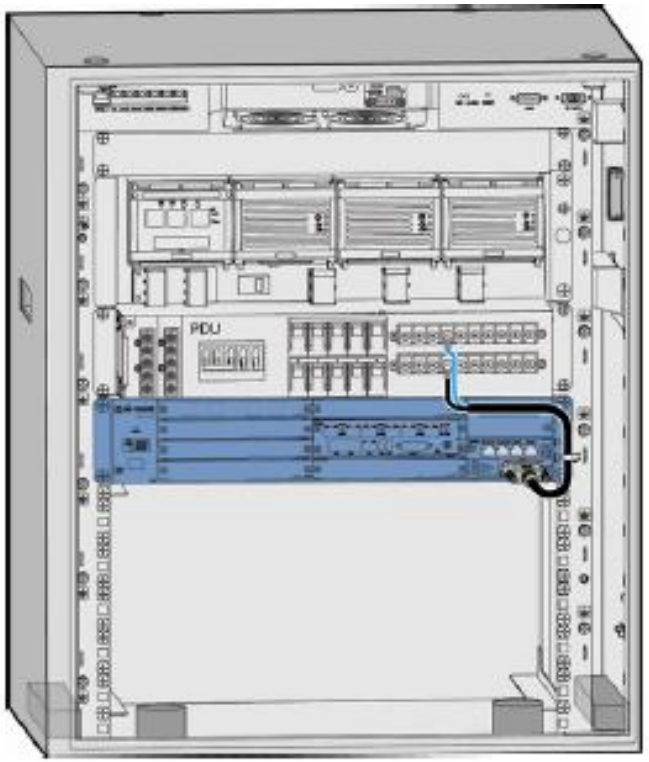
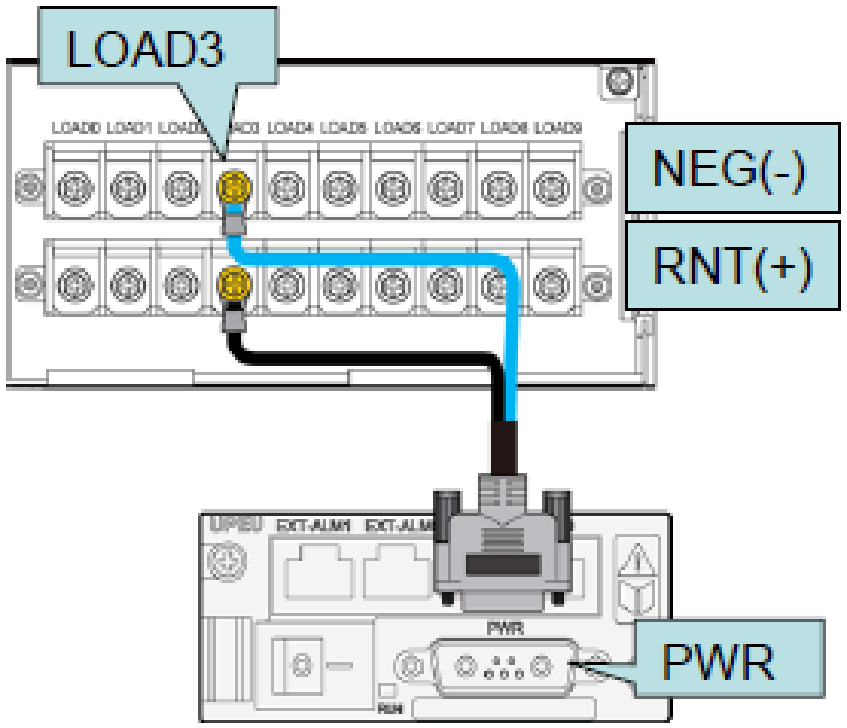
BBU3900 Cable Connection



BBU3900 Power Cable Installation





Procedure-

❑Connect the OT terminal of the power cable to the LOAD3 terminal of the PDU, and then fix the 3V3 connector of the power cable to the PWR port on the BBU.

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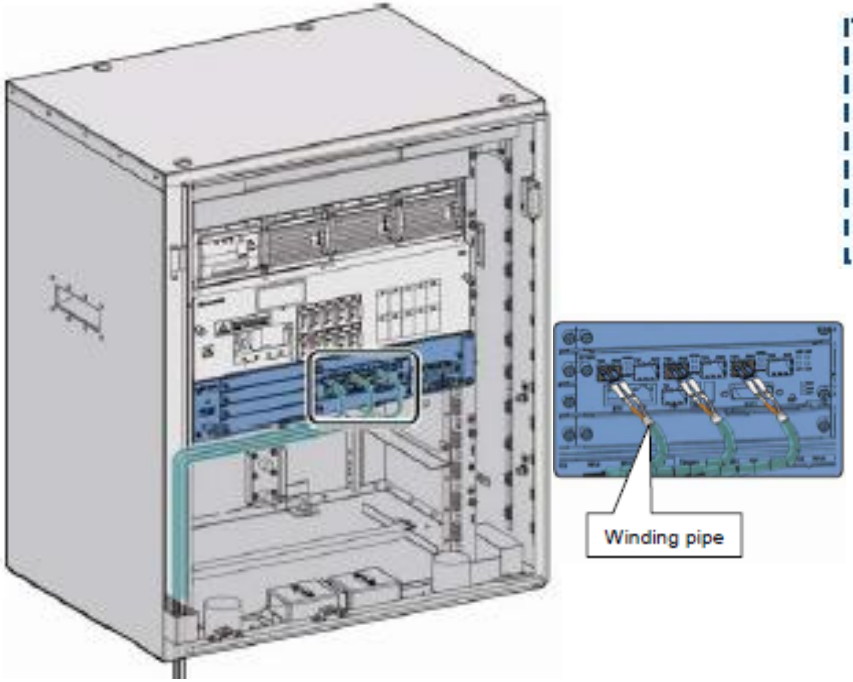
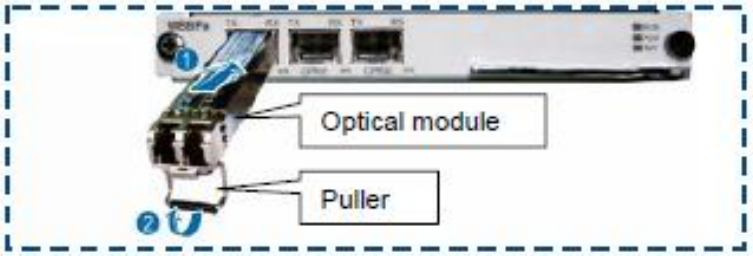
CPRI Cable Installation





NOTE-

- The single-mode optical module is labeled "SM" and multi-mode optical module is labeled "MM".
- If the puller of an optical module is blue, the module is a single-mode optical module. If the puller of an optical
- module is black or grey, the module is a multi-mode optical module.
- The TX port on the BBU is connected to the RX port on the RRU.
- The RX port on the BBU is connected to the TX port on the RRU.

Procedure-

Connect the fiber tails labeled 2A and 2B to one of the CPRI0 to CPRI5 ports on the GTMU, and connect the fiber tails labeled 1A and 1B to the CPRI_W port on the RRU.

- Insert the optical module into the CPRI0,CPRI1, CPRI2 CPRI3, CPRI4 orCPRI5 port, and then turn outwards the puller on the optical module.
- Insert one end of the CPRI optical cable into the optical module, and then lead the CPRI optical cable out of the cabinet along the right side of the cabinet.
- Wrap the fiber tail with the winding pipe.

HUAWEI

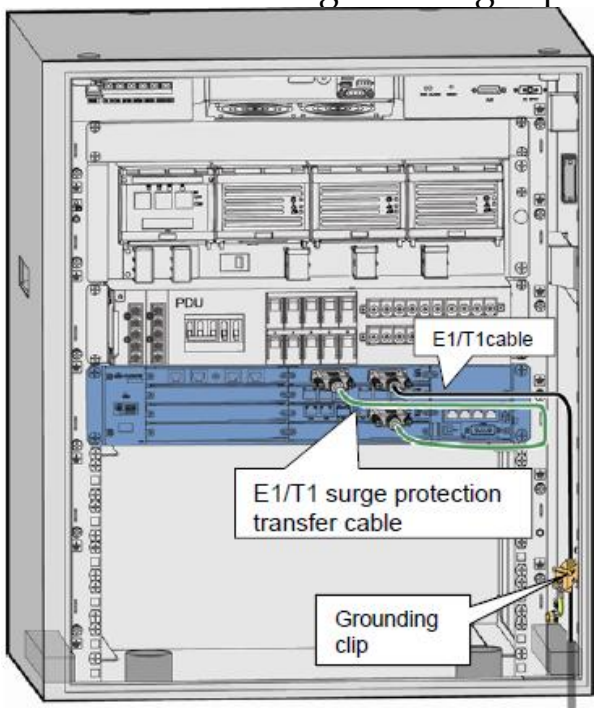
E1/T1 Cable Installation

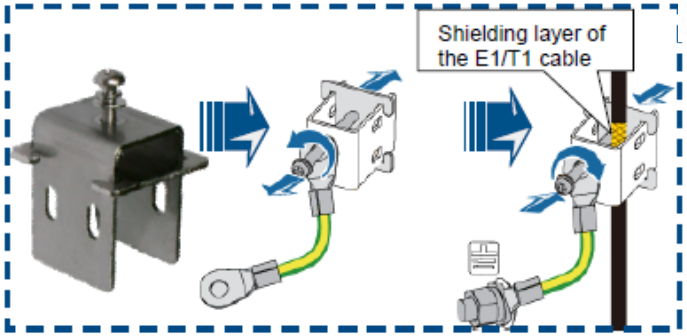
Install the E1/T1 surge protection transfer cable.

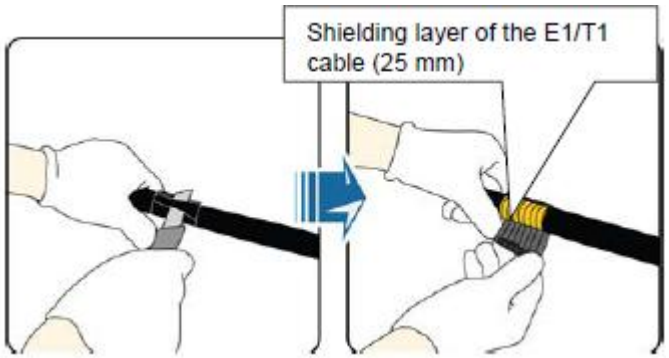
- ❑ Fix the DB25 connector of the E1/T1 surge protection transfer cable to the INSIDE port on the UELP and the DB26 connector to the E1/T1 port on the GTMU.

Install E1 Cable,

- ❑ Cabling the E1 Cable.
- ❑ Fix the DB26 connector of the E1/T1 cable to the OUTSIDE port on the UELP.
- ❑ Strip the jacket off the E1/T1 cable near the grounding point at the lower right corner of the cabinet to expose the shielding layer.
- ❑ Thread the E1/T1 cable through the grounding clip. Then, tighten the screw on the grounding clip to make the shielding layer of the E1/T1 cable in full contact with the grounding clip. Finally, connect the PGND cable on the grounding clip to the ground bolt of the APM30.







HUAWEI

FE Cable Installation

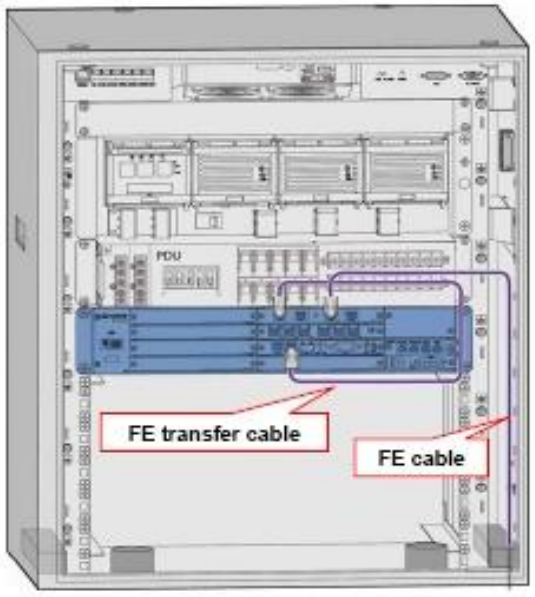
Install the FE Transfer Cable (FE Transmission Mode).

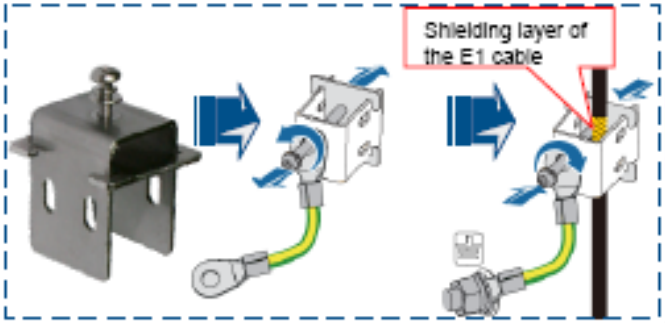
- Connect one end of the FE transfer cable to the FE0 port near the INSIDE label on the UFLP and the other end to the FE0 port on the GTMU.

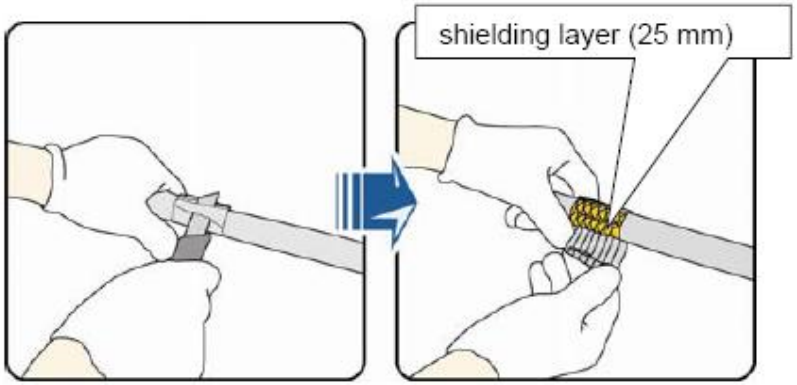
Install the FE cable (FE transmission).

- Connect one end of the FE cable to the FE0 port near OUTSIDE label on the UFLP.Then lead the other end out of the cabinet along the right side of the cabinet.

- Thread the FE cable through the grounding clip. Then tighten the screw on the grounding clip to make the shielding layer of the FE cable in full contact with the grounding clip. Connect the PGND cable on the grounding clip to the grounding bolt of the APM30.

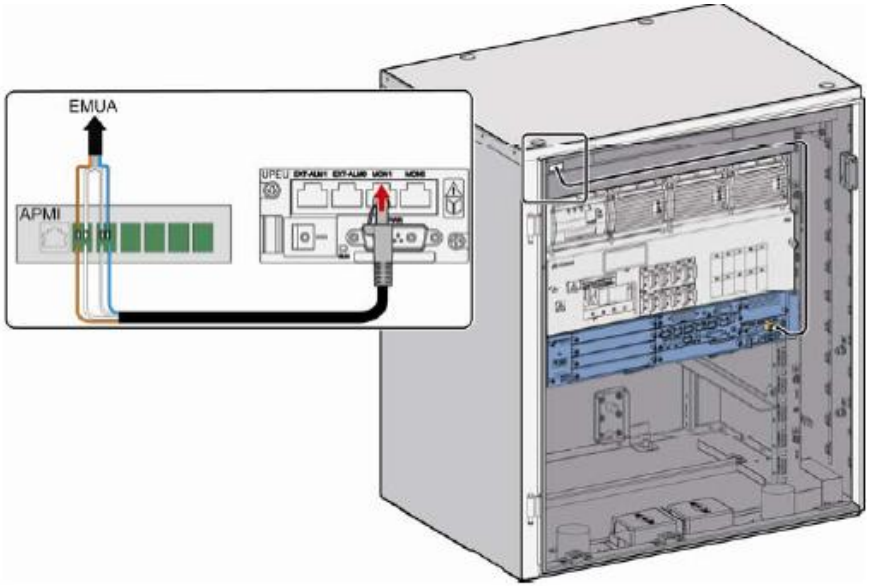






HUAWEI

Installation of Monitoring Cables of BBU in APM30HCabinet

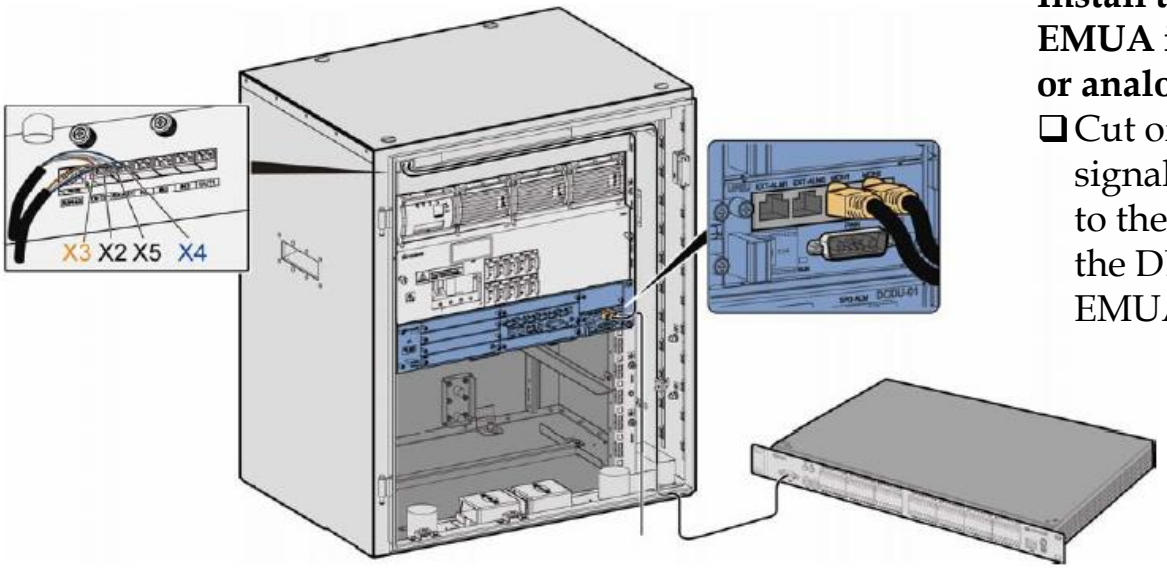


Note-

RRU & BBU are on the same site.

Install the monitoring signal cable between the APMI and the BBU.

- ❑ Fix the RJ45 connector at one end of the cable to the MON1 port on the UPEU.
- ❑ Cut off the RJ45 connector at the other end of the cable on site, and then connect the four exposed wires to the RX+, RX-, TX+, and TX- ports on the APMI.



Install the EMUA monitoring signal cable. (The EMUA is configured if there are external dry contacts or analog detection is required.)

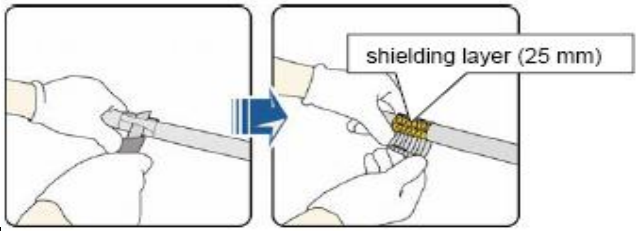
- ❑ Cut off the RJ45 connector of the EMUA monitoring signal cable, and then connect the four exposed wires to the RX+, RX-, TX+, and TX- ports on the APMI. Fix the DB9 connector to the corresponding port on the EMUA.

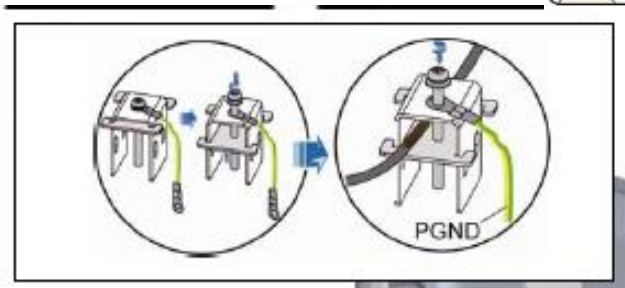
HUAWEI

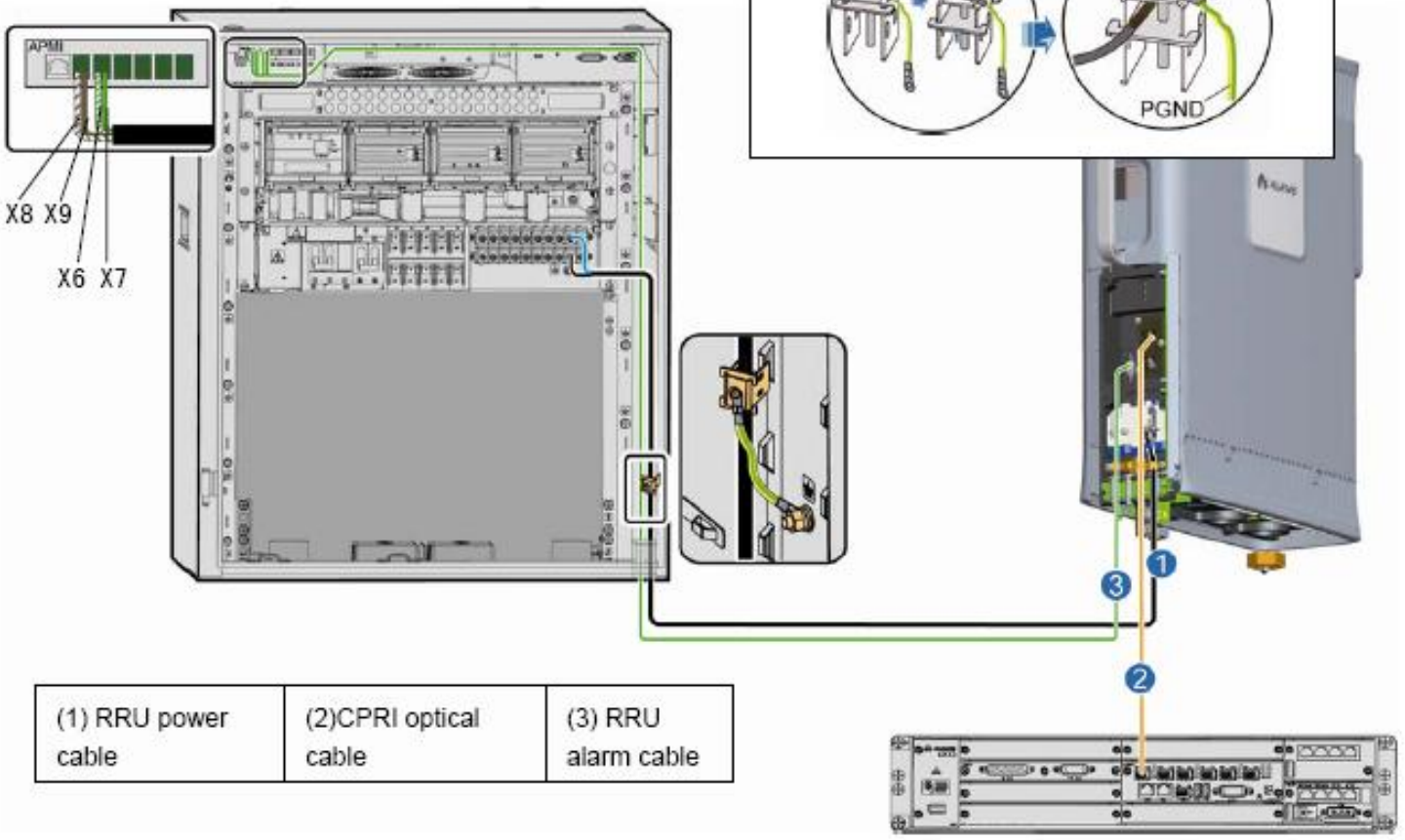
Installation of Monitoring Cables of BBU in APM30HCabinet

Note-

RRU & BBU are not on the same site & the RRU monitors the APM30H.







(1) RRU power cable	(2)CPRI optical cable	(3) RRU alarm cable

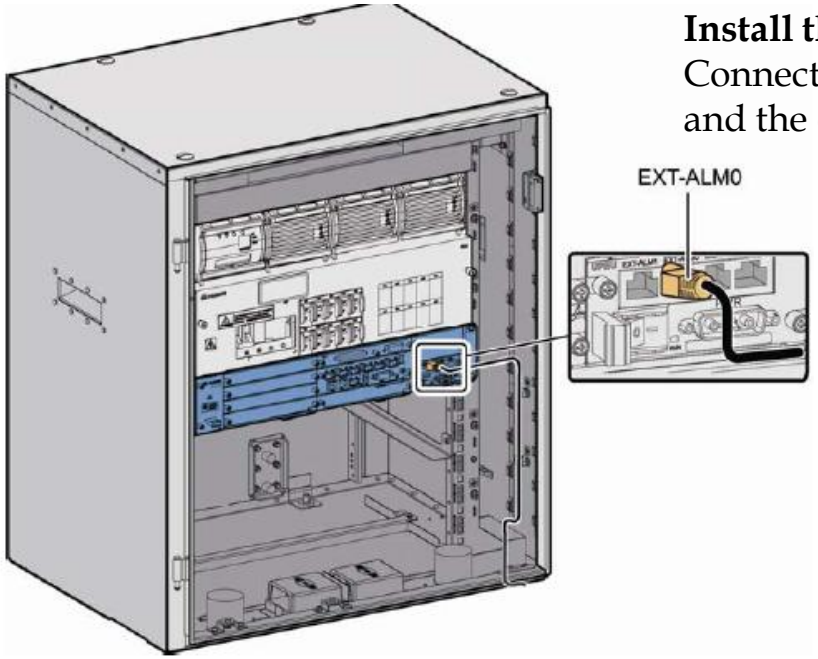
Procedure-

❑The DC RRU power cable is connected to one of the LOAD8 to LOAD13 terminals of the EPS.

❑Strip the jacket of the DC RRU power cable for a strap, press the exposed shielding layer on the Strap and then connect the PGND cable on the strap to the nearest grounding bolt on the side in the APM30H(Ver.B).

HUAWEI

Alarm Cable Installation



Install the alarm cable.

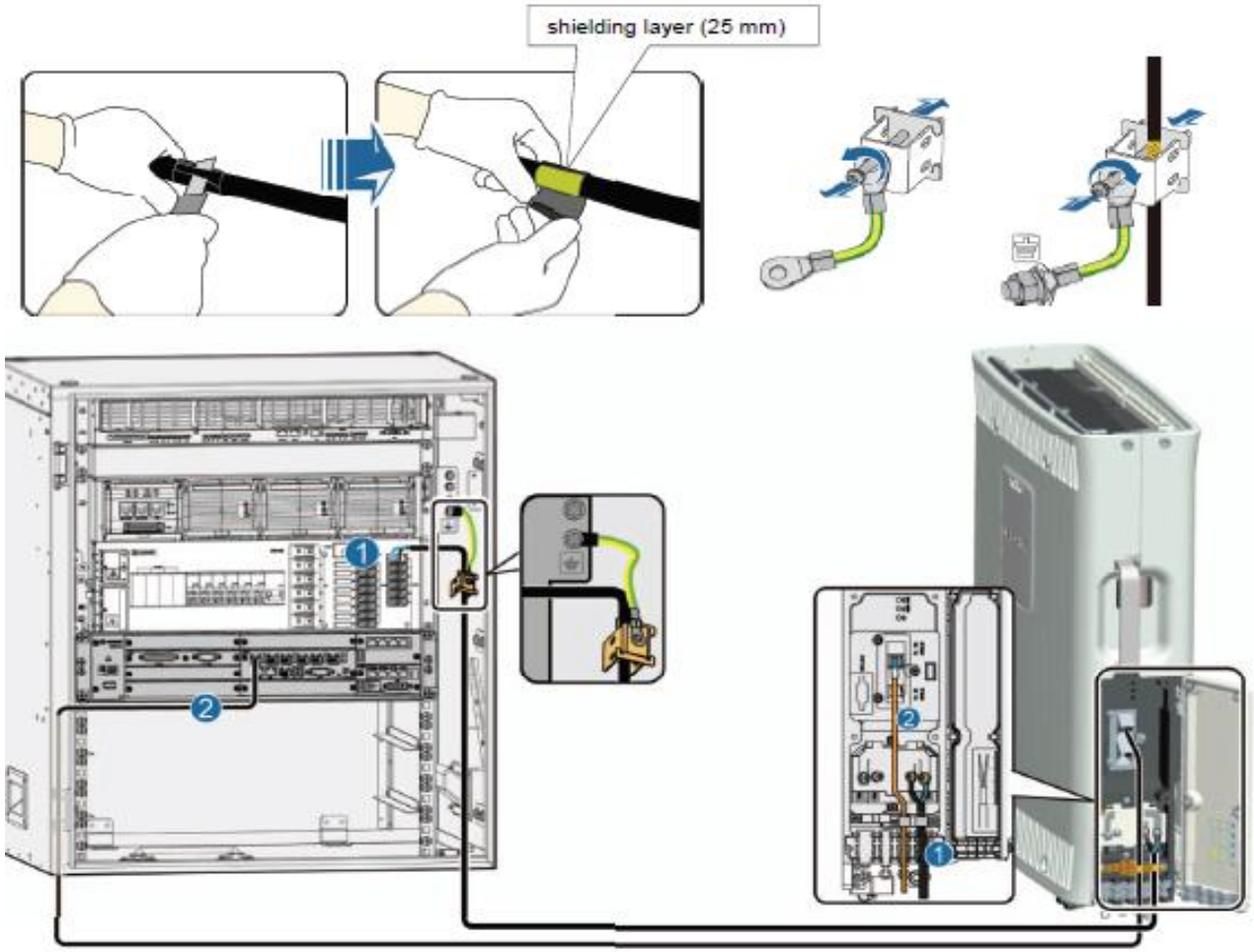
Connect one end of the alarm cable to the EXT-ALM port on the UPEU and the other end to the corresponding alarm device.

HUAWEI

Grounding of RRU DC Power Cable shield

Note-

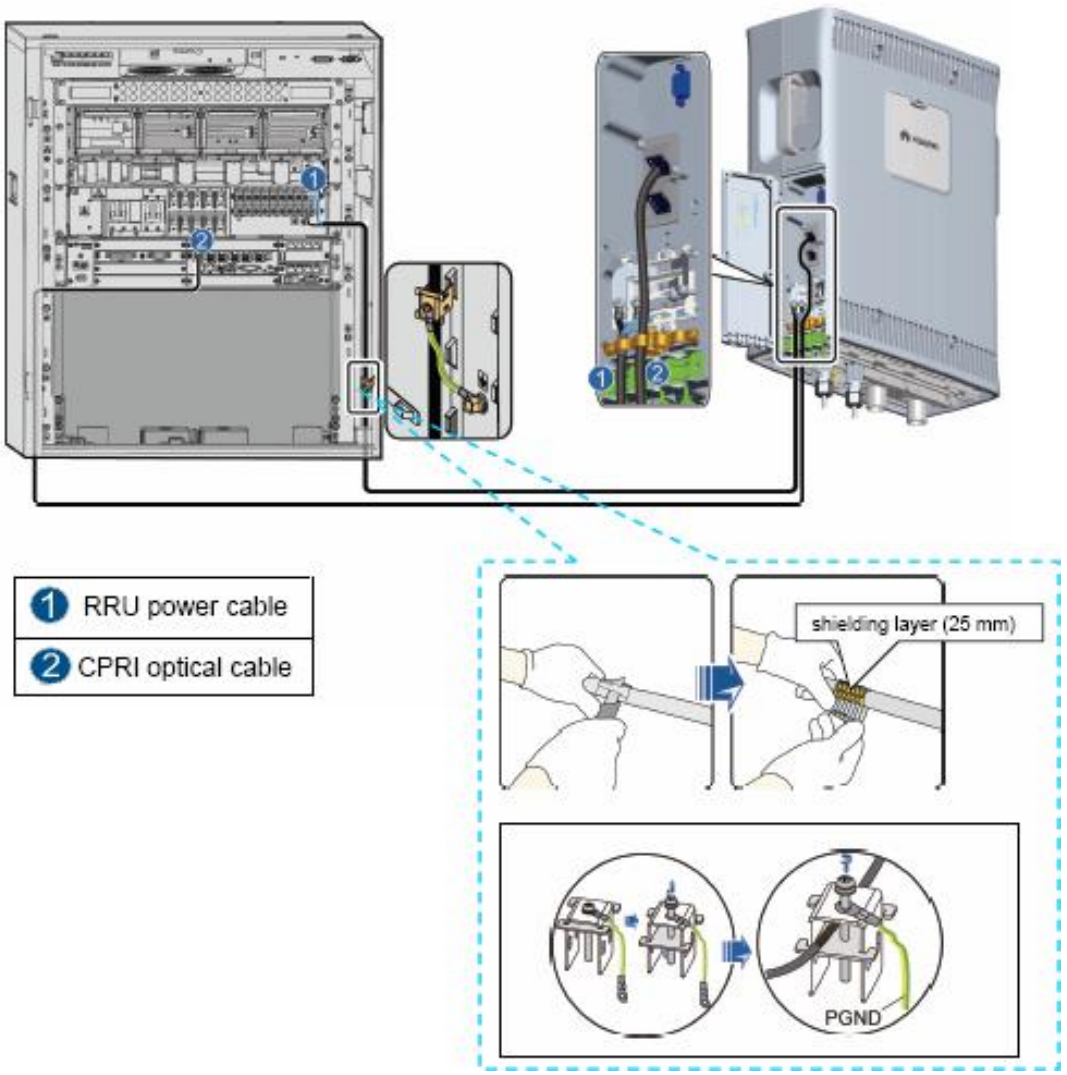
RRU & BBU are on the same site & the BBU monitors the APM30H



(1) DC RRU power cable	(2)CPRI optical cable

HUAWEI

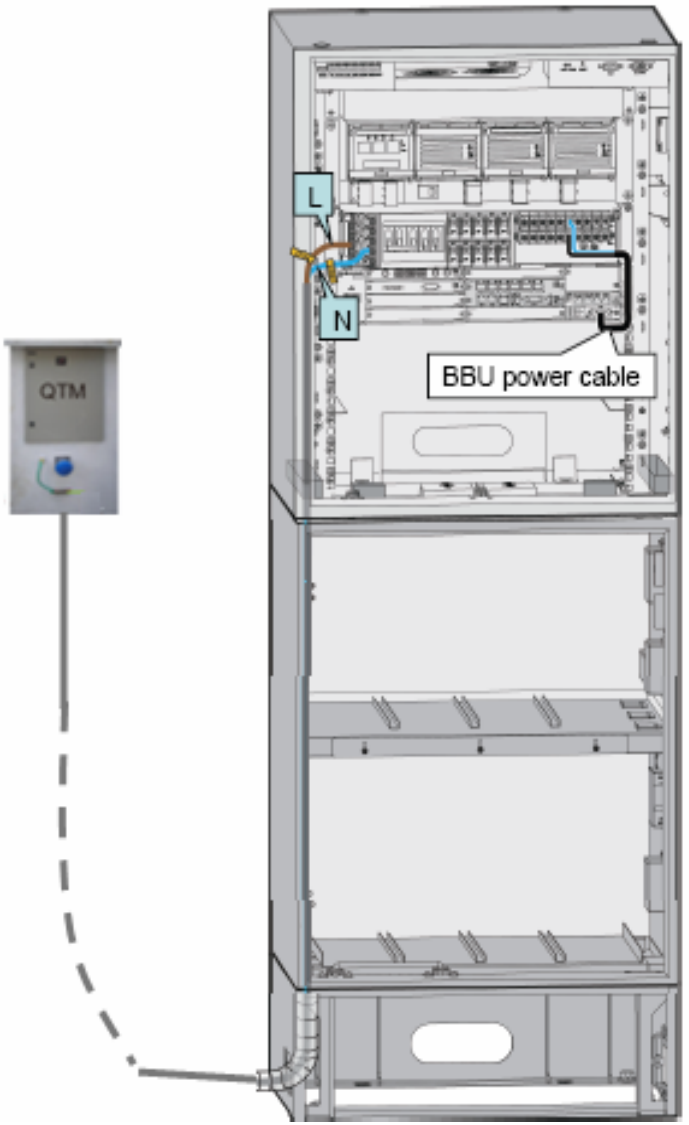
Grounding of RRU DC Power Cable shield

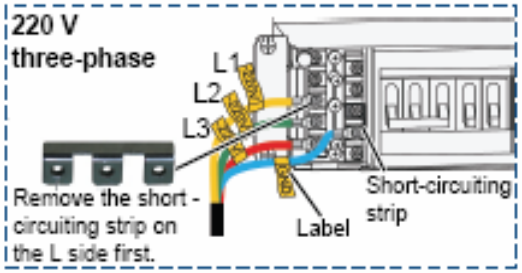


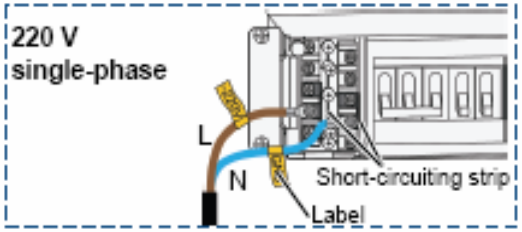
1	Strip the jacket off the RRU power cable.
2	Strip off the shielding layer and then lead the cable through a heat-shrinkable tube.
3	Assemble an OT terminal at one end of the cable
4	Use right color code cables for +ve & -ve
5	Use right tools for crimping, tightening of cables and installation of cables.
6	Bend 90 degrees for the assembled OT terminals.
7	The RRU power cable is connected to one of the LOAD4 to LOAD9 terminals of the PDU.
8	Strip the jacket of the RRU power cable for a small part, press the exposed shielding layer on the strap, and then connect the PGND cable on the strap to the nearest grounding bolt on the side in the APM30/APM30H.
9	Connect the blue wire of the RRU power cable to the -48 V terminal on the PDU and black wire to the GND terminal.

HUAWEI

Installation of I/P AC Power Cable







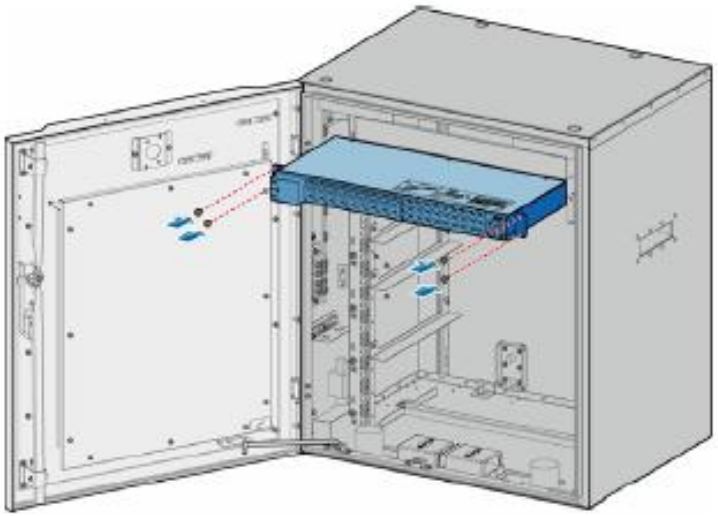
110 V dual-live-wire See "220 V single-phase".

1	Cut the proper length of the power cable according to the distance between APM30 and QTM.
2	Route the power cable and fix it on the ground in order to make it look well.(use corrugated PVC conduits for routing of cables)
3	Make the both ends of the power cable with OT terminals.
4	Use and terminated proper color coding cables as indicated in pics.
5	Tighten all the terminals properly. Use proper tools for stripping, crimping & tightening of all connectors.
6	Connect one end of the cable to the MCB/Fuse at incomer & connect the other end to the PDU inside AMP30.

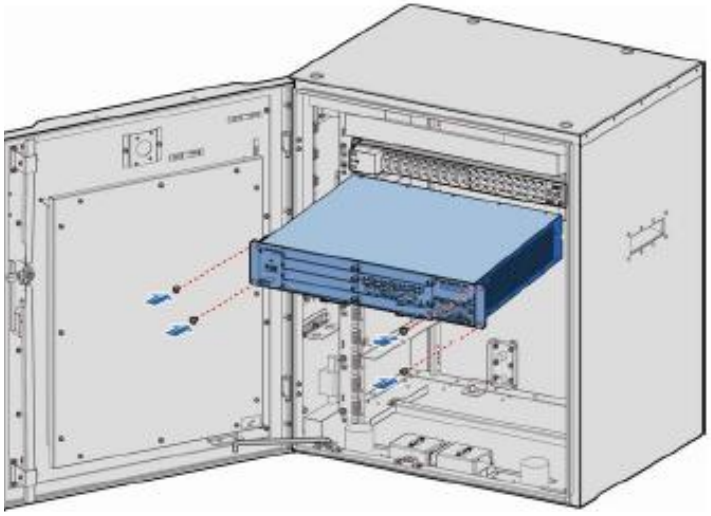
HUAWEI

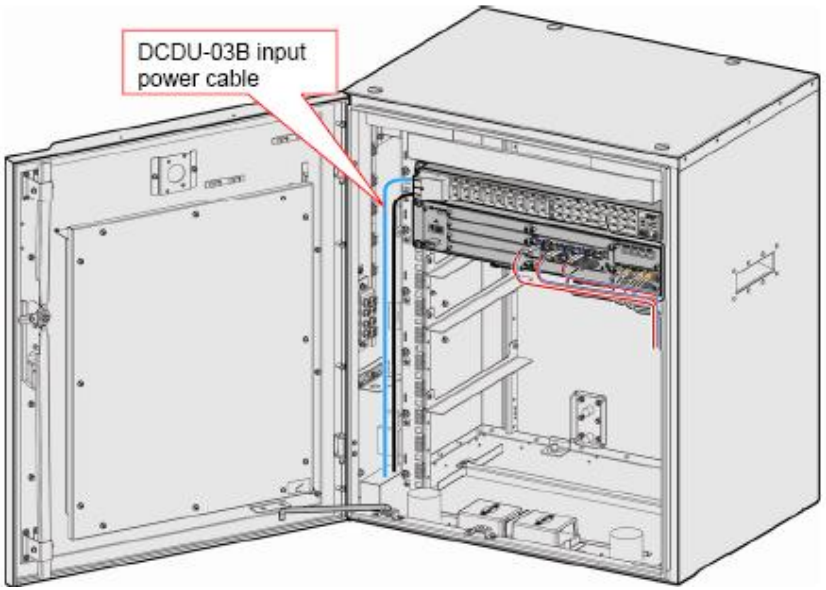
Installation of BBU3900 in TMC11H Cabinet

INSTALLATION OF DCDU-03B IN TMC RACK



INSTALLATION OF BBU 3900 IN TMC RACK

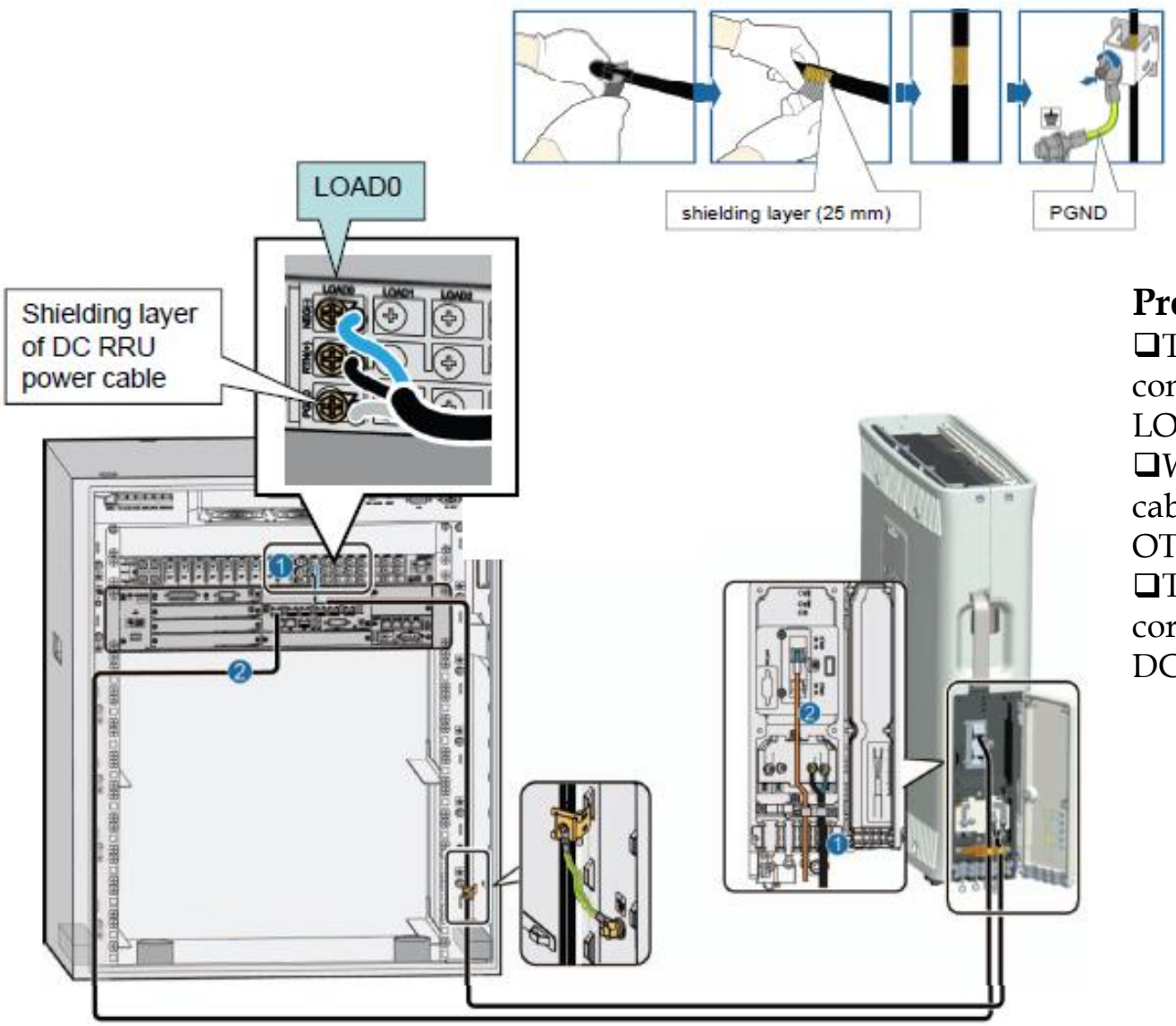




INSTALLATION OF BBU 3900 CABLES

HUAWEI

DC Cable Installation for BBU3900 & RRU



Procedure of DC Power Cabling,

❑The DC RRU Power Cable is connected to one of the LOAD0 to LOAD5 terminals of the DCDU-03B.

❑When connecting the DC RRU power cable to the DCDU-03B,must add an OT terminal to the shielding layer.

❑Then fix the OT terminal to the corresponding PGND terminal of the DCDU-03B.

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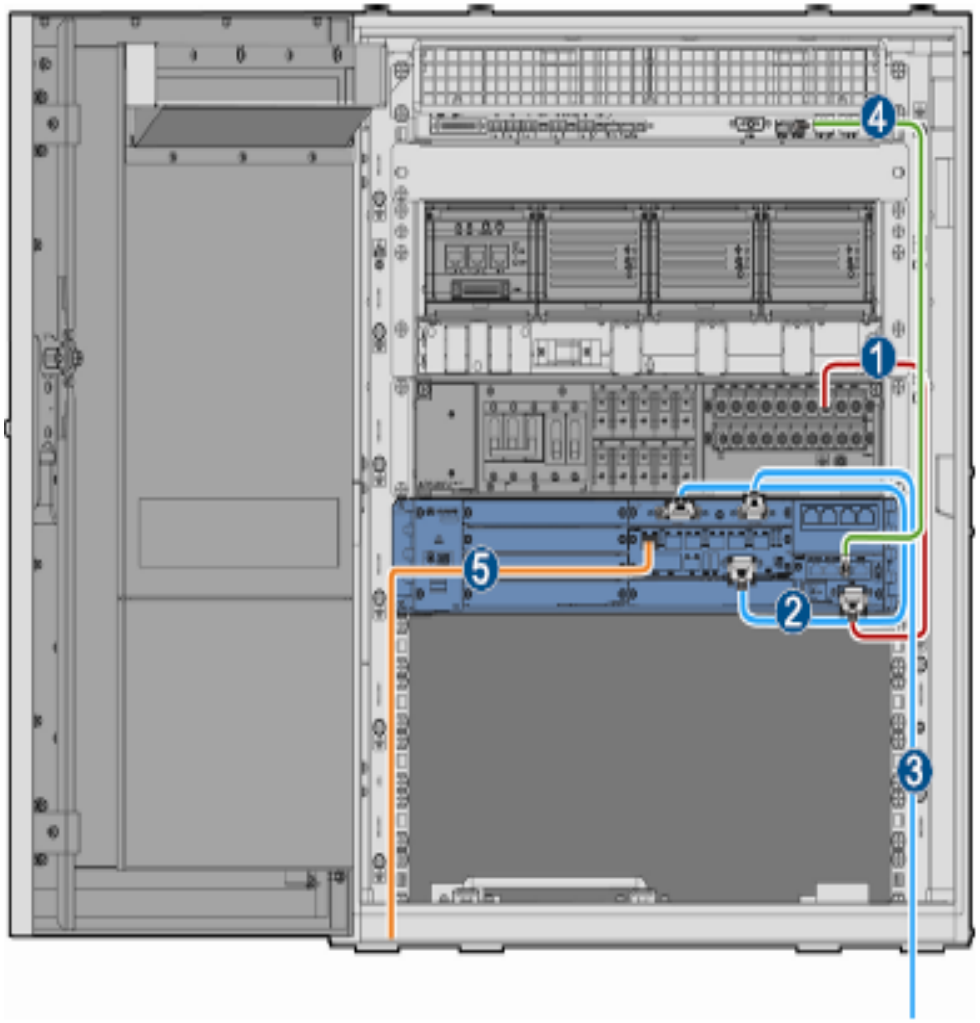
CPRI & E1/FE Cable Installation



No.	Cable	Installation Position	
		One end is connected to...	The other end is connected to...
1	BBU power cable	LOAD3 terminal of the PDU	PWR port on the BBU
2	E1 transfer cable	E1/T1 port on the GTMU	INSIDE port on the UELP
3	E1 cable	OUTSIDE port on the UELP	GEHUB or HUBBTS
4	Monitoring signal cable	COM IN port on the HEUA	MON1 port on the BBU
5	CPRI optical cable	CPRI port on the BBU	CPRI port on the RRU

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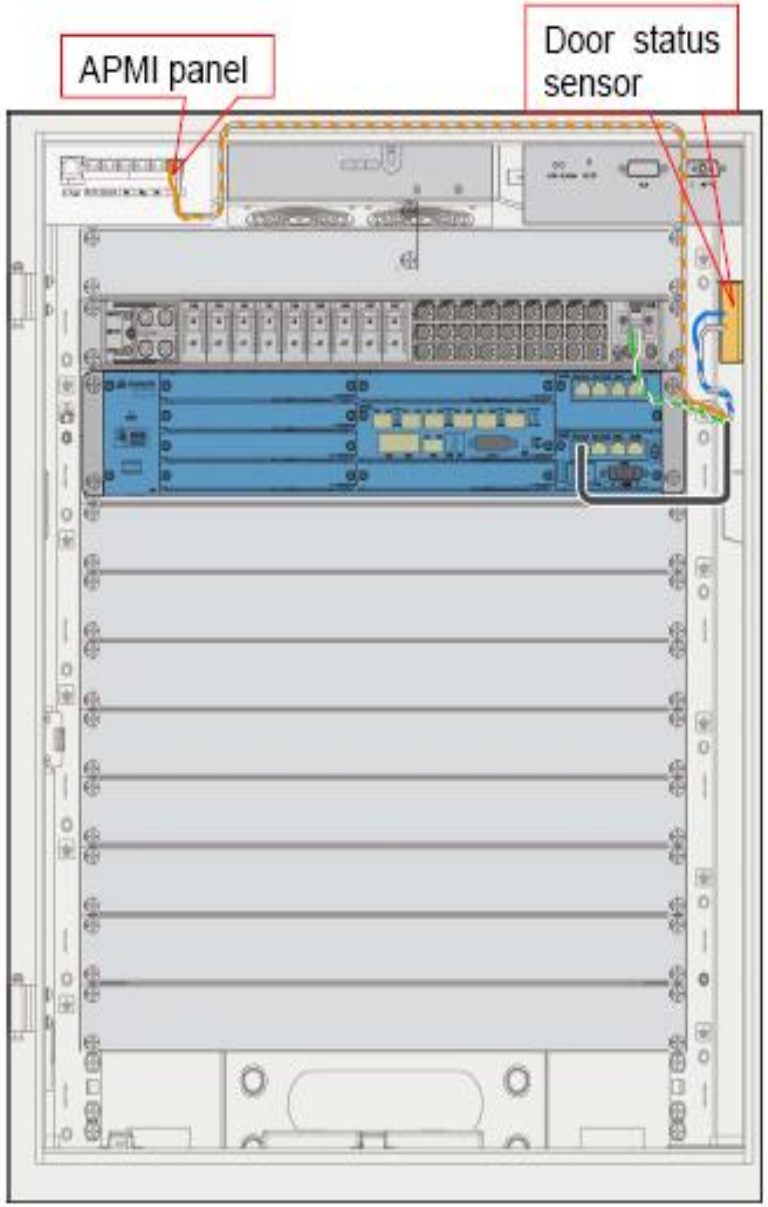
Installation of Monitoring Cables in TMC11H Cabinet



Procedure of Monitoring Signal Cabling,

- Fix the RJ45 Connector at one end of the alarm cable to the EXT_ALM1 port on BBU.
- Connect the two bare terminals X1.4 (Blue) & X1.5(White) to the alarm wiring terminals of the door sensor.
- Connect the two bare terminals X1.1 (white) & X1.2 (Orange) to the
- OUT1+ & OUT1- alarm wiring terminals on the APMI.
- Connect the two bare terminals X1.3 (white) & X1.6(green) to the alarm wiring terminals of the DCDU.

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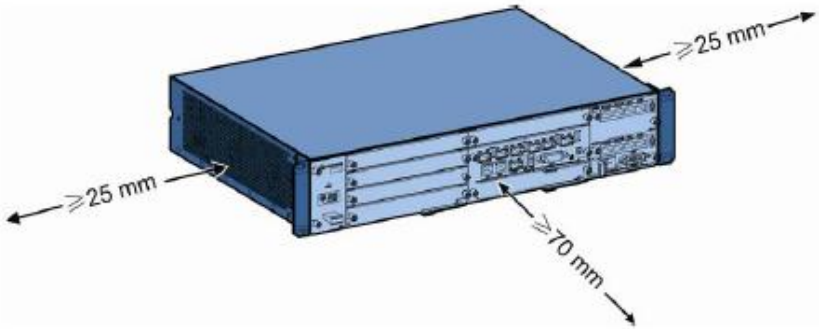
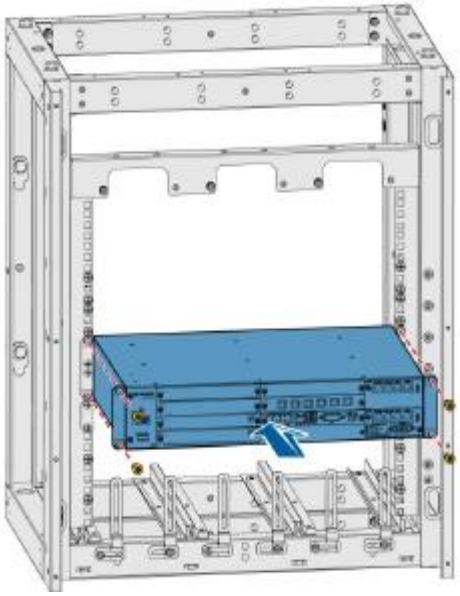
Installation of BBU in 19″ Cabinet/Rack

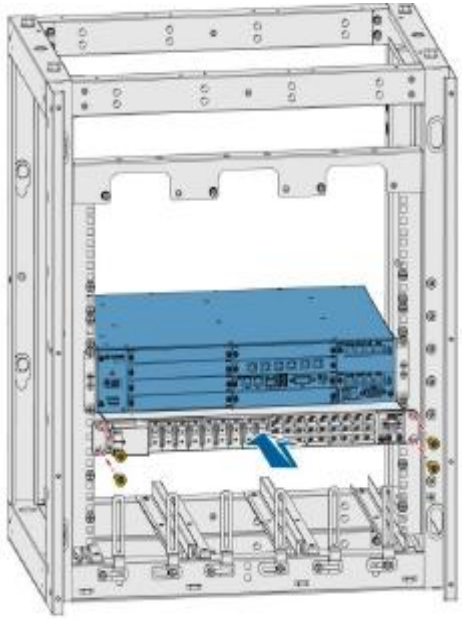
SPACE & CLEARANCE



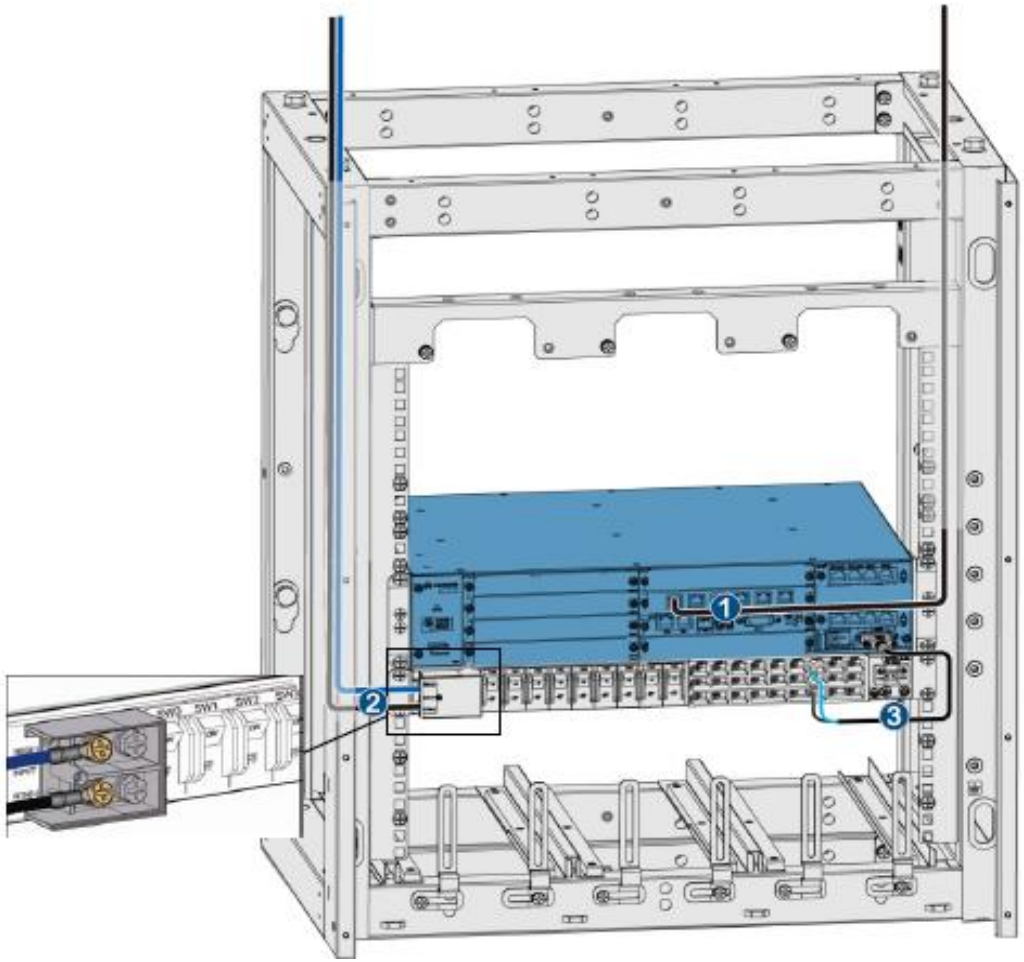
INSTALLATION OF BBU 3900 CASE IN 19″ RACK



INSTALLATION OF DCDU-03B IN 19″ RACK



Installation BBU Cables



No.	Cable	Installation Position	
		One end is connected to...	The other end is connected to...
1	CPRI optical cable	CPRI port on the GTMU	CPRI port on the RRU
2	External power cable	BEG(-) and RTN(+) on the DCDU-03B	External power equipment
3	BBU power cable	PWR1 on the UPEU	LOAD6 on the DCDU-03B

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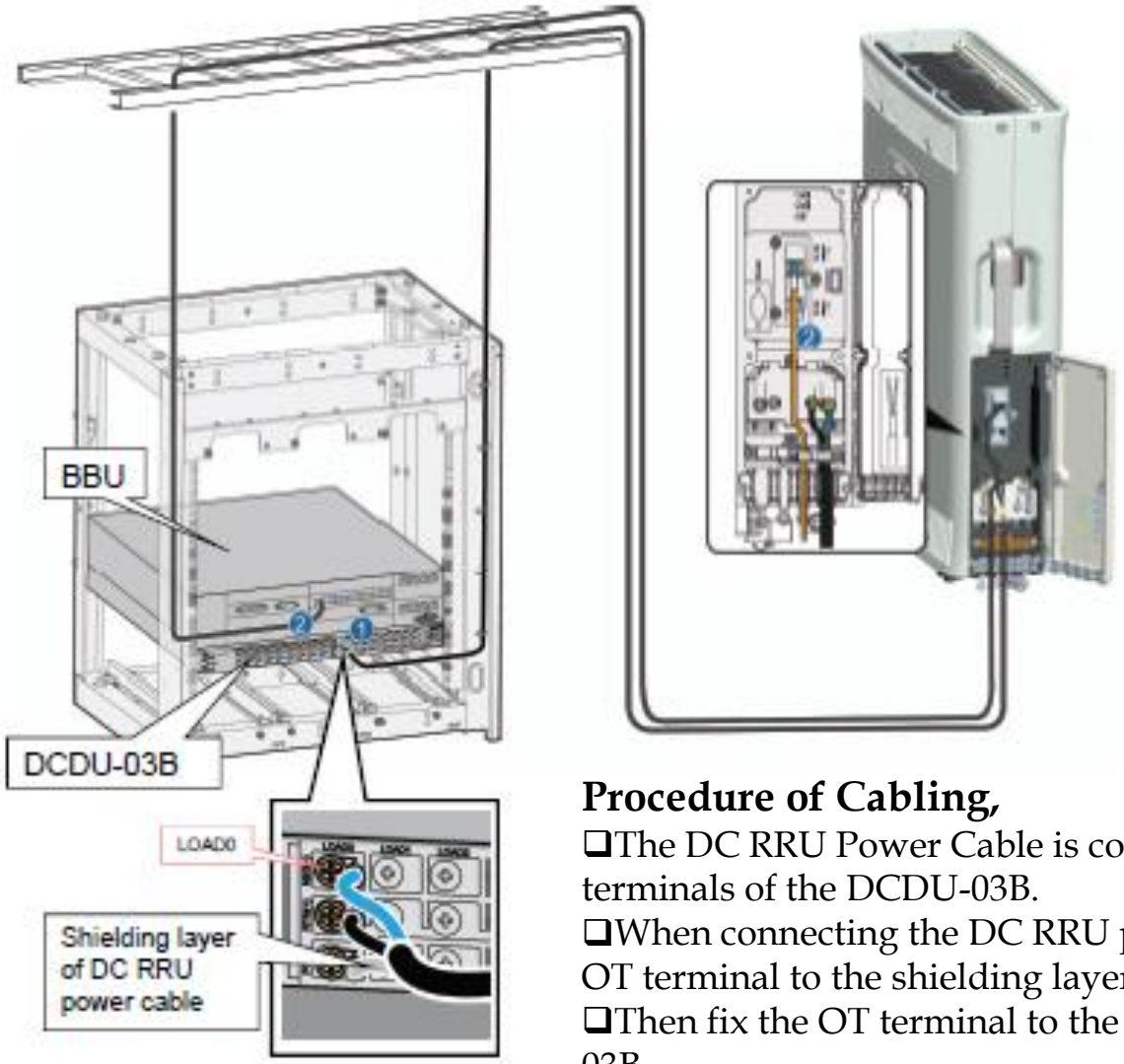
Installation of Power Cables (Incase BBU is in 19″ Cabinet/Rack)



Procedure of Cabling,

❑The DC RRU Power Cable is connected to one of the LOAD0 to LOAD5 terminals of the DCDU-03B.

❑When connecting the DC RRU power cable to the DCDU-03B,must add an OT terminal to the shielding layer.

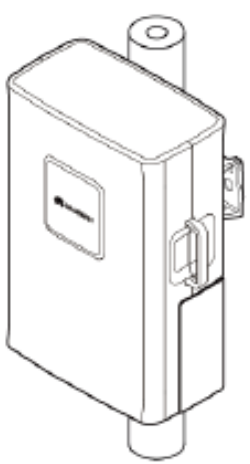
❑Then fix the OT terminal to the corresponding PGND terminal of the DCDU-03B.

HUAWEI

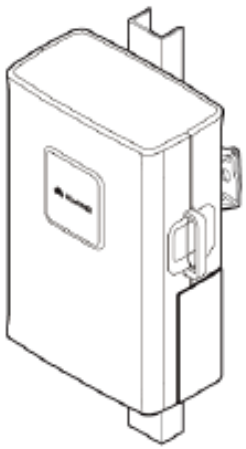
INSTALLATION OF RRU

INSTALLATION OF DC RRU

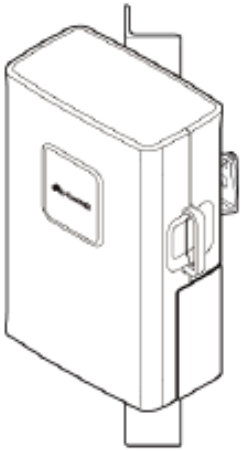
Installation Options of RRU's



On a metal pole

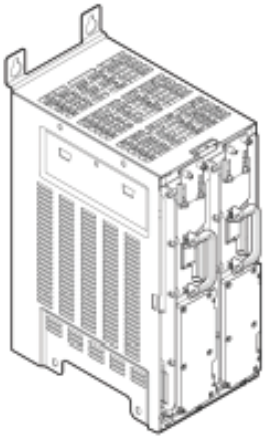


On U-steel

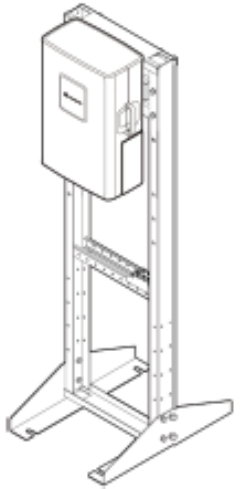


On angle steel

On a wall

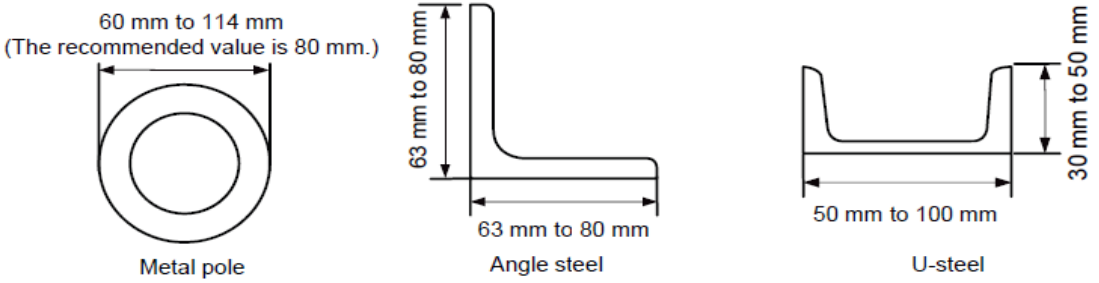


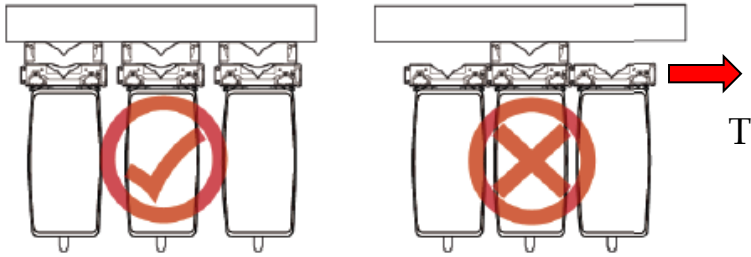
DC RRU for capacity expansion



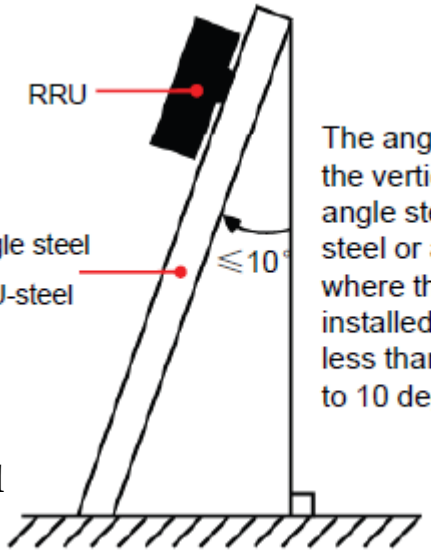
On an H-shaped stand

The following figure describes the specifications for the metal pole, angle steel, and U-steel where the RRU is installed.





The Brackets can not be combined



The angle between the vertical and the angle steel or U-steel or angle steel where the RRU is installed must be less than or equal to 10 degree.

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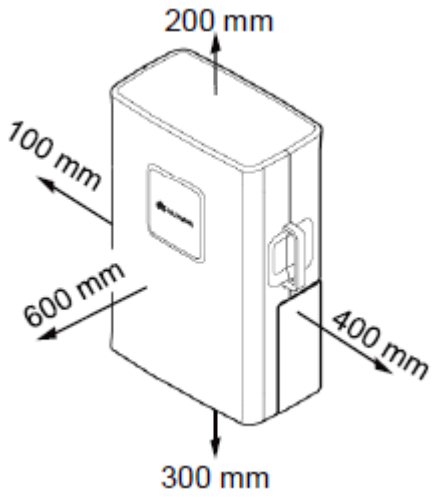
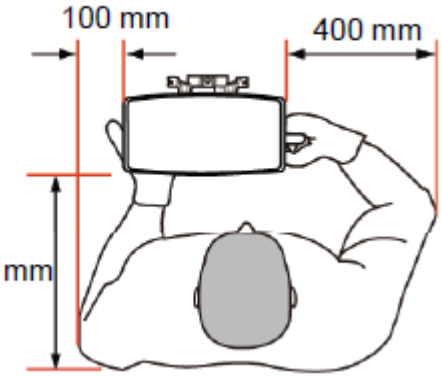
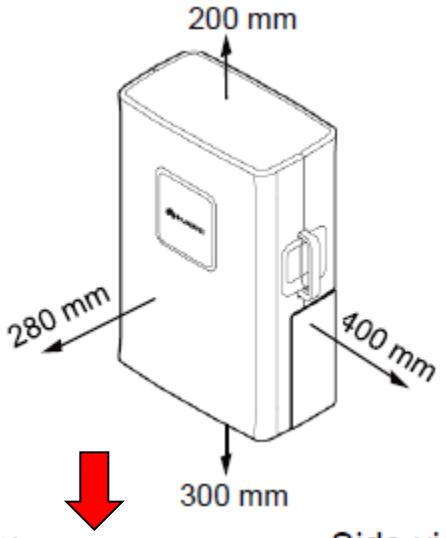
Space & Clearance for Installation of RRU's



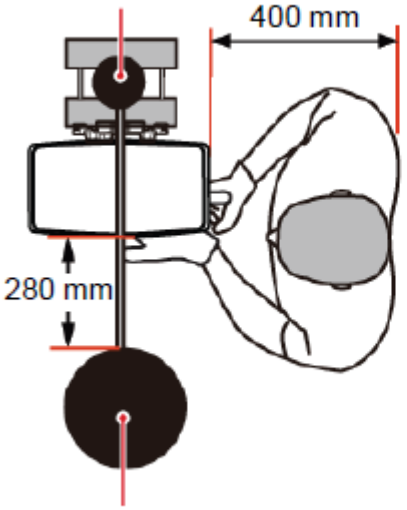
Top view



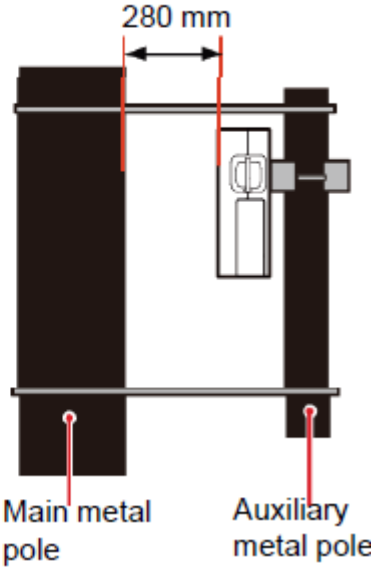


Top view

Auxiliary metal pole

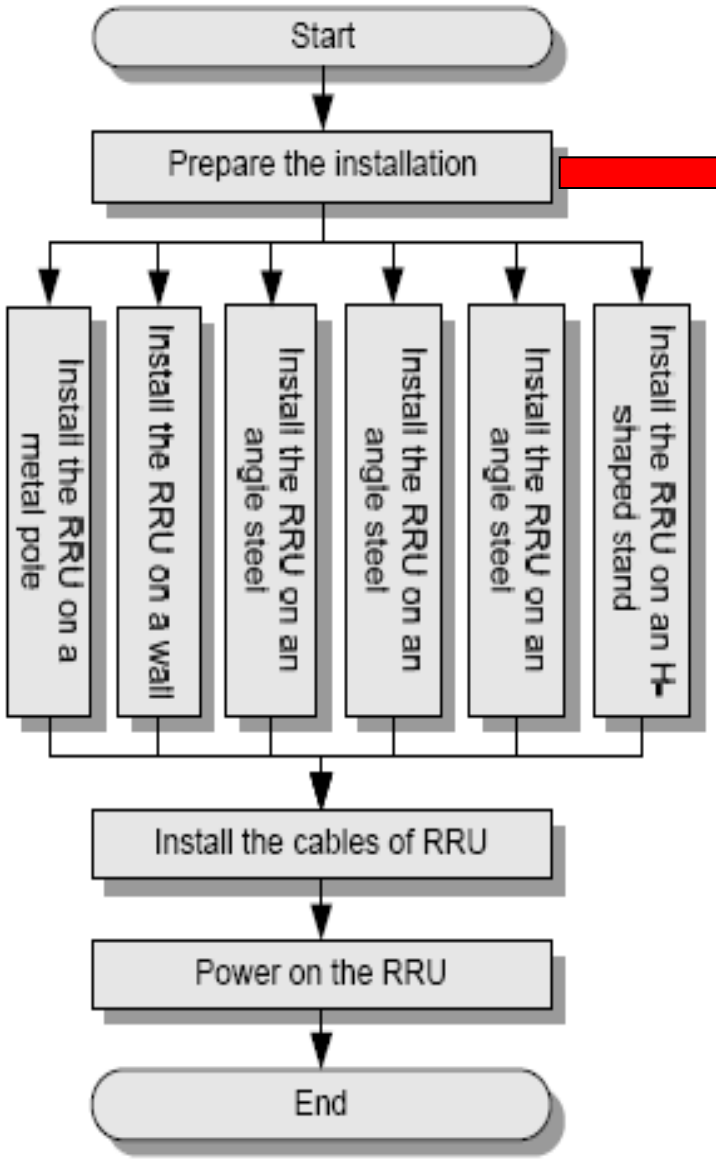


Side view

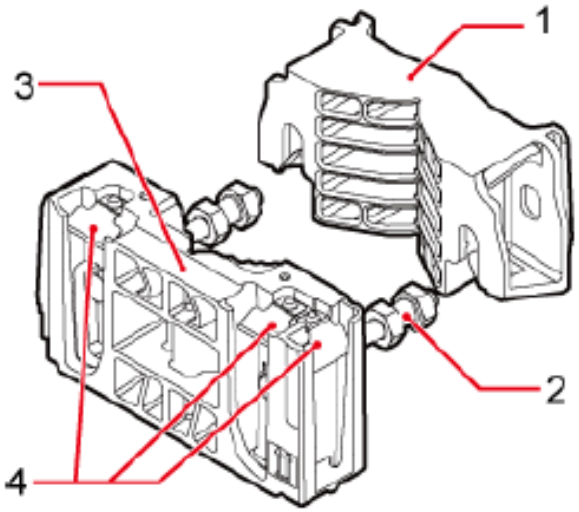


HUAWEI

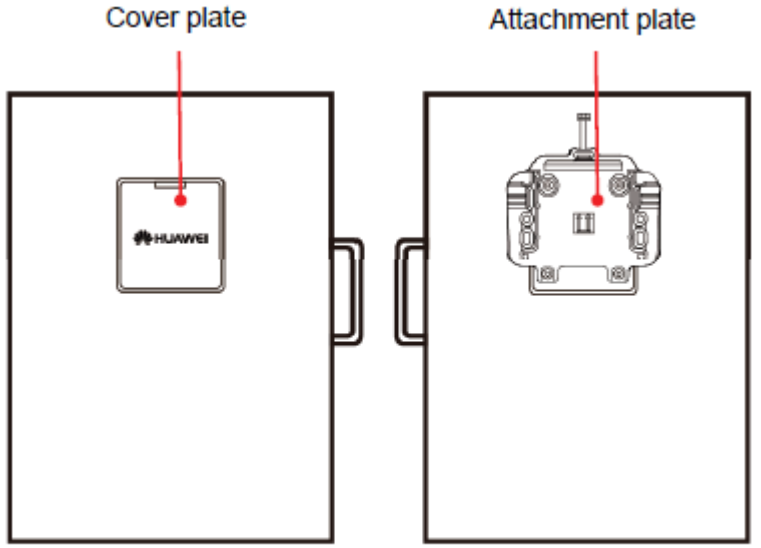
Installation Procedures of RRU Installation



Main and auxiliary brackets for the RRU



1. Auxiliary mounting bracket.
2. Dual-nut bolts assembly.
3. Main mounting bracket
4. Hoist clamp on the main mounting bracket.



HUAWEI

Hoisting of RRU's on Tower

Before installing an RRU on a tower, bind the RRU and mounting kits and then hoist them onto the tower. The RRU can be installed on a pole, U-steel, or angle steel.

Precautions:

Place a foam pad or cardboard on the ground to protect the housing of the RRU and mounting kits from damage before the binding. Do not stand the RRU upright because the load-bearing capacity of the RF ports at the RRU bottom is low.

Procedure

❑Bind the RRU and mounting kits properly using a lifting sling.

❑Bind the RRU by leading the lifting sling along the bottom of the attachment plate and through the RRU handle. Then, bind mounting kits to the lifting sling and bind the RRU handle to the traction sling.

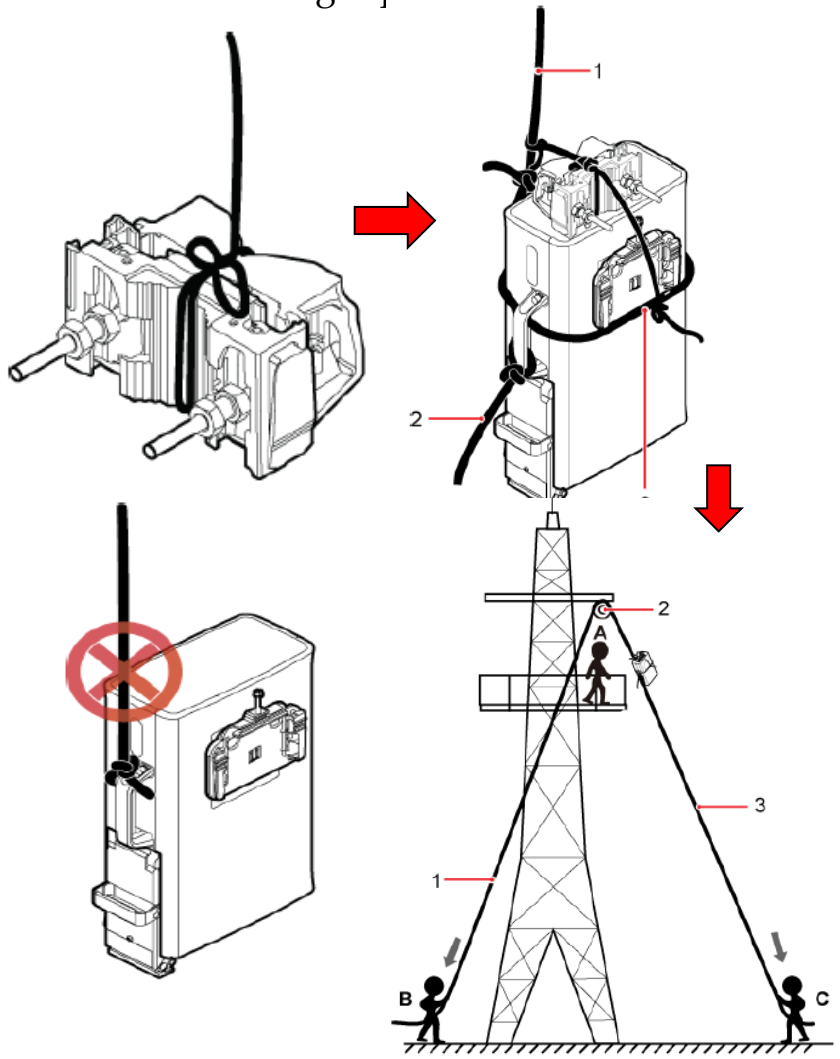
❑Hoist the RRU and mounting kits onto the tower.

❑After climbing up to the tower, installation engineer A secures the fixed pulley to the tower platform support and leads the lifting sling through the fixed pulley.

❑Installation engineer C binds the RRU and mounting kits using the lifting sling and secures the traction sling to the RRU handle.

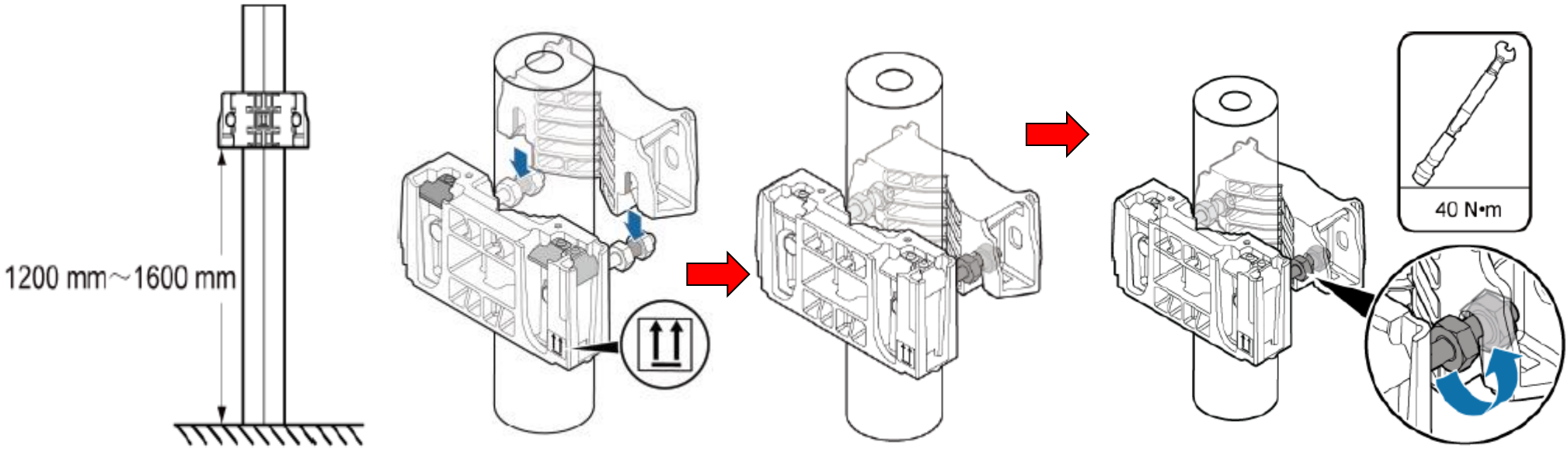
❑Installation engineer B pulls the lifting sling downwards, and installation engineer C pulls the traction sling outwards to protect the RRU and mounting kits from colliding with the tower.

❑Installation engineer A catches the RRU and mounting kits and then unties the sling.



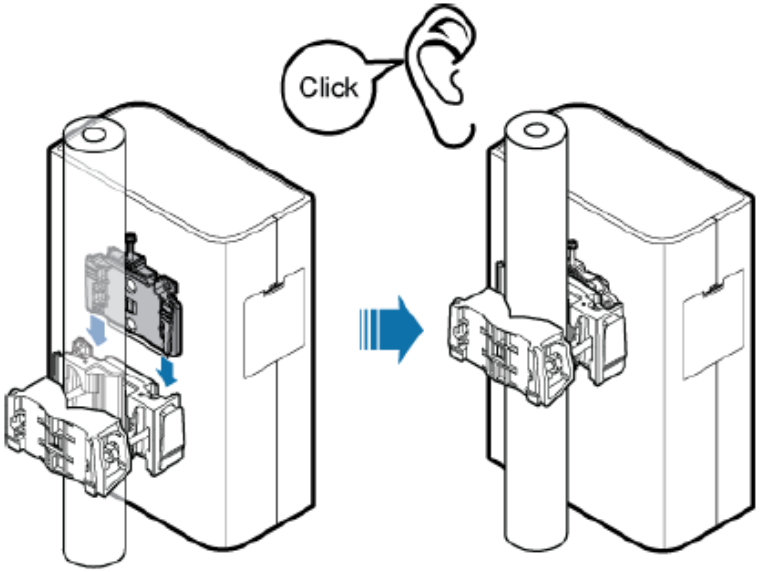
HUAWEI

Installation of RRU Brackets on metal Pole



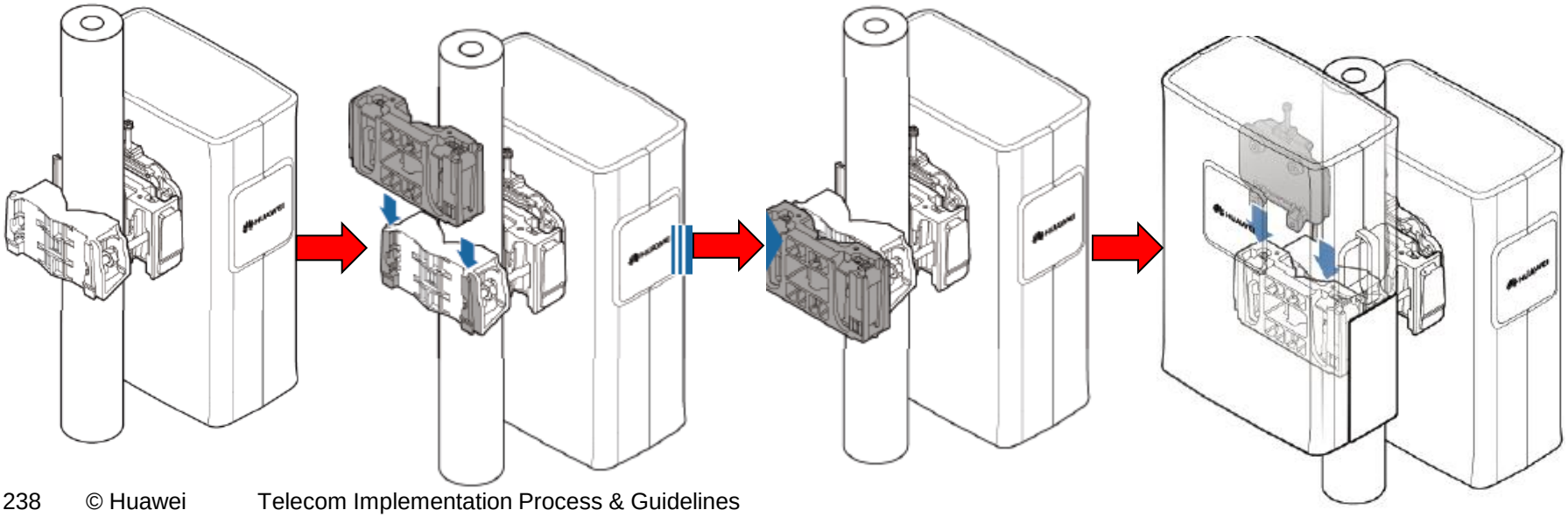
❑When installing the main fixture ,ensure that the contact piece on the fixture is fixed & ensure that the arrow on the main fixture is upward.
❑It is recommended that the bottom of the highest main fixture be 1200mm to 1600mm above the ground for easy maintenance.
❑Fit one end of the auxiliary mounting bracket to one dual-nut bolt assembly of the main mounting bracket.
❑Install main and auxiliary mounting brackets on the pole, and then fit the other end of the auxiliary mounting bracket to the other dual-nut bolt assembly
❑Fasten the two dual-nut bolt assemblies alternatively. After the brackets are secure, use a tape to measure the spacing between the main bracket and the auxiliary bracket at the two sides and ensure that the spacing is the same.
❑Use an adjustable wrench to tighten the nuts until the fastening torque is 40 N-M.

Installation of RRU's on metal Pole



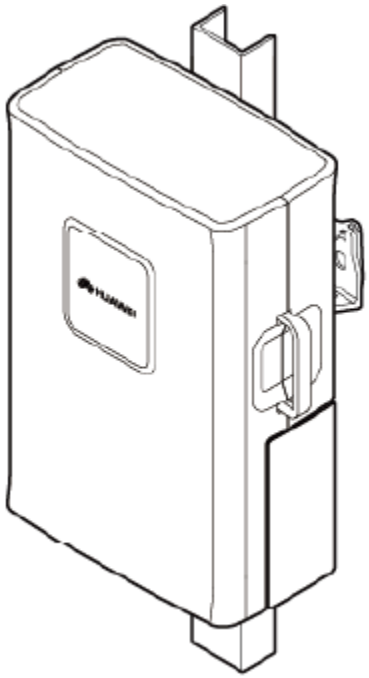
- ❑Install the RRU on main bracket ,when you hear the click sound , it can be infer that the RRU is installed correctly.
- ❑The weight-bearing capacity of the RF ports at the bottom of the RRU is low. Do not place the RRU at its.
- ❑During the operation, place the foam pad or cardboard under the RRU to prevent any damage to the housing of the RRU.

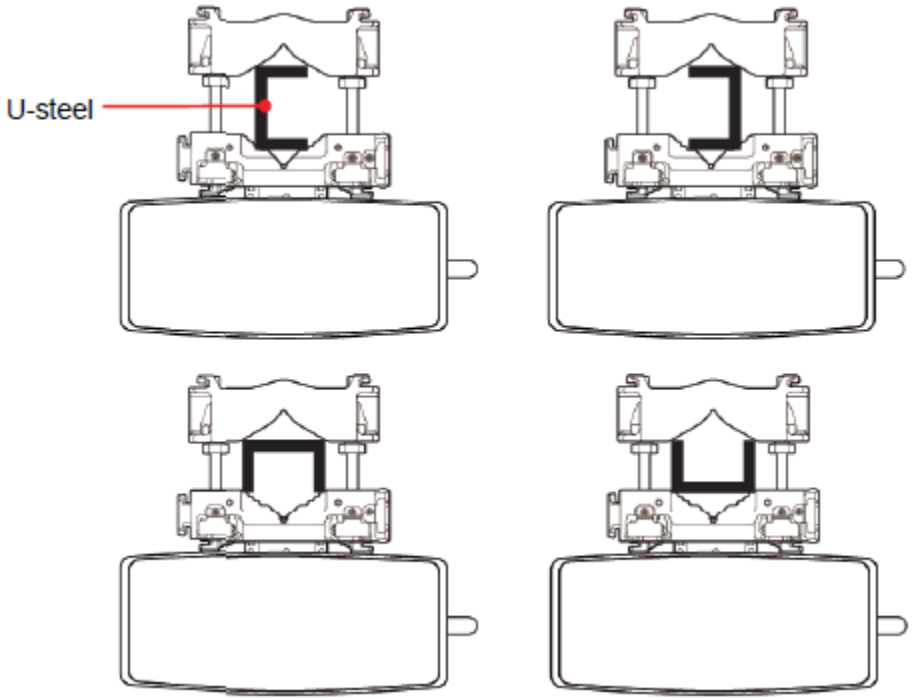
2 RRU on a single POLE Installation



HUAWEI

Installation of RRU's on U- Pole



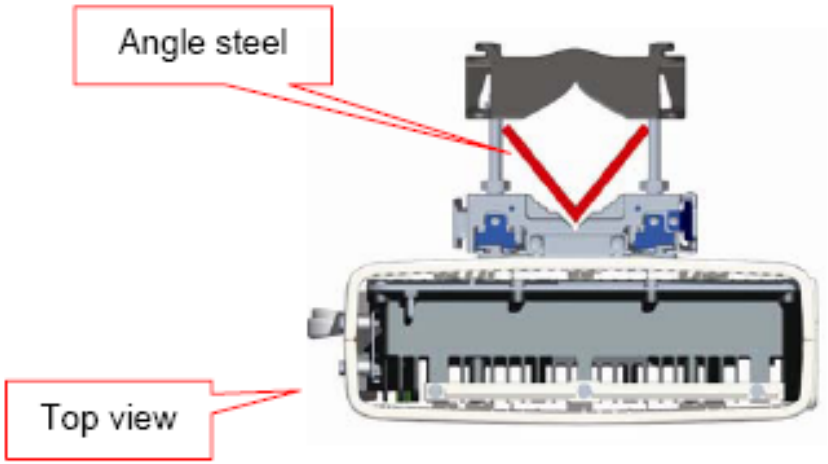


Procedure-

- The procedure for installing the RRU on U-steel is the same as that on a metal pole.
- Only one RRU can be installed on U-steel.

HUAWEI

Installation of RRU's on Angled Steel

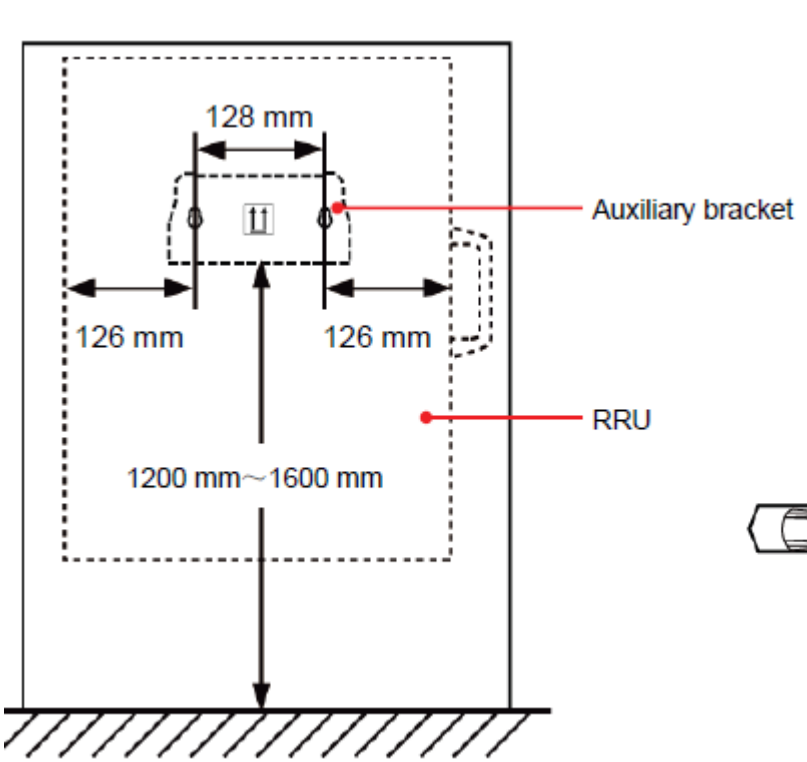


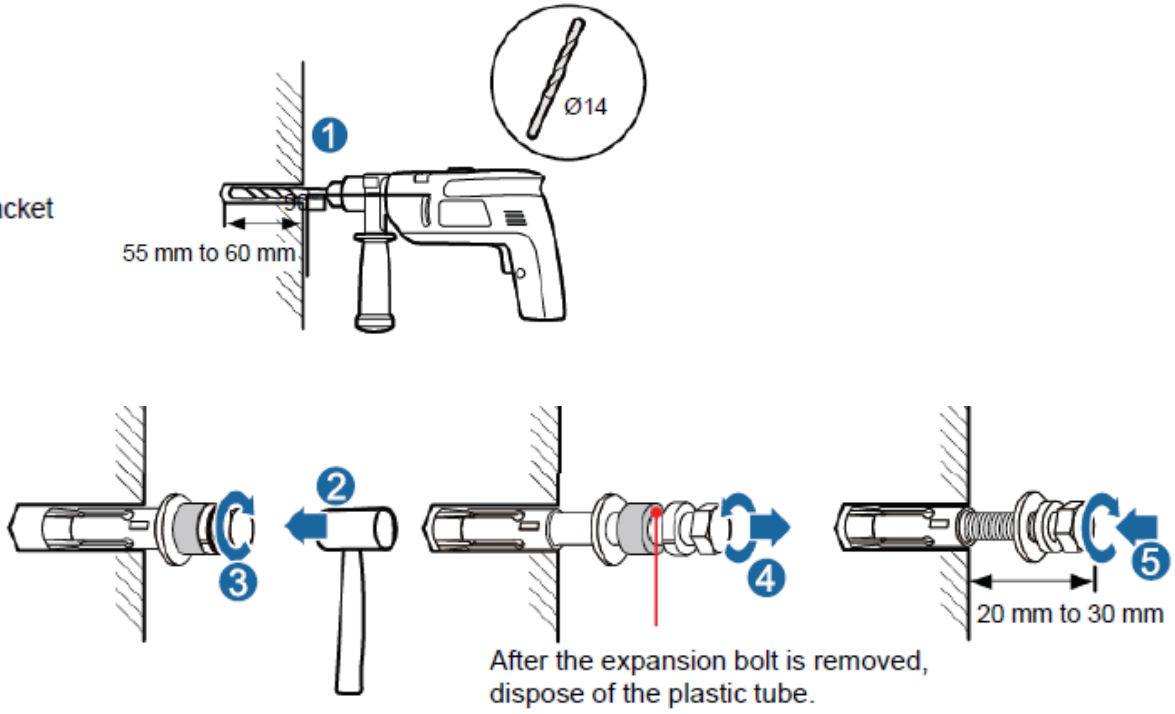
Procedure-

- The procedure for installing the RRU on U-steel is the same as that on a metal pole.
- Only one RRU can be installed on U-steel.

HUAWEI

Installation of RRU's on Wall





Procedure-

- It is recommended that the auxiliary bracket be 1,200 mm to 1,600 mm above the ground.
- The RRUs cannot installed on a wall in centralized mode.
- Therefore, expansion bolt assemblies should be prepared for each RRU.
- For one RRU, the wall has a weight-bearing capacity of 68 kg.
- The fastening torque of the expansion bolt reaches 30 N·m, the expansion bolt works properly, and no damages such as cracks are on the wall.

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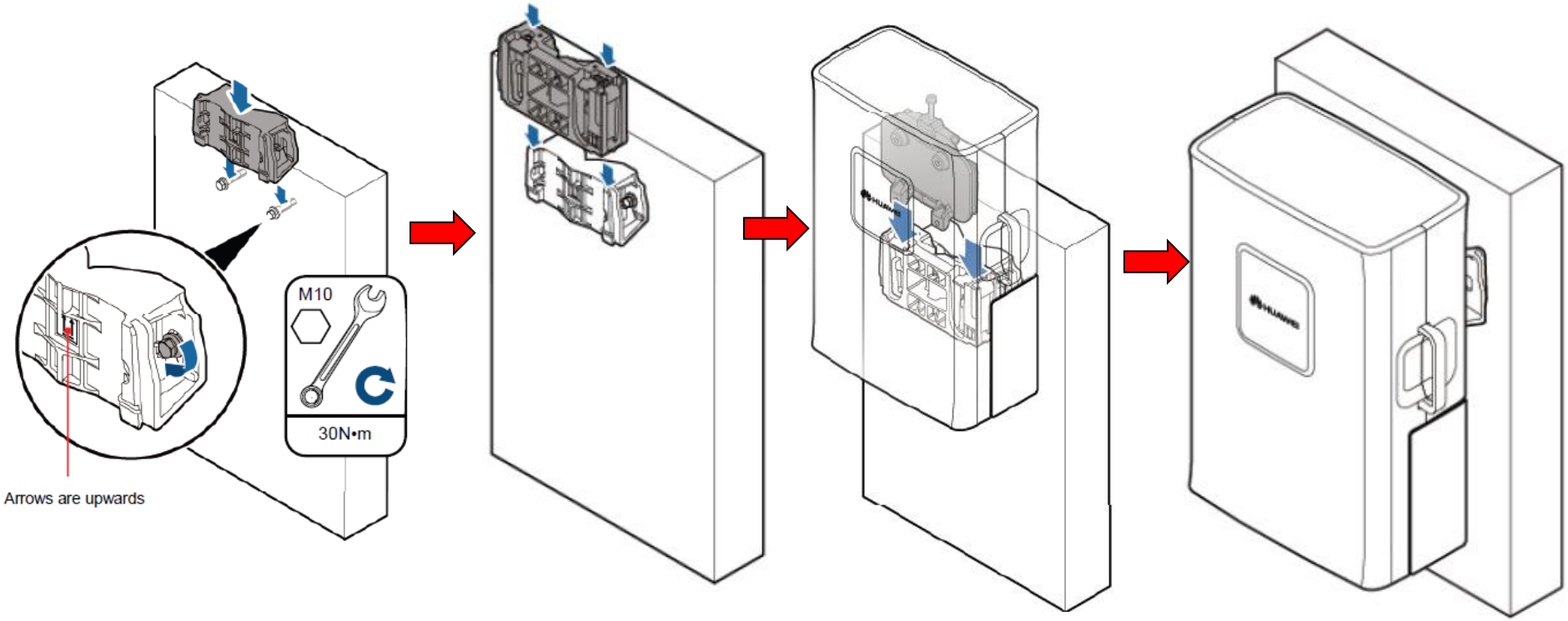
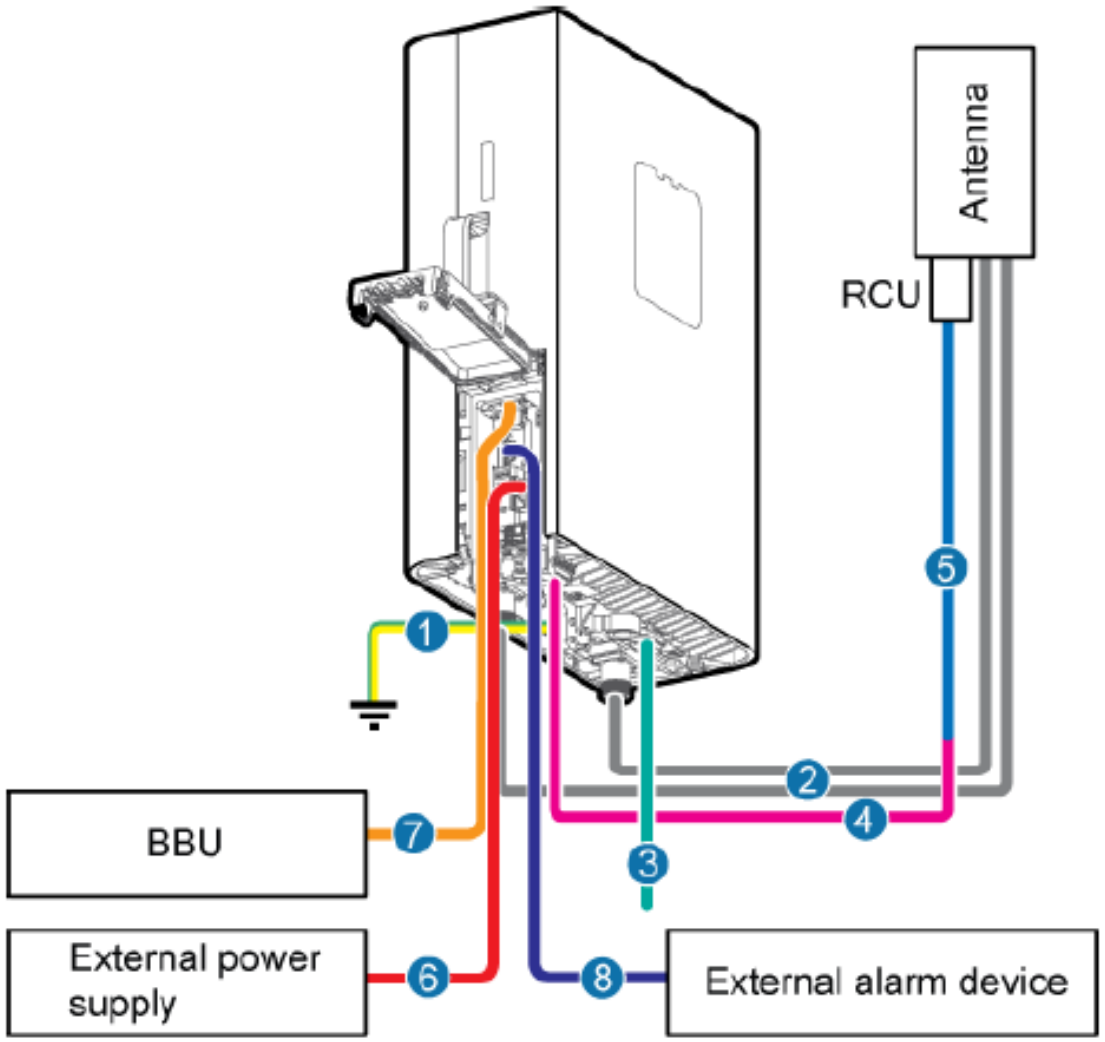
Installation of RRU's on Wall



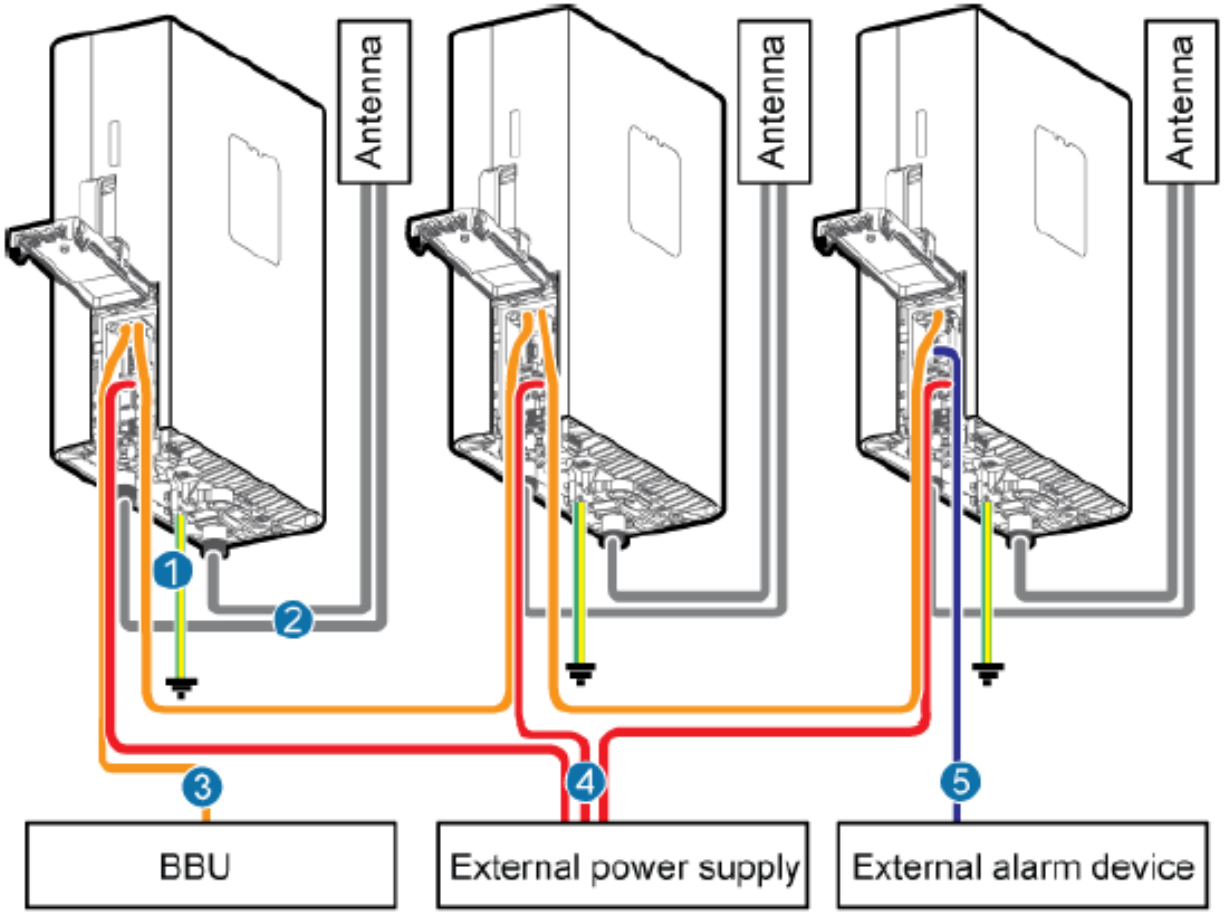
- Fit the auxiliary mounting bracket on the expansion bolt, and then use a combination wrench (17 mm [0.67 in.]) to tighten the expansion bolt to 30 N·m (265.52 lbf.in.).
- Install the main mounting bracket.
- Install the RRU on the main mounting bracket until the RRU snaps shut.

Cable Connections for Single RRU



(1) PGND cable
(2) RRU RF jumper
(3) Inter-RRU RF cable
(4) RRU AISG multi-core cable
(5) RRU AISG extension cable
(6) RRU power cable
(7) CPRI optical fiber
(8) RRU alarm cable

Cable Connections for Multiple RRU's



(1) PGND cable
(2) RRU RF jumper .
(3) CPRI optical fiber
(4) RRU power cable
(5) RRU alarm cable

- A lower-level RRU obtains power directly from the external power system, but not from an upper-level RRU using a power cable.
- If you must cascade two or more RRUs in the same cell, for example, when expanding capacity, install the alarm cable to the last RRU.

PGND Cable Installation for RRU's

The cross-sectional area of an RRU PGND cable is 16 mm2 (0.02 in.2). The OT terminals at two ends of the cable are M6 and M8 terminals.

