tyco Electronics

FOSC-MCO-250

INSTALLATION INSTRUCTION

FOSC Metal Closure Organizer

TELECOM OUTSIDE PLANT

Content

1 Introduction

· The FOSC-MCO closure is a metal butt closure (cable entry/exit at the same end), environmentally sealed and specially developed for use on the optical grounding wires (earthing wires) of overhead electrical power network lines.
It can be used as a:
-Track Joint (TJ)
- Spur Joint (SJ)

· FOSC-MCO closures are suitable for use above ground attached to high voltage towers, poles, walls or other support structures.

· The product is designed to allow splicing of the required fibers, for example, to connect OPGW cables to each other or to connect the OPGW cable to a central office or to make a branch to conventional plastic sheathed fiber-optic cable. The FOSC-MCO closure provides for both termination and sealing of OPGW and conventional fiber optic cables. The product can be tailored to almost any required configuration by adding an extra basket and/or extra FOSC trays.

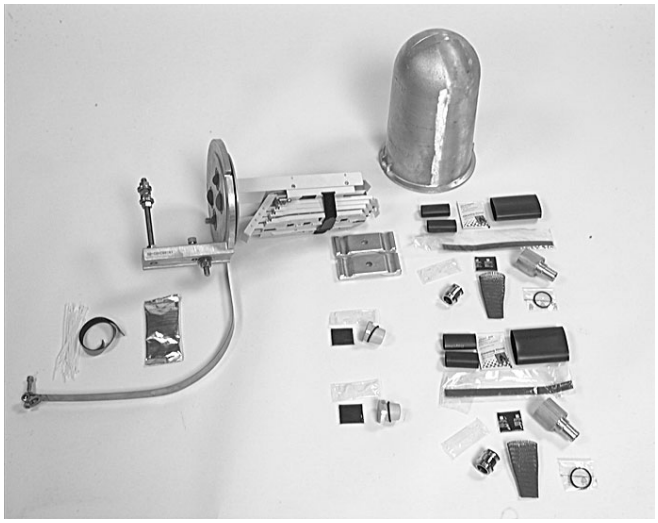
Follow all local safety regulations related to optical fibre plant elements.

Dimensions

Length	512 mm including mounting bracket
Diameter at base section	250 mm

2 General

2.1 Kit content (for the installation of 2 cables)



- Metal dome
- Metal base (including the bracket for pole fixation)
- Assembly with pre-installed FOSC tray(s)
- O-ring
- Screws, nuts and washers to fix cable clamps
- Silicagel
- Plugs to temporarily protect cable ports (4, pre-installed in base)
- 2 plugs to seal off unused ports
- 1 set cable clamp to hold 2 cables
- 2 feedthrough and sealing kits
- A set of tie wraps and foam strips to fix loose tubes/transportation tubes on basket and FOSC trays
- Installation instruction

2.2 Elements needed from the valise

Product Name	UOM	Qty/UOM	Product description
FISTV-E7186-0510	1 rl	30 m	FOPT-CT: Cable to FOPT-CS protection tube
FISTV-E7186-0509	1 rl	30 m	FOPT-CS: Cable to SECO protection tube

2.4 Tools

Besides the standard tools necessary to install fiber optic closures, following tools are recommended

- FACC-TUBE-CUTTER-01 to cut FOPT
- FACC-TUBE-STRIPPER-02 to strip non metallic loose tube
- FACC-HEAT-GUN-220V to shrink cable seals

2.4 Accessories

Product Name	QTY/UOM	Product description
MCO-GWSK-X	1 pc	Cable feed-through & seal kit for OPGW cable X : Depends on cable dimensions
MCO-OCSK-X	1 pc	Cable feed-through & seal kit for plastic sheathed FO cable X : Depends on cable dimensions
MCO-CAP-PG21	1 pc	Metal caps to plug unused ports
MCO-CLAMP-2-A	1 set	Cable clamps to hold 2 OPGW or FO cables between 10 - 14
MCO-CLAMP-2-B	1 set	Cable clamps to hold 2 OPGW or FO cables between 14.1 - 20
MCO-CLAMP-2-C	1 set	Cable clamps to hold 2 OPGW or FO cables between 20.1 - 26
MCO-DUCA-10	1 pc	Dummy rods to fill up not used entries in cable clamps, D=10 mm
MCO-DUCA-12	1 pc	Dummy rods to fill up not used entries in cable clamps, D=12 mm
MCO-DUCA-14	1 pc	Dummy rods to fill up not used entries in cable clamps, D=14 mm
MCO-DUCA-16	1 pc	Dummy rods to fill up not used entries in cable clamps, D=16 mm
MCO-DUCA-18	1 pc	Dummy rods to fill up not used entries in cable clamps, D=18 mm
MCO-DUCA-20	1 pc	Dummy rods to fill up not used entries in cable clamps, D=20 mm
MCO-DUCA-22	1 pc	Dummy rods to fill up not used entries in cable clamps, D=22 mm
MCO-DUCA-24	1 pc	Dummy rods to fill up not used entries in cable clamps, D=24 mm
MWTM-25/8-1000-239	1 m	Medium-wall tubing to be cut to length as required for cable built-up
E7158-0439	1 m	Aluminum sheet to built-up OPGW cable between cable clamps
MCO-MOBRA-1	1 pc	Bracket to mount closure to pole with clamps (in case drilling holes in pole construction is not allowed)

2.5 Capacity

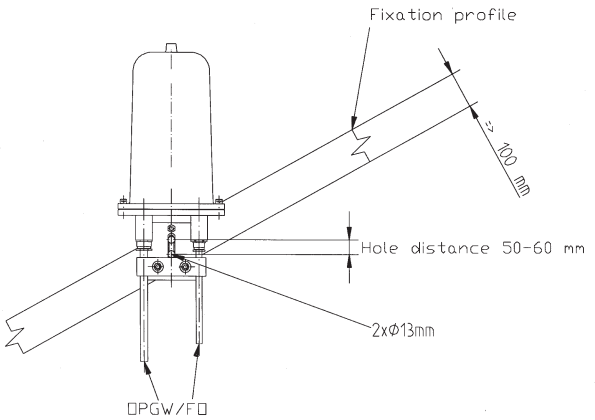
Cable capacity is 4 cables (OPGW and/or FO cable)

	Diameter (mm)	
	Min.	Max.
OPGW	9	25
FO-cable	9	22

The fiber capacity depends upon the type of cable used and must therefore be determined on a case-by-case basis.
Maximum quantity of splices that can be stored is 192.
Maximum quantity of fibers per loose tube is 24.

3 Installation preparations

3.1 Determine the position of the closure for attachment to high voltage towers, poles, walls or other support structures.

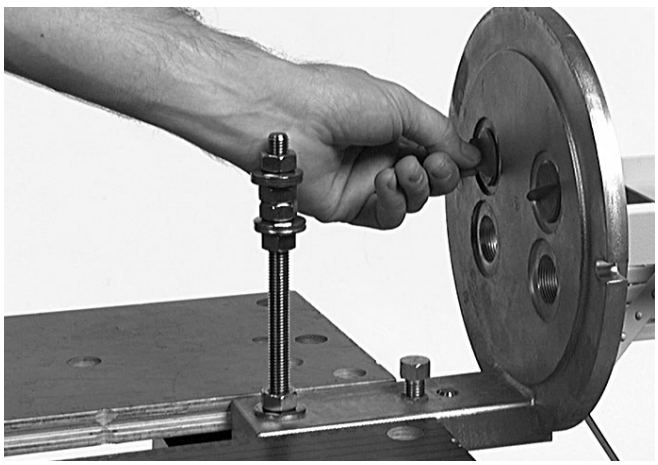


3.2 Drill the holes in the support structure according to drawing.
Note: When drilling is not allowed, the MCO-MOBRA-1 can be used to fixate the closure onto the pole.

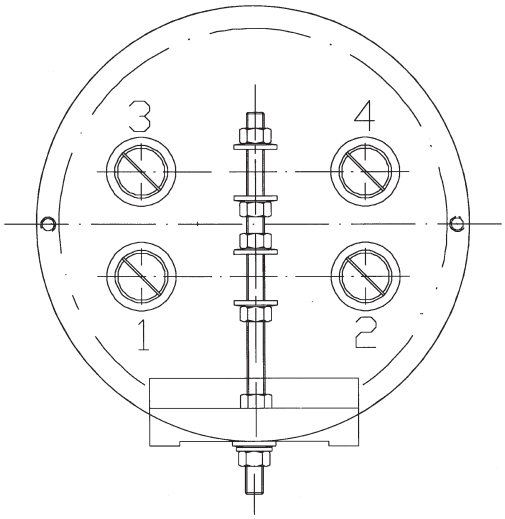
4 Preparation of the closure

4.1 Installation of cable feedthrough and metal plugs.

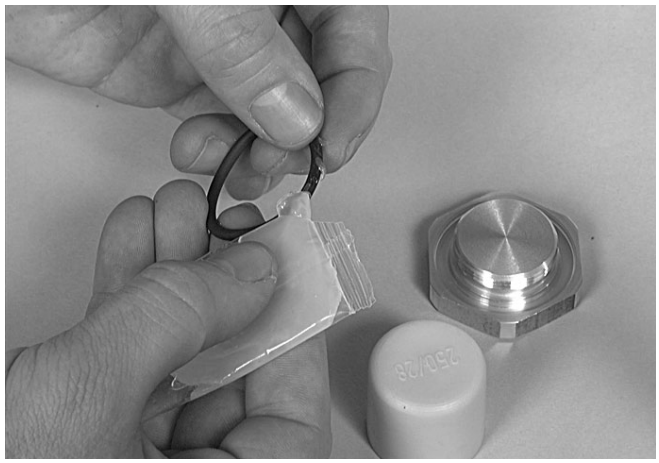
4.1.1 Untighten the screws, remove metal strap, dome and O-ring.

