TIESTON
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GJS-I-8013 Fiber Optical Splice Closure Installation Manual

Version:1.0

1. Scope of application

This Installation Manual suits for the Fiber Optic Splice Closure (Hereafter abbreviated as FOSC), as the guidance of proper installation.

The scope of application is: aerial, underground, wall-mounting, duct-mounting, handhole-mounting. The ambient temperature ranges from -40 to 65℃.

2. Basic structure and configuration

2.1 Dimension and capacity

Outside dimension (Height x Diameter)	500mm×228mm
Weight (excluding outside box)	2300g—2940g
Number of inlet/out ports	6 pieces
Diameter of fiber cable	Φ8mm～Φ16mm
Capacity of FOSC	Bunchy: 12-120(cores), Ribbon: up to360 (cores)

2.2 Main components

No.	Name of components	Quantity	Usage	Remarks
1	FOSC cover	1 piece	Protecting fiber cable splices in whole	Height x Diameter 400mm x 220mm
2	Fiber optic splice tray (FOST)	Max. 10 trays (bunchy) Max. 6 trays (ribbon)	Fixing heat shrinkable protective sleeve and holding fibers	Suitable for: Bunchy: 12 (cores)
3	Base	1set	Fixing internal and external structure	
4	Plastic hoop	1 set	Fixing between FOSC cover and base	
5	Gasket ring for housing and cable inlets/outlets	Gasket ring for housing; ring for big inlets/outlets; Gasket ring for small inlets/outlets; Seal fittings for double holes;	Big gasket ring is used to seal FOSC cover and base.Small gasket ring is used to seal inlet/outlet tube	1 piece of big gasket ring, 6 pieces of small gasket ring
6	Plastic gasket	1 set	Protect elastic seal rings from white ant and corruption	Φ 16.5mm,6pcs for each kind

2.3 Main accessories and special tools

No.	Name of accessories	Quantity	Usage	Remarks
1	Installation manual	1pc	Installation guide	
2	Splice protection sleeves	72 pcs	Protecting fiber splices	
3	Earthing deriving device	1 set	To deriving metallic parts of fiber cable in FOSC for earthing connection	
4	Earthing wire	1 set	Putting through between earthing devices	
5	Cable & Fiber Identification rings	2 sets	Labeling fibers	
6	Abrasive cloth	1 pc	Scratching fiber cables	
7	Cable tying 100mm	12 nos	To fix fiber with protective coat	
8	Seal tape	2 roll	Enlarging diameter of fiber cable which fits in with gasket ring	70cm
9	Tissue/lens paper 3”x4”	50 pcs	To protect the base of the closure while heating	
10	Special wrench	3pieces	Installing and tightening nut of reinforced core and nut (plastic) of inlet/outlet tube	2 cotton of 8 JC with one set of wrench.
11	PVC adhesive tape	1 roll	To scratch part of fiber cable	
12	Velcro tape	1 pc	To fix trays when transport	
13	Transport tube Φ4mm*Φ3mm	10 pcs	To protect fiber	
14	Desiccant	1 bag	Put into FOSC before sealing for desiccating air	
15	Pressure Valve	1 no	Used for pressure testing and sealing testing	
16	Wall mounting kit	1 set	Used for wall mounting	

3. Necessary tools for installation

3.1 Supplementary materials (to be provided by operator)

Name of materials	Usage
Scotch tape	Labeling, temporarily fixing
Ethyl alcohol	Cleaning
Gauze	Cleaning

3.2 Special tools (to be provided by operator)

Name of tools	**Usage**
Fiber cutter	Cutting off fiber cable
Fiber stripper	Strip off protective coat of fiber cable
Combo tools	Assembling FOSC

