Conductor Bar

Insul-8® 8-Bar | Side Contact | Cluster Bar

Howell Saf-T-Bar®





CONDUCTIX wampfler

DELACHAUX GROUP

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Conductor Bar Summary Chart

Conductor Bar Lines Manufactured in the USA

Safe-Lec 2 and Hevi-Bar II are shown in catalog CAT1003. Welded Cap Rail, see brochure BRO2009

	Safe-Lec 2	Hevi-Bar II	8-Bar	Side Contact	Cluster Bar	Saf-T-Bar	Welded Cap Rail
Common Applications	Small to medium over-head cranes, moderate curves	Medium to large overhead cranes, higher speeds	Small to medium overhead cranes, tighter curves	Constrained spaces, slip ring applications, curves	Monorail hoists, switches, small spaces, doors, ASRS, 1 to many conductors	Small, medium, and large overhead cranes,	Very large cranes, mill handling systems, and transit
Bar Ampacity Selections	60 100 125 160 200 250 315 400	500 700 1000 1500	40 90 110 250 350 500	40 90 110 250 350	40 120	**C Series:** 110,250,300,350 **H Series:** 500, 750, 1000, 1500 **T Series:** 65	4000 6000
Max. Voltage	600	600 [1]	600	600	600	600	600 [1]
Max. Speed [2] **ft/min (m/min.)**	1200 (365.7)	2000 (609.6)	900 (274.3)	600 (182.8)	600 (182.8)	900 (274.3)	2000 (609.6)
Bar Spacing in. (mm)	1.7 (43.2)	3.0 (76.2)	3.0 (76.2)	1.375 (34.9)	0.75 (19.1)	C: 1.5/2.0 (38.1/50.1) H: 5.0 (127) T: 1.0/2.0 (25.4/50.1)	7.0 (177.8)
Cover Temps Low 160°F (71°C) Med 250°F (121°C) High 400°F (204°C)	Low Med	Low Med High	Low Med High	Low Med	Low	160° F (71° C) 260° F (127° C) 375° F (191° C)	n/a
Outdoor Rated?	Yes	Yes	Yes	No	No	C & H Series: Yes T Series: No	Yes
Dura-Coat Available?	No	Yes	No	No	No	No	No
Orientation (Collector Entry)	Bottom/ Side	Bottom/Side	Bottom/Side	Side Only	Bottom/Side	Bottom/Side	Bottom/Side/ Top
Min Bend Rad. Low-Temp Cover in. (mm)	60.0 (1524)	Consult Factory	18.0 (457) [3] 45.0 (1143) [4]	9.0 (228)	16.0 (406)	18.0 (457) [3]	n/a
Med-Temp Cover in. (mm)	60.0 (1524)	Consult Factory	57.0 (1447)	57.0 (1447)	N/A	n/a	n/a
Heater Wire Available?	Yes	500A & 1500A	No	No	No	No	No

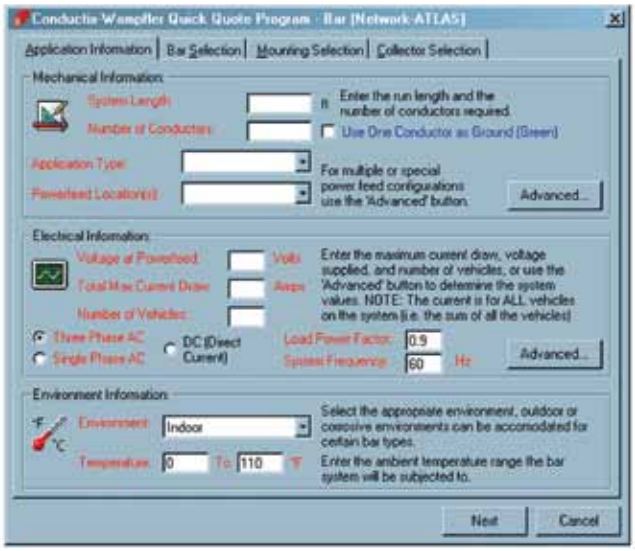
[1] Can be configured for 5000 volts and more - Contact Factory. [2] For faster speeds - Contact Factory. [3] The "easy way" (bar profile vertical) [4] The "hard way" (horizontal)

Conductix-Wampfler Germany - Conductor Rail Products

Conductix-Wampfler Germany's high-performance conductor rails are stocked and available in the USA. Please contact our office in Florence, KY (1-800-326-2899) for more information. See Pg. 90 of this catalog for a brief overview of available series

Don't see what you need? Give us a call. We offer hundreds of special designs and options!

Conductix-Wampfler “Quick Quote” Software



If you configure or purchase conductor bar systems, festoon systems, push button pendants, radio controls, and/or cable reels on a regular basis, you need a copy of our innovative Quick Quote software! This advanced program automatically configures complete systems. It generates bills of materials, quotations, and system schematics. You can also load your customers into the program and send quotes automatically. You can turn your quote into an order with a click! Here is just a partial list of Quick Quote’s advanced features:

Conductor Bar Systems:

- Calculates crane amp draw with multiple vehicles
- Automatically calculates and graphs voltage drop given single or multiple power feed locations
- Handles advanced bar and collector mounting configurations
- Provides conductor bar system schematic

Festoon Systems:

- Handles most common festoon mounting configurations
- Allows set-up cable package arrangements and clamp configurations
- Handles festoon pre-wiring and pre-assembly options

Pendants & Radios:

- Handles custom pendant configurations
- Handles custom radio applications and kits

Quick Quote is supplied on our CD ROM “All Catalogs and Quick Quote”, which can be ordered on www.conductix.us from the Catalogs section. The program requires an access code which can be obtained from Conductix-Wampfler.

Contact Conductix-Wampfler Sales today at 1-800-521-4888 or e-mail us at info.us@conductix.com for more information.

Cluster Bar: Speed Skating Rink, Winter Olympic Games

8-Bar: El Tesoro Copper Mine, Chile

Conductor Bar Specification Data Sheet

Fax to: 800-780-8329 or 402-339-9627 **E-mail to: info.us@conductix.com**

Request Date		**Sales Person**	
Company		**Name**	
		Title	
		Phone	
		Fax	
Company Type		**E-mail**	

APPLICATION

1. Application Type: ☐ Runway ☐ Bridge ☐ Monorail ☐ Other
2. ☐ New Approved Installation? ☐ Extended Existing? ☐ Replacement?
3. System Length: _____ ☐ Feet ☐ Meters
4. Total Number of Conductors: _____ Will one conductor be designated as a ground? ☐ Yes ☐ No

ENVIRONMENTAL DATA

Describe the environment where the conductor system will be located:

1. ☐ Indoors ☐ Outdoors ☐ Both Indoors and Outdoors ☐ Outdoor & Ice
2. Ambient temperature range Min _____ Max _____ Degrees ☐ Fahrenheit ☐ Celsius
3. Will a heater wire need to be included? ☐ Yes ☐ No (If yes, consult factory)
4. Is there a source of corrosion present? ☐ Yes ☐ No **Refer to Appendix I Pg. 83.**

   If yes, describe the corrosive: _____
5. Other environmental considerations (dust, etc.)? _____

MECHANICAL DATA

1. Vehicle Speed _____ ☐ Feet/Min ☐ M/Min Duty Cycle _____
2. Number of vehicles or trolleys _____ Crane Class (if applicable) _____

Refer to Appendix I Pg. 83-86.

3. Will Conductix-Wampfler be supplying mounting brackets? ☐ Yes ☐ No
4. Does the system include any curves? ☐ Yes ☐ No (if yes, consult factory)
5. Other mechanical notes: _____

ELECTRICAL SPECIFICATIONS

1. Number of power feeds _____
2. Location of power feeds (check all that apply): ☐ Center ☐ Multiple ☐ End **Refer to Appendix I Pg. 84.**

   ☐ Advanced: Distance power feeds will be from end of system _____ (or attach diagram)
3. Number of power phases _____ Operating voltage _____ (volts) ☐ AC ☐ DC
4. Total current draw (sum of all vehicles) _____(Amps) Demand factor _____ (typically .9)
5. Operating Frequency _____(Hz - USA is 60 Hz) (Refer to chart on Pg. 7 for multiple cranes)

Contact Conductix-Wampfler today to discuss your Conductor Bar application.

Conductor Bar Specification Data Sheet

Sizing systems for multiple hoists, motors, and/or multiple cranes

For a single crane: Size the conductor bar to handle 100% of the current draw of the largest motor or group of motors, plus 50% of the combined current draw of the other motors on the vehicle.

For multiple cranes or vehicles: Determine the current draw for each crane/vehicle, using the method above. Sum all the current draws for each crane/vehicle, then multiply the sum by the appropriate demand factor:

# of Cranes/vehicles	Demand Factor
2	.95
3	.91
4	.87
5	.84
6	.81
7	.78

8-Bar: An excellent choice for tightly curved systems

Insul-8® 8-Bar, Side Contact, and Cluster Bar

Conductix-Wampfler has designed and built state-of-the-art conductor bar systems for over 60 years. Our experienced engineering and sales people are recognized experts in the application of conductor bar systems to solve industrial problems.

The "Americas branch" of Conductix-Wampfler was founded in 1944 as Insul-8 Corporation. Insul-8 developed the first “Figure 8” conductor bar system, which became the standard method for electrifying overhead cranes. In 1991 the company moved its manufacturing facility to its current location in Harlan, Iowa, USA.

Recent conductor bar innovations include the new “finger-safe” Safe-Lec 2 V-contact bar and the Hevi-Bar II conductor system with optional Dura-Coat corrosion protection see catalog number CAT1003.

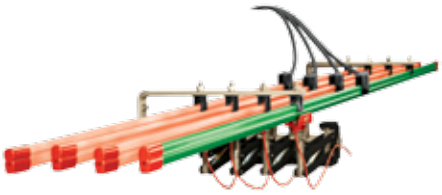
Conductix-Wampfler 8-Bar, Side Contact, and Cluster Bar are manufactured in the USA to provide quick delivery, many configurations and options, and competitive prices. All Conductix manufacturing facilities are ISO 9001:2000 certified. Our stringent quality systems assure that you will get the right product every time.

We offer a complete complement of mobile electrification products including Cable Festoon Systems, Cable Reels (spring and motorized), Push-Button Pendants, Radio Remote Controls, and Crane Bumpers - See Pg. 91.

In 2006, the company, part of the Delachaux Group since 1975, was renamed “Conductix". With the merger of Conductix and Wampfler in 2007, **Conductix-Wampfler** is now the world leader in the design and manufacture of high-performance conductor bar systems for industrial applications.

MATERIAL HANDLING INDUSTRY OF AMERICA® Member Company

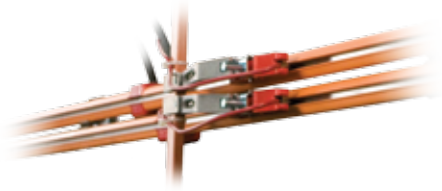
CMAA OEM Crane Component Manufacturer



8-Bar

The first insulated conductor system for crane/monorail electrification. If you need 8-bar, insist on the original! Many accessories available. Able to accommodate small bend radii for curved systems and slip rings. 40A, 90A, 110A, 250A, 350A, and 500A capacity bars.

UL / CSA Listed



Side Contact

Similar in construction to 8-Bar, Side Contact is the appropriate system for constrained spaces and difficult installations. Side contact can accommodate very small bend radii for curved systems and slip rings. 40A, 90A, 110A, 250A, and 350A capacity bars.

UL / CSA Listed

Cluster Bar

A compact "finger safe" (IP2) system featuring 3/4” minimum spacing between bars. Ideal for small cranes, material handling applications, and automated storage and retrieval systems. Can accommodate bottom or lateral entry and can be bent to a small radii for curved systems and slip rings. 40A and 120A capacity bars.

CSA Listed

Safe-Lec 2 and Hevi-Bar II

For details on the Safe-Lec 2 and Hevi Bar II conductor bar, please refer to catalog CAT1003.

Series 811, 812, 813, 815, 832, 842

For details on conductor bar products manufactured by Conductix-Wampfler Germany, please refer to catalog KAT0***-0001-US (*** = series no.)

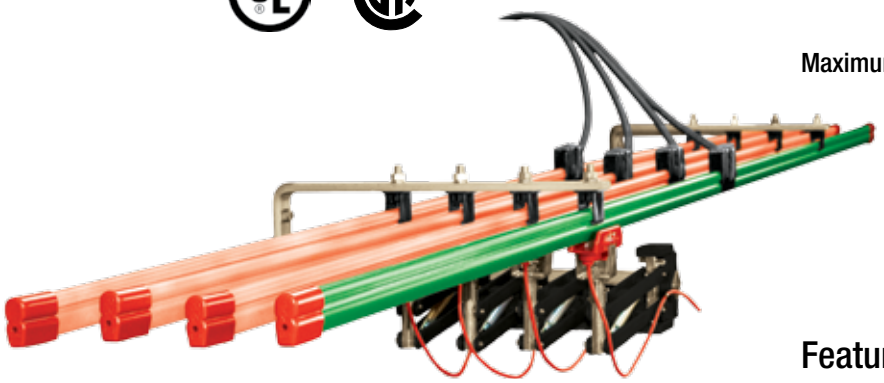

Omaha Plant


Harlan Plant

Insul-8® 8-Bar Design Features

Conductix-Wampfler "Insul-8® 8-Bar"was invented by Insul-8 Corporation over 60 years ago. This is the **original** "figure 8" conductor bar system! This innovative system provided the first safe, insulated electrification solution for cranes, monorails, hoists, conveyors, and many other applications. Thousands of miles of 8-Bar are in use all around the world. There are many "copy cat" systems around. Don't settle for imitations; insist on the original 8-Bar system!

UL and CSA Listed



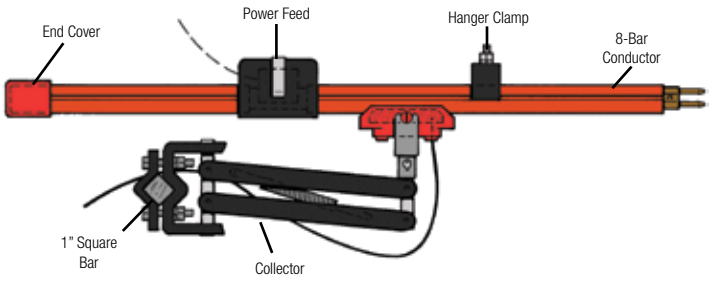
Insul-8® 8-Bar is Ideal for:

- Small/Medium sized cranes
- Conveyors
- Monorails
- Hoists
- Tightly curved systems
- Other mobile power applications

Current range: 40A, 90A, 110A, 250A, 350A, 500A @ 600 volts max.

Maximum Speed: 900 ft/min (274 meters/min)

Basic 8-Bar Components



Power Feed: Conducts the power source to the conductor bar

Collector: "Collects" power from the bar and transfers it to the moving machine. Connects to a 1" mounting staff

Hanger Clamp: Supports the conductor bar

End Cover: Caps off the end of the conductor bar

Bracket: Attaches to crane beam or other structure to support multiple hangers

Anchor Clamp: Connects the bar to the structure and directs movement of the conductors during thermal expansion/contraction

Features

- Designed and built in the USA under stringent ISO 9001:2000 standard
- In stock availability for quick shipment
- A large number of special options and adaptations developed over 60 years of usage to handle numerous industrial situations.
- The ability to be curved into a tighter radius than most other systems.
- Knurled joint pins for secure joints. Won't pull apart under normal conditions when properly installed.
- Backed by the best customer service and engineering services in the industry.

Installs Quickly and Easily

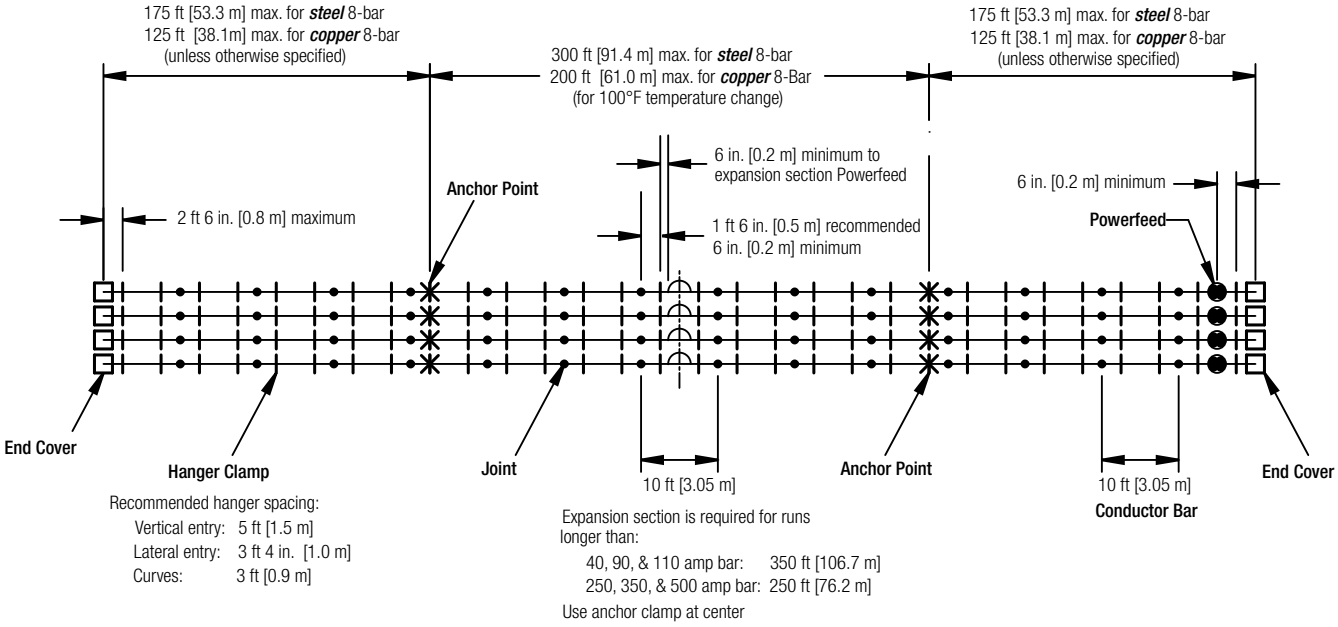
- Minimum number of basic parts
- Quick "pin-style" splice joints
- Bar snaps into mating hanger

Many Options

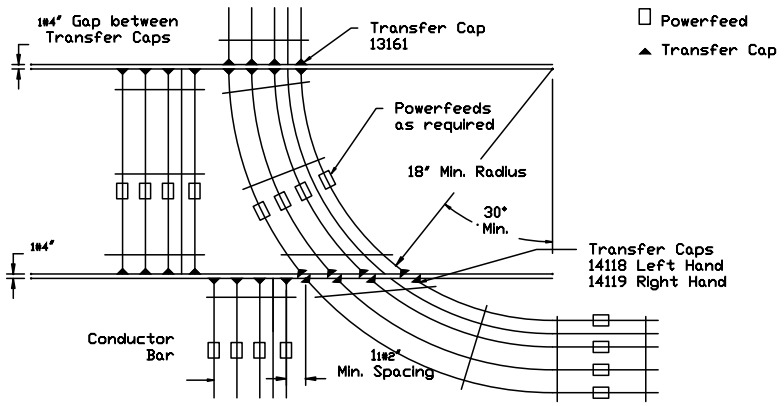
- Stainless steel hardware
- Green bonding (ground) conductor covers
- Black "UV stable" outdoor covers
- Curved systems with low heat cover; can be curved to 18" minimum radius with the bar profile vertical (i.e. the "easy" way) or 45" the "hard way" (low heat cover).

Automate your work with our advanced "Quick Quote" software - See Pg. 5.

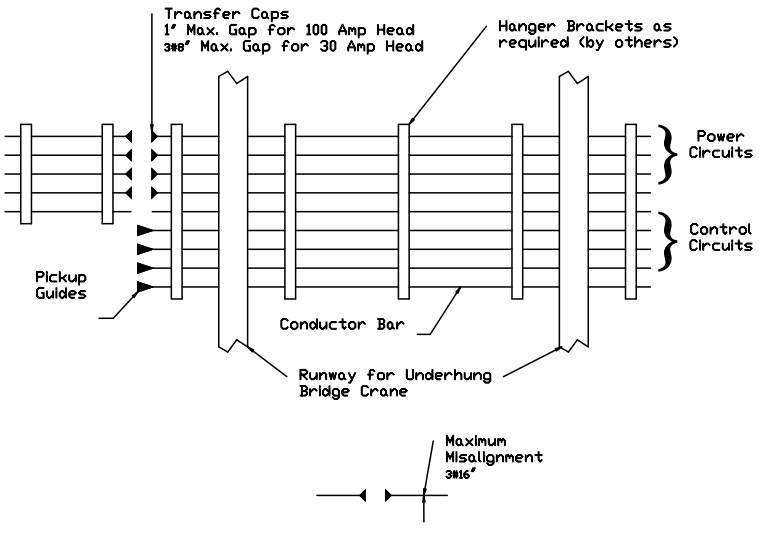
8-Bar Typical 4-Bar Layouts



2-WAY STUB SWITCH



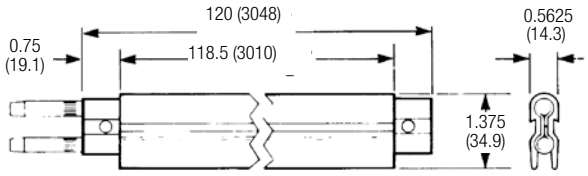
BRIDGE CRANE INTERLOCK



8-Bar Specifications

Conductor Bar Information

Please use the Specification Data Sheets on Pgs. 6-7 and the information in Appendices I through III at the back of this catalog to determine your conductor bar needs. Consult Conductix-Wampfler Sales if you have any questions about the suitability of this product to your application.



Part No. 11000

Roll formed of 1/16" (1.59 mm) material except laminates which are 1/32" (0.79 mm) copper, steel, or stainless steel, and the 90 A galvanized bar. The cross-section area is 188 mcm (95 mm^2); except solid copper bar which is 313 mcm (158 mm^2). The equivalent rectangle for all conductors is 1" x 1/4" (25.4 x 6.3 mm). Supports are required every 3 feet (0.91m) for curves, 3 feet 4 inches (1.01m) for lateral mount, and 5 feet (1.52m) standard.

Assembled with Connector Pins and Cover								Micro-ohms per foot *		
Part No.										
Material	Lgth ft (m)	w/PVC Cover	w/Med Heat Cover	w/High Heat Cover	Expansion Coefficient in./in./^{0}F	Nominal Wt lb/ft (kg/m)	Max. Amps (cont duty)	Resist. R (DC)	Reac-tance X (60 Hz, 3-phase	Imp. Z (60 Hz)
Stainless Steel	10 (3.05)	**14299**	**24304**	**24307**	.000007	0.72 (0.0995)	40	2230	60	2231
Galvanized Steel	10 (3.05)	**22135**	**22141**	**22147**	.000007	0.46 (0.0636)	90	750	600	960
Galvanized Steel	10 (3.05)	**11000**	**11019**	**11038**	.000007	0.65 (0.0899)	110	354	600	702
Stainless Clad Copper Laminate	10 (3.05)	**11004**	**11023**	**11042**	.000009	0.65 (0.0899)	250	100	60	116
Copper Steel Laminate	10 (3.05)	**11008**	**11027**	**11046**	.000009	0.65 (0.0899)	250	100	60	116
Rolled Copper	10 (3.05)	**11012**	**11031**	**11050**	.000009	0.76 (0.1051)	350	60	60	84
Solid Copper	20 (6.10)	**11016**	**11035**	**11054**	.000009	1.16 (0.5262)	500	40	60	70

✱ Example: 0.000060 ohms/ft. X values are calculated at 3 inch center-line spacing, adjusted for three conductors with multiplier 1:26 a nominal permeability m of 10-12 is used for the steel conductor calculations. For reference, $X = m\ 52.9 \log 10^{3} \times \frac{1.26 + 34.5.}{1250}$ $Z = \sqrt{R^2\ 1\ X^3}$

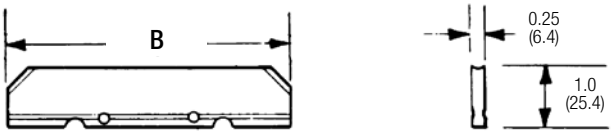
Collector Shoe Information

Standard collector shoe material is sintered copper graphite (CG).

30 Amps

Contoured Shoe: 18.0 (457) Minimum Radius

100 Amps



Contoured Shoe: 48.0 (1219) Minimum Radius

Current Rating (Amps)	"B" Lgth in. (mm)	Description	Part No.
30	3.00 (73)	CG	**13136**
20	3.00 (73)	Carbon	**13137**
30	3.00 (73)	Cast Iron	**13138**
30	3.00 (73)	Insuloy	**19678**
60	3.00 (73)	CG	**11154**
30	3.00 (73)	Carbon	**11155**
60	3.00 (73)	Cast Iron	**11156**
100	4.75 (121)	CG	**11157**
50	4.75 (121)	Carbon	**11158**
100	4.75 (121)	Cast Iron	**11159**
100	4.75 (121)	Insuloy	**19347**

8-Bar Conductors

8-Bar conductor bars come with cover and connector pins installed. Bars are available in 40A, 90A, 110A, 250A, 350A, 500A capacities (@ 600 volts maximum). Expansion Sections are listed below. These are required to compensation for thermal expansion; every 350 feet (106.7 m) for 40A, 90A, and 100A systems or 250 feet (76.2 m) for 250A, 350A, and 500A systems. Power Feeds bring outside power to the conductor bar.

Factory installed covers are available in:

- **Rigid PVC:** -10^0 F to 160^0 F (- 23.3^{0}C to 71.1^{0}C)
- **Medium Heat:** - 25^0 F To 250^0 F (- 31.7^{0}C to 121.1^{0}C)
- **High Heat:** - 60^0 F To 400^0 F (-51.1^{0}C to 204.2^{0}C)

Stainless Steel, 40A

Item	Rigid PVC Cover		Med Heat Cover		High Heat Cover	
	Part No.	Wt lb (kg)	Part No.	Wt lb (kg)	Part No.	Wt lb (kg)
Conductor Bar, 10 ft (3.05 m)	**14299**	7.0 (3.18)	**24304**	6.6 (2.29)	**24307**	7.5 (3.40)
Conductor Bar, 5 ft (1.52 m)	**14823**	3.5 (1.59)	**24305**	3.3 (1.50)	**24308**	3.8 (1.72)
Expansion Section, 10 ft (3.05 m)	**24279**	7.5 (3.40)	**24306**	7.0 (3.18)	**24309**	8.2 (3.72)
Power Feed	**11091**	0.4 (0.18)	**11091**	0.4 (0.18)	**11122**	0.4 (0.18)
End Cover	**11088**	0.1 (0.05)	**11088**	0.1 (0.05)	**11633**	0.1 (0.05)

Galvanized Steel, 90A

Item	Rigid PVC Cover		Med Heat Cover		High Heat Cover	
	Part No.	Wt lb (kg)	Part No.	Wt lb (kg)	Part No.	Wt lb (kg)
Conductor Bar, 10 ft (3.05 m)	**22135**	4.4 (2.00)	**22141**	4.1 (1.86)	**22147**	4.9 (2.22)
Conductor Bar, 5 ft (1.52 m)	**22136**	2.2 (1.00)	**22142**	2.1 (0.95)	**22148**	2.5 (1.14)
Expansion Section, 10 ft (3.05 m)	**22140**	6.7 (3.31)	**22146**	6.3 (2.86)	**22152**	7.4 (3.36)
Power Feed	**11091**	0.4 (0.18)	**11091**	0.4 (0.18)	**11122**	0.4 (0.18)
End Cover	**22070**	0.1 (0.05)	**22070**	0.1 (0.05)	**11633**	0.1 (0.05)

Galvanized Steel,110A

Item	Rigid PVC Cover		Med Heat Cover		High Heat Cover	
	Part No.	Wt lb (kg)	Part No.	Wt lb (kg)	Part No.	Wt lb (kg)
Conductor Bar, 10 ft (3.05 m)	**11000**	4.4 (2.00)	**11019**	4.1 (1.86)	**11038**	4.9 (2.22)
Conductor Bar, 5 ft (1.52 m)	**11001**	2.2 (1.00)	**11020**	2.1 (0.95)	**11039**	2.5 (1.13)
Expansion Section, 10 ft (3.05 m)	**11057**	6.7 (3.31)	**11064**	6.3 (2.86)	**11070**	7.4 (3.36)
Power Feed	**11091**	0.4 (0.18)	**11091**	0.4 (0.18)	**11122**	0.4 (0.18)
End Cover	**11088**	0.1 (0.05)	**11088**	0.1 (0.05)	**11633**	0.1 (0.05)

8-Bar Conductors

Cover Temperature Ratings:
- Rigid PVC: -10^0 F to 160^0 F (- 23.3^{0}C to 71.1^{0}C)
- Medium Heat: - 25^0 F To 250^0 F (- 31.7^{0}C to 121.1^{0}C)
- High Heat: - 60^0 F To 400^0 F (-51.1^{0}C to 204.2^{0}C)

Stainless Clad Copper, 250A

Item	Rigid PVC Cover		Med Heat Cover		High Heat Cover	
	Part No.	Wt lb (kg)	Part No.	Wt lb (kg)	Part No.	Wt lb (kg)
Conductor Bar, 10 ft (3.05 m)	**11004**	6.6 (2.99)	**11023**	6.2 (2.81)	**11042**	7.1 (3.22)
Conductor Bar, 5 ft (1.52 m)	**11005**	3.3 (1.47)	**11024**	3.1 (1.41)	**11043**	3.6 (1.63)
Expansion Section, 10 ft (3.05 m)	**11059**	8.5 (3.86)	**11065**	8.0 (3.63)	**11071**	9.2 (4.17)
Power Feed	**11092**	0.7 (0.32)	**11093**	0.7 (0.32)	**11093**	0.7 (0.32)
End Cover	**11088**	0.1 (0.05)	**11088**	0.1 (0.05)	**11633**	0.4 (0.18)

Copper Steel Laminate, 250A

Item	Rigid PVC Cover		Medium Heat cover		High Heat Cover	
	Part No.	Wt lb (kg)	Part No.	Wt lb (kg)	Part No.	Wt lb (kg)
Conductor Bar, 10 ft (3.05 m)	**11008**	6.2 (2.81)	**11027**	5.8 (2.63)	**11046**	6.7 (3.04)
Conductor Bar, 5 ft (1.52 m)	**11009**	3.1 (1.41)	**11028**	2.9 (1.32)	**11047**	3.4 (1.54)
Expansion Section, 10 ft (3.05 m)	**11060**	10.0 (4.54)	**11066**	9.4 (4.26)	**11072**	10.8 (4.90)
Power Feed	**11092**	0.7 (0.32)	**11093**	0.7 (0.32)	**11093**	0.7 (0.32)
End Cover	**11088**	0.1 (0.05)	**11088**	0.1 (0.05)	**11633**	0.4 (0.18)

Rolled Copper, 350A

Item	Rigid PVC Cover		Medium Heat Cover		High Heat Cover	
	Part No.	Wt lb (kg)	Part No.	Wt lb (kg)	Part No.	Wt lb (kg)
Conductor Bar, 10 ft (3.05 m)	**11012**	7.0 (3.18)	**11031**	6.6 (2.99)	**11050**	7.5 (3.40)
Conductor Bar, 5 ft (1.52 m)	**11013**	3.5 (1.59)	**11032**	3.3 (1.50)	**11051**	3.8 (1.72)
Expansion Section, 10 ft (3.05 m)	**11062**	11.0 (4.99)	**11068**	11.0 (4.99)	**11074**	11.8 (5.35)
Power Feed	**11094**	0.7 (0.32)	**11094**	0.7 (0.32)	**11094**	0.7 (0.32)
End Cover	**11088**	0.1 (0.05)	**11088**	0.1 (0.05)	**11633**	0.4 (0.18)

Solid Copper, 500A

500 amp solid copper bar includes copper connector clamp rather than connector pins - See Pg. 15.

