

Installation Guidelines - – HELIAX® FiberFeed® Solutions

Fiber/Copper Cables: HFT1206 Low Inductance | HFT406 Low Inductance | HFT412

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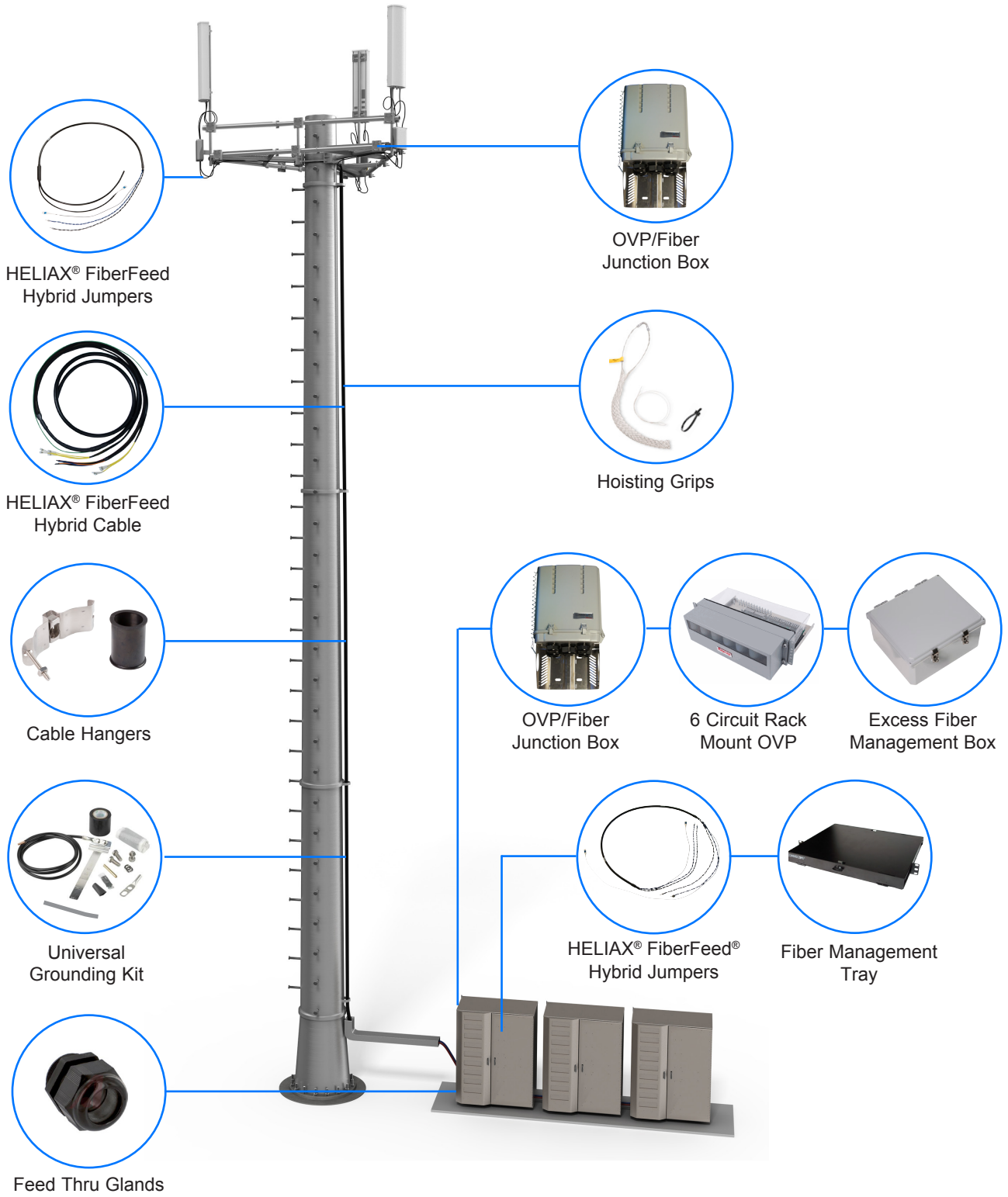
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For more information, Contact Customer Service Center

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HELIAX® FiberFeed® Verizon System Components



**WARNING:** CommScope Hybrid FiberFeed cables require the use of approved installation accessories.

## General Specifications

Cable Type	HFT1206-24SVL-XXX	HFT406-8SVL-XXX
Rating	UL Type RHC	UL Type RHC
Center Conductor Gauge	6 AWG	6 AWG
Conductors, quantity	12	4
Total Fiber Quantity	24	8
Shielding Type	Corrugated aluminum	Corrugated aluminum
Fiber Type	Bend insensitive single mode	Bend insensitive single mode
Alarm Wire (Qty   Gauge)	18   18 AWG	10   18 AWG

## Dimensions

Cable Weight	1.918 lb/ft	.68 lb/ft
Diameter Over Jacket	1.71 in	1.34 in
Breakout Length, Fiber, end 1	39 in, 37 in, 35 in	21 in, 23 in
Breakout Length, Power, end 1	15 in, 12 in, 9 in	11 in, 8 in
Breakout Length, Fiber, end 2	39 in, 37 in, 35 in	47 in, 49 in
Breakout Length, Power, end 2	29 in	24 in

