

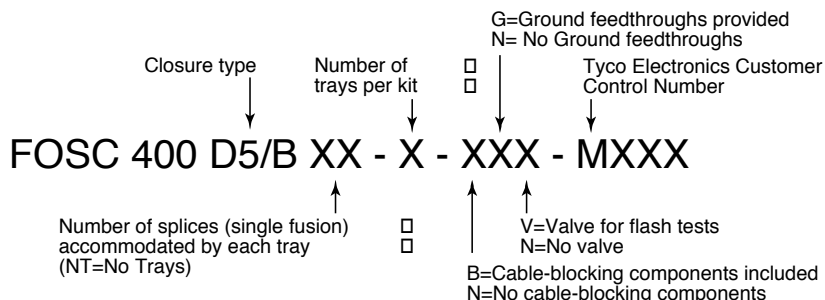
Fiber Optic Splice Closure

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1. General Product Information

The FOSC 400 D5/B closure is a cable closure and splice organizer that combines mechanical seals and heat-shrinkable sleeves with hot-melt adhesives to environmentally seal fiber cable splice points.

The FOSC 400 D5/B closure (henceforth referred to as the "D5/B") is available in several configurations, as described by the kit naming convention shown below:



Cables

The D5 supports a butt splice configuration with one oval cable entry port and five large round cable entry ports. The chart below indicates each port's capacity:

Port	Capacity	Cable Diameter Range (inches)
Oval	2 cables	0.4 to 1.0
Round	1 or 2 cables	0.2 to 1.25

The D5 accommodates cable with any combination of the following characteristics:

Cable Types:

- Loose buffer tube (stranded-fiber)
- Central core tube (stranded-fiber, cable ends only)

Strength Member/Shield Types:

- Dual strength member
- Central member
- Multiple strength member
- Unshielded
- Shielded
- Double-shielded

Fiber Types:

- Single-fiber (250 micron or 900 micron [tight-jacketed])

Splices

The standard D5/B closure will hold up to 12 "B" size splice organizer trays. Each tray holds two splice modules. The chart below indicates tray splice capacity:

Splice Modules	Splices Accommodated	Splices Tray per Tray	Kit
SM6	Mass fusion	12	B Tray 12
	Single fusion (60mm)	12	
	Single mechanical	12	
SM8	Single fusion (40mm)	16	B Tray 16
	Single fusion (60mm)	16	
	Single mechanical	8	
SM12*	Single fusion (40mm)	24	B Tray 24
	Single fusion (60mm)	24	
	NT QPAK	24	

* For SM12, use Raychem SMOUV or fusion splice protectors having a max. recovered diameter of 0.15"

2. Warnings

As with any electrical equipment, various safety precautions should be noted when operating a hot-air gun. Please take note of these warnings:

1. Keep the area clear of all combustible materials and gases, such as gasoline, solvents, and dirty rags. Consult your company-approved practice for procedures to clear and ventilate the work area to avoid the potential for fire and/or explosion.

2. The cleaning tissues provided in the kit are extremely flammable, and should not be exposed to excessive heat or open flame.
3. Do not immerse the hot-air gun in water, as electrical shock could occur.
4. Flash test the closure to no more than 5 psi.

3. Required Tools and Materials

You will need these tools and materials to install B closures:

- AC power source capable of providing at least 1750 watts of power
- FOSC closurework stand (FOSC-ACC-Work Stand (optional))
- Snips and sheath knife
- Buffer tube cutter
- Hot-air gun with tip (FOSC ACC CV 1981)
- Assorted hand tools, such as a hacksaw, screwdrivers, pliers, Crescent wrenches, can wrench
- White marking pencil
- Locally approved cleaning solution
- Tape measure
- Clean, dry cloth

4. Standard Components (Standard Kits Contain one Tray)

The following items are included in D5 Fiber Optic Splice Closure kits:

Basic Components:

- base
- splice organizer tray(s) with dust cover
- velcro strap
- dome
- mechanical dome-to-base seal and O-ring
- closure mounting brackets

Cable Termination Components:

- 1 heat-shrinkable cable seal for the oval port
- aluminum tape
- branch-off clip
- abrasive strip
- cleaning tissues
- bond wires and clamps
- 2 distribution funnels and caps
- 2 heat-shrink tubes for use with funnels
- small transportation tubes
- large transportation tubes
- buffer tube identification labels
- tie wraps
- installation instructions

Cable Blocking Components**:

- yellow adhesive rings
- adhesive foam strips
- clear heat-shrinkable tubes
- abrasive strip
- cleaning tissues

5. General Installation Notes

To ensure the proper performance of the heat-shrinkable sleeves, take note of these precautions:

1. Do not install the heat-shrinkable sleeves at temperatures below -1 °C (30°F).
2. If the cable is wet, dry the cable before installing the heat-shrinkable sleeve. Steam generated during heating will cause gaps in the adhesive, resulting in a faulty seal.

