SmartAX MA5631 Multi-service Access
V800R308C02

Quick Installation Guide

SmartAX MA5631 多业务接入设备
V800R308C02

快速安装指南

HUAWEI TECHNOLOGIES CO., LTD.

HUAWEI

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Precautions 注意事项

Electrostatic Protection 静电防护

Before touching the device, or holding the boards or IC chips, wear the ESD gloves , to prevent the electrostatic discharge of the human body from damaging the sensitive components.

在接触设备，手拿单板或IC芯片等操作之前，为防止人体静电损坏敏感元器件，必须佩戴防静电手套。

Affixing labels / tags 粘贴标签/标识牌

After routing the cable, affix the label or fasten the tag to the cable, and 20 mm away from the connector.

电缆布放完成后需要粘贴标签/绑扎标识牌，默认粘贴/绑扎在距离连接器20mm 处。

After the label for the signal cable is affixed to the signal cable, the rectangular text area of the label should face rightwards or downwards.

信号线标签在信号线上粘贴后长条形文字区域一律朝向右或向下。

After the identification plate for the power cable is affixed to the power cable, the text area of the plate should face rightwards or downwards. Ensure that the side affixed with the label faces outwards.

电源线标识牌在电源线上绑扎后文字区域一律朝向右或向下，并保证粘贴标签的一面朝向外侧。

CAUTION

The chassis is flip cover, and it can not restrict the cover. When loosen the bolts, please buttress the cover, let it down slowly, or else it may drop down.

机箱是上下翻盖式，没有限位装置。当用户松开外壳螺栓时，请扶住机箱缓慢放下，否则箱盖可能突然翻下来。

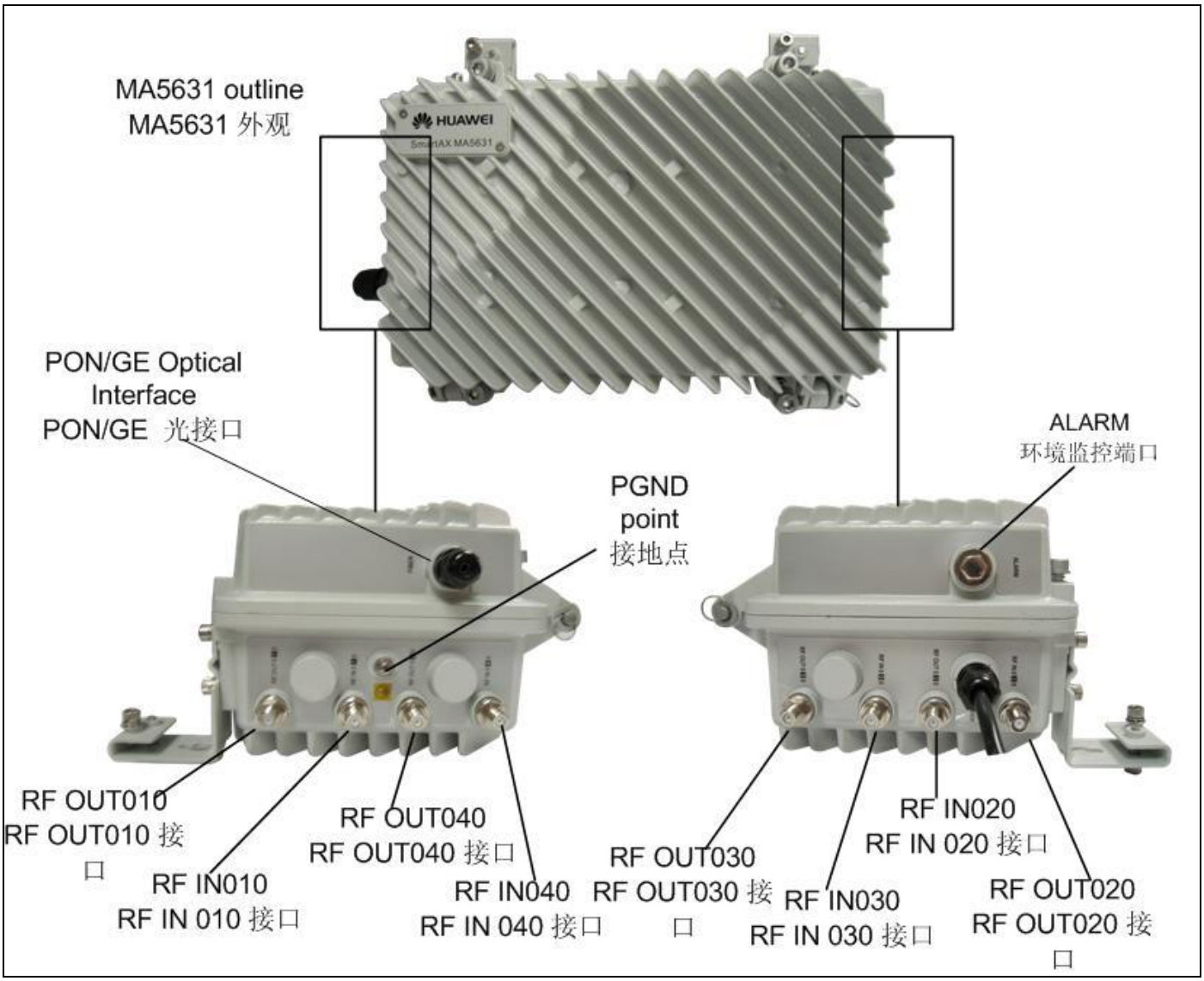
Check Tools and Meters 检查工具仪表

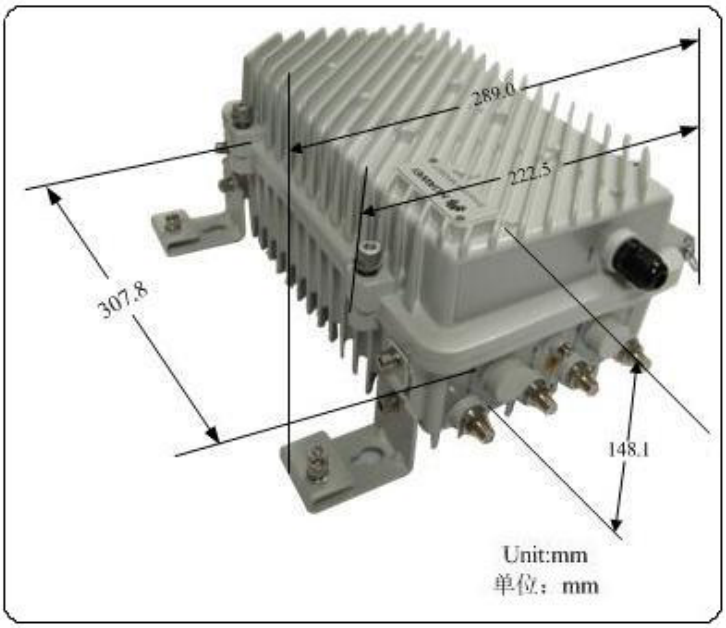
Before you begin, get the following tools ready.

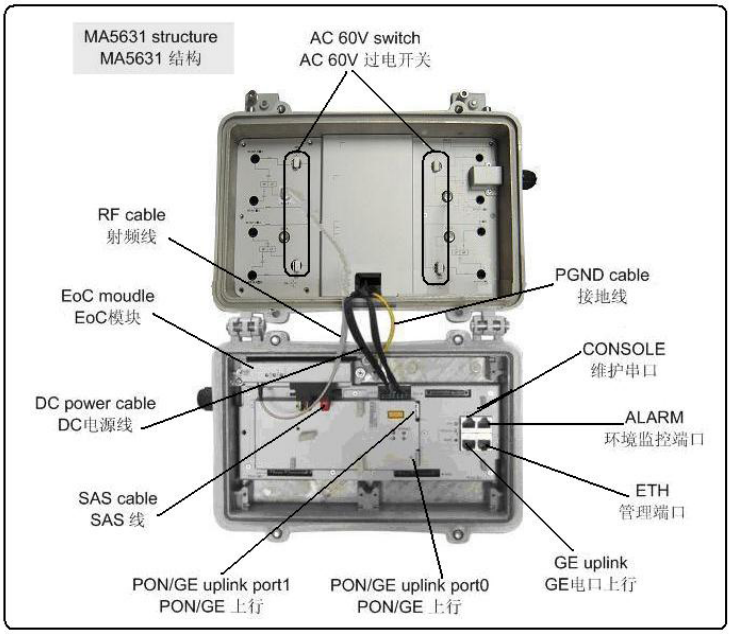
在安装前，请准备下面的工具：

 Marker pen 记号笔	 Flathead screwdriver 一字螺丝刀	 Phillips screwdriver 十字螺丝刀	 Diagonal Pliers 斜口钳
 Wire cutter 打线刀	 M6,M8 inner hexagon spanner M6、M8内六角扳手	 Adjustable wrench 活动扳手	 Socket wrench 套筒扳手
 Tape measure 长卷尺	 Claw hammer 羊角锤	 Percussion drill 冲击钻	 Bit 钻头
 Power cable crimping tool 电源线压线钳	 Cable cutter 断线钳	 Network cable crimping pliers 网线钳	 Network cable tester 网线测试仪
 Multimeter 万用表	 Optical power meter 光功率计	 ESD gloves 防静电手套	 ESD wrist strap 防静电手腕

