FIK01 FTTR Fiber Installation Kit and Transparent Cable

Construction Guide

Issue 09

Date 2024-05-14

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Preface

General Safety Precautions

To ensure human and equipment safety, observe all the safety precautions marked on the equipment and provided in this document. The WARNING, CAUTION, and NOTE marks in this document do not cover all the safety precautions that must be followed; they only supplement general safety precautions as a whole. Huawei is not liable for any consequence that results from customers' violation of universal operation requirements or equipment design, manufacturing, and usage safety standards.

Local Laws and Regulations

When operating a device, obey local laws and regulations.

Personnel Requirements

Engineers that are responsible for installing and maintaining Huawei equipment must be trained, and have a thorough understanding of the proper operation methods and safety precautions.

Symbol Conventions

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

Symbol Conventions

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,

Symbol	Description
	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.

Human Safety

Do not look into the optical port without eye protection.

When drilling holes, take proper protection measures to avoid inhaling dust and prevent dust from hurting your eyes.

When working at heights, take proper measures to prevent objects from falling down.

Change History

Issue	Date	Description
09	2024-05-14	Updated FAQs.
08	2024-02-07	Added the procedures for installing cable clip with nail, self-adhesive cable clip, and external corner protector, and added the scenario of routing cables through a wall.
07	2023-06-01	Added precautions for transparent optical cables.
06	2023-05-29	Added the scenario where wall construction is not supported and optimized the construction specifications.
05	2023-05-16	Optimized construction specifications.
04	2023-04-20	Optimized the construction specifications and added the FAQ section.
03	2023-04-12	Add 5 other risks or precautions in construction.
02	2023-03-01	Modified the auxiliary tool for the internal and external corners to adhesive scrapper.
01	2022-12-30	This issue is the first official release.

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1 Installation Preparation

Material	Pictures	Overview
FIK		The fiber installation kit (FIK) is used to route invisible indoor optical cables. This tool is used with a 1.2 mm x 1.6 mm flat transparent drop cable. It heats the hot-melt adhesive on the surface of an optical cable, passes the optical cable through a guiding trough, and then sticks the optical cable on a wall, baseboard, or ceiling. The tool has a battery that lasts for a long time, and enables rapid and neat cable routing.
Transparent Optical Cable (pre-adhesive cable)		Optical cables with hot-melt adhesive can be rapidly deployed on applicable surfaces listed in Table 2-1When routing the optical cable at an external corner, you need to install a corner protector add described in 4.2 External Corner Cabling. After routing the optical cable, use adhesive or cable clips for reinforcement if necessary. For details, see5 Checking and Reinforcing after Cabling.

⚠ CAUTION

Do not leave the optical cable in a vehicle exposed to sunshine. The adhesive will melt at a temperature higher than 60 ℃ and cause optical cable adhesion so that construction is impossible.

1.1 Appearance and Structure

FIK Body

Battery Compartment (2 PCS)

Extension Rod (1 PCS)

1.2 Installation Tools and Accessories

Fiber Installation Kit Accessories

Adhesive scrapper (1 PCS)	Canvas handbag (1 PCS)
	

List of Construction Tools

Transparent optical cable/ATB installation tools				
External corner protector (14261567） 	Double-sided adhesive (corner protector) 	Wall-throughing cable supporter (14261567) 	Rubber heat insulation finger cot 	Duster 
FMC 	Measuring tape 	Scissors 	Ladder 	
Reinforcement tools				
Adhesive spreader 	Cable clip (14261567) 	Hot-melt glue tool and hot melt adhesive stick 	Single-sided waterproof tape 	
Splicing tools		**Acceptance tools**		
Splicing tool kit 	Splicing protection tube (60 mm length x 3 mm inner diameter hole) 	Optical power meter + light source 	Pen-style visual fault locator 	Fiber connector cleaner 

Table 1-1 Recommended purchase links for tools and auxiliary materials

Materials	Specification	Recommended Purchase Link
FWC01 Transparent Optical Cable Clip (14261567)	Transparent optical cable matching package supports ≤ 2x1.6mm transparent cables and can be fixed after routing. Each set includes: 1. Self-adhesive cable clip x 50 2. Cable clip with nail x 50 3. External corner cable supporter x 20 4. Wall-throughing cable supporter x 4	
Adhesive spreader	/	 Example link: https://detail.tmall.com/item.htm?spm=a230r.1.14.16.35723984uw4PkA&id=528896082110&ns=1&abbucket=6
Rubber heat insulation finger cot	/	Search for the product by keyword **finger cover** on Amazon.  Example link: https://amzn.eu/d/9f1QFKQ
Hot-melt glue tool and adhesive stick	Hot-melt glue tool power: 40 W Adhesive stick: 60 PCS, length: 150 mm, diameter: 7 mm	Search for the product by keyword **portable glue gun** on eBay or Amazon.  Example link: https://www.amazon.de/-/en/Bosch-Cordless-Lithium-Ion-Battery-1-5Ah/dp/B00SBN0NSW/ref=sr_1_1?crid=W4G0D3ACWO84&keywords=klebepistole+tragbar+mit+lithium-ionen&qid=1673405093&sprefix=portable+glue+gun+with+lithium-ion%2Caps%2C333&sr=8-1

Materials	Specification	Recommended Purchase Link
NOTICE If the height of an external corner of a special-shaped door frame or door frame is greater than 13.5 mm, the external corner protector (14261567) cannot be used. You are advised to use strong double-sided tape and single-sided waterproof tape instead.		
Single-sided waterproof tape (transparent)	Wholesale	Search for the product by keyword **transparent waterproof sealing tape** on eBay or Amazon.  Example link: https://www.amazon.com/Stripping-Silicone-Anti-Collision-Silicone-Transparent/dp/B0831R3KP3/ref=sr_1_17_sspa?crid=11TAOOC165CHK&keywords=Transparent%2Bwaterproof%2BSealing%2BTape&qid=1673403946&sprefix=transparent%2Bwaterproof%2Bsealing%2Btape%2Caps%2C832&sr=8-17-spons&spLa=ZW5jcnlwdGVkUXVhbGlmaWVyPUEyU1ZCT0RLRTBPV0FFJmVuY3J5cHRlZElkPUEwNjM1ODA2MjdLODVJQTNRMVdIUCZlbmNyeXB0ZWRBZElkPUEwMzg5NjkwM1Y4TVdFVDdaNU5PRiZ3aWRnZXROYW1lPXNwX210ZiZhY3Rpb249Y2xpY2tSZWRpcmVjdCZkb05vdExvZ0NsaWNrPXRydWU&th=1
Double-sided adhesive (transparent)	Width: 30 mm or above Thickness: 2 mm	Search for the product by keyword **nano double sided tape** on eBay or Amazon.  Example link: https://www.amazon.com/Multipurpose-Removable-Mounting-Transparent-Household/dp/B09QW86KMS/ref=sr_1_3?crid=2FA2K4CQH4CWV&keywords=Nano+Double+Sided+Tape&qid=1673404032&sprefix=nano+double+sided+tape%2Caps%2C846&sr=8-3

Transparent Optical Cable（Pre-adhesive Cable）

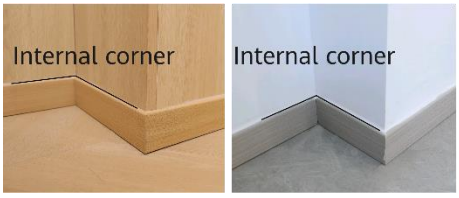
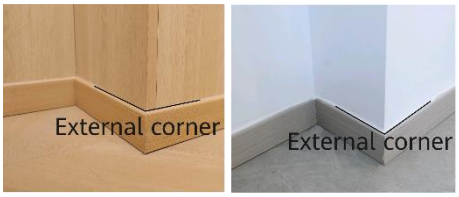
NOTICE

Optical cables with hot-melt adhesive can be rapidly deployed on applicable surfaces. When routing the optical cable at an external corner, you need to install a corner protector. After routing the optical cable, use adhesive or cable clips for reinforcement if necessary.

Table 1-2 Specifications of transparent optical cables

Optical Cable Type	BOM Number	Fiber Type	Bending Radius
1.2 mm x 1.6 mm transparent optical cable-B	14130ATC: Patch Cord / XC/UPC-SC/UPC,single,0.5m/10m/15m-G.657B3-GJXFN,1.2x1.6mm, transparent.	G.657 B3	≥ R 5 mm
	14130ATD: Patch Cord / XC/UPC-XC/UPC,single,10m/20m/30m/40m/50m-G.657B3-GJXFN, 1.2x1.6mm, transparent.		
	14130AVP: Patch Cord / SC/APC-SC/APC,single,10m/15m/20m/30m/40m/50m-G.657B3-GJXFN,1.2x1.6mm, transparent.		

1.3 Definitions of Common Terms

Term	Description	Example Image
Internal corner	A concave corner of a wall	
External corner	A convex corner of a wall	
Plane corner	Right-angle turning in the same plane	
Door gap	Gaps between door panels	
Door frame	A frame that fixed door panels on a wall	
Ceiling	Liner on the top of the interior of a room and bottom of the upper floor	

Term	Description	Example Image
Baseboard	It is a term used in decoration. As its name implies, a baseboard is the outline of a wall right above a floor.	 

2 Preparing for Cabling

2.1 Planning Fiber Routes

1. Based on the information box position, residence decoration, and user requirements, determine the cabling route (preferably the route along the baseboard, door frame, cabinet door, eave, and ceiling, avoid cracks and aging walls and places that need to be cleaned frequently). Ensure that the route is safe and concealed, and away from heat sources and potential hazards.
2. Select the cabling route in a corridor based on the actual scenario. The principle is as follows: Route cables in a straight line on baseboard.
3. Measure the distance between the FAT and the terminal box and select a transparent optical cable of an appropriate length.
4. Make sure path of the transparent cable follows the valid background or wall. Refer see Table 2-1

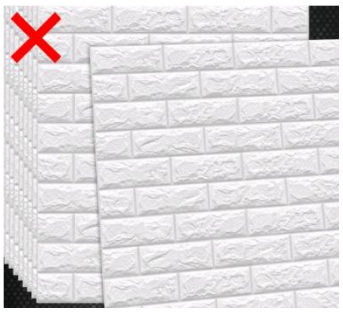
Table 2-1 Wall Surfaces Recommended for Construction

Scenario	Picture	Scenario	Picture
Latex paint		Marble seam	
Wooden wall		Diatom mud	
Wallpaper		Metal wall	

5. Construction is not allowed in the following scenarios due to insufficient surface adhesion or requirements on the bending radius of optical cables.

Table 2-2 Not allowed construction

Scenario	Description	Picture
Stone wall surface	Do not deploy the optical cable on a stone wall surface which is uneven and cannot attach the optical cable securely.	
Concrete wall surface	Do not deploy the optical cable on a concrete wall which is course and flaky and cannot attach the optical cable securely.	