Item	Rigid PVC Cover		Medium Heat Cover		High Heat Cover	
	Part No.	Wt lb (kg)	Part No.	Wt lb (kg)	Part No.	Wt lb (kg)
Conductor Bar, 20 ft (6.10 m)	**11016**	23.6 (10.71)	**11035**	22.1 (10.02)	**11054**	24.6 (11.16)
Conductor Bar, 10 ft (3.05 m)	**11017**	11.8 (5.35)	**11036**	11.0 (4.99)	**11055**	12.3 (5.58)
Expansion Section, 10 ft (3.05 m)	**11063**	18.5 (3.39)	**11069**	17.3 (7.85)	**11075**	20.0 (9.07)
Power Feed	**11094**	2.6 (1.18)	**11094**	2.6 (1.18)	**11094**	2.6 (1.18)
End Cover	**12171**	0.2 (0.09)	**11633**	0.2 (0.09)	**11633**	0.4 (0.18)

8-Bar Replacement Covers, Connectors, & Joint Covers

Replacement 8-Bar Covers

Meets all requirements for plastic electrical insulation and may be used indoors or outdoors. Covers are included with the conductors listed on Pgs. 12-13.

Replacement length is 9 ft to 10.5 ft. (2.74m to 3.20m)

Material	Color	Temp-Rating	Part No.	Wt lb (kg)
Rigid PVC	Orange	-10^0 F to 160^0 F	**11114**	1.2 (0.54)
Rigid PVC	Green	-10^0 F to 160^0 F	**11114G**	1.2 (0.54)
UV Stable PVC	Black	-10^0 F to 160^{0}F	**11114B**	1.2 (0.54)
Medium Heat Lexan	Red	-25^0 F to 250^0 F	**11115**	0.8 (0.36)
High Heat Polyester	Dark Orange	-60^0 F to 400^0 F	**11116**	1.7 (0.77)

Replacement Connector Pins

21914

11120

Used to connect two bar sections together. For quick and easy installation. Supplied with conductors listed on Pgs. 12-13. Two required per connection.

Pin Used With:	Material	Part No.
Stainless steel 40A 8-Bar	Stainless steel	**24196**
Galvanized steel 90A 8-Bar	Zinc plated steel	**21914**
Galvanized steel 110A 8-Bar	Zinc plated Steel	**11120**
Rolled copper and laminated 8-Bar	Copper	**11121**
3 in. (76mm) Transition Pin: For joining 90 to 110A 8-Bar	Zinc plated steel	**22885**

Joint Covers

Insulated protective covers for conductor bar joining parts. Required when ordering Conductor Bars from pgs: 12-13.

Used with:	Part No.	Wt lb (kg)
40A to 350A Rigid PVC Cover	**13601**	0.1 (0.05)
40A to 350A Medium Heat Cover	**13600**	0.1 (0.05)
40A to 350A High Heat Cover	**11123**	0.4 (0.18)

8-Bar Joint Parts & Tools

Copper Connector Clamp and Case

To connect 500A solid copper conductor together. For all cover types.

11117 (Shown with only half of the cover)

Description	Part No.	Wt lb (kg)
Complete Assembly for Solid Copper 8-Bar	**11117**	1.5 (0.68)
Connector Case Only	**11118**	0.5 (0.23)
Connector Clamp Only	**11119**	1.0 (0.45)

Joint Keeper

To secure and stabilize all copper conductor bar. Required when ordering Conductor Bars from pgs: 12-13.

Used With:	Part No.	Wt lb (kg)
Rolled or laminated copper 8-Bar, 250A and 350A	**11125**	0.01 (0.004)

Joint Repair Kit

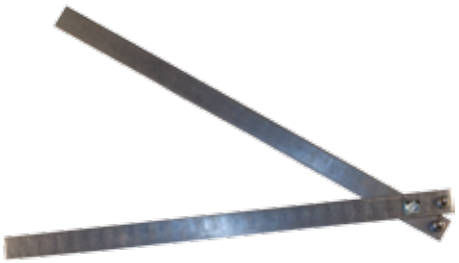
To repair joints of damaged conductor bar.

24632 (Shown with only half cover)

Used For:	Part No.	Wt lb (kg)
40A to 350A formed 8-Bar	**24632**	0.7 (0.32)
High Heat Systems	**51666**	0.7 (0.32)

Connector Pin Tool

Inserts into pre-punched holes of the conductor bar to pull conductor sections together securely. Supplied with the appropriate system at a nominal charge.



Used with:	Part No.	Wt lb (kg)
40A to 350A 8-Bar Conductors	**11134**	2.3 (1.04)

8-Bar End Covers & Power Feeds

End Cover

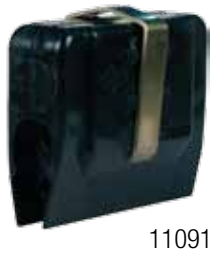
For covering the exposed ends of 8-Bar Conductors.

11088

Used With 8-Bar Conductors:	Max. Temp. ^{0}F (^{0}C)	Part No.	Wt lb (kg)
40A, 110A, and 350A	300 (149)	**11088**	0.03 (0.02)
90A	400 (204)	**22070**	0.03 (0.02)
110A, 250A, 350A	400 (204)	**11633**	0.03 (0.02)
500A Solid Copper	160 (71)	**12171**	0.40 (0.02)
500A Solid Copper w/ Stainless Steel Hardware	160 (71)	**27102**	0.40 (0.02)

Power Feeds

Provides attachment of incoming power to the conductor rails. Fully insulated, simple clamp design for easy installation anywhere on the system.



11091

Current Cap.	Clamp Matl	Case Matl	Max. Temp ^{0}F (^{0}C)	Part No.	Wt lb (kg)
90 or 110	Steel	Rigid PVC	160 (71)	**11091**	0.4 (0.18)
90 or 110	Steel	Polyester	400 (204)	**11122**	0.4(0.18)
250	Copper	Rigid PVC	160 (71)	**11092**	0.7 (0.32)
250	Copper	Polyester	400 (204)	**11093**	0.7 (0.32)
500	Copper	Polyester	400 (204)	**11094**	2.60 (1.19)
250	Copper Clamp w/Stainless Steel Hardware	Rigid PVC	160 (71)	**27104**	0.7 (0.32)
500	Copper Clamp w/Stainless Steel Hardware	Polyester	400 (204.2)	**27106**	2.60 (1.19)

Power Feed Parts/Accessories

Description	Part No.	Wt lb (kg)
Case & clip only. PVC 90/110, 250A	**11131**	0.2 (0.09)
Case & clip only. High heat. 90/110, 250A	**11132**	0.3 (0.14)
Case only. High heat 500A	**11133**	1.0 (0.45)
Power Feed Clamp only. For Galvanized Steel, 90/110A	**11128**	0.1 (0.04)
Power Feed Clamp only. For Copper, 250A	**11129**	0.4 (0.18)
Power Feed Clamp only. For Copper, 500A	**11130**	1.6 (0.73)

8-Bar Expansions & Isolation Sections

Expansion Section

Required every 300 feet (94.1 m) for steel conductors or every 200 feet (61.0 m) for copper conductors to compensate for thermal expansion. Power feeds and flexible jumpers are factory installed to meet electrical and mechanical requirements of your system.

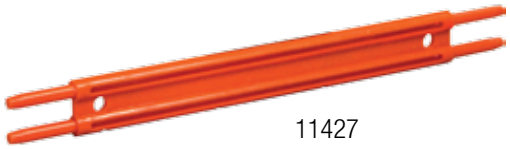
Note: Part numbers are located in the Conductor tables - See Pgs. 12-13.

Isolation Section

Conductor isolation sections are used to electrically isolate control circuits, maintenance bays, etc. The kit includes 11127 Guide Assembly, PVC Cover, and Isolation Section for 40A to 350A (not including 90A). Consult our factory for proper selection.

Part No.	Wt lb (kg)
21841	2.3 (1.04)

Isolation Section Parts



11427

11618

11127

Components used for in-field modification.

Description	Part No.	Wt lb (kg)
Molded plastic insulating piece; only for 21841	**11427**	0.3 (0.14)
Molded plastic 1" (25.4 mm) isolating pin. For 40-350A except for 90A; Two required per location.	**11615**	0.03 (0.01)
Molded plastic, 1" (25.4 mm) isolating pin. For 90A only. Two required per location.	**11618**	0.03 (0.01)
Galvanized Steel Guide Assembly. Provides rigid support at isolation areas.	**11127**	1.5 (0.68)

8-Bar Transfer Caps, Pickup Guides

Transfer Caps

Used in switches and interlocks to accomplish smooth collector transfer.

Item Description	Part No.	Wt lb (kg)
End Transfer cap for 90A bar.	**22070**	0.03 (0.01)
Left Transfer cap for 90A bar.	**22395**	0.03 (0.01)
Right Transfer cap for 90A bar.	**22396**	0.03 (0.01)
End Transfer cap for 40-350A bar	**13161**	0.03 (0.01)
Left-hand cap for 40-350A bar	**14118**	0.03 (0.01)
Right-hand cap for 40-350A bar	**14119**	0.03 (0.01)

Pick-Up Guides

13142

The Pick-up Guide allows the collector to leave the conductor and re-track upon return. Requires use of Self-Centering J-Head Collectors, see Pgs. 24-25. Consult Factory for selection.

Used:	Part No.	Wt lb (kg)
Indoors, for 3” bar spacing	**13142**	1.75 (0.79)
Indoors, for 4” bar spacing	**11089**	1.75 (0.79)
Outdoors, for 3” bar spacing	**13143**	2.00 (0.91)
Outdoors, for 4” bar spacing	**11090**	2.00 (0.91)

8-Bar Hanger and Anchor Clamps

Polycarbonate Snap-in Hanger Clamps

22800 24405

Hanger Clamps are designed to grip 8-Bar Conductors for stable support. Clamps are required every 5 foot (1.52m) standard. These Polycarbonate Snap-in Hanger Clamps are recommended for standard mount only; not recommended for curves or lateral mount.

Type	Hardware	Part No.	Wt lb (kg)
Without Insulator	Zinc Plated	**22800**	0.3 (0.14)
Without Insulator	Stainless Steel	**23370**	0.3 (0.14)
With Insulator	Zinc Plated	**24405**	0.3 (0.14)
With Insulator	Stainless Steel	**28122**	0.3 (0.14)

Steel Snap-in Hanger Clamp

21600 22000

The spring-steel Hanger Clamps are designed to grip 8-Bar Conductors for stable support.

Clamps are required every 5 foot (1.52m) standard. Steel Snap-in Hanger Clamps are recommended for standard mounting; not recommended for curves or lateral mount.

Type	Part No.	Wt lb (kg)
Without Insulator	**21600**	0.2 (0.09)
With Insulator	**22000**	0.3 (0.4)

Cross-Bolt Hanger Clamp

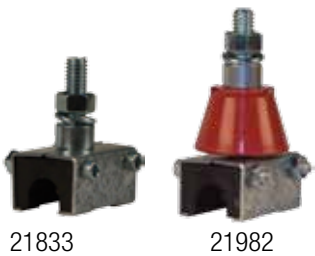
11076 11082

Cross-Bolt Hanger Clamps are designed to lock to 8-Bar Conductors for stable support.

Hangers are required every 5’ for vertical entry, 3’ for curved systems and every 3’ 4” for lateral entry. Cross-Bolt Hanger Clamps are recommended for standard mounting, lateral mounting, and curved systems.

Type	Material	Part No.	Wt lb (kg)
Without Insulator	Plated Steel	**11076**	0.2 (0.11)
Without Insulator	Stainless Steel	**11078**	0.3 (0.14)
With Insulator	Plated Steel	**11082**	0.4 (0.18)
With Insulator	Stainless Steel	**11084**	0.4 (0.18)

Anchor Clamp



21833 21982

For standard mount, not recommended for curves or lateral mount.

Type	Material	Part No.	Wt lb (kg)
Without Insulator	Plated Steel	**21833**	0.3 (0.14)
Without Insulator	Stainless Steel	**28123**	0.3 (0.14)
With Insulator	Plated Steel	**21982**	0.5 (0.23)
With Insulator	Stainless Steel	**28124**	0.5 (0.23)

8-Bar Standard Brackets - Without Hangers

Web Bracket

22014

For top running, web-mounted, bottom entry systems. Zinc plated steel. See Pg. 19 for hangers.

Distance to First Hole:	Part No.	Wt lb (kg)
6.0 (152)	**22014**	2.4 (1.09)
9.0 (229); with three more holes - At 12.0 (305), 15 (381), and 18 (457)	**29876**	4.5 (2.04)

Flange Mount Brackets

27762

For bottom entry monorail and under-hung systems, flange-mounted. Zinc plated steel. See Pg. 19 for hangers.

Type	Part No.	Wt lb (kg)
For 2 hangers each side	**27762**	2.5 (1.13)
For 4 hangers on one side	**27767**	2.5 (1.13)

8-Bar Standard Brackets - With Hangers

Brackets w/Pre-Assembled Hanger Clamps

The following brackets come with hanger clamps on 3" centers, brackets are zinc plated steel. **Hanger Clamp styles are described on Pg. 19.**

Web Bracket # 34189 shown

With Polycarbonate Snap-In Hanger Clamps

	Without Insulators		With Insulators	
Description	**Part No.**	**Wt lb (kg)**	**Part No.**	**Wt lb (kg)**
Web type 6"	**28829**	2.0 (0.907)	**51004**	2.4 (1.09)
Web type 9"	**34189**	3.1 (1.402)	**50314**	3.5 (1.59)
Flange type, 2 hangers each side	**51864**	2.6 (1.179)	**51865**	3.1 (1.41)
Flange type, 4 hangers on one side	**51870**	2.6 (1.179)	**51871**	3.1 (1.41)

Steel Snap-In Hanger Clamps

	Without Insulators		With Insulators	
Description	**Part No.**	**Wt lb (kg)**	**Part No.**	**Wt lb (kg)**
Web type 6"	**30281**	1.6 (0.726)	**51005**	2.0 (0.91)
Web type 9"	**50313**	2.7 (1.225)	**50315**	3.1 (1.41)
Flange type, 2 hangers each side	**51866**	2.1 (0.953)	**51867**	2.5 (1.11)
Flange type, 4 hangers on one side	**51872**	2.1 (0.953)	**51873**	2.5 (1.11)

Flange Bracket # 51864 shown

Cross-Bolt Hanger Clamps

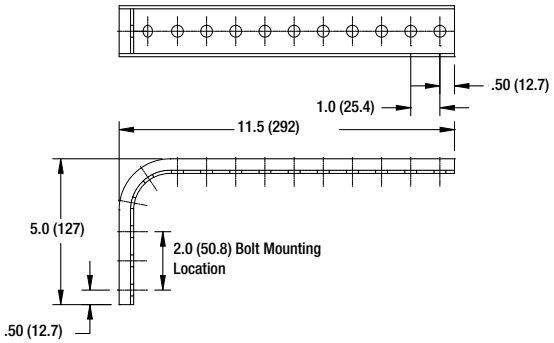
	Without Insulators		With Insulators	
Description	**Part No.**	**Wt lb (kg)**	**Part No.**	**Wt lb (kg)**
Web type 6"	**31762**	2.0 (0.907)	**29534**	2.3 (1.04)
Web type 9"	**50312**	3.1 (1.406)	**50316**	3.5 (1.59)
Flange type, 2 hangers each side	**51868**	2.5 (1.114)	**51869**	2.9(1.32)
Flange type, 4 hangers on one side	**51874**	2.5 (1.114)	**51875**	2.9 (1.32)

8-Bar Universal Brackets

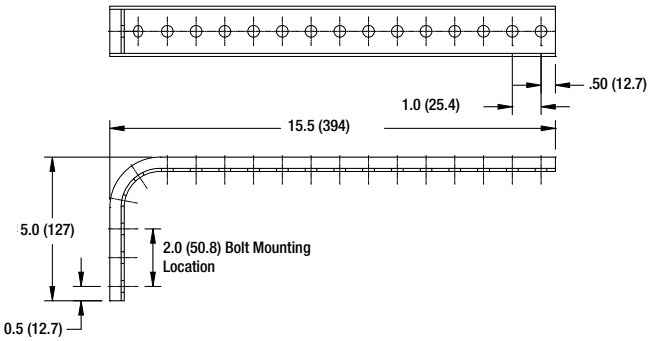
You can order pre-assembled brackets with your choice of hangers on Pg. 21. Or, if these hanger locations don't work for the application, the "Universal Brackets" shown below should address most special applications. Holes are drilled on 1.0 inch (25.4 mm) centers.

Type	Length	Part No.	Wt lb (kg)
Web Bracket, Short	11.5 (29)	**31409**	1.0 (0.45)
Web Bracket, Long	15.5 (39)	**31407**	1.3 (0.59)
Flange Bracket	18.0 (46)	**31408**	1.2 (0.54)
Flange Bracket with Beam Clips	18.0 (46)	**31418**	1.6 (0.73)
Flange Bracket with Beam Clips	24.0 (61)	**31911**	2.0 (0.91)

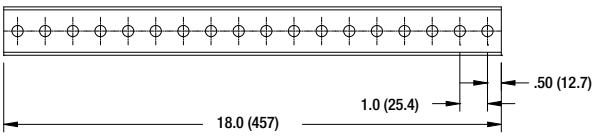
Web Bracket - Short (31409)



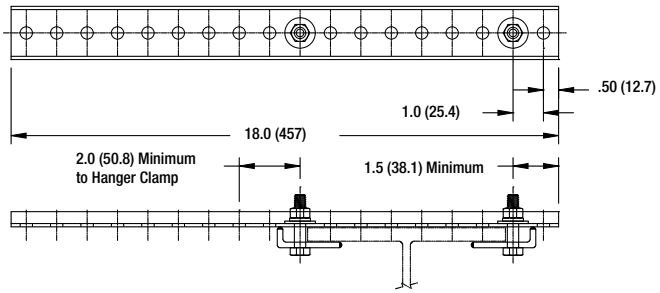
Web Bracket - Long (31407)



Flange Bracket (31408)



Flange Bracket with Clips (31418)



8-Bar Universal Brackets with Pre-assembled Hangers

Ordering Instructions:

1) Choose the desired bracket style by part number - See bracket styles below.

2) Also referring to the drawings below, choose the hole number locations at which hangers are to be assembled. Here is the recommended hanger spacing:

Recommended Minimum Conductor Bar Spacing

	Indoor, inch (mm)	Outdoor, inch (mm)
8 Bar (bottom entry)	2.0 (50.8)	3.0 (76.2)
Side Contact (Lateral Mount)	3.0 (76.2)	Not for outside use

For less than 2.0" (50.8 mm) spacing, consult factory

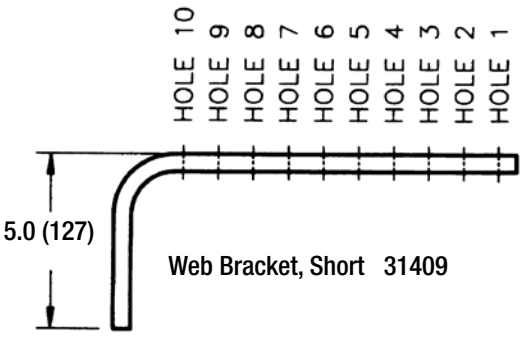
3) Select desired hanger type by part number - From Pg. 19.

Example Order lines:

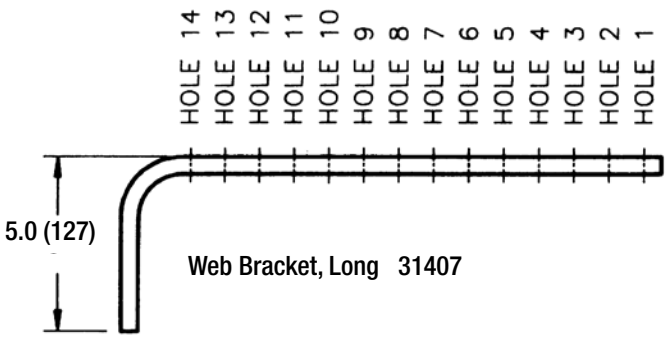
Qty	Part No. (Hole #'s) where hangers are to be mounted	Description
10	**31407 (1, 3, 5, 7)**	Web Bracket, Long (from below)
40	**22800**	Polycarbonate Snap Hanger (from Pg. 19)

Note: When order is received, a unique part number will be created for the requested bracket/hangers combination.

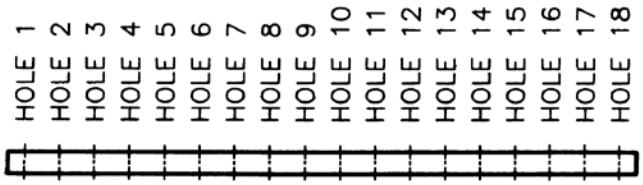
Bracket Hole Position Numbers: 1.0" (25.4 mm) Spacing Between Holes



Web Bracket, Short 31409



Web Bracket, Long 31407

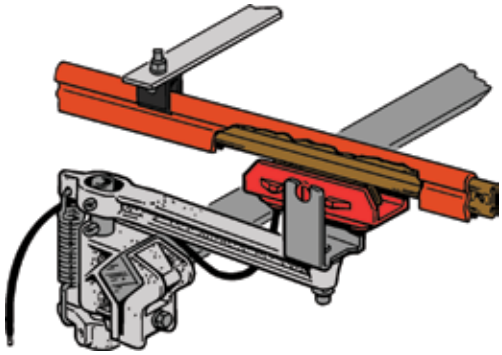


Flange Bracket: 31408

Flange Bracket with Beam Clips 31418

8-Bar Collector Assemblies

Sliding contact Collector Assemblies are offered in either single or double contact shoe types providing current capacities from 30A to 200A. Operational wear is confined to easily replaceable contact shoes. The shoes are supported by insulated holders on articulating, spring-loaded collector arms.



30A J-Head, C-Base Type

13128

13130

For systems up to 600 volts with straight runs and curves to 18" minimum radius. For lateral mount, consult factory. The "Self-Centering" versions are used with Pick-up Guides - See Pg. 18.

Type	Part No.	Wt lb (kg)
Standard Mount	**13128**	2.5 (1.13)
Tandem Standard Mount	**13082**	4.7 (2.13)
Self-Centering Standard Mount	**13130**	2.6 (1.180)
Self-Centering Tandem Standard Mount	**13084**	4.9 (2.22)

Replacement Shoe

30 amp replacement shoe	**13136**	0.4 (0.18)

30A J-Head, H-Base Type

13131

For systems up to 600 volts with straight runs and curves to 18" minimum radius. For lateral mount, consult factory. The "Self-Centering" versions are used with Pick-up Guides - See Pg. 18.

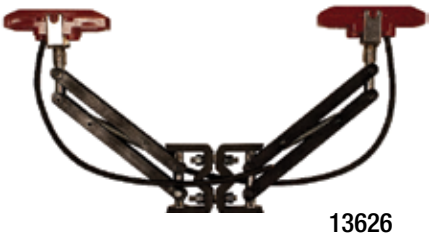
Description	Part No.	Wt lb (kg)
Standard Mount	**13131**	1.4 (0.64)
Self-Centering Standard Mount	**13132**	1.7 (0.77)

Replacement Shoe

30 amp replacement shoe	**13136**	0.4 (0.18)

8-Bar Collector Assemblies

200A J-Head, C-Base Type



13626

For straight system runs of 600V or less. For lateral mount, consult factory. The "Self-Centering" versions are used with Pick-up Guides - See Pg. 18.

Description	Part No.	Wt lb (kg)
Standard Mount	**13613**	3.1 (1.41)
Standard tandem Mount	**13626**	5.8 (6.23)
Self-Centering Standard Mount	**13625**	3.2 (1.45)
Self-Centering Tandem Standard Mount	**13628**	6.0 (0.72)

Replacement Shoe

100 amp replacement shoe	**11157**	0.9 (0.41)

100A J-Head, H-Base Type

13630

For straight system runs of 600V or less, and curves to a minimum of 48" radius. For lateral mount, consult factory. The "Self-Centering" versions are used with Pick-up Guides - See Pg. 18.

Description	Part No.	Wt lb (kg)
Standard Mount	**13629**	1.4 (0.65)
Self-Centering Standard Mount	**13630**	1.7 (0.77)

Replacement Shoe

100 amp replacement shoe	**11157**	0.9 (0.41)

8-Bar Curves & Slip Rings

Curved 8-Bar

Factory curved conductors. Refer to page 27 to specify your curve requirements. Consult Factory for your curved 8-Bar Requirements. Maximum length: 10 feet (3.05 meters).

Cover Type	Conductor Bar	Current Cap.	Part No.	Min. Radius in. (mm)
Rigid PVC	Galvanized Steel	110A	**11003**	18.0 (457)
Rigid PVC	Stainless Clad Copper Laminate	250A	**11007**	18.0 (457)
Rigid PVC	Copper Steel Laminate	250A	**11011**	18.0 (457)
Rigid PVC	Rolled Copper	350A	**11015**	18.0 (457)
Rigid PVC	Solid Copper	500A	**11018**	18.0 (457)
Lexan (Medium Heat)	Galvanized Steel	110A	**11022**	57.0 (1447)
Lexan (Medium Heat)	Stainless Clad Copper Laminate	250A	**11026**	57.0 (1447)
Lexan (Medium Heat)	Copper Steel Laminate	250A	**11030**	57.0 (1447)
Lexan (Medium Heat)	Rolled Copper	350A	**11034**	57.0 (1447)
Lexan (Medium Heat)	Solid Copper	500A	**11037**	57.0 (1447)
Polyester (High Heat)	Galvanized Steel	110A	**11041**	57.0 (1447)
Polyester (High Heat)	Stainless Clad Copper Laminate	250A	**11045**	57.0 (1447)
Polyester (High Heat)	Copper Steel Laminate	250A	**11049**	57.0 (1447)
Polyester (High Heat)	Rolled Copper	350A	**11053**	57.0 (1447)
Polyester (High Heat)	Solid Copper	500A	**11056**	57.0 (1447)

Slip Rings

Curved segments for factory manufactured ring. Consult Factory for your curved 8-Bar Requirements.

Conductor Bar (Current Rating)	Ring Radius Range in. (mm)	Cover Material	Pieces	Part No.
Galvanized Steel (110A)	18.0 to 35.0 (457 to 889)	Rigid PVC	2-180^0	**23626**
Stainless Clad Copper Laminate (250A)	18.0 to 35.0 (457 to 889)	Rigid PVC	2-180^0	**23627**
Copper Steel Laminate (250A)	18.0 to 35.0 (457 to 889)	Rigid PVC	2-180^0	**23628**
Rolled Copper (350A)	18.0 to 35.0 (457 to 889)	Rigid PVC	2-180^0	**23629**
Galvanized Steel (110A)	35.1 to 54.0 (892 to 1371)	Rigid PVC	3-120^0	**23630**
Stainless Clad Copper Laminate (250A)	35.1 to 54.0 (892 to 1371)	Rigid PVC	3-120^0	**23631**
Copper Steel Laminate (250A)	35.1 to 54.0 (892 to 1371)	Rigid PVC	3-120^0	**23632**
Rolled Copper (350A)	35.1 to 54.0 (892 to 1371)	Rigid PVC	3-120^0	**23633**
Solid Copper (500A)	35.1 to 54.0 (892 to 1371)	Rigid PVC	3-120^0	**24292**
Galvanized Steel (110A)	54.1 to 72.0 (1374 to 1828)	Rigid PVC	4-90^0	**23634**
Stainless Clad Copper Laminate (250A)	54.1 to 72.0 (1374 to 1828)	Rigid PVC	4-90^0	**23635**
Copper Steel Laminate (250A)	54.1 to 72.0 (1374 to 1828)	Rigid PVC	4-90^0	**23636**
Rolled Copper (350A)	54.1 to 72.0 (1374 to 1828)	Rigid PVC	4-90^0	**23637**
Solid Copper (500A)	54.1 to 72.0 (1374 to 1828)	Rigid PVC	4-90^0	**24293**
Galvanized Steel (110A)	57.0 to 72.0 (1447 to 1828)	Lexan (Med Heat)	4-90^0	**23638**
Stainless Clad Copper Laminate (250A)	57.0 to 72.0 (1447 to 1828)	Lexan (Med Heat)	4-90^0	**23639**
Copper Steel Laminate (250A)	57.0 to 72.0 (1447 to 1828)	Lexan (Med Heat)	4-90^0	**23640**
Rolled Copper (350A)	57.0 to 72.0 (1447 to 1828)	Lexan (Med Heat)	4-90^0	**23641**
Solid Copper (500A)	57.0 to 72.0 (1447 to 1828)	Lexan (Med Heat)	4-90^0	**24294**

8-Bar Curves & Slip Rings Specification Data

This worksheet is designed to help you choose the correct curved section for your application. Consult factory when calculating your requirements.

