

Frequently Asked Questions

F-SERIES TERAFRAME® CABINET SYSTEM



Q. What is the difference between a generation 1 (Gen 1) F-Series TeraFrame Cabinet and a generation 2 (Gen 2) F-Series TeraFrame Cabinet?

A. In most cases, cabinets manufactured after February 9, 2009 are the Gen 2 F-Series TeraFrame Cabinets. The cabinet manufacturing date can be located on the lower rear frame member. If the "Mfg Code" or "Lot" is greater than "09040" and the front to rear frame is a track with captured hardware (not punched round holes) the cabinet should be a Gen 2 frame. The Gen 2 F-Series TeraFrame Cabinet features an improved frame design that includes an extruded aluminum slide assembly that allows mounting rails and accessories to be quickly repositioned in depth. Mounting rails and accessories slide front-to-rear along channels formed in the sides of the frame. The grounding features and the load capacities have not been changed as a result of the new frame design. The new frame design requires new side panels, rear doors, server top panels, mounting rails, baying kits, and caster kits specific for the Gen 2 F-Series TeraFrame Cabinet. The new rear doors and top panels are backward compatible with the Gen 1 F-Series TeraFrame Cabinet, but all other service parts must be matched to the frame generation. The top level part number for cabinets (FXXX-XXXX-XXX) has not changed as the design change is simply a model change-over.

On the original Gen 1 F-Series TeraFrame Cabinet, mounting rails and accessories attached to punched holes along the side of the cabinet frame and the hardware had to be completely removed to be repositioned. The original frame was an all steel, welded construction.

For more detailed instructions on determining your cabinet frame design, please reference the F-Series TeraFrame Cabinet Frame Construction Guide available online : www.chatsworth.com/f-series , click on Frame Construction Guide under Product Information or contact CPI technical support. CPI technical support can assist you in identifying your product or assist you in selecting service parts.

Q. Why is F-Series TeraFrame available in three widths 23.6"W (600 mm), 27.6"W (700 mm) and 31.5"W (800 mm)?

A. Wider cabinets provide more internal space for cable management.

Q. What is the best use of a 23.6"W (600 mm) F-Series TeraFrame Cabinet?

A. The 23.6"W (600 mm) F-Series TeraFrame is best used to store blade servers and data storage equipment. The 23.6"W (600 mm) cabinet provides approximately 1" (25 mm) of internal cable management space along both sides of the cabinet and equipment. Use the 23.6"W (600 mm) cabinet to align with and match the width of standard 600 mm or 24"W access floor tiles.

Q. What is the best use of a 27.6"W (700 mm) F-Series TeraFrame Cabinet?

A. The 27.6"W (700 mm) cabinet is best used to store low-profile (1U, 2U, 3U) rack-mount servers and data storage equipment or a mix of computer and network equipment. The 27.6"W (700 mm) cabinet provides approximately 3" (80 mm) of internal cable management space along both sides of the cabinet and equipment. The 27.6"W (700 mm) cabinet is wider than access floor tiles, but provides more internal cable management space.



Frequently Asked Questions

F-SERIES TERAFRAME® CABINET SYSTEM

Q. What is the best use of a 31.5"W (800 mm) F-series TeraFrame Cabinet?

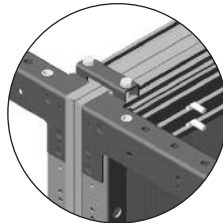
A. The 31.5"W (800 mm) cabinet is best used to store network equipment and cables. The 31.5"W (800 mm) cabinet provides approximately 5" (130 mm) of internal cable management space along both sides of the cabinet and equipment. The 31.5"W (800 mm) cabinet is wider than access floor tiles, but provides more internal cable management space.

Q. How do you bay F-Series TeraFrames together side-by-side to create a continuous row of cabinets?

A. There are four baying kits available for F-Series TeraFrame Cabinets. The Zero Spacing Baying Kit (P/N 35078-001) is a set of four M6 bolts, washers and nuts that connect cabinets through holes in the frame uprights. This kit can be used to bay cabinets of any width, with or without side panels installed, but the cabinets must be the same height and depth. The Narrow Baying Brackets Kit (P/N 35079-X02) is a set of two C-shaped brackets and installation hardware that connect cabinets across the tops of the cabinets at the front and rear of the cabinets. This kit can be used to bay cabinets of any widths, with or without side panels installed, but there will be a small gap between the cabinets if one or both side panels are omitted. (If one or both side panels are omitted, seal the gap between cabinets with a Seal Kit.) Cabinets must be the same height, but can be different depths if side panels are included. The other two baying kits are used specifically to bay and center 23.6"W (600 mm) cabinets over 24"W (610 mm) access floor tiles and are discussed in the answer to the next question.



P/N 35079-X02



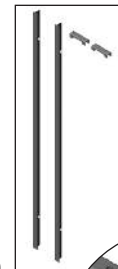
Q. How do you bay two or more 23.6"W (600 mm) F-Series TeraFrame Cabinets so that they are centered over 600 mm access floor tiles?