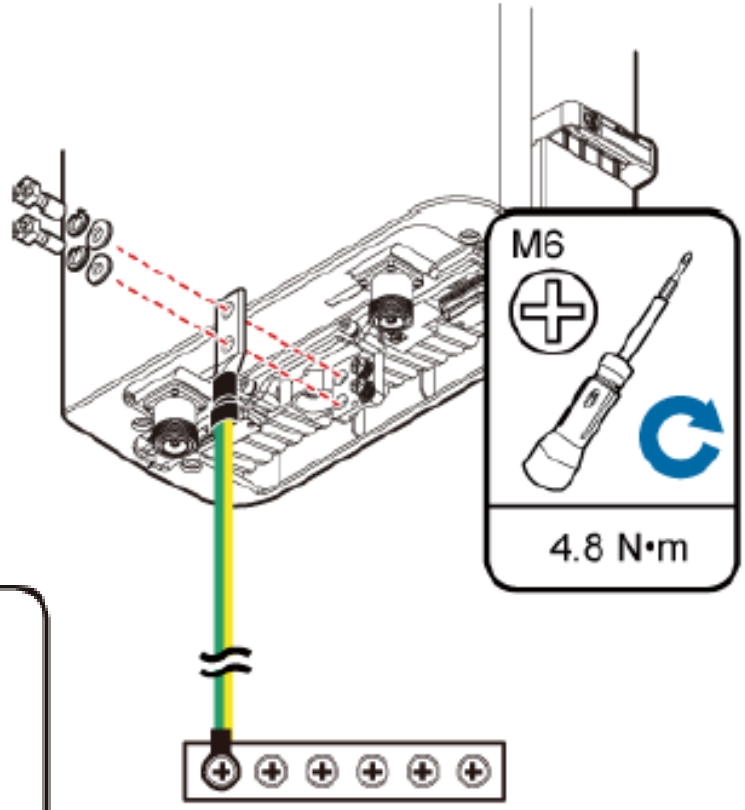
Procedure

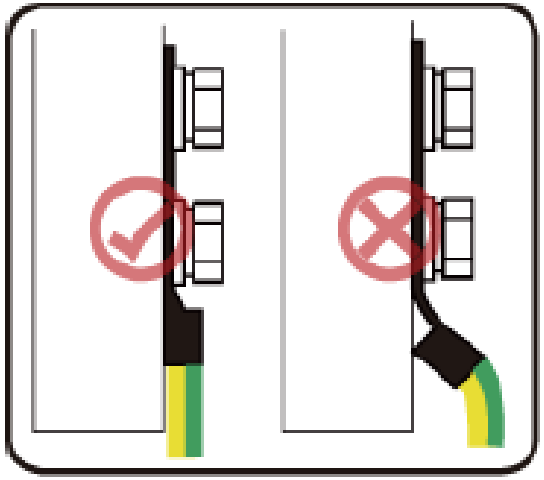
Prepare an RRU PGND cable.

1. Cut the cable to the required length based on the actual cable route.
2. Add an OT terminal to each end of the cable by referring to Assembling the OT Terminal and the Power Cable.

Install the RRU PGND cable.

Connect the M6 OT terminal at one end of the PGND cable to the ground terminal at the RRU bottom and the M8 OT terminal at the other end to the external ground bar,





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Jumper Cable Installation for RRU's

Procedure;

❑Link the DIN connector at one end of the RF jumper to the ANT port and the other end to the external antenna system.

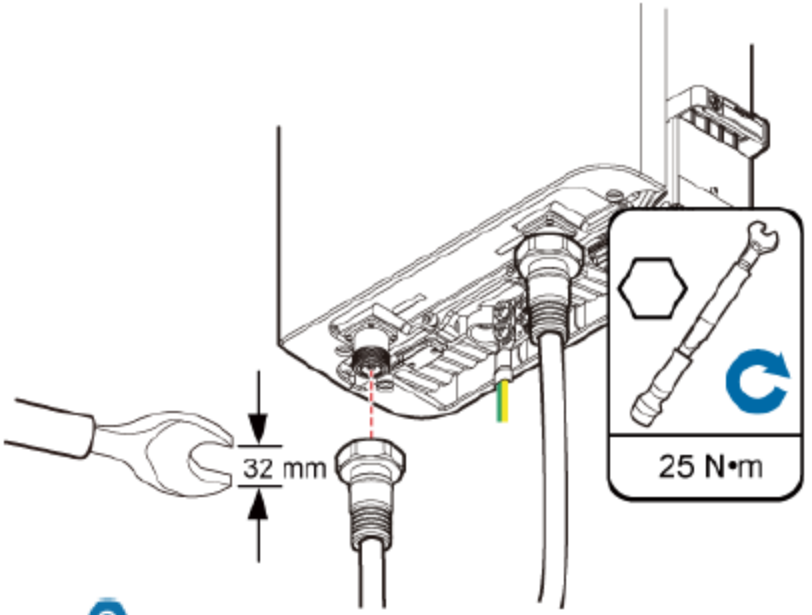
❑Seal the connectors of the RF jumper by referring to Sealing Outdoor Connectors.

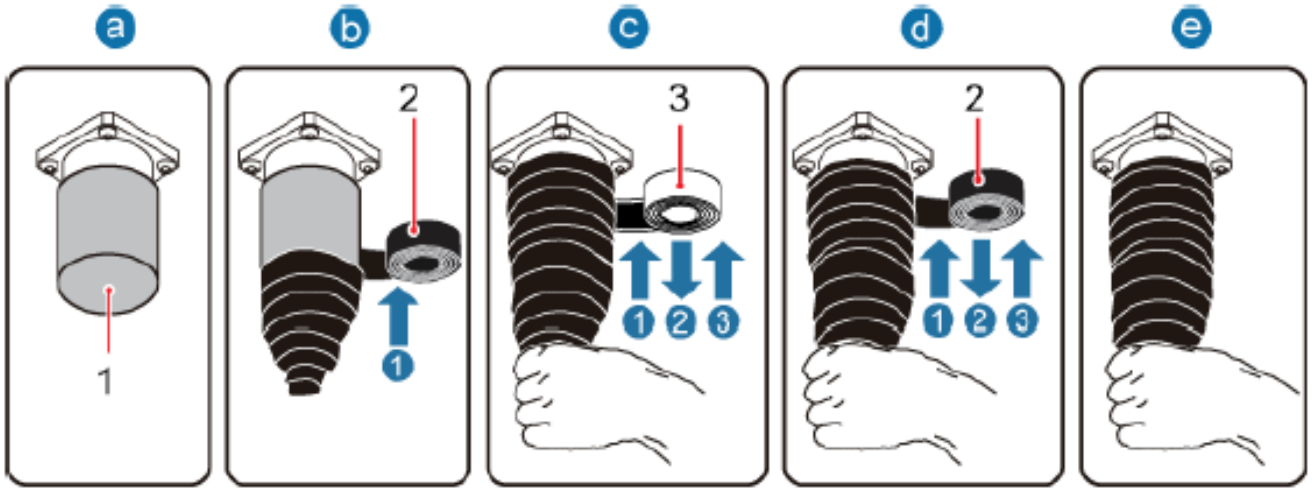
❑Do not remove dustproof caps from vacant antenna connectors. In outdoor scenarios, dustproof caps must be wrapped with waterproof tape.

❑Lay out the jumper and then bind the jumper using cable ties.

❑Label the installed jumper by referring to Attaching a Sign Plate Label.

❑Attach color-codings to the jumper by referring to Attaching the Color Ring.

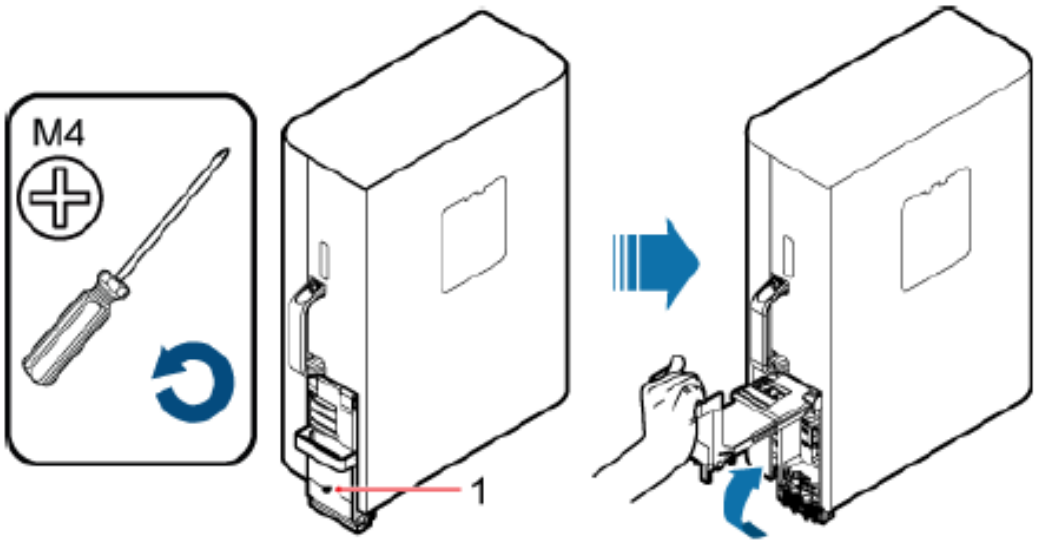


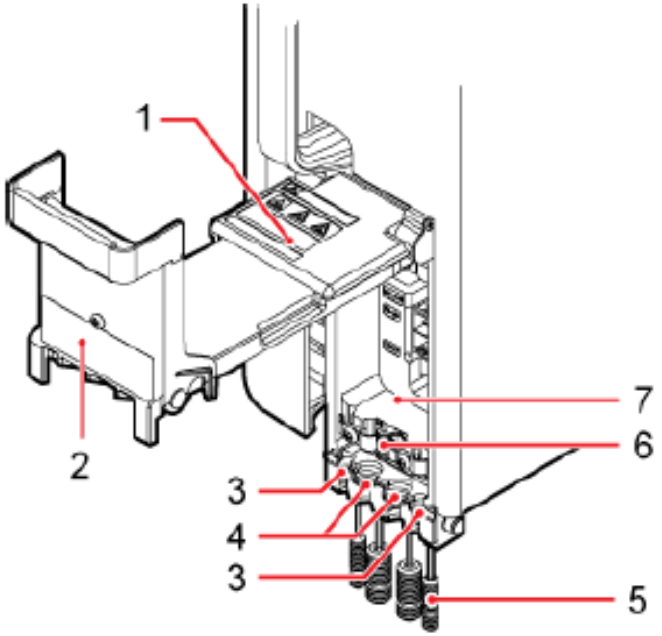


(1) Dustproof cap (2) PVC insulation tape (3) Waterproof tape

HUAWEI

Opening of Cabling Cavity in RRU3008





(1) Cover plate (2) Cable diagram on labels (3) Cable trough for the optical fiber (4) Cable trough for the power cable (5) Waterproof block (6) Clip (7) Cabling cavity

Procedure;

Wear an ESD wrist strap or ESD gloves.

Loosen the protection screw on the cover plate of the RRU cabling cavity using an M4 Phillips screwdriver, and then push the handle outwards to open the cover plate.

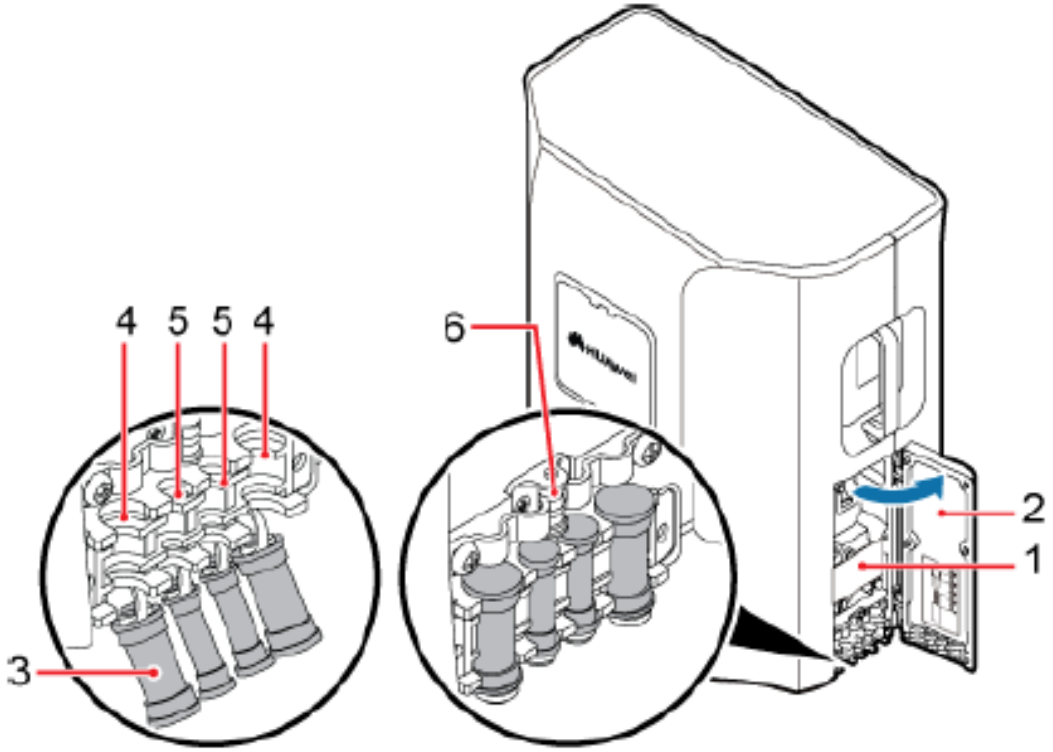
HUAWEI

Opening of Cabling Cavity for RRU3004

Procedure

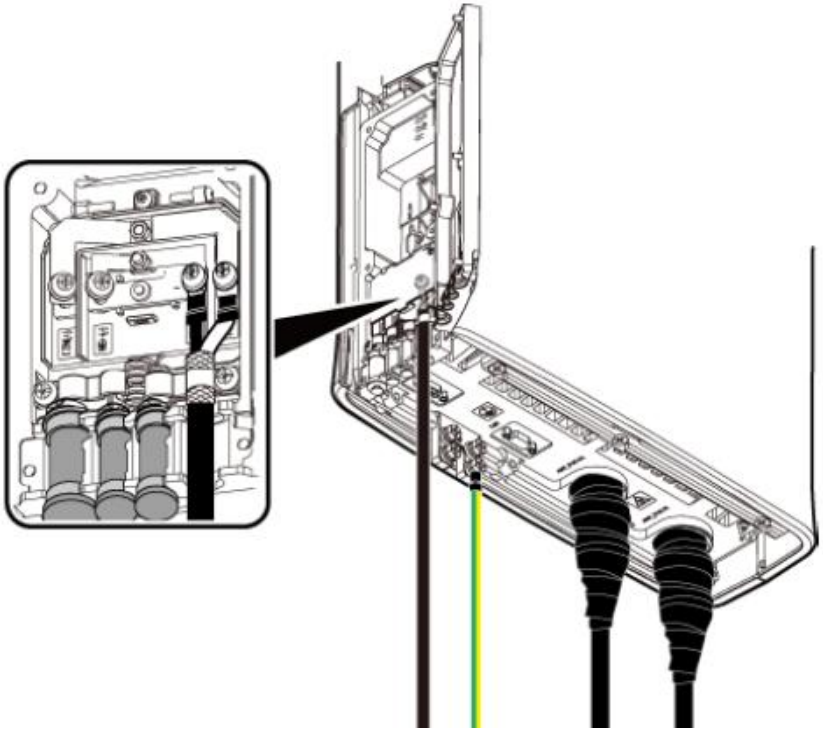
❑ Wear an ESD wrist strap or ESD gloves.

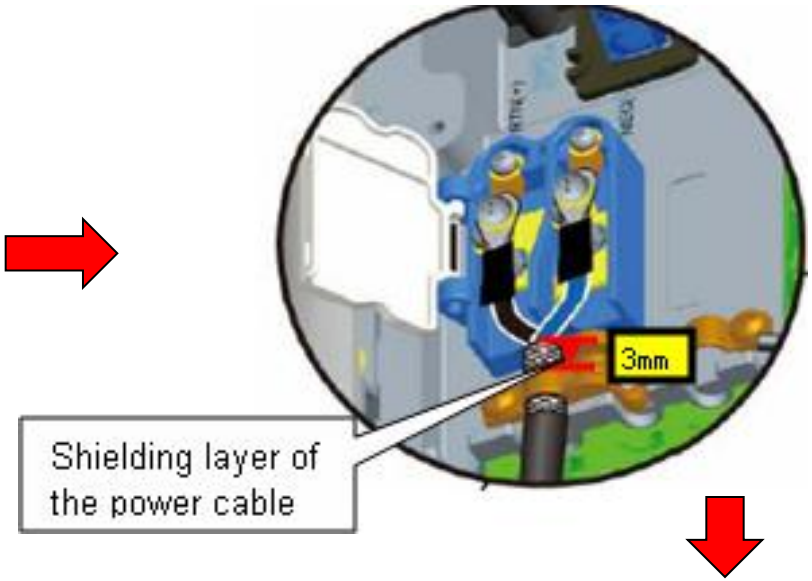
❑Loosen the six screws on the cover plate of the RRU cabling cavity using an M4 Phillips screwdriver, and then open the cover plate.



(1) Cover plate (2) Cabling cavity (3) Waterproof block (4) Cable trough for the power cable (5) Cable trough for the optical fiber (6) Clip

DC Power Cable Installation for RRU-3004





Procedure

❑Install an RRU power cable that feeds power to an RRU from a DCDU-03B when the DCDU-03B is configured.

❑Connect the OT terminals of the blue and black/brown core wires at one end of the RRU power cable to the NEG(-) and RTN(+) ports on the RRU cabling cavity respectively.

❑Connect the OT terminals of the blue and black/brown core wires at the other end of the RRU power cable to the NEG(-) and RTN(+) ports of the LOAD0 on the DCDU-03B respectively.

HUAWEI

DC Power Cable Installation for RRU3008

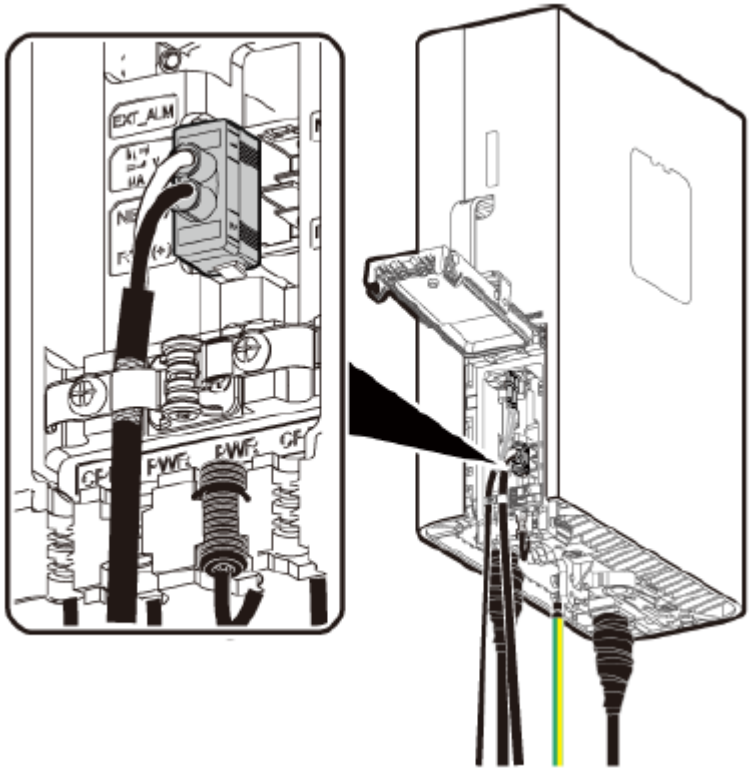
Procedure;

❑Install an RRU power cable that feeds power to an RRU from a DCDU-03B when the DCDU-03B is configured.

- ➢Link the easy power receptacle (pressfit type) connector at one end of the RRU power cable to the power supply socket on the RRU. That is, connect the blue and black/ brown core wires in the easy power receptacle (pressfit type) connector to the NEG (-) and RTN(+) ports on the RRU cabling cavity respectively.
- ➢Connect the OT terminals of the blue and black/brown core wires at the other end of the RRU power cable to the NEG(-) and RTN(+) ports of the LOAD0 on the DCDU-03B respectively.
- ➢Lay out the cable and then bind the cable using cable ties.
- ➢Label the installed cable by referring to Attaching a Cable-Tying Label.

❑Install an RRU power cable that feeds power to an RRU from the EPS system when the EPS system is configured.

- ➢Link the easy power receptacle (pressfit type) connector at one end of the RRU power cable to the power supply socket on the RRU. That is, connect the blue and black/ brown core wires in the easy power receptacle (pressfit type) connector to the NEG (-) and RTN(+) ports on the RRU cabling cavity respectively.
- ➢Link the easy power receptacle (pressfit type) connector at one end of the RRU power cable to the RRU0 port on the EPS system.
- ➢Lay out the cable and then bind the cable using cable ties.
- ➢Label the installed cable by referring to Attaching a Cable-Tying Label.



HUAWEI

CPRI Cable Installation for RRU3004

Prerequisite

Before the installation, single-mode optical modules are distinguished from multi-mode optical modules in either of the following ways:

❑SM and MM labels on an optical module: SM indicates a single-mode optical module, and MM indicates a multi-mode optical module.

❑Color of the puller on an optical module: Blue indicates a single-mode optical module, and black or gray indicates a multi-mode optical module.

Procedure;

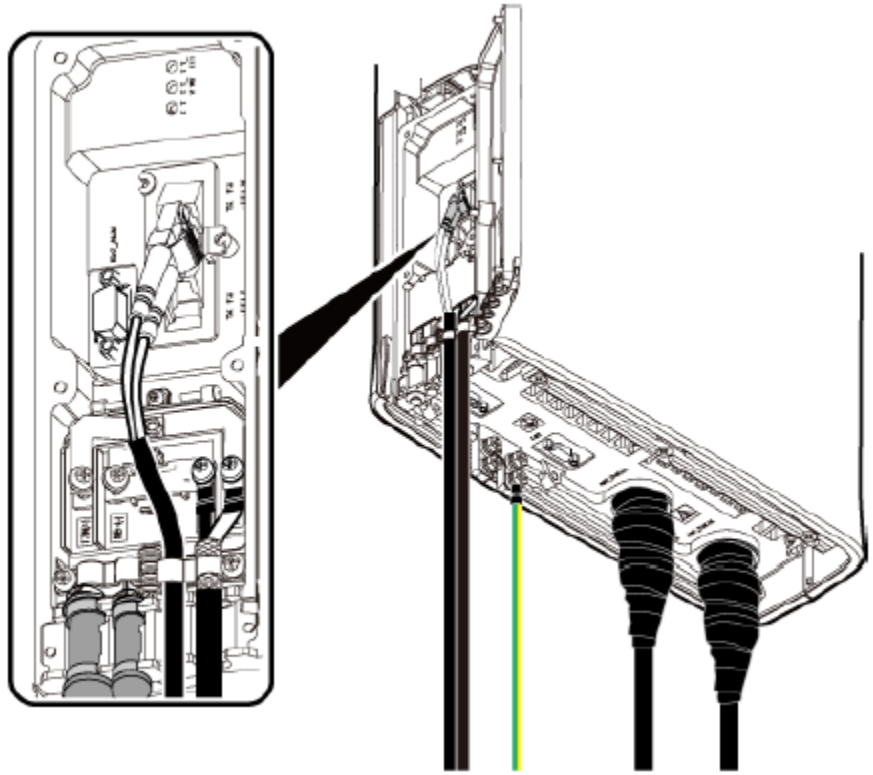
❑Turn the pullers of two optical modules outwards, insert one optical module into the CPRI0 port on the RRU and the other optical module into the CPRI port on the BBU, and then turn the pullers inwards.

❑Connect the ends labeled 1A and 1B of the optical fiber to the optical module on the RRU side.

❑Connect the ends labeled 2A and 2B of the optical fiber to the optical module on the BBU side.

❑Lay out the optical fiber and then bind the fiber using cable ties.

❑Label the optical fiber by referring to Attaching an L-Shaped Label.



HUAWEI

CPRI Cable Installation for RRU3008

Prerequisite

Before the installation, single-mode optical modules are distinguished from multi-mode optical modules in either of the following ways:

❑SM and MM labels on an optical module: SM indicates a single-mode optical module, and MM indicates a multi-mode optical module.

❑Color of the puller on an optical module: Blue indicates a single-mode optical module, and black or gray indicates a multi-mode optical module.

Procedure;

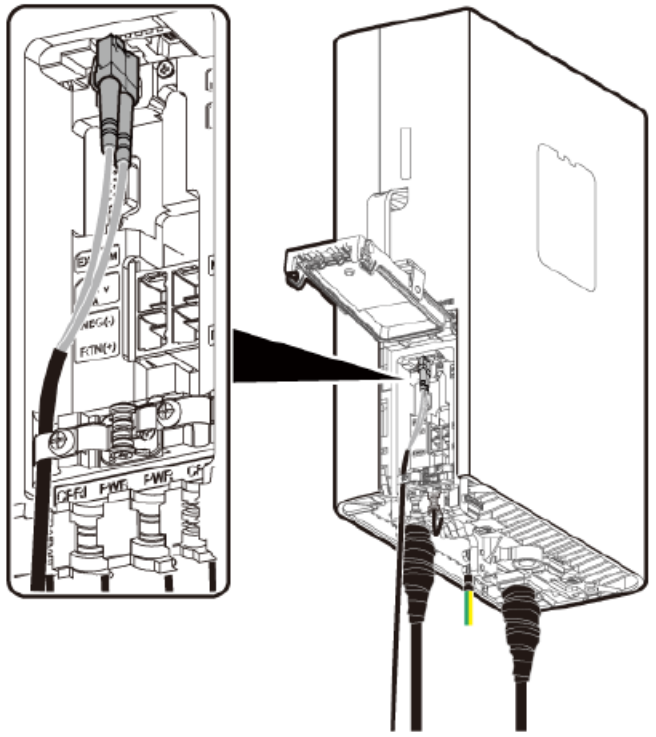
❑Turn the pullers of two optical modules outwards, insert one optical module into the CPRI0 port on the RRU and the other optical module into the CPRI port on the BBU, and then turn the pullers inwards.

❑Connect the ends labeled 1A and 1B of the optical fiber to the optical module on the RRU side.

❑Connect the ends labeled 2A and 2B of the optical fiber to the optical module on the BBU side.

❑Lay out the optical fiber and then bind the fiber using cable ties.

❑Label the optical fiber by referring to Attaching an L-Shaped Label.



HUAWEI

Closing of Cabling Cavity for RRU3004

Procedure

❑ Wear an ESD wrist strap or ESD gloves.

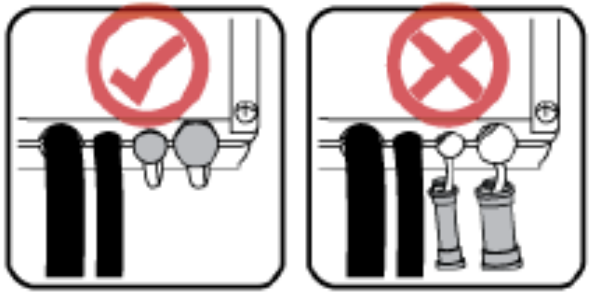
❑Insert waterproof blocks into vacant cable troughs in the cabling cavity.

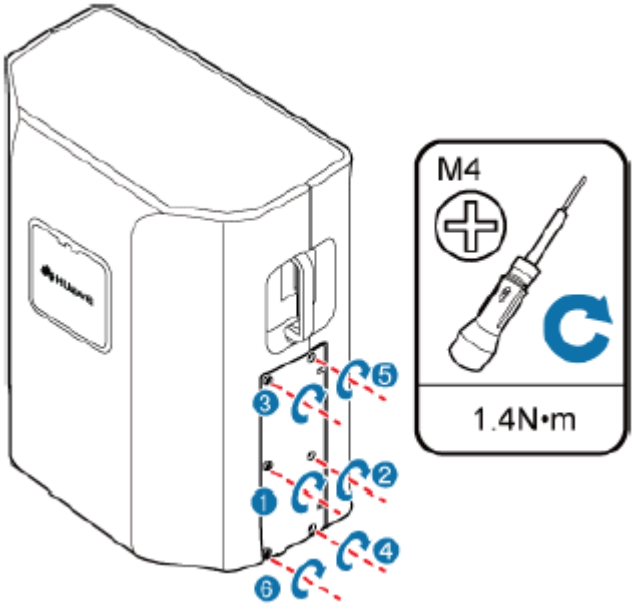
❑Check the transmission of CPRI signals by observing the status of CPRI LEDs. For details about the status of LEDs.

❑Close the cover plate and tighten the screws on the cover plate to 1.4 N·m (12.39 lbf.in.) using an M4 Phillips screwdriver.

❑Before tightening the screws on the cover plate, ensure that cables and waterproof blocks are properly inserted into troughs.

❑Take off the ESD wrist strap or gloves, and then pack up all the tools.





HUAWEI

Closing the cover plate of Cavity of RRU3008

Procedure;

❑Wear an ESD wrist strap or ESD gloves.

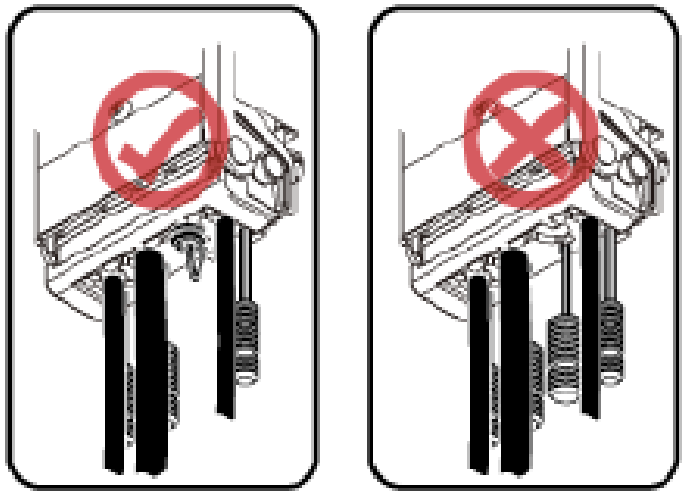
❑Insert waterproof blocks into vacant cable troughs in the cabling cavity.

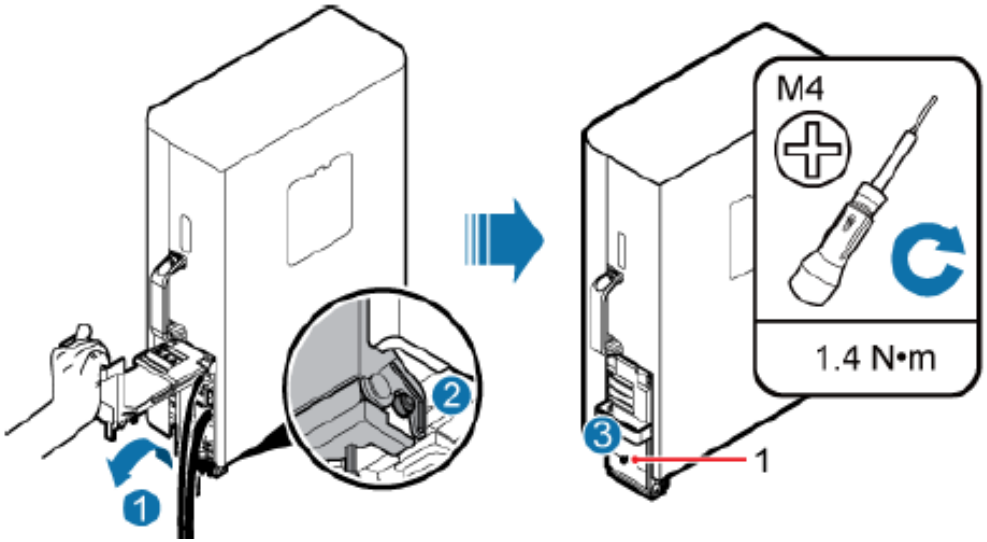
❑Check the transmission of CPRI signals by observing the status of CPRI LEDs. For details about the status of LEDs.

❑Close the cover plate and tighten the screws on the cover plate to 1.4 N·m (12.39 lbf.in.) using an M4 Phillips screwdriver.

❑Take off the ESD wrist strap or gloves, and then pack up all the tools.

❑Before tightening the screws on the cover plate, ensure that cables and waterproof blocks are properly inserted into troughs.





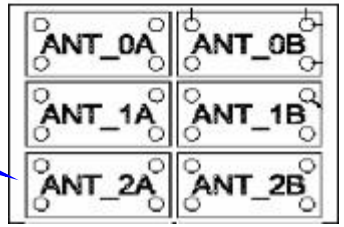
HUAWEI

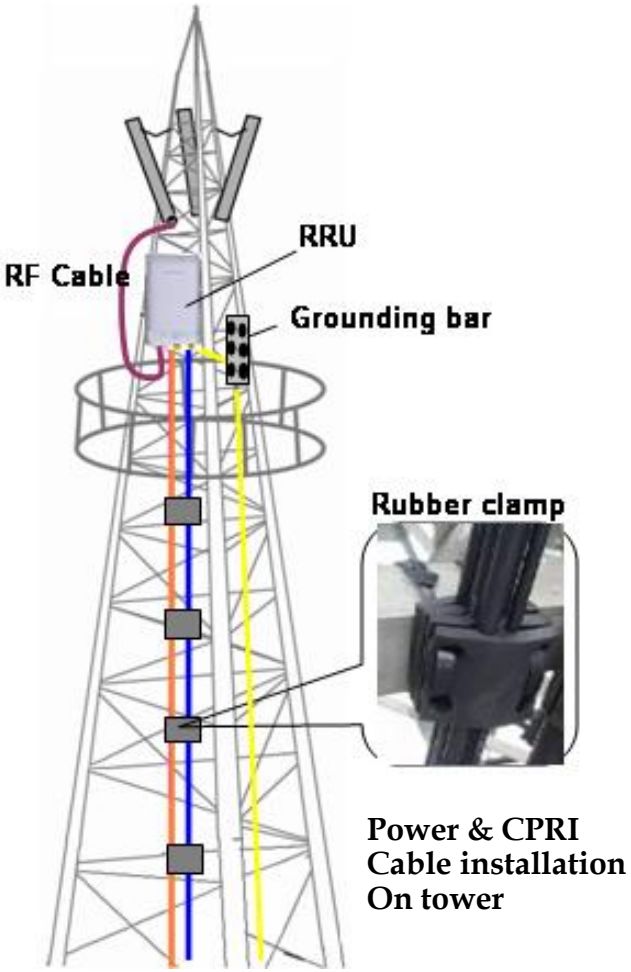
Labels for RRU's Cables on Tower

RRU Power cable label

RRU CPRI cable label

RRU RF cable label



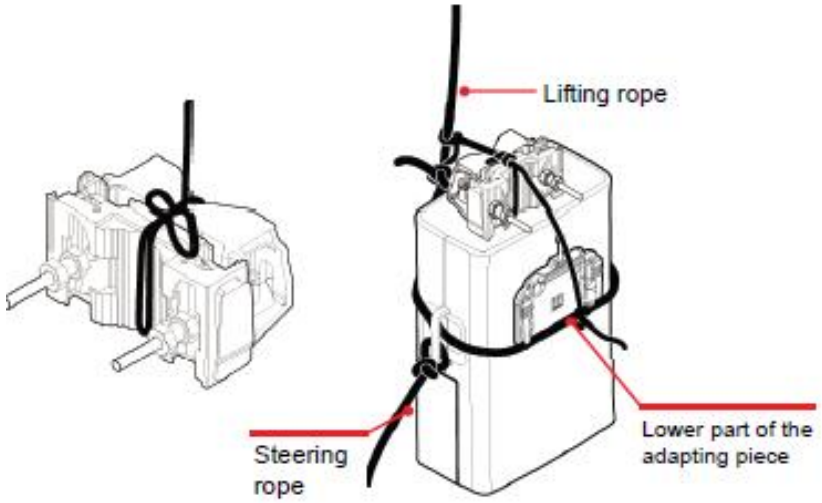


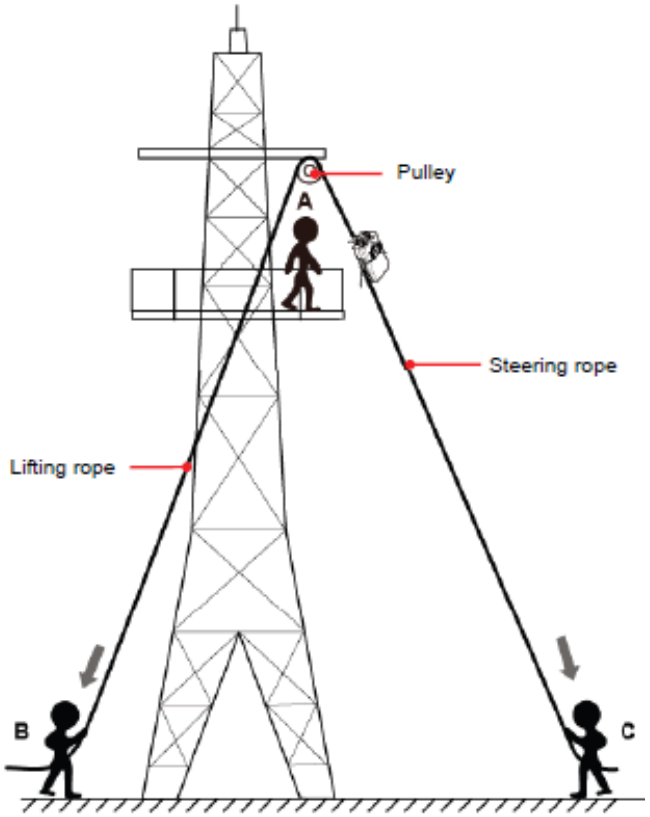
Procedure-

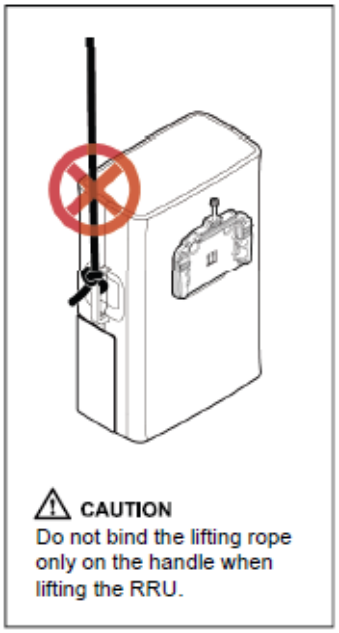
Bundle the outdoor engineering label on the RRU power cable, CPRI fiber cable ,RF cable with black cable tie. The label is 200mm away from the connector.

HUAWEI

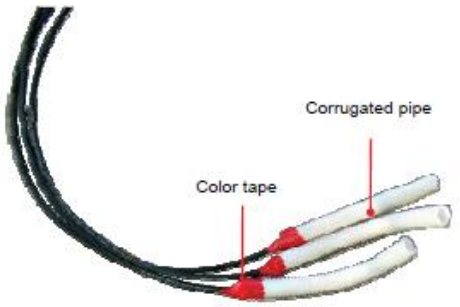
Lifting of RRU & CPRI cable







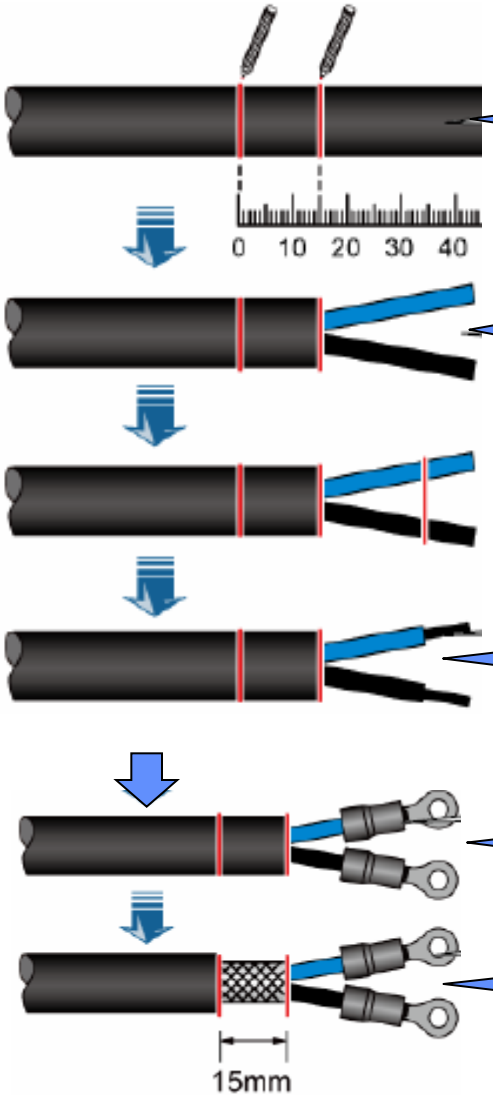
⚠ CAUTION
Do not bind the lifting rope only on the handle when lifting the RRU.



CPRI Cable Lifting

HUAWEI

Procedure of OT Terminals



Determine lengths of power cables for different operations according to the scales on the inner side of the cover plate of the cabling cavity.

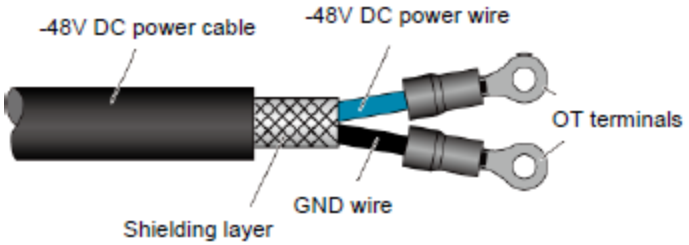
Based on the determined length, remove the jacket and shielding layer from the power cable.

Remove the jacket from each wire.

Add OT Terminals to each wires

Strip a 15 mm jacket off the power cable to reveal the shielding layer of the power cable.

The assembling of OT terminals to the power cable must be complete before the BTS3900E is installed on a metal pole.



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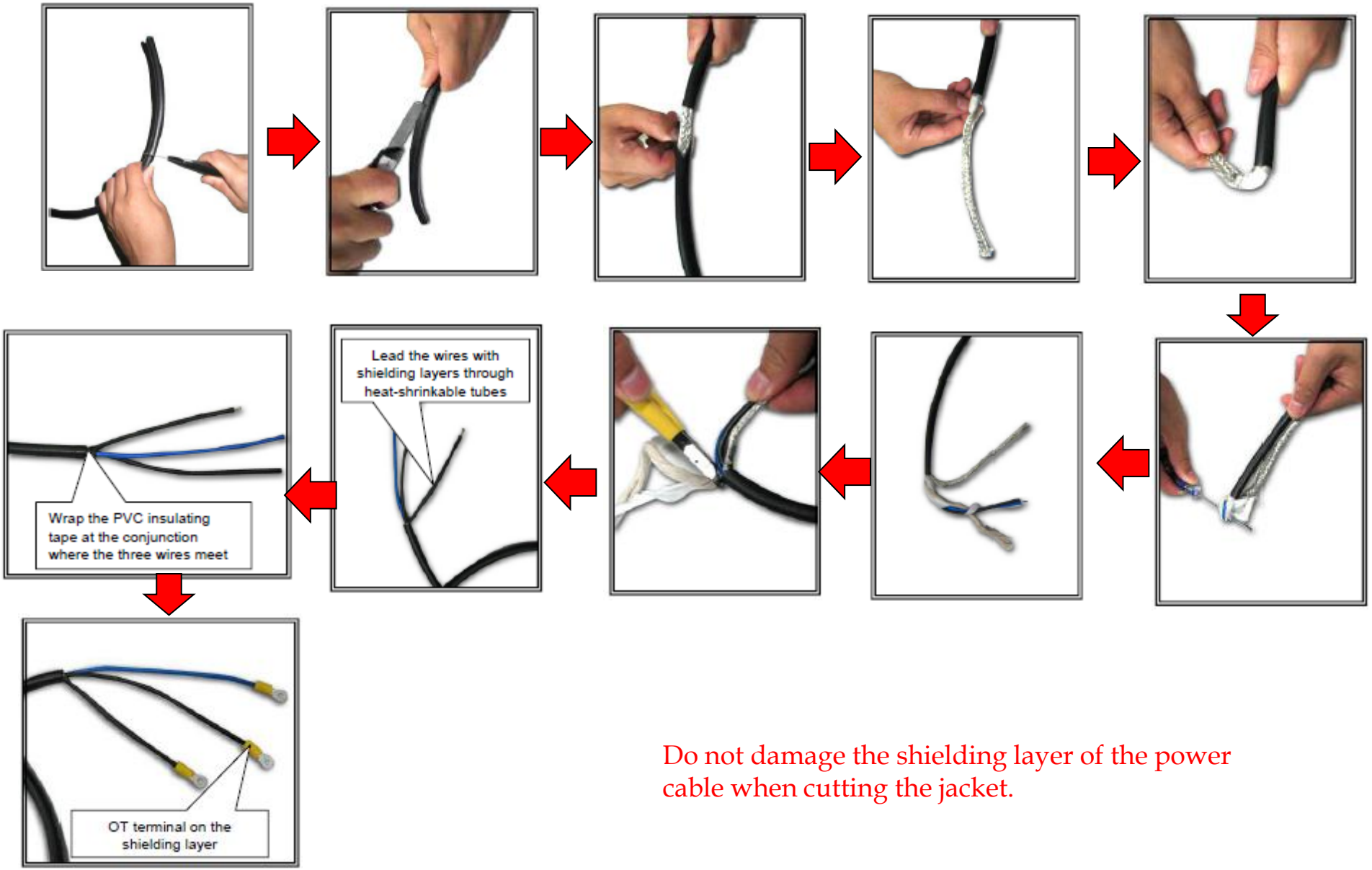
Procedure of OT Terminals



Do not damage the shielding layer of the power cable when cutting the jacket.

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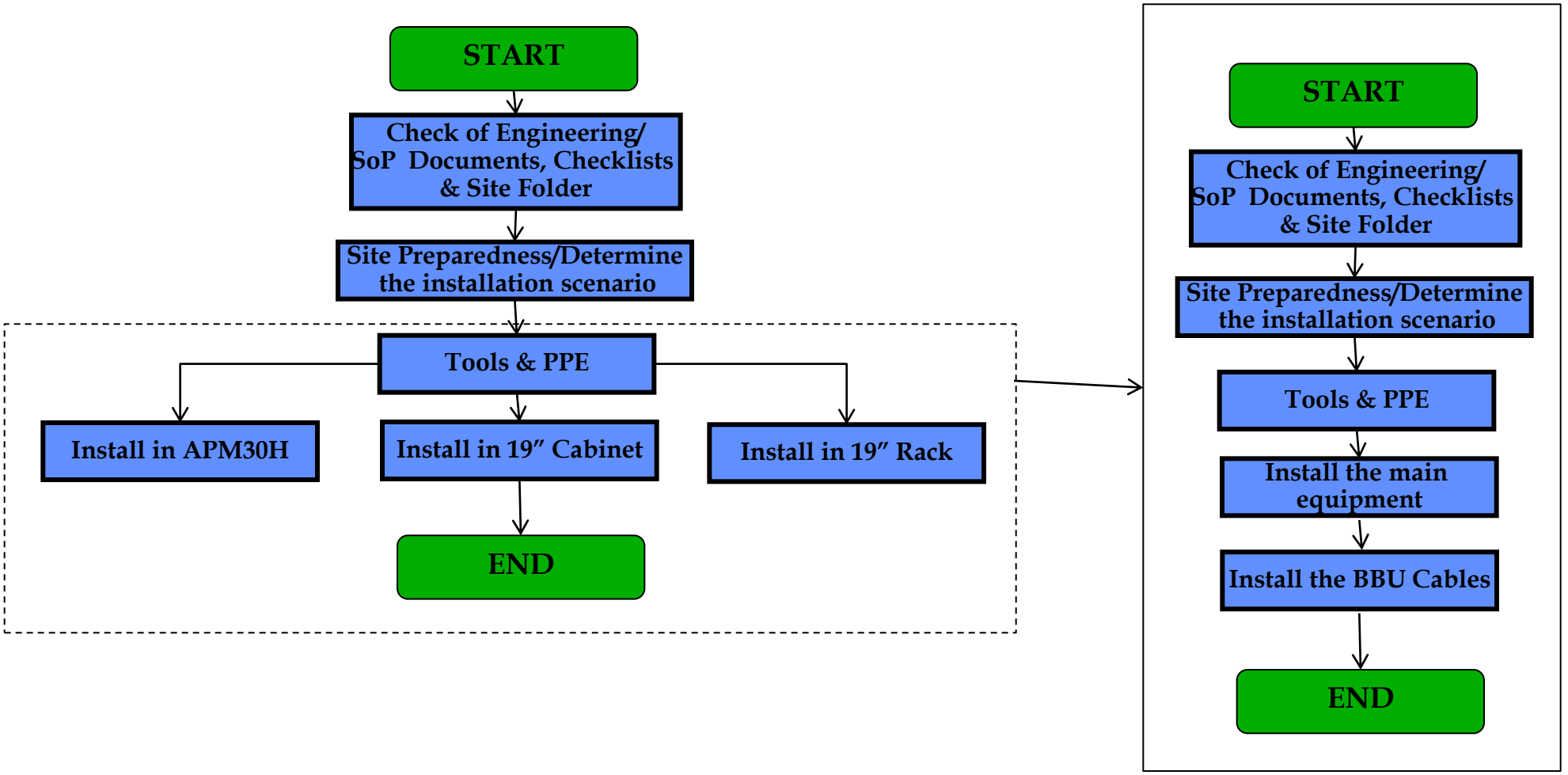
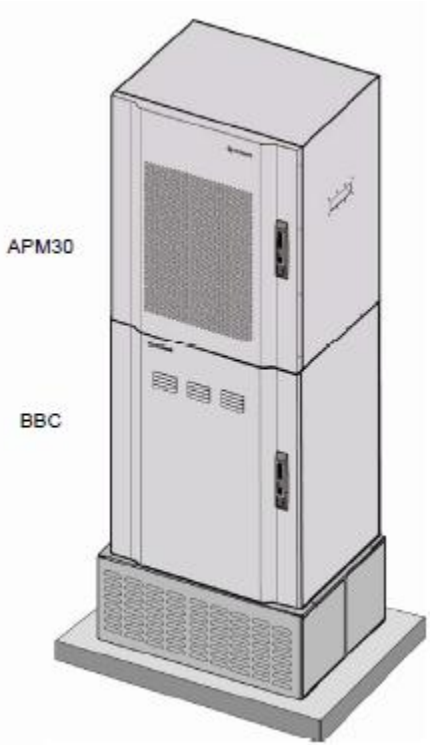
DBS3900 –CDMA BTS INSTALLATION

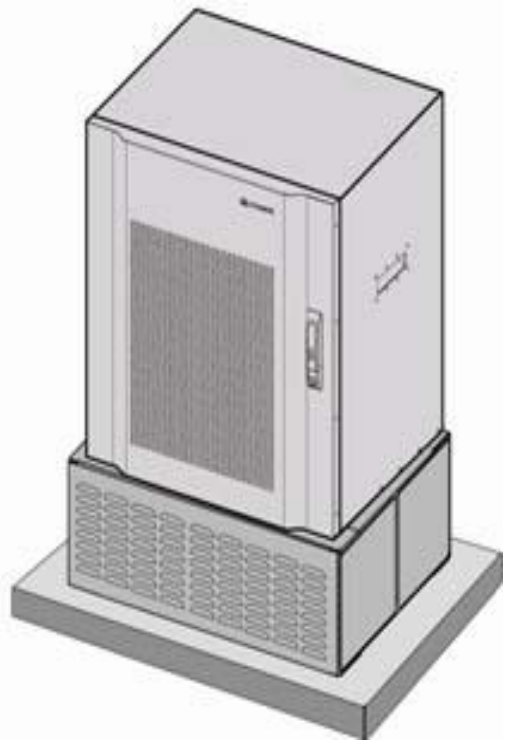
BBU3900 INSTALLATION IN CDMA DBS3900

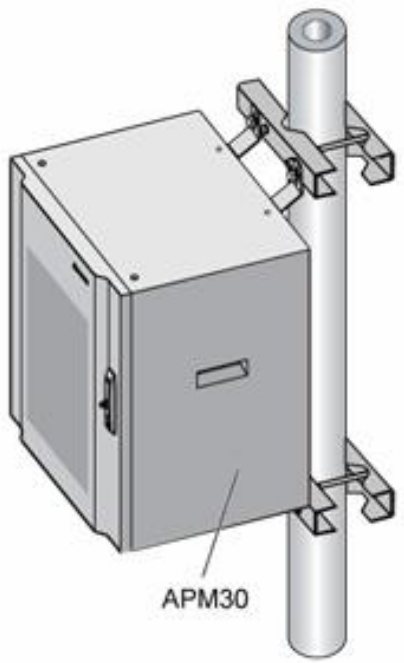
BBU3900- CDMA Installation Process



Installation Mode of APM30H Cabinet

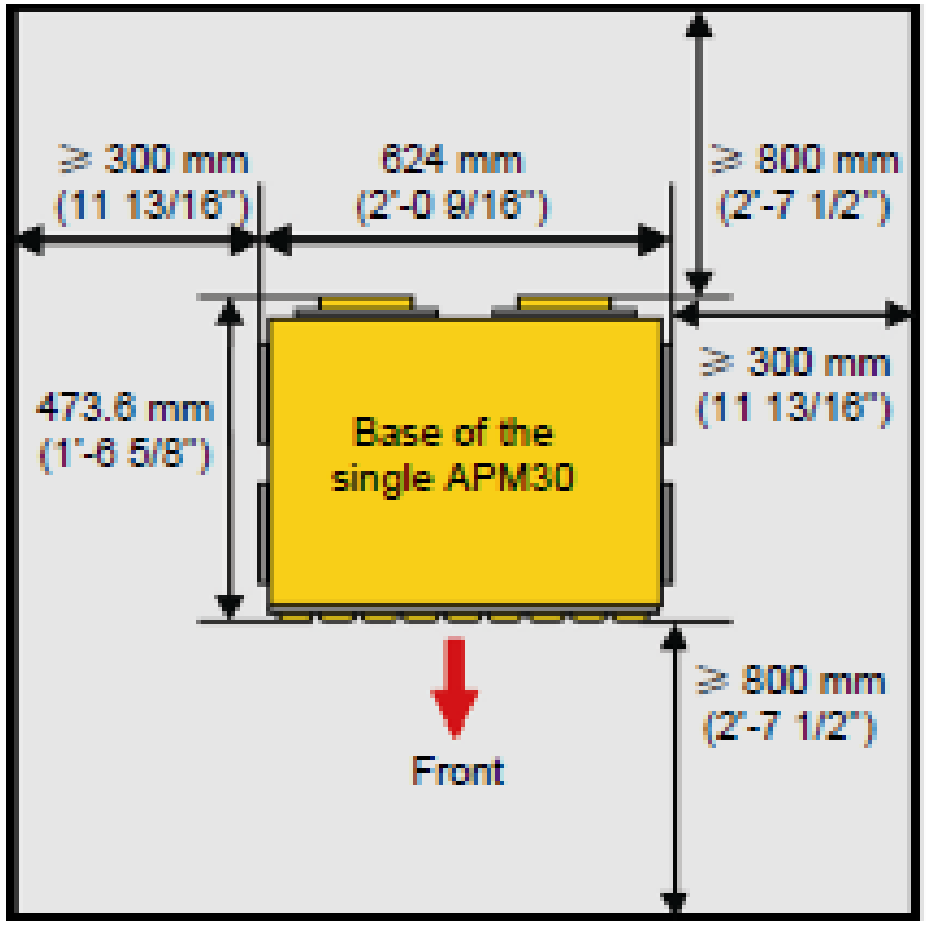




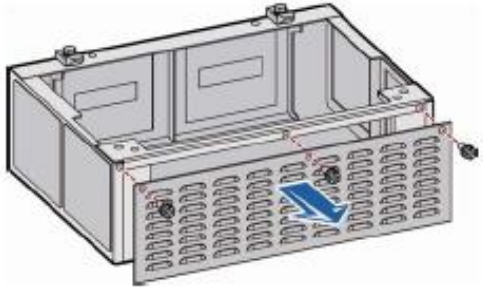


Space Requirement for Base of APM30H Cabinet

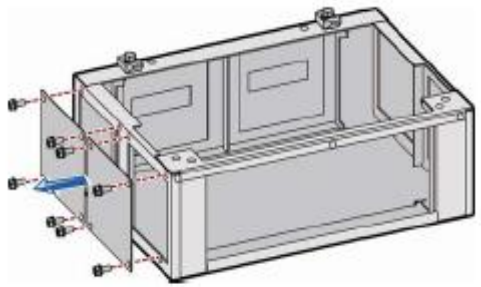
Base of the single APM30



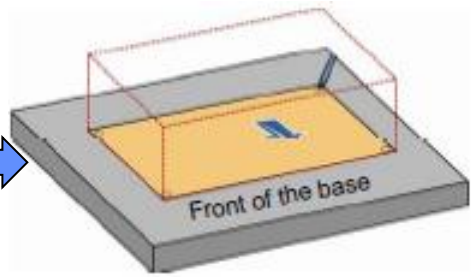
Installation of Base for APM30 Cabinet



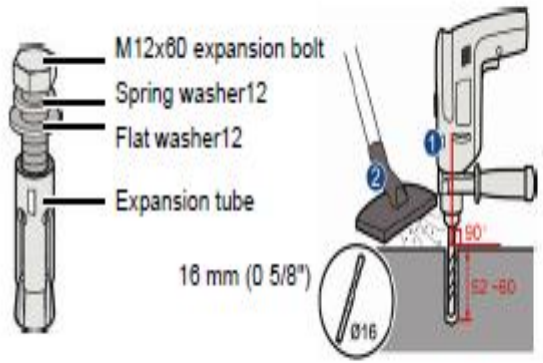
Remove the front panel of the base

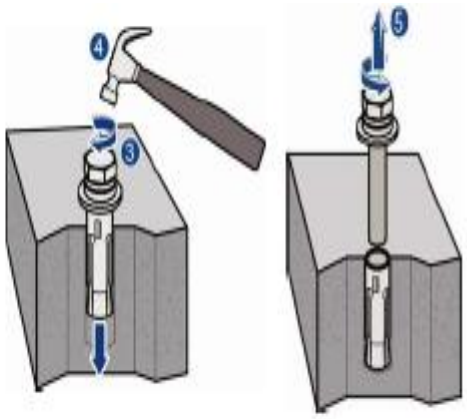


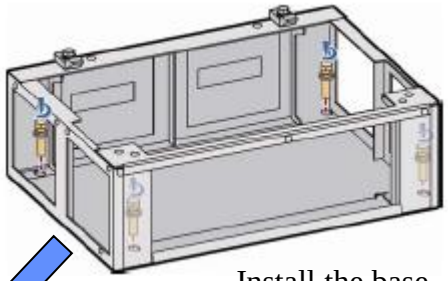
Remove the panels of cable outlets on both sides



Determine the positions of installation holes (using the base)

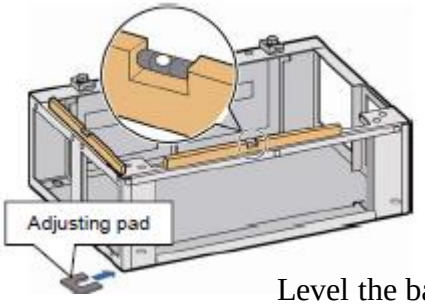






Install the base

Recommended torque: 44 N.m



Level the base

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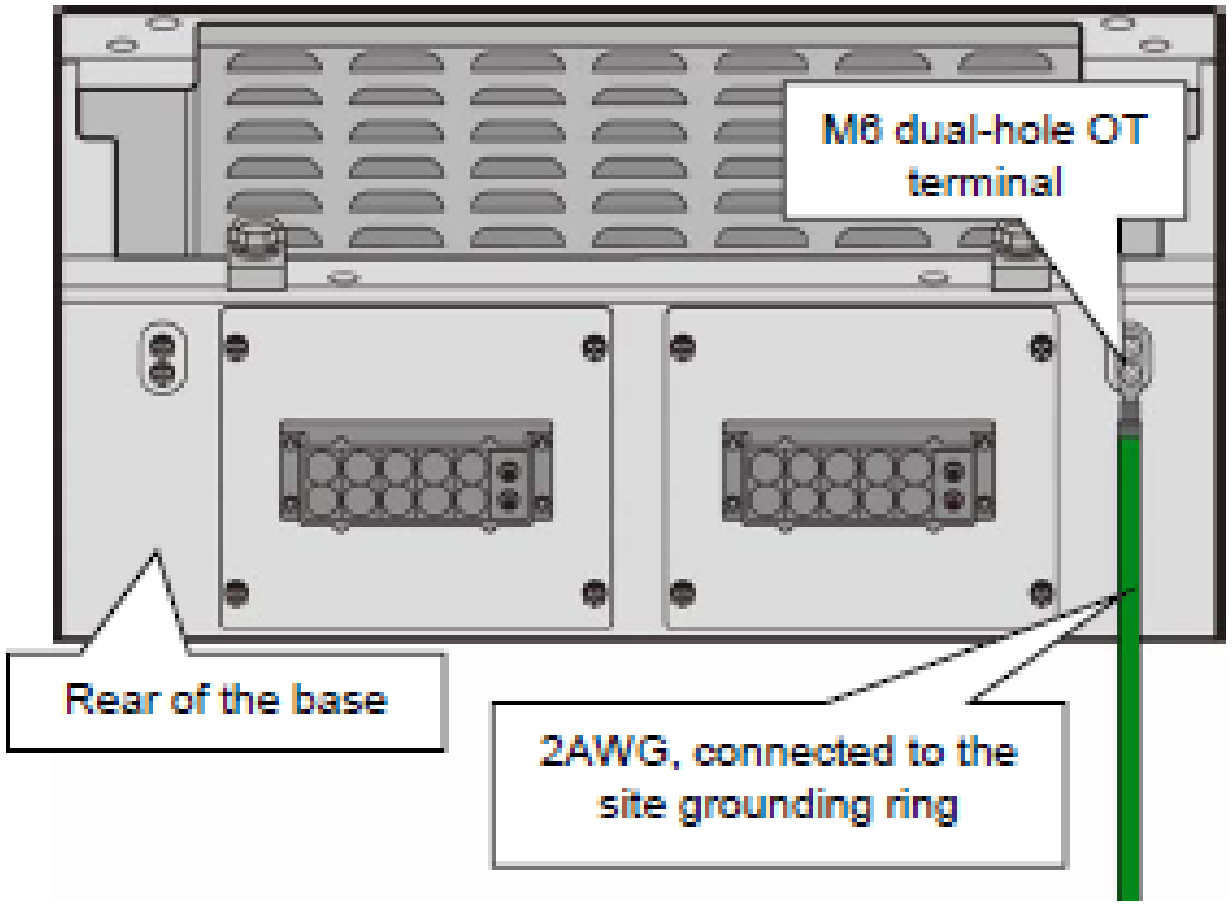
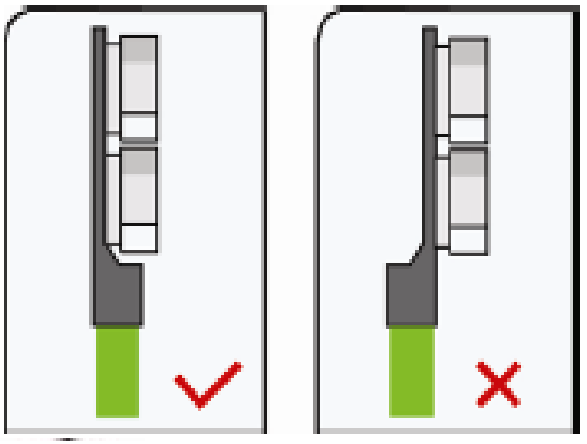
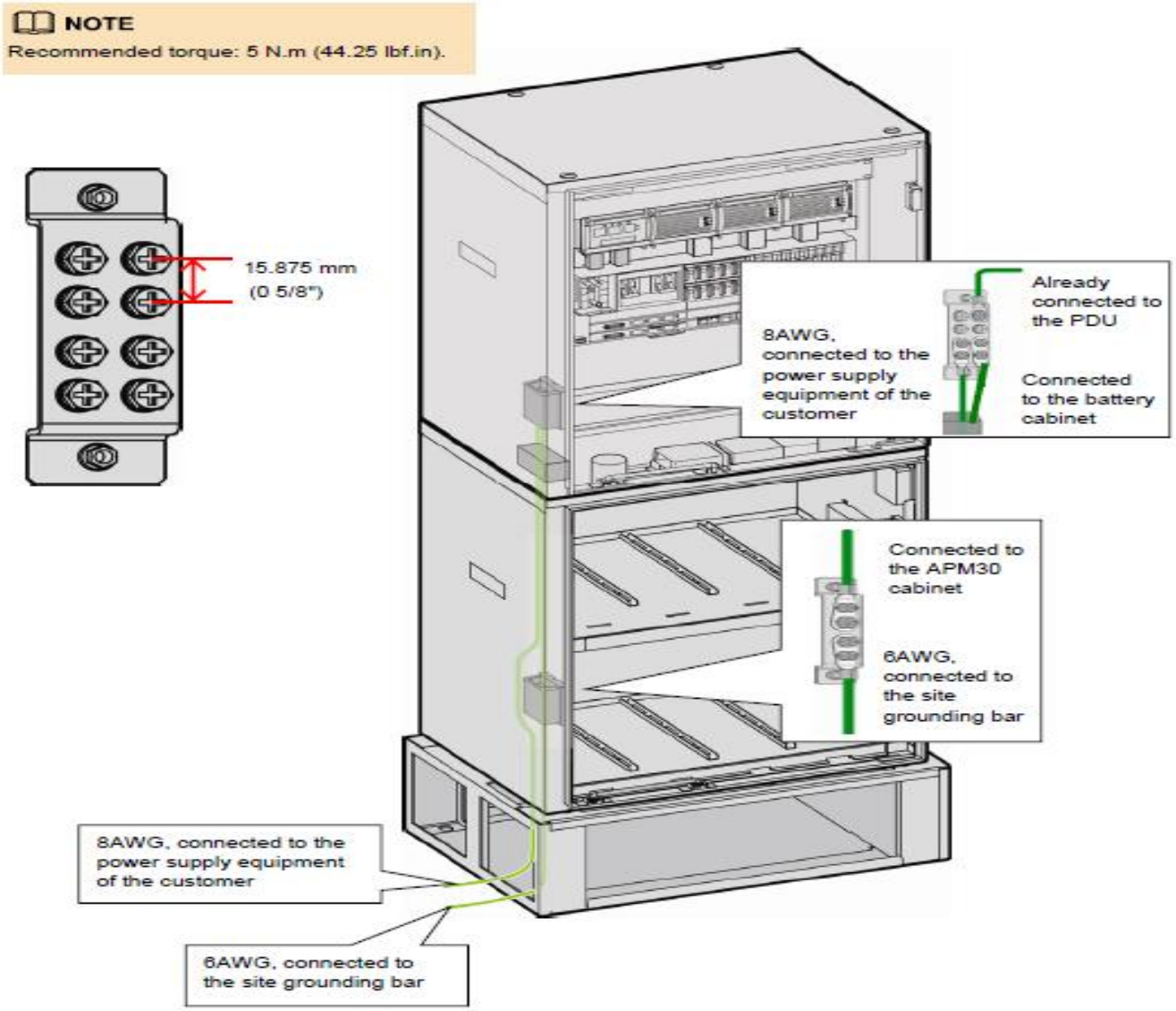
Installation of PGND cable for Base of APM30 Cabinet

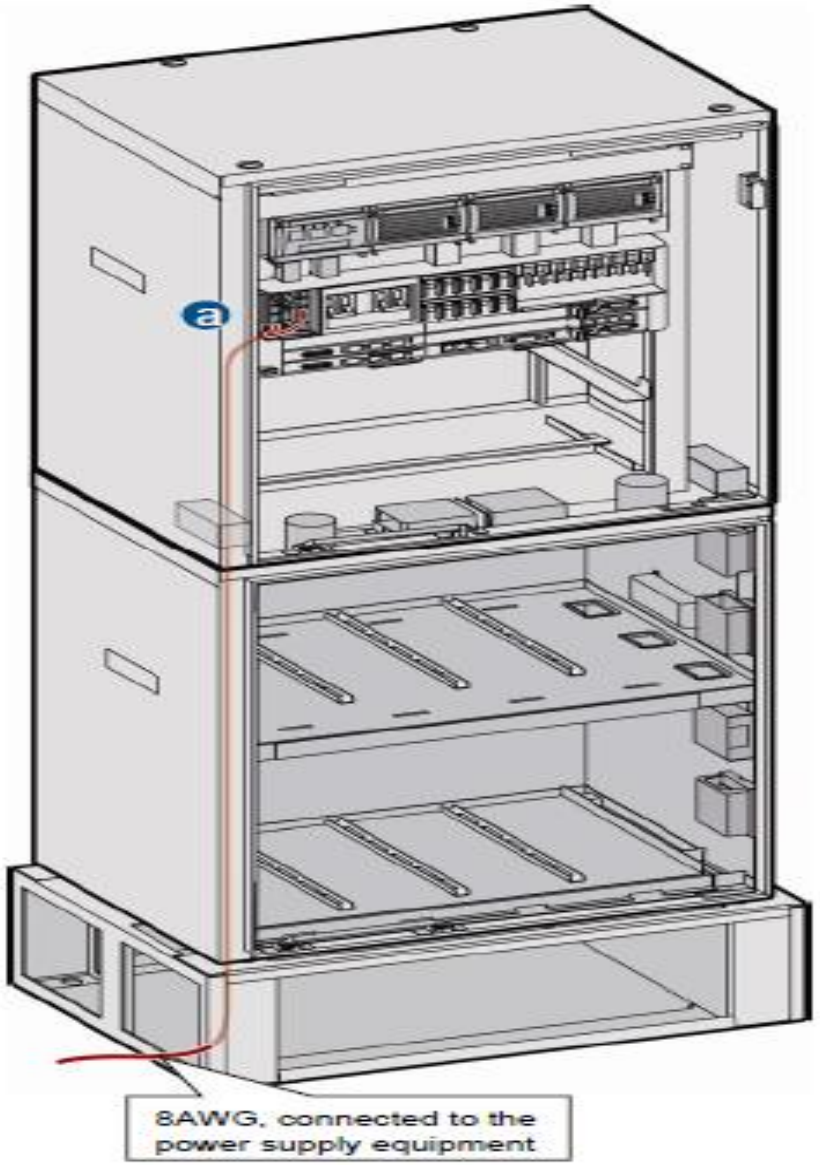




Installation of PGND cable for APM30 AC Cabinet



Installation of Power cable for APM30 AC Cabinet



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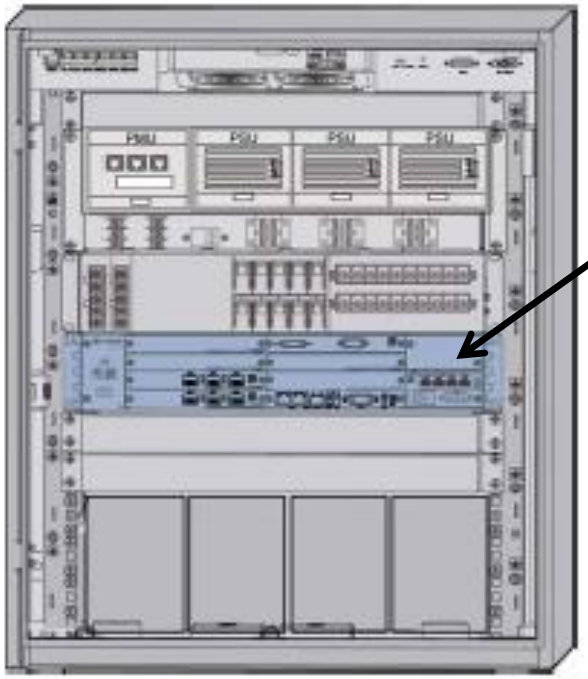
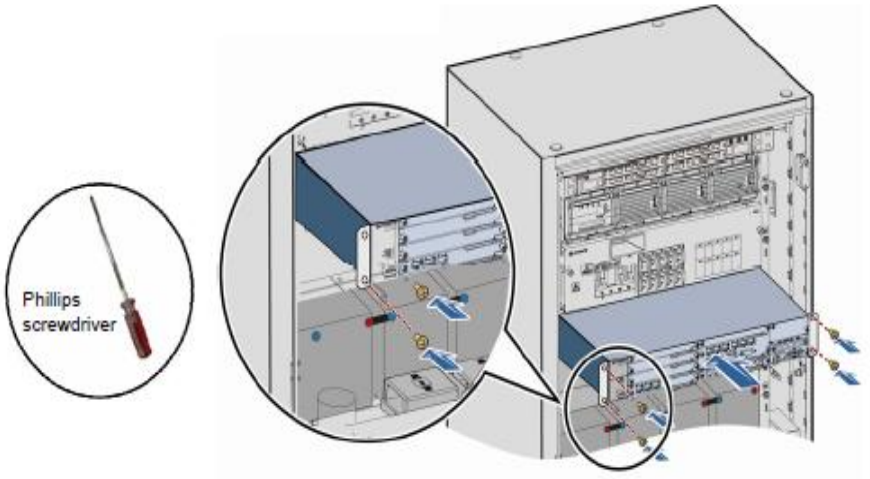
Installation of BBU in APM30 AC Cabinet



Installation position of the BBU3900 in the APM30 AC cabinet



1. Hold the BBU with your hands and align the holes for mounting ears with the holes for installing the cabinet.

2. Push the BBU in the cabinet slowly along the guide rails.

3. Use a Phillips screwdriver to tighten the four screws (M6 x 12) on the panel to fix the BBU in the cabinet

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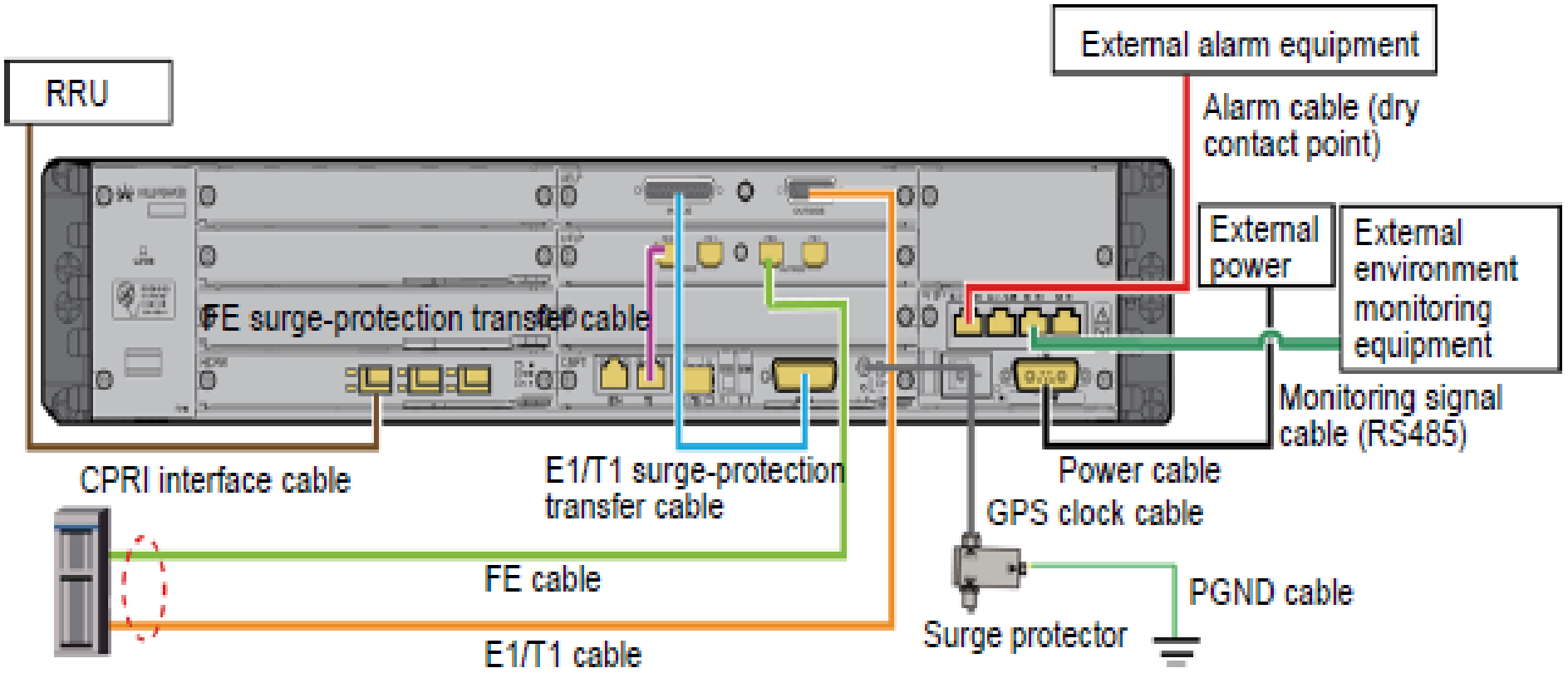
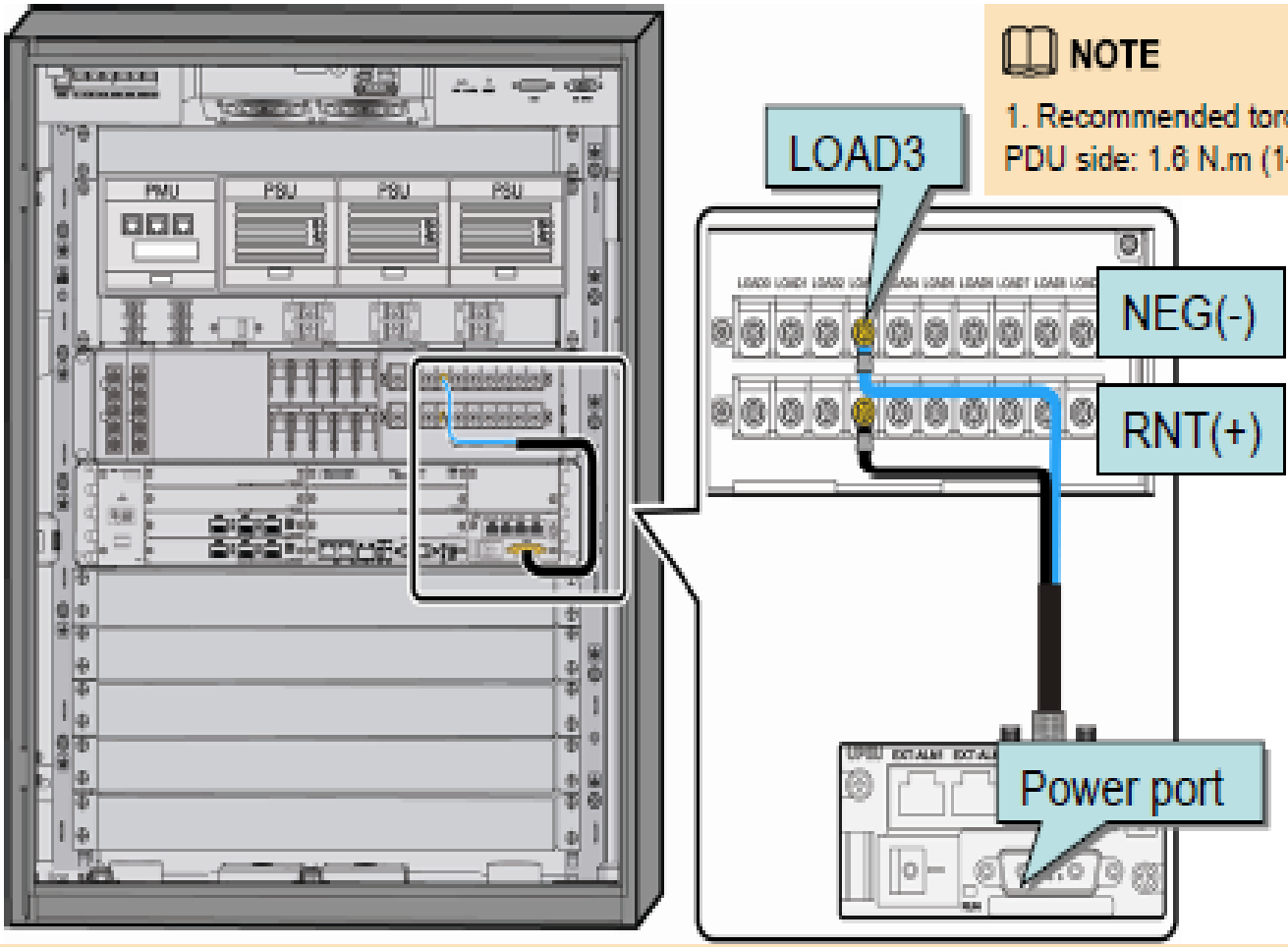
Cable Connection in BBU



Installation of Power Cable for BBU

NOTE

- The OT terminal must be connected to the 12A DC output terminal. The positive pole (black) must be connected to the RTN (+).
- The 3V3 connector must be connected to the Power port on the UPEU.



NOTE

1. Recommended torque at the PDU side: 1.6 N.m (14.16 lbf.in.).

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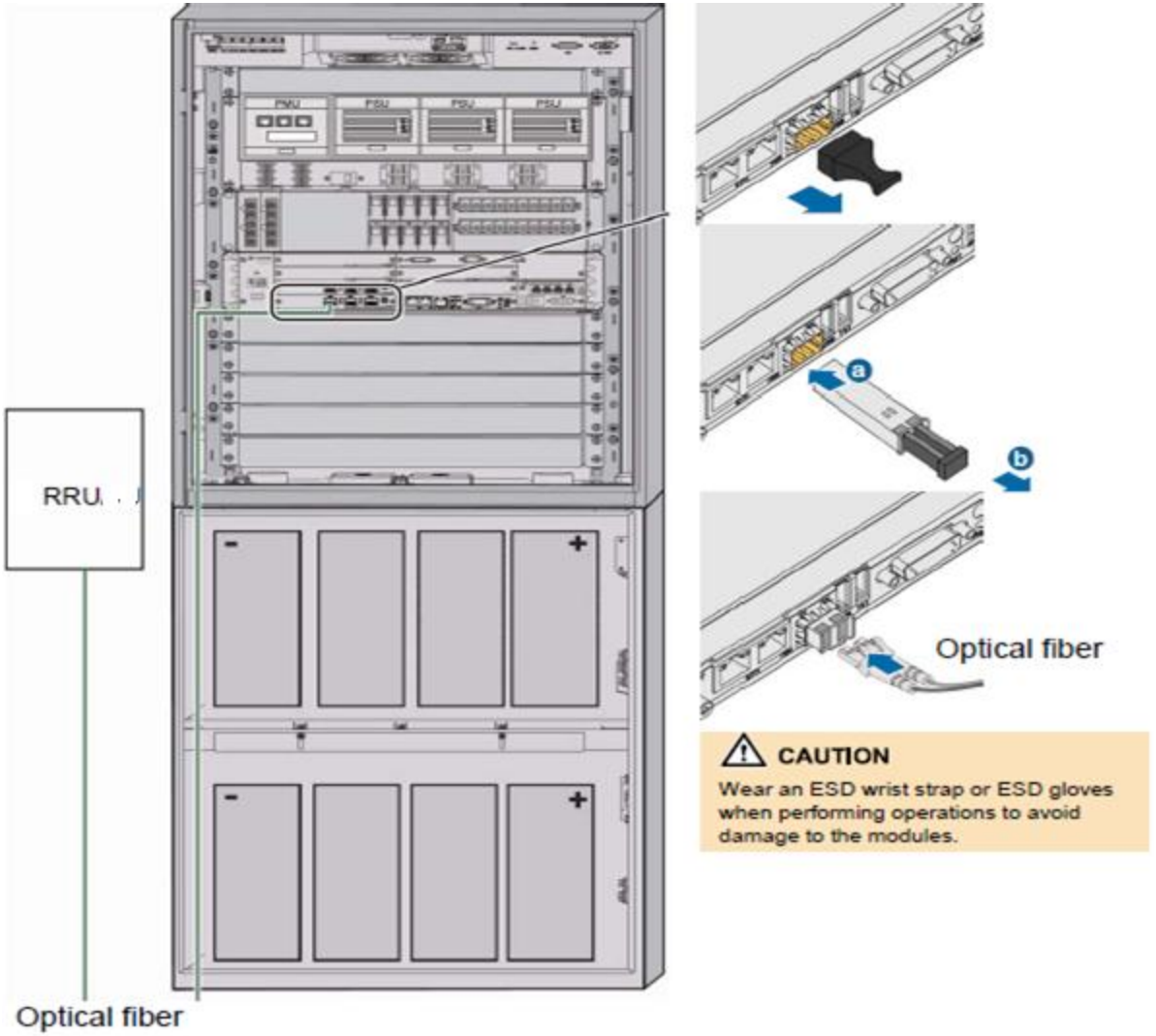
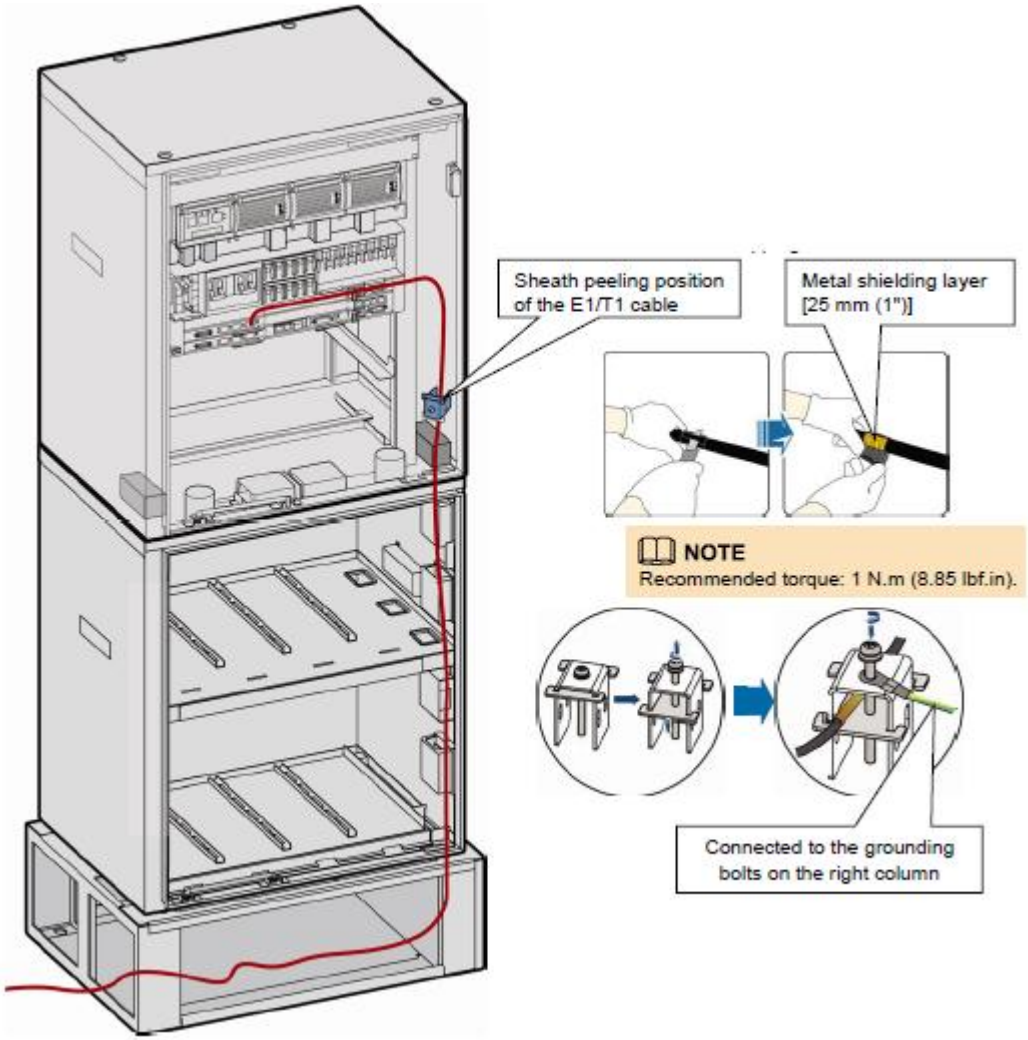
Installation of CPRI Cable for BBU



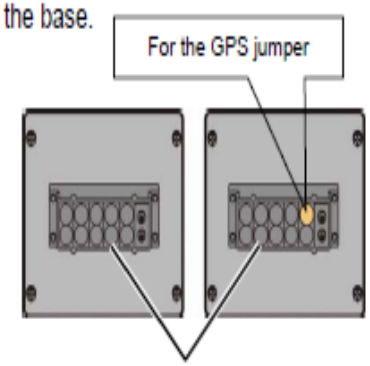
Installation of EI/T1/FE Cable for BBU



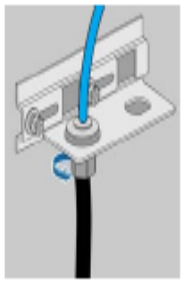
Installation of GPS Clock Cable for BBU

CAUTION
Install the connectors after routing jumper through the cabinet.

a Remove the cable outlets at the rear of the base.



b Route the GPS jumper and connect it to the GPS clock signal cable of the BBU3900.



NOTE
Recommended torque: 1 N.m (8.85 lbf.in.).

c Connect the other end of the GPS jumper to the GPS surge arrester.

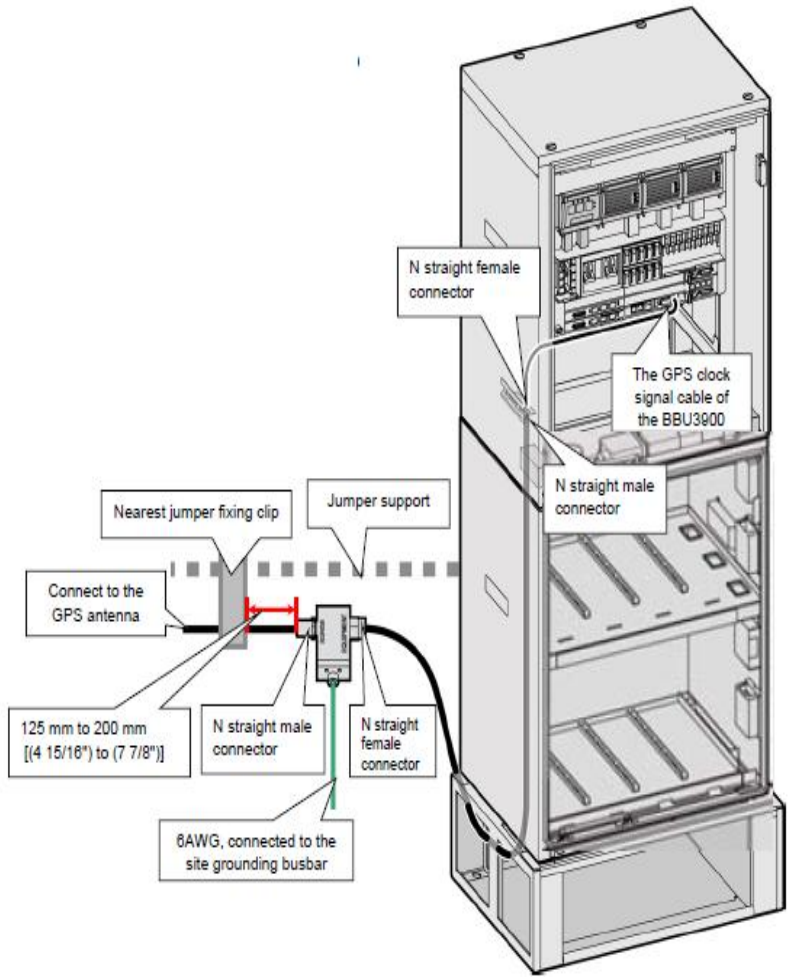
d Use the jumper fixing chip to fix the GPS surge arrester on the jumper support.

NOTE
Recommended torque: 1 N.m (8.85 lbf.in.).

e Install the PGND cable from the GPS surge arrester to the site grounding busbar.

f Waterproof the connectors on the GPS surge arrester.

CAUTION
The length of the PGND cable from the GPS surge arrester to the site grounding busbar should be shorter than 3 m (9'-10 1/8") and as short as possible.



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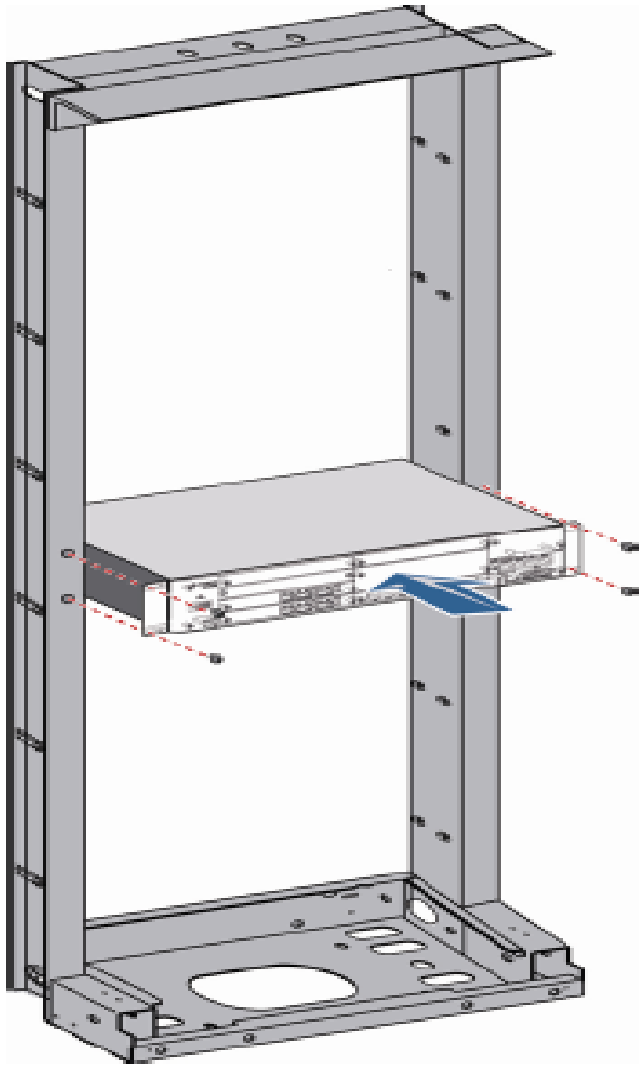
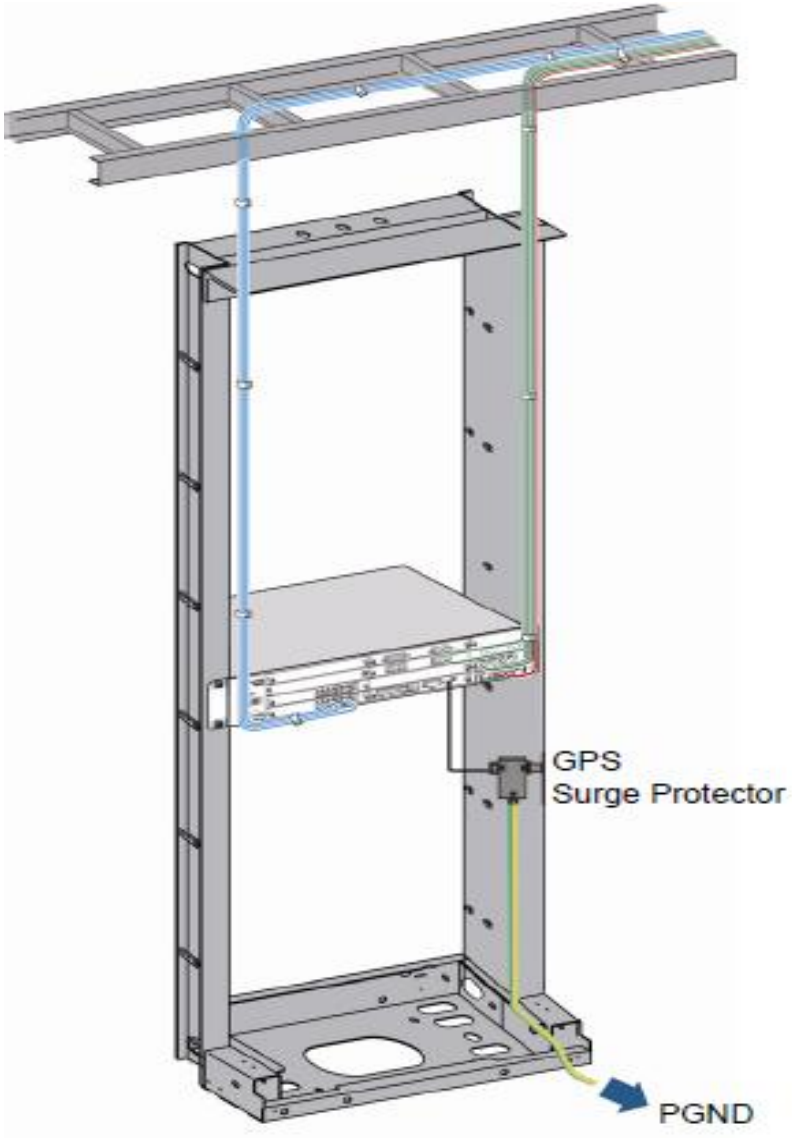
Installation of BBU3900 in 19″ Rack



Installation of Cable for BBU3900 in 19″ Rack



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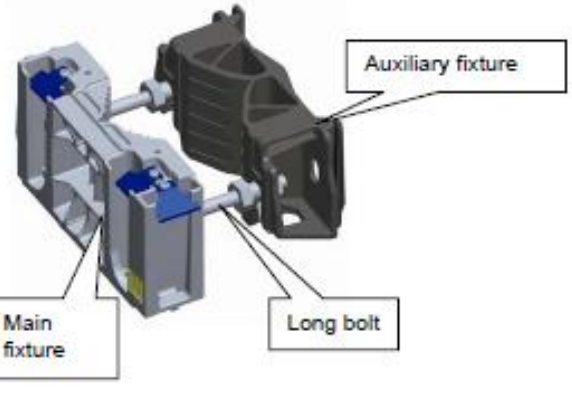
DC RRU3606 INSTALLATION IN CDMA DBS3900

Exterior of the RRU3606

Weight: module + case ⩽ 17 kg (37.48 lb)

Auxiliary Parts of the RRU3606

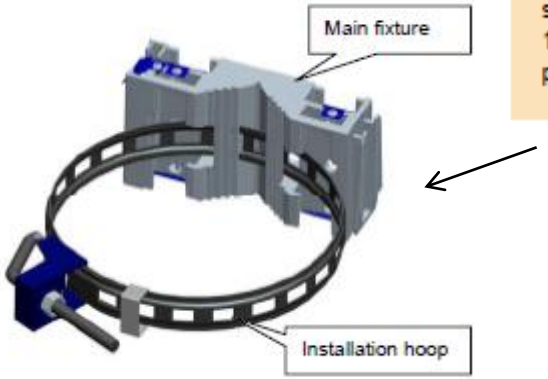
a Fixtures of the RRU



NOTE

The fixtures apply to the scenarios of installing the RRU on the pole, wall, angle steel, and channel steel. When the RRU is installed indoors, the auxiliary parts are not required.

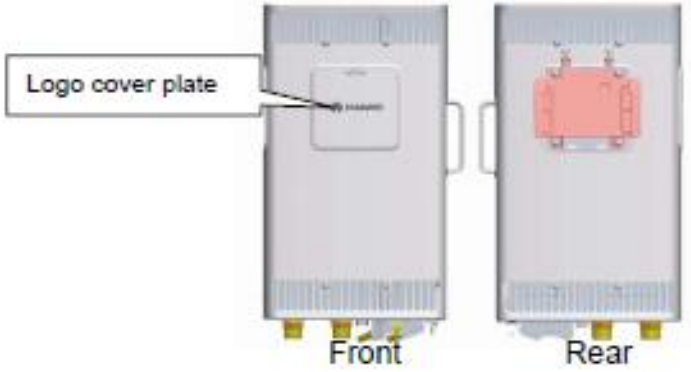
b Installation Hoop of the RRU



NOTE

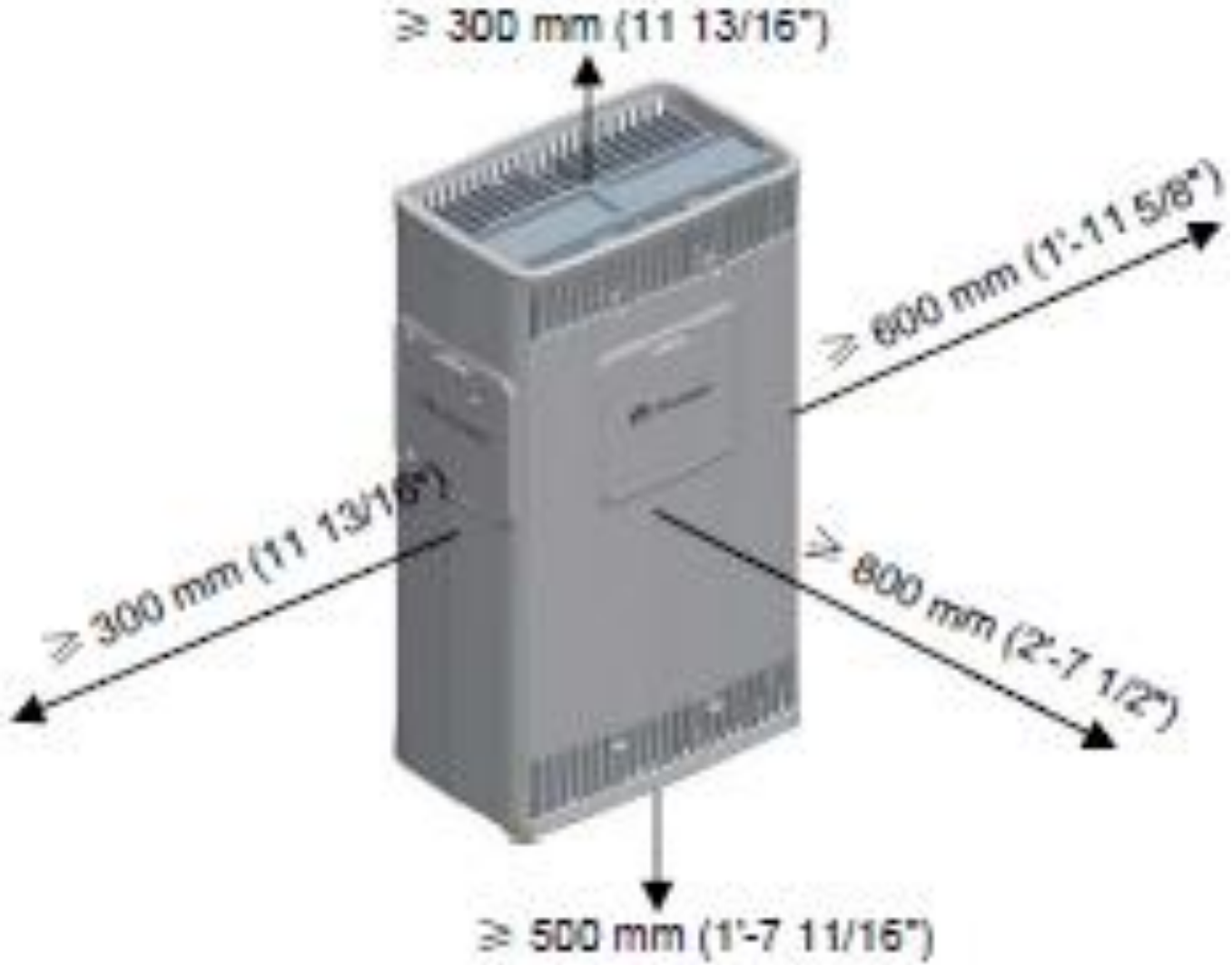
The installation hoop applies to the following scenarios: The diameter of the pole is not less than 114 mm (4 1/2"); the RRU is installed on the utility pole.

c RRU Transitional Piece



HUAWEI

Space requirement for RRU3606



Installation Scenarios for RRU3606

Installation on the pole (regular mode)

Installation on the pole (flag mode)

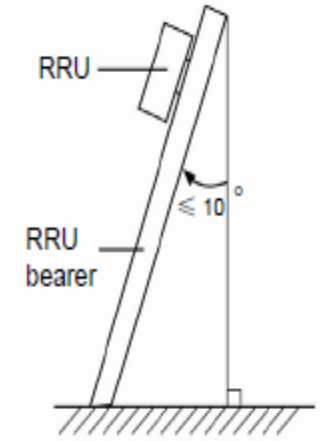
Installation on the wall (regular mode)

Installation on the wall (flag mode)

Channel steel

Angle steel

On the utility pole



As shown in the figure, when the RRU is installed on the angle steel or channel steel, the included angle between the steel and the vertical line must be 10 degrees or smaller.

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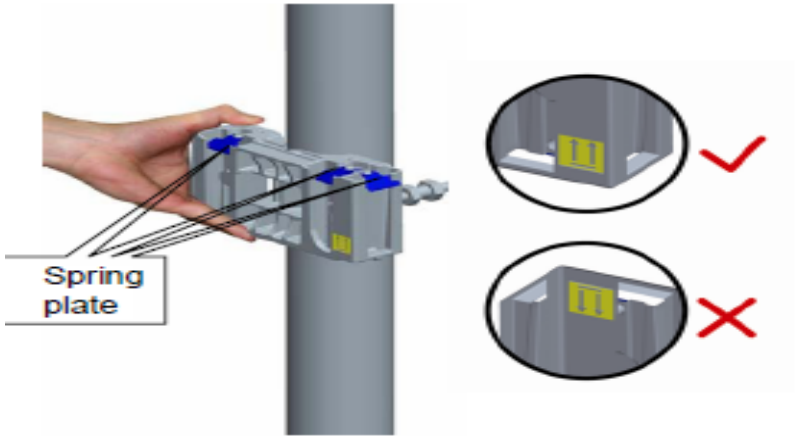
Installation of RRU3606 on Metal Pole of Dia 60mm-114mm (Single RRU on the Pole (Regular Mode))

1. Install the main fixture.



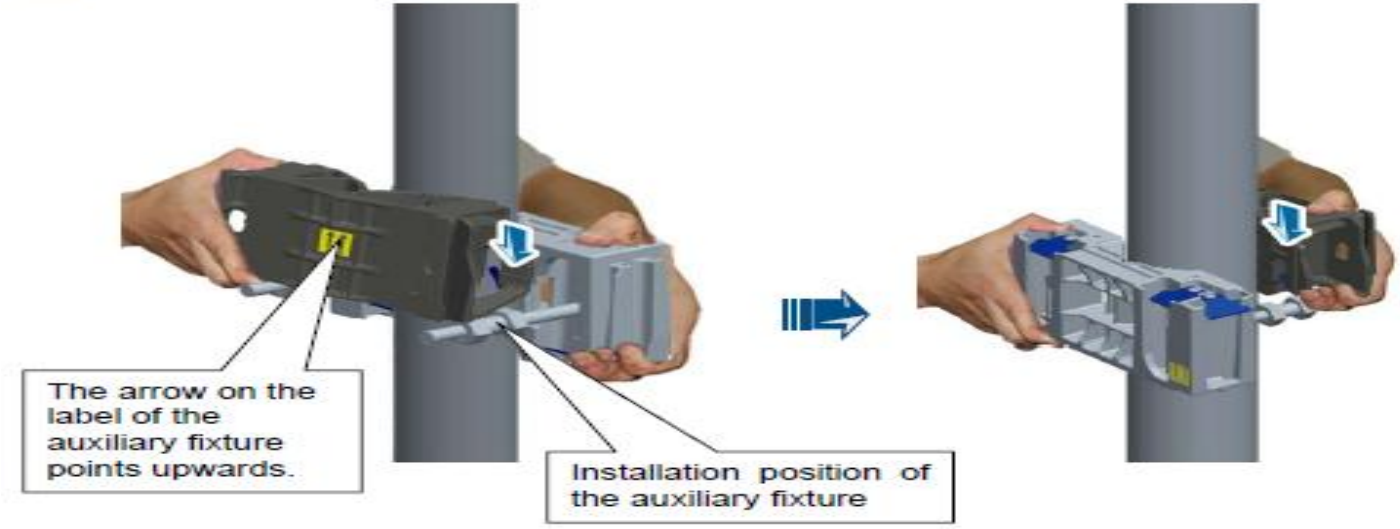
CAUTION

1. Before you install a main fixture, check whether the spring of the main fixture is properly fixed.
2. Before you install a main fixture, ensure that the arrow of the main fixture points upwards.

NOTE

For easy maintenance, install the main fixture at a height of 1200 mm (3'-11 1/4") to 1600 mm (5'-3").

2. Add the auxiliary fixture between the dual-head nuts of the main fixture.



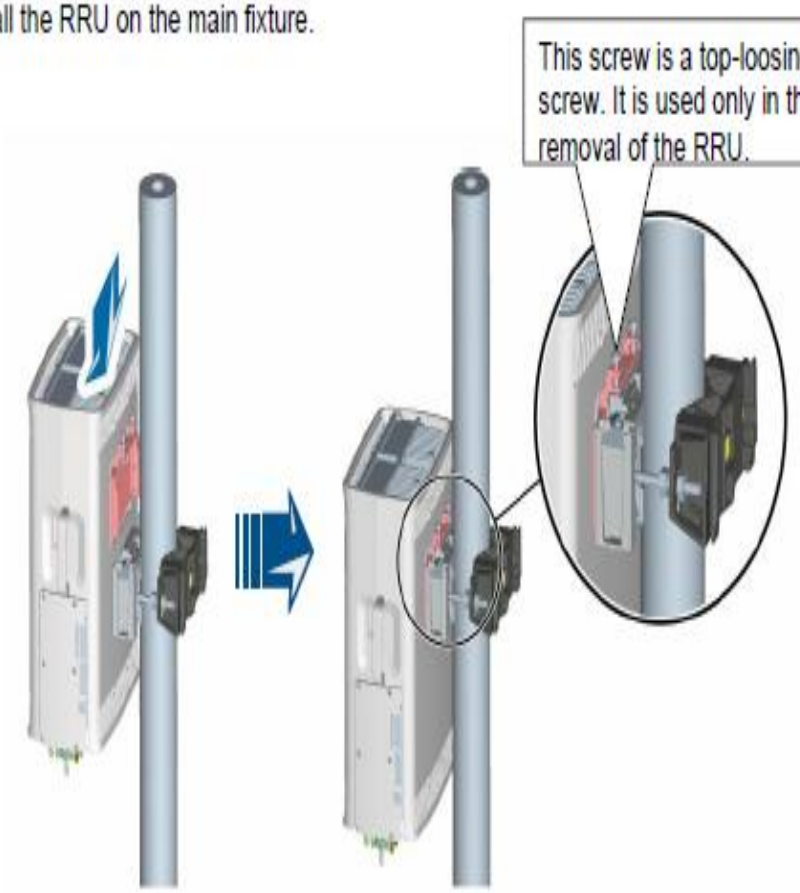
Installation of RRU3606 on Metal Pole of Dia 60mm-114mm (Single RRU on the Pole (Regular Mode))

3 Use the adjustable wrench or the combination wrench [21 mm (0 13/16")] to tighten the nuts and fully fix the main and auxiliary fixtures on the pole.

CAUTION

Tighten the two dual-head nuts at the same time. The recommended torque for tightening the nuts is 35 N.m (309.78 lbf.in.).

