

# Conductor Bar Safe-Lec<sup>®</sup>2 | Hevi-Bar II



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### Conductor Bar, Expansion Sections, Splices, Power Feeds, Power Interrupting Sections, End Covers, Hangers, Anchor Pins

500A	36-37	700A	38-39
1000A	40-41	1500A	42-43
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### Support Brackets

500A	45	700A / 1000A / 1500A	46-47
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## Safe - Lec 2 and Hevi - Bar II Overview

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.

Recent 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. Conductix-Wampfler Safe-Lec 2 and Hevi-Bar II are manufactured in the USA to provide quick delivery, many configurations and options, and competitive prices.

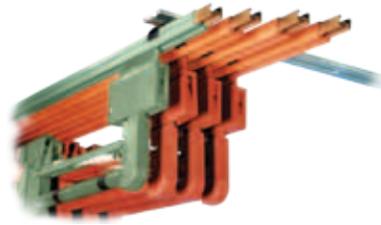
We offer a complete complement of mobile electrification products including Cable Festoon Systems, Cable Reels (spring and motorized), Push-Button Pendants, Radio Remote Controls, and Crane Bumpers.

All Conductix manufacturing facilities are ISO 9001:2000 certified. Our stringent quality systems assure that you will get the right product every time.

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 the current location in Harlan, Iowa. In 2006, the company, part of the Delachaux Group since 1975, was renamed "Conductix".

Now, with the merger of Conductix and Wampfler in 2007, **Conductix-Wampfler** is the world leader in the design and manufacture of high-performance conductor bar systems for industrial applications.



### Safe-Lec 2

The **new industry standard** for crane, monorail, and material handling electrification. Easy to install and maintain. Collector shoes track accurately on V-contact bar. Requires fewer joints and expansion sections than other systems. "Finger-safe" (IP2 rated). Can be mounted for bottom or lateral entry. Heater wire system available for cold climates; black UV resistant cover for outdoor applications.

cUL Listed 



### Hevi-Bar II

The ideal conductor bar system for large process cranes and material handling equipment used in mills and other heavy industrial applications. Aluminum body efficiently dissipates heat; stainless steel V-contact surface for accurate shoe tracking and long wear. Can be mounted for bottom or lateral entry. Heater wire system available for cold climates; black UV resistant cover for outdoor applications.

UL / CSA Listed  

### 8-Bar, Side Contact, Cluster Bar

For details on the original "Insul-8" conductor bar products, please refer to catalog CAT1004.

### Series 811, 812, 813, 815, 831, 842

For details on the "former Wampfler" conductor bar lines, please refer to catalog KATO\*\*\*-0001-US (\*\*\*) = series no.)



# Conductor Bar Summary Chart

## Conductor Bar Lines Manufactured in the USA

8-Bar, Side Contact, Cluster Bar and Saf-T-Bar are shown in catalog CAT1004. For Welded Cap Rail, see brochure BR02009

	Safe-Lec 2	Hevi-Bar II	8-Bar	Side Contact	Cluster Bar	Saf-T-Bar	Welded Cap Rail
<b>Common Applications</b>	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
<b>Bar Ampacity Selections</b>	100 125 160 200 250 315 400	500 700 1000 1500	40 90 110 250 350 500	40 90 110 250 350	40 120	<b>C Series:</b> 90, 110, 250, 300, 350  <b>H Series:</b> 500, 750, 1000, 1500  <b>T Series:</b> 65	4000 6000
<b>Max. Voltage</b>	600	600 <sup>1</sup>	600	600	600	600	600 <sup>1</sup>
<b>Max. Speed<sup>2</sup></b> 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)
<b>Bar Spacing</b> in. (mm)	1.7 (43.2)	3.0 (76.2)	3.0 (76.2)	1.375 (34.9)	0.75 (19.1)	C: 1.5/2.0 (38.1/50.1) H: 5.0 (127) T: 1.0/2.0 (25.4/50.1)	7.0 (177.8)
<b>Cover Temps</b> 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
<b>Outdoor Rated?</b>	Yes	Yes	Yes	No	No	C & H Series: Yes T Series: No	Yes
<b>Dura-Coat Available?</b>	No	Yes	No	No	No	No	No
<b>Orientation</b> (Collector Entry)	Bottom/ Side	Bottom/Side	Bottom/Side	Side Only	Bottom/Side	Bottom/Side	Bottom/Side/ Top
<b>Min Bend Rad</b> Low-Temp Cover in. (mm)	60.0 (1524)	Consult Factory	18.0 (457) <sup>3</sup> 45.0 (1143) <sup>4</sup>	9.0 (228)	16.0 (406)	18.0 (457) <sup>3</sup>	n/a
<b>Med-Temp. Cover</b> in. (mm)	60.0 (1524)	Consult Factory	57.0 (1447)	57.0 (1447)	N/A	n/a	n/a
<b>Heater Wire Available?</b>	Yes	500A & 1500A	No	No	No	No	n/a

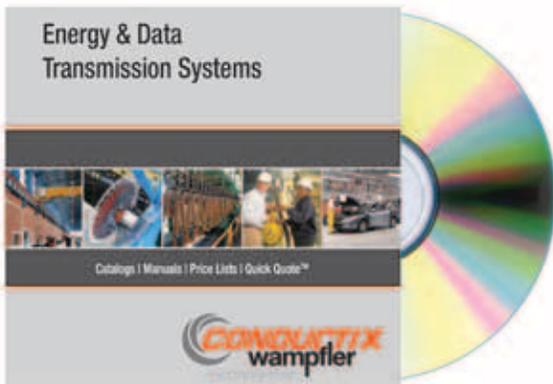
<sup>1</sup> Can be configured for 5000 volts and more - contact Factory. <sup>2</sup> For faster speeds - contact Factory. <sup>3</sup> The "easy way" (bar profile vertical) <sup>4</sup> The "hard way" (horizontal)

### Conductix-Wampfler Germany - Conductor Bar Lines

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. 86 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:

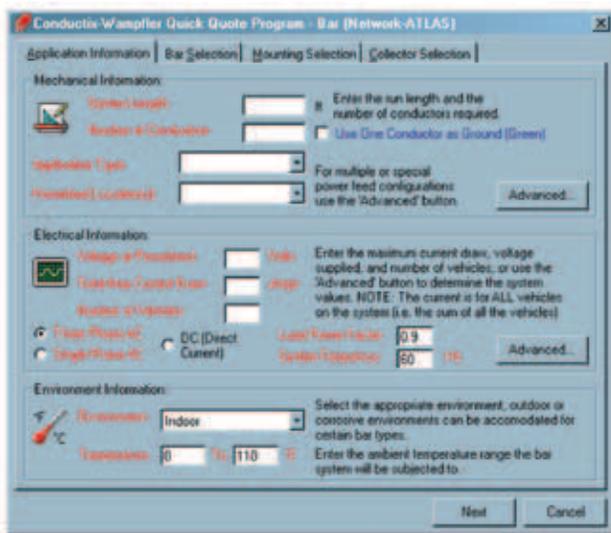
- Calculates crane amp draw with multiple vehicles
- Automatically calculates and graphs voltage drop given single or multiple power feed locations
- Handles advanced bar and collector mounting configurations
- Provides conductor bar system schematic

## 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](http://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](mailto:info.us@conductix.com) for more information.



**Hevi-Bar II - 500 Amp**



# Conductor Bar Specification Data Sheet

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

## APPLICATION

- Application Type:  Runway  Bridge  Monorail  Other
- New Approved Installation?  Extended Existing?  Replacement?
- System Length: \_\_\_\_\_  Feet  Meters
- Total # of Conductors: \_\_\_\_\_ Will one conductor be designated as a ground?  Yes  No

## ENVIRONMENTAL DATA

Describe the environment where the conductor system will be located:

- Indoors  Outdoors  Both Indoors and Outdoors  Outdoor & Ice
- Ambient temperature range: Min. \_\_\_\_\_ Max. \_\_\_\_\_ Degrees  Fahrenheit  Celcius
- Will a heater wire need to be included?  Yes  No (if yes, consult factory)
- Is there a source of corrosion present?  Yes  No **Refer to Appendix I Pg. 57.**  
 If yes, describe the corrosive: \_\_\_\_\_
- Other environmental considerations (dust, etc.)? \_\_\_\_\_

## MECHANICAL DATA

- Vehicle Speed \_\_\_\_\_  feet/min  M/min Duty Cycle: \_\_\_\_\_
- Number of vehicles or trolleys: \_\_\_\_\_ Crane Class (if applicable) \_\_\_\_\_  
**Refer to Appendix I Pg. 60.**
- Will Conductix-Wampfler be supplying mounting brackets?  Yes  No
- Does the system include any curves?  Yes  No (if yes, consult factory)
- Other mechanical notes: \_\_\_\_\_

## ELECTRICAL SPECIFICATIONS

- Number of power feeds: \_\_\_\_\_
- Location of power feeds (check all that apply):  Center  Multiple  End **Refer to Appendix I Pg. 58.**  
 Advanced: Distance power feeds will be from end of system: \_\_\_\_\_ (or attach diagram)
- Number of power phases: \_\_\_\_\_ Operating voltage: \_\_\_\_\_ (volts)  AC  DC
- Total current draw: (sum of all vehicles ) \_\_\_\_\_ (Amps) Demand factor \_\_\_\_\_ (typically .9)
- 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.**



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# 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



Hevi-Bar II - Ore Bridge Application



Hevi-Bar II - Mill Application



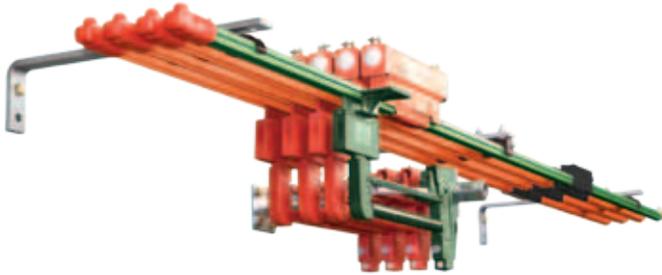
Hevi-Bar II - Foundry Crane



Hevi-Bar II - Curved System

## Safe-Lec 2 Overview & Design Features

**Safe-Lec 2™** - The “next generation” in electrification for overhead cranes and other moving equipment. This modern system delivers safe, reliable power in a rugged, easy-to-install package. **UL Listed.**



### Safe-Lec 2 is ideal for:

- Small to medium cranes
- Monorails
- Conveyor systems
- Material Handling Equipment
- Moderately curved systems
- Amusement rides

### Ampacity range:

100A, 125A, 160A, 200A, 250A, 315A, & 400A capacities up to 600 volts maximum.

### Maximum Speed:

1200 ft/min

### Options:

Heater wire systems (Pg. 26), stainless steel hardware, green bonding (ground) conductor covers, black “UV resistant” outdoor covers, curved systems to a minimum of 60” radius (curved at our factory).

### Safe-Lec 2 Features:

- Positive shoe tracking and superior conductivity. Long-wearing shoe is guided by the V-contact in the rail.
- Robust collector arm articulates to help maintain contact.
- IP2 “finger safe” operation; no live parts exposed.
- Secure, bolted splice joints pre-installed on conductors for superior electrical connection. Won’t pull apart over time. Includes one-piece snap-on cover.
- Integrated collector cables; won’t snag on moving equipment.
- Peaked insulating covers to shed dust and water. The same cover profile fits all bar styles; fewer parts to stock.

### Safe-Lec 2 Installs Quickly:

- Less expense and shorter crane downtime.
- Requires fewer splice joints; 14’ 9” (4.5m) rail lengths versus 10’ for most other systems.
- Includes pre-installed splice joints on one end of bar.
- Uses multi-pole hanger; multiple bars snap into the same hanger and hanger mounts with a single bolt.
- Requires fewer expansion joints; up to 492’ (150m) without an expansion section.
- Is easy to install and align with slotted hanger brackets.
- Is easy to wire; power wires connect to lug at base of collector. Requires no in-line splices or connectors.

Automate your quotations with our advanced “Quick Quote” software - See Pg. 5.



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# Safe-Lec 2 Overview & Design Features

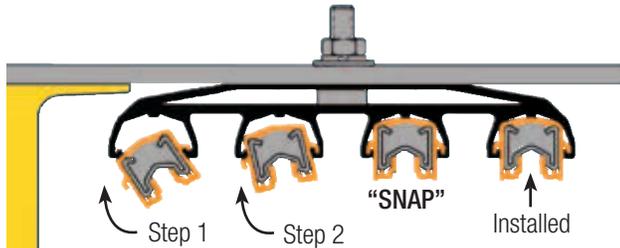
Here are several specific reasons why Safe-Lec 2 is superior to a traditional (and now outmoded) 8-Bar system. And we should know . . . we invented 8-Bar over 50 years ago!

## Safe-Lec 2

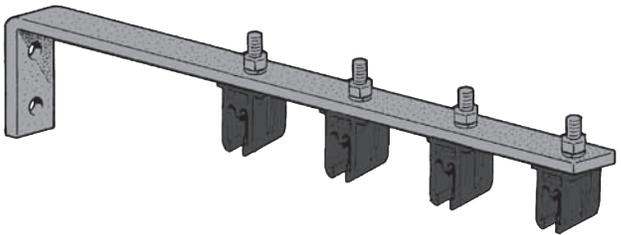
## 8-Bar

### Quicker and less costly Installation

- 14.76 ft (4.50m) bar lengths; fewer joints
- Multiple pole hangers; a “snap” to install



- Wires connect into lug integrated in the collector arm



- 10 ft (3.05m) bar lengths; more splices required
- Hangers hold only one bar each

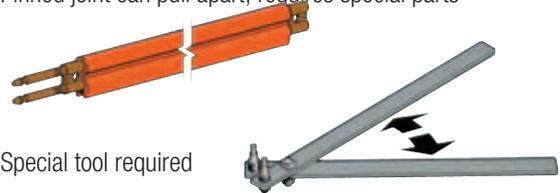
- Wires must be spliced to collector pigtails

### More secure splice joint

- Bolted joints
- No special tools required
- No need for “joint keepers” or “joint repair kits”, etc



- Pinned joint can pull apart; requires special parts



- Special tool required

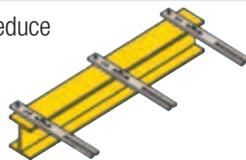
### Fewer expansion sections required

- Safe-Lec 2 can go 492 ft (150m) before an expansion is required

- 8-Bar can only go 300 ft before an expansion section is required (or 200 ft for copper bar)

### Easier system alignment

- Slotted brackets are available to reduce hole alignment problems
- System alignments are easy!



- Brackets have round holes, so alignment must be perfect
- Harder to make system alignment adjustments



### Superior Collector Shoe Tracking

- Shoe is guided by the V-contact in the metal bar
- Collector arm articulates to accommodate mild system misalignments

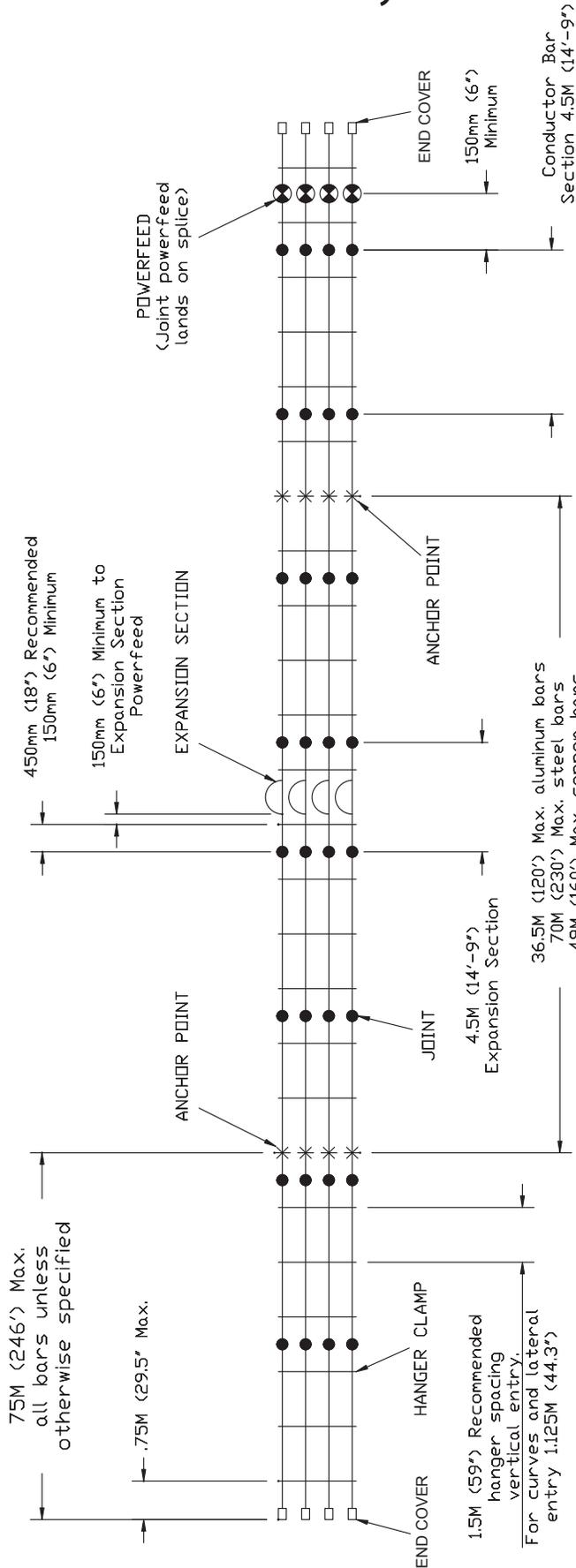


- Shoe is guided by the plastic cover
- Accurate system alignment is much more critical

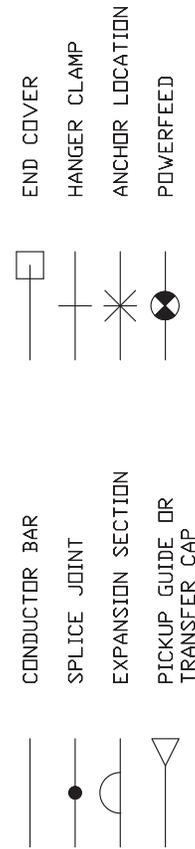


# Typical 4-Bar Safe-Lec 2 System

## EXAMPLE OF 4 CONDUCTOR RUNWAY SAFELEC 2 (3 PHASE + 1 GROUND)



NOTES: Maximum length without expansions:  
150M (492'), use anchor clamp at center



Minimum Conductor Spacing  
All styles of conductor hangers  
1.7" (43 mm)

# Electrical Ratings for Safe-Lec 2

## Voltage Drop Calculations

Volt drop calculation  $\Delta U$ :

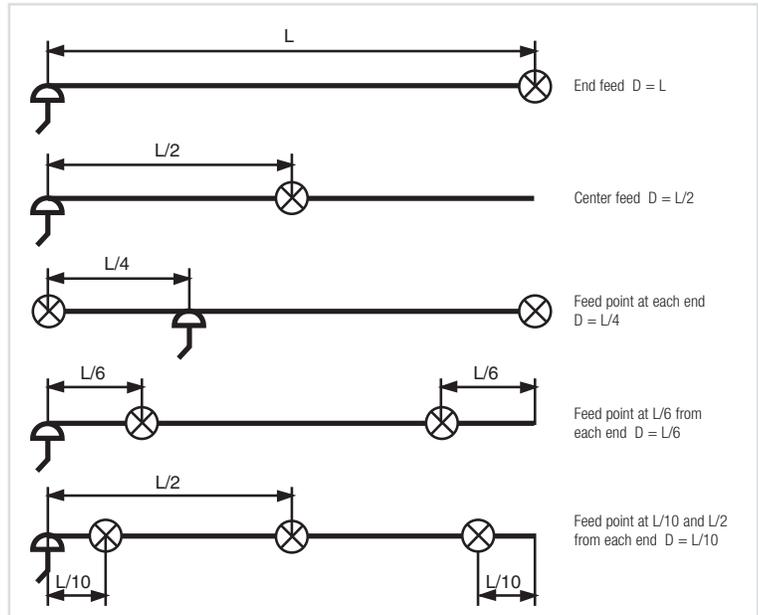
3-Phase AC  $\Delta U = \sqrt{3} \times I \times D \times Z$   
 Single Phase AC  $\Delta U = 2 \times I \times D \times Z$   
 Continuous current DC  $\Delta U = 2 \times I \times D \times R$

$$\Delta U\% = (\Delta U \times 100) / U_n$$

**Where:**

- $\Delta U$ : voltage drop in Volts
- $U_n$ : Nominal voltage
- I: Maximum current in amps
- D: Distance between the feed and pick-up points in meters.
- R: Resistance of conductor in ohms per meter (see Pg. 13)
- Z: Impedance of conductor in ohms per meter (see Pg. 13)

**See Appendix I and Appendix II for more information about voltage drop.**



## Current Rating

The maximum allowable continuous current rating of the conductor bar depends on the Duty Factor "K" of the cranes and the maximum ambient temperature  $T_a$ . Allowable current (I) is calculated using the following formula:

$$I_{\text{allowable}} = \text{Nominal Current} \times K$$

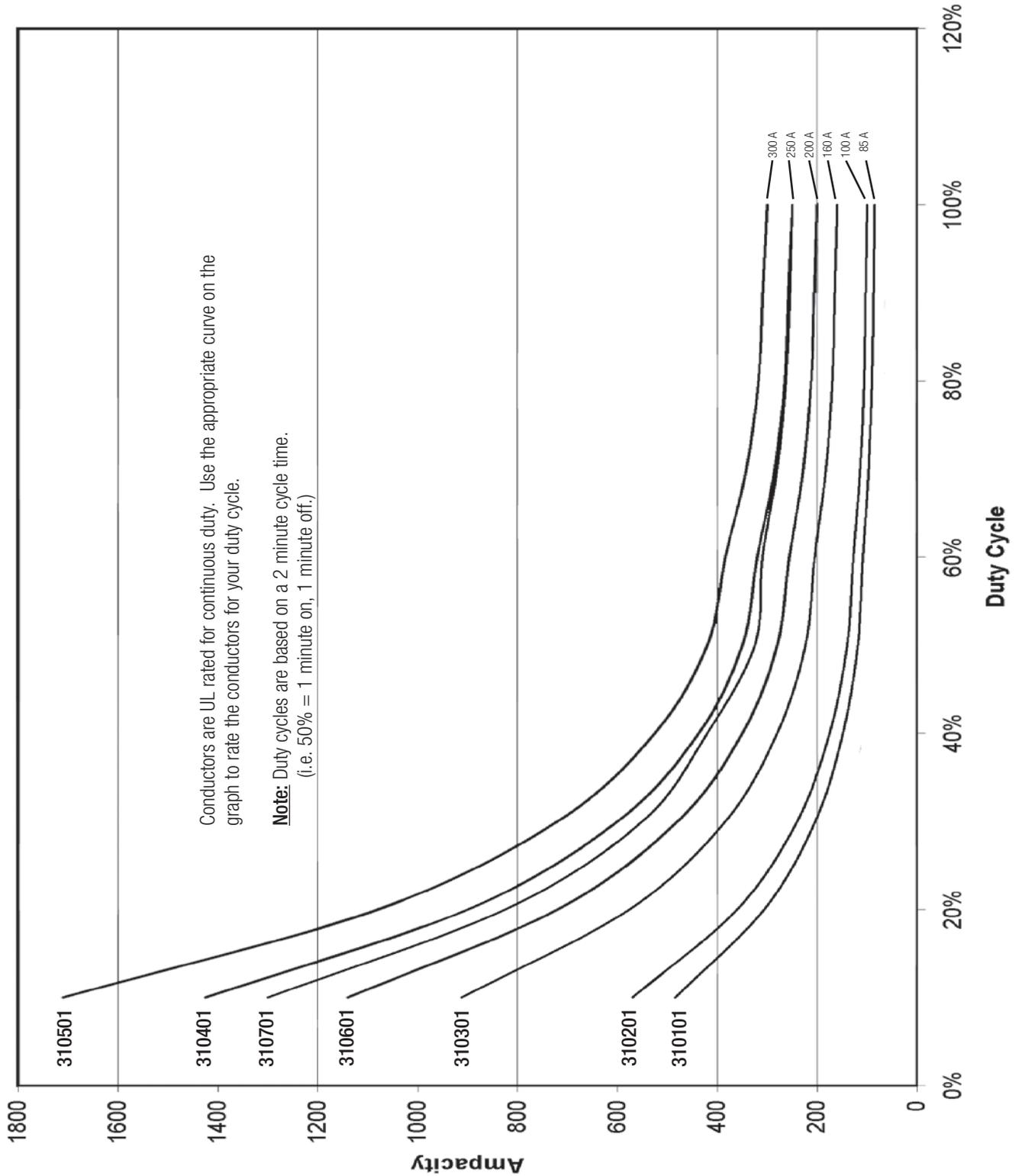
		Factor "K"				
		Duty 100%	80%	60%	40%	20%
Standard Cover	$T_a$					
		77°F (25°C)	1.000	1.118	1.291	1.581
	95°F (35°C)	0.905	1.011	1.168	1.430	2.023
	113°F (45°C)	0.798	0.892	1.030	1.261	1.784
	130°F (55°C)	0.674	0.754	0.870	1.066	1.508
Medium Heat Cover	150°F (65°C)	0.775	0.866	1.000	1.225	1.732
	167°F (75°C)	0.707	0.791	0.913	1.118	1.581
	185°F (85°C)	0.632	0.707	0.816	1.000	1.414

**For UL rated capacities, see graph on Pg. 12**



## Safe-Lec 2 Electrical Ratings

### Conductor De-rating



## Safe-Lec 2 Specifications

The appropriate conductor bar can be chosen only when all the relevant factors are known. Please refer to the Data Sheet on Pg. 6, 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.