3.3 Universal tools (to be provided by operator)

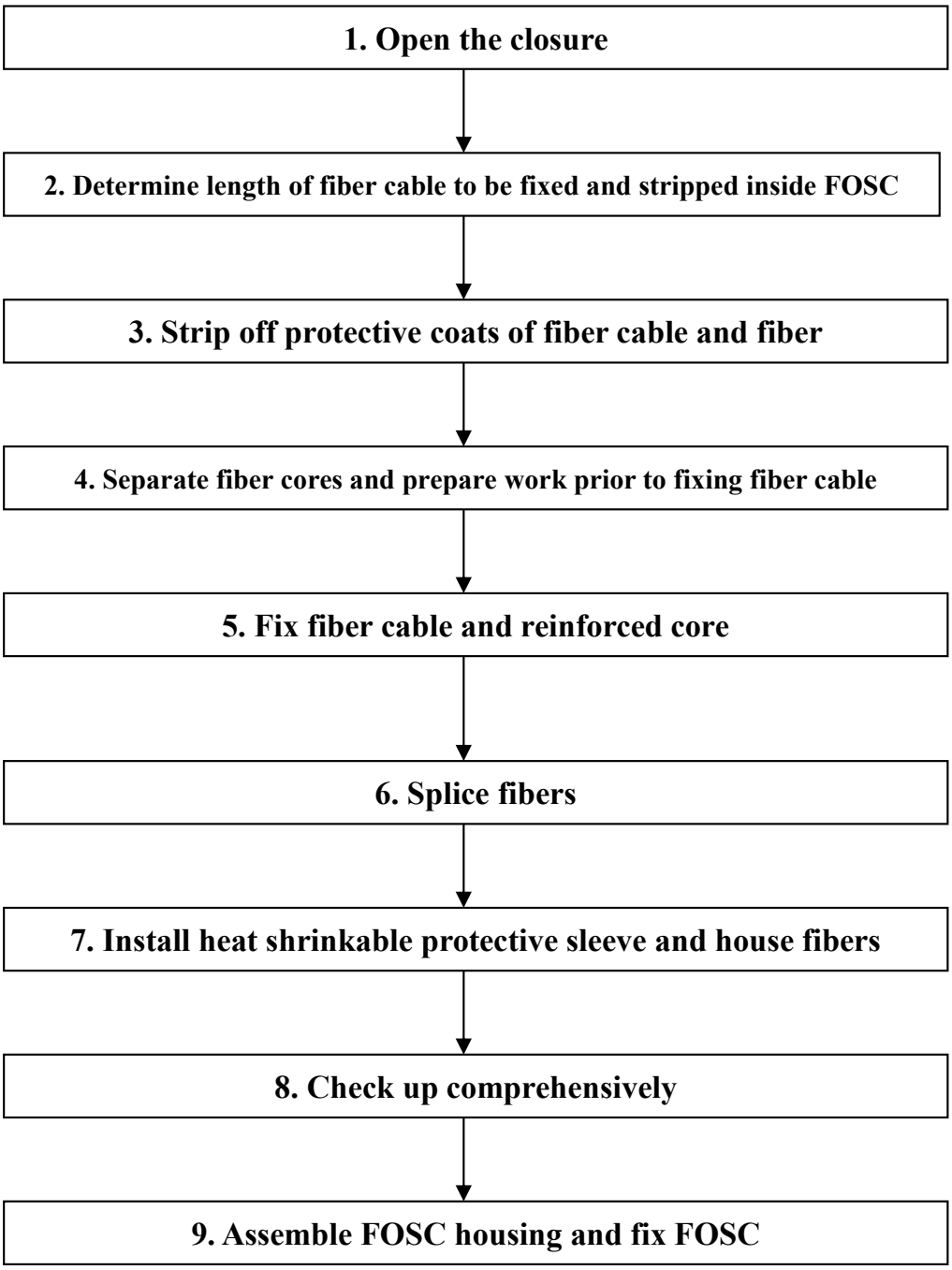
Name of tools	**Usage and specification**
Band tape	Measuring fiber cable
Pipe cutter	Cutting fiber cable
Electrical cutter	Take off protective coat of fiber cable
Combination pliers	Cutting off reinforced core
Screwdriver	Crossing/Paralleling screwdriver
Scissor	
Waterproof cover	Waterproof, dustproof
Metal wrench	Tightening nut of reinforced core

3.4 Splicing and testing instruments (to be provided by operator)

Name of instruments	**Usage and specification**
Fusion Splicing Machine	Fiber splicing
OT DR	Splicing testing
Provisional splicing tools	Provisional testing

Notice: The above-mentioned tools and testing instruments should be provided by the operators themselves.

4. Installation flow chart



5. The process of installing FOSC.

Step One - Open the closure

Cleaning the locale and determine where to install the FOSC and then place fiber cables required. Check whether the main components and accessories have been well prepared inside the package.