4 Install the RRU on the main fixture.

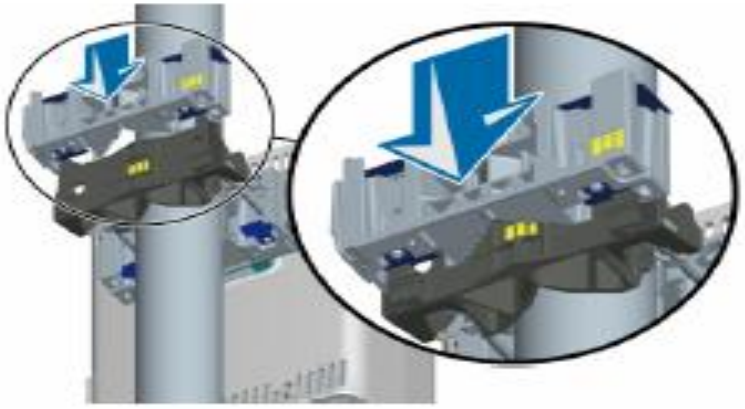


HUAWEI

Installation of RRU3606 on Metal Pole of Dia 60mm-114mm (RRU on the Pole (Back to Back Mode))

1. Install the first RRU. For the procedure, refer to the installation of a single RRU.

2. Install the second main fixture and fit it with the auxiliary fixture.



3. Swap the positions of the front cover of the second RRU and the transitional piece on the back.

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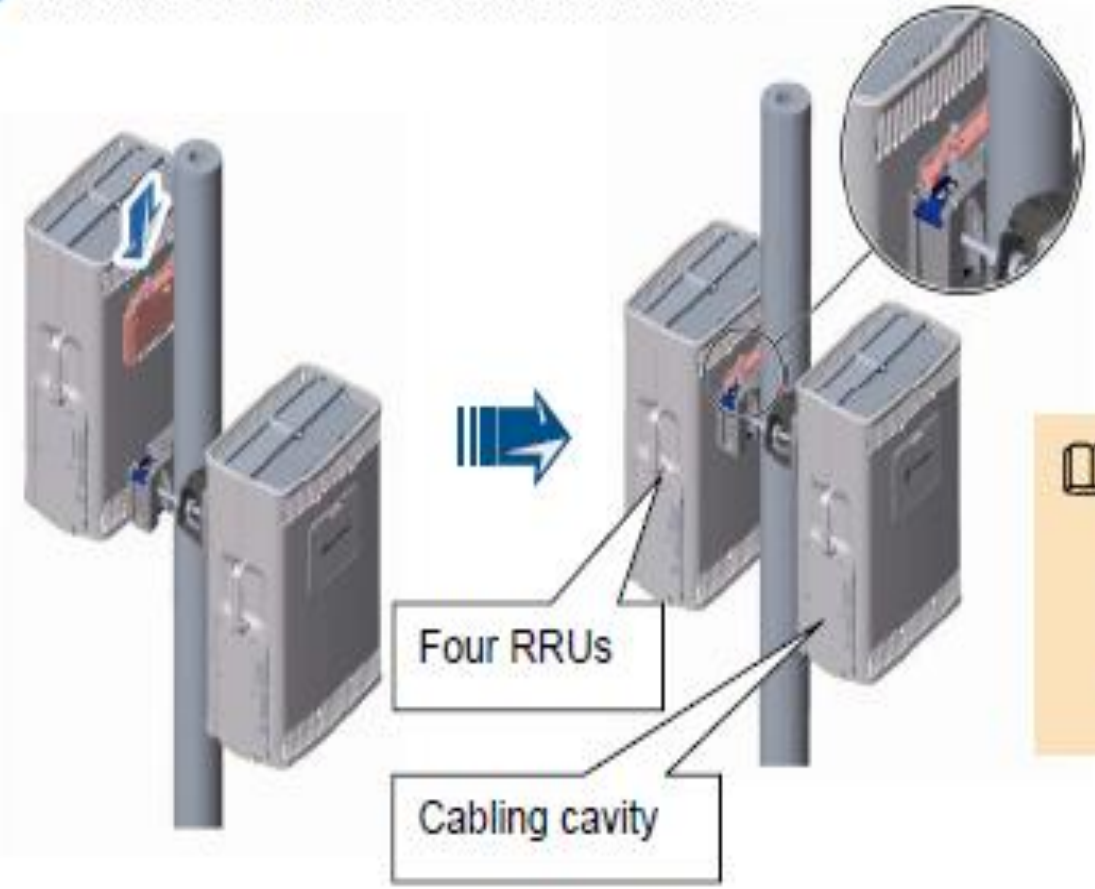
Installation of RRU3606 on Metal Pole of Dia 60mm-114mm (RRU on the Pole (Back to Back Mode))

4 Install the second RRU on the main fixture.



NOTE

In back-to-back mode, the orientations of the cabling cavities of the two RRUs must be the same.

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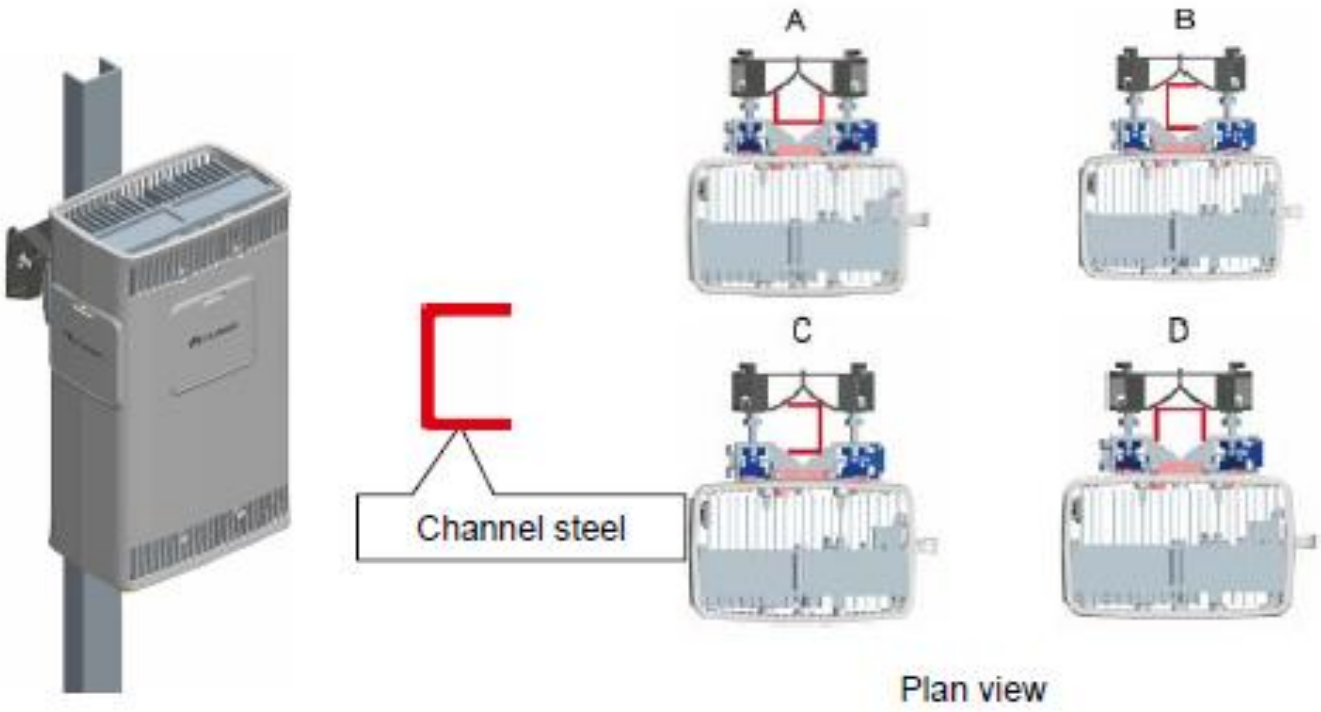
Installation of RRU3606 on Channel Steel



NOTE

Avoid installing multiple RRUs on a channel steel. The procedure for installing the RRU on the channel steel is the same as the one for installing the RRU on the pole.

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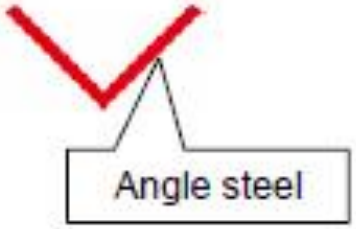
Installation of RRU3606 on Angle Steel



Plan view

NOTE

Avoid installing multiple RRUs on an angle steel. The procedure for installing the RRU on an angle steel is the same as the one for installing the RRU on a pole.

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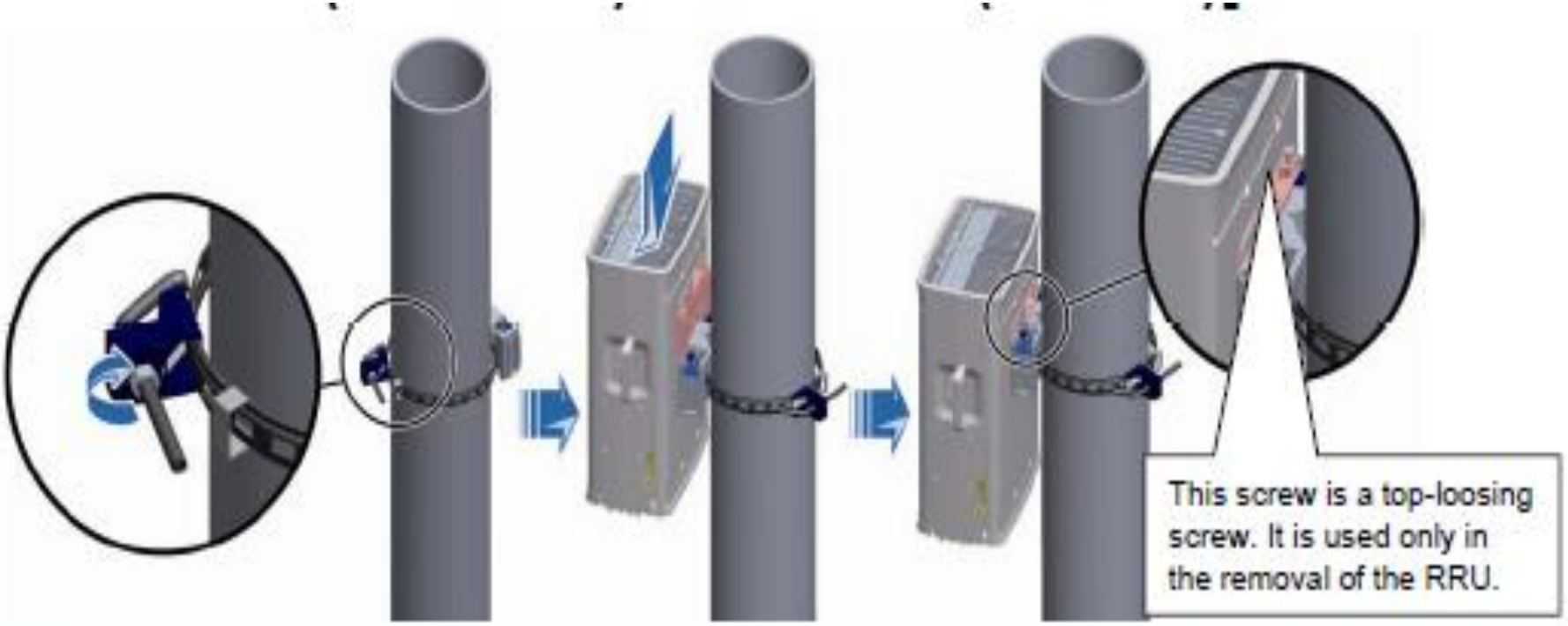
Installation of RRU3606 on the Utility Pole of Dia more than 114mm



NOTE

Avoid installing multiple RRUs on a utility pole. The procedure for installing the RRU on a utility pole is the same as the one for installing the RRU on a pole.

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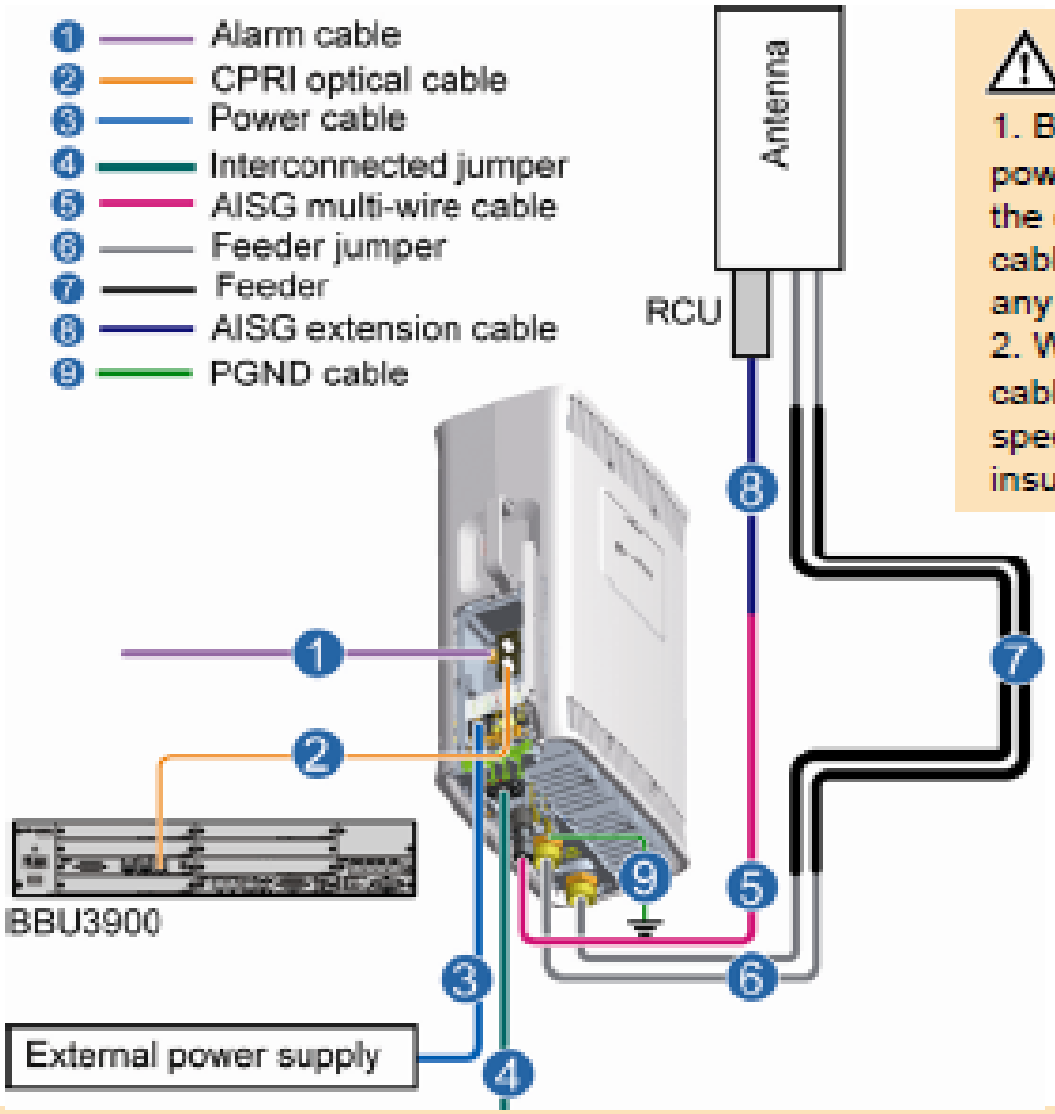
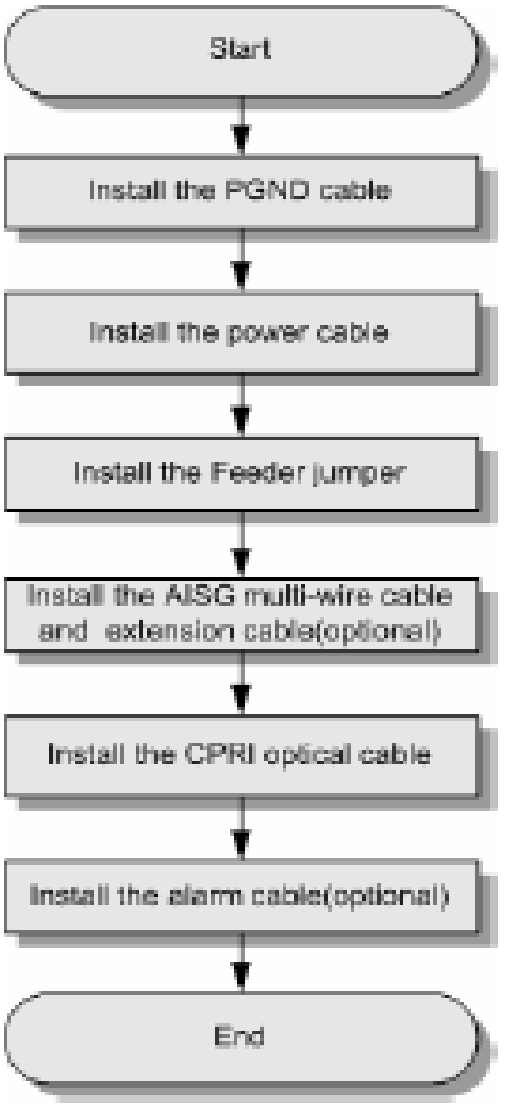
Installation of RRU3606 Cable (Cable Connections on a Single RRU)



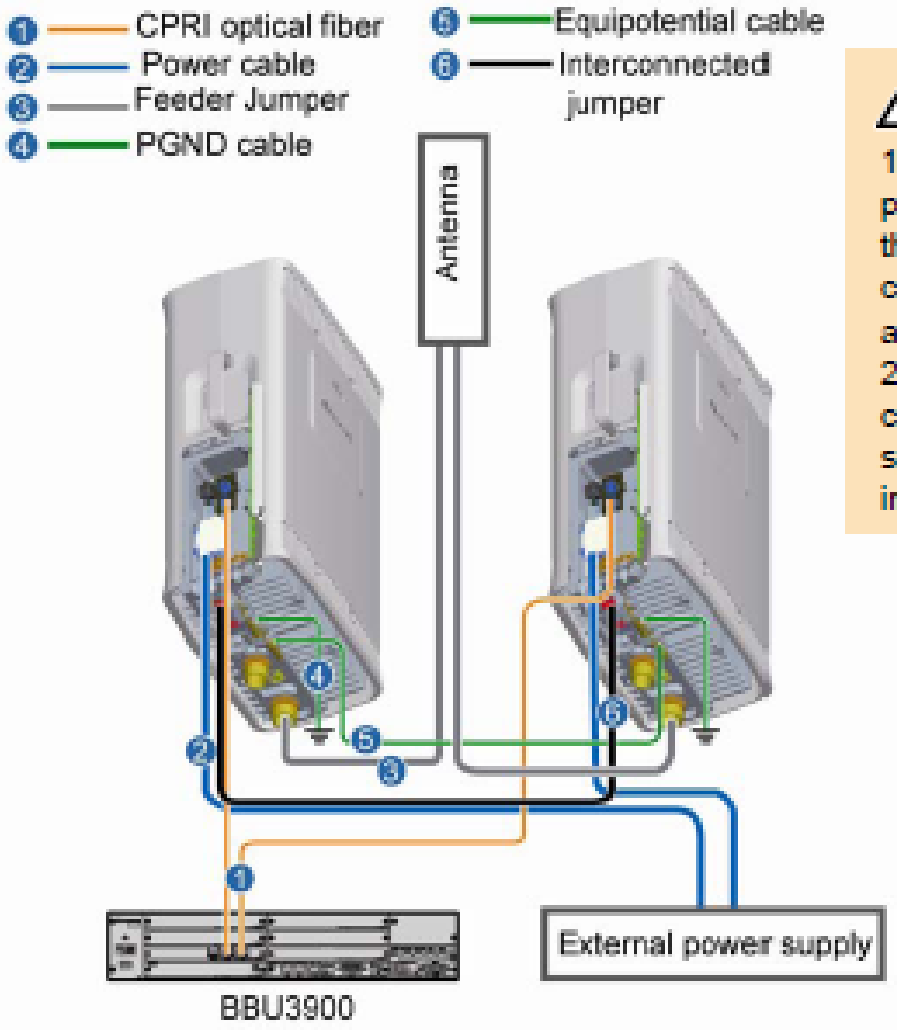
CAUTION

1. Before connecting a power cable, ensure that the other end of the power cable is not connected to any power supply.
2. When installing the cables, you need to use special tools, such as the insulating screwdriver.



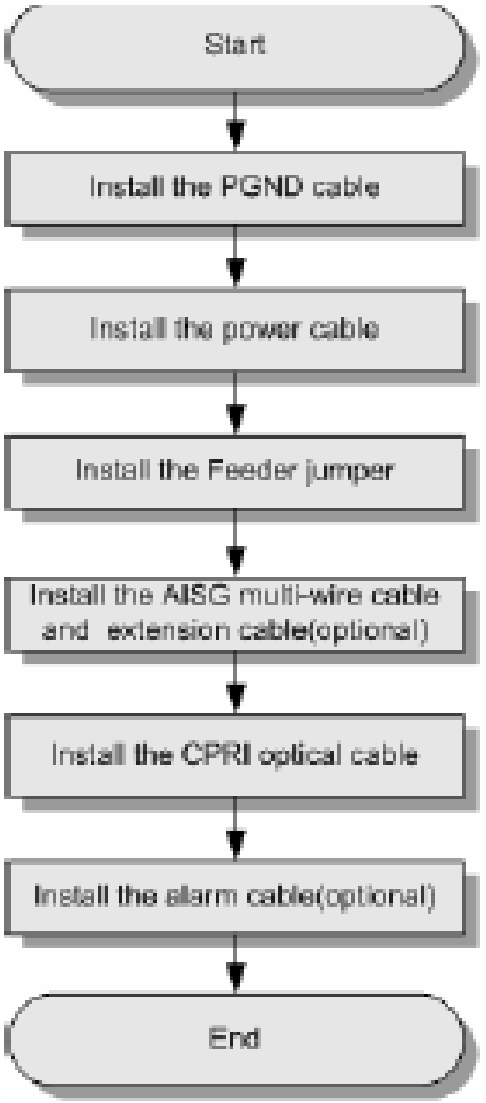
HUAWEI

Installation of RRU3606 Cable (Cable Connections on Two RRUs)



CAUTION

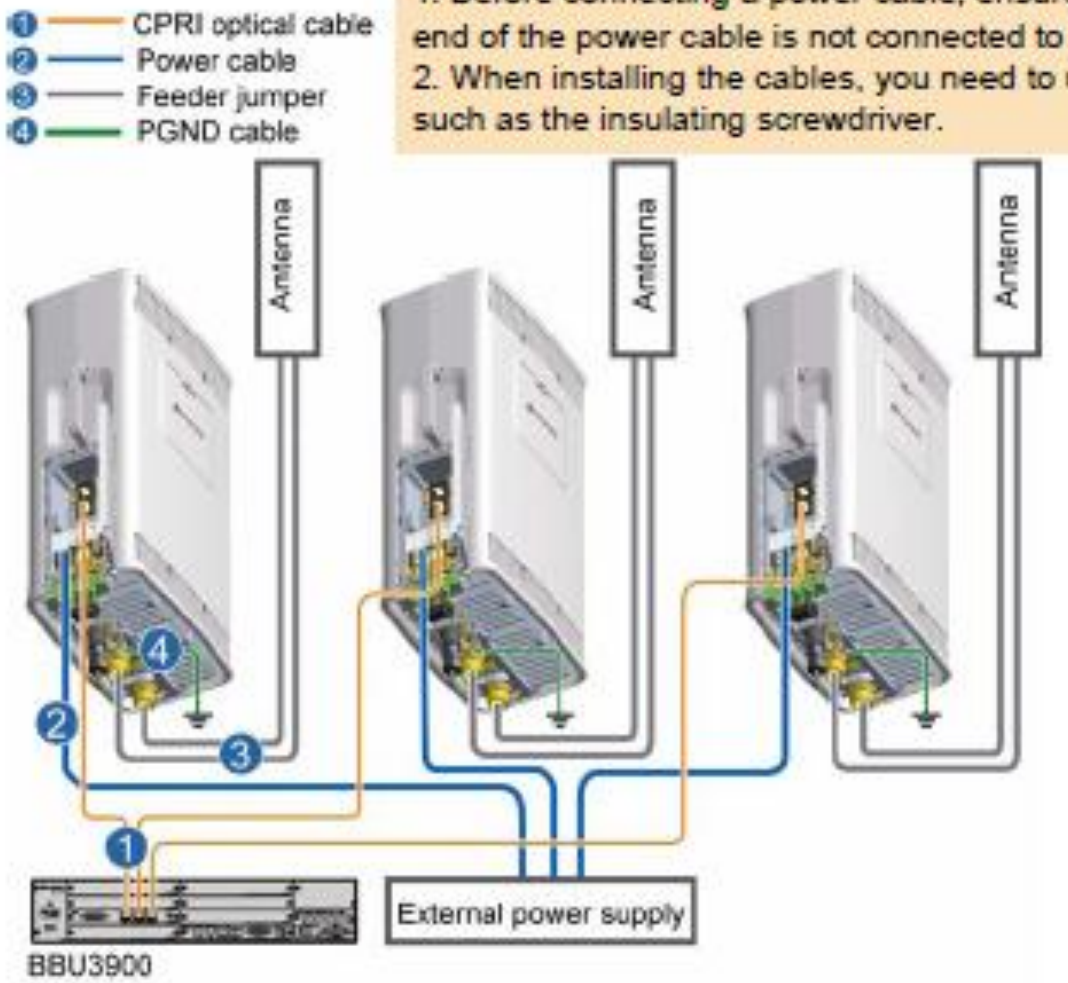
1. Before connecting a power cable, ensure that the other end of the power cable is not connected to any power supply.
2. When installing the cables, you need to use special tools, such as the insulating screwdriver.

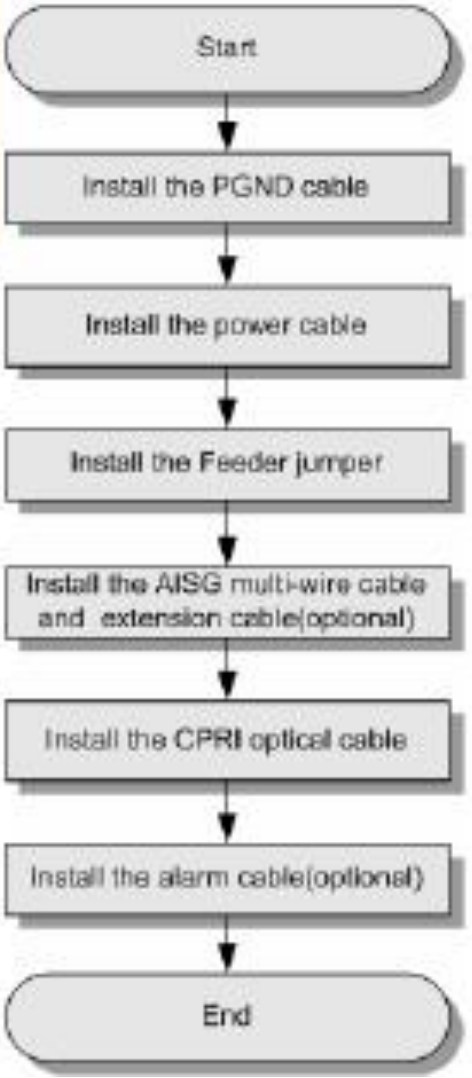


Installation of RRU3606 Cable (Cable Connections on Multiple RRUs)

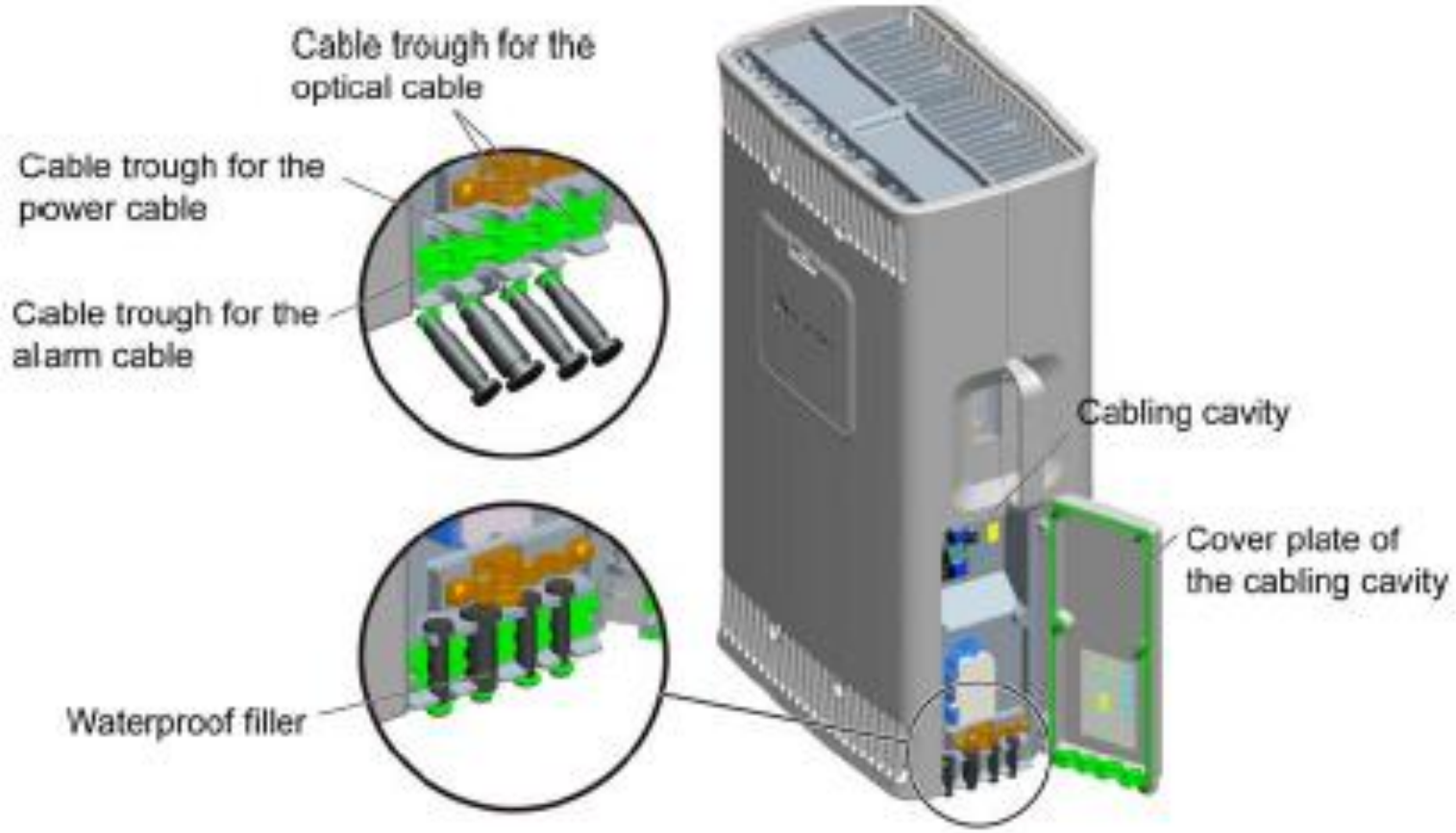
CAUTION

1. Before connecting a power cable, ensure that the other end of the power cable is not connected to any power supply.
2. When installing the cables, you need to use special tools, such as the insulating screwdriver.





Cabling Cavity of RRU



Opening and Closing Cover Plate of the Cabling Cavity of RRU

- Open the cover plate of the cabling cavity of the RRU.

- Close the cover plate of the cabling cavity of the RRU.

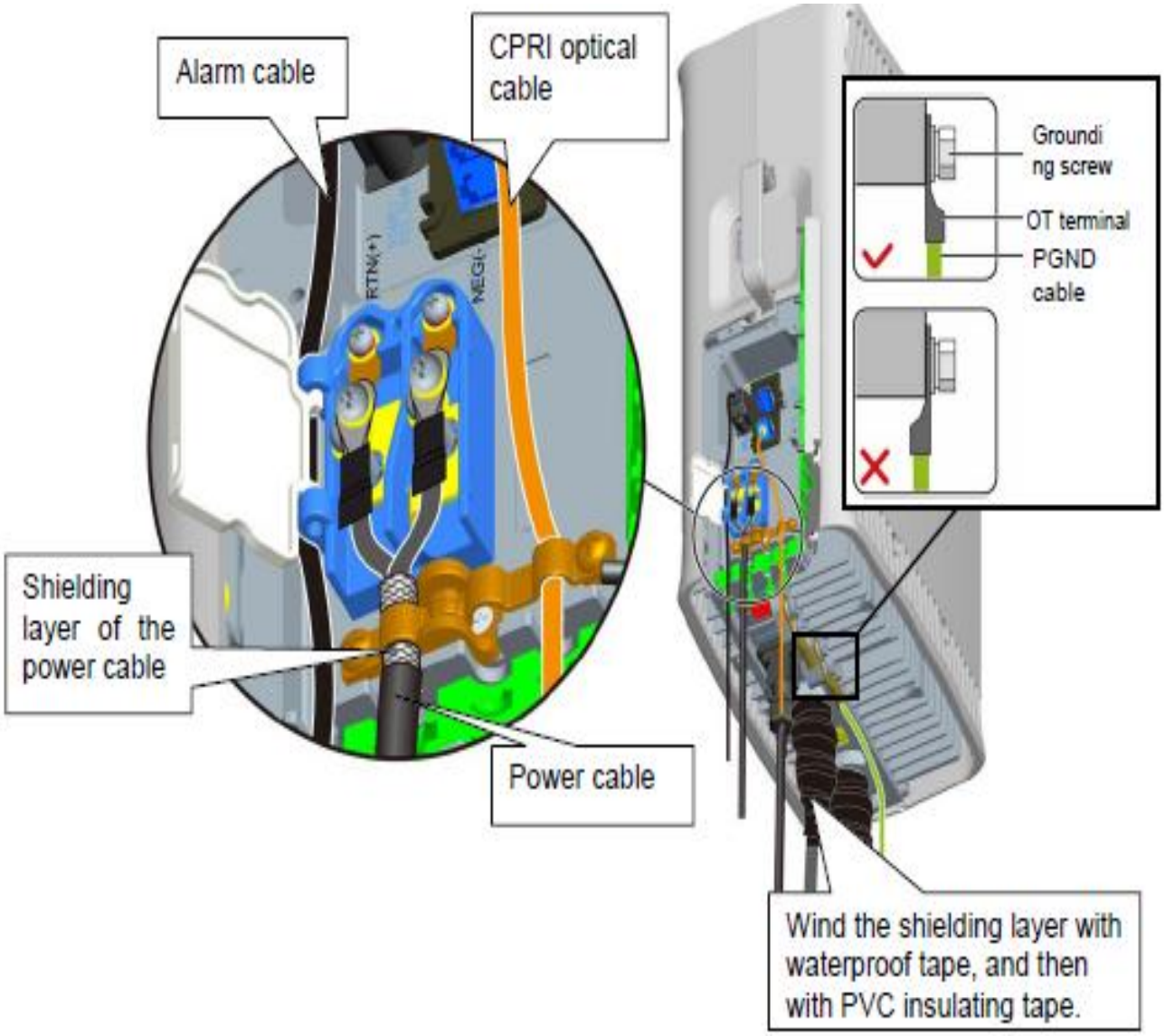
1.4 N.m (12.39 lbf.in.)

⚠ CAUTION

1. The torque for tightening the screws on the cover plate is 1.4 N.m (12.39 lbf.in.).
2. Follow the sequence described in the figure to tighten the screws on the cover plate of the cabling cavity.

HUAWEI

Cable Connection at RRU End



CAUTION

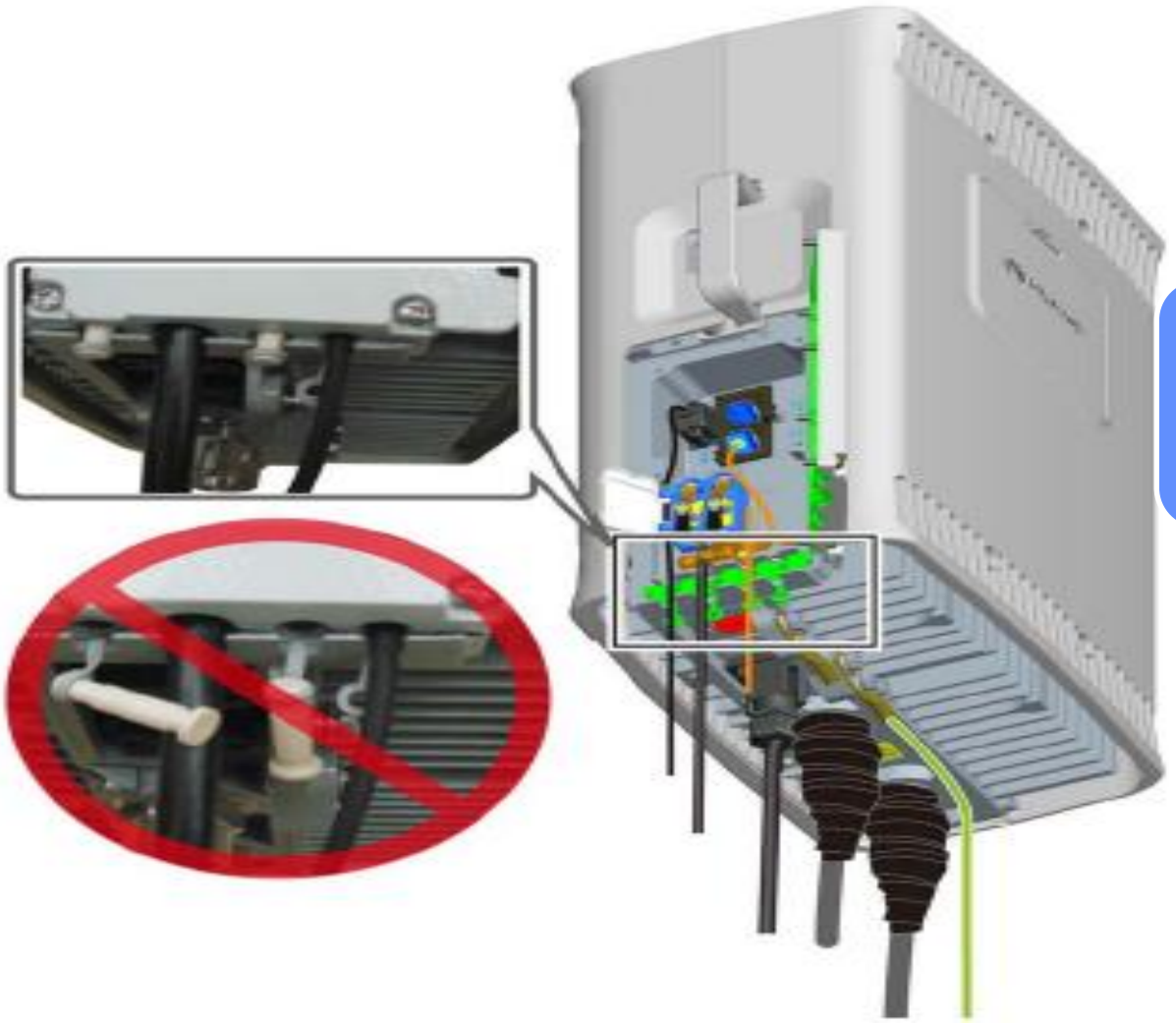
- Before connecting a power cable,ensure that the other end of power cable is not connected to any power supply.
- When installing the cables ,special tools need to use ,such as the insulating screwdriver etc.
- The ratchet crimp slip of the power cable must tightly clip the shield layer.
- The shielding layer at the other end of the power cable also need to be grounded.

NOTE

- The optical cable used for the RRU has an LC connector.
- The length of tails at two ends of the cable are different.The shorter tail is connected to the RRU & longer one is connected at BBU.
- CPRI_E is used to connecte the lower level RRU & CPRI_W is ised to connect the BBU or upper level RRU.

HUAWEI

Cable Connection at RRU End

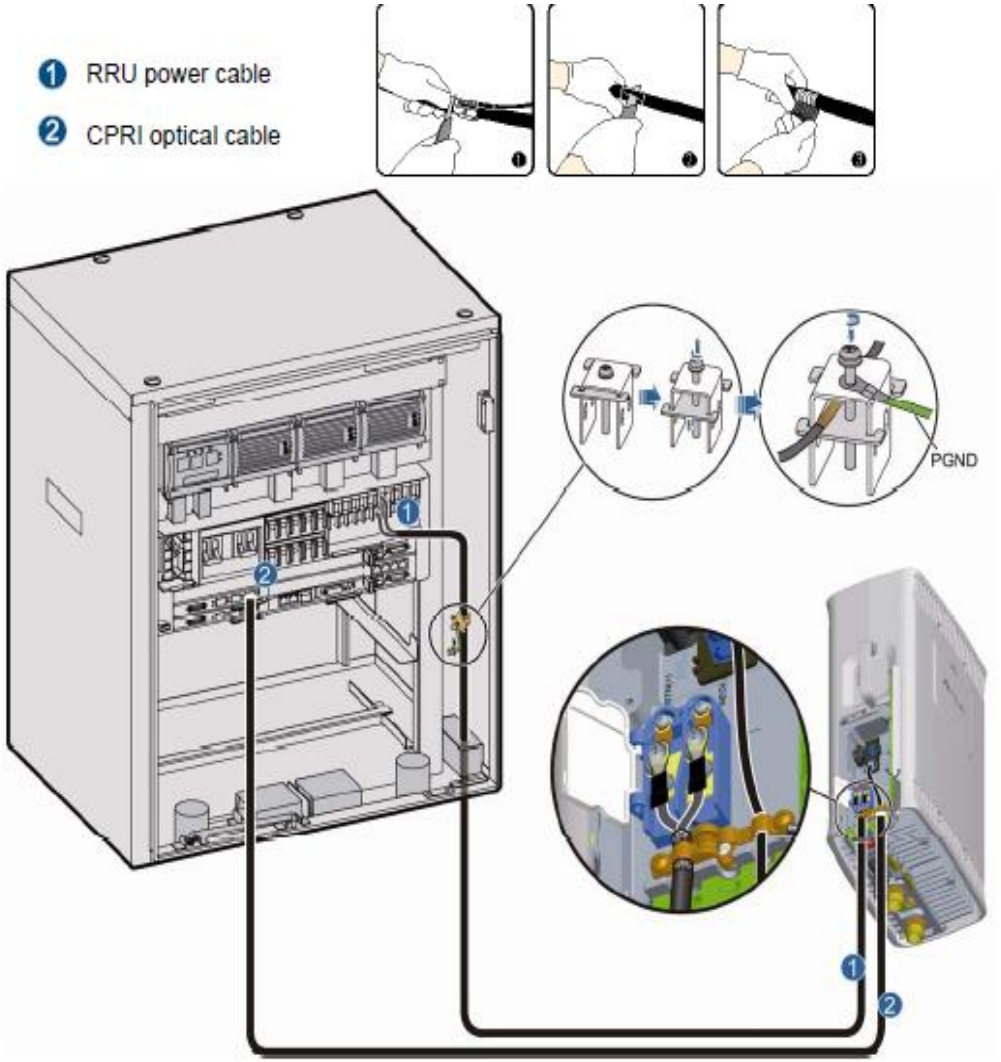


NOTE

- After all cables are installed, bock all the unused cable troughs with proper waterproof plugs.
- Close the cover plate of the cabling cavity.

HUAWEI

Cable Connection at BBU End



CAUTION

- Before connecting a power cable,set the MCB controlling RRU on the panel f the PDU/DCDU to OFF condition.
- When installing the cables, special tools needs to be used.

NOTE

- The power cable of the RRU is connected to LOAD4-LOAD9 of the PDU.
- In-case of power tapping from PDU, Remove 25mm of the sheath of the power cable & then fix the cable on the grounding clip & ensure there is contact between the shielding layer & the grounding clip. After fixing the cable, connect the grounding clip to the closest grounding point of the cabinet
- In-case of power tapping from DCDU, remove the shield at end of cable & prepare the OT terminal for shield. Connect the shield at PGND terminal of DCDU.

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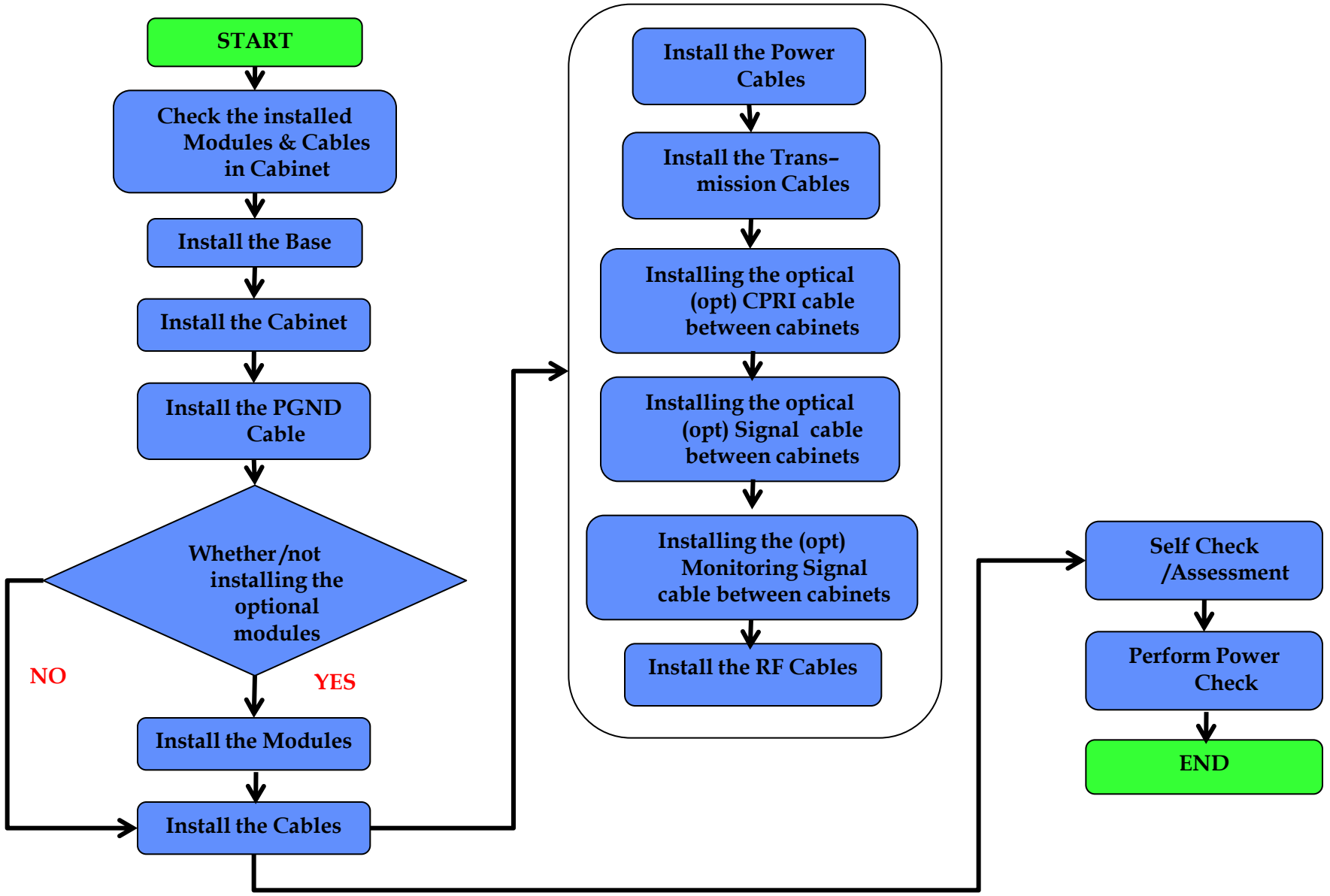
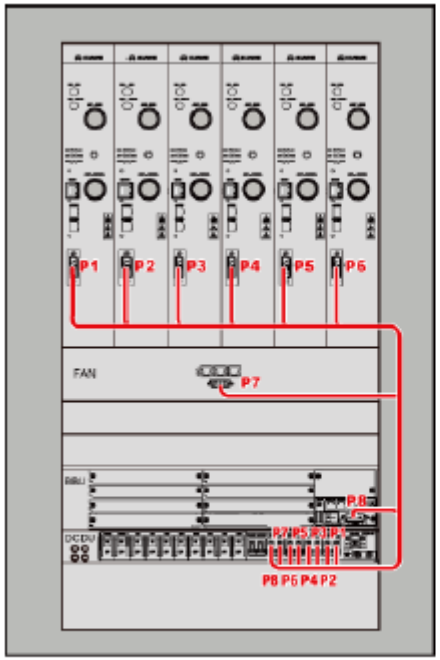
BTS3900 WCDMA INSTALLATION

BTS3900 WCDMA Installation Procedure

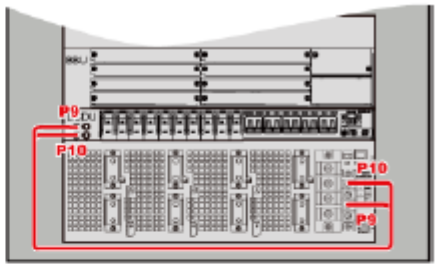


HUAWEI

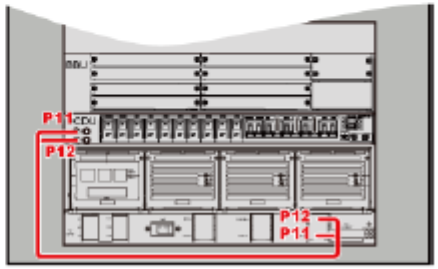
Check of Cables BTS3900 WCDMA



1



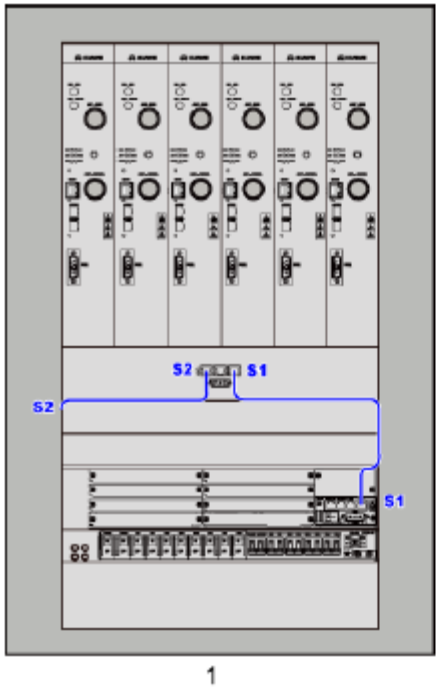
2



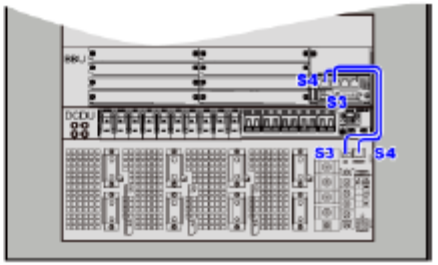
3

(1) -48 V cabinet (2) +24 V cabinet (3) AC cabinet

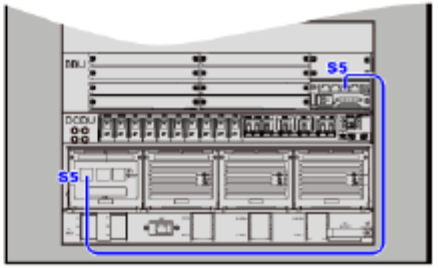
Power Cables



1



2



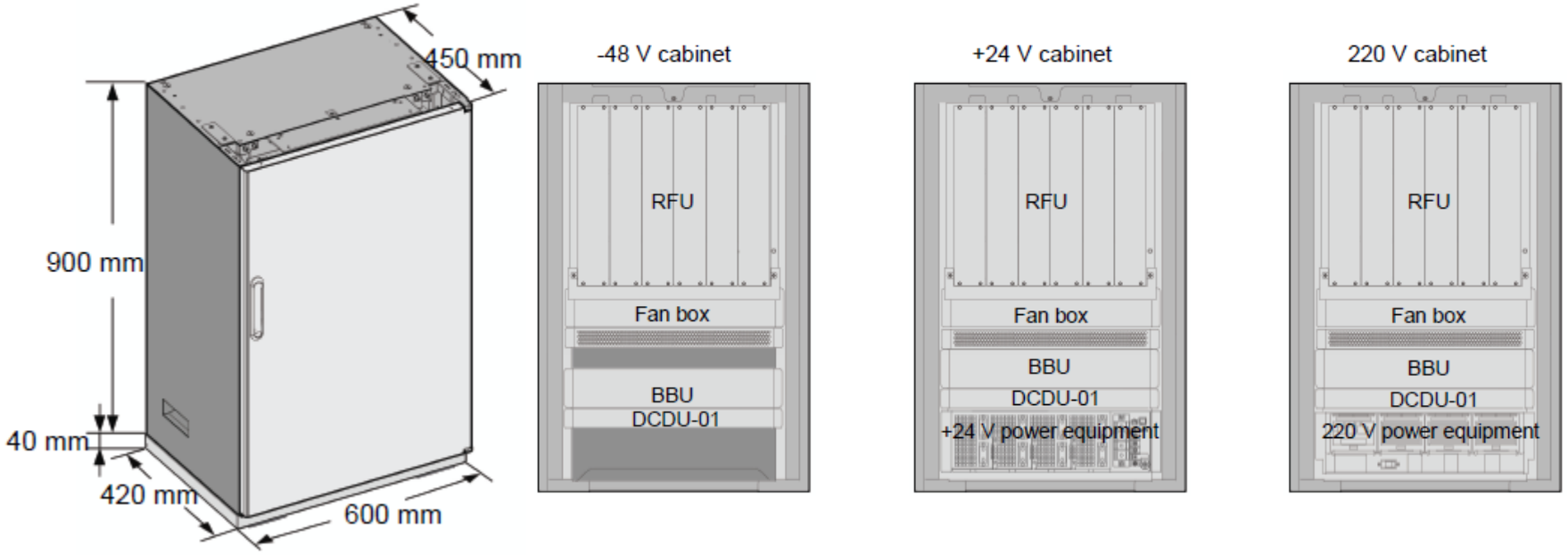
3

(1) -48 V cabinet (2) +24 V cabinet (3) AC cabinet

Signal Cables

HUAWEI

BTS3900 WCDMA Installation Preparation



Note-

The Cabinet Installation & its PGND, Power –DC/AC cabling of BTS3900 WCDMA is same as the BTS3900 GSM .

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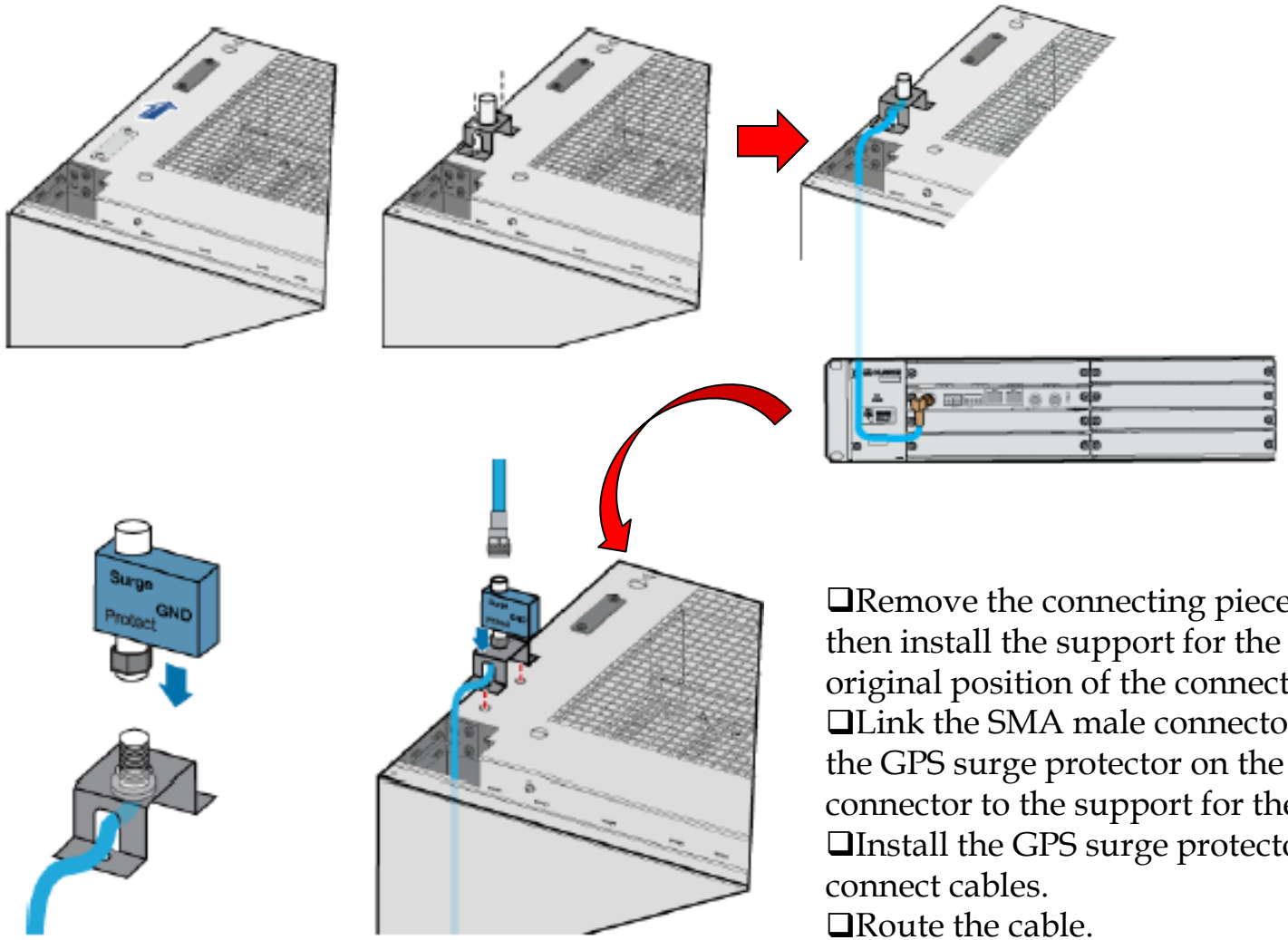
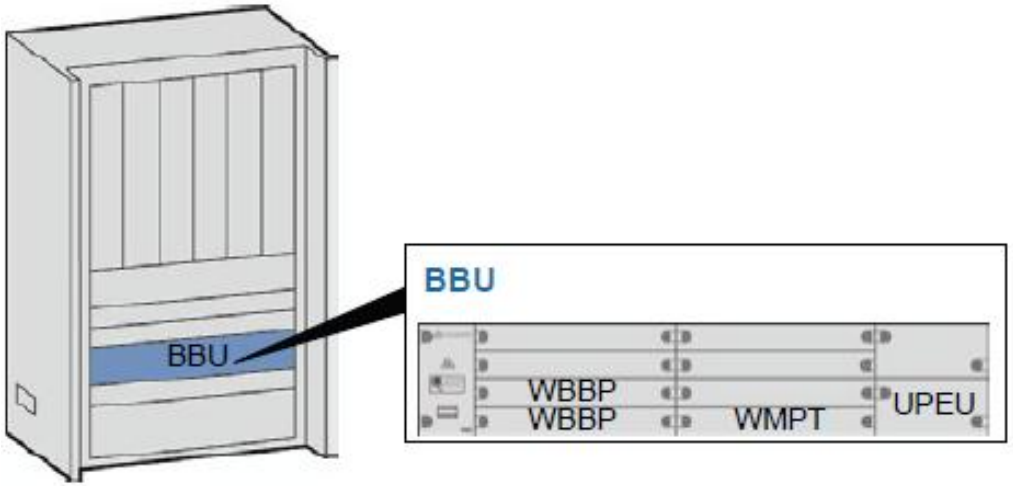
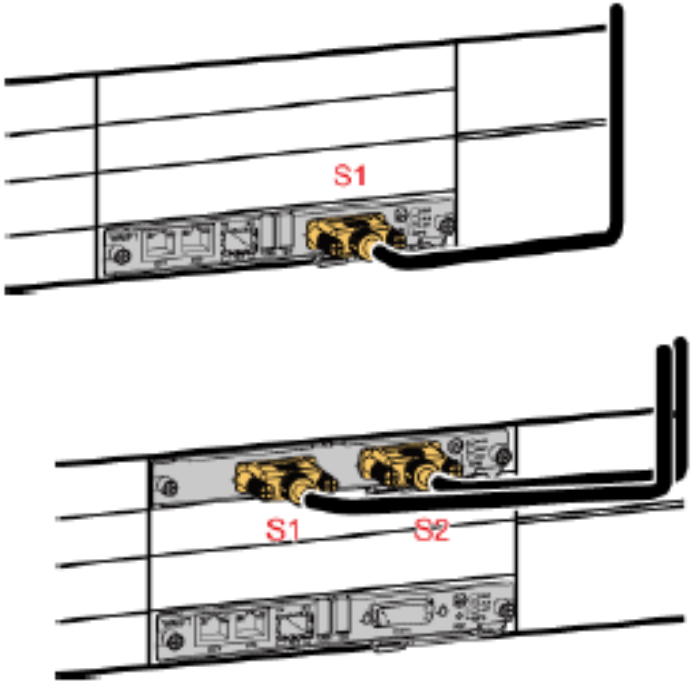
Installation of GPS Surge Arrestor in BTS3900 WCDMA



❑Remove the connecting piece from the cabinet top, and then install the support for the GPS surge protector in the original position of the connecting piece.
❑Link the SMA male connector of the GPS signal cable to the GPS surge protector on the USCU and the N-type connector to the support for the GPS surge protector.
❑Install the GPS surge protector to the support, and then connect cables.
❑Route the cable.
❑Attach labels to the installed cables.

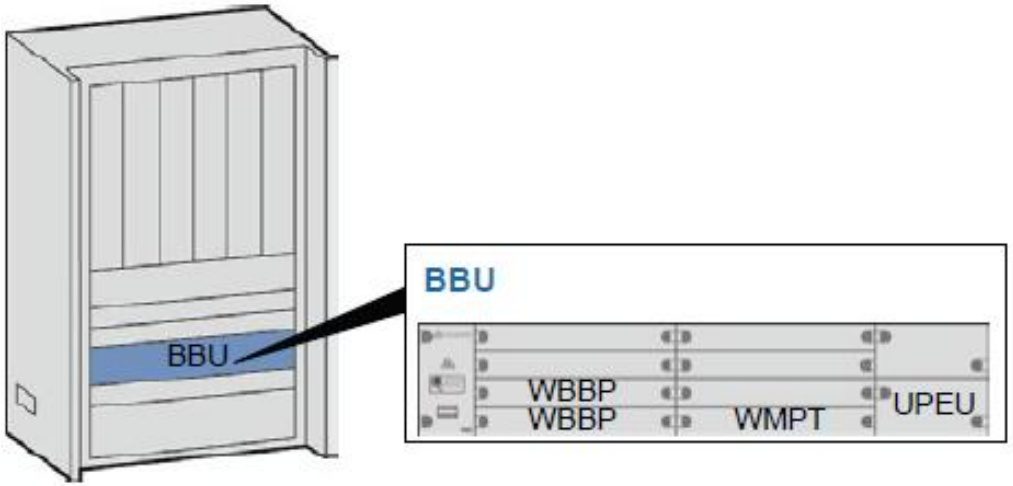
Installation of Transmission Cable for BTS3900 WCDMA

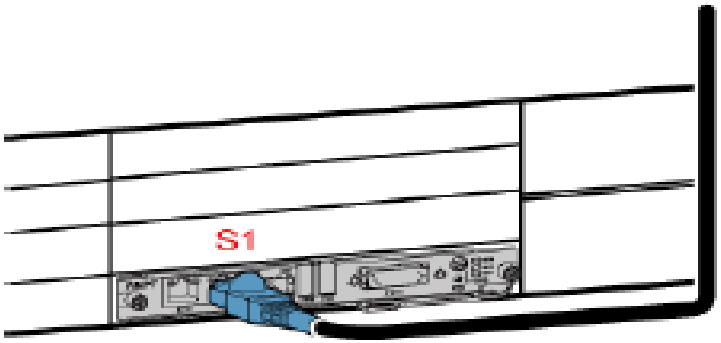


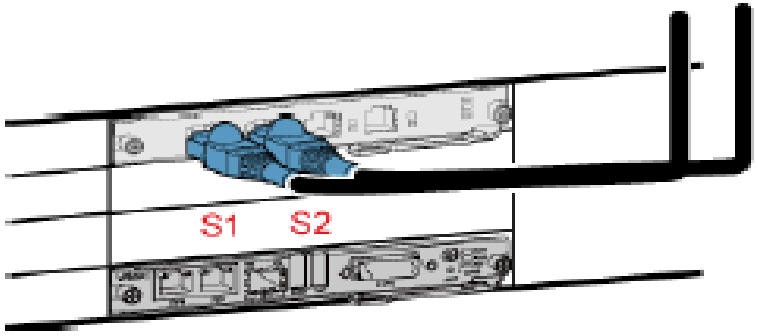


- If the UTRP is not configured, link the DB26 male connector of the E1/T1 cable to the port labeled E1/T1 on the WMPT.
- If the UTRP is configured, link the DB26 male connectors of the E1/T1 cables to the ports labeled E1/T1 (0-3) and E1/T1 (4-7) on the UTRP, and then tighten the screws.
- Route the E1/T1 cable along the cable trough on the right of the cabinet, and then use cable ties to bind the cable.
- Attach labels to the installed cable.

Installation of FE Cable for BTS3900 WCDMA

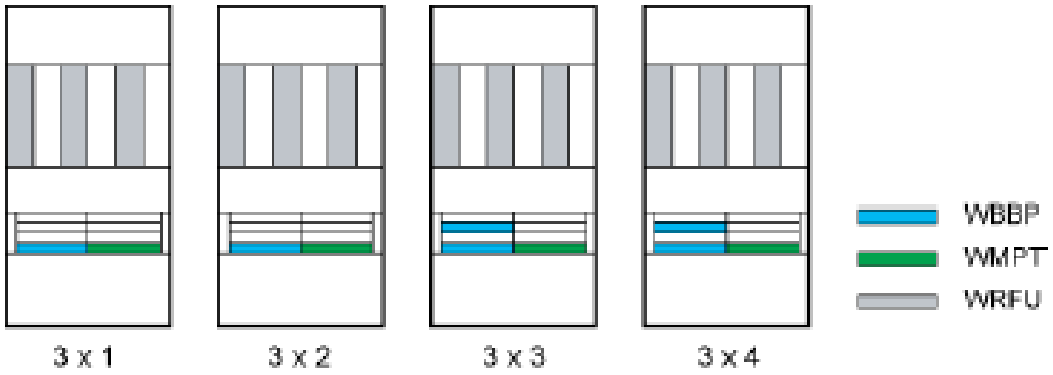


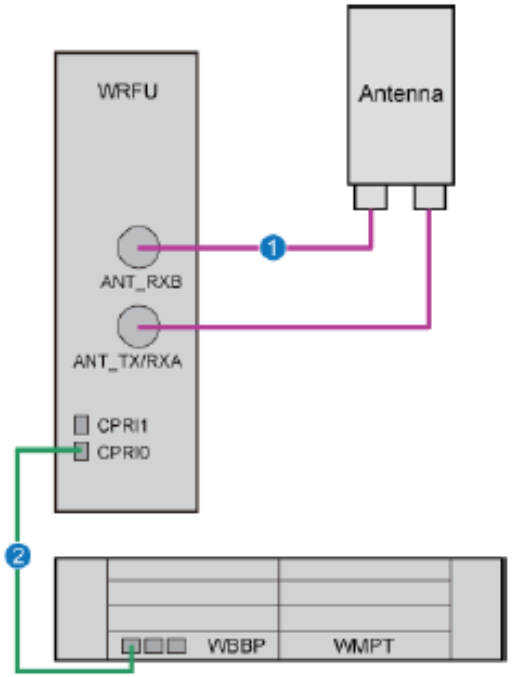




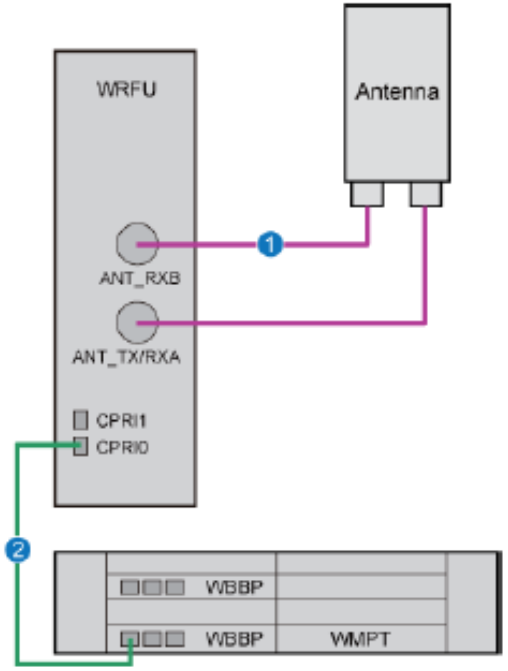
- If the UTRP is not configured, link the RJ-45 connector of the FE cable to the port labeled FE0 on the WMPT,
- If the UTRP is configured, link the RJ-45 connectors of the FE cables to the ports labeled FE/GE0 and FE/GE1 on the UTRP, and then tighten the screws.
- Route the FE cable along the cable trough on the right of the cabinet, and then use cable ties to bind the cable.
- Attach labels to the installed cable.

WCDMA (Node-B) Typical Configuration





3x1



3x4

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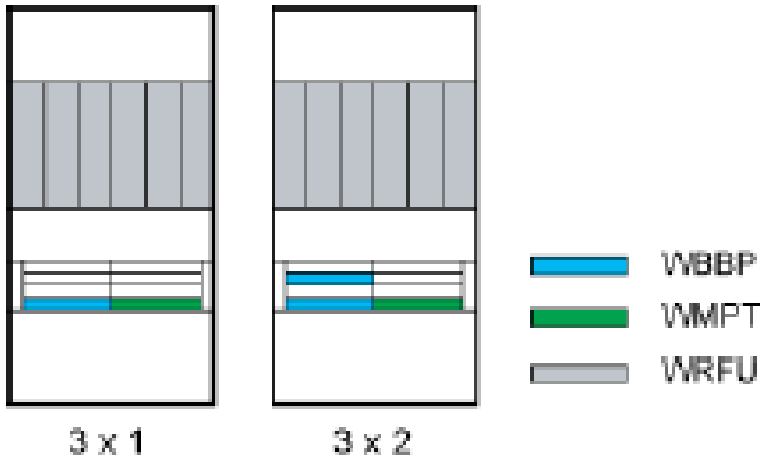
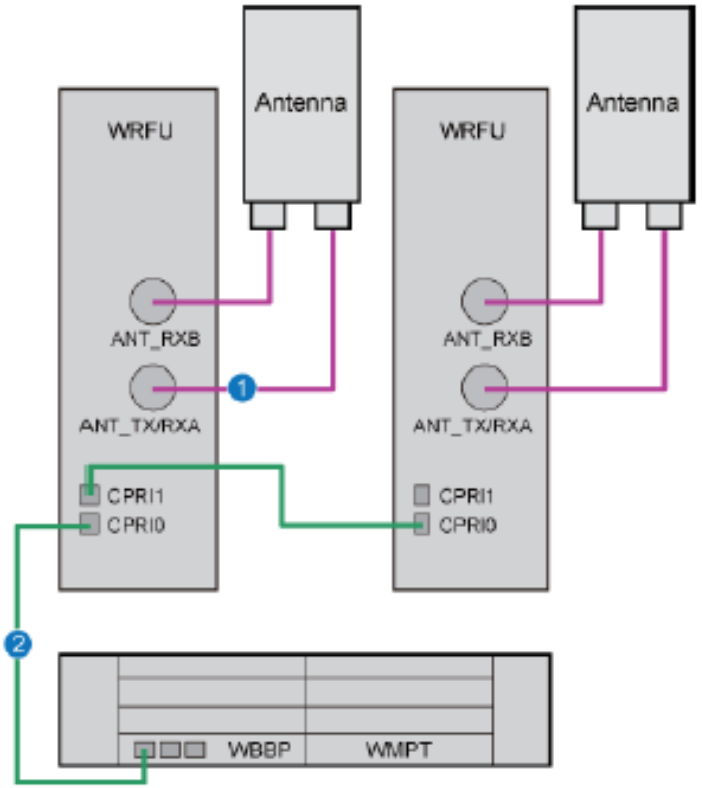
WCDMA (Node-B) -4 Way Rx diversity Configuration

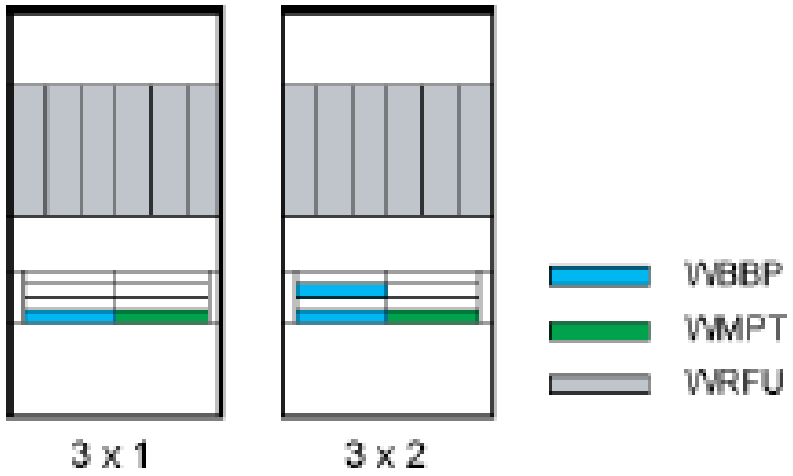


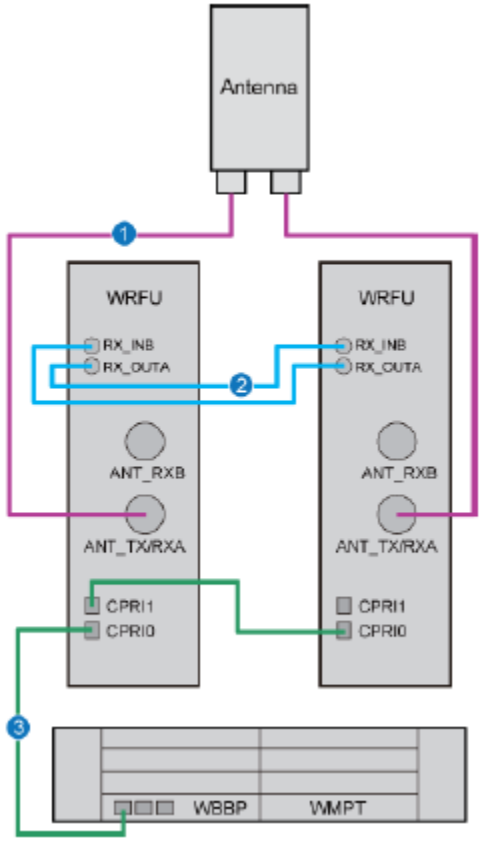


3x1 Configuration(4 Way Rx Diversity)

3x1 3x4

WCDMA (Node-B) -Tx diversity Configuration





3x1 Configuration(Tx Diversity)

3x1 3x4

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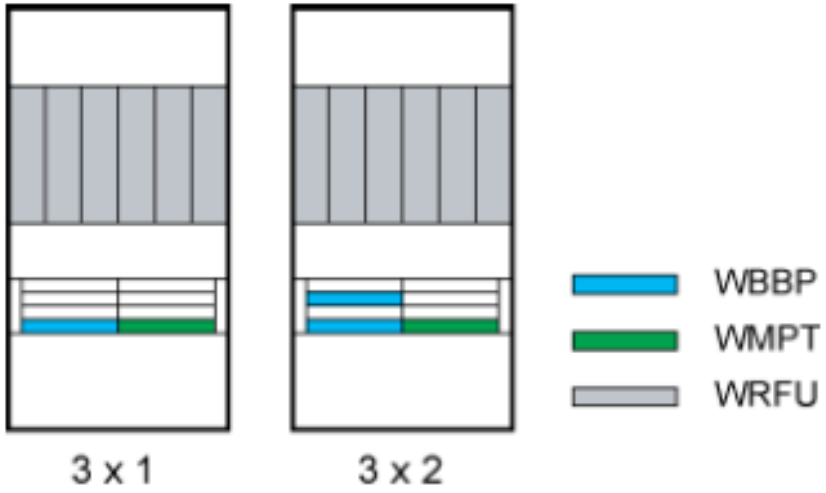
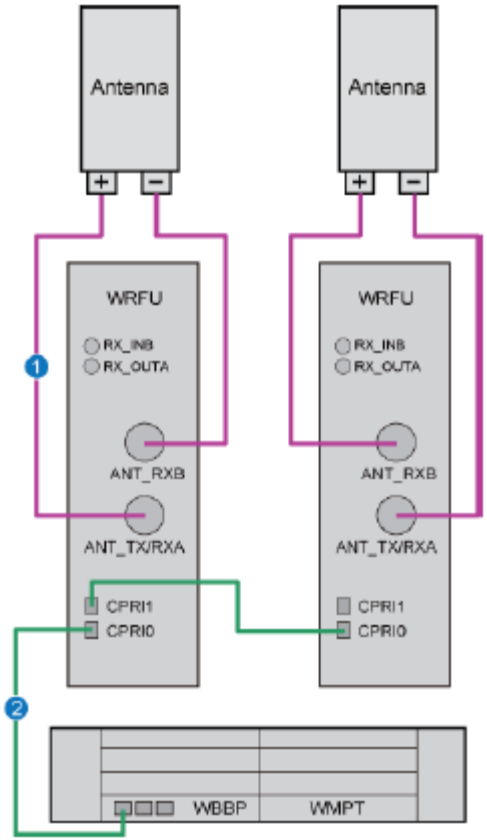
WCDMA (Node-B) 2 Tx & 4Rx Diversity Configuration

The BTS3900 supports the TX diversity and 4-way RX diversity (2T4R) at the same time.
In configurations of 2T4R, the mandatory boards of the BTS3900 are the WMPT, WBBP, and WRFU. The WMPT and WBBP are installed in the BBU3900.
The WBBPs can support three cells or six cells according to their specifications.

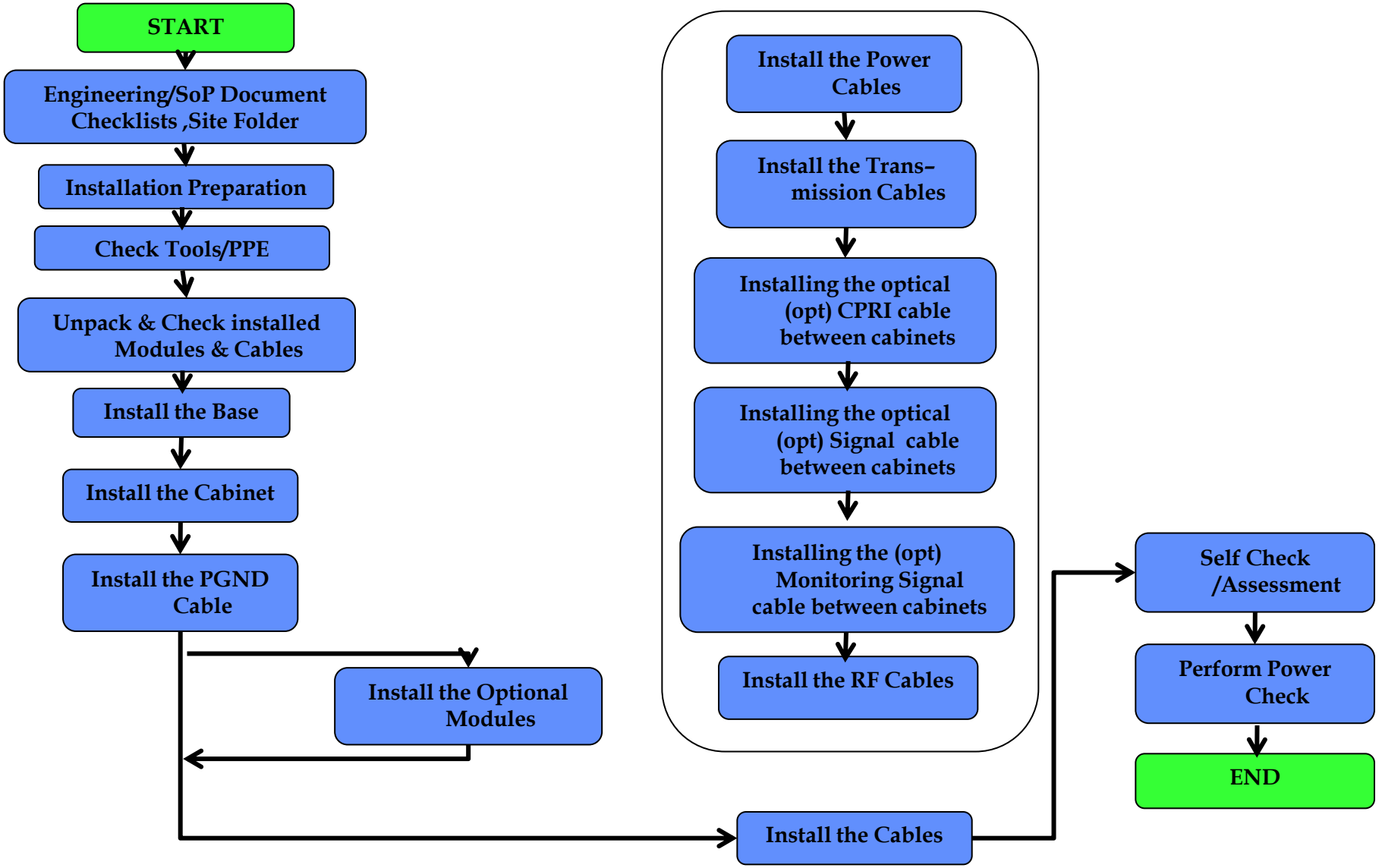




3x1 Configuration(Tx Diversity)

BTS3900A WCDMA INSTALLATION

BTS3900A WCDMA Installation Procedure



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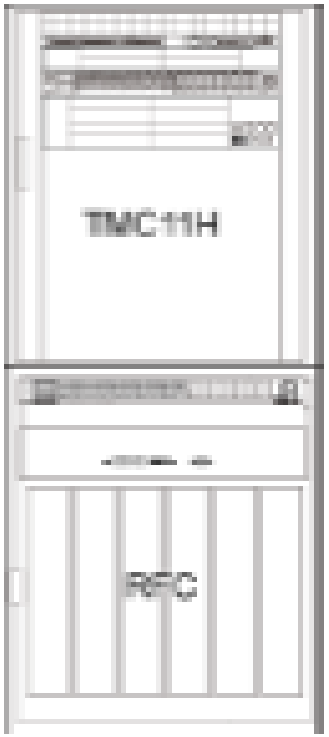
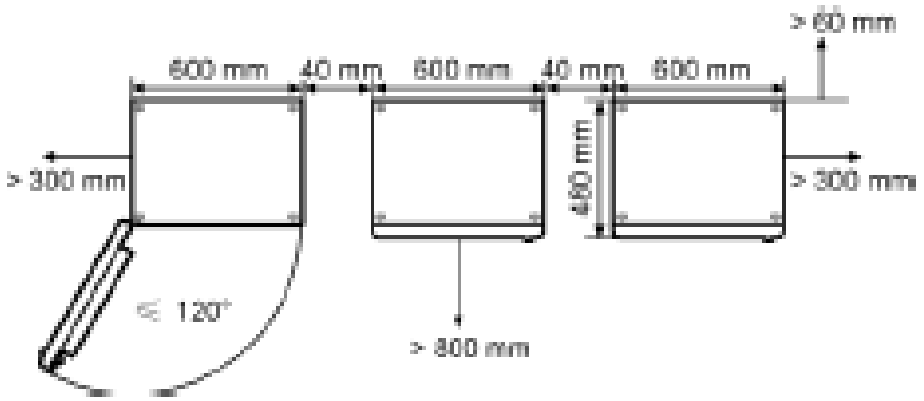
BTS3900A-WCDMA Configuration



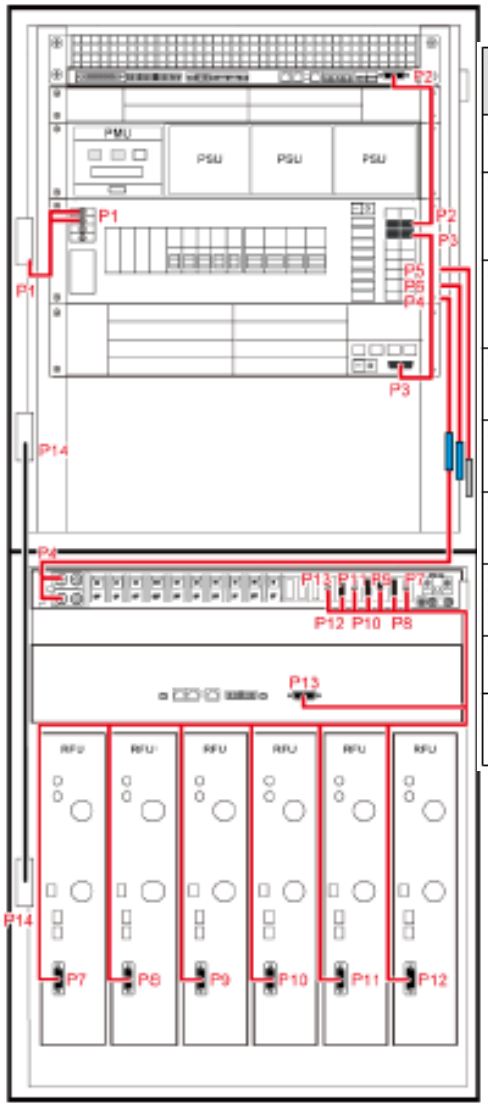


Note-

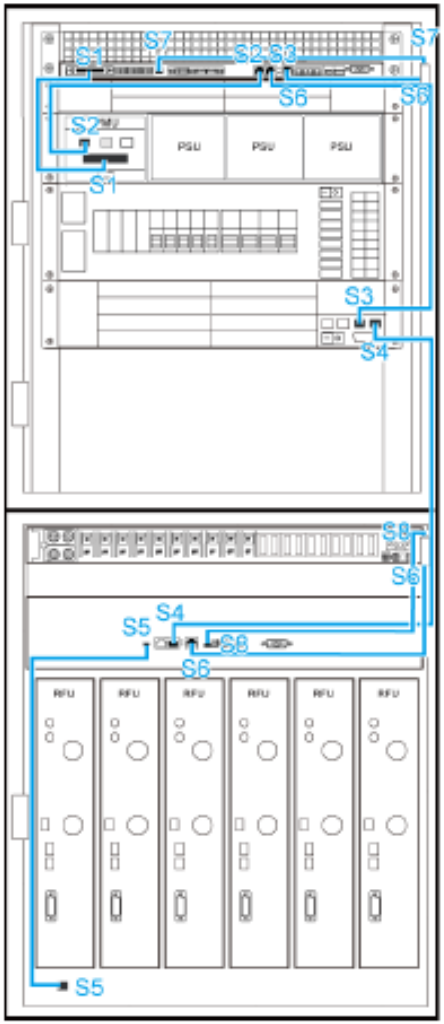
The Cabinet Installation & its PGND, Power –DC/AC cabling of BTS3900A WCDMA is same as the BTS3900A GSM .

HUAWEI

Check of Power & Signal Cables in BTS3900A WCDMA-AC



No.	Cable	One End		The Other End	
		Connector	Installation Position	Connector	Installation Position
P1	Input power cable for the junction box	OT terminal	EPS/AC OUTPUT/L1 and N1	OT terminal	Junction box/L and N
P2	Power cable for the fan box in the APM30H	Easy power receptacle (prestfit type) connector	EPS/LOAD0	3V3 power connector	Fan box in the APM30H/PWR
P3	Power cable for the BBU	Easy power receptacle (prestfit type) connector	EPS/LOAD1	3V3 power connector	BBU/UPEU/ PWR
P4	Input power cable for the RFC	Power series 120 connector (blue)	EPS/Power series 120 connector (blue)	OT terminal	DCDU-01/ INPUT/RTN(+) and NEG(-)
P5	Power cable for the IBBS200D/ IBBS200T	Power series 120 connector (grey)	EPS	OT terminal	Reserved for the IBBS200D/ IBBS200T
P6	Input power cable for the RFC	Power series 120 connector (blue)	EPS	OT terminal	Reserved for the RFC
P7 to P12	Power cable for the RFU	Parallel terminal	DCDU-01/ RFU0 to RFU5	3V3 power connector	RFU0 to RFU5/ PWR
P13	Power cable for the fan box in the RFC	Parallel terminal	DCDU-01/FAN	3V3 power connector	Fan box in the RFC/PWR
P14	Equipotential cable between the APM30H and the RFC	OT terminal	APM30H/ Ground bar	OT terminal	RFC/Ground bar



No.	Cable	One End		The Other End	
		Connector	Installation Position	Connector	Installation Position
S1	Environment monitoring signal cable	DB50 male connector	PMU/COM	DB50 male connector	Fan box in the APM30H/ HPMI/ PMU_DB50
S2	Monitoring signal transfer cable	RJ-45 connector	PMU/ COM_IN	RJ-45 connector	Fan box in the APM30H/ CMUA/ COM_OUT
S3	Monitoring signal cable between the BBU and the CMUA in the APM30H	RJ-45 connector	CMUA/ COM_IN	RJ-45 connector	BBU/UPEU/ MON1
S4	Monitoring signal cable between the BBU and the CMUA in the RFC	RJ-45 connector	CMUA/ COM_IN	RJ-45 connector	BBU/UPEU/ MON0
S5	Temperature monitoring signal cable for the RFC	4-pin connector	Fan box in the RFC/ CMUA/ TEM	Temperature sensor	Air inlet at the bottom of the RFC
S6	Signal cable for the ELU	RJ-45 connector	ELU	RJ-45 connector	Fan box in the APM30H or in the RFC/CMUA/ ELU
S7	Monitoring signal cable for the door status sensor in the APM30H	2-pin connector	Fan box in the APM30H/ HPMI/ GATE	Bare wire	Door status sensor in the APM30H
S8	Monitoring signal cable for the door status sensor in the RFC	Cord end terminal	Fan box in the RFC/ CMUA/ GATE	Bare wire	Door status sensor in the RFC

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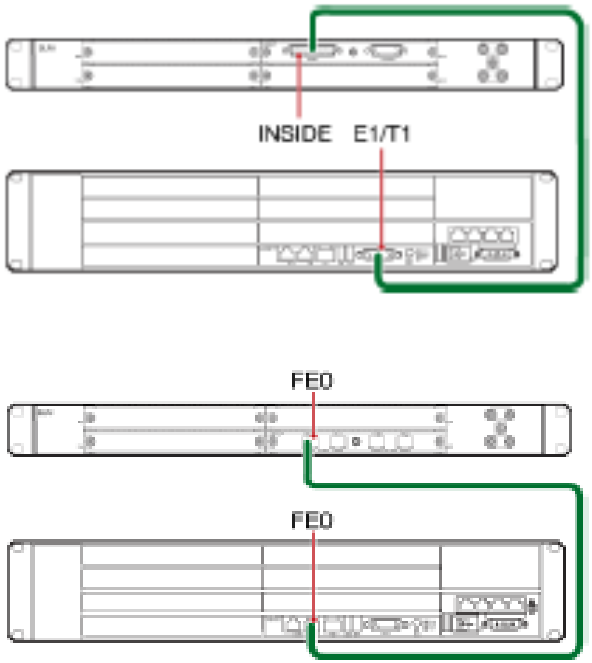
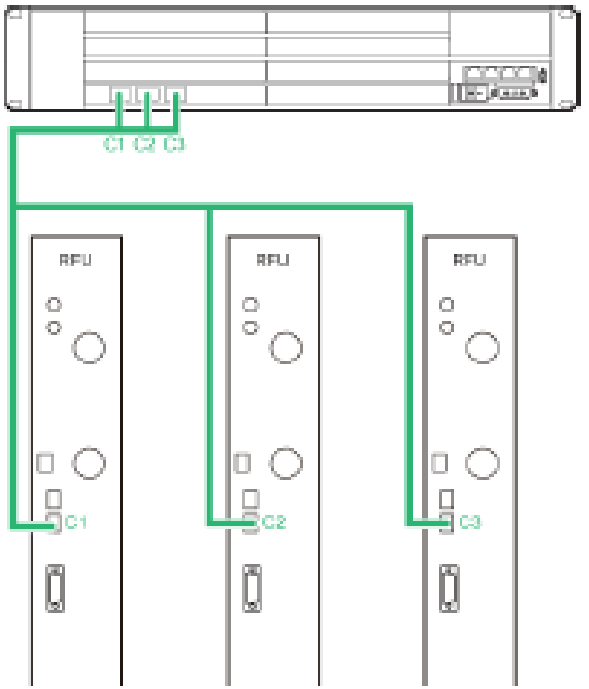
Check of-E1/T1,FE&CPRI Cables in BTS3900A WCDMA-AC



No.	Cable	One End		The Other End	
		Connector	Installation Position	Connector	Installation Position
E1	E1/T1 surge protection transfer cable	DB26 connector	SLPU/UELP/ INSIDE	DB25 connector	UTRP or WMPT/ E1/T1
FE	FE/GE surge protection transfer cable	RJ-45 connector	BBU/WMPT/FE0	RJ-45 connector	SLPU/UFLP/ INSIDE/FE0



No.	Cable	One End		The Other End	
		Connector	Installation Position	Connector	Installation Position
C1 to C3	CPRI cable	SFP200 male connector	BBU/WBBP/ CPRI0 to CPRI2	SFP200 male connector	WRFU/CPRI0

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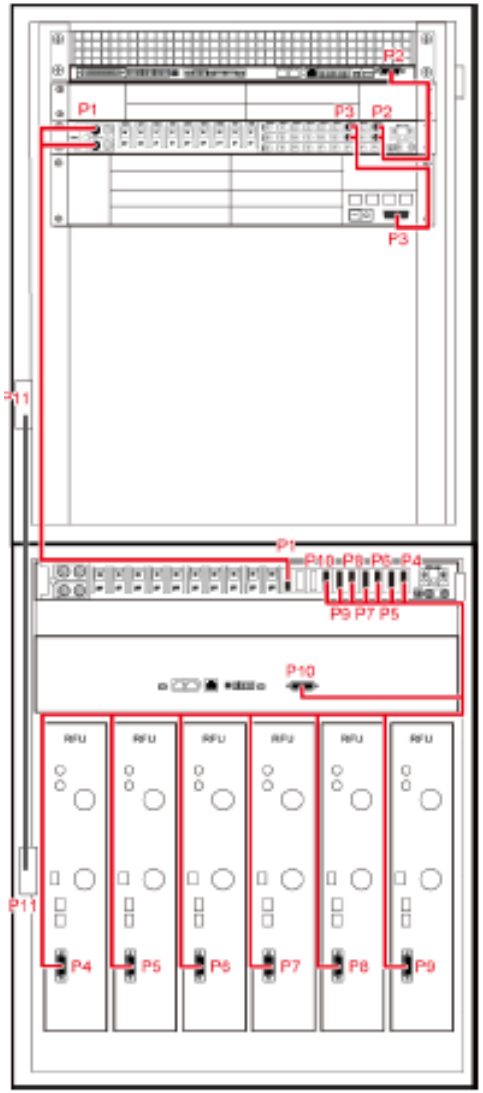
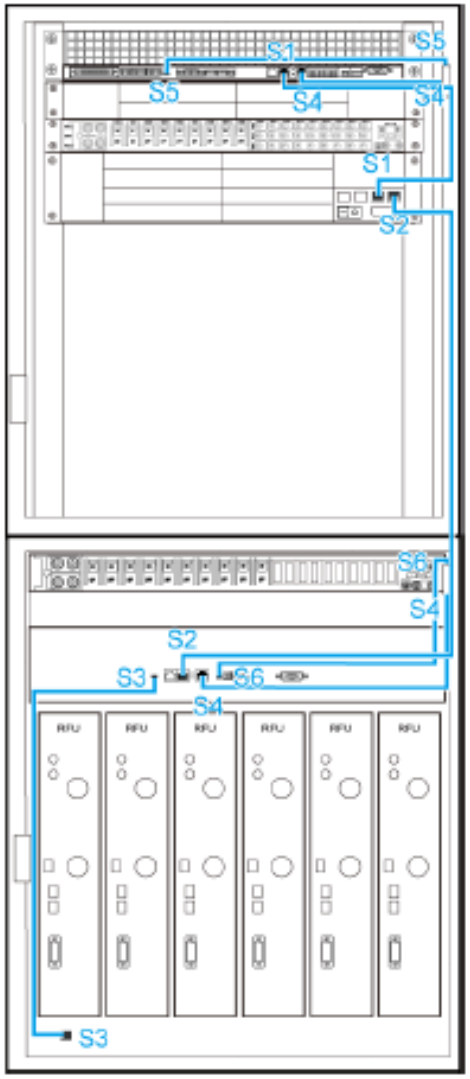
Check of Power & Signal Cables in BTS3900A WCDMA-(-48VDC)



No.	Cable	One End		The Other End	
		Connector	Installation Position	Connector	Installation Position
P1	Input power cable for the RFC	Parallel terminal	DCDU-01/ SPARE2	OT terminal	DCDU-03/ INPUT/RTN (+) and NEG (-)
P2	Power cable for the fan box in the TMC11H	OT terminal	DCDU-03/ LOAD8	3V3 power connector	Fan box in the TMC11H/ PWR
P3	Power cable for the BBU	OT terminal	DCDU-03/ LOAD6/RTN (+) and NEG (-)	3V3 power connector	BBU/UPEU/ PWR
P4 to P9	Power cable for the RFU	Parallel terminal	DCDU-01/ RFU0 to RFU5	3V3 power connector	RFU0 to RFU5/PWR
P10	Power cable for the fan box in the RFC	Parallel terminal	DCDU-01/ FAN	3V3 power connector	Fan box in the RFC/PWR
P11	Equipotential cable between the TMC11H and the RFC	OT terminal	TMC11H/ Ground bar	OT terminal	RFC/Ground bar



No.	Cable	One End		The Other End	
		Connector	Installation Position	Connector	Installation Position
S1	Monitoring signal cable between the BBU and the CMUA in the APM30H	RJ-45 connector	CMUA/ COM_IN	RJ-45 connector	BBU/UPEU/ MON1
S2	Monitoring signal cable between the BBU and the CMUA in the RFC	RJ-45 connector	CMUA/ COM_IN	RJ-45 connector	BBU/UPEU/ MON0
S3	Temperature monitoring signal cable for the RFC	4-pin connector	Fan box in the RFC/CMUA/ TEM	Temperature sensor	Air inlet at the bottom of the RFC
S4	Signal cable for the ELU	RJ-45 connector	ELU	RJ-45 connector	Fan box in the APM30H or in the RFC/ CMUA/ELU
S5	Monitoring signal cable for the door status sensor in the APM30H	2-pin connector	Fan box in the APM30H/ HPMI/GATE	Bare wire	Door status sensor in the APM30H
S6	Monitoring signal cable for the door status sensor in the RFC	Cord end terminal	Fan box in the RFC/CMUA/ GATE	Bare wire	Door status sensor in the RFC

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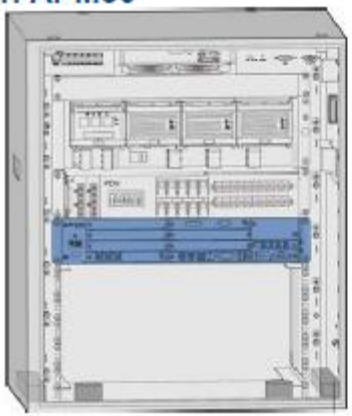
DBS3900 WCDMA INSTALLATION

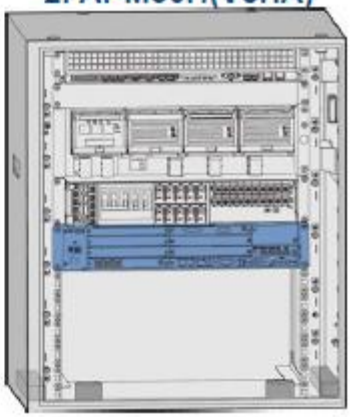
BBU3900 INSTALLATION IN DBS3900 WCDMA

BBU3900- WCDMA Installation Scenario

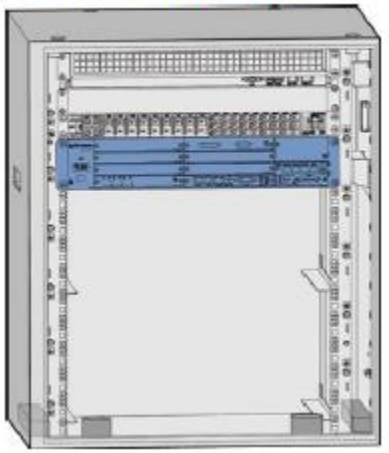
1. APM30



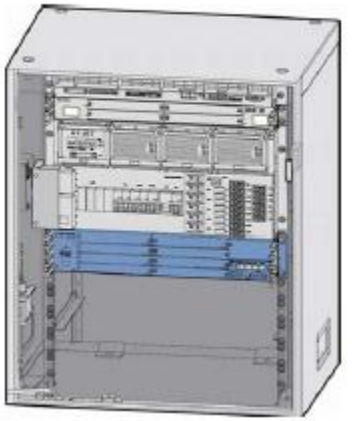
2. APM30H(Ver.A)



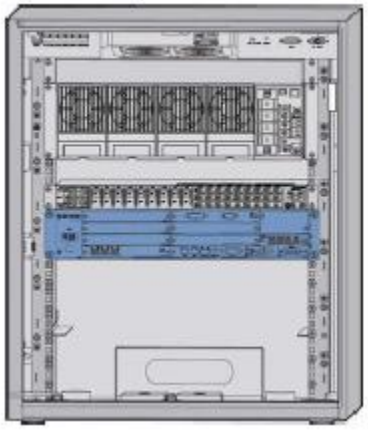
5. TMC11H(Ver.A)



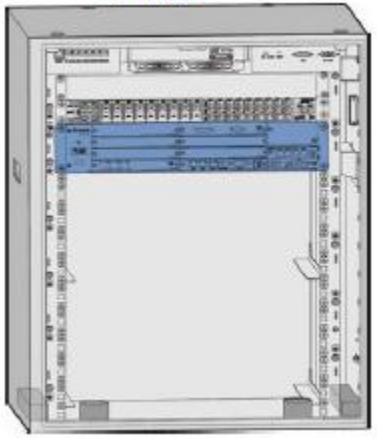
6. APM30H(Ver.B)



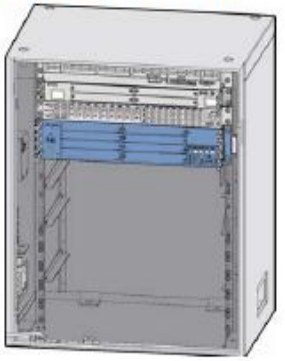
3. APM30(+24V）



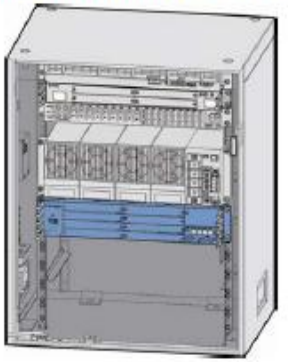
4. TMC



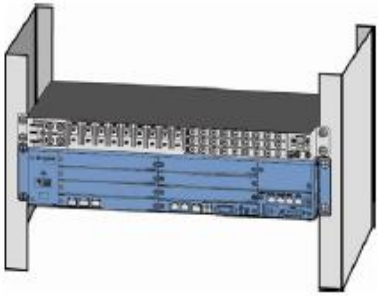
7. TMC11H(Ver.B)



8. APM30H(Ver.B, +24V)



9. In 19-inch cabinet



Note-
Installation of Cabinets,& all related cabling and BBU inside cabinet is same as DBS3900 GSM.