### Safe-Lec 2 Conductor Bar

	Galvanized Steel		Copper			Aluminum / Stainless Steel		
Nominal Current	100A	125A	160A	250A	400A	200A	315A	400A
Cross Sectional Area	63mm <sup>2</sup>	93mm <sup>2</sup>	50mm <sup>2</sup>	63mm <sup>2</sup>	93mm <sup>2</sup>	104mm <sup>2</sup>	120mm <sup>2</sup>	156mm <sup>2</sup>
Maximum System Voltage AC or DC (Per UL listing) *	600V	600V	600V	600V	600V	600V	600V	600V
Resistance R (for DC) at 20° C (Ω/m)	0.002867	0.001933	0.000342	0.000274	0.000184	0.000301	0.000261	0.000199
Impedance Z (for AC) at 20° C (Ω/m)	0.002891	0.001968	0.000364	0.000300	0.000221	0.000325	0.000288	0.000234
Maximum Allowable Ambient Temperature for 100% Duty Cycle	25°C	25°C	25°C	25°C	25°C	25°C	25°C	25°C
Bar Length	4.5m	4.5m	4.5m	4.5m	4.5m	4.5m	4.5m	4.5m
Support Pitch	Standard	1500mm	1500mm	1500mm	1500mm	1500mm	1500mm	1500mm
	Lateral	1125mm	1125mm	1125mm	1125mm	1125mm	1125mm	1125mm
Minimum Pitch Centers Standard	43mm	43mm	43mm	43mm	43mm	43mm	43mm	43mm
Expansion Sections (Not required for runs less than)	150m	150m	150m	150m	150m	150m	150m	150m
Minimum Bending Radius (Horizontal only, bent at factory)	1.5m	1.5m	1.5m	1.5m	1.5m	1.5m	1.5m	1.5m

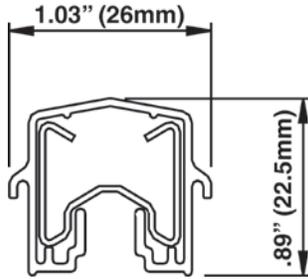
\* Contact Conductix-Wampfler for other voltages

### Safe-Lec 2 Conductor Bar Covers

	Standard (Orange or Green)	UV Stable (Black)	Medium Heat (Red)
Material	PVC	PVC	Polycarbonate
Dielectric Strength	180 kv/cm	180 kv/cm	240 kv/cm
Surface Resistivity	10 <sup>11</sup> Ω	10 <sup>11</sup> Ω	>10 <sup>14</sup> Ω
Volume Resistivity	>10 <sup>15</sup> Ω/cm	>10 <sup>15</sup> Ω/cm	>10 <sup>16</sup> Ω/cm
Vicat Softening Temperature <b>Never expose PVC cover to temperatures in excess of 176° F (80° C)</b>	160°F (71.1°C)	160°F (71.1°C)	250°F (121.1°C)
Flame Test	Self extinguishing	Self extinguishing	Self extinguishing
Oxygen Index	54%	54%	24%
Specific Density	1.5 g/cm <sup>3</sup>	1.5 g/cm <sup>3</sup>	1.15 g/cm <sup>3</sup>

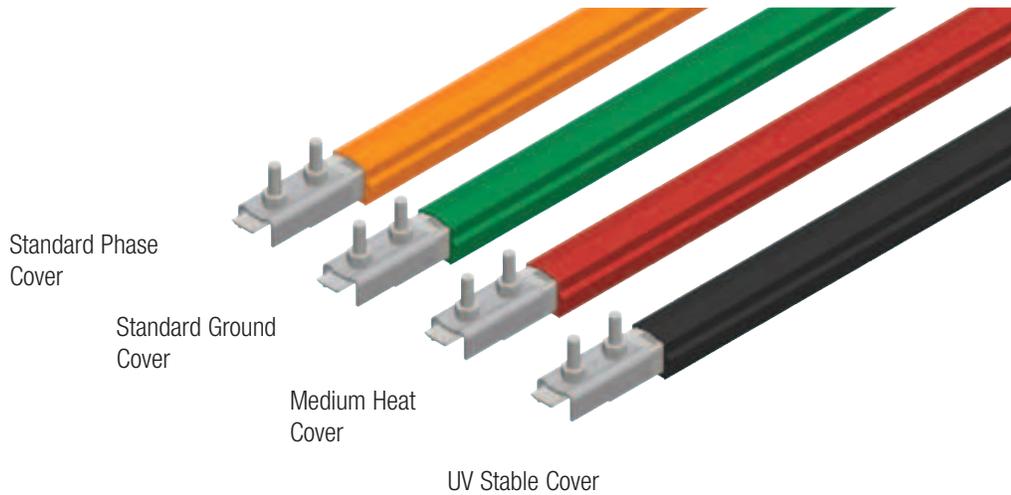


## Safe - Lec 2 Galvanized Steel Bar Galvanized Steel Conductor Bars with Splice Installed



Bar Length: 14.76' (4.5m)

COVER TYPE	CURRENT RATING	
	100A	125A
Standard Phase Cover (Orange)	310101-J	310201-J
Standard Ground Cover (Green)	310102-J	310202-J
Medium Heat Cover (Red)	310103-J	310203-J
UV Stable (Black)	310101B-J	310201B-J
Wt lb (kg)	6.2 (2.8)	8.6 (3.9)



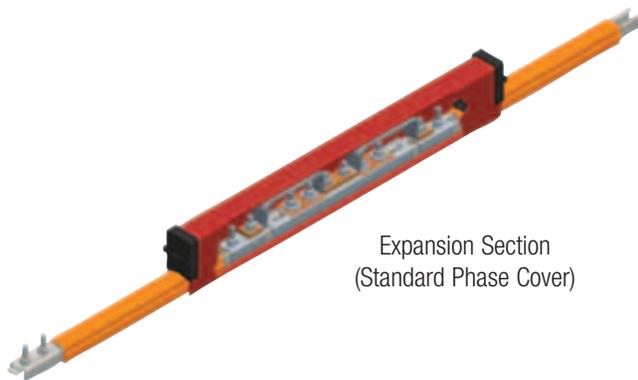
Standard Phase Cover

Standard Ground Cover

Medium Heat Cover

UV Stable Cover

## Expansion Sections with Splice Installed



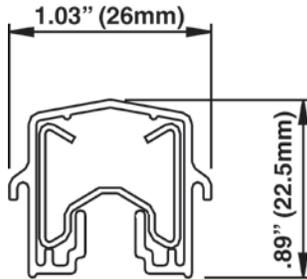
Expansion Section  
(Standard Phase Cover)

Expansion Sections are used at all structural expansion joints and for systems longer than 492 ft (150m) to allow for thermal expansion / contraction of the bar. The maximum gap of the Expansion Section is 2.0" (50 mm). The Expansion Section is 14' 9" (4.5 m) long and is installed in place of one length of conductor bar.

COVER TYPE	CURRENT RATING	
	100A	125A
Standard Phase Cover (Orange)	310107-J	310207-J
Standard Ground Cover (Green)	310108-J	310208-J
Medium Heat Cover (Red)	310109-J	310209-J
UV Stable (Black)	39130-J	39131-J
Wt lb (kg)	7.5 (3.4)	9.5 (4.3)

# Safe - Lec 2 Cooper Bar

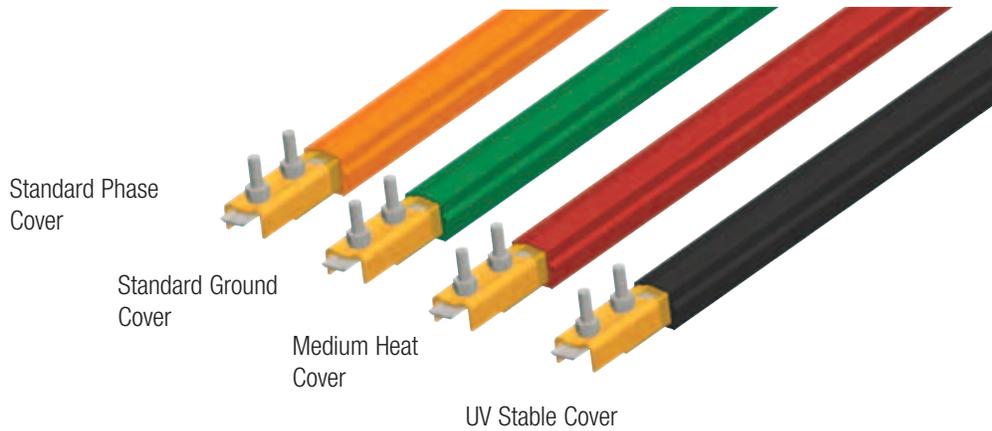
## Copper Conductor Bars with Splice Installed



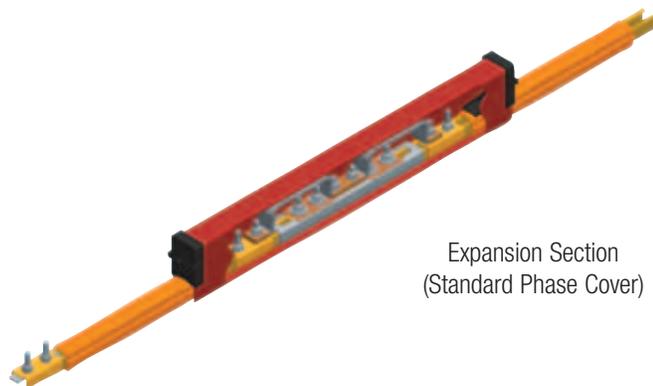
Bar Length: 14.76' (4.5m)

### CURRENT RATING

COVER TYPE	160A	250A	400A
Standard Phase Cover (Orange)	310301-J	310401-J	310501-J
Standard Ground Cover (Green)	310302-J	310402-J	310502-J
Medium Heat Cover (Red)	310303-J	310403-J	310503-J
UV Stable (Black)	310301B-J	310401B-J	310501B-J
Wt lb (kg)	6.2 (2.8)	6.8 (3.1)	10.0 (4.5)



## Expansion Sections with Splice Installed



Expansion Section (Standard Phase Cover)

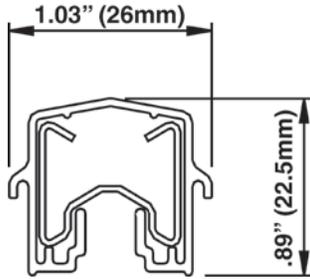
Expansion Sections are used at all structural expansion joints and for systems longer than 492 ft. (150m) to allow for thermal expansion / contraction of the bar. The maximum gap of the Expansion Section is 2.0" (50 mm). The Expansion Section is 14' 9" (4.5 m) long and is installed in place of one length of conductor bar.

### CURRENT RATING

COVER TYPE	160A	250A	400A
Standard Phase Cover (Orange)	310307-J	310407-J	310507-J
Standard Ground Cover (Green)	310308-J	310408-J	310508-J
Medium Heat Cover (Red)	310309-J	310409-J	310509-J
UV Stable (Black)	39132-J	39133-J	39134-J
Wt lb (kg)	7.5 (3.4)	8.9 (4.0)	10.6 (4.8)

# Safe - Lec 2 Aluminum / Stainless Bar

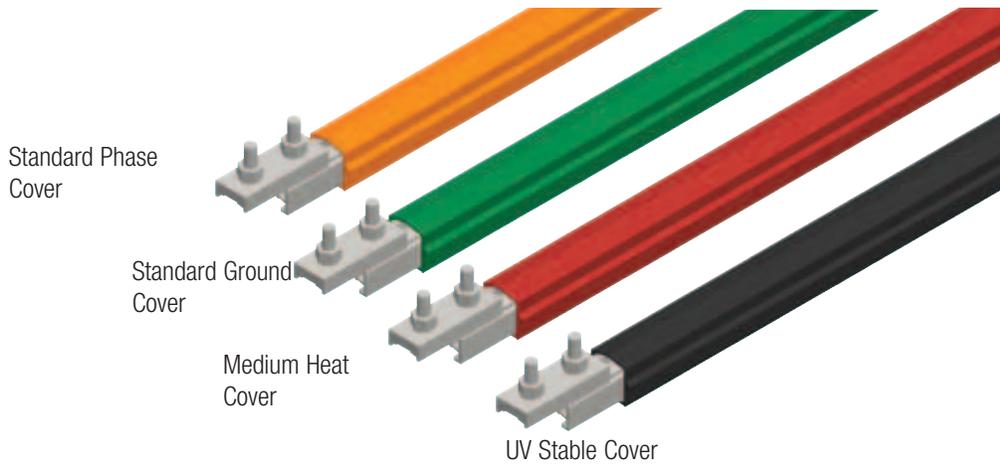
## Aluminum / Stainless Steel Conductor Bars with Splice Installed



Bar Length: 14.76' (4.5m)

### CURRENT RATING

COVER TYPE	200A	315A	400A
Standard Phase Cover (Orange)	310601-J	310701-J	399101-J
Standard Ground Cover (Green)	310602-J	310702-J	399102-J
Medium Heat Cover (Red)	310603-J	310703-J	399103-J
UV Stable (Black)	310601B-J	310701B-J	399101B-J
Wt lb (kg)	4.9 (2.2)	5.1 (2.3)	5.8 (2.6)



## Expansion Sections with Splice Installed



Expansion Sections are used at all structural expansion joints and for systems longer than 492 ft. (150m) to allow for thermal expansion / contraction of the bar. The maximum gap of the Expansion Section is 2.0" (50 mm). The Expansion Section is 14' 9" (4.5 m) long and is installed in place of one length of conductor bar.

### CURRENT RATING

COVER TYPE	200A	315A	400A
Standard Phase Cover (Orange)	310607-J	310707-J	399107-J
Standard Ground Cover (Green)	310608-J	310708-J	399108-J
Medium Heat Cover (Red)	310609-J	310709-J	399109-J
UV Stable (Black)	39135-J	39136-J	399107B-J
Wt lb (kg)	7.3 (3.3)	7.8 (3.5)	8.6 (3.9)

# Safe - Lec 2 Joints & Power Feeds

## Splice Joints

One splice joint is included with bar part numbers ending with "-J" (see Pgs. 14-16)



Steel Joint 310872



Copper Joint 310873



Aluminum Joint 310874



Heavy Duty Copper Joint 399549

TYPE	Part No.	Wt lb (kg)
Steel	<b>310872</b>	0.11 (0.049)
Copper	<b>310873</b>	0.10 (0.044)
Aluminum	<b>310874</b>	0.07 (0.032)
Heavy Duty Copper	<b>399549</b>	0.44 (0.200)

## Joint Covers

Must be ordered separately - one per splice joint.



Standard Phase Joint Cover  
310850B



Heavy Duty Joint Cover  
399541 (used with 399549)

TYPE	Part No.	Wt lb (kg)
Standard Cover (UV Black)	<b>310850B</b>	.06 (0.027)
Heavy Duty Cover	<b>399541</b>	.06 (0.027)
Medium Heat Cover (Red)	<b>310855</b>	.06 (0.027)

## Joint Compound

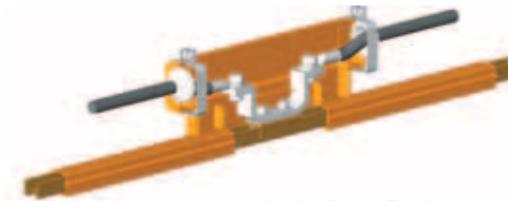
Joint compound is applied to the contact surfaces at every joint on aluminum systems. One tube is included with every aluminum/stainless bar system at a nominal cost and is sufficient for over 300 connections (equal to a 1000 foot long system with four phases).



Part No.	Wt lb (kg)
<b>15629</b>	.50 (0.225)

## Joint Power Feeds

The Joint Power Feed is usually installed on top of a splice joint. Cable lugs are customer supplied.



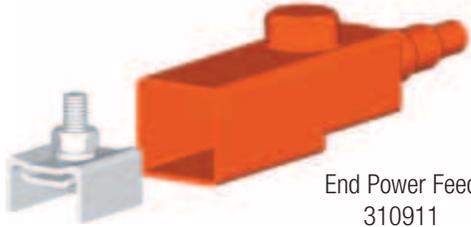
250A Joint Power Feed  
310910B

### CURRENT RATING

TYPE	Up to 250A	Up to 400A
Standard Cover (Black)	<b>310910B</b>	<b>310912B</b>
Medium Heat Cover (Red)	<b>310913</b>	<b>310915</b>
No. of Cable Connections	2	2
Max. Cable Size	#3/0 (95mm <sup>2</sup> )	300kcmil (150mm <sup>2</sup> )
Wt lb (kg)	0.55 (0.25)	0.66 (0.30)

# Safe - Lec 2 Hanger / Clamps

## End Power Feed



End Power Feed  
310911

The End Power Feed is installed in place of an end cover. Maximum cable connection size: 6 AWG (16mm<sup>2</sup>). These are suitable for 100A Galvanized Steel Bar only.

Part No.	Wt lb (kg)
<b>310911</b>	0.09 (0.037)

## Hanger Clamps Standard

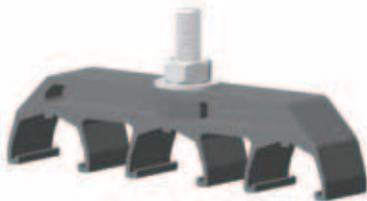
Maximum support bracket spacing is 59.1" (1.5m) Hardware is plated steel unless noted otherwise.



Single Pole Hanger 310824  
310919 (stainless steel hardware)



Two Pole Hanger  
310882



Three Pole Hanger  
310861



Four Pole Hanger, Standard Mount  
310821 (plated hardware)  
39768 (stainless steel hardware)



Stainless Steel Hanger  
399416B



Four Pole Hanger, Lateral Mount  
310835 (plated hardware)  
50120 (stainless steel hardware)

TYPE	Mounting Orientation		Acetyl (Black) 160° Max.	Polycarbonate (Red) 250° Max.	Stainless Steel	Wt lb (kg)
	Standard	Lateral				
Single Pole	X	X	<b>310824</b>	<b>310829</b>	<b>310919</b>	0.07 (0.03)
Two Pole	X	X	<b>310882</b>	<b>310899</b>	-	0.09 (0.04)
Three Pole	X	X	<b>310861</b>	<b>310871</b>	-	0.11 (0.05)
Four Pole	X		<b>310821</b>	<b>310857</b>	<b>39768</b>	0.13 (0.06)
Four Pole		X	<b>310835</b>	<b>310859</b>	<b>50120</b>	0.18 (0.08)
Single Pole	X	X	-	-	<b>399416B</b>	0.15 (0.17)

## Safe - Lec 2 Hanger / Anchor Clamps

### Hanger Clamps With Insulator

In particularly dusty, humid, or outdoor environments, hangers with insulators should be used. Two-Part Hangers are ideal for installation where conductor bar must be repeatedly installed and removed.



Single Pole Hanger  
310918

TYPE	Material	Max. Temp	Part No.	Wt lb (kg)
Single Pole	Acetyl (Black)	160° F	<b>310918</b>	0.22 (0.10)
Single Pole	Polycarbonate (Red)	250° F	<b>310834</b>	0.22 (0.10)
Single Pole	Stainless Steel	250° F	<b>38779</b>	0.24 (0.11)
Single Pole, Two-Part	Acetyl (Black)	160° F	<b>399544</b>	0.18 (0.08)
Two Pole, Two-Part	Acetyl (Black)	160° F	<b>399647</b>	0.40 (0.18)



Single Pole Hanger  
310834



Stainless Steel Hanger  
38779



Two-Part Single Pole  
Hanger  
399544



Two-Part Two Pole  
Hanger  
399647

### Anchor Clamps

Anchor points are usually situated in the middle of a conductor system. Additional anchor points are required for systems with expansion sections.



Anchor Clamp  
310832 (plated hdwe)  
310833 (stainless steel hdwe)

TYPE	Max. Temp	Part No. Plated Steel Hdwe	Part No. Stainless Steel Hdwe	Wt lb (kg)
Standard	250° F	<b>310832</b>	<b>310833</b>	0.14 (0.06)
With Insulator	250° F	<b>310969</b>	<b>38780</b>	0.27 (0.12)
Without Top Bolt (Two req'd per anchor point)	250° F	<b>310831</b>	<b>38220</b>	0.11 (0.05)



Anchor Clamp, with Insulator  
310969 (plated hdwe)  
38780 (stainless steel hdwe)



Anchor Clamp, without Top Bolt  
310831 (plated hdwe)  
38220 (stainless steel hdwe)

# Safe - Lec 2 End Caps & Pick Up Guides

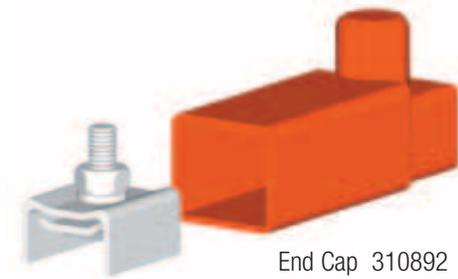
## End Caps

End Caps are insulated covers installed at the ends of the conductor system. Transfer Caps transfer the collectors across switch gaps up to 0.40" (10mm) wide.

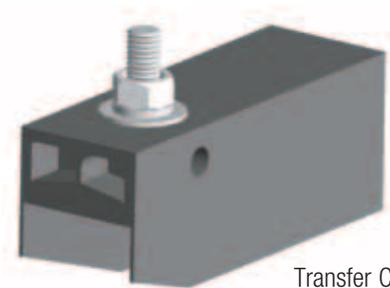
### Transfer Cap Tolerances

Vertical tolerance  $\pm 0.20"$  (5mm)

Horizontal tolerance  $\pm 0.08"$  (2mm)



End Cap 310892



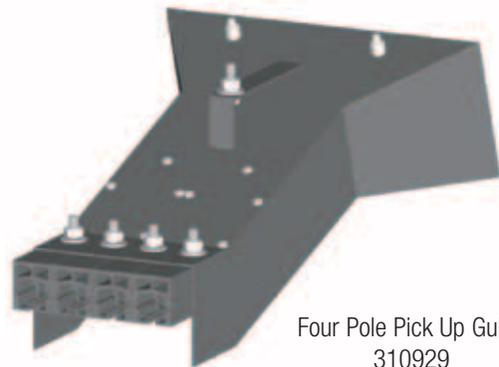
Transfer Cap 310951

TYPE	Material	Part No.	Wt lb (kg)
End Cap Steel / Copper Bar	PVC	<b>310892</b>	0.09 (0.04)
End Cap Aluminum Bar	PVC	<b>310893</b>	0.05 (0.02)
Transfer Cap	Polycarbonate	<b>310951</b>	0.22 (0.10)

## Pick Up Guides

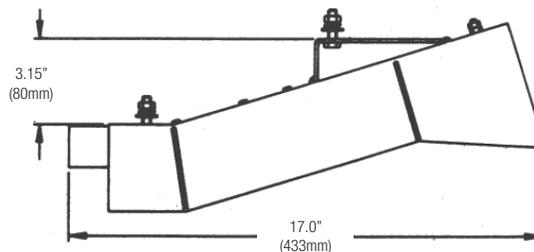
Pick-up Guides are used on discontinuous systems to guide collectors on and off the conductors. Special collectors are required for systems where pick up guides are fitted - see Pg. 22. Guide housing is black painted steel. Guide surfaces are PVC. Molded guides are Polycarbonate.

**Not recommended for lateral mounting**



Four Pole Pick Up Guide  
310929

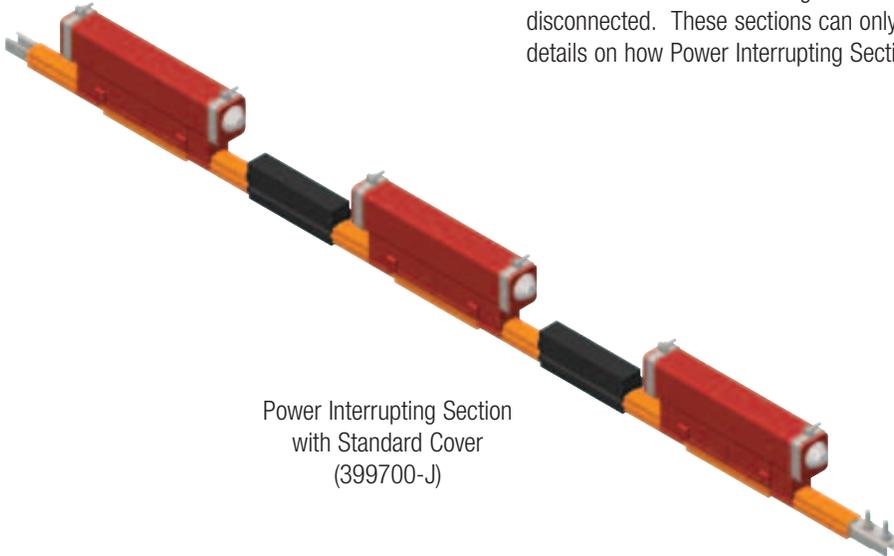
TYPE	Part No.	Wt lb (kg)
Single Pole	<b>310920</b>	2.8 (1.27)
Three Pole	<b>399502</b>	4.8 (2.16)
Four Pole	<b>310929</b>	5.6 (2.54)



# Safe - Lec 2 Power Interrupting Sections

## Power Interrupting Sections with Splice Installed

Power Interrupting Sections provide a dead or safe zone between adjacent, separately powered zones of the system. Each section is 14' - 9" (4.5m) long and is installed in place of one length of conductor bar. It is recommended that Power Interrupting Sections are not mounted in ground conductors so that the ground is never disconnected. These sections can only be used indoors in dry, clean conditions. For details on how Power Interrupting Sections are used, see Appendix IV, Pgs. 63-64.