6. Supplementary Kits

The following chart identifies supplementary kits available for use with the D5 closure, and briefly describes their uses.

Kit Name	Usage
FOSC ACC Cable Seal - 1 NT	Cable sealing kit (T=tubular seal) for installing one cable in any round port.
FOSC ACC Cable Seal - 1 BT	Same as above with cable blocking components.
FOSC ACC Cable Seal - 1 NW	Wraparound cable seal (sleeve only) for use on any round port.
FOSC ACC Cable Seal - 2 NW	Wraparound cable seal (sleeve only) for use on any oval port.
FOSC ACC Branch Off Clip	Branch-off clip plus aluminum tape for installing two cables in one port. (Use with FOSC ACC Cable Seal 1-XX kits).
FOSC ACC B Tray 12	B splice tray with 2 SM6 splice modules (12 splices/tray).
FOSC ACC B Tray 16	B splice tray with 2 SM8 splice modules (16 splices/tray).
FOSC ACC B Tray 24	B splice tray with 2 SM12 modules (24 splices/tray).
FOSC ACC TTube Lrge 16"	Large (3/16") transportation tubes, 16" (for 12-fiber loose buffer tubes).
FOSC ACC TTube Sml 16"	Small (5/32") transportation tubes, 16" (for 6-fiber loose buffer tubes and funnels).
FOSC ACC Fiber Ext Grnd	External ground or "FEG" kit to isolate one cable ground through port.
FOSC ACC Aerial Clamps	Clamps for mounting A, B, or D closures to an aerial strand.

7. Installation Instructions

Note: Cable core blocking is optional with D5/B closure kits. If cables are to be blocked prior to installation in a splice closure, ignore the instructions in this section and refer to the instructions on cable preparation included with the cable blocking components. (Use longer bond wire in cable termination components bag when using cable core blocking, not 3" bond wire attached to closure).

7.1 Loose Buffer Tube Cable End Preparation

To prepare the ends of loose buffer tube cable, follow these steps:

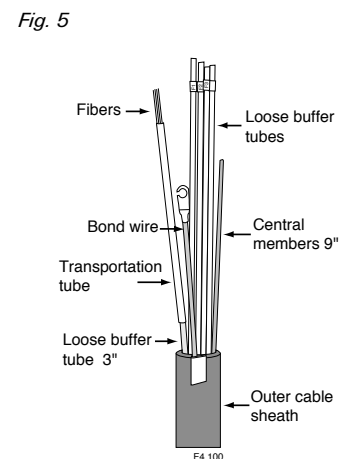
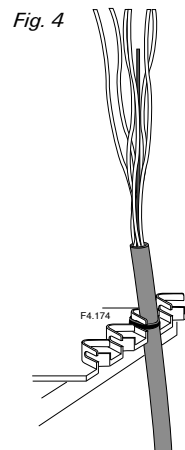
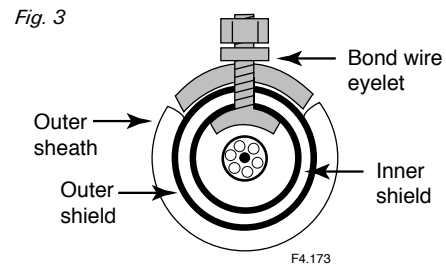
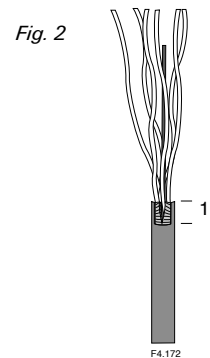
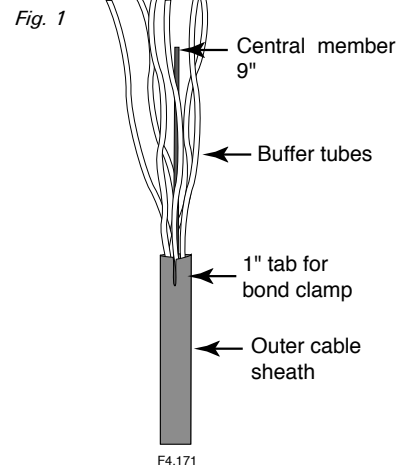
1. Clean the cable and remove 70" of the outer cable sheath and shield if present. Remove the aramid and fiber yarns to the ring cut.
2. Cut central member 9" from the ring cut. (Figure 1)
3. Strip away any insulation present on the central member all the way back to the ring cut.
4. If a shield is present in the cable, tab the cable 1" from the ring cut. Crimp the alligator bond clamp to the tab in the sheath.