A. Use the Narrow Baying Brackets Kit (P/N 35079-X02). The Narrow Baying Brackets Kit is a set of two C-shaped brackets and installation hardware that connect cabinets across the

tops of the cabinets at the front and rear of the cabinets. This kit can be used to bay cabinets with or without side panels installed, but there will be a small gap between the cabinets if one or both side panels are omitted. (If one or both side panels are omitted, seal the gap between cabinets with a Seal Kit.) Cabinets must be the same height, but can be different depths if side panels are included.

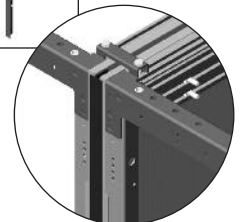
Q. How do you bay two or more 23.6"W (600 mm) F-Series TeraFrame Cabinets so that they are centered over 24"W (610 mm) access floor tiles?

A. There are two baying kits available for baying and centering 23.6" (600 mm) F-Series TeraFrame Cabinets over 24"W (610 mm) access floor tiles. The 24" (610 mm) Baying & Fascia Kit (P/N 35080-XXX) includes a set of two C-shaped brackets and installation hardware to space and connect the cabinets and two fascia strips to cover the gap left between the cabinets. (If one or both side panels are omitted, seal the gap between cabinets with a Seal Kit.) Cabinets must be the same height and depth. Alternately, the 24" (610 mm) Baying Brackets kit (P/N 35079-X01) includes a set of two C-shaped brackets and installation hardware to space and connect the cabinets, but no fascia to cover the gap between the cabinets. Cabinets must be the same height, but can be different depths if side panels are included.



P/N 35080-XXX
Baying &
Fascia Kit

Installation
view shown
below



Q. What handle-latch-lock combinations are available for the F-Series TeraFrame Cabinet?

A. There are seven standard handle-latch-lock options:

- Swing handle, single-point slam latch & keyed lock
- Swing handle, single-point cam latch & keyed lock
- Swing handle, two-point cam latch & keyed lock
- Swing handle, single-point slam latch & combination lock
- Swing handle, single-point cam latch & combination lock
- Swing handle, two-point cam latch & combination lock
- Swing handle, single-point cam latch & stand-alone electronic lock



Frequently Asked Questions

F-SERIES TERAFRAME® CABINET SYSTEM

Q. What is a swing handle?

A. All F-Series TeraFrame doors have a swing handle. A swing handle is a special type of pivoting door handle that has an open and closed position. When in the open position, the swing handle can be turned to release the latch. When in the closed position, swing handles provide additional security because they cannot be turned.



Q. What is the difference between a single-point and a two-point latch?

A. The latch is the mechanism that interfaces with the cabinet frame to secure the door in the closed position. Latches can be single-point or two-point. A single-point latch secures at one point – in the center of the door next to the swing handle. A two-point latch secures at the top and bottom of the door and provides better physical security for equipment. Double doors always require a two-point latch. Two-point latches provide added security for equipment.



Shown:

P/N 34575; Single-Pont, Cam Combination

P/N 34546; Single-Point Slam

Q. What is the difference between a slam and cam latch?

A. Slam and cam refer to how the latch mechanism is controlled. The slam latch has a spring loaded mechanism that secures the door when it is pushed closed. The swing handle must be operated to open the door. The cam latch requires the swing handle to be turned to both open and close the door. The cam latch does not automatically engage when the door is in the closed position. The slam latch provides more convenience, but is not available with a two-point latch.

Q. What is the difference between the keyed, combination and electronic lock?

A. The differences in the locks are how they are opened. The keyed lock is a basic lock that includes and is opened with a physical key. Use keyed locks to provide basic security for equipment. The mechanical combination lock is opened with a key or a user-set three-digit combination. The combination is entered by turning three dials that are built into the swing handle. Use the combination lock to assign up to 1,000 different individual combinations to each cabinet or groups of cabinets to simplify access for IT staff or to assign specific users access to specific cabinets. Electronic locks have a nine-digit keypad integrated into the swing handle on the front door that controls access to both the front and rear doors. The keypad can be programmed with up to five (four-digit to six-digit) codes for each door. Both the front and rear door can be programmed with the same code. Codes are programmed on the keypad by entering a factory assigned programming code. The electronic keypad is not connected to a network and cannot be controlled remotely. The electronic keypad requires a power connection and locks in the power out condition. Use the electronic lock to assign multiple access codes to each cabinet to create and assign different levels of user access in the data center. A networked Electronic Locking System (ELS) is available as an accessory.

Q. Do both doors have the same latch?

A. Yes, in a standard configuration the front and rear door will be fitted with the same latch. There are two exceptions. When you configure a cabinet with a double rear door and a single-point latch the rear door will have a two-point cam latch with the same type of lock (keyed or combination) as the front door. Additionally, when you order an electronic stand alone lock, the front door handle will have an integrated keypad, the rear door swing handle will not. The keypad will open both doors.

