



# About MacLean Power Systems



MacLean Power Systems, a MacLean-Fogg Company, is a leading manufacturer of products used by utilities for building transmission and distribution lines and substations. MPS product families include hardware and connection products as well as insulation and protection products. With global raw material sourcing capabilities, MPS produces over 10,000 items in six domestic production facilities. The MPS business model supports local manufacturing for high service levels, diversity development programs and also sustainability and green initiatives. MPS products include: automatic splices and bolted connectors, silicone rubber non-ceramic insulators, hollow core insulators, surge arresters, guy and foundation anchors, pole line hardware, aluminum and ductile clamps, fiberglass brackets, crossarms and guy strains, steel fabrications, fuse cutouts and grounding equipment.

With MacLean Power Systems' addition of the S&C Electric porcelain and polymer fuse cutouts in 2010, MPS provides the most comprehensive line of brand name T&D products to the utility and telecommunication industries. Starting with the 1986 purchase of Reliable Power Products, the MacLean Power Systems' family has grown to include: Bethea Electrical Products, Continental Electric, Precision Fiberglass, Atlas Fabrications, Utilities Service, Hydrocom International, American Metals Products, American Connector Engineering Company (ACE) – an operating unit of Preformed Line Products, the Sediver composite insulator business in York, SC, the Sediver composite hollow core business in St. Yorre, France, Joslyn Manufacturing Company, and Dixie Manufacturing Company. In addition, in 2003, to facilitate the growing Asian market, MPS established a joint venture with MPC in Guangzhou, China.

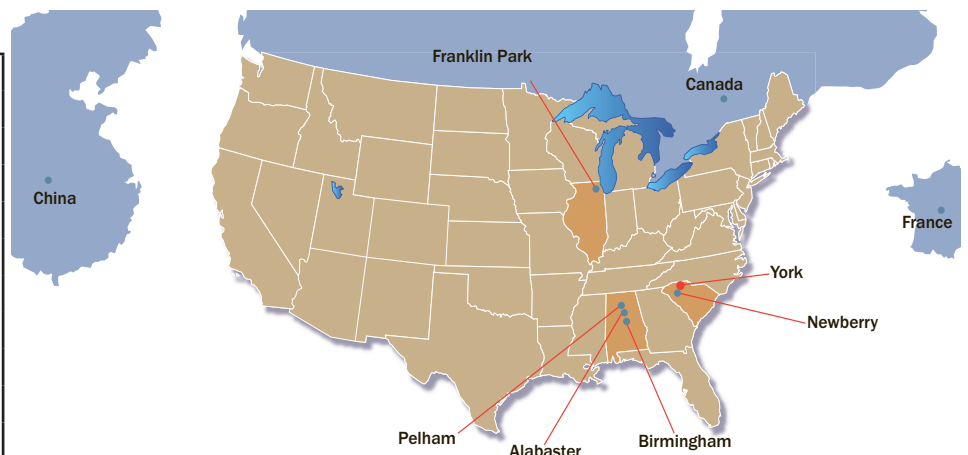
Today, MacLean Power Systems operates out of nine manufacturing facilities worldwide. MPS serves our Canadian customers through our MacLean Power Canada operation in Chateaugay, Quebec. MacLean Power France houses our hollow core insulator business and serves markets throughout the world. MacLean Power China serves not only the rapidly growing greater China region, but also manufactures insulators for our worldwide customer base. For the international market, we also have representatives located across Latin America, Middle East, Asia Pacific, Africa and Europe.

Powerful Solutions for Distribution, Substation and Transmission applications.

MacLean Power Systems is constantly reviewing our products for improvement of existing products as well as designing new products. For regular updates to this catalog, register at <http://www.macleanpower.com/contact>.

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MacLean Power Systems Worldwide Factory Locations



# MacLean Power Systems

Please note that because MacLean Power Systems follows a policy of continuous product improvement, we reserve the right to change specifications and drawings at any time without notice.



# Anchoring Systems Catalog



MPS offers anchors systems, Strandvise® deadend connectors, guy strain insulators, guy bonding clamps, and guy guards to meet all your anchor application requirements.

MacLean Power Systems offers a wide range of anchors for distribution and transmission guy applications, as well as helical foundation piles for street light poles, bumper guards, substations, transmission towers and other applications. The combined Joslyn and Dixie anchor brands have been supplying products to the utility and telecommunication industries since the 1920's.

The most popular anchors are the Power Hub style screw anchors, with either solid hub or internal socket drive Turbo Drive® (patent pending) with a torque capacity ranging from 4,000 to 15,000 ft/lbs to provide cost effective options from easy to install to tough soil applications. MPS uses the Cam Action® helix for superior installation performance. The Power Hub anchors are typically installed with line trucks or similar equipment.

Power Hub, Power Shaft and no-wrench screw anchors provide many benefits: a cost effective total installed cost, ease of installation under variable soils or weather conditions, and provide reliable anchoring system. The anchor holding strength can be confirmed by monitored installing torque during installation.

MPS anchors have been designed, tested and installed from distribution to 765kV transmission lines throughout the world. Electronic torque measuring and recording in a wide range of soils provides application information in easy to use charts.

Power Shaft screw anchors for transmission guy applications have a torque capacity to 15,000 ft/lbs and holding strength to 150,000 lbs. These anchors can be installed in excess of 100 ft depth when soil conditions warrant.

Material for MPS anchors is received from steel mills with material certifications that meet the appropriate ASTM or MPS proprietary specifications. Laboratory testing includes torsion tests, helix compression, tension and other tests that confirm the product meets the specification.

MacLean Power Systems employs a quality assurance program to assure that all materials, manufacturing processes, and critical dimensions are in conformance to ASTM material and hot dip galvanizing, ANSI and other applicable standards as well as the proprietary MPS specifications.

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MacLean Power Systems has anchor systems for many soil types that provides ease of installation and for immediate application under adverse working conditions.



# MacLean Power Systems

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## Power Hub Anchors

MacLean Power Systems' Power Hub Anchor System offers a versatile and cost effective power driven screw anchor for applications through Class 2 soils and to 36,000 lb holding strength. These anchors can be installed to a depth of 14' with either a boom suspended torque motor line truck or rack type digger truck.

A complete Power Hub Anchor Assembly consists of a helix-hub assembly, anchor rod, and eyenut. The helix size (diameter) and number of helices are selected for the required holding strength. The hub, either socket drive Turbo Drive® (patent pending), or solid hub is selected for installation torque requirement. The rod is selected for the guy load and installed depth and eyenut is selected for the number of guys.

The helix hub is either a socket drive or solid hub with various combinations of helices, torque ratings, and different rod sizes as listed in the tables. The torque required to install the anchor will determine the anchor hub rating.



The anchor rods are 5/8", 3/4" and 1" nominal sizes for 16,000, 23,000 and 36,000 lb ultimate tension, respectively. Anchor rod lengths are 3.5' and 7'. The ends of the 3/4" diameter rod are upset and have the same thread as the 1" rod. The typical installation is with one 7' length rod.

Eyenuts are designated with an "S", "D" or "T" for attaching one, two, or three guys, respectively.





# Power Hub-RCS Solid Hub Anchors

## Features

- Used for normal soils
- Install with standard 10,000 ft/lb 5 1/4" bolt circle power hub anchor installing tool
- All of the power hub anchor rods are used with this anchor



Single Helix



Twin Helix

## 1 3/8" Solid Square Hub

For Standard Installing Tool

Single Helix 4,000 Ft/Lb Ultimate Installing Torque			
Catalog Number	Helix Size (In)	Tapped for Rod Size (In)	Wt Ea (Lb)
D82	8	5/8	10.0
D84		3/4 or 1	
D102	10	5/8	13.0
D104		3/4 or 1	
D112	12	5/8	16.0
D114		3/4 or 1	
D134	14	3/4 or 1	21.0
Twin Helix 4,000 Ft/Lb Ultimate Installing Torque			
D84-2	8	3/4 or 1	24.0
D104-2	10		30.0
Single Helix 6,000 Ft/Lb Ultimate Installing Torque			
D82-6	8	5/8	10.0
D84-6		3/4 or 1	
D102-6	10	5/8	13.0
D104-6		3/4 or 1	
D112-6	12	5/8	16.0
D114-6		3/4 or 1	
D134-6	14	3/4 or 1	21.0

## 1 1/2" Solid Square Hub

For Standard Installing Tool

Single Helix 5,500 Ft/Lb Ultimate Installing Torque			
Catalog Number	Helix Size (In)	Tapped for Rod Size (In)	Wt Ea (Lb)
D182	8	5/8	11.0
D184		3/4 or 1	
D1102	10	5/8	14.0
D1104		3/4 or 1	
D1114	12	3/4 or 1	17.0
D1134	14		22.0
Twin Helix 5,500 Ft/Lb Ultimate Installing Torque			
D284	8	3/4 or 1	32.0
D2104	10		38.0
Single Helix 7,000 Ft/Lb Ultimate Installing Torque			
D184-7	8	3/4 or 1	11.0
D1104-7	10		15.0
D1114-7	12		18.0
Twin Helix 7,000 Ft/Lb Ultimate Installing Torque			
D244-7	4	3/4 or 1	8.0
D284-7	8		27.0
D2104-7	10		32.0

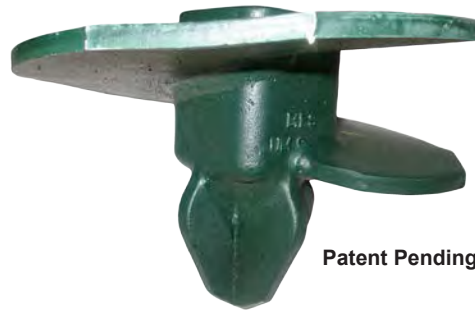


# Power Hub Socket Drive Turbo Drive® Anchors



## Features

- Used for tough soils where the solid hub anchors cannot be installed
- One piece cast steel hub for increased torque and bending strength
- Four flute hub to break up tough soils
- Install 2 1/4" with standard power installed anchor installing tool (5 1/4" bolt circle)
- Install 2 1/2" with high strength power installed anchor installing tool (7 5/8" bolt circle)
- All of the power installed anchor rods are used with the Turbo Drive® anchor
- Standard Turbo Drive® are used with 3/8" helix
- Heavy duty Turbo Drive® anchors are used with 1/2" helix



Patent Pending

## 2 1/4" Socket Drive Anchor

Standard 10,000 Ft/Lb Ultimate Torque Capacity			
Catalog Number	Helix Size (In)	Tapped for Rod Size (In)	Wt Ea (Lb)
TD225-82	8	5/8	11.2
TD225-84		3/4 or 1	
TD225-102	10	5/8	14.2
TD225-104		3/4 or 1	
TD225-112	12	5/8	17.9
TD225-114		3/4 or 1	
TD225-134	14	3/4 or 1	22.4

Heavy Duty 10,000 Ft/Lb Ultimate Torque Capacity			
Catalog Number	Helix Size (In)	Tapped for Rod Size (In)	Wt Ea (Lb)
TDH225-82	8	5/8	12.7
TDH225-84		3/4 or 1	
TDH225-102	10	5/8	16.7
TDH225-104		3/4 or 1	
TDH224-112	12	5/8	21.6
TDH225-114		3/4 or 1	
TDH225-134	14	3/4 or 1	27

## 2 1/2" Socket Drive Anchor

Standard Duty 10,000 Ft/Lb Ultimate Torque Capacity			
Catalog Number	Helix Size (in)	Tapped for Rod Size (in)	Wt Ea (lb)
TD250-82	8	5/8	13.2
TDH250-84		3/4 or 1	
TD250-102	10	5/8	16.2
TDH250-104		3/4 or 1	
TD250-112	12	5/8	19.9
TDH250-114		3/4 or 1	
TDH250-134	14	3/4 or 1	24.3

Heavy Duty 15,000 Ft/Lb Ultimate Torque Capacity			
Catalog Number	Helix Size (In)	Tapped for Rod Size (In)	Wt Ea (Lb)
TD250-82	8	5/8	14.6
TDH250-84		3/4 or 1	
TD250-102	10	5/8	18.6
TDH250-104		3/4 or 1	
TD250-112	12	5/8	23.6
TDH250-114		3/4 or 1	
TDH250-134	14	3/4 or 1	29



# Power Hub Rods, Eyenuts and Couplings



## Rods with Eyenuts

### Features

- Power hub anchor rod and eye nut are assembled at the factory
- Used with solid hub or socket drive power hub screw anchors
- One catalog number for both the rod and eye nut simplifies material handling
- All parts hot dip galvanized

### 5/8" Diameter

16,000 Lb Ultimate Tensile Strength			
Catalog Number	Length (Ft)	Eye nut Type	Wt Ea (Lb)
D623 1/2 S	3.5	Single Guy Eye	4.6
D623 1/2 D		Double Guy Eye	5.4
D623 1/2 T		Triple Guy Eye	6.0
D62S	7	Single Guy Eye	8.2
D62D		Double Guy Eye	9.1
D62T		Triple Guy Eye	9.4

### 3/4" Diameter

23,000 Lb Ultimate Tensile Strength			
Catalog Number	Length (Ft)	Eye nut Type	Wt Ea (Lb)
D7531/2S	3.5	Single Guy Eye	6.9
D7531/2D		Double Guy Eye	6.8
D7531/2T		Triple Guy Eye	7.2
D75S	7	Single Guy Eye	11.2
D75D		Double Guy Eye	11.1
D75T		Triple Guy Eye	11.5

### 1" Diameter

36,000 Lb Ultimate Tensile Strength			
Catalog Number	Length (Ft)	Eye nut Type	Wt Ea (Lb)
D10031/2S	3.5	Single Guy Eye	11.5
D10031/2D		Double Guy Eye	11.4
D10031/2T		Triple Guy Eye	11.8
D100S	7	Single Guy Eye	17.4
D100D		Double Guy Eye	17.4
D100T		Triple Guy Eye	17.7

## Rods Only

### Features

- Power hub anchor rod used with solid hub or socket drive power hub screw anchors



### 5/8" Diameter

16,000 Lb Ultimate Tensile Strength		
Catalog Number	Length (Ft)	Wt Ea (Lb)
D6231/2	3.5	3.6
D62	7	7.3

### 3/4" Diameter

23,000 Lb Ultimate Tensile Strength		
Catalog Number	Length (Ft)	Wt Ea (Lb)
D7531/2	3.5	5.0
D75	7	9.3

### 1" Diameter

36,000 Lb Ultimate Tensile Strength		
Catalog Number	Length (Ft)	Wt Ea (Lb)
D10031/2	3.5	9.6
D100	7	15.5



## Rod Extensions with Coupling

### Features

- Power hub anchor rod and coupling are assembled at the factory
- Used with solid hub or socket drive power hub screw anchors
- One catalog number for both the rod and coupling simplifies material handling

### 5/8" Diameter

16,000 Lb Ultimate Tensile Strength		
Catalog Number	Length (Ft)	Wt Ea (Lb)
D6231/2C	3.5	4.1
D62C	7	7.7

### 3/4" Diameter

23,000 Lb Ultimate Tensile Strength		
Catalog Number	Length (Ft)	Wt Ea (Lb)
D7531/2C	3.5	5.5
D75C	7	9.8

### 1" Diameter

36,000 Lb Ultimate Tensile Strength		
Catalog Number	Length (Ft)	Wt Ea (Lb)
D10031/2C	3.5	10.1
D100C	7	16.0



## Eye nuts Only

### Features

- Used with power hub rods for solid hub or socket drive power hub screw anchors

### 5/8" Diameter

16,000 Lb Ultimate Tensile Strength		
Catalog Number	Eye nut Type	Wt Ea (Lb)
D6510A	Single Guy Eye	1.0
D6560A	Double Guy Eye	1.8
D6565	Triple Guy Eye	2.2

### 3/4" & 1" Diameter

36,000 Lb Ultimate Tensile Strength		
Catalog Number	Eye nut Type	Wt Ea (Lb)
D6512	Single Guy Eye	1.9
D6562A	Double Guy Eye	1.8
D6567	Triple Guy Eye	2.2

## Couplings Only

### Features

- These couplings are used with all power hub rods when additional rods must be installed



### 5/8" Diameter

16,000 Lb Ultimate Tensile Strength	
Catalog Number	Wt Ea (Lb)
D352	0.5

### 3/4" and 1" Diameter

36,000 Lb Ultimate Tensile Strength	
Catalog Number	Wt Ea (Lb)
D354	0.5





## Power Shaft Anchors

MacLean Power Systems' Power Shaft Screw Anchor System offers a versatile and cost effective power driven screw anchor for application through Class 2 soils and to 150,000 lb holding strength. These anchors can be installed to an unlimited depth with either a boom suspended torque motor line truck or rack type digger truck.

A complete Power Shaft Assembly consists of a helix-shaft or lead section assembly, extension, and guy adapter or other attachment. The helix size (diameter) and number of helices are selected for the required holding strength. The shaft size and rating is selected for the installation torque requirement. The guy attachment is selected for the number of guys.

The shafts are available in 4 sizes: 1 1/4" round with a 2,300 ft/lb; 1 1/2" square with a 5,500 or 7,000 ft/lb; a 1 3/4" square with a 10,000 ft/lb; and a 2" with a 15,000 ft/lb ultimate torque rating. The variety of anchors permits selection of the most economical product for the anchor application.



Extensions for each size/rating are available in various lengths from 3.5' to 10'. An integral forged upset socket connects the extension to either the lead section or previously installed extensions.

Extension with helix are used where an additional helix is required.

Guy attachments are available for one, two or three guys.



# 1 1/4" 2,300 ft/lb Power Shaft Round Shaft Anchors



## 1 1/4" Round Shaft Anchors

### Features

- 1 1/4" diameter round shaft power shaft screw anchor is used in areas where relatively soft soils are present and with moderate holding strength requirement
- Ultimate torsion capacity of the shaft is 2,300 ft/lbs

## 1 1/4" Round Shaft

7' Length

2,300 Ft/Lb Ultimate Installing Torque		
Catalog Number	Helix Size (In)	Wt Ea (Lb)
D6708	8	40.0
D6710	10	42.0
D6711	12	42.4
D6713	14	55.0
D6720	8 & 10	48.0
D6730	(3) 8, 10, & 12	57.0

### Notes:

- 1) Catalog numbers above are for lead section only
- 2) Add suffix "-S" for single guy eye attachment; add "-D" for double guy eye attachment; add suffix "-T" for triple guy eye attachment

## 1 1/4" Round Shaft Extensions

### Features

- Extensions range from 3.5' to 10' in length

2,300 Ft/Lb Ultimate Installing Torque		
Catalog Number	Shaft Length (Ft)	Wt Ea (Lb)
D6733	3.5	18.0
D6735	5	24.7
D6737	7	33.4
D6740	10	46.6

### Notes:

- 1) Catalog numbers above are for lead section only
- 2) Add suffix "-S" for single guy eye attachment; add "-D" for double guy eye attachment; add suffix "-T" for triple guy eye attachment



## 1 1/2" Guy Attachments

### Features

- Available in single guy eye, double guy eye, or triple guy eye

Catalog Number	No. of Guys	Wt Ea (Lb)
D6602US	1	9.2
D6604US	2	
D6606US	3	

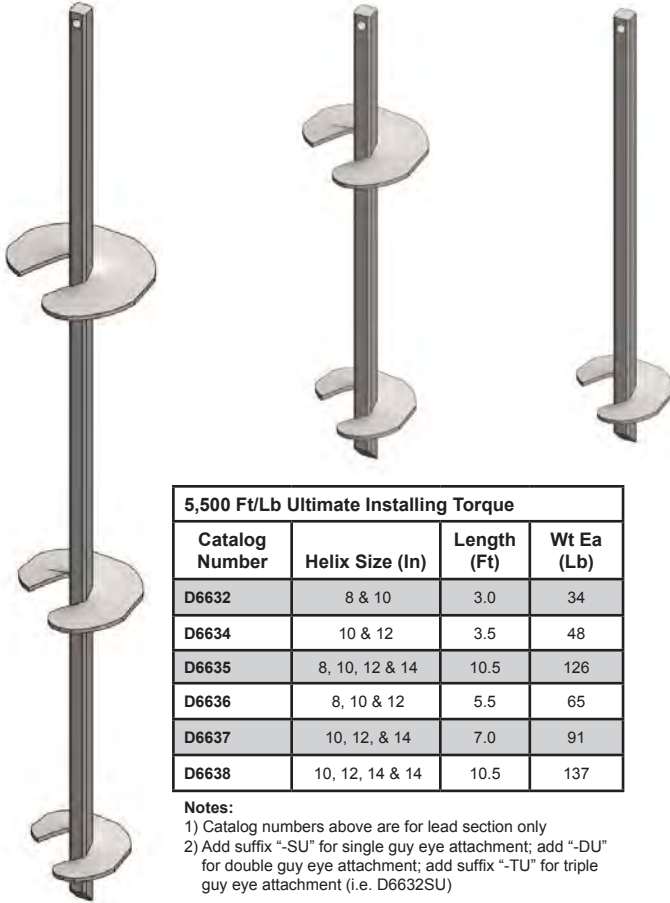


# 1 1/2" 5,500 ft/lb Power Shaft Square Shaft Anchors

## 1 1/2" Square Shaft Lead Anchors

### Features

- 1 1/2" square solid shaft power shaft screw anchors are used in areas where additional helices must be installed and greater torque capacity is required
- There are two ratings - a standard with 5,500 ft/lbs and a high strength with 7,000 ft/lbs ultimate torque capacity
- Ultimate anchor holding strength and mechanical strength (lead section, extension, guy adapter) is 70,000 lbs



5,500 Ft/Lb Ultimate Installing Torque			
Catalog Number	Helix Size (In)	Length (Ft)	Wt Ea (Lb)
D6632	8 & 10	3.0	34
D6634	10 & 12	3.5	48
D6635	8, 10, 12 & 14	10.5	126
D6636	8, 10 & 12	5.5	65
D6637	10, 12, & 14	7.0	91
D6638	10, 12, 14 & 14	10.5	137

### Notes:

- 1) Catalog numbers above are for lead section only
- 2) Add suffix "-SU" for single guy eye attachment; add "-DU" for double guy eye attachment; add suffix "-TU" for triple guy eye attachment (i.e. D6632SU)

## 1 1/2" Square Extensions

### Features

- Extensions with helix for additional helices
- Extensions range from 3.5' to 10' in length
- The extension torque rating must match the lead section



## 1 1/2" Square Shaft Extension

With Helix

5,500 Ft/Lb Ultimate Installing Torque			
Catalog Number	Helix Size (In)	Length (Ft)	Wt Ea (Lb)
D6620UC	12	5	52.4
D6620UD	14		56.5

## 1 1/2" Square Shaft Extension

Without Helix



5,500 Ft/Lb Ultimate Installing Torque		
Catalog Number	Length (Ft)	Wt Ea (Lb)
D6616U	3.5	28.2
D6620U	5	39.9
D6625-U	7	56.8
D6630-U	10	81.0

## 1 1/2" Guy Attachments

### Features

- Available in single guy eye, double guy eye, or triple guy eye



Catalog Number	No. of Guys	Wt Ea (Lb)
D6602US	1	9.2
D6604US	2	
D6606US	3	



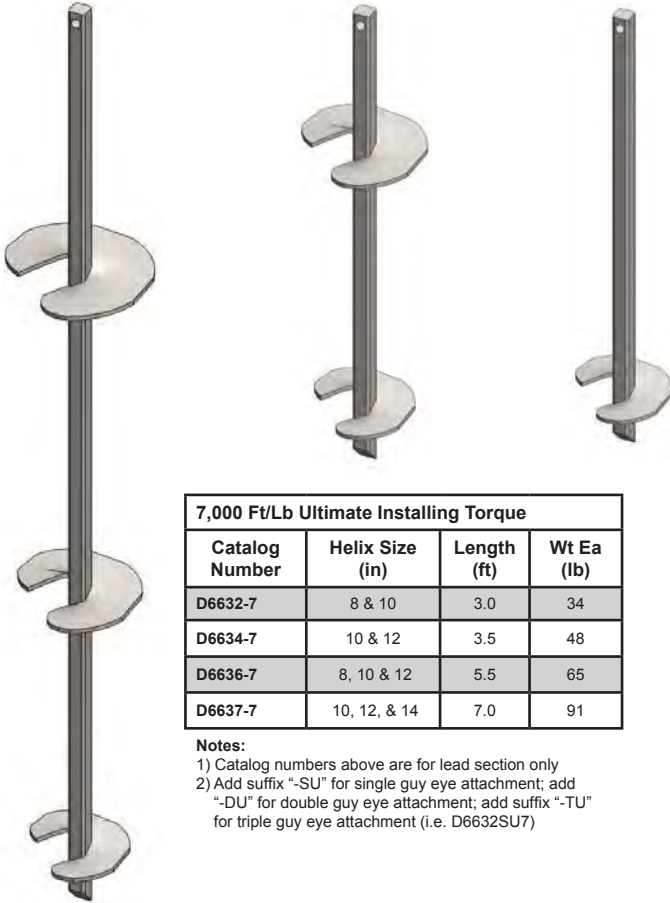


# 1 1/2" 7,000 ft/lb Power Shaft Square Shaft Anchors

## 1 1/2" Square Shaft Lead Anchors

### Features

- 1 1/2" square solid shaft power shaft screw anchors are used in areas where additional helices must be installed and greater torque capacity is required
- There are two ratings - a standard with 5,500 ft/lbs and a high strength with 7,000 ft/lbs ultimate torque capacity
- Ultimate anchor holding strength and mechanical strength (lead section, extension, guy adapter) is 70,000 lbs



7,000 Ft/Lb Ultimate Installing Torque			
Catalog Number	Helix Size (in)	Length (ft)	Wt Ea (lb)
D6632-7	8 & 10	3.0	34
D6634-7	10 & 12	3.5	48
D6636-7	8, 10 & 12	5.5	65
D6637-7	10, 12, & 14	7.0	91

### Notes:

- 1) Catalog numbers above are for lead section only
- 2) Add suffix "-SU" for single guy eye attachment; add "-DU" for double guy eye attachment; add suffix "-TU" for triple guy eye attachment (i.e. D6632SU7)

## 1 1/2" Square Extensions

### Features

- Extensions with helix for additional helices
- Extensions range from 3.5' to 10' in length
- The extension torque rating must match the lead section



## 1 1/2" Square Shaft Extension With Helix

7,000 Ft/Lb Ultimate Installing Torque			
Catalog Number	Helix Size (in)	Length (ft)	Wt Ea (lb)
D6616UC7	12	3.5	40.6
D6616UD7	14		49.0

## 1 1/2" Square Shaft Extension Without Helix

7,000 Ft/Lb Ultimate Installing Torque		
Catalog Number	Length (ft)	Wt Ea (lb)
D6616U7	3.5	28.2
D6620U7	5	40.7
D6625U7	7	56.8
D6630U7	10	81.0



## 1 1/2" Guy Attachments

### Features

- Available in single guy eye, double guy eye, or triple guy eye



Catalog Number	No. of Guys	Wt Ea (Lb)
D6602US	1	9.2
D6604US	2	
D6606US	3	

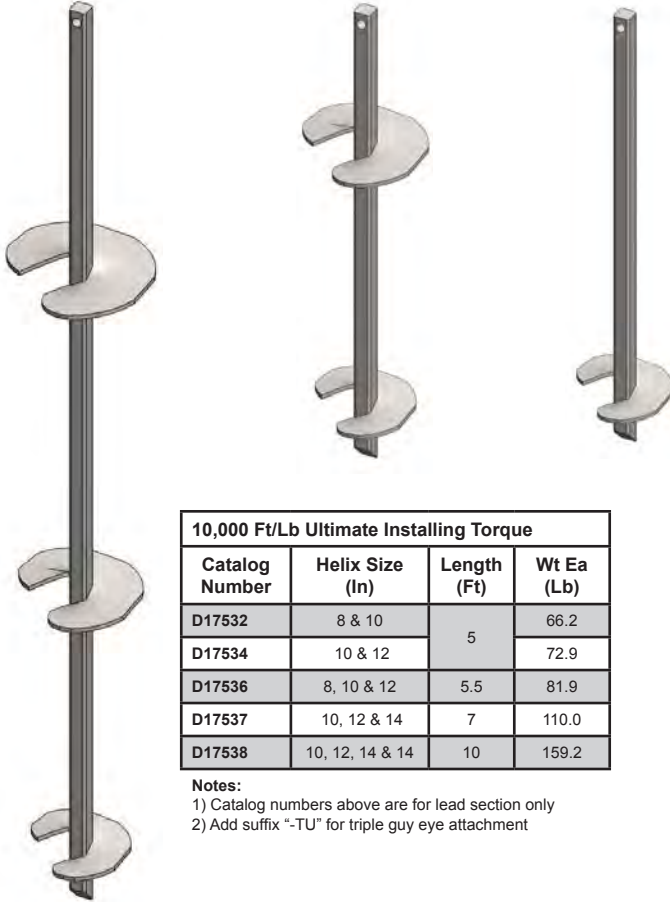


# 1 3/4" 10,000 ft/lb Power Shaft Square Shaft Anchors

## 1 3/4" Square Shaft Anchors

### Features

- 1 3/4" square solid shaft power shaft screw anchors are used in areas where additional helices must be installed and greater torque capacity is required
- The shaft is rated at 10,000 ft/lbs ultimate torque capacity
- Ultimate anchor holding strength and mechanical strength (lead section, extension, guy adapter) is 100,000 lbs



10,000 Ft/Lb Ultimate Installing Torque			
Catalog Number	Helix Size (In)	Length (Ft)	Wt Ea (Lb)
D17532	8 & 10	5	66.2
D17534	10 & 12		72.9
D17536	8, 10 & 12	5.5	81.9
D17537	10, 12 & 14	7	110.0
D17538	10, 12, 14 & 14	10	159.2

### Notes:

- 1) Catalog numbers above are for lead section only
- 2) Add suffix "-TU" for triple guy eye attachment

## 1 3/4" Square Extensions

### Features

- Extensions with helix for additional helices
- Only to be installed to the lead section
- Extensions range from 3 1/2' to 10' in length
- The extension torque rating must match the lead section

## 1 3/4" Square Shaft Extension

With Helix

### 10,000 Ft/Lb Ultimate Installing Torque

Catalog Number	Helix Size (In)	Length (Ft)	Wt Ea (Lb)
D2801-0011	14	4	67.5



## 1 3/4" Square Shaft Extension

Without Helix

### 10,000 Ft/Lb Ultimate Installing Torque

Catalog Number	Length (Ft)	Wt Ea (Lb)
D17516	3.5	38.0
D17520	5.0	54.1
D17525	7.0	77.1
D17530	10.0	107.8



## 1 3/4" Guy Attachments

### Features

- Triple guy eye

Catalog Number	No. of Guys	Wt Ea (Lb)
D2801-0002	3	25.5



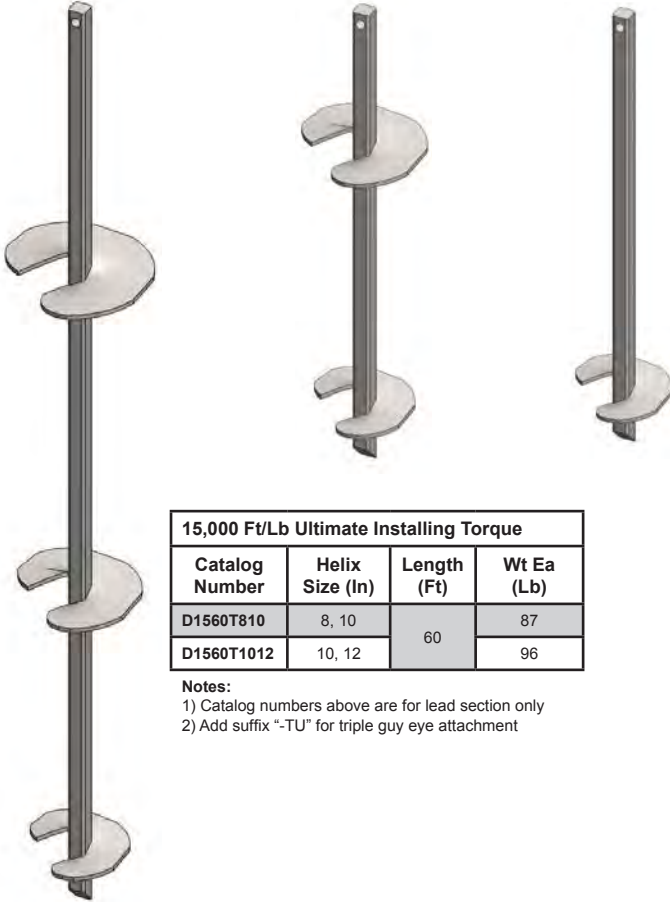


# 2" 15,000 ft/lb Power Shaft Square Shaft Anchors

## 2" Square Shaft Anchors

### Features

- 2" square solid shaft power shaft screw anchors are used in areas where additional helices must be installed and greater torque capacity is required
- The shaft is rated at 15,000 ft/lbs ultimate torque capacity
- Ultimate anchor holding strength and mechanical strength (lead section, extension, guy adapter) is 150,000 lbs



15,000 Ft/Lb Ultimate Installing Torque			
Catalog Number	Helix Size (In)	Length (Ft)	Wt Ea (Lb)
D1560T810	8, 10	60	87
D1560T1012	10, 12		96

#### Notes:

- 1) Catalog numbers above are for lead section only
- 2) Add suffix "-TU" for triple guy eye attachment

## 2" Square Extensions

### Features

- Extensions with helix for additional helices
- Only to be installed to the lead section
- Extensions range from 3 1/2' to 10' in length
- The extension torque rating must match the lead section



## 2" Square Shaft Extension

With Helix

15,000 Ft/Lb Ultimate Installing Torque			
Catalog Number	Helix Size (In)	Length (Ft)	Wt Ea (Lb)
D15E42T14	14	3.5	71.0
D15E60T12	12	5.0	99.0
D15E60T14	14		104.5
D15E84T14	14	7.0	118.5

## 2" Square Shaft Extension

Without Helix

15,000 Ft/Lb Ultimate Installing Torque		
Catalog Number	Length (Ft)	Wt Ea (Lb)
D15E42	3.5	63
D15E60	5.0	84
D15E84	7.0	97
D15E120	10.0	135







# Expanding, Cross Plate, and Pole Key Anchors and Rods



## Galvanized Forged Eye Rods

### Features

- Rods feature an integral forged eye available for one, two, or three guys and in various diameters and lengths for use with expanding, cross plate and other similar anchors
- The rods are threaded 3.5" and are assembled with a heavy square nut



## Expanding Anchors

### Features

- Expanding anchors are made for installation in holes augered by power drillers. One piece formed anchor with wings and a base. A retainer on the bottom holds the nut from the forged eye rod

Catalog Number	Hole Size (In)	Area (Sq In)	Rod Size (In)	Wt Ea (Lb)
J0870	6	70	5/8	5.0
J8115	8	115	5/8 or 3/4	9.0
J8135		135	1	
J8135-1				
J8200-1	10	200	5/8 or 3/4	18.0
J8200-3/4				
J0283	12	300	1 1/4	29.0
J0283-1			1	



## Cross Plate Anchors

### Features

- Cross plate anchors are made for installation in holes augered by power drillers. One piece plate anchor formed of two structural members that are ribbed for reinforcement. A retainer on the bottom holds the nut from the forged eye rod

Catalog Number	Hole Size (In)	Area (Sq In)	Rod Size (In)	Wt Ea (Lb)
J3516	16	150	5/8 or 3/4	10.0
J3520	20	250	5/8 or 3/4	16.0
J3520-1			1	
J3524-3/4	24	400	5/8 or 3/4	33.0
J3524			1	
J3524-1			1 1/4	



## Pole Key Anchor

### Features

- This expanding anchor keys pole at their butt to reinforce them against unbalanced loads in soft soils

Catalog Number	Width Expanded (In)	Blade Width (In)	Area Expanded (Sq In)	Wt Ea (Lb)
J4817	27 1/4	7	276	25.0

## Single Guy Eye

Catalog Number	Ultimate Strength Rating (Lb)	Rod Diameter (In)	Length (Ft)	Wt Ea (Lb)
J7415	16,000	5/8	5	5.4
J7416			6	6.4
J7417			7	7.5
J7418			8	8.0
J7427	23,000	3/4	7	11.0
J7428			8	12.5
J7429			10	15.0
J7430				

## Double Guy Eye

Catalog Number	Ultimate Strength Rating (Lb)	Rod Diameter (In)	Length (Ft)	Wt Ea (Lb)
J7516	16,000	5/8	6	6.5
J7517			7	8.0
J7518			8	8.4
J7527	23,000	3/4	7	11.0
J7528			8	12.4
J7529			9	14.0
J7530			10	15.7
J7538	36,000	1	8	22.9
J7540			10	28.4

## Triple Guy Eye

Catalog Number	Ultimate Strength Rating (Lb)	Rod Diameter (In)	Length (Ft)	Wt Ea (Lb)
J7327	23,000	3/4	7	11.2
J7328			8	12.5
J7329			9	14.3
J7338	36,000	1	8	22.0
J7340			10	27.0
J7350				58,000



# Rock Anchors and No Wrench Anchors and Accessories



## Rock Anchors

### Features

- Installed into rock and expands to develop the full strength of the anchor rod
- Hole is core drilled into rod
- Triple guy eye



## No Wrench Anchors

### Features

- Integral forged eye anchor with a helix welded to the shaft
- For manual or machine installation
- Triple guy eye

### 3/4" Diameter

23,000 IB Ultimate Strength Rating					
Catalog Number	Rod Length (In)	Anchor Size Closed (In)	Anchor Size Expanded (In)	Hole Size (In)	Wt Ea (Lb)
J3436	15	1 3/4	2 3/8	1 7/8	5.0
J3437	30				7.0
J3438	53				10.0
JR360	60				11.0
JR372	72				12.0
JR384	84				13.0
JR396	96				15.0

### 1" Diameter

36,000 IB Ultimate Strength Rating					
Catalog Number	Rod Length (In)	Anchor Size Closed (In)	Anchor Size Expanded (In)	Hole Size (In)	Wt Ea (Lb)
JR130L	30	2 1/4	3 1/8	2 3/8	14.0
JR153L	53				18.0
JR172L	72				24.0
JR196L	96				29.0

Catalog Number	Helix Size (In)	Rod Diameter (In)	Rod Length (Ft)	Wt Ea (Lb)
J6524WCA	4	3/4	54	8.1
J6526WCA	6		66	10.9
J6528WCA	8	1	96	19.1
J6530WCA	10	1 1/4		30.3
J6550WCA	14			41.1
J6584WCA	14			47.0
J6585WCA	15			52.0



## No Wrench Anchor Extension

### Features

- Integral forged eye with a forged clevis when greater installing depths are required
- Triple guy eye

Catalog Number	Rod Diameter (In)	Rod Length (Ft)	Wt Ea (Lb)
J6566	1 1/4	6	29.0



# Clamps and Accessories



## Guy Bonding Clamp for Power Hub Anchor Eyunuts

- Features**
- Designed for use with MPS Power Hub anchor eyenuts to maintain firm contact between the guy strand and the eyenut when the down guy also serves as a ground

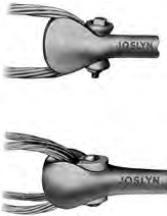
Catalog Number	Rod Type	Rod Diameter (In)	Wt Ea (Lb)
J26714	Single Guy Eye	1/2 & 5/8	0.14
J26715		3/4 & 1	0.23
J26716	Double Guy Eye	5/8, 3/4 & 1	0.32



## Auxiliary Anchor Rod Eye Clamp

- Features**
- Auxiliary eye clamp permits an efficient method of adding an eye to an existing anchor rod for attaching an additional guy. The eye has a 1.5" diameter thimble

Catalog Number	Rod Diameter (In)	Maximum Strand Size (In)	Wt Ea (100/Lb)
PA155	5/8 - 3/4	1/2	270
PA155A	7/8 - 1		338



## Guy Bonding Clamp for Forged Eye Rods

- Features**
- Designed for use with MPS rods with integral forged eye to maintain firm contact between the guy strand and the rod eye when the down guy also serves as a ground

Catalog Number	Rod Type	Rod Diameter (In)	Strand Size (In)	Wt Ea (100/Lb)
J3230	Single Guy Eye	5/8	3/16 - 3/8	17.3
		3/4	3/8 - 1/2	
		1	3/8 - 1/2	
J3231	Double Guy Eye	5/8	1/4 - 1/2	13.7
		3/4	1/4 - 1/2	
		1	3/8 - 1/2	
J3233	Triple Guy Eye	3/4, 1 & 1 1/4	1/4 - 1/2	25.0





# Helical Foundation Piles for Light Poles



## Features

- High strength pipe
- Rugged helix for difficult soils
- Lead point "stinger" to facilitate initial penetration and "setting the plumb"
- Structural steel top base plate with slots for variable bolt hole circles to meet pole base dimensions
- Supplied with high strength bolts to secure pole
- Available in 6", 8", 10" diameters
- Lengths from 5 - 10 ft
- Two - sided entrance wiring slots
- Torque ratings up to 20,000 ft-lbs
- Hot dip galvanized for corrosion protection
- Installs in minutes
- Reduced total installation costs
- Poles can be installed immediately
- No building forms, setting rebar and anchor bolts
- Installation in all weather conditions
- Minimal site cleanup of disturbed soil



6" Diameter Pipe with 12" Square Top Plate							
Catalog Number	Top Plate Fig No.	Length (ft)	Bolt Circle Range (in)	Cableway Size (in)	Cableway Location from Base Plate (in)	Hardware Size (in)	Wt Ea (100/Lb)
D06060BBB08148V	1	5	8 - 14	2 5/8 x 12	12	1 x 4 carriage bolt	142
D06072BBB08148V		6					161
D06084BBB08148V		7					180
8" Diameter Pipe with 16" Square Top Plate							
D06060BBB11178V	1	5	11 - 17	2 5/8 x 12	12	1 x 4 carriage bolt	187
D06072BBB11178V		6	8 - 14				161
D06084BBB11178V		7					180
10" Diameter Pipe with 12" Square Top Plate							
D10060BBB15178V	1	5	15 - 17	2 5/8 x 12	12	1 x 4 carriage bolt	217
D10072BBB15178V		6					245
D10084BBB15178V		7					273
D10096BBB15178V		8					301
D10120BBB15178V		10					357

Notes: Contact your representative for other catalog numbers



# Helical Foundation Piles for Light Poles

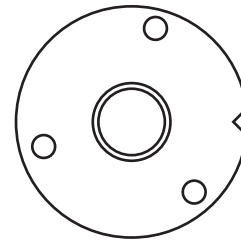
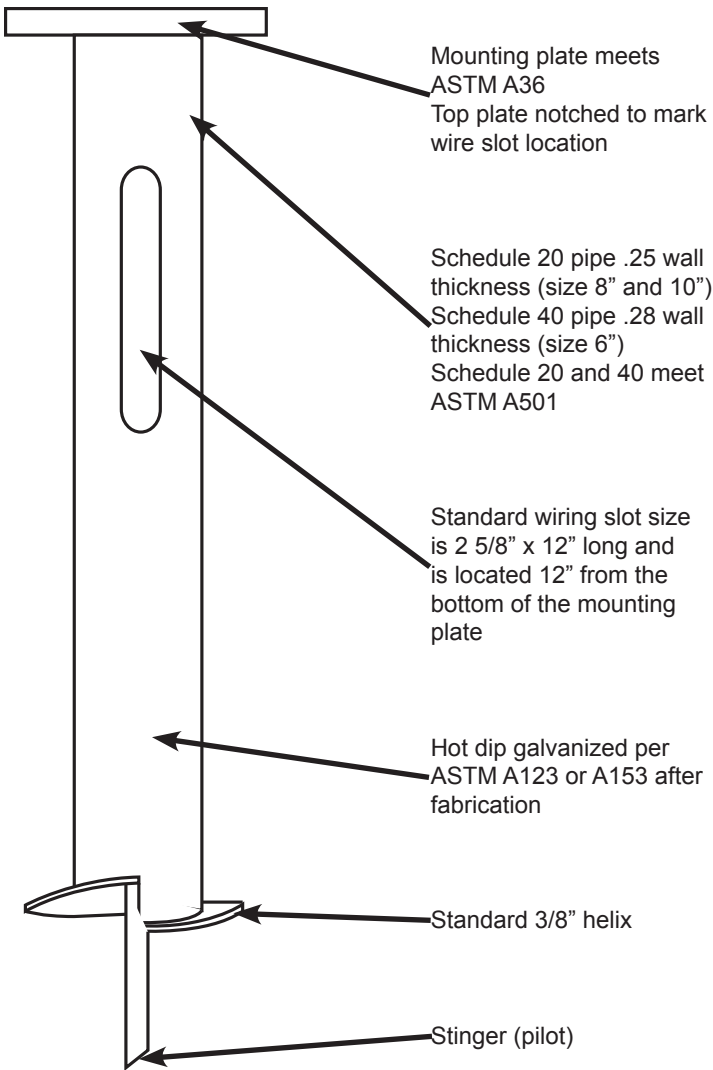


Fig. 3

3-bolt circle

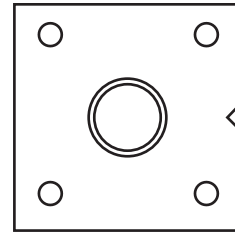


Fig. 2

4-bolt circle

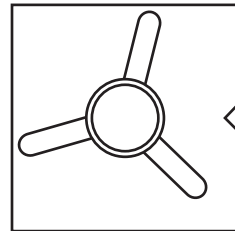


Fig. 1

3-bolt variable bolt circle

## Pole Load Determination Form

Pole Mounting Height.....	_____ in	Arm Shape (see list below).....	_____
Pole Material.....	_____	Arm Length.....	_____ ft
Pole Shape (see list below).....	_____	Arm Diameter:	
Pole Diameter:		Bottom.....	_____ in
Bottom.....	_____ in	Tip.....	_____ in
Top.....	_____ in	Number of Arms.....	_____
Breakaway Base Required.....	Yes or No	Number of Luminaires.....	_____
Pole Base Bolt Circle.....	_____ in	Luminaire EPA.....	_____ sq ft
Foundation Bolt Circle.....	_____ in	Wind Load Requirement.....	_____ MPH
Bolt:		Wiring Slot:	
Diameter.....	_____ in	Length.....	_____ in
Length.....	_____ in	Width.....	_____ in
Soil:		Location from Top Plate.....	_____ in
Class Number.....	_____	Other.....	_____
Blow Count.....	_____		

### Pole and Arm Shape Options:

- |          |                         |                     |         |
|----------|-------------------------|---------------------|---------|
| Cylinder | Hexdecagonal (16 sides) | Octagonal (8 sides) |         |
| Flat     | Dodecagonal (12 sides)  | Square (4 sides)    | Diamond |



# Installing Tools



Kelly Bar Adapters			
Catalog Number	Bolt Circle	For Drive Head Shaft Size Hex	Torque Rating ft-lbs
KB200-525	5 1/4	2"	10000
KB250-525		2 1/2"	
KB2625-525		2 5/8"	
KB200-7625	7 5/8	2"	20000
KB250-7625		2 1/2"	
KB2625-7625		2 5/8"	
KB300-7625		3"	



Drive Tools for 1 1/2" RCS, 1 3/4" RCS, and 2" RCS			
Catalog Number	Description	Bolt Circle	Torque Rating ft-lbs
IT28-7625	For 1 1/2" RCS	7 5/8	20000
IT35-7625	For 1 3/4" RCS		
IT45-7625	For 2" RCS		
D4806-0007	For 1 1/2" RCS	5 1/4	10000



Locking Dog Assemblies				
Catalog Number	Description	Bolt Circle	For Drive Head Shaft Size	Torque Rating ft-lbs
D4806-0053	For 5 1/4" bolt circle	5 1/4	---	10000
D4806-0024	For 7 5/8" bolt circle	7 5/8		
D4806-0010	Combo tool- locking dog assembly with 2 1/2" hex kelly bar adapter	---	2 1/2" hex	15000
D4806-0005	Combo tool- locking dog assembly with 2 5/8" hex kelly bar adapter		2 5/8" hex	

Torque Tubes for Locking Dog Assemblies		
Catalog Number	Description	Torque Rating ft-lbs
D9101-0003	7' tube for 1 3/8" solid hub and 2 1/4" socket drive	10000
D30187	7' tube for 1 1/2" solid hub and 2 1/4" socket drive	
D30187-1	10" tube for 1 1/2" RCS	



## Installing Tools



No-Wrench Drive Tool			
Catalog Number	Description	Bolt Circle	Torque Rating ft-lbs
D4806-0052	For 3/4", 1", and 1 1/4" dia. tripeley shafts	5 1/4	2500



Street Light Foundation Pile Tools			
Catalog Number	Description	For Drive Head Shaft Size	Torque Rating ft-lbs
D4806-0015	Installing tool for 6", 8", and 10" street light foundations with 2 1/2" hex kelly bar adapter	2 1/2" hex	20000
D4806-0016	Installing tool for 6", 8", and 10" street light foundations with 2 5/8" hex kelly bar adapter		



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J7350	Galvanized Forged Eye Rods - Triple Eye Guy	AN-13	PA155A	Auxiliary Anchor Rod Eye Clamp	AN-15
J7415	Galvanized Forged Eye Rods - Single Eye Guy	AN-13	TD225-102	2 1/4" Socket Drive Anchor - Standard	AN-5
J7416	Galvanized Forged Eye Rods - Single Eye Guy	AN-13	TD225-104	2 1/4" Socket Drive Anchor - Standard	AN-5
J7417	Galvanized Forged Eye Rods - Single Eye Guy	AN-13	TD225-112	2 1/4" Socket Drive Anchor - Standard	AN-5
J7418	Galvanized Forged Eye Rods - Single Eye Guy	AN-13	TD225-114	2 1/4" Socket Drive Anchor - Standard	AN-5
J7427	Galvanized Forged Eye Rods - Single Eye Guy	AN-13	TD225-134	2 1/4" Socket Drive Anchor - Standard	AN-5
J7428	Galvanized Forged Eye Rods - Single Eye Guy	AN-13	TD225-82	2 1/4" Socket Drive Anchor - Standard	AN-5
J7429	Galvanized Forged Eye Rods - Single Eye Guy	AN-13	TD225-84	2 1/4" Socket Drive Anchor - Standard	AN-5
J7430	Galvanized Forged Eye Rods - Single Eye Guy	AN-13	TD250-102	2 1/2" Socket Drive Anchor - Standard	AN-5
J7516	Galvanized Forged Eye Rods - Double Eye Guy	AN-13	TD250-102	2 1/2" Socket Drive Anchor - Heavy Duty	AN-5
J7517	Galvanized Forged Eye Rods - Double Eye Guy	AN-13	TD250-112	2 1/2" Socket Drive Anchor - Standard	AN-5
J7518	Galvanized Forged Eye Rods - Double Eye Guy	AN-13	TD250-112	2 1/2" Socket Drive Anchor - Heavy Duty	AN-5
J7527	Galvanized Forged Eye Rods - Double Eye Guy	AN-13	TD250-82	2 1/2" Socket Drive Anchor - Standard	AN-5
J7528	Galvanized Forged Eye Rods - Double Eye Guy	AN-13	TD250-82	2 1/2" Socket Drive Anchor - Heavy Duty	AN-5
J7529	Galvanized Forged Eye Rods - Double Eye Guy	AN-13	TDH224-112	2 1/4" Socket Drive Anchor - Heavy Duty	AN-5
J7530	Galvanized Forged Eye Rods - Double Eye Guy	AN-13	TDH225-102	2 1/4" Socket Drive Anchor - Heavy Duty	AN-5
J7538	Galvanized Forged Eye Rods - Double Eye Guy	AN-13	TDH225-104	2 1/4" Socket Drive Anchor - Heavy Duty	AN-5
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# Surge Arresters Catalog



MacLean Power Systems offers a full range of polymer housed surge arresters meeting the needs for transmission, substation, distribution and secondary surge protection. With over 75 years of arrester design and manufacturing under the Joslyn brand, combined with MacLean Power Systems' polymer manufacturing expertise, the MPS arrester product offering provides maximum surge protection for the long term.

All of our arresters are designed for the growing demands of power quality and reliability with safety of workers and the public as a first priority. Each design maximizes protection for each application to extend the life of operating lines and equipment.

## Distribution

- Zforce™ direct 'mold-on' polymer housing design provides the best protection for overhead distribution circuits and the best protection against moisture ingress for the most reliable service life
- ZE elbow arresters for distribution underground open point protection

## Substation

- ZSP polymer housed station class arresters are lightweight and easy to install
- ZIP polymer housed intermediate class arresters designed for lower energy demands
- ZJP polymer housed, light fault duty, intermediate class arresters for low fault current system applications

## Transmission Lines

- ZQPT heavy duty, polymer housed transmission line arresters are designed for line protection to significantly reduce lightning outages and extend recloser life
- ZXLA Insulator-Arrester combination assemblies designed with MPS transmission insulators to provide an easy to install combination for maximum insulation and over-voltage protection

## Secondary Voltage

- SurgeTec - 175, 480 and 650 volt secondary arresters with a patented fault withstand safety design. Provide protection for meters and facility service entrance

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# MacLean Power Systems

Please note that because MacLean Power Systems follows a policy of continuous product improvement, we reserve the right to change specifications and drawings at any time without notice.







# Arresters General Information

## Insulation Coordination

Arresters are used to limit voltage surges on an electrical system to a known and controlled level. The concept of insulation coordination means that properly installed arresters limit the incoming voltage surges to levels within the withstand capability of the insulating system. Arresters prevent insulation, such as air, porcelain, oil, cable or wire insulation, etc. from breaking down, therefore, significantly improving the reliability of the electrical system. Figure 1 demonstrates this basic concept. The difference between the two curves is the protective margin.

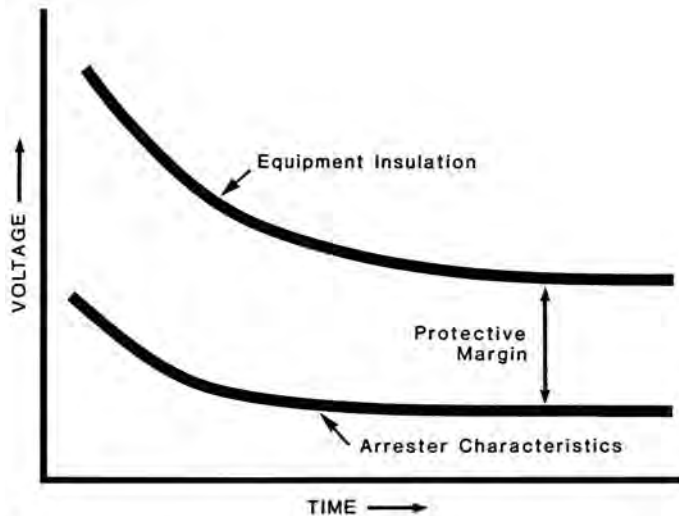


Figure 1

The process of correlating the insulation withstand levels of the protected equipment and the protective characteristics of surge arresters is known as insulation coordination. Without sparkgaps, the insulation coordination between the metal oxide arrester and the insulation being protected is defined by the discharge voltage of the arrester from very short times in the impulse region to longer times in the switching surge region. The equivalent front-of-wave of the arrester is used to coordinate with the chopped wave withstand value, generally defined as 1.15 x BIL of the transformer. For station class arresters, the equivalent front-of-wave (EFOW) of the arrester is obtained by discharging a 10kA (5kA for intermediate arresters) impulse current wave which produces a voltage wave cresting in 0.5 microseconds.

Discharge voltage, at a specific current level, is used to coordinate with the equipment Basic Insulation Level (BIL). The discharge voltage is the crest voltage that results from an 8/20 microsecond current surge. The coordinating current selected will depend on the shielding of the substation and other system conditions. A typically recommended value for the coordinating current is 10kA.

The switching surge protective level is determined by comparing the switching surge response of the arrester, with the switching surge withstand level of the transformer, generally defined as .83 x BIL of the transformer. The voltage of the arrester is a function of the current. A current of 500 amperes

is used for the intermediate arresters and station class arresters from 3-96kV. A 1000 ampere surge is used for station arresters rated 108kV to 198kV. All current impulses have a 45/90 microsecond wave shape.

To determine the margin of protection, the following equation is used:

$$\text{Percent Margin} = \left[ \left( \frac{\text{Transformer Withstand Level}}{\text{Arrester Protective Level}} \right) - 1 \right] \times 100$$

A Type ZSP arrester rated 108 kV protecting a transformer with a 450 kV BIL has the following margins of protection:

Chopped Wave Withstand - Equivalent Front of Wave

$$\text{Percent Margin} = \left[ \left( \frac{1.15 \times 450}{273.7} \right) - 1 \right] \times 100 = 82 \%$$

Full Wave Withstand - Discharge Voltage for a 10kA Impulse Current

$$\text{Percent Margin} = \left[ \left( \frac{450}{249.2} \right) - 1 \right] \times 100 = 74 \%$$

Switching Surge Withstand - Switching Surge Voltage

$$\text{Percent Margin} = \left[ \left( \frac{0.83 \times 450}{195.2} \right) - 1 \right] \times 100 = 73 \%$$

All margins are well above the minimum 20% margin recommendation of the ANSI application guide C62.22.

## Application

Proper application of metal oxide arresters is needed to receive appropriate performance and adequate protection. Arrester selection depends on the application and should be based on the level of protection needed, durability of the arrester and quality assurance of the manufacturer.

Level of protection is the first and most important factor in applying arresters. The purpose of an arrester is to protect system equipment against damaging surges. The level of protection is a function of the discharge voltage characteristics of the arrester. The lower the discharge voltage, the greater the level of protection provided. The discharge voltage characteristics of distribution arresters provide excellent margins of protection needed for even the most severe applications.

Protective margins are not the only criteria in arrester selection. Proper performance is based on selecting the appropriate ratings to withstand system conditions. The maximum continuous line-to-ground voltage of the system should not exceed the MCOV rating of the arrester. The MPS arrester ratings are in accordance with the ANSI/IEEE C62.11-2005 Standard for Metal Oxide Surge Arresters for AC Power Circuits. Temporary overvoltages (TOV) can have damaging effects on metal oxide arresters. The excellent TOV characteristics of the MOV arresters will exceed the potential system overvoltages when properly selected.



# Arresters General Information

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There are four basic types of arresters defined by industry standards. The arrester type selected for the application depends on the equipment being protected and what level of protection is required.

**Secondary**—Available in ratings up to 650 volts, secondary arresters are used to protect equipment at the utilization voltage level.

**Distribution**—Typically used for the protection of equipment on power distribution circuits. They are available in ratings up to 36kV. This type of arrester is further defined by Normal Duty and Heavy Duty and includes special application arresters such as riser pole or dead front elbow type.

**Intermediate**—Available in ratings up to 144kV, intermediate type arresters offer improved protective characteristics and durability. They are generally used for protection of smaller substations, or medium class power equipment.

**Station**—Available in ratings up to 216kV, station class arresters offer the best performance among the four different types. They are typically used to protect substation equipment, rotating machines or other applications where premium protection is required.

## Fault Current Data

Fault current testing, also known as short circuit testing, demonstrates an arrester failure based on the most probable failure modes over a range of fault currents. Two failure modes are tested: 1) a fuse wire runs along the side of the internal valve elements to simulate an internal flashover (moisture or collar failure), 2) overvoltage the arrester until the resistive elements fail to simulate a system overvoltage exceeding the unit's TOV capability.

ANSI/IEEE C62.11 2005, specifies the test procedures and acceptance criteria for fault current tests on surge arresters.

## Temporary Overvoltage

Temporary power frequency overvoltages (TOV) can occur due to the voltage rise on unfaulted phases during a line-to-ground fault, the loss of the neutral ground of an effectively grounded system, sudden loss of load, generator over speed and other conditions. Overvoltages exceeding an arrester's MCOV ( $U_c$ ) rating cause an increase in current, resulting in increased power loss and temperature, thereby, affecting the arrester's stability.

## Quality Assurance

ISO 9001:2000 Certified

MacLean Power Systems metal oxide facility is ISO 9001:2000 certified. Years of extensive quality control processes easily met the requirements of ISO certification, and has been proven with unsurpassed field performance of arresters. MPS employs an extensive quality system from raw materials through final assembly.

Each block is selected for final assembly based on discharge voltage, to assure the discharge voltage of the arrester will not exceed published values. After final assembly, the complete arrester once again receives a series of electrical tests including watts loss, reference voltage and radio influence voltage. Only units accepted by the computerized tester continue on for final packaging and shipping.

## Research and Development

Research and development is an on-going process at MPS. Our engineers are continually striving for new materials or processes that will lead to improved arrester performance in the field. Specifically designed test equipment provides the capability to properly evaluate new developments. Research and Development is an important part of our business and commitment to the future.



# Arrester Ratings for Various System Voltages

System L-L Voltage (kV)		Grounded Neutral Circuits		Ungrounded, Temporarily Ungrounded Impedance Grounded Circuits	
Nominal	Maximum	Rating	MCOV	Rating	MCOV
2.40	2.52	3*	2.55	3*	2.55
4.16	4.37			6*	5.10
4.80	5.04	6*	5.10	9*	7.65
6.90	7.25			10*	8.40
8.32	8.74			9*	7.65
12.00	12.70	10	8.40	18	15.30
12.47	13.20	9*	7.65	15*	12.70
		10	8.40	18	15.30
13.20	13.90	10*		10.20	15
		12	18*		15.30
13.80	14.50	10*	8.40	-	-
		12	10.20	-	-
23.00	24.20	18*	15.30	27*	22.00
		21	17.00	30	24.40
24.90	26.10	18*	15.30	30*	
		21	17.00	36	
34.50	36.20	27*	22.00	39*	31.50
		30	24.40	45	36.50
46.00	48.30	36*	29.00	48*	39.00
		39	31.50	54	42.00
69.00	72.50	54*	42.00	66*	54.00
		60	48.00	72	57.00
115.00	121.00	90*	70.00	-	-
	121.00	96	76.00	108*	84.00
138.00		145.00	108	84.00	120
	108*		132*		106.00
161.00	169.00	120	98.00	144	115.00
		120*		-	-
230.00	242.00	132	106.00	144*	115.00
		144	115.00	168	131.00
230.00	242.00	172*	140.00	-	-
		180	144.00		
		192	152.00		

\*Nominal recommended ratings are highlighted. Use higher rating for severe duty.



## Zforce™ Distribution Arresters



### Features

- Zforce™ mold-on polymer housing for the ultimate seal against moisture ingress
- High strength fiberglass wrap for high fault-withstand design
- Integrated Ground Lead Disconnect for fast, reliable operation. Operates in less than 2 seconds at 1 amp and less than 2 cycles at 1,000 amps

**Zforce™ ZNP (5kA Normal Duty Polymer)**

**Zforce™ ZHP (10kA Heavy Duty Polymer)**

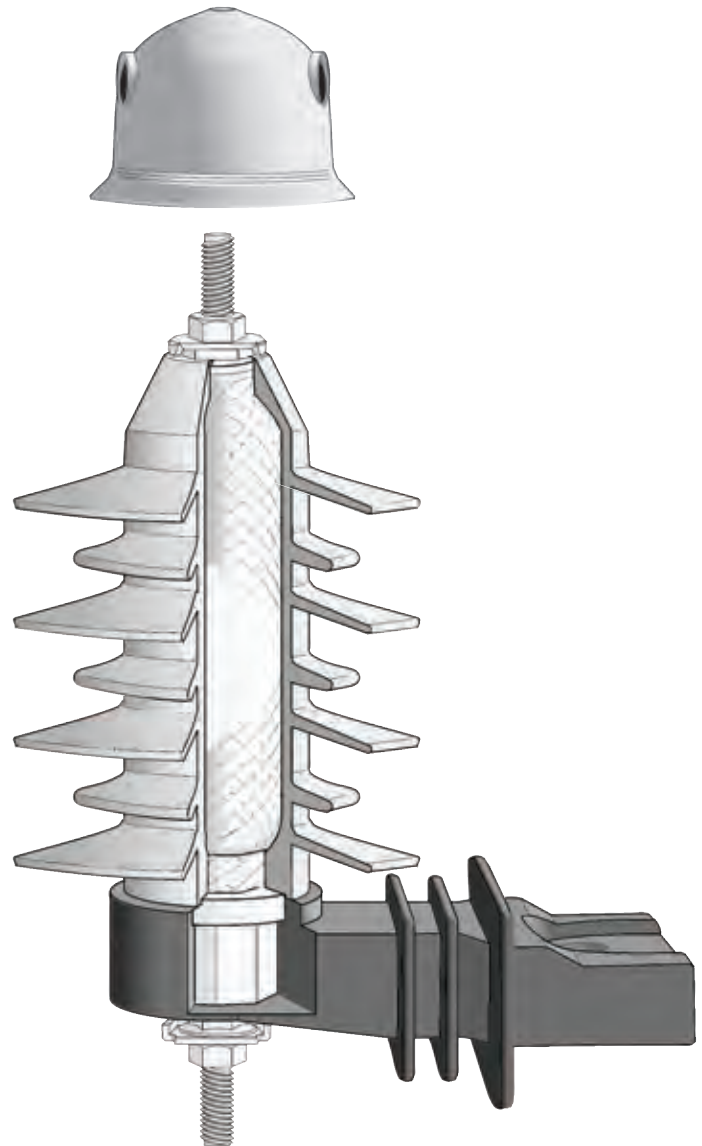
**Zforce™ ZRP (10kA Riser Pole Polymer)**

### Durability

Heavy Duty and Riser Pole Distribution Class arresters have been called upon to serve in the most demanding of applications. Typically unshielded, overhead lines can produce some of the most severe lightning surges on the power system. MPS distribution arresters are designed to meet the demands of protecting underground and overhead equipment, respectively. Tested in accordance with the latest industry standard, ANSI/IEEE C62.11-2005 for metal oxide arresters, Zforce™ distribution arresters withstand the following minimum design tests:

#### Zforce Design Performance:

- High Current Short Duration
  - ZNP - 65kA
  - ZHP & ZRP - 100kA
- Low Current Long Duration
  - ZNP - 150A
  - ZHP & ZRP - 250A
- Duty Cycle per ANSI
  - ZNP - 5kA
  - ZHP & ZRP - 10kA
- Nominal Discharge Class per IEC:
  - ZNP - 5kA
  - ZHP & ZRP - 10kA, Class 1
- Minimum Switching Energy Capability (2 Surges)
  - ZNP - 2.2kJ/kV MCOV
  - ZHP - 2.7kJ/kV MCOV
  - ZRP - 2.2kJ/kV MCOV
- Lightning Energy Capability (1 Surge)
  - ZNP - 2.3kJ/kV MCOV
  - ZHP - 3.4kJ/kV MCOV
  - ZRP - 2.7kJ/kV MCOV
- Fault Withstand Capability
  - ZNP - 10kA
  - ZHP & ZRP - 20kA
- RUS Listed





# Zforce™ Distribution Arresters

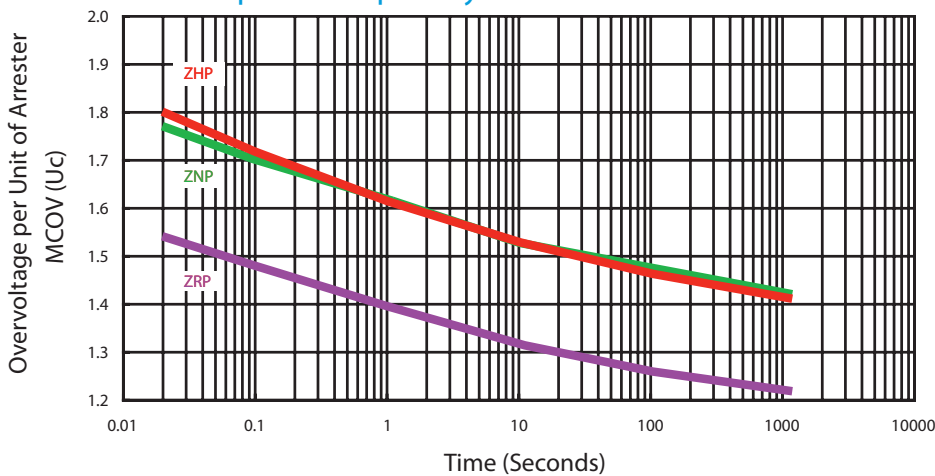
## Terminal Connection

Distribution arrester line terminals utilize a stainless steel four corner “Star Clamp” for maximum conductor range and speed of installation. The ground terminals utilize a stainless steel “U clamp”. Both connectors securely clamp aluminum or copper conductors from No. 10 solid through 2/0 stranded. MPS specifies that no more than 20 ft/lbs of torque be applied to the line and ground terminals.



Duration (sec)	Voltage P.U. of MCOV (Uc)		
	ZNP	ZHP	ZRP
0.02	1.77	1.80	1.54
0.10	1.70	1.73	1.48
1.00	1.61	1.63	1.40
10	1.52	1.54	1.31
100	1.47	1.47	1.26
1000	1.42	1.43	1.22

TOV Graph and Capability 3kV to 36kV



## Zforce ZNP™ (5kA Normal Duty Polymer)

Physical Characteristics														
kV	Creepage <sup>1</sup>		Strike		A		B		C		D		Weight <sup>2</sup>	
	In	Mm	In	Mm	In	Mm	In	Mm	In	Mm	In	Mm	Lb	Kg
9	15.04	382	7.69	195	8.83	224	4.00	102	7.71	195	3.93	100	2.90	1.32
10	17.41	442	8.00	203	9.14	232			8.02	204			3.00	1.36
18	26.59	675	11.23	285	12.23	311			11.16	283			5.43	138

Electrical Characteristics										
Voltage Rating (Ur) (kV-rms)	MCOV (Uc) <sup>3</sup> (kV-rms)	Max Equiv FOW <sup>4</sup> (kV-Crest)	Max Switch Surge <sup>6</sup> (kV-Crest)	Maximum Discharge Voltage (kV-Crest) Using an 8/20 μs Current Impulse						
				1.5 kA	2.5 kA	3.0 kA	5.0 kA	10 kA	20 kA	
9	7.65	29.9	23.7	25.4	26.2	26.6	28.2	30.5	33.8	
10	8.4	32.9	26.3	28.1	29.2	29.6	31.3	33.9	37.4	
18	15.3	59.7	47.4	50.7	52.3	53.1	56.4	61.0	67.5	





# Zforce ZNP™ and ZHP™ Distribution Arresters



## Zforce ZHP™ (10kA Heavy Duty Polymer)

Physical Characteristics														
kV	Creepage <sup>1</sup>		Strike		A		B		C		D		Weight <sup>2</sup>	
	In	Mm	In	Mm	In	Mm	In	Mm	In	Mm	In	Mm	Lb	Kg
3	7.96	202	5.47	139	6.52	166	4.30	109	5.40	137	3.93	100	2.30	1.05
6	11.94	303	6.02	153	7.66	195			6.54	166			3.00	1.37
9	15.92	404	7.76	197	8.80	224			7.68	195			3.60	1.64
10	18.28	464	8.21	209	9.14	232			8.02	204			3.70	1.68
12	19.90	506	8.91	226	9.94	253			8.82	224			4.20	1.91
15	23.84	606	10.01	254	11.09	282			10.02	254			4.90	2.23
18	27.87	708	11.40	290	12.23	311			11.16	283	5.90	2.68		
21	31.85	809	12.54	319	13.37	340			12.30	312	6.50	2.96		
24	35.83	910	13.69	348	14.51	369			13.44	341	7.10	3.23		
27	39.92	1014	14.52	369	15.66	398			14.59	371	7.80	3.52		
30	43.90	1115	15.51	394	16.78	426			15.71	399	8.40	3.80		
36	51.95	1320	17.79	452	19.13	486			18.06	459	9.60	4.38		

Electrical Characteristics									
Voltage Rating (Ur) (kV-rms)	MCOV (Uc) <sup>3</sup> (kV-rms)	Max Equiv FOW <sup>5</sup> (kV-Crest)	Max Switch Surge <sup>6</sup> (kV-Crest)	Maximum Discharge Voltage (kV-Crest) Using an 8/20 μs Current Impulse					
				1.5 kA	2.5 kA	3.0 kA	5.0 kA	10 kA	20 kA
3	2.55	10.4	7.8	8.5	8.8	8.9	9.3	9.9	10.9
6	5.10	20.7	15.5	16.9	17.5	17.7	18.6	19.8	21.8
9	7.65	31.0	23.3	25.4	26.2	26.6	27.9	29.7	32.7
10	8.40	34.5	25.9	28.2	29.1	29.5	31.0	33.0	36.3
12	10.20	41.3	31.0	33.8	34.9	35.4	37.2	39.6	43.5
15	12.70	51.7	38.8	42.2	43.6	44.2	46.5	49.5	54.4
18	15.30	62.0	46.5	50.7	52.3	53.1	55.8	59.4	65.3
21	17.00	72.3	54.3	59.1	61.0	61.9	65.1	69.3	76.2
24	19.50	82.6	62.1	67.6	69.7	70.7	74.4	79.2	87.0
27	22.00	92.9	69.9	76.0	78.4	79.6	83.7	89.1	98.9
30	24.40	103.3	77.6	84.4	87.1	88.4	93.0	99.0	108.8
36	29.00	124.0	93.1	101.3	104.5	106.1	111.5	118.8	130.5

## Zforce ZRP™ (10kA Riser Pole Polymer)

Physical Characteristics														
kV	Creepage <sup>1</sup>		Strike		A		B		C		D		Weight <sup>2</sup>	
	In	Mm	In	Mm	In	Mm	In	Mm	In	Mm	In	Mm	Lb	Kg
3	7.96	202	5.47	139	6.52	166	4.30	109	5.40	137	3.93	100	2.30	1.05
6	11.94	303	6.02	153	7.66	195			6.54	166			3.00	1.37
9	15.92	404	7.76	197	8.80	224			7.68	195			3.60	1.64
10	18.28	464	8.21	209	9.14	232			8.02	204			3.70	1.68
12	19.90	506	8.91	226	9.94	253			8.82	224			4.20	1.91
15	23.84	606	10.01	254	11.09	282			10.02	254			4.90	2.23
18	27.87	708	11.40	290	12.23	311			11.16	283	5.90	2.68		
21	31.85	809	12.54	319	13.37	340			12.30	312	6.50	2.96		
24	35.83	910	13.69	348	14.51	369			13.44	341	7.10	3.23		
27	39.92	1014	14.52	369	15.66	398			14.59	371	7.80	3.52		
30	43.90	1115	15.51	394	16.78	426			15.71	399	8.40	3.80		
36	51.95	1320	17.79	452	19.13	486			18.06	459	9.60	4.38		



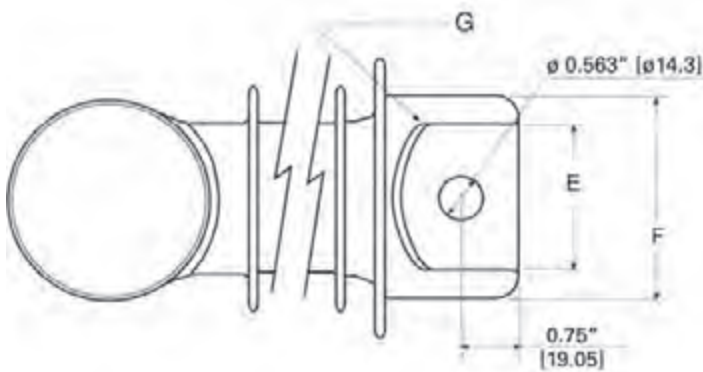
# Zforce ZRP™ Distribution Arresters



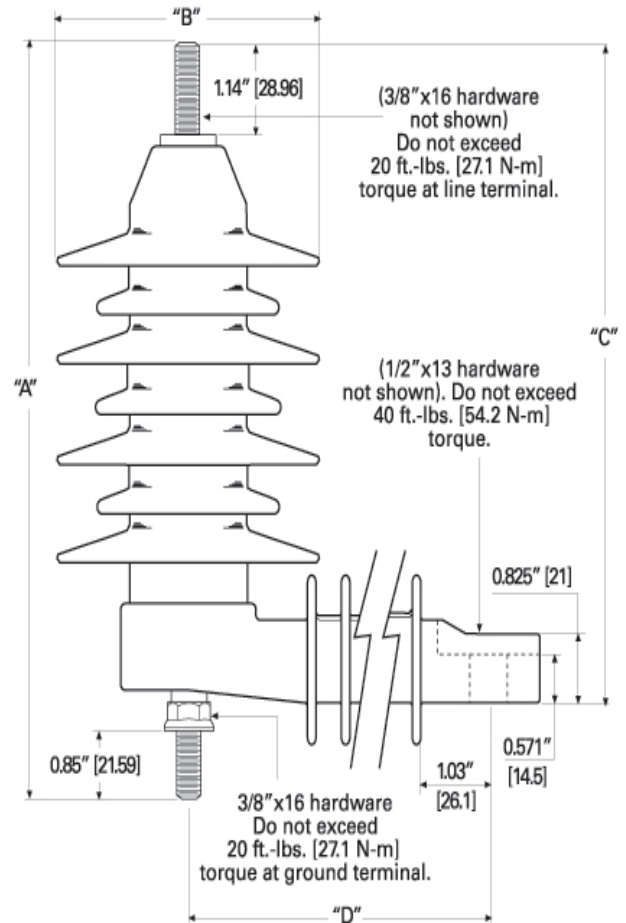
Electrical Characteristics										
Voltage Rating (Ur) (kV-rms)	MCOV (Uc) <sup>3</sup> (kV-rms)	Max Equiv FOW <sup>5</sup> (kV-Crest)	Max Switch Surge <sup>6</sup> (kV-Crest)	Maximum Discharge Voltage (kV-Crest) Using an 8/20 μs Current Impulse						
				1.5 kA	2.5 kA	3.0 kA	5.0 kA	10 kA	20 kA	40 kA
3	2.55	8.6	6.2	6.8	7.1	7.2	7.5	8.2	9.0	10.3
6	5.10	17.1	12.4	13.6	14.1	14.3	15.1	16.3	18.1	20.6
9	7.65	25.7	18.6	20.3	21.2	21.5	22.6	24.5	27.1	30.9
10	8.40	28.5	20.7	22.6	23.5	23.9	25.1	27.2	30.1	34.3
12	10.20	34.2	24.8	27.1	28.2	28.7	30.1	32.6	36.1	41.2
15	12.70	42.8	31.1	33.9	35.3	35.9	37.7	40.8	45.2	51.5
18	15.30	51.3	37.3	40.7	42.3	43.0	45.2	49.0	54.2	61.7
21	17.00	59.9	43.5	47.5	49.4	50.2	52.7	57.1	63.2	72.0
24	19.50	68.4	49.7	54.2	56.4	57.4	60.2	65.3	72.2	82.3
27	22.00	77.0	55.9	61.0	63.5	64.5	67.8	73.4	81.3	92.6
30	24.40	85.5	62.1	67.8	70.5	71.7	75.3	81.6	90.3	102.9
36	29.00	102.6	74.5	81.4	84.6	86.0	90.4	97.9	108.4	123.5

**Notes:**

- 1) Reduce creepage by 1.45 inches (36.8 mm) when ordering without insulating bracket
  - 2) Does not include metal mounting bracket hardware
  - 3) MCOV = Maximum Continuous Operating Voltage that may be applied continuously between the terminals of the arrester
  - 4) The equivalent Front-of-Wave is the maximum discharge voltage for a 5kA impulse current wave which produces a voltage wave cresting in 0.5 μs
  - 5) The equivalent Front-of-Wave is the maximum discharge voltage for a 10kA impulse current wave which produces a voltage wave cresting in 0.5 μs
  - 6) Based on a switching surge current impulse of 45x90 μs, 500 amperes
- \* Single pack modifier required for 30 kV and 36 kV ratings



Insulated Bracket Data									
Arrester Rating (kV)	Creepage		Skirts	E		F		G (Radius)	
	In	Mm		In	Mm	In	Mm	In	Mm
3 - 15	4.60	117	3	1.875	47.62	2.70	66.58	1.312	33.34
18 - 36	9.12	232	6	2.130	54.10	2.95	74.93	1.656	42.06





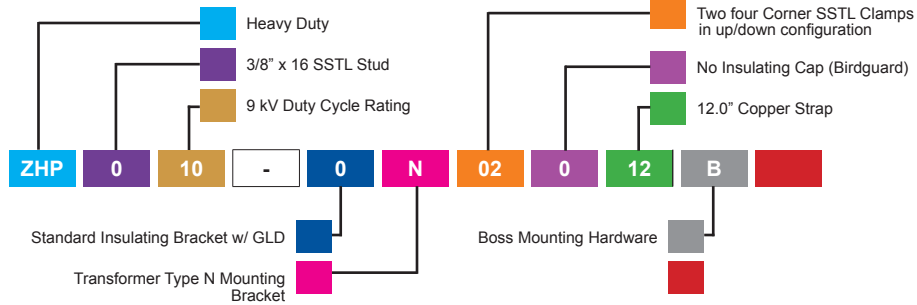
# Zforce™ Distribution Arresters EZ Ordering Information



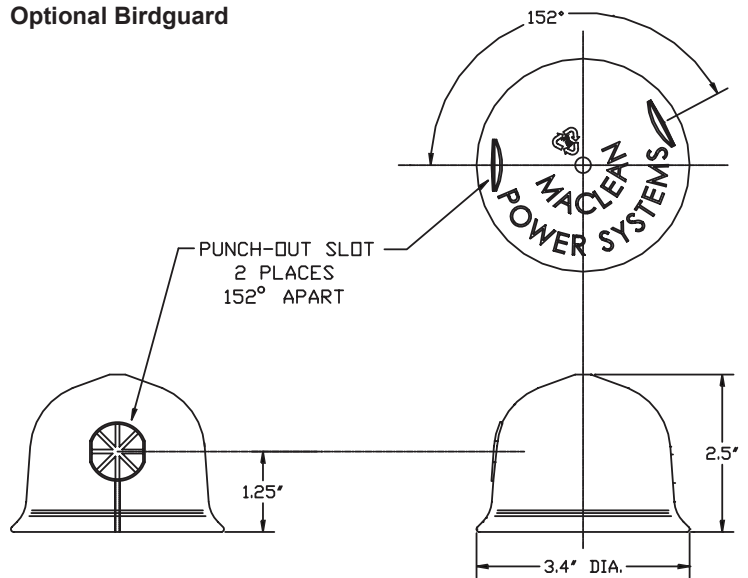
Z\_P P0 kV - P1 P2 P3 P4 P5 P6 P7

<p><b>Z_P Pole Type</b></p> <p><b>ZNP</b> - Zinc Oxide Normal Duty 5 kA Polymer Arresters</p> <p><b>ZHP</b> - Zinc Oxide Heavy Duty 10 kA Polymer Arresters</p> <p><b>ZRP</b> - Zinc Oxide Riser Pole 10 kA Polymer Arresters</p>	<p><b>P2 Additional Bracket Options</b></p> <p><b>0</b> - No NEMA Brackets</p> <p><b>A</b> - Transformer Type "A" Bracket</p> <p><b>C</b> - Crossarm Bracket (top mounting with backstrap assembly)</p> <p><b>N</b> - Transformer Type "N" Bracket</p> <p><b>W</b> - Transformer Type "W" Bracket</p>	<p><b>P5 Bottom Terminal Options*</b></p> <p><b>00</b> - Standard - "U" clamp and nut</p> <p><b>02</b> - Two four corner SSTL clamps (up/down)</p> <p><b>12</b> - 12.0" Copper Strap</p>
<p><b>P0 General Options</b></p> <p><b>0</b> - 3/8" x 16 SSTL Studs (line and ground terminals)</p>	<p><b>P3 Top Terminal Options*</b></p> <p><b>00</b> - Standard - Four corner SSTL clamp and nut</p> <p><b>02</b> - Two four corner SSTL clamps</p> <p><b>12</b> - 18" Insulated Wire Lead with two ring terminals/flat washer/lock washer</p>	<p><b>P6 Bagging Options</b></p> <p><b>B</b> - Boss Mounting Hardware</p>
<p><b>kV(U<sub>r</sub>) Duty-Cycle Rating of Arresters</b></p> <p>03, 06, 09, 10, 12, 15, 18, 21, 24, 27, 30, 36</p>	<p><b>P4 Universal Insulating Cap (Birdguard)</b></p> <p><b>0</b> - Without Cap</p> <p><b>1</b> - With Cap</p> <p><b>2</b> - Fuse Kit</p>	<p><b>P7 Packaging Options</b></p> <p><b>#S</b> - Single pack modifier <u>required</u> only for 30kV and 36kV ratings</p> <p><b>#K</b> - Bulk packing</p>
<p><b>P1 Insulating Bracket Options</b></p> <p><b>0</b> - Standard Insulating Bracket, with GLD</p> <p><b>1</b> - Standard Insulating Bracket, no GLD</p> <p><b>2</b> - No Insulating Bracket, with GLD (line arrester)</p> <p><b>3</b> - No Insulating Bracket, no GLD (switchgear application)</p>	<p>* Top/Bottom Terminal: Fits wire ranges for aluminum or copper conductors from #10 solid (3.0mm diameter) through 2/0 stranded (11.0mm diameter)</p>	

## Catalog Order Number Example



## Optional Birdguard





# Zforce™ Distribution Arrester Accessories

## Optional Bagging Accessories

Transformer mounting hardware is available upon request. To specify, add suffix “-B” for boss mounting hardware to catalog number.



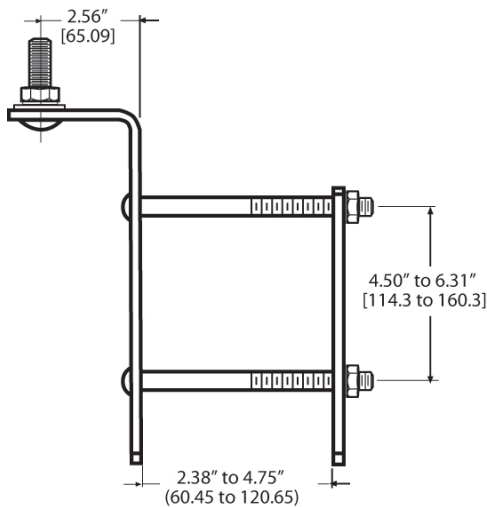
**Boss Mounting Hardware**  
Cat No. AD1137-B

## Flipper Fuse Kit

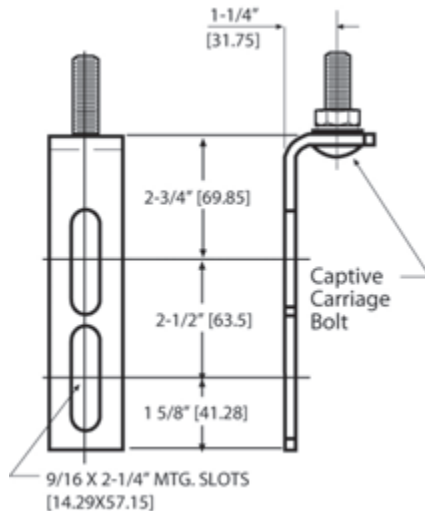
The AD524-Z fuse kit includes a stationary terminal for mounting on the transformer bushing. Its spring arm subjects the fuselink to moderate tension during steady-state operation and provides a positive whip action to quickly separate the link during fault conditions. An insulating cap for the transformer bushing and an insulating sleeve for the spring arm are included for wildlife protection.



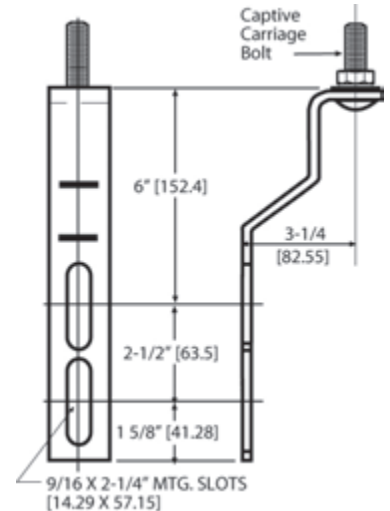
## Mounting Brackets



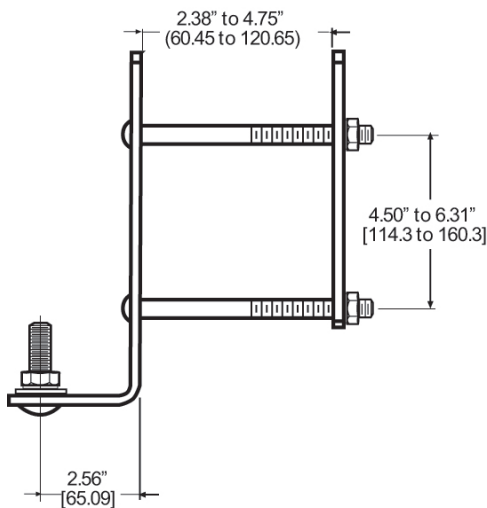
**Type “C”**  
Catalog No. 7106A0025



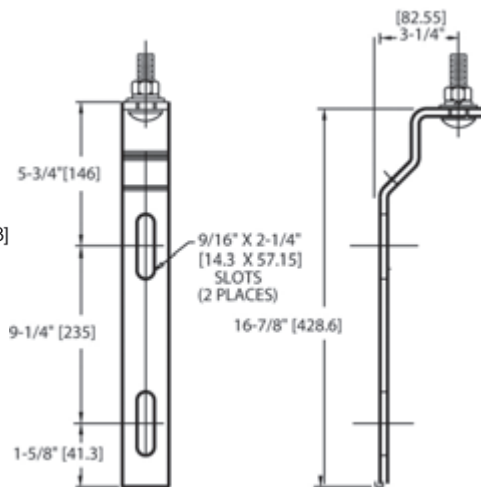
**Type “A”**  
Catalog No. 7106A0013



**Type “N”**  
Catalog No. 7106A0015



**Type “E”**  
Catalog No. J24515



**Type “W”**  
Catalog No. 7106A0047



## ZE Elbow Distribution Arresters



The type “ZE” arrester incorporates surge protection in a one-piece, shielded elbow housing. It permits arrester installation on standard separable connector bushings, maintaining the dead front concept.

### Performance

The “ZE” elbow arrester consistently withstands the following minimum design tests:

- High Current-Short Duration: 2 current surges of 40kA magnitude
- Low Current-Long Duration: 20 current surges of 75 amperes magnitude and 2000 microsecond duration
- Duty Cycle: 22 discharges with a current surge of 5kA magnitude and 8/20 microsecond wave shape
- Following each of these tests, the “ZE” arrester remains thermally stable and the discharge voltage increase at rated current is less than 10%

### Design

The type “ZE” arrester was developed specifically for protection of underground distribution systems. It is installed at the open point of the underground system to prevent voltage wave doubling. When also installed at an intermediate point, voltage reflections from the open point arrester are harmlessly discharged. The housing, made of peroxide cured EPDM rubber, is totally shielded with a molded conductive EPDM jacket to maintain the dead front concept. The one-piece construction requires no field assembly. The “ZE” dead front elbow arrester is RUS listed.

### Reliability

Rigid control standards insure that all material conforms to exacting engineering specifications. Each finished arrester is subjected to electrical tests to determine reference voltage, total leakage current and corona levels.

### Application

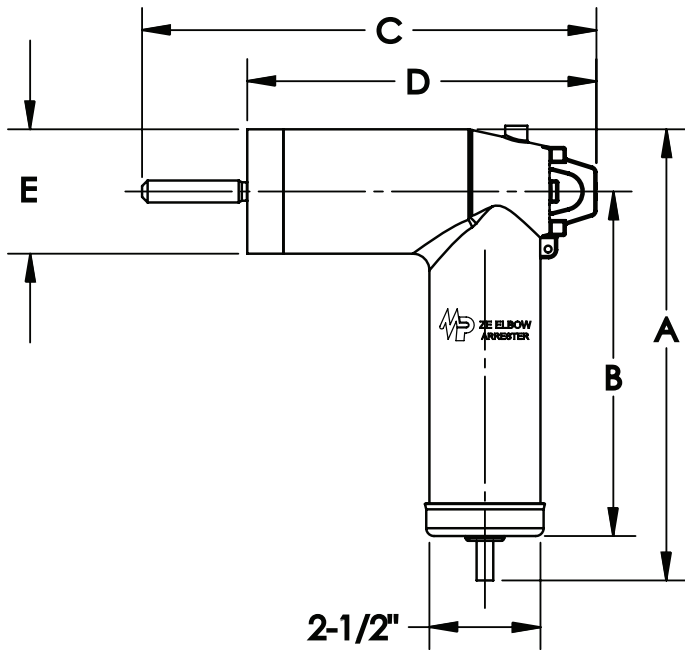
The type “ZE” arrester rated voltage designates the 60Hz voltage applied across the arrester terminals during the duty cycle test. In addition, the type “ZE” arrester Maximum Continuous Operating Voltage (MCOV) designates the maximum power frequency voltage that may be continuously applied across the arrester in service. Selection of the appropriate type “ZE” rating is made on the basis that the maximum continuous line-to-ground voltage on the system does not exceed the MCOV of the arrester.

The 10kV, 18kV and 27kV rated arresters are designed for application on nominal 15kV, 25kV and 35kV URD systems, respectively. The three ratings include standard ANSI/IEEE 386 separable connector interface designs that are compatible with major interface suppliers at each voltage level.





# ZE Elbow Distribution Arresters



### Probe

Standard load break probe is shipped assembled with each unit

### Ground Cable

Size: #5 stranded copper wire- 37" length

### Lubricant

Each arrester is shipped with a packet of silicone grease, wiping cloth and instruction sheet

Physical Characteristics														
Catalog Number	kV Rating	A		B		C		D		E		Elbow Interface*	Weight	
		In	Mm	In	Mm	In	Mm	In	Mm	In	Mm		Lb	Kg
8132B0003J001	3	7.0	177.8	4.6	116.8	8.1	205.7	7.7	195.6	2.9	73.7	15kV	3.0	1.4
8132B0006J001	6					10.1	256.5							
8132B0010J001	10					8.1	205.7					15kV	4.0	1.8
8132B1010J001	10	10.1	256.5	25kV	4.7	2.1								
8132B0012J001	12	8.3	210.8	5.9	149.9	8.1	205.7	10.1	256.5	4.0	101.6	35kV <sup>2</sup>	5.2	2.4
8132B0018J001	18	10.0	254.0	7.6	193.0	10.1	256.5							
8132B0024J001	24	13.3	337.8	10.3	261.6	12.6	320.0							
8132B1027J001	27	13.4	340.4	11.0	279.4	10.1	256.5	7.7	195.6	2.9	73.7	35kV <sup>2</sup>	6.4	2.9
8132B2027J001		14.5	368.3	11.5	292.1	12.6	320.0	10.1	256.5	4.0	101.6		8.5	3.9

Electrical Characteristics							
Voltage Rating (Ur) (kV-rms)	MCOV (kV-rms)	Max Equiv FOW* (kV-Crest)	Maximum Discharge Voltage (kV-Crest) Using an 8/20 μs Current Impulse				
			1.5 kA	3.0 kA	5.0 kA	10 kA	20 kA
3	2.55	10.0	8.5	8.8	9.3	10.2	12.9
6	5.10	20.1	17.0	17.6	18.6	20.4	25.8
10	8.40	30.5	28.0	29.0	30.7	33.7	42.6
12	10.20	40.2	34.0	35.2	37.2	40.8	51.6
18	15.30	60.3	51.0	52.8	55.8	61.2	77.4
24	19.50	80.4	68.0	70.4	74.4	81.6	103.2
27	22.00	90.5	76.5	79.2	83.7	91.8	116.1

**Notes:**

- \* Compatible with standard ANSI/IEEE 386, 1995
- 1) Small 35kV Interface, 21.1/36kV Figure 7 of ANSI/IEEE 386, 1995
- 2) Large 35kV Interface, 21.1/36.6kV Figure 8 of ANSI/IEEE 386, 1995



# ZIP and ZJP Intermediate Class Surge Arresters



The type “ZIP”/“ZJP” intermediate class arresters offer the benefits of polymer housings for system voltages up to 161kV. The arresters are approximately 1/5 the weight of the porcelain equivalent. Handling and installation become much easier tasks. Also, the risk of damage to the housing is reduced compared to porcelain.

## Performance

**ZIP:**  
3 kV through 144 kV duty cycle rating, 2.55 kV through 115 kV MCOV, 2.4 kV through 161 kV system line-line voltage

**ZJP:**  
3 kV through 45 kV duty cycle rating, 2.55 kV through 36.5 kV MCOV, 2.4 kV through 46 kV system line-line voltage

The arrester designs are tested in accordance with the latest industry standards for metal oxide arresters. The “ZIP”/“ZJP” arresters consistently withstand the following minimum design tests:

- High Current-Short Duration: 100 kA crest
- Duty Cycle per ANSI: 10 kA
- Nominal Discharge Current per IEC: 10 kA
- Line Discharge Class per IEC: Class 2
- Minimum Energy Capability: 5.0 kJ/kV MCOV
- Fault Withstand Capability:
  - ZIP—50 kA rms
  - ZJP—20 kA rms
- Working Cantilever Strength:
  - ZIP—5000 in.-lbs.
  - ZJP—720 in.-lbs.
- ZIP RUS listed

## Design

The design consists of a number of metal oxide valve elements contained within a fiberglass winding and then inserted into the polymer housing. Type “ZIP”/“ZJP” arresters are shipped as single units for all ratings. There is no need to combine sections, even for the 144kV duty cycle rating. The metal oxide valve elements combine excellent protective characteristics with steady state performance to maximize protection over many years of service.

## Fault Current Withstand

The severity of a failure depends on the duration and magnitude of the available fault current conducting through the arrester at the time of failure. This type of arrester, with its polymer housing, eliminates the potential danger of porcelain fragmentation. The design uses a fiberglass epoxy wrap to relieve the pressure that is present during a fault.

## Benefits

The use of polymer housings for our arresters provides many benefits over porcelain designs.

- **LIGHTWEIGHT**—The lightweight design provides much easier handling and installation. The polymer arresters are less than 1/5 the weight of the porcelain equivalents. The burden on mounting structures and personnel is greatly reduced.
- **REDUCED CLEARANCES**—The smaller physical size of the polymer housing and the line side of the arrester allow the clearances to be reduced. This provides added flexibility with design and layout since they can be used in tighter areas.
- **SINGLE UNIT DESIGN**—The single unit design simplifies installation by reducing handling that was previously required for multi-section porcelain designs. This also provides improved contamination performance over multi-unit arresters.
- **DAMAGE RESISTANT**—The polymer housings resist damage from handling where porcelain units are most vulnerable to chipping and breakage.
- **SAFETY**—The “ZIP”/“ZJP” arresters minimize safety hazards to personnel and nearby equipment that exists with porcelain housings.

## Reliability

Each completed “ZIP”/“ZJP” arrester unit must pass the following electrical tests: reference voltage, power loss, and RIV.



# ZIP Intermediate Class Surge Arresters

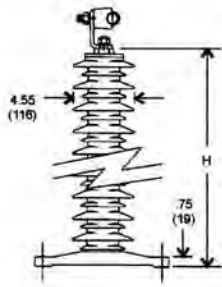


Figure 1

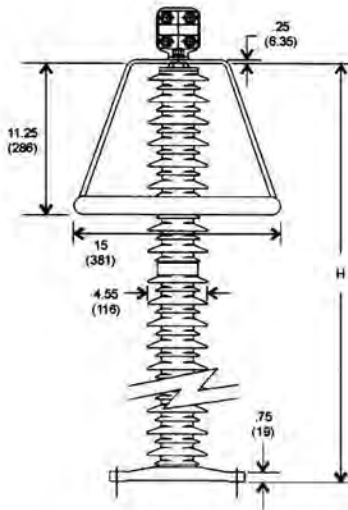


Figure 2

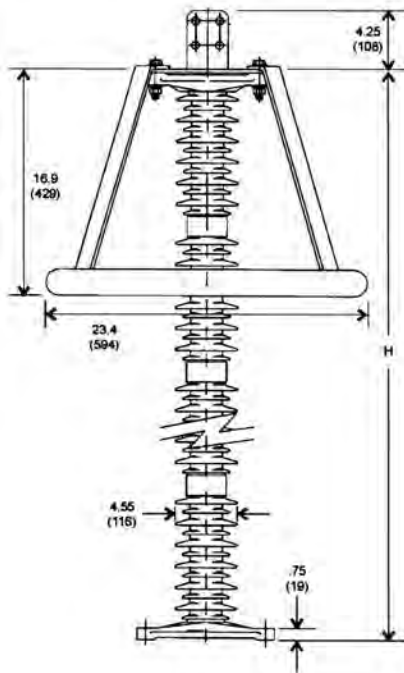
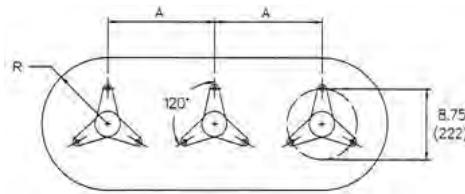
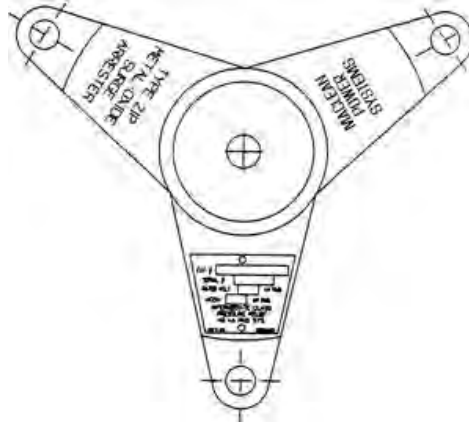


Figure 3



## Three Phase Installation Layout

The holes for mounting are .56" (42 mm) for 1/2" bolts. Mounting bolts and washers are not furnished with arrester.



## Nameplates

In addition to the information that is included on the tripod base, a nameplate is attached to the casting to provide all of the required arrester details. The catalog number, the rated voltage, the maximum continuous operating voltage, and the pressure relief current rating are shown. The serial number includes information about the time of manufacture.

Physical Characteristics and Clearances													
Catalog Number	Figure	kV Rating	MCOV kV	Total Height		Creepage		Minimum Clearances <sup>1</sup>				Weight	
				In	Mm	In	Mm	A		R		Lb	Kg
ZIP0003	1	3	2.55	6.80	173	15.70	400	9.5	241	5.5	140	8.0	3.6
ZIP0006		6	5.10	6.80	173								
ZIP0009		9	7.65	6.82	173								
ZIP0010		10	8.40	6.87	175	15.80	401			11.0	5.0		
ZIP0012		12	10.20	6.85	174								
ZIP0015		15	12.70	8.31	211	20.20	512			5.8	147	12.0	5.4
ZIP0018		18	15.30	9.22	234	22.00	559						
ZIP0021		21	17.00	10.70	272	26.40	671						
ZIP0024		24	19.50	12.10	308	30.70	781			7.8	198	14.0	6.4
ZIP0027		27	22.00	13.10	333	33.70	856						
ZIP0030		30	24.40	14.60	370	38.10	967	10.5	267	8.8	224	15.0	6.8
ZIP0033		33	26.70	15.90	403	40.30	1024						
ZIP0036		36	29.00	16.80	428	44.20	1122	12.5	318	10.8	274	17.0	7.8
ZIP0039		39	31.50	18.30	466	48.60	1234	13.5	343	11.8	300	18.0	8.2
ZIP0042		42	34.00	19.20	489	51.40	1307	14.5	369	12.8	326	19.0	8.7
ZIP0045		45	36.50	21.30	542	54.50	1385	15.5	394	13.8	351	20.0	9.1
ZIP0048		48	39.00	23.00	583	61.70	1567	16.5	419	14.8	376	24.0	10.9
ZIP0054		54	42.00	24.90	634	67.60	1718	18.5	470	16.8	427	25.0	11.3
ZIP0060		60	48.00	27.90	708	76.40	1940	20.5	521	18.8	478		
ZIP0066		66	54.00	30.50	774	80.80	2054	23.5	597	21.8	554	27.0	12.3
ZIP0072	72	57.00	32.40	823	88.60	2251	29.0					13.2	
ZIP0084	84	68.00	37.20	945	103.00	2620	25	635	23.30	592	32.40	14.70	
ZIP0090	2	90	70.00	41.40	1051	109.00	2775	40.0	1016	33.0	838	41.0	18.6
ZIP0096		96	76.00	43.80	1112	119.00	3027	42.0	1067	35.0	889	43.0	19.6
ZIP0108		108	84.00	48.00	1218	133.00	3379	46.0	1168	39.0	991	47.0	21.4
ZIP0120		120	98.00	53.30	1355	149.00	3788	49.0	1245	42.0	1067	51.0	23.1
ZIP0132		132	106.00	59.30	1507	161.00	4088	51.0	1296	44.0	1118	55.0	25.0
ZIP0144	3	144	115.00	63.50	1613	177.00	4507	67.0	1702	55	1397	73.0	33.2

**Notes:**

1) These minimum clearances are determined by the protective capabilities of the arresters and they are secondary to any other clearance requirement that may exist for specific applications.



# ZIP Intermediate Class Surge Arresters

Electrical Characteristics												
Catalog Number	Voltage Rating (kV-rms)	MCOV (kV-rms)	TOV <sup>1</sup>		Max Equiv FOW <sup>2</sup> (kV-Crest)	Max Switch Surge <sup>3</sup> (kV-Crest)	Maximum Discharge Voltage (kV-Crest) Using an 8/20 $\mu$ s Current Impulse					
			1 s (kV-rms)	10 s (kV-rms)			1.5 kA	3.0 kA	5.0 kA	10 kA	20 kA	40 kA
ZIP0003	3	2.55	3.7	3.5	8.55	6.34	6.79	7.17	7.50	8.09	8.96	10.1
ZIP0006	6	5.10	7.41	7.04	17.1	12.7	13.6	14.3	15	16.2	17.9	20.2
ZIP0009	9	7.65	11.10	10.6	25.9	19.2	20.5	21.7	22.7	24.5	27.1	30.5
ZIP0010	10	8.40	12.20	11.6	28.3	21	22.5	23.7	24.8	26.8	29.6	33.4
ZIP0012	12	10.20	14.80	14.1	34.2	25.4	27.2	28.7	30	32.4	35.8	40.4
ZIP0015	15	12.70	18.40	17.5	43.1	32	34.2	36.1	37.8	40.8	45.1	50.8
ZIP0018	18	15.30	22.20	21.1	51.3	38.1	40.8	43	45	48.6	53.8	60.6
ZIP0021	21	17.00	24.70	23.5	56.6	42	44.9	47.5	49.6	53.6	59.3	66.8
ZIP0024	24	19.50	28.30	26.9	68.5	50.8	54.3	57.4	60	64.8	71.7	80.7
ZIP0027	27	22.00	31.90	30.4	77.3	57.4	61.4	64.8	67.8	73.2	81	91.2
ZIP0030	30	24.40	35.40	33.7	83.5	61.9	66.2	70	73.2	79	87.4	98.4
ZIP0033	33	26.70	38.80	36.9	91.9	68.2	72.9	77	80.6	86.9	96.3	108
ZIP0036	36	29.00	42.10	40	98.9	73.4	78.5	82.9	86.7	93.5	104	117
ZIP0039	39	31.50	45.70	43.5	109	80.5	86.1	90.9	95.1	103	114	128
ZIP0042	42	34.00	49.40	47	117	86.7	92.7	97.9	102	111	122	138
ZIP0045	45	36.50	53.00	50.4	125	92.9	99.4	105	110	119	131	148
ZIP0048	48	39.00	56.60	53.9	137	102	109	115	120	130	143	161
ZIP0054	54	42.00	61.00	58	155	115	123	130	136	146	162	182
ZIP0060	60	48.00	69.70	66.3	167	124	132	140	146	158	175	197
ZIP0066	66	54.00	78.40	74.6	184	136	146	154	161	174	193	217
ZIP0072	72	57.00	82.80	78.7	198	147	157	166	173	187	207	233
ZIP0084	84	68.00	98.70	93.9	234	173	185	196	205	221	245	276
ZIP0090	90	70.00	102.00	96.7	251	186	199	210	220	237	262	296
ZIP0096	96	76.00	110.00	105	267	198	212	224	234	253	280	315
ZIP0108	108	84.00	122.00	116	297	220	235	249	260	281	311	350
ZIP0120	120	98.00	142.00	135	334	248	265	280	293	316	350	394
ZIP0132	132	106.00	154.00	146	367	273	292	308	322	348	385	433
ZIP0144	144	115.00	167.00	159	396	293	314	332	347	374	414	467

**Notes:**

- 1) Temporary Overvoltage without any Prior Duty
- 2) The equivalent Front-of-Wave is the maximum discharge voltage for a 10kA impulse current wave which produces a voltage wave cresting in a 0.5  $\mu$ s
- 3) Based on a switching surge current of 500 amperes



# ZJP Intermediate Class Surge Arresters

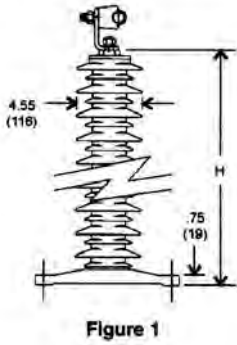


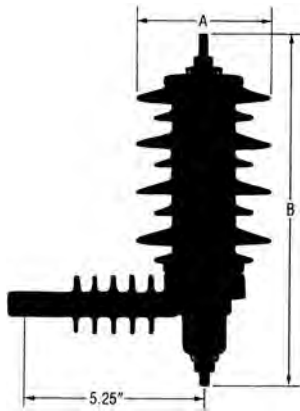
Figure 1

Physical Characteristics and Clearances													
Catalog Number	Figure	kV Rating	MCOV kV	Total Height		Creepage		Minimum Clearances <sup>1</sup>				Weight	
				In	Mm	In	Mm	A		R		Lb	Kg
ZJP0003-1211	1	3	2.55	6.8	173	15.7	400	9.5	241	5.5	140	7.7	3.5
ZJP0006-1211		6	5.10					9.5	241	5.5	140	8.1	3.7
ZJP0009-1211		9	7.65					6.82	400	9.5	241	5.5	140
ZJP0010-1211		10	8.40	6.87	175	15.8	401	9.5	241	5.5	140	8.6	3.9
ZJP0012-1211		12	10.20	6.85	174		401	9.5	241	5.5	140	10.7	4.9
ZJP0015-1211		15	12.70	8.31	211	20.2	512	9.5	241	5.5	140	11	5
ZJP0018-1211		18	15.30	9.22	234	22	559	9.5	241	5.8	147	11.4	5.2
ZJP0021-1211		21	17.00	10.7	272	26.4	671	9.5	241	6.8	173	11.9	5.4
ZJP0024-1211		24	19.50	12.1	308	30.7	781	9.5	241	7.8	198	14	6.4
ZJP0027-1211		27	22.00	13.1	333	33.7	856	10.5	267	8.8	224	14.7	6.7
ZJP0030-1211		30	24.40	14.6	370	38.1	967	10.5	267	8.8	224	14.7	6.7
ZJP0033-1211		33	26.70	15.9	403	40.3	1024	10.5	267	8.8	224	15.7	7.1
ZJP0036-1211		36	29.00	16.8	428	44.2	1122	12.5	318	10.8	274	16.6	7.5
ZJP0039-1211		39	31.50	18.3	466	48.6	1234	13.5	343	11.8	300	17.5	8
ZJP0042-1211		42	34.00	19.2	489	51.4	1307	14.5	369	12.8	326	18.4	8.4
ZJP0045-1211		45	36.50	21.3	542	54.5	1385	15.5	394	13.8	351	19.3	8.8

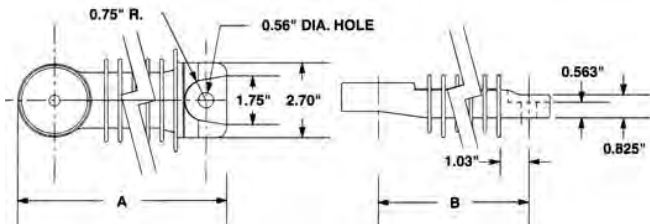
**Notes:**

1) These minimum clearances are determined by the protective capabilities of the arresters and they are secondary to any other clearance requirement that may exist for specific applications.

## ZJP D Series Intermediate Class Arresters



Physical Characteristics and Clearances											
Catalog Number	kV Rating	Width A		Length B		Nominal Strike		Nominal Creepage		Weight	
		In	Mm	In	Mm	In	Mm	In	Mm	Lb	Kg
ZJP0003-D005	3	4.6	116	11.1	282	6.8	173	15.7	400	4.8	2.2
ZJP0006-D005	6									5.2	2.3
ZJP0009-D005	9									5.6	2.5
ZJP0010-D005	10			11.12	283	6.82	15.8	401	5.7	2.6	
ZJP0012-D005	12			11.15	283	6.85			174	7.8	3.5
ZJP0015-D005	15			12.61	320	8.31	211	20.2	512	8.2	3.7
ZJP0018-D005	18			13.52	343	9.22	234	22	559	8.5	3.9
ZJP0021-D005	21			15	381	10.7	272	26.4	671	9	4.1
ZJP0024-D005	24			16.42	417	12.1	308	30.7	781	11.1	5
ZJP0027-D005	27			17.41	442	13.1	333	33.7	856	11.8	5.4
ZJP0030-D005	30			18.88	480	14.6	370	38.1	967		
ZJP0033-D005	33			20.18	513	15.9	403	40.3	1024	12.8	5.8
ZJP0036-D005	36			21.14	537	16.8	428	44.2	1122	13.7	6.2
ZJP0039-D005	39			22.64	575	18.3	466	48.6	1234	14.6	6.6
ZJP0042-D005	42			23.54	598	19.2	489	51.4	1307	15.5	7
ZJP0045-D005	45			25.64	651	21.3	542	54.5	1385	16.4	7.5







# ZJP Intermediate Class Surge Arresters

Electrical Characteristics												
Catalog Number	Voltage Rating (kV-rms)	MCOV (kV-rms)	TOV <sup>1</sup>		Max Equiv FOW <sup>2</sup> (kV-Crest)	Max Switch Surge <sup>3</sup> (kV-Crest)	Maximum Discharge Voltage (kV-Crest) Using an 8/20 $\mu$ s Current Impulse					
			1 s (kV-rms)	10 s (kV-rms)			1.5 kA	3.0 kA	5.0 kA	10 kA	20 kA	40 kA
ZJP0003	3	2.55	3.7	3.5	8.55	6.34	6.79	7.17	7.5	8.09	8.96	10.1
ZJP0006	6	5.10	7.41	7.04	17.1	12.7	13.6	14.3	15	16.2	17.9	20.2
ZJP0009	9	7.65	11.1	10.6	25.9	19.2	20.5	21.7	22.7	24.5	27.1	30.5
ZJP0010	10	8.40	12.2	11.6	28.3	21	22.5	23.7	24.8	26.8	29.6	33.4
ZJP0012	12	10.20	14.8	14.1	34.2	25.4	27.2	28.7	30	32.4	35.8	40.4
ZJP0015	15	12.70	18.4	17.5	43.1	32	34.2	36.1	37.8	40.8	45.1	50.8
ZJP0018	18	15.30	22.2	21.1	51.3	38.1	40.8	43	45	48.6	53.8	60.6
ZJP0021	21	17.00	24.7	23.5	56.6	42	44.9	47.5	49.6	53.6	59.3	66.8
ZJP0024	24	19.50	28.3	26.9	68.5	50.8	54.3	57.4	60	64.8	71.7	80.7
ZJP0027	27	22.00	31.9	30.4	77.3	57.4	61.4	64.8	67.8	73.2	81	91.2
ZJP0030	30	24.40	35.4	33.7	83.5	61.9	66.2	70	73.2	79	87.4	98.4
ZJP0033	33	26.70	38.8	36.9	91.9	68.2	72.9	77	80.6	86.9	96.3	108
ZJP0036	36	29.00	42.1	40.0	98.9	73.4	78.5	82.9	86.7	93.5	104	117
ZJP0039	39	31.50	45.7	43.5	109	80.5	86.1	90.9	95.1	103	114	128
ZJP0042	42	34.00	49.4	47	117	86.7	92.7	97.9	102	111	122	138
ZJP0045	45	36.50	53	50.4	125	92.9	99.4	105	110	119	131	148.3

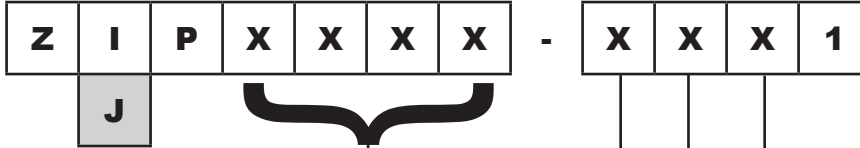
**Notes:**

- 1) Temporary Overvoltage without any Prior Duty
- 2) The equivalent Front-of-Wave is the maximum discharge voltage for a 10kA impulse current wave which produces a voltage wave cresting in a 0.5  $\mu$ s
- 3) Based on a switching surge current of 500 amperes



# ZIP/ZJP Intermediate Class Arrester Ordering Information

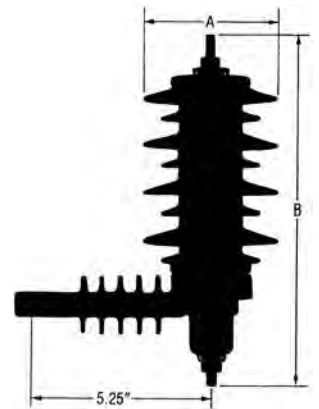
Fault Withstand	
ZIP	= 50kA
ZJP	= 20kA



kV Rating	
0003	= 3
0006	= 6
0009	= 9
0010	= 10
0012	= 12
0015	= 15
0018	= 18
0021	= 21
0024	= 24
0027	= 27
0030	= 30
0033	= 33
0036	= 36
0039	= 39
0042	= 42
0045	= 45
0048	= 48
0054	= 54
0060	= 60
0066	= 66
0072	= 72
0084	= 84
0090	= 90
0096	= 96
0108	= 108
0120	= 120
0132	= 132
0144	= 144

Configuration (not available on "D" Series)	Top & Bottom Connectors (not available on "D" Series)
<p>1 - Stainless steel top cover with tripod base</p>	<p>1 - Eyebolt with a 90° angle bracket</p> <p>Conductor Range: 0.25" - 0.75" (6.35 - 19.05 mm)</p>
<p>2 - Tripod on top with stainless steel bottom cover (Inverted Mounting)</p>	<p>2 - Four hole NEMA pad with a 90° angle</p> <p>Conductor Range: 0.25" - 1.25" (6.35 - 31.75 mm)</p>
<p>3 - Stainless steel covers on both ends</p>	<p>3 - Four hole NEMA pad with a 45° angle</p> <p>Conductor Range: 0.25" - 1.25" (6.35 - 31.75 mm)</p>
<p>4 - Tripod on both ends</p>	

"D" Series ZJP only	
D001	= Crossarm Bracket
D005	= Standard Unit
D106	= with Birdguard
D109	= Birdguard and Crossarm Bracket





# Station Class Arresters



The type “ZSP” station class arresters offer the benefits of polymer housings for system voltages up to 230kV. The arresters are approximately 25% the weight of the porcelain equivalent. Handling and installation become much easier tasks. Also, the risk of damage to the housing is reduced compared to porcelain.

## Performance

“ZSP” arresters are available in duty cycle ratings from 3kV through 216kV (2.55kV through 174kV MCOV) and are designed for system line-line voltages of 2.4kV through 230kV. The “ZSP” arrester design is tested in accordance with the latest industry standards for metal oxide arresters. The “ZSP” arresters consistently withstand the following minimum design tests:

- High Current-Short Duration: 100kA crest
- Duty Cycle per ANSI: 10kA
- Nominal Discharge Current per IEC: 10kA
- Line Discharge Class per IEC: Class 2 or 3
- Minimum Energy Capability: 6.1 kJ/kV MCOV
- Fault Withstand Capability: 80kA rms
- Working Cantilever Strength: 10,000 in.-lbs.
- RUS Listed

## Design

The design consists of a number of metal oxide valve elements contained within a fiberglass winding and then inserted into the polymer housing. Type “ZSP” arresters are shipped as single units for all ratings. There is no need to combine sections, even for the 216kV duty cycle rating. The metal oxide valve elements combine excellent protective characteristics with steady state performance to maximize protection over many years of service.

## Fault Current Withstand

The severity of a failure depends on the duration and magnitude of the available fault current conducting through the arrester at the time of failure. The “ZSP” type arrester with its polymer housing eliminates the potential danger of porcelain fragmentation. The “ZSP” design uses a high strength fiberglass epoxy wrap to relieve the pressure that is present during a fault. The arresters achieved a fault withstand capability of 80kA.

## Benefits

The use of polymer housings for our arresters provides many benefits over porcelain designs.

- **LIGHTWEIGHT**—The lightweight design provides much easier handling and installation. The polymer arresters are less than 1/5 the weight of the porcelain equivalents. The burden on mounting structures and personnel is greatly reduced.
- **REDUCED CLEARANCES**—The smaller physical size of the polymer housing and the line side of the arrester allow the clearances to be reduced. This provides added flexibility with design and layout since they can be used in tighter areas.
- **SINGLE UNIT DESIGN**—The single unit design simplifies installation by reducing handling that was previously required for multi-section porcelain designs. This also provides improved contamination performance over multi-unit arresters.
- **DAMAGE RESISTANT**—The polymer housings resist damage from handling where porcelain units are most vulnerable to chipping and breakage.
- **SAFETY**—The ZSP arresters minimize safety hazards to personnel and nearby equipment that exists with porcelain housings.

## Reliability

Each completed “ZSP” arrester unit must pass the following electrical tests: reference voltage, power loss, and RIV.



# ZSP Electrical Characteristics

Electrical Characteristics												
Catalog Number	Voltage Rating (kV-rms)	MCOV (kV-rms)	TOV <sup>1</sup>		Max Equip FOW <sup>2</sup> (kV-Crest)	Max Switch Surge <sup>3</sup> (kV-Crest)	Maximum Discharge Voltage (kV-Crest) Using an 8/20 $\mu$ s Current Impulse					
			1 s (kV-rms)	10 s (kV-rms)			1.5 kA	3.0 kA	5.0 kA	10 kA	20 kA	40 kA
ZSP0003	3	2.55	3.74	3.53	8.23	5.87	6.32	6.65	6.96	7.49	8.27	9.38
ZSP0006	6	5.10	7.47	7.06	16.5	11.7	12.6	13.3	13.9	15	16.5	18.8
ZSP0009	9	7.65	11.2	10.6	24.7	17.6	19	20	20.9	22.5	24.8	28.2
ZSP0010	10	8.40	12.3	11.6	27.8	19.8	21.4	22.5	23.5	25.3	28	31.7
ZSP0012	12	10.20	14.9	14.1	33	23.6	25.4	26.7	27.9	30.1	33.2	37.7
ZSP0015	15	12.70	18.6	17.6	41.3	29.4	31.7	33.4	34.9	37.6	41.5	47.1
ZSP0018	18	15.30	22.4	21.2	49.8	35.5	38.2	40.2	42.1	45.3	50	56.8
ZSP0021	21	17.00	24.9	23.5	55.2	39.4	42.4	44.6	46.7	50.3	55.5	63
ZSP0024	24	19.50	28.6	27	65	46.4	49.9	52.6	55	59.2	65.4	74.2
ZSP0027	27	22.00	32.2	30.5	72.9	52	56	59	61.7	66.4	73.3	83.2
ZSP0030	30	24.40	35.7	33.8	79.9	57	61.4	64.6	67.6	72.7	80.3	91.1
ZSP0033	33	26.70	39.1	37	88	62.7	67.6	71.1	74.4	80.1	88.4	100.4
ZSP0036	36	29	42.5	40.2	96.2	68.6	73.9	77.8	81.5	87.6	96.8	109.8
ZSP0039	39	31.50	46.1	43.6	103	73.5	79.1	83.3	87.2	93.8	103.6	117.5
ZSP0042	42	34	49.8	47.1	113.5	81	87.2	91.8	96.1	103.4	114.2	129.5
ZSP0045	45	36.5	53.5	50.6	120.3	85.8	92.4	97.3	101.8	109.5	120.9	137.2
ZSP0048	48	39	57.1	54	128.6	91.7	98.7	104	108.8	117.1	129.3	146.7
ZSP0054	54	42	61.5	58.2	143.6	102.4	110.3	116.1	121.5	130.8	144.4	163.8
ZSP0060	60	48	70.3	66.5	163.1	116.4	125.3	131.9	138.1	148.5	164	186.1
ZSP0063	63	50.25	73.6	69.6	170.3	121.4	130.8	137.7	144.1	155	171.2	194.3
ZSP0066	66	52.50	76.9	72.7	177.5	126.6	136.3	143.5	150.2	161.6	178.4	202.4
ZSP0072	72	57	83.5	78.9	192.3	137.1	147.7	155.5	162.7	175.1	193.3	219.3
ZSP0072-58*	72	58	85	80.3	192.3	137.1	147.7	155.5	162.7	175.1	193.3	219.3
ZSP0090	90	70	102.6	97	227.1	161.9	174.4	183.6	192.2	206.7	228.3	259
ZSP0090-74*	90	74	108.4	102.5	240.6	171.6	184.8	194.6	203.6	219	241.9	274.5
ZSP0096	96	76	111.3	105.3	257.1	183.4	197.5	207.9	217.6	234.1	258.5	293.3
ZSP0108	108	84	123.1	116.3	273.7	195.2	210.2	221.3	231.6	249.2	275.2	312
ZSP0108-88*	108	88	128.9	121.9	287.2	204.8	220.6	232.3	243.1	261.5	288.8	328
ZSP0120	120	98	143.6	135.7	326	239.7	250.6	263.9	276.1	297.1	328	372
ZSP0120-102*	120	102	149.4	141.3	331	243	254	267.5	279.9	301	333	377
ZSP0132	132	106	155.3	146.8	347	255	266.7	280.8	293.8	316	349	396
ZSP0144	144	115	168.5	159.3	385	282.4	295.3	311	325	350	387	439
ZSP0150	150	121	177.3	167.6	411	302	315	332	347	374	413	468
ZSP0168	168	131	191.9	181.4	450	331	346	364	381	410	453	514
ZSP0172	172	140	205.1	193.9	460	338	354	372	390	419	463	525
ZSP0180	180	144	211	199.4	481	354	370	389	407	438	484	549
ZSP0192	192	152	222.7	210.5	511	375	392	413	432	465	514	583
ZSP0198	198	160	234.4	221.6	532	391	409	431	451	485	535	607
ZSP0210	210	170	249.1	235.5	562	413	432	454	476	512	565	641
ZSP0216	216	174	254.9	241	577	424	443	466	488	525	580	658

**Notes:**

- 1) Temporary Overvoltage without any Prior Duty
- 2) The equivalent Front-of-Wave is the maximum discharge voltage for a 10kA impulse current wave which produces a voltage wave cresting in a 0.5  $\mu$ s
- 3) Based on a switching surge current of 500 amperes for arresters rated 2.55kV MCOV to 84kV MCOV and 1000 amperes for arresters from 88kV MCOV to 174kV MCOV
- \* The catalog number for special MCOV levels would use the following format = ZSP0090-1231-74 and ZSP 0108-1231-88



# ZSP Physical Characteristics and Clearances

Physical Characteristics and Clearances																	
Catalog Number	Figure	kV Rating	MCOV kV	Total Height		Creepage		Minimum Clearances <sup>1</sup>				Weight					
				In	Mm	In	Mm	A		R		Lb	Kg				
								In	Mm	In	Mm						
ZSP0003	1	3	2.55	7.6	192	18.1	461	12	305	6	152	18	8.2				
ZSP0006		6	5.10														
ZSP0009		9	7.65														
ZSP0010		10	8.40	9.2	234	24.1	612			13	330			7	178	21	9.5
ZSP0012		12	10.20														
ZSP0015		15	12.70														
ZSP0018		18	15.30	11	279	30.1	765	14	356	8	203	25	11.3				
ZSP0021		21	17.00														
ZSP0024		24	19.50														
ZSP0027		27	22.00	12.8	325	36.2	920	16	406	10	254			29	13.2		
ZSP0030		30	24.40														
ZSP0033		33	26.70														
ZSP0036		36	29.00	13.6	344	41.3	1048	17	432	11	279	31	14.1				
ZSP0039		39	31.50	14.5	367	42.2	1071	18	457	12	305	33	15				
ZSP0042		42	34.00	16	406	48	1218	19	483	13	330	36	16.3				
ZSP0045		45	36.50	18.1	461	54.4	1382	20	508	14	356	41	18.6				
ZSP0048		48	39.00														
ZSP0054		54	42.00														
ZSP0060		60	48.00	19.6	498	60.2	1528	23	584	17	432	44	20				
ZSP0063		63	51.00														
ZSP0066		66	54.00														
ZSP0072		72	57.00	23.3	591	72.4	1838	25	635	19	483	52	23.6				
ZSP0072-58*		72	58.00														
ZSP0090		90	70.00														
ZSP0090-74*		90	74.00	23.9	607	73	1855	27	686	22	559	53	24				
ZSP0096		96	76.00														
ZSP0108		108	84.00														
ZSP0108-88*		108	88.00	34.7	882	109.6	2783	31	787	25	635	77	34.9				
ZSP0120		120	98.00														
ZSP0120-102*		120	102.00														
ZSP132	132	106.00	44.9	1140	145.4	3694	40	1016	35	889	99	44.9					
ZSP144	144	115.00															
ZSP150	150	121															
ZSP168	168	131.00	45	1144	145.6	3697	42	1067	37	940	100	45.4					
ZSP172	172	140.00	46.3	1175	146.8	3728	46	1168	40	1016	102	46.3					
ZSP180	180	144.00	55.8	1418	182.1	4624	48	1219	43	1092	139	63					
ZSP192	192	152.00	59.8	1519	194.1	4931	64	1626	53	1346	146	66.2					
ZSP198	198	157.00															
ZSP210	210	170															
ZSP216	216	174	63.5	1613	206.4	5243	65	1651	54	1372	154	69.8					
ZSP180	180	144.00	67.2	1706	218.6	5553	67	1702	56	1422	162	73.5					
ZSP192	192	152.00															
ZSP198	198	157.00															
ZSP210	210	170	68.4	1739	219.9	5586	75	1905	63	1600	165	74.8					
ZSP216	216	174	69.1	1755	220.5	5602	76	1930	65	1651	167	75.7					

**Notes:**

1) These minimum clearances are determined by the protective capabilities of the arresters and they are secondary to any other clearance requirement that may exist for specific applications.

\* The catalog number for special MCOV levels would use the following format = ZSP0090-1231-74 and ZSP 0108-1231-88





# ZSP Physical Characteristics and Clearances

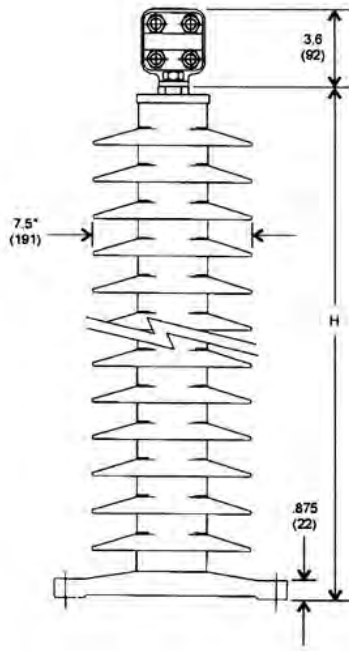


Figure 1

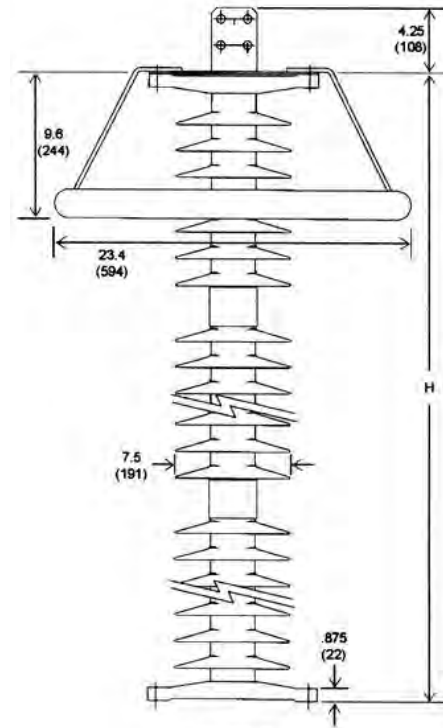
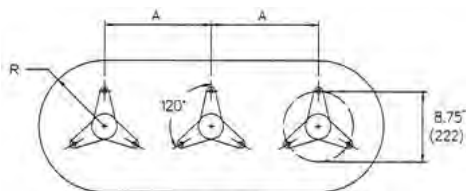
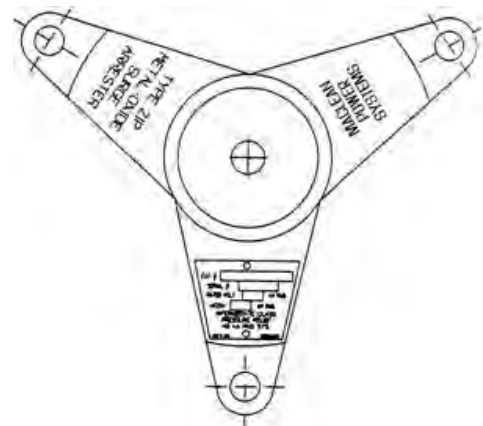


Figure 2



### Three Phase Installation Layout

The holes for mounting are .56" (42 mm) for 1/2" bolts. Mounting bolts and washers are not furnished with arrester.



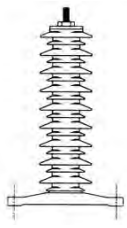
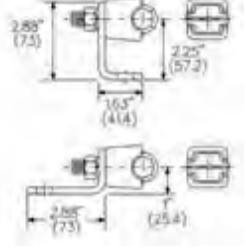
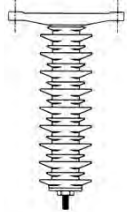
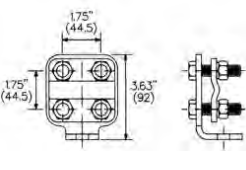
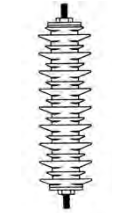
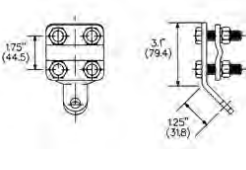

### Nameplate

In addition to the information that is included on the tripod base, a nameplate is attached to the casting to provide all of the required arrester details. The catalog number, the rated voltage, the maximum continuous operating voltage, and the pressure relief current rating are shown. The serial number includes information about the time of manufacture.



# ZSP Station Class Arrester Ordering Information



kV Rating	Configuration	Top & Bottom Connectors
0003 = 3 0006 = 6 0009 = 9 0010 = 10 0012 = 12 0015 = 15 0018 = 18 0021 = 21 0024 = 24	 <p>1 - Stainless steel top cover with tripod base</p>	 <p>1 - Eyebolt with a 90° angle bracket Conductor Range: 0.25" - 0.75" (6.35 - 19.05 mm)</p>
0027 = 27 0030 = 30 0033 = 33 0036 = 36 0039 = 39 0042 = 42 0045 = 45	 <p>2 - Tripod on top with stainless steel bottom cover (Inverted Mounting)</p>	 <p>2 - Four hole NEMA pad with a 90° angle Conductor Range: 0.25" - 1.25" (6.35 - 31.75 mm)</p>
0048 = 48 0054 = 54 0060 = 60 0063 = 63 0066 = 66 0072 = 72 0090 = 90	 <p>3 - Stainless steel covers on both ends</p>	 <p>3 - Four hole NEMA pad with a 45° angle Conductor Range: 0.25" - 1.25" (6.35 - 31.75 mm)</p>
0096 = 96 0108 = 108 0120 = 120 0134 = 132 0144 = 144 0168 = 168 0172 = 172 0180 = 180 0192 = 192 0198 = 198 0210 = 210 0216 = 216	 <p>4 - Tripod on both ends</p>	

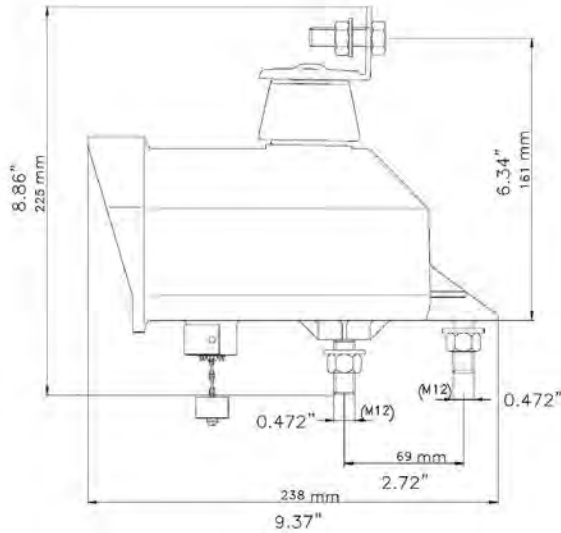
### Special Needs

For special arrester characteristics other than those shown in this catalog, contact your MPS representative

**Example**

108kV rated arrester with:  
 Small top cover & tripod base  
 Top - eyebolt with a 90° angle bracket  
 Bottom - Four hole NEMA pad with a 45° angle

**Catalog Number - ZSP0108-1131**



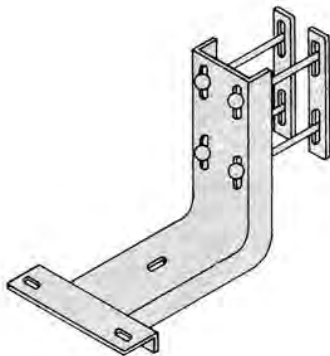
## Discharge Counter Catalog No. 7120B0004H0001

The optional discharge counter records the number of current discharges through the ground lead of the arrester. A five-digit cyclometer records each current discharge. The counter registers impulse discharges of an amplitude of 200 amperes or more. No external power source is required. The discharge counter must be used in conjunction with insulating sub-bases.

A millimeter comes with the discharge counter to provide continuous reading of the total current through the metal oxide valve elements and the leakage current across the external polymer insulation. A 0-30 milliamperes scale is used.

Heavy external contaminants on the polymer housing will increase the level of current registered and may serve as an indication the polymer housing needs washing. Steadily increasing readings with a clean housing may be an indication of potential problems with the arrester metal oxide valve elements.

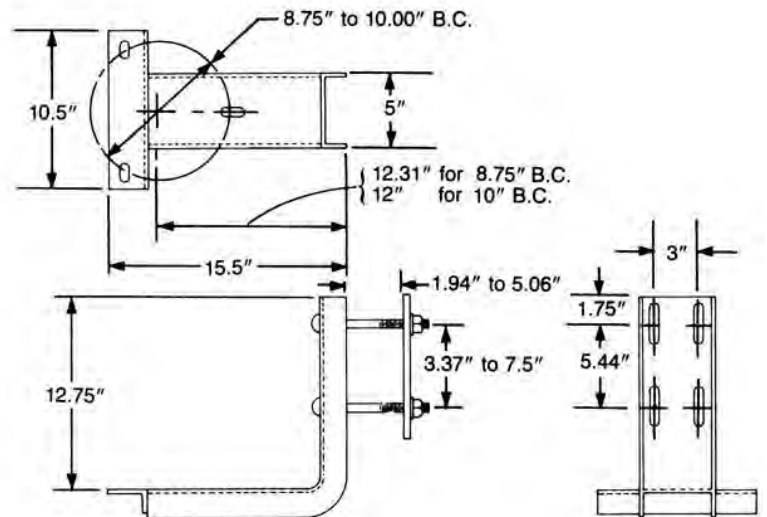
## Mounting Brackets Hot Dip Galvanized



### Single Crossarm Mounting Bracket Catalog No. 7106C0001

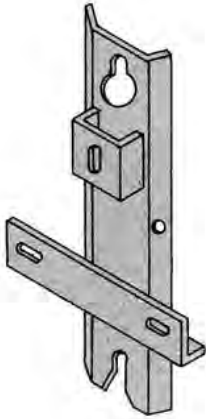
Maximum Arrester Sizes:  
ZIP-96kV; ZSP-108kV

Includes 2 backstraps, 1/2" bolt size hardware and pipe spacers for inverted mounting.





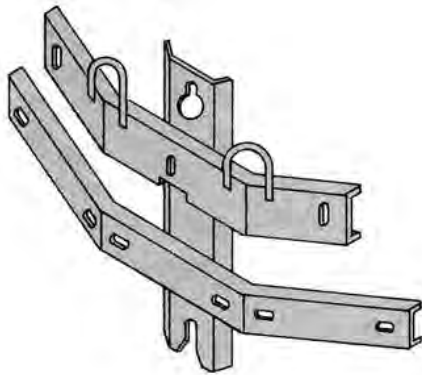
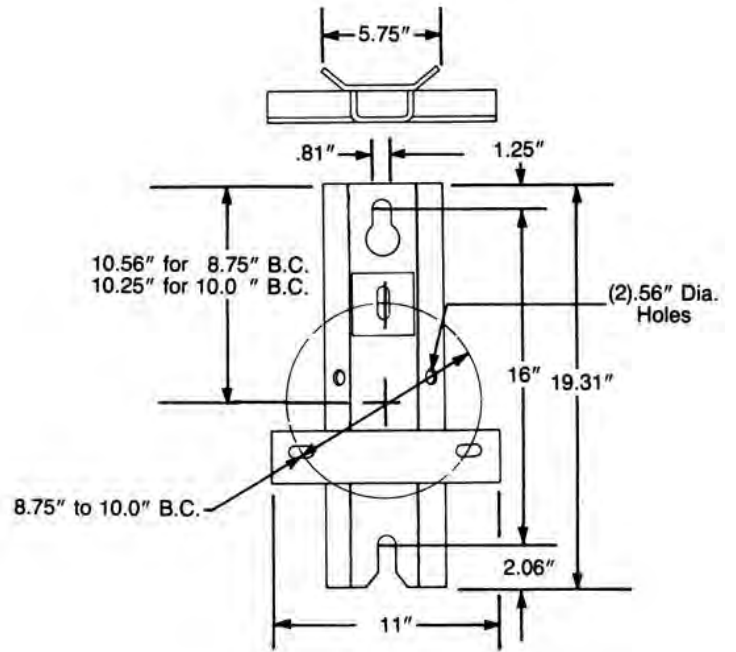
# Station Class Arresters Accessories



**Pole Mounting Bracket  
One Arrester, Horizontal Mounting  
Catalog No. 7102C0003**

Maximum Arrester Sizes:  
ZIP-60kV; ZSP-72kV

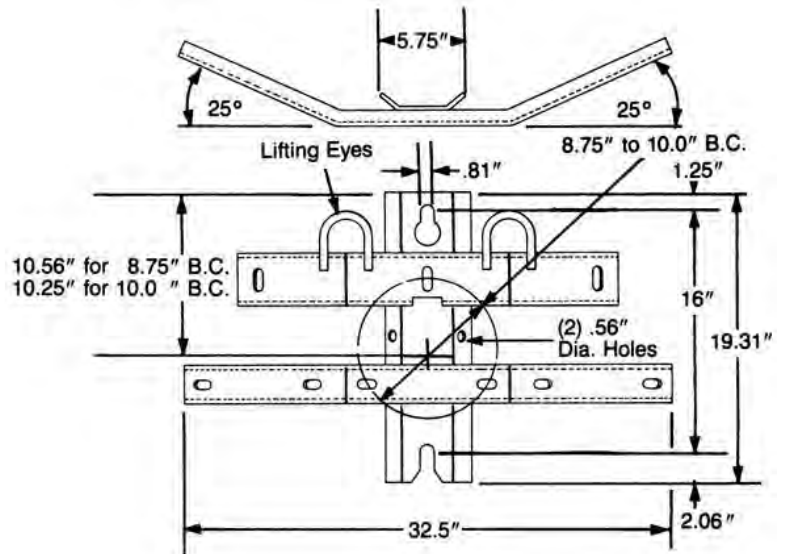
No hardware included.



**Pole Mounting Bracket  
Three Arrester, Horizontal Mounting  
Catalog No. 7102D0002**

Maximum Arrester Sizes:  
ZIP-60kV; ZSP-72kV

No hardware included.





# Transmission Line Arrester and Assemblies

## Type “ZQPT”/“ZXLA”

Available for System Voltages Up to 161kV

Users of electricity have become more and more demanding over recent years. The quality of the power they receive is critical to their operations. Sensitive electronic equipment cannot tolerate voltage fluctuations and many problems are directed to the utility. The heightened awareness of power quality has brought the issue to all levels of operations, including transmission.



In the area of transmission line power quality, MPS offers the “ZQPT”/“ZXLA” transmission line arrester and arrester insulator assembly. The lightweight construction makes it possible to easily mount arresters on transmission line structures. The arresters provide a preferred path between line and ground, guarding against insulator flashover.

Transmission line surge protection is a solution to troublesome outages and customer dissatisfaction. State-of-the-art protection of transmission lines using polymer MOV arresters provides higher power quality which will improve customer satisfaction.

“ZQPT”/“ZXLA” transmission line arresters and assemblies are available for system voltages up to 161kV. The metal oxide blocks are specially selected and wrapped under compression with a strong fiberglass wrap.

## Application

“ZQPT”/“ZXLA” transmission line arresters and assemblies are applied to:

- Improve power quality and overall line performance
- Supplement shield wire protection
- Provide protection for lines without a shield wire
- Create more space on structures by eliminating the shield wires
- Protect both new construction and retrofit

The factors that impact transmission line lightning performance include the following: The amount of lightning activity in a given area per year, the stroke magnitude and the wave shape of the lightning, the tower height and the amount of nearby natural shielding from trees or buildings, the tower footing resistance, the presence of an overhead shield wire and the shield angle, and the existing line insulation.

When selecting transmission line arresters for specific application, there are several things to keep in mind. The application is usually different for a line with an overhead shield wire than without. The arrester rating should be coordinated with the arresters in the substation. The transmission line arresters should be the same rating or larger so that they do not end up protecting the substation arresters.

The transmission line arresters should be sized by evaluating the line voltage and the line insulation. By using a high MCOV arrester the temporary overvoltage (TOV) capability will be increased and the energy capability will also be greater. With the added lightning exposure that may be expected on a transmission line, it is helpful to have higher capabilities in these categories. Also, higher rated arresters will not experience as much duty because the reference voltage is higher and will not turn on as soon as lower rated units.

## Benefits

Lightning is one of the major causes of power interruption. Currently, shield wires serve as lightning protection for transmission lines.

“ZQPT”/“ZXLA” transmission line arresters and assemblies provide these advantages over the use of shield wire alone:

- Minimize the requirement to lower ground resistance
- Protect against backflash
- Safeguard from induced surges caused by nearby lightning
- Limit effects of switching surges
- Install easily and economically
- Allow for reduction of structure BIL
- Reduce system breaker operations
- Provide protection for isolated problem areas
- Improve overall line performance
- Enhance customer relations





# ZQPT Transmission Line Arresters

Physical Characteristics											
Catalog Number	kV Rating	Width A		Length B		Nominal Strike		Nominal Creepage		Weight	
		In	Mm	In	Mm	In	Mm	In	Mm	Lb	Kg
8155CS036T****	36	4.2	107	19.6	498	20.1	511	55	1397	12	5.5
8155CS039T****	39			23.4	595	24.0	610	65	1651	14	6.4
8155CS045T****	45			27.2	691	27.9	709	76	1931	16	7.3
8155CS054T****	54			40.7	1034	41.9	1065	114	2896	24	10.9
8155CS060T****	60			41.5	1055	41.2	1047			26	11.8
8155CS072T****	72			4.5	115	47.5	1207	47.3	1202	131	3328
8155CS090T****	90	51.2	1301			51.2	1301	141	3582	31	14.1
8155CS096T****	96	55.0	1397			58.1	1476	152	3861	33	15.0
8155CS108T****	108										
8155CS120T****	120										

**Notes:**

\* The asterisks identify the mounting hardware

Electrical Characteristics										
Catalog Number	Voltage Rating (kV-rms)	MCOV (kV-rms)	Max Equip FOW <sup>1</sup> (kV-Crest)	Max Switch Surge <sup>2</sup> (kV-Crest)	Maximum Discharge Voltage (kV-Crest) Using an 8/20 $\mu$ s Current Impulse					
					1.5 kA	3.0 kA	5.0 kA	10 kA	20 kA	40 kA
8155CS036T****	36	29.0	130.2	84.9	95.1	98.5	104.1	115.5	131.3	155.1
8155CS039T****	39	31.5	134.7	87.8	98.4	101.9	107.8	119.5	135.9	160.5
8155CS045T****	45	36.5	156.8	102.2	114.5	118.6	125.4	139	158.1	186.8
8155CS054T****	54	42	195.8	127.7	143	148.1	156.7	173.7	197.5	233.3
8155CS060T****	60	48	217.3	141.7	158.7	164.4	173.9	192.8	219.2	258.9
8155CS072T****	72	57	261.5	170.5	191	197.8	209.2	231.9	263.7	311.5
8155CS090T****	90	70	326	212.6	238.1	246.6	260.8	289.1	328.8	388.3
8155CS096T****	96	76	347.5	226.6	253.8	262.9	278	308.2	350.5	414
8155CS108T****	108	88	391.1	255	285.6	295.9	312.9	346.9	394.5	465
8155CS120T****	120	98	434.6	283.5	317.5	328.8	347.7	385.5	438.4	517

**Notes:**

- 1) The equivalent Front-of-Wave is the maximum discharge voltage for a 10kA impulse current wave which produces a voltage wave cresting in a 0.5  $\mu$ s
- 2) Based on a switching surge current of 500 amperes for arresters rated 3kV to 90kV and 1000 amperes for arresters from 108kV to 144kV



# ZXLA Transmission Line Arrester and Insulator Assembly

## Horizontal Transmission Assembly

Line Voltage	ZXLA Catalog No.	Arrester Duty Voltage Rating	Arrester Catalog No.	MCOV	Insulator Catalog No.	Insulator Section Length	Assembly Leakage	Assembly Weight
kV		kV		kV		in (mm)	in (mm)	lbs (kg)
46	ZH4PKG13-036	36	8155CS036T****	29.0	NPKG20XG13S0 OLPK-13-SIL-GB-12	25.2 (640)	42.3 (1074)	38.0 (17.2)
	ZH4PKG13-039	39	8155CS039T****	31.5				
69	ZH4PKG17-054	54	8155CS054T****	42.0	NPKG20XG17S0 OLPK-17-SIL-GB-12	29.2 (742)	54.0 (1372)	45.0 (20.4)
	ZH4PKG17-060	60	8155CS060T****	48.0				
69	ZH4PKG21-054	54	8155CS054T****	42.0	NPKG20XGM21S0 MLPK-21-SIL-GB-12	29.2 (742)	59.4 (1509)	46.0 (20.9)
	ZH4PKG21-060	60	8155CS060T****	48.0				
69	ZH4PKG25-060	60	8155CS060T****	48.0	NPKG20XGM25S0 MLPK-25-SIL-GB-12	31.2 (792)	71.1 (1806)	48.0 (21.8)

\* Consult factory for system voltages greater than 69kV

## Vertical Transmission Assembly

Line Voltage	ZXLA Catalog No.	Arrester Duty Voltage Rating	Arrester Catalog No.	MCOV	Insulator Catalog No.	Insulator Section Length	Assembly Leakage	Assembly Weight
kV		kV		kV		in (mm)	in (mm)	lbs (kg)
46	ZV4PKG13-036	36	8155CS036T****	29.0	NPKV20XG13S0 OLPK-13-SIL-VB-12	23.4 (594)	42.3 (1074)	38.0 (17.2)
	ZV4PKG13-039	39	8155CS039T****	31.5				
69	ZV4PKG17-054	54	8155CS054T****	42.0	NPKV20XG17S0 OLPK-17-SIL-VB-12	27.4 (696)	54.0 (1372)	45.0 (20.4)
	ZV4PKG17-060	60	8155CS060T****	48.0				
69	ZV4PKG21-054	54	8155CS054T****	42.0	NPKV20XGM21S0 MLPK-21-SIL-VB-12	27.4 (696)	59.4 (1509)	46.0 (20.9)
	ZV4PKG21-060	60	8155CS060T****	48.0				
69	ZV4PKG25-060	60	8155CS060T****	48.0	NPKV20XGM25S0 MLPK-25-SIL-VB-12	31.4 (798)	71.1 (1806)	48.0 (21.8)

\* Consult factory for system voltages greater than 69kV

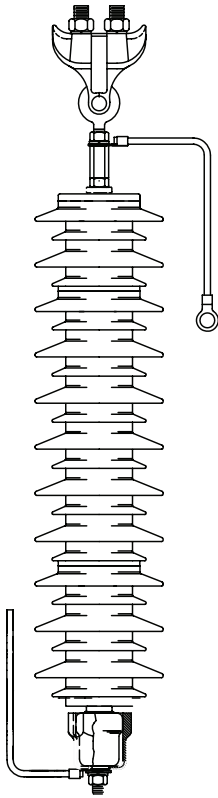
## Deadend Transmission Assembly

Line Voltage	ZXLA Catalog No.	Arrester Duty Voltage Rating	Arrester Catalog No.	MCOV	Insulator Catalog No.	Insulator Section Length	Assembly Leakage	Total Weight (Est)
kV		kV		kV		in (mm)	in (mm)	lbs (kg)
46	ZD148035MX01-039	39	8155CS039T****	31.5	S148035MX01	35.4 [899]	60.8 [1544]	27.3 [12.4]
69	ZD148035MX01-054	54	8155CS054T****	42.0	S148035MX01	35.4 [899]	60.8 [1544]	39.3 [17.8]
	ZD148035MX01-060	60	8155CS060T****	48.0				
	ZD148035MX01-072	72	8155CS072T****	57.0				
115	ZD148035MX01-090	90	8155CS090T****	70.0	S148054MX01	54.3 [1379]	109.2 [2774]	45.6 [20.7]
138	ZD148035MX01-108	108	8155CS0108T****	48.0	S148065MX01	65.3 [1659]	137.4 [3490]	57.1 [25.9]
	ZD148035MX01-132	132	8155CS0132T****	106.0				

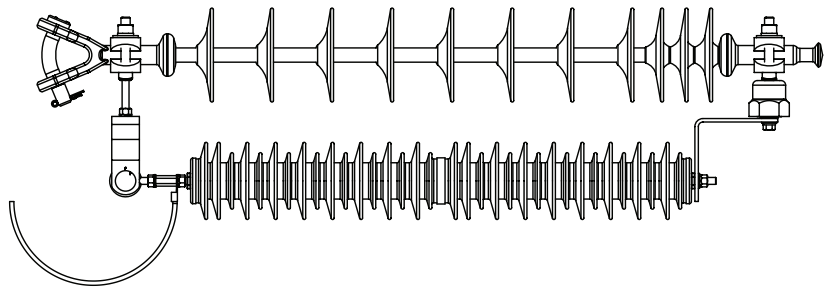
\* Consult factory for system voltages greater than 138 kV



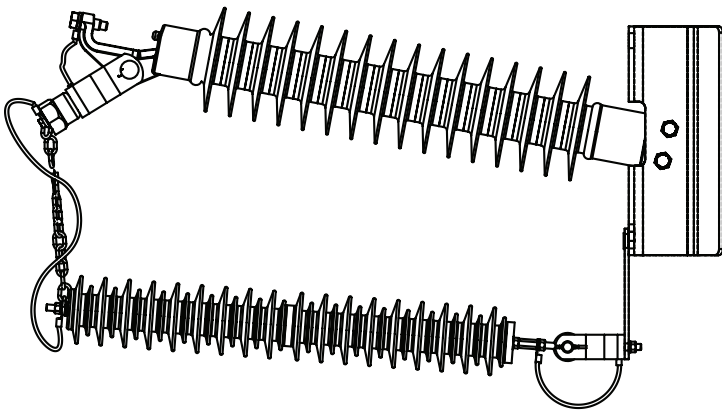
# Transmission Line Protection Configurations



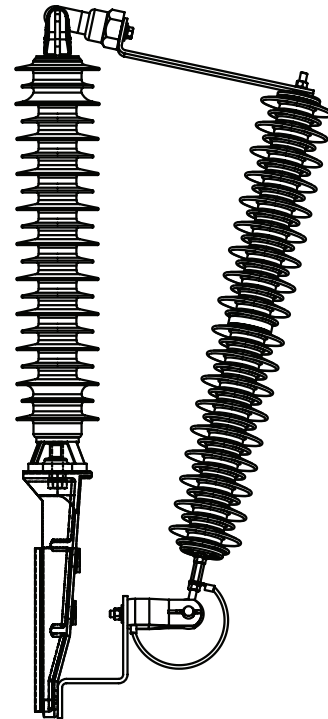
Suspension Configuration



Deadend Configuration



Horizontal Configuration



Vertical Configuration



## Surge Tec® Secondary Arresters



Electricity users, from the homeowner to big business, are more interested today in the quality of the power they receive than in the past, and with good reason. Advances in technology have introduced new electronic equipment and appliances that are more susceptible to damage by power surges. Replacing or repairing damaged equipment is inconvenient and can be costly.