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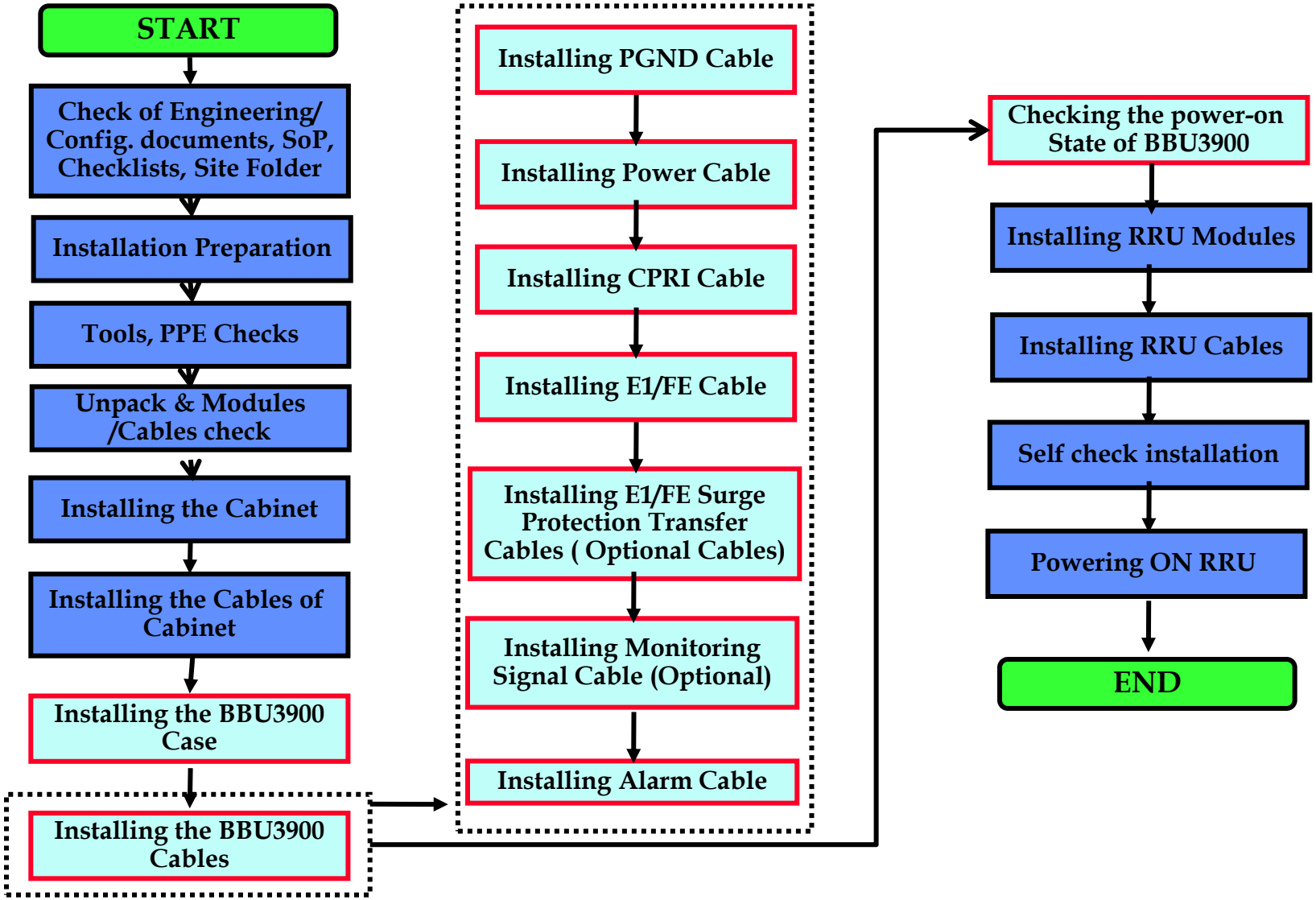
BBU3900- WCDMA Installation Procedure



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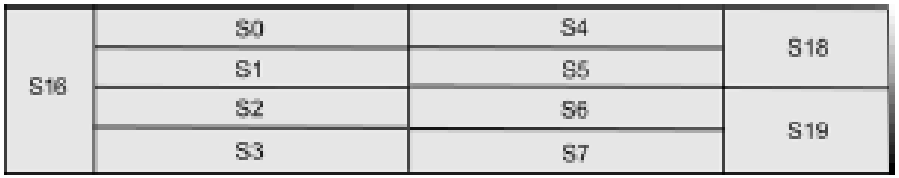
BBU3900- WCDMA Configuration

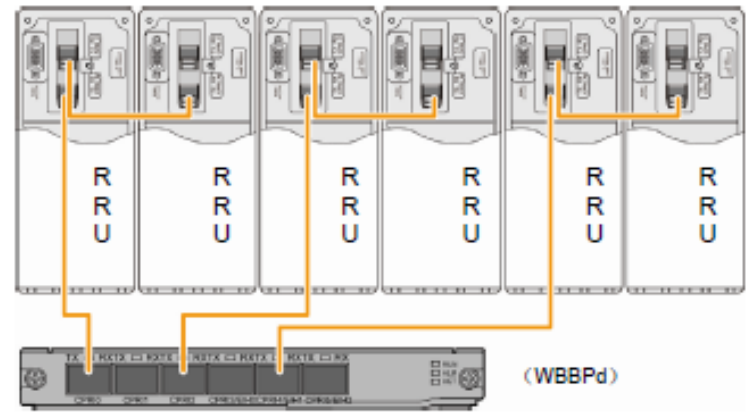


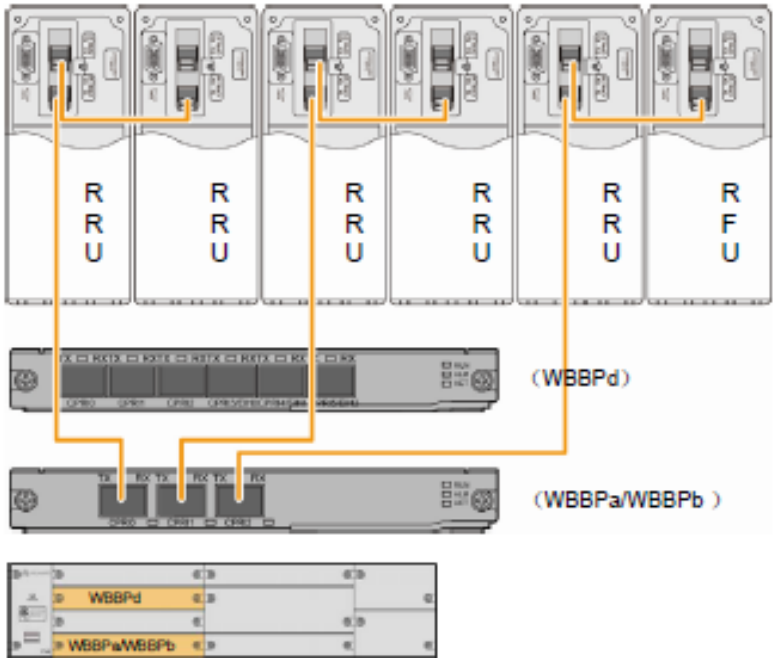
S16	S0	S4	S18
	S1	S5	
	S2	S6	S19
	S3	S7	

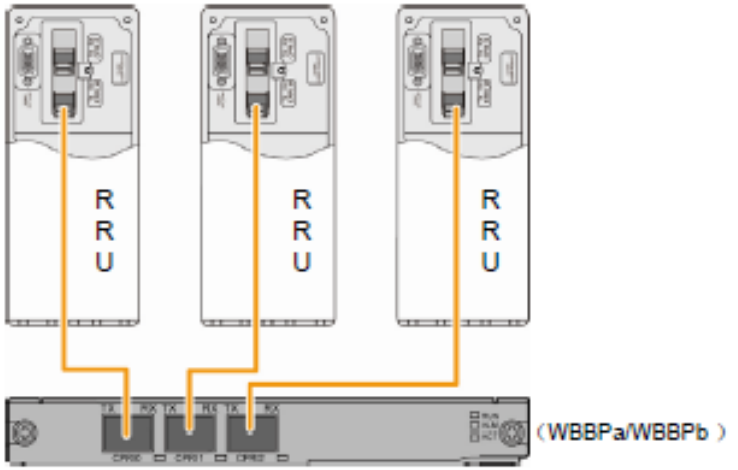
Board	Mandatory /Optional	Full Configuration	Installation Slot	Remarks
WMPT	Mandatory	2	S6 and S7	Preferentially configured in S7.
WBBP	Mandatory	4	S0 to S3	The WBBP is installed in S3 by default. If extension CPRI ports are required, the board is installed in S2. If extension CPRI ports are not required, the priority of the installation position of the board is from s0 to S1, and then to S2.
UBFA	Mandatory	1	S16	Configured in S16.
UPEU	Mandatory	2	S18 or S19	Preferentially configured in S19.
UEIU	Optional	1	S18	Preferentially configured in S18.
UTRP	Optional	4	S0/S1/S4/S5	The priority of the UTRP installation position of the board is from S4 to S5, and then to S0 and S1.
USCU	Optional	1	S1 or S0	-

BBU3900- WCDMA Configuration

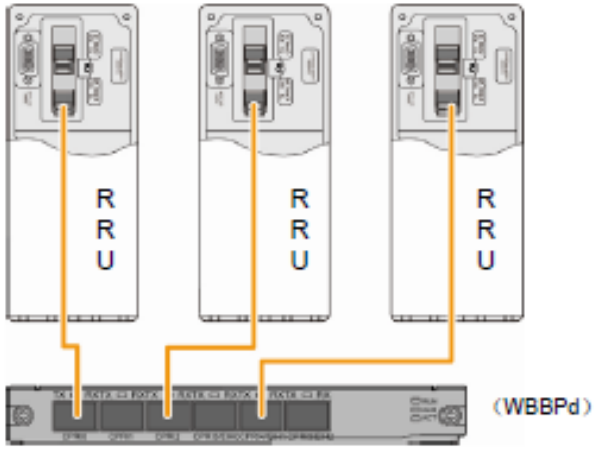
6RRU:







3RRU:



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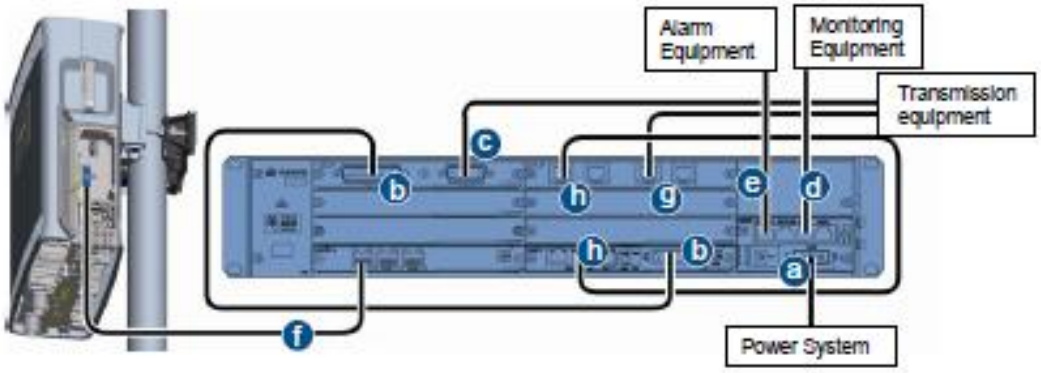
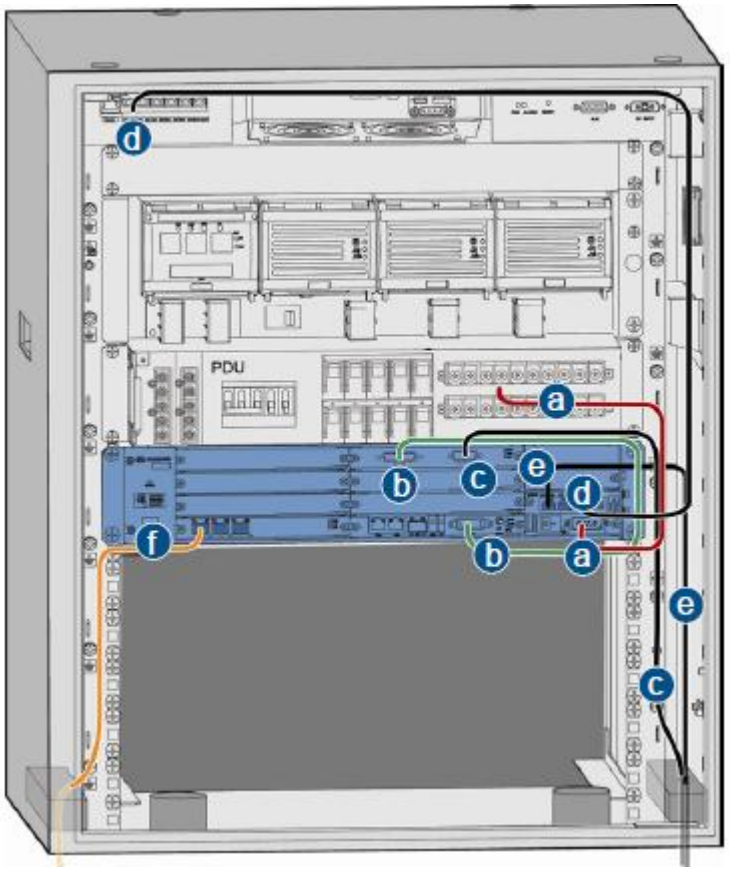
Cable Connection of BBU3900 in APM30H - WCDMA



a BBU Power Cable
b E1 surge protection transfer cable
c E1/T1 Cable
d Monitoring Cable
e Alarm Cable
f CPRI Optical cable
g FE/GE Ethernet cable
h FE surge protection transfer cable



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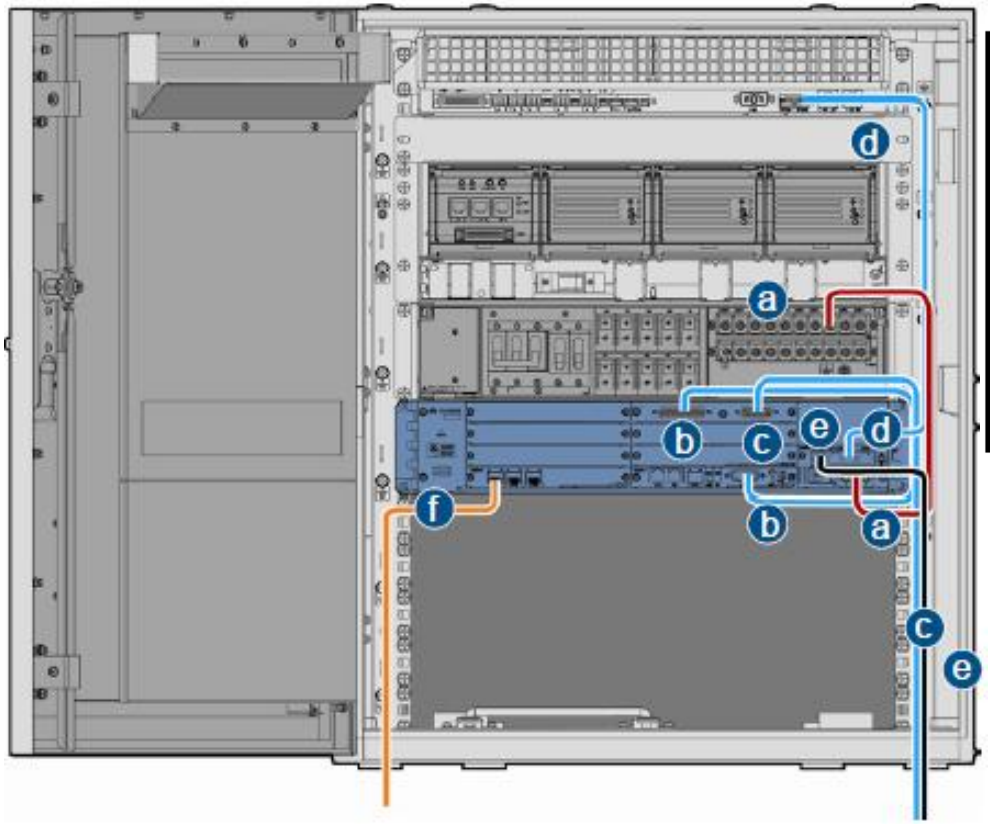
Cable Connection of BBU3900 in APM30H,VerA - WCDMA



Cable	Installation Position	
	One end is connected to...	The other end is connected to...
a BBU power cable	LOAD3 terminal of the PDU	PWR port on the BBU
b E1 transfer cable	E1/T1 port on the WMPT	INSIDE port on the UELP
c E1/T1 cable	OUTSIDE port on the UELP	External transmission device
d Monitoring signal cable	COM IN port on the HEUA	MON1 port on the BBU
e External alarm cable	EXT-ALM0 or EXT-ALM1 on UPEU	Associated alarm device
f CPRI optical cable	CPRI port on the WBBP	CPRI port on the RRU

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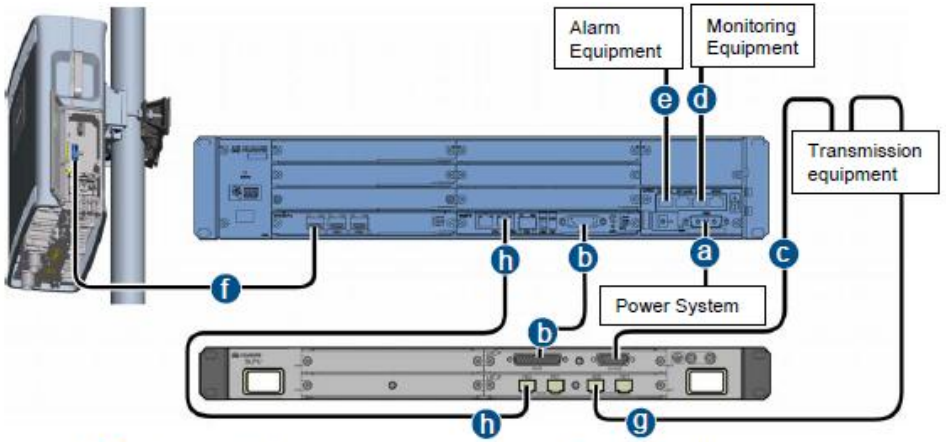
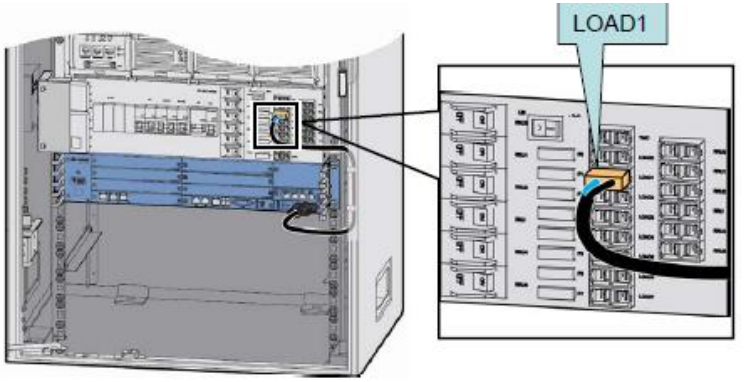
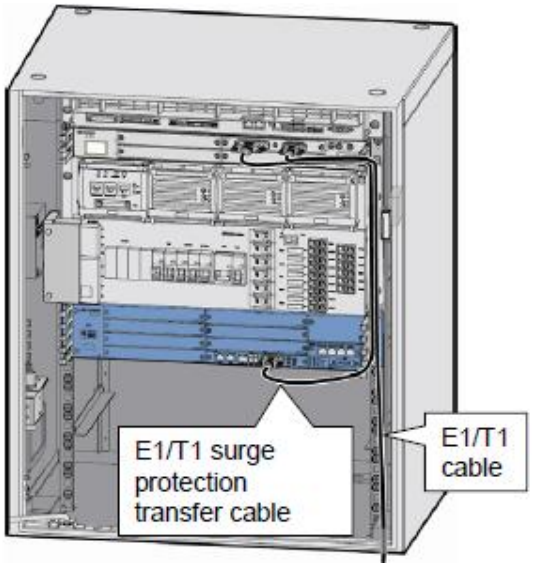
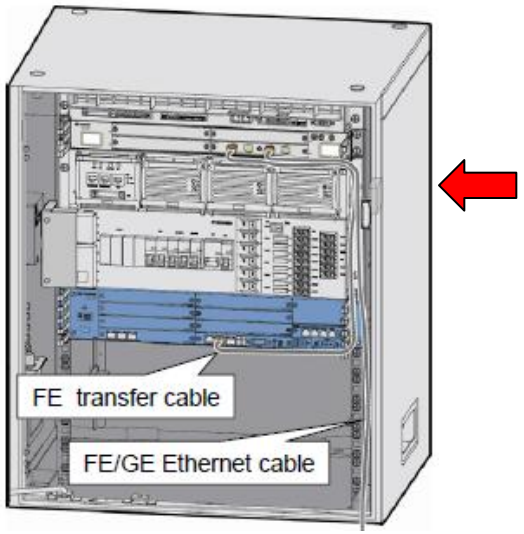
Cable Connection of BBU3900 in APM30H,VerB - WCDMA

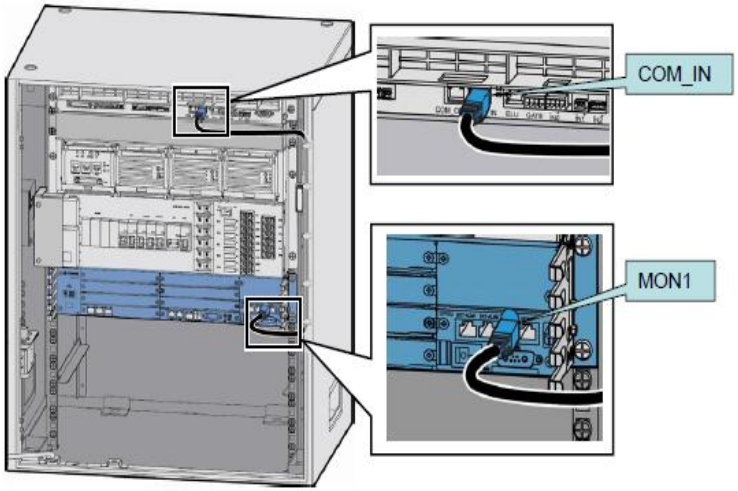


a BBU Power Cable
b E1 surge protection transfer cable
c E1/T1 cable
d Monitoring Cable
e Alarm Cable
f CPRI Optical cable
g FE/GE Ethernet cable
h FE surge protection transfer cable

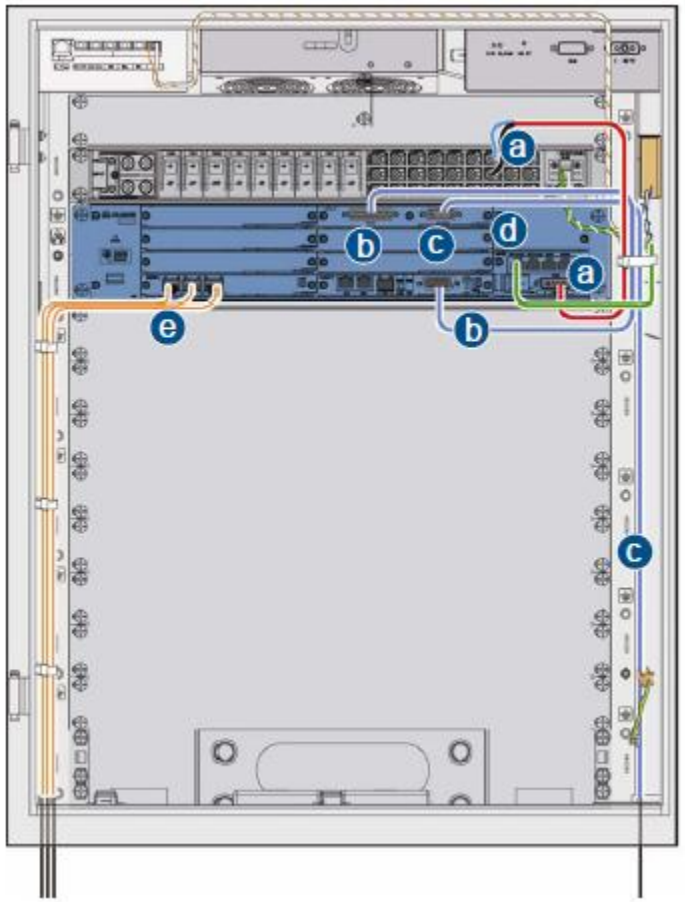








Cable Connection of BBU3900 in TMC11 - WCDMA



Cable	Installation Position	
	From...	To...
a BBU power cable	LOAD6 terminal of the PDU	PWR port on the BBU
b E1 transfer cable	E1/T1 port on the WMPT	INSIDE port on the UELP
c E1/T1 cable	OUTSIDE port on the UELP	External transmission device
d Monitoring signal cable	Wiring terminal of cabinet monitoring	ALM1 port on the BBU
e CPRI optical cable	CPRI port on the WBBP	CPRI port on the RRU

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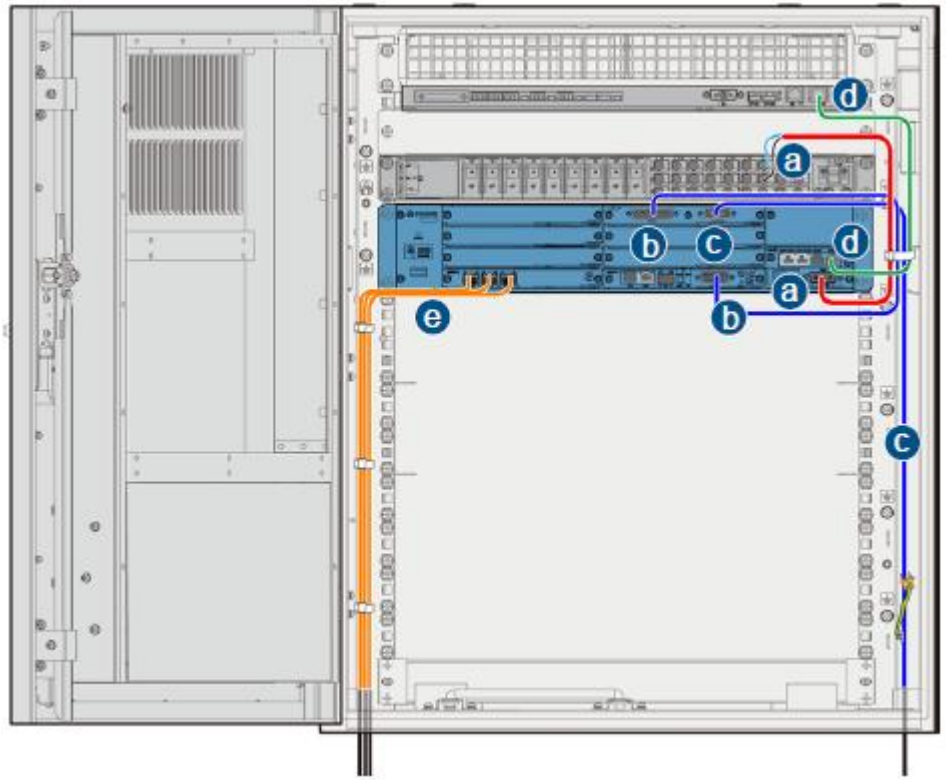
Cable Connection of BBU3900 in TMC11 VerA - WCDMA



Cable	Installation Position	
	From...	To...
a BBU power cable	LOAD6 terminal on the DCDU	PWR port on the BBU
b E1 transfer cable	E1/T1 port on the WMPT	INSIDE port on the UELP
c E1/T1 cable	OUTSIDE port on the UELP	External transmission device
d Monitoring signal cable	Wiring terminal of cabinet monitoring	MON1 port on the BBU
e CPRI optical cable	CPRI port on the WBBP	CPRI port on the RRU

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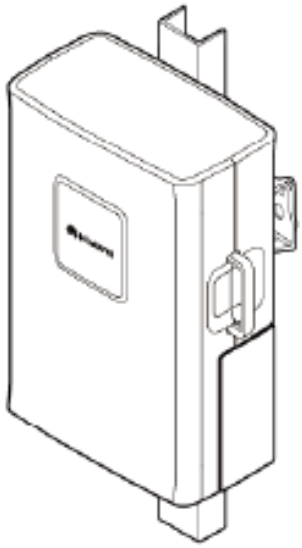
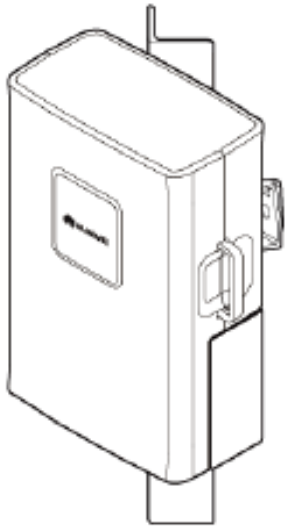
RRU3804/3801C INSTALLATION IN DBS3900 WCDMA

RRU- WCDMA Installation Scenario

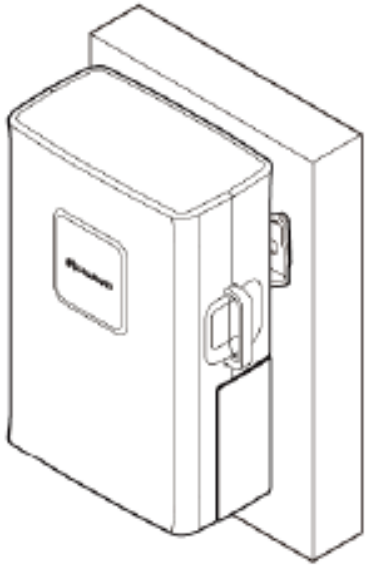
On a metal pole (in ordinary Mode)



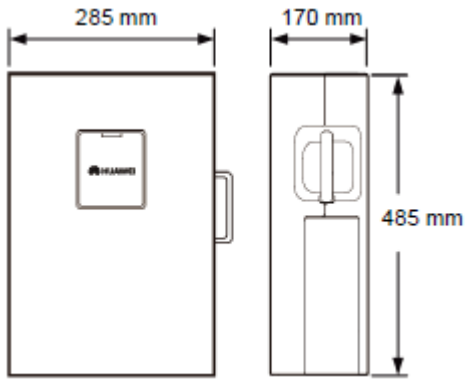
On a U-steel

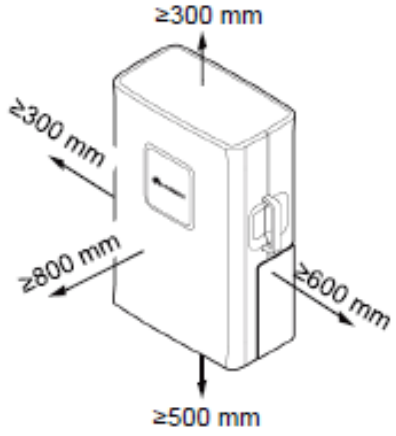


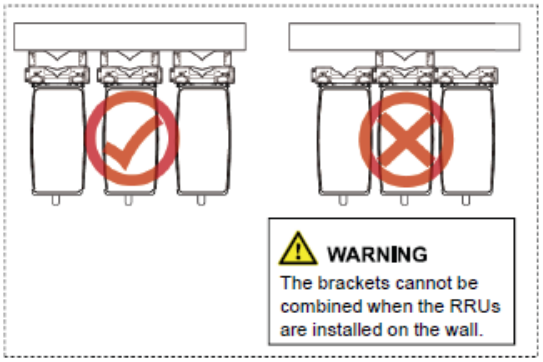
On an angle steel

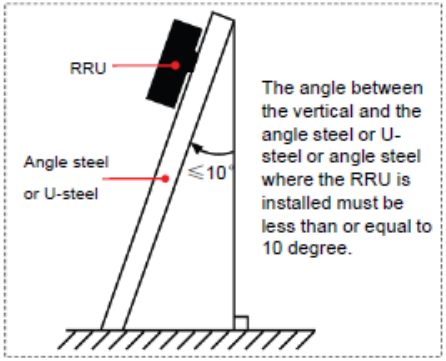


On a wall









Note-

Installation of RRU's ,its clearances ,& all related cabling are same as RRU incase of DBS3900 GSM.

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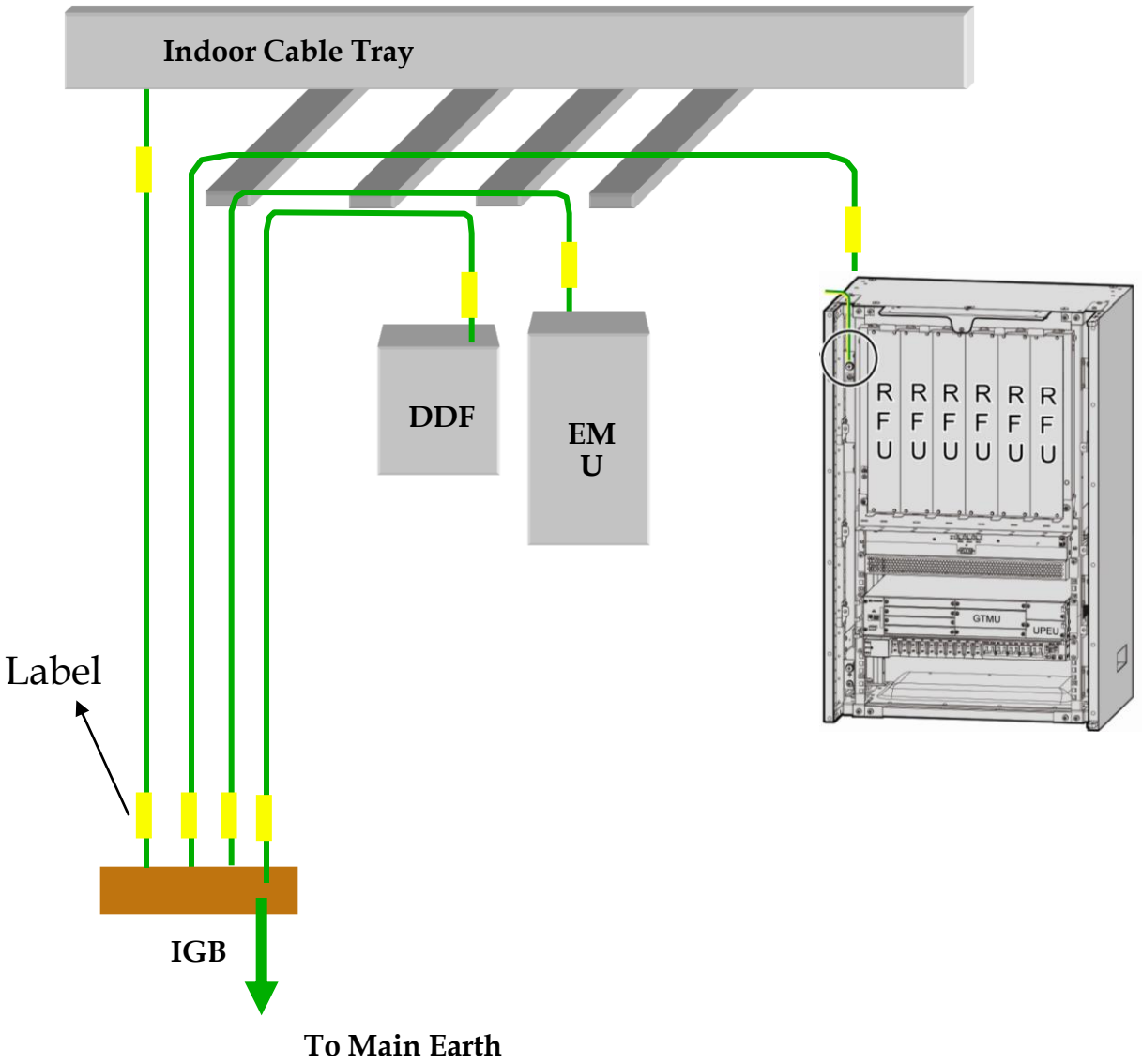
CABLING PRINCIPLE/GUIDELINES FOR BTS SITES

Grounding of Equipments inside Shelter/Room-BTS3900



- BTS grounding cable size is 16mm^2.
- DDF grounding cable size is 6mm^2.
- EMU grounding Cable Size is 6mm2
- Right cable lugs have to be suitable for grounding cable.
- All cables have to be labeled on both end of the cable (source and destinations).
- Proper tools have to be used during grounding cable installation & crimping.
- All cables have to be fixed properly.
- SS nuts –Bolts & washers shall be used for grounding terminations.

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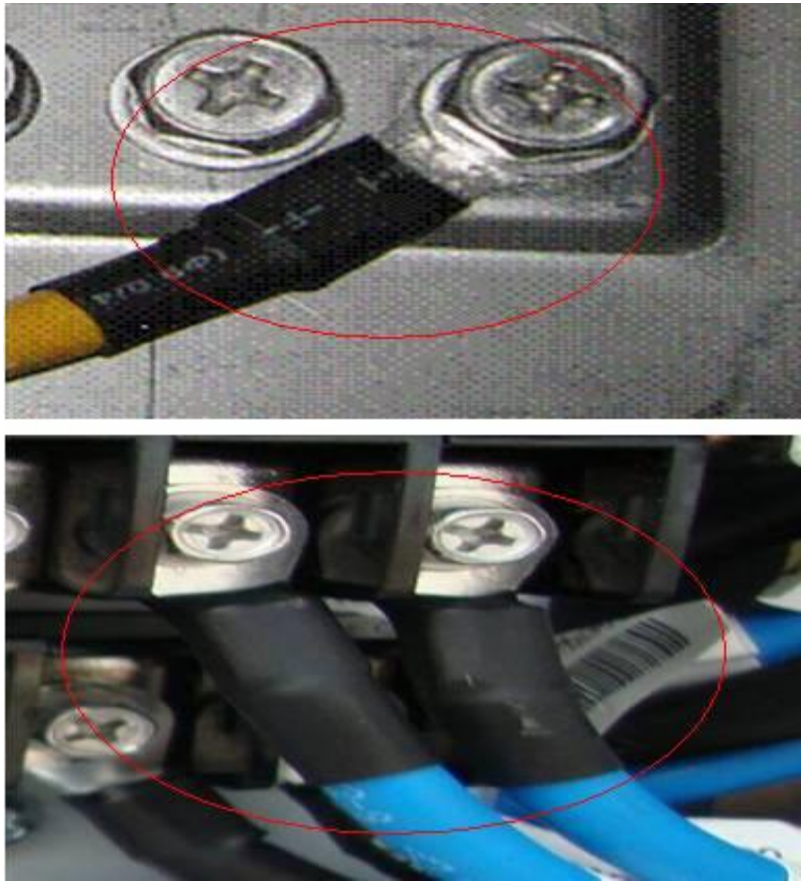
Unaccepted Crimping of Cables

CRIMPING OF CABLES HAS NOT DONE AS PER RECOMMENDATIONS/PROPER TOOLS NOT USED/ LUGS USED NOT AS PER CABLES.

Unaccepted Crimping of Cables

Defective Picture

Correct Picture



Examples of Site Cabling inside Shelter-ID BTS (3900)

Defective Picture

Correct Picture

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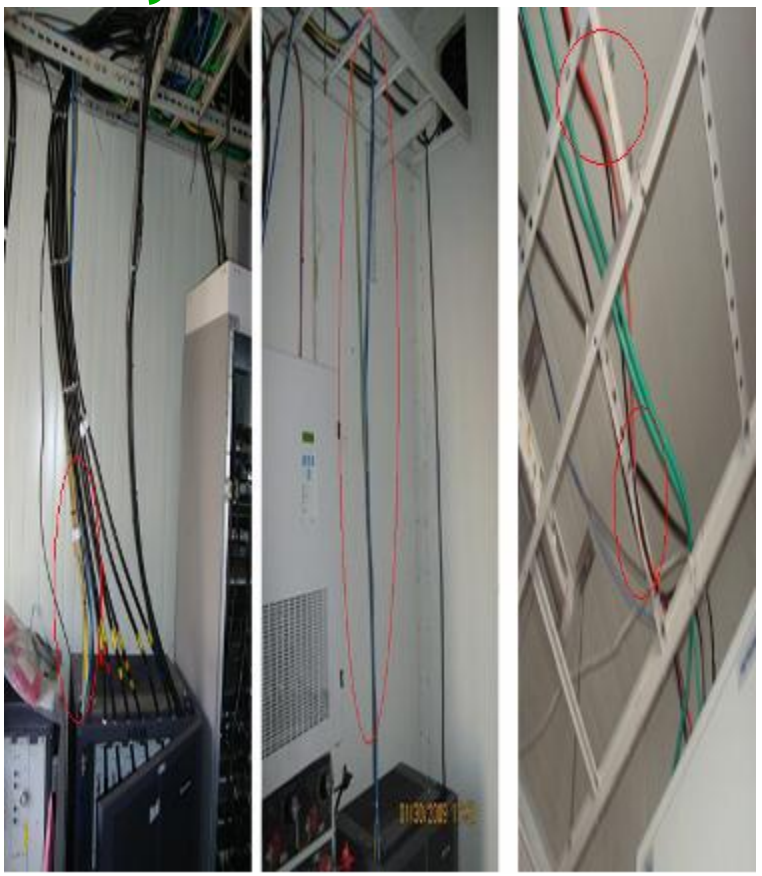
Examples of Site Cabling inside Shelter-ID BTS (3900)

Defective Picture



Correct Picture

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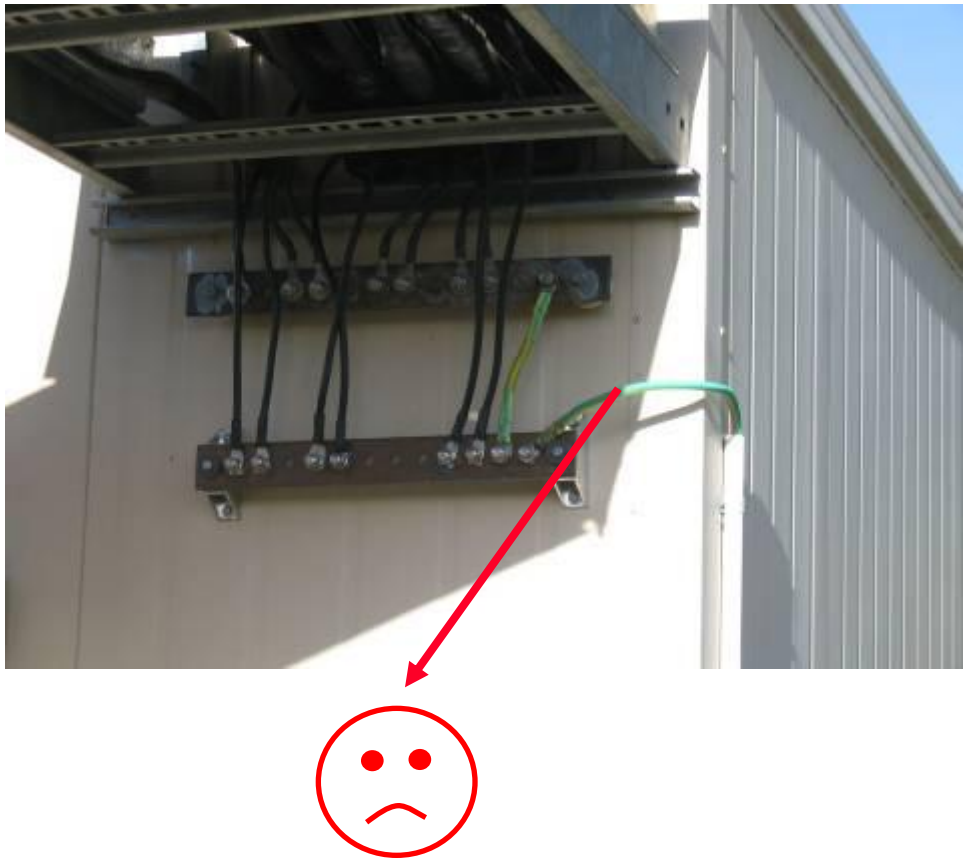
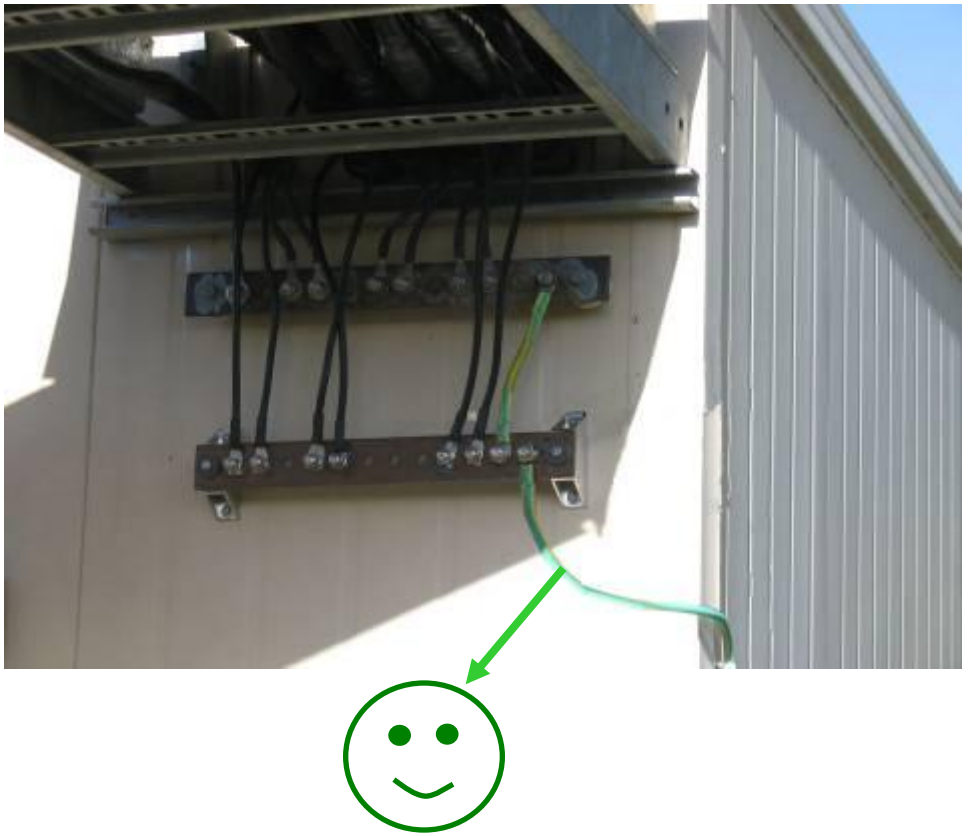
Make Acceptable Routing/Installation of Grounding Cables





Always try to treat the lightning path as a drain.

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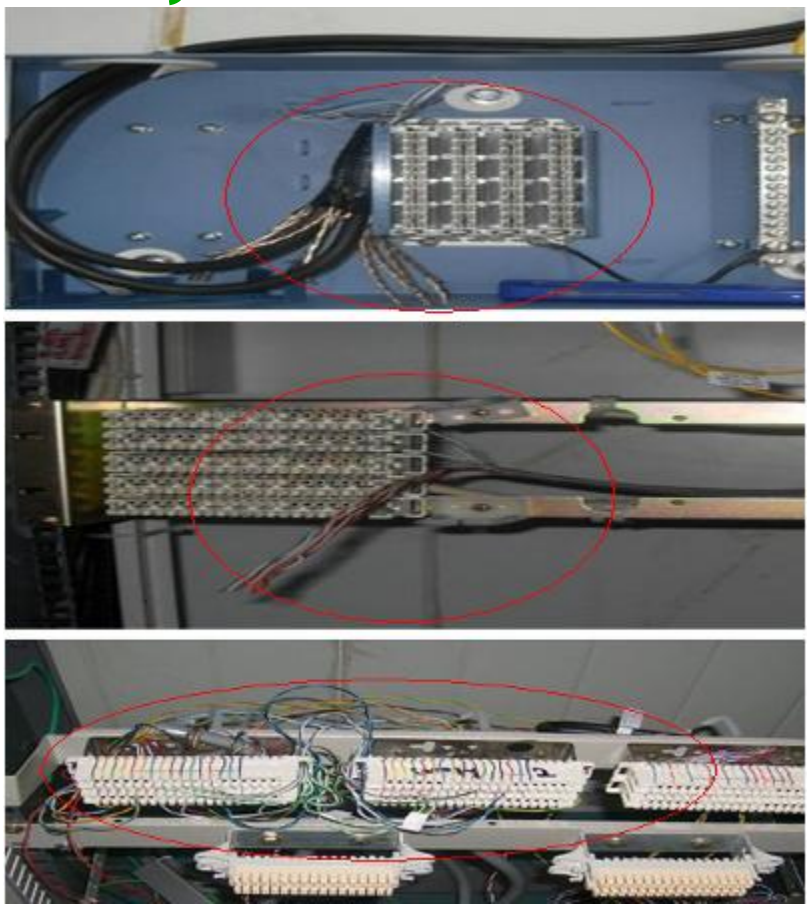
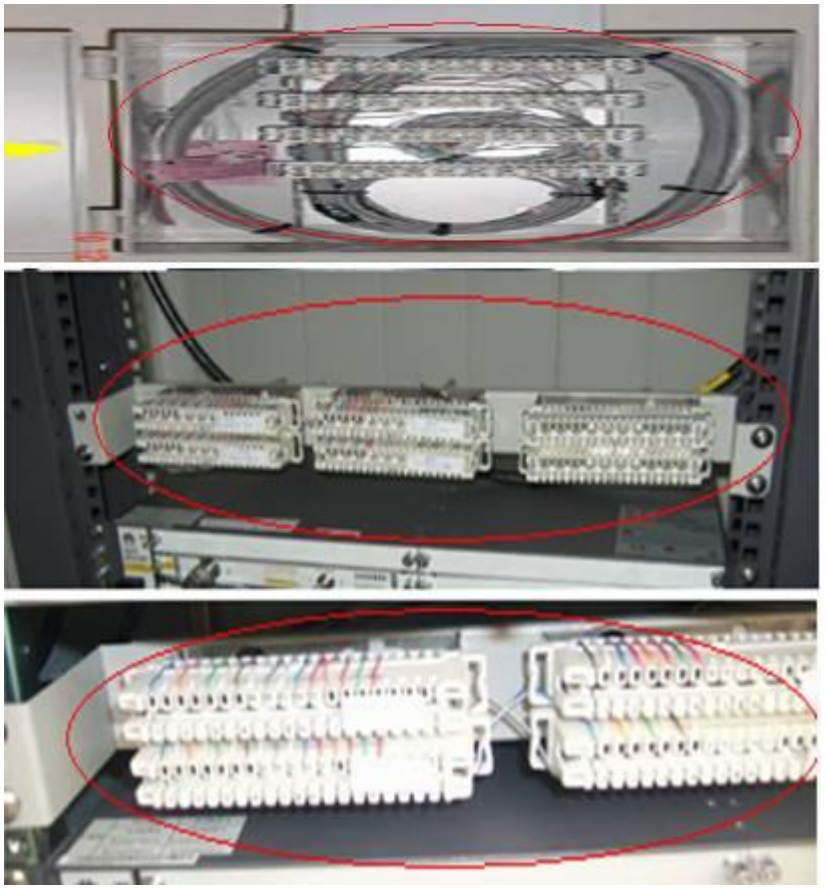
Example of E1/Alarm Cabling in DDF

Defective Picture



Correct Picture



General Guidelines of Cabling

This describes the cabling specifications for the BTS. The power cables and signal cables for the BTS must be routed in compliance with specified requirements to avoid electromagnetic interference to the signals.

Requirements for Cables of General Use

The bending radius of the cables must meet the following requirements:

- The bending radius of the power cable or PGND cable must be 10 times greater than the diameter of the cable.
- The bending radius of the optical cable must be 20 times greater than the diameter of the optical cable.
- The bending radius of the E1/T1 cable must be 10 times greater than the diameter of the cable.
- The bending radius of the signal cable must be 10 times greater than the diameter of the cable.

The requirements for binding the cables are as follows:

- Cables of different types must be routed separately. The cables cannot be coiled.
- The cables should be tightly bound in neat appearance. The jackets of the cables should be free from damage.
- The cable ties should be horizontal and should face the same direction. The extra length of the cable ties should be cut off.
- Labels or nameplates must be attached or bound on the installed cables.

The requirements for routing the cables are as follows:

- Cables of different types must be routed separately.
- Cables of different types cannot be cross-routed.
- Space between cables of different types must be greater than 30 mm or separated by special objects when the cables are routed in parallel.

General Guidelines of Cabling

Requirements for Cables of Specific Use

The requirements for routing the power cables are as follows:

- The -48 V power cable and the DC grounding cable should be bound together.
- The power cables must be routed separately from the other cables.
- Bind the power cables before they are routed.
- Power cables should be routed according to the engineering design.
- If the power cable is not long enough, replace it with a new one that is long enough. Do not add a connector or solder a new one to that cable.

The requirements for routing the PGND cables are as follows:

- The PGND cables and DC grounding cables must be connected to the same grounding body.
- The PGND cable must be buried in the ground or routed indoors. The PGND cable cannot be routed overhead outdoors before it is led to the equipment room.
- The cross-sectional area of the grounding cable between the cabinet and the lightning protection unit must be greater than 50 mm2.
- The external conductor of the coaxial cable and both ends of the shielding layer on the shielding cable must be in proper electrical contact with the outer surface of the metallic casing of the connected equipment.
- The grounding lead-in and the signal cable cannot be bound together or coiled. A certain distance should be reserved to avoid mutual interference.
- Adding switches or fuse boxes on the PGND cable is forbidden.
- Other devices cannot be used as a component of the electrical connection for the grounding cables.
- All the accessible conductive metallic parts in the casing of the equipment must be in reliable connection with the protection grounding terminal.

The requirements for routing the E1 cables are as follows:

- The E1 cables cannot be cross-routed with the power cables, PGND cables, or RF cables.
- If the transmission cables are routed in parallel with the power cables, PGND cables, or RF cables, the space between the cables of different types must be greater than 30 mm.
- The E1 cables should be tightly bound with cable ties and be routed in neat appearance.
- A slack of E1 cables should be reserved at the turnings.

General Guidelines of Cabling

The requirements for routing the optical cables are as follows:

- The optical cable should not be stretched violently or be stepped on. Heavy objects should not be placed on the cable. In addition, the cable should be kept away from sharp objects to avoid damage.
- The PVC corrugated tubes must be applied to the optical cables for protection purpose before the cables are routed.
- Extra optical cables should be coiled on the special device such as the fiber coiler.
- You should use moderate force to coil the optical cable. Do not bend the cable forcibly.

The requirements for routing of IF cables are as follows:

- Signal cables should be routed separately from power cables, fiber jumpers, and jumpers.
- The specifications and cross-sectional area of the cable, and the route and position for the cabling should be designed beforehand. All the cables should be arranged neatly.
- Cable turns should be smooth. The bending radius of cable turns should be larger than 60mm, and the bending radius of fiber turns should be larger than 40 mm.
- There should be no damage to the insulating layer of the conducting wire.
- They should be bundled closely with appropriate tightness. The spacing between cable ties should be even.
- IDU cables should be routed along the left and the right to facilitate operations, and should not cover the board indicators.
- In other words, the cables of the boards in the left slots should be routed to the left of the cabinet and those in the right slots should be routed to the right of the cabinet.

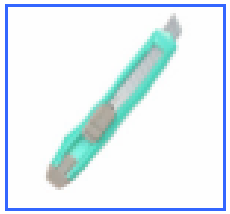
GSM ANTENNA & FEEDER SYSTEM INSTALLATION

GSM ANTENNA INSTALLATION

Tools Required For Antenna Installation

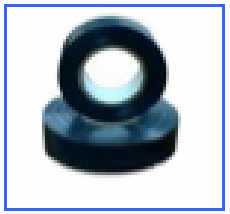

Flat-head screwdriver (M4 / M6)

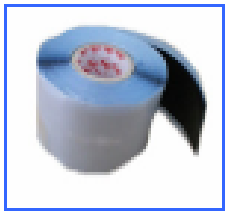

Phillips screwdriver (M4 / M6)

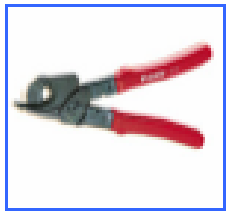

Snap-off knife

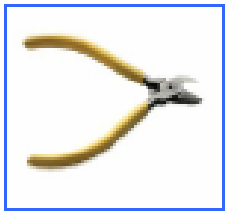

Open-end wrench (13 mm – 32 mm)


Adjustable wrench


Insulation tape


Waterproof tape


Cable cutter


Diagonal pliers


Pincer pliers


Hacksaw


File


Ladder


Measuring tape


Brush


Heat blower


Feeder cutter


Color ring tape


Steel tape


Compass


Inclinometer


VSWR tester

GSM Antenna Installation Procedure

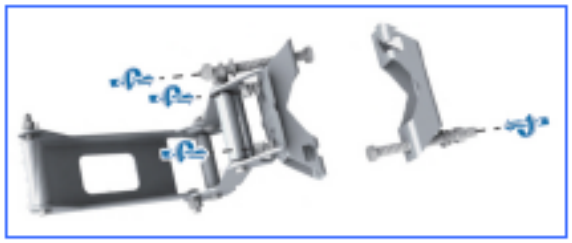
Preliminary

- Unpack the Antenna's, check the condition of delivered items and report any damage or deficiencies immediately to Huawei.
- Check that the Antenna Type Numbers on the boxes delivered to site match those detailed in the Site Folder and are as nominated for the site.
- Note down which antennas are for each sector and the associated function of the antenna eg TX/Rx, RxDiv.
- Remove Antenna Factory Test Certificate from each antenna and also mark each certificate with the Sector and function eg: Tx/Rx.

Assembly & Installation

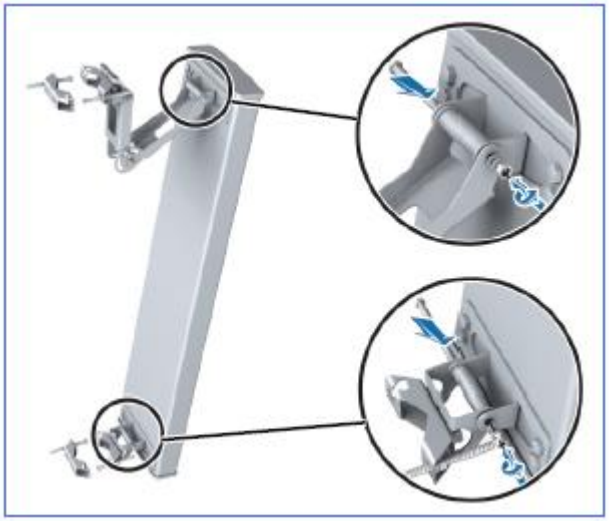
- Assemble antenna mount and down tilt assembly as per Supplier's installation instructions.
- Determine position of TMA in relation to antenna. Determine the jumper cable length from the TMA to antenna allowing for azimuth changes of +/- 30 Deg. A Jumper length of approximately 1.5 Meters suits most installations. However some installations may require longer jumpers, (seek approval from Huawei).
  Note: TMA may be positioned on antenna mounting pole without obstructing any azimuth changes.
- Feeders must have a straight attachment path to the TMA and be secured to prevent movement in windy conditions.
- Install each antenna on the antenna mount, monopole type, tower type or rooftop type in accordance with the Manufacturers Installation Instruction Sheet supplied with each Antenna.

GSM Antenna Assembling



Assemble the upper support

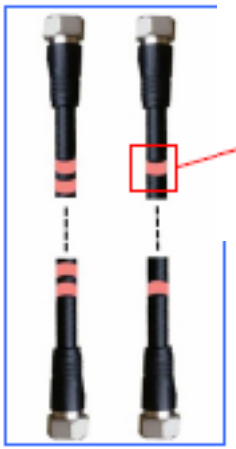
Assemble the lower support



Fix the Support to antenna

Cut the Feeder-After measuring the routing distance of feeders, cut feeders according to the length identifiers on the feeders.

Make Feeder Connectors



Put Color Rings on Feeders
Stick color rings corresponding to the sectors at both ends of the feeder at the position 200 mm away from the connector.

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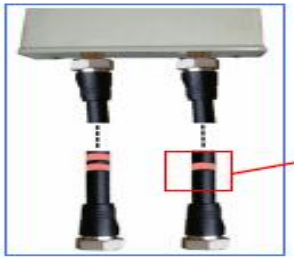
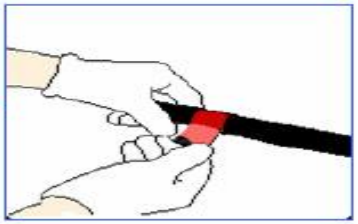
Jumpers Connection with GSM Antenna

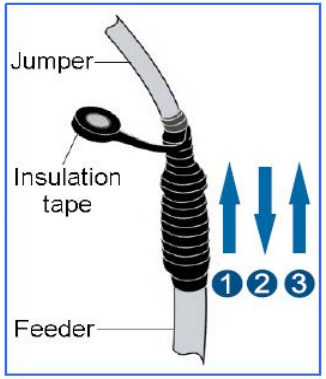
Optional

- When wrapping the tape, ensure that the upper layer covers more than 50% of the lower layer. Wrap each layer around the feeders tightly. Before wrapping the waterproof tape, stretch the tape till the width of the tape becomes 1/2 of the original.
- Wrap the metal connector using waterproof tape with extended lengths about 20 mm, and wrap the waterproof tape using insulation tape with extended lengths about 10 mm.

Stick color rings





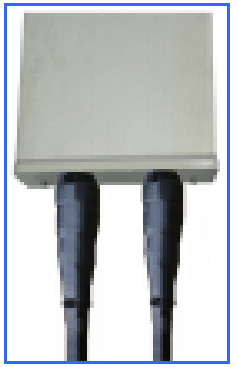


Wrap three layers of insulation tape

Wrap three layers of waterproof tape

Wrap three layers of insulation tape

Fix cable ties



Finished

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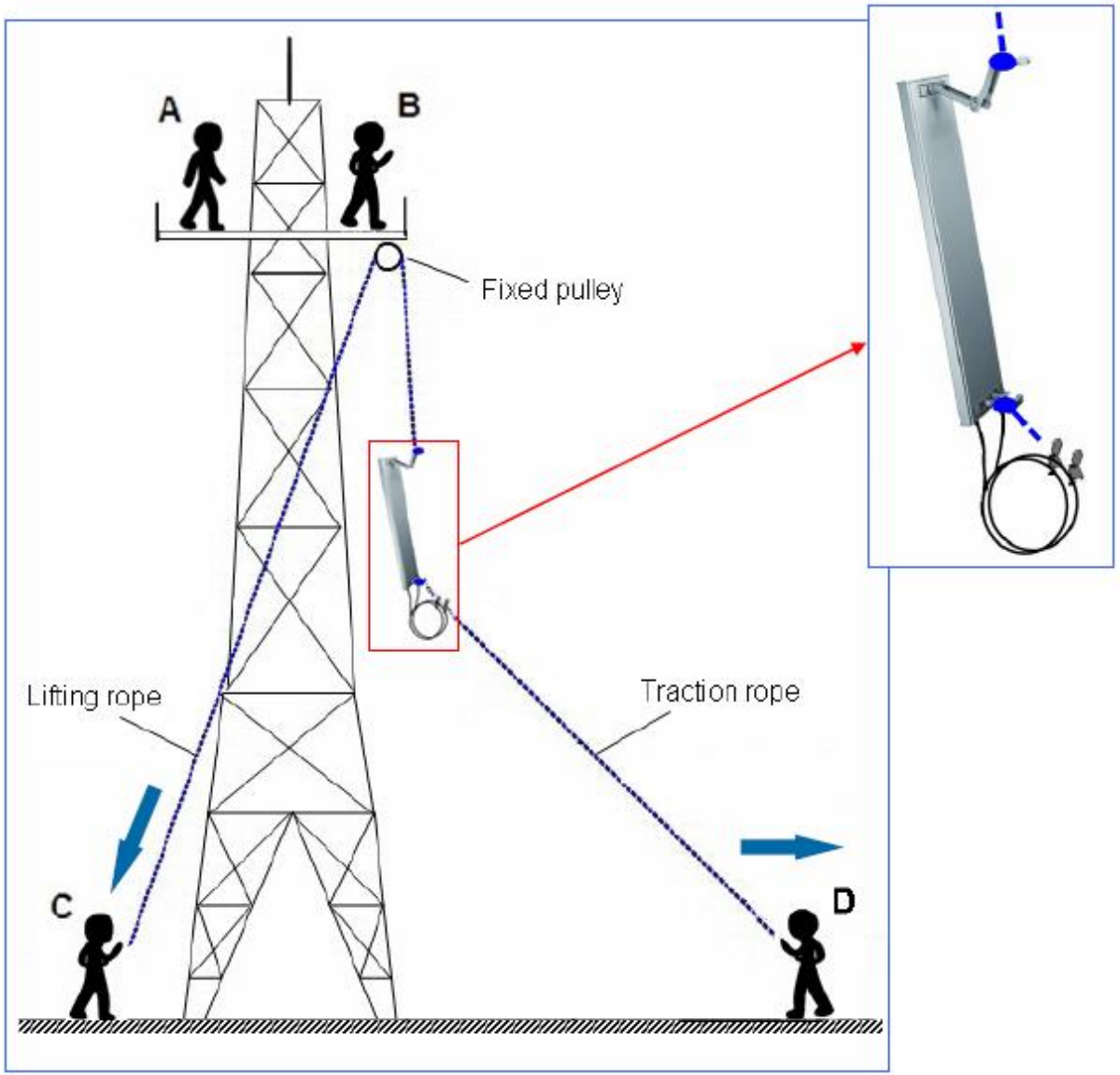
GSM Antenna Lifting



Note-

- Installers A and B climb onto the tower. Installer B fixes the fixed pulley onto the support of the tower platform and puts the lifting rope through the fixed pulley.
- Installer D uses plastic bags or tape to wrap the jumper connectors and then coils the jumpers. Fasten the lifting rope to the upper support of the antenna and the traction rope to the lower support.
- Installer C pulls down the lifting rope, and installer D pulls the traction rope outwards to prevent the antenna from hitting the tower.
- Installers A and B hold the antenna and unfasten the ropes.
- After three antennas are lifted onto the platform, do not remove the fixed pulley, because the feeder needs to be lifted later.

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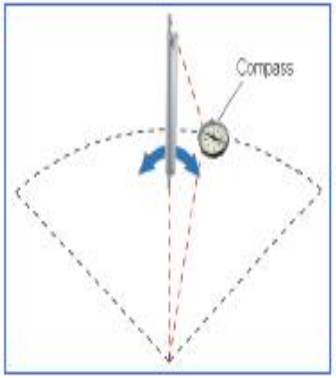
GSM Antenna Installation Procedure on Pole

Note-

- Do not over tighten the screws of the upper and lower supports. But the screws can not be too loose, or the antenna may slide.
- Bind the jumpers at several positions on the pole and tower platform.
- The operation must be performed by two personnel. The personnel under the tower use the compass at the position where is 10 m to 20 m away from the tower. The personnel on the tower adjust the antenna. After the azimuth reaches the requirement, tighten screws of the upper and lower supports.



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GSM Antenna Alignment Procedure

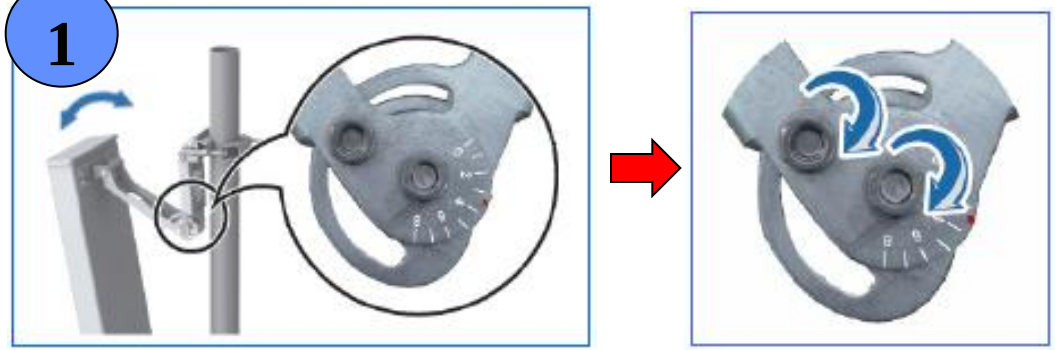
Down Tilt

1.Installation and calibration information for RET system is included with the delivery.
2.The degree for the electrical tilt should be read off the RF plan.4E/2M means 4degree electrical down tilt and 2 degree mechanical down tilt.
3.Mechanical down tilt is set by measuring the rear of the antenna with as inclinometer. This inclinometer should be accurate with +/- 0.5 degree.
The type & model of the inclinator should be noted in site folder.
4.Note:- The down tilt bracket of an antenna cannot be used instead of an inclinometer because it cannot be guaranteed that the mounting hardware is straight.

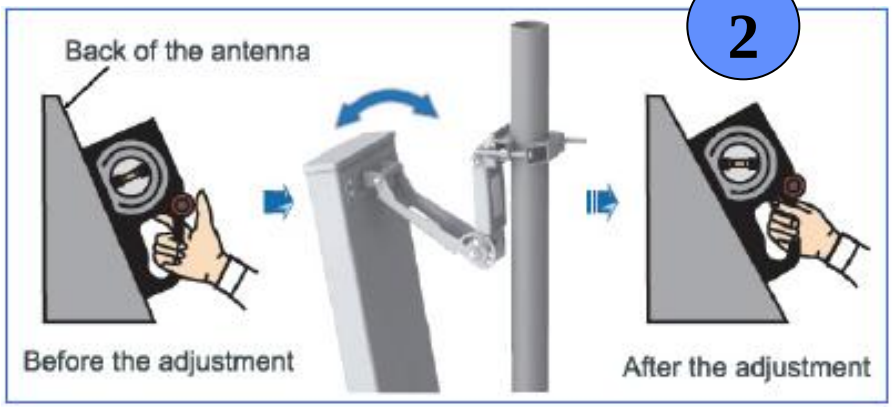
When install the antenna to the pole, using antenna mounting brackets & install the down tilt kit to TOP bracket of antenna , if 0 deg. Or +ve (i.e 6 Deg.) mechanical tilt mentioned in the site specific RF data.
When negative ,i.e -6 deg.(negative) mechanical tilt is needed install the down tilt kit to LOWER bracket of antenna .
Install mounting brackets & tilt kits firmly ,so that there is no possibility of movement & make sure installed antenna types in each sector corresponds to site specific RF data.
Normal mechanical tilting range is 0 deg to 10 deg. & adjustable with steps of 0.5 deg.
Make sure the installed tilt in each sector corresponds to site specific RF data within the accuracy 0f +/- 0.5 deg. measured by digital spirit level.

GSM Antenna Tilt Methods

1



2



3

Note-

- Push the antenna forward and backward till the scale is adjusted properly. After the down tilt angle reaches the requirement, tighten screws of the scale.
- Before adjusting the down tilt angle, adjust the angle of the inclinometer to the desired angle. Push or pull the antenna till the bead in the inclinometer is located in the middle horizontally. After the down tilt angle reaches the requirement, tighten screws of the scale.
- Turn the adjustment tool until it aligns with the scale on the ruler.

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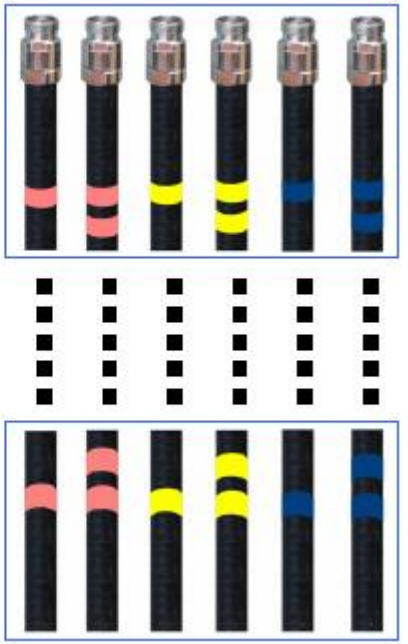
FEEDER LINE INSTALLATION

Feeders Line Preparation

Cut feeders according to the length identifiers on the feeders.

Rotate the feeder cutter till the inner and outer conductors are completely cut.



Note-

- ❑Fix a DIN female connector to one end of the feeder.
- ❑Stick color rings at one end of the feeder.
- ❑Ensure that the first color ring is at the position 200 mm away from the feeder connector.
- ❑Stick color rings at the other end of the feeder.
- ❑Ensure that the first color ring is at the position 200 mm away from the feeder end.

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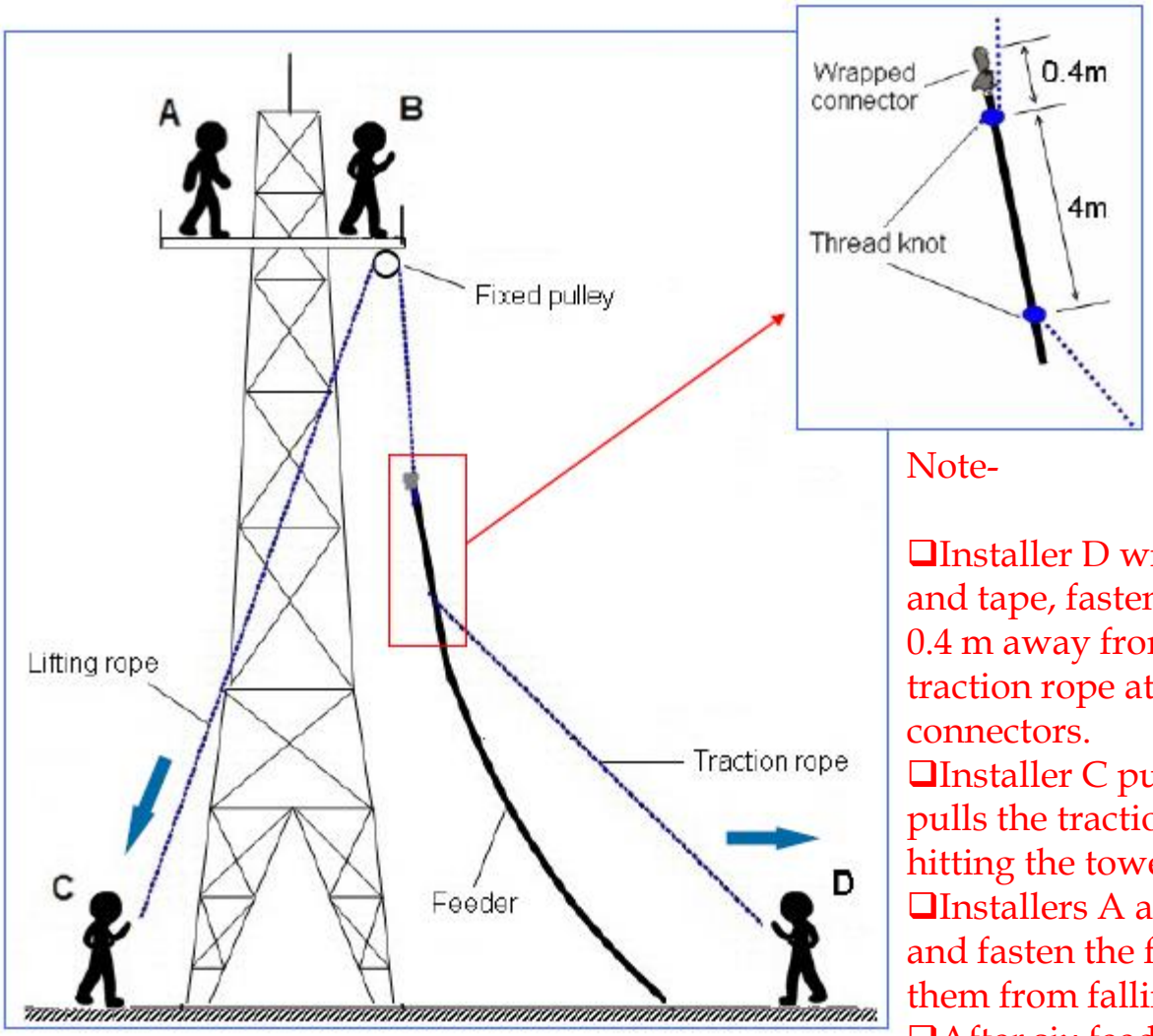
Feeders Lifting Procedure



Note-

- Installer D wraps the feeder connectors with plastic bags and tape, fasten the lifting rope to the feeders at the position 0.4 m away from the feeder connectors and fasten the traction rope at the position 4.4 m away from the feeder connectors.
- Installer C pulls down the lifting rope, and installer D pulls the traction rope outwards to prevent the feeders from hitting the tower.
- Installers A and B hold the feeders, unfasten the ropes, and fasten the feeders onto the tower platform to prevent them from falling down to the ground.
- After six feeders are lifted onto the tower one by one, installer B removes the fixed pulley.

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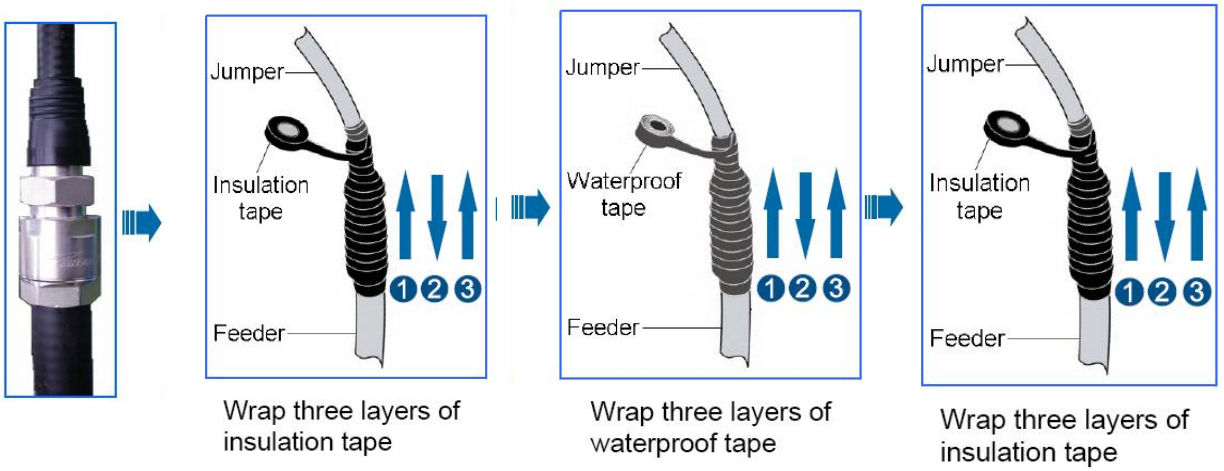
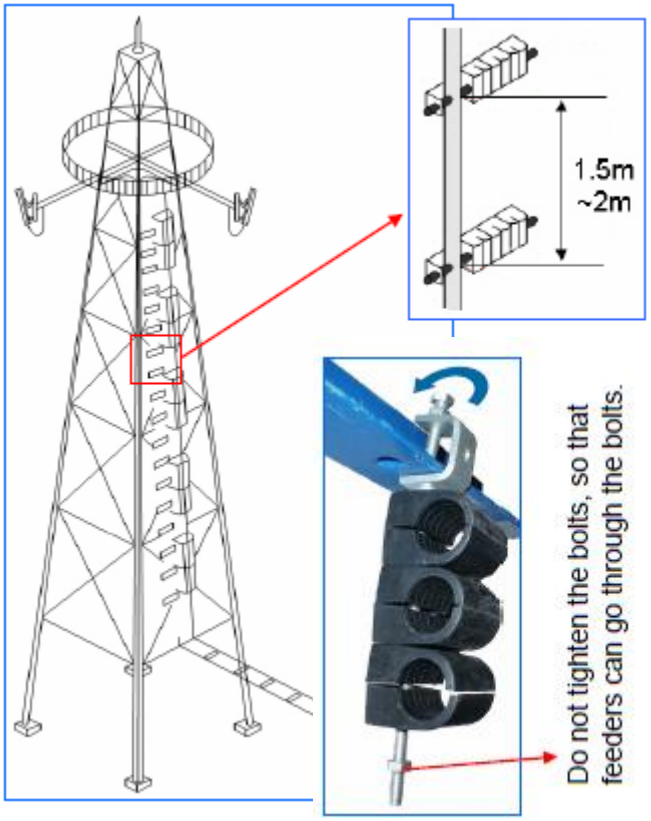
Feeder & Jumper Connection and Support System





Note-

- The installation spacing of the clips for the feeder (7/8 inch) is 1.5 m to 2 m. The installation spacing of the clips for the feeder (larger than 7/8 inch) can be extended.
- If multiple rows of feeder fasteners need to be fixed, arrange the fasteners properly to keep a neat appearance.
- TAKE CARE OF sharp edes !
- Clamps FIXED TOO TIGHT cause rising of the return loss
- Takecare of NOT TO DROP plastic cushions
- Cables shall be terminated by the resistive load (or source) impedance equal to the characteristic impedance, which generally is 50 Ω.

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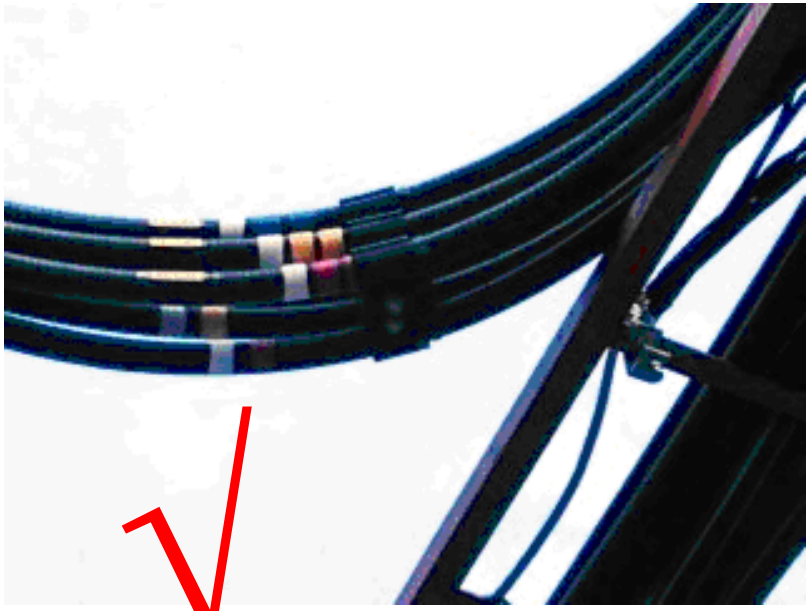
Recommended Feeder support distances

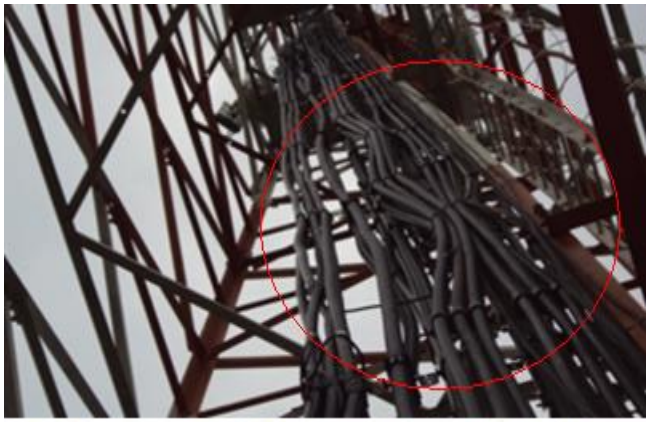
Cable Type	Support Distance Spacing	
	Preferred	Max
1/2″ Feeder	1000mm	2000mm
7/8″ Feeder	1000mm	1500mm
1-5/8″ Feeder	1000mm	1500mm

Recommended Feeder Bending Radius

FEEDER TYPE	MINIMUM SINGLE BENDING RADIUS	MINIMUM REPEATED BENDING RADIUS
RFF 3/8″-50	13 mm	25 mm
RFF 1/2″-50	15 mm	30 mm
RF 1/2″-50	**80 mm**	**160 mm**
RF 7/8″-50	**120 mm**	**250 mm**
RF 1 1/4″-50	200 mm	350 mm
RF 1 5/8″-50	250 mm	500 mm

Example of Correct Feeder Cable Routing/Bending/Support





TAKE CARE OF:

- ❑ BENDING RADIUS
- ❑ MAXIMUM PULLING FORCE
- ❑ CORRECT DRUM HANDLING
- ❑ CORRECT TOOL/CABLE HANDLING
- ❑ ORDINARY CABLE FIXING
- ❑ COMPLETE WATER PROOFING
- ❑ TIGHTENING OF THE RF CONNECTORS.

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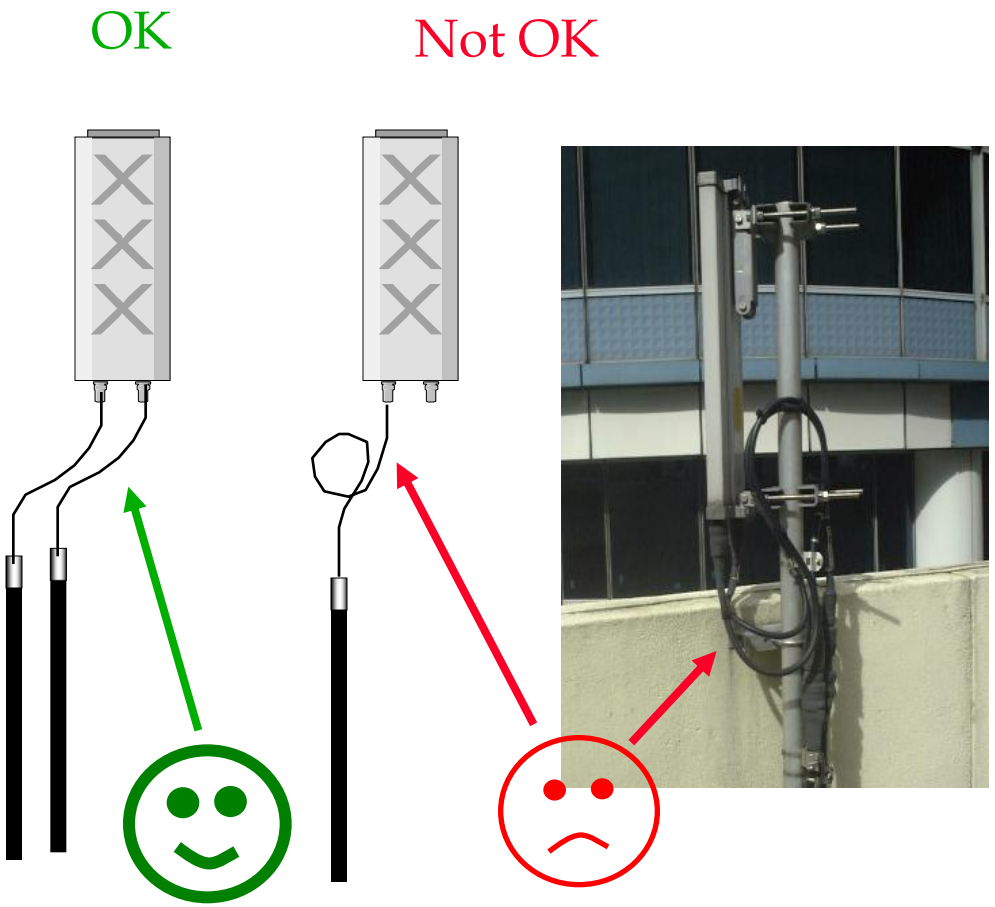
Unacceptable Feeder support on Tower

Defective Picture

Correct Picture

Jumper Cable Installation (Antenna Ends)



- Jumper Cables have to be installaed as straight as possible.
- Avoid additional bendings.
- Follow manufacturers bending instructions.
- Proper tools have to be used during jumper installation.
- All cables have to be fixed properly.
- Prefabricated jumpers have to be used always when possible.
- On existing sites most practical solution should be used.
- Always the jumpers on tower should be tied with the tower portion to avoid swinging on air.

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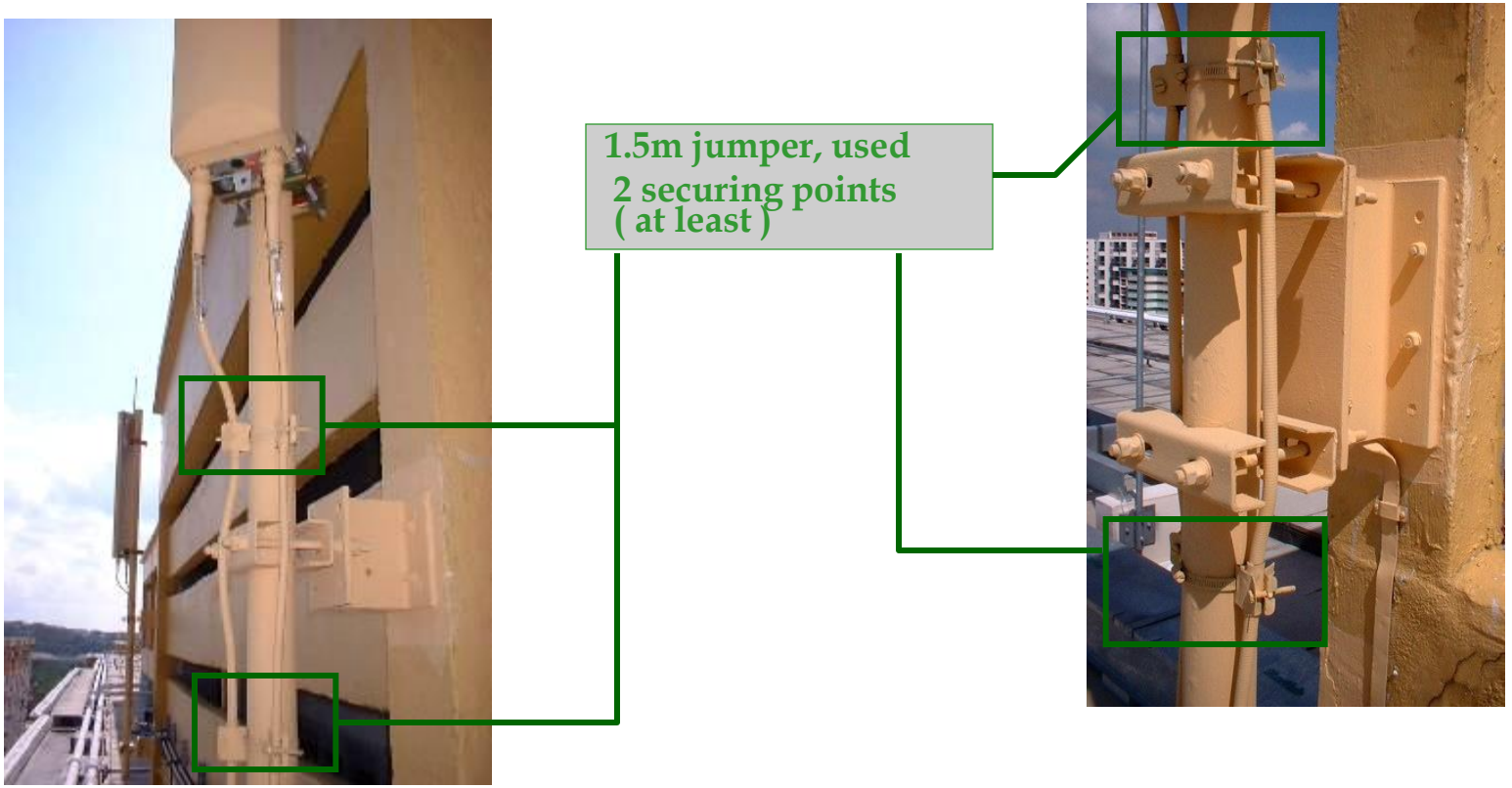
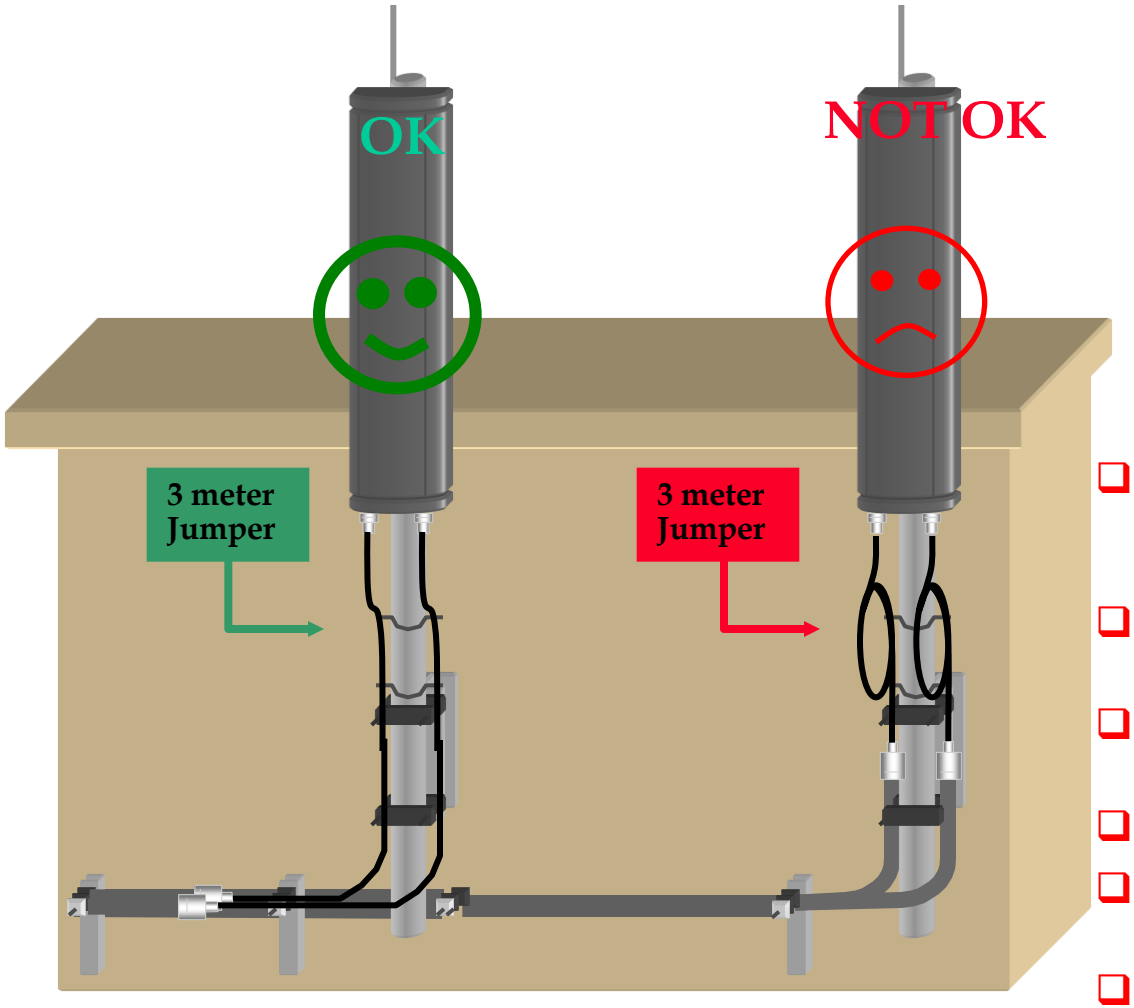
Antenna jumper cable installation-Pole Site

- The distance clamps for jumper cables is about 500mm
- It is vitally important that the internal and external jumper cables have to be supported securely. For the 1.5m jumper, minimum 2 (two) points of support are to be used, and for the 3m jumpers, minimum 4 (four) points.



Antenna jumper cable installation-Pole Site



- Jumper Cables have to be installed as straight as possible , Avoid additional bendings.
- Follow manufacturers bending instructions.
- Proper tools have to be used during jumper installation.
- All cables have to be fixed properly.
- Prefabricated jumpers have to be used always when possible.
- On existing sites most practical solution should be used.

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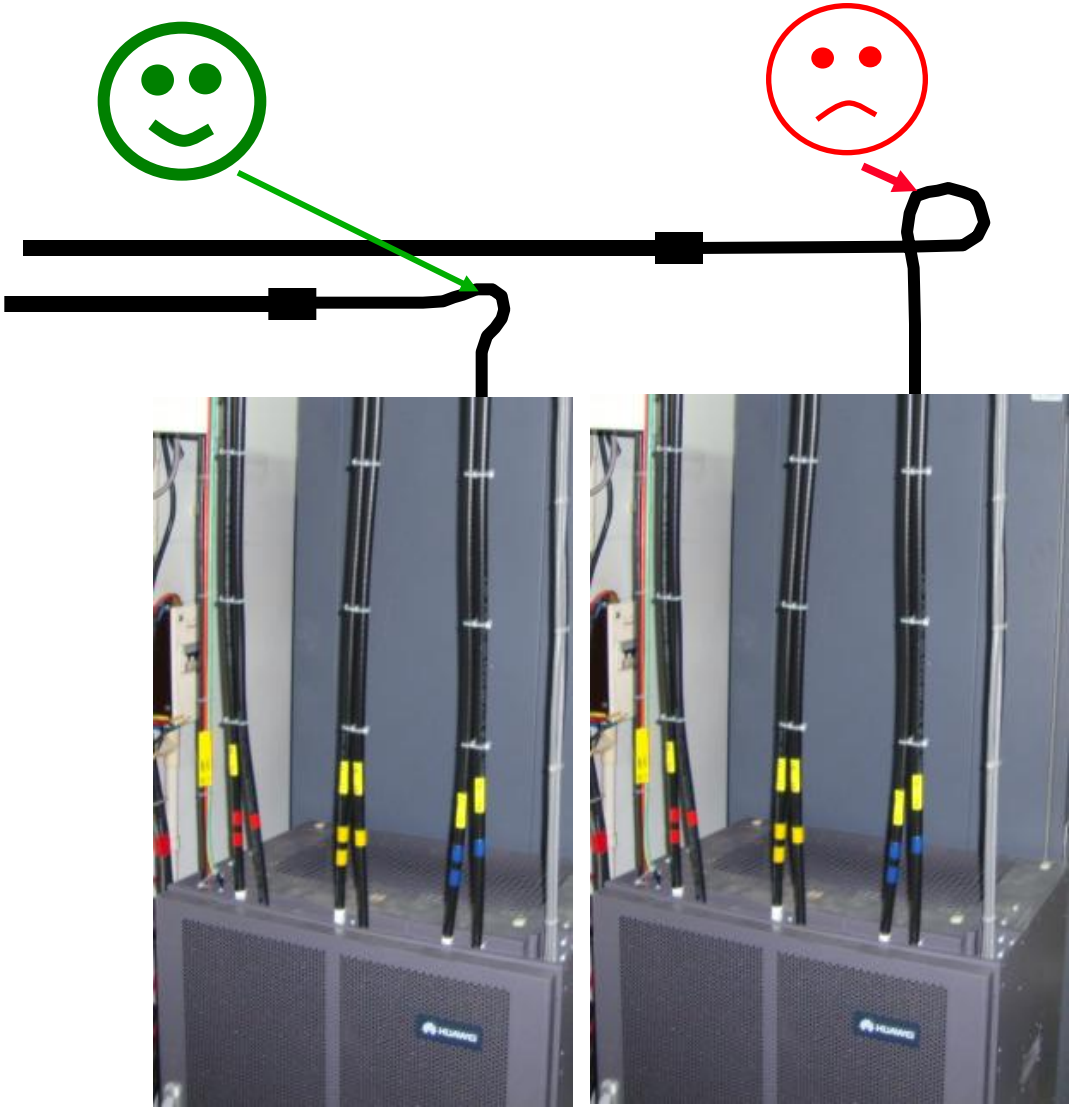
Jumper Cable Installation at BTS end



- Jumpers Cables have to be installaed as straight as possible, Avoid additional bendings.
- Follow manufacturers bending instructions.
- Proper tools have to be used during jumper installation.
- All cables have to be fixed properly.
- Prefabricated jumpers have to be used always when possible.
- On existing sites most practical solution should be used.

Unacceptable Jumper Cable Installation

Defective Picture

Correct Picture

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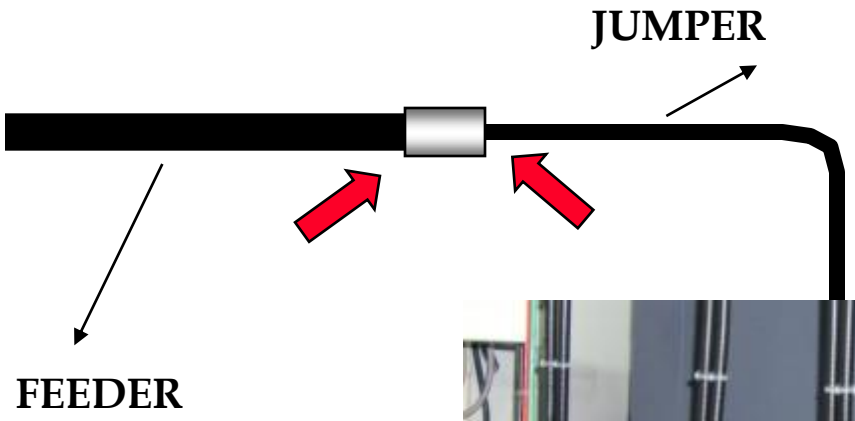
Feeder & Jumper Connection



- Proper tools have to be used during feeders connectorisations.
- All connections have to be tightened with correct torque.
  - SMA connector 1Nm
  - N Connector 15 N-m
  - 7/16 DIN Connector - 25N-m

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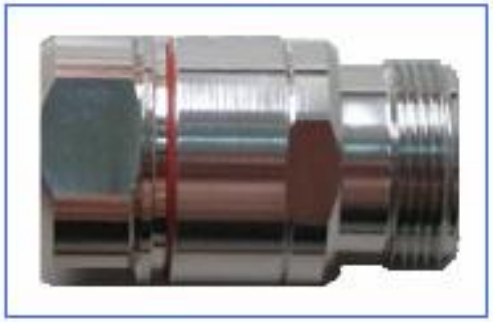
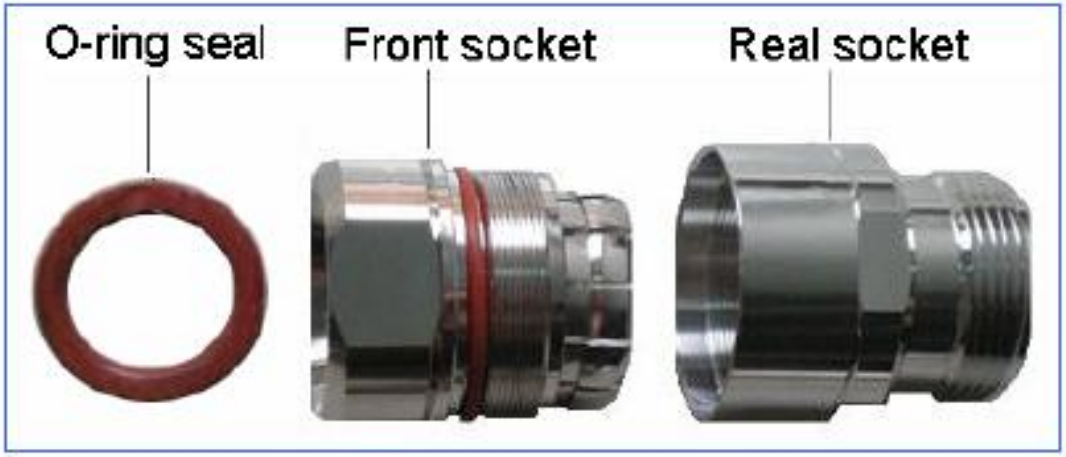
RF FEEDERS CONNECORIZATION PROCEDURES

Connectorization Procedure (7/8″ Cu. Coaxial Cable) –DIN Female Connector



DIN straight female connector

7/8" feeder



NOTE

This appendix describes the procedure for making the DIN straight female connectors of Andrew to 7/8" feeders. How to make other connectors, see relative manuals.

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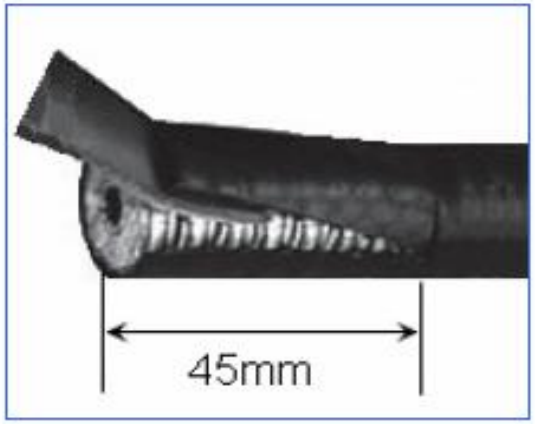
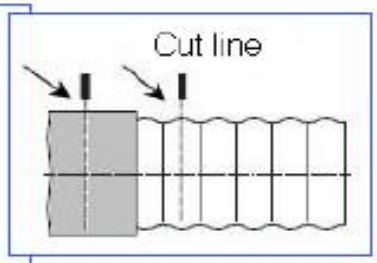
Connectorization Procedure (7/8" Cu. Coaxial Cable) –DIN Female Connector

a Strip the feeder



b Cut the feeder

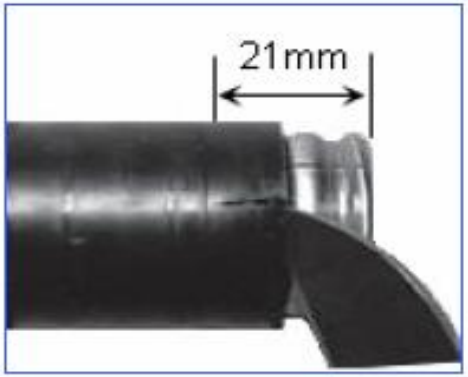


Note-

- Ensure that the feeder cable is cut with reference to the guide in the package box of the connector.
- Ensure that the cross-section of the cut feeder cable is smooth ,intact & round.
- Ensure that the feeder cable is cut at the wave crest of the outer conductor.

b Cut the feeder

Rotate the feeder cutter till the inner and outer conductors are completely cut.



Cut the broken covering of the feeders.

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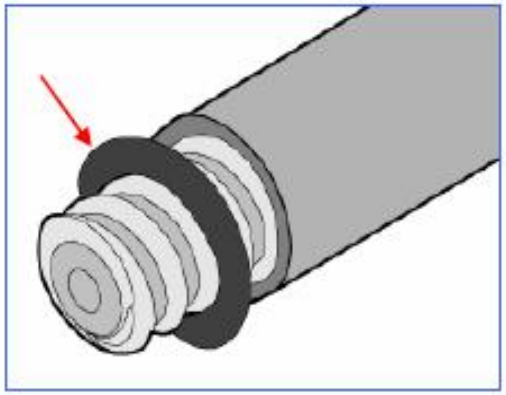
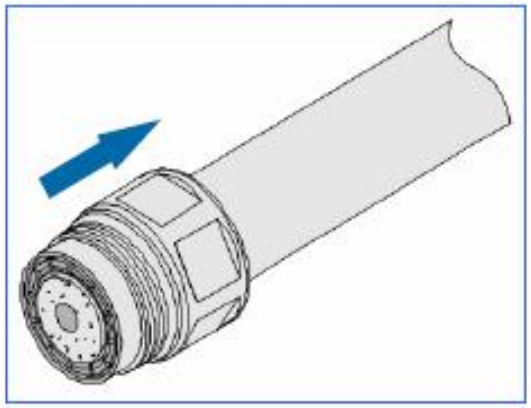
Connectorization Procedure (7/8″ Cu. Coaxial Cable) –DIN Female Connector

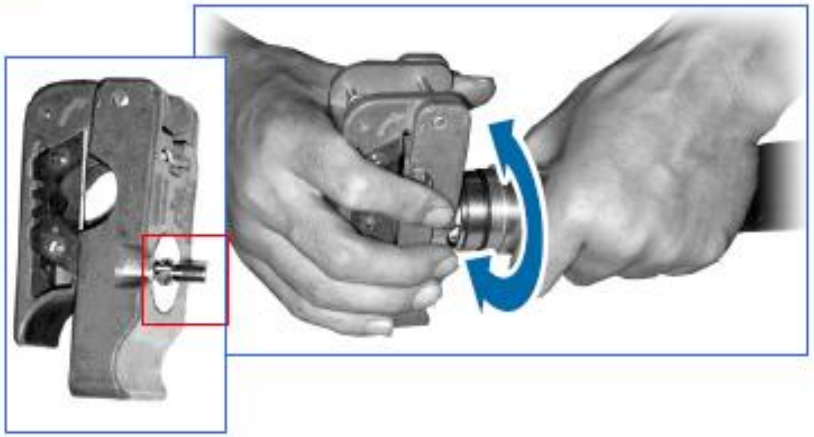
c Fix the O-ring seal



d Fix the rear socket



e Stretch the conductor of the feeder

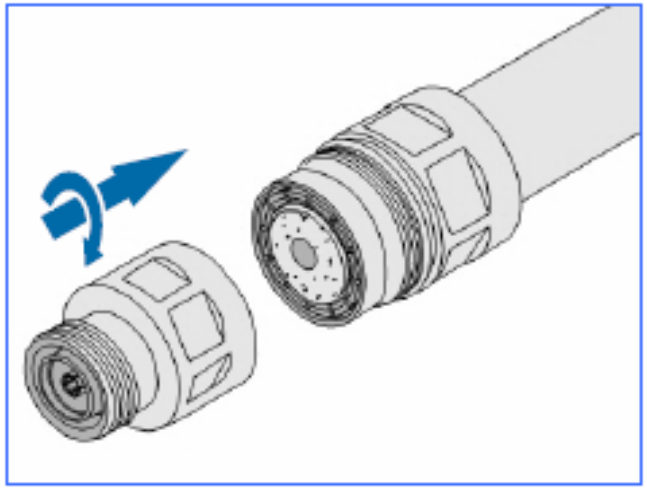


NOTE

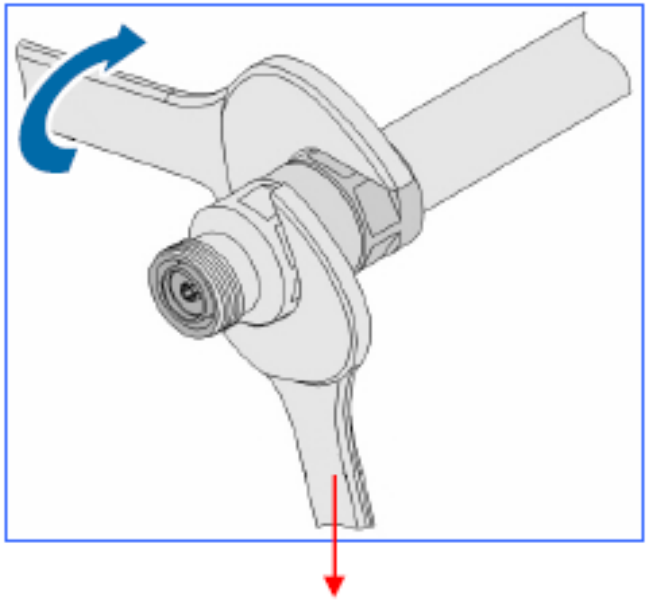
Insert the feeder into the feeder cutter, rotate the cutter to stretch the outer conductor. Use a hand to draw the rear socket, ensure that the rear socket does not come off from the feeder.

Connectorization Procedure (7/8″ Cu. Coaxial Cable) –DIN Female Connector

f Fix the front socket



g Fasten the front and rear sockets



Torque Required to tighten the connector is 25 to 30 N-M.

Connectorization Procedure (7/8" Al. Coaxial Cable) –DIN Female Connector

Tools Required,

- 780 EXPT Coring Tool.
- 34mm Open end wrenches.
- Hacksaw (32 teeth per inch is recommended).
- Drill machine.
- Knife
- Brush
- Torque wrench

Tips for use of tools,

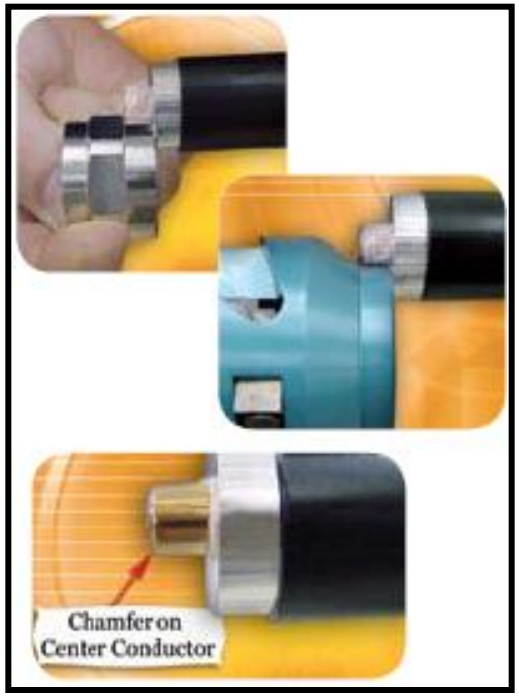
- Straighten the cable end as much as possible.
- Align the tool with the cable.
- Start the tool spinning before engaging the end of the cable.
- Continue the tool spinning at all times during coring.
- Allow the tool to self feed ,no additional pressure is needed.
- When using the tool by hand ,continuous inward pressure is required while

Turning the tool during the coring process.

Connectorization Procedure (7/8" Al. Coaxial Cable) –DIN Female Connector

1. To Core the Cable ,assemble the tool with the supplied handle or attach the tool to a high torque, low speed portable power drill.
Tool is self feeding and no additional force is needed. Core & no additional cable material is exiting from the tool.

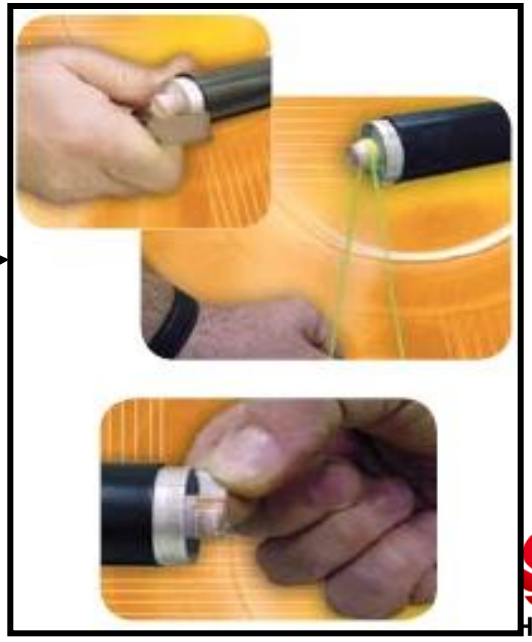
Note-Keep coring tool clean at all times.



2. Confirm proper center conductor length by comparing it to the connector back nut barrel or the gauge located on the front of the coring tool. A properly cored cable end will have a chamfer on the end of the center conductor.

3. Carefully remove the dielectric materials from the center conductor using a knife

Note-It is important to remove the dielectric Materials before installing the back nut. It Will be difficult to remove the materials after The back nut is installed.
The dielectric materials must be removed 360 Deg. Around the center conductor.



Connectorization Procedure (7/8" Al. Coaxial Cable) –DIN Female Connector

4. Being screwing the back nut on to the cable in a counter clockwise motion
while applying inward pressure. Continue until the back nut stops turning, properly seated back nut.

Note-Don't allow the back nut to become mis-aligned while assembling on the cable.

5. To flare the outer conductor slide the B-body over the end of the center conductor & begin spinning the drill Use slight inward & even pressure to flare the outer conductor.

Important- Remove any residue or debris from the Flaring process before proceeding to the next step.

Caution-Do not use a steel bristle Brush ,it could potentially Harm the electrical performance.

Note-When flaring by hand , apply slight inward pressure until the flare begins. Then increase even inward pressure to complete the flare & cleaning process.

Connectorization Procedure (7/8" Al. Coaxial Cable) –DIN Female Connector

6. Push the connector front nut onto the prepared cable end. Mate the front nut to the back nut.
While holding the back nut stationary ,turn the front nut clockwise by hand to tighten the connector as tight as possible before using wrenches.

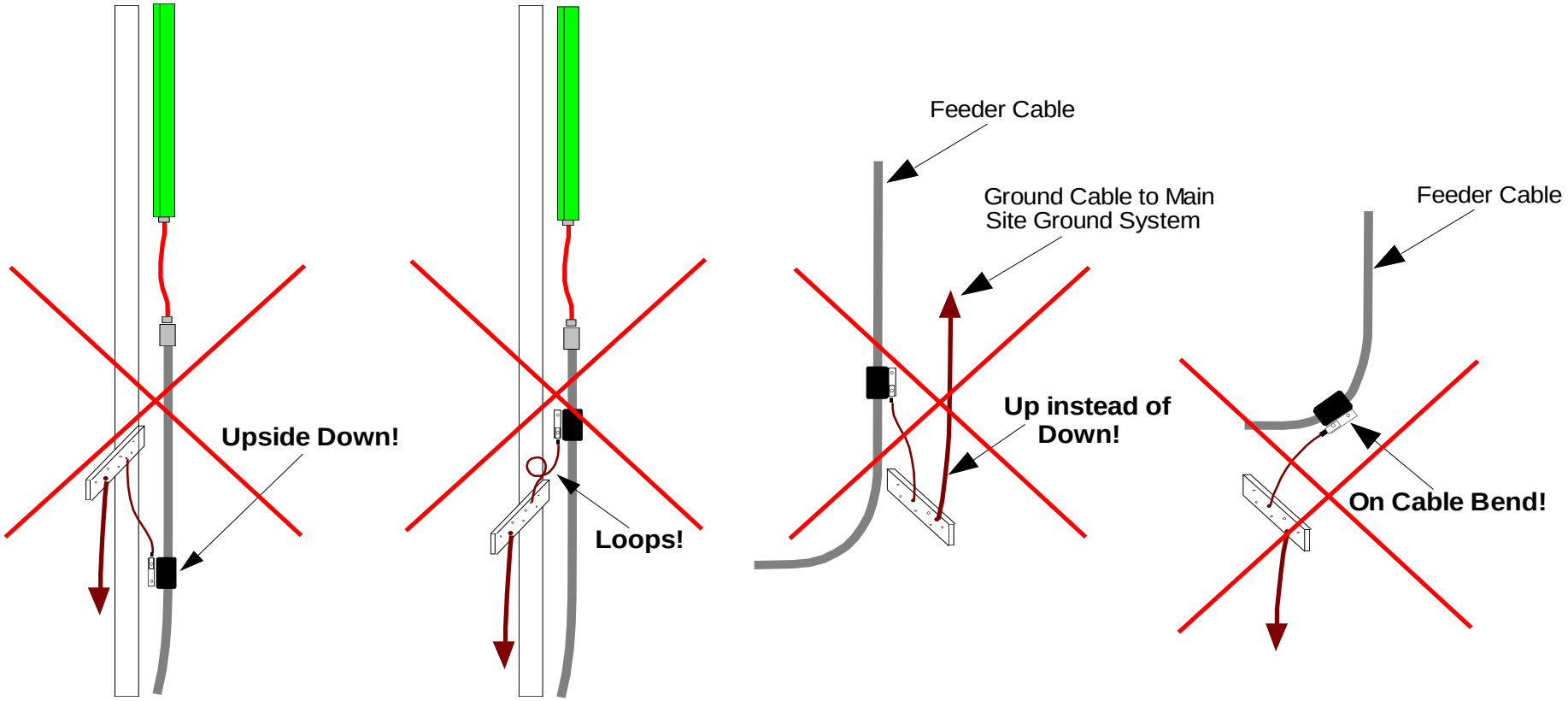
7. Continue to tighten the connector with the wrenches until metal to metal contact is reached.

Important- During the tightening process ,make sure the back nut doesn't turn. Tighten the connector until you achieve a positive stop & the O-ring completely disappears.

