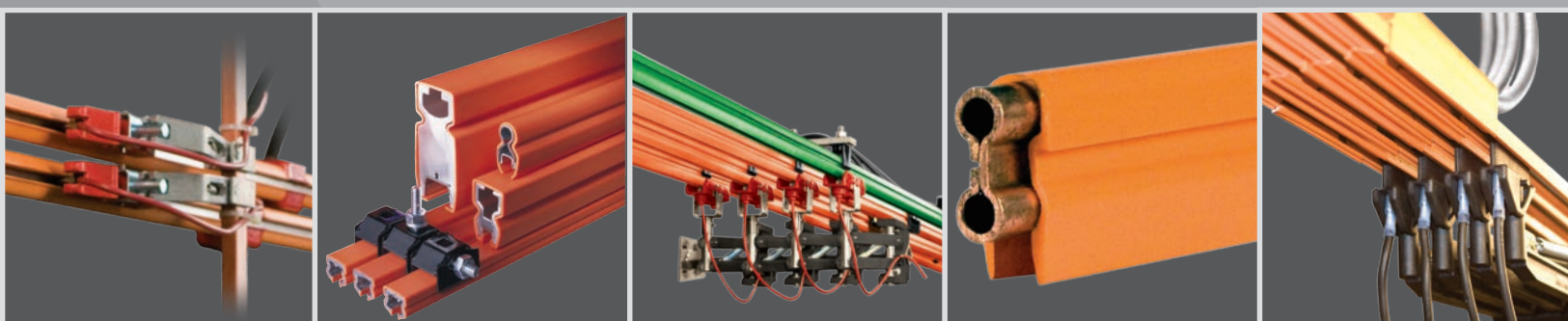


Conductor Bar

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

Saf-T-Bar®



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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: 110 300 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) 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 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:

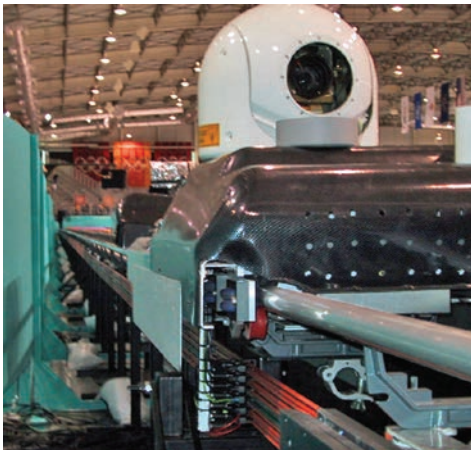
- Handles most common festoon mounting configurations
- Allows set-up cable package arrangements and clamp configurations
- Handles festoon pre-wiring and pre-assembly options

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.

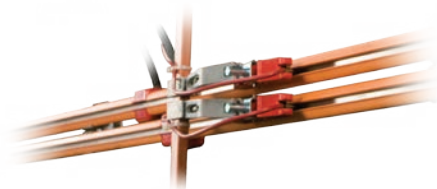
The "Americas branch" of Conductix-Wampfler was founded in 1944 as Insul-8 Corporation. Insul-8 developed the first "Figure 8" conductor bar system, which became the standard method for electrifying overhead cranes. In 1991 the company moved its manufacturing facility to its current location in Harlan,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



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

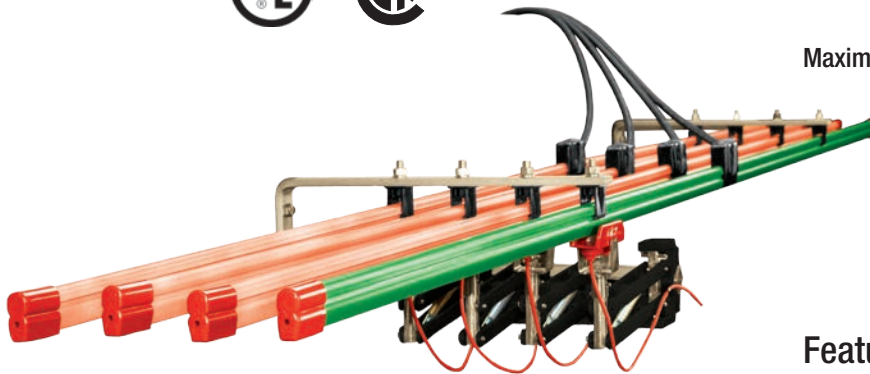
For details on conductor bar products manufactured by Conductix-Wampfler Germany, please refer to catalog KATO***-0001-US (***) = series no.)



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
- Hoists
- Conveyors
- Tightly curved systems
- Monorails
- Other mobile power applications

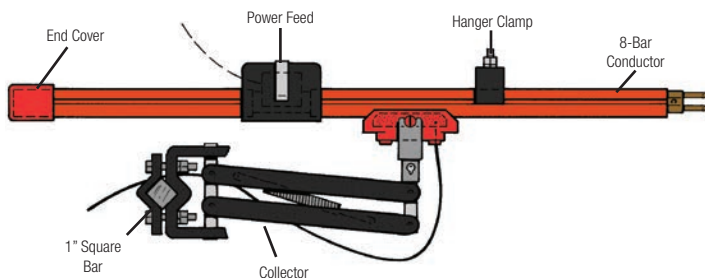
Current range: 40A, 90A, 110A, 250A, 350A, 500A
@ 600 volts max.

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

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.

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

Installs Quickly and Easily

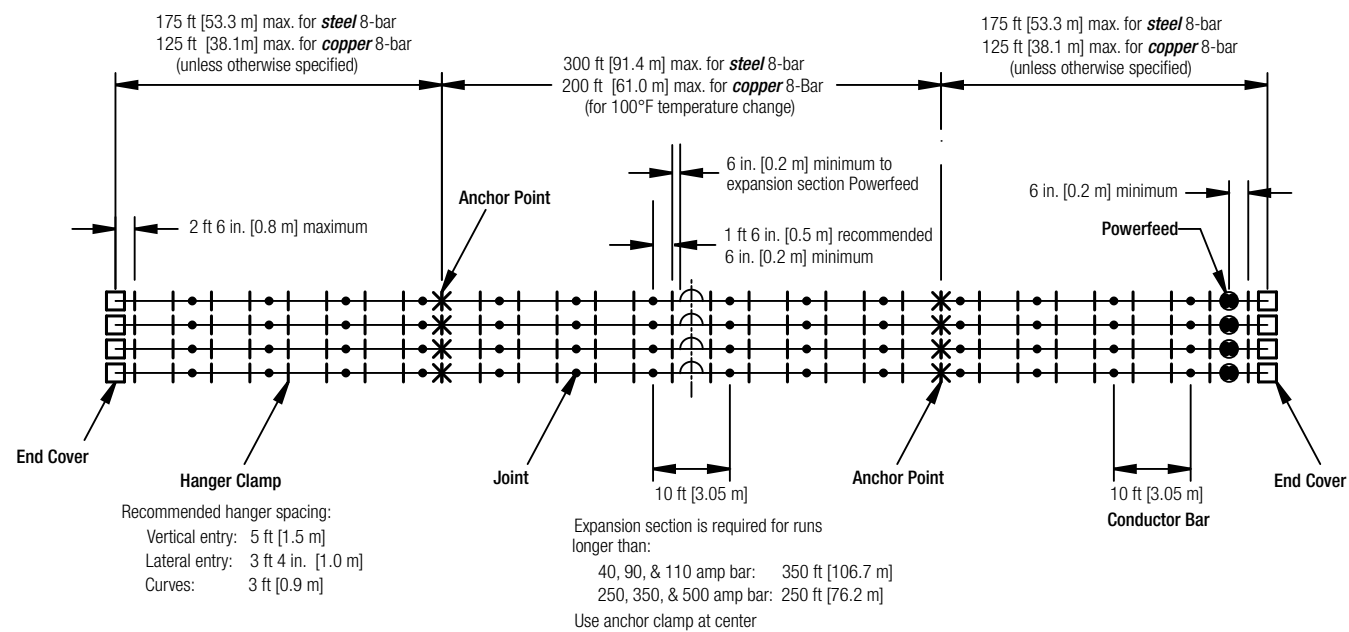
- Minimum number of basic parts
- Quick "pin-style" splice joints
- Bar snaps into mating hanger

Many Options

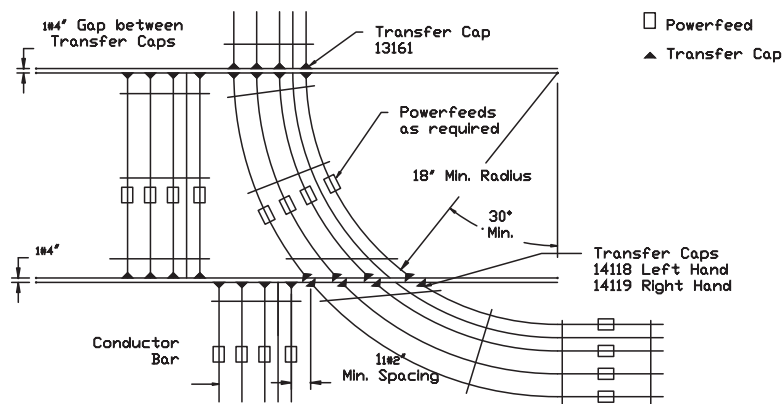
- Stainless steel hardware
- Green bonding (ground) conductor covers
- Black "UV stable" outdoor covers
- Curved systems with low heat cover; can be curved to 18" minimum radius with the bar profile vertical (i.e. the "easy" way) or 45" the "hard way" (low heat cover).

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

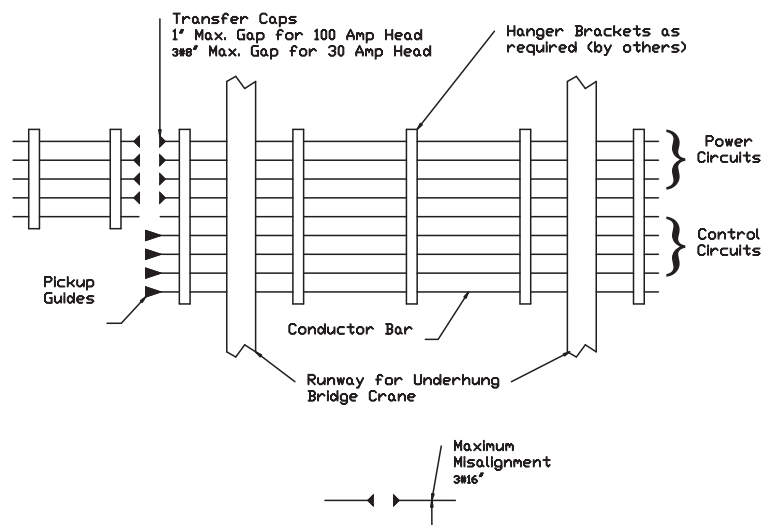
8-Bar Typical 4-Bar Layouts



2-WAY STUB SWITCH



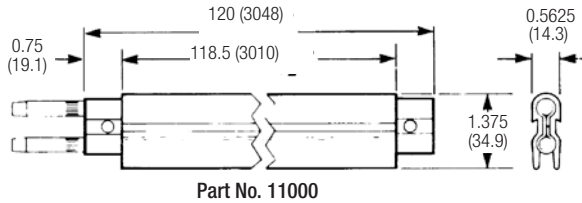
BRIDGE CRANE INTERLOCK



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.



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 mm²); except solid copper bar which is 313 mcm (158 mm²). 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										
Part No.							Micro-ohms per foot *			
Material	Lgth ft (m)	w/PVC Cover	w/Med Heat Cover	w/High Heat Cover	Expansion Coefficient in./in./°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 μ of 10-12 is used for the steel conductor calculations. For reference, $X = \mu \frac{52.9 \log 10^3 \times 1.26 + 34.5}{1250}$ $Z = \sqrt{R^2 + X^2}$

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° F to 160° F (- 23.3°C to 71.1°C)
- **Medium Heat:** - 25° F To 250° F (- 31.7°C to 121.1°C)
- **High Heat:** - 60° F To 400° F (-51.1°C to 204.2°C)

Stainless Steel, 40A



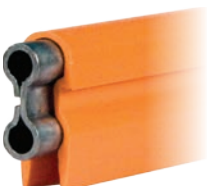
Item	Rigid PVC Cover		Med Heat Cover		High Heat Cover	
	Part No.	Wt lb (kg)	Part No.	Wt lb (kg)	Part No.	Wt lb (kg)
Conductor Bar, 10 ft (3.05 m)	14299	7.0 (3.18)	24304	6.6 (2.29)	24307	7.5 (3.40)
Conductor Bar, 5 ft (1.52 m)	14823	3.5 (1.59)	24305	3.3 (1.50)	24308	3.8 (1.72)
Expansion Section, 10 ft (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° F to 160° F (- 23.3°C to 71.1°C)
 - Medium Heat: - 25° F To 250° F (- 31.7°C to 121.1°C)
 - High Heat: - 60° F To 400° F (-51.1°C to 204.2°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° F to 160° F	11114	1.2 (0.54)
Rigid PVC	Green	-10° F to 160° F	11114G	1.2 (0.54)
UV Stable PVC	Black	-10° F to 160° F	11114B	1.2 (0.54)
Medium Heat Lexan	Red	-25° F to 250° F	11115	0.8 (0.36)
High Heat Polyester	Dark Orange	-60° F to 400° 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



11117 (Shown with only half of the cover)

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

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



24632 (Shown with only half cover)

To repair joints of damaged conductor bar.

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. °F (°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 °F (°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.



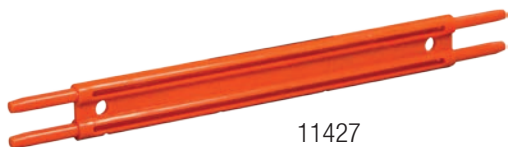
Isolation Section



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



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, Collector Brackets

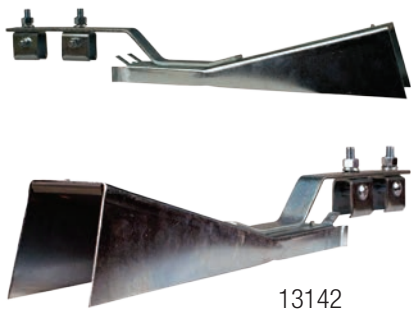
Transfer Caps



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)

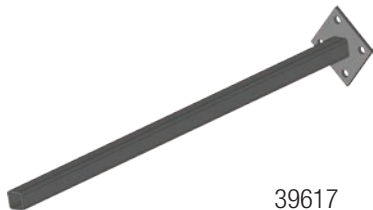
Pick-Up Guides



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)

Collector Brackets



For mounting collectors to the moving vehicle. Applicable for all 8-Bar and Series C Collectors. See Pages 24 & 25 for Collector Assemblies.

TYPE	Type	Post Size in. (mm)	Part No.	Wt lb (kg)
Single Post	Plated Steel	1.00 (25)	39617	1.77 (0.80)
Single Post	Stainless Steel	1.00 (25)	50142	1.77 (0.80)

8-Bar Hanger and Anchor Clamps

Polycarbonate Snap-in Hanger Clamps



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



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

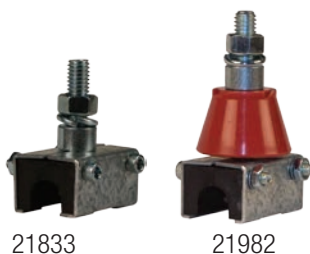


Cross-Bolt Hanger Clamps are designed to lock to 8-Bar Conductors for stable support.