Lightning or an interruption in the power line can generate a power surge. These high energy surges can enter a home or building through the electric service entrance. Once the surge enters the building, there is a possibility that high voltages resulting from the surge current will damage electrical wiring or equipment. Surge Tec® arresters are designed to limit surge voltages by discharging (bypassing) surge current to ground.

Individuals should assess their risk by evaluating the potential impact that a power surge may have on their property. In many cases, the cost of protection is relatively inexpensive compared to the possible loss. The Surge Tec® arrester is designed to provide brute force protection against surges at the service entrance, where protection is needed the most. The family of Surge Tec® arresters provides an excellent first line of defense for any critical electrical service, whether it is in a home, business or industrial applications.

### Surge Arrester Application

MPS' Surge Tec® arresters are designed for service entrance installations. The arresters are designed for repeated operation and continuous protection.

Surge arresters provide the path of least resistance to ground for surges on a system. THE ARRESTERS SHOULD BE INSTALLED BY A LICENSED ELECTRICIAN. To provide the best protection, the lead wires should be kept as short as possible. When installed properly, they will divert lightning surges to ground very quickly. Surge Tec® arresters offer the first line of defense for the entire electrical service and protect wiring, major appliances, pumps, and heating/air conditioning equipment. For added protection to computers, MPS recommends plug-in-strip type of device with lower clamping voltages as a second line of defense. This type of coordination provides excellent surge protection for the entire electric service.

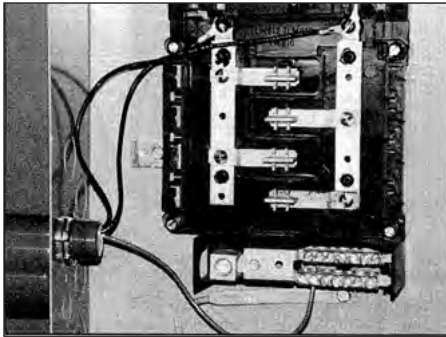
### Features

Surge Tec® arresters incorporate special features that make them stand above other Secondary Arresters and Transient Voltage Surge Suppressors (TVSS). These arresters use a patented (#5,502,612) fault withstand design along with replacement indication. The arresters are available in 175 volt, 480 volt and 650 volt AC ratings for application on system voltages below 650 volts phase to ground and operate at frequencies between 48 and 62 Hz. The units come with 18 inch, #14 AWG solid copper wire leads and are designed to be mounted outdoors or indoors.

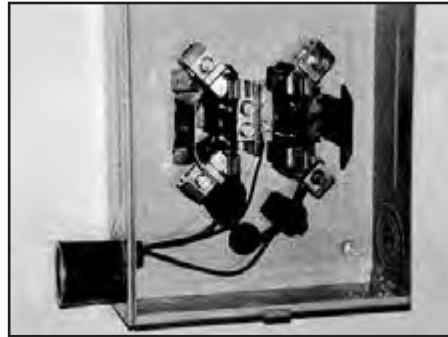
- **METAL OXIDE VARISTORS**—Surge Tec® arresters use metal oxide varistors (MOV). This takes advantage of our experience with metal oxide production for the utility industry. The arresters meet ANSI/IEEE C62.11-1993 for secondary arresters. In addition, they have passed a 5kA Duty Cycle test. They provide high speed response and excellent energy capability for today's critical electric loads.
- **REPLACEMENT INDICATION**—A visual indication on the front label permits routine checks of the arrester's operational status. Indication windows on the label turn black if the arrester has faulted. The arrester should be replaced when any area of any window turns black.
- **FAULT WITHSTAND CAPABILITY**—The Surge Tec® secondary arresters have a patented fault withstand design. This unique design has been tested at high current failure modes to verify its ability to withstand a failure without a violent fracture of the housing. Fault current is the full available system current that the device conducts in the event it is short circuited by conducting a surge beyond the designed capability. This provides significant advantages in the area of secondary voltage protection. There currently is not a standard requirement or test specification for fault withstand capability of secondary arresters. The Surge Tec® arresters were tested by failing them with an overvoltage and then applying fault currents of 4kA and 10kA. The arresters achieved the fault withstand capability of 10kA rms without the use of, or the requirement for, any external fusing.
- **COST EFFECTIVE**—The Surge Tec® arresters are very inexpensive compared to potential equipment damage.



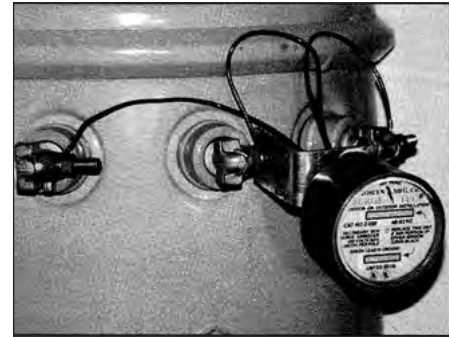
# Surge Tec® Physical and Electrical Characteristics



**Knockout Mounting**  
Z2-175-0



**Meterbase Mounting**  
with insulating piercing connector



**Transformer Mounting**  
Z2-480-4C  
Z2-650-4C  
(for 3/8" hardware)

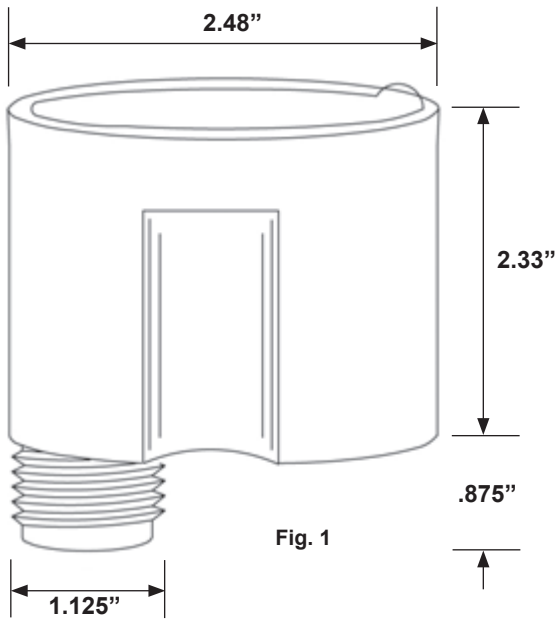


Fig. 1

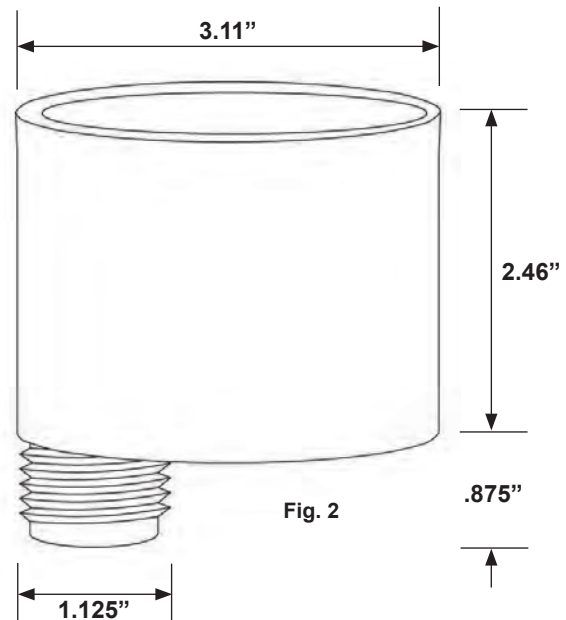


Fig. 2

## Physical and Electrical Characteristics

Catalog No.	Voltage Rating MCOV	Poles	Weight Oz (Gram)	Figure	Energy Capability (Joules/Phase)	Response Time (nsec)	Front-of-Wave Protection Level (kV-Crest)	Max. Discharge Voltage Clamping Using an 8/20 μsec Current Wave (units-kV)		
								1.5kA	5.0kA	10kA
Z1-175-0	175	1	14 (435)	1	427	<5	1.21	0.75	0.95	1.27
Z2-175-0		2	15 (466)							
Z3-175-0		3	18 (560)	2						

\*Add an "A" suffix to obtain the mounting bracket (e.g. Z1-175-0A)

Z1-480-0	480	1	15 (466)	1	742	<5	1.90	1.42	1.76	2.16
Z2-480-0		2	19 (590)							
Z3-480-0		3	20 (622)							

\*Add an "A" suffix to obtain the mounting bracket (e.g. Z1-480-0A)

Z1-650-0	650	1	19 (590)	1	919	<5	2.48	2.01	2.44	2.55
Z2-650-0		2	20 (622)							
Z3-650-0		3	21 (653)							

\*Add an "A" suffix to obtain the mounting bracket (e.g. Z1-650-0A)

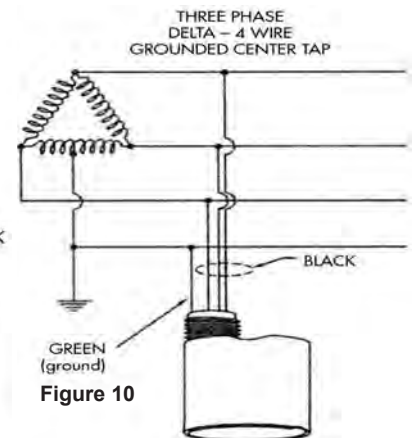
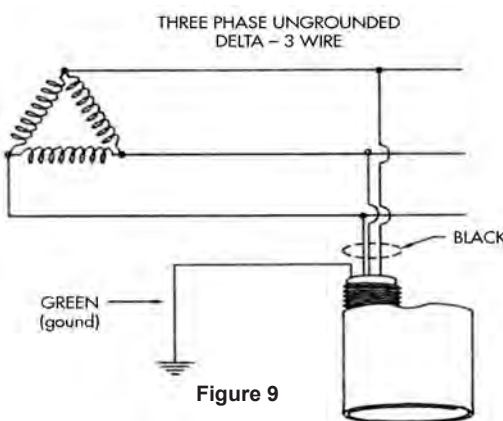
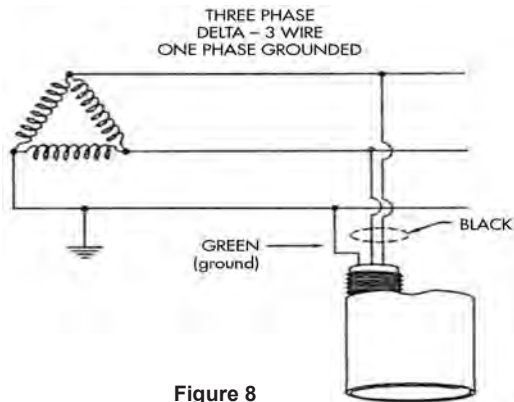
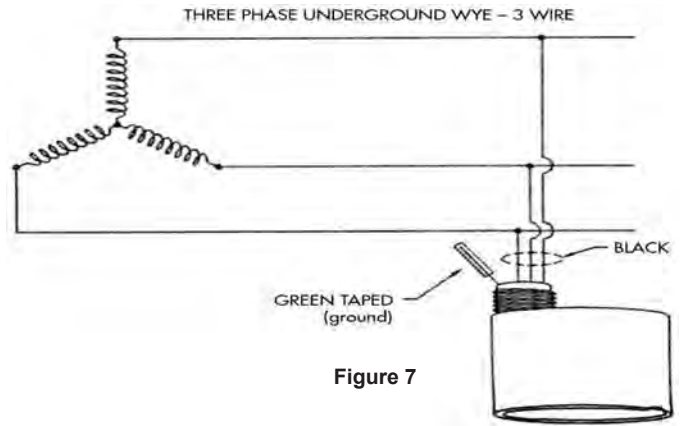
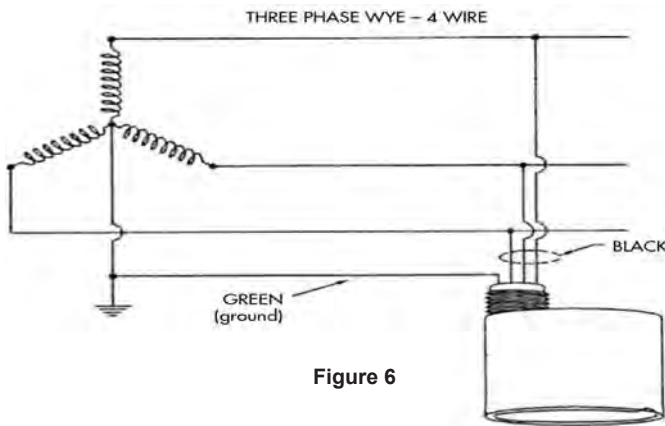
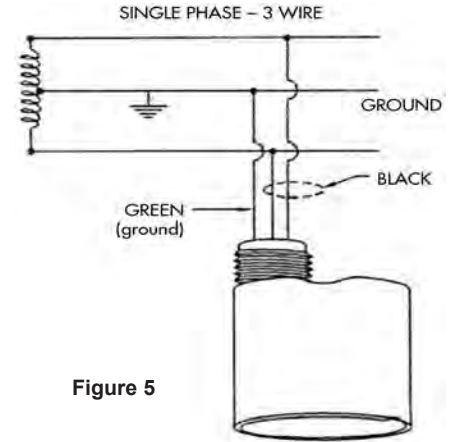
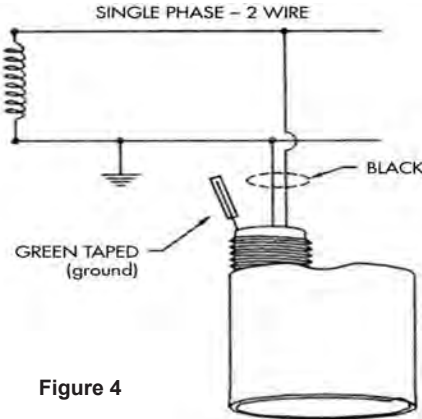
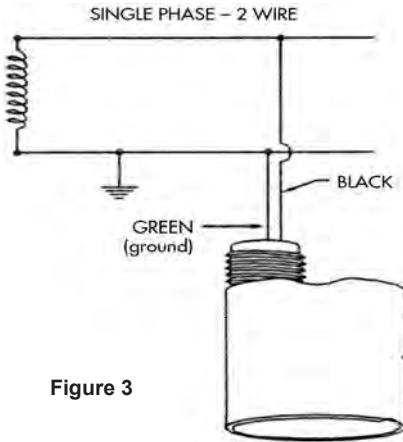




# Surge Tec® Typical Wiring Connections

Maximum Phase-Phase/Phase-Ground Voltages									
Figure No.	Z1-175	Z2-175	Z3-175	Z1-480	Z2-480	Z3-480	Z1-650	Z2-650	Z3-650
3	175/NA			480/NA			650/NA		
4		350/NA			960/NA			1300/NA	
5		350/175			960/480			1300/650	
6			303/175			831/480			1125/650
7									
8		175			480			650	
9			175/101			480/277			650/375
10									

For severe duty applications, select arrester with next highest voltage rating.





# Surge Tec® Catalog Numbering System

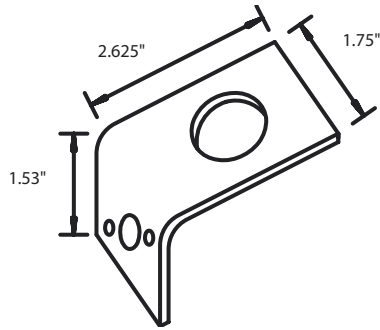
<b>Z</b>	<b>2</b>	<b>-</b>	<b>175</b>	<b>-</b>	<b>0</b>	<b>A</b>
	Number of Poles		Max. Voltage per Pole (MCOV)		Lead Wire Length (in/mm)	Mounting Bracket/Hardware Options

1 - One pole  
2 - Two poles  
3 - Three poles

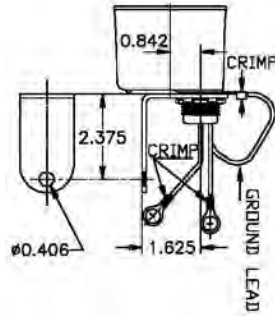
175 - 175 volt  
480 - 480 volt  
650 - 650 volt

0 - 18"/457  
1 - 24"/610  
2 - 36"/914

A - Aluminum 'A' Bracket  
C - Aluminum 'C' Bracket  
1" Ring Terminals - Ground 3/8" Ring Terminals - Line Connections



'A' Bracket  
Part No. 8340903



Option 'C'



Catalog Number	Description	Page
7102C0003	Pole Mounting Bracket; One Arrester, Horizontal Mounting	AR-26
7102D0002	Pole Mounting Bracket; Three Arrester, Horizontal Mounting	AR-26
7106C0001	Single Crossarm Mounting Bracket	AR-25
712B0004H0001	Discharge Counter	AR-25
Z1-175	Surge Tec®	AR-31 - 34
Z1-480	Surge Tec®	AR-31 - 34
Z1-650	Surge Tec®	AR-31 - 34
Z2-175	Surge Tec®	AR-31 - 34
Z2-480	Surge Tec®	AR-31 - 34
Z2-650	Surge Tec®	AR-31 - 34
Z3-175	Surge Tec®	AR-31 - 34
Z3-480	Surge Tec®	AR-31 - 34
Z3-650	Surge Tec®	AR-31 - 34
<b>ZE Series</b>	ZE Elbow Distribution Arresters	AR-12 - 13
<b>ZHP Series</b>	Zforce ZHP™ (10kA Heavy Duty Polymer)	AR-8
<b>ZIP Series</b>	ZIP Intermediate Class Surge Arresters	AR-14 - 19
<b>ZJP Series</b>	ZJP Intermediate Class Surge Arresters	AR-14 - 19
<b>ZNP Series</b>	Zforce™ ZNP (5kA Normal Duty Polymer)	AR-8
<b>ZQPT Series</b>	ZQPT Transmission Line Arresters	AR-27 - 28
<b>ZRP Series</b>	ZRP™ (10kA Riser Pole Polymer)	AR-9
<b>ZSP Series</b>	Station Class Arresters	AR-20 - 24
<b>ZXLA Series</b>	ZXLA Transmission Line Arrester and Insulator Assembly	AR-27 - 29



# Conductor Hardware Catalog



MacLean Power Systems offers a broad range of Conductor Hardware to meet the needs of the power utility and telecommunication industries. Manufactured domestically in our Franklin Park, Illinois and Birmingham, Alabama plants, our Conductor Hardware products include all connectors, clamps and fittings for the overhead distribution and transmission utility systems as well as telephone and CATV lines. These products have been time-tested to provide the highest quality with best in class reliability, outstanding customer service and proven performance during emergencies.

MPS Conductor Hardware is manufactured to applicable ANSI, ASTM or IEC standards and includes high quality current carrying aluminum and copper for products that splice, deadend or support conductor and high strength steel forgings and ductile iron for products that connect to the pole or tower. MacLean Power Systems products require no special tools for installation. Our expertise in EHV applications and installations has driven design optimization for part consolidation, corona free design and the ability for working the line hot.

MacLean Power Systems provides complete hardware assemblies or sets, with or without polymer insulators, to connect the conductor(s) to the tower for all transmission insulation applications, including corona free assemblies for EHV applications. Each hardware set is engineered to properly support the conductor mechanically and electrically, including properly mating hardware and insulator for fit and strength, and can be ordered using a single catalog number for each design type. For more information, please contact your MPS Sales Representatives.

MPS offers a wide variety of connectors, clamps, and fittings for the power utility and telecommunication industries.

Systems maintains a dedicated storm stock in centrally located domestic shipping facilities. In addition, highly efficient domestic cellular manufacturing results in fast turnaround on these products when existing utility and distributor stock are depleted. Our commitment to customer service means that MacLean Power Systems works around the clock until service is restored.

Conductor Hardware is a critical need during the summer and winter months because they are required for emergency restoration of distribution and transmission lines. MacLean Power

MPS has been a proven storm emergency product manufacturer to the utility market. The MPS commitment to domestic manufacturing means that we will continue to be a valuable supplier to the utility market in the future for storm repair and everyday requirements.

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# MacLean Power Systems

Please note that because MacLean Power Systems follows a policy of continuous product improvement, we reserve the right to change specifications and drawings at any time without notice.



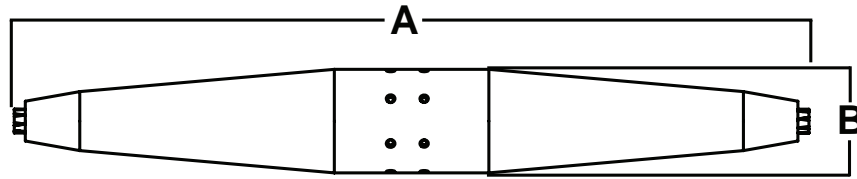




Strandlinks® are used for splicing applications with overhead or down guy wire.

**Features**

- Rated to hold a minimum of 90% of RBS of the strand used
- “Universal Grades” are recommended for use with Alumoweld, EHS, aluminized and galvanized steel
- “All Grades” are recommended for use on common grade, Siemens-Martin, high strength utility grade, galvanized and aluminized steel strand

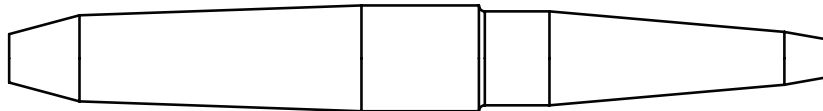


**Universal Grade**

Catalog Number	Primary Strand Application	Range (In)	A	B
5039	3/16"	.145-.215	7.50	1.03
5040	1/4"	.215-.270	7.62	1.13
5041	5/16"	.270-.315	9.28	1.26
5042	3/8"	.325-.392	10.62	1.45
5043	7/16"	.392-.455	10.59	1.59
5044	1/2"	.455-.520	10.75	1.70

**All Grade**

Catalog Number	Primary Strand Application	Range (In)	A	B
4999	3/16"	.185-.193	5.10	0.70
5000	1/4"	.240-.253	6.40	0.90
5001	5/16"	.310-.335	7.25	1.04
5002	3/8"	.360-.405	8.00	1.25



**Reducers**

Catalog Number	Primary Strand Application	Range Large End (In)	Range Small End (In)
5086	1/4" x 3/16"	.215-.270	.145-.215
5087	5/16" x 1/4"	.270-.315	.215-.270
5022	3/8" x 5/16"	.360-.450	.310-.335
5023	7/16" x 3/8"	.410-.455	.360-.405



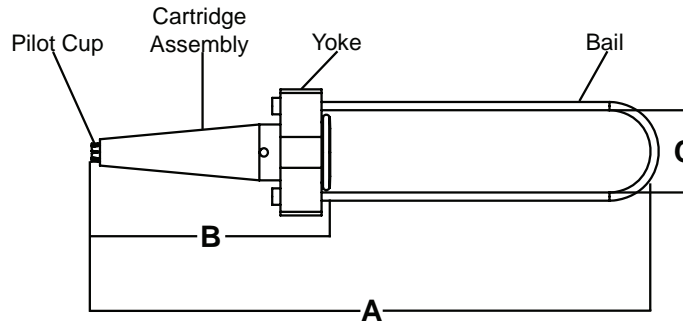
# Strandvise®



Strandvises® are used for deadend applications with overhead or down guy wire.

### Features

- Rated to hold a minimum of 90% of RBS of the strand used
- Color indicator for easy identification
- "Universal Grades" are recommended for use with Alumoweld, EHS, aluminized and galvanized steel
- "All Grades" are recommended for use on common grade, Siemens-Martin, high strength utility grade, galvanized and aluminized steel strand



### 3/16" Universal Grade Strand - Red

Wire Range: .145-.215				
Catalog Number	A	B	C	Bail Type
5199	10.12	4.66	1.63	A
5255	12.75	4.66	2.75	E
5261	22.31	4.66	2.75	E



### 3/8" Universal Grade Strand - Orange

Wire Range: .325-.392				
Catalog Number	A	B	C	Bail Type
5202	12.88	6.47	1.63	A
5252	15.12	6.47	2.25	B
5202L	18.00	6.47	2.00	C
5264	25.00	6.47	2.75	E
5270	31.00	6.47	2.75	E

### 1/4" Universal Grade Strand - Yellow

Wire Range: .215-.270				
Catalog Number	A	B	C	Bail Type
5200	10.38	4.88	1.63	A
5250	13.87	4.88	2.25	B
5200L	13.87	4.88	1.63	C
5262	22.62	4.88	2.75	E
5268	28.63	4.88	2.75	E

### 7/16" Universal Grade Strand - Green

Wire Range: .392-.455				
Catalog Number	A	B	C	Bail Type
5203	14.75	6.72	2.06	A
5253-6	17.25	6.72	2.75	D
5203L	21.00	6.72	2.00	C



### 5/16" Universal Grade Strand - Black

Wire Range: .270-.315				
Catalog Number	A	B	C	Bail Type
5201	10.69	5.38	1.63	A
5251	14.00	5.38	2.25	B
5201L	15.75	5.38	1.63	C
5257	14.06	5.38	2.75	E
5263	23.44	5.38	2.75	E
5269	29.69	5.38	2.75	E

### 1/2" Universal Grade Strand - Blue

Wire Range: .455-.520				
Catalog Number	A	B	C	Bail Type
5204	16.31	7.09	2.06	A
5254	17.50	7.09	2.25	B
5254-6	17.38	7.09	2.75	D
5204L	20.50	7.09	2.00	C



### 3/16" All Grade Strand - Red

Wire Range: .185-.193				
Catalog Number	A	B	C	Bail Type
5099	8.06	2.97	1.63	A

### 5/16" All Grade Strand - Black

Wire Range: .310-.335				
Catalog Number	A	B	C	Bail Type
5101	9.88	4.37	1.63	A
5151	13.10	4.37	2.25	B
5151-6	13.26	4.37	2.75	D



### 1/4" All Grade Strand - Yellow

Wire Range: .240-.253				
Catalog Number	A	B	C	Bail Type
5100	9.56	3.94	1.63	A
5150	12.82	3.94	2.25	B
5100L	13.10	3.94	1.63	C

### 3/8" All Grade Strand - Orange

Wire Range: .360-.405				
Catalog Number	A	B	C	Bail Type
5102	11.88	5.00	1.63	A
5152	13.82	5.00	2.25	B
5152-6	13.50	5.00	2.75	D



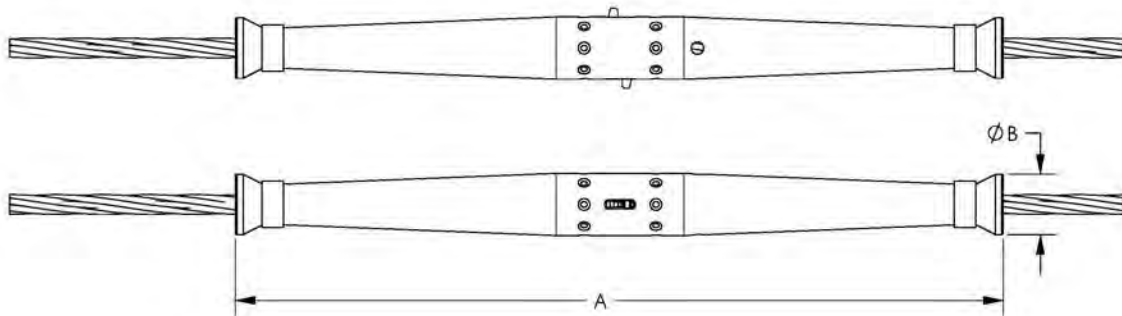
# ACSR VIP Splice



VIP - Visual Indicator Projection automatic splices are used on ACSR, AAC, and AAAC conductor

### Features

- Pop up tab to verify proper insertion
- 2 additional drainage holes
- Stainless steel spring and pilot cup
- Rated to hold a minimum of 95% of RBS of the strand used
- ANSI C119.4 Full Tension Class A connector
- Factory installed inhibitor
- Color coded strand guide for easy identification



Catalog Number	ACSR ASTM-B232	AAAC ASTM-B399	AAC ASTM-B231	A	B	Strand Color Guide	Conductor Diameter Range
7651-VIP	#4	#4	#4	10.0	0.92	Orange	0.229 - 0.265
7652AP-VIP	#2 & #4	#2 & #4	#2 & #4	12.5	1.01	Red/Orange	0.229 - 0.340
7653-VIP	1/0	1/0	1/0	15.25	1.20	Yellow	0.365 - 0.425
7654AP-VIP	1/0 & 2/0	1/0 & 2/0	1/0 & 2/0	16.0	1.27	Gray/Yellow	0.365 - 0.475
7656AP-VIP	3/0 & 4/0	3/0 & 4/0	3/0 & 4/0	17.25	1.56	Pink/Black	0.502 - 0.585
7658AP-VIP	266.8 - 18/1 336.4 - 18/1	266.8 & 336.4	266.8, 366.4, & 397.5	21.5	1.85	Green/Brown	0.580 - 0.724
7659-VIP	397.1 - 18/1 477 - 18/1	397.5 & 477	477 & 556.5	23.5	2.06	Aqua	0.740 - 0.856

### Notes:

- 1) Tension representing a minimum of 15% of the rated breaking strength of the conductor is recommended to assure a permanent low resistance electrical connection.



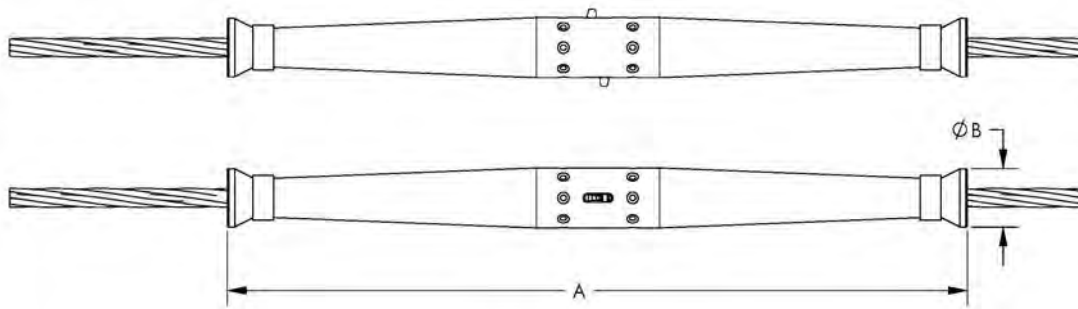
# ACSR CRS Splice



CRS - Corrosive Resistant Splice automatic splices are used on ACSR, AAC, and AAAC conductor

### Features

- Pop up tab to verify proper insertion
- Stainless steel spring and pilot cup
- Rated to hold a minimum of 95% of RBS of the strand used
- ANSI C119.4 Full Tension Class A connector
- Factory installed inhibitor, with 4x the life of existing inhibitor
- Color coded strand guide for easy identification



Catalog Number	ACSR ASTM-B232	AAAC ASTM-B399	AAC ASTM-B231	A	B	Strand Color Guide	Conductor Diameter Range
7651-CRS	#4	#4	#4	10.0	0.92	Orange	0.229 - 0.265
7652AP-CRS	#2 & #4	#2 & #4	#2 & #4	12.5	1.01	Red/Orange	0.229 - 0.340
7653-CRS	1/0	1/0	1/0	15.25	1.20	Yellow	0.365 - 0.425
7654AP-CRS	1/0 & 2/0	1/0 & 2/0	1/0 & 2/0	16.0	1.27	Gray/Yellow	0.365 - 0.475
7656AP-CRS	3/0 & 4/0	3/0 & 4/0	3/0 & 4/0	17.25	1.56	Pink/Black	0.502 - 0.585
7658AP-CRS	266.8 - 18/1 336.4 - 18/1	266.8 & 336.4	266.8, 366.4, & 397.5	21.5	1.85	Green/Brown	0.580 - 0.724
7659-CRS	397.1 - 18/1 477 - 18/1	397.5 & 477	477 & 556.5	23.5	2.06	Aqua	0.740 - 0.856

**Notes:**

1) Tension representing a minimum of 15% of the rated breaking strength of the conductor is recommended to assure a permanent low resistance electrical connection.



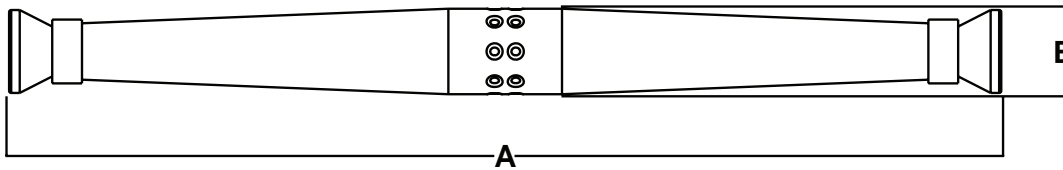
# ACSR ConductRlink™



ACSR ConductRlink™ automatic splices are used on ACSR, AAC, and AAAC conductor.

### Features

- Rated to hold a minimum of 95% of RBS of the strand used
- ANSI C119.4 Full Tension Class A connector
- Factory installed inhibitor
- Color coded strand guide for easy identification



Catalog Number	ACSR ASTM-B232	AAAC ASTM-B399	AAC ASTM-B231	A	B	Strand Color Guide	Conductor Diameter Range
7651	#4	#4	#4	9.12	0.92	Orange	.229-.265
7652AP	#2 & #4	#2 & #4	#2 & #4	11.66	1.01	Red/Orange	.229-.340
7653	1/0	1/0	1/0 & 2/0	14.28	1.20	Yellow	.365-.425
7654AP	1/0 & 2/0	1/0 & 2/0	1/0, 2/0 & 3/0	15.00	1.27	Gray/Yellow	.365-.475
7656AP	3/0 & 4/0	3/0 & 4/0	4/0	16.00	1.56	Pink/Black	.502-.585
7658AP	266.8-18/1 336.4-18/1	266.8 & 336.4	266.8, 366.4 & 397.5	20.00	1.85	Green/Brown	.580-.724
7659	397.1-18/1 477 - 18/1	397.5 & 477	477 & 556.5	21.76	2.06	Aqua	.740-.856
AL55795	-	636	795	18.75	2.19	Orange	.991-1.03

### Notes:

Tension representing a minimum of 15% of the rated breaking strength of the conductor is recommended to assure a permanent low resistance electrical connection



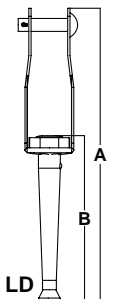
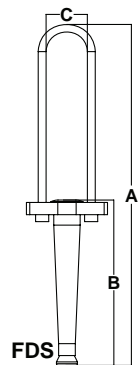
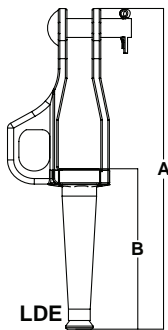
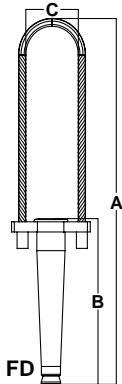
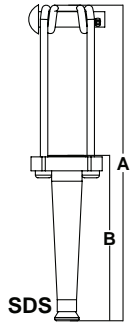
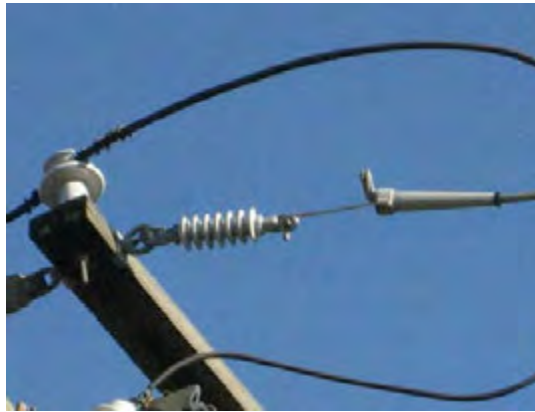


# ACSR ConductRvise™

ACSR ConductRvise™ automatic deadends are used on ACSR, AAC, and AAAC conductor.

### Features

- Rated to hold a minimum of 95% of RBS of the strand used
- ANSI C119.4 Full Tension Class A connector
- Factory installed inhibitor



Catalog Number	ACSR ASTM-B232	AAAC ASTM-B399	AAC ASTM-B231	A	B	Strand Color Guide	Conductor Diameter Range
7651 SDS	#4	#4	#4	12.20	6.40	Orange	.229-.265
7651 LD	#4	#4	#4	11.30	6.40		
7651 LDE	#4	#4	#4	12.40	6.40		
7651 FD	#4	#4	#4	14.20	6.40		
7651 FDS	#4	#4	#4	13.20	6.40		
7652AP SDS	#2 & #4	#2 & #4	#2 & #4	12.03	6.60	Red/Orange	.229-.340
7652AP LD	#2 & #4	#2 & #4	#2 & #4	11.65	6.60		
7652AP LDE	#2 & #4	#2 & #4	#2 & #4	12.15	6.60		
7652AP FD	#2 & #4	#2 & #4	#2 & #4	14.15	6.60		
7652AP FDS	#2 & #4	#2 & #4	#2 & #4	12.90	6.60		
7653 SDS	1/0	1/0	1/0 & 2/0	14.03	7.50	Yellow	.365-.425
7653 LD	1/0	1/0	1/0 & 2/0	13.95	7.50		
7653 FD	1/0	1/0	1/0 & 2/0	14.32	7.50		
7653 FDS	1/0	1/0	1/0 & 2/0	17.20	7.50		
7654AP SDS	1/0 & 2/0	1/0 & 2/0	1/0, 2/0 & 3/0	13.35	7.80	Gray/Yellow	.365-.475
7654AP LD	1/0 & 2/0	1/0 & 2/0	1/0, 2/0 & 3/0	14.27	7.80		
7654AP FD	1/0 & 2/0	1/0 & 2/0	1/0, 2/0 & 3/0	14.64	7.80		
7656AP SDS	3/0 & 4/0	3/0 & 4/0	4/0	19.50	9.00	Pink/Black	.502-.585
7656AP FD	3/0 & 4/0	3/0 & 4/0	4/0	16.62	9.00		
7656AP FDS	3/0 & 4/0	3/0 & 4/0	4/0	17.55	9.00		
7656AP FDSN	3/0 & 4/0	3/0 & 4/0	4/0	17.55	9.00		
7658AP SDS	266.8-18/1 336.4-18/1	266.8 & 336.4	266.8, 366.4 & 397.5	20.00	1.85	Green/Brown	.580-.724
7659 SDS	397.1-18/1 477 - 18/1	397.5 & 477	477 & 556.5	21.76	2.06	Aqua	.740-.856
AL795 SDS	-	636	795	18.75	2.19	Orange	.991-1.03

### Notes:

Tension representing a minimum of 15% of the rated breaking strength of the conductor is recommended to assure a permanent low resistance electrical connection

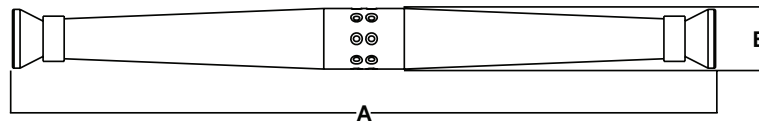


# Aluminum ConductRlink™ and ConductRvise™



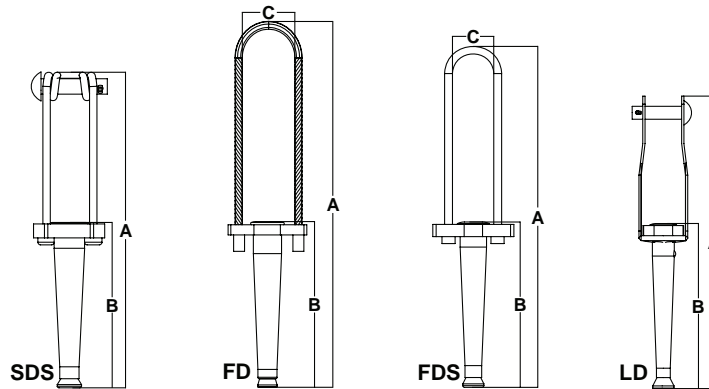
### Features

- Rated to hold a minimum of 95% of RBS of the strand used
- Used on AAC, and AAAC conductor



### Aluminum ConductRlink™ Splices

Catalog Number	AAAC ASTM-B399	AAC ASTM-B231	A	B	Strand Color Guide	Conductor Diameter Range
AL5547	#4	#4	6.50	0.76	-	.225-.250
AL55207	1/0	2/0	7.56	1.08	-	.393-.420
AL55795	636	795	18.75	2.19	Orange	.991-1.03



### Aluminum ConductRvise™ Deadends

Catalog Number	AAAC ASTM-B399	AAC ASTM-B231	A	B	C	Strand Color Guide	Conductor Diameter Range
AL207 LD	2/0	1/0	10.50	4.00	---	-----	.393-.420
AL207 FDN	2/0	1/0	12.50	4.00	2.00	-----	
AL407 LD	3/0	4/0	10.75	4.40	---	-----	3.30
AL407 FDN	3/0	4/0	12.50	4.40	3.30	-----	
AL795 SDS	636	795	20.75	10.25	---	Orange	.991-1.03



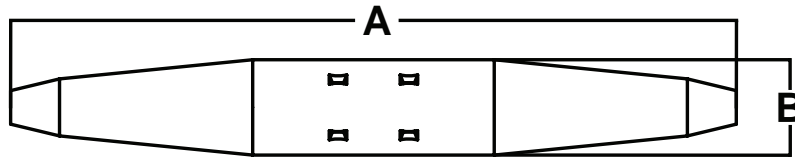
# Copper Automatic Splices



Automatic splices used on copper conductors

### Features

- Single piece brass jaw which simplifies conductor installation and eliminates jaw disengagement
- Center barrier provides a positive indication of full conductor insertion
- Solid copper conductor rated at 90% of the conductor RBS
- Stranded copper conductor rated at 80% of the conductor RBS
- Copperweld conductor rated at 75% of the conductor RBS



### Copper Automatic Splices

Catalog Number	CU Solid ASTM-B258	CU 7-Strand ASTM-B8	Copperweld Strand	A	B	Conductor Diameter Range
81	#8	-	-	3.87	0.54	.120-.135
61	#6	#8	-	3.87	0.54	.146-.168
41	#4	#6	8A	3.87	0.50	.184-.210
47	#3	#4	6A	3.87	0.50	.225-.245
21	#2 & #3	#3	5A	5.37	0.56	.228-.265
27	#1	#2	4A	4.37	0.56	.270-.305
101	1/0	#1	3A	4.37	0.56	.305-.340
107	2/0	1/0	2A	5.80	0.75	.340-.385
207	3/0	2/0	-	5.80	0.75	.398-.420
307	4/0	3/0	-	6.80	1.25	.437-.475
407	-	4/0	-	6.80	1.25	.485-.540

### Copper Reducer Splices

Catalog Number	Large End			Small End			A	B
	CU Solid ASTM-B258	CU 7-Strand ASTM-B8	Copperweld Strand	CU Solid ASTM-B258	CU 7-Strand ASTM-B8	Copperweld Strand		
4161	#4	-	8A	#6	#8	-	3.67	0.50
4761	#3	#4	6A	#6	#8	-	3.67	0.50
4741	#3	#4	6A	#4	#6	8A	3.67	0.50
2141	#2 & #3	#3 & #4	-	#4	#6	8A	5.38	0.56
2747	#1	#2	4A	#3	#4	6A	4.38	0.56
2721	#1	#2	4A	#2 & #3	#3 & #4	5A	5.38	0.56
10141	1/0	#1	2A	#4	#6	8A	4.38	0.56
107101	2/0	1/0	2A	1/0	#1	3A	5.88	0.75
207107	3/0	2/0	-	2/0	1/0	2A	5.88	0.75

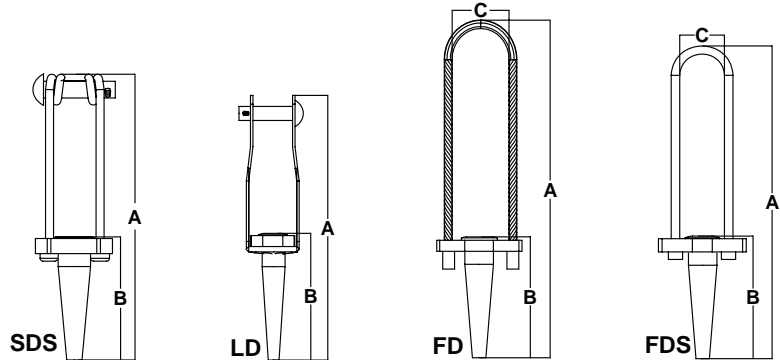


# Copper Automatic Deadends

Automatic deadends used on copper conductors

## Features

- Single piece brass jaw which simplifies conductor installation and eliminates jaw disengagement
- Solid copper conductor rated at 90% of the conductor RBS
- Stranded copper conductor rated at 80% of the conductor RBS
- Copperweld conductor rated at 75% of the conductor RBS



### Conductor Diameter Range: .120-.135

Catalog Number	CU Solid ASTM-B258	CU 7-Strand ASTM-B8	Copperweld Strand	A	B	C
81 LD	#8	-	-	6.87	2.36	-
81 FD	#8	-	-	9.25	2.36	2.00

### Conductor Diameter Range: .146-.168

Catalog Number	CU Solid ASTM-B258	CU 7-Strand ASTM-B8	Copperweld Strand	A	B	C
61 SDS	#6	#8	-	7.00	2.36	-
61 LD	#6	#8	-	6.87	2.36	-
61 FD	#6	#8	-	9.25	2.36	2.00
61 FDN	#6	#8	-	9.25	2.36	2.00
61 FDS	#6	#8	-	9.25	2.36	2.00

### Conductor Diameter Range: .184-.210

Catalog Number	CU Solid ASTM-B258	CU 7-Strand ASTM-B8	Copperweld Strand	A	B	C
41 SDS	#4	#6	8A	7.45	2.40	-
41 LD	#4	#6	8A	6.69	2.40	-
41 FD	#4	#6	8A	9.26	2.40	2.00
41 FDN	#4	#6	8A	6.26	2.40	2.00
41 FDS	#4	#6	8A	7.26	2.40	2.00
41 FDSN	#4	#6	8A	7.26	2.40	2.00

### Conductor Diameter Range: .225-.245

Catalog Number	CU Solid ASTM-B258	CU 7-Strand ASTM-B8	Copperweld Strand	A	B	C
47 SDS	#3	#4	6A	7.45	2.40	-
47 LD	#3	#4	6A	6.69	2.40	-
47 FD	#3	#4	6A	9.26	2.40	2.00
47 FDN	#3	#4	6A	9.26	2.40	2.00
47 FDS	#3	#4	6A	7.26	2.40	2.00

### Conductor Diameter Range: .228-.265

Catalog Number	CU Solid ASTM-B258	CU 7-Strand ASTM-B8	Copperweld Strand	A	B	C
21 SDS	#2 & #3	#3	5A	8.32	2.75	-
21 LD	#2 & #3	#3	5A	8.26	2.75	-
21 FD	#2 & #3	#3	5A	9.90	2.75	2.00
21 FDN	#2 & #3	#3	5A	9.90	2.75	2.00
21 FDS	#2 & #3	#3	5A	7.52	2.75	2.00

### Conductor Diameter Range: .270-.305

Catalog Number	CU Solid ASTM-B258	CU 7-Strand ASTM-B8	Copperweld Strand	A	B	C
27 SDS	#1	#2	4A	8.32	2.75	-
27 LD	#1	#2	4A	8.26	2.75	-
27 FD	#1	#2	4A	9.90	2.75	2.00
27 FDN	#1	#2	4A	9.90	2.75	2.00
27 FDS	#1	#2	4A	7.52	2.75	2.00

### Conductor Diameter Range: .305-.340

Catalog Number	CU Solid ASTM-B258	CU 7-Strand ASTM-B8	Copperweld Strand	A	B	C
101 SDS	1/0	#1	3A	8.32	2.75	-
101 LD	1/0	#1	3A	8.26	2.75	-
101 FD	1/0	#1	3A	9.90	2.75	2.00
101 FDN	1/0	#1	3A	9.90	2.75	2.00

### Conductor Diameter Range: .340-.385

Catalog Number	CU Solid ASTM-B258	CU 7-Strand ASTM-B8	Copperweld Strand	A	B	C
107 SDS	2/0	1/0	2A	8.40	3.40	-
107 LD	2/0	1/0	2A	8.95	3.40	-
107 FD	2/0	1/0	2A	12.52	3.40	2.00
107 FDN	2/0	1/0	2A	12.52	3.40	2.00
107 FDS	2/0	1/0	2A	10.36	3.40	2.31

### Conductor Diameter Range: .398-.420

Catalog Number	CU Solid ASTM-B258	CU 7-Strand ASTM-B8	Copperweld Strand	A	B	C
207 SDS	3/0	2/0	-	8.40	3.40	-
207 LD	3/0	2/0	-	8.95	3.40	-
207 FD	3/0	2/0	-	12.52	3.40	2.00
207 FDN	3/0	2/0	-	12.52	3.40	2.00

### Conductor Diameter Range: .437-.475

Catalog Number	CU Solid ASTM-B258	CU 7-Strand ASTM-B8	Copperweld Strand	A	B	C
307 SDS	4/0	3/0	-	12.00	4.80	-
307 LD	4/0	3/0	-	11.15	4.80	-
307 FDS	4/0	3/0	-	11.63	4.80	2.31

### Conductor Diameter Range: .485-.540

Catalog Number	CU Solid ASTM-B258	CU 7-Strand ASTM-B8	Copperweld Strand	A	B	C
407 SDS	-	4/0	-	12.00	4.80	-
407 LD	-	4/0	-	11.15	4.80	-
407 FD	-	4/0	-	12.46	4.80	2.00
407 FDN	-	4/0	-	12.46	4.80	2.00



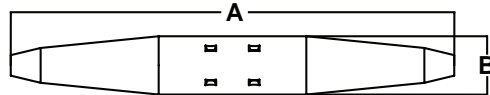
# Wirelink® and Wirevise®



Wirelinks® and Wirevises® are used to splice/deadend galvanized steel messenger mid-span of a service drop.

### Features

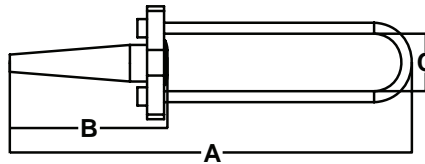
- Minimum holding strength is 90% RBS of wire specified
- Designed to support both ends of self supporting multi-pair drop wire that uses a solid galvanized steel messenger wire that is integrated into the jacket in a figure 8 configuration



### Wirelink®

Catalog Number	A	B	Wire Range	
			In	Mm
5057 5057N	2.94	0.39	.062-.100 16 USSWG 15 USSWG 14 USSWG 13 USSWG	1.40-2.60 16 BWG 15 BWG 14 BWG 13 BWG
5059 5059N	2.94	0.43	.091-.114 13 USSWG 12 USSWG	2.30-2.90 13 BWG 12 BWG
5063 5063N	4.06	0.55	.120-.135 11 USSWG 10 USSWG	3.10-3.50 11 BWG 10 BWG
5039	9.00	1.03	.140-.215 9 USSWG 8 USSWG 7 USSWG 6 USSWG 5 USSWG	3.70-5.50 9 BWG 8 BWG 7 BWG 6 BWG

Notes:  
N = polyolefin covered Wirelink®



### Wirevise®

Catalog Number	A	B	C	Wire Range	
				In	Mm
5056	5.50	1.55	1.60	.062-.100 16 USSWG 15 USSWG 14 USSWG 13 USSWG	1.40-2.60 16 BWG 15 BWG 14 BWG 13 BWG
5058	5.50	1.47	1.60	.091-.114 13 USSWG 12 USSWG	2.30-2.90 13 BWG 12 BWG
5062	7.70	2.46	1.50	.120-.135 11 USSWG 10 USSWG	3.10-3.50 11 BWG 10 BWG
5199	10.20	4.66	1.60	.140-.215 9 USSWG 8 USSWG 7 USSWG 6 USSWG 5 USSWG	3.70-5.50 9 BWG 8 BWG 7 BWG 6 BWG

Notes:  
5056 available in .083 range only as 5056T



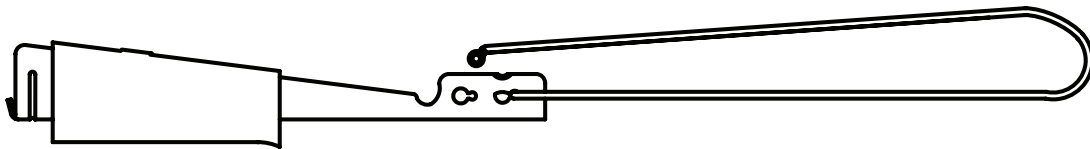
# Wedge Clamps



Wedge clamps are mechanical holding devices used for strain relief in service applications.

### Features

- Wedge clamps are available with a variety of bail lengths and styles as well as with Irridited finish for contaminated areas
- Designed for low tension applications only
- Flexible bails are available and designed for use with hooks and eyes



Catalog Number	Bail Description	ACSR ASTM-B232	AAAC ASTM-B399	AAC ASTM-B231	Conductor Diameter Range	Mechanical Ratings (Lb)
7195	6 1/2" solid stainless steel	#2 - #6	#2 - #6	#1 - #6	.160-.330	1000
7195-I	6 1/2" solid stainless steel with irrilited finish on wedge and shell	#2 - #6	#2 - #6	#1 - #6		
7196	11" solid stainless steel	#2 - #6	#2 - #6	#1 - #6		
7195-F	12" flexible nylon jacket galvanized aircraft strand	#2 - #6	#2 - #6	#1 - #6		
7195-FI	12" flexible nylon jacket galvanized aircraft strand with irrilited finish on wedge and shell	#2 - #6	#2 - #6	#1 - #6		
7195-FL	12" flexible nylon jacket galvanized aircraft strand less ferrule	#2 - #6	#2 - #6	#1 - #6		
7187	6 1/2" solid stainless steel	1/0 - #4	1/0 - #4	2/0 - #2	.250-.414	1200
7187-I	6 1/2" solid stainless steel with irrilited finish on wedge and shell	1/0 - #4	1/0 - #4	2/0 - #2		
7188	11" solid stainless steel	1/0 - #4	1/0 - #4	2/0 - #2		
7187-F	12" flexible nylon jacket galvanized aircraft strand	1/0 - #4	1/0 - #4	2/0 - #2		
7187-FI	12" flexible nylon jacket galvanized aircraft strand with irrilited finish on wedge and shell	1/0 - #4	1/0 - #4	2/0 - #2		
7187-FL	12" flexible nylon jacket galvanized aircraft strand less ferrule	1/0 - #4	1/0 - #4	2/0 - #2		
7197	6 1/2" solid stainless steel	4/0 - 2/0 1/0*	4/0 - 2/0	4/0 - 2/0	.414	1800
7198	11" solid stainless steel	4/0 - 2/0 1/0*	4/0 - 2/0	4/0 - 2/0		
7197-F	12" flexible nylon jacket galvanized aircraft strand	4/0 - 2/0 1/0*	4/0 - 2/0	4/0 - 2/0		
7197-FI	12" flexible nylon jacket galvanized aircraft strand with irrilited finish on wedge and shell	4/0 - 2/0 1/0*	4/0 - 2/0	4/0 - 2/0		
7197-FL	12" flexible nylon jacket galvanized aircraft strand less ferrule	4/0 - 2/0 1/0*	4/0 - 2/0	4/0 - 2/0		

**Notes:**

- 1) Suffix "I" denotes irrilited finish on wedge and shell
- 2) Flexible bails are for use on hooks and small eyes. Solid stainless bails are for use on eye hooks and insulators with diameters larger than 1.5"
- 3) \*\*\* = 1/0 conductor use is 500 lbs maximum
- 4) For other options, consult factory



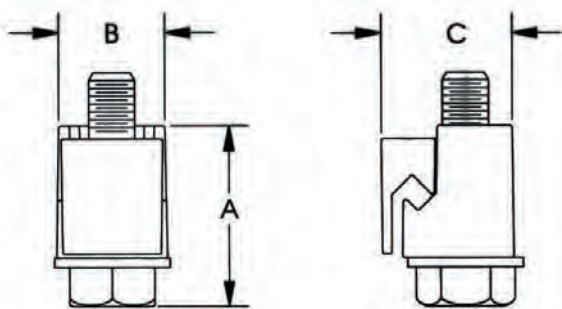


# Bronze Vise Connectors



## Features

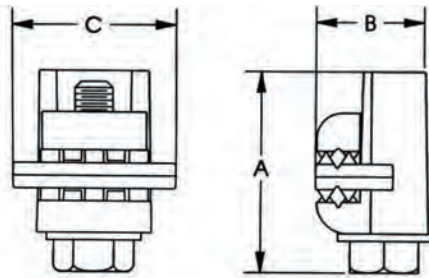
- Interlocking components ensure a long term, vibration proof connection
- One Piece, side opening design eliminates loose parts, cross threading, and eases installation on run conductor
- Wide range allows for minimal inventory
- Easy to install with gloves or hot sticks
- Connectors can be installed on structures, cabinets and enclosures for grounding applications
- Four NEW ground lug designs available



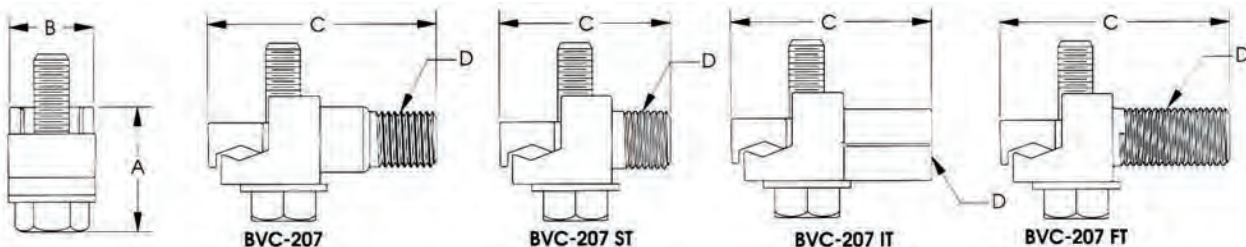
Catalog Number	Conductor Range		A	B	C	Bolt Thread Size	Bolt Hex Head Size
	Max	Min					
BVC-6	#6 STR	#10 SOL	0.88	0.64	0.73	1/4	3/8
BVC-4	#4 STR	#8 SOL	1.13	0.73	0.83	5/16	9/16
BVC-2	#2 SOL	#6 SOL	1.33	0.81	0.93	5/16	9/16
BVC-2S	#2 STR	#5 SOL	1.52	0.79	0.93	5/16	9/16
BVC-20	1/0 STR	#4 SOL	1.72	0.80	1.03	5/16	9/16
BVC-20S	2/0 STR	#3 SOL	1.91	0.94	1.19	3/8	9/16
BVC-40	4/0 STR	1/0 STR	2.14	0.95	1.27	3/8	9/16

### Notes:

For Cable Range - each connector will accept two conductors listed within the range listed, in any combination



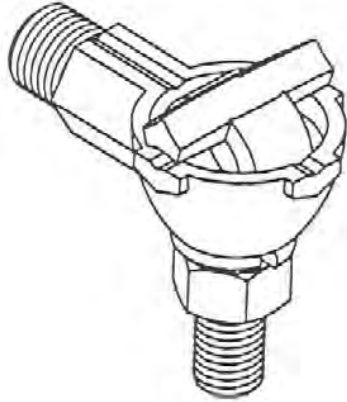
Catalog Number	Diameter		A	B	C	Bolt Thread Size	Bolt Hex Head Size
	Messenger	Ground Tap					
BVC-167P	.146-.312	.146-.312	1.56	0.89	1.27	5/16	9/16



Catalog Number	Conductor Range		A	B	C	D	Bolt Thread Size	Bolt Hex Head Size
	SOL	STR						
BVC-207	#8	1/0	1.02	0.77	2.00	1/2-13	5/16	9/16
BVC-207 IT	#8	1/0	1.02	0.77	1.75	3/8-13	5/16	9/16
BVC-207 ST	#8	1/0	1.02	0.77	1.50	1/2-13	5/16	9/16
BVC-207 FT	#8	1/0	1.02	0.77	2.00	1/2-13	5/16	9/16



# Transformer Tank Ground

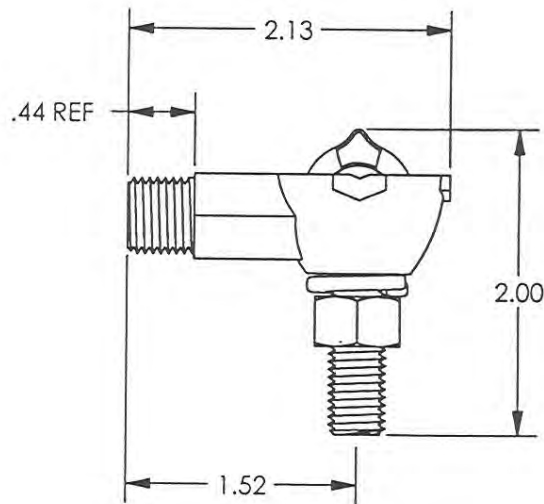


### Features

- Eye bolt rotates to accommodate conductor in either vertical or horizontal direction
- 1/2" - 13 stud fits all standard EEI-NEMA
- No special tools required

### Material

Casting: Bronze alloy  
Eye Bolt: Bronze alloy  
Hardware: Silicon bronze or stainless steel



Catalog Number	Cable Range		Stud Thread Size UNC-2A
	Minimum	Maximum	
TG-820	#8 SOL	2/0 STR	1/2"-13

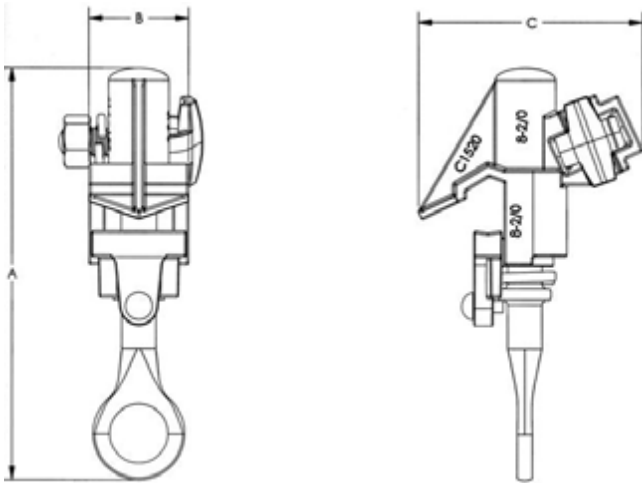


# Hot Line Clamps



## Features

- MPS Hot Line Clamps are live line tools compatible for distribution tap connections
- Bronze alloy and aluminum alloy castings offer high strength, corrosion resistance, and conductor compatibility
- Extended jaw width means excellent conductor contact, reduced joint temperature, minimal conductor cold flow and reduced twisting of the conductor during installation
- Spring loaded feature compensates for cold flow and offsets tightening torque vibrations
- Forged eyebolts provide corrosion free strength and uniformed expansion under loading
- The side positioned tap connection prevents possible corrosion of conductor or clamp on bimetal connections
- Successful Current Cycle testing per ANSI C119.4 provides assurances that the MPS Hot Line Clamp will withstand the ampacity of a properly installed connection



Catalog Number	Connection Type		Run			Tap			A	B	C	Tap Nut
	Run	Tap	Diameter	Max	Min	Diameter	Max	Min				
C1520	CU	CU	.128-.414	2/0 STR	#8 SOL	.128-.414	2/0 STR	#8 SOL	4.50	1.25	2.75	9/16
C1520LD	CU	CU	.128-.414	2/0 STR	#8 SOL	.128-.414	2/0 STR	#8 SOL	4.50	1.25	3.15	9/16
C1530	CU	CU	.162-.745	400 MCM	#6 SOL	.152-.682	4/0 STR	#6 SOL	6.50	1.75	2.50	3/4
C1530A	AL	AL/CU	.162-.745	336.4 MCM	#6 ACSR	.152-.682	4/0 STR	#6 SOL	6.50	1.75	2.50	3/4
C1535A	AL	AL/CU	.250-.860	477 MCM	#4 ACSR	.250-.860	477 MCM	#4 ACSR	6.50	2.65	2.75	3/4
C1540A	AL	AL/CU	.502-1.031	800 MCM	4/0 ACSR	.198-.703	350 MCM	#4 SOL	6.50	2.00	3.00	3/4

### Notes:

- 1) Suffix "A" indicates aluminum body clamps
- 2) For "General Purpose" clamps, add suffix "P" for tin plating
- 3) Add suffix "-9" for packaging with inhibitor
- 4) For other options, consult factory



# Hot Line Stirrup Clamps

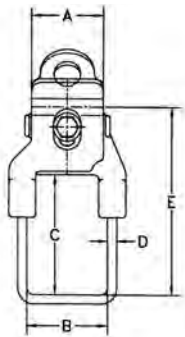


Figure 1

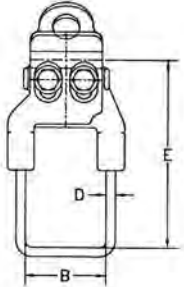


Figure 2



Figure 3

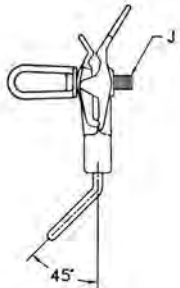


Figure 4

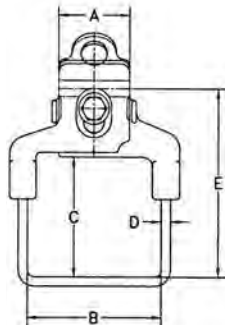


Figure 5



## Features

- Compression joint inhibitor filled
- Snap-on action
- Twin current path design
- Captured hardware to prevent disassembly
- Inhibitor filled conductor groove
- Individually polyethylene packaged

## Material

- Casting: Aluminum alloy
- Bail: Hard drawn copper
- Bolts: Steel, hot dip galvanized

Catalog Number	Figure	Conductor Range		A	B	C	D	E	F
		ACSR ASTM-B232	AAC ASTM-B231						
HLS-2/0	1 & 3	#6 - 2/0	#4 - 2/0	2.00	2.25	3.38	#2 CU	5.19	0.50
HLS-2/0-E	1 & 4	#6 - 2/0	#4 - 2/0	2.00	2.25	3.13	#2 CU	4.88	0.50
HLS-2/0-WB	5 & 3	#6 - 2/0	#4 - 2/0	2.00	3.75	3.38	#2 CU	5.19	0.50
HLS-2/0-E-WB	5 & 4	#6 - 2/0	#4 - 2/0	2.00	3.75	3.13	#2 CU	4.88	0.50
HLS-4/0	1 & 3	#4 - 4/0	#3 - 4/0	2.75	3.19	4.00	1/0 CU	6.25	0.50
HLS-4/0-E	1 & 4	#4 - 4/0	#3 - 4/0	2.75	3.19	3.88	1/0 CU	5.75	0.50
HLS-397	2 & 3	1/0 - 397.5	2/0 - 477	4.00	3.13	4.25	2/0 CU	5.19	0.50
HLS-397-E	2 & 4	1/0 - 397.5	2/0 - 477	4.00	3.13	4.00	2/0 CU	4.88	0.50
HLS-397-LD	2 & 3	1/0 - 397.5	2/0 - 477	4.00	3.13	4.13	1/0 CU	5.19	0.50
HLS-397-LD-E	2 & 4	1/0 - 397.5	2/0 - 477	4.00	3.13	3.88	1/0 CU	4.88	0.50
HLS-795	2 & 3	336.4 - 795	397.5 - 954	4.00	3.56	5.13	4/0 CU	8.75	0.50
HLS-795-E	2 & 4	336.4 - 795	397.5 - 954	4.00	3.56	5.00	4/0 CU	6.88	0.50
HLS-795-LD	2 & 3	336.4 - 795	397.5 - 954	4.00	3.56	4.25	2/0 CU	7.25	0.50
HLS-795-LD-E	2 & 3	336.4 - 795	397.5 - 954	4.00	3.56	4.00	2/0 CU	6.88	0.50

## Notes:

- 1) Add suffix "TN" for tin plated option
- 2) Add suffix "E" for forged steel, hot dip galvanized eye bolts and 45° bent bail

## Material

- Casting - Silicon bronze
- Bail - Hard drawn copper
- Hex Head Bolts - Silicon bronze

Catalog Number	Figure	Conductor Range		A	B	C	D	E	F
		Inches	AWG						
HLS-2-6-CC	1 & 3	.162-.258	#6 - #2	3.13	3.00	-	#2 CU	4.57	0.38
HLS-2/0-CC	1 & 3	.198-.447	#4 - 2/0	2.00	2.25	4.00	#2 CU	5.88	0.50
HLS-250-CC	1 & 3	.316-.522	#2 - 250	2.75	3.25	4.00	#1 CU	6.25	0.50

## Notes:

- 1) Add suffix "TN" for tin plated option
- 2) Add suffix "E" for forged steel, hot dip galvanized eye bolts and 45° bent bail



# Straight Line, Side Opening Deadend Clamps



## Aluminum Straight Line, Side Opening Deadend Clamps

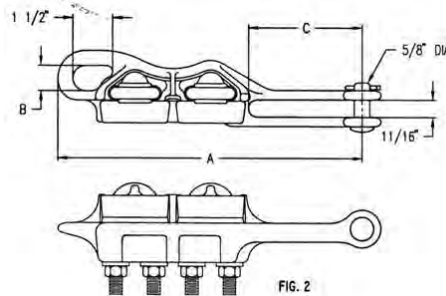
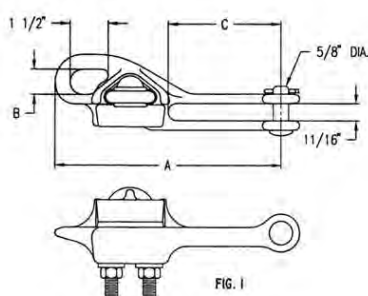
Connects primary conductor to deadend insulator

### Features

- U-Bolts are captive
- Spring loaded side opening - shipped in open position
- Tin plated for copper conductor (add suffix "-TP")

### Material

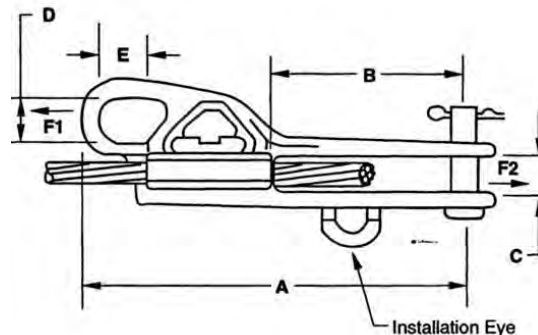
Body and Keeper: Aluminum Alloy A356-T6  
 Cotter Pin and Compression Spring: Stainless steel  
 Hardware: Steel hot dip galvanized ASTM A-153



Catalog Number	Conductor Range			U-Bolts		Dimensions			Ultimate Strength		Weight /100 (lbs)
	Inches	ACSR	Aluminum	No	Size	A	B	C	Body	Sag Eye	
ASO-398-1-N	0.198 - 0.447	#6 - 2/0	#4 - 2/0	1	3/8	7.78	3.56	1.06	6000	6000	116
ASO-570-1-N	0.198 - 0.570	#6 - 4/0	#4 - 4/0	1	1/2	8.63	3.75	1.06	8000	8000	160
ASO-684-1-N	0.250 - 0.684	#4 - 336.4	#2 - 350	1	1/2	9.13	4.25	1.06	8000	8000	191
ASO-684-2-N	0.250 - 0.684	#4 - 336.4	#2 - 350	2	1/2	12.22	4.25	1.06	8000	8000	277
ASO-858-1-N	0.250 - 0.880	#4 - 556.5	#2 - 556.6	1	1/2	9.84	4.81	1.06	8000	5000	208
ASO-858-2-N	0.502 - 0.880	3/0 - 556.5	4/0 - 556.5	2	1/2	13.50	5.00	1.06	12000	9000	393
ASO-1160-2-N	0.684 - 1.160	336.4 - 900	397.5 - 954	2	1/2	15.88	7.00	1.06	12000	9000	450
ASO-1259-2-N	0.666 - 1.263	336.4 - 1113	336.4 - 1200	2	1/2	15.50	6.75	1.06	15000	11250	610

#### Notes:

- 1) Suffix "-N" indicates no fitting
- 2) Replace "-N" with suffix "-S" for socket fitting
- 3) Replace "-N" with suffix "-C" for clevis fitting
- 4) Add suffix "-HP" for hex clevis pin fitting
- 5) Add suffix "-E" for lifting eye on keeper fitting
- 6) Add suffix "-TP" for tin plating
- 7) Recommended torque on U-Bolts: 3/8" - 20-25 ft/lbs; 1/2" - 40-45 ft/lbs



Catalog Number	Conductor Range			U-Bolts		Dimensions			Ultimate Strength		Weight /100 (lbs)
	Inches	ACSR	Aluminum	No	Size	A	B	C	Body	Sag Eye	
HCDS51-SO	0.190 - 0.510	#6 - 3/0	#4 - 4/0	1	1/2	8.00	3.81	0.75	8000	6000	175
HCDS88-SO	0.250 - 0.880	#4 - 556.5	#2 - 556.5	1	1/2	10.13	5.00	1.00	10000	6000	228

#### Notes:

- 1) Add suffix "-HP" for helix clevis pin
- 2) Add suffix "-TP" for tin plating
- 3) Recommended torque on U-Bolts: 1/2" - 40-45 ft/lbs.





# Straight Line, Side Opening Deadend Clamps

## Aluminum Straight Line, Side Opening Deadend Clamps

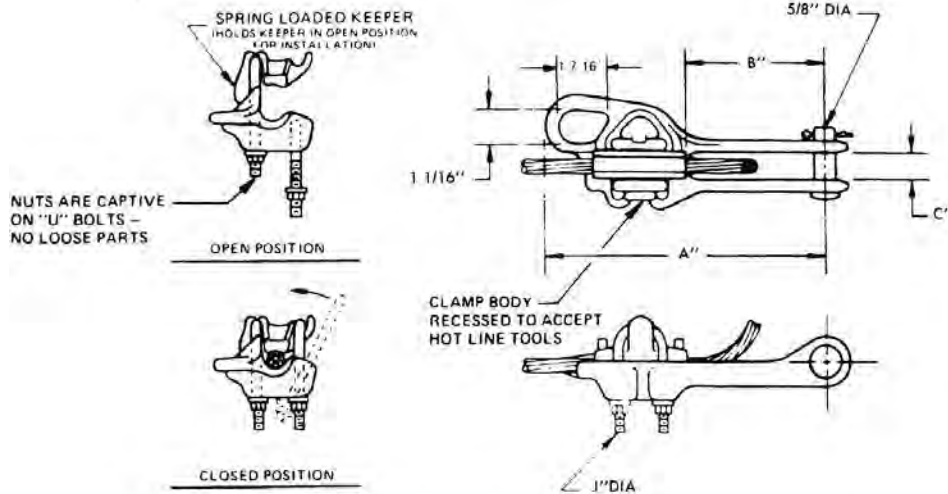
Connects primary conductor to deadend insulator, two U-bolt style

### Features

- U-Bolts are captive
- Spring loaded side opening - shipped in open position

### Material

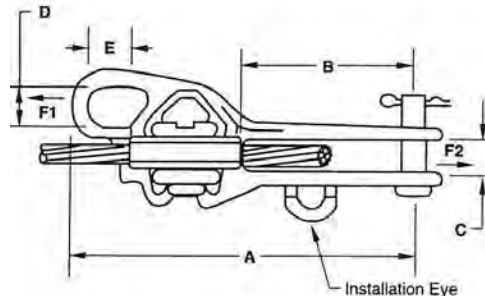
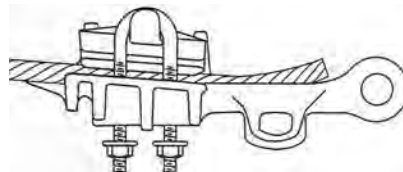
Body and Keeper: Aluminum Alloy A356-T6  
 Cotter Pin and Compression Spring: Stainless steel  
 Hardware: Steel hot dip galvanized ASTM A-153



Catalog Number	Conductor Range			U-Bolts		Dimensions			Ultimate Strength		Weight /100 (lbs)
	Inches	ACSR	Aluminum	No	Size	A	B	C	Body	Sag Eye	
HDSO-47	0.190 - 0.470	#6 - 2/0	#4 - 3/0	2	3/8	8.53	4.25	0.75	7000	4000	157
HDSO-57	0.250 - 0.570	#4 - 4/0	#2 - 4/0	2	3/8	8.88	4.06	0.75	8000	5000	178
HDSO-70	0.310 - 0.700	#2 - 336.4	#1 - 350	2	3/8	9.50	4.75	0.81	9000	6000	196
HDSO-82	0.250 - 0.820	#4 - 477	#2 - 477	2	1/2	10.13	4.88	0.88	9000	6000	308
HDSO-88	0.250 - 0.880	#4 - 556.5	#2 - 556.5	2	1/2	10.25	4.78	1.06	10000	6000	300
HDSO-88L-6	0.250 - 0.880	#4 - 556.5	#2 - 556.5	2	1/2	11.38	6.00	0.88	10000	6000	338
HDSO-88L-7	0.250 - 0.880	#4 - 556.5	#2 - 556.5	2	1/2	12.38	7.00	0.94	10000	6000	341
HDSO-116	0.680 - 1.160	336.4 - 954	397.5 - 1000	2	1/2	12.00	7.25	1.00	12000	8000	383
HDSO-116-2	0.680 - 1.160	336.4 - 954	397.5 - 1000	4	1/2	19.88	8.00	1.25	27000	16000	884
HDSO-130	0.680 - 1.300	300 - 1113	336.4 - 1272	2	1/2	14.00	8.00	1.00	15000	12000	420

### Notes:

- 1) Add suffix "-S" for socket fitting
- 2) Add suffix "-C" for clevis fitting
- 3) Add suffix "-HP" for hex clevis pin
- 4) Add suffix "-E" for lifting eye on keeper
- 5) Recommended torque on U-Bolts: 3/8" - 20-25 ft/lbs; 1/2" - 40-45 ft/lbs.



Catalog Number	Conductor Range			U-Bolts		Dimensions			Ultimate Strength		Weight /100 (lbs)
	Inches	ACSR	Aluminum	No	Size	A	B	C	Body	Sag Eye	
HCD60-SO	0.250 - 0.600	#4 - 266.8	#3 - 266.8	2	1/2	9.38	4.50	0.75	8000	6000	250
HCD80-SO	0.250 - 0.880	#4 - 556.5	#3 - 556.5	2	1/2	10.38	5.13	1.00	10000	6000	300
HCD116-SO	0.680 - 1.160	336.4 - 954	397.5 - 1000	2	1/2	12.75	6.38	1.00	12000	8000	420

### Notes:

- 1) Add suffix "-HP" for helix clevis pin
- 2) Recommended Torque on U-Bolts: 40-45 ft/lbs.





# Straight Line, Side Opening Deadend Clamps

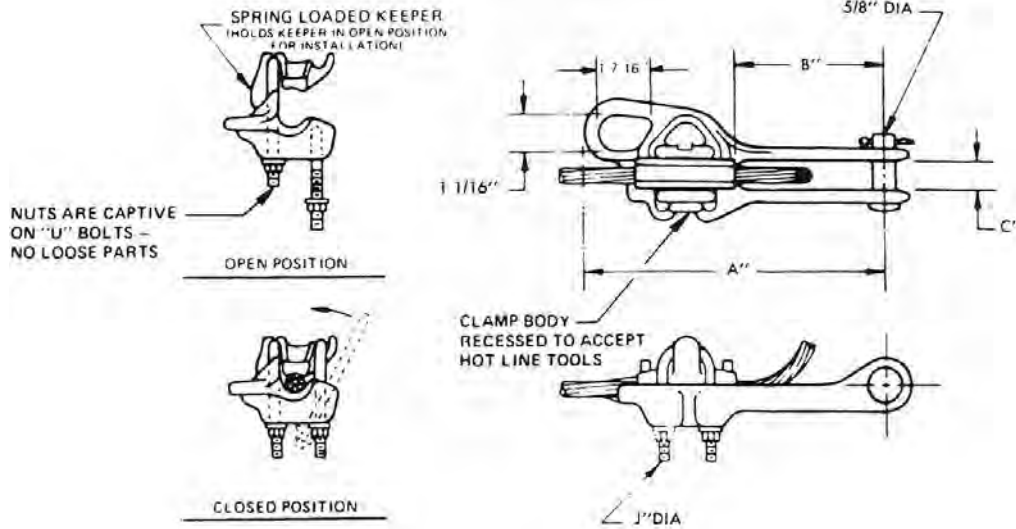
## Iron Straight Line, Side Opening Deadend Clamps

### Features

- U-Bolts are captive
- Spring loaded side opening - shipped in open position

### Material

Body and Keeper: Ductile iron hot dip galvanized  
 Cotter Pin and Compression Spring: Stainless steel  
 Hardware: Steel hot dip galvanized ASTM A-153



Catalog Number	Conductor Range			U-Bolts		Dimensions			Ultimate Strength		Weight /100 (lbs)
	Inches	ACSR	AL or Cu	No	Size	A	B	C	Body	Sag Eye	
HDSO-47-F	0.190 - 0.470	#6 - 2/0	#4 - 3/0	2	3/8	7.75	4.31	0.75	8000	5000	300
HDSO-57-F	0.250 - 0.570	#4 - 4/0	#2 - 4/0	2	3/8	8.38	4.50	0.75	9000	6000	400
HDSO-70-F	0.310 - 0.700	#2 - 336.4	#1 - 350	2	3/8	8.75	4.75	0.81	10000	7000	400

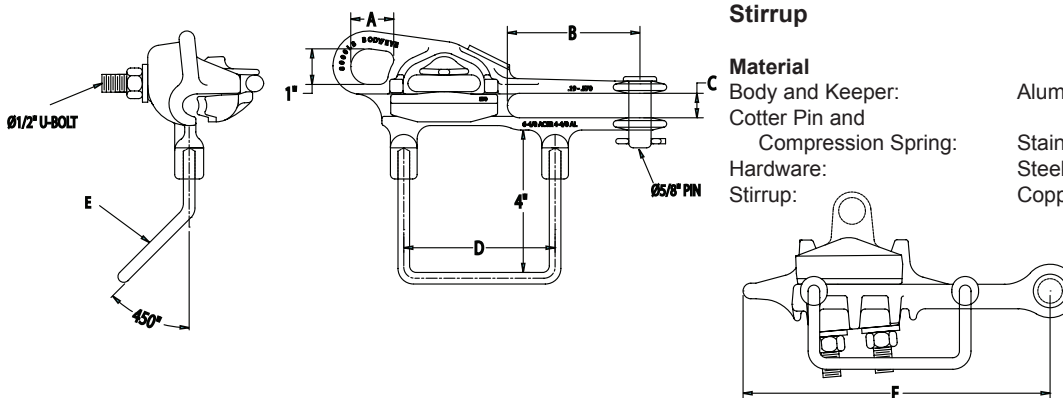
### Notes:

- 1) Add suffix "-S" for socket fitting
- 2) Add suffix "-C" for clevis fitting
- 3) Add suffix "-HP" for hex clevis pin
- 4) Recommended torque on U-Bolts: 3/8" - 20-25 ft/lbs

## Aluminum Straight Line, Side Opening Deadend Clamps with Stirrup

### Material

Body and Keeper: Aluminum Alloy  
 Cotter Pin and Compression Spring: Stainless Steel  
 Hardware: Steel hot dip galvanized  
 Stirrup: Copper



Catalog Number	AWG/MCM ACSR	AWG/MCM Aluminum	Dimensions								Ultimate Strength		Weight /100 (lbs)
			A	B	C	D	E	F	G	J	Body	Sag Eye	
ASOS-570-N	4 - 4/0	4 - 4/0	8.62	3.75	0.69	1/0 Sol. Cu	4.25	1.19	1	0.5	8000	8000	176
ASOS-858-TN	4 - 556 - 5	2 - 5565									8000	6000	250

### Notes:

- 1) Add suffix "E" if for lifting eye on keeper

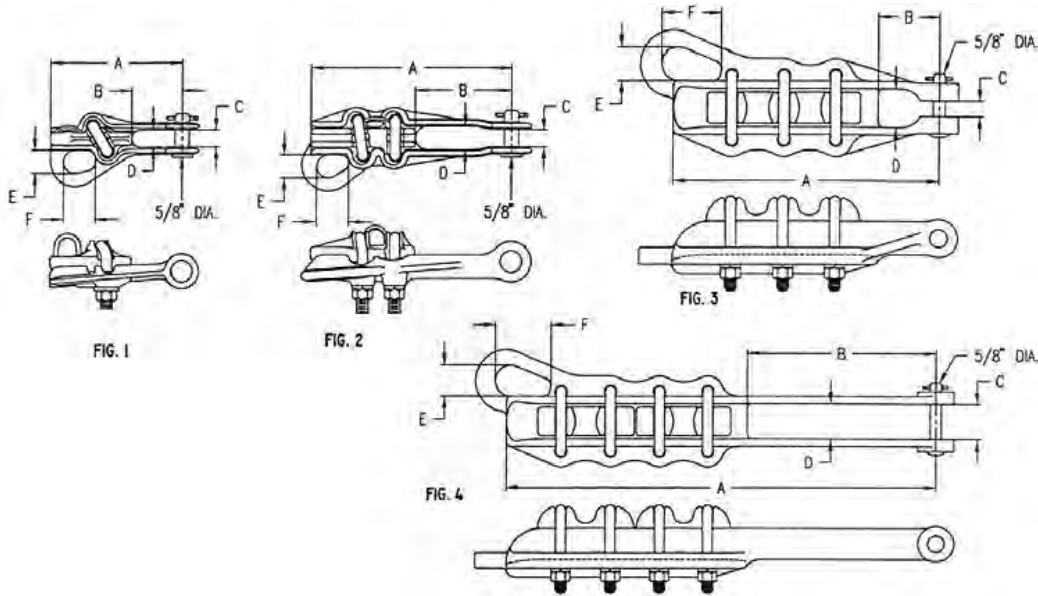


# Straight Line, Feed Through Deadend Clamps

**Aluminum Straight Line, Feed Through Deadend Clamps**  
Connects primary conductor to deadend insulator

**Material**

Body and Keeper: Aluminum Alloy A356-T6  
Cotter Pin and Compression Spring: Stainless steel  
Hardware: Steel hot dip galvanized ASTM A-153



Catalog Number	Conductor Range			U-Bolts		Dimensions						Ultimate Strength		Weight /100 (lbs)
	Inches	ACSR	Aluminum	No	Size	A	B	C	D	E	F	Body	Sag Eye	
ASD-1-N	0.150 - 0.470	#8 - 2/0	#6 - 3/0	1	1/2	5.75	2.25	0.69	0.75	1.00	1.38	7000	6000	121
ASD-1L-N	0.150 - 0.470	#8 - 2/0	#6 - 3/0	1	1/2	7.00	3.50	0.69	0.69	1.00	1.38	7000	600	125
ASD-2-N	0.190 - 0.470	#6 - 2/0	#6 - 3/0	2	3/8	6.50	2.25	0.69	0.63	1.00	1.38	7000	7000	124
ASD-2L-N	0.190 - 0.470	#6 - 2/0	#6 - 3/0	2	3/8	7.50	3.50	0.69	0.81	1.00	1.38	7000	7000	139
ASD-34-N	0.300 - 0.600	#2 - 266.8	#1 - 266.8	2	1/2	8.75	3.75	0.69	0.69	1.00	1.38	8500	8000	238
ASD-37-N	0.460 - 0.750	3/0 - 397.5	3/0 - 400	2	1/2	8.38	3.75	0.75	0.81	1.00	1.38	10000	10000	233
ASD-45-N	0.520 - 0.900	4/0 - 477	4/0 - 600	2	1/2	8.75	4.25	0.75	1.00	1.13	1.38	10000	10000	241
ASD-45L-N	0.520 - 0.900	4/0 - 477	4/0 - 600	2	1/2	10.13	5.63	0.75	1.25	1.00	1.38	12000	12000	253
ASD-58-N	0.650 - 1.250	211.3 - 1113	300 - 1113	2	1/2	9.63	5.25	0.75	1.38	1.13	1.50	15000	10000	344
ASD-69-N	0.720 - 1.550	336.4 - 1590	397.5 - 1800	2	5/8	10.75	6.00	0.81	1.75	1.13	1.50	15000	12000	446
ASD-92-N	1.380 - 2.000	1272 - 2156	1500 - 3000	3	5/8	14.13	3.25	0.81	2.00	1.75	3.00	25000	18750	1001

**Notes:**

- 1) Suffix "-N" indicates no fitting
- 2) Replace suffix "-N" with suffix "-S" for socket fitting
- 3) Recommended torque on U-Bolts: 3/8" - 20-25 ft/lbs; 1/2" - 40-45 ft/lbs



# Straight Line, Feed Through Deadend Clamps

## Iron Straight Line, Feed Through Deadend Clamps

### Material

Body and Keeper: Ductile iron hot dip galvanized  
 Cotter Pin and Compression Spring: Stainless steel  
 Hardware: Steel hot dip galvanized ASTM A-153

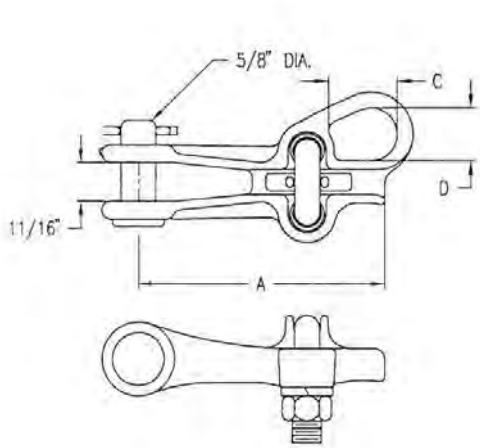


FIG. 1

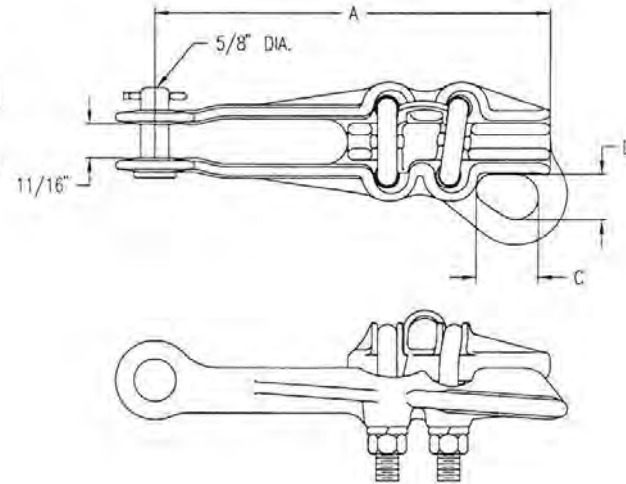
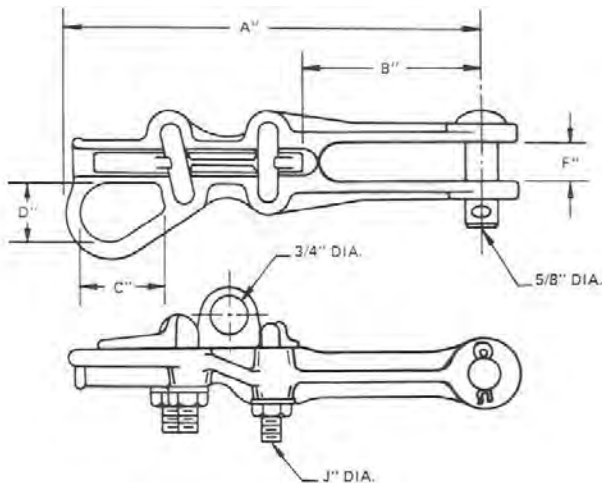


FIG. 2

Catalog Number	Fig	Conductor Range			U-Bolts		Dimensions			Ultimate Strength	Weight /100 (lbs)
		Inches	ACSR	AL or Cu	No	Size	A	C	D		
DEF-0-N	1	0.15 - 0.37	6 - 1	6 - 1/0	1	1/2	4.38	1.25	7/8	4000	121
DEF-45-N	2	0.46 - 0.92	3/0 - 477	3/0 - 636	2	1/2	10.25	1.25	7/8	10000	425

### Notes:

- 1) Add suffix "-S" for socket fitting
- 2) Recommended torque on U-Bolts: 3/8" - 20-25 ft/lbs; 1/2" - 40-45 ft/lbs



## Iron Straight Line, Feed Through Deadend Clamps Features

- U-Bolts are captive

### Material

Body and Keeper: Ductile iron hot dip galvanized  
 Cotter Pin and Compression Spring: Stainless steel  
 Hardware: Steel hot dip galvanized ASTM A-153

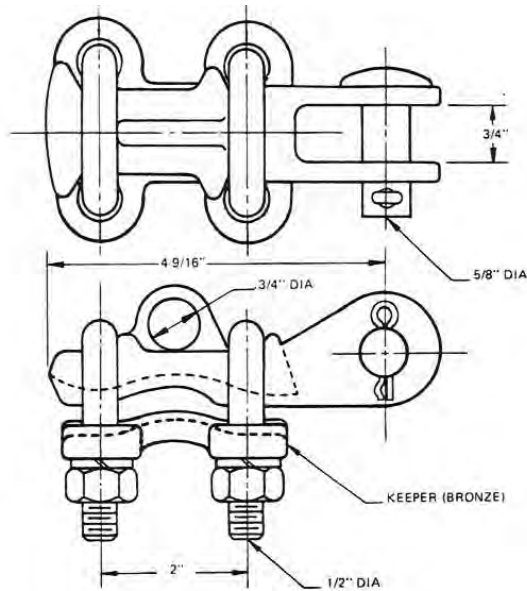
Catalog Number	Conductor Range			U-Bolts		Dimensions			Ultimate Strength		Weight /100 (lbs)
	Inches	ACSR	AL or Cu	No	Size	A	B	C	Body	Sag Eye	
SDE-46-F	0.160 - 0.460	#6 - 2/0	#6 - 3/0	2	3/8	7.00	2.13	0.69	8000	5000	200
SDE-73-F	0.250 - 0.730	#4 - 397.5	#4 - 400	2	1/2	9.13	3.63	0.81	10000	6000	400

### Notes:

- 1) Add suffix "-S" for socket fitting
- 2) Add suffix "-C" for clevis fitting
- 3) Recommended torque on U-Bolts: 3/8" - 20-25 ft/lbs; 1/2" - 40-45 ft/lbs



# Straight Line, Feed Through Deadend Clamps



## Iron Straight Line, Feed Through Deadend Clamps

### Features

- Ideal for heavy services - pole mounted transformer busses, industrial feeders

### Material

Body: Ductile iron hot dip galvanized  
Keeper: High strength bronze

Catalog Number	Conductor Range Copper	Ultimate Strength	Weight /100 (lbs)
SD-14C1	4/0 - 1000 MCM	5000	300

## Aluminum Straight Line, Feed Through Deadend Clamps

### Features

- Designed for use with clamp top type line post insulators
- U-Bolts are captive

### Material

Body and Keeper: Aluminum Alloy A356-T6  
Cotter Pin and Compression Spring: Stainless steel  
Hardware: Steel hot dip galvanized ASTM A-153

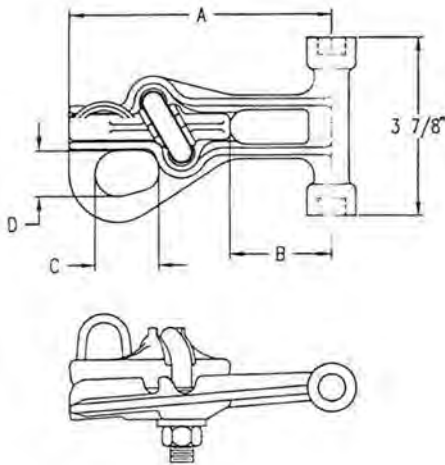


FIG. 1

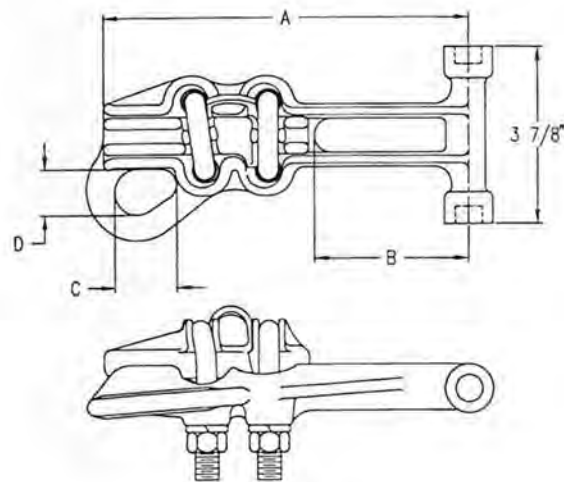


FIG. 2

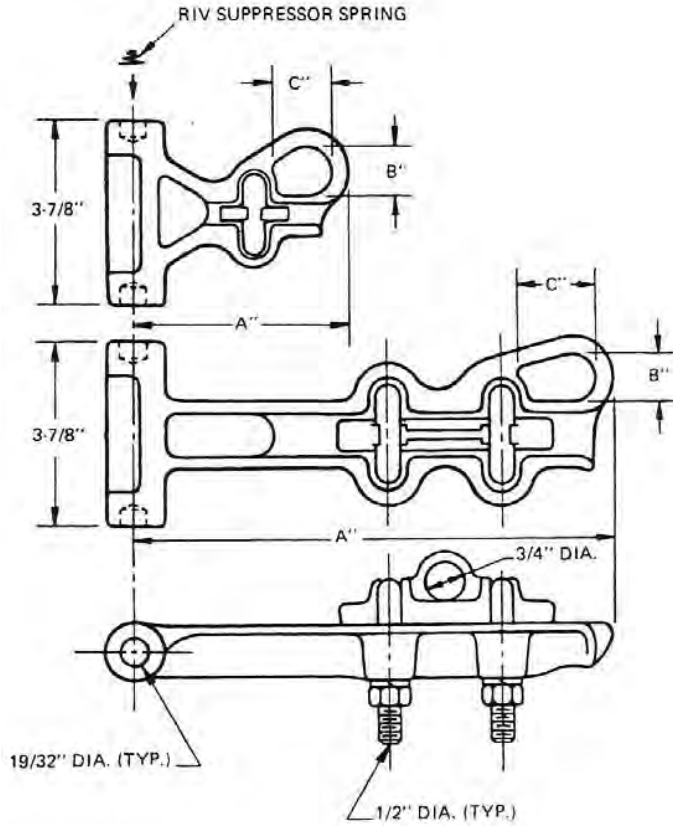
Catalog Number	Conductor Range			U-Bolts		Dimensions				Ultimate Strength		Weight /100 (lbs)
	Inches	ACSR	Aluminum	No	Size	A	B	C	D	Body	Sag Eye	
TSG-51	.016 - 0.51	#6 - #1	#1 - 1/0	1	1/2	5.75	2.25	1.25	1.00	5000	5000	119
TSG-74	0.30 - 0.62	#2 - 266.8	#1 - 266.8	2	1/2	8.38	3.75	1.25	1.00	5000	5000	227
TSG-90	0.45 - 0.90	2/0 - 556.5	3/0 - 556.5	2	1/2	8.75	4.25	1.25	1.00	5000	5000	250
TSG-125	0.62 - 1.25	266.8 - 1033.5	336.4 - 1113	2	1/2	9.63	5.25	1.25	1.00	5000	5000	343

### Notes:

- 1) For static suppressor conical spring in ONE trunnion hole, add suffix "-SL-1"
- 2) For static suppressor conical spring in BOTH trunnion holes, add suffix "-SL-2"
- 3) Recommended torque on U-Bolts: 1/2" - 40-45 ft/lbs



# Straight Line, Feed Through Deadend Clamps



## Iron Straight Line Trunion Deadend Clamps

### Features

- U-Bolts are captive

### Material

Body and Keeper:	Ductile iron hot dip galvanized
Cotter Pin and Compression Spring:	Stainless steel
Hardware:	Steel hot dip galvanized ASTM A-153

Catalog Number	Conductor Range			U-Bolts		Dimensions			Ultimate Strength		Weight /100 (lbs)
	Inches	ACSR	AL or Cu	No	Size	A	B	C	Body	Sag Eye	
CTD-41-F	0.160 - 0.450	#6 - 2/0	#6 - 2/0	1	1/2	5.88	1.06	1.25	5000	5000	225
CTD-73-F	0.380 - 0.730	#1 - 397.5	2/0 - 397.5	2	1/2	9.00	1.00	1.38	5000	5000	400

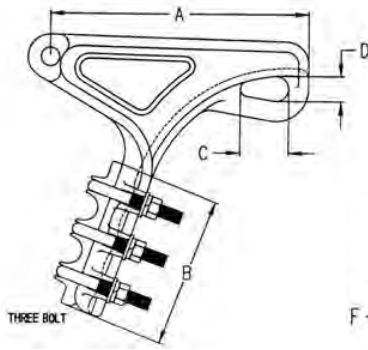
### Notes:

- 1) Recommended torque on U-Bolts: 1/2" - 40-45 ft/lbs

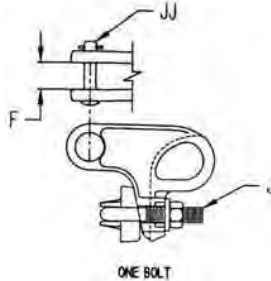




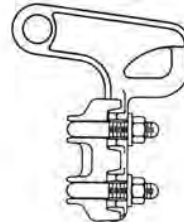
# Quadrant Deadend Clamps



DA Series



ONE BOLT



TWO BOLT

## Aluminum Quadrant Deadend Clamps

### Features

- Recommended torque on U-Bolts: 3/8" = 20-25 ft/lbs; 1/2" = 40-45 ft/lbs; 3/4" = 65-70 ft/lbs

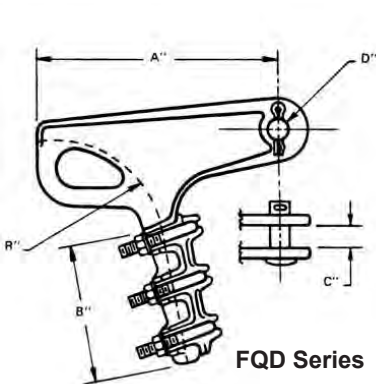
### Material

Body and Keeper: Aluminum  
Fittings: Ductile iron hot dip galvanized

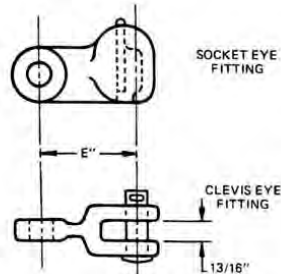
Catalog Number	Conductor Range			U-Bolts		Dimensions						Option Fitting Socket (-S)	Ultimate Strength	Weight /100 (lbs)	
	Inches	ACSR	Aluminum	No	Size	A	B	C	D	F	J				JJ
DA-10-N	0.160 - 0.522	6 - 3/0	6 - 4/0	1	1/2	3.63	1.88	1.19	15/16	11/16	1/2	5/8	SI-625	8000	106
DA-15-N	0.160 - 0.522	6 - 3/0	6 - 4.0	2	1/2	4.25	3.25	1.38	1 1/8	11/16	3/8	5/8	SI-625	8000	122
DA-15H-N	0.230 - 0.522	4 - 3/0	4 - 4/0	2	1/2	5.00	3.94	1.31	1	11/16	1/2	5/8	SI-625	10000	202
DA-20-N	0.25 - 0.62	4 - 266.8 18/1	2 - 266.8	2	1/2	5.88	3.94	1.50	1 1/8	15/16	1/2	5/8	SI-825	12000	231
DA-22-N	0.250 - 0.743	4 - 397.5 18/1	1/0 - 400	2	1/2	5.75	3.94	1.75	1 1/8	15/16	1/2	5/8	SI-875	15000	250
DA-30-N	0.44 - 0.88	2/0 - 556.5 18/1	3/0 - 556.5	2	1/2	5.13	4.00	1.75	1 1/8	15/16	1/2	5/8	SI-875	15000	258
DA-40-N	0.460 - 1.065	3/0 - 954 54/7	4/0 - 795	3	1/2	9.88	6.00	2.00	1 1/4	1 1/16	5/8	5/8	SI-1125	20000	480
DA-26-N	0.75 - 1.34	397.5 26/7 - 1113 54/19	447 - 1351.5	3	5/8	13.00	7.5	2.44	1 1/4	1 3/8	5/8	5/8	SI-1125	25000	1025

### Notes:

- Suffix "N" indicates no fitting
- Add suffix "S" for socket fitting
- Add suffix "C" for clevis fitting



FQD Series



SOCKET EYE FITTING

CLEVIS EYE FITTING

## Iron Quadrant Deadend Clamps

### Material

Body and Keeper: Ductile iron hot dip galvanized  
Cotter Pin: Stainless steel  
Fittings: Ductile iron hot dip galvanized  
Hardware: Steel hot dip galvanized ASTM A-153

Catalog Number	Conductor Range			U-Bolts		Dimensions				Option Fitting		Ultimate Strength	Weight /100 (lbs)
	Inches	ACSR	AL or Cu	No	Size	A	B	C	D	Socket (-S)	Clevis (-C)		
FQD-52-1	0.160 - 0.550	#6 - 3/0	#6 - 4/0	1	1/2	4.00	1.75	0.69	5/8	SI-625	SCE-55-625	15000	200
FQD-58-2	0.180 - 0.580	#6 - 4/0	#6 - 4/0	2	1/2	5.00	3.00	0.88	5/8	SI-625	SCE-55-625	20000	350
FQD-58-3	0.180 - 0.580	#6 - 4/0	#6 - 4/0	3	1/2	5.00	4.63	0.88	5/8	SI-625	SCE-55-625	20000	470
FQD-68-3	0.200 - 0.680	#4 - 300	#4 - 366.4	3	1/2	7.50	4.88	0.81	5/8	SI-750	SCE-55-875	25000	900
FQD-84-4	0.300 - 0.840	#2 - 477 18/1	#1 - 477	4	1/2	9.81	9.50	1.00	5/8	SI-875	SCE-55-875	30000	900

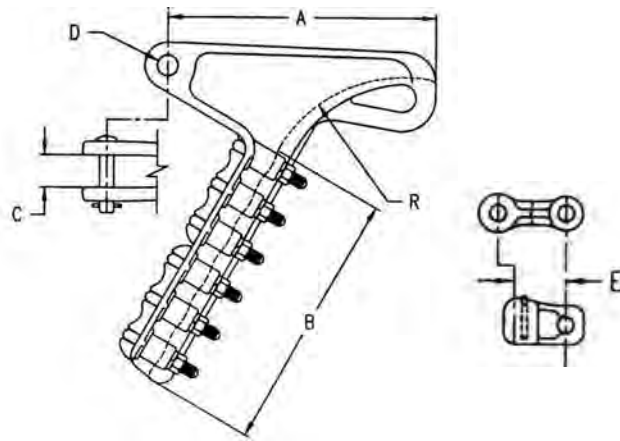
### Notes:

- For static suppressor conical spring in ONE trunnion hole, add suffix "-SL-1"
- For static suppressor conical spring in BOTH trunnion holes, add suffix "-SL-2"
- Recommended torque on U-Bolts: 1/2" - 40-45 ft/lbs





# Quadrant Transmission Deadend Clamps



## Aluminum Quadrant Transmission Deadend Clamps

### Material

Body and Keeper:	Aluminum
Cotter Pin:	Stainless steel
Fittings:	Ductile iron hot dip galvanized
Hardware:	Steel hot dip galvanized ASTM A-153

Catalog Number	Conductor Range		U-Bolts		Dimensions						Option Fitting		Ultimate Strength	Weight /100 (lbs)
	Inches	ACSR	No	Size	A	B	C	D	E	R	Socket (-S)	Clevis (-C)		
ADE-21-N	0.200 - 0.587	4 - 4/0	3	1/2	9.56	6.06	1.00	5/8	2 3/16	3 3/4	SI-875	SCE-55-875	15000	400
ADE-22-N	0.300 - 0.721	2 - 336.4 26/7	4	1/2	10.00	9.50	1.00	5/8	2 3/16	4 3/4	SI-875	SCE-55-875	20000	599
ADE-23-N	0.475 - 0.886	3/0 - 556.6 18/1	4	1/2	12.94	10.75	1.00	5/8	2 3/16	5 1/2	SI-875	SCE-55-875	23000	916
ADE-24-N	0.580 - 1.020	266.8 - 666.6	5	1/2	12.25	14.25	1.25	5/8	2 3/16	6	SI-875	SCE-55-875	27000	1150
ADE-2526-N	0.710 - 1.318	336.4 26/7 - 1192.5 45/7	5	5/8	14.31	13.69	1.50	3/4	2 3/16	7 1/2	SI-1375-6	SCE-56-1375	30000	1473
ADE-26-N	0.750 - 1.382	397.5 24/7 - 1272 54/19	6	5/8	14.63	14.25	1.75	3/4	3	8	SE-1625-6	SCE-56-1625	35000	1645
ADE-27-CE-N	1.30 - 1.83	1192.5 45/7 - 2167 72/7	5	5/8	16.75	14.50	2.00	3/4	2 11/16	13	SE-1750-6	SCE-56-1750	45000	2150
ADE-28-N	1.38 - 2.00	1272 54/19 - 2167 72/7	6	5/8	18.94	17.00	2.38	7/8	3	14	SE-2000-7	SCE-57-2000	60000	2400
ADE-120-N	0.50 - 1.20	3/0 - 954	5	5/8	13.00	9.00	1.38	3/4	2 3/8	7	SE-1000-6	SCE-56-1125	30000	789
ADE-140-N	0.71 - 1.40	4/0 - 1351.5 - 45/7	5	5/8	14.50	10.50	1.44	3/4	2 3/8	8	SE-1250-6	SCI-56-1375	35000	975
ADE-165-N	1.00 - 1.65	1780 - 84/19	5	5/8	15.50	12.00	1.69	3/4	3	9 1/2	SE-1625-6	SCE-56-1625	35000	1370
AQDH-94-N	0.46 - 0.94	636 - 18/1	4	1/2	10.50	6.50	1.06	5/8	2 3/16	5	SI-875	SCE-55-875	25000	529

### Notes:

- 1) Suffix "N" indicates no fitting
- 2) Add suffix "S" for socket fitting - for use on Class 52-3 or 52-5 insulators
- 3) Add suffix "C" for clevis fitting - for use on Class 52-1, 52-2, 52-4, or 52-6 insulators
- 4) Suffix "S8" indicates socket fitting - for use on Class 52-8 insulators
- 5) 90° clevis eye also available
- 6) Recommended torque on U-Bolts: 1/2" hardware = 40-45 ft/lbs, 5/8" hardware = 65-70 ft/lbs



# T2 Deadend and Strain Clamps

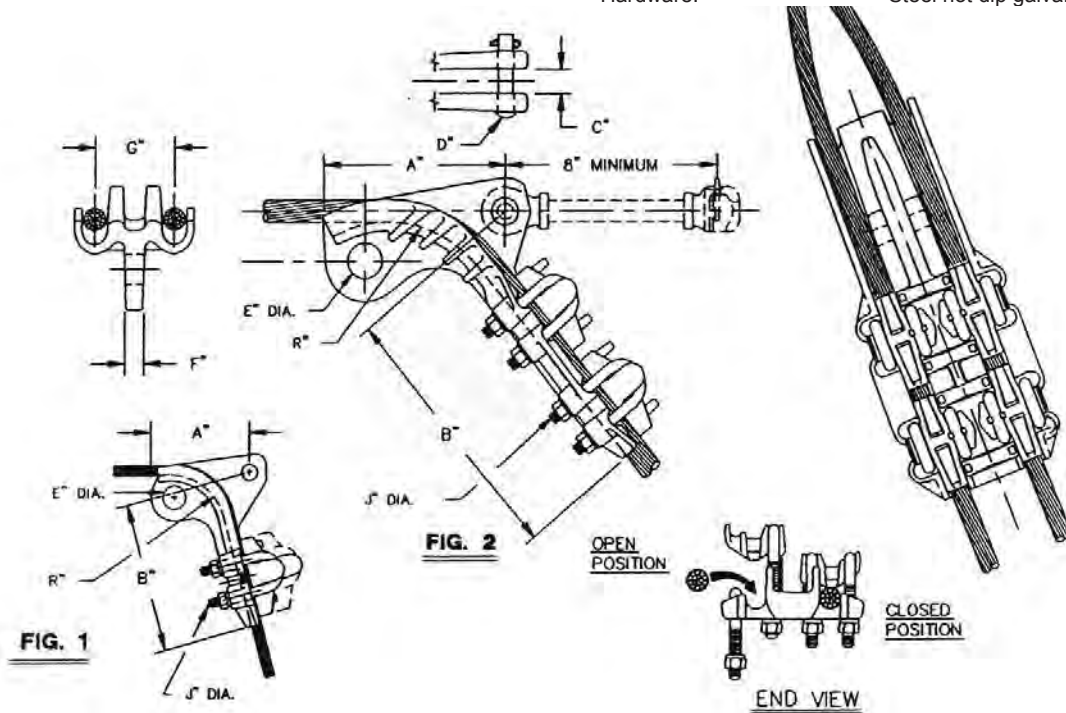
## Aluminum T2 Deadend Clamps

### Features

- Recommended torque on U-Bolts: 3/8" = 20-25 ft/lbs; 1/2" = 40-45 ft/lbs
- Captive Hardware
- Spring loaded keepers hold keeper in open position for easier conductor installation

### Material

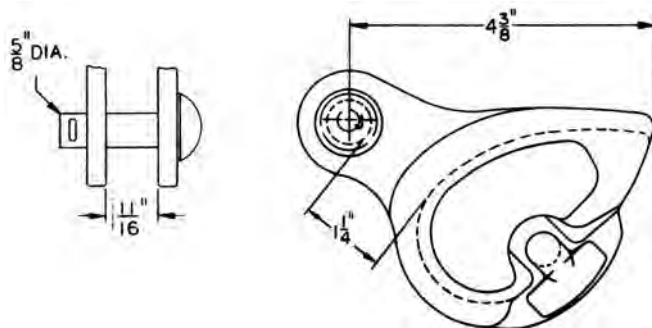
Body and Keeper: Aluminum alloy  
 Cotter Pin and Compression Spring: Stainless steel  
 Hardware: Steel hot dip galvanized



Catalog Number	Fig.	Conductor Range	Dimensions									Ultimate Strength		Weight /100 (lbs)
			A	B	C	D	E	F	G	J	R	Body	Sag Eye	
AQD-T2-57	1	0.250 - 0.570	5.50	6.63	0.75	5/8	1	1/2	2 3/4	3/8	2 3/8	17000	10000	512
AQDH-T2 94	2	0.502 - 0.940	7.88	11.13	0.88	5/8	1 1/2	5/8	3 3/8	1/2	5	30000	18000	1630

### Notes:

- 1) To specify socket fitting, add suffix "HLSE" to catalog number
- 2) It has been determined in field applications; it is not good construction practice to put T2 conductor in a conventional suspension clamp without separating the conductors. This is an extremely clean method for suspending T2 conductor.



## Strain Clamp

### Features

- Snail Shell Design

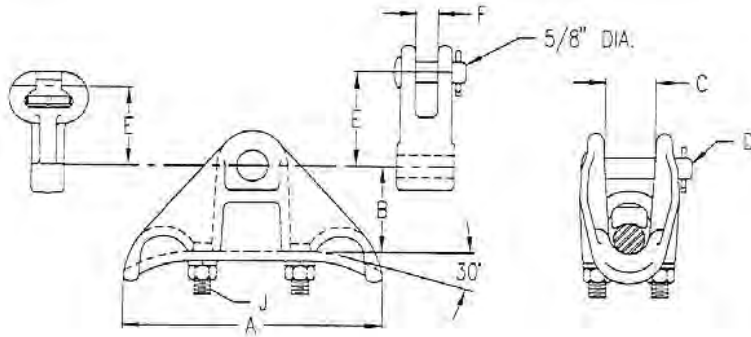
### Material

Clamp: Cast malleable iron  
 J-bolt keeper: Drop forged steel hot dip galvanized

Catalog Number	Fitting Type	Cable Diameter	Ultimate Strength	Weight /100 (lbs)
BT-2111	None	0.156 - 0.522	8000	170



# Standard Suspension Clamps



## Aluminum Standard Suspension Clamps

### Features

- Recommended torque on U-Bolts: 1/2" = 40-45 ft/lbs, 5/8" = 65-70 ft/lbs

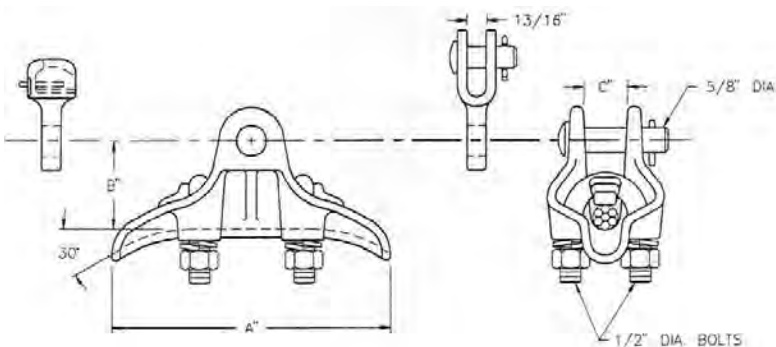
### Material

Body and Keeper: Aluminum alloy  
 Cotter Pin: Stainless steel  
 Hardware: Steel hot dip galvanized

Catalog Number	Conductor Range Inches	Dimensions					Option Fitting		Ultimate Strength	Weight /100 (lbs)
		A	B	C	D	F	Socket (-S)	Clevis (-C)		
LS-0-N	0.20 - 0.70	6.44	2.13	0.84	5/8	1/2	SI-625	SCE-625	17000	180
LS-1-N	0.40 - 0.87	7.44	2.31	1.00	5/8	1/2	SI-875	SCE-55-875	18000	253
LS-2-N	0.40 - 1.05	7.50	2.50	1.25	5/8	1/2	SI-1125	SCE-55-1125	25000	273
LS-3-N	0.75 - 1.19	7.88	2.63	1.38	5/8	1/2	SI-1375	SCE-55-1375A	25000	329
LS-4-N	0.87 - 1.37	7.88	2.75	1.56	5/8	1/2	SI-1375	SCE-55-1375A	25000	346
LS-6-N	1.00 - 1.49	8.56	3.00	1.63	5/8	1/2	SI-1375	SCE-55-1375A	25000	376
LS-7-N	1.10 - 1.77	9.88	3.25	2.00	5/8	1/2	SI-1750	SCE-55-1750	25000	461
LS-8-N	1.25 - 1.92	9.88	3.50	2.13	5/8	1/2	SI-1750	SCE-55-1750	25000	486
LS-9-N	1.40 - 2.18	10.00	3.81	2.25	5/8	1/2	SI-2000	SCE-55-2000	25000	686
ASC-10-N	1.75 - 2.33	10.38	3.88	2.31	5/8	5/8	SI-2187*	SCE-55-2187**	25000	705
ASC-11-N	2.00 - 2.55	11.00	4.13	2.63	5/8	5/8	SI-2500*	SCE-55-2500**	25000	894
ASC-12-N	2.35 - 2.85	14.00	5.00	3.00	3/4	5/8	SE-2750-6*		40000	1280

### Notes:

- 1) "-N" suffix indicates no fitting
- 2) "-S" suffix indicates socket fitting for use with Class 52-3 or 52-3 insulators
- 3) "-C" suffix indicates straight clevis for use with Class 52-1, 52-2, 52-4, or 52-6 insulators
- 4) "\*" = Socket fitting for Class 52-8 insulators available. Specify by adding suffix "-S8" instead of "-S"
- 5) "\*\*" = Clevis fitting for Class 52-7 insulators available. Specify by adding suffix "-C7" instead of "-C"



## Iron Standard Suspension Clamps

### Features

- Recommended torque on U-Bolts: 40-45 ft/lbs

### Material

Body and Keeper: Ductile iron hot dip galvanized  
 Cotter Pin: Stainless steel  
 Hardware: Steel hot dip galvanized

Catalog Number	Conductor Range Inches	Dimensions			Option Fitting		Ultimate Strength	Weight /100 (lbs)
		A	B	C	Socket (-S)	Clevis (-C)		
FSC-46	0.16 - 0.46	5 - 5/8	11/16	2	SI - 500	SCE-55-500	16000	247
FSC-60	0.20 - 0.60	6 - 3/8	7/8	2	SI - 625	SCE-55-625	17000	308
FSC-70	0.30 - 0.70	6 - 3/8	15/16	2 - 3/8	SI - 625	SCE-55-625	18000	389
FSC-83	0.40 - 0.83	6 - 3/4	1	2 - 3/8	SI - 875	SCE-55-875	18000	400



# Angled Suspension Clamps

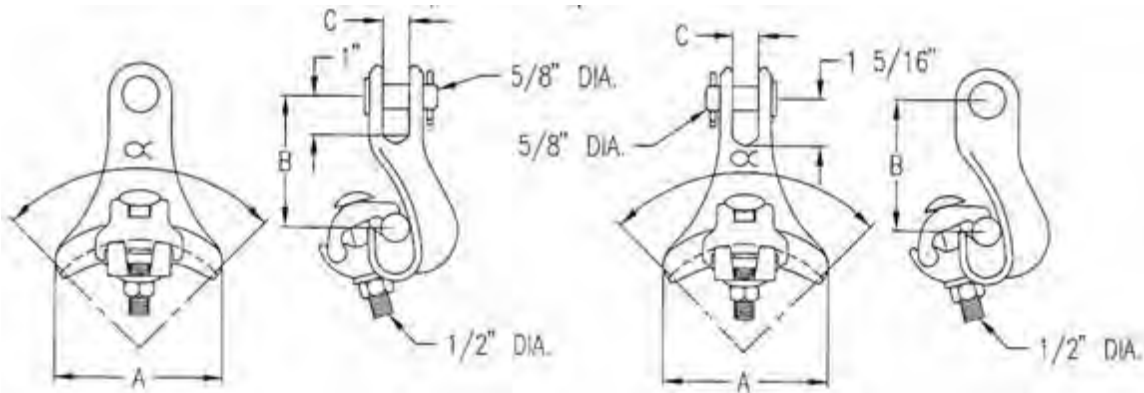
## Aluminum and Iron Angled Suspension Clamps

### Features

- Recommended torque on U-Bolts: 40-45 ft/lbs

### Material

Body and Keeper	Aluminum alloy
ALS, RALS, AC:	Ductile iron hot dip galvanized
FAC, FAC90:	Stainless steel
Cotter Pin:	Steel hot dip galvanized
Hardware:	Steel hot dip galvanized



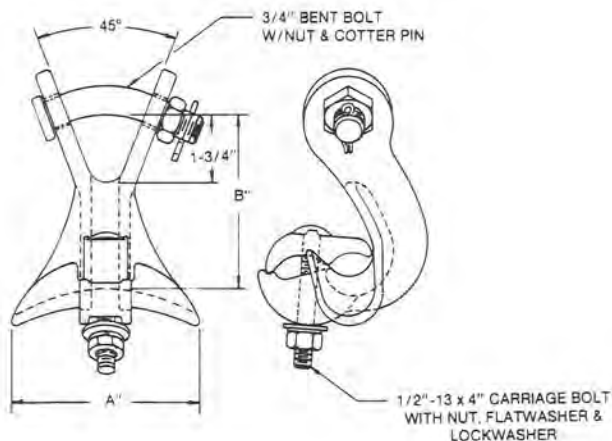
ALS and FAC90 series

RALS, AC and FAC series

Catalog Number	Cable Range			Dimensions			Angle (°)	Ultimate Strength	Weight /100 (lbs)
	Inches	ACSR	Aluminum	A	B	C			
ALS-1-N	0.23 - 0.75	4 - 397.5	4 - 397.5	4.13	3.38	0.69	90	10000	148
RALS-1-N	0.23 - 0.75	4 - 397.5	4 - 397.5	4.13	2.88	0.69	90	10000	148
AC-86	0.316 - 0.856	2 - 477	1 - 556.5	4.63	3.13	0.75	120	12000	133
ALS-2-N	0.50 - 1.04	3/0 - 795	4/0 - 795	4.63	3.63	0.69	90	10000	163
RALS-2-N	0.50 - 1.092	3/0 - 795	4/0 - 874.5	4.63	3.00	0.69	90	10000	152
AC-125	0.50 - 1.25	3/0 - 1033.5	4/0 - 1113	3.75	4.63	0.75	80	12000	183
ALS-3-N	1.02 - 1.66	715.5 - 1780	795 - 2000	7.75	4.13	0.69	80	18000	324
RALS-3-N	1.02 - 1.66	715.5 - 1780	795 - 2000	7.75	4.50	0.69	80	18000	340
FAC-75	0.16 - 0.75			3.00	4.25	0.75	120	11000	222
FAC90-75	0.16 - 0.75			4.25	2.38	0.75	120	11000	230

### Notes:

- 1) For piercing pin, add suffix "-S200"
- 2) Add suffix "-S" for socket fitting, SI-625



## Aluminum Angled Suspension Clamps

### Features

- Recommended torque on U-Bolts: 40-45 ft/lbs

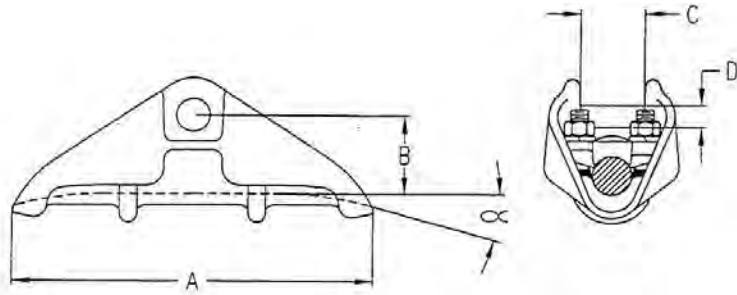
### Material

Body and Keeper:	Aluminum alloy
Cotter Pin:	Stainless steel
Hardware:	Steel hot dip galvanized

Catalog Number	Dimensions		Max Line Angle (°)	Ultimate Strength	Weight /100 (lbs)
	A	B			
YAC-125	4.69	4.00	80	12000	249



# Corona Free and Formula Type Suspension Clamps



## Aluminum Corona Free Suspension Clamps

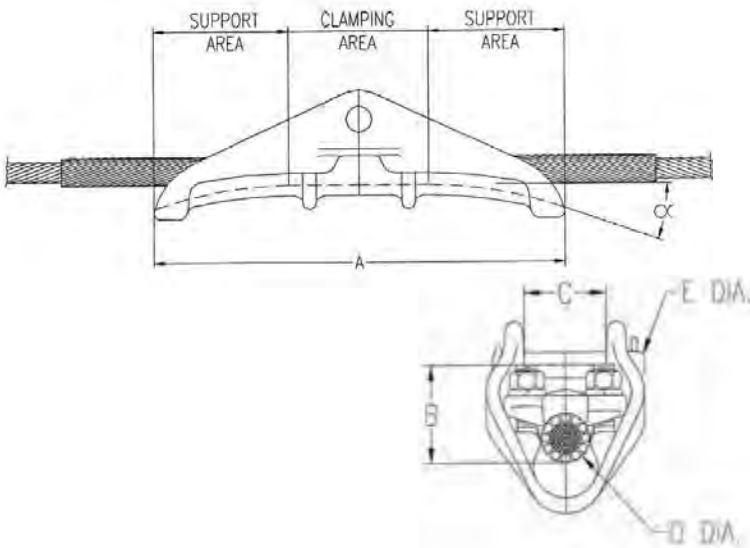
### Material

Body and Keeper: Aluminum alloy  
 Hardware: Steel hot dip galvanized  
 Cotter Keys: Stainless steel

Catalog Number	Cable Range Inches	Dimensions				U-Bolts		Option Fitting			Angle (°)	Ultimate Strength	Weight /100 (lbs)
		A	B	C	D	No	Size	Socket (-S)	Clevis (-C)	Y-Clevis (-Y)			
CF-111-N	1.00 - 1.11	10.50	2.25	1.88	5/8	2	1/2	SI-1750	SCE-55-1750	RYCI-65-1750	15	25000	405
CF-120-N	1.11 - 1.20	10.50	2.25	1.88	5/8	2	1/2	SI-1750	SCE-55-1750	RYCI-65-1750	15	25000	415
CF-143-N	1.20 - 1.43	10.50	2.44	1.88	5/8	2	1/2	SI-1750	SCE-55-1750	RYCI-65-1750	15	25000	460
CF-163-N	1.43 - 1.63	11.50	2.63	2.38	5/8	2	1/2	SI-2187	SCE-55-2187	RYCI-65-2187	15	25000	500
CF-184-N	1.63 - 1.84	11.50	2.88	2.50	5/8	2	1/2	SI-2187	SCE-55-2187	RYCI-65-2187	15	25000	510
CFA-111-N	1.00 - 1.11	13.00	2.38	1.88	5/8	2	1/2	SI-1750	SCE-55-1750	RYCI-65-1750	30	25000	440
CFA-120-N	1.11 - 1.20	13.00	2.25	1.88	5/8	2	1/2	SI-1750	SCE-55-1750	RYCI-65-1750	30	25000	440
CFA-143-N	1.20 - 1.43	13.00	2.44	1.88	5/8	2	1/2	SI-1750	SCE-55-1750	RYCI-65-1750	30	25000	490
CFA-204-N	1.82 - 2.04	13.75	3.17	2.75	5/8	2	1/2	SI-2187	SCE-55-2187	RYCI-65-2187	30	25000	610

### Notes:

- 1) Suffix "-N" indicates no connector fitting
- 2) Add suffix "-S" for socket fitting
- 3) Add suffix "-C" for clevis fitting
- 4) For bundled conductor usage change suffix to "-Y"
- 5) Type CF and CFA suspension clamps are corona free when used with correctly designed connecting hardware. CF clamps are generally used on tangent applications and CFA clamps are generally used on running angles. U-Bolts are inverted and retained in place by neoprene fommets during installation.



## Aluminum Formula Type Suspension Clamps

### Features

- Corona free design

### Material

Body and Keeper: Aluminum alloy  
 Hardware: Steel hot dip galvanized  
 Cotter Keys: Stainless steel

Catalog Number	Dimensions					Option Fitting			Angle (°)	Ultimate Strength	Weight /100 (lbs)
	A	B	C	D	E	Socket (-S)	Clevis (-C)	Y-Clevis (-Y)			
ACFS-175-20-20-N	20.00	3.25	2.38	1.63 - 1.75	5/8	SI - 2187	SCE - 55 - 2187	RYCI - 65 - 2187	20	20000	
ACFS-186-20-20-N	20.00	3.25	2.50	1.76 - 1.86	5/8	SI - 2187	SCE - 55 - 2187	RYCI - 65 - 2187	20	20000	1160
ACFS-214-20-20-N	20.00	3.25	2.50	2.04 - 2.14	5/8	SI - 2187	SCE - 55 - 2187	RYCI - 65 - 2187	20	20000	1136
ACFS-244-20-20-N	20.00	3.25	2.88	2.28 - 2.44	5/8	SI - 2500	SCE - 55 - 2500	RYCI - 65 - 2500	17	20000	1233

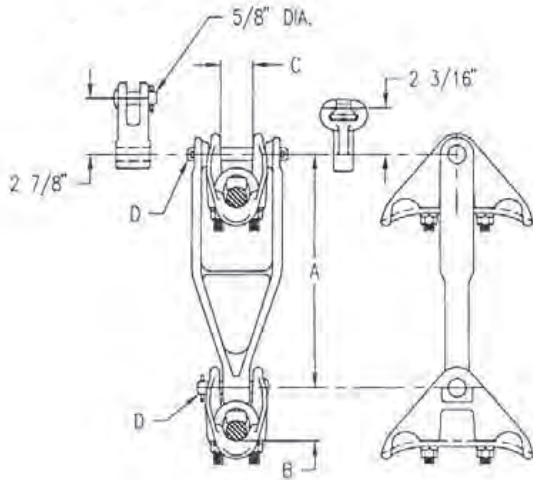
### Notes:

- 1) Above formula clamps are designed based on NSC heavy loading with 40% of conductor rated strength. To find out if the above clamps meet your application specification, a design data sheet is required.
- 2) For turns, please provide data information for specific clamp
- 3) Add suffix "-N" for no fittings
- 4) Add suffix "-S" for socket eye
- 5) Add suffix "-Y" for 90 degree Y-Clevis eye





# Vertical Bundle Assembly Suspension Clamps



## Vertical Bundle Assembly Suspension Clamps

### Features

- Ultimate Strength
  - Lower clamp: 14,000 lbs
  - Complete assembly: 25,000 lbs

### Material

- Body, Keeper, Spacer Yoke: Aluminum alloy
- Hardware: Steel hot dip galvanized
- Cotter Pin: Stainless steel
- Fitting: Ductile Iron hot dip galvanized

Vertical Bundle Assembly with LS Series Suspension Clamp									
Catalog Number	Conductor Range	Clamp Catalog Number	Dimensions				Option Fitting		
			A	B	C	D	Socket (-S)	Clevis (-C)	Y-Clevis (-Y)
VBLS-18-33-N	0.75 - 1.19	LS-3	18.00	2.75	1.25	5/8	SI-1125	SCE-55-1375A	
VBLS-18-44-N	0.87 - 1.317	LS-4	18.00	2.88	1.44	5/8	SI-1375	SCE-55-1375A	RYCI-65-1250
VBLS-18-66-N	1.00 - 1.49	LS-6	18.00	1.56	5/8	11/16	SI-1375	SCE-55-1375A	RYCI-65-1250
VBLS-18-77-N	1.10 - 1.77	LS-7	18.00	3.25	1.81	5/8	SI-1750	SCE-55-1750	RYCI-65-1750
VBLS-18-88-N	1.25 - 1.92	LS-8	18.00	3.50	2.00	5/8	SI-1750	SCE-55-1750	RYCI-65-1750
VBLS-18-99-N	1.40 - 2.18	LS-9	18.00	3.81	2.25	5/8	SI-2000	SCE-55-2000	RYCI-65-2000
VBLS-18-110-N	1.75-2.33	ASC-10-N	18.00	3.88	2.31	5/8	SI-2187	SCE-55-2187	RYCI-65-2187
VBLS-18-111-N	2.00 - 2.55	ASC-11-N	18.00	4.13	2.63	5/8	SI-2500	SCE-55-2500	
VBLS-18-112-N	2.35 - 2.85	ASC-12-N	18.00	5.00	3.00	3/4	SE-2750-6		

Vertical Bundle Assembly with CF Series Suspension Clamp									
Catalog Number	Conductor Range	Clamp Catalog Number	Dimensions				Option Fitting		
			A	B	C	D	Socket (-S)	Clevis (-C)	Y-Clevis (-Y)
VBCF-18-111-N	1.00 - 1.11	CF-111	18.00	2.25	1.88	5/8	SI-1750	SCE-55-1750	RYCI-65-1750
VBCF-18-120-N	1.11 - 1.20	CF-120	18.00	2.25	1.88	5/8	SI-1750	SCE-55-1750	RYCI-65-1750
VBCF-18-143-N	1.20 - 1.43	CF-143	18.00	2.44	1.88	5/8	SI-1750	SCE-55-1750	RYCI-65-1750
VBCF-18-163-N	1.43 - 1.63	CF-163	18.00	2.63	2.38	5/8	SI-2187	SCE-55-2187	RYCI-65-2187
VBCF-18-184-N	1.63 - 1.84	CF-184	18.00	2.88	2.50	5/8	SI-2187	SCE-55-2187	RYCI-65-2187
VBCFA-18-111-N	1.00 - 1.11	CFA-111	18.00	2.38	1.88	5/8	SI-1750	SCE-55-1750	RYCI-65-1750
VBCFA-18-120-N	1.11 - 1.120	CFA-120	18.00	2.25	1.88	5/8	SI-1750	SCE-55-1750	RYCI-65-1750
VBCFA-18-143-N	1.20 - 1.43	CFA-143	18.00	2.44	1.88	5/8	SI-1750	SCE-55-1750	RYCI-65-1750
VBCFA-18-204-N	1.82 - 2.04	CFA-204	18.00	3.17	2.75	5/8	SI-2187	SCE-55-2187	RYCI-65-2187

Vertical Bundle Assembly with ACFS Series Suspension Clamp									
Catalog Number	Conductor Range	Clamp Catalog Number	Dimensions				Option Fitting		
			A	B	C	D	Socket (-S)	Clevis (-C)	Y-Clevis (-Y)
VBACFS-18-1752020	1.63 - 1.75	ACFS-175-2020	18.00	3.25	2.38	5/8	SI - 2187	SCE-55-2187	RYCI-65-2187
VBACFS-18-1862020	1.76 - 1.86	ACFS-186-2020	18.00	3.25	2.50	5/8	SI - 2187	SCE-55-2187	RYCI-65-2187
VBACFS-18-2142020	2.04 - 2.14	ACFS-214-2020	18.00	3.25	2.50	5/8	SI - 2187	SCE-55-2187	RYCI-65-2187
VBACFS-18-2442020	2.28 - 2.44	ACFS-244-2020	18.00	3.25	2.88	5/8	SI - 2500	SCE-55-2500	RYCI-65-2500





# Trunnion Clamps

## Aluminum Trunnion Clamps

### Material

Body and Keeper:

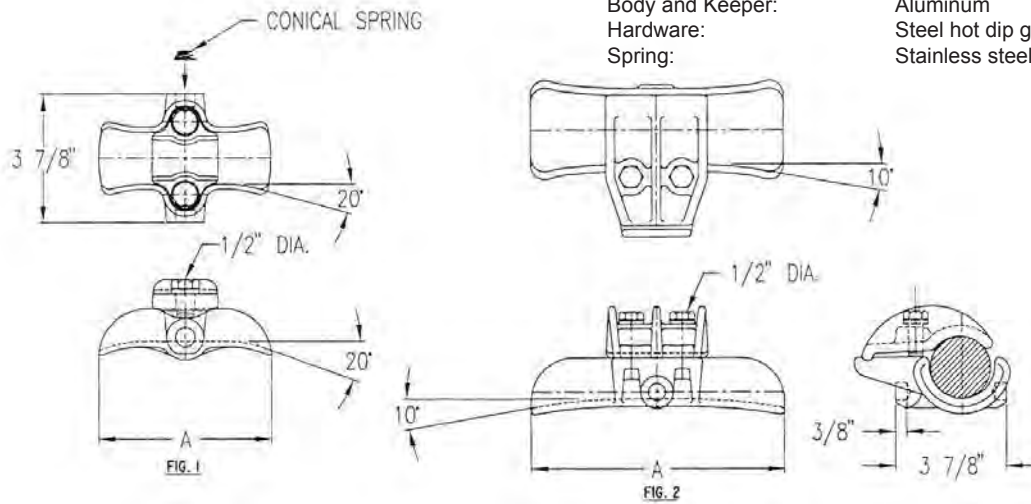
Aluminum

Hardware:

Steel hot dip galvanized

Spring:

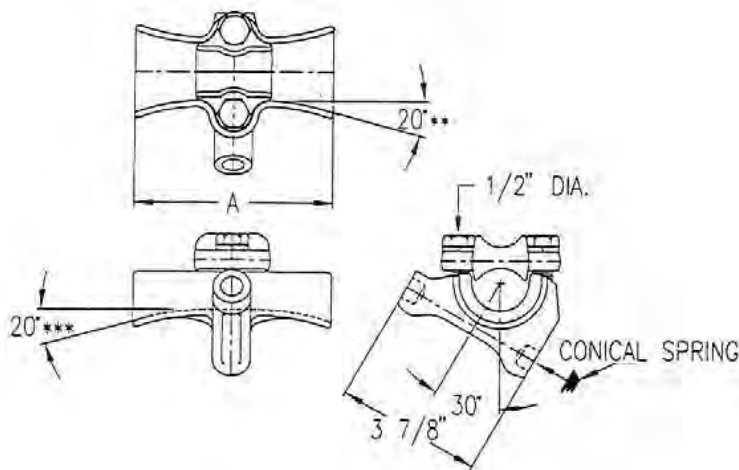
Stainless steel



Catalog Number	Fig	A	Conductor Range			Weight /100 (lbs)
			Inches	ACSR	Aluminum	
ACTS-057	1	5.25	0.23 - 0.57	4 - 4/0	4 - 4/0	82
ACTS-084	1	5.25	0.35 - 0.84	1 - 477	1/0 - 477	95
ACTS-118	1	5.25	0.50 - 1.18	3/0 - 795	4/0 - 1033.5	117
ACTS-150	1	5.25	0.93 - 1.50	556.5 - 1510.5	715.5 - 1590	127
ACTS-200	1	6.50	1.50 - 2.00	605 - 113*	795 - 1192.5	225
ACTS-230	2	8.75	1.90 - 2.30	1033.5 - 1431*	1192.5 - 1510.5*	242
ACTS-270	2	8.50	2.00 - 2.70	1272* - 2167*		275

### Notes:

- 1) For spring in one trunnion, add suffix "-SL1"
- 2) For spring in both trunnions, add suffix "-SL2"
- 3) For stainless steel hardware, add suffix "-SS"
- 4) "\*" = over formed armor rods



## Aluminum Angle Trunnion Clamps

### Material

Body and Keeper:

Aluminum

Hardware:

Steel hot dip galvanized

Spring:

Stainless steel

Catalog Number	A	Conductor Range			Weight/ 100 (lbs)
		Inches	ACSR	Aluminum	
ACP-057	5.25	0.23 - 0.57	4 - 4/0	4 - 4/0	82
ACP-084	5.25	0.35 - 0.84	1 - 477	1/0 - 477	95
ACP-118	5.25	0.50 - 1.18	3/0 - 795	4/0 - 1033.5	117
ACP-150	5.25	0.93 - 1.50	556.5 - 1510.5	715.5 - 1590	127
ACP-165	5.75	1.00 - 1.65	636 - 1780	795 - 2000	133
ACP-200	6.50	1.50 - 2.00	605 - 113*	795 - 1192.5	225

### Notes:

- 1) For spring in one trunnion, add suffix "-SL1" -- ACP series only
- 2) For spring in both trunnions, add suffix "-SL2" -- ACP series only
- 3) "\*" = over armor rods
- 4) "\*\*\*" = 15 degree for ACP-165
- 5) "\*\*\*\*" = 30 degrees for ACP-165



# Trunnion Clamps

## Iron Trunnion Clamps

### Material

Body and Keeper:

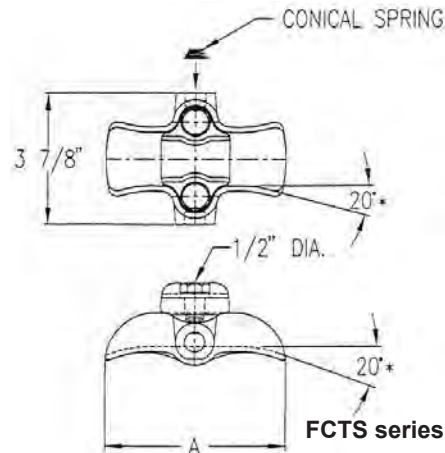
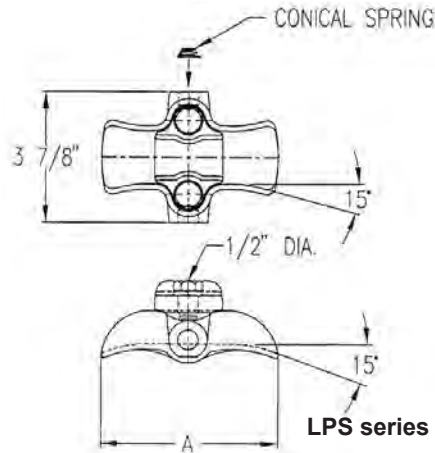
Iron hot dip galvanized

Hardware:

Steel hot dip galvanized or bronze

Spring:

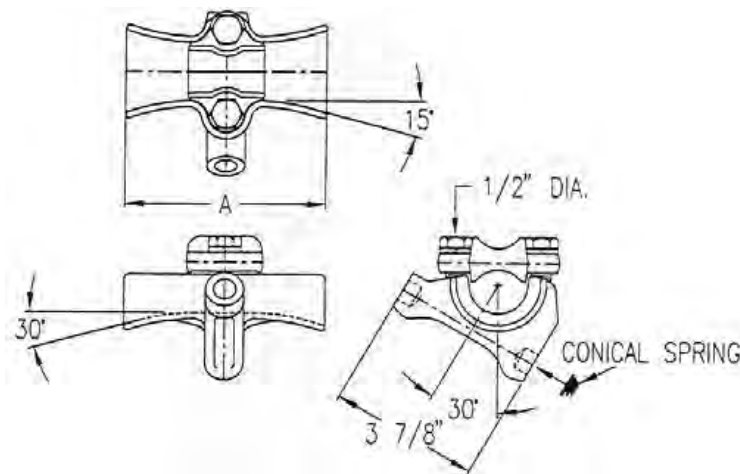
Stainless steel



Catalog Number	Material	A	Conductor Range Inches	Weight /100 (lbs)
LPS-57-F	Ductile Iron	5.13	0.25 - 0.57	200
LPS-57-B	Bronze	5.13	0.25 - 0.57	238
LPS-86-F	Ductile Iron	5.25	0.35 - 0.86	200
LPS-86-B	Bronze	5.25	0.35 - 0.86	232
LPS-118	Ductile Iron	5.50	0.50 - 1.18	120
FCTS-150	Ductile Iron	5.25	0.93 - 1.50	232

### Notes:

- 1) LPS series supplied with spring in one trunnion. For FCTS series, add suffix "-SL1" for single spring
- 2) For spring in both trunnions, add suffix "-SL2"
- 3) For stainless steel hardware, add suffix "-SS"
- 4) Clamps are supplied with spring in one trunnion



## Iron Angle Trunnion Clamps

### Material

Body and Keeper:

Iron hot dip galvanized

Hardware:

Steel hot dip galvanized

Spring:

Stainless steel

Catalog Number	A	Conductor Range Inches	Weight /100 (lbs)
PAC-200-F	6.00	1.50 - 2.00	200

### Notes:

- 1) Clamps supplied with spring in one trunnion



# Trunnion Clamps

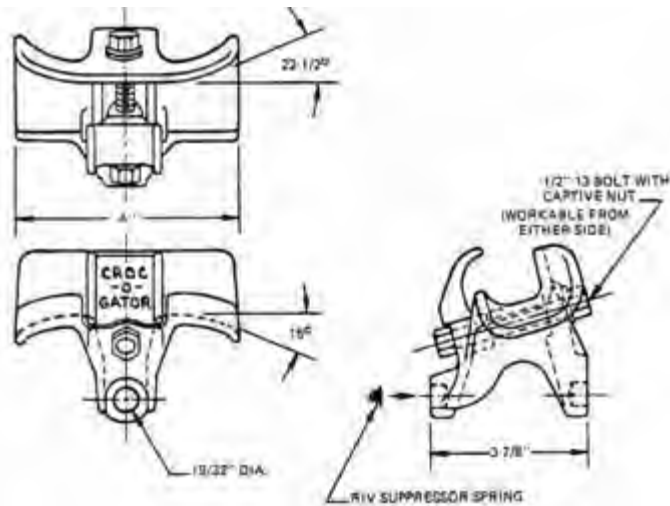
## Aluminum Universal Trunnion Clamps

### Features

- Tangent or angle clamps for line angles of 0-45°
- Reversible in trunnion for internal or external angles
- Recommended torque: 40-45 ft/lbs
- RIV suppressor spring installed in one trunnion

### Material

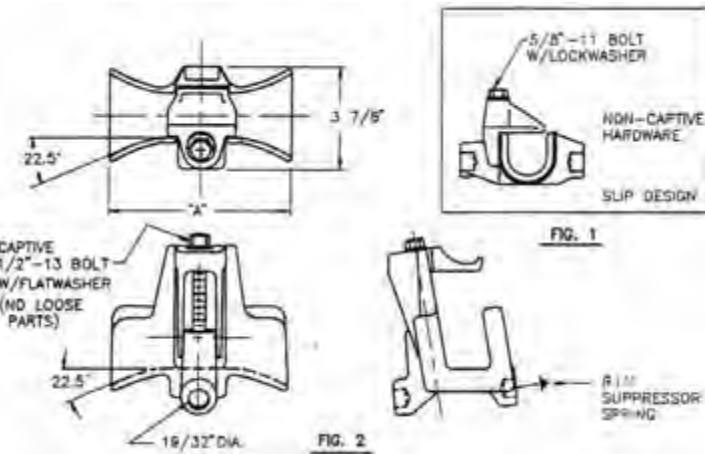
Body and Keeper: Aluminum alloy  
 Hardware: Hot dip galvanized  
 RIV Suppressor Spring: Stainless Steel



Catalog Number	Conductor Range Inches	A	Weight /100 (lbs)
ULPS2-75	0.25 - 0.75	5.00	140
ULPS2-118	0.68 - 1.18	5.50	144
ULPS2-140	0.68 - 1.40	6.00	158

### Notes:

- 1) Tangent or angle clamps for line angles 0-45°. Reversible in trunnion for internal or external angles.
- 2) RIV suppressor spring installed in one trunnion.



Catalog Number	Fig.	Conductor Range Inches	A	Weight /100 (lbs)
ULPS3-125-SCE	1	0.62 - 1.25	5.25	160
ULPS3-140	2	0.88 - 1.40	5.00	154

### Notes:

- 1) For stainless steel hardware, add suffix "-SS"
- 2) These clamps have a longer support radius for greater protection to the conductor.
- 3) Recommended for line angles up to 22-1/2°
- 4) RIV suppressor spring installed in one trunnion

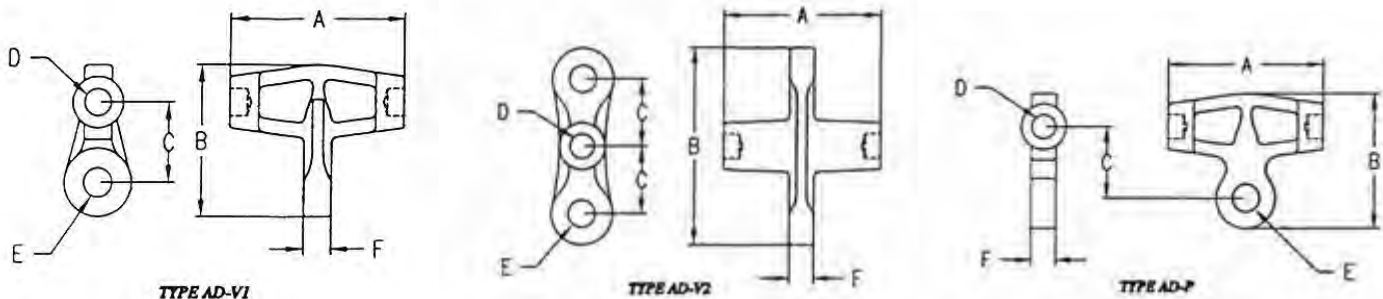
## Clamp Adapters

### Features

- AD-V1 adapters designed for use with both vertical and horizontal line post insulators
- AD-V2 adapters permit deadending in both directions from single insulator
- AD-P adapters designed for use with vertical line post insulators installed in either the horizontal or vertical position

### Material

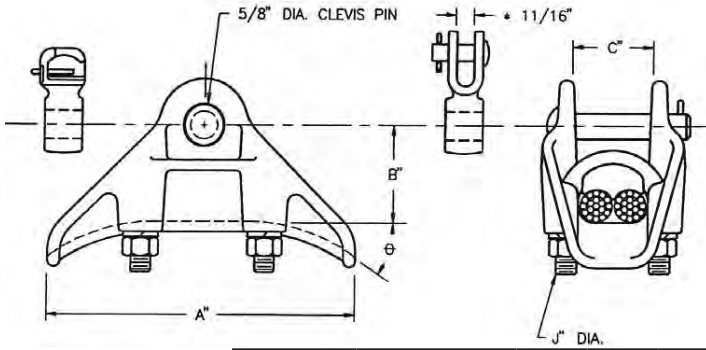
AD-V1/AD-V2: Aluminum  
 AD-P: Aluminum alloy



Catalog Number	A	B	C	D	E	F	Weight /100 (lbs)
AD-V1	3.88	3.38	1.75	35/64	21/32	5/8	38
AD-V2	3.88	4.75	1.63	35/64	21/32	5/8	57
AD-P	3.88	3.38	1.75	35/64	21/32	5/8	38



# T2 Clamps



## Aluminum T2 Standard Suspension Clamps

### Features

- Recommended torque: 40-45 ft/lbs
- Ultimate Strength: 25,000 lbs
- Angle: 30°

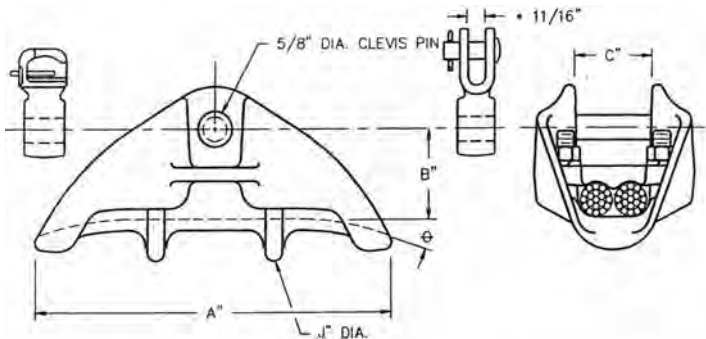
### Material

Body and Keeper:	Aluminum alloy
Hardware:	Steel hot dip galvanized
Cotter Pin:	Stainless steel
Grommets:	Neoprene
Socket and Clevis:	Ductile iron hot dip galvanized

Catalog Number	Conductor Range Inches	Dimensions				Option Fitting		Weight /100 (lbs)
		A	B	C	J	Socket (-S)	Clevis (-C)	
SC-T2-4/0	0.316 - 0.563	7.75	2.06	1.50	1/2	SI-1375	CE-55-9	240
SC-T2-397.5	0.398 - 0.783	7.75	2.31	1.81	1/2	SI-1750	SCE-55-1750	290
SC-T2-666	0.502 - 1.000	7.50	2.59	2.28	1/2	SI-2000	SCE-55-1750	400

### Notes:

- 1) It has been determined in field applications it is not good construction practice to put T2 conductor in a conventional suspension clamp without separating the conductors. This is an extremely clean method for suspending T2 conductor.



