Introduction

B-Line® Systems Inc. is the nation's leading manufacturer of steel, aluminum and fiberglass cable tray systems. B-Line is an active member of NEMA-5CT and the Cable Tray Institute.

B-Line® introduces four CENT-R-RAIL® cable support systems: DATA-TRACK®, VERTI-RACK®, HALF-RACK® and MULTI-TIER HALF-RACK®. CENT-R-RAIL® is engineered to B-Line's exacting standards and compliments other B-Line cable support products to offer unmatched versatility. This catalog presents revolutionary concepts and outstanding features for today's cable support systems and tomorrow's.

CENT-R-RAIL® systems offer flexibility and installation speed plus added unique features such as integrated supports, compatibility with B-Line's Strut System, vertical expansion capability and the ultimate in cable freedom to enter and exit the system.

B-Line® has been manufacturing cable tray for over 30 years and currently has over one million square feet of manufacturing floor space throughout the United States. B-Line presently fabricates cable tray products at the five following locations:

Troy, Illinois
Norcross, Georgia
Reno, Nevada

Ask The Experts!

Cooper B-Line

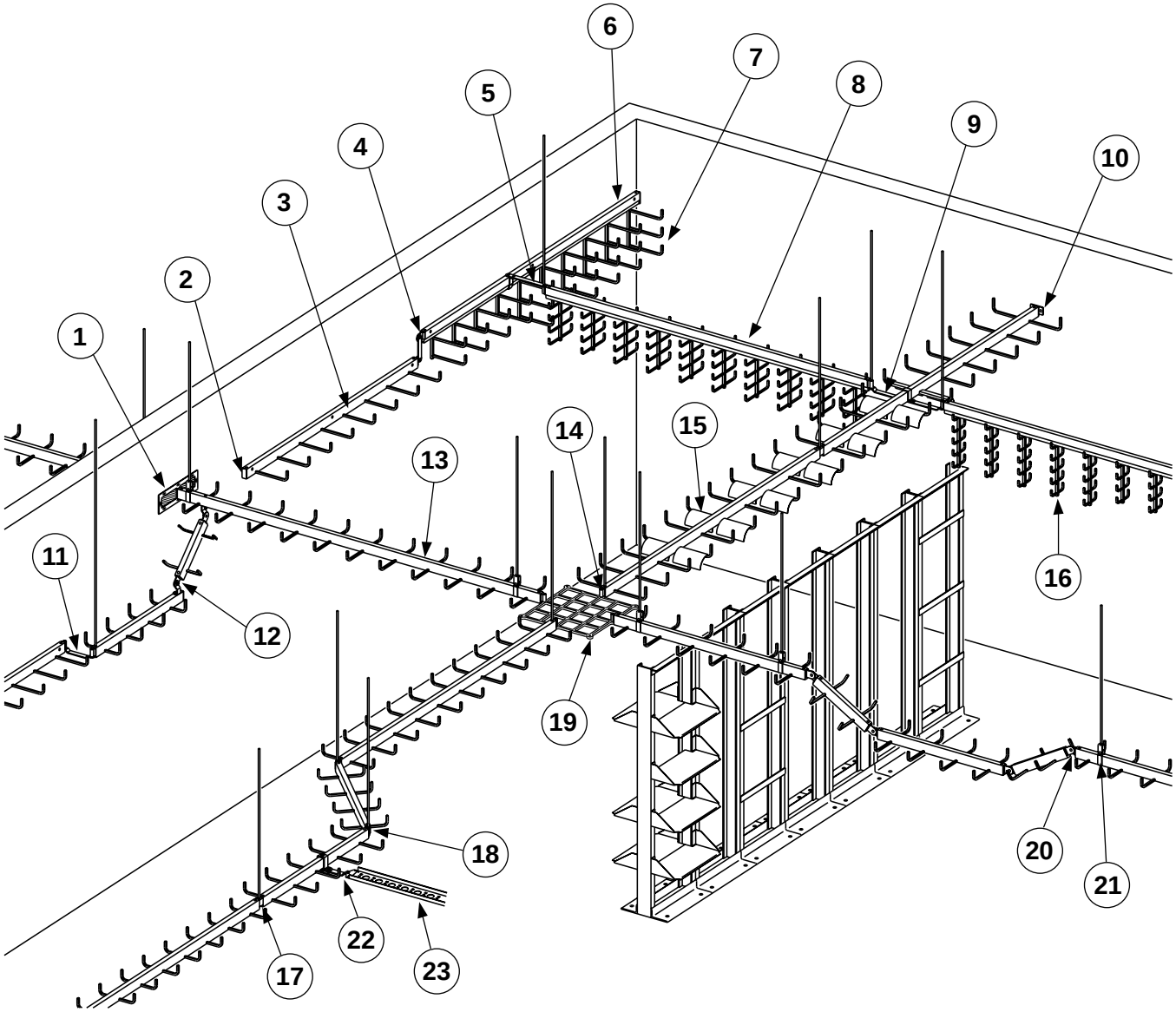
NEMA MEMBER

Questions, Comments, Suggestions?
"B-VOCAL℠ with B-Line"
Voice Of the Customer...Actively Listening

B-Line®
Systems that make sense

Table of Contents

Cent-R-Rail® Systems



1. Tray-To-Box Connector (pg. 51)
2. Center Rail End Cap (pg. 46)
3. HALF-RACK® Straight Section (pg. 18)
4. Vertical Offset Coupling (pg. 25)
5. Horizontal Tee Coupling (pg. 27)
6. MULTI-TIER HALF-RACK® Straight Section (pg. 20)
7. MULTI-TIER HALF-RACK® Add-A-Rung® (pg. 20)
8. VERTI-RACK® Straight Section (pg. 16)
9. Horizontal Cross Coupling (pg. 29)
10. Tray-To-Wall Connector (pg. 50)
11. Horizontal Offset Coupling (pg. 25)
12. Vertical Coupling (pg. 30)