Customer:

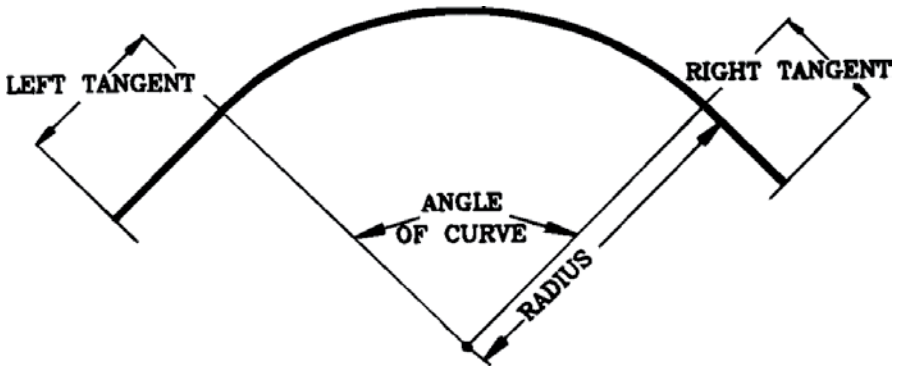
Project No.: **Item No.:** **Date:**

1. Bar type, Rating (Amps/Volts):

2. Environment / Ambient Temp:

3. Fill in

Angle of curve:	
Left tangent 6" (152mm) standard:	
Right tangent 6" (152mm) standard:	
Radius to contact surface: (Consult Pg. 26 for minimum radii.)	



4. Select style of bar:

○ Outside Contact

○ Inside Contact

○ Bottom Contact

5. For systems with parallel curves, sketch layout below and indicate the radius, angle and tangent for each.

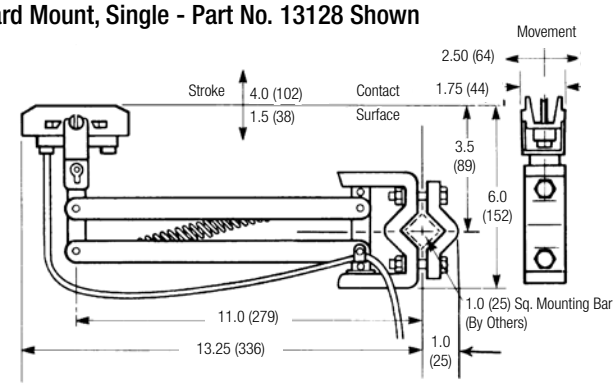
8-Bar Collector Dimensions

C Base Collectors

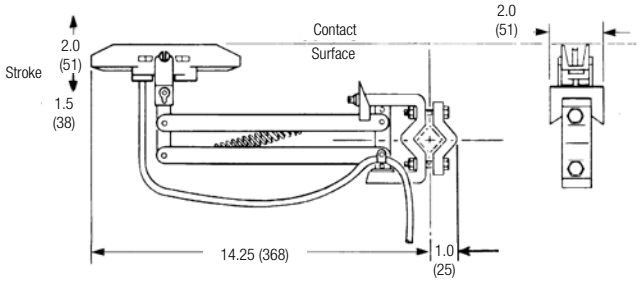
Dimensions common to all C-Base Collectors are not repeated.

Type	30 Amp	60 Amp Tandem	100 Amp	200 Amp Tandem
Standard Mount	13128	13082	13613	13626
Self-Centering	13130	13084	13625	13628

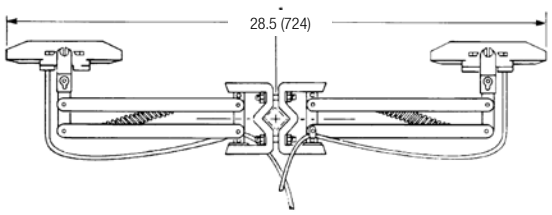
Standard Mount, Single - Part No. 13128 Shown



Self-Centering - Part No. 13625 Shown



Standard Mount, Tandem - Part No. 13626

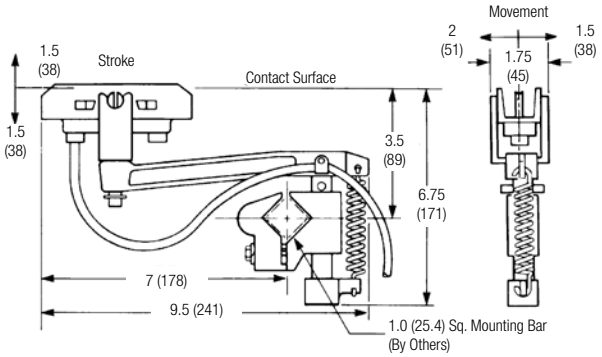


H Base Collector

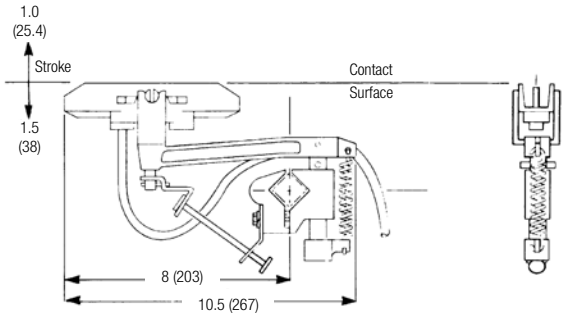
Dimensions common to all H-Base Collectors are not repeated.

Type	30 Amp	100 Amp
Standard Mount	13131	13629
Self-Centering	13132	13630

Standard Mount, Single - Part No. 13131Shown

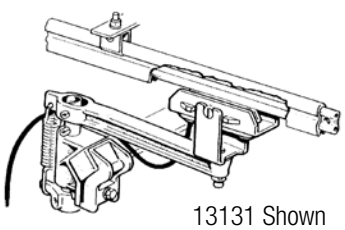


Standard Mount, Single - Part No. 13630 Shown



Collector Mounting

Standard Mount
(Vertical Entry)



13131 Shown

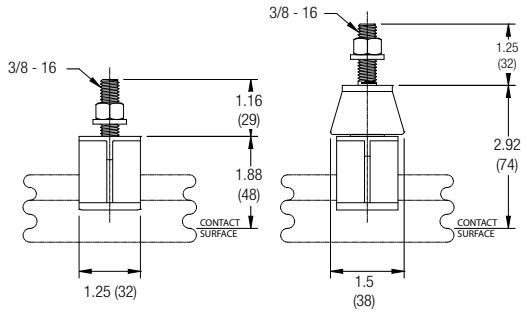
Shoe Pressure

30 amp: 3-5 lb
100 amp 6-9 lb

8-Bar Hanger and Anchor Dimensions

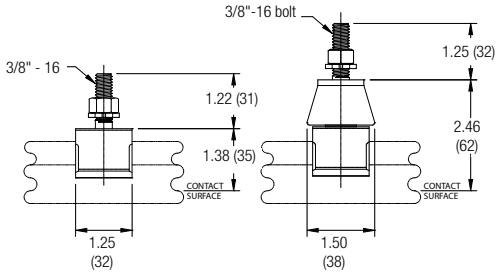
Note: Plastic or steel snap-in hangers are not recommended for lateral mounting or curves.

Plastic Snap-in Hanger Clamps, 250⁰ F



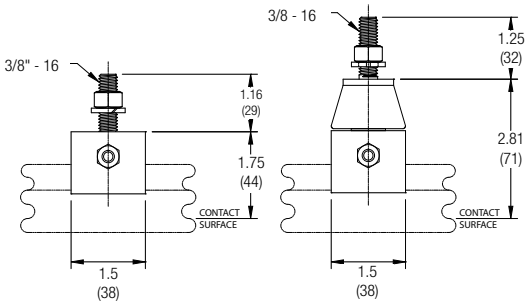
22800, 23370 24405, 28122 w/insulator

Spring Steel Snap-in Hanger Clamps, 400⁰ F



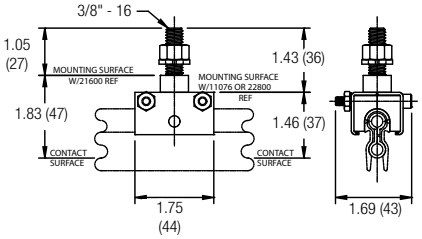
21600 22000 w/insulator

Cross-Bolt Hanger Clamps

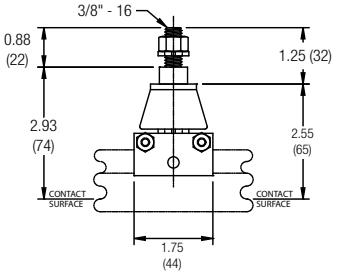


11076, 11078 11082, 11084

Anchor Clamp, 400⁰ F

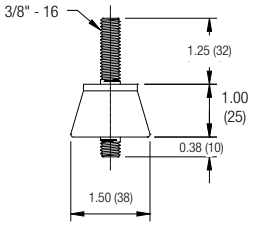


21833, 28123



21982, 28124

Insulator, 400⁰ F



11087 (plated inserts); 16424 (stainless inserts)

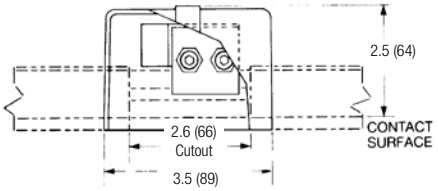
Transfer Cap, 300⁰ F

	Center	Left	Right
40, 110, 250, 350 amp	**13161**	**14118**	**14119**
90 amp only	**22070**	**22395**	**22396**

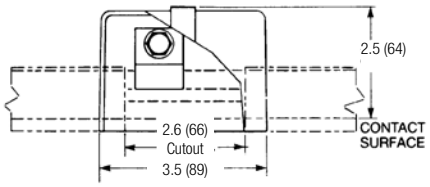
8-Bar Component Dimensions

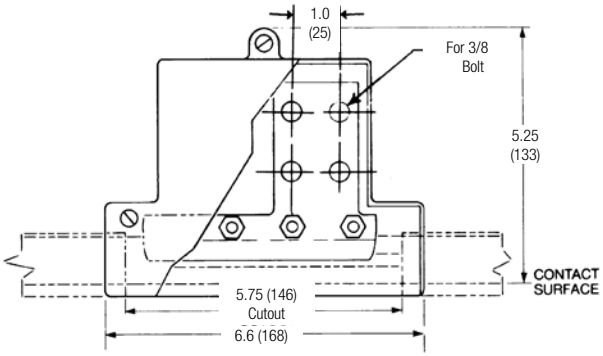
Powerfeeds

11092, 11093, 27104



11091, 11122

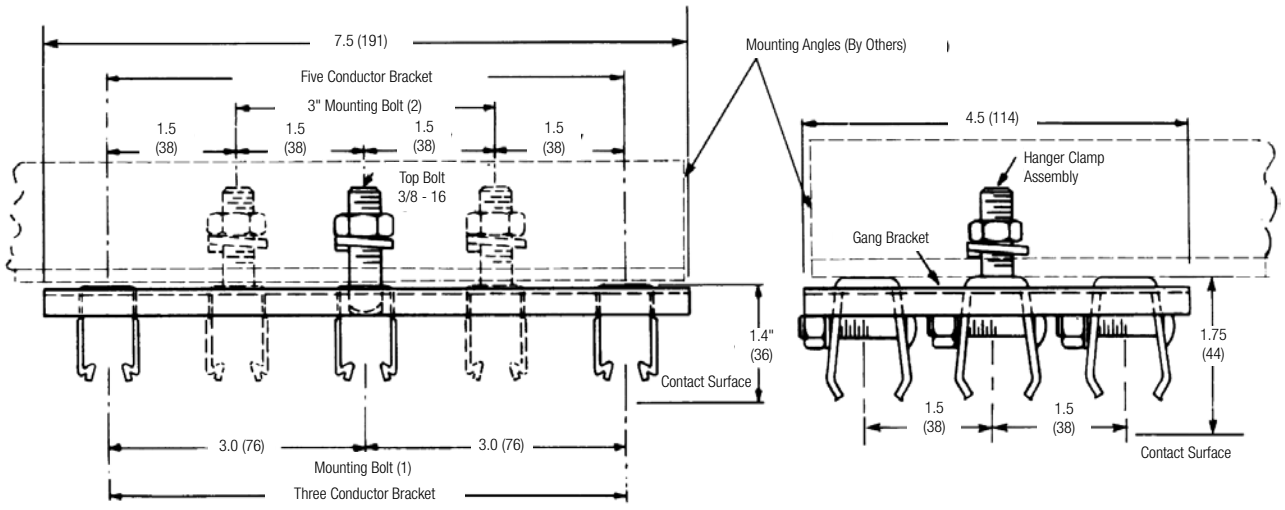




11094, 27106

Part No.	Current Cap. (Amps)	Temp. Rating ^{0}F (^{0}C)	Description
11091	90 / 110	160 (71.1)	Steel clamp type. Complete assembly of clamp and PVC case for steel systems only. Single bolt hole 1/4" for 3/0
11122	90 / 110	400 (204.4)	Steel clamp type. Complete assembly of clamp and high-heat case for steel systems only.
11092 / 27104	250	160 (71.1)	Copper clamp type. Complete assembly of clamp and PVC case for systems with feed wires from #8 AWG to 1/0.
11093	250	400 (204.4)	Copper clamp type. Complete assembly of clamp and high heat case for systems with feed wires from #8 AWG to 1/0.
11094 / 27106	500	400 (204.4)	Copper clamp type with stub. Complete assembly of clamp with NEMA standard 4-hole stub and case. Feed wires to 500 MCM.

Gang Hanger Clamp Bracket

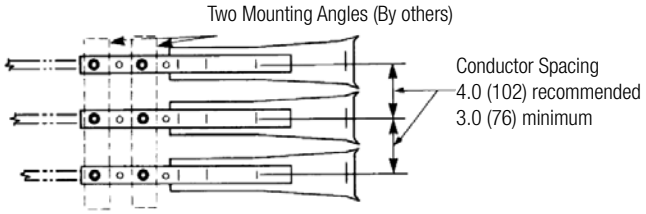


Snap-in Hanger 22646

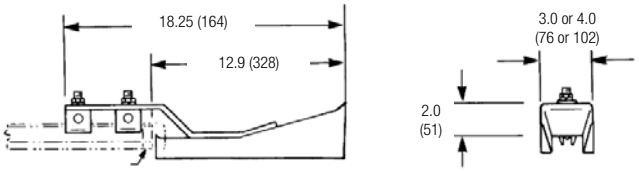
Cross-Bolt Hanger 22649

8-Bar Component Dimensions

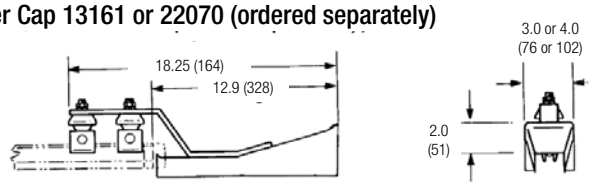
Pick-up Guides



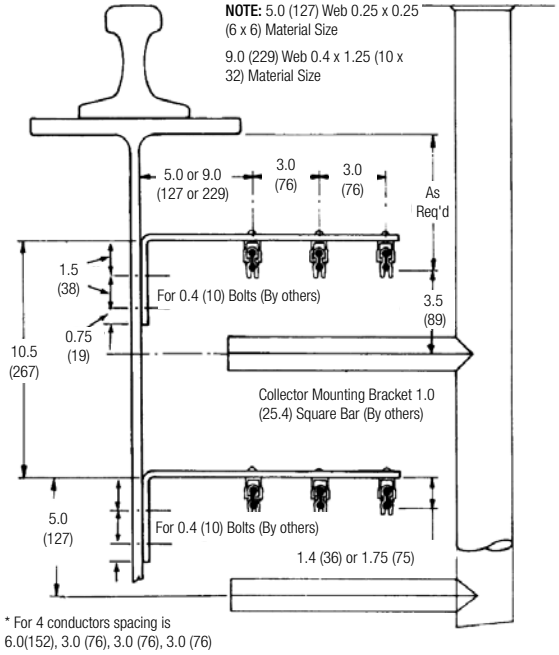
13142 For 'J' head collectors, indoors, 3.0 (76) spacing
11089 For 'J' head collectors, indoors, 4.0 (102) spacing

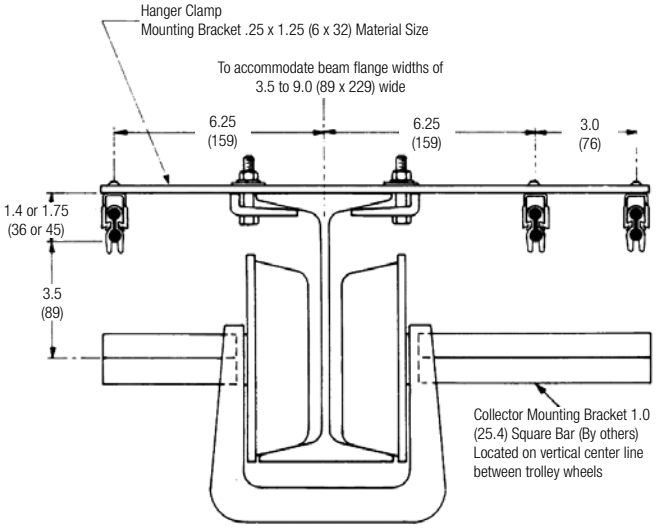


Transfer Cap 13161 or 22070 (ordered separately)



Crane Bridges and Runways



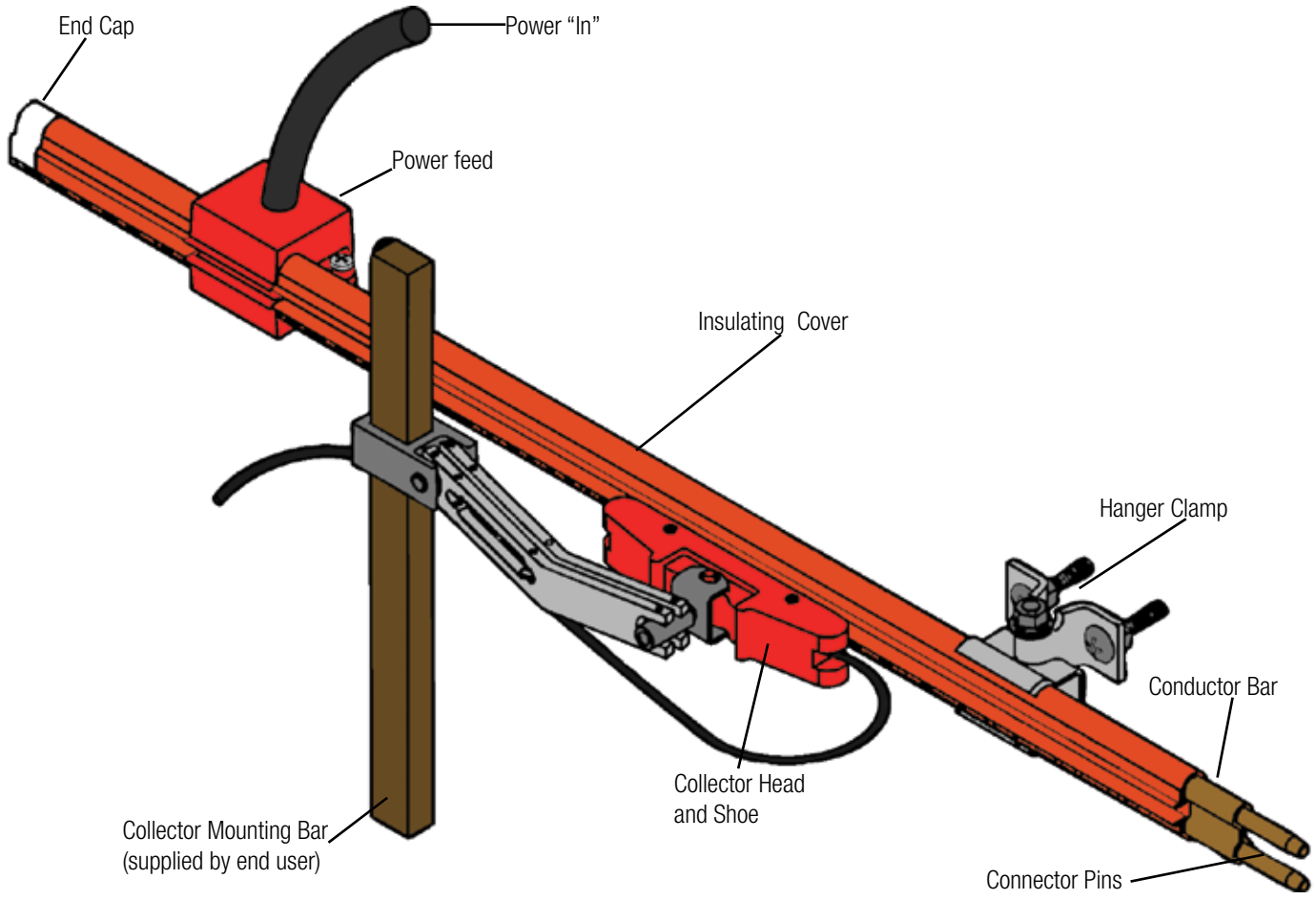


Side Contact Design Features

Conductix-Wampfler Side Contact Conductor Bar is a variation of the 8-Bar system designed for lateral (side) entry of the collector. UL / CSA listed.

Side Contact is Ideal When:

- There is insufficient room for standard "bottom entry" mounting
- Conductors must be more closely spaced than standard 8-Bar allows



Component Descriptions

Conductor Bar: The supply of incoming power

Power feed: Attachment of incoming power

Collector: Collects the incoming power and transfers it to the moving machine

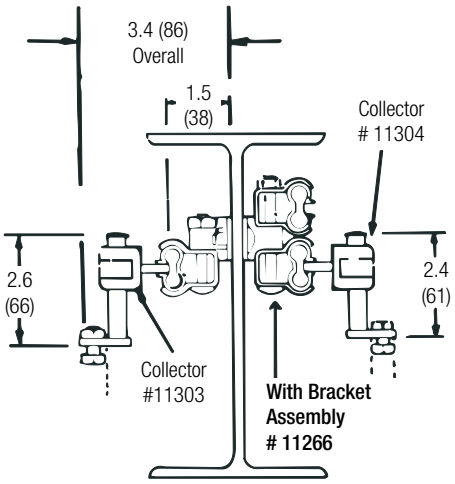
Hangers: Supports the conductor bar, may also be used as an anchor to direct movement due to expansion and contraction

End Cover: Safety protection at the end of conductor system

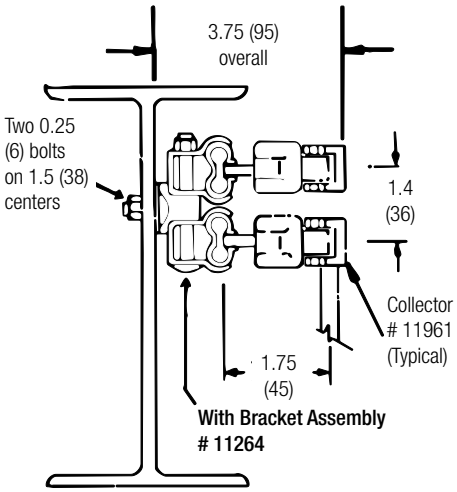
Typical Side Contact Mounting Arrangements

Shown below are some typical mounting arrangements for Side Contact. Trolleys on which collectors are mounted must be stabilized, particularly in systems involving discontinuous circuits. One acceptable way is to use guide rollers on the edge of the track flange.

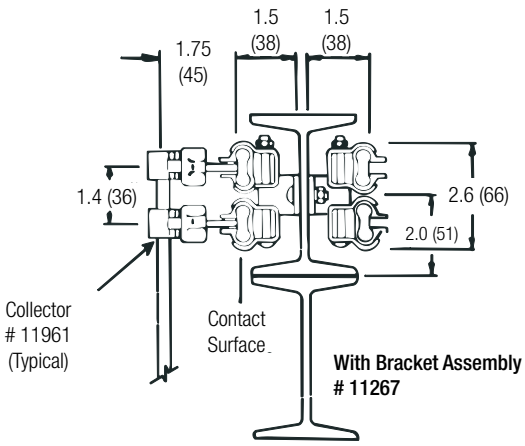
One Conductor Left and Two Right



Two Conductors on the Right



Two Conductor on the Right, Two on the Left



Side Contact Conductor Bar, Expansions, Power Feeds

Side Contact Conductor Bars come with cover and connector pins installed. Copper and Laminate Bars also come with Joint Keepers. Bars are available in 40A, 90A, 110A, 250A, and 350A capacities (@ 600 volts maximum). Expansion Sections are listed below. These are required to compensate for thermal expansion; every 350 feet (106.7m) for 40A, 90A, and 110A systems, or 250 feet (76.2m) for 250A, 350A, and 500A systems. Power Feeds bring outside power to the conductor bar.

Factory installed covers are available in:

- **Rigid PVC:** -10^0 F to 160^0 F (- 23.3^0 C to 71.1^0 C)
- **Medium Heat:** - 25^0 F To 250^0 F (- 31.7^0 C to 121.1^0 C)

Stainless Steel, 40A

Item	Rigid PVC Cover		Medium Heat Cover	
	Part No.	Wt lb (kg)	Part No.	Wt lb (kg)
Conductor Bar, 10 ft (3.05m)	**24273**	7.0 (3.18)	**24298**	6.6 (2.99)
Conductor Bar, 5 ft (1.52m)	**24274**	3.5 (1.59)	**24299**	3.3 (1.50)
Expansion Section, 10 ft (3.05)	**24277**	10.0 (4.57)	**24302**	10.3 (4.67)
Power feed	**11289**	0.34 (0.15)	**11289**	0.34 (0.15)
End Cover	**11295**	0.03 (0.01)	**11295**	0.03 (0.01)

Galvanized Steel, 90A

Item	Rigid PVC Cover		Medium Heat Cover	
	Part No.	Wt lb (kg)	Part No.	Wt lb (kg)
Conductor Bar, 10 ft (3.05m)	**24275**	4.5 (2.04)	**24300**	4.5 (2.04)
Conductor Bar, 5 ft (1.52m)	**24276**	3.5 (1.59)	**24301**	3.3 (1.59)
Expansion Section, 10 ft (3.05)	**24278**	6.7 (3.04)	**24303**	6.7 (3.04)
Power feed	**11289**	0.34 (0.15)	**11289**	0.34 (0.15)
End Cover	**24424**	0.03 (0.01)	**24424**	0.03 (0.01)

Galvanized Steel, 110A

Item	Rigid PVC Cover		Medium Heat Cover	
	Part No.	Wt lb (kg)	Part No.	Wt lb (kg)
Conductor Bar, 10 ft (3.05m)	**11223**	7.0 (3.18)	**11239**	6.6 (2.99)
Conductor Bar, 5 ft (1.52m)	**11224**	3.5 (1.59)	**11240**	3.3 (1.50)
Expansion Section, 10 ft (3.05)	**11255**	10.0 (4.57)	**11259**	10.3 (4.67)
Power feed	**11289**	0.34 (0.15)	**11289**	0.34 (0.15)
End Cover	**11295**	0.03 (0.0)	**11295**	0.03 (0.01)

Side Contact Conductor Bar, Expansions, Power Feeds

Stainless Clad Copper 250A

Item	Rigid PVC Cover		Medium Heat Cover	
	Part No.	Wt lb (kg)	Part No.	Wt lb (kg)
Conductor Bar, 10 ft (3.05m)	**11227**	7.0 (3.175)	**11243**	6.6 (2.994)
Conductor Bar, 5 ft (1.52m)	**11228**	3.5 (1.588)	**11244**	3.3 (1.497)
Expansion Section, 10 ft (3.05)	**11256**	11.0 (4.990)	**11260**	10.3 (4.672)
Power feed	**11289**	0.34 (0.154)	**11289**	0.34 (0.154)
End Cover	**11295**	0.03 (0.014)	**11295**	0.03 (0.014)

Copper Steel Laminate 250A

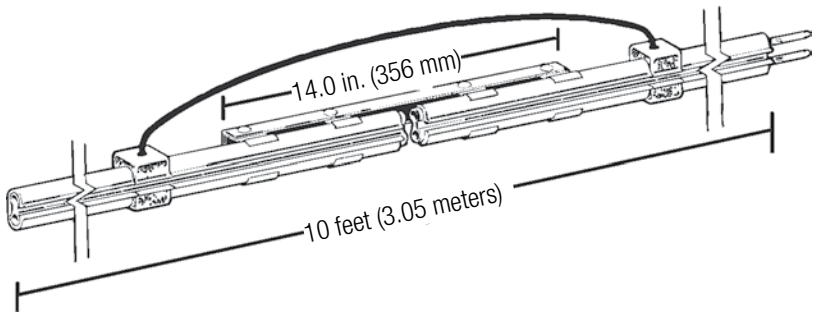
Item	Rigid PVC Cover		Medium Heat Cover	
	Part No.	Wt lb (kg)	Part No.	Wt lb (kg)
Conductor Bar, 10 ft (3.05m)	**11231**	7.0 (3.18)	**11247**	6.6 (2.99)
Conductor Bar, 5 ft (1.52m)	**11232**	3.5 (1.59)	**11248**	3.3 (1.50)
Expansion Section, 10 ft (3.05)	**11257**	11.0 (4.99)	**11261**	10.3 (4.67)
Power feed	**11289**	0.34 (0.15)	**11289**	0.34 (0.15)
End Cover	**11295**	0.03 (0.01)	**11295**	0.03 (0.01)

Electrolytic Copper 350A

Item	Rigid PVC Cover		Medium Heat Cover	
	Part No.	Wt lb (kg)	Part No.	Wt lb (kg)
Conductor Bar, 10 ft (3.05m)	**11235**	7.0 (3.175)	**11251**	6.6 (2.994)
Conductor Bar, 5 ft (1.52m)	**11236**	3.5 (1.588)	**11252**	3.3 (1.497)
Expansion Section, 10 ft (3.05)	**11258**	11.0 (4.990)	**11262**	10.3 (4.672)
Power feed	**11289**	0.4 (0.122)	**11289**	0.4 (0.122)
End Cover	**11295**	0.03 (0.014)	**11295**	0.03 (0.014)

Expansion Section

Expansion Sections compensate for the thermal expansion that occurs from a combination of ambient heat and electrical heat. Power feeds and flexible jumpers are factory installed to meet electrical and mechanical requirements of each system. Part numbers are located in the conductor tables - See Pgs. 34-35.