FEEDERS GROUNDING

Precautions for Feeder Groundings

- The grounding kit must always be positioned on the straight part of feeder cable and never on a bend or curve in the cable.
- Grounding kit's earthing cable can be cut or extended to make grounding cable connection to bar as straight as possible.



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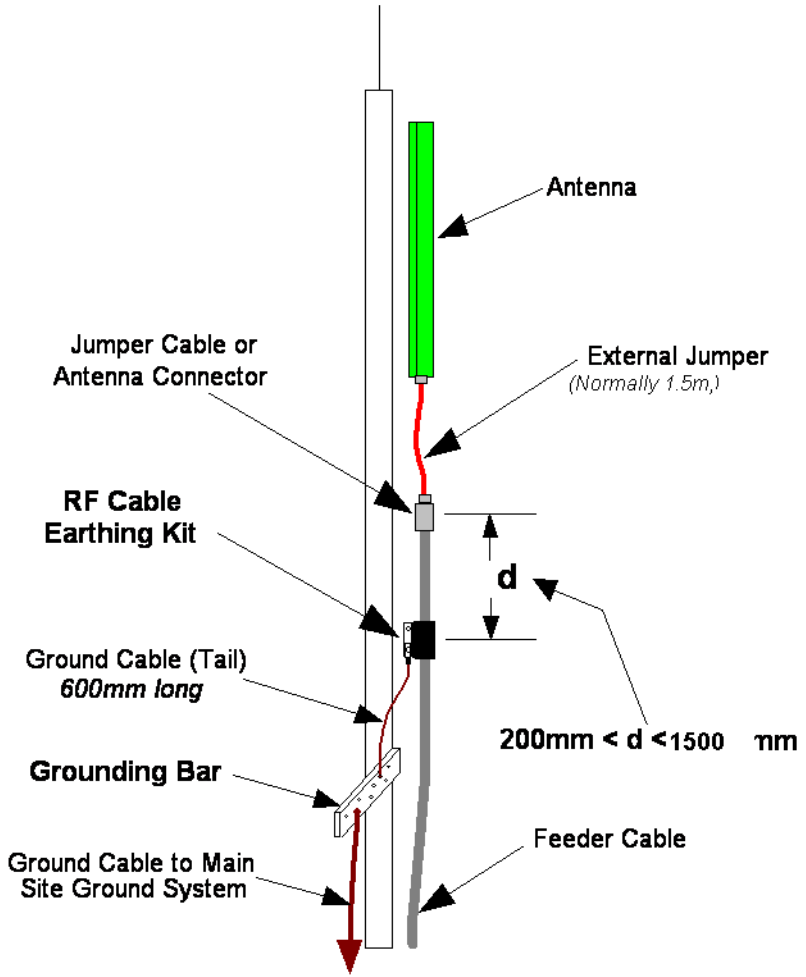
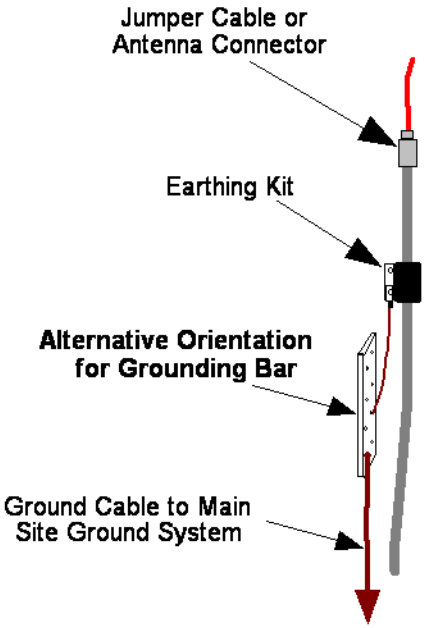
Recommendation for Feeder Groundings

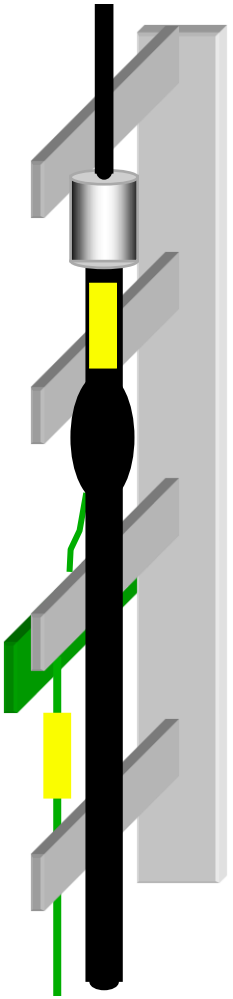
- Feeders have to be grounded after antenna jumper connection
- All feeder grounding kits have to be connected to feeder grounding bar





Note: Grounding bar should be fixed directly to the tower where the tower is itself the main ground down-conductor!

FEEDER GROUNDING bar



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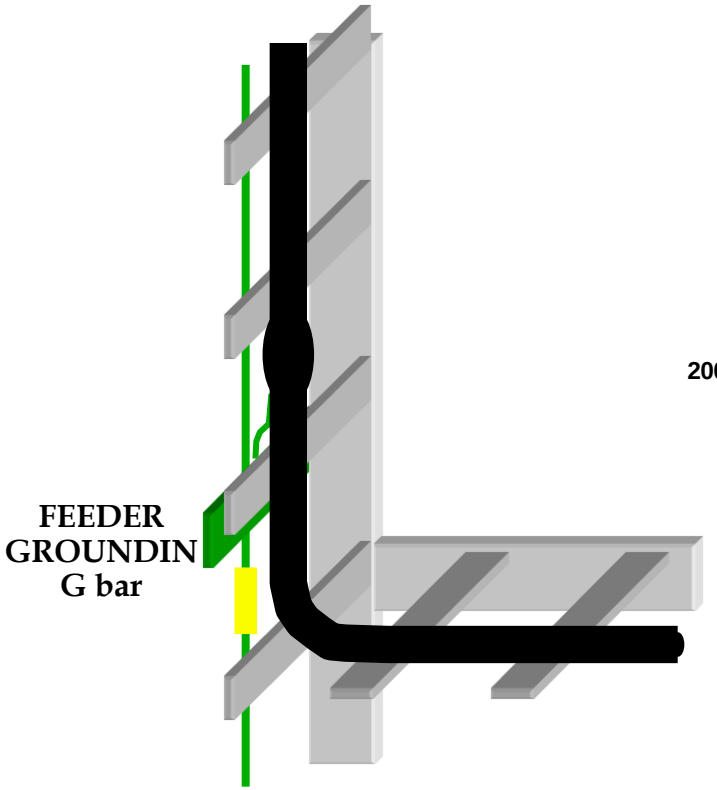
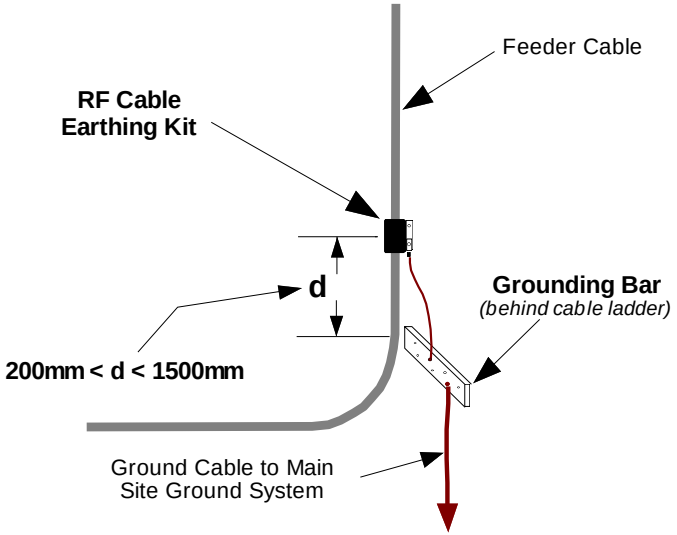
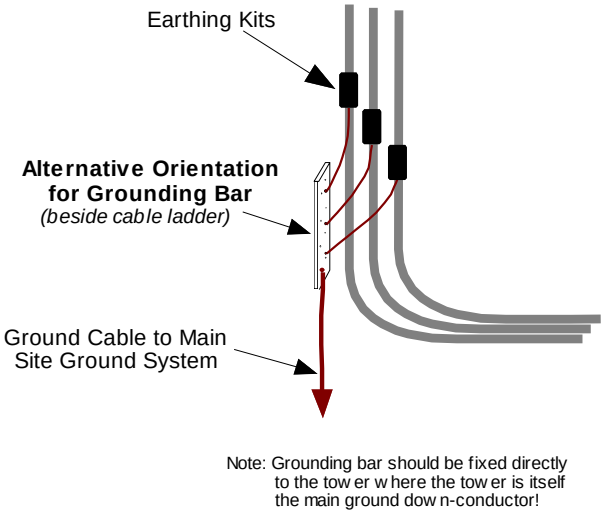
Recommendation for Feeder Groundings

- Feeders have to be grounded approx. 200-1500mm before horizontal bending
- All feeder grounding kits should be connected to a feeder grounding bar or other suitable earth point.







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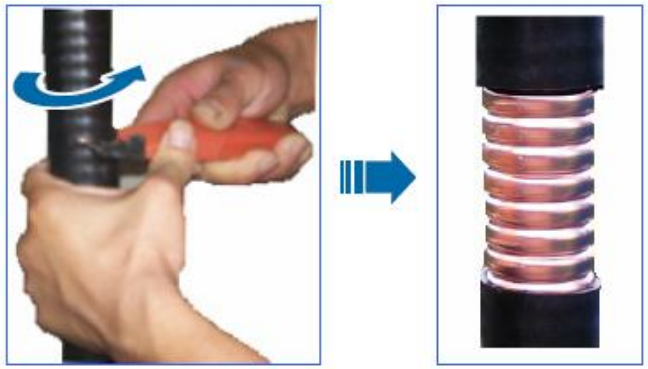
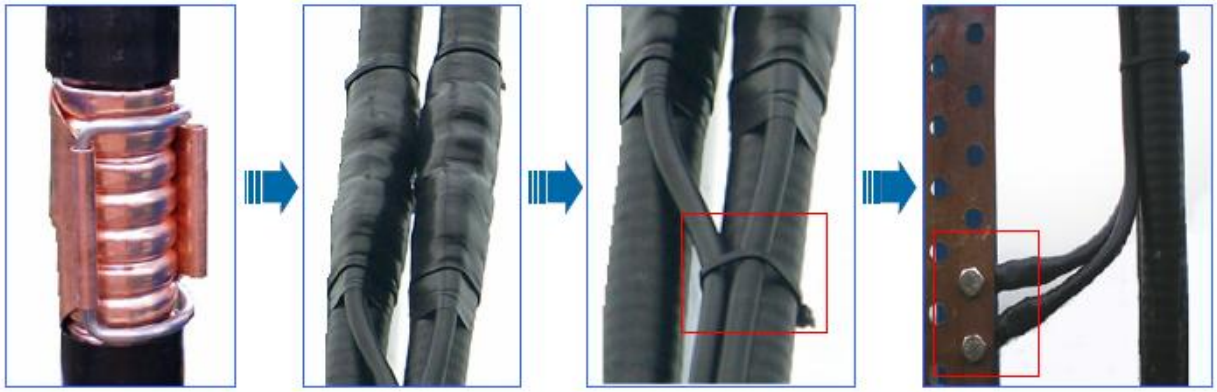
Procedures of Feeder Grounding

Metal jacket of the grounding clip of the feeder



Note,

The Stripped Part of the feeder should have The same length as the metal jacket of The grounding clip.



Install the metal jacket

Seal the joint points (three layers of waterproof tape + three layers of insulation tape)

Bind the grounding cables

Fix grounding cables to the grounding bar

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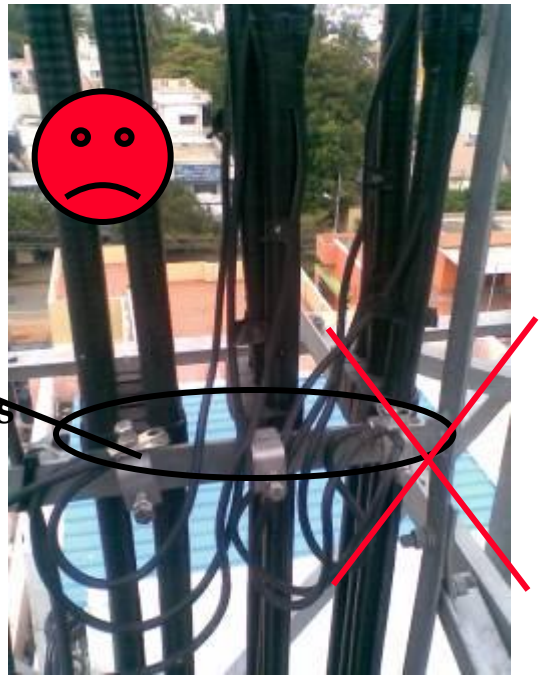
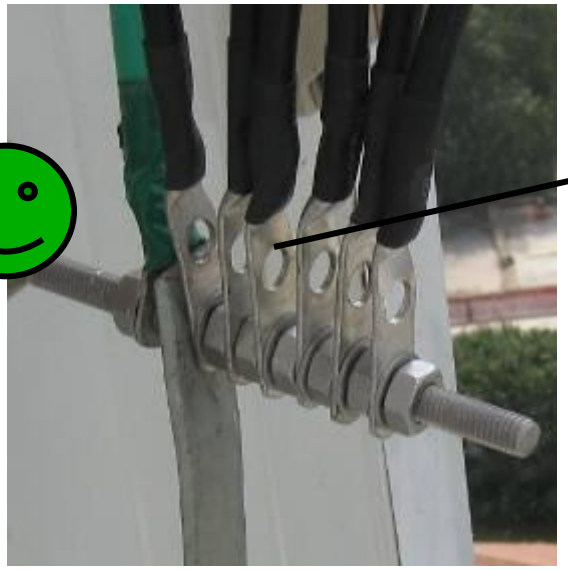
Unacceptable Feeder Groundings

Grounding terminations are upward





Correct way of Grounding cable termination

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Unacceptable Feeder Groundings

Feeder Groundings have been terminated
On Cable tray which is rusted & not connected
To main earth.

Feeder Groundings Cables have been terminated
Upward direction on Cable tray .(Should be made straight as much as possible)

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Unacceptable Feeder Groundings

GROUNDINGS DONE ON BEND

FEEDERS GROUNDING IS VERY CLOSE TO ENTRY ,THIS CAUSES GROUNDING CABLE LOOP

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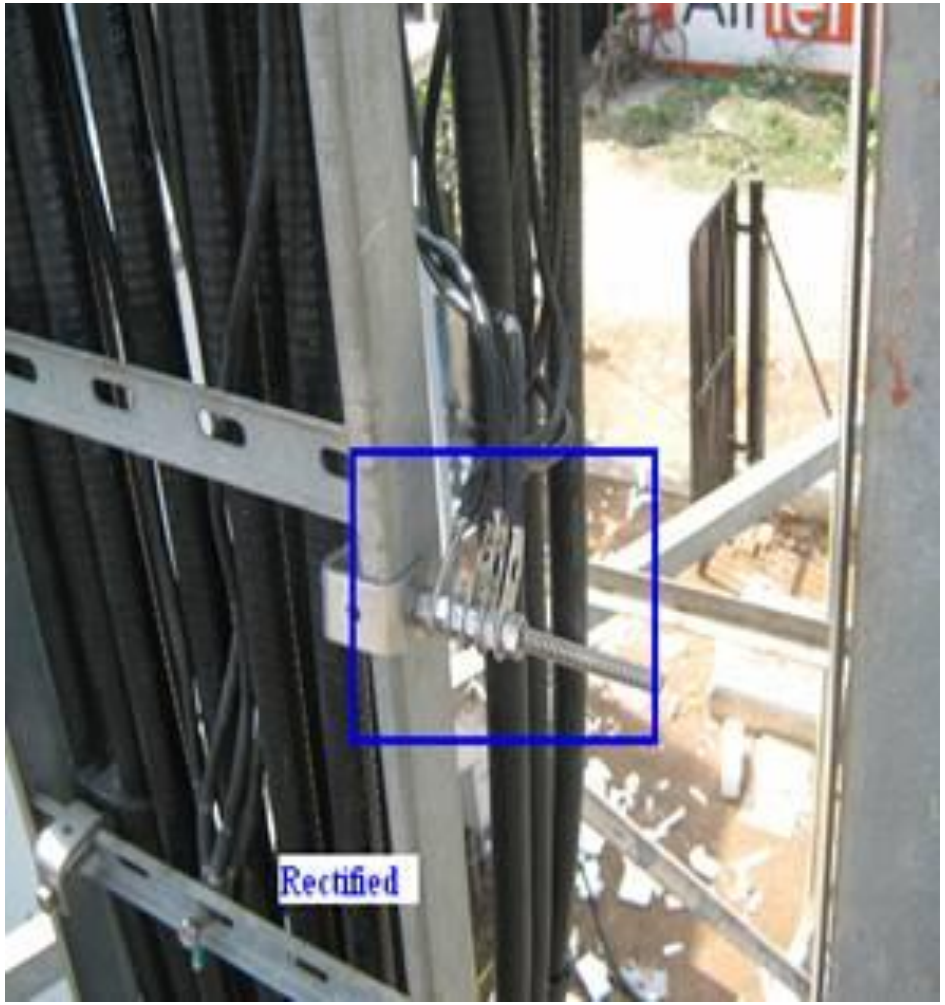
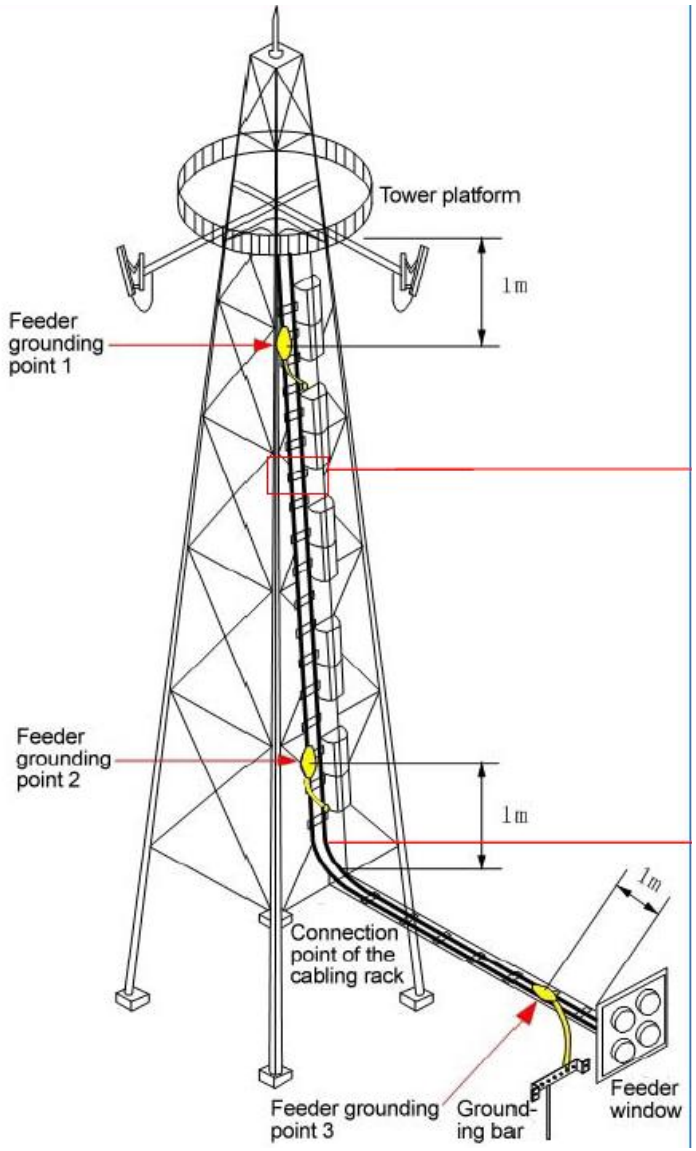
Acceptable Feeder Groundings



Recommended Locations for Grounding



- The grounding kit must always be positioned on the straight part of feeder cable and never on a bend or curve on the feeders cable.
- Grounding kit's earthing cable can be cut or extended to make grounding cable connection to busbar as straight as possible.
- Make sure that before terminations of feeders on tower portions ,the paints shall be removed from the terminations point for proper continuity & Ensure the grounding of Tower..

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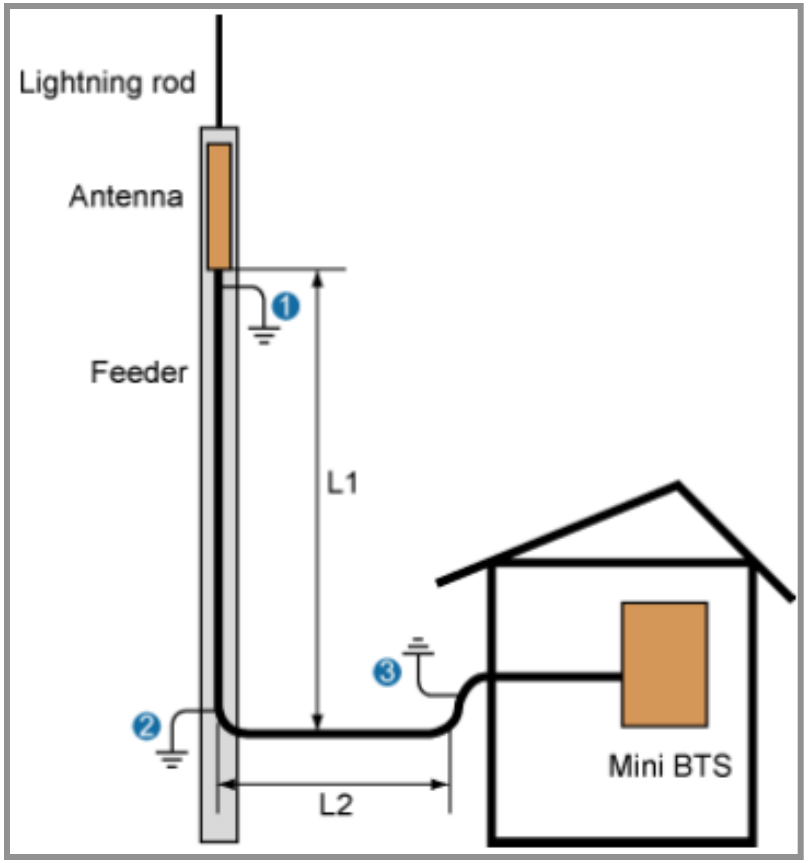
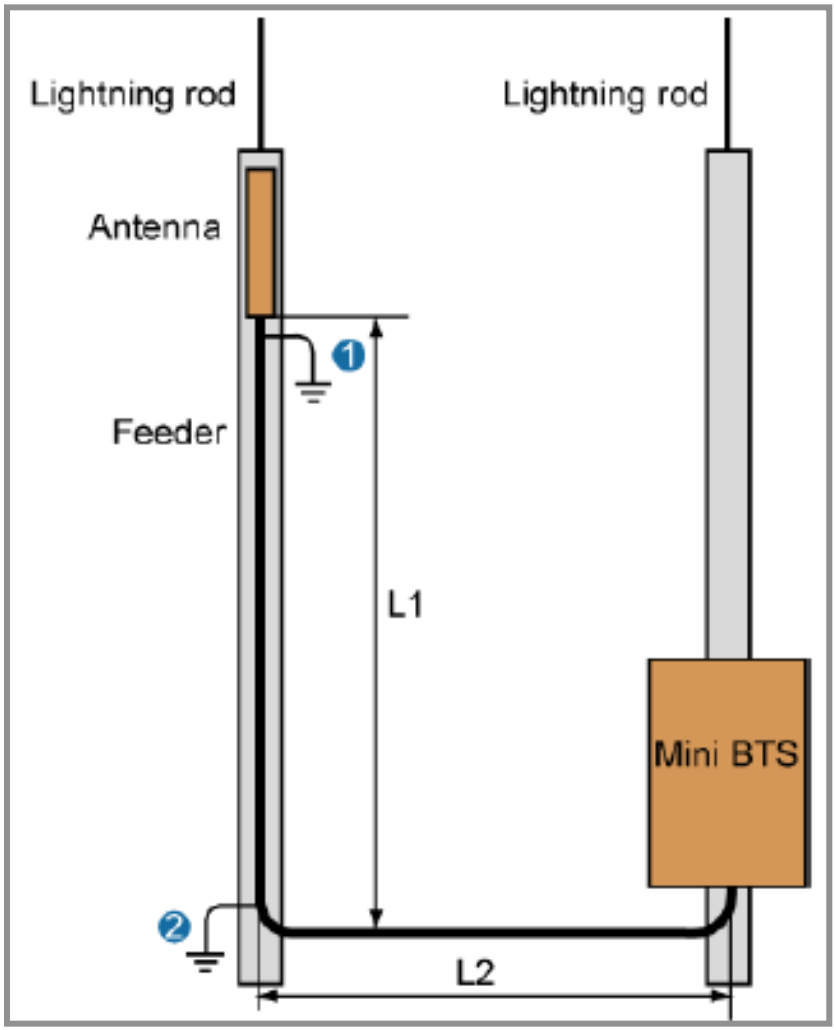
Recommended Locations for Grounding



The principles for feeder grounding are as follows:

- The feeders should be grounded at point 2.
- If the length (L1) of the vertical feeder is greater than 5 m [16.40 ft], ground it at point 1.
- If the length (L2) of the horizontal feeder is greater than 5 m [16.40 ft], ground it at point 3.
- If the length (L2) of the horizontal feeder is greater than 40 m [131.23 ft], ground it at one more point. Then, add a grounding point every 20 m [65.62 ft].

Recommended Locations for Grounding



The principles for feeder grounding are as follows:

- If the total length (L1 + L2) of feeders is smaller than or equal to 5 m [16.40 ft], grounding is not required.
- If the total length (L1 + L2) of feeders is greater than 5 m [16.40 ft] and the length (L1) of the vertical feeder is smaller than or equal to 5 m [16.40 ft], ground them at point 2.
- If the length (L1) of the vertical feeder is greater than 5 m [16.40 ft], ground it at points 1 and 2.
- If the length (L2) of the horizontal feeder is greater than 40 m [131.23 ft], ground it at one more point. Then, add a grounding point every 20 m [65.62 ft].

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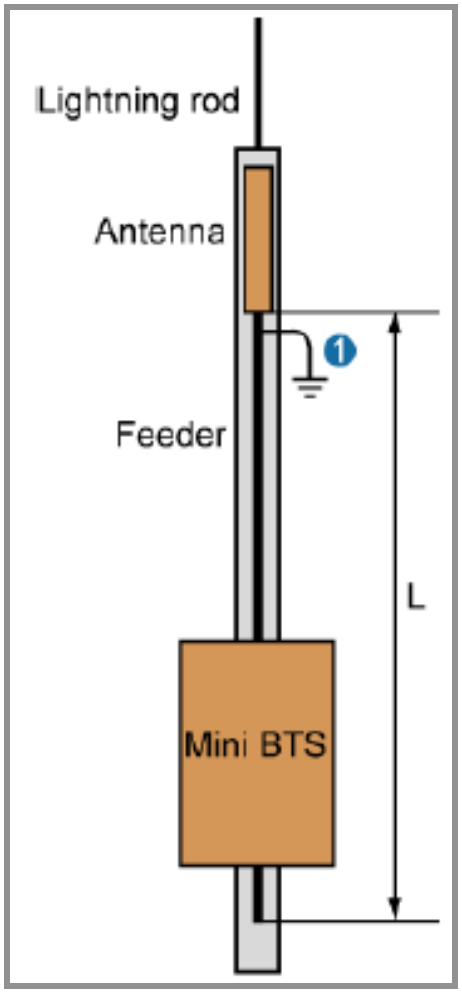
Recommended Locations for Grounding



The principles for feeder grounding are as follows:

- If the total length (L) of feeders is smaller than or equal to 5 m [16.40 ft], grounding is not required.
- If the total length (L) of feeders is greater than 5 m [16.40 ft], ground it at points 1.

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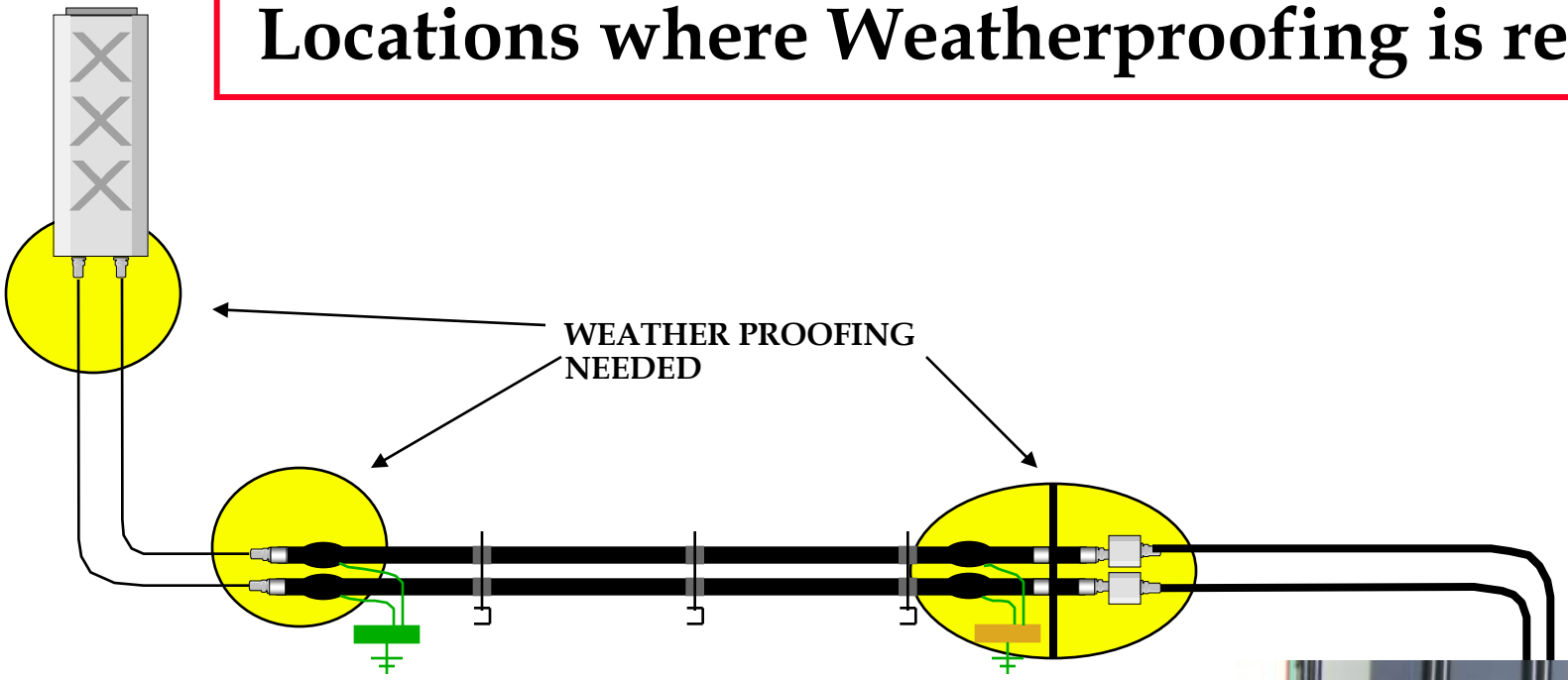
FEEDERS WATERPROOFING

Locations where Weatherproofing is required



- All ourdoor antenna line connections, grounding kits and wall entries have to be weather proofed.
- Connections where weather proofing is needed:
  - Feeder to jumper at antenna end.
  - Feeder to antenna
  - Feeder to Jumper at BTS End (if located outdoor)
- Grounding kits have to be sealed according to manufacturer instructions.
- Wall feed through have to be properly sealed.
- Ensure that all connectors are on correct torque before sealing!

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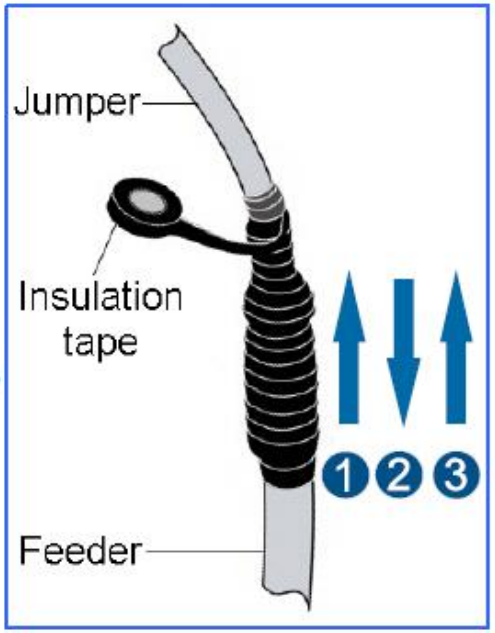
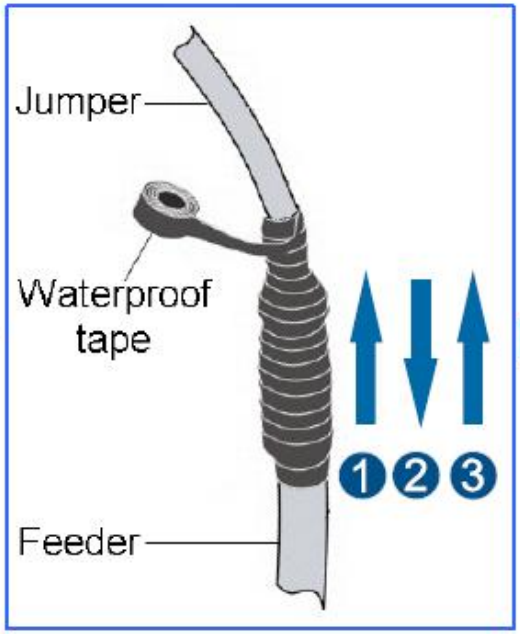
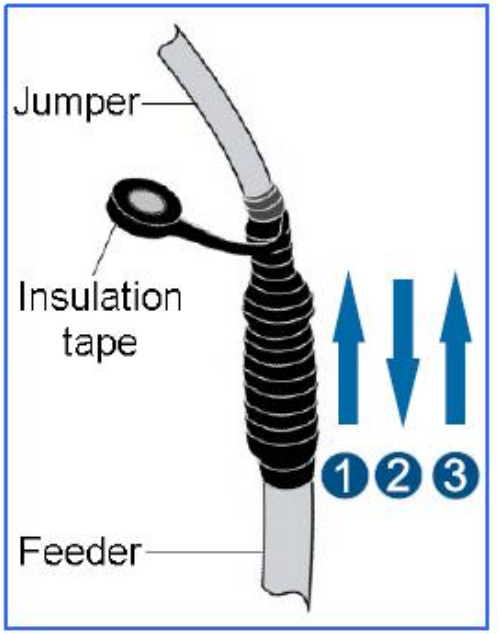
Procedures of Weatherproofing



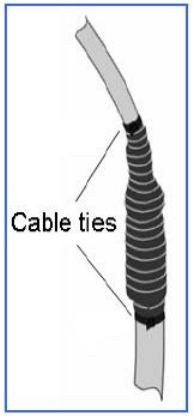
Wrap three layers of insulation tape



Wrap three layers of waterproof tape



Wrap three layers of insulation tape

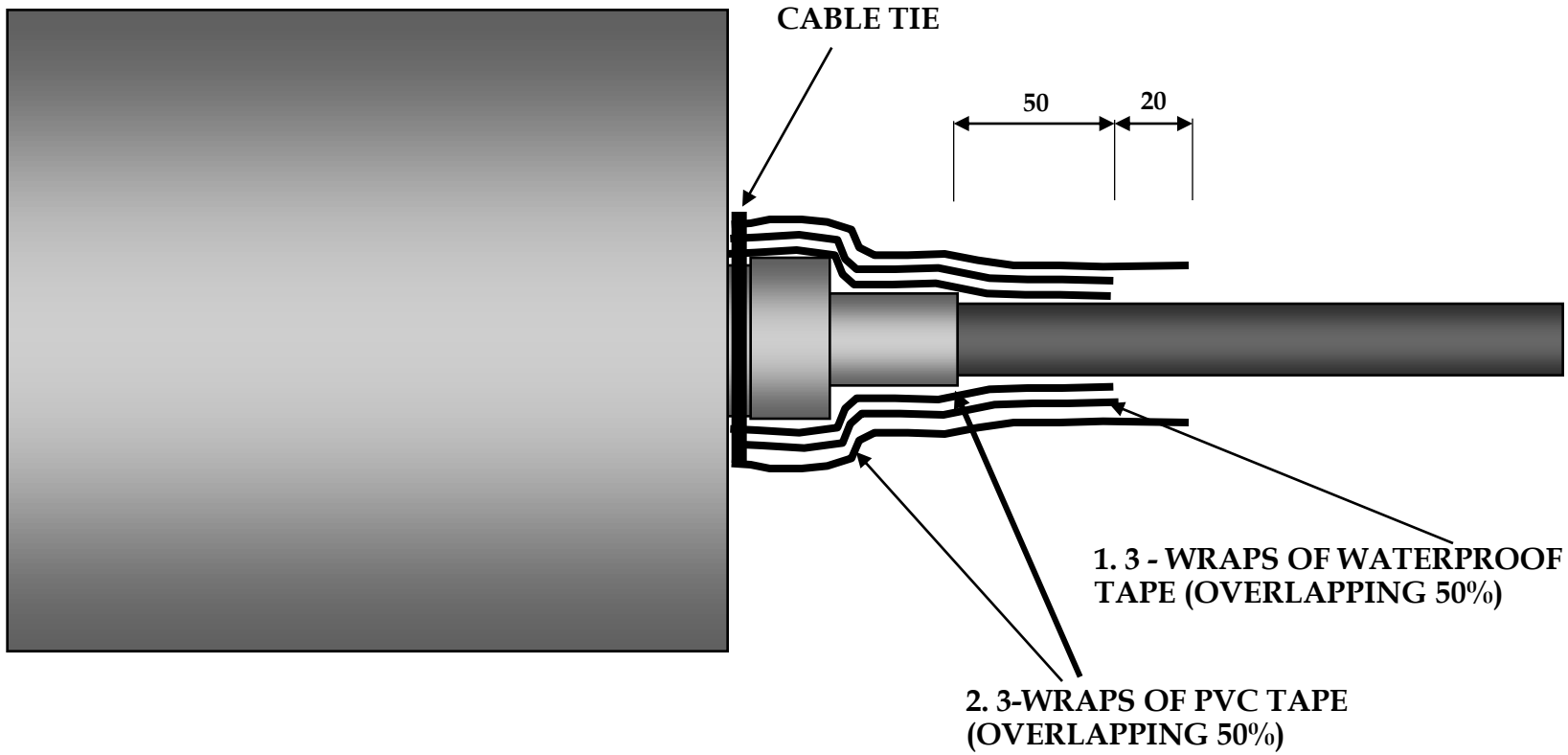


Fix the cable ties

Finished

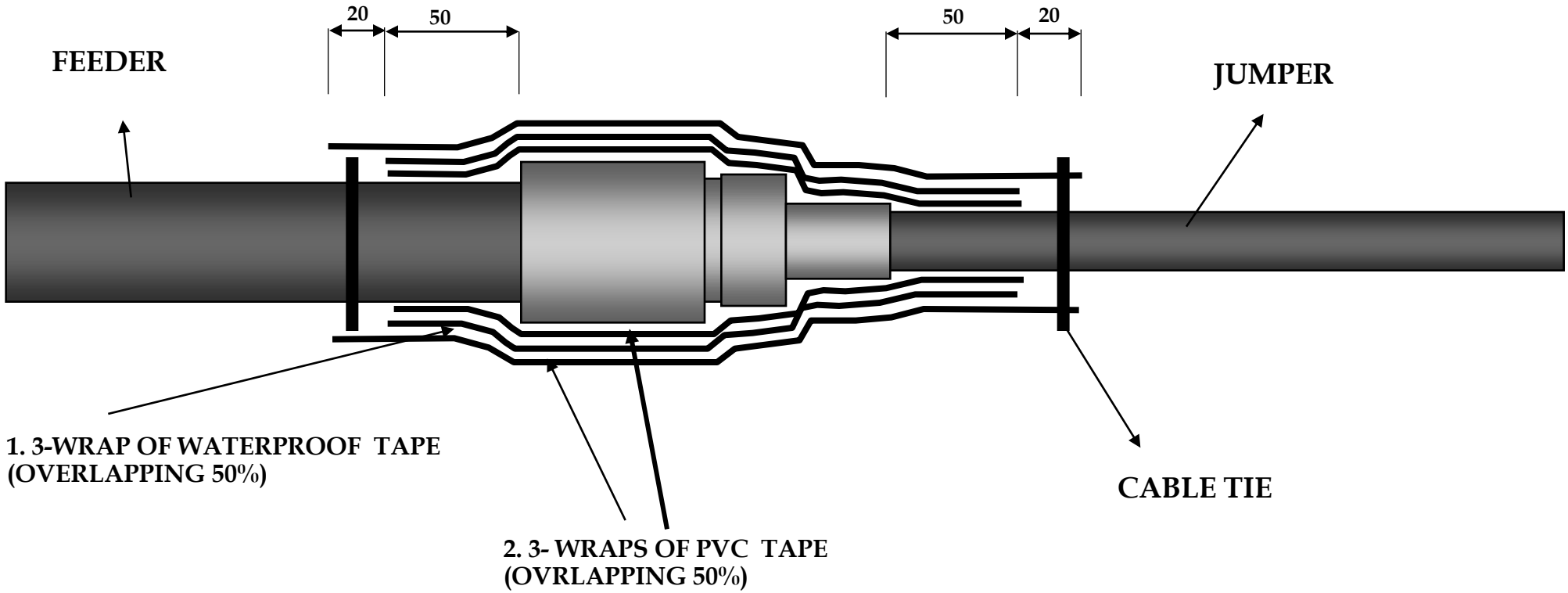
Procedures of Weatherproofing

- CONNECTION TO BE TAPED USING APPROVED TYPE OF INSULATION TAPE
- CONNECTION TO BE TAPED USING APPROVED TYPE OF WATER PROOF TAPE



Procedures of Weatherproofing

- 1.CONNECTION TO BE TAPED USING APPROVED TYPE OF WATER PROOF TAPE.
- 2.CONNECTION TO BE TAPED USING APPROVED TYPE OF PVC TAPE.



Procedures of Weatherproofing

-CONNECTION TO BE TAPED USING

VINYL ELECTRIC TAPE

-CONNECTION TO BE SEALED USING

RUBBER SPLICING TAPE

-CONNECTION TO BE TAPED USING

VINYL ELECTRIC TAPE

-AFTER WEATHER PROOFING OF CONNECTORS/GROUNDING KITS ,CABLE TIES TO BE USED OVER THE SAME

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Examples of Weatherproofing

WEATHERPROOFING OF CONNECTORS ARE NOT AS PER GUIDELINES

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Examples of Weatherproofing

Cut the Cable ties Completely.

GPS SYSTEM INSTALLATION

Installation tools


Flat-head screwdriver (M4 / M6)


Phillips screwdriver (M4 / M6)


Adjustable wrench


Open-end wrench (15 mm / 16 mm)


Snap-off knife


Cable cutter


Diagonal pliers


Hammer


File


Brush


Insulation tape


Waterproof tape


Steel tape


Percussion drill


Drill bit (Φ12)


Ladder


Heat blower

Requirements for GPS Antenna Installation Positions

General Requirements

1. The GPS antenna should be installed in an open space and is far from high buildings. The GPS antenna has a vertical visual angle no less than 90°, as shown in Figure 1.

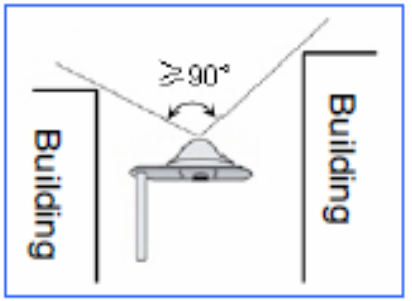


Figure 1

2. The GPS antenna should be installed in the protection range of the lightning rod (within the tilt angle of 45°under the lightning rod). The horizontal distance between the antenna and the lightning rod should be longer than 2 m, as shown in Figure 2.

3. If multiple GPS antennas are installed, ensure that the horizontal distance between antennas is greater than 0.5 m.

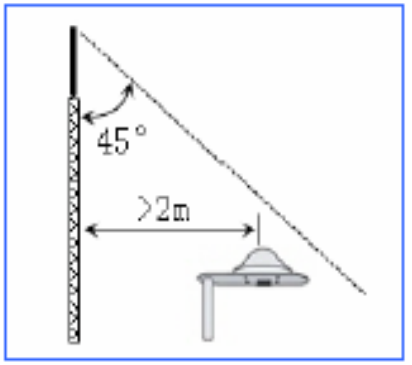


Figure 2

4. The GPS antenna should be far from:
- High-voltage power cables
- Strong radiation area of the TV transmission station
- Radiation area of the main lobe of the RF antenna
- Radiation area of the microwave antenna
- Other areas with inter-frequency interference or strong electromagnetic interference

Requirements for GPS Antenna Installation Positions

Requirements for Installation on the Roof

1. The GPS antenna should be installed in the middle of a roof. Avoid installing it on the surrounding walls.
2. The GPS shall not be installed on the corner of a roof, which is vulnerable to lightning strikes.
3. The GPS antenna should be installed as far as possible from ancillary buildings on the roof.

Requirements for Installation near the Tower

1. The GPS antenna should be installed on the top of the equipment room or of the outdoor macro-BTS near the tower.
2. The GPS antenna should not be installed in the following areas:
- Any area on the tower body
- Cabling rack between the tower and the equipment room

Requirements for Installation on the Pole

1. The GPS antenna should be installed in the middle of the pole rather than on the top of it.
2. When the GPS antenna and the main equipment are installed on the same pole, the vertical distance between them should be less than 2 m.

GPS System Components

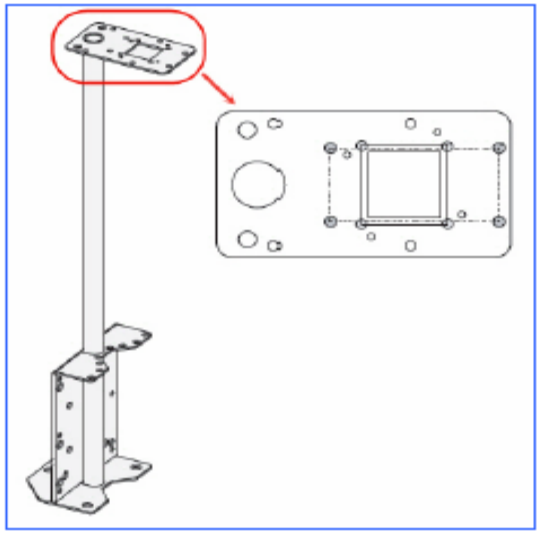
GPS Antenna

CSGPS-38BH

CCAH22ST11

AT1675-0

Antenna Support



Surge Protector

MHT-N5-2

Cut the Feeder and Make an Outdoor Feeder Connector

GPS feeders are classified into 1/2" feeders and RG8 feeders.

Measure the routing distance between the GPS antenna and main equipment. Then, use a cable cutter to cut the feeder according
to the length identifiers on the feeder.

Fix a N male connector to one end of the feeder

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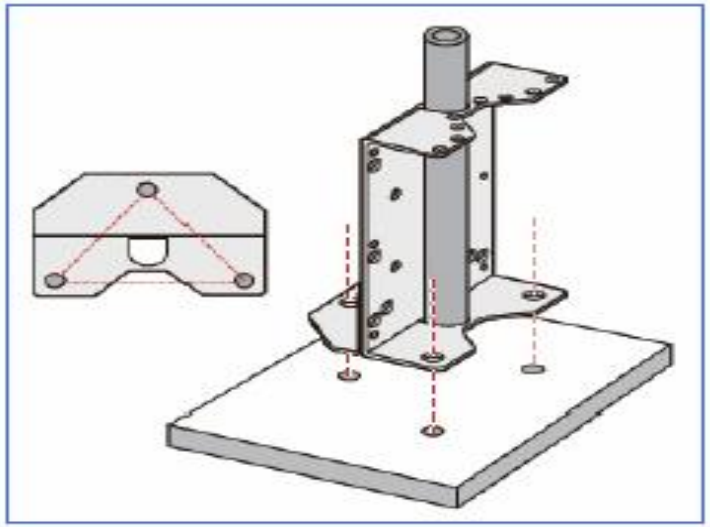
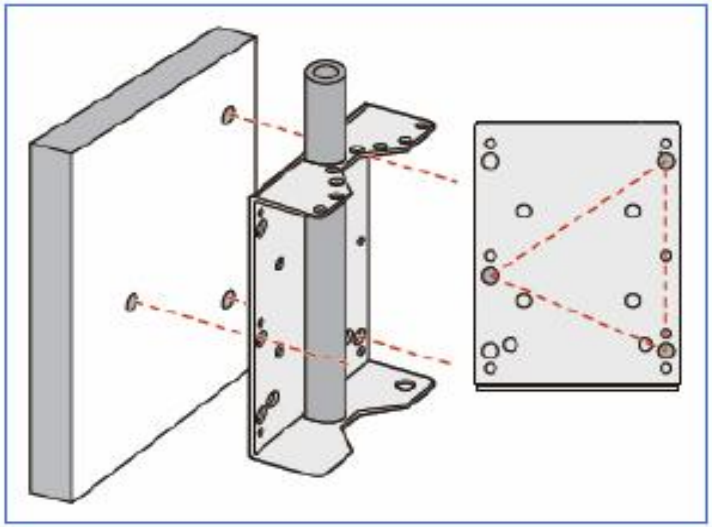
Install the Antenna Support

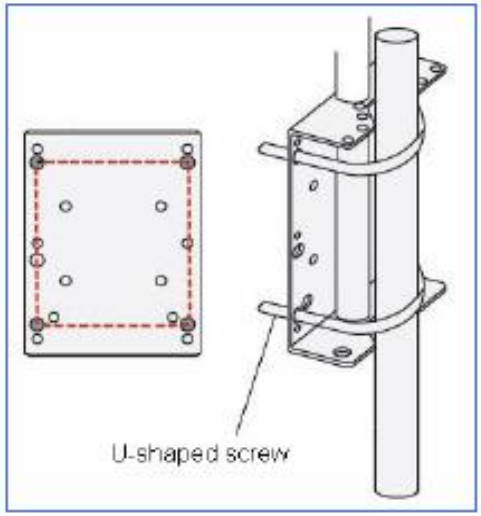
Installed on the cement ground



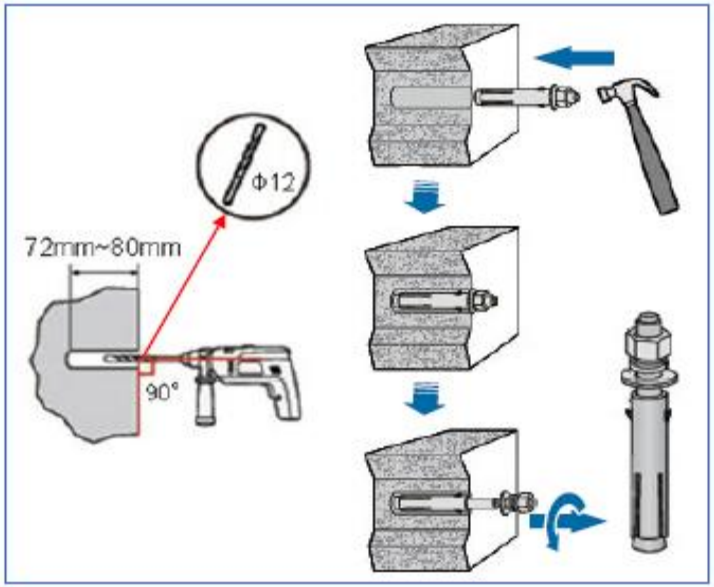
Installed on the parapet



Installed on the pole



Fix expansion bolts before installing an antenna support on the cement ground or parapet.



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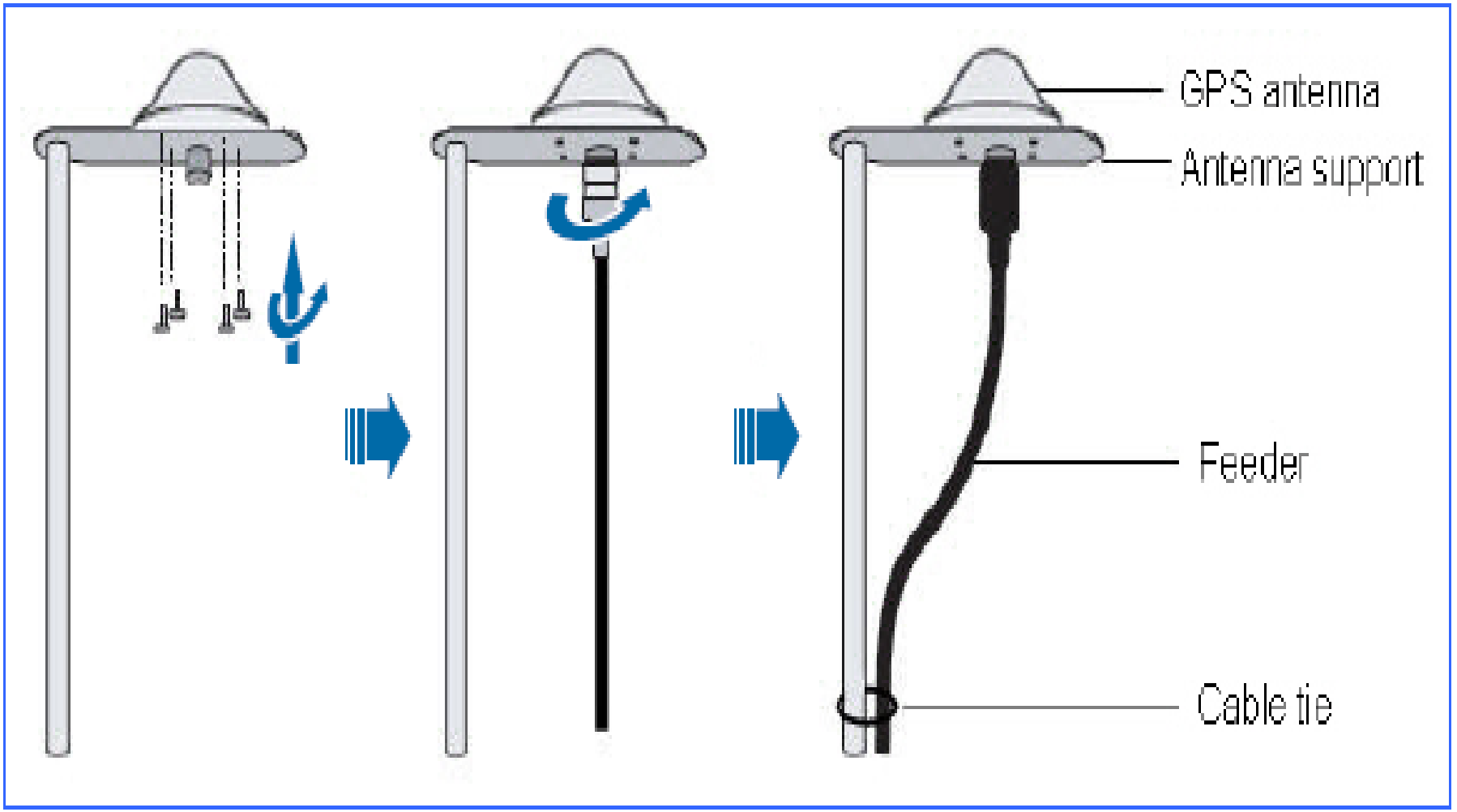
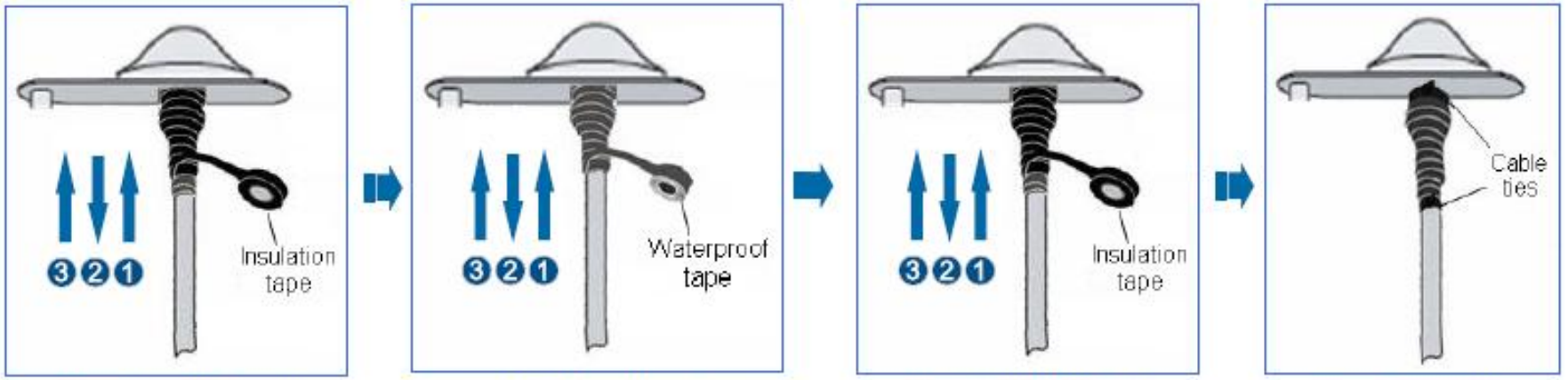
Install the GPS Antenna



Seal the connector



1. Every time you coil a layer of tape, ensure that the new layer covers the area of previous layer by 50% or more.

2. Before wrapping the waterproof tape, stretch the tape till the width of the tape becomes 1/2 of the original.

3. Wrap the metal connector using waterproof tape with extended lengths about 20 mm, and wrap the waterproof tape using insulation tape with extended lengths about 10 mm.

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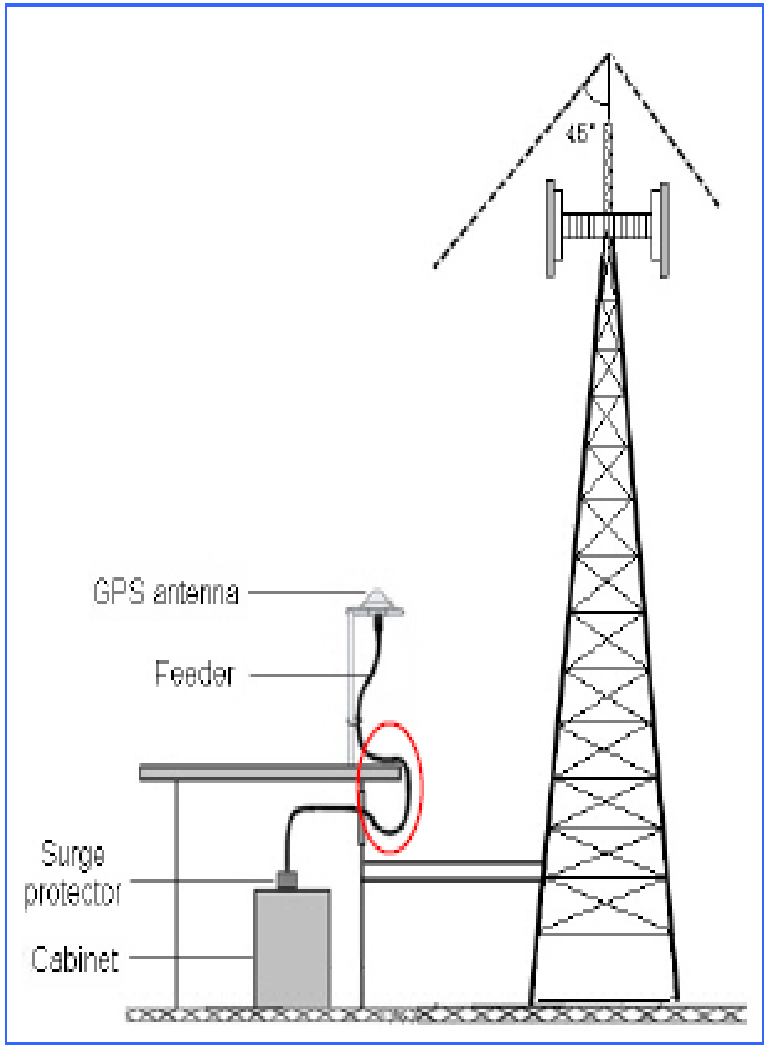
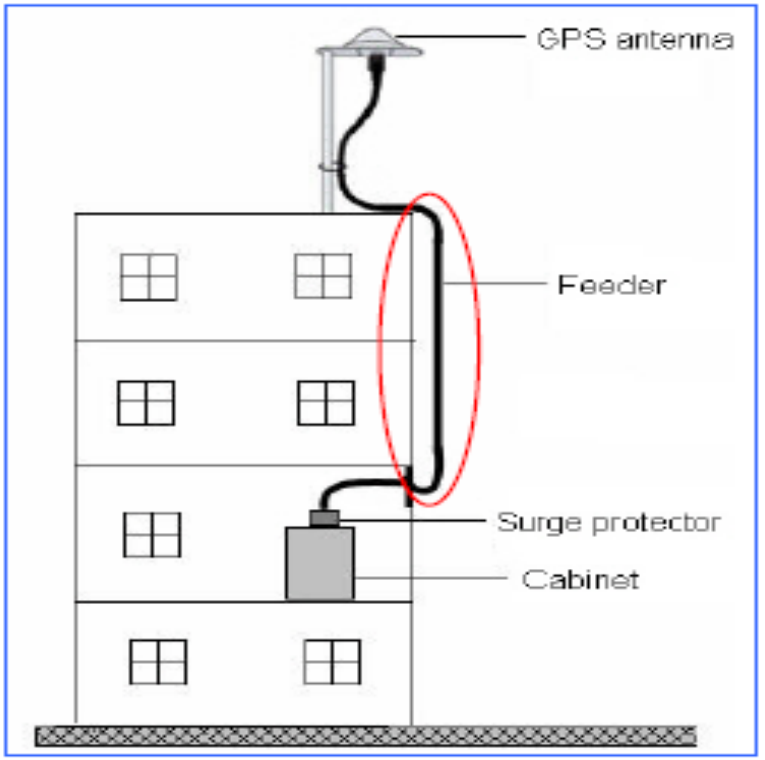
Route the Outdoor Feeder

Typical Scenario 1



Typical Scenario 2



Route the feeder along the cable rack that is mounted on the wall and use feeder fasteners to fix the feeder. The interval between feeder fasteners is 1 m.

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Install the Feeder into the Equipment Room

Put the feeder

Make the waterproof curve

Screw the fasteners

Install the Indoor Feeder

1. Make the feeder connector

Cut the redundant feeder to fit the surge protector. Make a N male connector for the feeder.

2. Bind the feeder

Route the feeder along the indoor cable rack and bind the feeder with cable ties.

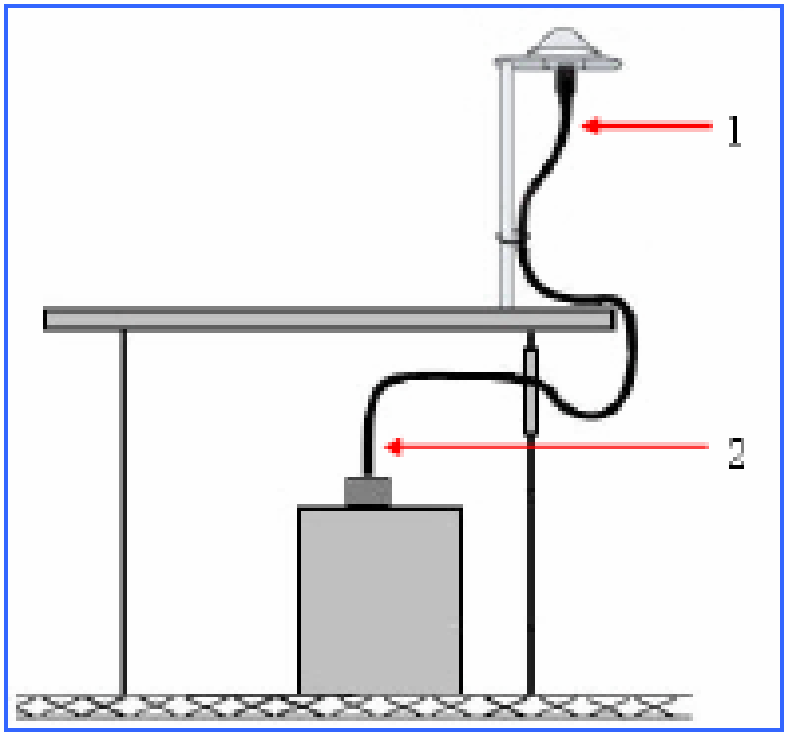
3. Connect the feeder to the surge protector

Connect the feeder to the Surge port of the surge protector.

HUAWEI

Stick the Labels

1. Positions of the labels



The positions of the labels are as follows:

- 200 mm away from the outdoor feeder connector
- 200 mm away from the surge protector

2. Stick the labels

Bind the labels with cable ties

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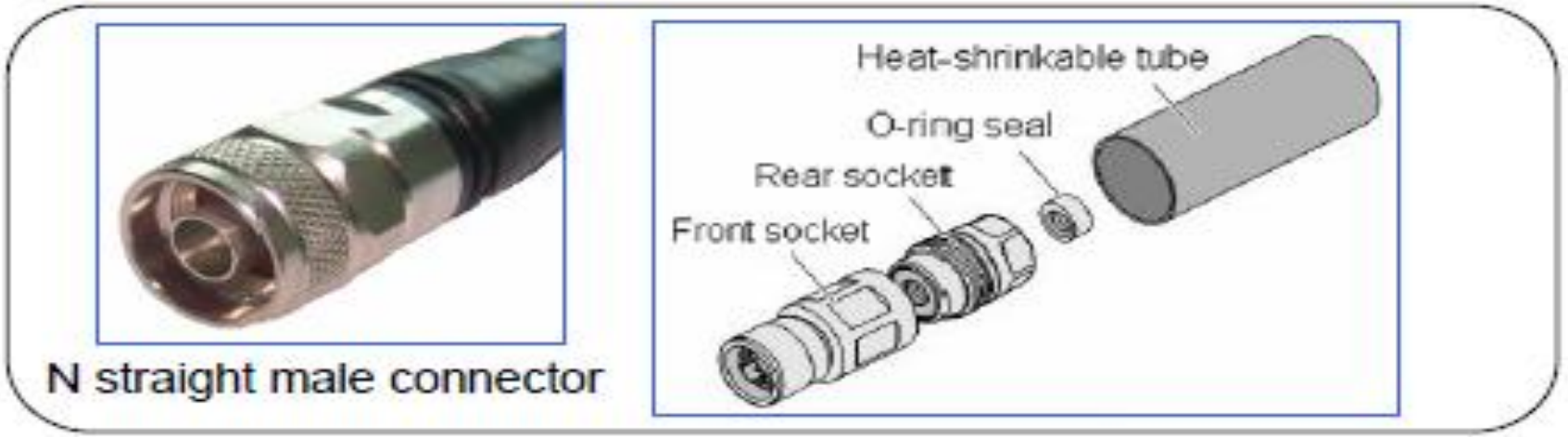
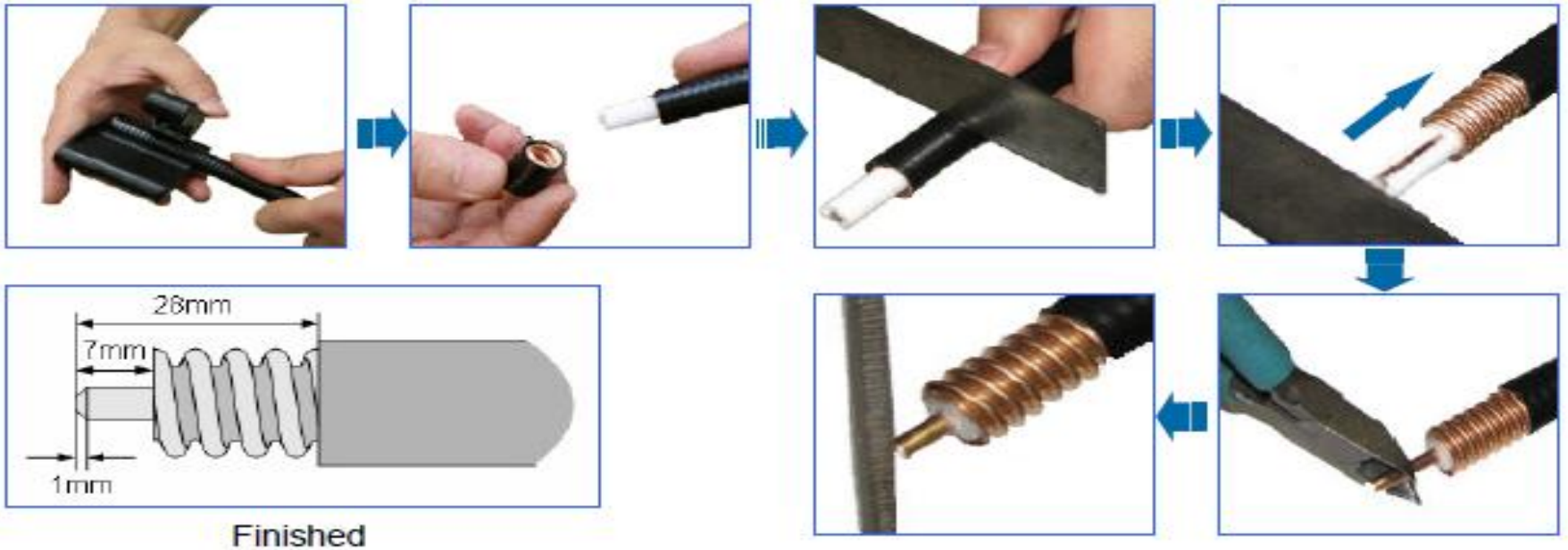
Make the 1/2" Feeder Connector



1. Cut the feeder



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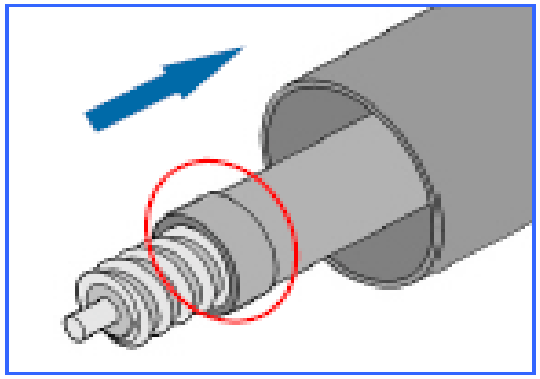
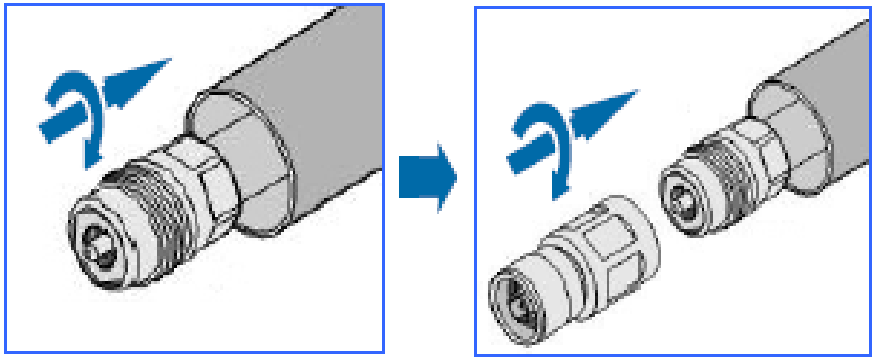
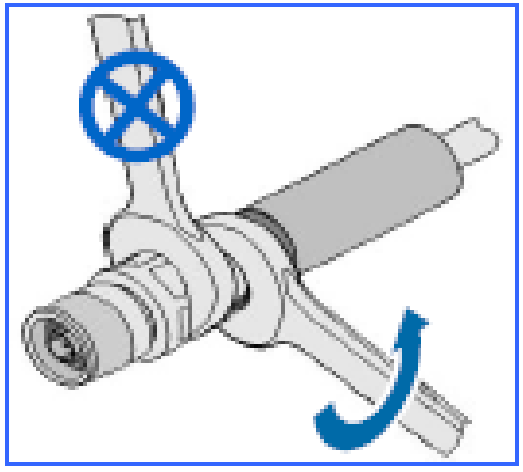
2. Install the heat-shrinkable tube and O-ring seal



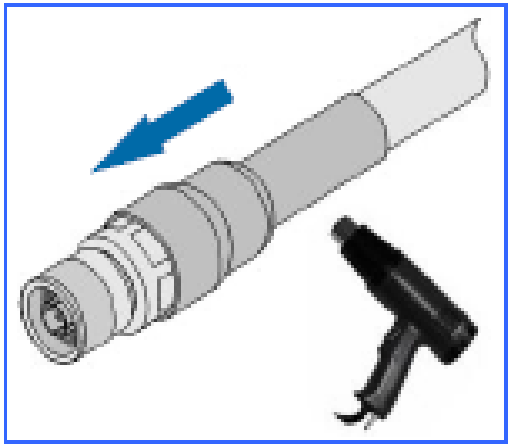
3. Fix the rear and front sockets



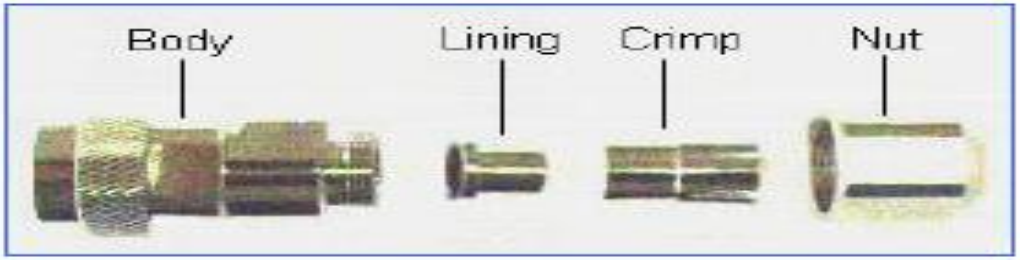
4. Fasten the front and rear sockets



5. Shrink the heat-shrinkable tube

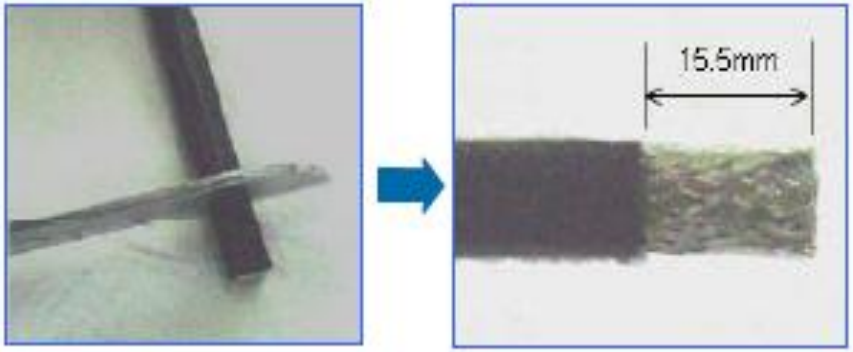


Make the RG8 Feeder Connector

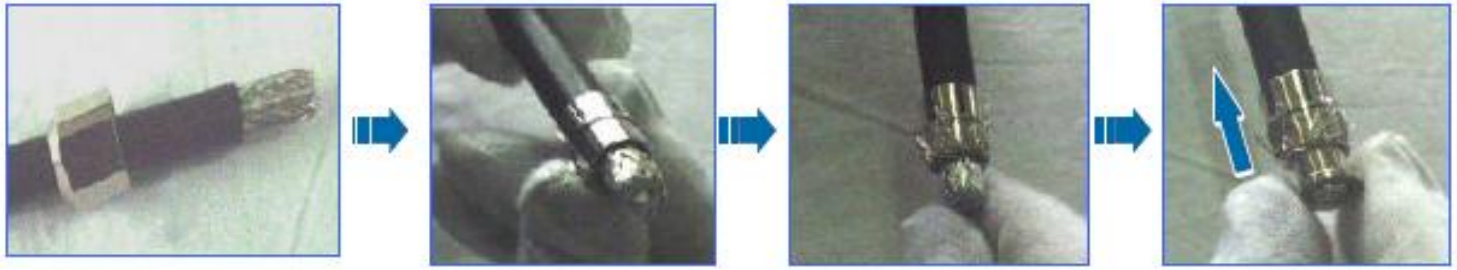


N straight male connector

1. Cut the feeder jacket



2. Install the nut and crimp and lining



Install the crimp Uncover the insulation layer Push the lining

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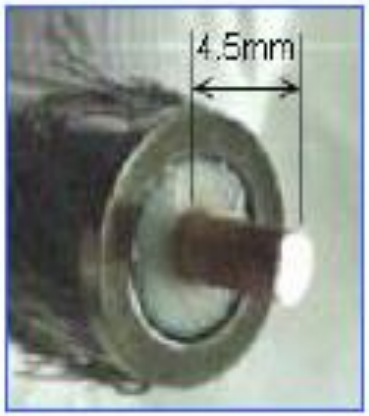
3. Cut the feeder insulation layer



Taper inner conductor

Remove debris

4. Install the body

Push the body

Fasten the body and crimp

Fix the clamping nut

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MW PRODUCT OVERVIEW & INSTALLATION

RTN605,IDU PRODUCT DESCRIPTION

INTRODUCTION TO RTN600

- The OpitX RTN 620 is one of the series products of the OptiX RTN 600 radio transmission system.
- The OptiX RTN 600 radio transmission system product series are classified into the OptiX RTN 620 and the OptiX RTN 605. The OptiX RTN 620 and the OptiX RTN 605 share one set of ODUs.
- The OptiX RTN 620 adopts 2U-high IDU (namely, IDU 620), supports one to four microwave directions, and provides the TDM microwave and Hybrid microwave integrated solution.
- The OptiX RTN 605 adopts 1U-high IDU (namely, IDU 605), supports one microwave direction, and provides the TDM microwave and Hybrid microwave terminal access solution.

Appication-

- The OpitX RTN 620 is a split microwave transmission system developed by Huawei.
- The OpitX RTN 620 provides several types of service interfaces and features flexible configuration and easy installation .
- the OpitX RTN 620 can provide a TDM microwave and Hybrid microwave integrated solution according to the network requirements.

RTN 605, IDU Description

IDU 605 1A

IDU 605 2F

IDU 605 1B

IDU 605 2B

IDU 605 1F

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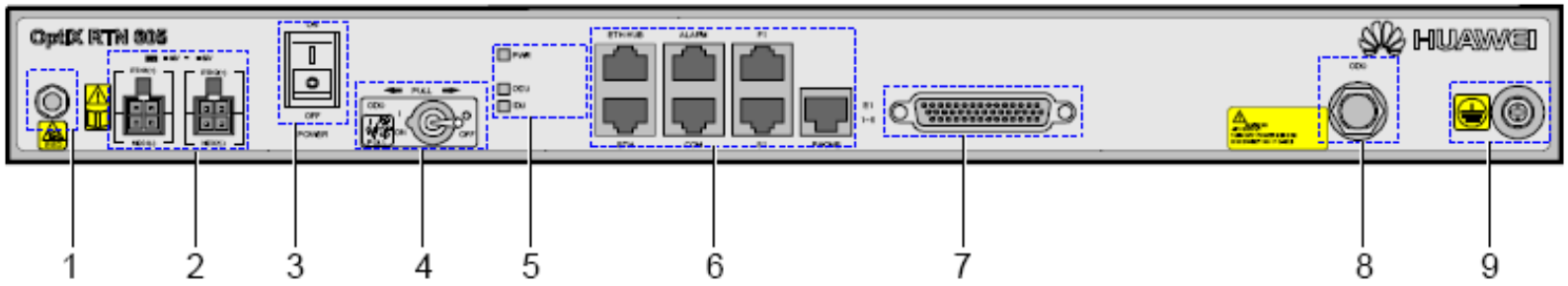
RTN605,IDU Description

Type of IDU 605	1A	1B	2B	1F	2F
Microwave type	PDH			Hybrid[a]	
Microwave modulation scheme	QPSK			QPSK/16QAM/32QAM/ 64QAM/128QAM/256QAM	
Adaptive modulation (AM) function[b]	Does not support the AM function.			Supports the AM function.	
RF configuration	1+0	1+0	1+1 HSB/ FD/SD	1+0	1+1 HSB/ FD/SD
Number of E1s	5	16		16	
Number of Ethernet interfaces	0			3xFE + 1xGE/FE	
Power	–48 V/–60 V			–48 V/–60 V	

RTN605,IDU Description

Physical & Electrical Specifications of IDU –

Size- 442mm (w) x 220mm(d) x 44 mm (h)
Weight- 2.5 to 2.7 Kgs.
Power Consumption – 17 Watts to 31 Watts @ -48VDC.



1. ESD jack
2. Power interfaces
3. Main power switch
4. ODU power switch
5. Indicators
6. Management and auxiliary interfaces
7. E1 interface
8. ODU (IF) interface
9. Grounding terminal

FRONT PANEL DETAILS FOR IDU605 1A

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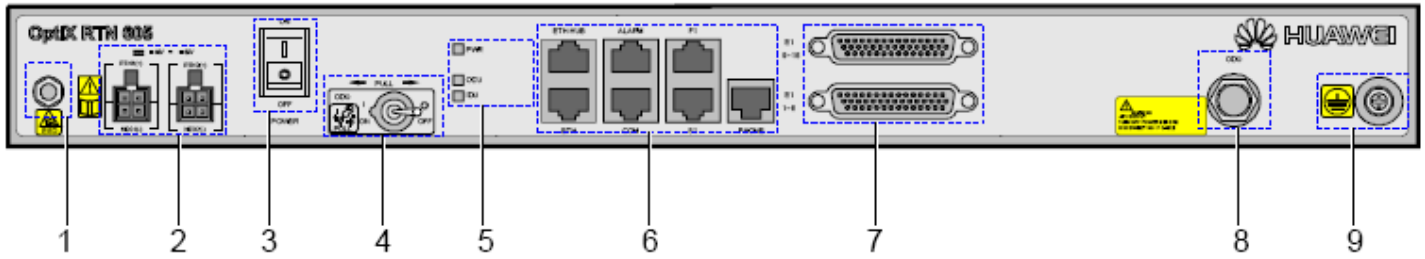
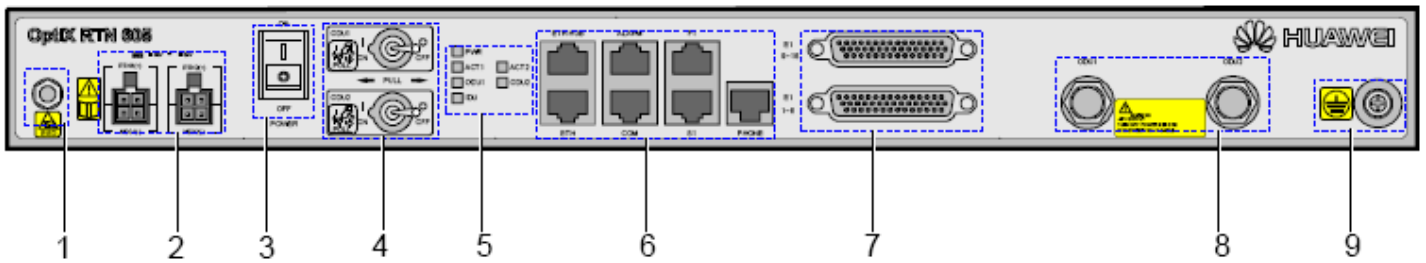
RTN 605,IDU Description



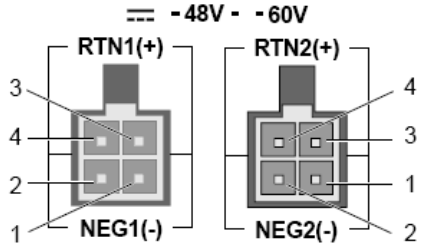
FRONT PANEL DETAIL IDU605 1B

1. ESD jack
2. Power interfaces
3. Main power switch
4. ODU power switch
5. Indicators
6. Management and auxiliary interfaces
7. E1 interface
8. ODU (IF) interface
9. Grounding terminal



FRONT PANEL DETAIL IDU605 2B

1. ESD jack
2. Power interfaces
3. Main power switch
4. ODU power switches
5. Indicators
6. Management and auxiliary interfaces
7. E1 interfaces
8. ODU (IF) interfaces
9. Grounding terminal



Interface	Pin	Signal
Power interface	1	Input power (negative, –48 V/–60 V)
	2	
	3	Input power (positive, power ground)
	4	

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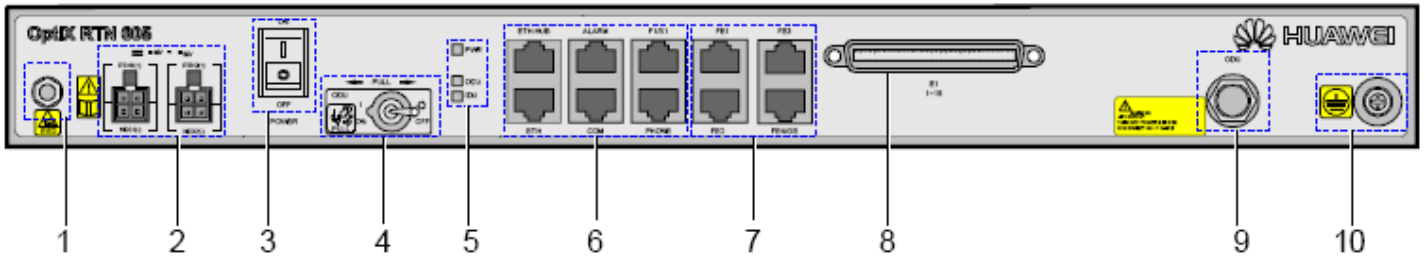
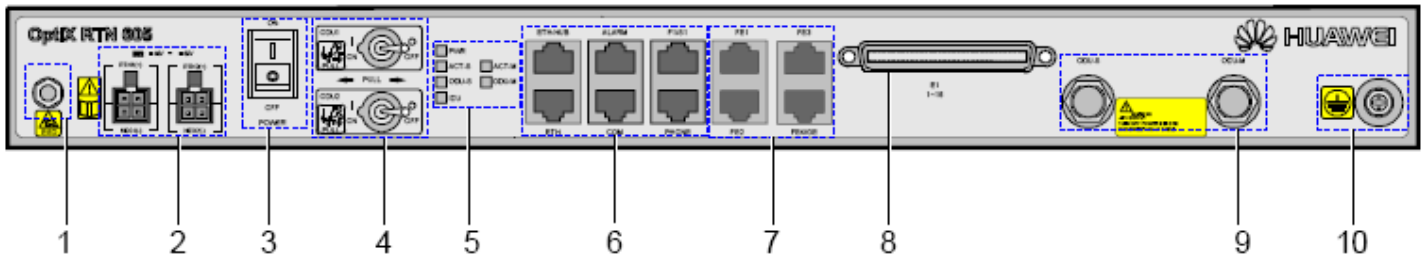
RTN 605,IDU Description



FRONT PANEL DETAIL IDU605 1F

1. ESD jack 2. Power interfaces 3. Main power switch 4. ODU power switch 5. Indicators
6. Management and auxiliary interfaces 7. Ethernet interface 8. E1 interface 9. ODU (IF) interface 10. Grounding terminal



FRONT PANEL DETAIL IDU605 2F

1. ESD jack 2. Power interfaces 3. Main power switch 4. ODU power switch 5. Indicators
6. Management and auxiliary interfaces 7. Ethernet interface 8. E1 interface 9. ODU (IF) interface 10. Grounding terminal

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Function –RTN605,IDU 1A/1B/2B

IF Processing	•Multiplexes E1 Service signals into microwave frame signals. •Codes & decodes PDH microwave frame signals. •Modulates & demodulates PDH microwave frame signals. •Modulates & demodulates ODU control signals. •Combine & splits service signals,ODU control signals & -48V power supply. •ATPC function.
Service Processing	•IDU 605 1A can access 5xE1 signals. •IDU605 1B/2B can access 16xE1 signals. •IDU 605 supports the setting of the impedance of E1 signals by using the software (75 / 120 Ohms)
Protection Processing	•The IDU 605 1A/1B/2B supports 1+1 protection for the input power supplies. •The IDU 605 2B supports the 1+1 HSB/FD/SD protection & 1+1 FD/SD hitless switching.
System Control & Communication	•Provides the system control & communication to manage the IDU & ODU. •Provides the function of collecting performance events & alarm information. •Provides the function of communicating with the NMS.
Overhead Processing	•Processes the overhead of PDH microwave frame signals. •Supports the setting & query of the link ID.

Function-RTN605,IDU 1F/2F

IF Processing

- Multiplexes E1 Service signals into microwave frame signals.
- Supports AM technology.
- Codes & decodes microwave frame signals.
- Modulates & demodulates PDH microwave frame signals.
- Modulates & demodulates ODU control signals.
- Combine & splits service signals,ODU control signals & -48V power supply.
- ATPC function.

Ethernet Layer 2 Service Processing

- Supports the EPLAN service that are based on the IEEE802.1d bridge.
- Supports EVPLAN services.

E1 Service Processing

- The IDU 605 1F/2F can access 16xE1 Signals.
- Supports the setting of the impedance of E1 signals by using the software (75/120 Ohms).

Ethernet Service signal Processing.

- IDU 605 1F/2F provides one FE/GE electrical interface & three FE electrical interfaces.
- Supports the setting & query of the working modes of the ethernet ports- 1)The FE electrical interface supports 10M full & half duplex,100M full & half duplex, & auto negotiation.2)The FE/GE electrical interface supports 10M full & half duplex,100M full & half duplex & auto negotiation.
- Supports the setting & query of the TAG attributes of the ethernet ports (tag aware,access & hybrid).
- Support the link aggregation group (LAG).

Function-RTN605,IDU 1F/2F

Protection Processing	•IDU 605 1F/2F supports 1+1 protection for the input power. •IDU605 2F supports the 1+1 HSB/FD/SD protection , 1+1 FD/SD hitless switching.
System control & communication function	•Provides the system control & communication function to manage the IDU & ODU. •Provides the function of collecting performance events and alarm information. •Provides the function of communicating with NMS.
Management & auxilary Interfaces.	• Provides one NM ethernet interface & one NE cascading interface. • Provides one management serial port. • Provides one 3-Input & 1-output alarm interface. • Provides one RS232 asynchronous data interface.

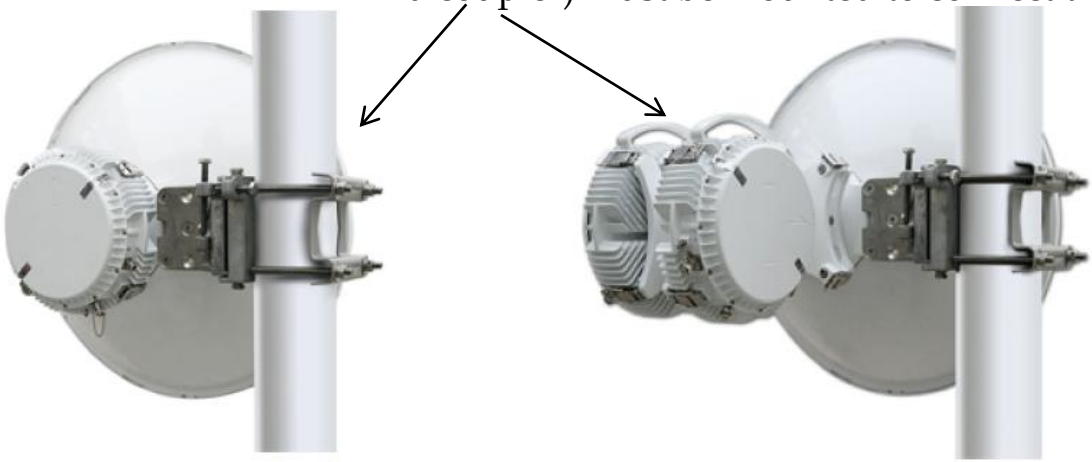
Product Description-ODU for RTN600

Item	Description		
	Standard Power ODU	High Power ODU	Low Capacity for PDH ODU
ODU type	SP and SPA	HP	LP and LPA
Frequency band	7/8/11/13/15/18/23/26/38 GHz (SP ODU) 6/7/8/11/13/15/18/23 GHz (SPA ODU)	7/8/11/13/15/18/23/26/32/38 GHz	7/8/11/13/15/18/23 GHz (LP ODU) 7/8/11/13/15/18/23/26/32/38 GHz (LPA ODU)
Microwave modulation Mode	QPSK/16QAM/32QAM/64QAM/128QAM/256QAM (SP ODU) QPSK/16QAM/32QAM/64QAM/128QAM (SPA ODU)	QPSK/16QAM/32QAM/64QAM/128QAM/256QAM	QPSK/16QAM (LP ODU) QPSK/16QAM/32QAM (LPA ODU)
Channel Spacing	3.5/7/14/28 MHz	7/14/28/40/56 MHz	3.5/7/14/28 MHz

Installation Modes-ODU for RTN600

Different installation modes are available for an ODU, depending on the type of antenna configuration. There are two methods of mounting the ODU and the antenna: direct mounting and separate mounting.

1. The direct mounting method is normally adopted when a small-diameter and single polarized antenna is used. In this situation, if one ODU is configured for one antenna, the ODU is directly mounted at the back of the antenna. If two ODUs are configured for one antenna, an RF signal combiner/splitter (hereinafter referred to as a hybrid coupler) must be mounted to connect the ODUs to the antenna.



2. The separate mounting method is adopted when a double-polarized antenna or big-diameter and single-polarized antenna is used.

Functions-ODU for RTN600

The ODU implements the following functions:

In the transmit direction, the ODU performs up-conversions and amplifications for the analog IF signal coming from the IDU. After the IF signal is converted into the RF signal with a specific frequency, the ODU transmits the RF signal to the antenna.

In the receive direction, the ODU performs down-conversions and amplifications for the RF signal coming from the antenna. After the RF signal is converted into the analog IF signal, the ODU transmits the IF signal to the IDU.

The ODU provides the control channel to receive control and management from the IDU.

The ODU provides the ATPC function.

The ODU provides rich alarms and performance events.

The ODU supports the detection of the ODU transmit power and the received signal strength indicator (RSSI).

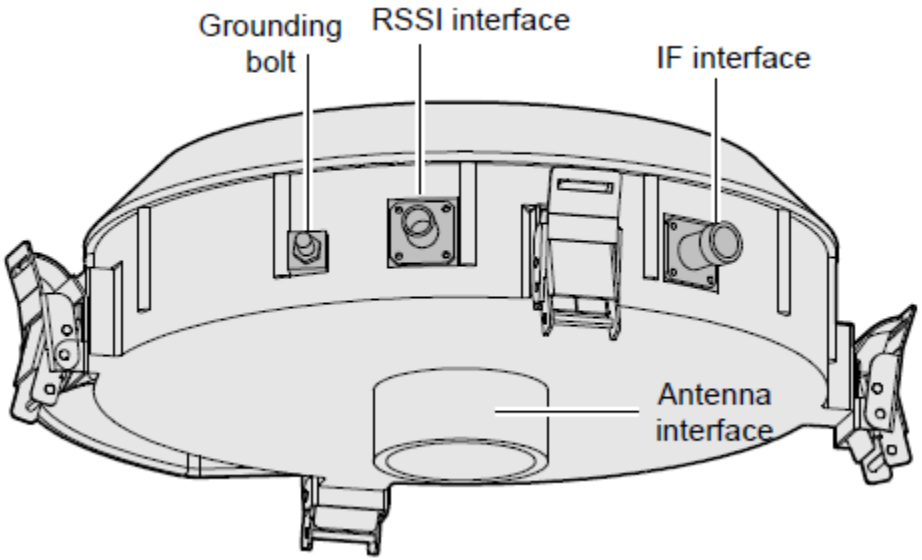
The ODU supports the detection of the ODU temperature.

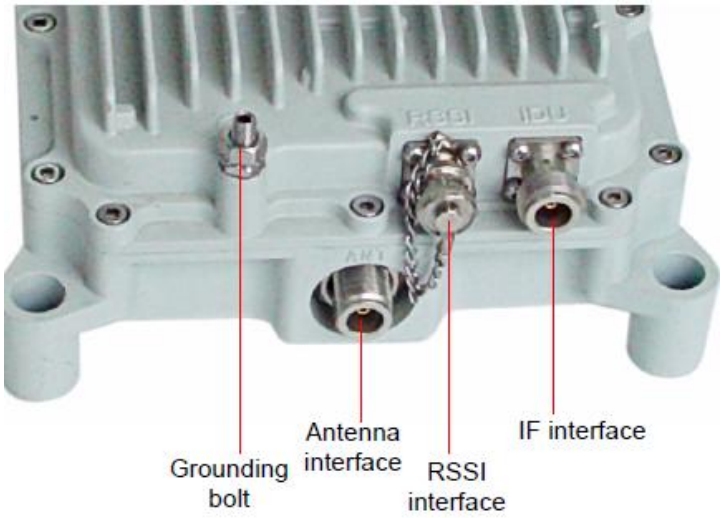
The ODU supports the querying of the manufacturing information of the ODU.

The ODU supports the setting of mute/unmute.

Interfaces-ODU for RTN600

The ODU has the antenna interface, IF interface, RSSI interface, and grounding bolts.
The ODUs are classified into the ODU with the waveguide interface and the ODU with the coaxial interface according to the type of the antenna interface of the ODU. The antenna interfaces of the 7–38 GHz ODUs are waveguide interfaces, and the antenna interfaces of the 6 GHz SPA ODUs are coaxial interfaces.





Antenna Interface- N type Female Connector
IF interface connector- N type Female
RSSI – BNC Female

MW Antenna Specification

Antenna size (cm)	Weight without mounting (kg)	Weight with mounting (kg)	Diameter (mm)	Depth (mm)
20	2.5		256 x 246 (square)	120
30	3		390	165
60	6		690	255
90	-	32.2 - 63.1	889 - 890	485 - 655
120	-	82 - 135	1247 - 1300	686 - 708
180	-	154 - 239	1918 - 1939	975 - 1002
240	-	200 [1)]	2500	1300 - 1790
300	-	250 [2)]	3200	1415 - 1790

Notes:

1) For 7-8 GHz the weight of a 240 cm antenna is 227-376 kg, for 13 GHz 376-461 kg, and for 15 GHz 376 kg.

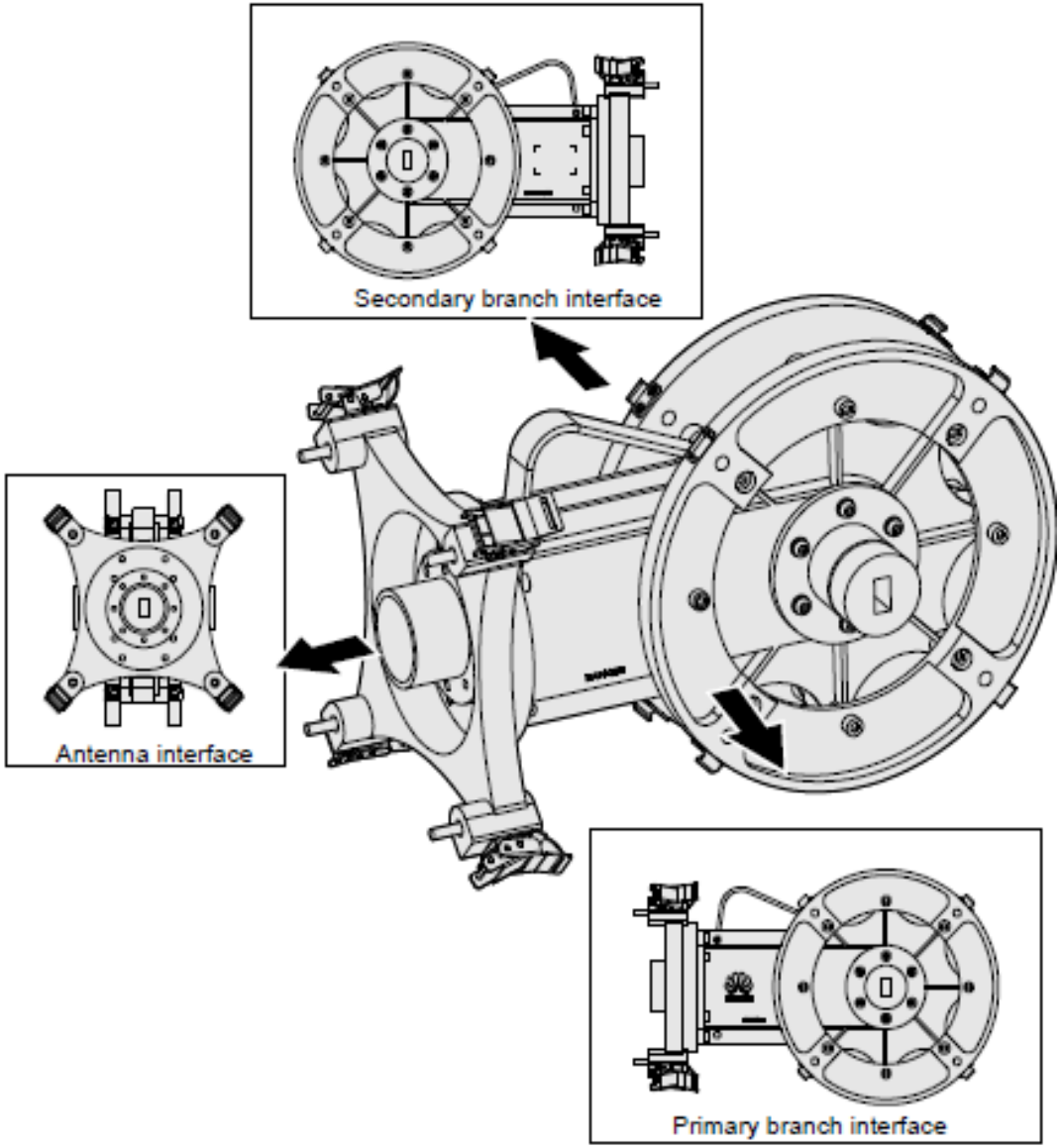
2) For 7 GHz the weight of a 300 cm antenna is 261-550 kg.

Hybrid Coupler & its interfaces

The hybrid coupler is used to combine and split RF signals.

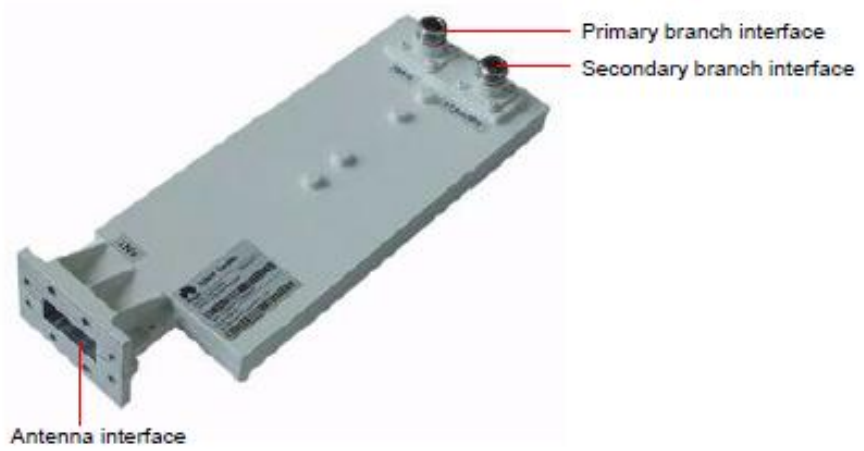
❑In the transmit direction, the hybrid coupler combines two ODU RF signals into one RF signal which is then transmitted to the antenna.
❑In the receive direction, the hybrid coupler divides the RF signal received from the antenna into two RF signals which are then transmitted to the ODU.

A hybrid coupler consists of a waveguide cavity-.
❑The waveguide cavity is the major part of a hybrid coupler. It has three ports. They are the common interface, primary branch interface, and secondary branch interface.
❑In the transmit direction, the RF signals received by the two branch interfaces are combined into one in the waveguide cavity, which is then output through the common interface.
❑In the receive direction, the RF signal received by the common interface are divided into two RF signals in the waveguide cavity, which are then output through the two branch interfaces.



Hybrid Coupler & its interfaces

The hybrid coupler has three types of interfaces: antenna interface, primary branch interface, and secondary branch interface.



The hybrid couplers are classified into the hybrid coupler with waveguide interfaces and the hybrid coupler with coaxial interfaces according to the type of the branch interfaces of the hybrid coupler. The ODUs with waveguide interfaces use the hybrid couplers with waveguide interfaces, and the ODUs with coaxial interfaces use the hybrid couplers with coaxial interfaces.

The hybrid couplers is available in two series: 3 dB balanced hybrid coupler and 6 dB unbalanced hybrid coupler.

- A 3 dB balanced hybrid coupler can split one RF signal into two RF signals that have almost the same power. In other words, each of the two RF signals is attenuated about 3 dB, compared with the original RF signal.
- A 6 dB unbalanced hybrid coupler can split one RF signal into two RF signals that have different power. The RF signal that has the smaller power is attenuated about 6 dB, compared with the original RF signal.

Interface	Mark	Function	Type of Connector
Antenna interface	-	Connects to the antenna.	UDR70
Primary branch interface[a]	MAIN	Connects to the active ODU.	Type-N (female)
Secondary branch interface[a]	STANDBY	Connects to the standby ODU.	

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RTN620,IDU PRODUCT DESCRIPTION

RTN620,IDU Configuration Modes & Service interface

The OpitX RTN 620 supports the 1+0 protection configuration, 1+1 protection configuration, N+1 protection configuration, and XPIC configuration

Configuration Mode		Maximum Number of Directions
1+0 non-protection configuration		4
1+1 protection configuration (1+1 HSB/FD/SD)		2
N+1 protection configuration	2+1 (for one NE)	1
	3+1 (for two NEs)	1
XPIC configuration		2

Note: - The Hybrid microwave and the PDH microwave do not support the N+1 protection configuration and the XPIC configuration

Type of the service interface board	Service Interface	Number of Interfaces Provided by One Board	Maximum Number of Boards
PO1	75/120-ohm E1 interface	8	4
PH1	75/120-ohm E1 interface	16	4
PD1	75/120-ohm E1 interface	32	4
PL3	75-ohm E3/T3 interface	3	4
SL4	STM-4 optical interfaces: S-4.1, L-4.1, and L-4.2	1	2
SL1	STM-1 optical interface: Ie-1, S-1.1, L-1.1, and L-1.2	1	4
SD1	STM-1 optical interface: Ie-1, S-1.1, L-1.1, and L-1.2	2	4
SLE	75-ohm STM-1 electrical interface	1	4
SDE	75-ohm STM-1 electrical interface	2	4
EFT4	FE electrical interface: 10/100BASE-T(X)	4	4

RTN620,IDU Physical Appearance & Interfaces

FAN Slot 20	EXT/IF	Slot7	EXT/IF	Slot8
	EXT/IF	Slot5	EXT/IF	Slot6
	PXC	Slot3	EXT	Slot4
	PXC	Slot1	SCC	Slot2

The Board details are as below,

- IF Board : IF1A/IF1B,IFX,IF0A/IF0B,IFH2.
- SDH Board: SL4,SL1,SD1,SLE & SDE.
- PDH Board:PL3,PO1,PH1,PD1.
- Ethernet Board:EFT4,EMS6.
- Integrated power cross connect board:PXC.
- System Control and communication board: SCC.
- Fan Board :FAN

Dimension of one IDU 620 is
442 mm x 220 mm x 87 mm .

I/P Power Supply & MCB Requirements are as below,
I/P Voltage- (- 40VDC to -60VDC) ,MCB required is 2 Nos of 10A.

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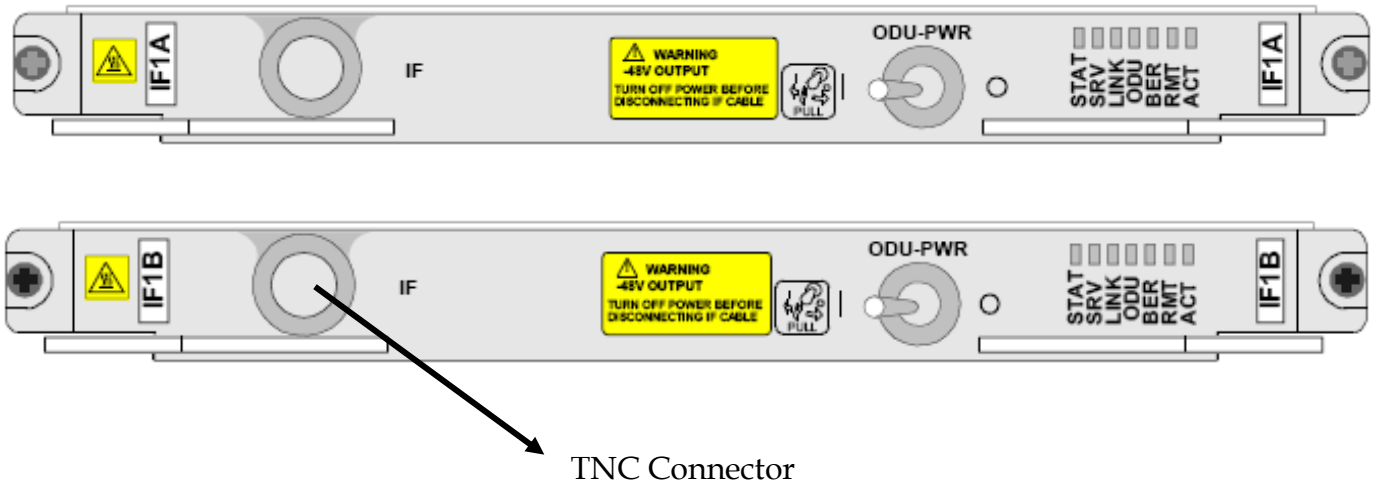
RTN620,IDU IF Board & Interfaces



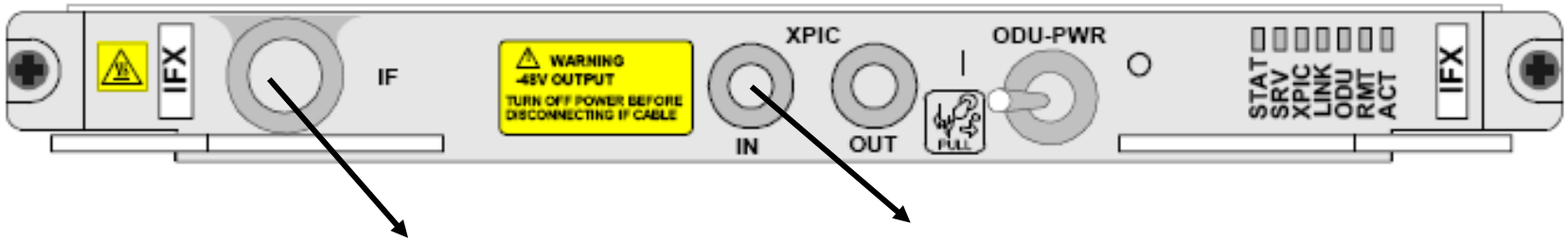
Dimension & Weight of one IF Board is
203.6 mm x 201.3 mm x 19.6 mm .
Weight – 420 Gms for IF1A & 400Gms for IF1B
I/P Power Supply is as below,
Power Consumption is 12.2 Watts.