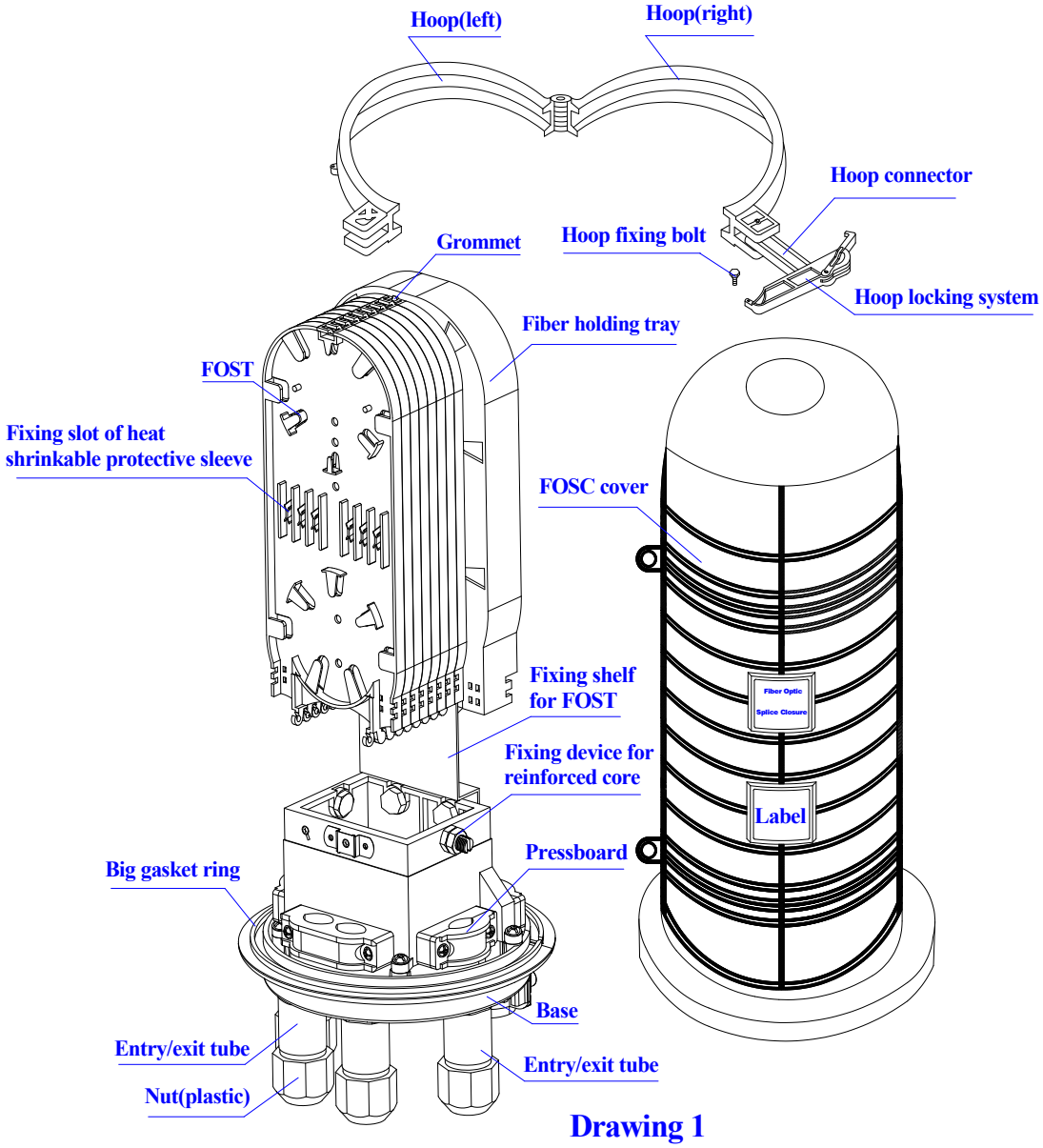
Open the closure

① Demount hoop fixing bolt and pull hoop locking system out, then lock the shaft of hoop by locking system, make the hoop loosen, then pull off and demount the hoop by hand.

② Pull the FOSC cover upwards out, installation could begin.

See Drawing 1

Important issues: If the weather condition is not good enough, then a tent must be pitched for waterproof and dustproof.



Drawing 1

5.2 Step Two -Determine length of fiber cable to be fixed and stripped inside FOSC

5.2.1 ①. Fiber cable in 120mm length: the distance from small gasket ring to fiber cable pressboard.

②. Fiber cable in 1740mm length: it is used to be winded and spliced after stripping.

③. Fiber with protective coat in 140mm length: the distance from the fixing point of fiber cable to the fixing point of FOST (fiber optic splice tray).

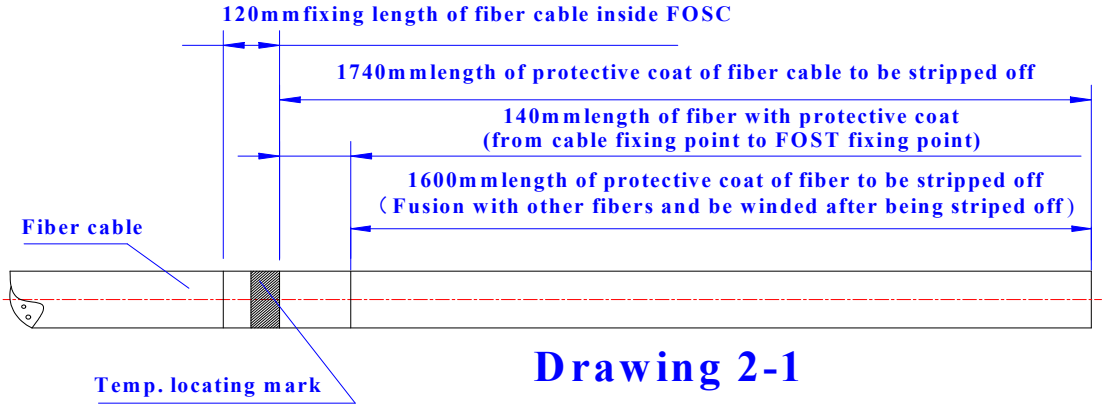
④. Fiber in 1600mm length: after stripping off the protective coat, it is to be winded inside the FOST after splicing with other fibers.

⑤ The length of stripping off protective coat shows table

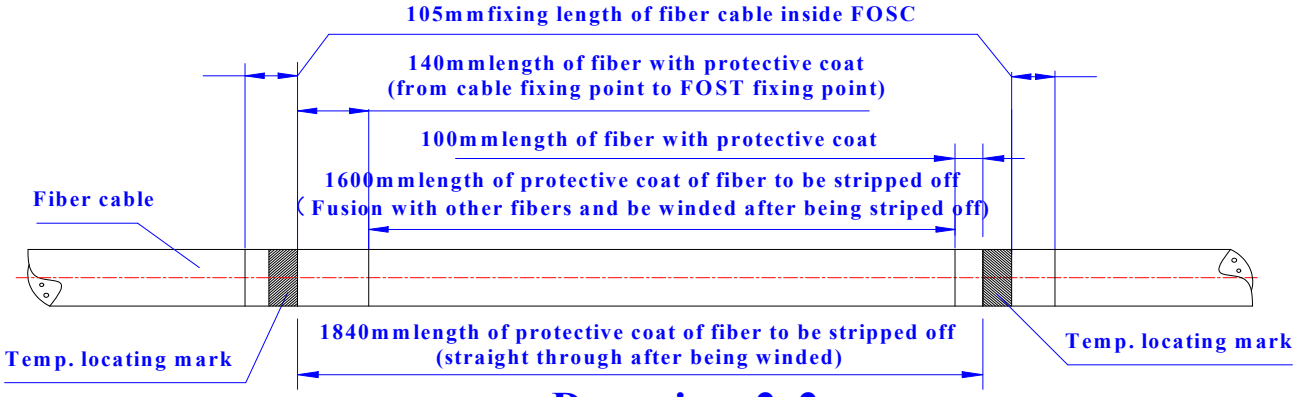
5.2.2 See Drawing 2

Important issues: 1. Reserve enough length of fiber cable to be spliced.