Scenario	Description	Picture
Weak attaching scenario	If the surface is made of smooth materials such as glass cement, glass, and glazed marble, the hot melt adhesive cannot be attached to the background. Therefore, it is not recommended that the transparent optical cable be routed on such surfaces.	  
Flammable, non-temperature resistant, and soft surfaces	The temperature of the fiber installation kit (hot-melt adhesive tool) is high during working. If the surface is made of flammable or non-high-temperature-resistant materials, such as soft wallpaper (EPP material), or PVC resin wallpaper, the wall may be burnt or damaged. Therefore, you are not recommended to use the hot-melt adhesive tool on such surfaces.	 
Passing through the upper side of a multi-layer door frame	If there is no seam or space for routing the optical cable on the top of a door frame, do not route transparent optical cables there.	

Scenario	Description	Picture
Aluminum alloy door frame	An aluminum alloy door frame with a sliding door will definitely break the optical cable. Therefore, do not route transparent optical cables there.	
Dusty and low-adhesion surface	For dirty walls that cannot be cleaned, coarse diatom mud walls*, granular walls, and other walls with rough surfaces, hot melt adhesive may not be able to attach the optical cable. Therefore, do not route transparent optical cables there.	
Flaky wall surface	If a wall may become moist due to seasonal changes, the wall surface may flake off. Therefore, do not route transparent optical cables there.	 
Non-indoor scenario	Transparent optical cables cannot be routed outdoors, through pipes, or vertically.	

NOTICE

1. Considering the diversity of materials and techniques of home decoration, construction personnel need to further judge whether the construction can continue based on the actual state and adhesion effect of the construction surface.
2. If a scenario is not listed in Table 1 or Table 2, confirm with Huawei before performing the construction.

2.2 Cleaning the Cable Route

NOTICE

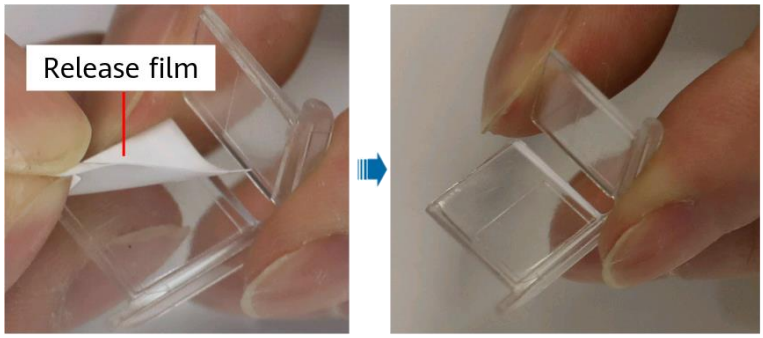
After cleaning a wall, you can touch the wall with your hands. If there is no dust on your hands, the wall is clean.

Step 1 Clean the indoor cabling route and remove the dust. It is recommended that dry rags and kitchen paper be used for cleaning.

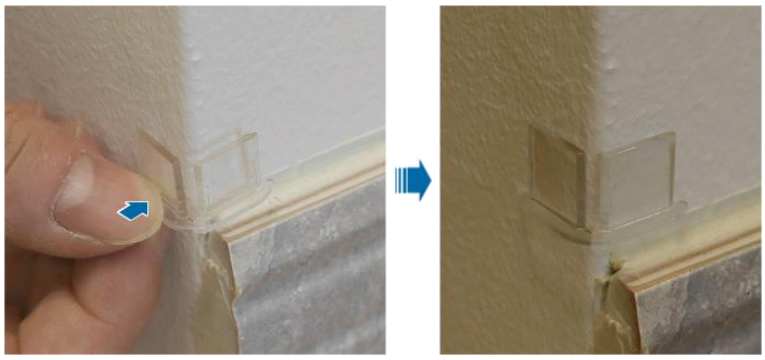
----End

2.3 Attach the External Corner Protector

Step 1 Remove the release film from the rear of the external corner protector.



Step 2 Attach an external corner protector at an external corner.



NOTICE

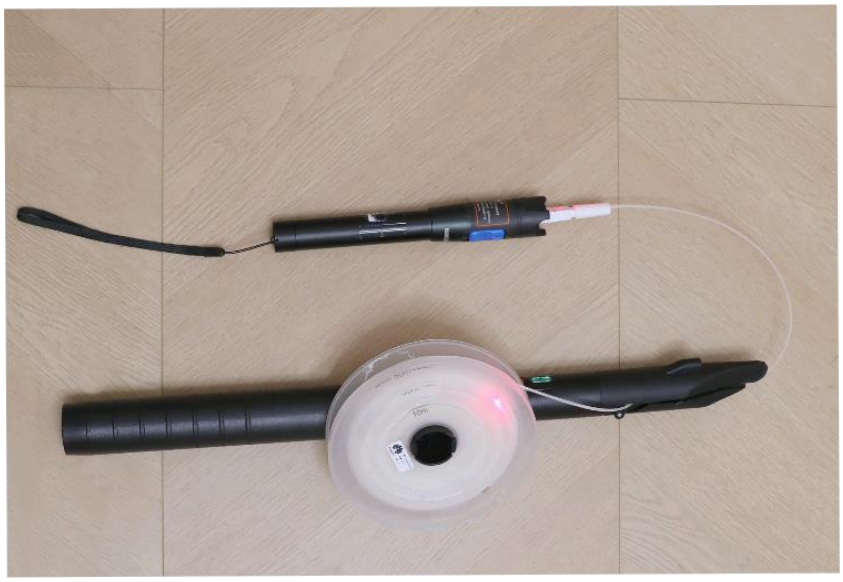
1. Scenarios where exposed corner protectors do not apply: the height of the door frame or exposed corner of the door frame is higher than 13.5 mm.

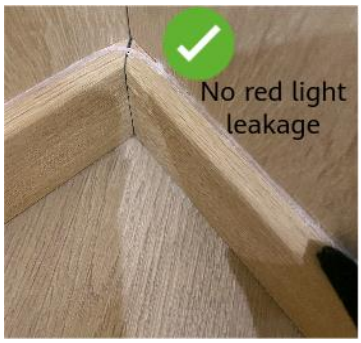
2. In scenarios where the external corner protectors do not fit, attach the strong double-sided tape (about 50 mm) to the bending point of the external corner and remove the release film of the double-sided adhesive.

----End

2.4 Installing an Optical Cable Drum to the Fiber Installation Kit

Step 1 Use a pen-style visual fault locator to monitor fiber cuts or overbending during cable routing.



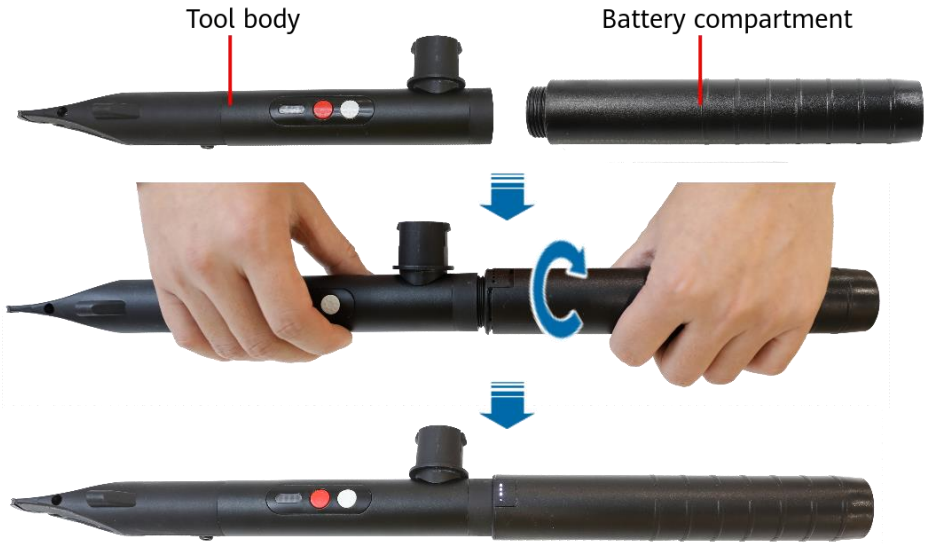
Typical Scenario	OK	Not OK
Internal corner		
External corner		
Plane corner		
Door gap		

NOTE

Make or splice a fiber connector at the initial routing point. If a fiber connector already exists, skip this step.

For details about how to install a field-mountable optical connector (FMC) on a 1.2 mm x 1.6 mm transparent optical cable, see the *14130AUR FTK01 & FMC2105-SU FTTR Fiber Termination Kit & Field Mountable Connector Quick Installation Guide 01*.

Step 2 Remove the plugs from the battery compartment and tool body, remove the protective cover from the heating head, and assemble the battery compartment to the fiber installation kit (FIK).

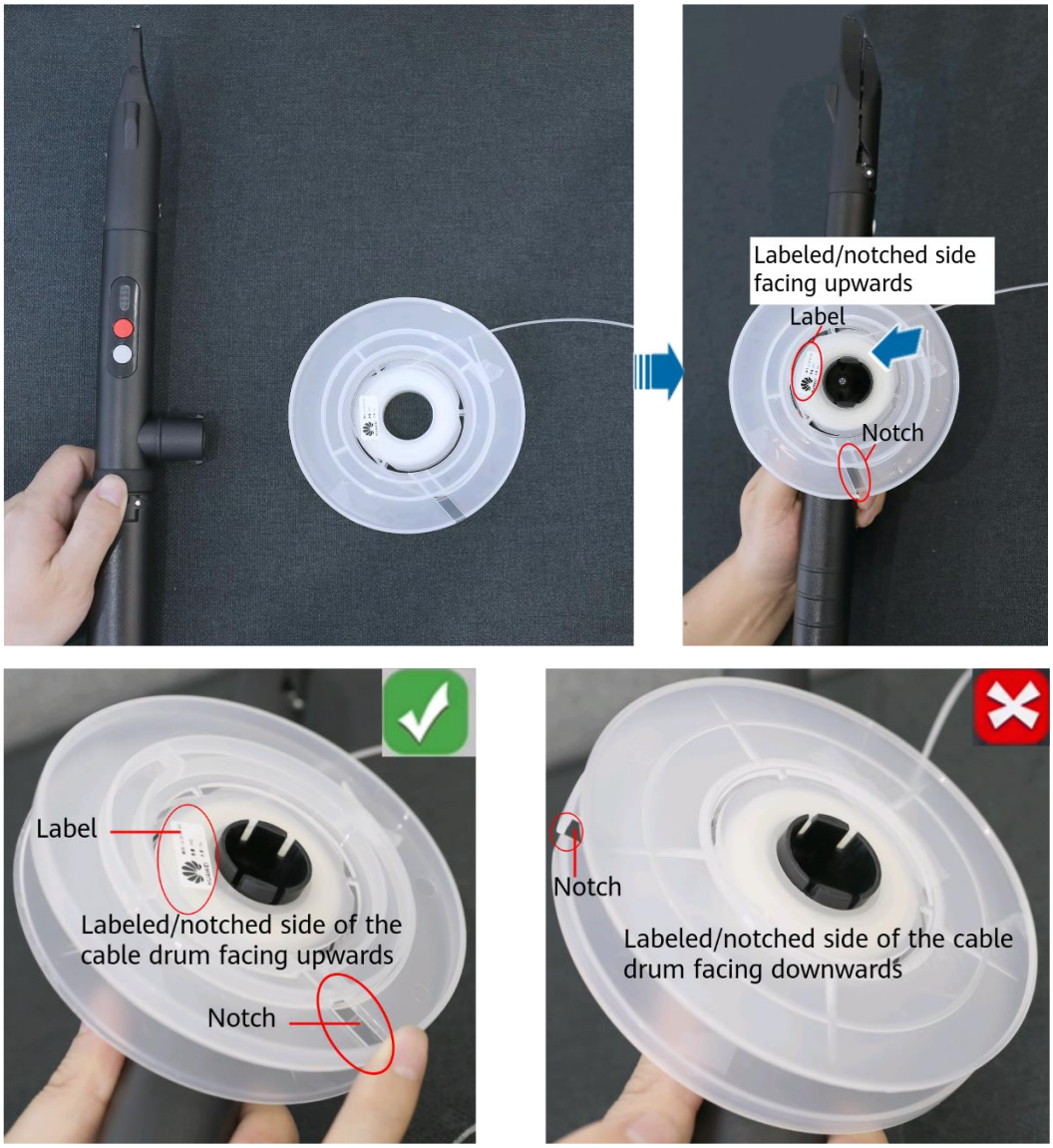


Input power	Maximum construction speed (m/min)
5 V/3 A (battery power supply); normal temperature recommended for construction: 15 ℃ to 35 ℃	1.3

