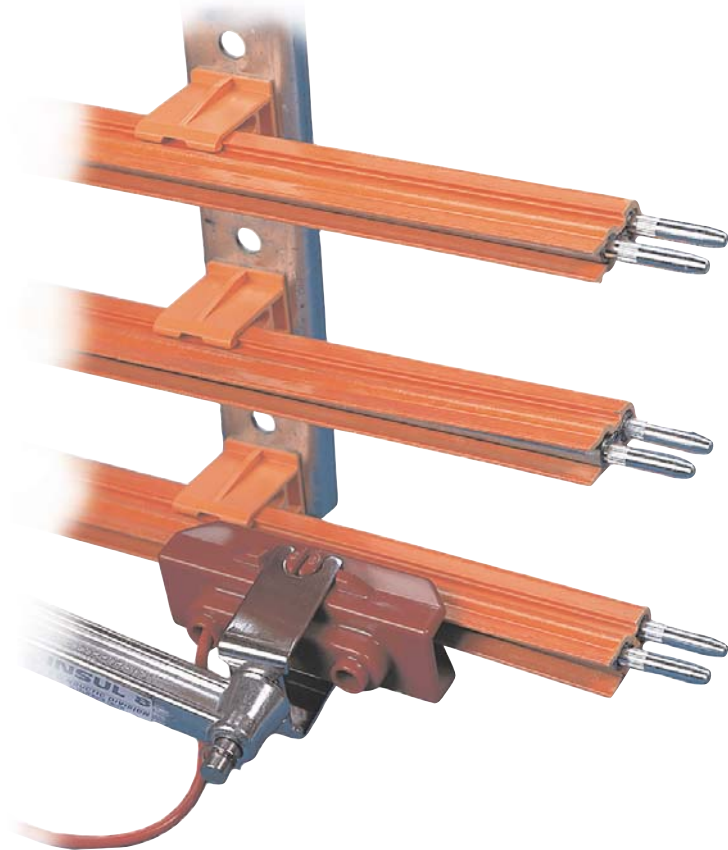


Insul-8 Mobile Electrification

Cable Reels ♦ Conductor Bar ♦ Festoon ♦ Pendants ♦ Slip Rings ♦ Radio Controls

Solutions From A Single Source

8-Bar Conductor Bar Systems



For the Electrification of:

- Cranes
- Monorails
- Automated Storage and Retrieval Systems



www.insul-8.com

THE INDUSTRY STANDARD FOR OVER 50 YEARS

- **Product Design**
- **Commitment to Quality**
- **Customer Service**
- **Quick and Reliable Deliveries**
- **Low Maintenance Systems**
- **Engineering Assistance**

Insul-8 figure 8-Bar has been the industry's standard for over 50 years. It remains a highly economical and reliable solution to your mobile electrification needs for cranes and mono-rails as well as trolleys, hoists, conveyors and many other applications. Insul-8 specializes in engineered systems, covering a wide variety of both standard and custom designs.

FIGURE 8-BAR IS AVAILABLE IN:

- | | |
|-------------------|---------------------------------------|
| • 40 Amp. | Stainless Steel |
| • 90 Amp. | Galvanized Steel |
| • 110 Amp. | Galvanized Steel |
| • 250 Amp. | Copper Steel Laminate |
| • 250 Amp. | Stainless Clad Copper Laminate |
| • 350 Amp. | Rolled Copper |
| • 500 Amp. | Solid Copper |

INCLUDES THESE OUTSTANDING FEATURES:

- **UL listed and CSA Approved**
- **Low maintenance**
- **Fast, simple installation**
- **Insul-8 Bar is the original figure 8-Bar**
- **50 years of experience in the industry**

CALL NOW! FOR ALL YOUR MOBILE ELECTRIFICATION NEEDS.

800/521-4888(USA)

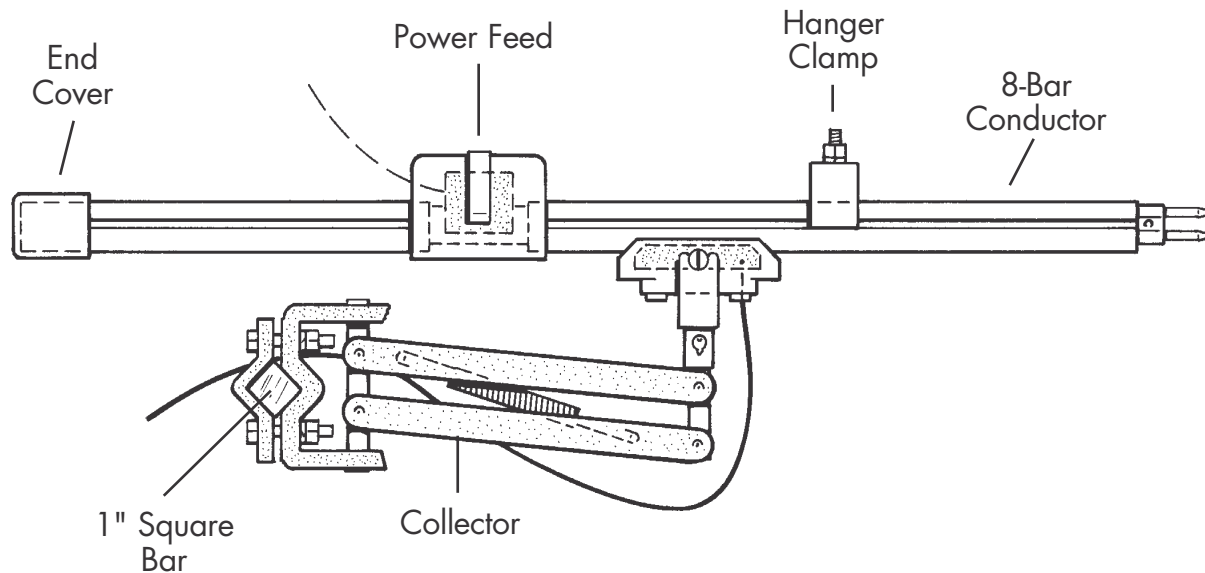
800/677-2487(CANADA)

402/339-9300

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Specifications May Change Without Notice.

BASIC 8-BAR COMPONENTS



1) Conductor Bar

The supply of incoming power.

2) Powerfeed

Attachment of incoming power.

3) Collector

Collects the incoming power and forwards to machine.

4) Hangers

Supports the conductor bar.

5) End Cover

Safety protection at the end of conductor system.

6) Brackets

Supporting device for attachment of multiple hangers.

7) Anchor Clamp

Supporting device for directing movement of conductors during thermal expansion and contraction.

SELECTING A SYSTEM IS SIMPLE

To assist you in selecting an 8-Bar system, answer the following questions.
Return via fax and we'll provide a quote and qualified customer support .

- 1) Type of system (Runway, Bridge, Monorail, Other)_____
- 2) Length of System (ft.)_____ 3) Number of Conductors_____
- 4) Number of vehicles (cranes, etc.)_____
- 5) Voltage_____ AC___ DC___ Phase___ Cycle___
- 6) Amperage requirement of each vehicle_____ (see pg. 21)
- 7) Total ampacity required_____ (see pg. 21)
- 8) Environment: Indoor___ Outdoor ___ Both___
- 9) Ambient temperature: (if other than -10° F to +100° F)_____ to _____
- 10) Atmosphere: Dry___ Wet___ Dusty ___ Dirty___
Corrosive___ Nuclear___ Other_____
- 11) Bracket Required: No___ Web 5"___ Web 9"___ Flange___
- 12) Do you want brackets supplied: Yes___ No___
- 13) Special Concerns:_____

Curved systems? Please refer to pgs. 19 and 20 for proper selection.
Icing problem? We offer heated systems. Consult factory for details.

NEED ASSISTANCE?
CONTACT INSUL-8 OR YOUR LOCAL REPRESENTATIVE NOW!
WE'LL BE HAPPY TO QUOTE YOUR SYSTEM
OR PARTS REQUIREMENTS FOR YOU.

PICK YOUR SYSTEM

The following components make up standard conductor bar systems used on cranes, monorails, conveyors and other mobile electrification applications.

- 1) Conductor bar amperage required?
- 2) Hanger Clamps to support the bar (Indoor or Outdoor)? (See pg.13)
- 3) Brackets required? (pgs. 16 and 17)
- 4) Powerfeeds: attachment to incoming power.
- 5) End covers: for protection at the end of system.
- 6) Collectors: to conduct the power from the electrified bar to the motors that are used to power the crane, hoist, etc.

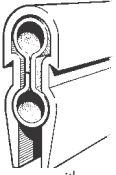
Notes: *Connector tool is included free with the complete system.*

Connector Pins, Joint Covers, and where applicable Joint Keepers supplied at no additional charge with each conductor bar.

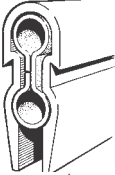
Expansion sections may be required to compensate for thermal expansion.

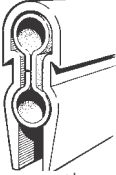
Consult factory for stainless steel hardware requirements.

STAINLESS STEEL 40 AMP.