2. Stripping length also could be decided by customers according to installation requirement



Drawing 2-1



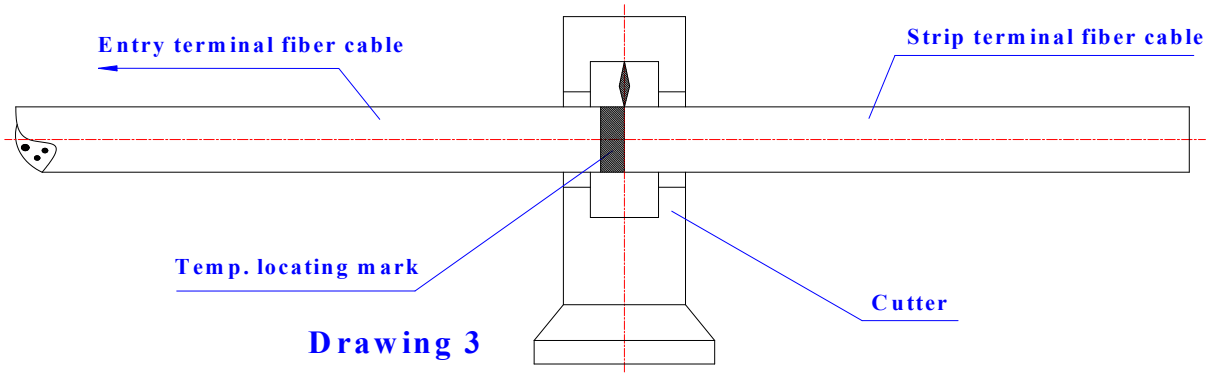
Drawing 2-2

5.3 Step three –Strip off protective coat of fiber cable and fiber

5.3.1 Strip off protective coat of fiber cable from the temp. locating mark with the cutter and the stripper, please refer to Drawing 2 for stripping length. Stripping length also could be decided according to installation requirement

5.3.2 See Drawing 3.

Important issues: If it is difficult to strip off all the protective coat of fiber cable at one time, strip it off section by section to avoid fiber breakage.



Drawing 3

5.4 Step Four – Separate fiber cores and prepares work prior to fixing fiber cable.

5.4.1 Wind 2 layers of insulation tape on protective coat of fiber core for protection. Meanwhile, get rid of the stuffing to separate fiber and clean them. Form a ring with the diameter of 100 mm or so and fix it on the fiber cable temporarily by adhesive tape.

5.4.2 Two optical cable stripping method

(1) All fibers in FOSC splice and branch

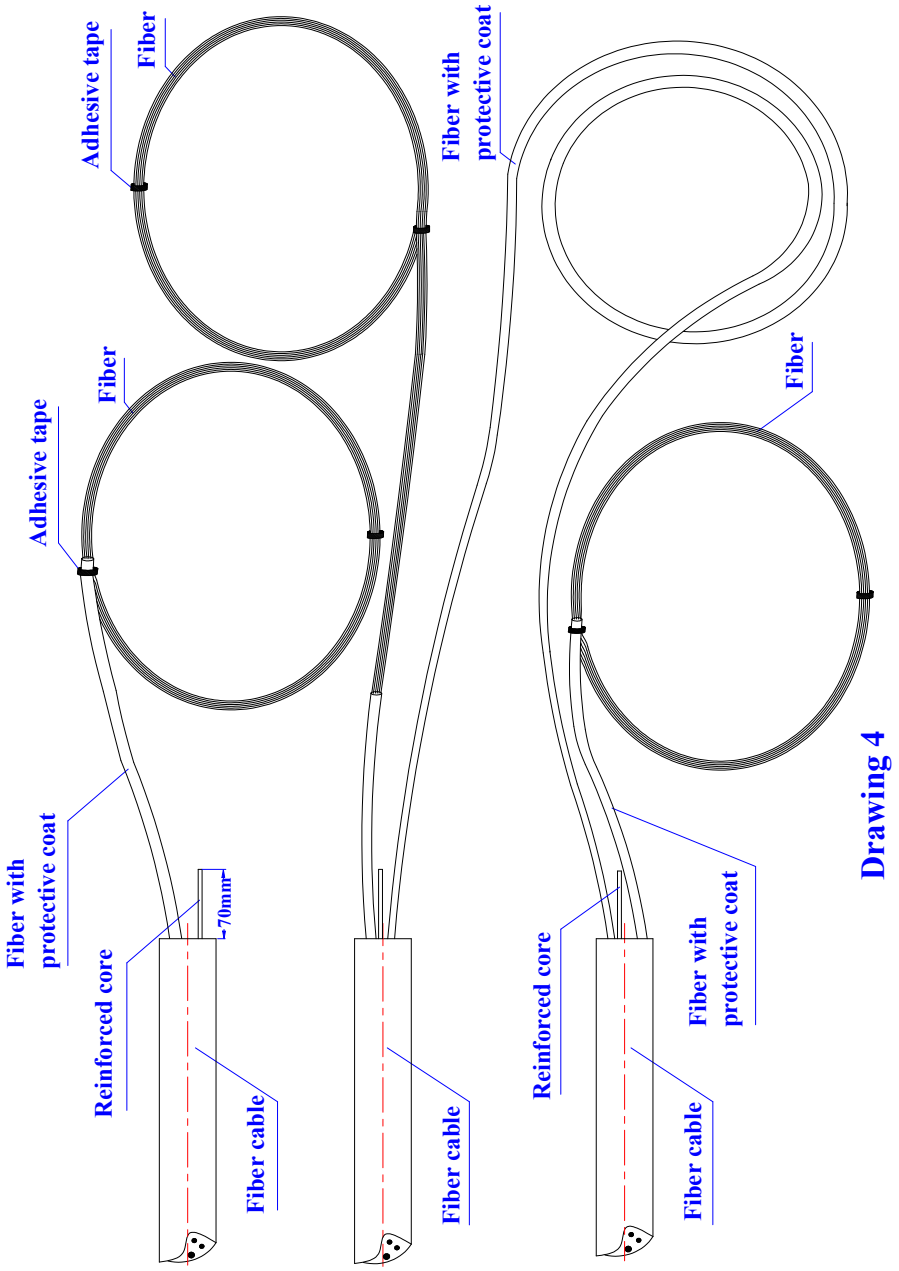
(2) Some of fibers through FOSC after winding inside, other fibers spice with branching fibers.