Outline and Structure 机箱外观和结构







Collecting the MAC Address and Serial Number 采集MAC地址和序列

NOTE

- On the installation site, the hardware installation engineer should collect the “MAC Address” or “Serial Number” of the MA5631 for the software commissioning engineer to configure and manage the MA5631 remotely.
  现场施工时，硬件安装工程师需采集MA5631的“MAC地址”或“序列号”，提供给软调工程师，以便软调工程师能对MA5631进行远程配置管理。
- The “MAC Address” is used for MA5631 (with the EPON optical module).
  “MAC地址”用于配置有EPON光模块的MA5631。
- The “Serial Number” is used for MA5631 (with the GPON optical module).
  “序列号”用于配置有GPON光模块的MA5631。
- When collecting the “MAC Address” or “Serial Number”, the hardware installation engineer needs to affix the "MAC Address" or “Serial Number” label to the corresponding place of the following table, and then record the actual installation location of the MA5631.
  硬件工程师采集时，分别把“MAC地址”或“序列号”标签粘贴到下面表格中的对应位置，并记录下MA5631安装的实际位置。
- After the hardware installation, transfer this piece of paper to the software commissioning engineer.
  硬件施工完毕，将该纸张提供给软调工程师。

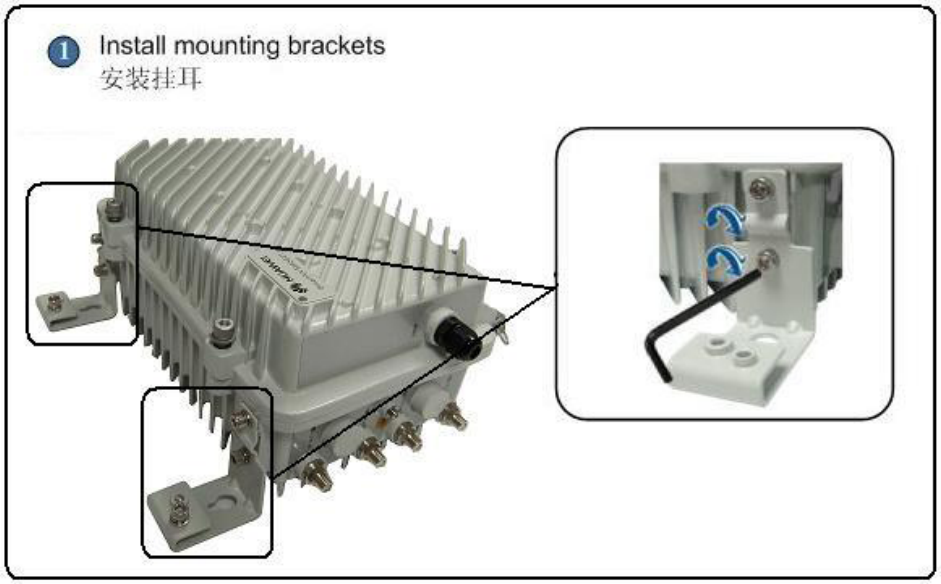
NO. 序号	Device type 设备类型		MAC Address and Serial Number MAC地址和序列号	Device Installation Location 设备所处位置
Example 样例	MA5631	EPON	781DBADEE1B7 · B8 (2)	** Building ** Floor ONU-1 **大厦**楼ONU-1
		GPON	48575443DEE1B704	
1	MA5631	EPON		
		GPON		

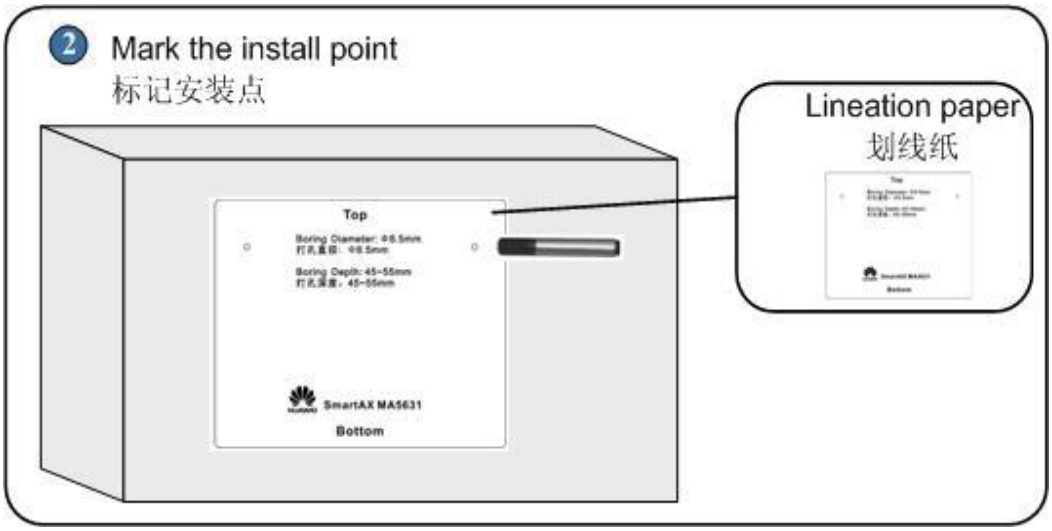
Installing the Chassis 安装机箱

5.1 Installing the device on the wall 壁挂安装

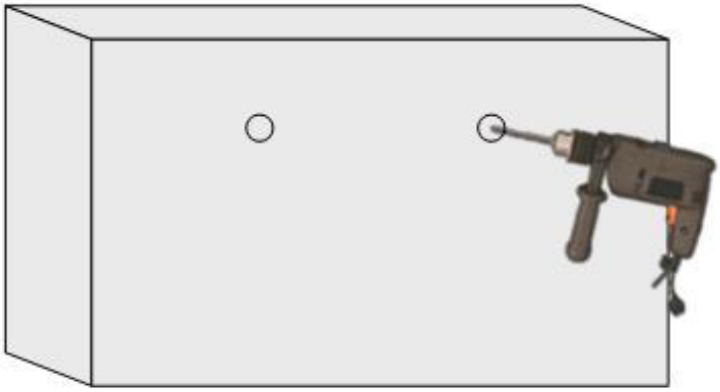
NOTE

- The power should be cut off before installing the device,and ensure that the texture of the walls to withstand the weight of the chassis (full 6.8Kg) .
  安装前请确保断开电源，确保墙壁的质地能够承受机箱的重量（满载6.8Kg）。
- When install the MA5631 outside, it should avoid the device in the sun radiation long time.
  安装MA5631在室外墙面时，避免MA5631长时间处于太阳光辐射下。
- The chassis is flip cover, and it can not restrict the cover. When loosen the bolts, please buttress the cover, let it down slowly, or else it may drop down.
  机箱是上下翻盖式，没有限位装置。当用户松开外壳螺栓时，请扶住机箱缓慢放下，否则箱盖可能突然翻下来。