## Aluminum T2 Corona Free Suspension Clamps

### Features

- Recommended torque: 40-45 ft/lbs
- Ultimate Strength: 25,000 lbs

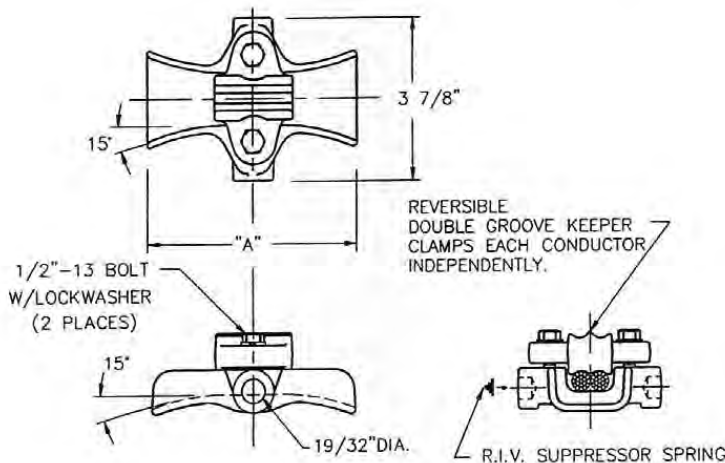
### Material

Body and Keeper:	Aluminum alloy
Hardware:	Steel hot dip galvanized
Cotter Pin:	Stainless steel
Grommets:	Neoprene
Socket and Clevis:	Ductile iron hot dip galvanized

Catalog Number	Conductor Range Inches	Dimensions				Option Fitting		Angle (°)	Weight /100 (lbs)
		A	B	C	J	Socket (-S)	Clevis (-C)		
CF-081-T2H-N	0.38 - 0.810	10.00	1.88	2.00	1/2	SI-1750	CE-55-144	17 1/2	516
CSC-T2-636	0.793 - 0.977	10.50	2.47	2.19	1/2	SE-16	CE-55-16	15	490
CSC-T2-1113	0.914 - 1.259	10.50	2.75	2.42	1/2	SE-16	CE-55-16	15	800

### Notes:

- 1) This suspension clamp is corona free when used with correctly designed connecting hardware. U-Bolts are inverted and retained in place by neoprene grommets during installation.
- 2) It has been determined in field applications it is not good construction practice to put T2 conductor in a conventional suspension clamp without separating the conductors. This is an extremely clean method for suspending T2 conductor.



## Aluminum T2 Trunnion Clamps

### Features

- Bolts contain captive lock washers
- Recommended for line angles up to 15°
- Recommended torque on keeper bolts: 20-25 ft/lbs
- RIV suppressor spring is installed on one of the trunnions

### Material

Body:	Ductile iron hot dip galvanized
Keeper:	Aluminum alloy
Hardware:	Steel hot dip galvanized
RIV Suppressor Spring:	Stainless steel

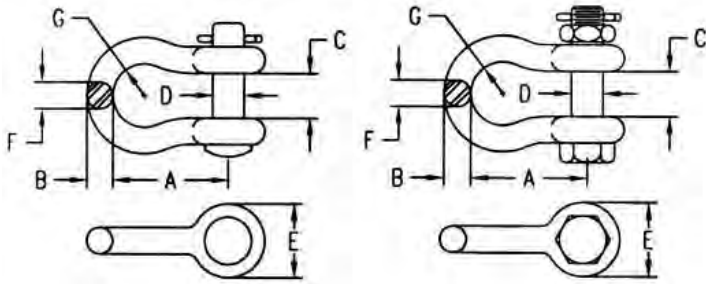
Catalog Number	Conductor Range (in)	A	Weight /100 (lbs)
LPS-T2-4/0	0.316 - 0.563	5.25	204
LPS-T2-477	0.500 - 0.880	5.25	3

### Notes:

- 1) These clamps have a longer support radius for greater protection to the conductor. The keeper is reversible for a closer fit on the conductor.
- 2) For stainless steel hardware, add suffix "-SS" to catalog number
- 3) For aluminum body, add suffix "-A" to catalog number



# Anchor Shackle and Ball Type Insulator Fittings



## Anchor Shackle

### Material

Shackle:

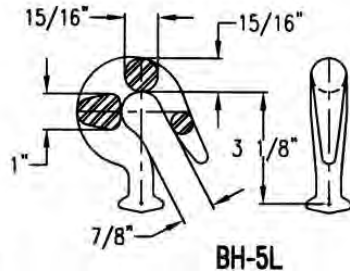
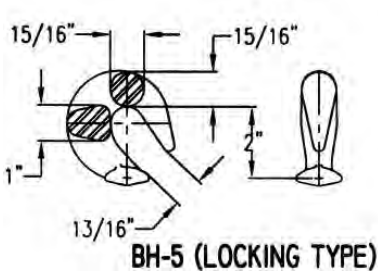
Hardware:

Forged steel hot dip galvanized  
Stainless steel

Catalog Number	Dimensions							Ultimate Strength (lbs)	Weight /100 (lbs)
	A	B	C	D	E	F	G		
ASH-45	2 3/16	1/2	7/8	5/8	1 3/8	1/2	11/16	25000	80
ASH-55	2 3/4	5/8	7/8	5/8	1 1/2	6/16	11/16	30000	112
ASH-56	2 3/4	5/8	1 1/16	3/4	1 3/4	5/8	3/4	40000	147
ASH-66	3 1/2	7/8	1 1/4	3/4	1 7/8	3/4	1	50000	230
ASH-66-BC	3 1/2	7/8	1 1/4	3/4	1 7/8	3/4	1	60000	230
ASH-66A	3 1/2	3/4	7/8	3/4	1 7/8	3/4	3/4	50000	225
ASH-66A-BC	3 1/2	3/4	7/8	3/4	1 7/8	3/4	3/4	60000	225
ASH-66B	5	3/4	7/8	3/4	1 7/8	3/4	11/16	50000	262
ASH-66B-BC	5	3/4	7/8	3/4	1 7/8	3/4	11/16	60000	262
ASH-67	3 1/2	7/8	1 1/4	7/8	1 7/8	3/4	1	50000	242
ASH-67-BC	3 1/2	7/8	1 1/4	7/8	1 7/8	3/4	1	60000	242
ASH-67A	3 1/2	3/4	7/8	7/8	1 7/8	3/4	3/4	50000	230
ASH-67A-BC	3 1/2	3/4	7/8	7/8	1 7/8	3/4	3/4	60000	230
ASH-77-BC	3 3/4	1	1 7/16	7/8	2 1/8	7/8	1 1/8	72000*	240
ASH-BC-SPEC	3 3/4	1	1 3/16	7/8	2 1/8	7/8	1 1/8	72000*	240
ASH-78-BC	3 3/4	1	1 7/16	1	2 1/8	7/8	1 1/8	80000*	375
ASH-BC-SPEC	3 3/4	1	1 3/16	1	2 1/8	7/8	1 1/8	80000*	375
ASH-89-BC	4 5/16	1	1 11/16	1 1/8	2 3/8	1	1 3/8	90000*	528
ASH-89A-BC	6	1	1 3/16	1 1/8	2 3/8	1	1 1/16	90000*	690

### Notes:

- 1) For bolt, nut and cotter instead of clevis pin and cotter, add suffix "-BC" to catalog number
- 2) \* indicates supplied with bolt, nut and cotter key



## Ball - Hook

### Material

Forged steel hot dip galvanized

Catalog Number	For Insulator Class	Ultimate Strength (lbs)	Weight /100 (lbs)
BH-5	ANSI 52-3 & 5	30000	105
BH-5L	ANSI 52-3 & 5	30000	125

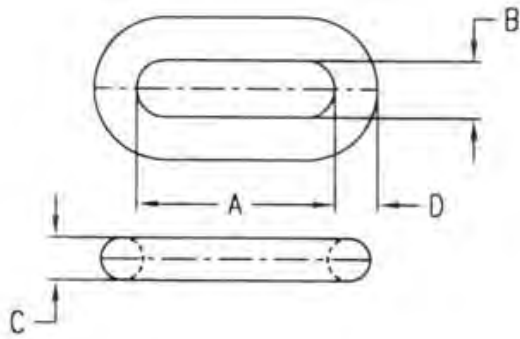
### Notes:

- 1) ANSI 52-5 & IEC 16mm are generally accepted as being interchangeable





# Chain Type Insulator Fittings

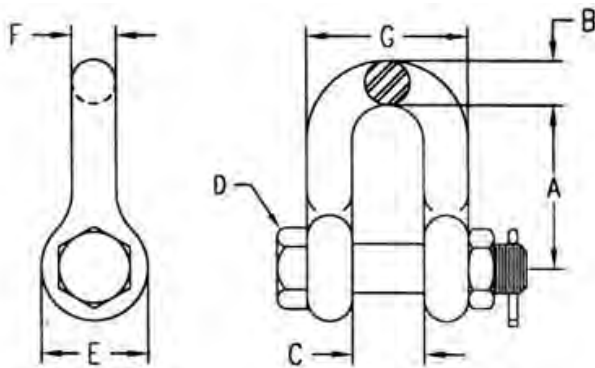


## Chain Link

### Material

Forged steel hot dip galvanized

Catalog Number	A	B	C	D	Ultimate Strength (lbs)	Weight /100 (lbs)
CL-4	2 1/4	1	1/2	1/2	30000	40
CL-5	3 1/4	1	5/8	5/8	40000	92
CL-6	3 1/2	1	3/4	3/4	60000	145
CL-8	4	1 1/4	1	1	110000	294



## Chain Shackle

### Material

Shackle:  
Hardware:

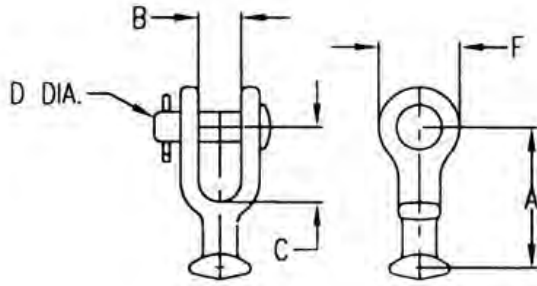
Forged steel hot dip galvanized  
Stainless steel

Catalog Number	A	B	C	D	E	F	G	Ultimate Strength (lbs)	Weight /100 (lbs)
CSH-1010-BC	4 5/8	1 1/4	2	1 1/4	3	1 1/4	4 1/2	100000	965
CSH-1011-BC	4 5/8	1 1/4	2	1 3/8	3	1 1/4	4 1/2	150000	975
CHS-1212BC	5 1/16	1 1/2	2 3/8	1 1/2	3 5/8	1 1/2	5 3/8	200000	1690





# Clevis Type Insulator Fittings



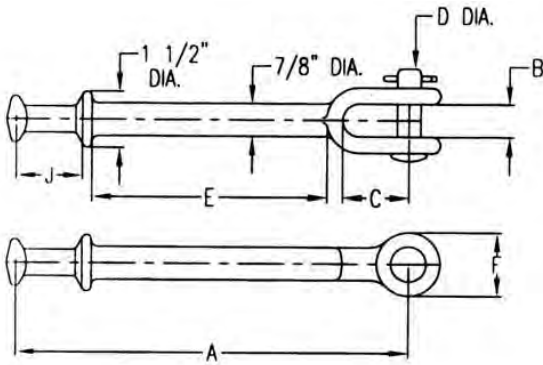
## Clevis - Ball, Standard Material

Forged steel hot dip galvanized

Catalog Number	For Insulator Class	A	B	C	D	F	Ultimate Strength (lbs)	Weight /100 (lbs)
CB-55	*ANSI 52-3 & 5	2 15/16	13/16	1 9/16	5/8	1 11/16	35000	110
CB-55L	*ANSI 52-3 & 5	3 15/16	13/16	2 1/2	5/8	1 11/16	35000	145
CB-78	*ANSI 52-8 & 11	4 3/16	1 1/8	2	7/8	2	50000	216

**Notes:**

- 1) For bolt, nut and cotter instead of clevis pin and cotter, add suffix "-BC" to catalog number
- 2) ANSI 52-3 & IEC 16mm are generally accepted as being interchangeable



## Clevis - Ball, Hot Line Material

Forged steel hot dip galvanized

Catalog Number	For Insulator Class	A	B	C	D	E	F	J	Ultimate Strength (lbs)	Weight /100 (lbs)
CBHL-55A	ANSI 52-3 & 5	10 1/2	7/8	1 3/4	5/8	6	1 11/16	1 3/4	35000	210
CBHL-78	ANSI 52-8 & 11	10 15/16	1 1/8	2	7/8	6	2	1 7/8	50000	375
BT3090	ANSI 52-3 & 5	9 3/4	1 1/2	1 3/4	-	-	-	-	30000	260

**Notes:**

- 1) For bolt, nut and cotter instead of clevis pin and cotter, add suffix "-BC" to catalog number
- 2) ANSI 52-5 & IEC 16mm are generally accepted as being interchangeable

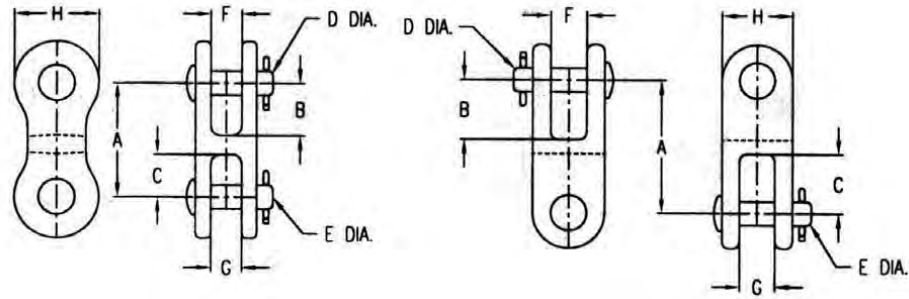


# Clevis Type Insulator Fittings

## Clevis - Clevis

### Material

Ductile iron hot dip galvanized



Catalog Number	A	B	C	D	E	F	G	H	Ultimate Strength (lbs)	Weight /100 (lbs)
CCR-55	3 1/2	1 9/16	1 9/16	5/8	5/8	15/16	15/16	1 7/8	30000	208
CC-55A	3 1/2	1 9/16	1 9/16	5/8	5/8	13/16	13/16	1 7/8	35000	242
CC-66	4 1/8	1 3/4	1 3/4	3/4	3/4	15/16	15/16	--	40000	400
CCR-66A	5 1/4	2 3/8	2 3/8	3/4	3/4	1 1/16	1 1/16	2 1/8	45000	460
CC-77A	6	2 11/16	2 11/16	7/8	7/8	2	1	--	60000	--

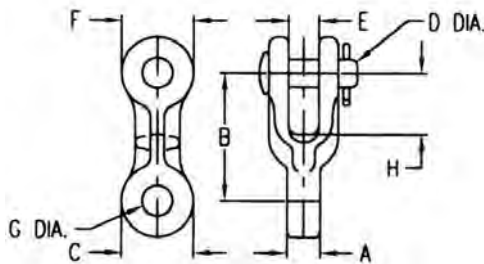
#### Notes:

1) For bolt, nut and cotter instead of clevis pin and cotter, add suffix "-BC" to catalog number

## Clevis - Eye, Standard

### Material

Ductile iron hot dip galvanized



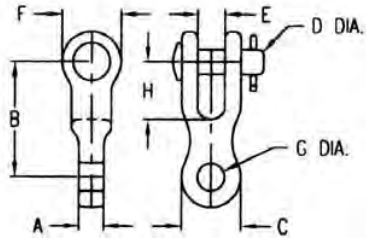
Catalog Number	A	B	C	D	E	F	G	H	Ultimate Strength (lbs)	Weight /100 (lbs)
SCE-55-500	1/2	2 1/2	1 3/4	5/8	16/16	1 3/4	11/16	1 1/4	18000	130
SCE-55-625	5/8	2 7/8	1 15/16	5/8	13/16	1 5/8	11/16	1 3/8	25000	135
SCE-55-750	3/4	2 7/8	1 5/8	5/8	11/16	1 5/8	11/16	1 3/8	25000	136
SCE-55-875	7/8	2 7/8	1 5/8	5/8	11/16	1 5/8	11/16	1 3/8	25000	138
SCE-55-875A	7/8	3 13/16	1 3/4	5/8	13/16	1 7/8	11/16	1 3/4	25000	139
SCE-55-1125	1 1/8	2 7/8	1 5/8	5/8	11/16	1 5/8	11/16	1 3/8	25000	140
SCE-55-1375	1 3/8	2 1/2	1 1/2	5/8	13/16	1 3/4	11/16	1 1/4	30000	158
SCE-55-1375A	1 3/8	2 7/8	1 7/16	5/8	11/16	1 5/8	11/16	1 3/8	30000	160
SCE-55-1500	1 1/2	2 1/2	1 1/2	5/8	11/16	1 3/4	11/16	1 3/4	30000	135
SCE-55-1625	1 5/8	2 1/2	1 1/2	5/8	5/8	1 3/4	11/16	1 1/4	30000	162
SCE-55-1750	1 3/4	2 7/8	1 1/2	5/8	11/16	1 5/8	11/16	1 1/4	30000	162
SCE-55-2000	2	2 7/8	1 5/8	5/8	11/16	1 7/8	11/16	1 7/16	30000	180
SCE-55-2187	2 3/16	2 7/8	1 5/8	5/8	11/16	1 7/8	11/16	1 7/16	30000	210
SCE-55-2500	2 1/2	2 7/8	1 5/8	5/8	11/16	1 7/8	11/16	1 3/16	30000	214
SCE-56-625	5/8	2 15/16	2	5/8	3/4	2	16/16	1 3/16	30000	140
SCE-56-1125	1 1/8	3 1/8	1 7/8	5/8	7/8	1 3/4	13/16	1 1/2	30000	190
SCI-56-1375	1 3/8	2 1/2	1 11/16	5/8	13/16	1 3/4	13/16	1 1/8	30000	186
SCE-56-1625	1 5/8	2 7/8	1 1/2	5/8	13/16	1 3/4	13/16	1 11/16	30000	190
SCE-57-2000	2	2 7/8	1 3/4	5/8	11/16	1 3/4	15/16	1 11/16	30000	192
SCE-66-1625	1 5/8	2 7/8	1 3/4	3/4	7/8	2	13/16	1 3/4	35000	172
SCE-66-2000	2	3 1/2	2 1/8	3/4	1	2 1/8	13/16	2	40000	215

#### Notes:

1) For bolt, nut and cotter instead of clevis pin and cotter, add suffix "-BC" to catalog number



# Clevis Type Insulator Fittings

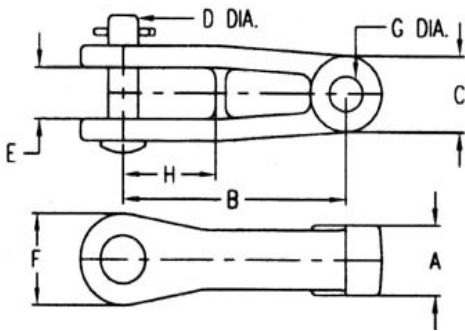


## Clevis - Eye, 90 Standard (RCE) Fitting

### Material

Ductile iron hot dip galvanized

Catalog Number	A	B	C	D	E	F	G	H	Ultimate Strength (lbs)	Weight /100 (lbs)
RCE-55-625	5/8	2 7/8	1 1/2	5/8	11/16	1 1/2	11/16	1	18000	135
RCE-55-750	3/4	2 3/8	2 1/2	5/8	1	2	11/16	1 3/8	30000	145
RCE-55-750A	3/4	2 7/8	1 1/2	5/8	11/16	1 1/2	11/16	1 1/4	18000	140
RCE-55-1125	1 1/8	2 7/8	1 5/8	5/8	13/16	1 1/8	11/16	1 5/16	25000	148
RCE-55-1375	1 3/8	2 7/8	1 1/2	5/8	13/16	1 1/8	11/16	1 7/8	25000	171
RCE-55-1750	1 3/4	2 7/8	1 3/8	5/8	13/16	1 1/8	11/16	1 7/8	30000	190
RCE-55-2000	2	2 7/8	1 5/8	5/8	7/8	1 1/8	11/16	1 7/8	30000	205
RCE-55-2187	2 3/16	2 7/8	1 5/8	5/8	7/8	1 1/8	11/16	1 5/16	30000	210
RCE-55-2500	2 1/2	2 7/8	1 5/8	5/8	7/8	1 1/8	11/16	1 7/8	30000	215
RCE-65-687	11/16	2	2 3/8	3/4	1	1 3/4	11/16	1 3/4	30000	145
RCE-66-812	13/16	3 1/2	2 1/4	3/4	1	2 5/16	13/16	1 5/8	40000	190
RCE-66-1000	1	2 9/16	1 3/4	3/4	13/16	2	13/16	1 11/16	30000	198
RCE-66-1125	1 1/8	3	1 3/4	3/4	15/16	1 7/8	13/16	2 1/8	30000	200



## Clevis - Eye, Long

### Material

Ductile iron hot dip galvanized

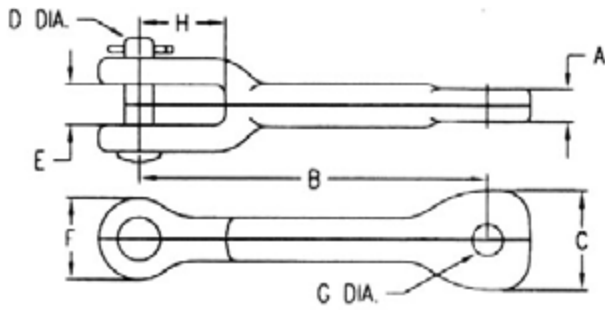
Catalog Number	A	B	C	D	E	F	G	H	Ultimate Strength (lbs)	Weight /100 (lbs)
RCEL-65-1250	1 1/4	5 1/2	1 3/4	3/4	1 1/8	2 1/8	11/16	2 5/16	40000	340
RCEL-65-1375	1 3/8	5 1/2	1 3/4	3/4	1 1/8	1 7/8	11/16	2 5/16	30000	340
RCEL-66-1250	1 1/4	5 1/2	1 3/4	3/4	1 1/8	2 1/8	13/16	2 5/16	40000	340
RCEL-66-1375	1 3/8	5 1/2	1 3/4	3/4	1 1/8	1 7/8	13/16	2 5/16	40000	340
RCEL-66-1500	1 1/2	5 1/2	1 15/16	3/4	1 1/8	1 15/16	13/16	2 1/8	40000	355
RCEL-66-1750	1 3/4	5 1/2	1 3/4	3/4	1 1/8	2 1/4	13/16	2 5/16	45000	380
RCEL-67-937	15/16	5 5/8	2 1/2	3/4	1 1/4	2 1/4	15/16	2 1/2	50000	390
RCEL-68-1125	1 1/8	5 1/2	1 3/4	3/4	1 1/8	2 1/8	1 1/16	2 5/16	36000	565
RCEL-68-15000	1 1/2	5 1/2	1 15/16	3/4	1 1/8	1 15/16	1 1/16	2 1/8	40000	395
RCEL-69-1250	1 1/4	5 1/2	2 3/8	3/4	1	2 1/8	1 3/16	2 5/16	40000	475
RCEL-77-1250	1 1/4	5 1/2	2 5/8	7/8	1 3/8	2 1/2	15/16	2 3/4	60000	555
RCEL-77-1625	1 5/8	5 1/2	2 1/4	7/8	158/16	2 1/2	15/16	2 3/4	60000	560
RCEL-78-1250	1 1/4	5 1/2	2 5/8	7/8	1 3/8	2 1/2	1 1/16	2 3/4	60000	555
RCEL-79-1250	1 1/4	5 1/2	2 5/8	7/8	1 3/8	2 1/2	1 3/16	2 3/4	60000	555

### Notes:

1) For bolt, nut and cotter instead of clevis pin and cotter, add suffix "-BC" to catalog number



# Clevis Type Insulator Fittings



## Clevis - Eye, Long

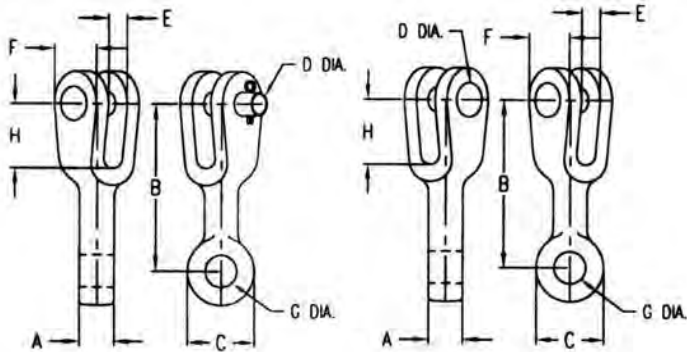
### Material

Ductile iron hot dip galvanized

Catalog Number	A	B	C	D	E	F	G	H	Ultimate Strength (lbs)	Weight /100 (lbs)
SCEL-55-687	11/16	7 7/16	2 1/8	5/8	7/8	1 3/4	11/16	3 3/4	30000	260
SCEL-55-687A	11/16	9	2 1/8	5/8	7/8	1 3/4	11/16	3 3/4	30000	290
SCEL-55-687B	11/16	12 1/2	2 1/8	5/8	7/8	1 3/4	11/16	3 3/4	30000	330
SCEL-55-687C	11/16	16	2 1/8	5/8	7/8	1 3/4	11/16	3 3/4	30000	370
SCEL-66-1000	1	9	1 15/16	3/4	1 3/16	2 1/4	13/16	1 5/8	30000	298
SCEL-68-1125	1 1/8	5 1/2	2 1/4	3/4	7/8	2 1/8	1 1/16	2 1/8	40000	442
SCEL-77-1125	1 1/8	8 5/8	2 1/2	7/8	1 1/4	2 1/2	15/16	2	60000	525
SCEL-77-1125A	1 1/8	11	2 1/2	7/8	1 1/4	2 1/2	15/16	2	60000	620

### Notes:

1) For bolt, nut and cotter instead of clevis pin and cotter, add suffix "-BC" to catalog number



## Clevis - Eye, Angled

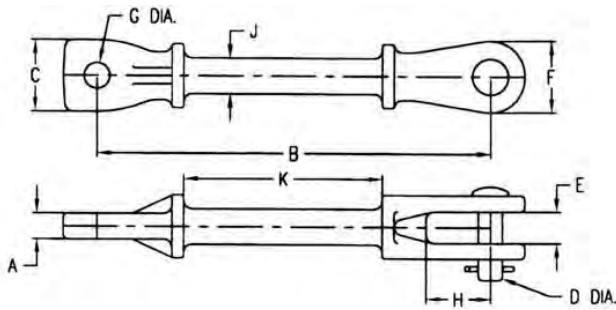
### Material

Ductile iron hot dip galvanized

Catalog Number	Fig.	A	B	C	D	E	F	G	H	Row	Ultimate Strength (lbs)	Weight /100 (lbs)
CEA-68-125L	2	1 1/8	5 1/2	2 1/4	3/4	7/8	2 1/8	1 1/16	2 1/8	45	45000	475
CEA-68-1125R	1	1 1/8	5 1/2	2 1/4	3/4	7/8	2 1/8	1/16	2 1/8	45	45000	475



# Clevis Type and Oval Eye Type Insulator Fittings



## Clevis - Eye, Hot Line

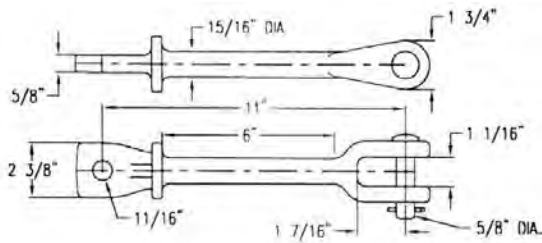
### Material

Ductile iron hot dip galvanized

Catalog Number	A	B	C	D	E	F	G	H	J	K	Ultimate Strength (lbs)	Weight /100 (lbs)
CEHL-55-625	5/8	7 3/8	2	5/8	13/16	1 7/8	11/16	1 1/2	15/16	2 15/16	30000	240
CEHL-55-687	11/16	11	2 1/8	5/8	1 1/8	2	11/16	1 1/2	15/16	6 1/8	30000	331
CEHL-56-1625	1 5/8	10	1 3/4	5/8	3/4	1 7/8	13/16	1	15/16	5 7/16	30000	346
CEHL-66-812	13/16	12 3/8	2 1/4	3/4	1	2 1/4	13/16	2	1 1/8	6 1/4	40000	600

### Notes:

1) For bolt, nut and cotter instead of clevis pin and cotter, add suffix "-BC" to catalog number



## Clevis - Eye, Hot Line 90 Degrees

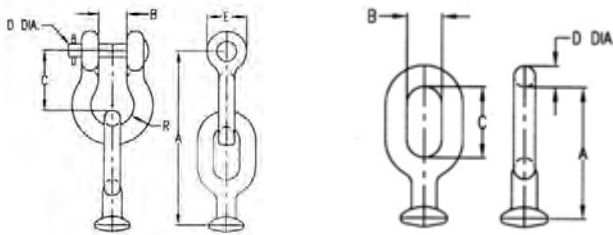
### Material

Ductile iron hot dip galvanized

Catalog Number	Ultimate Strength (lbs)	Weight /100 (lbs)
RCEHL-55-625	30000	285

### Notes:

1) For bolt, nut and cotter instead of clevis pin and cotter, add suffix "-BC" to catalog number



## Oval Eye - Ball

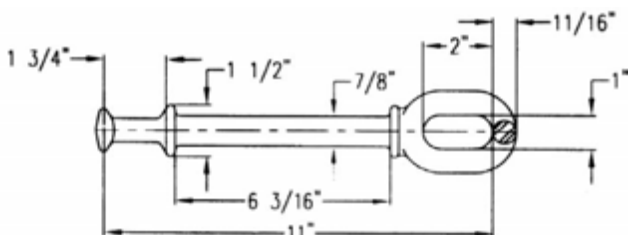
### Material

Forged steel hot dip galvanized

Catalog Number	For Insulator Class	A	B	C	D	E	R	Ultimate Strength (lbs)	Weight /100 (lbs)
ASBE-55	*ANSI 52-3 & 5	6 1/2	7/8	2 1/8	5/8	1 1/2	11/16	30000	222
ASBE-65A	*ANSI 52-3 & 5	7 1/4	7/8	2 13/16	3/4	1 7/8	38/4	35000	257
ASBE-86	*ANSI 52-8	7 3/8	1 1/16	2 1/8	3/4	1 3/4	3/4	40000	317
OEB-55	*ANSI 52-3 & 5	3 3/4	1	2	11/16	--	--	35000	110
OEB-68	ANSI52-8 & 11	4 5/8	1 1/4	2 1/2	3/4	--	--	50000	170

### Notes:

1) ANSI 52-5 & IEC 16mm are generally accepted as being interchangeable



## Oval Eye - Ball, Hot Line Link

### Material

Forged steel hot dip galvanized

Catalog Number	For Insulator Class	Ultimate Strength (lbs)	Weight /100 (lbs)
OEBHL-55	ANSI 52-3 & 5	35000	270

### Notes:

1) ANSI 52-5 & IEC 16mm are generally accepted as being interchangeable

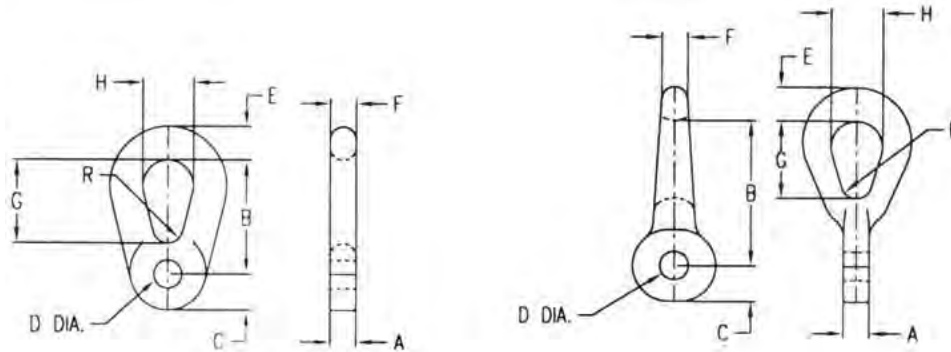


# Oval Eye Type Insulator Fittings

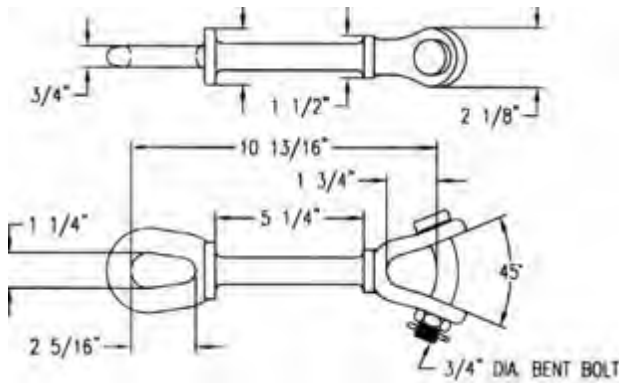
## Oval Eye - Eye

### Material

Ductile iron hot dip galvanized



Catalog Number	A	B	C	D	E	F	G	H	R	Ultimate Strength (lbs)	Weight /100 (lbs)
OE-5-625A	5/8	4 9/16	1 1/4	11/16	7/8	3/4	2 1/2	1 1/4	7/16	30000	120
OER-5-625	5/8	3 1/2	7/8	11/16	13/16	5/8	1 15/16	1 1/4	3/8	20000	105



## Oval Eye - Eye, Y Clevis Hot Line

### Material

Fitting: Ductile iron hot dip galvanized

Bolt and Nut: Steel

Cotter Pin: Stainless steel

Catalog Number	Ultimate Strength (lbs)	Weight /100 (lbs)
LOY-66-11	30000	550



## Oval Eye - Oval Eye, Hot Link

### Material

Forged steel hot dip galvanized

Catalog Number	Length (L)	Weight /100 (lbs)
LOO-77-45	45	1290
LOO-77-66	66	1640
LOO-77-74	75	1809
LOO-77-77	77	1876
LOO-77-81	81	1956
LOO-77-84	84	2180
LOO-77-97	97	2325
LOO-77-102	102	2434
LOO-77-107	107	2545

#### Notes:

- 1) LOO-77-XX (XX = Length "L")
- 2) Min Length = 45"
- 3) LOO-77R-XX = 90° rotated eye / eye
- 4) For custom length, contact MPS
- 5) For use in 30k to 60k applications
- 6) Ideal replacement for steel strap sets

Catalog Number	Length (L)	Weight /100 (lbs)
LOO-55-15	15	377
LOO-55-18	18	396
LOO-55-20	20	563
LOO-55-24	24	580
LOO-55-28	28	597
LOO-55-34	34	622
LOO-55-42	42	804
LOO-55-55	55	1025
LOO-55-75	75	1438

#### Notes:

- 1) LOO-55-XX (XX = Length "L")
- 2) Min Length = 15"
- 3) LOO-55R-XX = 90° rotated eye / eye
- 4) For custom length, contact MPS
- 5) For use in 30k to 60k applications
- 6) Ideal replacement for steel strap sets





# Socket Type Insulator Fittings

## Socket - Ball, Hot Link

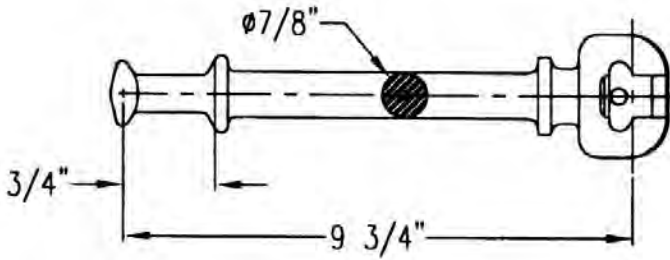
### Material

Forged steel hot dip galvanized

Catalog Number	For Insulator Class	Ultimate Strength (lbs)	Weight /100 (lbs)
HLSB-30-55	*ANSI 52-3 & 5	30000	300

### Notes:

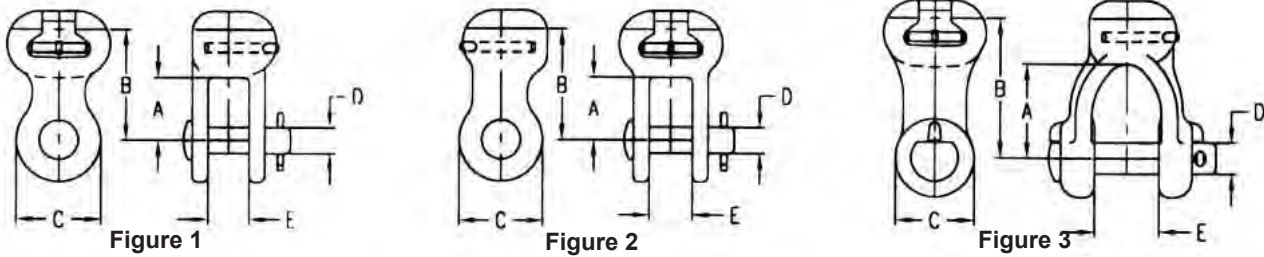
1) ANSI 52-5 & IEC 16mm are generally accepted as being interchangeable



## Socket - Clevis, Standard

### Material

Ductile iron hot dip galvanized



Catalog Number	Fig.	For Insulator Class	A	B	C	D	E	Ultimate Strength (lbs)	Weight /100 (lbs)
SC-55	1	*ANSI- 52-5 & 5	1 1/2	2 5/8	2	5/8	15/16	30000	200
SC-55A	3	*ANSI 52-3 & 5	1 1/8	2 1/4	1 3/4	5/8	1 13/16	30000	220
CSS90-55	1	*ANSI 52-3 & 5	1 5/8	2 5/8	1 3/4	5/8	13/16	30000	226
SCR-55	2	*ANSI 52-3 & 5	1 1/2	2 5/8	2	5/8	1	30000	197
SC-86	1	ANSI 52-8	2	3 1/4	2 1/8	3/4	1 1/4	45000	240
SCR-87	2	ANSI 52-8 & 11	2 1/4	4 1/2	2	7/8	1 1/8	50000	460
SC-87A	3	ANSI 52-8	2 3/16	3 3/8	2 1/8	7/8	1 11/16	40000	330
SC-87B	3	ANSI 52-8 & 11	2 1/4	4 1/2	2	7/8	1 7/16	50000	345

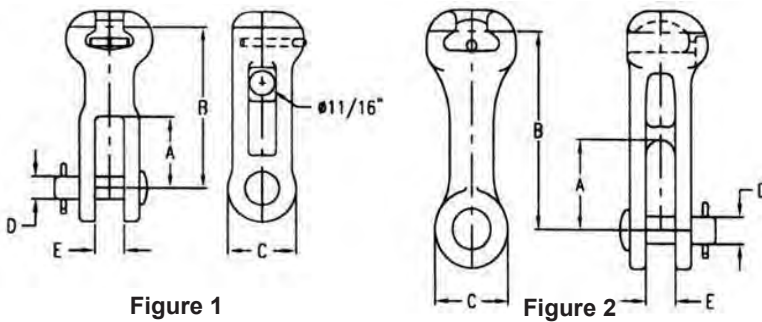
### Notes:

1) ANSI 52-5 & IEC 16mm are generally accepted as being interchangeable

## Socket - Clevis, Long

### Material

Ductile iron hot dip galvanized



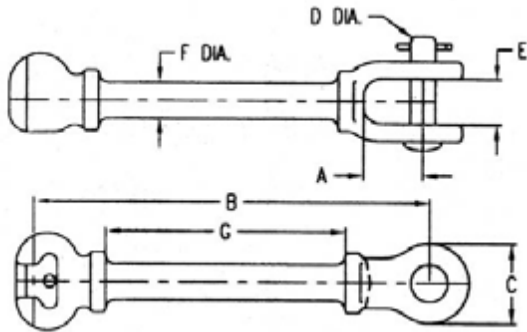
Catalog Number	Fig.	For Insulator Class	A	B	C	D	E	Ultimate Strength (lbs)	Weight /100 (lbs)
SCL-55B	1	*ANSI 52-3 & 5	2	4 1/2	1 7/8	5/8	13/16	30000	265
SCL-207	2	IEC 20MM	2 7/8	6 5/16	2 1/2	7/8	1	45000	565

### Notes:

1) ANSI 52-5 & IEC 16mm are generally accepted as being interchangeable



# Socket Type Insulator Fittings



**Socket - Clevis, Hot Line Material**  
 Ductile iron hot dip galvanized

Catalog Number	For Insulator Class	A	B	C	D	E	F	G	Ultimate Strength (lbs)	Weight /100 (lbs)
SCHL-55	*ANSI 52-3 & 5	1 3/8	8 3/8	2 1/8	5/8	1	15/16	5 3/16	30000	325
SCHL-55A	*ANSI 52-3 & 5	1 1/2	10	2	5/8	1 1/8	15/16	6 1/16	30000	345
SCHL-56A	*ANSI 52-3 & 5	1 1/2	10	2	5/8	1 1/8	15/16	6 1/16	30000	345
SCHL-86	ANSI 52-8	1 3/4	10 5/8	2 1/8	3/4	1 1/8	1 1/8	5 3/4	40000	585
SCHL-87	ANSI 52-8 & 11	2 1/4	10 5/8	2 1/4	2 1/4	7/8	1 1/8	**5/18	50000	595
SCHL-87A	ANSI 52-8 * 11	2 1/4	11 1/4	2 1/4	7/8	1 1/8	1 1/8	**6	50000	610

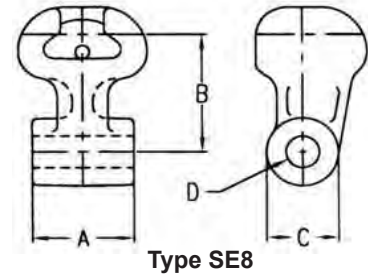
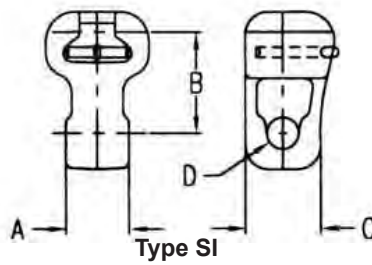
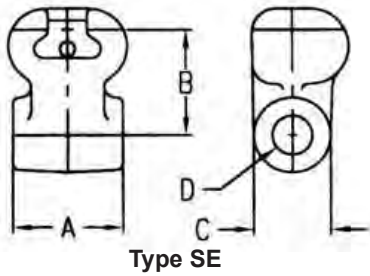
**Notes:**

1) ANSI 52-5 & IEC 16mm are generally accepted as being interchangeable



# Socket Type Insulator Fittings

**Socket - Eye, Standard**  
**Material**  
 Ductile iron hot dip galvanized



Catalog Number	For Insulator Class	A	B	C	D	Ultimate Strength (lbs)	Weight /100 (lbs)
SI-500	*ANSI 52-3 & 5	1/2	2 3/16	1 5/8	11/16	18000	108
SI-625	*ANSI 52-3 & 5	5/8	2 3/16	1 5/8	11/16	20000	111
SI-750	*ANSI 52-3 & 5	3/4	2 3/16	1 5/8	11/16	25000	113
SE-750-6	*ANSI 52-3 & 5	3/4	2 3/4	2	13/16	30000	180
SI-875	*ANSI 52-3 & 5	7/8	2 3/16	1 5/8	11/16	30000	115
SE-875-6	*ANSI 52-3 & 5	7/8	2 3/16	1 11/16	13/16	30000	121
SE-1000-6	*ANSI 52-3 & 5	1	2 3/8	1 11/16	13/16	30000	185
SI-1062	*ANSI 52-3 & 5	1 1/16	2 5/16	1 5/8	11/16	30000	117
SI-1125	*ANSI 52-3 & 5	1 1/8	2 3/16	1 5/8	11/16	30000	118
SE-1250-6	*ANSI 52-3 & 5	1 1/4	2 3/8	1 11/16	13/16	30000	235
SE-1250-8	*ANSI 52-3 & 5	1 1/4	2 1/2	2	1 1/16	30000	235
SI1375	*ANSI 52-3 & 5	1 3/8	2 3/16	1 1/2	11/16	30000	122
SI-1375-6	*ANSI 52-3 & 5	1 3/8	2 3/16	1 5/8	13/16	30000	128
SE-11	*ANSI 52-3 & 5	1 3/8	2 3/8	1 5/8	11/16	30000	22
SE-1625-6	*ANSI 52-3 & 5	1 5/8	3	1 3/4	13/16	30000	195
SI-1750	*ANSI 52-3 & 5	1 3/4	2 3/16	1 1/2	11/16	30000	130
SE-1750-6	*ANSI 52-3 & 5	1 3/4	2 11/16	1 5/8	13/16	30000	240
SI-2000	*ANSI 52-3 & 5	2	2 3/16	1 1/2	11/16	30000	138
SE-2000-6	*ANSI 52-3 & 5	2	2 3/16	1 9/16	13/16	30000	230
SI-2187	*ANSI 52-3 & 5	2 3/16	2 3/16	1 1/2	11/16	30000	146
SI-2500	*ANSI 52-3 & 5	2 1/2	2 3/16	1 1/2	11/16	30000	168
SE-2500A-6	*ANSI 52-3 & 5	2 1/2	3	1 3/4	13/16	30000	255
SE8-1437-6	ANSI 52-8 & 11	1 7/16	5 5/16	2 1/4	13/16	45000	580
SE8-1437-7	ANSI 52-8 & 11	1 7/16	5 5/16	2 1/4	15/16	50000	580
SE8-1437-8	ANSI 52-8 & 11	1 7/16	5 5/16	2 1/4	1 1/16	50000	580
SE8-1437-9	ANSI 52-8 & 11	1 7/16	5 5/16	2 1/4	1 3/16	50000	580
SE8-1625-6	ANSI 52-8 & 11	1 5/8	3 3/8	1 3/4	13/16	45000	335
SE8-1750-6	ANSI 52-8 & 11	1 3/4	3 3/8	1 3/4	13/16	45000	340
SE8-2187-6	ANSI 52-8 & 11	2 3/16	3 3/8	1 3/4	13/16	45000	378
SE8-2500-6	ANSI 52-8 & 11	2 1/2	3 3/8	1 3/4	13/16	45000	382
SE8-3250-7	ANSI 52-8 & 11	3 1/4	3 3/8	2	15/16	50000	420

Notes:  
 1) ANSI 52-5 & IEC 16mm are generally accepted as being interchangeable



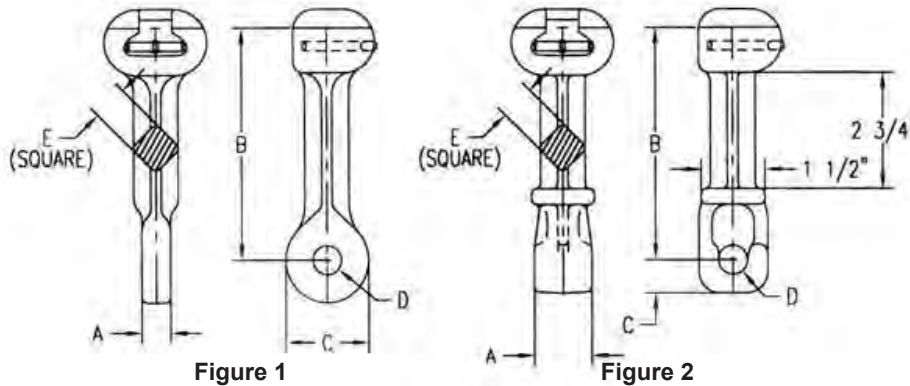
# Socket Type Insulator Fittings

## Socket - Eye, Long

**Material**

Fitting: Ductile iron hot dip galvanized

Cotter Pin: Stainless steel



Catalog Number	Fig.	For Insulator Class	A	B	C	D	E	Ultimate Strength (lbs)	Weight /100 (lbs)
SEL-687	1	ANSI 52-3 & 5	11/16	5 1/2	2 3/4	11/16	7/8	35000	230
SEL-1125	2	ANSI 52-3 & 5	1 1/8	5 1/2	3/4	11/16	7/8	30000	225
SEL-1375	2	ANSI 52-3 & 5	1 3/8	5 1/2	3/4	11/16	7/8	30000	235
SEL-1750	2	ANSI 52-3 & 5	1 3/4	5 1/2	3	11/16	7/8	30000	245

**Notes:**

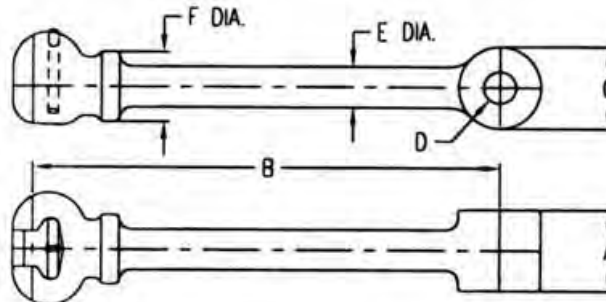
1) For ANSI Class 52-3 and 52-5 insulators

## Socket - Eye, Hot Line

**Material**

Fitting: Ductile iron hot dip galvanized

Cotter Pin: Stainless steel



Catalog Number	For Insulator Class	A	B	C	D	E	F	Ultimate Strength (lbs)	Weight /100 (lbs)
SEHL-625	ANSI 52-3 & 5	5/8	10	3	11/16	15/16	1 1/2	30000	280
SEHL-625-8	ANSI 52-3 & 5	5/8	10	2	1 1/16	15/16	1 1/2	30000	280
SEHL-687	ANSI 52-3 & 5	11/16	12 7/8	2	11/16	15/16	1 1/2	30000	350
SEHL-750	ANSI 52-3 & 5	3/4	8 3/8	1 3/4	11/16	15/16	1 1/2	30000	272
HLSE-750-7	ANSI 52-3 & 5	3/4	8 3/8	2	15/16	7/8	1 1/2	30000	264
HLSE-30-65-5	ANSI 52-3 & 5	3/4	10	1 9/16	11/16	7/8	1 1/2	30000	319
SEHL-1125	ANSI 52-3 & 5	1 1/8	8 3/8	1 9/16	11/16	15/16	1 1/2	30000	265
SEHL-1125-6	ANSI 52-3 & 5	1 1/8	8 3/8	1 3/4	13/16	15/16	1 1/2	30000	265
SEHL-1375	ANSI 52-3 & 5	1 3/8	10	1 3/4	11/16	15/16	1 1/2	30000	270
SEHL-1375-6	ANSI 52-3 & 5	1 3/8	10	1 3/4	13/16	15/16	1 1/2	30000	268
SEHL-1625	ANSI 52-3 & 5	1 5/8	10	1 3/4	11/16	15/16	1 1/2	30000	272
SEHL-1625-6	ANSI 52-3 & 5	1 5/8	10	1 3/4	13/16	15/16	1 1/2	30000	272
SEHL-1750	ANSI 52-3 & 5	1 3/4	10	1 3/4	11/16	15/16	1 1/2	30000	275
SEHL-1750-6	ANSI 52-3 & 5	1 3/4	10	1 3/4	13/16	15/16	1 1/2	30000	275

**Notes:**

1) ANSI 52-5 & IEC 16mm are generally accepted as being interchangeable



# Socket Type Insulator Fittings

**Socket - Y-Clevis, Standard Material**  
 Ductile iron hot dip galvanized

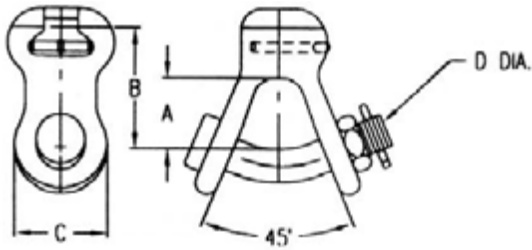


Figure 1

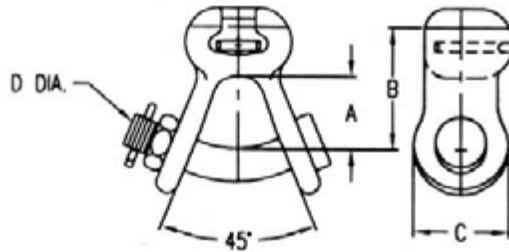
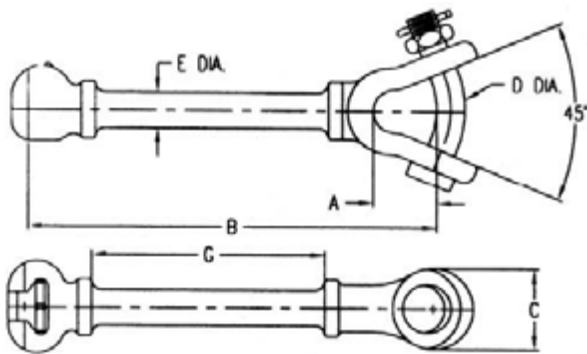


Figure 2

Catalog Number	Fig.	For Insulator Class	A	B	C	D	Ultimate Strength (lbs)	Weight /100 (lbs)
SYC-56	1	*ANSI 52-3 & 5	1 5/8	2 3/4	2 1/8	3/4	30000	321
SYC-56F	1	*ANSI 52-3 & 5	1 3/4	4	2 1/8	3/4	30000	340
SYC-86	1	ANSI 52-8	1 11/16	3	2 3/8	3/4	40000	360
SYC-87	1	ANSI 52-8 & 11	1 7/8	3	2 1/2	7/8	50000	385
SYC-207	1	IEC 20MM	2	4 1/4	2 1/2	7/8	45000	410
SYC-249	1	IEC 24MM	3	4 5/8	3 1/16	1 1/8	66000	1325
SYCR-56	2	*ANSI 52-3 & 5	1 5/8	2 3/4	2 1/8	3/4	30000	290
SYC-87	2	ANSI 52-8 & 11	1 7/8	3	2 1/2	7/8	50000	385

**Notes:**

1) ANSI 52-5 & IEC 16mm are generally accepted as being interchangeable



**Socket - Y-Clevis, Hot Line Material**  
 Ductile iron hot dip galvanized

Catalog Number	For Insulator Class	A	B	C	D	E	G	Ultimate Strength (lbs)	Weight /100 (lbs)
SYCHL-56A	*ANSI 52-3 & 5	1 5/8	10 3/4	2 1/8	3/4	15/16	6 3/16	30000	325
SYCHL-87	ANSI 52-8 & 11	2	12	2 3/4	7/8	1 1/4	6 1/2	50000	345

**Notes:**

1) ANSI 52-5 & IEC 16mm are generally accepted as being interchangeable



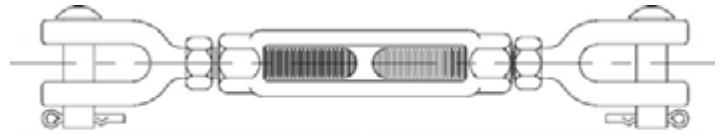
# Turnbuckles



**JAW & EYE**



**EYE & EYE**



**JAW & JAW**

**Features**

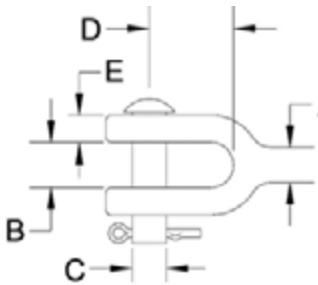
- For bolt, nut and cotter add BC suffix
- Turnbuckles recommended for straight or in-line pull only

**Material**

- Hot dip galvanized steel

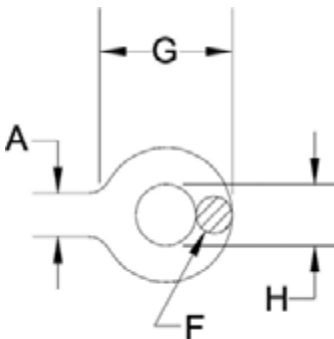
**Eye-Eye**

Catalog Number	Thread Dia. & Take Up	Ultimate Loads	A	B	C	D	E	F	G	H	Open	Close	Weight (lbs)
G-226-3/4x6	3/4x6	26,000	0.75	---	---	---	---	0.63	2.75	1.50	20.75	14.75	3.98
G-226-3/4x9	3/4x9										27.00	18.00	5.13
G-226-3/4x12	3/4x12										33.75	21.75	5.81
G-226-3/4x18	3/4x18										45.75	27.75	6.66
G-226-7/8x12	7/8x12	36,000	0.88	---	---	---	---	0.88	3.50	1.75	34.50	22.50	7.88
G-226-7/8x18	7/8x18										46.50	28.50	12.12
G-226-1x6	1x6	50,000	1.00	---	---	---	---	0.88	3.75	2.00	23.00	17.00	8.05
G-226-1x12	1x12										37.00	25.00	10.78
G-226-1x18	1x18										39.00	31.00	13.86
G226-1 1/4x12	1 1/4x12										76,000	1.25	---



**Jaw-Eye**

Catalog Number	Thread Dia. & Take Up	Ultimate Loads	A	B	C	D	E	F	G	H	Open	Close	Weight (lbs)
G-277-3/4x6	3/4x6	26,000	0.75	0.94	0.63	1.84	0.50	0.63	2.75	1.50	21.63	15.63	4.03
G-277-3/4x9	3/4x9										27.75	18.75	5.23
G-227-3/4x12	3/4x12										34.00	22.00	6.03
G-227-3/4x18	3/4x18										46.00	28.00	7.02
G-227-7/8x6	7/8x6	36,000	0.88	1.16	0.75	1.97	0.56	0.88	3.50	1.75	25.00	19.00	6.55
G-227-7/8x12	7/8x12										35.50	23.50	8.43
G-227-7/8x18	7/8x18										47.50	29.50	12.52
G-227-1x6	1x6	50,000	1.00	1.19	0.88	2.41	0.69	0.88	3.75	2.00	25.13	19.13	8.72
G-227-1x12	1x12										37.25	25.25	11.38
G-227-1x18	1x18										49.25	31.25	14.63
G-227-1 1/4x12	1 1/4x12										76,000	1.25	1.75



**Jaw-Jaw**

Catalog Number	Thread Dia. & Take Up	Ultimate Loads	A	B	C	D	E	F	G	H	Open	Close	Weight (lbs)
G-228-3/4x6	3/4x6	26,000	0.75	0.94	0.63	1.84	0.50	---	---	---	22.50	16.50	4.18
G-228-3/4x9	3/4x9										28.50	19.50	5.45
G-228-3/4x12	3/4x12										34.50	22.50	6.20
G-228-BC-3/4x12	3/4x12										34.50	22.50	6.20
G-228-3/4x18	3/4x18										46.50	28.50	7.53
G-228-BC-3/4x18	3/4x18										46.50	28.50	7.53
G-228-7/8x12	7/8x12	36,000	0.88	1.16	0.75	1.97	0.56	---	---	---	36.50	24.50	8.63
G-228-7/8x18	7/8x18										48.50	30.50	12.81
G-228-1x6	1x6	50,000	1.00	1.19	0.88	2.41	0.69	---	---	---	27.19	21.19	9.11
G-228-1x12	1x12										37.50	25.50	11.65
G-228-1x18	1x18										49.50	31.50	15.18



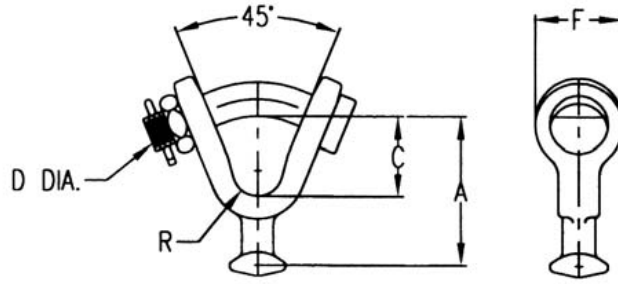


# Y-Clevis Type Insulator Fittings

## Y-Clevis - Ball, Standard

### Material

Forged steel hot dip galvanized



Catalog Number	For Insulator Class	A	C	D	F	R	Ultimate Strength (lbs)	Weight /100 (lbs)
YCB-65A	*ANSI 52-3 & 5	3 1/4	1 9/16	3/4	1 7/8	1/2	35000	215
YCB-78	ANSI 52-8 & 11	3 13/16	1 9/16	7/8	2 3/16	5/8	50000	330
YCB-720	IEC 20MM	4 1/16	1 9/16	7/8	2 3/16	5/8	40000	340

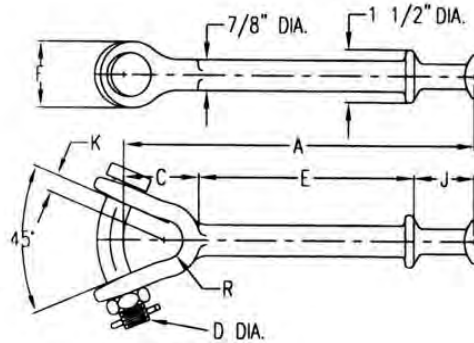
### Notes:

1) ANSI 52-5 & IEC 16mm are generally accepted as being interchangeable

## Y-Clevis - Ball, Hot Line

### Material

Forged steel hot dip galvanized



Catalog Number	For Insulator Class	A	C	D	E	F	J	K	R	Ultimate Strength (lbs)	Weight /100 (lbs)
YCBHL-65A	*ANSI 52-3 & 5	10 1/8	1 11/16	3/4	6	1 7/8	1 3/4	1/2	9/16	35000	317
YCBHL-78	ANSI 52-8 & 11	10 7/8	1 3/4	7/8	6	2 3/16	1 7/8	9/16	11/16	50000	460

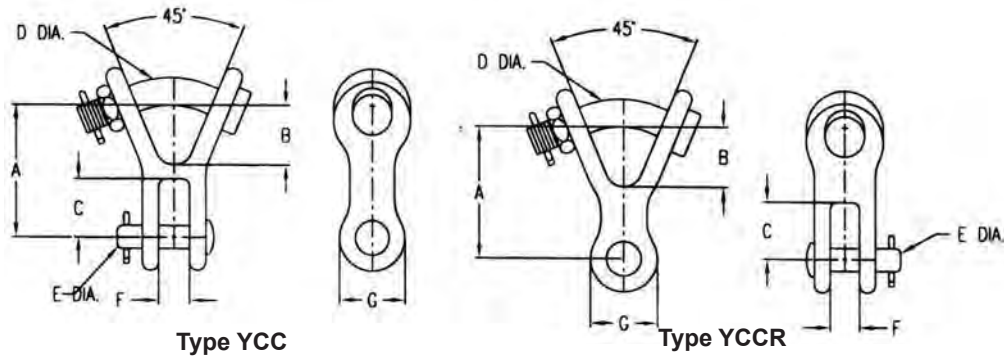
### Notes:

1) ANSI 52-5 & IEC 16mm are generally accepted as being interchangeable



# Y-Clevis Type Insulator Fittings

## Y-Clevis - Clevis, Standard Material Ductile iron hot dip galvanized

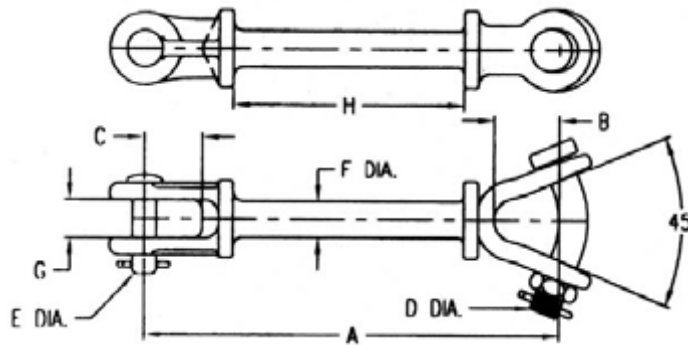


Catalog Number	For Insulator Class	A	C	D	E	F	G	Ultimate Strength (lbs)	Weight /100 (lbs)
YCC-65	3 5/8	1 9/16	1 9/16	3/4	5/8	13/16	1 7/8	30000	135
YCC-76	4 1/8	1 3/4	1 3/4	7/8	3/4	15/16	2	40000	145
YCC-77	4 1/8	1 3/4	1 3/4	7/8	3/4	15/16	2	50000	140
YCCR-65	3 5/8	1 9/16	1 9/16	3/4	5/8	13/16	1 3/4	30000	148

**Notes:**

1) For bolt, nut and cotter instead of clevis pin and cotter, add suffix "-BC" to catalog number

## Y-Clevis - Clevis, Hot Line Material Ductile iron hot dip galvanized



Catalog Number	A	B	C	D	E	F	G	H	Ultimate Strength (lbs)	Weight /100 (lbs)
YCCHL-65	10 7/8	1 3/4	1 1/2	3/4	5/8	15/16	13/16	8 7/8	30000	524
YCCHL-76A	11 3/4	1 3/4	1 1/4	4/8	3/4	1 1/8	13/16	6	40000	650

**Notes:**

1) For bolt, nut and cotter instead of clevis pin and cotter, add suffix "-BC" to catalog number



# Y-Clevis Type Insulator Fittings

## Y-Clevis - Eye, Standard Material

Ductile iron hot dip galvanized

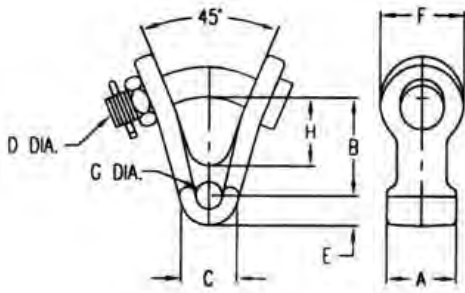


Figure 1

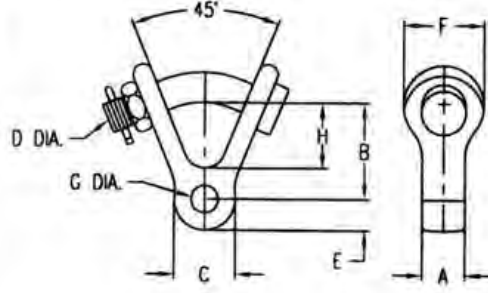


Figure 2

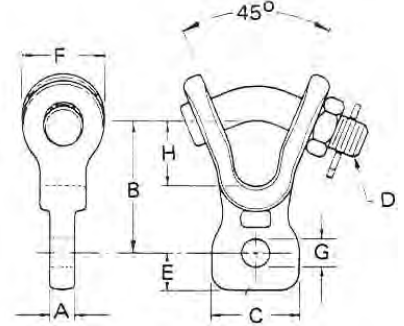


Figure 3

Catalog Number	Fig.	A	B	C	D	E	F	G	H	Ultimate Strength (lbs)	Weight /100 (lbs)
RYCE-65-625	2	5/8	3 1/2	1 5/8	3/4	13/16	2	11/16	1 3/4	19000	205
RYCE-65-625A	3	5/8	2 5/8	2 1/8	3/4	15/16	2 1/8	11/16	1 13/16	30000	220
RYCE-65-1062	2	1 1/16	2 1/2	1 9/16	3/4	13/16	2	11/16	1 3/4	30000	275
RYCE-65-2000	2	2	2 9/16	1 3/4	3/4	3/4	2 1/8	11/16	1 9/16	30000	295
RYCE-65-2187	1	2 3/16	2 5/8	1 1/2	3/4	3/4	2 1/8	11/16	1 7/8	30000	305
RYCE-65-2500	2	2 1/2	2 5/8	1 5/8	3/4	13/16	2	11/16	1 5/8	30000	310
RYCE-66-875	2	7/8	3 1/2	2	3/4	15/16	2 1/8	13/16	1 3/4	30000	275
RYCE-66-1062	2	1 1/16	2 1/2	1 9/16	3/4	13/16	2	13/16	1 3/4	25000	270
RYCE-66-1250	2	1 1/4	2 7/16	1 5/8	3/4	13/16	2 13/16	13/16	1 9/16	30000	275
RYCE-66-1750	2	1 3/4	2 9/16	1 3/4	3/4	13/16	2 1/8	13/16	2	30000	285
RYCE-66-2000	2	2	2 9/16	1 3/4	3/4	3/4	2 1/8	13/16	1 9/16	30000	295
RYCE-66-2125	1	2 1/8	2 5/8	1 5/8	3/4	13/16	2 1/8	13/16	1 7/8	30000	305
RYCI-65-1750	1	1 3/4	2 5/8	1 1/2	3/4	3/4	2 1/8	11/16	1 7/8	30000	245

**Notes:**

1) ANSI 52-5 & IEC 16mm are generally accepted as being interchangeable

## Y-Clevis - Eye, 90° Material

Ductile iron hot dip galvanized

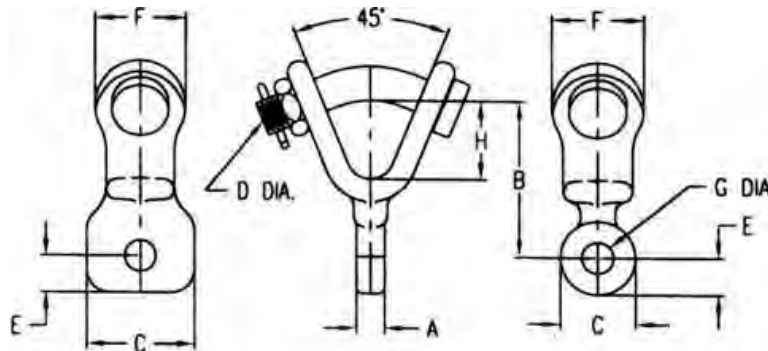


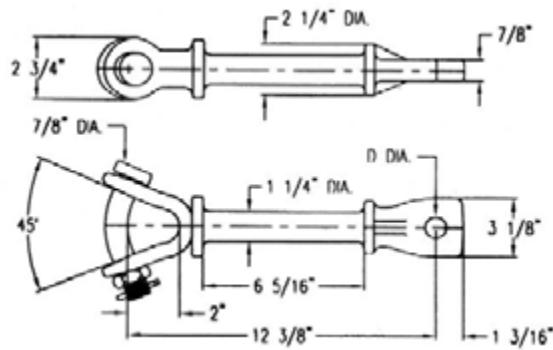
Figure 1

Figure 2

Catalog Number	Fig.	A	B	C	D	E	F	G	H	Ultimate Strength (lbs)	Weight /100 (lbs)
YCE-65-625A	1	5/8	3 1/2	2 3/8	3/4	15/16	2/18	11/16	1 3/4	30000	220
YCE-65-625	2	5/8	3 1/2	1 5/8	3/4	13/16	2	11/16	1 3/4	19000	205
YCE-66-750	2	3/4	3 5/8	2	3/4	1	2 1/8	13/16	1 3/4	30000	240



# Y-Clevis Type Insulator Fittings

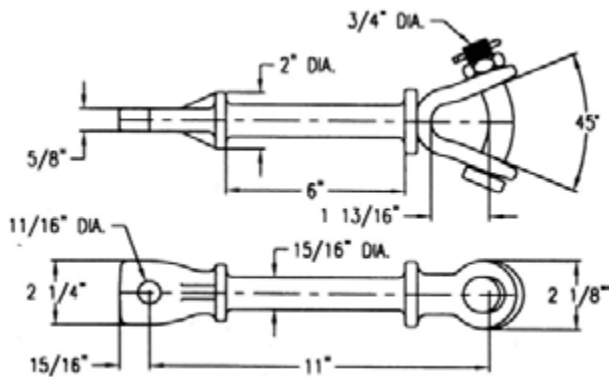


## Y-Clevis - Eye, Hot Line Link

### Material

Ductile iron hot dip galvanized

Catalog Number	D	Ultimate Strength (lbs)	Weight /100 (lbs)
RYCEHL-76-875	13/16	40000	620
RYCEHL-77-875	15/16	50000	620

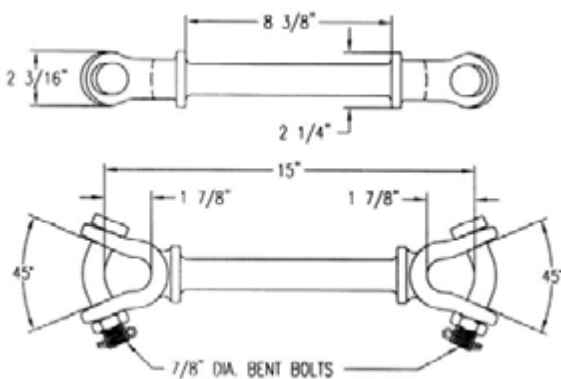


## Y-Clevis - Eye, Hot Line Link

### Material

Ductile iron hot dip galvanized

Catalog Number	Ultimate Strength (lbs)	Weight /100 (lbs)
YCEHL-65-625	30000	320



## Y-Clevis-Y-Clevis, Hot Line

### Material

Fitting: Ductile iron hot dip galvanized  
Bolts and Nuts: Steel hot dip galvanized  
Cotter Pin: Stainless steel

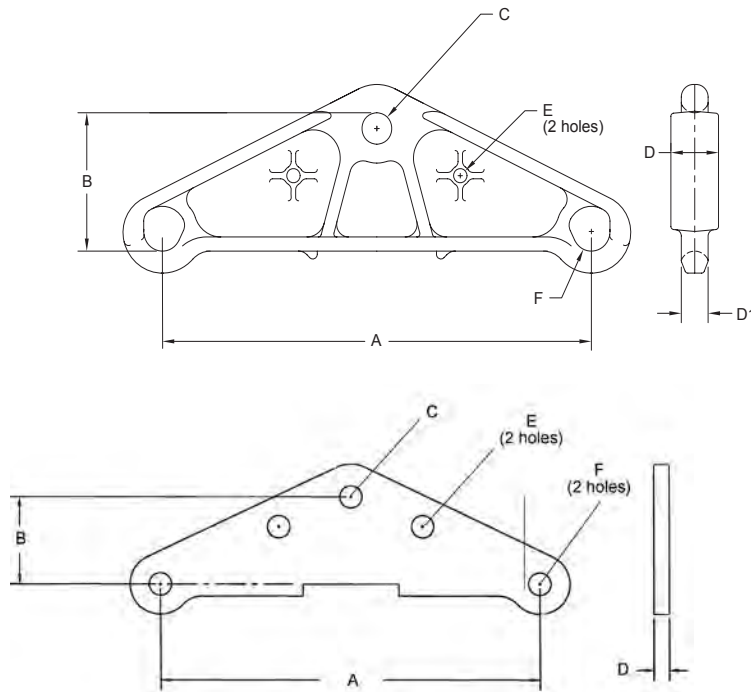
Catalog Number	Ultimate Strength (lbs)	Weight /100 (lbs)
YCYCHL-77	50000	300



# Yoke Plates

<b>Y</b>	<b>2</b>	<b>TT</b>	<b>030</b>	<b>A</b>	<b>18</b>	<b>00</b>
YP Series	# of Cond.	Yoke Plate Type	Ult. Strength	Material	Spacing	MPS ID
	1 2 3 4 6	TT = Tangent Triangular DT = DE Triangular DR = DE Rectangular VS = V-String RV = Restrained V TA = Turn Angle JS = Jumper Susp JW = Jumper w/ weight	30k 40k 50k 60k 80k 100k	A = Aluminum D = Ductile S = Steel	18" & 13"	

## Tangent Triangular



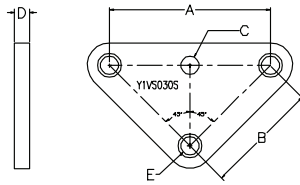
### Tangent Triangular Yoke Plates

Catalog Number	Ultimate Strength	Material	Dimensions (inches)						
			A	B	C	D	D1	E	F
Y1TT030A1800	32,000	Aluminum	18	5 1/2	1 1/4	2	1 1/8	9/16	1 1/2
Y1TT040S1800	40,000	Steel	18	3 5/8	15/16	5/8	---	15/16	15/16
Y1TT050D1800	50,000	Ductile Iron	18	5 1/2	1 1/4	2	1 1/8	9/16	1 1/2
Y1TT050S1800	50,000	Steel	18	3 5/8	15/16	3/4	---	15/16	15/16

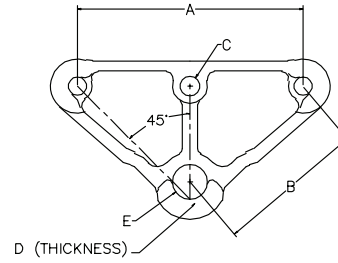


# Yoke Plates

## V-String Single Conductor Yokes



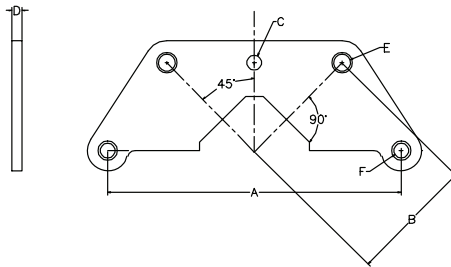
Steel



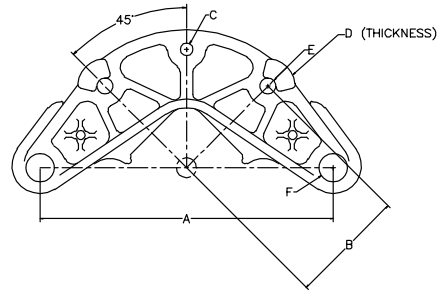
Aluminum

Catalog Number	Ultimate Strength	Material	Dimensions (inches)				
			A	B	C	D	E
Y1VS030S	30,000	Steel	8	5 21/32	15/16	5/8	15/18
Y1VS030A	30,000	Aluminum	14	8	1	1 1/8	1 3/4
Y1V2050S	50,000	Steel	8	5 21/32	15/16	3/4	15/16
Y1BS050D	50,000	iron	14	8	1	1 1/8	1 3/4

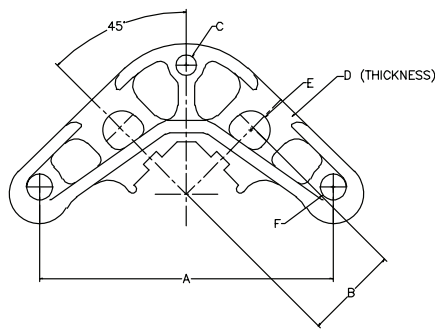
## V-String Double Conductor Yokes



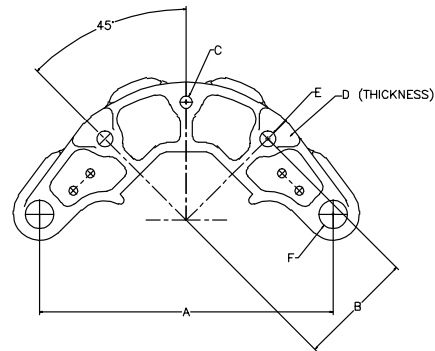
Steel



Aluminum, 30,000 lbs



Aluminum, 40,000 lbs



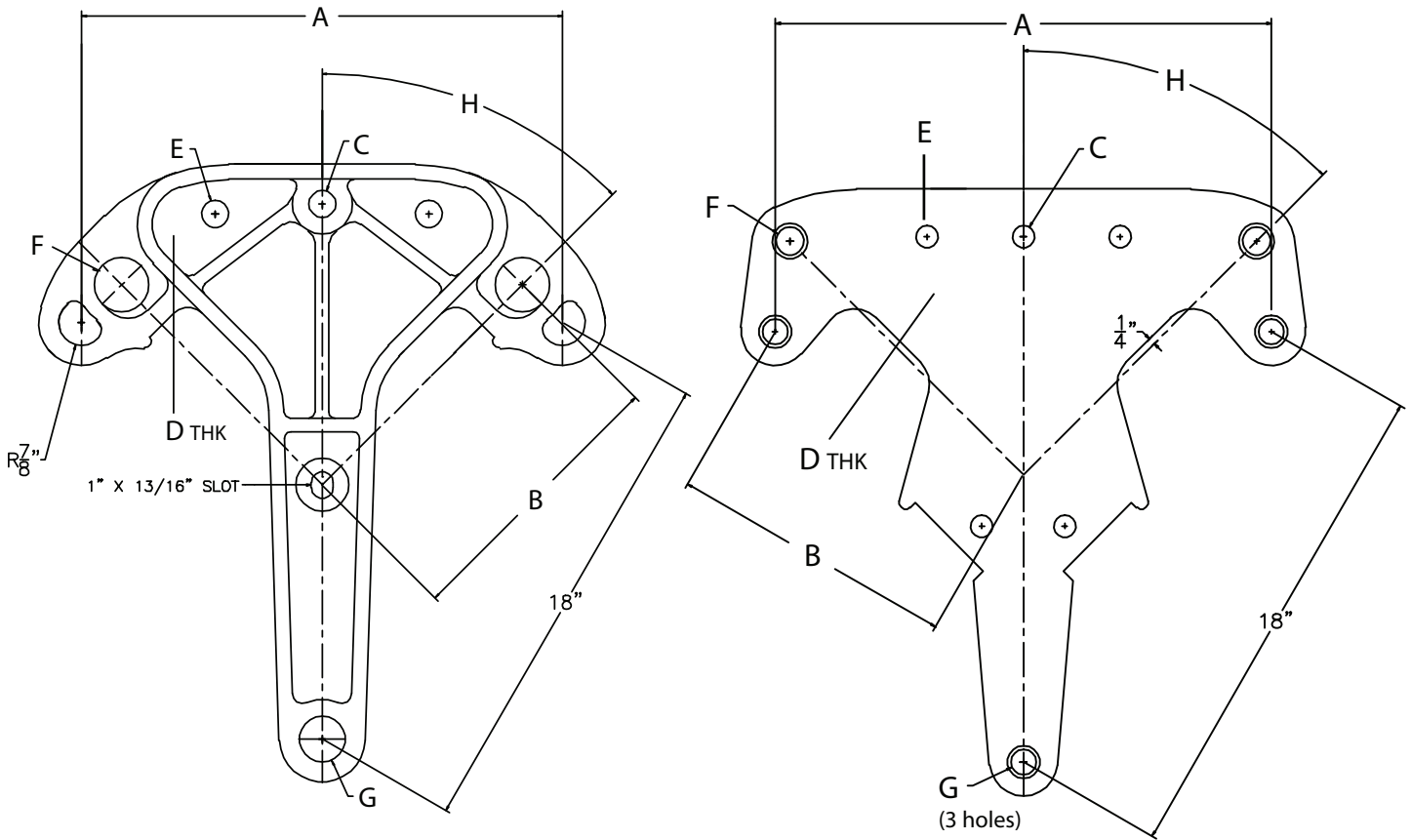
Iron

Catalog Number	Ultimate Strength	Material	Dimensions (inches)					
			A	B	C	D	E	F
Y2VS030S1845	30,000	Steel	18	7 11/16	15/16	5/8	1 1/16	15/16
Y2VS030A1800	30,000	Aluminum	18	7 5/64	13/16	1	1/4	1 3/4
Y2VS040A1800	40,000	Aluminum	18	6 3/4	1 1/4	1 5/8	2 3/8	1 5/8
Y2VS050D1800	50,000	Iron	18	7 1/16	13/16	1 1/8	1 1/8	1 3/4
Y2VS050S1845	50,000	Steel	18	7 11/16	15/16	3/4	1 1/16	15/16





# Yoke Plates



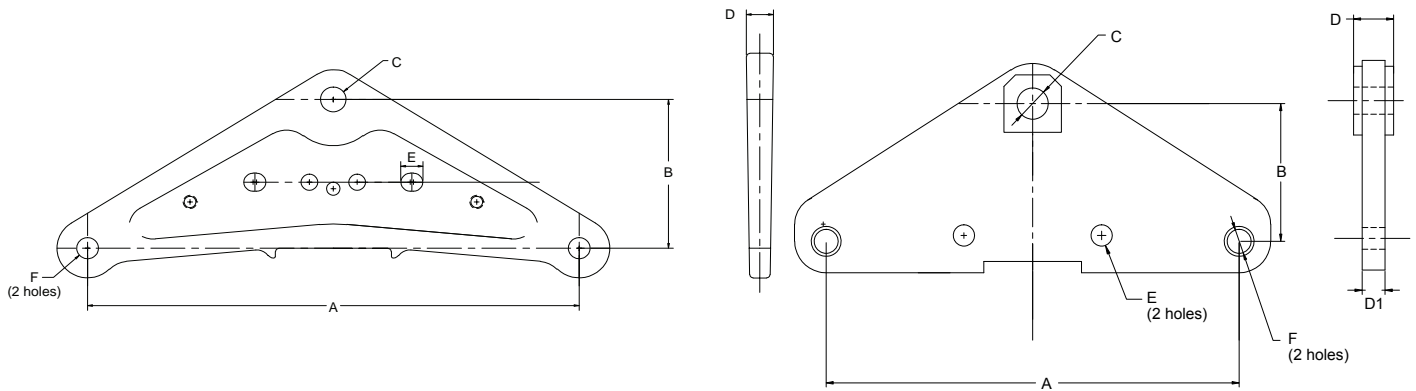
## V-String Triple Yoke Plate

Catalog Number	Ultimate Strength	Material	Type	Dimensions (inches)							
				A	B	C	D	E	F	G	H
Y3VS040A1845	40,000	Aluminum	Triple	18	10 5/8	1 1/16	2	1 1/16	2 1/16	1 3/4	45
Y3VS040A1850	40,000	Aluminum	Triple	18	11 7/8	1 1/16	2	1 1/16	1 1/4	1 3/4	50
Y3VS050S1845	50,000	Steel	Triple	18	10 3/8	13/16	3/4	1 1/16	15/16	15/16	45
Y3VS050S1850	50,000	Steel	Triple	18	10 7/16	13/16	3/4	1 1/16	15/16	15/16	50



# Yoke Plates

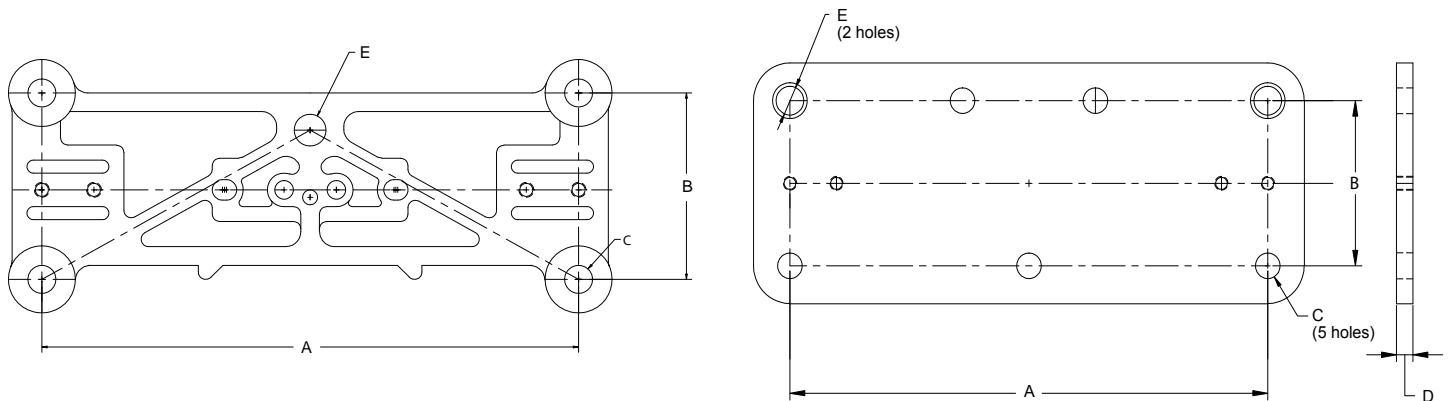
## Deadend Triangular



\* No pad on 60K steel yoke plates

Catalog Number	Ultimate Strength	Material	Type	Dimensions (inches)						
				A	B	C	D	D1	E	F
Y2DT060D1800	60,000	Ductile Iron	Double	18	5 5/8	15/16	1	---	13/16	13/16
Y2DT060S1800	60,000	Steel	Double	18	4 1/2	1 1/16	3/4	3/4	15/16	1 1/16
Y2DT080D1800	80,000	Ductile Iron	Double	18	6	1 3/16	1 3/8	---	15/16	1 1/16
Y2DT080S1800	80,000	Steel	Double	18	6	1 1/16	1 1/4	3/4	15/16	1 1/16
Y2DT100S1800	100,000	Steel	Double	18	6	1 3/8	1 3/4	1	15/16	1 1/16

## Deadend Rectangular



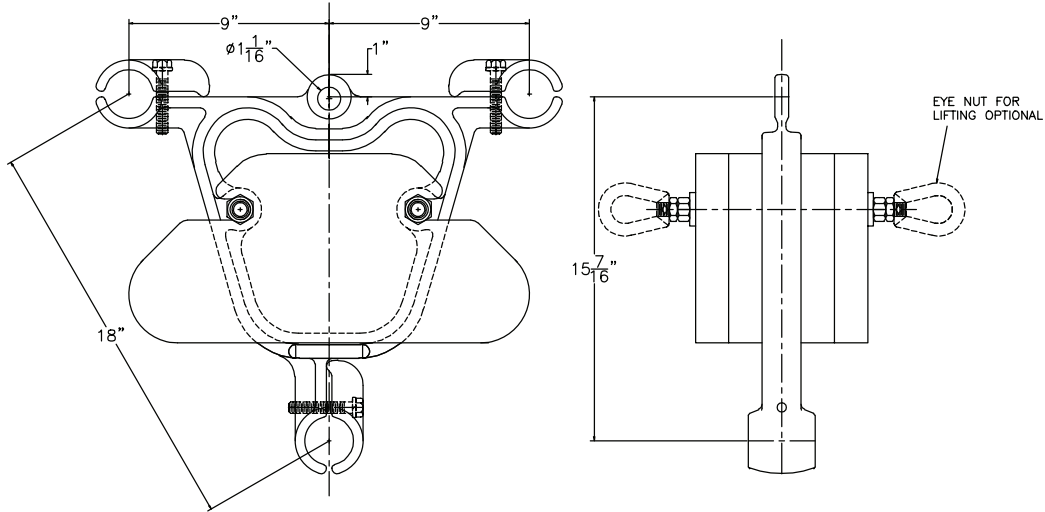
Catalog Number	Ultimate Strength	Material	Type	Dimensions (inches)				
				A	B	C	D	E
Y2DR060D1800	60,000	Ductile Iron	Double	18	6 1/4	15/16	3/4	1 1/16
Y2DR060S1800	60,000	Steel	Double	18	6	15/16	5/8	1 1/16
Y2DR080D1800	80,000	Ductile Iron	Double	18	6 1/4	15/16	7/8	1 1/16
Y2DR080S1800	80,000	Steel	Double	18	6	15/16	7/8	1 1/16
Y2DR100S1800	100,000	Steel	Double	18	6	15/16	7/8	1 1/16



# Yoke Plates

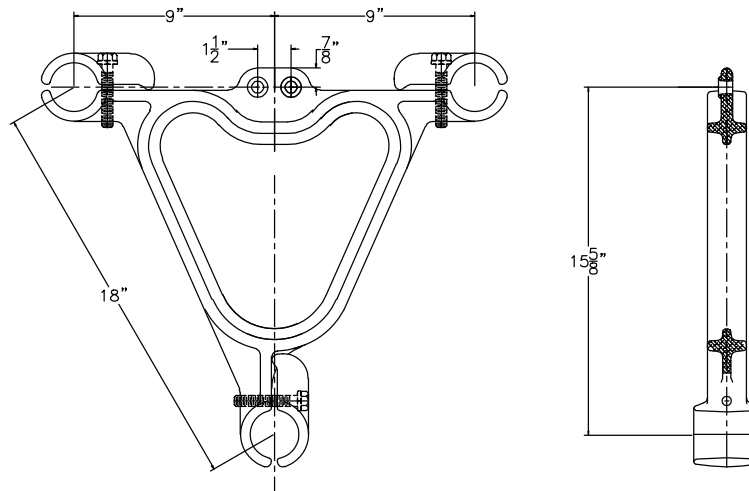
## 3 Conductor Jumper Yoke Plate

- For attachment to I-String insulator assembly.
- Drawing shown with optional weights added
- Catalog Number: JY3-(Groove Dia)-01-(Additional Weight)
- Any groove diameter available between 1.1" and 2.5"
- Weight in 50 lb increments
- Material - Aluminum
- Example: JY3-1.108-01-400 for Drake Conductor without armor rod with 400 lb weights added
- Example: JY3-1.345-01 for Bittern Conductor without armor rod and no weights added



## 3 Conductor Jumper Yoke Plate

- For attachment to Line Post insulator assembly.
- Catalog Number: JY3-(Groove Dia)-02
- Any groove diameter available between 1.1" and 2.5"
- Material - Aluminum
- Example: JY3-1.545-02 for Falcon Conductor without armor rod





# Aluminum Cable, Steel Reinforced (ACSR)

Code Word	Cross Section Aluminum Cir. Mils or AWG	Stranding Number and Dia. of Strands (in)		Dia. (in)		Ultimate Strength (lbs)	Weight per 1000 ft. (lbs)
		Aluminum	Steel	Complete Cable	Over Armor Rods Performed Alum. Alloy		
Turkey	6			0.198	0.440	1170	36.1
Swan	4	6	1 x 0.0834	0.250	0.542	1830	57.4
Swanate	4	7	1 x 0.1029	0.257	0.549	2288	67.1
Sparrow	2	6	1 x 0.1052	0.316	0.608	2790	91.3
Sparate	2	7	1 x 0.1299	0.325	0.617	3525	106.7
Robin	1	6	1 x 0.1182	0.355	0.647	3480	115.2
Raven	1/0	6 x 0.1327	1 x 0.1327	0.398	0.732	4280	145.2
Quail	2/0	6 x 0.1490	1 x 0.1490	0.447	0.781	5345	183.1
Pigeon	3/0	6 x 0.1672	1 x 0.1672	0.502	0.836	6675	230.9
Penguin	4/0	6 x 0.1878	1 x 0.1878	0.563	0.927	8420	291.1
Waxwing	266800	18 x 0.1217	1 x 0.1217	0.609	0.973	7100	289.7
Owl	266800	6 x 0.2109	7 x 0.0703	0.633	0.997	9645	343.3
Partridge	266800	26 x 0.1013	7 x 0.0788	0.642	1.006	11250	367.3
Ostrich	300000	26 x 0.1074	7 x 0.0835	0.680	1.088	12650	412.9
Merlin	336400	18 x 0.1367	1 x 0.1367	0.684	1.092	8950	366.0
Linnet	336400	26 x 0.1138	7 x 0.0885	0.721	1.129	14050	463.0
Oriole	336400	30 x 0.1059	7 x 0.1059	0.741	1.149	17040	527.1
Chickadee	397500	18 x 0.1486	1 x 0.1486	0.743	1.151	10400	432.0
Brant	397500	24 x 0.1287	7 x 0.0858	0.772	1.272	14690	512.1
Ibis	397500	26 x 0.1236	7 x 0.0961	0.783	1.283	16190	547.2
Lark	397500	30 x 0.1151	7 x 0.1151	0.806	1.306	19980	622.8
Pelican	477000	18 x 0.1628	1 x 0.1628	0.814	1.314	12300	518.0
Flicker	477000	24 x 0.1410	7 x 0.0940	0.846	1.346	17200	514.0
Hawk	477000	26 x 0.1355	7 x 0.1054	0.858	1.358	19430	656.0
Hen	477000	30 x 0.1261	7 x 0.1261	0.883	1.383	23300	747.3
Osprey	556500	18 x 0.1758	1 x 0.1758	0.879	1.379	13850	604.0
Parakeet	556500	24 x 0.1523	7 x 0.1015	0.914	1.414	19850	717.0
Dove	556500	26 x 0.1463	7 x 0.1138	0.927	1.427	22400	766.0
Eagle	556500	30 x 0.1362	7 x 0.1362	0.953	1.453	27200	872.0
Peacock	605000	24 x 0.1588	7 x 0.1059	0.953	1.453	21500	780.0
Squab	605000	26 x 0.1525	7 x 0.1186	0.966	1.466	24100	833.0
Teal	605000	30 x 0.1420	19 x 0.0852	0.994	1.614	30000	939.0
Swift	636000	36 x 0.1329	1 x 0.1329	0.930	1.430	13450	644.0
Kingbird	636000	18 x 0.1880	1 x 0.1880	0.940	1.440	15830	691.0
Rook	636000	24 x 0.1628	7 x 0.1085	0.977	1.597	22600	819.0
Grosbeak	636000	26 x 0.1564	7 x 0.1216	0.990	1.610	25000	875.0
Egret	636000	30 x 0.1456	19 x 0.0874	1.019	1.639	31500	988.0
Flamingo	666600	24 x 0.1667	7 x 0.1111	1.000	1.620	23700	859.0
Stilt	715500	24 x 0.1727	7 x 0.1151	1.036	1.656	25500	921.0
Starling	715500	26 x 0.1659	7 x 0.1290	1.051	1.671	28100	985.0
Redwing	715500	30 x 0.1544	19 x 0.0926	1.081	1.701	34600	1111.0
Coot	795000	36 x 0.1486	1 x 0.1486	1.040	1.660	16540	805.0
Tern	795000	45 x 0.1329	7 x 0.0886	1.063	1.683	22900	896.0
Cuckoo	795000	24 x 0.1820	7 x 0.1214	1.092	1.713	27900	1024.0
Condor	795000	54 x 0.1214	7 x 0.1214	1.093	1.713	28500	1024.0
Drake	795000	26 x 0.1749	7 x 0.1360	1.108	1.728	31200	1094.0
Mallard	795000	30 x 0.1628	19 x 0.0977	1.140	1.760	38400	1235.0
Ruddy	900000	45 x 0.1414	7 x 0.0943	1.131	1.740	25400	1015.0
Canary	900000	54 x 0.1291	7 x 0.1291	1.162	1.782	32300	1159.0
Catbird	954000	36 x 0.1628	1 x 0.1628	1.140	1.760	19520	966.0
Rail	954000	45 x 0.1456	7 x 0.0971	1.165	1.785	26900	1075.0



# Aluminum Cable, Steel Reinforced (ACSR)

Code Word	Cross Section Aluminum Cir. Mils or AWG	Stranding Number and Dia. of Strands (in)		Dia. (in)		Ultimate Strength (lbs)	Weight per 1000 ft. (lbs)
		Aluminum	Steel	Complete Cable	Over Armor Rods Performed Alum. Alloy		
Cardinal	954000	54 x 0.1329	7 x 0.1329	1.196	1.816	34200	1229
Tanager	1033500	36 x 0.1694	1 x 0.1694	1.186	1.850	21100	1046
Ortlan	1033500	45 x 0.1516	7 x 0.1011	1.213	1.943	28900	1165
Curlew	1033500	54 x 0.1384	7 x 0.1384	1.246	1.976	37100	1331
Bluejay	1113000	45 x 0.1573	7 x 9.1049	1.259	1.989	30900	1255
Finch	1113000	54 x 0.1436	19 x 0.0862	1.293	2.023	40200	1431
Bunting	1192500	45 x 0.1628	7 x 0.1085	1.302	2.032	33200	1344
Grackle	1192500	54 x 0.1486	19 x 0.0892	1.333	2.068	43100	1533
Bittern	1272000	45 x 0.1681	7 x 0.1121	1.345	2.075	35400	1434
Pheasant	1272000	54 x 0.1535	19 x 0.0921	1.382		44800	1635.0
Dipper	1351500	45 x 0.1733	7 x 0.1151	1.385	2.116	37600	1523.0
Martin	1351500	54 x 0.1582	19 x 0.0949	1.424	2.296	47600	1737.0
Bobolink	1431000	45 x 0.1783	7 x 0.1189	1.427	2.299	39800	1613.0
Plover	1431000	54 x 0.1628	19 x 0.0977	1.465		50400	1840.0
Nuthatch	1510500	45 x 0.1832	7 x 0.1211	1.466	2.338	41600	1702.0
Parrot	1510500	54 x 0.1675	19 x 0.1004	1.506	2.378	53200	1942.0
Lapwing	1590000	45 x 0.1878	7 x 0.1252	1.502	2.374	43800	1792.0
Falcon	1590000	54 x 0.1716	19 x 0.1030	1.545	2.417	56000	2044.0
Chukar	1780000	84 x 0.1456	19 x 0.0874	1.602	2.474	53600	2074.0
Bluebird	2156000	84 x 0.1602	19 x 0.0961	1.762		63400	2512.0
Kiwi	2167000	72 x 0.1735	7 x 0.1157	1.737	2.609	53000	2304.0
Grouse	80000	8 x 0.1000	1 x 0.1670	0.367	0.659	5206	149.0
Petrel	101800	12 x 0.0921	7 x 0.0921	0.461	0.795	9860	254.1
Minorca	110800	12 x 0.0961	7 x 0.0961	0.481	0.815	10730	276.6
Leghorn	134600	12 x 0.1059	7 x 0.1059	0.530	0.864	12920	336.0
Guinea	159000	12 x 0.1151	7 x 0.1151	0.576	0.940	15200	396.8
Dotterel	176900	12 x 0.1214	7 x 0.1214	0.607	0.971	16440	441.5
Dorking	190800	12 x 0.1261	7 x 0.1261	0.631	0.995	17730	476.3
Cochin	211300	12 x 0.1327	7 x 0.1327	0.663	1.027	19640	527.5
Brahma	203200	16 x 0.1127	19 x 0.0977	0.714	1.122	27500	676.7



# High Strength Aluminum Alloy Conductor (AAAC)

Code Word	Area		Stranding No. Dia. (in)	Ultimate Strength (lbs)	Weight per 1000 ft. (lbs)
	CM	Aprox. EC Equivalent AWG or CM			
Akron	30,580	6	7 x 0.0661	1,095	28.7
Alton	48,690	4	7 x 0.0834	1,744	45.7
Ames	77,470	2	7 x 0.1052	2,775	72.7
Azusa	123,300	1/0	7 x 0.1327	4,415	115.7
Anaheim	155,400	2/0	7 x 0.1490	5,334	145.9
Amherst	195,700	3/0	7 x 0.1672	6,717	183.7
Alliance	246,900	4/0	7 x 0.1878	8,473	231.8
Butte	312,800	266,800	19 x 0.1283	10,610	293.6
Canton	394,500	336,400	19 x 0.1441	12,830	370.3
Cairo	465,400	397,500	19 x 0.1565	15,130	436.9
Darien	559,500	477,000	19 x 0.1716	18,190	525.2
Elgin	652,400	556,500	19 x 0.1853	21,210	612.4
Flint	740,800	636,000	37 x 0.1415	24,090	695.4
Greeley	927,200	795,000	37 x 0.1583	30,150	870.4

Code Word	Size MCM	Stranding		Outside Dia. (In)	Rated Strength (lbs)	Weight per 1000 ft. (lbs)
		No	Dia. In.			
Kazoo	30.58	7	.0661	.198	915	28.7
Kaki	48.69	7	.0834	.250	1415	45.7
Kench	77.47	7	.1052	.316	2195	72.7
Kibe	123.3	7	.1327	.398	3405	115.7
Kayak	155.4	7	.1490	.447	4230	145.9
Kopeck	195.7	7	.1672	.502	4965	183.7
Kittle	246.9	7	.1878	.563	6265	231.8
Ratch	281.4	19	.1217	.609	7360	264.2
Ramie	312.8	19	.1283	.642	8180	293.6
Radar	355.1	19	.1367	.684	9290	333.3
Radian	394.5	19	.1441	.721	10180	370.3
Rede	419.6	19	.1486	.743	10830	393.9
Ragout	465.4	19	.1565	.783	11840	436.9
Rex	503.6	19	.1628	.814	12100	472.7
Remex	559.5	19	.1716	.858	13450	525.2
Ruble	587.2	19	.1758	.879	14110	551.2
Rune	652.4	19	.1853	.927	15680	612.4
Sural	704.6	37	.1380	.966	18430	661.4
Spar	740.8	37	.1415	.990	19110	695.4
Sora	833.6	37	.1501	1.051	21210	782.5
Solar	927.2	37	.1583	1.108	23590	870.4





# Aluminum Conductor Steel Supported (ACSS)

Code Word	kcmil	Stranding Number and Dia. of Strands (in)		Dia. (in)		ACSS GA/MA Rated Strength (lbs)	Weight per 1000 ft. (lbs)		
		Aluminum	Steel	Complete Cable	Steel Core		Total	Aluminum	Steel
Partridge	266.8	26 x 0.1013	7 x 0.0788	0.642	0.236	8880	366.9	251.3	115.6
Linnet	336.4	26 x 0.1137	7 x 0.0884	0.721	0.265	11200	462.0	316.6	145.4
Oriole	336.4	30 x 0.1059	7 x 0.1059	0.741	0.317	14800	526.4	317.7	208.7
Ibis	397.5	30 x 0.1236	7 x 0.0961	0.783	0.288	13000	546.0	374.1	171.9
Lark	397.5	30 x 0.1151	7 x 0.1151	0.806	0.345	17500	621.8	375.3	246.5
Flicker	477	24 x 0.1410	7 x 0.0940	0.846	0.282	13000	613.9	449.4	164.5
Hawk	477	26 x 0.1354	7 x 0.1053	0.858	0.316	15600	655.3	449.0	206.3
Hen	477	30 x 0.1261	7 x 0.1261	0.883	0.378	21000	746.4	450.4	296.0
Parakeet	556.5	24 x 0.1523	7 x 0.1015	0.914	0.304	15200	716.1	524.3	191.8
Dove	556.5	26 x 0.1463	7 x 0.1138	0.927	0.341	18200	765.2	524.2	241.0
Eagle	556.5	30 x 0.1362	7 x 0.1362	0.953	0.409	24500	870.7	525.5	345.2
Peacock	605	24 x 0.1588	7 x 0.1059	0.953	0.318	16500	778.8	570.1	208.7
Rook	636	24 x 0.1628	7 x 0.1085	0.977	0.326	17300	818.2	599.1	219.1
Grosbeak	636	26 x 0.1564	7 x 0.1216	0.990	0.365	20700	874.2	599.0	275.2
Egret	636	30 x 0.1456	19 x 0.0874	1.019	0.437	28000	987.2	600.5	386.7
Flamingo	666.6	24 x 0.1667	7 x 0.1111	1.000	0.333	18200	857.9	628.2	229.7
Starling	715.5	26 x 0.1659	7 x 0.1290	1.051	0.387	23300	983.7	674.0	309.7
Redwing	715.5	30 x 0.1544	19 x 0.0926	1.081	0.463	30800	1109.3	675.3	434.0
Tern	795	45 x 0.1329	7 x 0.0886	1.063	0.266	14200	895.0	748.6	146.4
Cuckoo	795	24 x 0.1820	7 x 0.1213	1.092	0.364	21700	1023.0	748.8	274.2
Condor	795	54 x 0.1213	7 x 0.1213	1.093	0.364	21700	1022.0	748.4	273.6
Drake	795	26 x 0.1749	7 x 0.1360	1.108	0.408	25900	1093.0	749.1	343.9
Mallard	795	30 x 0.1628	19 x 0.0977	1.140	0.489	34300	1233.9	750.7	483.2
Ruddy	900	45 x 0.1414	7 x 0.0943	1.131	0.283	15800	1013.0	847.4	165.6
Canary	900	54 x 0.1291	7 x 0.1291	1.162	0.387	24600	1158.0	847.7	310.3
Rail	954	45 x 0.1456	7 x 0.0971	1.165	0.291	16700	1074.0	898.5	175.5
Cardinal	954	54 x 0.1329	7 x 0.1329	1.196	0.399	26000	1227.1	898.3	328.8
Ortolan	1033.5	45 x 0.1515	7 x 0.1010	1.212	0.303	18100	1163.0	972.8	190.2
Curlew	1033.5	54 x 0.1383	7 x 0.1383	1.245	0.415	28200	1329.0	972.8	356.2
Bluejay	1113	45 x 0.1573	7 x 0.1049	1.259	0.315	19500	1254.0	1048.7	205.3
Finch	1113	54 x 0.1436	19 x 0.0862	1.293	0.431	30400	1430.0	1053.9	376.1
Bunting	1192.5	45 x 0.1628	7 x 0.1085	1.302	0.326	21400	1345.0	1123.4	221.6
Grackle	1192.5	54 x 0.1486	19 x 0.0892	1.338	0.446	32600	1531.0	1128.6	402.4
Bittern	1272	45 x 0.1681	7 x 0.1121	1.345	0.336	22300	1432.0	1197.7	234.3
Pheasant	1272	54 x 0.1535	19 x 0.0921	1.382	0.461	24100	1634.0	1204.3	429.7
Dipper	1351.5	45 x 0.1733	7 x 0.1155	1.386	0.347	23700	1521.0	1272.9	248.1
Martin	1351.5	54 x 0.1582	19 x 0.0949	1.424	0.475	36200	1735.0	1279.2	455.8
Bobolink	1431	45 x 0.1783	7 x 0.1189	1.427	0.357	25100	1611.0	1347.5	263.5
Plover	1431	54 x 0.1628	19 x 0.0977	1.465	0.489	38400	1838.0	1354.6	483.4
Lapwing	1590	45 x 0.1881	7 x 0.1253	1.504	0.376	27900	1790.0	1498.1	291.9
Falcon	1590	54 x 0.1716	19 x 0.1030	1.545	0.515	42600	2040.0	1505.0	535.0
Chukar	1780	84 x 0.1456	19 x 0.0874	1.602	0.437	35400	2072.0	1685.5	386.5
Bluebird	2156	84 x 0.1602	19 x 0.0961	1.762	0.481	42100	2508.0	2040.4	467.6
Kiwi	2167	72 x 0.1735	7 x 0.1157	1.735	0.347	29000	2310.0	2051.4	258.6
Thrasher	2312	76 x 0.1744	19 x 0.0814	1.802	0.407	35600	2523.0	2187.9	335.1



# Bare Aluminum Conductor

Code Word	Stranding		Conductor Size Circular mils or AWG	Cable Dia. (in)	Ultimate Strength (lbs)	Weight per 1000 ft. (lbs)
	Class	No and Dia of wires (in)				
Peachbell	A	7 x 0.0612	6	0.184	528	24.6
Rose	A	7 x 0.0772	4	0.232	826	39.2
Lily	A	7 x 0.0867	3	0.260	1022	49.4
Iris	AA, A	7 x 0.0974	2	0.292	1266	62.3
Pansy	AA, A	7 x 0.1094	1	0.328	1537	78.5
Poppy	AA, A	7 x 0.1228	1/0	0.368	1865	99.1
Aster	AA, A	7 x 0.1379	2/0	0.414	2350	124.9
Phlox	AA, A	7 x 0.1548	3/0	0.464	2845	157.5
Oxlip	AA, A	7 x 0.1739	4/0	0.522	3590	198.6
Daisy	---	7 x 0.1953	266800	0.586	4525	250.4
Laurel	A	19 x 0.1185	266800	0.593	4800	250.4
Tulip	AA, A	19 x 0.1331	336400	0.666	5940	315.8
Canna	AA, A	19 x 0.1447	397500	0.724	6880	372.5
Cosmos	AA	19 x 0.1585	477000	0.793	8090	447.8
Syringa	A	37 x 0.1135	477000	0.795	8600	447.8
Dahlia	---	37 x 0.1711	556500	0.856	9440	522.4
Mistletoe	AA, A	37 x 0.1226	556500	0.858	9830	522.4
Orchid	AA, A	61 x 0.1311	636000	0.918	11240	597.0
Violet	AA	37 x 0.1391	715500	0.974	12640	671.6
Nasturtium	A	61 x 0.1083	715500	0.975	13150	671.6
Arbutus	AA	37 x 0.1466	795000	1.026	13770	746.3
Lilac	A	61 x 0.1142	795000	1.028	14330	746.3
Anemone	AA	37 x 0.1538	874500	1.077	14830	820.9
Crocus	A	61 x 0.1198	874500	1.078	15760	820.9
Magnolia	AA	37 x 0.1606	954000	1.124	16180	895.5
Goldenrod	A	61 x 0.1251	954000	1.126	16860	895.5
Bluebell	AA	37 x 0.1672	1033500	1.170	17530	970.1
Larkspur	A	61 x 0.1302	1033500	1.172	18260	970.1
Marigold	AA, A	61 x 0.1351	1113000	1.216	19660	1045.0
Hawthorn	AA, A	61 x 0.1398	1192500	1.258	21000	1119.0
Narcissus	AA, A	61 x 0.1444	1272000	1.300	22000	1193.0
Columbine	AA, A	61 x 0.1489	1351500	1.340	23400	1269.0
Carnation	AA, A	61 x 0.1532	1431000	1.379	24300	1343.0
Gladiolus	AA, A	61 x 0.1574	1510500	1.417	25600	1418.0
Coreopsis	AA	61 x 0.1615	1590000	1.454	27000	1493.0
Dogwood	A	91 x 0.1322	1590000	1.454	28100	1493.0



# Bare Copper Wire, Stranded

Conductor Size		Stranding Class	Total Number of Wires	Wire Dia. (in)	Cable Dia. (in)	Min. Breaking Strength (lbs. hard)	Weight per 1000 ft. (lbs)
Mcm	AWG						
1.02	20	B	7	0.0121	0.0363	50.04	3.154
1.62	18	B	7	0.0152	0.0456	78.99	5.015
2.58	16	B	7	0.0192	0.0576	124.7	7.974
4.11	14	B	7	0.0242	0.0726	197.1	12.68
6.53	12	B	7	0.0305	0.0915	311.1	20.16
10.38	10	B	7	0.0385	0.116	491.7	32.09
13.09	9	B	7	0.0432	0.130	618.2	40.42
16.51	8	B	7	0.0486	0.146	777.2	50.97
20.82	7	B	7	0.0545	0.164	977.1	64.28
26.24	6	B	7	0.0612	0.184	1,288	81.05
33.09	5	B	7	0.0688	0.206	1,542	102.2
41.74	4	AA	3	0.1180	0.254	1,879	127.6
41.74	4	B & A	7	0.0772	0.232	1,938	128.9
52.62	3	AA	3	0.1325	0.286	2,359	160.9
52.62	3	B & A	7	0.0867	0.260	2,433	162.5
66.36	2	AA	3	0.1487	0.320	2,913	202.9
66.36	2	B & A	7	0.0974	0.292	3,045	204.9
83.69	1	AA	3	0.1670	0.360	3,621	255.9
83.69	1	A	7	0.1093	0.328	3,804	258.4
83.69	1	B	19	0.0664	0.332	3,899	258.4
105.6	1/0	A & AA	7	0.1228	0.368	4,752	325.8
105.6	1/0		12*	0.0938	0.390	4,841	325.8
105.6	1/0	B	19	0.0745	0.372	4,901	325.8
133.1	2/0	A & AA	7	0.1379	0.414	5,926	410.9
133.1	2/0		12*	0.1053	0.438	6,048	410.9
133.1	2/0	B	19	0.0837	0.419	6,152	410.9
167.8	3/0	A & AA	7	0.1548	0.464	7,366	518.1
167.8	3/0		12*	0.1183	0.492	7,556	518.1
167.8	3/0	B	19	0.0940	0.470	7,698	518.1
211.6	4/0	A & AA	7	0.1739	0.522	9,154	653.3
211.6	4/0		12*	0.1328	0.522	9,483	653.3
211.6	4/0	B	19	0.1055	0.528	9,617	653.3
250		AA	12	0.1443	0.600	11,130	771.9
250		A	19	0.1147	0.574	11,360	771.9
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<b>VBCFA-18-143-N</b>	Vertical Bundle Assembly with CF Series Suspension Clamp	CN-31	<b>Y3VS040A1845</b>	V-String Triple Yoke Plate	CN-56
<b>VBCFA-18-204-N</b>	Vertical Bundle Assembly with CF Series Suspension Clamp	CN-31	<b>Y3VS040A1850</b>	V-String Triple Yoke Plate	CN-56
<b>VBLS-18-110-N</b>	Vertical Bundle Assembly with LS Series Suspension Clamp	CN-31	<b>Y3VS050S1845</b>	V-String Triple Yoke Plate	CN-56
<b>VBLS-18-111-N</b>	Vertical Bundle Assembly with LS Series Suspension Clamp	CN-31	<b>Y3VS050S1850</b>	V-String Triple Yoke Plate	CN-56
<b>VBLS-18-1212-N</b>	Vertical Bundle Assembly with LS Series Suspension Clamp	CN-31	<b>YAC-125</b>	Aluminum Angled Suspension Clamps	CN-29
<b>VBLS-18-33-N</b>	Vertical Bundle Assembly with LS Series Suspension Clamp	CN-31	<b>YCB-65A</b>	Y-Clevis - Ball, Standard	CN-50
<b>VBLS-18-44-N</b>	Vertical Bundle Assembly with LS Series Suspension Clamp	CN-31	<b>YCB-720</b>	Y-Clevis - Ball, Standard	CN-50
<b>VBLS-18-66-N</b>	Vertical Bundle Assembly with LS Series Suspension Clamp	CN-31	<b>YCB-78</b>	Y-Clevis - Ball, Standard	CN-50
<b>VBLS-18-77-N</b>	Vertical Bundle Assembly with LS Series Suspension Clamp	CN-31	<b>YCBHL-65A</b>	Y-Clevis - Ball, Hot Line	CN-50
<b>VBLS-18-88-N</b>	Vertical Bundle Assembly with LS Series Suspension Clamp	CN-31	<b>YCBHL-78</b>	Y-Clevis - Ball, Hot Line	CN-50
<b>VBLS-18-99-N</b>	Vertical Bundle Assembly with LS Series Suspension Clamp	CN-31	<b>YCC-65</b>	Y-Clevis - Clevis, Standard	CN-51
<b>Y1BS050D</b>	V-String Single Conductor Yokes	CN-55	<b>YCC-76</b>	Y-Clevis - Clevis, Standard	CN-51
<b>Y1TT030A1800</b>	Tangent Triangular Yoke Plates	CN-54	<b>YCC-77</b>	Y-Clevis - Clevis, Standard	CN-51
<b>Y1TT040S1800</b>	Tangent Triangular Yoke Plates	CN-54	<b>YCCHL-65</b>	Y-Clevis - Clevis, Hot Line	CN-51
<b>Y1TT050D1800</b>	Tangent Triangular Yoke Plates	CN-54	<b>YCCHL-76A</b>	Y-Clevis - Clevis, Hot Line	CN-51
<b>Y1TT050S1800</b>	Tangent Triangular Yoke Plates	CN-54	<b>YCCR-65</b>	Y-Clevis - Clevis, Standard	CN-51
<b>Y1V2050S</b>	V-String Single Conductor Yokes	CN-55	<b>YCE-65-625</b>	Y-Clevis - Eye, 90°	CN-52
<b>Y1VS030A</b>	V-String Single Conductor Yokes	CN-55	<b>YCE-65-625A</b>	Y-Clevis - Eye, 90°	CN-52
<b>Y1VS030S</b>	V-String Single Conductor Yokes	CN-55	<b>YCE-66-750</b>	Y-Clevis - Eye, 90°	CN-52
<b>Y2DR060D1800</b>	Deadend Rectangular	CN-57	<b>YCEHL-65-625</b>	Y-Clevis - Eye, Hot Line Link	CN-53
<b>Y2DR060S1800</b>	Deadend Rectangular	CN-57	<b>YCYCHL-77</b>	Y-Clevis-Y-Clevis, Hot Line	CN-53
<b>Y2DR080D1800</b>	Deadend Rectangular	CN-57			
<b>Y2DR080S1800</b>	Deadend Rectangular	CN-57			
<b>Y2DR100S1800</b>	Deadend Rectangular	CN-57			
<b>Y2DT060D1800</b>	Deadend Triangular	CN-57			





# Cutouts Catalog



Type XS Fuse Cutouts outdoor distribution  
4.16 kV through 25 kV

MPS Type XS Fuse Cutouts provide full fault spectrum protection to overhead distribution systems. Whether your application is overhead transformers, capacitors, cables, or lines, our product covers systems rated 4.16 kV through 25 kV. “Full fault spectrum protection” means that Type XS Cutouts interrupt all faults from the lowest current melting the fuse link, to the maximum rated interrupting current. MPS cutouts protect against a fault on the transformer primary or secondary with line to line or line to ground voltage across the cutout, regardless of the transformers winding connections, and with the capability of handling a full range of transient recovery voltage severity associated with these conditions.

All MPS Type XS Cutouts employ single venting down and away design. This is an especially important feature which allows exhaust to be kept out of other phases in overbuilt circuits. The nonexpendable fuse-tube cap construction eliminates the extra expense of replacement.

Type XS Cutouts have been expressly designed for superior mechanical performance. Fusing is simple, even with gloved hands. The fuse tubes are simply inserted into the cutout hinge and easily closed without any need for careful aligning by the operating personnel. This makes installation simple even under extreme angles or adverse weather conditions. Type XS Cutouts can be opened and fuse tubes removed with equal ease.

MPS Type XS Fuse Cutouts are assigned single value nominal voltage ratings (not “dual,” “slant,” or “system voltage class” ratings) and can be applied without restriction on all three-phase systems having system maximum operating voltage (line to line) less than or equal to the cutout maximum voltage. Under certain fault conditions, cutouts can be exposed to voltages in excess of system line-to-neutral voltage— fault conditions which the cutout

should clear with no reliance on backup devices. Type XS Cutouts have been tested at full system line-to-line voltage across a wide spectrum of available fault currents, using transient recovery voltages representative of those seen in service.

Type XS Cutout interrupting ratings have been substantiated by testing performed in accordance with IEEE C37.41-2000.

Shown on page 2 are asymmetrical and symmetrical interrupting ratings for both three-phase and single-phase applications of Type XS Cutouts. The symmetrical ratings for the overhead pole-top style cutouts are based on an X/R ratio of either 8 or 12, depending on cutout voltage rating and interrupting current rating (as specified by IEEE C37.41-2000), realistic maximum ratios for locations where cutouts are normally applied on a typical distribution feeder. Higher symmetrical interrupting ratings apply at locations where the X/R ratio is lower. The curves in the chart below indicate the symmetrical ratings of Type XS Cutouts at other X/R ratios.

The mechanical construction of the Type XS Cutout is rugged and strong. It is designed to withstand the interruption forces of heavy fault currents and the typically forceful closing-in by operating personnel.

The upper contact and the hinge are attached to husky steel supports, and the mounting bracket is attached to a strong mounting insert.

The fuse tube is held at the upper contact by a self-aligning spring-loaded detent-type latch. The detent features silver-clad embossed surfaces for built-in wiping action—resulting in minimum electrical resistance between the upper contact and the silverclad fuse-tube cap. The silver-clad lower contacts also feature embossed surfaces for built-in wiping action, and are backed up by prestressed stainless steel loading springs for efficient current transfer between the contacts and the silver-clad fuse-tube trunnion. These specially designed high pressure upper and lower contacts, featuring built-in wiping action, assure superb current transfer—even after the contacts have been exposed to the atmosphere for an extended period of time.

◆ Also applicable on 26.4-kV through 34.5-kV systems for protection of single-phase-to-neutral circuits (lines or transformers) only, and grounded-wye connected capacitor banks in solidly-grounded-neutral (multigrounded-neutral) systems.

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# MacLean Power Systems

Please note that because MacLean Power Systems follows a policy of continuous product improvement, we reserve the right to change specifications and drawings at any time without notice.



# Cutouts

## OVERHEAD-POLE TOP STYLES—Three-Phase and Single-Phase Applications

Continuous Current Rating, Amperes		100						200			
Style		Extra-Heavy-Duty <sup>2</sup>			Ultra-Heavy-Duty <sup>3</sup>			Ultra-Heavy-Duty <sup>3</sup>			
Voltage Rating, kV, Nom.		14.4	25	25	14.4	25	25	25	14.4	25	25
kV, Max		15	27	27	15	27	27	27	15	27	27
kV, BIL		110	125	150	110	125	150	150	110	125	150
Leakage Distance to Ground, Minimum, Inches (mm)		8½ (216)	11 (279)	17 (432)	8½ (216)	11 (279)	17 (432) ◊	26 (660) ■	8½ (216)	11 (279)	17 (432)
Catalog Number	Porcelain Insulator	89021R10	89022R10	89042R10	89031R10	89032R10	89052R10	89053R10 ▲	89071R11	89072R11	89092R11
	Composite-Polymer Silicone Insulator	89021R10-P	—	89042R10-P	89031R10-P	—	89052R10-P	89053R10-P	89071R11-P	—	89092R11-P
System Voltage, kV		Short-Circuit Interrupting Rating, Amperes RMS, Asymmetrical <sup>4</sup> and Symmetrical <sup>5</sup> (one-shot rating, where applicable, shown in parentheses)									
4.16 thru 14.4		<b>10 000</b> (12 000) 7 100 (8 600)	<b>8 000</b> 5 300	<b>8 000</b> 5 300	<b>16 000</b> 10 600	<b>12 000</b> (16 000) 8 000 (10 600)	<b>12 000</b> (16 000) 8 000 (10 600)		<b>12 000</b> 8 000		
16.5 thru 24.9			<b>8 000</b> 5 300	<b>8 000</b> 5 300		<b>12 000</b> (16 000) 8 000 (10 600)	<b>12 000</b> (16 000) 8 000 (10 600)			<b>10 000</b> 7 100	<b>10 000</b> 7 100
26.4• thru 34.5•				<b>8 000</b> 5 300			<b>12 000</b> (16 000) 8 000 (10 600)				
26.4• thru 34.5•								<b>12 000</b> 8 000			

- Consult the nearest MPS Sales Office for 50-hertz ratings.
- Uses nonremovable or removable buttonhead fuse links.
- Uses removable buttonhead fuse links only.
- Asymmetrical rating is shown first, in bold-face type. Value in parentheses is associated one-shot rating, based on replacement of cutout tube.  
Asymmetrical rating is based on total available short-circuit current of the circuit including the dc component, in accordance with IEEE standards.
- Symmetrical rating is shown second, in light-face type. Value in parentheses is associated one-shot rating, based on replacement of cutout tube.  
Symmetrical rating is based on available symmetrical short-circuit current at locations where X/R ratio is equal to 8 (for Cutout Catalog Numbers 89021R10, 89071R11, 89072R11, and 89092R11) or 12 (for all other overhead—pole-top style cutouts). IEEE C37.41-2000 specifies these X/R ratios, as applicable, depending on cutout voltage rating and interrupting current rating.

- Cutout offering is, by definition, less connectors and mounting bracket
- ◊ Approximate fuse-tube length, top of fuse-tube cap to bottom of fuse tube: 14¾ inches (375 mm).
  - Approximate fuse-tube length, top of fuse-tube cap to bottom of fuse tube: 18¼ inches (464 mm).
  - ▲ Meets 170-kV BIL rating requirement of IEC Publication 282-2.
  - Applicable for protection of single-phase-to-neutral circuits (lines or transformers) only, and grounded-wye connected capacitor banks in solidly-grounded-neutral (multigrounded-neutral) systems—where the leakage distance to ground meets user's requirements.
  - ♦ Applicable for protection of single-phase-to-neutral circuits (lines or transformers) only, and grounded-wye connected capacitor banks in solidly-grounded-neutral (multigrounded-neutral) systems.



# Polymer Cutouts



Catalog Number 89031R10-P-D  
Ultra Heavy Duty Overhead-Pole  
Top Style, rated 15 kV maximum



Catalog Number 89052R10-P-D  
Ultra Heavy Duty Overhead-Pole  
Top Style, rated 27 kV maximum



Catalog Number 89053R10-P-D  
Ultra Heavy Duty Overhead-Pole  
Top Style, rated 25 kV maximum

## Polymer

### Features

- The supports and mounting insert are molded into a high strength, fiberglass reinforced polyester core, which is then molded over with composite polymer silicone insulation. The core has a thicker diameter near the top, center, and bottom for enhanced torsional rigidity.
- Provides *full-fault-spectrum* protection to overhead distribution systems rated 4.16kV through 25kV
- Interrupts all faults...from the lowest current that will melt the fuse link to the maximum rated interrupting current
- Employs single venting—*down and away only*—an especially important feature where exhaust must be kept out of other phases in overbuilt circuits
- Nonexpendable fuse-tube cap construction eliminates the extra expense of fuse-tube cap replacement
- Designed for superior mechanical performance
- Fuse tubes are readily inserted in the cutout hinge and easily closed without any need for careful steering or manipulation on the part of operating personnel
- XS Cutouts can be opened and fuse tubes removed with equal ease

### Accessories

- 100A and 200A Fuse Tubes
- 300A Disconnect Blade Tube
- Replacement Fuse Caps
- Mounting Brackets

Complete XS Cutout with Parallel Groove Connectors	Rating					Approx. Fuse Tube Length in (mm)	Leakage Distance to Ground in (mm)	Fuse Tube/ Disconnect Blade Only	Cutout Less Fuse Tube Catalog #
	kV			Amps, RMS					
	Nominal	Max	BIL	Cont.	Interrupting/ Momentary (Asym.)				
89021R10-P-D	14.4	15	110	100	10,000	11 1/4	8 1/2	89521R10	89811R10-P
89031R10-P-D	14.4	15	110	100	16,000	11 1/4	8 1/2	89531R10	
89071R10-P-D	14.4	15	110	200	12,000	11 1/4	8 1/2	89571R11	
89221R10-P-D	14.4	15	110	300	12,000	11 1/4	8 1/2	89621R10	
89042R10-P-D	25	27	150	100	8,000	14 3/4	17	89522R10	89802R10-P
89052R10-P-D	25	27	150	100	12,000	14 3/4	17	89532R10	
89092R10-P-D	25	27	150	200	10,000	14 3/4	17	89572R11	
89222R10-P-D	25	27	150	300	12,000	14 3/4	17	89622R10	
89053R10-P-D	25	27	170	100	12,000	18 1/4	26	89533R10	89823R10-P
89252R10-P-D	25	27	170	300	12,000	18 1/4	26	89623R10	

**Notes:**

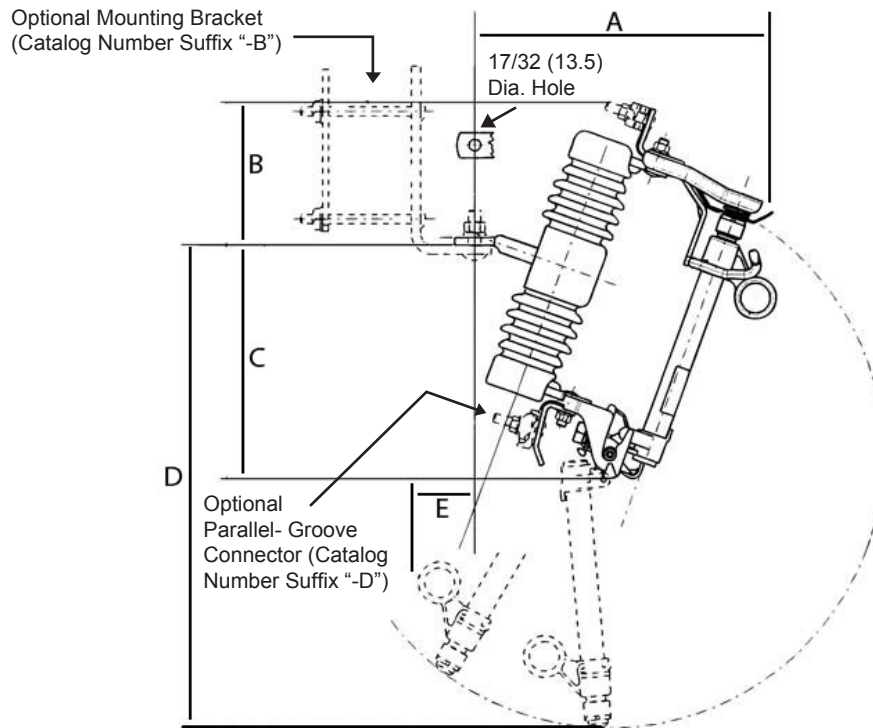
1) Catalog number specifies Parallel Groove connectors as standard. To request eyebolt connectors, replace "D" with an "M" in the above catalog numbers. For example: 89021R10-P-M. See Bracket and Connector options for more information.

2) To specify mounting bracket, if desired, add suffix letter to catalog number. For example: 89021R10-BD. See Bracket and Connector options for more information.



# Polymer Cutouts

## Extra Heavy Duty Overhead-Pole Top Style



Complete XS Cutout with Parallel Groove Connectors	Rating				Approx. Fuse Tube Length in (mm)	Leakage Distance to Ground in (mm)	Dimensions in inches (mm)					Net Weight lbs. (kg)
	kV		Amps, RMS				A	B	C	D	E	
	Max	BIL	Cont.	Interrupting/ Momentary (Asym.)								
89021R10-P-D	15	110	100	10,000	11 1/4	12 1/2	6 1/4	9 3/4	20 1/4	2 3/8	8 1/2	
89031R10-P-D	15	110	100	16,000	11 1/4						8 1/2	
89071R10-P-D	15	110	200	12,000	11 1/4						8 1/2	
89221R10-P-D	15	110	300	12,000	11 1/4						8 1/2	
89042R10-P-D	27	150	100	8,000	14 3/4	13 1/8	7 7/8	11 3/8	25 1/4	4 1/4	10	
89052R10-P-D	27	150	100	12,000	14 3/4						17	10
89092R10-P-D	27	150	200	10,000	14 3/4						17	11
89222R10-P-D	27	150	300	12,000	14 3/4						17	10
89053R10-P-D	27	170	100	12,000	18 1/4	13 3/4	9 1/2	13	31 3/8	6 1/4	12	
89252R10-P-D	27	170	300	12,000	18 1/4						26	12



# Porcelain Cutouts



Catalog Number 89021R11-D  
Ultra Heavy Duty Overhead-  
Pole Top Style, rated 15 kV  
maximum



Catalog Number 89072R11-D  
Ultra Heavy Duty Overhead-  
Pole Top Style, rated 27 kV  
maximum



Catalog Number 89042R10-M  
Ultra Heavy Duty Overhead-  
Pole Top Style, rated 27 kV  
maximum



Catalog Number 89253R10-D  
Ultra Heavy Duty Overhead-  
Pole Top Style, rated 27 kV  
maximum

## Porcelain\*

### Features

- The supports and mounting insert are permanently anchored into cavities in the insulator with inorganic cement, which does not deteriorate with age or absorb moisture. It won't shrink, so the supports and insert won't loosen. Nor does it swell, thus eliminating stress on the cavities. And, the cement retains a slight resiliency to partially absorb the shock of the interruption forces.
- Provides *full-fault-spectrum* protection to overhead distribution systems rated 4.16kV through 25kV
- Interrupts all faults...from the lowest current that will melt the fuse link to the maximum rated interrupting current
- Employs single venting—*down and away only*—an especially important feature where exhaust must be kept out of other phases in overbuilt circuits
- Nonexpendable fuse-tube cap construction eliminates the extra expense of fuse-tube cap replacement
- Designed for superior mechanical performance
- Fuse tubes are readily inserted in the cutout hinge and easily closed without any need for careful steering or manipulation on the part of operating personnel
- XS Cutouts can be opened and fuse tubes removed with equal ease

\* Porcelain fuse cutouts are only available from MPS for the US and Canada markets. International customers should contact S&C.

### Accessories

- 100A and 200A Fuse Tubes
- 300A Disconnect Blade Tube
- Replacement Fuse Caps
- Mounting Brackets

Complete XS Cutout with Parallel Groove Connectors	Rating					Approx. Fuse Tube Length in (mm)	Leakage Distance to Ground in (mm)	Fuse Tube/ Disconnect Blade Only	Cutout Less Fuse Tube Catalog Number
	kV			Amps, RMS					
	Nominal	Max	BIL	Cont.	Interrupting/ Momentary (Asym.)				
89021R10-D	14.4	15	110	100	10,000	11 1/4	8 1/2	89521R10	89811R10
89031R10-D	14.4	15	110	100	16,000	11 1/4	8 1/2	89531R10	
89071R10-D	14.4	15	110	200	12,000	11 1/4	8 1/2	89571R11	
89221R10-D	14.4	15	110	300	12,000	11 1/4	8 1/2	89621R10	89812R10
89022R10-D	25	27	1525	100	8,000	14 3/4	11	89522R10	
89032R10-D	25	27	125	100	12,000	14 3/4	11	89532R10	
89072R10-D	25	27	125	200	10,000	14 3/4	11	89572R11	89802R10
89222R10-D	25	27	125	300	12,000	14 3/4	11	89622R10	
89042R10-D	25	27	150	100	8,000	14 3/4	17	89522R10	
89052R10-D	25	27	150	100	12,000	14 3/4	17	89532R10	89813R10
89092R11-D	25	27	150	200	10,000	14 3/4	17	89572R11	
89033R10-D	25	27	150	100	12,000	18 1/4	17	89533R10	
89223R10-D	25	27	150	300	12,000	18 1/4	17	89623R10	89823R10
89053R10-D	25	27	150	100	12,000	18 1/4	26	89533R10	
89253R10-D	25	27	150	300	12,000	18 1/4	26	89623R10	

\* Catalog Number specifies Parallel Groove connectors as standard. To request eyebolt connectors, replace "D" with an "M" in the above catalog numbers. For example: 89021R10-M. See Bracket and Connector options for more information.

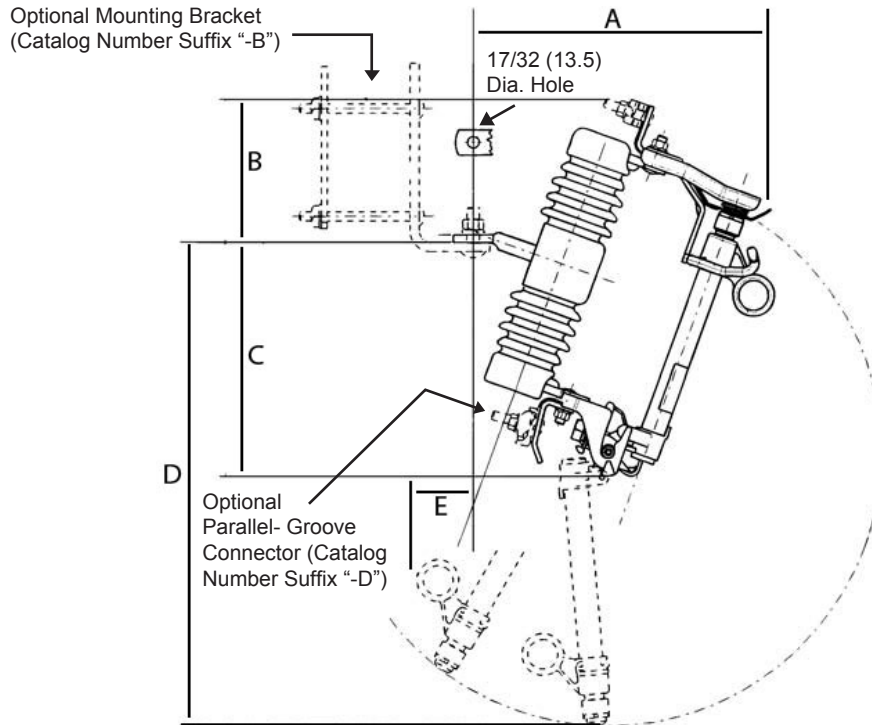
\*\* To specify mounting bracket, if desired, add suffix letter to catalog number. For example: 89021R10-BD. See Bracket and Connector options for more information.





# Porcelain Cutouts

## Extra Heavy Duty Overhead-Pole Top Style



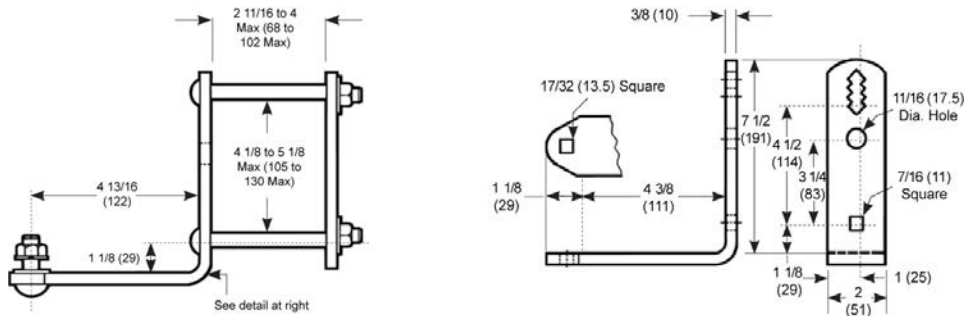
Complete XS Cutout with Parallel Groove Connectors	Rating				Approx. Fuse Tube Length in (mm)	Leakage Distance to Ground in (mm)	Dimensions in inches (mm)					Net weight lbs. (kg)
	Amps, RMS						A	B	C	D	E	
	Max	BIL	Cont.	Interrupting/Momentary (Asym.)								
89021R10-D	15	110	100	10,000	11 1/4	8 1/2	12 1/2	6 1/4	9 3/4	20 1/4	2 3/8	13
89031R10-D	15	110	100	16,000	11 1/4	8 1/2						13
89071R10-D	15	110	200	12,000	11 1/4	8 1/2						14
89221R10-D	15	110	300	12,000	11 1/4	8 1/2						13
89022R10-D	27	1525	100	8,000	14 3/4	11	13 1/8	7 7/8	11 3/8	25 1/4	4 1/4	15 1/2
89032R10-D	27	125	100	12,000	14 3/4	11						15 1/2
89072R10-D	27	125	200	10,000	14 3/4	11						16 1/2
89222R10-D	27	125	300	12,000	14 3/4	11						15 1/2
89042R10-D	27	150	100	8,000	14 3/4	17	13 1/8	7 7/8	11 3/8	25 1/4	4 1/4	20 1/2
89052R10-D	27	150	100	12,000	14 3/4	17						20 1/2
89092R11-D	27	150	200	10,000	14 3/4	17						21 1/2
89033R10-D	27	150	100	12,000	18 1/4	17						
89223R10-D	27	150	300	12,000	18 1/4	17	13 3/4	9 1/2	13	31 3/8	6 1/4	
89053R10-D	27	150	100	12,000	18 1/4	26	13 3/4	9 1/2	13	31 3/8	6 1/4	23
89253R10-D	27	150	300	12,000	18 1/4	26						23





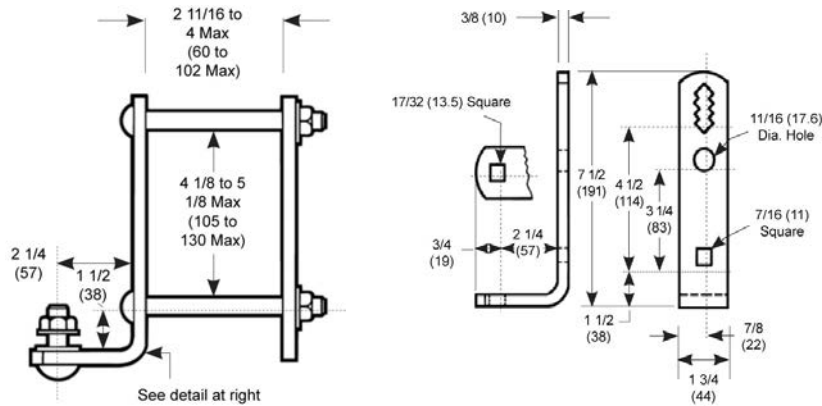
# Mounting Bracket Options

Mounting Brackets and Connector Options				
Item				Add Catalog Number Suffix
MPS Extended Mounting Bracket, for crossarm, pole, or wall mounting of overhead- pole top style cutouts				-B
NEMA Type B Mounting Bracket, for crossarm mounting of overhead- pole top style cutouts				-C
Item	Accommodating Conductors		Position	
	Quantity	Size and Material		
Parallel-Groove Conductors	Two	No. 6 solid (13.3 mm <sup>2</sup> ) through No. 2 stranded (44.4 mm <sup>2</sup> ) copper or aluminum in one groove; No. 2, solid (33.6 mm <sup>2</sup> ) through 250 kc mil (168 mm <sup>2</sup> ) stranded copper or aluminum or 4/0 ACSR (161 mm <sup>2</sup> ) in the other groove	Standard Orientation	-D
			Lower Connector Rotated 90°	-D90
Eye-Bolt Connectors	One	No. 8 solid (8.4 mm <sup>2</sup> ) through 250 kc mil (168 mm <sup>2</sup> ) stranded copper or aluminum, or 4/0 ACSR (161 mm <sup>2</sup> )	Standard Orientation	-M
			Lower Connector Rotated 90°	-M90



## Extended Mounting Bracket (Catalog Number Suffix "-B")

Adjustable for 3" x 4" to 4" x 5" (76 x 102 to 102 x 127) crossarm  
When purchased separately- KA-70165-1



## NEMA Type Mounting Bracket (Catalog Number Suffix "-C")

Adjustable for 3" x 4" to 4" x 5" (76 x 102 to 102 x 127) crossarm  
When purchased separately- J24712



-M Eyebolt Connector



-D parallel groove connector



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89021R10-P-D	Complete XS Cutout - Polymer	CU-4,5
89022R10-D	Complete XS Cutout - Porcelain	CU-6,7
89031R10-D	Complete XS Cutout - Porcelain	CU-6,7
89031R10-P-D	Complete XS Cutout - Polymer	CU-4,5
89031R10-P-D	Complete XS Cutout - Polymer	CU-4,5
89032R10-D	Complete XS Cutout - Porcelain	CU-6,7
89033R10-D	Complete XS Cutout - Porcelain	CU-6,7
89042R10-D	Complete XS Cutout - Porcelain	CU-6,7
89042R10-P-D	Complete XS Cutout - Polymer	CU-4,5
89042R10-P-D	Complete XS Cutout - Polymer	CU-4,5
89052R10-D	Complete XS Cutout - Porcelain	CU-6,7
89052R10-P-D	Complete XS Cutout - Polymer	CU-4,5
89052R10-P-D	Complete XS Cutout - Polymer	CU-4,5
89053R10-P-D	Complete XS Cutout - Polymer	CU-4,5
89053R10-P-D	Complete XS Cutout - Polymer	CU-4,5
8905R10-D	Complete XS Cutout - Porcelain	CU-6,7
89071R10-D	Complete XS Cutout - Porcelain	CU-6,7
89071R10-P-D	Complete XS Cutout - Polymer	CU-4,5
89071R10-P-D	Complete XS Cutout - Polymer	CU-4,5
89072R10-D	Complete XS Cutout - Porcelain	CU-6,7
89092R10-P-D	Complete XS Cutout - Polymer	CU-4,5
89092R10-P-D	Complete XS Cutout - Polymer	CU-4,5
89092R11-D	Complete XS Cutout - Porcelain	CU-6,7
89221R10-D	Complete XS Cutout - Porcelain	CU-6,7
89221R10-P-D	Complete XS Cutout - Polymer	CU-4,5
89221R10-P-D	Complete XS Cutout - Polymer	CU-4,5
89222R10-D	Complete XS Cutout - Porcelain	CU-6,7
89222R10-P-D	Complete XS Cutout - Polymer	CU-4,5
89222R10-P-D	Complete XS Cutout - Polymer	CU-4,5
89223R10-D	Complete XS Cutout - Porcelain	CU-6,7
89252R10-P-D	Complete XS Cutout - Polymer	CU-4,5
89252R10-P-D	Complete XS Cutout - Polymer	CU-4,5
89253R10-D	Complete XS Cutout - Porcelain	CU-6,7
89521R10	Fuse Tube/ Disconnect Blade Only	CU-4
89521R10	Fuse Tube/ Disconnect Blade Only	CU-6
89521R11	Fuse Tube/ Disconnect Blade Only	CU-4
89522R10	Fuse Tube/ Disconnect Blade Only	CU-4
89522R10	Fuse Tube/ Disconnect Blade Only	CU-6
89522R11	Fuse Tube/ Disconnect Blade Only	CU-4
89531R10	Fuse Tube/ Disconnect Blade Only	CU-4
89531R10	Fuse Tube/ Disconnect Blade Only	CU-6
89531R10	Fuse Tube/ Disconnect Blade Only	CU-6
89531R11	Fuse Tube/ Disconnect Blade Only	CU-4
89532R10	Fuse Tube/ Disconnect Blade Only	CU-4
89533R10	Fuse Tube/ Disconnect Blade Only	CU-4
89571R11	Fuse Tube/ Disconnect Blade Only	CU-4

Catalog Number	Description	Page
89571R11	Fuse Tube/ Disconnect Blade Only	CU-6
89571R12	Fuse Tube/ Disconnect Blade Only	CU-4
89572R11	Fuse Tube/ Disconnect Blade Only	CU-4
89572R11	Fuse Tube/ Disconnect Blade Only	CU-6
89621R10	Fuse Tube/ Disconnect Blade Only	CU-4
89621R10	Fuse Tube/ Disconnect Blade Only	CU-6
89621R11	Fuse Tube/ Disconnect Blade Only	CU-4
89622R10	Fuse Tube/ Disconnect Blade Only	CU-4
89622R10	Fuse Tube/ Disconnect Blade Only	CU-6
89623R10	Fuse Tube/ Disconnect Blade Only	CU-4
89802R10-P	Cutout Less Fuse Tube Catalog Number	CU-4,5
89811R10-P	Cutout Less Fuse Tube Catalog Number	CU-4,5
89823R10-P	Cutout Less Fuse Tube Catalog Number	CU-4,5



# Fiberglass Catalog



MacLean Power Systems family of fiberglass brackets and fiberglass guystrains

MacLean Power Systems offers the most comprehensive line of fiberglass products covering applications from guy strain insulators, equipment and pin brackets, fiber optic and telecommunication brackets, to a diverse crossarm offering.

**Guy Strain Insulators** are offered in traditional 15k, 21k, 30k and 36k ultimate strength ratings. The guy strain offering includes products for unique applications, such as 80k guy strains for tower guying applications as well as automatic guy strains, which incorporate an automatic connector end fitting. All guy strain insulators are 100% proof loaded to published capabilities.

The **Fiberglass Bracket** product line offers the most comprehensive selection of bases, end fittings, material, and length combinations in the utility industry. Insulator pin bracket applications offer a variety of thread options from nylon, lead, or plastisol material. The newest available option is nylon thread, which offers excellent fit with insulators while providing environmentally friendly material.

The **Fiberglass Crossarm** product line offers many diverse profiles and strengths. The rectangular crossarm profile is offered in a variety of strengths and configurations that provide a superior alternative to traditional wood crossarms, while maintaining a rectangular profile that is compatible with traditional crossarm hardware. Fiberglass crossarms are free of chemicals and preservatives, lighter than traditional wood assemblies, and provide improved overall system mechanical support. Crossarms are also available in round cross sectional profile for narrow conductor phase space applications.

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<b>Equipment Brackets</b>	<b>FG-8</b>	<b>Fiberglass Bracket End Fitting Index</b>	<b>FG-35</b>
Single Phase	FG-8	<b>Fiberglass Bracket Options Index</b>	<b>FG-40</b>
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Three Phase	FG-15	<b>Transmission Crossarm Assembly</b>	<b>FG-41</b>
<b>Pin Brackets</b>	<b>FG-18</b>	<b>Spacers, Sectionalizers, and Crossarm Braces</b>	<b>FG-42</b>
Single Phase	FG-18	<b>Rectangular Deadend Crossarm</b>	<b>FG-43</b>
Two Phase	FG-20	<b>Rectangular Tangent Crossarm</b>	<b>FG-44</b>
Three Phase	FG-22	<b>Fiberglass Crossarm Catalog Numbering System</b>	<b>FG-45</b>
<b>Fiber Optic Brackets</b>	<b>FG-23</b>	<b>Numerical Index</b>	<b>FG-46</b>
<b>Insulator Brackets</b>	<b>FG-25</b>		
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# MacLean Power Systems

Please note that because MacLean Power Systems follows a policy of continuous product improvement, we reserve the right to change specifications and drawings at any time without notice.





# Guy Strain Insulators

## Catalog Numbering System



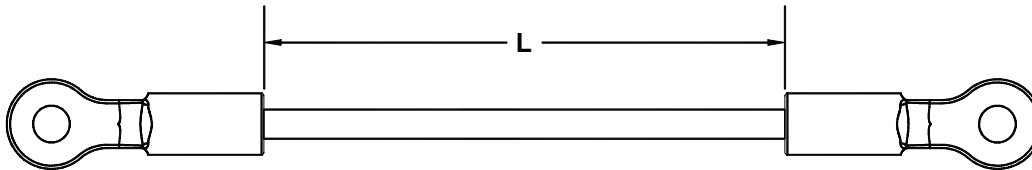
End Fitting Types	
<b>C</b>	= Clevis
<b>TE</b>	= Thimble Eye
<b>YC</b>	= Y-Clevis (except 15K lbs)

Minimum Ultimate Strength Rating (lbs)	
<b>15</b>	= 15,000
<b>21</b>	= 21,000
<b>30</b>	= 30,000
<b>36</b>	= 36,000

Length (L)
For standard lengths, see tables below
Custom lengths available, consult your sales representative for details

Roller
Omit to specify without roller(s)
<b>R</b> = Single roller
<b>R2</b> = Roller each end (Clevis-Clevis only)

\*For 50,000 lb and 80,000 lb guy strain insulator options, see page FG-5.