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



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

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

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

Description	Without Insulators		With Insulators	
	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

Description	Without Insulators		With Insulators	
	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

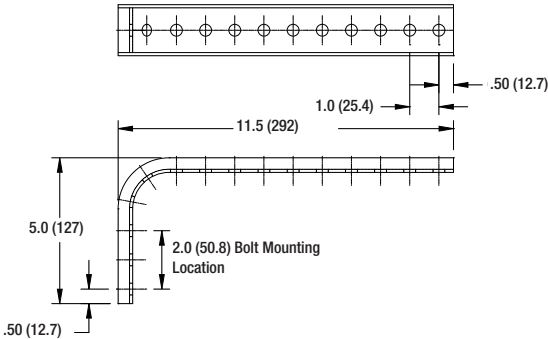
Description	Without Insulators		With Insulators	
	Part No.	Wt lb (kg)	Part No.	Wt lb (kg)
Web type 6"	31762	2.0 (0.907)	29534	2.3 (1.04)
Web type 9"	50312	3.1 (1.406)	50316	3.5 (1.59)
Flange type, 2 hangers each side	51868	2.5 (1.114)	51869	2.9(1.32)
Flange type, 4 hangers on one side	51874	2.5 (1.114)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

8-Bar Universal Brackets

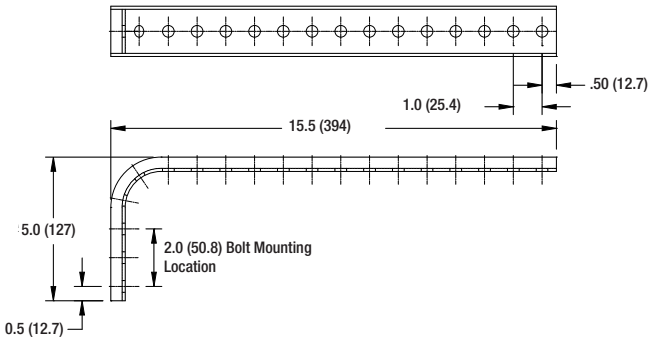
You can order pre-assembled brackets with your choice of hangers on Pg. 21. Or, if these hanger locations don't work for the application, the "Universal Brackets" shown below should address most special applications. Holes are drilled on 1.0 inch (25.4 mm) centers.

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)

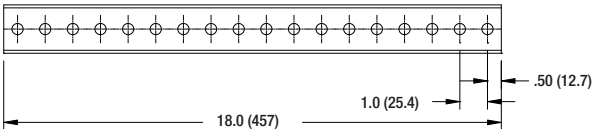
Web Bracket - Short (31409)



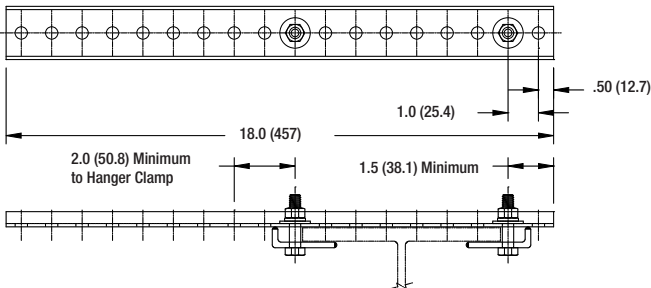
Web Bracket - Long (31407)



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

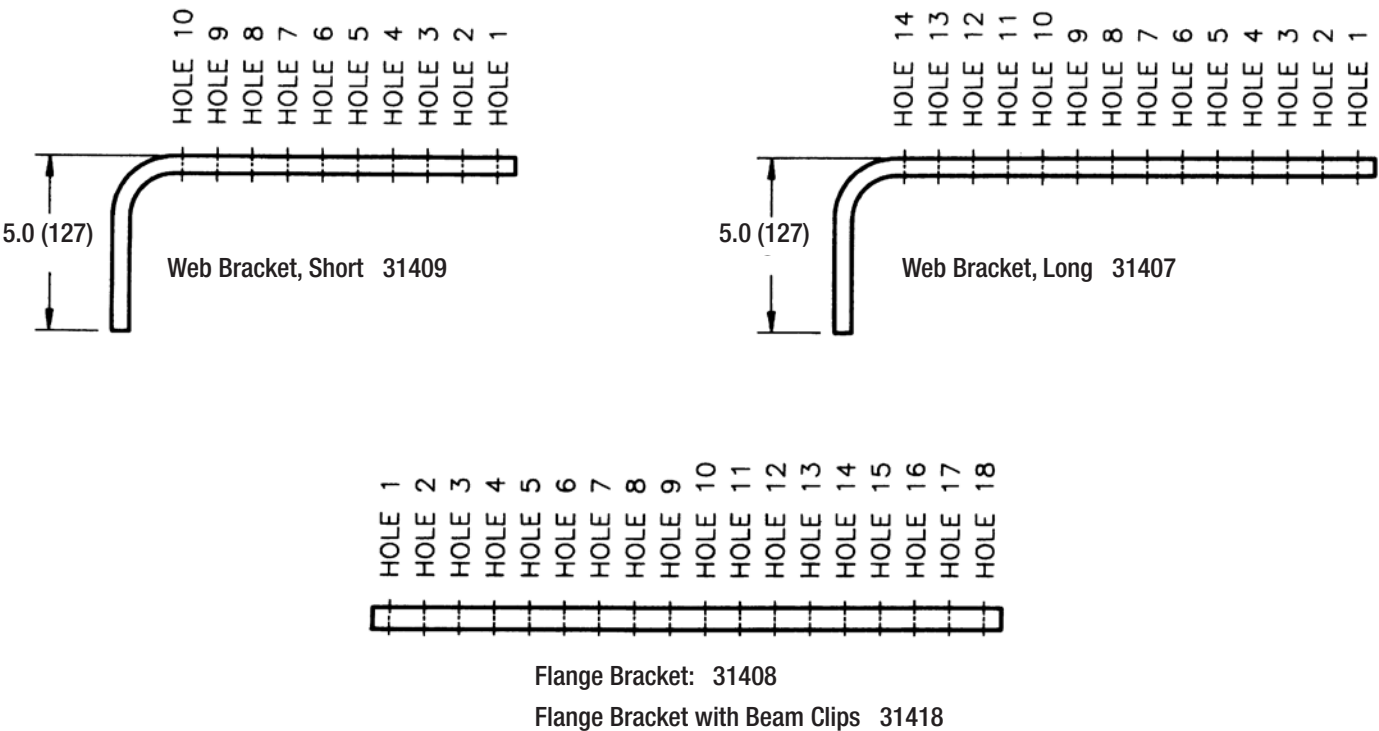
- 3) Select desired hanger type by part number - From Pg. 19.

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)

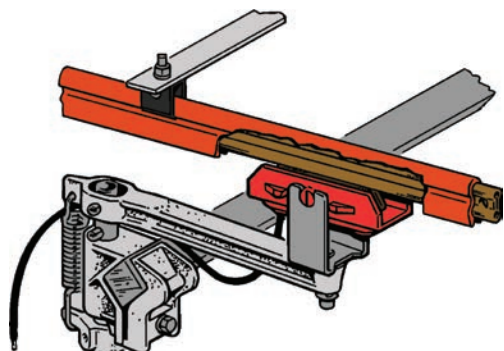
Note: When order is received, a unique part number will be created for the requested bracket/hangers combination.

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



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



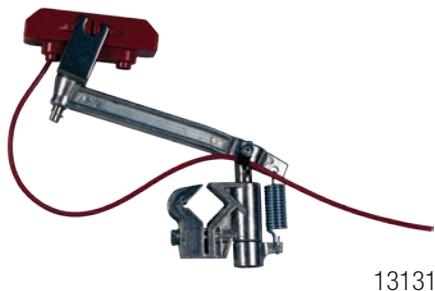
For systems up to 600 volts with straight runs and curves to 18" minimum radius. For lateral mount, consult factory. The "Self-Centering" versions are used with Pick-up Guides - See Pg. 18.

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)
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30A J-Head, H-Base Type



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.

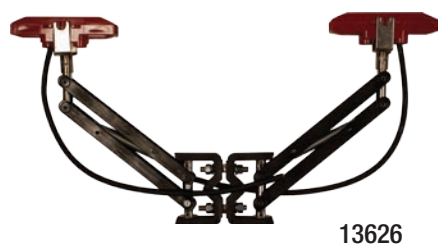
Description	Part No.	Wt lb (kg)
Standard Mount	13131	1.4 (0.64)
Self-Centering Standard Mount	13132	1.7 (0.77)

Replacement Shoe

30 amp replacement shoe	13136	0.4 (0.18)
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8-Bar Collector Assemblies

200A J-Head, C-Base Type



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)
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100A J-Head, H-Base Type



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)
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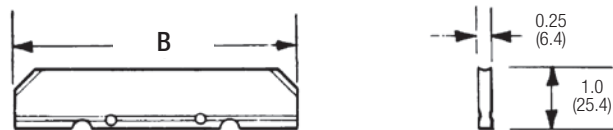
Collector Shoe Information

30 Amps



Contoured Shoe: 18.0 (457) Minimum Radius

100 Amps



Contoured Shoe: 48.0 (1219) Minimum Radius

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

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

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)

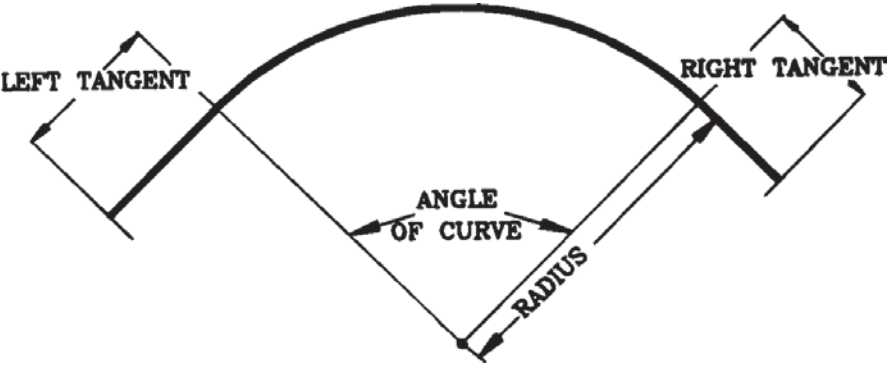
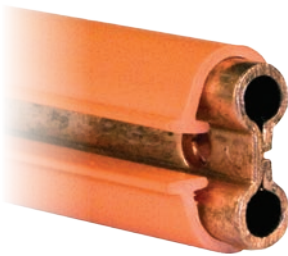
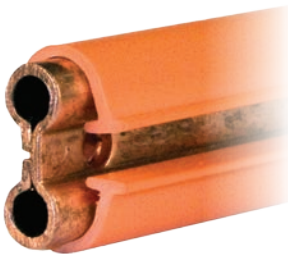
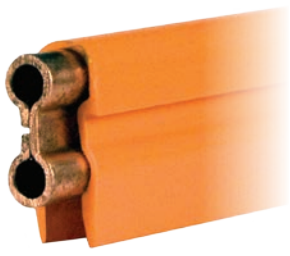
Slip Rings

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°	23626
Stainless Clad Copper Laminate (250A)	18.0 to 35.0 (457 to 889)	Rigid PVC	2-180°	23627
Copper Steel Laminate (250A)	18.0 to 35.0 (457 to 889)	Rigid PVC	2-180°	23628
Rolled Copper (350A)	18.0 to 35.0 (457 to 889)	Rigid PVC	2-180°	23629
Galvanized Steel (110A)	35.1 to 54.0 (892 to 1371)	Rigid PVC	3-120°	23630
Stainless Clad Copper Laminate (250A)	35.1 to 54.0 (892 to 1371)	Rigid PVC	3-120°	23631
Copper Steel Laminate (250A)	35.1 to 54.0 (892 to 1371)	Rigid PVC	3-120°	23632
Rolled Copper (350A)	35.1 to 54.0 (892 to 1371)	Rigid PVC	3-120°	23633
Solid Copper (500A)	35.1 to 54.0 (892 to 1371)	Rigid PVC	3-120°	24292
Galvanized Steel (110A)	54.1 to 72.0 (1374 to 1828)	Rigid PVC	4-90°	23634
Stainless Clad Copper Laminate (250A)	54.1 to 72.0 (1374 to 1828)	Rigid PVC	4-90°	23635
Copper Steel Laminate (250A)	54.1 to 72.0 (1374 to 1828)	Rigid PVC	4-90°	23636
Rolled Copper (350A)	54.1 to 72.0 (1374 to 1828)	Rigid PVC	4-90°	23637
Solid Copper (500A)	54.1 to 72.0 (1374 to 1828)	Rigid PVC	4-90°	24293
Galvanized Steel (110A)	57.0 to 72.0 (1447 to 1828)	Lexan (Med Heat)	4-90°	23638
Stainless Clad Copper Laminate (250A)	57.0 to 72.0 (1447 to 1828)	Lexan (Med Heat)	4-90°	23639
Copper Steel Laminate (250A)	57.0 to 72.0 (1447 to 1828)	Lexan (Med Heat)	4-90°	23640
Rolled Copper (350A)	57.0 to 72.0 (1447 to 1828)	Lexan (Med Heat)	4-90°	23641
Solid Copper (500A)	57.0 to 72.0 (1447 to 1828)	Lexan (Med Heat)	4-90°	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.		

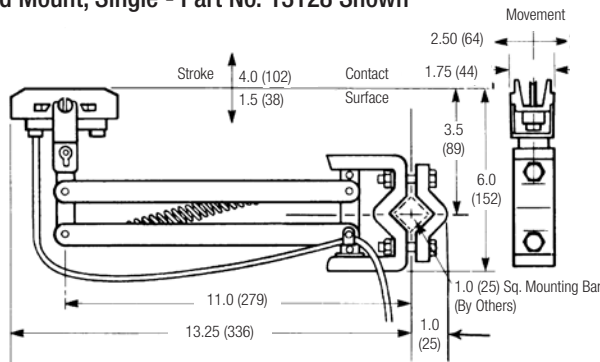
8-Bar Collector Dimensions

C Base Collectors

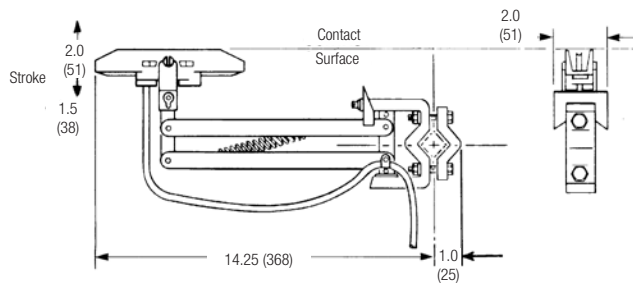
Dimensions common to all C-Base Collectors are not repeated.