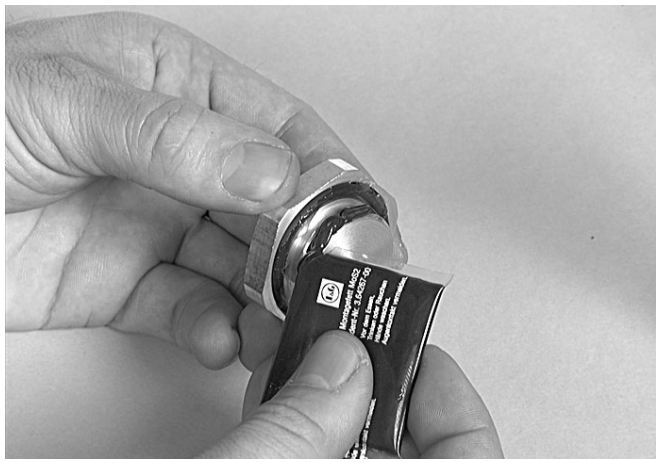


4.1.2 Position the closure on a mounting table and remove the plastic plugs.

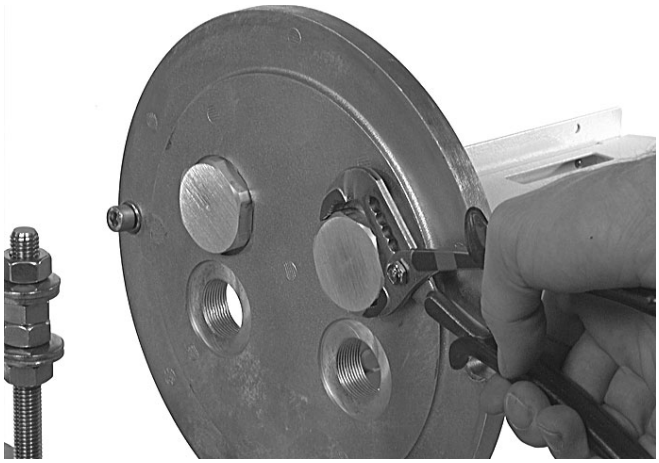


4.1.3 Start at bottom row with ports 1 and 2.

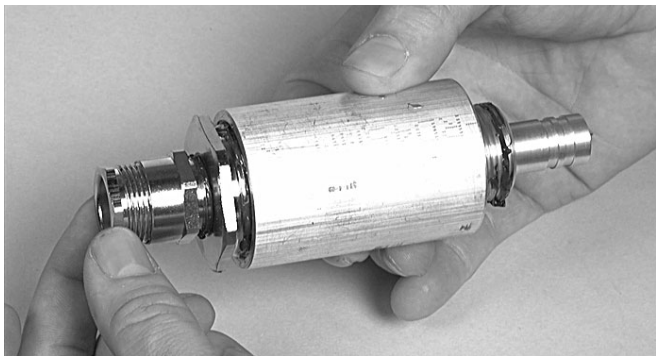




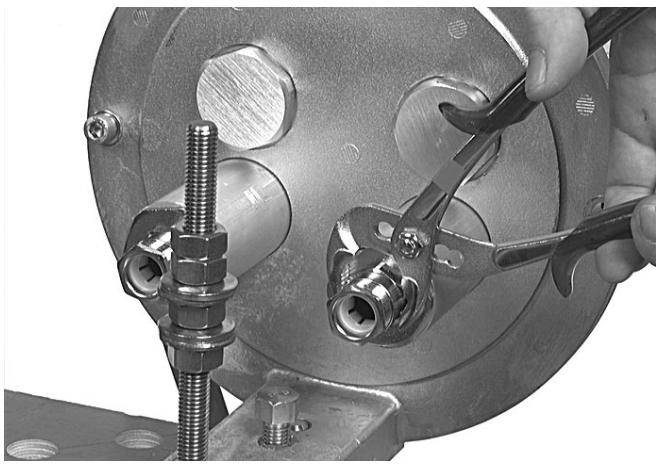
4.1.4 Install metal caps (PG 21) into unused ports.
Remove protection cap from metal cap (PG 21). Apply silicone grease(Included in kit) on the sealing ring and apply Molykote grease(Included in kit) on the thread of the metal cap (PG21) before installing.
Note: This grease is very important to be able to access the ports at a later date.



4.1.5 Install the metal caps with O-ring and tighten them.



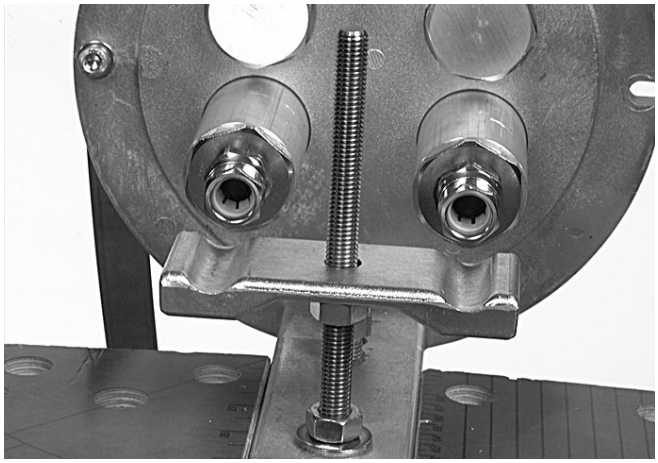
4.1.6 Install the glands and/or reductions on the cable feedthrough (included in kit when necessary).
Note: When several reductions and glands are included in the kit, choose the appropriate items corresponding with the cable diameter. See flyer included in kit.
Important : Apply Molykote grease on the threads.



4.1.7 Install the cable feedthrough with O-ring and tighten them.
Important: Apply silicone grease on the sealing ring and apply Molykote grease on the thread of the cable feed-through before installing.

4.2 Installation of cable clamps

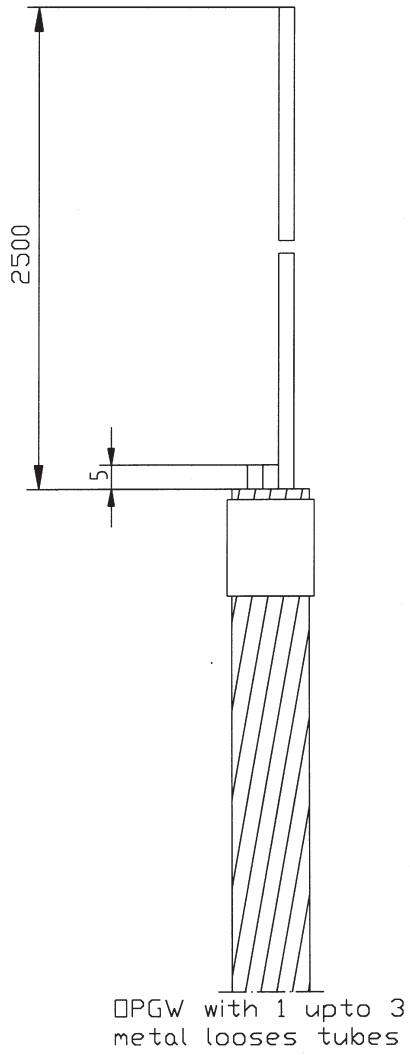
4.2.1 Take the cable clamps (delivered with closure).



4.2.2 Install the clamp. Start at the bottom row (port no 1, 2) and centre it with the ports entries.

5 Installation of optical grounding wires (OPGW) with metal loose tube(s)

5.1 Preparation



5.1.1 Straighten the cable over a minimum length of 2.5 meter.

5.1.2 Mark the cable at 2.5 meter and wrap some tape around the cable at the marking point.
Note: The 2.5 meter does not take into account the possible storage of overlength in the basket. This overlength depends on the number of loose tubes (or FOPT) to be stored and the maximum capacity of the basket (this is 12 meter of tubes per basket) .

5.1.3 Make a circumferential incision in the cable at the marking point by using a saw or file.

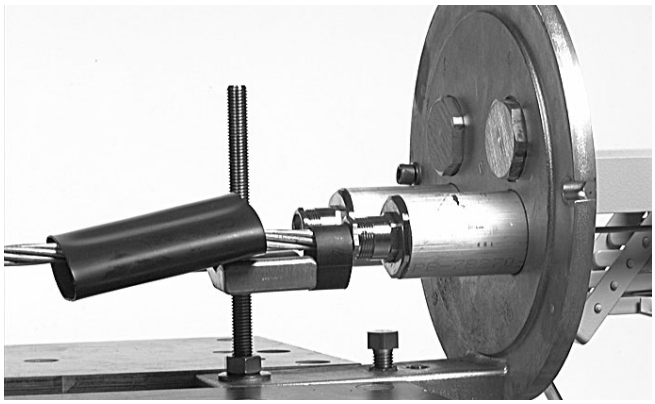
5.1.4 Remove the Aluminum cable strands starting from the cable end.

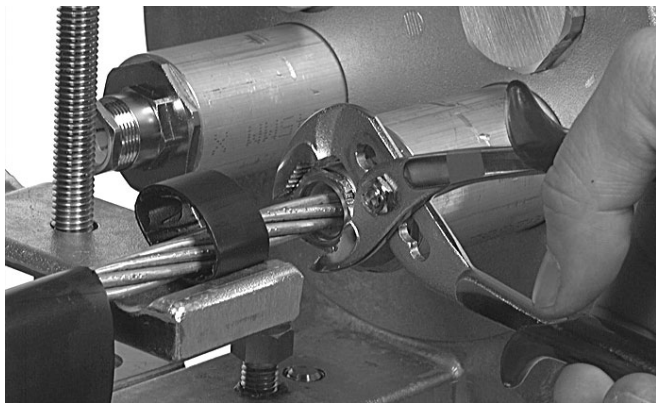
5.1.5 Break the strands and remove the sharp edges with a file.

5.1.6 Separate the metal loose tubes from the steel strands.

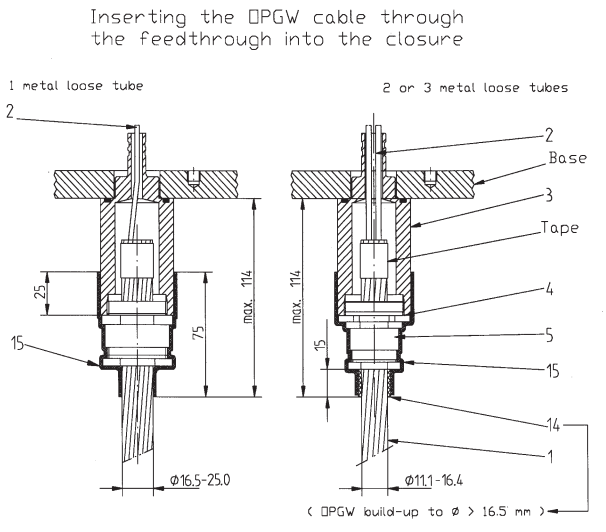
5.1.7 Remove the central steel strands according to above drawing.

