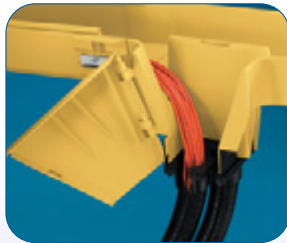
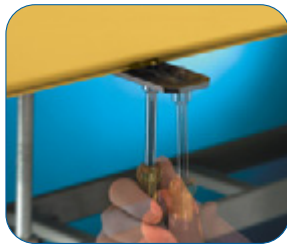
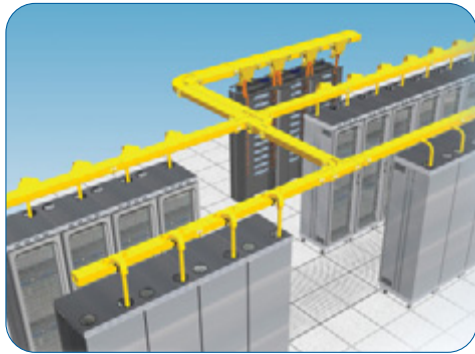


FIBERRUNNER[®] ROUTING SYSTEMS

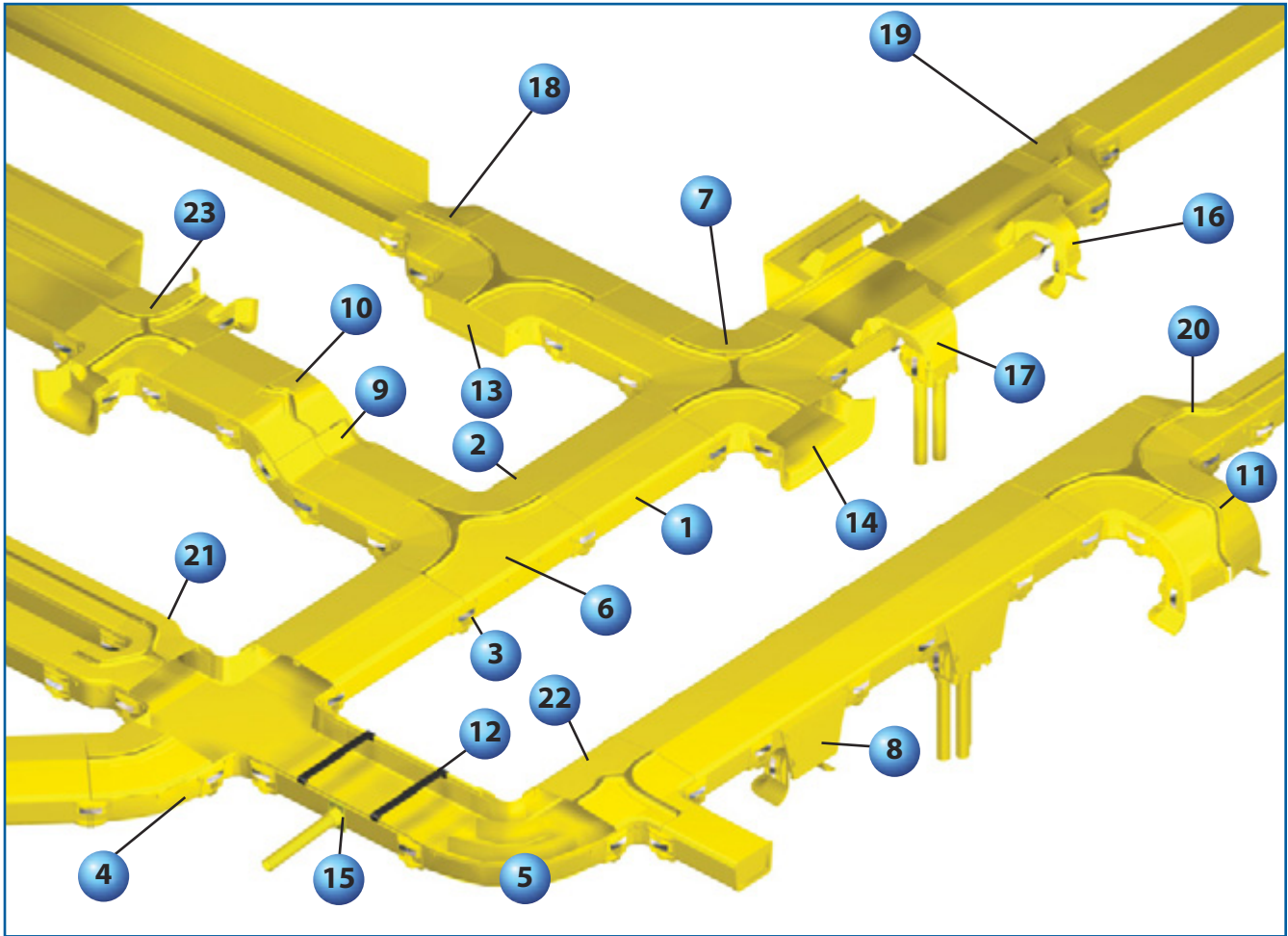
PANDUIT provides innovative solutions for routing fiber optic and high performance copper cabling to and between equipment racks within a data center, telecommunications room, or service provider facility. Routing products such as the FIBERRUNNER[®] Routing System are critical factors in your ability to quickly install, easily implement moves, adds, and changes and maintain the integrity of your fiber and copper cabling plant in order to maximize long-term performance.



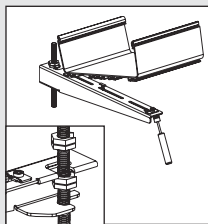
- Robust, large capacity 12x4 and 6x4 systems to handle large cable counts; 4x4 and 2x2 systems for use with smaller cable counts
- Hinged channel cover and split fitting covers protect cabling and provide easy access for future cabling revisions and additions
- **QUIKLOCK**[™] assembly features eliminate or minimize the need for tools to assemble the system; **QUIKLOCK**[™] Couplers and Brackets require less than five seconds to mechanically secure components
- Fittings provide minimum 2" (50.8mm) bend radius to protect against signal loss due to excessive cable bends
- Multiple spillover options provide versatility to make transitions to various equipment and rack configurations
- Compatible with **PANDUIT**[®] **FIBER-DUCT**[™] 4x4 and 2x2 Routing Systems, cable management, and racks

The FIBERRUNNER[®] 12x4, 6x4, 4x4 and 2x2 Routing Systems are comprised of channel, couplers, fittings and brackets designed to segregate, route, and protect fiber optic and high performance copper cabling.

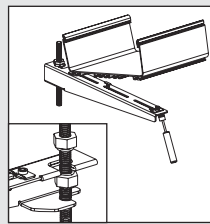
12x4 *FIBERRUNNER®* Routing System Roadmap



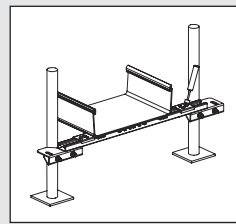
12x4 *FIBERRUNNER®* Mounting Brackets



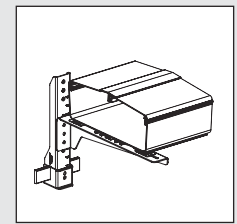
FR12TRBE58 – Existing Threaded Rod QuikLock™ Bracket (page C3.12)



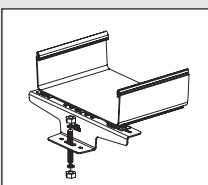
FR12TRBN58 – New Threaded Rod QuikLock™ Bracket (page C3.12)



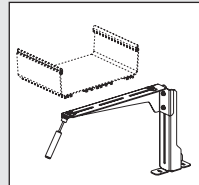
FR12USB – Underfloor Pedestal QuikLock™ Bracket (page C3.12)



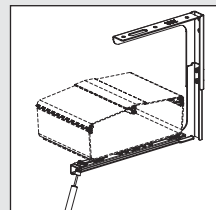
FR12ALB – Adjustable Ladder QuikLock™ Bracket (page C3.12)



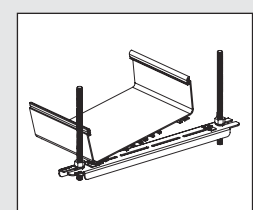
FR12CS58 – Center Support QuikLock™ Bracket (page C3.12)



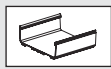
FR12ACAB – Adjustable Cabinet QuikLock™ Bracket (page C3.13)



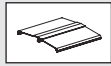
FR12ACB58 – Top Support Adjustable 'C' QuikLock™ Bracket (page C3.12)



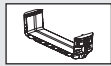
FR12TB58 – Trapeze QuikLock™ Bracket (page C3.12)



- 1** FR12X4**6 – 12x4 *FIBERRUNNER*® Channel (page C3.4)



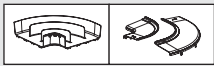
- 2** FRHC12**6 – 12x4 Snap-On Hinged Cover (page C3.4)



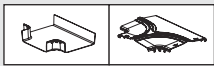
- 3** FRBC12X4** – 12x4 *QUIKLOCK*™ Coupler (page C3.5)



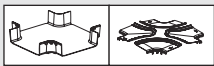
- 4** FRH4512X4** – 12x4 Horizontal 45° Angle Fitting and FRH45SC12** – Optional Split Cover (page C3.5)



- 5** FRRA12X4** – 12x4 Horizontal Right Angle Fitting and FRRASC12** – Optional Split Cover (page C3.5)



- 6** FRT12X4** – 12x4 Horizontal Tee Fitting and FRTSC12** – Optional Split Cover (page C3.6)



- 7** FRFWC12x4** – 12x4 4-Way Cross Fitting and FRFWCSC12** – Optional Split Cover (page C3.6)



- 8** FRVT12x4** – 12x4 Vertical Tee (page C3.9)



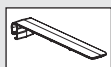
- 9** FRIV4512x4** – 12x4 Inside Vertical 45° Angle Fitting (page C3.7)



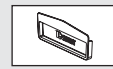
- 10** FROV4512x4** – 12x4 Outside Vertical 45° Angle Fitting and FROV45SC12** – Optional Split Cover (page C3.7)



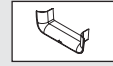
- 11** FROVRA12x4** – 12x4 Outside Vertical Right Angle Fitting and FROVRASC12** – Optional Split Cover (page C3.7)



- 12** FRCR12BL-X – Cable Retainer for 12x4 System (page C3.4)



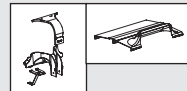
- 13** FREC12x4** – 12x4 End Cap Fitting (page C3.7)



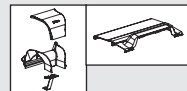
- 14** FRTR12x4** – 3-Sided BRC Trumpet Spillover for 12x4 Exit (page C3.11)



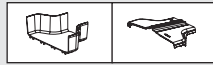
- 15** FR1.5IDE** – 1-Port Spillover Side Exit to 1.5" (38mm) Inside Diameter Corrugated Tubing (page C3.11)



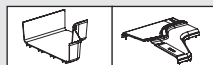
- 16** FRSP** – Spill-Over Junction with 2x2 Exit and FRSP12C** – Optional Cover for 12x4 System (page C3.9)



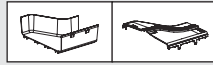
- 17** FRSP4** – Spill-Over Junction with 4x4 Exit and FRSP412C** – Optional Cover for 12x4 System (page C3.10)



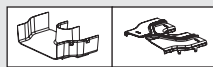
- 18** FRRF126** – 12x4 to 6x4 *FIBERRUNNER*® Reducer Fitting and FRRF126SC** – Optional Split Cover (page C3.7)



- 19** FRRF126L** – 12x4 to 6x4 Transition Left Reducer Fitting and FRRF126LSC** – Optional Split Cover (page C3.8)



- 20** FRRF126R** – 12x4 to 6x4 Transition Right Reducer Fitting and FRRF126RSC** – Optional Split Cover (page C3.8)



- 21** FRY126** – Y-Reducer from 12x4 to two 6x4 Exit and FRY126SC** – Optional Split Cover (page C3.8)



- 22** FRT12x4W6** – 12x4 Horizontal Tee with 6x4 Exit and FRTSC12W6** – Optional Split Cover (page C3.6)



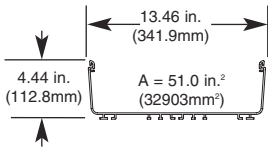
- 23** FRFWC12x4W6** – 12x4 4-Way Cross Fitting with 6x4 Exits and FRFWCSC12W6** – Optional Split Cover (page C3.6)

**Available colors include: YL (Yellow), OR (Orange), and BL (Black).

UL LISTED **12x4 FIBERRUNNER® Routing System**

Cable Fills for 12x4 FIBERRUNNER® Cable Routing System

The maximum amounts may vary according to the cable fill installation methods, straightness of cables, etc.



12x4 FIBERRUNNER® Cable Routing System							
Fill/Pile Up	Internal Area In.²	Diameter 1.6mm .063"	Diameter 2.0mm .079"	Diameter 3.0mm .118"	Augmented Cat. 6 23 AWG/UTP CM Diameter 9mm .354"	Fiber Optic Ribbon Interconnect Cable Diameter 5.20mm .205"	Category 6 Diameter 6.35mm .25"
40% Fill							
2" Pile Up	25.7	3299	2111	938	104	311	209
3" Pile Up	38.8	4980	3187	1417	158	470	316
4" Pile Up	51	6546	4189	1862	207	618	416
50% Fill							
2" Pile Up	25.7	4124	2639	1173	131	389	262
3" Pile Up	38.8	6225	3984	1771	197	588	395
4" Pile Up	51	8183	5237	2327	259	773	519
60% Fill							
2" Pile Up	25.7	4948	3167	1407	157	467	314
3" Pile Up	38.8	7470	4781	2125	237	705	474
4" Pile Up	51	9819	6284	2793	311	927	623

Channel cutting instructions: For optimum results, use FRCUT miter box and saw. For larger quantities use a plastic cutting saw blade for clean, burr-free cuts. Recommend: Carbide 80T and 100T; .090" thickness, .125" kerf.

12x4 FIBERRUNNER® Routing System – Channel and Cover

- Robust, large capacity 12x4 system ideal for use with large cable counts
- Multiple spillover options provide versatility to mate to various equipment and rack configurations
- *QUIKLOCK™* Couplers and Brackets reduce system installation time dramatically
- Channel, covers, fittings and other non-metallic system components made from V-0 flame class rated material
- Compatible with all sizes of *PANDUIT® FIBERRUNNER®* and *PANDUIT® FIBER-DUCT™* Routing Systems, cable management, and racks
- Compliant with the applicable tests in Telcordia GR-63-CORE Network Equipment Building Systems (NEBS) Level 3



FR12X4



FRHC12



FRCR12BL-X

Part Number	Part Description	Std. Pkg. Qty.	Std. Ctn. Qty.
12x4 FIBERRUNNER® Channel			
FR12X4YL6	Used to carry the cables horizontally throughout the system. Accepts cable retainers FRCR12BL-X or hinged cover FRHC12YL6. Use <i>QUIKLOCK™</i> Coupler FRBC12X4YL to attach channel and/or fittings.	6	12
12x4 Snap-On Hinged Cover			
FRHC12YL6	Optional snap-on hinged cover for channel FR12X4YL6. Can be folded down for height restricted areas.	6	12
Cable Retainer for 12x4 System			
FRCR12BL-X	Cable retainer holds cable in the channel when cover is not used. Install anywhere on channel, near the coupler or every 18" (457mm). Black color only.	10	100

For other colors replace YL (Yellow) with OR (Orange) or BL (Black).
 Order number of feet required, in multiples of standard 6' length increments.
 Order number of cable retainers required, in multiples of Standard Package Quantity.

12x4 FIBERRUNNER® QUIKLOCK™ Coupler

- Pre-assembled to provide fast mechanical assembly of components
- No tools required for installation; bolts loosen for component disassembly



Part Number	Part Description	Std. Pkg. Qty.	Std. Ctn. Qty.
FRBC12X4YL	Pre-assembled coupler quickly joins two sections of channel and/or fittings. Mechanically attaches without tightening bolts. Bolts release using 3/8" nut driver to allow coupler to be removed if necessary.	1	5

For a bulk package of ten couplers, order FRBC12X4YL-X.
For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

12x4 FIBERRUNNER® System Fittings

- Minimum 2" (50.8mm) bend radius control fittings
- Protects against signal loss and performance degradation
- Assemble using FRBC QUIKLOCK™ Couplers
- Optional split covers snap onto each fitting
- Covers feature 3/4" (19mm) gap to allow cable to be laid in

Part Number	Part Description	Couplers Required	Std. Pkg. Qty.	Std. Ctn. Qty.
12x4 Horizontal Right Angle Fitting				
FRRA12X4YL	Attaches to 12x4 channel and/or fitting to create a 90° horizontal turn from a straight horizontal run. Inside divider walls manage cables routed around horizontal right angles. Accepts optional split cover FRRASC12YL.	(2 pcs.) FRBC12X4YL	1	—



FRRA12X4

Split Cover for 12x4 Horizontal Right Angle Fitting

FRRASC12YL	Optional split cover for the horizontal right angle fitting FRRA12X4YL. Snap-on feature allows cover to be installed and removed with no tools required. Creates radiused 3/4" (19mm) opening for easy access to add or remove cables.	—	1	5
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FRRASC12

12x4 Horizontal 45° Angle Fitting

FRH4512X4YL	Attaches to 12x4 channel and/or fitting to create a 45° horizontal turn from a straight horizontal run. Accepts optional split cover FRH45SC12YL.	(2 pcs.) FRBC12X4YL	1	—
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FRH4512X4

Split Cover for 12x4 Horizontal 45° Angle Fitting

FRH45SC12YL	Optional split cover for the horizontal 45° angle fitting FRH4512X4YL. Snap-on feature allows cover to be installed and removed with no tools required. Creates radiused 3/4" (19mm) opening for easy access to add or removes cables.	—	1	5
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FRH45SC12

For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

Table continues on page C3.6

12x4 FIBERRUNNER® System Fittings (continued)


FRT12X4



FRTSC12



FRT12X4W6



FRTSC12W6



FRFWC12X4



FRFWCSC12



FRFWC12X4W6



FRFWCSC12W6

Part Number	Part Description	Couplers Required	Std. Pkg. Qty.	Std. Ctn. Qty.
12x4 Horizontal Tee Fitting				
FRT12X4YL	Attaches to 12x4 channel and/or fittings to create a 90° horizontal branch with a 12x4 exit from straight horizontal run. Accepts optional split cover FRTSC12YL.	(3 pcs.) FRBC12X4YL	1	—
Split Cover for 12x4 Horizontal Tee Fitting				
FRTSC12YL	Optional split cover for the horizontal tee fitting FRT12X4YL. Snap-on feature allows cover to be installed and removed with no tools required. Creates radiused 3/4" (19mm) opening for easy access to add or remove cables.	—	1	5
12x4 Horizontal Tee with 6x4 Exit				
FRT12X4W6YL	Attaches to 12x4 channel and/or fittings to create a 90° horizontal branch with a 6x4 exit from straight horizontal run. Accepts optional split cover FRTSC12W6YL.	(2 pcs.) FRBC12X4YL (1 pc.) FRBC6X4YL	1	—
Split Cover for 12x4 Horizontal Tee with 6x4 Exit				
FRTSC12W6YL	Optional split cover for the horizontal tee with 6x4 exit fitting FRT12X4W6YL. Snap-on feature allows cover to be installed and removed without tools. Creates radiused 3/4" (19mm) opening for easy access to add or remove cables.	—	1	5
12x4 4-Way Cross Fitting				
FRFWC12X4YL	Attaches to 12x4 channel and/or fittings to create a horizontal 4-way cross intersection with two 12x4 exits. Accepts optional split cover FRFWCSC12YL.	(4 pcs.) FRBC12X4YL	1	—
Split Cover for 12x4 4-Way Cross Fitting				
FRFWCSC12YL	Optional split cover for the 4-way cross fitting FRFWC12X4YL. Snap-on feature allows cover to be installed and removed with no tools required. Creates radiused 3/4" (19mm) opening for easy access to add or remove cables.	—	1	5
12x4 4-Way Cross Fitting with 6x4 Exits				
FRFWC12X4W6YL	Attaches to 12x4 channel and/or fittings to create a horizontal 4-way cross intersection with two 6x4 exits. Accepts optional split cover FRFWCSC12W6YL.	(2 pcs.) FRBC12X4YL (2 pcs.) FRBC6X4YL	1	—
Split Cover for 12x4 4-Way Cross Fitting with 6x4 Exits				
FRFWCSC12W6YL	Optional split cover for the 4-way cross fitting FRFWC12X4W6YL. Snap-on feature allows cover to be installed and removed with no tools required. Creates radiused 3/4" (19mm) opening for easy access to add or remove cables.	—	1	5