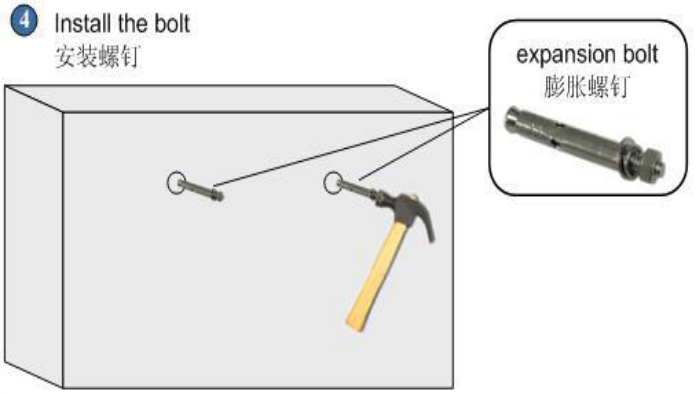




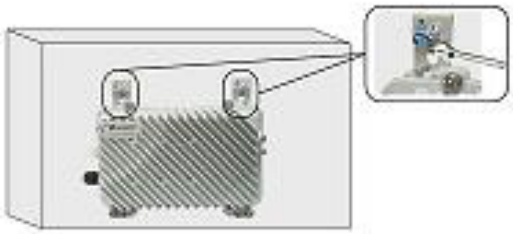
3 Drill the install hole
钻安装孔



4 Install the bolt
安装螺钉



5 Install the chassis
安装机箱

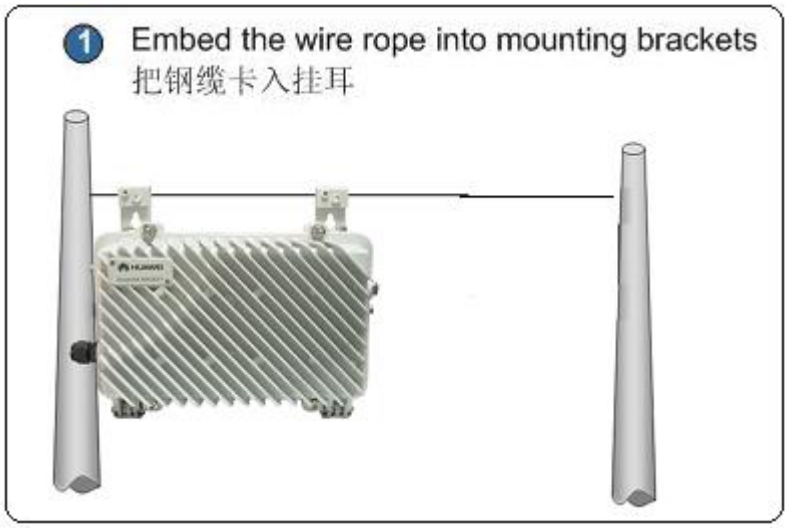


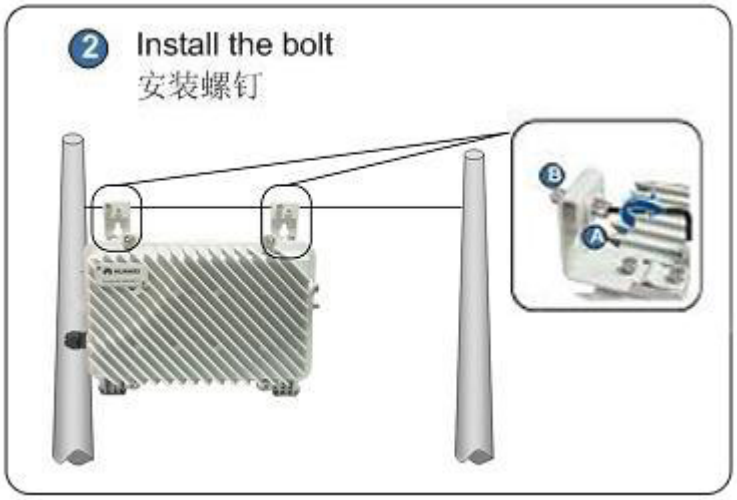
Installing the Chassis 安装机箱

5.2 Installing the device on the cable 线挂安装

NOTE

- When MA5631 running in outdoor,it should wrap the screw thread part that external connections connect to the chassis using waterproof adhesive tape or waterproof adhesive.
  当MA5631在室外工作时，需要用防水胶带或防水胶缠住外置接头连接机箱的螺纹部分。
- The chassis is flip cover, and it can not restrict the cover. When loosen the bolts, please buttress the cover, let it down slowly, or else it may drop down.
  机箱是上下翻盖式，没有限位装置。当用户松开外壳螺栓时，请扶住机箱慢慢放下来，否则箱盖可能突然翻下来。





Please tighten the bolt(B) first , avoid the wire rope moving. Then tighten the bolt(A), impact into the wire rope.

先拧紧螺钉(B)，防止钢缆松动。再拧紧螺钉(A)，压紧钢缆。

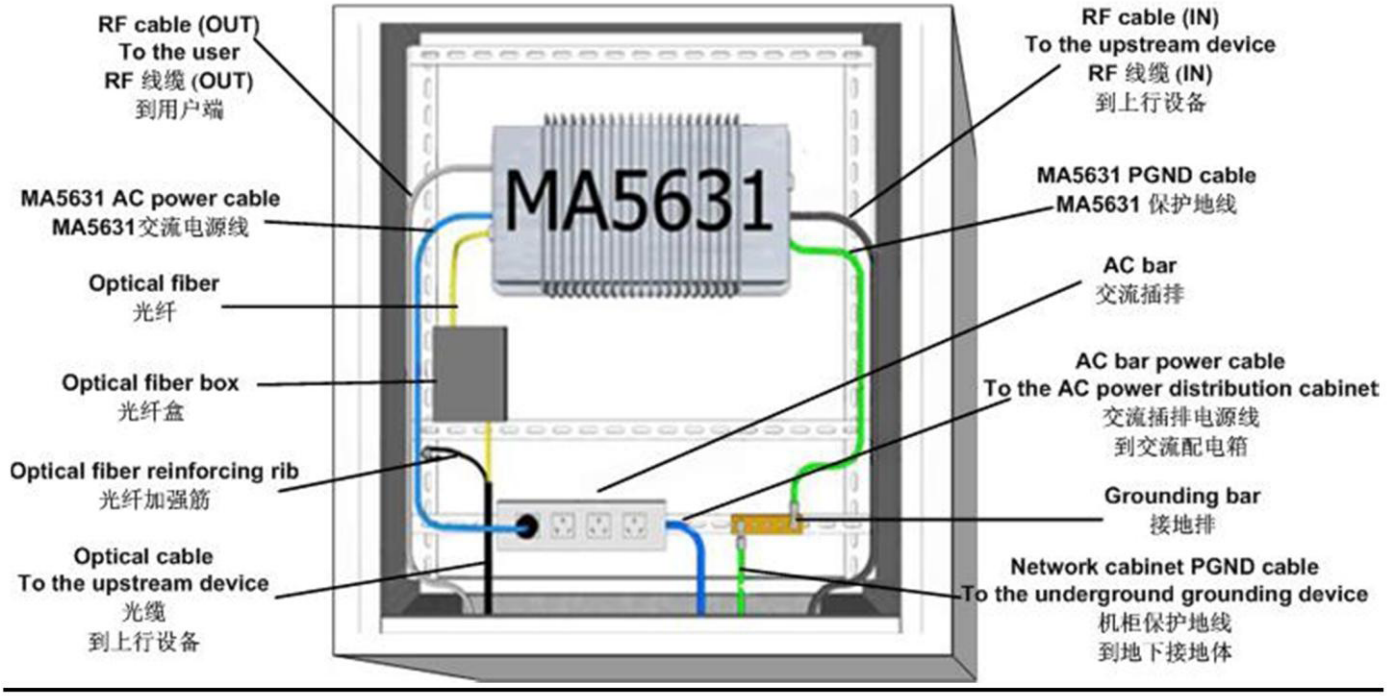
Installing the Chassis 安装机箱

5.3 Installing the device in the Network Cabinet of the Customer 在客户自备网络箱中安装

NOTE

- 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. ("IP" refers to International Protection. The first number "5" refers to the class for preventing the solid particle from entering the device. That is, the network cabinet cannot completely prevent dust from entering the device, but the amount of dust that enters the network cabinet does not damage the device. The second number "5" refers to the class for preventing water from entering the network cabinet. That is, the water sprayed from different directions to the network cabinet does not damage the device.
  在室外或易被雨水淋到的楼道环境中安装的网络箱必须达到IP55等级（"IP"为国际防护等级；第一个数字"5"为防外部固体颗粒侵入等级，即"网络箱不可能完全阻止灰尘进入，但灰尘进入的数量不会对设备造成损害"；第二个数字"5"为防水侵入等级，即"从每个方向对准网络箱柜体的射水都不会对设备造成损害"）。
- 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 first numbers "3" means the solid partcle with a diameter equal to larger than 2.5mm can be prevented from entering the cabinet. The second number "1"means the drips fallen vertically cannot damage the device.)
  在室内或雨水未能淋到的楼道环境中安装的网络箱必须达到IP31等级（第一个数字"3"表示网络箱能防止2.5mm直径和更大的外部固体颗粒；第二个数字"1"表示垂直落下的水滴不会对设备造成损害）。