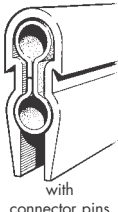
40 AMP	Description	W/Rigid PVC Cover -10° F. to 160° F.		W/Medium Heat Cover -25° F. to 250° F.		W/High Heat Cover -60° F. to 400° F.	
 with connector pins	Part Length	Part #	Approx. WT(lbs.)	Part #	Approx. WT(lbs.)	Part #	Approx. WT(lbs.)
	Conductor Length 10'	14299	7.0	24304	6.6	24307	7.5
	Conductor Length 5'	14823	3.5	24305	3.3	24308	3.8
	Expansion Section 10'	24279	11.0	24306	7.0	24309	11.8
	Powerfeed	11091	.34	11091	.34	11122	.34
	End Cover	11088	.10	11088	.10	11633	.10

GALVANIZED STEEL 90 AMP. AND 110 AMP.

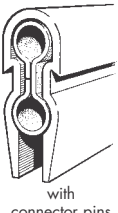
90 AMP	Description	W/Rigid PVC Cover -10° F. to 160° F.		W/Medium Heat Cover -25° F. to 250° F.		W/High Heat Cover -60° F. to 400° F.	
 with connector pins	Part Length	Part #	Approx. WT(lbs.)	Part #	Approx. WT(lbs.)	Part #	Approx. WT(lbs.)
	Conductor Length 10'	22135	4.4	22141	4.1	22147	4.9
	Conductor Length 5'	22136	3.5	22142	2.1	24148	2.5
	Expansion Section 10'	22140	6.7	22146	6.3	22152	7.4
	Powerfeed	11091	.34	11091	.34	11122	.4
	End Cover	22070	.03	22070	.10	11633	.4

110 AMP	Description	W/Rigid PVC Cover -10° F. to 160° F.		W/Medium Heat Cover -25° F. to 250° F.		W/High Heat Cover -60° F. to 400° F.	
 with connector pins	Part Length	Part #	Approx. WT(lbs.)	Part #	Approx. WT(lbs.)	Part #	Approx. WT(lbs.)
	Conductor Length 10'	11000	5.5	11019	5.8	11038	6.7
	Conductor Length 5'	11001	2.8	11020	2.9	11039	3.4
	Expansion Section 10'	11057	9.5	11064	8.9	11070	10.3
	Powerfeed	11091	.34	11091	.34	11122	.4
	End Cover	11088	.10	11088	.10	11633	.4

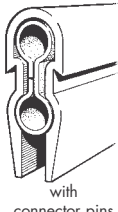
STAINLESS CLAD COPPER 250 AMP.

250 AMP	Description	W/Rigid PVC Cover -10° F. to 160° F.		W/Medium Heat Cover -25° F. to 250° F.		W/High Heat Cover -60° F. to 400° F.	
	Part Length	Part #	Approx. WT(lbs.)	Part #	Approx. WT(lbs.)	Part #	Approx. WT(lbs.)
	Conductor Length 10'	11004	6.6	11023	6.2	11042	7.1
	Conductor Length 5'	11005	3.3	11024	3.1	11043	3.6
	Expansion Section 10'	11059	8.5	11065	8.0	11071	9.2
	Powerfeed	11092	.7	11092	.7	11093	.7
	End Cover	11088	.10	11088	.10	11633	.4

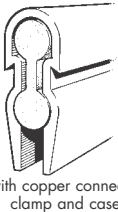
COPPER STEEL LAMINATE 250 AMP.

250 AMP	Description	W/Rigid PVC Cover -10° F. to 160° F.		W/Medium Heat Cover -25° F. to 250° F.		W/High Heat Cover -60° F. to 400° F.	
	Part Length	Part #	Approx. WT(lbs.)	Part #	Approx. WT(lbs.)	Part #	Approx. WT(lbs.)
	Conductor Length 10'	11008	6.2	11027	5.8	11046	6.7
	Conductor Length 5'	11009	3.1	11028	2.9	11047	3.4
	Expansion Section 10'	11060	10.0	11066	9.4	11072	10.8
	Powerfeed	11092	.7	11092	.7	11093	.70
	End Cover	11088	.10	11088	.10	11633	.4

ROLLED COPPER 350 AMP.

350 AMP	Description	W/Rigid PVC Cover -10° F. to 160° F.		W/Medium Heat Cover -25° F. to 250° F.		W/High Heat Cover -60° F. to 400° F.	
	Part Length	Part #	Approx. WT(lbs.)	Part #	Approx. WT(lbs.)	Part #	Approx. WT(lbs.)
	Conductor Length 10'	11012	7.0	11031	6.6	11050	7.5
	Conductor Length 5'	11013	3.5	11032	3.3	11051	3.8
	Expansion Section 10'	11062	11.0	11068	11.0	11074	11.8
	Powerfeed	11092	.7	11092	.7	11093	.70
	End Cover	11088	.10	11088	.10	11633	.4

SOLID COPPER 500 AMP.

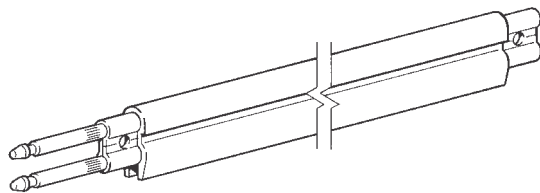
500 AMP	Description	W/Rigid PVC Cover -10° F. to 160° F.		W/Medium Heat Cover -25° F. to 250° F.		W/High Heat Cover -60° F. to 400° F.	
	Part Length	Part #	Approx. WT(lbs.)	Part #	Approx. WT(lbs.)	Part #	Approx. WT(lbs.)
	Conductor Length 20'	11016	23.6	11035	22.1	11054	24.6
	Conductor Length 10'	11017	11.8	11036	11.0	11055	12.3
	Expansion Section 10'	11063	18.5	11069	17.3	11075	20.0
	Powerfeed	11094	2.6	11094	.66	11094	2.6
	End Cover	12171	.2	11633	.2	11633	.4

8-BAR COMPONENTS

8-BAR

Rigid, figure 8-Bar is furnished in standard lengths, with connectors, joint cover and insulating cover.

(Copper Bar Also Includes Joint Keepers.)

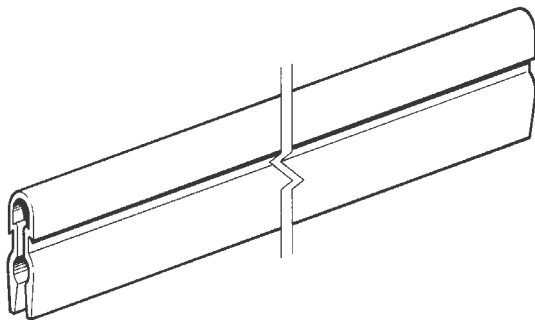


(90 Amp Bar Shown)

*For proper 8-Bar selection
see Quick Pick Section (pg 6-7)*

8-BAR COVER

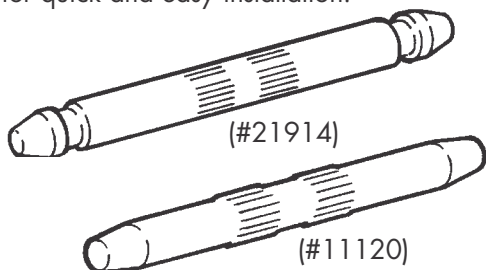
Meets all requirements for plastic electrical insulation, and may be used indoors or outdoors.



Part #	Material	Temp. Rating	Replacement Length	Approx. Weight
11114	Rigid PVC (Orange)	-10° F to +160° F	9'-10 1/2"	1.2
11115	Medium Heat (Lexan)(Red)	-25° F to +250° F	9'-10 1/2"	0.9
11116	High Heat (Polyester)	-60° F to +400° F	9'-7 1/4"	1.7

CONNECTOR PINS

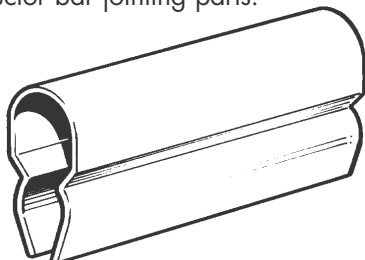
Used to connect two bar sections together for quick and easy installation.



Part #	Description
11120	Steel zinc plated used with galvanized steel 110 amp 8-Bar
11121	Used with rolled copper and laminated 8-Bar
24196	Stainless steel used with stainless steel 40 amp 8-Bar
21914	Steel zinc plated used with galvanized steel 90 amp 8-Bar
22885	Transition Pin for 90 and 110 amp 8-Bar, 3" long

JOINT COVER

Insulated protective covers for conductor bar jointing parts.



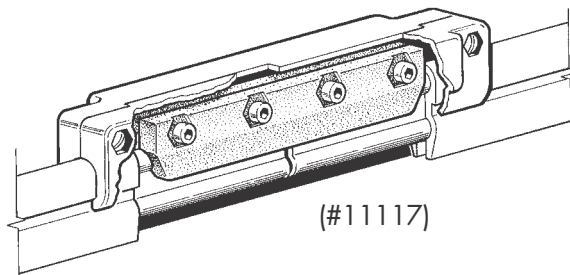
Part #	Description	Approx. Weight
13601	For 40 - 350 amp PVC cover	.03
13600	For 40 - 350 amp Medium Heat Cover	.03
11123	For 40 - 350 amp High Heat Cover	.40

8-BAR COMPONENTS

COPPER CONNECTOR CLAMP AND CASE

Used to connect 500 Amp. solid copper conductor together.