For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

12x4 FIBERRUNNER® System Fittings (continued)



FREC12X4



FRIV4512X4



FROV4512X4



FROV45SC12



FROVRA12X4



FROVRASC12



FRRF126



FRRF126SC

Part Number	Part Description	Couplers Required	Std. Pkg. Qty.	Std. Ctn. Qty.
12x4 End Cap Fitting				
FREC12X4YL	Used for closing off open ends of the channel or fittings. No coupler required. Push-on installation.	—	1	5
12x4 Inside Vertical 45° Angle Fitting				
FRIV4512X4YL	Attaches to 12x4 channel and/or fitting to create a 45° upward angle from a straight horizontal run. Used with outside vertical 45° angle fitting FROV4512X4YL to change level of a straight horizontal run. Includes split cover.	(2 pcs.) FRBC12X4YL	1	—
12x4 Outside Vertical 45° Angle Fitting				
FROV4512X4YL	Attaches to 12x4 channel and/or fitting to create a 45° downward angle from a straight horizontal run. Used with inside vertical 45° angle fitting FRIV4512X4YL to change level of a horizontal run. Accepts optional split cover FROV45SC12YL.	(2 pcs.) FRBC12X4YL	1	—
Split Cover for 12x4 Outside Vertical 45° Angle Fitting				
FROV45SC12YL	Optional split cover for the outside vertical 45° angle fitting FROV4512X4YL. Snap-on feature allows cover to be installed and removed with no tools required. Creates radiused 3/4" (19mm) opening for easy access to add or remove cables.	—	1	5
12x4 Outside Vertical Right Angle Fitting				
FROVRA12X4YL	Attaches to 12x4 channel and/or fittings to create a 90° vertical turn down from a straight horizontal run. Accepts optional split cover FROVRASC12YL.	(2 pcs.) FRBC12X4YL	1	—
Split Cover for 12x4 Outside Vertical Right Angle Fitting				
FROVRASC12YL	Optional split cover for the outside vertical right angle fitting FROVRA12X4YL. Snap-on feature allows cover to be installed and removed with no tools required. Creates radiused 3/4" (19mm) opening for easy access to add or remove cables.	—	1	5
12x4 to 6x4 FIBERRUNNER® Reducer Fitting				
FRRF126YL	Attaches any 12x4 FIBERRUNNER® Fitting or Channel to any 6x4 FIBERRUNNER® Fitting or Channel. Accepts split cover FRRF126SCYL.	(1 pc.) FRBC12X4YL (1 pc.) FRBC6X4YL	1	—
Split Cover for 12x4 to 6x4 FIBERRUNNER® Reducer Fitting				
FRRF126SCYL	Optional split cover for the reducer fitting FRRF126YL. Snap-on feature allows cover to be installed and removed with no tools required. Creates radiused 3/4" (19mm) opening for easy access to add or remove cables.	—	1	5

For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

Table continues on page C3.8

12x4 FIBERRUNNER[®] System Fittings (continued)



FRY126



FRY126SC



FRRF126R



FRRF126RSC



FRRF126L



FRRF126LSC

Part Number	Part Description	Couplers Required	Std. Pkg. Qty.	Std. Ctn. Qty.
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Y-Reducer from 12x4 to Two 6x4 Exits

FRY126YL	Attaches any 12x4 FIBERRUNNER [®] Fitting or Channel to two 6x4 FIBERRUNNER [®] Channels. Accepts split cover FRY126SCYL.	(1 pc.) FRBC12X4YL (2 pcs.) FRBC6X4YL	1	—
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Split Cover for Y-Reducer from 12x4 to Two 6x4 Exits

FRY126SCYL	Optional split cover for the Y-reducer fitting FRY126YL. Snap-on feature allows cover to be installed and removed with no tools required. Creates radiused 11/16" (17.5mm) opening for easy access to add or remove cables.	—	1	5
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12x4 to 6x4 Transition Right Reducer Fitting

FRRF126RYL	Attaches any 12x4 FIBERRUNNER [®] Fitting or Channel to any 6x4 FIBERRUNNER [®] Fitting or Channel while transitioning to the right. Accepts split cover FRRF126RSCYL.	(1 pc.) FRBC12X4YL (1 pc.) FRBC6X4YL	1	—
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Split Cover for 12x4 to 6x4 Transition Right Reducer Fitting

FRRF126RSCYL	Optional split cover for the transition right reducer fitting FRRF126RYL. Snap-on feature allows cover to be installed and removed with no tools required. Creates radiused 1/2" (12.7mm) opening for easy access to add or remove cables.	—	1	5
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12x4 to 6x4 Transition Left Reducer Fitting

FRRF126LYL	Attaches any 12x4 FIBERRUNNER [®] Fitting or Channel to any 6x4 FIBERRUNNER [®] Fitting or Channel while transitioning to the left. Accepts split cover FRRF126LSCYL.	(1 pc.) FRBC12X4YL (1 pc.) FRBC6X4YL	1	—
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Split Cover for 12x4 to 6x4 Transition Left Reducer Fitting

FRRF126LSCYL	Optional split cover for the transition left reducer fitting FRRF126LYL. Snap-on feature allows cover to be installed and removed with no tools required. Creates 1/2" (12.7mm) opening for easy access to add or remove cables.	—	1	5
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For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

12x4 FIBERRUNNER® System Spillouts

- Spill-overs allow safe transition from horizontal to vertical runs
- 2" (50.8mm) bend radius control
- Transition to channel, slotted channel, and corrugated loom tubing
- Spill-over junction fittings can be retro-fitted to existing horizontal runs



FRVT12X4



FRTR6X4



FRIDT6X4



FRHD4KT



TRC4HDBL



FRLPR64BL



FRSP



FRSP12C

Part Number	Part Description	Couplers Required	Std. Pkg. Qty.	Std. Ctn. Qty.
12x4 Vertical Tee				
FRVT12X4YL	Attaches to 12x4 channel and/or fittings to create a 90° vertical drop from a horizontal run. Hinged door included. Requires coupler to attach FRTR6X4YL or FRIDT6X4YL to vertical exit. Accepts optional snap-on cover FRHC12YL6 in conjunction with channel.	(2 pcs.) FRBC12X4YL (1 pc.) FRBC6X4YL	1	—
3-Sided BRC Trumpet Spillout for 6x4 Exit				
FRTR6X4YL	Used to limit the bend radius of the cable to 2" (50.8mm) when exiting from 6x4 channel, 6x4 horizontal tee fitting, or 6x4 exit on 12x4 vertical tee.	(1 pc.) FRBC6X4YL	1	5
3-Port Spillout to 1.5" (38mm) Inside Diameter Corrugated Tubing				
FRIDT6X4YL	Used to route cable into three separate pieces of 1.5" (38mm) diameter split corrugated tubing. Used with FRVT12X4YL or any 6x4 fitting. Securely holds corrugated split tubing to ensure system integrity and easy access to add or remove cables.	(1 pc.) FRBC6X4YL	1	5
4x4 Hinged Duct Vertical Cable Manager Kit				
FRHD4KTYL	Provides secure, accessible route for cables spilling out from vertical tee to rack mounted equipment. Kit includes 6' length of 4x4 capacity hinged duct, 6' length of 4x4 hinged duct cover, one end cap for 4x4 hinged duct, three FZBA1.5X4 adjustable "Z" brackets, an adapter fitting, six WR4-C wire retainers and all required mounting hardware. Attaches directly to 6x4 and 4x4 vertical tee exit or FRLPR64 low profile reducer.	—	1	—
4x4 Hinged Duct Bend Radius Control Trumpet				
TRC4HDBL	Bend radius control trumpet for exiting at the sidewall of 4" wall heights of type H hinged cover wiring duct channels. Maintains 1" (25.4mm) bend radius control. Black color only.	—	1	10
Low Profile Reducer 6x4 to 4x4 for Vertical Tee				
FRLPR64BL	Assembled into the 12x4 vertical tee FRVT12X4YL. The FRLPR64BL allows for the transition to 4x4 FIBER-DUCT™ Channel with minimal space required. No tools required for assembly. Black color only.	—	1	5
Spill-Over Junction with 2x2 Exit				
FRSPYL	Assembles onto 4x4, 6x4, or 12x4 FIBERRUNNER® Channel, spilling over the side into a 2x2 vertical channel, fitting, or corrugated tube. Mounts directly to existing installation with no alteration required. Mounting hardware provided for secure attachment.	—	1	—
Cover for Spill-Over Junction with 2x2 Exit for 12x4 Channel				
FRSP12CYL	Used to fully enclose 12x4 channel in conjunction with the spill-over junction FRSPYL. Cover snaps onto the channel base. Hinged feature allows easy access to add or remove cables.	—	1	5

For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

Table continues on page C3.10

12x4 FIBERRUNNER[®] System Spillouts (continued)



FTR2X2



FIDT2X2



FRHD2KT



TRC2HDBL



FRSP4



FRSP412C

Part Number	Part Description	Couplers Required	Std. Pkg. Qty.	Std. Ctn. Qty.
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3-Sided BRC Trumpet Spillout for 2x2 Exit

FTR2X2YL	Used to limit the bend radius of the cable to 2" (50.8mm) when exiting from a <i>FIBERRUNNER[®]</i> Spill-Over FRSPYL or from 2x2 <i>FIBER-DUCT[™]</i> Channel.	(1 pc.) FBC2X2YL	1	5
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1-Port Spillout to 1.5" (38mm) Inside Diameter Corrugated Tubing

FIDT2X2YL	Used to route cable into one piece of 1.5" (38mm) diameter split corrugated tubing. Used with <i>FIBERRUNNER[®]</i> Spill-Over FRSPYL, 2x2 <i>FIBER-DUCT[™]</i> Fittings, and the 2x2 <i>FIBERRUNNER[®]</i> Hinged Channel. Securely holds split corrugated tubing to ensure system integrity and easy access to add or remove cables.	(1 pc.) FBC2X2YL	1	5
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2x2 Hinged Duct Vertical Cable Manager Kit

FRHD2KTYL	Provides secure, accessible route for cables spilling out from a vertical tee or spill-over junction to rack mounted equipment. Kit includes 6' length of 2x2 <i>FIBERRUNNER[®]</i> Hinged Channel H2X2YL6, 6' length of 2x2 snap-on hinged cover HC2YL6, four adjustable "Z" brackets FZBA1.5X4, one <i>FIBERRUNNER[®]</i> 2x2 End Cap FHDEC2X2YL, six hinged duct 2" wire retainers WR2H-C and all required mounting hardware. Attaches to 2x2 vertical tee exit or spill-over junction with a 2x2 exit with a 2x2 <i>QUIKLOCK[™]</i> Coupler FBC2X2YL. Also attaches directly to 4x4 or 6x4 vertical tee exits with low profile reducer FRLPR42BL. Yellow and orange colors only.	—	1	—
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2x2 FIBERRUNNER[®] Bend Radius Control Trumpet

TRC2HDBL	Bend radius control trumpet for exiting at the sidewall of 2" wall heights of type H hinged cover wiring duct channels. Maintains 1" (25.4mm) bend radius control. Black color only.	—	1	10
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Spill-Over Junction with 4x4 Exit

FRSP4YL	Assembles onto 4x4, 6x4, or 12x4 <i>FIBERRUNNER[®]</i> Channel, spilling over the side into a 4x4 vertical exit. Requires coupler to attach 4x4 <i>FIBERRUNNER[®]</i> Channel and Fittings to the vertical exit. Mounts directly to existing installation with no alteration required. Mounting hardware provided for secure attachment.	(1 pc.) FRBC4X4YL	1	—
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Cover for Spill-Over Junction with 4x4 Exit for 12x4 Channel

FRSP412CYL	Used to fully enclose the 12x4 channel in conjunction with the spill-over junction FRSP4YL. Cover snaps onto the channel base. Hinged feature allows easy access to add or remove cables.	—	1	5
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For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

12x4 FIBERRUNNER® System Spillouts (continued)



Part Number	Part Description	Couplers Required	Std. Pkg. Qty.	Std. Ctn. Qty.
3-Sided BRC Trumpet Spillout for 4x4 FIBERRUNNER® Exit				
FRTR4X4YL	Used to limit the bend radius of the cable to 2" (50.8mm) when exiting from 4x4 FIBERRUNNER® Channel or a 4x4 FIBERRUNNER® Horizontal Tee.	(1 pc.) FRBC4X4YL	1	5
2-Port Spillout to 1.5" (38mm) Inside Diameter Corrugated Tubing				
FRIDT4X4YL	Used to route cable into one or two pieces of 1.5" (38mm) diameter split corrugated tubing. Requires coupler to be used with 4x4 FIBERRUNNER® Fitting. Used with any 4x4 FIBERRUNNER® Fitting. Securely holds corrugated split tubing to ensure system integrity and easy access to add or remove cables.	(1 pc.) FRBC4X4YL	1	5
1-Port Spillout Side Exit to 1.5" (38mm) Inside Diameter Corrugated Tubing				
FR1.5IDEYL	Used to route cable into 1.5" (38mm) diameter split corrugated tubing directly through a hole cut in the side wall of the 4x4, 6x4, and 12x4 FIBERRUNNER® Channel or 4x4 FIBER-DUCT™ Channel. Provides 1" (25.4mm) bend radius control at the exit. Securely holds split corrugated tubing to ensure system integrity and easy access to add or remove cables. Includes drilling template.	—	1	5
3-Sided BRC Trumpet Spillout for 12x4 Exit				
FRTR12X4YL	Used to limit the bend radius of the cable to 2" (50.8mm) when exiting from the 12x4 channel or a 12x4 horizontal tee.	(1 pc.) FRBC12X4YL	1	5

For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

12x4 FIBERRUNNER® Mounting Brackets



FR12TRBE58
FR12TRBE58M



FR12TRBN58
FR12TRBN58M



FR12USB



FR12ALB



FR12CS12
FR12CS58
FR12CS12M
FR12CS58M



FR12ACB12
FR12ACB58
FR12ACB12M
FR12ACB58M



FR12TB12
FR12TB58
FR12TB12M
FR12TB58M

Part Number	Part Description	For Threaded Rod Size	Std. Pkg. Qty.	Std. Ctn. Qty.
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Existing Threaded Rod **QuikLock™** Bracket for 12x4 System

FR12TRBE58	Used to support the 12x4 system from existing threaded rod installations. Bracket is secured to threaded rod with two split nuts. The pre-assembled slide clamps enable fast assembly to channel. Use 7/16" nut driver on slide clamps.	5/8"	1	—
FR12TRBE58M		16mm	1	—

New Threaded Rod **QuikLock™** Bracket for 12x4 System

FR12TRBN58	Used to support the 12x4 system from new threaded rod installations. Bracket is secured to threaded rod with two split nuts. The pre-assembled slide clamps enable fast assembly to channel. Use 7/16" nut driver on slide clamps.	5/8"	1	—
FR12TRBN58M		16mm	1	—

Underfloor Pedestal **QuikLock™** Bracket for 12x4 System

FR12USB	Used to support the 12x4 system by attaching to underfloor pedestals. (Contains all necessary hardware.) Use on pedestals up to 2" in diameter. The pre-assembled slide clamps enable fast assembly to channel. Use 7/16" nut driver on slide clamps.	—	1	—
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Adjustable Ladder **QuikLock™** Bracket for 12x4 System

FR12ALB	Used to support the 12x4 system attaching to any 3/8" (9.5mm) x 1 1/2" (38.1mm) or 3/8" (9.5mm) x 2" (50.8mm) ladder rack rail. Adjustable to nine incremental positions from 4" (101mm) to 12" (305mm) above or below the ladder rack. No threaded rod required. The pre-assembled slide clamps enable fast assembly to channel. Use 7/16" nut driver on slide clamps.	—	1	—
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Center Support **QuikLock™** Bracket for 12x4 System

FR12CS12	Used to support the 12x4 system from below with new threaded rod. Bracket is secured to threaded rod with two nuts. The pre-assembled slide clamps enable fast assembly to channel. Use 7/16" nut driver on slide clamps. Also can be secured directly to the top of cabinets.	1/2"	1	—
FR12CS58		5/8"	1	—
FR12CS12M		12mm	1	—
FR12CS58M		16mm	1	—

Top Support Adjustable "C" **QuikLock™** Bracket for 12x4 System

FR12ACB12	Used to support the 12x4 system from any new threaded rod extending down directly from the ceiling, grid, or ladder rack system. Two position height adjustments to accommodate system with or without hinged cover. Bracket is secured to threaded rod with two nuts. The pre-assembled slide clamps enable fast assembly to channel. Use 7/16" nut driver on slide clamps.	1/2"	1	—
FR12ACB58		5/8"	1	—
FR12ACB12M		12mm	1	—
FR12ACB58M		16mm	1	—

Trapeze **QuikLock™** Bracket for 12x4 System

FR12TB12	Used to support the 12x4 system by spanning two threaded rod drops. Can be installed from above or below. Bracket is secured to each threaded rod with two nuts. The pre-assembled slide clamps enable fast assembly to channel. Use 7/16" nut driver on slide clamps.	1/2"	1	—
FR12TB58		5/8"	1	—
FR12TB12M		12mm	1	—
FR12TB58M		16mm	1	—

12x4 FIBERRUNNER® Mounting Brackets (continued)



FR12ACAB

Part Number	Part Description	For Threaded Rod Size	Std. Pkg. Qty.	Std. Ctn. Qty.
Adjustable Cabinet QuikLock™ Bracket for 12x4 System				
FR12ACAB	Used to support the 12x4 system, dual 6x4 or dual 4x4 systems attaching to the top of cabinets. Adjustable from 4 1/4" (108mm) to 12" (305mm) allowing runs to be leveled over uneven cabinet heights. Also allows spillouts such as vertical tee to be positioned directly over cable inlets on cabinet tops. Bracket is secured to the cabinet frame with through bolts (not included). The pre-assembled slide clamps enable fast assembly to channel. Use 7/16" nut driver on slide clamps.	—	1	—



FEIAB58

EIA/TIA Threaded Rod Mounting Bracket				
FEIAB58	Bracket consists of two identical components that clamp onto the crossmembers of standard EIA/TIA racks and are secured with standard hex nuts and split lockwashers (included) tightened onto a length of 5/8" diameter threaded rod (not included). The threaded rod is positioned in the center of the brackets providing a vertical threaded rod stud to mount FIBERRUNNER® and FIBER-DUCT™ Threaded Rod Mounting Brackets onto.	5/8"	1	10



F2PCLB12
F2PCLB58
F2PCLB12M
F2PCLB58M

Two-Piece Ladder Rack Bracket for Attaching Threaded Rod to 1 1/2" – 2" Ladder Rack				
F2PCLB12	Two-piece bracket attaches to 3/8" (9.5mm) wide x 1 1/2" (38.1mm) or 3/8" (9.5mm) wide x 2" (50.8mm) ladder rack rail. Bracket halves slide into position and clamp together on the ladder rack rail, which allows for a one-handed assembly of the threaded rod (not included). Contains bracket and hardware for attaching bracket to ladder rack.	1/2"	1	10
F2PCLB58		5/8"	1	10
F2PCLB12M		12mm	1	10
F2PCLB58M		16mm	1	10



FRAF58

Two-Piece Framing Clip for Attaching 5/8" Threaded Rod to 2" x 9/16" C-Channel Auxiliary Framing Bars				
FRAF58	Two-piece framing clip attaches to auxiliary framing bars. Framing clip halves slide into position and interlock on the auxiliary framing bars, allowing easier assembly of the threaded rod to bars. Contains two-piece framing clip and hardware for attaching framing clip to auxiliary framing bars. (5/8" threaded rod not included.)	5/8"	1	10

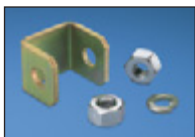


FR12BS-L

Self-Tapping Screws for 12x4 Brackets				
FR12BS-L	Self-tapping screws allow selected 12x4 fittings to be fastened directly to mounting brackets for additional support. Screws tap directly into those 12x4 fittings that have plastic bosses. Those part numbers are FRRA12X4YL, FRH4512X4YL, FRT12X4YL, FRT12X4W6YL, FRFWC12X4YL, FRFWC12X4W6YL, FRVT12X4YL, FRRF126RYL and FRRF126LYL.	—	50	500

Table continued on page C3.14

12x4 FIBERRUNNER[®] Mounting Brackets (continued)