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

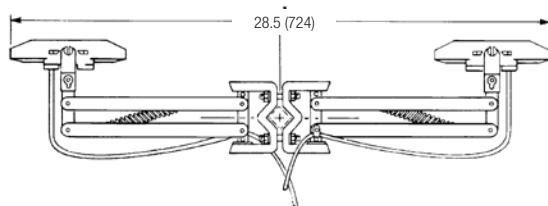
Standard Mount, Single - Part No. 13128 Shown



Self-Centering - Part No. 13625 Shown



Standard Mount, Tandem - Part No. 13626

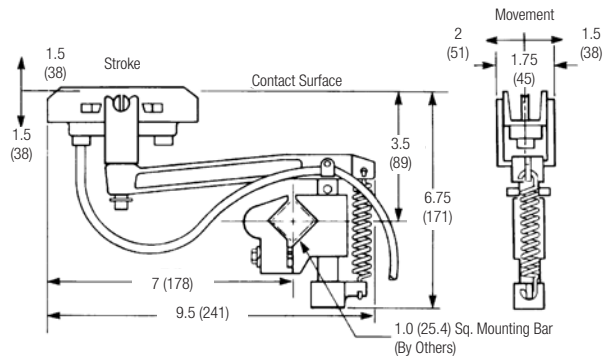


H Base Collector

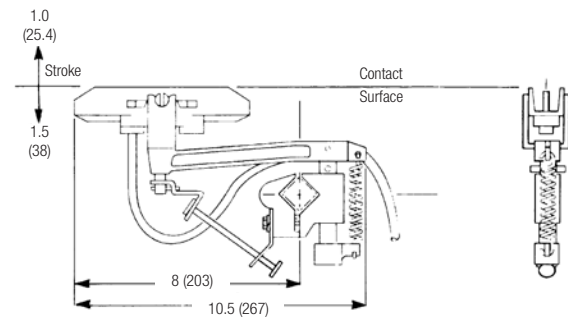
Dimensions common to all H-Base Collectors are not repeated.

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

Standard Mount, Single - Part No. 13131 Shown

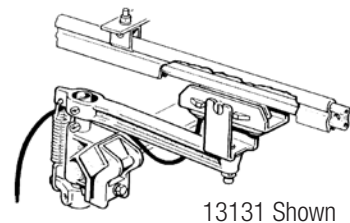


Standard Mount, Single - Part No. 13630 Shown



Collector Mounting

Standard Mount
(Vertical Entry)



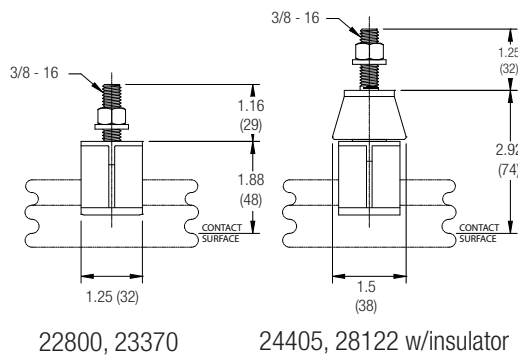
Shoe Pressure

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

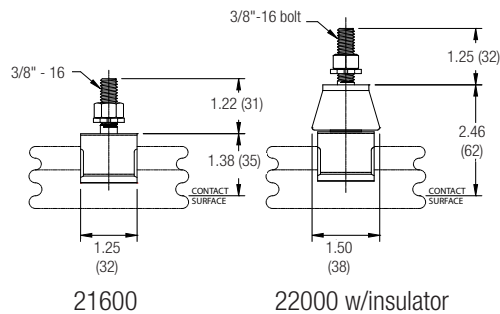
8-Bar Hanger and Anchor Dimensions

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

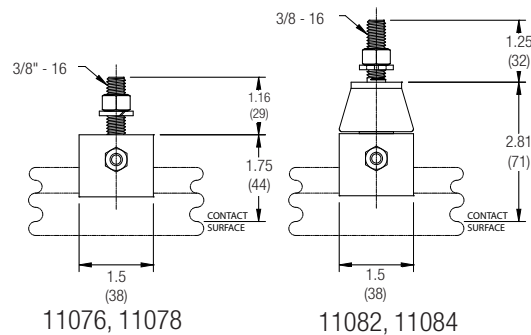
Plastic Snap-in Hanger Clamps, 250° F



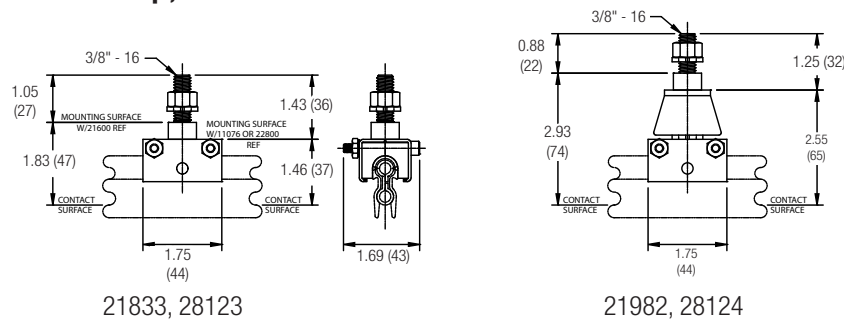
Spring Steel Snap-in Hanger Clamps, 400° F



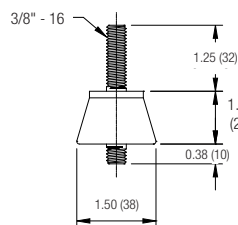
Cross-Bolt Hanger Clamps



Anchor Clamp, 400° F



Insulator, 400° F



11087 (plated inserts); 16424 (stainless inserts)

Transfer Cap, 300° F

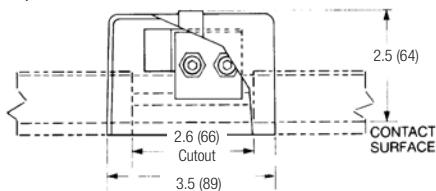


	Center	Left	Right
40, 110, 250, 350 amp	13161	14118	14119
90 amp only	22070	22395	22396

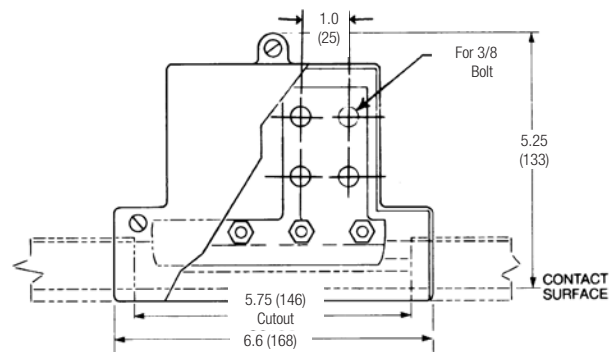
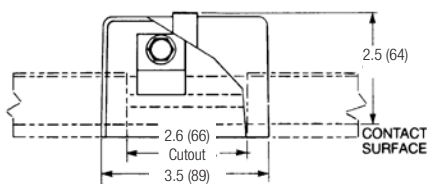
8-Bar Component Dimensions

Powerfeeds

11092, 11093, 27104



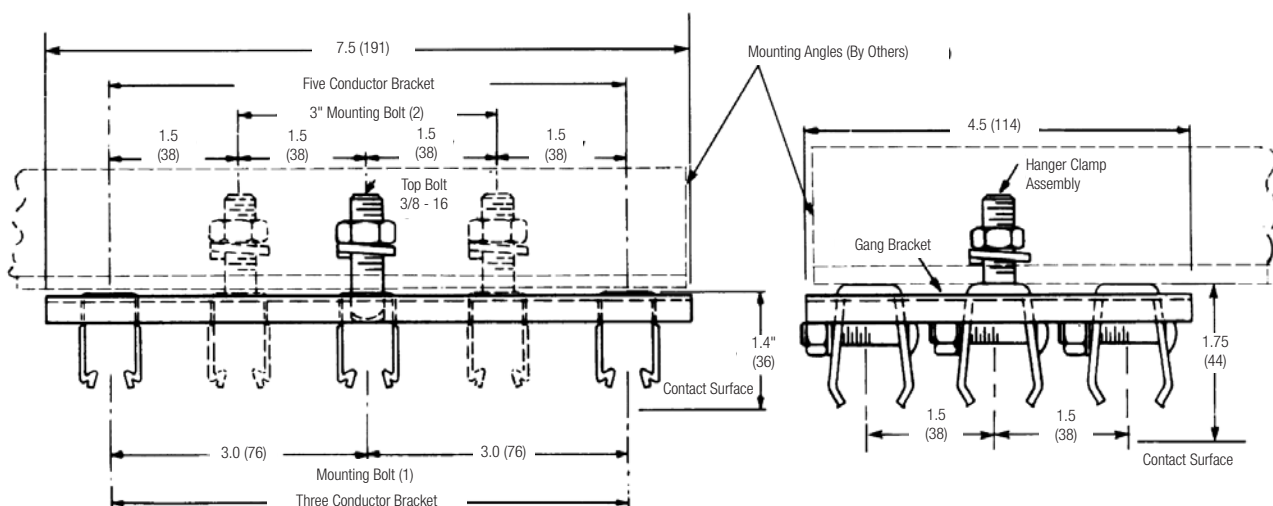
11091, 11122



11094, 27106

Part No.	Current Cap. (Amps)	Temp. Rating °F (°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

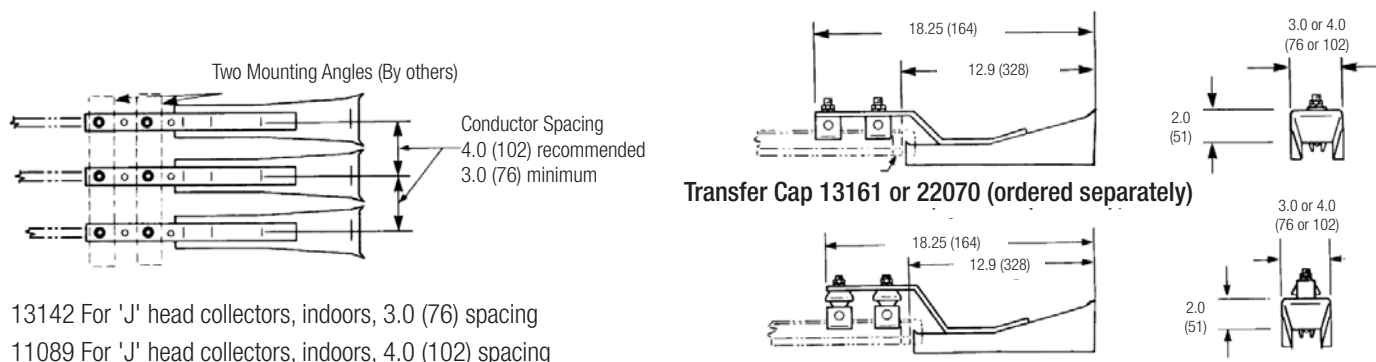


Snap-in Hanger 22646

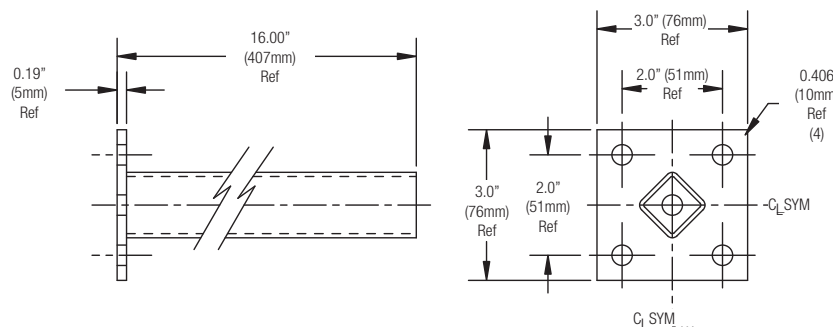
Cross-Bolt Hanger 22649

8-Bar Component Dimensions

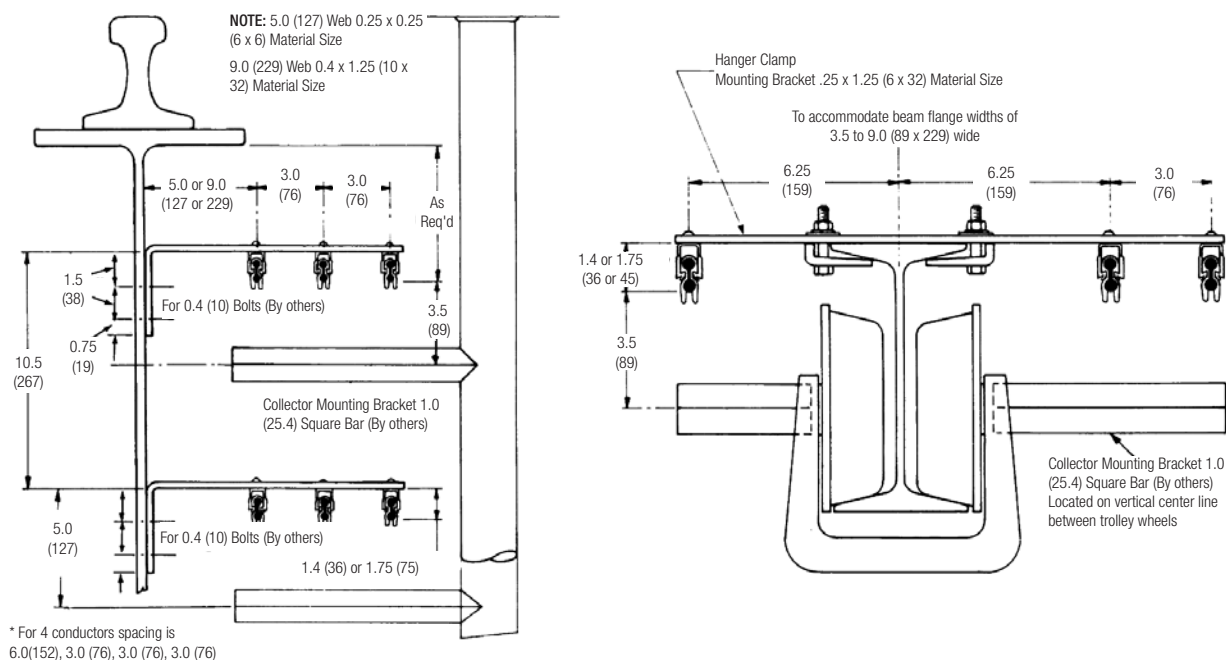
Pick-up Guides



Collector Bracket, 1.00" (25mm) square (39617 & 50142)