5.4.3 This FOSC is provided with 6 cables inlet/outlet ports, four of them can pass one piece Max. ϕ 13mm optical cable while one piece Max. ϕ 16mm optical cable can pass the other two ports, which are bisect suitable for passing straight-through optical cable (no need to cut).

Reserve reinforced core in 70mm length and cut off the unnecessary ones.

5.4.4 See Drawing 4.

Important issues：Inlet/outlet tubes are to be selected accurately to make it easy for splicing and sealing.



Drawing 4

5.5 Fix reinforced core, and pyrocondense, fix and seal fiber cable.

5.5.1 This FOSC is provided with 6 inlet/outlet tubes, among these tubes, 4 inlet/outlet tubes suit for fiber cable with max. diameter ϕ 16mm, 2 inlet/outlet tubes suit for fiber cables with max. diameter ϕ 21mm.

5.5.2 During bring optical cable, demount the nuts, gaskets, small seal rings after confirming the quantity, and hitch them to optical cable, then insert optical cable into cable inlet/outlet ports and tighten nuts to assure the sealing(The seal rings can shrink to ϕ8.5mm from ϕ 13mm)

5.5.3 While straight-through optical cable, choose two bisect ports; Demount the bolts of cutting base, then take away the cutting parts and open the cutting parts B.

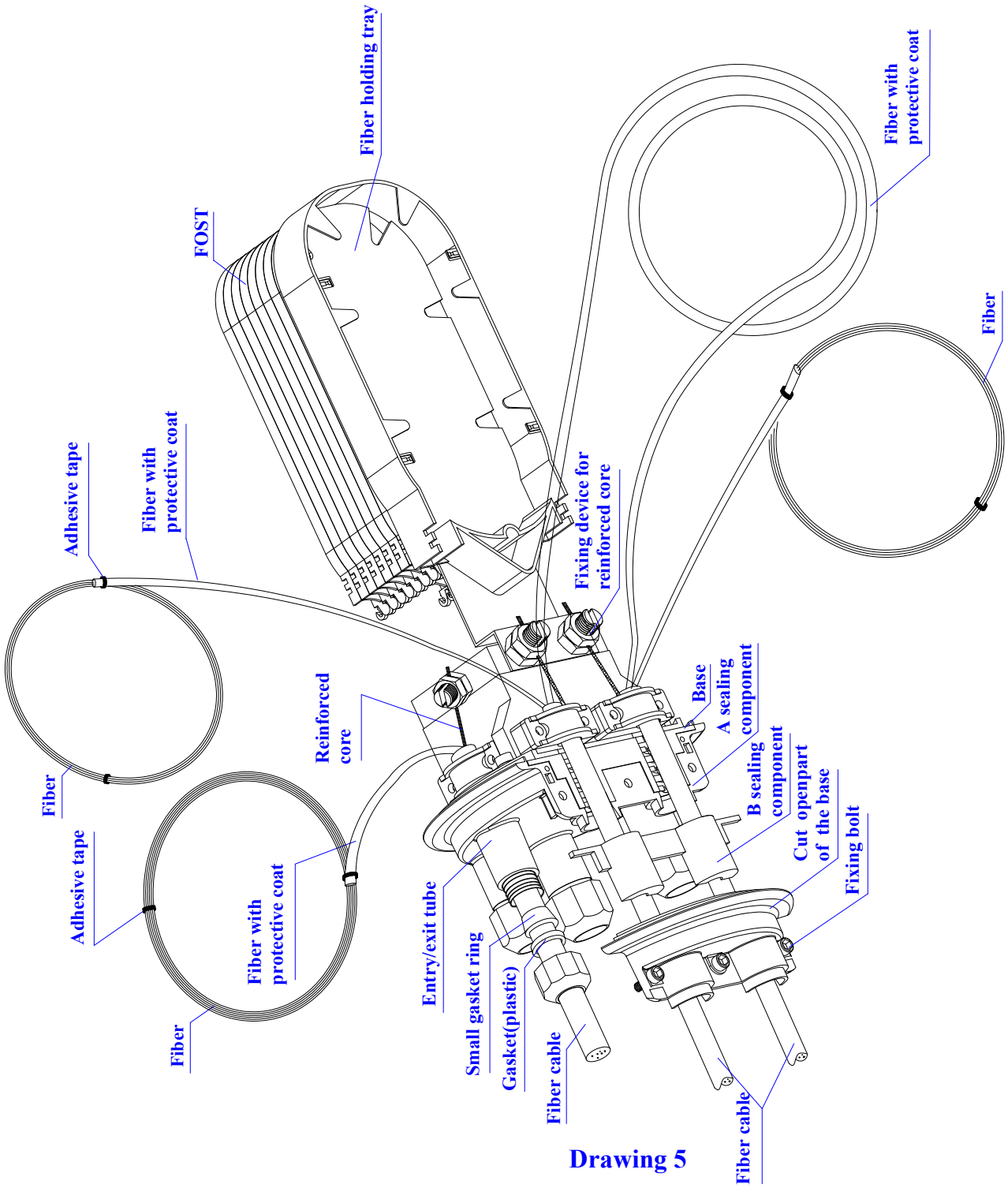
5.5.4 Demount the nut of fixing device of reinforced core with special wrench (plastic one), set reinforced core into fixing slot, tighten the nut, and retighten it with metal wrench

(metal wrench to be provided by operator).