**FLB12X15
FLB58X15
FLB12X20
FLB58X20**



FR4PRB58



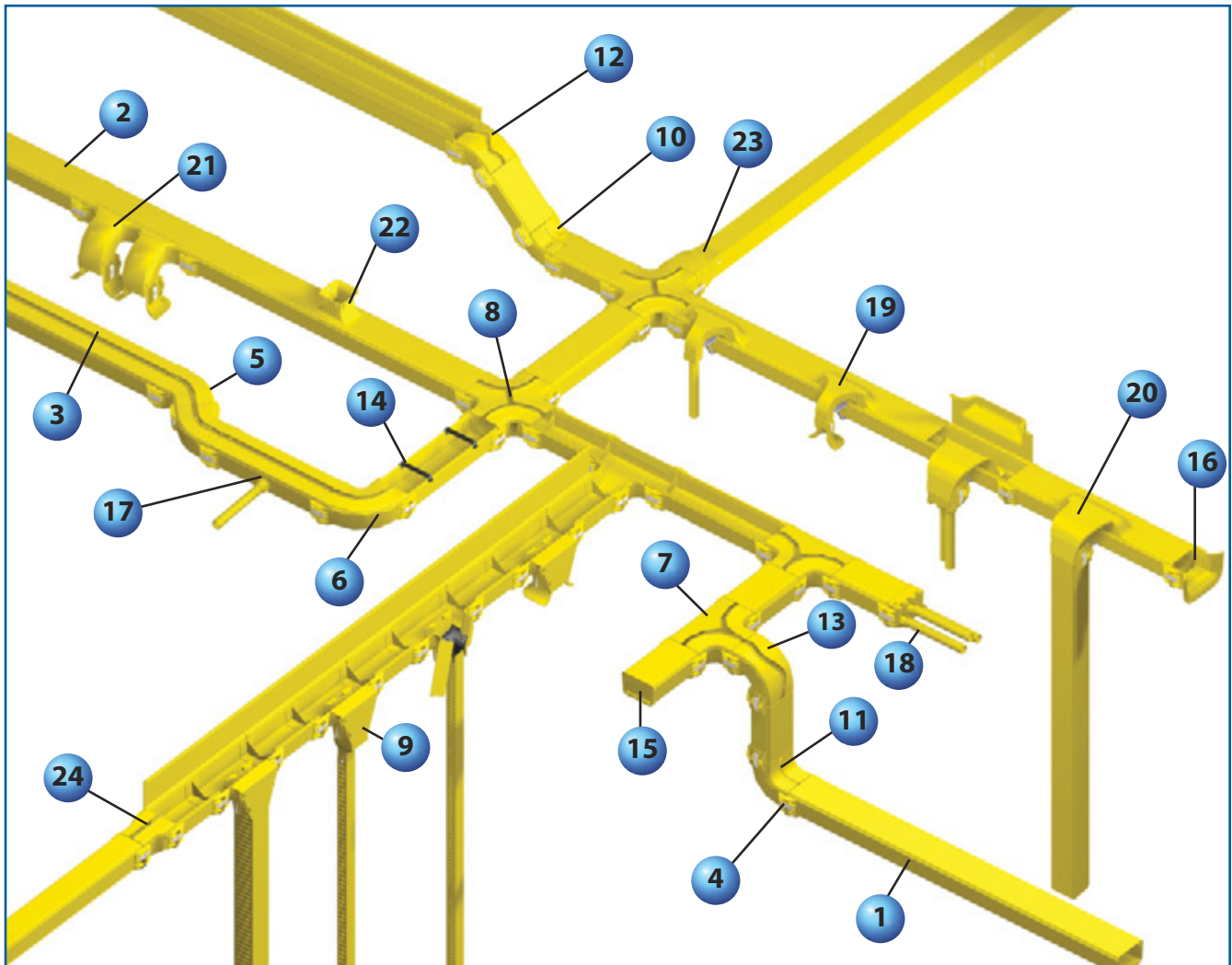
FRTBKT-X

Part Number	Part Description	For Threaded Rod Size	Std. Pkg. Qty.	Std. Ctn. Qty.
Bracket for Attaching Threaded Rod to 1 1/2" Ladder Rack				
FLB12X15	Bracket attaches to 3/8" (9.5mm) wide x 1 1/2" (38.1mm) ladder rack rail. Bracket accepts threaded rod (not included). Contains bracket and hardware for attaching bracket to ladder rack.	1/2"	1	10
FLB58X15		5/8"	1	10
Bracket for Attaching Threaded Rod to 2" Ladder Rack				
FLB12X20	Bracket attaches to 3/8" (9.5mm) wide x 2" (50.8mm) ladder rack rail. Bracket accepts threaded rod (not included). Contains bracket and hardware for attaching bracket to ladder rack.	1/2"	1	10
FLB58X20		5/8"	1	10
4 Post Rack Bracket				
FR4PRB58	Used to support 12x4, 6x4 and 4x4 systems attaching to the top of the 19" wide version of the <i>PANDUIT</i> NF4PR84 4 post rack. Contains all hardware required to assemble bracket to the top of the 4 post rack. Bracket accepts 5/8" threaded rod (not included).	5/8"	1	—
1/4" T-Bolt Kit				
FRTBKT-X	T-bolts can be used for additional attachment when securing <i>FIBERRUNNER</i> [®] Channel to mounting brackets. For example, a T-bolt can be inserted thru a 12x4 mounting bracket and positioned within the center rib structure on the underside of 12x4 channel. By tightening the nut, the 12x4 channel is more securely fastened to the mounting bracket.	—	10	100

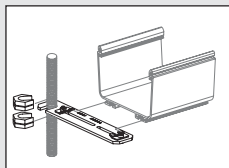
NOTES

A. System Overview
B1. Cable
B2. Modules
B3. Work Area Outlet Solutions
B4. Surface Raceway
B5. Zone Cabling Systems
B6. Wireless Solutions
C1. Copper Patch Panels, Cords & Punchdowns
C2. Fiber Connectors, Enclosures & Patch Cords
C3. Overhead & Underfloor Routing Systems
C4. Cabinets, Racks & Cable Management
C5. Grounding & Bonding
D. Managed System Solutions
E. Industrial
F1. Labeling & Identification
F2. Wiring Duct
F3. Cable Ties & Accessories
G. Index

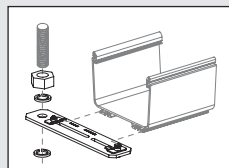
6x4 **FIBERRUNNER®** Routing System Roadmap



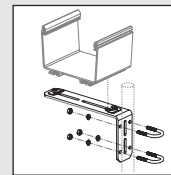
4x4 and 6x4 **FIBERRUNNER®** Mounting Brackets



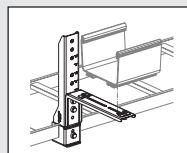
FR6TRBE58 – Existing Threaded Rod QuikLock™ Bracket (page C3.26)



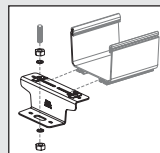
FR6TRBN58 – New Threaded Rod QuikLock™ Bracket (page C3.26)



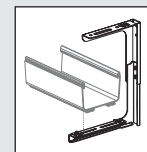
FR6USB – Underfloor Pedestal QuikLock™ Bracket (page C3.26)



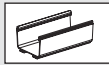
FR6ALB – Adjustable Ladder QuikLock™ Bracket (page C3.26)



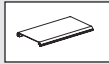
FR6CS58 – Center Support QuikLock™ Bracket (page C3.26)



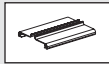
FR6ACB58 – Top Support Adjustable 'C' QuikLock™ Bracket (page C3.26)



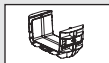
1 FR6X4**6 – 6x4 *FIBERRUNNER*® Channel (page C3.18)



2 FRHC6**6 – 6x4 Snap-On Hinged Cover (page C3.18)



3 FRSHC6**6 – 6x4 Split Hinged Cover (page C3.18)



4 FRBC6X4** – 6x4 *QUIKLOCK*™ Coupler (page C3.19)



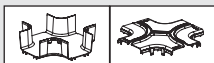
5 FRH456X4** – 6x4 Horizontal 45° Angle Fitting and FRH45SC6** – Optional Split Cover (page C3.19)



6 FRRA6X4** – 6x4 Horizontal Right Angle Fitting and FRRASC6** – Optional Split Cover (page C3.19)



7 FRT6X4** – 6x4 Horizontal Tee Fitting and FRTSC6** – Optional Split Cover (page C3.19)



8 FRFWC6X4** – 6x4 4-Way Cross Fitting and FRFWCSC6** – Optional Split Cover (page C3.20)



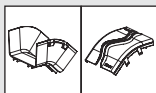
9 FRVT6X4** – 6x4 *QUIKLOCK*™ Vertical Tee (page C3.22)



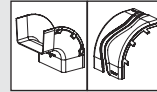
10 FRIV456X4** – 6x4 Inside Vertical 45° Angle Fitting (page C3.20)



11 FRIVRA6X4** – 6x4 Inside Vertical 90° Angle Fitting (page C3.20)



12 FROV456X4** – 6x4 Outside Vertical 45° Angle Fitting and FROV45SC6** – Optional Split Cover (page C3.20)



13 FROVRA6X4** – 6x4 Outside Vertical Right Angle Fitting and FROVRASC6** – Optional Split Cover (page C3.21)



14 FRCR6BL-X – Cable Retainer for 6x4 System (page C3.18)



15 FREC6X4** – 6x4 End Cap Fitting (page C3.20)



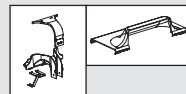
16 FRTR6X4** – 3-Sided BRC Trumpet Spillout for 6x4 Exit (page C3.25)



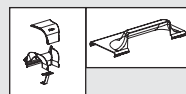
17 FR1.5IDE** – 1-Port Spillout Side Exit to 1.5" (38mm) Inside Diameter Corrugated Tubing (page C3.24)



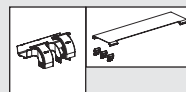
18 FRIDT6X4** – 3-Port Spillout to 1.5" (38mm) Inside Diameter Corrugated Tubing (page C3.25)



19 FRSP** – Spill-Over Junction with 2x2 Exit and FRSP6C** – Optional Cover for 6x4 System (pages C3.22 and C3.23)



20 FRSP4** – Spill-Over Junction with 4x4 Exit and FRSP46C** – Optional Cover for 6x4 System (page C3.23)



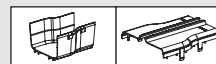
21 FRDDS6X4** – 6x4 Dual Downspout and FRDDSHC6** – Optional Cover for 6x4 Dual Downspout (page C3.24)



22 FRUPS6X4** – 6x4 Up Spout (page C3.25)



23 FRRF64** – 6x4 *FIBERRUNNER*® Fitting to 4x4 *FIBER-DUCT*™ Channel Reducer Fitting (page C3.21)



24 FRRF6FR4** – 6x4 to 4x4 *FIBERRUNNER*® Reducer Fitting and FRRF6FR4SC** – Optional Split Cover (page C3.21)

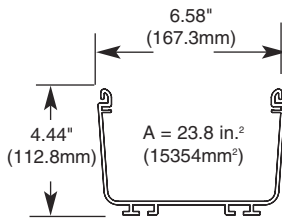
**Available Colors include: YL (Yellow), OR (Orange), and BL (Black).
Note: Additional 6x4 and 4x4 bracket applications, see page C3.32.



6x4 FIBERRUNNER® Routing System

Cable Fills for 6x4 FIBERRUNNER® Cable Routing System

The maximum amounts may vary according to the cable fill installation methods, straightness of cables, etc.



6x4 FIBERRUNNER® Cable Routing System							
Fill/Pile Up	Internal Area In.²	Diameter 1.6mm .063"	Diameter 2.0mm .079"	Diameter 30mm .118"	Augmented Category 6 23 AWG/UTP CM Diameter 9mm .354"	Fiber Optic Ribbon Interconnect Cable Diameter 5.20mm .205"	Category 6 Diameter 6.35mm .25"
40% Fill							
2" Pile Up	11.95	1534	982	436	49	145	97
3" Pile Up	18.16	2331	1492	663	74	220	148
4" Pile Up	23.8	3055	1955	869	97	288	194
50% Fill							
2" Pile Up	11.95	1917	1227	545	61	181	122
3" Pile Up	18.16	2914	1865	829	92	275	185
4" Pile Up	23.8	3819	2444	1086	121	361	242
60% Fill							
2" Pile Up	11.95	2301	1472	654	73	217	146
3" Pile Up	18.16	3496	2238	994	111	330	222
4" Pile Up	23.8	4582	2933	1303	145	433	291

Channel cutting instructions: For optimum results, use FRCUT miter box and saw. For larger quantities use a plastic cutting saw blade for clean, burr-free cuts. Recommend: Carbide 80T and 100T; .090" thickness, .125" kerf.

6x4 FIBERRUNNER® Routing System – Channel and Covers

- Robust, large capacity 6x4 system ideal for use with large cable counts
- Multiple spillover options provide versatility to mate to various equipment and rack configurations
- **QUIKLOCK™** Couplers and Brackets reduce system installation time dramatically
- Channel, covers, fittings and other non-metallic system components made from V-0 flame class rated material
- Compatible with all sizes of **PANDUIT® FIBERRUNNER®** and **PANDUIT® FIBER-DUCT™** Routing Systems, cable management, and racks
- Compliant with the applicable tests in Telcordia GR-63-CORE Network Equipment Building Systems (NEBS) Level 3



FR6X4



FRHC6



FRSHC6



FRCR6BL-X

Part Number	Part Description	Std. Pkg. Qty.	Std. Ctn. Qty.
6x4 FIBERRUNNER® Channel			
FR6X4YL6	Used to carry the cables horizontally throughout the system. Accepts hinged cable retainers FRCR6BL-X, hinged cover FRHC6YL6 or split hinged cover FRSHC6YL6. Use QUIKLOCK™ Coupler FRC6X4YL to attach channel and/or fittings.	6	36
6x4 Snap-On Hinged Cover			
FRHC6YL6	Optional snap-on hinged cover for channel FR6X4YL6. Hinge feature enables positioning of cover at angles between 30° and 90°.	6	36
6x4 Split Hinged Cover			
FRSHC6YL6	Optional split hinged cover for the channel FR6X4YL6. Creates radiused 3/4" (19mm) opening for easy access to add or remove cables. Snap-on hinge feature enables positioning of cover at angles between 30° and 90°.	6	36
Cable Retainer for 6x4 System			
FRCR6BL-X	Cable retainer holds cable in the channel when cover is not used. Install anywhere on channel, near the coupler or every 18" (457mm). Black color only.	10	100

For other colors replace YL (Yellow) with OR (Orange) or BL (Black).
Order number of feet required, in multiples of standard 6' length increments.
Order number of cable retainers required, in multiples of Standard Package Quantity.

6x4 FIBERRUNNER® QUIKLOCK™ Coupler

- Pre-assembled to provide fast mechanical assembly of components
- No tools required for installation; bolts loosen for component disassembly



Part Number	Part Description	Std. Pkg. Qty.	Std. Ctn. Qty.
FRBC6X4YL	Pre-assembled coupler quickly joins two sections of channel and/or fittings. Mechanically attaches without tightening bolts. Bolts release using 3/8" nut driver to allow coupler to be removed if necessary.	1	5

For a bulk package of twenty couplers, order FRBC6X4YL-E.
For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

6x4 FIBERRUNNER® System Fittings

- Minimum 2" (50.8mm) bend radius control fittings
- Optional split covers snap onto each fitting
- Protects against signal loss and performance degradation
- Covers feature 3/4" (19mm) gap to allow cable to be laid in
- Assemble using FRBC QUIKLOCK™ Couplers

Part Number	Part Description	Couplers Required	Std. Pkg. Qty.	Std. Ctn. Qty.
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6x4 Horizontal Right Angle Fitting

FRRA6X4YL	Attaches to 6x4 channel and/or fittings to create a 90° horizontal turn from a straight horizontal run. Accepts optional split cover FRRASC6YL.	(2 pcs.) FRBC6X4YL	1	5
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FRRA6X4

Split Cover for 6x4 Horizontal Right Angle Fitting

FRRASC6YL	Optional split cover for the horizontal right angle fitting FRRA6X4YL. Snap-on feature allows cover to be installed and removed with no tools required. Creates radiused 3/4" (19mm) opening for easy access to add or remove cables.	—	1	5
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FRRASC6

6x4 Horizontal 45° Angle Fitting

FRH456X4YL	Attaches to 6x4 channel and/or fittings to create a 45° horizontal turn from a straight horizontal run. Accepts optional split cover FRH45SC6YL.	(2 pcs.) FRBC6X4YL	1	5
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FRH456X4

Split Cover for 6x4 Horizontal 45° Angle Fitting

FRH45SC6YL	Optional split cover for the horizontal 45° angle fitting FRH456X4YL. Snap-on feature allows cover to be installed and removed with no tools required. Creates radiused 3/4" (19mm) opening for easy access to add or remove cables.	—	1	5
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FRH45SC6

6x4 Horizontal Tee Fitting

FRT6X4YL	Attaches to 6x4 channel and/or fittings to create a 90° horizontal branch from a straight horizontal run. Accepts optional split cover FRTSC6YL.	(3 pcs.) FRBC6X4YL	1	5
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FRT6X4

Split Cover for 6x4 Horizontal Tee Fitting

FRTSC6YL	Optional split cover for the horizontal tee fitting FRT6X4YL. Snap-on feature allows cover to be installed and removed with no tools required. Creates radiused 3/4" (19mm) opening for easy access to add or remove cables.	—	1	5
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FRTSC6

For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

Table continues on page C3.20

6x4 FIBERRUNNER® System Fittings (continued)



FRFWC6X4



FRFWCSC6



FREC6X4



FRIVRA6X4



FRIV456X4



FROV456X4



FROV45SC6

Part Number	Part Description	Couplers Required	Std. Pkg. Qty.	Std. Ctn. Qty.
6x4 4-Way Cross Fitting				
FRFWC6X4YL	Attaches to 6x4 channel and/or fittings to create a horizontal 4-way cross intersection. Accepts optional split cover FRFWCSC6YL.	(4 pcs.) FRBC6X4YL	1	5
Split Cover for 6x4 4-Way Cross Fitting				
FRFWCSC6YL	Optional split cover for the 4-way cross fitting FRFWC6X4YL. Snap-on feature allows cover to be installed and removed with no tools required. Creates radiused 3/4" (19mm) opening for easy access to add or remove cables.	—	1	5
6x4 End Cap Fitting				
FREC6X4YL	Used for closing off open ends of the channel or fittings. No coupler required. Push-on installation.	—	1	5
6x4 Inside Vertical 90° Angle Fitting				
FRIVRA6X4YL	Attaches to 6x4 channel and/or fittings to create a 90° upward angle from a straight horizontal run. Used with outside vertical 90° angle fitting FROVRA6X4YL to change level of a straight horizontal run. Includes split cover.	(2 pcs.) FRBC6X4YL	1	5
6x4 Inside Vertical 45° Angle Fitting				
FRIV456X4YL	Attaches to 6x4 channel and/or fittings to create a 45° upward angle from a straight horizontal run. Used with outside vertical 45° angle fitting FROV456X4YL to change level of a straight horizontal run. Includes split cover.	(2 pcs.) FRBC6X4YL	1	5
6x4 Outside Vertical 45° Angle Fitting				
FROV456X4YL	Attaches to 6x4 channel and/or fittings to create a 45° downward angle from a straight horizontal run. Used with inside vertical 45° angle fitting FRIV456X4YL to change level of a straight horizontal run. Accepts optional split cover FROV45SC6YL.	(2 pcs.) FRBC6X4YL	1	5
Split Cover for 6x4 Outside Vertical 45° Angle Fitting				
FROV45SC6YL	Optional split cover for the outside vertical 45° angle fitting FROV456X4YL. Snap-on feature allows cover to be installed and removed with no tools required. Creates radiused 3/4" (19mm) opening for easy access to add or remove cables.	—	1	5

For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

6x4 FIBERRUNNER® System Fittings (continued)