Crane Bridges and Runways



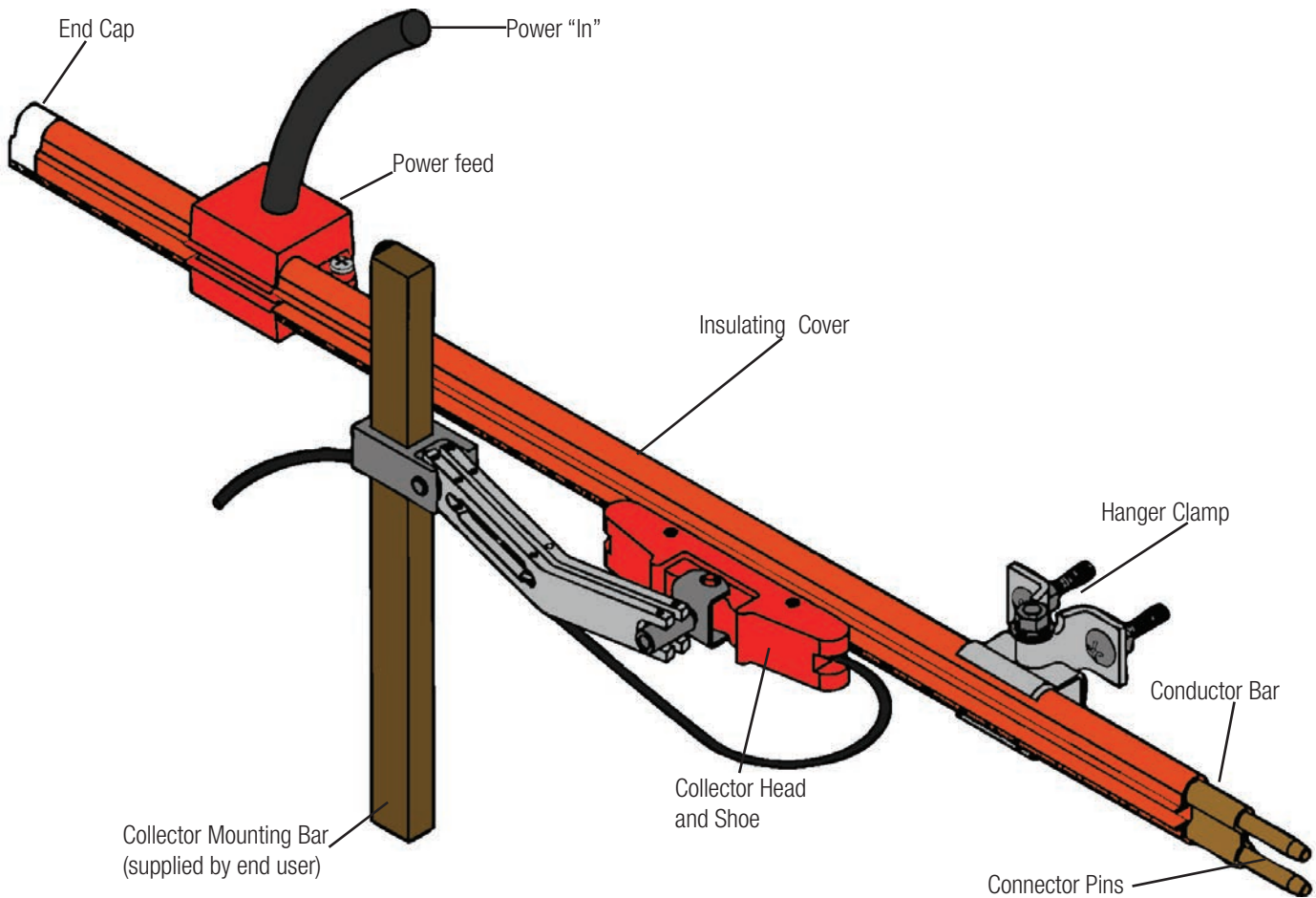
Side Contact Design Features

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

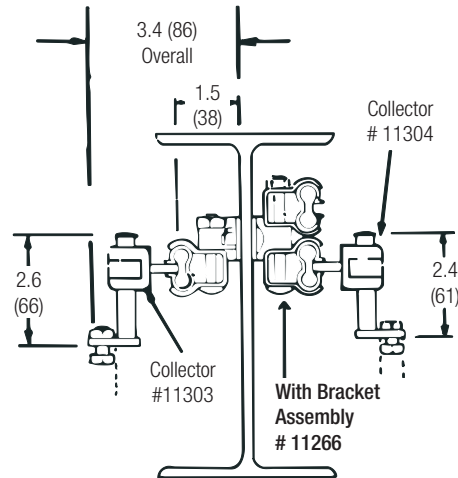
Hangers: Supports the conductor bar, may also be used as an anchor to direct movement due to expansion and contraction

End Cover: Safety protection at the end of conductor system

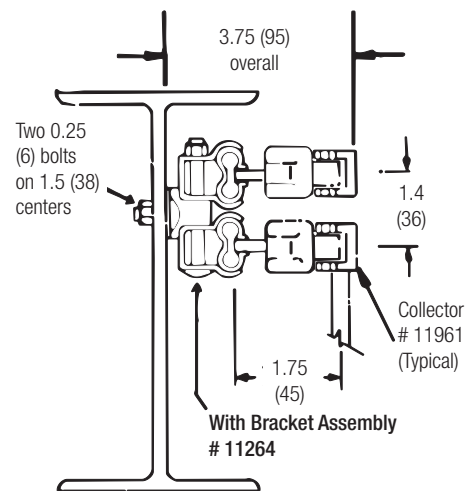
Typical Side Contact Mounting Arrangements

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.

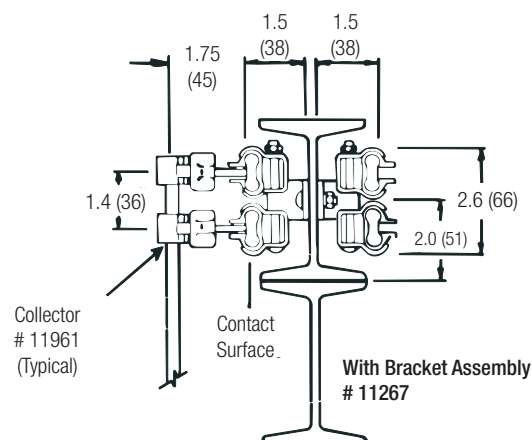
One Conductor Left and Two Right



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° F to 160° F (- 23.3° C to 71.1° C)
- **Medium Heat:** - 25° F To 250° F (- 31.7° C to 121.1° 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)

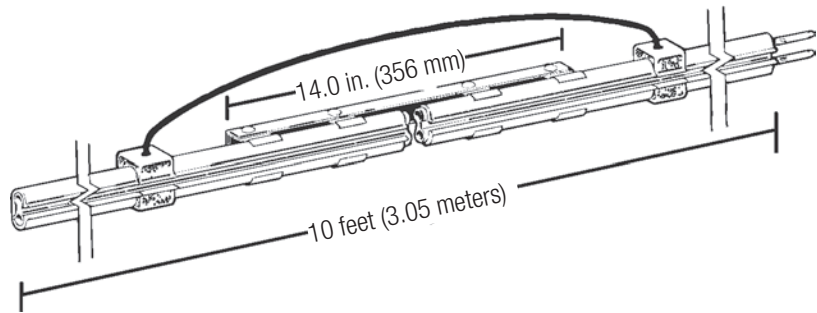
Electrolytic Copper 350A



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



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° F	34579	1.5 (6.80)
Medium Heat to 250° F	11294	1.5 (6.80)

End Cover



Used to close the end of the conductors to cover exposed conductor and avoid accidental contact. Also used as a transfer cap for switch applications.

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)

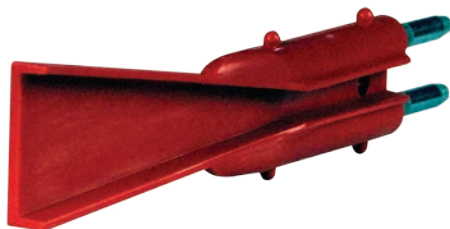
Description	Part No.	Wt lb (kg)
Complete Assembly, Clamp & Case	11289	0.34 (0.15)
Power feed case with hardware	11290	0.20 (0.09)
Clamp Assembly	11291	0.10 (0.05)

Pick-up Guides

Used at the end of conductors to guide collectors that completely leave the conductors (Discontinuous Systems) and then re-engage

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

NOT TO BE USED FOR SWITCH APPLICATIONS



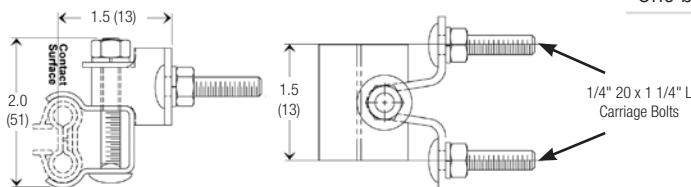
Description	Part No.	Wt lb (kg)
For all systems (except 90A)	11292	1.25 (0.57)

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.

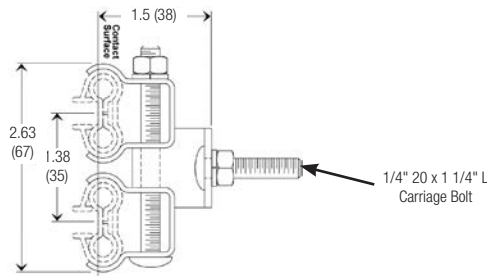
Consult Factory if you need a configurations not shown.

Single Bar, One Side of Beam



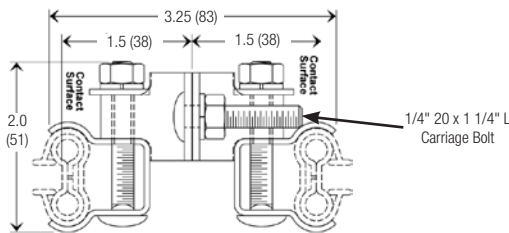
For	Part No.
One bar, one side of beam	11263

Two Bars, One Side of Beam



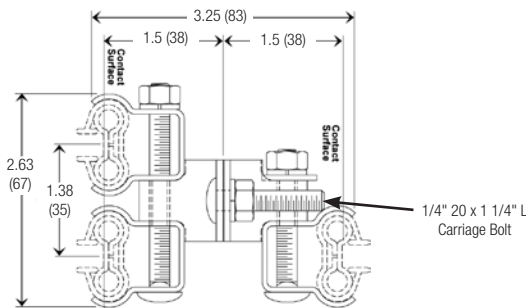
For	Part No.
Two bars, one side of beam	11264

One Bar, Each Side of Beam



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

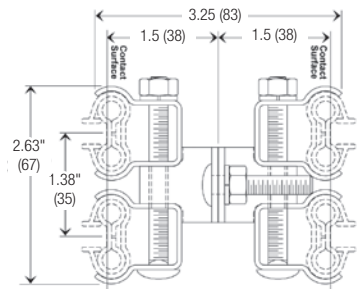
Two Bars One Side of Beam, One on the Other



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

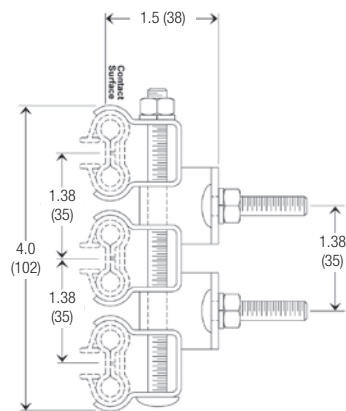
Side Contact Hanger Brackets and Clamps

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

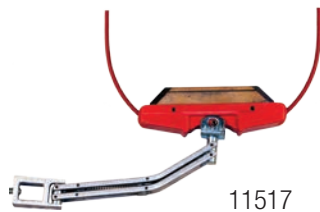


For conveyor, monorail systems, and crane bridges. Operates through curves at a minimum radii of 9.0 (228).

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

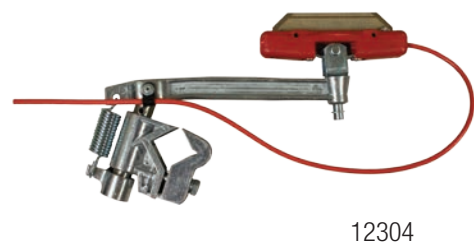


For conveyor, monorail systems, and crane bridges. Operates through curves at a minimum radii of 9.0 (228). Includes an additional pigtail for extra current capacity.

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



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)

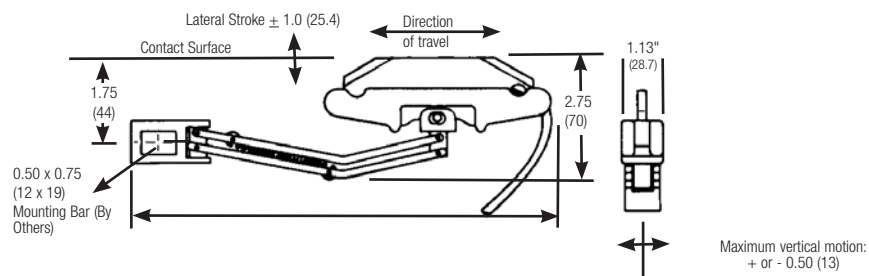
Description	Part No.
Standard Collector	11955
Self-centering tandem. For discontinued systems equipped with pickup guide 11292 that require 80A capacity.	11954

Side Contact Collector Parts

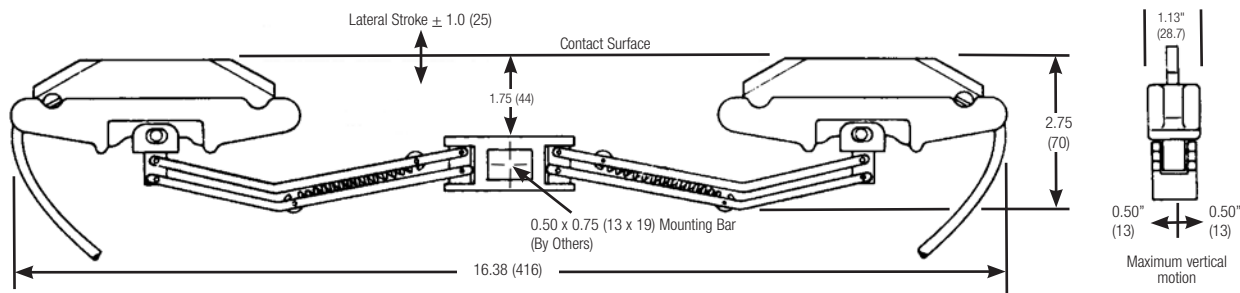
Description	Part No.
Case only, for M-Head, H-Base Collectors	11307
Case only, for M-Head, L-Base collectors	11300
Contact shoe (copper graphite) for all M-Head collectors	14104
Cast iron shoe	14135
Head assembly for M-Head, H-Base collectors	12296
Head assembly for M-Head, L-Base collectors	11930

Side Contact Collector Parts and Dimensions

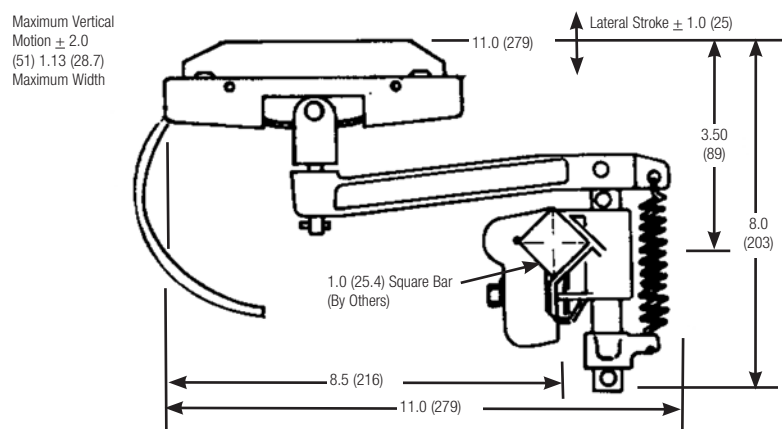
M-Head, L-Base Collectors (11961 shown)



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° pieces	23642
Stainless Clad Copper Laminate	250	9.0 to 34.0 (229 to 864)	2-180° pieces	23643
Copper Steel Laminate	250	9.0 to 34.0 (229 to 864)	2-180° pieces	23644
Rolled Copper	350	9.0 to 34.0 (229 to 864)	2-180° pieces	23645
Galvanized Steel	110	34.5 to 51.0 (876 to 1295)	3-120° pieces	23646
Stainless Clad Copper Laminate	250	34.5 to 51.0 (876 to 1295)	3-120° pieces	23647
Copper Steel Laminate	250	34.5 to 51.0 (876 to 1295)	3-120° pieces	23648
Rolled Copper	350	34.5 to 51.0 (876 to 1295)	3-120° pieces	23649
Galvanized Steel	110	51.1 to 69.0 (1298 to 1753)	4-90° pieces	23650
Stainless Clad Copper Laminate	250	51.1 to 69.0 (1298 to 1753)	4-90° pieces	23651
Copper Steel Laminate	250	51.1 to 69.0 (1298 to 1753)	4-90° pieces	23652
Rolled Copper	350	51.1 to 69.0 (1298 to 1753)	4-90° 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° 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