NOTICE

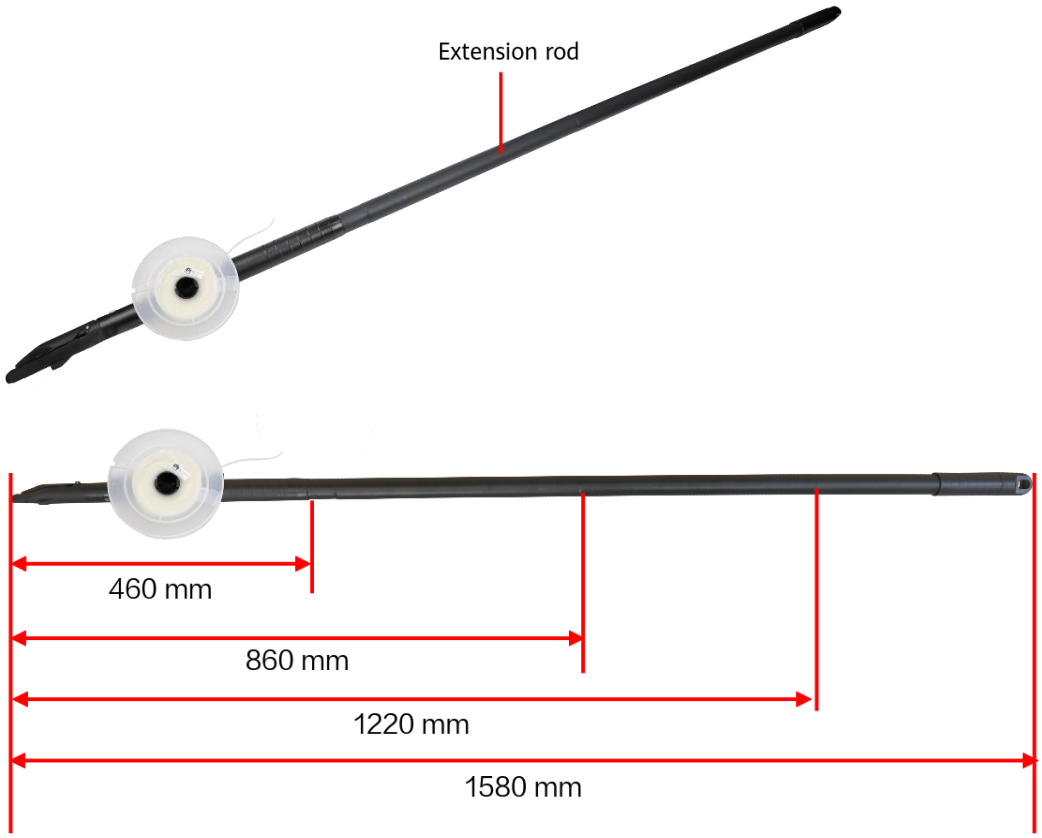
If the temperature of the construction wall is low, it is recommended that slow down the construction speed. The construction speed is based on the melting of hot melt adhesive and the transparent state of optical cables.

Step 3 Press the transparent optical cable drum downwards and clamp it onto the cable drum shaft of the FIK. Ensure that the labeled/notched side of the optical cable drum faces upwards.



No extension rod

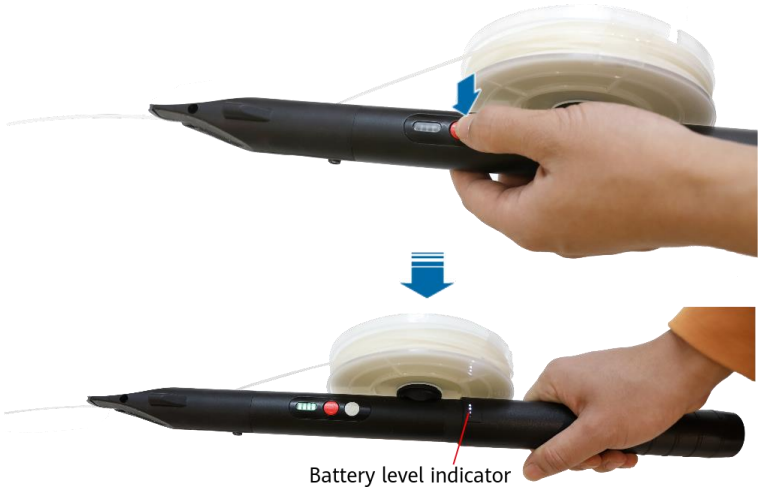
With an extension rod



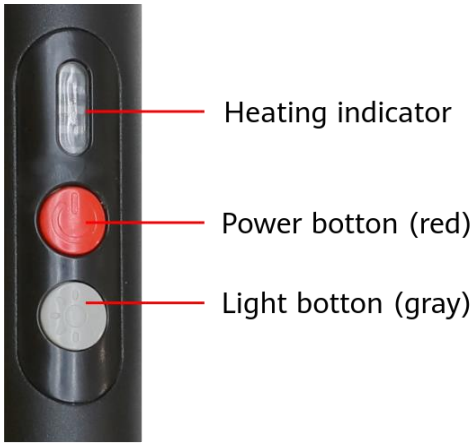
NOTE

The extension rod is used only in scenarios such as straight-line cabling on a ceiling.

Step 4 Press and hold down the red button for 3s. The tool starts heating, and the heating indicator blinks yellow. Wait until all four bars are steady green, and then starts cabling. It takes about 2 to 3 minutes for the heating indicator to turn from yellow to green. The heating process is as follows: one yellow bar, two yellow bars, three yellow bars, four yellow bars, and four green bars.

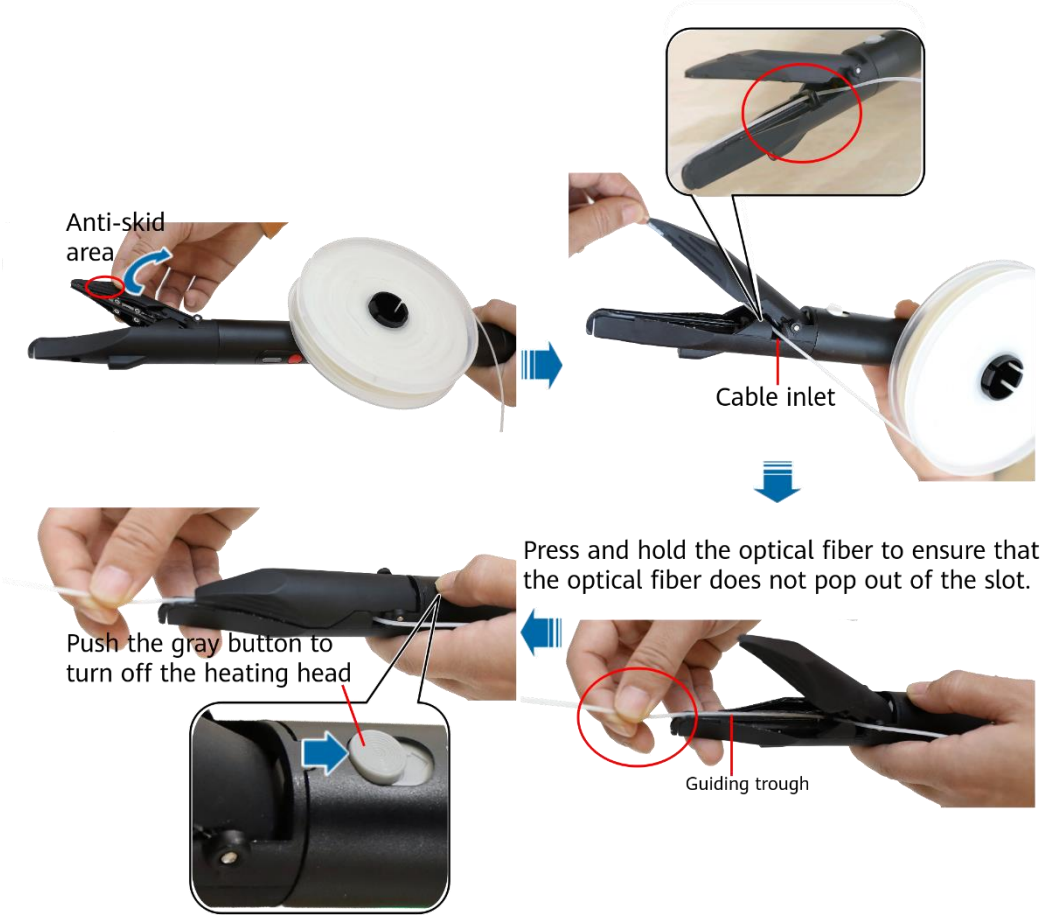


NOTE



- If the heating indicator is blinking yellow, the tool is heating.
- If the four heating bars are steady green, the tool has reached the rated temperature.
- If the battery level indicator blinks with one bar, the battery level is low.

Step 5 Pull the heating head assembly outwards to open the heating head. Lead the optical cable through the cable inlet and place it in the groove of the guiding trough. Push the gray button on the back of the FIK to close the heating head. Hold down the optical cable to ensure that the optical cable does not fall out and are not squeezed.



NOTICE

- The heating head can be opened to a maximum of 30 °. Do not open it to a too large angle.
- When closing the heating head, do not hurt your hands or break the optical cable.
- If the heating head cannot be opened due to residual adhesive after construction in the cooling state, it is recommended that you open the heating head by hand after heating it for 20s. Note that you should pinch your hand in the anti-skid area to avoid scalding.