FROVRA6X4



FROVRASC6



FRRF6FR4



FRRF6FR4SC



FRRF64

Part Number	Part Description	Couplers Required	Std. Pkg. Qty.	Std. Ctn. Qty.
6x4 Outside Vertical Right Angle Fitting				
FROVRA6X4YL	Attaches to 6x4 channel and/or fittings to create a 90° vertical turn down from a straight horizontal run. Accepts optional split cover FROVRASC6YL.	(2 pcs.) FRBC6X4YL	1	5
Split Cover for 6x4 Outside Vertical Right Angle Fitting				
FROVRASC6YL	Optional split cover for the outside vertical right angle fitting FROVRA6X4YL. Snap-on feature allows cover to be installed and removed with no tools required. Creates radiused 3/4" (19mm) opening for easy access to add or remove cables.	—	1	5
6x4 to 4x4 FIBERRUNNER® Reducer Fitting				
FRRF6FR4YL	Attaches any 6x4 FIBERRUNNER® Fitting or Channel to any 4x4 FIBERRUNNER® Fitting or Channel. Accepts split cover FRRF6FR4SCYL.	(1 pc.) FRBC6X4YL (1 pc.) FRBC4X4YL	1	5
Split Cover for 6x4 to 4x4 FIBERRUNNER® Reducer Fitting				
FRRF6FR4SCYL	Optional split cover for the 6x4 FIBERRUNNER® to 4x4 FIBERRUNNER® Reducer Fitting FRRF6FR4YL. Snap-on feature allows cover to be installed and removed with no tools required. Creates radiused 3/4" (19mm) opening for easy access to add or remove cables.	—	1	5
6x4 FIBERRUNNER® System to 4x4 FIBER-DUCT™ Reducer Fitting				
FRRF64YL	Attaches any 6x4 FIBERRUNNER® Fitting or Channel to the 4x4 FIBER-DUCT™ Channel S4X4YL6 or E4X4YL6. Includes solid cover.	(1 pc.) FRBC6X4YL	1	5

For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

6x4 FIBERRUNNER® System Spillouts

- Spill-overs allow safe transition from horizontal to vertical runs
- 2" (50.8mm) bend radius control

- Transition to channel, slotted channel, and corrugated loom tubing
- Spill-over junction fittings can be retro-fitted to existing horizontal runs



FRVT6X4



FTR4X4



FIDT4X4BL



FRHD4KT



TRC4HDBL



FRLPR42BL



FRSP

Part Number	Part Description	Couplers Required	Std. Pkg. Qty.	Std. Ctn. Qty.
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6x4 QUIKLock™ Vertical Tee

FRVT6X4YL	Attaches to 6x4 channel and/or fittings to create 90° vertical drop from a straight horizontal run. Hinged door included. Accepts FTR4X4YL, FIDT4X4BL, S4X4YL6 or E4X4YL6 directly. Accepts optional snap-on cover FRHC6YL6 in conjunction with channel.	(2 pcs.) FRBC6X4YL	1	5
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3-Sided Vertical Tee Trumpet Spillout

FTR4X4YL	Used to limit the bend radius of the cable to 2" (50.8mm) when exiting from a 4x4 or 6x4 FIBERRUNNER® Vertical Tee and 4x4 FIBER-DUCT™ Fittings.	—	1	5
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2-Port Spillout to 1.5" (38mm) Inside Diameter Corrugated Tubing

FIDT4X4BL	Used to route cable into one or two pieces of 1.5" (38mm) diameter split corrugated tubing. Used with FRVT6X4YL, FRVT4X4YL, or FVT4X4YL. Securely holds corrugated split tubing to ensure system integrity and easy access to add or remove cables. Black color only.	—	1	5
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4x4 Hinged Duct Vertical Cable Manager Kit

FRHD4KTYL	Provides secure, accessible route for cables spilling out from vertical tee to rack mounted equipment. Kit includes 6' length of 4x4 capacity hinged duct, 6' length of 4x4 hinged duct cover, one end cap for 4x4 hinged duct, three FZBA1.5X4 adjustable "Z" brackets, an adapter fitting, six WR4-C wire retainers and all required mounting hardware. Attaches directly to 6x4 and 4x4 vertical tee exit or FRLPR64 low profile reducer.	—	1	—
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4x4 Hinged Duct Bend Radius Control Trumpet

TRC4HDBL	Bend radius control trumpet for exiting at the sidewall of 4" wall heights of type H hinged cover wiring duct channels. Maintains 1" (25.4mm) bend radius control. Black color only.	—	1	10
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Low Profile Reducer 4x4 to 2x2 for Vertical Tee

FRLPR42BL	Assembled into the 6x4 vertical tee FRVT6X4YL or 4x4 vertical tee FRVT4X4YL with an audible snap, the FRLPR42BL allows for the transition to 2x2 FIBERRUNNER® or 2x2 FIBER-DUCT™ Channel with minimal space required. No tools required for assembly. Black color only.	—	1	5
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Spill-Over Junction with 2x2 Exit

FRSPYL	Assembles onto 4x4, 6x4, or 12x4 FIBERRUNNER® Channel, spilling over the side into a 2x2 vertical channel, fitting, or corrugated tube. Mounts directly to existing installation with no alteration required. Mounting hardware provided for secure attachment.	—	1	—
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For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

6x4 FIBERRUNNER® System Spillouts (continued)



FRSP6C



FTR2X2



FIDT2X2



FRHD2KT



TRC2HDBL



FRSP4



FRSP46C

Part Number	Part Description	Couplers Required	Std. Pkg. Qty.	Std. Ctn. Qty.
Cover for Spill-Over Junction with 2x2 Exit for 6x4 Channel				
FRSP6CYL	Used to fully enclose 6x4 channel in conjunction with the spill-over junction FRSPYL. Cover snaps onto the channel base. Hinged feature allows easy access to add or remove cables.	—	1	5

3-Sided BRC Trumpet Spillout for 2x2 Exit

FTR2X2YL	Used to limit the bend radius of the cable to 2" (50.8mm) when exiting from a FIBERRUNNER® Spill-Over FRSPYL or from 2x2 FIBER-DUCT™ Channel.	(1 pc.) FBC2X2YL	1	5
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1-Port Spillout to 1.5" (38mm) Inside Diameter Corrugated Tubing

FIDT2X2YL	Used to route cable into one piece of 1.5" (38mm) diameter split corrugated tubing. Used with FIBERRUNNER® Spill-Over FRSPYL, 2x2 FIBER-DUCT™ Fittings, and the 2x2 FIBERRUNNER® Hinged Channel. Securely holds split corrugated tubing to ensure system integrity and easy access to add or remove cables.	(1 pc.) FBC2X2YL	1	5
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2x2 Hinged Duct Vertical Cable Manager Kit

FRHD2KTYL	Provides secure, accessible route for cables spilling out from a vertical tee or spill-over junction to rack mounted equipment. Kit includes 6' length of 2x2 FIBERRUNNER® Hinged Channel H2X2YL6, 6' length of 2x2 snap-on hinged cover HC2YL6, four adjustable "Z" brackets FZBA1.5X4, one FIBERRUNNER® 2x2 End Cap FHDEC2X2YL, six hinged duct 2" wire retainers WR2H-C and all required mounting hardware. Attaches to 2x2 vertical tee exit or spill-over junction with a 2x2 exit with a 2x2 QUIKLOCK™ Coupler FBC2X2YL. Also attaches directly to 4x4 or 6x4 vertical tee exits with low profile reducer FRLPR42BL. Yellow and orange colors only.	—	1	—
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2x2 FIBERRUNNER® Bend Radius Control Trumpet

TRC2HDBL	Bend radius control trumpet for exiting at the sidewall of 2" wall heights of type H hinged cover wiring duct channels. Maintains 1" (25.4mm) bend radius control. Black color only.	—	1	10
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Spill-Over Junction with 4x4 Exit

FRSP4YL	Assembles onto 4x4, 6x4, or 12x4 FIBERRUNNER® Channel, spilling over the side into a 4x4 vertical exit. Requires coupler to attach 4x4 FIBERRUNNER® Channel and Fittings to the vertical exit. Mounts directly to existing installation with no alteration required. Mounting hardware provided for secure attachment.	(1 pc.) FRBC4X4YL	1	—
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Cover for Spill-Over Junction with 4x4 Exit for 6x4 Channel

FRSP46CYL	Used to fully enclose the 6x4 channel in conjunction with the spill-over junction FRSP4YL. Cover snaps onto the channel base. Hinged feature allows easy access to add or remove cables.	—	1	5
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For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

Table continues on page C3.24

6x4 FIBERRUNNER[®] System Spillouts (continued)



FRDDS6X4



FRDDSHC6



FRTR4X4



FRIDT4X4



FR1.5IDE

Part Number	Part Description	Couplers Required	Std. Pkg. Qty.	Std. Ctn. Qty.
6x4 Dual Downspout				
FRDDS6X4YL	Attaches to 6x4 channel and/or fittings to create two 90° 4x4 downward transitions from a horizontal run. Downspouts are positioned 600mm apart to provide drops into cable entrances on multiple cabinet line-ups. The fitting maintains a 2" bend radius control throughout the transition to the vertical downspouts. Includes two snap-on throat covers for the dual downspouts. Accepts optional cover FRDDSHC6YL.	(2) FRBC6X4YL (2) FRBC4X4YL	1	—
Cover for 6x4 Dual Downspout				
FRDDSHC6YL	Used to fully enclose the 6x4 dual downspout fitting FRDDS6X4YL. Cover is attached to the fitting base with three hinge clips. The hinge clips allow the hinged cover to rotate to a fully closed position and an open position greater than 90°.	—	1	5
3-Sided BRC Trumpet Spillout for 4x4 FIBERRUNNER[®] Exit				
FRTR4X4YL	Used to limit the bend radius of the cable to 2" (50.8mm) when exiting from 4x4 FIBERRUNNER [®] Channel or a 4x4 FIBERRUNNER [®] Horizontal Tee.	(1 pc.) FRBC4X4YL	1	5
2-Port Spillout to 1.5" (38mm) Inside Diameter Corrugated Tubing				
FRIDT4X4YL	Used to route cable into one or two pieces of 1.5" (38mm) diameter split corrugated tubing. Requires coupler to be used with 4x4 FIBERRUNNER [®] Fitting. Used with any 4x4 FIBERRUNNER [®] Fitting. Securely holds corrugated split tubing to ensure system integrity and easy access to add or remove cables.	(1 pc.) FRBC4X4YL	1	5
1-Port Spillout Side Exit to 1.5" (38mm) Inside Diameter Corrugated Tubing				
FR1.5IDEYL	Used to route cable into 1.5" (38mm) diameter split corrugated tubing directly through a hole cut in the side wall of the 4x4, 6x4, and 12x4 FIBERRUNNER [®] Channel or 4x4 FIBER-DUCT [™] Channel. Provides 1" (25.4mm) bend radius control at the exit. Securely holds split corrugated tubing to ensure system integrity and easy access to add or remove cables. Includes drilling template.	—	1	5

For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

6x4 FIBERRUNNER® System Spillouts (continued)



FRTR6X4



FRUPS6X4



FITF6X4



FRIDT6X4

Part Number	Part Description	Couplers Required	Std. Pkg. Qty.	Std. Ctn. Qty.
3-Sided BRC Trumpet Spillout for 6x4 Exit				
FRTR6X4YL	Used to limit the bend radius of the cable to 2" (50.8mm) when exiting from 6x4 channel, 6x4 horizontal tee fitting, or 6x4 exit on 12x4 vertical tee.	(1 pc.) FRBC6X4YL	1	5
6x4 Up Spout				
FRUPS6X4YL	Allows cable to be directed upward out of the channel deployed directly below racks and cabinets in underfloor installations. Provides 2" (50.8mm) bend radius. Snaps directly onto the channel and can be positioned to allow cables to be laid in. A 1" (25.4mm) top bezel is included. Other fittings can be installed for specific applications including FTR4X4YL and FIDT4X4BL.	—	1	5
Innerduct Transition Fitting				
FITF6X4	Metal fitting attaches to end of channel or fitting to transition up to four pieces of solid 1.5" (38mm) inside diameter inner duct. Hardware is included for installation. Black color only.	—	1	10
3-Port Spillout to 1.5" (38mm) Inside Diameter Corrugated Tubing				
FRIDT6X4YL	Used to route cable into three separate pieces of 1.5" (38mm) diameter split corrugated tubing. Used with FRVT12X4YL or any 6x4 fitting. Securely holds corrugated split tubing to ensure system integrity and easy access to add or remove cables.	(1 pc.) FRBC6X4YL	1	5

For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

A. System Overview

B1. Cable

B2. Modules

B3. Work Area Outlet Solutions

B4. Surface Raceway

B5. Zone Cabling Systems

B6. Wireless Solutions

C1. Copper Patch Panels, Cords & Punchdowns

C2. Fiber Connectors, Enclosures & Patch Cords

C3. Overhead & Underfloor Routing Systems

C4. Cabinets, Racks & Cable Management

C5. Grounding & Bonding

D. Managed System Solutions

E. Industrial

F1. Labeling & Identification

F2. Wiring Duct

F3. Cable Ties & Accessories

G. Index

4x4 and 6x4 FIBERRUNNER® Mounting Brackets



FR6TRBE12
FR6TRBE58
FR6TRBE12M
FR6TRBE58M



FR6TRBN12
FR6TRBN58
FR6TRBN12M
FR6TRBN58M



FR6USB



FR6ALB



FR6CS12
FR6CS58
FR6CS12M
FR6CS58M



FR6ACB12
FR6ACB58
FR6ACB12M
FR6ACB58M



FR6TB38
FR6TB12
FR6TB38M
FR6TB12M

Part Number	Part Description	For Threaded Rod Size	Std. Pkg. Qty.	Std. Ctn. Qty.
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Existing Threaded Rod **QUIKLOCK™** Bracket for 6x4 and 4x4 Systems

FR6TRBE12	Used to support the 6x4 and 4x4 systems from existing threaded rod installations. Bracket is secured to threaded rod with two split nuts. The pre-assembled slide clamps enable fast assembly to channel. Use 7/16" nut driver on slide clamps.	1/2"	1	10
FR6TRBE58		5/8"	1	10
FR6TRBE12M		12mm	1	10
FR6TRBE58M		16mm	1	10

New Threaded Rod **QUIKLOCK™** Bracket for 6x4 and 4x4 Systems

FR6TRBN12	Used to support the 6x4 and 4x4 systems from any new threaded rod installations. Bracket is secured to threaded rod with two nuts. The pre-assembled slide clamps enable fast assembly to channel. Use 7/16" nut driver on slide clamps.	1/2"	1	10
FR6TRBN58		5/8"	1	10
FR6TRBN12M		12mm	1	10
FR6TRBN58M		16mm	1	10

Underfloor Pedestal **QUIKLOCK™** Bracket for 6x4 and 4x4 Systems

FR6USB	Used to support the 6x4 and 4x4 systems by attaching to underfloor pedestals. (Contains all necessary hardware.) Use on pedestals up to 1" in diameter. The pre-assembled slide clamps enable fast assembly to channel. Use 7/16" nut driver on slide clamps.	—	1	10
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Adjustable Ladder **QUIKLOCK™** Bracket for 6x4 and 4x4 Systems

FR6ALB	Used to support the 6x4 and 4x4 systems attaching to any 3/8" (9.5mm) x 1 1/2" (38.1mm) or 3/8" (9.5mm) x 2" (50.8mm) ladder rack rail. Adjustable to nine incremental positions from 4" (101mm) to 12" (305mm) above or below the ladder rack. No threaded rod required. The pre-assembled slide clamps enable fast assembly to channel. Use 7/16" nut driver on slide clamps.	—	1	10
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Center Support **QUIKLOCK™** Bracket for 6x4 and 4x4 Systems

FR6CS12	Used to support the 6x4 and 4x4 systems from below with new threaded rod. Bracket is secured to threaded rod with two nuts. The pre-assembled slide clamps enable fast assembly to channel. Use 7/16" nut driver on slide clamps. Also can be secured directly to the top of cabinets.	1/2"	1	10
FR6CS58		5/8"	1	10
FR6CS12M		12mm	1	10
FR6CS58M		16mm	1	10

Top Support Adjustable "C" **QUIKLOCK™** Bracket for 6x4 and 4x4 Systems

FR6ACB12	Used to support the 6x4 and 4x4 systems from any new threaded rod extending down directly from the ceiling, grid, or ladder rack system. Two position height adjustments to accommodate system with or without hinged cover. Bracket is secured to threaded rod with two nuts. The pre-assembled slide clamps enable fast assembly to channel. Use 7/16" nut driver on slide clamps.	1/2"	1	—
FR6ACB58		5/8"	1	—
FR6ACB12M		12mm	1	—
FR6ACB58M		16mm	1	—

Trapeze **QUIKLOCK™** Bracket for 6x4 and 4x4 Systems

FR6TB38	Used to support the 6x4 and 4x4 systems by spanning two threaded rod drops. Can be installed from above or below. Bracket is secured to each threaded rod with two nuts. The pre-assembled slide clamps enable fast assembly to channel. Use 7/16" nut driver on slide clamps.	3/8"	1	10
FR6TB12		1/2"	1	10
FR6TB38M		10mm	1	10
FR6TB12M		12mm	1	10

4x4 and 6x4 FIBERRUNNER® Mounting Brackets (continued)

Part Number	Part Description	For Threaded Rod Size	Std. Pkg. Qty.	Std. Ctn. Qty.
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Adjustable Cabinet *QUIKLOCK*™ Bracket for 6x4 and 4x4 Systems



FR6ACAB

FR6ACAB	Used to support the 6x4 and 4x4 systems attaching to the top of cabinets. Adjustable from 4 1/4" (108mm) to 9" (229mm) allowing runs to be leveled over uneven cabinet heights. Also allows spillouts such as the vertical tee to be positioned directly over cable inlets on cabinet tops. Bracket is secured to the cabinet frame with through bolts (not included). The pre-assembled slide clamps enable fast assembly to channel. Use 7/16" nut driver on slide clamps.	—	1	—
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EIA/TIA Threaded Rod Mounting Bracket



FEIAB58

FEIAB58	Bracket consists of two identical components that clamp onto the crossmembers of standard EIA/TIA racks and are secured with standard hex nuts and split lockwashers (included) tightened onto a length of 5/8" diameter threaded rod (not included). The threaded rod is positioned in the center of the brackets providing a vertical threaded rod stud to mount <i>FIBERRUNNER</i> ® and <i>FIBER-DUCT</i> ™ Threaded Rod Mounting Brackets onto.	5/8"	1	10
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Two-Piece Ladder Rack Bracket for Attaching Threaded Rod to 1 1/2" – 2" Ladder Rack



F2PCLB12
F2PCLB58
F2PCLB12M
F2PCLB58M

F2PCLB12	Two-piece bracket attaches to 3/8" (9.5mm) wide x 1 1/2" (38.1mm) or 3/8" (9.5mm) wide x 2" (50.8mm) ladder rack rail. Bracket halves slide into position and clamp together on the ladder rack rail, which allows for a one-handed assembly of the threaded rod (not included). Contains bracket and hardware for attaching bracket to ladder rack.	1/2"	1	10
F2PCLB58		5/8"	1	10
F2PCLB12M		12mm	1	10
F2PCLB58M		16mm	1	10

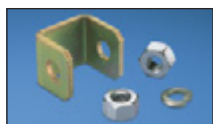
Two-Piece Framing Clip for Attaching 5/8" Threaded Rod to 2" x 9/16" C-Channel Auxiliary Framing Bars



FRAF58

FRAF58	Two-piece framing clip attaches to auxiliary framing bars. Framing clip halves slide into position and interlock on the auxiliary framing bars, allowing easier assembly of the threaded rod to bars. Contains two-piece framing clip and hardware for attaching framing clip to auxiliary framing bars. (5/8" threaded rod not included.)	5/8"	1	10
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Bracket for Attaching Threaded Rod to 1 1/2" Ladder Rack



FLB12X15
FLB58X15
FLB12X20
FLB58X20

FLB12X15	Bracket attaches to 3/8" (9.5mm) wide x 1 1/2" (38.1mm) ladder rack rail. Bracket accepts threaded rod (not included). Contains bracket and hardware for attaching bracket to ladder rack.	1/2"	1	10
FLB58X15		5/8"	1	10

Bracket for Attaching Threaded Rod to 2" Ladder Rack

FLB12X20	Bracket attaches to 3/8" (9.5mm) wide x 2" (50.8mm) ladder rack rail. Bracket accepts threaded rod (not included). Contains bracket and hardware for attaching bracket to ladder rack.	1/2"	1	10
FLB58X20		5/8"	1	10

Ladder Rack *QUIKLOCK*™ Bracket for 6x4 and 4x4 Systems



FR6LRB

FR6LRB	Used to support the 6x4 and 4x4 systems attaching directly to any 3/8" (9.5mm) x 1 1/2" (38.1mm) or 3/8" (9.5mm) x 2" (50.8mm) ladder rack rail. No threaded rod required. The pre-assembled slide clamps enable fast assembly to channel. Use 7/16" nut driver on slide clamps.	—	1	10
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Table continues on page C3.28

4x4 and 6x4 FIBERRUNNER[®] Mounting Brackets (continued)