Power Interrupting Section  
with Standard Cover  
(399700-J)

### Galvanized Steel Bar

COVER TYPE	CURRENT RATING	
	100A	125A
Standard Phase (Orange)	399700-J	399700-J
Medium Heat (Red)	399702-J	399702-J
UV Stable (Black)	399701-J	399701-J
Wt lb (kg)	9.3 (4.19)	9.3 (4.19)

### Copper Bar

COVER TYPE	CURRENT RATING		
	160A	250A	400A
Standard Phase (Orange)	399703-J	399703-J	399706-J
Medium Heat (Red)	399705-J	399705-J	399708-J
UV Stable (Black)	399704-J	399704-J	399707-J
Wt lb (kg)	7.5 (3.42)	7.5 (3.42)	10.4 (4.68)

### Aluminum / Stainless Steel Bar

COVER TYPE	CURRENT RATING		
	200A	315A	400A
Standard Phase (Orange)	399709-J	399712-J	399715-J
Medium Heat (Red)	399711-J	399714-J	399717-J
UV Stable (Black)	399710-J	399713-J	399716-J
Wt lb (kg)	5.3 (2.4)	5.8 (2.6)	6.5 (2.9)

# Safe - Lec 2 Collectors & Shoes

Safe-Lec 2 “V-Contact” Collectors articulate to accurately track in the conductor bar groove for superior conductivity. Includes long-wearing copper graphite shoe (in holder) and shunt wires as noted below. The green “ground” (earth) collectors are available without “deflector”, or with either right-hand or left-hand deflector. Deflectors prevent the ground collector from coming in contact with adjacent phase collectors. For recommendations about choosing collectors see Appendix I, Pg. 57.

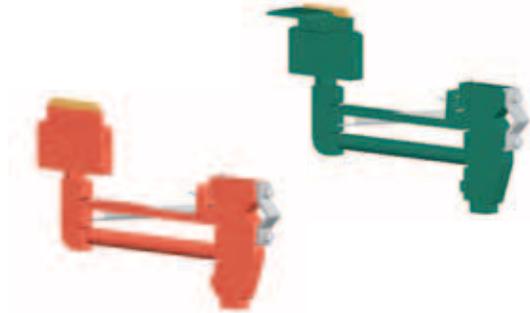
## 50A Collectors



Collector shoe shunt wire is integrated into the arm. Incoming cable is connected to the terminal lug at the base of the collector (maximum 8 AWG).

TYPE	Part No.	Wt lb (kg)
Phase (Red)	<b>399360</b>	0.84 (0.38)
Ground, w/o Deflector	<b>399380</b>	0.84 (0.38)
Ground, with RH Deflector	<b>399373</b>	0.84 (0.38)
Ground, with LH Deflector	<b>399372</b>	0.84 (0.38)

## 100A Collectors



Collector shoe shunt wire is integrated into the arm. Incoming cable is connected to the terminal lug at the base of the collector (maximum 2 AWG).

TYPE	Part No.	Wt lb (kg)
Phase (Red)	<b>310990</b>	1.77 (0.80)
Ground, w/o Deflector	<b>399355</b>	1.77 (0.80)
Ground, with RH Deflector	<b>399340</b>	1.77 (0.80)
Ground, with LH Deflector	<b>399352</b>	1.77 (0.80)

### Collectors used with Pick-up Guides Only, See Pg. 20.

Phase (Red)	<b>310988</b>	1.77 (0.80)
Ground	<b>399358</b>	1.77 (0.80)

## 200A Collectors



Two 2 AWG cables, 42” long, are connected to the collector shoe. Incoming cables splice directly to the shunt wires.

Type-Color	Part No.	Wt lb (kg)
Phase (Black)	<b>34956</b>	<b>1.80 (0.80)</b>

## Collector Shoe & Holder



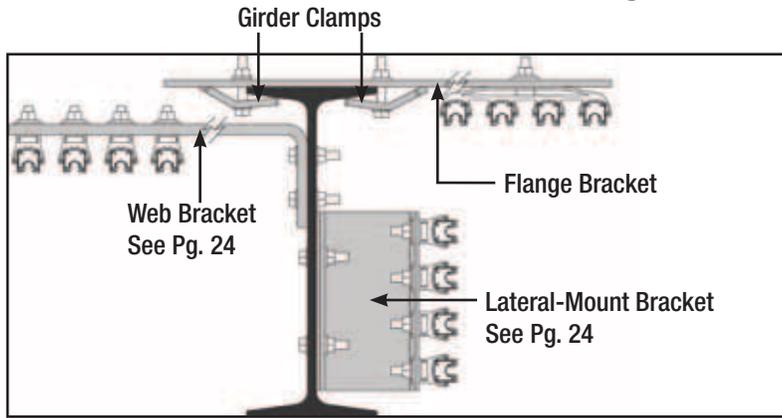
50A / 100A Collector Shoe and Holder  
310993



200A Collector Shoe and Holder  
35289

Current Rating	50A & 100A Phase (Red)	50A & 100A Ground (Green)	50A & 100A with Deflector (Green)	200A
Part No.	<b>310993</b>	<b>399357</b>	<b>399356</b>	<b>35289</b>
Wt lb (kg)	0.13 (0.06)	0.13 (0.06)	0.22 (0.10)	0.62 (0.28)

## Safe - Lec 2 Conductor Flange Brackets



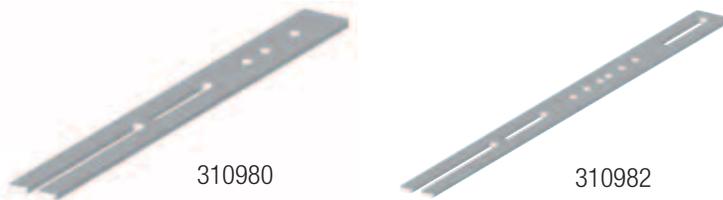
Example Bracket Installations

The various mounting brackets shown on this page and Pg. 24 are used to mount Safe-Lec 2 in many different configurations to suit the application. The diagram shown at the left illustrates how the various brackets are mounted to the I-beam. **All brackets are zinc plated unless noted otherwise.**

### Recommended Max. Bracket Spacing

Application	Collectors Coming Into	Spacing
Vertical Entry	Bottom of rail	59.0" (1.500 M)
Lateral Entry	Side of rail	44.3" (1.125 M)
Curves	Bottom of rail	44.3" (1.125 M)

### Single-sided Flange Brackets



For Beam Flange:	Part No.	Wt lb (kg)
3.15" to 6.10" (80 to 155 mm)	<b>310980</b>	1.46 (0.66)
6.10" to 12.01" (155 to 305 mm)	<b>310982</b>	1.90 (0.86)

### Double-sided Flange Brackets



For Beam Flange:	Part No.	Wt lb (kg)
3.15" to 7.28" (80 to 185 mm)	<b>310981</b>	1.85 (0.84)
7.28" to 12.01" (185 to 305 mm)	<b>310983</b>	2.38 (1.08)

### Girder Clamp



Two required with each flange bracket.

Part No.	Wt lb (kg)
<b>51142</b>	0.18 (0.08)

# Safe - Lec 2 Conductor Web and Collector Brackets

## Web Brackets

For mounting conductors horizontally to the web of the I-Beam. See drawing at the top of Pg. 23,



310984

Length	Part No.	Wt lb (kg)
10.23 (260)	<b>310984</b>	1.37 (0.62)
10.50 (267)	<b>36198</b>	0.99 (0.45)
10.50 (267) - Stainless Steel	<b>39948</b>	0.99 (0.45)
15.75 (400)	<b>36197</b>	2.10 (0.95)



36198  
39948 (stainless steel)



36197

## Lateral Mount Bracket

For mounting conductors laterally to the web of the I-Beam. See drawing at the top of Pg. 23,



Part No.	Wt lb (kg)
<b>399517</b>	1.61 (0.73)

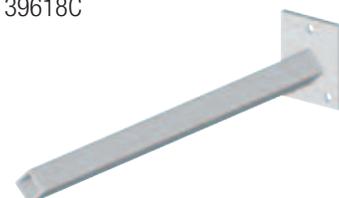
## Collector Brackets

For mounting collectors to the moving vehicle.



**Single Post Collector Bracket**  
39618C

TYPE	For	Post Size in. (mm)	Part No.	Wt lb (kg)
Single Post	50A Collectors	0.50 (13)	<b>39618C</b>	0.80 (0.36)
Double Post	50A Collectors	0.50 (13)	<b>39050</b>	1.60 (0.72)
Single Post	100A and 200A Collectors	1.00 (25)	<b>39617</b>	1.94 (0.88)
Double Post	100A and 200A Collectors	1.00 (25)	<b>37863</b>	4.06 (1.84)



**Single Post Collector Bracket**  
39617

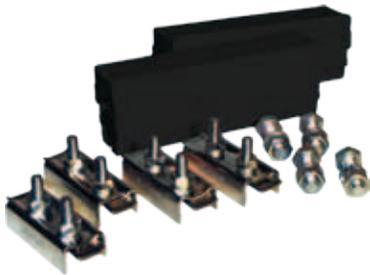


**Double Post Collector Bracket**  
37863 (1.00", 25 mm posts), 39050 (0.50", 13 mm posts)

# Safe - Lec 2 Splice Hardware Kits

When you're 40 feet in the air, small parts will unavoidably fall to the floor. Conductix-Wampfler now provides the spare parts that you need to make your installation easier. These parts are included with every Safe-Lec 2 system and are available using the information below.

## For 100, and 125 Amp Systems



Includes:

- 4 Steel Splice Assemblies
- 2 Splice Covers
- 4 Bolts, Nuts, and Washers for the Bar Hangers

Description	Part No.
Hardware Kit, 100, or 125 Amp	<b>37906</b>

## For 160, 250, and 400 Amp Systems



Includes:

- 4 Copper Splice Assemblies
- 2 Splice Covers
- 4 Bolts, Nuts, and Washers for the Bar Hangers

Description	Part No.
Hardware Kit, 160, 250, or 400 Amp	<b>37907</b>

## For 200, 315 and 400 Amp Systems



Includes:

- 4 Aluminum Splice Assemblies
- 2 Splice Covers
- 4 Bolts, Nuts and Washers for the bar hangers

Description	Part No.
Hardware Kit, 200, 315, or 400 Amp	<b>37908</b>

## Safe - Lec 2 Heater Wire

### Heater Wire System

A heater wire system is recommended for outdoor applications where frost and ice buildup may occur. The thermostatic control box will automatically energize the heater wire system at temperatures of 35°F (1.66°C) and below. Heater wires are pre-installed in each section of bar. Please consult Conductix-Wampfler for assistance in selecting the correct heater wire system.

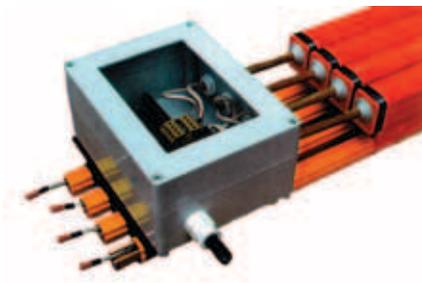


Heater Wire (Male/Female)

### Heater Wire Connection

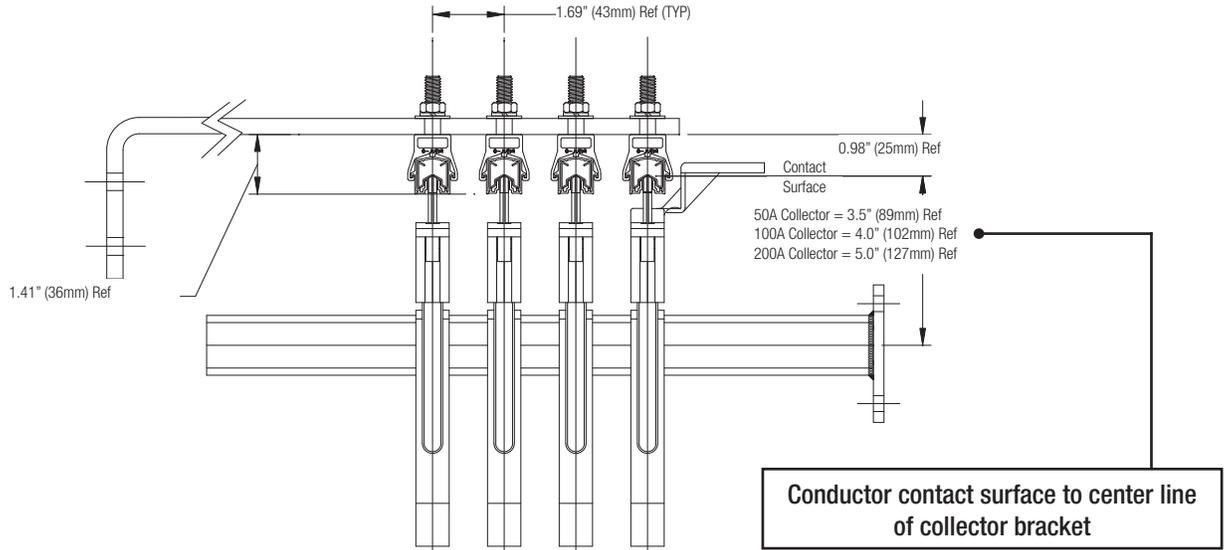


### Main Connection Box

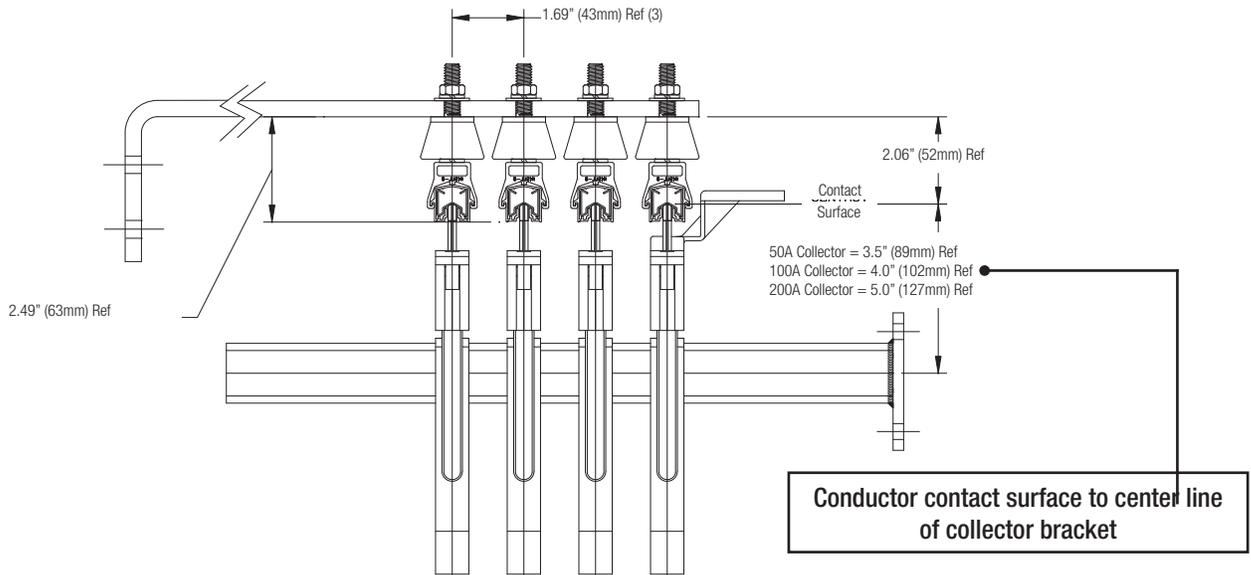


# Safe - Lec 2 Installed Dimensions

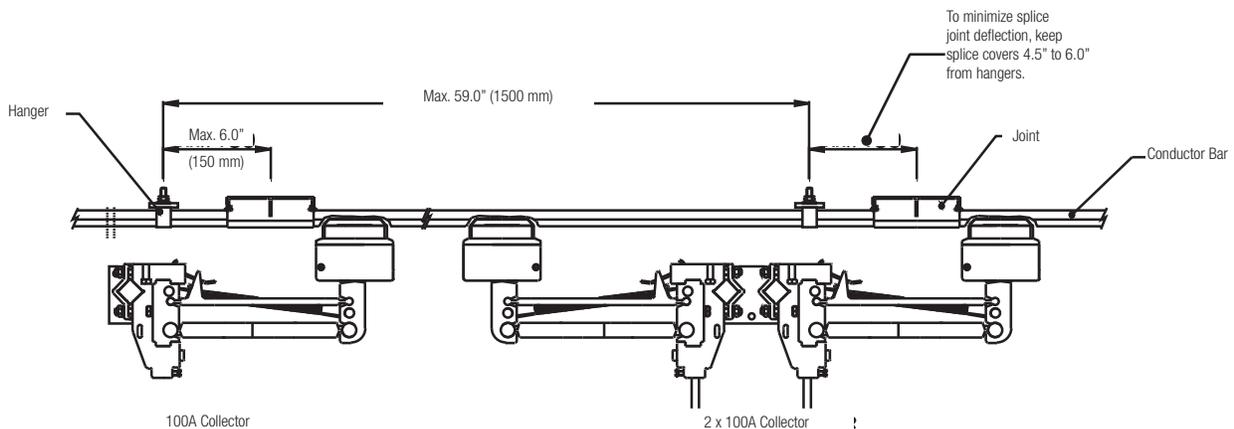
## End View - Standard Hanger Clamps



## End View - Hanger Clamps with Insulator

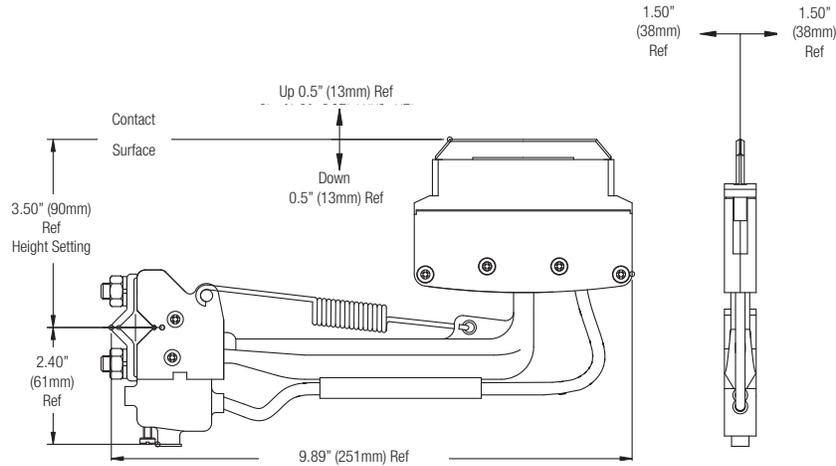


## Side View

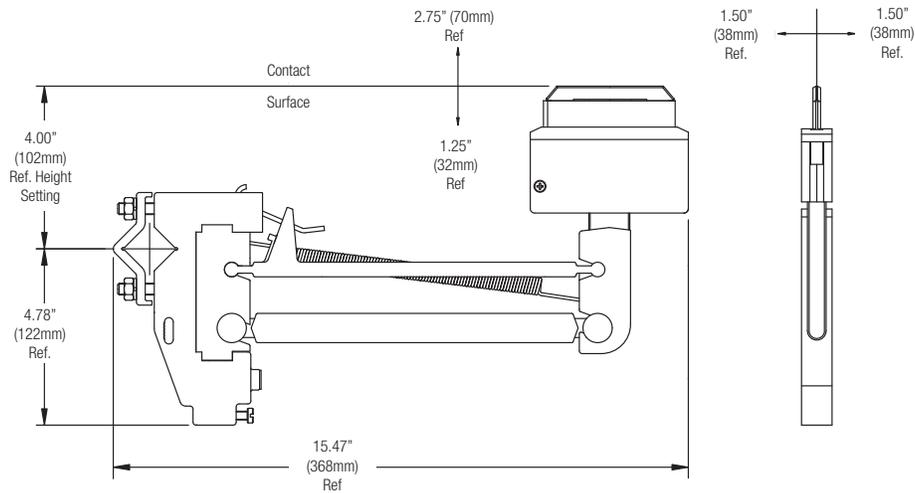


# Safe - Lec 2 Collector Dimensions

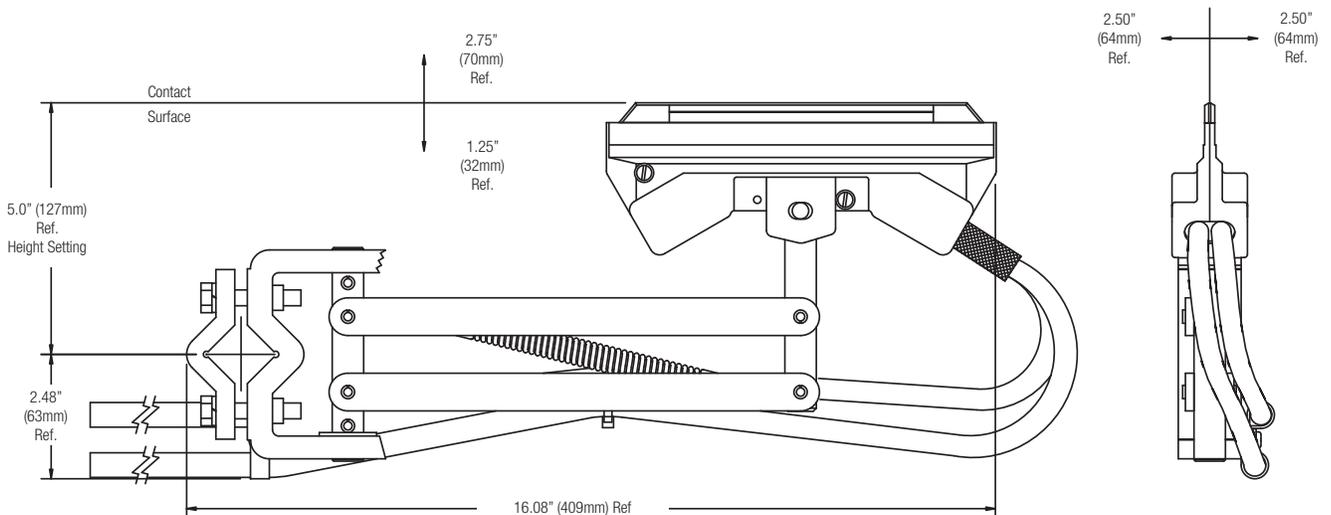
## 50A Collector (399360)



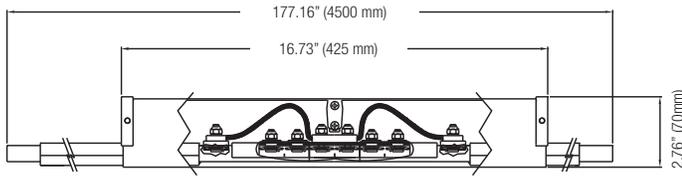
## 100A Collector (310990 / 399355)



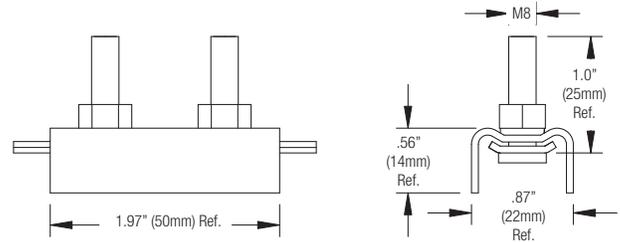
## 200A Collector (34956)



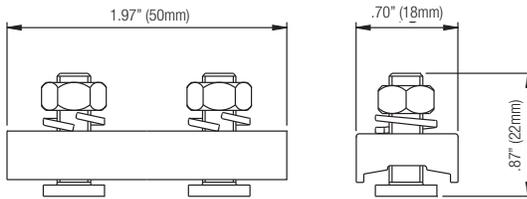
# Safe - Lec 2 Component Dimensions



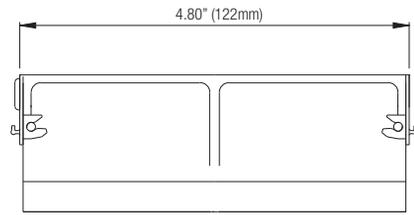
**Expansion Section  
(Typical)**



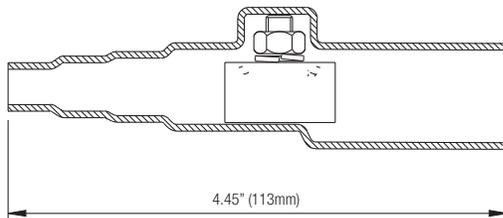
**Steel Joint / Copper  
(310872) / (310873)**



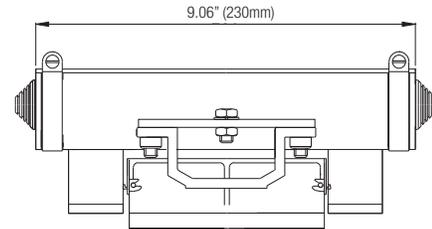
**Aluminum Joint  
(310874)**



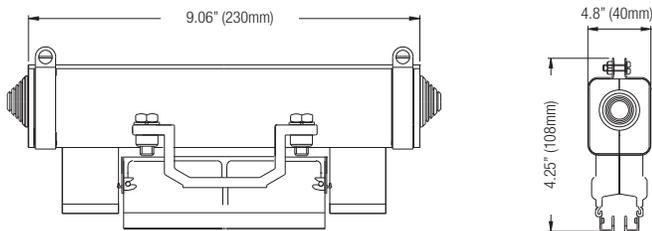
**Standard Phase Cover  
(310850B)**



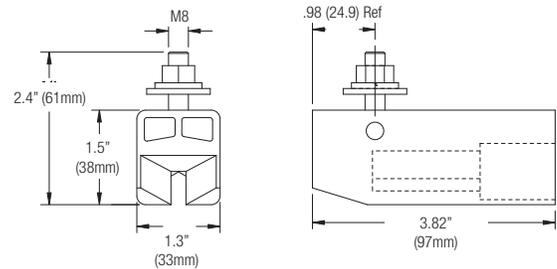
**End Power Feed  
(310911)**



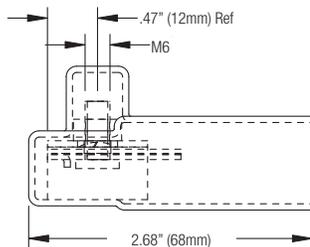
**400A Joint Power feed  
(310912B)**



**250A Joint Power feed  
(310910B)**

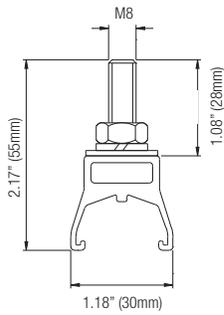


**Transfer End Cap  
(310951)**

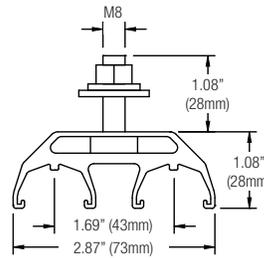


**End Cap  
for Aluminum Bar  
(310892)**

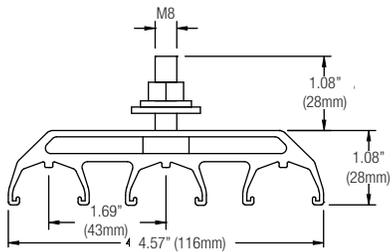
# Safe - Lec 2 Component Dimensions



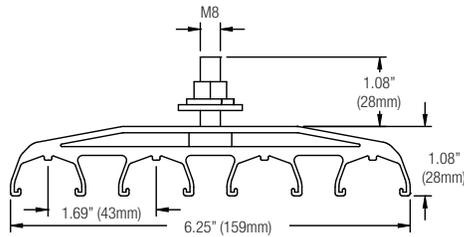
Single Pole  
Hanger Clamp  
Standard Mount  
(310824)