Example
• 78" Guy Strain Insulator
• Clevis - Clevis end fittings
• 15,000 Lb minimum ultimate strength rating
• Roller on each end
<b>Catalog Number - GCC15-78R2</b>

15,000 Lb Minimum Ultimate Strength Rating		
Catalog Number		Length (In)
Clevis-Clevis	Clevis-Thimble Eye	
GCC15-12R	GCTE15-12R	12
GCC15-18R	GCTE15-18R	18
GCC15-24R	GCTE15-24R	24
GCC15-36R	GCTE15-36R	36
GCC15-42R	GCTE15-42R	42
GCC15-54R	GCTE15-54R	54
GCC15-78R	GCTE15-78R	78
GCC15-96R	GCTE15-96R	96
GCC15-120R	GCTE15-120R	120
GCC15-144R	GCTE15-144R	144

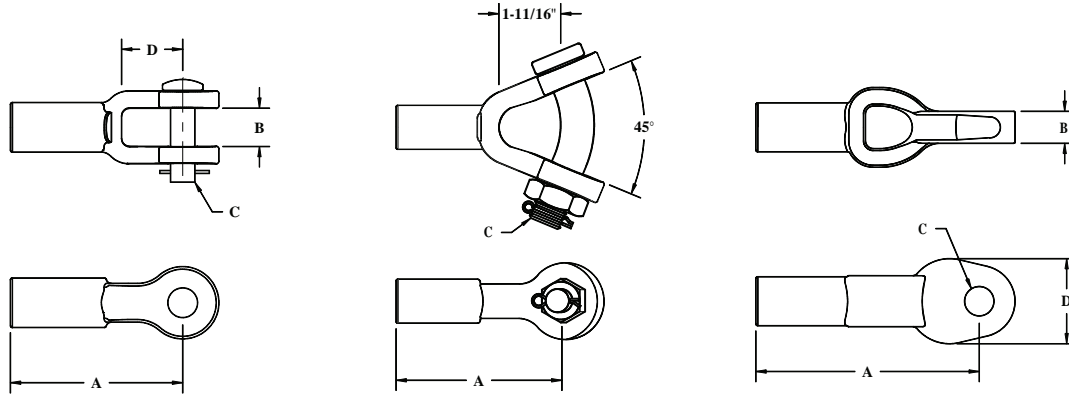
21,000 Lb Minimum Ultimate Strength Rating		
Catalog Number		Length (In)
Clevis-Clevis	Clevis-Thimble Eye	
GCC21-12R	GCTE21-12R	12
GCC21-18R	GCTE21-18R	18
GCC21-24R	GCTE21-24R	24
GCC21-36R	GCTE21-36R	36
GCC21-42R	GCTE21-42R	42
GCC21-54R	GCTE21-54R	54
GCC21-60R	GCTE21-60R	60
GCC21-78R	GCTE21-78R	78
GCC21-90R	GCTE21-90R	90
GCC21-96R	GCTE21-96R	96
GCC21-120R	GCTE21-120R	120
GCC21-144R	GCTE21-144R	144

30,000 Lb Minimum Ultimate Strength Rating		
Catalog Number		Length (In)
Clevis-Clevis	Clevis-Thimble Eye	
GCC30-24R	GCTE30-24R	24
GCC30-36R	GCTE30-36R	36
GCC30-42R	GCTE30-42R	42
GCC30-54R	GCTE30-54R	54
GCC30-78R	GCTE30-78R	78
GCC30-96R	GCTE30-96R	96
GCC30-120R	GCTE30-120R	120
GCC30-144R	GCTE30-144R	144

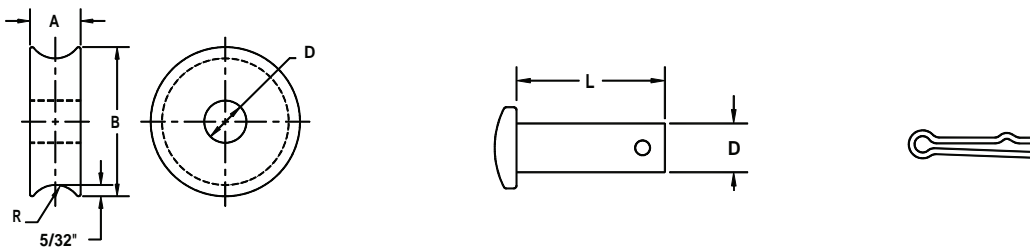
36,000 Lb Minimum Ultimate Strength Rating		
Catalog Number		Length (In)
Clevis-Clevis	Clevis-Thimble Eye	
GCC36-18R	GCTE36-18R	18
GCC36-54R	GCTE36-54R	54
GCC36-60R	GCTE36-60R	60
GCC36-78R	GCTE36-78R	78
GCC36-90R	GCTE36-90R	90
GCC36-120R	GCTE36-120R	120
GCC36-144R	GCTE36-144R	144



# Guy Strain Insulators



Dimensions (In)	Clevis (C)				Y-Clevis (YC)				Thimble-Eye (TE)			
	15000	21000	30000	36000	15000	21000	30000	36000	15000	21000	30000	36000
A	4	4	6 1/2	6 1/2		4 1/8	6 1/16	6 1/16	4 5/8	4 15/16	7 1/4	7 1/4
B	15/16	15/16	1	1					17/32	11/16	13/16	13/16
C	5/8	5/8	3/4	3/4		3/4	3/4	3/4	11/16	11/16	13/16	13/16
D	1 3/8	1 3/8	2	2					1 5/8	1 3/4	2 3/8	2 3/8

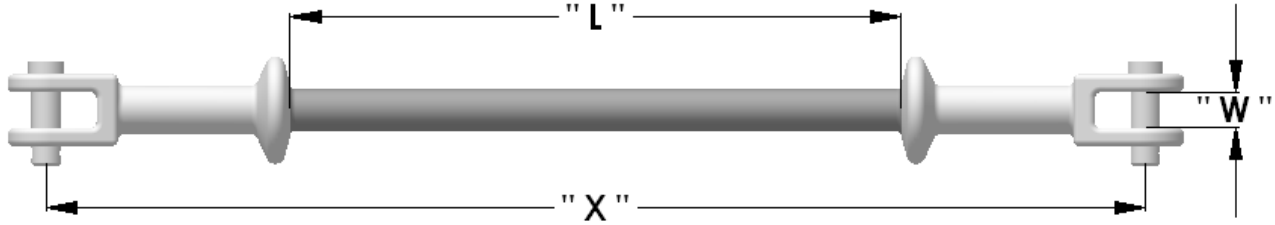


Roller						Clevis Pin				Cotter Pin		
Catalog Number	Rating (Lbs)	A (In)	B (In)	D (In)	R (In)	Catalog Number	Rating (Lbs)	D (In)	L (In)	Catalog Number	Rating (Lbs)	Pin Dia (In)
R-17-5	15000	3/4	1 7/8	11/16	5/16	CP-5	15000	5/8	2 1/8	M-111-3A	15000	5/8
	21000					CP-5-21	21000	5/8	2 3/8			
R-24-6	30000	27/32	2 3/8	13/16	13/32	CP-6-30	30000	3/4	2 1/2	M-111-2A	30000	3/4
	36000						36000					





# Guy Strain Insulators



## GCC50 Series

	Catalog Number	Rod Length "L"	Connection "X"	Clevis Opening "W"
		inch	inch	inch
Min. Ultimate Strength Rating: 50,000 lbs.	GCC50-18-SC	18	32	15/16"
	GCC50-24-SC	24	38	15/16"
	GCC50-36-SC	36	50	15/16"
	GCC50-42-SC	42	56	15/16"
	GCC50-54-SC	54	68	15/16"
	GCC50-60-SC	60	74	15/16"
	GCC50-78-SC	78	92	15/16"
	GCC50-90-SC	90	104	15/16"
	GCC50-96-SC	96	110	15/16"
	GCC50-120-SC	120	134	15/16"
	GCC50-144-SC	144	158	15/16"

**Notes:**

- 1) Minimum Ultimate Strength Rating - 50,000 lbs
- 2) Rod coated in Silicone Rubber
- 3) Cotter Pin Diameter - 3/4"

## GCC80 Series

	Catalog Number	Rod Length "L"	Connection "X"	Clevis Opening "W"
		inch	inch	inch
Min. Ultimate Strength Rating: 80,000 lbs.	GCC80-18-SC	18	37	1 1/16"
	GCC80-24-SC	24	43	1 1/16"
	GCC80-36-SC	36	55	1 1/16"
	GCC80-42-SC	42	61	1 1/16"
	GCC80-54-SC	54	73	1 1/16"
	GCC80-60-SC	60	79	1 1/16"
	GCC80-78-SC	78	97	1 1/16"
	GCC80-90-SC	90	109	1 1/16"
	GCC80-96-SC	96	115	1 1/16"
	GCC80-120-SC	120	139	1 1/16"
	GCC80-144-SC	144	163	1 1/16"

**Notes:**

- 1) Minimum Ultimate Strength Rating - 80,000 lbs
- 2) Rod coated in Silicone Rubber
- 3) Cotter Pin Diameter - 1"



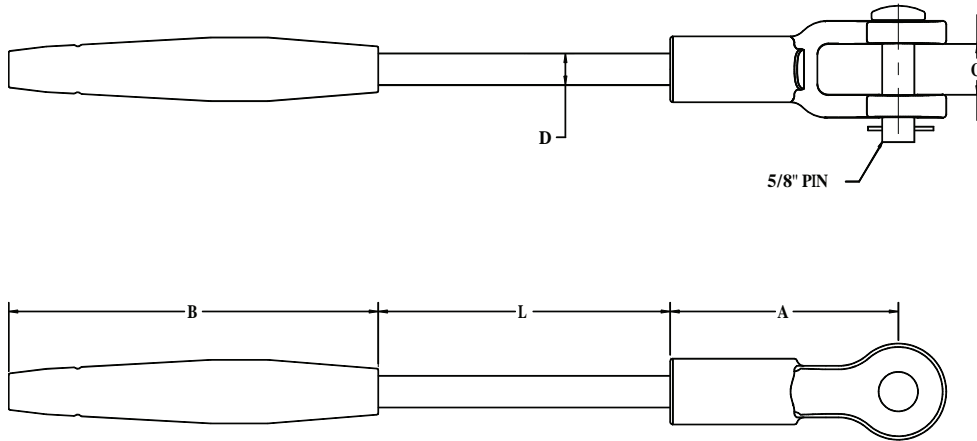
# Automatic Guy Strain Insulators

## Features

- Combines a fiberglass guy strain with automatic wire deadend
- Strength rating corresponds to 90% of steel strand rated breaking strength
- Tested for torsion and tension in both evaluated and ambient temperatures
- Improves crew efficiency without a cost premium - faster to install than formed or bolted deadends

## Material

End Fitting: Ductile iron hot dip galvanized ASTM-A-153  
MPS Strandwise  
Hardware: Steel hot dip galvanized ASTM-A-153  
Cotter Pin: Stainless Steel  
Rod: Fiberglass gray ultraviolet (UV) protective veil coating that exceeds ASTM for accelerated UV exposure



Catalog Number	Strength (Lbs)	Dimensions (In)					Wire Size		
		Length	A	B	C	D	Dia	Min	Max
GAC11-12	11000	12	4	7 1/2	7/8	5/8	5/16	.270	.315
GAC11-18	11000	18	4	7 1/2	7/8	5/8	5/16	.270	.315
GAC11-24	11000	24	4	7 1/2	7/8	5/8	5/16	.270	.315
GAC11-30	11000	30	4	7 1/2	7/8	5/8	5/16	.270	.315
GAC11-36	11000	36	4	7 1/2	7/8	5/8	5/16	.270	.315
GAC11-42	11000	42	4	7 1/2	7/8	5/8	5/16	.270	.315
GAC11-54	11000	54	4	7 1/2	7/8	5/8	5/16	.270	.315
GAC11-78	11000	78	4	7 1/2	7/8	5/8	5/16	.270	.315
GAC15-12	15000	12	4	9.29	7/8	5/8	3/8	.325	.392
GAC15-18	15000	18	4	9.29	7/8	5/8	3/8	.325	.392
GAC15-24	15000	24	4	9.29	7/8	5/8	3/8	.325	.392
GAC15-30	15000	30	4	9.29	7/8	5/8	3/8	.325	.392
GAC15-36	15000	36	4	9.29	7/8	5/8	3/8	.325	.392
GAC15-42	15000	42	4	9.29	7/8	5/8	3/8	.325	.392
GAC15-54	15000	54	4	9.29	7/8	5/8	3/8	.325	.392
GAC15-78	15000	78	4	9.29	7/8	5/8	3/8	.325	.392



# Download Brackets

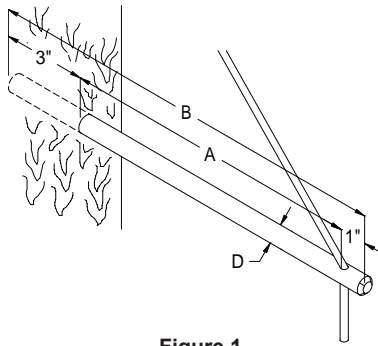


Figure 1

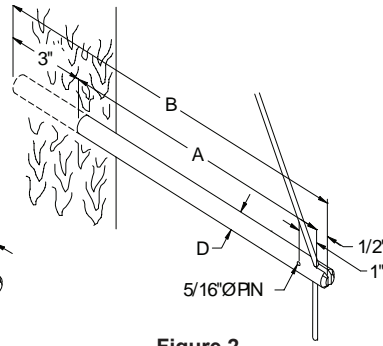


Figure 2

### Material

Base: Ductile iron hot dip galvanized ASTM A-153  
 End Fitting: Ductile iron hot dip galvanized ASTM A-153  
 Hardware: Steel hot dip galvanized ASTM A-153  
 Rod: Fiberglass gray ultraviolet (UV) protective coating

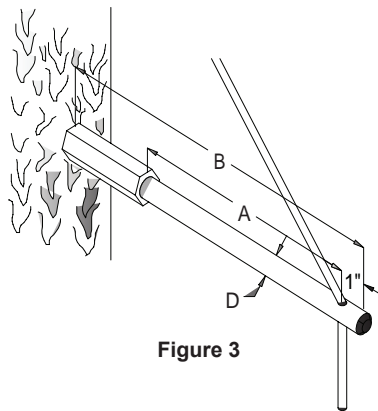


Figure 3

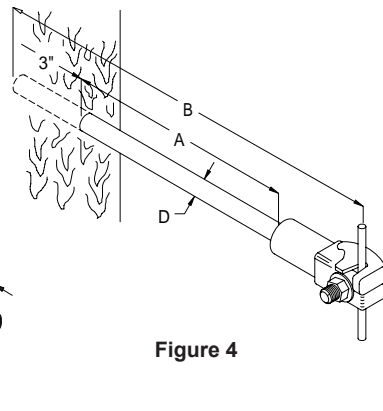


Figure 4

Catalog Number	Fig	Max Wire (In)	Dimensions (In)			Weight (Lbs)
			A	B	D	
DL12	1	1/4	12	16	3/4	0.6
DL18	1	1/4	18	22	3/4	0.8
DL24	1	1/4	24	28	3/4	1.0
DLS12	2	1/4	12	15 1/2	3/4	0.6
DLS18	2	1/4	18	21 1/2	3/4	0.8
DLS24	2	1/4	24	27 1/2	3/4	1.0
DLH125	3	1/4	12	16 1/4	5/8	0.8
DLH185	3	1/4	18	22 1/4	5/8	1.0
DLH245	3	1/4	24	28 1/4	3/4	1.4
DLH365	3	1/4	36	40 1/4	3/4	1.8

### Notes:

1) Lengths shown are considered standard; for other lengths, consult factory

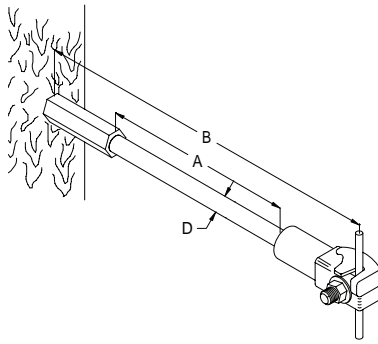


Figure 5

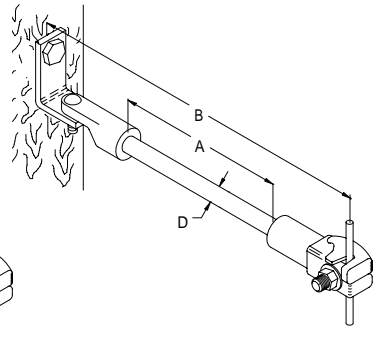


Figure 6

Catalog Number	Fig	Wire Range (In)	Dimensions (In)			Weight (Lbs)
			A	B	D	
DLC24	4	.125 - .398	24	30 1/4	3/4	2.0
DLC36	4	.125 - .398	36	42 1/4	3/4	2.6
DLB125	5	.125 - .398	12	18 1/2	5/8	1.8
DLB185	5	.125 - .398	18	24 1/2	5/8	2.0
DLB245	5	.125 - .398	24	30 1/2	3/4	2.4
DLB365	5	.125 - .398	36	42 1/2	3/4	2.8
DLBA12	6	.125 - .398	12	19 1/4	3/4	2.6
DLBA18	6	.125 - .398	18	25 1/4	3/4	2.8
DLBA24	6	.125 - .398	24	31 1/4	3/4	3.2
DLBB12	7	.125 - .398	12	16 1/2	5/8	1.7
DLBB18	7	.125 - .398	18	22 1/2	5/8	1.9
DLBB24	7	.125 - .398	24	28 1/2	3/4	2.3
DLBBJ12	8	.125 - .398	12	15 1/4	5/8	1.6
DLBBJ18	8	.125 - .398	18	21 1/4	5/8	1.8
DLBBJ24	8	.125 - .398	24	27 1/4	3/4	2.2

### Notes:

1) Lengths shown are considered standard; for other lengths, consult factory

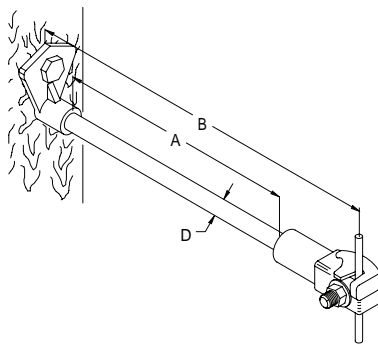


Figure 7

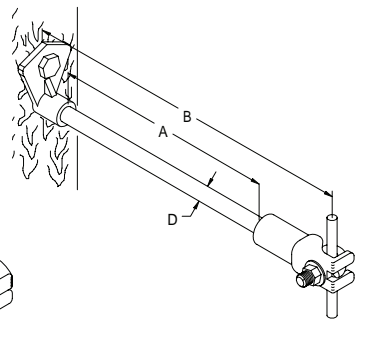


Figure 8



# Equipment Brackets

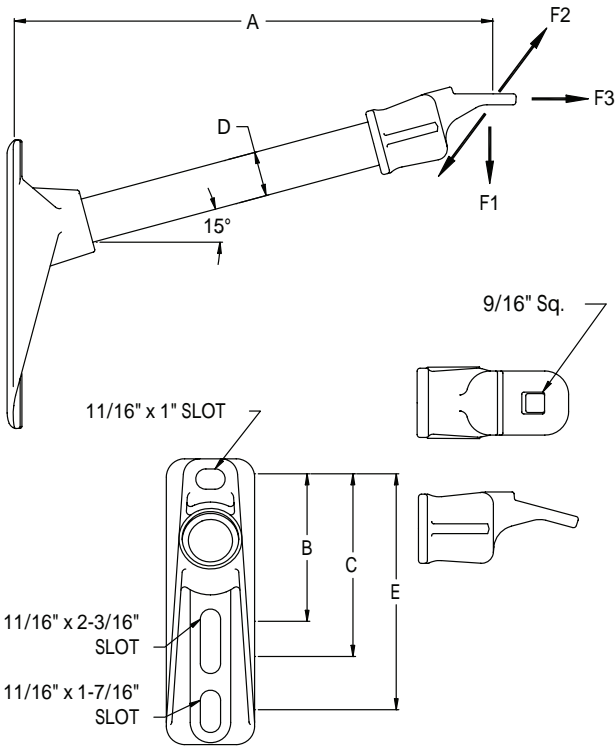
## Single Phase Single Position

### Features

- Accepts 5/8" mounting hardware
- Cleats to prevent bracket rotation on wood poles

### Material

Base: Ductile iron hot dip galvanized ASTM A-153  
 End Fitting: Ductile iron hot dip galvanized ASTM A-153  
 Rod: Fiberglass gray ultraviolet (UV) protective coating



Catalog Number	Dimensions (In)		Min Ultimate Load (Lbs)			Bolt Spacing (In)			Weight (Lbs)
	A	D	F1 Vert	F2 Long	F3 Trans	B	C	E	
G1MDA112DC	12	1.5	1800	1400	1500	5	6	8	6.8
G1MDA115DC	15	1.5	1500	1150	1500	5	6	8	7.2
G1MDA118DC	18	1.5	1200	900	1500	5	6	8	7.6
G1MDA124DC	24	1.5	900	700	1500	5	6	8	8.4

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) Add "B" for standard hardware (1/2" x 2" carriage bolt; 1/2" hex nut; 1/2" lock washer)
- 4) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix

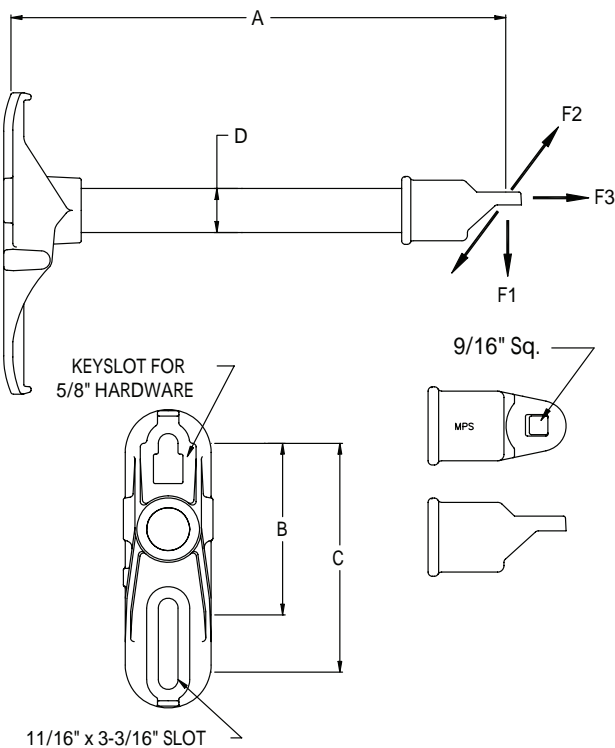
## Single Phase Single Position

### Features

- Accepts 5/8" mounting hardware
- Tab retainers for banding provisions
- Keyhole of installation ease on top bolt

### Material

Base: Aluminum A356-T6  
 End Fitting: Ductile iron hot dip galvanized ASTM A-153  
 Rod: Fiberglass gray ultraviolet (UV) protective coating



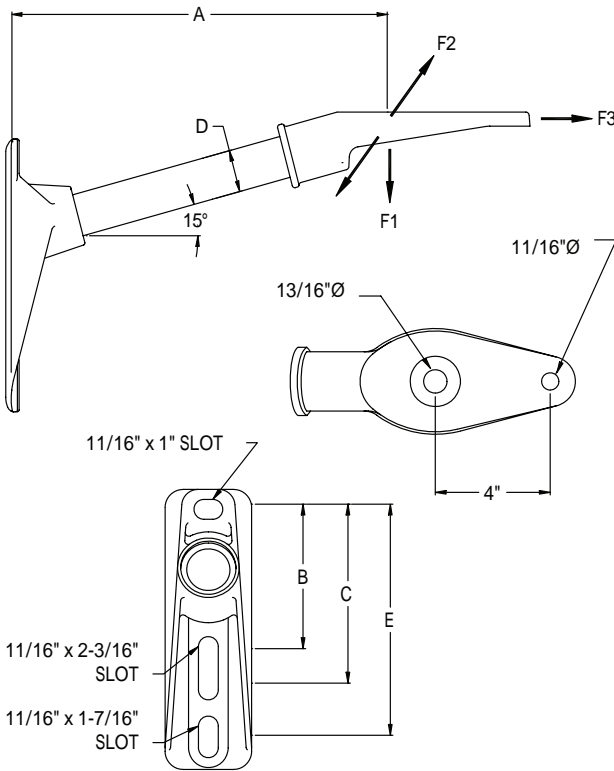
Catalog Number	Dimensions (In)		Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A	D	F1 Vert	F2 Long	F3 Trans	B	C	
G1MA0112DC	12	1.5	1800	1500	1500	6	8	3.4
G1MA0115DC	15	1.5	1500	1350	1500	6	8	3.7
G1MA0118DC	18	1.5	1200	1150	1500	6	8	4.1

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) Add "B" for standard hardware (1/2" x 2" carriage bolt; 1/2" hex nut; 1/2" lock washer)
- 4) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix



# Equipment Brackets



## Single Phase Single Position

### Features

- Accepts 5/8" mounting hardware
- Cleats to prevent bracket rotation on wood poles

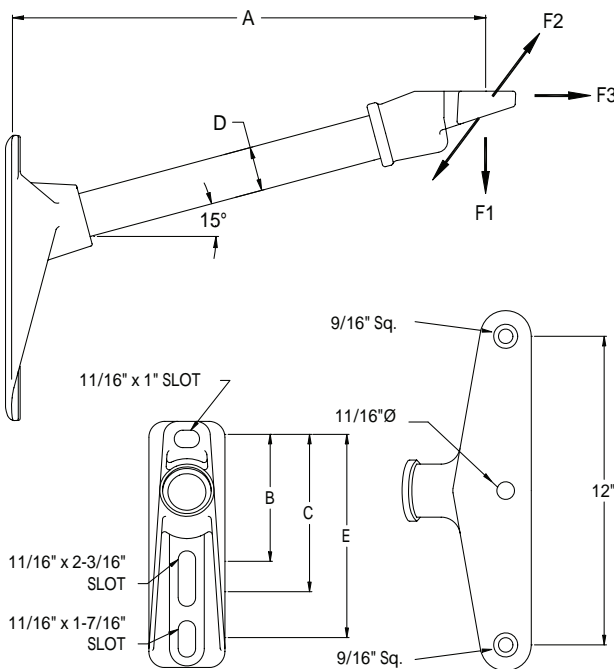
### Material

Base: Ductile iron hot dip galvanized ASTM A-153  
 End Fitting: Aluminum A356-T6  
 Rod: Fiberglass gray ultraviolet (UV) protective coating

Catalog Number	Dimensions (In)		Min Ultimate Load (Lbs)			Bolt Spacing (In)			Weight (Lbs)
	A	D	F1 Vert	F2 Long	F3 Trans	B	C	E	
G1MDA118AA	18	1.5	1200	900	10000	5	6	8	7.0
G1MDA121AA	21	1.5	1050	800	10000	5	6	8	7.4
G1MDA124AA	24	1.5	900	700	10000	5	6	8	7.8

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) Add "B" for standard hardware (1/2" x 2" carriage bolt; 1/2" hex nut; 1/2" lock washer)
- 4) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix



## Single Phase Double Position

### Features

- Accepts 5/8" mounting hardware
- Cleats to prevent bracket rotation on wood poles (1.5" only)
- Recessed cavity in base to allow double nutting for back to back mounting (2" only)

### Material

Base: Ductile iron hot dip galvanized ASTM A-153  
 End Fitting: Aluminum A356-T6  
 Rod: Fiberglass gray ultraviolet (UV) protective coating

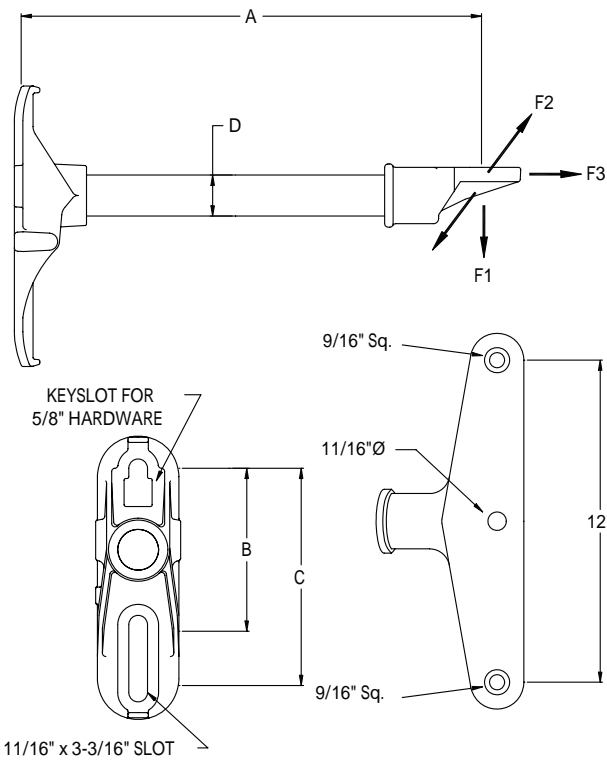
Catalog Number	Dimensions (In)		Min Ultimate Load (Lbs)			Bolt Spacing (In)			Weight (Lbs)
	A	D	F1 Vert	F2 Long	F3 Trans	B	C	E	
G1MDA112AD	12	1.5	1800	1400	10000	5	6	8	6.8
G1MDA115AD	15	1.5	1500	1150	10000	5	6	8	7.2
G1MDA118AD	18	1.5	1200	900	10000	5	6	8	7.6
G1MDA124AD	24	1.5	900	700	10000	5	6	8	8.4
G1HDA118AD	18	2.0	2250	1500	10000	8			11.9
G1HDA124AD	24	2.0	1750	1100	10000	8			13.3

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) Add "B" for standard hardware (1/2" x 2" carriage bolt; 1/2" hex nut; 1/2" lock washer)
- 4) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix



# Equipment Brackets



## Single Phase Double Position

### Features

- Accepts 5/8" mounting hardware
- Tab retainers for banding provisions
- Keyhole for installation ease on top bolt

### Material

Base: Aluminum A356-T6  
 End Fitting: Ductile iron hot dip galvanized ASTM A-153  
 Rod: Fiberglass gray ultraviolet (UV) protective coating

Catalog Number	Dimensions (In)		Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A	D	F1 Vert	F2 Long	F3 Trans	B	C	
G1MA0112DD	12	1.5	1800	1400	10000	6	8	4.5
G1MA0115DD	15	1.5	1500	1150	10000	6	8	4.9
G1MA0118DD	18	1.5	1200	900	10000	6	8	5.3
G1MA0124DD	24	1.5	900	700	10000	6	8	6.0

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) Add "B" for standard hardware (1/2" x 2" carriage bolt; 1/2" hex nut; 1/2" lock washer)
- 4) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix

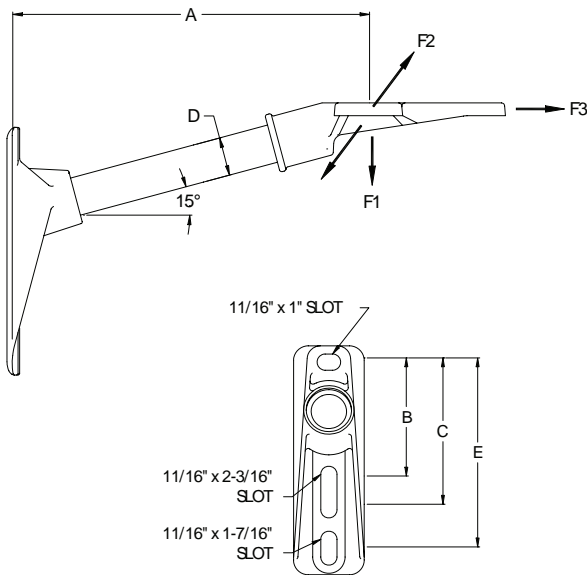
## Single Phase Triple Position

### Features

- Accepts 5/8" mounting hardware
- Cleats to prevent bracket rotation on wood poles (1.5" only)
- Tab retainers for banding provisions (2" only)
- Recessed cavity in base to allow double nutting for back to back mounting (2" only)

### Material

Base: Ductile iron hot dip galvanized ASTM A-153  
 End Fitting: Aluminum A356-T6  
 Rod: Fiberglass gray ultraviolet (UV) protective coating

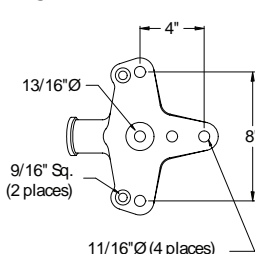


Catalog Number	Dimensions (In)		Min Ultimate Load (Lbs)			Bolt Spacing (In)			Weight (Lbs)
	A	D	F1 Vert	F2 Long	F3 Trans	B	C	E	
G1MDA112AT	12	1.5	1800	1400	10000	5	6	8	6.9
G1MDA118AT	18	1.5	1200	900	10000	5	6	8	7.6
G1MDA124AT	24	1.5	900	700	10000	5	6	8	8.4
G1HDA512AT	12	2.0	3000	1800	10000	8	10		12.2
G1HDA518AT	18	2.0	2250	1500	10000	8	10		13.6
G1HDA524AT	24	2.0	1750	1100	10000	8	10		15.0

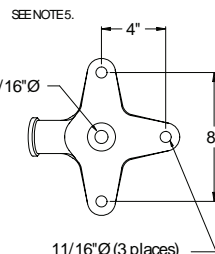
### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) Add "B" for standard hardware (1/2" x 2" carriage bolt; 1/2" hex nut; 1/2" lock washer)
- 4) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix
- 5) For end fitting style "G", replace fitting specification "T" (e.g. G1MDA112AG) - available for 1.5" diameter only

### STYLE - T



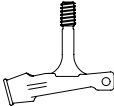
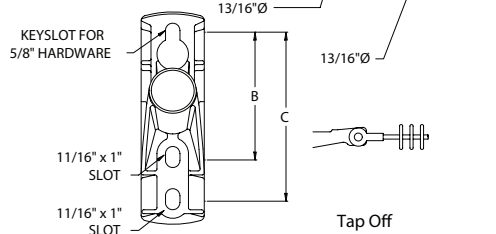
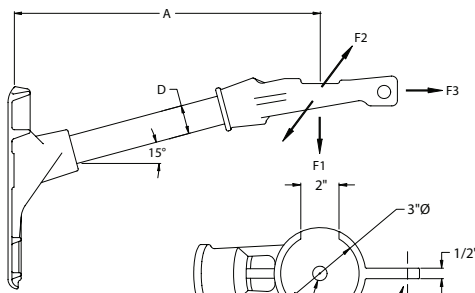
### STYLE - G







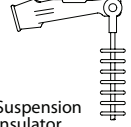
# Equipment Brackets



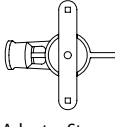
1" or 1-3/8" Pin



Post Type Insulator



Suspension Insulator



Adapter Strap

## Single Phase Universal

### Features

- Accepts 5/8" mounting hardware
- Cleats to prevent bracket rotation on wood poles

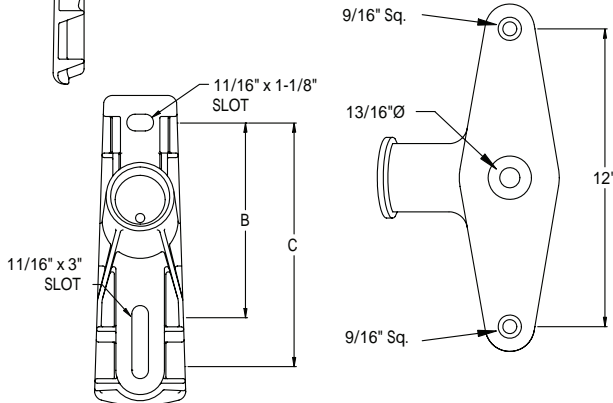
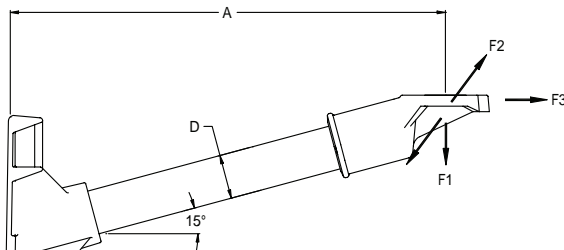
### Material

Base: Ductile iron hot dip galvanized ASTM A-153  
 End Fitting: Aluminum A356-T6  
 Rod: Fiberglass gray ultraviolet (UV) protective coating

Catalog Number	Dimensions (In)		Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A	D	F1 Vert	F2 Long	F3 Trans	B	C	
G1MAA312AU	12	1.5	1800	1400	10000	6	8	6.9
G1MAA318AU	18	1.5	1200	900	10000	6	8	7.6
G1MAA324AU	24	1.5	900	700	10000	6	8	8.4
G1HAA312AU	12	2.0	3000	1800	10000	8		12.2
G1HAA318AU	18	2.0	2250	1500	10000	8		13.6
G1HAA324AU	24	2.0	1750	1100	10000	8		15.0

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) Add "B" for standard hardware (1/2" x 2" carriage bolt; 1/2" hex nut; 1/2" lock washer)
- 4) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix



## Single Phase SCADA

### Features

- Accepts 5/8" mounting hardware
- Tab retainers for banding provisions
- Recessed cavity in base to allow double nutting for back to back mounting

### Material

Base: Aluminum A356-T6  
 End Fitting: Aluminum A356-T6  
 Rod: Fiberglass gray ultraviolet (UV) protective coating

Catalog Number	Dimensions (In)		Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A	D	F1 Vert	F2 Long	F3 Trans	B	C	
G1HAA526AKC1	26	2.0	2500	1650	10000	8	10	12.3

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix



# Equipment Brackets

## Two Phase Single Position

### Features

- Accepts 5/8" mounting hardware
- Recessed cavity in base to allow double nutting for back to back mounting

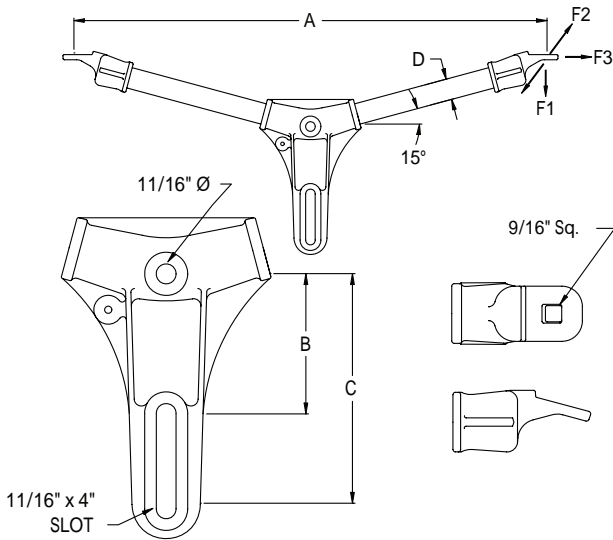
### Material

Base: Ductile iron hot dip galvanized ASTM A-153  
 End Fitting: Ductile iron hot dip galvanized ASTM A-153  
 Rod: Fiberglass gray ultraviolet (UV) protective coating

Catalog Number	Dimensions (In)		Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A	D	F1 Vert	F2 Long	F3 Trans	B	C	
G2MDA136DC	36	1.5	1200	1200	1500	5	8	12.7

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) Add "B" for standard hardware (1/2" x 2" carriage bolt; 1/2" hex nut; 1/2" lock washer)
- 4) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix



## Two Phase Single Position

### Features

- Accepts 5/8" mounting hardware
- Recessed cavity in base to allow double nutting for back to back mounting

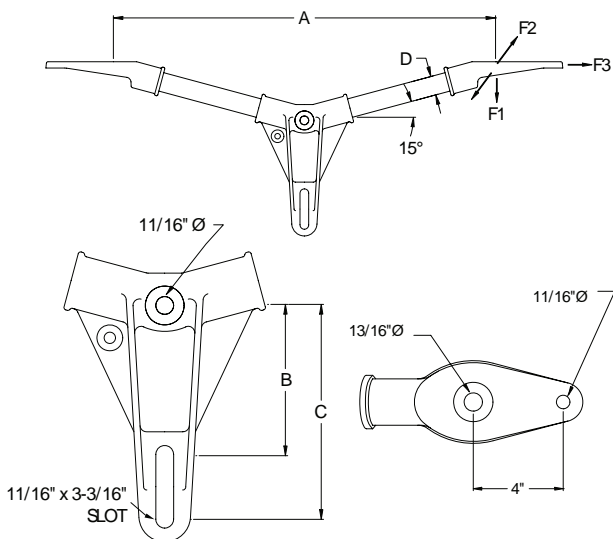
### Material

Base: Aluminum A356-T6  
 End Fitting: Aluminum A356-T6  
 Rod: Fiberglass gray ultraviolet (UV) protective coating

Catalog Number	Dimensions (In)		Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A	D	F1 Vert	F2 Long	F3 Trans	B	C	
G2MAA136AA	36	1.5	1200	900	10000	6	8	9.0

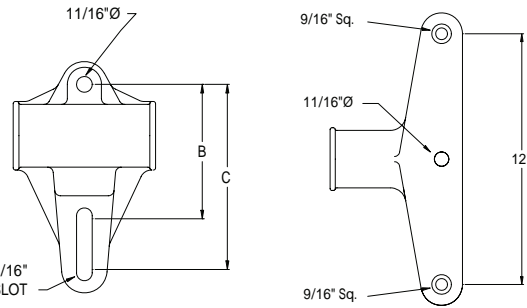
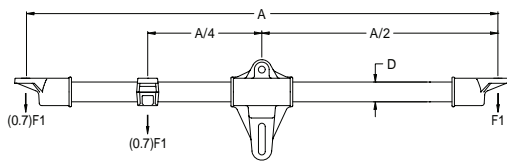
### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) Add "B" for standard hardware (1/2" x 2" carriage bolt; 1/2" hex nut; 1/2" lock washer)
- 4) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix





# Equipment Brackets



## Two Phase Double Position

### Features

- Accepts 5/8" mounting hardware

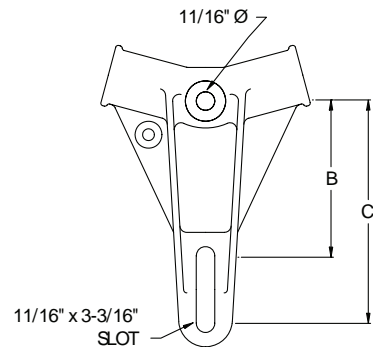
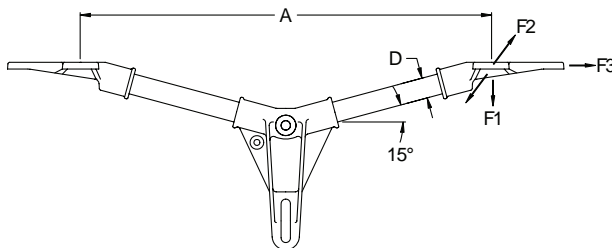
### Material

Base: Aluminum A356-T6  
 End Fitting: Ductile iron hot dip galvanized ASTM A-153  
 Rod: Fiberglass gray ultraviolet (UV) protective coating

Catalog Number	Dimensions (In)		Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A	D	F1 Vert	F2 Long	F3 Trans	B	C	
G2HA0160AD	60	2.0	1300			6	8	20.2
G2HA0172AD	72	2.0	1100			6	8	22.9

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) Add "B" for standard hardware (1/2" x 2" carriage bolt; 1/2" hex nut; 1/2" lock washer)
- 4) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix



## Two Phase Triple Position

### Features

- Accepts 5/8" mounting hardware
- Recessed cavity in base to allow double nutting for back to back mounting

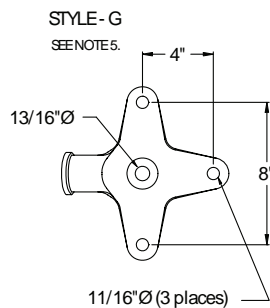
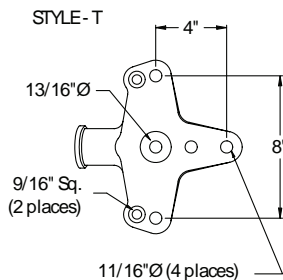
### Material

Base: Aluminum A356-T6  
 End Fitting: Aluminum A356-T6  
 Rod: Fiberglass gray ultraviolet (UV) protective coating

Catalog Number	Dimensions (In)		Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A	D	F1 Vert	F2 Long	F3 Trans	B	C	
G2MAA148AT	48	1.5	900	700	10000	6	8	11.7
G2HAA348AT	48	2.0	1650	1100	10000	8	10	18.7

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) Add "B" for standard hardware (1/2" x 2" carriage bolt; 1/2" hex nut; 1/2" lock washer)
- 4) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix
- 5) For end fitting style "G", replace fitting specification "T" (e.g. G2MAA148AG) - available for 1.5" diameter only





# Equipment Brackets

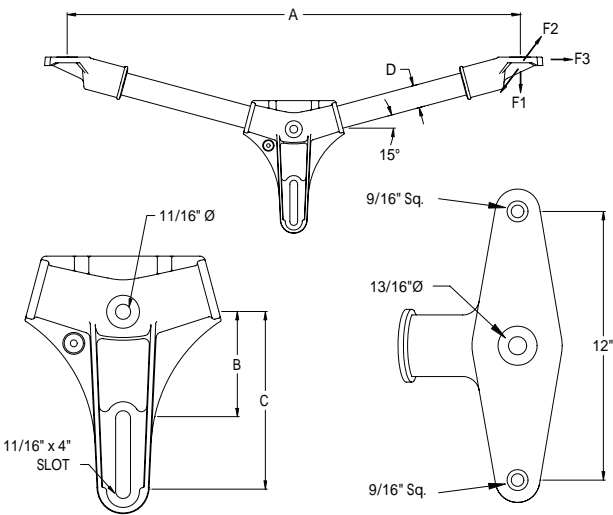
## Two Phase SCADA

### Features

- Accepts 5/8" mounting hardware
- Recessed cavity in base to allow double nutting for back to back mounting

### Material

Base: Aluminum A356-T6  
 End Fitting: Aluminum A356-T6  
 Rod: Fiberglass gray ultraviolet (UV) protective coating



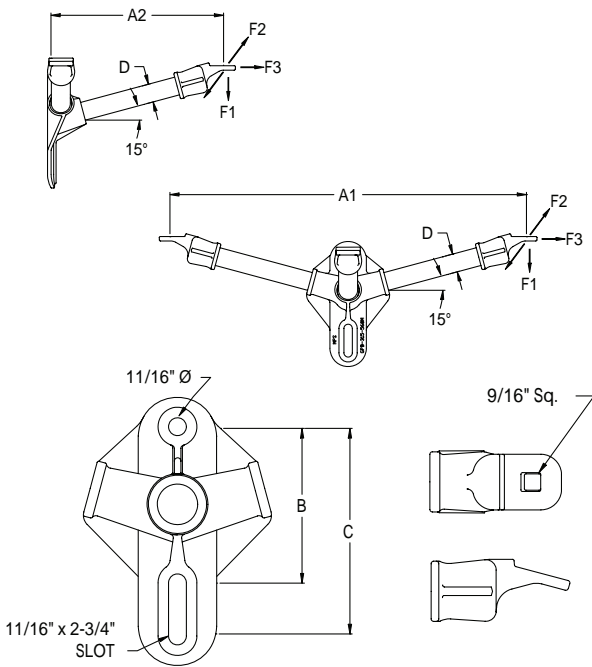
Catalog Number	Dimensions (In)		Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A	D	F1 Vert	F2 Long	F3 Trans	B	C	
G2HAA160AKC1	60	2.0	2400	1600	10000	6	8	23.4

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix



# Equipment Brackets



## Three Phase Single Position

### Features

- Accepts 5/8" mounting hardware

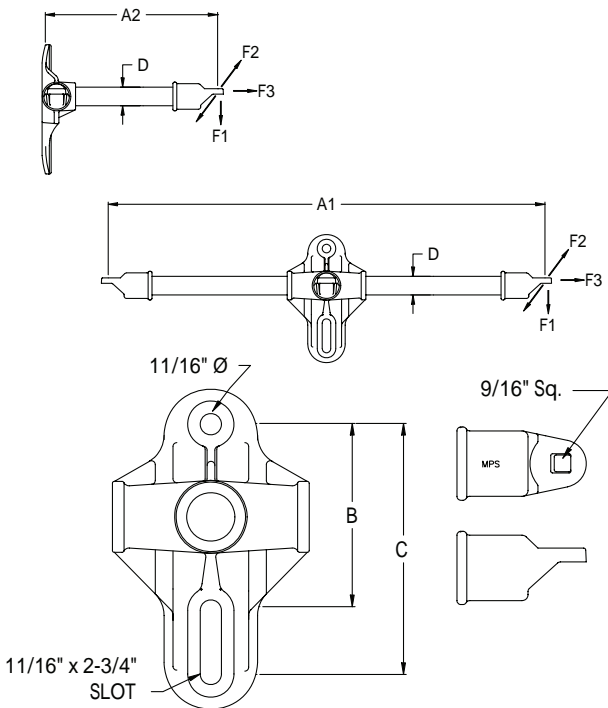
### Material

Base: Aluminum A356-T6  
 End Fitting: Ductile iron hot dip galvanized ASTM A-153  
 Rod: Fiberglass gray ultraviolet (UV) protective coating

Catalog Number	Dimensions (In)			Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A1	A2	D	F1 Vert	F2 Long	F3 Trans	B	C	
G3MAA13613DC	36	13	1.5	1200	900	1500	6	8	13.2
G3MAA14813DC	48	13	1.5	900	700	1500	6	8	14.7

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) Add "B" for standard hardware (1/2" x 2" carriage bolt; 1/2" hex nut; 1/2" lock washer)
- 4) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix



## Three Phase Single Position

### Features

- Accepts 5/8" mounting hardware

### Material

Base: Aluminum A356-T6  
 End Fitting: Ductile iron hot dip galvanized ASTM A-153  
 Rod: Fiberglass gray ultraviolet (UV) protective coating

Catalog Number	Dimensions (In)			Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A1	A2	D	F1 Vert	F2 Long	F3 Trans	B	C	
G3MA013613DC	36	13	1.5	1200	900	1500	6	8	8.9
G3MA014813DC	48	13	1.5	900	700	1500	6	8	10.3
G3MA014818DC	48	18	1.5	900	700	1500	6	8	11.0

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) Add "B" for standard hardware (1/2" x 2" carriage bolt; 1/2" hex nut; 1/2" lock washer)
- 4) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix



# Equipment Brackets

## Three Phase Double Position

### Features

- Accepts 5/8" mounting hardware
- Recessed cavity in base to allow double nutting for back to back mounting (2" only)
- Keyhole for installation ease on top bolt (2" only)

### Material

Base: Aluminum A356-T6  
 End Fitting: Aluminum A356-T6  
 Rod: Fiberglass gray ultraviolet (UV) protective coating

Catalog Number	Dimensions (In)			Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A1	A2	D	F1 Vert	F2 Long	F3 Trans	B	C	
G3MAA13013AD	30	13	1.5	1350	1000	10000	6	8	12.4
G3MAA14813AD	48	13	1.5	900	700	10000	6	8	14.7
G3MAA14818AD	48	18	1.5	900	700	10000	6	8	15.4
G3MAA14824AD	48	24	1.5	900	700	10000	6	8	16.1
G3HAA14813AD	48	13	2.0	1650	1100	10000	8		20.8
G3HAA14818AD	48	18	2.0	1650	1100	10000	8		22.0
G3HAA14824AD	48	24	2.0	1650	1100	10000	8		23.3

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) Add "B" for standard hardware (1/2" x 2" carriage bolt; 1/2" hex nut; 1/2" lock washer)
- 4) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix

## Three Phase Double Position

### Features

- Accepts 5/8" mounting hardware

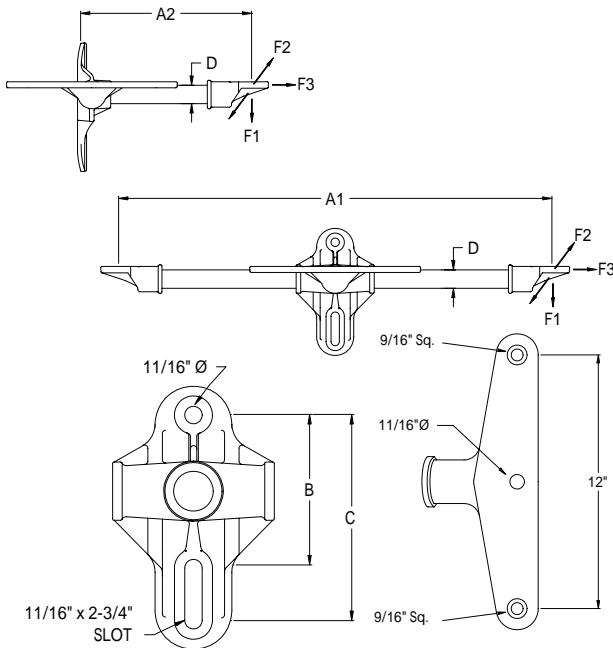
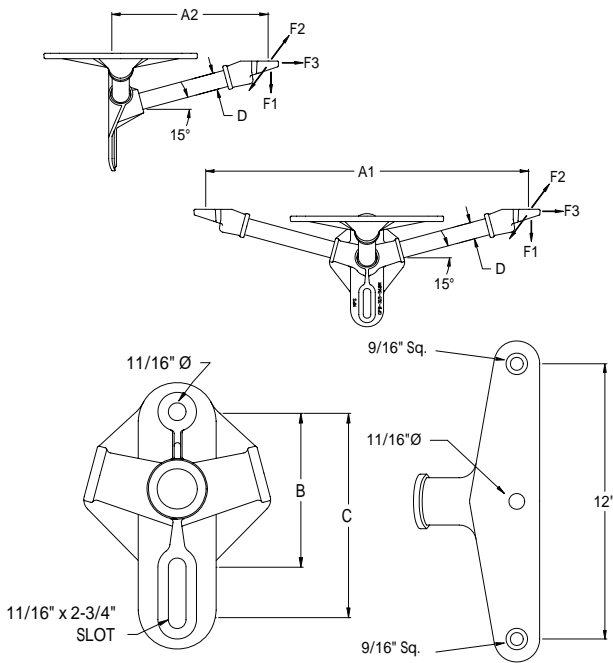
### Material

Base: Aluminum A356-T6  
 End Fitting: Ductile iron hot dip galvanized ASTM A-153  
 Rod: Fiberglass gray ultraviolet (UV) protective coating

Catalog Number	Dimensions (In)			Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A1	A2	D	F1 Vert	F2 Long	F3 Trans	B	C	
G3MA013613DD	36	13	1.5	1200	900	10000	6	8	12.3
G3MA014813DD	48	13	1.5	900	700	10000	6	8	13.8
G3MA014824DD	48	24	1.5	900	700	10000	6	8	15.2

### Notes:

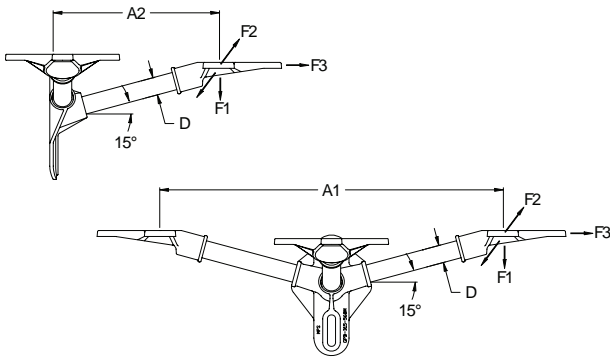
- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) Add "B" for standard hardware (1/2" x 2" carriage bolt; 1/2" hex nut; 1/2" lock washer)
- 4) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix







# Equipment Brackets



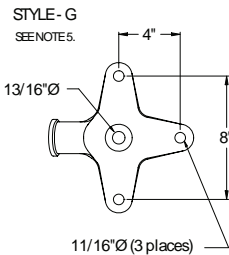
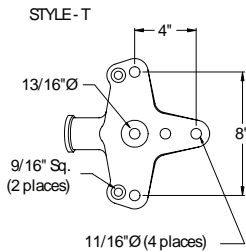
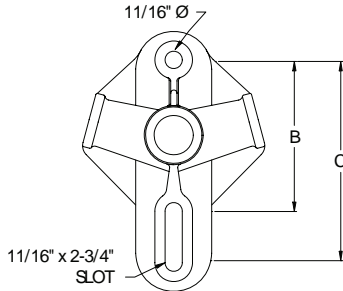
## Three Phase Three Position

### Features

- Accepts 5/8" mounting hardware
- Additional 6" bolt space (2" only)

### Material

- Base: 1.5" - Aluminum A356-T6  
 2.0" - Ductile iron hot dip galvanized ASTM A-153
- End Fitting: Aluminum A356-T6
- Rod: Fiberglass gray ultraviolet (UV) protective coating



Catalog Number	Dimensions (In)			Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A1	A2	D	F1 Vert	F2 Long	F3 Trans	B	C	
G3MAA13618AT	36	18	1.5	1200	900	10000	6	8	14.0
G3MAA14313AT	48	13	1.5	900	700	10000	6	8	14.9
G3MAA14824AT	48	24	1.5	900	700	10000	6	8	16.3
G3HAA13618AT	36	18	2.0	2250	1500	10000	5	8	27.5
G3HAA14813AT	48	13	2.0	1650	1100	10000	5	8	29.1
G3HAA14824AT	48	24	2.0	1650	1100	10000	5	8	31.6

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) Add "B" for standard hardware (1/2" x 2" carriage bolt; 1/2" hex nut; 1/2" lock washer)
- 4) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix
- 5) For end fitting style "G", replace fitting specification "T" (e.g. G3MAA13618AG) - available for 1.5" diameter only



# Pin Brackets

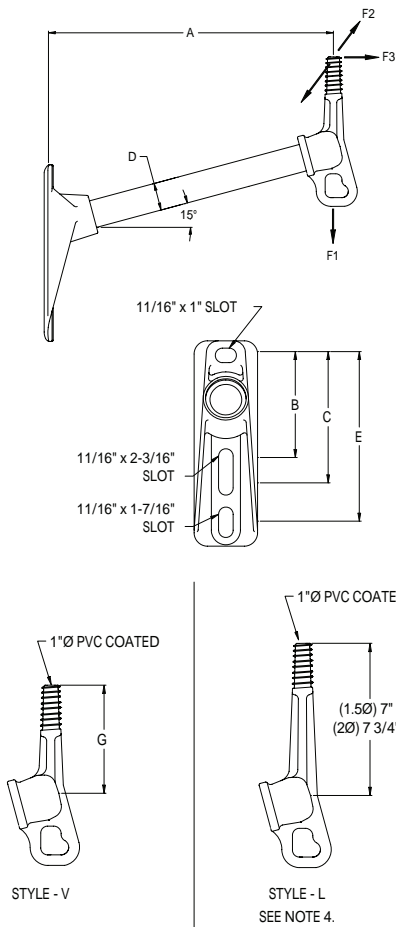
## Single Phase Vertical

### Features

- Accepts 5/8" mounting hardware
- Cleats to prevent bracket rotation on wood poles (1.5" only)
- Recessed cavity in base to allow double nutting for back to back mounting (2" only)

### Material

Base: Ductile iron hot dip galvanized ASTM A-153  
 End Fitting: Ductile iron hot dip galvanized ASTM A-153  
 Rod: Fiberglass gray ultraviolet (UV) protective coating



Catalog Number	Dimensions (In)			Min Ultimate Load (Lbs)			Bolt Spacing (In)			Weight (Lbs)
	A	D	G	F1 Vert	F2 Long	F3 Trans	B	C	E	
G1MDA112DV1	12	1.5	5	2100	1300	2000	5	6	8	7.1
G1MDA115DV1	15	1.5	5	1700	1100	2000	5	6	8	7.5
G1MDA118DV1	18	1.5	5	1500	900	2000	5	6	8	7.9
G1MDA121DV1	21	1.5	5	1200	800	2000	5	6	8	8.3
G1MDA124DV1	24	1.5	5	1000	700	2000	5	6	8	8.7
G1HDA118DV1	18	2.0	5 3/8	2250	1950	2500	8			13.2
G1HDA121DV1	21	2.0	5 3/8	2150	1850	2500	8			13.9
G1HDA124DV1	24	2.0	5 3/8	2100	1800	2500	8			14.6
G1HDA130DV1	30	2.0	5 3/8	1800	1750	2500	8			16.0

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix
- 4) For end fitting style "L", replace fitting specification "V" (e.g. G1MDA112DL1)

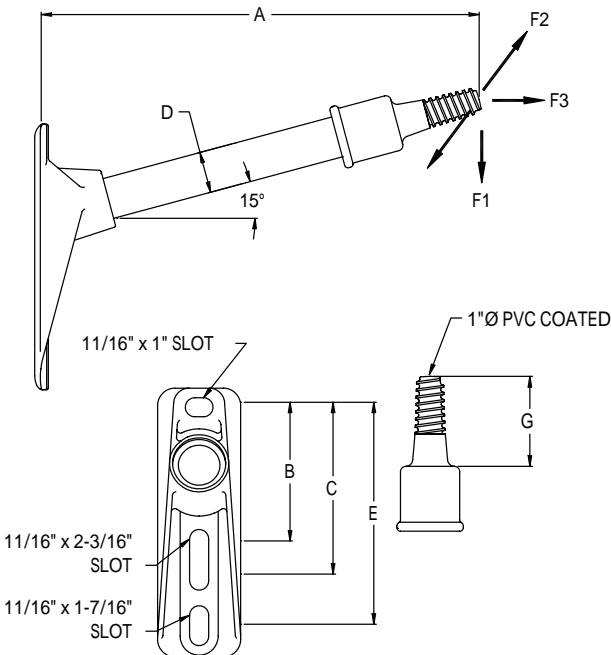
## Single Phase Horizontal

### Features

- Accepts 5/8" mounting hardware
- Cleats to prevent bracket rotation on wood poles (1.5" only)
- Recessed cavity in base to allow double nutting for back to back mounting (2" only)

### Material

Base: Ductile iron hot dip galvanized ASTM A-153  
 End Fitting: Aluminum A356-T6  
 Rod: Fiberglass gray ultraviolet (UV) protective coating



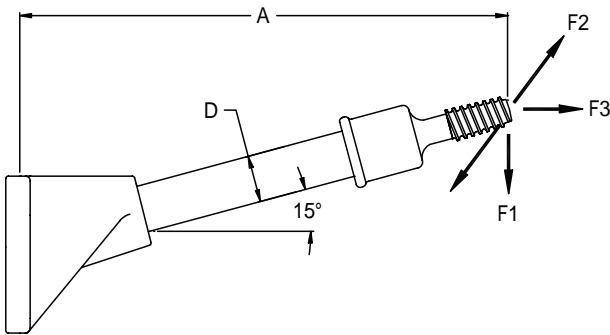
Catalog Number	Dimensions (In)			Min Ultimate Load (Lbs)			Bolt Spacing (In)			Weight (Lbs)
	A	D	G	F1 Vert	F2 Long	F3 Trans	B	C	E	
G1MDA112AS1	12	1.5	3 1/8	1850	1600	1500	5	6	8	5.5
G1MDA116AS1	16	1.5	3 1/8	1400	1250	1500	5	6	8	6.0
G1MDA118AS1	18	1.5	3 1/8	1200	1200	1500	5	6	8	6.2
G1MDA124AS1	24	1.5	3 1/8	1050	1050	1500	5	6	8	7.0
G1HDA118AS1	18	2.0	3 3/8	2000	1500	1500	8			11.3
G1HDA124AS1	24	2.0	3 3/8	1750	1200	1500	8			12.6

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix



# Pin Brackets



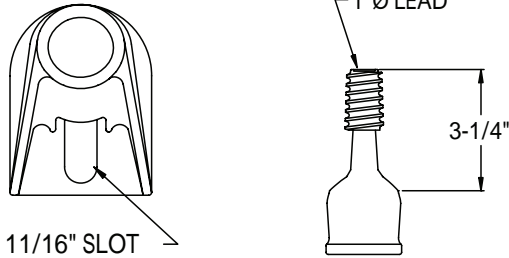
## Single Phase Jumper

### Features

- Accepts 5/8" mounting hardware

### Material

Base: Aluminum A356-T6  
 End Fitting: Ductile iron hot dip galvanized ASTM A-153  
 Rod: Fiberglass MPS gray ultraviolet (UV) protective coating



Catalog Number	Dimensions (In)		Min Ultimate Load (Lbs)			Weight (Lbs)
	A	D	F1 Vert	F2 Long	F3 Trans	
G1MAJ112DS2	12	1.5	1000	800	1500	3.5
G1MAJ113DS2	13	1.5	950	750	1500	3.6
G1MAJ118DS2	18	1.5	700	500	1500	4.3

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix

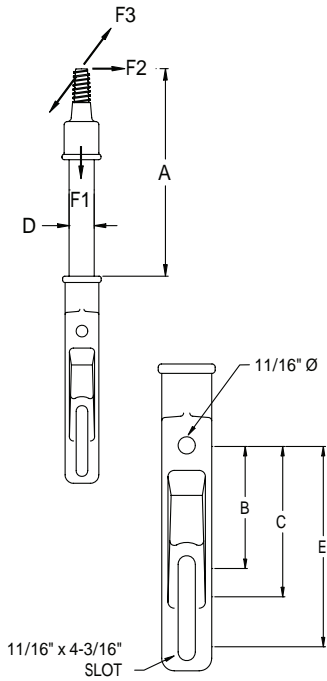
## Single Phase Pole Top

### Features

- Accepts 5/8" mounting hardware

### Material

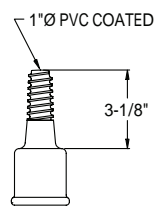
Base: Ductile iron hot dip galvanized ASTM A-153  
 End Fitting: 1.5" - Aluminum A356-T6  
 2.0" - Ductile iron hot dip galvanized ASTM A-153  
 Rod: Fiberglass MPS gray ultraviolet (UV) protective coating



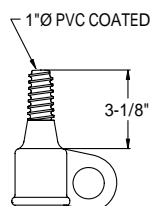
Catalog Number	Dimensions (In)		Min Ultimate Load (Lbs)			Bolt Spacing (In)			Weight (Lbs)
	A	D	F1 Vert	F2 Long	F3 Trans	B	C	E	
G1MDR113AS1	13	1.5	2500	1600	1600	5	6	8	5.6
G1MDR115AS1	15	1.5	2500	1500	1500	5	6	8	5.8
G1MDR118AS1	18	1.5	2500	1400	1400	5	6	8	6.2
G1MDR121AS1	21	1.5	2500	1200	1200	5	6	8	6.6
G1HDR118AS1	18	2.0	2500	2150	2150	5	6	8	11.3
G1HDR124AS1	24	2.0	2500	1750	1750	5	6	8	12.6
G1HDR130AS1	30	2.0	2500	1300	1300	5	6	8	14.0
G1HDR136AS1	36	2.0	2500	1100	1100	5	6	8	15.3

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix
- 4) For end fitting style "M", replace fitting specification "S" (e.g. G1MDR113AM1)



STYLE - S



STYLE - M  
SEE NOTE 4.



# Pin Brackets

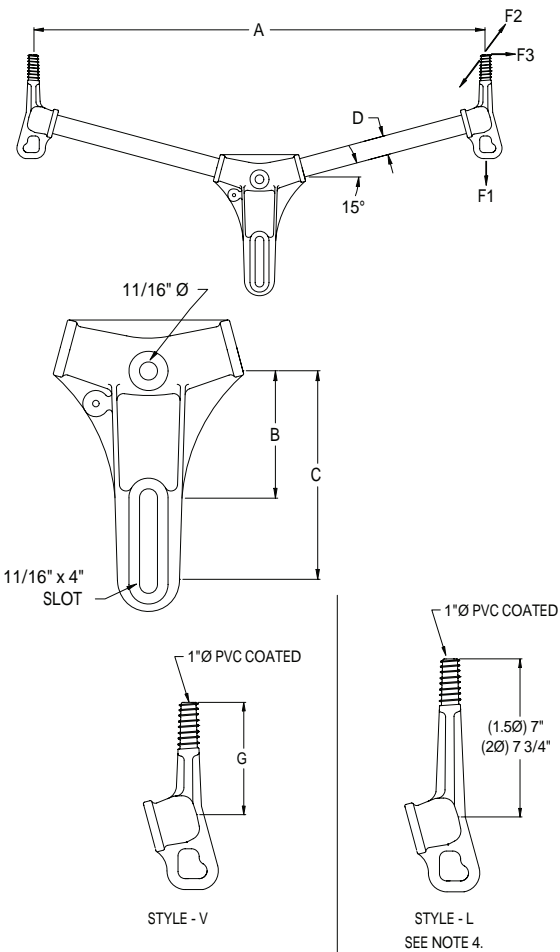
## Two Phase Vertical

### Features

- Accepts 5/8" mounting hardware
- Recessed cavity in base to allow double nutting for back to back mounting
- Cleats to prevent bracket rotation on wood poles (2" only)

### Material

Base: Ductile iron hot dip galvanized ASTM A-153  
 End Fitting: Ductile iron hot dip galvanized ASTM A-153  
 Rod: Fiberglass gray ultraviolet (UV) protective coating



Catalog Number	Dimensions (In)			Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A	D	G	F1 Vert	F2 Long	F3 Trans	B	C	
G2MDA136DV1	36	1.5	5	1500	900	2000	5	8	13.3
G2MDA140DV1	40	1.5	5	1300	850	2000	5	8	13.8
G2MDA148DV1	48	1.5	5	1000	700	2000	5	8	14.9
G2MDA160DV1	60	1.5	5	800	550	2000	5	8	16.4
G2HDA236DV1	36	2.0	5 3/8	2550	2000	2500	5	8	18.1
G2HDA242DV1	42	2.0	5 3/8	2400	1950	2500	5	8	18.9
G2HDA248DV1	48	2.0	5 3/8	2250	1900	2500	5	8	19.7
G2HDA260DV1	60	2.0	5 3/8	1950	1800	2500	5	8	21.2
G2HDA272DV1	72	2.0	5 3/8	1800	1750	2500	5	8	22.7

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix
- 4) For end fitting style "L", replace fitting specification "V" (e.g. G2MDA148DL1)

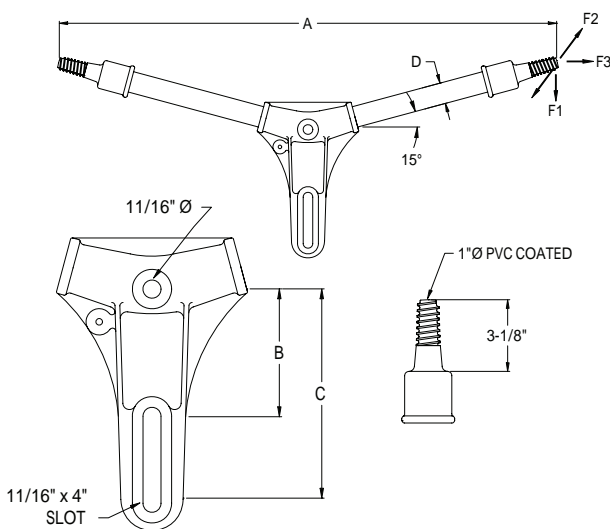
## Two Phase Horizontal

### Features

- Accepts 5/8" mounting hardware
- Recessed cavity in base to allow double nutting for back to back mounting

### Material

Base: Ductile iron hot dip galvanized ASTM A-153  
 End Fitting: Aluminum A356-T6  
 Rod: Fiberglass gray ultraviolet (UV) protective coating



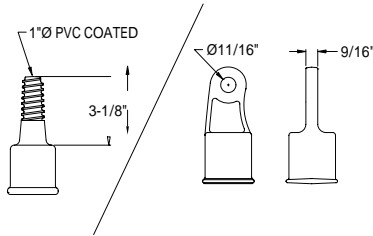
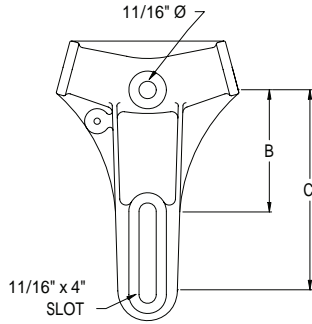
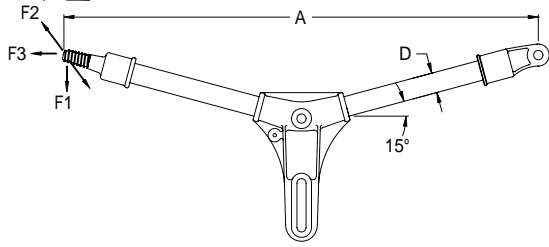
Catalog Number	Dimensions (In)		Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A	D	F1 Vert	F2 Long	F3 Trans	B	C	
G2MDA136AS1	36	1.5	1200	1200	1500	5	8	10.0
G2MDA148AS1	48	1.5	1050	1050	1500	5	8	11.5

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix



# Pin Brackets



## Two Phase Combination

### Features

- Accepts 5/8" mounting hardware
- Recessed cavity in base to allow double nutting for back to back mounting

### Material

Base: Ductile iron hot dip galvanized ASTM A-153  
 End Fitting: Aluminum A356-T6  
 Rod: Fiberglass gray ultraviolet (UV) protective coating

Catalog Number	Dimensions (In)		Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A	D	F1 Vert	F2 Long	F3 Trans	B	C	
G2MDA136AX1	36	1.5	1200	1200	1500	6	8	10.1

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix

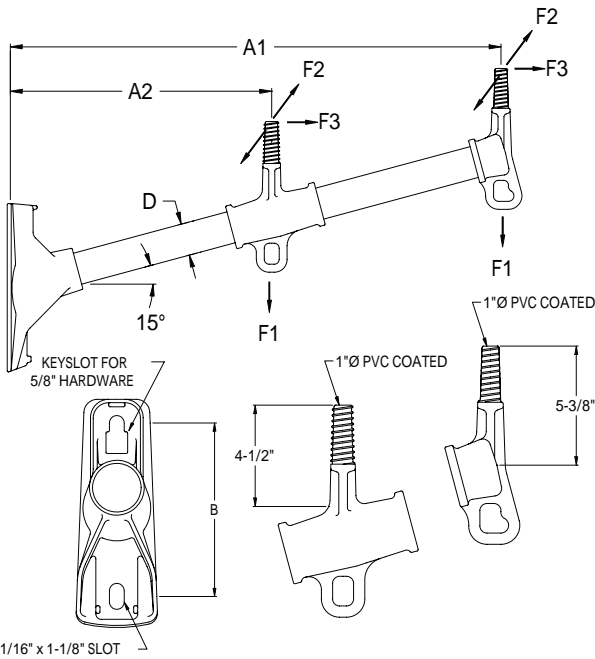
## Two Phase Alley Arm

### Features

- Accepts 5/8" mounting hardware
- Recessed cavity in base to allow double nutting for back to back mounting

### Material

Base: Ductile iron hot dip galvanized ASTM A-153  
 End Fitting: Ductile iron hot dip galvanized ASTM A-153  
 Rod: Fiberglass gray ultraviolet (UV) protective coating



Catalog Number	Dimensions (In)			Min Ultimate Load (Lbs)			Bolt Spacing (In)	Weight (Lbs)
	A1	A2	D	F1 Vert	F2 Long	F3 Trans	C	
G1HDA33814DV1	38	14	2.0	900	800	2000	8	22.2
G1HDA34212DV1	42	12	2.0	800	700	2000	8	23.2

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix



# Pin Brackets

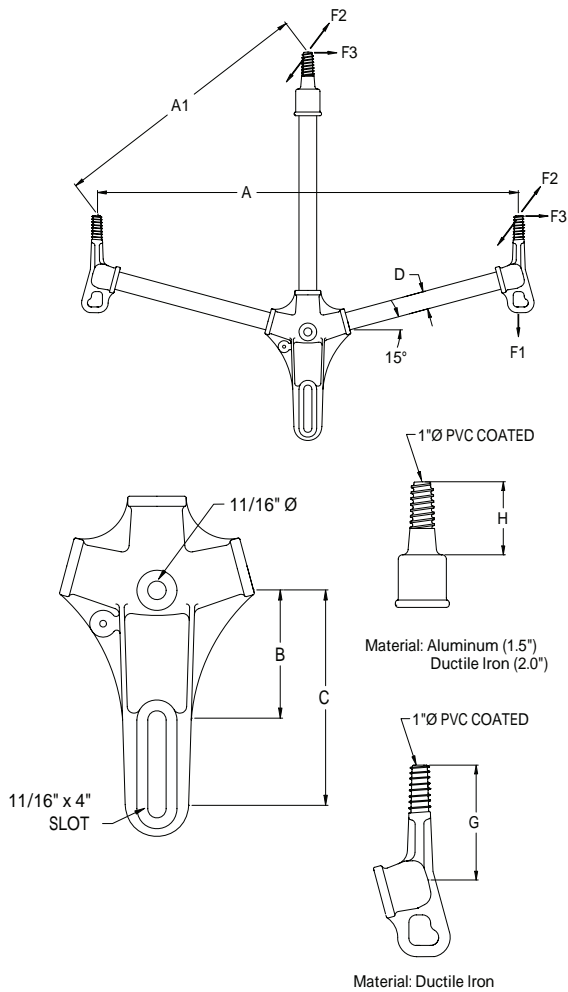
## Three Phase Vertical

### Features

- Accepts 5/8" mounting hardware
- Recessed cavity in base to allow double nutting for back to back mounting

### Material

Base: Ductile iron hot dip galvanized ASTM A-153  
 End Fitting: 1.5" - Ductile iron hot dip galvanized ASTM A-153  
 2.0" - Aluminum A356-T6  
 Rod: Fiberglass gray ultraviolet (UV) protective coating



Catalog Number	Dimensions (In)					Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A	A1	D	G	H	F1 Vert	F2 Long	F3 Trans	B	C	
G3MDV13024MY1	30	24	1.5	5	3 1/8	1700	1000	2000	5	8	17.2
G3MDV13624MY1	36	24	1.5	5	3 1/8	1500	900	2000	5	8	17.8
G3MDV14028MY1	40	28	1.5	5	3 1/8	1300	850	2000	5	8	18.7
G3MDV14628MY1	48	28	1.5	5	3 1/8	1000	700	2000	5	8	19.7
G3HDV14228DY1	42	28	2.0	5 3/4	4	2400	1950	2500	5	8	30.3
G3HDV14828DY1	48	28	2.0	5 3/4	4	2250	1800	2500	5	8	30.9

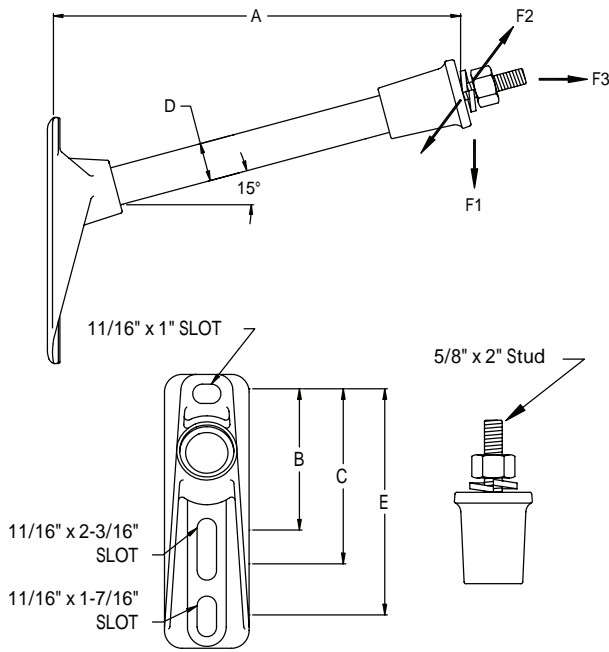
### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix





# Fiber Optic Brackets



## Features

- Accepts 5/8" mounting hardware
- Cleats to prevent bracket rotation on wood poles

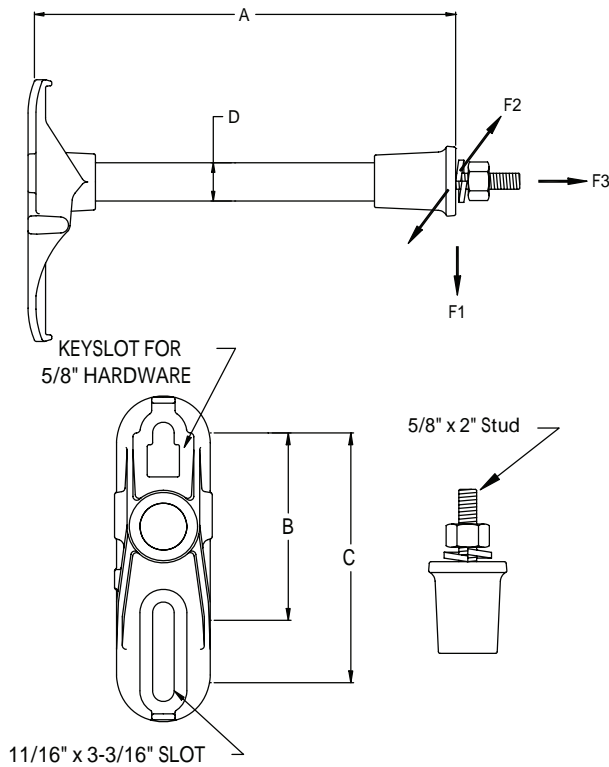
## Material

Base: Ductile iron hot dip galvanized ASTM A-153  
 End Fitting: Aluminum A356-T6  
 Rod: Fiberglass gray ultraviolet (UV) protective coating

Catalog Number	Dimensions (In)		Min Ultimate Load (Lbs)			Bolt Spacing (In)			Weight (Lbs)
	A	D	F1 Vert	F2 Long	F3 Trans	B	C	E	
G1MDA112AF	12	1.5	1850	1600	1500	5	6	8	5.8
G1MDA115AF	15	1.5	1500	1300	1500	5	6	8	6.2
G1MDA118AF	18	1.5	1200	1200	1500	5	6	8	6.6
G1MDA121AF	21	1.5	1050	1050	1500	5	6	8	7.0
G1MDA124AF	24	1.5	950	950	1500	5	6	8	7.4
G1MDA130AF	30	1.5	750	750	1500	5	6	8	8.2

## Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix



## Features

- Accepts 5/8" mounting hardware
- Tab retainers for banding provisions
- Keyhole for installation ease on top bolt

## Material

Base: Ductile iron hot dip galvanized ASTM A-153  
 End Fitting: Aluminum A356-T6  
 Rod: Fiberglass gray ultraviolet (UV) protective coating

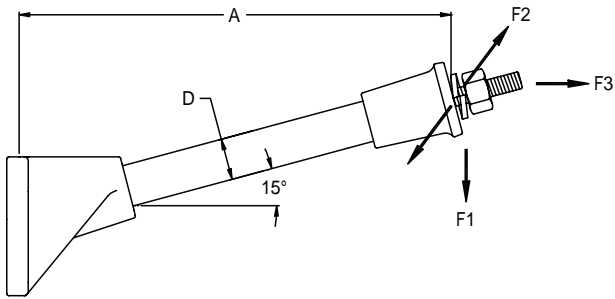
Catalog Number	Dimensions (In)		Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A	D	F1 Vert	F2 Long	F3 Trans	B	C	
G1MA0112AF	12	1.5	1850	1600	1500	6	8	3.7
G1MA0118AF	18	1.5	1200	1200	1500	6	8	4.4
G1MA0121AF	21	1.5	1050	1050	1500	6	8	4.8

## Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix



# Fiber Optic Brackets

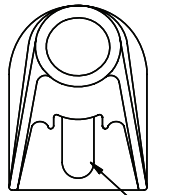


## Features

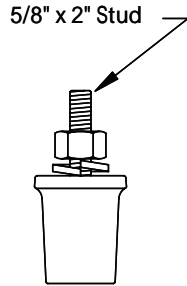
- Accepts 5/8" mounting hardware

## Material

Base: Aluminum A356-T6  
 End Fitting: Aluminum A356-T6  
 Rod: Fiberglass gray ultraviolet (UV) protective coating



11/16" SLOT



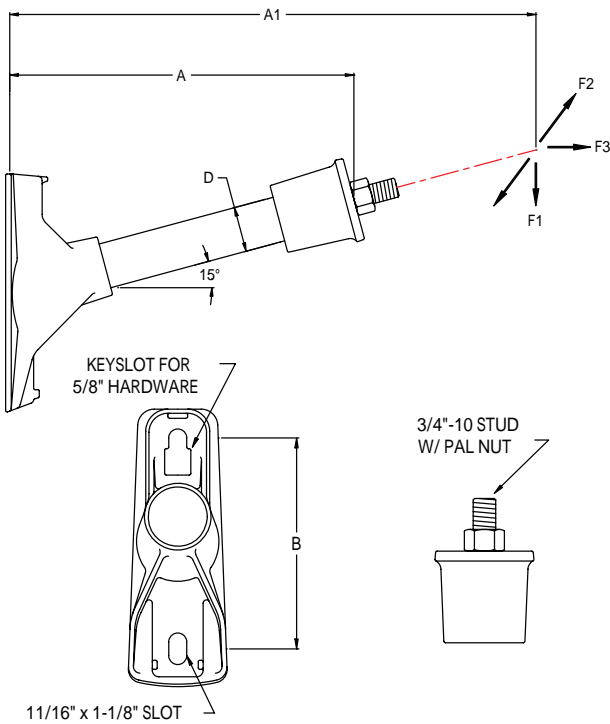
Catalog Number	Dimensions (In)		Min Ultimate Load (Lbs)			Weight (Lbs)
	A	D	F1 Vert	F2 Long	F3 Trans	
G1MAJ112AF	12	1.5	1000	800	1500	3.4
G1MAJ116AF	16	1.5	800	600	1500	3.9

## Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix



# Insulator Brackets



## Single Phase Line Post

### Features

- Accepts 5/8" mounting hardware
- Tab retainers for banding provisions
- Recessed cavity in base to allow double nutting for back to back mounting
- Keyhole for installation ease on top bolt

### Material

Base: Ductile iron hot dip galvanized ASTM A-153  
 End Fitting: Aluminum A356-T6  
 Rod: Fiberglass gray ultraviolet (UV) protective coating

Catalog Number	Dimensions (In)			Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A	A1	D	F1 Vert	F2 Long	F3 Trans	B		
G1HDA314AP	14	23.63	2.0	2100	1850	2500	8		11.6
G1HDA318AP	18	27.63	2.0	1750	1550	2500	8		12.5
G1HDA321AP	21	30.63	2.0	1550	1350	2500	8		13.1

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix

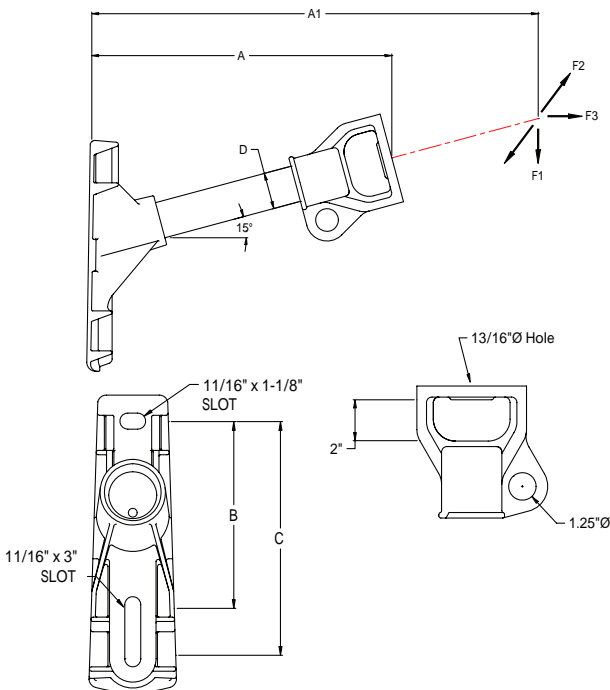
## Single Phase Line Post

### Features

- Accepts 5/8" mounting hardware
- Tab retainers for banding provisions
- Recessed cavity in base to allow double nutting for back to back mounting

### Material

Base: Aluminum A356-T6  
 End Fitting: Aluminum A356-T6  
 Rod: Fiberglass gray ultraviolet (UV) protective coating



Catalog Number	Dimensions (In)			Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A	A1	D	F1 Vert	F2 Long	F3 Trans	B	C	
G1HAA514AH	14	23.38	2.0	2100	1850	2500	8	10	8.3
G1HAA518AH	18	27.38	2.0	1750	1550	2500	8	10	9.0
G1HAA521AH	21	30.38	2.0	1550	1350	2500	8	10	9.8

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix



# Insulator Brackets

## Single Phase Horizontal Line Post

### Features

- Accepts 5/8" mounting hardware
- Recessed cavity in base to allow double nutting for back to back mounting

### Material

Base: Aluminum A356-T6  
 End Fitting: Steel  
 Rod: Fiberglass gray ultraviolet (UV) protective coating

Catalog Number	Dimensions (In)			Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A	A1	D	F1 Vert	F2 Long	F3 Trans	B	C	
G1XAA134SH	34	43.38	2.5	2800	2200	2500	8	10	21.0
G1XAA172SH	72	81.38	2.5	1400	1100	2500	8	10	34.5

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix

## Single Phase Suspension

### Features

- Accepts 5/8" mounting hardware
- Cleats to prevent bracket rotation on wood poles

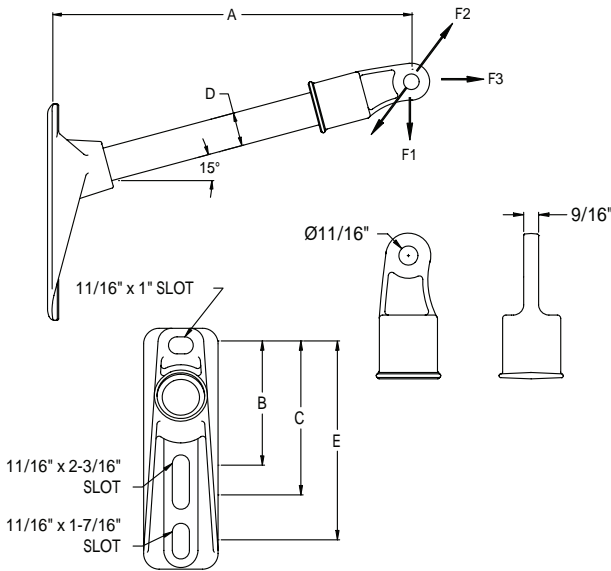
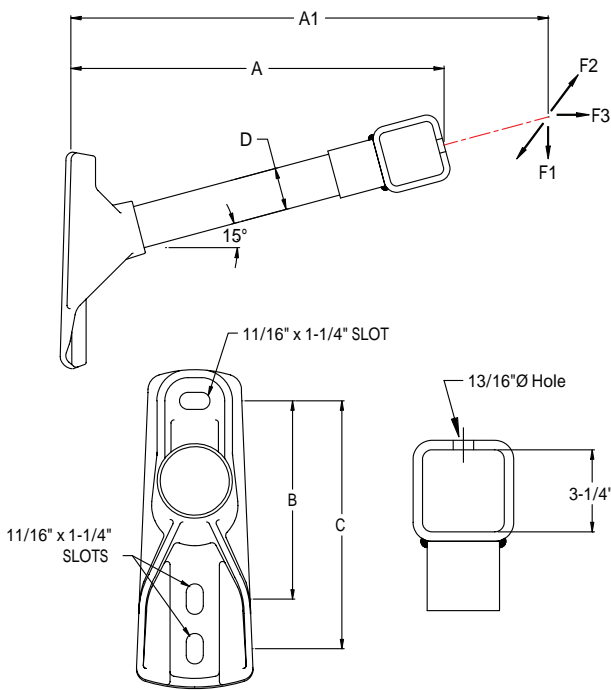
### Material

Base: Ductile iron hot dip galvanized ASTM A-153  
 End Fitting: 1.5" - Aluminum A356-T6  
 2.0" - Ductile iron hot dip galvanized ASTM A-153  
 Rod: Fiberglass gray ultraviolet (UV) protective coating

Catalog Number	Dimensions (In)		Min Ultimate Load (Lbs)			Bolt Spacing (In)			Weight (Lbs)
	A	D	F1 Vert	F2 Long	F3 Trans	B	C	E	
G1MDA118AE	18	1.5	1200	900	5000	5	6	8	6.4
G1HDA318DE	18	2.0	2550	2000	10000	8			16.2

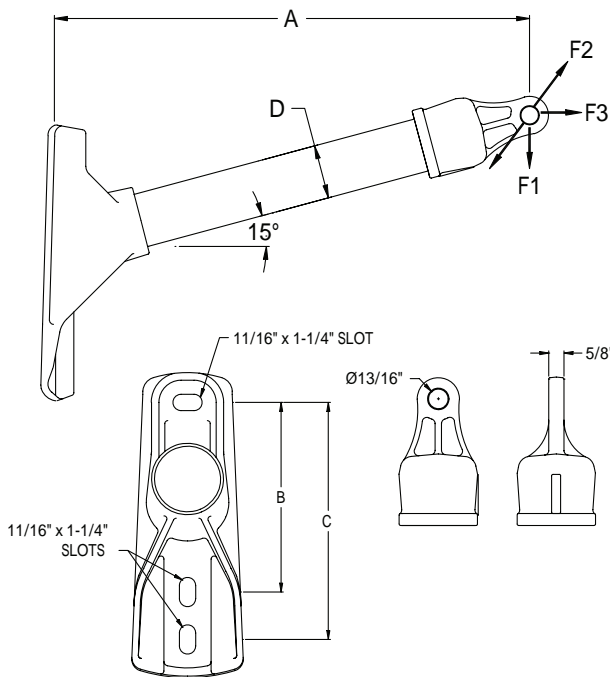
### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix
- 4) For end fitting style "M", replace fitting specification "S" (e.g. G1MDR113AM1)





# Insulator Brackets



## Single Phase Suspension

### Features

- Accepts 5/8" mounting hardware
- Recessed cavity in base to allow double nutting for back to back mounting

### Material

Base: Aluminum A356-T6  
 End Fitting: Ductile iron hot dip galvanized ASTM A-153  
 Rod: Fiberglass gray ultraviolet (UV) protective coating

Catalog Number	Dimensions (In)		Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A	D	F1 Vert	F2 Long	F3 Trans	B	C	
G1XAA124DE	24	2.5	4550	3600	10000	8	10	13.7
G1XAA136DE	36	2.5	2850	2400	10000	8	10	17.9

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix

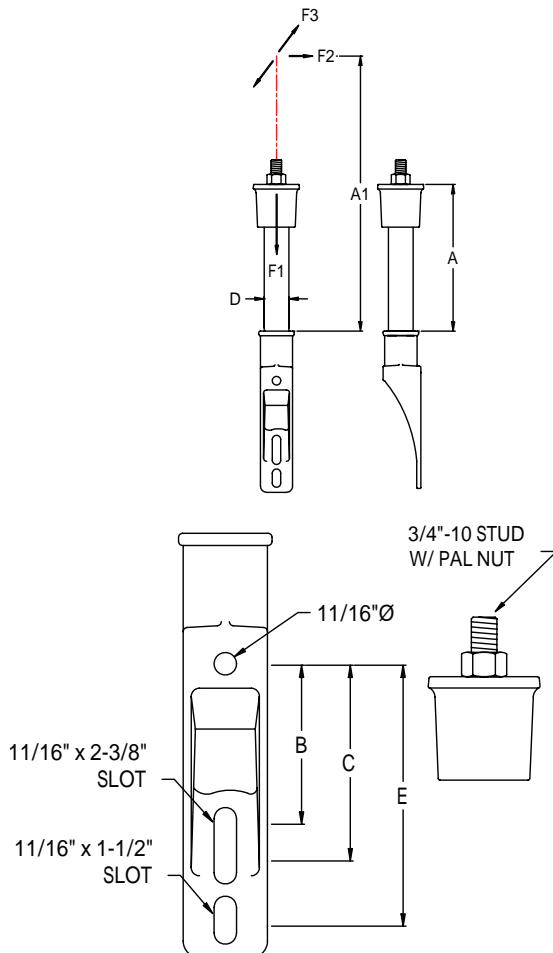
## Single Phase Vertical Line Post

### Features

- Accepts 5/8" mounting hardware
- Recessed cavity in base to allow double nutting for back to back mounting

### Material

Base: Ductile iron hot dip galvanized ASTM A-153  
 End Fitting: Aluminum A356-T6  
 Rod: Fiberglass gray ultraviolet (UV) protective coating



Catalog Number	Dimensions (In)			Min Ultimate Load (Lbs)			Bolt Spacing (In)			Weight (Lbs)
	A	A1	D	F1 Vert	F2 Long	F3 Trans	B	C	E	
G1HDR110AP	10	18.56	2.0	5000	2000	2000	5	6	8	9.5
G1HDR114AP	14	22.56	2.0	5000	2000	2000	5	6	8	10.4
G1HDR118AP	18	26.56	2.0	5000	1500	1500	5	6	8	11.3
G1HDR124AP	24	32.56	2.0	5000	1500	1500	5	6	8	12.6

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix



# Insulator Brackets

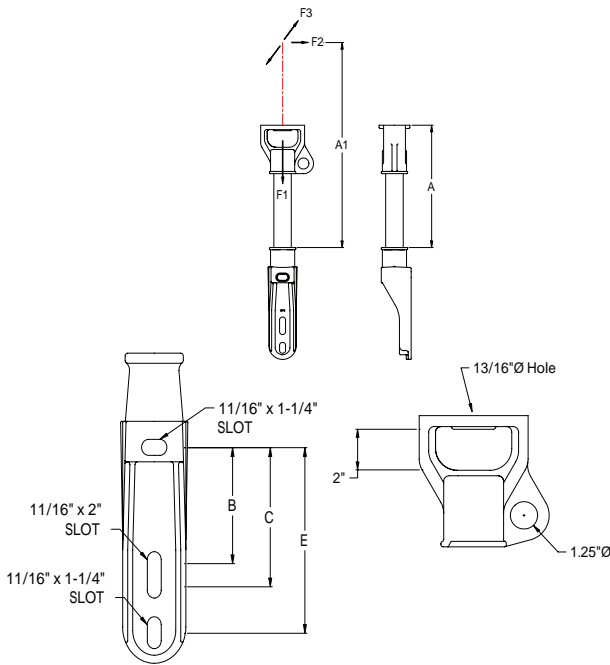
## Single Phase Vertical Line Post

### Features

- Accepts 5/8" mounting hardware
- Recessed cavity in base to allow double nutting for back to back mounting

### Material

Base: Ductile iron hot dip galvanized ASTM A-153  
 End Fitting: Aluminum A356-T6  
 Rod: Fiberglass gray ultraviolet (UV) protective coating



Catalog Number	Dimensions (In)			Min Ultimate Load (Lbs)			Bolt Spacing (In)			Weight (Lbs)
	A	A1	D	F1 Vert	F2 Long	F3 Trans	B	C	E	
G1HAR110AH	10	19.38	2.0	5000	2000	2000	5	6	8	8.3
G1HAR114AH	14	23.38	2.0	5000	2000	2000	5	6	8	9.2
G1HAR118AH	18	27.38	2.0	5000	1500	1500	5	6	8	10.0
G1HAR124AH	24	33.38	2.0	5000	1500	1500	5	6	8	11.4

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix

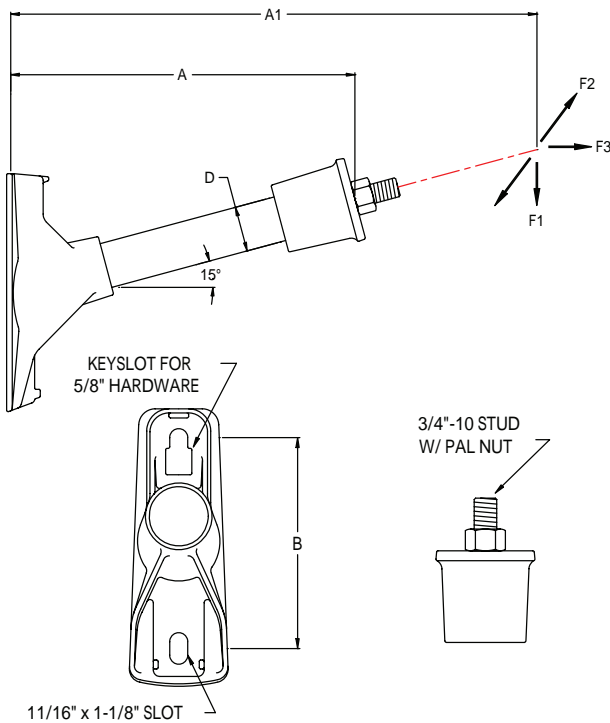
## Two Phase Horizontal Line Post

### Features

- Accepts 5/8" mounting hardware
- Cleats to prevent bracket rotation on wood poles
- Recessed cavity in base to allow double nutting for back to back mounting

### Material

Base: Ductile iron hot dip galvanized ASTM A153  
 End Fitting: Aluminum A356-T6  
 Rod: Fiberglass MPS gray ultraviolet (UV) protective coating



Catalog Number	Dimensions (In)			Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A	A1	D	F1 Vert	F2 Long	F3 Trans	B	C	
G2HDA234AP	34	52.25	2.0	1800	1600	2500	5	8	18.1
G2HDA253AP	53	71.25	2.0	1300	1100	2500	5	8	22.6

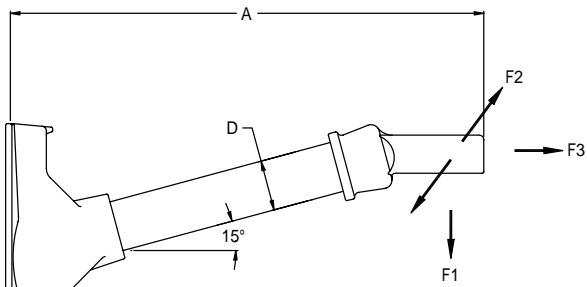
### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix





# Messenger Brackets and Sidewalk Guys



## Single Phase

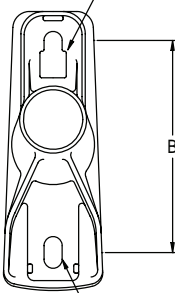
### Features

- Accepts 5/8" mounting hardware
- Tab retainers for banding provisions
- Recessed cavity in base to allow double nutting for back to back mounting
- Keyhole for installation ease on top bolt

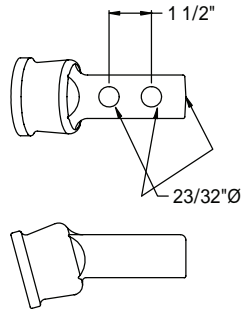
### Material

Base: Ductile iron hot dip galvanized ASTM A-153  
 End Fitting: Ductile iron hot dip galvanized ASTM A-153  
 Rod: Fiberglass gray ultraviolet (UV) protective coating

KEYSLOT FOR 5/8" HARDWARE



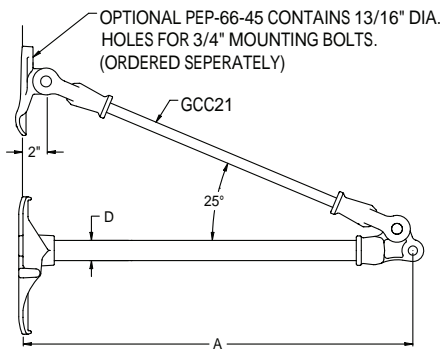
11/16" x 1-1/8" SLOT



Catalog Number	Dimensions (In)		Min Ultimate Load (Lbs)			Bolt Spacing (In)			Weight (Lbs)
	A	D	F1 Vert	F2 Long	F3 Trans	B	C	E	
G1HDA324DB	24	2.0	2100	1850	10000	5	6	8	13.3

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix



## Sidewalk Guys

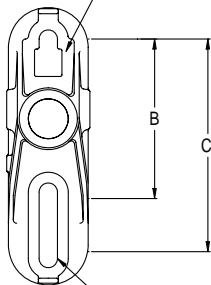
### Features

- Accepts 5/8" mounting hardware
- Tab retainers for banding provisions
- Keyhole for ease of installation on top bolt

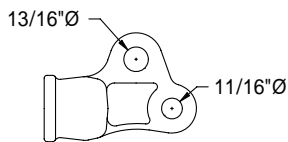
### Material

Base: Ductile iron hot dip galvanized ASTM A-153  
 End Fitting: Aluminum A356-T6  
 Rod: Fiberglass gray ultraviolet (UV) protective coating

KEYSLOT FOR 5/8" HARDWARE



11/16" x 3-3/16" SLOT



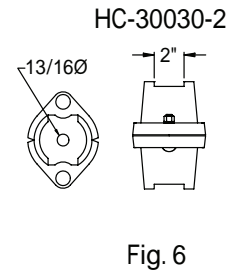
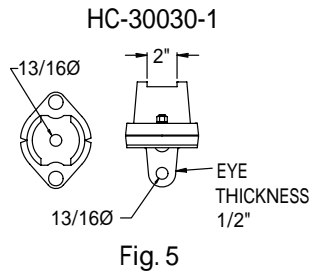
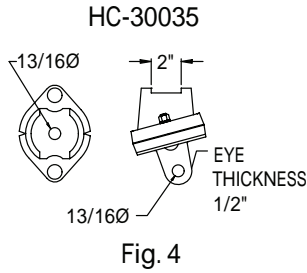
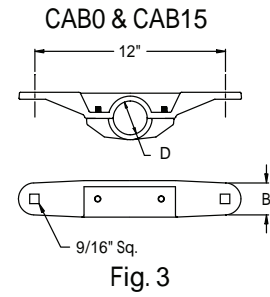
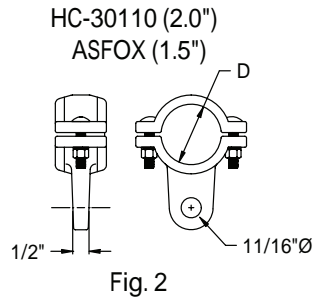
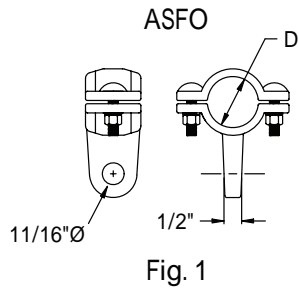
Catalog Number	Dimensions (In)		Min Ultimate Load (Lbs)			Bolt Spacing (In)		Weight (Lbs)
	A	D	F1 Vert	F2 Long	F3 Trans	B	C	
GSWG24M2E5	24	1.5	10000			6	8	10.3

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix



# Accessories



Catalog Number	Figure	Bracket Angle (Degree)	Dimensions (In)		Weight (Lbs)
			B	D	
ASFO	1	0° or 15°		1.5	0.6
ASFOX	2	0° or 15°		1.5	0.6
HC-30110	2	0° or 15°		2.0	0.8
CAB0-12-3.0	3	0°	2.31	3.0	1.9
CAB15-12-1.5	3	15°	2.0	1.5	1.7
CAB15-12-2.0	3	15°	2.0	2.0	1.8
HC-30035	4	15°		2.0	2.9
HC-30030-1	5	0°		3.0	2.9
HC-30030-2	6	0°		3.0	3.2

**Notes:**

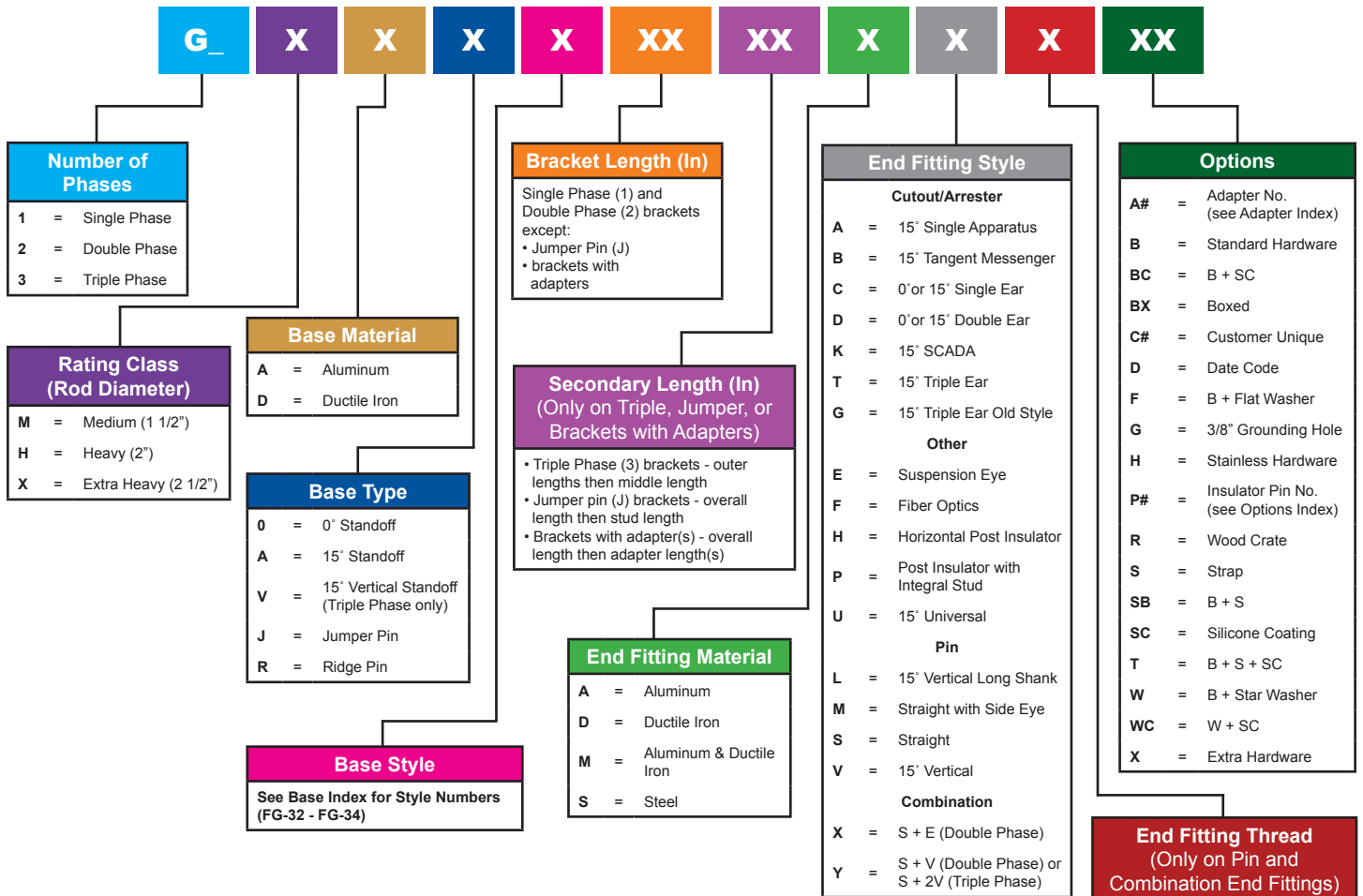
1) For CAB series:

- Add "B" for standard hardware (1/2" x 2" carriage bolt; 1/2" hex nut; 1/2" lock washer)
- Add "W" for standard hardware (1/2" x 2" carriage bolt; 1/2" hex nut; 1/2" lock washer) and 1/2" star washer

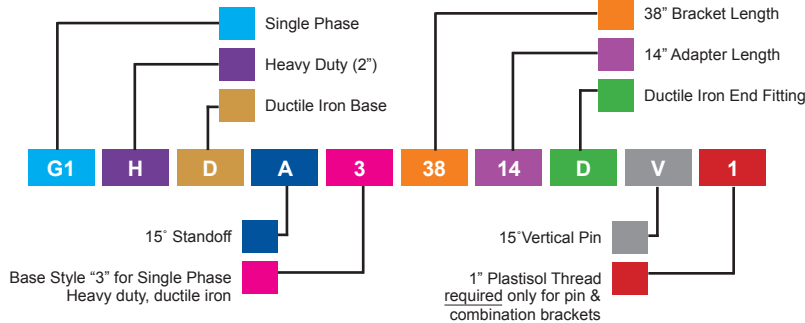
2) For other options, reference Fiberglass Catalog Numbering System Matrix



# Fiberglass Bracket Catalog Numbering System



## Catalog Order Number Example





# Fiberglass Bracket Base Index

Single Phase (1)				
Rod Diameter	1.5" (M)		2.0" (H)	
Material	Iron (D)	Aluminum (A)	Iron (D)	Aluminum (A)
Style Number	15° Standoff (A)			
1	 Features: C, 5		 Features: D, 5	 Features: D, 5
2	 Features: B, C, 5	 Features: B, D, 5	 Features: D, 6	
3	 Features: B, K, 5	 Features: B, D, K, 5	 Features: B, D, K, 5	 Features: D, K, 5
4	 Features: B, K, 5		 Features: B, D, K, 5	
5			 Features: B, D, 5	 Features: B, D, 5
Style Number	0° Standoff (0)			
1		 Features: B, K, 5		
Style Number	Ridge Pin (R)			
1	 Features: D, 5	 Features: D, 5	 Features: C, D, 5	 Features: D, 5

Features: B = Bandable  
5 = 11/16" Diameter

C = Cleats  
6 = 13/16" Diameter

D = Double Nut

K = Keyhole



# Fiberglass Bracket Base Index

Single Phase (1)				
Rod Diameter	1.5" (M)		2.0" (H)	
Material	Iron (D)	Aluminum (A)	Iron (D)	Aluminum (A)
Style Number	Jumper Pin (J)			
1		 Features: 5		
2		 Features: 5		
3		 Features: 6		 Features: 6
Double Phase (2)				
Rod Diameter	1.5" (M)		2.0" (H)	
Material	Iron (D)	Aluminum (A)	Iron (D)	Aluminum (A)
Style Number	15° Standoff (A)			
1	 Features: D, 5	 Features: D, 5	 Features: D, 5	 Features: D, 5
2	 Features: D, 5		 Features: C, D, 5	
3			 Features: D, 5	 Features: D, 5
Style Number	0° Standoff (0)			
1				 Features: 5

Features: B = Bandable  
5 = 11/16" Diameter

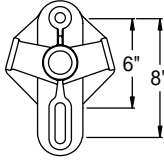
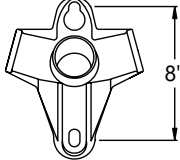
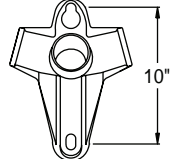
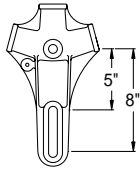
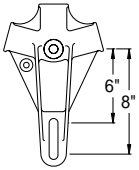
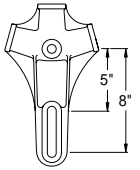
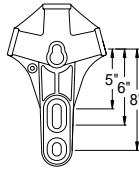
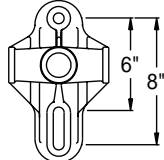
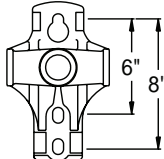
C = Cleats  
6 = 13/16" Diameter

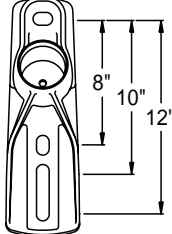
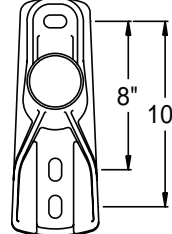
D = Double Nut

K = Keyhole



# Fiberglass Bracket Base Index

Triple Phase (3)				
Rod Diameter	1.5" (M)		2.0" (H)	
Material	Iron (D)	Aluminum (A)	Iron (D)	Aluminum (A)
Style Number	15° Standoff (A)			
1		 <p>Features: 5</p>		 <p>Features: D, K, 5</p>
2				 <p>Features: D, K, 5</p>
Style Number	15° Vertical Standoff (V)			
1	 <p>Features: D, 5</p>	 <p>Features: D, 5</p>	 <p>Features: D, 5</p>	 <p>Features: D, K, 5</p>
Style Number	0° Standoff (O)			
1		 <p>Features: 5</p>		
2		 <p>Features: B, D, K, 5</p>		

Transmission Single Phase (1)		
Rod Diameter	2.5" (X)	2.5" (X)
Material	Iron (D)	Aluminum (A)
Style Number	15° Standoff (A)	
see footnote	 <p>Features: D, 6</p> <p>Style Number: 1 and 2</p>	 <p>Features: D, 5</p> <p>Style Number: 1</p>

Features: B = Bandable  
5 = 11/16" Diameter

C = Cleats  
6 = 13/16" Diameter

D = Double Nut

K = Keyhole





# Fiberglass Bracket End Fitting Index

Cutout/Arrester				
Rod Diameter	1.5" (M)		2.0" (H)	
Material	Iron (D)	Aluminum (A)	Iron (D)	Aluminum (A)
<b>15° Single Apparatus (A)</b>				
<b>15° Single Ear (C)</b>				
<b>15° Double Ear (D)</b>				
<b>15° Triple Ear (T)</b>				
<b>15° Triple Ear Old Style (G)</b>				
<b>0° Single Ear (C)</b>				
<b>0° Double Ear (D)</b>				

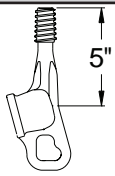
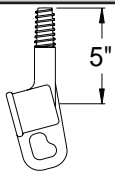
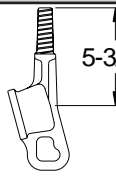
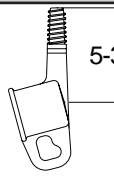
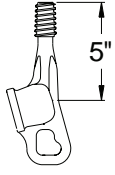
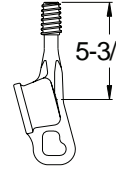
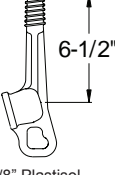
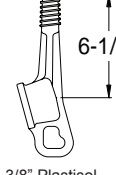
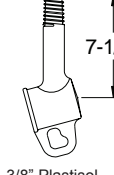
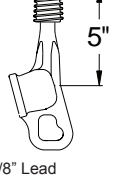
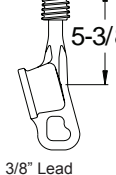
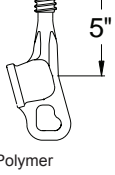
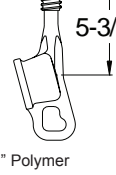
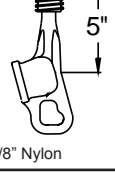
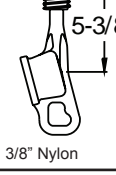
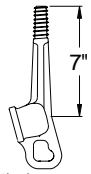
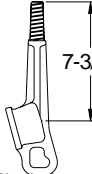


# Fiberglass Bracket End Fitting Index

Cutout/Arrester				
Rod Diameter	1.5" (M)		2.0" (H)	
Material	Iron (D)	Aluminum (A)	Iron (D)	Aluminum (A)
<b>15° Tangent Messenger (B)</b>				
<b>15° SCADA (K)</b>				
Other				
Rod Diameter	1.5" (M)		2.0" (H)	
Material	Iron (D)	Aluminum (A)	Iron (D)	Aluminum (A)
<b>Suspension Eye (E)</b>				
<b>Fiber Optics (F)</b>				
<b>Horizontal Post Insulator (H)</b>				
<b>Post Insulator with Integral Stud (P)</b>				
<b>15° Universal (U)</b>				

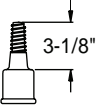
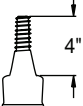
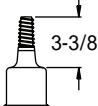
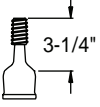
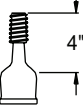
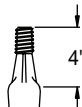
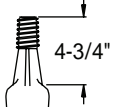
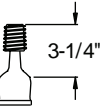
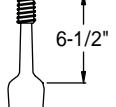
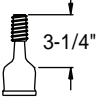
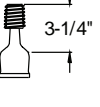
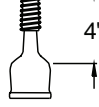
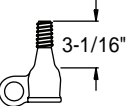
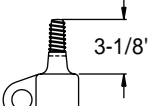


# Fiberglass Bracket End Fitting Index

Vertical Pin				
Rod Diameter	1.5" (M)		2.0" (H)	
Material	Iron (D)	Aluminum (A)	Iron (D)	Aluminum (A)
<b>15" Vertical Pin (V)</b>				
1	 Thread: 1" Plastisol	 Thread: 1" Plastisol	 Thread: 1" Plastisol	 Thread: 1" Plastisol
2	 Thread: 1" Lead		 Thread: 1" Lead	
3	 Thread: 1 3/8" Plastisol		 Thread: 1 3/8" Plastisol	 Thread: 1 3/8" Plastisol
4	 Thread: 1 3/8" Lead		 Thread: 1 3/8" Lead	
5	 Thread: 1" Polymer		 Thread: 1" Polymer	
6	 Thread: 1 3/8" Nylon		 Thread: 1 3/8" Nylon	
<b>15" Vertical Pin with Long Shank (L)</b>				
1	 Thread: 1" Plastisol		 Thread: 1" Plastisol	



# Fiberglass Bracket End Fitting Index

Straight Pin				
Rod Diameter	1.5" (M)		2.0" (H)	
Material	Iron (D)	Aluminum (A)	Iron (D)	Aluminum (A)
Straight Pin (S)				
1		 Thread: 1" Plastisol	 Thread: 1" Plastisol	 Thread: 1" Plastisol
2	 Thread: 1" Lead		 Thread: 1" Lead	
3		 Thread: 1 3/8" Plastisol	 Thread: 1 3/8" Plastisol	
4	 Thread: 1 3/8" Lead		 Thread: 1 3/8" Lead	
5	 Thread: 1" Polymer			
6	 Thread: 1 3/8" Nylon		 Thread: 1 3/8" Nylon	
Straight Pin with Side Eye (M)				
1		 Thread: 1" Plastisol		 Thread: 1" Plastisol



# Fiberglass Bracket Options Index

Transmission				
Rod Diameter		2.5" (X)		
Suspension Eye (E)		Horizontal Post Insulator (H)	15° Universal (U)	
<p>Material: Iron (D)</p>		<p>Material: Steel (S)</p>	<p>Material: Aluminum (A)</p>	
Adapter Fittings (A#)				
Rod Diameter		1.5" (M)	2.0" (H)	
Material	Iron (D)	Aluminum (A)	Iron (D)	Aluminum (A)
Suspension Eye Collar - Parallel Eye				
1				
Suspension Eye Collar - Perpendicular Eye				
2				
0° Cutout/Arrester Collar				
3				
15° Cutout/Arrester Collar				
4				
Alley Arm 15° Mid-Phase Vertical Pin				
Note: Material will be equivalent to end fitting material				
Consult factory for catalog number				



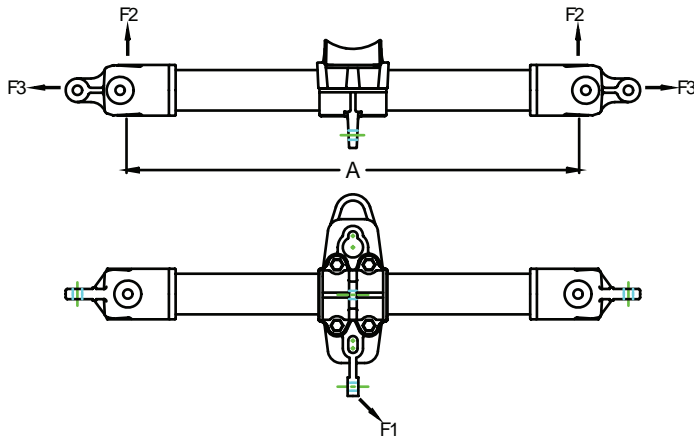
# Fiberglass Bracket Options Index

		Options	
Option #	Insulator Pin (P#)	Option #	Hardware
P1	<p>1" LEAD THREADS</p> <p>6"</p> <p>1-3/4"</p> <p>3/4"</p> <p>Material: Steel</p>	B Standard	<p>1/2" x 2" CARRIAGE BOLT</p> <p>1/2" HEX NUT</p> <p>1/2" LOCK WASHER</p> <p>Material: Steel</p>
P2	<p>1-3/8" LEAD THREADS</p> <p>8"</p> <p>1-3/4"</p> <p>3/4"</p> <p>Material: Steel</p>	F Standard + Flat Washer	<p>1/2" x 2" CARRIAGE BOLT</p> <p>1/2" HEX NUT</p> <p>1/2" LOCK WASHER</p> <p>1/2" FLAT WASHER</p> <p>Material: Steel</p>
		W Standard + Star Washer	<p>1/2" x 2" CARRIAGE BOLT</p> <p>1/2" HEX NUT</p> <p>1/2" LOCK WASHER</p> <p>1/2" STAR WASHER</p> <p>Material: Steel</p>
Option #	Strap		
S	<p>9/16" SQ. HOLES (2 PLACES)</p> <p>10-1/2"</p> <p>12"</p> <p>Material: Steel</p>		





# Round Deadend Crossarms



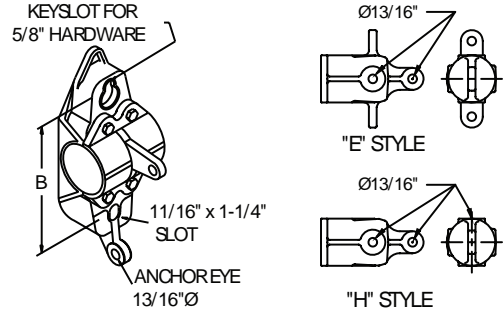
## Round Deadend Crossarm

### Features

- Accepts 5/8" mounting hardware
- Recessed cavity in base to allow double nutting for back to back mounting
- Keyhole for installation ease on top bolt

### Material

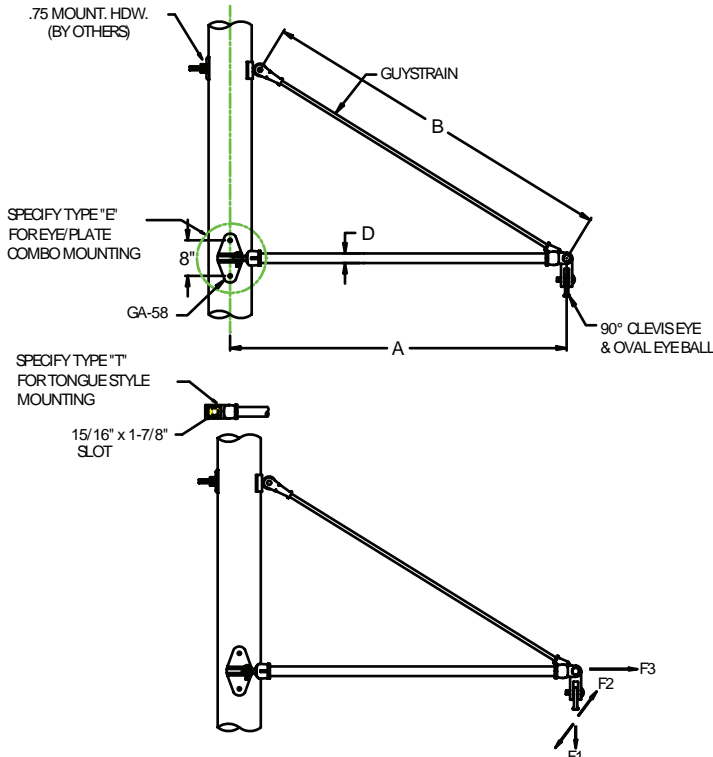
Base: Ductile iron, hot dip galvanized ASTM A-153  
 End Fitting: Aluminum A356-T6  
 Rod: Fiberglass, gray ultraviolet (UV) protective coating



Catalog Number	Dimensions (In)		Min. Ultimate Load (lbs)			Bolt Spacing B	Rod or Tube	Weight Ea (Lbs)
	A	D	F2 Long	F3 Trans	F1 Anchoring Eye			
GDAS36H	36	3.0	12000	10000	25000	8	Rod	34.1
GDAS42H	42	3.0	10000	10000	25000	8	Rod	37.3
GDAS48H	48	3.0	9500	10000	25000	8	Rod	40.4
GDAS54H	54	3.0	9000	10000	25000	8	Rod	43.6
GDAS60H	60	3.0	8500	10000	25000	8	Rod	46.7

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) For end fitting with side eyes, replace suffix "H" with "E"
- 3) Add "SC" for silicone coated rod (harsh environments)
- 4) For other options, thread sizes and optional bases and end fitting, reference Fiberglass Catalog Numbering System Matrix



## Transmission Crossarm Assembly

### Features

- Accepts 3/4" mounting hardware

### Material

Base: Ductile iron hot dip galvanized ASTM A-153  
 End Fitting: Ductile iron, hot dip galvanized  
 Rod: Fiberglass, gray ultraviolet (UV) protective coating

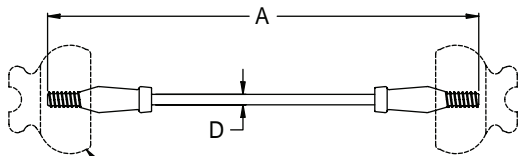
Catalog Number	Dimensions (In)			Min. Ultimate Load (lbs)			Weight Ea (Lbs)
	A	B	D	F2 Vert	F2 Long	F3 Trans	
GTA36MT	36	35	1.5	-	-	-	21.0
GTA48MT	48	49	1.5	5000	1700	10000	24.5
GTA72HE	72	76 3/4	2.0	5000	1200	10000	54.3
GTA84HE	84	90 5/8	2.0	7500	1000	10000	60.1
GTA96HE	96	103	2.0	5000	900	10000	66.5
GTA120HE	120	131	2.0	5000	800	10000	78.1
GTA72XE	72	76 3/4	2.5	5000	600	10000	72.2
GTA84XE	84	90 5/8	2.5	8000	900	10000	80.4
GTA96XE	96	103	2.5	7500	800	10000	91.3
GTA120XE	120	131	2.5	7500	700	10000	106.9

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes and optional bases and end fitting, reference Fiberglass Catalog Numbering System Matrix



# Spacers, Sectionalizers, and Crossarm Braces



GCS8  
INSULATORS NOT INCLUDED

## Spacers

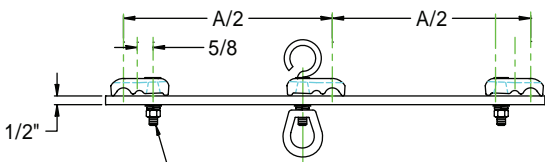
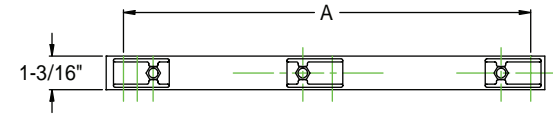
### Material

End Fitting: Aluminum A356-T6 with PVC coating  
Rod: Fiberglass gray ultraviolet (UV) protective coating

Catalog Number	Dimensions (In)		Weight (Lbs)
	A	D	
GCS8-13	13	3/4	1.1
GCS8-24	24	3/4	1.4
GCS8-36	36	3/4	1.6
GCS8-48	48	3/4	1.8
GSS-13	13		3.1
GSS-24	24		3.6
GSS-36	36		4.1
GSS-48	48		4.6

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments) - GCS8 type only



GSS  
5/16" BOLTS WITH FLAT & LOCKWASHER FURNISHED

## Sectionalizers

### Features

- Used to split a secondary conductor
- Swing-away keeper for easy installation
- All captive parts

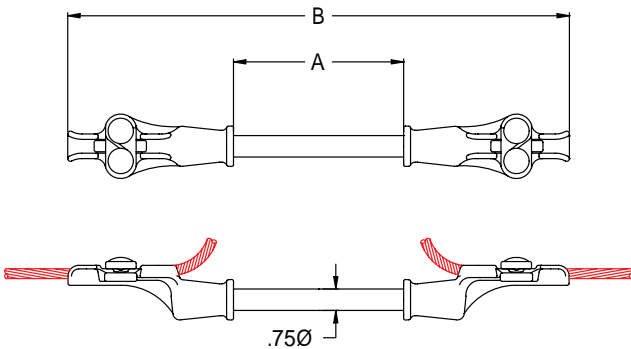
### Material

End Fitting: Ductile iron hot dip galvanized ASTM A-153  
Hardware: Steel hot dip galvanized ASTM A-153  
Rod: Fiberglass gray ultraviolet (UV) protective coating

Catalog Number	Dimensions (In)		Cable Range	Min Ultimate Load (Lbs)	Weight (Lbs)
	A	B			
GSP-51-6F	6	16.5	.14 - .502	6000	3.5

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory
- 2) Add "SC" for silicone coated rod (harsh environments)
- 3) For other options, thread sizes, and optional base and end fittings, reference Fiberglass Catalog Numbering System Matrix



## Crossarm Braces

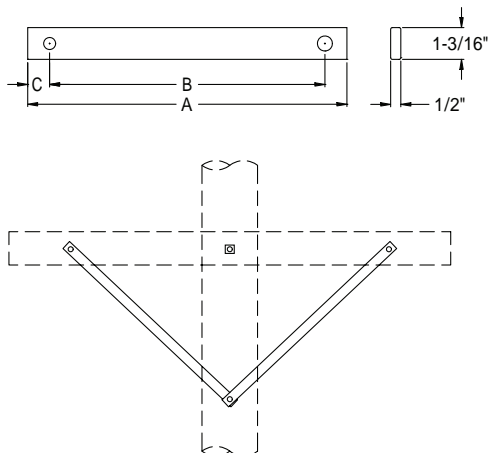
### Material

Rod: Fiberglass gray ultraviolet (UV) protective coating

Catalog Number	Dimensions (In)			Weight (Lbs)
	A	B	C	
CRB28	28	26	1.0	1.1
CRB29	29	28	1.5	1.2

### Notes:

- 1) Lengths shown are considered standard; for other lengths, consult factory





# Rectangular Deadend Crossarms

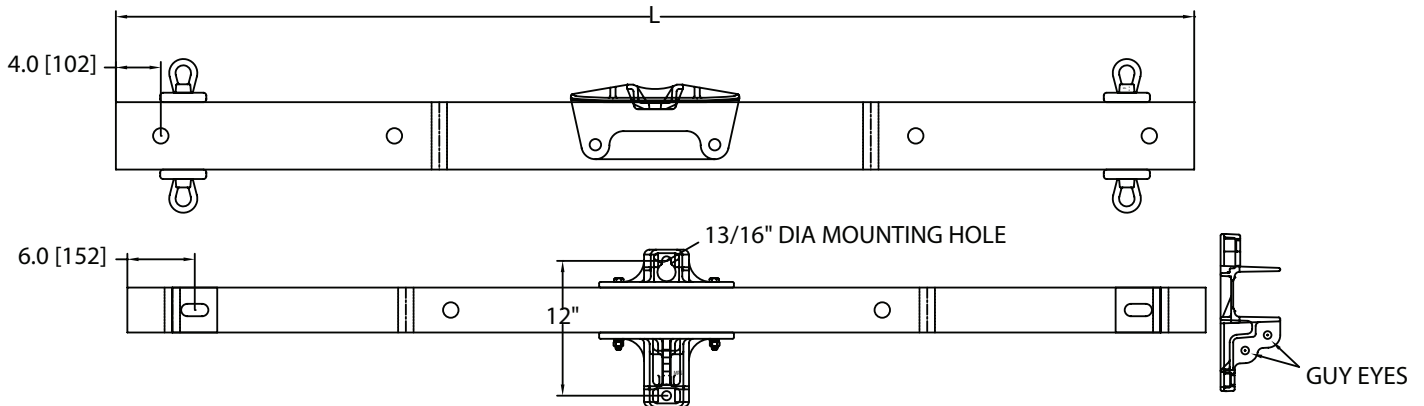


### Features

- RUS Accepted
- Pultruded fiberglass tube with integral UV stabilization
- External and internal UV protective veil
- High density, closed cell, expandable foam filled
- Keyhole for top bolt of mounting base for easy installation
- 12" Pole Mount Spacing
- Accepts 3/4" pole mounting hardware
- Recessed cavity in base to allow double nutting for back to back mounting
- Dual guy attachment
- High strength "Pentech" style washers

### Material

- Cast Iron Base: Ductile iron, hot dip galvanized ASTM A-153, 36k (13/16" guy holes)
- Cast Aluminum Base: Aluminum A356, marine grade, corrosion resistant, 21k (11/16" guy holes)
- Hardware: Ductile iron, hot dip galvanized ASTM A-153
- Tube: Fiberglass gray ultraviolet (UV) protective veil coating (foam filled)



Standard Duty Series						
Catalog Number	Length (ft)	Deflections per 1000 lbs (in)	Ultimate Load per side(lbs)	Tube Size (in)	End Cap Color	Weight (lbs)
PW05LD040-2E	5	<0.40	9750	3 5/8 x 4 5/8	gray	34
PW08LD003-2E	8	0.40	9750	3 5/8 x 4 5/8	gray	46
PW10LD005-2E	10	0.89	7500	3 5/8 x 4 5/8	gray	55
<b>Notes:</b> Standard Duty series available with aluminum base only						
Heavy Duty Series						
Catalog Number	Length (ft)	Deflections per 1000 lbs (in)	Ultimate Load per side(lbs)	Tube Size (in)	End Cap Color	Weight (lbs)
PY05SD040-2E-SM	5	<0.208	12500	4 x 6	Gray	59
PY08SD003-2E-SM	8	0.208	12500	4 x 6	Gray	72
PY10SD005-2E-SM	10	0.300	11000	4 x 6	Gray	81
PY12SD349-2E-SM	12	0.650	9000	4 x 6	Gray	90
Light Duty Series						
Catalog Number	Length (ft)	Deflections per 1000 lbs (in)	Ultimate Load per side(lbs)	Tube Size (in)	End Cap Color	Weight (lbs)
PZ05LD040-2E-SM	5	<0.506	7500	4 x 6	Black	54
PZ08LD003-2E-SM	8	0.506	7500	4 x 6	Black	66
PZ10LD005-2E-SM	10	0.667	6000	4 x 6	Black	72



# Rectangular Tangent Crossarms



### Features

- RUS Accepted
- Pultruded fiberglass tube with integral UV stabilization
- External and internal UV protective veil
- High density, closed cell, expandable foam filled
- Standard Tangent Centermount
  - 8, 10, 12" Pole Mounting Spacing
  - 5/8" pole mounting hardware
- Heavy Tangent Centermount
  - 3/4" pole mounting hardware
  - 10 - 12" pole mounting spacing
- Bandable
- Keyhole for top bolt of mounting base for easy installation

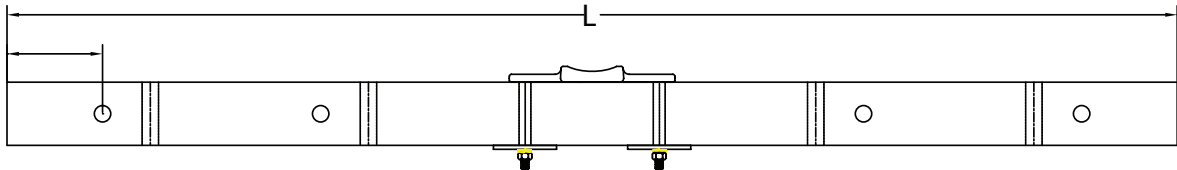
### Material

Base: Cast aluminum - A356 marine grade, corrosion resistant

Hardware: Ductile iron hot dip galvanized - ASTM A-153

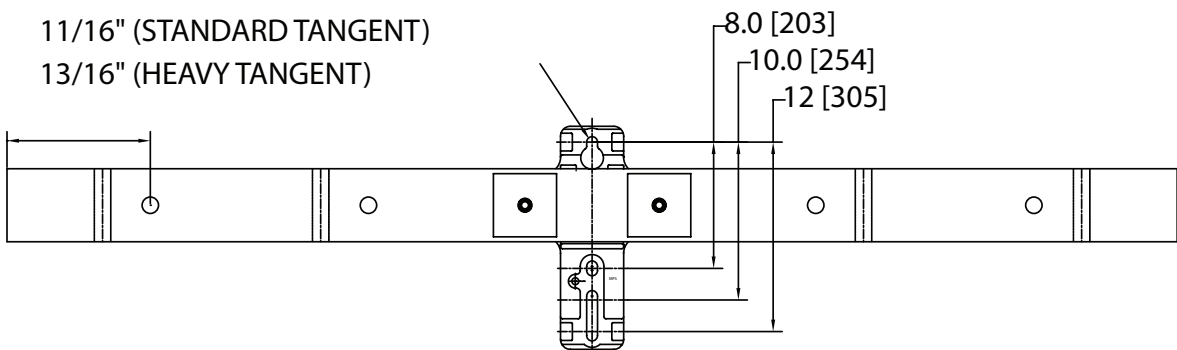
Tube: Fiberglass gray ultraviolet (UV) protective veil coating (foam filled)

4.0 [102]



11/16" (STANDARD TANGENT)  
13/16" (HEAVY TANGENT)

6.0 [152]



Standard Tangent Crossarms-Braceless						
Catalog Number	Length (Ft)	Deflections per 1000 lbs (in)	Ultimate Load per side(lbs)	Tube Size (in)	End Cap Color	Weight (Lbs)
PX08ST003	8	1.520	2500	3 5/8 x 4 5/8	black	40
PX08ST004	8	1.520	2500	3 5/8 x 4 5/8	black	40
PX10ST005	10	2.200	2000	3 5/8 x 4 5/8	black	47
Standard Tangent Crossarms-Braced						
PX08REA003	8	1.520	2000	3 5/8 x 4 5/8	black	32
PX10REA005	10	2.200	1500	3 5/8 x 4 5/8	black	40
Heavy Tangent Crossarms-Braceless						
PW08ST003	8	0.608	6000	3 5/8 x 4 5/8	gray	45
PW08ST004	8	0.608	6000	3 5/8 x 4 5/8	gray	45
PW10ST005	10	1.140	5000	3 5/8 x 4 5/8	gray	56
PW12ST349	12	1.750	4500	3 5/8 x 4 5/8	gray	66
Heavy Tangent Crossarms-Braced						
PW08REA003	8	0.750	4000	3 5/8 x 4 5/8	gray	34
PW08REA004	8	0.750	4000	3 5/8 x 4 5/8	gray	34
PW10REA005	10	1.200	4000	3 5/8 x 4 5/8	gray	45



# Fiberglass Crossarm Catalog Numbering System

**P** **Y** **08** **SD** **003** - **2E** - **SM**

Tube Size	
<b>X</b>	= 3.625" x 4.625" Standard Tangent
<b>W</b>	= 3.625" x 4.625" Heavy Tangent
<b>Z</b>	= 4" x 6" Light Deadend
<b>Y</b>	= 4" x 6" Heavy Deadend

Crossarm Length	
<b>08</b>	= 8 Feet
<b>10</b>	= 10 Feet
<b>12</b>	= 12 Feet
<b>xx</b>	= Custom Length

Options	
<b>—</b>	= Single sided eyenuts
<b>2E</b>	= Double sided eyenuts at 2 locations (deadends only)
<b>4E</b>	= Double sided eyenuts at 4 locations (deadends only)
<b>CH</b>	= Double sided eyenuts at 2 locations and center phase attachment (deadends only)

Deadend	
<b>SM</b>	= Included only on deadend applications except for "CH" design

Pole Mounting Options	
<b>SD</b>	= Heavy deadend centermount (standard)
<b>LD</b>	= Light deadend centermount (standard)
<b>ST</b>	= Tangent centermount (optional)
<b>REA</b>	= Tangent arm, no centermount, REA spec drilling
<b>UT</b>	= Tangent arm, no centermount, non-REA spec drilling

Drill Pattern	
<b>003</b>	= REA type 03 drilling (8')
<b>004</b>	= REA type 04 drilling (8')
<b>005</b>	= REA type 05 drilling (10')
<b>xxx</b>	= Customer defined drilled (3 digit number assigned)



# Index

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CAB0-12-3.0	Accessories	FG-30	G1HDA124AD	Single Phase Double Position	FG-9
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# Grounding & Tools Catalog



## Grounding Products

MacLean Power Systems grounding products have been manufactured for over 25 years for the power utility industry. Our products have been developed by working in conjunction with several utilities to provide temporary grounding that meets application and safety requirements. MPS products are recognized for their quality and reliability with the safety of workers as a first priority. MPS products can be used for temporary grounding applications in generating substations, transmission/distribution substations and lines, and also underground applications.

MacLean Power Systems grounding products are manufactured and independently tested to the latest ASTM F855 and IEC 61230 standards including the newly adopted high asymmetrical test requirement per Grade 5H of the latest ASTM F855 standard. Grounding assemblies are provided with a certificate of registration.

MacLean Power Systems grounding assemblies have sealing tape and heat shrink over ferrules and cable ends to inhibit moisture penetration and extend the life of the assembly. MPS grounding ball studs, grounding studs and ferrules are machined from pure copper to give maximum strength and conductivity. Test reports are available upon request.

## Tools and Accessories

MacLean Power Systems tools and accessories are manufactured in an ISO 9001 certified facility. MPS tools and accessories are molded in special urethane that has a UV inhibitor to resist fading and deterioration. They are also reinforced with fiberglass to give extra strength when necessary.

MacLean Power Systems's qualification testing for Personal Protective Ground sets.

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# MacLean Power Systems

Please note that because MacLean Power Systems follows a policy of continuous product improvement, we reserve the right to change specifications and drawings at any time without notice.







