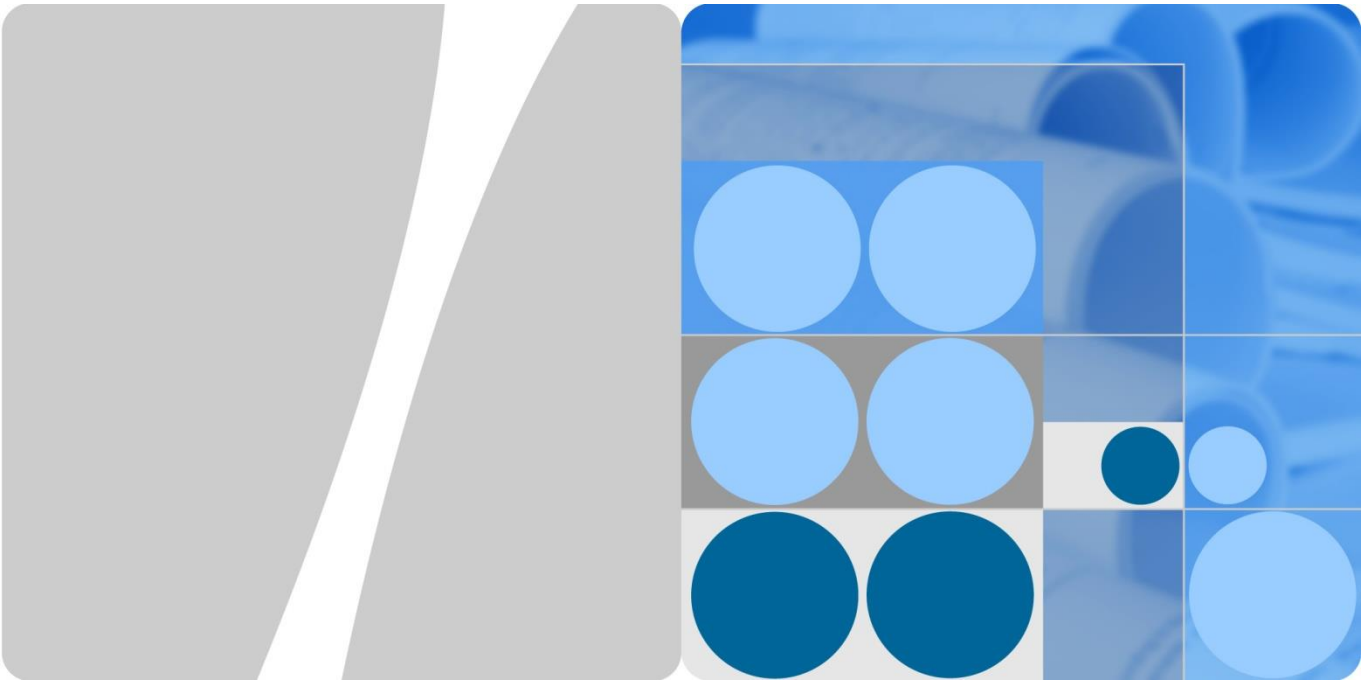


SmartAX MA5800-X2
Quick Installation Guide

Issue: 01
Date: 2016-10-28

HUAWEI TECHNOLOGIES CO., LTD.

About This Document

Intended Audience

This document describes how to install the MA5800-X2.

The intended audience is hardware installation engineers.

Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
NOTICE	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.
NOTE	Calls attention to important information, best practices and tips. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

Content

1 Precautions

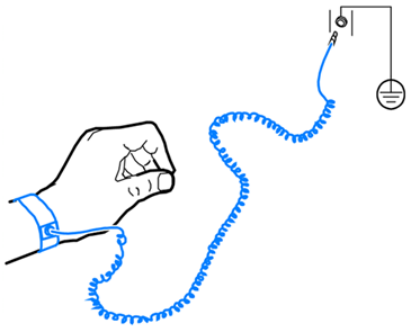
NOTE

- This document aims to provide simple and distinctive guidelines for hardware installation.
- This document does not describe operations for the pre-delivery installation of the internal cables and so on. Instead, this document describes only the operations for on-site installation.

Electrostatic Discharge

Before touching the device, or holding the boards and IC chips, wear the ESD gloves or the ESD wrist strap to prevent the electrostatic discharge of the human body from damaging the sensitive components. Ensure that the other end of the ESD wrist strap is properly grounded.

ESD gloves



ESD wrist strap

Bundling cables

- The distance between cable ties or binding straps inside the cabinet must be within 250 mm. (For user cable, the distance must be within 200 mm.)
- Use diagonal pliers to cut off the extra part of the cable tie to the end, and ensure that the cable tie is neat without sharp edges to prevent hand injury.

Affixing labels / tags

- After routing the cable, attach the label or fasten the tag to the cable 20 mm away from the connector.
- After the label for the signal cable is attached to the signal cable, the rectangular text area of the label must face rightwards or downwards.
- After the identification plate for the power cable is attached to the power cable, the text area of the plate must face rightwards or upwards. Ensure that the side attached with the label faces outwards.

2 Tools and Meters

Before you begin, get the following tools ready.