Side Contact Connectors and Covers

Connector Pins

11121

11120

Used to join the conductor bar together.

Description	Part No.	Wt lb (kg)
Galvanized steel for 110A	**11120**	0.8 (0.36)
Copper for 250 and 350A	**11121**	0.8 (0.36)
Galvanized steel for 90A	**21914**	0.8 (0.36)
Stainless steel for 40A	**24196**	0.8 (0.36)

Insulating Cover

Available in PVC or Lexan cover. The cover is designed for indoor use.

Description	Part No.	Wt lb (kg)
Rigid PVC to 160^0 F	**34579**	1.5 (6.80)
Medium Heat to 250^0 F	**11294**	1.5 (6.80)

End Cover

11295

Used to close the end of the conductors to cover exposed conductor and avoid accidental contact.

Description	Part No.	Wt lb (kg)
For 40, 110, 250 and 350A	**11295**	0.03 (0.01)
For 90A	**24424**	0.03 (0.01)

Side Contact Power Feed & Pick-up Guide

Power feed

Fully insulated clamp is easily installed anywhere on the system for feeding power to the conductor bar.

11289 (shown with only half cover)

Description	Part No.	Wt lb (kg)
Complete Assembly, Clamp & Case	**11289**	0.34 (0.15)
Power feed case with hardware	**11290**	0.20 (0.09)
Clamp Assembly	**11291**	0.10 (0.05)

Pick-up Guides

Used at the end of conductors to guide the re-engagement of the collectors on discontinuous circuits.

Requires use of self-centering collectors, see Pg. 40-41.

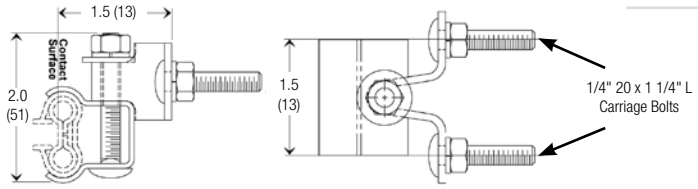
Description	Part No.	Wt lb (kg)
For all systems (except 90A)	**11292**	1.25 (0.57)

Side Contact Hanger Brackets and Clamps

Provides a simple method for installing Side Contact Conductors on conveyors, monorails, bridges, crane runways and switches. These supports secure and separate the insulated conductors uniformly with a minimal amount of installation time. Hanger clamps are all stainless steel with 1/4" zinc plated hardware.

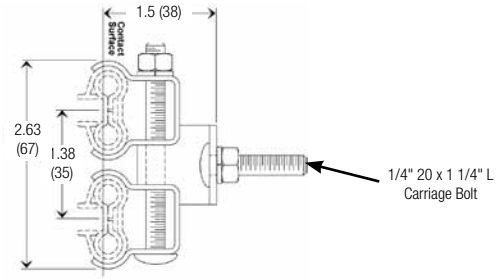
Consult Factory if you need a configurations not shown.

Single Bar, One Side of Beam



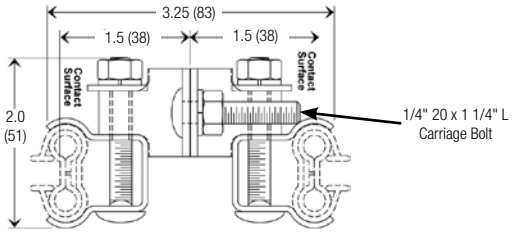
For	Part No.
One bar, one side of beam	**11263**

Two Bars, One Side of Beam



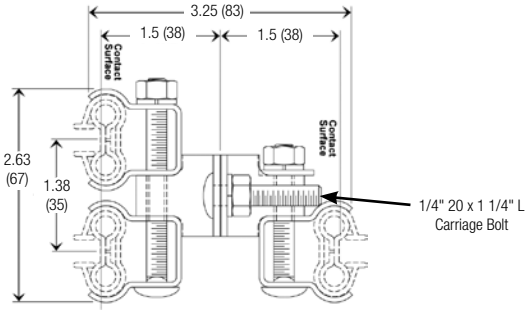
For	Part No.
Two bars, one side of beam	**11264**

One Bar, Each Side of Beam



For	Part No.
One bar, each side of beam	**11265**

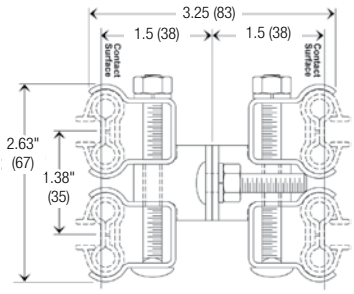
Two Bars One Side of Beam, One on the Other



For	Part No.
Two bars one side of beam, one on the other	**11266**

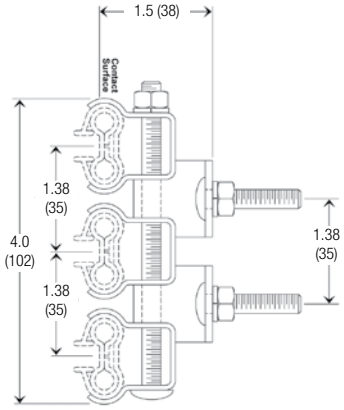
Side Contact Hanger Brackets and Clamps

Two Bars, On Each Side of Beam



For	Part No.
Two bars, each side of beam	**11267**

Three Bars, On One Side of Beam



For	Part No.
Three bars on one side of beam	**31844**

Single Conductor Hangers

17690

27927

Standard hanger spacing should every 4 feet for straight runs or every 3 feet for curves.

Description	Part No.
Stainless Steel hanger with 1/4” zinc plated hardware	**27927**
Stainless Steel hanger with 1/4” stainless steel hardware	**27926**
Stainless Steel hanger with insulator and 1/4” stainless steel hardware	**17690**

Side Contact Collectors

Side Contact Collectors are available in numerous configurations to match the application. Note that collectors should not be used as power switching devices. The resultant arcing may cause rapid deterioration of both contact shoes and conductor bars. Ampere capacity of conductor bars, power feeds, jumpers etc., should be greater than or equal to that off the system. Consult factory for systems using tandem mounted collectors and special requirements. For mechanically discontinuous systems, only collectors designated as "self-centering" should be used.

Contact shoe pressure: Between 4 and 6 pounds (1.81 kg to 2.72 kg) for all collector styles.

M-Head, L-Base Type, 40A

11961

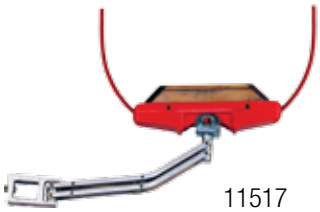
12295

For conveyor, monorail systems, and crane bridges. Operates through curves at a minimum radii of 9.0 (228).

Standard pigtail length: 15" (381 mm)

Description	Part No.
Standard Collector, for continuous systems	**11961**
Self Centering Collector, for discontinuous systems that are equipped with pickup guide 11292	**12295**

M-Head, L-Base Type, 80A



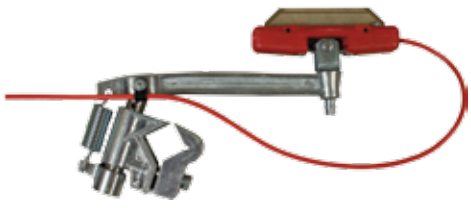
11517

For conveyor, monorail systems, and crane bridges. Operates through curves at a minimum radii of 9.0 (228). Includes an additional pigtail for extra current capacity.

Standard pigtail length: 15" (381 mm)

Description	Part No.
Standard Collector, for continuous systems	**11517**
Self Centering Collector, for discontinuous systems that are equipped with pickup guide 11292	**11518**

M-Head, H-Base Type, 40A



12304

This rugged collector provides a long stroke for continuous systems where clearance is not restricted.

Standard pigtail length: 15" (381 mm)

Description	Part No.
Standard Collector, for continuous systems	**12304**
Same as 12304, except a counter weight is added for lateral mount	**12306**

Side Contact Collectors

M-Head, L-Base Type, Tandem 160A

For systems that require 160A capacity. Operates through curves to minimum radii of 24.0 (610). Has tandem collectors and additional pigtails for the added current capacity.

Standard pigtail length: 15" (381 mm)

Description	Part No.
Standard Collector, for continuous systems	**11519**
Self-centering tandem. For discontinued systems equipped with pickup guide 11292 that require 160A capacity.	**15046**

M-Head, L-Base Type, Tandem 80A

Continuous systems that require 80A capacity. Operates through curves to minimum radii of 24.0 (610). Has tandem collectors.

Standard pigtail length: 15" (381 mm)

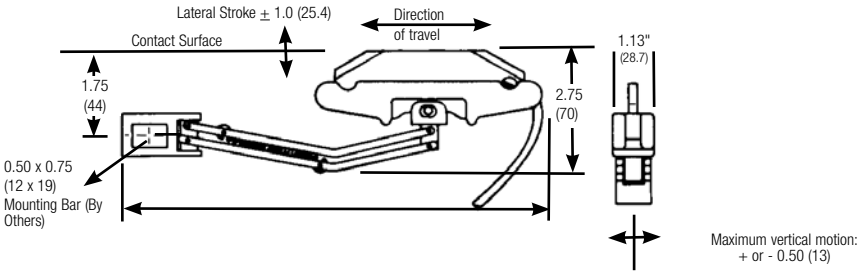
Description	Part No.
Standard Collector	**11955**
Self-centering tandem. For discontinued systems equipped with pickup guide 11292 that require 80A capacity.	**11954**

Side Contact Collector Parts

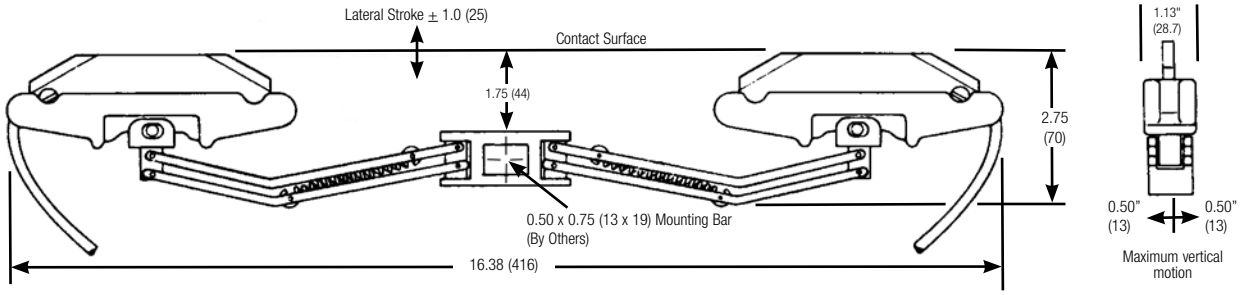
Description	Part No.
Case only, for M-Head, H-Base Collectors	**11307**
Case only, for M-Head, L-Base collectors	**11300**
Contact shoe (copper graphite) for all M-Head collectors	**14104**
Cast iron shoe	**14135**
Head assembly for M-Head, H-Base collectors	**12296**
Head assembly for M-Head, L-Base collectors	**11930**

Side Contact Collector Parts and Dimensions

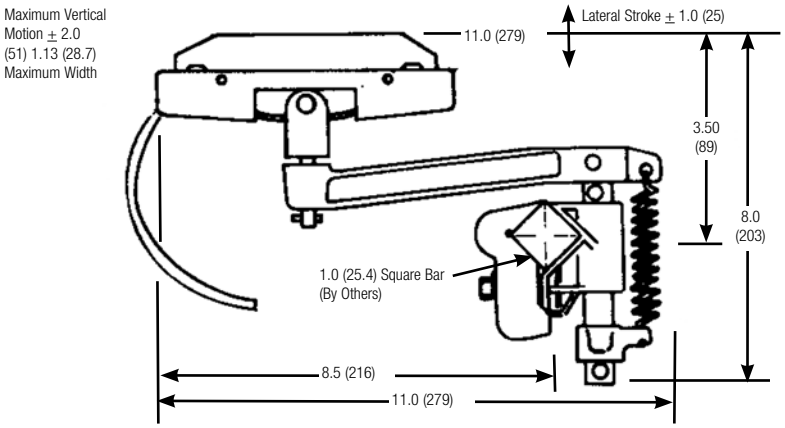
M-Head, L-Base Collectors (11961 shown)



M-Head, L-Base Collectors, Tandem (11955 shown)



M-Head, H-Base Collectors (12304 shown)



Side Contact Slip Rings & Curves

Curves

Side Contact can be set up to handle curves, horizontally or vertically, with standard 6.0 (152) tangents on each end. The systems are specially designed for curves, switches, interlocks, gaps, and continuous control circuits. They are readily adaptable to most operating conditions. Both conductor bar and insulated cover are sufficiently flexible to permit bending to any desired radius up to the noted minimums. Hanger spacing is every 3 feet (0.91 meters) on curves. Maximum bar length is 10 feet (3.05 meters). Information required for curves are:

- Radius for each conductor bar
- Angle
- Inside or outside contact
- Tangents if other than 6" standard.

Conductor Type	Cover	Current Cap. (Amps)	Min. Radius	Part No.
Galvanized Steel	PVC (standard heat)	110	9.0 (229)	**11226**
Stainless Clad Copper Laminate	PVC (standard heat)	250	9.0 (229)	**11230**
Copper Steel Laminate	PVC (standard heat)	250	9.0 (229)	**11234**
Rolled Copper	PVC (standard heat)	350	9.0 (229)	**11238**
Galvanized Steel	Lexan (medium heat)	110	57.0 (1448)	**11242**
Stainless Clad Copper Laminate	Lexan (medium heat)	250	57.0 (1448)	**11246**
Copper Steel Laminate	Lexan (medium heat)	250	57.0 (1448)	**11250**
Rolled Copper	Lexan (medium heat)	350	57.0 (1448)	**11254**

Slip Rings, PVC Standard Heat Covers

Conductor Type	Current Cap. (Amps)	Radius Range - in. (mm)	Pieces	Part No.
Galvanized Steel	110	9.0 to 34.0 (229 to 864)	2-180^0 pieces	**23642**
Stainless Clad Copper Laminate	250	9.0 to 34.0 (229 to 864)	2-180^0 pieces	**23643**
Copper Steel Laminate	250	9.0 to 34.0 (229 to 864)	2-180^0 pieces	**23644**
Rolled Copper	350	9.0 to 34.0 (229 to 864)	2-180^0 pieces	**23645**
Galvanized Steel	110	34.5 to 51.0 (876 to 1295)	3-120^0 pieces	**23646**
Stainless Clad Copper Laminate	250	34.5 to 51.0 (876 to 1295)	3-120^0 pieces	**23647**
Copper Steel Laminate	250	34.5 to 51.0 (876 to 1295)	3-120^0 pieces	**23648**
Rolled Copper	350	34.5 to 51.0 (876 to 1295)	3-120^0 pieces	**23649**
Galvanized Steel	110	51.1 to 69.0 (1298 to 1753)	4-90^0 pieces	**23650**
Stainless Clad Copper Laminate	250	51.1 to 69.0 (1298 to 1753)	4-90^0 pieces	**23651**
Copper Steel Laminate	250	51.1 to 69.0 (1298 to 1753)	4-90^0 pieces	**23652**
Rolled Copper	350	51.1 to 69.0 (1298 to 1753)	4-90^0 pieces	**23653**

Cluster Bar Features

Conductix-Wampfler Cluster Bar is a safe, economical system engineered to fit in confined areas. On-center bar spacing is only 3/4". The system features long-wearing copper-graphite shoes and continuously roll-formed 15 ft. sections in either 40A galvanized or 120A copper configurations. Bar covers are PVC to withstand up to 160^0 F and are rated V-0 (will not support combustion).

Cluster Bar can be factory-bent in three orientations to accommodate tight curves.

CSA Listed

Cluster Bar is Ideal for:

- Small cranes
- Automated Storage and Retrieval Systems
- Conveyors
- Tightly curved systems
- Hangar doors
- Moving cameras and instruments
- Other mobile power applications

Current range: 40A, 120A @ 600 volts maximum

Maximum Speed: 600 fpm

Features

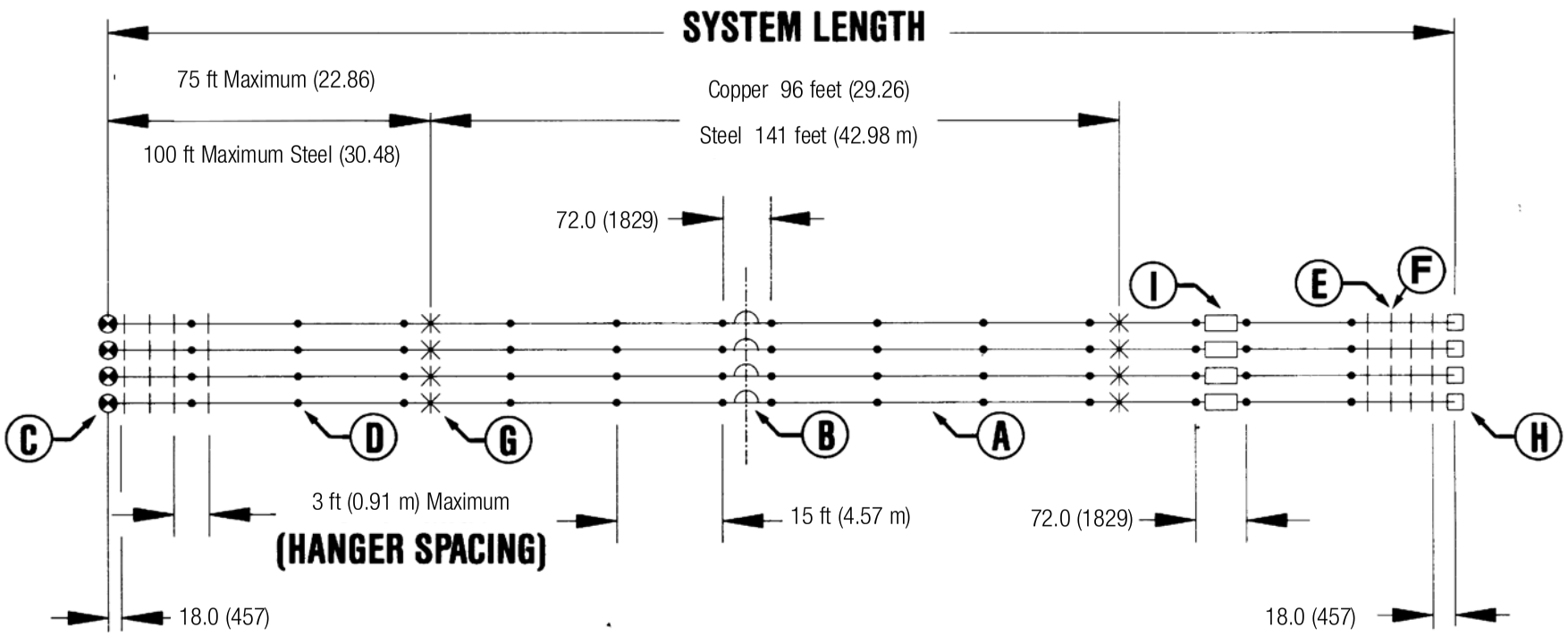
- IP2 insulated "finger safe" design
- Captive "V-contact" design for positive conductivity
- Can be curved to an 18" radius
- Backed by the best customer service and engineering services in the industry:
- Parts in stock for quick delivery
- Designed and built in the USA under stringent ISO 9001: 2000 standards
- Engineers are available to help with your unique application

Installs Quickly and Easily

- Minimum number of basic parts
- Crimped or bolted splices available
- Easy to maintain
- Can be mounted vertically or laterally

Automate your work with our advanced "Quick Quote" software - See Pg. 5.

Cluster Bar Typical 4-Bar Layout



NOTE: MAXIMUM LENGTH W/O EXPANSIONS

120 AMP COPPER IS 150'
40 AMP STEEL IS 200'

A = Conductor Bar
B = Expansion Section
C = Powerfeed
D = Splice Joint
E = Hanger Clamp
F = Hanger Bracket
G = Anchor Location
H = End Cover
I = Isolation Section

Cluster Bar Specifications

Technical Data

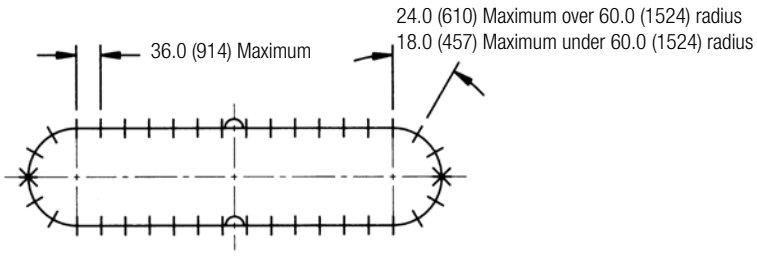
Factor "K"						
	Duty / Ta	100%	80%	60%	40%	20%
Standard Cover	25^0 C (77^0 F)	1.000	1.118	1.291	1.581	2.236
	35^0 C (95^0 F)	0.905	1.011	1.168	1.430	2.023
	45^0 C (113^0 F)	0.798	0.892	1.030	1.261	1.784
	55^0 C (130^0 F)	0.674	0.754	0.870	1.066	1.508

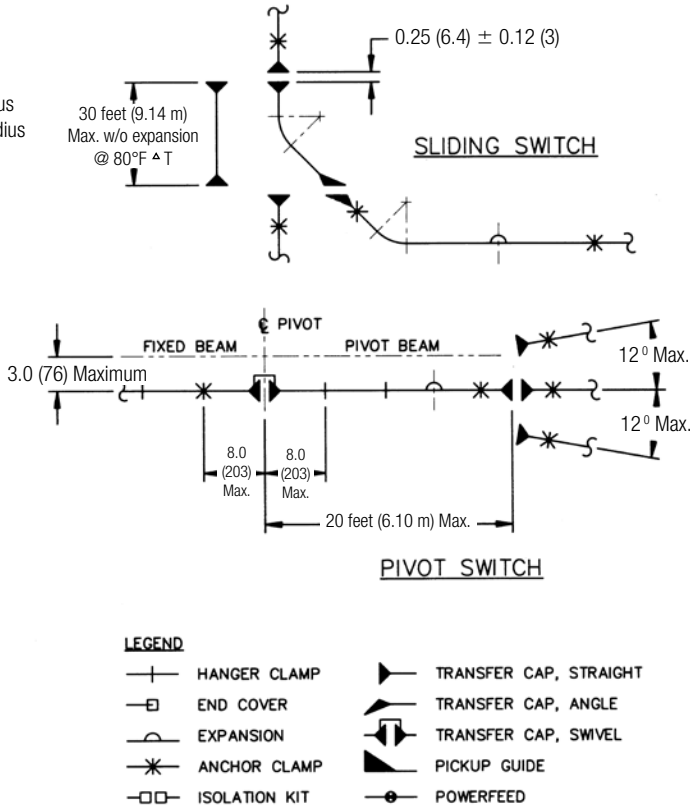
The maximum permissible continuous current rating of the conductor bar depends on the duty factor of the cranes and the maximum ambient temperature **Ta**. It can be established using the following formula: $I_{allowable}$ = **nominal current x K**

Conductor	Ampacity	Resistance R (DC)*	Reactance 60 HZ 30*	Independence z (60 HZ)*	Spacing in. (mm)
Steel	40A	2382	382	2412	0.75 (19.1)
Copper	120A	245	38	248	0.75 (19.1)

*Micro-Ohms Per Foot

Typical Installation Details





The appropriate conductor bar can be chosen only when all the relevant factors are known. Please refer to the Data Sheet on Pgs. 6-7, and to Appendices I through IV at the back of this catalog. Also, please consult Conductix-Wampfler Sales if you have any questions about the suitability of this product to your application.

Cluster Bar Components

Conductor Bar

Continuous roll formed inverted "V" cross section encased by an insulating PVC cover. Splice kit included with the price of conductor. Operating Temperature: -10^0 F to 160^0 F. Bars are 15.0 ft (4.57 m) long

Bar Type	Current Capacity (A)	Part No. (w/Bolted Splice)	Part No. (w/Crimped Splice)	Wt lb (kg)
Galvanized Steel	40	**28656**	**28101**	2.0 (0.91)
Rolled Copper	120	**28655**	**28100**	2.0 (0.91)

Expansion Section

Shown without cover

Factory assembled with overlapping design to provide continuous contact with collector shoes to compensate for thermal expansion. Power feeds are flexible jumpers installed to meet electrical and mechanical requirements. Spacing for expansion sections is every 141' for 40A steel conductor and 96' for 120A copper conductor. Length: 6 ft. (1.83m)

Bar Type	Current Capacity (A)	Part No. (w/Bolted Splice)	Part No. (w/Crimped Splice)	Wt lb (kg)
Galvanized Steel	40	**28658**	**28104**	6.0 (2.72)
Rolled Copper	120	**28657**	**28103**	7.0 (3.72)

Power feed

Shown with half cover

Provides the electrical connection from power source to the conductor bar. It may be located at any point along the conductor, preferably near the systems' center to reduce voltage drop.

Connection Wire Size (AWG)	Part No.	Wt lb (kg)
10	**28067**	0.4 (0.18)
6	**28066**	0.4 (0.18)

End Power Feed

Shown with half cover

Provides the electrical connection from the power source to the conductor bar. This power feed attaches to the end of the bar.

Connection Wire Size	Part No.	Wt lbs.
#8 AWG	**29836**	0.2 (0.09)
#10 AWG	**29837**	0.2 (0.09)

End Cover

Two-piece polypropylene boot used to close off the open ends of the conductor bar.

Part No.	Wt lb (kg)
28105	0.3 (0.14)

Cluster Bar Components

Crimping Tool

Used to join the crimp-style bars together.

Part No.	Wt lb (kg)
28102	5.0 (2.27)

Splice Cover Kit

Insulates the bar joint

Part No.	Wt lbs.
29875	0.2 (.09)

Splice Joints

Shown with half cover.

Connects two sections or conductors together

Bar Type	Current Capacity (A)	Part No. (Bolted Splice)	Part No. (Crimped Splice)	Wt lb (kg)
Galvanized Steel	40	**29632**	**30211**	6.0 (2.72)
Rolled Copper	120	**29548**	**30210**	7.0 (3.18)

Transfer Cap

Used to guide the contact shoe through a 1/4" maximum air gap

No. Cond	Part No.	Wt lb (kg)
1	**29413**	0.10 (0.05)
3	**28807**	0.30 (0.14)
4	**28808**	0.40 (0.18)
5	**28809**	0.50 (0.23)
6	**28810**	0.60 (0.23)

Pick-Up Guides

Scoop located at the end of the conductor. Designed to gather the collectors and align them to ride on the conductor bars for discontinuous operation. Consult factory for proper selection.

Isolation Kit

Provides electrical isolation between conductor bar. Wiring not included

Connection Wire Size (AWG)	Part No.	Wt lb (kg)
10	**28126**	0.5 (0.23)
8	**29869**	0.5 (0.23)

Cluster Bar Components

Hanger Clamps

Molded Polycarbonate hangers designed for vertical or horizontal mounting. The hanger clamps "snap on" the conductor for a sliding fit. No field adjustments are required.

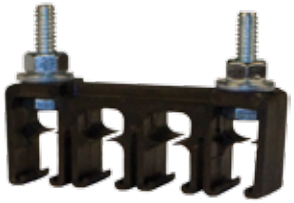
Part No.	Wt lb (kg)
28112	0.10 (0.045)

Anchor Clamps

These are molded plastic pieces that are bolted together and are positioned on each side of the hanger clamp. The anchor clamps hold the conductor firmly to control thermal expansion and contraction. The kit includes two clamps per conductor.

Part No.	Wt lb (kg)
29864	0.10 (0.05)

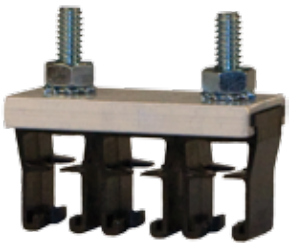
Multi-Conductor Bracket



Molded bracket with hanger clamps. There is no need for an aluminum mounting bracket.

No. Cond	Part No.	Wt lb (kg)	Mounting
3	**33138**	0.14 (0.06)	1 Bolt
4	**33137**	0.14 (0.06)	2 Bolt

Multi-Conductor Bracket



Aluminum mounting channel with hanger clamps, available in various conductor configurations.

No. Cond	Part No.	Wt lb (kg)
3	**28113**	1.0 (0.45)
4	**28114**	1.1 (0.50)
5	**28115**	1.3 (0.59)
6	**28116**	1.3 (0.59)

Multi-Conductor Web Brackets

Aluminum channel web bracket with assembled hanger clamps in various conductor configurations.

No. Cond	Part No.	Wt lb (kg)
3	**28665**	1.4 (0.64)
4	**29939**	1.5 (0.68)
5	**29940**	1.6 (0.73)
6	**29941**	1.6 (0.73)

Cluster Bar Components

Multi-Conductor Flange Brackets

Aluminum channel flange bracket with assembled hanger clamps in various conductor configurations. (Includes flange clips)

No. Cond	Bracket Setting	Part No.	Wt lb (kg)
3	2/1	**28666**	1.4 (0.64)
4	2/2	**29942**	1.5 (0.68)
5	2/3	**29943**	1.6 (0.73)
6	2/3	**29944**	1.6 (0.73)
3	0/3	**29986**	1.4 (0.64)
4	0/4	**29987**	1.6 (0.73)
5	0/5	**29988**	1.7 (0.77)
6	0/6	**29989**	1.8 (0.87)

30A Collector, Single Conductor

1/2" Square Bar Mount Type.