Because the dimension of the MA5631 is different from the specifications of the network cabinet , the MA5631 should placed horizontally on the clapboard of the network cabinet of the customer. The following section describes the horizontal placement modes. This can serve as a guide for hardware engineers to install the MA5631.
因为MA5631的尺寸不同于网络箱的规格，所以MA5631可以水平放置在客户自备网络箱中的隔板上。下面介绍MA5631水平放置安装方式，供硬件工程师安装时参考。



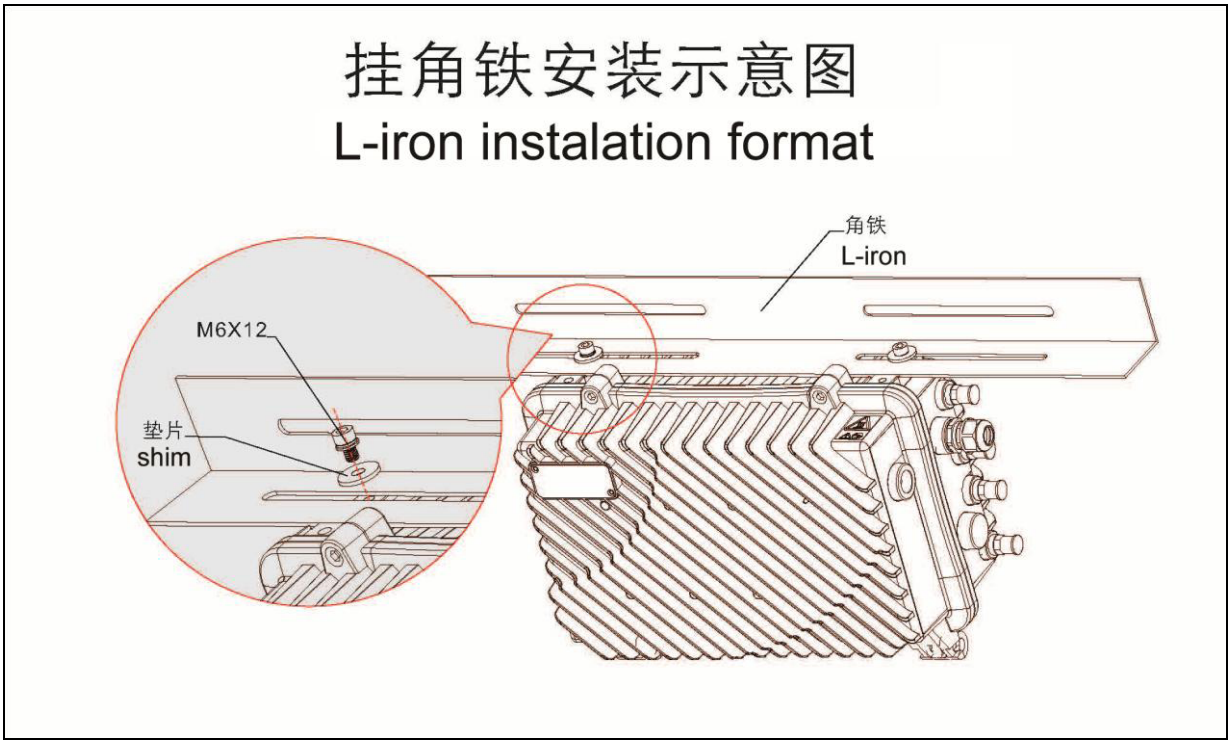
CAUTION

When placed the MA5631 horizontally, please don't let the MA5631 near to the edge of the network cabinet, avoid the MA5631 dropping down to be damaged or injure the person.
当水平放置MA5631时，请不要让MA5631靠近机柜边缘，避免MA5631跌落，损坏设备或伤人。

5.4 Installing the device with L-iron in the Network Cabinet of the Customer 在网络箱中三角铁的安装方式

NOTE

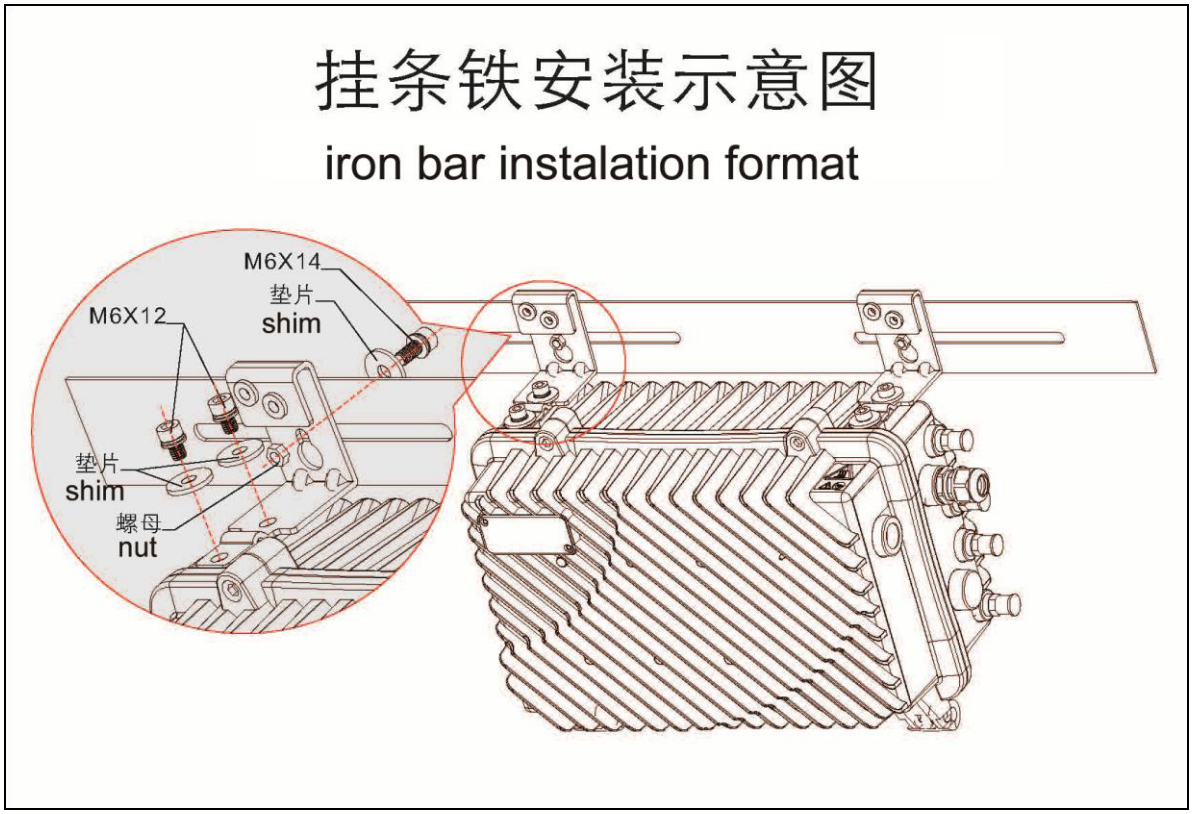
- Using the L-iron to install MA5631 in the network cabinet
  MA5631用于网络箱中，采用挂装三角铁的安装方式。
- Using the screw to pass through the hole on the L-iron and fix it by the sheet iron which has a diameter of 20mm,and than lock up the screw.
  采用固定安装件的螺钉和附带的20mm外径垫片，穿过角铁的水平面开孔，夹持住三角铁，打上螺钉实现吊装。