Marker

Flat-head screwdriver

Phillips screwdriver

Diagonal pliers

Network cable crimping tool

Network cable tester

Multimeter

Optical power meter

ESD gloves

ESD wrist strap

Cable cutter

Paper knife

Adjustable wrench

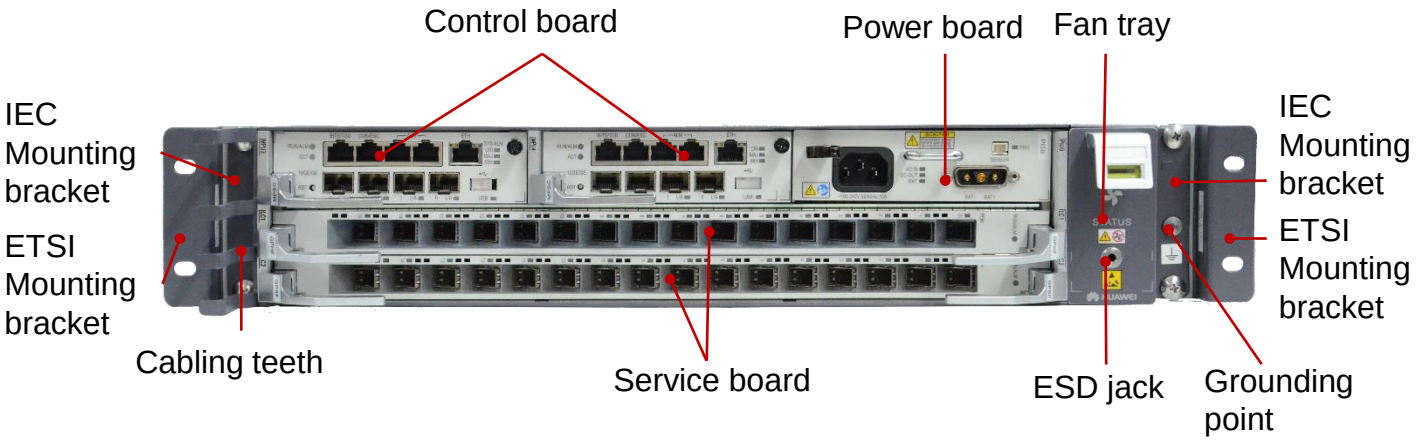
Mounting bar

Measuring tape

Cable cutter

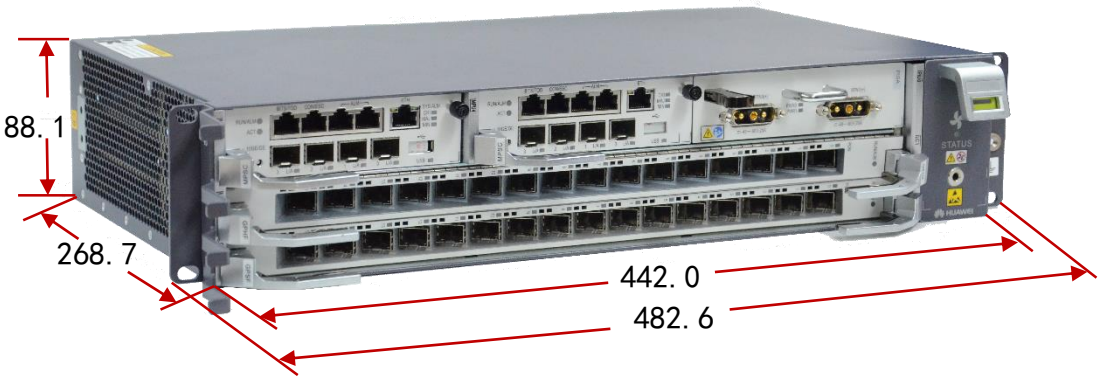
Optical fiber microscope

Optical fiber cleaner



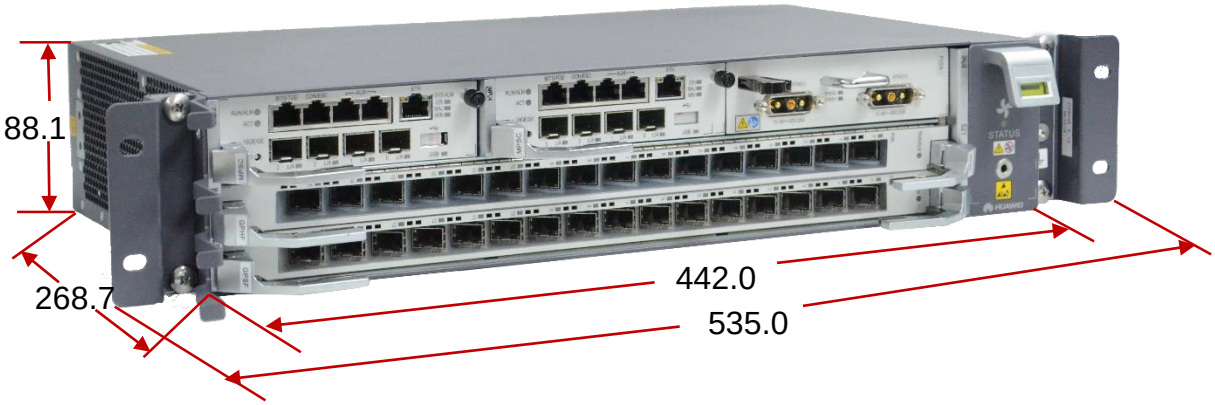
Service Subrack (with IEC mounting bracket)

Unit: mm



Service Subrack (with ETSI mounting bracket)

Unit: mm



4 Environment Requirements on Third-Party Cabinets

NOTICE

- **Cabinet dustproof requirement**: The MA5800-X2 subrack is not dustproof, so select dustproof cabinets that support dust filter maintenance.
- **Cabinet installation requirements**:

For the MA5800-X2 service subrack, select an IEC-compliant cabinet with a depth of 300 mm or more so that a space with a depth of 55 mm or more can be reserved for cable/fiber routing after boards are installed.

After the MA5800-X2 is installed in an ETSI-compliant cabinet that meets the related requirements, replace the mounting ears with the ETSI-compliant mounting ears customized by Huawei for the MA5800-X2.