5.5.6 Fix fiber cable to the fixing seat, press it with the pressboard. While diameter is small, enlarge the diameter with insulation tape at the fixing position of fixing seat.

5.5.7 See Drawing 5

Important issue: Fixing nut of reinforced core should be tightened.



Drawing 5

5.6 Step six - Splice fibers

5.6.1 Follow user manual of fusion splicing machine to splice fiber.

Important issue: pay attention to the twist and bend of fiber

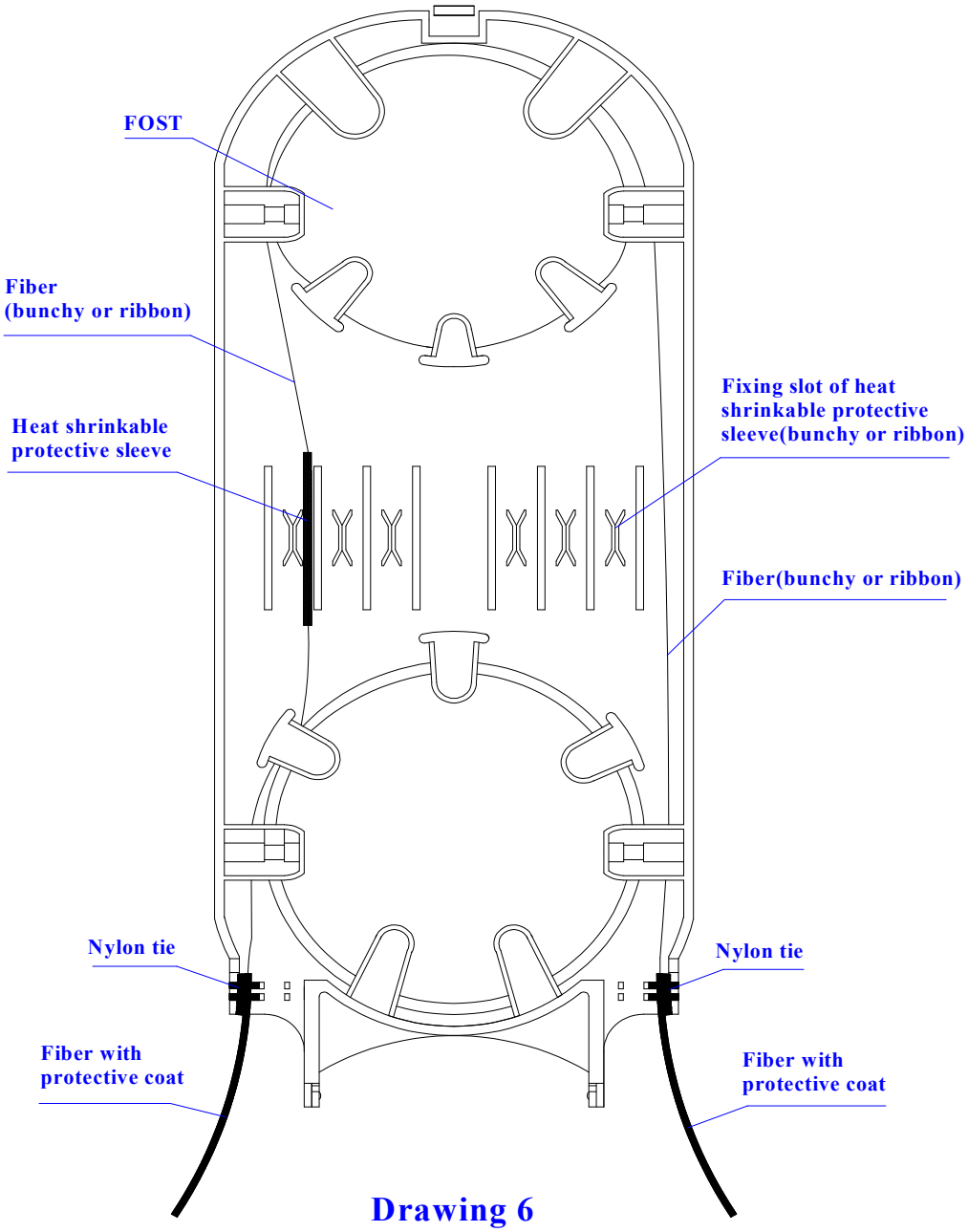
5.7 Step Seven -Install heat shrinkable protective sleeve and house fibers.

5.7.1 When having completed splicing the fibers, the first fiber ring should be housed on the farthest side of FOST, the remaining fiber should be winded, forming a ring with diameter not less than 80mm. then put it into FOST (Fiber Optic Splice Tray) together with heat shrinkable protective sleeve.

(Firstly fix heat shrinkable protective sleeve into the slot, then enlarge the diameter of fiber ring properly.)

5.7.2 See Drawing 6

Important issue: pay attention to the twist and bend of fiber.