Note: If no cable blocking, use 3" bond wire attached to closure. If cable blocking is done, use longer bond wire provided in "Cable Termination Components" bag.

5. If you are using a B-Bond clamp on double-armored cable, remove a 1" square section of the outer cable sheath around the tab. (Figure 2) Slide the lower plate of the bond clamp under the inner shield so that the stud bolt sticks up through the tab. Place the upper plate of the B-Bond clamp over the bolt. Place a double-eyelet bond wire (available in the FOSC ACC bond wire kit) over the bolt. Install the nut on the bolt and tighten it. Cut off the excess stud bolt and file it flush with the nut. (Figure 3)
6. Attach cable end to the FOSC closure work stand using a tie wrap as shown. (Figure 4)

***Note:** When flexible buffer tube cable is used, route the buffer tubes directly to the tray; do not use transportation tubes. Cut the buffer tube at the tray. Otherwise, perform Step 7 and 8.

7. Carefully ring cut and remove all but three inches * of each buffer tube. Clean the remaining buffer tubes, exposed fibers, strength members, and 6" of the cable sheath with a cloth and company-approved cleaning solution. (Figure 5)
8. Install one transportation tube on each buffer tube and slide it down to the sheath ring cut.



Note: Two sizes of transportation tube are provided for six-fiber and twelve-fiber buffer tubes.

9. Wrap cable with vinyl tape from 1" below the bond clamp to 1" past the ring cut to hold transportation tubes in place.
10. Place an identification marker on each transportation tube.

7.2 Loose Buffer Tube Cable-Midspan Opening

1. Clean the cable and remove 108" of cable sheath (and shield, if present).
2. Prepare both sides of the midspan opening as described in Section 7.1, but do not remove buffer tubes from fibers that will be looped, uncut, through the closure. See Section 10.4.6 for buffer tube storage procedures.

7.3 Central Core Tube Stranded Fiber Cable End Preparation

The following procedure describes the use of funnels to distribute fibers to the organizer trays. This closure will not accommodate express or uncut fibers from central core tube cable.

1. Clean the cable and remove 70" of outer cable sheath.
2. If dual strength members (e.g., LXE) or multiple metallic strength members (e.g., crossply) are present: expose each strength member and cut it off 9" from the ring cut. (Figure 6)
3. If multiple non-metallic strength members (e.g., EST) are present: cut them off at the ring cut.
4. If metal shield is present: Remove all but 1" of the metal shield. (Figure 6) Pry open a 1" tab in the exposed metal shield where the shield overlaps. Crimp the bond clamp onto the edge of the shield.
5. Attach the cable to the FOSC closure work stand with a tie wrap. (Figure 4)
6. Cut the central core tube 2-1/2" from the ring cut (1-1/2" beyond the metal shield if present) and remove the excess tube. (Figure 6)
7. Separate the fiber groups and clean the exposed components with a clean cloth and company-approved cleaning solution.
8. Slide the small end of the distributor funnel over the fiber groups, and slide it down over the central core tube.
9. Place one fiber group in each hole of the distributor cap. (Figure 7)
10. Carefully slide the distributor cap down until it seats in the funnel.
11. Place the fibers from each distributor cap hole into a transportation tube, and slide the tube down into the hole. (Figure 8)

Fig. 6

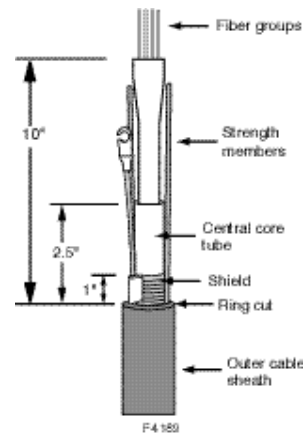


Fig. 7

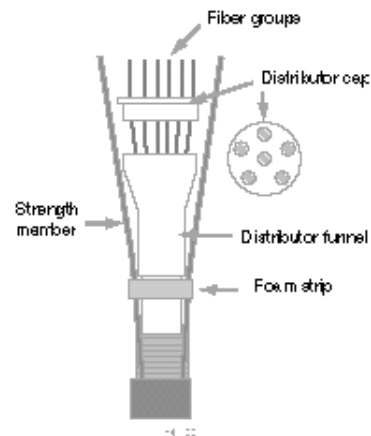
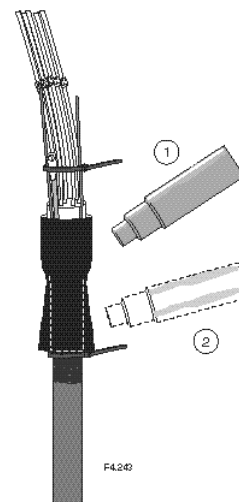