## Physical Specifications

Minimum Bend Radius, loaded	34.2 in	26.8 in
Minimum Bend Radius, unloaded	20.5 in	9.38 in
Tensile Load, long term, maximum	450 lbf	100 lbf
Tensile Load, short term, maximum	1500 lbf	300 lbf

## General Specifications

Cable Type	HFT412-2SXX-XX	HFT412-4SXX-XX
Rating	UL Type TC-OF-ER	UL Type TC-OF-ER
Center Conductor Gauge	12 AWG	12 AWG
Conductors, quantity	4	4
Total Fiber Quantity	2	4
Shielding Type	Corrugated aluminum	Corrugated aluminum
Fiber Type	Bend insensitive single mode	Bend insensitive single mode

## Dimensions

Cable Weight	.220 lb/ft	.220 lb/ft
Diameter Over Jacket	.62 in	.62 in
Breakout Length, Fiber, end 1	various	various
Breakout Length, Power, end 1	various	various
Breakout Length, Fiber, end 2	various	various
Breakout Length, Power, end 2	various	various

## Physical Specifications

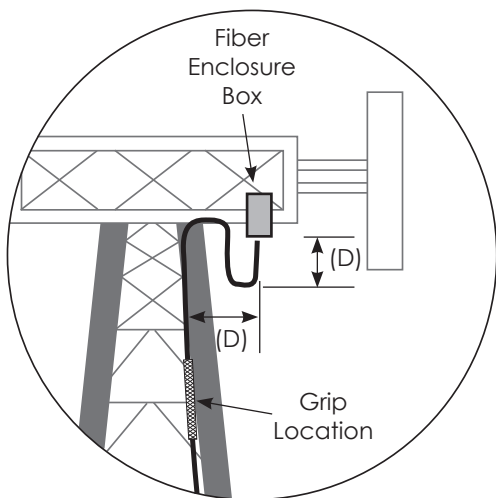
Minimum Bend Radius, loaded	12.4 in	12.4 in
Minimum Bend Radius, unloaded	6.2 in	6.2 in
Tensile Load, long term, maximum	90 lbf	90 lbf
Tensile Load, short term, maximum	300 lbf	300 lbf

## HELIAX® FiberFeed® Trunk Cable Hoisting Considerations

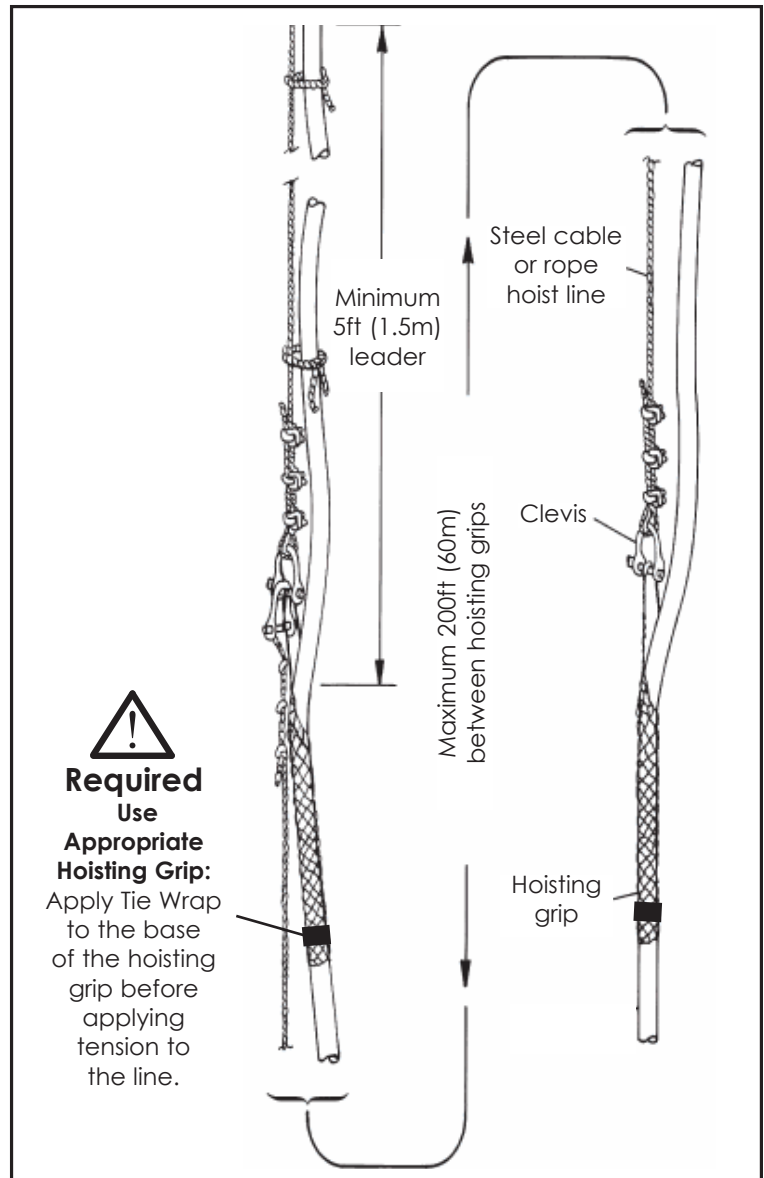
- In general this cable will handle similarly to coaxial cable, and similar installation techniques apply. All cables are individually serialized, be sure to write down the cable serial number for future reference.
- The terminated fiber ends (the broken out fibers plus connectors) however are fragile, and these must be protected during the installation process.
- Leave the protective tube and sock around the fiber tails and connectors in place during hoisting and securing the cable. Remove this only just prior to making the final connections to the Junction box.
- DO NOT BEND THE FIBER ENDS (in the furcation tubes) TIGHTER THAN 1.2 in (30 mm) BEND RADIUS ELSE THERE IS A RISK OF BREAKING THE GLASS FIBERS.
- Be sure that the lace up ends and fiber connectors are not damaged by attachment of a hoisting grip or during the hoisting process. Attach a hoisting grip on the jacketed cable no less than 6" below the fiber breakout point. If a hoisting grip is not easily attached, use a simple line attached below the fiber break-out point (i.e. at the cable outer jacket). Prevent the fiber tails (in protective tube) at the cable end from undue movement during hoisting by securing the protective tube (with outer sock) to the hoisting line.
- During hoisting ensure that there is a free path and that the cable, and especially the fiber ends, will not be snagged on tower members or other obstacles.
- Installation temperature range is -22F to 158F
- Minimum cable bend radii can be found in this document or on-line.
- Maximum cable tensile load can be found in this document or on-line.
- **CommScope Lace-Up Hoisting Grip 19256B-C required for 406 installations.**
- **CommScope Lace-Up Hoisting Grip 29961-C required for 1206 installations.**
- **Maximum hanger spacing 3ft (0.9m) - 4ft (1.2m)**