FR6LB



FR6RMBEIA



FRRMBNF58



FR4PRB58

Part Number	Part Description	For Threaded Rod Size	Std. Pkg. Qty.	Std. Ctn. Qty.
“L” Wall Mount QUIKLOCK[™] Bracket for 6x4 and 4x4 Systems				
FR6LB	Used to support the 6x4 and 4x4 systems attaching to a wall or the front or back of an equipment rack. The pre-assembled slide clamps enable fast assembly to channel. Use 7/16" nut driver on slide clamps.	—	1	10
EIA/TIA Rack Mount QUIKLOCK[™] Bracket for 6x4 and 4x4 Systems				
FR6RMBEIA	Used to support the 6x4 and 4x4 systems attaching to the top of an equipment rack. Contains hardware to mount to the top of EIA/TIA equipment racks. No threaded rod required. The pre-assembled slide clamps enable fast assembly to channel. Use 7/16" nut driver on slide clamps.	—	1	10
NETFRAME[®]/NETRACK[™] QUIKLOCK[™] Mounting Bracket for 6x4 and 4x4 Systems				
FRRMBNF58	Used to support the 6x4 and 4x4 systems attaching to the top of NETFRAME [®] or NETRACK [™] Rack. (Contains all necessary mounting hardware.) Bracket accepts 5/8" threaded rod.	5/8"	1	—
4 Post Rack Bracket				
FR4PRB58	Used to support 12x4, 6x4, and 4x4 systems attaching to the top of the 19" wide version of the PANDUIT NF4PR84 4 post rack. Contains all hardware required to assemble bracket to the top of the 4 post rack. Bracket accepts 5/8" threaded rod (not included).	5/8"	1	—

Adapters to Other Systems



FRADC12X4BL



FRADC6X4



FRADC4X4BL



FADC4X4



FRTEL6



FRTEL4



FRWBS68

Part Number	Part Description	Couplers Required	Std. Pkg. Qty.	Std. Ctn. Qty.
Adapter from 12x4 FIBERRUNNER® System to ADC 12x4 FiberGuide*				
FRADC12X4BL	Fitting that transitions from ADC's 12x4 FiberGuide* System to 12x4 FIBERRUNNER® System. Fitting has a black finish and is made from metal. Attachment hardware is included.	(1 pc.) FRBC12X4YL	1	5
Adapter from 6x4 FIBERRUNNER® System to ADC 6x4 FiberGuide*				
FRADC6X4YL	Fitting that transitions from ADC's 6x4 FiberGuide* System to 6x4 FIBERRUNNER® System. Bolts release using 3/8" nut driver to allow coupler to be removed, if necessary.	—	1	5
Adapter from 4x4 FIBERRUNNER® System to ADC 4x4 FiberGuide*				
FRADC4X4BL	Fitting that transitions from ADC's 4x4 FiberGuide* System to 4x4 FIBERRUNNER® System. Fitting has a black finish and is made from metal. Attachment hardware is included.	(1 pc.) FRBC4X4YL	1	5
Adapter from 4x4 FIBER-DUCT™ System to ADC 4x4 FiberGuide*				
FRADC4X4	Fitting that transitions from ADC's 4x4 FiberGuide* Fiber Cable Management System to 4x4 FIBER-DUCT™ System. Fitting has a black finish and is made from metal. Attachment hardware is included.	—	1	10
Adapter from 6x4 FIBERRUNNER® System to Telect 6x4 WaveTrax*****				
FRTEL6	Fitting that transitions from Telect's 6x4 WaveTrax***** System to 6x4 FIBERRUNNER® System. Fitting has a black finish and is made from metal. Attachment hardware is included.	(1 pc.) FRBC6X4YL	1	5
Adapter from 4x4 FIBERRUNNER® System to Telect 4x4 WaveTrax*****				
FRTEL4	Fitting that transitions from Telect's 4x4 WaveTrax***** System to 4x4 FIBERRUNNER® System. Fitting has a black finish and is made from metal. Attachment hardware is included.	(1 pc.) FRBC4X4YL	1	5
Adapter from 6x4 FIBERRUNNER® System to Warren & Brown 8x4 Lightpaths***				
FRWBS68	Fitting that transitions from Warren & Brown 8x4 Lightpaths*** System to 6x4 FIBERRUNNER® System. Fitting has a black finish and is made from metal. Attachment hardware is included.	(1 pc.) FRBC6X4YL	1	5

*FiberGuide is a registered trademark of ADC Telecommunications, Inc.

**Lightguide is a trademark of the Hellerman Tyton Corporation.

***Lightpaths is a registered trademark of Warren & Brown Technologies Pty Ltd.

****Newton is a tradename of Newton Instrument Company, Inc.

*****WaveTrax is a registered trademark of Telect, Inc.

*****Lightrax is a trademark of Tyco Electronics Corporation.

Table continues on page C3.30

Adapters to Other Systems (continued)



FRNWT12



FRNWT128



FRTYT68



FTDNS4X4

Part Number	Part Description	Couplers Required	Std. Pkg. Qty.	Std. Ctn. Qty.
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Adapter from 12x4 FIBERRUNNER® System to Various 12x4 System Channels

FRNWT12	Fitting that transitions from Tyton 12x4 Lightguide** Channel, Newton**** 12x4 Channel or Ditel 12x4 Lightrax***** Channel to 12x4 FIBERRUNNER® System. Fitting has a black finish and is made from metal. Attachment hardware is included.	(1 pc.) FRBC12X4YL	1	—
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Adapter from 12x4 FIBERRUNNER® System to Various 8x4 System Channels

FRNWT128	Fitting that transitions from Tyton 8x4 Lightguide** Channel, Newton**** 8x4 Channel or Ditel 8x4 Lightrax***** Channel to 12x4 FIBERRUNNER® System. Fitting has a black finish and is made from metal. Attachment hardware is included.	(1 pc.) FRBC12X4YL	1	—
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Adapter from 6x4 FIBERRUNNER® System to Various 8x4 System Channels

FRTYT68	Fitting that transitions from Tyton 8x4 Lightguide** Channel, Newton**** 8x4 Channel or Ditel 8x4 Lightrax***** Channel to 6x4 FIBERRUNNER® System. Fitting has a black finish and is made from metal. Attachment hardware is included.	(1 pc.) FRBC6X4YL	1	5
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Adapter from 4x4 FIBER-DUCT™ System to Various 4x4 Systems

FTDNS4X4YL	Fitting that transitions from various 4x4 systems to 4x4 FIBER-DUCT™ System. Attachment hardware is included.	—	1	5
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*FiberGuide is a registered trademark of ADC Telecommunications, Inc.

**Lightguide is a trademark of the Hellerman Tyton Corporation.

***Lightpaths is a registered trademark of Warren & Brown Technologies Pty Ltd.

****Newton is a tradename of Newton Instrument Company, Inc.

*****WaveTrax is a registered trademark of Telect, Inc.

*****Lightrax is a trademark of Tyco Electronics Corporation.

NOTES

A. System Overview

B1. Cable

B2. Modules

B3. Work Area Outlet Solutions

B4. Surface Raceway

B5. Zone Cabling Systems

B6. Wireless Solutions

C1. Copper Patch Panels, Cords & Punchdowns

C2. Fiber Connectors, Enclosures & Patch Cords

C3. Overhead & Underfloor Routing Systems

C4. Cabinets, Racks & Cable Management

C5. Grounding & Bonding

D. Managed System Solutions

E. Industrial

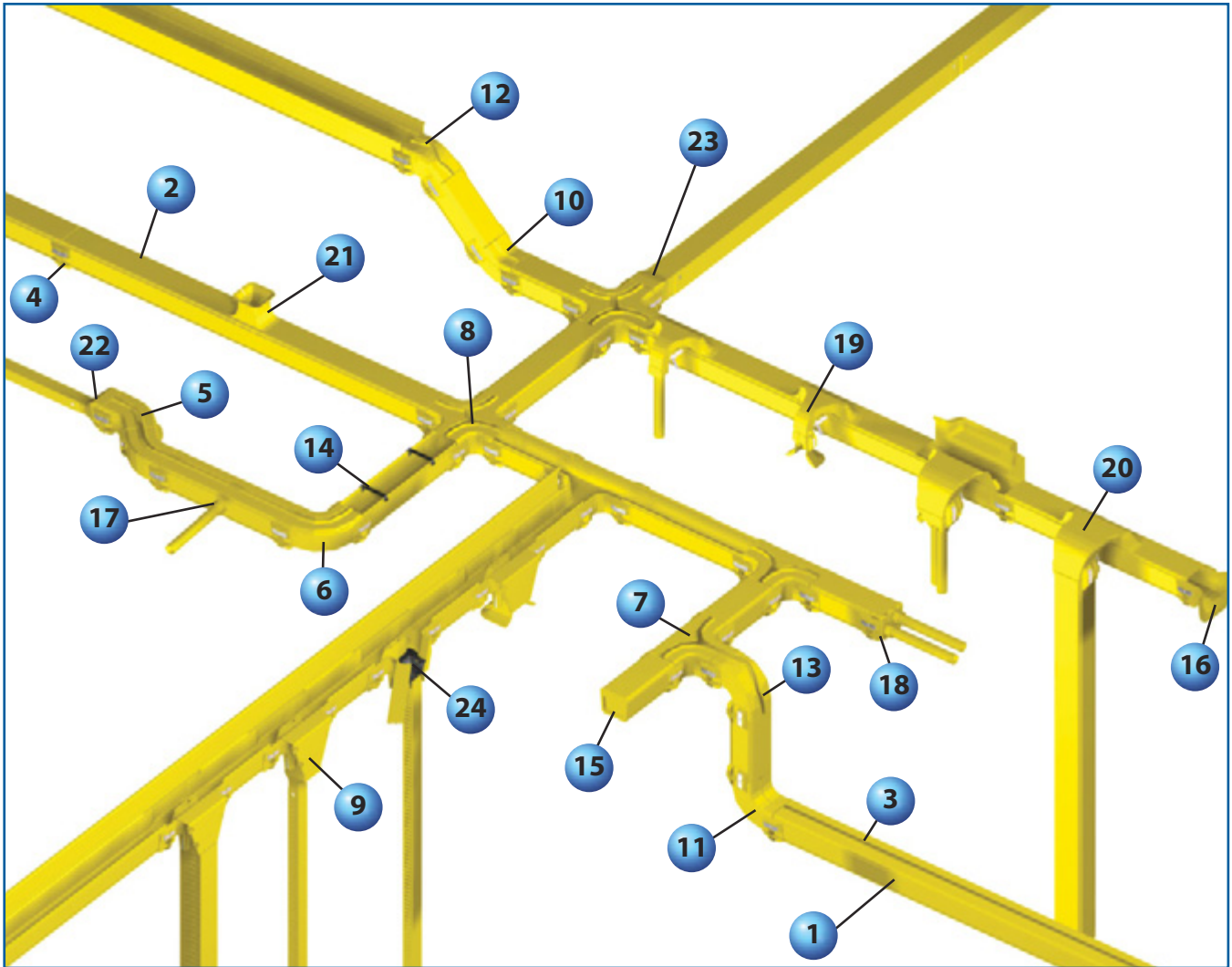
F1. Labeling & Identification

F2. Wiring Duct

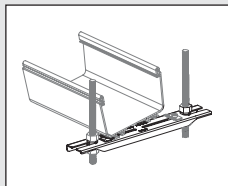
F3. Cable Ties & Accessories

G. Index

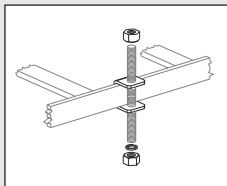
4x4 FIBERRUNNER® Routing System Roadmap



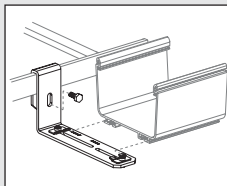
4x4 and 6x4 FIBERRUNNER® Mounting Brackets



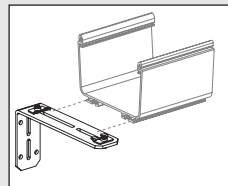
FR6TB38 – Trapeze Mounting Bracket
QUICKLOCK™ Bracket
 (page C3.26)



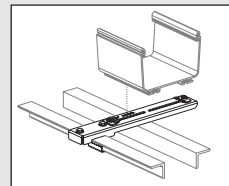
FLB12X20 – Bracket for Attaching Threaded Rod to Ladder Rack
 (page C3.27)



FR6LRB – Ladder Rack Mounting Bracket
QUICKLOCK™ Bracket
 (page C3.27)



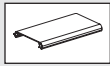
FR6LB – "L" Wall Mounting Bracket
QUICKLOCK™ Bracket
 (page C3.28)



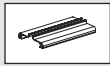
FR6RMBEIA – EIA/TIA Rack Mounting Bracket
QUICKLOCK™ Bracket
 (page C3.28)



1 FR4X4**6 – 4x4 *FIBERRUNNER*® Channel (page C3.34)



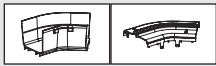
2 FRHC4**6 – 4x4 Snap-On Hinged Cover (page C3.34)



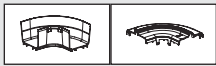
3 FRSHC4**6 – 4x4 Split Hinged Cover (page C3.34)



4 FRBC4X4** – 4x4 *QUICKLOCK*™ Coupler (page C3.35)



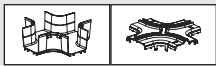
5 FRH454X4** – 4x4 Horizontal 45° Angle Fitting and FRH45SC4** Optional Split Cover (page C3.35)



6 FRRA4X4** – 4x4 Horizontal Right Angle Fitting and FRRASC4** – Optional Split Cover (page C3.35)



7 FRT4X4** – 4x4 Horizontal Tee Fitting and FRTSC4** – Optional Split Cover (page C3.36)



8 FRFWC4X4** – 4x4 4-Way Cross Fitting and FRFWCSC4** – Optional Split Cover (page C3.36)



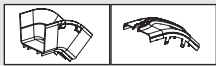
9 FRVT4X4** – 4x4 *QUICKLOCK*™ Vertical Tee (page C3.38)



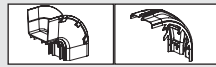
10 FRIV454X4** – 4x4 Inside Vertical 45° Angle Fitting (page C3.36)



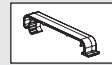
11 FRIVRA4X4** – 4x4 Inside Vertical 90° Angle Fitting (page C3.36)



12 FROV454X4** – 4x4 Outside Vertical 45° Angle Fitting and FROV45SC4** – Optional Split Cover (pages C3.36 and C3.37)



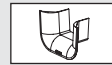
13 FROVRA4X4** – 4x4 Outside Vertical Right Angle Fitting and FROVRASC4** – Optional Split Cover (page C3.37)



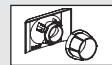
14 FRCR4BL-X – Cable Retainer for 4x4 System (page C3.34)



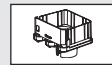
15 FREC4X4** – 4x4 End Cap Fitting (page C3.36)



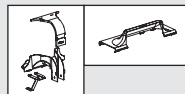
16 FRTR4X4** – 3-Sided BRC Trumpet Spillout for 4x4 *FIBERRUNNER*® Exit (page C3.40)



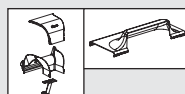
17 FR1.SIDE** – 1-Port Spillout Side Exit to 1.5" (38mm) Inside Diameter Corrugated Tubing (page C3.40)



18 FRIDT4X4** – 2-Port Spillout to 1.5" (38mm) Inside Diameter Corrugated Tubing (page C3.40)



19 FRSP** – Spill-Over Junction with 2x2 Exit and FRSP4C** – Optional Cover for 4x4 System (page C3.39)



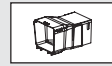
20 FRSP4** – Spill-Over Junction with 4x4 Exit and FRSP44C** – Optional Cover for 4x4 System (pages C3.39 and C3.40)



21 FRUPS4X4** – 4x4 Up Spout (page C3.40)



22 FRRF4FD2** – 4x4 *FIBERRUNNER*® System to 2x2 Reducer Fitting with Cover (page C3.37)



23 FRRF4FD4** – 4x4 *FIBERRUNNER*® System to 4x4 *FIBER-DUCT*™ Reducer Fitting with Cover (page C3.37)



24 FRLPR42BL – Low Profile Reducer 4x4 to 2x2 for Vertical Tee (page C3.38)

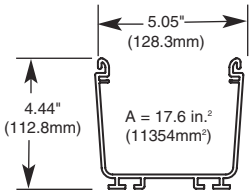
** Available colors include: YL (Yellow), OR (Orange), and BL (Black).
Note: Additional 6x4 and 4x4 bracket applications, see page C3.16.



4x4 FIBERRUNNER[®] Routing System

Cable Fills for 4x4 FIBERRUNNER[®] Cable Routing System

The maximum amounts may vary according to the cable fill installation methods, straightness of cables, etc.



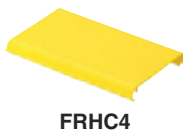
4x4 FIBERRUNNER [®] Cable Routing System							
Fill/Pile Up	Internal Area in ²	Diameter 1.6mm .063"	Diameter 2.0mm .079"	Diameter 3.0mm .118"	Augmented Cat. 6 23 AWG/UTP CM Diameter 9mm .354"	Fiber Optic Ribbon Interconnect Cable Diameter 5.20mm .205"	Category 6 Diameter 6.35mm .25"
40% Fill							
2" Pile Up	8.9	1142	731	325	36	108	73
3" Pile Up	13.58	1743	1116	496	55	165	111
4" Pile Up	17.6	2259	1446	643	72	213	143
50% Fill							
2" Pile Up	8.9	1428	914	406	45	135	91
3" Pile Up	13.58	2179	1394	620	69	206	138
4" Pile Up	17.6	2824	1807	803	89	267	179
60% Fill							
2" Pile Up	8.9	1714	1097	487	54	162	109
3" Pile Up	13.58	2615	1673	744	83	247	166
4" Pile Up	17.6	3389	2169	964	107	320	215

Channel cutting instructions: For optimum results, use FRCUT miter box and saw. For larger quantities use a plastic cutting saw blade for clean, burr-free cuts. Recommend: Carbide 80T and 100T; .090" thickness, .125" kerf.

4x4 FIBERRUNNER[®] Routing System – Channel and Covers

- Robust 4x4 system ideal for use with smaller cable counts
- Multiple spillover options provide versatility to mate to various equipment and rack configurations
- *QUIKLOCK*[™] Couplers and Brackets reduce system installation time dramatically
- Channel, covers, fittings and other non-metallic system components made from V-0 flame class rated material
- Compatible with all sizes of *PANDUIT*[®] *FIBERRUNNER*[®] and *PANDUIT*[®] *FIBER-DUCT*[™] Routing Systems, cable management, and racks
- Compliant with the applicable tests in Telcordia GR-63-CORE Network Equipment Building Systems (NEBS) Level 3

Part Number	Part Description	Std. Pkg. Qty.	Std. Ctn. Qty.
4x4 FIBERRUNNER[®] Channel			
FR4X4YL6	Used to carry the cables horizontally throughout the system. Accepts hinged cable retainers FRCR4BL-X, hinged cover FRHC4YL6, or split hinged cover FRSHC4YL6. Use <i>QUIKLOCK</i> [™] Coupler FRBC4X4YL to attach channel and/or fittings.	6	36
4x4 Snap-On Hinged Cover			
FRHC4YL6	Optional snap-on hinged cover for channel FR4X4YL6. Hinge feature enables positioning of cover at angles between 30° to 90°.	6	36
4x4 Split Hinged Cover			
FRSHC4YL6	Optional split hinged cover for the channel FR4X4YL6. Creates radiused 3/4" (19mm) opening for easy access to add or remove cables. Snap-on hinge feature enables positioning of cover at angles between 30° and 90°.	6	36
Cable Retainer for 4x4 System			
FRCR4BL-X	Cable retainer holds cable in the channel when cover is not used. Install anywhere on channel, near the coupler or every 18" (457mm). Black color only.	10	100



For other colors replace YL (Yellow) with OR (Orange) or BL (Black).
 Order number of feet required, in multiples of standard 6' length increments.
 Order number of cable retainers required, in multiples of Standard Package Quantity.