Part #	Description	Approx. Weight
11117	Complete assembly for solid copper 8-Bar, or for repairs	1.5
11118	Connector Case Only	0.5
11119	Connector Clamp Only	1.0

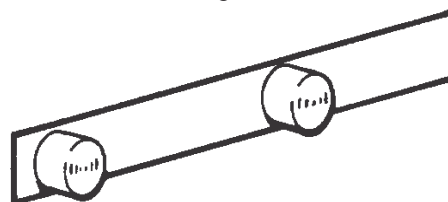


* Used with all cover types

JOINT KEEPER

Used to help secure copper conductor bar together and add stability.

Part #	Description	Approx. Weight
11125	For rolled copper and laminated 8-Bar	.01

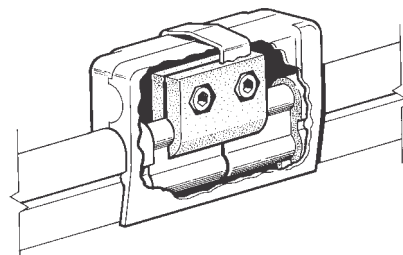


JOINT REPAIR KIT

To repair joints of damaged conductor bar.

Part #	Description	Approx. Weight
24632	For 40 - 350 amp. formed 8-Bar	.66

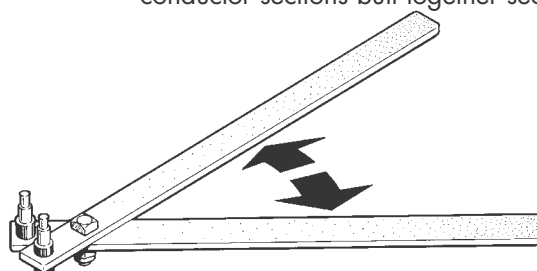
* For use with PVC cover only



CONNECTOR TOOL

Insert into the pre-punched holes of the conductor bar, pull together until conductor sections butt together securely.

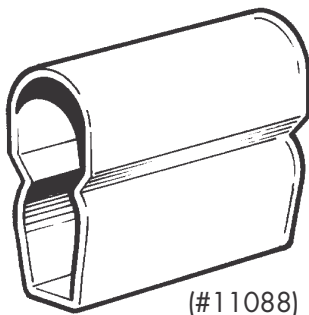
Part #	Description	Approx. Weight
11134	Used with 40 - 350 amp. 8-Bar	2.3



8-BAR COMPONENTS

END COVER

For covering the end of exposed figure 8-Bar.

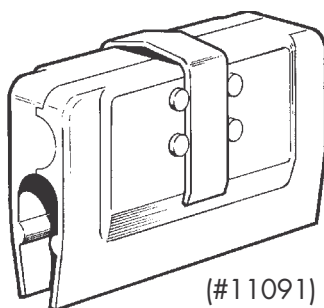


(#11088)

Part #	Description	Approx. Weight
11088	For 40, 110-350 amp. conductors to 300° F.	.03
22070	For 90 amp. conductors to 400° F.	.03
11633	For all 8-shaped conductors to 400° F.	.40
12171	For 500 amp. (solid copper) conductors to 160° F.	.40
27102	For 500 amp. (solid copper) to 160° F (stainless steel hardware)	.40

POWERFEED AND ACCESSORIES

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



(#11091)

Part #	Description	Approx. Weight
11091	90/110 amp. steel clamp and PVC case 160° F.	.34
11122	90/110 amp steel clamps and high heat case, 400° F.	.38
11092	250 amp. copper clamp and PVC case, 160° F.	.66
11093	250 amp. copper clamp and high heat case, 400° F.	.70
11094	500 amp. copper clamp with high heat case, 400° F.	2.60
27104	250 amp. copper clamp and PVC case, 160° F (stainless hardware)	.66
27106	500 amp. copper clamp with high heat case 400° F. (Stainless Hardware)	2.60

Part #	Description	Approx. Weight
11131	Case Clip Only. PVC 90/110, 250 amp	.2
11132	Case Clip Only. High Heat. 90/110, 250 amp	.3
11133	Case Clip Only. High Heat 500 amp	1.0
11128	Clamp Only. Steel 90/110 amp	.10
11129	Clamp Only. Copper, 250 amp	.4
11130	Clamp Only. Copper, 500 amp	1.6

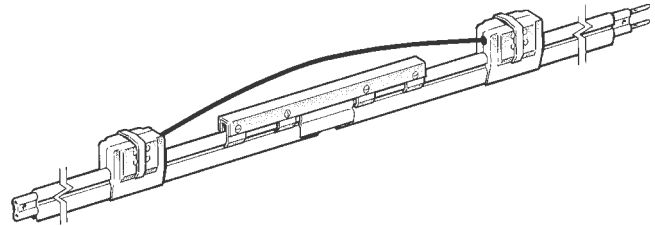
8-BAR COMPONENTS

EXPANSION SECTION

Used every 300' for steel conductors, every 200' for copper conductors to compensate for thermal expansion.
Powerfeeds and flexible jumpers are factory installed to meet electrical and mechanical requirements of your system.

*For proper expansion section selection
see quick pick (pgs. 6-7)*

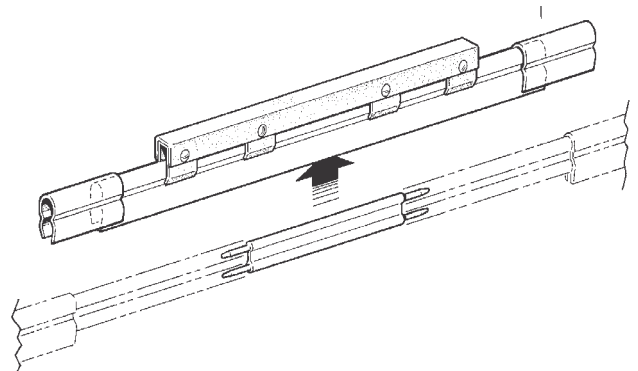
***** *To determine system expansion
requirements see page 26.*



ISOLATION SECTION

Conductor isolation sections are available for sectionalizing control circuits, maintenance bays, etc.

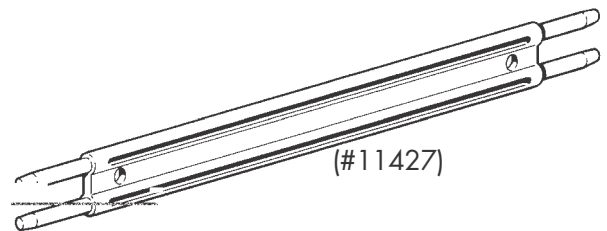
Consult factory for proper selection.



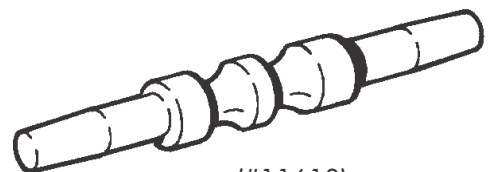
ISOLATION SECTION PARTS

Components used for in-field modification.

Part #	Description	Approx. Weight
21841	Kit: with 11127 guide assembly. PVC cover and isolation piece For 40 - 350 amp. Except 90 amp.	2.3
11427	Molded plastic. Insulating piece only for 21841	0.3
11615	Molded plastic, 1" isolating pin. For 40-350 amp, except for 90 amp. (2 per location required)	0.03
11618	Molded plastic, 1" isolating pin. For 90 amp only. (2 per location required)	.03



(#11427)

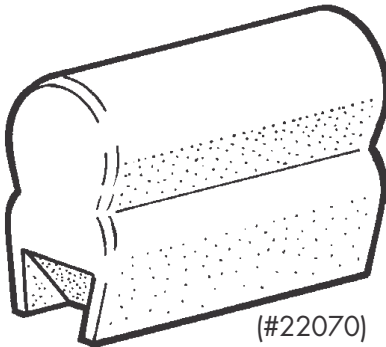


(#11618)

8-BAR COMPONENTS

TRANSFER CAPS

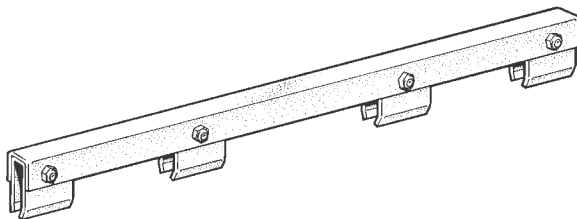
Used in switches, interlocks to accomplish smooth collector transfer.



Part #	Description	Approx. Weight
22070	End/transfer cap for 90 amp bar.	0.03
22395	Left transfer cap 90 amp bar	0.03
22396	Right transfer cap for 90 amp bar	0.03
13161	End/transfer cap for 40-350 amp bar	0.03
14118	Left hand cap for 40-350 amp bar	0.03
14119	Right hand cap for 40-350 amp bar	0.03

GUIDE ASSEMBLY

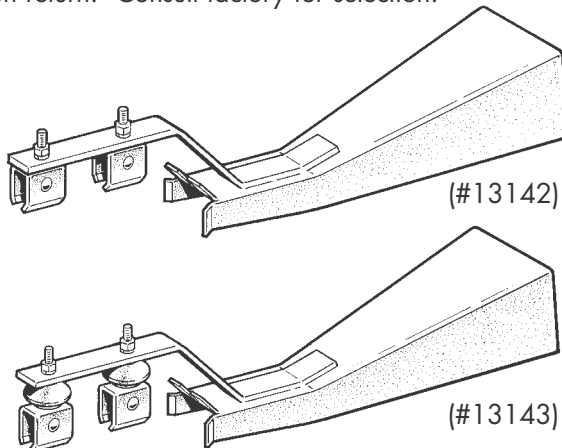
To provide rigid support at isolation areas.