⚠ **Hybrid Fiber Cables weigh more than traditional coaxial cables. Be sure to follow proper hoisting and attachment procedures.**

### Hoisting Recommendations



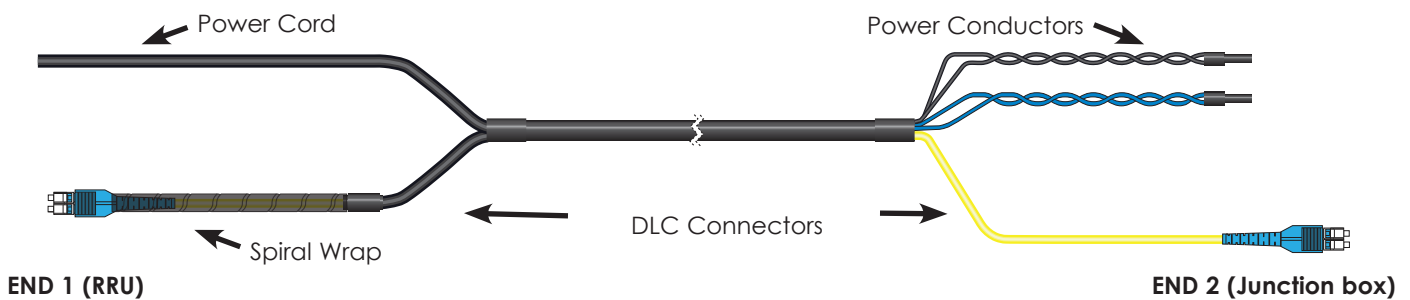
**Reminder:** Plan grip location by measuring distance (D) from Fiber Enclosure Box to tower support member.