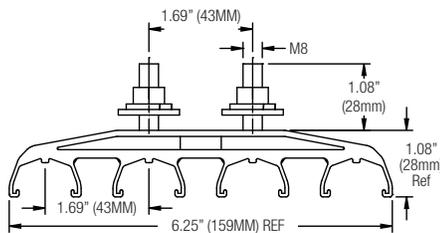
Two Pole  
Hanger Clamp  
Standard Mount  
(310882)



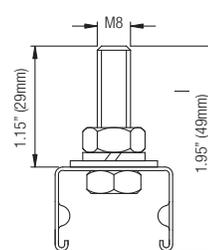
Three Pole  
Hanger Clamp  
Standard Mount  
(310861)



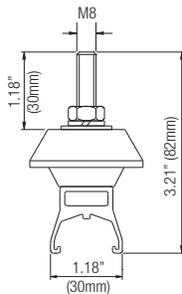
Four Pole  
Hanger Clamp  
Standard Mount  
(310821)



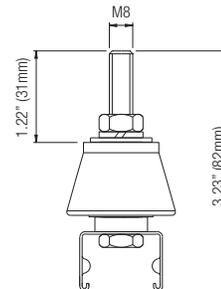
Four Pole  
Hanger Clamp  
Lateral Mount  
(310835)



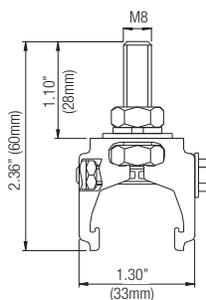
Stainless Steel  
Hanger Clamp  
(399416B)



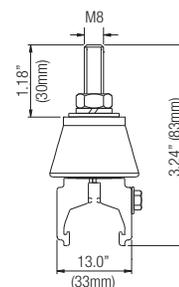
Single Pole  
Hanger Clamp  
with Insulator  
(310918)



Stainless Steel  
Hanger Clamp  
with Insulator  
(38779)



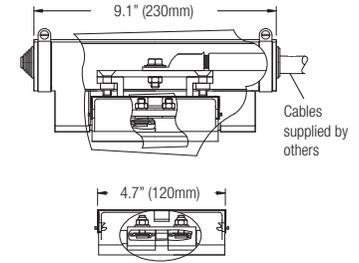
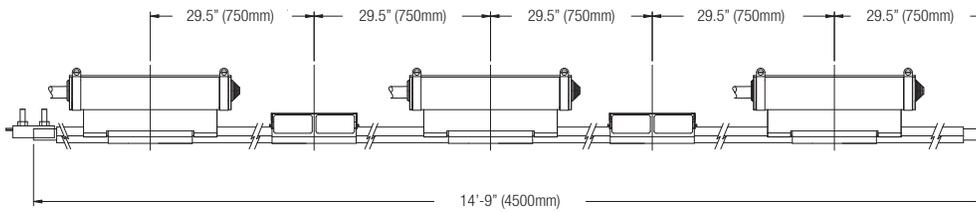
Anchor Clamp  
(310832)



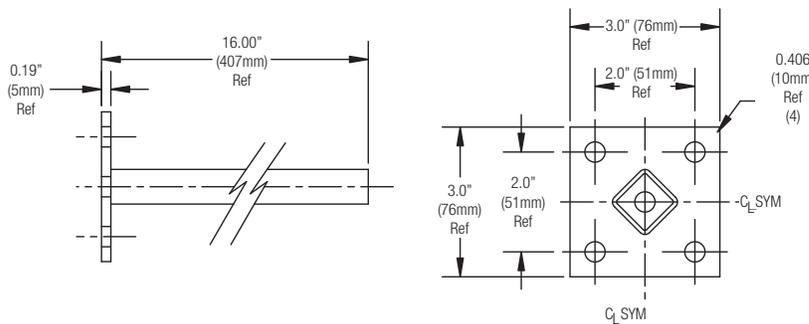
Anchor Clamp  
With Insulator  
(310969)

# Safe - Lec 2 Component Dimensions

## Power Interrupting Section (Typical)

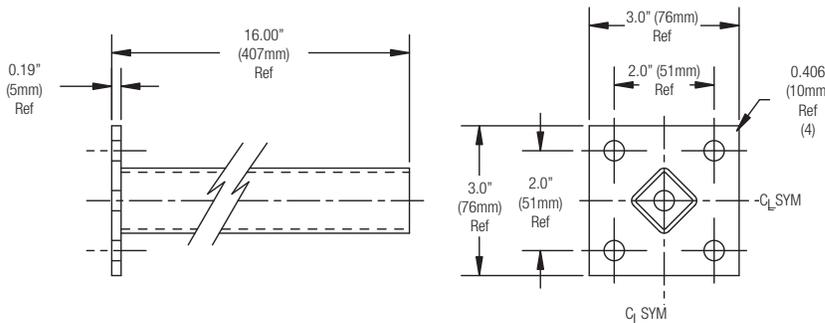


## Single Collector Bracket, 0.51" (13mm) square (39618C)



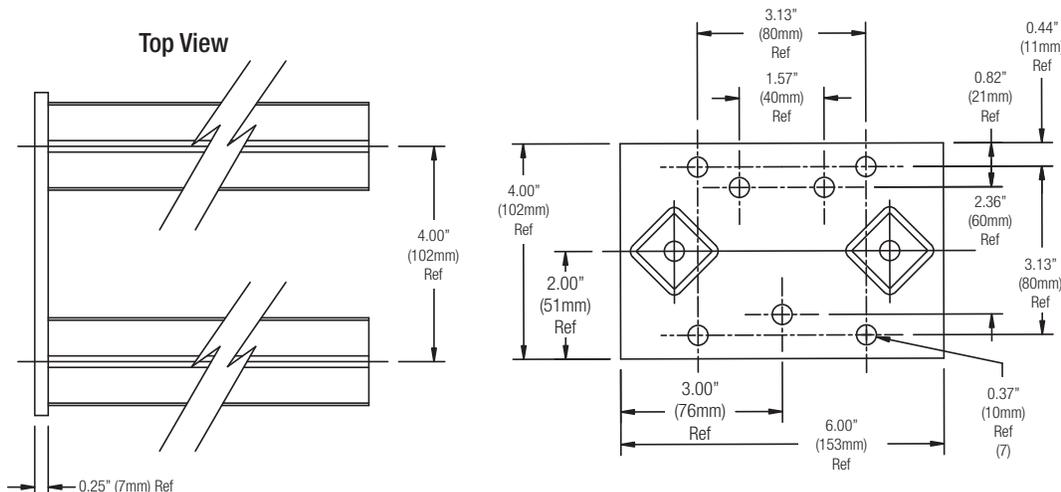
Used only with 50A Collectors

## Single Collector Bracket, 0.99" (25mm) square (39617)



Used with 100A and 200A Collectors

## Dual Collector Bracket, 0.99" (25mm) square (37863)

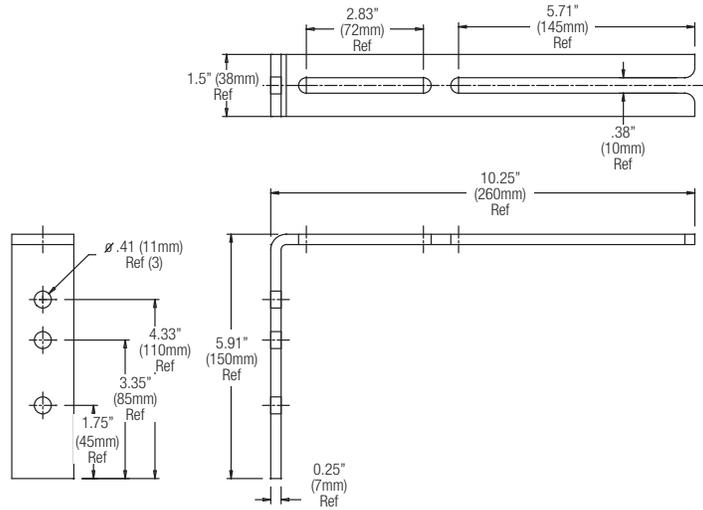


Used with 100A and 200A Collectors

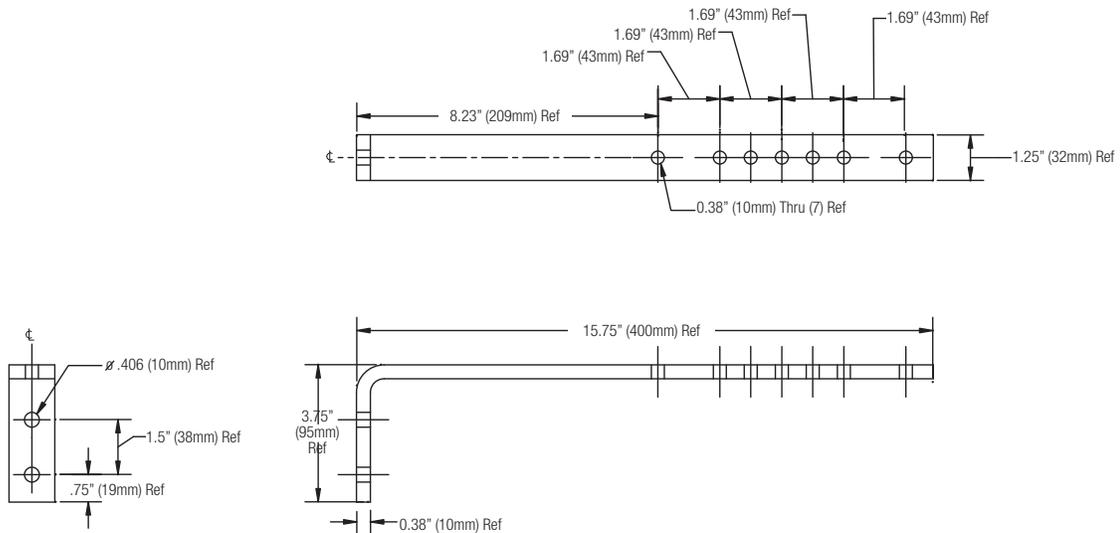
(For the 50A Dual Post Collector Bracket 39050, contact the Factory)

# Safe - Lec 2 Bracket Dimensions

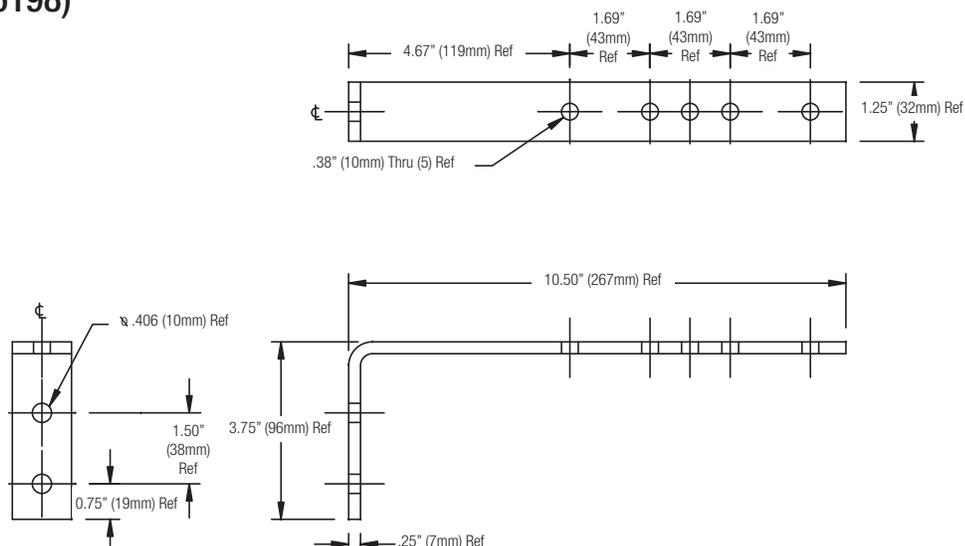
## Web Bracket (310984)



## Web Bracket (36197)

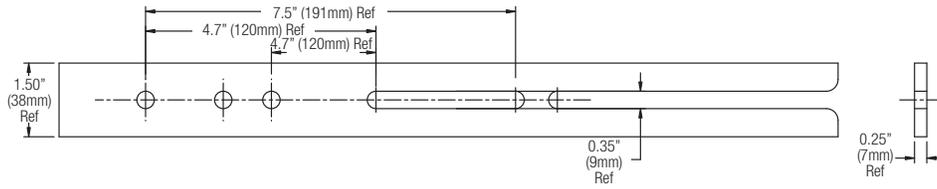


## Web Bracket (36198)

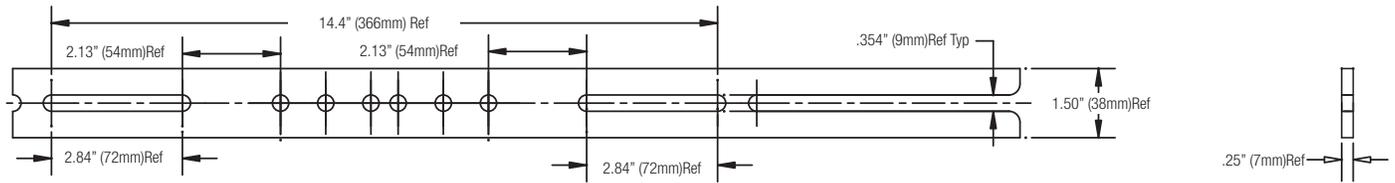


# Safe - Lec 2 Bracket Dimensions

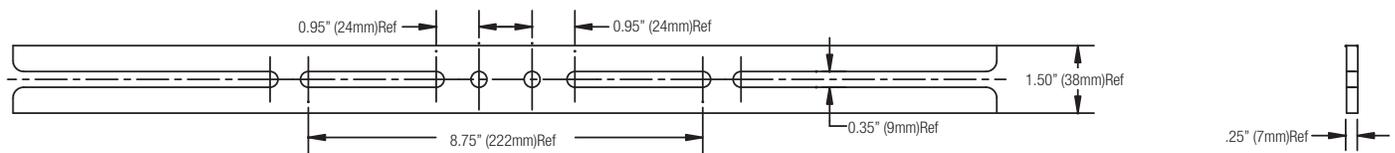
## Single Sided Flange Bracket - Fits beam widths up to 7" (310980)



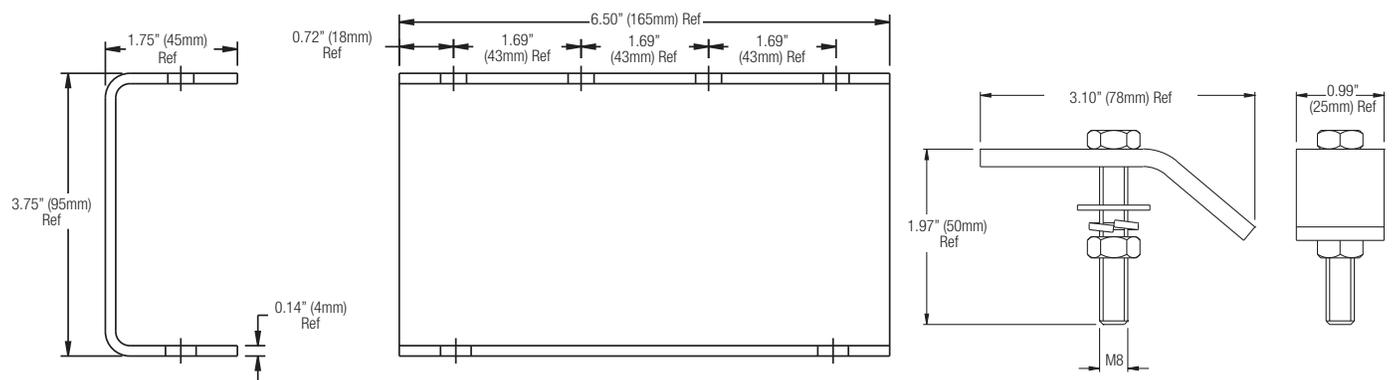
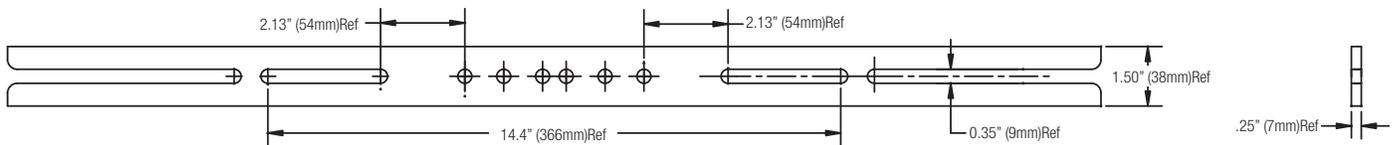
## Single Sided Flange Bracket - Fits beam widths up to 14" (310982)



## Double Sided Flange Bracket - Fits beam widths up to 8" (310981)



## Double Sided Flange Bracket - Fits beam widths up to 14" (310983)



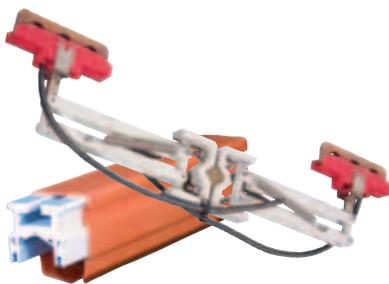
**Lateral Web Bracket (399517)**

**Girder Clamp (51142)**

## Hevi - Bar II Overview

The rugged Hevi-Bar II Conductor Bar System delivers reliable, high-capacity electrical performance. It is ideal for tough environments and demanding, heavy-use applications found in mills, heavy industry, storage yards, and transit systems. It is truly a “put it up once and forget it” system that will last for the life of your equipment.

UL Listed



### Hevi-Bar II is ideal for:

- Medium to large cranes
- Bulk Handling Systems
- Mills and heavy industry
- Transit Systems
- Material Handling Equipment
- Other mobile power applications

**Ampacity Selections:** 500A, 700A, 1000A, and 1500A, at 600 volts.

**Maximum Speed:** 2000 feet per minute  
(Contact the factory if higher speeds are needed)

### Hevi-Bar II Features

- Uses surface area rather than mass to dissipate heat generated by high current conditions
- Can be mounted horizontally or vertically (“side entry”)
- V-grooved for positive and accurate collector shoe tracking
- Has hardened, long-wearing and corrosion resistant stainless steel contact surface.
- Offers a choice of insulating covers:
  - Standard orange for indoor use
  - Green for the ground (bonding) conductor
  - Black UV-resistant for outdoor use
  - Medium or high heat versions to withstand higher ambient temperatures

Hevi Bar II is easy to install and maintain. For further information, please download the Hevi Bar II manual from our web site.

### DURA-COAT Option - for Hevi-Bar II

**Hevi-Bar II** is available with our optional **DURA-COAT** finish, specially formulated for extremely corrosive environments. This coating combines a ceramic compound with an epoxy binder to provide superior corrosion resistance and adhesion to the base materials. The entire bar is coated, with the exception of the stainless steel running surface. The insulating cover is applied over the coating. All metal parts of the collector arm are coated.

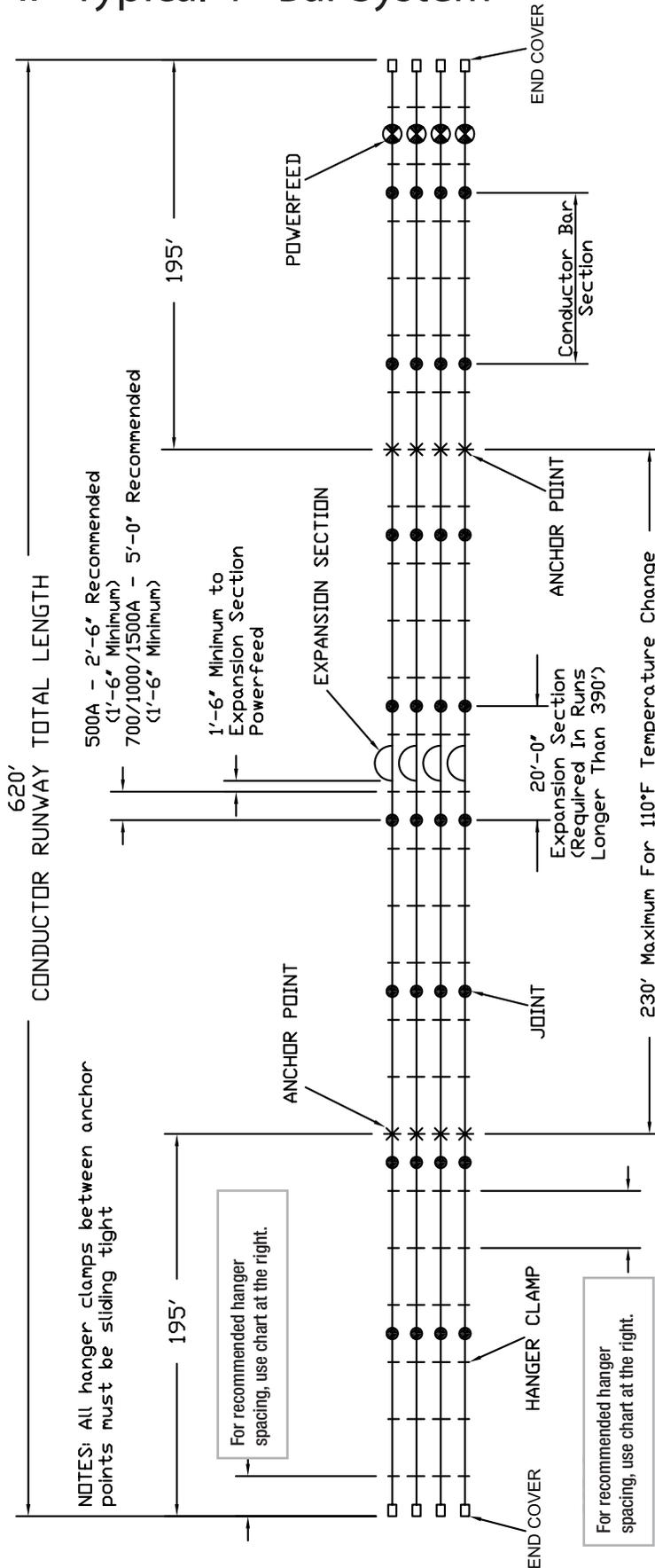
**DURA-COAT** is ideal for galvanizing and electro-plating lines, chemical plants, smelters, foundries and cast houses, coke and ore handling cranes, and oxidizing/electro-winning facilities.

Contact Conductix-Wampfler for further information about **DURA-COAT**.

For a list of job references, contact **Conductix-Wampfler**

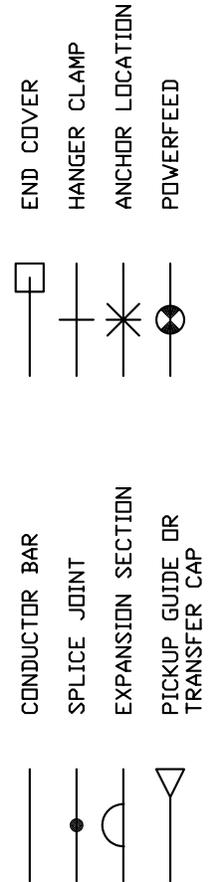
# Hevi - Bar II - Typical 4 - Bar System

## EXAMPLE OF 4 CONDUCTOR RUNWAY HEAVY BAR 2 (3 PHASE + 1 GROUND)



HANGER SPACING CHART

SYSTEM	FIRST HANGER	MAX.HANGER SPACING
500 AMP	2'-6"	5'-0"
700 AMP	3'-9"	7'-6"
1000 AMP	5'-0"	10'-0"
1500 AMP	5'-0"	10'-0"

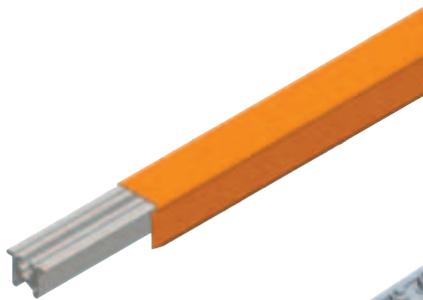


# Hevi - Bar II - 500A Conductors

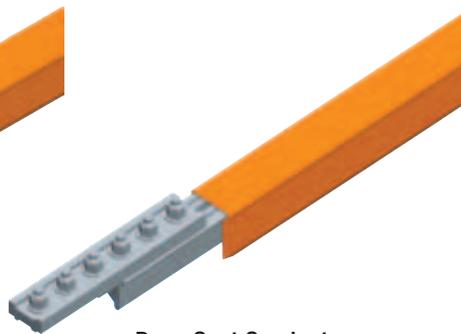
## Standard Conductor Bar and Components

Type / Max Temp.	Use (Color)	Conductor Bar	Conductor Bar Cut Lgth (Specify 5 to 29 ft)	Expansion Section	Splice	Power Feed	Power Interrupting Section ♦	End Cover
PVC 160° F	Phase / Indoors (Orange)	27582	27583	37677	37676	37674	50746	27588
	Ground / Indoors (Green)	50258	50260	37677E	37676	37674	N/A	27588
	Phase & Ground / Outdoors UV Stable (Black)	38925	38926	38946	37676	37674	50746B	27588
Poly - carbonate 250°F	Phase & Ground / Indoors & Outdoors (Red)	32496	39225	32498	32499	32500	50747	27588
<b>Wt lb (kg)</b>		25.0 (11.34)	.81 lb/ft. (.112 kg/m)	30.0 (13.61)	1.5 (0.681)	4.0 (1.814)	45.0 (20.41)	1.0 (0.454)
<b>Length ft (m)</b>		30.0 (9.114)	*	30.0 (9.114)	/	/	30.0 (9.114)	/

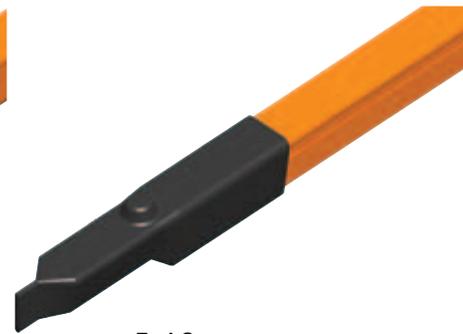
♦ See Appendix IV Pgs. 63-64.