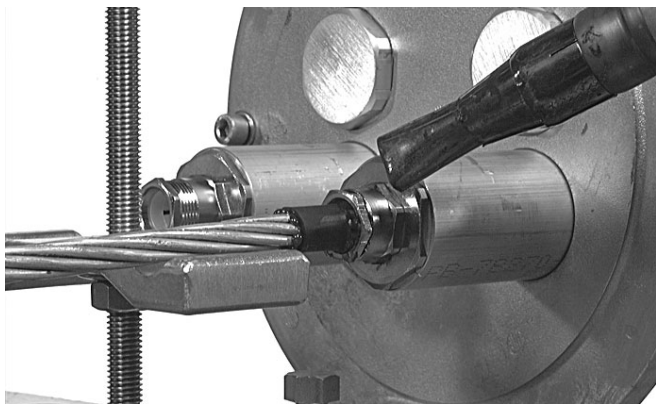
5.1.8 Remove sharp edges with a file.
Attention: Put a metal plate between metal loose tubes and steel strands during removal. Check metal loose tubes for damage after removal of steel strands and filing.

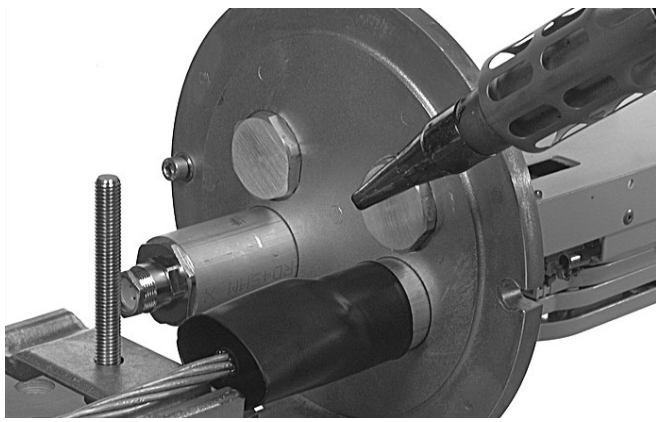




5.2 Installation





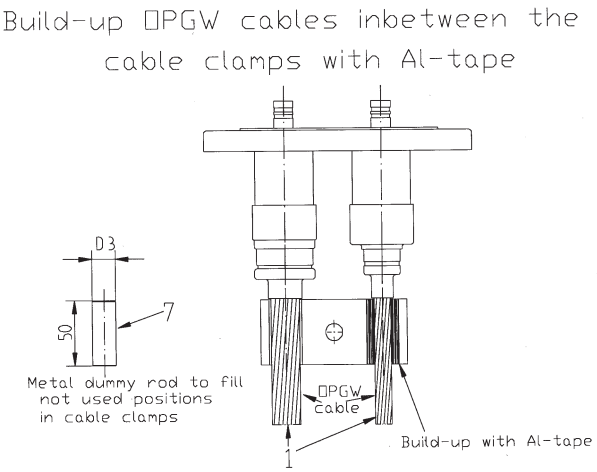


5.2.1 Slide the necessary heat-shrink tubes over the cables.

5.2.2 MWTM-50/16 (in feedthrough and sealing kit), to be installed over the cable feedthrough, reduction and gland onto the OPGW cable (needed on all inserted cables) (n° 15 on drawing).

5.2.3 When cable diameter is smaller then 16.5 mm, cut a MWTM-25/8 to a length of 15 mm to built up the OPGW cable between the cable clamps and the cable feedthrough (n° 14 on drawing 5.2.1).

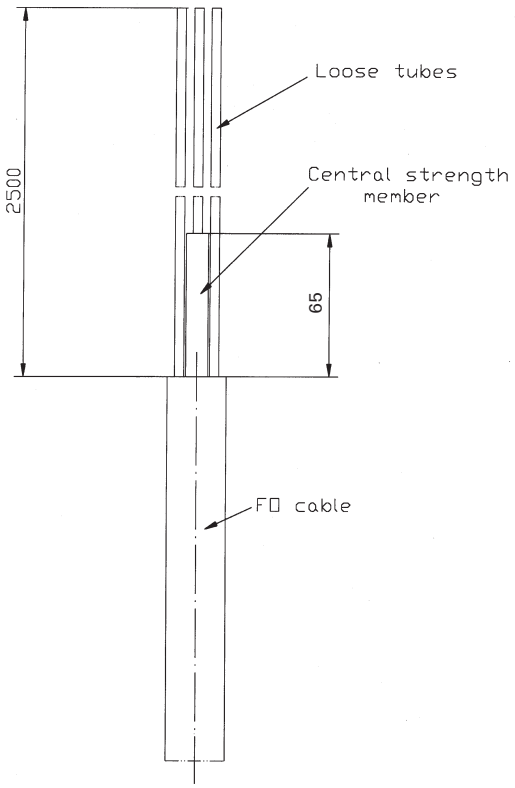
5.2.4 Slide necessary tubes over cable. Push the OPGW cable through the cable feed-through and tighten the gland. Check by pulling on the cable if the gland is tightened properly. Install the necessary heat-shrink tubes.
Attention: MWTM should NOT be inbetween the cable clamps after installation (equipotential).



5.2.5 When necessary use Aluminum tape to built up the cable diameter of an OPGW cable inbetween the cable clamps so it has the same diameter as the adjacent cable (OPGW or FO cable) (see drawing).

6 Installation of plastic sheathed FO cable

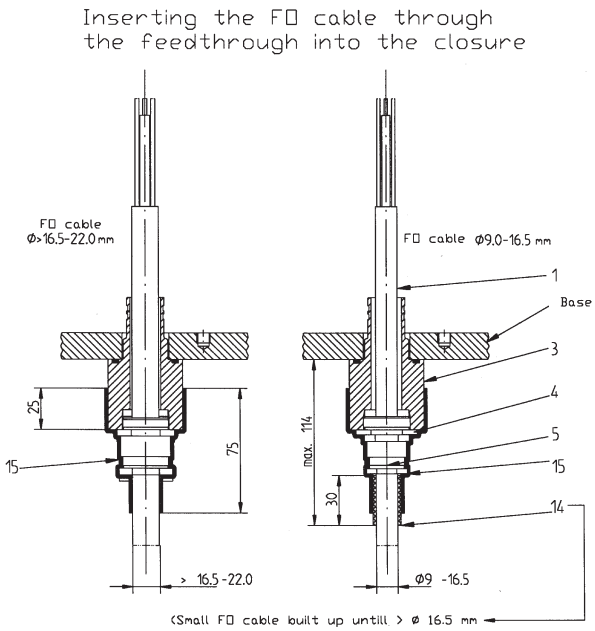
6.1 Preparation



6.1.1 Remove the cable jacket at 2.5 meter and clean the loose tubes.
Note: The 2.5 meter does not take into account the possible storage of overlength in the basket. This overlength depends on the number of loose tubes (or FOPT) to be stored and the maximum capacity of the basket (this is 12 meter of tubes per basket).

6.1.2 Cut the strength member at 65 mm from the cable jacket.

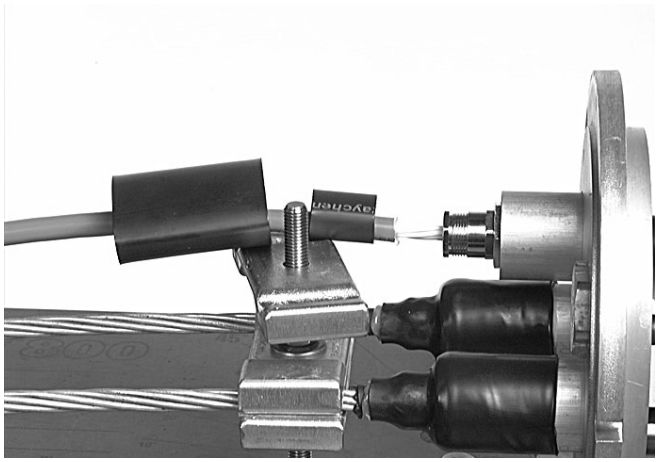
6.2 Installation



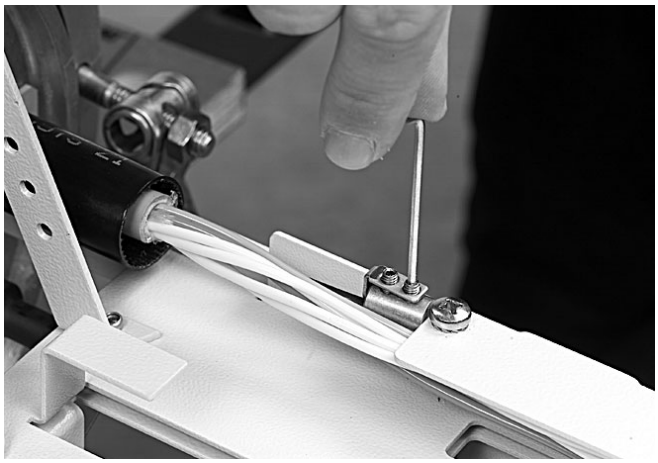
6.2.1 Slide the necessary heat-shrink tubes over the cables.

6.2.2 MWTM-50/16 (in feedthrough & sealing kit), installed over the cable feed-through, reduction and gland onto the FO cable (needed on all inserted cables) (n°15 on drawing).

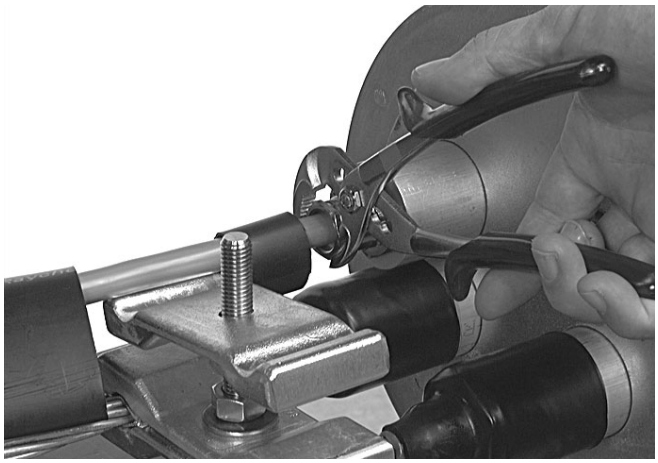
6.2.3 When cable diameter is smaller then 16.5 mm, cut a MWTM-25/8 to a length of 30 mm to built up the OPGW cable between the cable clamps and the cable feedthrough (n°14 on drawing point 6.2.1).