13. DATA-TRACK® Straight Section (pg. 14)
14. Horizontal Pivot Connector (pg. 32)
15. Cable Drop-Out (pg. 44)
16. VERTI-RACK® Add-A-Rung® (pg. 16)
17. Qwik-Bolt® Splice Hanger (pg. 23)
18. Horizontal Adjustable Splice (pg. 26)
19. Universal Hub Fitting (pg. 31)
20. Vertical Adjustable Splice (pg. 30)
21. Clevis Hanger (pg. 34)
22. Cent-R-Rail To Channel Cable Connector (pg. 74)
23. Channel Cable Tray (pg. 75)

WARNING: Do NOT use as a walkway, ladder or support for personnel.

B-Line® Systems that make sense

Cent-R-Rail® Systems

DATA-TRACK®
VERTI-RACK®

HALF-RACK®
MULTI-TIER HALF-RACK®

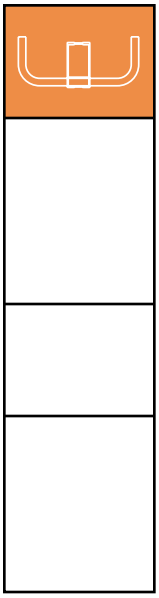
Features Common to B-Line Cent-R-Rail® Systems:

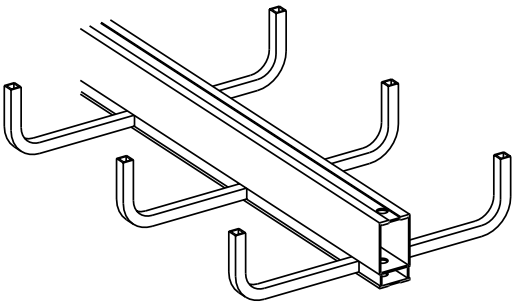
- The fastest cable tray systems to install
- Sides and bottom are open for easy loading and inspection of cables
- Light-weight, high-strength, corrosion-resistant aluminum construction
- Provide the most freedom for cables to enter or exit - perfect for future change
- Cable fill area is free of sharp edges and connection hardware
- The splice can also be used to support the tray
- Qwik-Bolt® splice maximizes installation speed and minimizes hardware
- Clevis hangers are available for random support locations without drilling center rail
- Systems are designed to install with 1/2" ATR
- Cent-R-Rail® engineered to simplify the in-field drilling process and to provide post modification integrity
- All Cent-R-Rail® Systems use the same internal connectors
- All Cent-R-Rail® Systems are interactive with each other
- Designed to interact with B-Line's Strut System and Strut Raceway System
- Comprehensive accessory options allow for complete installations without traditional cable tray fittings
- Colored rung end caps are available for system labeling
- UL Classified (cross sectional area 0.60 in^2/1000 amps)
- Patent Information