----End

3 Starting Optical Cable Routing

Start routing the optical cable about 100 mm away from the device port. This distance is reserved to facilitate subsequent insertion and removal operations. When routing an optical cable, press the optical cable head to avoid loose contact. After the optical cable is routed for about 50 mm and securely attached, release the optical cable head. It is recommended that single-sided waterproof tape be used to secure the reserved length.

4 Cabling in Various Scenarios

CAUTION

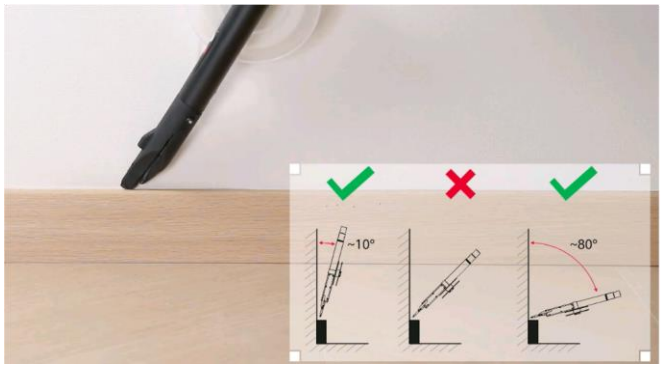
1. The installation and maintenance personnel should fully practice in the training and be familiar with the processes before onsite installation and maintenance.
2. During construction, use adhesive spreader and wear rubber heat insulation finger cot to prevent burns caused by accidental contact with the heating head or optical cable.

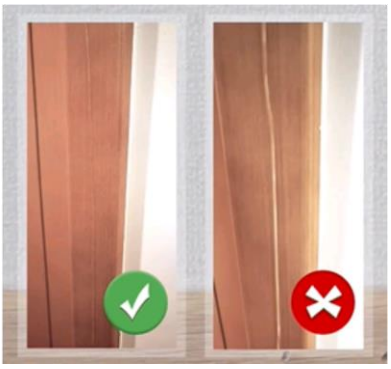
Rubber heat insulation finger cot

Adhesive spreader

4.1 Baseboard Cabling

During cable routing, it is recommended that the hot-melt adhesive tool be vertical to the attaching surface and the hot-melt adhesive of the optical cable be fully melted. The recommended cable routing speed is 1 m/min to ensure that the optical cable is closely attached to the baseboard or wall.





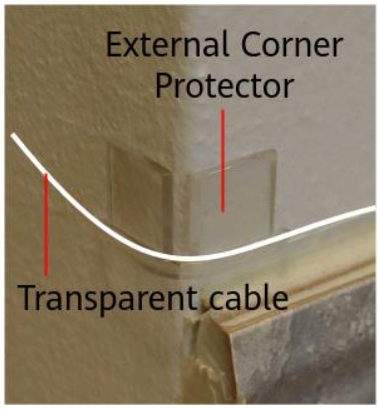
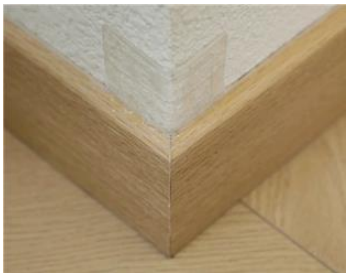
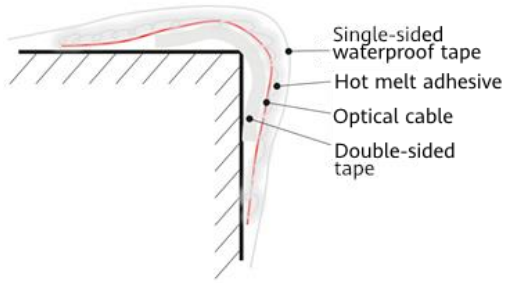
NOTICE

Note that a transparent optical cable cannot be routed in a crack in a wall.

4.2 External Corner Cabling

External corner

When routing cables at external corners, use the following method:

Option 1: External corner protector fixed (Preferred solution)	**Option 2: Two-layer adhesive tape (Suitable for scenarios where the external corner protector is not suitable)**
	 
External corner cornering protection	
Construction method: 1. Remove the release film from the rear of the external corner protector.	Construction method: 1. Attach the strong double-sided tape to the bending point of the external corner and remove the release film of the double-sided adhesive.

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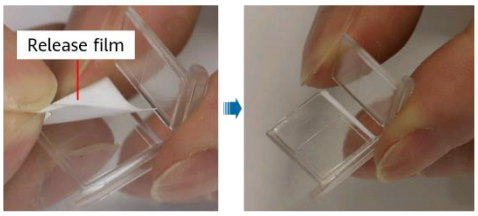
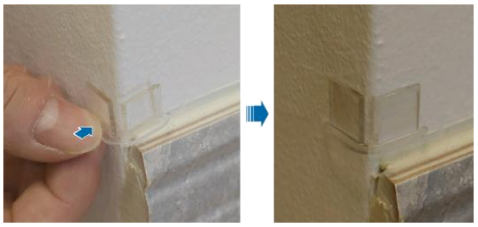
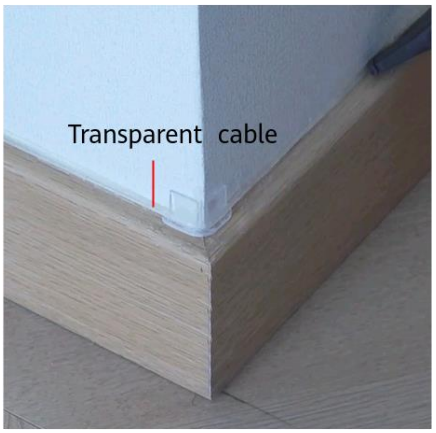


2. Attach an external corner protector at an external corner.

3. When the optical cable passes through, the external corner protector can ensure the bending radius of the optical cable meets the requirements.


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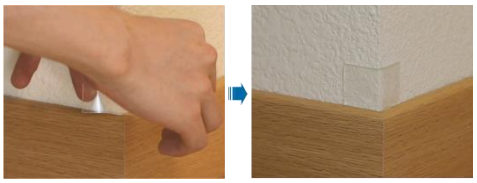
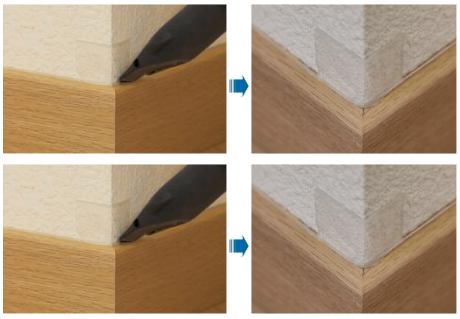
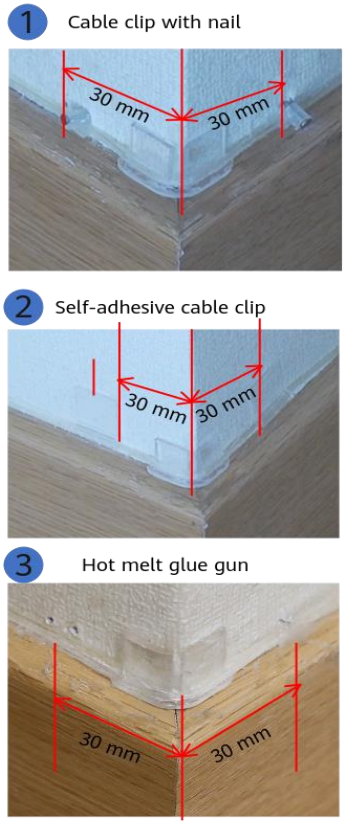

2. When the optical cable passes through, use strong double-sided tape to ensure the bending radius of the optical cable.

</td>
</tr>
<tr>
<td colspan="2">Reinforcement after cabling</td>
</tr>
<tr>
<td>After a cable is routed, attach self-adhesive cable clips/cable clip with nail or use a hot melt adhesive gun to dispense 30 mm away from both sides of an exposed corner protector for reinforcement.</td>
<td>After the cable is routed, attach self-adhesive cable clips/cable clip or use a hot melt adhesive gun to dispense adhesive by 30 mm on the corner protector on both sides the corner, and then use an adhesive spreader to spread the hot melt adhesive evenly.</td>
</tr>
</table>

<table>
<tr>
<td> 
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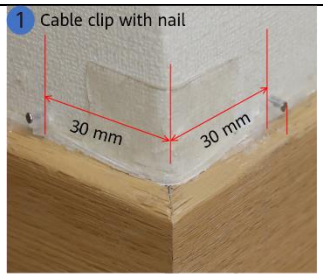
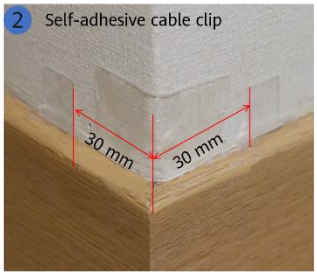
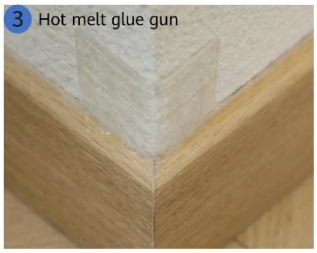
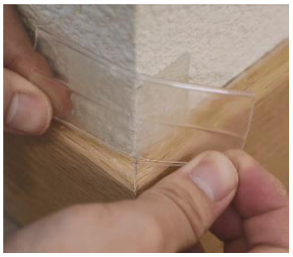
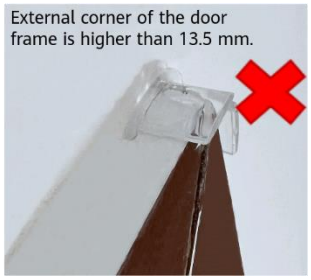
<td> 





After the reinforcement, use single-sided waterproof tape as a supplement.
 </td>
</tr>
<tr>
<td>Tools:
1. FTTR fiber installation kit
2. External corner protector
3. Cable clip
4. Hot-melt glue tool and adhesive stick
5. Adhesive spreader</td>
<td>Tools:
1. FTTR fiber installation kit
2. Strong double-sided tape (1–2 mm thick)
3. Single-sided waterproof tape
4. Hot-melt glue tool and adhesive stick
5. Cable clip
6. Adhesive spreader</td>
</tr>
<tr>
<td colspan="2">Remarks:
1. It is recommended that you fully communicate with the customer before the construction. If the optical cable is not reinforced with clips at corners, there is a high risk that the cable will fall off. Therefore, it is necessary to use transparent clip, nail clips, or transparent adhesive tape for reinforcement.
2. Scenarios where exposed corner protectors do not apply: the height of the door frame or exposed corner of the door frame is higher than 13.5 mm. In this case, you can choose another cabling method. Ensure that the bending radius of the optical cable meets the requirement.</td>
</tr>
</table>



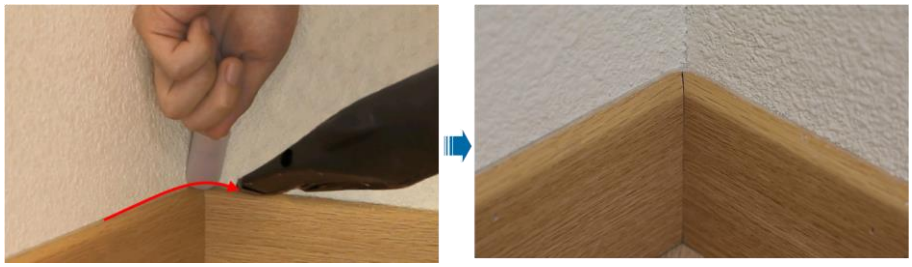
3. Self-adhesive clip application scope: wooden board, latex paint, wallpaper; nail clip application scope: wooden board, wallpaper.