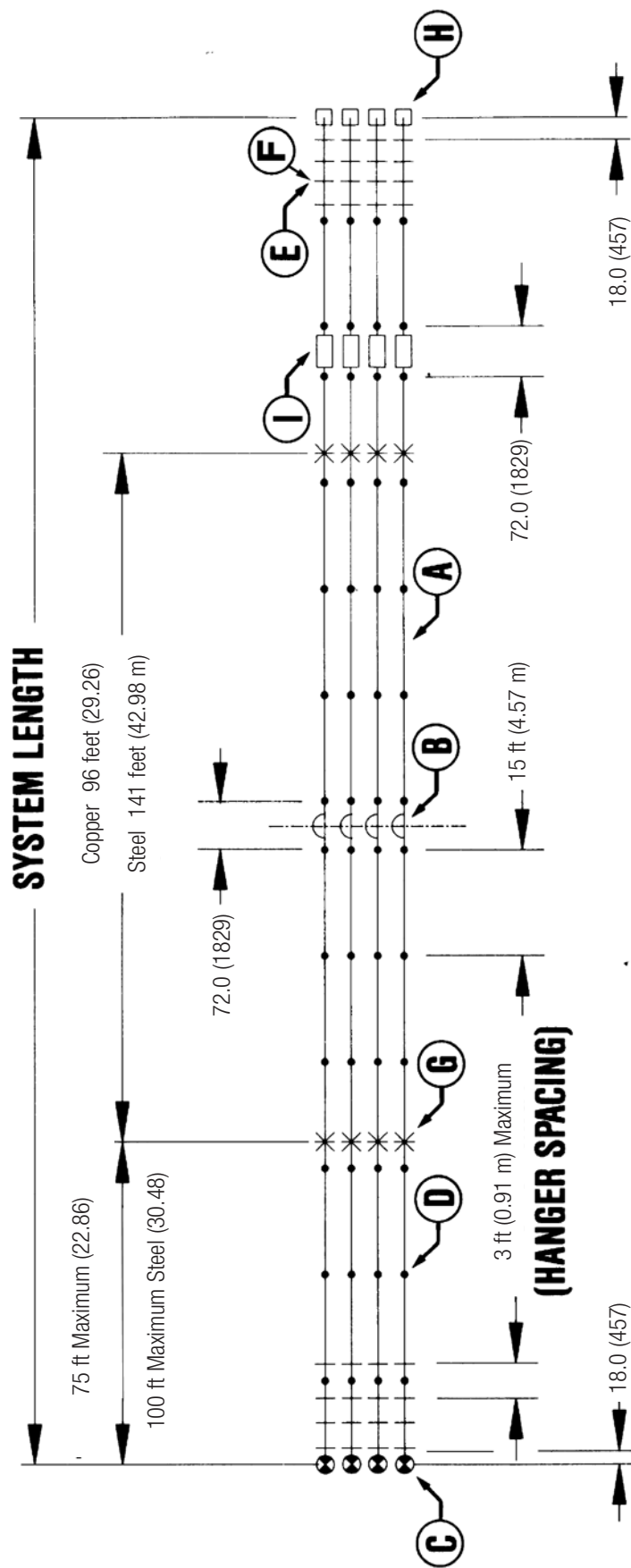
Installs Quickly and Easily

- 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

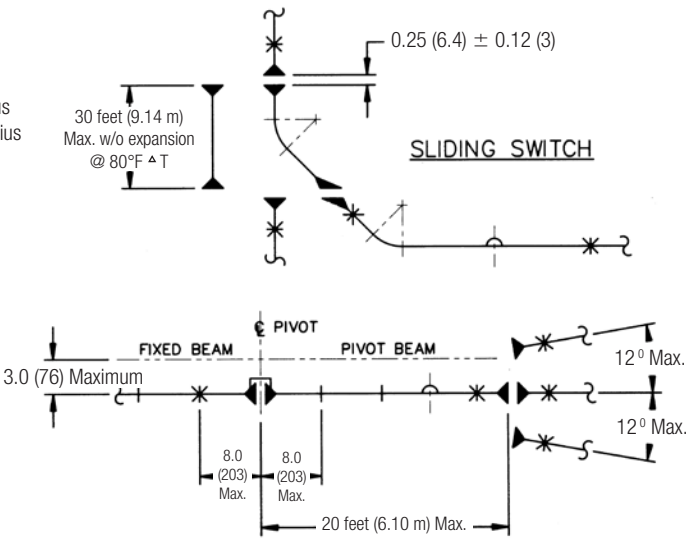
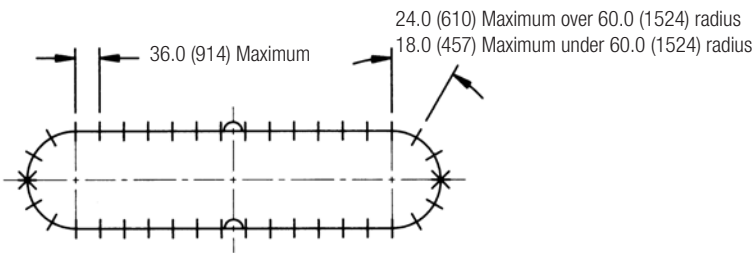
Factor "K"						
	<div><div>Ta</div><div>Duty</div></div>	100%	80%	60%	40%	20%
Standard Cover	25° C (77° F)	1.000	1.118	1.291	1.581	2.236
	35° C (95° F)	0.905	1.011	1.168	1.430	2.023
	45° C (113° F)	0.798	0.892	1.030	1.261	1.784
	55° C (130° F)	0.674	0.754	0.870	1.066	1.508

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: $I_{allowable} = \text{nominal current} \times K$

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



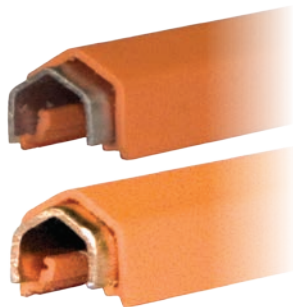
PIVOT SWITCH

LEGEND	
	HANGER CLAMP
	END COVER
	EXPANSION
	ANCHOR CLAMP
	ISOLATION KIT
	TRANSFER CAP, STRAIGHT
	TRANSFER CAP, ANGLE
	TRANSFER CAP, SWIVEL
	PICKUP GUIDE
	POWERFEED

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° F to 160° 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)

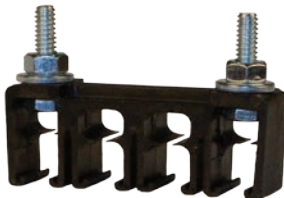
Anchor Clamps



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)

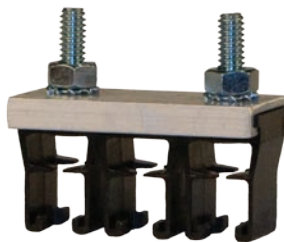
Multi-Conductor Bracket



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

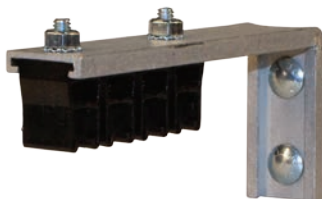
Multi-Conductor Bracket



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.

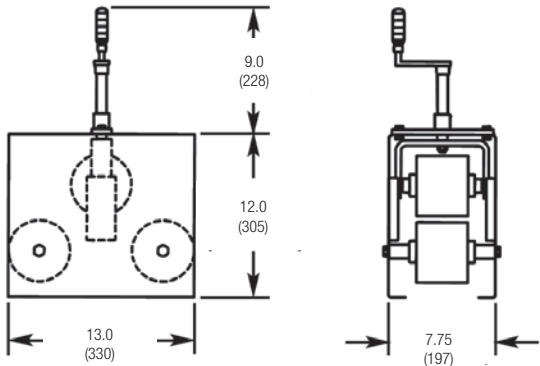
Consult Factory for Assistance in Regards to Your Curve and Slip Ring Requirements.

Description	Part No. (40 Amp)	Part No. (120 Amp)	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	29364	29363	16
Horizontal outside	23959	29358	16
Vertical	29366	29365	32

Curving Machine

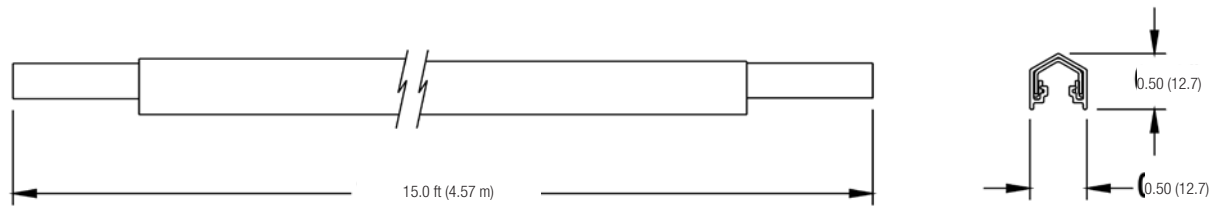
For curving of Cluster Bar, either on site or in the shop. Available for Lease or Sale.

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

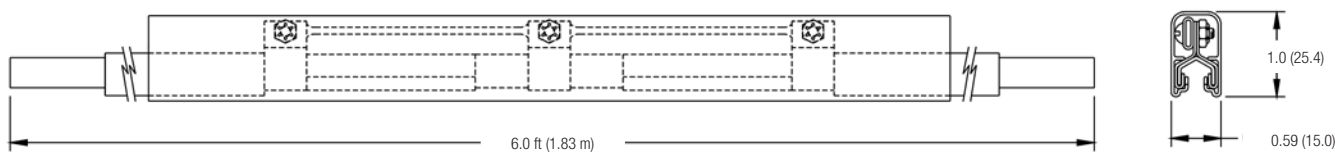


Cluster Bar Dimensions

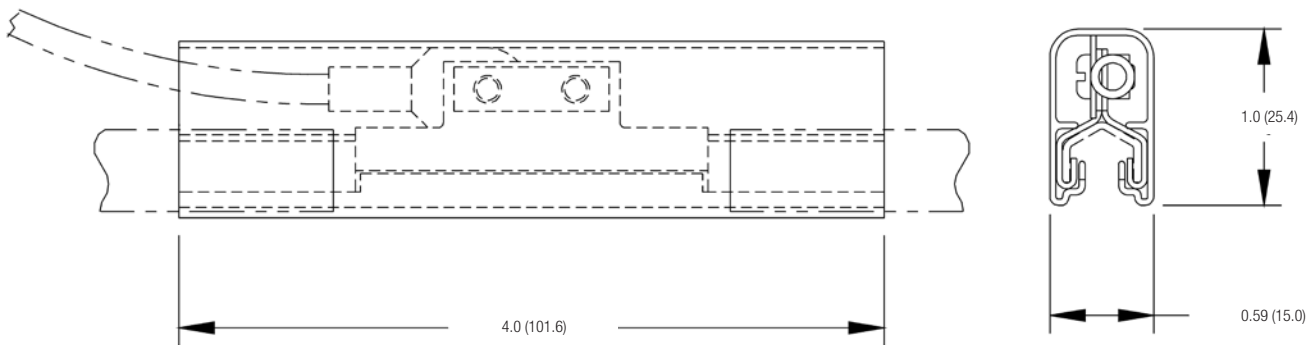
Conductors



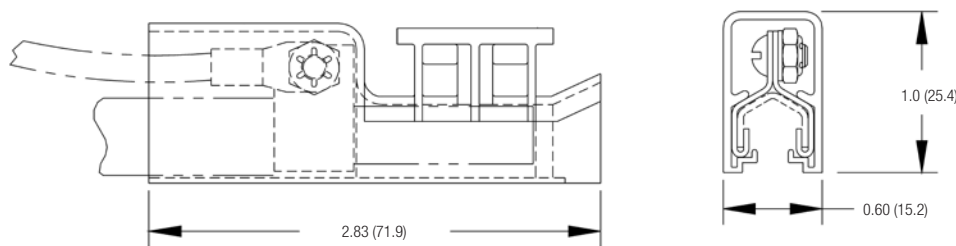
Expansion Section



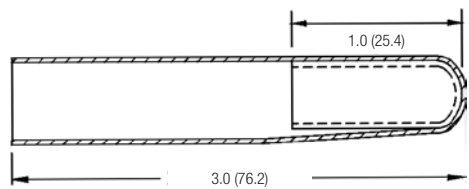
In-Line Power Feed



End Power Feed

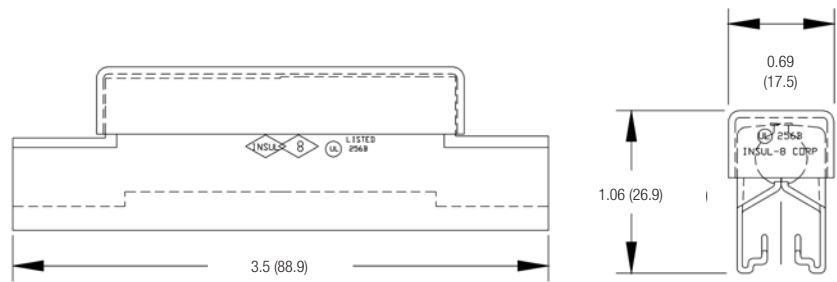


End Cap

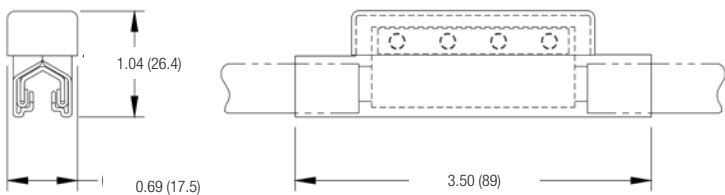


Cluster Bar Dimensions

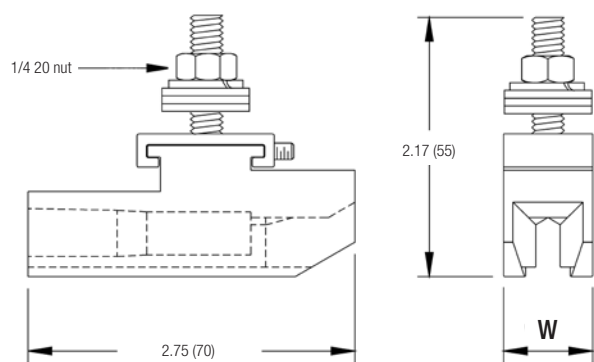
Splice Cover Kit



Splice Joint

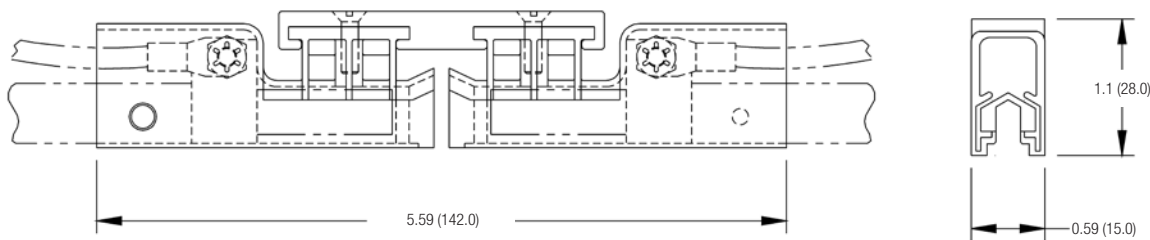


Transfer Cap



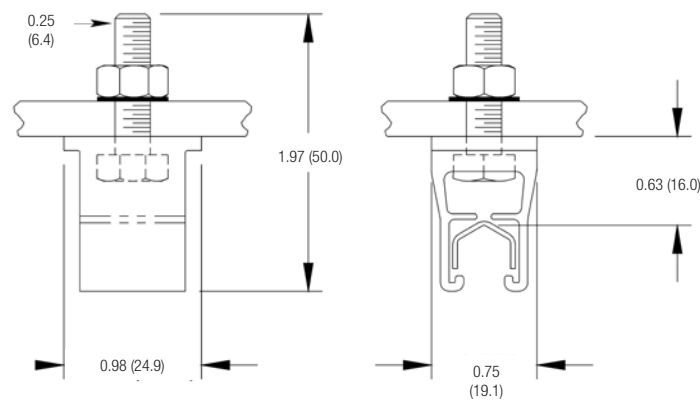
No. Cond.	Part No.	"W" (in.)	"W" (mm)
1	29413	0.60	15.2
3	28807	1.80	45.7
4	28808	2.40	61.0
5	28809	3.00	76.2
6	28810	3.60	91.4