4x4 FIBERRUNNER® QUIKLOCK™ Coupler

- Pre-assembled to provide fast mechanical assembly of components
- No tools required for installation; bolts loosen for component disassembly



Part Number	Part Description	Std. Pkg. Qty.	Std. Ctn. Qty.
FRBC4X4YL	Pre-assembled coupler quickly joins two sections of channel and/or fittings. Mechanically attaches without tightening bolts. Bolts release using 3/8" nut driver to allow coupler to be removed if necessary.	1	5

For a bulk package of twenty couplers, order FRBC4X4YL-E.
For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

4x4 FIBERRUNNER® System Fittings

- Minimum 2" (50.8mm) bend radius control fittings
- Protects against signal loss and performance degradation
- Assemble using FRBC QUIKLOCK™ Couplers
- Optional split covers snap onto each fitting
- Covers feature 3/4" (19mm) gap to allow cable to be laid in

Part Number	Part Description	Couplers Required	Std. Pkg. Qty.	Std. Ctn. Qty.
4x4 Horizontal Right Angle Fitting				
FRRA4X4YL	Attaches to 4x4 channel and/or fitting to create a 90° horizontal turn from a straight horizontal run. Accepts optional split cover FRRASC4YL.	(2 pcs.) FRBC4X4YL	1	5



FRRA4X4

Split Cover for 4x4 Horizontal Right Angle Fitting

FRRASC4YL	Optional split cover for the horizontal right angle fitting FRRA4X4YL. Snap-on feature allows cover to be installed and removed with no tools required. Creates radiused 3/4" (19mm) opening for easy access to add or remove cables.	—	1	5
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FRRASC4

4x4 Horizontal 45° Angle Fitting

FRH454X4YL	Attaches to 4x4 channel and/or fittings to create a 45° horizontal turn from a straight horizontal run. Accepts optional split cover FRH45SC4YL.	(2 pcs.) FRBC4X4YL	1	5
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FRH454X4

Split Cover for 4x4 Horizontal 45° Angle Fitting

FRH45SC4YL	Optional split cover for the horizontal 45° angle fitting FRH454X4YL. Snap-on feature allows cover to be installed and removed with no tools required. Creates radiused 3/4" (19mm) opening for easy access to add or remove cables.	—	1	5
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FRH45SC4

For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

Table continued on page C3.36

4x4 FIBERRUNNER[®] System Fittings (continued)

Part Number	Part Description	Couplers Required	Std. Pkg. Qty.	Std. Ctn. Qty.
4x4 Horizontal Tee Fitting				
FR4X4YL	Attaches to 4x4 channel and/or fittings to create a 90° horizontal branch from straight horizontal runs. Accepts optional split cover FR4TSC4YL.	(3 pcs.) FRBC4X4YL	1	5
Split Cover for 4x4 Horizontal Tee Fitting				
FR4TSC4YL	Optional split cover for the horizontal tee fitting FR4X4YL. Snap-on feature allows cover to be installed and removed with no tools required. Creates radiused 3/4" (19mm) opening for easy access to add or remove cables.	—	1	5
4x4 4-Way Cross Fitting				
FR4WC4X4YL	Attaches to 4x4 channel and/or fittings to create a horizontal 4-way cross intersection. Accepts optional split cover FR4WCSC4YL.	(4 pcs.) FRBC4X4YL	1	5
Split Cover for 4x4 4-Way Cross Fitting				
FR4WCSC4YL	Optional split cover for the 4-way cross fitting FR4WC4X4YL. Snap-on feature allows cover to be installed and removed with no tools required. Creates radiused 3/4" (19mm) opening for easy access to add or remove cables.	—	1	5
4x4 End Cap Fitting				
FR4EC4X4YL	Used for closing off open ends of the channel or fittings. No coupler required. Push-on installation.	—	1	5
4x4 Inside Vertical 90° Angle Fitting				
FR4VRA4X4YL	Attaches to 4x4 channel and/or fittings to create a 90° upward angle from a straight horizontal run. Used with outside vertical 90° angle fitting FROVRA4X4YL to change level of a straight horizontal run. Includes split cover.	(2 pcs.) FRBC4X4YL	1	5
4x4 Inside Vertical 45° Angle Fitting				
FR4V454X4YL	Attaches to 4x4 channel and/or fittings to create a 45° upward angle from a horizontal run. Used with outside vertical 45° angle fitting FROV454X4YL to change level of a straight horizontal run. Includes split cover.	(2 pcs.) FRBC4X4YL	1	5
4x4 Outside Vertical 45° Angle Fitting				
FROV454X4YL	Attaches to 4x4 channel and/or fittings to create a 45° downward angle from a horizontal run. Used with inside vertical 45° angle fitting FR4V454X4YL to change level of a straight horizontal run. Accepts optional split cover FROV45SC4YL.	(2 pcs.) FRBC4X4YL	1	5

For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).



FR4X4



FR4TSC4



FR4WC4X4



FR4WCSC4



FR4EC4X4



FR4VRA4X4



FR4V454X4



FROV454X4

4x4 FIBERRUNNER® System Fittings (continued)



FROV45SC4



FROVRA4X4



FROVRASC4



FRRF6FR4



FRRF6FR4SC



FRRF4FD2



FRRF4FD4

Part Number	Part Description	Couplers Required	Std. Pkg. Qty.	Std. Ctn. Qty.
Split Cover for 4x4 Outside Vertical 45° Angle Fitting				
FROV45SC4YL	Optional split cover for the outside vertical 45° angle fitting FROV454X4YL. Snap-on feature allows cover to be installed and removed with no tools required. Creates radiused 3/4" (19mm) opening for easy access to add or remove cables.	—	1	5
4x4 Outside Vertical Right Angle Fitting				
FROVRA4X4YL	Attaches to 4x4 channel and/or fittings to create a 90° vertical turn down from a straight horizontal run. Accepts optional split cover FROVRASC4YL.	(2 pcs.) FRBC4X4YL	1	5
Split Cover for 4x4 Outside Vertical Right Angle Fitting				
FROVRASC4YL	Optional split cover for the outside vertical right angle fitting FROVRA4X4YL. Snap-on feature allows cover to be installed and removed with no tools required. Creates radiused 3/4" (19mm) opening for easy access to add or remove cables.	—	1	5
6x4 to 4x4 FIBERRUNNER® Reducer Fitting				
FRRF6FR4YL	Attaches any 6x4 FIBERRUNNER® Fitting or Channel to any 4x4 FIBERRUNNER® Fitting or Channel. Accepts split cover FRRF6FR4SCYL.	(1 pc.) FRBC6X4YL (1 pc.) FRBC4X4YL	1	5
Split Cover for 6x4 to 4x4 FIBERRUNNER® Reducer Fitting				
FRRF6FR4SCYL	Optional split cover for the 6x4 FIBERRUNNER® to 4x4 FIBERRUNNER® Reducer Fitting FRRF6FR4YL. Snap-on feature allows cover to be installed and removed with no tools required. Creates radiused 3/4" (19mm) opening for easy access to add or remove cables.	—	1	5
4x4 FIBERRUNNER® to 2x2 Reducer Fitting with Cover				
FRRF4FD2YL	Attaches any 4x4 FIBERRUNNER® Fitting or Channel to the 2x2 FIBER-DUCT™ Channel, S2X2YL6 or E2X2YL6 or 2x2 FIBERRUNNER® Channel, HS2X2YL6 or H2X2YL6. Note: Attachment to 2x2 FIBERRUNNER® Channel requires a QUIKLOCK™ Coupler FBC2X2YL. Includes solid cover.	(1 pc.) FRBC4X4YL	1	5
4x4 FIBERRUNNER® to 4x4 FIBER-DUCT™ Reducer Fitting with Cover				
FRRF4FD4YL	Attaches any 4x4 FIBERRUNNER® Fitting or Channel to the 4x4 FIBER-DUCT™ Channel, S4X4YL6 or E4X4YL6. Includes solid cover.	(1 pc.) FRBC4X4YL	1	5

For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

4x4 FIBERRUNNER® System Spillouts

- Spill-overs allow safe transition from horizontal to vertical runs
- 2" (50.8mm) bend radius control
- Transition to channel, slotted channel, and corrugated loom tubing
- Spill-over junction fittings can be retro-fitted to existing horizontal runs



FRVT4X4



FTR4X4



FIDT4X4BL



FRHD4KT



TRC4HDBL



FRLPR42BL

Part Number	Part Description	Couplers Required	Std. Pkg. Qty.	Std. Ctn. Qty.
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4x4 QUIKLock™ Vertical Tee

FRVT4X4YL	Attaches to 4x4 channel and/or fittings to create a 90° vertical drop from a horizontal run. Hinged door included. Accepts FTR4X4YL, FIDT4X4BL, S4X4YL6 or E4X4YL6 directly. Accepts optional snap-on cover FRHC4YL6 in conjunction with channel.	(2 pcs.) FRBC4X4YL	1	5
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3-Sided Vertical Tee Trumpet Spillout

FTR4X4YL	Used to limit the bend radius of the cable to 2" (50.8mm) when exiting from a 4x4 or 6x4 FIBERRUNNER® Vertical Tee and 4x4 FIBER-DUCT™ Fittings.	—	1	5
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2-Port Spillout to 1.5" (38mm) Inside Diameter Corrugated Tubing

FIDT4X4BL	Used to route cable into one or two pieces of 1.5" (38mm) diameter split corrugated tubing. Used with FRVT6X4YL, FRVT4X4YL, or FVT4X4YL. Securely holds corrugated split tubing to ensure system integrity and easy access to add or remove cables. Black color only.	—	1	5
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4x4 Hinged Duct Vertical Cable Manager Kit

FRHD4KTYL	Provides secure, accessible route for cables spilling out from vertical tee to rack mounted equipment. Kit includes 6' length of 4x4 capacity hinged duct, 6' length of 4x4 hinged duct cover, one end cap for 4x4 hinged duct, three FZBA1.5X4 adjustable "Z" brackets, an adapter fitting, six WR4-C wire retainers and all required mounting hardware. Attaches directly to 6x4 and 4x4 vertical tee exit or FRLPR64 low profile reducer.	—	1	—
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4x4 Hinged Duct Bend Radius Control Trumpet

TRC4HDBL	Bend radius control trumpet for exiting at the sidewall of 4" wall heights of type H hinged cover wiring duct channels. Maintains 1" (25.4mm) bend radius control. Black color only.	—	1	—
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Low Profile Reducer 4x4 to 2x2 for Vertical Tee

FRLPR42BL	Assembled into the 6x4 vertical tee FRVT6X4YL or 4x4 vertical tee FRVT4X4YL with an audible snap, the FRLPR42BL allows for the transition to 2x2 FIBERRUNNER® or 2x2 FIBER-DUCT™ Channel with minimal space required. No tools required for assembly. Black color only.	—	1	5
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For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

4x4 FIBERRUNNER® System Spillouts (continued)

Part Number	Part Description	Couplers Required	Std. Pkg. Qty.	Std. Ctn. Qty.
Spill-Over Junction with 2x2 Exit				
FRSPYL	Assembles onto 4x4, 6x4, or 12x4 FIBERRUNNER® Channel, spilling over the side into a 2x2 vertical channel, fitting, or corrugated tube. Mounts directly to existing installation with no alteration required. Mounting hardware provided for secure attachment.	—	1	—
Cover for Spill-Over Junction with 2x2 Exit for 4x4 Channel				
FRSP4CYL	Used to fully enclose 4x4 channel in conjunction with the spill-over junction FRSPYL. Cover snaps onto the channel base. Hinged feature allows easy access to add or remove cables.	—	1	5
3-Sided BRC Trumpet Spillout for 2x2 Exit				
FTR2X2YL	Used to limit the bend radius of the cable to 2" (50.8mm) when exiting from a FIBERRUNNER® Spill-Over FRSPYL or from 2x2 FIBER-DUCT™ Channel.	(1 pc.) FBC2X2YL	1	5
1-Port Spillout to 1.5" (38mm) Inside Diameter Corrugated Tubing				
FIDT2X2YL	Used to route cable into one piece of 1.5" (38mm) diameter split corrugated tubing. Used with FIBERRUNNER® Spill-Over FRSPYL, 2x2 FIBER-DUCT™ Fittings, and the 2x2 FIBERRUNNER® Hinged Channel. Securely holds split corrugated tubing to ensure system integrity and easy access to add or remove cables.	(1 pc.) FBC2X2YL	1	5
2x2 Hinged Duct Vertical Cable Manager Kit				
FRHD2KTYL	Provides secure, accessible route for cables spilling out from a vertical tee or spill-over junction to rack mounted equipment. Kit includes 6' length of 2x2 FIBERRUNNER® Hinged Channel H2X2YL6, 6' length of 2x2 snap-on hinged cover HC2YL6, four adjustable "Z" brackets FZBA1.5X4, one FIBERRUNNER® 2x2 End Cap FHDEC2X2YL, six hinged duct 2" wire retainers WR2H-C and all required mounting hardware. Attaches to 2x2 vertical tee exit or spill-over junction with a 2x2 exit with a 2x2 QUIKLOCK™ Coupler FBC2X2YL. Also attaches directly to 4x4 or 6x4 vertical tee exits with low profile reducer FRLPR42BL. Yellow and orange colors only.	—	1	—
2x2 FIBERRUNNER® Bend Radius Control Trumpet				
TRC2HDBL	Bend radius control trumpet for exiting at the sidewall of 2" wall heights of type H hinged cover wiring duct channels. Maintains 1" (25.4mm) bend radius control. Black color only.	—	1	10
Spill-Over Junction with 4x4 Exit				
FRSP4YL	Assembles onto 4x4, 6x4, or 12x4 FIBERRUNNER® Channel, spilling over the side into a 4x4 vertical exit. Requires coupler to attach 4x4 FIBERRUNNER® Channel and Fittings to the vertical exit. Mounts directly to existing installation with no alteration required. Mounting hardware provided for secure attachment.	(1 pc.) FRBC4X4YL	1	—

For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).



FRSP



FRSP4CYL



FTR2X2YL



FIDT2X2YL



FRHD2KTYL



TRC2HDBL



FRSP4YL

Table continued on page C3.40

4x4 FIBERRUNNER[®] System Spillouts (continued)



FRSP44C



FRTR4X4



FRIDT4X4



FR1.5IDE



FRUPS4X4

Part Number	Part Description	Couplers Required	Std. Pkg. Qty.	Std. Ctn. Qty.
Cover for Spill-Over Junction with 4x4 Exit for 4x4 Channel				
FRSP44CYL	Used to fully enclose the 4x4 channel in conjunction with the spill-over junction FRSP4YL. Cover snaps onto the channel base. Hinged feature allows easy access to add or remove cables.	—	1	5
3-Sided BRC Trumpet Spillout for 4x4 FIBERRUNNER[®] Exit				
FRTR4X4YL	Used to limit the bend radius of the cable to 2" (50.8mm) when exiting from 4x4 FIBERRUNNER [®] Channel or a 4x4 FIBERRUNNER [®] Horizontal Tee.	(1 pc.) FRBC4X4YL	1	5
2-Port Spillout to 1.5" (38mm) Inside Diameter Corrugated Tubing				
FRIDT4X4YL	Used to route cable into one or two pieces of 1.5" (38mm) diameter split corrugated tubing. Requires coupler to be used with 4x4 FIBERRUNNER [®] Fitting. Used with any 4x4 FIBERRUNNER [®] Fitting. Securely holds corrugated split tubing to ensure system integrity and easy access to add or remove cables.	(1 pc.) FRBC4X4YL	1	5
1-Port Spillout Side Exit to 1.5" (38mm) Inside Diameter Corrugated Tubing				
FR1.5IDEYL	Used to route cable into 1.5" (38mm) diameter split corrugated tubing directly through a hole cut in the side wall of the 4x4, 6x4, and 12x4 FIBERRUNNER [®] Channel or 4x4 FIBER-DUCT [™] Channel. Provides 1" (25.4mm) bend radius control at the exit. Securely holds split corrugated tubing to ensure system integrity and easy access to add or remove cables. Includes drilling template.	—	1	5
4x4 Up Spout				
FRUPS4X4YL	Allows cable to be directed upward out of the channel deployed directly below racks and cabinets in underfloor installations. Provides 2" (50.8mm) bend radius. Snaps directly onto the channel and can be positioned to allow cables to be laid in. A 1" (25.4mm) top bezel is included. Other fittings can be installed for specific applications including FTR4X4YL and FIDT4X4BL.	—	1	5

For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

FIBERRUNNER® Accessories



FRCUT



FR38DR



FR716DR



FR516DR



FRUIB-X



FRSSM2



FRSTRCLIP



FRTBKT-X

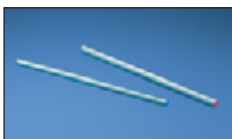
Part Number	Part Description	For Threaded Rod Size	Std. Pkg. Qty.	Std. Ctn. Qty.
Miter Box and Saw				
FRCUT	Used to cut 2x2, 4x4, and 6x4 <i>FIBERRUNNER</i> ® Channel and Hinged Cover, 4x4 <i>FIBER-DUCT</i> ™ Channel and Cover and 2x2 <i>FIBER-DUCT</i> ™ Channel and Cover.	—	1	—
3/8" Nut Driver				
FR38DR	Used to disassemble 4x4, 6x4, and 12x4 <i>FIBERRUNNER</i> ® <i>QUIKLOCK</i> ™ Couplers when required.	—	1	10
7/16" Nut Driver				
FR716DR	Used to assemble <i>QUIKLOCK</i> ™ Bracket slide clamps.	—	1	10
5/16" Nut Driver				
FR516DR	Used to disassemble 2x2 <i>FIBERRUNNER</i> ® <i>QUIKLOCK</i> ™ Couplers when required.	—	1	10
Universal Innerduct Bracket				
FRUIB-X	Used to secure any size corrugated tubing or inner-duct to any surface including equipment racks and channel or fittings. Two 1/4" (6.3 mm) holes must be drilled through to secure brackets.	—	10	100
Slack Spool Manager with 2.37" Bend Radius Diameter				
FRSSM2	The slack spool manager can be mounted in 12x4, 6x4, and 4x4 <i>FIBERRUNNER</i> ® Channels and in 4x4 <i>FIBER-DUCT</i> ™ Channel to create an in-channel slack management. It can be deployed in a vertical or horizontal channel run and can withstand a 20 lb. load without pulling away from the base. Mounting fasteners are included.	—	1	5
Strut Clip Kit				
FRSTRCLIP	Strut mounting clip assembly allows <i>FIBERRUNNER</i> ® Channel to be attached directly to standard 1 5/8" wide strut structures. Contains two clips and all hardware for assembly. Bolts release with 7/16" nut driver.	—	1	10
1/4" T-Bolt Kit				
FRTBKT-X	T-bolts can be used for additional attachment when securing <i>FIBERRUNNER</i> ® Channel to mounting brackets. For example, a T-bolt can be inserted thru a 12x4 mounting bracket and positioned within the center rib structure on the underside of 12x4 channel. By tightening the nut, the 12x4 channel is more securely fastened to the mounting bracket.	—	10	100

Table continued on page C3.42

FIBERRUNNER® Accessories (continued)



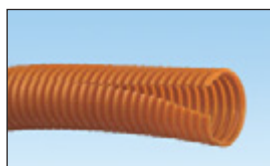
FRQMC-X



TR1-12-X
TR1-58-X



TRC18FR-X8



CLT150F-X3

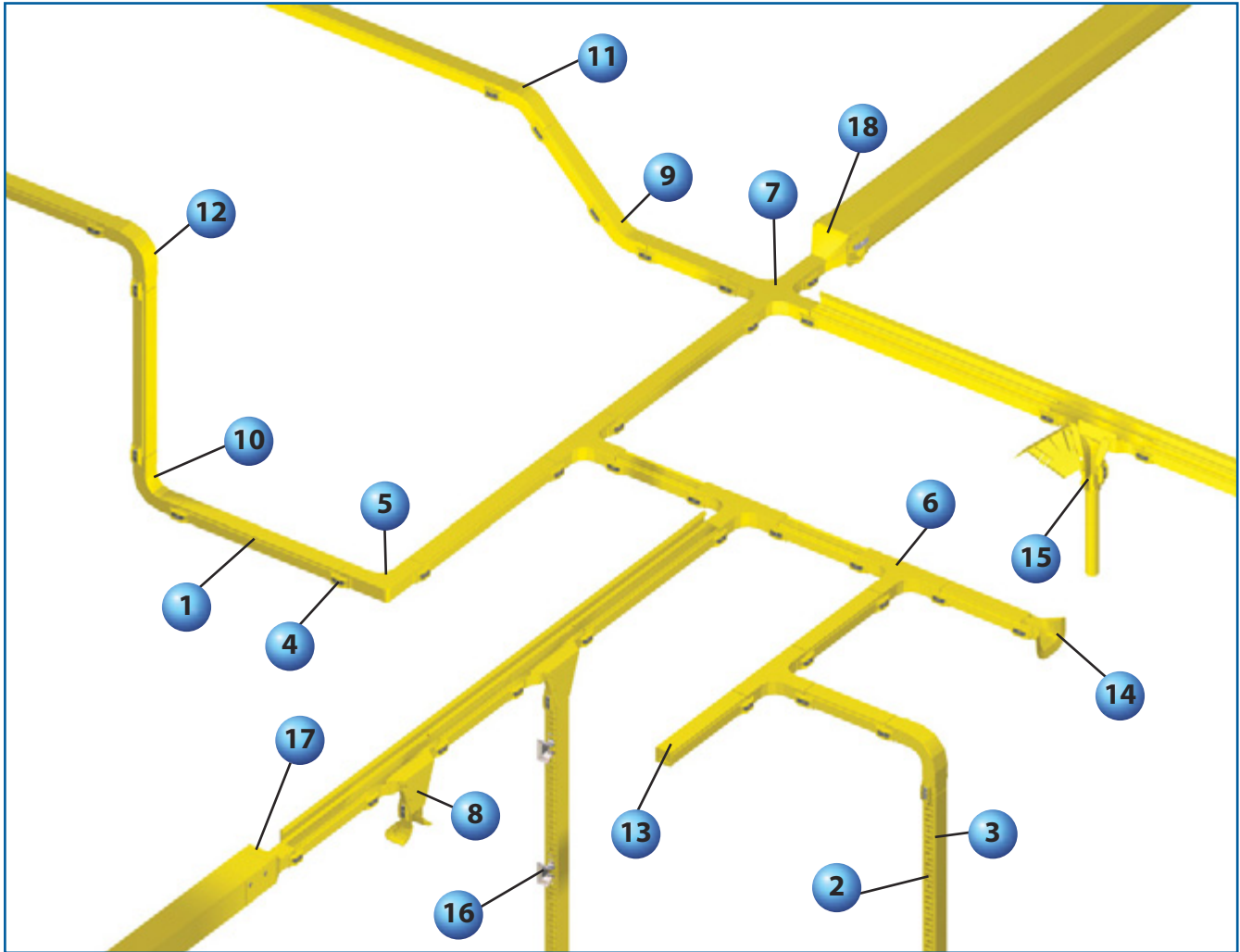
Part Number	Part Description	For Threaded Rod Size	Std. Pkg. Qty.	Std. Ctn. Qty.
FIBERRUNNER® Quick Mount Clips				
FRQMC-X	Used wherever additional <i>FIBERRUNNER®</i> Slide Clamps would be helpful. For example, use on 12x4 <i>FIBERRUNNER®</i> <i>QUIKLOCK™</i> Brackets to accommodate dual runs of 6x4 or 4x4 <i>FIBERRUNNER®</i> Channel.	—	10	100
Threaded Rod in 1' Lengths				
TR1-12-X	Threaded rod can be used with various mounting brackets. Length = 12" (305mm)	1/2"	10	—
TR1-58-X	Threaded rod can be used with various mounting brackets.	5/8"	10	—
Threaded Rod Cover				
TRC18FR-X8	Used to protect cabling from threaded rod. Vertical slit allows easy installation. Material meets UL 94V-0 specifications. For indoor use only. Available in 18" Lengths.	1/2" – 5/8"	10	100
Slit Corrugated Loom Tubing				
CLT150F-X3*	Slit corrugated loom tubing provides a vertical pathway as cables transfer from the <i>FIBERRUNNER®</i> Fitting to the equipment below. Inside diameter is 1.5" (38.1mm) and outside diameter 1.7" (43.2mm). Sold in 10' rolls.	—	1	—

*For other colors replace suffix X3 (Orange) with X4 (Yellow) or X20 (Black).