4.3 Internal Corner Cabling

When routing cables at internal corners, use the following method:

Option 1: Cable clip with nail/self-adhesive cable clip fixing (Preferred solution)	**Option 2: Dispensing for fixing**
 	
Natural bending	
Construction method: When optical fibers pass through, use a finger (wear a finger cot) to press the corner to prevent the optical cables from being pulled by tools and detached from the wall. In addition, press the optical cable with your finger to make a proper bending	

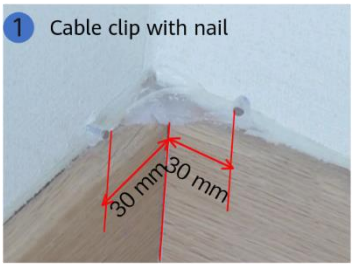
radius.

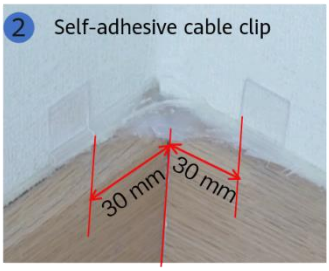


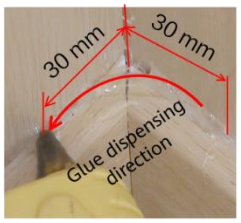
Reinforcement after cabling

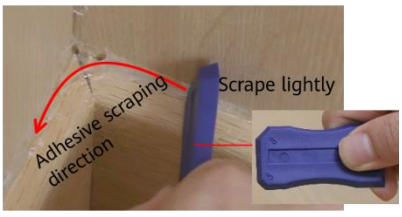
Tools:

After a cable is routed, attach self-adhesive cable clips/cable clip with nail or use a hot melt adhesive gun to dispense 30 mm away from both sides of an exposed corner protector for reinforcement.









1. FTTR fiber installation kit
2. Finger cot
3. Cable clip
4. Hot-melt glue tool and adhesive stick
5. Adhesive spreader

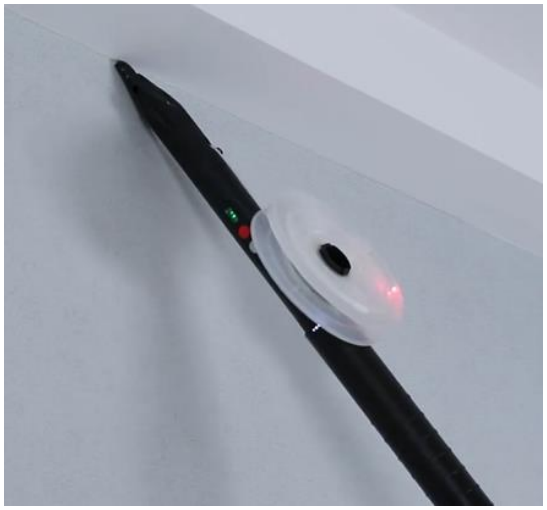
Remarks:

1. It is recommended that you fully communicate with the customer before the construction. If the optical cable is not reinforced with clips at corners, there is a high risk that the cable will fall off. Therefore, it is necessary to use transparent clip, nail clips, or transparent adhesive tape for reinforcement.
2. Self-adhesive clip application scope: wooden board, latex paint, wallpaper; nail clip application scope: wooden board, wallpaper.

4.4 Cabling on the Ceiling

1. Prepare a ladder before routing a cable on a ceiling. When routing a cable at an internal or external corner, you also need to use a ladder to attach a corner protector. For details, see the descriptions in external and internal cabling sections.

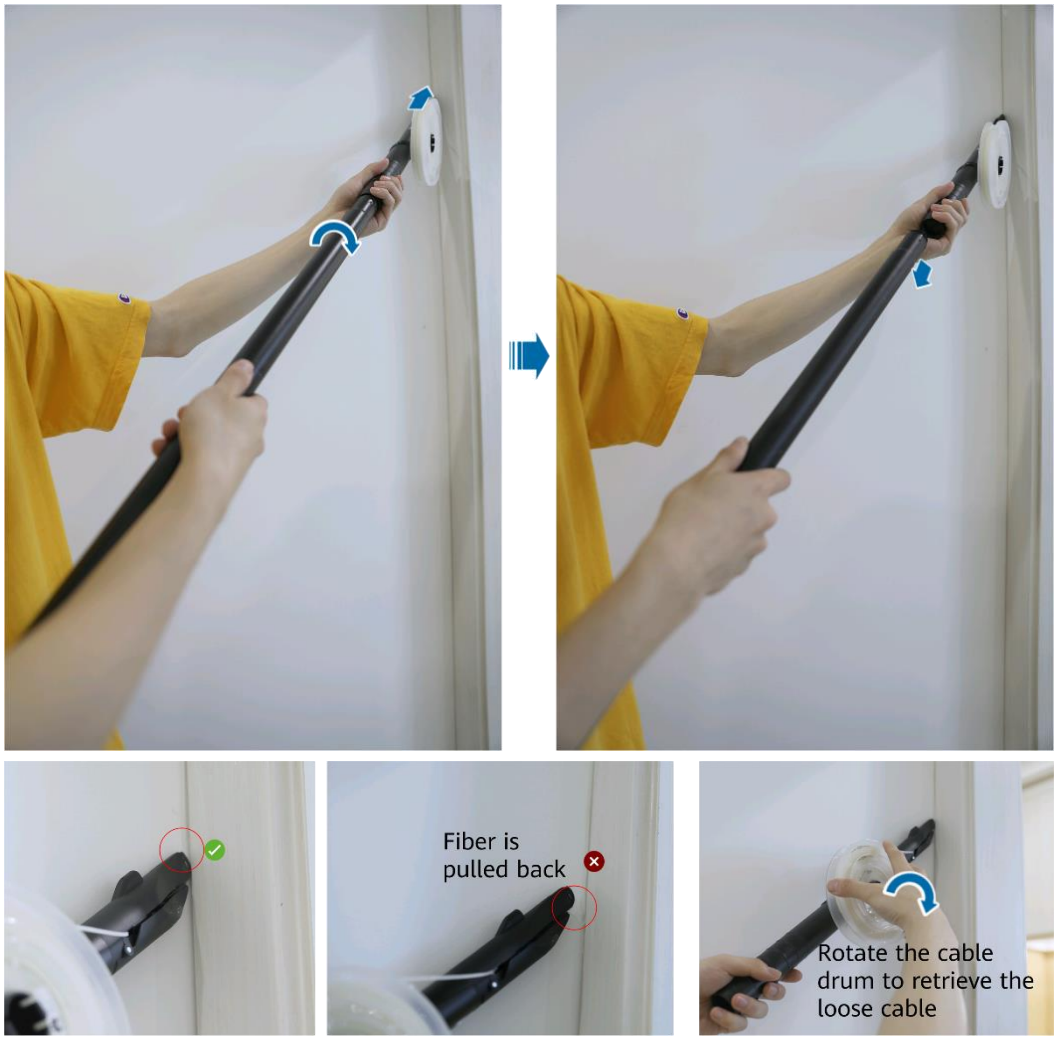
2. When routing a cable along a long straight section, you can use the extension rod to speed up the cabling.



3. Method for installing the extension rod: Install the extension rod on a ladder after cabling at an internal or external corner is complete on the ceiling. Hold the upper part of the extension rod against the ceiling and install the lower part to avoid pulling back the optical cable. After installing the extension rod, check that the optical cable is not pulled

back. If the optical cable is pulled back and becomes loose, wind it on the cable drum and route it again.

4. Method for removing the extension rod: If the optical cable can be routed without a ladder and extension rod, remove the extension rod on the floor. After removing the extension rod, check that the optical cable is not pulled back. If the optical cable is pulled back and becomes loose, wind it on the cable drum and route it again.



5. Two persons need to work together to route an optical cable on a ceiling.

NOTICE

When routing a cable on the ceiling, attach external corne protector strong double-sided tape (corner protector) to the external corners along the cabling path in advance.

4.5 Cable Routing on a Door Frame

Route a cable along a door frame in the same way as routing a cable at an internal or external corner. Use a ladder if necessary when routing the cable along the top of a door frame.

4.6 Door Gap Cabling

The following conditions must be met for door gap cabling:

- The gap between the lower edge of the door and the floor is greater than 3 mm, and the gap in the axial direction of the door is also greater than 3 mm.
- There is no door threshold.
- The floor is level.
- An optical cable cannot be routed into a room from the top of the door.
- This routing mode does not apply to seamless sliding doors.

Step 1 When the transparent optical cable needs to pass through a door gap, remove it from the FIK and remove the cable drum from the cable spool shaft.

Step 2 Route the transparent optical cable through the door gap.

Step 3 Reinstall the cable drum back to the cable spool shaft, secure the transparent optical cable to the heating head of the FIK, and continue to route the optical cable.

NOTE

- If you do not route the cable through a door gap, the cabling operation is as follows:

Outdoor

Indoor

- Based on onsite conditions, you can attach double-sided tape before cabling to ensure a proper bending radius for the optical cable.
- Ensure that the cable is close to the ground to prevent fibers from being broken when the door is opened or closed.

Step 4 After the cable is routed, use a hot-melt glue tool to dispense adhesive along the routing path based on the actual situation, and then use an adhesive spreader to spread the hot melt adhesive evenly.

NOTE

If you do not route the cable through a door gap, the adhesive dispensing operation is as follows:

Step 5 Check the route. Open and close the door to verify that the optical cable is not squeezed after cable routing. If the optical cable is squeezed, adjust the cable route.

----End

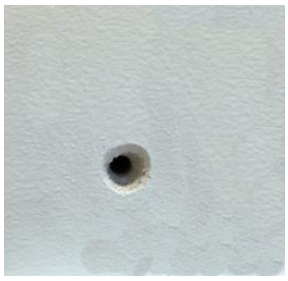
NOTE

- If the two sides of the door gap are right angles (non-continuous internal or external corners), route the cables in the same way as routing cables at external corners.
- If possible, cover the cable with glass adhesive or single-sided waterproof tape to prevent the cable from being damaged by external forces during routine cleaning and sweeping.

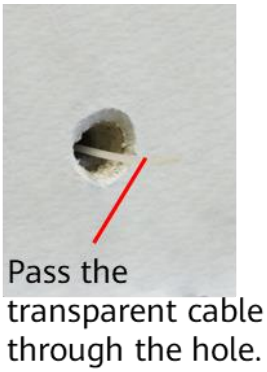
4.7 Routing Optical Cables Through a Wall

Step 1 Drill a hole with an inner diameter of 8–15 mm.