  The indicated patented products in this catalog are protected by one or more of the following patents.
  U.S. Patents 5,618,014; 5,628,481; 5,628,580; 5,634,614; 5,651,518; 5,564,658; 5,720,567; 5,730,400; 5,782,439; 5,816,542; 5,868,361.
  U.K. Patents 2,285,344; 2,317,508; 2,317,509.
  Germany Patent 4,447,144. Mexico-Pending.
  Canada Patent 2,139,201.

Cent-R-Rail® Systems

DATA-TRACK®

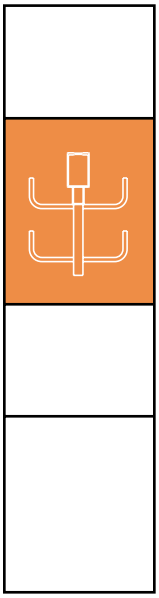


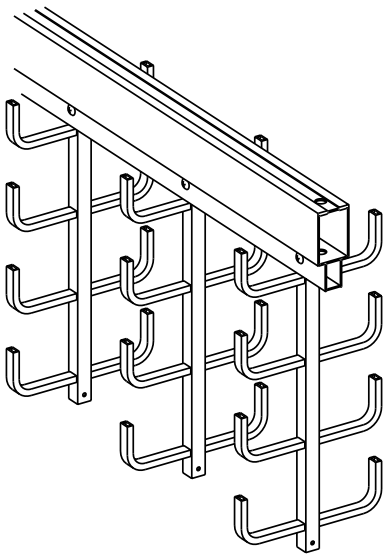


- Ceiling hung or floor mounted
- Low profile
- Built-in barrier
- NEMA 12C load classification
- Seismic restraint systems available (see appendix page A-4)
- CSA classified

Sizes Available
Loading depth: 3" (75), 4" (100), 6" (150) and straight rung
Width: 6" (150), 9" (225), 12" (225), 18" (450), 24" (600)
Length: 120" (3m), 144" (4m)
Rung Spacing: 6" (150), 9" (225), 12" (300)

VERTI-RACK®





- Ceiling hung
- Multiple tray runs with one center rail
- Installs in narrow spaces
- Provides cable system segregation
- NEMA 12C load classification
- Expandable with ADD-A-RUNG®
- Expanded sizes available (page A-5)
- Variable widths available (page A-6)
- Inverted design available (page A-7)

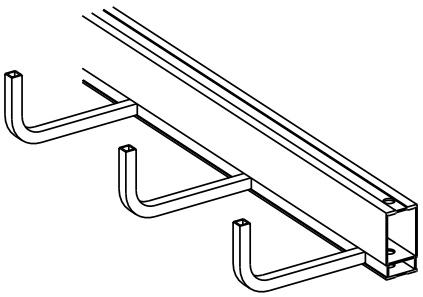
Sizes Available
Loading depth: Each tier 2" (50) and straight rung
Width: 3" (75), 6" (150), 9" (225), 12" (300)
Number of tiers: 2, 3, 4, 5 & 6
Length: 120" (3m), 144" (4m)
Rung Spacing: 6" (150), 9" (225), 12" (300), specials available

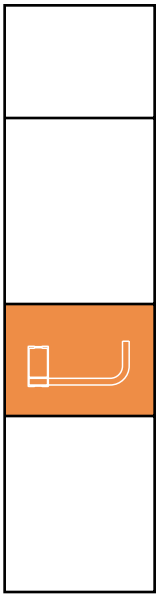
Dimensions shown in parentheses are in millimeters, unless otherwise specified.