Insulated contact heads mounted on self centering, spring loaded arm assemblies that articulate in both the vertical and horizontal positions. Exposed metal surfaces do not carry current. The sliding contact type confines wear only to the easily replaceable contact shoes. Part #: 28082

Description	Part No.	Wt lb (kg)
For 1 Conductor	**31589**	0.80 (0.36)

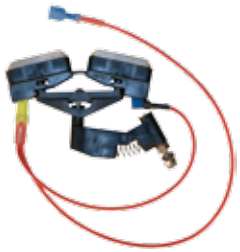
30A Collector, Multi Conductor

Channel Mount Type

Insulated contact heads mounted on self centering spring loaded arm assemblies that articulate in both the vertical and horizontal positions. Exposed metal surface does not carry current. The sliding contact type confines wear only to the easily replaceable contact shoes.

No. Cond	Part No.	Wt lb (kg)
3	**31583**	3.0 (1.36)
4	**31584**	3.8 (1.72)
5	**31585**	4.6 (2.09)
6	**31586**	5.4 (2.45)

30A Compression Collector



Description	Part No.	Wt lb (kg)
14mm, compression collector	**32180**	0.80 (0.36)

Cluster Bar Components

Collector Mounting Staff

Available in double or single mount. Used for 31589 collector mounting.

Description	Part No.	Wt lb (kg)
Single	**39618C**	0.5 (0.23)
Double	**39050**	1.0 (0.45)

Slip Rings and Curves

Factory supplied in 360° rings or segments to fit the mounting specifications. 16" minimum radius for inside or outside contact. Factory engineered curved systems available.

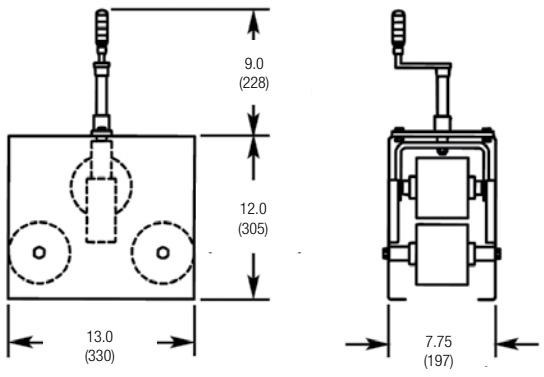
Consult Factory for Assistance in Regards to Your Curve and Slip Ring Requirements.

Description	Part No. (Crimped Splice)	Part No. (Bolted Splice)	Minimum Radius In. (mm)
1-piece 360°, 16" Radius to 27" Radius	**29960**	**29962**	
2-180° pieces, 27.1" Radius to 54" Radius	**29964**	**29966**	
3-120° pieces, 54.1" Radius to 80" Radius	**29968**	**29970**	
Horizontal inside, 40A	**28503**	**29364**	16
Horizontal inside, 120A	**28500**	**29363**	16
Horizontal outside, 40A	**28504**	**29359**	16
Horizontal outside, 120A	**28501**	**29358**	16
Vertical, 40A	**28505**	**29366**	32
Vertical, 120A	**28502**	**29365**	32

Curving Machine

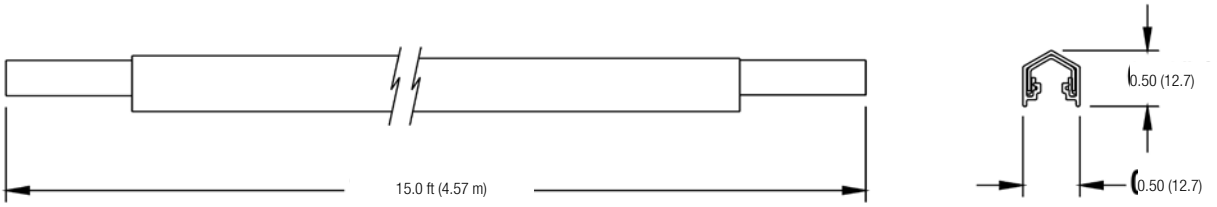
For curving of Cluster Bar, either on site or in the shop. Available for Lease or Sale.

Description	Part No.	Wt lb (kg)
Curving Machine	**29931**	25.0 (11.34)

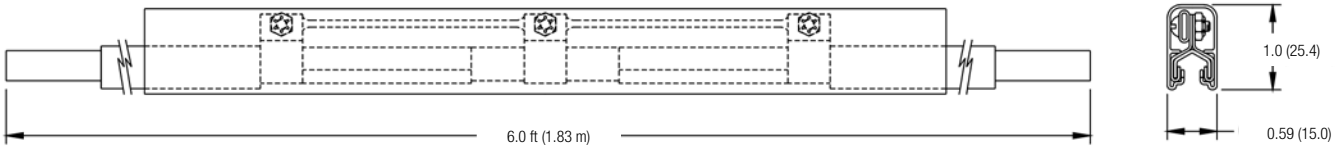


Cluster Bar Dimensions

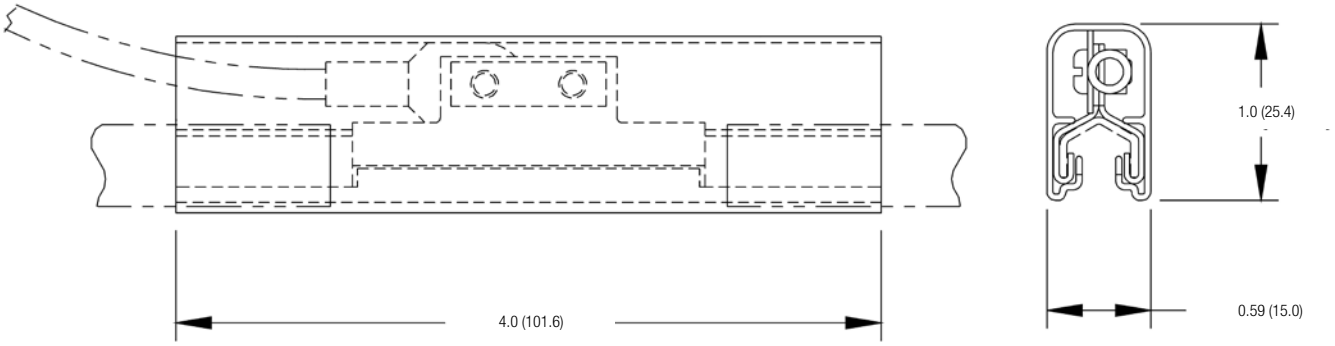
Conductors



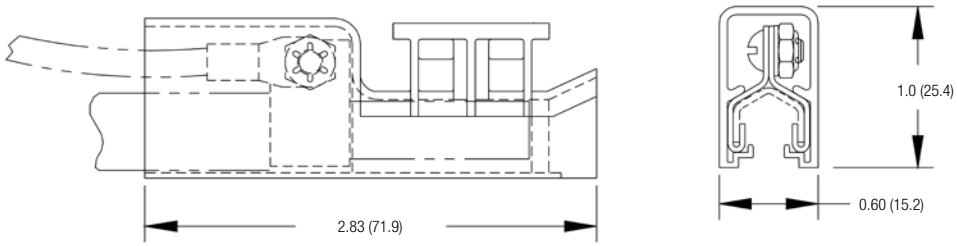
Expansion Section



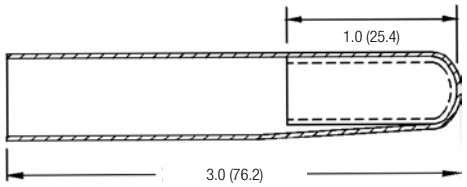
In-Line Power Feed



End Power Feed

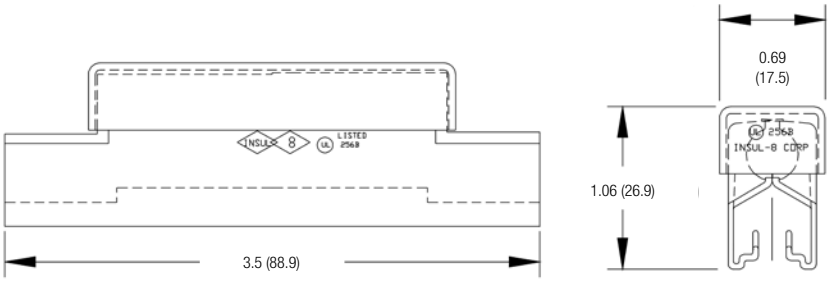


End Cap

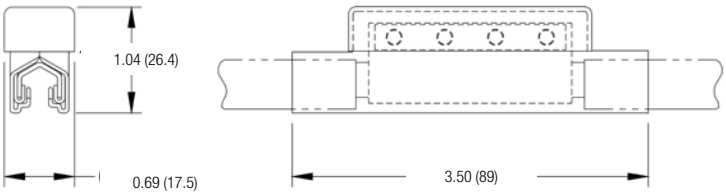


Cluster Bar Dimensions

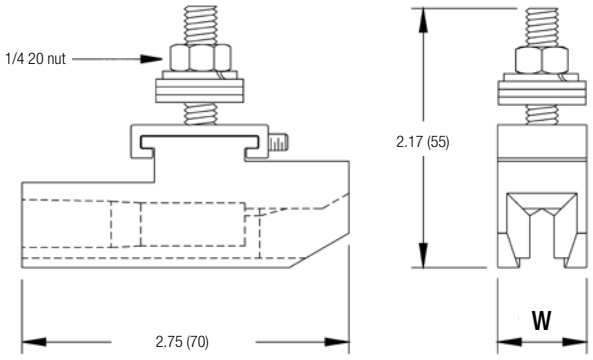
Splice Cover Kit



Splice Joint

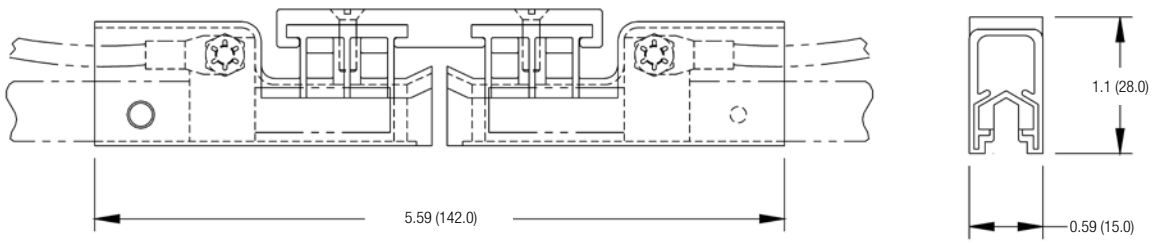


Transfer Cap



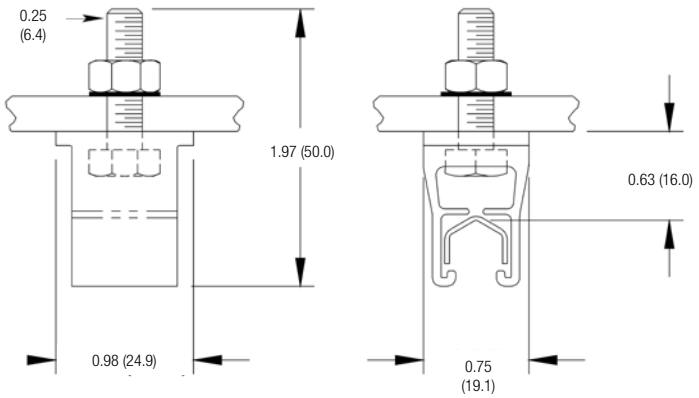
No. Cond.	Part No.	"W" (in.)	"W" (mm)
1	**29413**	0.60	15.2
3	**28807**	1.80	45.7
4	**28808**	2.40	61.0
5	**28809**	3.00	76.2
6	**28810**	3.60	91.4

Isolation Kit

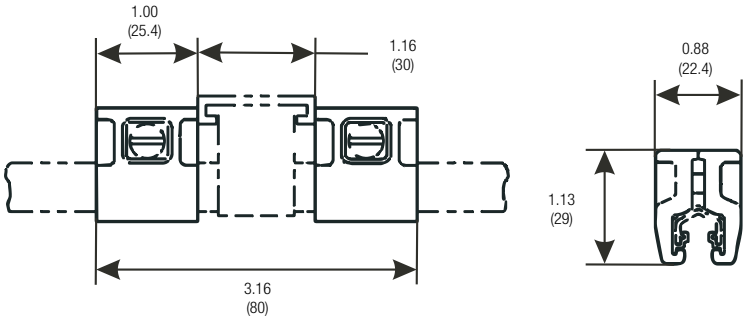


Cluster Bar Dimensions

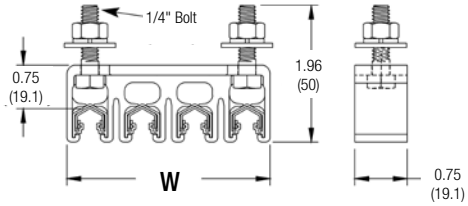
Hanger Clamp



Anchor Clamp

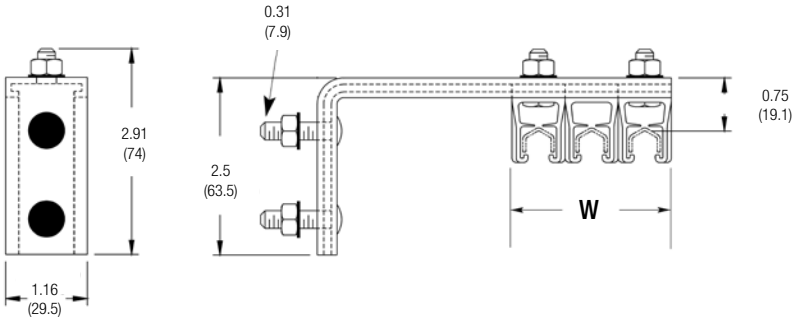


Multi-Conductor Web Bracket



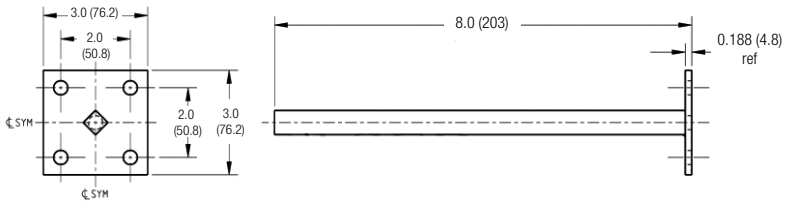
No. Cond.	Part No.	"W" (in.)	"W" (mm)
3	**33138**	2.16	54.9
4	**33137**	2.90	73.7

Multi-Conductor Web Bracket



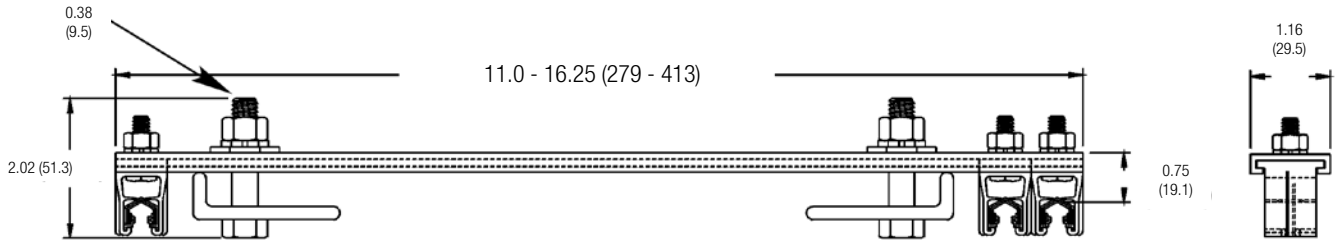
No. Cond.	Part No.	"W" (in.)	"W" (mm)
3	**28665**	2.25	57.2
4	**29939**	3.00	76.2
5	**29940**	3.75	95.3
6	**29941**	4.50	114.3

Collector Mounting Staff

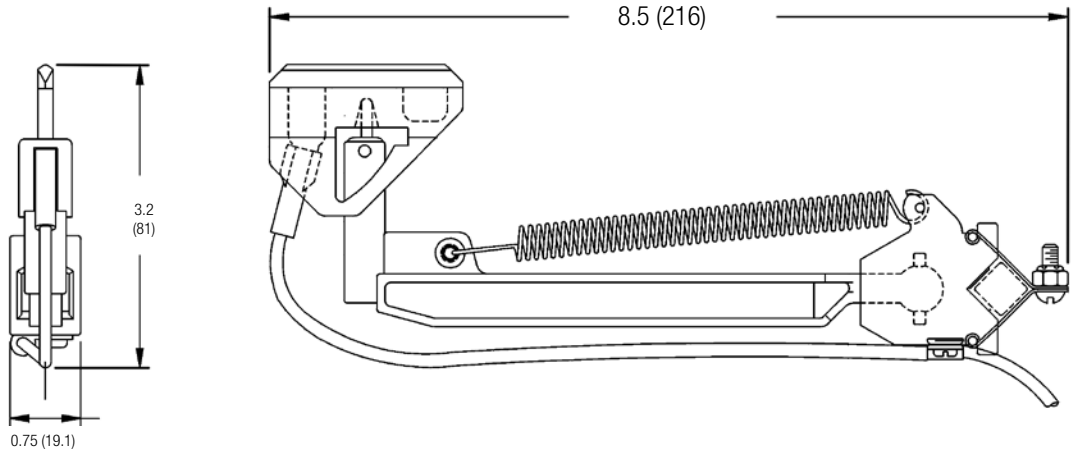


Cluster Bar Dimensions

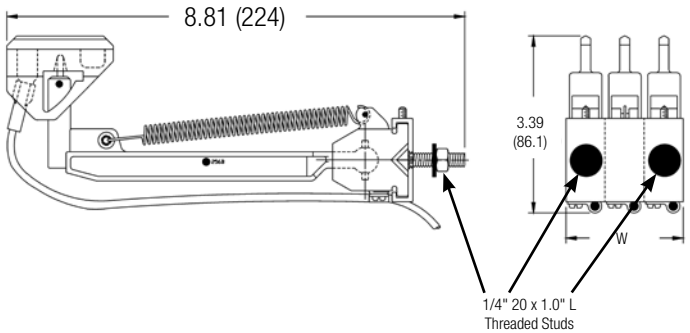
Multi-Conductor Flange Bracket



30A Collector, Single Conductor, 0.50" (12.7mm) Square Bar Mount



30A Collector, Multi Conductor, Channel Mount



Part No.	No. Cond.	W dim.		Stud Centers	
		in.	(mm)	in.	(mm)
31583	3	2.25	57.2	1.50	38.1
31584	4	3.00	76.2	2.25	57.2
31585	5	3.75	95.3	3.00	76.2
31586	6	4.50	114.3	3.75	95.3

Saf-T-Bar Features and Series

The Saf-T-Bar line of conductor bar products was originally manufactured by the Howell Corporation and is now part of the Conductix-Wampfler product family. Saf-T-Bar is designed to provide customers with a cost effective, yet highly reliable system for the transmission of electrical energy. Each system is designed with simplicity and reliability in mind. The performance of the product line has been proven in the field for over 30 years.

UL Listed

Saf-T-Bar® is Ideal for:

- Small to Large Cranes
- Hoists
- Conveyors
- ASRS Systems (T Series)
- Monorails and Trolleys
- Other Moving Equipment

Current range @ 600 Volts Maximum:

C Series: 110A, 250A, 300A, 350A
H Series: 500A, 750A, 1000A, 1500A
T Series: 65A

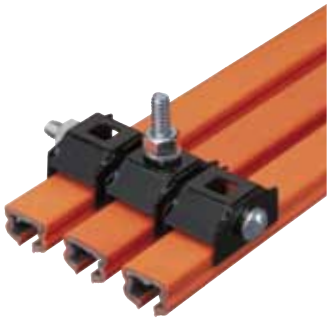
Maximum Speed: 900 ft/min (274 meters/min)

Series C

The Series C range of conductor bars is available in capacities from 110 amps through to 350 amps and can be mounted in any plane. The "C"-shaped metal guideway provides positive tracking of the collector shoe within the profile of the bar; the shoe will track with or without the cover. The flat contact surface of the bar and copper graphite shoe yields minimal shoe wear. Skin-tight insulation runs cooler and will not deform under clamping pressure. The push-pin joint system requires no loose hardware to install. C Series bars are available with standard rigid PVC insulation, or optional medium-heat Lexan or high-heat fiberglass insulation. Available accessories include single or tandem collectors, various single or multi-pole hanger clamps (3 or 4 pole), isolation sections, and expansion sections for longer runs.

Series H

The Series H Conductor Bar has the highest current rating of the Saf-T-Bar lines, available in four amperages; 500, 750, 1000, and 1500 amps. Each of the profiles are constructed of extruded aluminum with an integrated stainless steel contact channel rolled into aluminum material to ensure positive tracking of the collector and optimum collector shoe wear. This series is available with standard or high temperature insulation covers and a vast array of accessories.



Series T

The T Series system is unique to Conductix-Wampfler and features a captive collector concept resulting in an extremely compact system. The conductor bars are supplied with pre-mounted joints. Using the jointing tool, adjoining rails can be connected quickly and easily. Special spring collectors are constructed of a chromium-copper material which ensures optimized collector wear. Available in 65 amp galvanized steel with a full line of accessories.

Saf-T-Bar Ordering Information

System Components:

Conductor Bar: Selected to meet ampacity, voltage drop, duty cycle, environmental, and application requirements.

Rail Joints : Required for each connection, unless the joint is pre-mounted to the bar - Series C and Series T only.

Hanger/Anchor Clamps: Must be installed at the spacing specified in this catalog. Anchor points must be determined and set according to the expansion of the system. Hangers must be installed at least 6"(152 mm) from any rail joint or power feed to allow for adequate system expansion.

Support Arms: Support arms are required at each hanger clamp location and must be of sufficient strength to ensure safe suspension of the conductor bar system.

Power Feeds: The ideal location for a single power feed is the center point of the system to yield the minimum voltage drop. A minimum of one power feed is required per pole.

Expansion Sections: Expansion sections are required for installations beyond certain total system lengths - See Pg. 65.

End Caps: End caps are required to insulate the system at the rail ends.

Collectors: Collectors must be selected to meet the amperage requirements of crane/machine and the related duty cycle of the application.

Collector Towing Arm: Is required for each set of current collectors and is required to tow the collector assembly.

System Calculations

The Specification Data Sheets on pages 6-7 will help you collect information about your application. Also, see Pgs. 83-88 for other considerations that will help you choose the correct conductor bar system for your application. Please also refer to your relevant local, state/provincial, and federal regulations to make sure that the correct material is selected. In the USA, refer to calculation methods used in NEC 610-14(e). For constant loads such as magnets, lights, and air conditioners, etc., plus high duty cycles, use full load amperages to select conductor size.

Once these values are determined, depending upon the ambient temperature, apply ampacity correction factors (as per table 610.14(A).

National Electric Code Ampacity Requirements

1. For one motor, use 100% of motor nameplate full load ampere rating.
2. For multiple motors on a single crane or hoist, the minimum circuit ampacity of the power supply conductors on a crane or hoist shall be the nameplate full load ampere rating of the largest motor or group of motors for any single crane motion, plus 50% of the nameplate full load ampere rating of the next largest motor or group of motors.
3. For multiple cranes and/or hoists supplied by a common conductor system, compute the motor minimum ampacity for each crane as in step (2), add them together and multiply the sum of the demand factor from the following table:

Number of cranes	Demand factor
2	.95
3	.91
4	.87
5	.84
6	.81
7	.78

4. For constant loads such as magnets, lights, and air conditioners, etc., plus high duty cycles, use full load amperage, in selecting conductor size.

Voltage Drop Calculation - See also Pgs. 84 and 87.

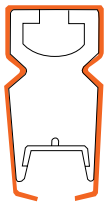
As most motors are designed to operate with a 2.5% to 5% voltage drop, divide volts lost by line voltage to determine if a larger conductor or additional feed points are required. See tables for values Z and R.

3 phase AC Volts lost = 1.73 x Z x Length in feet from feed x Ampere load

1 phase AC Volts lost = 2 x Z x Length in feet from feed x Ampere load

DV Volts lost = 2 x R x Length in feet from feed x Ampere load

Saf-T-Bar Specifications

Bar Series	Bar Profile	Nominal current[1] (amps)	Approximate rail dim. in. (mm)	Total weight [2] lb/ft (kg/m)	AC impedance [3] (Z)	DC resistance [4] (R)	Standard rail length ft (m)
CA110		110	0.6 x 1.4 (15.2 x 35.6)	0.50 (0.23)	0.000970	0.000500	10 (3.0)
CA250		250	0.6 x 1.4 (15.2 x 35.6)	0.50 (0.23)	0.000131	0.000127	10 (3.0)
CA300		300	0.6 x 1.4 (15.2 x 35.6)	0.48 (0.22)	0.000110	0.000080	10 (3.0)
CA350		350	0.6 x 1.4 (15.2 x 35.6)	0.50 (0.23)	0.000080	0.000060	10 (3.0)
HC500		500	1.4 x 1.7 (35.6 x 43.2)	1.39 (0.63)	0.0000363	0.0000194	20 (6.1)
HC750		750	1.4 x 1.7 (35.6 x 43.2)	1.39 (0.63)	0.0000363	0.0000194	20 (6.1)
HC1000		1000	1.4 x 1.7 (35.6 x 43.2)	1.62 (0.73)	0.0000355	0.0000155	20 (6.1)
HC1500		1500	1.4 x 2.8 (35.6 x 71.1)	3.14 (1.42)	0.0000385	0.0000067	20 (6.1)
TA65		65	0.7 x 1.0 (17.8 x 25.4)	0.30 (0.14)	0.00180	0.00090	10 (3.0)

Maximum voltage for all Series - 600 volts.

[1] Nominal current is based on 30°C and 100% duty cycles.
[2] Weight includes both the bar material and the insulating cover.
[3] AC impedance is measured in ohms/ft based on 30°C and the largest typical bar centers. Please adjust as necessary for other ambient temperatures and/or bar centers.
[4] DC resistance is measured in ohms/ft based on 30°C and the largest typical bar centers. Please adjust as necessary for other ambient temperatures and/or bar centers.
[5] Maximum nominal voltage is based on standard insulation materials and spacing. For higher voltage applications, please consult the factory.

Please refer to Specification Data Sheets on Pgs. 6-7 and the Appendices on Pgs. 83-88 for more information about choosing the correct conductor bar system.

Saf-T-Bar Specifications

	Maximum Support Spacing ft (m)	Typical Rail Centers in. (mm)	Maximum Nominal Voltage[5]	High-Temp Option	Outdoor	Page
	5 (1.5)	1.5 or 2.0 (38.1 or 50.1)	600V	▫	▫	61
	5 (1.5)	1.5 or 2.0 (38.1 or 50.1)	600V	▫	▫	61
	5 (1.5)	1.5 or 2.0 (38.1 or 50.1)	600V	▫	▫	61
	5 (1.5)	1.5 or 2.0 38.1 or 50.1)	600V	▫	▫	61
	10 (3.0)	5 (127)	600V	▫	▫	71
	10 (3.0)	5 (127)	600V	▫	▫	71
	10 (3.0)	5 (127)	600V	▫	▫	71
	10 (3.0)	5 (127)	600V	▫	▫	71
	5 (1.5)	1 or 2 (25.4 or 50.1)	600V	▫		79

Safety Precautions

Please observe the following safety recommendations when selecting, installing or maintaining any conductor bar system.

Regulations: Please ensure the system is selected, located and installed in accordance to all relevant local, state and federal standards and regulations and that unauthorized personnel do not have access to any part of the system when energized.

Electrical Connections: Please ensure all electrical connections, including connection to the conductor bar power feed and installation and connection of the current collectors is conducted by an experienced and qualified personnel.

Lock-Out: During installation and/or service, please always lock out/tag out all electrical power before commencing any works on or around the conductor bar system.

Saf-T-Bar Series C

Series C Conductor Bars are roll-formed of galvanized steel or copper/steel laminate (250A) or copper (300A and 350A). The "U" shaped contact surface ensures positive tracking of the collector shoe and ensures good contact throughout the travel of the system. The standard material is supplied in 10 ft lengths with all necessary joining hardware. Installation is simple and requires only a jointing tool to connect the rails.

Saf-T-Bar Series C is ideal for:

- Cranes
- Hoists
- Conveyors
- Monorails
- Automated storage and retrieval systems

Ampacity range:

Based on continuous service with a 86^{0}F (30^{0}C) rise. Higher ratings can be obtained by increasing temperature rise and using high heat covers - Contact the Factory.

CA110	110
CA250	250
CA300	300
CA350	350

Bar Material:

CA110	1010 galvanized steel
CA250	Steel/copper
CA300	Copper
CA350	Electrolytic copper

Bar Features:

- **Skin-tight insulation** runs cooler, will not deform under clamping pressure
- **Metal Guideways** assure positive tracking of collector shoe
- **Flat contact surface** for long conductor wear and greatest possible sliding contact area

Collector Features:

- **Contact shoe** made with sintered copper and graphite, self-lubricating, draws current to collectors. Flat contact surface.
- **Pantograph spring suspension** of collector provides even pressure to shoe throughout stroke, yielding maximum electrical and mechanical performance.

Atmospheric specifications

In wet and icy atmospheres, the system can be shielded with a protective hood for additional protection. In dirty and dusty atmospheres, mount the conductor in down-turned position (bottom entry).

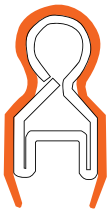
Insulating cover options

Standard is orange rigid PVC extrusion, 160^{0}F (71^{0}C) heat distortion point at 260 psi, self-extinguishing. Medium heat cover of red Lexan extrusion can be specified when necessary, 260^{0}F (127^{0}C) heat distortion point at 260 psi, self extinguishing. High heat fiberglass cover is available, 375^{0}F (191^{0}C) heat distortion.

Long run options

Push-in-place locking tabs are available if required for use on long runs with expansion gaps on copper and steel/copper conductor sections.

Saf-T-Bar Series C



Can be mounted so collector shoes enter from the bottom (vertical mode) or from the side (horizontal mode). Able to be factory curved to a minimum of 18 inches (457mm) radius with a maximum collector size of 35A.