# Single Phase Assemblies

**BD** - **B2** - **2/0** - **Y** - **10**

Cable End 1	
<b>B</b>	= Universal Grounding Clamp 01-M-037
<b>B2</b>	= Two grounding ball studs 25 mm installed on clamp
<b>BD</b>	= One grounding ball stud 25 mm installed on right hand side of clamp (jaw facing user)
<b>BG</b>	= One grounding ball stud 25 mm installed on left hand side of clamp (jaw facing user)
<b>H</b>	= Universal Grounding Clamp 01-M-034
<b>H2</b>	= Two grounding ball studs 20 mm installed on clamp
<b>HD</b>	= One grounding ball stud 20 mm installed on right hand side of clamp (jaw facing user)
<b>HG</b>	= One grounding ball stud 20 mm installed on left hand side of clamp (jaw facing user)
<b>D</b>	= Duck Bill Clamp HCDB-117
<b>DP</b>	= With parking stud installed
<b>DS</b>	= Duck Bill Clamp with Serrated Jaws HCDB-117S
<b>DSP</b>	= With parking stud installed
<b>P</b>	= Ball Stud Grounding Clamp HC-10015
<b>Q</b>	= Ball Stud Grounding Clamp HC10015-A
<b>C</b>	= C Clamp 01-M-044
<b>CH</b>	= C Clamp 01-M-044H for 350 MCM Ferrule
<b>U</b>	= Universal Grounding Clamp HC-10041
<b>M</b>	= Cable with ferrule
<b>E</b>	= Exception
<b>Z 15</b>	= 15kV Elbow
<b>Z 25</b>	= 25kV Elbow
<b>Z 35</b>	= 35kV Elbow

Cable End 2	
<b>B</b>	= Universal Grounding Clamp 01-M-037
<b>B2</b>	= Two grounding ball studs 25 mm installed on clamp
<b>BD</b>	= One grounding ball stud 25 mm installed on right hand side of clamp (jaw facing user)
<b>BG</b>	= One grounding ball stud 25 mm installed on left hand side of clamp (jaw facing user)
<b>H</b>	= Universal Grounding Clamp 01-M-034
<b>H2</b>	= Two grounding ball studs 20 mm installed on clamp
<b>HD</b>	= One grounding ball stud 20 mm installed on right hand side of clamp (jaw facing user)
<b>HG</b>	= One grounding ball stud 20 mm installed on left hand side of clamp (jaw facing user)
<b>D</b>	= Duck Bill Clamp HCDB-117
<b>DP</b>	= With parking stud installed
<b>DS</b>	= Duck Bill Clamp with Serrated Jaws HCDB-117S
<b>DSP</b>	= With parking stud installed
<b>P</b>	= Ball Stud Grounding Clamp HC-10015
<b>Q</b>	= Ball Stud Grounding Clamp HC10015-A
<b>C</b>	= C Clamp 01-M-044
<b>CH</b>	= C Clamp 01-M-044H for 350 MCM Ferrule
<b>U</b>	= Universal Grounding Clamp HC-10041
<b>M</b>	= Cable with ferrule
<b>E</b>	= Exception
<b>T</b>	= T-Handle HC-10026

Cable Length
Cable length in feet

Jacket Type	
<b>B</b>	= Carolprene - black
<b>C</b>	= Carol (Class M) - orange
<b>E</b>	= Excelene (Class K) - red
<b>S</b>	= Silicone - transparent
<b>Y</b>	= Grounding Cable - yellow

Cable Size	
<b>2</b>	= 2 AWG
<b>1/0</b>	= 1/0 AWG
<b>2/0</b>	= 2/0 AWG
<b>4/0</b>	= 4/0 AWG
<b>350</b>	= 350 MCM
<b>500</b>	= 500 MCM



Single Phase Assembly



Carrying Bag 01-C-025-25



Cascade Assembly



Cluster Assembly





# Three Phase Cluster Assemblies

**BD** - **B2** - **2/0** - **Y** - **10** - **Y** - **10**

Cable End 1	
<b>B</b>	= Universal Grounding Clamp 01-M-037
<b>B2</b>	= Two grounding ball studs 25 mm installed on clamp
<b>BD</b>	= One grounding ball stud 25 mm installed on right hand side of clamp (jaw facing user)
<b>BG</b>	= One grounding ball stud 25 mm installed on left hand side of clamp (jaw facing user)
<b>H</b>	= Universal Grounding Clamp 01-M-034
<b>H2</b>	= Two grounding ball studs 20 mm installed on clamp
<b>HD</b>	= One grounding ball stud 20 mm installed on right hand side of clamp (jaw facing user)
<b>HG</b>	= One grounding ball stud 20 mm installed on left hand side of clamp (jaw facing user)
<b>D</b>	= Duck Bill Clamp HCDB-117
<b>DP</b>	= With parking stud installed
<b>DS</b>	= Duck Bill Clamp with Serrated Jaws HCDB-117S
<b>DSP</b>	= With parking stud installed
<b>P</b>	= Ball Stud Grounding Clamp HC-10015
<b>Q</b>	= Ball Stud Grounding Clamp HC10015-A
<b>C</b>	= C Clamp 01-M-044
<b>U</b>	= Universal Grounding Clamp HC-10041
<b>M</b>	= Cable with ferrule
<b>E</b>	= Exception
<b>Z 15</b>	= 15kV Elbow
<b>Z 25</b>	= 25kV Elbow
<b>Z 35</b>	= 35kV Elbow

Cable End 2	
<b>B</b>	= Universal Grounding Clamp 01-M-037
<b>B2</b>	= Two grounding ball studs 25 mm installed on clamp
<b>BD</b>	= One grounding ball stud 25 mm installed on right hand side of clamp (jaw facing user)
<b>BG</b>	= One grounding ball stud 25 mm installed on left hand side of clamp (jaw facing user)
<b>H</b>	= Universal Grounding Clamp 01-M-034
<b>H2</b>	= Two grounding ball studs 20 mm installed on clamp
<b>HD</b>	= One grounding ball stud 20 mm installed on right hand side of clamp (jaw facing user)
<b>HG</b>	= One grounding ball stud 20 mm installed on left hand side of clamp (jaw facing user)
<b>D</b>	= Duck Bill Clamp HCDB-117
<b>DP</b>	= With parking stud installed
<b>DS</b>	= Duck Bill Clamp with Serrated Jaws HCDB-117S
<b>DSP</b>	= With parking stud installed
<b>P</b>	= Ball Stud Grounding Clamp HC-10015
<b>Q</b>	= Ball Stud Grounding Clamp HC10015-A
<b>C</b>	= C Clamp 01-M-044
<b>U</b>	= Universal Grounding Clamp HC-10041
<b>M</b>	= Cable with ferrule
<b>E</b>	= Exception
<b>Z 15</b>	= 15kV Elbow
<b>Z 25</b>	= 25kV Elbow
<b>Z 35</b>	= 35kV Elbow
<b>T</b>	= T-Handle HC-10026

Jacket Type	
<b>B</b>	= Carolprene - black
<b>C</b>	= Carol (Class M) - orange
<b>E</b>	= Excelene (Class K) - red
<b>S</b>	= Silicone - transparent
<b>Y</b>	= Grounding Cable - yellow

Cable Size	
<b>2</b>	= 2 AWG
<b>1/0</b>	= 1/0 AWG
<b>2/0</b>	= 2/0 AWG
<b>4/0</b>	= 4/0 AWG

**Cable Length (L2)**  
Cable length in feet

**Letter "Y"**  
Y = Three Phase Assembly

**Cable Length (L1)**  
Cable length in feet



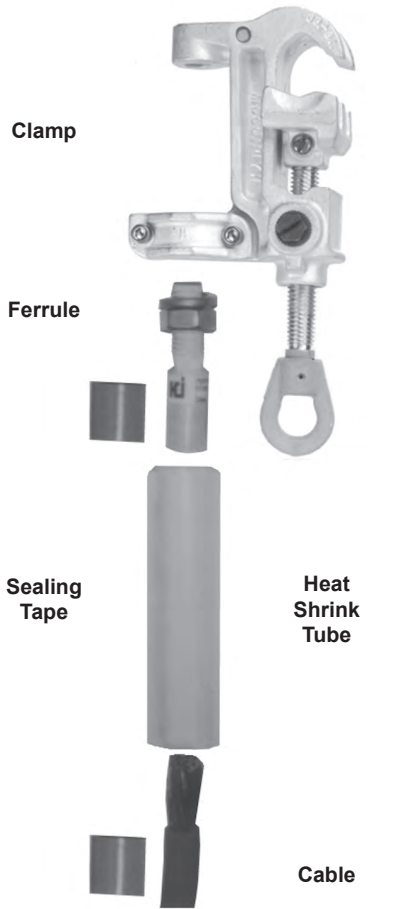
Three Phase Cluster Assembly



Carrying Bag 01-C-025-25



# Grounding Assemblies



## Grounding Assemblies

### Features

- All grounding components can be sold separately
- For other components, see following pages

Sealing Tape		
Catalog Number	Required Per End	Length (In)
HC-10068-C	1	6
HC-10068		25 ft roll

## Clear Polymer Heat Shrink Tube

Catalog Number	Required Per End	Length (In)	I.D. (In)	For Cable Size
HC-10067-1.1	1	5.0	1.1	#2 - 2/0
HC-10067-1.1-7	1	7.0	1.1	#2 - 2/0
HC-10067-1.5	1	6.0	1.5	4/0
HC-10067-1.5L	1	9.6	1.5	4/0
HC-10067-2.0	1	9.6	1.5	350 - 500 MCM

## Cable Termination Kits (per each extremity)

Each kit includes (1) ferrule, heat shrink tube, and sealing tape

Catalog Number	For Cable Size
KIT 01-M-038-35-2	#2
KIT 01-M-038-50-1/0	1/0
KIT 01-M-038-2/0	2/0
KIT 01-M-038-4/0	4/0
KIT 01-M-038-350	350 MCM
KIT 01-M-038-500	500 MCM

## Ferrules

### Features

- All ferrules are filled with inhibitive grease to prevent humidity infiltration
- Compression ferrules for 5/8 - 11 UNC threaded type terminal
- Stainless steel hardware (nut and lock washer) and grease cap included

### Material

99.9% electrolytic tin-plated copper



Catalog Number	Cable Caliber	Compression Die		Dimensions		Capacity 15 Cycles	Capacity 30 Cycles	Weight
		Husky	Burndy	A	L			
01-M-038-35-2	2 AWG	HT41CE	U-164*	0.625	3	12kA (IEC) 14.5kA (ASTM)	10kA (ASTM)	0.26
01-M-038-35-50-1/0	1/0 AWG	HT41CF	U-166	0.690	3	20kA (IEC) 21kA (ASTM)	15kA (ASTM)	0.23
01-M-038-2/0	2/0 AWG	HT41CF	U-166	0.750	3	22kA (IEC) 27kA (ASTM)	20kA (ASTM)	0.29
01-M-038-4/0	4/0 AWG	HT41CJ	U-168	0.940	3	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	0.37
01-M-038-350	350 MCM	HT41BL	U34-RT	1.062	7	40kA (IEC) 75kA (ASTM)	53kA (ASTM)	1.05
01-M-038-500	500 MCM	HT41BP	U39-RT	1.300	7	55kA (IEC) 86.3kA (ASTM)	61kA (ASTM)	1.40

### Notes:

\* - For 2 AWG transparent silicone jacket cable and 2 AWG yellow jacket cable, use Die U-165



# Grounding Cable



Jacket                      Separator                      Strands

## Opaque Class "K" Yellow Jacket Cable

Catalog Number	Color	Caliber AWG	Conductor Diameter	Number of Strands	Cable Diameter	Capacity 15 Cycles	Capacity 30 Cycles	Temperature (F)	Separator	Weight (Lbs/1000')
2C65STRBCGRD	Yellow	2	.32	661/30	.49	12kA (IEC) 14.5kA (ASTM)	10kA (ASTM)	-58 - 221	Paper	294
1/01050STRBCGRD	Yellow	1/0	.42	1050/30	.59	20kA (IEC) 21kA (ASTM)	15kA (ASTM)	-58 - 221	Paper	455
2/01323STRBCGRD	Yellow	2/0	.47	1323/30	.63	22kA (IEC) 27kA (ASTM)	20kA (ASTM)	-58 - 221	Paper	539
4/02107STRBCGRD	Yellow	4/0	.59	2107/30	.80	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	-58 - 221	Paper	857

## Transparent Silicone Jacket Cable

Catalog Number	Color	Caliber AWG	Conductor Diameter	Number of Strands	Cable Diameter	Capacity 15 Cycles	Capacity 30 Cycles	Temperature (F)	Separator	Weight (Lbs/1000')
090606	Clear	2	.33	665/30	.53	12kA (IEC) 14.5 (ASTM)	10kA (ASTM)	-67 - 302	None	296
025230	Clear	1/0	.44	1050/30	.65	20kA (IEC) 21kA (ASTM)	15kA (ASTM)	-67 - 302	None	455
SF-70MM2	Clear	2/0	.50	1323/30	.70	22kA (IEC) 27kA (ASTM)	20kA (ASTM)	-67 - 302	None	565
2109-30-4/0	Clear	4/0	.64	2107/30	.84	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	-67 - 302	None	871

## Opaque Class "K" Red Jacket Cable, Excelene

Catalog Number	Color	Caliber AWG	Conductor Diameter	Number of Strands	Cable Diameter	Capacity 15 Cycles	Capacity 30 Cycles	Temperature (F)	Separator	Weight (Lbs/1000')
2604	Red	2	.32	651/30	.49	12kA (IEC) 14.5 (ASTM)	10kA (ASTM)	-58 - 221	Paper	294
2609	Red	1/0	.42	1050/30	.59	20kA (IEC) 21kA (ASTM)	15kA (ASTM)	-58 - 221	Paper	455
2602	Red	2/0	.47	1323/30	.63	22kA (IEC) 27kA (ASTM)	20kA (ASTM)	-58 - 221	Paper	539
2600	Red	4/0	.59	2107/30	.80	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	-58 - 221	Paper	857

## Opaque Class "M" Jacket Cable, Carol

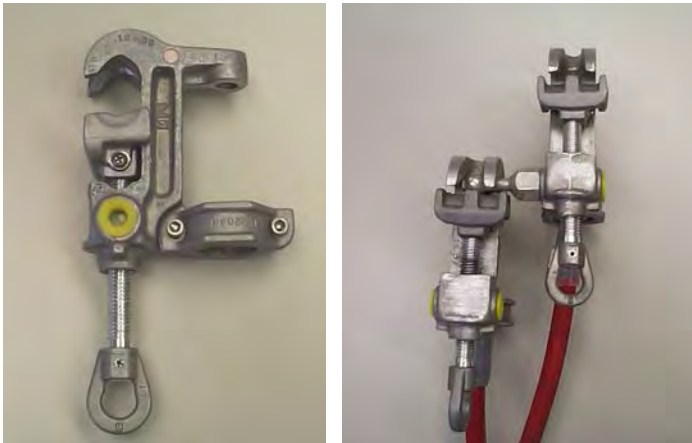
Catalog Number	Color	Caliber AWG	Conductor Diameter	Number of Strands	Cable Diameter	Capacity 15 Cycles	Capacity 30 Cycles	Temperature (F)	Separator	Weight (Lbs/1000')
2605	Orange	2	.32	1650/34	.49	12kA (IEC) 14.5 (ASTM)	10kA (ASTM)	-58 - 194	Paper	302
2603	Orange	2/0	.47	3300/34	.65	22kA (IEC) 27kA (ASTM)	20kA (ASTM)	-58 - 194	Paper	549
2601	Orange	4/0	.59	5225/34	.83	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	-58 - 194	Paper	871

## Carolprewe Silicone Jacket Cable

Catalog Number	Color	Caliber AWG	Conductor Diameter	Number of Strands	Cable Diameter	Capacity 15 Cycles	Capacity 30 Cycles	Temperature (F)	Separator	Weight (Lbs/1000')
2607	Black	350 MCM	.77	3432/30	1.06	40kA (IEC) 75kA (ASTM)	53kA (ASTM)	-58 - 194	Paper	1369
2611	Black	500 MCM	.95	5054/30	1.25	55kA (IEC) 86.3 (ASTM)	61kA (ASTM)	-58 - 194	Paper	1949



# Grounding Clamps



## C-Clamp, Distribution

### Features

- Can be installed on all electrical facilities, apparatus, tubes, and conductors as well as various equipment (trucks, pulling equipment, etc.)
- This universal clamp can also be used on a jumper cable
- Installation on conductor, round bus bar and grounding ball stud of 25 mm
- Thermal shock indicator changes color when the clamp reaches a temperature of 200° F (93° C)
- Stress relief to reduce cable damage and serve as a shock damper if fault occurs, which protects cable strands
- Locations on each side of clamp for 25 mm grounding ball studs installation, which serve as support studs for either a grounding cluster or cascade assembly
- Fitted to receive a 5/8-11 UNC threaded stud ferrule
- Lubrication chamber for upkeep of threads
- Installation eye for installing clamp with shotgun stick
- Double internal threads for fast removal

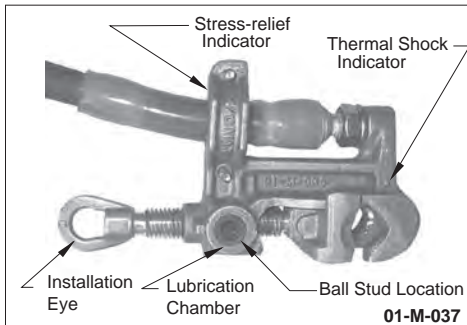
### Material

Clamp and Keeper: Aluminum  
 Eye Screw: Bronze or Aluminum

### T-Handle Option

Used to attach grounding clamp by hand. Fits all MPS grounding clamps and most industry grounding clamps

**Material**  
 Aluminum



Catalog Number	Ground Stud	Jumper Cable		Main Conductor		Jaw Opening	Capacity 15 Cycles	Capacity 30 Cycles	Continuous Current Rating	Weight Ea (lbs)
		Min	Max	Min	Max					
01-M-034	20 mm	2 AWG	4/0 AWG	#8 (.13)	556 (.86)	1 3/8	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	400A	1.3
01-M-037*	25 mm	2 AWG	4/0 AWG	#8 (.13)	795 (1.13)	1 3/8	46kA (IEC) 55kA (ASTM)	39kA (ASTM)	400A	1.4

### Notes:

- 1) For "T" Handle screw, add suffix "-T" to catalog number
- 2) HC-30033 ball stud can be used as a Grounding Stud with 01-M-037
- 3) \* = Tested at 46kA with an asymmetry factor of 2.5 (115kA Peak)



## Duck Bill Clamp, Distribution

### Features

- Thermal shock indicator changes color when the clamp reaches a temperature of 200° F (93° C)
- Stress relief to reduce cable damage and serve as a shock damper if fault occurs, which protects cable strands
- 3/4 - 10 UNC double lead threads for strength and fast installation
- Lubrication chamber for upkeep of threads

### Materials

Body and Eye Screw: Aluminum

Catalog Number	Dimensions	Jumper Cable		Main Conductor		Capacity 15 Cycles	Capacity 30 Cycles	Weight Ea (lbs)
		Min	Max	Min	Max			
HCDB-117	6.875 x 5.5 x 2.875	#2	4/0	6 AWG (.16)	900 MCM (1.162)	35kA (IEC) 50kA (ASTM)	35kA (ASTM)	1.2

### Notes:

- 1) IEC rating is Phase-Phase on 900 MCM conductor, ASTM rating is Phase-Ground on 900 MCM Conductor
- 2) Product shown is HCDB-117P, which includes a parking stud attached to HCDB-117
- 3) For serrated jaws - HCDB-117S



# Grounding Clamps



## Ball Stud Clamp, Distribution

### Features

- Installation on 20 mm or 25 mm grounding ball stud
- Thermal shock indicator changes color when the clamp reaches a temperature of 200° F (93° C)
- Fitted to receive a 5/8-11 UNC threaded stud ferrule
- Lubrication chamber for upkeep of threads
- Double threads for fast installation and removal

### Material

HC-10015: Tin-plated copper/zinc alloy  
 HC-10015A: Bronze

Catalog Number	Dimensions	Grounding Stud	Jumper Cable		Capacity 15 Cycles	Capacity 30 Cycles	Weight Ea (lbs)
			Min	Max			
HC-10015	6.25 x 3 .25 x 1.75"	20 mm	#2	1/0	20kA (IEC) 21kA (ASTM)	15kA (ASTM)	1.55
HC-10015A	6.25 x 3.25 x 1.75"	25 mm	#2	4/0	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	1.75



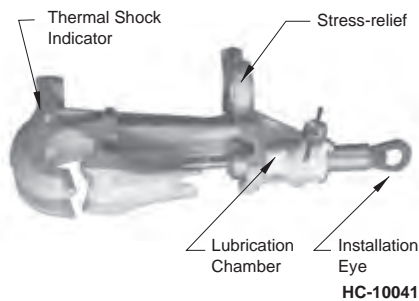
## Universal Clamp, Transmission

### Features

- Can be installed on all electrical facilities, apparatus, tubes, and conductors as well as various equipment (trucks, pulling equipment, etc.)
- Installation on conductor, round bus bar and grounding ball stud of 30 mm
- Thermal shock indicator changes color when the clamp reaches a temperature of 200° F (93° C)
- Stress relief to reduce cable damage and serve as a shock damper if fault occurs, which protects cable strands
- Fitted to receive a 5/8-11 UNC threaded stud ferrule
- Lubrication chamber for upkeep of threads
- Double internal threads for fast installation and removal
- No exposed threads for minimal maintenance

### Material

Body and Eye Screw: Aluminum



Catalog Number	Dimensions	Ground Stud	Jumper Cable		Main Conductor		Jaw Opening	Capacity 15 Cycles	Capacity 30 Cycles	Weight Ea (lbs)
			Min	Max	Min	Max				
HC-10041	15.5 x 6.5 x 3.25	30 mm	#2	500 MCM	1/0 (.40)	1796 (1.34)	2"	55kA (IEC) 86.3kA (ASTM)	61kA (ASTM)	3.9

### Notes:

1) This clamp meets ASTM Grade 7 requirements for temporary grounding



# Grounding Clamps



## Universal Grounding Clamp - 2" IPS 'C' Clamp

### Features

- Can be installed on all electrical facilities, apparatus, round bus bar and flat bus base as well as various equipment (trucks, pulling equipment, etc.)
- Installation eye for use with shotgun stick
- 01-M-044 fitted to receive a 5/8-11 UNC threaded stud ferrule
- 01-M-044H fitted to receive a 3/4-10 UNC threaded stud ferrule
- Stress relief to reduce cable damage and serves as shock damper if fault occurs
- Lubrication chamber for upkeep of threads

### Benefits

- Lightweight and easy to use
- Compact design allows use in restrained areas
- Wide range taking allows for use in several grounding applications

### Material

Aluminum body, keeper and eyescrew A356T6

Catalog Number	Jumper Cable		Main Conductor (in)		Jaw Opening (in)	Tested 15 Cycles	Maximum Peak	Last Cycle Peak	Weight (lbs)
	Min	Max	Min	Max					
01-M-044	#2	4/0	2 1/2	(0.13) 4AWG	2 3/8	51.3 kA Grade 5H	138 kA	74.7 kA	2.6
01-M-044H	350MCM	350MCM	2 1/2	(0.13) 4AWG	2 3/8	60.7 kA	161 kA		2.6

#### Notes:

- 1) For 'T' Handle screw add suffix 'T' to catalog number
- 2) 01-M-044H will fit 30 mm Ball Stud



## Grounding Clamp for 2" to 4" Tubes or Bars

### Features

- Can be installed on tubes 2" to 4" O.D. and flat bars 2" to 4"
- Fitted to receive 25 mm Ball Stud, 03-M-015 Grounding Stud and 30 mm Ball Stud
- Lubrication chamber for upkeep of threads

### Benefits

- Unit is installed with hot stick without the weight of the grounding cable
- Allows use of grounding cable with smaller clamps to minimize weight

Catalog Number	Connection	Main Conductor (in)		Jaw Opening (in)	Tested 15 Cycles	Maximum Peak	Last Cycle Peak	Weight (lbs)
		Min	Max					
01-M-051	03-M-015 Gr. Stud	2" round or flat	4" round or flat	4 1/3	51.3 kA Grade 5H	138 kA	74.7 kA	4.9
01-M-052	25 mm Ball Stud	2" round or flat	4" round or flat	4 1/3	43 kA ASTM Grade 5 H			4.9
01-M-053	25 mm Ball Stud	2" round or flat	4" round or flat	4 1/3	43 kA ASTM Grade 5 H			5.2

#### Notes:

- 1) 01-M-052 is rated per ASTM Grade 5 further testing at a later date
- 2) 01-M-053 was tested at 60.7 kA with a Peak Current of 161 kA further testing at a later date



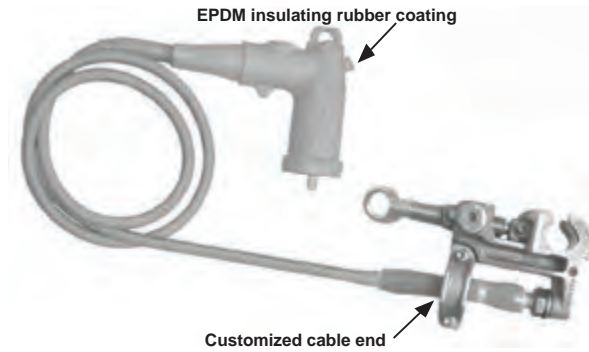


# Temporary Underground Elbow Assemblies

## Temporary Underground Elbow Assemblies

### Features

- Each custom grounding elbow assembly is supplied with 6 feet of cable



**Z15** - **B** - **2/0** - **Y** - **6**

Voltage	
Z15	= 15kV Elbow
Z25	= 25kV Elbow
Z35	= 35kV Elbow

Cable Size	
1/0	= 1/0 AWG
2/0	= 2/0 AWG

Cable Length	
6	Cable length in feet

Jacket Type	
Y	= Grounding Cable - yellow opaque jacket

Customized Cable End	
B	= Universal Grounding Clamp 01-M-037
H	= Universal Grounding Clamp 01-M-034
D	= Duck Bill Clamp HCDB-117
C	= Cable only
M	= Cable with ferrule
E	= Exception

## Jumpering Assemblies

### Jumpering Assemblies

#### Features

- All suggested clamps are rated 400 Amps continuous rating
- This rating depends on the jumper cable rating
- Pre-assembled with a 5/8 - 11 UNC ferrule at each end
- Ends sealed with sealing tapes and clear heat shrink tubes
- Storage straps included



**DP** - **D** - **15** - **1/0** - **6**

Cable End 1	
D	= Duck Bill Clamp HCDB-117
DP	= Duck Bill Clamp with parking stud HCDB-117P
OC	= Yellow opaque #6 SOL-954 MCM clamp
CC	= Clear #6 SOL-954 ACSR clamp
S	= Cable with ferrules

Cable End 2	
D	= Duck Bill Clamp HCDB-117
DP	= Duck Bill Clamp with parking stud HCDB-117P
OC	= Yellow opaque #6 SOL-954 MCM clamp
CC	= Clear #6 SOL-954 ACSR clamp
S	= Cable with ferrules

Cable Insulation and Size					
Cable Insulation (kV)	Size (AWG)	No of Strands	O.D. (In)	Current Rating	Jacket Color
2	4/0	551	0.841	400	Black
15	#2	259	0.780	200	Red
15	1/0	259	0.865	250	Red
15	2/0	259	0.910	300	Red
15	4/0	437	1.052	400	Red
25	1/0	413	1.113	260	Red
25	2/0	266	1.116	300	Red
35	1/0	427	1.270	250	Red

Cable Length	
6	Cable length in feet



HCDB-117P

Optional Jumper cable carriage bag



HC-10094



# Grounding Products Accessories



## Grounding Cluster Block

### Features

- For installation on a pole or structure. The 11.5" bar accepts up to four grounding clamps
- Block also has two threaded holes to accept 5/8 - 11 UNC ferrules
- Rating: 43kA ASTM

### Material

Bar: 3/4" tinned copper

Catalog Number	Mounting	Weight Ea (lbs)
HC-10111	Chain tightener	6.7



## Temporary Grounding Rod

### Features

- A time saving product for maintenance or testing where there is no permanent ground. It can also be used for applications where there is no system neutral
- T-Lug is provided for a maximum 2/0 ground cable
- If required, compression type threaded ferrules can also be used for ground cable connection

### Materials

Auger bit and handle: Bronze alloy  
Shaft: Copperweld

Catalog Number	Maximum Conductor Size	Overall Dimensions	Weight Ea (lbs)
133007	2/0 AWG class "K"	1/2" diameter x 6 feet	29.0

Grounding block



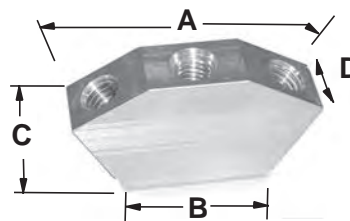
## Three Way Grounding Block

### Features

- Connection joint in a temporary grounding three phase assembly
- Tested up to 49kA (ASTM) and 35kA (IEC)

### Material

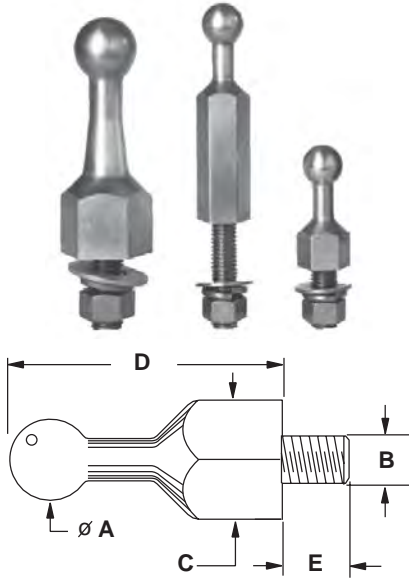
Aluminum 6061-T6



Catalog Number	Jumper Cable		Dimensions				Capacity 15 Cycles	Capacity 30 Cycles	Weight Ea (lbs)
	Min	Max	A	B	C	Thread			
HC-10093	2 AWG	4/0 AWG	3 3/4	2 3/8	2	1	35 kA (IEC) 49kA (ASTM)	30kA (ASTM)	0.3



# Grounding Ball Studs



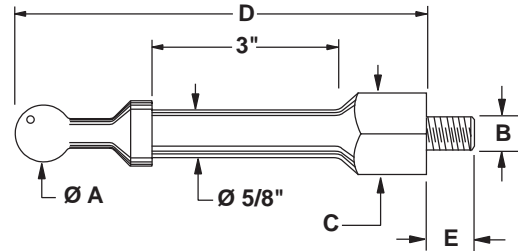
## Grounding Ball Studs

### Features

- Permanent grounding ball studs permit universal and ball stud clamps to be used for different electrical systems such as apparatus, bus bar, conductors, vehicles, reels, etc
- Spherical form of grounding ball stud permits installation of grounding clamp at various angles to reach the most inaccessible areas
- Meets ASTM and IEC standards
- Stainless steel hardware (washer, lock washer, and nut) included (if applicable)

### Material

99.9% electrolytic tin-plated copper



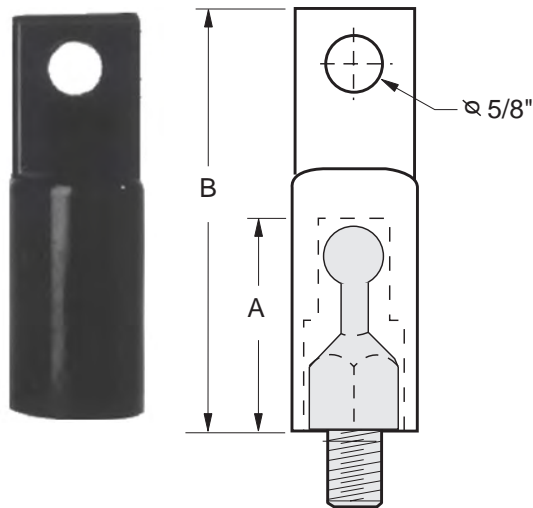
Catalog Number	Dimensions					Weight
	A	B	C	D	E	
03-M-006	20 mm	1/2 - 13	7/8	2 15/16	no screw	0.2
03-M-006-0.5	20 mm	1/2 - 13	7/8	2 15/16	1/2	0.3
03-M-006-1*	20 mm	1/2 - 13	7/8	2 15/16	1	0.4
03-M-026	20 mm	1/2 - 13	7/8	4	no screw	0.6
03-M-026-0.5	20 mm	1/2 - 13	7/8	4	1/2	0.7
03-M-026-1*	20 mm	1/2 - 13	7/8	4	1	0.7
HC-30015	20 mm	1/2 - 13	7/8	6	no screw	0.8
HC-30015-0.5	20 mm	1/2 - 13	7/8	6	1/2	0.9
HC-30015-1*	20 mm	1/2 - 13	7/8	6	1	0.9
03-M-027	20 mm	5/8 - 11	1	4	no screw	0.8
03-M-027-0.5	20 mm	5/8 - 11	1	4	1/2	0.9
03-M-027-1*	20 mm	5/8 - 11	1	4	1	0.9
HC-30028	20 mm	5/8 - 11	1	2 5/8	no screw	0.7
HC-30028-0.5	20 mm	5/8 - 11	1	2 5/8	1/2	0.8
HC-30028-1*	20 mm	5/8 - 11	1	2 5/8	1	0.8
HC-30029	25 mm	1/2 - 13	1	3	no screw	0.5
HC-30029-0.5	25 mm	1/2 - 13	1	3	1/2	0.6
HC-30029-1*	25 mm	1/2 - 13	1	3	1	0.6
HC-30036	25 mm	1/2 - 13	1	6 1/4	no screw	1.1
HC-30036-0.5	25 mm	1/2 - 13	1	6 1/4	1/2	1.2
HC-30036-1*	25 mm	1/2 - 13	1	6 1/4	1	1.2
HC-30037	25 mm	5/8 - 11	1	3	no screw	0.4
HC-30033	25 mm	5/8 - 11	1	3	1/2	0.5
HC-30037-1*	25 mm	5/8 - 11	1	3	1	0.5
HC-30012	30 mm	5/8 - 11	1 1/2	4 3/8	no screw	1.8
HC-30012-0.5	30 mm	5/8 - 11	1 1/2	4 3/8	1/2	1.9
HC-30012-1*	30 mm	5/8 - 11	1 1/2	4 3/8	1	1.9

### Notes:

- 1) \* - hardware included
- 2) HC-30033 used as grounding ball stud on 01-M-037
- 3) Other length for "E" available upon request (e.g. HC-30029-3.5 for 3.5" length)
- 4) 20 mm and 25 mm grounding ball studs are rated for 35kA per IEC 61230 and 43kA per ASTM R855
- 5) 30 mm grounding ball studs are rated for 60kA per IEC 61230 and 74kA per ASTM R855



# Grounding Ball Studs



## Insulated Protective Cap

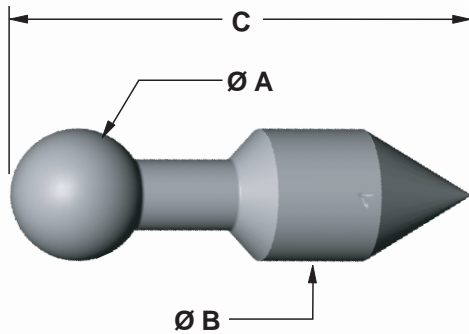
### Features

- Used to insulate 20 mm or 25 mm grounding ball studs and protects from contamination
- Handle for installation with a shotgun stick

### Material

Polyurethane

Catalog Number	Dimensions		Ground Stud	Weight Ea (lbs)
	A	B		
01-P-064	2 1/2	4 5/8	20 mm	0.20
01-P-064-25	3 1/4	5 7/8	25 mm	0.24



## Grounding Ball Stud for CADWELD Connections

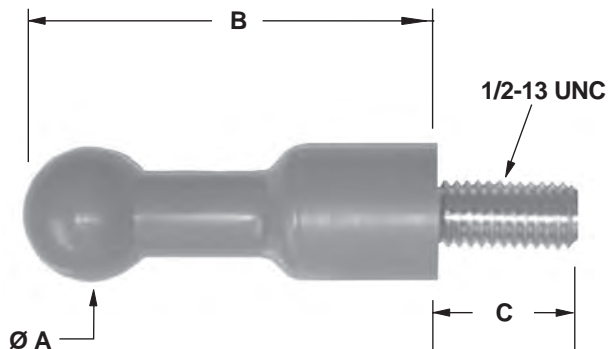
### Features

- Permanent welded grounding ball stud allowing the installation of either a universal or ball stud grounding clamp to a steel structure
- Grounding ball stud can be installed in most inaccessible areas

### Material

99.9% electrolytic tin-plated copper

Catalog Number	Dimensions			Weight Ea (lbs)
	A	B	C	
HC-30055-20	20 mm	5/8	2 25/32	0.2
HC-30055-25	25 mm	7/8	4 1/4	0.6
HC-30055-30	30 mm	7/8	3 7/8	0.6



## PVC Grounding Ball Stud for Support Device

### Features

- Used as a support for universal and ball stud grounding clamp on different equipment
- Stainless steel hardware (nut, flat and lock washer) included

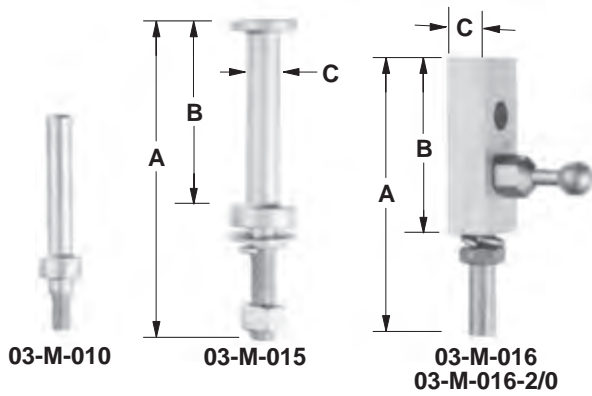
### Material

Gray PVC

Catalog Number	Dimensions			Weight Ea (lbs)
	A	B	C	
HC-30029-1PVC	25 mm	3	1	0.25



# Grounding Studs, Terminals & Connectors



## Grounding Studs and Terminals

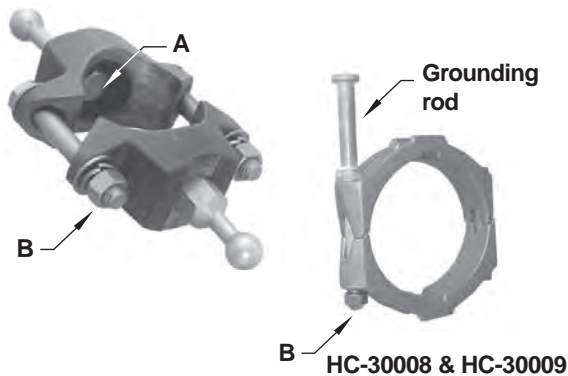
### Features

- Can be installed on all electrical facilities such as apparatus, tubes, conductors, tracks, pulling equipment, etc

Catalog Number	Description	Connector Material	Dimensions				Capacity 15 Cycles	Capacity 30 Cycles	Weight Ea (lbs)
			A	B	C	Thread			
03-M-010	Grounding Stud	Tin-Plated Copper	3 5/8	2 23/64	7/16	3/8 - 16 UNC	12kA (IEC) 15kA (ASTM)	10kA (ASTM)	0.1
03-M-015	Grounding Stud	Tin-Plated Copper	7 1/8	4 1/8	3/4	5/8 - 11 UNC	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	1.2
03-M-016	Grounding Terminal (1/0 ferrule; 20 mm ball stud)	Aluminum Block Tin-Plated ferrule and stud	6 1/2	3 1/4	1 1/2	-	12kA (IEC) 15kA (ASTM)	10kA (ASTM)	0.5
03-M-016-2/0	Grounding Terminal (2/0 ferrule; 20 mm ball stud)	Aluminum Block Tin-Plated ferrule and stud	6 1/2	3 1/4	1 1/2	-	12kA (IEC) 15kA (ASTM)	10kA (ASTM)	0.5

### Notes:

- 1) 03-M-010, 03-M-016, 03-M-016-2/0 includes stainless steel hardware (lock washers, flat washers, and nut)
- 2) 03-M-015 includes bronze hardware (lock washers, flat washers, and nut)
- 3) For 25 mm ball stud installed on 03-M-016 or 03-M-016-2/0, add suffix "-25" to catalog number



## Grounding Connector for Tube

### Features

- Permanent ball grounding connector to install on vertical riser tube, solid rod or connector for easy installation of temporary grounding sets
- Meets ASTM and IEC standards
- Stainless steel hardware included

### Material

HC-30005/6/7

Connector: Bronze  
Ball Stud: 99.9% electrolytic tin-plated copper

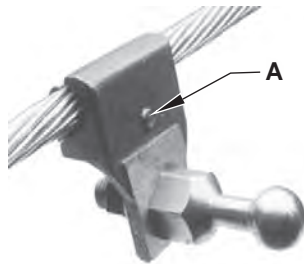
HC-30008/9

Connector: Aluminum  
Ball Stud: 99.9% electrolytic tin-plated copper

Catalog Number	Tube (IPS)	External Diameter	Ball Stud Included (Catalog No.)	Bolt A	Bolt B	Capacity 15 Cycles	Capacity 30 Cycles	Weight Ea (lbs)
HC-30005-1-25	1 1/2	1 7/8	1 X 25 mm (HC-30029)	1/2 - 13	3/8 - 16	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	4.5
HC-30005-2-25	1 1/2	1 7/8	2 x 25 mm (HC-30029)	1/2 - 13	3/8 - 16	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	5.0
HC-30006-1-25	2	2 3/8	1 x 25 mm (HC-30029)	1/2 - 13	1/2 - 13	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	4.5
HC-30006-2-25	2	2 3/8	2 x 25 mm (HC-30029)	1/2 - 13	1/2 - 13	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	5.1
HC-30007-1-25	2 1/2	2 7/8	1 x 25 mm (HC-30029)	1/2 - 13	1/2 - 13	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	4.5
HC-30007-2-25	2 1/2	2 7/8	2 x 25 mm (HC-30029)	1/2 - 13	1/2 - 13	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	5.0
HC-30008	3 1/2	4	1 x Ground Rod (03-M-014)	-	5/8 - 11	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	2.6
HC-30009	6	6 5/8	1 x Ground Rod (03-M-014)	-	5/8 - 11	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	2.7



# Grounding Connectors



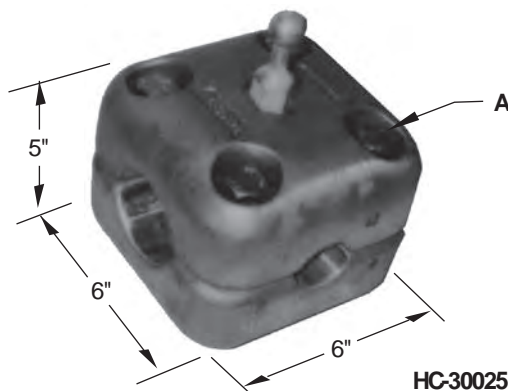
## Grounding Connector for Conductor or Tube Features

- Permanent ball stud grounding connector to install on vertical riser tube, solid rod, or conductor for easy installation of temporary grounding sets
- Meets ASTM and IEC standards
- Stainless steel hardware included

### Material

Connector: Aluminum  
Ball Stud: 99.9% electrolytic tin-plated copper

Catalog Number	Conductor		Tube (O.D.)	Connector Material	Bolt A	Capacity 15 Cycles	Capacity 30 Cycles	Weight Ea (lbs)
	Min	Max						
03-M-017-25	1/0 AWG	4/0 AWG	1/2	Aluminum	5/16	12kA (IEC) 15kA (ASTM)	10kA (ASTM)	0.9
03-M-018-25	4/0 AWG	350 MCM	5/8	Aluminum	3/8	12kA (IEC) 15kA (ASTM)	10kA (ASTM)	1.1
03-M-019-25	350 MCM	500 MCM	3/4	Aluminum	3/8	12kA (IEC) 15kA (ASTM)	10kA (ASTM)	1.2
03-M-020-25	1/0 AWG	2/0 AWG	3/8	Bronze	5/16	12kA (IEC) 15kA (ASTM)	10kA (ASTM)	0.9
03-M-021-25	2/0 AWG	4/0 AWG	1/2	Bronze	5/16	22kA (IEC) 27kA (ASTM)	20kA (ASTM)	1.1
03-M-022-25	4/0 AWG	350 MCM	5/8	Bronze	3/8	22kA (IEC) 27kA (ASTM)	20kA (ASTM)	1.3
03-M-023-25	350 MCM	500 MCM	3/4	Bronze	3/8	22kA (IEC) 27kA (ASTM)	20kA (ASTM)	1.5
HC-10019-25	500 MCM	750 MCM	7/8	Bronze	7/16	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	2.0
HC-10020-25	750 MCM	1000 MCM	1	Bronze	1/2	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	2.9
HC-10021-25	500 MCM	750 MCM	7/8	Aluminum	1/2	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	3.9
HC-30023-25	1750 MCM	2500 MCM	1 9/16	Aluminum	1/2	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	4.1
HC-30024-25	1000 MCM	1300 MCM	1 1/8	Bronze	1/2	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	2.1
HC-30024-25-T	1000 MCM	1300 MCM	1 1/8	Tinned Bronze	1/2	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	2.1
HC-30032-25	1500 MCM		1 1/4	Bronze	1/2	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	2.5



## Ball Stud Grounding Connector Features

- Permanent ball grounding connector to install on conductor or tubes for easy installation of temporary ground sets
- Stainless steel hardware included

### Material

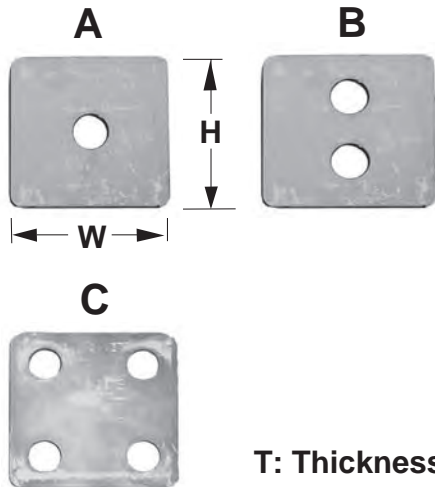
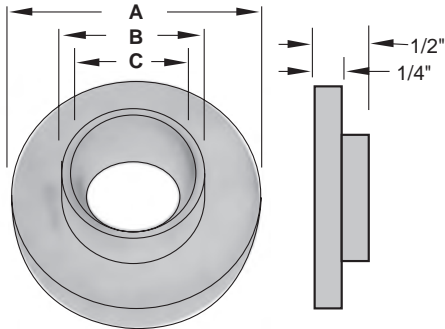
Connector: Aluminum  
Ball Stud: 99.9% electrolytic tin-plated copper

Catalog Number	Conductor	Ball Stud Included (Catalog No.)	Bolt A	Capacity 15 Cycles	Capacity 30 Cycles	Weight Ea (lbs)
HC-30025-20	1796 and 4000 MCM	20 mm (03-M-006)	5/8 - 11 UNC	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	10.9
HC-30025-25	1796 and 4000 MCM	25 mm (HC-30029)	5/8 - 11 UNC	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	10.9
HC-30025-30	1796 and 4000 MCM	30 mm (HC-30012)	5/8 - 11UNC	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	10.9





# Grounding Ferrules, Spacers & Plates



T: Thickness

## Ferrule Adapter

### Features

- Serves as an interface between a jumper cable equipped with a stud ferrule, a grounding clamp, or apparatus
- Fitted to receive a 5/8 - 11 UNC threaded stud ferrule
- Shock damper reduces stress to cable

### Material

Bronze

Catalog Number	Jumper Cable		Capacity 15 Cycles	Capacity 30 Cycles	Weight Ea (lbs)
	Min	Max			
HC-10043	#2	4/0	35 kA (IEC) 43kA (ASTM)	30kA (ASTM)	1.2

## Grounding Assembly Carrying Bag

### Features

- Orange carrying bag to permit storage and handling of up to three grounding assemblies

### Material

Orange vinyl 19 oz

Catalog Number	Dimensions
01-C-025-25	25 x 25 x 2"

## Reducer Spacer

### Features

- Reduces a 5/8" diameter hole in a grounding plate to a 1/2" hole for a grounding ball stud installation

### Material

99.9% electrolytic tin-plated copper

Catalog Number	Dimensions			Capacity 15 Cycles	Capacity 30 Cycles	Weight Ea (lbs)
	A	B	C			
HC-10016	1 1/4	5/8	17/32	35 kA (IEC) 43kA (ASTM)	30kA (ASTM)	0.10

## Grounding Plates

### Features

- Permits installation of a grounding ball stud on a galvanized steel surface or any other surface to increase contact surface

### Material

99.9% electrolytic tin-plated copper

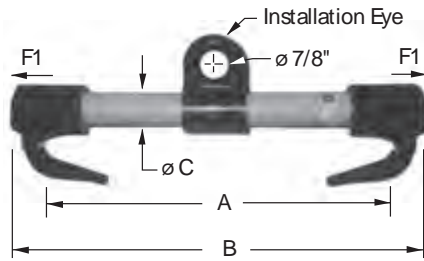
Catalog Number	Type	Dimensions			Capacity 15 Cycles	Capacity 30 Cycles	Weight Ea (lbs)
		T	W	H			
HC-30053	A	1/4	2.0	4.5	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	0.8
HC-30052	A	1/4	2.5	3.6	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	0.8
HC-30021	A	1/4	3.0	3.0	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	0.9
HC-30051	A	3/8	2.0	4.5	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	1.2
HC-30050	A	3/8	2.5	3.6	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	1.2
HC-30022	A	3/8	3.0	3.0	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	0.9
HC-30054	B	1/4	3.0	6.0	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	1.6
HC-30017	C	1/4	3.0	3.0	35kA (IEC) 43kA (ASTM)	30kA (ASTM)	0.4

### Notes:

1) For 5/8" hardware, add suffix "-5/8". For 1/2" hardware, add suffix "-1/2".



# Jumper Accessories



## Jumper Support

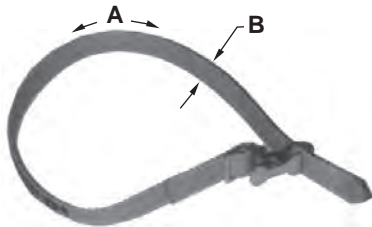
### Features

- Supports the weight of a jumper cable during installation
- Offers more working space at work site
- \* Installation with insulated gloves or with shotgun stick

### Material

Tube: Fiberglass with polyurethane foam  
 Hooks and Installation Eye: Polyurethane

Catalog Number	Dimensions			Capacity (F1)	Weight Ea (lbs)
	A	B	C		
HC-10126	11	12	1	150	0.8



## Spring Buckle Strap

### Features

- Permits storage and handling of a jumper cable

### Material

Strap: Nylon  
 Buckle: Zinc plated  
 Spring: Stainless Steel

Catalog Number	Dimensions		Weight Ea (lbs)
	A	B	
01-PM-060	24	1	0.1



## Jumper Cable Carriage Bag

### Features

- Permits storage and handling of a jumper cable

### Material

Orange canvas 19 oz.

Catalog Number	Dimensions
HC-10094	4 x 21" diameter



# Warning Systems



## Ground Structures

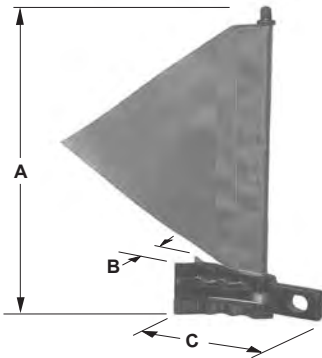
### Features

- Permanent installation in an underground transformer vault (UTV)
- Used to verify the insulation integrity of distribution class URD conductors

### Material

Ball studs: 99.9% electronically tin-plated copper  
 Support: Structural fiberglass composite  
 Cables: Copper with silicone jacket  
 Clamps: Copper/Zinc tin-plated alloy  
 Bar: Aluminum with polyurethane coating

Catalog Number	A	B	C	D	E	Weight Ea (lbs)
HC-70001	22 1/8	18 1/4	16	13 3/4	23 5/8	29
HC-70001R	22 1/8	18 1/4	17	13 3/4	23 5/8	29



## Flags

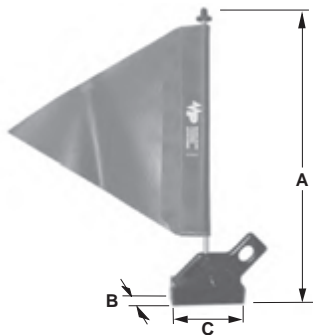
### Features

- Fits onto a 1/4" to 3/8" diameter rod or signaling rope
- HC-10063 uses a Velcro-strip fastening system
- HC-10064 fits on 1/4" to 3/8" diameter or signaling rope

### Material

Vinyl

Catalog Number	A	B	C	Color	Weight Ea (lbs)
HC-10063-R	12	12		Red	
HC-10063-V	12	12		Green	
HC-10064-R	6	6		Red	
HC-10064-V	6	6		Green	
HC-10047-R	15	2 5/8	4 5/16	Red	0.6
HC-10047-V	15	2 5/8	4 5/16	Green	0.6
HC-10047	15	2 5/8	4 5/16		0.6
HC-10047-A	4 3/4	2 5/8	4 5/16		0.6



## Flags

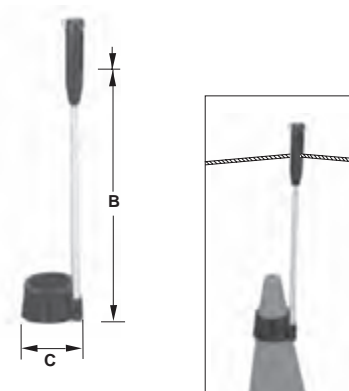
### Features

- For installation on any steel surface
- Corrosion resistant magnet
- Installation eye for installation with shotgun stick

### Material

Base: Steel with polyurethane coating  
 Rod: Fiberglass

Catalog Number	A	B	C	Color	Weight Ea (lbs)
HC-10046-R	15 1/2	3	4 5/16	Red	1.6
HC-10046-V	15 1/2	3	4 5/16	Green	1.6
HC-10046	15 1/2	3	4 5/16		1.6



## Flags

### Features

- For installation on any steel surface
- Corrosion resistant magnet

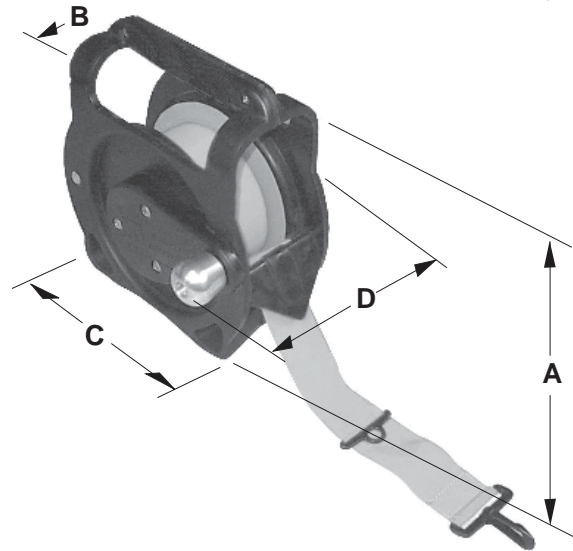
### Material

Base: Steel with fiberglass casing  
 Rod: Fiberglass covered with polyethylene

Catalog Number	A	B	C	Color	Weight Ea (lbs)
HC-10046-R	10	2 7/8	2 1/8	Red	0.8
HC-10046-V	10	2 7/8	2 1/8	Green	0.8
HC-10046	10	2 7/8	2 1/8		0.8



# Reels, Tape, Posts and Cones



## Reels and Tape

### Features

- Holds 2" wide warning tape
- Unique mechanism prevents fraying of tape
- Locking Handle
- Sturdy plastic hook used to attach to end of pole or any other structure
- Optional aluminum base for a secure installation
- Reel installs paridly with a wing nut

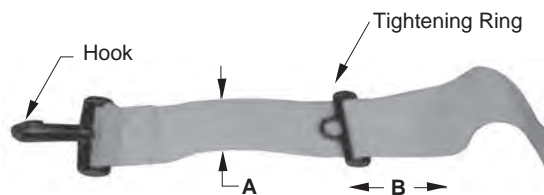
### Material

Enclosure: Polyurethane  
 Tape: Vinyl  
 Handle: Aluminum  
 Hardware: Stainless steel  
 Optional Base: 1/4" thick 0601T6 aluminum

Catalog Number	A	B	C	Weight Ea (lbs)
HC-10133	5	3	10	2.5

Catalog Number	A	B	C	D	Weight Ea (lbs)
HC-10134	9 3/4	3 3/4	9	5 1/2	3.1

Catalog Number	A	B	C	D	Color	Length of Tape	Weight Ea (lbs)
HC-10135	9 3/4	3 3/4	9	5 1/2	Red	100	4.4
HC-10135-150	9 3/4	3 3/4	9	5 1/2	Red	150	5.0



## Reels and Tape

### Features

- Used with a reel to mark a work area
- Flourescent red for greater visibility

### Material

Enclosure: Polyurethane  
 Hook and Tightening Ring: Plastic

Catalog Number	A	B	Weight Ea (lbs)
HC-10136	2	100	1.3
HC-10136-150	2	150	1.9

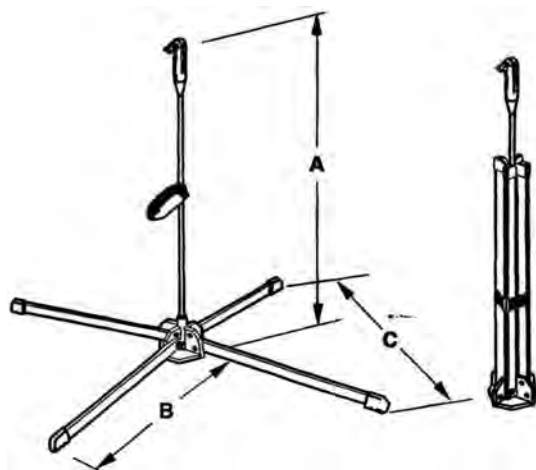
## Posts and Cones

### Features

- Used to hold different types of markers such as warning tape, a rope, a display or a warning flag to mark a working area
- Folding legs and a velcro strap allows for easy storage

### Material

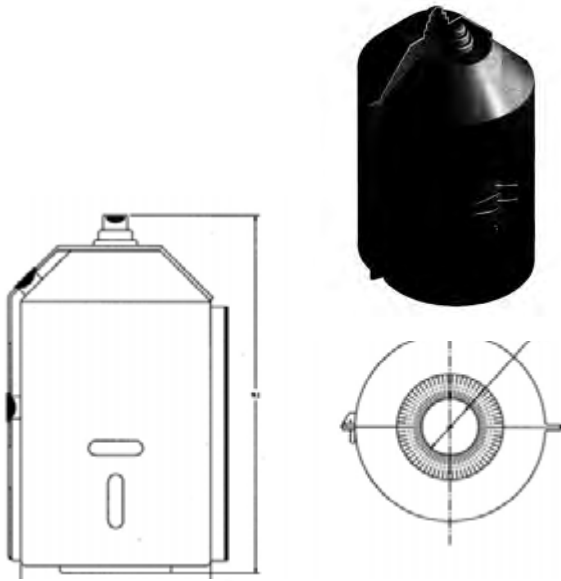
Rod: Fiberglass  
 Head and Feet: Polyurethane



Catalog Number	A	B	C	Weight Ea (lbs)
HC-10062	38	25	36	5.6
HC-10062-T	6	1 1/4	3/4	0.2
HC-10137	3 1/2	17 1/4	5	0.8



# Wildlife Protectors, Pulling Hooks, and Spacers



## Wildlife Protector

### Features

- Designed for protection of equipment and bushings from accidental animal contact
- One-piece, hinged design allows easy retrofit installation without the need to take an outage
- Multiple exit ports accommodate a variety of tap conductor configuration; allowing flexibility in the field
- Molded from polypropylene with a state of the art UV inhibitors for the longest service life available
- Flexible fingers secure the protector on a range of throat diameters preventing nesting of animals
- Protector accepts bushings with a skirt diameter of up to 4.75", making it ideal for distribution transformers and many types of substation apparatus

### Material

Polyurethane

Catalog Number	A	B	Bottom Hole Dia.	Weight /100 (lbs)
S635	9.1	4.8	1.4	29.0



## Pulling Hooks

### Features

- Designed for efficient installation of reliable automatic deadend connectors

Catalog Number	Mark Work Load	Copper Automatics Splice Type	Copper Automatics Bail Type	ACSR Automatics Splice Type	ACSR Automatics Bail Type	Strandvise Automatics Slice Type	Weight Ea (lbs)
9055	5200					5200, 5201, 5100, 5101, 5102, 5200L, 5201, 5100L, 5101L, 5102L	1.8
9062	4000	47, 21, 27, 101, 107, 207, 307, 407	SDS, FD, FDN, FDS, FDSN, LD	7651, 7652, 7653	LD	5199, 5199L, 5202, 5203, 5204, 5202L, 5203L, 5204L, 5200, 5201, 5200L, 5201L, 5100, 5101L, 5102L	2.7



## Spacers

### Features

- For use in 2.3 through 40kV distribution systems where minimum right of way designs are required, such as heavily treed areas, alleys and where multiple circuits are in use.
- Open diamond shape
- Concentric high voltage rings separate each phase leg and messenger
- Provisions for stabilizer bar attachment which eliminates excess vibration
- Single tie for all conductor size reduces inventory and insures the conductor is locked into position
- Monlethic or clamp type messenger attachments

### Material

High density polyethylene

Catalog Number	Conductor Spacing (in [mm])					Leakage Distance (in [mm])					Ultimate Strength (lbs)	Line Voltage (kV)	Electrical Flashover (kV 60Hz)		Weight Ea (lbs)
	B	C	D	E	F	B	C	D	E	F			Dry	Wet	
S-8	7.00 [177.8]	8.75 [222.3]	8.75 [222.3]	8.00 [203.2]	13.75 [349.3]	9.50 [241.3]	10.50 [266.7]	10.50 [266.7]	14.30 [363.2]	19.00 [482.6]	1800	15	75	49	1.6



# Insulated "C" Clamp, Come-A-Long, and Skinning Knives



## Insulated "C" Clamp

### Features

- For installation over flexible line hose
- Fiberglass reinforced polyurethane body
- Door can be opened with insulated tools or with insulated gloves
- Special mechanism allows door to remain in open position even if support is upside down
- Accommodates class 4 type 2 orange cell core flexible line hose

### Material

Fiberglass reinforced polyurethane body  
 Polymer insulator  
 Aluminum pole clamp

Catalog Number	Weight Ea (lbs)
HC-10305	4.5



## Come-A-Long

### Features

- Used in-line for pulling of power cables
- Safety lock that keeps the come-a-long on the conductor
- Floating keeper for better alignment on conductor
- Slide bar is locked when safety lock is up and in use
- Hardened steel rollers for smooth operation
- Can be installed with an operating stick
- Easy to operate

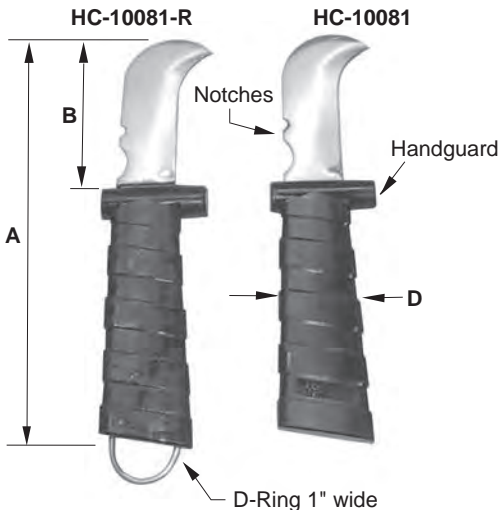
### Material

Body: Aluminum  
 Rollers: Hardened steel  
 Hardware: Stainless steel

Catalog Number	Description	A	B	C	Conductor Range	Max Work Load (lbs)	Weight Ea (lbs)
HCC-477L	Left	12	5	5	#4 - 477 ACSR (0.25 - 0.81)	4500	3.8
HCC-477-R	Right	12	5	5	#4 - 477 ACSR (0.25 - 0.81)	4500	3.8

### Notes:

1) For aluminum conductors ONLY (not for use on guy wire or copper conductors)



## Skinning Knives

### Features

- Equipped with a handguard to prevent injuries
- Grooved handle for a better grip back of blade contains two notches for cleaning conductors

### Material

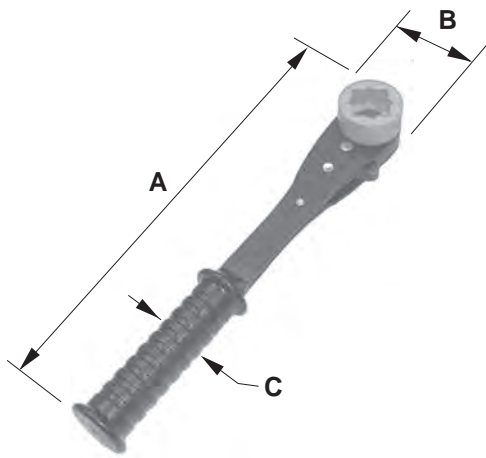
Blade: Tempered steel  
 Handle: Polyurethane  
 Dee-Ring: 0.120" diameter steel knickel plated

Catalog Number	A	B	D	Weight Ea (lbs)
HC-10081	8 1/8	3 1/4	1 1/2	0.3
Hc-10081-R	8 7/8	3 1/4	1 1/2	0.3





# Non-Slip Wrench, Spreaders, and Holding Accessories



## Non-Slip Wrench

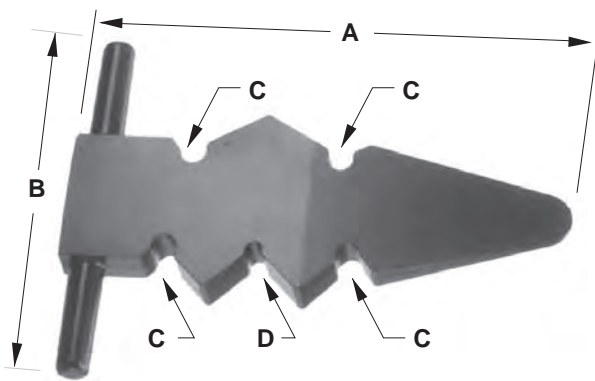
### Features

- Universal wrench for bolting 1/2", 5/8, and 3/4"
- Grooved handle for a better grip

### Material

Wrench: Steel  
Handle: Polyurethane

Catalog Number	A	B	C	Weight Ea (lbs)
HC-10120	13 3/8	2	1 5/16	2.5



## Spreaders

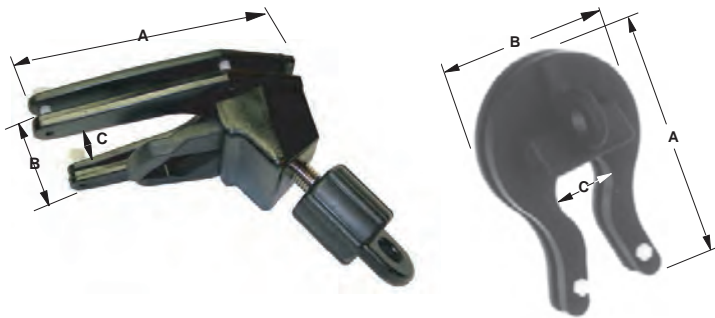
### Features

- Used to separate triplex and quadruplex conductors for easy skinning of conductors and installation of connectors
- Handle reinforced with fiberglass rod

### Material

Body: Polyurethane  
Handle: Fiberglass

Catalog Number	A	B	Radius		Thickness (in)	Weight Ea (lbs)
			C	D		
01-P-026	14 3/4	11	3/8	1/4	1 13/32	2.8



## Holding Accessories

### Features

- Used to hold down the hot lin insulator blanket on a pole top pin
- Installation eye for mounting holder with a shotgun stick

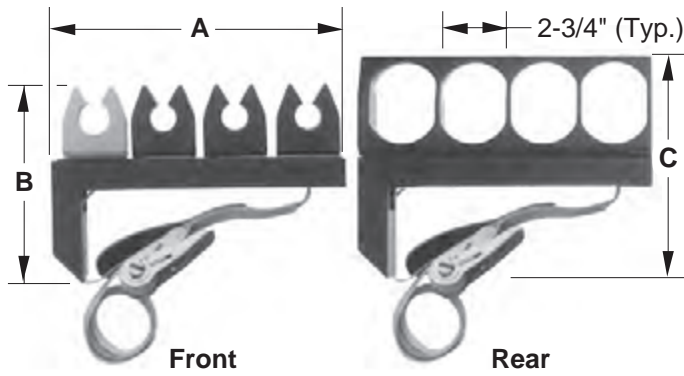
### Material

Body: Polyurethane  
Screws: Nylon

Catalog Number	A	B	C	Color	Weight Ea (lbs)
01-P-062-1.9	7 1/4	4 3/4	1.9	Black	0.6
HC-10335	6 3/4	4 1/2	2 3/4	Black	0.6



# Hot Stick Carriers and Insulated Sticks and Accessories



## Hot Stick Carriers, Boom Mounted

### Features

- Used to hold down the hot line insulator blanket on a pole top pin
- Installation eye for mounting holder with shotgun stick

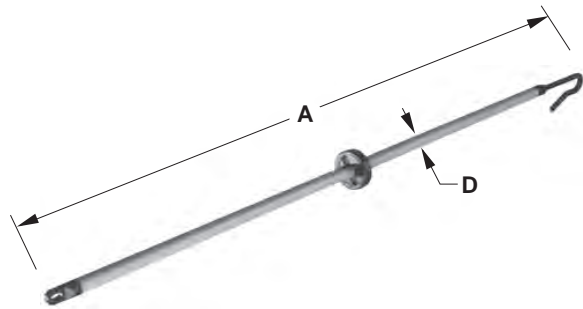
### Material

Body: Polyurethane  
Screws: Nylon

Catalog Number	A	B	C	Weight Ea (lbs)
01-P-058-4	12 1/2	8	9	5.2

### Notes:

- 1) Ratchet slings not included



## Insulated Sticks & Accessories

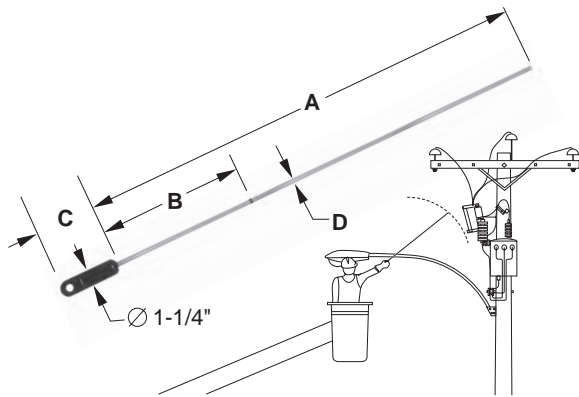
### Features

- Used to tighten and loosen hardware
- Supplied with polyurethane handguard
- 7/16" hexagon drive at one end and 1/2" square drive at other end
- Torque rating: 3/8" 20 to 25 ft/lbs 1/2" 40 to 45 ft/lbs

### Material

Tube: Fiberglass filled with polyurethane foam  
7/16" and 1/2" drives: Stainless steel

Catalog Number	A	D	Weight Ea (lbs)
01-PM-044	48 7/8	1 1/4	2.4



## Insulated Sticks & Accessories

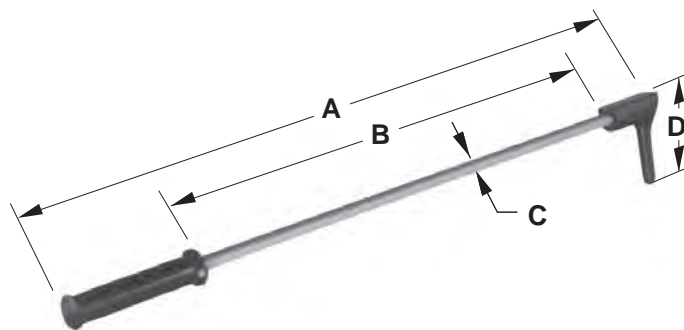
### Features

- Used to ascertain approach limit to line component
- Installation eye for use with shotgun stick

### Material

Rod: Fiberglass  
Handle: Polyurethane

Catalog Number	A	B	C	D	Weight Ea (lbs)
01-PM-044	24				0.3
01-P-072-36	36	12	4 1/2	0.362	0.4
01-P-072-48	48				0.5



## Insulated Sticks & Accessories

### Features

- Used to open and close conductor holder

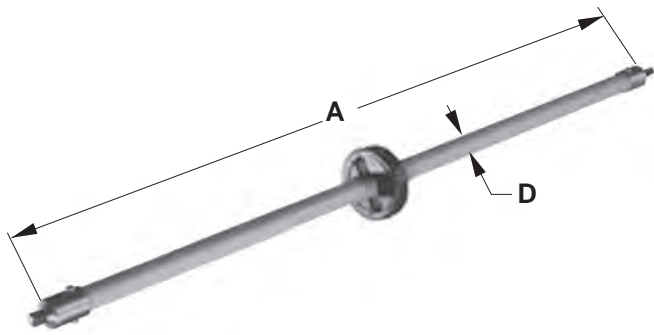
### Material

Tube: Fiberglass filled with polyurethane foam  
Hook and handle: Polyurethane

Catalog Number	A	B	C	D	Weight Ea (lbs)
01-P-002	40	26	5/8	4 7/8	0.9



# Insulated Sticks and Accessories



## Insulated Sticks & Accessories

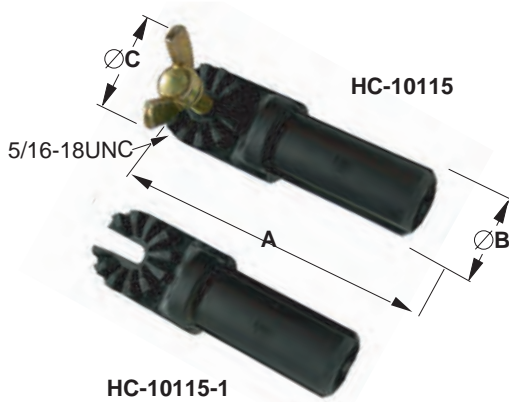
### Features

- Used for disconnect switch padlocking
- Supplied with polyurethane handguard

### Materials

Tube: Fiberglass filled with polyurethane foam  
 Hook and handle: Polyurethane

Catalog Number	A	D	Weight Ea (lbs)
01-P-045	84	1	2.5
01-P-046	60		1.8
01-P-047	112		3.3



## Insulated Sticks & Accessories

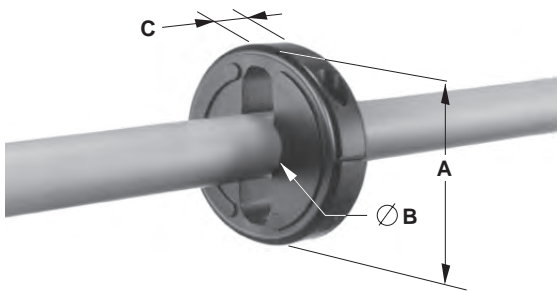
### Features

- Made of non-conducting material
- Permanently attached to a 1 1/4 diameter stick for holding a tool, instrument, piece of equipment, or accessory

### Material

Structural fiberglass composite

Catalog Number	A	B	D	Weight Ea (lbs)
HC-10115	4	1	1 1/4	0.2
HC10115-1				



## Insulated Sticks & Accessories

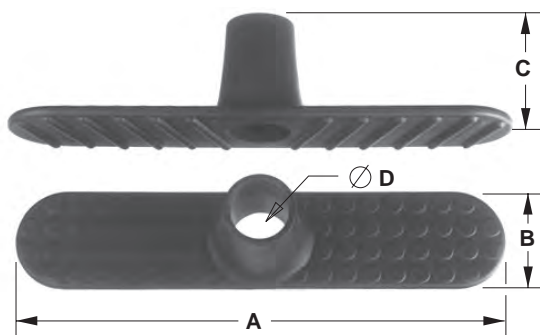
### Features

- Used to establish the closest limit of approach
- Central opening permits handguard to be installed on a shotgun stick

### Material

Polyurethane

Catalog Number	A	B	D	Weight Ea (lbs)
01-P-048-1	3 1/4	1	7/8	0.2
01-P-048-1.25		1 1/4		
01-P-048-1.5		1 1/2		



## Insulated Sticks & Accessories

### Features

- Used to stabilize a round telescopic pole on the ground with one's feet

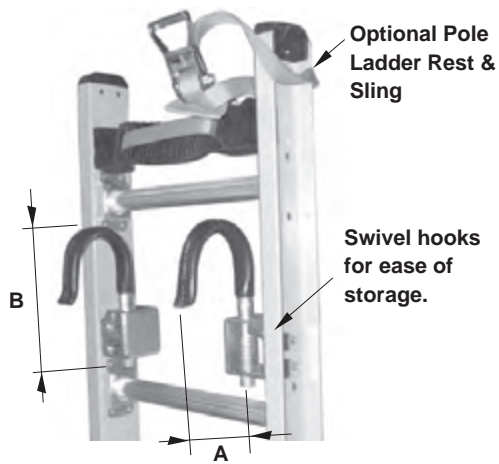
### Material

Fiberglass with polyurethane coating

Catalog Number	A	B	C	D	Weight Ea (lbs)
01-P-050	24	5	5 1/2	3 1/4	4.0



# Ladder Security Hooks and Rest, S Hooks, and Safety Box



## Ladder Security Hooks

### Features

- Used to hang ladder to a conductor

### Material

Aluminum with polyurethane coating

Catalog Number	A	B	Weight Ea (lbs)
HC10040	6 1/2	8 5/8	3.1



## Pole Ladder Rest

### Features

- Used to stabilize ladder against pole

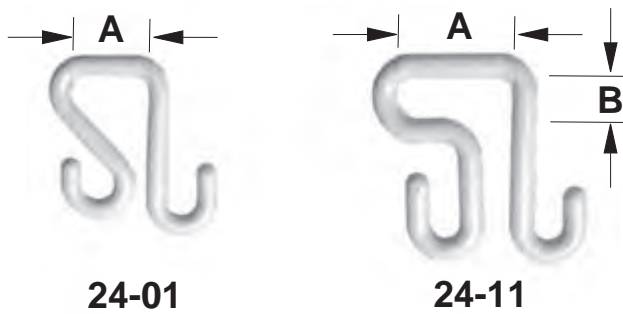
### Material

Polyurethane

Catalog Number	A	B	C	Weight Ea (lbs)
01-P-068	13 1/2	1 7/8	2 1/2	1.3
01-P-068-W				

### Notes:

- 1) Ratchet sling not included



## "S" Hooks

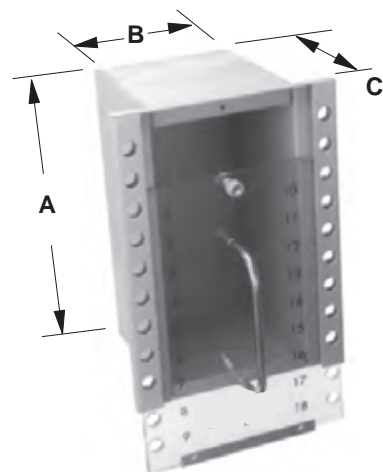
### Features

- High strength yellow molded polymer hook to secure canvas tools tray to aerial lift bucket
- Fits most manufacturer's tool buckets

### Material

Polymer

Catalog Number	A	B	Color	Weight Ea (lbs)
24-01	2	---	Yellow	0.30
24-11	3	1 3/8		0.35



## Safety Box

### Features

- Used to store keys and locks
- Captive screw fixture

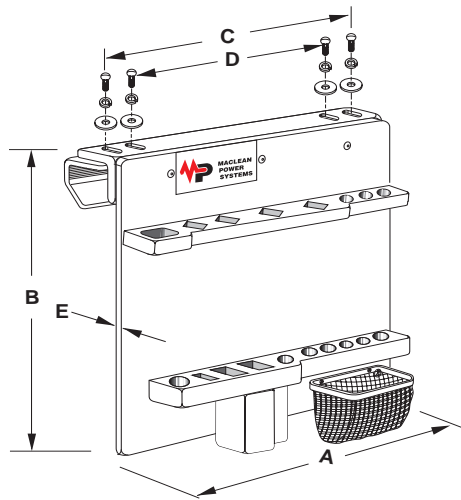
### Material

Box: Grey 18 gage steel  
 Cover: Transparent polycarbonate  
 Handle: Chromed Steel

Catalog Number	A	B	C	No. of Holes	Weight Ea (lbs)
HC-10010	10	56	6	18	4.4



# Tool Board, Adapters, and Anchor Rod Pulling Eye



## Tool Board

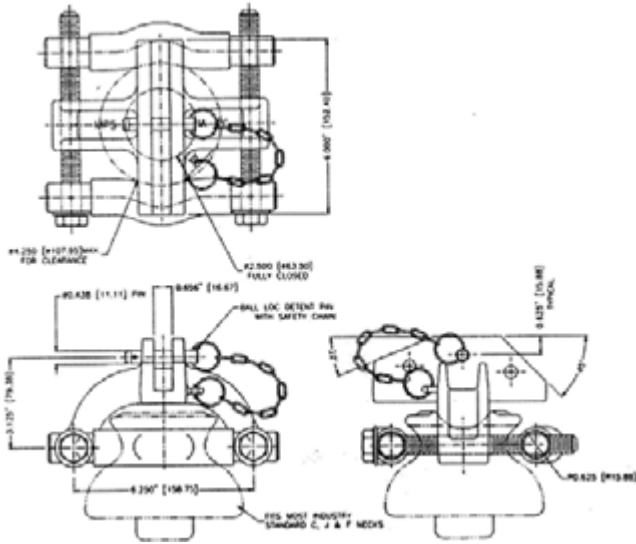
### Features

- For mounting on buckets with or without liner
- Can hold up to 13 tools and pouch - can accommodate a variety of nuts, bolts, and drill bits
- Fixed installation ensures stability in bucket
- Polyurethane grooves permit an excellent tool retaining force and an easy retrieval

### Material

Board: Grey painted fiberglass  
 Racks: Black polyurethane  
 Pouch: Nylon  
 Hardware: Stainless steel

Catalog Number	A	B	C	D	E	Weight Ea (lbs)
01-P-001	18	21	16 1/2	12 1/2	3/16	10



## Adapters

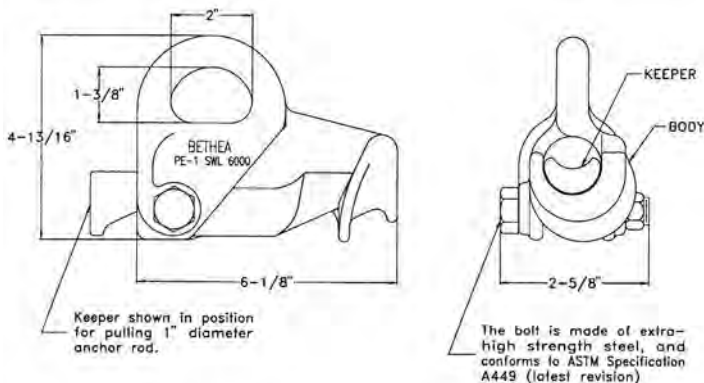
### Features

- 5 position block attachment - 0, 22, 45, 68, and 90 degrees
- Fits most industry standard C, J, & F neck insulators

### Material

Clamping Bars: Aluminum alloy  
 Fasteners and Pins: Steel cadmium or electro-zinc plated

Catalog Number	Safe Working Load (lbs)	Ultimate Working Load	Weight Ea (lbs)
IA-2C	2500	7500	5.7



## Anchor Rod Pulling Eye

### Material

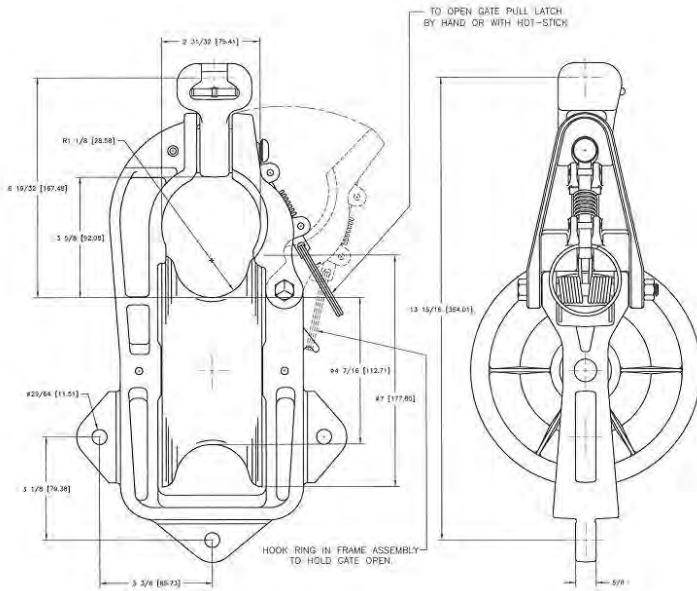
Ductile iron yellow epoxy paint finish

Catalog Number	Safe Working Load (lbs)	Ultimate Working Load	Weight Ea (lbs)
PE-1	6000	30000	5





# Stringing Equipment



## Blocks, Distribution Features

- "Quick opening gate" allows for spring loaded gate closure
- Versatile mounting-mounts in 5 different angles

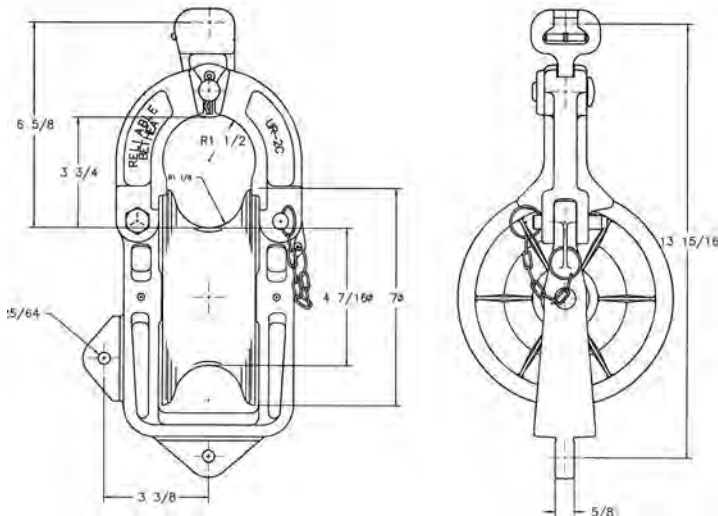
## Materials

A356 Aluminum Alloy-Heat treated to T6 condition

Catalog Number	Sheave Lining	Max Cond. Dia.	Safe Working Load	Ultimate Strength		Weight Ea (lbs)
			Suspended or Lug Mounted	Suspended (lbs)	Lug Mounted (lbs)	
UR-2B	Machined	2 in.	2500	12000	7500	9.4
UR-2B-UL	Urethane					

### Notes:

1) Optional Fittings: "-C" for CB-55 Clevis Ball, "-Y" for YCB-65A Y-clevis ball, "-H" for BH-ball hook, "-SH" for SHB-1 safety ball hook, and "-OE" for OEB-55 oval eye ball



## Blocks, Distribution Features

- Gate closed by use of a ball loc pin
- Versatile mounting-mounts in 5 different angles

Catalog Number	Sheave Lining	Max Cond. Dia.	Safe Working Load	Ultimate Strength		Weight Ea (lbs)
			Suspended or Lug Mounted	Suspended (lbs)	Lug Mounted (lbs)	
UR-2C	Machined	2 in.	2500	12000	7500	7.8
UR-2C-UL	Urethane					

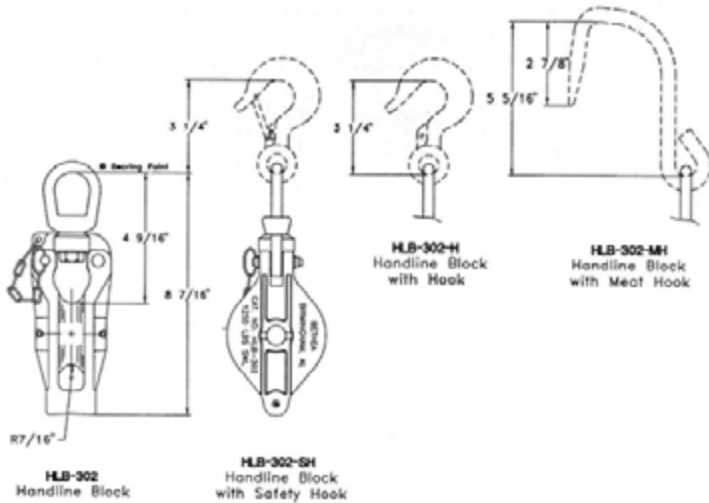
### Notes:

1) Optional Fittings: "-C" for CB-55 Clevis Ball, "-Y" for YCB-65A Y-clevis ball, "-H" for BH-Lball hook, "-SH" for SHB-1 safety ball hook, and "-OE" for OEB-55 oval eye ball





# Stringing Equipment



## Blocks, Handline

### Features

- Light weight design
- 5/16" pin closure on gate

### Material

A356 Aluminum Alloy-Heat treated to T6 condition

Catalog Number	Sheave Dia. (in)	Attachment	Ultimate Strength	Weight Ea (lbs)
HLB-302	3	Swivel Eye	1250	31
HLB-302-H		Hook		37
HLB-302-MH		Meat Hook		
HLB-302-SH		Safety Hook		

### Notes:

1) For closed head series, add "C". Example: HLB-302C-SH



## Blocks, Transmission

### Features

- Two frame designs available: helicopter style or full frame traveler
- Optional boom for helicopter frame blocks

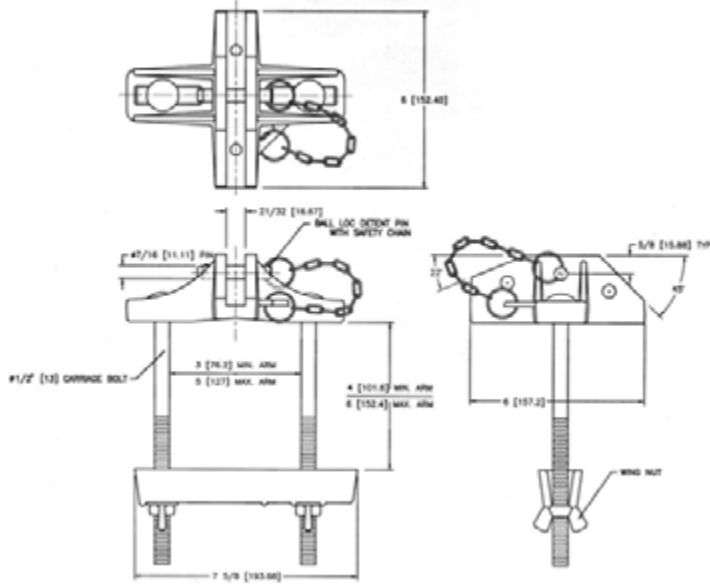
### Materials

Aluminum (frame and sheave)  
Urethane Lining

Catalog Number	Sheave Lining	Sheave ID	Sheave OD	Frame Type	Weight Ea (lbs)
52-34/30-UL	Urethane	30	34	Full	69.0
62-34/30-UL				Helicopter	67.0
52-28/24-UL		24	28	Full	48.3
62-28/24-UL				Helicopter	46.5
52-22/18-UL		18	22	Full	43.5
62-22/18-UL				Helicopter	41.5
52-16/14-UL		14	16	Full	26.3
62-16/14-UL				Helicopter	25.0
52-12/10-UL		10	12	Full	22.0
62-12/10-UL				Helicopter	20.5



# Stringing Equipment



## Brackets, Crossarm

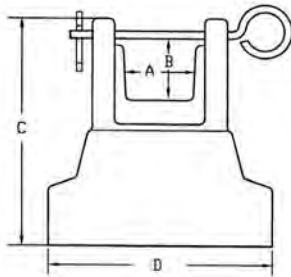
### Features

- Bracket allows for 5 block positions: 0, 22, 45, 68, and 90°

### Material

Frame: A356T6 Aluminum Alloy  
Fasteners and Pins: Steel, cadmium, or electro zinc plated

Catalog Number	Safe Working Load	Ultimate Working Load	Max Xarm Dim	Weight Ea (lbs)
XA-1	2500	7500	6" high x 5" wide	3.25



S-823-SR



S-823 (shown) & S-823SI

## Pin Insulators

### Features

- A protective, polymeric device used for installing the wire for distribution class applications at voltages below 35kV
- Three designs available that can be mounted on standard NEMA pins with 1" acme threads

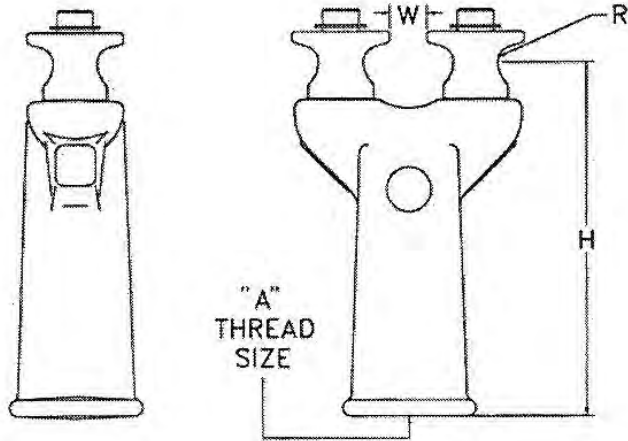
### Material

Polymer construction

Catalog Number	A	B	C	D	Dry Arc (in)	CIF Dry (kV)	DIF Wet	Dielectric Strength (V)	Leakage Distance	Weight Ea (lbs)
S-823	1.75	2.50	7.00	6.25	6.12	94	82	580	16.0	3
S-823SI	2.50	2.90			5.75	87	76		15.5	3.6
S-823SR	2.87	1.87			6.75	104	91		17.0	3.5



# Stringing Equipment



## Rollers

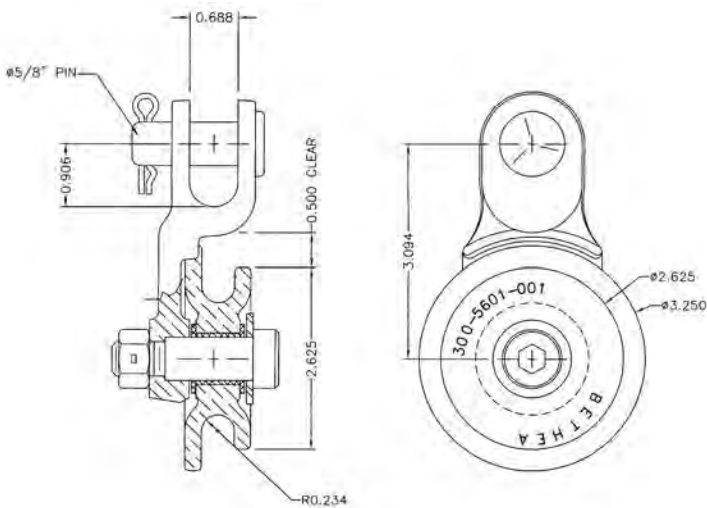
### Features REA-1 & REA-2

- Rollers are designed for mounting on type A angle pins and 1 3/8" lead threads respectively
- Economic tool for stringing and sagging of conductor on runs up to 15°

### Material

Body: Ductile iron  
Rollers: Steel alloy

Catalog Number	Dimensions				Ultimate Strength	Weight Ea (lbs)
	A	H	W	R		
REA-1	1	5 5/16	7/16	1/4	2500 lbs	3.15 lbs
REA-2	1 3/8	5 5/16	17/32	1/4	2500 LBS	3.15 LBS



## Rollers

### Features REA-3

- Suspension type angle roller designed to mount with a 5/8" bolt or clevis pin
- Roller is used for stringing and sagging conductor through angles of 60°

### Material

- Ductile Iron

Catalog Number	Ultimate Strength	Weight
REA-3	3000 lbs	3.5 lbs



# Index

Catalog Number	Description	Page	Catalog Number	Description	Page
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2600	Opaque Class "K" Red Jacket Cable, Excelene	GR-6	01-P-068	Pole Ladder Rest	GR-25
2601	Opaque Class "M" Jacket Cable, Carol	GR-6	01-P-068-W	Pole Ladder Rest	GR-25
2602	Opaque Class "K" Red Jacket Cable, Excelene	GR-6	01-P-072-36	Insulated Sticks & Accessories	GR-23
2603	Opaque Class "M" Jacket Cable, Carol	GR-6	01-P-072-48	Insulated Sticks & Accessories	GR-23
2604	Opaque Class "K" Red Jacket Cable, Excelene	GR-6	01-PM-044	Insulated Sticks & Accessories	GR-23
2605	Opaque Class "M" Jacket Cable, Carol	GR-6	01-PM-060	Spring Buckle Strap	GR-17
2607	Carolprewe Silicone Jacket Cable	GR-6	03-M-006	Grounding Ball Studs	GR-12
2609	Opaque Class "K" Red Jacket Cable, Excelene	GR-6	03-M-006-0.5	Grounding Ball Studs	GR-12
2611	Carolprewe Silicone Jacket Cable	GR-6	03-M-006-1	Grounding Ball Studs	GR-12
9055	Pulling Hooks	GR-20	03-M-010	Grounding Studs and Terminals	GR-14
9062	Pulling Hooks	GR-20	03-M-015	Grounding Studs and Terminals	GR-14
25230	Transparent Silicone Jacket Cable	GR-6	03-M-016	Grounding Studs and Terminals	GR-14
90606	Transparent Silicone Jacket Cable	GR-6	03-M-016-2/0	Grounding Studs and Terminals	GR-14
133007	Temporary Grounding Rod	GR-11	03-M-017-25	Grounding Connector for Conductor or Tube	GR-15
01-C-025-25	Grounding Assembly Carrying Bag	GR-16	03-M-018-25	Grounding Connector for Conductor or Tube	GR-15
01-M-034	C-Clamp, Distribution	GR-7	03-M-019-25	Grounding Connector for Conductor or Tube	GR-15
01-M-037	C-Clamp, Distribution	GR-7	03-M-020-25	Grounding Connector for Conductor or Tube	GR-15
01-M-038-2/0	Ferrules	GR-5	03-M-021-25	Grounding Connector for Conductor or Tube	GR-15
01-M-038-350	Ferrules	GR-5	03-M-022-25	Grounding Connector for Conductor or Tube	GR-15
01-M-038-35-2	Ferrules	GR-5	03-M-023-25	Grounding Connector for Conductor or Tube	GR-15
01-M-038-35-50-1/0	Ferrules	GR-5	03-M-026	Grounding Ball Studs	GR-12
01-M-038-4/0	Ferrules	GR-5	03-M-026-0.5	Grounding Ball Studs	GR-12
01-M-038-500	Ferrules	GR-5	03-M-026-1	Grounding Ball Studs	GR-12
01-M-044	Universal Grounding Clamp - 2" IPS 'C' Clamp	GR-9	03-M-027	Grounding Ball Studs	GR-12
01-M-044H	Universal Grounding Clamp - 2" IPS 'C' Clamp	GR-9	03-M-027-0.5	Grounding Ball Studs	GR-12
01-M-051	Grounding Clamp for 2" to 4" Tubes or Bars	GR-9	03-M-027-1	Grounding Ball Studs	GR-12
01-M-052	Grounding Clamp for 2" to 4" Tubes or Bars	GR-9	1/01050STRBCGRD	Opaque Class "K" Yellow Jacket Cable	GR-6
01-M-053	Grounding Clamp for 2" to 4" Tubes or Bars	GR-9	2/01323STRBCGRD	Opaque Class "K" Yellow Jacket Cable	GR-6
01-P-001	Tool Board	GR-26	2109-30-4/0	Transparent Silicone Jacket Cable	GR-6
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01-P-048-1.5	Insulated Sticks & Accessories	GR-24	52-22/18-UL	Blocks, Transmission	GR-28
01-P-050	Insulated Sticks & Accessories	GR-24	52-28/24-UL	Blocks, Transmission	GR-28
01-P-058-4	Hot Stick Carriers, Boom Mounted	GR-23	52-34/30-UL	Blocks, Transmission	GR-28
01-P-062-1.9	Holding Accessories	GR-22	62-12/10-UL	Blocks, Transmission	GR-28
01-P-064	Insulated Protective Cap	GR-13	62-16/14-UL	Blocks, Transmission	GR-28
			62-22/18-UL	Blocks, Transmission	GR-28
			62-28/24-UL	Blocks, Transmission	GR-28



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HC-10015	Ball Stud Clamp, Distribution	GR-8	HC-10136-150	Reels and Tape	GR-19
HC-10015A	Ball Stud Clamp, Distribution	GR-8	HC-10137	Posts and Cones	GR-19
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HC-10019-25	Grounding Connector for Conductor or Tube	GR-15	HC-10335	Holding Accessories	GR-22
HC-10020-25	Grounding Connector for Conductor or Tube	GR-15	HC-30005-1-25	Grounding Connector for Tube	GR-14
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HC-10041	Universal Clamp, Transmission	GR-8	HC-30006-2-25	Grounding Connector for Tube	GR-14
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HC-10046	Flags	GR-18	HC-30008	Grounding Connector for Tube	GR-14
HC-10046-R	Flags	GR-18	HC-30009	Grounding Connector for Tube	GR-14
HC-10046-R	Flags	GR-18	HC-30012	Grounding Ball Studs	GR-12
HC-10046-V	Flags	GR-18	HC-30012-0.5	Grounding Ball Studs	GR-12
HC-10046-V	Flags	GR-18	HC-30012-1	Grounding Ball Studs	GR-12
HC-10047	Flags	GR-18	HC-30015	Grounding Ball Studs	GR-12
HC-10047-A	Flags	GR-18	HC-30015-0.5	Grounding Ball Studs	GR-12
HC-10047-R	Flags	GR-18	HC-30015-1	Grounding Ball Studs	GR-12
HC-10047-V	Flags	GR-18	HC-30017	Grounding Plates	GR-16
HC-10062	Posts and Cones	GR-19	HC-30021	Grounding Plates	GR-16
HC-10062-T	Posts and Cones	GR-19	HC-30022	Grounding Plates	GR-16
HC-10063-R	Flags	GR-18	HC-30023-25	Grounding Connector for Conductor or Tube	GR-15
HC-10063-V	Flags	GR-18	HC-30024-25	Grounding Connector for Conductor or Tube	GR-15
HC-10064-R	Flags	GR-18	HC-30024-25-T	Grounding Connector for Conductor or Tube	GR-15
HC-10064-V	Flags	GR-18	HC-30025-20	Ball Stud Grounding Connector	GR-15
HC-10067-1.1	Clear Polymer Heat Shrink Tube	GR-5	HC-30025-25	Ball Stud Grounding Connector	GR-15
HC-10067-1.1-7	Clear Polymer Heat Shrink Tube	GR-5	HC-30025-30	Ball Stud Grounding Connector	GR-15
HC-10067-1.5	Clear Polymer Heat Shrink Tube	GR-5	HC-30028	Grounding Ball Studs	GR-12
HC-10067-1.5L	Clear Polymer Heat Shrink Tube	GR-5	HC-30028-0.5	Grounding Ball Studs	GR-12
HC-10067-2.0	Clear Polymer Heat Shrink Tube	GR-5	HC-30028-1	Grounding Ball Studs	GR-12
HC-10068	Grounding Assemblies	GR-5	HC-30029	Grounding Ball Studs	GR-12
HC-10068-C	Grounding Assemblies	GR-5	HC-30029-0.5	Grounding Ball Studs	GR-12
HC-10081	Skinning Knives	GR-21	HC-30029-1	Grounding Ball Studs	GR-12
Hc-10081-R	Skinning Knives	GR-21	HC-30029-1PVC	PVC Grounding Ball Stud for Support Device	GR-13
HC-10093	Three Way Grounding Block	GR-11	HC-30032-25	Grounding Connector for Conductor or Tube	GR-15
HC-10094	Jumper Cable Carriage Bag	GR-17	HC-30033	Grounding Ball Studs	GR-12
HC-10111	Grounding Cluster Block	GR-11	HC-30036	Grounding Ball Studs	GR-12
HC-10115	Insulated Sticks & Accessories	GR-24	HC-30036-0.5	Grounding Ball Studs	GR-12
HC10115-1	Insulated Sticks & Accessories	GR-24	HC-30036-1	Grounding Ball Studs	GR-12
HC-10120	Non-Slip Wrench	GR-22	HC-30037	Grounding Ball Studs	GR-12
HC-10126	Jumper Support	GR-17	HC-30037-1	Grounding Ball Studs	GR-12
HC-10133	Reels and Tape	GR-19	HC-30050	Grounding Plates	GR-16
HC-10134	Reels and Tape	GR-19			
HC-10135	Reels and Tape	GR-19			

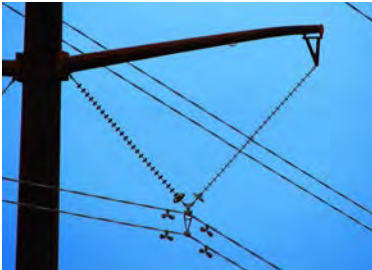


Catalog Number	Description	Page
HC-30051	Grounding Plates	GR-16
HC-30052	Grounding Plates	GR-16
HC-30053	Grounding Plates	GR-16
HC-30054	Grounding Plates	GR-16
HC-30055-20	Grounding Ball Stud for CADWELD Connections	GR-13
HC-30055-25	Grounding Ball Stud for CADWELD Connections	GR-13
HC-30055-30	Grounding Ball Stud for CADWELD Connections	GR-13
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HC-70001R	Ground Structures	GR-18
HCC-477L	Come-A-Long	GR-21
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HLB-302-H	Blocks, Handline	GR-28
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KIT 01-M-038-350	Cable Termination Kits (per each extremity)	GR-5
KIT 01-M-038-35-2	Cable Termination Kits (per each extremity)	GR-5
KIT 01-M-038-4/0	Cable Termination Kits (per each extremity)	GR-5
KIT 01-M-038-500	Cable Termination Kits (per each extremity)	GR-5
KIT 01-M-038-50-1/0	Cable Termination Kits (per each extremity)	GR-5
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REA-2	Rollers	GR-30
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S635	Wildlife Protector	GR-20
S-8	Spacers	GR-20
S-823	Pin Insulators	GR-29
S-823SI	Pin Insulators	GR-29
S-823SR	Pin Insulators	GR-29
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UR-2B-UL	Blocks, Distribution	GR-27
UR-2C	Blocks, Distribution	GR-27
UR-2C-UL	Blocks, Distribution	GR-27
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# Insulator Systems Catalog



MacLean Power Systems offers a complete line of Silicone Polymer Overhead Power Line Insulators covering all applied voltage classes from Distribution Class Insulators to Extra High Voltage transmission applications including 800kVDC. In addition, MPS offers Silicone Polymer Non-Ceramic Insulators for electrical substation applications for both substation post and switching apparatus needs. MacLean Power Systems is a leader in Silicone Polymer Insulator Technology with product installations in over 38 countries world-wide with the capabilities of providing both ANSI and IEC qualified products and systems.

MacLean Power Systems' APEX™ brand of insulator systems serves Transmission Overhead Line applications providing complete assemblies from the tower to the conductor. The complete family of products includes transmission suspension and line posts, transmission insulators and hardware including braced post insulator systems and EHV transmission assemblies, as well as advanced engineering solutions and custom packaging.

APEX™ Insulator Systems provide the highest level of quality in design, manufacturing, and reliability. APEX™ transmission insulators are designed for long-lived reliable service. The APEX™ Silicone Rubber formulation has provided decades of service with superior protection against UV radiation, electrical aging and corona effect. Patented design characteristics such as the Stacked Weathershed configuration and the redundant end-fitting sealing system provide inherent protection against material aging and environmental stresses.

Application engineering expertise is available including design assistance, verification of mechanical performance using state of the art Finite Element Analysis, and electrical modeling capabilities including e-field modeling to verify the effectiveness of corona mitigation design. A complete range of transmission hardware options are available. MPS provides a single catalog number and drawing for each insulator assembly to ensure efficient and accurate engineering and procurement.

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# MacLean Power Systems

Please note that because MacLean Power Systems follows a policy of continuous product improvement, we reserve the right to change specifications and drawings at any time without notice.

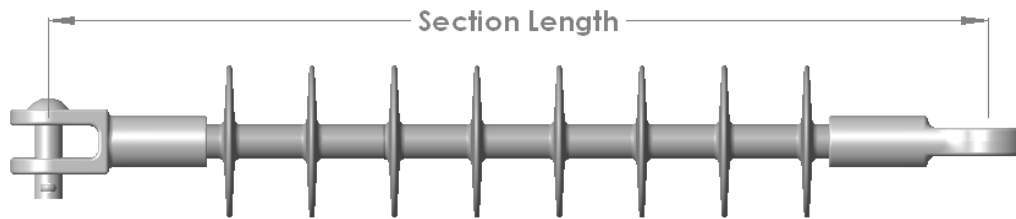
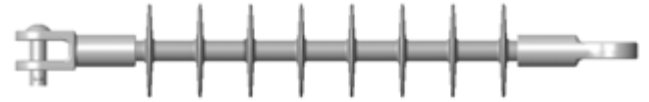
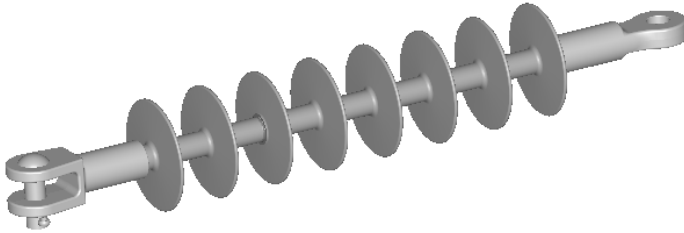




# Distribution Deadend - DS-M Series

## DS-M Series Distribution Deadend Insulators

- Conventional design deadend insulator
- Silicone shed housing is injection molded onto and bonded to the CR rod core
- Ductile iron end fittings are crimped to the fiberglass core in a tightly controlled process that ensures predictable tensile strength
- Unique multi-level sealing process
- Multiple fitting options available



Line Voltage kV	Catalog No.	Section Length in [mm]	Dry Arc in [mm]	Leakage in [mm]	Electrical Flashover (kV)				Weight lbs [kgs]	Quantity	
					60 Hz		CIFO			CTN	Pallet
					Dry	Wet	Pos	Neg			
15	DS-15M	13.0 [330]	7.6 [193]	15.8 [401]	90	65	140	145	2.6 [1.2]	18	432
28	DS-28M	17.0 [432]	11.6 [295]	24.7 [627]	130	100	190	220	2.9 [1.3]	18	324
28/35	DS-25M	18.75 [476]	13.6 [345]	31.5 [800]	150	135	255	265	3.2 [1.4]	18	324
35	DS-35M	22.0 [559]	16.8 [426]	37.6 [954]	170	155	180	290	3.4 [1.5]	18	216

### Notes:

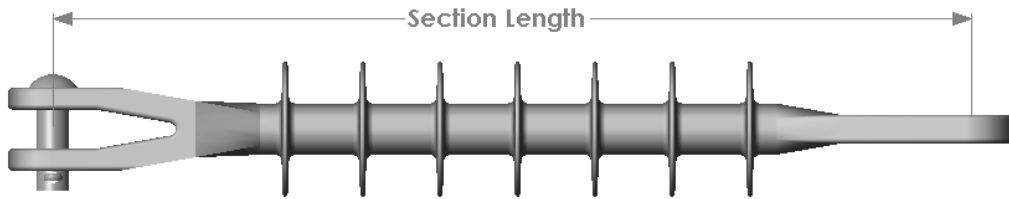
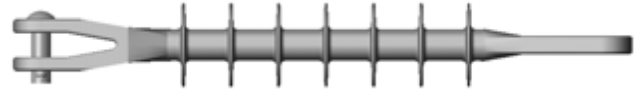
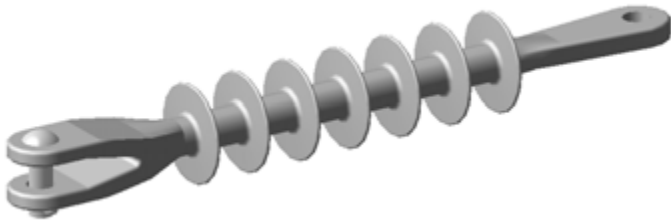
- 1) SML = 15,737 lbs [70 kN]
- 2) RTL = 7,869 lbs [35 kN]
- 3) Maximum Torsional Load = 37 ft/lbs [50 Nm]
- 4) All ratings meet or exceed the requirements of ANSI C29.13 (2000) and LWIWG-01 (96)
- 5) Corrosion Resistant Fiberglass Core / Silicone Housing / ANSI 52-4 Clevis & Tongue End Fittings
- 6) HP Suffix Denotes Hex Pin
- 7) RUS Accepted
- 8) To order special fitting combinations, add 2 character suffix (i.e. DS-XXM-SB (socket / ball) - TT (tongue / tongue))



# Distribution Deadend - Fiberlink

## Fiberlink Distribution Deadend Insulators

- “Wound Fiberglass Core” and metal eyelets make up the basic astructure of this unique insulators.
- Silicone rubber is molded onto the wound core. The lack of metal end fittings result in a greater dry arc distance, which increases electrical performance
- Light weight insulator
- 300 Series Stainless Steel Eyelets



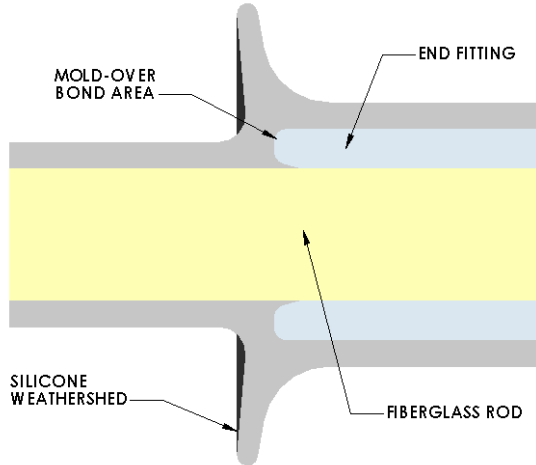
Line Voltage	Catalog No.	Section Length	Leakage	Electrical Flashover (kV)				Weight	Quantity	
				60 Hz		CIFO			CTN	Pallet
kV		in [mm]	in [mm]	Dry	Wet	Pos	Neg	lbs [kgs]		
15	DS-15S	12.5 [318]	15.0 [381]	113	112	202	225	1.2 [0.5]	18	540
28	DS-28S	17.75 [452]	26.0 [660]	177	157	286	357	1.6 [0.7]	18	486
35	DS-35S	22.6 [573]	34.8 [884]	222	199	325	401	2.0 [0.9]	18	342

### Notes:

- 1) SML = 15,000 lbs [66.7 kN]
- 2) RTL = 7,500 lbs [33.4 kN]
- 3) 300 Series Stainless Steel Eyelets
- 4) Galvanized clevis pin
- 5) “-SS” suffix denotes stainless steel clevis pin



# Distribution Line Post



## INJECTION MOLD-OVER WEATHERSHEDS & COVERINGS

To protect the fiberglass rod, the housing is injection molded using high temperature and high pressure to bond Silicone Rubber to the surfaces of both the rod and end fittings. The housing completely encapsulates the fiberglass core to end fitting interface. In addition to providing a complete seal against moisture ingress, the mold-over of the fitting maximize the electrical strike distance.

## HOUSING MATERIAL

**Silicone** - In addition to providing protection against ultraviolet radiation, electrical arcing, and corona effect, silicone exhibits hydrophobic properties. The hydrophobic properties of the silicone provide excellent recovery characteristics to control leakage currents in highly polluted or coastal environments.

MPS silicone rubber formulation has consistently outperformed other silicone formulations in its hydrophobicity, its hydrophobicity recovery rate, and enhanced electrical properties in contaminated environments.

## Catalog Number Definition - Injection Molded Design

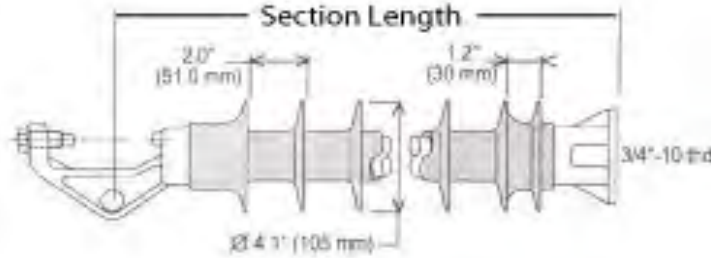
<b>N</b>	<b>P</b>	<b>K</b>	<b>G</b>	<b>10</b>	<b>XB</b>	<b>005</b>	<b>S</b>	<b>0</b>
ANSI Class	Base	Line End Fitting	Base Attachment	Rod Size	Shed Profile	Number of Sheds	Material Choice	Corona Ring Requirement
	<b>P = Fixed</b>	<b>K = Trunnion</b> <b>V = Vertical</b> <b>N = Tie Top</b>	<b>G = Gain Base</b> <b>N = No Base (Stud Mount)</b>	<b>10 = 1.5"</b> <b>20 = 1.75"</b>	<b>XB = Series 10</b> <b>XG = Series 20</b>		<b>S = Silicone</b>	<b>0 = No Ring</b>

"-U" Suffix added to the end of the catalog number designates the addition of a Universal Trunnion Clamp.



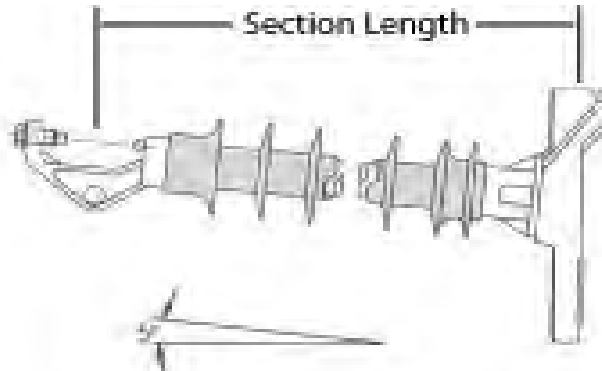
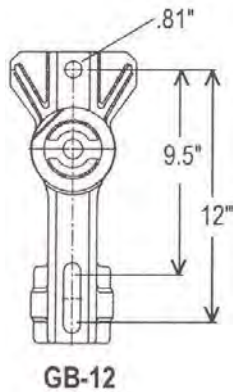
# Distribution Line Post - Series 10 Horizontal

## 10XB Series Line Post Insulators (1.5" Rod)



### Horizontal Trunnion Insulators - Stud Mounting Type

Line Voltage kV	Catalog No.	MDCL lbs [kN]	Section Length in [mm]	Dry Arc in [mm]	Leakage in [mm]	Electrical Flashover (kV)				Weight lbs [kgs]	Standard	
						60 Hz		CIFO			Box Qty	Pallet Qty
15	NPKN10XB003S0	1235 [5.5]	10.9 [277]	7.2 [183]	11.3 [287]	Dry	Wet	Pos	Neg	6.2 [2.8]	3	162
28	NPKN10XB005S0	1235 [5.5]	14.9 [378]	11.2 [284]	18.8 [478]	122	103	208	271	7.1 [3.2]	3	108
35	NPKN10XB006S0	1235 [5.5]	16.9 [429]	13.2 [335]	22.4 [569]	141	122	239	309	7.6 [3.4]	3	108
35	NPKN20XGO09S0	1250 [5.6]	18.0 [457]	14.3 [362]	30.6 [777]	151	131	255	329	10.3 [4.7]	3	108



### Horizontal Trunnion Insulators - With Gain Base: for pole mounted line posts

Line Voltage kV	Catalog No.	MDCL lbs [kN]	Section Length in [mm]	Dry Arc in [mm]	Leakage in [mm]	Weight lbs [kgs]	Standard
							Crate Qty
15	NPKG10XB003S0	1235 [5.5]	12.4 [315]	7.2 [183]	11.3 [287]	13.2 [6.0]	42
28	NPKG10XB005S0	1235 [5.5]	16.4 [417]	11.2 [284]	18.8 [478]	14.1 [6.4]	42
35	NPKG10XB006S0	1235 [5.5]	18.4 [467]	13.2 [335]	22.4 [569]	14.6 [6.6]	42
35	NPKG20XGO09S0	1250 [5.6]	19.4 [493]	14.3 [362]	30.6 [777]	17.33 [7.8]	42

**Notes:**

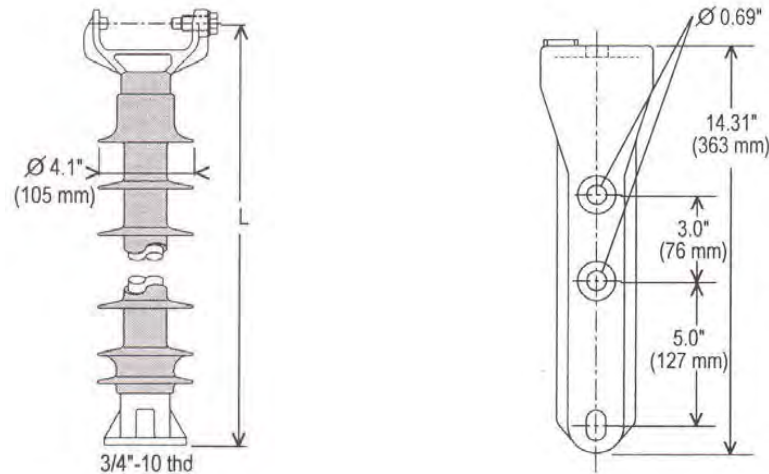
- 1) MDCL = Max. Design Cantilever Load
- 2) To order 1.5" Line Post Insulators, contact your local MPS Sales Representative.
- 3) STL (Specified Tensile Load) - 5,000 lbs [22.2 kN]
- 4) NPKN10XB Series supplied with 3/4" - 10 Stud Base
- 5) NPKG10XB Series supplied with 12" Fixed Gain Base
- 6) S0 = Electrical data is without Corona Ring
- 7) For other ratings or custom insulator designs, contact your local MPS Sales Representative





# Distribution Line Post - Series 10 Vertical

## 10XB Series Line Post Insulators (1.5" Rod)



### Vertical Trunnion Insulators - Stud Mounting Type

Line Voltage	Catalog No.	MDCL	Section Length	Dry Arc	Leakage	Electrical Flashover (kV)				Weight	Standard	
						60 Hz		CIFO			Box Qty	Pallet Qty
kV		lbs [kN]	in [mm]	in [mm]	in [mm]	Dry	Wet	Pos	Neg	lbs [kgs]		
15	NPVN10XB003S0	1235 [5.5]	10.9 [277]	7.2 [183]	11.3 [287]	86	66	146	193	6.1 [2.8]	6	216
28	NPVN10XB005S0	1235 [5.5]	14.9 [378]	11.2 [284]	18.8 [478]	122	103	208	271	7.1 [3.2]	3	162
35	NPVN10XB006S0	1235 [5.5]	16.9 [429]	13.2 [335]	22.4 [569]	141	122	239	309	7.7 [3.5]	3	162
35	NPVN20XGO09S0	1250 [5.6]	18.9 [457]	14.3 [362]	30.6 [787]	151	131	255	329	10.3 [4.7]	3	162

### Vertical Trunnion Insulators - With Vertical Gain Base: for pole mounted line posts

Line Voltage	Catalog No.	MDCL	Section Length	Dry Arc	Leakage	Weight	Standard
							Crate Qty
kV		lbs [kN]	in [mm]	in [mm]	in [mm]	lbs [kgs]	
15	NPVG10XB003S0	1235 [5.5]	25.2 [640]	7.2 [183]	11.3 [287]	14.3 [6.5]	40
28	NPVG10XB005S0	1235 [5.5]	29.2 [742]	11.2 [284]	18.8 [478]	15.3 [6.9]	40
35	NPVG10XB006S0	1235 [5.5]	31.2 [792]	13.2 [335]	22.4 [569]	15.8 [7.2]	40
35	NPVG20XGO09S0	1250 [5.6]	32.3 [820]	14.3 [362]	30.6 [777]	18.4 [8.3]	40

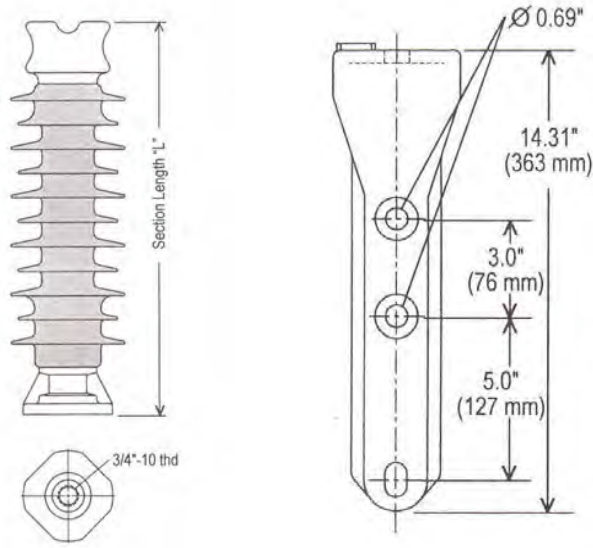
**Notes:**

- 1) MDCL = Max. Design Cantilever Load
- 2) STL (Specified Tensile Load) - 5,000 lbs [22.2 kN]
- 3) NPVN10XB Series supplied with 3/4" - 10 Stud Base
- 4) NPVG10XB Series supplied with vertical base
- 5) S0 = Electrical data is without Corona Ring
- 6) For other ratings or custom insulator designs, contact your local MPS Sales Representative.



# Distribution Line Post - Series 20 F-Neck

20XB Series F-Neck Line Post Insulators (1.75" Rod)



## Tie-Top Insulator / F-Neck Design

Voltage Class				Catalog No.	MDCL	Section Length	Dry Arc	Leakage	Electrical Flashover (kV)				Weight	Standard	
									60 Hz		CIFO			Box Qty	Pallet Qty
25	35	46	69	lbs [kN]	in [mm]	in [mm]	in [mm]	Dry	Wet	Pos	Neg	lbs [kgs]			
				NPNN20XG07S0	1250 [5.6]	12.1 [309]	8.2 [208]	19.9 [505]	95	76	161	213	10.8 [4.9]	3	162
				NPNN20XG09S0	1250 [5.6]	14.3 [363]	11.0 [279]	25.0 [635]	121	101	204	267	11.0 [5.0]	3	162
				NPNN20XG11S0	1250 [5.6]	16.1 [409]	13.0 [330]	30.7 [780]	140	120	236	306	12.3 [5.6]	3	162
				NPNN20XG13S0	1250 [5.6]	18.3 [465]	15.2 [386]	36.5 [927]	160	140	270	347	13.1 [5.9]	3	108
				NPNN20XG15S0	1250 [5.6]	20.2 [513]	17.0 [432]	42.4 [1077]	176	156	298	380	13.8 [6.3]	3	108
				NPNN20XG17S0	1250 [5.6]	22.4 [569]	19.0 [483]	48.2 [1224]	195	174	330	415	14.5 [6.6]	3	72
				NPNN20XG19S0	1250 [5.6]	24.4 [619]	21.0 [533]	54 [1372]	213	192	360	450	15.2 [6.9]	3	72

**Notes:**

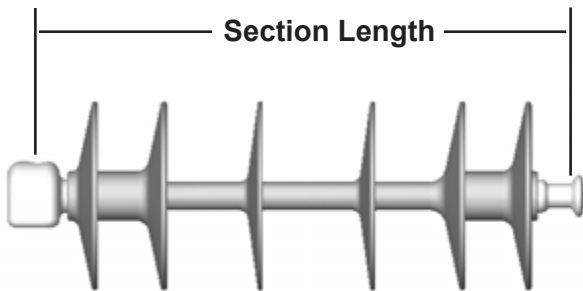
- 1) MDCL = Max. Design Cantilever Load
- 2) To include mounting base add suffix -181 (Horizontal) -182 (Vertical)



# Bell Equivalent Suspension



Insulator Strength Ratings		
	SML	RTL
S1	25 klb	12.5 klb
	112 kN	56 kN



## BE Series 35 kV - 69 kV

MacLean Power Systems' polymer mold-on bell equivalent insulator is targeted at maintenance applications where insulators need to be the same length. Traditionally with insulators 69kV and under, to achieve the same electrical and strength ratings of a porcelain insulator, the polymer insulator needs to be longer, which isn't possible on existing lines.

The strength of the polymer insulator is achieved by crimping metal end fittings to the fiberglass core. These end fittings are approximately the length of one porcelain or glass disk causing that much shorter of a dry arcing distance, which is necessary for the electrical ratings of the insulator. MPS designed the "Bell Equivalent" to overcome this length obstacle by molding the silicone housing over the end fittings, leaving just the socket and ball exposed for the connection to the conductor hardware and tower. By molding over the metal end fittings, the polymer insulator now has the same electrical properties and length as its porcelain counterpart.

Some of the benefits of using MacLean Power Systems' Bell Equivalent insulators over porcelain or glass insulators include:

- Installation right out of the box – eliminates the assembly of the individual bells of a porcelain string
- Silicone housing has 20% more leakage distance – superior performance in contaminated environment
- Corrosion resistant E-glass core – eliminates concern of brittle fracture failure
- Higher mechanical strength – 25k SML v. 15k SML

### Features

- 4, 5, & 6 Bell equivalents
- High strength 25k SML
- Silicone housing
- 20% higher leakage than porcelain
- Corrosion Resistant E-Glass
- ANSI 52-5 socket & ball end fittings
- 82% lighter weight compared to porcelain

### Benefits

- Direct length replacement for bells
- 15k SML for bells
- Hydrophobicity / encapsulation
- Superior performance for contamination
- Eliminates brittle fracture concerns
- Fits standard socket / ball hardware
- Lower installation labor

Catalog Number	# Bells	Section Length		Leakage Distance		Dry Arcing Distance		Dry kV	Wet kV	CIFO+ kV	CIFO- kV	Weight lbs
		in	mm	in	mm	in	mm					
S178023BE04	4	23.0	584	55.1	1400	24.0	610	255	190	420	435	5.6
S178029BE05	5	28.7	730	69.4	1763	29.8	756	315	245	500	510	6.3
S178035BE06	6	34.5	876	84.0	2134	35.4	900	375	305	580	310	7.3

#### Notes:

- 1) BE Series = ideal for maintenance
- 2) Standard Package Quantity = 6 pcs [skid quantity available]
- 3) To order Bell Equivalent Insulators, contact your local MPS sales representative.





## APEX FAMILY OF SOLUTIONS:

- Transmission Suspension
- Transmission Line Posts
- Braced Post Assemblies
- Transmission Assemblies
- EHV Assemblies

# APEX™

INSULATOR SYSTEMS

First in **Innovation.**  
Tops in **Performance.**

MacLean Power System's APEX™ Insulators are trusted by electric utilities and operators of electrical transmission infrastructure around the world to deliver proven performance and long, trouble-free service. In fact, no other silicone transmission insulator system available today can match APEX™ for its innovative features, decades of service life and extensive Extra High Voltage experience.

APEX™ Transmission Insulator Systems include transmission suspension and line post insulators, transmission insulators and hardware assemblies including braced post assemblies and extra high voltage assemblies, and engineering solutions and custom packaging. APEX™ insulator Systems offer complete assemblies from the tower to the conductor for applications at sub-transmission voltages to EHV including 800KVDC. In addition our applications experts can help you select the most optimal and cost effective design for your application. APEX™ applications engineers utilize the latest in modeling technology to analyze your insulator application for optimum performance including state of the art braced post load curve development and electric field modeling.



What makes APEX™ tops in performance:

### Reliability- long-established success:

- 13 million units in service since 1984
- Same proprietary silicone formulation for 25 years
- Field tested more than 25 years
- 3.8 million units installed at HV and EHV levels
- Consistently outperforms other silicone formulations for:
  - Hydrophobicity
  - Hydrophobic recovery rate
  - Enhanced containment

### Innovation- a long history of industry firsts:

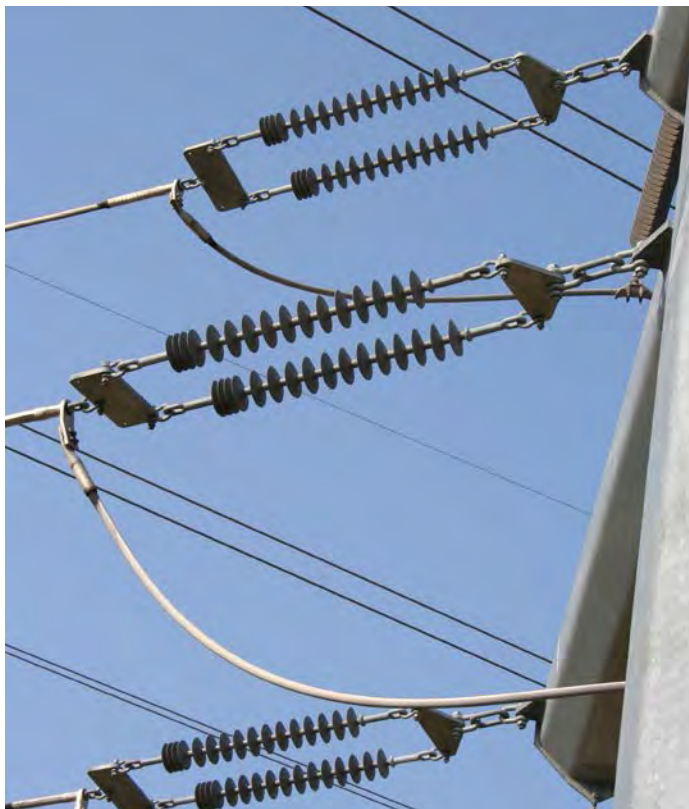
- 1984: MPS began manufacture of silicone non-ceramic insulators
- 1994: Patented the split corona ring design
- 1997: First to offer a redundant sealing system
- 1999: First U.S. supplier to offer boron-free CR E-glass
- 2001: Introduced patented stacked shed design

### Support- meeting each customer's unique needs:

- Complete insulator assemblies
- Highest level of technical support
- Custom packaging

### Engineering- exceeding industry standards:

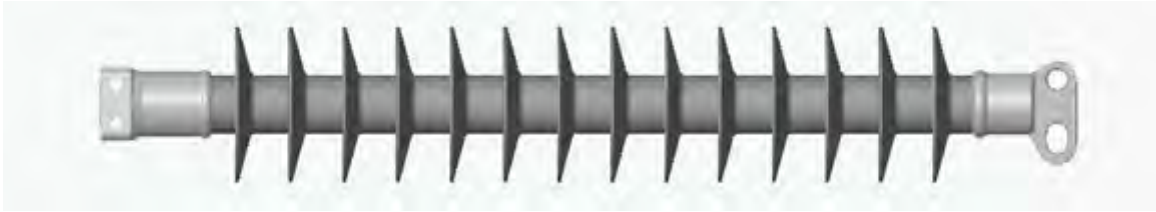
- Design enhancements
- Cost & lead-time saving alternatives
- Mechanical performance review
- Electrical capability verification
- E-field modeling







MPS can supply silicone line post insulators using one of two efficient manufacturing processes to satisfy the various needs of the market place. Process #1 is an injection molded process that produces molded line posts, while process #2 uses the extruded assembly process that produces modular line posts. Both use the same proven MPS Silicone Formulation, E-Glass Core, end fittings, and PST Sealing system.



## Molded Line Posts

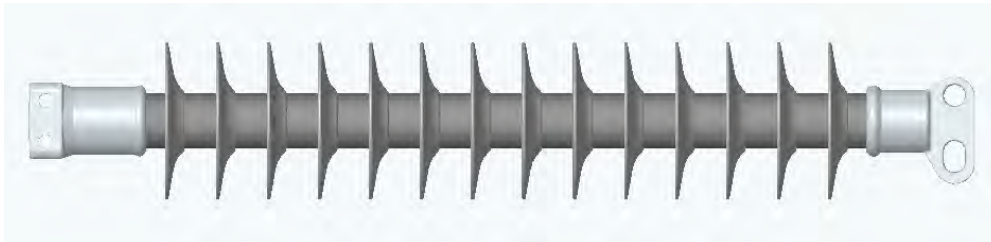
The Molded posts are standard products that are ideal for post applications from 69kV to 161kV system voltages. The silicone housing is injection molded, using high temperature and high pressure injection, onto the FRP rod. The end fittings are crimped onto the molded sub-assembly using the MPS “P-S-T” triple seal to prevent moisture ingress to the core.

### Features

- Molded Silicone Housing
- Volume Production / Stock
- Standard Designs
- Fixed Length & Leakage

### Molded Post Series

- 20XG Series – 1.75” Rod
- 30XH Series – 2.5” Rod
- 40XV Series – 3.5” Rod



## Modular Line Posts

The Modular posts are custom products that are ideal for special applications (high leakage), for applications 230kV and above, and also as a back-up to the molded standard products. The “Modular” design line post insulator offers the unique ability to custom design for any application, with the flexibility to produce custom section lengths (in 1” increments) and leakage distances. The silicone rubber is extruded onto the FRP to produce a seamless concentric sheath. The sheds are assembled and vulcanized to the sheath as a secondary process. Variable shed count and spacing is used to provide custom leakage distances, or leakage in accordance to the IEC60815 Recommendation for Polluted Areas.

### Features

- Extruded Seamless Sheath/ Assembled Sheds
- Manufactured to Order
- Custom Designs
- Variable Length & Leakage
- 69kV – 765kV [EHV]

### Modular Post Series

- H1 Series – 2.0” Rod
- H2 Series – 2.5” Rod
- H3 Series – 3.0” Rod





High voltages can result in unwanted noise (RIV) and corona. To minimize the effects of corona, corona rings are applied to one or both ends of the insulator (attached onto the end fittings). Typically, for system voltages 230 kV and above, a corona ring or combination of rings is necessary. However, some application may require rings are lower system voltages. Refer to the Corona Ring section of the Application Guide for detailed information or contact the factory.

### Recommended Corona Ring Application

Class	End Fitting	138 kV	161 kV	230 kV	345 kV	500 kV
H1 & H2 30XH	Line End	None	None	6"	12"	12"
	Tower End	None	None	None	None	12"
H3 40XH	Line End	None	None	None	12"	12"
	Tower End	None	None	None	None	12"

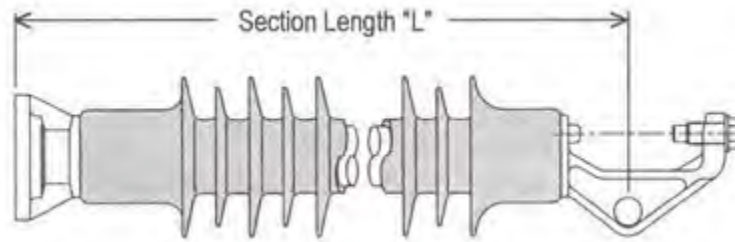


**6" Corona Ring**



**12" Corona Ring**

For insulators 230 kV and above, MPS recommends use of Corona Rings. The Application Table above depicts typical coronaring usage on MPS suspension Insulators. For corona ring usage on special applications, environments, and elevations, please contact MPS.

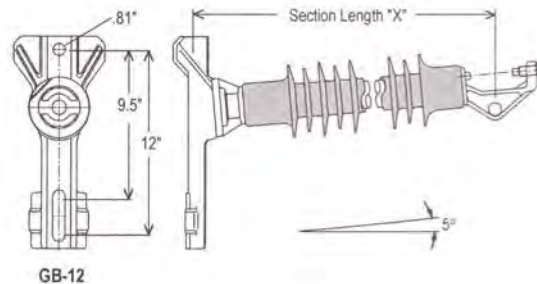


## 1.75" Horizontal Trunnion - Stud Mount

Line Voltage (kV)	Catalog No.	Tap	MDCL	Section Length	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
							60 Hz		CIFO		
46	69		lbs [kN]	in [mm]	in [mm]	in [mm]	Dry	Wet	Pos	Neg	lbs [kgs]
	NPKN20XGO09S0	3/4"	1250 [5.6]	18.0 [457]	14.3 [363]	30.6 [777]	151	131	255	329	10.3 [4.7]
	NPKN20XGO13S0	3/4"	1250 [5.6]	22.0 [559]	18.3 [465]	42.3 [1074]	188	168	318	403	11.3 [5.1]
	NPKN20XGO17S0	7/8"	1200 [5.3]	26.0 [660]	22.3 [566]	54.0 [1372]	224	203	381	472	13.4 [6.1]
	NPKN20XGM21S0	7/8"	1200 [5.3]	26.0 [660]	22.3 [566]	59.4 [1509]	221	210	392	484	13.7 [6.2]
	NPKN20XGM25S0	7/8"	921 [4.1]	30.0 [762]	27.0 [686]	71.1 [1806]	267	2445	455	550	15.6 [7.1]

**Notes:**

- 1) STL (Specified Tensile Load) - 5,000 lbs [22.2 kN]
- 2) NPKN20XGO17S0, M21S0, and M25S0 supplied with 7/8"-9 Stud Base  
For 3/4"-10 Stud Base add suffix "-101" [NPKN20XGO17S0-101]
- 3) S0 = Electrical data is without Corona Ring
- 4) For other ratings or custom insulator designs, contact your local MPS Sales Representative

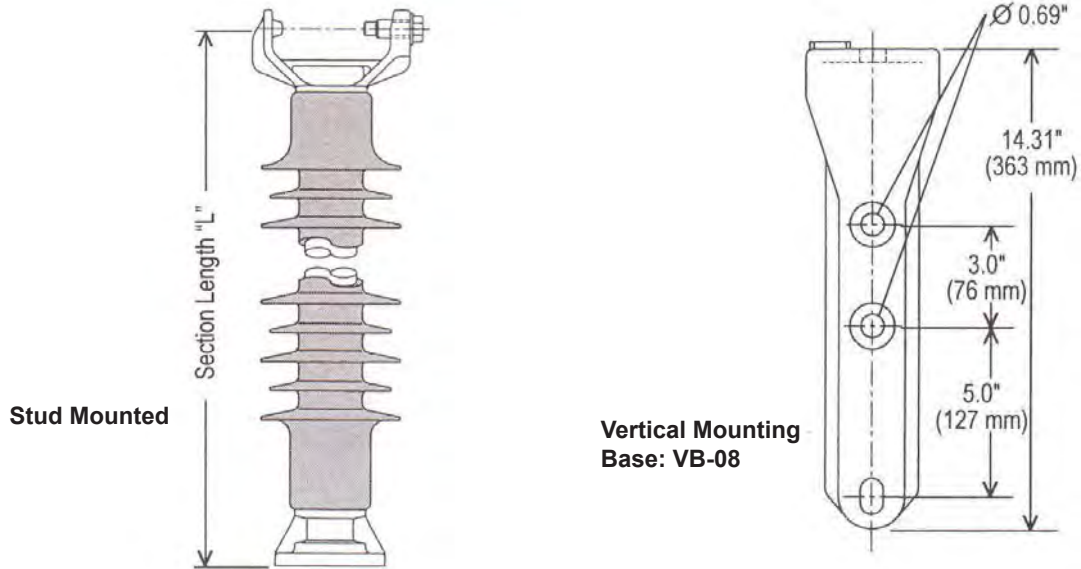


## 1.75" Horizontal Trunnion - Gain Base

Line Voltage (kV)	Catalog No.	MDCL	Section Length	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
						60 Hz		CIFO		
46	69	lbs [kN]	in [mm]	in [mm]	in [mm]	Dry	Wet	Pos	Neg	lbs [kgs]
	NPKG20XGO09S0	1250 [5.6]	19.4 [493]	14.3 [363]	30.6 [777]	151	131	255	329	17.3 [7.8]
	NPKG20XGO13S0	1250 [5.6]	23.4 [594]	18.3 [465]	42.3 [1074]	188	168	318	403	18.8 [8.5]
	NPKG20XGO17S0	1250 [5.6]	27.4 [696]	22.3 [566]	54.0 [1372]	224	203	381	472	20.3 [9.2]
	NPKG20XGM21S0	1250 [5.6]	27.4 [696]	22.3 [566]	59.4 [1509]	221	210	392	484	20.7 [9.4]
	NPKG20XGM25S0	921 [4.1]	31.4 [798]	27.0 [686]	71.1 [1806]	267	2445	455	550	22.3 [10.1]

**Notes:**

- 1) STL (Specified Tensile Load) - 5,000 lbs [22.2 kN]
- 2) NPKG Series supplied with 12" Fixed Gain Base
- 3) S0 = Electrical data is without Corona Ring
- 4) For other ratings or custom insulator designs, contact your local MPS Sales Representative



### 1.75" Vertical Trunnion - Stud Base

Line Voltage (kV)	Catalog No.	MDCL	Section Length	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
						60 Hz		CIFO		
46   69		lbs [kN]	in [mm]	in [mm]	in [mm]	Dry	Wet	Pos	Neg	lbs [kgs]
	NPVN20XGO09S0	1250 [5.6]	18.0 [457]	14.3 [363]	30.6 [777]	151	131	255	329	10.3 [4.7]
	NPVN20XGO13S0	1250 [5.6]	22.0 [559]	18.3 [465]	42.3 [1074]	188	168	318	403	11.3 [5.1]
	NPVN20XGO17S0	1200 [5.3]	26.0 [660]	22.3 [566]	54.0 [1372]	224	203	381	472	13.4 [6.1]
	NPVN20XGM21S0	1200 [5.3]	26.0 [660]	22.3 [566]	59.4 [1509]	221	210	392	484	14.2 [6.4]
	NPVN20XGM25S0	921 [4.1]	30.0 [762]	27.0 [686]	71.1 [1806]	267	2445	455	550	15.6 [7.1]

- Notes:
- 1) STL (Specified Tensile Load) - 5,000 lbs [22.2 kN]
  - 2) NPVN20XGO17S0, M21S0, and M25S0 supplied with 7/8"-9 Stud Base  
For 3/4"-10 Stud Base add suffix "-103" [NPVN20XGO17S0-103]
  - 3) S0 = Electrical data is without Corona Ring
  - 4) For F-Neck Series see page IN-8
  - 5) For other ratings or custom insulator designs, contact your local MPS Sales Representative

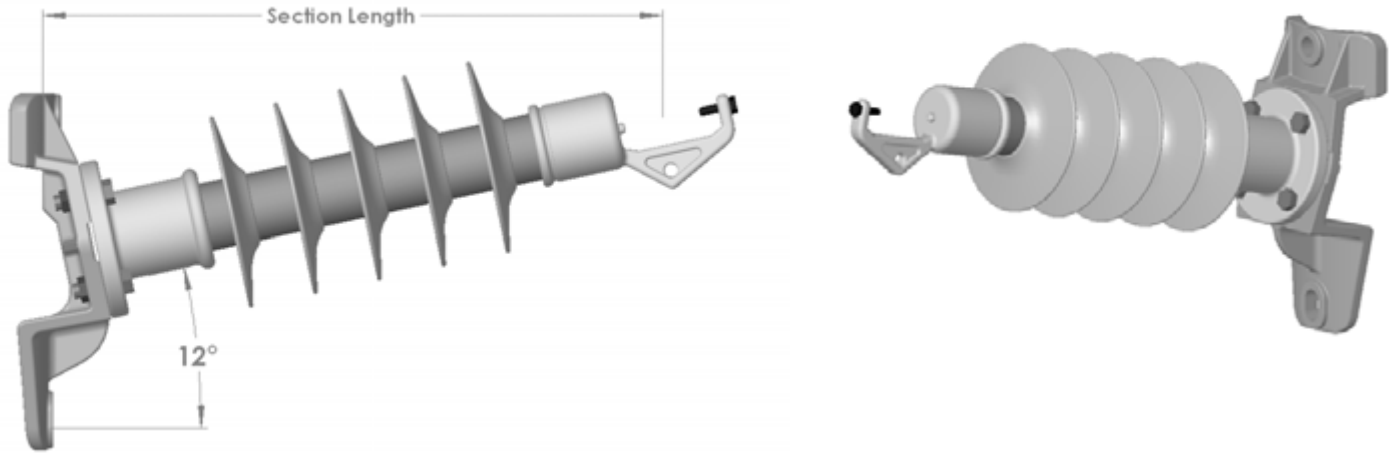
### 1.75" Vertical Trunnion - Gain Base

Line Voltage (kV)	Catalog No.	MDCL	Section Length	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
						60 Hz		CIFO		
46   69		lbs [kN]	in [mm]	in [mm]	in [mm]	Dry	Wet	Pos	Neg	lbs [kgs]
	NPVG20XGO09S0	1250 [5.6]	18.0 [457]	14.3 [363]	30.6 [777]	151	131	255	329	17.8 [8.1]
	NPVG20XGO13S0	1250 [5.6]	22.0 [559]	18.3 [465]	42.3 [1074]	188	168	318	403	18.8 [8.5]
	NPVG20XGO17S0	1250 [5.6]	26.0 [660]	22.3 [566]	54.0 [1372]	224	203	381	472	20.3 [9.2]
	NPVG20XGM21S0	1250 [5.6]	26.0 [660]	22.3 [566]	59.4 [1509]	221	210	392	484	20.7 [9.4]
	NPVG20XGM25S0	921 [4.1]	30.0 [762]	27.0 [686]	71.1 [1806]	267	2445	455	550	22.3 [10.1]

- Notes:
- 1) STL (Specified Tensile Load) - 5,000 lbs [22.2 kN]
  - 2) NPVG Series supplied with Vertical Gain Base
  - 3) S0 = Electrical data is without Corona Ring
  - 4) For other ratings or custom insulator designs, contact your local MPS Sales Representative



# Transmission Line Post - H1C2 Series



**H1C2 Series Modular Line Post Insulators [2.0" Rod]**

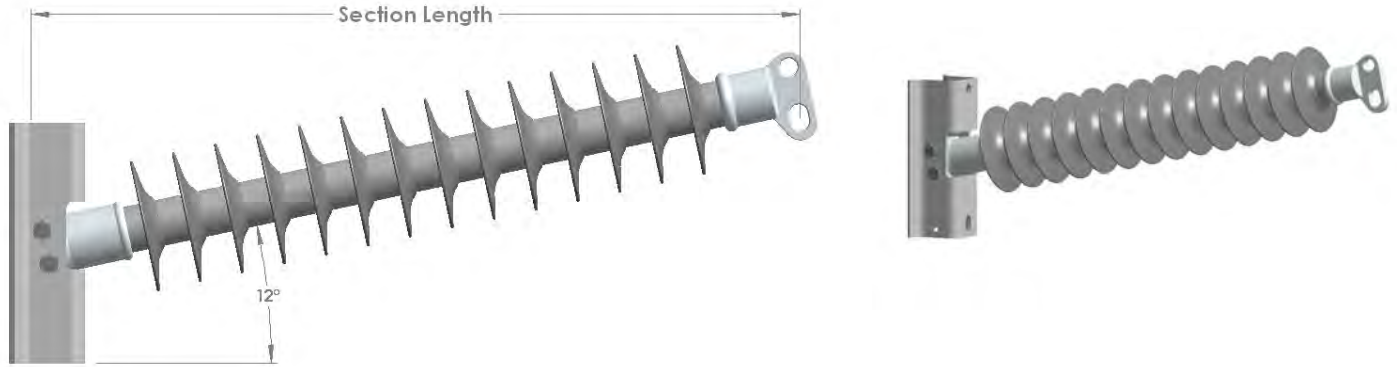
Line Voltage (kV)					Catalog No.	MDCL	Section Length	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
46	69	115	138	161						60 Hz		CIFO		
										Dry	Wet	Pos	Neg	
					lbs [kN]	in [mm]	in [mm]	in [mm]					lbs [kgs]	
					H1C2021FX01	2500 [11.1]	21.0 [533]	13.2 [335]	26.0 [660]	141	122	239	309	33.9 [15.4]
					H1C2021FX02			36.0 [914]					35.5 [16.1]	
					H1C2026FX01	1983 [8.8]	26.0 [660]	18.3 [465]	36.2 [919]	188	168	319	403	36.0 [16.3]
					H1C2026FX02			46.2 [1173]					37.6 [17.1]	
					H1C2030FX01	1656 [7.4]	30.0 [762]	22.4 [569]	50.3 [1278]	226	204	383	474	38.6 [17.5]
					H1C2030FX02			60.3 [1532]					40.2 [18.2]	
					H1C2034FX01	1329 [5.9]	34.0 [864]	27.0 [586]	44.8 [1138]	267	245	455	549	36.8 [16.7]
					H1C2034FX02			74.8 [1900]					41.7 [18.9]	
					H1C2037FX01	1276 [5.7]	37.0 [940]	29.6 [752]	62.4 [1585]	291	267	496	591	41.1 [18.6]
					H1C2037FX02			77.4 [1966]					43.6 [19.8]	
					H1C2040FX01	1152 [5.1]	40.0 [1016]	32.6 [828]	70.5 [1791]	318	293	545	638	42.7 [19.4]
					H1C2040FX02			90.9 [2309]					45.9 [20.8]	
					H1C2044FX01	1041 [4.6]	44.0 [1118]	36.7 [932]	104.6 [2657]	355	328	609	697	48.5 [22.0]
					H1C2044FX02			139.6 [3546]					54.2 [24.6]	
					H1C2049FX01	912 [4.1]	49.0 [1245]	41.8 [1062]	104.7 [2659]	401	371	691	767	49.0 [22.2]
					H1C2049FX02			149.7 [3802]					56.3 [25.5]	
					H1C2054FX01	821 [3.7]	54.0 [1372]	46.9 [1191]	94.8 [2408]	446	413	772	833	7.8 [21.7]
					H1C2054FX02			144.8 [3678]					55.9 [25.4]	
					H1C2060FX01	728 [3.2]	60.0 [1524]	53.1 [1349]	115.9 [2944]	500	462	869	915	51.7 [23.5]
					H1C2060FX02			165.9 [4214]					59.8 [27.1]	

**Notes:**

- 1) STL = (Specified Tensile Load) - 5,000 lbs [22.2 kN]
- 2) H1C2 Series supplied with standard Fixed Gain Base
- 3) For Drop Tongue end fitting, change the "2" in H1C2... to "1" = H1C2... [Drop Tongue STL = 7000 lbs]
- 4) FX - Electrical data is without Corona Ring



# Transmission Line Post - H191 Series



**H191 Series Modular Line Post Insulators [2.0" Rod]**

Line Voltage (kV)					Catalog No.	MDCL	Section Length	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
										60 Hz		CIFO		
46	69	115	138	161		lbs [kN]	in [mm]	in [mm]	in [mm]	Dry	Wet	Pos	Neg	lbs [kgs]
█	█	█	█	█	H191024FX01	2102 [9.3]	24.0 [610]	17.4 [442]	30.2 [767]	180	160	304	386	38.4 [17.4]
					H191024FX02			45.2 [1148]	40.8 [18.5]					
█	█	█	█	█	H191030FX01	1607 [7.1]	30.0 [762]	23.5 [597]	46.4 [1179]	236	214	400	493	41.5 [18.8]
					H191030FX02			66.4 [1687]	44.7 [20.3]					
█	█	█	█	█	H191036FX01	1286 [5.7]	36.0 [914]	29.6 [752]	57.5 [1461]	291	268	497	592	43.8 [19.9]
					H191036FX02			72.5 [1842]	46.2 [21.0]					
█	█	█	█	█	H191042FX01	1075 [4.8]	42.0 [1067]	35.8 [909]	73.6 [1869]	346	320	595	684	46.9 [21.3]
					H191042FX02			93.6 [2377]	50.1 [22.7]					
█	█	█	█	█	H191048FX01	916 [4.1]	48.0 [1219]	41.9 [1064]	84.8 [2154]	401	372	692	769	49.2 [22.3]
					H191048FX02			104.8 [2662]	52.4 [23.8]					
█	█	█	█	█	H191054FX01	809 [3.6]	54.0 [1372]	48.0 [1219]	95.9 [2436]	456	422	789	846	51.5 [23.4]
					H191054FX02			120.9 [3071]	55.5 [25.2]					
█	█	█	█	█	H191060FX01	719 [3.2]	60.0 [1524]	54.2 [1377]	112.0 [2845]	510	471	886	932	54.6 [24.8]
					H191060FX02			147.0 [3734]	60.3 [27.4]					

**Notes:**

- 1) STL (Specified Tensile Load) - 3,000 lbs [31.1 kN]
- 2) H191 Series supplied with standard G2-0 Bendable Gain Base
- 3) For Flat Base F2-0, change the "9" in H191...to "1" = H111...[See base section for details]
- 4) For Trunnion end fitting, change the "1" in H191... to "2" = H192... [Trunnion STL = 5,000 lbs]
- 5) FX - Electrical data is without Corona Ring
- 6) For other ratings or custom insulator designs, contact your local MPS Sales Representative



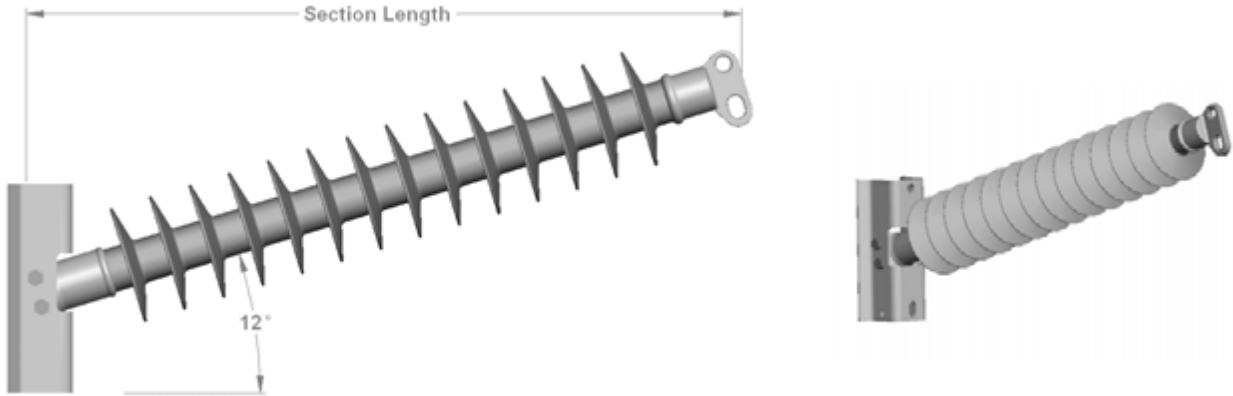
**NPKG30XH Series Molded Line Post Insulators [2.5" Rod]**

Line Voltage (kV)				Catalog No.	MDCL	Section Length	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
									60 Hz		CIFO		
69	115	138	161		lbs [kN]	in [mm]	in [mm]	in [mm]	Dry	Wet	Pos	Neg	lbs [kgs]
				NPKG30XH014S0	2500 [11.1]	32.0 [813]	22.7 [577]	63.2 [1605]	229	207	388	480	43.3 [19.6]
				NPKG30XH016S0	2500 [11.1]	35.0 [889]	25.8 [655]	72.4 [1839]	256	234	436	530	45.3 [20.5]
				NPKG30XH018S0	2500 [11.1]	38.0 [965]	28.8 [732]	81.5 [2070]	284	261	484	579	47.3 [21.5]
				NPKG30XH020S0	2500 [11.1]	40.9 [1039]	31.8 [808]	90.7 [2304]	311	287	532	626	49.4 [22.4]
				NPKG30XH021S0	2310 [10.3]	42.4 [1077]	33.3 [846]	95.3 [2421]	325	300	556	648	50.4 [22.9]
				NPKG30XH023S0	2204 [9.8]	45.4 [1153]	36.4 [93.4]	104.5 [2654]	352	325	604	692	52.4 [23.8]
				NPKG30XH025S0	1970 [8.8]	48.3 [1227]	39.4 [1001]	113.7 [2888]	379	351	652	735	54.4 [24.7]
				NPKG30XH028S0	1834 [8.2]	52.8 [1341]	44.0 [1118]	127.5 [3239]	419	388	724	795	57.5 [26.1]
				NPKG30XH029S0	1731 [7.7]	54.3 [1379]	45.5 [1156]	132.1 [3355]	433	401	749	814	58.5 [26.5]
				NPKG30XH032S0	1603 [7.1]	58.7 [1491]	50.0 [1270]	145.9 [3706]	473	438	821	869	61.5 [27.9]
				NPKG30XH033S0	1533 [6.8]	60.2 [1529]	51.5 [1308]	150.5 [3823]	486	450	844	892	62.5 [28.3]
				NPKG30XH034S0	1524 [6.8]	61.7 [1567]	53.1 [1349]	155.1 [3940]	500	462	868	915	63.6 [28.8]
				NPKG30XH036S0	1415 [6.3]	64.7 [1643]	56.1 [1425]	164.3 [4173]	526	486	916	961	65.6 [29.8]
				NPKG30XH037S0	1376 [6.1]	66.1 [1679]	57.6 [1463]	168.9 [4290]	540	498	940	983	66.6 [30.2]
				NPKG30XH038S0	1366 [6.1]	67.6 [1717]	59.1 [1501]	173.5 [4407]	553	510	964	1006	67.6 [30.7]
				NPKG30XH039S0	1306 [5.8]	69.1 [1755]	60.6 [1539]	178.0 [4521]	566	521	987	1028	68.6 [31.1]
				NPKG30XH040S0	1299 [5.8]	70.6 [1793]	62.1 [1577]	182.6 [4638]	579	533	1011	1050	69.6 [31.6]

**Notes:**

- 1) STL (Specified Tensile Load) - 5,000 lbs [22.2 kN]
- 2) NPKG Series supplied with Fixed Fain Base
- 3) For Drop Tongue end fitting, change the "K" in NPKG to "S" = NPSG...
- 5) S0 - Electrical data is without Corona Ring
- 6) For other ratings or custom insulator designs, contact your local MPS Sales Representative





**NBSG30XH Series Molded Line Post Insulators [2.5" Rod]**

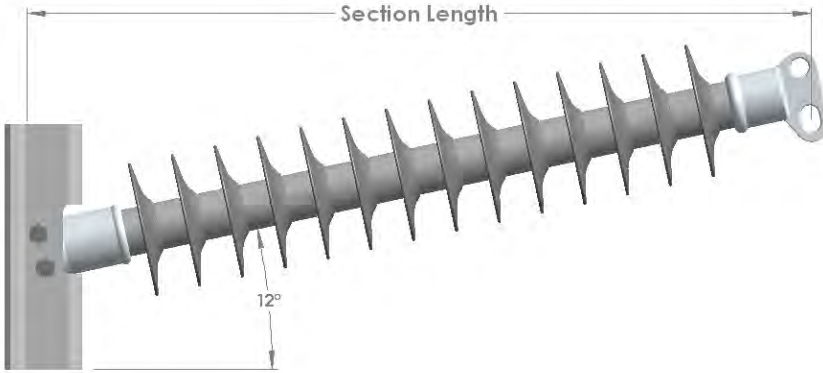
Line Voltage (kV)				Catalog No.	MDCL	Section Length	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
									60 Hz		CIFO		
69	115	138	161		lbs [kN]	in [mm]	in [mm]	in [mm]	Dry	Wet	Pos	Neg	lbs [kgs]
				NBSG30XH014S0	3331 [14.8]	31.8 [808]	22.7 [577]	63.2 [1605]	229	207	388	480	53.2 [24.1]
				NBSG30XH016S0	3125 [13.9]	34.8 [884]	25.8 [655]	72.4 [1839]	256	234	436	530	54.4 [24.7]
				NBSG30XH018S0	2682 [11.9]	37.8 [960]	28.8 [732]	81.5 [2070]	284	261	484	579	57.3 [26.0]
				NBSG30XH020S0	2540 [11.3]	40.7 [1034]	31.8 [808]	90.7 [2304]	311	287	532	626	59.3 [26.9]
				NBSG30XH021S0	2325 [10.3]	42.2 [1072]	33.3 [846]	95.3 [2421]	325	300	556	648	60.3 [27.4]
				NBSG30XH023S0	2223 [9.9]	45.2 [1148]	36.4 [93.4]	104.5 [2654]	352	325	604	692	61.1 [27.4]
				NBSG30XH025S0	1989 [8.8]	48.1 [1222]	39.4 [1001]	113.7 [2888]	379	351	652	735	64.3 [29.2]
				NBSG30XH028S0	1847 [8.2]	52.6 [1336]	44.0 [1118]	127.5 [3239]	419	388	724	795	67.4 [30.6]
				NBSG30XH029S0	1744 [7.8]	54.1 [1374]	45.5 [1156]	132.1 [3355]	433	401	749	814	68.4 [31.0]
				NBSG30XH032S0	1619 [7.2]	58.5 [1486]	50.0 [1270]	145.9 [3706]	473	438	821	869	71.4 [32.4]
				NBSG30XH033S0	1542 [6.9]	60.0 [1524]	51.5 [1308]	150.5 [3823]	486	450	844	892	72.5 [32.9]
				NBSG30XH034S0	1535 [6.8]	61.5 [1562]	53.1 [1349]	155.1 [3940]	500	462	868	915	73.5 [33.3]
				NBSG30XH036S0	1427 [6.3]	64.4 [1636]	56.1 [1425]	164.3 [4173]	526	486	916	961	75.5 [34.2]
				NBSG30XH037S0	1388 [6.2]	65.9 [1674]	57.6 [1463]	168.9 [4290]	540	498	940	983	76.5 [34.7]
				NBSG30XH038S0	1380 [6.1]	67.4 [1712]	59.1 [1501]	173.5 [4407]	553	510	964	1006	77.5 [35.2]
				NBSG30XH039S0	1313 [5.8]	68.9 [1750]	60.6 [1539]	178.0 [4521]	566	521	987	1028	78.5 [35.6]
				NBSG30XH040S0	1308 [5.8]	70.4 [1788]	62.1 [1577]	182.6 [4638]	579	533	1011	1050	79.5 [36.1]

**Notes:**

- 1) STL (Specified Tensile Load) - 15,000 lbs [66.7 kN]
- 2) NBSG30XH Series supplied with standard G2-0 Bendable Gain Base
- 3) For Bendable Flat Base F2-0, change the "G" in NBSG... to "F" = NBSF ... [See base section for details]
- 4) For Trunnion end fitting, change "S" in NBSG... to "K" = NBKG... [Trunnion limits MDCL to 2500 lbs]
- 5) S0 - Electrical data is without Corona Ring
- 6) For other ratings or custom insulator designs, contact your local MPS Sales Representative



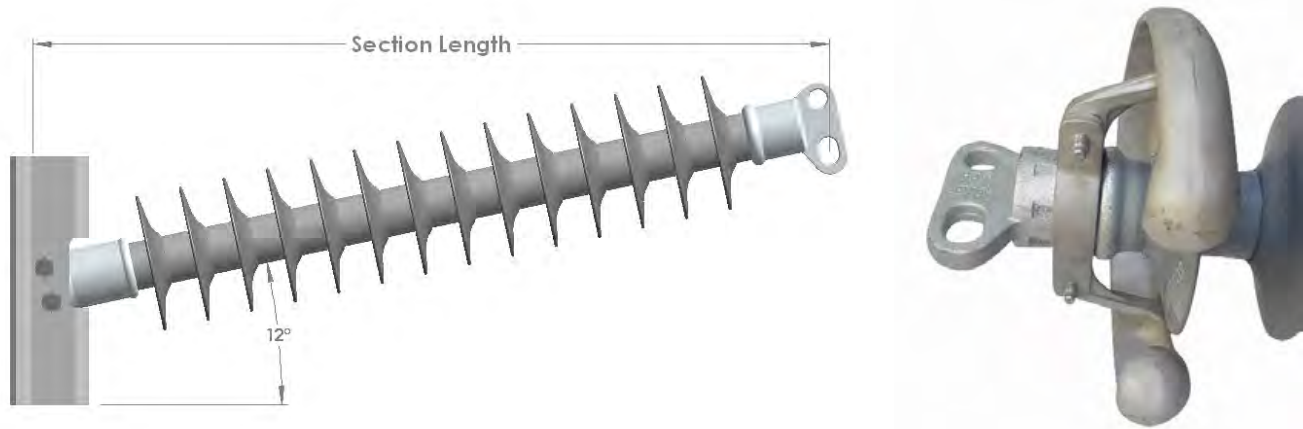
# Transmission Line Post - H291 Series



**H2 Series Modular Line Post Insulators [2.5" Rod]**

Line Voltage (kV)					Catalog No.	MDCL	Section Length	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
46	69	115	138	161						60 Hz		CIFO		
										Dry	Wet	Pos	Neg	
					H291022FX01	5363 [23.9]	22 [559]	13.3 [338]	24.8 [630] 38.4 [975]	142	122	240	311	43.4 [19.7] 45.3 [20.5]
					H291024FX01	4751 [21.1]	24 [610]	15.0 [381]	31.1 [790] 44.7 [1135]	158	139	268	344	44.7 [20.3] 46.6 [21.1]
					H291027FX01	3999 [17.8]	27 [686]	18.4 [467]	38.9 [988] 87.1 [1450]	189	169	320	404	46.6 [21.1] 49.1 [22.3]
					H291030FX01	3435 [15.3]	30 [762]	21.5 [546]	46.5 [1181] 64.7 [1643]	217	196	368	458	48.3 [21.9] 50.8 [23.0]
					H291033FX01	3114 [13.9]	33 [838]	24.2 [615]	53.9 [1369] 72.0 [1829]	242	221	412	505	49.9 [22.6] 52.5 [23.8]
					H291035FX01	2884 [12.8]	35 [889]	26.3 [668]	55.9 [1420] 87.6 [2225]	261	239	444	539	50.7 [23.0] 55.1 [25.0]
					H291038FX01	2587 [11.5]	38 [965]	29.4 [747]	68.0 [1727] 86.2 [2189]	289	265	493	588	53.1 [24.1] 55.6 [25.2]
					H291043FX01	2248 [10.0]	43 [1092]	34.5 [876]	82.2 [2088] 100.3 [2548]	335	309	574	665	56.2 [25.5] 58.7 [26.6]
					H291049FX01	1919 [8.5]	49 [1245]	40.6 [1031]	88.3 [2243] 101.9 [2588]	390	361	671	751	58.4 [26.5] 60.3 [27.4]
					H291054FX01	1712 [7.6]	54 [1372]	45.7 [1161]	11.6 [2835] 134.2 [3409]	435	403	752	818	62.8 [28.5] 65.9 [29.9]
					H291060FX01	1525 [6.8]	60 [1524]	51.9 [1318]	122.2 [3104] 144.9 [3680]	489	452	849	897	65.6 [29.8] 68.8 [31.2]
					H291065FX01	1390 [6.2]	65 [1651]	57.2 [1453]	132.2 [3358] 163.9 [4163]	536	495	934	978	68.2 [30.9] 72.6 [32.9]
					H291070FX01	1270 [5.6]	70 [1778]	62.4 [1585]	155.4 [3947] 182.6 [4638]	581	535	1014	1054	72.6 [32.9] 76.4 [34.7]
					H291075FX01	1193 [5.3]	75 [1905]	67.2 [1707]	169.3 [4300] 196.5 [4991]	623	571	1090	1125	75.6 [34.3] 79.4 [36.0]