Q. Can you configure a F-Series TeraFrame door without a latch?

A. No, the door will not remain closed without a latch. All standard configurations are shipped with latches installed on the doors. Note that there is a [None] option in the order matrix for latches, but this option is only used if no doors are



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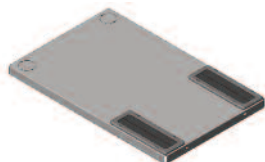
Frequently Asked Questions

F-SERIES TERAFRAME® CABINET SYSTEM

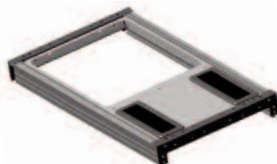
ordered with the cabinet. You can configure a cabinet with a single door, but you must designate a latch for that door. Also, the electronic stand alone lock can only be ordered when a front and rear door are selected and cannot be used with double doors. If you need to change or add a door or a latch after the initial installation of the cabinet, you can order the door or latch separately. If you have questions about a custom configuration, please contact CPI Technical Support at (800-834-4969).

Q. What is the difference between a server and network top panel?

A. The difference between a server and network top panel is the number and location of brush-sealed cable openings in the panel. A server top panel has two large 3" x 11.5" (76 mm x 292 mm) brush sealed cable openings located at the rear corners of the panel. A network top panel has four large brush-sealed cable openings located at the front and rear corners of the panel. All top panels also have 3" (80 mm) diameter knock-outs for power cables. Additionally, server top panels for cabinet frames that are 41.3" (1050 mm) deep or deeper have a cutout that can be removed to add a Vertical Exhaust Duct.



Server Top Panel for cabinets less than 1025 mm deep



Server Top Panel for cabinets 1050 mm deep or deeper used with Vertical Exhaust Duct



Network Top Panel

Q. How many cables will pass through each cable opening in the F-Series TeraFrame top panels?

A. The amount of cable that will pass through the openings in the F-Series TeraFrame top panel depends on the size of the cable. To estimate maximum cable fill quantities, divide the

area of the opening by the area of the cable and multiply the answer by 50%. Use 25% for planning cable fills. Top panel opening size and area and estimated cable fills are given in the following tables:

Size and Area For Top Panel Openings:			
Cable Opening	Width	Length	Area
Large Opening	3" (76 mm)	11.5" (292 mm)	34.5 in ² (22 192 mm ²)
Round Grommet	2.75"Ø (70 mm Ø)	N/A	5.9 in ² (3848 mm ²)

Estimated Cable Fill Quantities For Top Panel Openings (50% fill):			
Cable Opening	Cat 5e	Cat 6	Cat 6a
Large Opening	78	176	123
Round Grommet	7	30	21

Note: Quantities per opening.

Estimated Cable Fill Quantities Using All Top Panel Large Openings (50% fill):			
Top Panel Style	Cat 5e	Cat 6	Cat 6a
Server (2)	556	352	246
Network (4)	1112	704	492

Note: Quantities do not include grommet openings.

Estimated Cable Fill Quantities Using All Top Panel Grommet Openings (50% fill):			
Top Panel Style	Cat 5e	Cat 6	Cat 6a
Server (2)	94	60	42
Network (4)	188	120	84

Note: Quantities do not include large openings.

Cable fill estimates are based on typical size cables: .30"OD 4-pair Category 6a UTP, .25"OD 4-pair Category 6 UTP, and .20"OD 4-pair Category 5e UTP. To estimate fiber fills, use Cat6 quantities for 6-stand indoor plenum tight buffered fiber. Reduce quantities by half for loose tube and armored fibers.

Q. What is the Vertical Exhaust Duct System top panel option?

A. The Vertical Exhaust Duct System top panel option includes an extendable top-mount Vertical Exhaust Duct, Server Top Panel, an Airflow Director and a Rear Door Sealing Kit. The cabinet should be configured with a solid rear door, side panels, an Air Dam Kit and Snap-In Filler Panels in each open rack-mount space. The Vertical Exhaust Duct System is available for 41.3"D to 47.2"D (1050 mm to 1200 mm) cabinet frames and is ordered with the cabinet or as individual components.



Vertical Exhaust Duct and Server Top Panel



Frequently Asked Questions

F-SERIES TERAFRAME® CABINET SYSTEM

Q. When do I use the Vertical Exhaust Duct System top panel option?

A. The Vertical Exhaust Duct System is used with high heat loads in special applications that use the drop ceiling plenum as a closed hot air return for the room's cooling system.

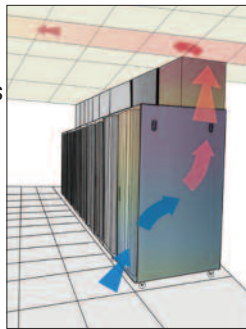
Q. What is the Vertical Exhaust Duct?

A. The Vertical Exhaust Duct is part of the Vertical Exhaust Duct System for the TeraFrame Cabinet. The Vertical Exhaust Duct is an extendable top-mount duct that attaches over a Server Top Panel. The Vertical Exhaust Duct is available for 41.3"D to 47.2"D (1050 mm to 1200 mm) cabinet frames. The Vertical Exhaust Duct connects the top of the cabinet to an overhead drop ceiling and is used with a solid rear door, side panels or a Seal Kit, a Rear Door Sealing Kit, an Airflow Director, a Bottom Panel, an Air Dam Kit and Snap-In Filler Panels to create a complete front-to-top airflow pathway that isolates hot exhaust air from the room as part of a closed hot air return system.