Support Spacing: 5 ft (1.5 M)

Maximum rail temperature: 160^{0}F (71^{0}C) at 260 PSI (standard cover)
260^{0}F (127^{0}C) at 260PSI (medium temperature Lexan cover)
375^{0}F (191^{0}C) at 260 PSI (high heat fiberglass cover)

Type	Bar Material	Specifications				
		Nominal Current (Amps) [1]	Max. Voltage	DC Resistance (Ohms/ft)	AC impedance (Ohms/ft at 60Hz)	Wt lb/ft (kg/m)
CA110	Galvanized Steel	110	600	0.00050	0.000970	0.48
CA250	Steel/Copper Laminate	250	600	0.00127	0.000131	0.50
CA300	Electrolytic Copper	300	600	0.00008	0.000110	0.45
CA350	Electrolytic Copper	350	600	0.00006	0.000080	0.55

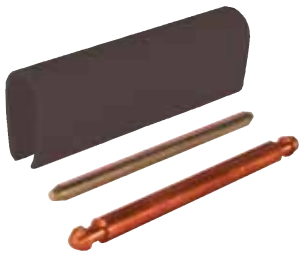
	PART NUMBERS									
Type	Std Heat Phase Conductor [2]	Std Heat Ground Conductor [3]	Std Heat (UV White) Conductor [4]	Med Heat [5]	High Heat [6]	Joint/Extra Joint Kit [7]	Joint/Extra Joint Kit [8] Med Heat	Power Feed	Expansion Section [7]	Power Feed Med Heat
CA110	**CA110X10**	**CA110X10G**	**CA110X10G**	**CA110HHX10**	**CA110FIX10**	**CJ110**	**CJ110HH**	**350F**	**CA110XG-2***	**350FHH**
CA250	**CA250X10**	**CA250X10G**	**CA250X10G**	**CA250HHX10**	**CA250FIX10**	**CJ250**	**CJ250HH**	**350F**	**CA250XG-2***	**350FHH**
CA300	**CA300X10**	**CA300X10G**	**CA300X10G**	**CA300HHX10**	**CA300FIX10**	**CJ300**	**CJ300HH**	**350F**	**CA300XG-2***	**350FHH**
CA350	**CA350X10**	**CA350X10G**	**CA350X10G**	**CA350HHX10**	**CA350FIX10**	**CJ350**	**CJ350HH**	**350MCM-2**	**CA350XG-2***	**350FHH**

End Cap Part Number: CN100 ("Standard Heat" only)

[1] Nominal current is based on 86^{0}F (30°C) and is for 100% duty.
[2] Complete with orange rigid "Standard Heat" PVC insulator cover, which has a 160° F (71^0 C) heat distortion point, 260psi. Self-extinguishing.
[3] Complete with green rigid PVC insulator cover, which has a 160° F (71^{0}C) heat distortion point, 260psi. Self-extinguishing. Some hand-safe options available, please consult Factory.
[4] Complete with white rigid PVC insulator cover, which has a 160° F (71^{0}C) heat distortion point, 260psi. Self-extinguishing. Some hand-safe options available, please consult Factory.
[5] Complete with red Lexan "Medium Heat" insulator cover, which has a 260° F (127^0 C) heat distortion point, 260psi. Self-extinguishing.
[6] Complete with fiber glass "High Heat" cover, which has 375° F (191^0 C) heat distortion point, 260psi. Self-extinguishing.
[7] Series C and Series T are provided with the rail joint pre-mounted to the rail. If special cuts are required, the extra joint kit is available for series C.
[8] Expansion Sections come with "Standard Heat" orange PVC covers. Medium Heat, High Heat, and green ground covers are also available. Please refer to the relevant section or contact factory.

Saf-T-Bar Series C Components

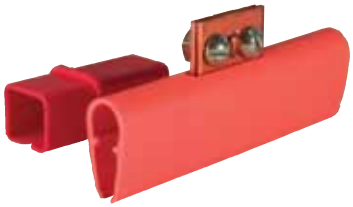
Extra Joint Kits



For completing field fabricated joints. Includes connector pins and a # 100JC snap-on insulating cover.

For Bar Type	Joint Kit Part No.	Pins Included in Kit
CA110	**CJ110**	5/16" x 4" (7.9 x 101.6) Steel & 15/64" x 3.75 (5.9 x 95.3) Copper
CA250	**CJ250**	5/16" x 4" (7.9 x 101.6) Copper & 15/64" x 3.75 (5.9 x 95.3) Copper
CA300	**CJ300**	5/16" x 4" (7.9 x 101.6) Copper & 15/64" x 3.75 (5.9 x 95.3) Copper
CA350	**CJ350**	5/16" x 4" (7.9 x 101.6) Copper & 7/32" x 3.75 (5.8 x 95) Copper

Powerfeeds



The Powerfeed provides an electrical connection from power source to conductor bar. May be located at any point, but preferably near the center of the system. The powerfeed is 1 1/4" (31.8 mm) long and clamps to the top lobe of the conductor with 1/4" screws. The powerfeed is insulated by a cover and a nylon cap. The 350MCM-2 include provisions for attaching single and double-bolt 350 mcm terminals.

For Type	Part No.
CA110	**350F**
CA250	**350F**
CA300	**350F**
CA350	**350MCM-2**

End caps

Black nylon cap is driven onto end of the conductor to complete the insulation. Contoured to permit passage of the collector shoe. End caps can be used in pairs at switch transfers, interlocks, expansion gaps, and isolation points. Trim conductor slot after installation.

	Part No.
End Cap	**CN100**

Hanger Brackets

Insul-8 Bar brackets are compatible with Series C Saf-T-Bar. Please refer to Pages; 20, 22 and 23 for more information.

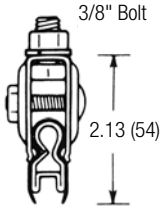
Saf-T-Bar Series C Hangers

Cross-Bolt Hanger Clamps

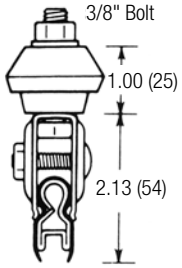
Cross-bolt hanger clamps are factory set to snap in place, but must be field adjusted for correct sliding tension after installing the conductor (unless used as an anchor).

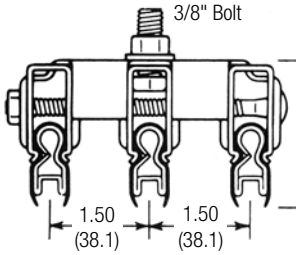
Sliding hangers (for conductor expansion): Tighten cross bolts, then back off 1/4 turn.
Anchor hangers: Tighten cross-bolts to 6 ft lb.

100H



100KN



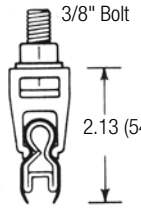


100H3-1

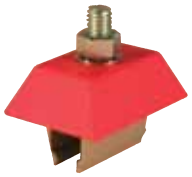
Description	Application	Part No.
Single Hanger, Plated Steel	Indoors, clean, dry	**100H**
Steel Single Hanger, Stainless Steel	Indoors, corrosive environments	**100HSS**
Single Hanger, Plastic Coated Steel	Indoors, dirty, dry	**100HN**
Single Hanger, with Insulator Spool, Plated Steel	Indoors/outdoors, wet, dirty	**100K**
Single Hanger, with Insulator Spool, Stainless Steel	Indoors/outdoors, wet, dirty, corrosive environments	**100KSS**
Single Hanger, with Insulator Spool, Plastic Coated Steel	Indoors, outdoors, wet, dirty, corrosive	**100KN**
Three-Pole Hanger, 1.5" Centers	Indoors, clean, dry. Requires staggered collector mounting	**100H3-1**
Three-Pole Hanger, 2.0" Centers	Indoors, clean, dry. Does not require staggered collector mounting	**100H3-2**

Snap-in Hanger Clamps

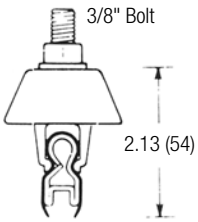
Lexan snap-in hangers for use only on Series C PVC cover rated to 160°F, with holding rib. For high temperature applications, use Cross Bolt Hanger Clamps. All push-on snap hangers require a firm press to seat the conductor into the hanger. To remove the conductor, it is recommended that it be slid out to avoid damage to the hanger.



100P



100PH



100PA

Can use instead of:	Application notes:	Part No.
100H, 100HN, 100K, or 100KN	Same mounting dimensions as 100H hanger	**100P**
100H, 100HN, 100K, or 100KN	Same as 100P, with "rain hat" for severe outdoor conditions	**100PH**
100H3-1	Multiple pole, 1.5" (38.1mm) centers: Indoors, wet, dirty. Requires staggered collector mounting	**100P3-1**
100H3-2	Multiple pole, 2.0" (50.8mm) centers: Indoors, wet, dirty. Does not require staggered collector mounting	**100P3-2**
	Anchor Hanger - Incorporates fiberglass filler for added strength, includes Fiber Pin Anchor Device inserted into 1/4" field-drilled hole.	**100PA**

Saf-T-Bar Series C Four-Pole Hangers

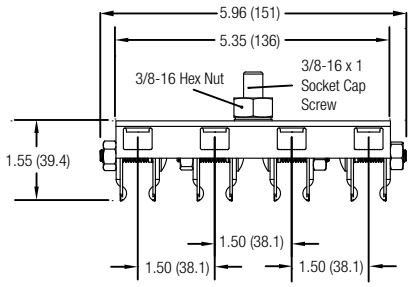
Steel Cross-Bolt Multiple Hanger

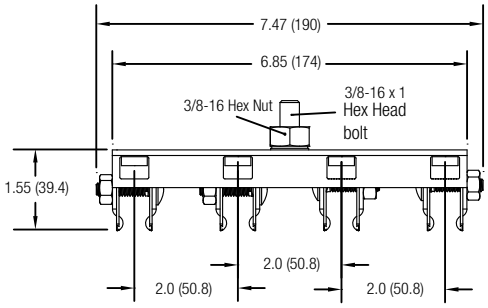
Hanger bodies are made with 1.62" (14.1mm) wide galvanized steel channel. These brackets can be used horizontally (bottom entry) or vertically (lateral entry).

100H4-1

100H4-2

Spacing Between Bars, in. (mm)	Part No.
1.5 (38.1)	**100H4-1**
2.0 (50.8)	**100H4-2**



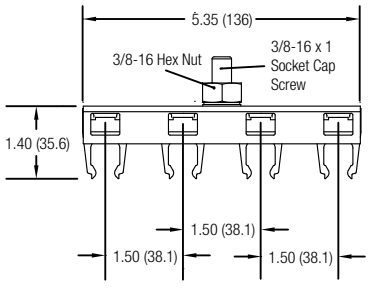


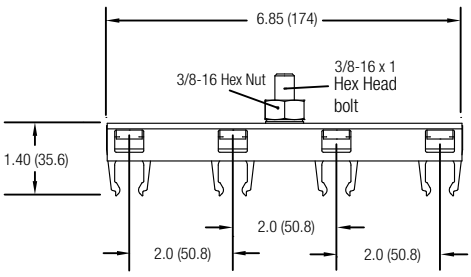
"Snap-in" Multiple Hangers

Spacing Between Bars, in. (mm)	Part No.
1.5 (38.1)	**100P4-1**
2.0 (50.8)	**100P4-2**

100P4-1

100P4-2



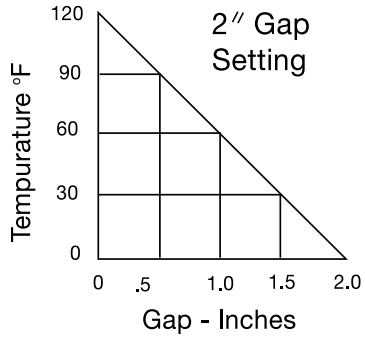


Saf-T-Bar Series C Expansion Sections

Expansion Sections - 2” gap

This assembly will accommodate up to a 2" expansion gap. The gap should be set based on the bar temperature according to the table below. Use tandem collectors to provide power across the expansion gap.

The expansion section is 10 feet long and takes the place of one standard bar length.



For Bar Type	Expansion required at ft (m)	Part No.	Powerfeeds included	Jumper(s) included
CA110	300 (91.4)	**CA110XG-2**	350F	ONE #4
CA250	200 (61.0)	**CA250XG-2**	350F	TWO #4
CA300	200 (61.0)	**CA300XG-2**	350F	TWO #4
CA350	200 (61.0)	**CA350XG-2**	350F	TWO #4

Series C Curves

Factory curved conductor sections for applications requiring bends and curves. Please contact factory for further information and pricing.

- Minimum Bend Radius is 16"
- Minimum Bend Radius for High Heat Fiberglass cover is 57"

For Bar Type	Standard Heat (PVC)	Standard Heat (GRD)	Standard Heat (UV)	Medium Heat (Lexan)	High Heat (Fiberglass)
CA110	CA110X10-CV	CA110X10G-CV	CA110X10W-CV	CA110HHX10-CV	CA110FIX10-CV
CA250	CA250X10-CV	CA250X10G-CV	CA250X10W-CV	CA250HHX10-CV	CA250FIX10-CV
CA300	CA300X10-CV	CA300X10G-CV	CA300X10W-CV	CA300HHX10-CV	CA300FIX10-CV
CA350	CA350X10-CV	CA350X10G-CV	CA350X10W-CV	CA350HHX10-CV	CA350FIX10-CV

Safe-T-Bar Series C Collectors

Light Spring (35E)

Standard Arm Collectors (E) are recommended for general use on cranes and stable monorails. 2”(51 mm) vertical stroke. Also available in a self-centering version for use with Pick Up Guides - See Pg. 69.

Long Arm Collectors (L) are used where there is excessive motion vertically or horizontally (as with a swaying hoist) and for high-speed applications. 3” (38mm) vertical stroke and are suitable for higher speed applications. Also available in a self-centering version for use with Pick Up Guides - See Pg. 69.

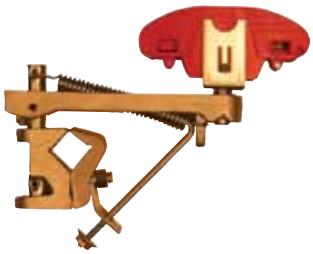
Self-Centering Collectors, in either standard arm (C) or long arm (LC) configurations, have centering attachments for discontinuous circuits, swaying hoists, or high speed applications.

Dual-Head (Tandem) Collectors are available in standard (V), long arm (W or LL), and long arm self-centering (LLC) versions depending on ampacity. Dual Head Collectors maintain full shoe contact through gaps (i.e. Expansion Gaps) and apply less pressure per length of bar. These are also used to obtain higher amperage than single collectors. Tandem collections must be mounted on 2" (50.8 mm) centers.

*** Pigtails not included with collectors. These will need to be ordered separate.**

Standard Arm (70E)

	Part No.			
Collector Type	**35A**	**70A**	**150A**	**100A**
Standard Arm	**35E**	**70E**	**150E**	**100E**
Long Arm	**35L**	**70L**	**150L**	**100L**
Standard Arm, Self-Centering	-	**70C**	-	**100C**
Long Arm, Self-Centering	-	**70LC**	-	**100LC**
Dual-Head (Tandem), Standard Arm	**35V**	-	-	-
Dual-Head (Tandem), Long Arm	**35W**	**70LL**	**150LL**	**100W**
Dual-Head (Tandem), Long Arm, Self-Centering	-	**70LLC**	-	**100LLC**
Pigtails	**2 10wire (35A)**	**2 6wire (70A)**	**2 4wire (150A)**	**2 6wire (100A)**



Self-centering, Standard Arm(70C)

Self-centering Long Arm (70LC)

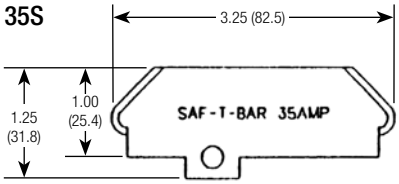
Dual Head Standard (35V)

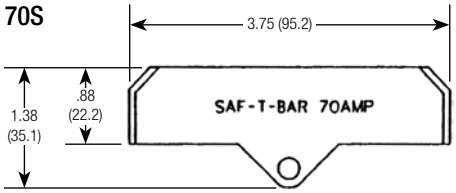
Dual-Head, Long Arm (70LL)

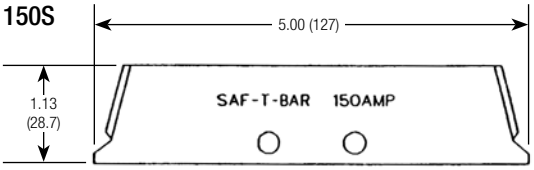
Safe-T-Bar Series C Collector Shoes and Dimensions

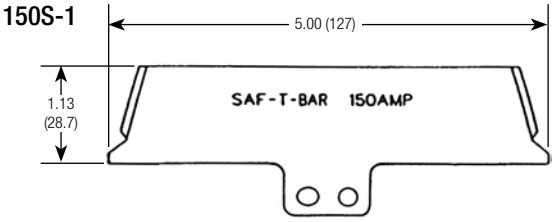
Collector Shoes

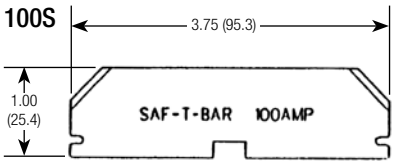
Shoe Material	Current Capacity (Amps)	For Collectors:	Part No.
Standard Copper Graphite	35	**35E, 35V, 35L, 35W**	**35S**
Standard Copper Graphite	70	**70E, SC70, SCL70, 70L, SCC70, SCCL70, 70LL, SD70, SE70, SDD70, SEE70**	**70S**
Standard Copper Graphite	100	**100E, 100L, 100W**	**100S**
Standard Copper Graphite	150	**150E, 150L, 150LL**	**150S1**
Abrasive Cleaning Material	70	**70E, SC70, SCL70, 70L, SCC70, SCCL70, 70LL, SD70, SE70, SDD70, SEE70**	**70XX**
Abrasive Cleaning Material	100	**100E, 100L, 100W**	**100XX**
Abrasive Cleaning Material	150	**150E, 150L, 150LL**	**150XX**
Cast Iron	70	**70E, SC70, SCL70, 70L, SCC70, SCCL70, 70LL, SD70, SE70, SDD70, SEE70**	**70SC**
Cast Iron	150	**150E, 150L, 150LL**	**150SC**











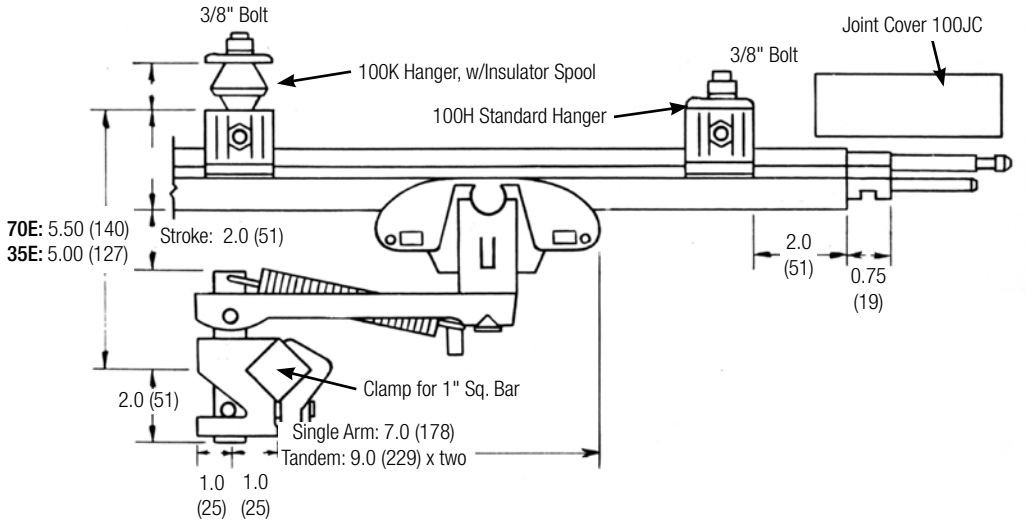
Collector Parts

Description	35 amps	70 amps	100 amps	150 amps
Spring	**35Z**	**100Z**	**100Z**	**100Z**
Case & shoe assembly	**401AS**	**707S**	**601AS100**	**150AS**
Case only (Two halves w/Screws	**401A**	**7071**	**601A100**	**150A**
(2 halves w/screws)				
Yoke assembly	**401Y**	**707Y**	**707Y**	**777Y**
Shoe Clip	-	-	**100Y**	-

Safe-T-Bar Series C Collector Dimensions

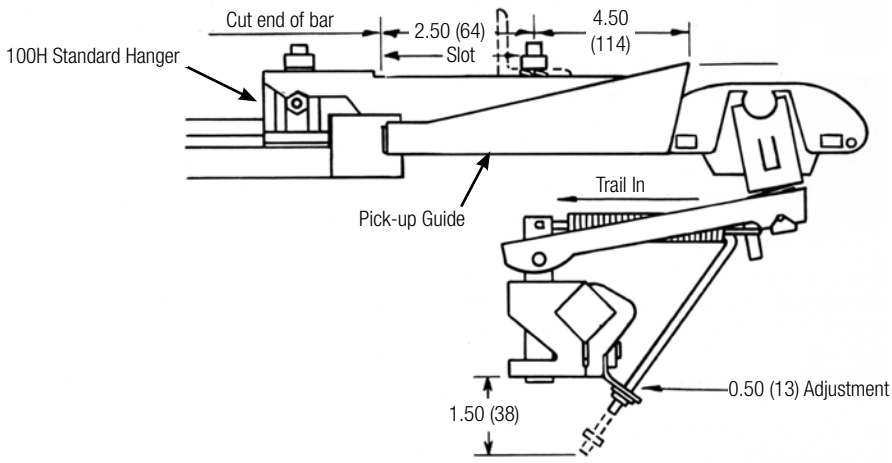
Standard Arm Dimensions

35E
35V
70E
100E
150E



Self-Centering

70C
100C

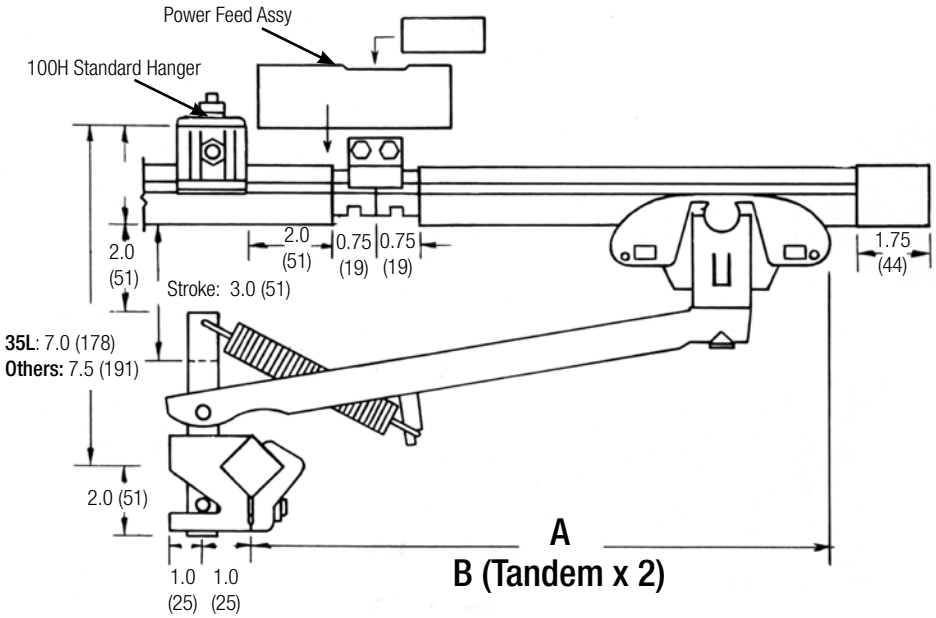


Also available in Long Arm (70LC and 100LC) and Tandem (70LLC and 100LLC) Versions:

Contact the Factory for Dimensions.

Long Arm Collector

Collector	A	B
35L	12.00 (305)	
70L	12.00 (305)	
100L	12.25 (311)	
150L	12.25 (311)	
70LL		14.50 (368)
100W		14.75 (375)
150LL		15.00 (381)



Saf-T-Bar Series C Components

Collector Shoes

Amp Range	Drag	Shoe Length	Contour	Curves?	Shoe Thickness	Part No.	Case #
100-150	Normal	4.375	Blunt	None	0.21	**150SI**	150A
50-100	Normal	3.75	Tapered	None	0.19	**70S**	707-1
25-50	Light	3.00	Blunt	Short	0.19	**35S**	401A
100-125	Normal	3.75	Blunt	None	0.225	**100S**	601A100

Isolation Sleeve

Used to electrically isolate adjacent conductor sections with a 1/2" over surface gap. The sleeve will support adjacent conductor sections, but must have hangers within 6" on each side of the isolation sleeve. Collectors bridge the gap electrically. Two sleeves separated by 6" of conductor are required to prevent collectors from bridging the gap as in signal or control functions.

	Part No.
Isolation Sleeve	**CA100IS**

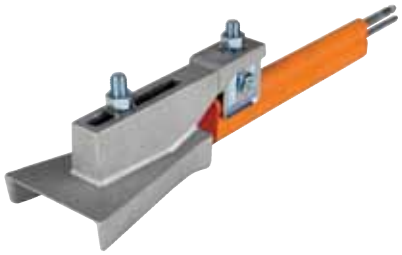
Pick-up Guides

Used for discontinuous circuits such as bridge controls, runway circuits at fire doors, etc., to allow collector to leave conductor and be realigned on return. Works with all bar capacities. Use with self-centering collectors only.

The guide is provided with hanger clamp and end cap. The guide itself is secured to the bracket with a 3/8" bolt and the conductor is secured to the guide with a hanger clamp. Conductors must be mounted on 3" (76 mm) centers minimum. Install conductor one inch into guide throat.

	Part No.
Pick-up Guide	**CP100**

Transfer Guides



Used to track the collector through bar misalignments of 1/8" to ½" (3-13 mm) laterally and of up to 1/8" in the direction of contact. Self-centering collectors are not required, but dual collectors are required if power interruption cannot be tolerated.

Conductors must be mounted on 3" (76 mm) centers minimum. Install conductor 1-1/2" (38 mm) into guide throat.

	Part No.
Transfer Guide	**CT100**

Saf-T-Bar Series H Conductor Bar

The advanced "Series H" Saf-T-Bar system features integral insulated conductors to provide years of safe, economical, and trouble-free service. It is designed for compact, low-cost installation, and minimum maintenance.

Series H conductors are supplied in 20 foot lengths with factory installed insulating covers. Joint fittings and covers are ordered separately.

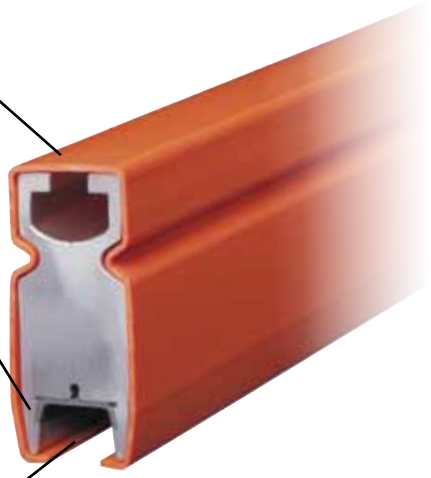
Series H is ideal for:

- Heavy duty cranes and monorails
- Wet locations
- Port authority equipment
- Dusty and dirty environments
- Environments conducive to electrical tracking

Skin-tight insulation runs cooler, will not deform under clamp pressure. Standard insulation is 160° F (71° C). Alternative insulations are available

Metal guideways assure positive tracking of collector shoe with or without insulating cover

Flat contact surface for maximum conductor wear; the stainless steel channel insert provides resistance to corrosion and electrical pitting.



Current Capacities

HC500	500
HC750	750
HC1000	1000
HC1500	1500

Material

All capacities: Aluminum with 304 Stainless Steel Contact Strip

Other available features

- Contact shoe with flat surface of sintered copper and graphite, self-lubricating to effective draw current to the collector. Heat sink collector heads available for high current draw.
- Compact mounting of conductor in vertical or horizontal position without special parts or fittings.
- Collectors are available in either single or dual arm construction. Single (L, LL), and pantograph dual-arm constructions (D, DD) are available.

Atmospheric specifications

In wet atmospheres, the system should be mounted on insulated hangers with the conductor in the downturn position. In dirty and dusty atmospheres, mount the conductor in the downturn position. If the atmosphere is likely to cause electrical over-surface tracking, choose hanger clamps with spool insulators rather than the standard coated hanger clamp.

Insulating hanger option

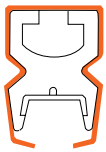
A plastic slide hanger is available as an alternative design.

Insulating cover options

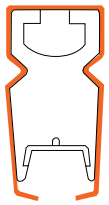
Prefix A Standard rigid vinyl for cranes and hoists
Suffix H Medium heat plastic to 260°F for cranes and hoists
Suffix FI High heat fiberglass to 375°F for cranes and hoists

Saf-T-Bar Series H Conductor Bar Characteristics

HC500 (HH)
HC750 (HH)



HC1000 (HH)



HC1500 (HH)

Series H Conductor Bars are constructed of extruded aluminum with a stainless steel "U" shaped contact surface which guides collector shoe movement and minimizes collector shoe wear.

Bars are provided in four sizes: 500, 750, 1000, or 1500 Amp, each with "Standard Heat" rigid PVC insulation, "Medium Heat" Lexan, or "High Heat" fiberglass insulations are available by request. The standard rail length is 20 feet (6.10 m).

	Bar Type:	HC500	HC750	HC1000	HC1500
Specifications	Nominal Current (amps) [1]	500	750	1000	1500
	DC Resistance (ohms/ft)	0.0000194	0.0000194	0.0000155	0.0000067
	AC Impedance (ohms/ft at 60Hz) measured at 3.5" c/c	0.0000301	0.0000301	0.0000279	0.0000389
	AC Impedance (ohms/ft at 60Hz) measured at 5.0" c/c	0.0000363	0.0000363	0.0000355	0.0000385
	Wt lb/ft (kg/m)	1.390 (0.1922)	1.390 (0.1922)	1.616 (0.2234)	3.141(0.4328)
	Max. Voltage (V)	600	600	600	600
Common Characteristics	Nominal Support Spacing (ft)	10 foot (3.05 m)			
	Standard Rail Length (ft)	20 ft (6.10 m)			
	Maximum Rail Temperature	160° F (71.1° C) at 260 PSI (Standard Heat Cover) 260° F (126.7° C) at 260 PSI (Medium Heat Lexan Cover) 360° F (182.2° C) at 260 PSI (High Heat Fiberglass Cover)			
	Conductor Mounting Orientation	Can be installed vertically or horizontally			
	Curves	Consult Factory			

[1] Nominal current is based on 30°C and is for 100% duty.