Fig. 8



12. Place an identification marker on each transportation tube. On feeder tubes (in cable), place the markers 6" above the ring cut. On distribution tubes (out cable), place the markers 9" above the ring cut.
13. Place the tie-wrap 1" below the ring cut. Slide the 4"-long black heat-shrinkable tube over the cable components and allow it to rest on the tie wrap. The top of the tube should be roughly 1/2" below the top of the funnel. (Figure 8)
14. Place a tie wrap around the transportation tubes to hold them in place.
15. With the CV1981 on setting 6, begin shrinking the tube around the top of the funnel. After recovering 1" of tube on funnel, pause for 15 seconds to allow the adhesive to set on the funnel. Complete shrinking the tube. (Figure 9)
16. After the tube has cooled, remove the tie wraps.

Fig. 9



Splice Closure Installation Instructions

Figure 10 indicates that the oval port side of the base is the feeder (or in cable) side of the D5/B closure, and the opposite side is the distribution (or out cable) side.

8. Remove Dome/Base Seal

1. Push the handle to the side to release the pin from the notch, then lift the handle. (Figure 11, Step 1)
2. Hook the "feet" of the handle behind the two posts and pry open one half of the clamp. (Figure 11, Steps 2 and 3)
3. Move the handle out of the way and gently tap the other half of the clamp to release it from the dome.
4. Support the dome before removing the clamp. Remove dome and O-ring. Hang O-ring on top of dome.
5. Protect dome from dirt during installation. **DO NOT SIT ON DOME!**

Fig. 10

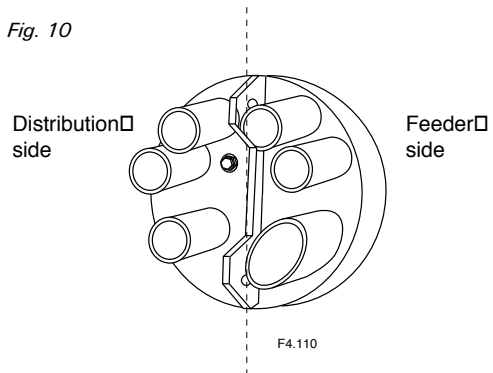
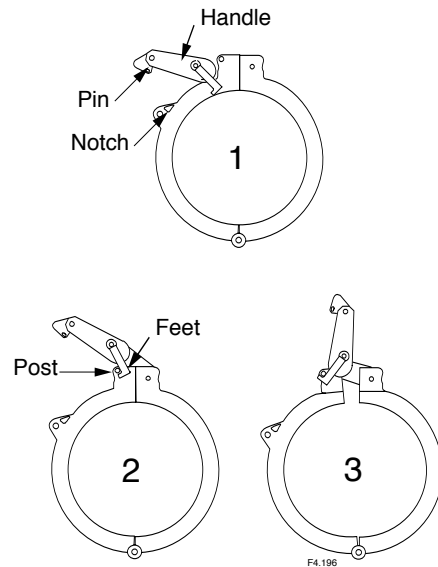
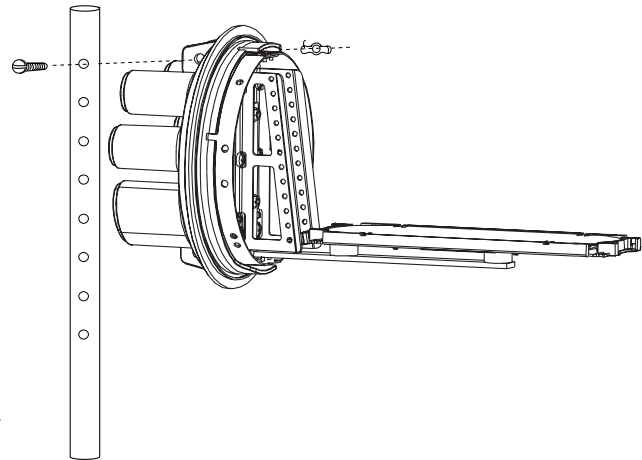


Fig. 11



- Attach the D5/B base to the FOSC Work Stand. (Figure 12)

Fig. 12



9. Install Cables

- Select the appropriate port to open on the D5/B base. These instructions assume that the oval port is selected.