Function are as below,

- The IF1A/IF1B receives & transmits one IF signal & provides the management channel to the ODU and the -48VDC to ODU.
- IF Processing – Maps PDH ,SDH & Ethernet Service signals to MW signal.
- Code & Decodes Microwave Signals.
- Modulate & demodulate MW signals.
- Overhead Processing
- Pointer Processing – Process AU Pointer in SDH & TU Pointer in PDH MW signals.
- Protection Processing

RTN620,IDU IFX Board & Interfaces

The IFX is a cross polarization interface cancellation (XPIC) IF board >The IFX board supports only the DC-C power distribution mode.



TNC

SMA

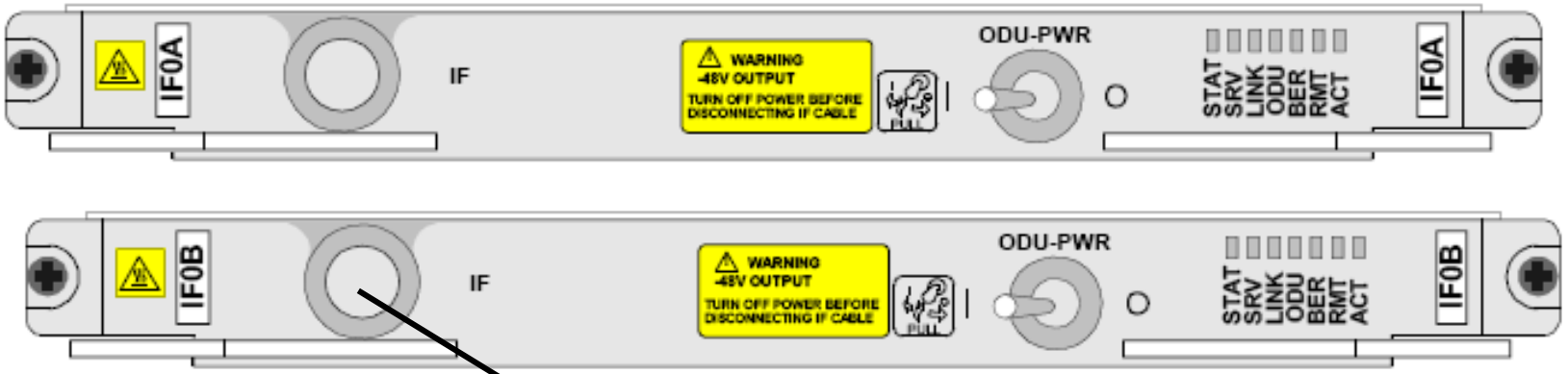
Dimension & Weight of one IF Board is
203.6 mm x 201.3 mm x 19.6 mm .
Weight – 450 Gms.
I/P Power Supply is as below,
Power Consumption is 14.5 Watts.

Function are as below,

- The IFX receives & transmits one IF signal & provides the management channel to the ODU & the -48V power that the ODU requires. The IFX can cancel the cross polarization interference in the IF signal.
- IF Processing – Maps VC-4 Service Signal to SDH MW frame signal .
- Code & Decodes SDH Microwave Signals.
- Modulate & demodulate SDH MW signals.
- Pointer Processing – Process AU Pointer in SDH MW signals.
- Protection Processing

RTN620,IDU IF0A/IF0B Board & Interfaces

The IF0A/IF0B receives & transmits one IF signal ,and provides the management channel to the ODU & the -48VDC power that the ODU requires.



TNC

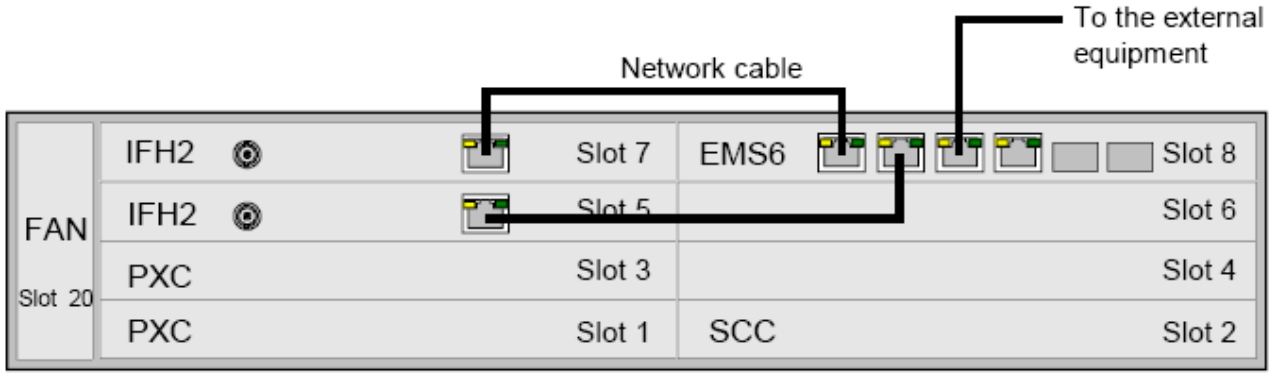
Dimension & Weight of one IF Board is
203.6 mm x 201.3 mm x 19.6 mm .
Weight – 520 Gms.
I/P Power Supply is as below,
Power Consumption is 13.7 Watts.

Function are as below,

- IF Processing – Multiplexes 2E1/5E1/10E1/16E1 service signal to PDH MW frame signal.
- Code & Decodes PDH Microwave Signals.
- Modulate & demodulate PDH MW signals.
- Modulate & demodulate ODU control signal.

RTN620,IDU IFH2 Board & Interfaces

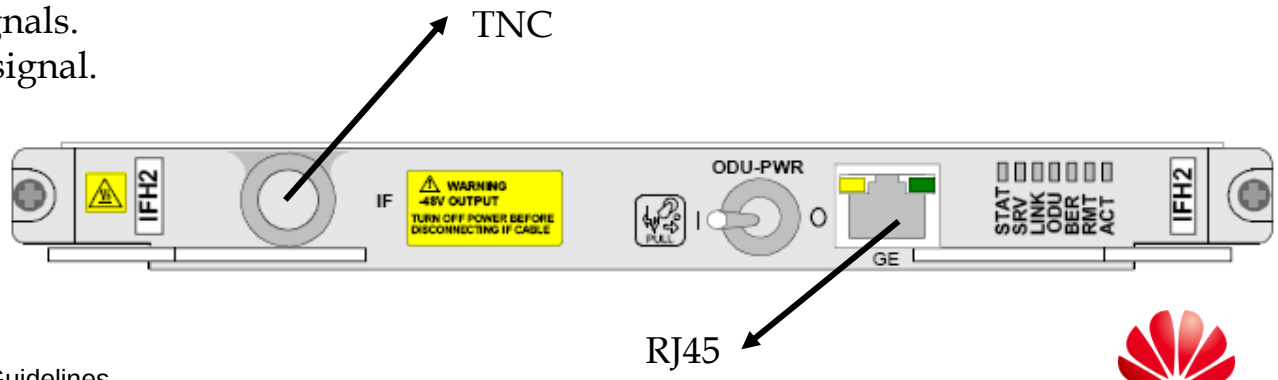
The IFH2 receives & transmits one IF signal, and provides the management channel to the ODU and the -48VDC power that the ODU requires. The IFH2 supports the hybrid transmission of E1 services & Ethernet services.



Dimension & Weight of one IF Board is
203.6 mm x 201.3 mm x 19.6 mm .
Weight – 580 Gms.
I/P Power Supply is as below,
Power Consumption is 16.4 Watts.

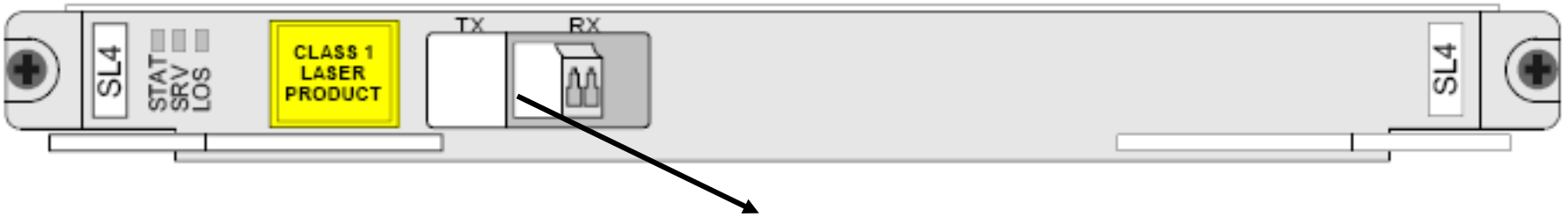
Function are as below,

- ❑ IF Processing – Support the Hybrid MW frame & supports the pure transmission of the E1 / Ethernet signals and the hybrid transmission of the E1 & Ethernet signals.
- ❑ Support adaptive modulation.
- ❑ Maps service signal to MW frame signals.
- ❑ Code & Decodes Microwave frame Signals.
- ❑ Modulate & demodulate MW frame signals.
- ❑ Modulate & demodulate ODU control signal.



RTN620,IDU SL4 Board & Interfaces

The SL4 receives & transmits 1xSTM-4 optical signals.



LC SFP (Single Mode)

Dimension & Weight of one SL4 Board is
203.6 mm x 201.3 mm x 19.6 mm .
Weight – 290 Gms.
I/P Power Supply is as below,
Power Consumption is 7.2 Watts.

Function are as below,

- Process the regenerator section overhead of the STM-4 signals.
- Process the multiplex section overhead of the STM-4 signals.
- Process the higher order path overhead of the STM-4 signals.
- Process AU pointer.

RTN620,IDU SL1/SD1 Board & Interfaces

The SL1 receives & transmits 1xSTM-4 optical signals. The SD1 receives & transmits 2xSTM-1 optical signals

Slot 20	SL1/SD1	Slot7	SL1/SD1	Slot8
	SL1/SD1	Slot5	SL1/SD1	Slot6
		Slot3	SL1/SD1	Slot4
		Slot1		Slot2

Dimension & Weight of one SL1 & SD1 Board is
203.6 mm x 201.3 mm x 19.6 mm .
Weight – 290 Gms. For SL1 & 300 Gms for SD1
I/P Power Supply is as below,
Power Consumption is 3.9 Watts.

Function are as below,

- ❑ Process the regenerator section overhead of the STM-1 signals.
- ❑ Process the multiplex section overhead of the STM-1 signals.
- ❑ Process the higher order path overhead of the STM-1 signals.
- ❑ Process AU pointer.

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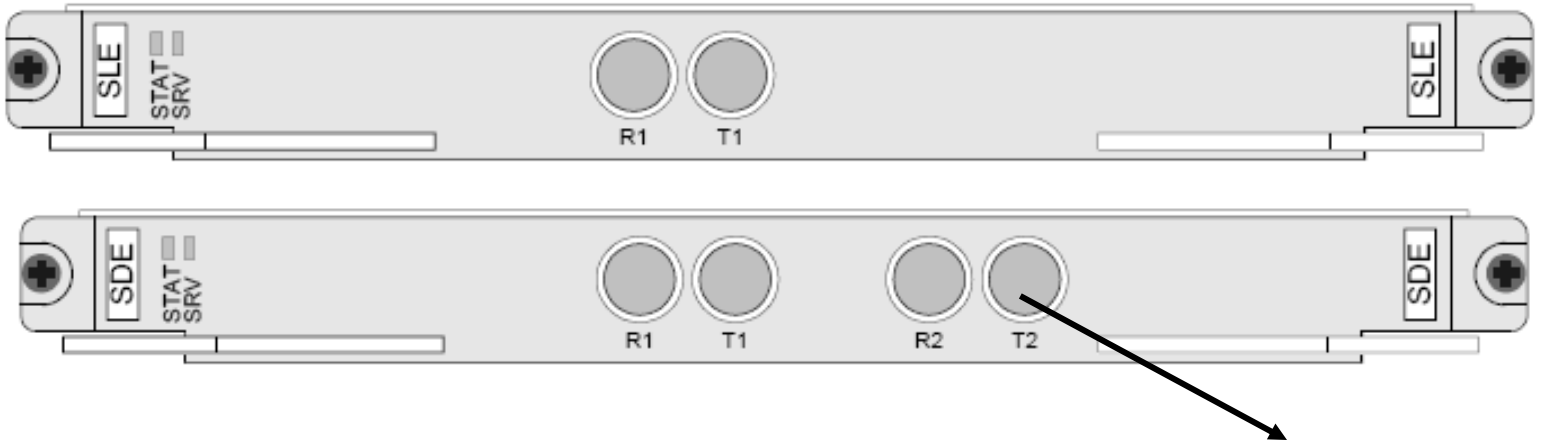
RTN620,IDU SLE/SDE Board & Interfaces

The SLE receives & transmits 1xSTM-1 electrical signals .The SDE receives & transmits 2xSTM-1 electrical signals.



Function are as below,

- Process the regenerator section overhead of the STM-1 signals.
- Process the multiplex section overhead of the STM-1 signals.
- Process the higher order path overhead of the STM-1 signals.
- Process AU pointer.
- Supports the setting of the SNCP switching conditions.
- Supports the setting of the linear MSP switching conditions.

Dimension & Weight of one SLE & SDE Board is
203.6 mm x 201.3 mm x 19.6 mm .
Weight – 300 Gms. For SLE & 330 Gms for SDE
I/P Power Supply is as below,
Power Consumption is 4.9 Watts.

Slot 20	SLE/SDE	Slot7	SLE/SDE	Slot8
	SLE/SDE	Slot5	SLE/SDE	Slot6
		Slot3	SLE/SDE	Slot4
		Slot1		Slot2

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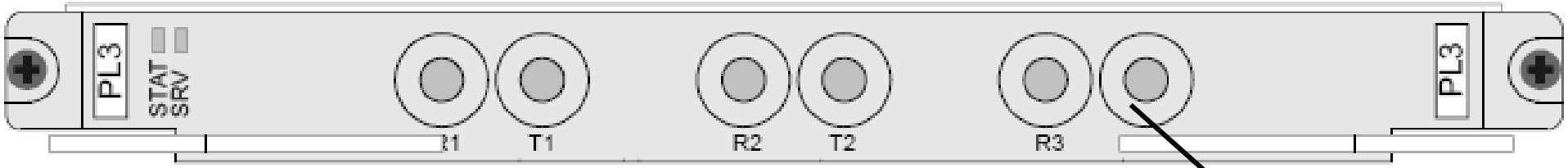
RTN620,IDU PL3 Board & Interfaces

The PL3 receives & transmits 3xE3/T3 signals .



Slot 20	PL3	Slot7	PL3	Slot8
	PL3	Slot5	PL3	Slot6
		Slot3	PL3	Slot4
		Slot1		Slot2

SMB Connector

Function are as below,

- Supports the settings & querying of the type of the accessed service signal by the software (E3/T3).
- Supports the setting & querying of the Input/Output equalization of the T3 signal.
- Processes overhead & pointers at the VC-3 level.
- Supports the first & third E3/T3 signals to be extracted as the tributary clock source.

Dimension & Weight of one PL3 Board is
203.6 mm x 201.3 mm x 19.6 mm .
Weight – 310 Gms.
I/P Power Supply is as below,
Power Consumption is 5.1 Watts.

RTN620,IDU PO1/PH1/PD1 Board & Interfaces

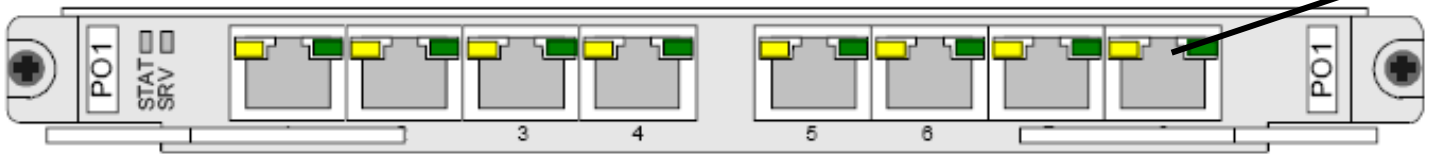
The PO1 receives & transmits 8xE1 signals. The PH1 receives & transmits 16xE1 & PD1 receives & transmits 32xE1 signal. The PO1 has two functional versions : SL61PO1 & SL62PO1.The functional version of PH1 and PD1 is SL61.

SL61PO1---DB44 Connector & both 75 and 120 Ohms impedance.

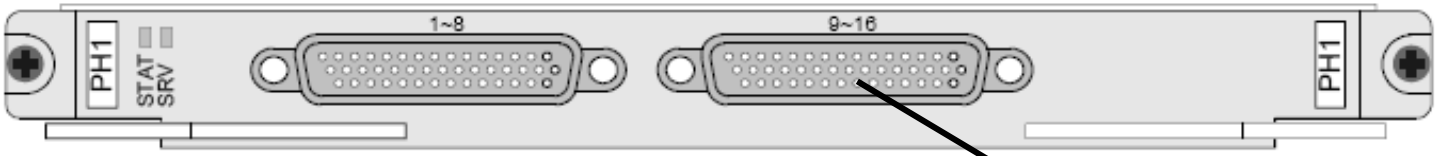
SL62PO1---RJ45 Connector & only support 120Ohms.

SL61PO1

SL62PO1



RJ45 Connector



DB44 Connector

Function are as below,

- Supports the retiming function of E1 signals.
- Supports the 1st & 5th E1 signals to be extracted as the tributary clock source.
- Supports the in loop & out loop at the E1 tributary.
- Supports the querying of the manufacturing information of the board.

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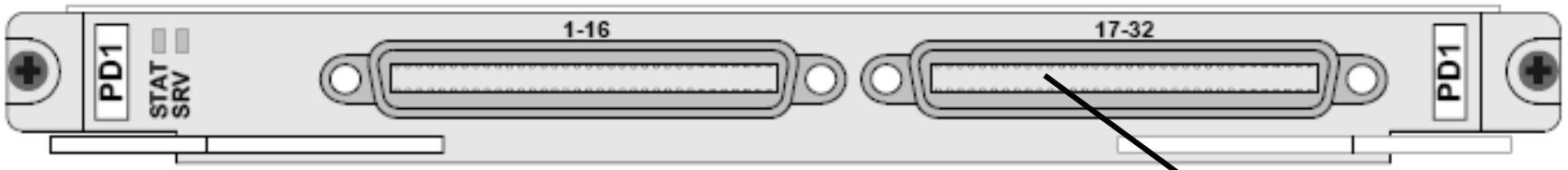
RTN620,IDU PO1/PH1/PD1 Board & Interfaces



Slot 20	PO1/PH1	Slot7	PO1/PH1	Slot8
	PO1/PH1	Slot5	PO1/PH1	Slot6
		Slot3	PO1/PH1	Slot4
		Slot1		Slot2

MDR68 Connector

Dimension & Weight of Boards are,
203.6 mm x 201.3 mm x 19.6 mm .
Weight –
PO1-280Gms ,PH1-310Gms,PD1-380Gms.

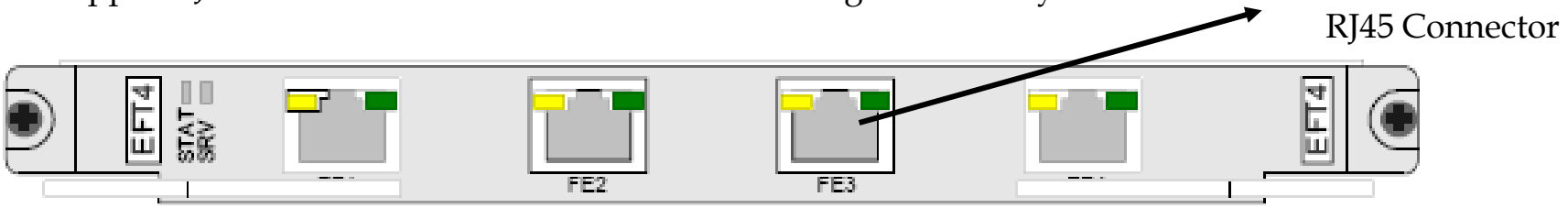
I/P Power Supply is as below,
PO1-2 Watts,PH1-2.8Watts & PD1-5.8Watts.

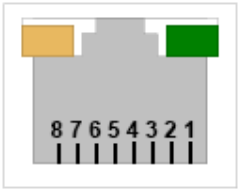
RTN620,IDU EFT4 Board & Interfaces

The EFT4 transparently transmits 4xFE signals. It has two functional versions, : SL61EFT4VERA & SL61EFT4VERB.

The functions are as below,

- Supports the setting & querying of the working modes of the Ethernet ports. The working modes supported are 100M
- full-duplex ,10M full duplex & auto negotiation.
- Supports JUMBO frames with a maximum frame length of 9600 bytes.





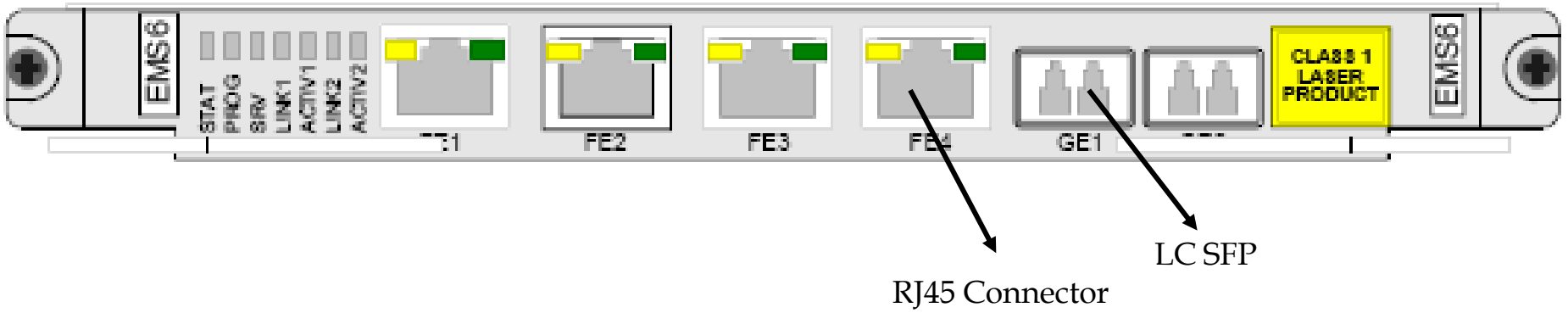
Dimension & Weight of Boards is, ----203.6 mm x 201.3 mm x 19.6 mm .
Weight – 306Gms.
I/P Power Supply is ---7.5 Watts

Interface	Pin	Signal
FE1–FE4	1	Transmitting data (+)
	2	Transmitting data (–)
	3	Receiving data (+)
	6	Receiving data (–)
	4, 5, 7, 8	Reserved

Slot 20	EFT4	Slot7	EFT4	Slot8
	EFT4	Slot5	EFT4	Slot6
		Slot3	EFT4	Slot4
		Slot1		Slot2

RTN620,IDU EMS6 Board & Interfaces

The EMS6 accesses 4xFE signals & 2xGE/FE signals, and supports transparent transmission services & Layer 2 switching services.



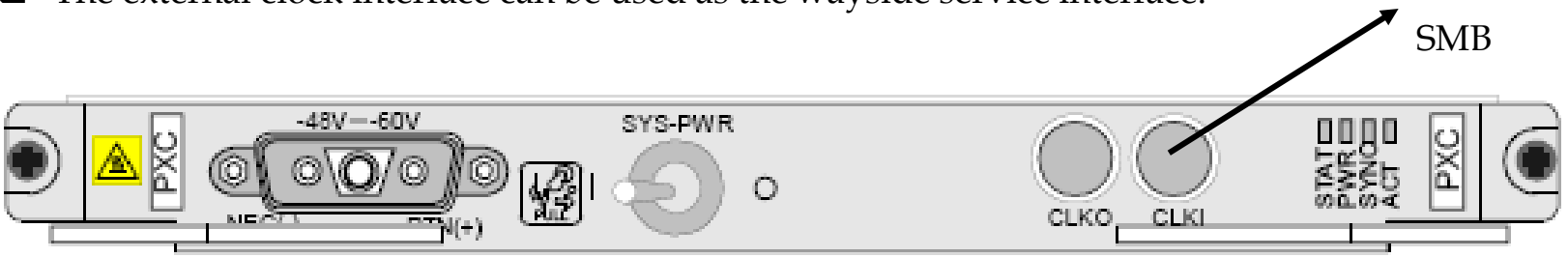
Slot 20	EMS6	Slot7	EMS6	Slot8
	EMS6	Slot5	EMS6	Slot6
		Slot3	EMS6	Slot4
		Slot1		Slot2

Dimension & Weight of Boards is, ----203.6 mm x 201.3 mm x 19.6 mm .
Weight – 400Gms.
I/P Power Supply is ---12.3 Watts

RTN620,IDU PXC Board & Interfaces

The PXC supports not only the cross connection & timing ,but also supplies power to the other boards.

- It Receives one input of -48 VDC power & output is one -48VDC & +3.3VDC for other boards.
- Detect & protect the input power.
- Supports the detection of the external clock source.
- Supports the trace ,holdover & free run modes.
- One PXC supports one input & one Output of the external clock.
- The external clock interface can be used as the wayside service interface.

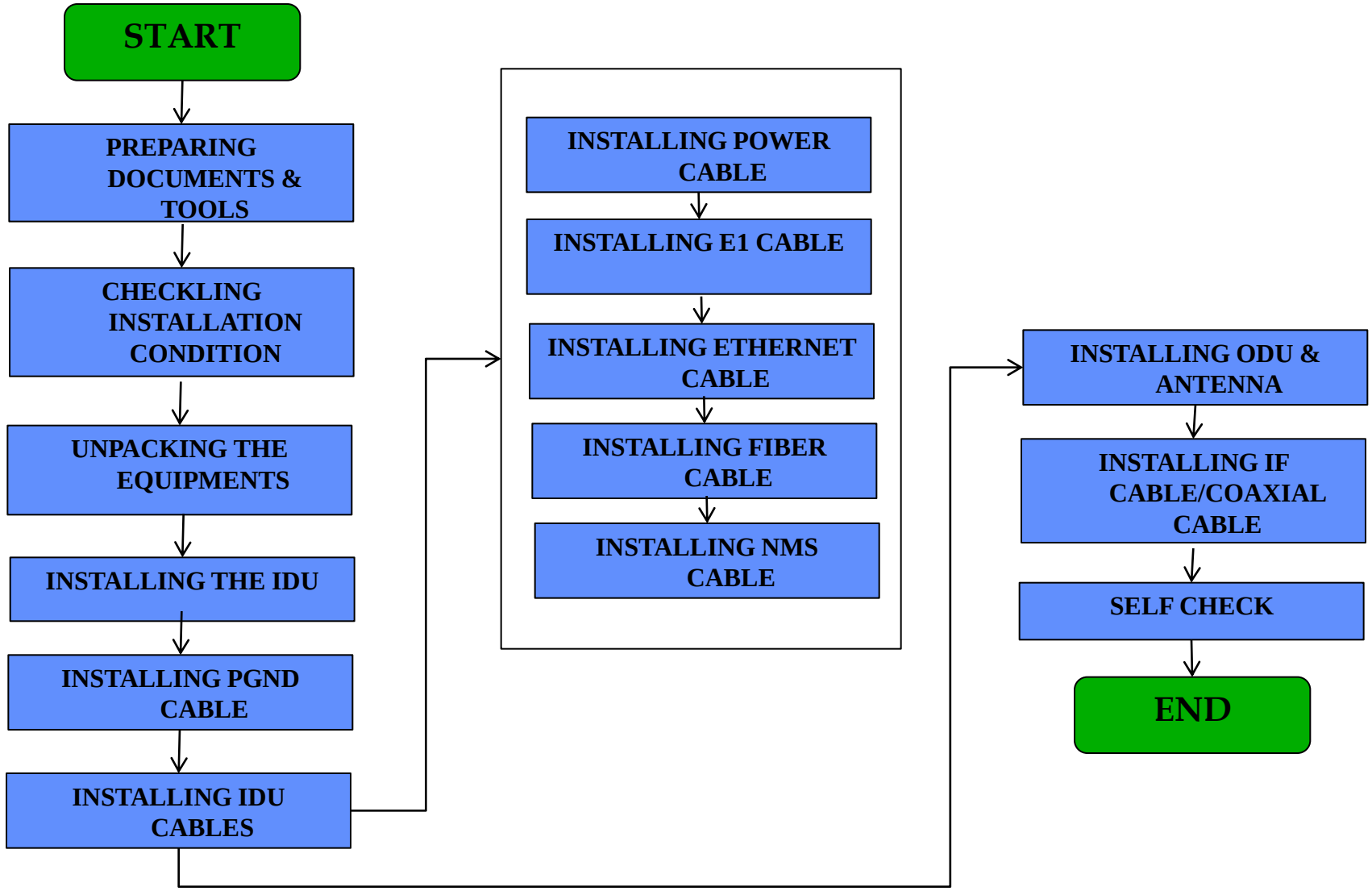


Slot 20		Slot7	Slot8
		Slot5	Slot6
	PXC	Slot3	Slot4
	PXC	Slot1	Slot2

Dimension & Weight of Boards is, ----203.6 mm x 201.3 mm x 19.6 mm .
Weight – 540 Gms.
I/P Power Supply is ---7.5 Watts

RTN605 -IDU INSTALLATION

IDU 605 Installation Procedure



Tools for installing IDU

 Tape Measure 长卷尺	 Level Bar 水平尺	 Philips Screwdriver 十字螺丝刀	 Flathead Screwdriver 一字螺丝刀	 Adjustable Wrench 活动扳手
 Socket Wrench 成套套筒	 Torque Wrench 力矩扳手	 Allen Wrench 内六角扳手	 Ratchet Crimp Tool 压线钳	 Cable Cutter 断线钳
 Wire Stripper 剥线钳	 Network Cable Crimping Pliers 网线钳	 Diagonal Pliers 斜口钳	 Crimping Tool 冷压钳	 Sharp-nose Pliers 尖嘴钳
 Bayonet Wrench 呆扳手	 Pliers 钢丝钳	 File 锉刀	 Multimeter 万用表	 Heat Gun 热风枪
 Percussion Drill 冲击钻	 Marker Pen 划线笔	 Paper Knife 裁纸刀	 Claw Hammer 羊角锤	 Antistatic gloves 安装手套
 Antistatic Gloves 防静电手套	 Antistatic Wrist Strap 防静电腕带	 Ladder 梯子	 Electric Iron 电烙铁	 Punching Wire pliers 打线刀
 Cleaner 吸尘器	 Binding Strap 光纤绑扎带	 Insulation Tape 电器绝缘胶带		

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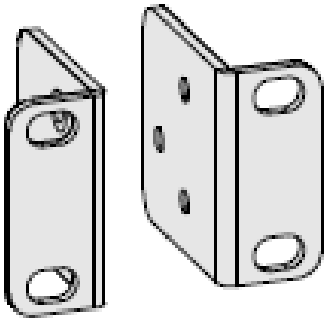
IDU 605 Rack mounting ears

When you install the IDU 605 in a cabinet, use the rack-mounting ears that match the type of cabinet.



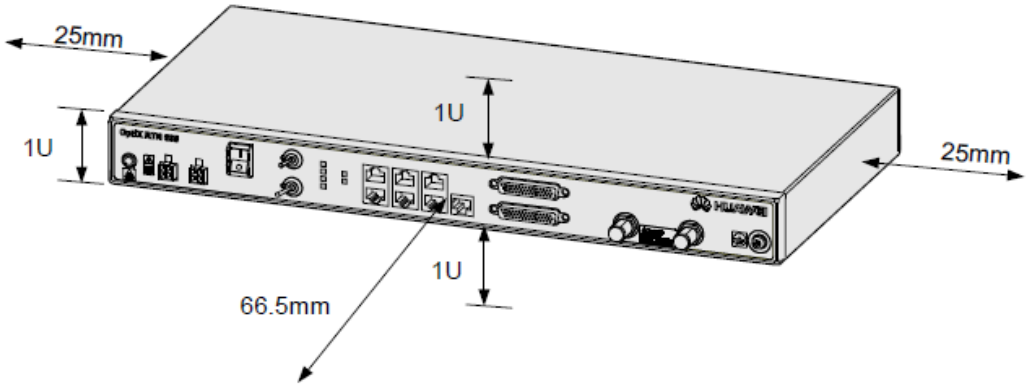
Prerequisite;
The cabinet must be installed.
The chassis and installation materials must be shipped to the installation site.

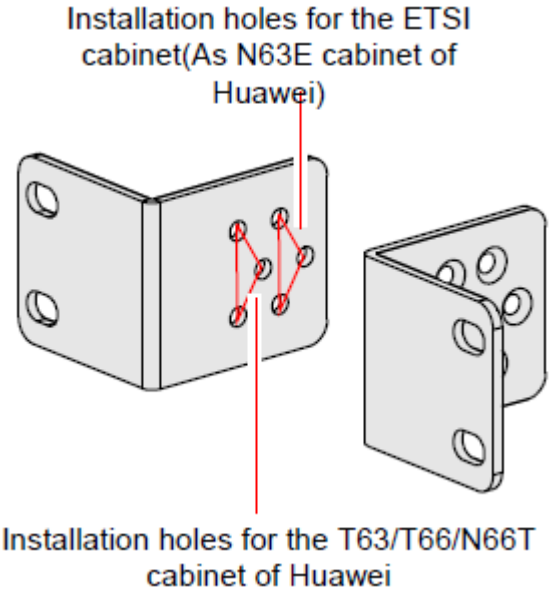
There must be space for the chassis in the cabinet.

❑As the IDU 605 applies the air convection method, a space of 1U at the top and bottom of the IDU chassis must be provided for heat dissipation. And ensure to prevents the high temperature air from other equipment, from entering the chassis.

❑The rack-mounting ears for the 19-inch cabinet have been installed on the IDU before delivery.

❑The installation holes on an ear are classified into two groups. One group of installation holes is used to install an IDU into a standard ETSI cabinet(as N63E cabinet of HuaWei), and the other group of installation holes is used to install an IDU into the T63/T66/N66T cabinet of Huawei.



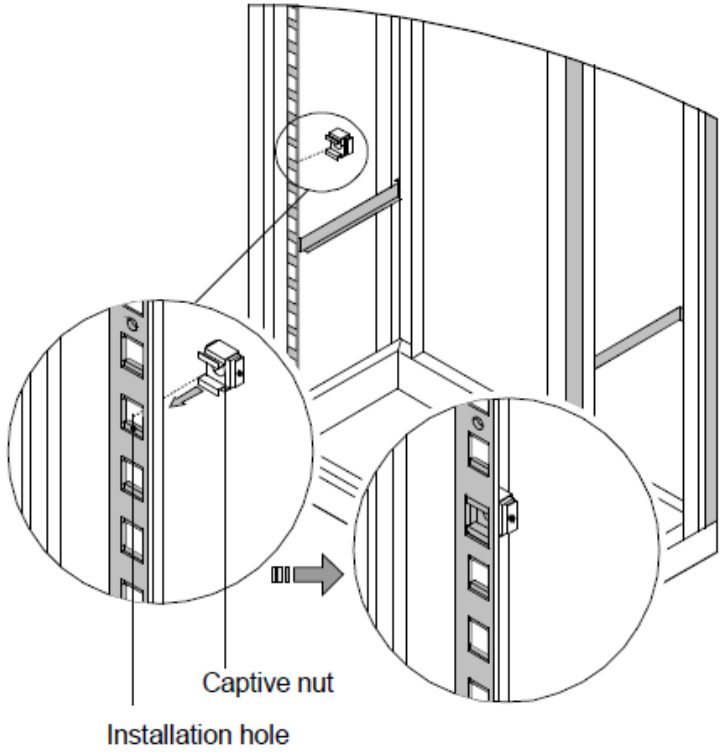


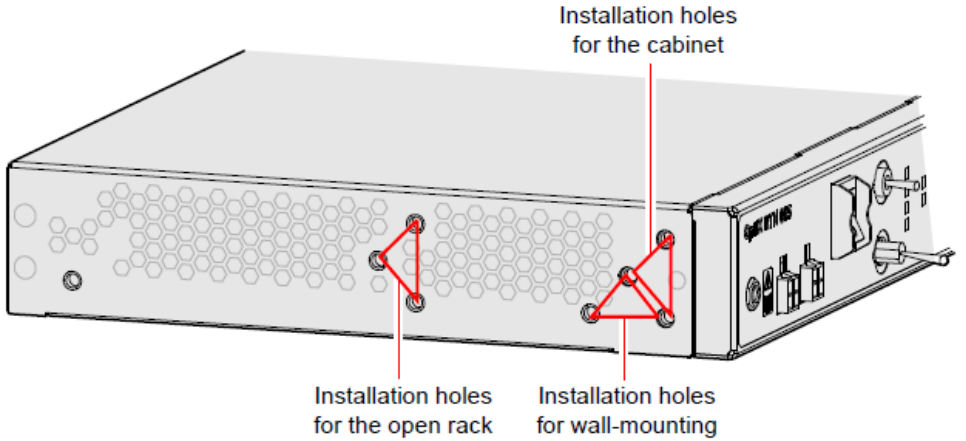
IDU 605 Installation

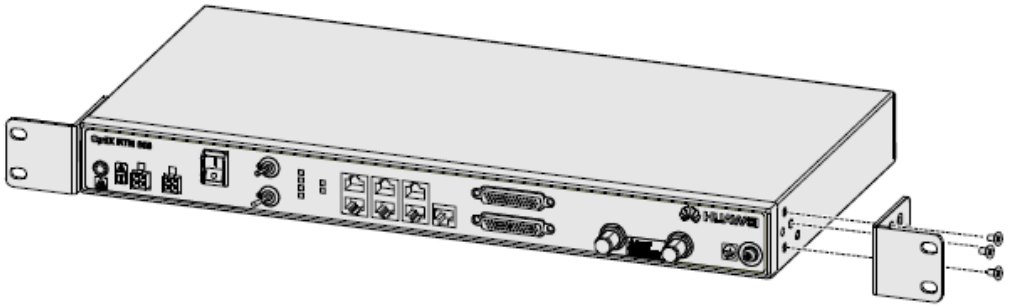
The IDU 605 can be installed as follows;

- ❑In a 300 mm ETSI cabinet
- ❑In a 600mm ETSI cabinet
- ❑In a 450 mm 19-inch cabinet
- ❑In a 600mm 19-inch cabinet
- ❑In an open rack
- ❑On the wall

IDU Installation in 19″ Rack-Indoor

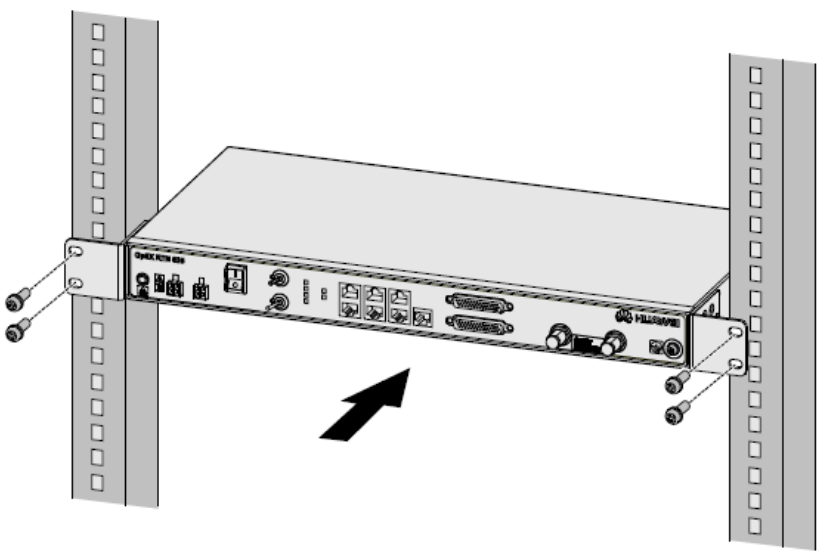


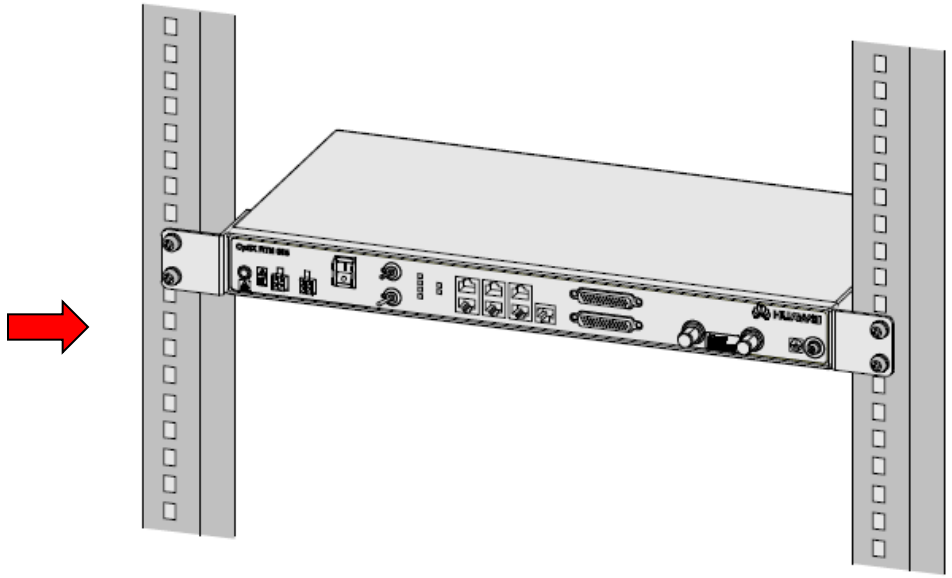


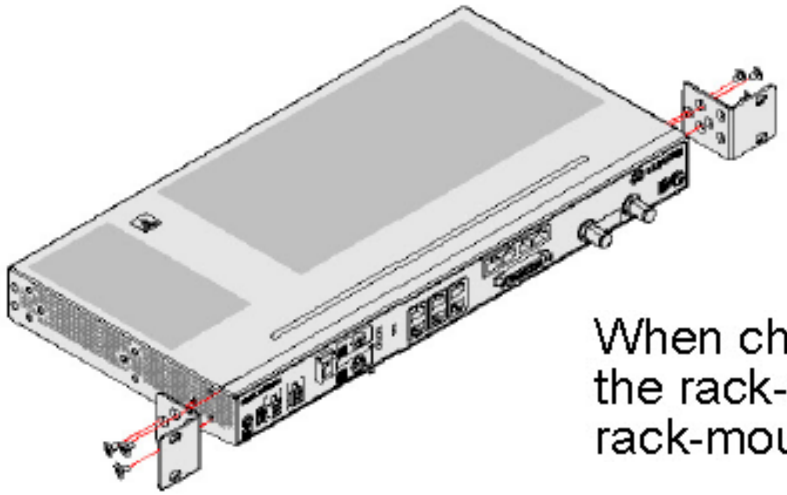


- ❑ Determine the installation location of the chassis in the cabinet. Fasten the captive nuts into the corresponding installation holes in the upright posts of the cabinet.
- ❑Replace the rack-mounting ears for the 19-inch cabinet on both sides of the IDU with the rack-mounting ears for the ETSI cabinet packed with the IDU.
- ❑ Fasten two captive nuts on each side of the cabinet. All the captive nuts should be at the same level.

IDU 605 Installation in 19″ Cabinet







When chassis installed in the ETSI cabinet, replacing the rack-mounting ears for the 19-inch cabinet with the rack-mounting ears for the ETSI cabinet .

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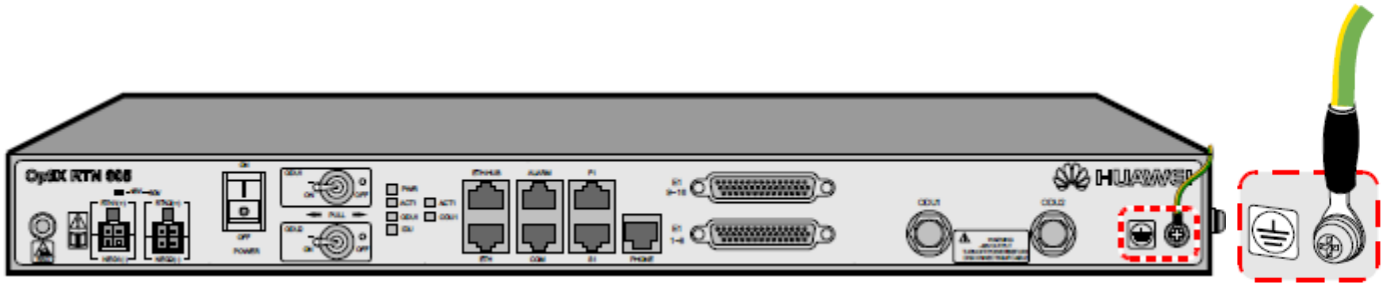
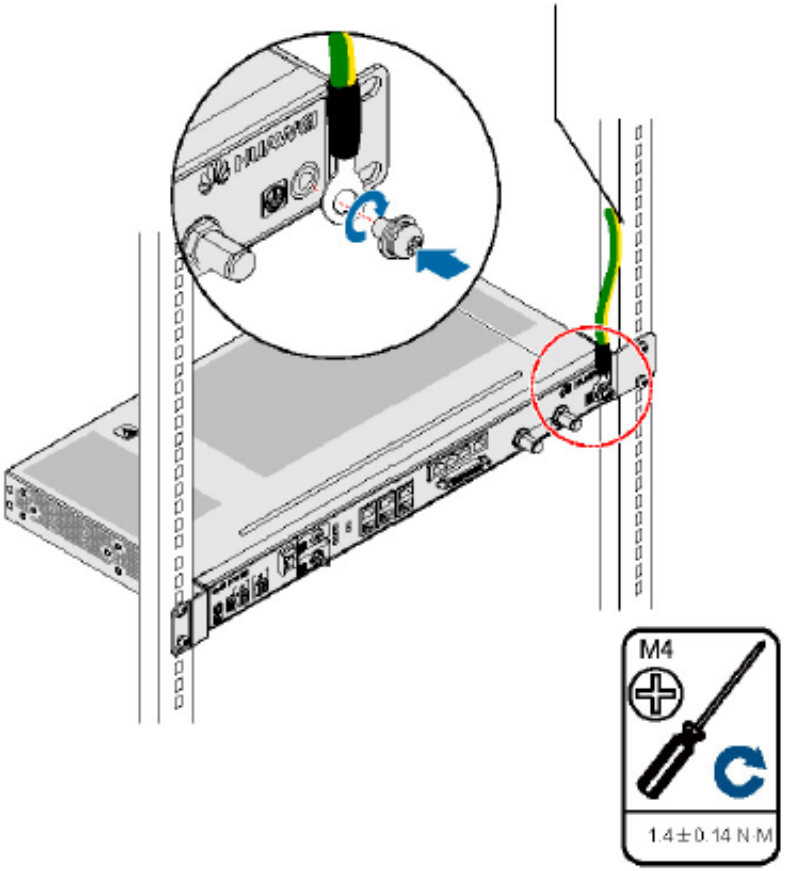
IDU 605 PGND Cable Installation

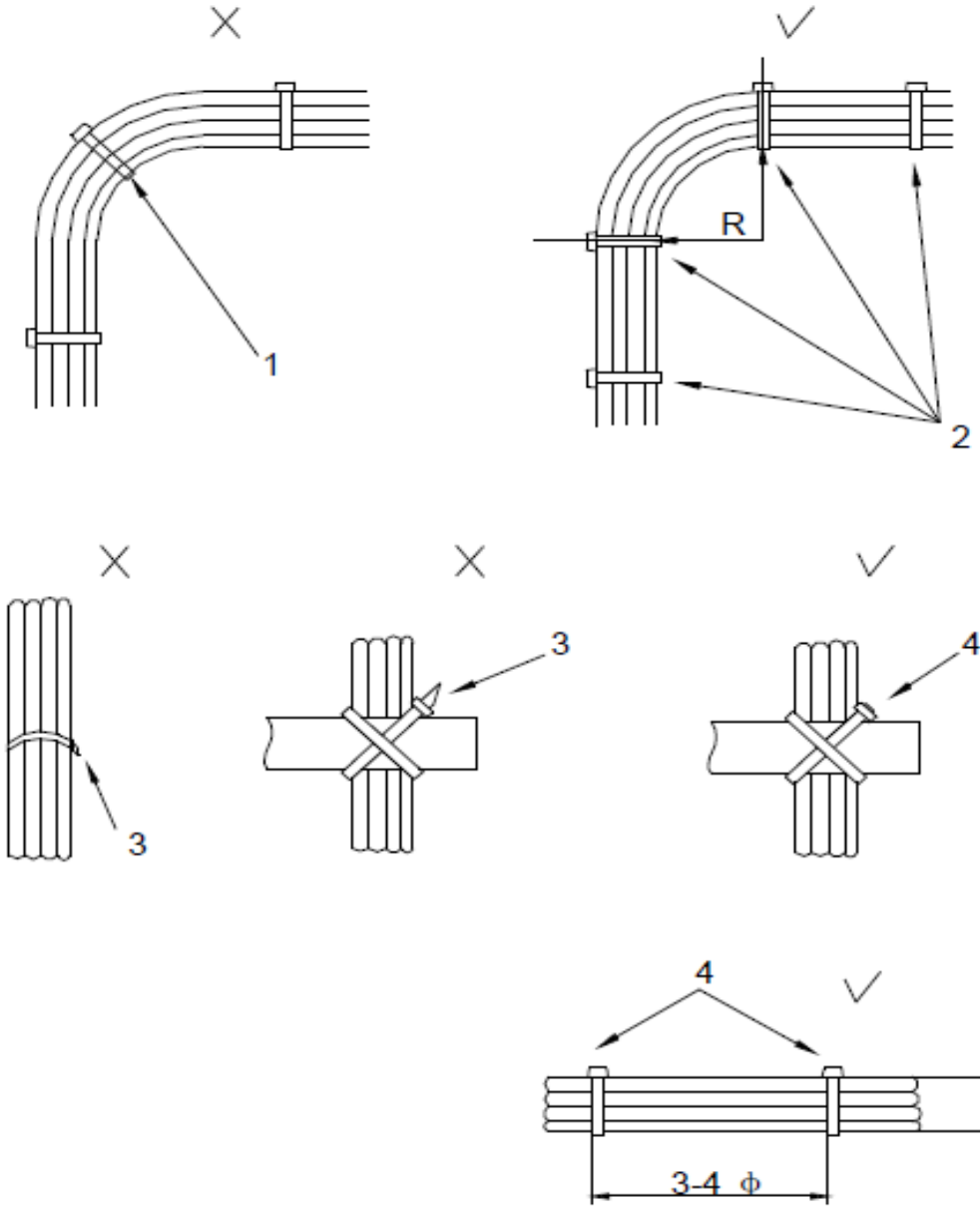


❑Procedure of IDU grounding;

❑Fasten the protection grounding cable on the grounding point that is on the right on the front panel of the IDU 605.
❑Cut the protection grounding cable to the correct length and connect the OT terminal, depending on the distance to the grounding point.
❑Connect the protection grounding cable to the grounding point provided by the cabinet (for example, the grounding bar).
❑Bind the cable.
❑IDU cables should be routed along the left and the right to facilitate operations, and should not cover the board indicators.
❑Cables that are routed along the wiring frame must be bundled.
❑The specifications and cross-sectional area of the cable, and the route and position for the cabling should be designed beforehand. All the cables should be arranged neatly.

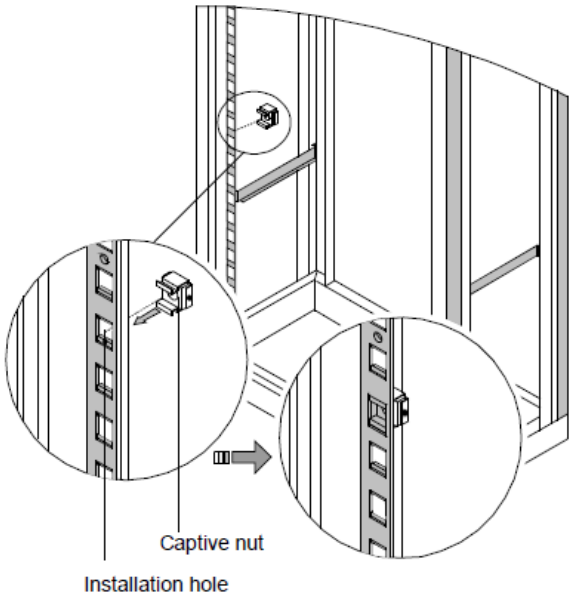


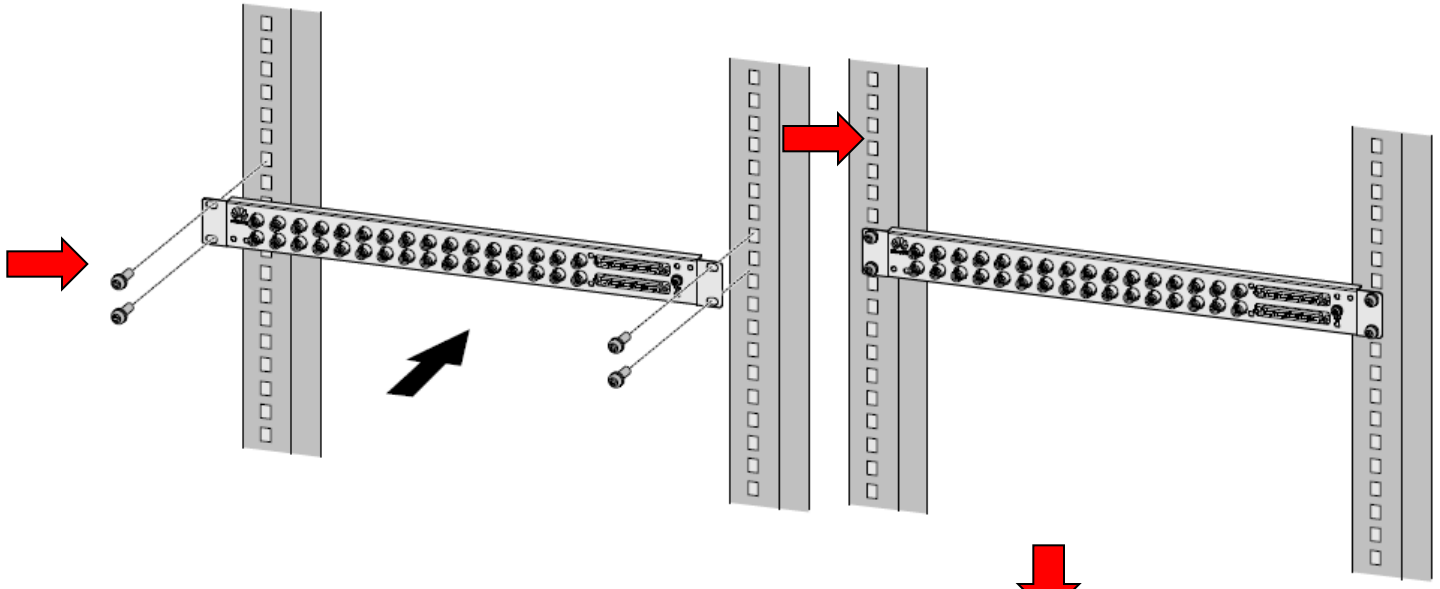
IDU 605 Cable Installation

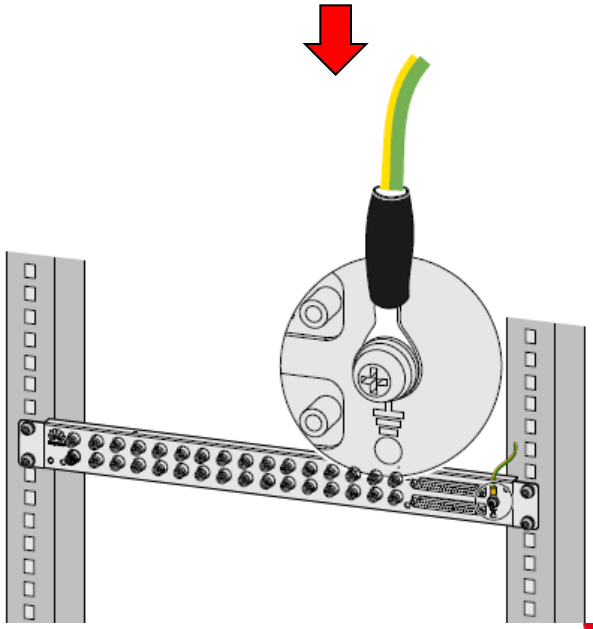


1. No cable tie at turns 2. Cable tie 3. Burr 4. Trimmed √: Correct bundling ×: Wrong bundling

IDU 605 DDF INSTALLATION







- ❑Determine the installation location of the E1 panel in the cabinet. Fit the captive nuts into the corresponding installation holes in the upright posts of the cabinet.
- ❑Fit two captive nuts on each side. All the captive nuts should be level.
- ❑Use the four M6 panel screws to fasten the E1 panel on the cabinet.
- ❑Fix the OT terminal of the protection grounding cable onto the grounding stud of the E1 panel.
- ❑Cut the protection grounding cable to the correct length and connect the OT terminal, depending on the distance to the grounding point.
- ❑Connect the protection grounding cable to the grounding point provided by the equipment room (for example, the grounding bar).
- ❑Bind the cable.

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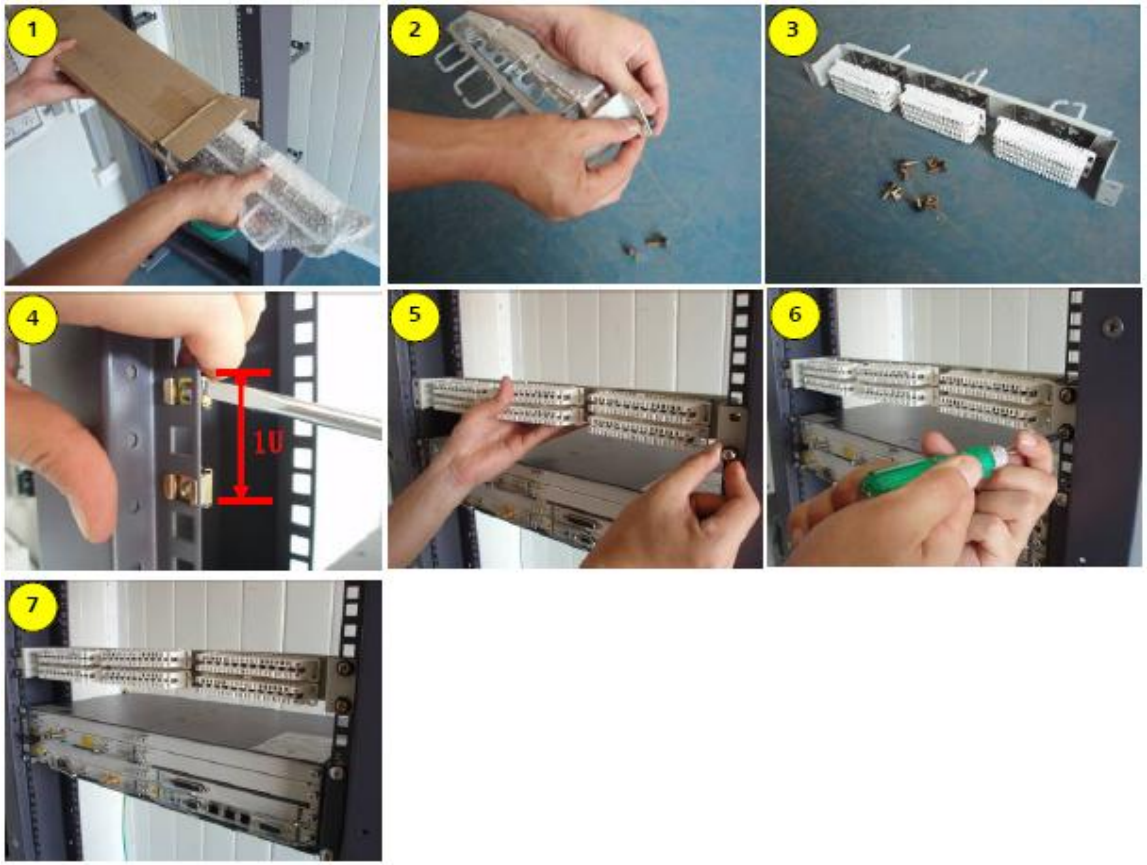
IDU 605 DDF Frame Installation



Steps for installation of DDF frame-

- ❑Take out DDF Frame from Box.
- ❑Remove the Cage nuts and panel screws.
- ❑Install the cage nuts on vertical mounting bar on the rack ,according to approved location of DDF frame.
- ❑Tighten the screws.
- ❑Install grounding of DDF frame & connect at IGB/Bus bar of 19″ Rack.
- ❑Ensure that the bus bar at 19″ rack is connected at IGB.

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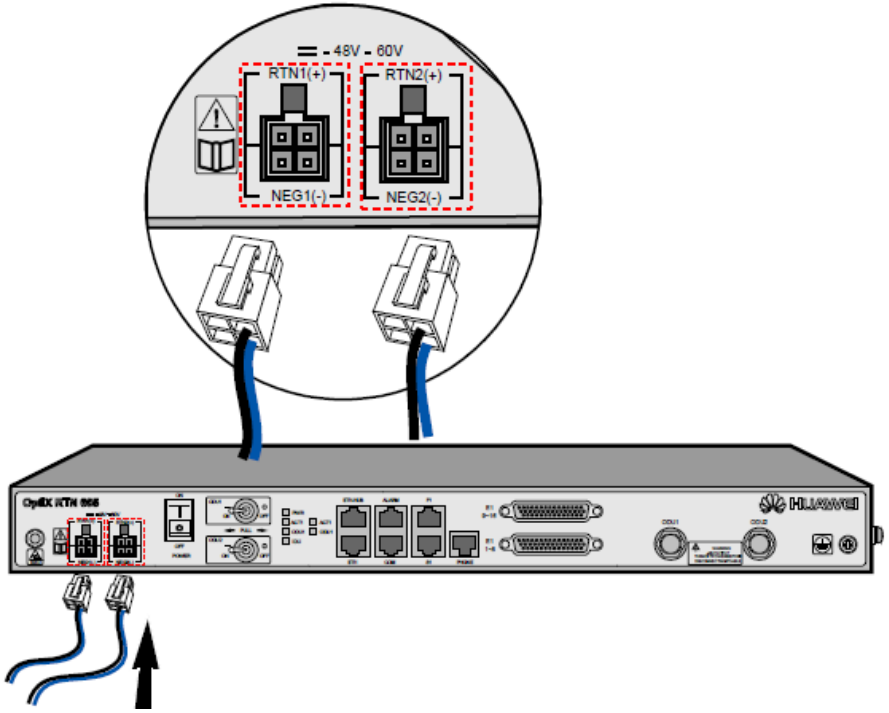
IDU 605 Power Cable Installation

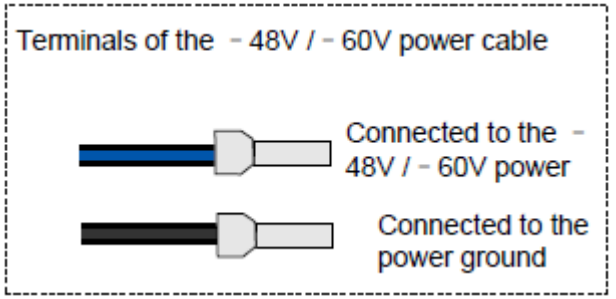
Prerequisite

The IDU 605 must be correctly installed in the cabinet.
The protection grounding cable of the IDU must be installed.
The switch that controls the IDU power on the power distribution box of the cabinet must be turned off.
The power switch of the IDU 605 must be turned off.

Procedure of DC Power Cabling for IDU 605;

❑Depending on the distance between the IDU 605 and the power supply equipment, cut the power cable at the end that is connected to the power supply equipment. Then, make terminals according to the regulations for preparing power cables.
❑Connect the power cable to the output terminal of the power supply equipment and fasten the power cable.
❑If the IDU 605 uses the –48 V /–60 V power system, connect the black wire of the power cable to the power ground, and connect the blue wire of the power cable to the –48 V /–60 V power.(6A MCBx2 Nos is required for 1 IDU).
❑Route the power cable to the IDU 605.
❑Connect the connector of the power cable to the power port of the IDU 605 and tighten the connector.
❑Bind the power cables.
❑Affix engineering labels to both ends of the power cables.

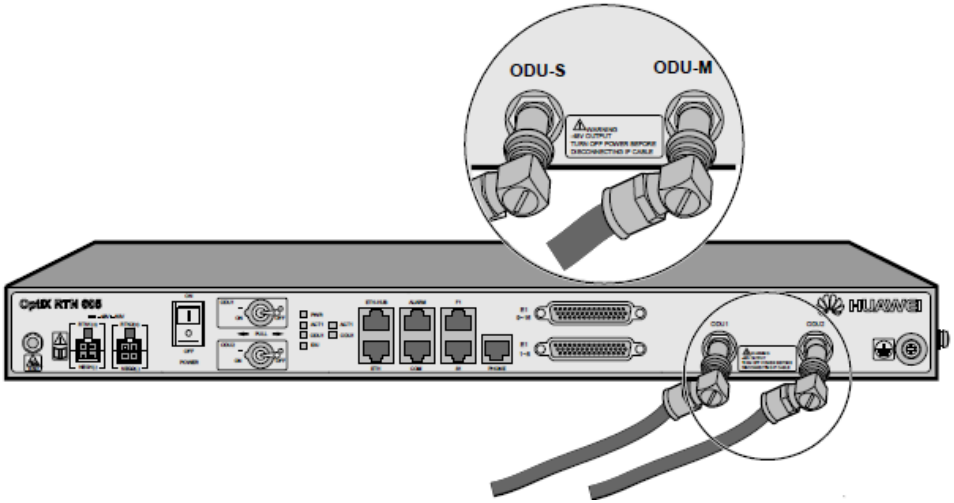




IDU 605 IF Jumper Cable Installation

Prerequisite

The IDU must be correctly installed in the cabinet.
The protection grounding cable of the IDU must be installed.
The POWER switch and the ODU switch on the front panel of the IDU 605 1A/1B/1F must be turned off.
The POWER switch, ODU-S switch, and ODU-M switch on the front panel of the IDU 605 2B/2F must be turned off.



Procedure of IF Jumper Cabling for IDU 605;

- ❑Affix temporary labels to both ends of the IF jumper.
- ❑Lead the IF jumper through the cable hole from outside the cabinet and route the jumper to the IDU.
- ❑Connect the TNC connector of the IF jumper to the IF port on the front panel of the IDU 605 and leave enough slack.
- ❑Bind the jumper.
- ❑Use a multimeter to check whether there is a short circuit or an open circuit in the IF jumper.
- ❑Tighten the connector of the jumper.
- ❑If the IF cable is installed, connect the jumper to the IF cable on the wiring frame and tighten the connection.
- ❑Remove the temporary labels and affix the engineering labels.

NOTE

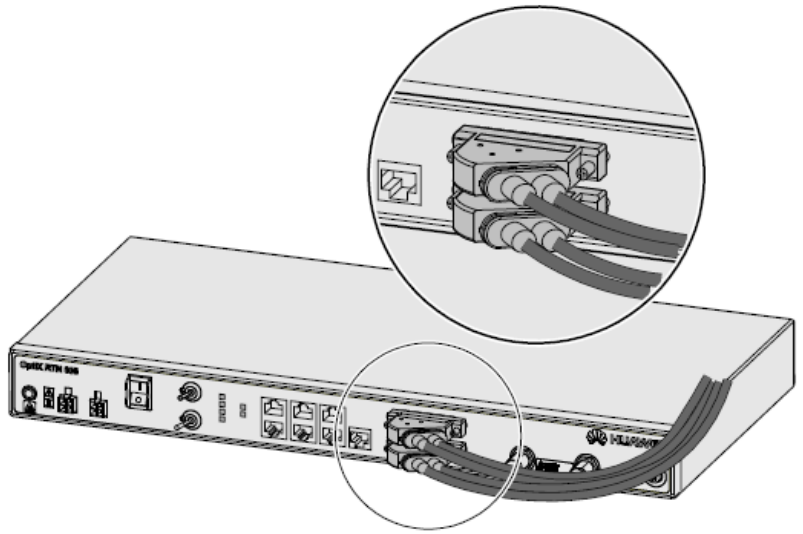
- ❑In the case of the IDU 605 1A/1B/1F, connect the TNC connector of the IF jumper to the ODU port on the front panel of the IDU.
- ❑In the case of the IDU 605 2B/2F, connect the IF jumper that is connected to the IF cable of the main ODU to the ODU-M port on the front panel of the IDU, and connect the IF jumper that is connected to the IF cable of the standby ODU to the ODU-S port on the front panel of the IDU.
- ❑In the case of earlier product deliveries, the silkscreen on the front panel of the IDU 605 2B may be slightly different from the silkscreen depicted in this document. On the silkscreen of earlier product deliveries, ODU1 refers to the ODU-S, and ODU2 refers to the ODU-M.

IDU 605 (1A/1B/2B) E1 Cable Installation

Prerequisite

The IDU 605 1A/1B/2B must be correctly installed in the cabinet.

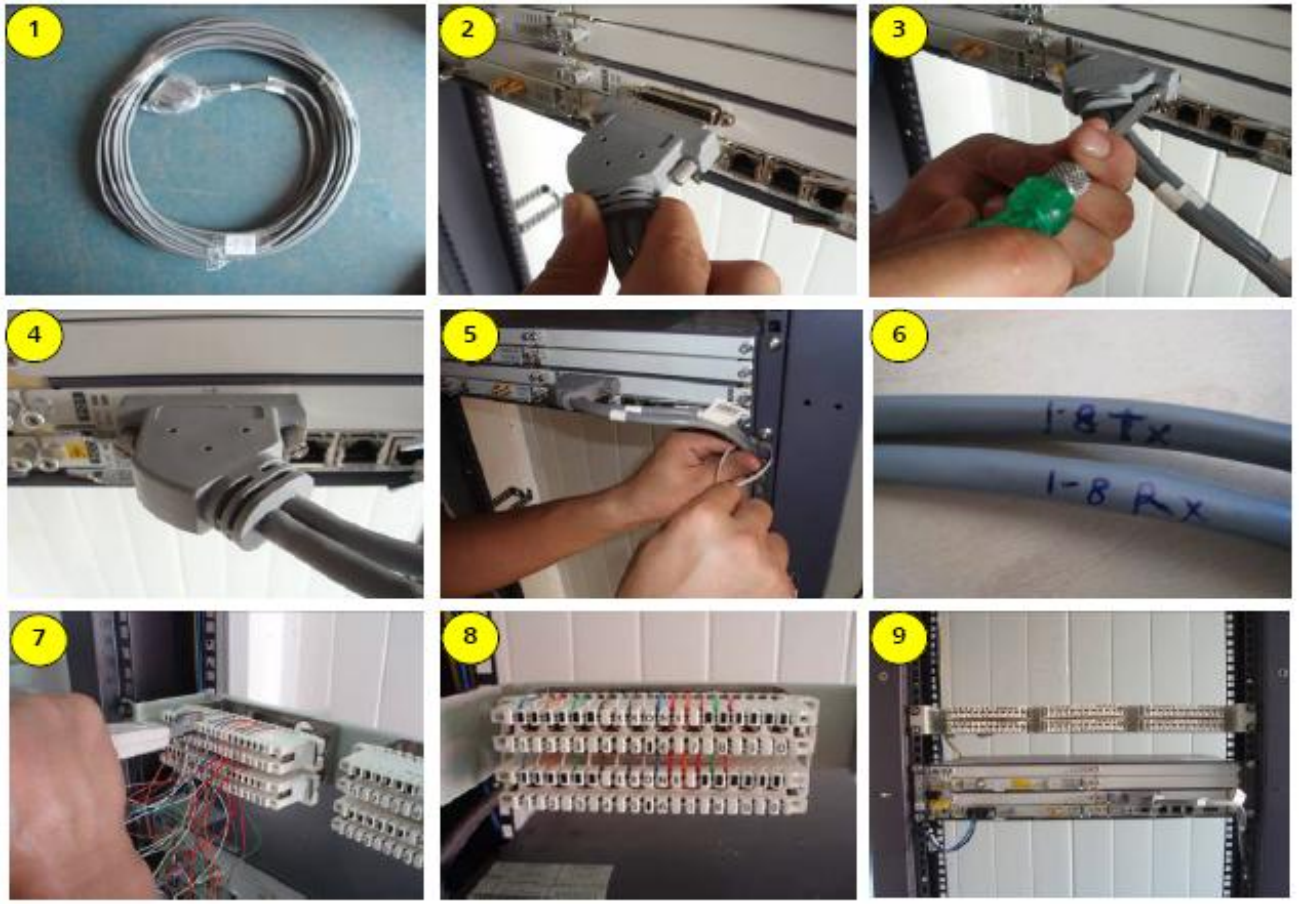
The protection grounding cable of the IDU 605 1A/1B/2B must be installed.



Procedure of E1 Cabling for IDU 605;

- ❑Affix temporary labels to both ends of the E1 Cable.
- ❑Route the cables from the DDF to the cabinet, lead them through the cable hole, and finally route them to the IDU 605 1A/1B/2B.
- ❑Connect the DB44 connectors of the cables to the E1 ports of the IDU 605 1A/1B/2B.
- ❑Bind the Cable.
- ❑Disconnect the cables from the IDU 605 1A/1B/2B.
- ❑On the DDF side, cut off the cable slack and make cable connectors.
- ❑Use a multimeter to check if there is a short circuit or an open circuit in the cables.
- ❑Connect the connectors on both sides of cables and fasten them.
- ❑Remove the temporary labels and affix the engineering labels.

IDU 605 E1 Cable Installation



Steps for installation of E1 Cables-

- ❑Connect the E1 cable to the E1 interface on tributary board & tighten the screws to fix the cables.
- ❑Route the E1 cables from the equipment side to the DDF.
- ❑Cut the E1 cables top a proper length & mark the cables for the transmit and receive direction.

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IDU 605 (1F/2F) E1 Cable Installation

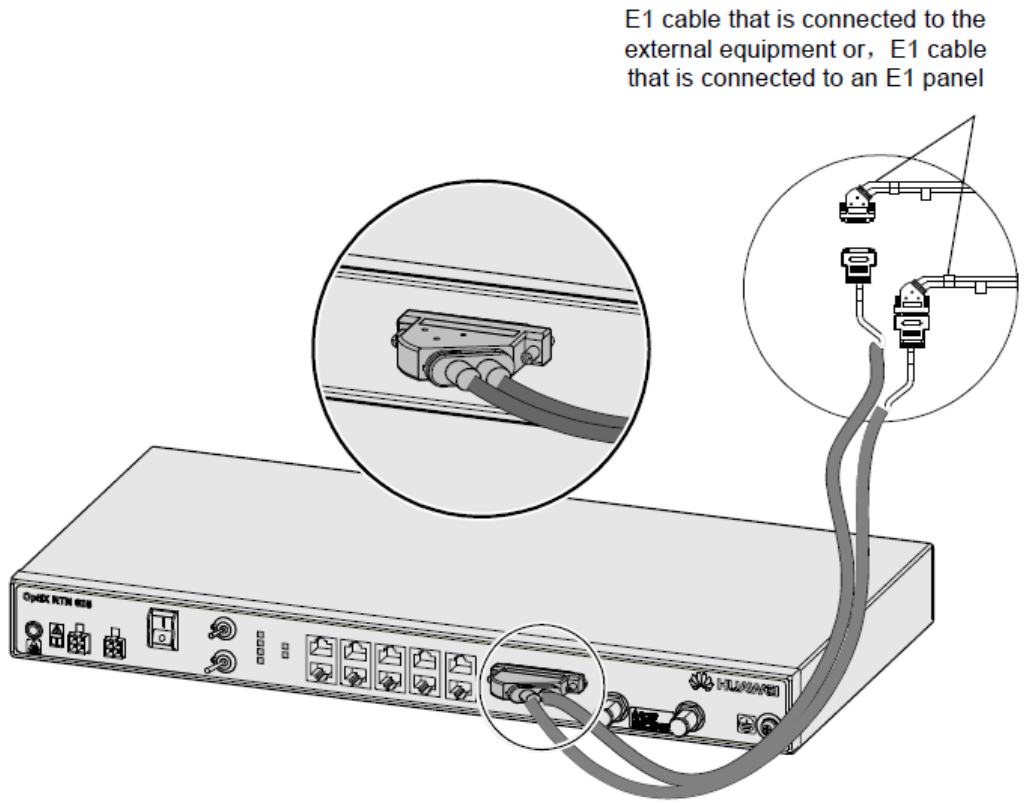
Prerequisite

The IDU 605 and E1 panel must be correctly installed in the cabinet.

The protection grounding cable of the IDU and the protection grounding cable of the E1 panel must be installed.

Procedure of E1 Cabling for IDU 605;

- ❑Affix temporary labels to both ends of the E1 Cable.
- ❑Route the cables from the DDF to the cabinet, lead them through the cable hole, and finally route them to the IDU 605 1F/2F.
- ❑Insert the MDR68 connector of the E1 transit cable into the E1 interface on the IDU 605 1F/2F, and connect the DB44 connector to the E1 cable that connects to the external equipment.
- ❑Bind the Cable.
- ❑Disconnect the E1 transit cable from the E1 interface on the IDU 605 1F/2F.
- ❑On the DDF side, cut off the cable slack and prepare cable connectors.
- ❑Use a multimeter to check if there is a short circuit or an open circuit in the cables.
- ❑Connect the connectors on both sides of cables and fasten them.
- ❑Remove the temporary labels and affix the engineering labels.



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IDU 605 Ethernet Cable Installation

Prerequisite

The IDU must be correctly installed in the cabinet.

The protection grounding cable of the IDU must be installed.

Procedure of Ethernet Cabling for IDU 605;

❑Depending on the distance between the Ethernet Equipment and the IDU, cut off a length of

❑Ethernet cable. Make connectors for both ends of the Ethernet cable.

❑Affix temporary labels to both ends of the Ethernet cable.

❑Route the Ethernet cable from the Ethernet Equipment to the cabinet, lead it through the cable

❑hole, and finally route it to the IDU.

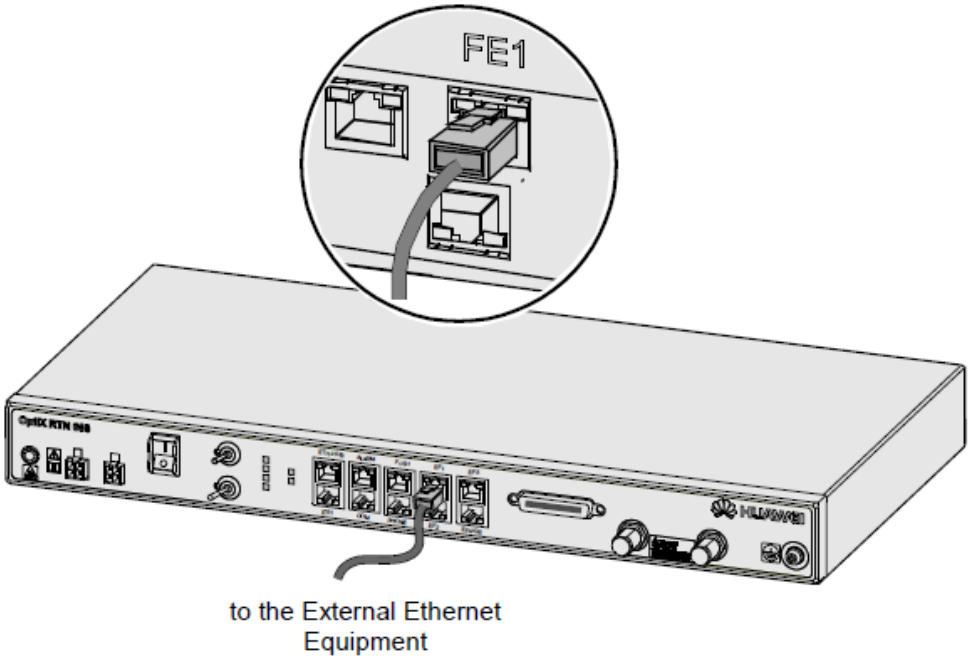
❑Connect the RJ-45 connector at one end of the Ethernet cable to the Ethernet electrical interface

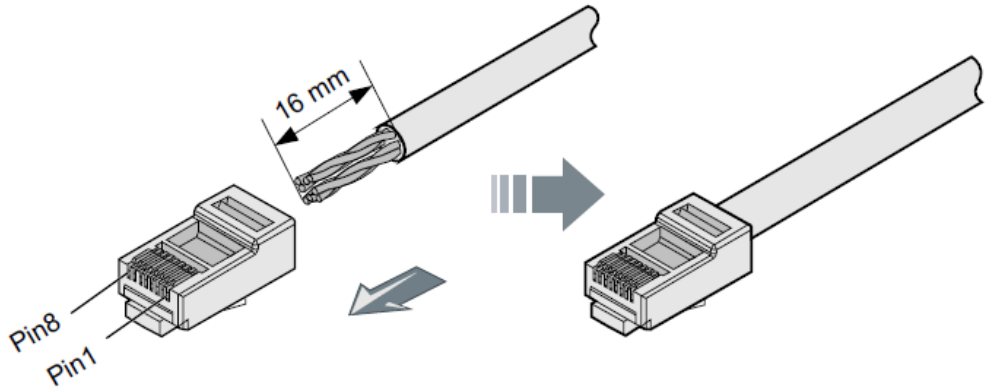
❑EF1 of the IDU 605 1F/2F,and connect the connector at the other end to the electrical interface

❑on the Ethernet Equipment.

❑Bind the cable.

❑Remove the temporary labels and affix the engineering labels.





Cable connection of the straight through cable		
Pin	Color	Relation
1	White/Orange	Twisted pair
2	Orange	
3	White/Green	Twisted pair
6	Green	
4	Blue	Twisted pair
5	White/Blue	
7	White/Brown	Twisted pair
8	Brown	

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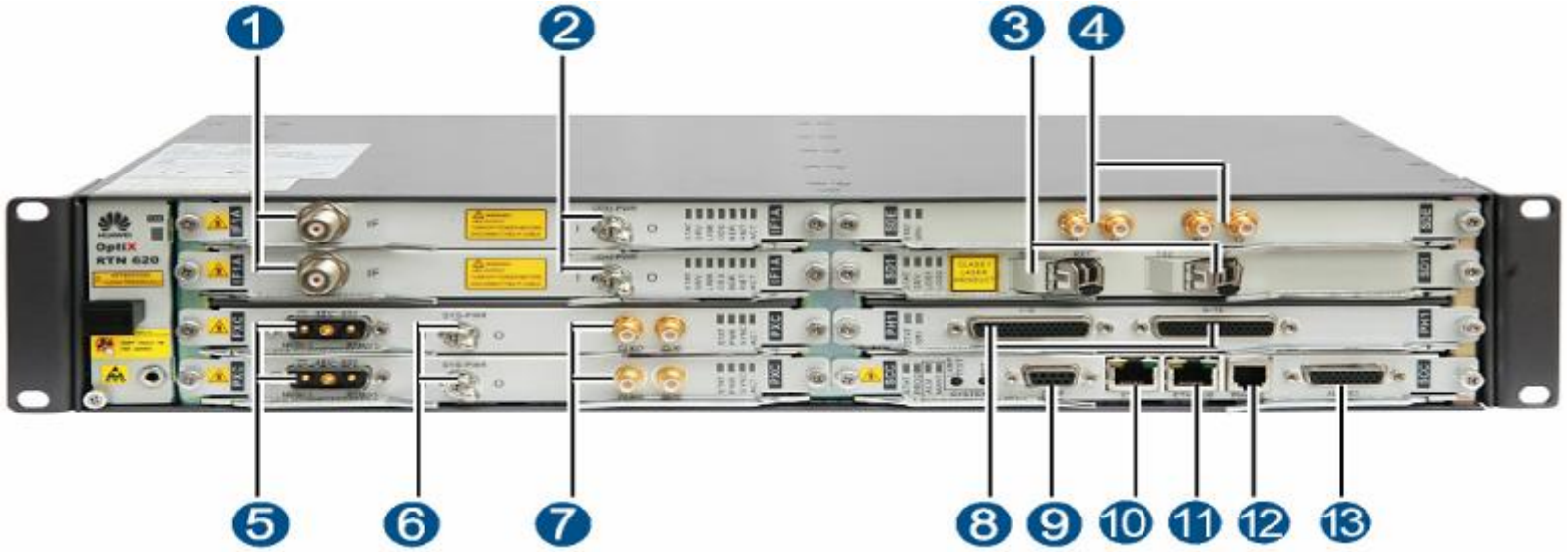
RTN-620 ,IDU INSTALLATION

Function of Different Ports on IDU-620



1. IF Interface
2. ODU Power Switch
3. STM-1 Optical Interface.
4. STM-1 electrical interface.
5. Input Power
6. Input Power Switch
7. External clock/WS service interface.
8. E1 interface.
9. Management serial port.
10. NM Ethernet interface.
11. NE cascading interface.
12. Order wire phone interface
13. External alarm

Note-
According to different board configurations , the position of the IDU interfaces in the actual Application may be different from the positions shown in above figure.

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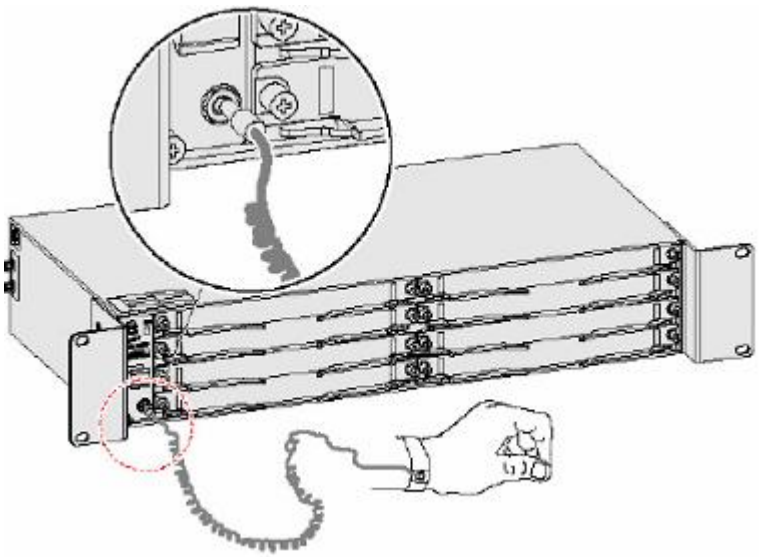
IDU-620 Installation Precautions

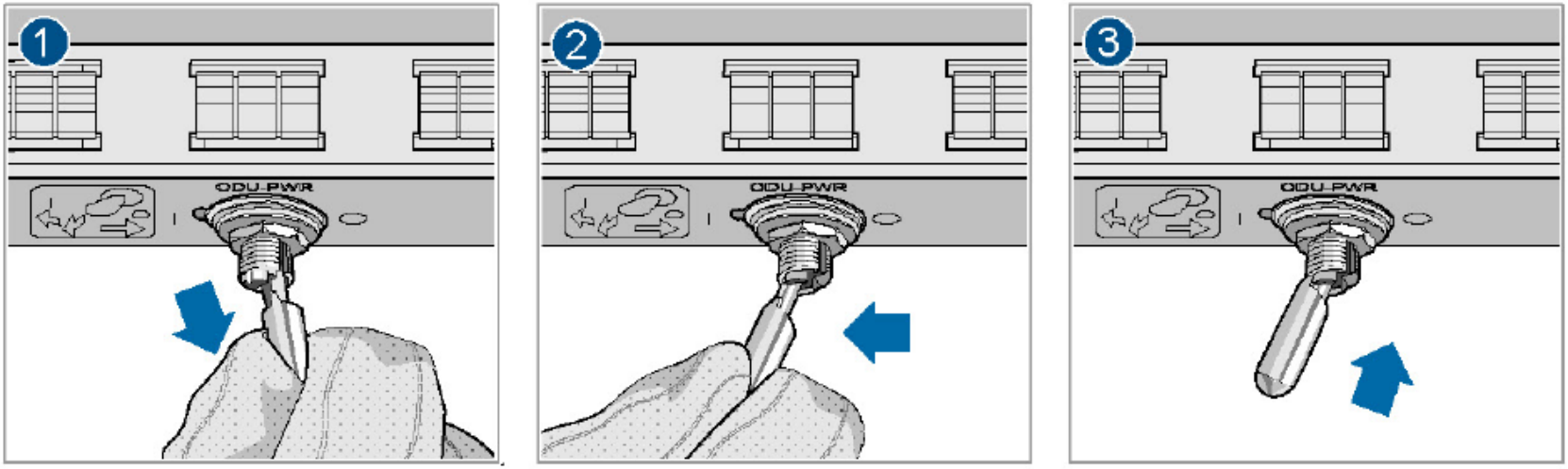


Note-

- ❑ Before touching the equipment/ boards ,ensure that wrist strap is weared.
- ❑ Check the location ,power supply, grounding, Electrical/optical
- ❑ signal & environment.
- ❑ Check all materials are in place.
- ❑ The toggle switch position ,should be in off (0-direction).

❑As the IDU 610 applies the air convection method, a space of 1U at the top and bottom of the IDU chassis must be provided for heat dissipation. And ensure to prevents the high temperature air from other equipment, from entering the chassis.

❑As the IDU 620 is air cooled, there must be enough space around the air intake vent at the left of the chassis and around the air exhaust vent at the right to ensure that the flow of cool air is not blocked.



1 Pull the switch out slightly. 2 Turn the switch. 3 Release the switch.

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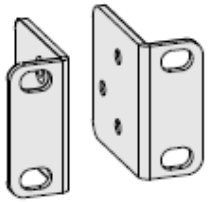
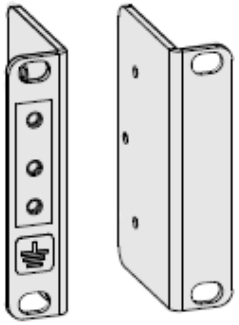
IDU-610/620 Mounting Ears



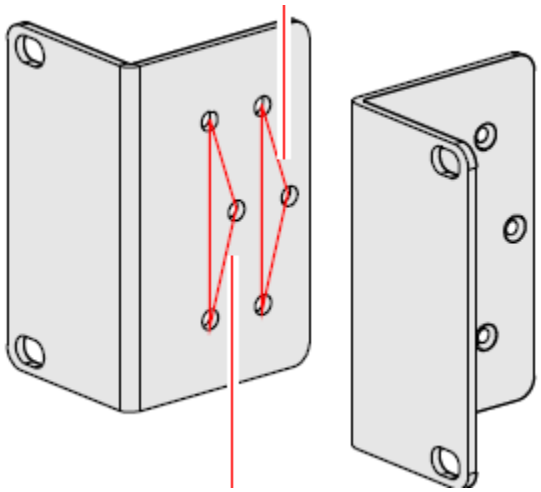
For IDU 610



For IDU 620

Rack Mounting Ears for 19” Rack

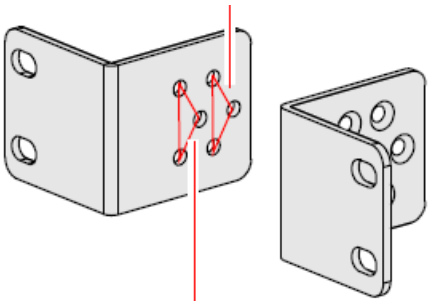
Installation holes for the ETSI cabinet(As N63E cabinet of Huawei)



Installation holes for the T63/T66/ N66T cabinet of Huawei

Rack Mounting Ears for ETSI Rack-IDU620

Installation holes for the ETSI cabinet(As N63E cabinet of Huawei)



Installation holes for the T63/T66/N66T cabinet of Huawei

Rack Mounting Ears for ETSI Rack-IDU610

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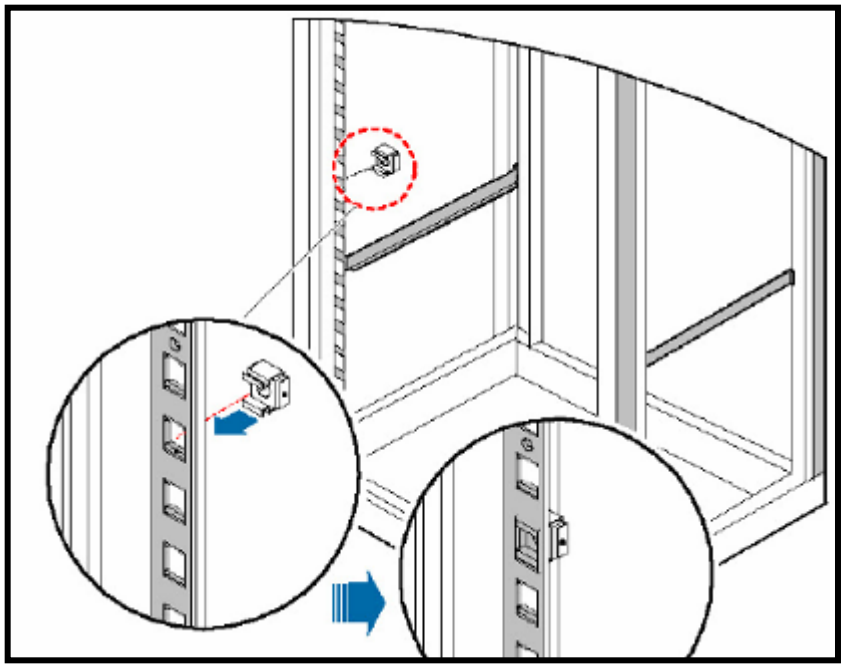
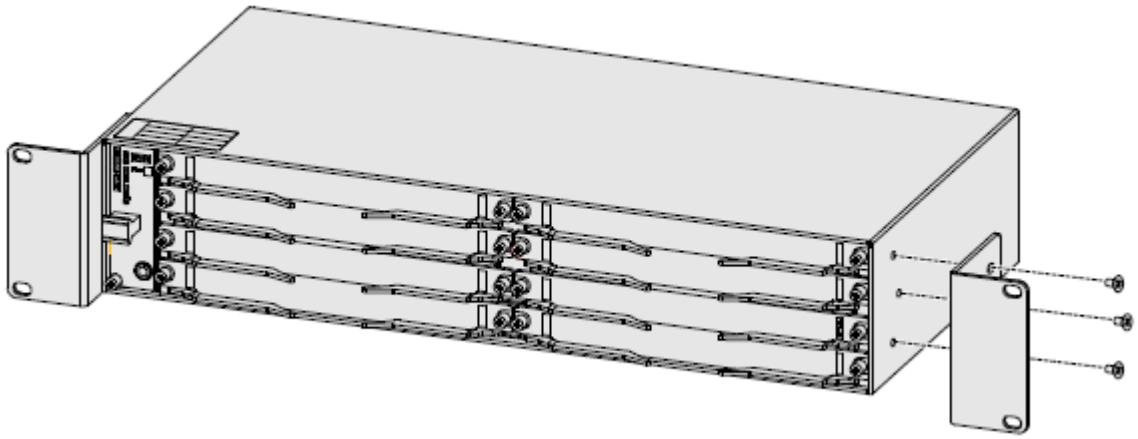
IDU-620 Installation in a Rack





Procedure of installing IDU 620;

- Determine the place where the chassis is to be installed in the cabinet.
- Fit the cage nuts into the corresponding installation holes in the upright columns of the cabinet.
- As the IDU620 applies air cooling, there must be enough space around the air intake vent on the left side panel of the chassis & around the air exhaust vent on the right side panel to ensure no blocking.
- Replacing the rack mounting ears for the 19 inch cabinet with the rack mounting ears for the ETSI cabinet .

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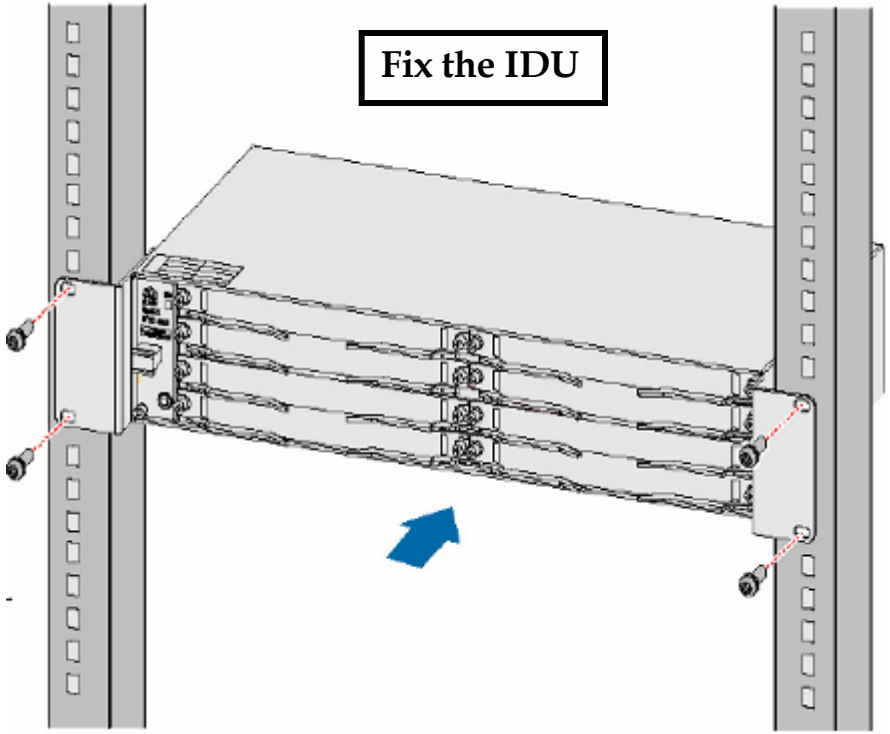
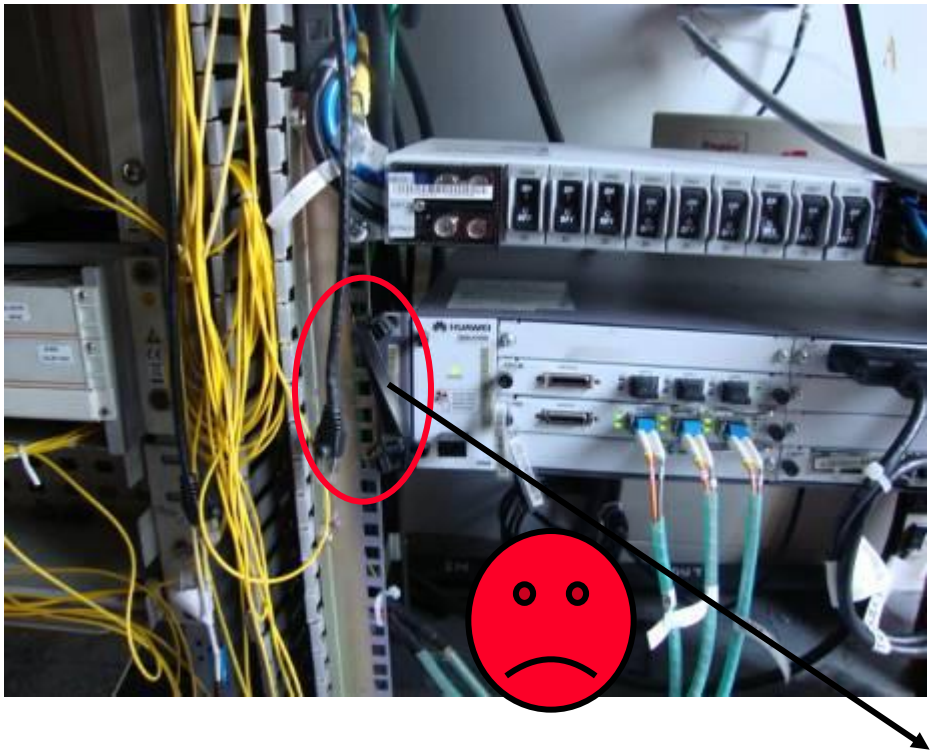
IDU-620 Installation in Rack





Cable ties have been used to fix the IDU

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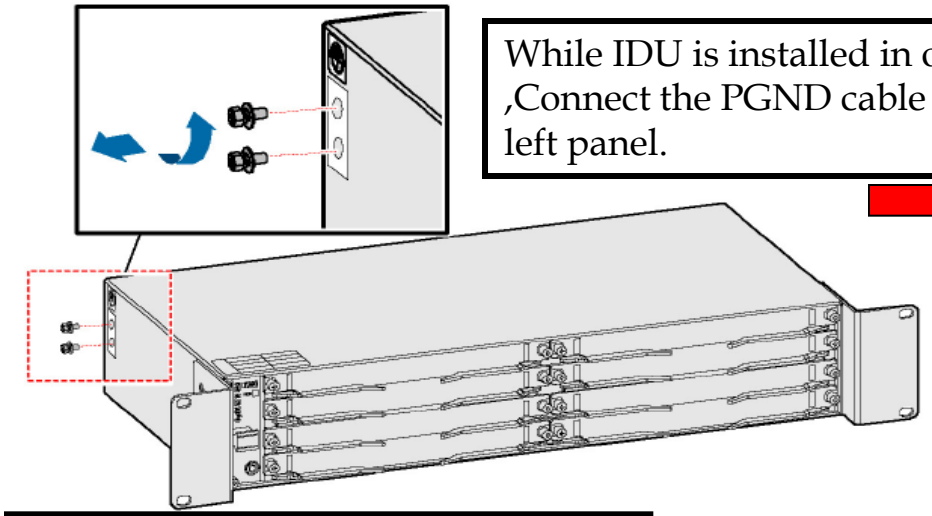
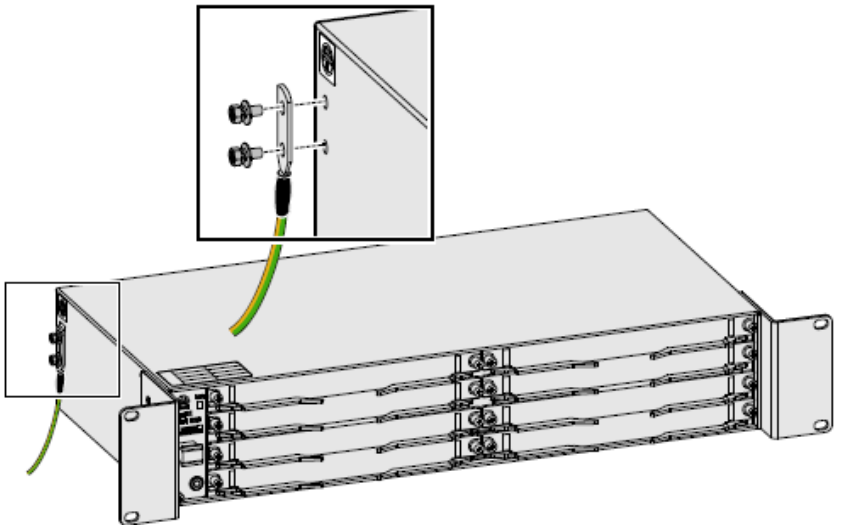
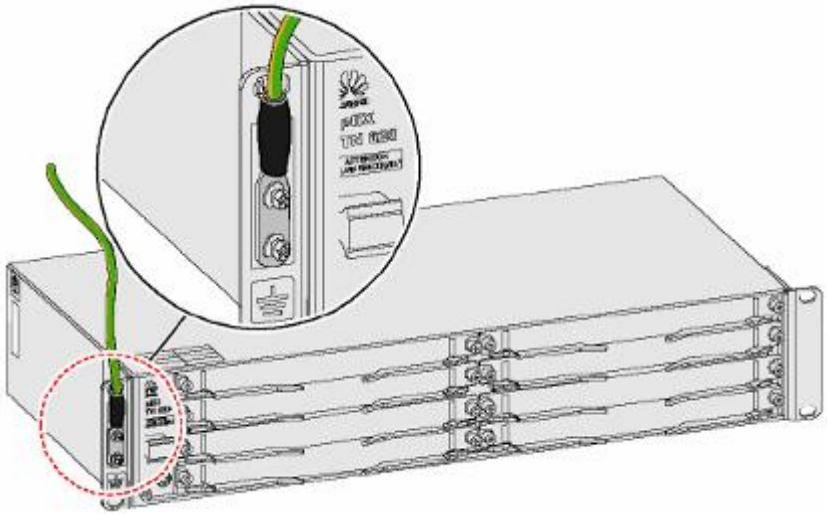
PGND Cable Installation-IDU-620



While IDU is installed in open rack ,Connect the PGND cable at rear left panel.



While IDU is installed in closed rack ,connect the PGND cable at front.



Procedure of PGND Cable Installation;

- ❑ PGND Cable should be of 6Sq.mm Copper Cable.
- ❑ Correct nuts & bolts with washers shall be used.
- ❑ Tighten properly at both equipment & IGB end.
- ❑ Use labels at both ends.
- ❑ Route the cable properly.

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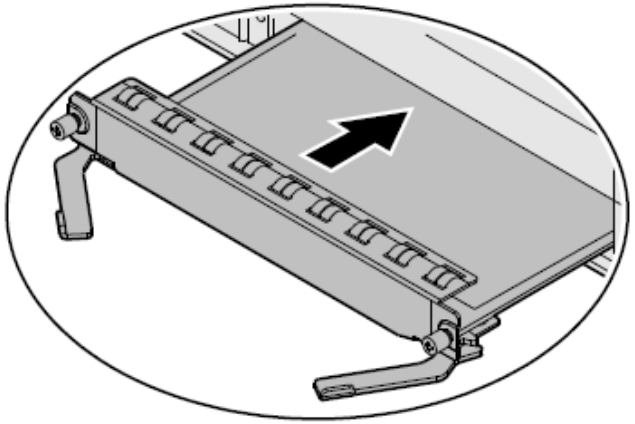
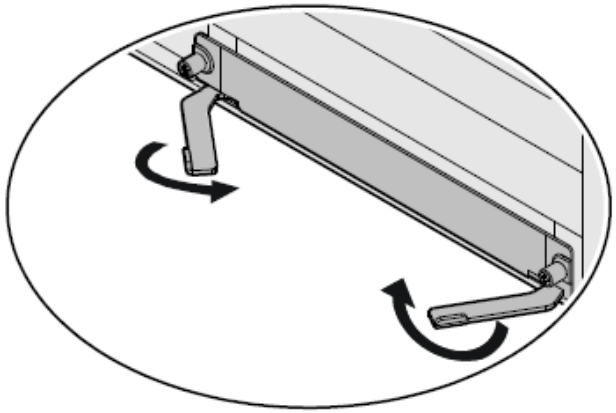
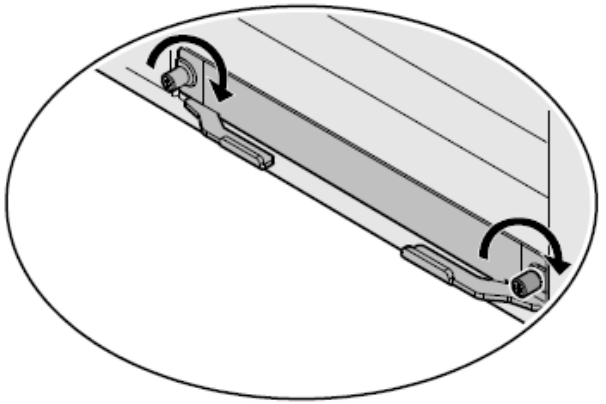
Boards Installation-IDU-620

Pre-requisite of Board Installation;

- ❑Insert one end of the ESD wrist strap into the ESD connector on the cabinet. Wear the ESD wrist strap.
- ❑Hold the ejector levers with hands on the panel. Push them outwards so that the angle between the ejector lever and the panel is 45 degrees or so.
- ❑Push the board gently along the slot guide rail until the board cannot slide further.



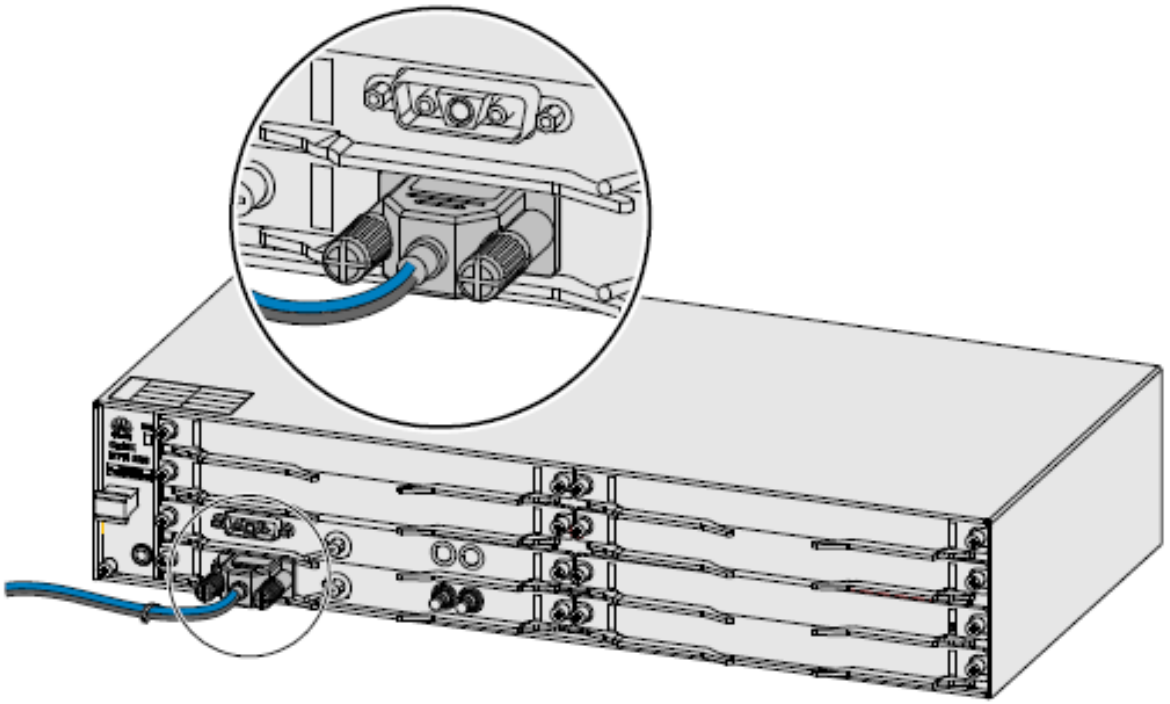




DC Power Cable Installation-IDU-620

Prerequisite;

- ❑The IDU must be correctly installed in the cabinet.
- ❑The protection grounding cable of the IDU must be connected to the grounding terminal.
- ❑The switch that controls the IDU power on the power box must be turned off.
- ❑The power switch on the PXC board must be turned off.



Procedure of Power cabling;

- ❑Route the ends of the cables that have cord end terminals, to the output terminals of the power box and fasten them.
- ❑Ground the black cable and connect the blue cable to the -48 V power.
- ❑Route the power cables to the IDU.
- ❑Connect the type-D connectors of the cables to the sockets on the PXC board and fasten them.
- ❑Bind the power cables.
- ❑Affix the engineering labels to both ends of the power cables.
- ❑2 Nos of 10A MCB required for IDU-610/620.