- **Cabinet door requirement**: When devices are operating, keep the cabinet door closed.
- **Grounding requirement:** Huawei cabinets are grounded through mounting bars. Ensure that third-party cabinets are properly grounded based on site conditions.
- **Power distribution requirements:** Ensure that an over-current protection mechanism has been deployed on the upper-level device. A 20-A DC over-current protection mechanism and an 8-A AC over-current protection mechanism are recommended for the MA5800-X2. Ensure that the circuit breaker trip value of the upper-level device is greater than or equal to the rated value on the device nameplate.
- **Heat dissipation requirements**:

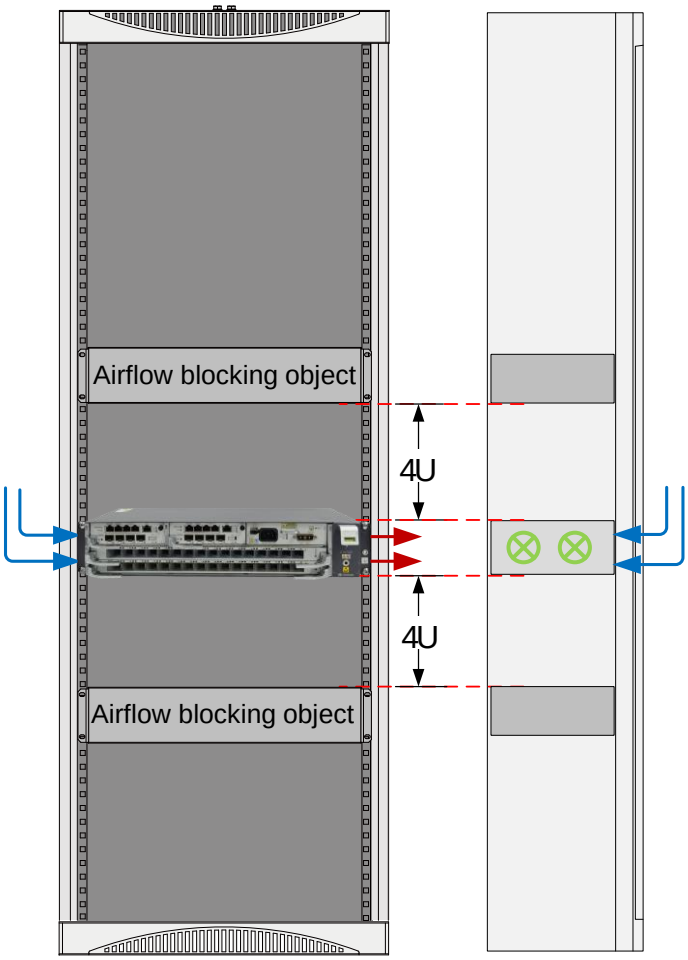
  Ensure that the cabinet has an air inlet and the hole density of the cabinet door is 60% or higher.

  When a cabinet accommodates multiple subracks or the device shares a cabinet with other active devices, ensure that the following space requirements are met.

5.1 When the Cabinet Accommodates One MA5800-X2 Subrack

NOTICE

- The MA5800-X2 supports left-in right-out heat dissipation, so the cabinet must have an unblocked air inlet on its door.
- You are advised to reserve more than 4 U space above and under the MA5800-X2 respectively to minimize the impact on other components in the cabinet.
- Ensure that the fan tray is not blocked by the cable routing. If the fan tray is blocked, it cannot be smoothly removed or installed.



Front view Side view

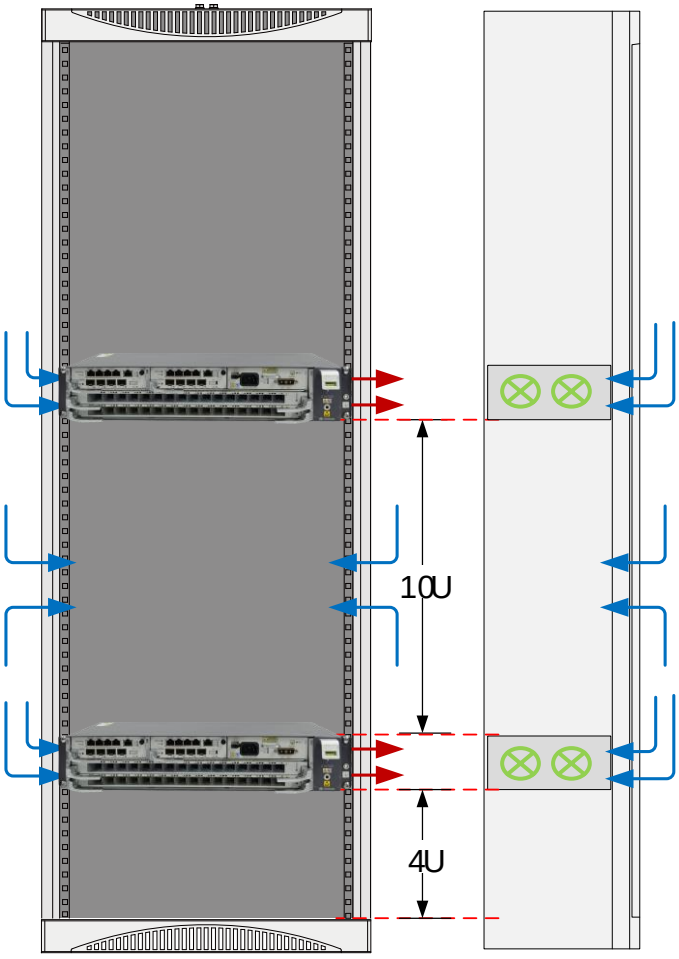
5.2 When the Cabinet Accommodates Two Subracks

NOTICE

- Reserve 10 U space between the devices or add a 3 U air deflector to redirect air flows to minimize the mutual heat dissipation impacts on the devices.
- Reserve at least 4 U space when you route fibers or install other passive devices to facilitate subsequent air inlet or dust filter cleaning.