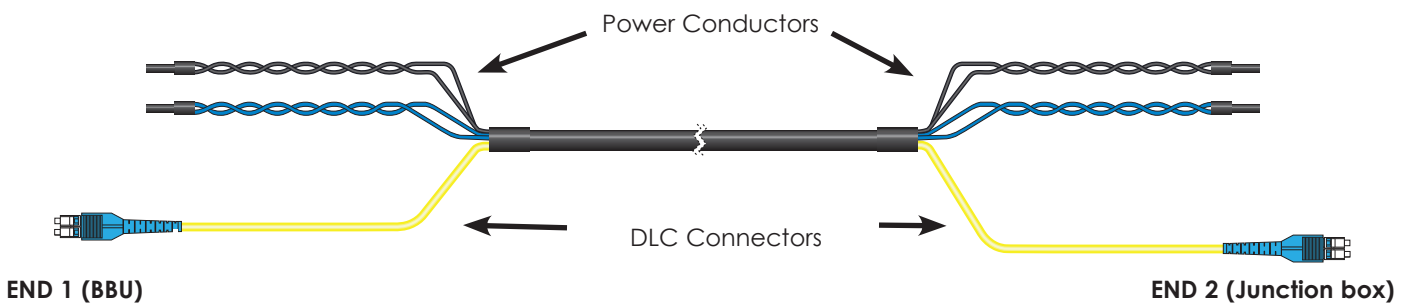
## HELIAX® FiberFeed® Jumpers

- In general this cable will handle similarly to a coaxial cable.
- The terminated fiber ends however are fragile and must be protected during installation. Leave the packaging around the fiber ends in place until ready to connect the jumper between OVP box and RRU or BBU.
- DO NOT BEND THE FIBER ENDS (in the furcation tubes) TIGHTER THAN 1.2 in (30 mm) BEND RADIUS ELSE THERE IS A RISK OF BREAKING THE GLASS FIBERS.
- Attach the main cable securely to the structure or equipment using hangers and/or cable ties to prevent strain on connections from movement in wind or snow / ice conditions.
- Ensure the DLC fiber connectors are seated firmly in the OVP box, RRU or in BBU equipment.
- Ensure the weatherproof boots for both fiber and power connections and seated firmly in the RRU.
- Heat shrink tube of the jumper should be 1 in (25.40 mm) inside of the OVP box.
- Installation temperature range is -22F to 158F (-30C to 70C).
- Minimum cable bend radii can be found in this document or on-line.
- All jumpers are individually serialized, for immediate access to test results visit [www.commscope.com/webtrak/](http://www.commscope.com/webtrak/)
- Power connector is supplied with the RRU
- Blue power conductor is -48V
- Black power conductor is 0V (return)
- RRU/BBU connectivity per OEM instruction

### HFT412-2S28 Hybrid tails, 2 Fiber - RRU to 2-OVP Box HFT412-2S29 Hybrid tails, 2 Fiber - RRU to 6-OVP Box



### HFT412-2S27 Hybrid tails, 2 Fiber - BBU to 2-OVP Box



## Breakout Procedure

After the trunk cable has been installed and you are ready to make the final connection to the OVP box follow these steps for the removal of fiber protection tube.



Remove electrical tape from the trunk cable and corrugated protection tube. While holding the protection tube straight pull the tube away from cable.

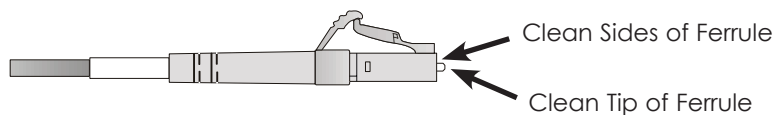


After you have pulled the fiber and power conductors into the OVP box remove electrical tape from the trunk cable and remove clear tube for access to all optical connectors.

## DLC Connectors and Adapter cleaning

Clean exposed connector ferrule by lightly moistening lint-free wipe with fiber optic cleaning solution (or >91% isopropyl alcohol), and by applying medium pressure, first wipe against wet area and then onto dry area to clean potential residue from end face. Clean connector ferrule inside adapter by inserting lightly moistened cleaning stick with fiber optic cleaning solution (or >91% isopropyl alcohol) inside the adapter until contact is made with connector on opposite end. Rotate cleaning stick with medium pressure in one circular motion as it is pulled away from the adapter. Repeat process using dry cleaning stick.

**Caution:** Signal strength will be affected if end and sides of ferrule are not thoroughly cleaned. Discard cleaning sticks after each use. Do not turn cleaning sticks back and forth pressing against connector end face. This may cause scratches if large contamination is present. Always inspect connector end face for contamination after each cleaning.



Clean adapter by inserting adapter cleaning stick (or fiber adapter sleeve brush) moistened with fiber optic cleaning solution (or >91% isopropyl alcohol) inside the adapter and gently pull out with twisting motion. Repeat process with a dry cleaning stick.

**Caution:** Do not try to clean adapter with a standard pipe cleaner. The sleeve inner diameter of DLC adapters is too small. Do not try to clean the adapter with cleaning stick if a connector is mounted in one side. Discard cleaning sticks after each use.

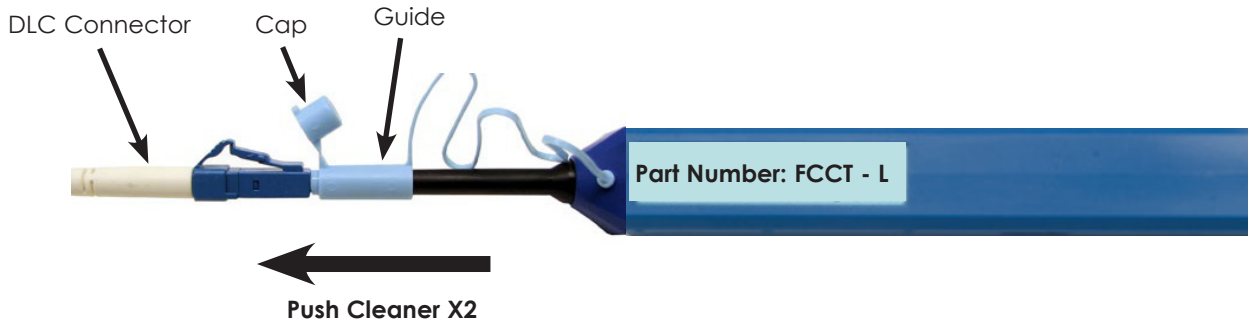


**All-in-one cleaner**

Device designed for cleaning the ferrule end faces of DLC connectors

Open guide cap, insert DLC connector into guide, push the outer shell to start cleaning the DLC connector interface, a "click" sound indicates end of a cleaning process, repeat, close cap immediately after use.