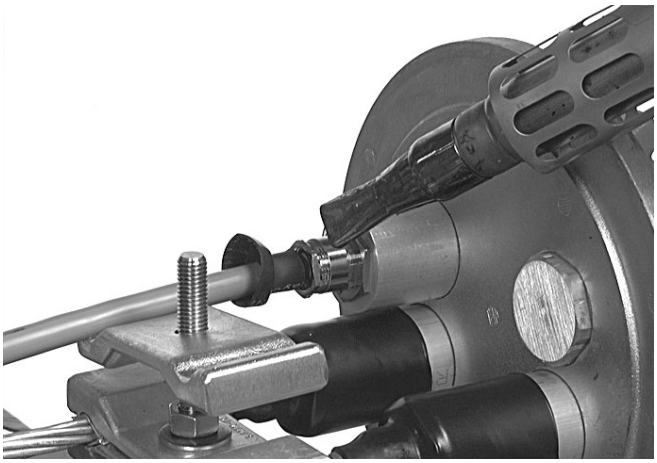
6.2.4 Slide necessary tubing over the FO cable. Feed the cable through the feedthrough.
Note: when the cable is fed through ports 3 or 4, install first the second basket (see section 12).

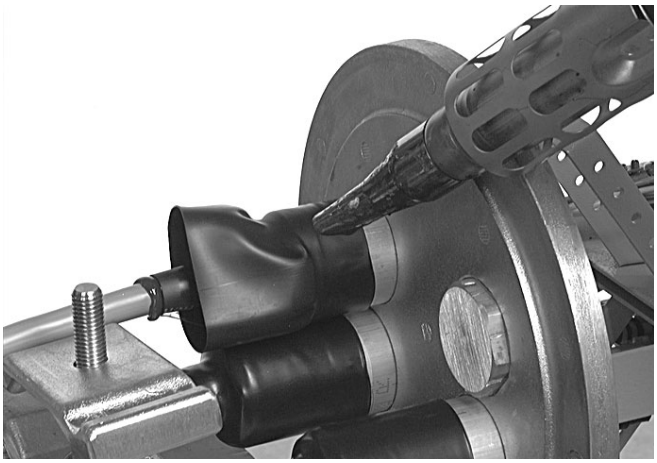


6.2.5 Slide sealing tube (included in kit) over cable, push strenghtmember in strenghtmember attachment and tighten screws.

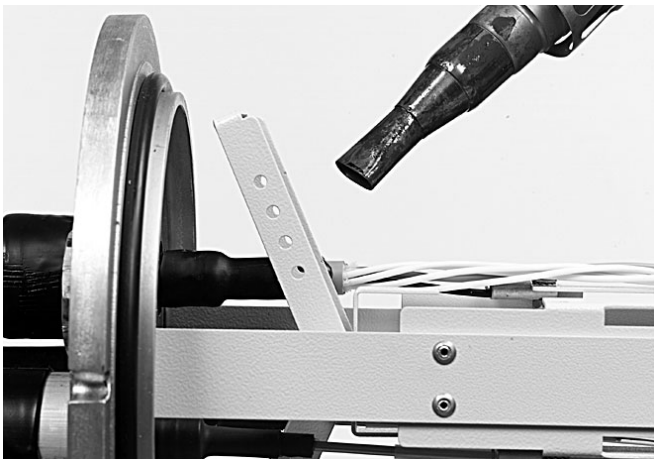


6.2.5 Tighten the gland, check by pulling the cable if gland is tightened properly.

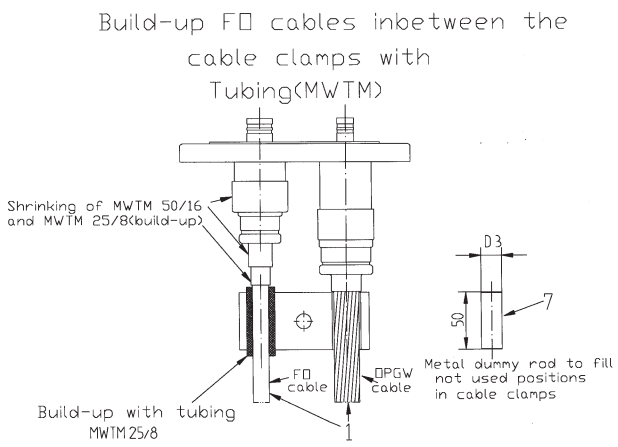




6.2.6 Install the necessary heat-shrink tubes.
Note : Make sure the cable is cleaned before installing tubes.



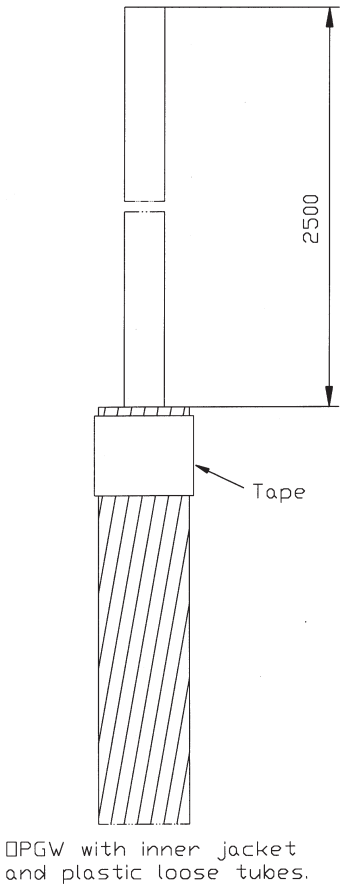
6.2.7 Install the inner heatshrink (sealing).
Note: Make sure cable and cable entry are degreased properly. Be careful not to damage the already routed tubes.



6.2.3 When necessary cut a MWTM-25/8 to a length of 50 mm to built up the cable diameter of a FO cable between the cable clamps so it has the same diameter as the adjacent cable (OPGW or FO cable) (see drawing).

7 Installation of Optical Grounding Wires (OPGW)with inner cable jacket and plastic loose tubes

7.1 Preparation



OPGW with inner jacket and plastic loose tubes.

7.1.1 Straighten the cable over a minimum length of 2,5 meter.

7.1.2 Mark the cable at 2.5 meter and wrap tape around the cable at the marking point.
Note: The 2.5 meter does not take into account the possible storage of overlength in the basket. This overlength depends on the number of loose tubes (or FOPT) to be stored and the maximum capacity of the basket (this is 12 meter of tubes per basket).

7.1.3 Make a circumferential incision in the cable at the marking point by using a saw or file.

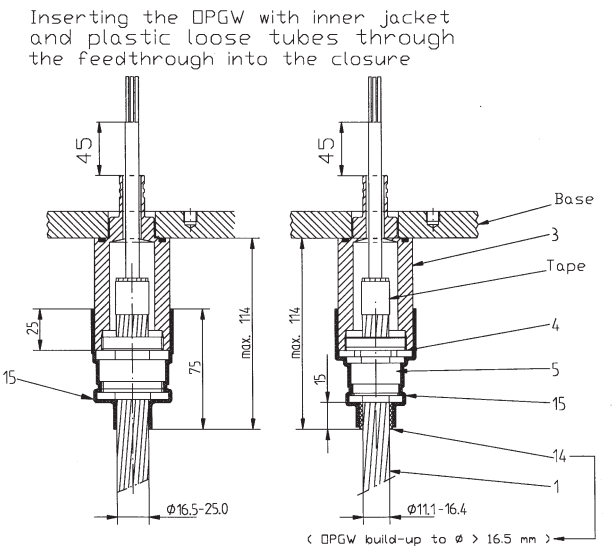
7.1.4 Remove the Aluminum cable strands starting from the cable end.

7.1.5 Break the strands and remove the sharp edges with a file.
Note: Check inner cable jacket for damage and clean it after filing.

7.1.6 Remove inner jacket at 100 mm from strands.

7.1.7 When strenghtmember available, cut at 65 mm from end of inner jacket.
Note: When cable is a slotted core, the core can be used as strenghtmember attachment. File the core until it fits in the strenghtmember attachment.

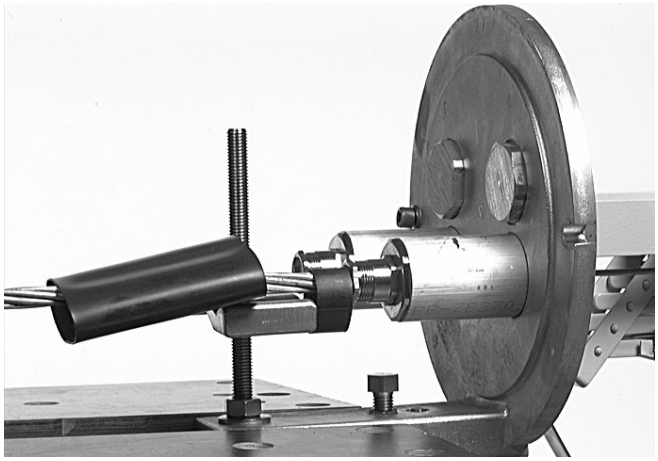
7.2 Installation

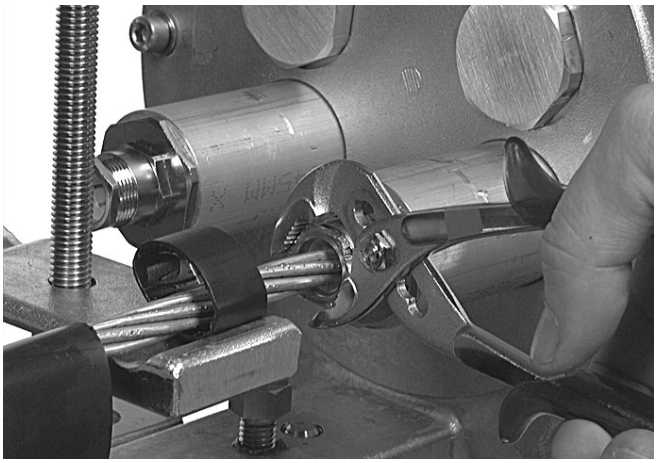


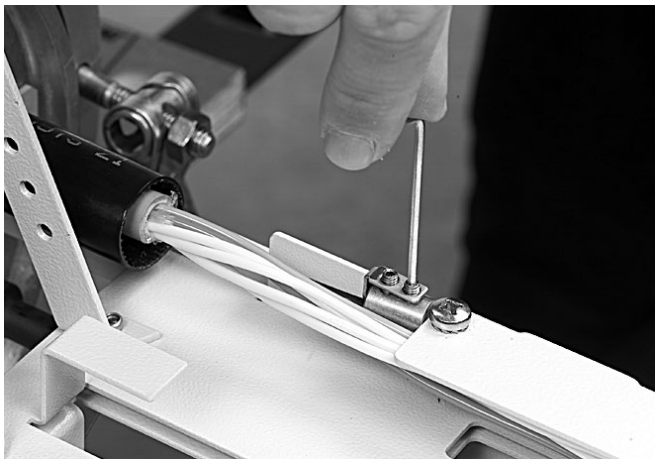
7.2.1 Slide the necessary heat-shrink tubes over the cables.