Isolation Kit

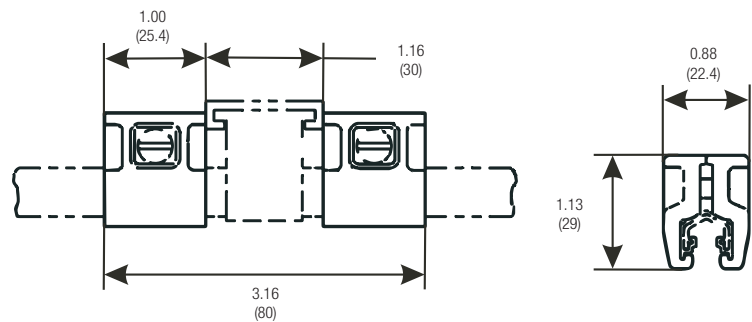


Cluster Bar Dimensions

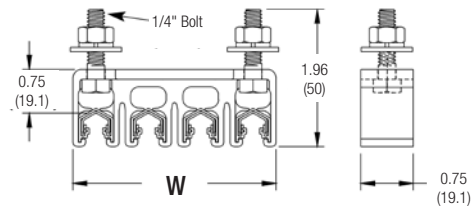
Hanger Clamp



Anchor Clamp

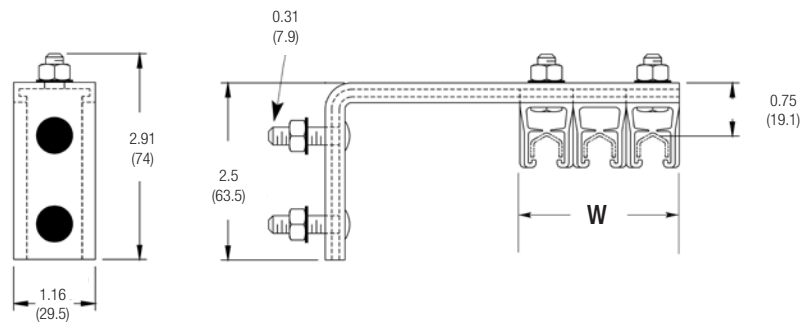


Multi-Conductor Web Bracket



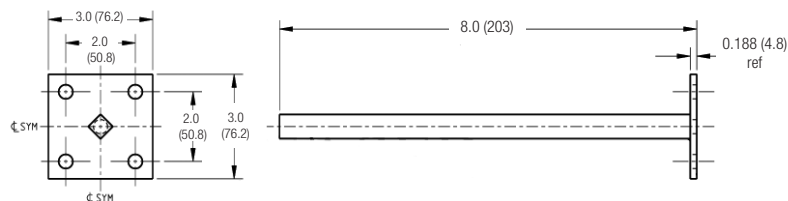
No. Cond.	Part No.	"W" (in.)	"W" (mm)
3	33138	2.16	54.9
4	33137	2.90	73.7

Multi-Conductor Web Bracket



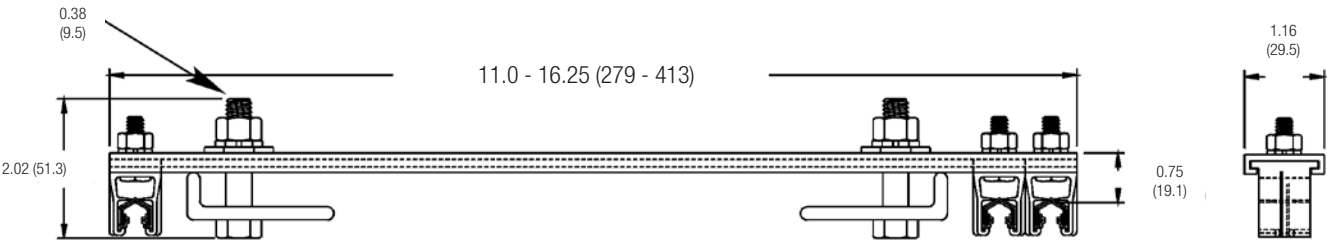
No. Cond.	Part No.	"W" (in.)	"W" (mm)
3	28665	2.25	57.2
4	29939	3.00	76.2
5	29940	3.75	95.3
6	29941	4.50	114.3

Collector Mounting Staff

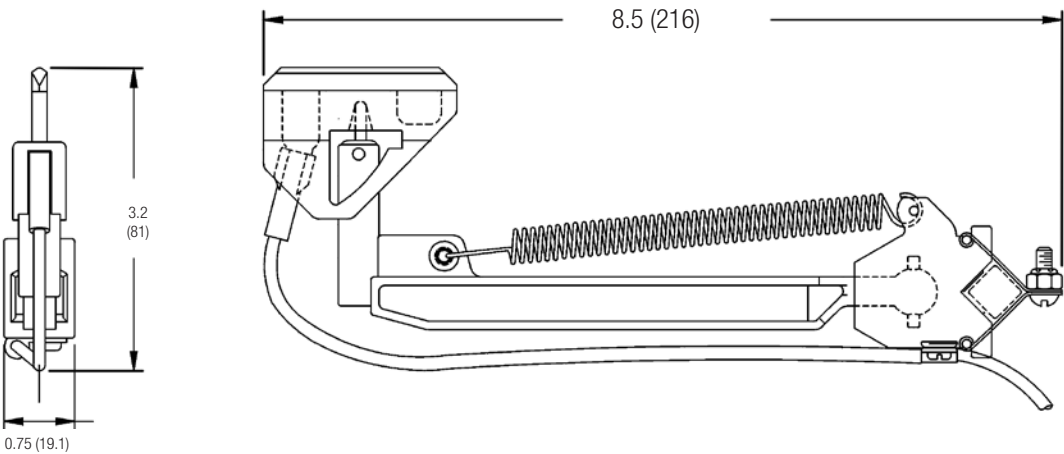


Cluster Bar Dimensions

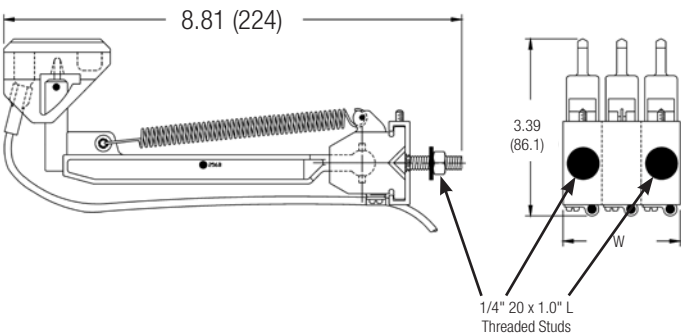
Multi-Conductor Flange Bracket



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



30A Collector, Multi Conductor, Channel Mount

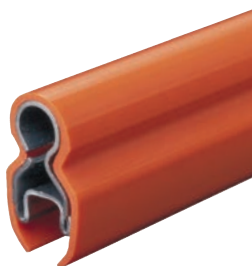


Part No.	No. Cond.	W dim.		Stud Centers	
		in.	(mm)	in.	(mm)
31583	3	2.25	57.2	1.50	38.1
31584	4	3.00	76.2	2.25	57.2
31585	5	3.75	95.3	3.00	76.2
31586	6	4.50	114.3	3.75	95.3

Saf-T-Bar Features and Series

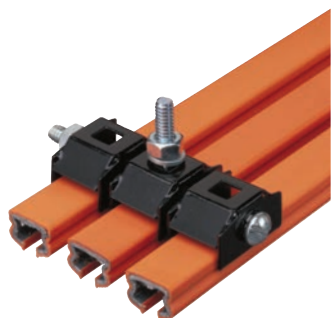
The Saf-T-Bar line of conductor bar products was originally manufactured by the Howell Corporation and is now part of the Conductix-Wampfler product family. Saf-T-Bar is designed to provide customers with a cost effective, yet highly reliable system for the transmission of electrical energy. Each system 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



Series C

The Series C range of conductor bars is available in 110 amp and 300 amp capacities 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 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® 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, 300A,
T Series: 65A

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

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.

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.

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).

Voltage Drop Calculation - See also Pgs. 76 and 77.



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 = $1.73 \times Z \times \text{Length in feet from feed} \times \text{Ampere load}$

1 phase AC Volts lost = $2 \times Z \times \text{Length in feet from feed} \times \text{Ampere load}$

DV Volts lost = $2 \times R \times \text{Length in feet from feed} \times \text{Ampere load}$

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)
CA300		300	0.6 x 1.4 (15.2 x 35.6)	0.48 (0.22)	0.000110	0.000080	10 (3.0)
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. 75-81 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	<input type="checkbox"/>	<input type="checkbox"/>	61
	5 (1.5)	1.5 or 2.0 (38.1 or 50.1)	600V	<input type="checkbox"/>	<input type="checkbox"/>	61
	5 (1.5)	1 or 2 (25.4 or 50.1)	600V	<input type="checkbox"/>		79

Safety Precautions

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

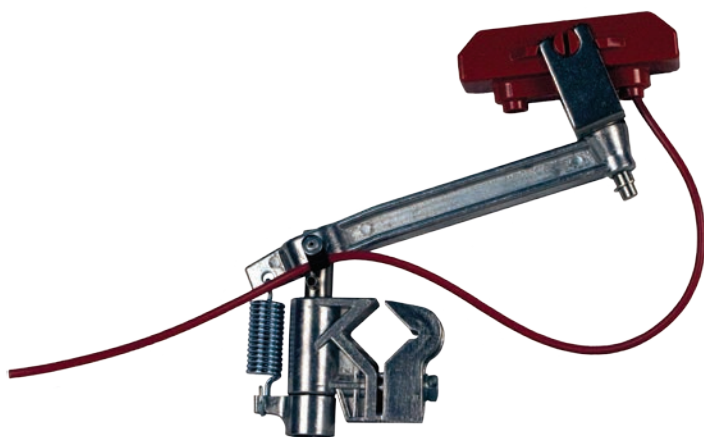
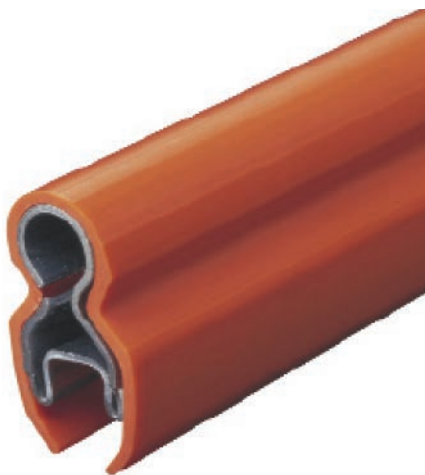
Regulations: Please ensure the system is selected, located and installed in accordance to all relevant local, state and federal standards and regulations and that unauthorized personnel do not have access to any part of the system when energized.

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 (100 amp) or copper (300A). 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°F (30°C) rise. Higher ratings can be obtained by increasing temperature rise and using high heat covers - Contact the Factory.

CA110	110
CA300	300

Bar Material:

CA110	1010 galvanized steel
CA300	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.

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°F (71°C) heat distortion point at 260 psi, self-extinguishing. Medium heat cover of red Lexan extrusion can be specified when necessary, 260°F (127°C) heat distortion point at 260 psi, self-extinguishing. High heat fiberglass cover is available, 375°F (191°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°F (71°C) at 260 PSI (standard cover)
 260°F (127°C) at 260PSI (medium temperature Lexan cover)
 375°F (191°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
CA300	Electrolytic Copper	300	600	0.00008	0.000110	0.45

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
CA300	CA300X10	CA300X10G	CA300X10G	CA300HHX10	CA300FIX10	CJ300	CJ300HH	350F	CA300XG-2*	350FHH

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

¹ Nominal current is based on 86°F (30°C) and is for 100% duty.

² Complete with orange rigid "Standard Heat" PVC insulator cover, which has a 160° F (71° C) heat distortion point, 260psi. Self-extinguishing.

³ Complete with green rigid PVC insulator cover, which has a 160° F (71° 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° 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° C) heat distortion point, 260psi. Self-extinguishing.

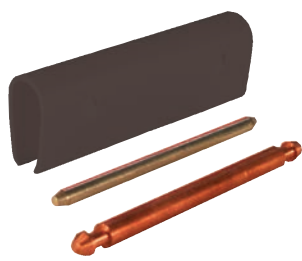
⁶ Complete with fiber glass "High Heat" cover, which has 375° F (191° C) heat distortion point, 260psi. Self-extinguishing.

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

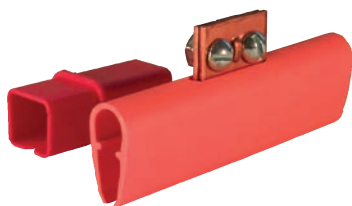
Extra Joint Kits



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
CA300	CJ300	5/16" x 4" (7.9 x 101.6) Copper & 15/64" x 3.75 (5.9 x 95.3) 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
CA300	350F

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.

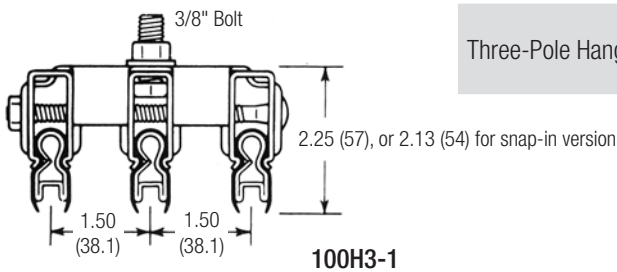
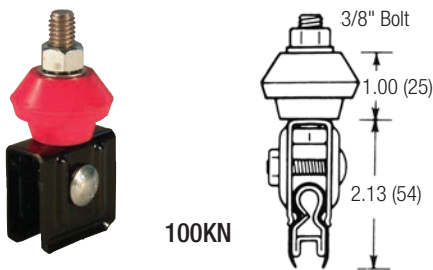
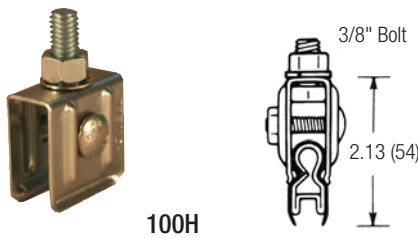
	Part No.
End Cap	CN100

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

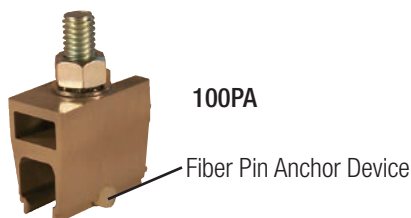
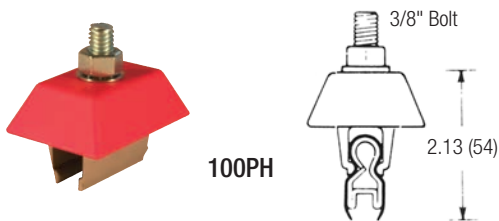
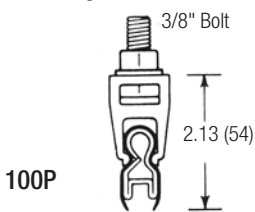


Cross-bolt hanger clamps are factory set to snap in place, but must be field adjusted for correct sliding tension after installing the conductor (unless used as an anchor).