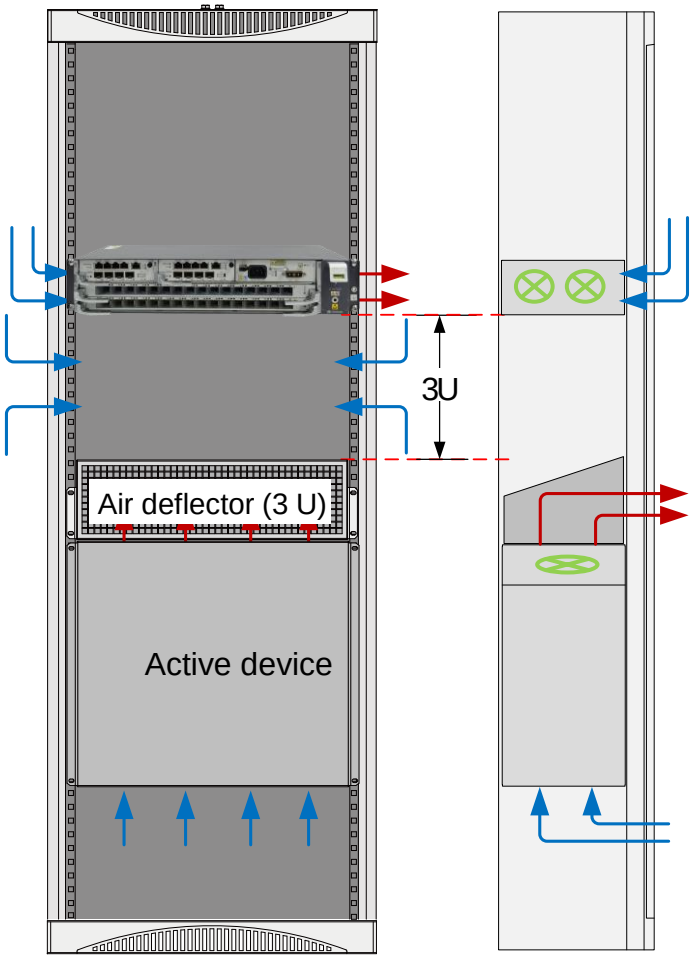
When the cabinet accommodates two MA5800-X2 subracks or one MA5800-X2 subrack and another device

Without an air deflector



Front view Side view

With an air deflector



Front view Side view

NOTE

If the MA5800-X2 subrack is installed in a subrack with B-T airflow, you are advised to add an air deflector to the subrack so that the hot air does not direct flow to the MA5800-X2. When 2 U space is reserved at the air inlet and 3 U space is reserved at the air outlet, the cabinet panels will have less impact on the heat dissipation of the MA5800-X2.

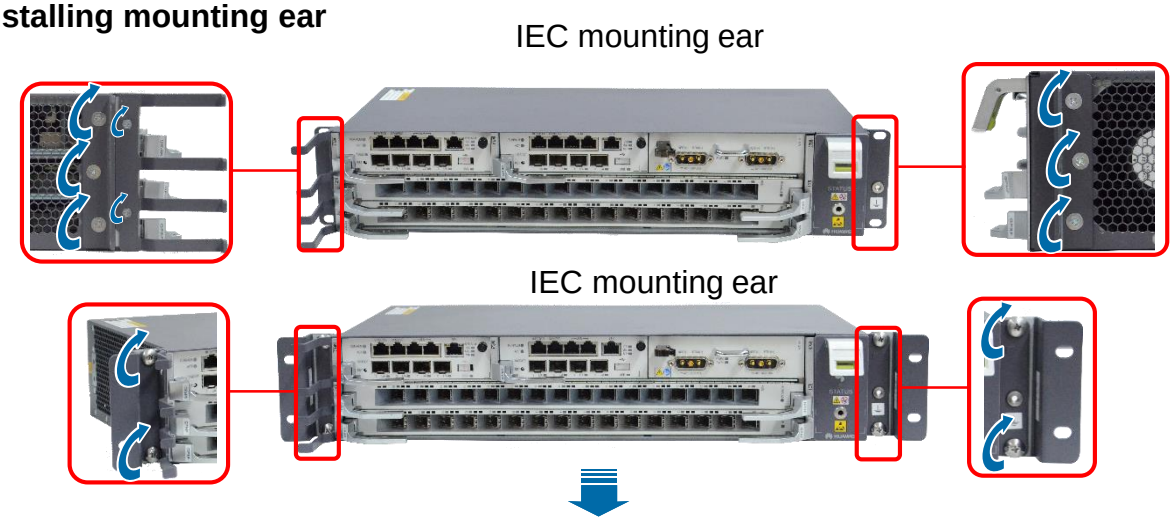
6 Installing the Service Subrack

6.1 Installation in a Cabinet or a Rack

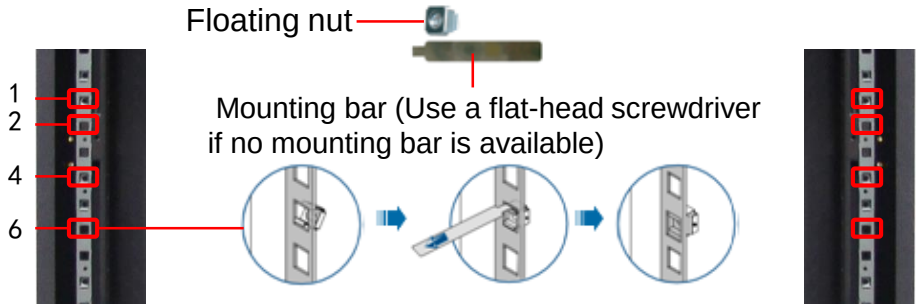
NOTE

- Use the IEC mounting bracket when the service subrack is installed in the IEC cabinet or rack.
- Install the mounting ears of the IEC subrack, and then install the mounting ears of the ETSI subrack on the mounting ears of the IEC subrack.
- If the cable manager is not configured, a 1 U high space on the top of MA5800-X2 must be reserved for routing cables.