Part #	Description	Approx. Weight
11127	Galvanized steel	1.5

PICK-UP GUIDE

Requires use of self-centering collectors to allow the collector to leave the conductor and be re-tracked on return. Consult factory for selection.



Part #	Description	Approx. Weight
13142	For "J" head collectors, indoors, for 3" bar spacing	1.75
11089	For "J" head collectors, indoors, for 4" bar spacing	1.75
13143	For "J" head collectors, outdoors, for 3" bar spacing	2
11090	For "J" head collectors, outdoors, for 4" bar spacing	2

HANGER AND ANCHOR CLAMPS

Hanger Clamps

Hanger clamps are designed to grip the figure 8-Bar shape for stable support.

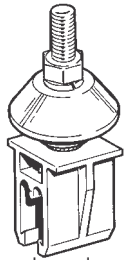
RECOMMENDED HANGER SPACING

Locate every 5 feet for vertical entry.
Locate every 3 feet for curved systems.
Locate every 3 feet 4 inches for lateral entry.

Insulated Hangers Recommended for Outdoor Applications

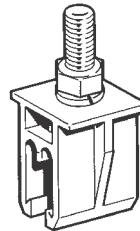
PLASTIC SNAP-IN HANGER CLAMP

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



with insulator

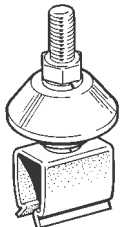
Description	Part #	Approx. Weight
Polycarbonate plastic with plated hardware	24405	.3
Polycarbonate plastic with stainless steel hardware	28122	.3



Description	Part #	Approx. Weight
Polycarbonate plastic with plated hardware	22800	0.11
Polycarbonate plastic with stainless steel hardware	23370	0.11

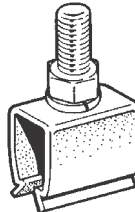
STEEL SNAP-IN HANGER CLAMP

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



with insulator

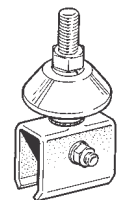
Description	Part #	Approx. Weight
Spring Steel	22000	0.23



Description	Part #	Approx. Weight
Spring Steel	21600	0.11

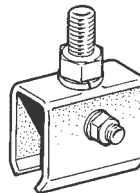
CROSS-BOLT HANGER CLAMP

For use on standard mount, lateral mount, and curved systems



with insulator

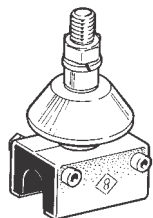
Description	Part #	Approx. Weight
Plated Steel	11082	0.4
Stainless Steel	11084	0.4



Description	Part #	Approx. Weight
Plated Steel	11076	0.25
Stainless Steel	11078	0.3

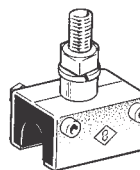
ANCHOR CLAMPS

For use at mid-point or between expansion sections and ends.



with insulator

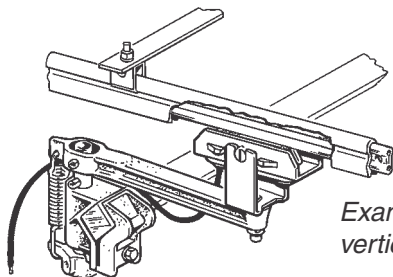
Description	Part #	Approx. Weight
Plated Steel	21982	0.5
Stainless Steel	28124	0.5



Description	Part #	Approx. Weight
Plated Steel	21833	0.3
Stainless Steel	28123	0.3

COLLECTORS

Collector assemblies are offered in either single or double contact shoe type providing a current take-off from 30 to 200 amperes. The collectors are the sliding contact type which confines wear to the easily replaceable contact shoe. The contact shoes are supported by insulated shoe holders on spring loaded collector arms designed to articulate and swivel.



Example of standard mount, vertical entry

30 AMP COLLECTORS

"J" Head "C" Base Type

For straight runs and curves to 18" minimum radius.
For lateral mount, consult factory.

Part #	Description	Approx. Weight
13128	Standard mount	2.5
13130	Standard mount, self centering *	2.6
13082	Standard tandem mount	4.7
13084	Standard tandem mount, self-centering *	4.9

"J" Head "H" Base Type

For straight runs and curves to 18" minimum radius.
For lateral mount, consult factory.

Part #	Description	Approx. Weight
13131	Standard mount	1.4
13132	Standard mount, self centering *	1.7

100 AMP COLLECTORS

"J" Head "C" Base Type

For straight runs and discontinuous systems of 600V, or less. For lateral mount, consult factory.

Part #	Description	Approx. Weight
13613	Standard mount	3.1
13625	Standard mount, self centering *	3.2
13626	Standard tandem mount	5.8
13628	Standard tandem mount, self-centering *	6.0

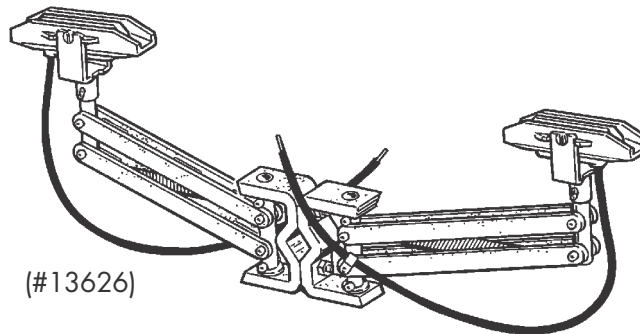
"J" Head "H" Base Type

For straight runs and discontinuous systems of 600V, or less and curves to minimum of 48" radius. For lateral mount, consult factory.

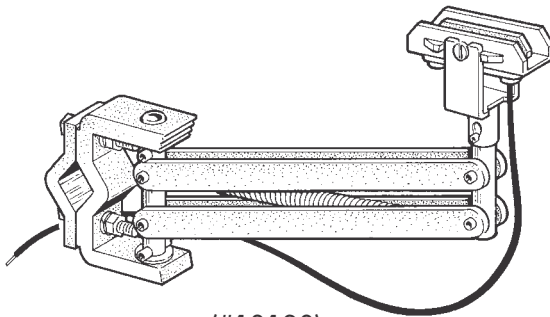
Part #	Description	Approx. Weight
13629	Standard mount	2.2
13630	Standard mount, self centering *	2.2

* For use with Pick-up Guides only.

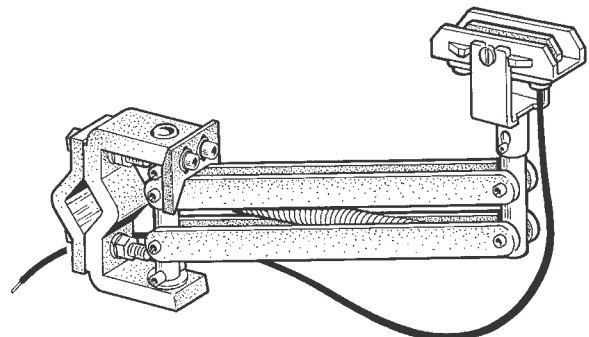
"C" BASE COLLECTORS



(#13626)

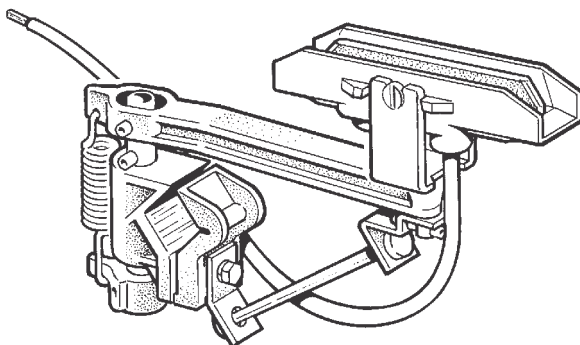


(#13128)

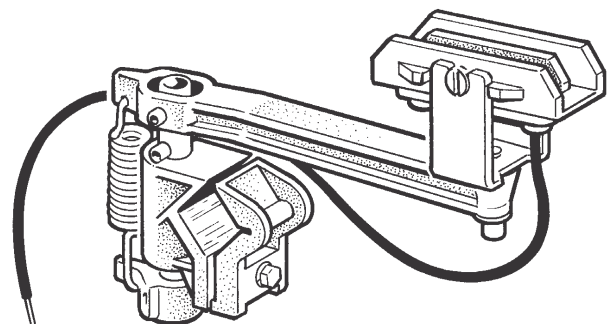


(#13130)

"H" BASE COLLECTORS



(#13630)



(#13131)

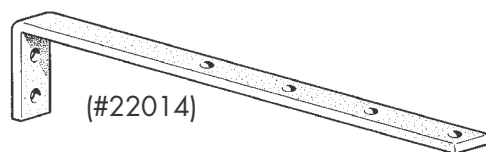
BRACKETS

BRACKETS ONLY

Zinc plated steel brackets (See page 13 for hangers).