- Notes:**
- 1) STL (Specified Tensile Load) - 15,000 lbs [66.7 kN]
  - 2) H291 Series supplied with standard Bendable Gain Base G2-0
  - 3) For Flat Base F2-0, change the "9" in H291... to "1" = H292... [Trunnion STL = 5,000]
  - 4) FX = Electrical data is without Corona Ring
  - 5) FA = Electrical data is with a 6" Corona Ring on the line end fitting
  - 6) FB = Electrical data is with a 12" Corona Ring on the line end fitting
  - 7) FE = Electrical data is with two 12" Corona Rings on the line and tower end fittings
  - 8) For other ratings or custom insulator designs, contact your local MPS Sales Representative



**H2 Series Modular Line Post Insulators [2.5" Rod], continued...**

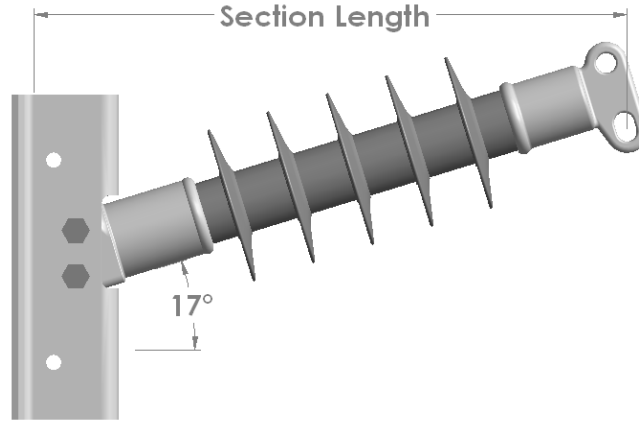
Line Voltage (kV)	Catalog No.	MDCL	Section Length	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
						60 Hz		CIFO		
		lbs [kN]	in [mm]	in [mm]	in [mm]	Dry	Wet	Pos	Neg	lbs [kgs]
230 kV	H291080FA01	1109 [4.9]	80 [2032]	71.4 [1814]	192.8 [4897]	658	602	1154	1186	85.1 [38.6]
	H291080FA02				233.6 [5933]					90.8 [41.2]
	H291085FA01	1028 [4.6]	85 [2159]	76.5 [1943]	193.4 [4912]	702	640	1232	1261	86.3 [39.1]
	H291085FA02				234.1 [5946]					92.0 [41.7]
	H291090FA01	977 [4.3]	90 [2286]	81.6 [2073]	207.5 [5271]	745	676	1310	1335	89.4 [40.6]
	H291090FA02				243.8 [6193]					94.5 [42.9]
	H291096FA01	915 [4.1]	96 [2438]	87.7 [2228]	209.2 [5314]	797	719	1402	1422	91.0 [41.3]
	H291096FA02				249.9 [6347]					96.7 [43.9]
345 kV	H291104FB01	834 [3.7]	104 [2642]	94.8 [2408]	226.4 [5751]	856	767	1506	1522	94.8 [43.0]
	H291104FB02				253.6 [6441]					98.5 [44.7]
	H291112FB01	779 [3.5]	112 [2845]	103.0 [2616]	266.3 [6764]	923	815	1624	1636	102.1 [46.3]
	H291112FB02				302.5 [7684]					107.2 [48.6]
	H291116FB01	753 [3.3]	116 [2946]	107.0 [2718]	265.8 [6751]	957	834	1682	1693	103.0 [46.7]
	H291116FB02				320.2 [8133]					110.5 [50.1]
	H291120FB01	727 [3.2]	120 [3048]	111.1 [2822]	288.0 [7315]	990	854	1740	1749	107.0 [48.5]
	H291120FB02				337.9 [8583]					113.9 [51.7]
500 kV	H291160FE01	546 [2.4]	160 [4064]	149.3 [3792]	342.5 [8700]	1291	1031	2247	2255	128.2 [58.2]
	H291160FE01				442.2 [11232]					142.1 [64.5]
	H291160FE01	521 [2.3]	170 [4318]	159.5 [4051]	352.8 [8961]	1369	1079	2376	2384	131.9 [59.8]
	H291160FE01				452.4 [11491]					145.8 [66.1]
	H291160FE01	496 [2.2]	180 [4572]	169.7 [4310]	403.7 [10254]	1446	1126	2502	2512	141.3 [64.1]
	H291160FE01				507.9 [12901]					155.8 [70.7]
	H291160FE01	471 [2.1]	190 [4826]	179.9 [4569]	414.0 [10516]	1521	1174	2626	2637	145.3 [65.8]
	H291160FE01				518.2 [13162]					159.5 [72.3]

**Notes:**

- 1) STL (Specified Tensile Load) - 15,000 lbs [66.7 kN]
- 2) H291 Series supplied with standard Bendable Gain Base G2-0
- 3) For Flat Base F2-0, change the "9" in H291... to "1" = H292... [Trunnion STL = 5,000]
- 4) FX = Electrical data is without Corona Ring
- 5) FA = Electrical data is with a 6" Corona Ring on the line end fitting
- 6) FB = Electrical data is with a 12" Corona Ring on the line end fitting
- 7) FE = Electrical data is with two 12" Corona Rings on the line and tower end fittings
- 8) For other ratings or custom insulator designs, contact your local MPS Sales Representative



# Transmission Line Post - H391 Series



## H391 Series Modular Line Post Insulators [3.0" Rod]

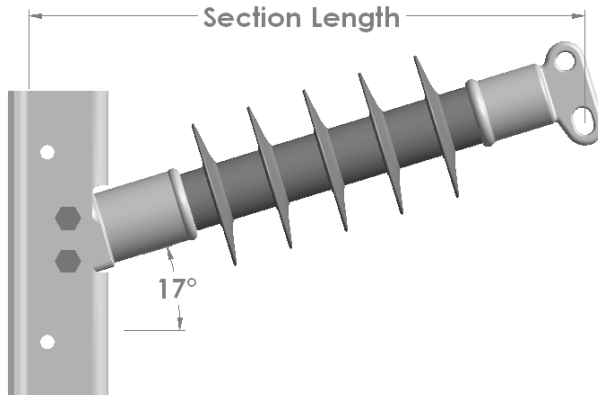
Line Voltage (kV)	Catalog No.	MDCL	Section Length	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
						60 Hz		CIFO		
						Dry	Wet	Pos	Neg	
46										
69										
115										
138										
161										
	H391032FX01	6053 [26.9]	32.0 [813]	19.4 [493]	36.7 [932] 51.2 [1300]	198	178	336	422	71.2 [32.3] 74.1 [33.6]
	H391032FX02									
	H391036FX01	5100 [22.7]	36.0 [914]	23.6 [599]	40.8 [1036] 60.2 [1529]	236	215	402	494	73.4 [33.3] 77.3 [35.1]
	H391036FX02									
	H391040FX01	4461 [19.8]	40.0 [1016]	27.8 [706]	59.5 [1511] 78.9 [2004]	274	252	468	563	78.5 [35.6] 82.4 [37.4]
	H391040FX02									
	H391045FX01	3792 [16.9]	45.0 [1143]	33.0 [838]	69.6 [1768] 93.8 [2383]	322	297	551	643	82.3 [37.3] 87.1 [39.5]
	H391045FX02									
	H391051FX01	3263 [14.5]	51.0 [1295]	39.3 [998]	104.9 [2664] 119.4 [3033]	378	350	651	734	91.4 [41.5] 94.3 [42.8]
	H391051FX02									
	H391055FX01	2947 [13.1]	55.0 [1397]	43.5 [1105]	104.3 [2349] 123.6 [3139]	415	384	717	789	92.6 [42.0] 96.5 [43.8]
	H391055FX02									
	H391060FX01	2674 [11.9]	60.0 [1524]	48.7 [1237]	114.3 [2903] 138.5 [3518]	461	427	800	854	96.3 [43.7] 101.2 [45.9]
	H391060FX02									
	H391066FX01	2384 [10.6]	66.0 [1676]	55.0 [1397]	120.6 [3063] 154.5 [3924]	517	477	899	944	99.6 [45.2] 106.4 [48.3]
	H391066FX02									
	H391071FX01	2179 [9.7]	71.0 [1803]	60.2 [1529]	130.7 [3320] 169.4 [4303]	562	518	981	1022	103.3 [46.9] 111.1 [50.4]
	H391071FX02									
	H391076FX01	2030 [9.0]	76.0 [1930]	65.4 [1661]	140.7 [3574] 184.3 [4681]	607	558	1062	1099	107.0 [48.5] 115.8 [52.5]
	H391076FX02									

**Notes:**

- 1) STL (Specified Tensile Load) - 20,000 lbs [89.0 kN]
- 2) H391 Series supplied with standard G3-0 Bendable Gain Base
- 3) For Flat Base F3-0, change the "9" in H391... to "1" = H311... [See base section for details]
- 4) For Trunion end fitting, change the "1" in H391...to "2" = H392... [Trunion limits MDCL to 2500 lbs]
- 5) FX = Electrical data is without Corona Ring
- 6) FA = Electrical data is with a 6" Corona Ring on the line end fitting
- 7) FB = Electrical data is with a 12" Corona Ring on the line end fitting
- 8) FE = Electrical data is with two 12" Corona Rings on the line and tower end fittings
- 9) For other ratings or custom insulator designs, contact your local MPS Sales Representative



# Transmission Line Post - H391 Series

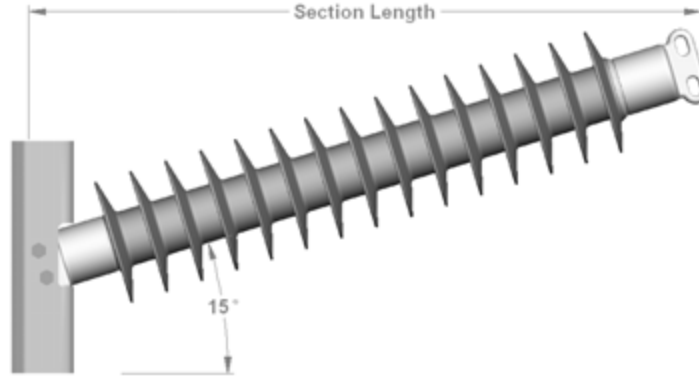


**H391 Series Modular Line Post Insulators [3.0" Rod], continued...**

Line Voltage (kV)	Catalog No.	MDCL	Section Length	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
						60 Hz		CIFO		
		lbs [kN]	in [mm]	in [mm]	in [mm]	Dry	Wet	Pos	Neg	lbs [kgs]
230 kV	H391081FA01	1882	81.0	69.5	184.7 [4691]	642	588	1125	1159	122.5 [55.6]
	H391081FA02	[8.4]	[2057]	[1765]	208.9 [5306]					127.4 [57.8]
	H391086FA01	1744	86.0	74.7	289.9 [4823]	687	627	1206	1235	125.3 [56.8]
	H391086FA02	[7.8]	[2184]	[1897]	219.0 [5563]					131.1 [59.5]
	H391092FA01	1634	92.0	91.0	191.4 [4862]	740	672	1301	1326	127.6 [57.9]
	H391092FA02	[7.3]	[2337]	[2311]	234.9 [5966]					136.3 [61.8]
	H391097FA01	1542	97.0	86.2	196.6 [4994]	785	709	1379	1401	130.4 [59.1]
	H391097FA02	[6.9]	[2464]	[2189]	249.8 [6345]					141.0 [64.0]
	H391102FA01	1451	102.0	91.5	206.7 [5250]	828	745	1457	1475	134.1 [60.8]
	H391102FA02	[6.5]	[2591]	[2324]	264.7 [6723]					145.7 [66.1]
345 kV	H391104FB01	1414	104.0	92.2	228.1 [5794]	834	750	1468	1786	139.6 [63.3]
	H391104FB02	[6.3]	[2642]	[2342]	358.8 [9114]					165.7 [75.2]
	H391107FB01	1373	107.0	95.3	240.9 [6119]	861	771	1514	1530	143.2 [65.0]
	H391107FB02	[6.1]	[2718]	[2421]	289.3 [7348]					152.8 [69.3]
	H391113FB01	1304	113.0	101.6	285.9 [7262]	912	809	1605	1618	154.2 [69.9]
	H391113FB02	[5.8]	[2870]	[2581]	358.5 [9106]					168.7 [76.5]
	H391120FB01	1223	120.	108.9	264.2 [6711]	972	843	1709	1719	152.2 [69.0]
	H391120FB02	[5.4]	[3048]	[2766]	312.6 [7940]					161.9 [73.4]
500 kV	H391160FE01	898	160.0	148.1	359.3 [9126]	1282	1026	2233	2240	190.4 [86.4]
	H391160FE02	[4.0]	[4064]	[3762]	441.5 [11214]					206.8 [93.8]
	H391170FE01	853	170.0	158.6	369.7 [9390]	1362	1075	2365	2373	195.9 [88.9]
	H391170FE02	[3.8]	[4318]	[4028]	452.0 [11481]					212.3 [96.3]
	H391180FE01	805	180.0	169.9	4149 [10538]	1447	1127	2504	2514	213.3 [96.8]
	H391180FE02	[3.6]	[4572]	[4315]	516.5 [13119]					233.6 [106.0]
	H391190FE01	760	190.0	180.4	425.4 [10805]	1524	1176	2632	2642	218.8 [99.2]
	H391190FE02	[3.4]	[4826]	[4582]	527.0 [13386]					239.1 [108.5]

**Notes:**

- 1) STL (Specified Tensile Load) - 20,000 lbs [89.0 kN]
- 2) H391 Series supplied with standard G3-0 Bendable Gain Base
- 3) For Flat Base F3-0, change the "9" in H391... to "1" = H311... [See base section for details]
- 4) For Trunnion end fitting, change the "1" in H391... to "2" = H392... [Trunnion limits MDCL to 2500 lbs]
- 5) FX = Electrical data is without Corona Ring
- 6) FA = Electrical data is with a 6" Corona Ring on the line end fitting
- 7) FB = Electrical data is with a 12" Corona Ring on the line end fitting
- 8) FE = Electrical data is with two 12" Corona Rings on the line and tower end fittings
- 9) For other ratings or custom insulator designs, contact your local MPS Sales Representative



### NBSG40XV Series Molded Line Post Insulators [3.5" Rod]

Line Voltage	Catalog No.	MDCL	Section Length	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
						60 Hz		CIFO		
						Dry	Wet	Pos	Neg	
69		lbs [kN]	in [mm]	in [mm]	in [mm]					lbs [kgs]
115	NBSG40XV015S0	5863 [26.1]	36.7 [932]	24.3 [617]	62.2 [1580]	243	221	413	506	97.5 [44.2]
138	NBSG40XV019S0	5032 [22.4]	42.6 [1082]	30.4 [772]	78.9 [2004]	298	274	509	603	103.8 [47.1]
161	NBSG40XV023S0	5612 [25.0]	48.5 [1232]	36.4 [925]	95.6 [2428]	352	326	605	693	110.1 [49.9]
	NBSG40XV028S0	4672 [20.8]	55.8 [1417]	44.0 [1118]	116.5 [2959]	420	389	725	796	118.0 [53.5]
	NBSG40XV034S0	3888 [17.3]	64.6 [1641]	53.1 [1349]	141.5 [3594]	500	462	869	916	127.5 [57.8]
	NBSG40XV038S0	3505 [15.6]	70.4 [1788]	59.4 [1504]	158.2 [4018]	553	510	964	1006	133.8 [60.7]

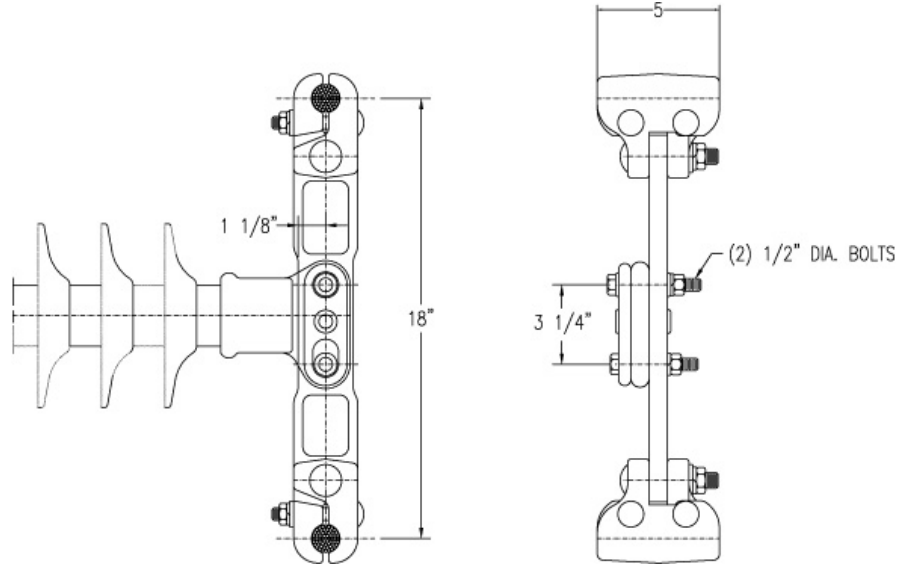
**Notes:**

- 1) STL (Specified Tensile Load) - 15,000 lbs [66.8 kN]
- 2) NBSG40XV Series supplied with standard G4-0 Bendable Gain Base
- 3) For Bendable Flat Base F4-0, change the "G" in NBSG... to "F" = NBSF... [See base section for details]
- 4) For Trunnion end fitting, change the "S" in NBSG... to "K" = NBKG... [Trunnion limits MDCL to 2500 lbs]
- 5) S0 = Electrical data is without Corona Ring
- 6) For other ratings or custom insulator designs, contact your local MPS Sales Representative





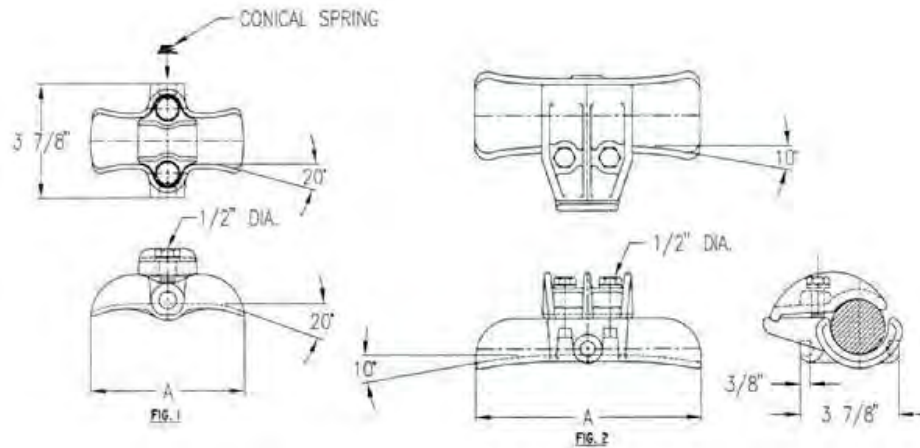
## LPH3D Series Jumper Clamp



Catalog Number	Clamping Range
NPH3D-18-106	0.90" - 1.06"
NPH3D-18-140	1.00" - 1.40"
NPH3D-18-175	1.40" - 1.75"
NPH3D-18-200	1.60" - 2.00"

Fits 2.0", 2.5", 3.0" Drop Tongue Line Posts

## ACTS Trunnion Clamps



Catalog Number	Conductor Range			Dimension A	Weight lbs/100
	Inches	ACSR	Alum.		
ACTS-057	0.23 - 0.57	4 - 4/0	4 - 4/0	5 1/4	82
ACTS-084	0.35 - 0.84	1 - 477	1/0 - 477	5 1/4	95
ACTS-118	0.50 - 1.18	3/0 - 795	4/0 - 1033.5	5 1/4	117
ACTS-150	0.93 - 1.50	556.5 - 1510.5	715 - 1590	5 1/4	127
ACTS-200	1.50 - 2.00	605 - 1113*	795 - 1192.5	6 1/2	225

**Notes:**

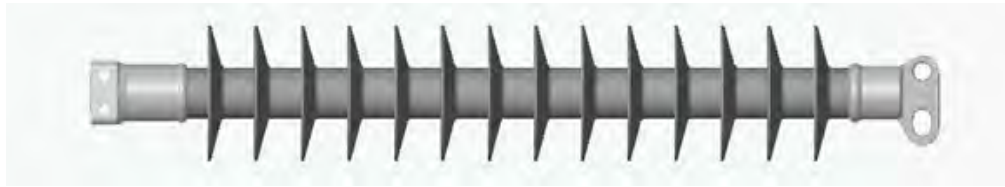
- 1) For spring in one trunnion, add suffix "-SL1"
- 2) For spring in both trunnions, add suffix "-SL2"
- 3) For stainless steel hardware, add suffix "-SS"
- 4) \* = over formed armor rods
- 5) For more clamp options, see clamp section



# Molded Line Post



## Catalog Number Definition



<b>N</b>	<b>P</b>	<b>K</b>	<b>G</b>	<b>30</b>	<b>XH</b>	<b>028</b>	<b>S</b>	<b>0</b>
ANSI Class	Base	Line End Fitting	Base Attachment	Rod Size	Shed Profile	Number of Sheds	Material Choice	Corona Ring Requirement
<b>P = Fixed</b> <b>B = Bendable</b>		<b>K = Trunnion</b> <b>S = Drop Tongue</b> <b>V = Vertical Trunnion</b>	<b>G = Gain</b> <b>F = Flat</b> <b>N = No Base</b>	<b>20 = 1.75"</b> <b>30 = 2.5"</b> <b>40 = 3.5"</b>	<b>XG = Series 20</b> <b>XH = Series 30</b> <b>XV = Series 40</b>	<b>S = Silicone</b>		<b>0 = No Ring</b> <b>1 = One Ring</b>

## Typical End Fittings

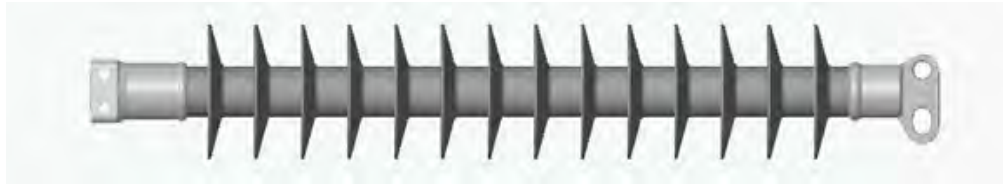
<b>B</b>	<b>P</b>	<b>S</b>	<b>K</b>	<b>V</b>
<b>Bendable Base</b>	<b>Fixed Base</b>	<b>Drop Tongue (Slotted Blade)</b>	<b>Horizontal Trunnion (Clamp Top)</b>	<b>Vertical Trunnion</b>



# Molded Line Post



## Catalog Number Definition

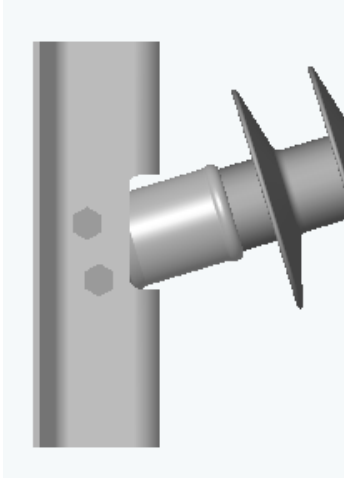


<b>H 2</b>	<b>9</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>F</b>	<b>A</b>	<b>00</b>
Insulator Type	Base	Line	Section Length (Inches)			Shed Profile	Corona Rings	MPS Internal Use

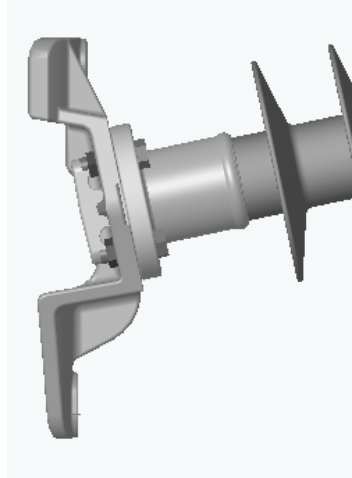
<b>Post Orientation</b> H - Horizontal V - Vertical  <b>Rod Diameter</b> 1 - 2.0" 2 - 2.5" 3 - 3.0"	<b>Base Type</b> 1 - 2pc Bendable Flat (Steel) 5 - 5" Bolt Circle 8 - No Base (Anchor Only) 9 - 2pc Bendable Gain (Steel) C - 2pc Fixed Gain X - None	<b>Line End Fitting</b> 1 - Drop Tongue 2 - Horizontal Trunnion 5 - 5" Bolt Circle 6 - Vertical Trunnion C - Extended Drop Tongue D - Double Trunnion X - None	<b>Shed Profile</b> F = Standard Shed Profile (Fixed) M = Molded Shed Profile (Fixed) V = Variable Leakage (Custom) X = No Sheds (Sheath Only)	<b>Tower</b> A - None B - None X - None	<b>Line</b> 6" 12" None
--	---	---	--	--	----------------------------------

## Typical End Fittings

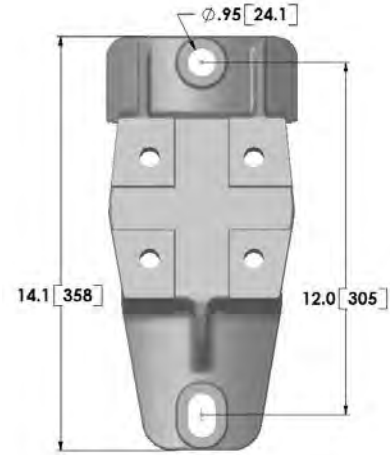
<b>B</b>	<b>P</b>	<b>S</b>	<b>K</b>	<b>V</b>
<b>Bendable Base</b>	<b>Fixed Base</b>	<b>Drop Tongue (Slotted Blade)</b>	<b>Horizontal Trunnion (Clamp Top)</b>	<b>Vertical Trunnion</b>



**Bendable Base**



**Fixed Gain Base**



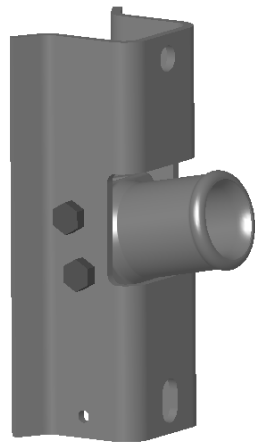
**Fixed Gain Base**

**Bendable Base** - Formed steel base that mates with an anchor end fitting of the insulator via 2 mounting bolts. Bendable bases come in gain and flat designs, with 0° & 12° upsweep angles, as required. (0° upsweep design is intended for braced post application only.)

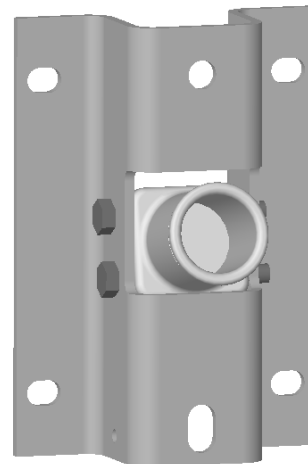
**Fixed Base** - Cast iron base that mates with a 5" bolt circle end fitting of the insulator (4 bolts). Where the bendable designs allow for some articulation of the insulator, the fixed base does not. The fixed design comes in gain and flat designs, with a standard 12° upsweep angle.

**Gain Base** - Base design used to mate the insulator to a round pole surface. This base is attached to the pole through the center bolt mount holes.

**Flat Base** - Base design used to mate the insulator to a flat surface, using either the 4 bolt holes along the ears of the base, or the 2 center mount bolt holes.



**Gain Base**



**Flat Base**



# Line Post Base Section

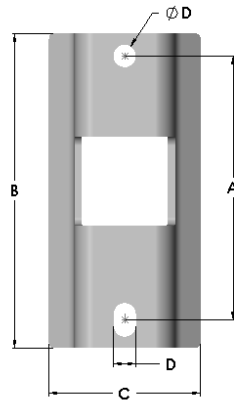


Fig. 1

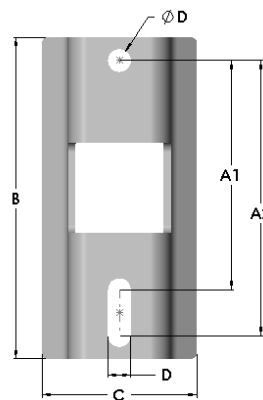


Fig. 2

Base Code	Fig #	A +/- 1/4"	A1 - 1/2"	A2 + 1/2"	B	C +/- 1/4"	D +/- 1/16"	Typical Bolt Size	Unswep Angle
G2-0*	1	12"	-	-	14"	8"	15/16"	3/4" - 7/8"	12°
G2-2	2	-	12"	14"	16.5"	8"	15/16"	3/4" - 7/8"	0°
G2-4	2	-	12"	14"	16.5"	8"	15/16"	3/4" - 7/8"	12°
G2-G	2	-	12"	14"	16.5"	8"	1 1/16"	7/8" - 1"	12°
G2-X	2	-	12"	14"	16.5"	8"	15/16"	3/4" - 7/8"	12°
G3-0*	2	-	12"	14"	17"	11.7"	1 1/16"	7/8" - 1"	17°
G4-0*	2	-	12"	14"	18"	11.6"	1 3/8"	1 1/4"	15°

**Notes:**

- 0\* = Standard Base. Supplied on all standard line post catalog numbers with gain base. All other base options available upon request.
  - G2 Bases for use with all H2, H1, and NB\_G30XH Series line posts [2.0" & 2.5" Rod]
  - G3 Base for use with all H3 Series line posts only [3.0" Rod]
  - G4 Base for use with NB\_G40XH Series line posts only [3.5" Rod]
- 0° Upsweep bases intended for use within a braced post assembly

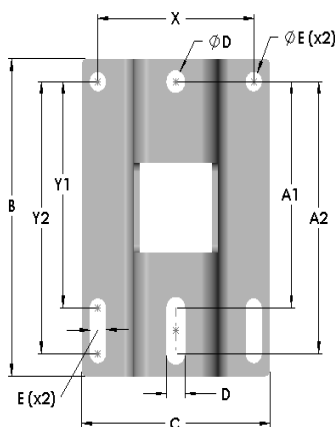


Fig. 1

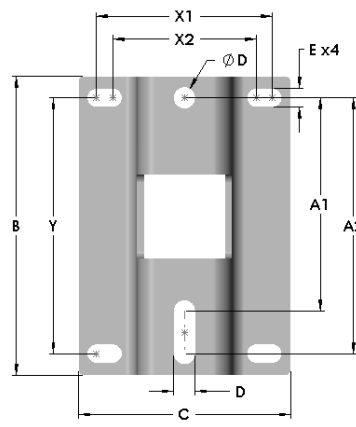


Fig. 2

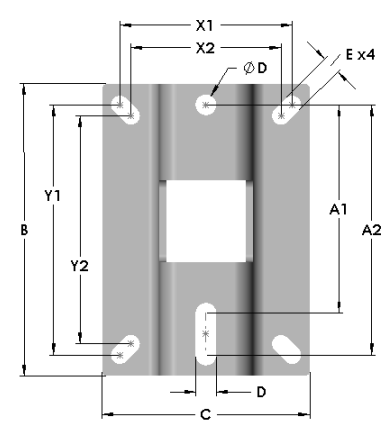


Fig. 3

Base Code	Fig #	A1 - 1/2"	A2 + 1/2"	B	C +/- 1/4"	D +/- 1/16"	Unswep Angle	X1	X2	Y1	Y2	E +/- 1/16"
F2-0*	1	12"	14"	14.5"	10"	15/16"	12°	8"	-	10"	12"	13/16"
F2-1	1	12"	14"	14.5"	10"	15/16"	0°	8"	-	10"	12"	13/16"
F2-J	2	12"	14"	17"	13.5"	1 1/16"	12°	8"	11"	14"	-	7/8"
F3-0*	3	12"	14"	17"	12.2"	1 1/16"	17°	9"	10"	13"	15"	13/16"
F4-0*	1	12"	14"	18"	12"	1 3/8"	15°	10"	-	12"	15"	15/16"

**Notes:**

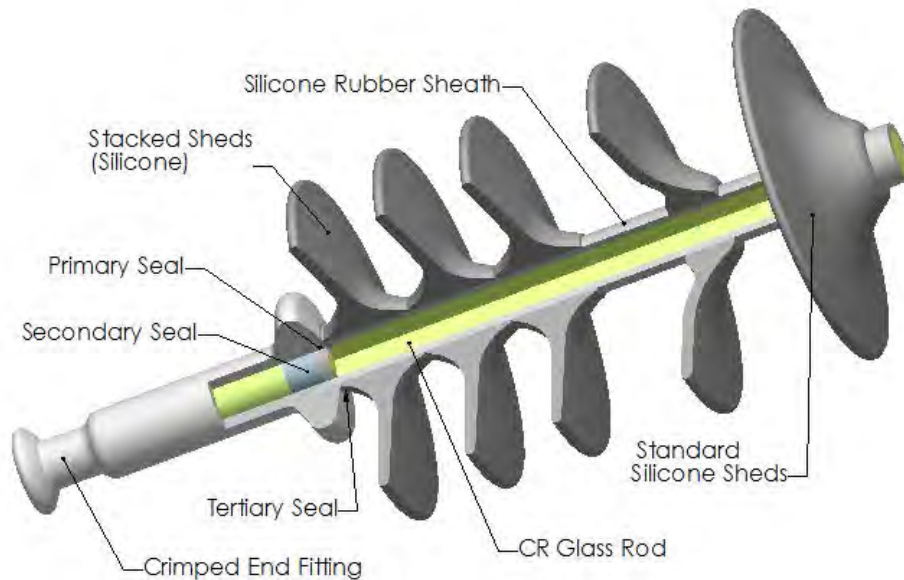
- 0\* = Standard Base. Supplied on all standard line post catalog numbers with gain base. All other base options available upon request.
- G2 Bases for use with all H2, H1, and NB\_G30XH Series line posts [2.0" & 2.5" Rod]
- G3 Base for use with all H3 Series line posts only [3.0" Rod]
- G4 Base for use with NB\_G40XH Series line posts only [3.5" Rod]







## The MPS “Complete Solution”



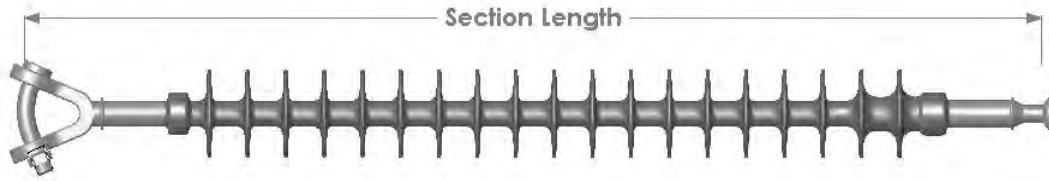
**CR E-Glass Core** - MPS uses “Boron Free” Corrosion Resistant E-Glass on all its insulators for its High Electrical Integrity & High Resistance to acid corrosion. The boron free formulation of the fiberglass core makes it resistant to nitric acid attacks. There has never been a brittle fracture failure of a CR E-glass Insulator in over 30 years of use.

**Silicone Rubber** - MPS uses a Silicone formulation that has been unchanged since the early 80's. The Si-O molecular bonds (inorganic backbone of Silicone) are very stable and have bond strengths higher than sunlight, making the silicone resistant to UV degradation. In addition to providing protection against the ultraviolet radiation, electrical aging, and corona effect, silicone exhibits hydrophobic properties; which provide excellent recovery characteristics to control leakage currents in highly polluted or coastal environments.

The MPS silicone rubber formulation has consistently outperformed other silicone formulations in its hydrophobicity, its hydrophobicity recovery rate, and enhanced electrical properties in contaminated environments.

**P-S-T End Fitting Seal** - The P-S-T sealing system is a triple seal design with built-in redundancies. **Primary Seal** - rubber sheath compressed into chamfer of end fitting. **Secondary seal** - RTV silicone applied to core / sheath / end fitting interface. **Tertiary seal** - final external RTV seal applied to sheath / end fitting interface. The P-S-T system has clearly shown its superiority to withstand moisture penetration.

**Stacked Shed** - The MPS Stacked Shed configuration offers inherent protection against material aging in critical areas of the sheath and resists the resultant material erosion when installed in highly contaminated environments (resistance to Water Droplet Corona). In addition, stacked shed profiles enhance the ability of the insulator to resist mechanical damage in these most critical areas during transportation and installation.



**Corona Ring**



**Molded Stacked Shed**

**Features**

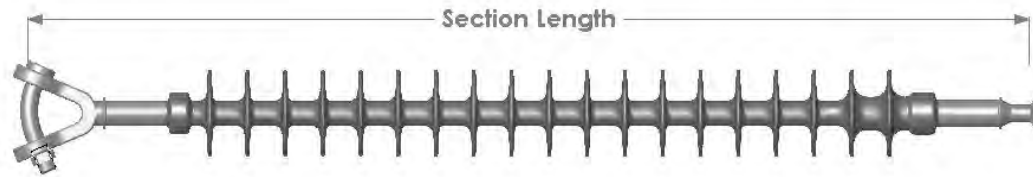
- 46kV - 161kV
- ANSI 52-5 - 25kV [111kN] SML  
IEC-16 - 27k [120kN] SML
- Molded MPS Silicone Rubber
- Molded Stacked Shed
- Corrosion Resistant E-Glass
- Y-Clevis & ANSI 52-5 Ball  
ANSI 52-5 Socket & Ball  
IEC-16 Socket & Ball
- Corona Ring available as requested  
(change MX to MA for ring)

## Catalog Number Definition

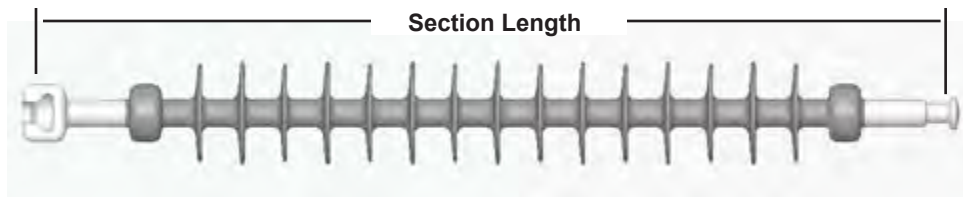
<b>S1</b>	<b>4</b>   <b>8</b>	<b>035</b>	<b>M</b>	<b>X</b>	<b>01</b>
Insulator Type	End Fitting Type	Section Length	Molded Housing	Corona Ring	Design Type
S1 = 25 kSML ANSI 52-5 S1 = 120kN SML IEC - 16	4 = Y-Clevis 7 = Socket 8 = Ball	Fixed	Fixed Leakage Distance	X = None A = Corona Ring	01 = ANSI Standard 11 = IEC Standard Leakage



Insulator Strength Ratings		
	SML	RTL
S1	25 klb	12.5 klb
	111.2 kN	55.6 kN
16 mm Rod		



Line Voltage (kV)					"S1" Type Catalog No.	Section Length	Dry Arc	Leakage	Electrical Flashover (kV)				Standard Crate Qty
46	69	115	138	161					60 Hz		CIFO		
									Dry	Wet	Pos	Neg	
					S148035MX01	35.4 (899)	27.2 (691)	60.8 (1544)	273	247	475	510	122
					S148041MX01	41.7 (1059)	33.5 (851)	76.8 (1951)	333	301	578	617	122
					S148046MX01	46.4 (1179)	38.2 (970)	89.0 (2261)	378	341	653	696	108
					S148054MX01	54.3 (1379)	46.1 (1171)	109.2 (2774)	453	406	778	825	108
					S148060MX01	60.6 (1539)	52.4 (1331)	125.2 (3180)	513	457	876	926	95
					S148065MX01	65.3 (1659)	57.1 (1450)	137.4 (3490)	558	494	948	1000	95
					S148071MX01	71.7 (1821)	63.4 (1610)	154.7 (3929)	618	543	1044	1099	95



### S178 ANSI 52-5 Socket & Ball

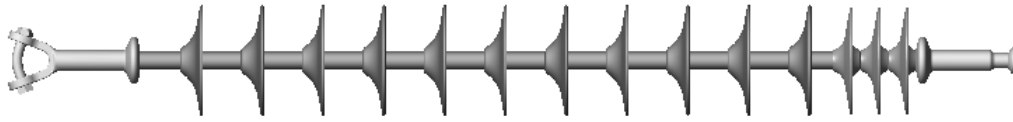
Line Voltage (kV)					"S1" Type Catalog No.	Section Length	Dry Arc	Leakage	Electrical Flashover (kV)				Standard Crate Qty
46	69	115	138	161					60 Hz		CIFO		
									Dry	Wet	Pos	Neg	
					S178034MX01	34.2 (869)	27.2 (691)	60.8 (1544)	273	247	475	510	122
					S178040MX01	40.5 (1029)	33.5 (851)	76.8 (1951)	333	301	578	617	122
					S178045MX01	45.2 (1148)	38.2 (970)	89.0 (2261)	378	341	653	696	108
					S178053MX01	53.1 (1349)	46.1 (1171)	109.2 (2774)	453	406	778	825	108
					S178059MX01	59.4 (1509)	52.4 (1331)	125.2 (3180)	513	457	876	926	95
					S178064MX01	63.9 (1623)	57.1 (1450)	137.4 (3490)	558	494	948	1000	95

**Notes:**

- 1) Electrical Data is without Corona Rings.
  - 2) For insulator with Corona Ring, change catalog number from MX to MA
  - 3) For IEC 16 Socket & Ball insulators, change catalog number suffix from MX01 to MX11
- \* To order MX Suspension insulators, contact your local MPS Sales Representative.



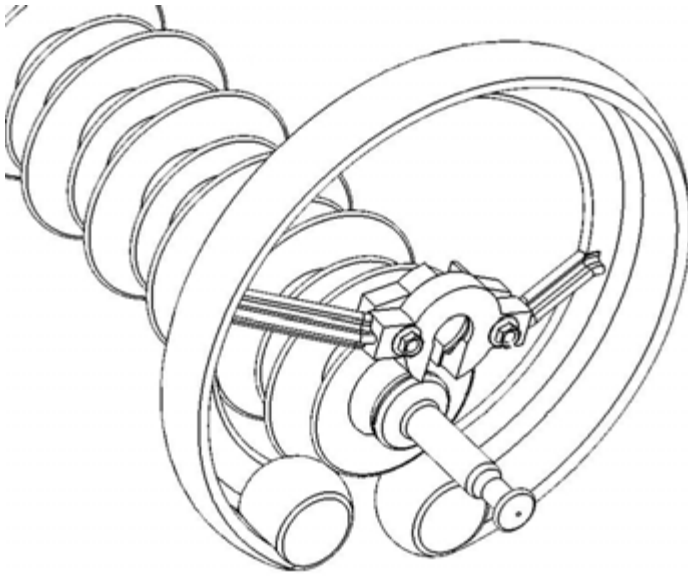
## Catalog Number Definition



<b>S</b>	<b>2</b>	<b>4</b>	<b>8</b>	<b>0</b>	<b>9</b>	<b>7</b>	<b>F</b>	<b>A</b>	<b>01</b>																								
Insulator Type (Specified Mechanical Lead)	End Fitting Type			Section Length (inches)			Corona Ring		MPS Internal Use																								
S1 = 25k SML S5 = 30k SML S6 = 36k SML S2 = 50k SML S4 = 80k SML	4 = Y-Clevis 5 = Tongue 6 = Clevis 7 = Socket 8 = Ball 9 = Eye			F = Standard Shed Profile (Fixed) M = Molded Shed Profile (Fixed) V = Variable Leakage (Custom) X = No Sheds (Sheath Only)			<table border="1"> <tr> <th>Tower</th> <th>Line</th> <th>Tower</th> <th>Line</th> </tr> <tr> <td>A = None</td> <td>8"</td> <td>F = 17"</td> <td>17"</td> </tr> <tr> <td>B = None</td> <td>12"</td> <td>G = 8"</td> <td>12"</td> </tr> <tr> <td>C = None</td> <td>17"</td> <td>H = 12"</td> <td>17"</td> </tr> <tr> <td>D = 8"</td> <td>8"</td> <td>V = 8"</td> <td>17"</td> </tr> <tr> <td>E = 12"</td> <td>12"</td> <td>X = None</td> <td>None</td> </tr> </table>		Tower	Line	Tower	Line	A = None	8"	F = 17"	17"	B = None	12"	G = 8"	12"	C = None	17"	H = 12"	17"	D = 8"	8"	V = 8"	17"	E = 12"	12"	X = None	None	
Tower	Line	Tower	Line																														
A = None	8"	F = 17"	17"																														
B = None	12"	G = 8"	12"																														
C = None	17"	H = 12"	17"																														
D = 8"	8"	V = 8"	17"																														
E = 12"	12"	X = None	None																														

Suspension Insulators												
Available End Fittings												
End Fitting Type	4		5		6		7		8		9	
	Y-Clevis		Tongue		Clevis		Socket		Ball		Eye	
Insulators	ANSI	IEC	ANSI	IEC	ANSI	IEC	ANSI	IEC	ANSI	IEC	ANSI	IEC
S1	25 klb	*Yes		52-6		52-6		52-5		52-5		*Yes
	120 klb		*Yes		16-C		16-C		16		16	*Yes
S5	30 klb	*Yes		52-6		52-6		52-5		52-5		*Yes
S6	36 klb	*Yes		52-6		52-6				52-8		*Yes
	160 klb		*Yes		16N		19-L		20		20	*Yes
S2	30 klb							52-5		52-5		
	50 klb	*Yes		52-12		52-10		52-11		52-11		*Yes
	210 klb				22N		19-C/22-L		20/24		20/24	*Yes
S4	80 klb											*Yes
	300 klb						22-L		24		24	*Yes

\* = No ANSI or IEC classification available



High voltages can result in unwanted noise (RIV) and corona. To minimize the effects of corona, corona rings are applied to one or both ends of the insulator (attached onto the end fittings). Typically, for system voltages 230kV and above a corona ring or combination of rings is necessary. However, some applications may require rings at lower system voltages when addition corona protection is required; high contamination, high altitude, or applications with tight phase spacing. For these special cases or any corona ring application assistance, contact MPS.

The MPS Smart Fit corona rings are designed around the needs of the end user. It is easy to install, unidirectional (not able to install in the wrong direction), and can be installed or removed with hot stick tools. By making the ring a one-piece design, we have eliminated the problem of missing or lost parts. This was made possible by designing a unique clamping mechanism that uses two bolted keepers to secure the ring to the insulator. Additionally, the clamping section was designed such that the ring can only be installed in one direction, which eliminates the problem of misapplied rings. As a final step, the ring was designed with a split (opening) to allow installation with hot stick tools.

## Recommended Corona Ring Application Table

	138 kV	161 kV	230 kV	345 kV	400 kV	500 kV
Line End	None	None	8"	12"	12"	17"
Tower End	None	None	None	None	8"	8"

Three Ring Diameters are available for use on all suspension insulator styles:



8" Corona Ring

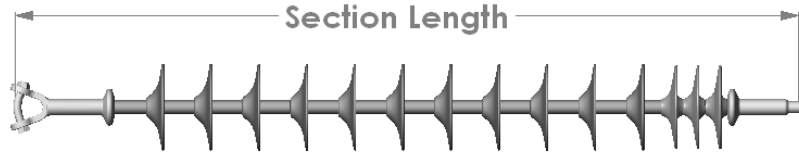
12" Corona Ring

17" Corona Ring

For Insulators 230kV and above, MPS recommends use of Corona Rings. The Application Table above depicts typical corona ring usage on MPS suspension Insulators. For corona ring usage on special applications, environments, and elevations; please contact MPS.



Insulator Strength Ratings		
	SML	RTL
<b>S1</b>	25.0 klb	12.5 klb
	120.0 kN	60.0 kN
<b>16 mm Rod</b>		



### S1 Series Insulators

Line Voltage (kV)					Catalog No.	Section Length	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
46	69	115	138	161					60 Hz		CIFO		
									Dry	Wet	Pos	Neg	
					S148033FX01	33 [838]	22.9 [582]	56.2 [1427]	232	209	404	435	7.5 [3.4]
					S148033FX02			63.9 [1623]					8.1 [3.7]
					S148035FX01	35 [889]	24.9 [632]	62.1 [1577]	251	227	437	470	7.8 [3.5]
					S148035FX02			73.7 [1872]					8.7 [3.9]
					S148042FX01	42 [1067]	31.9 [810]	76.8 [1951]	318	287	552	590	8.7 [3.9]
					S148042FX02			92.3 [2344]					9.9 [4.5]
					S148049FX01	49 [1245]	38.9 [988]	95.4 [2423]	385	347	664	707	9.8 [4.4]
					S148049FX02			110.9 [2817]					11.0 [5.0]
					S148055FX01	55 [1397]	44.9 [1140]	109.2 [2774]	442	396	759	805	10.7 [4.9]
					S148055FX02			128.5 [3264]					12.2 [5.5]
					S148060FX01	60 [1524]	49.9 [1267]	121.9 [3096]	490	437	837	886	11.4 [5.2]
					S148060FX02			145.1 [3686]					13.2 [6.0]
					S148064FX01	64 [1626]	53.9 [1369]	133.6 [3393]	528	469	899	949	12.2 [5.5]
					S148064FX02			156.9 [3985]					14.0 [6.4]
					S148068FX01	68 [1727]	57.9 [1471]	145.4 [3693]	566	500	960	1013	12.9 [5.9]
					S148068FX02			168.6 [4282]					14.7 [6.7]
					S148072FX01	72 [1829]	61.9 [1572]	153.2 [3891]	604	531	1021	1075	13.4 [6.1]
					S148072FX02			184.2 [4679]					15.8 [7.2]

Section Length Adjustment Table: Base Fitting Combination Y-Clevis / Ball

Tower Fitting	Line Fitting	Catalog Prefix	Length Change in [mm]
Oval Eye	Ball	S198	0.11 [2.8]
Oval Eye	Oval Eye	S199	1.72 [43.7]
Y-Clevis	Y-Clevis	S144	1.50 [38.1]
Socket	Ball	S178	-1.08 [-27.4]
Y-Clevis	Oval Eye	S149	1.61 [40.9]

**Notes:**

- 1) 230 kV and higher collage designs include corona ring(s) and are reflected in the electrical values
- 2) An 8 inch corona ring may be added to any design by changing the 'X' to 'A'
- 3) Adding an 8" corona ring will reduce the arc distance by 2.6 inches (66mm)
- 4) Contact representative for other lengths / leakages / or fitting combinations

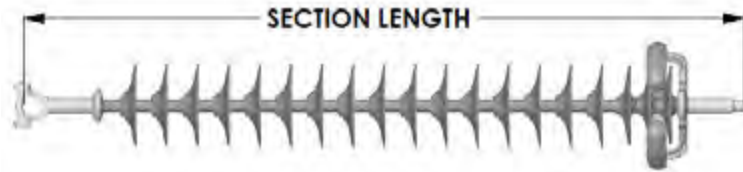




# Transmission Suspension S1-FX Series



Line Voltage		Line End	Tower End
230 kV	FA	8" Ring	None
345 kV	FB	12" Ring	None
400 kV	FG	12" Ring	8" Ring
500 kV	FV	17" Ring	8" Ring

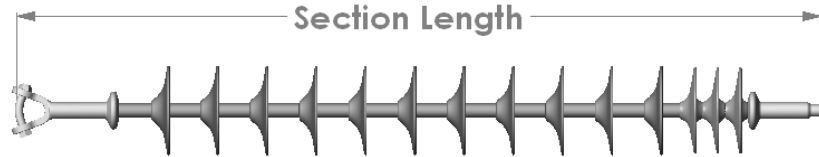
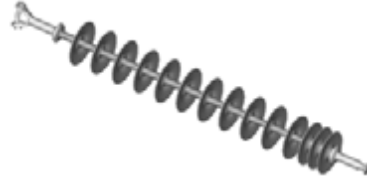


## S1 Series Insulators (continued...)

Line Voltage (kV)	Catalog No.	Section Length in [mm]	Dry Arc in [mm]	Leakage in [mm]	Electrical Flashover (kV)				Weight lbs [kgs]
					60 Hz		CIFO		
					Dry	Wet	Pos	Neg	
230 kV	S148077FA01	77 [1956]	64.3 [1633]	166.0 [4216]	627	549	1057	1112	18.1 [8.2]
	S148077FA02			196.9 [5001]					20.5 [9.3]
	S148081FA01	81 [2057]	68.3 [1735]	177.7 [4514]	665	580	1118	1174	18.9 [8.6]
	S148081FA02			208.7 [5301]					21.3 [9.7]
	S148086FA01	86 [2184]	73.3 [1862]	190.5 [4839]	712	617	1193	1250	19.6 [8.9]
	S148086FA02			221.4 [5624]					22.0 [10.0]
	S148090FA01	90 [2286]	77.3 [1963]	198.3 [5037]	751	646	1252	1311	20.1 [9.1]
	S148090FA02			233.2 [5923]					22.8 [10.3]
	S148095FA01	95 [2413]	82.3 [2090]	211.1 [5362]	798	681	1326	1386	20.9 [9.5]
	S148095FA02			249.8 [6345]					23.9 [10.8]
	S148099FA01	99 [2515]	86.3 [2192]	222.8 [5659]	836	709	1385	1446	21.6 [9.8]
	S148099FA02			261.5 [6642]					24.6 [11.2]
	S148104FA01	104 [2642]	91.3 [2319]	231.7 [5885]	884	754	1458	1521	22.1 [10.0]
	S148104FA02			278.1 [7064]					25.7 [11.7]
345 kV	S148108FB01	108 [2743]	95.3 [2421]	243.4 [6182]	922	784	1517	1581	23.6 [10.7]
	S148108FB02			286.0 [7264]					26.9 [12.2]
	S148112FB01	112 [2845]	99.3 [2522]	255.2 [6482]	960	815	1575	1640	24.4 [11.1]
	S148112FB02			301.6 [7661]					28.0 [12.7]
	S148116FB01	116 [2946]	103.3 [2624]	266.9 [6779]	991	844	1634	1698	25.1 [11.4]
	S148116FB02			313.3 [7958]					28.7 [13.0]
	S148120FB01	120 [3048]	107.3 [2725]	278.6 [7076]	1020	874	1692	1757	25.9 [11.7]
	S148120FB02			325.1 [8258]					29.5 [13.4]
	S148124FB01	124 [3150]	111.3 [2827]	286.5 [7277]	1050	903	1750	1816	26.3 [11.9]
	S148124FB02			336.8 [8555]					30.2 [13.7]
S148130FB01	130 [3302]	117.3 [2979]	296.4 [7529]	1093	946	1836	1903	26.8 [12.2]	
S148130FB02			350.6 [8905]					31.0 [14.1]	
400 kV	S148142FG01	142 [3607]	127.4 [3236]	331.6 [8423]	1167	1009	1981	2049	33.0 [15.0]
	S148142FG02			393.5 [9995]					37.8 [17.7]
500 kV	S148154FV01	154 [3912]	139.4 [3541]	412.0 [10465]	1255	1071	2153	2223	44.1 [20.0]
	S148154FV02			511.3 [12987]					52.2 [23.7]



Insulator Strength Ratings		
	SML	RTL
<b>S5</b>	30.0 klb	15.0 klb
	133.0 kN	66.5 kN
<b>16 mm Rod</b>		



### S5 Series Insulators

Line Voltage				Catalog No.	Section Length	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
69	115	138	161					60 Hz		CIFO		
								Dry	Wet	Pos	Neg	
				in (mm)	in (mm)	in (mm)						
				S548034FX01	34.0 (864)	22.0 (559)	47.4 (1204)	224	201	389	419	7.3 (3.3)
				S548034FX02			59.0 (1499)					8.1 (3.7)
				S548036FX01	36.0 (914)	24.0 (610)	57.1 (1450)	243	218	422	454	8.0 (3.6)
				S548036FX02			72.6 (1844)					9.1 (4.1)
				S548042FX01	42.0 (1067)	30.0 (762)	78.6 (1996)	300	271	520	557	9.3 (4.2)
				S548042FX02			97.9 (2487)					10.7 (4.9)
				S528049FX01	49.0 (1245)	37.0 (940)	97.2 (2469)	366	330	633	675	10.5 (4.8)
				S528049FX02			120.4 (3058)					12.1 (5.5)
				S528055FX01	55 (1397)	43.0 (1092)	95.5 (2426)	424	380	729	774	10.2 (4.6)
				S528055FX02			114.8 (2916)					11.5 (5.2)
				S528060FX01	60 (1524)	48 (1219)	115 (2944)	471	421	807	855	11.5 (5.2)
				S528060FX02			143.0 (3632)					13.4 (6.1)
				S548064FX01	64 (1626)	52 (1321)	116.1 (2949)	509	453	869	919	11.4 (5.2)
				S548064FX02			143.2 (3637)					13.3 (6.0)
				S548069FX01	69 (1753)	57 (1448)	140.4 (3566)	557	493	946	998	13.0 (5.9)
				S548069FX02			171.4 (4354)					15.2 (6.9)
				S548068FX01	68 (1727)	56 (1422)	143.3 (3640)	547	485	931	982	13.2 (6.0)
				S548068FX02			178.1 (4524)					15.7 (7.1)
				S548072FA01	72 (1829)	57.3 (1455)	135.7 (3447)	560	495	951	1003	15.6 (7.1)
				S548072FA02			170.5 (4331)					18.0 (8.2)

Tower Fitting	Line Fitting	Catalog Prefix	Length Change in [mm]
Oval Eye	Ball 52-5	S598	0.43 [10.9]
Socket	Ball 52-5	S578	-1.27 [-32.3]

**Notes:**

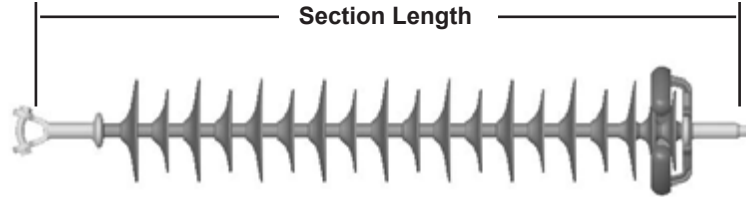
- 1) 230 kV and higher colltage designs include corona ring(s) and are reflected in the electrical values
- 2) An 8 inch corona ring may be added to any design by changing the 'X' to 'A'
- 3) Adding an 8" corona ring will reduce the arc distance by 2.6 inches (66mm)
- 4) Contact representative for other lengths / leakages / or fitting combinations



# Transmission Suspension S5-FX Series



Line Voltage		Line End	Tower End
230 kV	FA	8" Ring	None
345 kV	FB	12" Ring	None
400 kV	FG	12" Ring	8" Ring
500 kV	FV	17" Ring	8" Ring

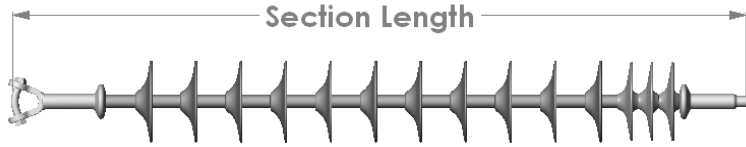


## S5 Series Insulators (continued...)

Line Voltage	Catalog No.	Section Length	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
					60 Hz		CIFO		
					Dry	Wet	Pos	Neg	
230 Kv	S548077FA01	77 (1956)	62.3 (1582)	136.8 (3475)	607	534	1027	1081	15.5 (7.0)
	S548077FA02			167.8 (4262)					17.7 (8.0)
	S548081FA01	81 (2057)	66.3 (1684)	164.0 (4166)	646	564	1087	1143	17.3 (7.8)
	S548081FA02			206.6 (5248)					20.4 (9.3)
	S548085FA01	85.0 (2159)	70.3 (1786)	164.2 (4171)	684	594	1147	1204	17.2 (7.8)
	S548085FA02			206.7 (5250)					20.3 (9.2)
	S548090FA01	90 (2286)	75.3 (1913)	192.4 (4887)	731	631	1222	1280	19.1 (8.7)
	S548090FA02			238.8 (6066)					22.4 (10.2)
	S548094FA01	94.0 (2388)	79.3 (2014)	192.5 (4890)	769	660	1281	1341	19.0 (8.6)
	S548094FA02			239.0 (6071)					22.3 (10.1)
	S548099FA01	99 (2515)	84.3 (2141)	193.6 (4917)	817	695	1355	1416	19.0 (8.6)
	S548099FA02			240.1 (6099)					22.3 (10.1)
345 kV	S548103FB01	103.0 (2616)	88.3 (2243)	228.6 (5806)	855	723	1414	1476	23.3 (10.6)
	S548103FB02			286.7 (7282)					27.5 (12.5)
	S548107FB01	107.0 (2718)	92.3 (2344)	228.7 (5809)	893	762	1473	1536	23.2 (10.5)
	S548107FB02			286.8 (7285)					27.4 (12.4)
	S548111FB01	111.0 (2819)	96.3 (2246)	286.9 (7287)	931	792	1531	1595	27.3 (12.4)
	S548111FB02			354.1 (8994)					34.3 (15.6)
	S548115FB01	115.0 (2921)	100.3 (2548)	287.0 (7290)	969	822	1590	1654	27.2 (12.3)
	S548115FB02			358.1 (9096)					34.5 (15.6)
	S548120FB01	120 (3048)	105.3 (2675)	288.2 (7320)	1005	859	1662	1727	27.1 (12.3)
	S548120FB02			365.6 (9286)					32.6 (14.8)
	S548125FB01	125.0 (3175)	110.3 (2802)	289.3 (7348)	1042	896	1735	1801	27.1 (12.3)
	S548125FB02			366.7 (9314)					32.6 (14.8)
345 kV	S548130FG01	130 (3302)	113.3 (2878)	286.6 (7280)	1064	917	1778	1844	29.7 (13.5)
	S548130FG02			367.8 (9342)					35.5 (16.1)
	S548134FG01	134.0 (3404)	117.3 (2979)	286.7 (7282)	1093	946	1836	1903	29.6 (13.4)
	S548134FG02			368.0 (9347)					35.4 (16.1)



Insulator Strength Ratings		
	SML	RTL
S6	36.0 klb	18.0 klb
	160.0 kN	80.0 kN
<b>18 mm Rod</b>		



## S6 Series Insulators

Line Voltage	Catalog No.	Section Length	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
					60 Hz		CIFO		
					Dry	Wet	Pos	Neg	
69	S648036FX01	36 (914)	24.3 (617)	45.8 (1163)	246	221	427	459	7.2 (3.3)
	S648036FX02			57.4 (1458)					8.0 (3.6)
	S648038FX01	38 (965)	26.3 (668)	59.4 (1509)	265	239	460	494	8.1 (3.7)
	S648038FX02			71.0 (1803)					8.9 (4.0)
	S648044FX01	44 (1118)	32.3 (820)	77.0 (1956)	322	291	558	597	9.2 (4.2)
	S648044FX02			96.4 (2449)					10.6 (4.8)
	S648051FX01	51.0 (1295)	39.3 (998)	95.7 (2431)	389	350	670	713	10.3 (4.7)
	S648051FX02			118.9 (3020)					12.0 (5.4)
	S648057FX01	57 (1448)	45.3 (1151)	93.9 (2385)	446	399	765	812	10.0 (4.5)
	S648057FX02			148.1 (3762)					11.7 (5.3)
	S648062FX01	62 (1575)	50.3 (1278)	114.4 (2906)	493	440	843	892	11.3 (5.1)
	S648062FX02			145.4 (3693)					13.5 (6.1)
	S648066FX01	66 (1676)	54.3 (1379)	114.5 (2908)	531	472	905	956	11.2 (5.1)
	S648066FX02			145.5 (3696)					13.4 (6.1)
	S648071FX01	71 (1803)	59.3 (1506)	135.0 (3429)	579	511	981	1034	12.6 (5.7)
	S648071FX02			169.8 (4313)					15.0 (6.8)
	S648075FX01	75 (1905)	63.3 (1608)	135.1 (3432)	617	542	1042	1097	12.5 (5.7)
	S648075FX02			170.0 (4318)					14.9 (6.8)

Tower Fitting	Line Fitting	Catalog Prefix	Length Change in (mm)
Oval Eye	Ball 52-8	S698	0.43 (10.9)
Oval Eye	Oval Eye	S699	2.16 (54.9)
Y-Clevis	Y-Clevis	S644	1.30 (33.0)
Socket 52-8	Ball 52-8	S678	-0.62 (-15.7)
Y-Clevis	Oval Eye	S649	1.73 (43.9)
Socket (IEC20)	Ball (IEC 20)	S678xxxFX1x	-0.82 (-20.8)

### Notes:

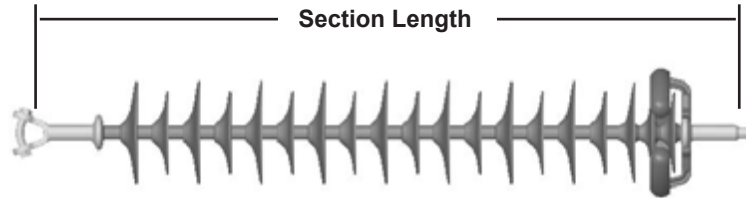
- 1) 230 kV and higher colltage designs include corona ring(s) and are reflected in the electrical values
- 2) An 8 inch corona ring may be added to any design by changing the 'X' to 'A'
- 3) Adding an 8" corona ring will reduce the arc distance by 2.6 inches (66mm)
- 4) Contact representative for other lengths / leakages / or fitting combinations



# Transmission Suspension S6-FX Series



Line Voltage		Line End	Tower End
230 kV	FA	8" Ring	None
345 kV	FB	12" Ring	None
400 kV	FG	12" Ring	8" Ring
500 kV	FV	17" Ring	8" Ring

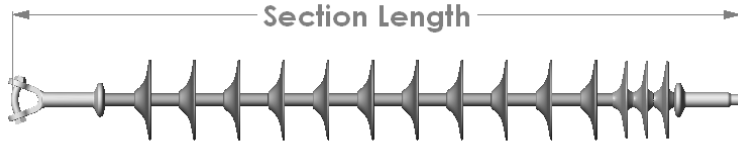


## S6 Series Insulators (continued...)

Line Voltage	Catalog No.	Section Length	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
					60 Hz		CIFO		
					Dry	Wet	Pos	Neg	
		in (mm)	in (mm)	in (mm)					lbs (kgs)
230 Kv	S648079FA01	79 (2007)	64.6 (1641)	166.2 (4221)	630	552	1062	1117	17.6 (8.0)
	S648079FA02			208.8 (5304)					20.6 (9.3)
	S648083FA01	83 (2108)	68.6 (1742)	166.4 (4227)	668	582	1122	1178	17.5 (7.9)
	S648083FA02			208.9 (5306)					20.5 (9.3)
	S648088FA01	88 (2235)	73.6 (1869)	190.7 (4844)	715	619	1197	1255	19.1 (8.7)
	S648088FA02			241.0 (6121)					22.6 (10.3)
	S648092FA01	92 (2337)	77.6 (1971)	190.8 (4846)	753	648	1256	1316	19.0 (8.6)
	S648092FA02			241.1 (6124)					22.5 (10.2)
	S648096FA01	96 (2438)	81.6 (2073)	194.8 (4948)	791	676	1316	1376	19.1 (8.7)
	S648096FA02			241.3 (6129)					22.4 (10.2)
S648101FA01	101 (2565)	86.6 (2200)	192.1 (4879)	839	711	1389	1451	18.8 (8.5)	
S648101FA02			238.5 (6058)					22.1 (10.0)	
345 kV	S648105FB01	105 (2667)	90.6 (2301)	230.9 (5865)	877	749	1448	1511	23.5 (10.7)
	S648105FB02			289.0 (7341)					27.6 (12.5)
	S648110FB01	110 (2794)	95.6 (2428)	232.1 (5895)	925	787	1522	1585	23.4 (10.6)
	S648110FB02			286.2 (7269)					27.3 (12.4)
	S648115FB01	115 (2921)	100.6 (2555)	287.4 (7300)	971	824	1594	1659	27.2 (12.3)
	S648115FB02			357.0 (9068)					32.2 (14.6)
	S648122FB01	122 (3099)	107.6 (2733)	286.6 (7280)	1022	876	1696	1761	27.0 (12.2)
	S648122FB02			367.9 (9345)					32.7 (14.8)
S648126FB01	126 (3200)	111.6 (2835)	286.8 (7285)	1052	905	1754	1820	26.9 (12.2)	
S648126FB02			368.0 (9347)					32.6 (14.8)	
345 kV/ 400 kV	S648130FB01	130 (3302)	115.6 (2936)	286.9 (7287)	1081	934	1812	1878	26.8 (12.2)
	S648130FB02			368.2 (9352)					32.5 (14.7)
	S648134FB01	134 (3404)	119.6 (3038)	333.5 (8471)	1110	963	1869	1936	30.0 (13.6)
	S648134FB02			414.7 (10533)					35.7 (16.2)
500 kV	S648144FV01	144 (3658)	127.7 (3244)	331.8 (8428)	1169	1011	1985	2053	36.6 (16.6)
	S648144FV02			417.0 (10592)					42.6 (19.3)
	S648153FV01	153 (3886)	136.6 (3470)	333.1 (8461)	1235	1057	2114	2183	36.4 (16.5)
	S648153FV02			414.4 (10526)					42.2 (19.1)
	S648157FV01	157 (3988)	140.6 (3571)	333.2 (8463)	1264	1077	2171	2240	36.3 (16.5)
	S648157FV02			414.5 (10528)					42.1 (19.1)
	S648194FV01	194 (4928)	177.6 (4511)	509.6 (12944)	1535	1233	2694	2765	47.9 (21.7)
	S648194FV02			637.3 (16187)					56.9 (25.8)



Insulator Strength Ratings		
	SML	RTL
<b>S2</b>	50.0 klb	25.0 klb
	210.0 kN	105.0 kN
<b>24 mm Rod</b>		



## S2 Series Insulators

Line Voltage	Catalog No.	Section Length	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
					60 Hz		CIFO		
					Dry	Wet	Pos	Neg	
69	S248036FX01	36 (914)	22.8 (579)	48.3 (1227)	232	208	403	434	10.5 (4.8)
	S248036FX02			59.7 (1516)					11.4 (5.2)
115	S248038FX01	38 (965)	24.8 (630)	57.9 (1471)	251	226	436	469	11.2 (5.1)
	S248038FX02			73.2 (1859)					12.4 (5.6)
138	S248045FX01	45.0 (1143)	31.8 (808)	76.4 (1941)	317	287	551	589	12.6 (5.7)
	S248045FX02			95.6 (2428)					14.2 (6.4)
161	S248051FX01	51.0 (1295)	37.8 (960)	97.7 (2482)	375	338	647	689	14.3 (6.5)
	S248051FX02			120.7 (3066)					16.1 (7.3)
	S248057FX01	57 (1448)	44 (1113)	92.2 (2342)	432	387	742	788	13.8 (6.3)
	S248057FX02			115.2 (2926)					15.7 (7.1)
	S248062FX01	62 (1575)	49 (1240)	116.4 (2957)	479	428	820	869	15.7 (7.1)
	S248062FX02			143.2 (3637)					17.9 (8.1)
	S248066FX01	66 (1676)	53 (1341)	116.6 (2962)	517	460	882	932	15.7 (7.1)
	S248066FX02			143.4 (3642)					17.8 (8.1)
	S248071FX01	71 (1803)	55 (1405)	136.9 (3477)	541	480	921	972	19.4 (8.8)
	S248071FX02			167.5 (4255)					21.8 (9.9)
	S248075FX01	75 (1905)	59 (1506)	137.0 (3480)	579	511	982	1035	19.4 (8.8)
	S248075FX02			167.7 (4260)					21.8 (9.9)

Tower Fitting	Line Fitting	Catalog Prefix	Length Change in (mm)
Oval Eye	Ball	S298	0.95 (24.1)
Oval Eye	Oval Eye	S299	2.52 (64.0)
Y-Clevis	Y-Clevis	S244	0.62 (15.7)
Socket	Ball	S278	-0.15 (-3.8)
Y-Clevis	Oval Eye	S249	1.57 (39.9)
Socket (IEC20)	Ball (IEC 20)	S278xxxF1x	-0.09 (-2.3)

**Notes:**

- 1) 230 kV and higher colltage designs include corona ring(s) and are reflected in the electrical values
- 2) An 8 inch corona ring may be added to any design by changing the 'X' to 'A'
- 3) Adding an 8" corona ring will reduce the arc distance by 2.6 inches (66mm)
- 4) Contact representative for other lengths / leakages / or fitting combinations

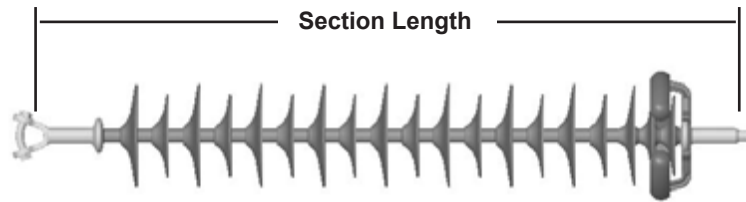




# Transmission Suspension S2-FX Series



Line Voltage		Line End	Tower End
230 kV	FA	8" Ring	None
345 kV	FB	12" Ring	None
400 kV	FG	12" Ring	8" Ring
500 kV	FV	17" Ring	8" Ring



## S2 Series Insulators (continued...)

Line Voltage	Catalog No.	Section Length	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
					60 Hz		CIFO		
					Dry	Wet	Pos	Neg	
230 Kv	S248079FA01	79 (2007)	63 (1608)	167.9 (4265)	617	542	1043	1097	21.8 (9.9)
	S248079FA02			210.0 (5334)					25.1 (11.4)
	S248083FA01	83 (2108)	67 (1709)	168.0 (4267)	655	572	1103	1159	21.8 (9.9)
	S248083FA02			206.3 (5240)					24.8 (11.2)
	S248088FA01	88 (2235)	72.3 (1836)	192.2 (4882)	703	609	1178	1235	23.7 (10.8)
	S248088FA02			238.1 (6048)					27.3 (12.4)
	S248092FA01	92 (2337)	76.3 (1938)	192.3 (4884)	741	639	1238	1296	23.6 (10.7)
	S248092FA02			238.3 (6053)					27.3 (12.4)
	S248096FA01	96 (2438)	80.3 (2040)	192.5 (4890)	779	667	1297	1357	23.6 (10.7)
	S248096FA02			238.5 (6058)					27.3 (12.4)
S248101FA01	101 (2565)	85.3 (2167)	193.7 (4920)	827	703	1371	1432	23.7 (10.8)	
S248101FA02			239.6 (6086)					27.4 (12.4)	
345 kV	S248105FB01	105 (2667)	89.4 (2271)	232.2 (5898)	865	730	1430	1492	29.3 (13.3)
	S248105FB02			285.8 (7259)					33.6 (15.2)
	S248110FB01	110 (2794)	94.3 (2395)	229.5 (5829)	913	777	1503	1566	29.1 (13.2)
	S248110FB02			286.9 (7287)					33.6 (15.2)
	S248115FB01	115 (2921)	99.3 (2522)	288.1 (7318)	960	815	1576	1640	33.7 (15.3)
	S248115FB02			357.1 (9070)					39.2 (17.8)
	S248122FB01	122 (3099)	106.3 (2700)	287.5 (7303)	1013	867	1677	1743	33.6 (15.2)
	S248122FB02			367.9 (9345)					40.0 (18.1)
	S248126FB01	126 (3200)	110.3 (2802)	287.6 (7305)	1042	896	1735	1801	33.6 (15.2)
	S248126FB02			368.1 (9350)					40.0 (18.1)
345 kV/ 400 kV	S248130FB01	130 (3302)	114.3 (2903)	287.8 (7310)	1072	925	1793	1860	33.6 (15.2)
	S248130FB02			368.2 (9352)					40.0 (18.1)
	S248134FB01	134 (3404)	118.3 (3005)	333.9 (8481)	1101	954	1851	1918	37.2 (16.9)
	S248134FB02			414.4 (10526)					43.6 (19.8)
500 kV	S248144FV01	144 (3658)	126.5 (3213)	336.3 (8542)	1160	1004	1968	2036	43.8 (19.9)
	S248144FV02			416.7 (10584)					50.2 (22.8)
	S248153FV01	153 (3886)	135.5 (3442)	333.8 (8479)	1226	1052	2037	2166	43.5 (19.7)
	S248153FV02			414.2 (10521)					49.9 (22.6)
	S248157FV01	157 (3988)	139.5 (3543)	333.9 (8481)	1256	1072	2154	2224	43.5 (19.7)
	S248157FV02			414.4 (10526)					49.9 (22.6)
	S248194FV01	194 (4928)	176.5 (4483)	508.8 (12924)	1526	1229	2678	2749	57.2 (25.9)
	S248194FV02			635.2 (16134)					67.2 (30.5)



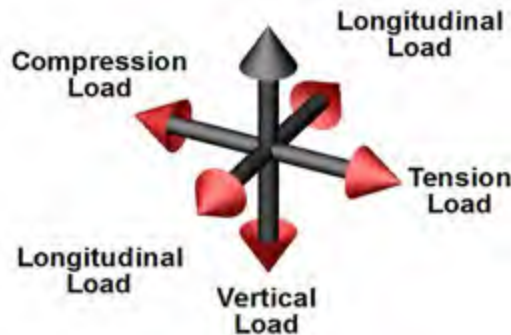
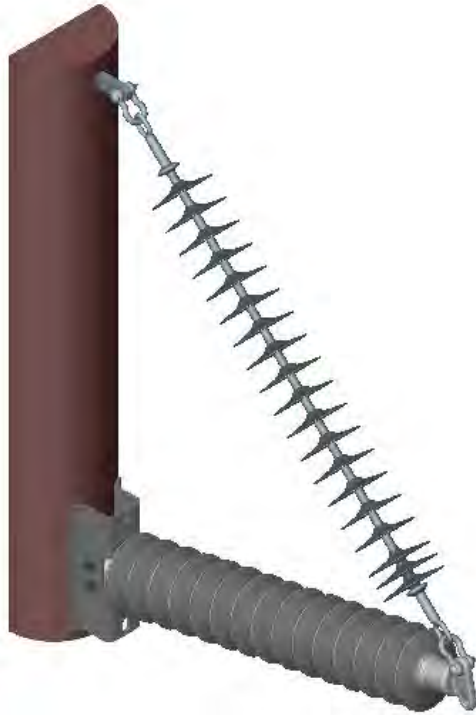
Transmission line design must take into account economics, right-of-way, aesthetics, construction efficiency, and reliability. The composite braced post design is the clear choice to achieve each of these sometimes conflicting objectives. Composite Braced Posts allow the use of monopole structures vs. traditional lattice and H-frame construction significantly reducing the visual impact of the line as well as the right-of-way required to construct it.

Composite Braced Posts vastly improve the vertical loading capability of conventional line posts allowing for greater span lengths and less total structures. Because they are composite and are made of silicone rubber, they also offer advantages of light weight, vandal resistance, and contamination performance unmatched by other insulator designs.

Braced Post Assemblies are used effectively at system voltages from 69kv to 345kv. The composite braced post offers both urban aesthetics as well as a low environmental impact.

Upper Left: Double Circuit Braced Post Structure  
Below: Braced Post vs. V-String Design  
Lower Left: Lattice Structure





**Braced Post:** Unique insulator design that combines the cantilever properties of a horizontal line post with the tension strength of a suspension insulator to make a high strength insulator assembly. The suspension insulator, or brace, is attached to the line post and to the tower via connection hardware. When loaded, the brace goes into tension, and is the primary support mechanism for the assembly. The line post provides stability for transverse (tension & compression) & longitudinal loads exerted onto the assembly.

**Connection Hardware:** The hardware used to connect the brace to the post and tower can be supplied in a variety of combinations. Typically, the hardware used is greater than or equal to the SML rating of the brace insulator, and the type of connections is determined by the end fittings supplied on the suspension. Options for connection hardware discussed in later sections.

**Vertical Load:** (MDCL) Downward load applied to the assembly, usually determined by the weight of the conductor.

**Tension Load:** Transverse load pulling perpendicularly away from the tower, essentially putting the line post in tension.

**Compression Load:** Transverse load pulling perpendicularly into the tower, compressing the line post towards the tower.

**Longitudinal Load:** Side load applied to the assembly. Ideally, the load on each side of the assembly will be equal / balanced, resulting in no longitudinal load. Longitudinal loading is critical when loads are unbalanced and for broken conductor consideration.

**Combined Load Curves:** Load curve that combines the effects of the various loads and plots working and ultimate strength of the assembly. Load curves are supplied upon request.

**Working Load Curve:** The maximum load that can be applied to the insulator for long periods of time, without damaging or fatiguing the insulator.

**Ultimate Load Curve:** The load at which the assembly approaches its ultimate strength, point of failure.

**Braced Post Load Application:** The maximum load (or worst case load) of a specific application should fit right at or below the working load curve for that respective design. This max load is determined by the customer, and should take into account environmental influences (wind, ice, etc) along with the utilities safety factor practice. Max load applications that surpass the working curve require upgrades in strength for the braced post.

**Strength Upgrades:** Depending on the specific loading requirements, there are many ways to upgrade the strength of a braced post, listed below are a few of the most common upgrades.

- Increase the SML of the brace insulator [~ increase Vertical Loading Capability]
- Increase the rod diameter of the line post [~ higher Vertical / Transverse Loading Capability]
- Change from fixed base to swivel base [~ improves Longitudinal Loading Capability]
- Dimensional design changes (Changes to upsweep angle, brace angle, height, etc.)



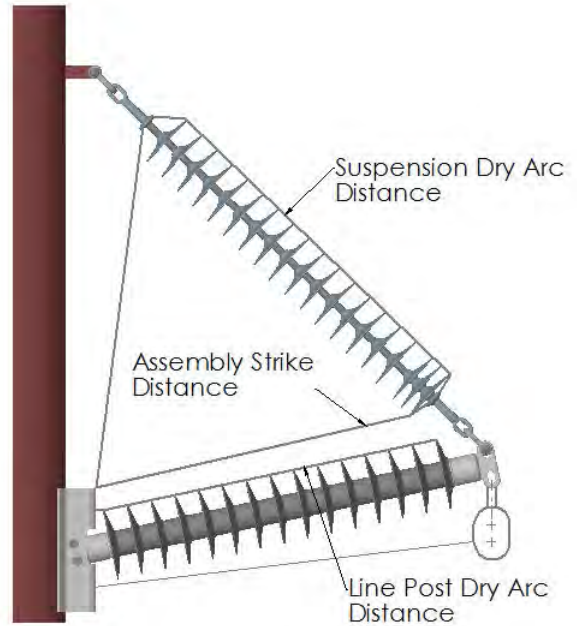
**Insulator Electrical Performance:** The electrical values of an insulator are driven by the dry arc distance, and the insulators' contamination performance is dictated by the leakage distance.

**Dry Arc Distance:** The shortest distance metal to metal up and along the insulator tangent to the sheds. The electrical values for 60Hz & critical impulse flashovers are statistically derived by the dry arc distance of the insulator.

**Assembly Strike Distance:** In a combination assembly, the individual dry arc distances of each insulator are usually not the shortest paths metal to metal. This shorter path or dry arc for the assembly is called the strike distance, which could be the distance from the post base to the brace end fitting or corona ring, or it could be the distance to the conductor hardware, especially on double bundled assemblies with horizontal yoke plates. The strike distance drives the electrical values of the braced post assembly.

**Leakage Distance:** The continuous path across the insulator from metal to metal, measured across the profile of each shed. The leakage distance is controlled by the number of sheds on the insulator.

**Assembly Leakage Distance:** The leakage distance for a braced post assembly is the shortest leakage distance of the 2 insulators that make up the assembly. If the post has 230" of leakage, and the brace has 180" of leakage, the braced post leakage distance is 180".



The strike distance of the braced post assembly is typically shorter than the dry arc distances of either the post or brace insulators. Therefore, the electrical values of the individual insulators are greater than the electrical values of the assembly. The sketch above shows the various strike distances of the assembly, the shortest of which determines the electrical values.

## Recommended Corona Ring Application for the Braced Post



8" Corona Ring



12" Corona Ring

	230 kV	345 kV
Brace	8" Ring	12" Ring
Post	None	6" Ring

High voltages can result in unwanted noise (RIV) and corona. To minimize the effects of corona, corona rings are applied to one or both of the insulators of the assembly. Typically, for system voltages 230kV and above a corona ring or combination of rings is necessary. However, some applications may require rings at lower system voltages. The table above shows the recommended corona ring applications for 230kV & 345kV. The ultimate decision of corona ring application is determined by the customer and by the environmental factors where the assembly will be used.



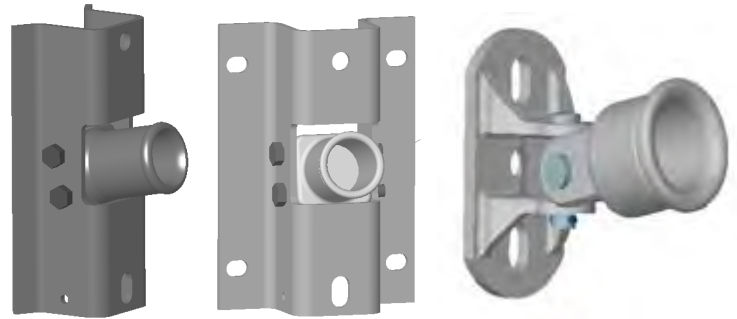


## Braced Post Design Options

### Insulator Options

**Line Post:** Typically, the line post of the braced post assembly will have a tongue line end fitting (F), and a bendable base tower connection (E). The bendable base is available as a gain or flat design type, or it can be replaced with a swivel or pivoting base, depending on the requirements of the application.

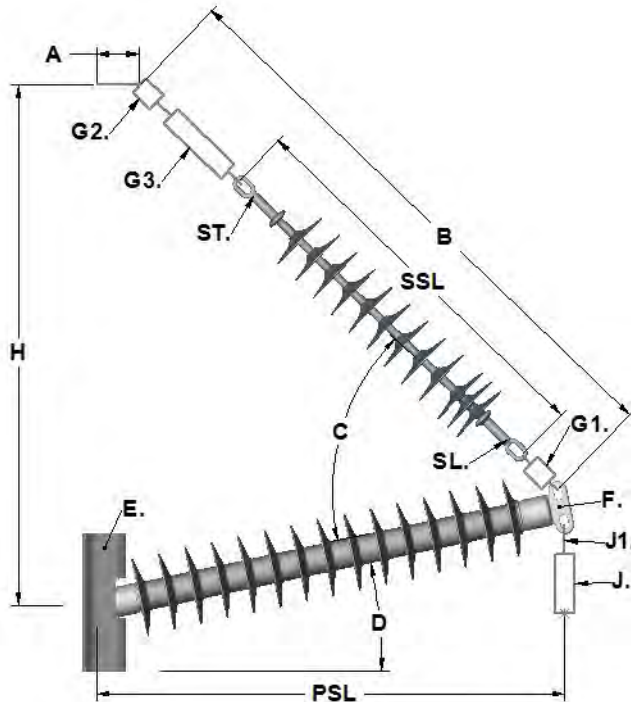
**Brace Insulator:** The suspension insulator that makes up the brace can be comprised of many end fitting combinations, per customer preference. The Eye / Eye combination is a commonly used design, it offers a greater degree of articulation when combined with anchor shackles.



**Bendable Gain**

**Bendable Flat**

**Swivel Base**



**Bendable Base** – Formed steel base that mates with an anchor end fitting on the insulator via 2 mounting bolts. These bases provide some vertical articulation of the post, which offers adjustment for the brace and connection hardware to the pole. Bendable bases come in gain and flat designs, with 0° & 12° up-sweep angles, as required for by application.

**Gain Base** – Base design used to mate the insulator to a round pole surface. This base is attached to the pole through the center bolt mount holes.

**Flat Base** – Base design used to mate the insulator to a flat surface, using either the 4 bolt holes along the ears of the base, or the 2 center mount bolt holes.

**Swivel Base or Pivoting Base** – This base provides articulation in the vertical and longitudinal directions. This design is typically used in areas where high longitudinal loading is required to compensate for unbalanced loads or broken conductor conditions.

**Pole Band Assemblies** – Another method of attaching a braced post assembly to a tower is by means of a pole band assembly. Pole bands are used on poles when mount holes are not available and cannot be drilled, or for maintenance / emergency response applications. Contact MPS for additional details.

## Brace Connection Hardware Options

The brace of the braced post assembly can be made up of many different insulator and hardware combinations, depending on customer preference and design.

- The suspension insulator can make up the entire length of the brace, connected to the post and tower via anchor shackles. This is the simplest and more cost efficient design.
- The brace can consist of an electrically proportionate length suspension, combined with shackles for G1. & G2, and some form of steel hardware for item G3 (turnbuckle, straps, links, etc).

Options for G1	Options for G2	Options for G3	EF Options for SSL
Anchor Shackle (SL = Eye) Socket/Clevis (SL = Y-Clevis)	Anchor Shackle (SL = Eye)	Turnbuckle Steel Strap Chain Links	Eye / Eye Eye / Ball Y-Clevis / Ball



## Custom Braced Post Designs

The MPS “Braced Post” section of this catalog has many standard designs available for system voltages 69kV through 230kV. If the designs shown in the catalog do not exactly satisfy the requirements of an application, custom braced post designs are available. At the end of the braced post section is a braced post request worksheet, which is designed to communicate the specific details of a custom braced post design to MPS. The information provided on this sheet is used by MPS Design Engineering to develop the best fit design per customer request. In order to properly develop these designs, it is important to know the specific requirements of the application along with clarification about which details are most critical and which have some flexibility within the design. More Information = better designs and faster response time.

**Braced Post Assembly Details:** This section outlines the geometric/dimensional requirements of the assembly, including assembly height, section length, and angles. Ideally, the dimensions required would be expressed as a nominal value, with some +/- tolerances. When a specific dimension is absolutely required, it should be identified as “critical”. Not every dimension can be critical, as some dimensions of the assembly are driven by others, therefore only 2-3 dimensions should be marked as critical.

**Mechanical Loading Requirements:** This section identifies the loading characteristics of the application. These values should be ultimate loads the assembly will be expected to withstand over long periods of time, and should fit within the working load curve of the assembly.

**Electrical Requirements:** This section determines the minimal requirement of the assembly with respect to electrical performance.

- Minimum leakage distance (and / or description of contamination level for the application)
- Minimum strike distance / dry arc
- Minimum requirements for 2 of the 4 electrical values (ex. Dry FO & CIFO+)
- Corona ring requirement

**Assembly Details:** The remaining sections identify the various options of the assembly...

- Line post base requirement
- Suspension end fitting requirements
- Hardware attachments
- Extension hardware
- Conductor information (armor rod)
- Conductor attachment hardware

## Hardware Assemblies & Packaging

MPS provides a single catalog number & drawing for each braced post assembly, whether it is a standard catalog item, or a custom design. The catalog number includes all the insulators, connection hardware, and conductor hardware as required, with all the various catalog numbers of the individual components bundled into one catalog number.

**Packaging:** There are several options for packaging insulator assemblies. Typically, the individual components are bulk packed separately and mated in the field by the customer. Custom packs and tower packs are available upon request. These value added options reduce costs in the field, help minimize lost or missing parts, and reduce the time from receipt of goods to installation.

**Tower Packs:** Unique packaging where each component of the assembly is packed into one crate, usually in quantities of 3, 6, or 9. MPS verifies fit and quantity of the components of the assembly. The crate can be marshaled out to the job site and dropped at the tower, where it can then be assembled and installed.

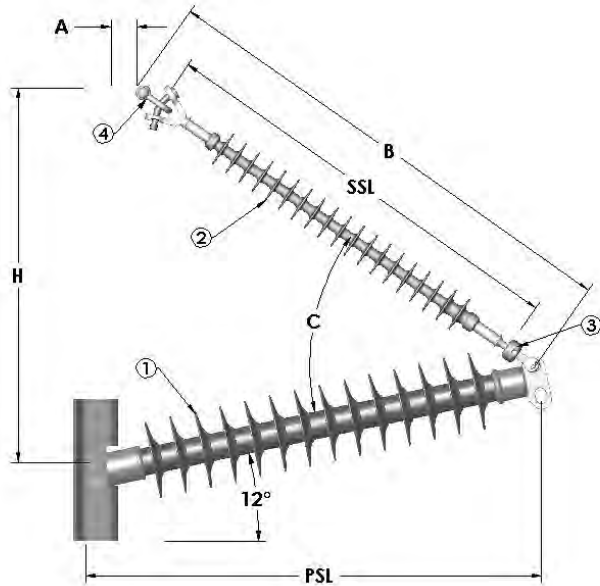
**Custom Packs:** MPS packages components together as required by the customer.

For additional information about braced post assemblies, contact your local MPS Sales Representatives





# Braced Post - B191-XL Series



### Identification

A = 1.5" [38mm] (not included) (pole connection offset)  
 B = Brace Length  
 C = Brace Angle  
 H = Assembly Height (Tolerance = +/- 3")  
 SSL = Suspension Length  
 PSL = Post Section Length

Fig.	PSL	SSL	H	C	B
	in (mm)	in (mm)	in (mm)	Deg.	in (mm)
1	32.0 (813)	35.4 (899)	35.0 (889)	54.0°	40.9 (1039)
2	32.0 (813)	41.7 (1059)	44.0 (1118)	63.0°	47.2 (1199)
3	35.0 (889)	41.7 (1059)	42.0 (1067)	58.0°	47.2 (1199)
4	35.0 (889)	46.4 (1179)	48.0 (1219)	62.0°	51.9 (1318)
5	41.0 (1041)	46.4 (1179)	43.5 (1105)	53.0°	51.9 (1318)
6	41.0 (1041)	54.3 (1379)	54.5 (1384)	61.0°	59.8 (1519)
7	48.0 (1219)	54.3 (1379)	49.0 (1245)	52.0°	59.8 (1519)
8	48.0 (1219)	60.6 (1539)	58.0 (1473)	58.0°	66.1 (1679)
9	54.0 (1372)	60.6 (1539)	53.0 (1346)	50.0°	66.1 (1679)
10	54.0 (1372)	65.3 (1659)	60.0 (1524)	55.0°	70.8 (1798)
11	60.0 (1524)	65.3 (1659)	54.0 (1372)	47.0°	70.8 (1798)
12	60.0 (1524)	71.7 (1821)	64.0 (1626)	53.0°	77.2 (1961)

### List Of Materials:

#### Standard Strength Braced Posts

- 1) 2.0" Line Post Insulator (1 each)
- 2) 25klb MX Suspension Insulator (1 each)
- 3) SYC-56 Socket Y-Clevis (1 each)
- 4) ASH-55 Anchor Shackle (2 each)

Fig.	Catalog Number	Line Voltage	MDCL	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
						60 Hz		CIFO		
						Dry	Wet	Pos	Neg	
1	B191032XL4AM 1	69	10,387	23.3	51.2 (1300)	234	213	298	490	46.5 (21.1)
2	B191032XL4AM 2	69	11,330	24.5	51.2 (1300)	245	223	416	509	46.4 (21.0)
3	B191035XL4AM 1	69	10,200	29.3	55.9 (1420)	288	264	491	586	47.8 (21.7)
4	B191035XL4AM 2	69	11,200	30.4	37.3 (1709)	298	274	509	604	50.1 (22.7)
5	B191041XL4AM 1	69	10,048	36.3	79.3 (2014)	351	325	603	691	53.5 (24.3)
6	B191041XL4AM 2	115	10,949	37.2	79.5 (2019)	359	332	617	704	53.2 (24.1)
7	B191048XL4AM 1	115	10,023	42.4	85.6 (2174)	405	375	699	775	55.3 (25.1)
8	B191048XL4AM 2	115	10,908	43.3	85.6 (2174)	414	383	714	787	55.0 (24.9)
9	B191054XL4AM 1	138	10,043	48.5	91.5 (2324)	460	426	797	851	56.8 (25.8)
10	B191054XL4AM 2	138	10,762	49.2	96.7 (2456)	466	431	808	860	57.9 (26.3)
11	B191060XL4AM 1	138	10,043	48.5	91.5 (2324)	460	426	797	851	56.8 (25.8)
12	B191060XL4AM 2	138	10,762	49.2	96.7 (2456)	466	431	808	860	57.9 (26.3)

#### Notes:

- MDCL = Max. Design Cantilever Load (Load Curves provided upon request)
- Electrical Data is derived from the assembly "Strike Distance", without corona rings for 161kV and below. All 230kV Braced Post assemblies supplied with a corona ring (Electrical Values include the corona ring).
- B191 Series supplied with standard G2-0 Bendable Gain Base on line post.
- For Flat Base F2-0, change the "9" in B191... to "1" = B111...[See line post base section for details]
- For Higher Strength or Custom Designs, please complete the Braced Post Request Worksheet at the end of this section and return the completed worksheet to MPS through your local MPS Sales Representative.
- Customized Designs include any dimensional changes, strength changes, hardware changes, end fitting changes, etc.



# Braced Post - B191-XT Series

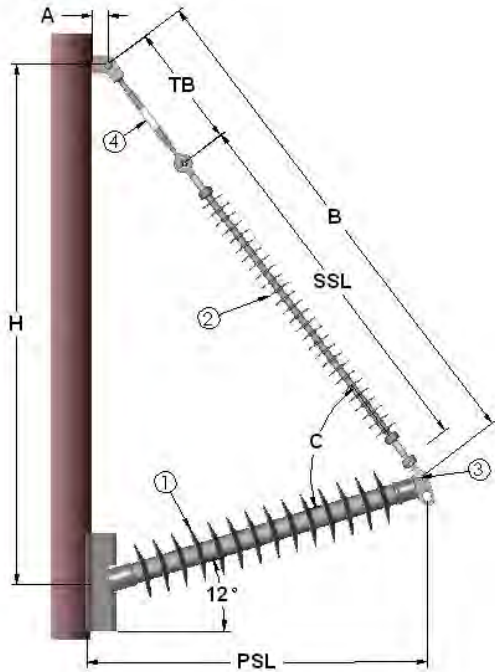


Fig.	PSL in (mm)	SSL in (mm)	H		C Deg.	B	
			MIN in (mm)	MAX in (mm)		MIN in (mm)	MAX in (mm)
1	36.0 (914)	35.4 (899)	50.0 (1270)	57.5 (1461)	63° - 68°	53.58 (1367)	59.5 (1519)
2	36.0 (914)	35.4 (899)	54.0 (1372)	65.0 (1651)	66° - 71°	56.9 (1445)	65.9 (1674)
3	41.0 (1041)	41.7 (1059)	55.0 (1397)	63.0 (1600)	62° - 66°	60.1 (1527)	66.0 (1676)
4	41.0 (1041)	41.7 (1059)	59.0 (1499)	70.0 (1778)	64° - 69°	63.2 (1605)	72.2 (1834)
5	47.0 (1194)	46.4 (1179)	57.0 (1448)	65.5 (1664)	58° - 63°	64.8 (1646)	70.8 (1798)
6	47.0 (1194)	46.4 (1179)	61.5 (1562)	73.0 (1854)	61° - 66°	67.9 (1725)	76.9 (1953)
7	54.0 (1372)	54.3 (1379)	63.0 (1600)	71.5 (1816)	57° - 61°	72.7 (1847)	78.7 (1999)
8	54.0 (1372)	54.3 (1379)	37.5 (1715)	79.0 (2007)	59° - 64°	75.8 (1925)	84.8 (2154)
9	60.0 (1524)	60.3 (1532)	67.0 (1702)	75.5 (1918)	55° - 59°	78.7 (1999)	84.7 (2151)
10	60.0 (1524)	60.3 (1532)	71.5 (1816)	83.5 (2121)	57° - 63°	81.8 (2078)	90.8 (2306)
11	65.0 (1651)	65.3 (1659)	69.5 (1765)	78.5 (1994)	53° - 58°	83.7 (2126)	89.7 (2278)
12	65.0 (1651)	65.3 (1659)	74.5 (1892)	86.5 (2197)	56° - 61°	86.8 (2205)	95.8 (2433)

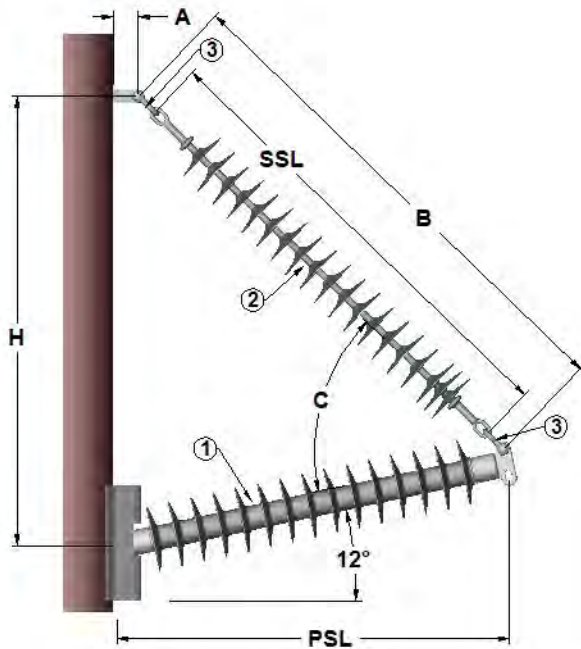
## List Of Materials:

- 1) 2.0" Line Post Insulator (1 each)
- 2) 25klb MX Suspension Insulator (1 each)
- 3) SYC-56 Socket Y-Clevis (1 each)
- 4) Turnbuckle

Fig.	Catalog Number	Line Voltage kV	MDCL lbs (kN)	Dry Arc in (mm)	Leakage in (mm)	Electrical Flashover (kV)				Weight lbs. (kg)
						60 Hz		CIFO		
						Dry	Wet	Pos	Neg	
1	B191036XT4AM6	69	11,369 (50.6)	26.6 (676)	60.8 (1544)	264	242	449	544	62.3 (28.3)
2	B191036XT4AM9									
3	B191041XT4AM6	69	11,233 (50.0)	31.6 (803)	76.8 (1951)	309	285	529	622	66.7 (30.3)
4	B191041XT4AM9									
5	B191047XT4AM6	115	10,851 (48.3)	37.4 (950)	89.0 (2261)	361	334	620	707	70.8 (32.1)
6	B191047XT4AM9									
7	B191054XT4AM6	115 /138	10,652 (47.4)	44.4 (1128)	109.2 (2774)	424	392	732	801	76.0 (34.5)
8	B191054XT4AM9									
9	B191060XT4AM6	138	10,448 (46.5)	50.4 (1280)	125.2 (3180)	477	441	827	876	80.5 (36.5)
10	B191060XT4AM9									
11	B191065XT4AM6	138 /161	10,250 (45.6)	55.4 (1407)	137.4 (3490)	520	480	905	950	84.4 (38.3)
12	B191065XT4AM9									

### Notes:

- MDCL = Max. Design Cantilever Load (Load Curves provided upon request)
- Electrical Data is derived from the assembly "Strike Distance", without corona rings for 161kV and below. All 230kV Braced Post assemblies supplied with a corona ring (Electrical Values include the corona ring).
- B191 Series supplied with standard G2-0 Bendable Gain Base on line post.
- For Flat Base F2-0, change the "9" in B191... to "1" = B111...[See line post base section for details]
- For Higher Strength or Custom Designs, please complete the Braced Post Request Worksheet at the end of this section and return the completed worksheet to MPS through your local MPS Sales Representative.
- Customized Designs include any dimensional changes, strength changes, hardware changes, end fitting changes, etc.



### Identification

A = 1.5" [38mm] (not included) H = Assembly Height  
 (pole connection offset) (Tolerance = +/- 3")  
 B = Brace Length SSL = Suspension Length  
 C = Brace Angle PSL = Post Section Length

Fig.	PSL	SSL	H	C	B
	in (mm)	in (mm)	in (mm)	Deg.	in (mm)
1	35.0 (889)	39.0 (991)	37.9 (963)	54°	44.5 (1130)
2	41.0 (1041)	45.0 (1143)	41.5 (1054)	52°	50.5 (1283)
3	45.0 (1143)	49.0 (1245)	44.0 (1118)	50°	54.5 (1384)
4	52.6 (1336)	58.0 (1473)	51.5 (1308)	50°	63.5 (1613)
5	54.0 (1372)	75.0 (1905)	74.0 (1880)	62°	80.5 (2045)
6	58.5 (1486)	67.9 (1725)	59.8 (1519)	51°	72.5 (1842)
7	59.0 (1499)	84.0 (2134)	83.0 (2108)	63°	89.5 (2273)
8	61.5 (1562)	70.0 (1778)	61.5 (1562)	50°	75.5 (1918)
9	65.0 (1651)	93.0 (2362)	91.0 (2311)	63°	98.5 (2502)
10	67.4 (1712)	78.0 (1981)	68.2 (1732)	51°	83.5 (2121)
11	70.4 (1788)	81.0 (2057)	69.9 (1775)	54°	86.5 (2197)
12	70.0 (1778)	100.0 (2540)	96.0 (2438)	62°	105.5 (2680)
13	75.0 (1905)	88.0 (2235)	75.0 (1904)	51°	93.5 (2375)
14	84.0 (2134)	100.0 (2540)	85.0 (2159)	51°	105.5 (2680)
15	85.0 (2159)	123.0 (3124)	118.0 (2997)	63°	128.5 (3264)
16	90.0 (2286)	107.0 (2718)	90.0 (2287)	51°	112.5 (2858)
17	90.0 (2286)	133.0 (3378)	127.0 (3226)	63°	138.5 (3518)
18	96.0 (2438)	114.0 (2896)	95.0 (2413)	50°	119.5 (3035)

### List Of Materials:

#### Standard Strength Braced Posts

- 5) 2.5" Line Post Insulator (1 each)
- 6) 25klb (S199) Suspension Insulator (1 each)
- 7) ASH-55 Anchor Shackle (2 each)

### Notes:

- MDCL = Max. Design Cantilever Load (Load Curves provided upon request)
- Electrical Data is derived from the assembly "Strike Distance", without corona rings for 161kV and below. All 230kV Braced Post assemblies supplied with a corona ring (Electrical Values include the corona ring).
- HS = High Strength design. Brace SML = 36k
- For Higher Strength or Custom Designs, please complete the Braced Post Request Worksheet at the end of this section and return the completed worksheet to MPS through your local MPS Sales Representative.
- B191 Series supplied with standard G2-0 Bendable Gain Base on line post.
- For Flat Base F2-0, change the "9" in B191... to "1" = B111... [See line post base section for details]
- Customized Designs include any dimensional changes, strength changes, hardware changes, end fitting changes, gain to flat base changes, etc.



# Braced Post - B291-XL Series



Continued...

Fig.	Catalog Number	Line Voltage	MDCL	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
						60 Hz		CIFO		
		kV	lbs (kN)	in (mm)	in (mm)	Dry	Wet	Pos	Neg	lbs (kg)
1	B291035XL99 A	69	10,375 (46.2)	23.3 (591)	48.9 (1242)	233	212	396	489	63.6 (28.9)
	60.4 (1534)				64.5 (29.3)					
	72.4 (1839)				65.7 (29.8)					
2	B291041XL99 A	69	10,028 (44.6)	28.8 (731)	48.5 (1232)	283	260	484	578	68.4 (31.0)
	70.3 (1786)				70.2 (31.9)					
	90.7 (2304)				71.7 (32.5)					
3	B291045XL99 A	115	9,910 (44.1)	33.2 (843)	78.2 (1986)	323	298	553	645	72.2 (32.7)
	104.5 (2654)				74.3 (33.7)					
	124.7 (3167)				76.0 (34.5)					
4	B291052XL99 A	115	9,829 (43.7)	40.6 (1031)	75.6 (1920)	390	361	671	751	77.9 (35.4)
	95.0 (2413)				79.4 (36.0)					
	125.9 (3198)				81.8 (37.1)					
5	B291054XL99 A	115	11,295 (50.2)	43.8 (1113)	81.0 (2057)	418	387	722	793	66.7 (30.3)
	111.6 (2835)				72.8 (33.0)					
	138.8 (3526)				78.7 (35.7)					
6	B291058XL99 A	138	10,032 (44.6)	46.8 (1189)	92.3 (2344)	444	411	769	830	82.8 (37.6)
	123.3 (3132)				85.2 (38.7)					
	145.9 (3706)				87.0 (39.5)					
7	B291059XL99 D	138	11,377 (50.6)	49.1 (1247)	97.7 (2482)	465	430	805	858	70.7 (32.1)
	124.8 (3170)				76.6 (34.7)					
	155.8 (3957)				83.4 (37.8)					
8	B291061XL99 A	138	9,908 (44.1)	49.7 (1262)	91.35 (2324)	470	435	815	865	84.7 (38.4)
	122.4 (3109)				87.1 (39.5)					
	153.4 (3896)				89.5 (40.6)					
9	B291065XL99 A	161	11,352 (50.5)	55.2 (1402)	109.2 (2774)	518	479	902	947	74.1 (33.6)
	136.4 (3465)				80.0 (36.3)					
	163.6 (4155)				85.9 (39.0)					
10	B291067XL99 A	161	9,969 (44.3)	55.8 (1417)	107.2 (2723)	523	483	911	956	89.6 (40.7)
	142.0 (3607)				92.3 (41.9)					
	173.0 (4394)				94.7 (43.0)					
11	B291070XL99 A	161	9,870 (43.9)	58.7 (1491)	106.0 (2692)	549	506	957	1000	91.4 (41.5)
	141.2 (3586)				94.1 (42.7)					
	182.6 (4638)				97.4 (44.2)					



# Braced Post - B291-XL Series



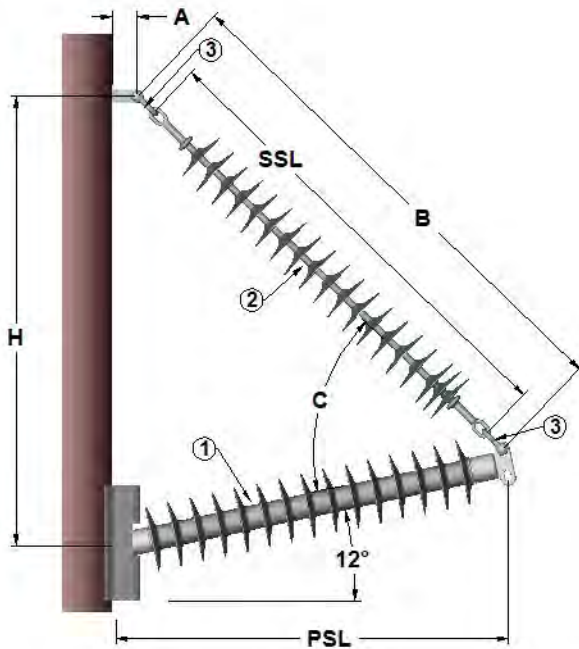
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Fig.	Catalog Number	Line Voltage	MDCL	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
						60 Hz		CIFO		
		kV	lbs (kN)	in (mm)	in (mm)	Dry	Wet	Pos	Neg	lbs (kg)
12	B291070XL99 I	161	11,276 (50.2)	60.0 (1524)	125.3 (3183)	560	516	978	1019	78.8 (35.7)
	B291070XL99 J				150.6 (3825)					84.0 (38.1)
	B291070XL99 K				191.1 (4854)					92.7 (42.0)
13	B291075XL99 A	161	9,901 (44.0)	63.7 (1618)	113.3 (2878)	593	545	1036	1074	94.7 (43.0)
	B291075XL99 B				140.4 (3566)					96.8 (43.9)
	B291075XL99 C				194.6 (4943)					101.0 (45.8)
14	B291084AL99 A	230	9,951 (44.3)	69.7 (1770)	151.3 (3843)	644	590	1129	1162	9038 (41.2)
	B291084AL99 B				202.7 (5149)					101.7 (46.1)
	B291084AL99 C				228.0 (5791)					107.5 (48.8)
15	B291085AL99 A	230	11,305 (50.3)	72.3 (1836)	156.1 (3965)	666	609	1168	1200	91.6 (41.5)
	B291085AL99 B				193.1 (4905)					99.7 (45.2)
	B291085AL99 C				237.4 (6030)					109.3 (49.6)
16	B291090AL99 A	230	9,887 (44.0)	75.8 (1925)	155.6 (3952)	696	635	1222	1251	93.0 (42.2)
	B291090AL99 B				202.0 (5131)					102.9 (46.7)
	B291090AL99 C				239.0 (6071)					110.9 (50.3)
17	B291090AL99 D	230	11,357 (50.5)	77.3 (1963)	162.0 (4115)	709	646	1245	1273	93.6 (42.5)
	B291090AL99 E				207.3 (5265)					103.5 (46.9)
	B291090AL99 F				247.4 (6284)					112.2 (50.9)
18	B291096AL99 A	230	9,830 (43.7)	81.5 (2070)	154.8 (3932)	745	676	1308	1333	93.6 (42.5)
	B291096AL99 B				199.8 (5075)					103.4 (46.9)
	B291096AL99 C				258.7 (6571)					116.2 (52.7)

Data in this table corresponds with the Sketches on the previous page.

**Notes:**

- MDCL = Max. Design Cantilever Load (Load Curves provided upon request)
- Electrical Data is derived from the assembly "Strike Distance", without corona rings for 161kV and below. All 230kV Braced Post assemblies supplied with a corona ring (Electrical Values include the corona ring).
- HS = High Strength design. Brace SML = 36k
- For Higher Strength or Custom Designs, please complete the Braced Post Request Worksheet at the end of this section and return the completed worksheet to MPS through your local MPS Sales Representative.
- Customized Designs include any dimensional changes, strength changes, hardware changes, end fitting changes, gain to flat base changes, etc.



### Identification

A = 1.5" [38mm] (not included) H = Assembly Height  
 (pole connection offset) (Tolerance = +/- 3")  
 B = Brace Length SSL = Suspension Length  
 C = Brace Angle PSL = Post Section Length

Fig.	PSL	SSL	H	C	B
	in (mm)	in (mm)	in (mm)	Deg.	in (mm)
5	54.0 (1372)	75.0 (1905)	74.0 (1880)	62°	80.5 (2045)
7	59.0 (1499)	84.0 (2134)	83.0 (2108)	63°	89.5 (2273)
9	65.0 (1651)	93.0 (2362)	91.0 (2311)	63°	98.5 (2502)
12	70.0 (1778)	100.0 (2540)	96.0 (2438)	62°	105.5 (2680)
15	85.0 (2159)	123.0 (3124)	118.0 (2997)	63°	128.5 (3264)
17	90.0 (2286)	133.0 (3378)	127.0 (3226)	63°	138.5 (3518)

### High Strength Braced Posts [marked "HS"]

- 1) 2.5" Line Post Insulator (1 each)
- 2) 36klb (S699) Suspension Insulator (1 each)
- 3) ASH-56 Anchor Shackle (2 each)

Fig.	Catalog Number	Line Voltage	MDCL	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
						60 Hz		CIFO		
						Dry	Wet	Pos	Neg	
5	B291054XL99 L	115	14,000 (62.3)	43.8 (1113)	82.7 (2101)	418	387	722	793	68.3 (31.0)
	B291054XL99 M				109.8 (2789)					74.4 (33.7)
	B291054XL99 N				138.8 (3526)					80.3 (36.4)
7	B291059XL99 L	138	14,000 (62.3)	49.1 (1247)	99.4 (2525)	465	430	805	858	72.3 (32.8)
	B291059XL99 M				122.6 (3114)					78.2 (35.5)
	B291059XL99 N				157.5 (4001)					85.0 (38.6)
9	B291065XL99 L	161	14,000 (62.3)	55.2 (1402)	108.4 (2753)	518	479	902	947	75.7 (34.3)
	B291065XL99 M				135.5 (3442)					81.6 (37.0)
	B291065XL99 N				163.6 (4155)					87.5 (39.7)
12	B291070XL99 L	161	14,000 (62.3)	60.0 (1524)	127.0 (3226)	560	516	978	1019	80.4 (36.5)
	B291070XL99 M				150.2 (3815)					85.6 (38.8)
	B291070XL99 N				191.3 (4859)					94.3 (42.8)
15	B291085XL99 L	230	14,000 (62.3)	72.3 (1836)	156.9 (3985)	666	609	1168	1200	93.2 (42.3)
	B291085XL99 M				192.6 (4892)					101.3 (45.9)
	B291085XL99 N				238.4 (6055)					110.9 (50.3)
17	B291090XL99 L	230	13,577 (60.4)	77.3 (1963)	162.0 (4115)	709	646	1245	1273	95.2 (43.2)
	B291090XL99 M				206.5 (5245)					105.1 (47.7)
	B291090XL99 N				245.2 (6228)					113.8 (51.6)

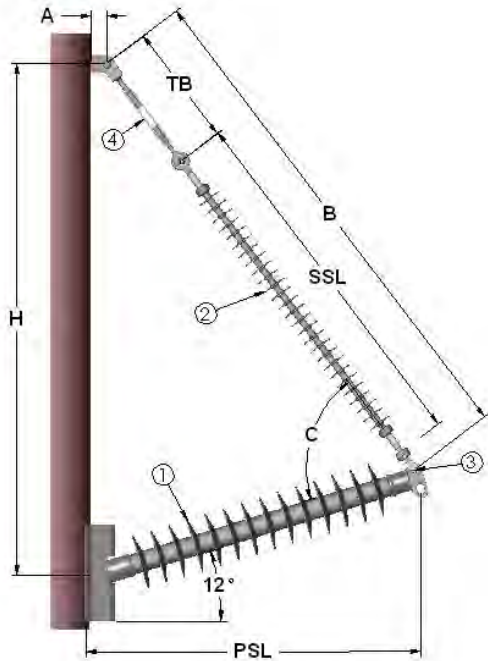
### Notes:

- MDCL = Max. Design Cantilever Load (Load Curves provided upon request)
- Electrical Data is derived from the assembly "Strike Distance", without corona rings for 161kV and below. All 230kV Braced Post assemblies supplied with a corona ring (Electrical Values include the corona ring).
- HS = High Strength design. Brace SML = 36k
- For Higher Strength or Custom Designs, please complete the Braced Post Request Worksheet at the end of this section and return the completed worksheet to MPS through your local MPS Sales Representative.
- Customized Designs include any dimensional changes, strength changes, hardware changes, end fitting changes, gain to flat base changes, etc.





# Braced Post - B291-XT Series



### Identification

A = 1.5" [38mm] (not included) H = Assembly Height  
 (pole connection offset) TB = Turnbuckle  
 B = Brace Length SSL = Suspension Length  
 C = Brace Angle PSL = Post Section Length

Fig.	PSL in (mm)	SSL in (mm)	H		C Deg.	B	
			MIN	MAX		MIN	MAX
			in (mm)	in (mm)		in (mm)	in (mm)
1	34.8 (884)	35.4 (899)	51.0 (1295)	58.0 (1473)	65° - 69°	53.8 (1367)	59.8 (1519)
2	34.8 (884)	35.4 (899)	55.0 (1397)	65.0 (1651)	67° - 72°	56.9 (1445)	65.9 (1674)
3	40.7 (1034)	41.7 (1059)	55.5 (1410)	62.5 (1588)	62° - 66°	60.1 (1527)	66.0 (1676)
4	40.7 (1034)	41.7 (1059)	59.5 (1511)	70.0 (1778)	65° - 70°	63.2 (1605)	72.2 (1834)
5	48.0 (1219)	46.4 (1179)	57.0 (1448)	64.5 (1638)	57° - 62°	64.8 (1646)	70.8 (1798)
6	48.0 (1219)	46.4 (1179)	61.0 (1549)	72.0 (1829)	60° - 65°	67.9 (1725)	76.9 (1953)
7	52.6 (1336)	54.3 (1379)	64.5 (1638)	72.0 (1829)	58° - 62°	72.7 (1847)	78.7 (1999)
8	52.6 (1336)	54.3 (1379)	68.5 (1740)	79.5 (2019)	60° - 65°	75.8 (1925)	84.8 (2154)
9	61.5 (1562)	60.3 (1532)	66.0 (1676)	74.0 (1880)	53° - 57°	78.7 (1999)	84.7 (2151)
10	61.5 (1562)	60.3 (1532)	70.5 (1791)	82.5 (2096)	56° - 61°	81.8 (2078)	90.8 (2306)
11	66.0 (1676)	65.3 (1659)	69.0 (1753)	77.0 (1956)	52° - 56°	83.7 (2126)	89.7 (2278)
12	66.0 (1676)	65.3 (1659)	73.5 (1867)	86.0 (2184)	55° - 60°	86.8 (2205)	95.8 (2433)

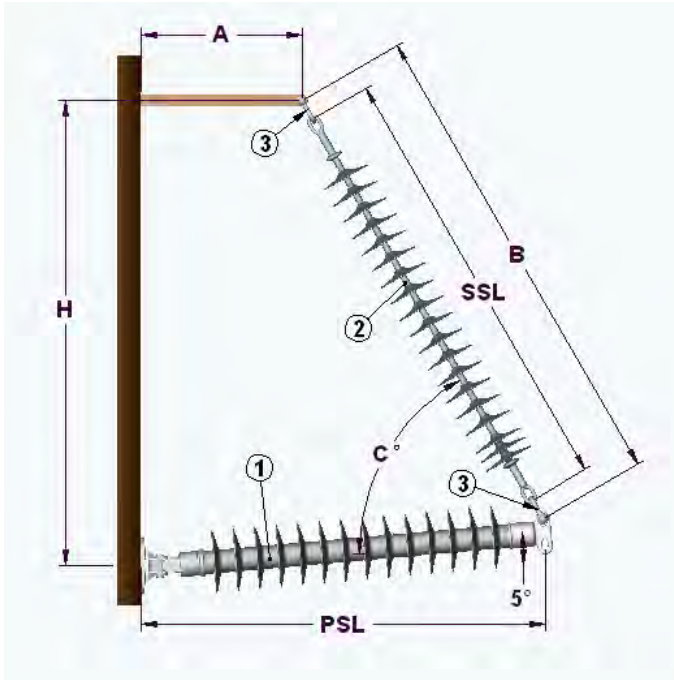
### List Of Materials:

- 5) 2.5" Line Post Insulator (1 each)
- 6) 25klb MX Suspension Insulator (1 each)
- 7) SYC-56 Socket Y-Clevis (1 each)
- 8) Turnbuckle

Fig.	Catalog Number	Line Voltage	MDCL	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
						60 Hz		CIFO		
						kV	lbs (kN)	in (mm)	in (mm)	
1	B291035XT4M6	69	11,528 (51.3)	25.6 (650)	60.8 (1544)	255	233	433	527	72.0 (32.7)
2	B291035XT4M9									
3	B291041XT4M6	69	11,265 (50.1)	31.3 (795)	76.8 (1951)	307	282	524	628	77.0 (34.9)
4	B291041XT4M9									
5	B291048XT4M6	115	10,740 (47.8)	38.3 (973)	89.0 (2261)	370	342	635	720	80.0 (36.3)
6	B291048XT4M9									
7	B291053XT4M6	155 /138	11,320 (50.4)	43.5 (1105)	109.2 (2774)	415	385	717	789	88.0 (39.9)
8	B291053XT4M9									
9	B291062XT4M6	138	10,301 (45.8)	51.9 (1318)	125.2 (3180)	489	452	849	897	96.0 (43.5)
10	B291062XT4M9									
11	B291066XT4M6	138 /161	10,130 (45.1)	56.4 (1433)	137.4 (3490)	529	488	921	965	94.0 (42.6)
12	B291066XT4M9									

### Notes:

- MDCL = Max. Design Cantilever Load (Load Curves provided upon request)
- Electrical Data is derived from the assembly "Strike Distance", without corona rings for 161kV and below. All 230kV Braced Post assemblies supplied with a corona ring (Electrical Values include the corona ring).
- HS = High Strength design. Brace SML = 36k
- For Higher Strength or Custom Designs, please complete the Braced Post Request Worksheet at the end of this section and return the completed worksheet to MPS through your local MPS Sales Representative.
- B191 Series supplied with standard G2-0 Bendable Gain Base on line post.
- For Flat Base F2-0, change the "9" in B191... to "1" = B111...[See line post base section for details]
- Customized Designs include any dimensional changes, strength changes, hardware changes, end fitting changes, gain to flat base changes, etc.



### Identification

- A = pole connection offset (not included)
- B = Brace Length
- C = Brace Angle
- H = Assembly Height (Tolerance = +/- 3")
- SSL = Suspension Length
- PSL = Post Section Length

Fig.	PSL	SSL	H	A	C	B
	in (mm)	in (mm)	in (mm)	in (mm)	Deg.	in (mm)
1	54.0 (1372)	52.0 (1321)	51.0 (1295)	18.0 (457)	57°	57.5 (1461)
2	60.0 (1524)	58.0 (1473)	56.0 (1422)	20.0 (508)	57°	63.5 (1613)
3	66.0 (1676)	64.0 (1626)	61.0 (1549)	22.0 (559)	57°	69.5 (1765)
4	72.0 (1829)	70.0 (1778)	66.0 (1676)	24.0 (610)	56°	75.5 (1918)
5	87.0 (2210)	87.0 (2210)	80.0 (2032)	28.0 (711)	56°	92.5 (2350)
6	93.0 (2362)	93.0 (2362)	85.0 (2159)	30.0 (762)	56°	98.5 (2502)

### List Of Materials

#### Standard Strength Braced Posts

- 1) 2.5" Line Post Insulator (1 each)
- 2) 25klb (S199) Suspension Insulator (1 each)
- 3) ASH-55 Anchor Shackle (2 each)

#### High Strength Braced Posts [marked "HS"]

- 1) 2.5" Line Post Insulator (1 each)
- 2) 36klb (S699) Suspension Insulator (1 each)
- 3) ASH-56 Anchor Shackle (2 each)

### Notes:

- MDCL = Max. Design Cantilever Load (Load Curves provided upon request)
- Electrical Data is derived from the assembly "Strike Distance," without corona rings for 161kV and below. All 230kV Braced Post assemblies supplied with a corona ring (Electrical Values include the corona ring).
- HS = High Strength design. Brace SML = 36k
- For Higher Strength or Custom Designs, please complete the Braced Post Request Worksheet at the end of this section and return the completed worksheet to MPS through your local MPS Sales Representative.
- Customized Designs include any dimensional changes, strength changes, hardware changes, end fitting changes, gain to flat base changes, etc.



# Braced Post - B261 Series w/ Swivel Base



Fig.	Catalog Number	Line Voltage	MDCL	Dry Arc	Leakage	Electrical Flashover (kV)				Weight
						60 Hz		CIFO		
						Dry	Wet	Pos	Neg	
1	B261054XL99 A	115	10,538 (46.9)	42.6 (1082)	83.7 (2126)	408	378	704	778	49.2 (22.3)
	B261054XL99 B				106.3 (2700)					54.0 (24.5)
	B261054XL99 C				129.0 (3277)					59.0 (26.8)
	B261054XL99 L	HS	14,000 (62.3)	42.6 (1082)	82.9 (2106)	408	378	704	778	50.3 (22.8)
	B261054XL99 M				106.0 (2692)					55.1 (25.0)
	B261054XL99 N				129.0 (3277)					60.1 (27.3)
2	B261060XL99 A	138	10,494 (46.7)	48.6 (1234)	102.7 (2609)	460	426	798	852	54.4 (24.7)
	B261060XL99 B				122.0 (3099)					28.9 (26.7)
	B261060XL99 C				149.1 (3787)					64.3 (29.2)
	B261060XL99 L	HS	14,000 (62.3)	48.6 (1234)	100.5 (2553)	460	426	798	852	55.5 (25.2)
	B261060XL99 M				123.7 (3142)					60.0 (27.2)
	B261060XL99 N				146.9 (3731)					65.4 (29.7)
3	B261066XL99 A	161	10,458 (46.5)	54.5 (1384)	112.6 (2860)	513	474	892	937	57.7 (26.2)
	B261066XL99 B				139.7 (3548)					63.5 (28.8)
	B261066XL99 C				163.7 (4158)					68.8 (31.2)
	B261066XL99 L	HS	14,000 (62.3)	54.5 (1384)	110.4 (2804)	513	474	892	937	58.8 (26.7)
	B261066XL99 M				137.5 (3493)					64.6 (29.3)
	B261066XL99 N				164.5 (4178)					69.9 (31.7)
4	B261072XL99 A	161	10,427 (46.4)	60.5 (1537)	122.4 (3109)	565	520	986	1027	61.0 (27.7)
	B261072XL99 B				153.4 (3896)					37.2 (30.5)
	B261072XL99 C				188.2 (4780)					74.9 (34.0)
	B261072XL99 L	HS	14,000 (62.3)	60.5 (1537)	120.2 (3053)	565	520	986	1027	62.1 (28.2)
	B261072XL99 M				151.2 (3840)					68.3 (31.0)
	B261072XL99 N				186.0 (4724)					76.0 (34.5)
5	B261087XL99 A	230	10,380 (46.2)	72.2 (1834)	154.9 (3934)	665	608	116	1198	74.2 (33.7)
	B261087XL99 B				193.6 (4917)					82.7 (37.5)
	B261087XL99 C				228.4 (5801)					89.9 (40.8)
	B261087XL99 L	HS	14,000 (62.3)	72.2 (1834)	152.7 (3879)	665	608	116	1198	75.3 (34.2)
	B261087XL99 M				191.4 (4862)					83.8 (38.0)
	B261087XL99 N				225.5 (5728)					91.0 (41.3)
6	B261093XL99 A	230	10,361 (46.1)	78.1 (1984)	163.6 (4155)	716	652	1258	1285	77.5 (35.2)
	B261093XL99 B				208.9 (5306)					87.4 (39.6)
	B261093XL99 C				245.1 (6226)					95.1 (43.1)
	B261093XL99 L	HS	13,577 (60.4)	78.1 (1984)	162.6 (4130)	716	652	1258	1285	78.6 (35.7)
	B261093XL99 M				208.9 (5306)					88.5 (40.1)
	B261093XL99 N				243.9 (6195)					96.2 (43.6)

Data on this table corresponds with the sketches on the previous page.

**Notes:**

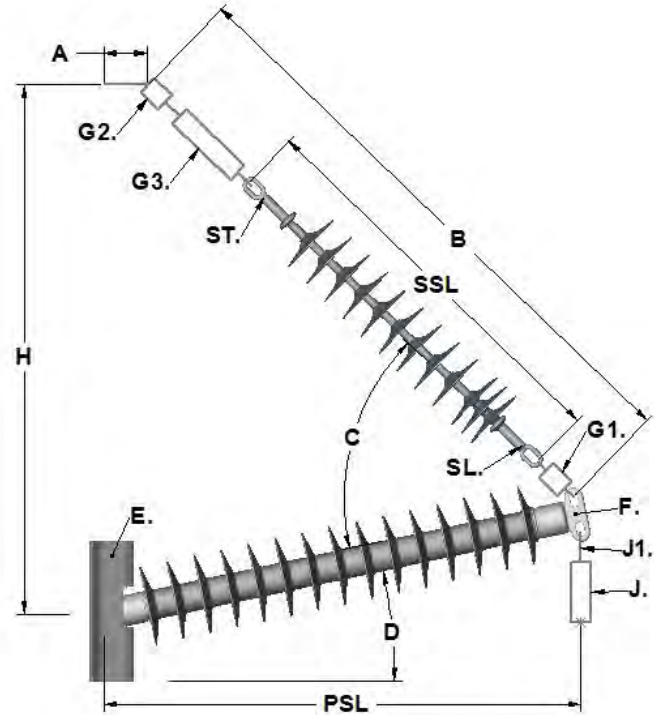
- MDCL = Max. Design Cantilever Load (Load Curves provided upon request)
- Electrical Data is derived from the assembly "Strike Distance", without corona rings for 161kV and below. All 230kV Braced Post assemblies supplied with a corona ring (Electrical Values include the corona ring).
- HS = High Strength design. Brace SML = 36k
- For Higher Strength or Custom Designs, please complete the Braced Post Request Worksheet at the end of this section and return the completed worksheet to MPS through your local MPS Sales Representative.
- Customized Designs include any dimensional changes, strength changes, hardware changes, end fitting changes, gain to flat base changes, etc.



# Custom Braced Post Request Sheet



Name:		Project Title:		
Company:		Quantity Required:		
Contact #:		Requested Delivery Date:		
<b>System Voltage (kV):</b>				
For Standard Design, fill in catalog number below:				
_____				
Proceed to Conductor Information...				
<b>Custom Braced Post Design</b>				
<b>Brace Post Assembly Details**</b>				
Item #	Description	Nominal	Max.	Min.
PSL	Post Section Length			
SSL	Suspension Section Length			
H	Assembly Height			
A	Vang Length			
B	Brace Length			
C	Brace Angle			
D	Post Upsweep Angle			
<b>Mechanical Load Requirements (Minimum)</b>				
	Tension			lbs.
	Vertical			lbs.
	Longitudinal			lbs.
	Compression			lbs.
<b>Electrical Requirements (Minimum)</b>				
Leakage				inch
Dry Arc Length				inch
60 Hz Flashover DRY				kV
60 Hz Flashover WET				kV
CIFO Positive (+)				kV
CIFO Negative (-)				kV
<b>Corona Rings Required on: (Circle One)</b>				
None	Suspension	Post		
<b>Conductor Information</b>				
Conductor Name:	Size (OD):	Armor Rod		
		Yes	No	



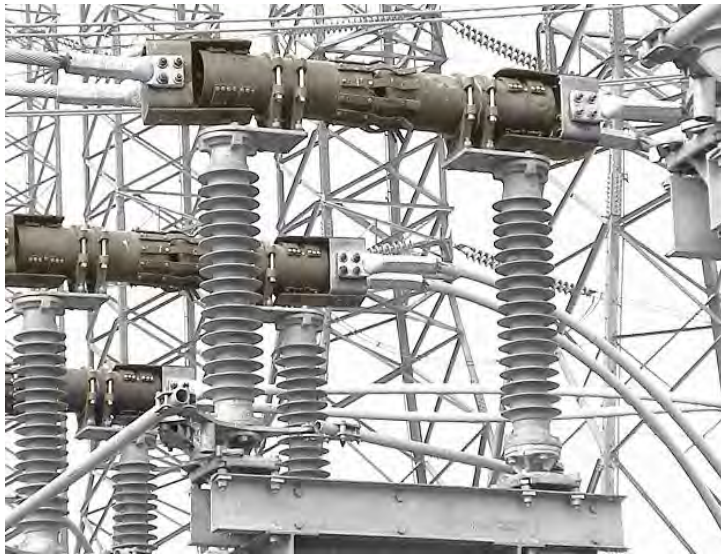
Post Insulator Customization			
Name	ID#	Description	New #
Post Base Type	E.		
Post Line End Fitting	F.		
Suspension Insulator Customization			
Low End Fitting	SL.		
Tower End Fitting	ST.		
Hardware Attachment Customization			
Susp. to Post Connect	G1.		
Susp. to Tower (vang)	G2.		
Extension to Tower (Select 1 Option)			
G3.	None / Insulator Only		
	Steel Strap		
	Turnbuckle		
	Other (specify)		
Conductor Attachment Hardware			
Suspension Clamp	J.		
Attachment Hardware	J1.		
Other			

\*\* Specify which dimensions are critical to the application by adding a tolerance (Max/Min). For the remaining dimensions, provide only the nominal value. MPS will attempt to meet these values, but may change them to meet the critical dimensions.





# Station Posts



**B.I.L.: 95 kV - 1470 kV  
7.5 kV to 500 kV**

- Light Weight
- Resistant to mechanical shock
- Permanent protection against moisture penetration
- Excellent weathering properties
- Superior contamination performance
- No washing needed
- Resistant to vandalism
- Compliance with IEEE 693 seismic Standard

This document intends to help users replace ANSI TR porcelain with composite station posts

- The comparison with *ANSI C29.9 Technical Reference No's* applies only for dimensional and electrical values. The cantilever strengths exceed those of the relevant TR porcelains.
- The **MWL** (Maximum Working Load) of the relevant TR porcelains are taken to be 40% of their cantilever rating.
- The **MDCL** (Maximum Design Cantilever Load) of the composite insulator is defined as the maximum load that can be permanently applied to the composite insulator without mechanical degradation.
- The **SML** (Specified Mechanical Load) is the cantilever load at which irreversible mechanical damage may be evident. In this document, the S.M.L is the withstand cantilever strength of the composite insulator and it is derived from the bending moment strength of the metal fittings.
- The *height* of the composite insulator matches exactly the height of the relevant porcelain insulator.
- The *deflection values* given in this document correspond to the deflections measured at the relevant ANSI TR porcelain *MWL*. To evaluate deflections for other loads, the ratio of deflection / load is constant up to the *MDCL*.



## Catalog Numbering System

<b>N</b> ANSI Standards	<b>A</b> Bottom Fitting	<b>A</b> Top Fitting	<b>100</b> Rod Diameter	<b>XH</b> Profile Type	<b>13</b> # of Sheds	<b>S</b> Silicone Rubber Covering	<b>0</b> Corona Ring
A = Captive Hole P = Through Hole		<b>20</b> = 1.75" Rod insulators with 3" bolt circle diameter  <b>100</b> = 2.5" rod insulators with 5" bolt circle diameter  <b>200</b> = 3.5" rod insulators with 5" bolt circle diameter		XG = 1.75" rod insulators  XH = 2.5" rod insulators  XV = 3.5" rod insulators		1 = Corona Ring 0 = No Corona Ring  Supplied automatically with insulators of 900 kV B.I.L. and above	



# Station Posts - Standard Strength

## Standard Strength

Porcelain Characteristics						Composite Mechanical Characteristics						Composite Electrical Characteristics		
Porcelain Technical Reference	Voltage	BIL Rating	Height	Cantilever Rating	MWL @ 40%	Catalog Number	Weight	SML	Comp	Leakage	Deflection @ TR MWL	CIFO +	Low Freq. Wet Withstand	Critical Impulse Withstand
TR	kV	kV	Inch	Lbs	Lbs		Lbs	Lbs	Lbs	Inch	Inch	kV	kV	kV
202	7.5	95	7.5	2000	800	NPP20XG05S	6	2000	10000	12.7	0.1	105	30	105
205	15	110	10.0	2000	800	NPP20XG07S	7	2000	10000	20.5	0.1	125	45	125
208	23	150	14.0	2000	800	NPP20XG11S	9	2000	10000	32.2	0.2	170	60	170
210	34.5	200	18.0	2000	800	NPP20XG15S	10	2000	10000	43.9	0.7	225	80	225
214	46	250	22.0	2000	800	NPP20XG19S	12	2000	10000	55.6	0.8	280	100	280
216	69	350	30.0	1500	600	NPP20XG27S	17	1500	7500	77.0	1.5	390	145	390
278	69	350	30.0	3000	1200	NAA100XH16S0	38	4400	25000	72.0	0.7	390	180	390
286	115	550	45.0	1700	680	NAA100XH23S0	46	2800	12000	106.1	1.9	610	300	610
287				2600	1040						2.9			
288*	138	650	54.0	1400	560	NAA100XH29S0	49	2300	8000	133.7	2.6	710	380	710
289				2200	880						4.0			
291	161	750	62.0	1200	480	NAA100XH34S0	60	2000	6000	156.7	3.1	810	450	810
295				1850	740						4.8			
304	230	900	80.0	950	380	NAA100XH46S1	52	1600	3400	211.8	5.0	1010	590	1010
308				1450	580						7.6			
312	315	1050	92.0	800	320	NAA100XH54S1	57	1400	2500	248.6	6.4	1210	680	1210
316				1250	500						9.6			

\*For example, when replacing a TR 288 porcelain unit with a composite insulator, the given composite insulator deflection (2.6 inches) is measured at 560 lbs (40% of the TR 288's rated 1400 lbs).

Tensile Strength for NPP20XG series is 16000 lbs. Tensile Strength for NAA100XH series is 17500 lbs.

Torsion Strength for NPP20XG series is 12000 inches/lb. Torsion Strength for NAA100XH series is 32000 inches/lb.





# Station Posts - High and Extra High Strength

## High and Extra High Strength

Porcelain Characteristics						Catalog Number	Weight	Composite Mechanical Characteristics				Composite Electrical Characteristics		
Porcelain Technical Reference	Voltage	BIL Rating	Height	Cantilever Rating	MWL @ 40%			SML	Comp	Leakage	Deflection @ TR MWL	CIFO +	Low Freq. Wet Withstand	Critical Impulse Withstand
TR	kV	kV	Inch	Lbs	Lbs			Lbs	Lbs	Inch	Inch	kV	kV	kV
227	23	150	15.0	4000	1600	NAA100XH06S	26	8000	25000	27.0	0.2	170	60	170
231	34.5	200	20.0	4000	1600	NAA100XH09S	30	6500	25000	40.8	0.3	225	80	225
267	46	250	24.0	4000	1600	NAA100XH12S	34	5500	25000	53.0	0.6	280	100	280
278	69	350	30.0	3000	1200	NAA100XH16S	38	4400	25000	72.0	0.7	390	145	390
278	69	350	30.0	3000	1200	NAA200XV15S0	53	10000	10000	62.0	0.2	390	180	390
286	115	550	45.0	1700	680	NAA200XV24S0	69	7100	40000	99.0	0.5	610	300	610
287				2600	1040						0.8			
288	138	650	54.0	1400	560	NAA200XV28S0	77	6000	35000	117.5	0.7	710	380	710
289				2200	880						1.1			
291	161	750	62.0	1200	480	NAA200XV33S0	86	5160	25000	138.3	0.9	810	450	810
295				1850	740						1.4			
304	230	900	80.0	950	380	NAA200XV45S1	110	4000	16000	188.4	1.5	1010	590	1010
308				1450	580						2.2			
312	315	1050	92.0	800	320	NAA200XV53S1	122	3475	12000	221.0	2.3	1210	680	1210
316				1250	500						3.5			
362				2300	920						6.5			
324	345	1300	106.0	1000	400	NAA200XV62S1	137	3000	8500	259.3	3.9	1410	790	1410
367				1450	580						5.7			
369				2050	820						8.0			
330	500	1470	122.0	900	360	NAA200XV73S1	154	2600	6500	305.2	5.4	1610	870	1610
371				1170	468						7.1			
373				1750	700						10.6			

Tensile Strength for NAA100XH series is 17500 lbs. Tensile Strength for NAA200XV series is 25500 lbs.  
 Torsion Strength for NAA100XH series is 32000 inches/lb. Torsion Strength for NAA200XV series is 54000 inches/lb.

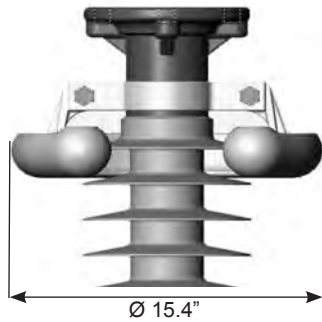


# Station Posts - End Fittings

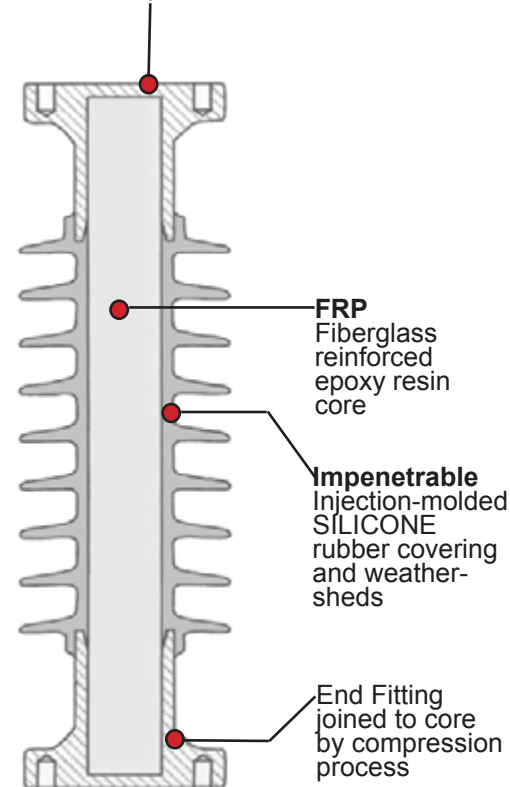
At lower voltages, corona rings may be considered for areas of high local contamination, and/or with altitudes > 3300 feet.

Corona rings for 2 1/2 and 3 1/2 inch insulators will be included in proposals where MPS considers them necessary.

The user is ultimately responsible for the proper application of corona rings.

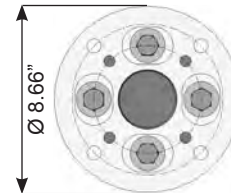
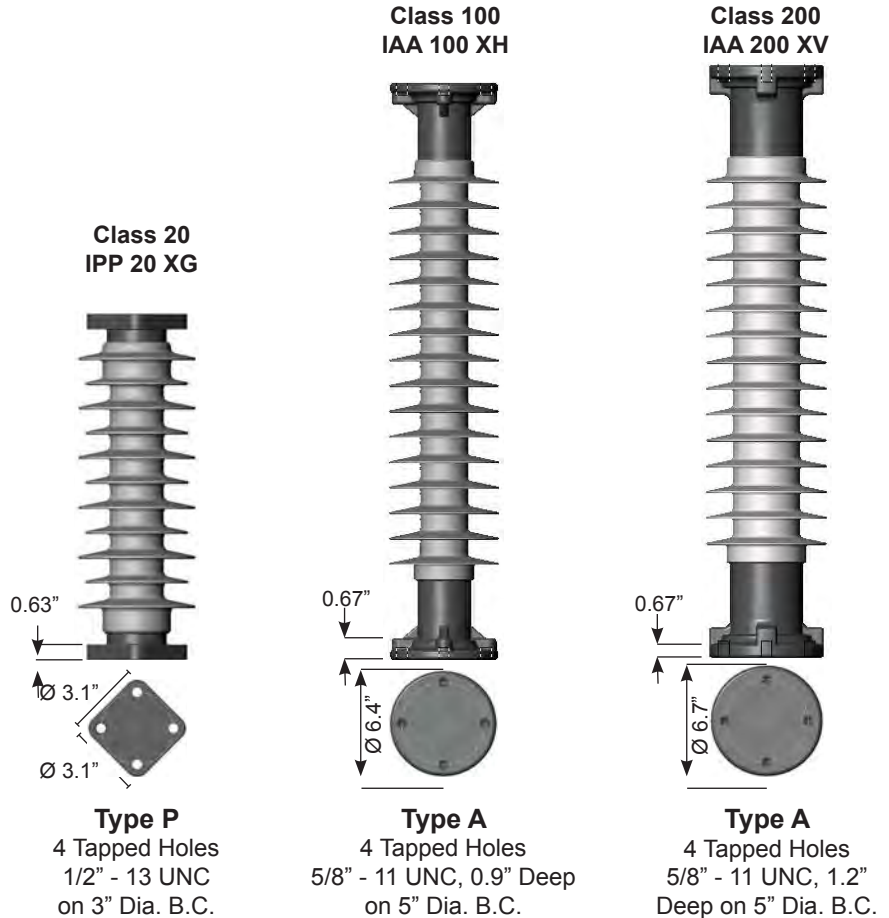


Iron end fitting; outer surfaces galvanized for corrosion protection



## Crimped End Fittings

All end fittings are attached using a crimping process to achieve the required tensile strength.



**Adapter Plate**  
4 x 3/4 - 10 Tapped Holes on 7" Dia. B.C.

## Adapter plates

To comply with ANSI standards on 7" B.C.D. fittings, MPS has adopted the use of 1" adapter plates (5"-7") shown here. The top adapter plate, when needed, has integral slotted holes to facilitate alignment during erection of bus supports.

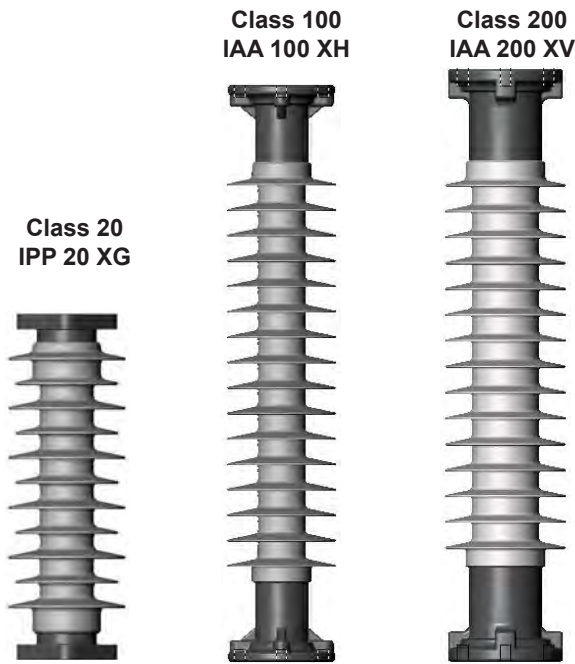
*The use of adapter plates increases the height of insulators by 1" or 2". For retrofitting, it is possible to adjust the total height to original TR value. Contact factory for details.*

## Standards

Complies with ANSI and IEEE standards + IEC tests. Seismically validated and tested per IEEE 693. Recommended for most applications with B.I.L. ≥ 900 kV.



# IEC Silicone Station Posts



To service the international market MacLean produces silicone composite station posts that meet the dimensional requirements of IEC 60273. Silicone IEC station posts in addition to providing protection against ultraviolet radiation, electrical aging, seismic activity. They also exhibit hydrophobic properties that make them an excellent product to use in highly polluted or coastal environments. These insulators may be used on bus support and may also be used by switch manufacturers because of the reduced weight and ease of construction. MacLean has a long history of working with switch manufacturers for both substation and line switches.

IEC No.	MacLean No.	Strength	Height	Cantilever	Leakage	Lightening Impulse	Power Frequency	Top BC	Bottom BC	Pallet/ Crate
			mm	kN	mm	Withstand kV	Wet kV	mm	mm	Quantity
C-60	IPP20XG05S0	Standard	191	10.0	322	60.0	20.0	75.0	76.0	162*
C-75	IPP20XG050S0-XXX	Standard	215	10.0	372	75.0	28.0	76.0	76.0	162*
C-95	IPP20XG07S0	Standard	254	12.5	520	95.0	38.0	76.0	76.0	162*
C-125	IPP20XG09S0	Standard	305	12.5	669	125.0	50.0	76.0	76.0	162*
C-150	IPP20XG11S0	Standard	356	12.5	817	150.0	50.0	76.0	76.0	162*
C-170	Call Factory	Standard	455					76.0	76.0	
	IAA100XH07S0	High	455	12.5	793	170.0	70.0	127.0	127.0	21
C-200	IPP20XG15S0	Standard	475	6.0	1114	200.0	70.0	76.0	76.0	108
	IAA200XH08S0	High	475	12.5	910	200.0	70.0	127.0	127.0	21
C-250	IPPXG19S0	Standard	559	6.0	1411	250.0	95.0	76.0	76.0	72
	IAA200XG19S0	High	560	12.5	1144	250.0	95.0	127.0	127.0	21
C-325	IAA100XH15S0	Standard	770	20.0	1727	325.0	140.0	127.0	127.0	21
	IAA2000XV15S0	High	770	20.0	1561	325.0	140.0	127.0	127.0	18
C-450	IAA100XH22S0	Standard	1020	20.0	2545	450.0	185.0	127.0	127.0	21
	IAA200XV21S0	High	1020	20.0	2196	450.0	185.0	127.0	127.0	18
C-550	IAA100XH27S0	Standard	1220	20.0	3129	550.0	230.0	127.0	127.0	21
	IAA200XV26S0	High	1220	20.0	2726	550.0	230.0	127.0	127.0	18
C-650	IAA100XH34S0	Standard	1500	16.0	3946	650.0	275.0	127.0	127.0	21
	IAA200XV34S0	High	1500	20.0	3574	650.0	275.0	127.0	127.0	18
C-750	IAA100XH40S0	Standard	1700	16.0	4646	750.0	325.0	127.0	127.0	21
	IAA200XV39S0	High	1700	20.0	4104	750.0	325.0	127.0	127.0	18
C-850	IAA100XH45S0	Standard	1900	12.5	5230	850.0	360.0	127.0	127.0	21
	IAA200XV44S0	High	1900	20.0	4634	850.0	360.0	127.0	127.0	18

IEC 273 Number C-XXX for Height Reference Only

Switch users should consult factory for application suggestions

Consult factory for detailed drawings

\* Boxed in Cartons of Three

For IEC Station Posts larger than the C-850 Series, consult MacLean Factory



# Cap and Pin Replacement Station Posts

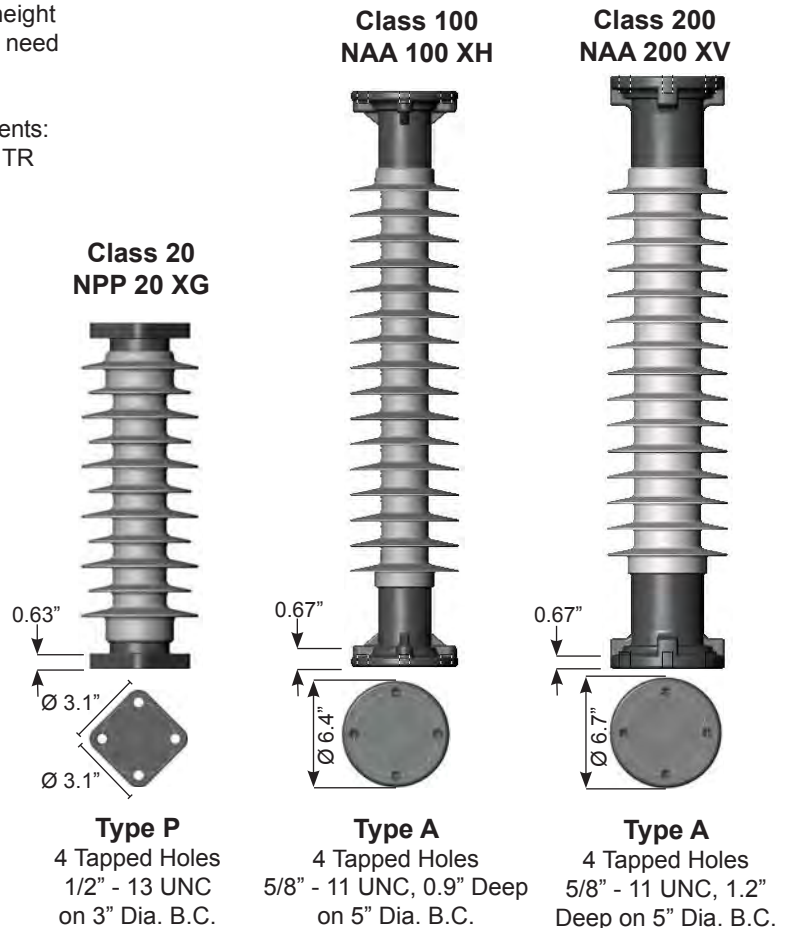
## Cap and Pin Insulator Replacement Insulators

For many years, substations were constructed using porcelain cap and pin insulators. Many of these substations are now reaching an age where the cap and pin designs have problems and need to be replaced. Many utilities using the cap and pin designs have experienced failures in service in which the insulators separate and come apart. By stacking multiple cap and pins on top of each other to get the required insulation voltage, this meant there were multiple joints to allow separation and failure. These failures can usually be attributed to cement growth.

As a result of age problems, many utilities have now found the need to replace the old cap and pin style insulators. A major problem has been that cap and pin insulators were generally a different height from the current station posts being used today. To solve this problem, MacLean Power Systems has developed a series of silicone insulators that are the one piece units that are direct height replacements for the old cap and pin designs. This means no need to adjust bus or switches.