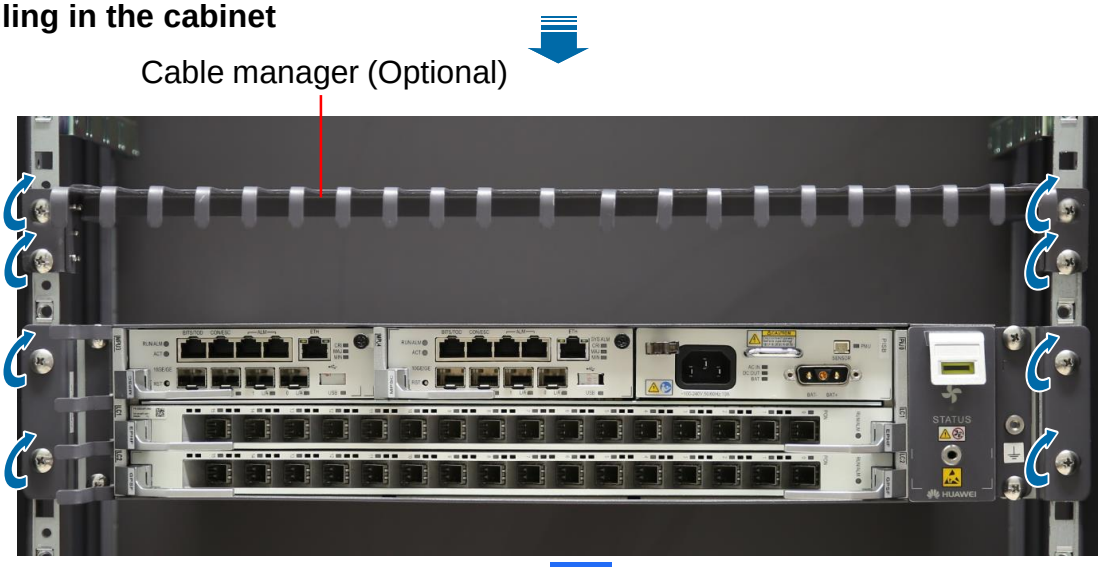
1 Installing mounting ear



2 Installing floating nut



3 Installing in the cabinet



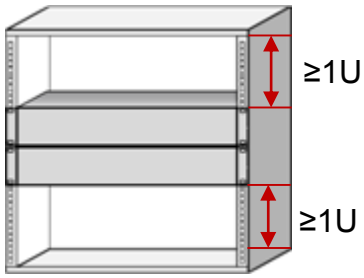
6.2 Installation in the Network Cabinet of the Customer

NOTE

- For better heat dissipation, when installing the MA5800-X2 in the network cabinet, avoid the short circuit of airflow inside the MA5800-X2 and maximize the vent area.
- If the network cabinet is installed outdoors or in a corridor that is exposed to rain, the network cabinet must meet the requirements of IP55 class protection.
- If the network cabinet is installed indoors or in a corridor that is out of rain, the network cabinet must meet the requirements of IP31 class protection.

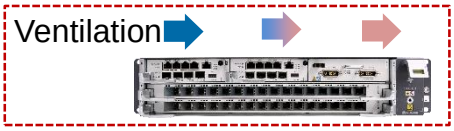
The modes of installing the MA5800-X2 in the network cabinet of the customer vary with the specifications for the network cabinet of the customer. The following section describes the common modes to be taken for installing the MA5800-X2 in the network cabinet of the customer. This can serve as a guide for hardware engineers to install the MA5800-X2.

1. MA5800-X2 horizontally installed (with the panel facing the front)

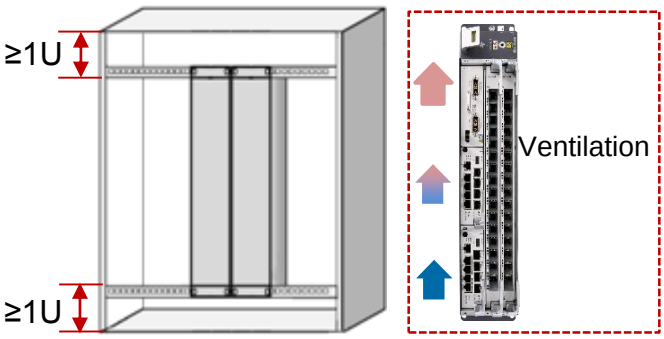


NOTE

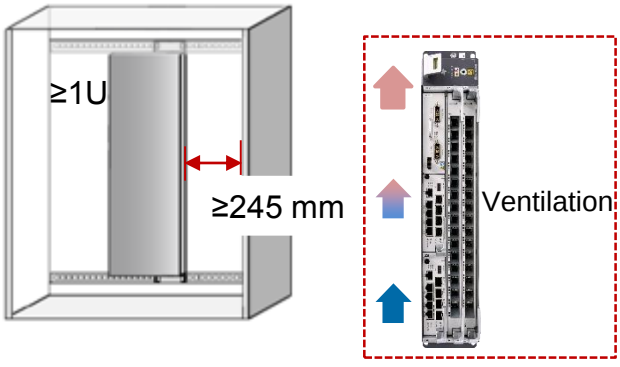
1U= 44.5 mm



2. MA5800-X2 vertically installed (with the panel facing the front)

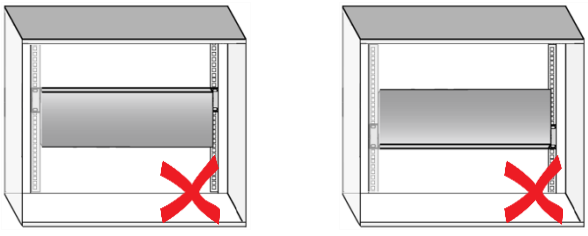


3. MA5800-X2 vertically installed (with the panel facing the right)



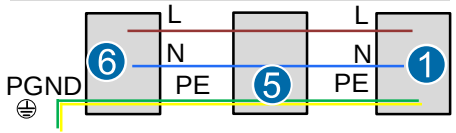
CAUTION

To avoid dusts accumulating on the board or the board dropping off, do not install the MA5800-X2 vertically in the network cabinet, regardless of the front panel facing upward or downward.