Web Mount

Main line/top running applications,
web mounted bottom entry systems.

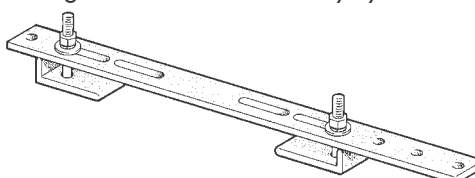


Note: 9" bracket has position for 4th hanger at 6"

Part #	Description	Approx. Weight
21784	Web bracket 5"	1.25
22014	Web bracket 9"	2.35

Flange Mount

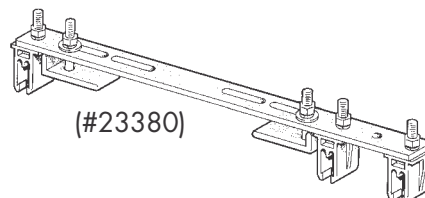
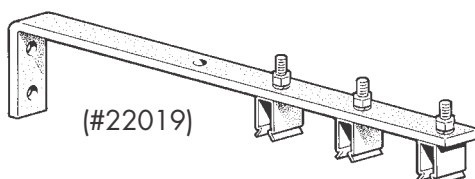
Monorail/underhung applications,
flange mounted bottom entry systems.



Part #	Description	Approx. Weight
22095	Flange bracket	1.77

BRACKETS WITH HANGER CLAMPS

The above brackets are pre-assembled with hanger clamps on 3" centers.

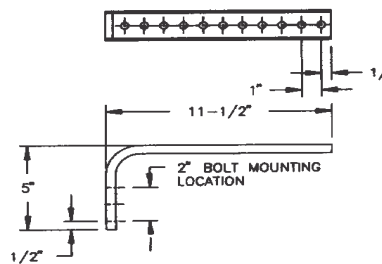


Description	Steel Snap-In Clamps				Plastic Snap-In Clamps	
	Without Insulators		With Insulator			
	Part #	Approx. Weight	Part #	Approx. Weight	Part #	Approx. Weight
Web type 5"	22017	1.55	22011	1.95	23378	1.55
Web type 9"	22019	2.68	22021	3.10	23379	2.68
Flange	22079	2.1	22080	2.5	23380	2.1

Description	Cross Bolt Clamps			
	Without Insulator		With Insulator	
	Part #	Approx. Weight	Part #	Approx. Weight
Web type 5"	22096	1.97	22099	2.33
Web type 9"	22103	3.10	22106	3.50
Flange	22110	2.52	22113	2.88

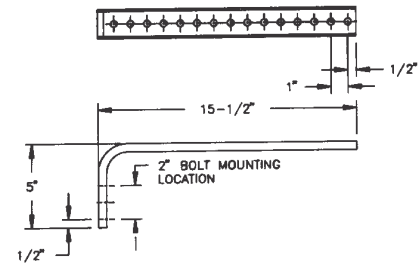
1" ON CENTER PREDRILLED HOLES. LARGER NUMBER OF POSITIONS
ALLOWS "UNIVERSAL BRACKETS" TO ADDRESS MOST APPLICATIONS

WEB BRACKET - SHORT



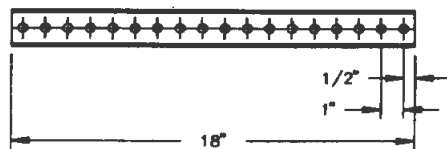
Part #	Approx. Wt.
31409	1.0

WEB BRACKET - LONG



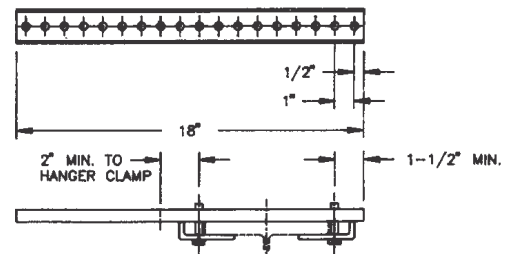
Part #	Approx. Wt.
31407	1.25

FLANGE BRACKET



Part #	Approx. Wt.
31408	1.15

FLANGE BRACKET WITH CLIPS



Part #	Approx. Wt.
31418	1.55

ORDER PREASSEMBLED BRACKETS
WITH YOUR CHOICE OF HANGERS PG. 18

PREASSEMBLED BRACKET ORDER FORM

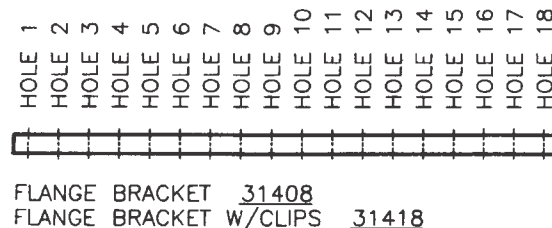
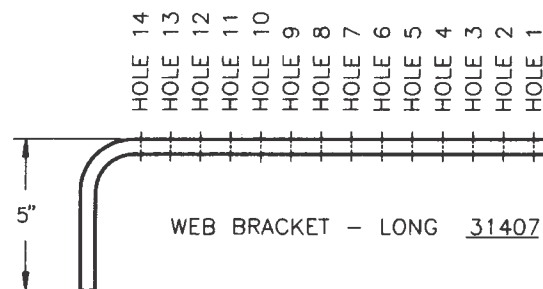
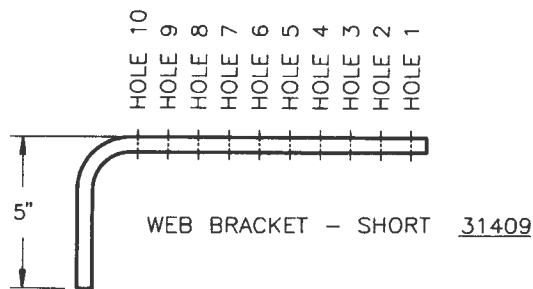
DIRECTIONS

- 1) Make **BRACKET** selection and identify (in parantheses) the hole number locations in which hangers are to be assembled. (see bottom of page for recommended minimum hanger spacing).
- 2) Make hanger selection (see pg. 13).

EXAMPLE:

Qty.	Part #	Description
10	31407 (1,3,5,7)	Long Bracket
40	22800	Plastic Snap Hange

BRACKET HOLE LISTING (1" SPACING BETWEEN)



RECOMMENDED MINIMUM CONDUCTOR BAR SPACING

	Indoor	Outdoor
Insul-8-Bar	2"	3"
Side Contact (Lateral Mount)	3"	Not for outside use

For less than 2" spacing, consult factory.

SLIP RINGS AND CURVES

CURVES

Factory curved conductors. Refer to page 20 to specify your curve requirements.

Conductor Bar	Cover	Minimum Radius	Maximum Length	Part #
Galvanized Steel (110 amp)	PVC	18"	10'	11003
Stainless Clad Copper Laminate (250 amp)	PVC	18"	10'	11007
Copper Steel Laminate (250 amp)	PVC	18"	10'	11011
Rolled Copper (350 amp)	PVC	18"	10'	11015
Solid Copper (500 amp)	PVC	18"	10'	11018
Galvanized Steel (110 amp)	Med. Heat	57"	10'	11022
Stainless Clad Copper Laminate (250 amp)	Med. Heat	57"	10'	11026
Copper Steel Laminate (250 amp)	Med. Heat	57"	10'	11030
Rolled Copper (350 amp)	Med. Heat	57"	10'	11034
Solid Copper (500 amp)	Med. Heat	57"	10'	11037
Galvanized Steel (110 amp)	High Heat	57"	10'	11041
Stainless Clad Copper Laminate (250 amp)	High Heat	57"	10'	11045
Copper Steel Laminate (250 amp)	High Heat	57"	10'	11049
Rolled Copper (350 amp)	High Heat	57"	10'	11053
Solid Copper (500 amp)	High Heat	57"	10'	11056

CONSULT FACTORY FOR
ASSISTANCE WITH YOUR
CURVE AND SLIP RING REQUIREMENTS.

SLIP RINGS

Curved segments for factory manufactured ring.

Conductor Bar	Ring Description	Part #
Galvanized Steel (110 amp)	18" to 35" radius 2-180° pieces PVC Cover	23626
Stainless Clad Copper Laminate (250 amp)		23627
Copper Steel Laminate (250 amp)		23628
Rolled Copper (350 amp)		23629
Galvanized Steel (110 amp)	35.1" to 54" radius 3-120° pieces PVC Cover	23630
Stainless Clad Copper Laminate (250 amp)		23631
Copper Steel Laminate (250 amp)		23632
Rolled Copper (350 amp)		23633
Solid Copper (500 amp)	54.1" to 72" radius 4-90° pieces PVC Cover	24292
Galvanized Steel (110 amp)		23634
Stainless Clad Copper Laminate (250 amp)		23635
Copper Steel Laminate (250 amp)		23636
Rolled Copper (350 amp)	57" to 72" radius 4-90° pieces Medium Heat Cover	23637
Solid Copper (500 amp)		24293
Galvanized Steel (110 amp)		23638
Stainless Clad Copper Laminate (250 amp)		23639
Copper Steel Laminate (250 amp)	Medium Heat Cover	23640
Rolled Copper (350 amp)		23641
Solid Copper (500 amp)		24294

CURVE DEFINITION SHEET

Consult factory when calculating your requirements. This worksheet is intended to assist you in choosing the correct curved section for your application.