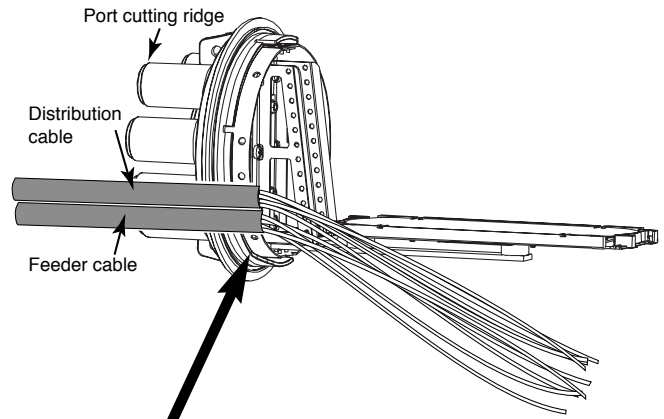
Note: An oval port seal is included with this kit. If you intend to open a round port, you will need one FOSC ACC cable seal 1XX closure kit to seal each opened round port.

- Cut the end off the selected port at the ridge with a hacksaw.

Important: Slide tubular cable port seal over cables before installing cables in the port!!! The arrow on the seal should point at the base. (If you forget this step, you may need to order a wraparound oval port sleeve).

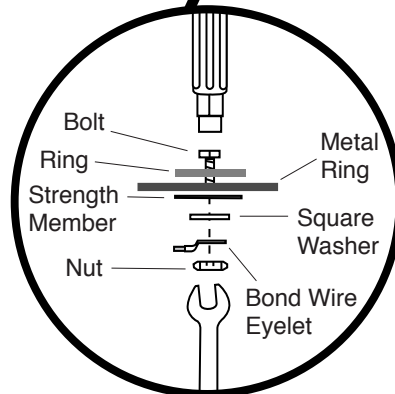
- Insert the cables through the port. For cables installed in the oval port, place the Feeder cable on the bottom, and the distribution cable on the top. (Figure 13). The eyelet on the bond wire should fit under the nut (Figure 13) without bending. (Use 3" bond wire if no cable blocking, 7" bond wire with cable blocking). For dielectric cable, align the sheath ring cut or the end of the cable block with the inside surface of the closure.

Fig. 13



- Align the cable central member with the square washer, and trim the central member 1/4" beyond the edge of the square washer. (Figure 13)
- Place the central member between the square washer and the ring, and tighten the bolt to secure the central member and bond wire against the ring. (Figure 13)

Note: It may be necessary with large central members to place a piece of the member under each side of the washer to keep the washer level.



9.1 Seal Cables in Oval Port

To seal cables in the oval port, follow these steps:

1. Clean the port and 8" of the cable sheath beyond the port edge with the supplied cleaning tissue.
2. Abrade the port and 8" of cable with the supplied abrasive strip, and remove any abraded material from the port and sheath with a clean, dry cloth.
3. Slide the tubular cable port seal up around the port and cable. Be sure that the inside edge of the tube butts against the base. Squeeze the tube down onto the base and place a white pencil mark on the cable at the end of the tube.
4. Slide the tube back off the port.
5. Wrap one lap of aluminum tape around each cable. The edge of the tape closest to the closure should be 1/2" inside the white mark on the cable as shown in Figure 14.
6. Re-install the heat-shrinkable tube, being sure that the edge of the tube butts against the base. (Figure 15)
7. Install the branch-off clip as shown. The clip's base must not touch the tube. (Figure 16)
8. Tie the cables together with a tie wrap 1" beyond the end of the tube. (Figure 16)
9. Using a CV1981 hot-air gun on setting 10, begin shrinking the tube at the end closest to the base of the closure. Direct the air around the tube until the green paint turns black.
10. Continue heating the remainder of the tube as evenly as possible until it has completely conformed to the cable(s).
11. The seal is completely installed when:
 - Melted adhesive appears at the cable end of the tube around the branch-off clip, and
 - All green thermochromic paint on the tube has turned black.

Note: Do not overheat the tube or the closure base.

10. Fiber Organizing and Splicing

10.1 Fiber Routing

1. If multiple trays are present, fill the bottom tray first. Trays can be held in up position with provided "rope" by hooking rope around end of tray and back over mounting tab on base of closure. (Figure 21)
2. Remove the tray cover and route the "feeder" (in) and "distribution" (out) tubes to the appropriate sides of the tray.

Note: If slack or extra lengths of buffer tube required, route as in Fig. 17. If using transportation tubes or short lengths of buffer tube, route tubes directly from cable to tray. Ensure trays can hinge without crimping tubes.