5.5 Installing the device with iron bar in the Network Cabinet of the Customer 在客户自备网络箱中条铁的安装方式

NOTE

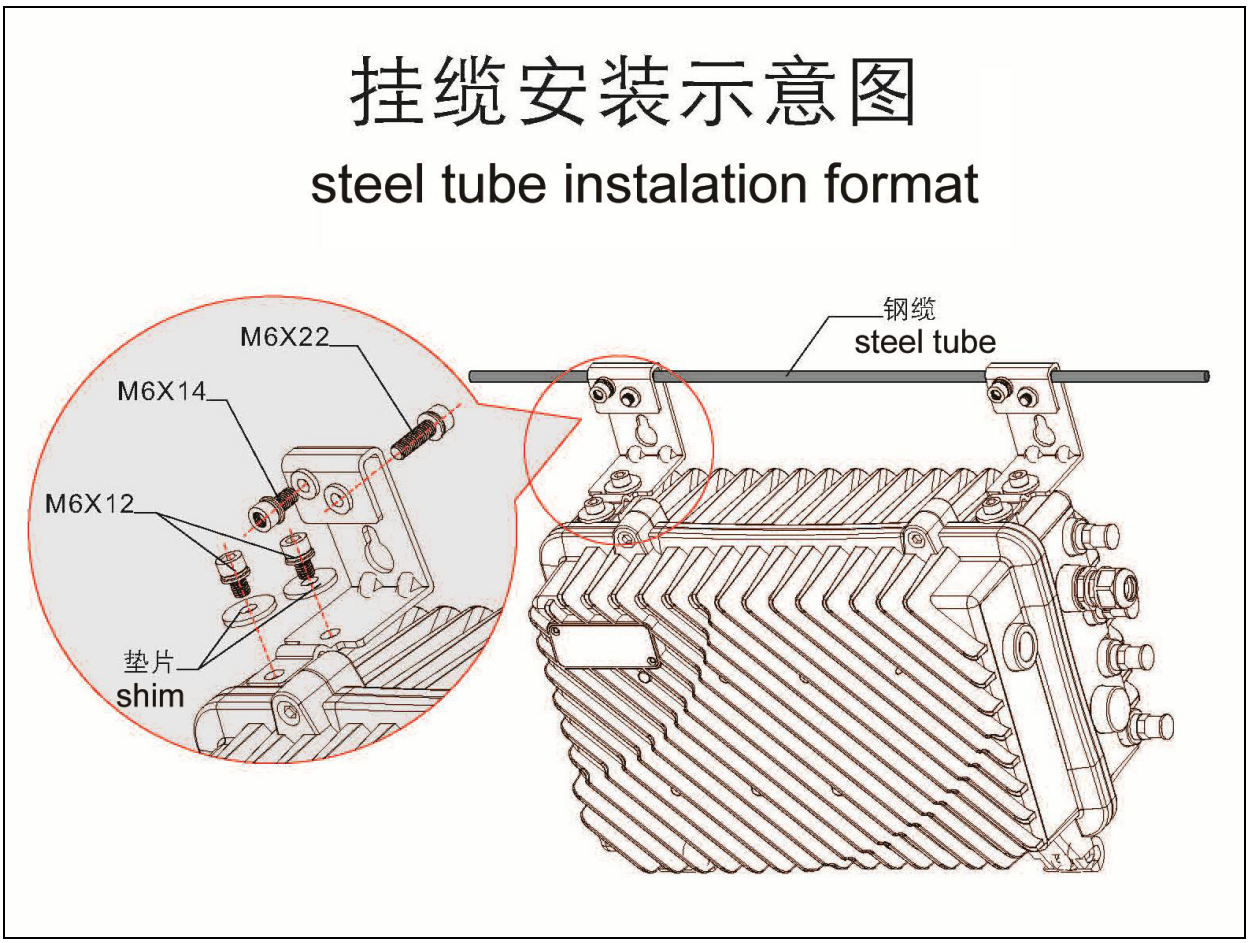
- Using the iron bar to install MA5631 in the network cabinet.
  MA5631用于网络箱中，利用条铁的竖直面安装。
- Using the screw to pass through the hole on the iron bar and fix it by the sheet iron which has a diameter of 20mm and than lock up the screw.
  采用挂缆安装用的紧固螺钉和附带的20mm外径垫片，穿过角铁的竖直面开孔，用膨胀螺钉上的螺母固定。



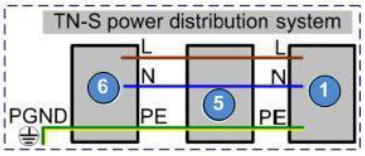
5.6 Installing the device with in the Network Cabinet of the Customer在客户自备网络箱中钢缆的安装方式

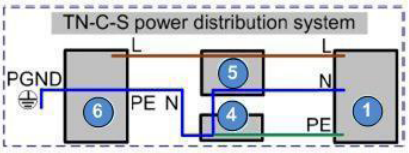
NOTE

- Put the bracket on the steel tube.
  MA5631用于网络箱中，将挂耳挂至钢缆。
- Fix the bracket by M6 x 22 and M6 x 14 screw.
  采用M6 x 22的紧固螺钉从挂耳后面拧紧，再将M6 x 14的紧固螺钉从挂耳前面拧紧。



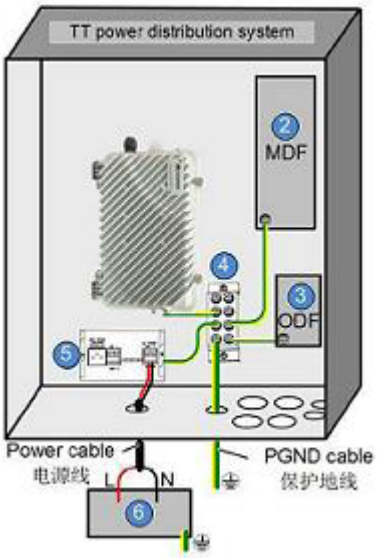
5.7 Guide for Grounding the Network Cabinet of the Customer 客户自备网络箱接地指导





1 MA5631 2 MDF 3 ODF
4 Grounding bar 接地排
5 AC lightning protection bar 交流防雷插排
6 AC power distribution cabinet 交流电源配电柜

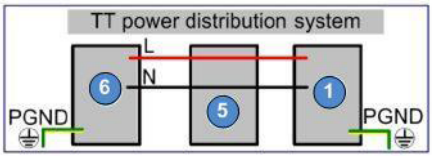
In the case of the TN-C-S and TN-S AC power distribution systems, it is recommended that you use the PE wire of the AC power cable for the MDU grounding connection. The prerequisite is that the PE wire of the AC power cable for the corridor of the building is already grounded properly.
对于 TN-C-S 和 TN-S 交流配电系统，推荐采用交流电源线的 PE 线实现 MDU 的接地，前提是楼道建筑物自身交流电源线的 PE 线已可靠接地。



Use the ground cable (the cross-sectional area of the ground cable must be equal to or greater than 6mm^2) to connect the grounding bar and all the internal dcvices, and the grounding bar to the network cabinet in an equipotential manner through a metallic structure.
网络箱内部所有设备连接通过接地线（线径应不小于 6 mm^2）到接地排，接地排通过金属结构与网络箱实现等电位连接。

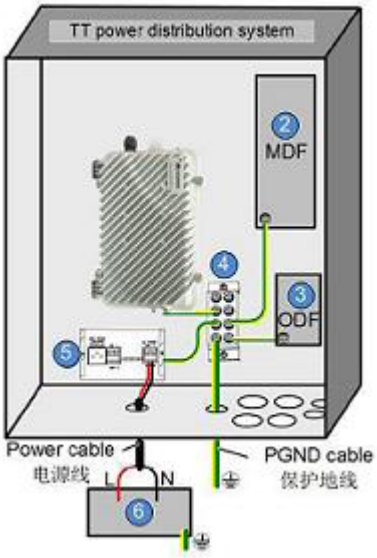
Connect the grounding point of the reinforcing rib of the optical fiber to the ground bar through a ground cable, or connect this grounding point to the network cabinet in an equipotential manner through a metallic structure.
光纤加强筋接地点，需要通过地线与接地排连接；接地点也可以通过金属结构与网络箱等电位连接。

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.
当楼道建筑物自身的交流电源线的 PE 线不具备接地条件时，网络箱必须通过外部地线（保护地线）接地，且要保证光纤加强筋和设备地断开。
A power cable with 3-5 m must be used for decoupling between the surge protector and the ONU power supply.
防雷器到 ONU 设备电源之间要求采用 3m~5m 长的电源线做退耦。



1 MA5631 2 MDF 3 ODF 4 Grounding bar 接地排
5 AC PDU 交流配电盒 6 AC power distribution cabinet 交流电源配电柜

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 grounding bar) or the base steel of the reinforcement concrete of the building, or deploy a new earth screen.
对于 TT 配电系统，推荐采用外部接地装置进行接地，比如采用建筑物专用接地装置（接地扁钢、地桩、接地排）、建筑物混凝土基础钢筋、新建接地网等。