Conductor Bar



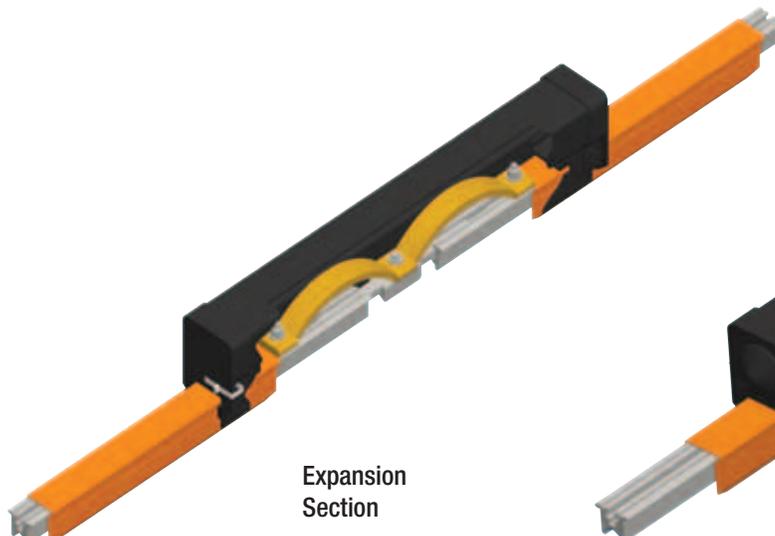
Dura-Coat Conductor Bar with Splice



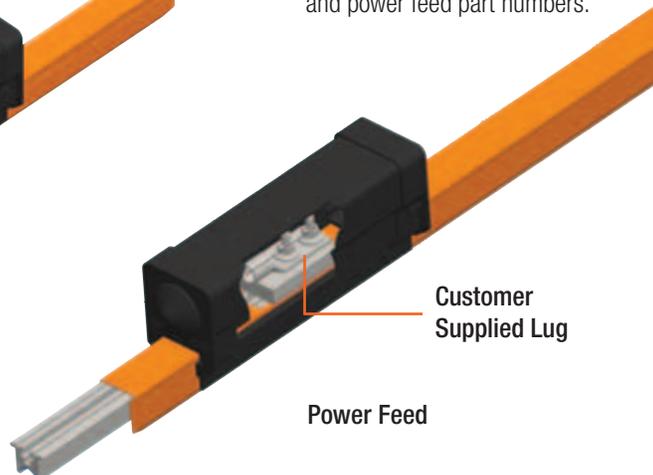
End Cover

## Expansion Sections and Power Feed

Expansion Sections are required at all structural expansion joints and for all systems greater than 390 ft (118.87 m). See table above for expansion and power feed part numbers.



Expansion Section



Power Feed

Customer Supplied Lug



# Hevi - Bar II - 500A Dura - Coat & Hangers

## DURA-COAT Conductor Bar & Components

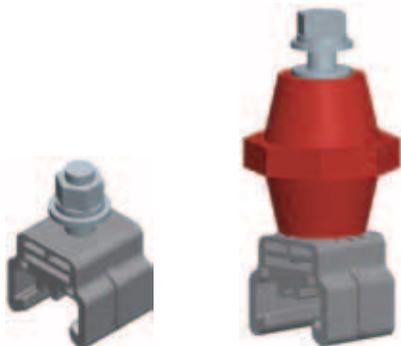
The ideal option for highly corrosive environments. Splices are pre-installed on Dura-Coat conductors.

Type / Max Temp.	Use (Color)	Conductor Bar	Conductor Bar Cut Lgth (Specify 5 to 29 ft)	Expansion Section	Splice Cover	Power Feed	Power Interrupting Section ♦	End Cover
PVC 160°F	Phase / Indoors (Orange)	39745-J	39747-J	39741-J	51304	37674	50749-J	27588
	Ground / Indoors (Green)	39745G-J	51861-J	39741G-J	51304	37674	N/A	27588
	Phase & Ground / Outdoors UV Stable (Black)	39745B-J	51367-J	39741B-J	51304	37674	50749B-J	27588
Poly-carbonate 250°F	Phase & Ground / Indoors & Outdoors (Red)	50731-J	51383-J	50741-J	51305	32500	50750-J	27588
<b>Wt lb (kg)</b>		25.0 (11.34)	0.81 lb/ft (0.1120 kg/m)	30.0 (13.61)	1.5 (0.68)	4.0 (1.81)	45.0 (20.41)	1.0 (0.454)
<b>Length ft (m)</b>		30.0 (9.144)	-	30.0 (9.144)	/	/	30.0 (9.144)	/

♦ See Appendix IV Pgs. 63-64.

## Hangers

Hangers can be installed on brackets up to 3/8" thick (9.5mm).



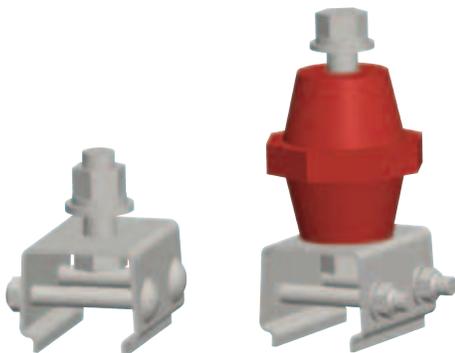
Polycarbonate Snap-In

Polycarbonate Snap-in w/Insulator

Hangers - Used with 500A Bar Only	Plated Hardware	Stainless Steel Hardware	Wt lb (kg)
Polycarbonate Snap-In	26591	28368	0.30 (0.136)
Polycarbonate Snap-in w/Insulator	27483	27780	0.89 (0.404)
Stainless Steel Cross Bolt	27481	27788	0.59 (0.268)
Stainless Steel Cross Bolt w/Insulator	27482	29574	1.13 (0.513)

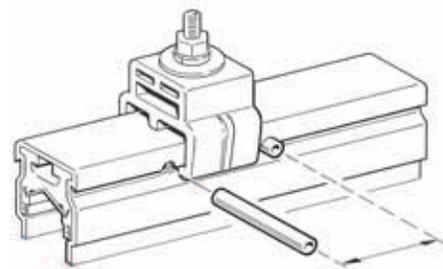
## Anchor Pin

Anchor Pin	Part No.	Wt lb (kg)
Anchor Pin (2 Req'd Per Hanger to turn a hanger into an anchor)	23946	.1 (0.05)



Stainless Steel Cross Bolt

Stainless Steel Cross Bolt w/Insulator



Anchor Pin 23946 (Two Shown)

# Hevi - Bar II - 700A Conductors

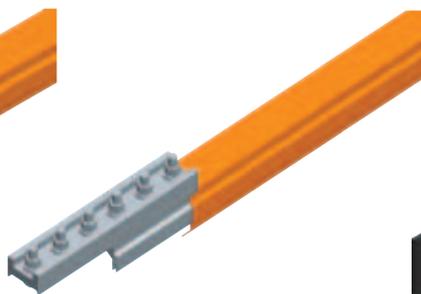
## Standard Conductor Bar and Components

Type / Max Temp.	Use (Color)	Conductor Bar	Conductor Bar Cut Lgth (Specify 5 to 29 ft)	Expansion Section	Splice	Power Feed	Power Interrupting Section ♦	End Cover
PVC 160°F	Phase / Indoors (Orange)	24528	24529	24566	38115	38117	50748	50859
	Ground / Indoors (Green)	24528B	51369	24566B	38115	38117	N/A	50859
	Phase & Ground / Outdoors UV Stable (Black)	38934	38936	38949	38115	38117	50748B	50859
Poly Carbonate 250°F	Phase & Ground / Indoors & Outdoors (Red)	50733	51371	50738	38115C	50067	50752	50859
Fiberglass Reinforced Polyester 400°F	Phase & Ground / Indoors (Orange)	24554	24555	24567D	24558	24594	50754	24585
<b>Wt lb (kg)</b>		40.0 (18.14)	1.31 lb/ft (0.1811 kg/m)	50.0 (22.68)	3.0 (1.36)	5.0 (2.27)	70.0 (31.75)	2.0 (0.91)
<b>Length ft (m)</b>		30.0 (9.114)	*	15.0 (4.572)	/	/	30.0 (9.114)	/

♦ See Appendix IV Pgs. 63-64.



Conductor Bar



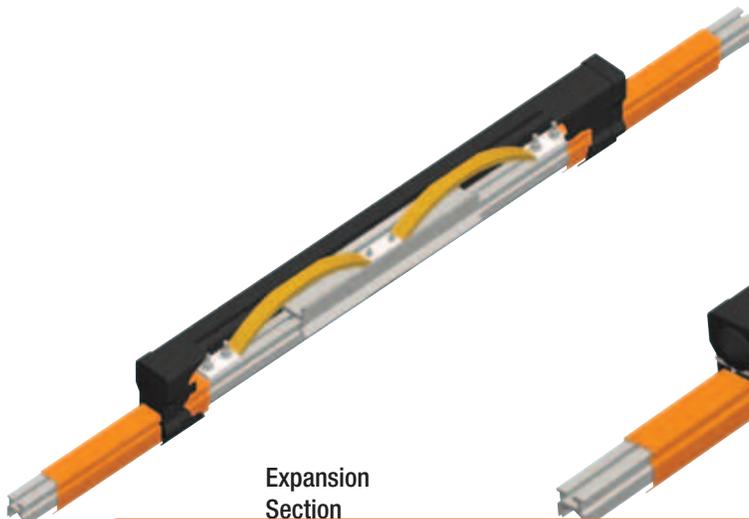
Dura-Coat Conductor Bar with Splice



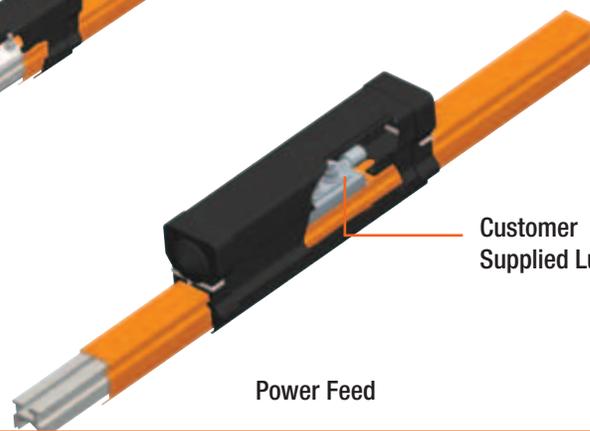
End Cover

## Expansion Sections and Power Feed

Expansion Sections are required at all structural expansion joints and for all systems greater than 390 ft (118.87 m). See table above for expansion and power feed part numbers.



Expansion Section



Power Feed

Customer Supplied Lug

# Hevi - Bar II - 700 A Dura - Coat & Hangers

## DURA-COAT Conductor Bar & Components

The ideal option for highly corrosive environments. Splices are pre-installed on Dura-Coat conductors.

Type / Max Temp.	Use (Color)	Conductor Bar	Conductor Bar Cut Lgth (Specify 5 to 29 ft)	Expansion Section	Splice Cover	Power Feed	Power Interrupting Section ♦	End Cover
PVC 160° F	Phase / Indoors (Orange)	39847-J	51372-J	50739-J	51320	38117	50751-J	50859
	Ground / Indoors (Green)	39847G-J	51862-J	50739B-J	51320	38117	N/A	50859
	Phase & Ground / Outdoors UV Stable (Black)	39847B-J	51376-J	50740-J	51320	38117	50751B-J	50859
Poly - carbonate 250°F	Phase & Ground / Indoors & Outdoors (Red)	50062-J	51374-J	50063-J	51321	50067	50753-J	50859
<b>Wt lb (kg)</b>		40.0 (18.14)	1.31 lb/ft (0.1811 kg/m)	50.0 (22.68)	3.0 (1.361)	5.0 (2.268)	70.0 (31.75)	2.0 (0.907)
<b>Length ft (m)</b>		30.0 (9.114)	-	15.0 (4.57)	1.5 (0.457)	1.5 (0.457)	30.0 (9.114)	1.5 (0.457)

♦ See Appendix IV Pgs. 63-64.

## Hangers

Hangers can be installed on brackets up to 3/8" thick (9.5mm).



Polycarbonate Snap-In



Polycarbonate Snap-in w/Insulator

Hangers - Used with 700 to 1500A Bar	Plated Hardware	Stainless Steel Hardware	High Temp.	Wt lb (kg)
Polycarbonate Snap-In	23223	28220	N/A	0.28 (0.127)
Polycarbonate Snap-in w/insulator	24902	24902B	N/A	0.87 (0.395)
Stainless Steel Cross Bolt	25986	28374	51972	0.61 (0.277)
Stainless Steel Cross Bolt w/insulator	51971	32807	24973	1.16 (0.526)

## Anchor Pin

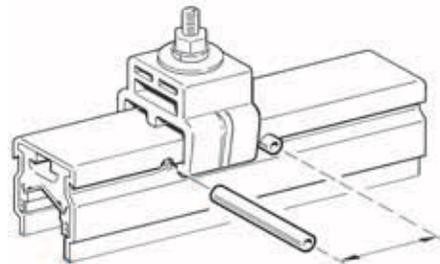
Anchor Pin	Part No.	Wt lb (kg)
Anchor Pin (2 Req'd Per Hanger to turn a hanger into an anchor)	23946	.1 (0.05)



Stainless Steel Cross Bolt



Stainless Steel Cross Bolt w/Insulator



Anchor Pin 23946 (Two Shown)



# Hevi - Bar II - 1000 A Conductors

## Standard Conductor Bar and Components

Type / Max Temp.	Use (Color)	Conductor Bar	Conductor Bar Cut Lgth (Specify 5 to 29 ft)	Expansion Section	Splice	Power Feed	Power Interrupting Section ♦	End Cover
PVC 160° F	Phase / Indoors (Orange)	23500	23503	23512	37746	38184	50755	33796B
	Phase & Ground / Outdoors UV Stable (Black)	23500D	38938	23512C	37746	38184	50755B	33796B
Poly - carbonate 250°F	Phase & Ground / Indoors & Outdoors (Red)	31991	51408	50941	31964	38184D	50756	33796B
Fiberglass Reinforced Polyester 400°F	Phase & Ground / Indoors (Orange)	23508	23511	23514	23520	23530	50757	23523
<b>Wt (lb)</b>		85 (38.56)	2.8 lb/ft (.3871 kg/m)	70 (31.75)	3.5 (1.588)	6.5 (2.948)	105 (47.63)	1.5 (0.680)
<b>Length (ft.)</b>		30	-	20.0	/	/	30.0	/

♦ See Appendix IV Pg. 63-64.



Conductor Bar



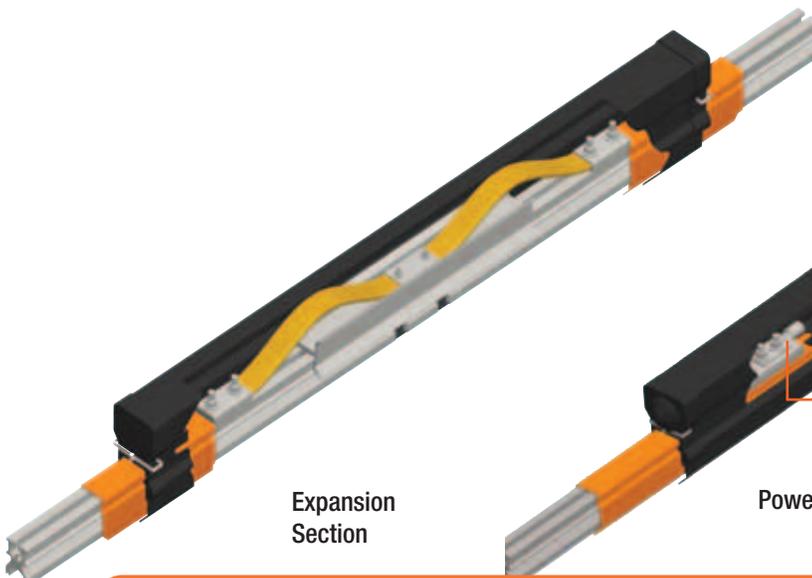
Dura-Coat Conductor Bar with Splice



End Cover

## Expansion Sections and Power Feed

Expansion Sections are required at all structural expansion joints and for all systems greater than 390 ft (118.87 m). See table above for expansion and power feed part numbers.



Expansion Section



Power Feed

Customer Supplied Lug

# Hevi - Bar II - 1000 A Dura - Coat & Hangers

## DURA-COAT Conductor Bar & Components

The ideal option for highly corrosive environments. Splices are pre-installed on Dura-Coat conductors.

Type / Max Temp.	Use (Color)	Conductor Bar	Conductor Bar Cut Lgth (Specify 5 to 29 ft)	Expansion Section	Splice Cover	Power Feed	Power Interrupting Section ♦	End Cover
PVC 160°F	Phase / Indoors (Orange)	50736-J	51377-J	50743-J	51322	38184	50758-J	33796B
	Phase & Ground / Outdoors UV Stable (Black)	50736B-J	51381-J	50743B-J	51322	38184	50758B-J	33796B
Poly-carbonate 250°F	Phase & Ground / Indoors & Outdoors (Red)	50735-J	51379-J	50817-J	534845	38184D	50759-J	33796B
<b>Wt lb (kg)</b>		85 (38.56)	2.8 lb/ft (0.3871 kg/m)	70 (31.75)	3.5 (1.59)	6.5 (2.95)	105 (47.63)	1.5 (0.68)
<b>Length ft (kg)</b>		30 (9.114)	*	20 (6.096)	/	/	30 (9.114)	/

♦ See Appendix IV Pgs. 63-64.

## Hangers

Hangers can be installed on brackets up to 3/8" thick (9.5mm).



Polycarbonate Snap-In



Polycarbonate Snap-in w/Insulator

Hangers - Used with 700 to 1500A Bar	Plated Hardware	Stainless Steel Hardware	High Temp.	Wt lb (kg)
Polycarbonate Snap-In	23223	28220	N/A	0.28 (0.127)
Polycarbonate Snap-in w/insulator	24902	24902B	N/A	0.87 (0.395)
Stainless Steel Cross Bolt	25986	28374	51972	0.61 (0.277)
Stainless Steel Cross Bolt w/insulator	51971	32807	24973	1.16 (0.526)

## Anchor Pin

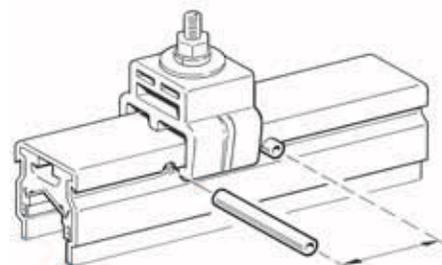
Anchor Pin	Part No.	Wt lb (kg)
Anchor Pin (2 Req'd Per Hanger to turn a hanger into an anchor)	23946	.1 (0.05)



Stainless Steel Cross Bolt



Stainless Steel Cross Bolt w/Insulator



Anchor Pin 23946 (Two Shown)

# Hevi - Bar II - 1500 A Conductors

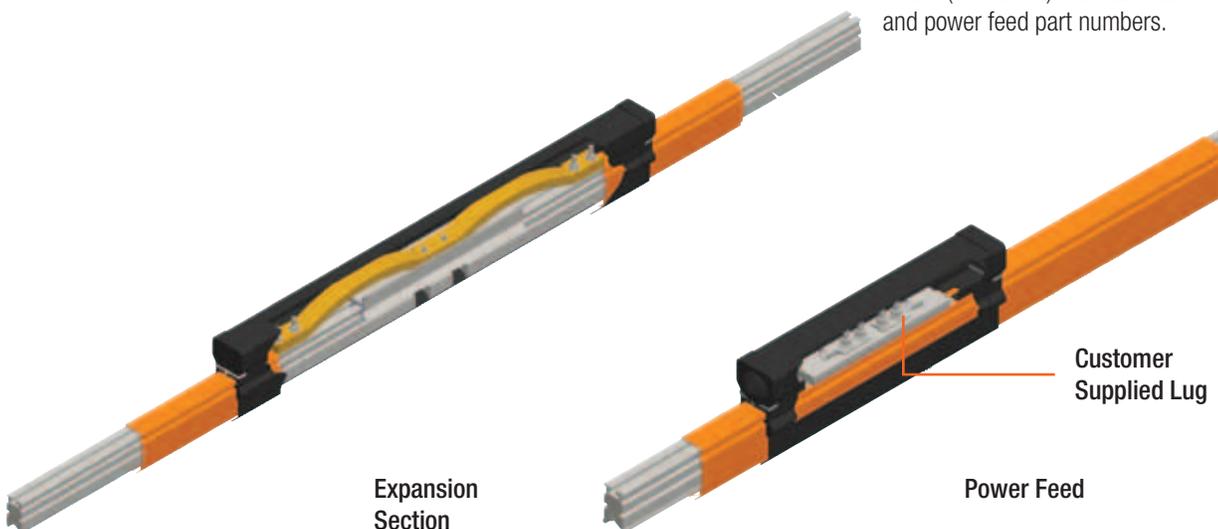
## Standard Conductor Bar and Components

Type / Max Temp.	Use (Color)	Conductor Bar	Conductor Bar Cut Lgth (Specify 5 to 29 ft)	Expansion Section	Splice	Power Feed	Power Interrupting Section ♦	End Cover
PVC 160° F	Phase / Indoors (Orange)	24000	24003	32820	38968	50227	50760	33796B
	Phase & Ground / Outdoors UV Stable (Black)	24000C	38944	38952	38968	50227	50760B	33796B
Poly - carbonate 250°F	Phase & Ground / Indoors & Outdoors (Red)	39296	34296	39287	34802	50227C	50761	33796B
<b>Wt lb (kg)</b>		110 (49.90)	3.6 lb/ft (0.4977 kg/m)	88 (39.92)	4.0 (1.81)	130 (58.97)	130.0 (58.97)	1.5 (0.680)
<b>Length ft (m)</b>		30 (9.114)	-	20 (6.10)	/	/	30 (9.114)	/



## Expansion Sections and Power Feed

Expansion Sections are required at all structural expansion joints and for all systems greater than 390 ft (118.87 m). See table above for expansion and power feed part numbers.



# Hevi - Bar II - 1500 A Dura - Coat & Hangers

## DURA-COAT Conductor Bar & Components

The ideal option for highly corrosive environments. Splices are pre-installed on Dura-Coat conductors.

Type / Max Temp.	Use (Color)	Conductor Bar	Conductor Bar Cut Lgth (Specify 5 to 29 ft)	Expansion Section	Splice Cover	Power Feed	Power Interrupting Section ♦	End Cover
PVC 160° F	Phase / Indoors (Orange)	50734-J	51382-J	50742-J	51297	50227	50762-J	33796B
	Phase & Ground / Outdoors UV Stable (Black)	50734B-J	50230-J	50742B-J	51297	50227	50762B-J	33796B
Poly - carbonate 250°F	Phase & Ground / Indoors & Outdoors (Red)	39430-J	39430-J	50060-J	51297B	50227C	50763-J	33796B
<b>Wt lb (m)</b>		110 (49.90)	3.6 lb/ft (0.4977 kg/m)	88 (39.92)	4.0 (1.81)	130 (58.97)	130 (58.97)	1.5 (0.68)
<b>Length ft (m)</b>		30.0 (9.144)	-	20.0 (6.10)	/	/	30.0 (9.144)	/

♦ See Appendix IV Pgs. 63-64.

## Hangers

Hangers can be installed on brackets up to 3/8" thick (9.5mm).



Polycarbonate Snap-In



Polycarbonate Snap-in w/Insulator

Hangers - Used with 700 to 1500A Bar	Plated Hardware	Stainless Steel Hardware	High Temp.	Wt lb (kg)
Polycarbonate Snap-In	23223	28220	N/A	0.28 (0.127)
Polycarbonate Snap-in w/insulator	24902	24902B	N/A	0.87 (0.395)
Stainless Steel Cross Bolt	25986	28374	51972	0.61 (0.277)
Stainless Steel Cross Bolt w/insulator	51971	32807	24973	1.16 (0.526)

## Anchor Pin

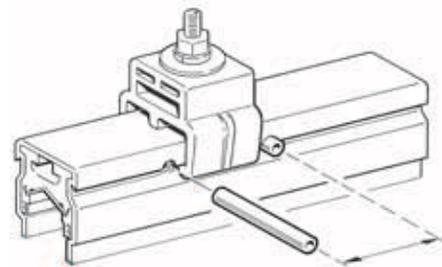
Anchor Pin	Part No.	Wt lb (kg)
Anchor Pin (2 Req'd Per Hanger to turn a hanger into an anchor)	23946	.1 (0.05)



Stainless Steel Cross Bolt



Stainless Steel Cross Bolt w/Insulator

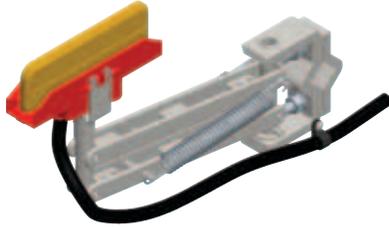


Anchor Pin 23946 (Two Shown)

# Hevi - Bar II - Collectors & Replacement Shoes

All collectors include long-wearing copper graphite shoes (in holders) and “pigtail” wiring as noted below. For recommendations about choosing collectors, see Appendix I Pgs. 57-60.