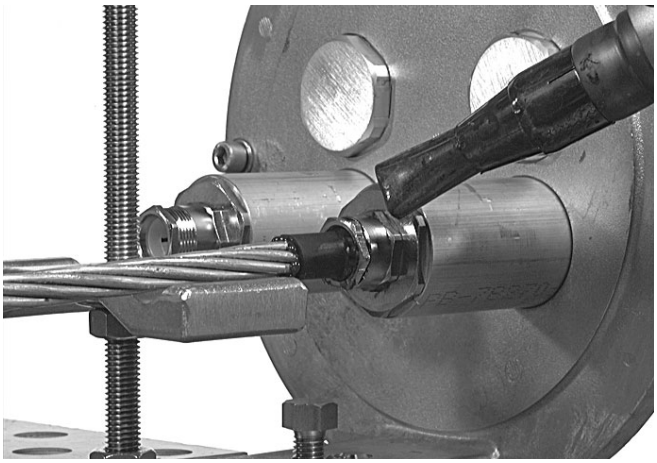
7.2.2 MWTM-50/16 (in feedthrough and sealing kit), installed over the cable feedthrough, reduction and gland onto the OPGW cable (needed on all inserted cables) (n°15 on drawing).

7.2.3 When cable diameter is smaller then 16.5 mm, cut a MWTM-25/8 to a length of 15 mm to built up the OPGW cable between the cable clamps and the cable feedthrough (n°14 on drawing point 7.2.1).

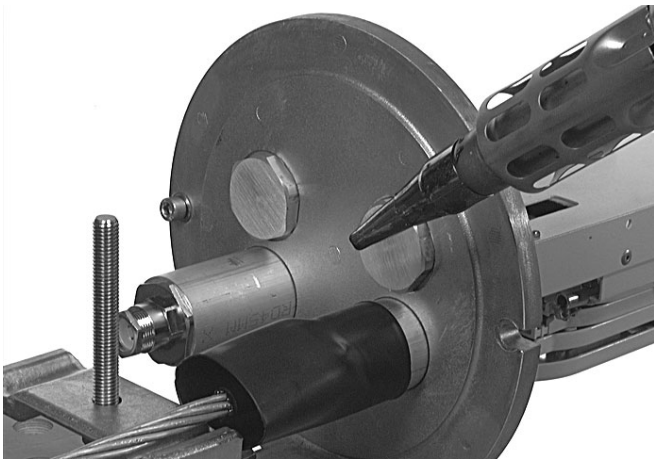




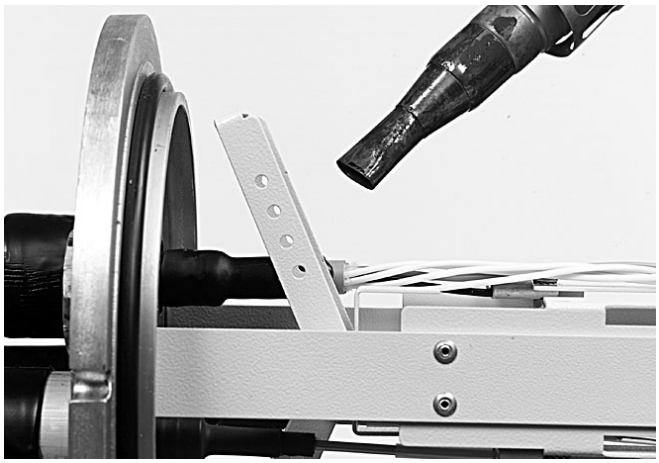




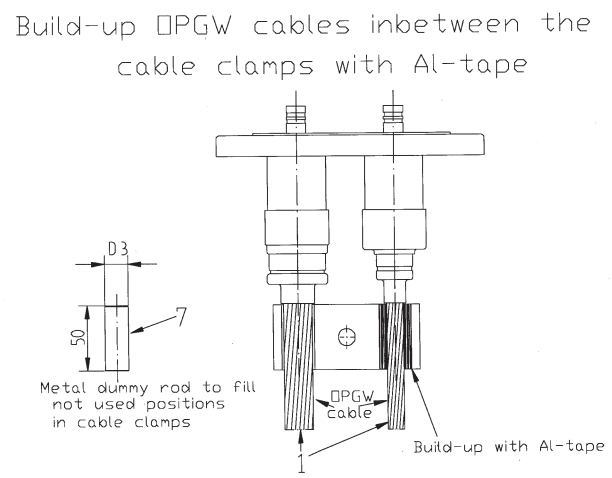
7.2.4 Slide sealing tube (included in kit) over cable, push strenghtmember in strenghtmember attachment and tighten screws.



7.2.5 Tighten gland. Check by pulling on the cable if the gland is tightened properly. Install the heat-shrink tubes.
Attention: MWTM should NOT be inbetween the cable clamps after installation (equipotential).

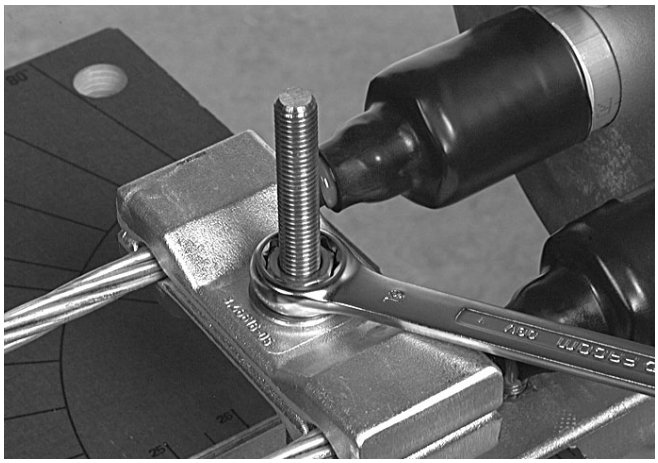


7.2.6 Install the inner heatshrink (sealing).
Note: Make sure cable and cable entry are degreased properly. Be careful not do damage the already routed tubes.



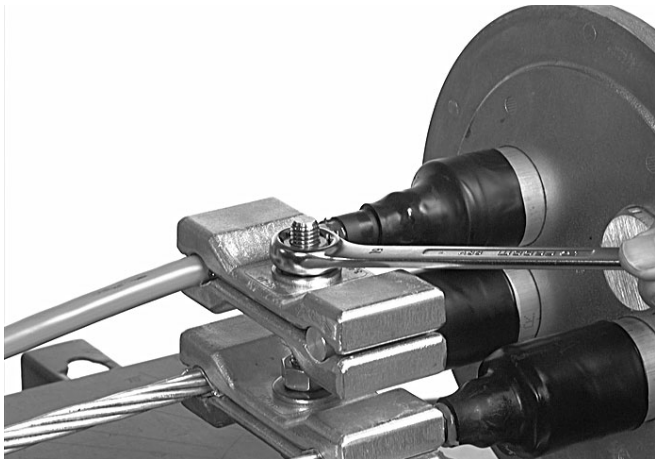
7.2.7 When necessary use Aluminum tape to built up the cable diameter of a OPGW cable between the cable clamps so it has the same diameter as the adjacent cable (OPGW or FO cable) (see drawing).

8 Closing cable clamps



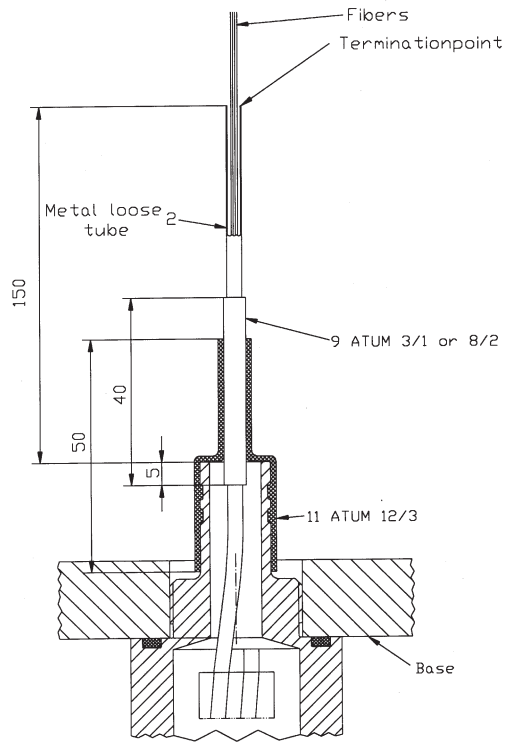
8.1 Install second half of cable clamp, centre the cable clamps and tighten.