**Caution:** Be careful not to slant DLC connector while inserting into the Guide cap. Do not overly exert force during insertion as this may cause damage to both the connector and the cleaner.



**Inspecting**

There are 3 basic principles that are critical to achieving an efficient fiber optic connection:

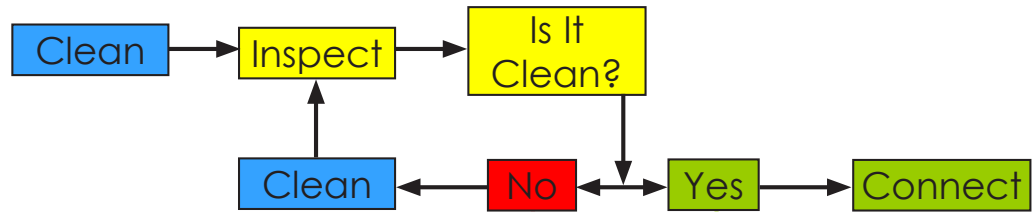
1. Perfect Core Alignment
2. Physical Contact
3. Pristine Connector Interface

Today's connector design and production techniques have eliminated most of the challenges to achieving core alignment and physical contact. What remains challenging is maintaining a pristine end-face. As a result, CONTAMINATION is the #1 reason for troubleshooting optical networks.

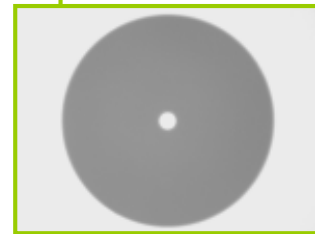
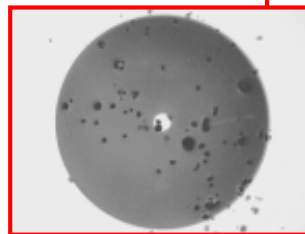
**Implementing the process of cleaning and inspecting before mating can reduce the time spent troubleshooting, optimize signal performance and prevent damage.**



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**Abrasive particles (i.e. rock dust) can cause permanent damage to the interface. If interface is scratched it cannot be repaired, it would need to be replaced.**



## OVP Identification

Part Number	Description	Excess Fiber Storage
RC3DC-3315-PF-48*	Distribution box with 6 Strikesorb modules	55 ft
RC3DC-4750-PF-48*	Distribution box with out Strikesorb modules	55 ft
RC3DC-1064-PF-48*	Sector box with 2 Strikesorb modules	45 ft
RCMDC-2260-RM-48*	6 circuit rack mount OVP	N/A



Note: \*

RC3DC-XXXX-PF-48 couples with HFT series cables (accommodates expanded alarm wire pairs)

## Gland Installation

At the base of the OVP boxes there are glands that provide weatherproofing for the enclosure. The following steps will show how to install the Hybrid cable properly. **Review the instructions that are with the Raycap unit for proper gasket selection.**

**1**

Remove compression nut

**2**

Pull out center gasket

**3**

Slide compression nut over breakout, compress gasket to slide over breakout. Leaving protective polly tubing on will simplify this procedure. Be careful not to damage the fiber connectors.