3. Place a pen mark on each tube 1/4" beyond the tie-wrap slots on the trays. Use a buffer tube cutter to cut each tube at the mark, and remove the excess tube from each fiber group. (Figure 17)
4. Secure the transportation tubes or buffer tubes to the tray with two tie wraps as shown. (Figure 18)

Fig. 14

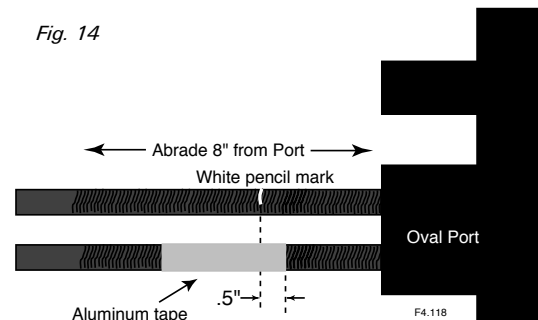


Fig. 15

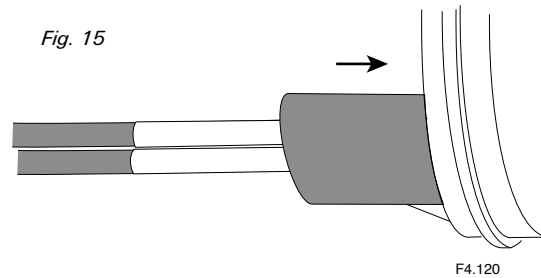


Fig. 16

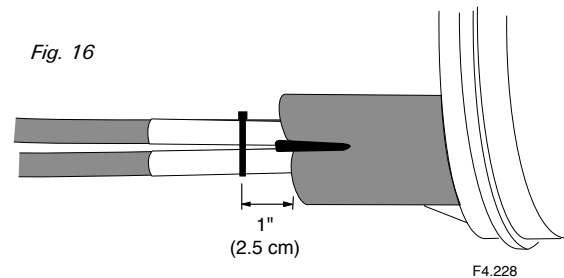


Fig. 17

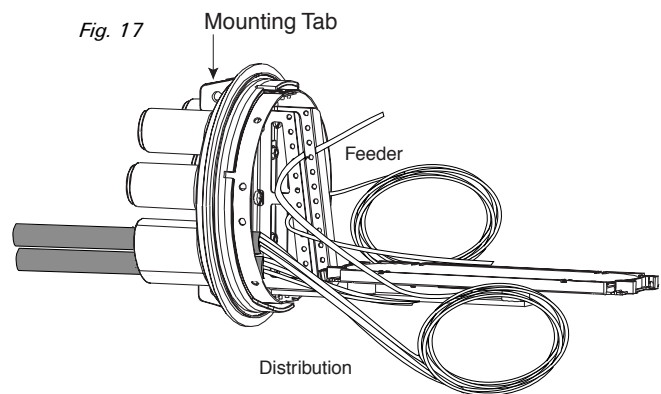
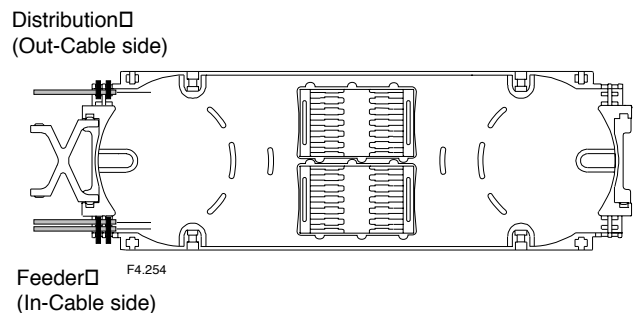


Fig. 18



5. Arrange the fiber around the tray for storage. Replace the tray cover.
6. Repeat Steps 1-5 for each tray until all fiber has been stored on a tray.
7. If there are slack loose buffer tubes to be stored, loop them and store them in the clear plastic "socks" included with this kit. Hold socks in place with velcro strap. (Figure 19)

Note: Two "socks" are provided. One can be located on each side of tray bank as required.

8. Buffer tubes can be routed to opposite side of trays by utilizing pass through area between bottom tray and metal bracket, (Figure 20), or through tray hinge base bracket.

Caution: Make sure the buffer tubes are routed between the plastic spacers and not pinched between the splice tray and spacer.

10.2 Add/Remove Splice Trays

Additional splice trays are available in FOSC ACC B tray kits. To add splice trays, align the tray pins with the holes in the base bracket. Squeeze the tray pins and slip the tray into the base bracket. (Figure 21)

After installing additional splice trays, ensure all of the trays are fully engaged by rotating trays up and down.

To remove splice trays, reverse this procedure. (Use a screwdriver to pry the hinge away from the bracket if necessary.)

10.3 Add Intertray Jumpers

If fiber placed on one tray is to be spliced with fiber from another tray, you must use an intertray jumper to route the fiber to the desired tray. To create an intertray jumper, follow these steps:

1. Place appropriate intertray identification markers on a transportation tube. (Intertray ID markers are marked "1TO" through "4TO" and "1" through "4" to indicate which tray the jumper came from and which tray it is going to.)
2. Thread the desired fibers through the marked transportation tube (now called the intertray jumper).
3. Secure one end of the intertray jumper to the originating splice tray with two tie wraps. If you have to remove existing tie wraps, cut and replace them one at a time to avoid moving existing transportation tubes.
4. Guide the jumper behind the tray hinge base bracket to the appropriate destination tray and position it in the tray.