8.2 When there are cables inserted in top row (ports 3 and 4),see section 12.

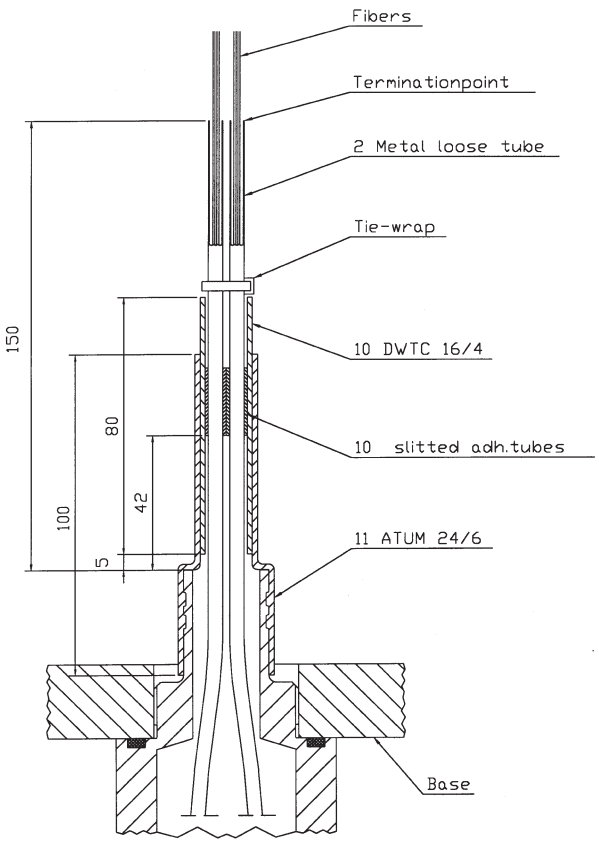


8.3 Use a metal dummy rod (MCO-DUCA-...) in case only one cable per clamp.

9 Termination, sealing and routing of OPGW cable with <=24 fibers/metal tube

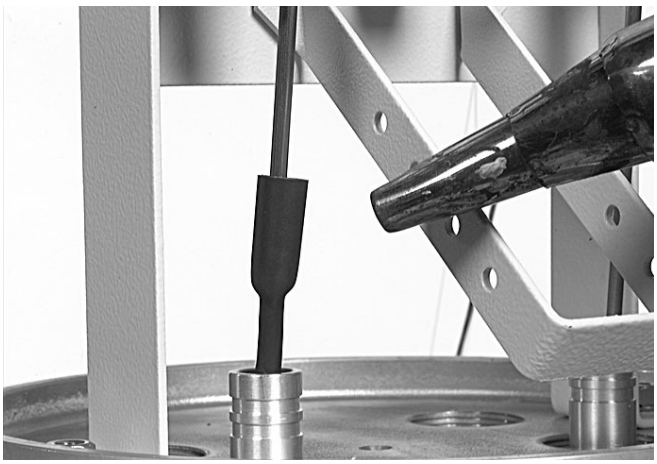


Sealing of 1 metal tube

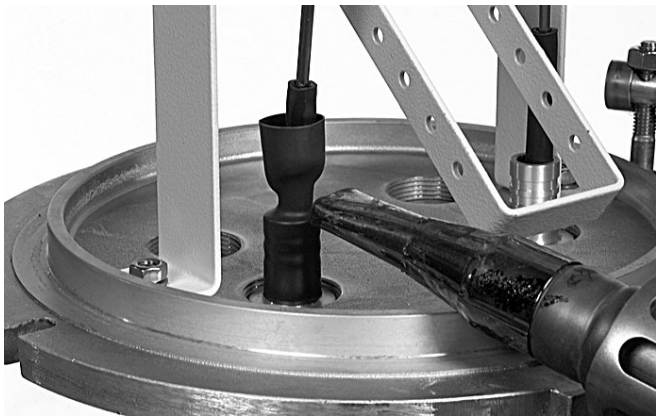


Sealing of 2 or 3 metal tubes

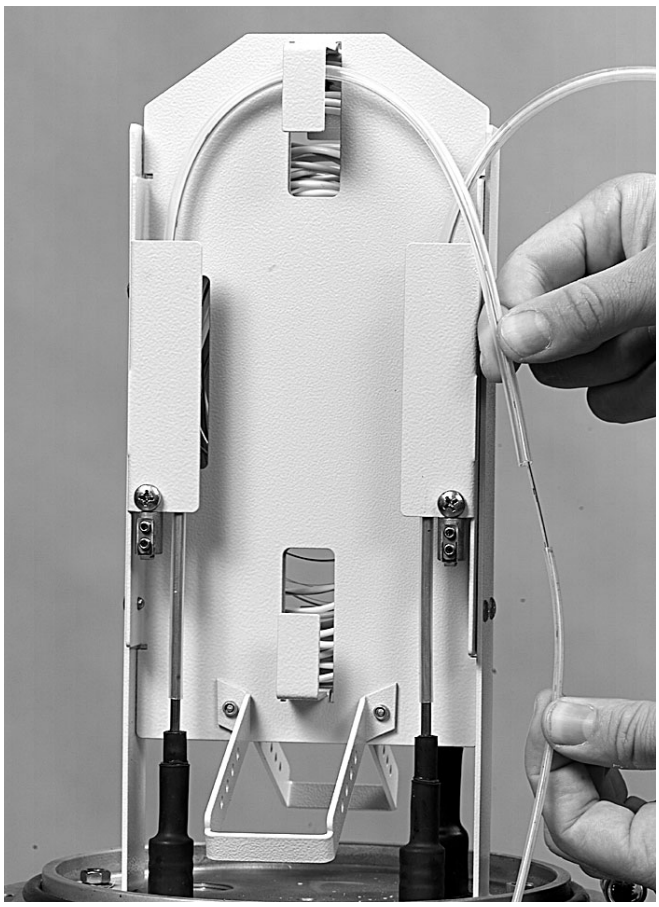
9.1 Strip the metal loose tubes according to the drawing .



9.2 The metal tube should be built-up to minimum 3 mm. Use ATUM 3/1 and/or ATUM 8/2 included in the kit.



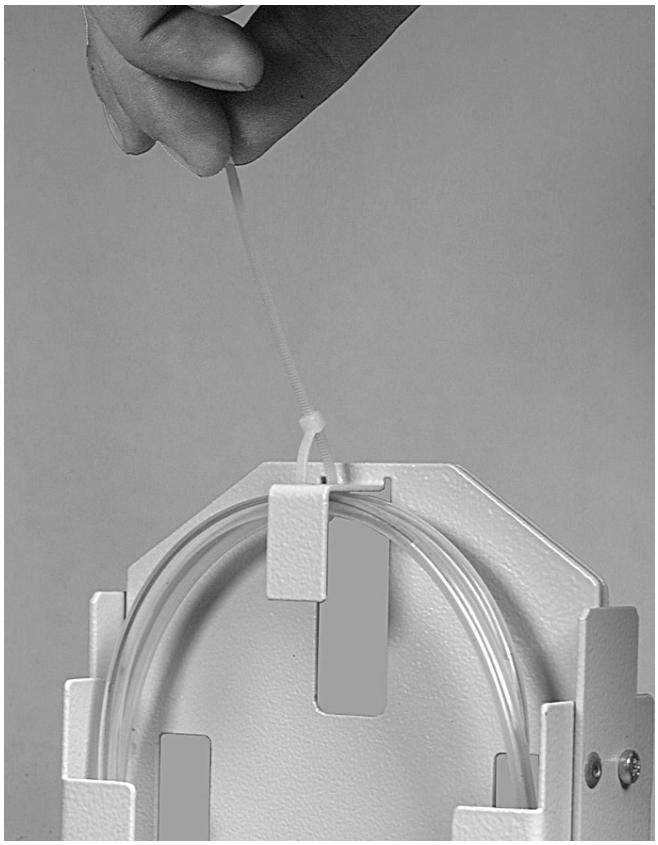
9.3 Install applicable seals (in feedthrough and sealing kit) according to drawing.
Note: Straighten the metal tubes before beginning to install the seal.



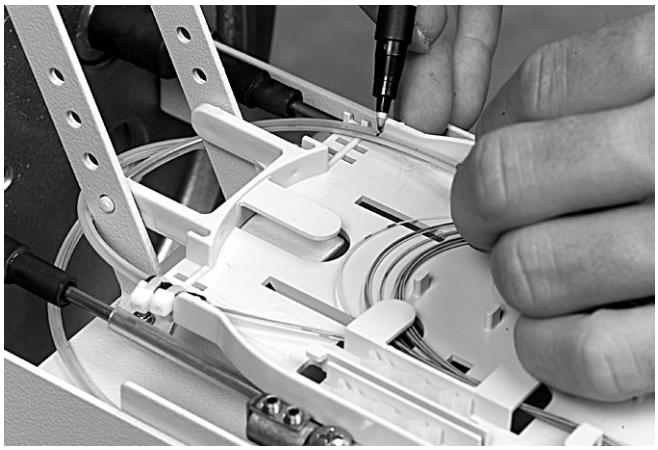
9.4 In case metal tube diameter is > 2.3 mm, cut a transition tube FOPT-CT to a length of 400 mm. Slide the tube ± 100 mm over the metal tube and insert the FOPT-CS ± 100 mm into the FOPT-CT.

In case metal tube diameter is < 2.3 mm, use FOPT-CS and slide it ± 100 mm over the metal tube.

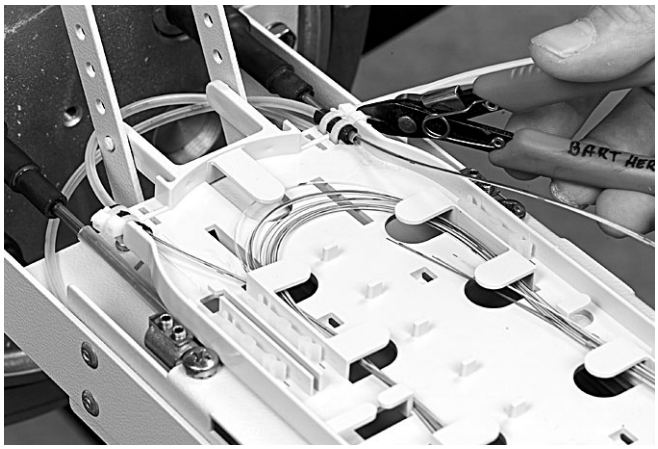
The length of the FOPT-CS depends on the application, overlength needed or not.
Note: A maximum of 12 meter tube can be stored per basket.
On the tray a length of 1.2 meter bare fiber is recommended .



9.5 Fixate all FOPT-CT tubes with tie-wrap to the basket.



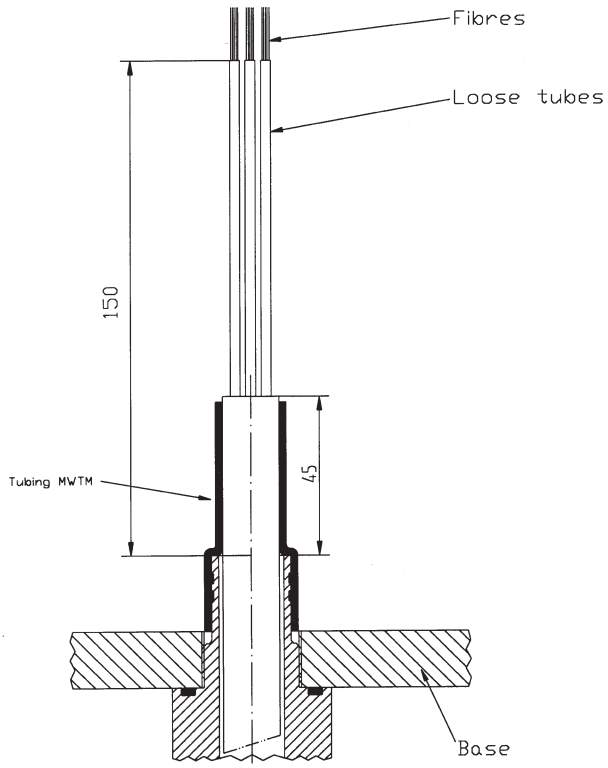
9.6 Route FOPT-CS to designated tray and mark tube at 15 mm from tray end. Carefully cut and remove tube at mark .