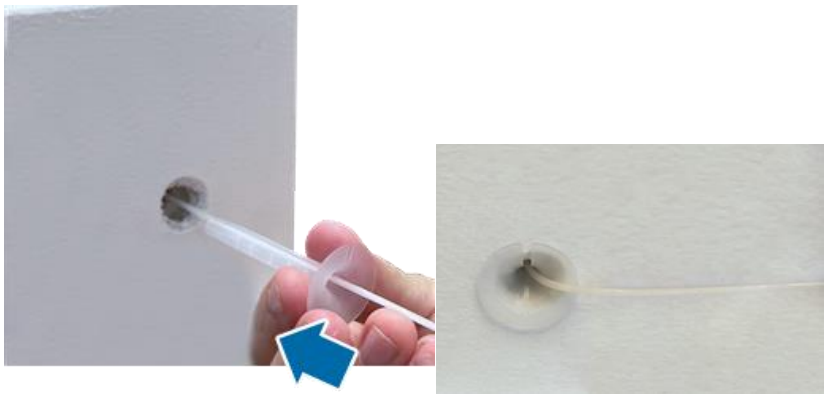
Step 2 Ream the outer diameter of the hole to about 20 mm.



Step 3 Pass the transparent cable through the hole.



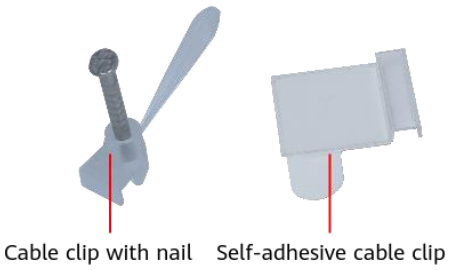
Step 4 Put the wall-throughing cable supporter onto the transparent cable, and push the clip into the hole.

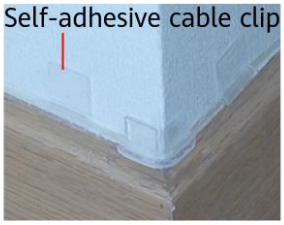
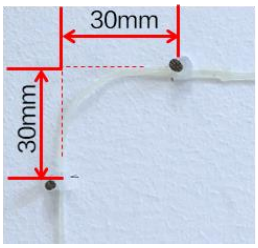
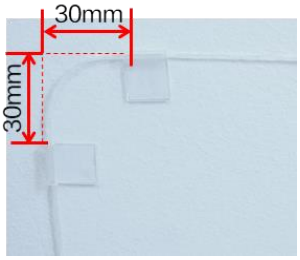
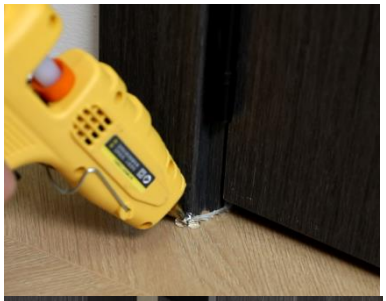
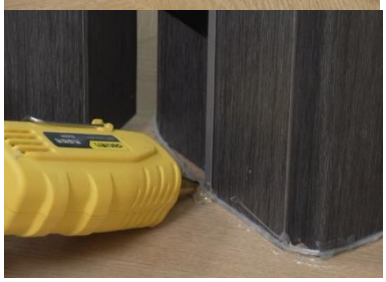


----End

5 Checking and Reinforcing after Cabling

Check the entire cable route, and use the hot-melt glue tool or cable clip to reinforce the cable at corners and other parts where the cable does not stick reliably. Cable clips are preferred to adhesive.

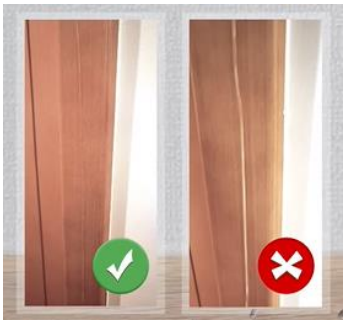
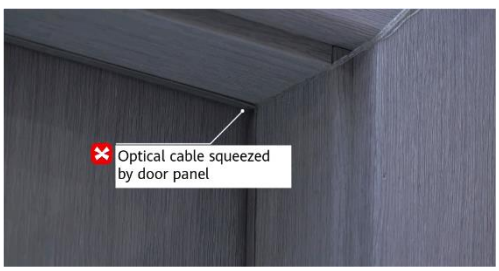
Option 1: Cable clips for reinforcement (preferred solution)	**Option 2: Hot-melt glue tool and adhesive stick (Applicable to scenarios where cable clips are not applicable)**
	
Construction Procedure: 1. Find the parts not securely attached, such as the internal and external corners, straight sections, start and end sections, and sections where the optical cable is off the surface. 2. Use nail clips or self-adhesive clips to secure the cables.	1. Find the parts not securely attached, such as the internal and external corners, plane corners, straight sections where the adhesive is not fully melted, start and end sections, and sections where the optical cable is off the surface. 2. Use a hot-melt glue tool to dispense adhesive, and then use an adhesive spreader to spread the hot melt adhesive evenly. 3. Check whether the hot melt adhesive completely covers the optical cable.
Pictures after clip reinforcement	Pictures after glue reinforcement
Cable clip fixing at an external corner	Adhesive dispensing at an external corner

 	
Cable clip fixing at an internal corner	Adhesive dispensing at an internal corner
 	
Cable clip fixing at a plane corner	Adhesive dispensing at a plane corner
 	
Cable clip fixing at a straight section	Dispense glue at the door gap
 	 

	The hot melt adhesive is not fully melted due to fast cabling. Adhesive dispensing is required for reinforcement.  
1. Nail clip application scope: wooden board, and wallpaper 2. Self-adhesive clip application scope: wooden board, latex paint, and wallpap 3. The scenarios include but are not limited to the following: The optical cable is not securely attached because the hot-melt adhesive is not fully melted. The optical cable is not securely attached when being routed using the extension rod. The optical cable is not securely attached because the cabling path is not thoroughly cleaned. In these scenarios, you need to reinforce the optical cable using adhesive or cable clips.	

6 Acceptance after Optical Cable Construction

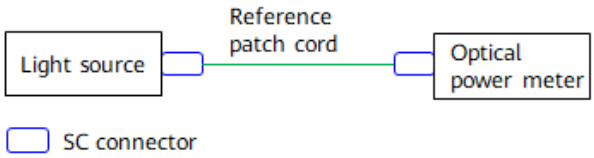
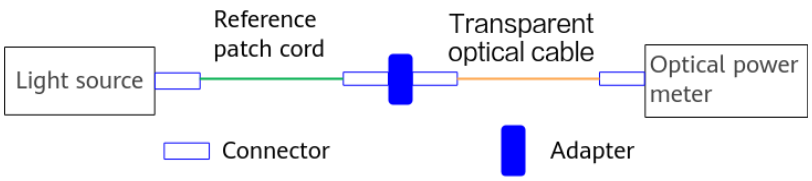
Step 1 Check whether the attachment is reliable and secure.

Acceptance Method	Check whether the optical cable is securely attached.
Objective	Verify that optical cables are securely attached to walls after construction. Check the moving parts, such as door frames, for fiber interference or clamping.
Acceptance Criteria	The optical cable is transparent, the adhesive is melted, and optical cables are securely attached to walls. Optical fibers are not interfered or clamped during the whole process between opening and closing the door frame.  
Test Result	
Result (Pass/Failed)	

Step 2 Check whether the red light leaks on the cabling path.

Acceptance Method	Check the entire optical cabling path, especially the red light leakage at corners.
Objective	Verify that optical cables are not twisted or over bent after the construction.
Acceptance Criteria	There is no red light leakage along the cabling path. 
Test Result	
Result (Pass/Failed)	

Step 3 Check whether the optical power on an optical cable is normal after construction.

Acceptance Method	Turn on the optical power meter, connect the optical power meter to the light source using a reference patch cord, and set the same working wavelength for them. Check whether the optical power is normal and reset the meter.  Connect the optical power meter to the light source using the transparent optical cable to be tested and corresponding adapter to check whether the optical attenuation is less than 1 dB. Test schematic diagram of transparent optical cable. 
Objective	Verify that the optical power is normal after construction.
Acceptance Criteria	The optical power displayed on the optical power meter is less than 1 dB.
Test Result	
Result (Pass/Failed)	

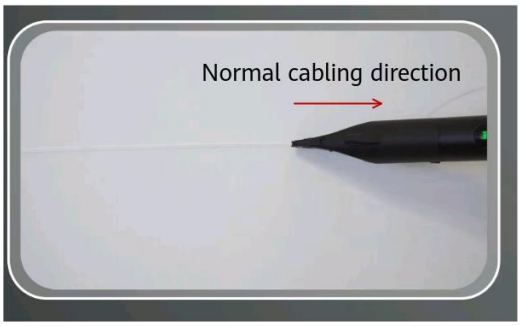
Step 4 After the results of all acceptance items are Pass, output an acceptance report and conclusion onsite.

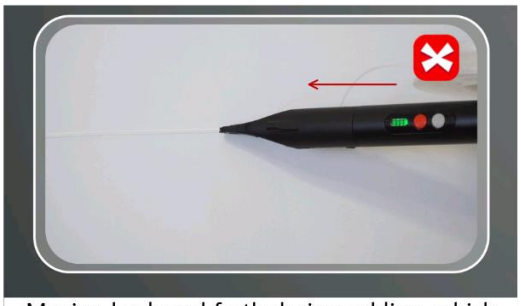
----End

7 Other Risks or Precautions

Other Risks or Precautions

1. Route the optical fiber in only one direction (do not move the FIK back and forth).





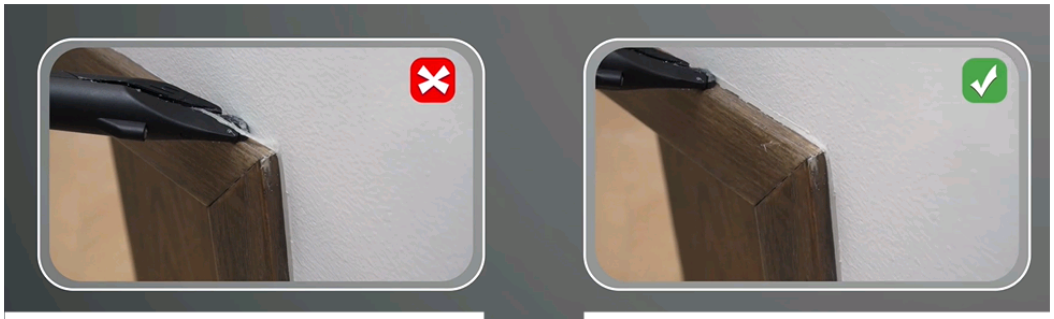
Moving back and forth during cabling, which may break the optical cable and affect usage

2. Route a cable at an even speed. If the cabling speed is too fast, the optical cable may not be securely attached. If the cabling speed is too slow, the adhesive may melt too much and drop off the optical cable. The specific speed depends on the wall surface. Ensure that the hot melt adhesive is fully melted.