Cent-R-Rail® Systems

HALF-RACK®

- Supported on wall or other structure
- Low profile
- Flush mounted without spacers or brackets
- Seismic restraint systems available (see appendix page A-4)
- CSA classified

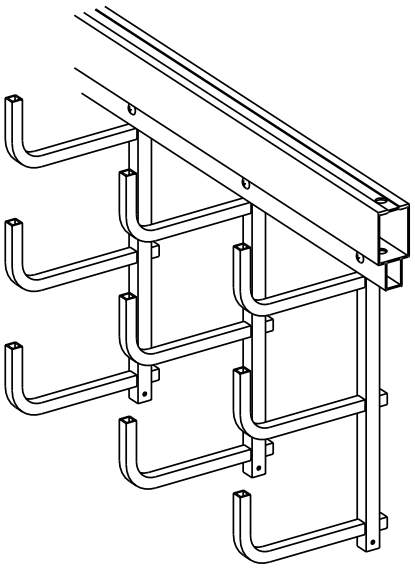


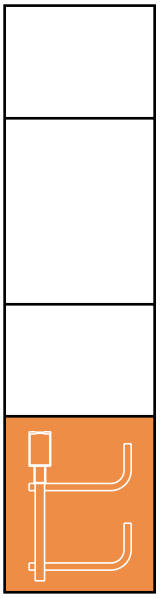


Sizes Available
Loading depth: 3" (75), 4" (100), 6" (150) and straight rung
Width: 3" (75), 6" (150), 9" (225), 12" (300)
Length: 120" (3m), 144" (4m)
Rung Spacing: 6" (150), 9" (225), 12" (300)

MULTI-TIER HALF-RACK®

- Supported on wall or other structure
- Multiple tray runs with one center rail
- Installs in narrow spaces
- Provides cable system segregation
- Flush mounted without spacers or brackets
- Expandable with ADD-A-RUNG®
- Seismic restraint systems available (see appendix page A-4)
- Variable widths available (page A-6)





Sizes Available
Loading depth: 3" (75), 4" (100) and straight rung
Width: 3" (75), 6" (150), 9" (225), 12" (300)
Number of tiers: 2, 3 & 4
Length: 120" (3m), 144" (4m)
Rung Spacing: 6" (150), 9" (225), 12" (300), specials available

Dimensions shown in parentheses are in millimeters, unless otherwise specified.

Guide for Sizing CENT-R-RAIL®

The following guidelines are based on the 1999 National Electrical Code, Article 318.

I) Number of Multiconductor Cables Rated 2000 Volts or Less, in DATA-TRACK® and HALF-RACK® (Excluding Straight Rung)

(1) Multiconductor Control and/or Signal Cables Only

A ladder cable tray containing only control and/or signal cables, may have 50% of its total fill area filled with cable. When using continuous bottom pans, the allowable fill is reduced from 50% to 40%.

Example: Cable tray width is obtained as follows:

2/C - #16 AWG instrumentation cable cross sectional area = 0.04 sq. in.
Total Cross Sectional Area for 300 Cables = 12.00 sq. in.
Minimum tray fill area needed = 12.00 x 2 = 24.00 sq. in.; therefore, the tray width required for 4" loading depth tray = 24.00/4 = 6 inches.

(2) 4/0 or Larger Cables

The ladder cable tray must have an inside usable width equal to or greater than the sum of the diameters (Sd) of the cables, which must be installed in a single layer. When using continuous bottom pans, the sum of the cable diameters can not exceed 90% of the usable tray width.

Example: Cable tray width is obtained as follows:

List Cable Sizes	(D) List Cable Outside Diameter	(N) List Number of Cables	Multiply (D) x (N) = Subtotal of the Sum of the Cable Diameters
3/C - #500 kcmil	2.26 inches	1	2.26 inches
3/C - #250 kcmil	1.76 inches	2	3.52 inches
3/C - #4/0 AWG	1.55 inches	4	6.20 inches

The sum of the diameters (Sd) of all cables = 2.26 + 3.52 + 6.20 = 11.98 inches; therefore, a cable tray with a usable width of at least 12 inches is required.