Q. How does the Vertical Exhaust Duct System work?

A. The Vertical Exhaust Duct System connects the top of the cabinet to an overhead drop ceiling plenum (or HVAC ductwork) that isolates hot air from the room and returns hot air directly to the air conditioning system. The Vertical Exhaust Duct System is used with a solid rear door and side panels. A door seal helps prevent the re-circulation of hot air. The system includes an Airflow Director that guides hot exhaust air from the bottom of the cabinet to the top of the cabinet. The system does not require fans, thus providing a passive thermal solution that eliminates the need for complex rack-level cooling system redundancy.



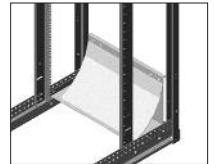
Q. Is the Vertical Exhaust Duct System shipped installed?

A. When the Vertical Exhaust Duct System top panel option is selected, most of the components of the Vertical Exhaust Duct System ship installed on the cabinet; however, the Vertical Exhaust Duct (the top-mount duct) ships partially assembled in

a separate carton. A separate carton is necessary because of the combined height of the cabinet and duct.

Q. What is the Airflow Director?

A. The Airflow Director is used as part of the Vertical Exhaust Duct System. The Airflow Director is a 8"D x 10"H (203 mm x 254 mm) curved airflow baffle that is mounted at the bottom rear of F-Series TeraFrame Cabinets to direct hot exhaust air towards the top of the cabinet.



Q. What is the Bottom Panel?

A. The Bottom Panel (P/N 35085-XXX) covers the bottom of the cabinet frame to block airflow into and out of the base of the cabinet. It includes a brush-sealed cable access port. Use it when cabinets are supported on leveling feet or casters (elevated above the floor).

Q. What is the Seal Kit?

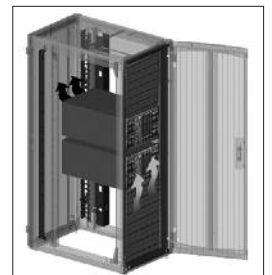
A. The Seal Kit (P/N 35081-0XX) includes rubber tubing that is used to create a seal between bayed cabinets when one or both side panels are omitted so that hot air does not escape through the sides of the cabinet.

Q. What is the Air Dam Kit?

A. The Air Dam Kit is an airflow baffle that blocks the space between the frame and the equipment mounting rails preventing airflow around the top, sides and bottom of equipment mounting space within the F-Series TeraFrame Cabinet. The Air Dam Kit is used with Snap-In Filler Panels to improve equipment cooling by forcing cold air to travel through equipment and by helping to prevent the internal recirculation of hot exhaust air from the back of the cabinet to the front of the cabinet.

Q. What is a Snap-In Filler Panel?

A. A Snap-In Filler Panel is a solid 19" EIA rack-mount panel used to close open rack-mount spaces in the cabinet. Closing open rack-mount spaces improves rack-mount equipment cooling by helping to



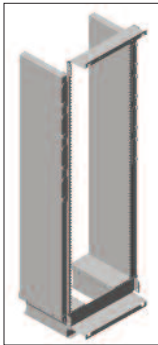
Frequently Asked Questions

F-SERIES TERAFRAME® CABINET SYSTEM

control airflow in the cabinet. Filler panels block airflow in between equipment to prevent internal re-circulation of hot exhaust air through the cabinet. Snap-In Filler Panels attach to CPI's square-punch rails without installation hardware. A 1U and 2U size are available.

Q. What is the Internal Air Duct?

A. The Internal Air Duct is a combination airflow baffle and duct that blocks airflow around the equipment mounting space while delivering additional cold air from an access floor plenum to the top half of a F-Series TeraFrame cabinet. The Internal Air Duct attaches to the front of the cabinet frame and includes an air duct along both sides of the cabinet, integrated square-punched equipment mounting rails and adjustable doors that control and direct airflow to equipment. The Internal Air Duct can be used in 23.6"W (600 mm) and 27.6"W (700 mm) F-Series TeraFrame Cabinets that store 19" EIA rack-mount equipment.



Q. Are there special installation requirements for the Internal Air Duct?

A. Yes. Because installation requires cuts in the access floor, the Internal Air Duct must be installed when the cabinet is installed and before equipment is added to the cabinet. If side panels will be used on the cabinet, the cabinet must be at least 39.4"D (1000 mm). Additionally, the duct has integrated square-punched equipment mounting rails that replace the front pair of equipment mounting rails in the cabinet. The integrated rails are setback to allow maximum airflow to equipment. The total rail-to-rail depth (usable depth) in the cabinet is reduced by 2.5" (64 mm) and the total rack-mount space in the cabinet is reduced by 2U.

Q. When should I use the Internal Air Duct?

A. The Internal Air Duct is an alternative to fans in cabinets with equipment power requirements between 4 kW to 7 kW per cabinet. The Internal Air Duct is used in an access floor environment where the space under the floor is used to deliver cold air and is most effective in hot aisle/cold aisle layouts when used in cabinets that support rack-mount equipment.

Q. How does the Internal Air Duct work?

A. The Internal Air Duct is used to supplement airflow in cabinets and delivers additional cold air from under the access floor to the top half of the cabinet. The amount of additional airflow provided by the Internal Air Duct is dependent on the static pressure under the access floor. Optimal airflow values are listed in the table below.