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

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



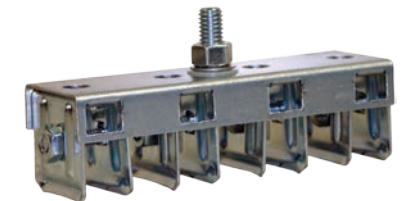
Lexan snap-in hangers for use only on Series C PVC cover rated to 160°F, with holding rib. For high temperature applications, use Cross Bolt Hanger Clamps. All push-on snap hangers require a firm press to seat the conductor into the hanger. To remove the conductor, it is recommended that it be slid out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

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.

Saf-T-Bar Series C Four-Pole Hangers

Steel Cross-Bolt Multiple Hanger



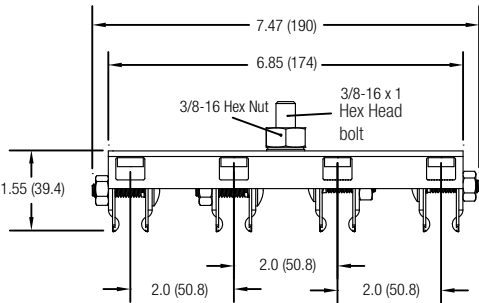
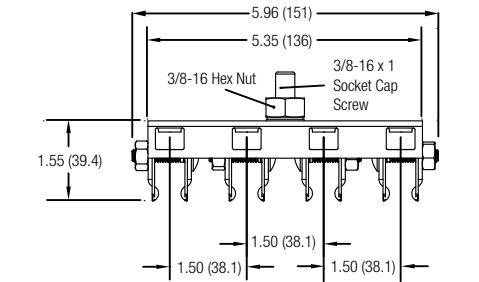
100H4-1



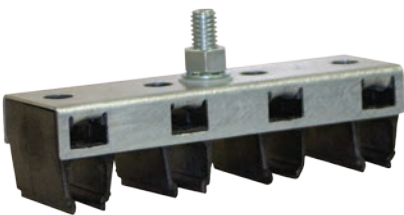
100H4-2

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).

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



"Snap-in" Multiple Hangers

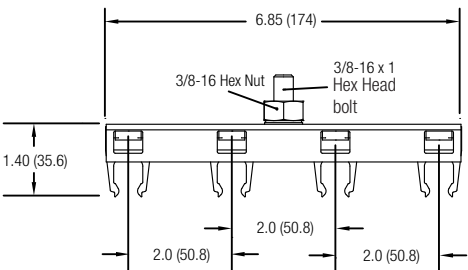
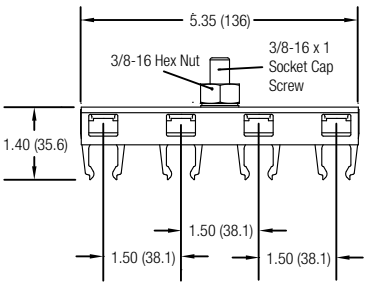


100P4-1



100P4-2

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

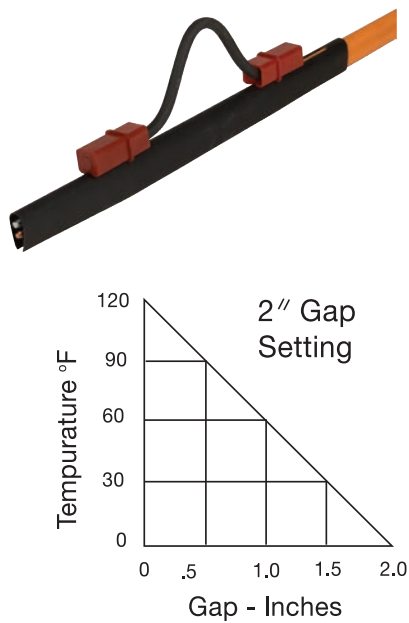


Saf-T-Bar Series C Expansion Sections

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
CA300	200 (61.0)	CA300XG-2	350F	TWO #4

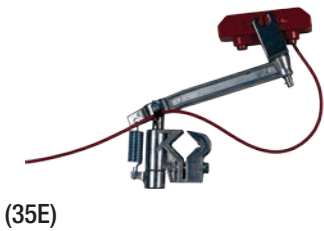
Series C Curves

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
CA300	CA300X10-CV	CA300X10G-CV	CA300X10W-CV	CA300HHX10-CV	CA300FIX10-CV

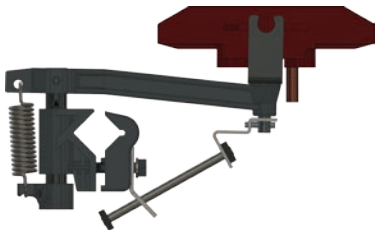
Saf-T-Bar Series C Collectors



(35E)



Standard Arm (70E)



Self-centering, Standard Arm(100C)



Self-centering Long Arm (70LC)



Dual Head Standard (35W)



Dual-Head, Long Arm (70LL)

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

Self-Centering Collectors, have centering attachments for discontinuous circuits.

Dual-Head (Tandem) Collectors are available in 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.

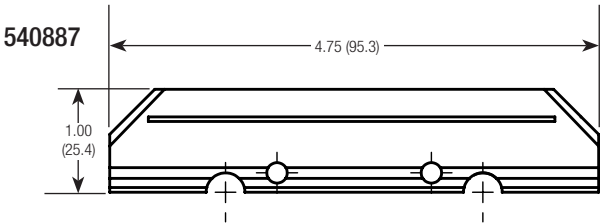
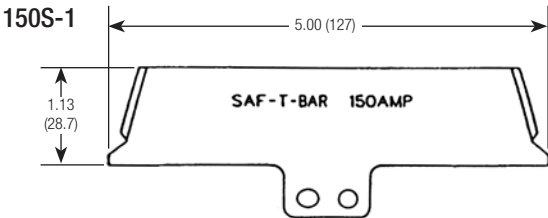
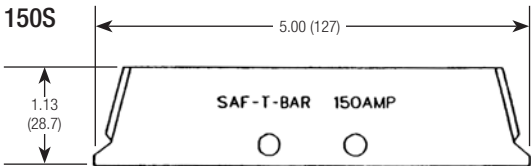
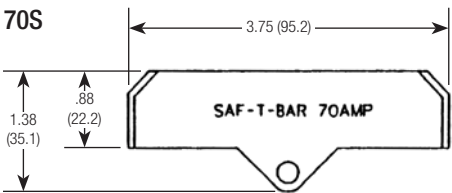
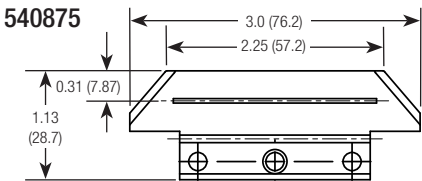
* Pigtails not included with 70A or 150A collectors. These will need to be ordered separate.

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

Saf-T-Bar Series C Collector Shoes and Dimensions

Collector Shoes

Shoe Material	Current Capacity (Amps)	For Collectors:	Part No.
Standard Copper Graphite	70	70E, 70L, 70LL	70S
Standard Copper Graphite	150	150E, 150L, 150LL	150S1
Abrasive Cleaning Material	70	70E, 70L, 70LL	70XX
Abrasive Cleaning Material	100	100E, 100L, 100W	100XX
Abrasive Cleaning Material	150	150E, 150L, 150LL	150XX
Cast Iron	70	70E, 70L, 70LL,	70SC
Cast Iron	150	150E, 150L, 150LL	150SC



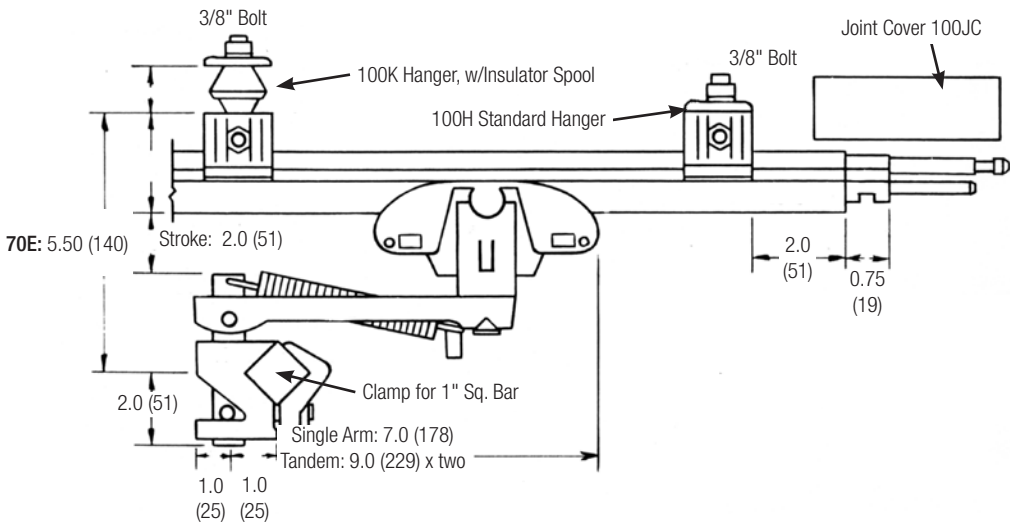
Collector Parts

Description	70 amps	150 amps
Spring	100Z	100Z
Case & shoe assembly	707S	150AS
Case half only	7071-1	150A-1
Yoke assembly	707Y	777Y

Saf-T-Bar Series C Collector Dimensions

Standard Arm Dimensions

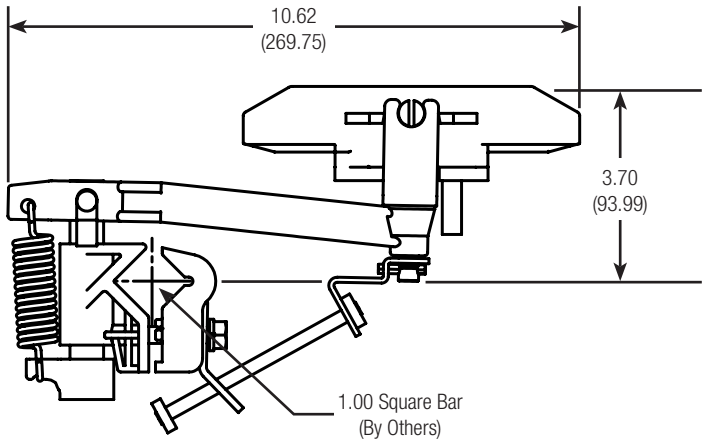
70E
150E



Self-Centering

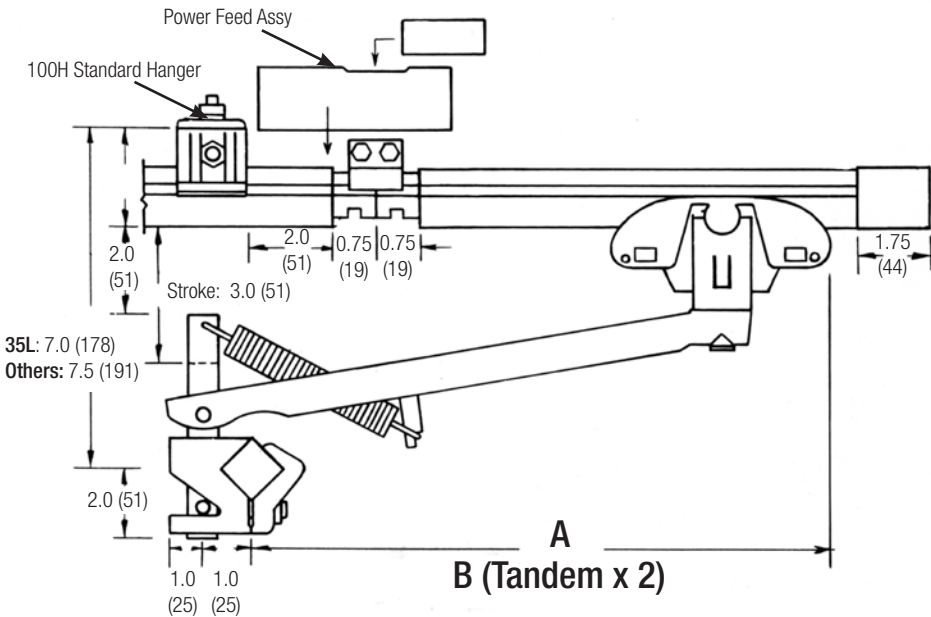
100C

Also available in Long Arm 100LC and Tandem 100LLC Versions:
Contact the Factory for Dimensions.



Long Arm Collector

Collector	A	B
70L	12.00 (305)	
150L	12.25 (311)	
70LL		14.50 (368)
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

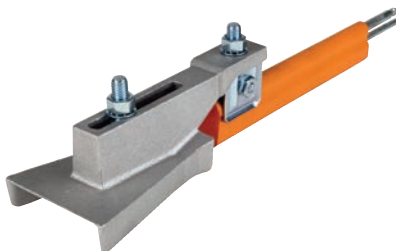


Used for discontinuous circuits such as bridge controls, runway circuits at fire doors, etc., to allow collector to leave conductor and be realigned on return. Works with all bar capacities. Use with self-centering collectors only.

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 1/2" (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.

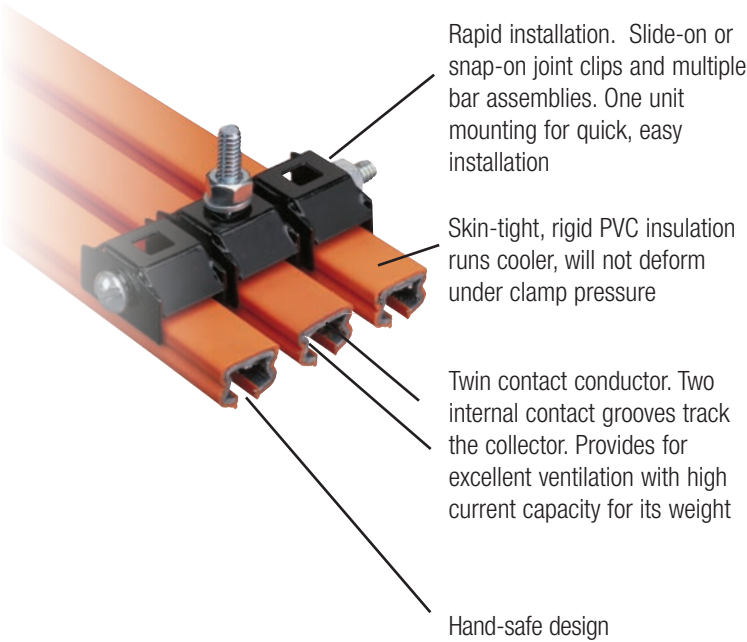
Conductors must be mounted on 3" (76 mm) centers minimum. Install conductor 1-1/2" (38 mm) into guide throat.

	Part No.
Transfer Guide	CT100

Saf-T-Bar Series 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



Current capacity¹

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.