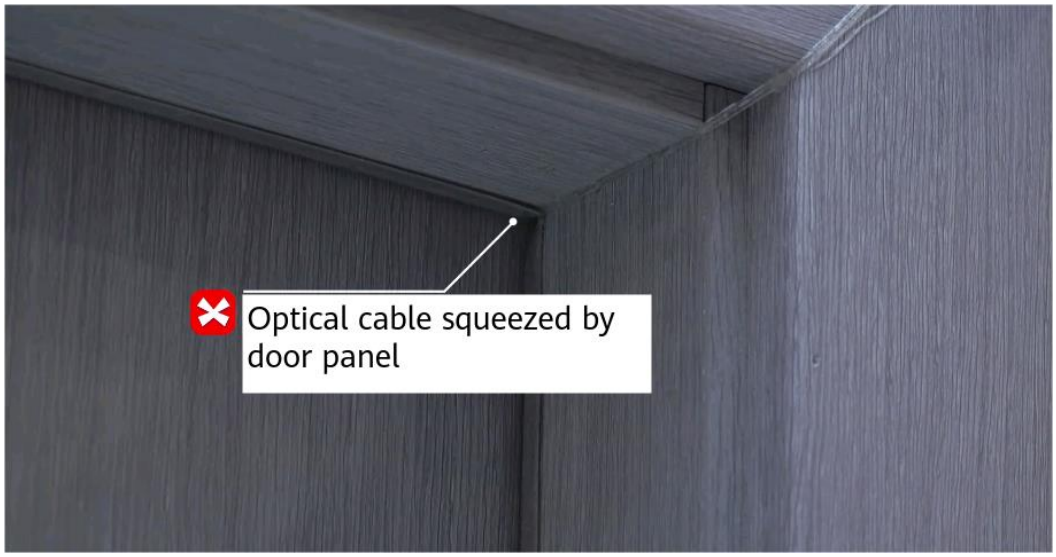
Cabling too fast, adhesive not fully melted

3. During cabling, do not press the optical fiber hard with the FIK head; otherwise, the optical fiber may be broken.
4. During the construction, ensure that the speed is even and the bending radius at the internal and external corners is greater than or equal to the minimum bending radius of the corresponding optical cable.

5. If the optical cable is separated from the heating slot, stop the construction immediately. Before you continue to lay out the optical cable, open the heating head and place the cable into the groove of the heating head.

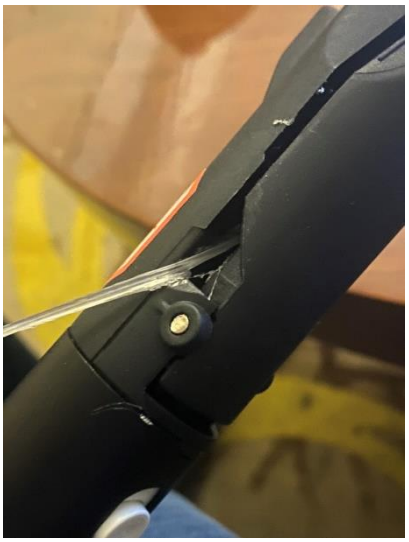


6. Do not route a cable from the top of the door frame. Otherwise, the cable may be squeezed.

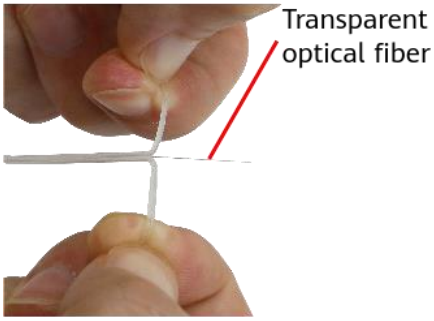


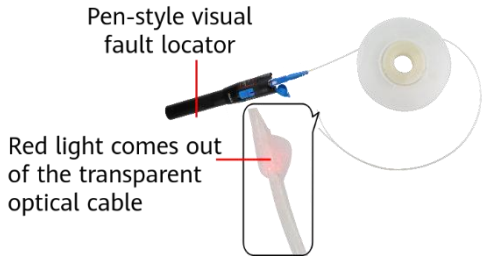
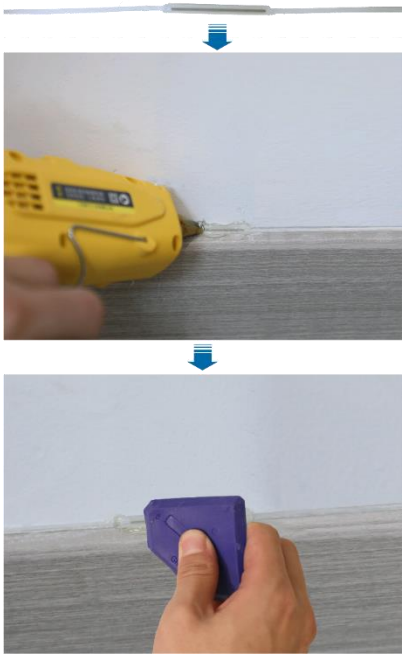
7. Do not bump the front end of the heating head. Do not perform construction in scenarios where cable routing is allowed. Do not press the front end of the heating head with excessive force during construction.

8. If the resistance is large when the optical cable is pulled (especially in the rollback scenario), stop the construction immediately and check whether the optical cable is attached to the melted adhesive at the cable inlet of the FIK and on the cable drum. In this case, separate the optical cable from the residual adhesive in a timely manner to ensure that the optical cable can be pulled smoothly.

9. The temperature of the heating head at the front end of the tool is about 155 ℃. Some wallpapers may be scalded with dents. Therefore, in scenarios with risks such as plastic wallpapers or other materials that are not heat-resistant, route the cable at invisible positions first, and consult the customer's opinion about the result. If the customer agrees, continue with the cable routing.
10. If the cabling route is blocked by large furniture, or the gap between the furniture and the wall is too narrow to use the tool for cabling, you need to remove the optical cable from the tool, route it without the tool, and secure it using a hot-melt glue tool or single-sided waterproof tape.
11. If cable routing fails, for example, a fiber cut occurs, cut off the optical cable in place and redeploy a new optical cable. If a fiber cut occurs near the end of the construction, splicing is recommended in a place that does not affect the appearance of the fiber. In this case, reserve 30–40 cm of optical cable for splicing, and use the hot-melt glue tool to attach the splice protection sleeve to the baseboard. The procedure is as follows:

To repair a fiber cut, perform the following steps:	
1. Use a tool such as diagonal pliers to cut the optical cable at the fiber cut point along the middle.	2. Strip the optical cable from the middle to expose the transparent fiber.
	
3. If you cannot find the fiber after stripping	4. After splicing the fibers, attach the splice

To repair a fiber cut, perform the following steps:	
the optical cable, use a pen-style visual fault locator to locate the fiber.	protection sleeve to the baseboard. Use a hot-melt glue tool to dispense adhesive to cover the splice protection sleeve, and use an adhesive spreader to make the adhesive evenly distributed.
	

12. Construction is not allowed or not recommended in the following scenarios due to insufficient surface adhesion or requirements on the bending radius of optical cables. For details, see Table 2-2.

8 FAQs

8.1 Maintenance FAQs

8.1.1 Optical Cable Falling Off

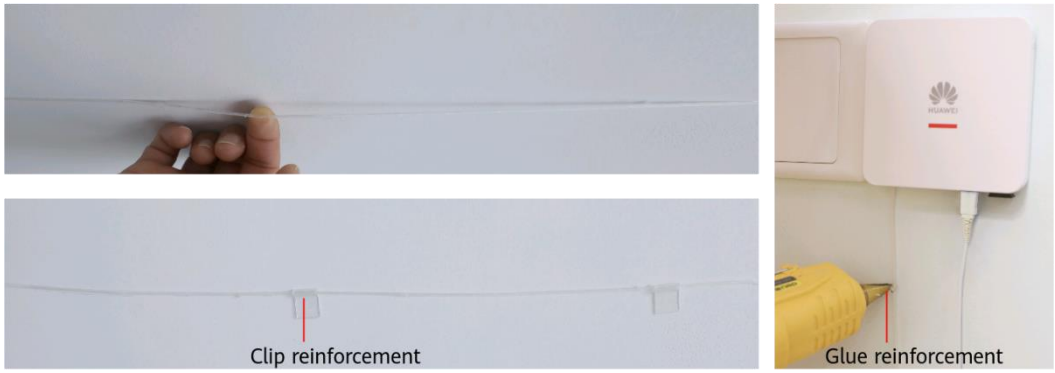
Possible Causes

The base materials of the cabling wall may not meet the requirements. The wall surface is damp or the base materials are easy to flake off.

Handling Process

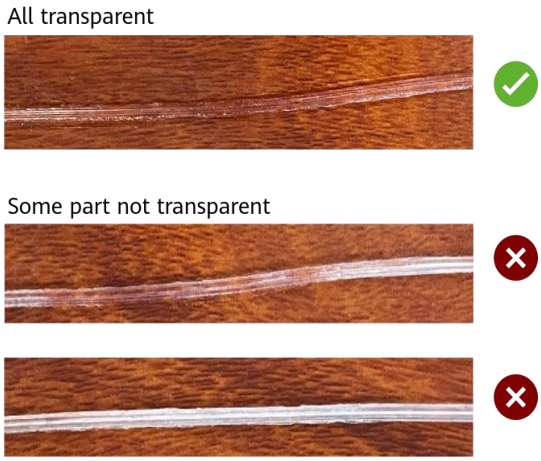
If the bonding surface is aged or damp, you are advised to reinforce the entire section or replace the entire section with an optical cable that has hot-melt adhesive.

If some parts fall off due to cabling or environment reasons, it is recommended that you use cable clips or hot-melt adhesive gun to dispense adhesive for reinforcement.



8.1.2 Checking the Construction Effect

1. Ensure that the optical cable is transparent throughout the process.



2. Ensure that optical cables at internal and external corners (especially external corners) are properly attached, and are not suspended or detached.
3. Ensure that the optical power attenuation after cable routing does not exceed 1 dB.

8.1.3 Routed Transparent Optical Cable Has White Lines or Poor Adhesion

Possible Causes

- The heating temperature of the hot-melt adhesive tool does not reach the preset temperature (170 ℃ for 1.2 x 1.6 mm optical cables).
- The optical cable is routed too fast. As a result, the hot-melt adhesive on the transparent optical cable is not completely melted.
- The base material of the cabling wall does not meet the requirements. The wall surface is damp or the base material is easy to fall off.

Handling Process

1. Check whether the hot-melt adhesive tool LCD displays the correct temperature.
2. The cabling speed should not be too fast. Ensure that the glue is fully heated and melted and the optical cable is transparent after construction. The cabling speed should be about 1 m/min.
3. Ensure that the cabling path is clean and tidy. Do not route a cable on damp walls or walls where latex paint easily falls off. The cable routing will intensify the peeling of latex paint.