Cabinet Size	Additional Airflow
23.6"W (600 mm)	356 CHM at .02 kPa (210 CFM at .1" of water)
27.6"W (700 mm)	865 CHM at .02 kPa (510 CFM at .1" of water)

Q. What is the advantage of using the Internal Air Duct instead of fans?

A. The Internal Air Duct is an effective passive cooling method that does not use fans. Using the Internal Air Duct eliminates noise, additional electrical requirements, redundancy requirements and the additional electrical maintenance and cost of using fans. The Internal Air Duct increases the amount of cold air entering the cabinet without the added cost associated with fans, and specifically delivers that air to the top half of the cabinet where most heat issues occur.

Q. How do you increase airflow in the cabinet if it is placed on a slab floor?

A. Use the Delphi ECS Enclosure Blower (CPI P/N 12900-001) to supplement airflow in medium heat load cabinets where equipment requires 4 kW to 7 kW of power. ECS Enclosure Blower collects air from the bottom of the cabinet and delivers it to the space between the front door and equipment. The ECS Enclosure Blower uses the bottom 2 RMU of space and requires a single 115 VAC ~ 15 Amp (NEMA 5-15P) power connection. The ECS Enclosure Blower does not have a redundant power connection and should be connected to a UPS-protected power feed when supporting critical equipment. The ECS Enclosure Blower can be used in access floor cooling systems also.

Q. What is the Vertical Cable Manager?

A. The Vertical Cable Manager is a cable organizer that attaches vertically alongside the cabinet's equipment mounting



Frequently Asked Questions

F-SERIES TERAFRAME® CABINET SYSTEM

rails and uses no equipment mounting space. The Vertical Cable Manager features T-shaped cable guides that organize cables as they enter the rack-mount space. The cable guides are made of a composite material with rounded edges to help prevent damage to cables. An opening large enough for 24 patch cords aligns with each rack-mount space on the mounting rail. In the 27.6"W (700 mm) and 31.5"W (800 mm) cabinets, the Vertical Cable Managers are U-shaped troughs with snap on covers. These models have cable edge protected pass through holes at the side and rear of the trough that allow cables to exit into the space behind the equipment mounting rails and to pass front-to-rear. Each cabinet can support up to four Vertical Cable Managers (1 per mounting rail). Alternately, the Vertical Cable Manager can be attached directly to the Gen2 cabinet frame to move independent of the equipment mounting rails with the Slide Adapter Kit (P/N 35092-C0X). The 27.6"W (700 mm) and 31.5"W (800 mm) Vertical Cable Managers are available with long and short cable guides. The 23.6"W (600 mm) Vertical Cable Managers have short cable guides only. Note that mounting rails are setback 4.5" (115 mm) with short cable guides and 7" (178 mm) with long cable guides to leave room for cable management.

Q. How many cables will each Vertical Cable Manager hold?

A. The amount of cable that the Vertical Cable Manager will hold depends on the size of the cable. To estimate maximum cable fill quantities, divide the inside area of the cable manager by the area of the cable and multiply the answer by 50%. Use 25% for planning cable fill. The following tables list size, area and estimated cable fills for Vertical Cable Managers. Note that wider cabinets have wider and deeper cable managers for increased cable capacity.

Internal Dimensions and Cable Area For Vertical Cable Managers			
Cabinet Width	Width	Depth	Area
Cable Managers with Short Cable Guides			
23.6"W (600 mm)	.56" (14 mm)	9.3" (236 mm)	7.1 in ² (4484 mm ²)
27.6"W (700 mm)	2.3" (58 mm)	11.0" (279 mm)	27 in ² (17 476 mm ²)
31.5"W (800 mm)	4.2" (107 mm)	11.0" (279 mm)	46 in ² (27 812mm ²)
Cable Managers with Long Cable Guides			
27.6"W (700 mm)	2.3" (58 mm)	13.6" (345 mm)	34 in ² (21 760 mm ²)
31.5"W (800 mm)	4.2" (107 mm)	13.6" (345 mm)	58 in ² (37 120 mm ²)

Note: Internal width varies. Table lists minimum width.

Estimated Cable Fill Quantities for a single Vertical Cable Manager (50% fill)			
Cabinet Width	Cat 5e UTP	Cat 6 UTP	Cat 6a UTP
Cable Managers with Short Fingers			
23.6"W (600 mm)	57	36	25
27.6"W (700 mm)	217	137	96
31.5"W (800 mm)	370	234	164
Cable Managers with Long Fingers			
27.6"W (700 mm)	274	173	121
31.5"W (800 mm)	467	295	207

Note: Cable fill estimates are based on typical size cables: .30"OD 4-pair Category 6a UTP, .25"OD 4-pair Category 6 UTP, and .20"OD 4-pair Category 5e UTP. To estimate fiber fills, use Cat6 quantities for 6-stand indoor plenum tight buffered fiber. Reduce quantities by half for loose tube and armored fibers.