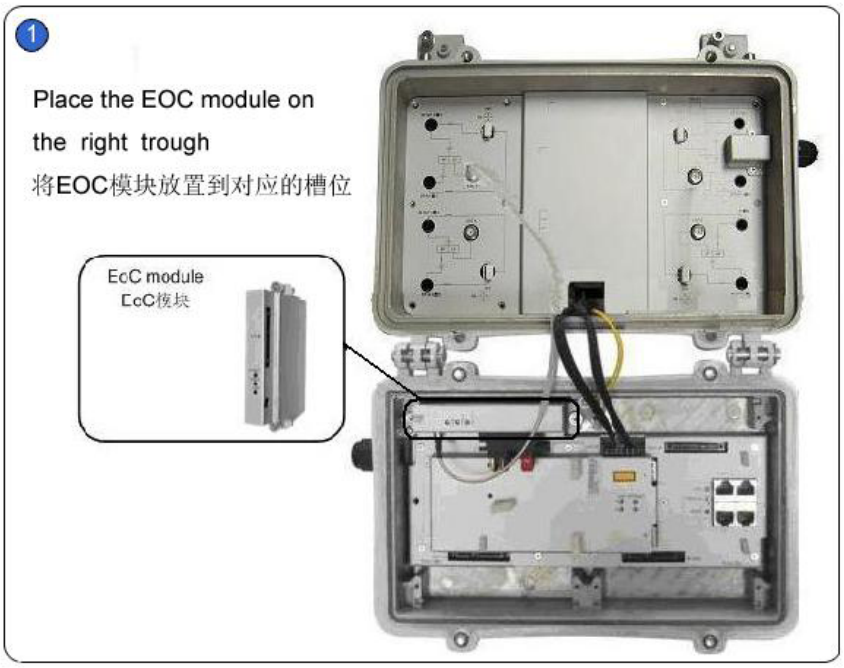
Use the ground cable (the cross-sectional area of the ground cable must be equal to or greater than 6mm^2) to connect the grounding bar and all the internal dcvices, and the grounding bar to the network cabinet in an equipotential manner through a metallic structure.
网络箱内部所有设备连接通过接地线（线径应不小于 6 mm^2）到接地排，接地排通过金属结构与网络箱实现等电位连接。

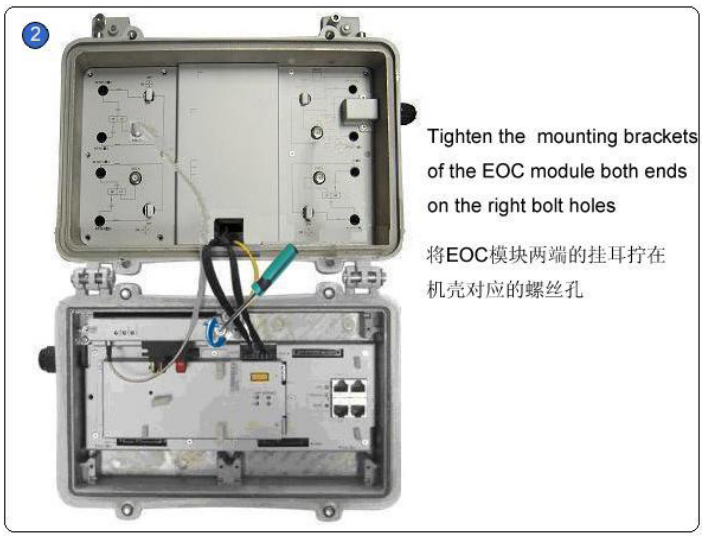
Connect the external ground cable (PGND cable) of the network cabinet to the external grounding device. As specified by the national grounding standard, the cross-sectional area of the external ground cable must be equal to or greater than 16 mm^2 .
网络箱外部接地线（保护地线），要连接到外部接地装置，按照国家的接地标准，此线径应不小于 16 mm^2。

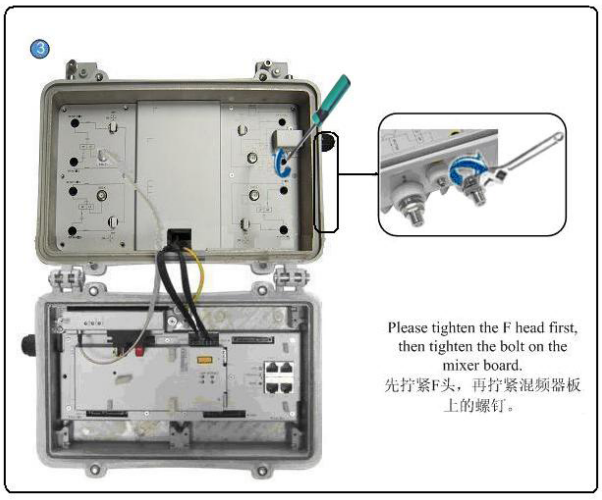
Installing the module (optional) 安装EOC模块（可选）

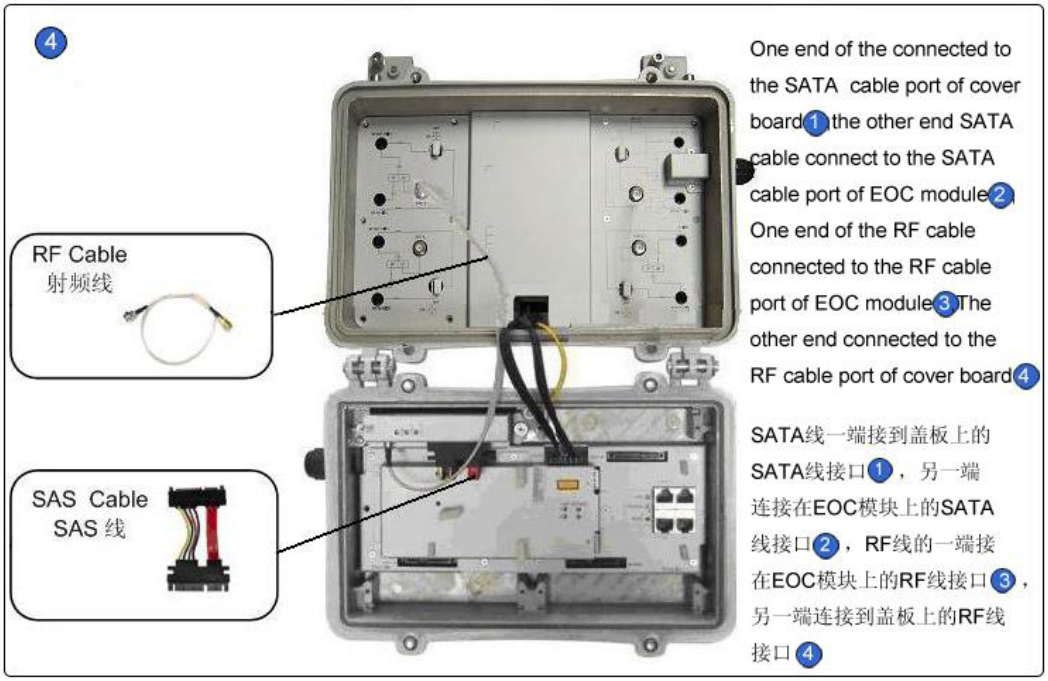
NOTE

- SATA line is shorter, it is recommended to connect to the motherboard first , then connect to the EoC module.
  SATA线较短，建议先连接底板端，再连接EoC模块端。
- The RF cable connected to the EoC module end is the plug-in mode. Please pay attention to the intensity when plug the RF cable to avoid damaging the RF line, and to avoid injuring your hand.
  射频线连接EoC模块端是插拔式，插拔时注意力度，避免损坏射频线，以及避免伤手。
- When connect the RF cable to the mixer, please pay attention to your operation , don't scrape the cover board.
  连接射频线到混频器时，请注意操作，不要刮花盖板。









One end of the connected to the SATA cable port of cover board 1 the other end SATA cable connect to the SATA cable port of EOC module 2 One end of the RF cable connected to the RF cable port of EOC module 3 The other end connected to the RF cable port of cover board 4

SATA线一端接到盖板上的SATA线接口 1 ，另一端连接在EOC模块上的SATA线接口 2 ，RF线的一端接在EOC模块上的RF线接口 3 ，另一端连接到盖板上的RF线接口 4