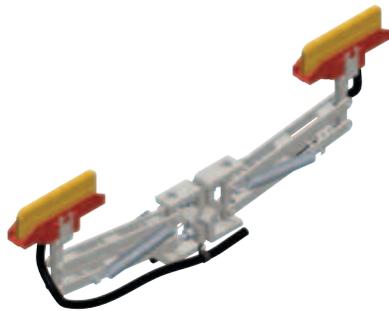
## 125A Single Collector



21” long pigtails, 4 AWG, are supplied on the collector. Customer supplied wiring connects to the collector pigtail with in-line connectors. **Used on 500A conductor bar only.**

TYPE	Part No.	Wt lb (kg)
Standard Collector with Shoe.	<b>30388</b>	3.37 (1.529)
DURA-COAT Collector with Shoe.	<b>50205</b>	3.87 (1.755)
Replacement Shoe for Standard or DURA-COAT	<b>30516</b>	1.00 (0.454)

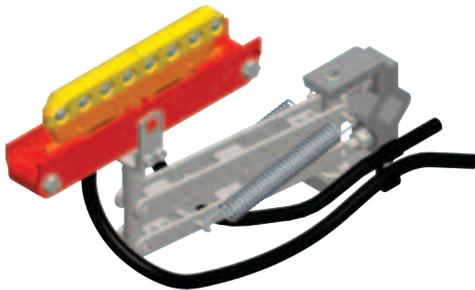
## 250A Tandem Collector



21” long pigtails, 4 AWG, are supplied on the collector. Customer supplied wiring connects to the collector pigtail with in-line connectors. **Used on 500A conductor bar only.**

TYPE	Part No.	Wt lb (kg)
Standard Collector with Shoes	<b>30389</b>	6.39 (2.898)
DURA-COAT Collector with Shoes	<b>39752</b>	7.39 (3.352)
Replacement Shoe for Standard or DURA-COAT (Two required per collector)	<b>30516</b>	1.00 (.454)

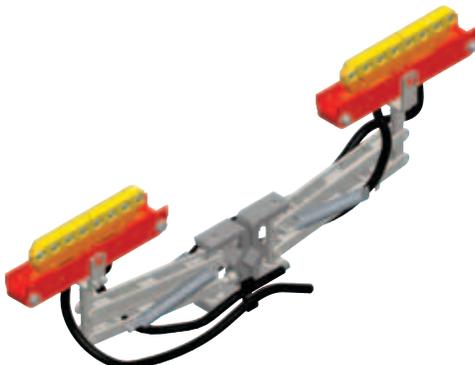
## 200A Single Collector



42” long pigtails, 2 AWG, are supplied on the collector. Customer supplied wiring connects to the collector pigtail with in-line connectors. **Used on 700A - 1500A conductor bar only.** Note that the 300A version is the same as the 200A, except with an extra tension spring on the arm.

TYPE	Part No.	Wt lb (kg)
Standard Collector with Shoe.	<b>24060</b>	6.87 (3.116)
DURA-COAT Collector with Shoe.	<b>51522</b>	7.37 (3.343)
300A Standard Collector with Shoe.	<b>24060Q</b>	7.47 (3.388)
Replacement Shoe for Standard & DURA-COAT	<b>11417X</b>	0.38 (0.172)

## 400A Tandem Collector



42” long pigtails, 2 AWG, are supplied on the collector. Customer supplied wiring connects to the collector pigtail with in-line connectors. **Used on 700A - 1500A conductor bar only.** Note that the 600A version is the same as the 400A, except with one extra tension spring on each arm.

TYPE	Part No.	Wt lb (kg)
Standard Collector with Shoes	<b>24061</b>	13.40 (6.078)
DURA-COAT Collector with Shoes	<b>39848</b>	13.90 (6.305)
600A Standard Collector with Shoes	<b>24061B</b>	14.10 (51.75)
Replacement Shoe for Standard & DURA-COAT (Two required per collector)	<b>11417X</b>	0.38 (0.172)

# Hevi - Bar II - 500 A Support Brackets

The Hevi-Bar II Support Brackets listed below are for 500A conductors. They are available in three types as listed below and can be ordered in five different configurations:

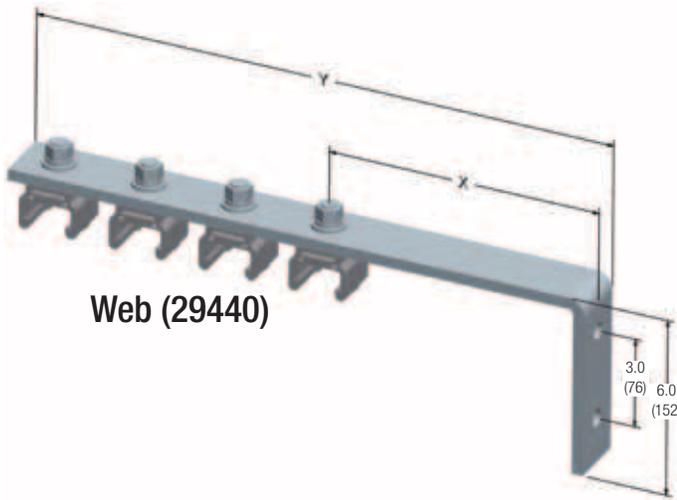
- Bracket only (no hangers included)
- Bracket with four pre-installed hangers - standard Polycarbonate
- Bracket with four pre-installed hangers - standard Polycarbonate w/insulators
- Bracket with four pre-installed hangers - stainless steel cross-bolt
- Bracket with four pre-installed hangers - stainless steel cross-bolt w/insulators

All holes to accept hangers are 3" on-center and .56" diameter (to accept 3/8" diameter hanger bolts).

## Web Bracket

Mounts to vertical web of beam. Bracket is 2 1/2" wide by 3/8" thick.

Bracket Finish	Dim X inches (mm)	Dim Y inches (mm)	Part No. <u>Bracket Only</u>	Wt lb (kg)	Part Nos. - With Four Hangers Pre-Installed			
					Standard Polycarbonate	Standard Polycarbonate w/Insulators	Stainless Steel Cross-Bolt	Stainless Steel Cross-Bolt w/Insulator
Plated Steel	6.0 (152)	16.25 (413)	<b>29441</b>	4.6 (2.087)	<b>29440</b>	<b>29440B</b>	<b>29440C</b>	<b>29440D</b>
Plated Steel	9.0 (229)	19.25 (489)	<b>30503</b>	5.2 (2.359)	<b>51785</b>	<b>51785B</b>	<b>51785C</b>	<b>51785D</b>
Plated Steel	11.0 (279)	21.25 (540)	<b>33655</b>	5.5 (2.495)	<b>38268</b>	<b>38268B</b>	<b>38268C</b>	<b>38268D</b>
Stainless Steel	9.0 (229)	19.25 (489)	<b>35337</b>	5.2 (2.359)	<b>51786</b>	<b>51786B</b>	<b>51786C</b>	<b>51786D</b>
Hot Dip Galv.	9.0 (229)	19.25 (489)	<b>30697</b>	5.2 (2.359)	<b>34814</b>	<b>34814B</b>	<b>34814C</b>	<b>34814D</b>



## Flange Bracket

Mounts to top flange of beam. Bracket is a 2"x2" angle, by 3/8" thick. The first hole is 1 1/4" from the end.

Bracket Finish	Dim X inches (mm)	Dim Y inches (mm)	Part No. <u>Bracket Only</u>	Wt lb (kg)	Part Nos. - With Four Hangers Pre-Installed			
					Standard Polycarbonate	Standard Polycarbonate w/Insulators	Stainless Steel Cross-Bolt	Stainless Steel Cross-Bolt w/Insulator
Plated Steel	13.25 (337)	23.50 (597)	<b>30529</b>	8.8 (3.992)	<b>30493</b>	<b>30493B</b>	<b>30493C</b>	<b>30493D</b>

# Hevi - Bar II - 700 A - 1000 A - 1500 A Support Brackets

The Hevi-Bar II Support Brackets listed below are for 700A, 1000A, or 1500A conductors. They are available in three types as listed below, and can be ordered in five different configurations:

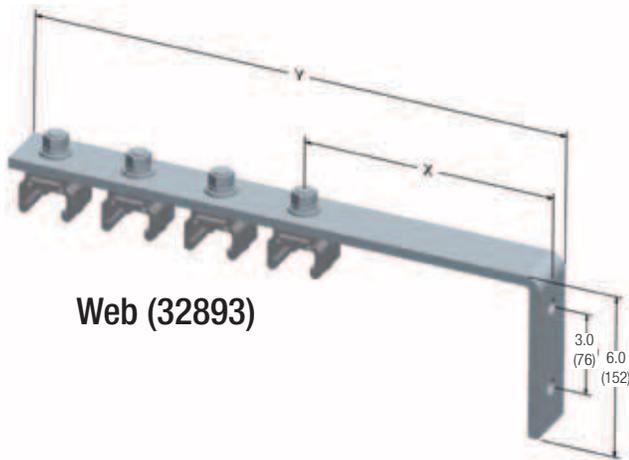
- Bracket only (no hangers included)
- Bracket with four pre-installed hangers - standard Polycarbonate
- Bracket with four pre-installed hangers - standard Polycarbonate w/insulators
- Bracket with four pre-installed hangers - stainless steel cross-bolt
- Bracket with four pre-installed hangers - stainless steel cross-bolt w/insulators

All holes to accept hangers are 3" on-center and .56" diameter (to accept 3/8" diameter hanger bolts).

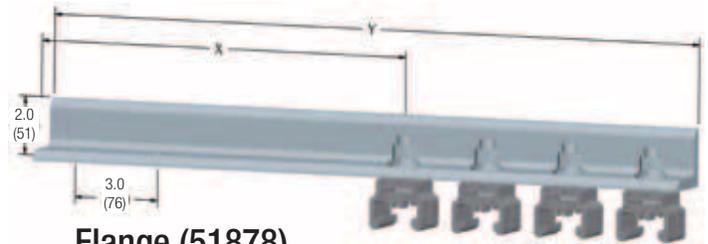
## Web Bracket

Mounts to vertical web of beam. Bracket is 2 1/2" wide by 3/8" thick.

Bracket Finish	Dim X Inches (mm)	Dim Y Inches (mm)	Part No. Bracket Only	Wt (lb)	Part No. - With Four Hangers Pre-Installed			
					Standard Polycarbonate	Standard Polycarbonate w/Insulators	Stainless Steel Cross-Bolt	Stainless Steel Cross-Bolt w/Insulator
Plated Steel	6.0 (152)	16.25 (413)	<b>29441</b>	4.6	<b>32893</b>	<b>32893B</b>	<b>32893C</b>	<b>32893D</b>
Plated Steel	9.0 (229)	19.25 (489)	<b>30503</b>	5.2	<b>39923</b>	<b>39923B</b>	<b>39923C</b>	<b>39923D</b>
Stainless Steel	9.0 (229)	19.25 (489)	<b>35337</b>	5.2	<b>51788</b>	<b>51788B</b>	<b>51788C</b>	<b>51788D</b>
Hot Dip Galv.	9.0 (229)	19.25 (489)	<b>30697</b>	5.2	<b>32932</b>	<b>32932B</b>	<b>32932C</b>	<b>32932D</b>



**Web (32893)**



**Flange (51878)**

## Flange Bracket

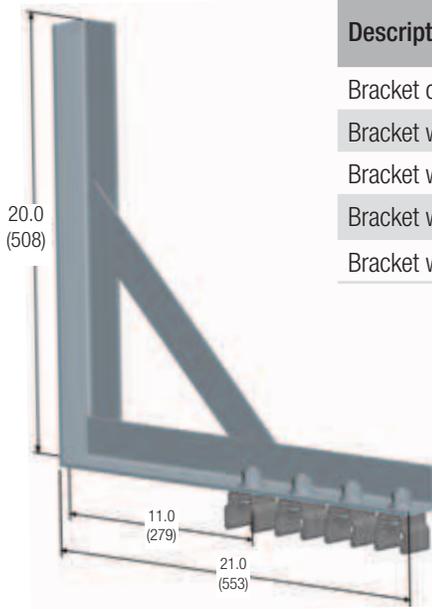
Mounts to top flange of beam. Bracket is a 2"x 2" angle, by 3/8" thick. The first hole is 1 1/4" from the end.

Bracket Finish	Dim X Inches (mm)	Dim Y Inches (mm)	Part No. Bracket Only	Wt (lb)	Part Nos. - With Four Hangers Pre-Installed			
					Standard Polycarbonate	Standard Polycarbonate w/Insulators	Stainless Steel Cross-Bolt	Stainless Steel Cross-Bolt w/Insulator
Plated Steel	13.25 (337)	23.50 (597)	<b>30529</b>	8.9	<b>51878</b>	<b>51878B</b>	<b>51878C</b>	<b>51878D</b>

# Hevi - Bar II - 700 A - 1000 A - 1500 A Support Brackets

## Braced Web Bracket

Plated steel weldment with brace, used for heavier conductor bar (e.g. 1500A). Not for 500A bar.

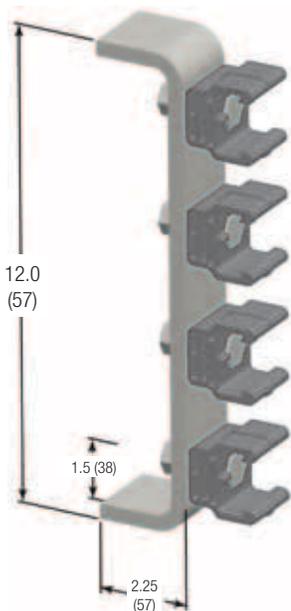


**Braced Web (25691)**

Description	Hanger Type	Part No.	Wt lb (kg)
Bracket only	n/a	<b>25720</b>	3.3 (1.50)
Bracket with 4 Hangers Installed	Polycarbonate (# 23223)	<b>25691</b>	4.4 (2.00)
Bracket with 4 Hangers Installed	Polycarbonate w/insulators (# 24902)	<b>25691B</b>	6.8 (3.08)
Bracket with 4 Hangers Installed	Stainless Steel Cross Bolt (# 25986)	<b>25691C</b>	5.7 (2.59)
Bracket with 4 Hangers Installed	Stainless Steel Cross Bolt w/Insulators (# 51971)	<b>25691D</b>	7.9 (3.58)

## Lateral Bracket

Mounts to vertical web of beam to configure conductor bar one above the other. Bracket is 2 1/2" wide by 3/8" thick. Not for 500A bar.



**Lateral (51876)**

Description	Hanger Type	Part No.	Wt lb (kg)
Bracket only	n/a	<b>50498</b>	3.2 (1.45)
Bracket with 4 Hangers Installed	Polycarbonate (# 23223)	<b>51876</b>	4.3 (1.95)
Bracket with 4 Hangers Installed	Polycarbonate w/insulators (# 24902)	<b>51876B</b>	6.7 (3.04)
Bracket with 4 Hangers Installed	Stainless Steel Cross Bolt (# 25986)	<b>51876C</b>	5.6 (2.54)
Bracket with 4 Hangers Installed	Stainless Steel Cross Bolt w/Insulators (# 51971)	<b>51876D</b>	7.8 (3.54)

# Hevi - Bar II - Specifications

## Conductor Bar Cover

	Cover Type:				
	Standard (Ground)	UV Resistant	Medium Heat	Hi Heat*	Bare Bar
<b>Material</b>	PVC	PVC	Lexan Polycarbonate	Fiberglass Reinforced	N/A
<b>Color</b>	Orange (Green)	Black	Red	Orange	no color
<b>Normal Ambient</b>	-40°F to 104°F -40°C to 40°C	-40°F to 104°F -40°C to 40°C	-40°F to 200°F -40°C to 93.3°C	-40°F to 345°F -40°C to 173.8°C	-40°F to 690°F -40°C to 365.5°C
<b>Max. Temperature</b>	160°F (71.1°C)	160°F (71.1°C)	250°F (121.1°C)	400°F (204.4°C)	750°F (398.8°C)
<b>Material</b>	PVC	PVC	Lexan Polycarbonate	Fiberglass	N/A
<b>Dielectric Strength</b>	450 volts/mil	450 volts/mil	600 volts/mil	200 volts/mil	N/A
<b>Volume Resistivity</b>	>10 <sup>12</sup> (Ω/mil)	>10 <sup>12</sup> (Ω/mil)	>10 <sup>13</sup> (Ω/mil)	>10 <sup>11</sup> (Ω/mil)	N/A
<b>Flame Test</b>	Self Extinguishing	Self Extinguishing	Self Extinguishing	Self Extinguishing	N/A
<b>Specific Density</b>	1.5 g/cm <sup>3</sup>	1.5 g/cm <sup>3</sup>	1.15 g/cm <sup>3</sup>	1.24 g/cm <sup>3</sup>	N/A

\* 700A and 1000A only

## Conductor Bar

	Nominal Current of Bar:			
	500A	700A	1000A	1500A
<b>Cross Sectional Area, in. (mm)</b>	0.45 (11.4)	0.70 (17.8)	1.05 (26.7)	2.29 (58.2)
<b>AC &amp; DC Voltage</b>	600	600/4160	600/4160	600/4160
<b>DC Resistance at 20°C (Ω/ft.)</b>	3.27 x 10 <sup>-5</sup>	2.11 x 10 <sup>-5</sup>	1.41 x 10 <sup>-5</sup>	0.64 x 10 <sup>-5</sup>
<b>Phase Corrected Impedance Z at 20°C (Ω/ft.)</b>	5.40 x 10 <sup>-5</sup>	4.21 x 10 <sup>-5</sup>	3.39 x 10 <sup>-5</sup>	2.28 x 10 <sup>-5</sup>
<b>Conductor Length, ft. (m)</b>	30.0 (9.1)	30 feet (9.1)	30 feet (9.1)	30 feet (9.1)
<b>Support Spacing, ft. (m)</b>	5 (1.52)	7.5 (2.28)	10 (3.05)	10 (3.05)
<b>Spacing between Conductors, in. (mm)</b>	3.0 (76.2)	3.0 (76.2)	3.0 (76.2)	3.0 (76.2)
<b>Expansion Sections not required for runs less than: ft. (m)</b>	390 (11.9)	390 (11.9)	390 (11.9)	390 (11.9)
<b>Minimum Bending Radius, ft. (m)</b>	8.0 (2.4)	10.0 (3.05)	12.0 (3.7)	15.0 (4.6)

## Corrosion Protection

Hardware Type:	Duty
Zinc Plated	Moderate
Stainless Steel	Severe
DURA-COAT	Extreme Duty

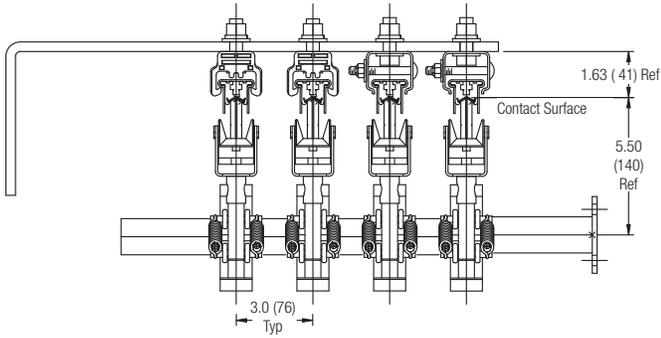
## Available Accessories (Contact Conductix-Wampfler)

- Thermostatically controlled heater wire system, for ice and snow environments (500A only)
- Transfer Caps for switches
- Pick-up Guides for discontinuous systems
- Vertical and horizontal curves

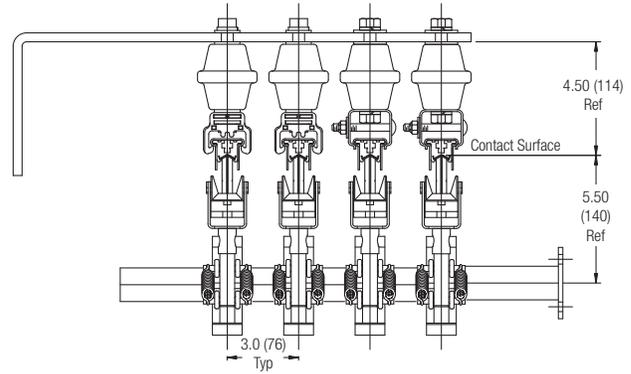
The appropriate conductor bar can be chosen only when all the relevant factors are known. Please refer to the Specification Data Sheet on Pg. 6, and to Appendices I through IV at the back of this catalog. Also, please consult Conductix-Wampfler Sales if you have any questions about the suitability of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