Advantages of using MacLean Silicone Cap and Pin Replacements:

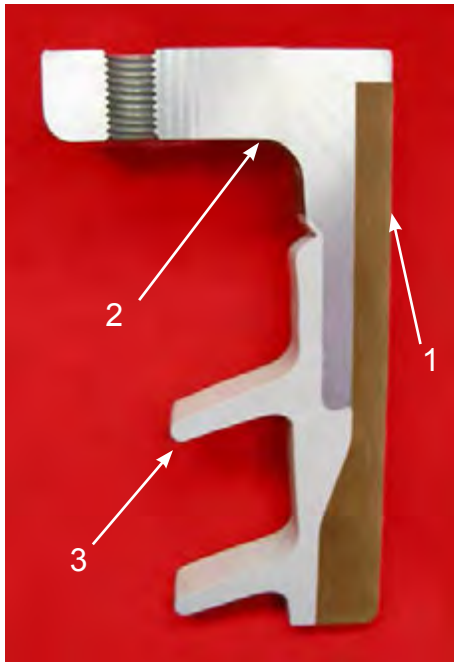
- Direct height replacement for porcelain cap and pin TR numbers in ANSI C-29.8
- Lighter weight one piece designs
- Assembly cost savings
- Superior contamination performance from silicone
- Superior seismic performance
- Damage resistant



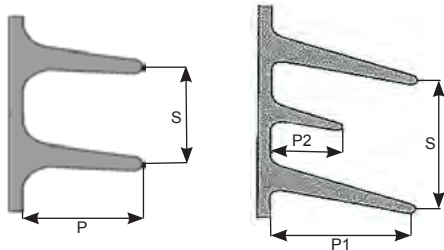
TR No.	Catalog No.	Voltage	Height	SML (lbs)	Leakage	Top BC	Bottom BC
4	NPP20XG07S	15	10	2000	14.6	3" tapped	3" tapped
7	NPP20XG09S	23	12	2000	26.0	3" tapped	3" tapped
10	NPP20XG13S	35	15	2000	38.0	3" tapped	3" tapped
16	NPP20XG25S	69	29	1500	70.0	3" tapped	3" tapped
56	NPA100XH15S	69	29	4552	70.0	5" tapped	5" thru
Special	NPA100XH23S0-121	115	40	3150	106.0	5" tapped	5" thru
19	NPA100XH23S0	115	43.5	2800	106.0	5" tapped	5" thru
173	NAAXV23S0	115	43.5	7100	94.0	5" tapped	5" tapped
25	NPA100XH33S0	138/161	58	2000	157.0	5" tapped	5" thru
123/174	NAAXV31S0	138/161	58	5550	131.0	5" tapped	5" tapped
175	NAA200XV40S1	161/230	72.5	4400	180.0	5" tapped	5" tapped
176	NAA200XV50S1	230	87	3600	216.0	5" tapped	5" tapped
Special	NPA100XH47S1	230	80	1600	216.0	5" tapped	5" thru



## Hollow Core



Composite Hollow Core Cutaway



Standard Profile

High Leakage Profile

MacLean Power Systems (MPS) composite Hollow Core Insulators are a direct replacement of porcelain insulators used on substation apparatus applications. MPS Hollow Core Insulators are manufactured at the MacLean Power France (MPF) facility in St. Yorre, France as well as our York, South Carolina facility.

The core of the product is the <sup>1</sup>fiberglass tube made using electrical grade glass fibers and epoxy resin in a special “wet wind” filament winding process. The tubes are machined and fitted into high strength <sup>2</sup>aluminum alloy flanges using a patented process that guarantees a gas tight and leak proof seal. The subassembly is then coated with <sup>3</sup>silicone rubber weathersheds using a unique “spiral wrap” extrusion process, which allows insulators to be customized for virtually any application from 72 to 800kV.

### Product Applications

- Measuring Transformers
- Cable Terminations
- Optical Insulators
- Live Tank Breakers
- Dead Tank Breakers
- Station Posts
- Bushings

### MPS Technology

- Spiral Wrap Shed Profiles
  - 12 available optimized extrusion dies
  - Single or alternating shed profile
  - Light (16 mm/kV) to extreme (>45mm/kV) creepage
- Filament Wound Tube Profiles
  - Cylindrical, conical or combination profiles
  - 33 available tube mandrels
  - 0.3 m to 6.1 m (1-20 ft) length

### Standards

Maclean Power hollow core insulators are designed according to a selection of IEC and NEMA standards to assure long-term performance under normal and proper usage. The function and stresses are determined by the OEM and end-user specifications and meet applicable clauses of current composite insulator standards including IEC 60815 and IEC 61462.

### Design Concepts

In order to assure the best and long term performance, Maclean hollow core insulators are designed to perform mechanically, electrically, and environmentally according to specified requirements.

- Mechanically  
The hollow core insulators are designed to withstand maximum design stresses without affecting long-term mechanical performance, basically assuring that the maximum expected loads are below the damage limit of fibers and flanges.
- Electrically  
The final electrical performance is guaranteed by the OEM. The hollow core insulator housing expected electrical characteristics are typically based on geometrical factors. The final design of MacLean hollow core insulators has to meet the Maclean criteria for long-term electrical and material performance.
- Environmentally  
The hollow core insulator weather sheds are made from an exclusive HTV silicone compound designed and tested according to IEC standards to withstand long term environmental conditions. MacLean insulators have met the most stringent tests such as IEC’s long term aging tests and 5,000 hour weather cycling tests.





## Hollow Core



Dead Tank Breakers

### Benefits

- Fault current failure mode is delamination of the housing without launching of destructive fragments
- Minimized risk of damage due to vandalism
- Lighter weight means easier handling with lighter equipment and less labor at the job site
- Lower transportation and installation costs
- Lighter structural components needed
- Reduced life cycle cost due to reduced maintenance - no washing or coatings needed (which also means no maintenance outages required)
- Better contamination performance due to HTV silicone rubber
- Silicone rubber sheds can be customized for any contamination zone without the need for washing or coating
- Unlike ceramics, minor shed damage can be field repaired
- Seismic withstand > 1 g without damage
- No shock absorbers or high strength special designs required



Cable Terminations

### Advantages

- Fiber Reinforced Plastic (FRP) tubes can be customized (wall thickness and wind angle) for high pressure performance and resistance to bending motion
- The highest strength to weight ratio of any apparatus insulator on the market
- Materials used for sheds, tube and interfaces allow high permanent working temperatures of the apparatus
- Stable behavior at extreme climatic conditions -50° to +110°C
- Same HTV silicone rubber used on overhead line insulators offers the best tracking and erosion resistance
- Silicone rubber hydrophobicity insures higher flashover values in heavily contaminated environments
- Custom shed profiles in single or alternating designs to meet various IEC pollution categories



Measuring Transformers





# Insulator Specification Form

Dear Customer, in order to define precisely your need, please fill in this document.  
Send it by email to sales@macleanpower.fr or by fax N° + 33 4 70 58 84 21 with name and address.

### Your Company

### Application

### Service Temperature

Minimum	Maximum
<input type="text"/> °C	<input type="text"/> °C

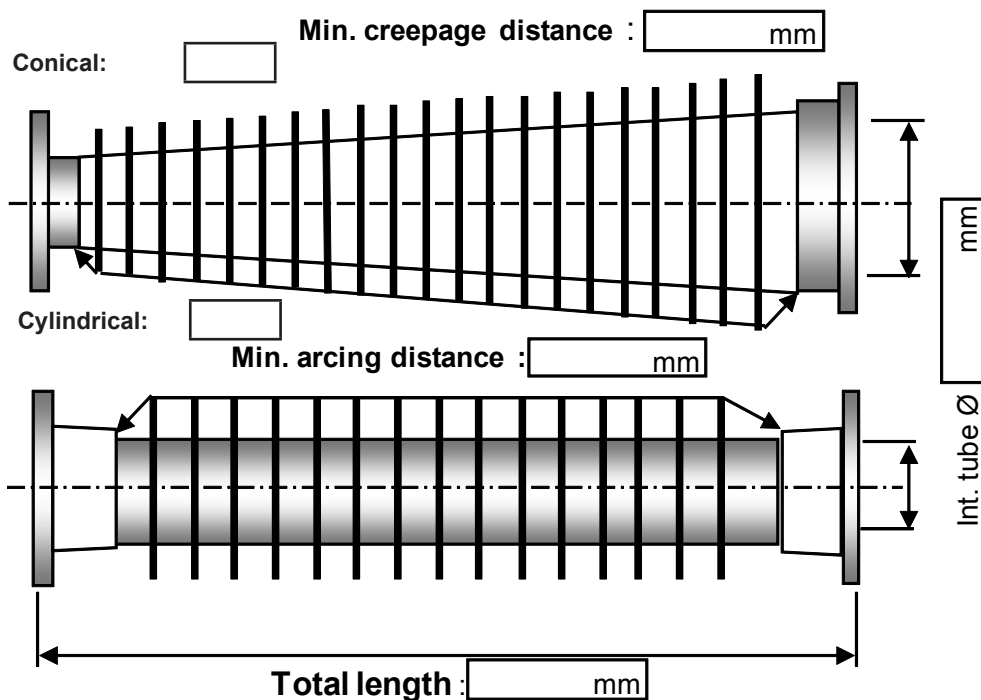
### Contact Person

Name:

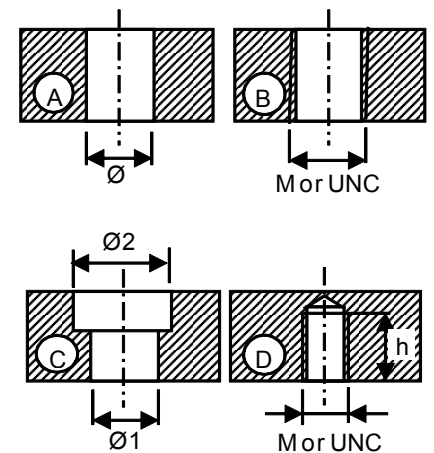
Fax/Tel.:

Insulating medium    Oil     SF6     Other

Rated voltage     kV    AC     DC



### Fixing of the fittings



### Mechanical Performance

Max. Mechanical Load (MML)	N
Specified Mechanical Load (SML)	N
Max. Deflection at MML	mm
Max. Service Pressure (MSP)	bar
Other definition	
Other definition	

### Flange data (mm)

Bottom flange							
A	B	C		D		Nber	Bolt circle
Ø	M	UNC	Ø1	Ø2	Mxh		
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Top flange							
A	B	C		D		Nber	Bolt circle
Ø	M	UNC	Ø1	Ø2	Mxh		
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Marketing Information:    Monthly Quantity     Annual Quantity

### Note:

- All our insulators are designed and tested in accordance with Technical Report IEC 61462.
- On request, we can carry out type tests or design tests according to IEC 61462 or other specification.
- Our technical department is equipped for calculations of electrical field and simulation of seismic behavior.
- For very large insulators, we can supply special crates for easier handling.
- Anodized fittings may be supplied under request.



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# Pole Line Hardware Catalog



MPS provides high quality pole line hardware for virtually all construction applications.

MacLean Power Systems' Pole Line Hardware has been manufactured for over 100 years for the Power Utility and Telecommunications industries. Our reputation of quality, reliability and product durability has been earned and sustained through our rigid specifications, manufacturing processes, raw material requirements and quality assurance standards. MPS's integrity has withstood the test of time.

### Product Offering

This catalog section includes our standard line of Pole Line Hardware – those items commonly used by electric and telephone utilities and CATV systems. Large hardware inventories are maintained by our nationwide network of experienced electrical and telecommunications distributors as well as at our hardware manufacturing facilities in Franklin Park, Illinois and Birmingham, Alabama.

Numerous other hardware products, not shown in this catalog, are produced for customers on special orders in quantities that justify production. Contact us for your requirements of non-standard hardware items. Constantly changing construction needs and practices require new products. Our experienced staff can assist in the design, development, testing and manufacture of special products where standard items are not suitable and an alternative design is required.

### Specifications

MPS Pole Line Hardware is designed and manufactured primarily from specially selected steel, or ductile/malleable iron castings with chemical and physical properties most suitable for product performance and applications in which they are used. In addition, MPS also manufactures products from various types of materials including wood, aluminum and plastic alloys – such as our nylon alloy insulator threads on forged steel crossarm pins. MPS products are engineered for strength, reliability, durability and ease of installation. Our modern, efficient production equipment and rigid quality control standards assure that MPS hardware is consistently of the highest obtainable quality.

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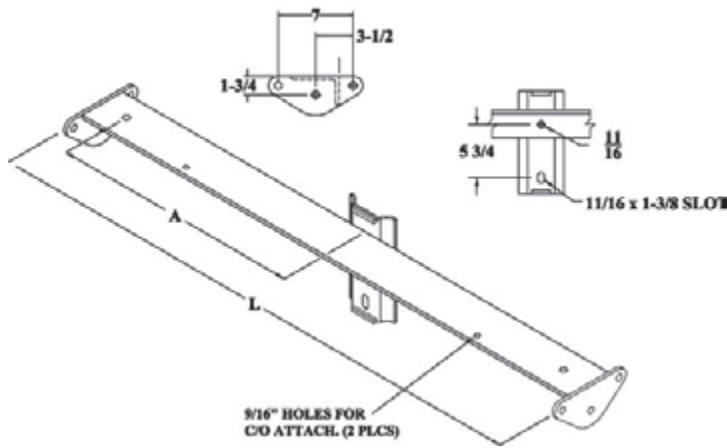
# MacLean Power Systems

Please note that because MacLean Power Systems follows a policy of continuous product improvement, we reserve the right to change specifications and drawings at any time without notice.

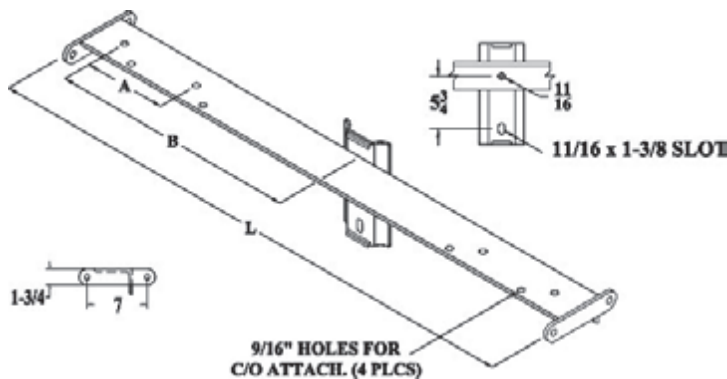


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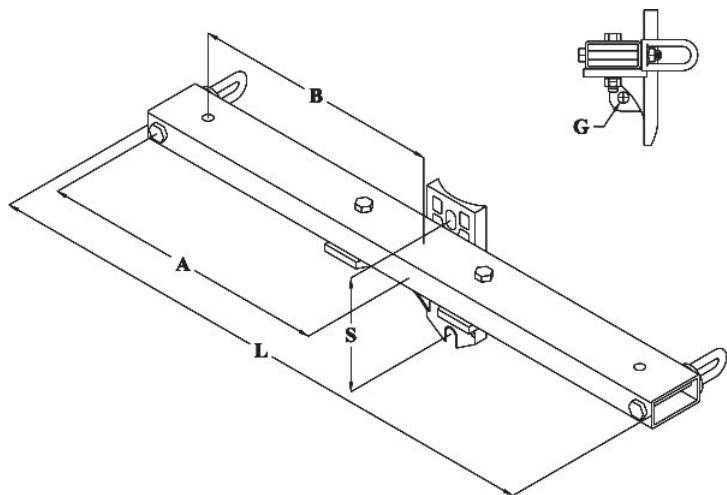
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9/16" HOLES FOR C/O ATTACH. (2 PLCS)



9/16" HOLES FOR C/O ATTACH. (4 PLCS)



## Steel Arms

Steel crossarms are produced from structural steel angle or tubing for high strength deadend and tangent applications.

### Features

- Multiple bolt holes for a variety of conductor attachment points permit assembly of jumper pins and arrester/equipment mounting brackets
- Provided with a center mounting plate for attachment to pole

### Material

Steel hot dip galvanized

Steel Crossarm (3" x 5" x 3/8" Angle)				
Catalog Number	L	A	Ult Strength Rating Per Phase (lbs)	Weight Ea (lbs)
D-21140-GA	60	27	5000	59

#### Notes:

- 1) All holes are 11/16" diameter unless otherwise noted
- 2) Strength ratings based on balanced load applications

Steel Crossarm (3" x 5" x 3/8" Angle)					
Catalog Number	L	A	B	Ult Strength Rating Per Phase (lbs)	Weight Ea (lbs)
D-21143-GA	78	20	32	4000	70

#### Notes:

- 1) All holes are 11/16" diameter unless otherwise noted
- 2) Strength ratings based on balanced load applications

Steel Crossarm (2" x 4" Rectangular Tubing)							
Catalog Number	L	A	B	G	S	Ult Strength Rating Per Phase (lbs)	Weight Ea (lbs)
DEA86H40BE6	42	20	18	13/16	8	10000	37
DEA86H46BE6D	48	23	21	13/16	8	9500	43
DEA86H58.5BE6	60	29	27.25	13/16	8	9000	50
DEA86H58.5BE6D	60	29	27.25	13/16	8	9000	52

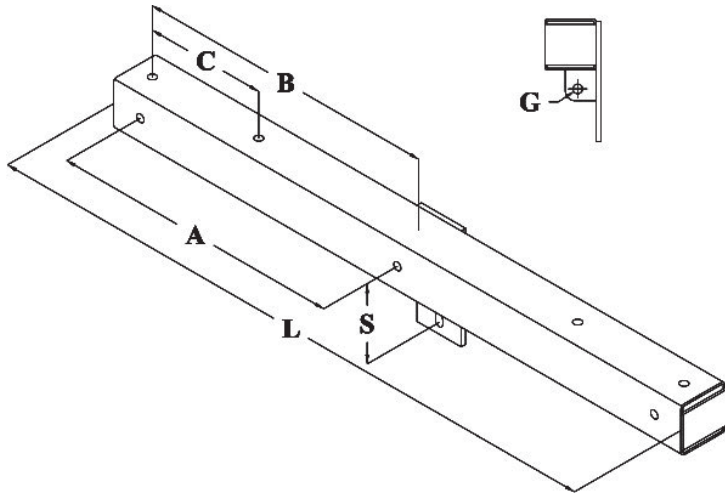
#### Notes:

- 1) All holes are 13/16" diameter unless otherwise noted
- 2) Suffix "D" indicates double deadend hardware (eyelets on both sides of arm)
- 3) Strength ratings based on balanced load applications





# Arms, Steel



## Steel Arms

Steel crossarms are produced from structural steel angle or tubing for high strength deadend and tangent applications.

### Features

- Multiple bolt holes for a variety of conductor attachment points permit assembly of jumper pins and arrester/equipment mounting brackets
- Provided with a center mounting plate for attachment to pole

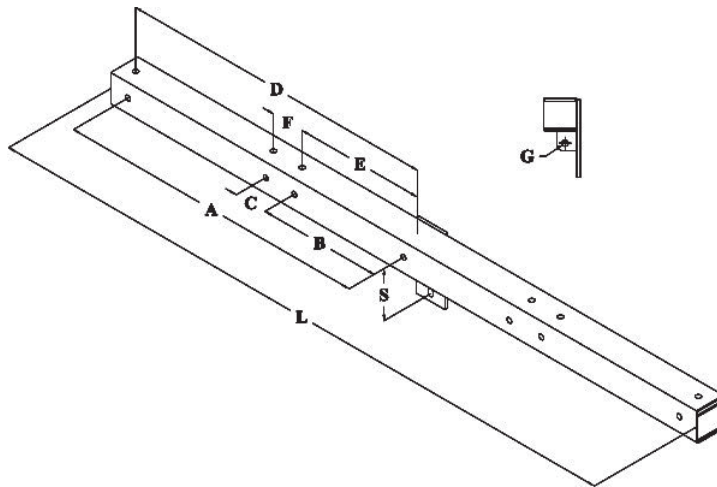
### Material

Steel hot dip galvanized

Steel Crossarm (5" x 5" Square Tubing)							
Catalog Number	L	A	B	C	S	Ult Strength Rating Per Phase (lbs)	Weight Ea (lbs)
SF-TA-68-64	64	29	20	12	8	8000	80

### Notes:

- 1) All holes are 13/16" diameter unless otherwise noted
- 2) Strength ratings based on balanced load applications



Steel Crossarm (5" x 5" Square Tubing)										
Catalog Number	L	A	B	C	D	E	F	G	S	Weight Ea (lbs)
SF-TA-102-FPL	102	48	19	5	49	20	5	15/16	8	118

### Notes:

- 1) All holes are 13/16" diameter unless otherwise noted
- 2) Strength ratings based on balanced load applications

Hole Spacings	19	24	48	Load / Connection
6 wire (3/Phase)	x	x	x	2500 lbs.
4 wire (2/Phase)	x		x	3500 lbs.
4 wire (2/Phase)		x	x	3000 lbs.
2 wire (1/Phase)			x	5000 lbs.



# Bands, Pole



## Link Style Pole Bands

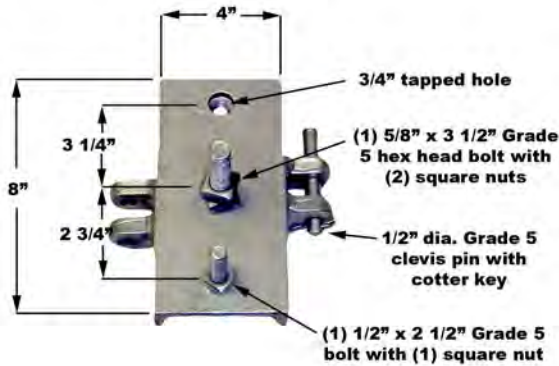
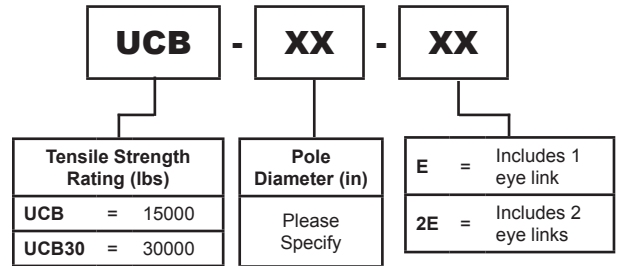
Link style pole bands provide an ideal product for guying and deadending to steel, wood or concrete poles (non-square) without the need for bolt holes in the pole. The bands will accommodate pole diameters from a minimum of 8" through a virtually unlimited maximum pole diameter.

### Features

- Available in 15,000 lbs and 30,000 lbs Tensile Strength Rating
- Supplied with up to 4 links with connecting eye used for terminating points to deadend and guy
- One "CLP" clip included - allows a 4" take up adjustment of band assembly. Additional CLP can be ordered for additional adjustment
- Full and half links are available to order for additional adjustments

### Material

Links: Ductile iron hot dip galvanized  
 Hardware: Steel hot dip galvanized  
 Cotter Key: Stainless steel



### Mounting Bracket

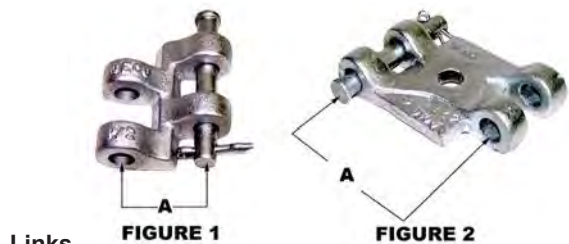
This mounting bracket is used with the UCB 15,000 lb pole bands for mounting messenger suspension clamps in telecommunication construction applications and crossarm or electrical equipment for power applications.

Catalog Number	Weight (lbs)
SF-TEL-8	7.0



### PEL Eye Links

Catalog Number	Tensile Strength Ratings (lbs)	Eye Hole Dia (in)	Weight (lbs)
PEL-15	15000	15/16	2.3
PEL-30	30000	15/16	4.0



### Links

Catalog Number	Tensile Strength Ratings (lbs)	A	Fig	Weight (lbs)
P-1/2	15000	1 11/16	1	1.0
P1/2-30	30000	2 3/16	1	2.0
P	15000	3 7/16	2	1.5
P-30	30000	3 7/16	2	3.0



### CLP Style Clip

Catalog Number	Tensile Strength Rating (lbs)	Weight (lbs)
CLP-2	15000	5.0
CLP30-2	30000	10.0



# Bands, Pole

## Strap Style Pole Bands

MPS strap style pole bands have been designed to accommodate a wide range of distribution pole diameters. Each unit incorporates four (4) 3/4" diameter studs and each band section has 9/16" square holes for lag screws.

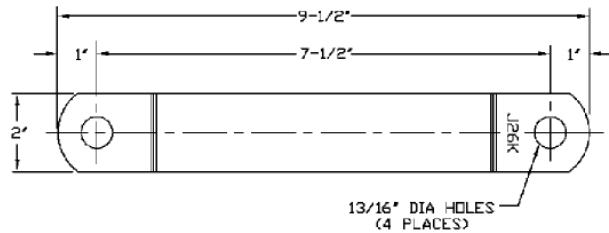
### Features

- Ultimate Tensile Strength: 20,000 lbs
- Band Section: 1/4" x 4" (except J6643 = 5/16" x 3")
- Connecting Link Mounting Position: All Four Sides

### Material

Links: Steel hot dip galvanized  
Hardware: Steel hot dip galvanized

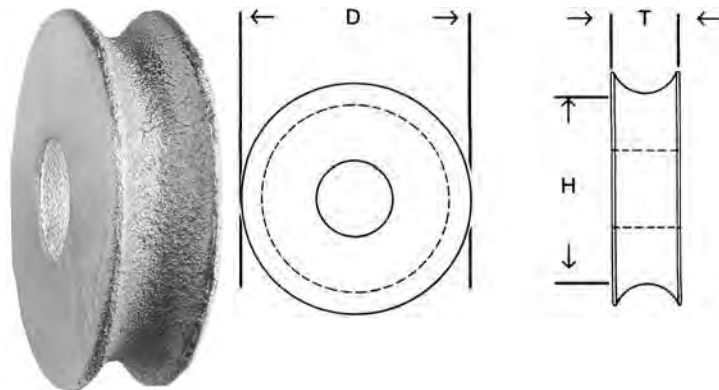
Catalog Number	Pole Diameter Range (in)	Weight (lbs)
J6641	9 1/2 - 13 1/2	16.0
J6643	7 - 9 1/2	13.2
J6644	8 - 11	15.0
J6684	12 - 16	18.6



## Connecting Link

Catalog Number	Size (in)	Length	Hole Size (in)	Ultimate Strength (lbs)	Weight /100 (lbs)
J6650	1/4 x 2 x 9 1/2	7 1/2	13/16	20000	261

\* Each J6650 consists of one pair (two halves)

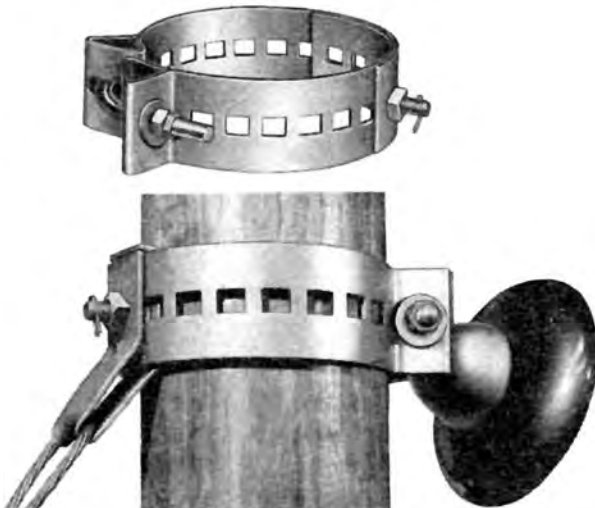


## Guy Roller

Catalog Number	Hole Size (in)	Wireseat Radius (in)	D	H	T	Weight /100 (lbs)
J6288	13/16	0.41	2 3/8	2 1/16	13/16	64



# Band, Pole



## Universal Style Bands

MPS universal wrap-around type pole bands are ideal for deadending, guying and spare arm suspension assemblies.

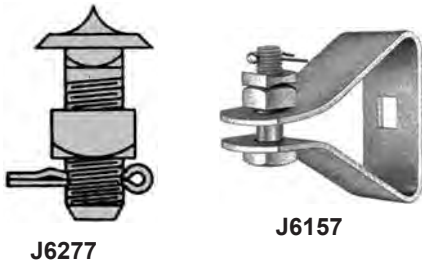
### Features

- Installs in minutes
- Assembled with one 3/4" curved bolt and one J6277 cone head bolt

### Material

Steel hot dip galvanized

Catalog Number	Pole Diameter Range (in)	Steel Size	Weight (lbs)
J6270	8 - 14	4 x 3/16	14.0
J6280	6 - 10	4 x 3/16	11.0



## Universal Band Accessories

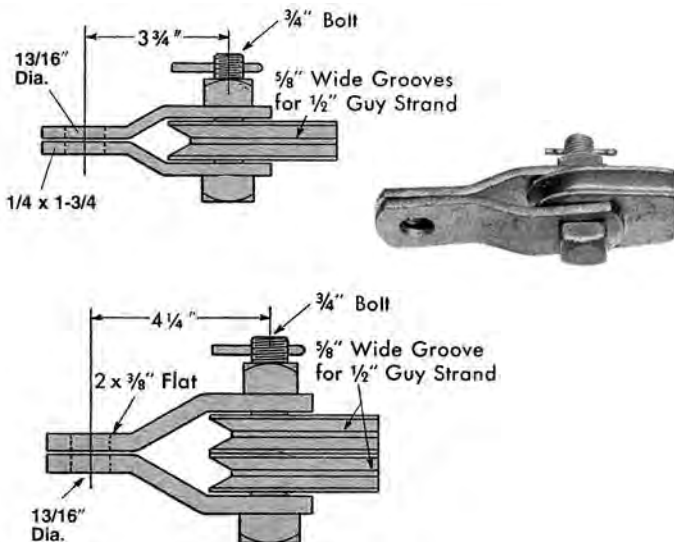
Cone head bolts are used to attach fittings to universal bands. Installed from the inside of the band, the square shoulder fits into the rectangular band slots and the special head digs into the pole to counteract band slippage.

The J6157 clevis is designed to surround the 4" wide section of a universal pole band, developing great strength for deadending. The deadend clevis is furnished complete with a 3/4" bolt, square nut, concave locknut and a selflocking cotter pin.

### Material

Steel hot dip galvanized

Catalog Number	Description	Steel Size (in)	Weight /100 (lbs)
J6157	Deadend Clevis	2 1/2 x 3/16	272
J6277	Cone Head Bolt	3/4 x 2 1/2	50



## Guy Attachment Assembly

Catalog Number	Type	Weight /100 (lbs)
J6273	Single	320
J6274	Double	607



# Bayonets

## Ground Wire

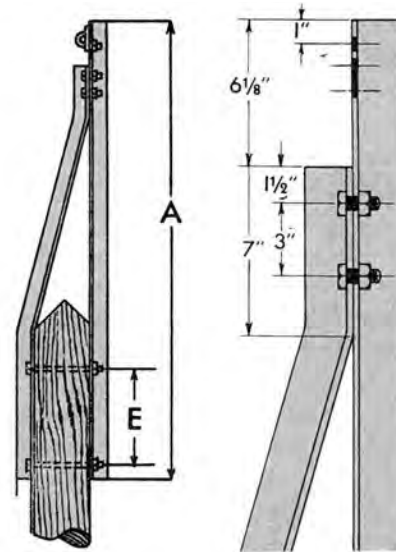
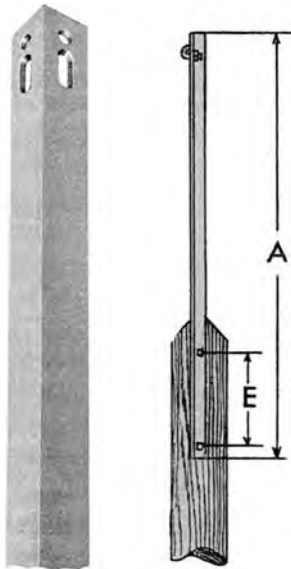
Ground wire bayonets are used for supporting overhead ground wires.

## Features

- Top hole and slot 9/16" diameter with 2" hole centers used to mount clamps with 1/2" diameter bolts
- Clamps are not included and should be ordered separately
- Mounting holes for 5/8" machine bolts
- Available in straight and corner styles

## Material

Steel hot dip galvanized



## Straight Bayonet

### Features

Straight type bayonet consists of one angle with clamp holes punched in both legs to permit mounting the bayonet to either the face or the side of the pole. Straight bayonets also have a 7/16" diameter hole at the bottom for a ground lug if required.

Catalog Number	A	E	Angle Size	Weight /100 (lbs)
J1130	36	10	2 x 2 x 1/4	960
J1132	48	12	2 1/2 x 2 1/2 x 1/4	1600
J1134	84	20	3 x 3 x 1/4	3400

## Corner Bayonet

### Features

Corner bayonets consist of two angle sections and two 1/2" bolts for fastening them together. One angle is offset to fit 8" diameter poles; however, the legs can either be spread apart or pushed together to fit other diameters. The mounting bolts in the bent legs are slotted to allow for any pole boring inaccuracy.

Catalog Number	A	E	Angle Size	Weight /100 (lbs)
J1135	36	10	2 x 2 x 3/16	1400
J1137	66	15	2 x 2 x 1/4	3440





# Bolts



## "A" Cable Suspension

"A" cable suspension bolts are supplied with two square nuts. One nut is used to fasten the square head bolt to the pole and the other nut is used to secure a straight or angle cable suspension clamp to the bolt

### Material

Steel hot dip galvanized

5/8" Diameter - Minimum Tensile Strength 13,500			
Catalog Number	Bolt Length (in)	Thread Length (in)	Weight /100 (lbs)
JCA6645.A01	8	4	85
JCA6645.A02	10	6	104
JCA6645.A03	12	6	120
JCA6645.A04	14	6	138
JCA6645.A05	16	6	153
JCA6645.A06	18	6	168
JCA6645.A07	20	6	183
JCA6645.A08	22	6	198
JCA6645.A09	24	6	214

3/4" Diameter - Minimum Tensile Strength 20,050			
Catalog Number	Bolt Length (in)	Thread Length (in)	Weight /100 (lbs)
JCA6645.A10	10	6	165
JCA6645.A11	12	6	187
JCA6645.A12	14	6	204
JCA6645.A13	16	6	220
JCA6645.A14	18	6	220



## Brace

Brace bolts are used in place of carriage bolts or machine bolts to fasten braces to crossarms. The integral washer/hex head construction provides a static-proof design.

### Material

Steel hot dip galvanized

Minimum Tensile Strength 4,250 lbs			
Catalog Number	Size (in)	Thread Length (in)	Weight /100 (lbs)
J8624-1/2	3/8 x 4 1/2	2	21



## Carriage

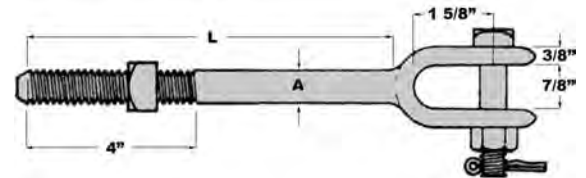
MPS carriage bolts are roll threaded with square shoulder and square nut

### Material

Steel hot dip galvanized

3/8" Diameter - Minimum Tensile Strength 4,250 lbs			
Catalog Number	Bolt Length (in)	Thread Length (in)	Weight /100 (lbs)
J8634	4	3	16
J8634-1/2	4 1/2	3	16
J8635	5	3	18
J8636	6	3	22
J8637	7	4	24
J8638	8	4	26
J8640	10	4	34

1/2" Diameter - Minimum Tensile Strength 8,500 lbs			
Catalog Number	Bolt Length (in)	Thread Length (in)	Weight /100 (lbs)
J8645	5	3	35
J8646	6	3	41
J8647	7	4	44
J8648	8	4	51



## Clevis

Clevis bolts are used to provide deadend connections to eyes or links. Clevis end includes 1/2" diameter machine bolt with nut and a stainless steel self locking cotter pin to provide a secure vibration proof assembly.

### Material

Steel hot dip galvanized

Minimum Tensile Strength 13,500 lbs			
Catalog Number	Size (in) [A x L]	Thread Length (in)	Weight /100 (lbs)
J7810	5/8 x 10	4	172
J7812	5/8 x 12	4	192
J7814	5/8 x 14	4	208





# Bolts



## Double Arming

Double arming bolts are fully threaded and used in double crossarm construction to secure and lock in spacing between crossarms

### Features

- Fully threaded and assembled with 4 square nuts
- Ends can accept eyenuts for deadend applications
- Length dimensions do not include points

### Material

Steel hot dip galvanized

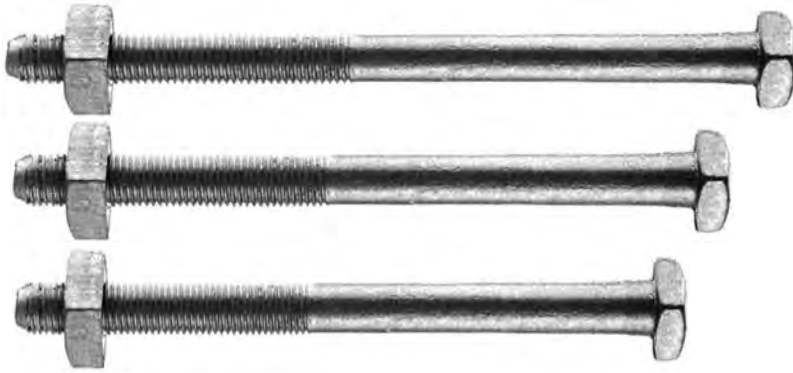
5/8" Diameter - Minimum Tensile Strength 13,550 lbs		
Catalog Number	Bolt Length (in)	Weight /100 (lbs)
J8860	10	118
J8862	12	136
J8864	14	142
J8866	16	158
J8868	18	187
J8870	20	192
J8872	22	208
J8874	24	224
J8876	26	240
J8877	28	256
J8878	30	264
J8879	32	284
J8880	34	295
J8881	36	332

3/4" Diameter - Minimum Tensile Strength 20,050 lbs		
Catalog Number	Bolt Length (in)	Weight /100 (lbs)
J8883	10	163
J8882	12	196
J8884	14	220
J8886	16	240
J8888	18	260
J8890	20	284
J8892	22	304
J8894	24	336
J8896	26	345
J8897	28	365
J8898	30	386
J8899	32	400
J9003	34	420
J9004	36	460

7/8" Diameter - Minimum Tensile Strength 27,700 lbs		
Catalog Number	Bolt Length (in)	Weight /100 (lbs)
J9112	12	283
J9114	14	312
J9116	16	341
J9118	18	370
J9120	20	399
J9122	22	427
J9124	24	456
J9126	26	485
J9128	28	514
J9130	30	543
J9132	32	572
J9134	34	601
J9136	36	630
J9138	38	659
J9140	40	688
J9142	42	717



# Bolts



## Machine

### Features

- Square head and square nut
- Roll threaded
- Bolts 1/2" diameter and larger and 7" length and longer also have cone points which permit driving without damage to threads

### Material

Steel hot dip galvanized

3/8" Diameter - Minimum Tensile Strength 4,250 lbs			
Catalog Number	Bolt Length (in)	Thread Length (in)	Weight /100 (lb)
J8603	3	1	13
J8604	4	3	15
J8604-1/2	4 1/2	3	17
J8605	5	3	18
J8606	6	3	21
J8608	8	4	27
J8610	10	4	32

1/2" Diameter - Minimum Tensile Strength 8,500 lbs			
Catalog Number	Bolt Length (in)	Thread Length (in)	Weight /100 (lb)
J8701-1/2	1 1/2	1 1/2	18
J8702	2	1 1/4	20
J8702-1/2	2 1/2	1 1/4	23
J8703	3	1 1/4	25
J8704	4	3	31
J8705	5	3	36
J8706	6	3	41
J8707	7	4	48
J8708	8	4	50
J8709	9	4	57
J8710	10	6	60
J8712	12	6	70
J8714	14	6	79
J8716	16	6	89

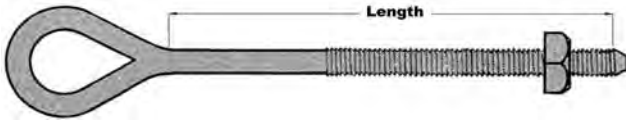
5/8" Diameter - Minimum Tensile Strength 13,550 lbs			
Catalog Number	Bolt Length (in)	Thread Length (in)	Weight /100 (lb)
J8801-1/2	1 1/2	1 1/4	30
J8802	2	1 1/2	34
J8802-1/2	2 1/2	1 1/2	38
J8803	3	1 1/2	44
J8804	4	3	50
J8805	5	3	57
J8806	6	3	62
J8807	7	4	72
J8808	8	4	82
J8809	9	4	88
J8810	10	6	94
J8812	12	6	108
J8814	14	6	125
J8816	16	6	136
J8818	18	6	152
J8820	20	6	170
J8822	22	6	184
J8824	24	6	200
J8826	26	6	224
J8828	28	6	242

3/4" Diameter - Minimum Tensile Strength 20,050 lbs			
Catalog Number	Bolt Length (in)	Thread Length (in)	Weight /100 (lb)
J8902	2	1 3/4	57
J8903	3	1 3/4	67
J8906	6	4	101
J8908	8	4	118
J8910	10	6	142
J8912	12	6	162
J8914	14	6	188
J8916	16	6	212
J8918	18	6	228
J8920	20	6	252
J8922	22	6	268
J8924	24	6	296
J8926	26	6	316
J8928	28	6	344

7/8" Diameter - Minimum Tensile Strength 27,700 lbs			
Catalog Number	Bolt Length (in)	Thread Length (in)	Weight /100 (lb)
J9062	12	6	240
J9064	14	6	264
J9066	16	6	288
J9068	18	6	320
J9070	20	6	345
J9072	22	6	380
J9074	24	6	430
J9076	26	6	442



# Bolts



## Oval Eye

Eyebolts are commonly used as an attachment point to secure thimbles, clevises, links and deadend insulators.

### Features

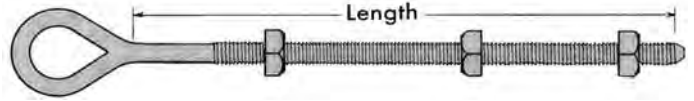
- Forged, one-piece design
- Supplied assembled with square nut
- Eye I.D. - 1 1/2 x 2"

### Material

Steel hot dip galvanized

5/8" Diameter - Minimum Tensile Strength 13,550 lbs			
Catalog Number	Bolt Length (in)	Thread Length (in)	Weight /100 (lbs)
J9406	6	4	112
J9408	8	4	128
J9409	9	4	136
J9410	10	6	146
J9412	12	6	156
J9414	14	6	168
J9416	16	6	188
J9418	18	6	212
J9420	20	6	220

3/4" Diameter - Minimum Tensile Strength 20,050 lbs			
Catalog Number	Bolt Length (in)	Thread Length (in)	Weight /100 (lbs)
J9508	8	4	180
J9510	10	6	200
J9512	12	6	220
J9514	14	6	240
J9516	16	6	256
J9518	18	6	280



## Oval Eye - Double Arming

- Double Arming Eyebolts (D.A. Eyebolts) are forged in a one piece design and are commonly used as a combination double arming bolt as well as an eyebolt.
- Double arming eyebolts are fully threaded the entire bolt length except for 2 inches under the eye. They are supplied assembled with three square nuts.
- Eye I.D. 1-1/2" width x 2" length

### Material

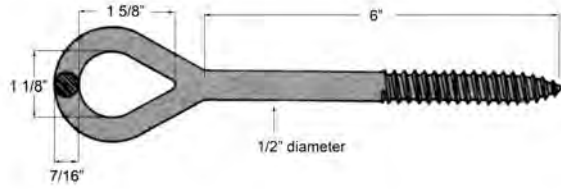
Steel - hot dip galvanized

5/8" Diameter - Minimum Tensile Strength 13,550 lbs			
Catalog Number	Bolt Length (in)	Thread Length (in)	Weight /100 (lbs)
J9614	14	12	204
J9616	16	14	220
J9618	18	16	232
J9620	20	18	244
J9622	22	20	260
J9624	24	22	280
J9626	26	24	300

3/4" Diameter - Minimum Tensile Strength 20,050 lbs			
Catalog Number	Bolt Length (in)	Thread Length (in)	Weight /100 (lbs)
J9636	16	14	300
J9638	18	16	320
J9640	20	18	340
J9642	22	20	360
J9644	24	22	380
J9646	26	24	400



# Bolts



## Screw Oval Eye

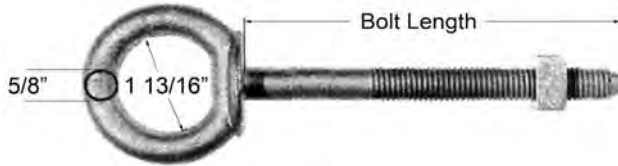
### Features

- Forged, one-piece design
- Supplied assembled with square nut
- Eye I.D - 1 1/8" x 1 5/8"

### Material

Steel hot dip galvanized

Catalog Number	Bolt size (in)	Thread Length (in)	Weight /100 (lbs)
J8930	1/2 x 6	3	62



## Shoulder Eye

Shoulder eyebolts are used to attach suspension and deadend insulators, clevises, links and other hardware to poles and crossarms. The integral collar provides a broad bearing surface to resist elongation of the bolt hole in wood poles and crossarms

### Features

- 3/4" diameter, forged, one-piece design
- Supplied assembled with square nut
- Ultimate Tensile Strength: 20,050 lbs

### Material

Steel hot dip galvanized

3/4" Diameter - Ultimate Tensile Strength 20,050 lbs			
Catalog Number	Bolt Length (in)	Thread Length (in)	Weight /100 (lbs)
J9528	8	4	216
J9530	10	6	221
J9532	12	6	248
J9534	14	6	280
J9536	16	6	320
J9538	18	6	340
J9540	20	6	365



# Bolts



### Spool

MPS spool bolts are used for side-of-pole installation when supporting neutral conductors and secondary service wires.

### Features

- Forged with either a single or double integral washer upset at insulator end
- Double upset provide 1 5/8" clearance between insulator and pole
- Spool bolts have 5/8" rolled threads
- Supplied with all associated hardware as illustrated
- J0101, J101 or J151 insulator must be ordered separately

### Material

Steel hot dip galvanized

Single Upset - Minimum Tensile strength 13,550				
Catalog Number	Shank Length (in)	Overall Length (in)	Thread Length (in)	Weight /100 (lbs)
J2343-1/2	9	13 1/2	4	145
J2344-1/2	10	14 1/2	4	156
J2346-1/2	12	16 1/2	6	173
J2348-1/2	14	18 1/2	6	237

Double Upset - Minimum Tensile strength 13,550				
Catalog Number	Shank Length (in)	Overall Length (in)	Thread Length (in)	Weight /100 (lbs)
J2395	9	15	4	165
J2396	10	16	4	172
J2398	12	18	6	192



### Thimbleye®

Thimbleye® bolts eliminate the need for thimbles, shackles, links and guy hooks. The broad radius of the eye provides an excellent attachment point to deadend or guy messenger wire, guy strand or formed wire grips.

### Features

- Forged in two styles: Straight and at 45° angle

### Material

Steel hot dip galvanized

### Straight Style

5/8" Diameter - Minimum Tensile Strength 13,550 lbs			
Catalog Number	Bolt Length (in)	Thread Length (in)	Weight /100 (lbs)
J8051	10	4	142
J8052	12	6	10
J8053	14	6	172
J8054	16	6	186
J8055	18	6	204

3/4" Diameter - Minimum Tensile Strength 20,050 lbs			
Catalog Number	Bolt Length (in)	Thread Length (in)	Weight /100 (lbs)
J8062	12	6	228
J8063	14	6	256

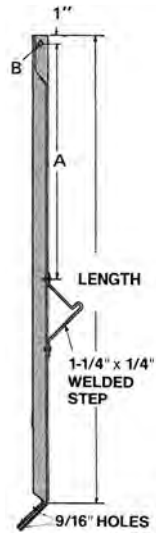
### 45° Angle Style

5/8" Diameter - Minimum Tensile Strength 13,550 lbs			
Catalog Number	Bolt Length (in)	Thread Length (in)	Weight /100 (lbs)
J8151	10	4	144
J8152	12	6	162
J8153	14	6	184
J8154	16	6	206

3/4" Diameter - Minimum Tensile Strength 20,050 lbs			
Catalog Number	Bolt Length (in)	Thread Length (in)	Weight /100 (lbs)
J8161	10	4	216
J8162	12	6	240
J8163	14	6	264



# Braces



## Alley Arm

Alley arms, crossarms mounted to one side of the pole, require rigid bracing to insure proper alignment of power distribution and transmission lines.

### Features

- Mount at 45° angle
- Include welded lineman step
- Mount to alley arm using a machine bolt and attach to pole using (2) 1/2" lag screws

### Material

Steel hot dip galvanized

Catalog Number	A	B	Angle Size (in)	Length (ft)	Weight /100 (lbs)
J1522	30	9/16	1 3/4 x 1 3/4 x 3/16	5	1300
J1525	30	11/16	1 3/4 x 1 3/4 x 3/16	7	1750
J1526	50	11/16	2 x 2 x 1/4	10	3600

## Crossarm, Flat Steel

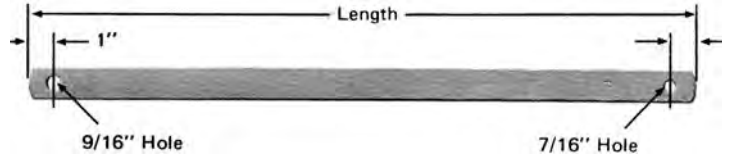
Flat crossarm braces, used in pairs, are an inexpensive means of aligning and supporting crossarms

### Features

- Mounting hole diameters are 7/16" for 3/8" crossarm mounting bolts and 9/16" for pole mounting with 1/2" lag screw or through bolt
- Hole centers 1" from brace ends - which are rounded for safety

### Material

Steel hot dip galvanized



1 1/4" x 1/4" size			
Catalog Number	Length (in)	Mounting Hole Center (in)	Weight /100 (lbs)
J7126	26	24	230
J7128	28	26	250
J7130	30	28	270
J7132	32	30	280
J7136	36	34	350

## Angle

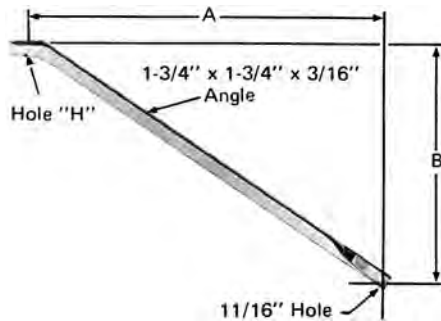
Angle braces are used as tension members on the side of the arm opposite the odd conductor to compensate for the unbalanced load.

### Features

- Flat pole mounting end allows for either a right-hand or left-hand member

### Material

Steel hot dip galvanized



Catalog Number	A	B	H	Weight /100 (lbs)
J1442	42	27	11/16	950





# Braces

## Crossarm, Wood

MPS wood crossarm braces are design engineered to support wood crossarms to provide durability, strength and extended service life. MPS wood crossarm braces have better insulation properties than conductive metal braces.

### Features

- Lightweight alternative to steel crossarm braces
- Corrosion resistant aluminum end fittings
- Tongue and groove configuration permanently pins end fitting to wood
- Preservative treated, extra strong Apitong wood resists insect, fungus and environmental attack
- Reversible style eliminates need for left- / right-hand braces
- Available in underarm and sidearm styles
- Sold in pairs

### Material

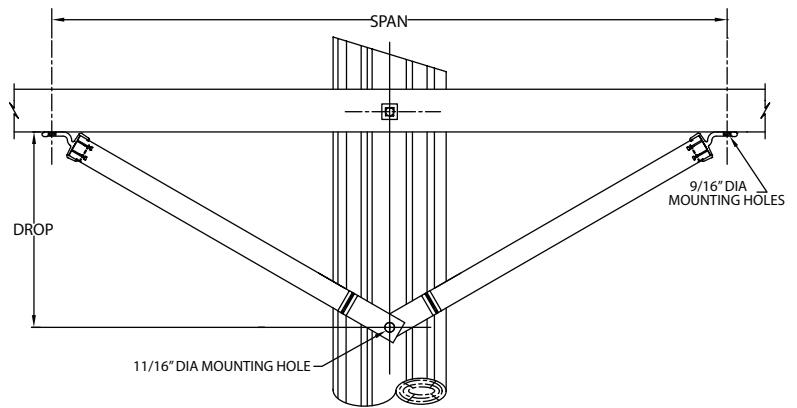
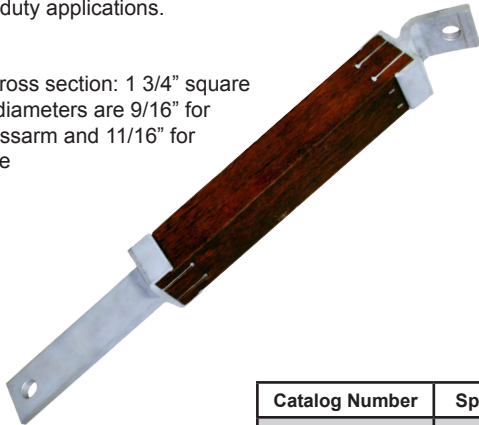
End Fittings: Aluminum alloy  
 Brace: Preservative treated Apitong wood

## Underarm Style

MPS underarm style wood crossarm braces are used for heavier duty applications.

### Features

- Apitong wood cross section: 1 3/4" square
- Mounting hole diameters are 9/16" for mounting to crossarm and 11/16" for mounting to pole



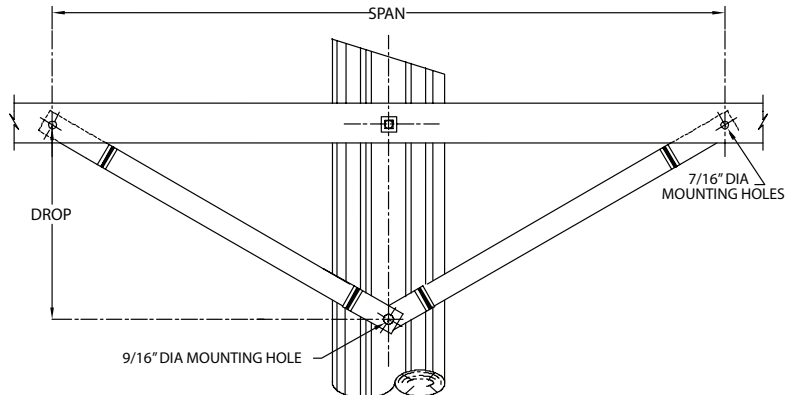
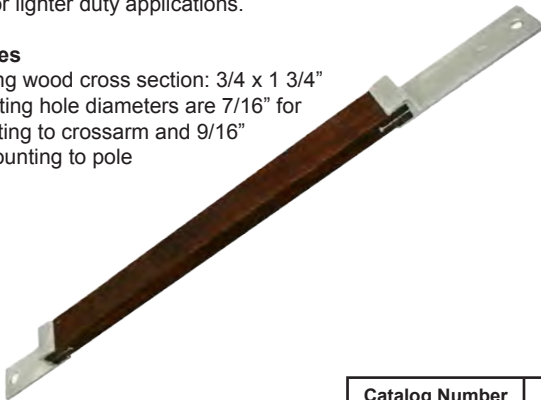
Catalog Number	Span (in)	Drop (in)	Weight / pair (lbs)
JA4730R	60	30	8.0
JA4760R	60	18	6.6
JA4761R	60	26	7.5
JA4766R	66	20	7.2
JA4772R	72	22	7.9
JA4788R	48	18	5.6

## Sidearm Style

MPS sidearm style wood crossarm braces are used for lighter duty applications.

### Features

- Apitong wood cross section: 3/4 x 1 3/4"
- Mounting hole diameters are 7/16" for mounting to crossarm and 9/16" for mounting to pole



Catalog Number	Span (in)	Drop (in)	Weight / pair (lbs)
JA5526	38	18	2.4



# Braces

## Double Span, Steel

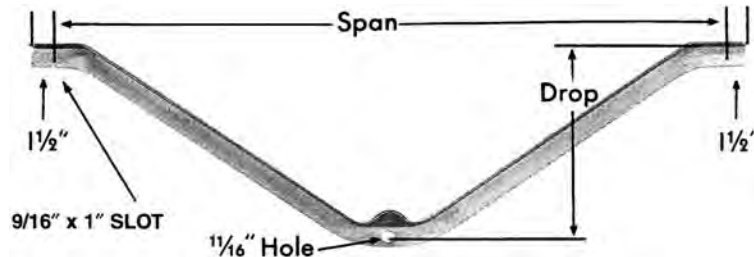
One piece, angle steel, double span braces are used to support heavy crossarm construction.

### Features

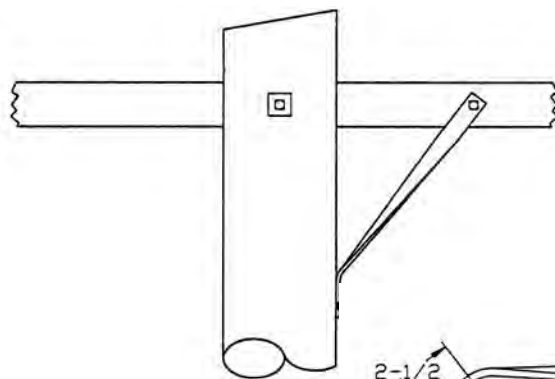
- Mounts to underside of crossarm with 1/2" bolts or lag screws
- Fastened to pole with 5/8" bolt
- Pole mounting section designed to allow ample clearance for wrenching

### Material

Steel hot dip galvanized



Catalog Number	Angle Size	Span (in)	Drop (in)	Weight /100 (lbs)
J1506	1 1/2 x 1 1/2 x 3/16	42	12	800
J1514	1 1/2 x 1 1/2 x 3/16	48	18	1000
J1508	1 1/2 x 1 1/2 x 3/16	60	18	1100
J1510	1 3/4 x 1 3/4 x 3/16	60	18	1340
J1512	1 3/4 x 1 3/4 x 3/16	72	22	1500



## Guard Arm

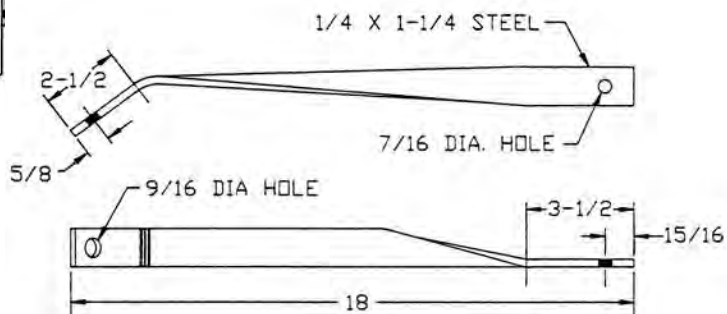
The MPS guard arm brace is used for light duty support and stability of crossarms in telecommunications construction.

### Features

- Mounts to crossarm with a 3/8" bolt
- Fastens to pole with a 1/2" lag screw

### Material

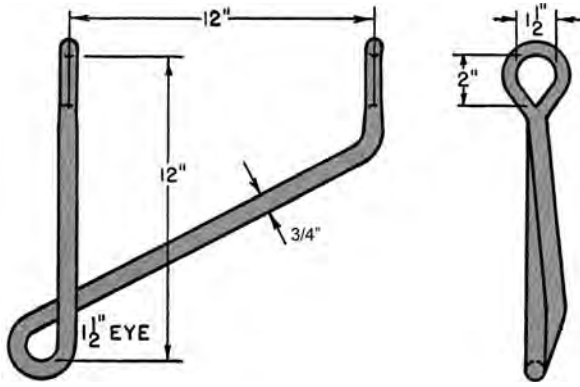
Steel hot dip galvanized



Catalog Number	Weight /100 (lbs)
J8240	170



# Brackets



## Angle

Angle brackets provide extra clearance for supporting insulator strings and other suspension hardware at angle structures.

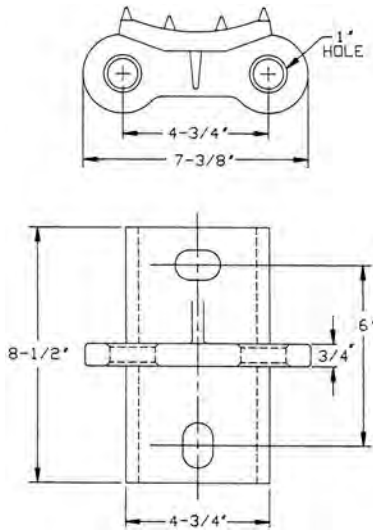
### Features

- Closed forged oval eyes
- Fasten to crossarm or pole with drop forged clevis bolts

### Material

Steel hot dip galvanized

Catalog Number	Stock Diameter (in)	Weight /100 (lbs)
J7936	3/4	520



## Angle Double Deadend

Angle double deadend brackets allow angle construction applications by deadending to the two termination points of the bracket.

### Features

- Pole mounting slots are 15/16 x 1/2" to accommodate 7/8" diameter bolts

### Material

Ductile iron hot dip galvanized

Catalog Number	45° Ultimate Strength (lbs)	Weight /100 (lbs)
PX44	40,000	770
PX44LT	40,000	770

### Notes:

Suffix "LT" denotes less teeth for use on steel or concrete poles



# Brackets

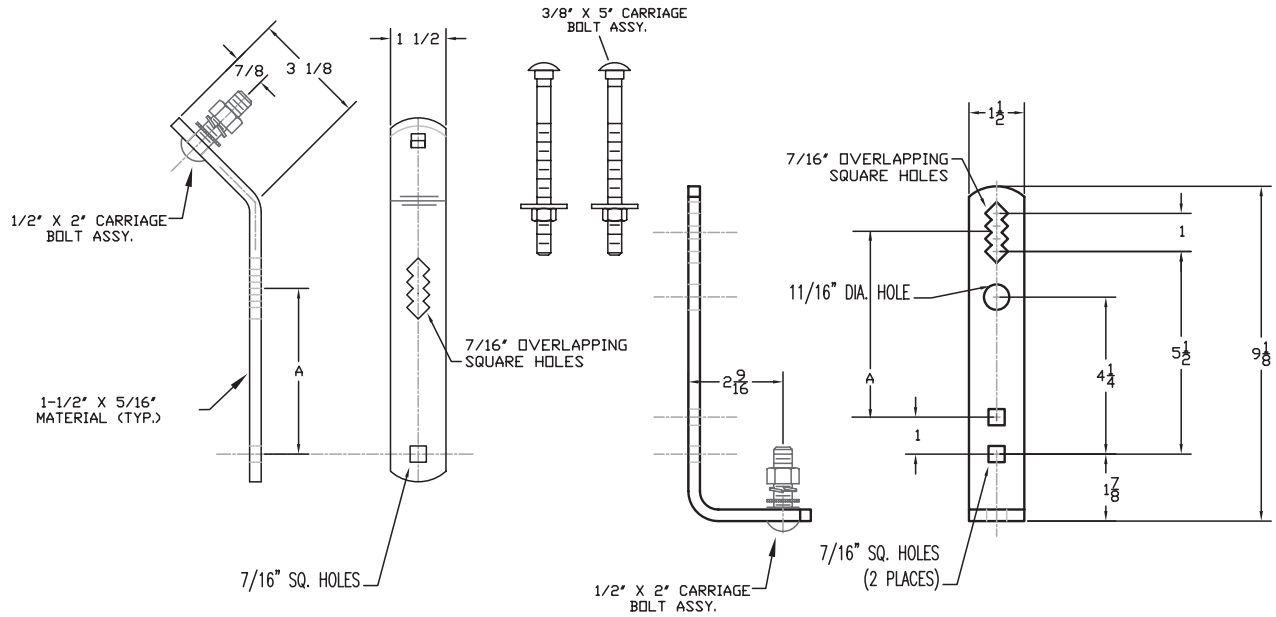
## Apparatus Mounting Brackets

### Features

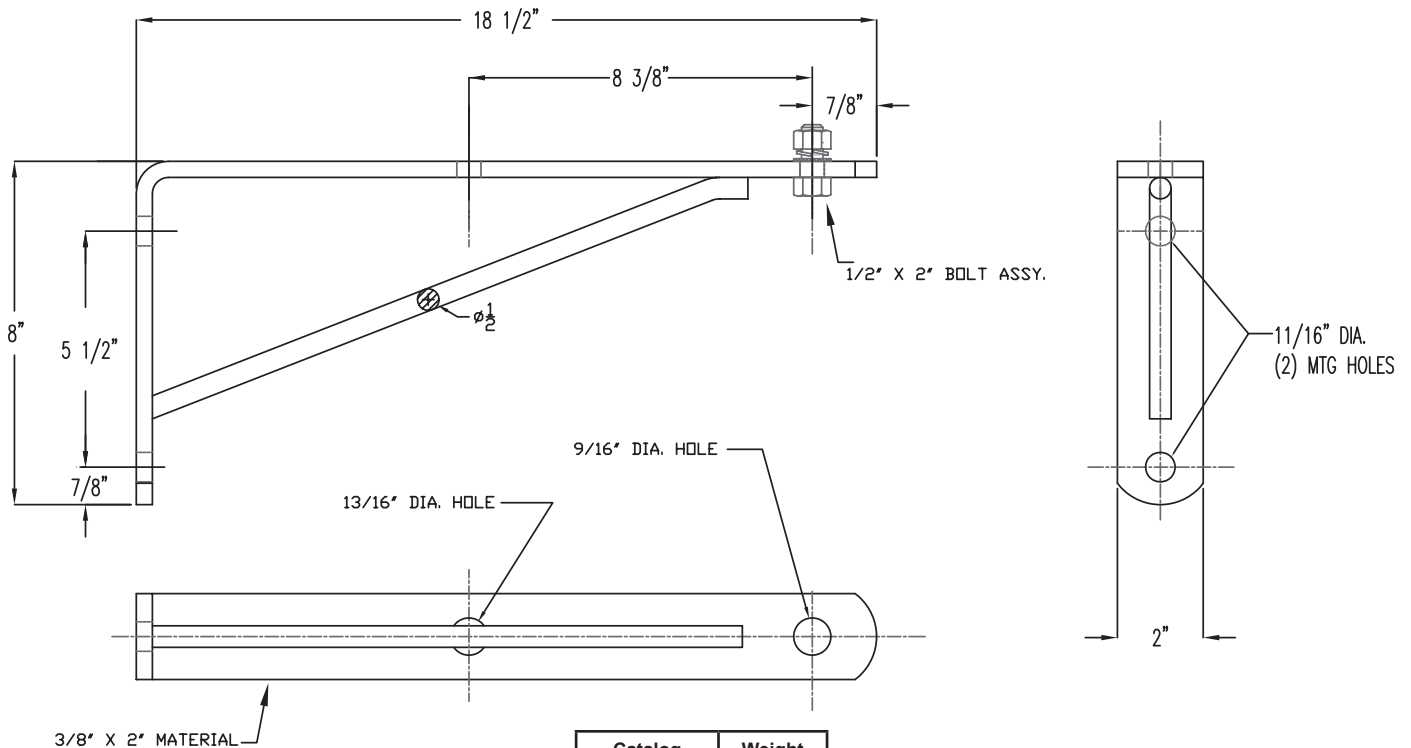
- Engineered for strength and mounting a variety of electrical equipment including arresters, cutouts, combination units, and terminations

### Material

Steel hot dip galvanized



Catalog Number	Steel Size	A	Weight /100 (lbs)
U35930	5/16" x 1 1/2"	4 1/2" to 5 1/2"	355



Catalog Number	Weight /100 (lbs)
U8101-AC-HDW	355



# Brackets

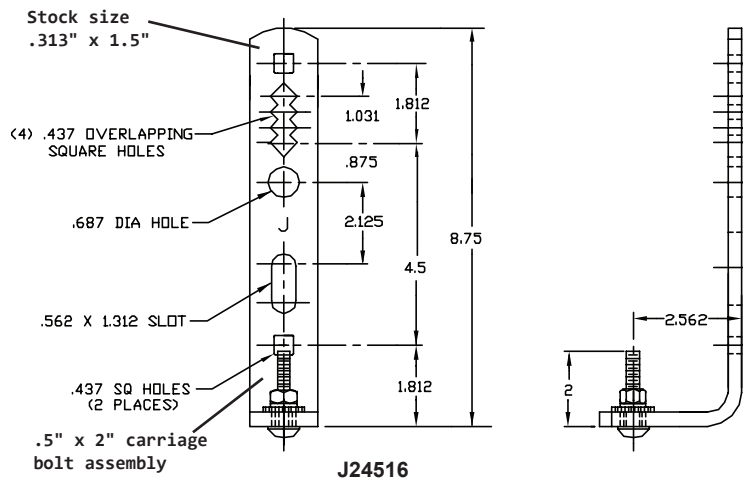
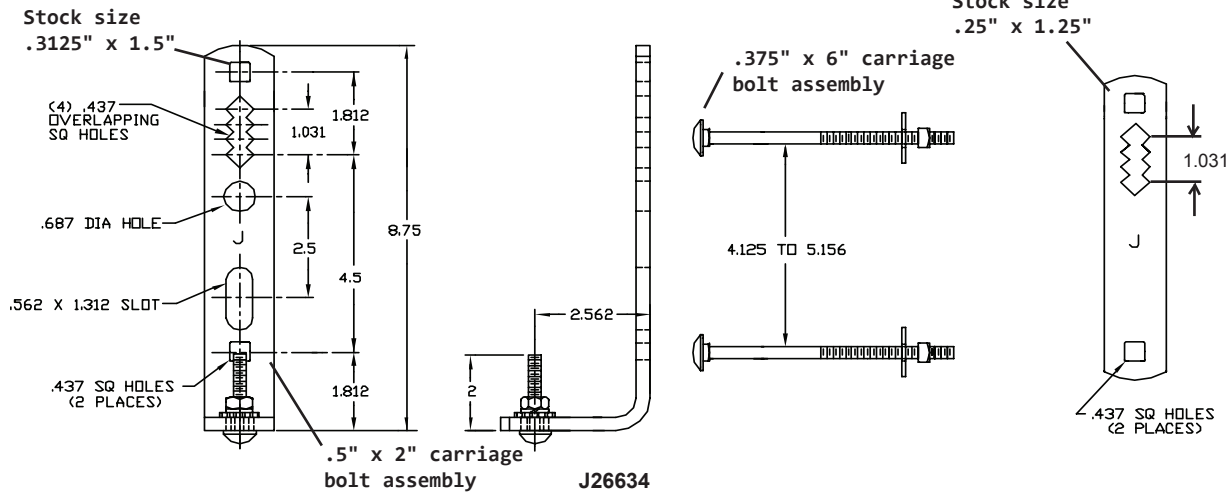
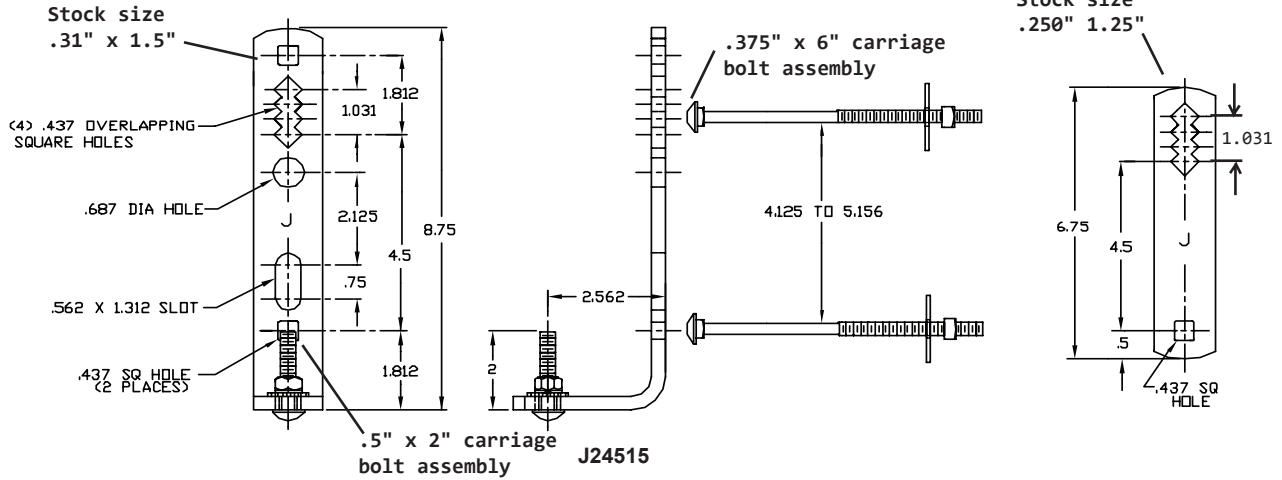
## Apparatus Mounting Brackets

### Features

- Engineered for strength and mounting a variety of electrical equipment including arresters, cutouts, combination units, and terminations

### Material

Steel hot dip galvanized





# Brackets

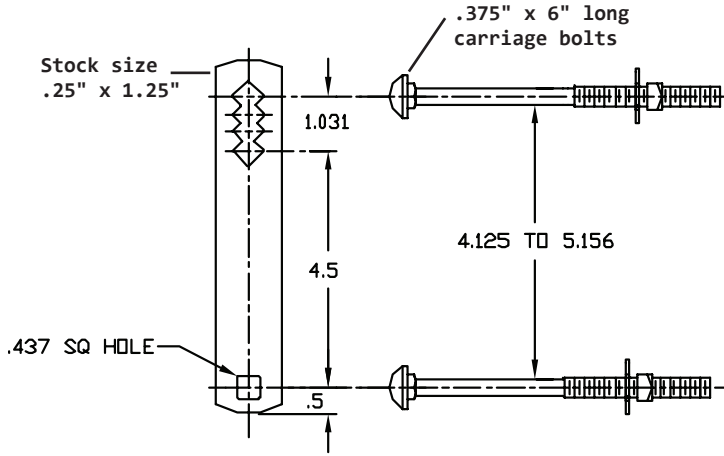
## Apparatus Mounting Brackets

### Features

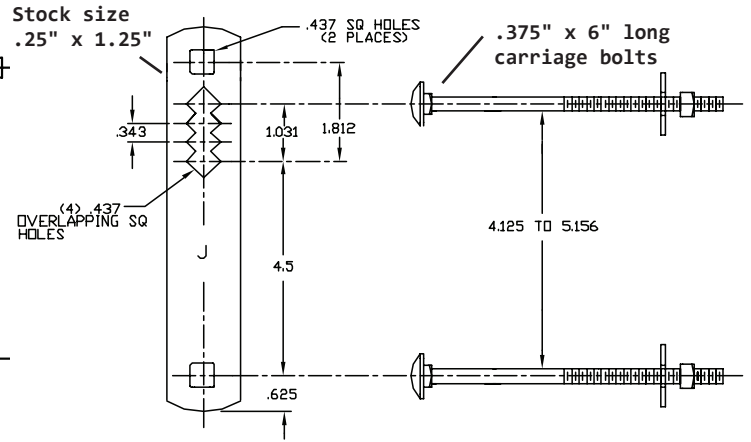
- Engineered for strength and mounting a variety of electrical equipment including arresters, cutouts, combination units, and terminations

### Material

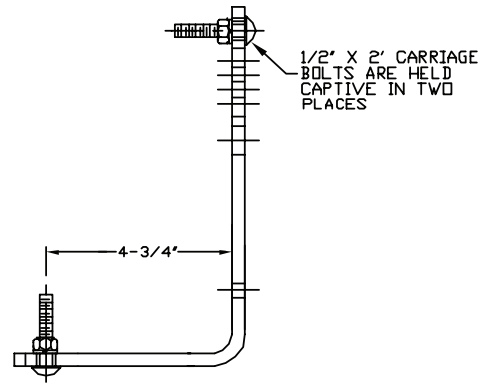
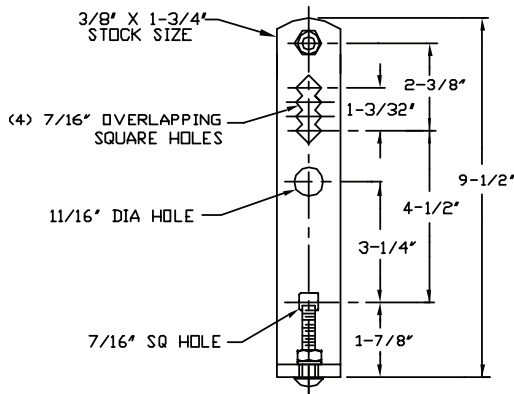
Steel hot dip galvanized



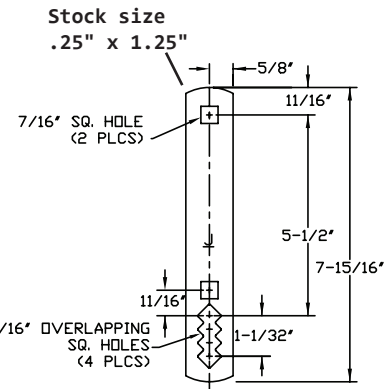
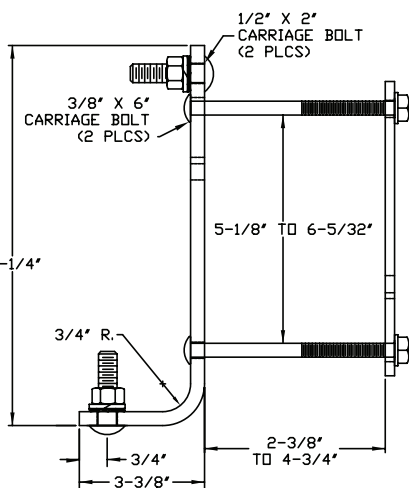
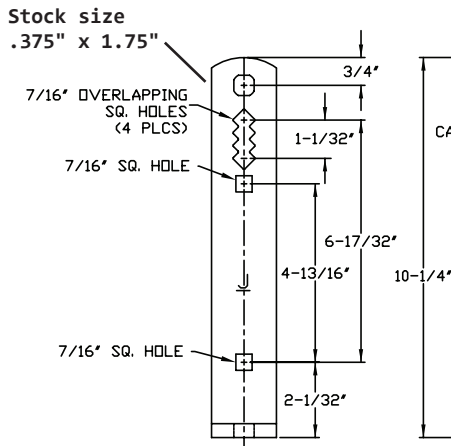
J24517



J26620C



J26482



D30509





# Brackets

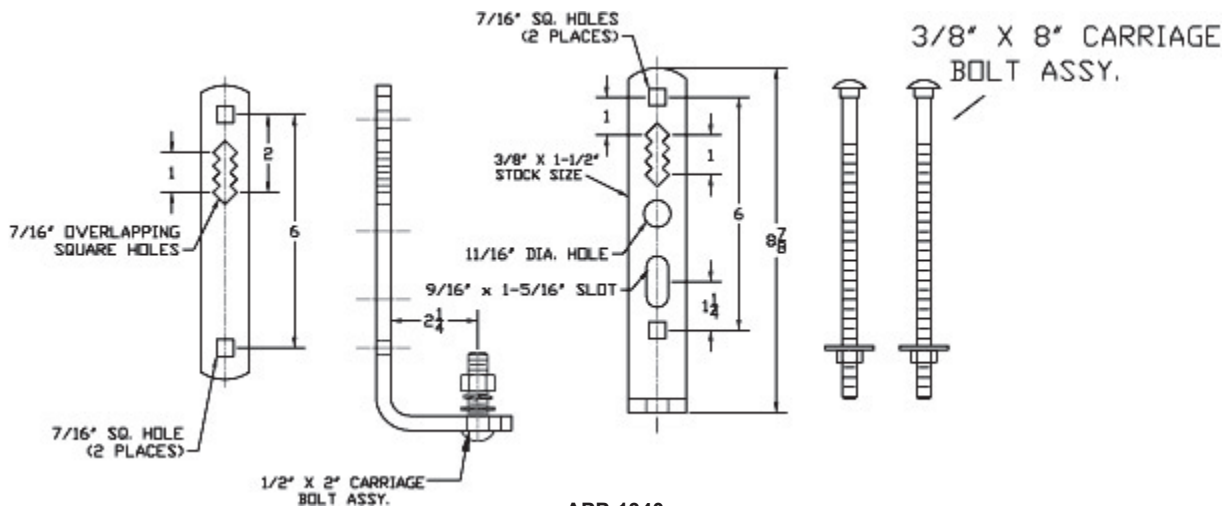
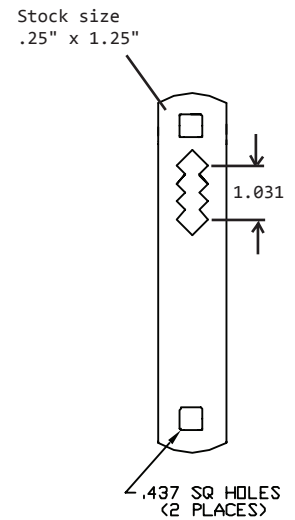
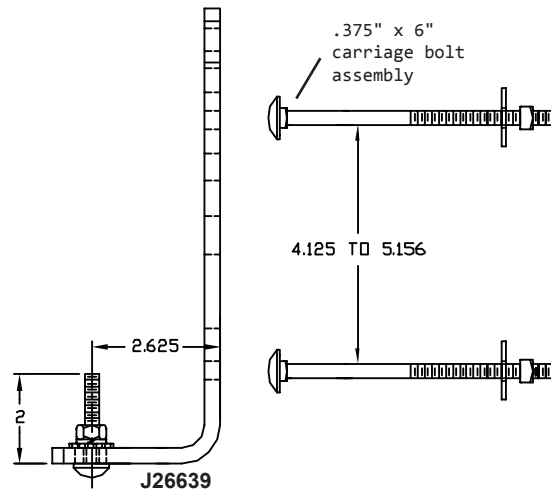
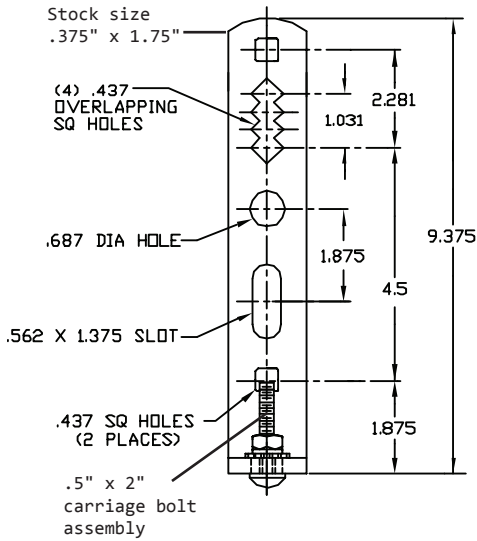
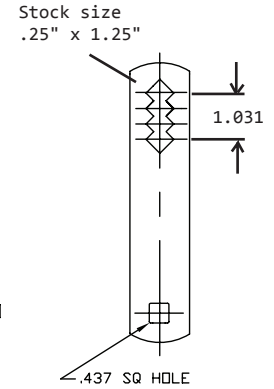
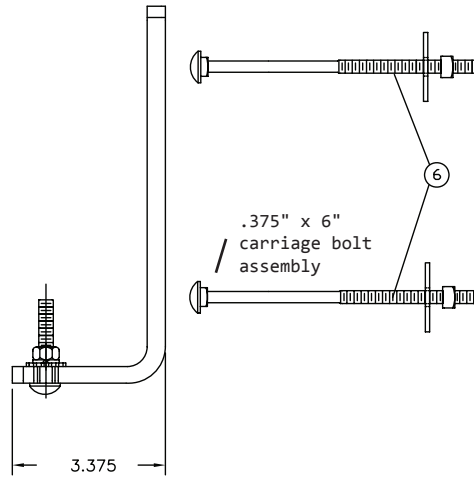
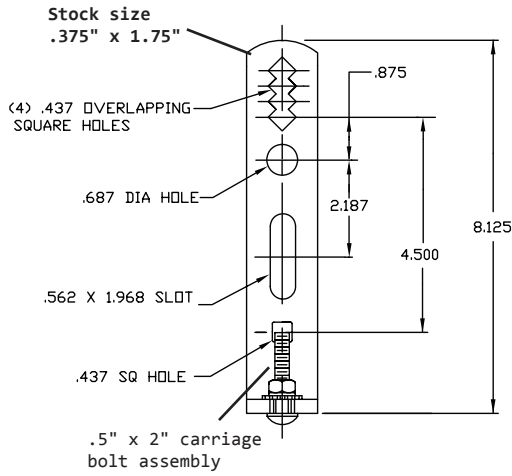
## Apparatus Mounting Brackets

### Features

- Engineered for strength and mounting a variety of electrical equipment including arresters, cutouts, combination units, and terminations

### Material

Steel hot dip galvanized



APP-1340



# Brackets

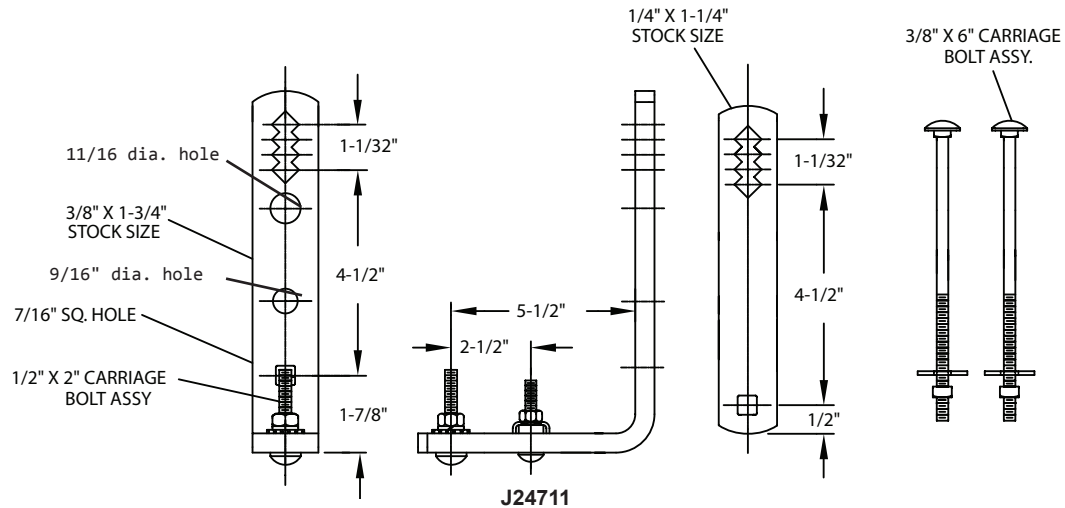
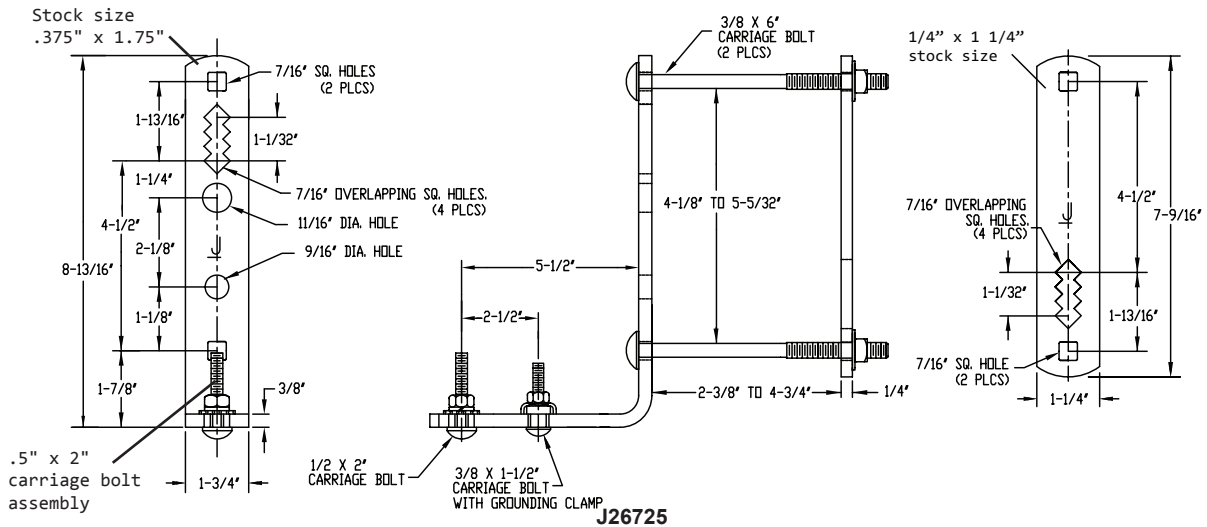
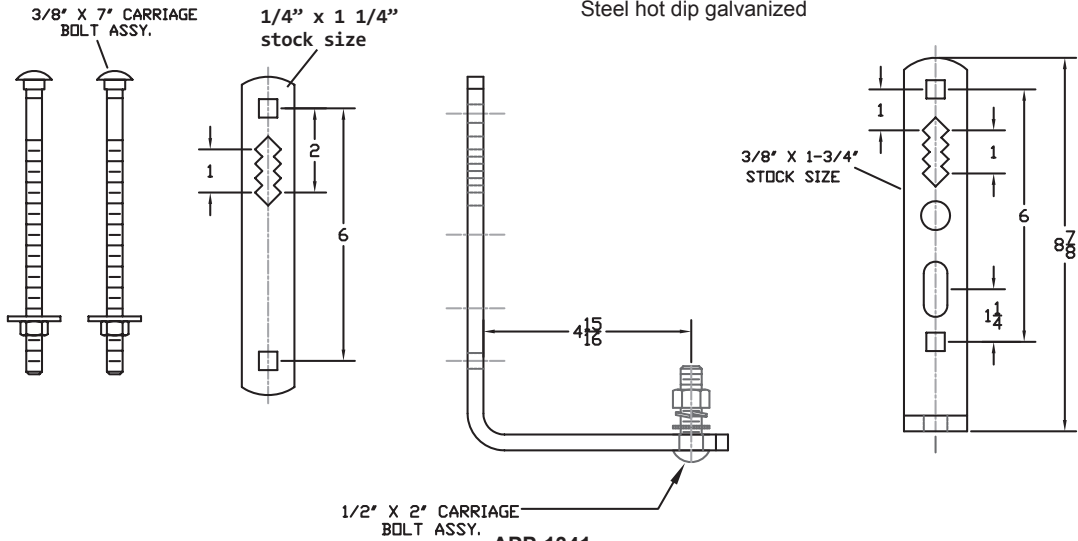
## Apparatus Mounting Brackets

### Features

- Engineered for strength and mounting a variety of electrical equipment including arresters, cutouts, combination units, and terminations

### Material

Steel hot dip galvanized





# Brackets

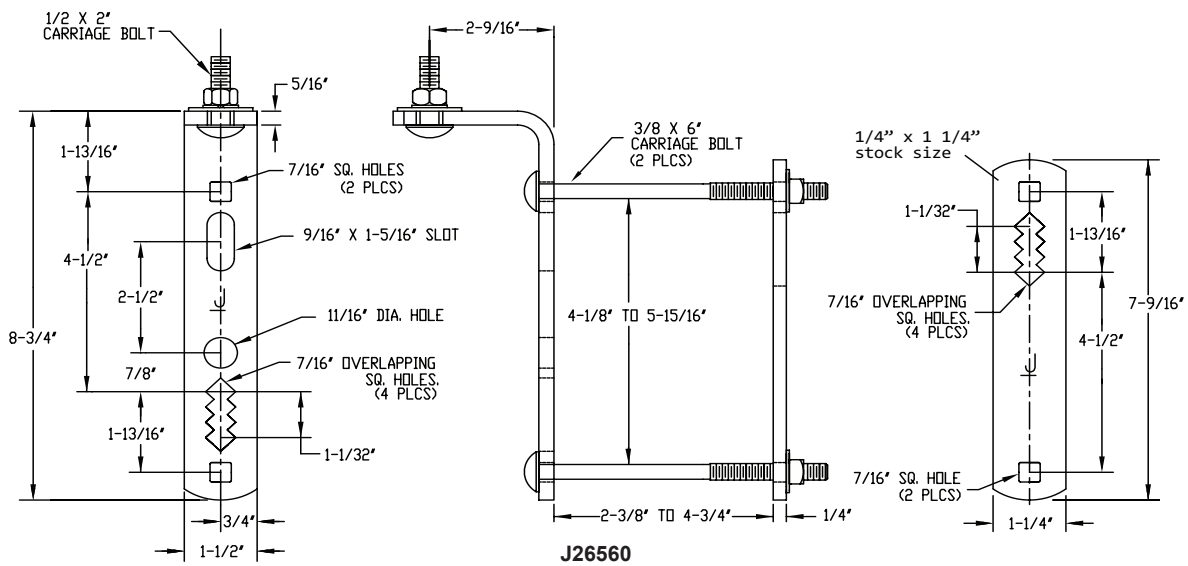
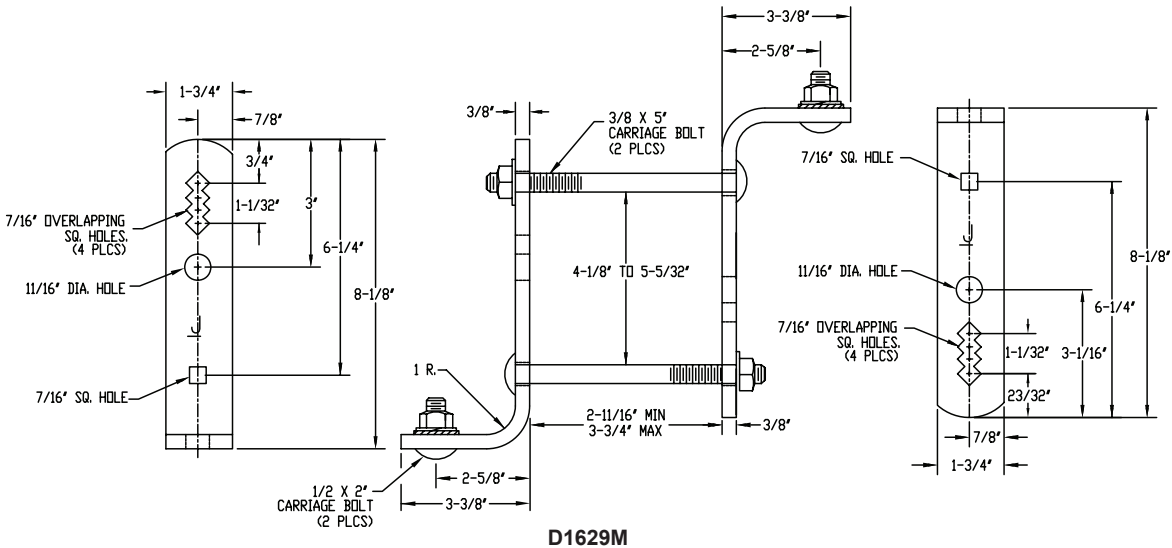
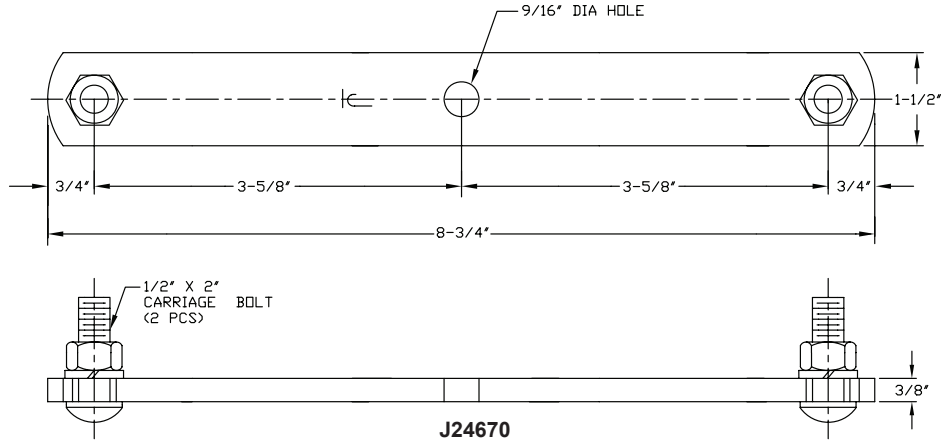
## Apparatus Mounting Brackets

### Features

- Engineered for strength and mounting a variety of electrical equipment including arresters, cutouts, combination units, and terminations

### Material

Steel hot dip galvanized





# Brackets

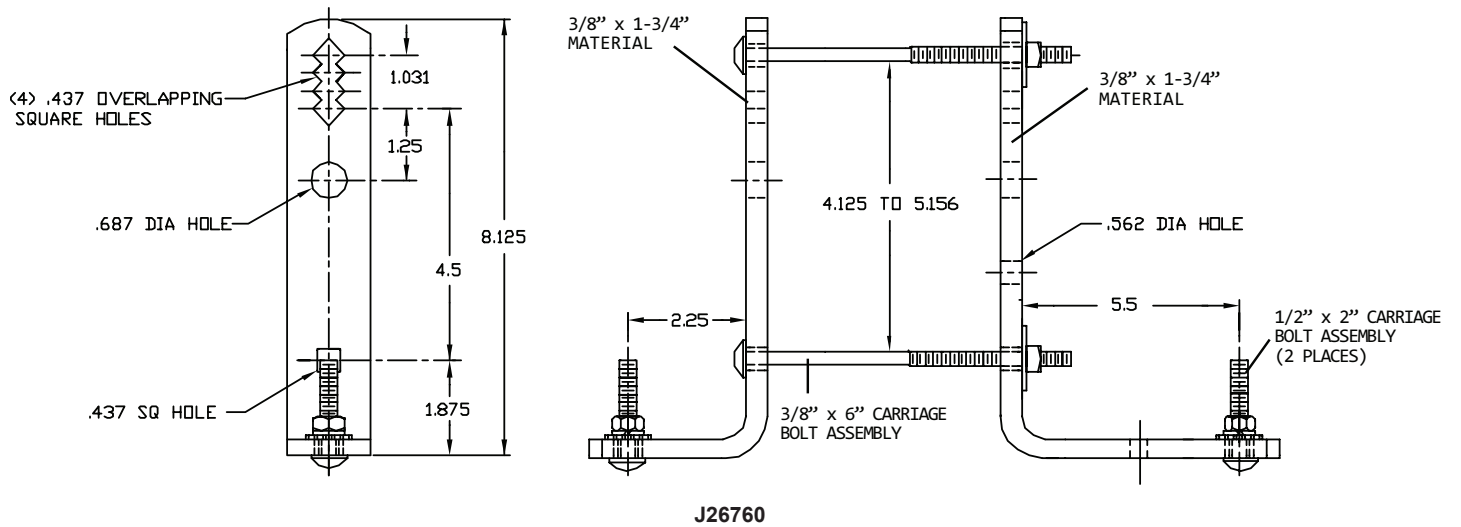
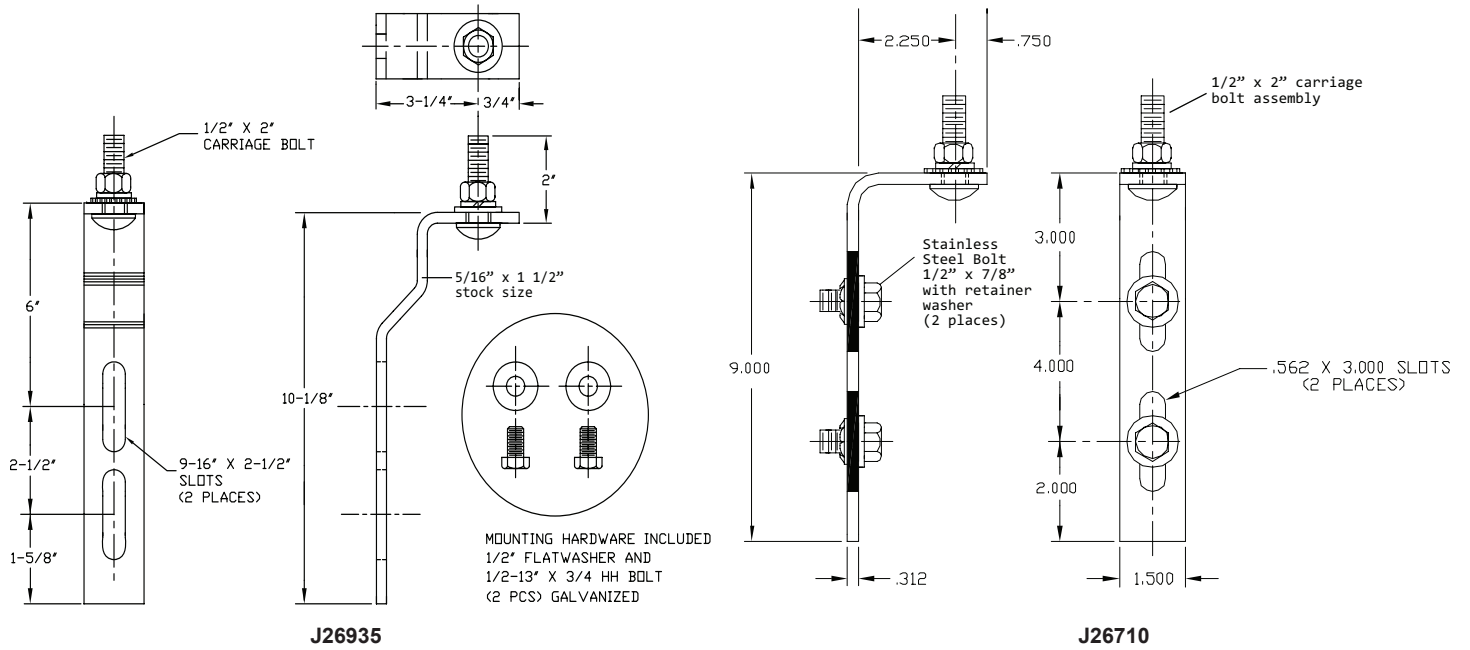
## Apparatus Mounting Brackets

### Features

- Engineered for strength and mounting a variety of electrical equipment including arresters, cutouts, combination units, and terminations

### Material

Steel hot dip galvanized





# Brackets

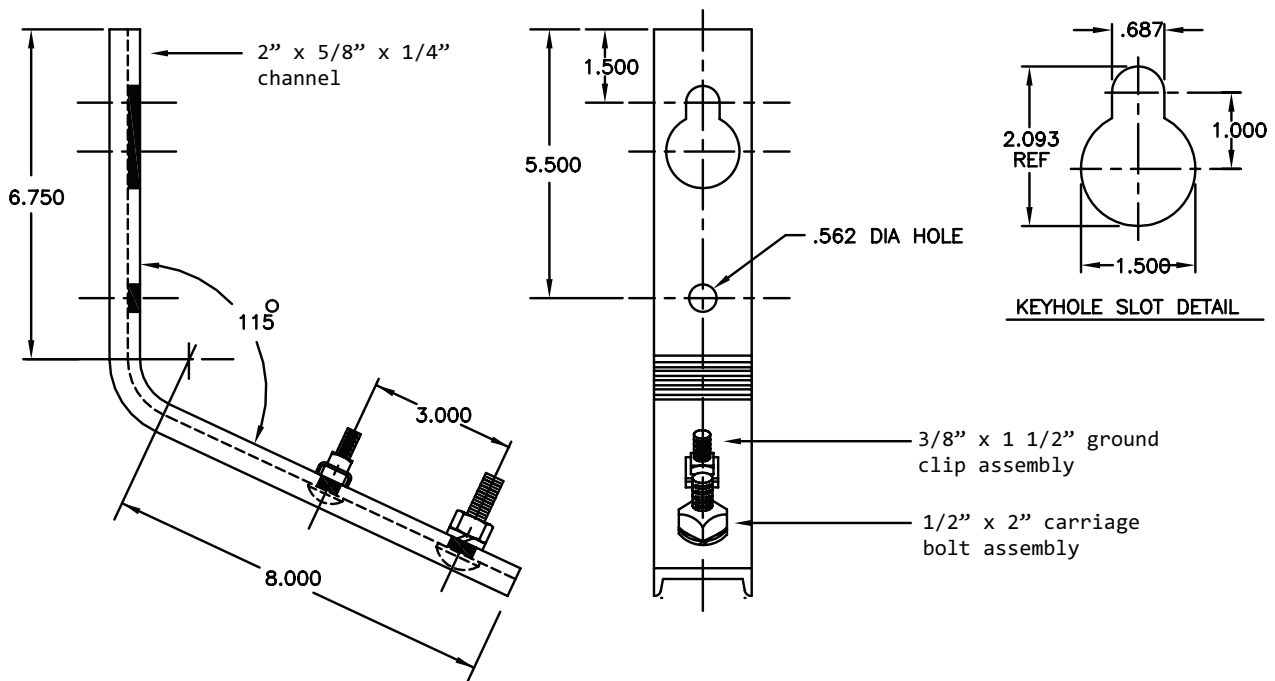
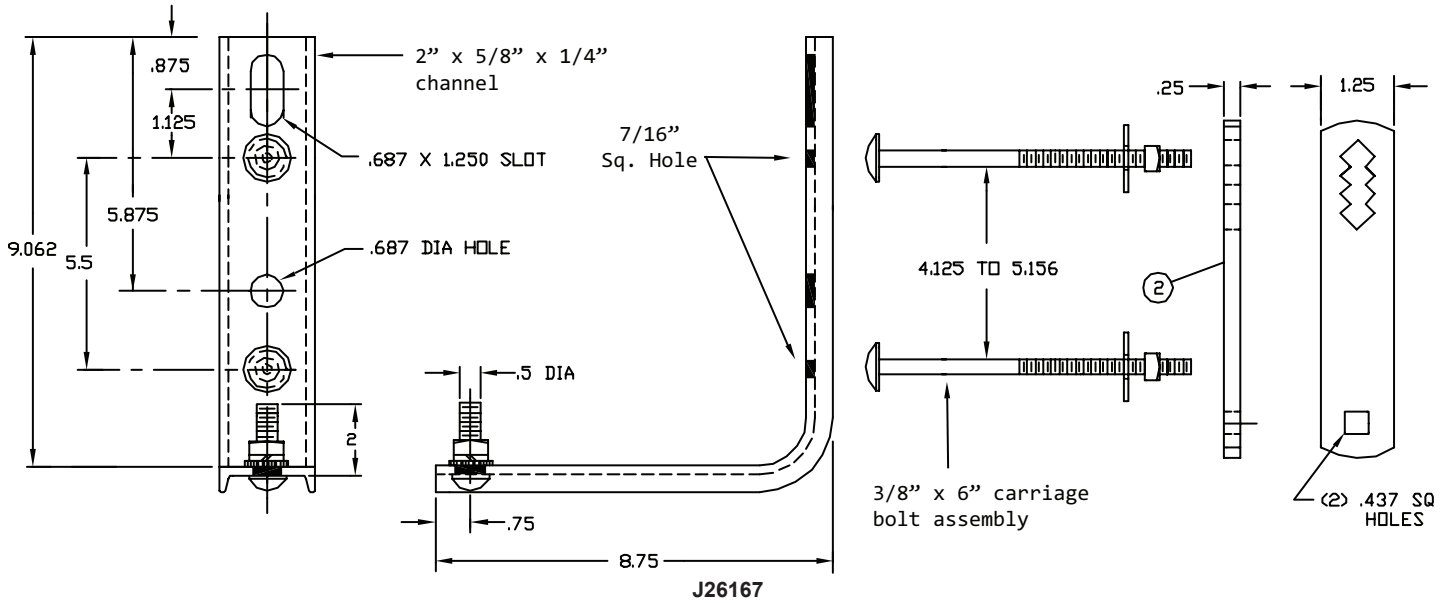
## Apparatus Mounting Brackets

### Features

- Engineered for strength and mounting a variety of electrical equipment including arresters, cutouts, combination units, and terminations

### Material

Steel hot dip galvanized



J24673



# Brackets

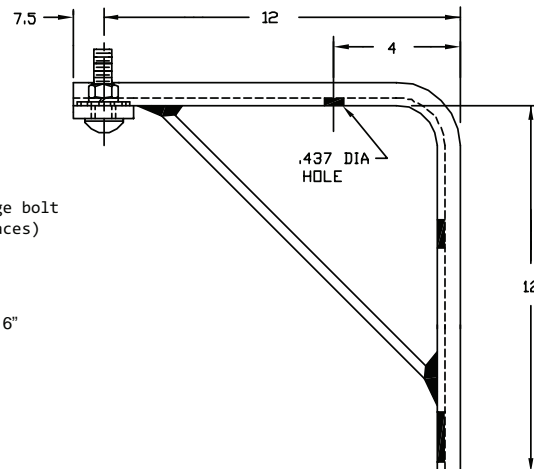
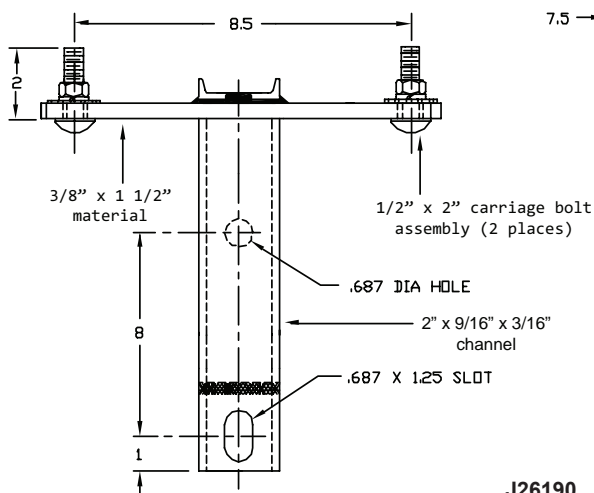
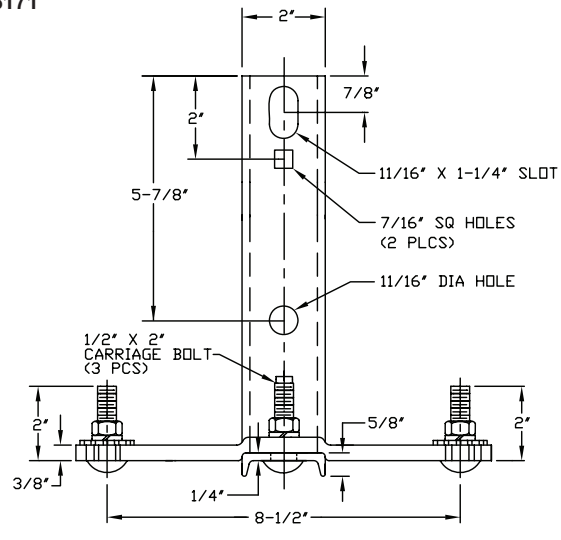
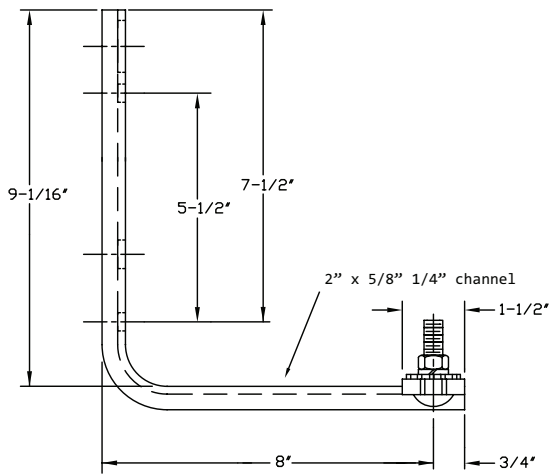
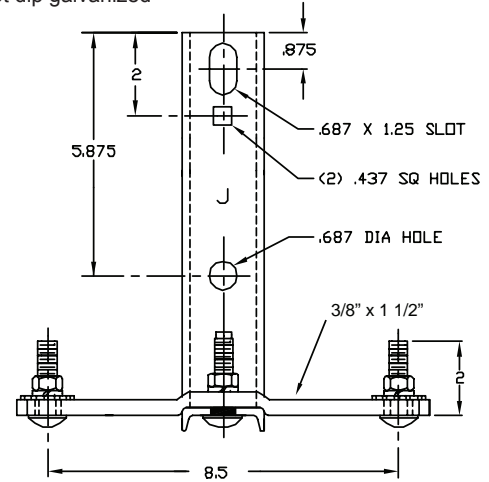
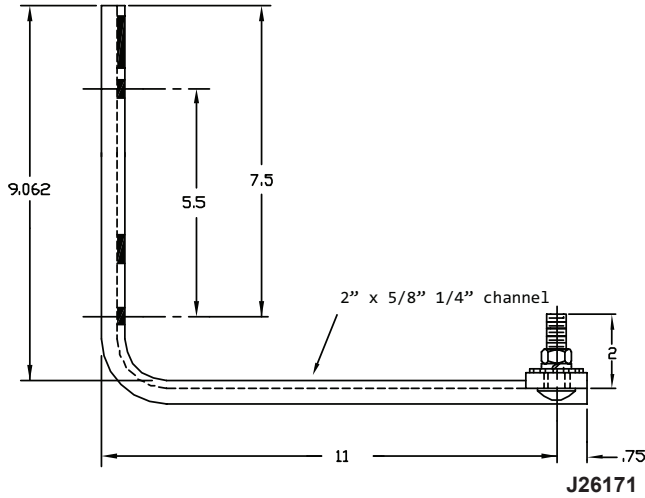
## Apparatus Mounting Brackets

### Features

- Engineered for strength and mounting a variety of electrical equipment including arresters, cutouts, combination units, and terminations

### Material

Steel hot dip galvanized







# Brackets

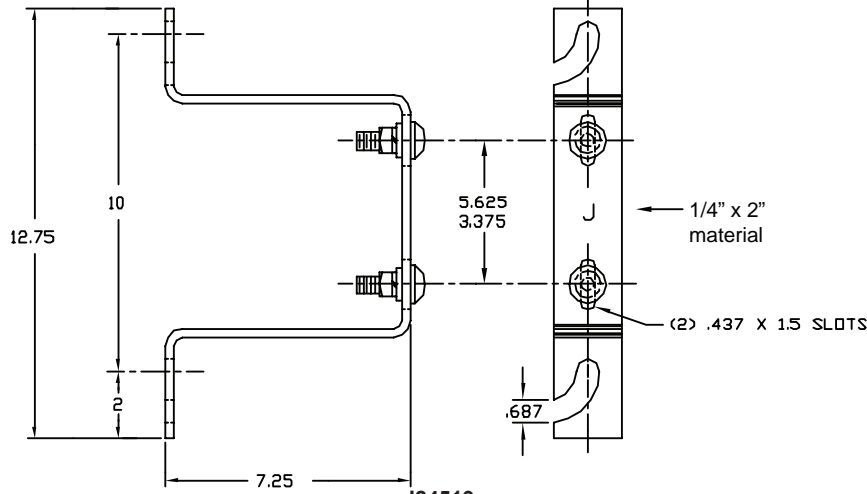
## Apparatus Mounting Brackets

### Features

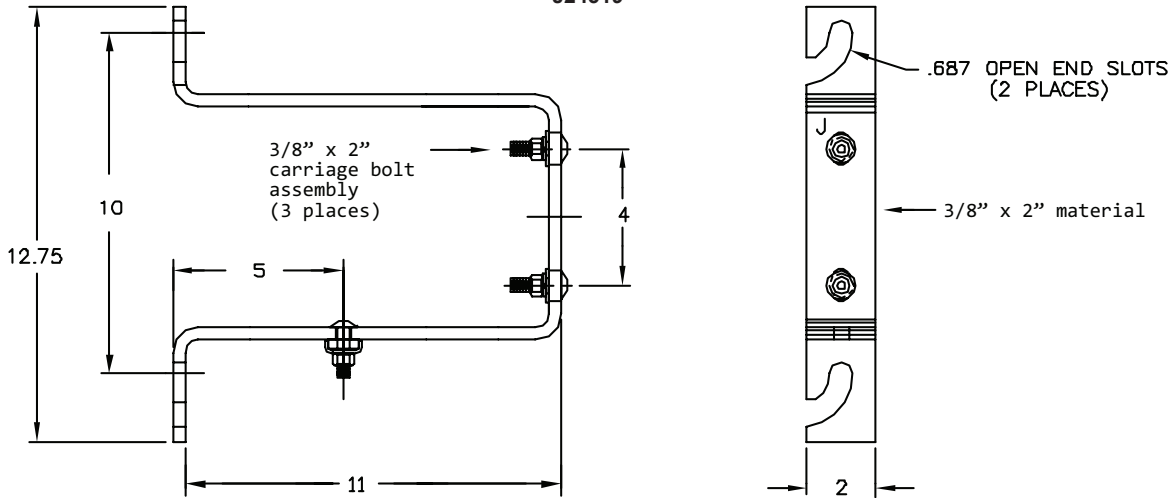
- Engineered for strength and mounting a variety of electrical equipment including arresters, cutouts, combination units, and terminations

### Material

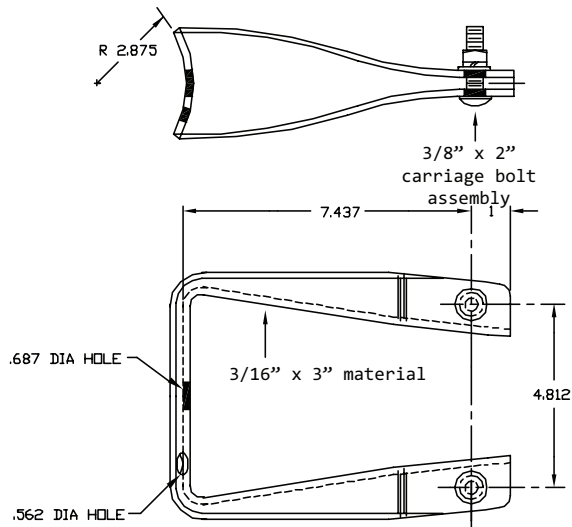
Steel hot dip galvanized



J24519



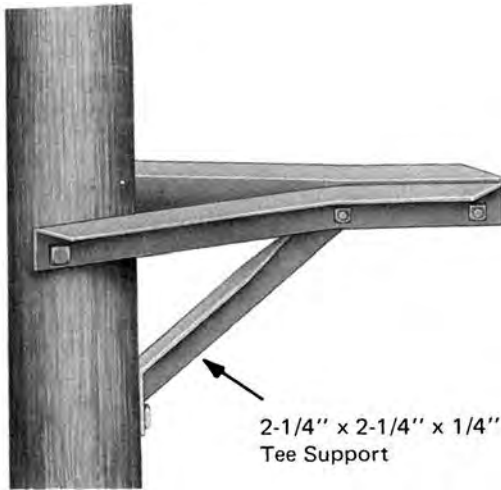
J24665



J24518



# Brackets



### Cable Extension

The cable extension bracket supports a telephone cable at a distance from the pole.

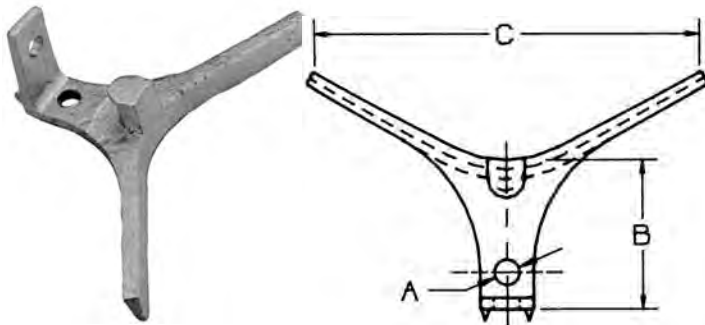
#### Features

- Messenger cable is held by a standard J1096 suspension clamp which is bolted against the underside of the two angles by a 5/8" machine bolt which is fitted between the legs of the two angles and can be adjusted for proper extension from the pole
- Mounts to pole with a 5/8" or 3/4" machine bolt at upper position and two 1/2" lag screw bolts at the lower
- All mounting bolts, lag screws and suspension clamps must be ordered separately

#### Material

Steel hot dip galvanized

Catalog Number	Angle Size	Extension from Center of Pole (in)	Weight /100 (lbs)
J7920	3 x 2 1/2 x 5/16	17 1/2 - 26	2900
J7921	3 1/2 x 2 1/2 x 5/16	26 1/2 - 44 1/2	6000



### Conduit Mounting Standoff

#### Features

- Brackets will accommodate 1-3 conduits up to 6" diameter each
- Conduit is secured by banding to post on bracket
- Mounts to pole with 5/8" machine bolt

#### Material

Steel hot dip galvanized

Catalog Number	A	B	C	Weight /100 (lbs)
CRB396	11/16	4	10 1/2	270



# Brackets

## Insulator and Equipment

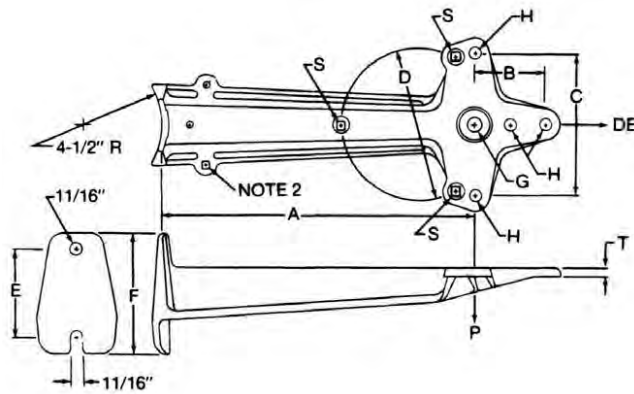
"VIB", "IAC" and "IACB" series insulator and equipment brackets provide flexibility for mounting a variety of equipment vertically onto the pole.

### Features

- For mounting arresters, cutouts, line post insulators, insulator pins, cable terminations, and flood lights

### Material

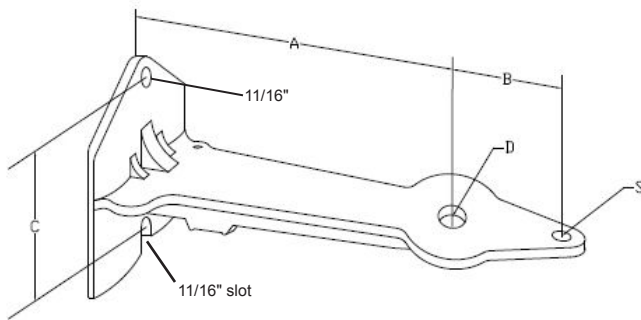
VIB series: Aluminum alloy  
 IAC and IACB series: Ductile iron hot dip galvanized



Catalog Number	A	B	C	D	E	F	G	H	S	T	Ultimate Strength (P)	Ultimate Strength (DE)	Weight /100 (lbs)
VIB3-12	12	4	8	8 3/4	5	6 3/4	13/16	11/16	17/32	1/2	2500	10000	470
VIB3-18	18	4	8	8 3/4	5	6 3/4	13/16	11/16	17/32	1/2	2500	10000	580

### Notes:

- 1) To specify two 1/2" captive bolts in outer two holes, add suffix "-B"
- 2) To specify grounding device, add suffix "-GC"



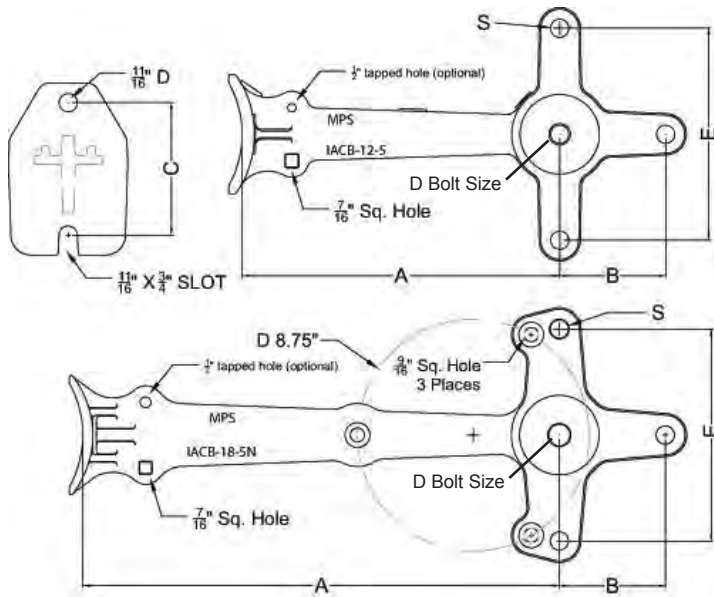
Catalog Number	A	B	C	D	S	Pole Mounting Bolts	Weight /100 (lbs)
IAC-7-5	7	2 5/8	5	13/16	11/16	5/8	450
IAC-12-5	12	3 5/16	5	13/16	11/16	5/8	1060
IAC-18-5	18	4	5	13/16	11/16	5/8	1330

### Notes:

For 1/2" captive bolt for cutout mounting, add suffix "-B"



# Brackets



## Insulator and Equipment

“VIB”, “IAC” and “IACB” series insulator and equipment brackets provide flexibility for mounting a variety of equipment vertically onto the pole.

### Features

- For mounting arresters, cutouts, line post insulators, insulator pins, cable terminations, and flood lights

### Material

VIB series: Aluminum alloy  
IAC and IACB series: Ductile iron hot dip galvanized



Catalog Number	A	B	C	D	E	S	Weight /100 (lbs)
IACB-12-5	12	4	5	5/8 - 3/4	8	11/16	800
IACB-18-5N	18	4	5	5/8 - 3/4	8	11/16	1100

Notes:  
For 1/2" captive bolt for cutout mounting, add suffix "-B"



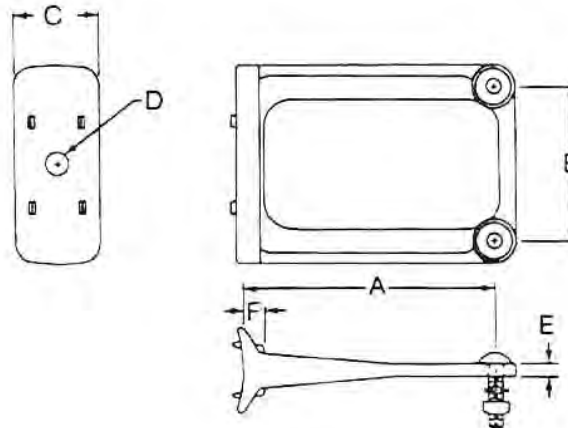
## Insulator and Equipment

### Features

- Bracket is easily mounted on utility pole with single 5/8" diameter through bolt
- Cleats on base of bracket anchor it securely to pole
- Supplied with (2) 3/8" x 1' 3/4" carriage bolts, hex nuts and lock washers

### Material

Aluminum alloy



Catalog Number	A	B	C	D	E	F	Weight /100 (lbs)
CAB-8	7 1/2	4 1/2	2 1/2	11/16	11/32	1/2	110



# Brackets

## Insulator

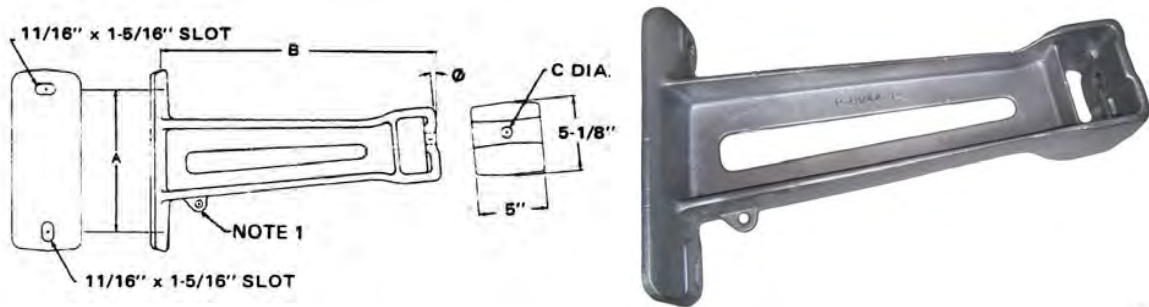
“HBB”, “HB” and “HIB” insulator brackets provide flexibility for mounting a variety of equipment horizontally onto the pole.

## Features

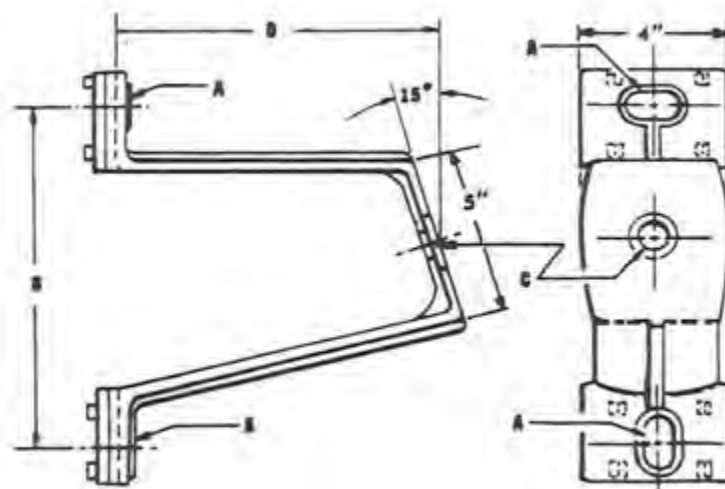
- For mounting line post insulators and insulator pins

## Material

HBB series: Ductile iron hot dip galvanized  
 HB and HIB series: Ductile iron hot dip galvanized



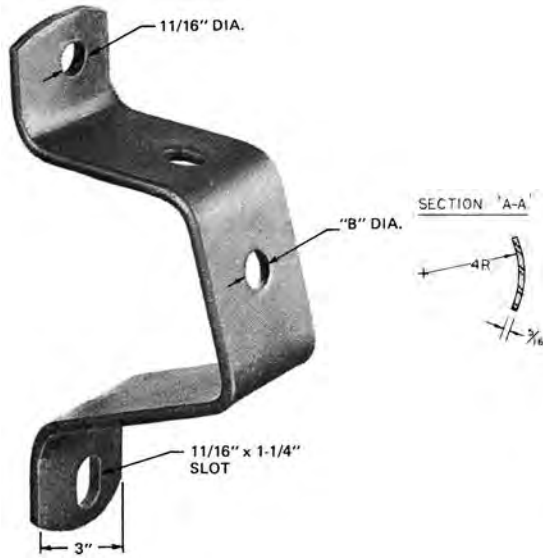
Catalog Number	kV Rating	A	B	C	Angle	In-lbs Rating	Weight /100 (lbs)
HBB-12-32	69	10	32	13/16	5	50120	1950



Catalog Number	kV Rating	A	B	C	D	E	Material	Weight /100 (lbs)
HIB-109-5	35	5/8" Mounting Bolt	10	5/8 - 3/4" Insulator Stud Bolt	9 Pole Clearance	15° Base Angle	Ductile Iron	861
HIB-1020-6A	88	7/8" Mounting Bolt	10 or 12	3/4 - 7/8" Insulator Stud Bolt	20 Pole Clearance	15° Base Angle	Ductile Iron	3300



# Brackets

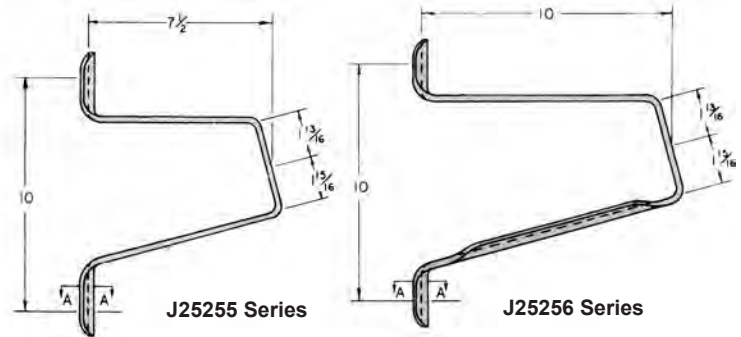


## Insulator

Post Insulator brackets are used to mount post type insulators from 15kV through 34.5kV directly to the side of the pole, thus eliminating a crossarm assembly.

## Material

Steel hot dip galvanized - 5/16" x 3" steel



Catalog Number	B	Weight /100 (lbs)
J25255.1	11/16	600
J25256.1	11/16	800
J25256.2	13/16	800

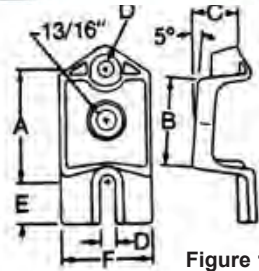


Figure 1

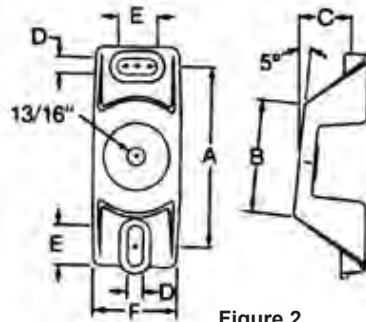


Figure 2

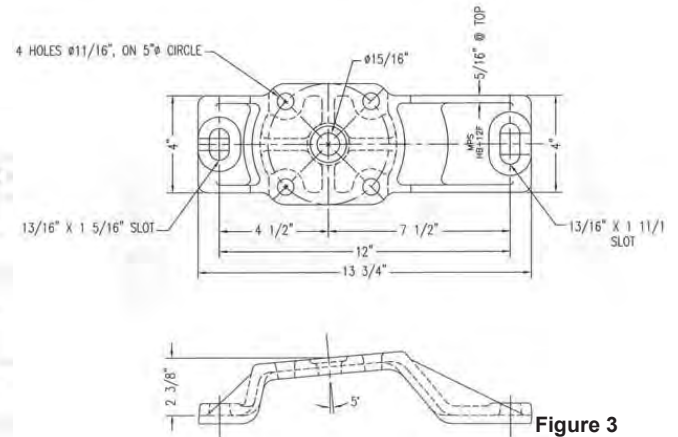
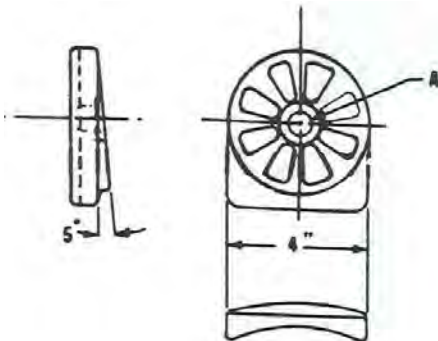


Figure 3

Catalog Number	Fig	kV Rating	A	B	C	D	E	F	In-lbs Rating	Material	Weight /100 (lbs)
HB-6	1	35	5	3 7/8	1 7/8	11/16	1 11/16	4	30000	Aluminum	170
HB-8	2	45	8	5	2 1/4	23/32	1 7/8	3 13/16	40000	Aluminum	260
HB-12F	3	88	12	6 1/4	2 3/8	13/16	1 5/16	5	62000	Ductile Iron	1142
HIB-62-5	1	35	5	3 7/8	2	5/8	1 11/16	4	36750	Ductile Iron	300
HIB-82-5	2	66	8	5	2	5/8	1 7/8	4	50120	Ductile Iron	600



## Insulator

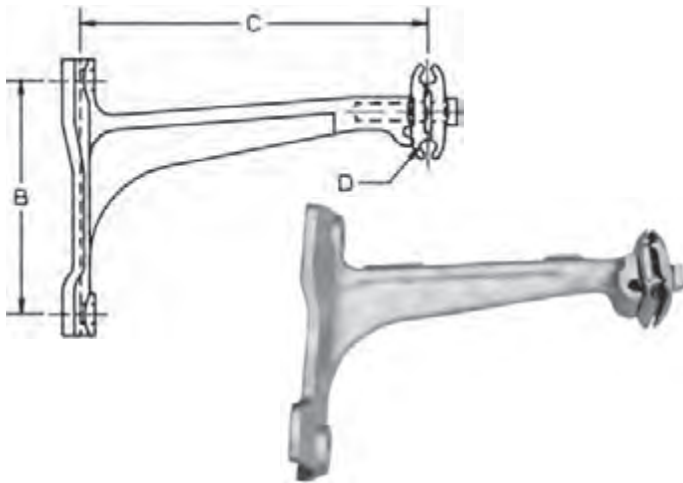
For use as a line post insulator adapter

Catalog Number	A	Material	Weight /100 (lbs)
IB-5	11/16	Aluminum	60
UDT-4	13/16	Ductile Iron	150





# Brackets



## Messenger Extension

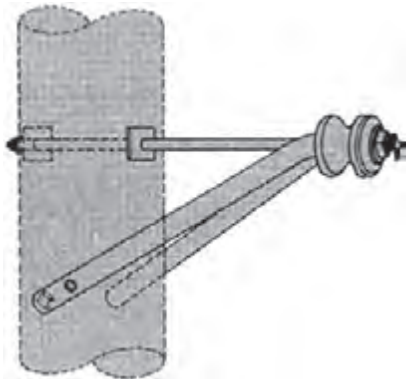
### Features

- Provides a 12" clearance from the pole and is fastened with two 5/8" mounting bolts
- Clamp plates are reversible to accept a wide range of messenger brackets

### Material

Ductile iron hot dip galvanized

Catalog Number	B	C	D	Weight /100 (lbs)
SCB-12-5	8	12	1/4 - 5/8	1129



## Neutral Extension

The neutral extension bracket is designed for new construction and accommodates pole diameters of 6-11".

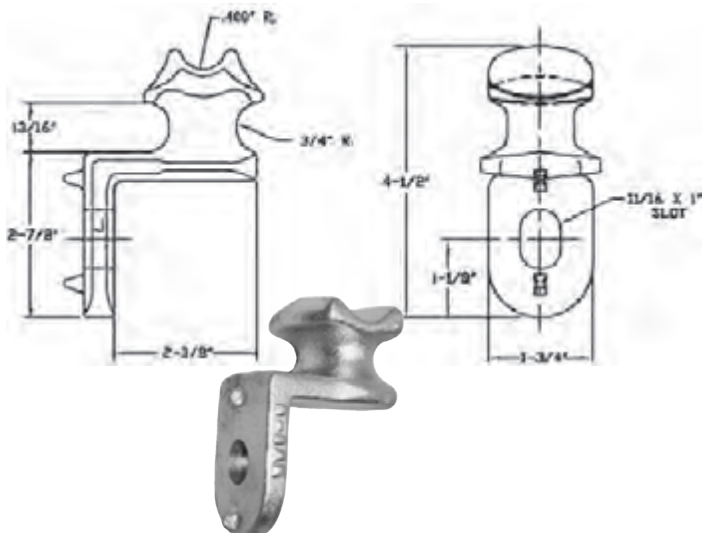
### Features

- Pole end consists of 5/8" bolt, welded washer, square nut, and lock nut
- Spool end consists of flat steel brace, two round washers, square nut and self-locking cotter key
- Provides 11 3/4" extension from pole
- Spool insulators and lag screws ordered separately

### Material

Steel hot dip galvanized

Catalog Number	Weight /100 (lbs)
J2352	800



## Neutral Wire

The NWB5 is a non-insulating malleable iron bracket for pole mounting of neutral wire.

### Features

- Accommodates wire up to and including .666" diameter (336 .4 AAC)
- Includes spikes in mounting surface that embed into wood to resist movement
- Accommodates 5/8" mounting bolt

### Material

Ductile Iron hot dip galvanized

Catalog Number	Weight /100 (lbs)
NWB5	155



# Brackets

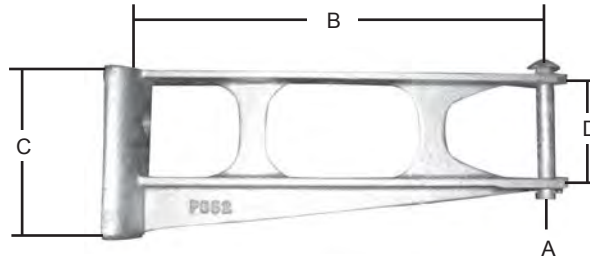


### Neutral Extension

The pole mounting base of this neutral wire bracket is furnished with integral spikes to resist movement and allow mounting with a single 5/8" machine bolt.

### Material

Ductile hot dip galvanized



Catalog Number	Ultimate Vertical Strength (lbs)	Ultimate Straight Deadend Strength (lbs)	A	B	C	D	Weight /100 (lbs)
PA362	3,500	10,000	11/16	14 1/8	5 1/2	3 1/4	796



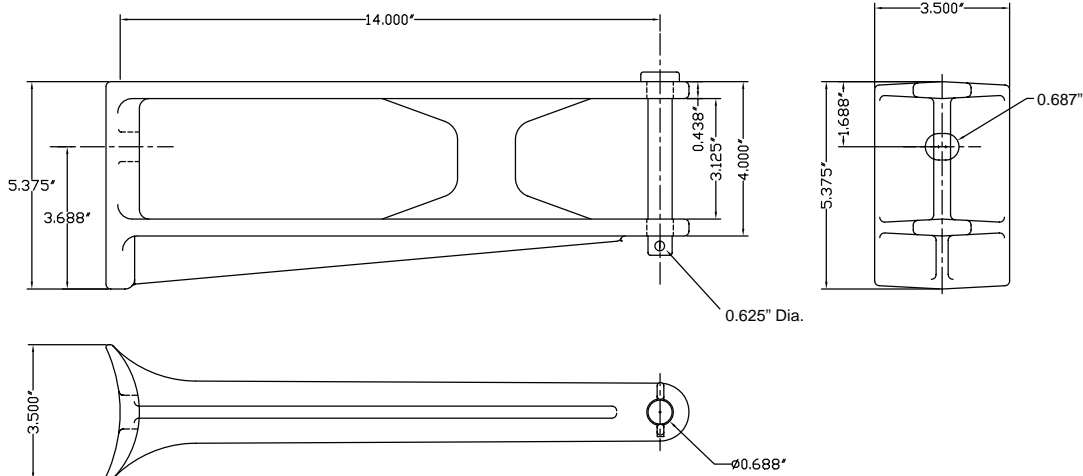
### Neutral Extension

The pole mounting base of this neutral wire bracket is furnished with integral spikes to resist movement and allow mounting with a single 5/8" machine bolt.

### Material

Aluminum Alloy Bracket  
Galvanized Steel Bolt  
Stainless Steel Cotter Key

Catalog Number	Ultimate Vertical Strength (lbs)	Ultimate Straight Deadend Strength (lbs)	Weight /100 (lbs)
ANCB-14	3,500	10,000	367





# Brackets



## Pole Brace Connector Bracket

Pole brace connector brackets will permit an attachment angle from 0° to 90° with the pole.

### Features

- The pole contacting surface is curved with integral teeth for maximum stability and distribution of the load
- USA- series has one center pole mounting hole in each bracket section
- PAX- series has three mounting holes in each bracket section for flexibility of normal or heavy duty bracing applications
- PAX- series center pole mounting hole is used for normal loads, the two outer holes are used for heavy loads
- Distance from center hole to slot is 3"

### Material

Ductile iron hot dip galvanized

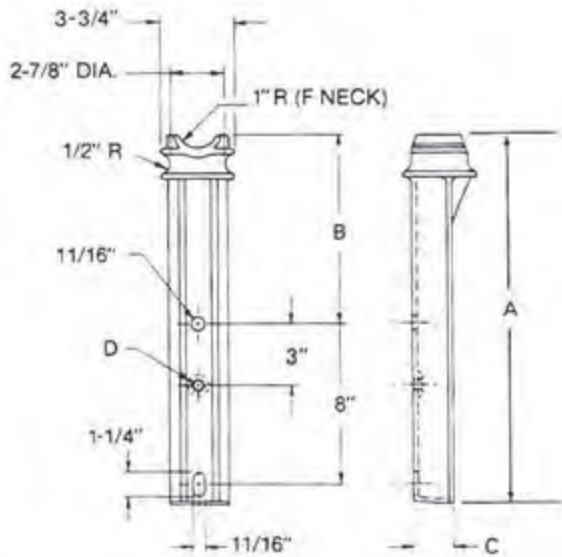
Catalog Number	Pole Range	A	B	Hinge Bolt Dia.	Mounting Bolt Dia.	Weight /100 (lbs)
USA-5634-5	4.5 - 7"	3 1/2	5 3/4	5/8	5/8	575
USA-5634-6	4.5 - 7"	3 1/2	5 3/4	5/8	3/4	575
PAX138	6 - 11"	4	8	3/4	3/4	1300

## Pole Top

### Material

Ductile iron hot dip galvanized

Catalog Number	A	B	C	D	Weight /100 (lbs)
PTB-18	18 1/2	8 13/16	1 1/2	1/2 tapped	340
PTB-24	24 9/16	14 7/8	1 3/4	11/16	550





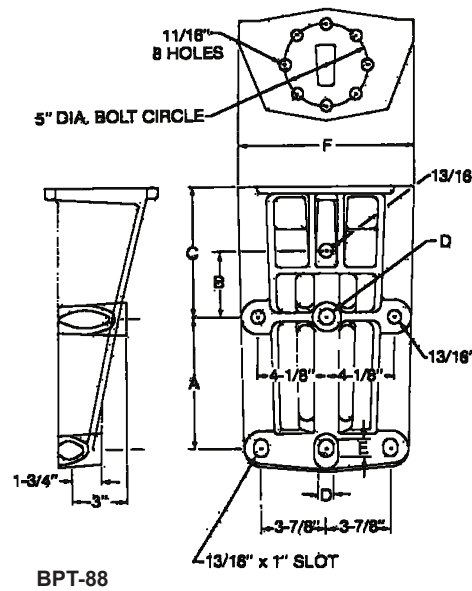
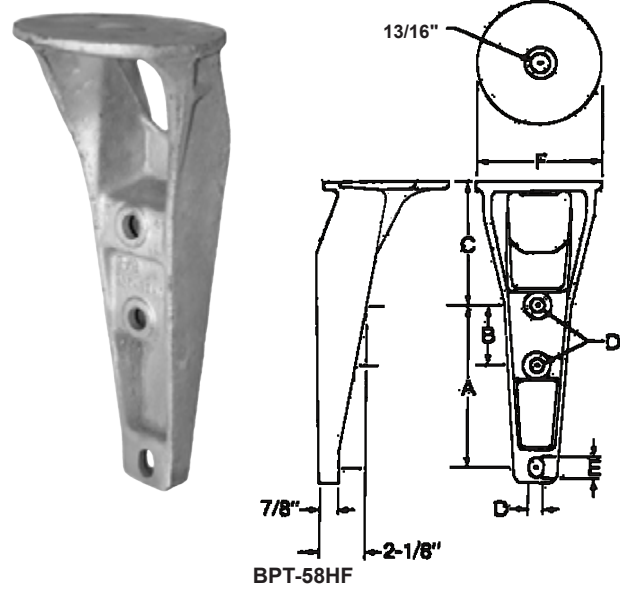
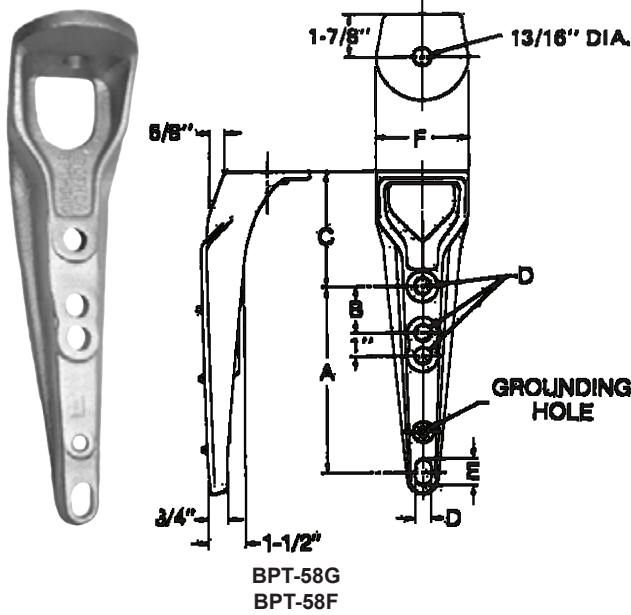
# Brackets

## Pole Top

### Material

BTP-88: Aluminum alloy

BPT-58F / BPT-58G / BPT-58HF: Ductile iron hot dip galvanized



Catalog Number	kV Rating	A	B	C	D	E	F	In-lbs Rating	Material	Weight /100 (lbs)
BPT-58F	35	8	2	5	11/16	1 1/8	4	29400	Ductile iron hot dip galv	583
BPT-58G	35	8	2	6	11/16	1 1/8	4	36750	Ductile iron hot dip galv	680
BPT-58HF	69/88	8	3	6	11/16	1	6	54600	Ductile iron hot dip galv	1150
BPT-88	115	8	4	8	15/16	1 1/16	11	134400	Aluminum	1700



# Brackets

## Pole Top

Pole top brackets are used to mount line post insulators and provide increased distance in separation of the middle phase.

### Material

Ductile iron hot dip galvanized

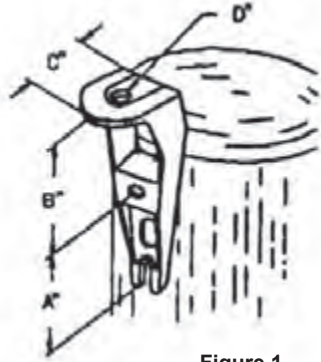


Figure 1

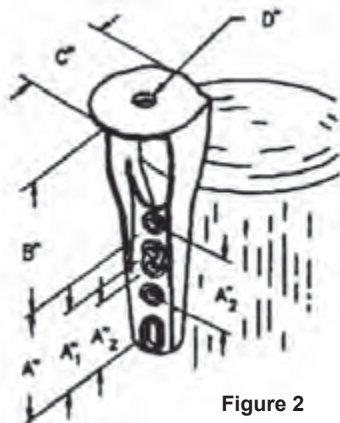


Figure 2

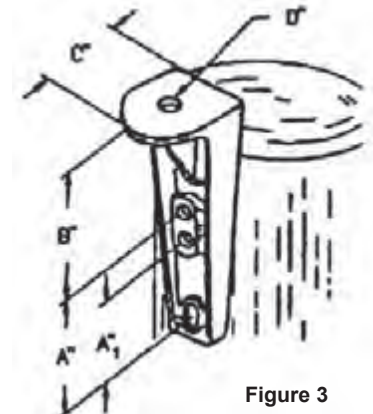
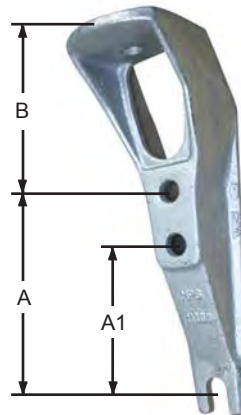


Figure 3

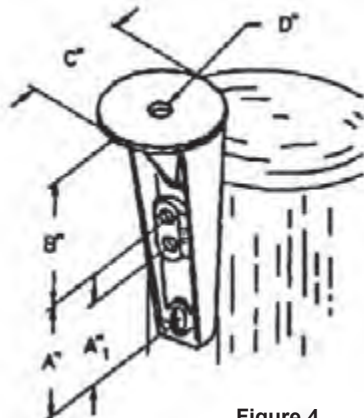
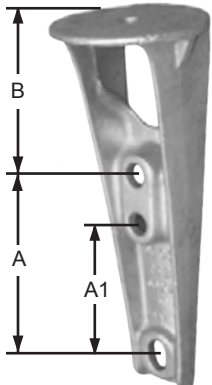
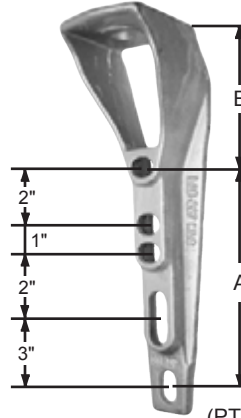


Figure 4



PTB-5L (PTB55-8 no center holes)

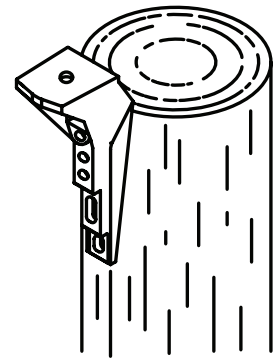
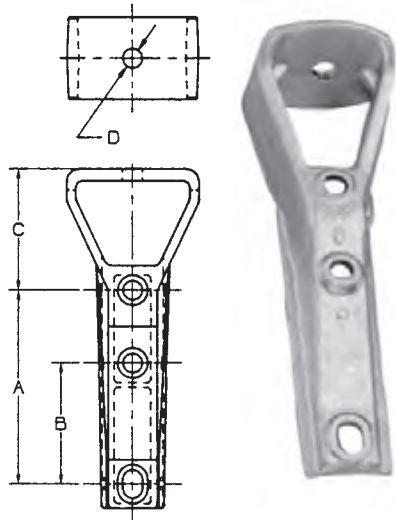


Figure 5

Catalog Number	Fig	Max Voltage Class	A	B	C	D	Mounting Bolt Diameter	A1	A2	Weight /100 (lbs)
PTB-55L	5	35	8	6	3 3/4	5/8 - 3/4 Stud Bolt	5/8			530
PTB-55-8	5	35	8	6	3 3/4	5/8 - 3/4 Stud Bolt	5/8			525
PTB-55W	1	35	5	5	3 5/8	5/8 - 3/4 Stud Bolt	5/8			450
PTB-66	2	55	8	6 3/8	3 3/4	5/8 - 3/4 Stud Bolt	5/8	6	5	860
PTB-66H	3	69	8	6	4 1/2	5/8 - 3/4 Stud Bolt	5/8 - 3/4	6		1100
PTB-66XH	3	69	8	6	6	5/8 - 3/4 Stud Bolt	5/8 - 3/4	6		1200
PTB-66XHA	4	88	8	6	6	3/4 - 7/8 Stud Bolt	5/8 - 3/4	6		1200



# Brackets



P532

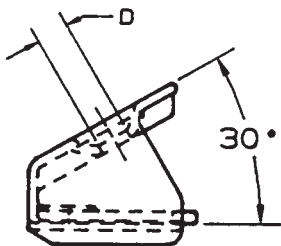
### Pole Top

Pole top brackets are used to mount line post insulators and provide increased distance in separation of the middle phase.

### Material

Ductile iron hot dip galvanized

Catalog Number	kV Rating	A	B	C	D	Mounting Bolt Diameter	Weight /100 (lbs)
P532	69	8	5	5	5/8 - 3/4	5/8 - 3/4	700



P533



### Pole Top

The P533 bracket provides a sturdy base with a 30° angle top surface for mounting 5/8" or 3/4" short shank insulator pins or short line post studs. The bottom of the bracket is designed to sit on crossarms or pole top insulator brackets up to 3 3/4" surface width and is fastened with a 3/4" diameter bolt.

### Material

Ductile iron hot dip galvanized

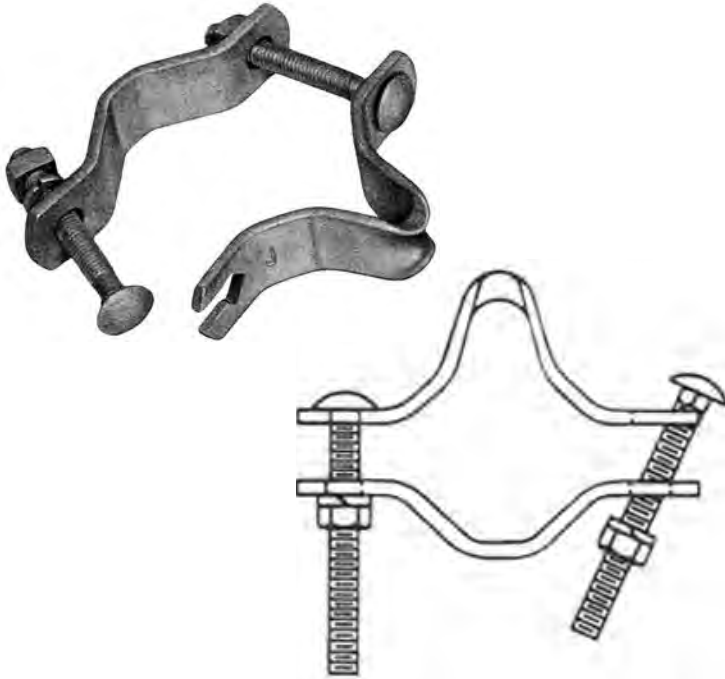
Catalog Number	D	Mounting Bolt Diameter	Weight /100 (lbs)
P533	13/16	3/4	500





# Brackets

## Service Mast



Service Mast brackets are used with service wedge clamps to attach the neutral wire of a drop cable to the service mast. The bracket is attached to pipe service masts to provide a secure attachment point for service drop wires. The center of the front strap is formed in a generous radius to prevent damaging the bail of service wedge clamps.

The brackets incorporate a specially designed slot on one end of the front strap to permit installation of the bracket without removing the bolt. The special slot feature captures the carriage bolt shoulder to prevent it from turning or slipping out after installation.