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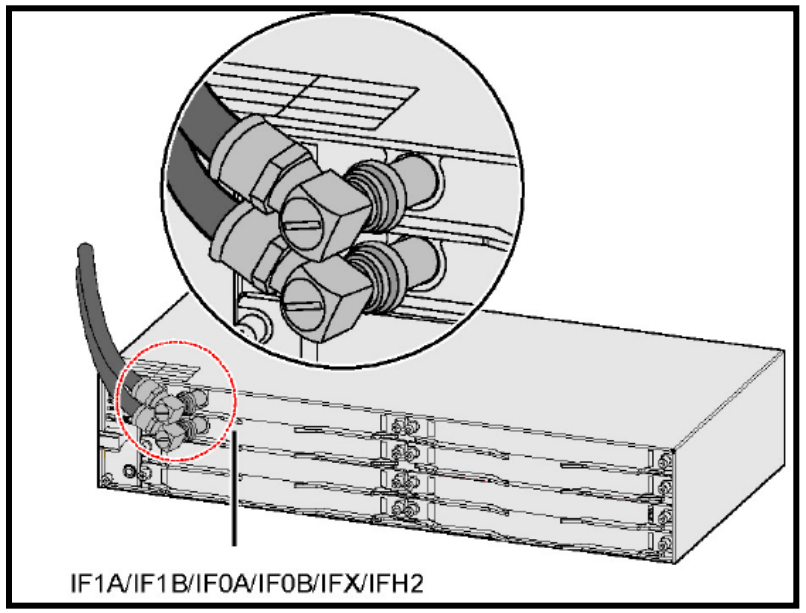
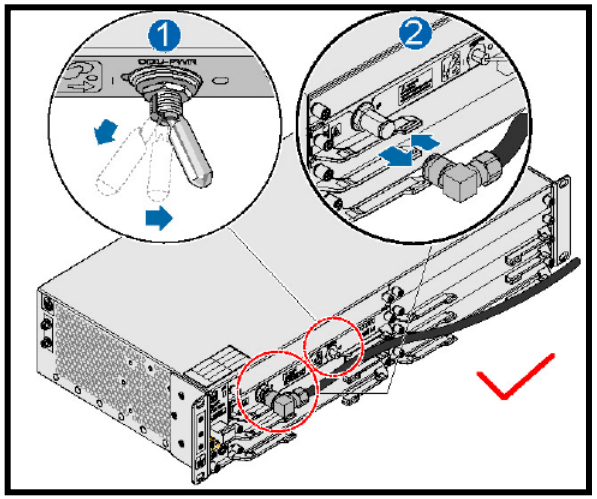
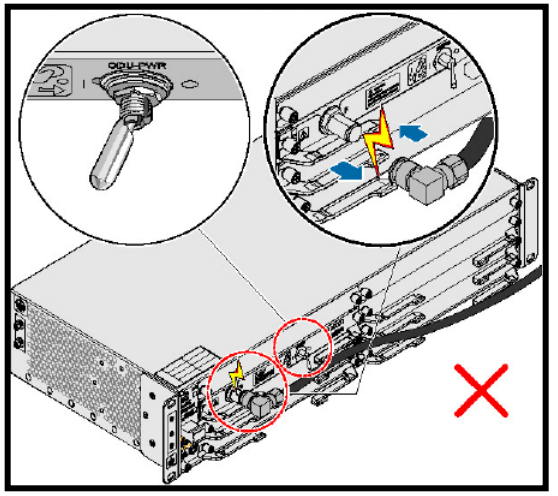
IF Cable Installation at IDU end -IDU-620



Prerequisite

The IDU must be correctly installed in the cabinet.
The protection grounding cable of the IDU must be installed.
The ODU power switch on the IF board must be turned off.





Procedure of IF Jumper installation;

- ❑Affix temporary labels to both ends of the IF jumper.
- ❑Lead the IF jumper through the cable hole from outside the cabinet and route the jumper to the IDU.
- ❑Connect the TNC connector of the jumper to the IF port of the IF board and leave enough slack.
- ❑Bind the Jumpers.
- ❑Use a multimeter to check if there is a short circuit or an open circuit in the IF jumper.
- ❑Tighten the connector of the jumper.
- ❑If the IF cable is installed, connect the jumper to the IF cable on the wiring frame and tighten the connection.
- ❑Remove the temporary labels and affix the engineering labels.

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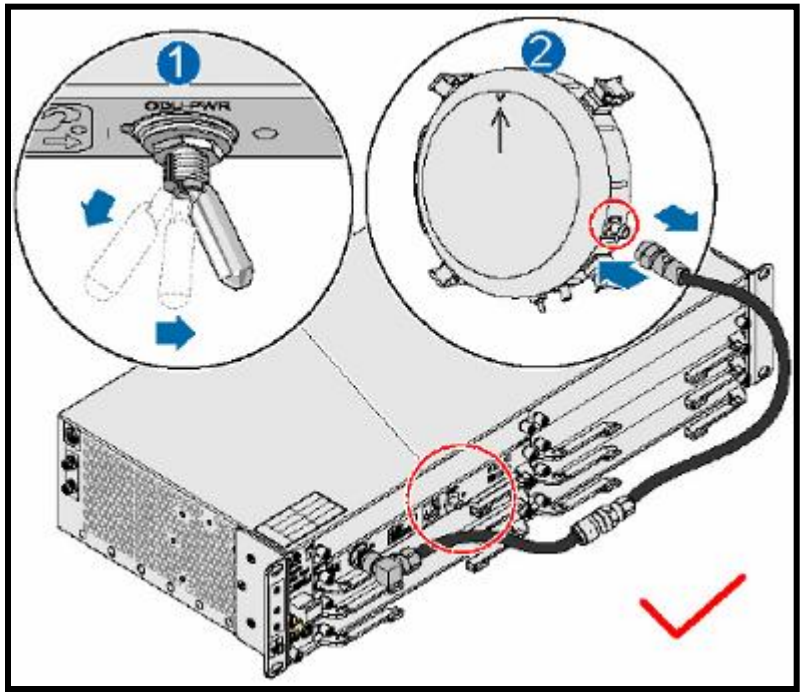
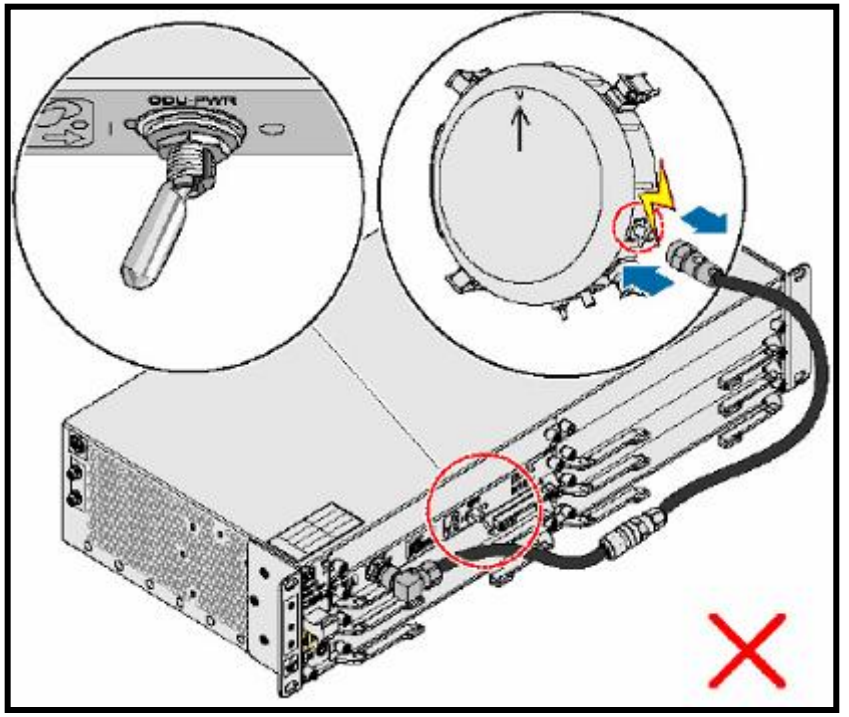
IF Cable Installation at IDU end -IDU-620





Note-

Don't insert or Remove IF cable from/to IDU while the toggle switch is in ON position.
Also don't insert or remove IF cable from/to ODU while the toggle Switch is in ON position.

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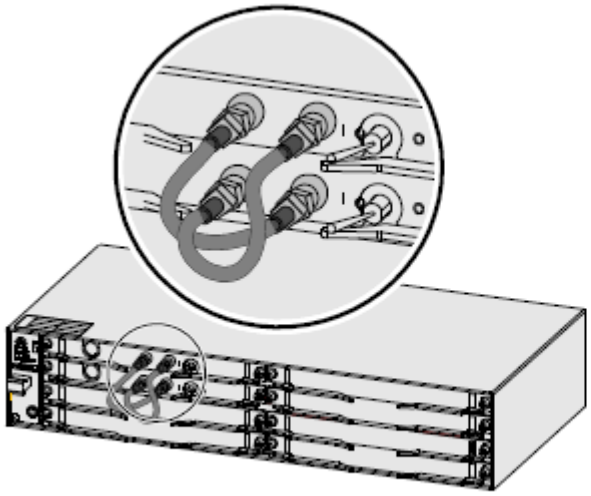
XPIC Cable Installation-IDU-620

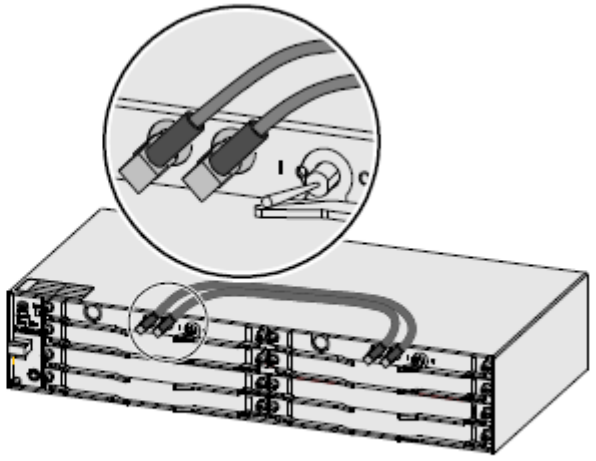
Prerequisite

The IDU must be correctly installed in the cabinet.

The protection grounding cable of the IDU must be installed.



Using the shorter pair of XPIC cables



Using the longer pair of XPIC cables

Procedure of Installing XPIC Cable;

Select proper XPIC cables.

One pair of IFX boards is configured with four XPIC cables. If the IFX boards are installed in slot 5 and slot 7, or in slot 6 and slot 8 of an NE, use the pair of XPIC cables that is shorter in length. Otherwise, use the pair of XPIC cables that is longer in length.

Connect the XPIC cables to the IN/OUT ports of the pair of IFX boards.

The IN port of one IFX board must be connected to the OUT port of the other IFX board.

Bind the cables.

If the XPIC function of an IFX board is disabled, use a shorter XPIC cable to connect the IN port of the IFX board to the OUT port of the same IFX board. Otherwise, the signals in the IFX board are deteriorated.

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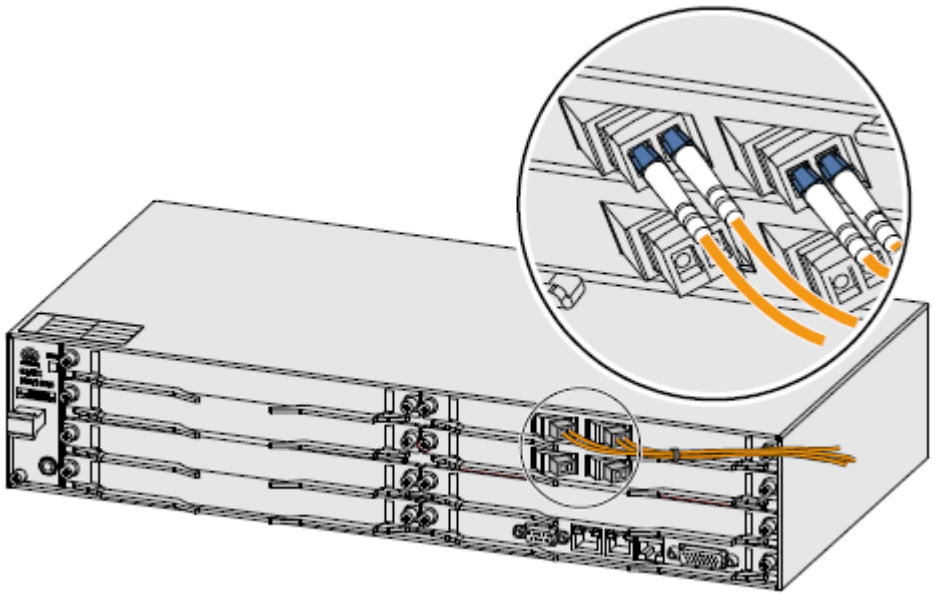
Fiber Jumper Cable Installation-IDU-620



Prerequisite

The IDU must be correctly installed in the cabinet.
The protection grounding cable of the IDU must be installed.

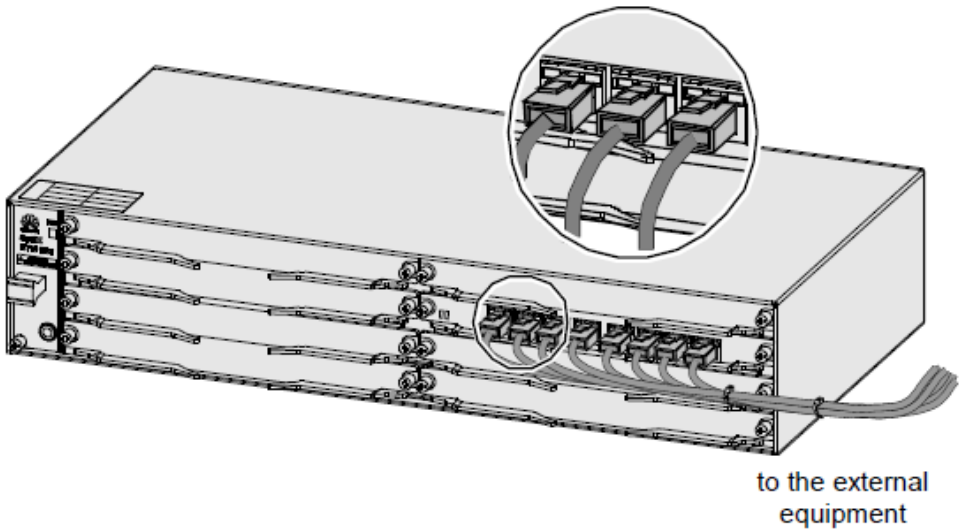
Procedure of Fiber Jumper installation;

❑Affix temporary labels to both ends of the fiber jumpers.
❑Lead the fiber jumpers through the corrugated pipe. Wrap adhesive tapes around the cuts of the corrugated pipe. Do not force the fiber jumpers into the pipe to prevent the pipe from wearing out.
❑Route the corrugated pipe from the ODF to the cabinet. Lead the pipe through the fiber hole and bind the pipe onto the hole.
❑If the fiber hole cannot provide enough space for the pipe to pass through, lead the pipe through the cable hole and fasten the pipe.
❑Route the fiber jumpers to the IDU.
❑Remove the protective caps from the fiber connectors and connect the connectors to the optical ports on the boards.
❑Bind the fiber jumpers.
❑Install the fiber jumpers on the ODF side.
❑Remove the temporary labels and affix the engineering labels.

E1(SL62PO1 Board) Cable Installation -IDU-620

Prerequisite

The IDU must be correctly installed in the cabinet.
The protection grounding cable of the IDU must be installed.



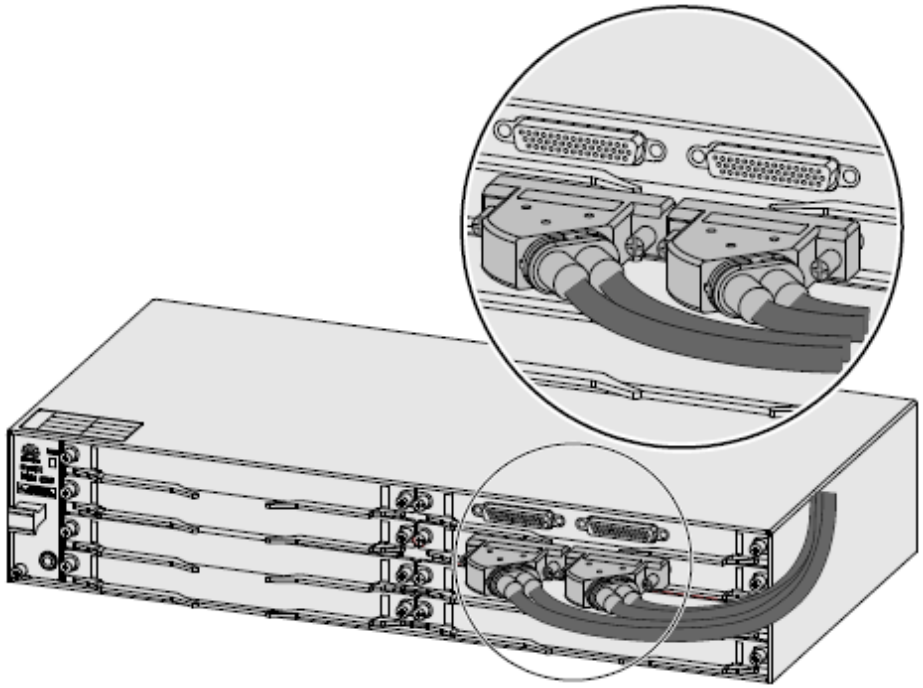
Procedure of E1 Cable Installation;

❑Obtain a network cable according to the distance from the external equipment to the IDU.
❑Make a network cable on site to connect one side of the SL62PO1 board according to the cable routing table. The cables that are made on site are the E1 cables with the RJ-45 connectors.
❑Affix temporary labels to both ends of the E1 cables.
❑Route the E1 cables from the DDF to the cabinet, lead them through the cable hole, and finally route them to the IDU.
❑Connect the RJ-45 connectors of the E1 cables to the E1 interfaces on the SL62PO1 board.
❑Bind the cables.
❑Disconnect the cables from the board.
❑On the DDF side, cut off the cable slack and make cable connectors.
❑Use a multimeter to check if there is a short
❑circuit or an open circuit in the cables.
❑Connect the connectors on both sides of cables and fasten them.
❑Remove the temporary labels and affix the engineering labels.

E1(SL61PO1/PH1 Board) Cable Installation -IDU-620

Prerequisite

The IDU must be correctly installed in the cabinet.
The protection grounding cable of the IDU must be installed.



Procedure of E1 Cable Installation;

- ❑Affix temporary labels to both ends of the E1 cables.
- ❑Route the E1 cables from the DDF to the cabinet, lead them through the cable hole, and finally route them to the IDU.
- ❑Connect the DB44 connectors of the E1 cables to the E1 interface of the SL61PO1/PH1 board.
- ❑Bind the cables.
- ❑Disconnect the cables from the board.
- ❑On the DDF side, cut off the cable slack and make cable connectors.
- ❑Use a multimeter to check if there is a short
- ❑circuit or an open circuit in the cables.
- ❑Connect the connectors on both sides of cables and fasten them.
- ❑Remove the temporary labels and affix the engineering labels.

Installing the ODU with Antenna

Appearance after ODU Installation

One ODU with One Antenna (Direct Mount)

Two ODU with One Antenna (Direct Mount)

One ODU with One Antenna (Separate Mount)

ODU with Dual Polarized Antenna

Two ODU with One Antenna (Separate Mount)

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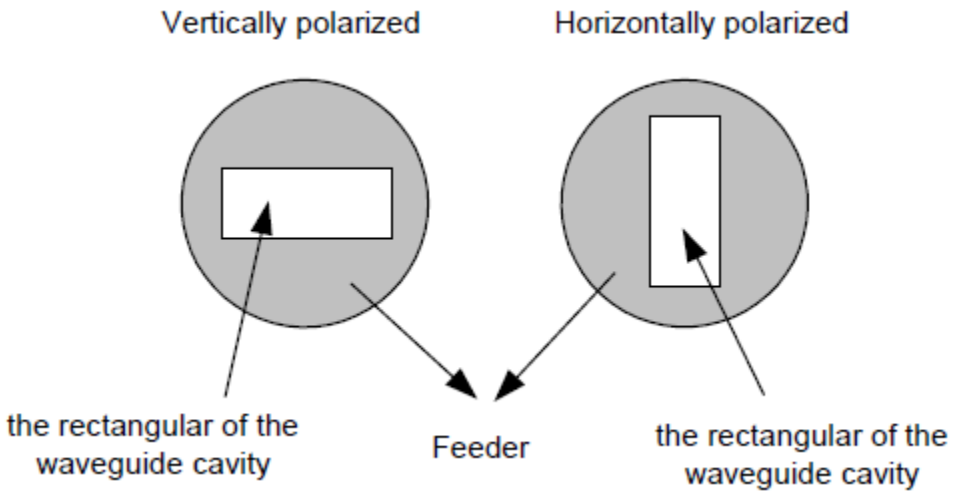
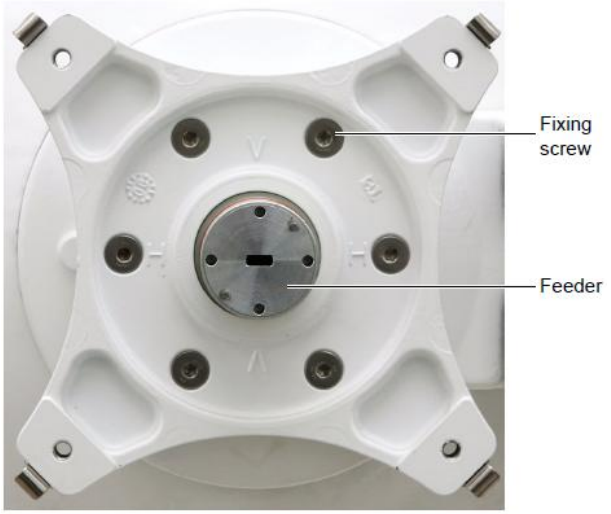
Installing the ODU with the Waveguide Interface

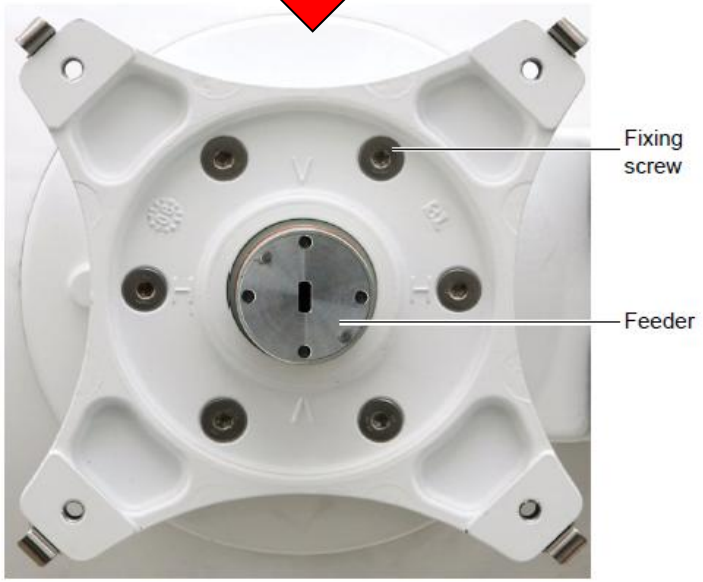
Unpacking of MW Antenna (60CM) & ODU

Remove the antenna & accessories From the boxes.
Use proper tools to unpack the boxes.

One ODU on One Single-Polarized Antenna-Integrated







By default, the antenna applies vertical polarization. If horizontal polarization is required, rotate the feed boom at the back of the antenna to change the polarization direction of the antenna. If the waveguide on the feed boom is a round waveguide, the polarization direction of the antenna need not be changed.

- ❑Check if the antenna is vertically polarized.
- ❑Loosen the fixing screws to allow the feed boom to rotate freely.
- ❑Rotate the feed boom 90 degrees to the right or left until its positioning pin is plugged into the positioning slot in the base.
- ❑Tighten the fixing screws.
- ❑Apply glue around the screws.

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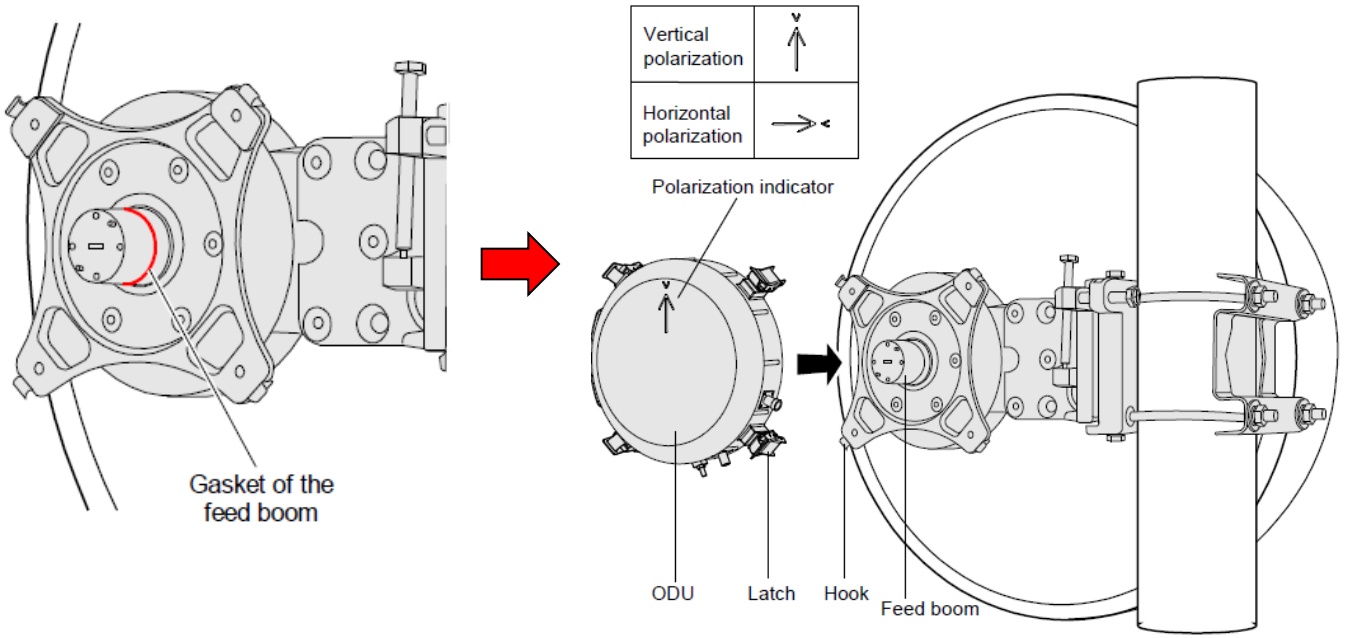
Installing ODU on Antenna

Prerequisite

The antenna must be installed.

The ODU must be raised onto the installation platform and must not be damaged.

The type of the ODU must be in accordance with the plan.



Procedure of installing ODU on Antenna

❑Remove the protective caps from the feed boom of the antenna and from the ODU antenna port.

❑Apply the appropriate quantity of lubricant on the gasket of the feed boom and the surface of the waveguide near the gasket

❑Do not apply the lubricant on the surface of the feed boom. Otherwise, the transmission of signals is affected.

❑Do not apply the lubricant on the internal surface of the antenna port on the ODU. Otherwise,the transmission of signals is affected.

❑Ensure that the polarization indicator on the ODU points to the required polarization direction of the antenna. If the antenna is vertically polarized, ensure that the polarization indicator points upwards. If the antenna is horizontally polarized, ensure that the polarization indicator points right. Place the ODU antenna port against the feed boom. Slowly fit the feed boom in such that the four ODU latches engage with the four antenna hooks.

❑Close the four latches cornerwise.

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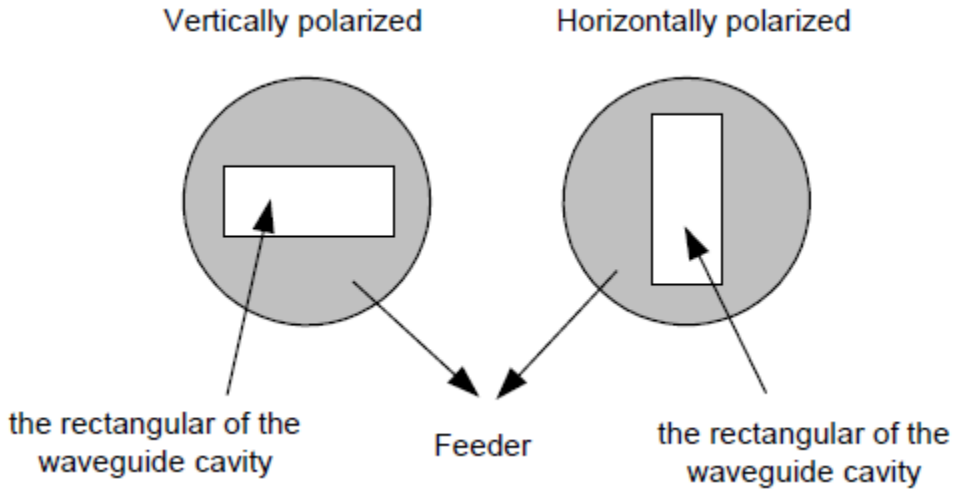
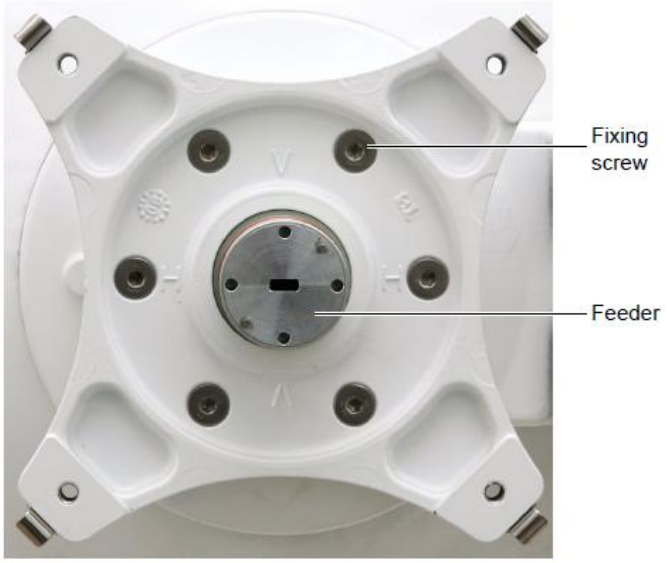
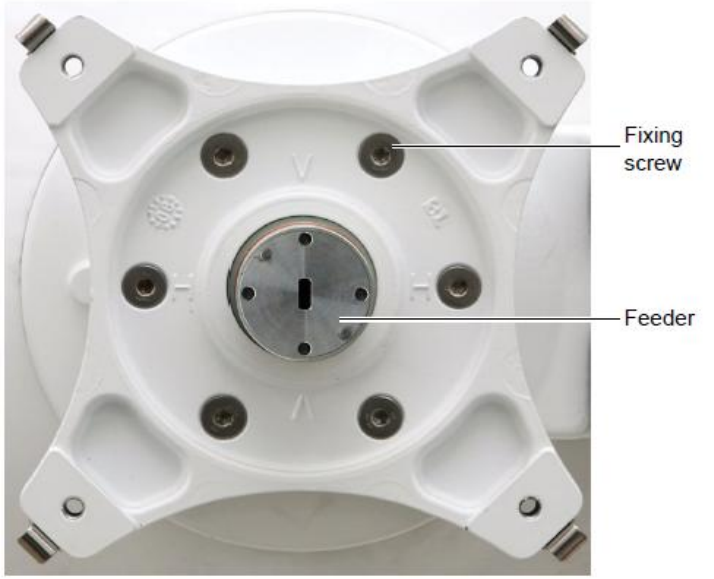
Two ODU on One Single-Polarized Antenna-Integrated





By default, the antenna applies vertical polarization. If horizontal polarization is required, rotate the feed boom at the back of the antenna to change the polarization direction of the antenna. If the waveguide on the feed boom is a round waveguide, the polarization direction of the antenna need not be changed.



- ❑Check if the antenna is vertically polarized.
- ❑Loosen the fixing screws to allow the feed boom to rotate freely.
- ❑Rotate the feed boom 90 degrees to the right or left until its positioning pin is plugged into the positioning slot in the base.
- ❑Tighten the fixing screws.
- ❑Apply glue around the screws.

Hybrid Coupler installation

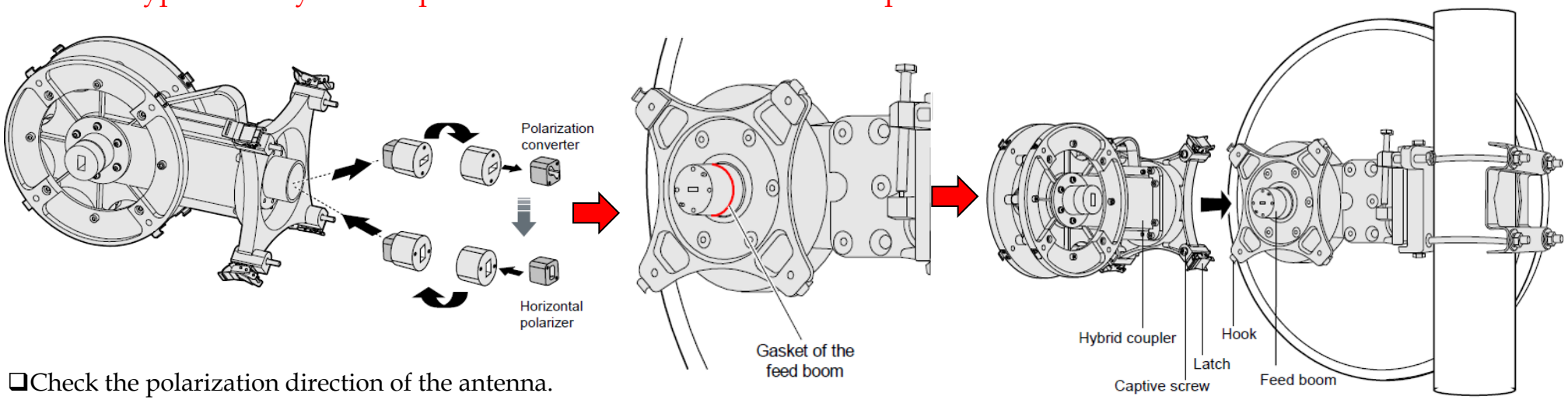
Prerequisite

The antenna must be installed.

The antenna polarization must meet the network planning.

The hybrid coupler must be raised onto the installation platform and must not be damaged.

The type of the hybrid coupler must be in accordance with the plan.



❑Check the polarization direction of the antenna.

❑Install a horizontal polarizer.

1. Remove the protective cap from the antenna port on the coupler.
2. Remove the polarization component on the antenna port of the coupler.
3. Replace the polarization converter on the polarization component by using a horizontal polarizer.
4. Install the polarization component back onto the antenna port on the coupler.

❑Remove the protective cap from the feed boom. Apply the appropriate quantity of lubricant on the gasket and the surface of the waveguide near the gasket.

❑Apply appropriate anti-seize grease to the four captive screws of the coupler.

❑Align the antenna port of the coupler over the feed boom. Slowly let the feed boom fit in such that the four latches engage with the antenna hooks.

❑When installing the hybrid coupler on the antenna, the ODU port identifiers marked on the hybrid coupler such as "MAIN" and "STD BY" should face upwards.

❑Close the four latches cornerwise.

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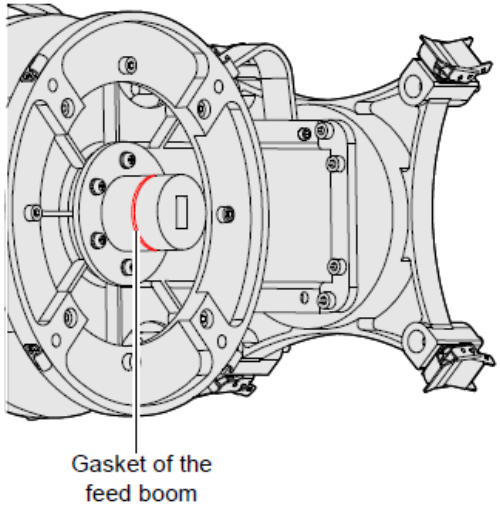
Installing ODU on Hybrid Coupler

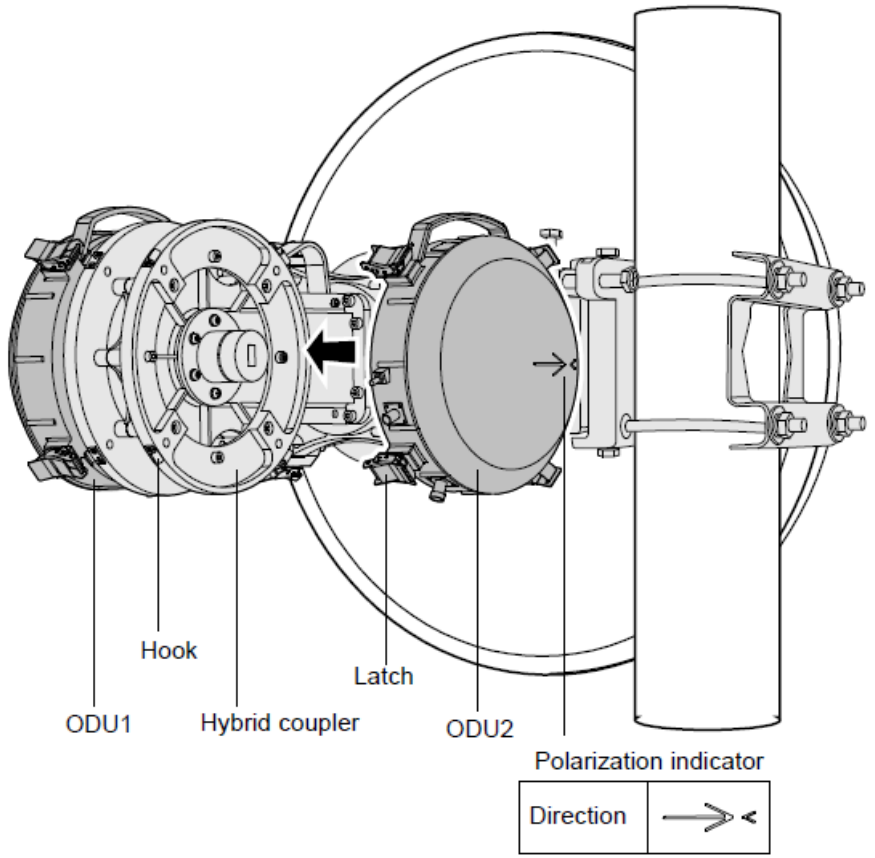
Prerequisite

The hybrid coupler must be installed.

The ODU must be raised onto the installation platform and must not be damaged.

The type of the ODU must be in accordance with the plan.





❑Remove the protective caps from the feed boom of the hybrid coupler and from the ODU antenna port. Apply the appropriate quantity of lubricant on the gasket of the feed boom and the surface of the waveguide near the gasket.

❑Ensure that the polarization indicator on the ODU points right and the IF port faces downwards.

❑Place the ODU antenna port against the feed boom of the coupler. Slowly fit the feed boom in such that the four ODU latches engage with the four coupler hooks.

❑Close the four latches cornerwise.

❑The main ODU must be installed on the MAIN port of the coupler and the standby ODU must be installed on the STD BY port of the coupler.

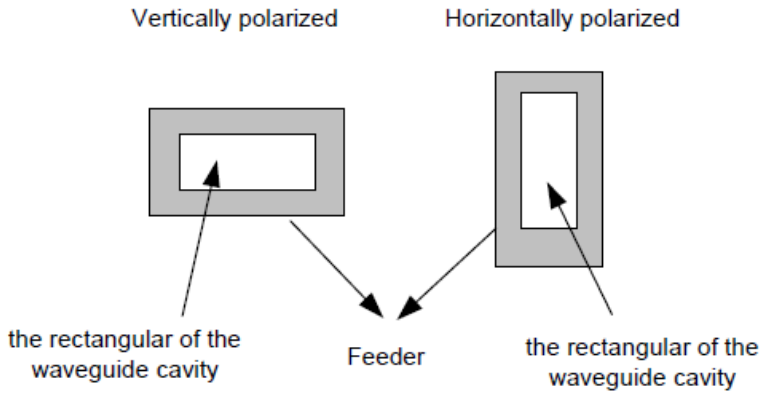
❑When you install the ODU, the IF port of the ODU should face downwards.

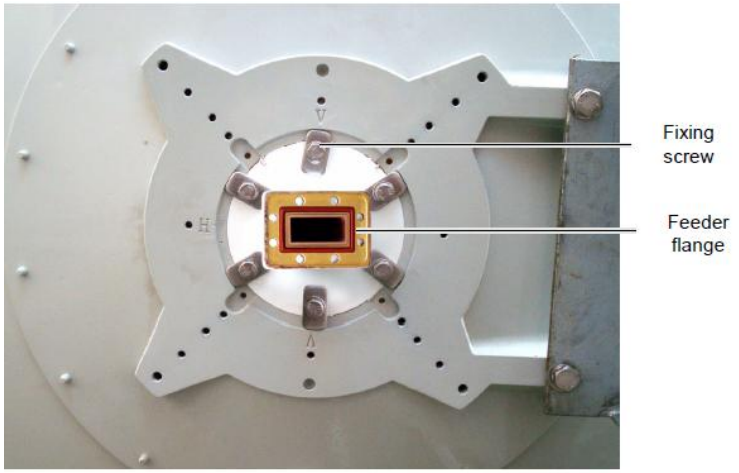
One ODU on One Single-Polarized Antenna-Separate

The ODU can be installed separate from the single-polarized antenna. In this case, the ODU is installed onto an ODU adapter, which is connected to the single-polarized antenna through a flexible waveguide.

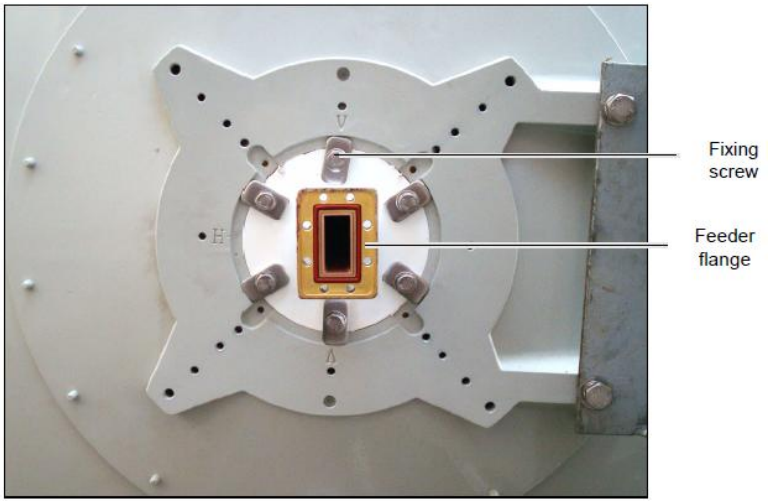
Prerequisite

The antenna must be installed.





- ❑Check if the antenna is vertically polarized.
- ❑Loosen the fixing screws to allow the feed boom to rotate freely.
- ❑Rotate the feed boom 90 degrees to the right or left until its positioning pin is plugged into the
- ❑positioning slot in the base.
- ❑Tighten the fixing screws.
- ❑Apply glue around the screws.



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One ODU on One Single-Polarized Antenna-Separate

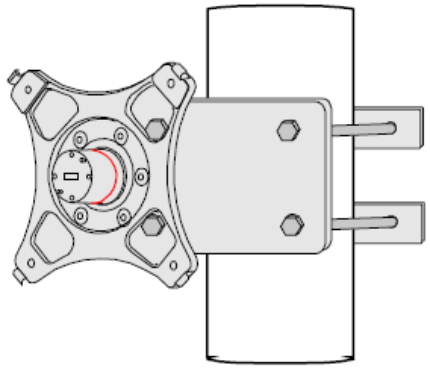
In the case of the ODU being indirectly mounted onto an antenna, separate mounting parts are required. The separate mounting parts include the ODU adapter and flexible waveguide.

Prerequisite

The antenna must be installed.

ODU adapter

Flexible waveguide



❑Install the ODU adapter onto a proper position on the antenna pole.

❑Keep the direction of the waveguide cavity of the flexible waveguide consistent with that of the adapter or the antenna. Then, install the flexible waveguide onto the flange interfaces of the ODU adapter and of the antenna using screws, Use the corresponding cramping kit to fix the flexible waveguide.

❑waterproof the interface of the flexible waveguide.

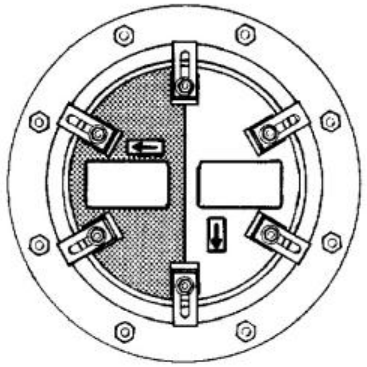
Installation of ODU on one Dual Polarized Antenna

Installing ODUs on one dual-polarized antenna is similar to installing one ODU on one single polarized antenna in the separate mounting mode. The difference between the two methods lies in the method of adjusting the polarization direction of the antenna due to the fact that the dual polarized antenna has two feed booms.

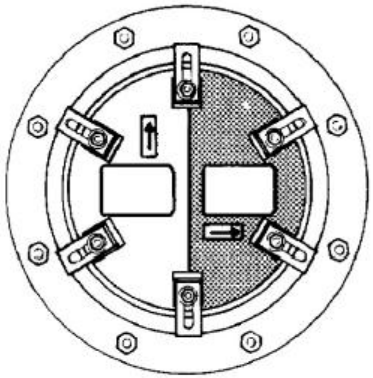
Prerequisite

The equipment must be shipped to the installation site.

The type of the equipment such as the ODUs and hybrid coupler must be the same as the type information provided in the packing list.



The feed boom on the left is horizontally polarized.
The feed boom on the right is vertically polarized.



The feed boom on the left is vertically polarized.
The feed boom on the right is horizontally polarized.

Procedure of Installing ODUs with dual polarized antenna;

- ❑Install the antenna by following the instructions provided in the packing box.
- ❑Adjust the polarization directions of the dual-polarized antenna by following the instructions for installing the antenna.
- ❑The feed booms of the adjusted dual-polarized antenna are arranged in two ways.
- ❑Install the ODU adapter onto a proper position on the antenna pole.
- ❑Keep the direction of the waveguide cavity of the flexible waveguide consistent with that of the adapter or the antenna. Then, install the flexible waveguide onto the flange interfaces of the ODU adapter and of the antenna using screws, Use the corresponding cramping kit to fix the flexible waveguide.
- ❑Install the vertically polarized ODU on the vertically polarized feed boom of the dual-polarized antenna according to the installation type.

Installing the ODU with the Coaxial Interface

Installation of ODU on Antenna

One ODU with One Antenna

One ODU with Two Antenna

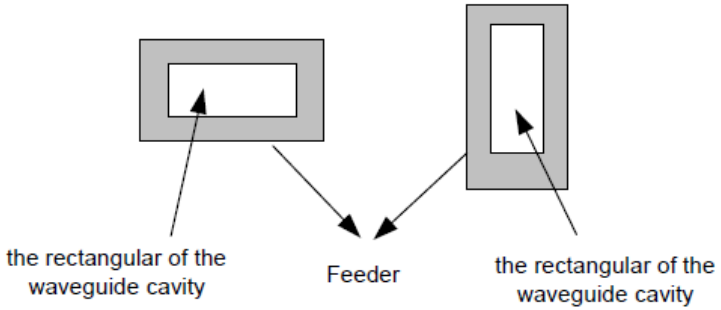
Installing One ODU on One Single-Polarized Antenna

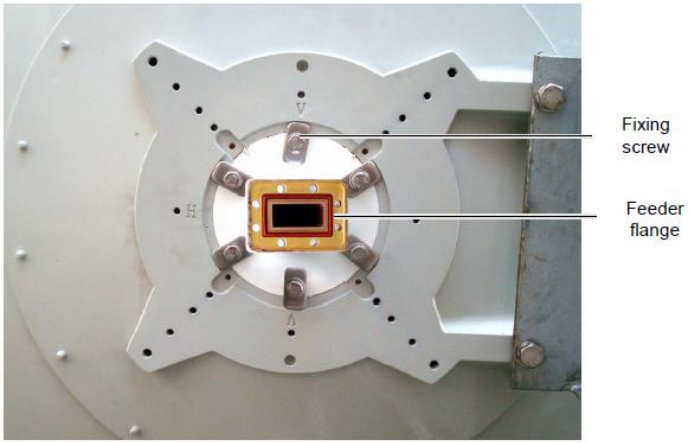
In this case, the ODU is connected to the waveguide-to-coaxial converter installed on the single polarized antenna through an RF cable.

By default, the antenna applies vertical polarization. If horizontal polarization is required, rotate the feed boom at the back of the antenna to change the polarization direction of the antenna. If the waveguide on the feed boom is a round waveguide, the polarization direction of the antenna need not be changed.

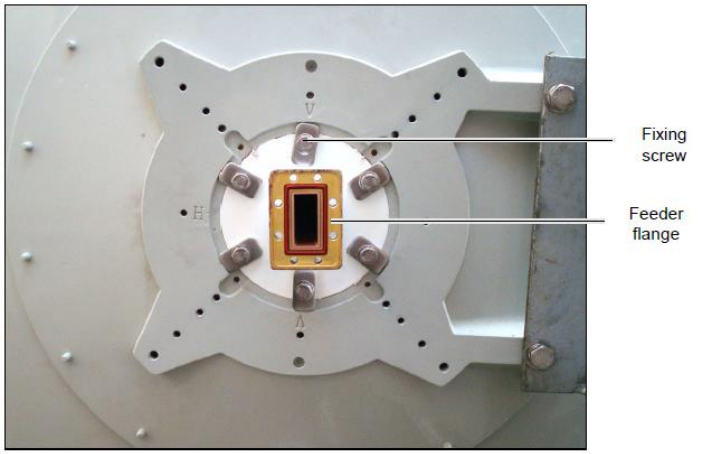
Prerequisite

The antenna must be installed.





- ❑Check if the antenna is vertically polarized.
- ❑Loosen the fixing screws to allow the feed boom to rotate freely.
- ❑Rotate the feed boom 90 degrees to the right or left until its positioning pin is plugged into the
- ❑positioning slot in the base.
- ❑Tighten the fixing screws.
- ❑Apply glue around the screws.



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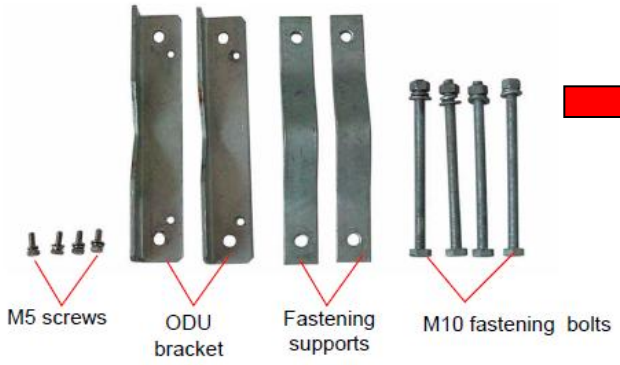
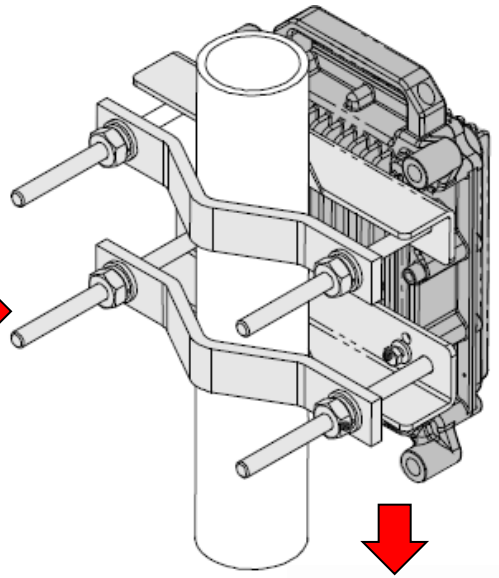
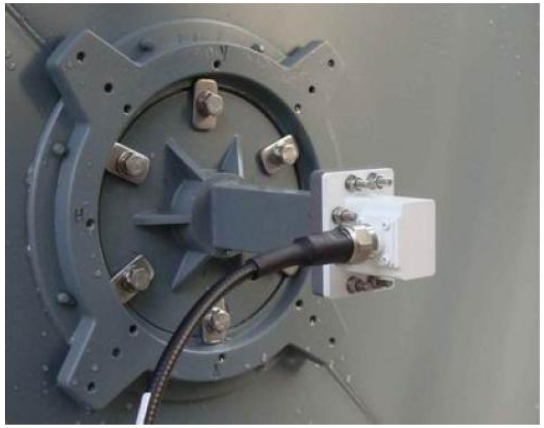
Installing ODU on Pole

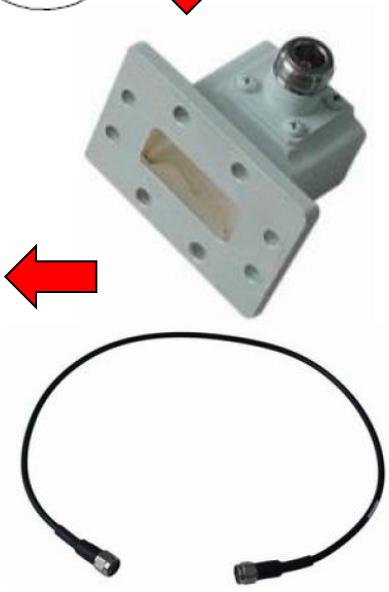
Prerequisite
The antenna must be installed.
There must be space for the ODU on the pole.





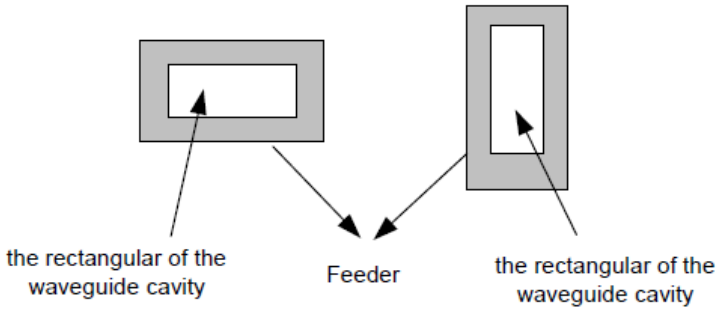
❑Use the four M5 screws to install the ODU onto the ODU bracket.
❑Use the fastening supports and bolts to install the ODU on the pole. The installation location must be proper.
❑The IF port and RF port of the ODU must face downwards.
❑Use the matching bolts to install the waveguide-to-coaxial converter onto the feed boom of the antenna.
❑Connect one type-N connector of the RF cable to the coaxial port of the waveguide-to-coaxial converter.
❑Connect the other type-N connector of the RF cable to the ANT port of the ODU.
❑waterproof the connection between the RF cable and the waveguide-to-coaxial converter and the connection between the RF cable and the ODU.

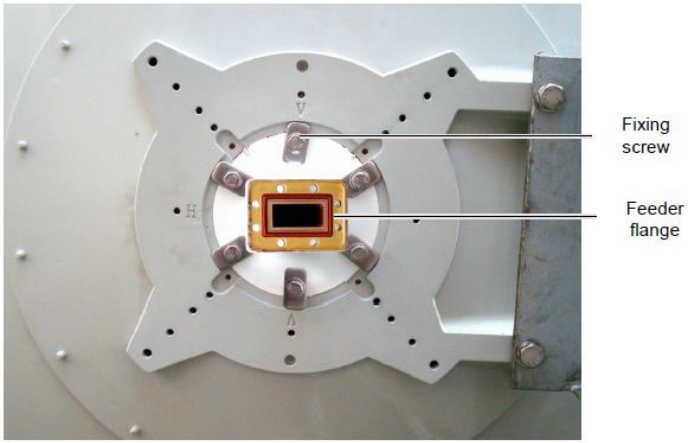




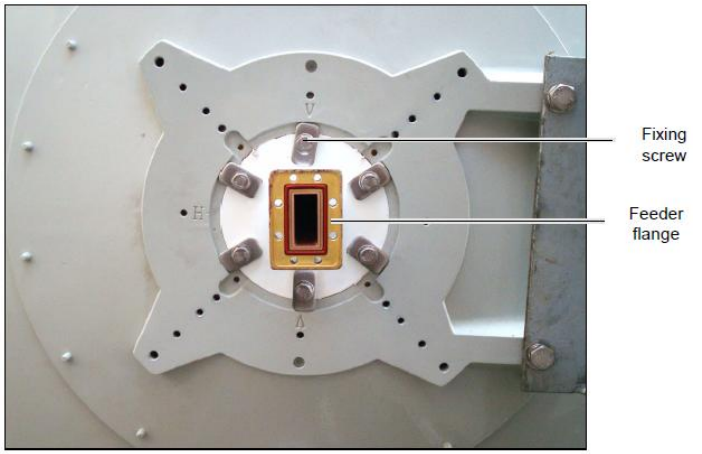
Installing Two ODUs on One Single-Polarized Antenna

In this case, the ODUs are connected to the hybrid coupler installed on the single-polarized antenna through RF cables. By default, the antenna applies vertical polarization. If horizontal polarization is required, rotate the feed boom at the back of the antenna to change the polarization direction of the antenna. If the waveguide on the feed boom is a round waveguide, the polarization direction of the antenna need not be changed.





- ❑Check if the antenna is vertically polarized.
- ❑Loosen the fixing screws to allow the feed boom to rotate freely.
- ❑Rotate the feed boom 90 degrees to the right or left until its positioning pin is plugged into the
- ❑positioning slot in the base.
- ❑Tighten the fixing screws.
- ❑Apply glue around the screws.



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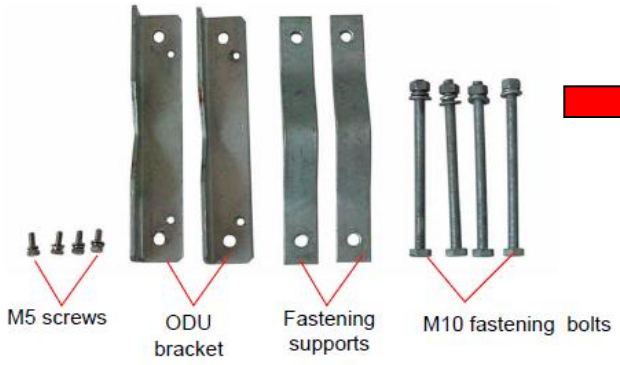
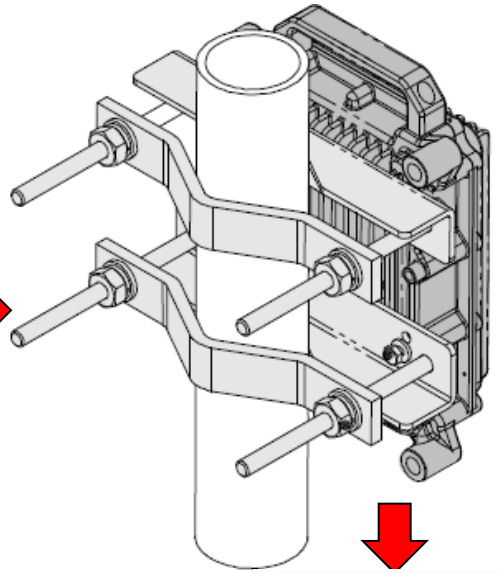
Installing ODU on Pole

Prerequisite

The antenna must be installed.

There must be space for the ODU on the pole.





- ❑Use the matching bolts to install the hybrid coupler onto the feed boom of the antenna.
- ❑If the feed boom of the antenna is vertically polarized, the coaxial port of the hybrid coupler should face downwards.
- ❑Connect one type-N connector of the RF cable to the coaxial port of the hybrid coupler.
- ❑Connect the other type-N connector of the RF cable to the ANT port of the ODU.
- ❑When you connect the RF cables, the main ODU must be connected to the MAIN port of the hybrid coupler and the standby ODU must be connected to the STD BY port of the hybrid coupler. Otherwise, transmission of signals will be affected.
- ❑waterproof the connection between the RF cable and the waveguide-to-coaxial converter and the connection between the RF cable and the ODU.

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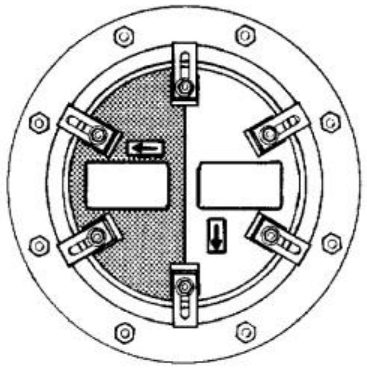
Installation of ODU on one Dual Polarized Antenna

Installing ODUs on one dual-polarized antenna is similar to installing one ODU on one single polarized antenna in the separate mounting mode. The difference between the two methods lies in the method of adjusting the polarization direction of the antenna due to the fact that the dual polarized antenna has two feed booms.

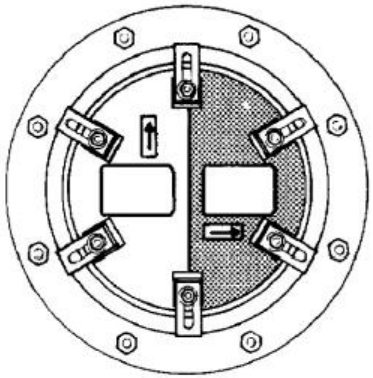
Prerequisite

The equipment must be shipped to the installation site.

The type of the equipment such as the ODUs and hybrid coupler must be the same as the type information provided in the packing list.



The feed boom on the left is horizontally polarized.
The feed boom on the right is vertically polarized.



The feed boom on the left is vertically polarized.
The feed boom on the right is horizontally polarized.

Procedure of Installing ODUs with dual polarized antenna;

- ❑Install the antenna by following the instructions provided in the packing box.
- ❑Adjust the polarization directions of the dual-polarized antenna by following the instructions for installing the antenna.
- ❑The feed booms of the adjusted dual-polarized antenna are arranged in two ways.
- ❑Install the ODU adapter onto a proper position on the antenna pole.
- ❑Keep the direction of the waveguide cavity of the flexible waveguide consistent with that of the adapter or the antenna. Then, install the flexible waveguide onto the flange interfaces of the ODU adapter and of the antenna using screws, Use the corresponding cramping kit to fix the flexible waveguide.
- ❑Install the vertically polarized ODU on the vertically polarized feed boom of the dual-polarized antenna according to the installation type.

Grounding of ODU

One end of the protection grounding cable of the ODU is connected to the grounding stud of the ODU, and the other end is connected to a grounding point.

- Fasten the OT terminal of the protection grounding cable to the grounding stud of the ODU.
- Fix the grounding clip base at the other end of the protection grounding cable on the tower. Pay attention to the following points:
  - Before the connection, first remove the anticorrosion paint and the oxidizing layer on the grounding points.
  - The grounding cable should not be spiral.
  - After the connection, rustproof and waterproof the grounding points.

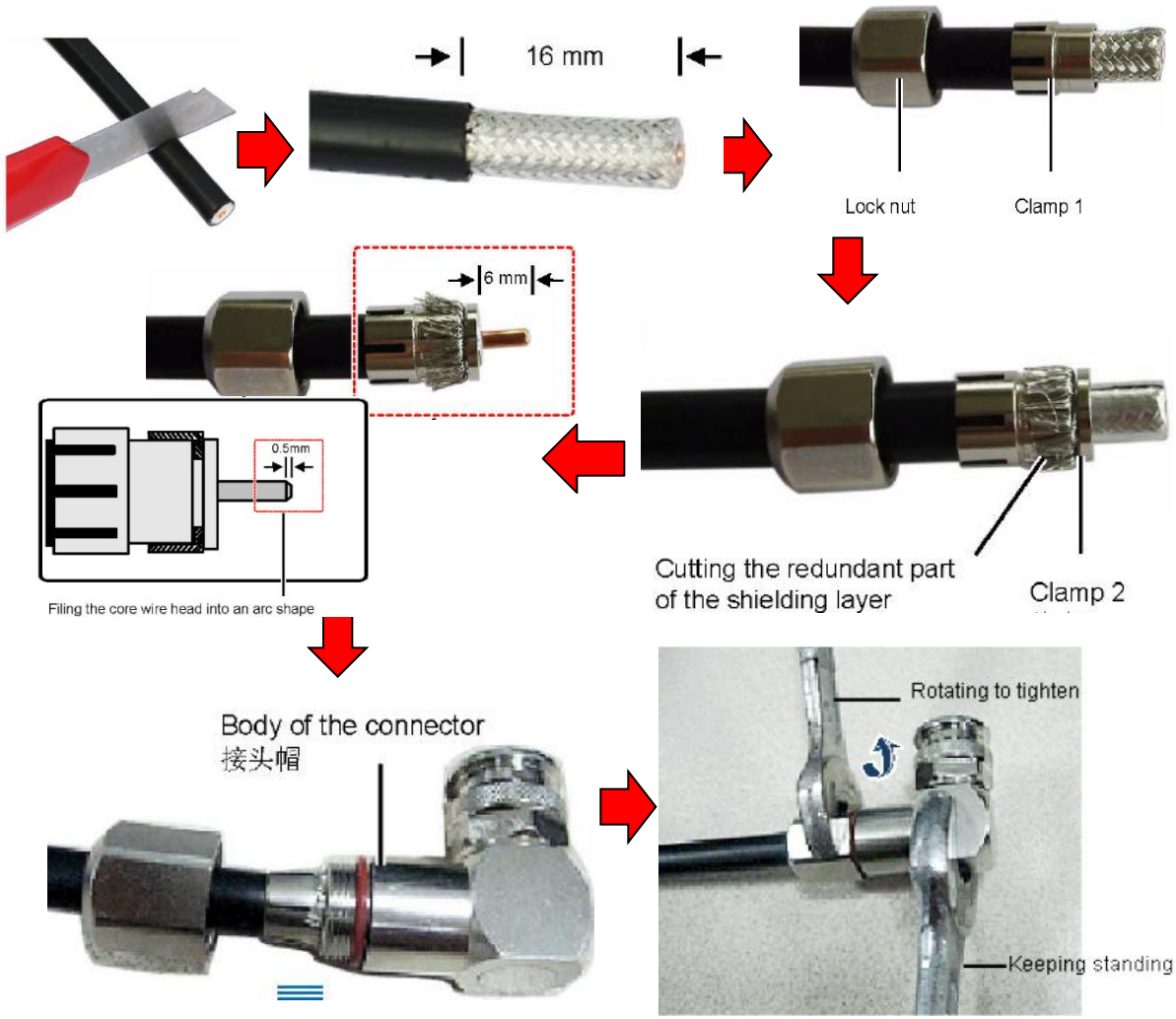
Installation Steps of MW Antenna Installation(120/180CM)

- Change the antenna polarization.
- Refer to the manufacturer's instruction on installing the antenna to the pole.
- Put two M8 Allen Screws into the holes on the antenna flange. (Put two M8 Allen screws out of total four into the holes on the Antenna flange ,upper left and lower right holes and turn only a few turns.).
- Fix the snap-on mounting to the antenna. (put the snap-on mounting into place, with the screws through the widened holes in the mounting. Turn the mounting clockwise.)
- Add the two remaining M8 screws and tighten all four screws with a 6mm Allen key. The torque is 8 N-M.
- If the antenna feeder is protected with a cover or tape then, Remove the cover or tape.

IF Connectorization-TNC Connector

One end of the IF cable needs to be terminated with a type-N connector and is connected to the ODU or lightning arrester. The other end of the IF cable needs to be terminated with a TNC connector and is connected directly to the IF cable or IDU.

- ❑Use an electric knife to strip back the 16 mm cable sheath.
- ❑Fit the lock nut and clamp 1 on the cable.
- ❑Fit clamp 2.
- ❑Fold back the braided shield to cover clamp 1.
- ❑Tidy the braided shield and use clamp 2 to bind the braided shield.
- ❑Cut the redundant part of the shielding layer.
- ❑Use the electric knife to strip back the dielectric insulating layer in front of clamp 2.
- ❑During the operation, the exposed cable wire should be 6 mm long.
- ❑Use a file to taper the edge of the core wire about 0.5 mm to make the top in an arc shape, and clean out the metal filings.
- ❑Fit the connector.
- ❑Connect the connector and the lock nut. Use a wrench to tighten the connection.
- ❑Use a wrench to rotate the lock nut and another wrench to position the body of the connector.
- ❑The recommended torque is 15±2 N•m.



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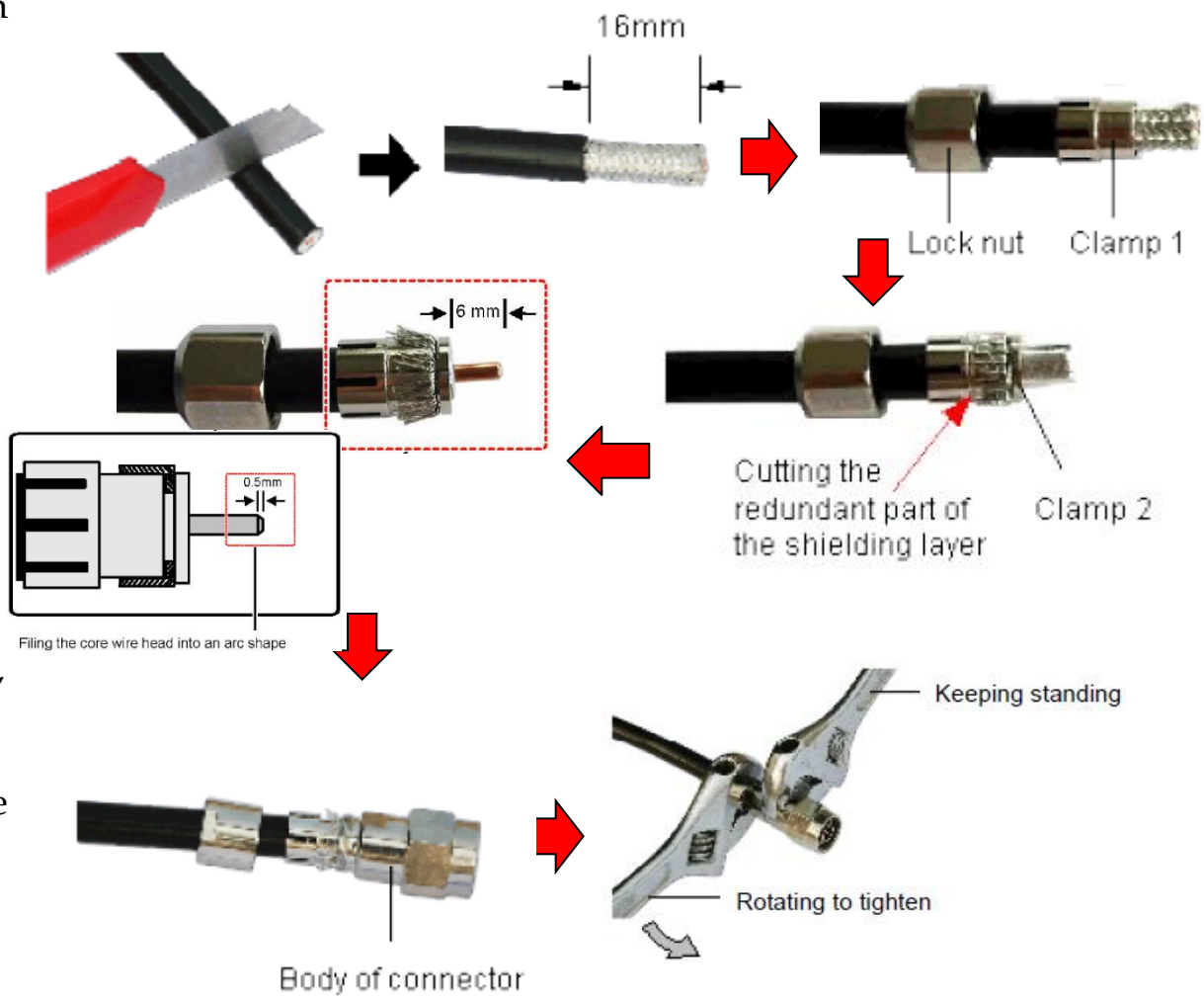
IF Connectorization-N Connector

Both ends of the RG-8U or 1/2–inch IF cable need to be terminated with type-N connectors. An IF jumper is required to connect the RG-8U or 1/2–inch IF cable to the IF board or IDU.

- ❑Use an electric knife to strip back the 16 mm cable sheath.
- ❑Fit the lock nut and clamp 1 on the cable.
- ❑Fit clamp 2.
- ❑Fold back the braided shield to cover clamp 1.
- ❑Tidy the braided shield and use clamp 2 to bind the braided shield.
- ❑Cut the redundant part of the shielding layer.
- ❑Use the electric knife to strip back the dielectric insulating layer in front of clamp 2.
- ❑During the operation, the exposed cable wire should be 6 mm long.
- ❑Use a file to taper the edge of the core wire about 0.5 mm to make the top in an arc shape, and clean out the metal filings.
- ❑Fit the connector.
- ❑Connect the connector and the lock nut. Use a wrench to tighten the connection.
- ❑Use a wrench to rotate the lock nut and another wrench to position the body of the connector.
- ❑The recommended torque is 15±2 N•m.

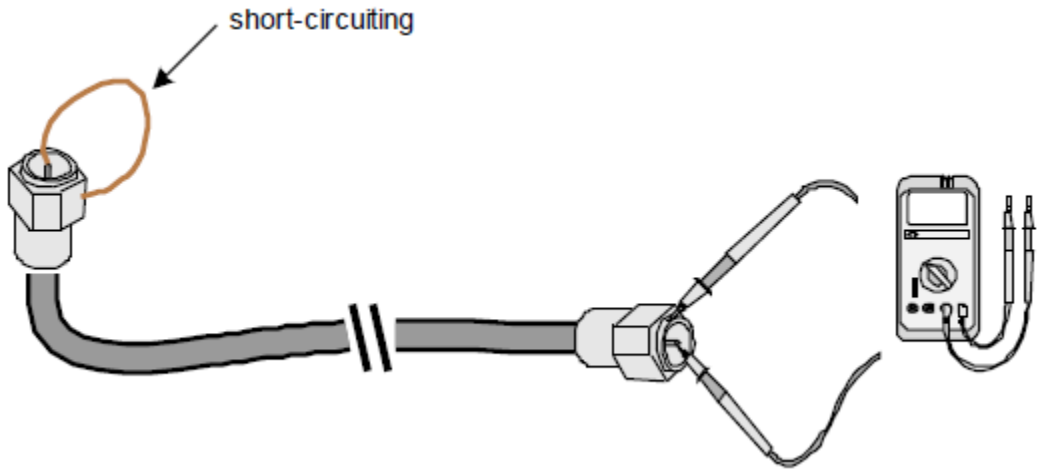


IF Connector-Continuity Check

During the procedures of routing or bundling cables, and installing connectors, the circuit in a cable may become open or broken. Hence, you need to test the connectivity of the cables after the preceding procedures are completed.

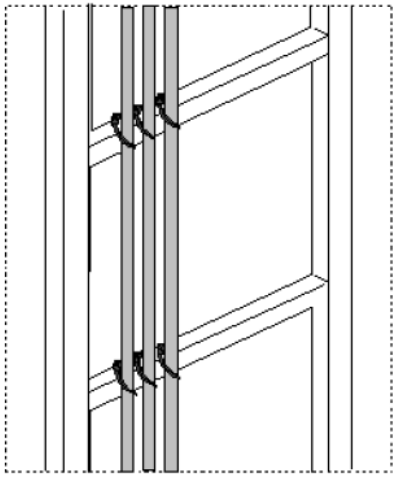
Procedure;

- At one end of the IF cable, use a short-circuiting line to short-circuit the internal and external conductors, and then use a multimeter to test the resistance. The resistance should be 0 ohms.
- Remove the short-circuiting line, and use a multimeter to test the resistance between the internal conductor and the external conductor. The resistance should be infinite.
- Connect one end of the IF cable to the ODU, and connect the other end to the IDU.

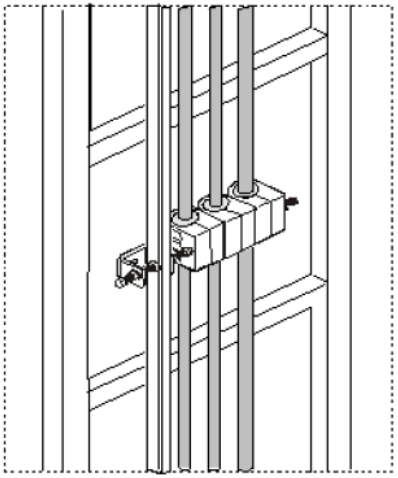


IF Cable Installation

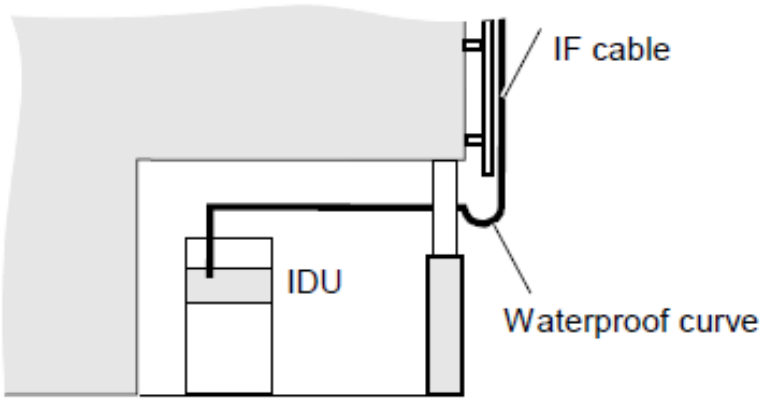
- Depending on the distance between the IDU and the ODU, cut off the extra length of IF cable after retaining a slack of 3 m to 5 m.
- Take protective measures to avoid damage to the connectors during hoisting and routing of the IF cables.
- Affix temporary labels to both ends of the IF cable.
- Leave enough slack on the IF cable. Then, route it and bind it along the pole, the wiring ladder, and the wiring frame.
- Connect the IF cable to the IF port of the ODU.
- If the RG-8U or 1/2–inch IF cable is used, make the type-N connectors and connect the type-N connectors to the RG-8U or 1/2–inch IF cable.
- Connect the IF jumper to the IF cable.
- In the case of the IDU 605 2B/2F, the IF cable of the main ODU is connected to the IF jumper connecting to the ODU-M port and the IF cable of the standby ODU is connected to the IF jumper connecting the ODU-S port.
- In the case of the IDU 620, if IF 1+1 protection is configured, the IF cable of the main ODU is connected to the IF jumper of the main IF board and the IF cable of the standby ODU is connected to the IF jumper of the standby IF board.
- If the IFX board is used and supports the XPIC function, the IF cable of the vertically polarized ODU is connected to the IF jumper of the IFX board that processes the vertically polarized waves; the IF cable of the horizontally polarized ODU is connected to the IF jumper of the IFX board that processes horizontally polarized waves.



Fixing the IF cable by using outdoor binding tapes



Fixing the IF cable by using cable clamps



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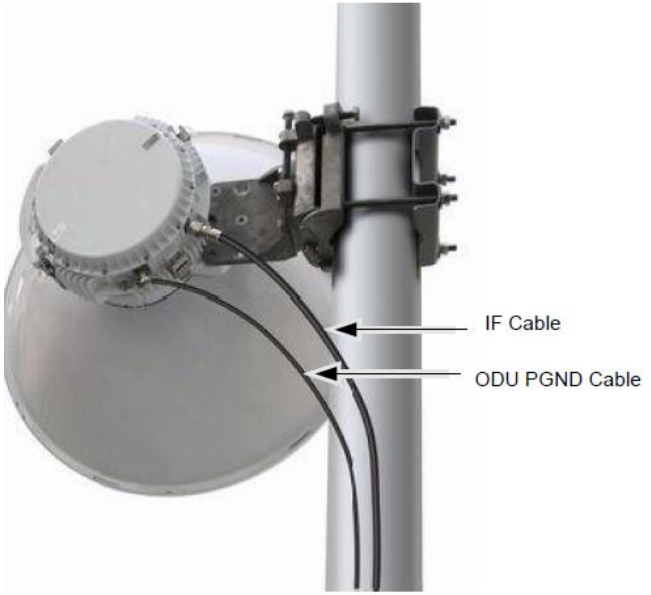
IF Cable Installation

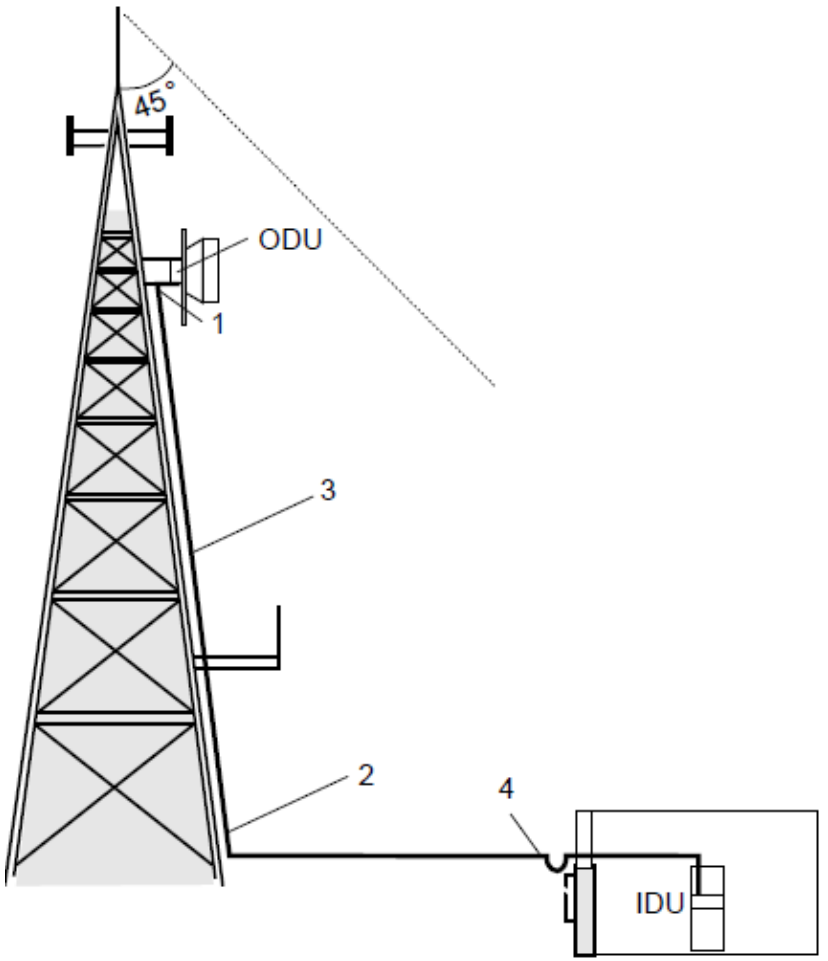
- If the 5D IF cable is used, make the TNC connector and connect the TNC connector to one end of the 5D IF cable.
- Connect the 5D IF cable to the IF interface of the IF board or IDU.
- In the case of the IDU 605 2B/2F, the IF cable of the main ODU is connected to the ODU-M port and the IF cable of the standby ODU is connected to the ODU-S port.
- In the case of the IDU 620, if IF 1+1 protection is configured, the IF cable of the main ODU is connected to the IF jumper of the main IF board and the IF cable of the standby ODU is connected to the IF jumper of the standby IF board.
- If the IFX board is used and supports the XPIC function, the IF cable of the vertically polarized ODU is connected to the IF jumper of the IFX board that processes the vertically polarized waves; the IF cable of the horizontally polarized ODU is connected to the IF jumper of the IFX board that processes horizontally polarized waves.



IF Cable Grounding

- To ground the IF cable, first determine the grounding point depending on the installation mode and the length of the IF cable, and then ground the cable by using the grounding clip.

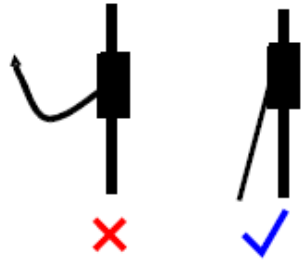
- The grounding point depends on the installation mode and the length of the IF cable. Generally, the IF cable should be grounded to a minimum of three points. When the IF cable is longer than 60 meters, add a grounding point for every extra 30 meters.
- If the distance between the grounding point 2 and the grounding point 3 (or the grounding point 5) is smaller than 20 m, cancel the grounding point 3 (or the grounding point 5).
- Depending on the installation mode and the length of the IF cable, determine the installation location of the grounding clips.
- Connect the grounding cable to the grounding points.

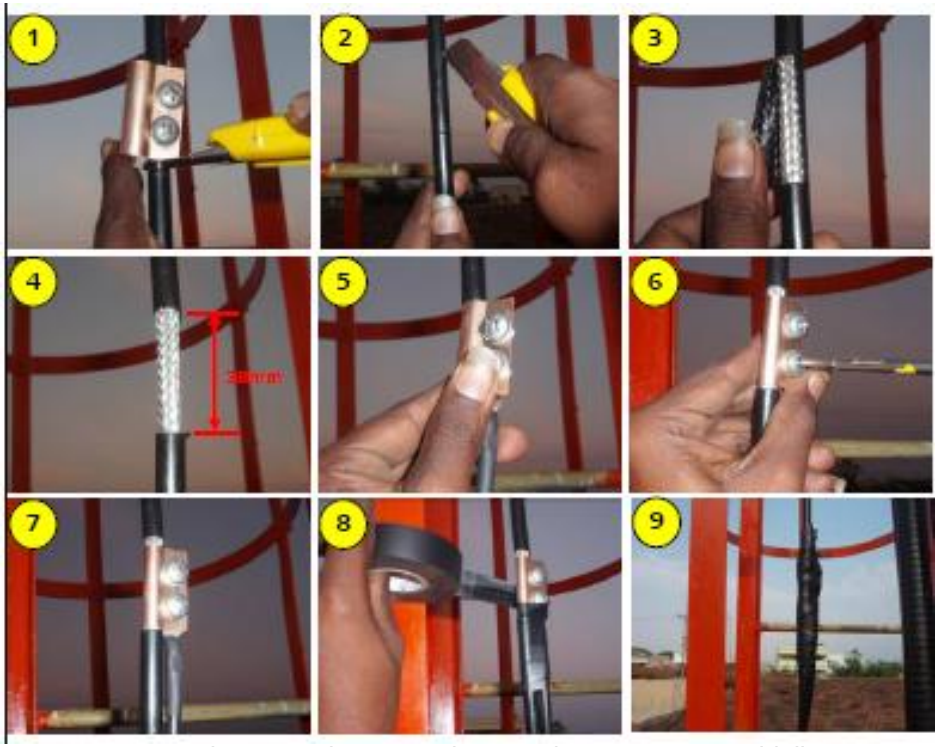


1,2,3,4: Grounding points of the IF cable

IF Cable Grounding

- Pay attention to the following points:
- Before the connection, first remove the anticorrosion paint and the oxidizing layer on the
- grounding points.
- The angle between the grounding wire of the clip and the IF cable should not be larger than 15 degrees.
- When the IF cable is vertically routed, the grounding wire of the clip should be led downwards.
- The grounding cable should not be spiral.
- After the connection, rustproof the grounding points.
- Use an electric knife to strip the cable sheath with the openness being the clip size at the installation location of the grounding clip and expose the external conductor.
- Clip the cable by using the grounding clip and press the clip tightly.
- The angle between the grounding wire of the clip and the IF cable should not be larger than 15 degrees. When the IF cable is vertically routed, the grounding wire of the clip should be led downwards.





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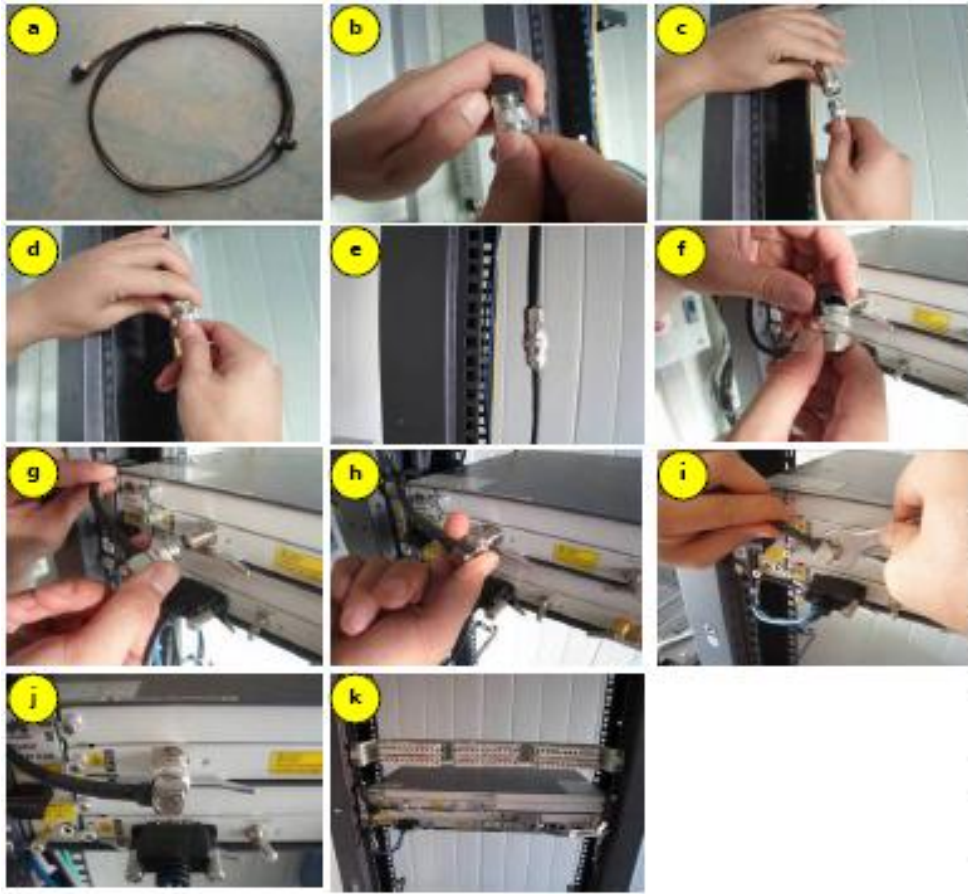
IF Cable Connection At IDU



Procedure of connecting IF jumpers to IF cable & IDU;

- Ensure that the ODU switch is in OFF (0).
- Ensure that the power switch to IDU is in OFF.
- Connect the IF jumper to the IF interface on the IF board and then fix the jumper.
- Route the IF jumper from the equipment end to a proper location on the cable tray.
- Connect the jumper with IF cable coming from ODU.
- Tighten properly .
- Put labels at IDU end on IF jumper.

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POWERING ON OF IDU

Procedure of Power ON of IDU;

- ❑ Before powering ON of IDU, Check the voltage at MCB/Fuse where IDU is connected & record the voltage.
- ❑ If the voltage is OK ,within operating range ,then switch ON the MCB.
- ❑ Turn ON the system power switch of the PXC board on the IDU ,and then the ODU power switch on the IF board.
- ❑ The startup time of the equipment is about 3 to 5 minutes.
- ❑ If the Standard I/P voltage is -48VDC ,then the range should be -38.4VDC to -57.6VDC.
- ❑ If the Standard I/P voltage is -60VDC ,then the range should be -48 VDC to -72VDC.

NOTE-

- ➢Pull out the toggle switch.(ODU & IDU)
- ➢Move the toggle switch to the left (I) or to the right (o).
- ➢Release the toggle switch.

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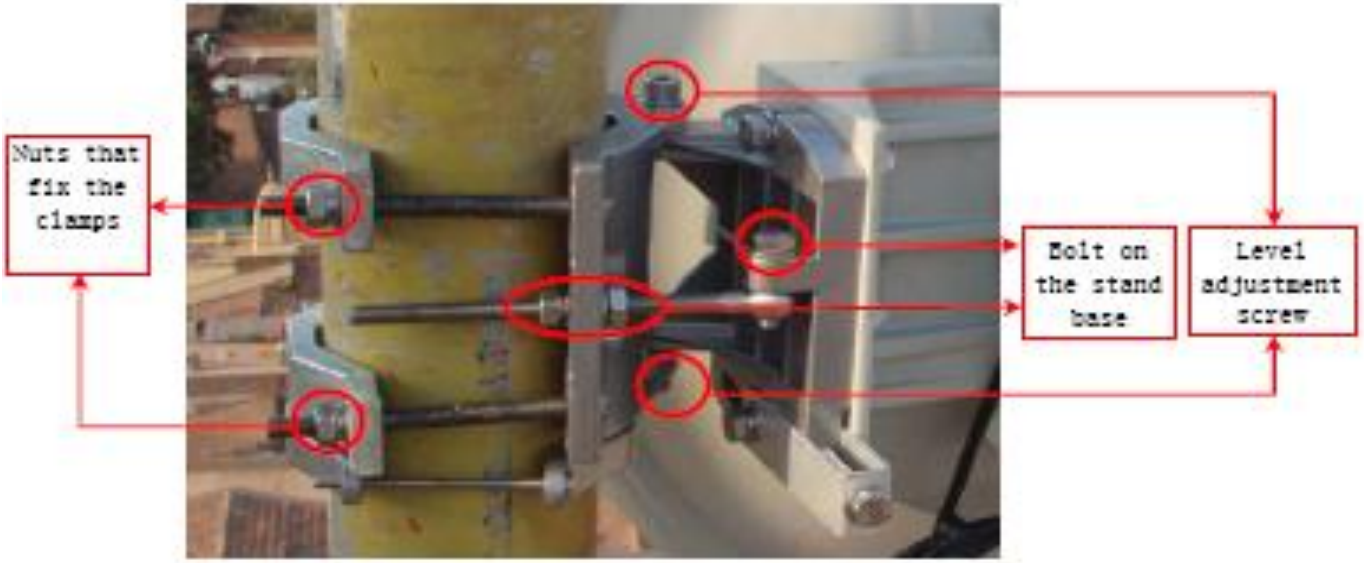
Alignment of MW Antenna

HORIZONTAL ALIGNMENT



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Alignment of MW Antenna

VERTICAL ALIGNMENT

Procedure of alignment;

1. Determine the azimuth of an antenna according to the installation position and height of the antenna. Then, adjust the elevation of the antenna to the horizontal position.
2. Connect a multimeter to the received signal strength indicator (RSSI) port on the ODU at the local end and test the voltage value VBNC.
3. Adjust the azimuth and elevation of an antenna .
4. Retain the position of the antenna at the remote end.
5. Use the multimeter to measure VBNC. At the local end, rotate the antenna widely in the horizontal direction.
6. Adjust the antenna until VBNC reaches the peak value. Then, fix the antenna at the local end.
7. Repeat the steps 1 & 2 at remote end to adjust the antenna at the remote end. When VBNC reaches the peak value, tighten the antenna at the remote end..
8. Repeat Step 2 to 4 for two to four times. When VBNC at the local end and VBNC at the remote end reach the peak value, tighten the antennas at both ends.

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RTN-910,IDU PRODUCT DESCRIPTION

IDU-RTN910-Components

- ❑Chasis height is 1HU =44.45mm
- ❑No of MW directions is 1 or 2
- ❑RF configuration mode are 1+0 non protection, 2+0 non-protection,1+1 protection ,N+1 protection & XPIC configuration.

The OptiX RTN 910 forms different configuration modes by flexibly configuring different control, switching, and timing boards, IF boards, and ODUs to meet the requirements of different microwave application scenarios.

Configuration Modes	Type of the Control, Switching, and Timing Board	Type of the IF Board	Type of the ODU	Main Application
PDH microwave equipment	CSTA	IF1	Low capacity for PDH ODU	Providing a radio link whose capacity is not higher than 16xE1
SDH microwave equipment	CSTA	IF1	Standard power ODU or high power ODU	Providing a 1xSTM-1 SDH radio link or a high-capacity PDH radio link
	CSTA	ISU2/ISX2	Standard power ODU or high power ODU	Providing a 1xSTM-1 or 2xSTM-1 SDH radio link
Hybrid/Packet microwave equipment	CSHA/CSHB/ CSHC/CSHD	IFU2/ISU2	Standard power ODU or high power ODU	Providing a Hybrid/Packet radio link
XPIC Hybrid/ Packet microwave equipment	CSHA/CSHB/ CSHC/CSHD	IFX2/ISU2	Standard power ODU or high power ODU	Providing a Hybrid/Packet radio link of the super capacity

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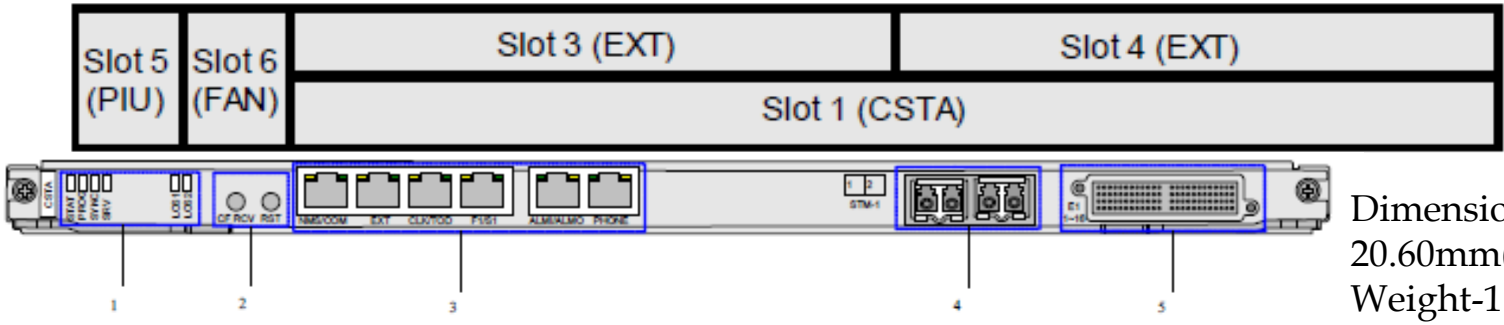
IDU-RTN910-Boards(CSTA)



Dimension-20.60mm(H)x3888.40mm(W)x266.79mm(D)
Weight-1.08Kgs.
Power consumption: < 13.6 W

1. Indicators	2. Buttons	3. Auxiliary ports and management ports
4. STM-1 optical ports	5. E1 (1-16) ports	-

Cross-connect capacity	•Supports full time division cross-connections (equivalent to 8x8 VC-4s) at the VC-12, VC-3, or VC-4 level.
System control and communication.	•Manages, monitors, and controls the running status of the IDU, and works as a communication service unit between the NMS and boards to help the NMS to control and manage the NE.
Port for monitoring an outdoor cabinet	•1 The port shares the same port with the external time port and its specifications comply with RS-485.
Asynchronous data port	•1 The transmission rate of the port is equal to or less than 19.2 kbit/s and the interfacing level complies with RS-232.
Clock synchronization at the physical layer	•Provides the system clock and frame headers for service signals and overhead signals for the other boards when tracing an appropriate clock source. The traced clock source can be any of the following: 1) External clock 2) SDH line clock,3) PDH tributary clock,4) Clock at the air interface.
OM	•Warm reset and cold reset. •In-service FPGA loading. •Board manufacturing information query. •Board temperature detection. •Board voltage detection.

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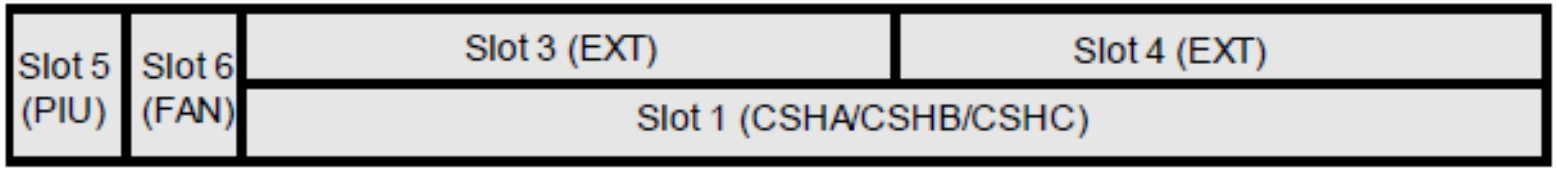
IDU-RTN910-Boards(CSTA) Function

SDH Service Function	•Receives and transmits 2xSTM-1 optical signals.
Protection.	•Linear MSP & SNCP.
Outband DCN.	•Each SDH line port can provide one DCC that is composed of three DCC bytes, nine DCC bytes, or twelve DCC bytes.
OM	•Supports the following loopback types:1) Outloops at optical ports,2) Inloops at optical ports,3) Outloops on VC-4 paths,4) Inloops on VC-4 paths •Automatic laser shutdown (ALS) function. •Detection and query of SFP optical module information.
PDH Function.	•Receives and transmits E1 signals.
Port specifications	•16x 75-ohm/120-ohm E1 port.
Clock	•Supports a tributary clock source extracted from the first or fifth E1 signal. •Supports clock protection based on clock source priorities. •E1 retiming function.

IDU-RTN910-Boards(CSHA/CSHB/CSHC)

The CSHA/CSHB/CSHC is the integrated Hybrid system control, switching, and timing board.
The CSHA, CSHB, and CSHC differ from each other with regard to the types and number of service ports.
The CSHA/CSHB/CSHC provides 4.2 Gbit/s packet switching, full time division crossconnection, system control and communication, and clock processing functions. The CSHA/ CSHB/CSHC provides FE/GE service ports, PDH/SDH service ports, auxiliary ports, and management ports.



CSHA

1. Indicators	2. Buttons	3. Clock ports, auxiliary ports, and management ports
4. FE service ports	5. GE electrical service ports	6. E1 (1-16) ports

Dimensions- 20.60mm(H)x388.40mm(W)x266.79mm(D).
Weight-CSHA-1.11Kgs, CSHB-1.16Kgs,CSHC-1.13Kgs.

Power consumption of the CSHA: < 18.0 W
Power consumption of the CSHB: < 22.7 W
Power consumption of the CSHC: < 19.6 W

IDU-RTN910-Boards(CSHA/CSHB/CSHC)

CSHB

1. Indicators	2. Buttons	3. Clock ports, auxiliary ports, and management ports
4. FE service ports	5. GE electrical service ports	6. E1 (1-32) ports

CSHC

1. Indicators	2. Buttons	3. Clock ports, auxiliary ports, and management ports
4. FE service ports	5. GE optical/electrical service ports (using SFP modules)	6. STM-1 optical ports (using SFP optical modules)
7. E1 (1-16) ports	-	-

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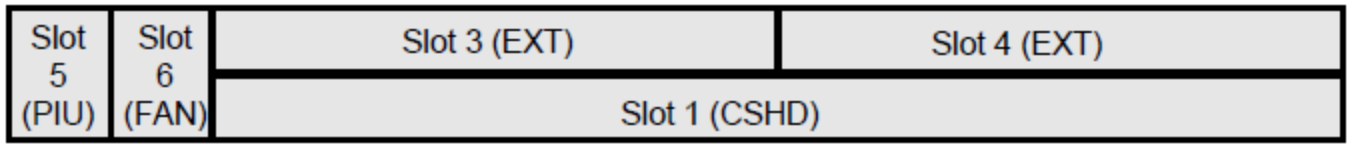
IDU-RTN910-Boards(CSHA/CSHB/CSHC) Function

Basic Functions as follows;	•Supports 4.2 Gbit/s packet switching function. •Supports full time division cross-connections (equivalent to 8x8 VC-4s) at the VC-12, VC-3, or VC-4 level.
Clock	•Provides the system clock and frame headers for service signals and overhead signals for the other boards when tracing an appropriate clock source. The traced clock source can be any of the following:1) External clock,2) SDH line clock,3) PDH tributary clock,4) Clock at the air interface,5) Synchronous Ethernet clock.
DCN	•Outband DCN-CSHA & CSHB Supports a maximum of five DCCs , CSHC Supports a maximum of Seven DCCs. • Inband DCN-Supports the inband DCN function. The DCN bandwidth is configurable.
MPLS/PWE3 functions	•Supports
SDH service functions	•Only CSHC supports & Receives and transmits 2xSTM-1 optical signals. •Each SDH line port can provide one DCC that is composed of three DCC bytes, nine DCC bytes, or twelve DCC bytes. •Supports the following loopback types:1) Outloops at optical ports,2)Inloops at optical ports,3) Outloops on VC-4 paths,4)Inloops on VC-4 paths.
PDH Functions.	•Receives and transmits E1 signals. •75-ohm/120-ohm E1 port (16 for CSHA,32 for CSHB & 16 for CSHC). •Supports a tributary clock source extracted from the first or fifth E1 signal. •Supports clock protection based on clock source priorities.

IDU-RTN910-Boards(CSHD)

The CSHD provides 4.4 Gbit/s packet switching, full time division cross-connection, system control and communication, and clock processing functions. The CSHD provides FE/GE service ports, E1 service ports, auxiliary ports, and management ports.



CSHD

1. Indicators	2. Buttons	3. Clock ports, auxiliary ports, and management ports
4. FE service ports	5. GE optical/electrical service ports (using SFP modules)	6. E1 (1-16) ports

Dimensions- 20.60mm(H)x388.40mm(W)x266.79mm(D).
Weight-CSHD-1.00Kg.

Power consumption of the CSHD:32.2Watts

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IDU-RTN910-Boards(CSHD) Function

Basic Functions as follows;	•Supports 4.4 Gbit/s packet switching function. •Supports full time division cross-connections (equivalent to 8x8 VC-4s) at the VC-12, VC-3, or VC-4 level.
Clock	•Provides the system clock and frame headers for service signals and overhead signals for the other boards when tracing an appropriate clock source. The traced clock source can be any of the following:1) External clock,2) SDH line clock,3) PDH tributary clock,4) Clock at the air interface,5) Synchronous Ethernet clock.
DCN	•Outband DCN-Supports a maximum of five DCCs . • Inband DCN-Supports the inband DCN function. The DCN bandwidth is configurable.
MPLS/PWE3 functions	•Static LSPs •1:1 MPLS tunnel APS •Supports the following OAM functions:l MPLS OAM that complies with ITU-T Y.1711,1) LSP ping and LSP trace route functions. •Supports the following service categories:1)CES services,2) ATM PWE3 services,3) ETH PWE3 services. •Static PWs. •1:1 PW APS

IDU-RTN910-Boards(CSHD) Function

QoS functions

- Supports traffic classification based on C-VLAN IDs, S-VLAN IDs, C-VLAN priorities, S-VLAN priorities, C-VLAN IDs + C-VLAN priorities, S-VLAN IDs + S-VLAN priorities, or DSCP values carried by packets.
- Provides the CAR function for traffic flows at ports.
- Supports the following queue scheduling policies:1) SP ,2)WRR,3) SP+WRR.

Ethernet service functions

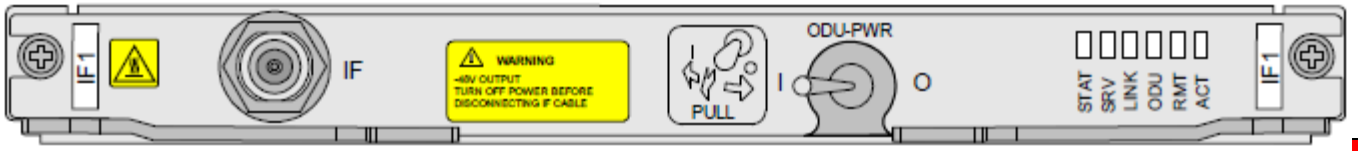
- Receives/Transmits FE/GE service signals and works with the packet switching unit to process the received FE/GE service signals.
- Four FE electrical port: 10/100BASE-T (X)
- Two GE port: SFP module (1000BASESX, 1000BASE-LX, and GE electrical module).
- The FE port supports 10M full-duplex, 100M fullduplex,
- and auto-negotiation.
- The GE electrical port supports 10M full-duplex, 100M full-duplex, 1000M full-duplex, and autonegotiation. The GE optical port supports 1000M full-duplex and auto-negotiation.
- Supports jumbo frames with a maximum frame length of 9600 bytes.

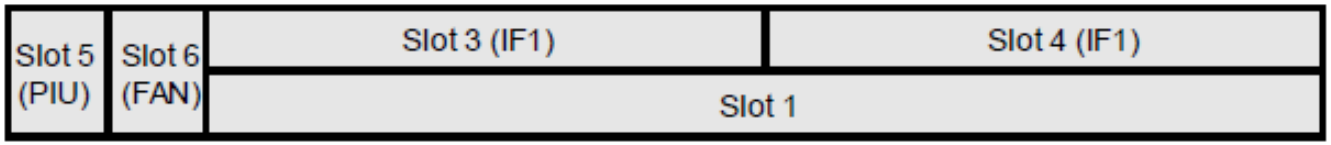
E1 service functions

- Receives and transmits E1 signals, and supports flexible configuration of E1 service categories.
- Supports the following E1 service categories:1) Native E1,2) CES E1,3) ATM/IMA E1.
- 16 - 75-ohm/120-ohm E1 port.
- Supports transparent service transmission at the 64kbit/s level.
- Maximum 64 number of ATM services.
- Maximum 256 number of ATM connections.
- Supports the following ATM encapsulation modes:1) N-to-one VPC,2) N-to-one VCC,3) One-to-one VPC,4) One-to-one VCC.

IDU-RTN910-Boards(IF1)

The IF1 receives and transmits one IF signal, provides management channels to the ODU, and supplies the required -48 V power to the ODU.





IF1

Dimensions- 19.82mm(H)x 193.80mm(W)x225.80mm(D).
Weight-IF1-0.72Kg.

Power consumption of the IF1:12Watts

Function of IF1 are as follows;

- ❑Receives and transmits one IF signal.
- ❑Provides management channels to the ODU.
- ❑Supplies the required -48 V power to the ODU.
- ❑1+1 HSB/FD/ SD protection
- ❑N+1 protection.
- ❑Protection based on clock source priorities
- ❑Protection by running the SSM protocol (supported only in SDH radio mode)
- ❑Protection by running the extended SSM protocol (supported only in SDH radio mode)
- ❑Inband DCN is not supported.
- ❑Outband DCN is supported & The PDH radio mode supports one DCC that is composed of one DCC byte if the capacity is less than 16xE1.
- ❑The PDH radio mode supports one DCC that is composed of three DCC bytes if the capacity is equal to or more than 16xE1.
- ❑The SDH radio mode supports one DCC that is composed of three DCC bytes, nine DCC bytes, or twelve DCC bytes.
- ❑Supports the following loopback types: Inloops at IF ports,Outloops at IF ports,Inloops at composite ports,Outloops at composite ports

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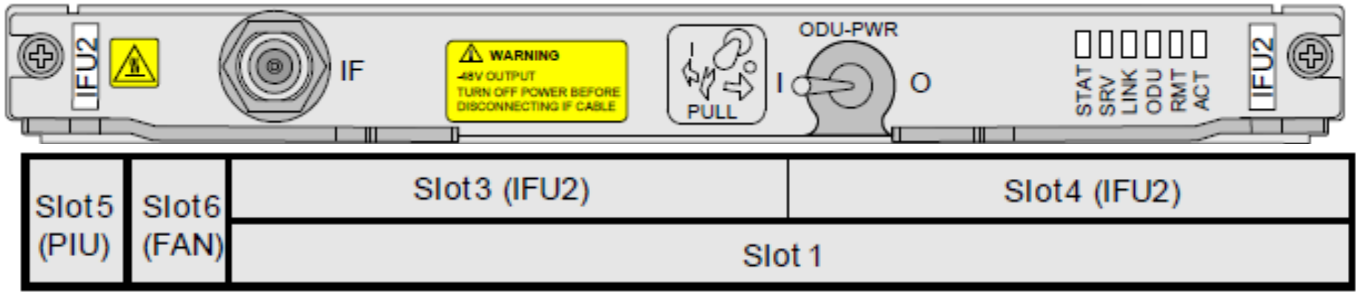
IDU-RTN910-Boards(IF2)

The IFU2 receives and transmits one IF signal, provides management channels to the ODU, and supplies the required -48 V power to the ODU.