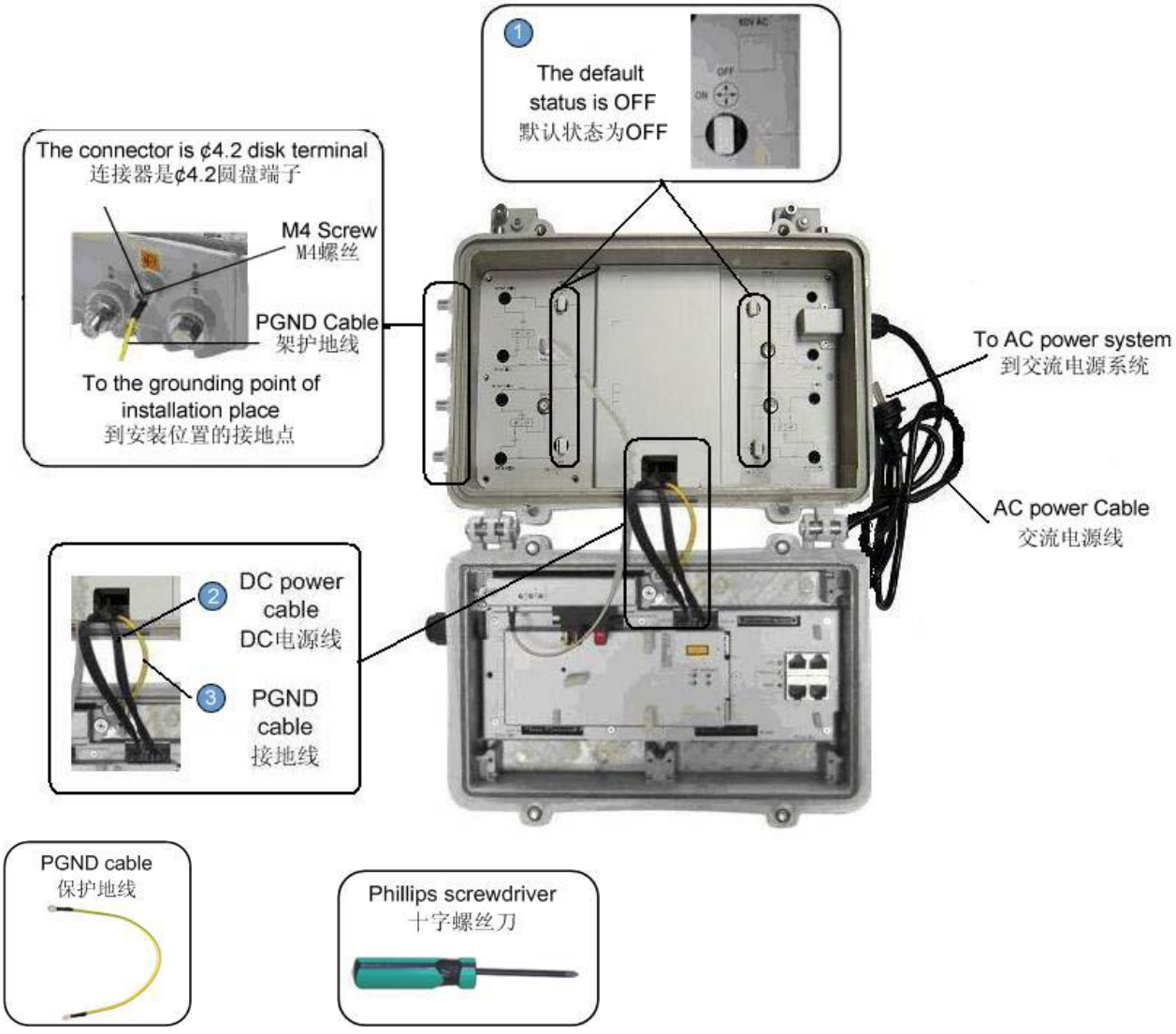
Routing Cables 布放线缆

7.1 Routing the PGND Cable and the Power Cable 布放保护地线和电源线

CAUTION

- Connect the PGND cable properly to ensure that the chassis is protected from the lightning and other interference.
  保护地线的正确连接是机箱防雷、防干扰的重要保障，所以必须正确地接好保护地线。
- When produce the PGND cable locale, it should be as short as possible to ensure the protection.
  现场制作保护地线时，为保证接地效果，保护地线应该尽量短。
  Before routing the AC power cable, turn off the output switch of the AC power system that supplies power to the MA5631.
- 布放交流电源线前，请断开为MA5631供电的交流电源系统输出开关。

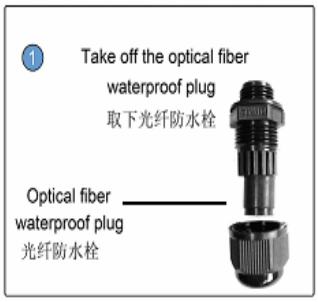
1. The default status of 60V AC switch is OFF. When need supply 60V AC, please pull out the jumper cap ，then insert it according to the ON direction.
60V AC 开关默认状态为OFF。当需要提供60V AC时，请将跳线帽拔出来，然后按ON的方向重新插入。
2. DC power cable, connect the power module and mainboard, and supply the power to mainboard.
DC 电源线，连接电源模块和主板，为主板供电。
3. PGND cable, connect the top and bottom of the chassis, and balance the voltage of the top and bottom.
接地线连接机箱上盖和下盖，平衡上下盖之间的电压。

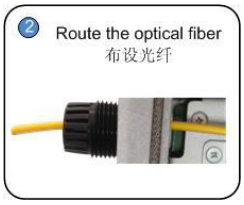


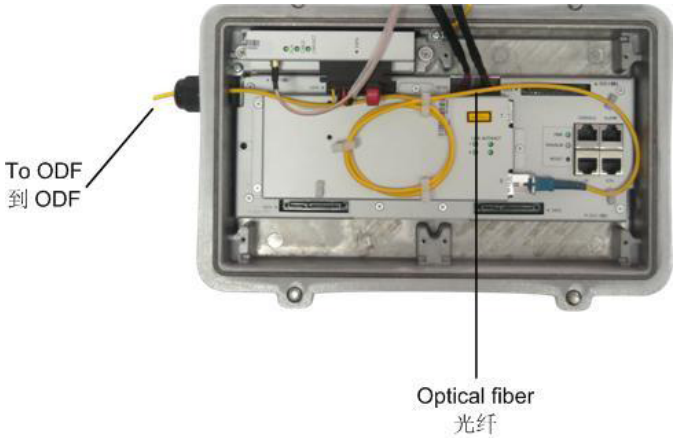
7.2 Routing Signal Cable 布放信号线缆

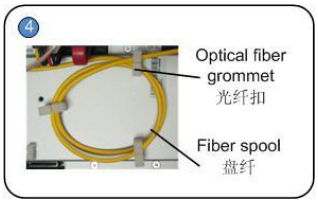
CAUTION

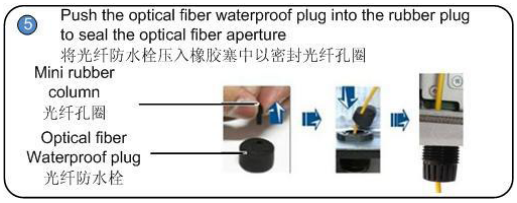
- Before routing cables, loosen the waterproof connector of the corresponding aperture. After routing cables is complete, fasten the waterproof connector to seal the aperture.
  布线前，需松开相应孔圈的防水连接器。布线完成后，需拧紧防水连接器密封接口。
- When handing optical fibers, do not stand close to, or look into the optical fiber outlet with unprotected eyes.
  进行光纤的安装、维护等各种操作时，严禁肉眼靠近或直视光纤接口。
- The bending radius of the optical fiber should be more than 20 times the optical fiber diameter. In general, the bending radius of the optical fiber is greater than or equal 40 mm.
  光纤的弯曲半径应大于20倍的光纤直径。一般情况下曲率半径不小于40mm。
- The optical fiber outside the chassis aperture should be protected by the fireproof PVC corrugated tube. To prevent the damage to the optical fiber, the mouth of the corrugated pipe must be wrapped with the adhesive tape.
  为防止损坏光纤，机箱外光纤必须套上防火PVC波纹管，并用胶带包裹波纹管口。
- You can decide based on the local standard and the customer requirements whether to perform the fiber splice operation. Only the qualified personnel are allowed to melt the optical fiber.
  根据当地标准和客户要求，决定是否实行光纤融接操作，仅专业人士才可融接光纤。