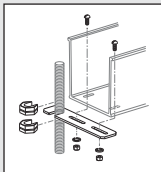
NOTES

A. System Overview**B1. Cable****B2. Modules****B3. Work Area Outlet Solutions****B4. Surface Raceway****B5. Zone Cabling Systems****B6. Wireless Solutions****C1. Copper Patch Panels, Cords & Punchdowns****C2. Fiber Connectors, Enclosures & Patch Cords****C3. Overhead & Underfloor Routing Systems****C4. Cabinets, Racks & Cable Management****C5. Grounding & Bonding****D. Managed System Solutions****E. Industrial****F1. Labeling & Identification****F2. Wiring Duct****F3. Cable Ties & Accessories****G. Index**

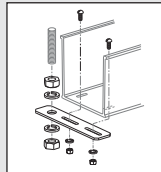
2x2 **FIBER-RUNNER** Routing System Roadmap



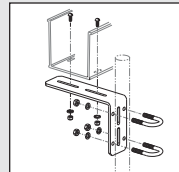
FIBER-DUCT™ Mounting Brackets



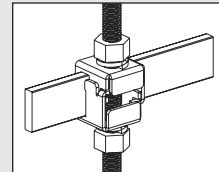
FTRBE12 - Existing Threaded Rod Bracket
(page C3.57)



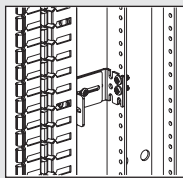
FTRBN12 - New Threaded Rod Bracket
(page C3.57)



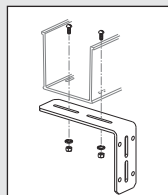
FUSB - Underfloor Pedestal Bracket
(page C3.57)



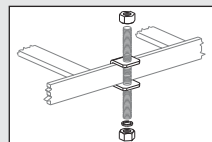
F2PCLB12 - Two-Piece Ladder Rack Bracket for Attaching Threaded Rod to 1 1/2" - 2" Ladder Rack
(page C3.58)



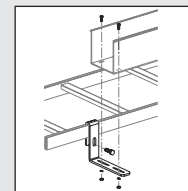
FZBA1.5X4 - Adjustable "Z" Bracket
(page C3.57)



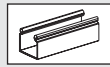
FLB - "L" Wall Mount Bracket
(page C3.57)



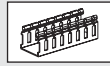
FLB12X20 - Bracket for Attaching Threaded Rod Ladder Rack
(page C3.57)



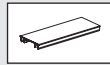
FLRB - Ladder Rack Bracket
(page C3.57)



1 HS2X2**6 – 2x2 *FIBERRUNNER*® Hinged Channel (page C3.46)



2 H2X2**6 – 2x2 *FIBERRUNNER*® Hinged Slotted Channel (page C3.46)



3 HC2**6 – 2x2 *FIBERRUNNER*® Snap-On Hinged Cover (page C3.46)



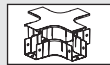
4 FBC2X2** – 2x2 *QUIKLOCK*™ Coupler (page C3.47)



5 FRA2X2** – 2x2 Horizontal Right Angle Fitting (page C3.54)



6 FT2X2** – 2x2 Horizontal Tee Fitting (page C3.54)



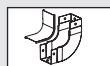
7 FFWC2X2** – 2x2 4-way Cross Fitting (page C3.54)



8 FVTHD2X2** – 2x2 Vertical Tee (page C3.48)



9 FIV452X2** – 2x2 Inside Vertical 45° Angle Fitting (page C3.54)



10 FIVRA2X2** – 2x2 Inside Vertical Right Angle Fitting (page C3.54)



11 FOV452X2** – 2x2 Outside 45° Angle Fitting (page C3.54)



12 FOVRA2X2** – 2x2 Outside Vertical Right Angle Fitting (page C3.54)



13 FHDEC2X2** – 2x2 End Cap Fitting (page C3.47)



14 FTR2X2** – 3-Sided BRC Trumpet Spillover for 2x2 Exit (page C3.48)



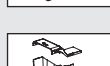
15 FIDT2X2** – 1-Port Spillover to 1.5" (38mm) Inside Diameter Corrugated Tubing (page C3.48)



16 TRC2HDBL – 2x2 Hinged Channel 1" Bend Radius Control Trumpet (page C3.48)



17 FRF42** – 4x4 to 2x2 *FIBER-DUCT*™ Reducer Fitting (page C3.54)



18 FRRF4FD2** – 4x4 *FIBERRUNNER*® to 2x2 Reducer Fitting (page C3.37)

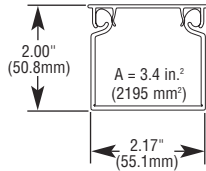
**Available colors include: YL (Yellow), OR (Orange), and BL (Black).



2x2 FIBERRUNNER® Routing System

Cable Fills for 2x2 FIBERRUNNER® Cable Routing System

The maximum amounts may vary according to the cable fill installation methods, straightness of cables, etc.



2x2 FIBERRUNNER® Cable Routing System							
Fill/Pile Up	Internal Area In.²	Diameter 1.6mm .063"	Diameter 2.0mm .079"	Diameter 3.0mm .118"	Augmented Cat. 6 23 AWG/UTP CM Diameter 9mm .354"	Fiber Optic Ribbon Interconnect Cable Diameter 5.20mm .205"	Category 6 Diameter 6.35mm .25"
40% Fill							
2" Pile Up	3.4	436	279	124	14	41	28
50% Fill							
2" Pile Up	3.4	546	349	155	17	52	35
60% Fill							
2" Pile Up	3.4	655	419	186	21	62	42

Channel cutting instructions: For optimum results, use FRCUT miter box and saw. For larger quantities use a plastic cutting saw blade for clean, burr-free cuts. Recommend: Carbide 80T and 100T; .090" thickness, .125" kerf.

2x2 FIBERRUNNER® Routing System – Channels and Cover

- 2x2 system ideal for use with smaller cable counts
- Multiple spillout options provide versatility to mate to various equipment and rack configurations
- **QUIKLOCK™** Couplers reduce system installation time dramatically
- Channel, covers, fittings and other non-metallic system components made from V-0 flame class rated material
- Compatible with all sizes of **PANDUIT® FIBERRUNNER®** and **PANDUIT® FIBER-DUCT™** Routing Systems, cable management, and racks
- 2x2 **FIBERRUNNER®** Hinged and Slotted Channels can be used with 2x2 **FIBER-DUCT™** fittings (see page C3.54) and brackets (see pages C3.57, C3.58)
- Compliant with the applicable tests in Telcordia GR-63-CORE Network Equipment Building Systems (NEBS) Level 3



HS2X2



H2X2



HC2



WR2H-C

Part Number	Part Description	Std. Pkg. Qty.	Std. Ctn. Qty.
2x2 FIBERRUNNER® Hinged Channel			
HS2X2YL6NM	Used to carry the cables throughout the system. Accepts hinged cover HC2YL6. Use QUIKLOCK™ Coupler FBC2X2YL to attach channel and/or fittings.	6	120
2x2 FIBERRUNNER® Hinged Slotted Channel			
H2X2YL6	Used to carry the cables vertically to the front or the back of equipment racks throughout the system. Accepts hinged cover HC2YL6. Extra supports required when used in horizontal applications. Use QUIKLOCK™ Coupler FBC2X2YL to attach channel and/or fittings.	6	120
2x2 Snap-On Hinged Cover			
HC2YL6	Optional snap-on cover for hinged channel HS2X2YL6 or H2X2YL6. The innovative cover can hinge open to 90° from either side of the channel and be removed completely if desired.	6	120
Cable Retainer for 2x2 System			
WR2H-C	Cable retainer can be installed between the slotted channel (H2X2YL6) fingers to retain cables. It can be used with cover and installs anywhere on channel. One retainer should be used approximately every 18" (457mm). Black color only.	100	1000

Note: Available with mounting holes. To order, delete NM from the part number. For other colors replace YL (Yellow) with OR (Orange) or BL (Black). Order number of feet required, in multiples of standard 6' length increments.

2x2 FIBERRUNNER® QUIKLOCK™ Coupler

- Pre-assembled to provide fast mechanical assembly of components
- No tools required for installation; bolts loosen for component disassembly



Part Number	Part Description	Std. Pkg. Qty.	Std. Ctn. Qty.
FBC2X2YL	Pre-assembled coupler quickly joins two sections of hinged channel and/or fittings. Mechanically attaches without tightening bolts. Bolts release using 5/16" nut driver to allow coupler to be removed if necessary.	1	5

For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

2x2 FIBERRUNNER® System Fittings



Part Number	Part Description	Std. Pkg. Qty.	Std. Ctn. Qty.
FHDEC2X2YL	Used for closing off open ends of the hinged channel or fittings. No coupler required. Push-on installation.	1	5

For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

2x2 FIBERRUNNER® System Spillouts

- Spill-overs allow safe transition from horizontal to vertical runs
- 2" bend radius control
- Transition to channel, slotted channel, and corrugated loom tubing



FVTHD2X2



FTR2X2



FIDT2X2



FRHD2KT



TRC2HDBL

Part Number	Part Description	Couplers Required	Std. Pkg. Qty.	Std. Ctn. Qty.
2x2 Vertical Tee				
FVTHD2X2YL	Attaches to 2x2 channel to create a 90° vertical drop from a horizontal run. Hinged door included. Accepts channel cover in conjunction with channel. Use <i>QUIKLOCK™</i> Coupler FBC2X2YL with HS2X2YL6 or H2X2YL6 channels. Use snap rivets NR2WH-L or bolts F14PN-L with S2X2YL6 or E2X2YL6 channels. Also accepts FIDT2X2YL.	(2 pcs.) FBC2X2YL	1	5
3-Sided BRC Trumpet Spillout for 2x2 Exit				
FTR2X2YL	Used to limit the bend radius of the cable to 2" (50.8mm) when exiting from a <i>FIBERRUNNER®</i> Spill-Over FRSPYL or from 2x2 <i>FIBER-DUCT™</i> Channel.	(1 pc.) FBC2X2YL	1	5
1-Port Spillout to 1.5" (38mm) Inside Diameter Corrugated Tubing				
FIDT2X2YL	Used to route cable into one piece of 1.5" (38mm) diameter split corrugated tubing. Used with <i>FIBERRUNNER®</i> Spill-Over FRSPYL, 2x2 <i>Fiber-Duct™</i> Fittings, and the 2x2 <i>FIBERRUNNER®</i> Hinged Channel. Securely holds split corrugated tubing to ensure system integrity and easy access to add or remove cables.	(1 pc.) FBC2X2YL	1	5
2x2 Hinged Duct Vertical Cable Manager Kit				
FRHD2KTYL	Provides secure, accessible route for cables spilling out from a vertical tee or spill-over junction to rack mounted equipment. Kit includes 6' length of 2x2 <i>FIBERRUNNER®</i> Hinged Channel H2X2YL6, 6' length of 2x2 snap-on hinged cover HC2YL6, four adjustable "Z" brackets FZBA1.5X4, one <i>FIBERRUNNER®</i> 2x2 End Cap FHDEC2X2YL, six hinged duct 2" wire retainers WR2H-C and all required mounting hardware. Attaches to 2x2 vertical tee exit or spill-over junction with a 2x2 exit with a 2x2 <i>QUIKLOCK™</i> Coupler FBC2X2YL. Also attaches directly to 4x4 or 6x4 vertical tee exits with low profile reducer FRLPR42BL. Yellow and orange colors only.	—	1	—
2x2 FIBERRUNNER® Bend Radius Control Trumpet				
TRC2HDBL	Bend radius control trumpet for exiting at the sidewall of 2" wall heights of type H hinged cover wiring duct channels. Maintains 1" (25.4mm) bend radius control. Black color only.	—	1	10

For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

FIBER-DUCT™ ROUTING SYSTEMS

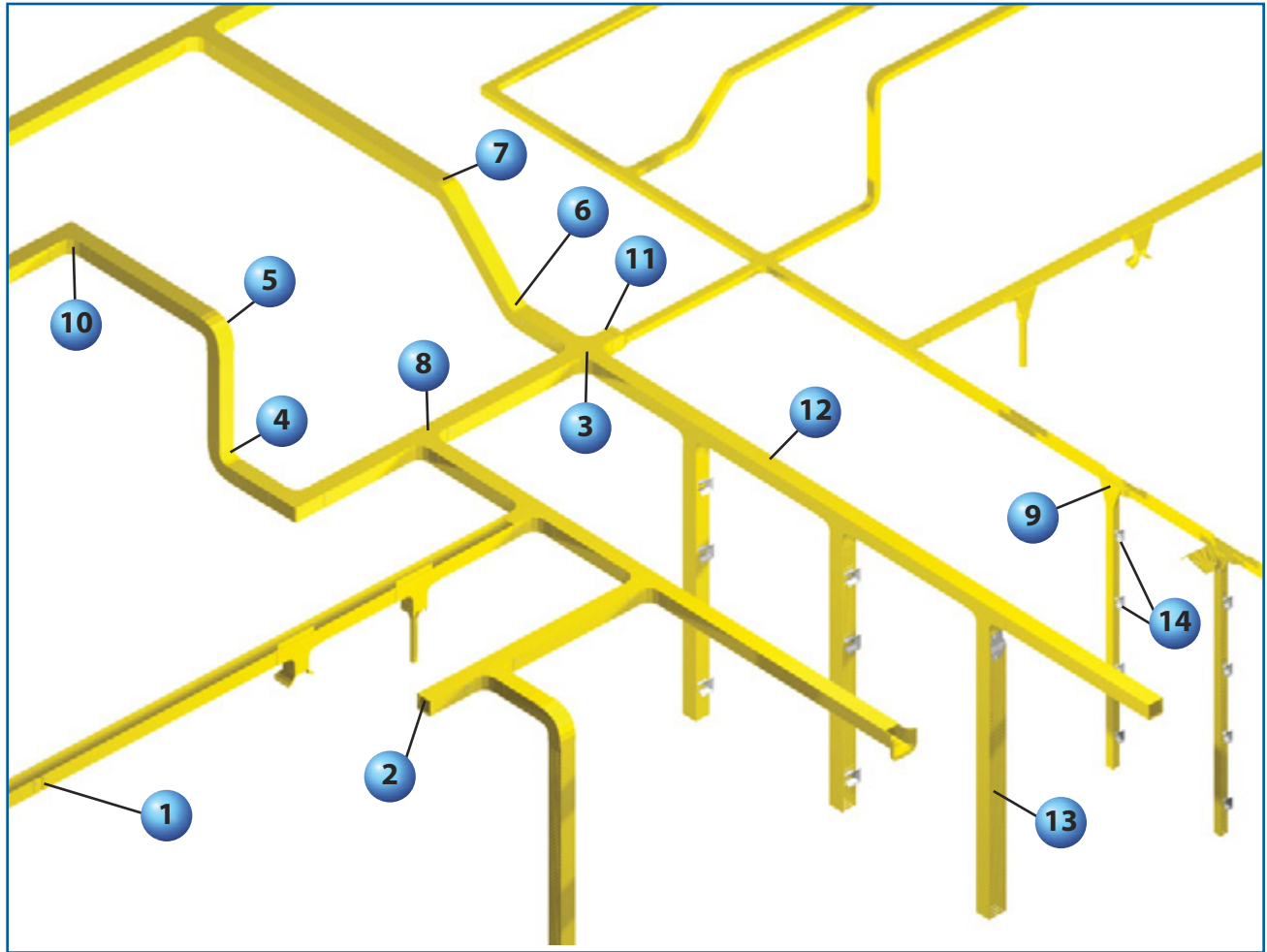
PANDUIT provides leading solutions for cable routing. These routing products are compatible with our cable management solutions increasing your ability to maintain an orderly and clean work environment, implement quick and easy moves, adds, and changes and maintain the integrity of your fiber and copper cabling plant in order to maximize long-term performance.



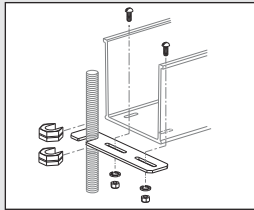
- Two system sizes available: 4x4 and 2x2
- Minimum 2" (50.8mm) bend radius fittings protect against signal loss due to excessive cable bends
- Optimized for use with PAN-NET® Network Solutions
- Snap-on non-slip covers
- Compatible with PANDUIT® FIBERRUNNER® 12x4, 6x4, 4x4 and 2x2 Routing Systems

The 2x2 and 4x4 FIBER-DUCT™ Routing Systems are comprised of channel, fittings, and brackets designed to segregate, route, and protect fiber optic and copper cabling to and between racks within the telecommunications room.