INSUL-8 CONDUCTOR BARS CURVE DEFINITION

CUSTOMER

PROJECT NO.:

ITEM NO.:

DATE:

1. BAR TYPE, RATING (AMPS / VOLTS):

2. ENVIRONMENT/AMBIENT TEMP.:

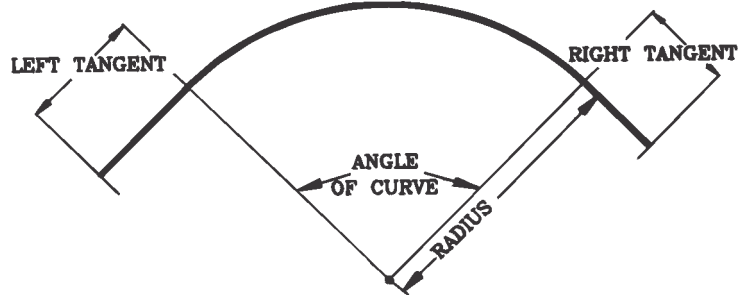
3. FILL IN

ANGLE
OF CURVE

LEFT TANGENT
6" STANDARD

RIGHT TANGENT
6" STANDARD

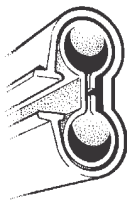
*RADIUS



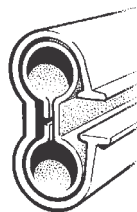
OUR CATALOG FOR MINIMUM RADII.

* ALWAYS TO CONTACT SURFACE. CONSULT

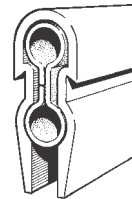
4. SELECT ONE 8-BAR USED FOR ILLUSTRATION ONLY, OTHER PRODUCTS AVAILABLE



OUTSIDE CONTACT



INSIDE CONTACT



BOTTOM CONTACT

5. IN CASE OF PARALLEL CURVES SKETCH LAYOUT BELOW,
INDICATING RADIUS / ANGLE / TANGENT FOR EACH

VOLTAGE DROP INFORMATION

Proper selection of conductor and covers for Insul-8-Bar™ contact conductor systems is simple, requiring only the ampacity, voltage and ambient conditions.

The method determining the rating for cranes and hoist is completely outlined in NEC 610-14(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.

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

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: (data taken from motor nameplates—all are 460V, 3 ϕ , 60 Hz).

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

$$\begin{aligned} \text{Crane \#2} \\ \text{Hoist} &= 52a \times 1 = 52 \\ \text{Bridge} &= 14a \times .5 = 7 \\ &= 59 \text{ amps} \\ \text{Total} &= 137.5 \times .95 = 130 \text{ amps} \end{aligned}$$

- II. When the motor ampere ratings are unknown, a good approximation may be made using the nominal horsepower ratings of the motors, converting them to full load amperes per NEC table 430-150 and proceeding as above. If the motors are not three-phase, applicable tables 430-147 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: "The arithmetical difference between the voltages at the feed point and the load at 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 Electrical Overhead Crane Industry specifications limit total voltage drops to 3% on runways and 2% on bridge conductors. Since powerfeeds are usually located at the mid-point of a system, the effective length is the distance from powerfeed to the end of the runway. On longer systems it may be necessary to provide additional feedpoints.

Voltage Drop Per 100 Ft. of Run Per 100 Amps of Current

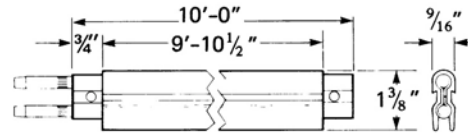
Conductor	3 ϕ 60 Hz	D.C.	Example
Stainless Steel 40 Amp.	35.2	44.6	Rolled copper 3 ϕ 350' long, 250 amp load Vd = 1.39 x 3.5 x 2.5 = 12.1 volts Assume load pF is 90
Galvanized Steel 90 Amp.	16.2	15.0	
Galvanized Steel 110 Amp.	10.1	7.1	
Stainless Clad Copper 250 Amp.	2.01	2.0	
Copper Steel Laminate 250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

3% at Max Amps and Length from Powerfeed			
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'

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

CONDUCTOR DATA

Roll formed of 1/16" material, except laminates which are 1/32" copper, 1/32" steel or stainless steel, and 1/32" steel for 90 amp conductor. The cross-section area is 188 mcm (.1477 sq. in.) except solid copper bar which is 313 mcm (.2458 sq. in.). The equivalent rectangle for all Insul-8 Bar conductors is 1" x 1/4". Supports are required at intervals of: 3' on curves, 3'-4" for lateral mount, 5' standard.



Conductor, assembled with cover, 40-350 amp.
Part No. 11000 shown.

(Assembled with cover, 10' lengths)						ELECTRICAL DATA*			
Material	PVC	Med. Heat	High Heat	Expansion Coefficient °F	Nominal Weight lbs/ft	Ampacity (continuous duty)	Resistance R (DC)	Reactance X (60 Hz) 3φ	Impedance Z (60 Hz)
Stainless Steel	14299	24304	24307	.000007	0.72	40 amp	2230	60	2231
Galvanized Steel	22135	22141	22147	.000007	0.46	90 amp	750	600	960
Galvanized Steel	11000	11019	11038	.000007	0.65	110 amp	354	600	702
Stainless Clad Copper Laminate	11004	11023	11042	.000009	0.65	250 amp	100	60	116
Copper Steel Laminate	11008	11027	11046	.000009	0.65	250 amp	100	60	116
Roller Copper	11012	11031	11050	.000009	0.76	350 amp	60	60	84
Solid Copper	11016	11035	11054	.000009	1.16	500 amp	40	60	70

All roll-formed conductors (40-350 amp.) are supplied assembled with conductor pins and cover, in standard 10' lengths. Joint covers and joint keepers are furnished with each order as required. The solid copper (500 amp.) conductors are supplied in 20' lengths, covered, with connector clamp and case. Conductor bars and covers may be ordered separately for replacement purposes.

*Electrical values R, X and Z are expressed in microhms per foot of single conductor. Example: .000060 ohms/ft.

X values are calculated at 3" centerline spacing, adjusted for three conductors with the multiplier 1:26 A nominal permeability μ of 10-12 is used for the steel conductor calculations.

$$\text{For reference, } X = \mu 52.9 \log_{10} \frac{3 \times 1.26}{1.250} + 34.5. \quad Z = \sqrt{R^2 + X^2}$$

$$V = IL \sqrt{3} (R \cos \theta + X \sin \theta) \times 10^{-6}, \text{ in volts for total drop, three-phase runway. } \cos \theta = .90, \sin \theta = .436 \text{ (.90 load power factor is assumed).}$$

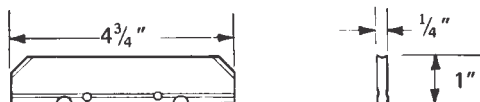
COLLECTOR SHOE INFORMATION

FOR 30 AMP.



18" Min. Radius

FOR 100 AMP.



48" Min. Radius

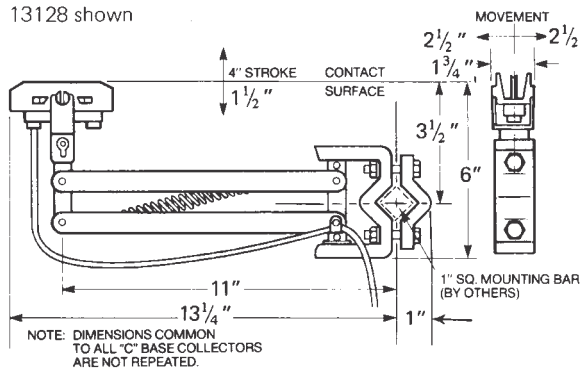
Part No.	Weight	Description	Amp. Rating	Std. Pkg. Quantity	Weight
3" OVERALL LENGTH FOR 30 AMP. COLLECTORS					
13136	(.16)	Sintered copper graphite (standard)	30A	12	(1.41)
13137	(.08)	Carbon	20A	6	(.50)
13138	(.16)	Cast iron	30A	6	(1.92)
19678	(.16)	Insuloy	30A	6	(1.92)
3" OVERALL LENGTH FOR 60 AMP. COLLECTORS (100 AMP. CASE ONLY)					
11154		Sintered copper graphite (standard)	60A	6	(.81)
11155		Carbon	30A	6	
11156		Cast iron	60A	6	
4 3/4" OVERALL LENGTH FOR 100 AMP. COLLECTORS					
11157	(.45)	Sintered copper graphite (standard)	100A	6	(1.5)
11158	(.22)	Carbon	50A	6	(1.32)
11159	(.45)	Cast iron	100A	6	(2.7)
19347	(.45)	Insuloy	100A	6	(2.7)