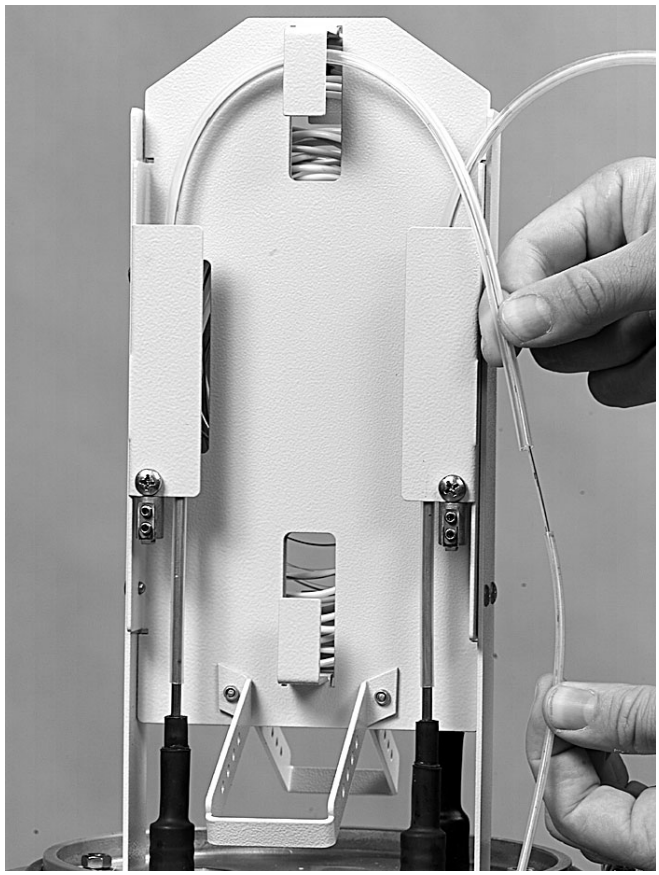
9.7 Wrap foam around tube and secure to tray with two tie-wraps.
Note: When necessary correct routing of the FOPT around the hinge. The FOPT should be ± 10 mm from the hinge bracket.

9.8 For fibre routing on the tray and splicing see point 11.

10 Termination, sealing and routing of plastic sheathed FO cable or OPGW with inner cable jacket and plastic loose tubes with <=24 fibers/plastic loose tube.



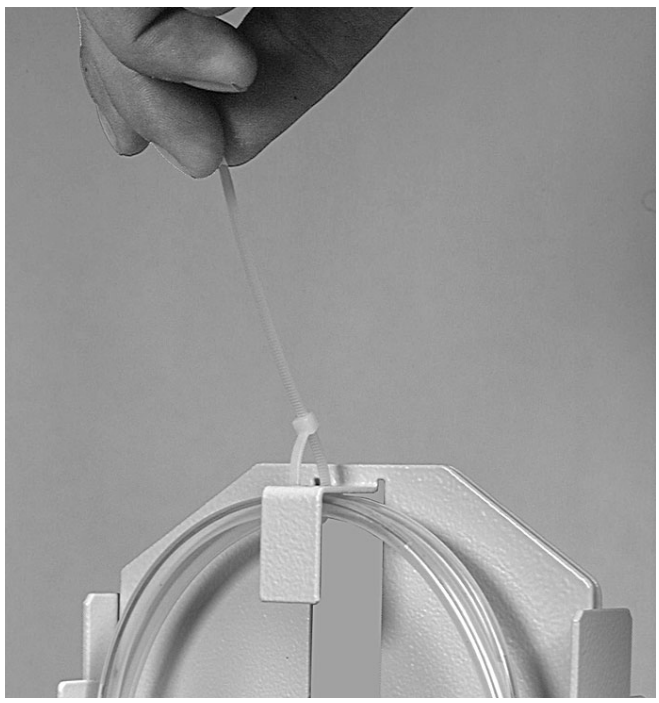
10.1 Strip the loose tubes according to drawing .
Note: When loose tubes are NOT kink sensitive, loose tubes can be routed directly to the appropriate tray.



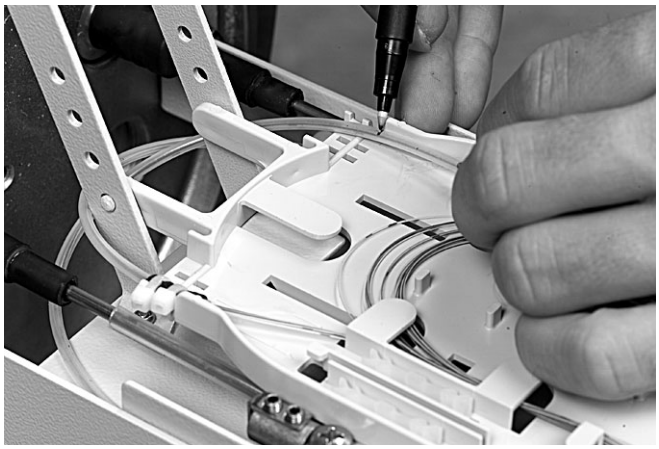
10.2 In case loose tube diameter is > 2.3 mm, cut a transition tube FOPT-CT to a length of 400 mm. Slide the tube ± 100 mm over the loose tube and insert the FOPT -CS ± 100 mm into the FOPT-CT.

In case loose tube diameter is < 2.3 mm, use FOPT-CS and slide it ± 100 mm over the loose tube.

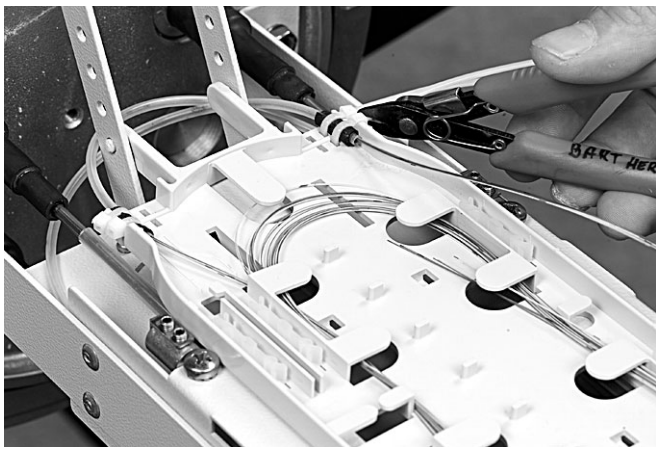
The length of the FOPT-CS depends on the application, overlength needed or not.
Note: A maximum of 12 meter tube can be stored per basket. On the tray a length of 1.2 meter bare fiber is recommended .



10.3 Fixate all FOPT-CT tubes with tie-wrap to the basket.



10.4 Route FOPT-CS to designated tray and mark tube at 15 mm from tray end. Carefully remove tube at mark .



10.5 Wrap foam around tube and secure to tray with two tie-wraps.
Note : When necessary correct routing of the FOPT around the hinge. The FOPT should be ± 10 mm from the hinge bracket.

10.6 For fibre routing on the tray and splicing see point 11.

11 Routing and splicing of fibers

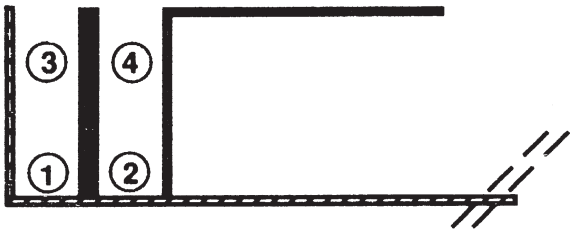
11.1 Splicing

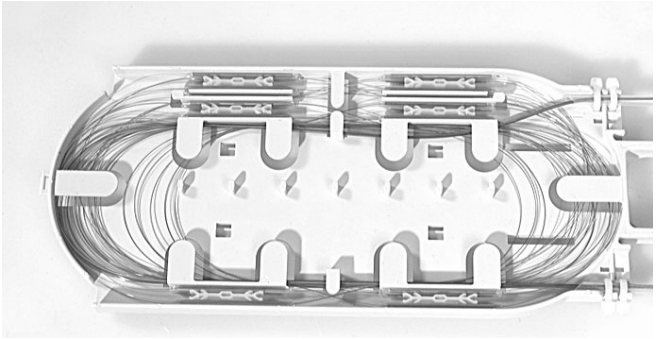
11.1.1 For heat shrinkable splice protectors

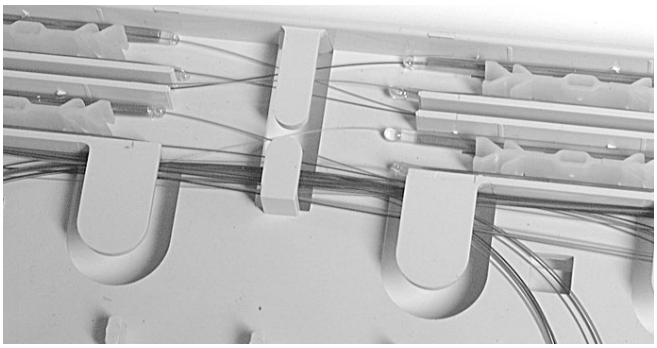
- slide the heat-shrinkable splice protector over one fiber;
- fuse the fibers according to local recommendations and procedures;
- after the fusion splice is made, install the heat shrinkable splice protection (e.g. SMOUV) with appropriate heating source;
- allow the splice protection to cool down to ambient temperature.

11.2 Storage

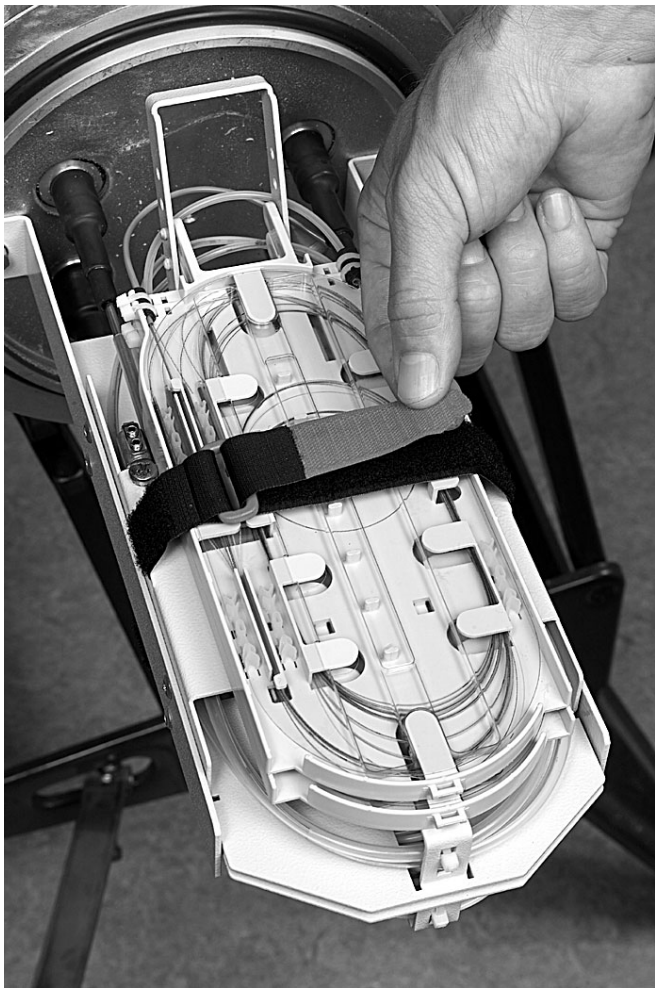
11.2.1 After each splice is made, the splice should be stored in the splice holder. Do not deform the splice during insertion. The fiber slack should be coiled into the tray. Follow the routing as shown.