# Hevi - Bar II - Installed Dimensions

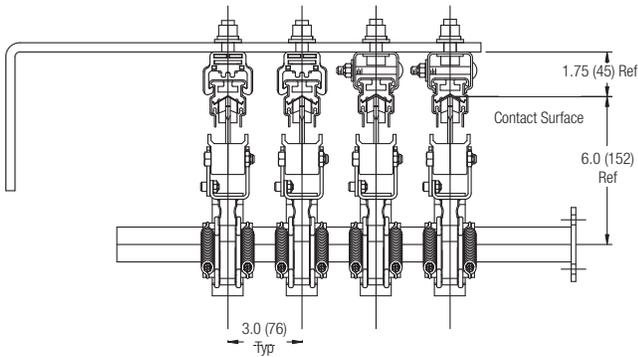
**500A - Standard Hanger**



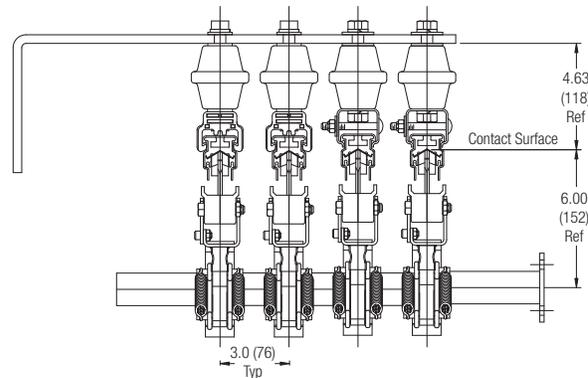
**500A - with Insulators**



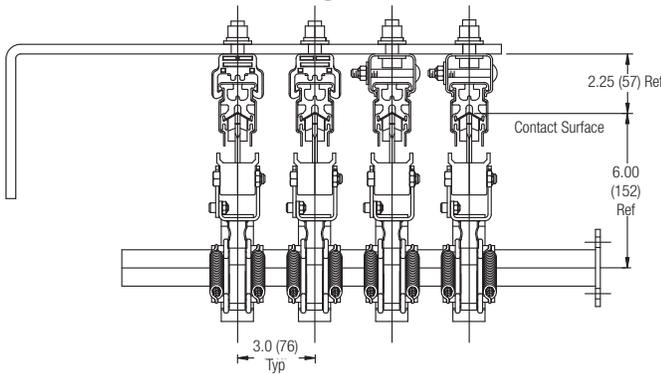
**700A - Standard Hangers**



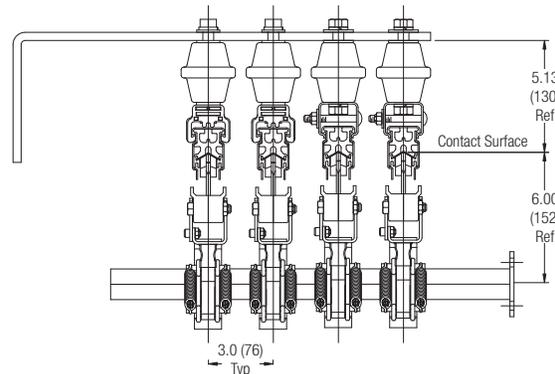
**700A - with Insulators**



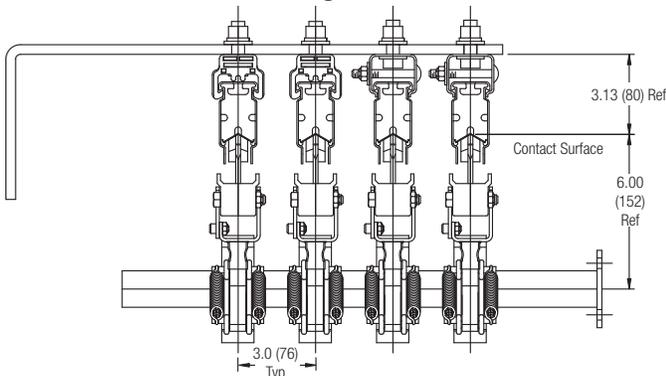
**1000A - Standard Hangers**



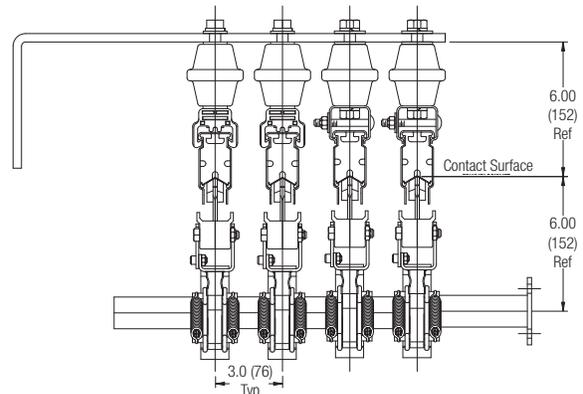
**1000A - with Insulators**



**1500A - Standard Hangers**

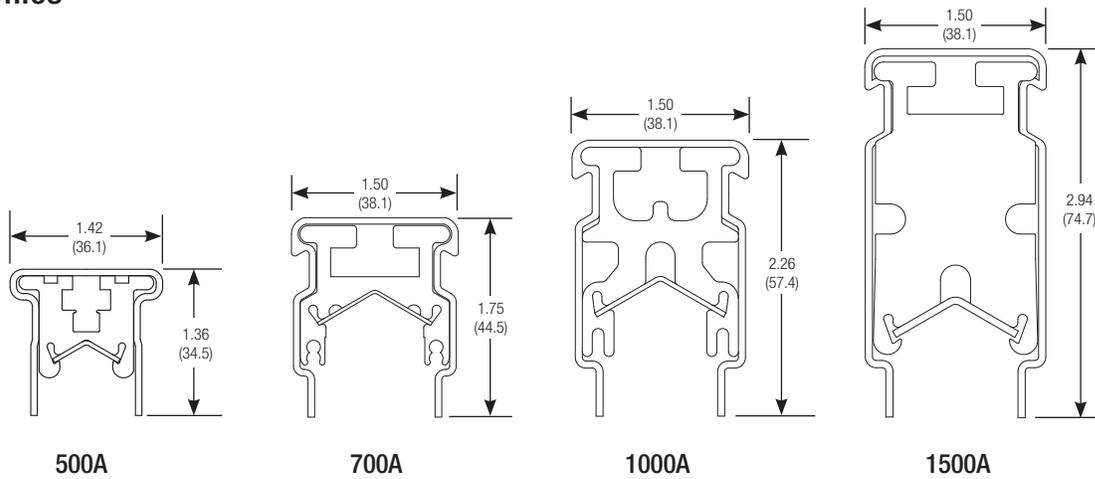


**1500A - with Insulators**

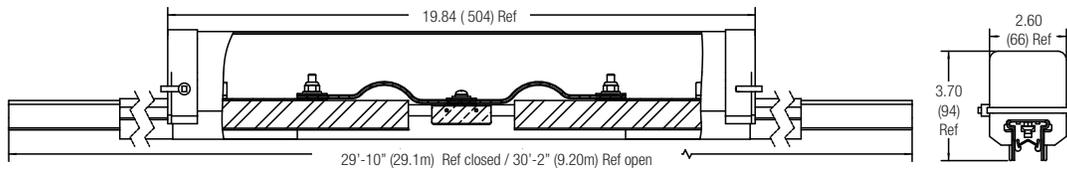


# Hevi - Bar II -Bar & Expansion Dimensions

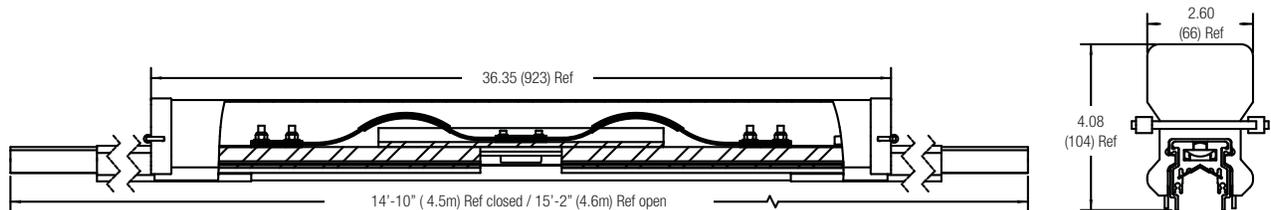
## Bar Profiles



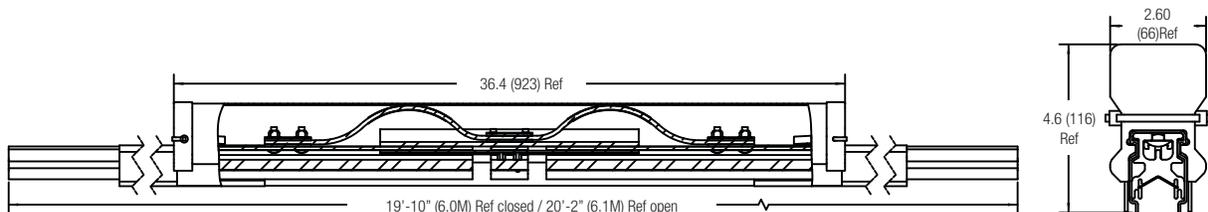
### 500A Expansion Section (37677)



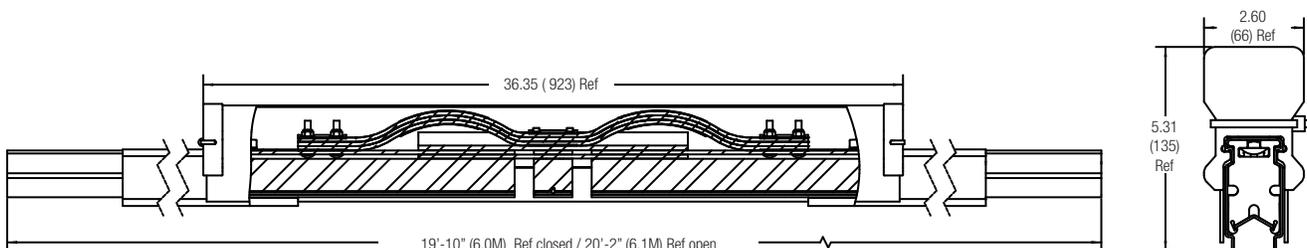
### 700A Expansion Section (50739)



### 1000A Expansion Section (23512)

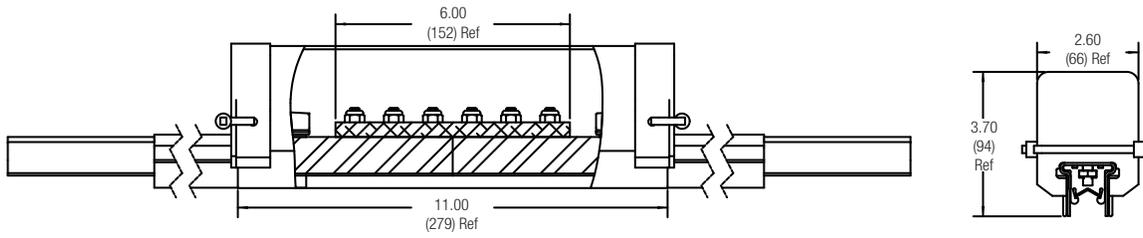


### 1500A Expansion Section (32820)

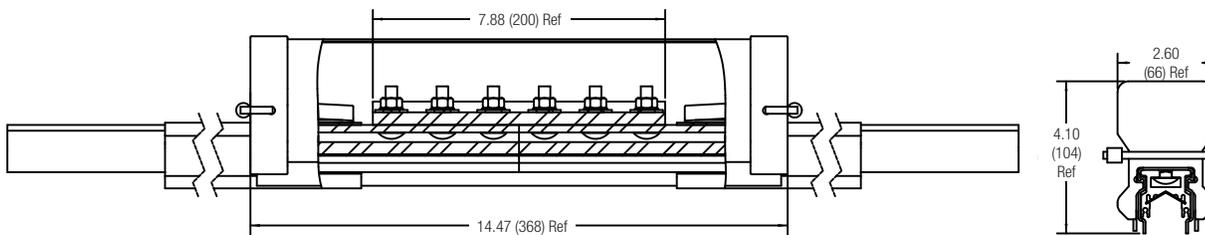


## Hevi - Bar II - Splice Dimensions

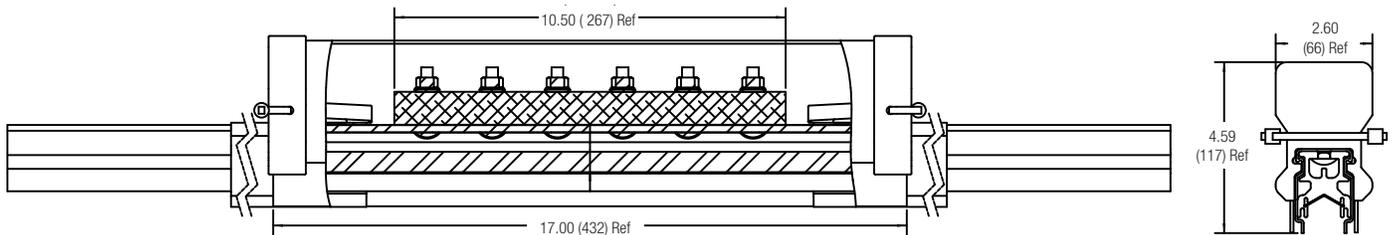
500A Splice (37676), 1/4" Bolts, Torque to 6 - 8 ft-lb



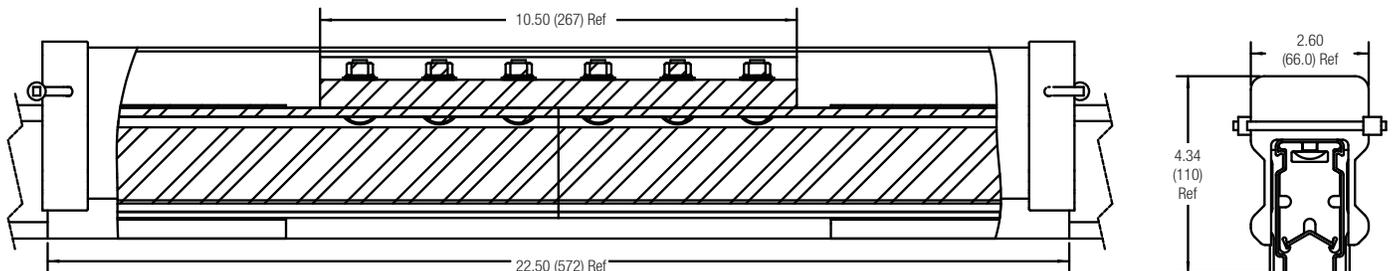
700A Splice (38115), 5/16" Bolts, Torque to 10 - 11 ft-lb



1000A Splice (37746), 5/16" Bolts, Torque to 10 - 11 ft-lb

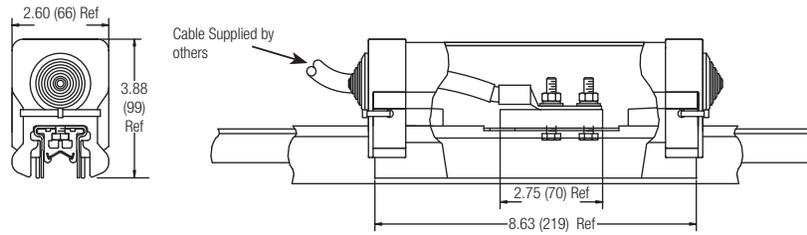


1500A Splice (38968), 5/16", Torque to 10 - 11 ft-lb

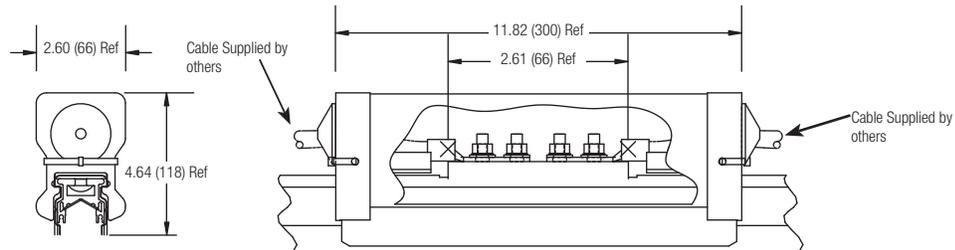


# Hevi - Bar II - Power Feed Dimensions

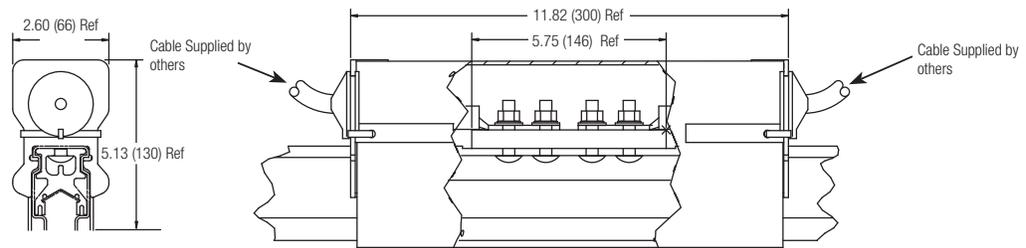
## 500A Power Feed (37674), 1/4" Bolts on 1" Centers, 6 - 8 ft-lb



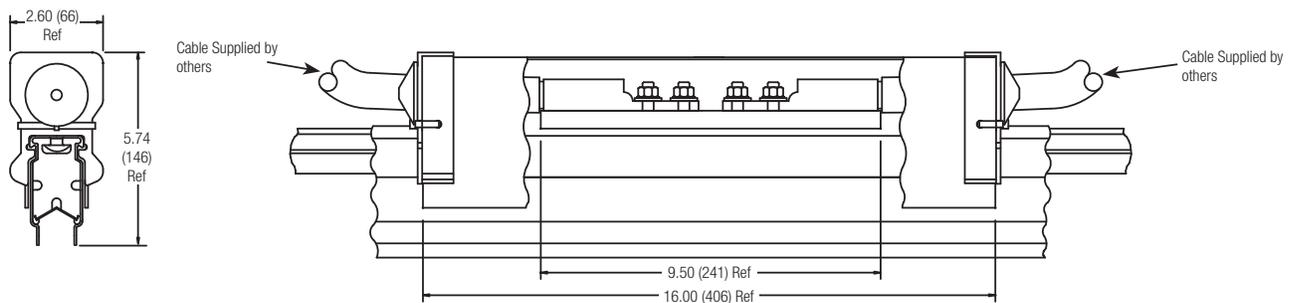
## 700A Power Feed (38117), 5/16" Bolts on 1" Centers, 10 - 11 ft-lb



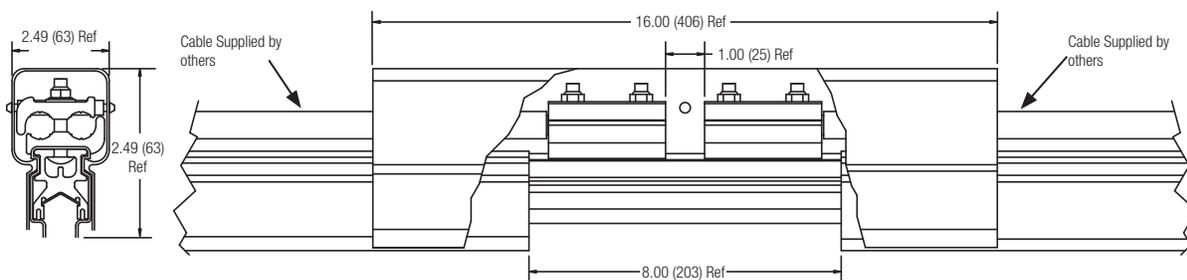
## 1000A Power Feed (38184), 5/16" Bolts on 1" Centers, 10 - 11 ft-lb



## 1500A Power Feed (50227), 5/16" Bolts on 1" Centers, 10 - 11 ft-lb

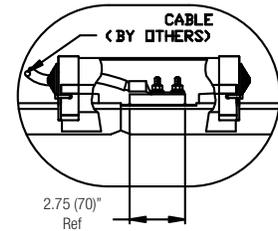
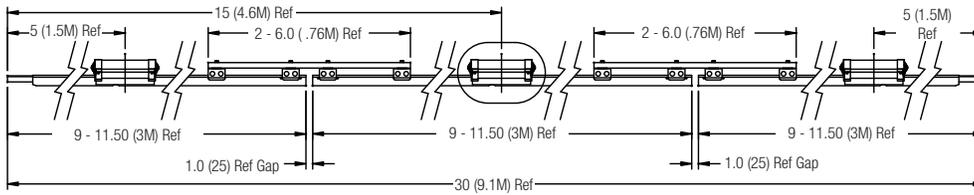


## 1500A Power Feed (28470), 5/16" Bolts on 1" Centers, 20 ft-lb

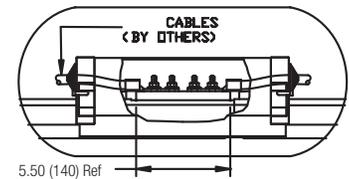
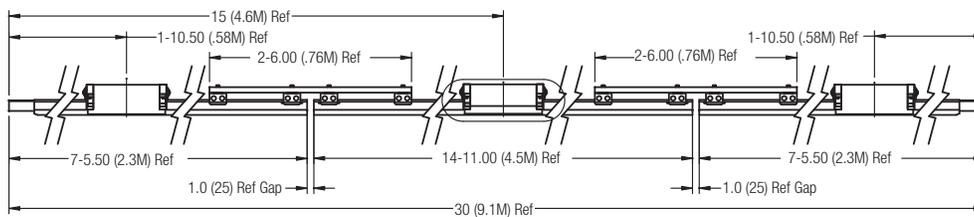


# Hevi - Bar II - Power Interrupting Section Dimensions

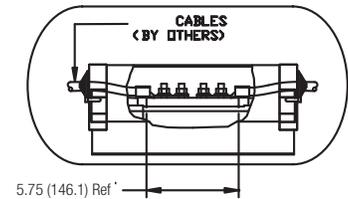
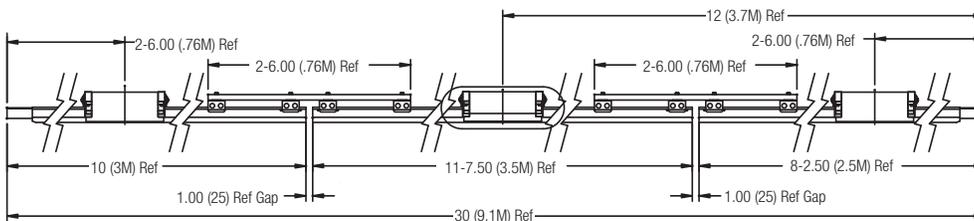
## 500A Power Interrupting Section (50746)



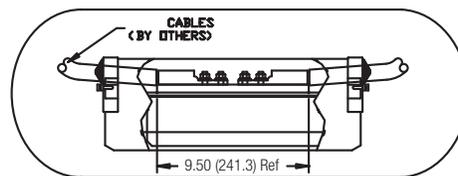
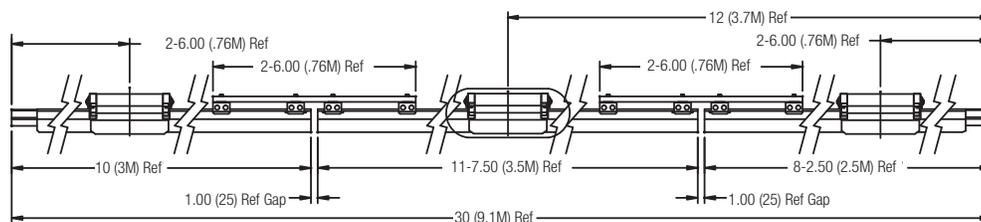
## 700A Power Interrupt (50748)



## 1000A Power Interrupt (50755)

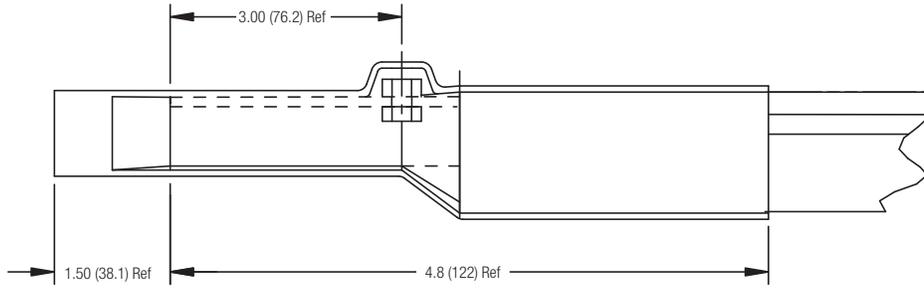


## 1500A Power Interrupt (50760)

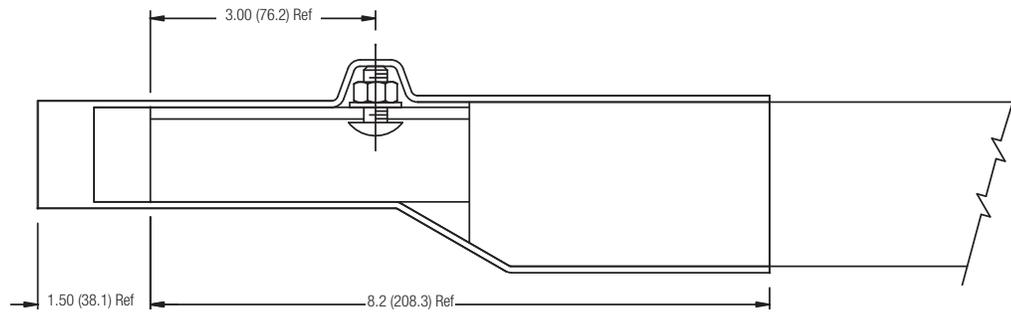


# Hevi - Bar II End Cover Dimensions

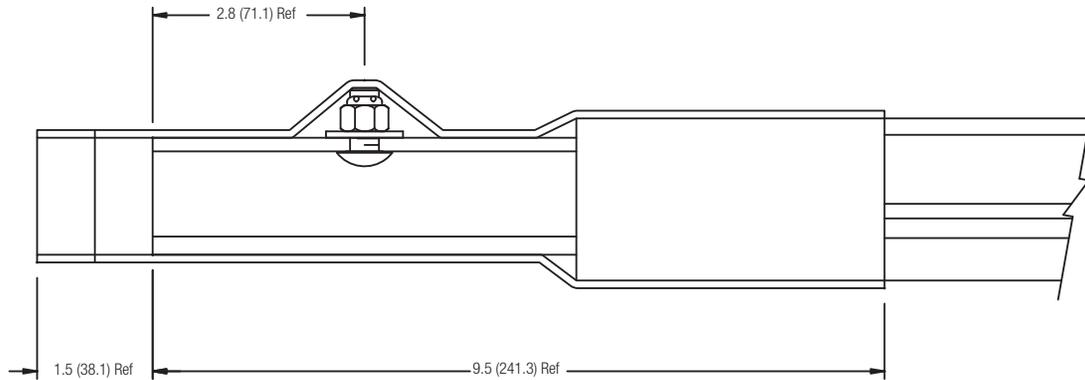
## 500A End Cover (27588)



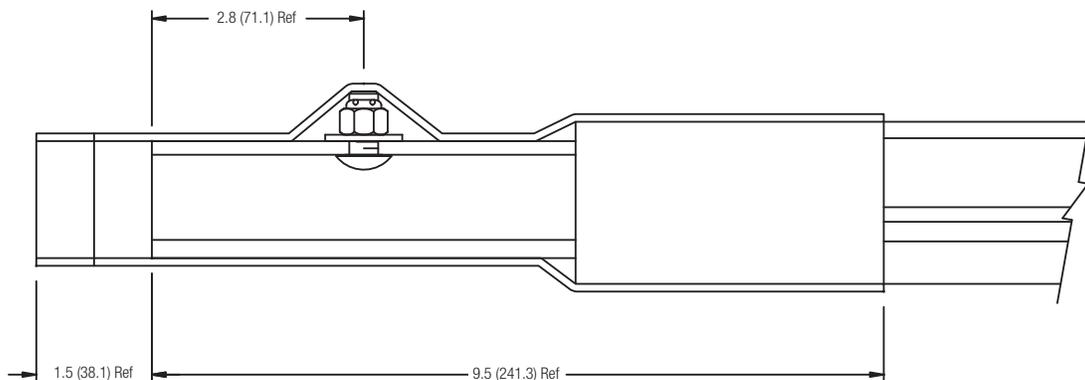
## 700A End Cover (50859)



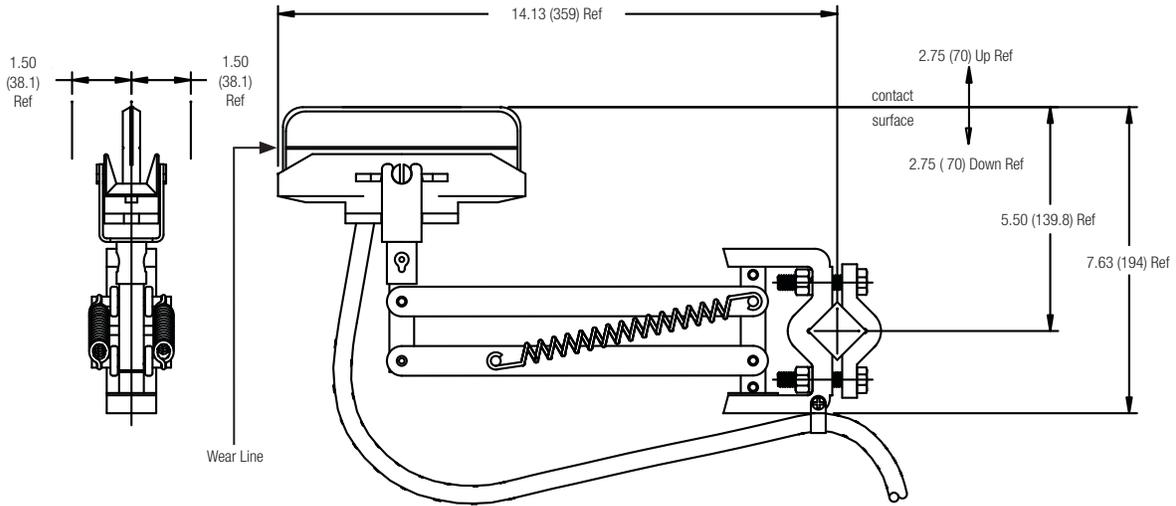
## 1000A End Cover (33796B)