(3) Cables Smaller Than 4/0

The total sum of the cross-sectional areas of all the cables to be installed in the cable tray must be equal to or less than the allowable cable area for the tray width, as indicated in Table 1. When using continuous bottom pans, the allowable cable area is reduced by 22%.

Table 1

Inside Width of Cable Tray inches	Allowable Cable Area square inches
6	7.0
9	10.5
12	14.0
18	21.0
24	28.0

Example: Cable tray width is obtained as follows:

List Cable Sizes	(A) List Cable Cross Sectional Areas	(N) List Number of Cables	Multiply (A) x (N) = Total of the Cross-Sectional Area for Each Size
3/C - #12 AWG	0.167 sq. in.	10	1.67 sq. in.
4/C - #12 AWG	0.190 sq. in.	8	1.52 sq. in.
3/C - # 6 AWG	0.430 sq. in.	6	2.58 sq. in.
3/C - # 2 AWG	0.800 sq. in.	9	7.20 sq. in.

The sum of the totals of the cross-sectional areas = 1.67 + 1.52 + 2.58 + 7.20 = 12.97 inches.
Using Table 1, a 12 inch wide tray with an allowable cable area of 14 sq. inches should be used.

Note: Increasing the cable tray loading depth does not permit an increase in cable fill area for power and lighting cables. The maximum allowable fill area for all cable tray with a 3 inch or greater loading depth is limited to the fill area for a 3 inch loading depth.

(4) 4/0 or Larger Cables Installed with Cables Smaller than 4/0

The ladder cable tray needs to be divided into two zones (a barrier or divider is not required, but one can be used if desired) so that the No. 4/0 and larger cables have a dedicated zone, as they must be placed in a single layer.

A direct method for determining the cable tray width is by figuring the cable tray widths that are required for each of the cable combinations, per steps (2) & (3); and then adding these widths together to select the proper cable tray width.

Example: Cable tray width is obtained as follows:

Part A- Width required for #4/0 AWG and larger multiconductor cables

List Cable Sizes	(D) List Cable Outside Diameter	(N) List Number of Cables	Multiply (D) x (N) = Subtotal of the Sum of the Cable Diameters (Sd)
3/C - #500kcmil	2.26 inches	1	2.26 inches
3/C - #4/0 AGW	1.55 inches	2	3.10 inches

Cable tray width required for large cables = 2.26 + 3.10 = 5.36 inches.

Part B- Width required for multiconductor cables smaller than #4/0 AWG

List Cable Sizes	(A) List Cable Cross Sectional Areas	(N) List Number of Cables	Multiply (A) x (N) = Total of the Cross-Sectional Area for Each Size
3/C - #12 AWG	0.167 sq. in.	10	1.67 sq. in.
3/C - #6 AWG	0.430 sq. in.	8	3.44 sq. in.
3/C - #2 AWG	0.800 sq. in.	2	1.60 sq. in.

The sum of the total areas = 1.67 + 3.44 + 1.60 = 6.71 sq. inches.
From Table 1, the cable tray width required for small cables is 6 inches.

The total cable tray width = 5.36 + 6.00 = 11.36 inches; therefore a 12 inch wide cable tray is required.

II) Number of Single Conductor Cables, Rated 2000 Volts or Less, in DATA-TRACK® and HALF-RACK® (Excluding Straight Rung)

Single conductor cables installed in cable tray must be 1/0 or larger, and they can not be installed with continuous bottom pans.

(1) 1000 KCMIL or Larger Cables

The sum of the diameters (Sd) of all single conductor cables shall not exceed the cable tray width. See Table 3, page 10.

(2) 250 KCMIL to 1000 KCMIL Cables

The total sum of the cross-sectional areas of all the cables to be installed in the cable tray must be equal to or less than the allowable cable area for the tray width, as indicated in Table 2. See Table 3, page 10.

Table 2

Inside Width of Cable Tray inches	Allowable Cable Area square inches
6	6.50
9	9.50
12	13.00
18	19.50
24	26.00

(3) Cables 1/0 through 4/0

These conductors must be installed in a single layer. See Table 3.