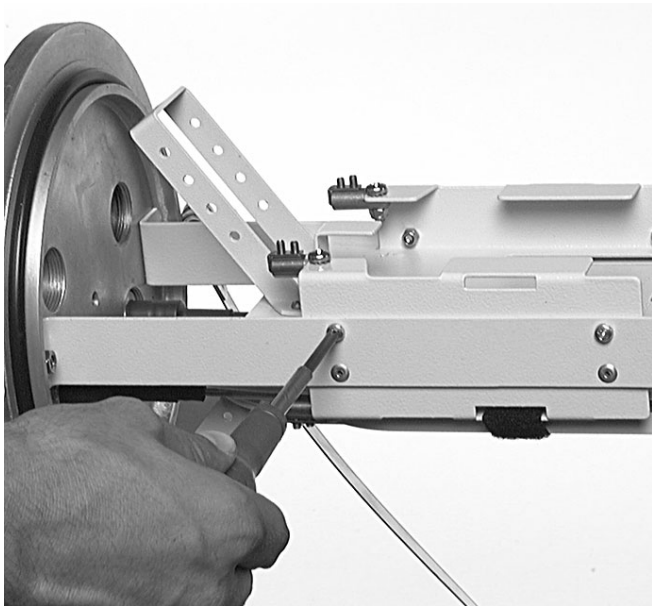


11.2.2 The tray organizer has 6 locations to store splice protectors. Each location can hold maximum 4 fusion splice protectors of type SMOUV-1120-02 (length 45 mm, installed outer diameter is 2.4 mm) or equivalent.
After each splice is made, the splice should be stored as indicated on the drawing. First protector in position 1, the second in position 2. Continue for other fibers. Fiber nr. 5 will be in position 1 of next location.
If splice protectors are stored on the side with the 4 locations, the fibers from the locations on the outside are first guided through the passage between the locations and then coiled into the tray.



11.2.3 Place the cover on the tray and secure the trays with the velcro strap.

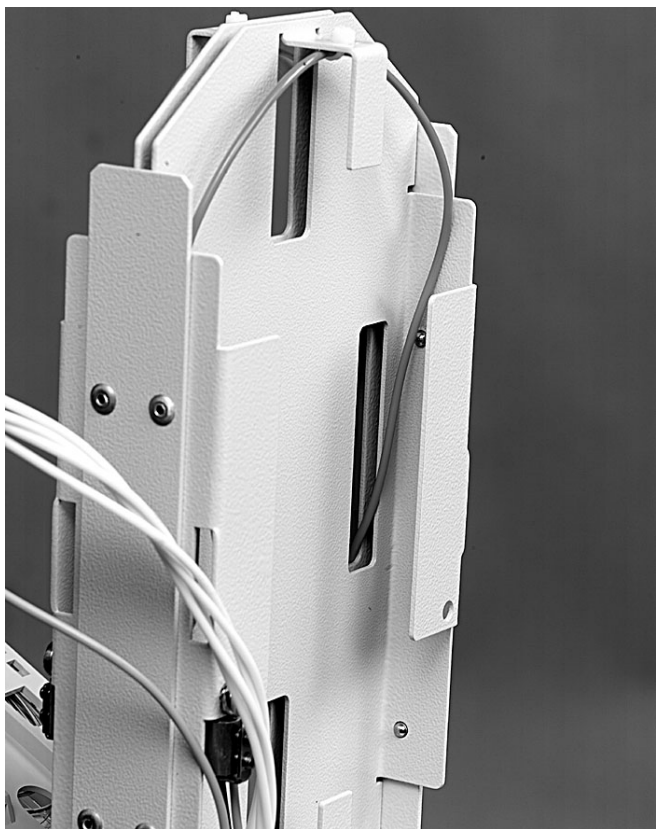
12 Installation of third and fourth cable



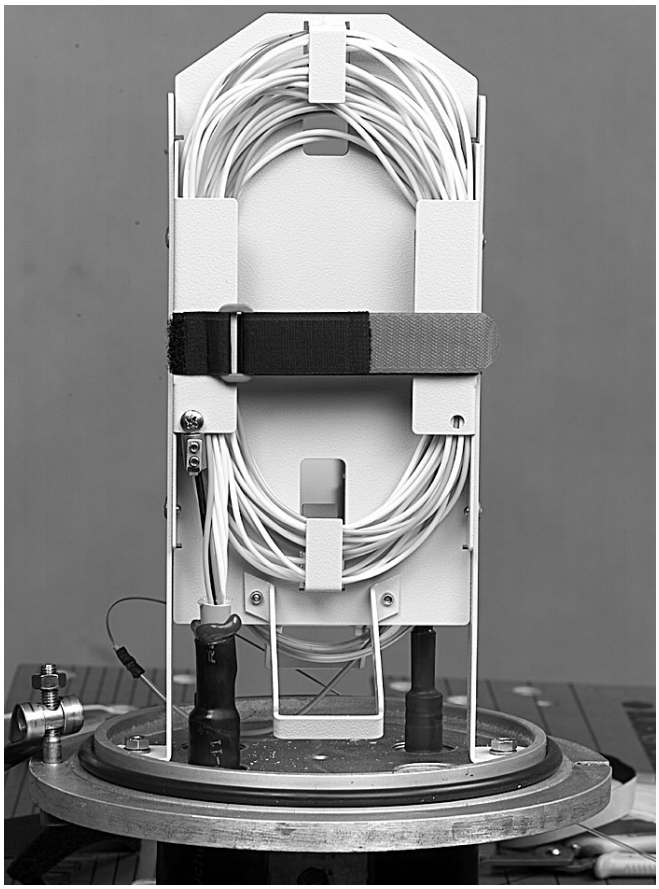
12.1 Install a second basket with 4 screws onto the holders (MCO-BASKET-FOSC-S).

12.2 Install the cable(s) according to the correct procedure (point 4 and 5 or 6 or 7).

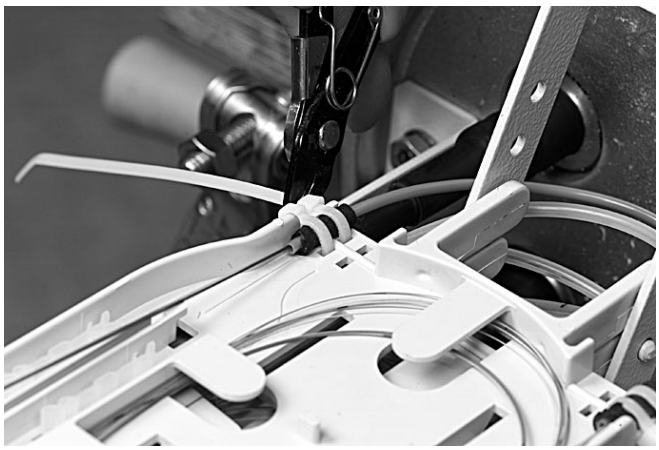
12.3 Terminate, seal and route according to the correct procedure (point 9 or 10).
Note : follow below sequence when the tubes have to be routed to opposite side.



12.4 Route the loose tube or FOPT-CS (when loose tube is too kink sensitive) through one of the middle openings to the other side.



12.5 Not used loose tubes can be stored on this side with a maximum of 12 meter .



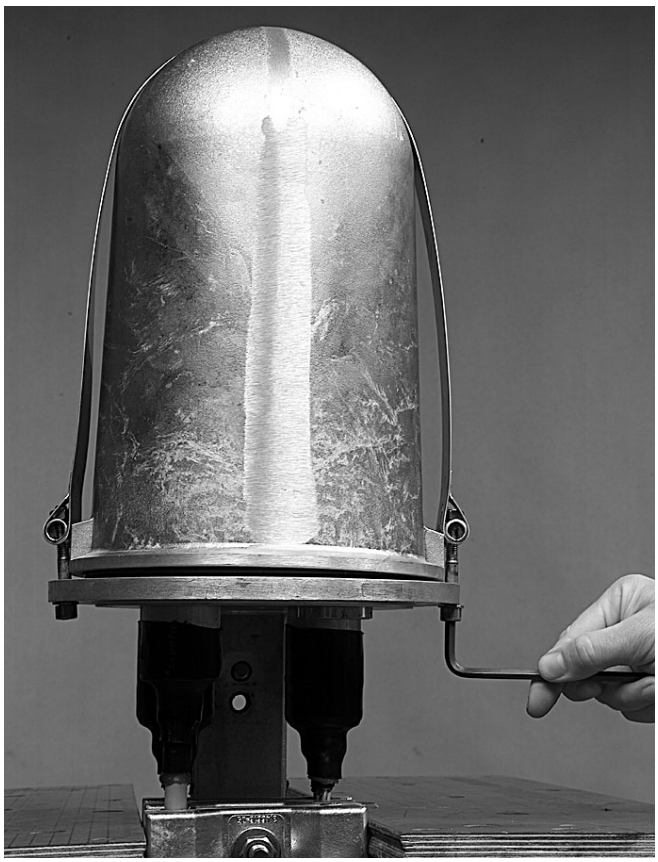
12.6 Route loose tube or FOPT-CS to appropriate tray and mark tube at 15 mm from edge of tray. Wrap foam around loose tube or FOPT-CS and strap it to the tray with two tie-wraps.

13 Closing the closure

13.1 Apply silicone grease on the sealing ring and place it back on the base.

13.2 Place the silicagel at the base.

Note: replace after each re-entry



13.3 Place the dome and secure with the metal strap.

13.4 Bring the closure to its position and attach it.

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