¹Ampere 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°F at 260 PSI (standard cover) 260°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 $\pm 1/8"$ (± 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

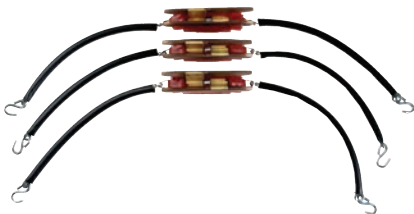
Note: A spool mount insulator hanger option is available as an alternative - Contact Factory

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



TE503CR

# Poles	Shoe Size	Towlines Included?	Cap.	Part No.
Single	Short	Yes	30 A	TE301
Dual	Short	Yes	30 A	TE302
Triple	Short	Yes	30 A	TE303
Single	Standard	Yes	30A	TE501CR
Single	Standard	No	30A	TE501ASCR
Dual	Standard	Yes	30A	TE502CR
Triple	Standard	Yes	30A	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

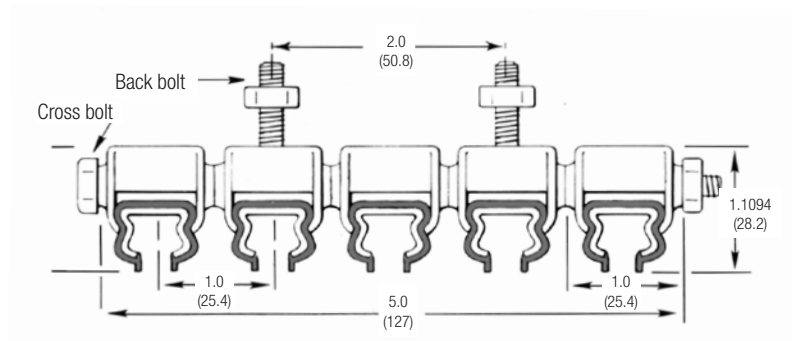
Factory curved conductor sections for applications requiring bends and curves. Please contact factory for further information and pricing.

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

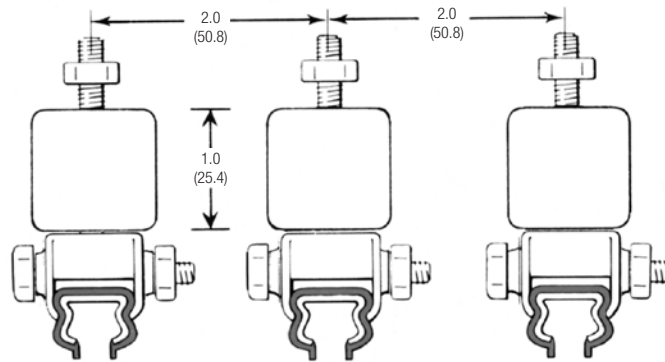
For Bar Type	Standard Heat (PVC)	Standard Heat (GRD)	Standard Heat (UV)	Medium Heat (Lexan)	High Heat (Fiberglass)	Joint*
TA65	TA65X10-CV	TA65X10G-CV	N/A	TA65HHX10-CV	N/A	TJS100

Saf-T-Bar Series T Dimensions

Hangar Mounting Clamps

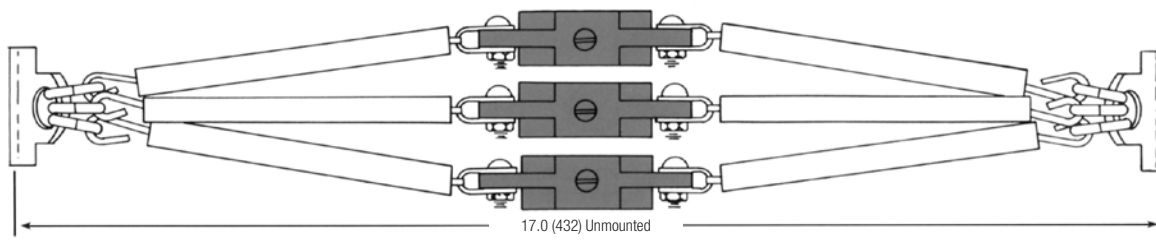
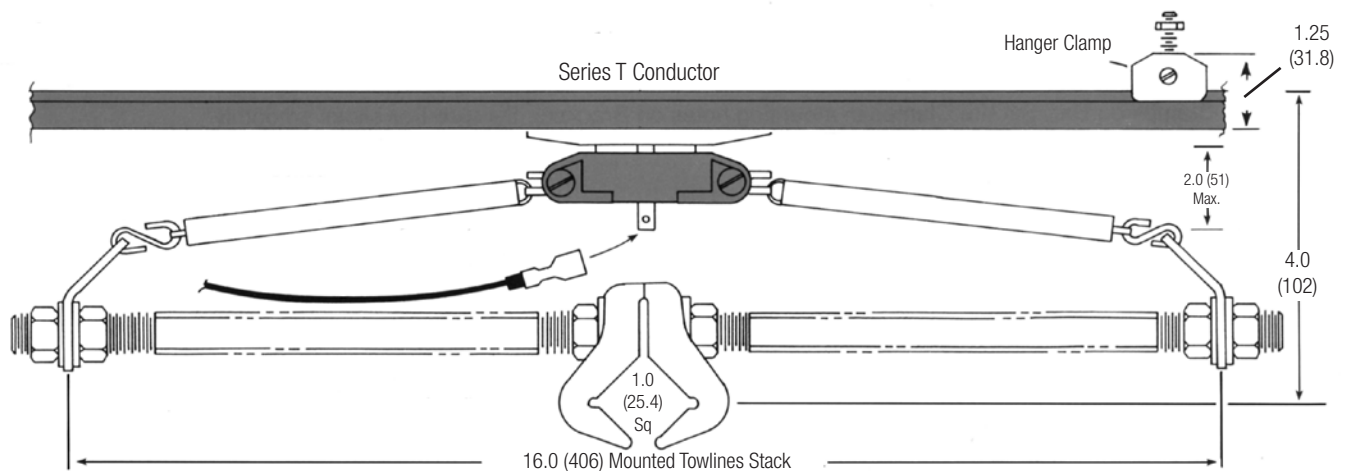


Standard Hangers



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 choose 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 voltage 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.

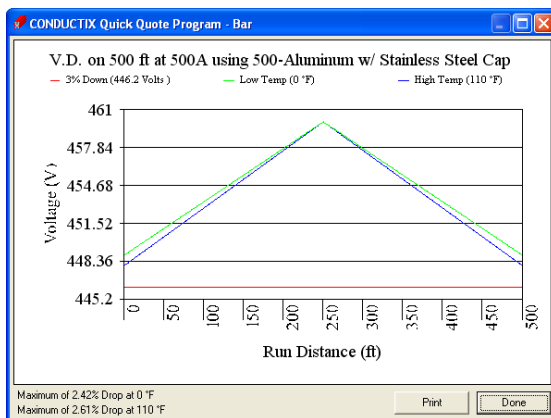


Figure 1 – Center Feed Example: Voltage drop along a 500 foot (152.4 meters) long runway with one crane drawing 500 amps at 460 volts on a 500 amp rated bar. The green line shows the voltage drop along the run at 0°F. The blue line shows the voltage drop at 110°F. The red line indicates the 3% maximum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

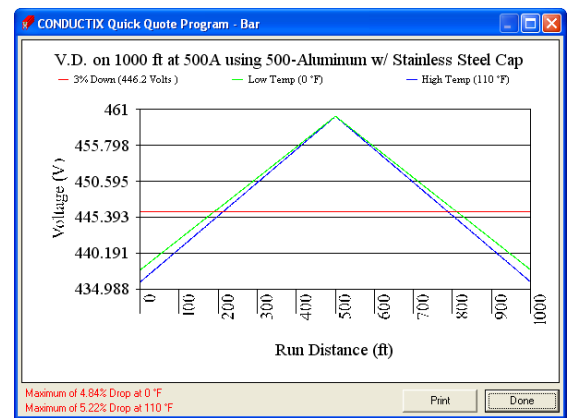


Figure 2: Same parameters as Fig. 1, except with a 1000 foot (304.8 meters) system. Note that the voltage drop is now greater than the recommended 3%.

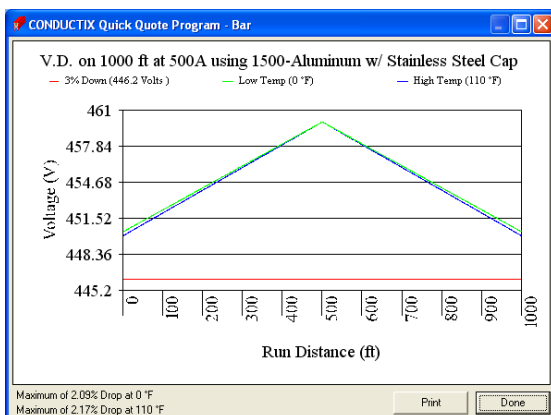


Figure 3: Center Power Example: With higher capacity 1500 amp bar to lower the voltage drop below 3%.

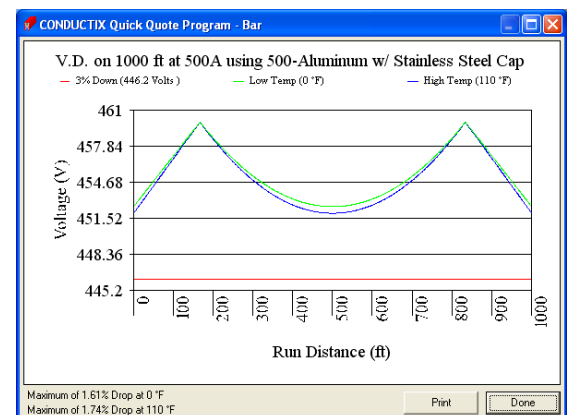


Figure 4: Two power feeds optimally located. The voltage drop remains under 3%, without the need to increase conductor capacity. A load positioned between the two feed points is supplied by both power feeds.

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° F (49° C), and the current-induced temperature rise of the conductor adds another 50° F, the total 170° F (76.7° C) exceeds the PVC cover rating of 70° C (156° 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° C or 120° 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° 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° C, which is a 40° C rise over 30° 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 than 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.

$$\begin{aligned}\text{Hoist} &= 65\text{A} \times 1 = 65.0 \\ \text{Bridge} &= 27\text{A} \times .5 = 13.5 \\ \text{Total} &= \underline{78.5\text{A}}\end{aligned}$$

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.

$$\begin{aligned}\text{Crane \#1} \\ \text{Hoist} &= 65\text{A} \times 1 = 65.0 \\ \text{Bridge} &= 27\text{A} \times .5 = 13.5 \\ \text{Total} &= \underline{78.5\text{A}}\end{aligned}$$

$$\begin{aligned}\text{Crane \#2} \\ \text{Hoist} &= 52\text{A} \times 1 = 52.0 \\ \text{Bridge} &= 14\text{A} \times .5 = 7.0 \\ \text{Total} &= \underline{59.0\text{A}}\end{aligned}$$

$$\text{Total of \#1 + \#2} = \underline{137.5 \times .195 = 130.0\text{A}}$$

- 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	Rolled Copper 3-phase 350' long, 250A load. $\text{VD} = 1.39 \times 3.5 \times 2.5 = 12.1 \text{ volts}$ Assume load pF is 90
Galvanized Steel 90A	16.2	15.0	
Galvanized Steel 110A	10.1	7.1	
Stainless Clad Copper 250A	2.01	2.0	
Copper Steel Laminate 250A	2.01	2.0	
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'

$$\begin{aligned}3\% \text{ of } 480\text{V} &= 14.4 \\ 2\% \text{ of } 240\text{V} &= 7.2 \\ 2\% \text{ of } 180\text{V} &= 9.6 \\ 2\% \text{ of } 240\text{V} &= 4.8\end{aligned}$$

Appendix III Electrical Formulas & Conversions

Electrical Formulas

Ohms Law

$\text{Ohms} = \frac{\text{volts}}{\text{amperes}}$	$\text{Amperes} = \frac{\text{volts}}{\text{ohms}}$	$\text{Volts} = \text{amperes} \times \text{ohms}$
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Power

$\text{Watts} = \text{amperes} \times \text{volts}$	$\text{3-phase Kilowatts} = \frac{\text{volts} \times \text{amperes} \times \text{power factor} \times 1.732}{1000}$
$\text{Amperes} = \frac{\text{watts}}{\text{volts}}$ (not 3-Phase)	$\text{3-phase Amperes} = \frac{746 \times \text{HP (Horsepower)}}{1.732 \times \text{volts} \times \text{efficiency} \times \text{power factor}}$
$\text{HP} = \frac{\text{volts} \times \text{amps} \times \text{efficiency}}{746}$	$\text{3-phase Volt-Amperes} = \text{volts} \times \text{amperes} \times 1.732$
$\text{Power Factor} = \frac{\text{watts}}{\text{amperes} \times \text{volts}}$	$\text{Single-phase Kilowatts} = \frac{\text{volts} \times \text{amperes} \times \text{power factor}}{1000}$
	$\text{Single-phase Amperes} = \frac{746 \times \text{HP (Horsepower)}}{\text{volts} \times \text{efficiency} \times \text{power factor}}$

Speed

$\text{Synchronous RPM} = \frac{\text{Hertz} \times 120}{\text{poles}}$	$\text{Percent Slip} = \frac{\text{Synchronous RPM} - \text{Full Load RPM}}{\text{Synchronous RPM}} \times 100$
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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 special 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.

Other Products from Conductix-Wampfler

Spring Driven Cable Reels from Conductix-Wampfler represent only one product line from the broad spectrum of Conductix-Wampfler components for the transfer of energy, data, gases, and fluids. The solutions we deliver for your applications are based on your specific requirements. In many cases, a combination of several different Conductix-Wampfler products are needed to fill the application. 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.



Motor driven cable reels

Motor driven reels by Conductix-Wampfler are the perfect solution for managing long lengths of heavy cable and hoses in very demanding industrial applications. Monospiral, level wind, and random wind spools.



Slip ring assemblies

Whenever powered machinery needs to rotate 360°, field proven slip ring assemblies by Conductix-Wampfler can flawlessly transfer energy and data. Here, everything revolves around flexibility and reliability.



Energy guiding chains

The "Jack of all Trades" when it comes to managing energy and data cables and air and fluid hoses. A wide range of energy guiding chains are available for many industrial applications.



Inductive Power Transfer IPT®

The contact-less system for transferring energy and data. For all tasks that depend on high speeds and absolute resistance to wear.



Welded Cap Conductor Rail

Our patented Welded Cap Rail gives you the conductivity and light weight of aluminum plus the wearability of stainless steel.



Cable Festoon systems

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



Push Button Pendants

Our ergonomic pendants are ideally suited for industrial control applications. They are available in a wide range of configurations for overhead cranes and other machinery.



Radio remote controls

Safe, secure, and reliable radios use the latest in microprocessor technology. Available in several models for overhead crane control and other types of machinery.



Workstation equipment

Complete with tool transporters, reels, or an entire air and electric supply system. Workstation equipment provides safety and flexibility for difficult tasks.



Air hoists and balancers

ENDO Air hoists accurately place delicate loads and continuously vary the speed for precise positioning. They run cool in **continuous operations**.



Bumpers

Conductix-Wampfler offers a complete range of bumpers for the auto industry, cranes, and heavy machinery. These include rubber, rubber/metal, and cellular types.



Spring balancers and retractors

ENDO spring balancers by Conductix-Wampfler are rugged, reliable high-precision positioning devices that reduce operator fatigue and assist with accurate tool placement.

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