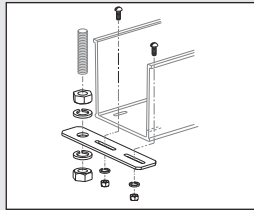
2x2 and 4x4 FIBER-DUCT™ Routing Systems Roadmap



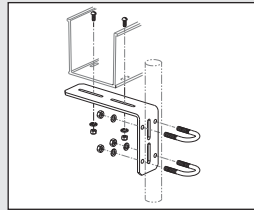
FIBER-DUCT™ Mounting Brackets



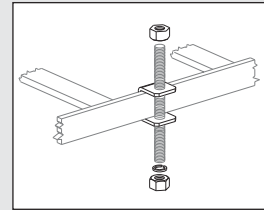
FTRBE12 – Existing Threaded Rod Bracket
(page C3.57)



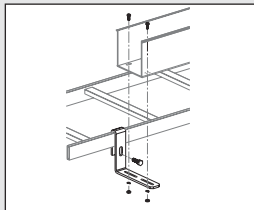
FTRBN12 – New Threaded Rod Bracket
(page C3.57)



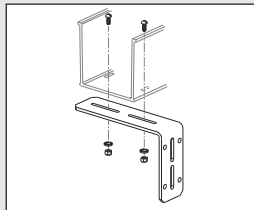
FUSB – Underfloor Pedestal Bracket
(page C3.57)



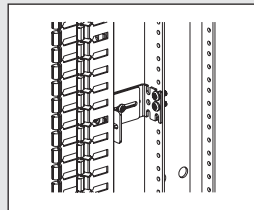
FLB12X15 – Bracket for Attaching Threaded Rod to Ladder Rack
(page C3.57)



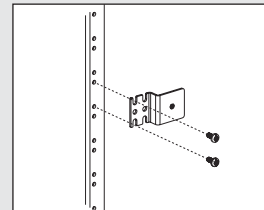
FLRB – Ladder Rack Bracket
(page C3.57)



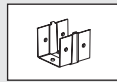
FLB – "L" Wall Mount Bracket
(page C3.57)



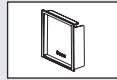
FZBA1.5X4 – Adjustable "Z" Bracket
(page C3.57)



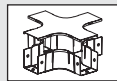
FZBLP – Low Profile "Z" Bracket
(page C3.57)



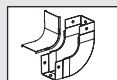
1 FCF2X2** and FCF4X4 – Coupler Fitting (page C3.54)



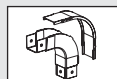
2 FEC2X2** and FEC4X4** – End Cap Fitting (page C3.54)



3 FFWC2X2** and FFWC4X4** – 4-Way Cross Fitting (page C3.54)



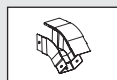
4 FIVRA2X2** and FIVRA4x4** – Inside Vertical Right Angle (page C3.54)



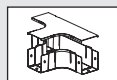
5 FOVRA2X2** and FOVRA4X4** – Outside Vertical Right Angle (page C3.54)



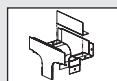
6 FIV452X2** and FIV454X4** – Inside Vertical 45° Angle (page C3.54)



7 FOV452X2** and FOV454X4** – Outside Vertical 45° Angle (page C3.54)



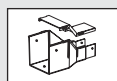
8 FT2X2** and FT4X4** – Horizontal Tee Fitting (page C3.54)



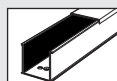
9 FVT4X4** – 4x4 Vertical Tee (page C3.55)



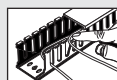
10 FRA2X2** – FRA4X4** – Right Angle Fitting (page C3.54)



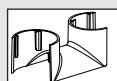
11 FRF42** – 4x4 to 2x2 FIBER-DUCT™ Reducer Fitting (page C3.54)



12 S2X2**6NM and S4X4**6NM FIBER-DUCT™ Channel (page C3.53)



13 E2X2**6 and E4X4**6 FIBER-DUCT™ Slotted Channel (page C3.53)



14 TRC2BL and TRC4BL – Bend Radius Control Trumpet (page C3.56)

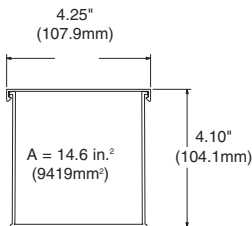
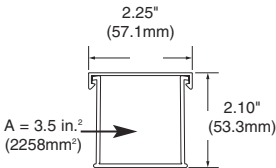
**Available colors include: YL (Yellow), OR (Orange), and BL (Black).



2x2 and 4x4 FIBER-DUCT™ Routing Systems

Cable Fills for 2x2 and 4x4 FIBER-DUCT™ Cable Routing Systems

The maximum amounts may vary according to the cable fill installation methods, straightness of cables, etc.



2x2 FIBER-DUCT™ Cable Routing System							
Fill/Pile Up	Internal Area in. ²	Diameter 1.6mm .063"	Diameter 2.0mm .079"	Diameter 3.0mm .118"	Augmented Cat. 6 23 AWG/UTP CM Diameter 9mm .354"	Fiber Optic Ribbon Interconnect Cable Diameter 5.20mm .205"	Category 6 Diameter 6.35mm .25"
40% Fill							
2" Pile Up	3.5	449	288	128	14	42	29
50% Fill							
2" Pile Up	3.5	562	359	160	18	53	36
60% Fill							
2" Pile Up	3.5	674	431	192	21	64	43

Channel cutting instructions: For optimum results, use FRCUT miter box and saw. For larger quantities use a plastic cutting saw blade for clean, burr-free cuts. Recommend: Carbide 80T and 100T; .090" thickness, .125" kerf.

4x4 FIBER-DUCT™ Cable Routing System							
Fill/Pile Up	Internal Area in. ²	Diameter 1.6mm .063"	Diameter 2.0mm .079"	Diameter 3.0mm .118"	Augmented Cat. 6 23 AWG/UTP CM Diameter 9mm .354"	Fiber Optic Ribbon Interconnect Cable Diameter 5.20mm .205"	Category 6 Diameter 6.35mm .25"
40% Fill							
2" Pile Up	7.60	976	624	277	31	92	62
3" Pile Up	11.30	1450	928	413	46	137	92
4" Pile Up	14.60	1874	1199	533	59	177	119
50% Fill							
2" Pile Up	7.60	1219	780	347	39	115	77
3" Pile Up	11.30	1813	1160	516	57	171	115
4" Pile Up	14.60	2343	1499	666	74	221	149
60% Fill							
2" Pile Up	7.60	1463	936	416	46	138	93
3" Pile Up	11.30	2176	1392	619	69	205	138
4" Pile Up	14.60	2811	1799	800	89	265	178

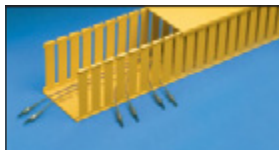
Channel cutting instructions: For optimum results, use FRCUT miter box and saw. For larger quantities use a plastic cutting saw blade for clean, burr-free cuts. Recommend: Carbide 80T and 100T; .090" thickness, .125" kerf.

2x2 and 4x4 FIBER-DUCT™ Routing Systems

- Channel, covers, fittings and other non-metallic system components made from V-0 flame class rated material
- Snap-on non-slip covers
- Compatible with PANDUIT® FIBERRUNNER® 2x2, 4x4, 6x4 and 12x4 Routing Systems



S2X2
S4X4



E2X2
E4X4



C2
C4

Part Number	Part Description	System Size	Std. Pkg. Qty.	Std. Ctn. Qty.
FIBER-DUCT™ Channel				
S2X2YL6NM	Used to carry the cables throughout the FIBER-DUCT™ Routing System. Accepts cover C2YL6. Cover sold separately.	2x2	6	120
S4X4YL6NM	Used to carry the cables throughout the FIBER-DUCT™ Routing System. Accepts cover C4YL6. Cover sold separately.	4x4	6	60

FIBER-DUCT™ Slotted Channel				
E2X2YL6	Used to carry the cables vertically to the front or the back of equipment racks throughout the system. Accepts cover C2YL6. Extra supports required when used in horizontal applications. Cover sold separately.	2x2	6	120
E4X4YL6	Used to carry the cables vertically to the front or the back of equipment racks throughout the system. Accepts cover C4YL6. Extra supports required when used in horizontal applications. Cover sold separately.	4x4	6	60

FIBER-DUCT™ Cover				
C2YL6	Cover for FIBER-DUCT™ Channel and FIBER-DUCT™ Slotted Channel. Non-slip cover design incorporates integral high friction lining to inhibit cover movement.	2x2	6	120
C4YL6	Cover for FIBER-DUCT™ Channel and FIBER-DUCT™ Slotted Channel. Non-slip cover design incorporates integral high friction lining to inhibit cover movement.	4x4	6	120

Note: Available with mounting holes. To order, delete NM from the part number. For fastest installation use NR2WH-L or NR4BL-L snap rivets. For other colors replace YL (Yellow) with OR (Orange) or BL (Black). Order number of feet required, in multiples of standard 6' length increments.

FIBER-DUCT[™] System Fittings



FCF2X2
FCF4X4



FRA2X2
FRA4X4



FT2X2
FT4X4



FFWC2X2
FFWC4X4



FEC2X2
FEC4X4



FIV452X2
FIV454X4



FOV452X2
FOV454X4



FIVRA2X2
FIVRA4X4



FOVRA2X2
FOVRA4X4



FRF42

Part Number	Part Description	System Size	Std. Pkg. Qty.	Std. Ctn. Qty.
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Coupler Fitting

FCF2X2YL	Used to join two sections of duct together. <i>FIBER-DUCT[™]</i> Coupler is not required at each fitting connection.	2x2	1	5
FCF4X4YL		4x4	1	5

Horizontal Right Angle Fitting

FRA2X2YL	Attaches to channel to create a 90° horizontal turn from a straight horizontal run. Cover included.	2x2	1	5
FRA4X4YL		4x4	1	5

Horizontal Tee Fitting

FT2X2YL	Attaches to channel to create a 90° horizontal branch from a straight horizontal run. Cover included.	2x2	1	5
FT4X4YL		4x4	1	5

4-Way Cross Fitting

FFWC2X2YL	Attaches to channel to create a horizontal 4-way cross intersection. Cover included.	2x2	1	5
FFWC4X4YL		4x4	1	5

End Cap Fitting

FEC2X2YL	Used for closing off open ends of the channel. No coupler required. Push-on installation.	2x2	1	5
FEC4X4YL		4x4	1	5

Inside Vertical 45° Angle Fitting

FIV452X2YL	Attaches to channel to create a 45° upward angle from a straight horizontal run. Used with outside vertical 45° angle fitting FOV452X2YL or FOV454X4YL to change level of straight horizontal runs. Cover included.	2x2	1	5
FIV454X4YL		4x4	1	5

Outside Vertical 45° Angle Fitting

FOV452X2YL	Attaches to channel to create a 45° downward angle from a straight horizontal run. Used with inside vertical 45° angle fitting FIV452X2YL or FIV454X4YL to change level of straight horizontal runs. Cover included.	2x2	1	5
FOV454X4YL		4x4	1	5

Inside Vertical Right Angle Fitting

FIVRA2X2YL	Attaches to channel to create a 90° upward angle from a straight horizontal run. Used with outside vertical 90° angle fitting FOVRA2X2YL or FOVRA4X4YL to change level of straight horizontal runs. Cover included.	2x2	1	5
FIVRA4X4YL		4x4	1	5

Outside Vertical Right Angle Fitting

FOVRA2X2YL	Attaches to channel to create a 90° downward angle from a straight horizontal run. Used with inside vertical 90° angle fitting FIVRA2X2YL or FIVRA4X4YL to change level of straight horizontal runs. Cover included.	2x2	1	5
FOVRA4X4YL		4x4	1	5

4x4 to 2x2 FIBER-DUCT[™] Reducer Fitting

FRF42YL	Joins any 4x4 <i>FIBER-DUCT[™]</i> Fitting to the 2x2 <i>FIBER-DUCT[™]</i> Channel, S2X2YL6 or E2X2YL6. Includes cover.	2x2 4x4	1	5
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For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).
Fittings include 5/16" assembly holes for fast mechanical fastening.

FIBER-DUCT™ Spillouts



FVTHD2X2



FTR2X2



FIDT2X2



FVT4X4



FTR4X4



FIDT4X4BL

Part Number	Part Description	System Size	Std. Pkg. Qty.	Std. Ctn. Qty.
2x2 Vertical Tee				
FVTHD2X2YL	Attaches to 2x2 channel to create a 90° vertical drop from a horizontal run. Hinged door included. Accepts channel cover in conjunction with channel. Use <i>QuickLock™</i> Coupler FBC2X2YL with HS2X2YL6 or H2X2YL6 channels. Use snap rivets NR2WH-L or bolts F14PN-L with S2X2YL6 or E2X2YL6 channels. Also accepts FIDT2X2YL.	2x2	1	5
3-Sided BRC Trumpet Spillout for 2x2 Exit				
FTR2X2YL	Used to limit the bend radius of the cable to 2" (50.8mm) when exiting from a <i>FIBERRUNNER®</i> Spill-Over FRSPYL or from 2x2 <i>FIBER-DUCT™</i> Channel.	2x2	1	5
1-Port Spillout to 1.5" (38mm) Inside Diameter Corrugated Tubing				
FIDT2X2YL	Used to route cable into one piece of 1.5" (38mm) diameter split corrugated tubing. Used with <i>FIBERRUNNER®</i> Spill-Over FRSPYL, 2x2 <i>FIBER-DUCT™</i> Fittings, and the 2x2 <i>FIBERRUNNER®</i> Hinged Channel. Securely holds split corrugated tubing to ensure system integrity and easy access to add or remove cables.	2x2	1	5
4x4 Vertical Tee				
FVT4X4YL	Attaches to channel to create a 90° vertical drop from a horizontal run. Accepts FIDT4X4BL, FTR4X4YL, S4X4YL6 or E4X4YL6 directly.	4x4	1	5
3-Sided Vertical Tee Trumpet Spillout				
FTR4X4YL	Used to limit the bend radius of the cable to 2" (50.8mm) when exiting from a 4x4 or 6x4 <i>FIBERRUNNER®</i> Vertical Tee and 4x4 <i>FIBER-DUCT™</i> Fittings.	4x4	1	5
2-Port Spillout to 1.5" (38mm) Inside Diameter Corrugated Tubing				
FIDT4X4BL	Used to route cable into one or two pieces of 1.5" (38mm) diameter split corrugated tubing. Used with FRVT6X4YL, FRVT4X4YL, or FVT4X4YL. Securely holds corrugated split tubing to ensure system integrity and easy access to add or remove cables. Black color only.	4x4	1	5

For other colors replace suffix YL (Yellow) with OR (Orange) or BL (Black).

FIBER-DUCT™ Bend Radius Control Trumpets

- Provide method to transition cabling into rack system
- Maintain 1" (25.4mm) bend radius control



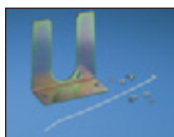
TRC2BL



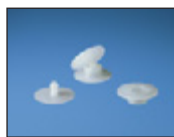
TRC4BL

Part Number	Part Description	System Size	Std. Pkg. Qty.	Std. Ctn. Qty.
TRC2BL	Bend radius control trumpet for exiting at the sidewall of 2" wall heights of type E FIBER-DUCT™ Channels.	2x2	1	10
TRC4BL	Bend radius control trumpet for exiting at the sidewall of 4" wall heights of type E FIBER-DUCT™ Channels.	4x4	1	10

FIBER-DUCT™ Accessories



FITF4X4B



NR2
NR4

Part Number	Part Description	System Size	Std. Pkg. Qty.	Std. Ctn. Qty.
Innerduct Transition Fitting – 4x4 Size				
FITF4X4B	Provides transition from 4x4 FIBER-DUCT™ Routing System to two pieces of 1 1/4" (31.8mm) inner duct.	4x4	1	10
Snap Rivets				
NR2WH-L	Snap rivet fastens channel and fittings together for added strength and rigidity. Snap rivet mounts flush to surfaces.	2x2	50	500
NR4BL-L		4x4	50	500



F14PWN-L



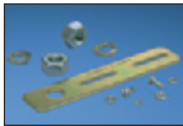
F14PN-L

Plastic Bolts and Nuts				
F14PWN-L	1/4" plastic bolts and wing nuts fastens channel and fittings together for added strength and rigidity.	2x2 4x4	50	500
F14PN-L	1/4" plastic bolts and hex nuts fastens channel and fittings together for added strength and rigidity.	2x2 4x4	50	500

FIBER-DUCT™ Mounting Brackets



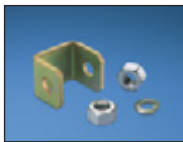
FTRBE12/FTRBE12M
FTRBE58



FTRBN12/FTRBN12M
FTRBN58



FUSB



FLB12X15
FLB58X15
FLB12X20
FLB58X20



FLRB



FLB



FZBA1.5X4



FZBLP

Part Number	Part Description	For Threaded Rod Size	Std. Pkg. Qty.	Std. Ctn. Qty.
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Existing Threaded Rod Bracket for FIBER-DUCT™ System

FTRBE12	Used for supporting the 2x2 and 4x4 FIBER-DUCT™ Systems from existing threaded rod installations. Bracket is secured to threaded rod with two split nuts. Contains hardware for attaching to threaded rods and hardware for mounting channel to bracket.	1/2"	1	10
FTRBE58		5/8"	1	10
FTRBE12M		12mm	1	10

New Threaded Rod Bracket for FIBER-DUCT™ System

FTRBN12	Used for supporting the 2x2 and 4x4 FIBER-DUCT™ Systems from new threaded rod installations. Bracket is secured to threaded rod with two nuts. Contains hardware for attaching to threaded rods and hardware for mounting channel to bracket.	1/2"	1	10
FTRBN58		5/8"	1	10
FTRBN12M		12mm	1	10

Underfloor Pedestal for FIBER-DUCT™ System

FUSB	Used to support the 2x2 and 4x4 FIBER-DUCT™ Systems by attaching to underfloor pedestal (not included). Use on pedestals up to 1" in diameter. Bracket contains hardware to attach to pedestal and hardware for mounting channel to bracket.	—	1	10
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Bracket for Attaching Threaded Rod to 1 1/2" Ladder Rack

FLB12X15	Bracket attaches to 3/8" (9.5mm) wide x 1 1/2" (38.1mm) ladder rack rail. Bracket accepts threaded rod (not included). Contains bracket and hardware for attaching bracket to ladder rack.	1/2"	1	10
FLB58X15		5/8"	1	10

Bracket for Attaching Threaded Rod to 2" Ladder Rack

FLB12X20	Bracket attaches to 3/8" (9.5mm) wide x 2" (50.8mm) ladder rack rail. Bracket accepts threaded rod (not included). Contains bracket and hardware for attaching bracket to ladder rack.	1/2"	1	10
FLB58X20		5/8"	1	10

Ladder Rack Bracket for FIBER-DUCT™ System

FLRB	Used to support the 2x2 and 4x4 FIBER-DUCT™ Systems attaching directly to any 3/8" (9.5mm) x 1 1/2" (38.1mm) or 3/8" (9.5mm) x 2" (50.8mm) ladder rack rail. No threaded rod required. Contains hardware for mounting channel to bracket.	—	1	10
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"L" Wall Mount Bracket for FIBER-DUCT™ System

FLB	Used to support 2x2 and 4x4 FIBER-DUCT™ Systems by attaching to a wall or the front or back of an equipment rack. Contains hardware for mounting channel to bracket.	—	1	10
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Adjustable "Z" Bracket

FZBA1.5X4	Bracket used to offset FIBER-DUCT™ System from mounting surface, adjustable from 1.5" (38mm) to 4" (101mm). Typically used on the front of an equipment rack.	—	1	10
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Low Profile "Z" Bracket

FZBLP	Bracket used to offset 4x4 or 2x2 FIBER-DUCT™ and hinged duct from the front face of an equipment rack. Bracket provides a secure mounting surface .67" (17mm) from the front of an equipment rack.	—	1	10
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Table continued on page C3.58

FIBER-DUCT™ Mounting Brackets (continued)



FEIAB58



F2PCLB12
F2PCLB58
F2PCLB12M
F2PCLB58M



FRAF58

Part Number	Part Description	For Threaded Rod Size	Std. Pkg. Qty.	Std. Ctn. Qty.
EIA/TIA Threaded Rod Mounting Bracket				
FEIAB58	Bracket consists of two identical components that clamp onto the crossmembers of standard EIA/TIA racks and are secured with standard hex nuts and split lockwashers (included) tightened onto a length of 5/8" diameter threaded rod (not included). The threaded rod is positioned in the center of the brackets providing a vertical threaded rod stud to mount <i>FIBERRUNNER</i> [®] and <i>FIBER-DUCT</i> [™] Threaded Rod Mounting Brackets onto.	5/8"	1	10

Two-Piece Ladder Rack Bracket for Attaching Threaded Rod to 1 1/2" – 2" Ladder Rack				
F2PCLB12	Two-piece bracket attaches to 3/8" (9.5mm) wide x 1 1/2" (38.1mm) or 3/8" (9.5mm) wide x 2" (50.8mm) ladder rack rail. Bracket halves slide into position and clamp together on the ladder rack rail, which allows for a one-handed assembly of the threaded rod (not included). Contains bracket and hardware for attaching bracket to ladder rack.	1/2"	1	10
F2PCLB58		5/8"	1	10
F2PCLB12M		12mm	1	10
F2PCLB58M		16mm	1	10

Two-Piece Framing Clip for Attaching 5/8" Threaded Rod to 2" x 9/16" C-Channel Auxiliary Framing Bars				
FRAF58	Two-piece framing clip attaches to auxiliary framing bars. Framing clip halves slide into position and interlock on the auxiliary framing bars, allowing easier assembly of the threaded rod to bars. Contains two-piece framing clip and hardware for attaching framing clip to auxiliary framing bars. (5/8" threaded rod not included.)	5/8"	1	10