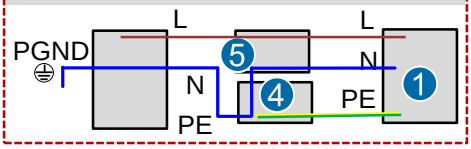
6.3 Guide for Grounding the Network Cabinet of the Customer

TN-S power distribution system

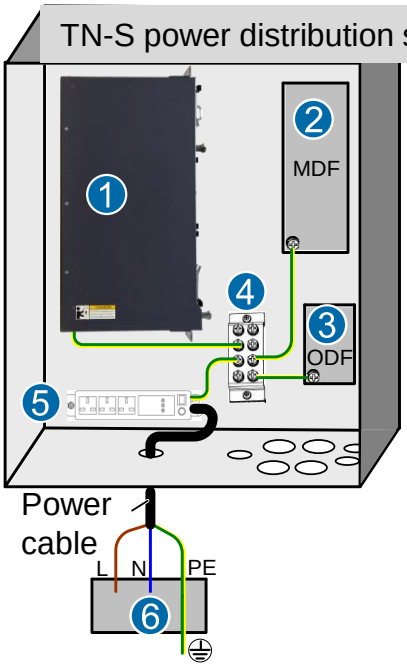


1 MA5800-X2 2 MDF
3 ODF 4 Ground bar
5 AC lightning protection bar
6 AC power distribution cabinet

TN-C-S power distribution system

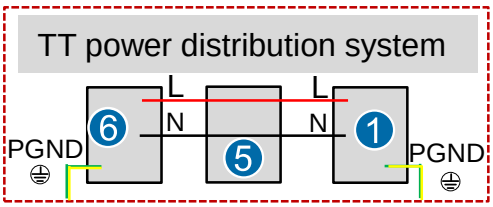


TN-S power distribution system

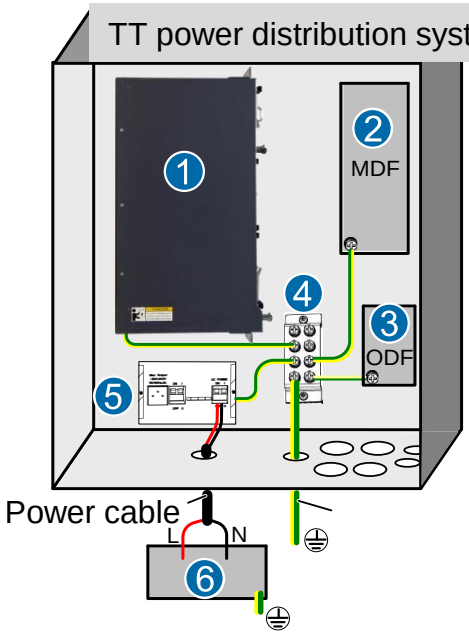


- In the case of the TN-C-S and TN-S AC power distribution systems, it is recommended that you use the PE wire of the AC power cable for the MDU grounding connection. The prerequisite is that the PE wire of the AC power cable for the corridor of the building is already grounded properly.
- Use the ground cable (the cross-sectional area of the ground cable must be greater than or equal to 6 mm^2) to connect the ground bar and all the internal devices, and the ground bar to the network cabinet in an equipotential manner through a metallic structure.
- Connect the grounding point of the reinforcing rib of the optical fiber to the ground bar through a ground cable, or connect this grounding point to the network cabinet in an equipotential manner through a metallic structure.

TT power distribution system



TT power distribution system



CAUTION

- When the PE line of the AC power cable in the building of the corridor does not meet the grounding requirement, the network cabinet must be grounded through an external ground cable (PGND cable), ensure that the reinforcing rib of the optical fiber is disconnected from the device.
- A power cable with 3-5 m must be used for decoupling between the surge protector and the ONU power supply.

1 MA5800-X2 2 MDF 3 ODF 4 Ground bar
5 AC PDU 6 AC power distribution cabinet

- In the case of the TT power distribution system, it is recommended that an external grounding device be adopted. For example, use the dedicated grounding device of the building (such as the grounding flat steel sheet, grounding stud, and ground bar) or the base steel bar of the reinforcement concrete of the building, or deploy a new earth screen.
- Use the ground cable (the cross-sectional area of the ground cable must be greater than or equal to 6 mm^2) to connect the ground bar and all the internal devices, and the ground bar to the network cabinet in an equipotential manner through a metallic structure.
- Connect the external ground cable (PGND cable) of the network cabinet to the external grounding device. As specified by the national grounding standard, the cross-sectional area of the external ground cable must be greater than or equal to 16 mm^2.

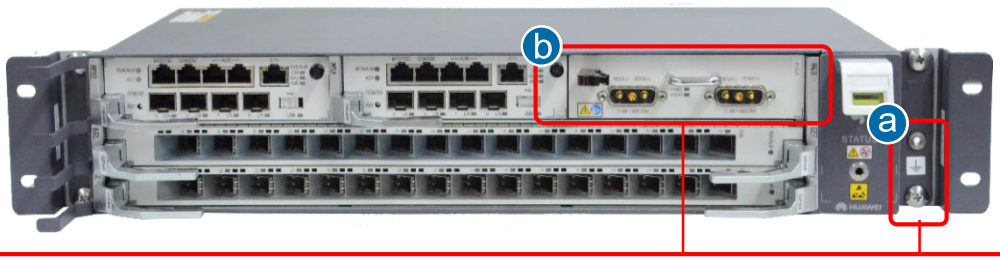
7 Routing Cables

7.1 Routing the PGND Cable and the External Power Cable

NOTE

- Connect the PGND cable properly to ensure that the service subrack is protected from the lightning and other interferences.
- Before routing the power cable, turn off the output switch of the DC power system.