	Basic Series H Part Numbers [6]							
Bar Type	Phase Conductor Std Heat [2]	Phase Conductor Med Heat [3]	WT lb (kg)	Joint Kit Std Heat [4]	Joint Kit Med Heat Lexan [4]	Power Feed Std Heat [4]	Expansion Gap Assemblies [5]	Power Feed Med Heat Lexan [4]
HC500	**HC500X20**	**HC500HHX20**	24.0 (10.89)	**HA500J**	**HA500HHJ**	**HA500F**	**HA500XG-8***	**HA500HHF**
HC750	**HC750X20**	**HC750HHX20**	24.0 (10.89)	**HA750J**	**HA750HHJ**	**HA750F**	**HA750XG-8***	**HA750HHF**
HC1000	**HC1000X20**	**HC1000HHX20**	30.0 (13.61)	**HA1000J**	**HA1000HHJ**	**HA1000F**	**HA1000XG-8***	**HA1000HHF**
HC1500	**HC1500X20**	**HC1500HHX20**	60.0 (27.22)	**HA1500J**	**HA1500HHJ**	**HA1500F**	**HA1500XG-8***	**HA1500HHF**

[2] Complete with "standard heat" cover (orange rigid PVC, 160°F heat distortion point, 260 psi, self extinguishing)

[3] Complete with "medium heat" cover (red Lexan, 260°F heat distortion point, 260 psi, self extinguishing)

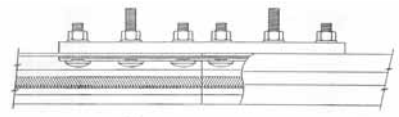
[4] See Pg. 72

[5] Powerfeeds and Expansion kits: medium heat Lexan and high heat fiberglass versions are available - Contact Factory

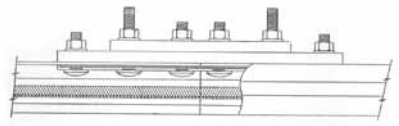
[6] End caps available for standard heat applications only - Part Nos.: **HA500N, HA750N, HA1000N, HA1500N** - See pg. 72
(Also available with white PVC (UV) cover for standard heat systems)

Saf-T-Bar Series H Components

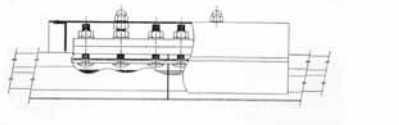
Splice Joints



HA500J



HA750J

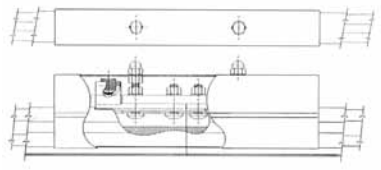


HA1000J
HA1500J

The bolted Splice Joint assembly is comprised of two stacked spring plates located inside the hollow portion of the conductor.

Used on Bar:	Part No. Std Heat	Part No. Med Heat	Wt (kg)
HC500	**HA500J**	**HA500HHJ**	1.0 (0.45)
HC750	**HA750J**	**HA750HHJ**	1.5 (0.48)
HC1000	**HA1000J**	**HA1000HHJ**	2.0 (0.91)
HC1500	**HA1500J**	**HA1500HHJ**	3.0 (1.36)

Powerfeed



The Powerfeed supplies power to the bar and is inserted in place of the bar splice joint. Or it can be mounted at any point along the conductor by cutting the bar and insulating cover.

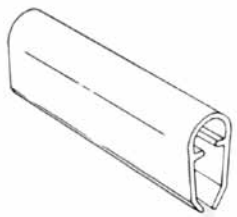
Used on Bar:	Terminals	Part No. Std Heat	Part No. Med Heat	Wt lb (kg)
HC500	Two 350 MCM	**HA500F**	HA500HHF	3.0 (1.36)
HC750	Two 350 MCM	**HA750F**	HA750HHF	3.0 (1.36)
HC1000	Two 350 MCM	**HA1000F**	HA1000HHF	3.0 (1.36)
HC1500	Three 350 MCM-2	**HA1500F**	HA1500HHF	6.0 (2.72)

End Cap

End caps are to be driven onto the exposed ends of the conductors to completely insulate the bar. Cap is 4" (102 mm) long.

Used on Bar:	Part No.	Wt lb (kg)
HC500-1000	**HA1000N**	0.50 (0.23)
HC1500	**HA1500N**	0.75 (0.34)

Isolation Joints



Isolation joints are required for circuit segmentation and are comprised of an insulating angle with attachment hardware to secure and space the adjacent rails.

Used on Bar:	Part No.	Wt lb (kg)
HC500	**HA1000IS**	**2.0 (0.91)**
HC750	**HA1000IS**	**2.0 (0.91)**
HC1000	**HA1000IS**	**2.0 (0.91)**
HC1500	**HA1000IS**	**2.0 (0.91)**

Saf-T-Bar Series H Components

Hanger Clamps and Anchors

Hanger clamp bracket should be attached to the runway beam by welding or bolting. Conductors should be spaced 5" (127 mm) inches apart, however, a minimum of 3.5" (89 mm) is acceptable. Hanger clamp brackets require 9/16" (14.3 mm) holes for 1/2" hanger clamp bolts.

To properly support the conductor and to keep standard rail overhang to 24" (610 mm), space the first two brackets on 6' (1.83 m) centers and all other brackets on 10' (3.05 m) centers.

The "Anchor" is a non-sliding version of the hanger which provides a solid fixing point on the conductor bar. Anchor clamp kit consists of an insulated keeper straddling each side of the standard hanger. The usual hanger bolt is replaced by a cup-point set screw that is tightened against the keeper plate at the desired anchor location. On HA1000H hangers, the set screw becomes the mounting bolt. ON HA1000K hangers, the set screw is threaded into the base of the insulator spool. HA1000PA anchors come with a drilled hole in the vertical stiffener. At the installation site, a hole is drilled through the conductor bar to accommodate a threaded rod. Threaded rod is captured by acorn nuts on both sides of the clamp.

HA1000H/HA

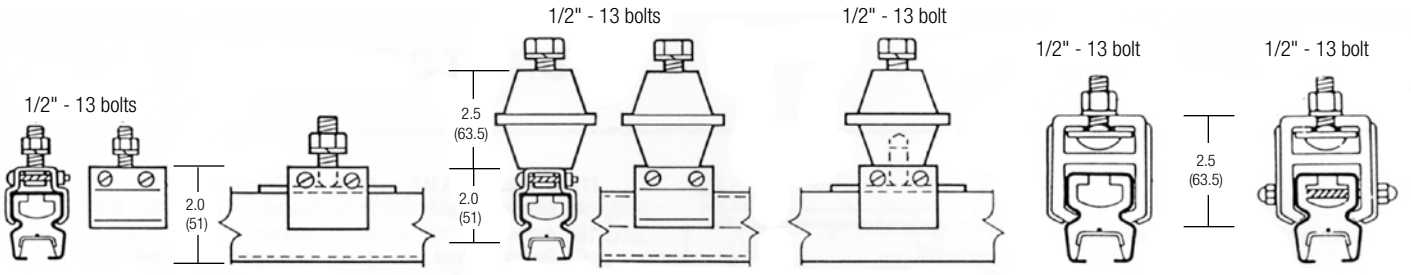
HA1000K/KA

HA1000P/PA

Hanger Clamp Type [2]	Usage	Part No. [1]	Wt lb (kg)
Hanger, coated steel	Normal atmospheres	**HA1000H**	0.5 (0.23)
Hanger, coated steel with insulator spool	Wet atmospheres	**HA1000K**	1.0 (0.45)
Hanger, Plastic	In lieu of: HA1000H or HA1000K	**HA1000P**	0.5 (0.23)
Anchor, coated steel with anchor clamp kit	Normal atmospheres	**HA1000HA**	0.6 (0.27)
Anchor, coated steel with insulator spool and anchor clamp kit	Wet atmospheres	**HA1000KA**	1.1 (0.50)
Anchor, plastic with anchor clamp kit		**HA1000PA**	0.6 (0.27)

[1]Suffix "A" indicates anchor options
[2]All H Series components are available with stainless steel hardware, designated by the suffix "SS"

Hanger Clamp Mounting



Hanger Clamp
HA1000H

Anchor-type Hanger Clamp with Set Screw
HA1000HA

Hanger Clamp with Insulator Spool
HA1000K

Anchor-type Hanger Clamp with Set Screw with Insulator Spool
HA1000K

Plastic Hanger Clamp
HA1000P

Plastic Hanger Clamp with Anchor Bolt
HA1000PA

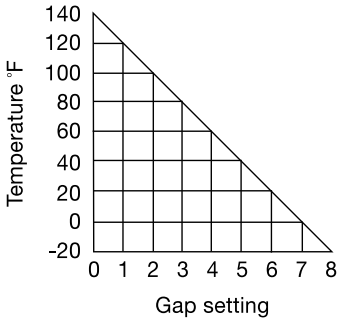
Saf-T-Bar Series H Expansion Gaps

HA500XG-8

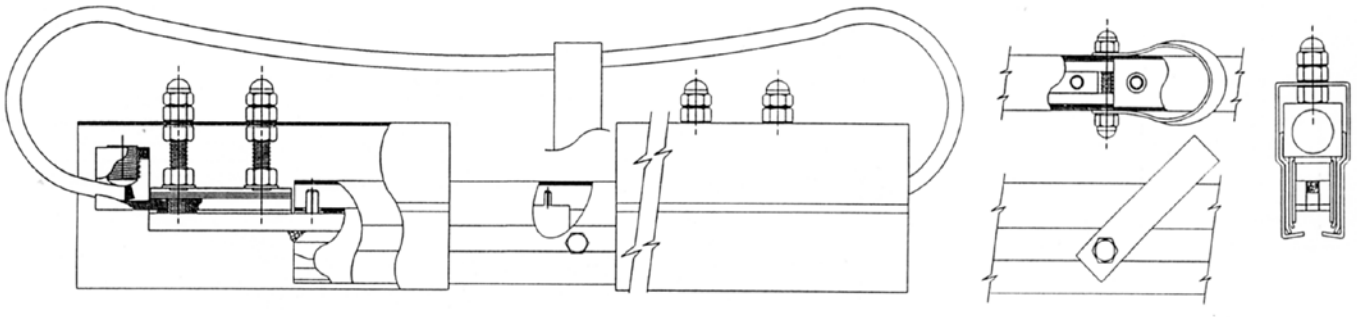
Expansion Gap assemblies are pre-assembled and ready to be installed between two adjacent sections of rail to compensate for thermal expansion of the rail due to environmental changes and power-generated heat. Each end of the expansion section is attached to its mating rail with a powerfeed type of rail splice.

Aluminum conductors will expand one inch in 70 feet per 100° F temperature variation. The Expansion Gap will handle expansions of up to 8". The Expansion Gap assembly is 12" long "closed" and 20" long expanded (with the maximum gap of 8".) The gap is normally set at 4" in an average 60° F environment. An Expansion Gap assembly is required for every 500 feet (or fraction thereof) in system length to handle a 100 degree F maximum temperature variation. A proportional decrease in the 500 foot interval is required for greater temperature variations.

Center point of all conductor runs using expansion gaps requires an anchor clamp kit to locate rail settings.

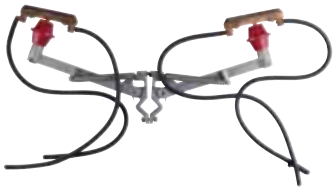


For Bar	Powerfeeds included	Jumpers included	Part No.	Wt lb (kg)
HC500	HA500F	# 3/0 x 40"	**HA500XG-8"**	13.0 (5.90)
HC750	HA750F	Two # 3/0 x 50"	**HA750XG-8"**	13.0 (5.90)
HC1000	HA1000F	Two # 3/0 x 50"	**HA1000XG-8"**	15.0 (6.80)
HC1500	HA1500F	Two 350 MC x 50"	**HA1500XG-8"**	20.0 (9.07)



Saf-T-Bar Series H Collectors

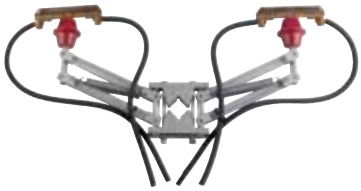
Standard L



For collector movement of 2" in direction of contact and ± 1" lateral drift.

Description	Intermittent Only	Continuous or Intermittent	Part No.
Single arm	300A	200A	**HA300LS**
Tandem arm	600A	400A	**HA600LLS**
Single arm	450A	300A	**HA400LS**
Tandem arm	900A	600A	**HA800LLS**

Standard D



For collector movement of 3" in direction of contact and ± 3" lateral drift.

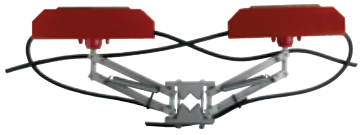
Description	Intermittent Only	Continuous or Intermittent	Part No.
Dual Parallel Arm, Single	300A	200A	**HA300DS**
Dual Parallel Arm, Tandem	600A	200A	**HA600DDS**
Dual Parallel Arm, Single	450A	300A	**HA400DS**
Dual Parallel Arm, Tandem	900A	600A	**HA800DDS**

Heat Sink L

For collector movement of 2" in direction of contact and ± 1" lateral drift.

Description	Intermittent Only	Continuous or Intermittent	Part No.
Single arm	500A	400A	**HA400LSHS**
Tandem arm	1000A	800A	**HA800LLSHS**

Heat Sink D



For collector movement of 3" in direction of contact and ± 3" lateral drift

Description	Intermittent Only	Continuous or Intermittent	Part No.
Single arm	500A	400A	**HA400DSHS**
Tandem arm	1000A	800A	**HA800DDSHS**

Saf-T-Bar Series H Collector Parts and Shoes

Collector Parts

Type	L Series	D Series	Heat Sink L Series	Heat Sink D Series
Body	**302B**	**50-901**	**302B**	
Contact Shoe	**300SHP (6") 400SHP (8")**	**300SHP (6") 400SHP (8")**	**400SHPHS (x2)**	**400SHPHS (x2)**
Spring	**300Z**	**300Z**	**300Z**	**300Z**
Arm	**300LP**	**50-902**	**300LP**	**50-902**
Spool	**1000Q**	**1000Q**	**50-906**	**50-906**
Welding cable	**WR002RD1600**			
Heat sink assembly	-	-	**400YHP-Head**	**400YHP-Head**

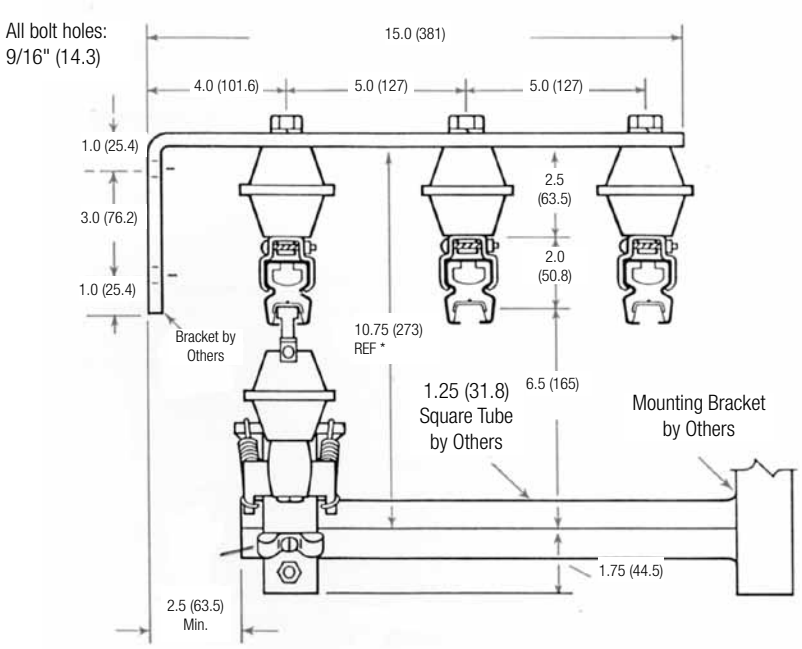
Collector Shoes

300SHP

Qty	Description	Shoe Size	Capacity (amps)		Part No.
			Continuous	Intermittent	
1	Single	5/8" x 6"	200	300	**300SHP**
2	Dual	5/8" x 6"	400	600	**300SHP**
1	Single	5/8 x 8"	300	450	**400SHP**
2	Dual	5/8 x 8"	600	900	**400SHP**
1	Single, Heat Sink Design	5/8 x 8"	400	500	**400SHPHS**
2	Dual, Heat Sink Design	5/8 x 8"	800	1000	**400SHPHS**

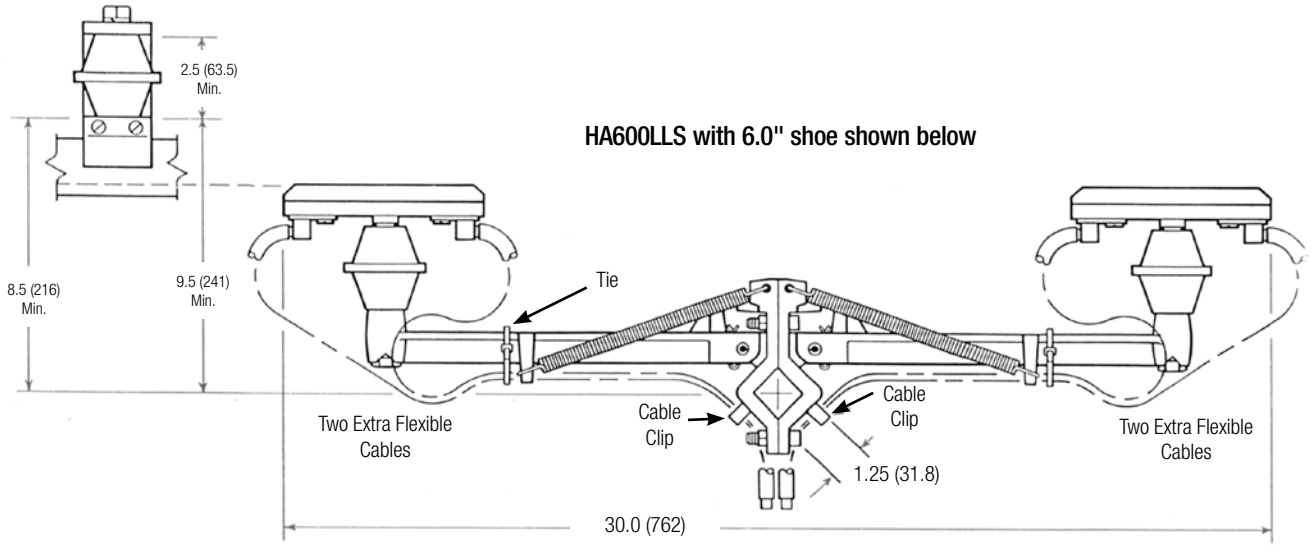
Saf-T-Bar Series H Dimensions

Installed End View



HC1000 Conductor Shown Above
*** For HC1500 Conductor, add 1.0" (25.4 mm)**

Collector Side View

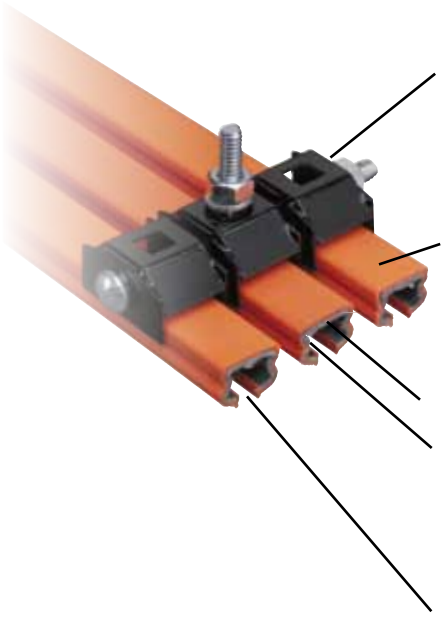


HA600LLS with 6.0" shoe shown below

Saf-T-Bar Series T

Series T is Ideal for:

- Light Rail Systems
- Automated Storage and Retrieval Systems
- Conveyors
- Indoor, Dry Locations
- Small cranes, monorails, hoists
- Moving cameras and instruments
- Other mobile power applications



Rapid installation. Slide-on or snap-on joint clips and multiple bar assemblies. One unit mounting for quick, easy installation

Skin-tight, rigid PVC insulation runs cooler, will not deform under clamp pressure

Twin contact conductor. Two internal contact grooves track the collector. Provides for excellent ventilation with high current capacity for its weight

Hand-safe design

Current capacity[1]

TA65	65 amps

Material

TA65	Galvanized Steel Rail with Rigid PVC Insulation rated at 160°F

Other features

- Collector is "captured" within the "twin-contact" conductor profile of the bar, assuring good contact
- Compact dimensions for efficient use of minimal space. One square inch per conductor.
- Modular design of this system facilitates use of multiple conductors easily mounted in various combinations with multiple collector assemblies.

Atmospheric specifications

Series T Saf-T-Bar is not recommended for dirty applications.

Insulating hanger option

A spool mount insulator hanger option is available as an alternative.

Insulating cover options

Insulating covers are rigid PVC extrusions rated at 160°F operating temperature and Lexan extrusions rated at 260°F. Both materials are self-extinguishing.

[1]Ampere ratings are based on continuous service with a 30°C rise.

Saf-T-Bar Series T Conductor Bar Characteristics

Series T conductor bars are constructed of roll-formed galvanized steel and are supplied with rail insulation along with the joint kit pre-mounted to one end of the conductor bar. The galvanized steel version provides a current capacity of 65 Amps at 30°C ambient temperature and continuous duty.

Description	TA65
Material	Galvanized Steel
Nominal current (Amps) [1]	65
DC resistance (ohms/ft)	0.0007
AC Impedance (ohms/ft at 60Hz)	0.0018
Weight	3.0 lb per 10 ft bar (1.36 per 3.05 m bar)
Max. Voltage (V)	600
Support Spacing (ft)	5.0
Standard Rail Length (ft)	10 feet - Other lengths on request
Maximum Rail Temperature	160^{0}F at 260 PSI (standard cover) 260^{0}F at 260 PSI (high temperature Lexan cover)
Conductor Mounting Orientation	Can be installed in either vertical or horizontal mode
Curves	Can be curved in our factory to a 12" (305 mm) minimum radius, using 30 Amp collector shoes.

Basic Series T Part Numbers

Bar Type	Phase Bar Part No. [2]	Ground Bar Part No. [3]	Med Heat Bar Part No. [4]	Joint Kit Std Heat Part No. [6]	Joint Kit Med Heat Lexan Part No. [4]	Power Feed Part No.	Power Feed Med. Heat Lexan Part No.	End Cap Part No. [7]
TA65	**TA65X10**	**TA65X10G**	**TA65HHX10**	**TJ65**	**TJ65HH**	**TF100**	**TF100HH**	**TN100C**

[1] Nominal current is based on 30°C and is for 100% duty.
[2] Complete with normal phase rail cover, orange rigid PVC, 160°F heat distortion point, 260psi, self extinguishing.
[3] Complete with ground rail cover, green rigid PVC, 160°F heat distortion point, 260psi, self extinguishing.
[4] Complete with red Lexan medium heat cover, 260°F heat distortion point, 260psi, self extinguishing.
[6] Series T conductor kits are provided with the rail joint pre-mounted to the rail. If special cuts are required, use this part number to order the extra joint kit
[7] End caps available for "standard heat" applications only.

Saf-T-Bar Series T Components

Splice Joint Kit

Connects and aligns standard 10' conductor lengths. Consists of a 4" joint cover that slides over the exposed joint area to complete the insulation. The joint cover locks in place by means of indents and is formed of the same material as the insulating conductor cover. Splice joints are pre-installed on one of complete conductor

Part No.
TJ65

Powerfeeds

The TF100 is a terminal lug with insulating cover that clamps onto a 3/4" (19.1 mm) length of bare conductor to feed power to the bar. It will accept wires up to # 6 flex. Rated at 100 amperes. The conductor may also be fed by securing a standard terminal lug to the 1/4" hole in the end of the conductor and taping over it for insulation.

Part No.
TF100

End Caps

End Cap TN100C is a sleeve required to complete the insulation of the conductor. It extends 1/2" (13 mm) over the end of the bar. As an alternative, the conductor may be cut back so that the regular insulating cover extends 1/2" beyond the end of the conductor. End Cap may also be used as a transfer end cap having a ± 1/8" (± 3.2 mm) tolerance with a 1" (25 mm) gap setting on interlocks.

Part No.
TN100C

Isolation Sleeves

A rigid plastic sleeve, providing 1/2" (13 mm) over-surface gap electrically, for electrical segmentation of conductor bars. A self-supporting sleeve.

Part No.
TA65IS

Hanger Mounting Clamps

TH402

Nylon coated stamped steel hanger clamps. Can be furnished in multiples on 1" (25 mm) centers. Can be mounted using cross bolt or back bolt. Bolts are 1/4" and require a 5/16" mounting hole. Hangers are required every 5' (1.52 m) of conductor. Joints should be located not more than 3" (76.2 mm) from hangers to avoid flexing.

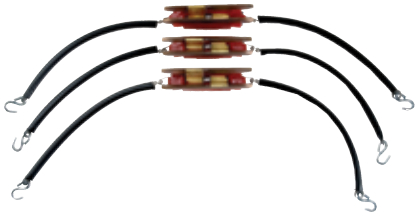
Phase	Part No.
1	**TH101**
2	**TH201**
3	**TH301**
4	**TH402**
5	**TH502**

Note: A spool mount insulator hanger option is available as an alternative - Contact Factory

Saf-T-Bar Series T Collectors and Tow Bar

Collectors with self-lubricating contacts for quiet operation and long life. Multiple collectors will be supplied as single units times the number of phases

TE501CR / TE501SC



TE503CR / TE503SC

# Poles	Shoe Size	Towlines Included?	Shoe Matl	Recommended For:	Cap.	Part No.
Single	Short	No	Chromium Copper	Systems using special towing arrangements	30 A	**TE301ASCR**
Single	Short	Yes	Chromium Copper	Systems with bend radii tighter than 48"	30 A	**TE301**
Dual	Short	Yes	Chromium Copper	Systems with bend radii tighter than 48"	30 A	**TE302**
Triple	Short	Yes	Chromium Copper	Systems with bend radii tighter than 48"	30 A	**TE303**
Single	Standard	Yes	Chromium Copper	Most systems without tight radii	50A	**TE501CR**
Single	Standard	No	Chromium Copper	Systems without tight radii	50A	**TE501ASCR**
Dual	Standard	Yes	Chromium Copper	Most systems without tight radii	50A	**TE502CR**
Triple	Standard	Yes	Chromium Copper	Systems without tight radii	50A	**TE503CR**

Tow Bar

The Tow Bar is an optional mounting bracket for Series T collectors. It is designed to mount to a 1" (25.4 mm) square bar and connect to the standard towlines supplied with the Series T collector assemblies. The threaded rod is 18 inches long and is equipped with a clip at each end which provides a connection point for the S-hook at the end of the T-bar towlines. The TB18 will provide the proper angle of pull to ensure smooth travel of the collectors as they are pulled through the rail.

Part No.
TB18

Series T Curves

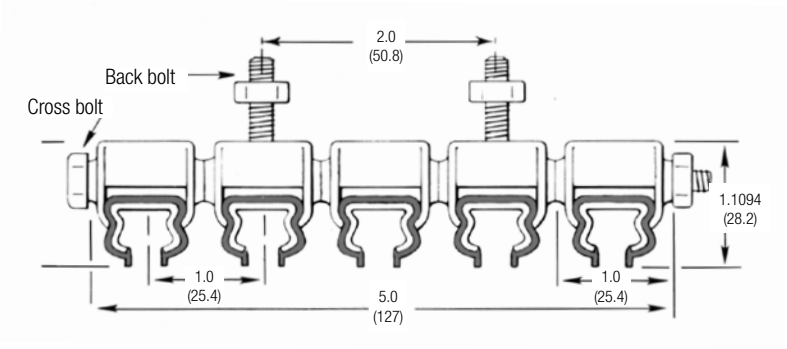
Factory curved conductor sections for applications requiring bends and curves. Please contact factory for further information and pricing.

- Minimum Bend Radius is 12"
- *T-Bar curves use different joint clip than the standard straight bar.