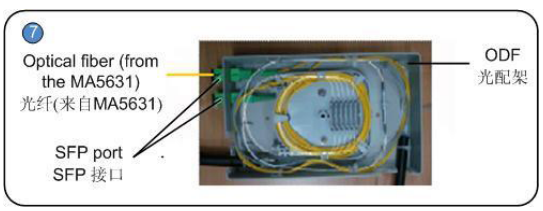


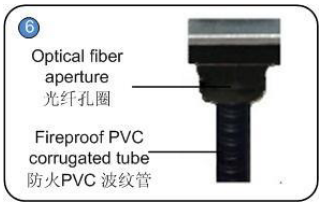












Checking the Installation 安装后检查

No. 序号	Description 检查内容	Method 检查方法
1	No any materials is placed on the chassis. 机箱上没有放置其他物品。	Observe 查看
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 resulting in a uniform appearance. 电缆绑扎间距均匀，松紧适度，线扣扎好后应将多余部分齐根剪掉，不留尖刺，扎扣朝同一个方向，保持整体整齐美观。	Observe 查看
3	The cross sectional areas of the power cable and the ground cable comply with the engineering design and meet the requirements of device running. 电源线、地线线径符合工程设计文件，满足设备配电要求。	Observe 查看
4	The power cable and the ground cable use an entire segment of copper core. The cable has no connection in the middle or scratch on the jacket. 电源线、地线应采用整段铜芯材料，中间不能有接头，外皮无损伤。	Observe 查看
5	The power cable and the ground cable must be routed horizontally and vertically without crossover. Proper margins must be reserved at the turning. 电源线、地线走线应平直，绑扎整齐，转弯处留合适余量。	Observe 查看
6	The power cable and the ground cable must be connected correctly and reliably. 电源线、地线连接正确可靠，接触良好。	Observe 查看
7	The identifiers on the power cable and ground cable must be correct, legible, and neat. 电源线、地线的标识正确、清晰、整齐。	Observe 查看
8	The power cable, ground cable, and signal cables must be routed separately. 电源线、地线与信号线分开布放。	Observe 查看
9	Signal cables must be of the correct length and must not be damaged or broken. There must not be any joints in the cable. 信号电缆必须有足够长度，不应有破损、断裂、中间接头。	Observe 查看
10	The connectors of the signal cables must be neat and intact. Each connector must be properly and firmly fastened. The tips must be connected securely. 信号电缆插头干净无损坏，插接正确可靠，芯线卡接牢固。	Observe 查看
11	Labels at both ends of the signal cables must be marked correctly, clearly and neatly. 信号电缆两端标识正确、清晰、整齐。	Observe 查看
12	If the optical fibers must be routed outside the cabinet, protection measures must be taken such as using corrugated pipes or guide troughs. 光纤在机柜外布放，须采取保护措施，如加波纹管或槽道等。	Observe 查看
13	Place the optical fiber pairs in order and bind them carefully with optical binders. No sharp edges are allowed. 成对光纤要理顺后用光纤绑扎带绑扎，且绑扎力度适宜，不能有扎痕。	Observe 查看
14	Place the RF cable in order before closing the cover, avoid the cover pining the RF cable. 合盖时应先理顺射频线，避免箱盖压住射频线。	Observe 查看

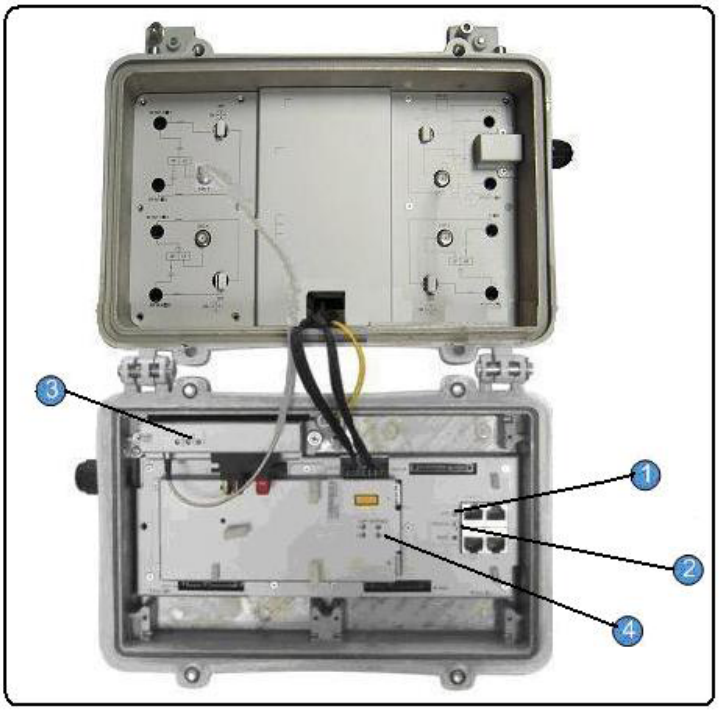
Powering On the System 上电检查

NOTE

Power on the device only when the input voltage is in the normal range.
输入电压在正常电压范围内，才可以进行设备的上电。

- Use the multimeter to test the AC input voltage. The voltage range for MA5631(220V) is from 100 V to 240V, and MA5631 (60V) is from 35 V to 85V.
  用万用表测量MA5631(交流220V)的供电交流输入电压值，电压正常范围为：100V ～240V。
  用万用表测量MA5631(交流60V)的供电交流输入电压值，电压正常范围为：35V ～85V。
- Status LED of the power supply Green: ON.
  电源状态指示灯正常状态：绿灯常亮。
- The board's running status LED Green: on for 1s and off for 1s repeatedly.
  单板运行状态指示灯正常状态：绿灯1s亮1s灭周期闪烁。
- Status LED of the fiber Green: ON.
  光口运行指示灯正常状态：绿灯常亮。

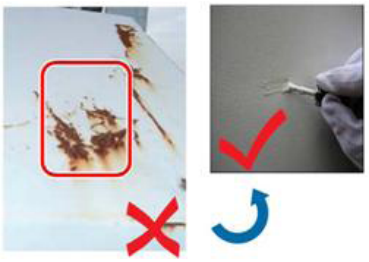
According to the label information in a product,input correct voitage value.If power plug drop when being used,you must open the product and connect to the power again based the information on the product label.
使用前必须依据产品内部标签上的信息，输入正确的电压。若在使用中，电源插头松脱，必须打开产品，依据产品内部标签上的信息重现接上电源。



FAQs for Installation 常见安装问题集锦

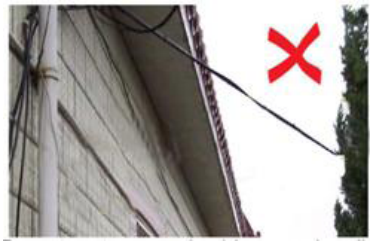
Keep of electromagnetic interface.
远离电磁干扰。

Use a dedicated lightning protection bar.
使用专业防雷插排。



Repaint the place that is collided.
磕碰处及时补漆。

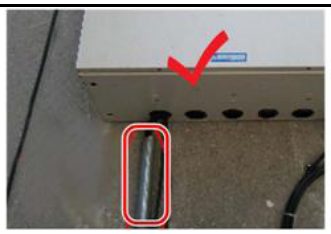
Signal cables should be routed separately from power cables.
信号线与电源线应分开布放。



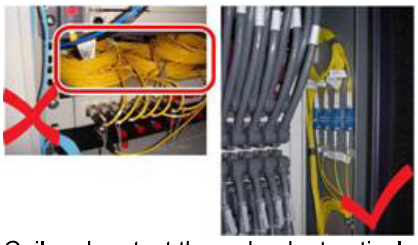
Do not route ground cables or subscriber cables into the room in the overhead mode.
禁止接地线、用户线架空入室。

Connect the ground cable to the grounding bar.
接地线应连接到接地排上。

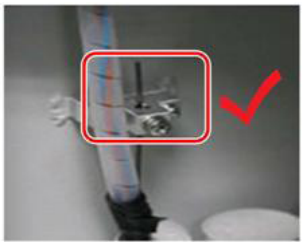
The paint on the grounding point should be removed to ensure proper grounding. After the cable is connected to the grounding point, the grounding point should be repainted.
为保证有效接地，接地点应将油漆擦除。完成接地后应及时补漆。



When routing cables out of the network cabinet, ground the outer jacket of the cable to the nearest grounding point on the network cabinet side, or use the metal tube that is grounded to route cables.
网络箱出线，在近网络箱端将线缆外层接地，或使用接地的金属套管走线。

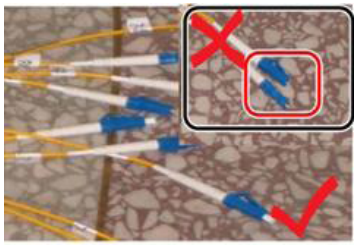


Coil and protect the redundant optical fiber in the fiber management tray, other fiber management parts, or the place convenient for operation.
多余的光纤应放入盘纤盒、可盘纤的器件或方便操作的地方进行保护。



Metal wires of optical cables should be grounded.
光缆金属线应进行接地处理。

Do not distort cables.
避免电缆扭曲。



The ends of the optical fiber that is not used should be protected with dustproof caps.
光纤未使用时应盖上光纤防尘帽。

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