**4**

1 in  
25.4 mm

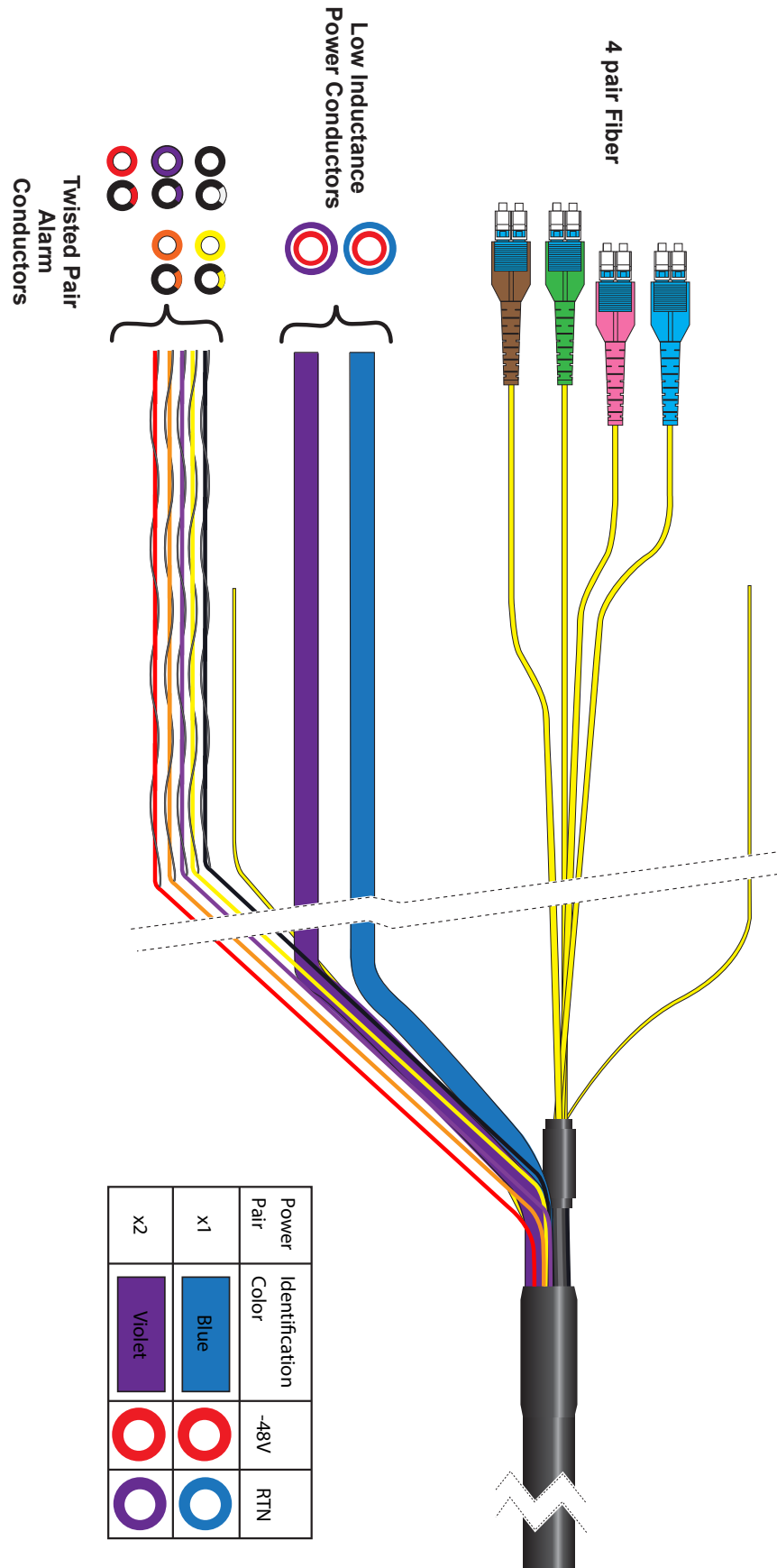
Gasket needs to be 1 in behind heat shrink tube.

**5**

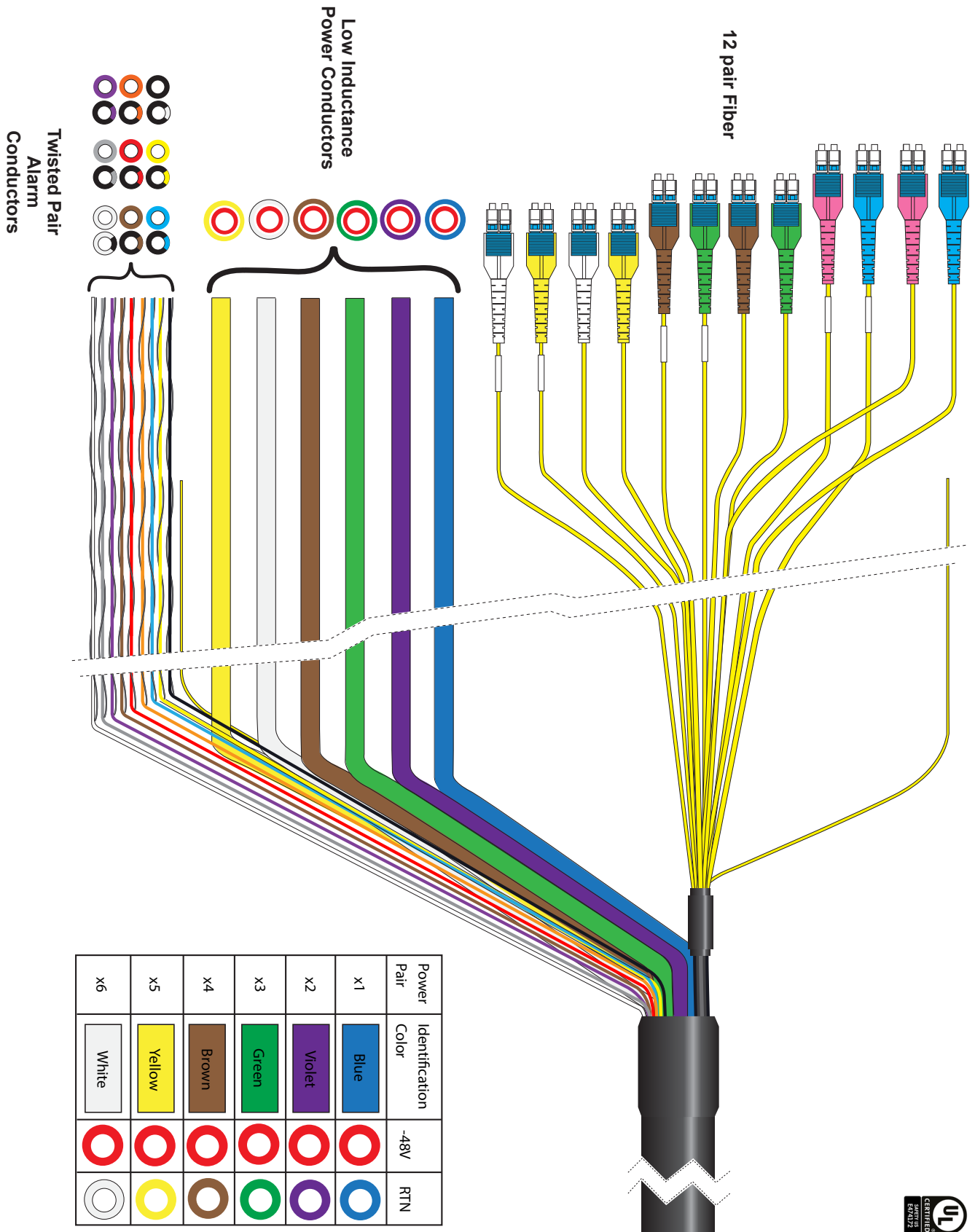
Carefully feed fiber and power conductors into the OVP box and tighten the compression nut.