Drawing 6

5.8 Step Eight - Check up comprehensively

To ensure the technical requirements, the following instructions must be followed:

5.8.1 Fibers with protective coat are fixed with nylon tie at the entrance of FOST.

5.8.2 Grommet should be pressed from inside to outside in order to properly install FOST.

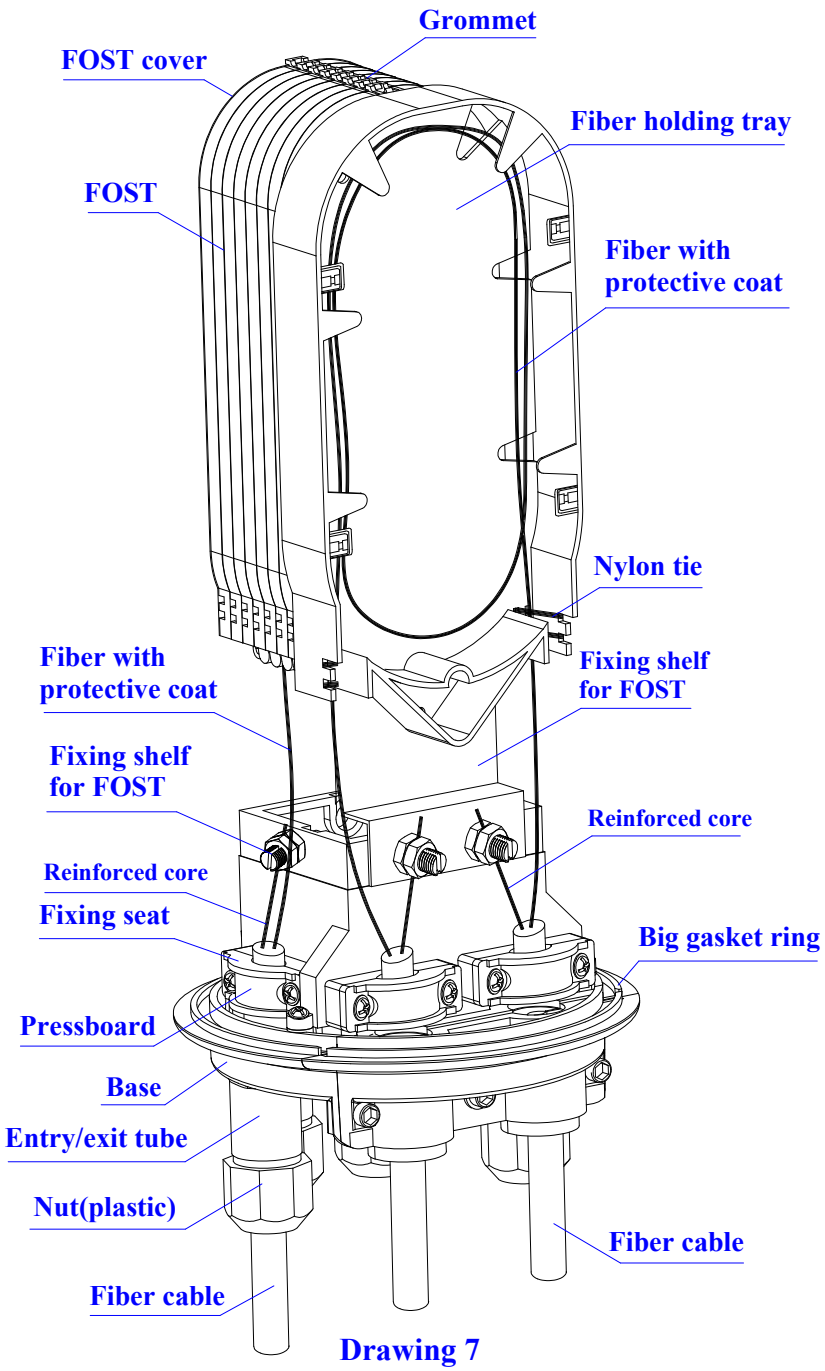
5.8.3 If there are fibers with protective coat reserved, wind it into the clasp.

5.8.4 Check whether the internal tighteners and reinforced core are well tightened.

5.8.5 Check whether gasket ring is installed neatly and smoothly without any incline. If not, adjust it in time.

5.8.6 See Drawing 7

Important issues: If any problems occur, they should be solved right away.



Drawing 7

5.9 Step Nine – Assemble FOSC housing and fix FOSC

5.9.1 Put FOSC cover on base directly.

5.9.2 Install plastic hoop between FOSC cover and the base, aim at center point of FOSC, and tighten hoop locking system, which is to be fixed by hoop fixing bolt then.