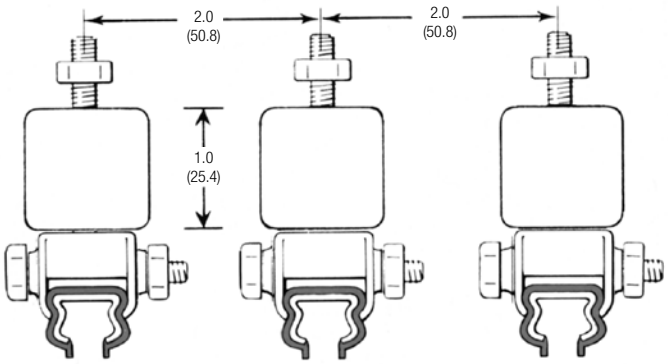
For Bar Type	Standard Heat (PVC)	Standard Heat (GRD)	Standard Heat (UV)	Medium Heat (Lexan)	High Heat (Fiberglass)	Joint*
TA65	TA65X10-CV	TA65X10G-CV	N/A	TA65HHX10-CV	N/A	TJS100

Saf-T-Bar Series T Dimensions

Hanger Mounting Clamps

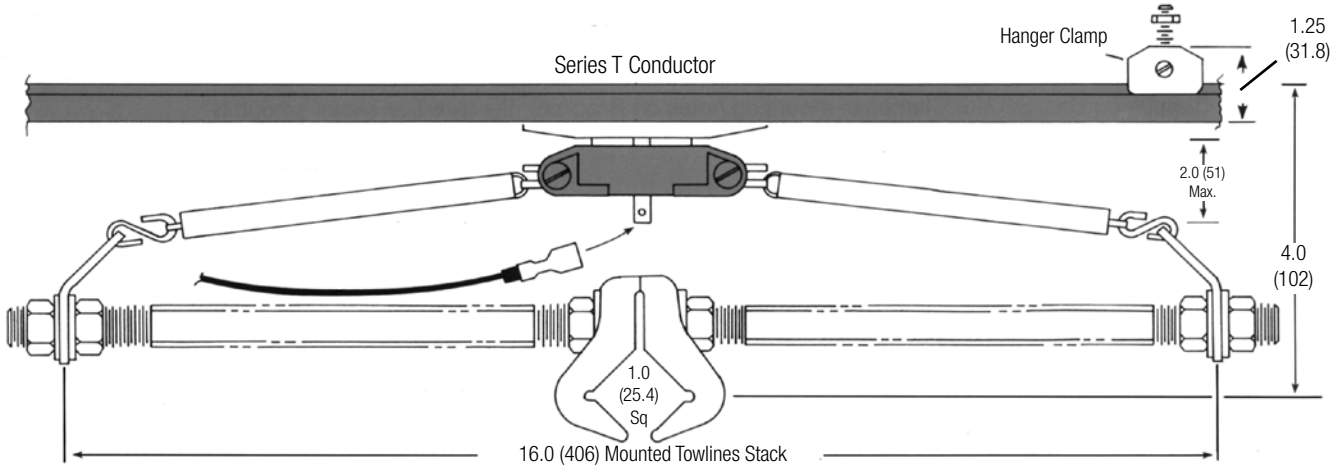


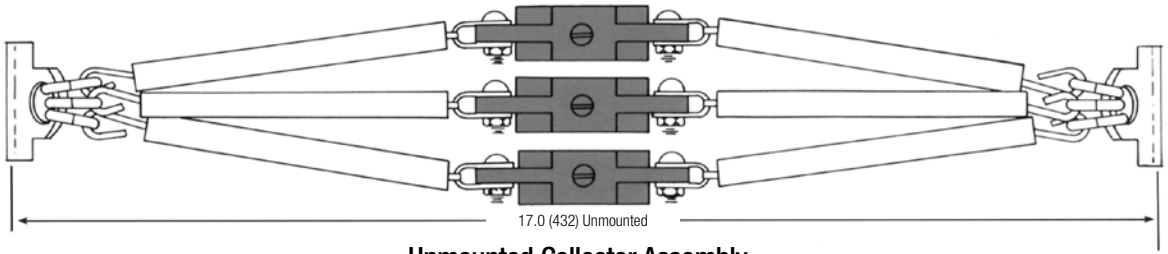
Standard Hangers



With Optional Insulator Spools

Collectors





Unmounted Collector Assembly

Multiple collectors will be supplied as single units times the number of phases.

Appendix I - Selection of Systems

Carefully review your equipment and application to chose the correct system and reduce the risk of system failures, equipment downtime, and maintenance time and expense. There are eight interrelated factors that should be considered when selecting the correct system.

Environmental Conditions

- **Freezing Conditions** - Might require a **heater wire** to keep the conductor contact surface free from ice.
- **Water and/or Dust** - Might adversely affect components and might require the use of insulated hangers to better isolate the "live" conductors from ground.
- **Chemicals** – Can adversely affect system components. Acidic or basic fumes may require stainless steel hardware and components. With the Hevi-Bar II system, you may want to consider the optional "**Dura-Coat**" treatment to reduce component corrosion. This is available for 8-bar; contact the Factory for details.
- **Cutting Oils** – May negatively affect polycarbonate components
- **Radiation** - May require the use of non-PVC components and non-galvanized plated components.

Mounting and Installation

- **Bottom Entry** – Puts the running surface on the bottom side of the conductor, which keeps dust, water, or debris away.
- **Lateral (or side) Entry** – Can be used if space is limited. Lateral mounting is not recommended for dusty, outdoor, or wet conditions. You may be able to stagger the collectors to decrease the space required for the system.
- **Installation** – Collector Arms are designed to accommodate a certain amount of movement or misalignments between the crane/vehicle and the conductor. However, if misalignments are excessive the collector could disengage from the bar. **Poor collector installation is the single greatest cause of new system problems.** Installation Instructions should be strictly followed to optimize system performance and prevent problems. Manuals are available at www.conductix.us.

Number of Power and Bonding Conductors Required

- **Power Legs** - Each "power leg" requires one run of bar
- **Bonding (Ground) Bar** - Per article 610.61 (National Electrical Code): "The trolley frame and bridge frame shall not be considered as electrically grounded through the bridge and trolley wheels and its respective tracks. A separate bonding conductor shall be provided". A bonding bar is required for all overhead cranes built after 2004.

Moving Versus Stationary Applications

- **Moving Machine** - Draws maximum power as it moves. Current-induced heat is dissipated over a wider area of the conductor.
- **Stationary Machine** - Draws maximum power while stationary for extended periods (e.g.: welding stations, testing equipment, or cranes that repeatedly lift in the same location). Current-induced heat is not easily dissipated when collectors are stationary. In these cases, verify that the collectors and conductors are adequate for the application.

Current and Voltage Requirements

The purchase of a new conductor system affords the opportunity to size the system for additional cranes or larger cranes that may be added in the future. A small investment now could avoid major investments in the future.

- **Conductor Bar Rating** – Per NEC Article 610-14, the bar must accommodate 100% of the current of all the largest motors involved in a single movement, plus 50% of the next largest motors. The auxiliary hoist motor must be included if it works in conjunction with the main hoist. The system also must accommodate 100% the current draw of auxiliary equipment such as magnets, lighting, air conditioners, etc. that operate when the largest motors are energized.
- **Multiple Cranes on a Single Runway** – Sum the amperage requirements of each crane, then apply the appropriate "diversity factor" (NEC Table 610-14e). All cranes do not pull the maximum load all the time or pull the load at the same time.
- **Two Cranes Working in Tandem** - Do not apply the diversity factor, since both run at the same time. See Specification Data Sheet, Pgs. 6-7 for further "total load" calculation details.

Appendix I - Selection of Systems

- **Voltage Rating** - 600 volt rated insulators are standard. Higher voltages require insulators designed for that voltage. Conductor separation may also be affected for medium voltage (e.g. 4160 volts) and higher. The conductor system may need to meet the fault force requirements as determined by a qualified engineer.

Voltage Drop and Power Feed Locations

Voltage drop along a conductor increases as system length increases and as ambient temperature increases.

- **Maximum Voltage Drop** - The CMAA (Crane Manufacturers Association of America) recommends a maximum volt age drop of 3% on runways and 2% on bridges. The voltage drop in volts will vary according to voltage available. For example, a 3% voltage drop on a 480 volt system is 14.40 volts; a 3% voltage drop at 115 volts is 3.45 volts.
- **Center Power Feed** - Is the optimal location for most systems. Longer runs may require multiple power feed locations to compensate for voltage drop and to minimize the total cost of the system.
- **Multiple Power Feeds** - Can reduce total system cost if the savings of a lower capacity bar offsets the cost to install the multiple powerfeed locations.
- **Calculating Voltage Drop** - Use Conductix-Wampfler Quick Quote (see Pg. 5) to automate this calculation, as shown in the examples below. Voltage drop can also be manually calculated – see Appendix II, Pg. 87.

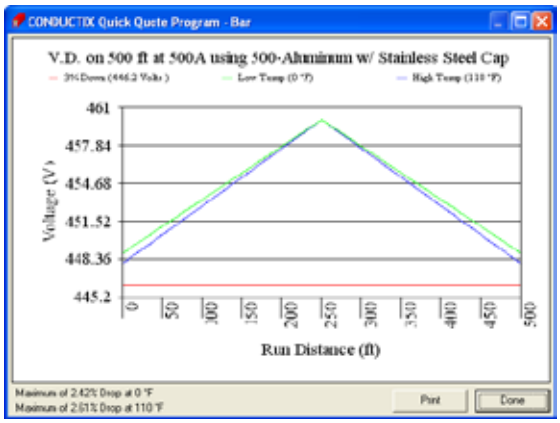


Figure 1 – Center Feed Example: Voltage drop along a 500 foot (152.4 meters) long runway with one crane drawing 500 amps at 460 volts on a 500 amp rated bar. The green line shows the voltage drop along the run at 0^0 F. The blue line shows the voltage drop at 110^0 F. The red line indicates the 3% maximum voltage drop. The voltage drop increases linearly as you move away from the center feed point.

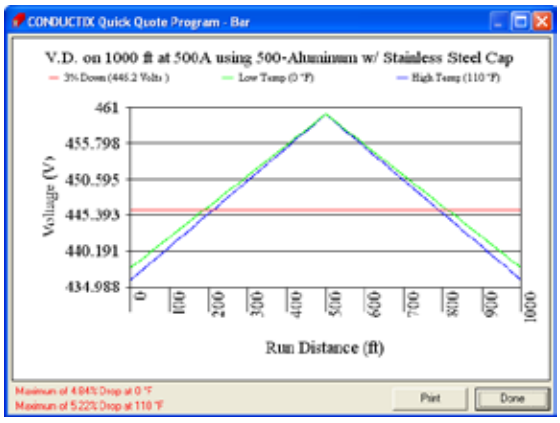


Figure 2: - Same parameters as Fig. 1, except with a 1000 foot (304.8 meters) system. Note that the voltage drop is now greater than the recommended 3%.

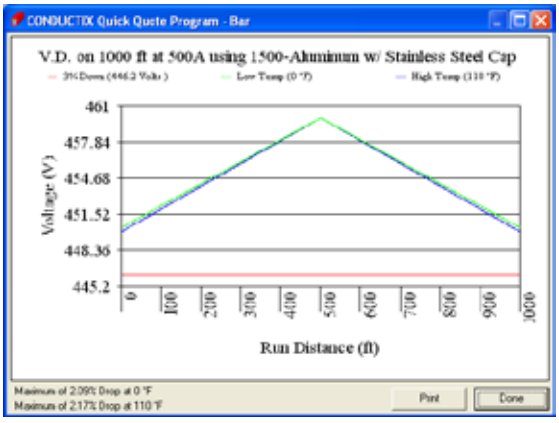


Figure 3: Center Power Example: With higher capacity 1500 amp bar to lower the voltage drop below 3%.

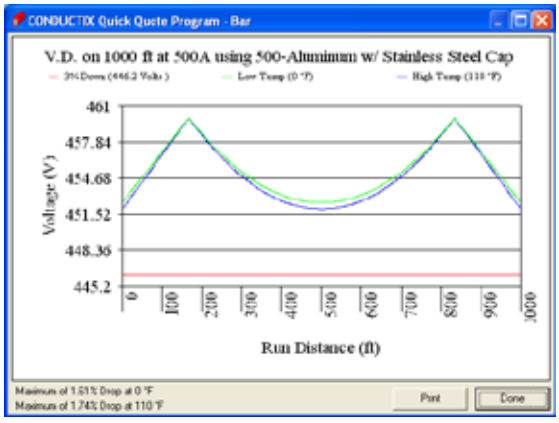


Figure 4: Two power feeds optimally located. The voltage drop remains under 3% , without the need to increase conductor capacity. A load positioned between the two feed points is supplied by both power feeds.

Appendix I - Selection of Systems

Thermal Expansion/Contraction and Other Effects of Heat

The effects of thermal expansion and contraction become more pronounced as the length of the run increases. The combination of ambient heat plus current-induced heat affects the size of conductor bar needed, the power feed arrangement, and the type of insulating cover required.

- **"Snaking"** – Occurs when the conductors heat up, and due to cumulative hanger friction, start to bow to the side. This can be observed by sighting down the runway. Each bar will bow alternately left and right between hangers, which puts strain on the collectors and hangers. Eventually, the collectors can disengage and damage the system.
- **"Snaking" - Older Systems -** May begin after a year or two in operation. This is because accumulated dirt increases friction between bar and hangers. This possibility should be considered when determining the number of expansions. Precautions taken at the time of installation could avoid costly repairs later.
- **Shorter Systems** - Can be anchored in the center. As the temperature of the conductor rises, the expansion simply pushes the bar outward. The longest system that can be successfully "center-anchored" depends on the friction of the hangers and the rigidity of the conductor.
- **Longer Systems** - Require the installation of one or more **"Expansion Sections"** - i.e. lengths of conductors designed to slide in and out to absorb bar expansion/contraction between anchor points. The slider is bridged by a jumper cable to maintain electrical continuity and acts as the running surface for the collector. Expansion sections effectively break the run into smaller lengths defined by the anchor points. The length of run an expansion section can accommodate is based on expansion/contraction parameters, including temperature range, conductor material, and the length of the slider. The **high end** of the temperature range is the sum of current-induced heat of the bar (at maximum load) plus the highest ambient temperature. The **low end** is the lowest ambient temperature, which may occur during a January system shutdown. Conductor sections need to be anchored properly between each expansion and between the last expansion and the end of the run.
- **Ambient Heat** – All heat sources must be considered and evaluated for their effect on the conductor and cover. Typical heat sources are furnaces, billets, slag, etc. Ambient heat is easy to measure and the effects are consistent with measured values.
- **Radiant Heat** - Can be difficult to measure and its effects hard to anticipate. It will directly affect cover, and the cover might withstand it. However, the effect on metal components might be even more pronounced. For example, metal hangers may heat to such a degree that they will melt the cover. Heat shields provide a good way of minimizing the effects of radiant heat. If heat shields are not practical, higher temperature rated covers might be required.
- **Total Operating Temperature** – The sum of the ambient temperature, radiant heat, and current-induced temperature rise. This is the total heat the conductor and its cover material must withstand. For example, if your machine is working in an ambient temperature of 120^0 F (49^0 C), and the current-induced temperature rise of the conductor adds another 50^0 F, the total 170^0 F (76.7^0 C) exceeds the PVC cover rating of 70^0 C (156^0 F). The cover will deform or melt, and interfere with collector tracking and/or interrupt power. In this scenario, the cover must be made from a heat-resistant material. Conductix-Wampfler offers "Medium Heat" or "High Heat" covers for most systems – see Pg. 4.

Conductor Bar Current Rating and Duty Cycle

- **Conductor Electrical Capacity** – A wide variety of capacities are offered, since conductors often power multiple vehicles. Ratings are based on the electrical load the conductor can handle before the operating temperature of the bar exceeds the temperature rating of its cover. The rating assumes a certain ambient temperature (e.g.: 49^0 C or 120^0 F) and a specific duty cycle.
- **Duty Cycle** - One manufacturer may rate their conductors for continuous duty; others for intermittent duty based on a given duty cycle. It is important to know which was used to establish the ratings.

Appendix I - Selection of Systems

- **Continuous Duty** - A conductor is put under a continuous load at some "normal" ambient, usually 30^0 C. Once the bar temperature has stabilized at the target load rating, the bar temperature cannot exceed the temperature rating of the cover. Most PVC covers can handle approximately 70^0 C, which is a 40^0 C rise over 30^0 C ambient.
- **Intermittent Duty** - Assumes that the current is "on" for a period of time and "off" for a period of time; i.e. one "duty cycle". The conductor is allowed to cool between "on" phases. A 50% duty cycle is most common – i.e. one minute on and one minute off. Since a crane cannot lift continuously, nor is current flowing at maximum for long periods of time, most operate at a 40% duty cycle or less. So a 50% duty cycle is sufficient. However, cranes that see heavy duty, especially Class D and E cranes (see end of this Appendix), may push the conductor beyond a 50% intermittent duty rating.
- **Collector Electrical Capacity** – A limited selection of collector capacities is available, since collectors only power the crane/vehicle they service. Additional collectors can be used if the crane/vehicle load exceeds the collector rating. Note that the load will not be shared equally among multiple collectors. The collector closest to the power feed will carry a larger load than those farther down the line. So when using multiple sets of collectors, make sure the collector capacities are adequate for this scenario

CMAA Crane Classifications

Provided for general information only. Refer to CMAA Section 78-6 for full definitions.

Class A (Standby or Infrequent Service) Performs precise lifts at slow speed, with long idle period between lifts. Performs lifts at full or near rated capacity. Power houses, public utilities, turbine rooms.

Class B (Light Service) Light service requirements at slow speed. Performs 2 to 5 lifts/hour, light to occasional full loads, at 10 ft. average height. Repair shops, light assembly, service buildings, light warehousing.

Class C (Moderate Service) Moderate service requirement with loads averaging 50% of capacity. 5 to 10 lifts per hour at 15 foot average lift height. Not more that 50% of lifts at rated capacity. Machine shops, paper mill machine rooms, etc.

Class D (Heavy Service) Bucket/magnet duty, where heavy duty production is required. Loads of 50% capacity handled constantly. 10 to 20 lifts per hour averaging 15 ft. lift-height. Not over 65% of the lifts at rated capacity. Heavy machine shops, foundries, fabricating plants, steel warehouses, container yards, lumber mills, etc.

Class E (Severe Service) Loads approaching capacity throughout the life of the crane. 20 or more lifts per hour at or near rated capacity. Magnet/bucket cranes for scrap yards, cement mills, lumber mills, fertilizer plants, container handling.

Class F (Continuous Severe Service) Handles loads approaching capacity continuously under severe service conditions throughout the life of the crane. Includes custom designed specialty cranes performing work critical to the total production facility. Needs to have the highest reliability and ease of maintenance.

For system recommendations based on Crane Class, contact Conductix-Wampfler Sales.

Appendix II - Voltage Drop Calculations

Proper selection of conductor and covers for Conductix-Wampfler conductor systems is simple, requiring only the ampacity, voltage and ambient conditions.

The method for determining the rating for cranes and hoists is completely outlined in NEC 640-14(e). Further reference to the Code is made where applicable.

I. For a single crane, simply use the nameplate full load ampere rating of the largest motor or group of motors for any one function plus half the rating of the next largest motor or motor groups.

Hoist = 65A x 1 = 65.0
Bridge = 27A x .5 = 13.5
Total 78.5A

For multiple cranes, use the same method for each crane, add the results and multiply by the demand factor shown in table 610-14(e) NEC Book. Examples with data taken from motor nameplates - all are 460V, 3-phase, 60 Hz.

Crane #1
Hoist = 65A x 1 = 65.0
Bridge = 27A x .5 = 13.5
Total 78.5A

Crane #2
Hoist = 52A x 1 = 52.0
Bridge = 14A x .5 = 7.0
Total 59.0A

Total of #1 + #2 137.5 x .195 = 130.0A

II. When the motor ampere ratings are unknown, a good approximation may be made using the nominal horse power ratings of the motors, converting them to full load amperes per NEC table 430-150; then proceed as above. If the motors are not three-phase, applicable tables 430-137 through 430-149 must be used.

A few examples from the tables are:

Full-Load Current (Three-Phase Alternating-Current Motors)

HP	230V	460V	575V
10	28	14	11
15	42	21	17
20	54	27	22
25	68	34	27
30	80	40	32
40	104	52	41
50	130	65	52
60	154	77	62
75	192	96	77
100	248	124	99
125	312	156	125
150	360	180	144
200	480	240	192

Full-Load Current in Amperes, Direct-Current Motors Armature Voltage Rating (Direct-Current)

HP	240V	HP	240V
10	38	60	206
15	55	75	255
20	72		
25	89		
		100	341
30	106	125	425
40	140	150	506
50	173	200	675

Voltage Drop

Voltage drop is the difference between the voltage at the feed point and the voltage at the extreme end. It is usually expressed as a percentage of the supply voltage and can be calculated as shown below.

Voltage drop increases in direct proportion to the length of the conductors. The CMAA specifications limit total voltage drops to 3% on runways and 2% on bridge conductors. Since power feeds are usually located at the mid-point of a system, the effective length is the distance from power feed to the end of the runway. On longer systems it may be necessary to provide additional feed points.

Voltage Drop per 100 Feet of Run Per 100A of Current

Conductor	3-Phase 60 Hz	D.C.	Example
Stainless Steel 40A	35.2	44.6	
Galvanized Steel 90A	16.2	15.0	
Galvanized Steel 110A	10.1	7.1	Rolled Copper 3-phase 350' long, 250A load.
Stainless Clad Copper 250A	2.01	2.0	VD = 1.39 x 3.5 x 2.5 = 12.1 volts
Copper Steel Laminate 250A	2.01	2.0	Assume load pF is 90
Rolled Copper 350A	1.39	1.2	
Solid Copper 500A	1.08	0.8	

3% at Max Amps and Length from Power feed			
Bar	**Amps**	**480V**	**240V**
SS	40	102'	51'
Galv	90	99'	49'
Galv	110	130'	65'
SS / CU	250	287'	144'
CU / Galv	250	287'	144'
Rolled Cu	350	296'	148'
Solid Cu	500	381'	191'

3% of 480V = 14.4
2% of 240V = 7.2
2% of 180V = 9.6
2% of 240V = 4.8

Appendix III Electrical Formulas & Conversions

Electrical Formulas

Ohms Law

Ohms = $\frac{\text{volts}}{\text{amperes}}$

Amperes = $\frac{\text{volts}}{\text{ohms}}$

Volts = amperes x ohms

Power

Watts = amperes x volts

Amperes = $\frac{\text{watts}}{\text{volts}}$ (not 3-Phase)

HP = $\frac{\text{volts x amps x efficiency}}{746}$

Power Factor = $\frac{\text{watts}}{\text{amperes x volts}}$

3-phase Kilowatts = $\frac{\text{volts x amperes x power factor x 1.732}}{1000}$

3-phase Amperes = $\frac{\text{746 x HP (Horsepower)}}{\text{1.732 x volts x efficiency x power factor}}$

3-phase Volt-Amperes = volts x amperes x 1.732

Single-phase Kilowatts = $\frac{\text{volts x amperes x power factor}}{1000}$

Single-phase Amperes = $\frac{\text{746 x HP (Horsepower)}}{\text{volts x efficiency x power factor}}$

Speed

Synchronous RPM = $\frac{\text{Hertz x 120}}{\text{poles}}$

Percent Slip = $\frac{\text{Synchronous RPM - Full Load RPM}}{\text{Synchronous RPM}}$ x 100

Metric Conversions

To Obtain	Multiply
Millimeters	Inches x 25.4
Inches	Millimeters x 0.0394
Meters	Feet x .3048
Feet	Meters x 3.281
Square Centimeters	Square Inches x 6.45
Square Inches	Square Centimeters x 0.155
Kilograms	Pounds x 0.4536
Pounds	Kilograms x 2.205
Kilograms per Meter	lb/ft (divided by) .6719
Pounds per Foot	kg/m X .6719
Degrees Celsius	(Degrees F-32) x 5/9
Degrees Fahrenheit	(Degrees C x 9/5) + 32

Appendix IV Terms, Conditions, and Warranty

The technical data and images which appear in this catalog are for informational purposes only. NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE CREATED BY THE DESCRIPTIONS AND DEPICTIONS OF THE PRODUCTS SHOWN IN THIS CATALOG. Conductix-Wampfler ("seller") makes no warranty and assumes no liability as to the function of equipment or the operation of systems built according to customer design or of the ability of any of its products to interface, operate or function with any portions of customer systems not provided by Conductix-Wampfler.

Seller agrees to repair or exchange the goods sold hereunder necessitated by reason of defective workmanship, and material discovered and reported to Seller within one year after shipment of such goods to Buyer. Except where the nature of the defect is such that it is appropriate in Seller's judgement to effect repairs on site, the seller's obligation hereunder to remedy defects shall be limited to repairing or replacing (at Seller's option), FOB point of original shipment by Seller, any part returned to Seller at the risk and cost of Buyer. Defective parts replaced by Seller shall become the property of Seller.

Seller shall only be obligated to make such repair or replacement of the goods which have been used by Buyer in service recommended by Seller and altered only as authorized by Seller. Seller is not responsible for defects which arise from improper installation, neglect, or improper use or from normal wear and tear.

Additionally, Seller's obligation shall be limited by the manufacturer's warranty (and shall not be further warranted by Seller) for all parts procured from others according to published data, specifications, or performance information not designed by or for Seller.

Seller further agrees to replace, or at Seller's option to provide a refund of the sales price of any goods that did not conform to applicable specifications or which differ from that agreed to be supplied which non-conformity is discovered and forthwith reported to Seller within thirty (30) days after shipment to Buyer. Seller's obligation to replace or refund the purchase price for non-conforming goods shall arise once Buyer returns such good FOB point of original shipment by Seller at the risk and cost of Buyer. Goods replaced by Seller shall be come property of Seller.

There is no guarantee or warranty as to anything made or sold by Seller, or any service performed, except as to title and freedom from encumbrances, and except as herein expressly stated and particularly without limiting the foregoing. There is no guarantee or warranty, express or implied, of merchantability or of fitness for any particular purpose or against claim of infringement or the like.

Seller makes no warranty (and assumes no liability) as to function of equipment or operation of systems built to Buyer's design or of the ability of any goods to interface, operate or function with any portions of Buyer's system not provided by Seller.

Seller's liability on any claim; whether in contract (including negligence) or otherwise, for any loss or damage arising out of, connected with, or resulting from the manufacture, sale, delivery, resale, repair, replacement or use of any products or, services shall in no case exceed the price paid for the product or services or any part thereof which give rise to the claim. In no event shall Seller be liable for consequential, special, incidental or other damages, nor shall Seller be liable in respect to personal injury or damage to property on the subject matter hereof unless attributable to gross misconduct of Seller, which shall mean an act of omission by Seller demonstrating reckless disregard of the foreseeable consequences thereof.

Seller is not responsible for incorrect choice of models or where products are used in excess of their rated and recommended capacities and design functions or under abnormal conditions. Seller assumes no liability for loss of time, damage or injuries to property or persons resulting from the use of Seller's products. Buyer shall hold Seller harmless from all liability, claims, suits and expenses in connection with loss or damage resulting from operation of products or utilization of services, respectively, of Seller and shall defend any suit or action which might arise there from Buyer's name, provided that Seller shall have the right to elect to defend any such suit or action for the account of Buyer. The foregoing shall be the exclusive remedies of the buyer and all persons and entitles claiming through the Buyer.

Other Conductor Rail Products

Conductor rails made in the Weil am Rhein, Germany Conductix-Wampfler plant are an ideal choice for the transmission of digital data and power up to 2000 amps and beyond. Special metal rails are used for the accurate transmission of data. Conductix-Wampfler's innovative electronic Powertrans is an extremely efficient system that permits reliable data transmission even under difficult operation conditions.

Conductix-Wampfler rails are available in any number of poles in any desired length and are designed for ease of installation. The rails feature robust construction suitable for harsh industrial environments. Heavy-duty collector assemblies guarantee reliable transmission without interruption for trouble-free operation.

Current collectors move along three axes to compensate for variations in assembly tolerances and inevitable travel variations during operation. This permits uninterrupted transmission of energy and digital data and keeps wear to a minimum. Conductor rails are available for travel speeds up to 33 feet per second.

The experienced engineering and sales people at Conductix-Wampfler are experts in the application of conductor rails to all kinds of industrial applications

For more information on these rail designs, please contact Conductix-Wampfler.

All Conductix-Wampfler plants in the United States, Germany, France, and Italy are ISO 9001:2000 certified. Our stringent quality systems assure that you will get the right product every time. See Pg. 91 for a sampling of our other quality products.

In 2007, with the merger of Conductix and Wampfler, the company is now the world leader in the design and manufacture of high performance energy and data transmission products for industrial applications.

811 Series

Available from 10 to 100 amps for automated storage and retrieval systems, monorails, cranes, and specials machines. Straight or curved tracks.

812 Series

Available from 25 to 400 amps. Ideal for mid-sized cranes, people movers, amusement rides, and special machines. Stainless steel running surface for straight or curved track.

813 Series

Available from 500 to 1250 amps Works well for heavy cranes, people movers, and special machines. Patented stainless steel running surface for straight or curved tracks.

815 Series

Available from 32 to 100 amps. A compact multi-conductor system for electrified overhead monorails and slip rings. Either .47 inch (12mm) or .55 inch (14mm) spacing. Straight or curved tracks.

831 Series

Handles from 10 to 125 amps, in 3, 4, or 5 pole configuration. Great for cranes, automated storage and retrieval systems, and special machines. Straight tracks.

842 Series

Accommodates from 35 to 140 amps in a continuous conductor strip and enclosed "box track" system. 5 or 7 poles. For cranes, ASRS systems, and work stations.

Your Applications - our Solutions

Compressed air and electric supply systems from Conductix-Wampfler represent only one of the many solutions made possible by the broad spectrum of Conductix-Wampfler components for the transport of energy, data and fluid media. The solutions we deliver for your applications are based on your specific requirements. In many cases, a combination of several different Conductix-Wampfler systems can prove advantageous. You can count on all of Conductix-Wampfler's Business Units for hands-on engineering support - coupled with the perfect solution to meet your energy management and control needs.

Cable reels

Motorized reels and spring reels by Conductix-Wampfler hold their own wherever energy, data and media have to cover the most diverse distances within a short amount of time - in all directions, fast and safe.

Festoon systems

It's hard to imagine Conductix-Wampfler cable trolleys not being used in virtually every industrial application. They're reliable and robust and available in an enormous variety of dimensions and designs.

Conductor rails

Whether they're enclosed conductor rails or expandable single-pole systems, the proven conductor rails by Conductix-Wampfler reliably move people and material.

Non-insulated conductor rails

Extremely robust, non-insulated conductor rails with copper heads or stainless steel surfaces provide the ideal basis for rough applications, for example in steel mills or shipyards.

Energy guiding chains

The "Jack of all trades" when it comes to transferring energy, data, air and fluid hoses. With their wide range, these energy guiding chains are the ideal solution for many industrial applications.

Slip ring assemblies

Whenever things are really "moving in circles", the proven slip ring assemblies by Conductix-Wampfler ensure the flawless transfer of energy and data. Here, everything revolves around flexibility and reliability!

Inductive Power Transfer IPT®

The no-contact system for transferring energy and data. For all tasks that depend on high speeds and absolute resistance to wear.

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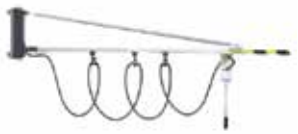
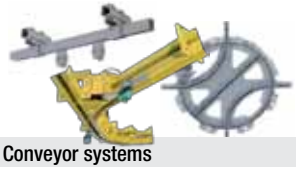
Whether for hoses or cables, as classical reels or high-precision positioning aids for tools, our range of reels and spring balancers take the load off your shoulders.



Jib boom

Complete with tool transporters, reels, or an entire media supply system - here, safety and flexibility are key to the completion of difficult tasks.



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