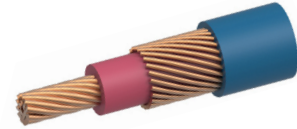
## Color coding (2 X 4 shown)



## Color coding (6 X 12 shown)

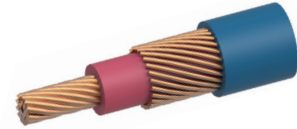


## Low Inductance Boot Installation (Box OVP / RRU end)



<p><b>1</b></p> <p>5 1/2 in (139.7 mm)</p> <p>With a cable stripping tool or knife remove 5 1/2 in (139.7 mm) of outer jacketing. DO NOT nick the copper wires; this may cause a voltage drop at the RRU.</p>	<p><b>2</b></p> <p>Separate the bare copper wires and the red insulated copper wire by following the natural cable twist.</p>
<p><b>3</b></p> <p>Use a pair of lineman pliers to twist the bare copper wires together to create a tight bundle to the cable jacketing. Trim copper braid flattened by pliers with compact cutters to have a rounded end.</p>	<p><b>4</b></p> <p>Slide boot over both conductor ends with long portion covering the bare copper.</p>
<p><b>5</b></p> <p>1/2 in (12.7 mm)</p> <p>1/2 in (12.7 mm)</p> <p>Use a pair of compact cutters to cut the bare copper wires to a length of 1/2 in (12.7 mm) from the end of the boot. Cut the red conductor to a matching length. Using a cable stripping tool or knife remove 1/2 in (12.7 mm) of jacketing from the red insulated copper wire.</p>	<p><b>6</b></p> <p>Wire is ready to install into the OVP.</p>

## Low Inductance Boot Installation (Rack mounted OVP / BBU end)



<p><b>1</b></p> <p>5 1/2 in (139.7 mm)</p> <p>With a cable stripping tool or knife remove 5 1/2 in (139.7 mm) of outer jacketing. <b>DO NOT</b> nick the copper wires; this may cause a voltage drop at the RRU.</p>	<p><b>2</b></p> <p>Separate the bare copper wires and the red insulated copper wire by following the natural cable twist.</p>
<p><b>3</b></p> <p>Use a pair of lineman pliers to twist the bare copper wires together to create a tight bundle to the cable jacketing. Trim copper braid flattened by pliers with compact cutters to have a rounded end.</p>	<p><b>4</b></p> <p>Slide boot over both conductor ends with long portion covering the bare copper.</p>
<p><b>5</b></p> <p>9/16 in (14.29 mm)</p> <p>9/16 in (14.29 mm)</p> <p>Use a pair of compact cutters to cut the bare copper wires to a length of 9/16 in (14.29 mm) from the end of the boot. Using a cable stripping tool or knife remove 9/16 in (14.29 mm) of jacketing from the red insulated copper wire.</p>	<p><b>6</b></p> <p>Attach blade lugs and the wire is ready to install to the OVP.</p>