Note: It is the opinion of some that this practice may cause problems with unbalanced voltages. To avoid these potential problems, the cables for this type of cable tray wiring system should be bundled with ties. The bundle should contain the circuit's three phase conductors plus the neutral, if one is used. The single conductor cables should be firmly tied to the cable trays at intervals not greater than 6 feet.

Table 3
Number of 600 Volt Single Conductor Cables that may be Installed in Ladder Cable Tray

Single Conductor Size	Outside Diameter in.	Area sq. in.	Cable Tray Width 6 in.	9 in.	12 in.	18 in.	24 in.
1/0	0.58	-	10	15	20	31	41
2/0	0.62	-	9	14	19	29	38
3/0	0.68	-	8	13	17	26	35
4/0	0.73	-	8	12	16	24	32
250 Kcmil	0.84	.55	11	18	24	35	47
350 Kcmil	0.94	.69	9	14	19	28	38
500 Kcmil	1.07	.90	7	11	14	22	29
750 Kcmil	1.28	1.29	5	8	10	15	20
1000 Kcmil	1.45	-	4	6	8	12	16

Cable diameters used are those for Oknite-Okolon 600 volt single conductor power cables.

III) Sizing VERTI-RACK® and MULTI-TIER HALF-RACK®

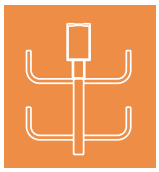
Due to the unique nature of multiple-tier cable trays, there are no existing guidelines for sizing these types of cable trays. However, the following tables are provided to assist you in comparing the usable widths and fill areas for the different Cent-R-Rail® trays available.

Guide for Sizing CENT-R-RAIL®

Usable Tray Width & Overall Outside Width:

DATA-TRACK®

Tray Width		Usable Width				Overall Outside Width			
		Bottom Rung		Top Rung		Bottom Rung		Top Rung	
in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)
6	(150)	6	(150)	6	(150)	8.7	(220)	7.1	(180)
9	(225)	9	(225)	9	(225)	11.7	(295)	10.1	(250)
12	(300)	12	(300)	12	(300)	14.7	(375)	13.1	(335)
18	(450)	16	(400)	18	(450)	19.1	(485)	19.1	(485)
24	(600)	22	(550)	24	(600)	25.1	(630)	25.1	(630)

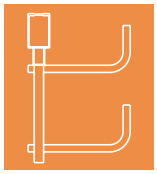


VERTI-RACK®

Tray Width		Total Usable Width										Overall Outside Width	
		2 tier		3 tier		4 tier		5 tier		6 tier			
in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)
3	(75)	6	(150)	9	(225)	12	(300)	15	(450)	18	(600)	4.4	(110)
6	(150)	12	(300)	18	(450)	24	(600)	30	(750)	36	(900)	7.4	(190)
9	(225)	18	(450)	27	(675)	36	(900)	45	(1125)	54	(1350)	10.4	(265)
12	(300)	24	(600)	36	(900)	48	(1200)	60	(1500)	72	(1800)	13.4	(340)

HALF-RACK®

Tray Width		Usable Width		Overall Outside Width	
in.	(mm)	in.	(mm)	in.	(mm)
3	(75)	3	(75)	5.2	(130)
6	(150)	6	(150)	8.2	(210)
9	(225)	9	(225)	11.2	(285)
12	(300)	12	(300)	14.2	(360)



MULTI-TIER HALF-RACK®

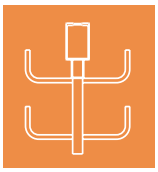
Tray Width		Total Usable Width						Overall Outside Width	
		2 tier		3 tier		4 tier			
in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)
3	(75)	6	(150)	9	(225)	12	(300)	4.7	(120)
6	(150)	12	(300)	18	(450)	24	(600)	7.7	(195)
9	(225)	18	(450)	27	(675)	36	(900)	10.7	(270)
12	(300)	24	(600)	36	(900)	48	(1200)	13.7	(350)

Guide for Sizing CENT-R-RAIL®

Tray Fill Area & Overall Outside Height:

DATA-TRACK®

Loading Depth		Tray Width		Fill Area				Overall Outside Height			
				Bottom Rung		Top Rung		Bottom Rung		Top Rung	
in.	(mm)	in.	(mm)	in.^{2}	(cm^2)	in.^{2}	(cm^2)	in.	(mm)	in.	(mm)
3	(75)	6	(150)	18	(120)	18	(120)	3.7	(95)	6.1	(155)
		9	(225)	27	(180)	27	(180)				
		12	(300)	36	(240)	36	(240)				
		18	(450)	49	(325)	54	(360)				
		24	(600)	67	(450)	72	(480)				
4	(100)	6	(150)	24	(160)	24	(160)	4.7	(120)	7.1	(180)
		9	(225)	36	(240)	36	(240)				
		12	(300)	48	(320)	48	(320)				
		18	(450)	65	(420)	72	(480)				
		24	(600)	89	(575)	96	(640)				
6	(150)	6	(150)	36	(240)	36	(240)	6.7	(170)	9.1	(230)
		9	(225)	54	(360)	54	(360)				
		12	(300)	72	(480)	72	(480)				
		18	(450)	98	(630)	108	(700)				
		24	(600)	134	(865)	144	(930)				



VERTI-RACK®

Loading Depth		Tray Width		Fill Area									
				2 tier		3 tier		4 tier		5 tier		6 tier	
in.	(mm)	in.	(mm)	in.^{2}	(cm^2)	in.^{2}	(cm^2)	in.^{2}	(cm^2)	in.^{2}	(cm^2)	in.^{2}	(cm^2)
2	(50)	3	(75)	12	(80)	18	(120)	24	(160)	30	(200)	36	(240)
		6	(150)	24	(160)	36	(240)	48	(320)	60	(400)	72	(480)
		9	(225)	36	(240)	54	(360)	72	(480)	90	(600)	108	(700)
		12	(300)	48	(320)	72	(480)	96	(640)	120	(800)	144	(930)

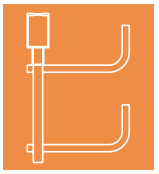
Overall Outside Height									
2 tier		3 tier		4 tier		5 tier		6 tier	
in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)
9.3	(235)	13.3	(340)	17.3	(440)	21.3	(540)	25.3	(645)

Guide for Sizing CENT-R-RAIL®

Tray Fill Area & Overall Outside Height:

HALF-RACK®

Loading Depth		Tray Width		Fill Area		Overall Outside Height	
in.	(mm)	in.	(mm)	in.²	(cm²)	in.	(mm)
3	(75)	3	(75)	9	(60)	3.7	(95)
		6	(150)	18	(120)		
		9	(225)	27	(180)		
		12	(300)	36	(240)		
4	(100)	3	(75)	12	(80)	4.7	(120)
		6	(150)	24	(160)		
		9	(225)	36	(240)		
		12	(300)	48	(320)		
6	(150)	3	(75)	18	(120)	6.7	(170)
		6	(150)	36	(240)		
		9	(225)	54	(360)		
		12	(300)	72	(480)		



MULTI-TIER HALF-RACK®

Loading Depth		Tray Width		Fill Area					
				2 tier		3 tier		4 tier	
in.	(mm)	in.	(mm)	in.²	(cm²)	in.²	(cm²)	in.²	(cm²)
3	(75)	3	(75)	18	(120)	27	(180)	36	(240)
		6	(150)	36	(240)	54	(360)	72	(480)
		9	(225)	54	(360)	81	(525)	108	(700)
		12	(300)	72	(480)	108	(700)	144	(930)
4	(100)	3	(75)	24	(160)	36	(240)	48	(320)
		6	(150)	48	(320)	72	(480)	96	(640)
		9	(225)	72	(480)	108	(700)	144	(930)
		12	(300)	96	(640)	144	(930)	192	(1240)

Overall Outside Height					
2 tier		3 tier		4 tier	
in.	(mm)	in.	(mm)	in.	(mm)
11.3	(285)	17.3	(440)	23.3	(590)