Q. Are there alternatives to the Vertical Cable Manager?

A. Yes, when there is less cable to manage, consider the Vertical Cable Ring Manager (P/N 35100-CXX or 35101-CXX) or the Cable Lashing Bracket (P/N 35087-CXX). The Vertical Cable Ring Manager includes large or small plastic D-rings with mounting brackets that attach to the side of the equipment mounting rail and provide a simple, low density cable pathway alongside equipment. The Cable Lashing Bracket is a 5"W (127 mm) bracket with cable lashing points in three vertical columns for 1.5" (38 mm) diameter cable bundles. The Cable Lashing Bracket attaches to the cabinet frame behind the rear pair of equipment mounting rails and can be adjusted in depth to match equipment requirements.

Q. Does the F-Series TeraFrame Cabinet include a PDU Mounting Bracket Kit for vertical PDUs?

A. Yes, F-Series TeraFrame Cabinets that are 42U or higher include one PDU Mounting Bracket Kit. On cabinets manufactured after August 1, 2011, the kit includes two brackets that attach to the rear corner post on the cabinet. The brackets have tool-less attachment points spaced 64.75" (1645 mm) and 61.25" (1556 mm) apart and will support two 2.4"W (61 mm) or narrower PDUs side-by-side. The brackets require a 6.7" (170 mm) rail setback. PDUs are oriented so that the outlets face the center of the cabinet. Cabinets manufactured before August 1, 2011, include a different bracket that mounts a single 2"W (51 mm) or narrower PDU that has tool-less attachment points spaced 64.75" (1645 mm) only.



Frequently Asked Questions

F-SERIES TERAFRAME® CABINET

Q. Are there other PDU mounting brackets available for the cabinet?

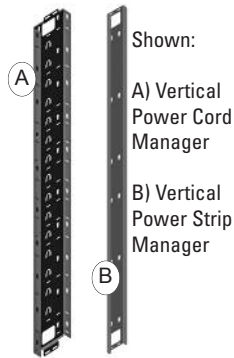
A. Yes, the PDU/Power Strip Lashing Bracket (P/N 35086-CXX) features attachment points for one or two CPI PDUs and cable tie points for securing bundled power cords. The bracket will support one 3.5"W (89 mm) CPI PDU or two 2.3"W (58 mm) CPI PDUs (P/N 356XX-XXX or 358XX-XXX). The bracket is S-shaped, 8.375"W x 1.7"D (213 mm x 42 mm) and requires a minimum 5" (127 mm) rail setback. Power Strip Lashing Bracket attaches to the cabinet frame behind the rear pair of equipment mounting rails and can be adjusted in depth to match equipment requirements.

Q. Are there mounting brackets for CPI Power Strips?

A. Yes, the Vertical Power Cord Manager (P/N's 34581-CXX, 34582-CXX) and the Vertical Power Strip Manager (P/N's 34595-CXX, 34596-CXX) support power strips, not PDUs.

Q. What are the differences between the Vertical Power Cord Manager and the Vertical Power Strip Manager?

A. The Vertical Power Cord Manager has cable tie points for securing bundled power cords, which are not available on the Vertical Power Strip Manager. However, the Vertical Power Strip Manager holds more power strips and uses less space within the cabinet. Choose the style of Vertical Power Manager based on the number of power strips and the amount of space available in the cabinet.



Q. What is the Vertical Power Cord Manager?

A. The Vertical Power Cord Manager is a support for power strips with attachment points for one or two CPI power strips (P/N 128XX-XXX) and cable tie points for securing bundled power cords. There are two sizes – a narrow and a wide manager. The narrow manager is L-Shaped, 2.5"W x 2.5"D (63 mm x 63 mm), requires a 6"D (152 mm) rail setback and supports a single vertical power strip. The wide manager is U-shaped, 8"W x 2"D (203 mm x 51 mm), requires a 11"D (279 mm) rail setback and supports two power strips. Vertical

Power Managers attach to the cabinet frame behind the rear pair of equipment mounting rails and can be adjusted in depth to match equipment requirements.

Q. What is the Vertical Power Strip Manager?

A. The Vertical Power Strip Manager is a support for power strips with attachment points for two or four CPI power strips (P/N's 128XX-XXX, 131XX-XXX and 132XX-XXX) and no cable tie points for power cords. There are two sizes – a dual and a quad manager. The dual manager is C-Shaped, 4.3"W x 1"D (110 mm x 25 mm), requires a 6.3"D (160 mm) rail setback and supports two vertical power strips. The quad manager is S-shaped, 8.4"W x 1.7"D (213 mm x 43 mm), requires a 8.7"D (221 mm) rail setback and supports four vertical power strips. Vertical Power Managers attach to the cabinet frame behind the rear pair of equipment mounting rails and can be adjusted in depth to match equipment requirements.

Q. Which Vertical Power Manager should I use?

A. Choose the style of Vertical Power Manager by the number of power strips and the amount of space available in the cabinet.

Vertical Power Manager	Number of Power Strips Supported	Cable Tie Points	Reduction in Rail Depth
Narrow	1	Yes	6" (152 mm)
Wide	2	Yes	11" (279 mm)
Dual	2	No	6.3" (160 mm)
Quad	4	No	8.7" (221 mm)
Lashing Bracket	2	Yes	5" (127 mm)

Q. How many cable and power managers should I use in my cabinet?

A. A typical server cabinet is configured with one Vertical Cable Manager and one Vertical Power Manager. The cable manager is placed on one side of the cabinet and the power manager is placed on the other side of the cabinet to keep network and power cables separated. A typical network cabinet will have four Vertical Cable Managers (two front, two rear) connected along the sides with Front-To-Back Cable Managers. The cable managers provide separate right and left-side pathways for premise cables and patch cords.