5.9.3 All nuts (plastic ones) of base need to be retightened once more.

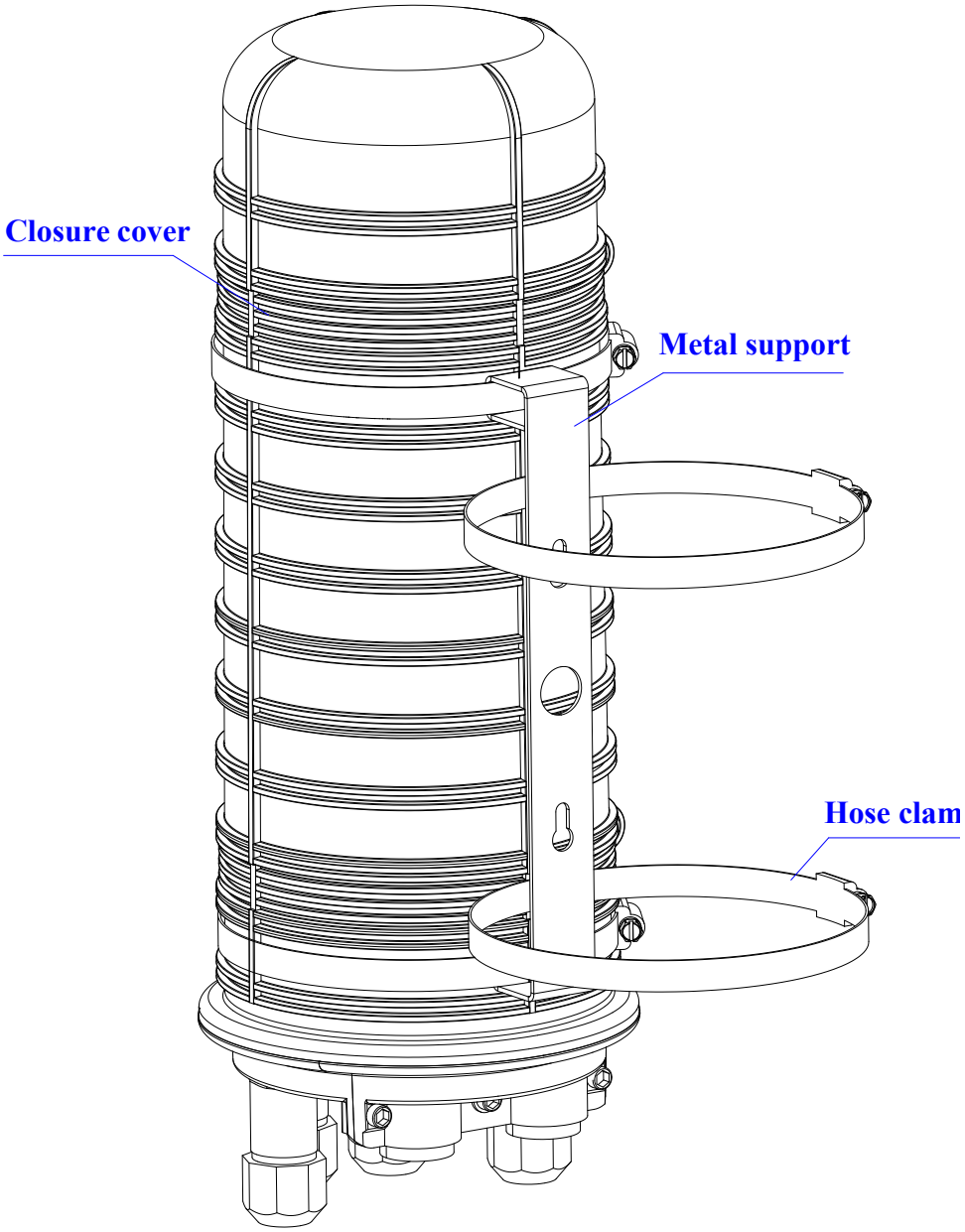
5.9.4 FOSC installation

Pole application: using metal hose clamp to fix. Please refer to Drawing 8

5.9.5 See drawing 8

Important issues: 1. Pay attention while installing plastic hoop.

2. The specification of the bolt for wall-mounting is M6.



Drawing 8

6 Fiber Optic Splice Closures (FOSC) inspecting and testing items

Inspecting item	Technical Requirements	Inspecting type	
		Routine test (Before leaving factory)	Type test
Package	Each small package contains one fiber optic splice closure, together with its accessories, tools, installation manual and packing list.	full	At least 3 sets sampled each time
Appearance	Intact in shape, no burrs, bubbles, chaps, pores, warps, impurities and other defects, all background colors should be even and continual.		
Sign	There is a clear sign on the housing, such as name and model of the product, etc.		
Fiber storage device	The fibers reserved are to be winded in fiber optic splice tray (FOST), the length of fibers housed in FOST is >1.6m, the curved radius is >30mm. During the installation and maintenance, there should be no attenuation on fibers.	At least 3 sets sampled each time	
Electrical jointing device	Inside FOSC: metallic components of fiber cables have the functions of electrical putting through, earthing connection and disconnecting. It is possible to install earthing deriving device outside the housing		
Sealing performance	After sealing according to the stipulated operation procedures, the injected air pressure is 100KPa ± 5Kpa, when immersed in clean water of normal temperature for 15 minutes, there should be no air bubbles, then observed for 24 hours, there should be no change of air pressure.		
Re-sealing performance	After reopening and resealing according to the stipulated operation procedures, the injected air pressure is 100KPa ± 5Kpa, when immersed in clean water of normal temperature for 15 minutes, there should be no air bubbles, then observed for 24 hours, there should be no change of air pressure.		
Pull	Bearing pull is ≧ 800N at axle orientation, there should be no breakage on the housing.		
Punching	Bearing pressure of 2000N/10cm for 1 minutes, there should be no breakage on the housing		
Impact	Bearing impact energy of 16N•m, 3 times of impacts there should be not breakage on the housing		

Bending	The spot between the FOSC and seal fitting can bear bending tension of 150N at bending angle of $\pm 45^0$ for 10 circles, there should be no breakage on the housing	full At least 3 sets sampled each time	At least 3 sets sampled each time
Torsion	Bearing torsion 50N•m, 10 circle at torsion angle$\pm 90^{0,}$ There should be no breakage on the housing.		
Temperature circle	Injected air pressure of 60KPa ± 5 KPa, the temperature circle ranging from -40℃~+65℃, 10 times of the circular tests (one circular consists of high temperature for 2 hours + indoor temperature for 2 hours + low temperature for 2 hours + indoor temperature for 2 hours) when the pressure declines, the amplitude is ≦5Kpa, immerse the swatch in clean water of normal temperature for 15 minutes, there should be no air bubbles.		
Voltage resistance strength	After sealing the FOSC according to the stipulated operation procedures, immerse it in clean water of normal temperature in 1.5m depth for 24 hours, there should be no breakdown or arc over between the metallic components of the FOSC, between metallic components and the ground at DC 15KV for 1 minutes.		
Isolating resistance	After sealing the FOSC according to stipulated operation procedure, immerse it in clean water in 1.5m depth for 24h, the isolating resistance between the metallic components of the FOSC, between the metallic components and the ground should be ≧ 2×10^4MΩ.		