IF2

Dimensions- 19.82mm(H)x 193.80mm(W)x225.80mm(D).
Weight-IF2-0.79Kg.

Power consumption of the IF2:23Watts

Function of IF2 are as follows

- ❑Receives and transmits one IF signal.
- ❑Provides management channels to the ODU.
- ❑Supplies the required -48 V power to the ODU.
- ❑1+1 HSB/FD/ SD protection
- ❑N+1 protection.
- ❑MPLS & PWE3 functions
- ❑Protection based on clock source priorities
- ❑Protection by running the SSM protocol
- ❑Protection by running the extended SSM protocol
- ❑Inband DCN -The DCN bandwidth is configurable.
- ❑Outband DCN Supports one DCC that is composed of three DCC bytes.
- ❑E-Line services based on ports- E-Line services based on port+VLAN , E-Line services carried by QinQ links, E-Line services carried by PWs.

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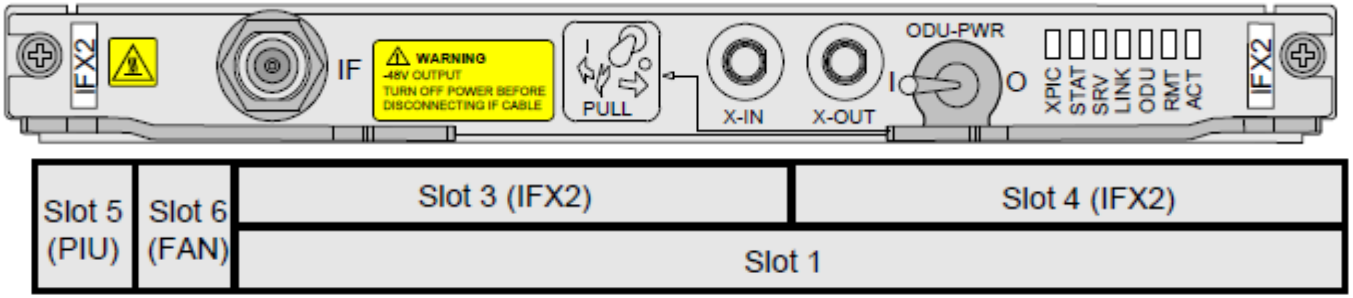
IDU-RTN910-Boards(IFX2)

The IFX2 receives and transmits one IF signal, provides management channels to the ODU, and supplies the required -48 V power to the ODU. The IFX2 supports cross-polarization interference cancellation (XPIC) processing for IF signals.



IFX2

Dimensions- 19.82mm(H)x 193.80mm(W)x225.80mm(D).
Weight-IFX2-0.80Kg.

Power consumption of the IFX2:33Watts

Function of IFX2 are as follows

- ❑Receives and transmits one IF signal.
- ❑Provides management channels to the ODU.
- ❑Supplies the required -48 V power to the ODU.
- ❑Supported only in Integrated IP radio mode, in which native TDM services are E1 services.
- ❑XPIC Function.
- ❑1+1 HSB/FD/ SD protection
- ❑N+1 protection.
- ❑MPLS & PWE3 functions
- ❑Protection based on clock source priorities
- ❑Protection by running the SSM protocol
- ❑Protection by running the extended SSM protocol.
- ❑In-service FPGA loading.
- ❑PRBS BER test at IF ports.
- ❑Board temperature & Voltage detection
- ❑Inband DCN -The DCN bandwidth is configurable.
- ❑Outband DCN Supports one DCC that is composed of three DCC bytes.
- ❑E-Line services based on ports- E-Line services based on port+VLAN , E-Line services carried by QinQ links, E-Line services carried by PWs.

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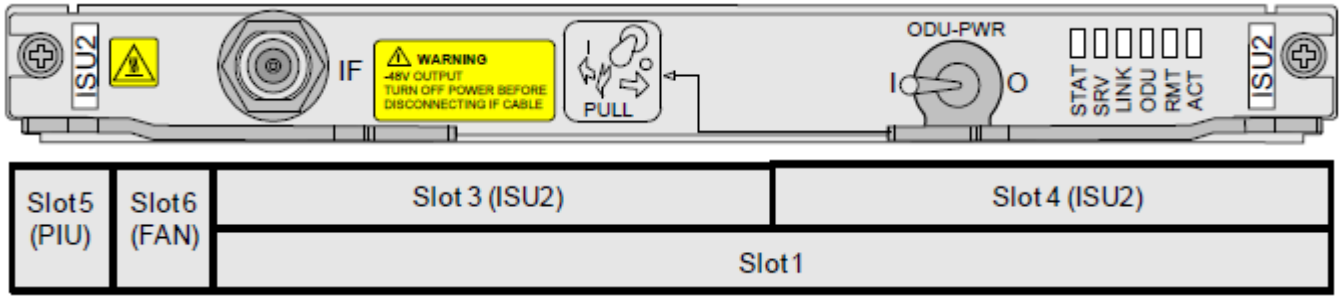
IDU-RTN910-Boards(ISU2)

The ISU2 receives and transmits one IF signal, provides management channels to the ODU, and supplies the required -48 V power to the ODU.



ISU2

Dimensions- 19.82mm(H)x 193.80mm(W)x225.80mm(D).
Weight-ISU2-0.60Kg.

Power consumption of the ISU2:22Watts

Function of ISU2 are as follows

- ❑Receives and transmits one IF signal.
- ❑Provides management channels to the ODU.
- ❑Supplies the required -48 V power to the ODU.
- ❑Radio Type -Integrated IP radio & SDH radio.
- ❑Native E1 + Ethernet & Native STM-1 + Ethernet.
- ❑Service Category-STM-1 & 2xSTM-1
- ❑1+1 HSB/FD/ SD protection
- ❑N+1 protection.
- ❑MPLS & PWE3 functions
- ❑Protection based on clock source priorities
- ❑Protection by running the SSM protocol
- ❑Protection by running the extended SSM protocol.
- ❑PRBS BER test at IF ports.
- ❑Board temperature & Voltage detection
- ❑Inband DCN -The DCN bandwidth is configurable.
- ❑Outband DCN Supports one DCC that is composed of three DCC bytes for each channel in Integrated IP radio mode.Supports one DCC that is composed of D1-D3
- ❑bytes, D4-D12 bytes, or D1-D12 bytes, for each
- ❑channel in SDH radio mode.
- ❑E-Line services based on ports- E-Line services based on port+VLAN , E-Line services carried by QinQ links, E-Line services carried by PWs.

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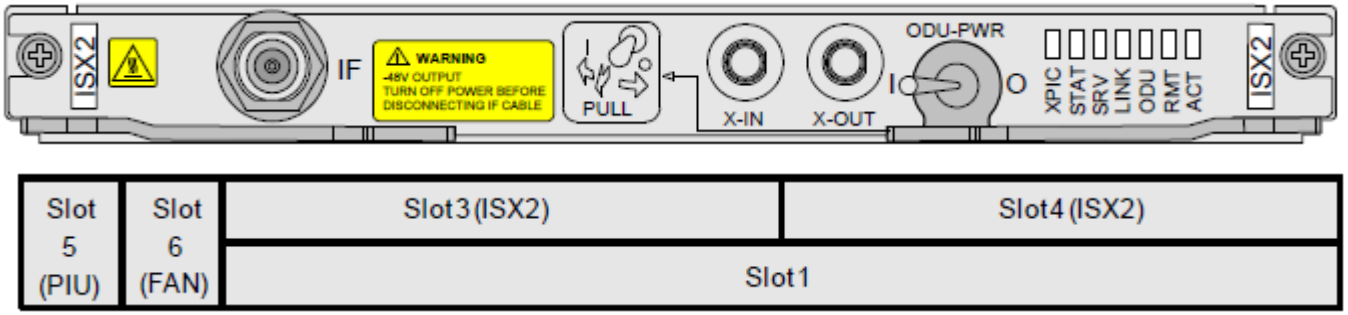
IDU-RTN910-Boards(ISX2)

The ISX2 receives and transmits one IF signal, provides management channels to the ODU, and supplies the required -48 V power to the ODU. In addition, the ISX2 provides the crosspolarization interference cancellation (XPIC) function for IF signals by transmitting/receiving XPIC reference signals.



ISX2

Dimensions- 19.82mm(H)x 193.80mm(W)x225.80mm(D).
Weight-ISX2-0.60Kg.

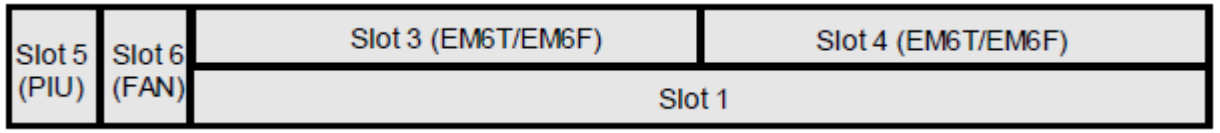
Power consumption of the ISX2:23Watts

IDU-RTN910-Boards(ISX2) Functions

- Receives and transmits one IF signal.
- Provides management channels to the ODU.
- Supplies the required -48 V power to the ODU.
- Integrated IP radio & SDH Radio .
- Service Category in Integrated IP mode -are Native E1 + Ethernet & Native STM-1 + Ethernet.
- Service Category in SDH Radio Mode are -STM-1 & 2xSTM-1.
- Supports high-efficiency encapsulation for L2 Ethernet packets and L3 IP packets.
- Supported only in integrated IP radio mode with native TDM services being E1 services.
- XPIC is supported.
- Link Protection - 1+1 HSB/FD/SD protection & N+1 protection.
- E1 services and STM-1 services & SNCP Protection.
- MPLS & PWE3 functions .
- Clock Protection-Protection based on clock source priorities ,Protection by running the SSM protocol &Protection by running the extended SSM Protocol.
- Inband DCN supported & Outband DCN -Supports one DCC that is composed of three DCC bytes for each channel in Integrated IP radio mode.
- Supports one DCC that is composed of D1-D3 bytes, D4-D12 bytes, or D1-D12 bytes, for each channel in SDH radio mode.
- In-service FPGA loading.
- PRBS BER test at IF ports
- Board manufacturing information query.
- Board temperature & Voltage detection.
- E-Line services based on ports.
- E-Line services based on port+VLAN.
- E-Line services carried by QinQ links.
- E-Line services carried by PWs.

IDU-RTN910-Boards(EM6T/EM6F)

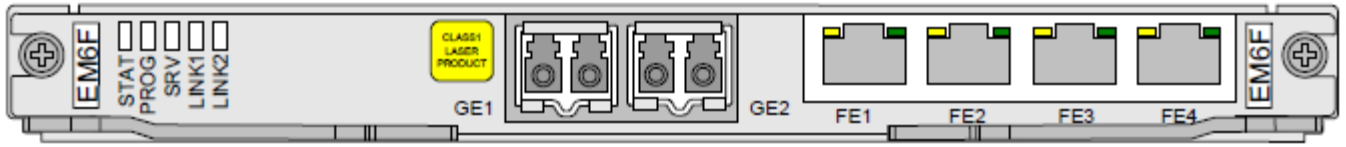
The EM6T/EM6F receives/transmits, processes, and converges four FE signals and two GE signals.



EM6T

Dimensions- 19.82mm(H)x193.80mm(W)x225.80mm(D).
Weight-EM6T & EM6F are -0.37Kg & 0.40 Kg.

Power consumption of the EM6T & EM6F are :10.4 & 11.3 Watts



EM6F

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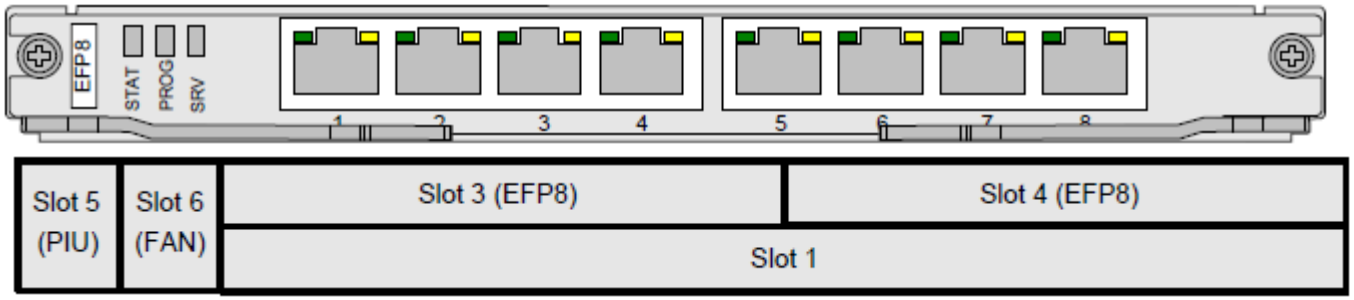
IDU-RTN910-Boards(EM6T/EM6F) Function

Function of EM6T/EM6F are as follows;

- Receives/Transmits FE/GE service signals and works with the packet switching unit to process the received
- FE/GE service signals.
- Both EM6T/EM6F Provides four 10/100BASE-T(X) ports.
- EM6T Provides two 10/100/1000BASE-T(X) ports (fixed) & EM6F Provides two GE ports by using SFP modules of any of the following types: 1) 1000BASE-SX l 1000BASE-LX, 2) 10/100/1000BASE-T(X).
- The FE port supports 10M full-duplex, 10M halfduplex, 100M full-duplex, 100M half-duplex, and auto-negotiation.
- The GE electrical port supports 10M full-duplex, 10M half-duplex, 100M full-duplex, 100M halfduplex,1000M full-duplex, and auto-negotiation.
- The GE optical port supports 1000M full-duplex and auto-negotiation.
- Supports the following types of E-Line services:
  - E-Line services based on ports
  - E-Line services based on port+VLAN
  - E-Line services based on port+QinQ
- Supports simple traffic classification by specifying PHB service classes for service flows based on their QoS information (C-VLAN priorities, S-VLAN priorities, and DSCP values) carried by the packets.
- Supports traffic classification at Ethernet ports based on C-VLAN IDs, S-VLAN IDs, C-VLAN priorities, SVLAN priorities, C-VLAN IDs + C-VLAN priorities, S-VLAN IDs + S-VLAN priorities, or DSCP values carried by packets.
- Supports the following queue scheduling policies: 1) SP, 2) WRR, 3) SP+WRR.
- Management of OAM maintenance points-1)Continuity check test, 2)Loopback test, 3) Link trace test.
- Board voltage & Temperature detection.

IDU-RTN910-Boards(EFP8)

The EFP8 receives/transmits 8xFE signals from its front panel and 1xGE packet plane signals from the backplane, and encapsulates the Ethernet signals into E1 signals, and transmits the Ethernet signals on the PDH network.



Dimensions- 19.82mm(H)x 193.80mm(W)x225.80mm(D).
Weight-EFP8-0.60Kg.

Power consumption of EFP8: < 13.5 W

Function of EFP8 are as follows;

- ❑Receives/Transmits 8xFE signals and 1xGE packet plane signals and performs EoPDH processing.
- ❑Eight FE electrical port:10/100BASE-T(X).
- ❑The FE port supports 10M full-duplex, 100M full-duplex, and autonegotiation.
- ❑Supports the following types of EVPL services:
  - ➢ EVPL services based on port +VLAN
  - ➢ EVPL services based on QinQ.
- ❑Maximum 16 number of VCTRUNKs supported by the board.
- ❑Maximum 1xVC-4 (63xE1) TDM service capacity supported by the backplane.
- ❑Maximum 16E1 number of E1s that can be bound with a single VCTRUNK.
- ❑Traffic classification based on ports
  - ➢ Traffic classification based on port +VLAN ID
  - ➢ Traffic classification based on port +VLAN ID+VLAN PRI
  - ➢ Traffic classification based on port +S-VLAN ID
  - ➢ Traffic classification based on port+C-VLAN ID+S-VLAN ID
- ❑Board manufacturing information query.
- ❑Board temperature detection.

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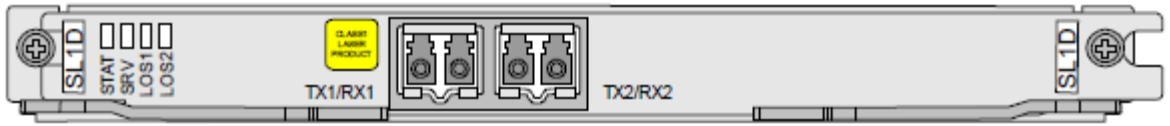
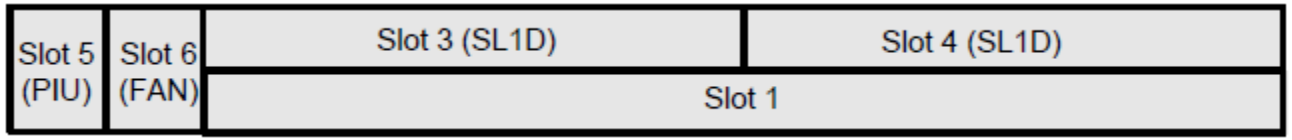
IDU-RTN910-Boards(SL1D)

The SL1D receives and transmits 2xSTM-1 optical signals.





Dimensions- 19.82mm(H)x 193.80mm(W) x225.80mm(D).
Weight-EFP8-0.30Kg.
Power Consumption-3.4Watts.

Function of SL1D are as follows;

- ❑Receives and transmits 2xSTM-1 optical signals.
- ❑Supports the following clock protection schemes:
  - ➢Protection based on clock source priorities.
  - ➢Protection by running the SSM protocol.
  - ➢Protection by running the extended SSM protocol.
- ❑Supports the following loopback types:
  - ➢Outloops at optical ports.
  - ➢Inloops at optical ports.
  - ➢Outloops on VC-4 paths.
  - ➢Inloops on VC-4 paths.
- ❑Detection and query of SFP optical module information.
- ❑Board manufacturing information query.

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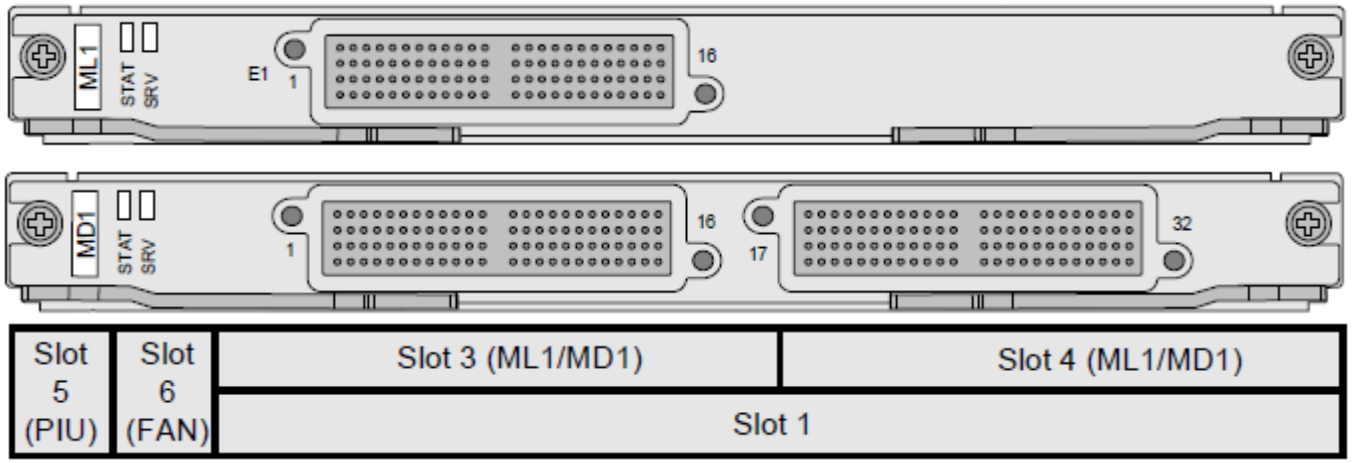
IDU-RTN910-Boards(ML1/MD1)

The ML1 is a 16xSmart E1 service processing board. The MD1 is a 32xSmart E1 service processing board.



Dimensions- 19.82mm(H)x 193.80mm(W) x225.80mm(D).
Weight-ML1/MD1-0.50Kg.
Power Consumption-7.0Watts for ML1 & 12.2Watts for MD1.

Function of ML1/MD1 are as follows;

- ❑Receives and transmits E1 signals, and supports flexible configuration of E1 service categories.
- ❑Supports the following E1 service categories:
  - ➢CES E1.
  - ➢ATM/IMA E1.
- ❑ML1 Supports 16E1 & MD1 supports 32 E1.
- ❑Maximum number of IMA group for ML1 is 16 & MD1 is 32
- ❑Maximum number of ATM services 64 & 256 Connections.
- ❑Supports inloops and outloops at E1 tributary ports.
- ❑Supports the following encapsulation modes:
  - ➢CESoPSN
  - ➢SAToP
- ❑PRBS tests at E1 ports.
- ❑Board manufacturing information query.

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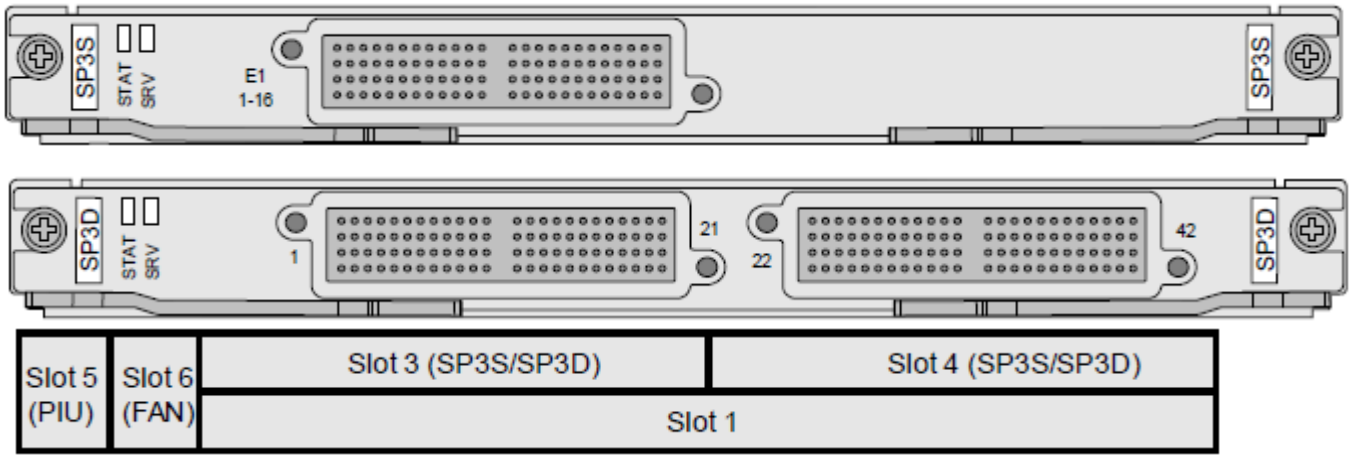
IDU-RTN910-Boards(SP3S/SP3D)

The SP3S is a 16xE1 75-ohm/120-ohm tributary board. The SP3D is a 32xE1 75-ohm/120-ohm tributary board.



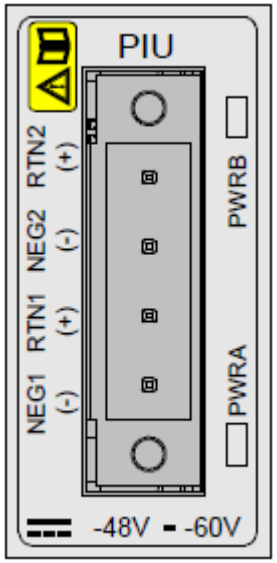
Dimensions- 19.82mm(H)x 193.80mm(W) x225.80mm(D).
Weight-SP3S/SP3D-0.64Kg.
Power Consumption-5.7Watts for SP3S& 9.6Watts for SP3D.

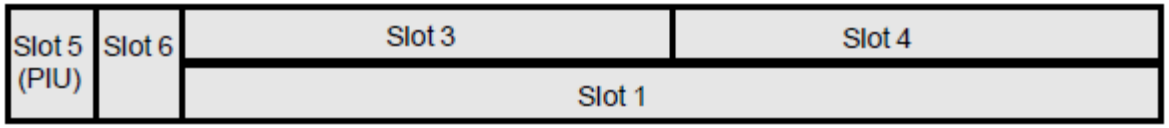
Function of SP3S/SP3D are as follows;

- ❑Supports a tributary clock source extracted from the first or fifth E1 signal.
- ❑SP3S Supports 16E1 & SP3D supports 32 E1.
- ❑Supports inloops and outloops at E1 tributary ports.
- ❑PRBS tests at E1 ports.
- ❑Board manufacturing information query.

IDU-RTN910-Boards(PIU)

The PIU is the power interface board and can access two -48 V DC or -60 V DC power supplies.





Dimensions- 21.0 mm x 41.4 mm x 224.8 mm
Weight- PIU -0.12Kg.

Function of PIU are as follows;

- ❑One PIU is provided and the PIU accesses two -48 V DC or -60 V DC power inputs.
- ❑The PIU provides other boards with -48 V power.
- ❑Supports 1+1 HSB protection.
- ❑Protection against overcurrent.
- ❑Protection against short circuits.

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RTN-950 ,IDU PRODUCT DESCRIPTION

IDU-RTN950-Product Overview

The IDU 950 is the indoor unit of an OptiX RTN 950 system. It accesses services, performs multiplexing /demultiplexing and IF processing of the services, and provides system control and communication function.

- Chasis Height-2U
- No of MW Direction -1 to 6.
- RF Configuration-
  - 1+0 non-protection.
  - N+0 non-protection. (N≤5).
  - 1+1 protection.
  - N+1 protection (N≤4).
- XPIC Configuration.

Different radio link forms of OptiX RTN 950 support different types of microwaves. The radio link form of the SDH/PDH microwave supports the PDH microwave and the SDH microwave.

SLOT 10	SLOT 11	SLOT 7	SLOT 8
		SLOT 5 (1 Gbit/s)	SLOT 6 (1 Gbit/s)
SLOT 9		SLOT 3 (1 Gbit/s)	SLOT 4 (1 Gbit/s)
		SLOT 1 (2 Gbit/s)	SLOT 2 (2 Gbit/s)

IDU-RTN950-Boards

- CXPR- System control, switching and timing board , Valid Slot is Slot-7 & 8.
- AUXQ- Auxiliary board, with 4xFE service interfaces, Valid Slot is Slot-1 to 6.
- IFE2- Packet IF board, which provides the packet-based microwave service, Valid Slot is Slot-1 to 6.
- IFU2- Universal IF board, which provides the hybrid microwave service and the packet-based microwave service, Valid Slot is Slot-1 to 6.
- IFX2- Universal IF board, which provides the hybrid microwave service and the packet-based microwave service, and supports the XPIC function of the hybrid microwave, Valid Slot is Slot-1 to 6.
- EM6T- 6-port RJ45 Ethernet/Gigabit Ethernet Interface Board, Valid Slot is Slot-1 to 6.
- EM6F- 4-port RJ45 + 2 Port SFP Fast Ethernet/Gigabit Ethernet Interface Board , Valid Slot is Slot-1 to 6.
- EF8T- 8xFE service interface board (electric interface),Valid Slot is Slot-1 to 6.
- EF8F- 8xFE service interface board (optical interface), Valid Slot is Slot-1 to 6.
- EG2- 2xGE service interface board, Valid Slot is Slot-1 to 6.
- ML1-16xE1 service processing board (75 ohms), Valid Slot is Slot-1 to 6.
- ML1A- 16xE1 service processing board (120 ohms), Valid Slot is Slot-1 to 6.
- CD1-1-channel STM-1 service processing board, Valid Slot is Slot-1 to 6.
- PIU- Slot 9 and 10.
- FAN-Slot 11

NOTE

- When housed in slot 1 or slot 2, the EG2 can process 2xGE signals. When housed in any other slot, the second port of the EG2 is not available.
- The second port of the CD1 can be used for only the LMSP protection.
- As the ML1 and ML1A have the same functions except for the match impedance, this document describes only the ML1 instead of both.
- All the boards except the power board support hot plugging.

IDU-RTN950- CXPR Board

The CXPR controls the system, grooms services, processes the clock, and provides auxiliary interfaces.

Function of CXPR are as follows;

- 8 Gbit/sec cross connect capacity.
- Supports switching, control, and clock management.
- Supports the board-level 1+1 backup function.
- Provides two clock/time input/output interfaces and provides the synchronization time source and clock source for the equipment.
- Provides one 10 Mbit/s/100 Mbit/s auto-sensing Ethernet NM interface or NM serial interface for communication with the NMS.

Board dimensions (mm): 22.86 (H) x 225.75 (D) x 193.80 (W)
Weight (kg): 0.66

IDU-RTN950- IFE2 Board

The IFE2 receives and transmits one IF signal, and provides the management channel to the ODU and the -48 V DC power that the ODU requires.

The functions and features of the IFE2 are as follows:

❑IF Processing
- ➢Supports the Adaptive Modulation function.
- ➢Performs mapping and demapping between packet service signals and microwave frame signals.
- ➢Codes and decodes microwave frame signals.
- ➢Modulates and demodulates microwave frame signals.
- ➢Modulates and demodulates ODU control signals.
- ➢Combines and splits service signals, ODU control signals, and -48 V DC power supplies.
- ➢Supports the automatic transmit power control (ATPC) function.

❑Overhead Processing
- ➢Processes the overheads of the microwave frame.
- ➢Supports the setting and querying of the Link ID.

❑Protection Processing
- ➢Supports 1+1 HSB/FD/SD protection.
- ➢Supports 1+1 FD/SD hitless switching.

❑Maintenance Features
- ➢Supports inloop and outloop at the IF port.

Board dimensions (mm): 20.32 (H) x 225.75 (D) x 193.80 (W)
Weight (kg): 0.53

IDU-RTN950- IFU2 Board

The IFU2 receives and transmits one Hybrid/Packet IF signal, provides the management channel to the ODU, and supplies the required -48 V power to the ODU.

The Function are as follows;

❑IF Processing

- ➢Supports the Packet microwave frames and supports the packet service transmission.
- ➢Supports the adaptive modulation (AM) technology. Maps service signals into microwave frame signals.
- ➢Codes and decodes microwave frame signals.
- ➢Modulates and demodulates microwave frame signals.
- ➢Modulates and demodulates ODU control signals.
- ➢Combines and splits service signals, ODU control signals, and -48 V power supplies.
- ➢Provides a maximum of 56 MHz signal bandwidth and supports the highest modulation mode of 256QAM.

❑Overhead Processing

- ➢Processes the overheads of the Hybrid/Packet microwave signals.
- ➢Supports the setting and query of the link ID.

❑Protection Processing

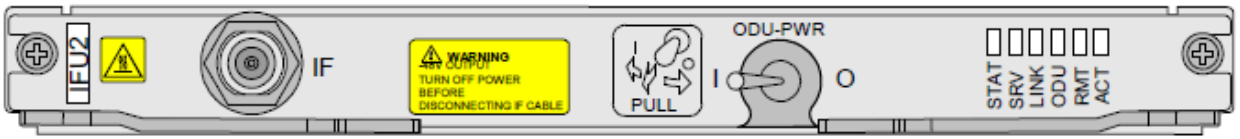
- ➢Supports 1+1 HSB/FD/SD protection.
- ➢Supports 1+1 FD/SD hitless switching.

❑Alarms and Performance Events

- ➢Reports various alarms and performance events.
- ➢Supports the alarm management functions such as setting the alarm reversion function and setting the BER threshold.
- ➢Supports the performance event management functions such as setting the performance thresholds and setting the automatic reporting of 15-minute/24-hour performance events.

❑Maintenance Features

- ➢Supports the inloop and outloop over IF interfaces.
- ➢Supports the inloop and outloop at composite ports.
- ➢Supports the PRBS BER test over IF interfaces.
- ➢Supports the detection of the board temperature.
- ➢Supports the monitoring of the power supply and the clock.



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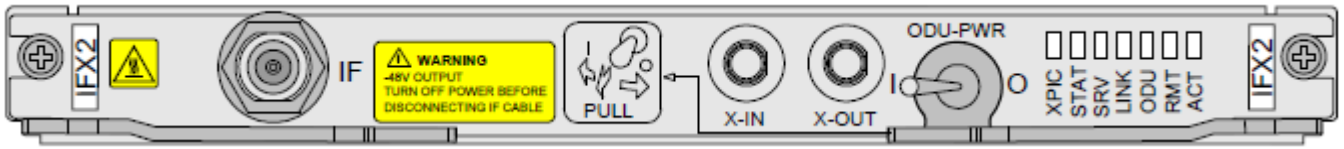
IDU-RTN950- IFX2 Board

The IFX2 is a general IF board, which can support the XPIC function of the Hybrid microwave and Packet microwave. The IFX2 board supports the DC-I power distribution mode.
The IFX2 receives and transmits one Hybrid/Packet IF signal, provides the management channel to the ODU, and supplies the required -48 V power to the ODU. The IFX2 can cancel the crosspolarization interference in the IF signal.



The Function are as follows;

❑IF Processing

➢Supports the XPIC function, provides the XPIC input and output interfaces, and supports the manual configuration of the XPIC function.
➢Supports the Packet microwave frames and supports the packet service transmission.
➢Supports the adaptive modulation (AM) technology.
➢Maps service signals into microwave frame signals.
➢Codes and decodes microwave frame signals.
➢Modulates and demodulates microwave frame signals.
➢Modulates and demodulates ODU control signals.
➢Combines and splits service signals, ODU control signals, and -48 V power supplies.
➢Provides the maximum signal bandwidth of 56 MHz and supports the highest modulation mode of 256QAM.

❑Overhead Processing

➢Processes the overheads of the Hybrid/Packet microwave signals.
➢Supports the setting and query of the link ID.

❑Protection Processing

➢Supports 1+1 HSB/FD/SD protection.
➢Supports 1+1 FD/SD hitless switching.

IDU-RTN950- CD1 Board

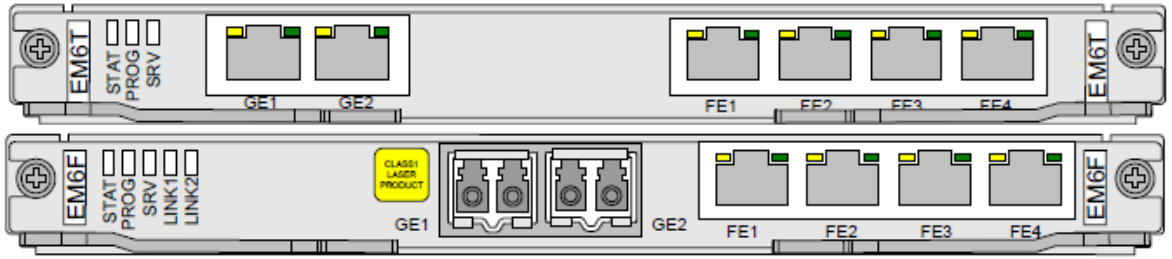
The CD1 accesses 1 x channelized STM-1 services. When used with the CXPR, the CD1 processes the service signals. The CD1 supports the IMA, CES, and ML-PPP protocols, and the service type can be flexibly configured.

The Function are as follows;

- ❑Supports the CES services and IMA services at 64 kibt/s level.
- ❑Supported 32 ATM E1 Services.
- ❑Supported 32 IMA group.
- ❑Supported 63 VC-12 timeslots in each IMA group.
- ❑Supported CBR,UBR,UBR+,rt-VBR & nrt-VBR traffic type.
- ❑Supported 63 CES Services.
- ❑Supports the 1+1 LMSP protection for two STM-1 ports on the same board and the inter-board 1:1 LMSP protection.

IDU-RTN950- EM6T/EM6F Board

The EM6T/EM6F accesses, processes, and aggregates four FE signals and two GE signals.
In this version, the backplane buses of the EM6T/EM6F provides the capacity of 1 Gbit/s.



Functions are as follows;

❑**Ethernet Service Signal Processing.**

❑The EM6T provides two GE electrical interfaces whereas the EM6F uses the SFP optical modules to provide two GE optical or electrical interfaces. The GE electrical interfaces are compatible with the FE electrical interfaces.

❑Supports the setting and query of the working modes of the Ethernet interfaces.

The supported working modes are as follows:

➢The FE interfaces support 10M full duplex, 10M half duplex, 100M full duplex, 100M half duplex, and auto-negotiation.

➢The GE electrical interfaces support 10M full duplex, 10M half duplex, 100M full duplex, 100M half duplex, 1000M full duplex, and auto-negotiation.

➢The GE optical interfaces support 1000M full-duplex and auto-negotiation.

❑Supports Jumbo frames with the maximum frame length of 9600 bytes.

❑**Clock Processing**

➢Supports synchronous Ethernet.

➢Supports receiving and transmitting SSM messages through Ethernet interfaces.

❑**Maintenance Features**

➢Supports the inloop at the PHY layer over Ethernet ports.

➢Supports the inloop at the MAC layer over Ethernet ports.

➢Supports the mirroring function over Ethernet interfaces.

➢Supports the warm reset and cold reset on the board.

➢Supports the detection of the board temperature.

➢Supports the query of the board manufacturing information.

➢Supports the query of the manufacturing information about the SFP module.

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IDU-RTN950- EF8T Board

The EF8T mainly accesses 8 x FE electrical signals, and processes the services with the CXPR.

Functions are as follows;

❑Supports eight FE electrical interfaces. Accesses 8 x FE electrical signals, and processes the services with the CXPR.

❑Supports the inband DCN. By default, the DCN function is enabled at the first four ports. In addition, this function can be disabled or enabled manually.

❑Detects the temperature and voltage of the board.

❑Automatic loopback release at the port.

IDU-RTN950- EF8F Board

The EF8F mainly accesses and processes 8 x FE optical signals, and processes the services with the CXPR.

Functions are as follows;

❑Supports eight FE optical interfaces.Accesses 8 x FE optical signals, and processes the services with the CXPR.

❑Supports the inband DCN. By default, the DCN function is enabled at the first four ports. In addition, this function can be disabled or enabled manually.

❑Detects the temperature and voltage of the board.

❑PHY-layer inloop & MAC-layer outloop

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IDU-RTN950- EG2 Board

The EG2 mainly accesses 2 x GE optical signals, and processes the services with the CXPR.

Functions are as follows;

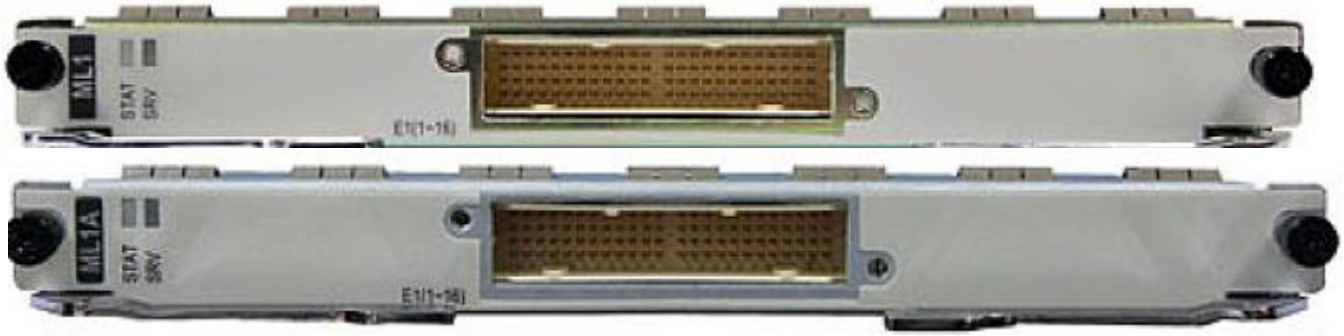
Supports two GE optical or electrical interfaces. Accesses 2 x GE signals, and processes the services with the CXPR.

Supports the inband DCN. By default, the DCN function is enabled at the two ports. In addition, this function can be disabled or enabled manually.

PHY-layer inloop and outloop & MAC-layer outloop.

IDU-RTN950- ML1/ML1A Board

The ML1 is a 75-ohm E1 board and the ML1A is a 120-ohm E1 board. The ML1 can access a maximum of 16 x E1 signals, supports flexible configuration of different services on each port, and is hot swappable.



The Functions are as follows;

- Accesses and processes 16xE1 signals and supports the IMA,CES, and ML-PPP protocols.
- Supports the in-band DCN. By default, the DCN function is enabled at the first and the sixteenth E1 ports. In addition, this function can be disabled or enabled manually.
- Supports the CES services and IMA services at 64 kbit/s level.
- Supported 8 IMA groups/d ATM E1 services.
- Supported 16 E1 linksin each IMA group.
- Supports the timeslot compression function. Provides the idle 64 kbit/s timeslot suppression function for the CES services in the CESoPSN mode to save the transmission bandwidth.
- The jitter buffer time of the CES service can be set. The jitter buffer time ranges from 0.375 ms to 16 ms, and the step value is 0.125 ms.
- The encapsulation buffer time of the CES service can be set. The encapsulation buffer time ranges from 0.125 ms to 5 ms, and the step value is 0.125 ms.
- Supported 7 MLPPP groups.
- Supported 16 links by each ML-PPP group.

IDU-RTN950- PIU Board

The PIU, a power access board, supports the functions and features such as power access, power protection, lightning protection detection, and information reporting.

The Functions are as follows;

- ❑Each of the two PIU accesses one -48 V DC (or -60 V DC) power supply for the equipment.
- ❑The PIU protects the power supply against overcurrent and short circuit. In this way, the overcurrent is prevented from shocking boards and components on them.
- ❑The PIU protects the equipment against lightning and reports an alarm if the protection fails.
- ❑Two PIU can achieve 1+1 hot backup. One PIU is capable of supplying power for the entire chassis.

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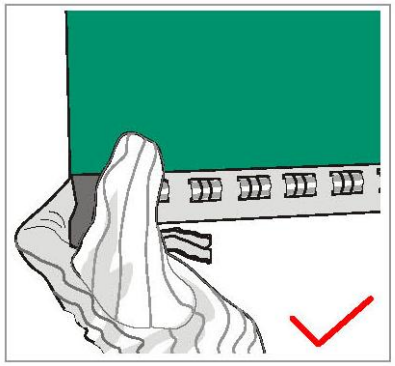
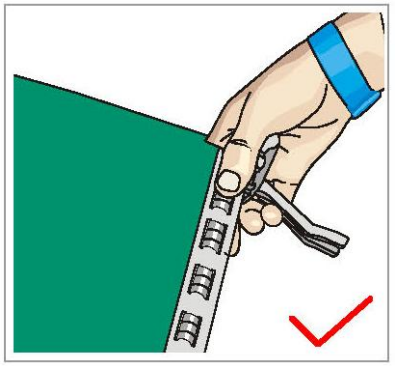
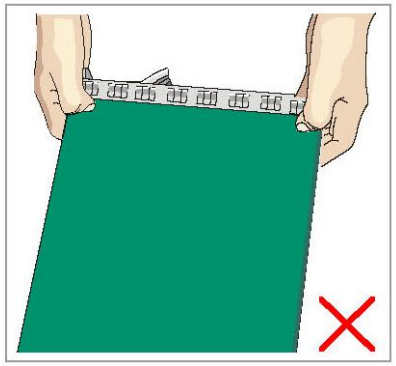
RTN910 ,IDU INSTALLATION

Precaution to handle boards

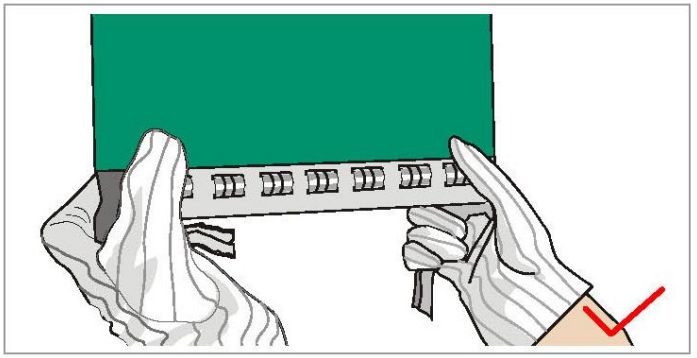


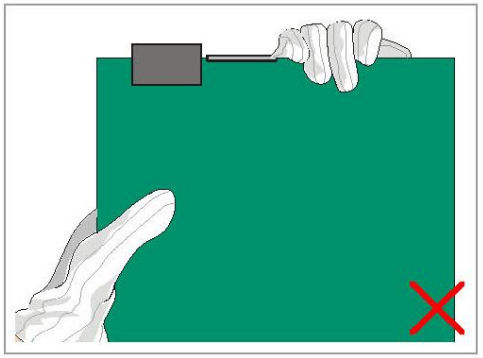


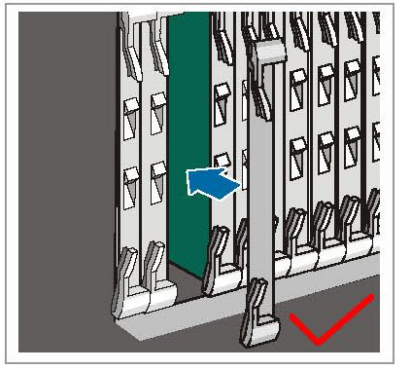


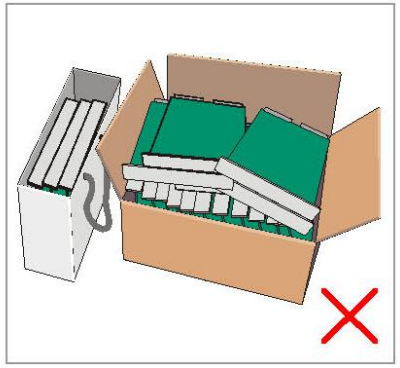
Donot hold boards without hand protection.
Wear an ESD wrist strap / ESD gloves before handling a board.

Hold front Panel of the board with hands.









Insert fillers panels into vacant slots on An NE to prevent foreign matters from Getting into NE,which may result faults On NE.
Boards are fragile & valuable.When Handling or placing a board,ecercise cautioon & put it into a dedicated packing box.

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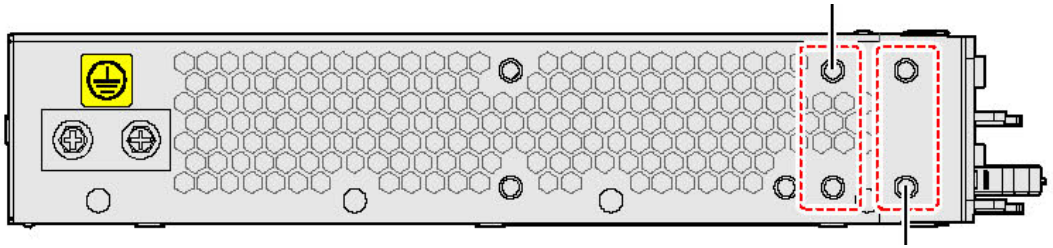
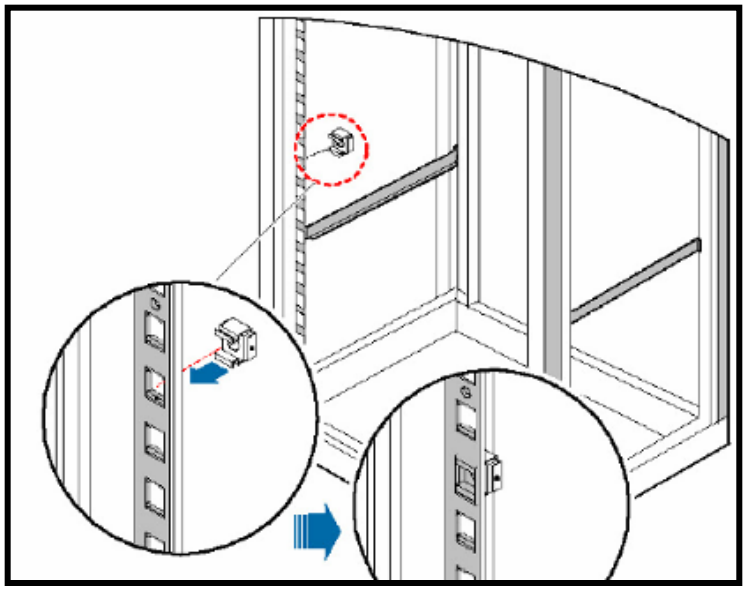
IDU 910 Installation

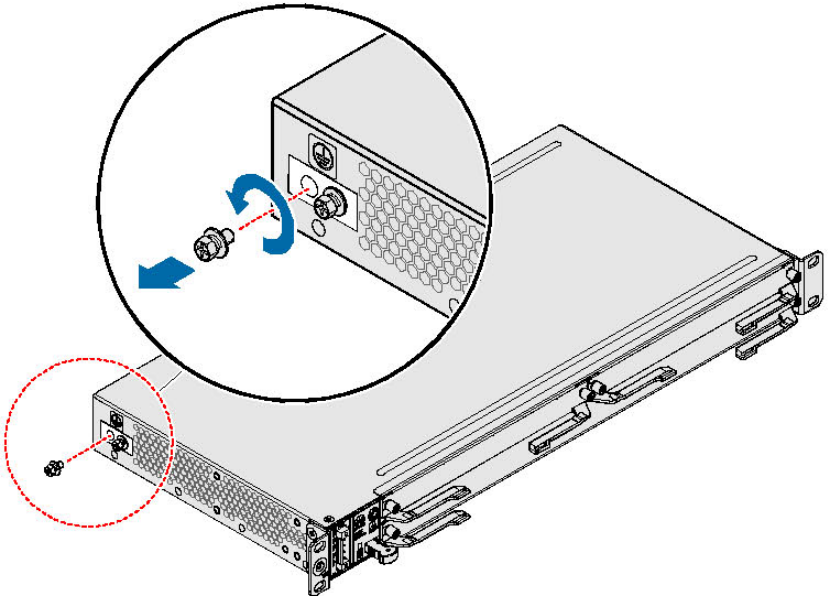
Holes for Installation in the T63/T66/N66T Cabinet



Before installing the chassis in the ETSI cabinet, adjust The holes for installing mounting ears based on the Type of cabinet used for IDU.



Holes for Installation in the N63E/19″ Cabinet



When tightening floating nuts ,ensure a minimum of 25mm space on the Left & right sides of the RTN910 is left for ventilation.

Remove & Kept the above detached screws for PGND cable termination.

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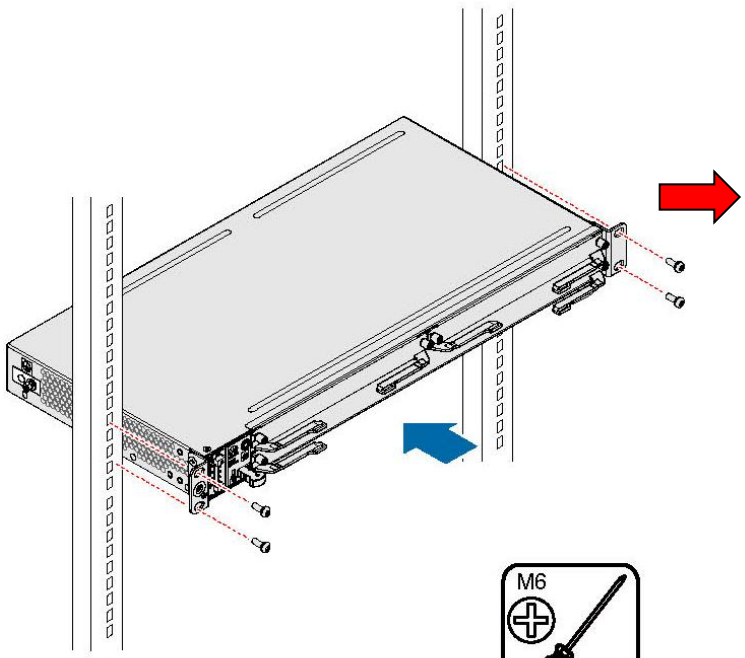
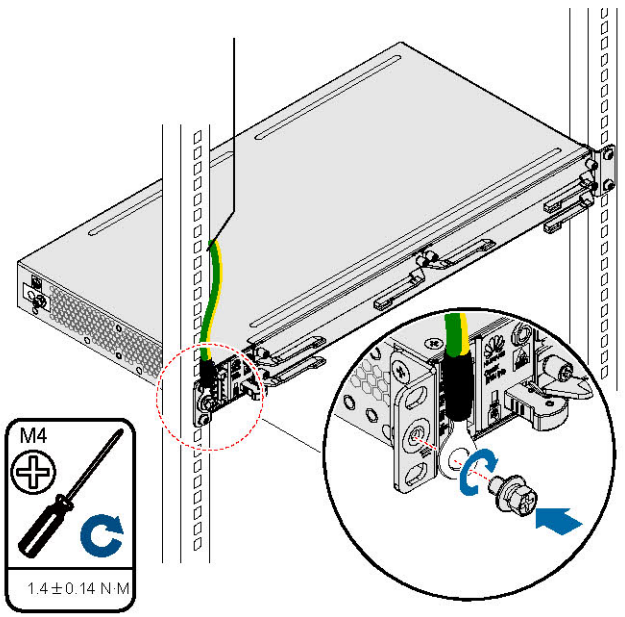
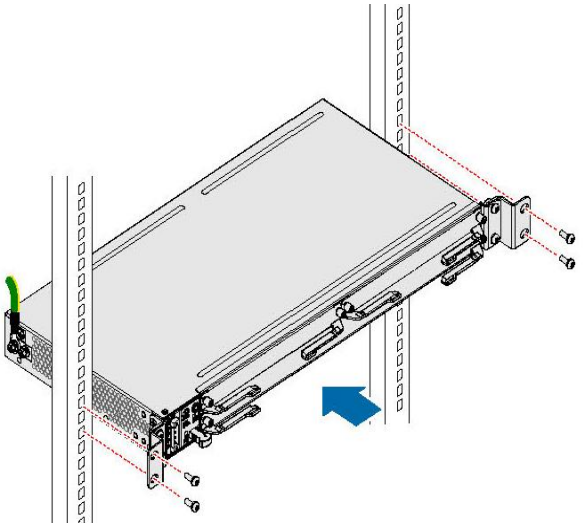
IDU 910 Installation







Connect PGND cables

Note-

Connect the PGND cable at side of the IDU ,if the rack is open

Connect the PGND cable at front of the IDU ,if the rack is closed type.

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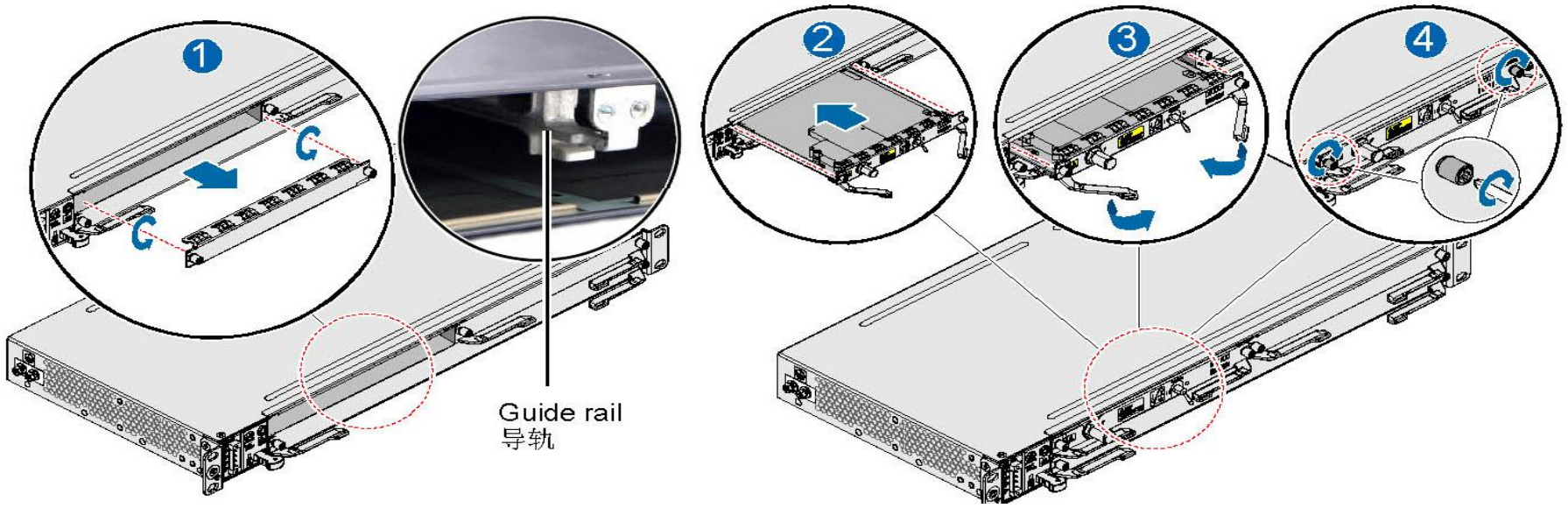
IDU 910 Board Installation



- ❑Loosen the screws on the filler panel & remove the filler panels.
- ❑Hold the ejector levers on the panel with hands & raise them to form an angle of 45degree between
- ❑ the ejector levers & the panel .Push the board gently along the guide rail until the board is secured.
- ❑Lower the two ejector levers of the boards.
- ❑Tighten the screws on the panel.

Note-

Before installing & removing/inserting a board, wear an ESD wrist strap or ESD gloves .Also ensure that the board is inserted on correct slot.

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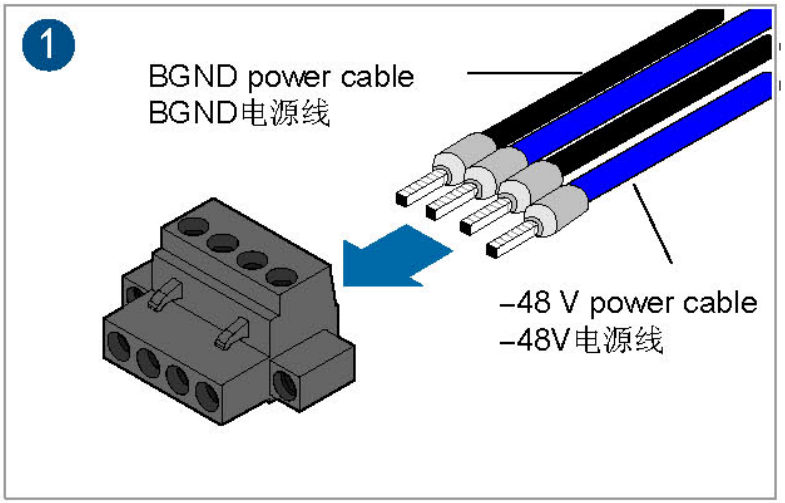
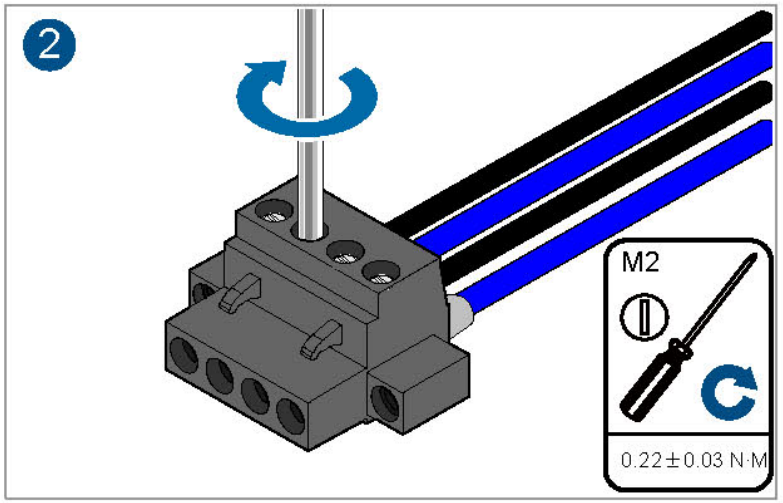
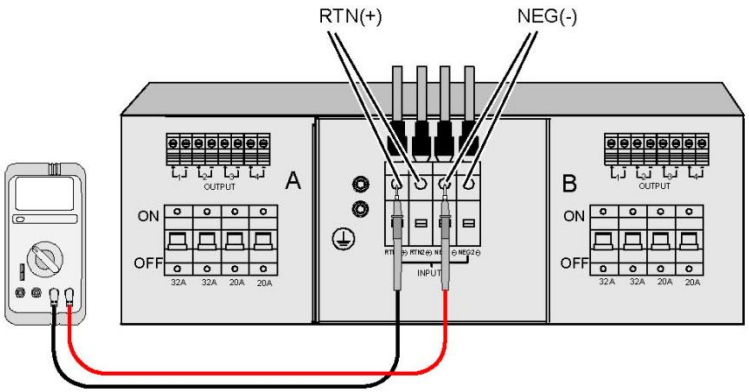
IDU 910 Power Cable Installation





- ❑Assemble a proper terminal for the power cable according to power cable processing specification.
- ❑Insert the power cable into the DC connector based on the pin assignment.
- ❑Loosen the screws on the DC connector, insert the conductor of the bare crimp terminal of the power cable into the DC connector,& then tighten the screws.
- ❑Check the fuse rating of external power source, i.e 2x10A MCB.
- ❑Check the voltage & polarity of external power source.



Note-
When assembling a terminal, press the connector securely & equip it with a heat shrink tube to avoid Exposure of the bare & the handle of the connector.

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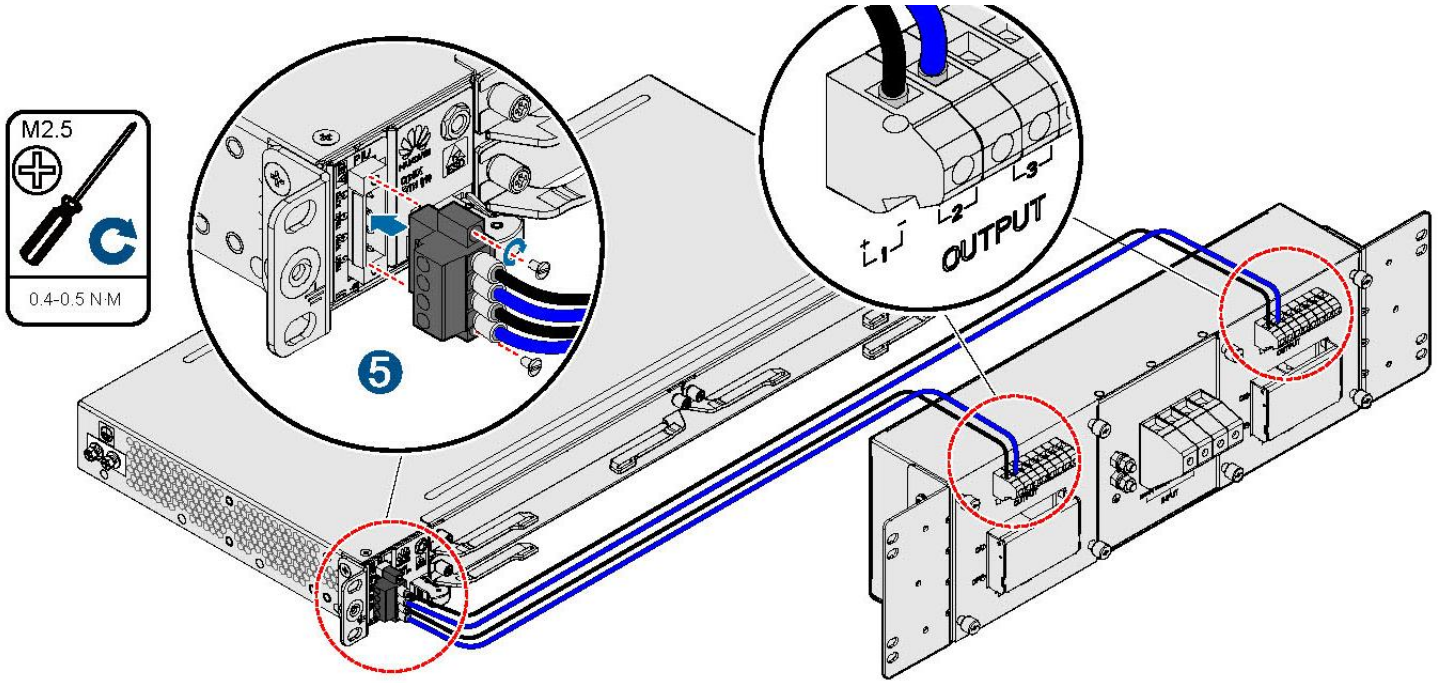
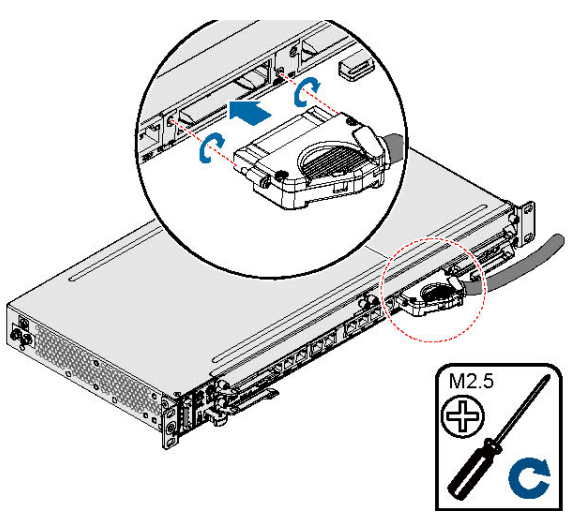
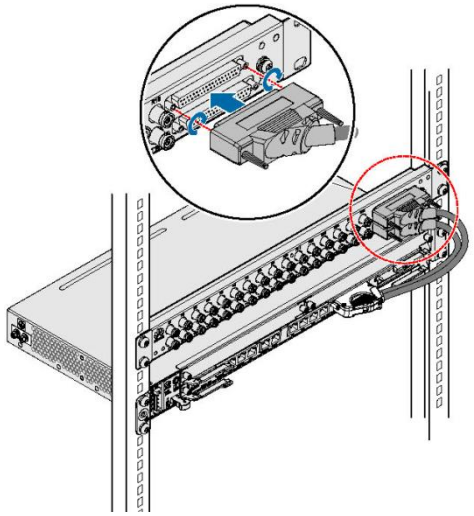
IDU 910 Power Cable Installation



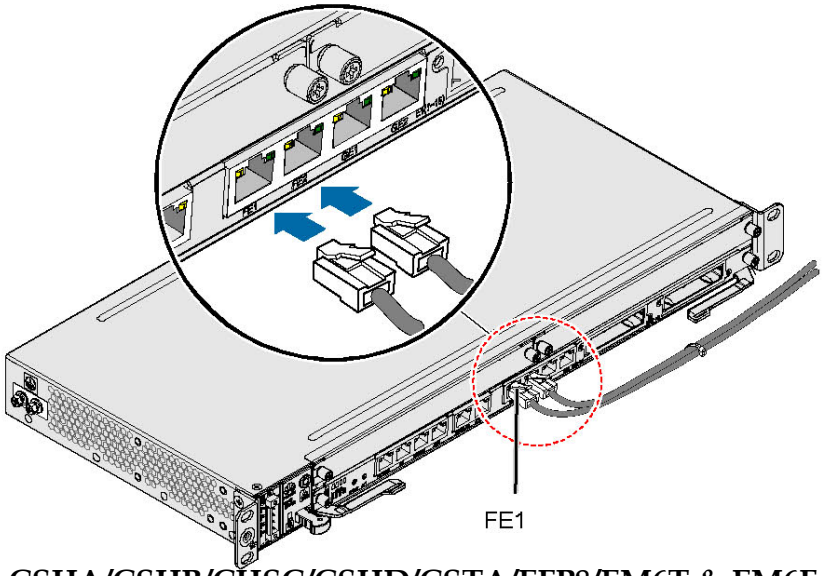
❑Ensure that the circuit breaker of the PDU is set to the OFF state. Insert the DC connector into the power port of the chasis.Ensure that the two groups of power cables are connected to different wiring terminals,& then tighten the screws of the power connectors & the chassis.

IDU 910 E1,FE,XPIC Cable Installation

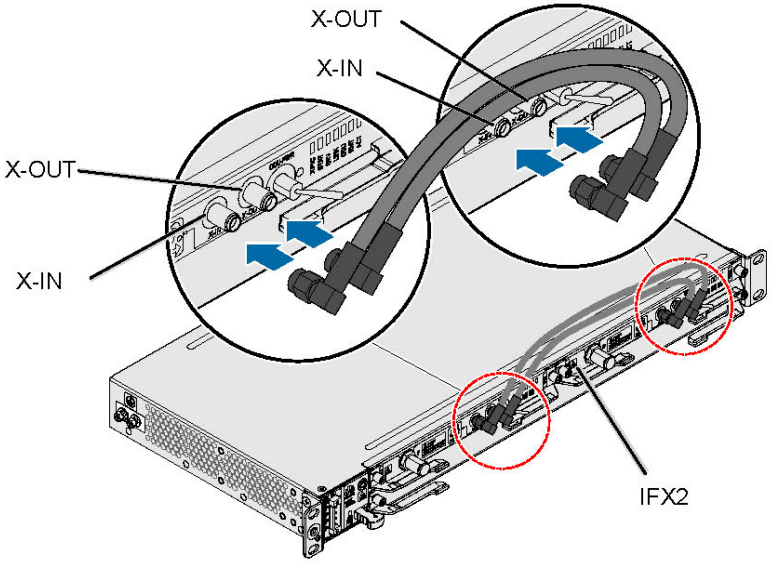




The CSHA/CSHB/CHSC/CSHD/CSTA/SP3D & SP3S boards are providing E1 Ports.



The CSHA/CSHB/CHSC/CSHD/CSTA/EFP8/EM6T & EM6F boards are providing FE Ports.



The ISX2 & IFX2 boards are providing XPIC Ports.

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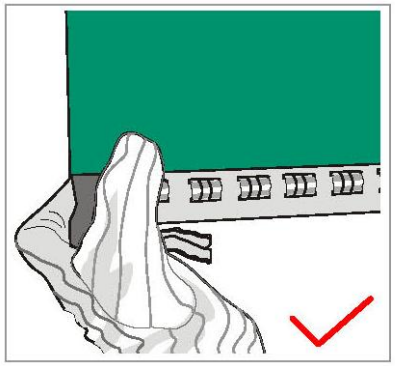
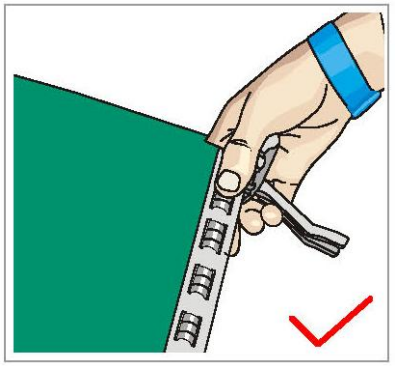
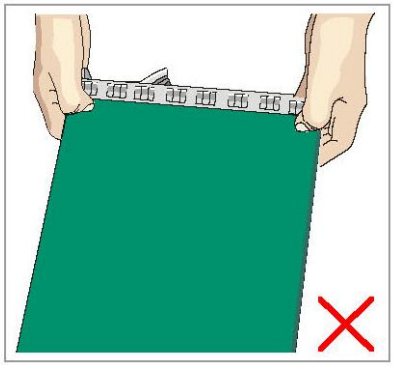
RTN950 ,IDU INSTALLATION

Precaution to handle boards

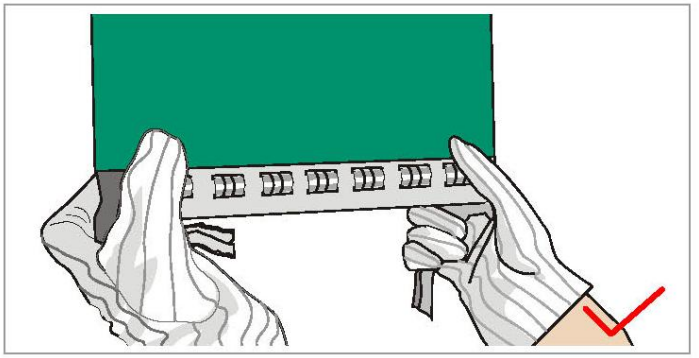


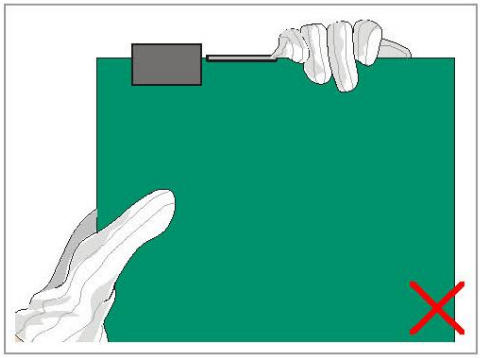


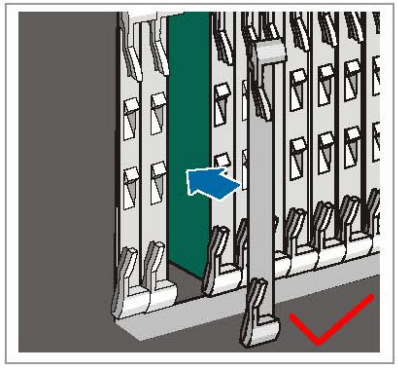


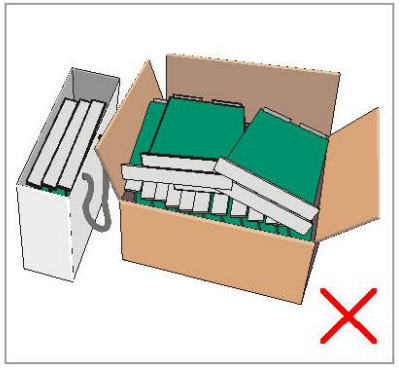
Donot hold boards without hand protection.
Wear an ESD wrist strap / ESD gloves before handling a board.

Hold front Panel of the board with hands.





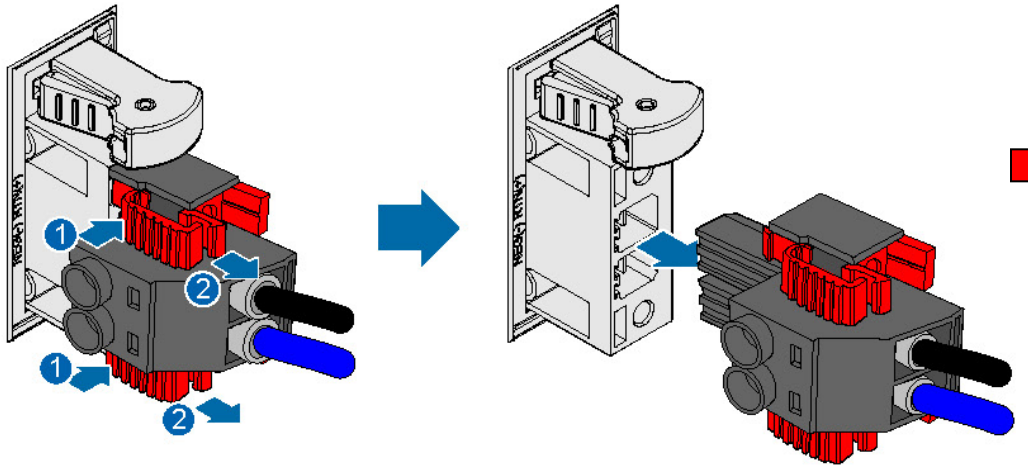




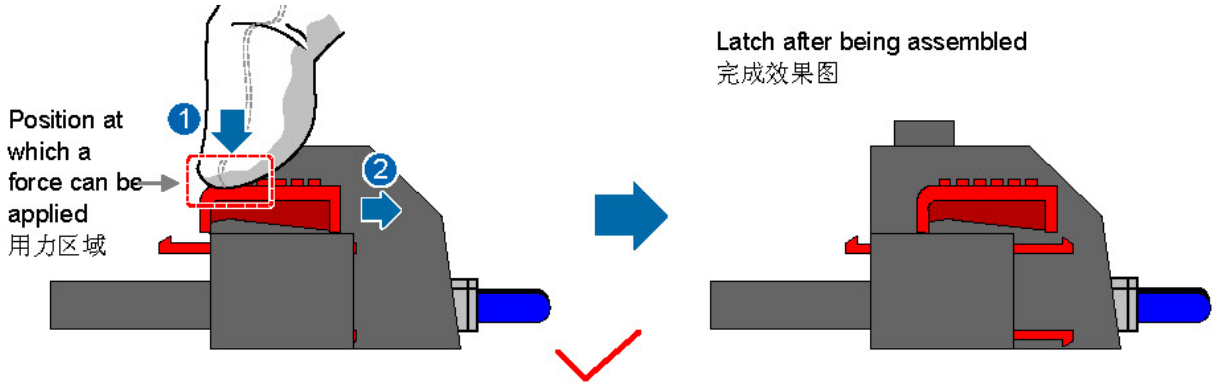
Insert fillers panels into vacant slots on An NE to prevent foreign matters from Getting into NE,which may result faults On NE.
Boards are fragile & valuable.When Handling or placing a board,ecercise cautioon & put it into a dedicated packing box.

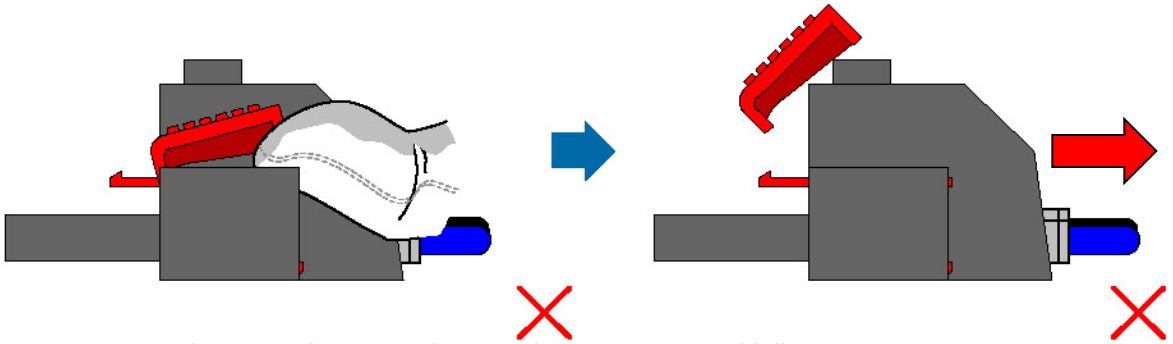
HUAWEI

Precaution to handle Power Cable terminals



Press the front of the latch , properly move
The red latch outward.





Don't pickup the tail end of the red latch by
Using a finger or a screwdriver
To avoid damage.

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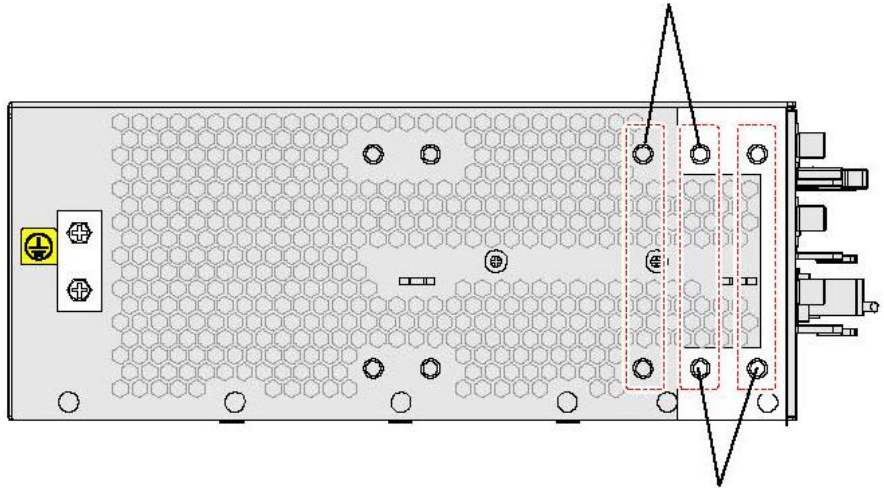
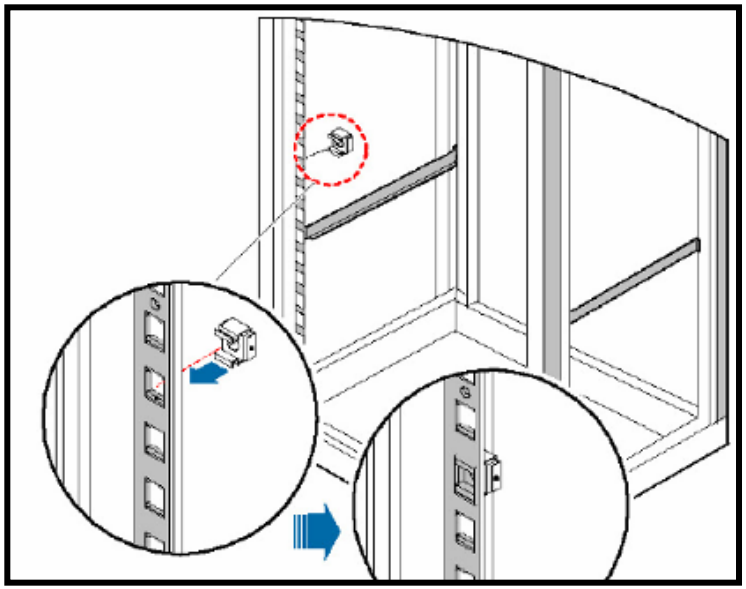
IDU 950 Installation

Holes for Installation in the T63/T66/N66T Cabinet



Holes for Installation in the N63E/19″ Cabinet

Note-
Before installing the chassis in the ETSI cabinet adjust The holes for installing mounting ears based on the type Of cabinet used for IDU.



Note-
When tightening floating nuts ,ensure a minimum of 25mm space on the Left & right sides of the RTN950 is left for ventilation.

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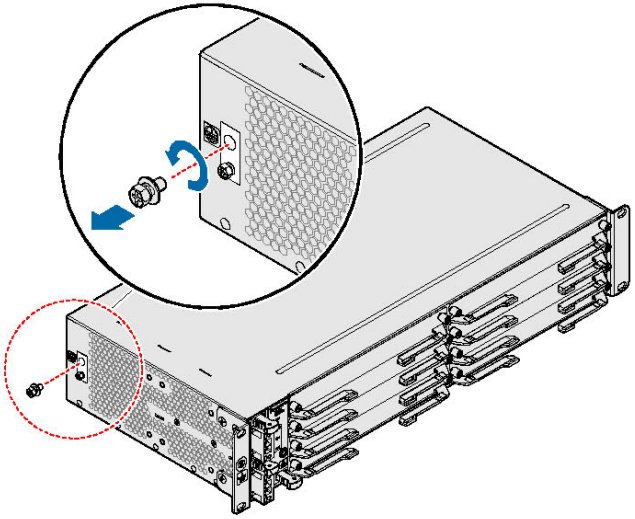
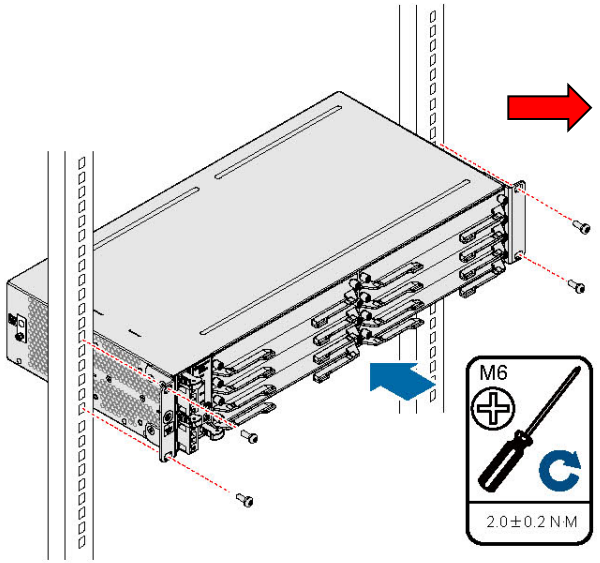
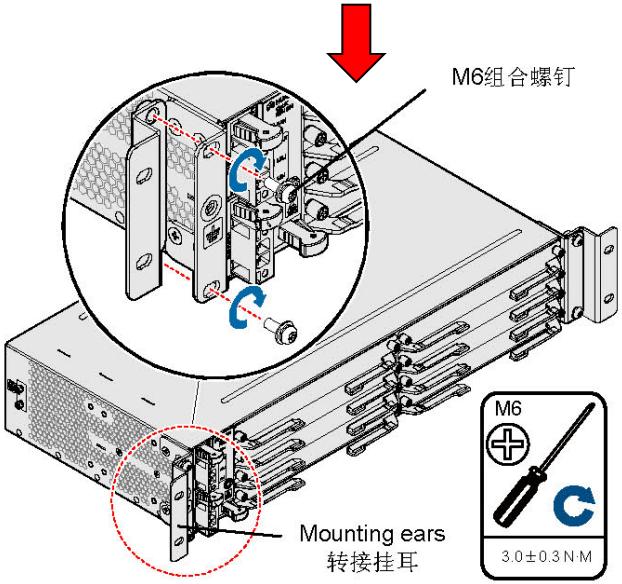
IDU 950 Installation & PGND Cabling

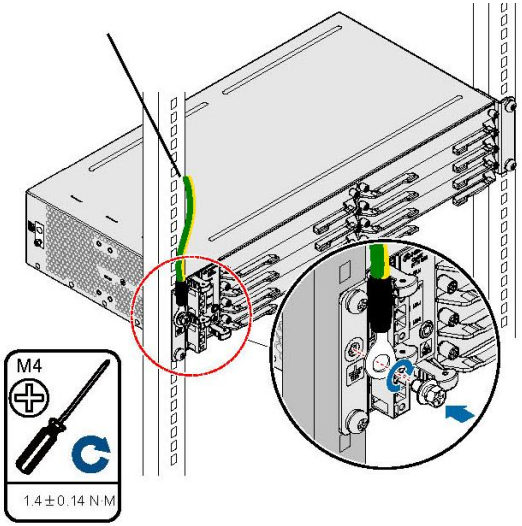


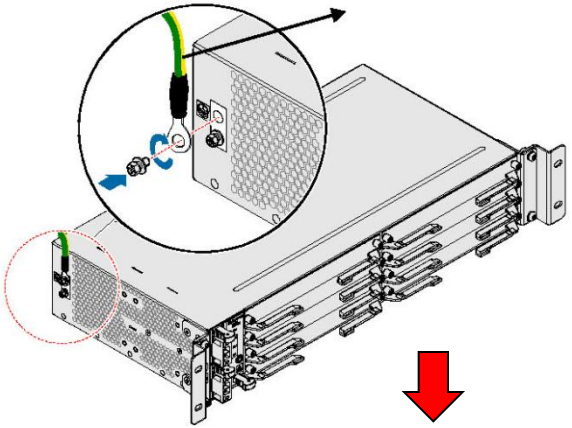
Remove & Kept the above detached screws for PGND cable termination.



Note-
As per figure, the IDU is being installed
In 19″ rack .if IDU is installed in ETSI rack ,
Then mounting ears are required







Connect PGND cables
Note-
Connect the PGND cable at side of the IDU ,if the rack is open
Connect the PGND cable at front of the IDU ,if the rack is closed type.

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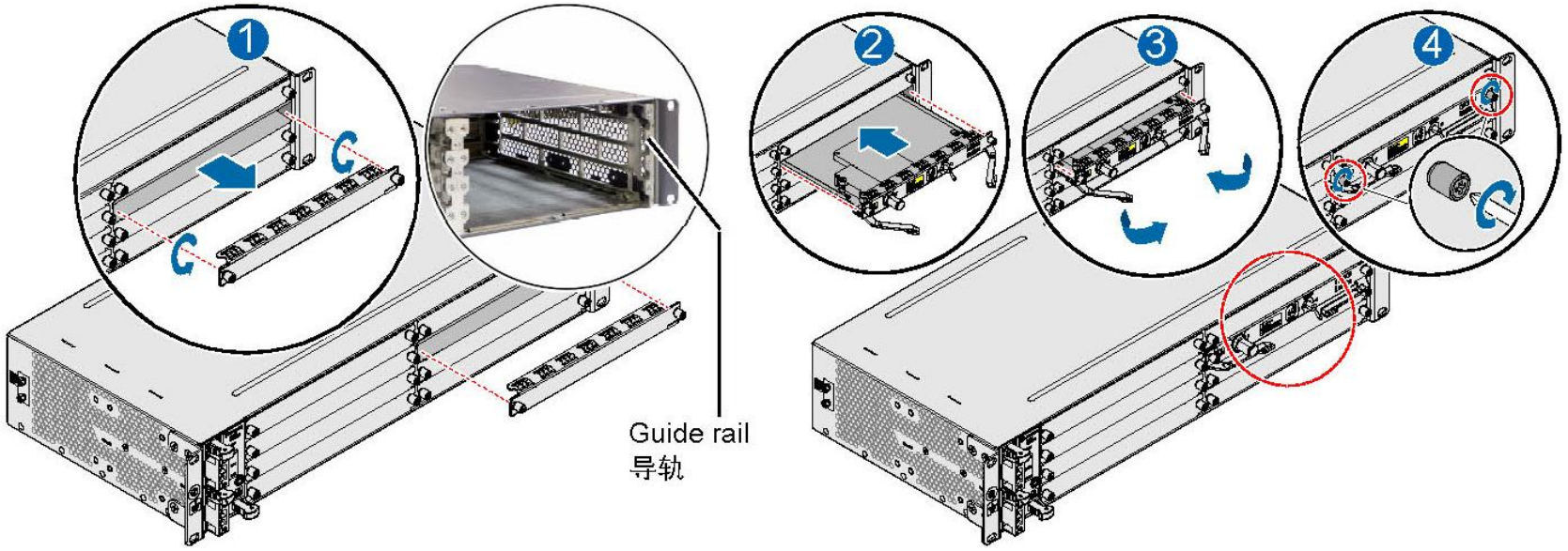
IDU 950 Board Installation



- ❑Loosen the screws on the filler panel & remove the filler panels.
- ❑Hold the ejector levers on the panel with hands & raise them to form an angle of 45degree between the ejector levers & the panel .Push the board gently along the guide rail until the board is secured.
- ❑Lower the two ejector levers of the boards.
- ❑Tighten the screws on the panel.

Note-

Before installing & removing/inserting a board, wear an ESD wrist strap or ESD gloves .Also ensure that the board is inserted on correct slot.

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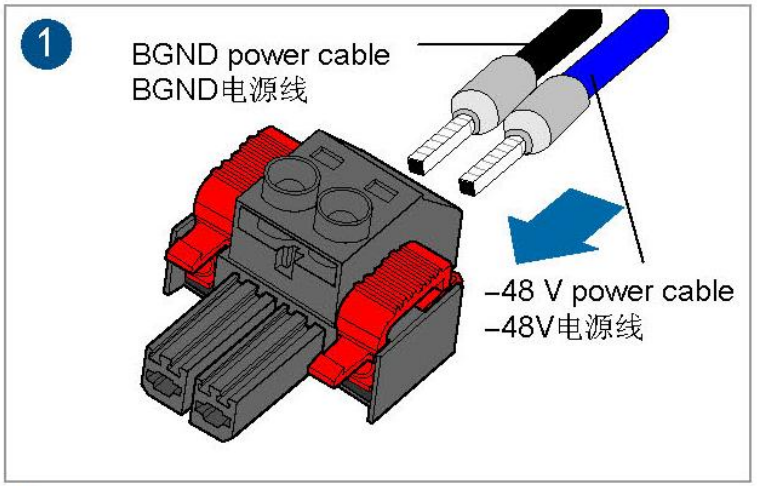
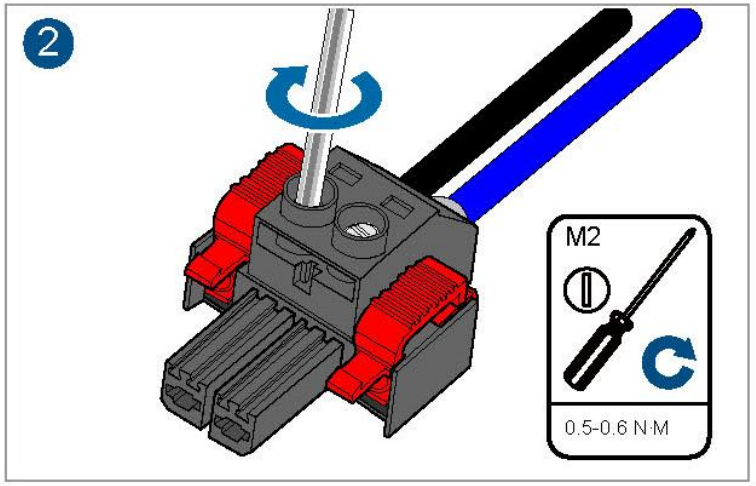
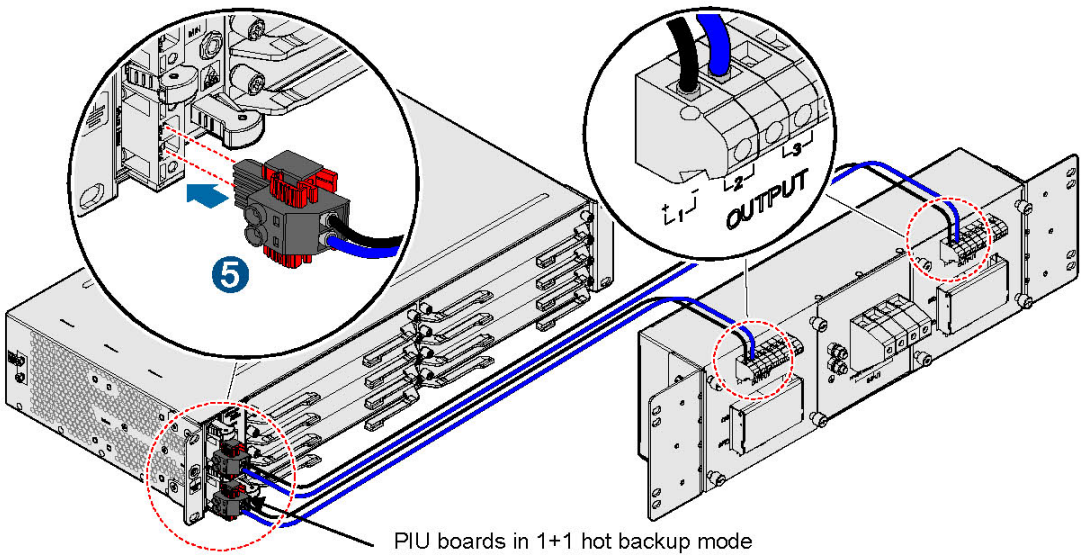
IDU 950 Power cable Installation







- ❑Assemble a proper terminal for the power cable according to power cable specification.
- ❑Then insert the power cable into the DC connector based on the pin assignment.
- ❑Loosen the screws on the DC connector, insert the conductor of the bare crimp terminal of the power cable into the DC connector & then tighten the screws.
- ❑Check the fuse capacity of external power source.i.e 2x20A.
- ❑Check the voltage & polarity of external power source before power ON.

SITE CLEANING & FINISHING

SITE CLEANING & FINISHING

Don't do these

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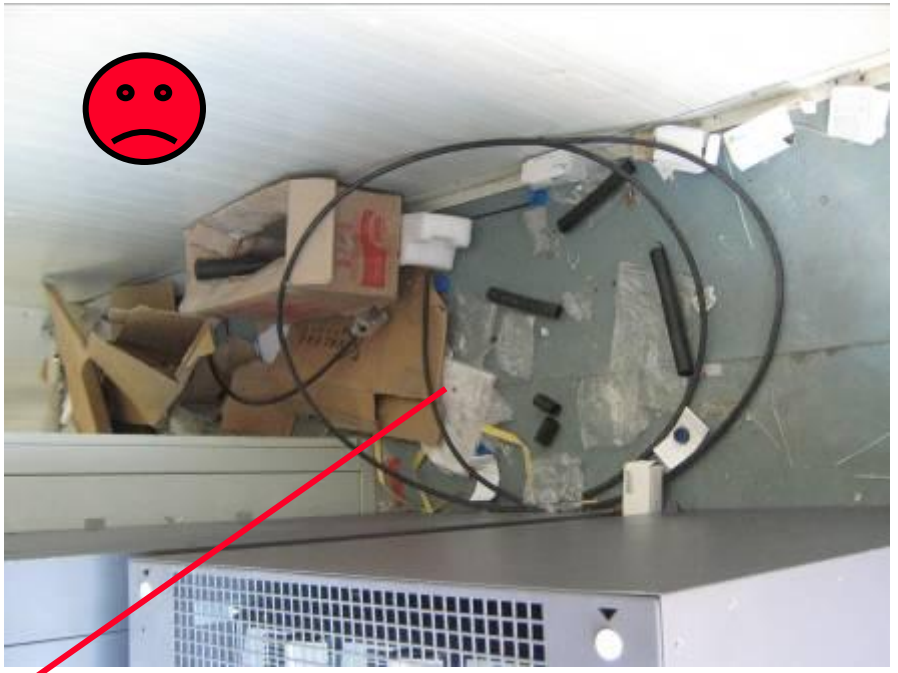
SITE CLEANING & FINISHING



Don’t do this

EQUIPMENT ROOM CLEANING & FINISHING

1. After Completion of Installation Works ,clear all the cable ties pcs., polythene & other debris from Shelter/Cage.
2. Dispose the debris at an isolated place ,where debris can be dumped.
3. Collect all extra inst materials ,Hardware (uninstalled) and keep at a single place.
4. Remove all dusts from site & clean the site.
5. Keep all site documents (site folder ,inst & comm. manuals of SMPS & Batt. at safe place .

PROJECT QUALITY PROCESS & SELF ASSESSMENT

PROJECT QUALITY PROCESS

PURPOSE

The purpose of Project Quality process to provide guidance for project management personnel and project quality management team, and to ensure smooth delivery of the project and customer satisfactory delivery with quality.

CORE CONCEPT OF QUALITY

Inspection Can Only Tell What Has Already Happened

- Too late - The defect is already there.
- Some defects may be not rectified.
- Compliance cannot be achieved directly.
- Normal work is affected.
- Cost is increased, and efficiency is reduced.

Only prevention can satisfy requirements with low cost and high efficiency.

CORE CONCEPT OF QUALITY

How to Conduct Prevention?

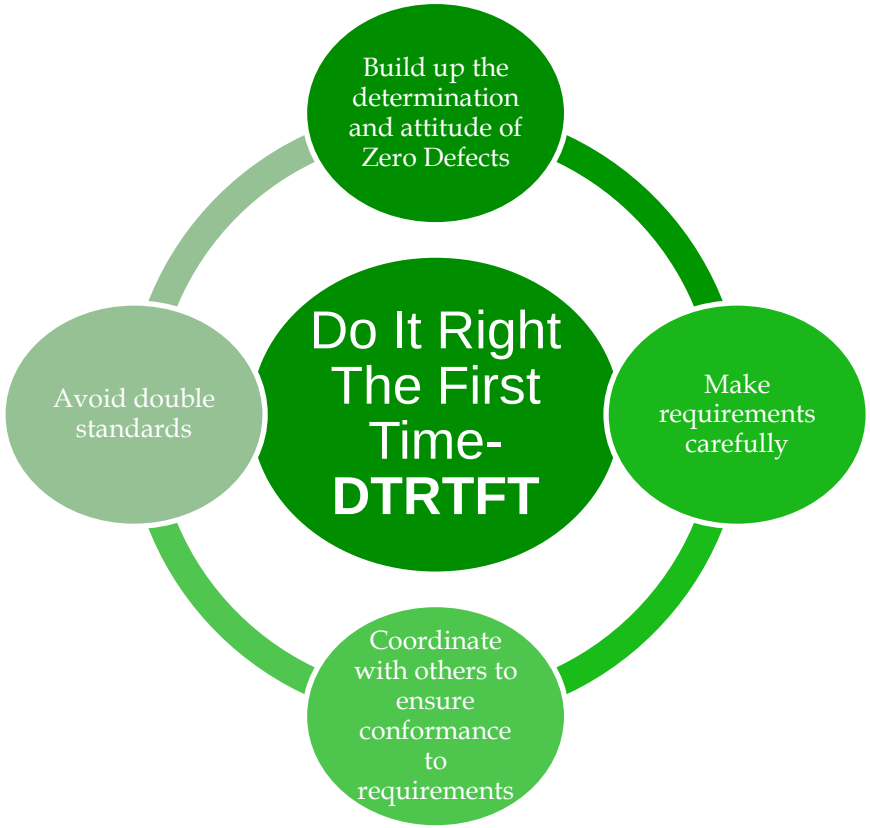
Prevent Problems from Recurring

- Conduct root cause analysis
- Create actions against root causes
- Take the actions and solve problems fundamentally
- ……

CORE CONCEPT OF QUALITY

The Performance Standard of Quality Is Zero Defect rather than "close enough is good enough.

Zero Defect typically means "do it right the first time".



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QUALITY PROCESS-SELF-ASSESSMENT

Main purpose is to:

- Identify deficiencies during assessment against the predefined project check-list and close the issue immediately at site before equipment power on.

Requirement:

- Subcontractor will do the self-assessment of each and every site i.e. 100% self-assessment and submit site quality assessment report (HSQR) to Huawei project team within 48hrs after completion of hardware installation work.

Site Quality Score Calculation Method

Class-A

- Critical Non Conformance points & Score of each point is '8'
- Critical problem means that the violation of this will influence the normal running of equipments.

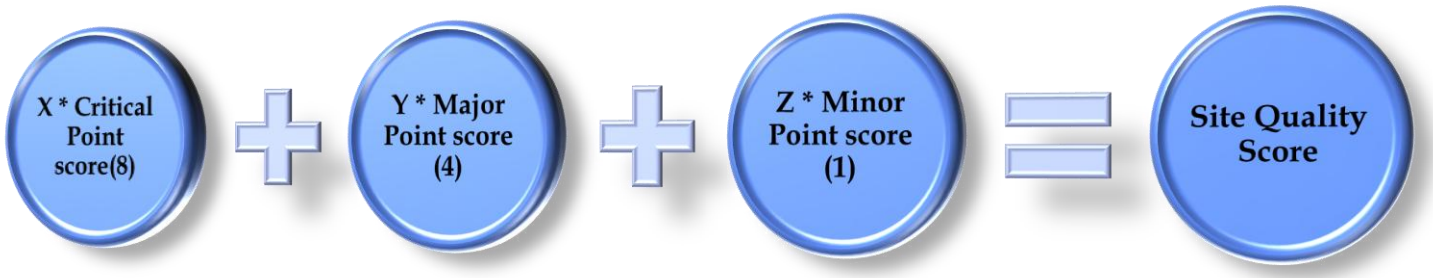
Class-B

- Major Non Conformance points & Score of each point is '4'
- Major problem means that the violation of this will influence the normal running of equipments /brings hidden troubles to the normal running.

Class-C

- Minor Non Conformance points & Score of each point is '1'
- Minor problem means that the violation of this will not influence the normal running of equipments but will have an impact on the future capacity expansion/the convenient of O&M.

The Site Quality score of site = The sum of all recorded non conformance scores corresponding to hardware quality standard of the product installed at a site. Higher the score , indicates the worse quality.



The site will be treated as PASS , if the site quality score of the site is < '8' & FAIL if Site Quality Score is ≥ '8'

Average Site Quality Score is = ((SQS of Site 1 + SQS of Site 2 + SQS of Site 3 +……..SQS of Site n)/n)

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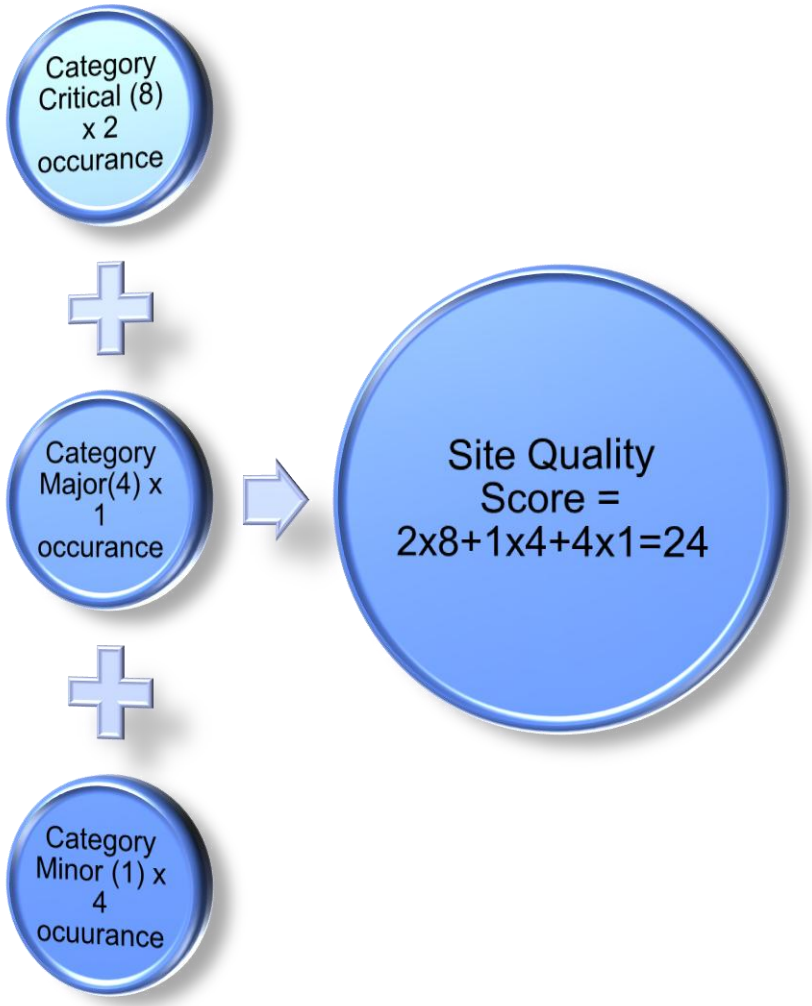
Example



The Site Quality Score of this site is 24 , which means this site is failed

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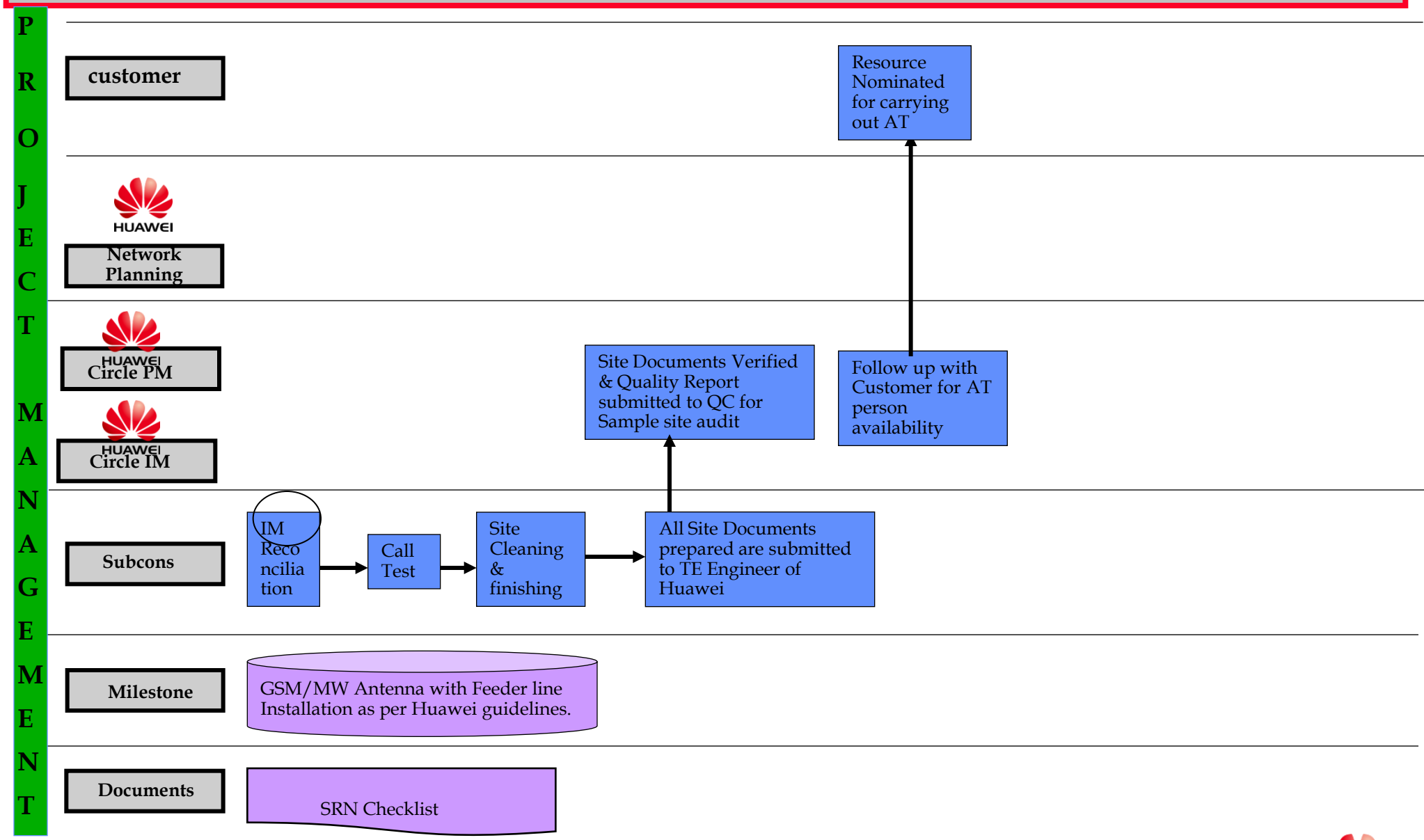
MATERIAL RECONCILATION

INSTALLATION MATERIAL RECONCILLATION PROCEDURE

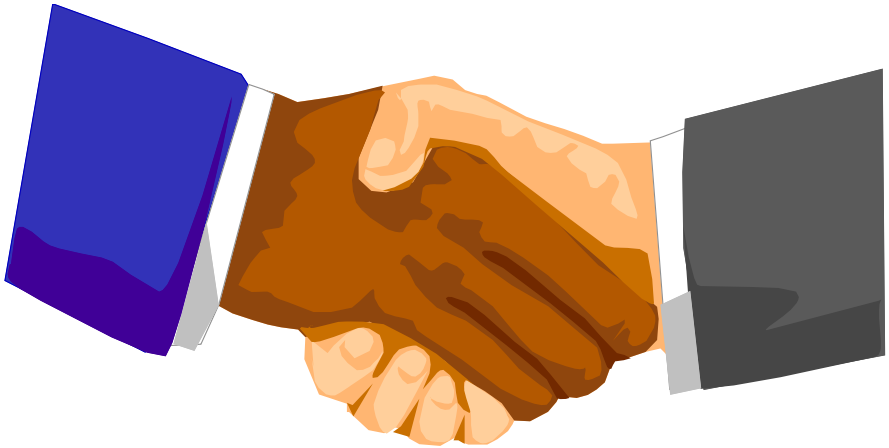


MATERIAL RECONCILATION

After completion of Implementation work ,Following to be reconciled after implementation.
Installation/auxiliary materials reconciliation to be done.
HW Inventory to be done.

All above documents to be kept in site folder. The auxiliary material reconciliation is done to understand
The wastage of materials (delivered vs. utilization).
The wastage should not be more than 5% of delivered materials.

Below are the formats for maintaining reconciliation (SRN) & HW inventory.



Thanks

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