DC configuration

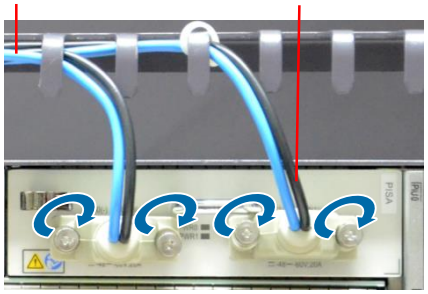


a

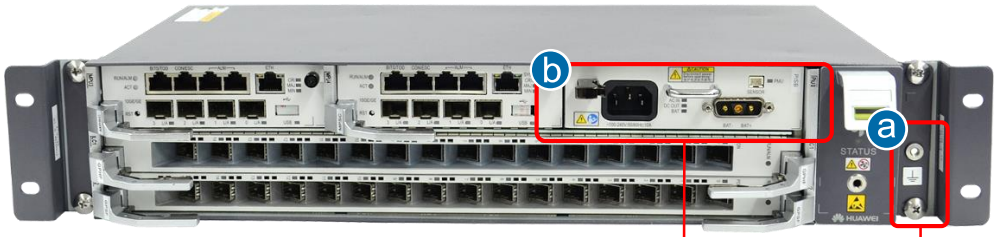
To the grounding point of the cabinet

PGND cable

b To DC PDU DC power cable



AC configuration



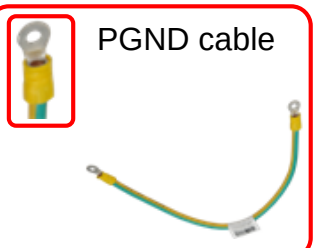
a

To the grounding point of the cabinet

PGND cable

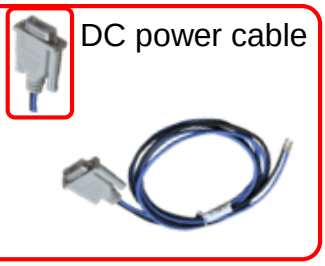
b To AC PDU

AC power cable



PGND cable

AC power cable

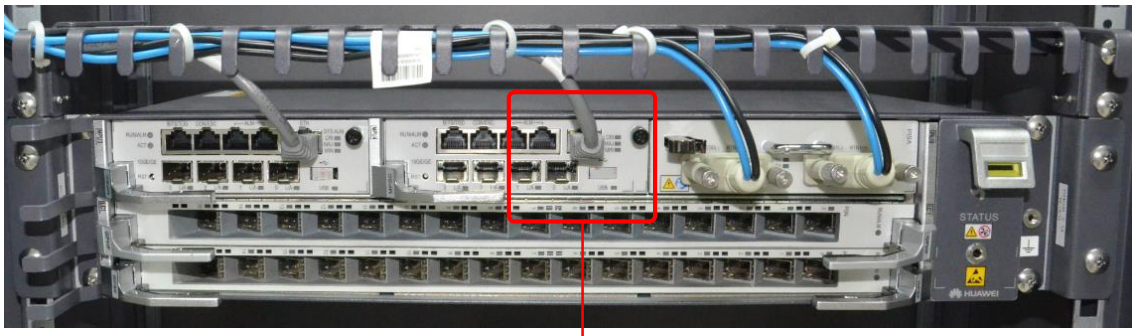


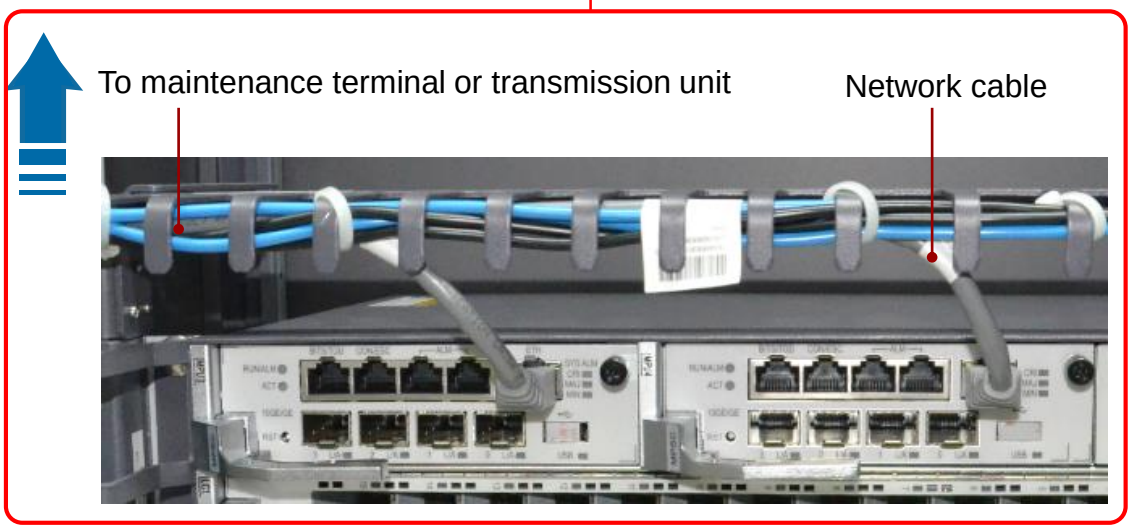
DC power cable

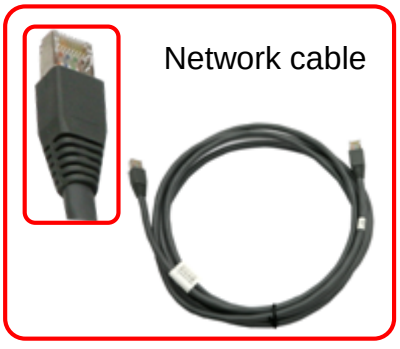
7.2 Routing Network Cables

NOTE

- Network cable and power cable need to maintain a certain distance.