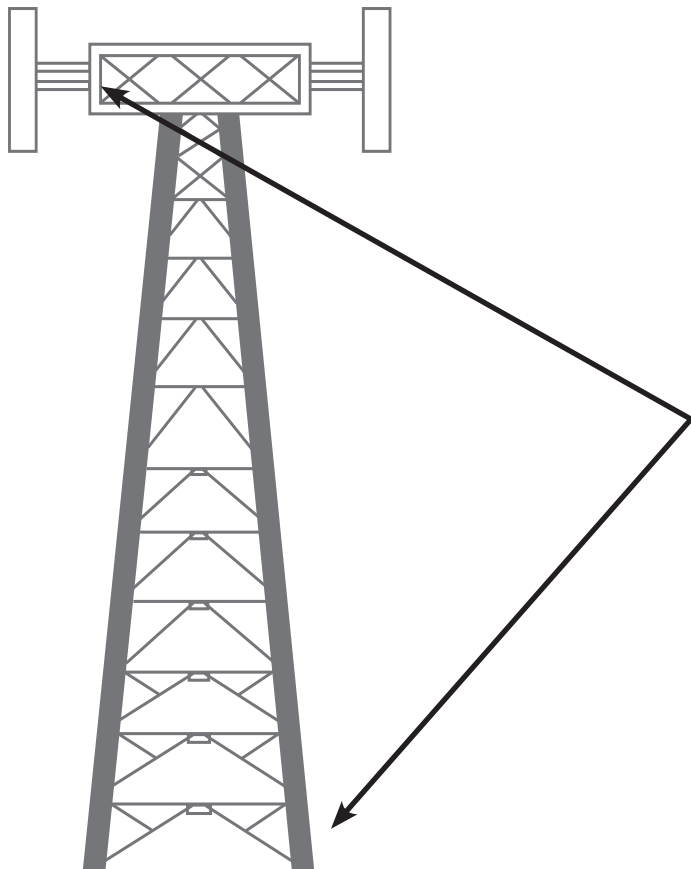
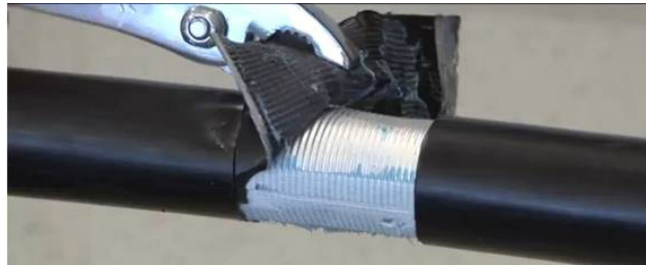
## Grounding

### Removing Jacketing for Grounding Kit installation

1. Score the jacketing 360°
2. Measure 2 in (51 mm) and repeat
3. Identify where the aluminum shielding overlaps, this will feel like a flat spot in the cable
4. With a knife flat on the cable remove a section of jacketing between score marks
5. Lift edge of jacketing with knife tip
6. Grab lifted edge of jacketing with a pair of pliers and roll on the cable
7. Remove excess adhesive with a piece of emery cloth



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view video



Ground Kit UG12158-15B4-T is a universal solution for all HFF trunk cables.

Only use Tin Plated grounding kits



Ground kits required at the top and bottom before entering the shelter / cabinet

## Excess Cable Management

If length of cable installed needs to be adjusted you can split the cable at the BBU end using the process below and then coiling the excess fiber subunits in a storage box. Fiber management trays are available to manage any excess fiber length in the breakouts at the BBU.



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Cable Splitter tool  
Part Number:  
FA-RCRT-PD



Excess Fiber storage Box  
Part Number:  
FE-14126-E





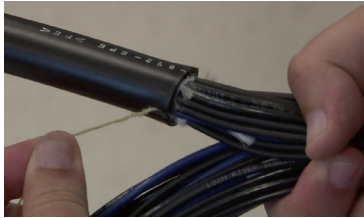

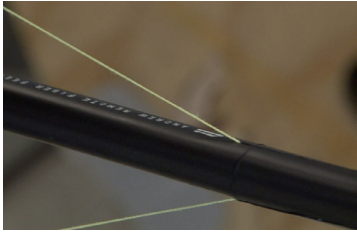
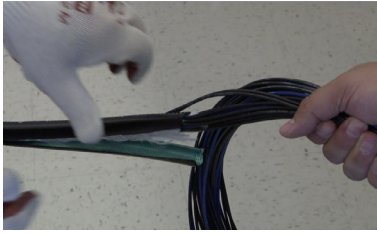




Fiber management tray,  
Part Number:  
FE-14192-IR



Seam Ripper



Click here for video

<p><b>1</b> Mark cutback length</p> 	<p><b>2</b> Notch Armor using flush cutter in-line with Kevlar strings</p> 
<p><b>3</b> Place Rip Cord in Notches</p> 	<p><b>4</b> Pull Rip Cord Parallel to Cable (while supporting breakout)</p> 
<p><b>5</b> Stop at Length Marker</p> 	<p><b>6</b> Separate Armor</p> 
<p><b>7</b> Cut Armor Using Side Cutter</p> 	<p><b>8</b> Remove Water Blocking Tape</p> <p><b>NOTE:</b> Step can be expedited by using a sewing seam ripper that can be purchased at local hobby stores</p> 
<p><b>9</b> Remove Excess Rip Cord</p> 	<p><b>10</b> Apply Electrical Tape to Protect Breakout</p> <p><b>NOTE:</b> Remember to slide identifier labels down the power conductors before trimming the cable to its final length</p> 

## Installation Check List

- Jumpers are properly supported to prevent strain on fiber during severe weather
- Bend radius minimums haven't been exceeded
- CommScope FiberFeed® approved installation accessories are used
- Maximum hanger spacing of 3 ft (0.9 m) - 4 ft (1.2 m) is maintained
- Visually inspected end face for residual dirt and damage
- Avoid migration of contaminations from one connector to another
- Check continuity by using LED or laser light source from one end face and look for light from other end to identify any broken fiber (Do not look directly at cable with laser source)
- Fiber Connections are engaged and the sectors are consistent with requirements
- Cable serial number has been documented in the closeout paperwork and a copy has been left on-site

### CommScope

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