COLLECTOR DRAWINGS

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

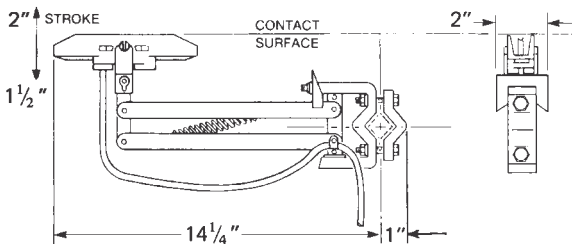
"C" BASE, STANDARD MOUNT

13128 shown



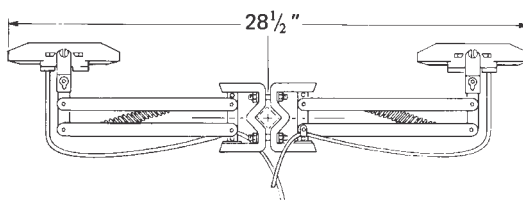
"C" BASE, SELF-CENTERING

13625 shown



"C" BASE, STANDARD MOUNT

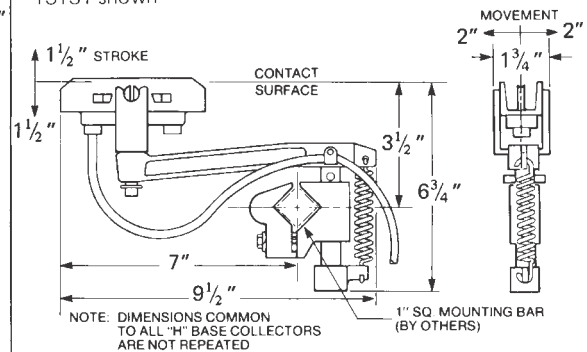
13626 Tandem (Shown)



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

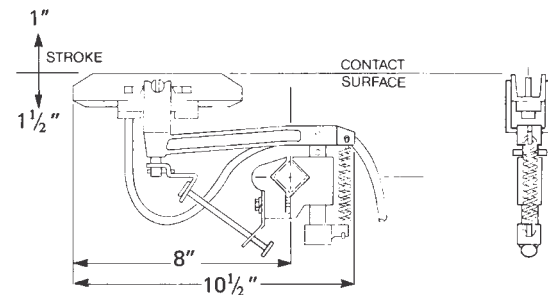
"H" BASE, STANDARD MOUNT

13131 shown



"H" BASE, SELF-CENTERING

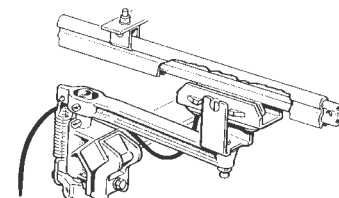
13630 shown



COLLECTOR MOUNTING

Standard mount
(vertical entry)

13131 shown



SHOE PRESSURE

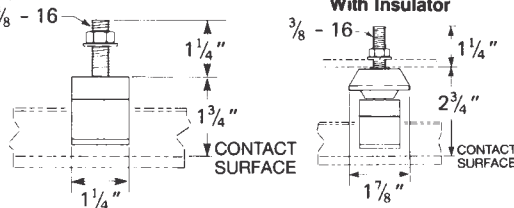
30 amp 3-5 lbs.
100 amp 6-9 lbs.

HANGERS AND POWERFEEDS

PLASTIC SNAP-IN HANGER CLAMPS

(Not recommended for curves)

250°F

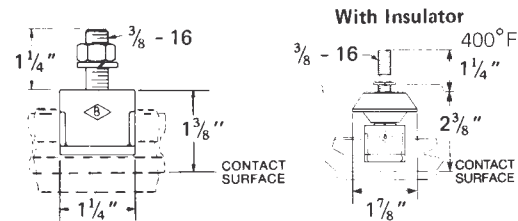


22800, 23370

24405, 28122

STEEL SNAP-IN HANGER CLAMPS

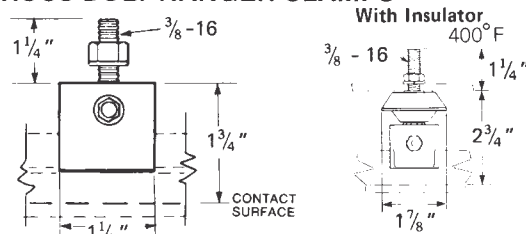
(Not recommended for lateral mount or curves)



21600

22000

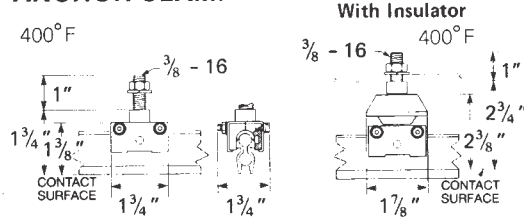
CROSS-BOLT HANGER CLAMPS



11076, 11078

11082, 11084

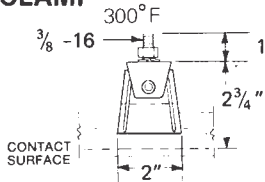
ANCHOR CLAMP



21833, 28123

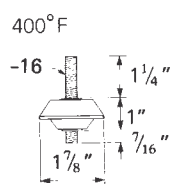
21982, 28124

INSULATING HANGER CLAMP



11085

INSULATOR

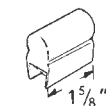


11087 with plated inserts
16424 with stainless inserts

TRANSFER CAP

Molded plastic for use at switches with pickup guides and other transfer points for 40-350 amp. conductors, to 300°F.

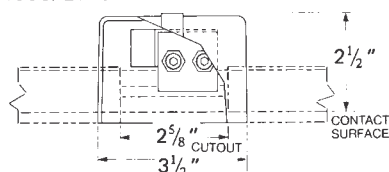
300°F



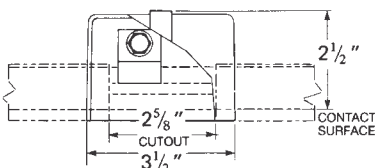
13161	For 40, 110, 250 350 amp bar	22070	For 90 amp only
14118	Left hand	22395	Left hand
14119	Right hand	22396	Right hand

POWERFEEDS

11092, 11093, 27104



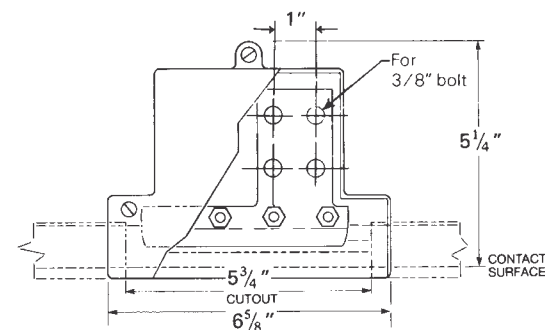
11091, 11122



11091 Steel clamp type. Complete assembly of clamp and PVC case for steel systems only. Single bolt hole 1/4" For crimp lug 3/0 and temperatures to 160°F.

11122 Steel clamp type. Complete assembly of clamp and high heat case for steel systems only. To 400°F.

11092/27104 Copper clamp type. Complete assembly of clamp and PVC case for systems with feed wires of #8-1/0. To 160°F.

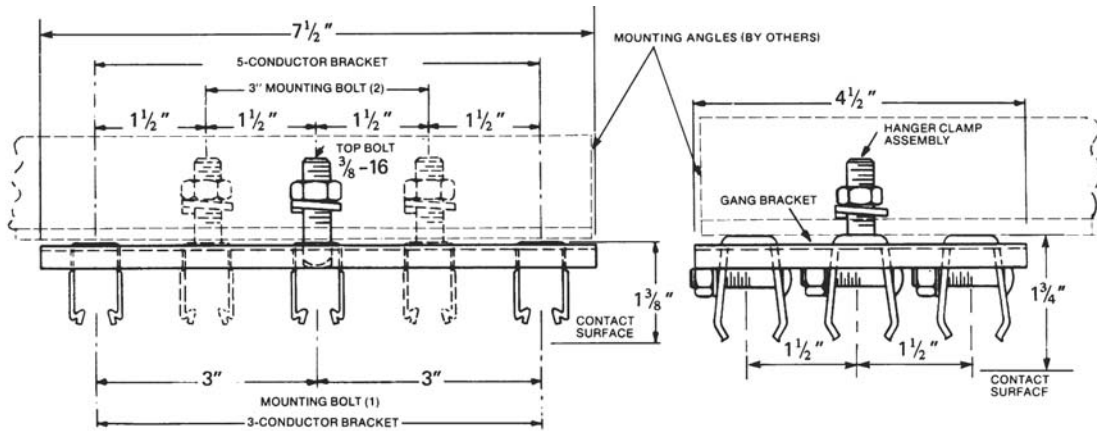


11094, 27106

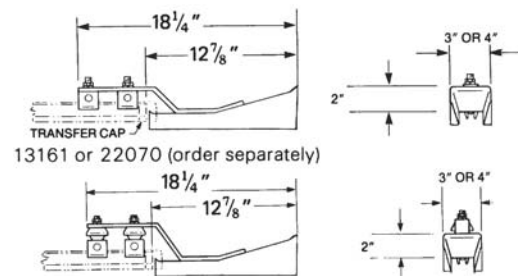
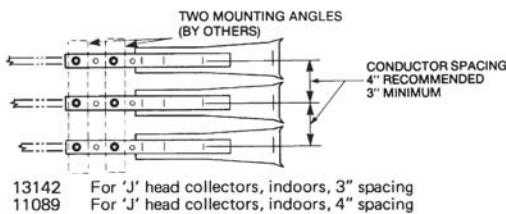
11093 Copper clamp type. Complete assembly of clamp and high heat case for systems with feed wires of #8-1/0 and temperatures to 400°F.