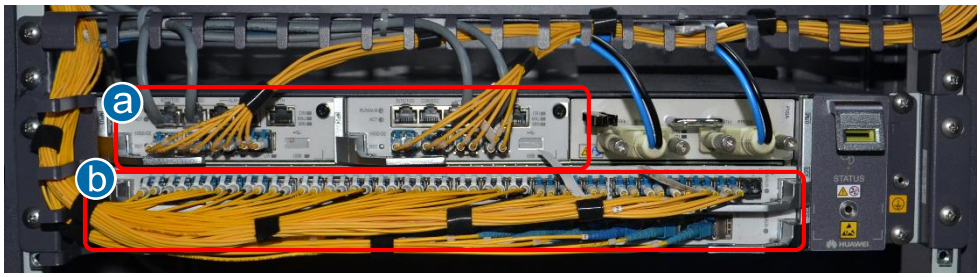




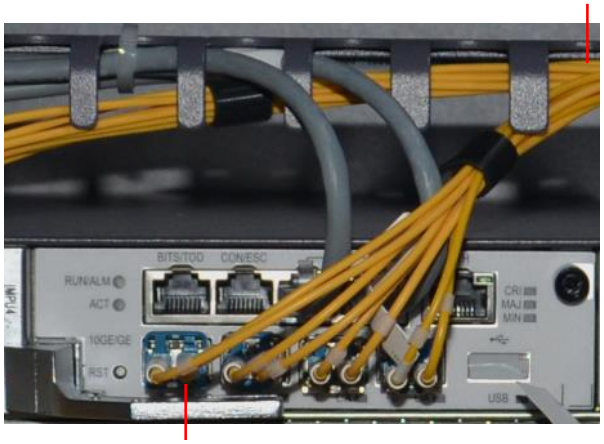
7.3 Routing Optical Fibers

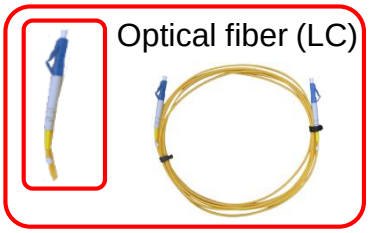
NOTE

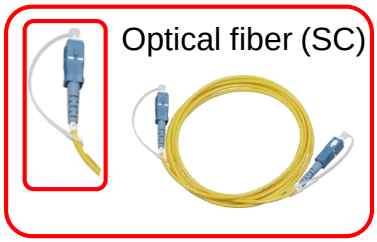
- When handling optical fibers, do not stand close to or look into the optical fiber port directly with naked eyes.
- The bending radius of the optical fiber should be more than 20 times the cable diameter. In general, the bending radius of the optical fiber is greater than or equal to 40 mm.



a Fiber for uplink







b Fiber for service

8 Checking the Installation

NO.	Description	Method
1	Do not place any materials on the service subrack.	Observe
2	All the cables are bound with proper tightness. The space between the cable ties is even, and the remaining parts of the cable ties are cut off neatly. All cable ties face the same direction, keeping the overall appearance nice.	Observe
3	The cross sectional area of the power cable and ground cable complies with the engineering design, and satisfy the requirements of equipment running.	Observe
4	The power cable and ground cable adopt a whole segment of copper core. The cable has no connection in the middle or scratch on the skin.	Observe
5	The power cable and ground cable must be routed horizontally and vertically without crossover. Proper margins must be reserved at the turning.	Observe
6	The power cable and ground cable must be connected correctly and reliably.	Observe
7	The identifiers on the power cable and ground cable must be correct, legible, and neat.	Observe
8	The power cables, ground cables, and signal cables must be routed separately.	Observe
9	Signal cables must be long enough, and must not be damaged or broken, without joint in the cable.	Observe
10	The connectors of the signal cables must be neat and intact. The connectors must be connected correctly and firmly. The tips must be connected securely.	Observe
11	Labels at both ends of the signal cables must be marked correctly, clearly and neatly.	Observe
12	If the fibers must be routed outside the cabinet, protection measures must be taken, such as using corrugated pipes or guide troughs.	Observe
13	Place the optical fiber pairs in order and bind them carefully with optical binders. No sharp edge is allowed.	Observe

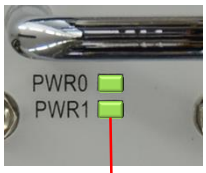
9 Powering On the System

NOTE

- Power on the device only when the input voltage is in the normal range.
- Use the multimeter to test the voltage between NEG(-) and RTN(+) on the DC PDU for the MA5800-X2 powered by the -48 VDC. The voltage should range from -38.4 V to -57.6 V.
- Use the multimeter to test the voltage between NEG(-) and RTN(+) on the DC PDU for the MA5800-X2 powered by the -60 VDC. The voltage should range from -50 V to -72 V.
- Use the multimeter to test the voltage on the AC PDU for the MA5800-X2 powered by the 220 VAC. The voltage should range from 200 V to 240 V.

DC configuration

a

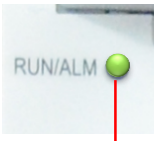


Green: on

b

Green: on

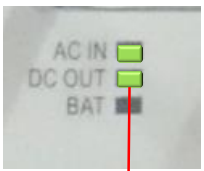
c



Green: on for 1s and off for 1s repeatedly

AC configuration

a

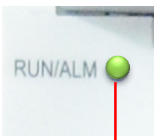


Green: on

b

Green: on

c



Green: on for 1s and off for 1s repeatedly