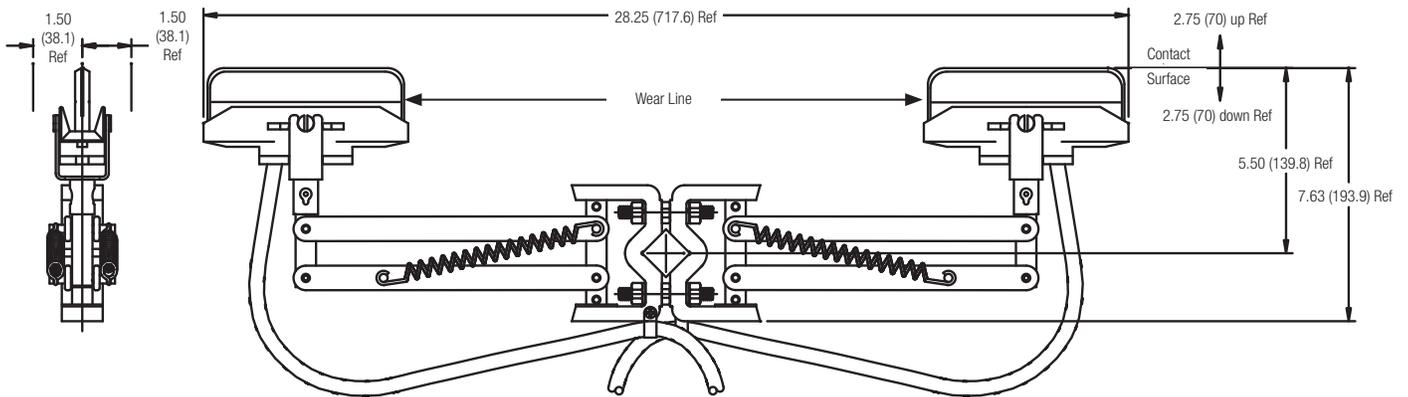
## 1500A End Cover (33796B)



## Hevi - Bar II Collector Dimensions 125A Single Collector \* (30388/50205)



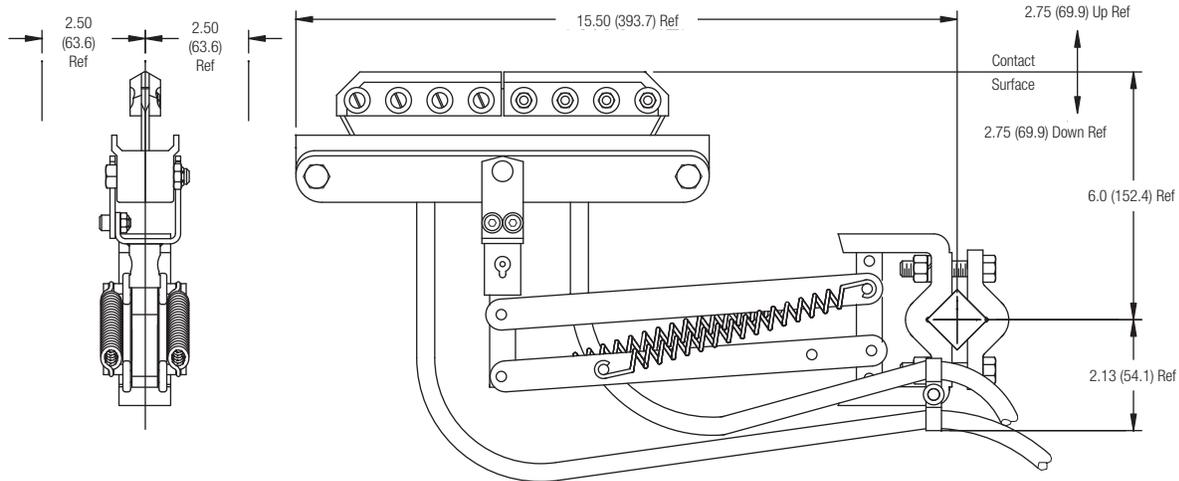
## 250A Tandem Collector \* (30389/39752)



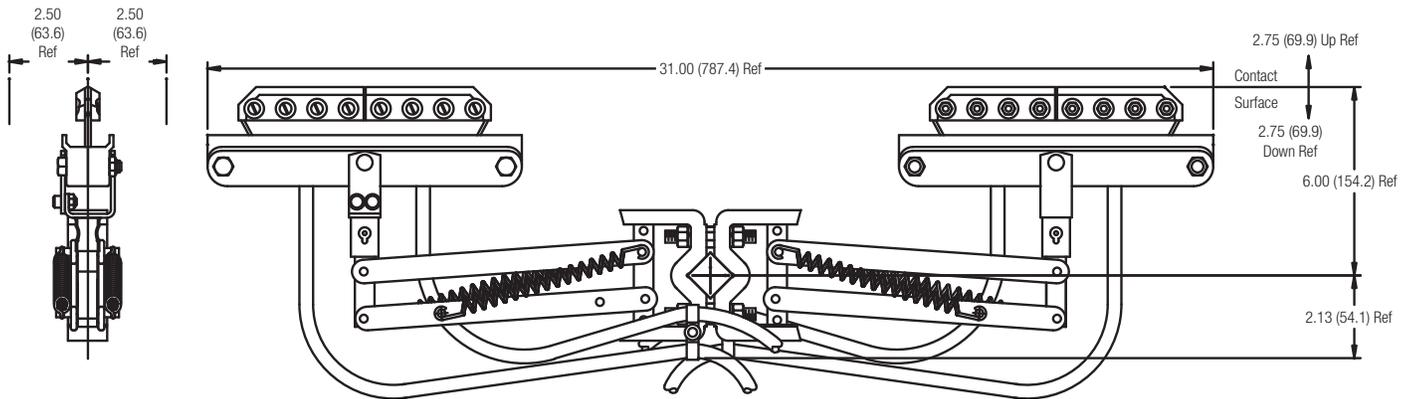
\* Only for use with 500A Conductor Bar

## Hevi - Bar II Collector Dimensions

### 200A & 300A Single Collector (24060 / 51522 / 24060Q)



### 400A & 600A Tandem Collector (24061 / 39848 / 24061B)



**\* Only for use with 700A, 1000A & 1500A Conductor Bar**

# 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 Have all aspects of the operating environment been accounted for?

- **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 (Pgs. 37, 39, 41, 44).
- **Cutting Oils** – May negatively affect polycarbonate components
- **Radiation** - May require the use of non-PVC components and non-galvanized plated components.

## Mounting and Installation How will your system be mounted?

- **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](http://www.conductix.us).

## Number of Power and Bonding Conductors Required Have you ordered enough conductor runs?

- **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 Is the equipment moving or stationary when operating?

- **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.: weld 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.*

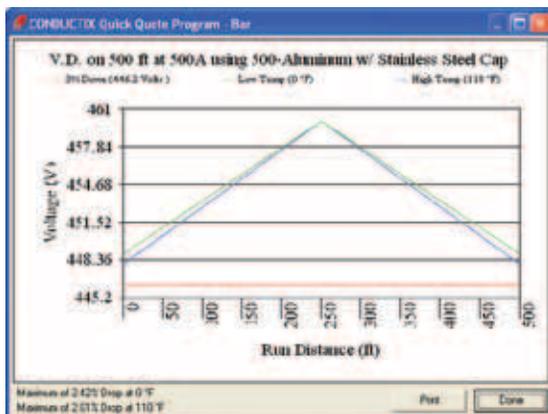
- **Conductor Bar Rating** – Per NEC Article 610-14, the bar must accommodate 100% of the current of all the largest motors involved in a single movement, plus 50% of the next largest motors. The auxiliary hoist motor must be included if it works in conjunction with the main hoist. The system also must 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, Pg. 6-7 for further “total load” calculation details.

## Appendix I - Selection of Systems

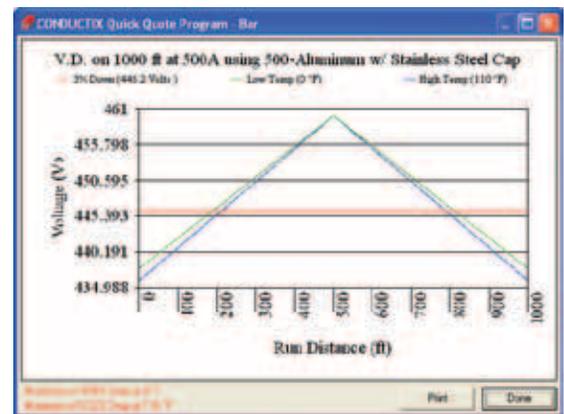
- **Voltage Rating** - 600 volt rated insulators are standard. Higher voltages require insulators designed for that voltage. Conductor separation may also be affected for medium voltage (e.g. 4160 volts) and higher. The conductor system may need to meet the fault force requirements as determined by a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

**Voltage Drop and Power Feed Locations** Voltage drop along a conductor increases as system length increases and as ambient temperature increases.

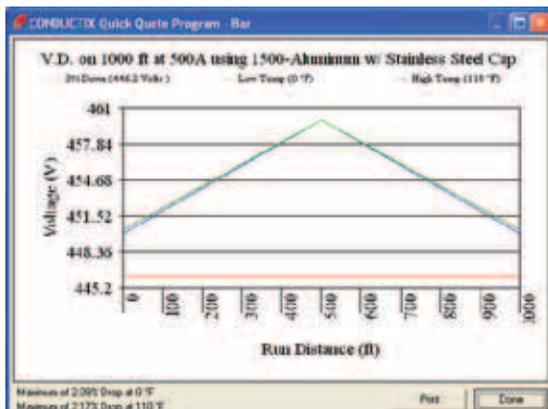
- **Maximum Voltage Drop** - The CMAA (Crane Manufacturers Association of America) recommends a maximum voltage drop of 3% on runways and 2% on bridges. The voltage drop in volts will vary according to voltage available. For example, a 3% voltage drop on a 480 volt system is 14.40 volts; a 3% voltage 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 power feed 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. 61.



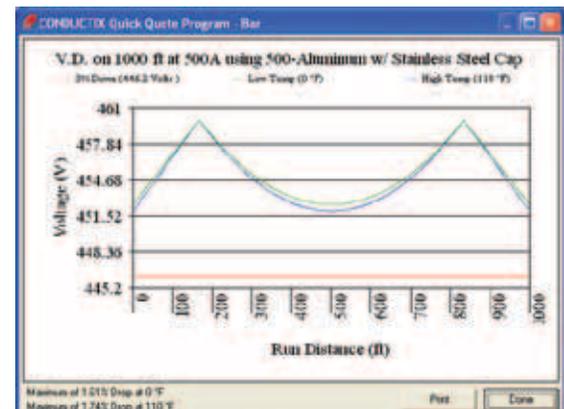
**Figure 1 – Center Feed Example:** Voltage drop along a 500 foot long runway with one crane drawing 500 amps at 460 volts on a 500 amp rated bar. The green line shows the voltage drop along the run at 0°F. The blue line shows the voltage drop at 110°F. The red line indicates the 3% maximum voltage drop. 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 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.
- **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.

## Appendix I - Selection of Systems

- **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 ft. 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.

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

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.

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

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

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

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

A few examples from the tables are:

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

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

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

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

### Voltage Drop

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

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

### Voltage Drop per 100 Ft. 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.
Galvanized Steel 90A	16.2	15.0	
Galvanized Steel 110A	10.1	7.1	VD = 1.39 x 3.5 x 2.5 = 12.1 volts
Stainless Clad Copper 250A	2.01	2.0	
Copper Steel Laminate 250A	2.01	2.0	Assume load pF is 90
Rolled Copper 350A	1.39	1.2	
Solid Copper 500A	1.08	0.8	

### 3% at Max Amps and Length from Power feed

Bar	Amps	480V	240V
SS	40	102'	51'
Galv	90	99'	49'
Galv	110	130'	65'
SS / CU	250	287'	144'
CU / Galv	250	287'	144'
Rolled Cu	350	296'	148'
Solid Cu	500	381'	191'

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

# Appendix III - Electrical Formulas & Conversions

## Electrical Formulas

### Ohms Law

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

### Power

<p><b>Watts</b> = amperes x volts</p> <p><b>Amperes</b> = <math>\frac{\text{watts}}{\text{volts}}</math> (not 3-Phase)</p> <p><b>HP</b> = <math>\frac{\text{volts} \times \text{amps} \times \text{efficiency}}{746}</math></p> <p><b>Power Factor</b> = <math>\frac{\text{watts}}{\text{amperes} \times \text{volts}}</math></p>	<p><b>3-phase Kilowatts</b> = <math>\frac{\text{volts} \times \text{amperes} \times \text{power factor} \times 1.732}{1000}</math></p> <p><b>3-phase Amperes</b> = <math>\frac{746 \times \text{HP (Horsepower)}}{1.732 \times \text{volts} \times \text{efficiency} \times \text{power factor}}</math></p> <p><b>3-phase Volt-Amperes</b> = volts x amperes x 1.732</p> <p><b>Single-phase Kilowatts</b> = <math>\frac{\text{volts} \times \text{amperes} \times \text{power factor}}{1000}</math></p> <p><b>Single-phase Amperes</b> = <math>\frac{746 \times \text{HP (Horsepower)}}{\text{volts} \times \text{efficiency} \times \text{power factor}}</math></p>
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### Speed

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

### Metric Conversion Formulas

To Obtain:	Calculate:
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

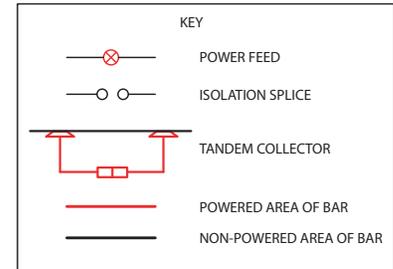
# Appendix IV - Power Interrupting Sections

Power can be shut off in a designated area along a bar system, either to safely maintain vehicles, or for some other purpose, while leaving the rest of the system powered. The shut off zone can be configured at the end of or in the middle of the system using a “Power Interrupting Section”. The following diagrams show how this is set up. Note that Tandem Collectors can bridge across the “isolation joint” of an isolation section, so enough Power Feeds and Isolation Sections must be used to ensure correct power switching.

## “End” Power Interrupting Sections

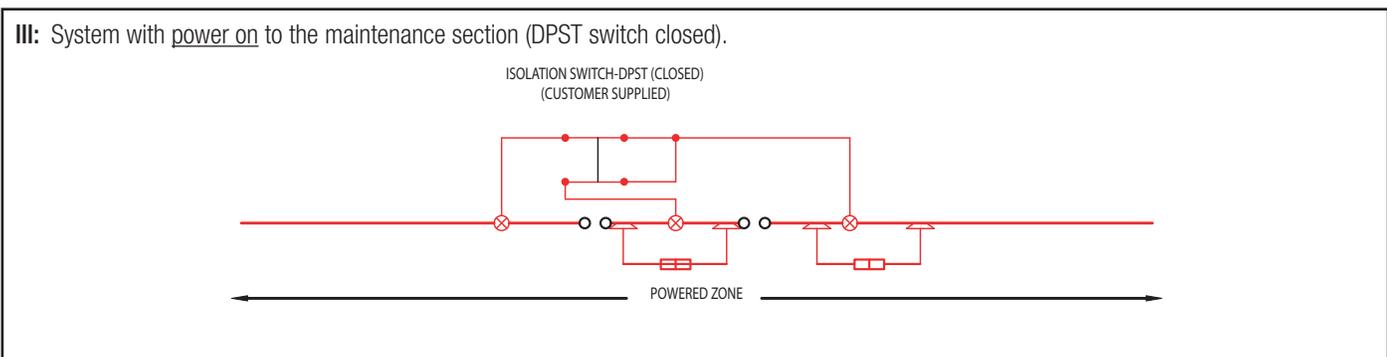
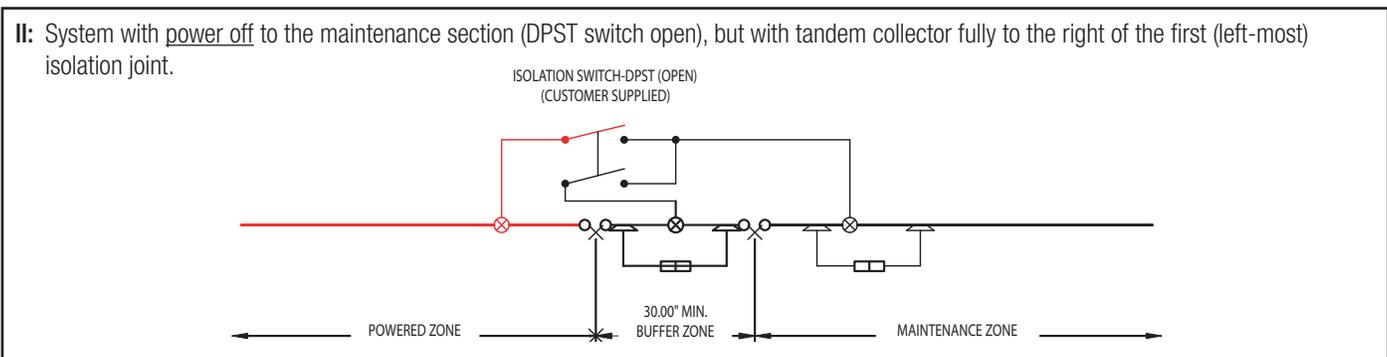
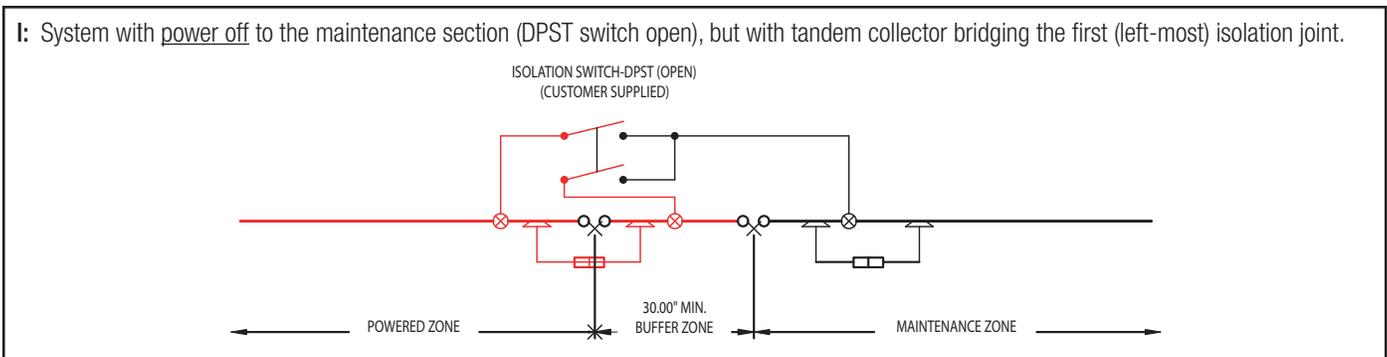
### Safe-Lec 2: For each power phase order:

- Qty. 1 - “Power Interrupting Section” of the desired current rating (Pg. 21).  
With this “kit” you get the required isolations and power feeds. Safe-Lec 2 interrupts are meant for indoor use only in dry, clean environments.
- Qty. 1 - “Customer supplied” DPST switch per phase and necessary power wiring (ordered from others)



### Hevi-Bar II: For each power phase order:

- Qty. 1 - “Power Interrupting Section” of the desired current rating (Pgs. 36-43). With this “kit” you get the required isolations and power feeds. The HB-II power interrupts can be used indoors or out and can withstand dirty/dusty environments common in mills.
- Qty. 1 - “Customer supplied” DPST switch per phase and necessary power wiring (ordered from others)



# Appendix IV - Power Interrupting Sections

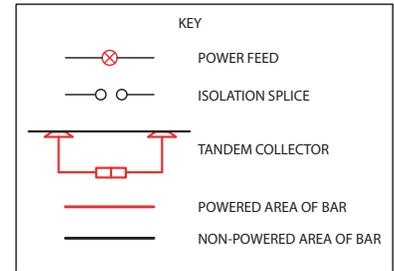
## “Middle” Power Interrupting Sections

### Safe-Lec 2: For each power phase order:

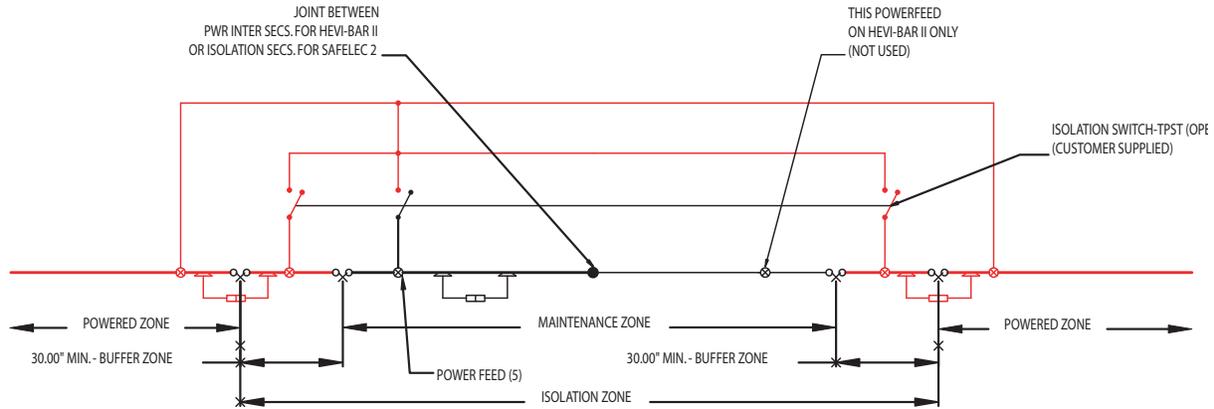
- Qty. 2 - “Power Interrupting Section” of the desired current rating (Pgs. 21). With this “kit” you get the required isolations and power feeds.
- Qty. 1 - “Customer supplied” TPST switch per phase and necessary power wiring (ordered from others)

### Hevi-Bar II: For each power phase order:

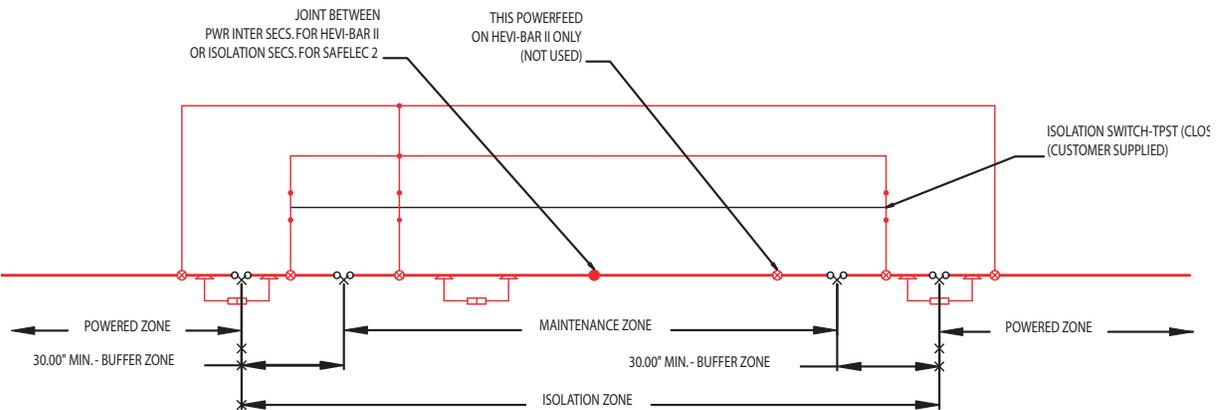
- Qty. 2 - “Power Interrupting Section” of the desired current rating (Pgs. 36-43). With this “kit” you get the required isolations and power feeds.
- Qty. 1 - “Customer supplied” TPST switch per phase and necessary power wiring (ordered from others)



I: System with power off to the maintenance section (TPST switches open), power will not feed into the maintenance zone.



II: System with power on (TPST switches closed), normal crane operation resumes with power to all zones.



## Appendix V - 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 ser, 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. 67 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.

## Field Service

### Hevi - Bar II - 1500 A Conductors

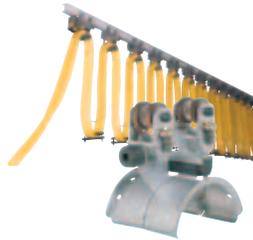
Our customers can count on us to meet their specific service needs and requirements. With Conductix-Wampfler everything is possible - from initial design and development to long term service contracts. The more complicated your system is, the greater your expectations are in terms of service life and operational reliability - and the more sense it makes to take advantage of our after-sales service. When it comes to service, you can count on Conductix-Wampfler to perform!



Contact your Conductix-Wampfler Sales Representative to discuss your installation, installation supervision, and service needs.

## Other Quality Products from Conductix-Wampfler

Conductor Bar from Conductix-Wampfler represents only one of the many products available from the broad spectrum of Conductix-Wampfler products for the transmission of energy and data. In every case, the solutions we deliver for your applications are based upon your specific requirements.



#### Festoon systems

Conductix-Wampfler Cable Trolleys are used in virtually every industrial application. They are reliable and robust and available in an enormous variety of sizes and designs.

Often, a combination of several different Conductix-Wampfler systems will be required, which is why you want to work with a full-line electrification company.



#### Motorized Cable reels

Motorized Cable Reels by Conductix-Wampfler are proven solutions wherever energy and data cables have to cover a range of distances within a short amount of time - in all directions, fast and safe.

You can count on all of Conductix-Wampfler's divisions for hands-on engineering support coupled with the perfect solution to meet your energy management and control needs.



#### Push Button Pendants and Radio Controls

Our ergonomic pendants and radios controls are ideally suited for industrial control applications. These are available in a wide range of configurations for overhead crane control and other types of machinery.



#### Bumpers

Conductix-Wampfler offers a complete range of bumpers (buffers) for the auto industry, cranes, and heavy machinery. These include rubber, rubber/metal, and cellular models, as well as special versions for vehicles, baggage conveyors and other purposes.



#### Inductive Power Transfer IPT®

The contactless system for transferring energy and data. For all tasks that depend on high speeds and absolute resistance to wear, IPT is the ideal solution.

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