11094/27106 Copper clamp type with stub. Complete assembly of clamp with NEMA standard four-hole stub and case for temperatures to 400°F. Feed wires to 500 MCM.

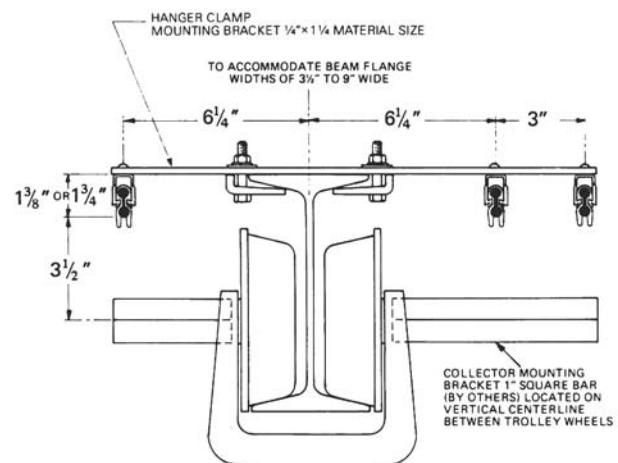
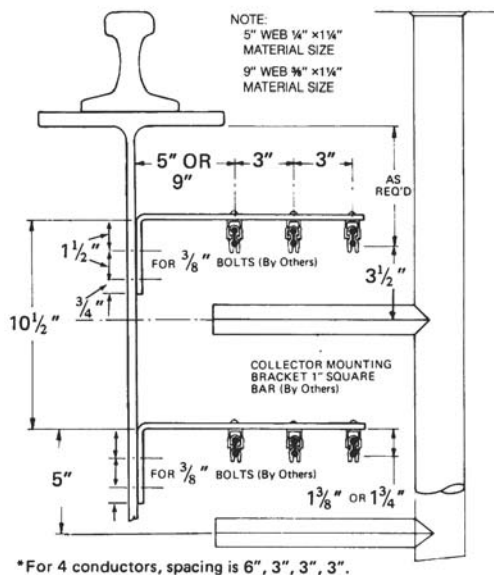
GANG HANGER CLAMP BRACKET



PICK-UP GUIDES



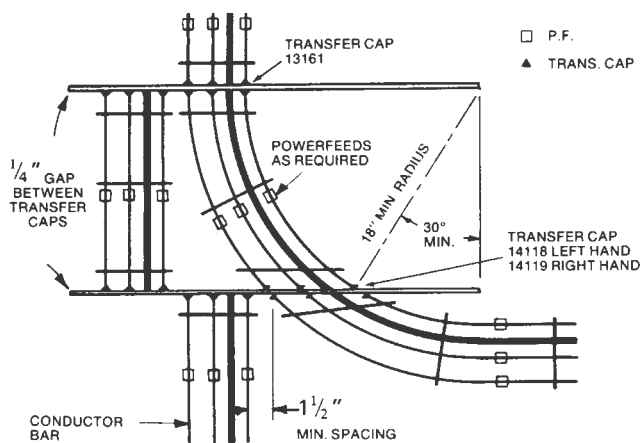
CRANE BRIDGES AND RUNWAYS



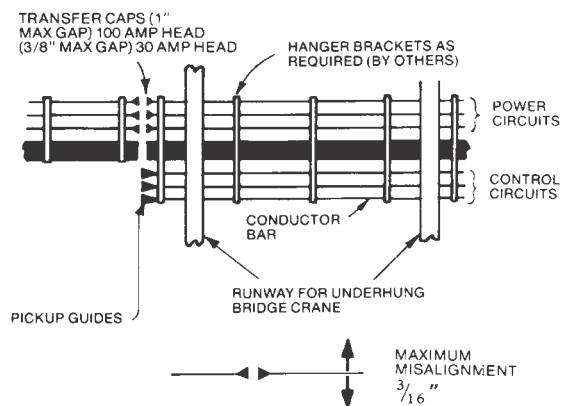
ASSEMBLY REFERENCES

2-WAY STUB SWITCH AND CRANE INTER-LOCK

2-WAY STUB SWITCH



BRIDGE CRANE INTERLOCK

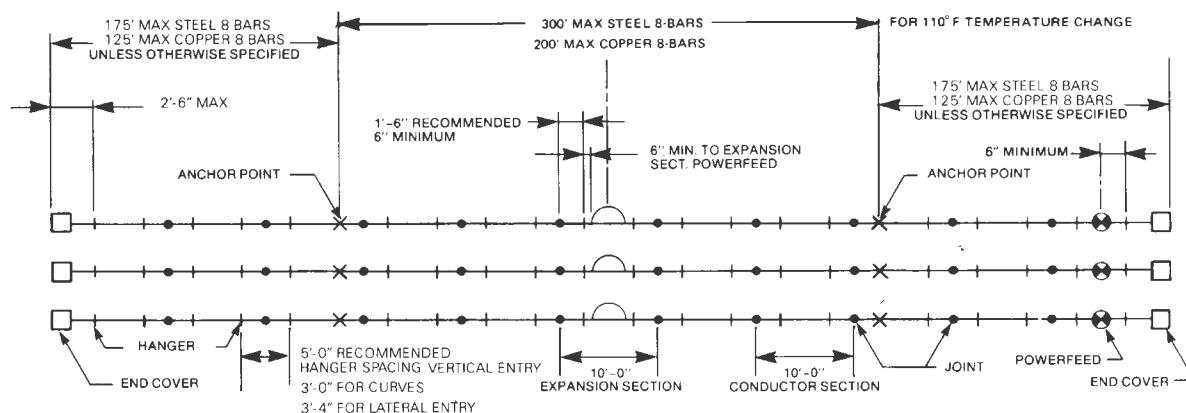


TYPICAL 3-PHASE RUNWAY

Typical 3-Phase Runway

TYPICAL 3-PHASE RUNWAY

CONDUCTOR SPACING:	COLLECTORS MOUNTED SIDE-BY-SIDE	SINGLE COLLECTORS STAGGERED
Minimum	2"	1 1/2"
Recommended	3"	2"



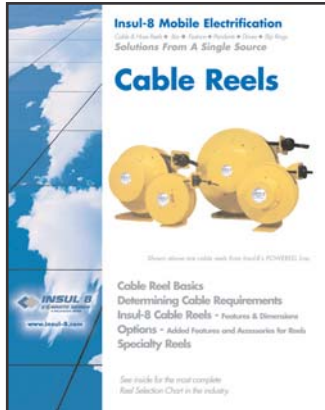
For greater than 110° temperature change, consult factory.

NOTES

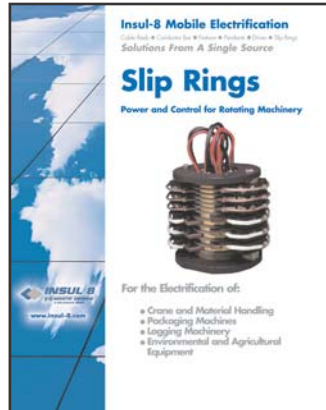
This image shows a single page of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Electrification Solutions from a Single Source

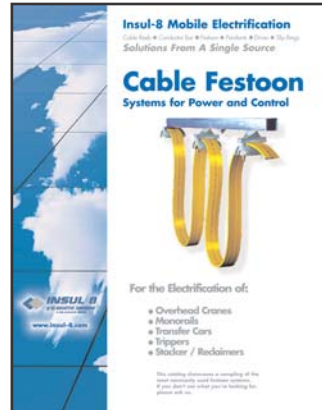
ISO 9001 Certified



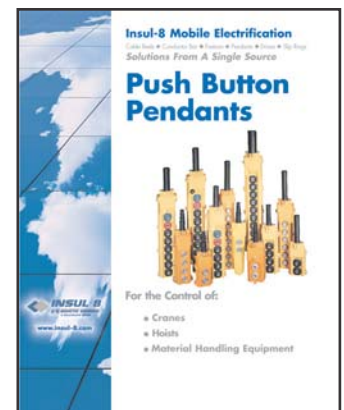
SPRING DRIVEN
REELS



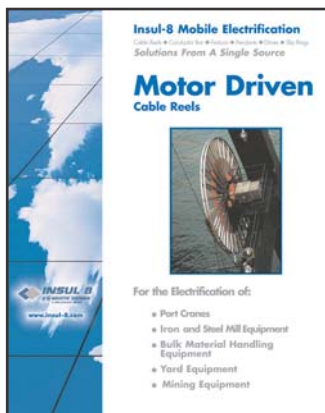
SLIP RINGS



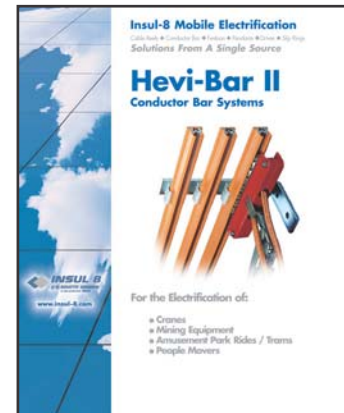
FESTOON



PENDANTS



MOTOR DRIVEN
REELS



CONDUCTOR BAR

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