Frequently Asked Questions

F-SERIES TERAFRAME® CABINET SYSTEM

Q. What are some basic room design practices that improve airflow to cabinets and equipment?

A. Arrange cabinets around hot and cold aisles and position cabinets so that they are parallel to cold air flow. Locate cable pathways so that the pathway does not block airflow to equipment. When an access floor is used to deliver cold air to equipment, place vented floor tiles in the cold aisles only and seal all cable access holes in the access floor tiles with KoldLok® Raised Floor Grommets.

Q. How do I configure a server cabinet for a hot aisle/cold aisle layout?

A. The goal of the hot aisle/cold aisle layout is to keep hot and cold air separated. The front of the cabinet faces the cold aisle; the rear of the cabinet faces the hot aisle. The cabinet configuration should promote airflow through the cabinet. Combine a solid top panel, solid side panels and perforated front and rear doors to allow air to travel through the cabinet.

Q. How do I improve cooling effectiveness in a cabinet that supports rack-mount (server) equipment?

A. Improve cooling effectiveness by controlling airflow through the cabinet. Create an airflow barrier between the front and rear of the cabinet so that cold air must go through equipment and hot air must exit the cabinet into the hot aisle. Use the Air Dam Kit to block the space around the top, bottom and sides of equipment and Snap-In Filler Panels to close open rack-mount spaces between equipment. Add a Bottom Panel if the cabinet is on leveling feet or casters. Add Seal Kits if side panels are omitted between bayed cabinets.

Q. Will adding fans or an Internal Air Duct help cool equipment in my cabinet?

A. Yes, increasing airflow in a cabinet will increase the amount of heat load that can be placed in the cabinet as long as the temperature of the air is within the required operating range designated by the equipment manufacturers. However, it is important to understand that fans and ducts do not lower the temperature of air. Fans and ducts move conditioned air to where it is needed most. Add Delphi ECS Enclosure Blower or Internal Air Duct to increase airflow in your cabinet.

Q. Is there a way to isolate hot exhaust air from the room?

A. Yes, use the Vertical Exhaust Duct System with a solid rear door. The Vertical Exhaust Duct System isolates hot air from the room and guides it from the top of the cabinet to the drop ceiling above the cabinets. The air conditioning system must be designed to use the space above the drop ceiling as a closed hot air return.

Q. How do I configure a server cabinet for heat loads between 4 kW and 7 kW?

A. Heat loads in the 4 kW to 7 kW range tend to require more cold air than is typically available to a single cabinet in standard hot aisle/cold aisle environments. Most of the heat issues are in the top 1/3 of the cabinet. The solution is to deliver more cold air into the front of the cabinet. Airflow must also be carefully controlled to prevent internal and external hot air recirculation. When placed over an access floor used to deliver cold air to equipment, cabinets in a hot aisle/cold aisle environment should be configured with a solid top panel, solid side panels and perforated front and rear doors. Add the Internal Air Duct to seal the space around equipment and to deliver additional cold air to the top half of the cabinet. Close all open RMU spaces with filler panels. In slab floor environments, use a Delphi ECS Enclosure Blower and Air Dam Kit instead of an Internal Air Duct to increase airflow to equipment.

Q. How do I configure a server cabinet for heat loads > 7 kW?

A. Heat loads above 7 kW require controlled hot air removal. Configure the cabinet with a Vertical Exhaust Duct System top panel, solid side panels, a perforated front door and solid rear door. Add the Air Dam Kit to close the space around equipment, and use Snap-In Filler Panels to close open rack-mount spaces. Use a Bottom Panel if the cabinet is placed on leveling feet or casters. Use a Seal Kit if side panels are not used between bayed cabinets. Air enters the cabinet through the front door, travels through equipment and exits the top of the cabinet through the Vertical Exhaust Duct. The duct isolates hot air from the room.



Frequently Asked Questions

F-SERIES TERAFRAME® CABINET SYSTEM

Q. How do I configure a cabinet for network equipment and cabling?

A. Network cabinets hold patch panels, fiber enclosures, cable, network switches and routers. This equipment requires threaded equipment mounting rails and front and rear cable pathways. Use an 31.5"W (800 mm) F-Series TeraFrame with threaded equipment mounting rails and a network top panel. Include four Vertical Cable Managers and several Front-To-Back Cable Managers. Any door style can be used but perforated doors are preferred. If the cabinet houses a large modular network switch that requires side-to-side airflow, use the N-Series TeraFrame Network Cabinet instead of the F-Series TeraFrame Cabinet.

Q. How do you attach equipment to the cabinet?

A. The F-Series TeraFrame Cabinet includes two pairs of adjustable depth equipment mounting rails. Equipment or shelves attach to the equipment mounting rails. Equipment mounting rails have 1-3/4"H (44.45 mm) rack-mount spaces and threaded or square-punched equipment mounting holes spaced according to the EIA-310-D Universal hole pattern. Most rack-mount server, data storage, networking and communications equipment is designed to fit this rail system. RMU spaces are marked and numbered for easy placement of equipment. Square-punched rails accept cage nuts allowing you to quickly change the mounting hardware. Tapped rails are threaded for #12-24 screws. Use square-punched rails for server applications or tapped rails for network and cabling applications.