Fig. 19

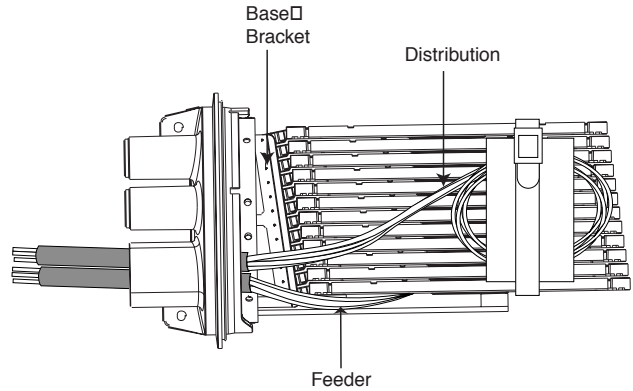


Fig. 20

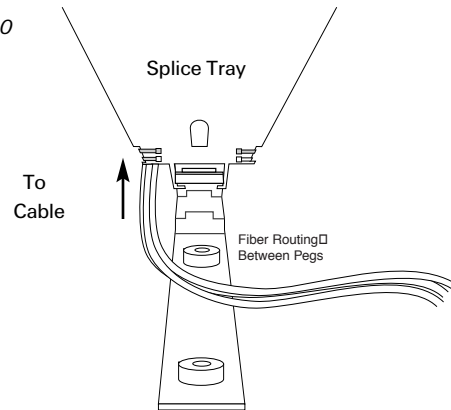
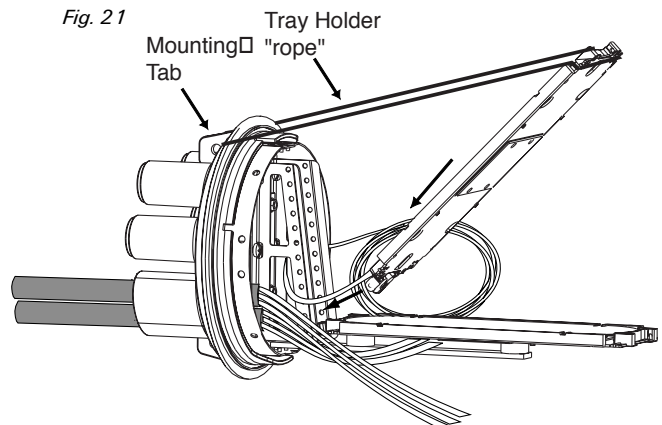


Fig. 21



- With a pen, mark the jumper 1/4" beyond the tie wrap slot. Use the buffer tube cutter to cut the jumper at the mark, and secure the jumper to the splice tray with two tie wraps. The fibers may now be pushed through the tube.

10.4 Splice Fibers and Store on Trays

Fiber splicing should be done in compliance with company-approved practices. This section outlines some basic splice organizing techniques to be followed with "B" trays:

- Always begin splicing with the bottom tray. Lift the remaining trays and secure them in place using the tray holder "rope". (See 10.1.1 and Figure 21)
- Remove all stored, unspliced fibers from the tray and clean those that will be spliced. Refer to the splice manufacturer's instructions for directions on fiber splicing.

Note: Protect and strain-relieve fusion splices with fusion splice support sleeves or similar company-approved devices. It is not necessary to use silicone or similar compounds to secure the fibers in the splice holders.

- Insert splices in the "top" and "bottom" splice modules and store slack fiber on the trays as shown in Figure 22 and 23. Install tray tabs if required. (Figure 24) (4 per tray)
- When all splices are completed and stored, replace the tray cover.
- Secure all trays to the bottom tray bracket with Velcro strap as shown. (Figure 24)
- Store the sock containing the loose buffer tubes (if present) alongside the trays as shown in Figure 25, and hold in place with the Velcro strap.
- Ensure tray holder "rope" is also stored under Velcro strap.