8.2 Construction FAQs

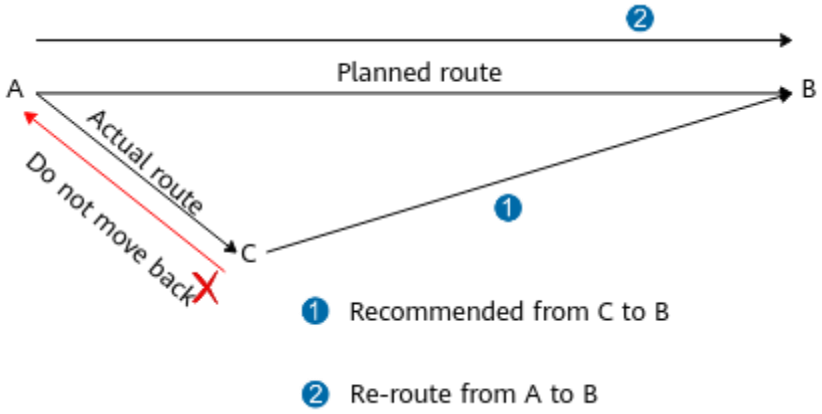
8.2.1 Incorrect Cabling Route

Possible Causes

The route survey is not performed before the construction.

Handling Process

Route the cable again or continue to route the cable forward. Moving back is not allowed.



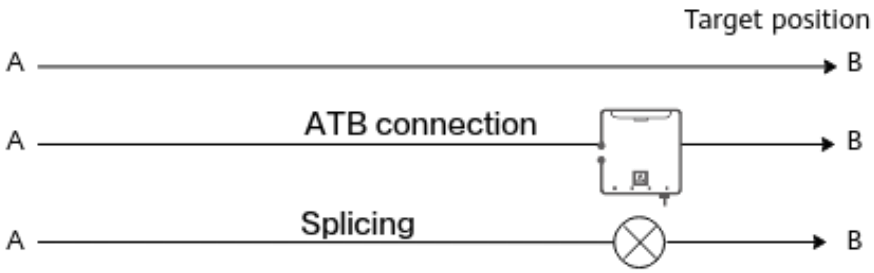
8.2.2 Transparent Optical Cable Too Short

Possible Causes

The cabling route length is not measured in advance or the cabling route length is not accurate when transparent optical cables are selected.

Handling Process

Use ATBs or splicing for extension or lay a new transparent optical cable from the beginning.



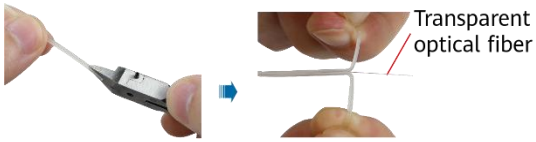
8.2.3 Transparent Optical Cable Breaks During Cabling

Possible Causes

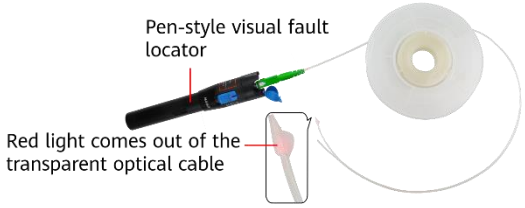
- During the routing, the optical cable is folded or broken, or the optical cable is pulled with excessive force.
- The hot-melt adhesive tool heats the same part of the optical cable for a long time.

Handling Process

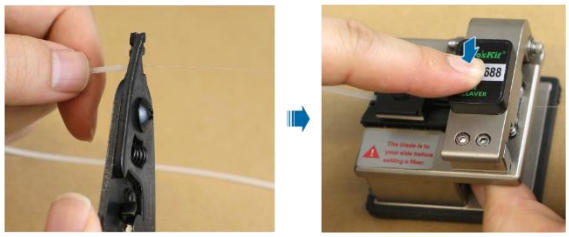
1. Perform construction according to the standard procedure and minimize cable pulling. In addition, do not keep the hot-melt adhesive tool heating the same position for more than 1 minute. If the construction is suspended for more than 1 minute, remove the transparent optical cable from the heating head or turn off the power supply of the hot-melt adhesive tool.
2. If the fiber cut occurs near the end of the construction or in a hidden position such as a corner of a wall, splicing is recommended.
   a. Use a tool such as diagonal pliers to cut the optical cable at the fiber cut point along the middle. Strip the optical cable from the middle to expose the transparent fiber



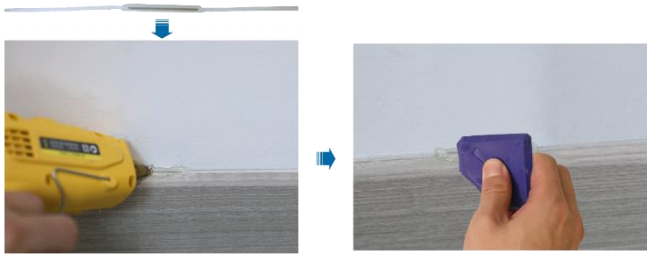
   b. If you cannot find the fiber after stripping the optical cable, use a pen-style visual fault locator to locate the fiber.



   c. Strip off the coating of the bare fibers, clean the stripped fibers, cut the fibers for a fixed-length, and splice the fibers.



   d. After splicing the fibers, attach the splice protection sleeve to the baseboard. Use a hot-melt glue tool to dispense adhesive to cover the splice protection sleeve, and use an adhesive spreader to make the adhesive evenly distributed.



3. If the fiber cut occurs near the start of the construction or in the positions such as ceilings that are not easy to splicing, cut off the broken transparent optical cable from the break point and do not lay out the subsequent optical cable. Discard the routed transparent optical cable and keep it at the original position.
4. Lay a new transparent optical cable from the beginning.

8.2.4 Optical Cable Routing Over Corners

Problem Description

How to route an optical cable over an internal or external corner?

Answer

External corner: Do not bend the optical cable into a right angle. To ensure that the bending radius of the optical cable is greater than or equal to 5 mm, attach an external corner protector to each external corner.

Internal corner: Use a finger (wear a finger cot) to press the optical cable to prevent the optical cables from being pulled by the tool and detached from the wall. In addition, ensure that the bending radius of the optical cable is greater than or equal to 5 mm by pressing the optical cable.

8.2.5 Door Requirements in the Door Gap Cabling Scenario

Problem Description

What are the door requirements for routing an optical cable into a room through a door gap?

Answer

- The gap between the lower edge of the door and the floor is greater than 3 mm, and the gap in the axial direction of the door is also greater than 3 mm.
- There is no door threshold.
- The floor is level.
- An optical cable cannot be routed into a room from the top of the door.
- This routing mode does not apply to seamless sliding doors.

8.3 Tool Usage FAQs

8.3.1 How to Clean Residual Adhesive

Question

How do I clean the residual adhesive from the heating head of the FIK after it has been used for a period of time?

Answer

After each use, check for residual adhesive at the heating head.

- If there is residual adhesive on the metal part, use fingernails to remove most of the residual adhesive at room temperature. If there is still some residual adhesive that cannot be cleaned by hand, heat the tool and use the adhesive scrapper to remove the residual adhesive gently (Be careful not to scrape vigorously in the heating state, otherwise the ceramic coating on the metal part and the head of adhesive scrapper will be damaged). Clean the residual adhesive on the metal part after each construction and then close the heating head.
- If there is residual adhesive on a plastic part, use fingernails to remove the residual adhesive at room temperature, or use a flat-head screwdriver, knife or other blade tools to remove the residual adhesive.

Use fingernails to remove the residual adhesive on the metal part. (at room temperature)

Use fingernails to remove the residual adhesive on the plastic part. (at room temperature)

Use a flat-head screwdriver, knife or other blade tools to remove the residual adhesive on the plastic part. (at room temperature)

Use the head of the adhesive scrapper to remove the residual adhesive on the metal part. (at the heating state)

8.3.2 Requirements for Using the Battery Delivered with the FIK

Question

What are the requirements for using the battery delivered with the FIK?

Answer

1. Requirements for battery usage: Charge the battery before using it for the first time. If the battery is not used for a long time (more than three months), the battery level may decrease, and you need to charge the battery before using it again. If the battery is not used for more than half a year, the battery may fail to be activated and cannot work properly.
2. When the battery is full, the FIK can work for about 3.5 hours and route transparent cable for 100 m.
3. To charge the battery using an adapter, it takes about 4–6 hours if the adapter output is 5 V 2 A, and 8–10 hours if the adapter output is 5 V 1 A.

8.3.3 What Can I Do if the FIK Cannot Be Turned on After Being Turned Off

Problem Description

The FIK cannot be turned on after being turned off. Why? How to turn it on again?

Answer

After the FIK is turned off, the battery enters the hibernation mode in 30s to protect circuits and save power. In this case, the FIK may fail to be turned on. You can remove and reinstall the battery compartment. Then the FIK can be turned on.

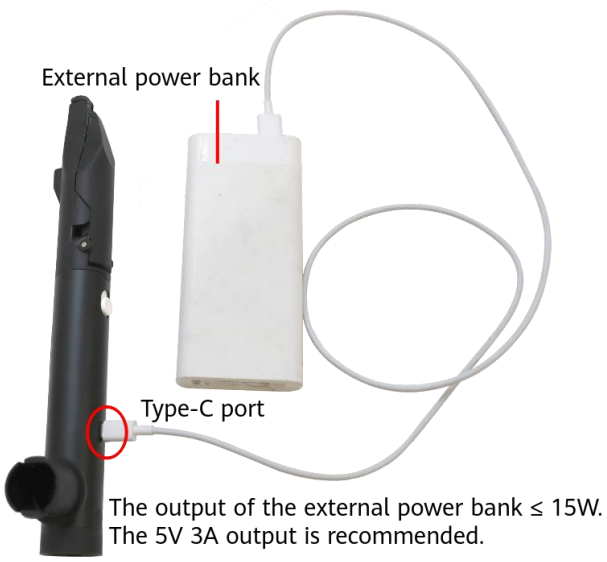
8.3.4 Backup Powering

Problem Description

How to back up the power for emergency use, when default battery runs out?

Answer

The FIK supports a mobile power bank. A mobile power bank must use a standard 5 V/3 A charging cable and charging adapter that meet the certification requirements to obtain a qualified heating power (13–15 W). If an unqualified charging cable or charging adapter is used, the heating power may be insufficient to deliver the rated heating temperature, and the adhesive on the optical cable may not be fully melted.



Input power	Maximum construction speed (m/min)
5 V/3 A (External power bank)	1.3
5 V/2 A (External power bank)	0.6

NOTICE

When the battery and external power bank supply power to the FIK at the same time, the battery input is used first.

8.3.5 Precautions for Using FIK

1. The surface temperature of the FIK heating head is high. When the FIK is powered on for a long time, the hot melt adhesive may generate slight fog. This is a normal situation, and no action is required.
2. Do not heat the same position of the optical cable for a long time during cable routing. If you need to temporarily stop cabling for more than 1 minute, remove the optical cable from the heating head or power off the FIK.