Q. Is equipment mounting hardware (rack-mount hardware) included with the cabinet?

A. Yes. Cabinets equipped with square-punched rails include 25 each M6 cage nuts and screws. Cabinets equipped with tapped rails include 50 each #12-24 screws. Additional equipment mounting hardware can be ordered separately.

Q. Are leveling feet included with the cabinet?

A. Yes. The cabinet includes leveling feet. Anchor brackets that can be used to attach the leveling feet to the floor with floor-mount hardware area available as an accessories.

Q. Are casters included with the cabinet?

A. No, casters are available as an accessory.

Q. How do you ground and bond the TeraFrame Cabinet?

A. All F-Series TeraFrame Cabinets manufactured after July 16, 2007 have an Integrated Grounding and Bonding System. All components are bonded together. A single connection can be made between the frame and the Telecommunications Ground. The cabinet frame is welded and includes a Two Mounting Hole Ground Terminal Block (ground lug) to make the connection to the telecommunications ground. The mounting rails, top panel, side panels and doors are electrically bonded to the frame. Most frame components are painted, but a combination of paint cutting washers, ground studs and grounding straps create metal-to-metal contact to bond the components. In the 23.6"W (600 mm) cabinet, the mounting rails, which are zinc-plated, attach directly to the cabinet frame with zinc plated bolts. The mounting rails attach to zinc-plated standoffs in the 27.6"W (700 mm) and 31.5"W (800 mm) cabinets. The rails are bolted to the standoff and the

standoff is bolted to the cabinet frame bonding the rails to the frame. The top panel is attached with bolts and paint cutting washers. The side panels and doors are connected by a ground strap to studs on the cabinet's vertical frame members. There are quick connectors on the doors and side panels that allow the ground straps to be disconnected when a door or side panel is removed.

Q. Is the F-Series TeraFrame Cabinet UL Listed?

A. Yes, all F-Series TeraFrame Cabinets ordered as standard catalog part numbers (P/N FXXX-XXXX-XXX) and manufactured after July 16, 2007 are UL Listed under the Information Technology and Communications Equipment Cabinet, Enclosure and Rack Systems (NWIN) category per the U.S. and Canadian Standard for Safety of Information Technology Equipment (UL60950-1) under file E227626. UL Listed cabinets have a UL Listed label with the UL Listed symbol. Note that the F-Series TeraFrame Cabinets ordered before July 16, 2007, are not UL Listed.



Frequently Asked Questions

F-SERIES TERAFRAME® CABINET SYSTEM

Q. Can I order an F-Series TeraFrame® Cabinet with accessories factory-installed?

A. Yes, most accessories for the F-Series TeraFrame® Cabinet can be factory-installed by CPI. To order the F-Series TeraFrame Cabinet with accessories installed, use CPI's on-line Product Configurator, www.chatsworth.com/configurator. The Product Configurator will assign a custom CPI part number (CPXXXXXX) to your order.

Q. Are configured F-Series TeraFrame Cabinets — CP part numbers — created using the on-line CPI Product Configurator UL Listed?

A. Configurations that include a standard F-Series TeraFrame Cabinet and any combination of the accessories listed in the question below are UL Listed. Configurations that include accessories that are not in the list below are not UL Listed. To simplify the product selection, the Product Configurator will ask you if you require a UL Listed cabinet before accessory selection.

Q. Which F-Series TeraFrame Cabinet accessories are UL Listed?

A. The following F-Series TeraFrame Cabinet accessories are UL Listed and can be configured into a UL Listed cabinet. Refer to the F-Series TeraFrame Cabinet data sheets for exact part numbers.

- 19"W Fixed Shelves
- 19"W Low Profile Fixed Shelves
- Vertical Exhaust Duct System
- Vertical Exhaust Duct
- Airflow Director
- Air Dam Kit
- Bottom Panel
- Internal Air Duct
- Snap-In Filler Panel
- Seal Kit
- Rack-Mount Cable Shelf
- Front-to-Back Cable Managers
- Vertical Cable Managers
- Vertical Cable Ring Manager
- Cable Lashing Bracket
- Vertical Power Strip Managers

- Power Strip Mounting Bracket Kit
- Power Strip Lashing Bracket
- Vertical Power Cord Manager Kit
- Power Cord Management
- Mounting Hardware

Q. I have questions about the assembly of components and/or installation of the cabinet?

A. The F-Series TeraFrame User Manual, which includes a complete installation guide, is available for download on the CPI website at www.chatsworth.com/teraframe.

Q. I did not find the answer to my question. Who do I contact for assistance?

A. Please contact CPI Technical Support (800-834-4969 or techsupport@chatsworth.com) for assistance. Also available is the CPI Product Configurator which is an easy-to-use on-line tool that guides you through the steps and selections necessary to create customized F-Series TeraFrame Cabinets. Visit the Product Configurator at www.chatsworth.com/configurator.