Fig. 22

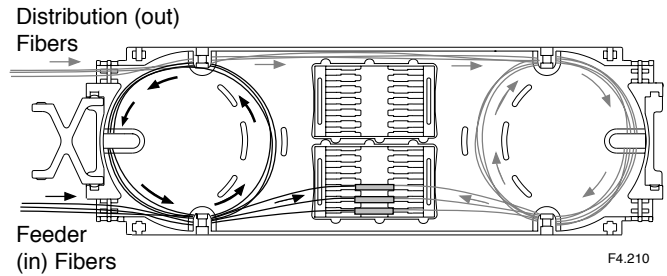


Fig. 23

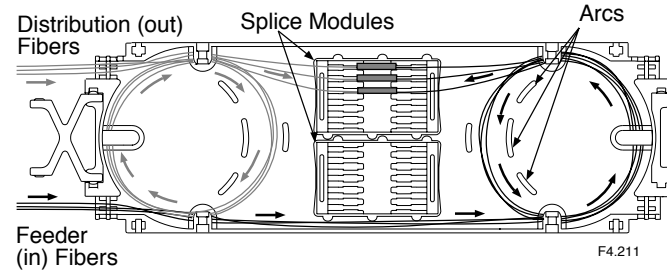


Fig. 24

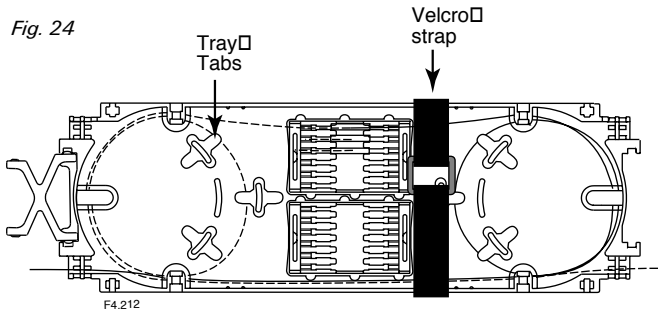
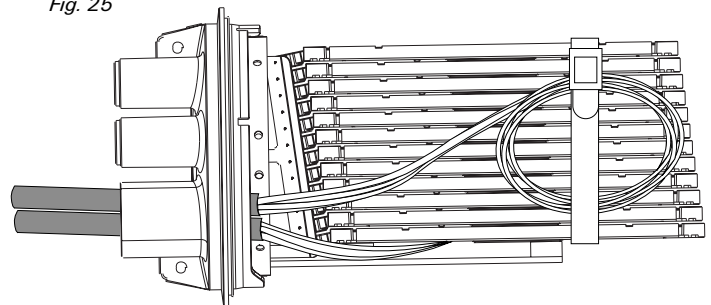


Fig. 25



11. Closing and Mounting Closure

11.1 Install Dome

1. If desiccant is to be used (optional - not supplied), install at least 100 grams of desiccant on top of the uppermost splice organizer tray. Secure it in place with the supplied Velcro strap.
2. Clean the O-ring and the O-ring seating area with a clean, dry cloth. Use clean water or alcohol wipe if necessary. Sealing surfaces must be free of contaminants such as cable grease, cable threads, fibers, dirt, and dust. Inspect for damage. Re-install the O-ring.
3. Align arrows and mount dome on base. Install clamp around the base/dome interface.
4. Position feet of handle in front of the two posts and push down on the handle to pull the two halves of the clamp together. (Figure 26, Steps 1-3)
5. Continue to push handle down until the small pin on the handle snaps into the triangular hole in the clamp. (Figure 26, Step 4)
6. A security lock or tie wrap can be inserted through the round holes in the handle and clamp to lock the closure.

11.2 Test Seals

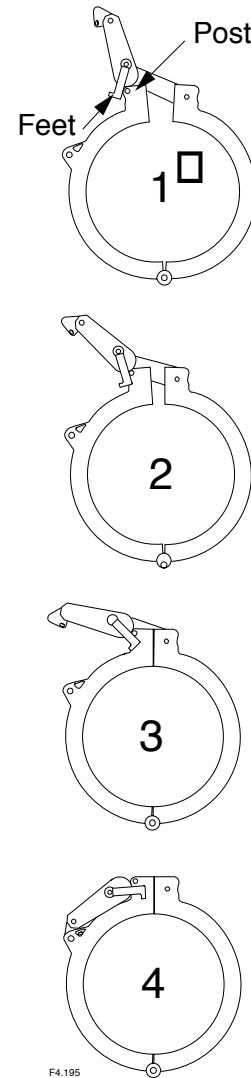
Ensure that all heat-shrinkable parts are cool to the touch. Pressure-test the closure with no more than 5 psi. Thoroughly soap all seals and the valve to check for seal integrity.

Important: After flash testing, bleed all pressure from the closure through the valve.

11.3 Mount Closure

Metallic or plastic lashing straps can be placed around the dome to hold closure in place. Optional accessories include the FOOSC ACC lashing strap and FOOSC ACC aerial clamp kits.

Fig. 26



CommScope Inc.

Patents:

<http://www.commscope.com/>

[ProductPatent/ProductPatent.aspx](http://www.commscope.com/ProductPatent/ProductPatent.aspx)

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