### Material

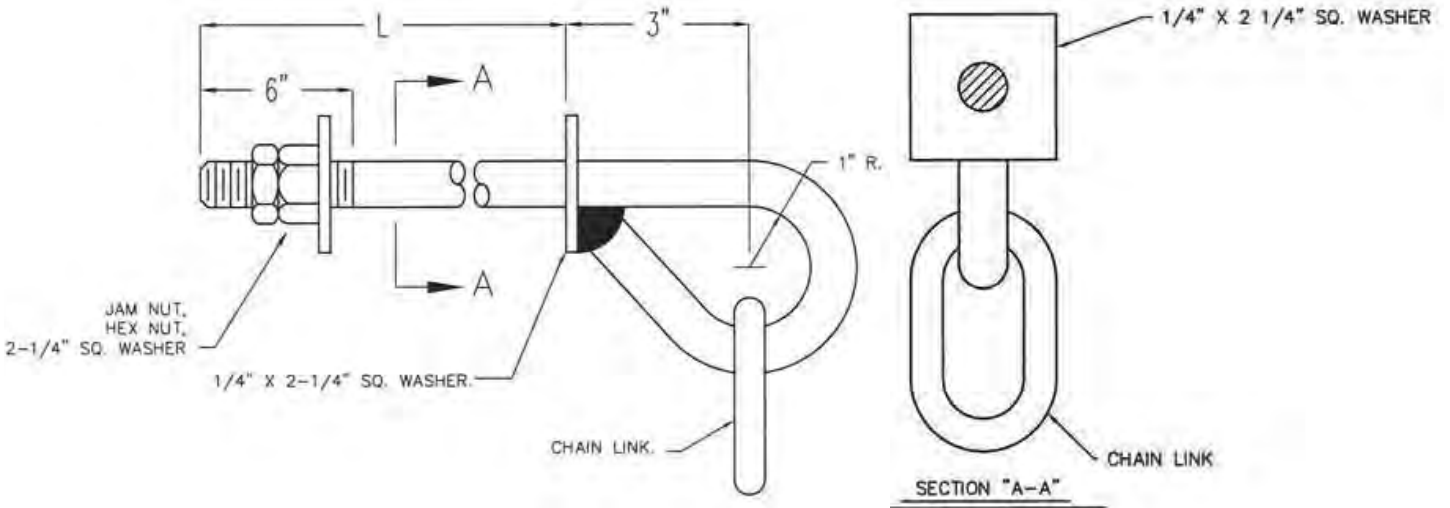
Steel hot dip galvanized

Catalog Number	Pipe Diameter Range (in)	Weight /100 (lbs)
J0590	1 1/4 - 3	105
SMB40	2 - 4	150

## Shield Wire Support

### Material

Steel hot dip galvanized



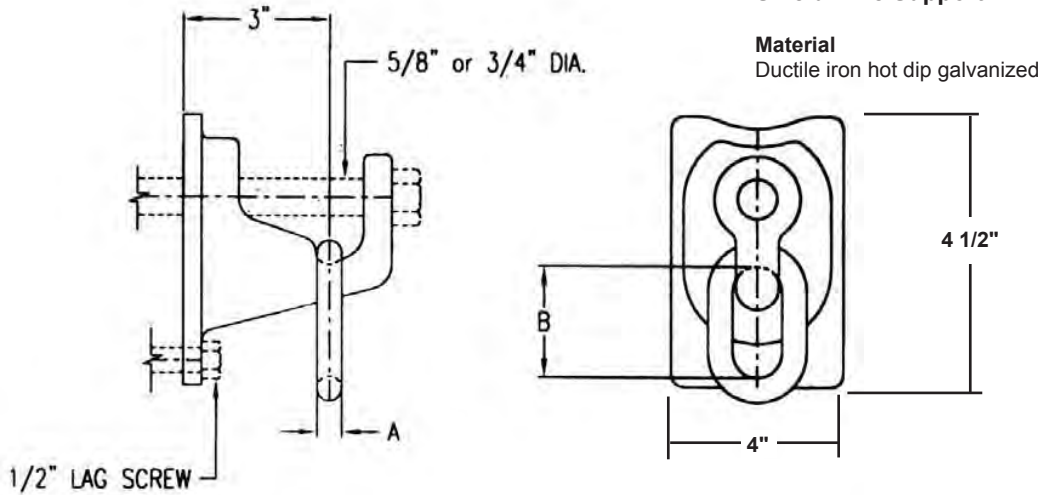
Catalog Number	A	L	Weight/100 (lbs)
SF-SWS-12-5	5/8	12	300
SF-SWS-12-6	3/4	12	500
SF-SWS-14-5	5/8	14	500
SF-SWS-14-6	3/4	14	500

Notes:  
 \*-5" suffix has 1/2" diameter link  
 \*-6" suffix has 5/8" diameter link



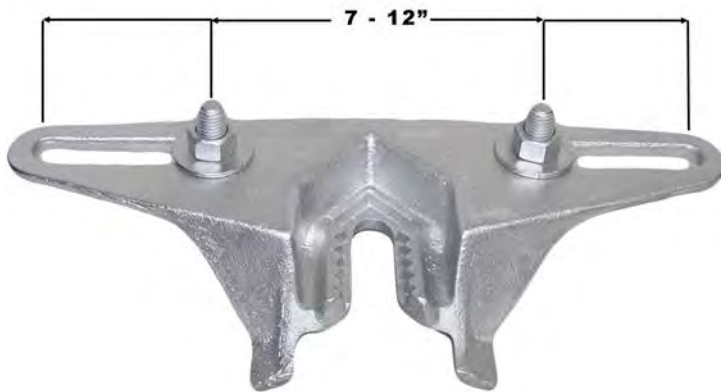
# Brackets

## Shield Wire Support



**Material**  
Ductile iron hot dip galvanized

Catalog Number	A	B	Minimum Ultimate Strength	Weight (lbs)
SWBR-6-4-L	5/8	3 1/4	20000	4



## Transformer Mounts

MPS transformer mounting brackets are used in heavy duty applications for mounting transformers 167 - 500kVA.

### Features

- Locking slot for a 3/4" diameter pole mounting bolt
- Recessed notched slot for locking through bolt and adjusting vertical spacing
- Can be installed on the transformer prior to the installation of assembly on pole
- Furnished with (2) 5/8" diameter bolts, nuts and washers for attachment to transformer
- Accommodates maximum 4000 lbs transformer weight

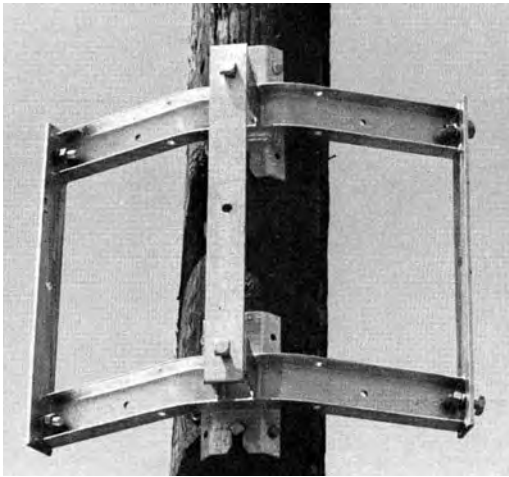
### Material

Ductile iron hot dip galvanized

Catalog Number	Mounting Bolts		Distance from Pole to Transformer	Lug Spacing	Weight /100 (lbs)
	Transformer	Pole			
TB-4	5/8	3/4	2 1/2	7 - 14"	900



# Brackets



## Transformer Mounts

These transformer mounting brackets can be used to mount three transformers on the pole ranging from 3 kVA to 50kVA with the J6865 bracket or 75 kVA to 333 kVA with the J6866 bracket.

### Features

- One-piece design makes installation easier by making them lighter
- Can be assembled with transformer on ground then installed on pole as one unit

#### J6865 Features

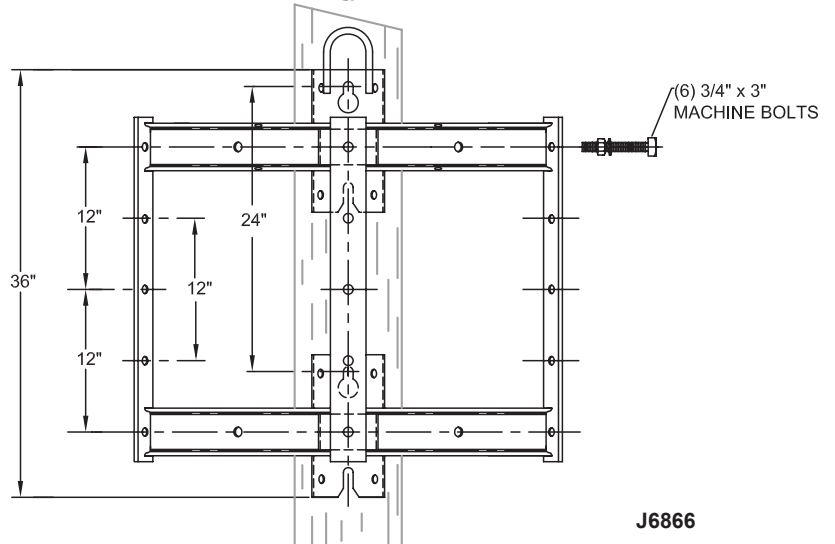
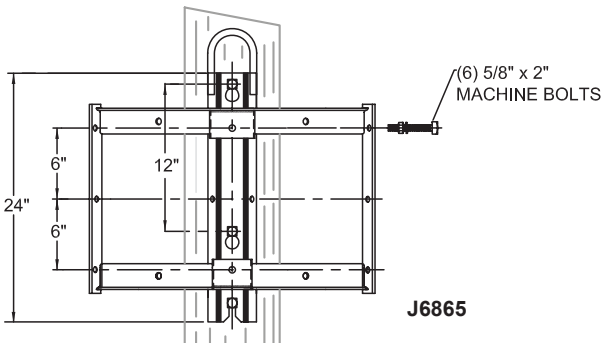
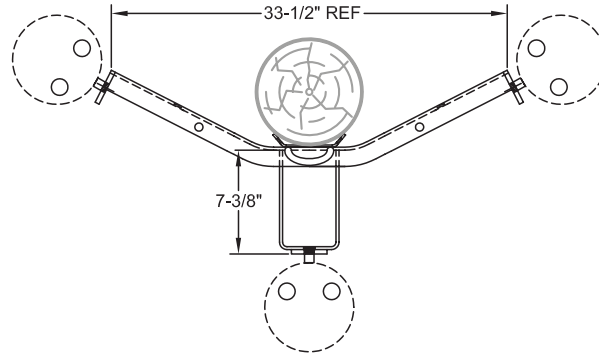
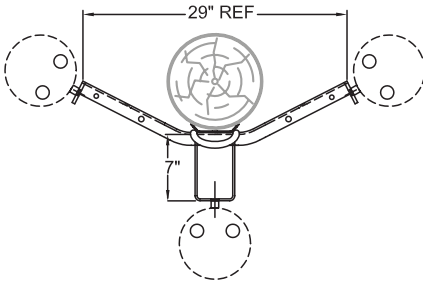
- 12" lug centers for mounting 3 transformers
- (6) 5/8 x 2" machine bolts included for bolting transformers to rack
- Secured to pole with (2) 3/4" machine bolts and (2) 1/2" lag screws for stability
- Holes are provided for a groundwire lug
- Strength capacity of 2000 per position

#### J6866 Features

- 24" mounting hole spacing
- Each position is designed to accommodate ANSI type "B" lug spacing
- (6) 3/4 x 3" machine bolts included for bolting transformers to rack
- Secured to pole with (2) 3/4" machine bolts and (2) 1/2" lag screws for stability
- Holes are provided for a groundwire lug
- Strength capacity of 5000 per position

### Material

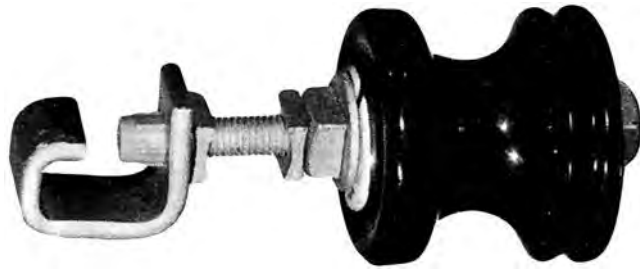
Steel hot dip galvanized



Catalog Number	Weight Ea (lbs)
J6865	38
J6866	78



# Brackets



## Transformer Trainer

Transformer Trainer brackets are clamped to the bottom edge of a transformer tank to provide an insulated support for secondary leads.

### Features

- Polythylene cap at bolt end protects outside of transformer from getting scratched
- Each bracket ships complete with insulator

### Material

Hardware: Steel hot dip galvanized  
 Insulator: Porcelain

Catalog Number	Machine Bolt Size (in)	Insulator Catalog Number	Weight /100 (lbs)
J6765	1/2 x 6	J101	220
J6765A	1/2 x 4 1/2	J100	130

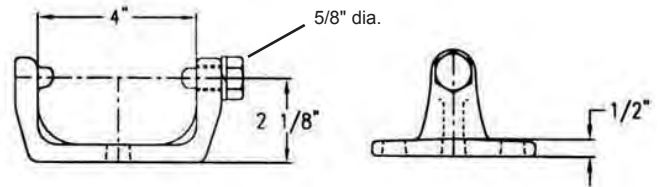
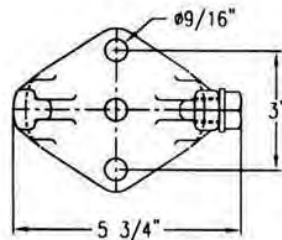


## Trunnion

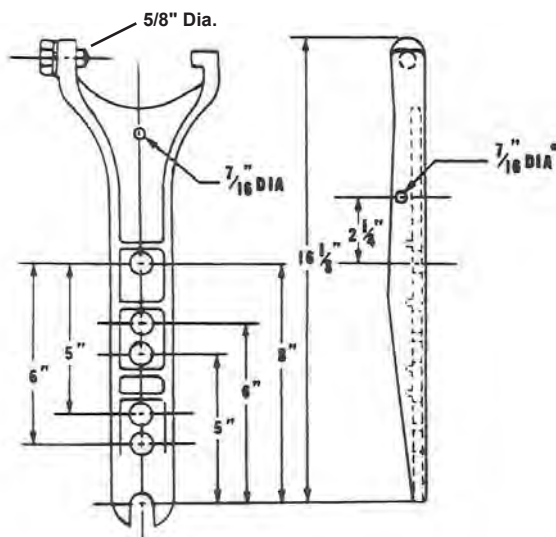
Trunnion brackets are generally used on top of transmission towers and pole tops for supporting clamps (or equivalents) holding overhead ground wires.

### Material

Bracket: Ductile iron hot dip galvanized  
 Trunnion Bolt: Steel hot dip galvanized



Catalog Number	Ultimate Longitudinal Strength (lbs)	Weight /100 (lbs)
TMB-1	12500	240



## Trunnion

### Material

Ductile iron hot dip galvanized

Catalog Number	Mounting Bolts	Mounting Bolt Spacing	Weight /100 (lbs)
BTA-55	5/8"	5, 6, or 8"	500

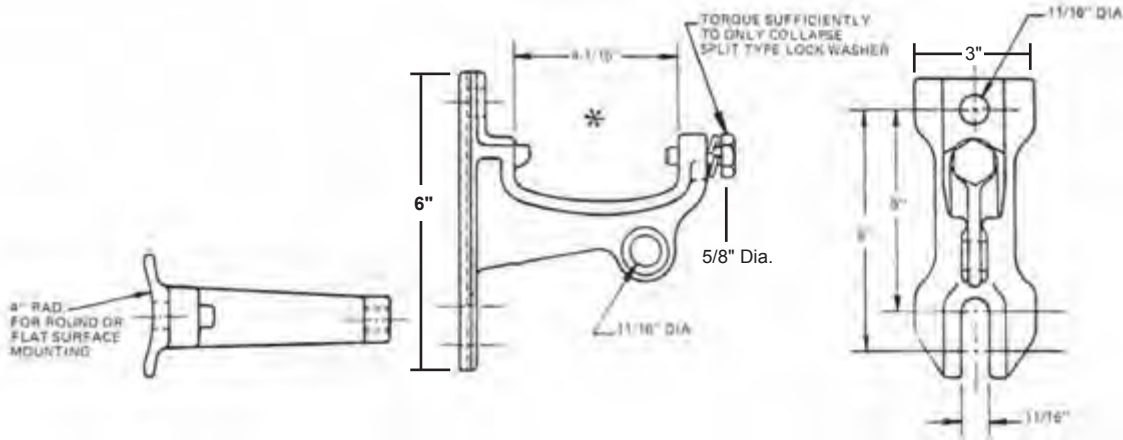


# Brackets

## Trunnion

### Material

Ductile iron hot dip galvanized



Catalog Number	Weight /100 (lbs)
TSWB-55-6	400

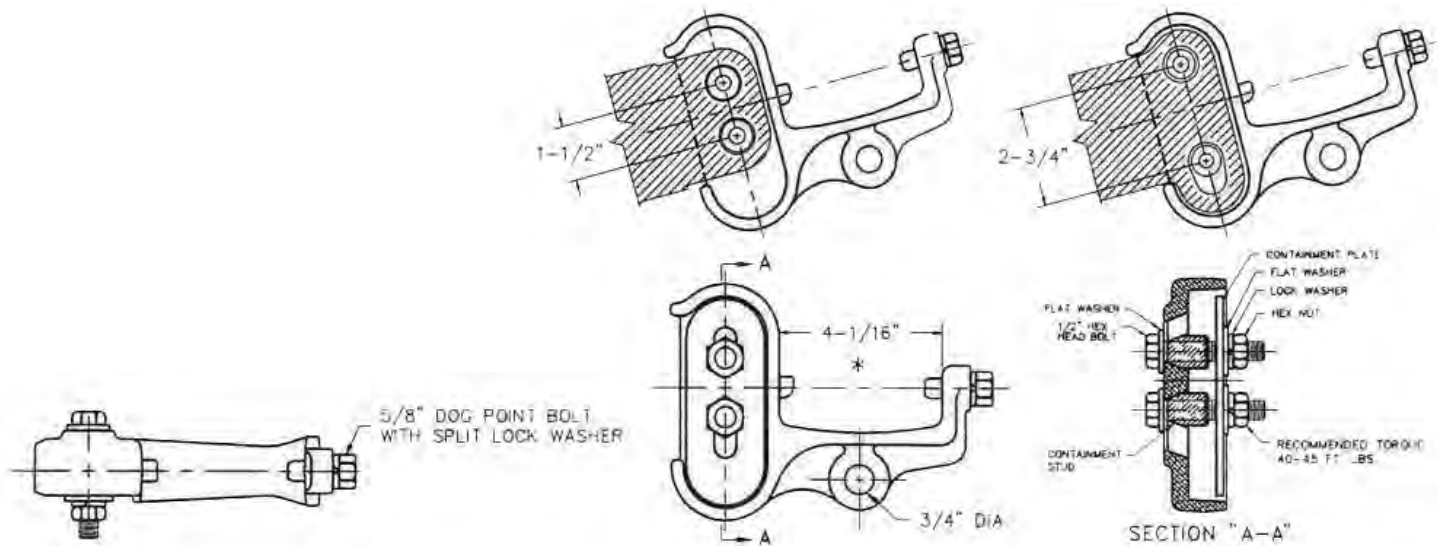
## Trunnion

### Features

- Containment studs will adjust to fit insulators being used
- Trunnion adapter fits standard 2 1/2" diameter polymer post insulators

### Material

Body: Aluminum alloy  
 Stud: Aluminum alloy  
 Plate: Aluminum alloy  
 Hardware: Steel hot dip galvanized



Catalog Number	Minimum Ultimate Strength (lbs)	Weight /100 (lbs)
PITA-250	2800	263





# Clamps

## Aerial Cable, Messenger

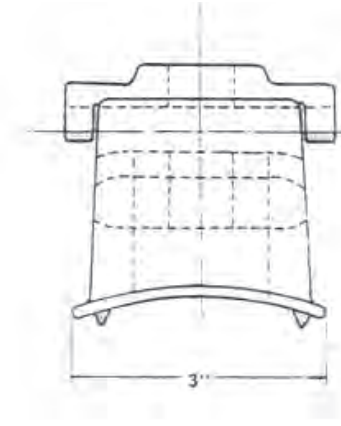
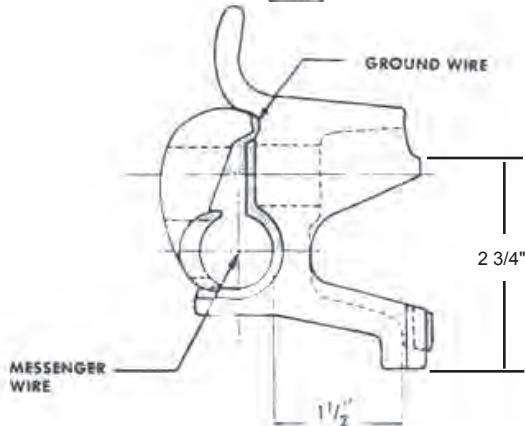


### Features

- Hook for supporting messenger during stringing operation
- Body tapped for 5/8" diameter bolt
- Independent clamping - messenger remains clamped if pole shrinkage occurs
- Teeth on legs to resist movement

### Material

Aluminum alloy



Catalog Number	Mounting Bolts	Ground Wire Dia. (in)	Messenger Range (in)	Weight /100 (lbs)
MBA-72	5/8"	0.12 - 0.25	0.25 - 0.72	65



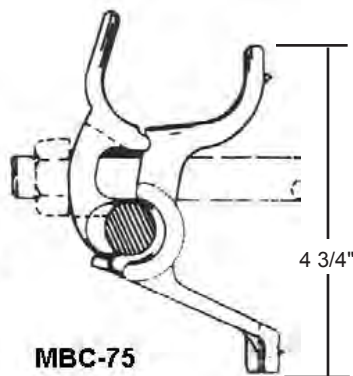
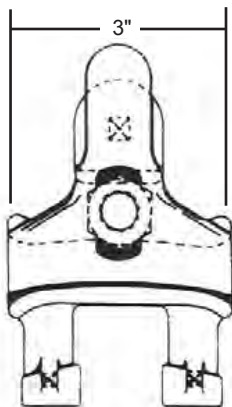
## Aerial Cable, Messenger

### Features

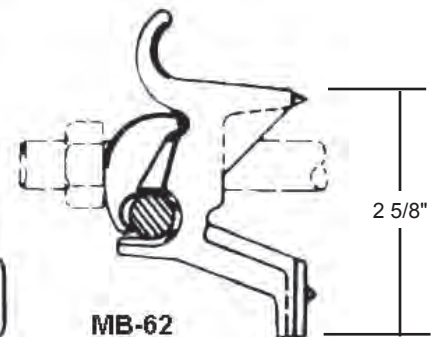
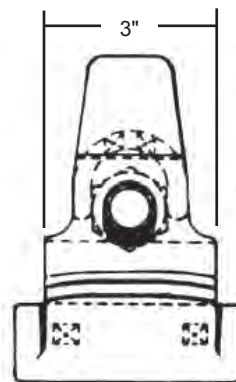
- Curved groove for more cable support
- Lip on bottom groove kicks upward to support cable during installation
- Hook to support cable during stringing operation
- Independent clamping - messenger remains clamped if pole shrinkage occurs

### Material

Ductile iron hot dip galvanized



**MBC-75**



**MB-62**

Catalog Number	Mounting Bolts	Pole Clearance	Ground Wire Dia. (in)	Messenger Range (in)	Weight /100 (lbs)
MBC - 75	5/8"	1 1/2"	--	0.35 - 0.75	175
MB-62	5/8"	1 1/2"	0.16 - 0.25	0.25 - 0.61	200





# Clamps

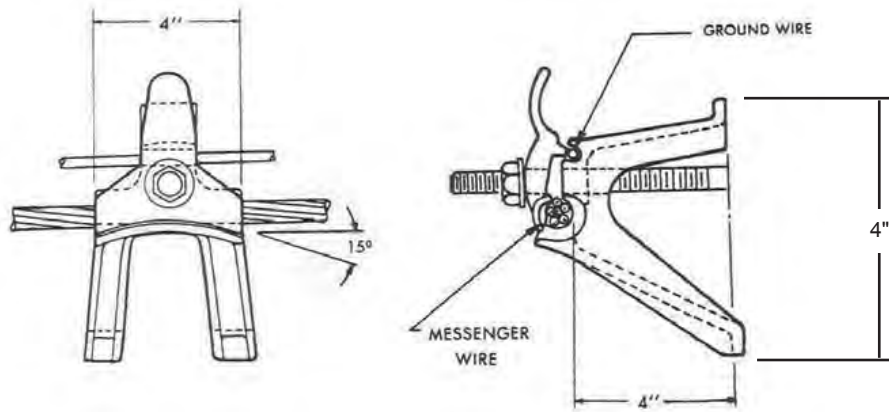
## Aerial Cable, Messenger

### Features

- Curved messenger groove for better support
- Body tapped for 5/8" - 11 UNC thru bolt
- Hook for supporting messenger during stringing operation
- Messenger groove lip kicks upward to support cable during installation
- Independent clamping- messenger remains tight if pole shrinkage occurs
- Cable range of ground wire is 0.16" to 0.25"

### Material

Aluminum Alloy



Catalog Number	Mounting Bolts	Ground Wire Range (in)	Messenger Range (in)	Weight /100 (lbs)
MBCA-72-4	5/8"	0.16 - 0.25	0.25 - 0.72	167

## Aerial Cable, Messenger

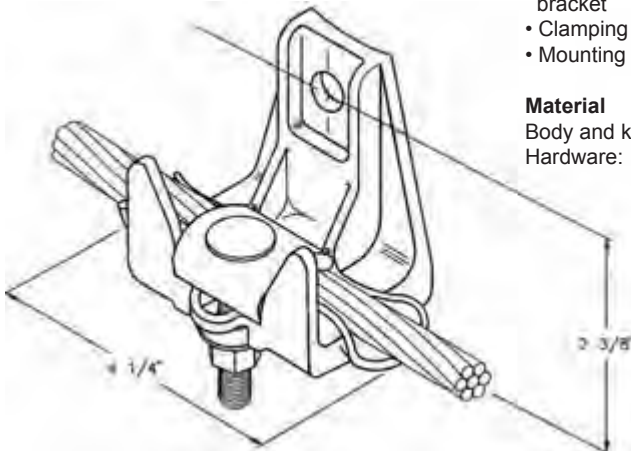
### Features

- May be used to support fiber optic cable
- Can be mounted on round or flat surfaces, on a pole, or on a standoff bracket
- Clamping range 0.398" - 0.56"
- Mounting hole is 11/16"

### Material

Body and keeper:  
Hardware:

Aluminum alloy  
Steel hot dip galvanized



Catalog Number	Weight /100 (lbs)
MSBC-56	119



# Clamps



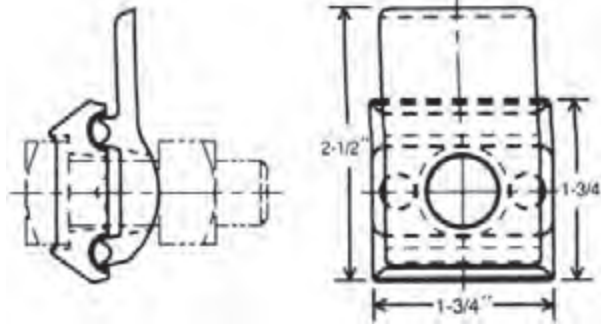
## Aerial Cable, Messenger

### Features

- Small economical clamp for light duty construction
- A stringing finger is included on the clamping plate
- The back of the clamp body is recessed to fit over nut
- A second nut secures the clamp plate and assures positive, independent clamping action regardless of wood shrinkage

### Material

Ductile iron hot dip galvanized



Catalog Number	Mounting Bolts	Ground Wire Dia	Messenger Range (in)	Weight /100 (lbs)
PA166A	5/8"	0.162 - 0.257	0.162 - 0.257	46

## Aerial Cable, Messenger

### Features

- For attaching medium to heavy duty cable on both angle and tangent construction
- Two separate clamping plate bolts allow clamping action to be independent of wood shrinkage

### Material

Ductile iron hot dip galvanized



Catalog Number	Mounting Bolts	Pole Clearance	Messenger Range (in)	Clamp Bolts	Weight /100 (lbs)
PA175C	3/4"	2"	0.43 - 0.63	5/8 - 2 1/2"	600

Notes:  
Two clamp bolts



# Clamps

## Aerial Cable, Messenger

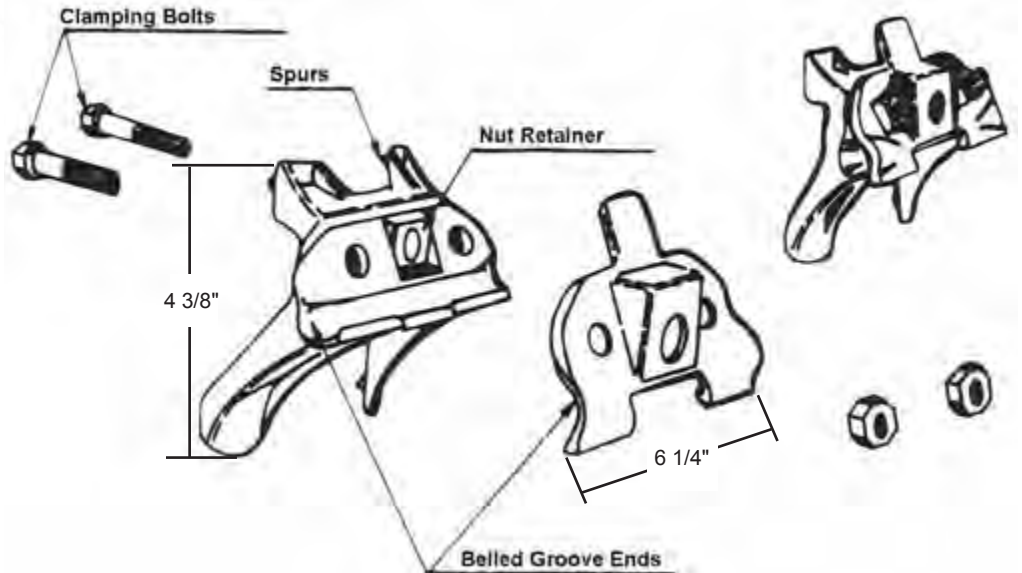


### Features

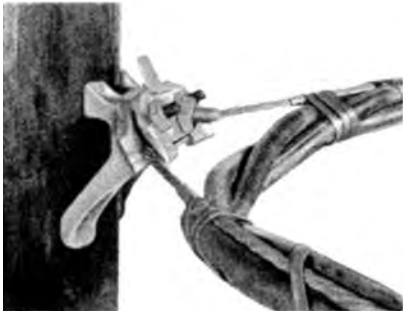
- Nut Retainer - cast in body of clamp permits independent mounting of body; also permits through bolt to act as an extra independent clamping bolt
- Belled Groove Ends - allow better angle, as well as tangent installations
- Spurs - provide better stability
- Independent Clamping - not affected by pole shrinkage

### Material

Ductile iron hot dip galvanized



Catalog Number	Mounting Bolts	Pole Clearance (in)	Ground Wire Dia. Range	Messenger Range (in)	Clamp Length	Weight /100 (lbs)
MBXH-82	3/4"	3	0.125" - 0.184"	3/8 - 3/4	5"	700



## Aerial Cable, Messenger

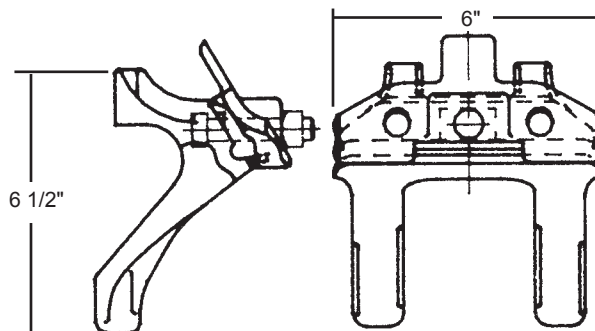
This messenger aerial cable clamp is designed for attaching medium size cable and triplex to a pole.

### Features

- 6" long curved clamping groove to conform to sag of span
- Generously belled groove ends for angles
- Teeth on feet resist downslotting
- Smooth area for stringing operation
- Special nut retaining feature around body mounting bolt hole

### Material

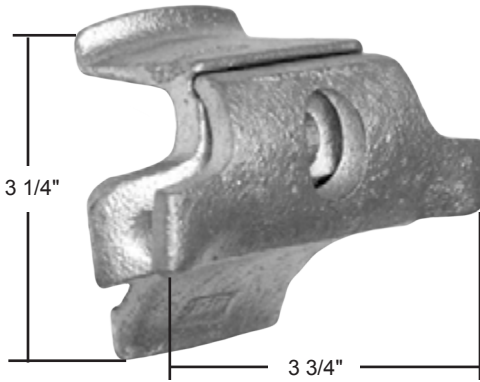
Ductile iron hot dip galvanized



Catalog Number	Mounting Bolt Dia.	Pole Clearance	Ground Wire Dia. Range	Messenger Range (in)	Clamp Bolt Dia.	Weight /100 (lbs)
PA192A	5/8"	2 1/4"	0.125" - 0.184"	0.310 - 0.500	(2) 1/2 x 2"	499



# Clamps



## Aerial Cable, Messenger

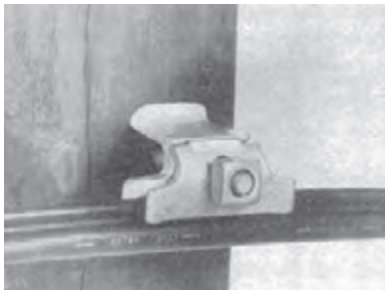
### Features

- Accommodates inside or outside angles from 10° to 35°
- Accommodates 0.25" - .50" bare messenger or 0.25" insulated messenger
- Clamp groove ends are generously rounded to prevent damage to bare or insulated messenger
- The inner pole side clamp section is tapped to accept a 5/8" diameter bolt and includes a curved surface with spurs to penetrate into the pole and provide a stable installation.
- The design provides a 1 - 5/8" clearance from the surface of the pole to the cable and 3 - 3/4" clamping surface length with a back base height of 3 1/4".

### Material

Ductile iron hot dip galvanized

Catalog Number	Weight /100 (lbs)
PA288	144



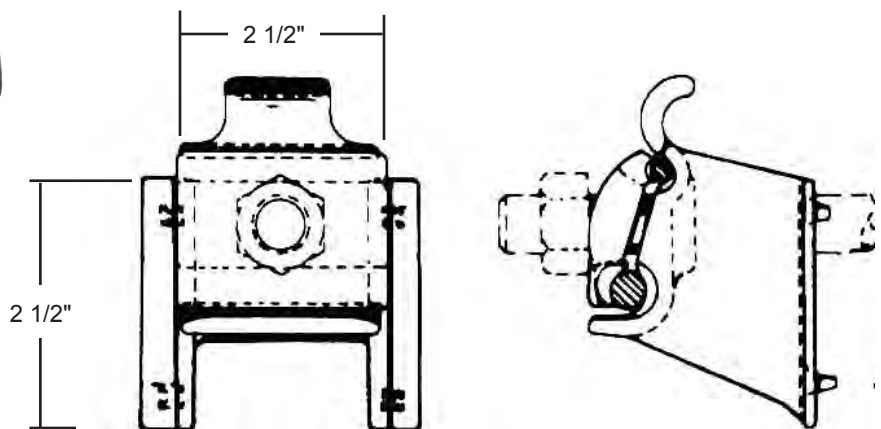
## Aerial Cable, Messenger

### Features

- Hook to support cable during stringing operation
- Independent clamping- messenger remains clamped if pole shrinkage occurs

### Material

Ductile iron hot dip galvanized



Catalog Number	Mounting Bolts	Pole Clearance	Ground Wire	Messenger Range (in)	Weight /100 (lbs)
SB32/42	5/8"	1 1/2"	0.16 - 0.37	0.25 - 0.56	150



# Clamps

## Aerial Cable, Messenger, Corner Attachment



### Features

- Corner attachment clamps are used for angles of 35° to 60°
- Accommodates 5/8" diameter pole mounting bolt
- The inner pole mounting surface is curved with integral spurs for contact stability with the pole
- The integral thimble eyes will accept deadending devices up to 1/2" diameter

### Material

Ductile iron hot dip galvanized

Catalog Number	Eye Center Spacing	Clamp Length	Weight /100 (lbs)
P294	2 1/2"	6	209

## Aerial Cable, Messenger, Midspan

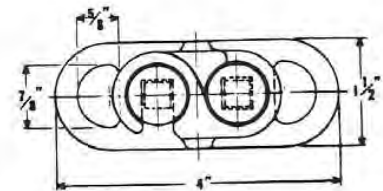
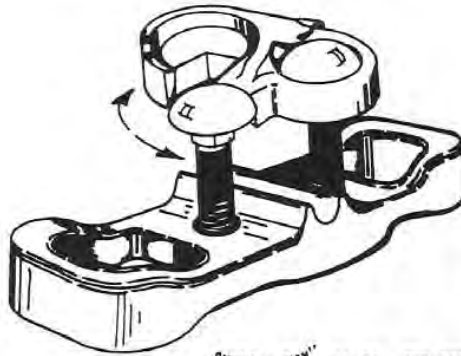
### Features

- MSD-4 has a "swing away" keeper for easy installation

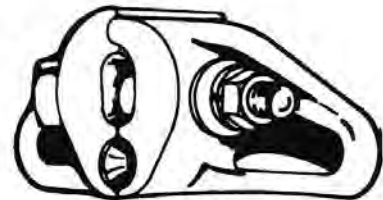
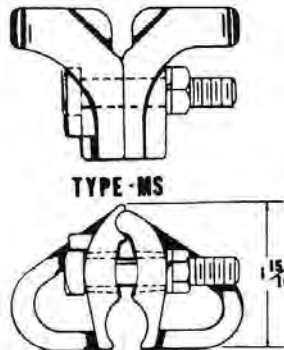
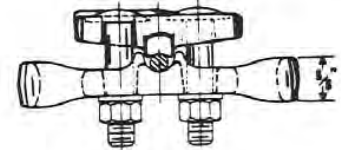
### Material

Body and keeper:  
Hardware:

Aluminum alloy  
Steel hot dip galvanized



TYPE-MSD



Catalog Number	Mounting Bolts	Cable Diameter	Weight /100 (lbs)
MSD-4	3/8"	0.23 - 0.42"	52
MS-6	3/8"	0.39 - 0.57"	50





# Clamps



PA296X



PA292X



## Aerial Cable, Messenger with Hook

These clamps are used for tangent construction or angles to 10°.

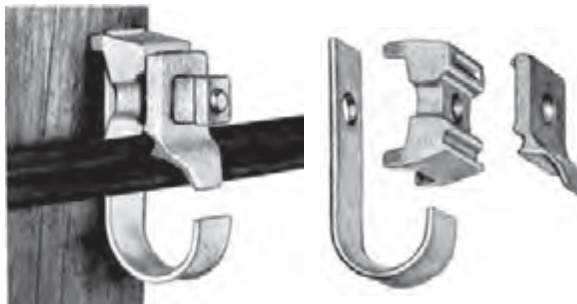
### Features

- Hook serves as a safety device and can be used in stringing the cable
- Accommodates 5/8" pole mounting bolt

### Material

Ductile iron hot dip galvanized

Catalog Number	Clamp Gripping Length (in)	Messenger Range	Weight /100 (lbs)
PA292X	1 3/4	250 insulated	57
PA296X	3 1/4	0.109 - 0.134" bare or insulated	147



## Aerial Cable, Messenger with Hook

### Features

- For tangent or angles to 10°
- Accommodates 1/4" insulated messenger
- Independent clamping-remains tight if pole shrinkage occurs

### Material

Ductile iron dip galvanized

Catalog Number	Clamp Gripping Length (in)	Weight /100 (lbs)
J2235	1 7/8	172
J2245	3 1/4	370





# Clamps

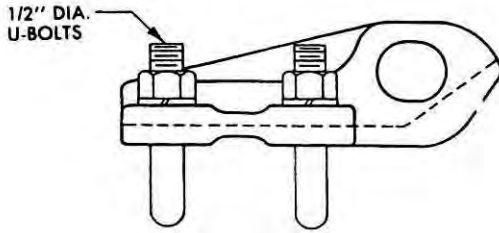


## Auxiliary Anchor Eye

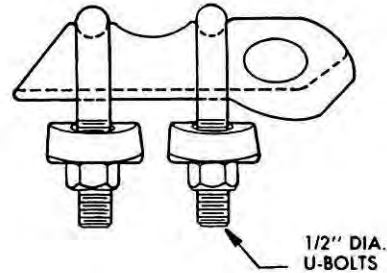
Auxiliary anchor eye rod clamps permit an efficient method of adding an eye to an existing anchor rod for attaching an additional guy wire

### Material

Ductile iron hot dip galvanized



**AE-155B**



**AE-155  
AE-155A**

Catalog Number	Thimble Diameter	Anchor Rod Dia. Range	Max Strand	Rating (lbs)	Weight /100 (lbs)
AE-155	1 1/2	5/8 - 3/4"	1/2	18000	253
AE-155-A	1 1/2	3/4 - 1"	1/2	18000	300
AE-155B	1 1/8	1 - 1/4"	9/16	18000	300



## Beam

B-beam clamp is used in conjunction with a 5/8" thimble eye bolt in the application of deadending to I beams

### Features

- Clamping screw allows the clamp to be positioned on the beam flange

### Material

Steel hot dip galvanized

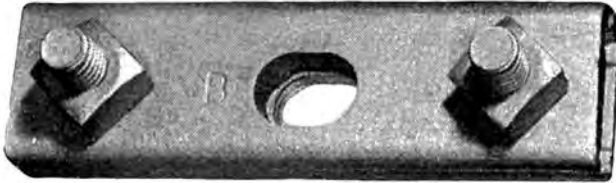
Catalog Number	Weight /100 (lbs)
J25911	75



# Clamps



One Bolt



Three Bolt

### Cable Suspension

MPS cable suspension clamps are used with through bolts which serve as a clamping member and are shaped to securely grip messenger wire to the pole.

#### Features

- A nut and square washer is used between the clamp and pole to provide proper spacing
- One bolt clamp consists of the clamping members only - a 5/8" through bolt (not included) tightens the clamp on the wire as well as to the pole
- Three bolt clamps are furnished with a 5/8" through bolt hole
- J25088.1 keeper plate is flat

#### Material

Steel hot dip galvanized

Catalog Number	No. of Bolts	Clamp Bolt Dia.	Clamp Length	Mounting Hole Dia.	Strand Dia.	Weight /100 (lbs)
J1095	1		2 1/2	11/16"	1/4 - 7/16"	67
J1096	3	1/2"	5 3/4	11/16 x 15/16"	1/4 - 7/16"	180
J25088.1	3	1/2"	5 3/4	11/16 x 15/16"	1/4 - 7/16"	175



### Cable Suspension

#### Features

- Incorporates serpentine grooves in the two mating clamp sections to provide superior holding strength of insulated messenger wire
- Can be used for tangent construction or angles to 30°
- Designed for use with 0.25" insulated figure 8 messenger or 0.25" bare messenger
- Clamps are supplied with two track bolt assemblies and a center mounting hole

#### Material

Ductile iron dip galvanized

Catalog Number	Clamp Bolt Dia.	Clamp Length	Mounting Hole Dia.	Weight /100 (lbs)
PA422	5/8"	6	11/16 x 15/16"	258



# Clamps

## Cable Suspension, Angle

### Features

- Angle suspension clamps have curved ends to prevent damage to the messenger strand when turning small angles
- All clamps firmly grip 1/4 to 7/16" diameter strand
- They are furnished with two track bolts and a center mounting hole

### Material

Steel hot dip galvanized



Catalog Number	Clamp Bolt Dia.	Clamp Length	Clamping Width (in)	Mounting Hole Dia.	Weight /100 (lbs)
J7901	1/2	5 3/4	1 11/16	13/16	208
J7901A	1/2	5 3/4	1 11/16	11/16	210
J7902B	5/8	6	2 3/16	13/16	385

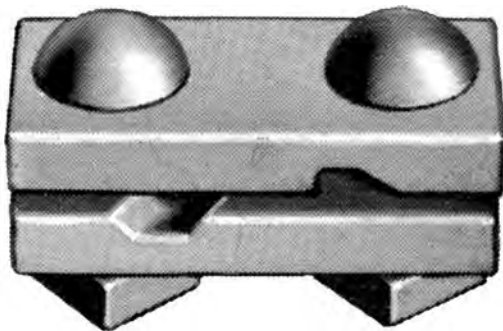
## Crossover

### Features

- Used to clamp on two messengers where they cross at right angles to prevent wear and abrasion
- The J7930 clamp sections are 1 1/2" wide and 3 1/4" long
- Two 1/2" diameter bolts have oval shoulders to prevent turning when tightening

### Material

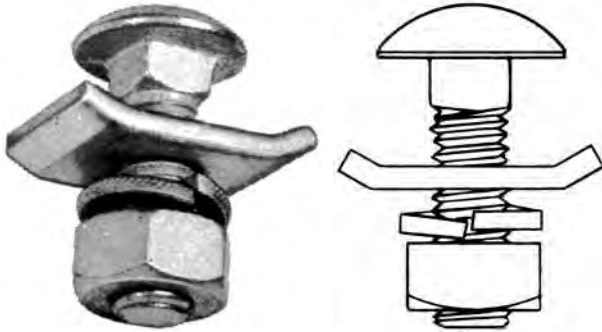
Ductile iron hot dip galvanized



Catalog Number	Strand Dia. Range	Weight /100 (lbs)
J7930	1/4 - 3/8"	154



# Clamps



## Ground/Bond

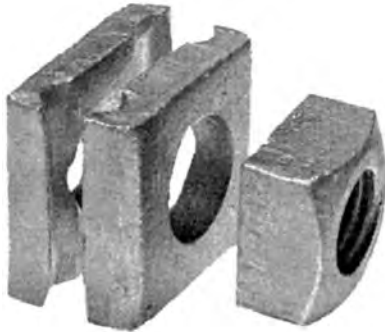
### Features

- Grounding lug assembly consists of a 3/8" x 1 1/4" carriage bolt, complete with wire clamp, spring lockwasher, and square nut

### Material

Steel hot dip galvanized

Catalog Number	Ground Wire Dia Range	Weight /100 (lbs)
J771018	0.16 - 0.38"	12.2



## Ground/Bond

### Features

- Used to attach ground wires at the nut end of bolts on transmission lines
- Includes two 1 1/2" long clamp sections and one square nut

### Material

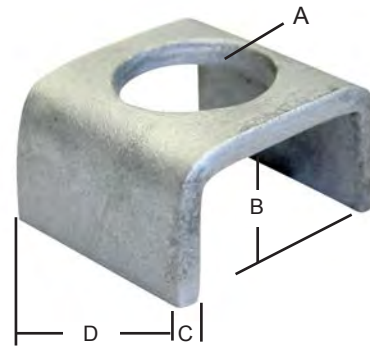
Steel hot dip galvanized

Catalog Number	Mounting Bolts	Ground Wire Dia.	Weight /100 (lbs)
J1163	5/8"	3/16 - 3/8"	50
J1164	3/4"	1/4 - 1/2"	52



## Ground/Bond

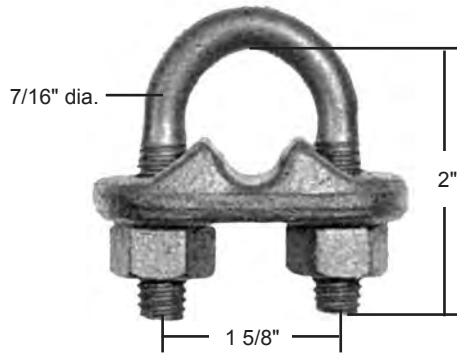
MacLean galvanize steel bond clamps provide a sturdy and efficient provision to connect ground wire to threaded bolts. The clamps are designed to nest over the square nut of the bolt. The grounding connection is accomplished by inserting the ground wire between the nut and the bonding clamp and adding an additional nut to secure the clamp and ground connection. The clamps accommodate the most common range of ground wire diameters.



Catalog Number	For Bolt & Square Nut Size				Ground Wire Dia. Range	Weight /100 lbs.
	A Bolt Size	B	C	D		
J27276	5/8	0.520	0.187	1.00	0.162-0.312	10.4
J27277	3/4	0.600	0.187	1.25	0.162-0.312	15.1
J27278	7/8	0.730	0.187	1.50	0.162-0.312	21.2
J27279	1	0.840	0.187	1.68	0.162-0.437	27.2



# Clamps



## Ground/Bond

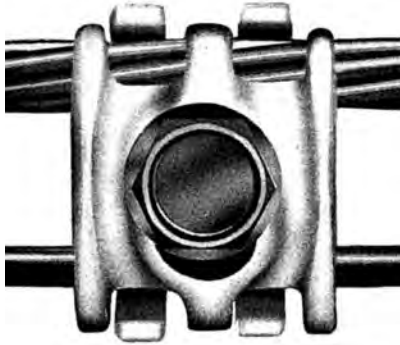
### Features

- Used to clamp ground wire to 5/8" and 3/4" rods

### Material

Steel hot dip galvanized

Catalog Number	Weight /100 (lbs)
J8225	55



## Ground/Bond

### Features

- The assembly consists of two clamp sections and a 5/16 x 7/8" bronze hex washerhead bolt
- One clamp section is tapped to allow installation with a single wrench

### Material

Bronze with tin plating

Catalog Number	Description	Wire Range	Weight /100 (lbs)
J8300	Semi-tin plated clamp with one bare bronze groove	0.162 - 0.398"	16
J8301	Completely tin plated clamp	0.162 - 0.398"	16



## Ground/Bond

MPS bronze ground rod clamps, used with copper-bonded ground rods, provide a low resistance, secure copper-to-copper connection.

### Features

- Heavy duty clamp develops high pressure contact between rod and grounding wire
- Can be easily disconnected to measure resistance of the ground

### Material

Bronze

Catalog Number	Rod Size	Ground Wire	Weight /100 (lbs)
J8491	1/2	2 - 10 AWG	16
J8492	5/8	8 - 1/0 AWG	18
J8493	3/4	8 - 1/0 AWG	26



## Ground/Bond

MPS ground rod clamps are designed for heavy duty ground connections to galvanized ground rods

### Features

- Consists of a stainless steel hex-head bolt and a hot dip galvanized clamp body
- Accommodates 5/8" diameter ground rods

### Material

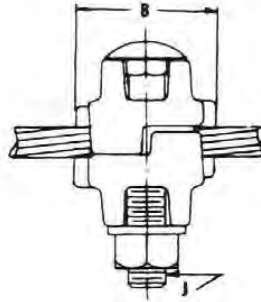
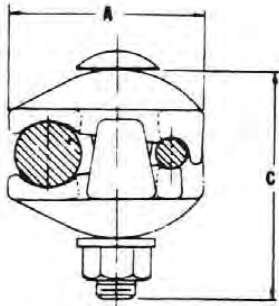
Ductile iron dip galvanized

5/8" Malleable Ground Rod Clamp		
Catalog Number	Ground Wire Dia.	Weight /100 (lbs)
J25932	#10 - #2	16





# Clamps

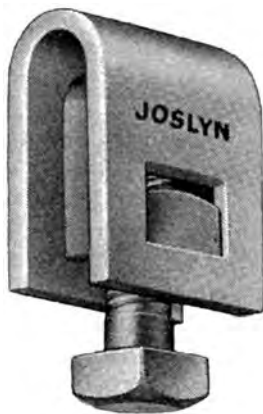


## Ground/Bond

### Material

Clamp: Ductile iron dip galvanized  
 Hardware: High strength steel, hot dip galvanized

Catalog Number	A	B	C	J	Cable Range		Weight /100 (lbs)
					Main	Tap	
BC-63	1 5/8	1 1/4	1 3/4	3/8	0.25 - 0.56"	0.16 - 0.30"	51
BC-105	2 1/2	1 1/2	3	1/2	0.50 - 1.00"	0.16 - 0.46"	107



## Ground/Bond

This grounding clamp is used to bond the cable sheath to the messenger strand

### Features

- Clamp body is made with an inside keeper riding on the end of the bolt
- 1/2" bolt can be removed to place the clamp over the messenger wire
- The clamp body is made of 1 1/2" x 3/16" steel

### Material

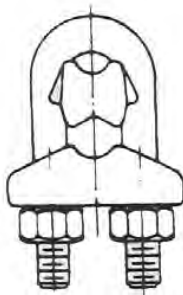
Steel hot dip galvanized

Catalog Number	Weight /100 (lbs)
J7956	52

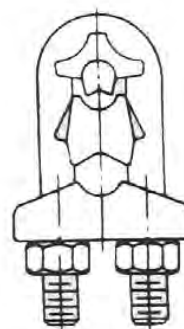
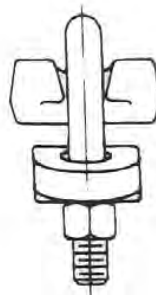
## Ground/Guy Clip

### Material

Keepers: Ductile iron hot dip galvanized  
 U-bolts: Steel hot dip galvanized



GC-67



GC-64C  
GC-67C



Catalog Number	Wire Range (in)	U-Bolt Dia. (in)	Weight /100 (lbs)
GC-64C	0.18 - 0.38	3/8	64
GC-67	0.25 - 0.50	1/2	106
GC-67C	0.25 - 0.50	1/2	130





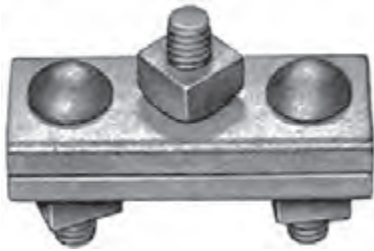
# Clamps



One Bolt



Two Bolt



Three Bolt



## Guy

### Features

- Rolled from carbon steel with straight parallel grooves that will not damage guy strand
- The clamping bolts have special shoulders to prevent turning when the nuts are tightened

### Material

Steel hot dip galvanized

Catalog Number	No. of Bolts	Bolt Dia.	Clamping Length	Clamping Width	Strand Dia. Range (in)	Weight /100 (lbs)
J1061	1	1/2	1 1/2	1 9/16	3/16 - 3/8	63
J1030	2	1/2	3 3/8	1 9/16	3/16 - 3/8	126
J929	3	1/2	4	1 9/16	3/16 - 7/16	160
J930	3	1/2	6	1 9/16	3/16 - 7/16	224
J931	3	5/8	6	1 21/32	5/16 - 1/2	256

## Static Wire/ Bayonet

Static wire clamps are used to secure 1/4" to 7/16" static wire to bayonet assemblies and steel tower members

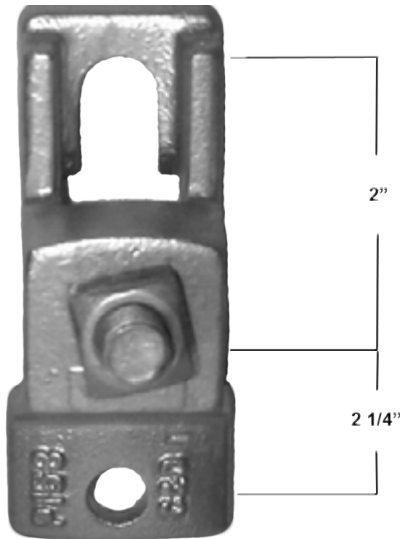
### Features

- Consists of two 2 1/2" long rolled steel clamp sections with the groove ends belled out to prevent damage to the wire and one 1/2 x 2 1/2" machine bolt for mounting
- Accommodates 1/4" - 7/16" wire range

### Material

Steel hot dip galvanized

Catalog Number	Weight /100 (lbs)
J5455	94



## Support Type B Extension

The Support Type B Extension clamp is designed to facilitate adding an additional cable to the opposite side of the pole.

### Features

- Installed by loosening the existing 5/8" diameter machine bolt and slipping the clamp support over the head of the bolt
- 5/8 x 2 1/4" machine bolt and nut are included to secure a suspension clamp
- For small inside angles, a 1/2" lag screw may be installed in the base for increased stability

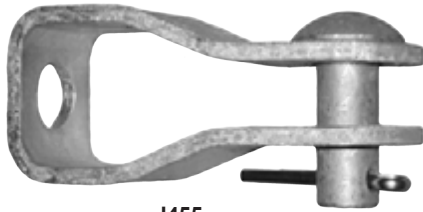
### Material

Body: Ductile iron hot dip galvanized  
Bolts and nuts: steel hot dip galvanized

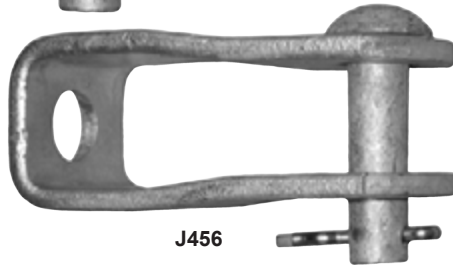
Catalog Number	Weight /100 (lbs)
PA158	180



# Clevises



J455



J456

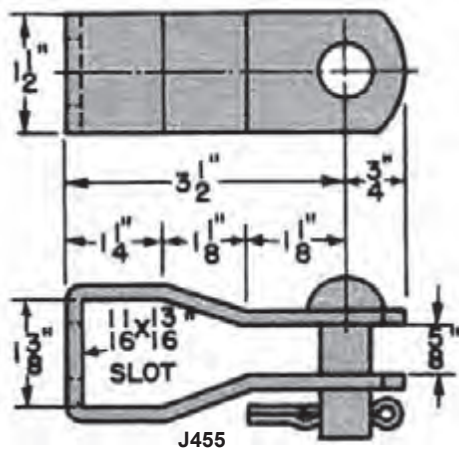
## Deadend Eyelet

### Features

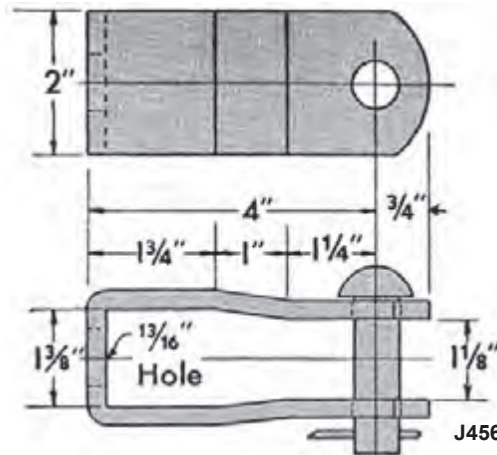
- Eyelet clevises are used under a bolt head or nut for deadending suspension insulators
- Furnished complete with a 5/8" diameter buttonhead bolt and self-locking cotter pin

### Material

Steel hot dip galvanized

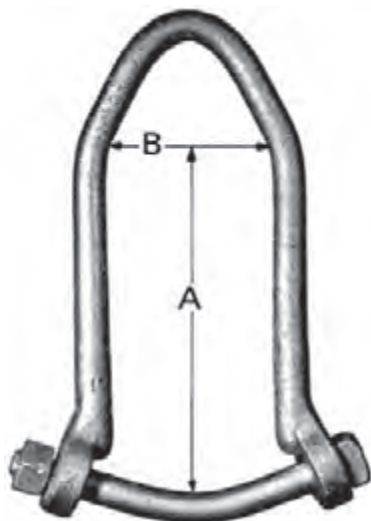


J455



J456

Catalog Number	Steel Size	Mounting Bolt Dia. (in)	Ultimate Strength (lbs)	Weight /100 (lbs)
J455	1 1/2 x 3/16	5/8	12000	98
J456	2 x 1/4	3/4	20050	176



## Heavy Strain Insulator

### Features

- Forged from 1/2" diameter steel with a 1/2" curved bolt complete with Anco® locknut and are used with porcelain guy strain insulator
- Minimum ultimate strength is 12,400 pounds

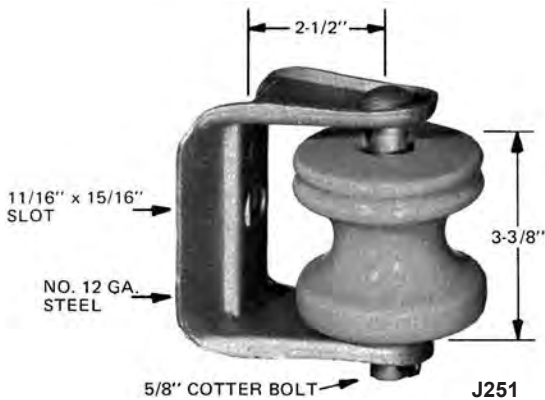
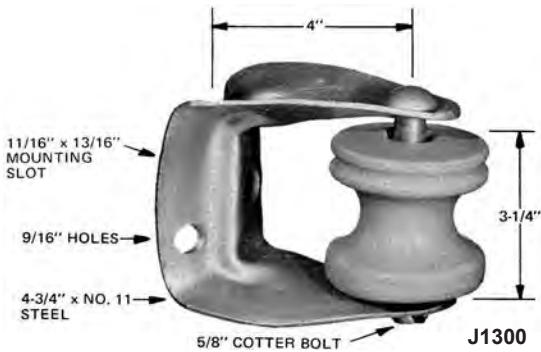
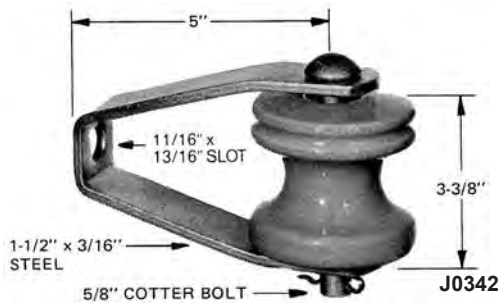
### Material

Steel hot dip galvanized

Catalog Number	A	B	Use with Insulator	Weight /100 (lbs)
J732	5	2 1/2	L506	146



# Clevises



## Insulated Secondary & Deadend

### Features

- Clevis mounting holes are for 5/8" bolts
- Mounting holes are slotted to permit installation without removing insulators
- Insulators must be ordered separately

### Material

Steel hot dip galvanized

Catalog Number	Weight /100 (lbs)
J0313	118
J0342	152

## Insulated Secondary & Deadend

The J1300 clevis is designed to develop high strength on deadends or line pulls.

### Features

- Clevis mounting holes are for 5/8" bolts
- Mounting holes are slotted to permit installation without removing insulators
- Includes mounting slot for one 5/8" machine bolt and two staggered side holes for 1/2" lag screws
- Used with either the J151 or J0101 spool insulator which is ordered separately

### Material

Steel hot dip galvanized

Catalog Number	Weight /100 (lbs)
J1300	210

## Insulated Secondary & Deadend

### Features

- Clevis mounting holes are for 5/8" bolts
- Mounting holes are slotted to permit installation without removing insulators
- Used with the J151 spool insulator which is ordered separately

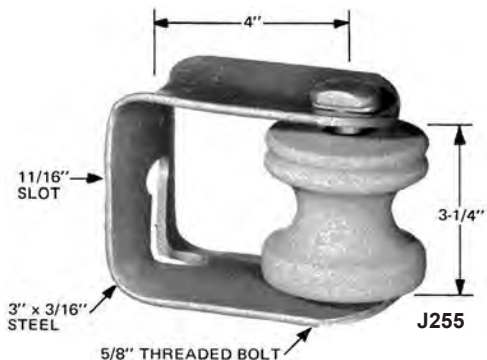
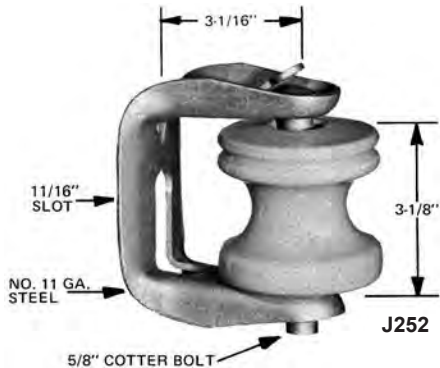
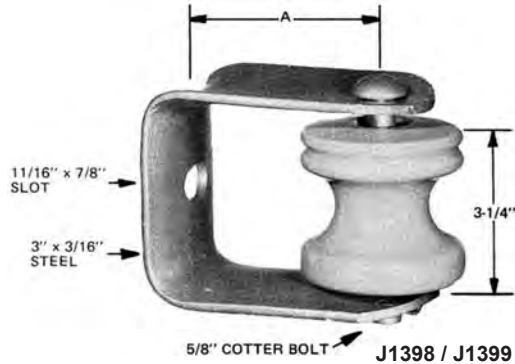
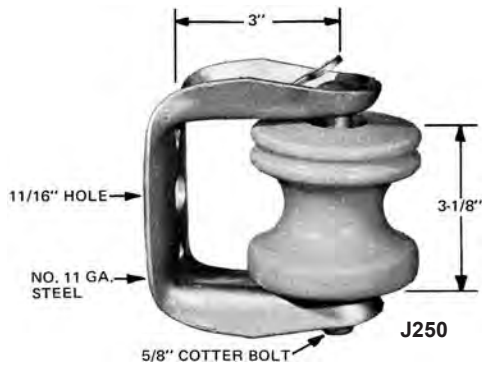
### Material

Steel hot dip galvanized

Catalog Number	Width	Weight /100 (lbs)
J251	3 3/4	118



# Clevises



## Insulated Secondary & Deadend

### Features

- The J250 has two sharp projections in the back to prevent it from twisting
- The cotter belt is held in position by means of the same type of tab that is used on the J252

### Material

Steel hot dip galvanized

Catalog Number	A	For use w/Insulator Catalog	Weight /100 (lbs)
J250		J151 or J101	152
J1398	3 1/2	J151 or J101	240
J1399	4	J151 or J101	254

## Insulated Secondary & Deadend

The J252 and J255 Secondary Pulley Brackets are designed for use both as stringing pulleys and as secondary clevises, making them especially useful for stringing and sagging conductors.

The conductor is strung and sagged with the bracket in the pulley position where it cannot bind. The 90° slot in the base makes it possible to rotate the bracket into the clevis position before or after the conductor is tied to the spool.

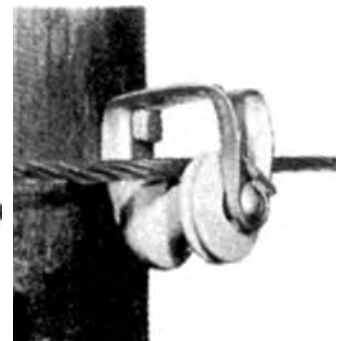
### Features

- J252 light-type has a metal tab which contains the insulator bolt
- The cotter bolt of the J255 heavy duty-type threads into the bottom of the clevis, locking the special Twist-Lock head into a groove in the clevis top
- Both features eliminate the cotter pin

### Material

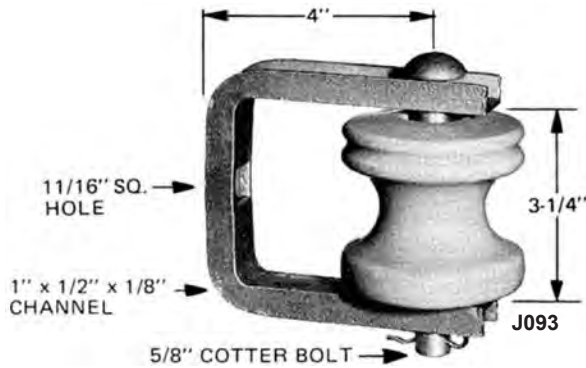
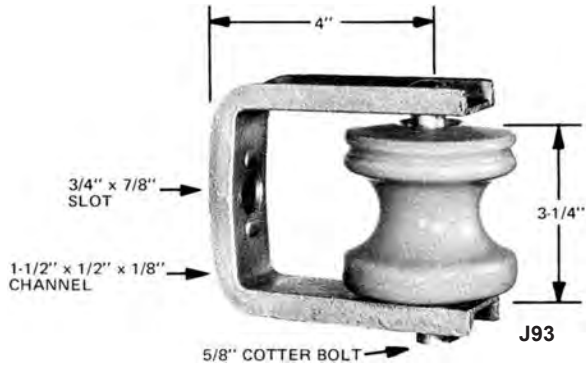
Steel hot dip galvanized

Catalog Number	For use w/Insulator Catalog	Width	Weight /100 (lbs)
J252	J151 or J101	2 5/8	150
J255	J151 or J101 or J0101	3	256





# Clevises



## Insulated Secondary & Deadend

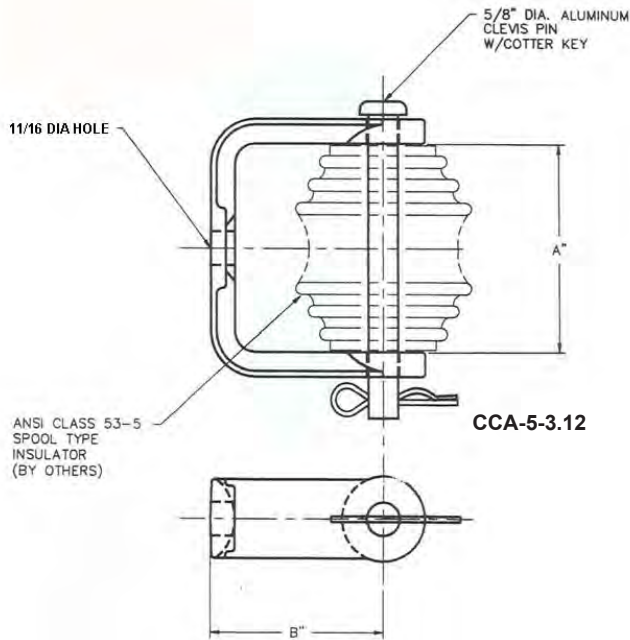
### Features

- J93 Clevis is formed from stiff, hot rolled channel, making it much heavier and stronger than similar brackets made of pressed steel channel
- The J93 clevis features raised projections near the bolt mounting slot which assist in capturing the bolt head to resist turning
- The J093 clevis has an 11/16 inch square hole for mounting with either a 5/8 inch carriage or machine bolt

### Material

Steel hot dip galvanized

Catalog Number	For use w/Insulator Catalog	Weight /100 (lbs)
J93	J151 or J101	168
J093	J151 or J101	140



## Insulated Secondary & Deadend

### Features

- Corrosion resistant aluminum alloy clevis for use with a 3 in. spool insulators

### Material

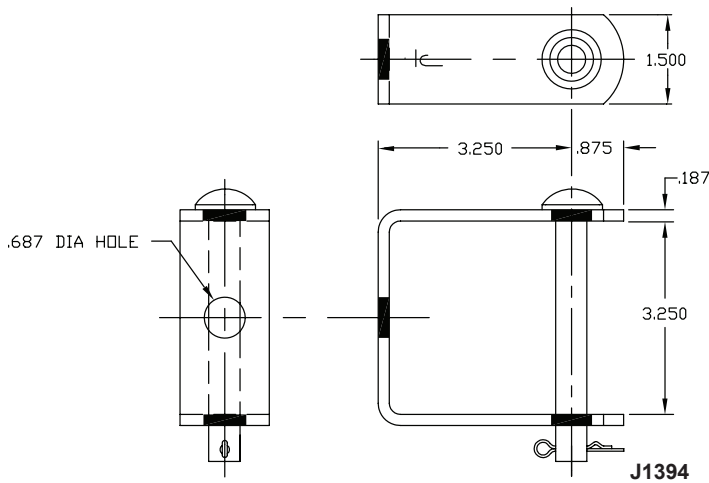
Clevis Body: Aluminum Alloy  
 Hardware: Aluminum Alloy  
 Cotter Key: Stainless Steel

Catalog Number	A	B	Weight /100 (lbs)
CCA-5-3.12	3 1/8	3 5/8	85





# Clevises



## Insulated Secondary & Deadend

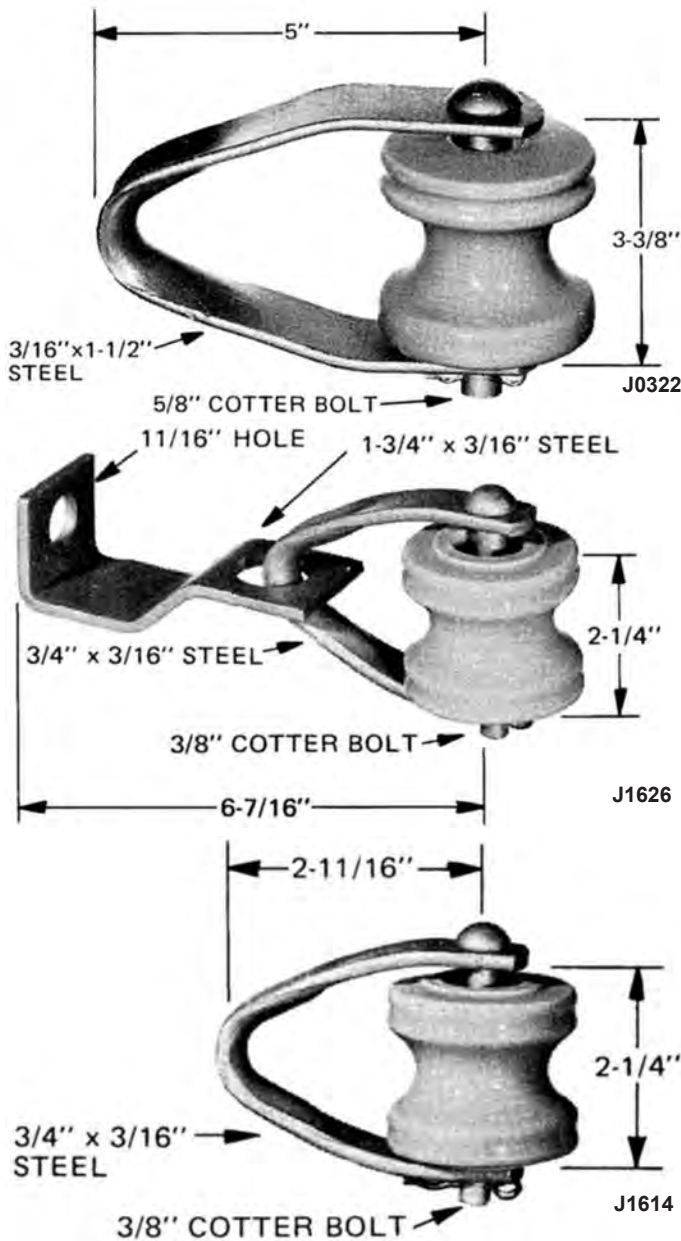
### Features

- Economical secondary clevis for standard 3 inch spool insulator

### Material

Steel hot dip galvanized

Catalog Number	For use w/Insulator Catalog	Weight /100 (lbs)
J1394	J151 or J101	124



## Insulated, Swinging

### Features

- The J0322 and J1614 are used with 5/8 inch or larger eyebolts or eyenuts giving a flexible mounting for equalizing strains at corners
- The J1626 can be bolted to crossarms to provide an insulated deadend assembly

### Material

Steel hot dip galvanized

Catalog Number	Weight /100 (lbs)
J0322	160
J1614	45
J1626	95





# Clevises

## Insulated, Swinging

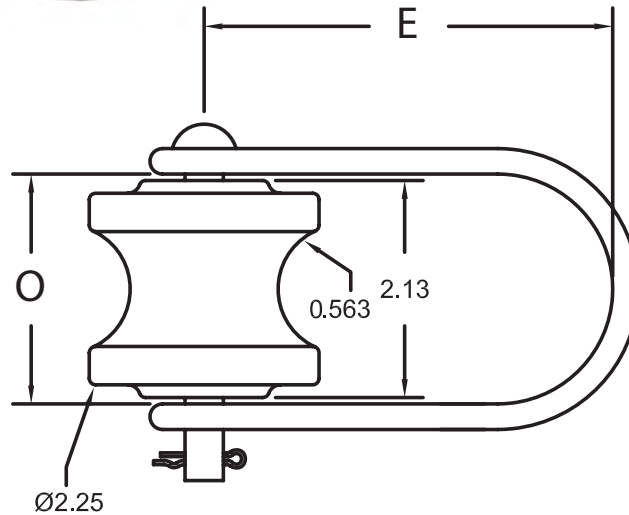


### Features

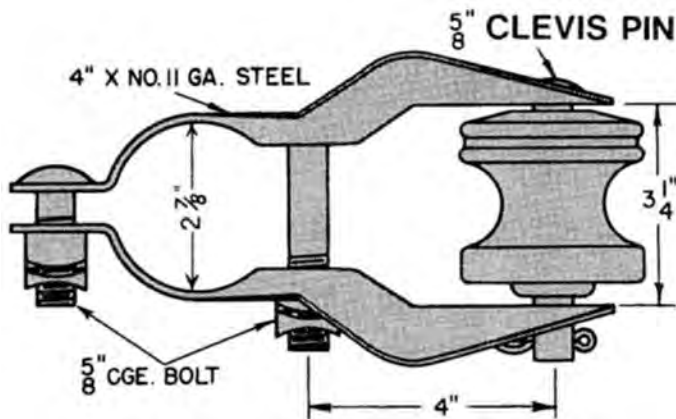
- This bail type secondary clevis, formed from 1/4 inch diameter steel is designed for attaching to eyebolts
- Porcelain spool insulator is included

### Material

Steel hot dip galvanized



Catalog Number	E	O	Steel Size	Pin Dia	Insulator Required	Weight /100 (lbs)
U36060/207B	4"	2 1/4"	1/4" Dia	3/8"	Included	78



## Pipe Riser

Pipe Riser clevises are used for triplex cable installations on 2-1/2" standard pipe risers.

### Features

- Furnished complete with two assembly bolts and one clevis pin
- Used with either the J101, J151, or J0101 spool insulator which is ordered separately

### Material

Steel hot dip galvanized

Catalog Number	Pipe Range	Weight /100 (lbs)
J0311	2 1/2"	400



# Clevises

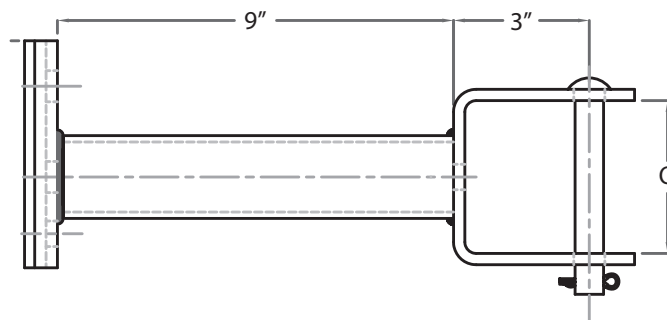
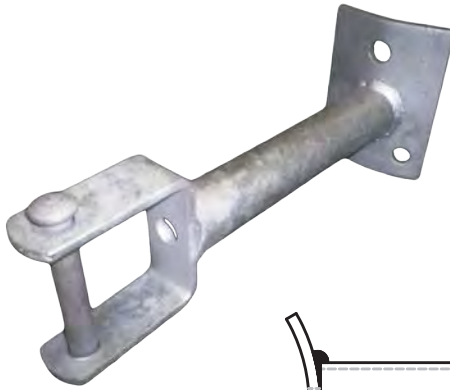
## Secondary Extension

### Features

- Extension bracket with clevis (U411B9) is used where additional line clearance is required or adjacent to a transformer
- For use with J101 or J151 spool insulator which is ordered separately.

### Material

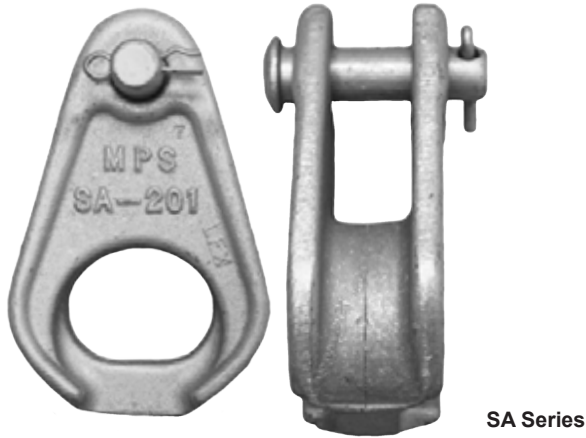
Steel hot dip galvanized



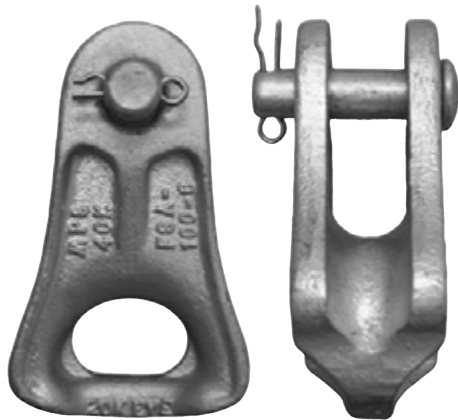
Catalog Number	Mtg Hole	O	Steel Size	Pin Dia	Weight /100 (lbs)
U411B9	11/16 Dia (2) 9/16 Dia	3 3/8"	1 1/4" Dia	5/8"	519



# Clevises



SA Series



FSA Series

## Thimble

Thimble clevises are used in guying and deadending applications.

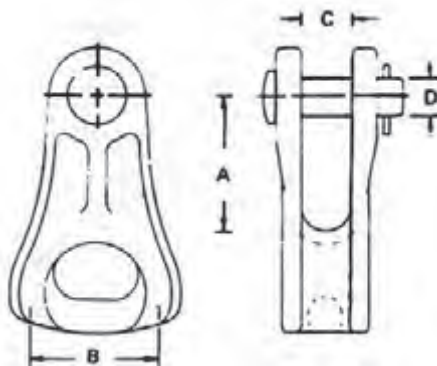
- They are the interface connection fitting used in attaching guy wire, conductor, wire grips or deadend bails to eye type fittings of insulators, eye bolts and pole eye plates.

## Features

- Generous wire seat diameter to assist the cable, wire grip or bail in maintaining its shape
- Integral pulling eye area accommodates hooks used in tensioning guy wire or conductor

## Material

Body: Ductile iron hot dip galvanized or aluminum alloy  
 Hardware: Steel hot dip galvanized  
 Cotter pin: Stainless steel



Ductile Iron Thimble Clevis - FSA Series							
Catalog Number	Min Ultimate Strength	Cable Groove Dia.	A	B	C	D	Weight /100 (lbs)
FSA-88A-5	30000	7/8"	1 7/8	2 1/4	7/8	5/8	145
FSA-100-6	40000	1"	2 1/2	2 1/2	1 1/16	3/4	308
FSA-125-8	60000	1 1/4"	3 3/4	2 1/2	1 1/4	1	550

Aluminum Thimble Clevis - SA Series							
Catalog Number	Min Ultimate Strength	Cable Groove Dia.	A	B	C	D	Weight /100 (lbs)
SA201	12000	7/8	1 7/8	2 1/4	7/8	5/8	78
SA209	12000	1 5/8	2 3/4	2 1/2	7/8	5/8	108
SA100-5	20000	1	2 5/8	2 1/2	1 1/16	5/8	120

Notes:  
 SA209 supplied with hex head bolt, nut and cotter

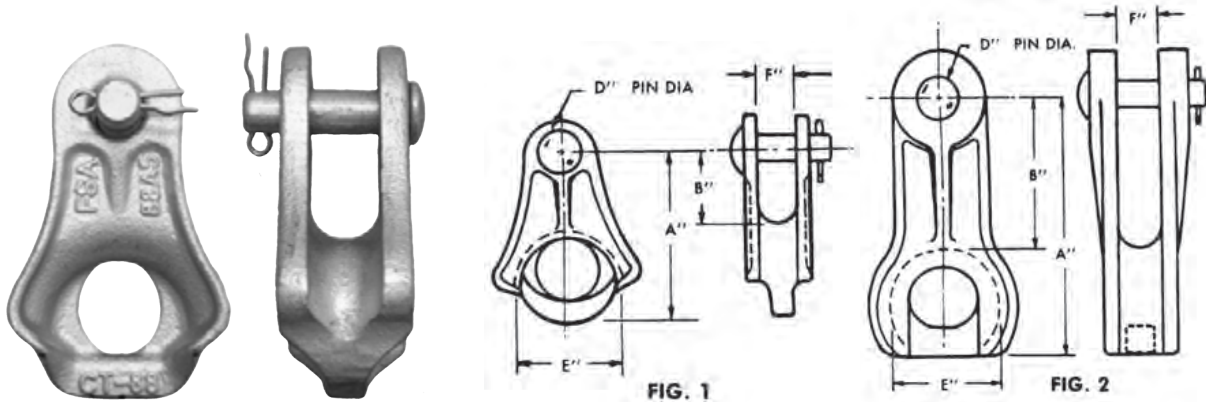


# Clevises

## Thimble

### Material

Body: Ductile iron hot dip galvanized or aluminum alloy  
 Hardware: Steel hot dip galvanized  
 Cotter pin: Stainless steel



Catalog Number	Figure	Ultimate Strength		Cable Groove Dia	A	B	D	E	F	Weight /100 (lbs)
		Thimble	Pulling Eye							
CT-88	1	20000	12500	0.88	3 9/16	1 3/4	5/8	2 1/4	7/8	175
CT-88H	2	35000	25000	0.88	4 3/8	2 1/4	3/4	2 1/4	7/8	225
CT-100H	2*	60000	40000	1.00	5 7/8	3 1/2	1	2 1/4	1 1/16	400
CT-100H10	2*	80000	40000	1.00	6	3 9/16	1 1/4	2 1/4	1 1/16	500

### Notes:

\*CT-100 series are equipped with bolt, nut and cotter instead of clevis bolt as illustrated

## Thimble

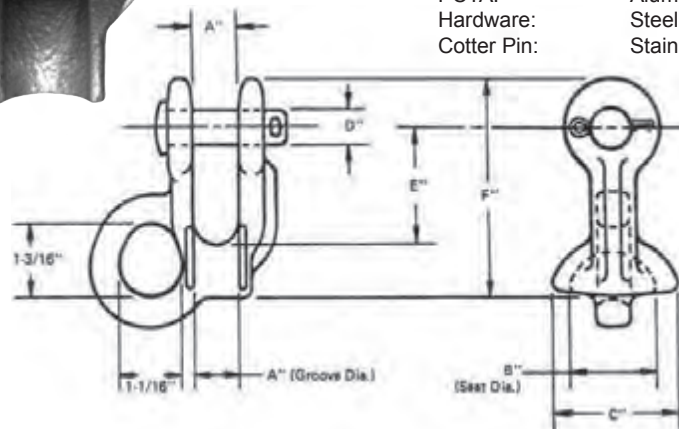
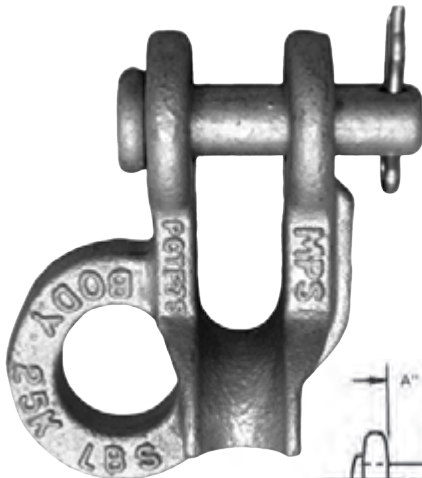
PCTF and PCTA series thimble clevises are used for normal duty guying and deadending applications of cable, wire grips, and bails where 1 1/2 inch wire seat diameters are required.

### Features

- Include an integral side pulling eye to facilitate tensioning the guy wire or conductor
- PCTA thimble clevis is made using aluminum alloy for areas with higher corrosion potential

### Material

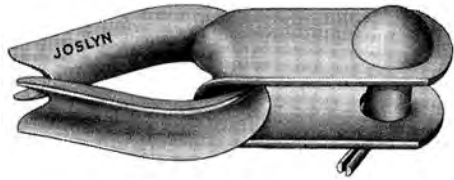
PCTF: Ductile iron hot dip galvanized  
 PCTA: Aluminum alloy  
 Hardware: Steel hot dip galvanized  
 Cotter Pin: Stainless steel



Catalog Number	Conductor Range		Ultimate Strength		A	B	C	D	E	F	Weight /100 (lbs)
	ACSR	Guy Wire	Thimble	Pulling Eye							
PCTF-75	6 - 336.4	3/16 - 5/16	25000	15000	3/4	1 1/2	2 1/8	5/8	1 15/16	3 3/4	200
PCTA-88	6 - 477	3/16 - 3/8	12000	7000	7/8	1 1/2	2 1/8	5/8	1 15/16	3 5/8	100
PCTA-75	6 - 336.4	3/16 - 5/16	10000	6000	3/4	1 1/2	2 1/8	5/8	1 15/16	3 5/8	100



# Clevises



J575

### Thimble

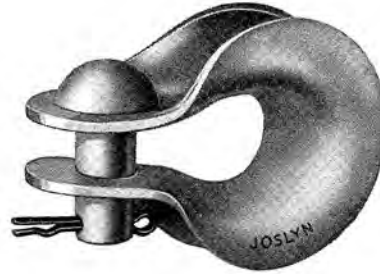
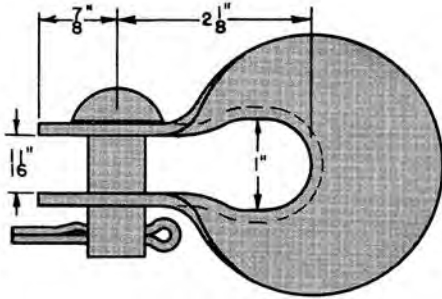
Formed steel thimble clevises provide a light duty, economical interface fitting to deadend wire grips, guy wire, conductor or bails to eye type fittings of insulators, eyebolts and pole eye plates.

### Features

- Used where 1 1/2 inch wire seat diameters are required.

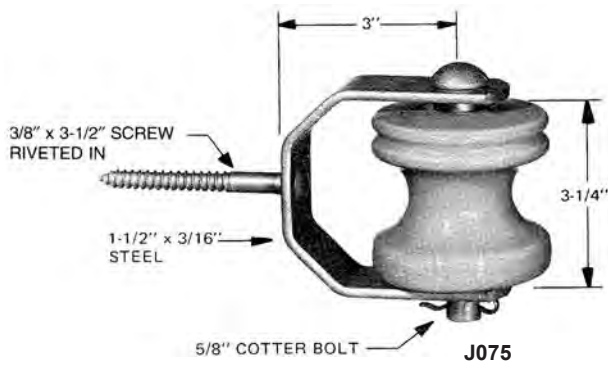
### Material

Pressed steel hot dip galvanized



Pressed Steel J554 and J555

Catalog Number	Pin Dia	Ultimate Strength (lbs)	Clevis Opening	Weight /100 (lbs)
J554	1/2	10000	1	97
J555	5/8	10000	1	101
J575	5/8	7500	1	100



J075

### Wireholder

### Features

- Used with either the J101 or J151 spool insulator for attaching services where triplex-type cable is used
- Insulator sold separately

### Material

Steel hot dip galvanized

Catalog Number	Weight /100 (lbs)
J075	136



# Eyelets

## Thimbleye and Ovaley

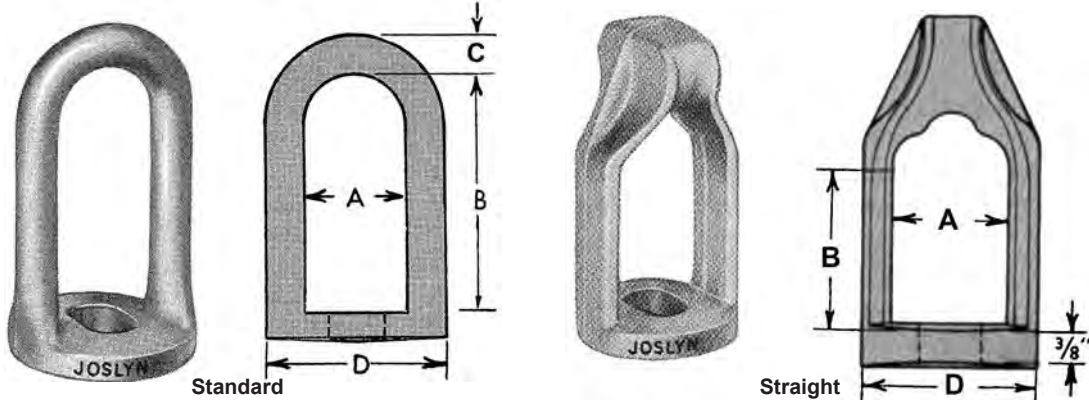
Eyelets, also known as bolt eyes, are used under the head or nut of a bolt. Straight thimble eyelets are used for span guys. Angle thimble eyelets are used for down guys.

### Features

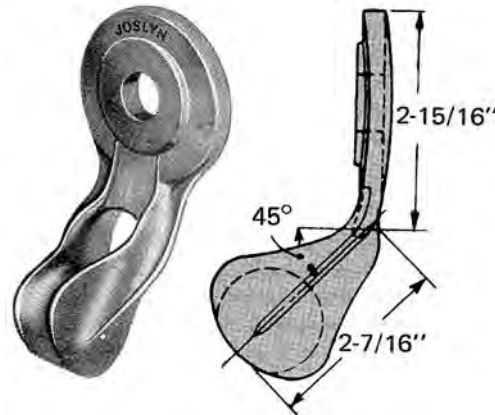
- Compatible with the strength of the bolts used with them; 5/8" = 13,550#, 3/4" = 20,050#
- Standard eyelets are used for deadending
- Standard eyelets and straight thimble eyelets have a slotted hole for ease in inserting the bolt

### Material

Steel hot dip galvanized



Catalog Number	Mounting Bolt Hole	Bolt Size (in)	A	B	C	D	Weight /100 (lbs)
J1126	1 1/8 x 11/16	5/8	1 1/4	3	1/2	2 1/4	78
J1127	1 1/8 x 13/16	3/4	1 1/4	3	1/2	2 1/4	70
J6550C	1 x 11/16	5/8	1 5/16	2	3/8	2 1/4	130
J6551	1 1/8 x 13/16	3/4	1 5/16	2	3/8	2 1/4	125



Angle Thimble Eyelet			
Catalog Number	Bolt Dia.	Max Strand	Weight /100 (lbs)
J6500	5/8	1/2	127





# Eyenuts



Oval Eyenut  
Figure 1



Thimble Eyenut  
Figure 3

## Oval, Thimble, Twineye, and Clevis Eye

Thimble eyenuts are used for span, head and stub guying, twin eyenuts accommodate double guys. Oval eyenuts are used for deadending with suspension and strain insulators or thimble clevises.

### Features

- Eyenuts are tapped to fit hot dip galvanized bolts made to ANSI specifications
- Designed to develop strength ratings consistent with the bolts with which they are used - i.e. 1/2" = 85,000 lbs, 5/8" = 133,500 lbs, 3/4" = 200,500 lbs, 1" = 333,500 lbs

### Material

Steel hot dip galvanized

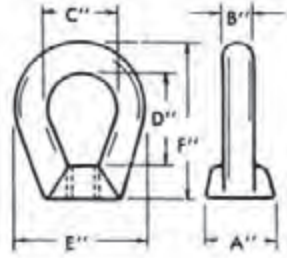


Figure 1

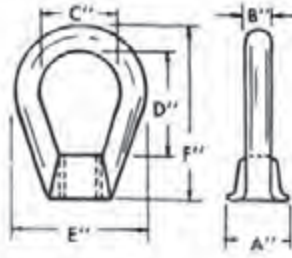


Figure 2

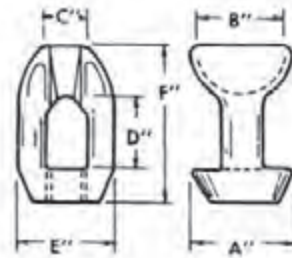


Figure 3

Catalog Number	Fig.	Bolt Size (in)	A	B	C	D	E	F	Weight /100 (lbs)
EN-4	1	1/2	1 3/8	9/16	1 1/2	1 3/4	2 5/8	3	100
J1092	1	5/8	1 3/8	9/16	1 1/2	1 3/4	2 5/8	3	72
J1093	1	3/4	1 3/8	9/16	1 1/2	1 3/4	2 5/8	3	53
ENL-5	2	5/8	1 3/8	5/8	1 1/2	2 1/2	2 5/8	4	100
ENL-6	2	3/4	1 3/8	5/8	1 1/2	2 1/2	2 5/8	4	100
J6510	3	5/8	1 1/2	1 1/2	7/8	1 3/8	1 7/8	3	100
J6511	3	3/4	1 1/2	1 1/2	7/8	1 3/8	1 7/8	3	91
J16512	3	1	2	2	7/8	1 1/2	2	4 1/2	200



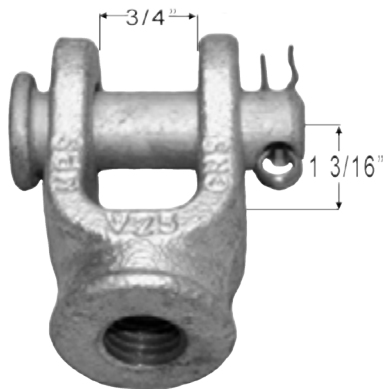
## Twineye

Twin eyenuts accommodate double guys.

### Material

Steel hot dip galvanized

Twin Eyenut			
Catalog Number	Bolt Dia. (in)	Strand Size	Weight /100 (lbs)
J6515	5/8	5/8	177
J6516	3/4	5/8	176



## Clevis Eyenut

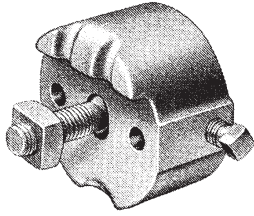
### Material

Ductile iron hot dip galvanized

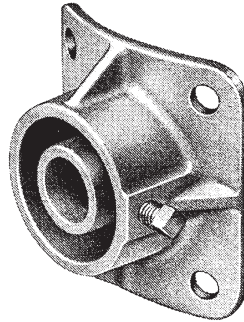
Clevis Eyenut			
Catalog Number	Bolt Dia. Tap Size	Pin Dia.	Weight /100 (lbs)
CN-5	5/8	5/8	100



# Fittings, Guy



J0522



J0521

## Sidewalk Guy

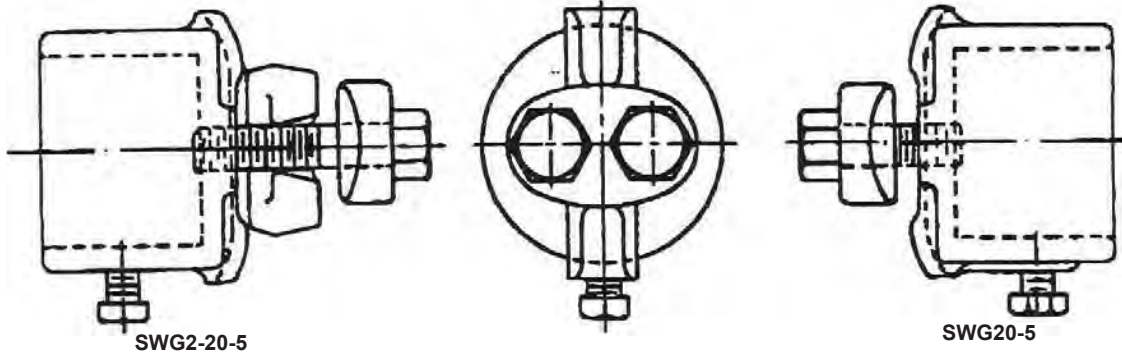
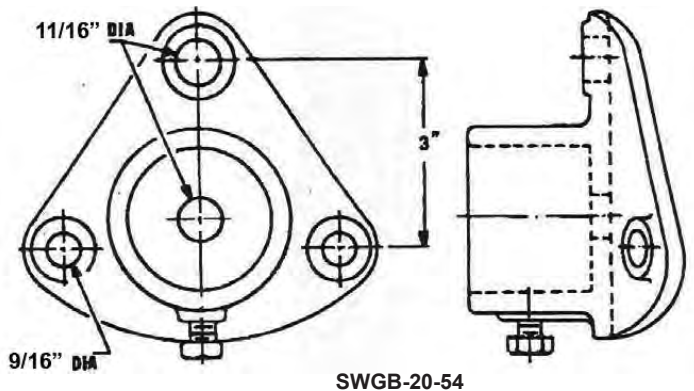
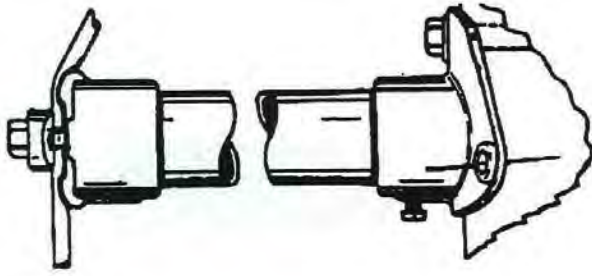
These cast iron fittings are used with standard pipe near sidewalks and buildings where there is insufficient space for standard guying and where head clearance must be maintained.

### Features

- SWGB-20-54 pole plate is mounted with one 5/8" bolt and two 1/2" lag screws
- SWG-20-5 end fitting clamps the strand
- SWG2-20-5 accomodates 2 guy wires
- The J0521 pole plate has four 9/16" holes for mounting with lag screws.
- The J0522 end fitting requires a J931 guy clamp which must be ordered separately. The 5/8 x 2-1/2" track bolt replaces one of the 'outer' bolts of the J931 guy clamp.

### Material

Ductile iron hot dip galvanized



Catalog Number	Description	Wire Range	Pipe Size	Weight /100 (lbs)
SWG2-20-5	Double Clamp End Fitting	5/16" to 9/16"	2	500
SWG-20-5	Clamp End Fitting	1/4" to 9/16"	2	400
SWGB-20-54	Pole Plate		2	225
J0521	Pole Plate		2 & 2 1/2	495
J0522	Clamp Bolt End Fitting		2 & 2 1/2	350



# Gains

## Braceless Crossarm

Braceless crossarm gains improve the stability of the crossarm and eliminate the need for crossarm braces and pole gaining.

### Features

- Design improves the structure appearance and permits the use of fiberglass, wood, steel channel or steel tubular arms
- Accommodates pole diameters from six inches to twelve inches
- Pole mounting slots are 13/16 inch wide on top and 11/16 inch on bottom

### Material

Ductile iron hot dip galvanized

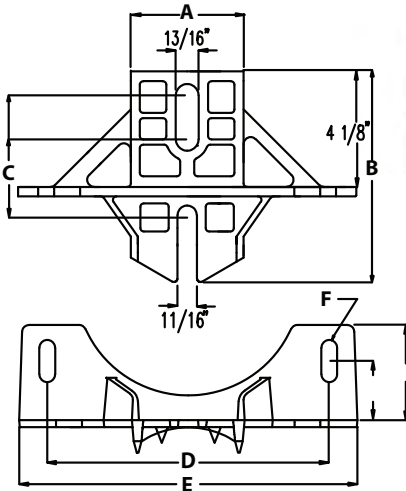


Figure 2

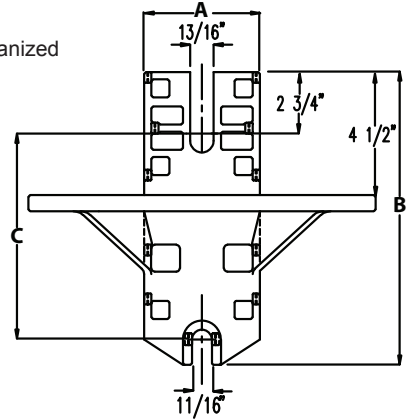
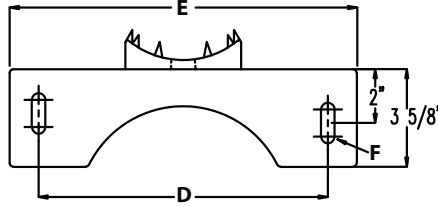


Figure 1

Catalog Number	Fig	Crossarm Range	A	B	C Slot Range	D	E	F	Weight /100 (lbs)
PX171	1	3 1/2 - 8"	4	11	7 1/4"	10	12	9/16 x 1 1/2	717
PX182A	2	4 1/2 - 6"	4	7 1/2	4 1/4 - 6"	10	12	9/16 x 1 1/2	480
PX182B	2	4 1/2 - 6"	4	7 1/2	4 1/4 - 6"	10	12	11/16 hole	485



Figure 1



Figure 2

## Crossarm (with Shelf)

Crossarm gains with a shelf provide increased stability for crossarm installations to poles.

### Features

- Integral teeth on the pole side
- Two separate hole positions for mounting the gain to the pole to enhance supporting the arm to the pole

### Material

Ductile iron hot dip galvanized

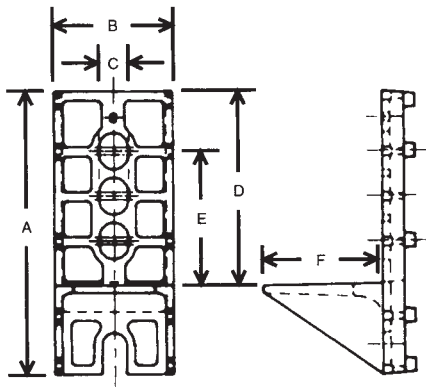


Figure 1

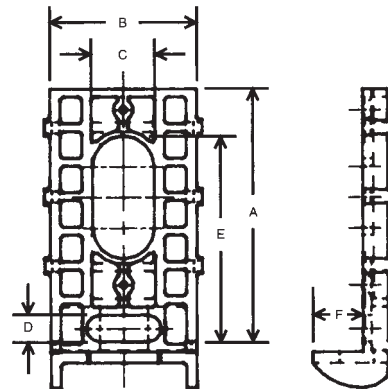


Figure 2

Catalog Number	Fig	Pole Dia. Range (in)	A	B	C	D	E	F	Weight /100 (lbs)
PX249G	1	8 - 12	9 1/2	4	1	6 1/2	4 1/2	4	470
PX249SG	1	8 - 12	13 1/8	4	1 1/16	10 1/8	5 3/8	6 1/2	1000
PX187	2	8 - 12	7 1/4	4	1 3/4	3/4	5 7/8	1 3/8	290



# Gains



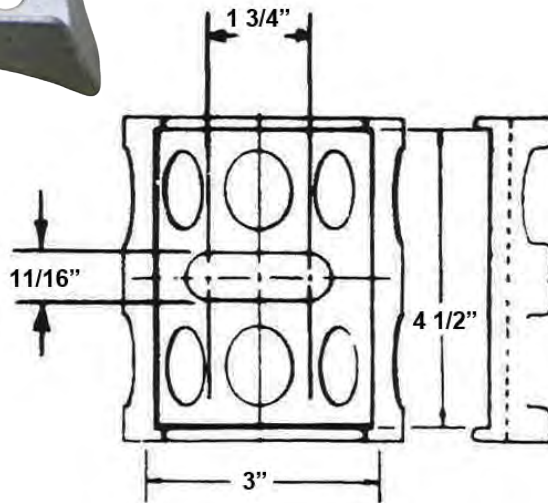
## Grid

### Features

- Teeth and integral ribs provide increased stability and resistance to movement both with and across the wood grain
- Strengthens bolt connections and helps resist slotting of the bolt hole by distributing the load over larger wood area
- Curved back provides smooth interface with large pole diameter range
- Flat side increases stability of mounted crossarms

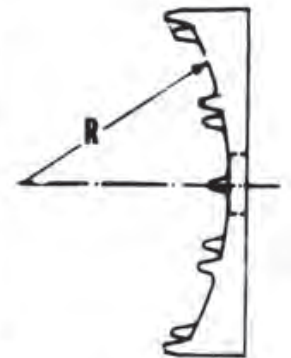
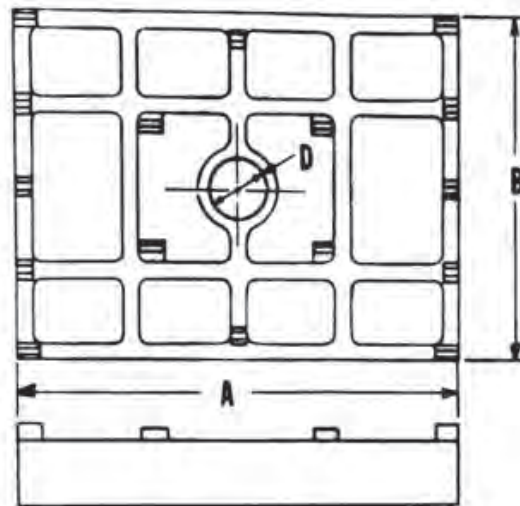
### Material

Ductile iron hot dip galvanized



Catalog Number	Pole Range	Bolt Dia. (in)	Crossarm Height	Weight /100 (lbs)
CAG-44-5	5 - 11"	5/8	4 1/2"	110

Notes:  
Crossarm height is a recommendation

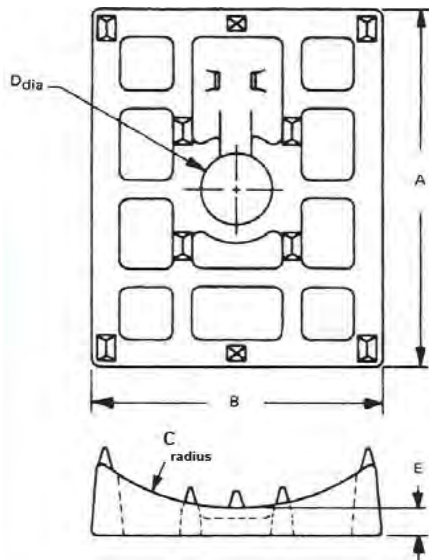


Catalog Number	Pole Range	A	B	D	R	Weight /100 (lbs)
GGSF-4040-7	6 - 16"	4	4	15/16	3 1/2	200
GGSF-6640-7	6 - 15"	6 3/4	4 1/8	15/16	4 1/2	220
GGSF-5340-6	6 - 11"	5 5/16	4	13/16	3	200
GGSF-7052-7	10 - 16"	7	5 1/4	15/16	5	220
GGSF-7052-8	10 - 16"	7	5 1/4	1 1/16	5	220





# Gains



## Grid

**Material**  
Aluminum alloy

Catalog Number	Pole Range	A	B	C	D	E	Weight /100 (lbs)
GSF-44-7	6 - 16"	4	4	3 1/2	15/16	5/16	64
GSF-54-6	6 - 16"	5	4	3	13/16	3/8	76
GSF-54-7	6 - 16"	5	4	3	15/16	3/8	73

## Grid

**Material**  
Ductile iron hot dip galvanized

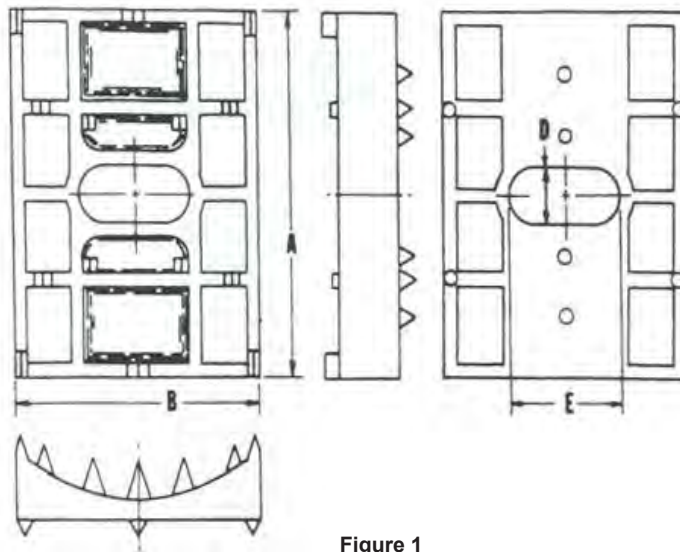


Figure 1

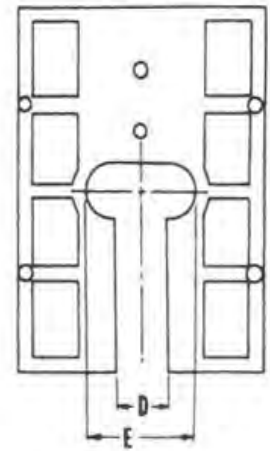


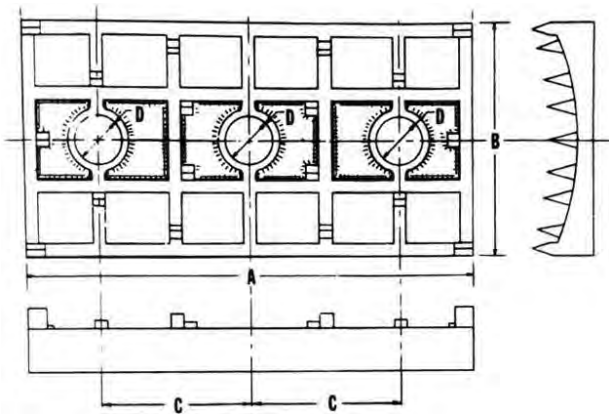
Figure 2

Catalog Number	Fig	Pole Range	A	B	D	E	Weight /100 (lbs)
GPA-43-6	1	6 - 11"	4	3	13/16	13/16	100
GPA-43-6T	2	6 - 11"	4	3	13/16	13/16	100
GPA-44-6	1	6 - 11"	4	4	13/16	13/16	120
GPA-54-6	1	6 - 11"	5	4	13/16	13/16	200
GPA-54-6T	2	6 - 11"	5	4	13/16	13/16	200

**Notes:**  
Add suffix "T" for T-slot (open slot per illustration)



# Gains



## Grid

### Material

Ductile iron hot dip galvanized

Catalog Number	Pole Range	A	B	C	D	Weight /100 (lbs)
GRF-9045-7	9 - 16"	9	4 1/2	3	15/16	300
GRF-1060-8LT	9 - 16"	10	6	3	1 1/16	730
GRF-1060-10LT	9 - 16"	10	6	3	1 5/16	700

### Notes:

Suffix "LT" indicates less teeth

## Grid

### Material

Aluminum alloy

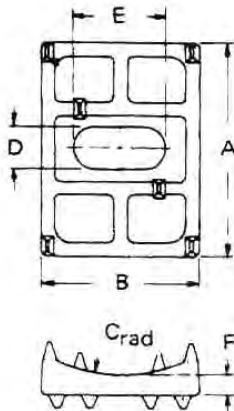


Figure 1

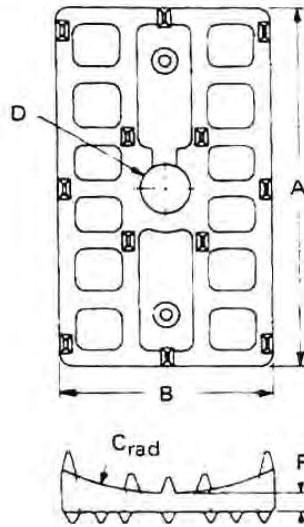


Figure 2

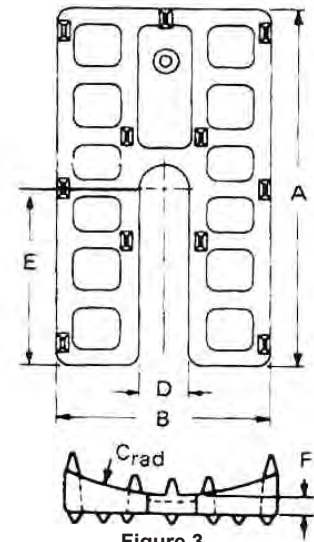
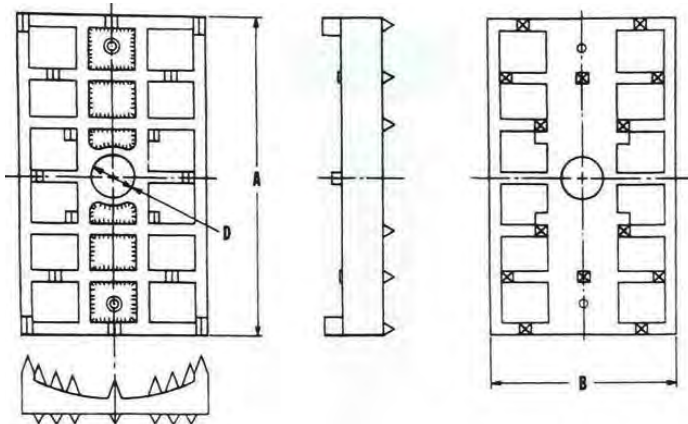


Figure 3

Catalog Number	Fig	Pole Range	A	B	C	D	E	F	Weight /100 (lbs)
CAG-44-6	1	6 - 11"	4	4	3 1/2	13/16	1 5/8	3/8	51
CAG-54-6T	3	6 - 11"	5 1/4	4	3	13/16	2 5/8	9/32	62
CAG-74-7	2	9 - 15"	6 3/4	4	4 1/2	15/16		3/8	90



## Grid

### Material

Ductile iron hot dip galvanized

Catalog Number	Pole Range	Bolt Size (in)	A	B	D	Weight /100 (lbs)
GCA-74-7	6 - 11"	7/8	6 3/4	4	15/16	200

### Notes:

Add suffix "B" for bond clip





# Gains



## Grid

### Features

- Timber connectors resist slotting of the bolt hole in the transfer of loads and connection of two wood members
- The integral teeth penetrate into the wood to assist in distributing the load over a larger wood surface area than the bolt hole only

### Material

Ductile iron hot dip galvanized

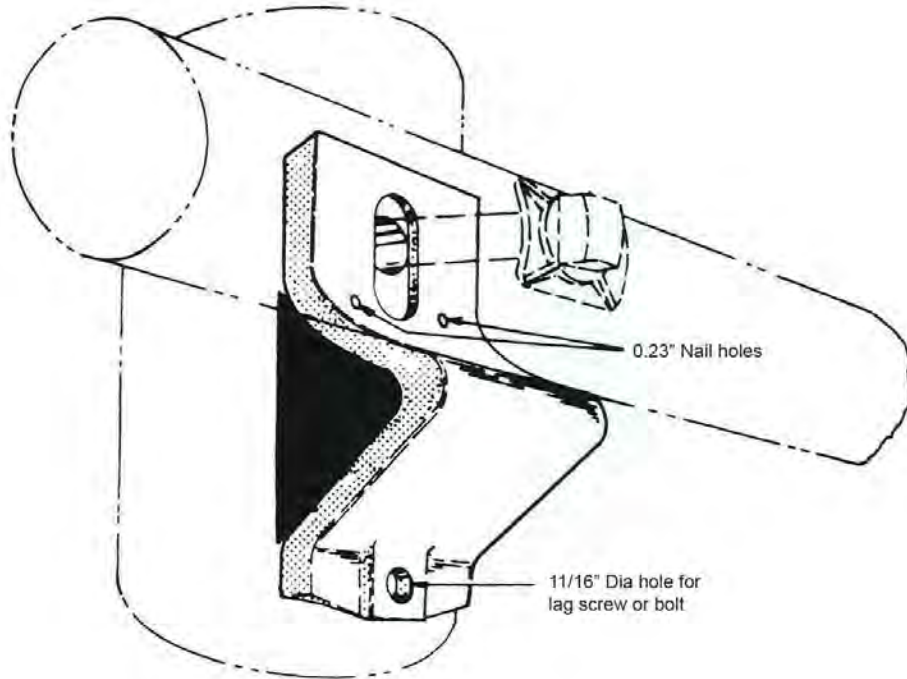
Catalog Number	Outside Dia.	Hole Dia.	Weight /100 (lbs)
PX156	2 1/2	11/16	40

## Grid

For round / spar arm construction applications.

### Material

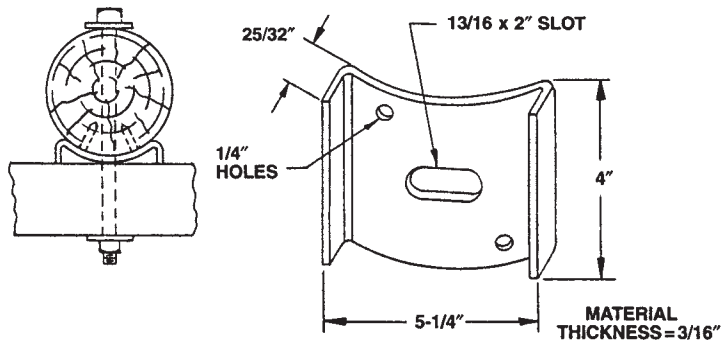
Ductile Iron hot dip galvanized



Catalog Number	Max Bolt Size	Crossarm Dia.	Weight /100 (lbs)
SABS-15	1"	6 - 12"	510



# Gains and Guards



### Pole

Pole gains are used where it is not possible or desirable to cut a gain in the pole.

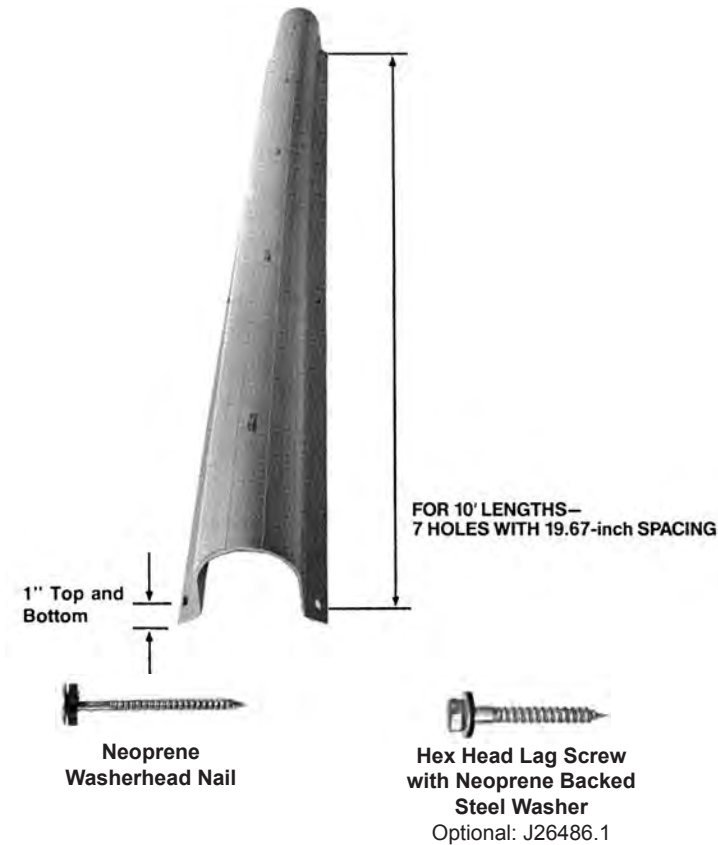
### Features

- Enhance the stability of the crossarm and pole interface

### Material

Formed steel hot dip galvanized

Catalog Number	Weight /100 (lbs)
J4060	140



### Cable, Plastic

Plastic U cable guards are designed to nest over the one piece galvanized cable guard as required by many construction standards which call for a galvanized guard at the base and a plastic guard up the balance of the pole.

### Features

- Strong, light weight, maintenance-free means of cable protection
- Nonconducting
- Can be cut to length in the field
- Guards are gray in color

### Material

UV stabilized, high impact resistant PVC

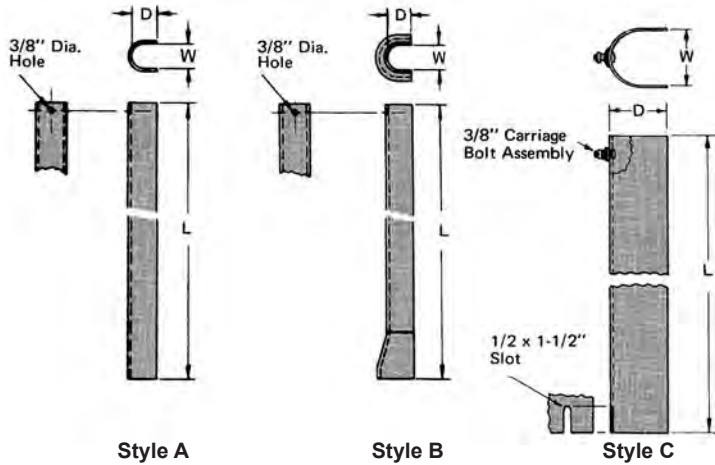
Catalog Number	Dimensions (I.D. x Length)	Weight /100 (lbs)
PGU210	2 x 10	6

### Notes:

Can be mounted with furnished 1 1/2" x 10 ga. neoprene washerhead nails or optional 1/4 x 2" hex head lag screw with neoprene backed steel washer (catalog number J26486.1)



# Guards



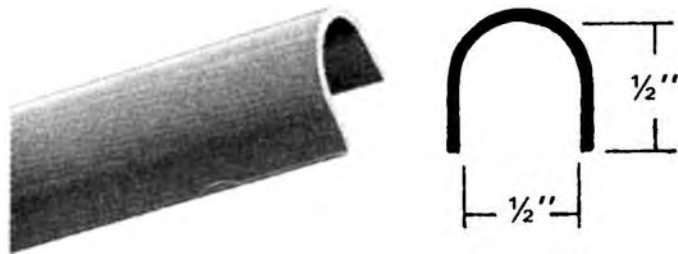
Style A

Style B

Style C



Strap



## Cable, Steel

Cable guards are used to protect power and telephone cable at riser installations.

### Features

- Offers maximum protection to cable against collisions and vandalism
- Inexpensive strap-mounted style uses lag screws to secure to pole
- Guards without frustrum can be used as extensions to attain any desired height on the pole
- Carriage bolt assembly is furnished on style "C" to fasten extensions and serve as a ground lead attachment

### Material

Steel hot dip galvanized

Strap Mounted Guards							
Catalog Number	Style	Steel Gage	Length (ft)	Depth (in)	Width (in)	Strap	Weight /100 (lbs)
J985	A	14	5	1 1/8	1 1/8	J995	470
J984	A	14	8	1 1/8	1 1/8	J995	700
J991	B	14	8	1 5/16	1 1/4	J995	900
J987	A	14	8	2 3/16	2 3/16	J996	1340
J989	A	14	8	3 3/16	3 3/16	J997	2000
J23395.8	C	14	8	3 3/16	3 3/16	J997	1800

Straps				
Catalog Number	Steel Size	For Guard Width (in)	Mounting Hole Dia. (in)	Weight /100 (lbs)
J995	1/8 x 3/4	1 1/8 or 1 1/4	9/32	19.1
J996	1/8 x 3/4	2 3/16	9/32	31.0
J997	3/16 x 1	3 3/16	11/32	69.3

## Ground Wire Molding, Plastic

Plastic ground wire molding provides strong, reliable protection of exposed ground wire.

### Features

- Low maintenance, safety, handling ease and low cost
- Easily secured to the pole with available diamond point staples or square shank, barbed staples

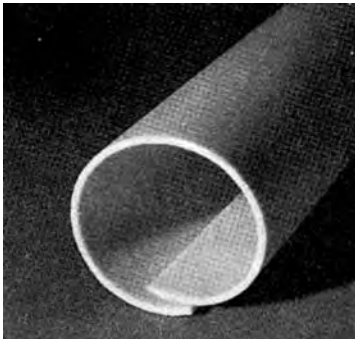
### Material

Gray, high impact resistant, UV stabilized PVC

Catalog Number	Description	Weight /100 (lbs) /1000 ft
PM128	1/2" x 8' molding	50



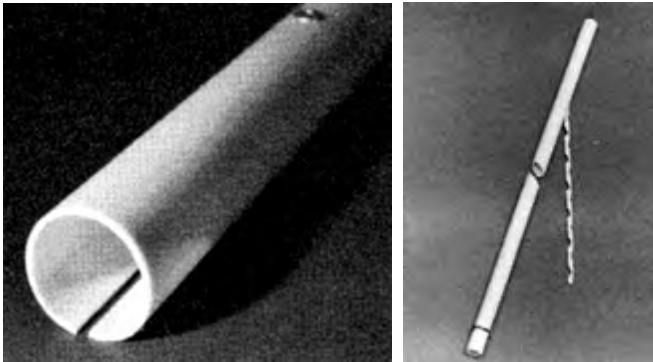
## Guards



J1493Y



J1491Y and J1498Y



J5518 and J5718

### Guy, Plastic

Provide a strong, highly visible, economical safeguard from exposed guy wires and anchor rods.

#### Features

- Ultraviolet stabilized for long life and resistant to fading

#### J1493Y Features

- 2" diameter full round design permits complete coverage of guy wire and anchor rod for maximum protection and improved visibility
- 3" long partial cutaway to facilitate installation of the galvanized bolted clamp assembly at one end
- The other end is secured by hand insertion of the one way, spiked plastic rivet

#### J1491Y & J1498Y Features

- 2 1/2" diameter, two-thirds round design provides excellent visibility and permits installation over anchor rods up to 1 1/4" diameter
- Four sets of holes are located along the guard to permit flexibility of mounting positions
- Bolted clamp assemblies or wire ties used for attachment methods

#### J5518 & J5718 Features

- Full round helical pigtail guards provide installation without the need for tools
- Utilize a 23" long helically formed polyethylene tie pigtail, which is wrapped around the guy strand to provide tool free installation to guy strands 3/16" to 1/2"
- Secured by a marine grade aluminum rivet positioned five feet above bottom of guard
- Bottom of guard includes one way locking nylon strap for additional installation security and resistance to unauthorized removal

#### Material

High-density, impact-resistant polyethylene or PVC

Catalog Number	Description	Attachment	Weight /100 (lbs)
J1493Y	8ft. yellow, Polyethylene	bolted clamp	240
J1491Y	8ft. yellow, PVC	3 bolted clamps	270
J1498Y	8ft. yellow, PVC	3 wire ties	190
J5518	8ft. yellow, PVC	helical tie	130
J5718	8ft. yellow, Polyethylene	helical tie	130



# Guards

## Tapered Guy, Steel

### Full Round

#### Features

- Full round guards are provided with U-bolt clamps at both ends
- Bottom fitting clamps directly to the guy rod
- Slot near the base of the guard easily engages the tongue of the fitting
- Strand swivel type top clamp is installed without removing the nuts

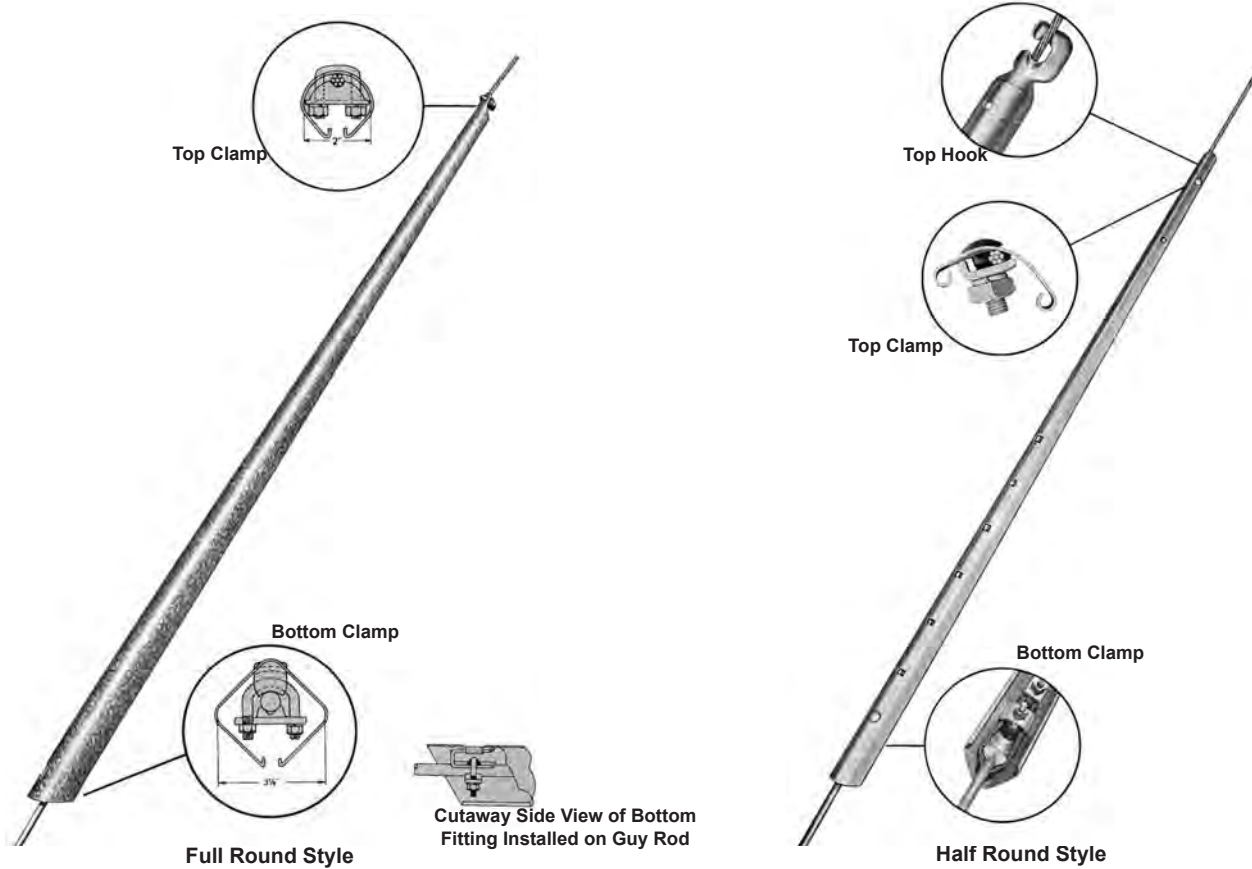
### Half Round

#### Features

- Half round guards come with either a hook or clamp at the top
- Curved jaws of the heavy gauge steel hook tighten firmly on 1/4 - 9/16 " strand as the guard is brought down into position
- Two holes are available in the top clamp type, the lower of which is used on short sweep guys
- Seven holes in the lower portion of both styles allow for proper positioning of the bottom clamp to the strand

### Material

Steel hot dip galvanized



Catalog Number	Length	Style	Weight /100 (lbs)
J1448	8	Half round, top hook	950
J1528	8	Half round, top clamp	913
J1618	8	Full round	1350





# Guy Attachments

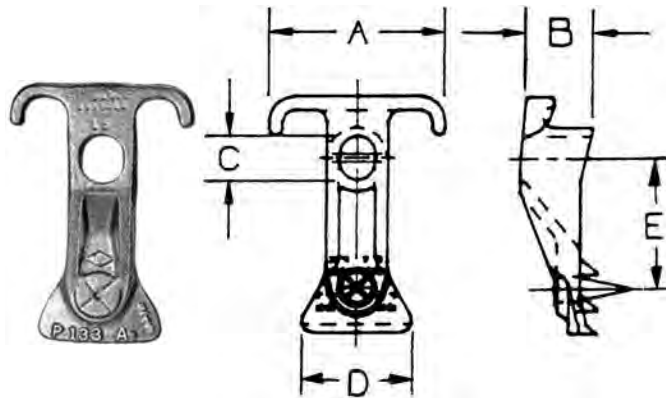
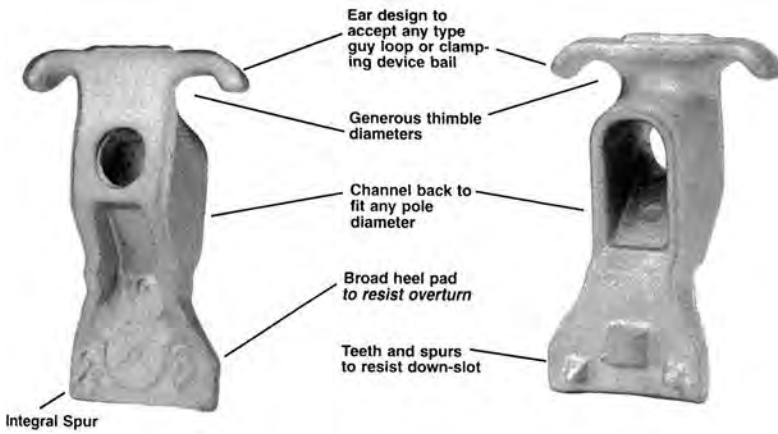
## Guy Hooks

### Features

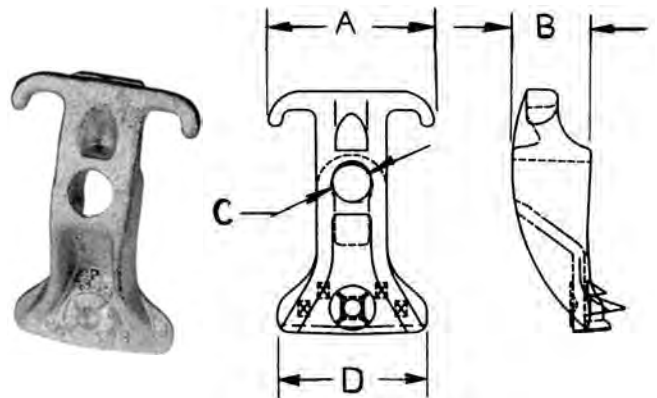
- Provide economical and efficient means of fastening guys to poles
- Well rounded wire grooves protect the strand from damage
- Wherever possible, installation should be made under the head of a machine bolt for down guy applications
- Guy hooks are not recommended to be mounted on the threaded end of a machine bolt
- Integral spur style for mounting with a through bolt only

### Material

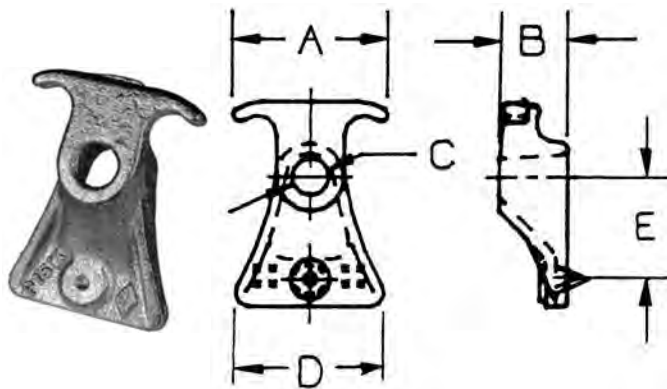
Ductile Iron - Hot Dip Galvanized



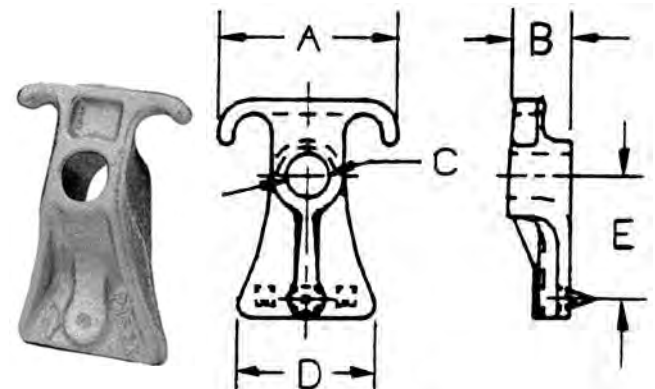
P133AX or P135AXW



P134AXW or P134BX



P151X or P152X



P157X

Catalog Number	Measurements (in)					Overall Length (in)	45° Ultimate Str. (lbs)	Weight /100 (lbs)
	A	B	C	D	E			
P133AX	3 15/16	1 5/8	13/16 x 1	2 1/2	2 7/8	5 1/2	20050	150
P134AXW	3 3/8	1 9/16	13/16 x 7/8	2 3/8	2 5/8	4 3/4	20050	128
P134BX	3 5/8	1 5/8	13/16 x 15/16	3 1/4	2 3/4	5 3/8	20050	177
P135AXW	3 1/8	1 1/2	11/16 x 3/4	2 1/8	2 1/2	4 1/2	13550	102
P151X	2 7/8	1 1/4	11/16	2 3/4	1 7/8	3 3/4	13550	95
P152X	3 1/8	1 3/8	13/16	2 3/4	2 3/8	4 1/4	20050	108
P157X	3 5/8	1 1/4	13/16	2 3/4	2 3/8	4 1/4	20050	96





# Guy Attachments



P132X



P138

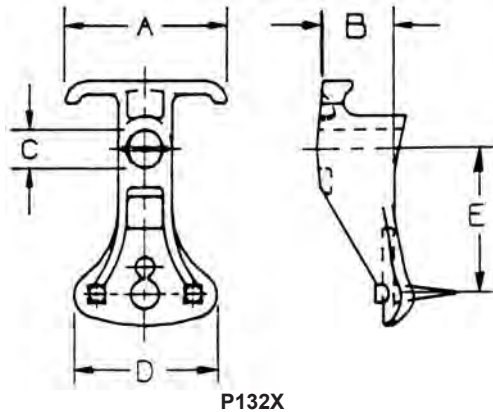
## Guy Hooks

### Features

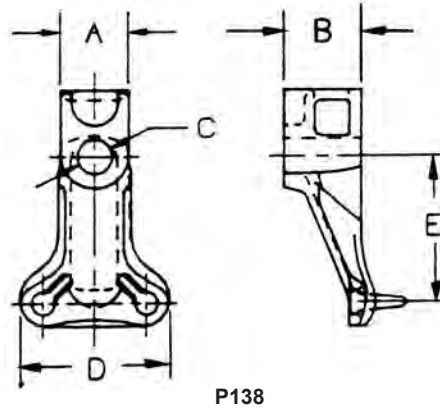
- Provide economical and efficient means of fastening guys to poles
- Installation should be made under the head of a machine bolt for down guy attachments
- Guy hooks are not recommended to be mounted on the threaded end of a machine bolt
- Integral teeth in the bottom base eliminate the need for a lag screw in the base

### Material

Ductile Iron - Hot Dip Galvanized

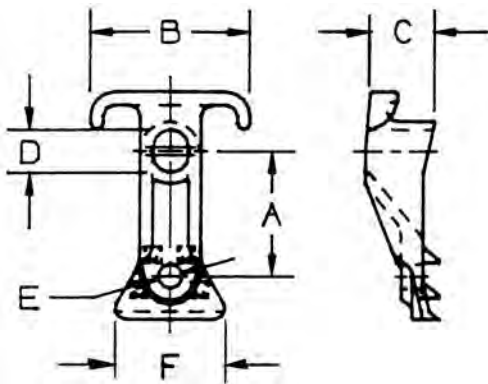


P132X



P138

Catalog Number	Measurements (in)					Overall Length (in)	45°; Ultimate Str. (lbs)	Weight /100 (lbs)
	A	B	C	D	E			
P132X	3 3/4	1 7/8	15/16" x 1"	2 3/4	3 1/2	6 3/4	27700	362
P138	1 13/16	1 13/16	15/16	4	3 7/8	6 1/4	27700	263



## Guy Hooks

### Features

- These guy hooks feature a base with integral teeth
- Hole for installation of a 1/2" diameter lag screw provides additional resistance to movement

### Material

Ductile Iron - Hot Dip Galvanized

Catalog Number	Measurements (in)						Overall Length (in)	45°; Ultimate Str. (lbs)	Weight /100 (lbs)
	A	B	C	D	E	F			
P133A	2 7/8	3 5/8	1 5/8	13/16	9/16	2 1/2	5 1/4	20050	152
P135A	3 1/2	3 3/4	7/16	11/16	9/16	2 1/2	4 3/4	13550	128



# Guy Attachments



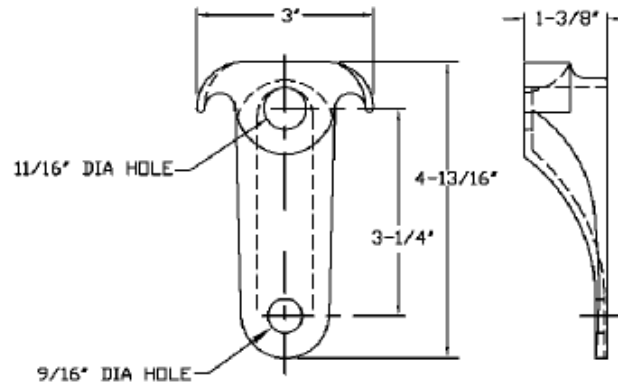
## Guy Hooks

### Features

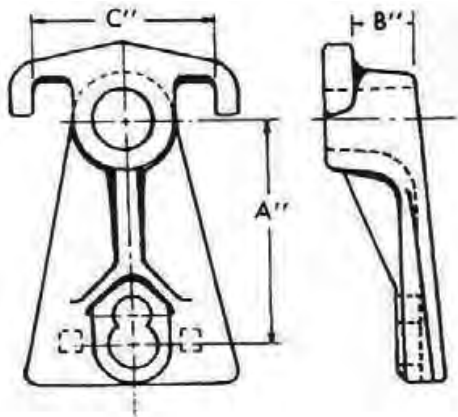
- These guy hooks feature a base with integral teeth
- Hole for installation of a 1/2" diameter lag screw provides additional resistance to movement

### Material

Ductile Iron - Hot Dip Galvanized



Catalog Number	Max Wire Dia	Bolt Hole Dia	45° Ultimate Str. (lbs)	Weight /100 (lbs)
J6555	1/2	11/16	13550	105
J6556	9/16	13/16	20050	120



## Guy Hooks

### Material

Ductile Iron - Hot Dip Galvanized

Catalog Number	Max Wire Dia	Measurements (in)				Mounting Bolts		Min Ultimate Strength	Weight /100 (lbs)
		A	B	C	R	Top	Bottom		
G764X2	3/4	4	1	3 7/16	7/8	7/8 or 3/4	5/8 to 3/4	25000	80
G864X2	3/4	4	1	3 7/16	7/8	7/8 or 1	1/2, 5/8 or 3/4	25000	200



# Guy Attachments

## Guy Hooks

### Features

- Corrosion resistant aluminum alloy with integral teeth in the base bottom to resist movement

### Material

Aluminum alloy

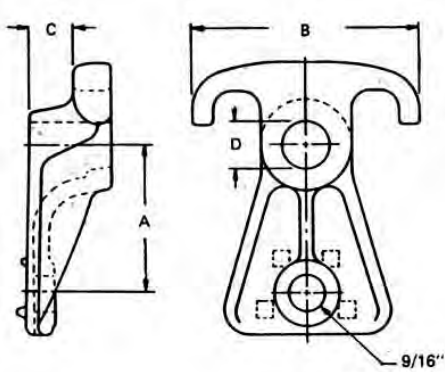


Figure 1

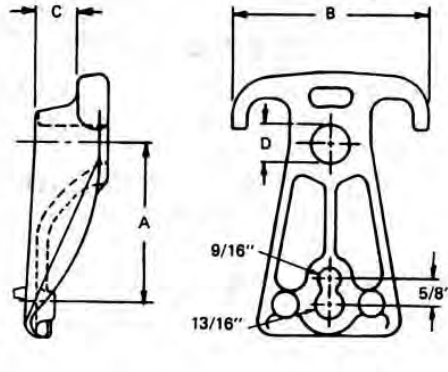


Figure 2

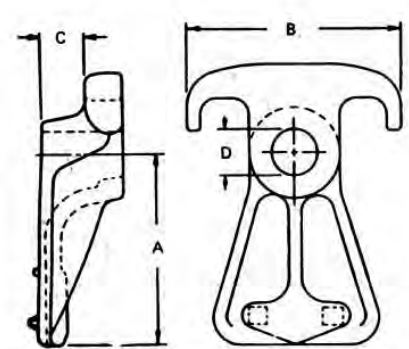


Figure 3

Catalog Number	Fig	Max Wire Dia	Measurements (in)				Mounting Bolts		Min Ultimate Strength (lbs)	Weight /100 (lbs)
			A	B	C	D	Top	Bottom		
AG-5	1	7/16	2 1/4	3 1/4	5/8	11/16	5/8	1/2	12400	38
AG-5X	3	7/16	2 7/8	3 1/4	5/8	11/16	5/8		12400	39
AG-6	1	1/2	2 1/4	3 7/16	11/16	13/16	3/4	1/2	18350	30
AG-6X	3	1/2	3 1/2	3 5/8	7/8	13/16	3/4		18350	61
AG-7	2	3/4	4	4 7/8	1	15/16	7/8	3/4	25400	109

### Notes:

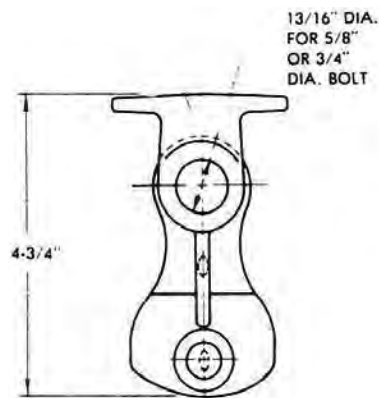
Figure 2 - 1/2" lag screw or 3/4" through bolt may be used in bottom hole if desired

## Guy Hooks

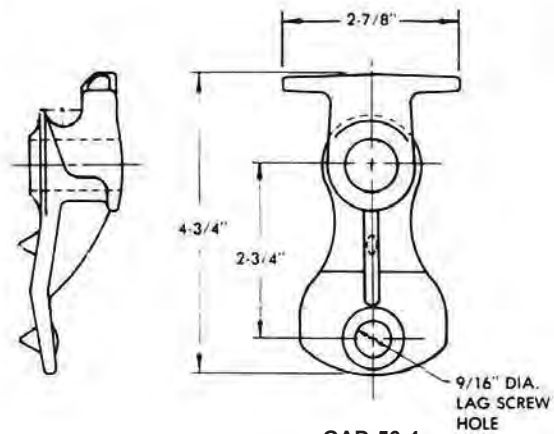
For use with formed guy grips, "bail type" automatic deadends, and "bail type" wirewise deadends. Ultimate Strength 20,050 lbs at 45 degree guy angle.

### Material

Ductile Iron - Hot Dip Galvanized



GAD-56-X



GAD-56-4

Catalog Number	Bolt Hole Dia	Weight /100 (lbs)
GAD-56-X	13/16	100
GAD-56-4	13/16	100

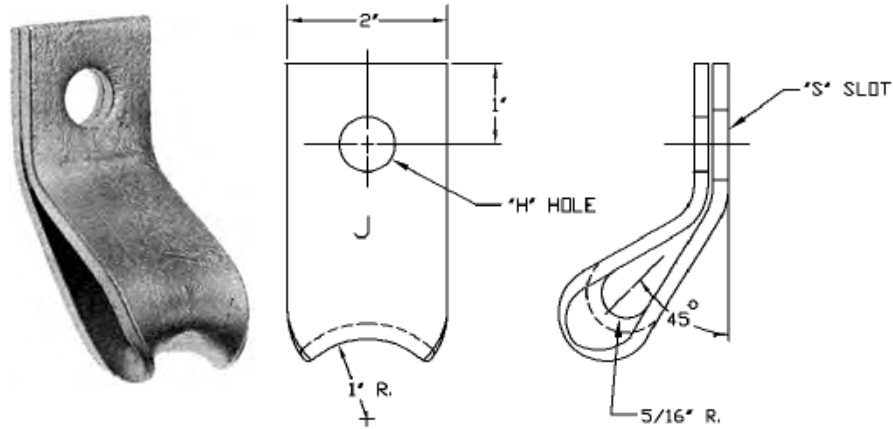


# Guy Attachments

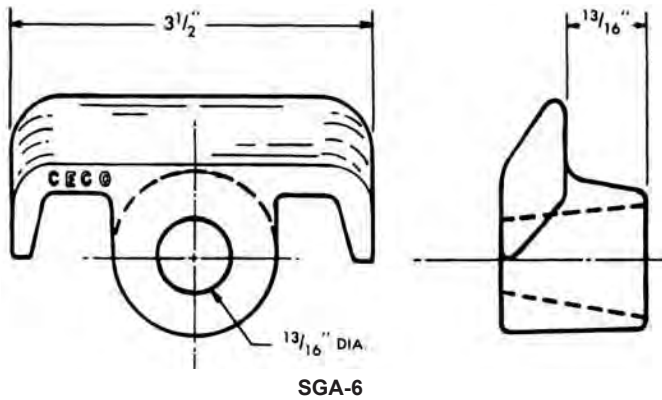
## Guy Hooks

### Material

Formed steel hot dip galvanized



Catalog Number	Steel Size	Bolt Hole Dia	45°; Ultimate Str. (lbs)	Weight /100 (lbs)
J25164	2 x 3/16	11/16	10000	113



## Guy Hooks

### Material

Ductile iron hot dip galvanized

Catalog Number	Max Wire Dia	Bolt Hole Dia	Thimble Diameter	Weight /100 (lbs)
SGA-6	1/2	5/8 or 3/4	1 1/2	54



## Guy Hooks

Two J1019 guy hooks are normally mounted on opposite sides of a pole under two turns of guy strand to prevent the strand from slipping on the pole. The rounded side of the 1/4 x 3/8" half oval steel prevents damage to the guy strand and its galvanized coating.

### Material

Steel hot dip galvanized

Catalog Number	Bolt Hole Dia	Weight /100 (lbs)
J1019	11/16	80



# Guy Attachments

## Multiple combination

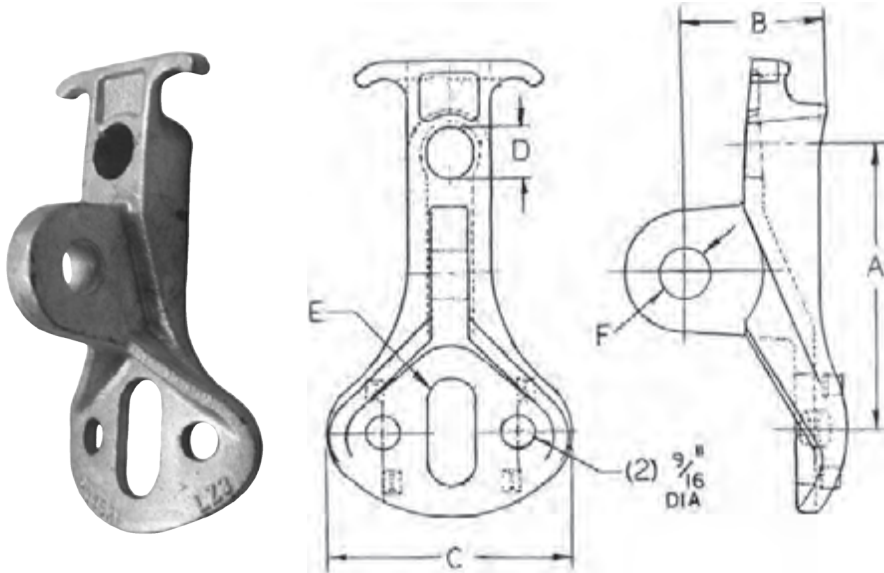
Combination type guy attachments provide flexibility to terminate guy wire or fiberglass guy strain insulators

## Features

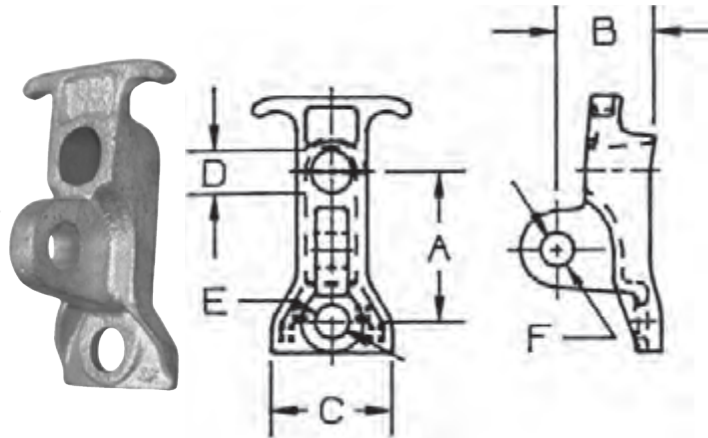
- More surface in contact with pole than other comparable guy attachments
- Greater protection to wood fibers

## Material

Ductile iron hot dip galvanized



Catalog Number	A	B	C	D	E	F	45°; Ultimate Str. (lbs)	Weight /100 (lbs)
P345A	4 1/2	2 1/8	4	13/16	7/8 x 1 3/4	13/16	21000	295



Catalog Number	A	B	C	D	E	F	45°; Ultimate Str. (lbs)	Weight /100 (lbs)
MGA-345	3	2	2 7/8	13/16	11/16	11/16	21000	145
MGA-345-N	3	2	2 7/8	13/16	11/16	11/16	21000	145
MGA-345-6	3	1 3/8	2 7/16	13/16	11/16	13/16	21000	145
MGA-345-6N	3	1 3/8	2 7/16	13/16	11/16	13/16	21000	145

### Notes:

Suffix "N" indicated no teeth and is for use on steel or concrete poles



# Guy Attachments

## Multiple Combination

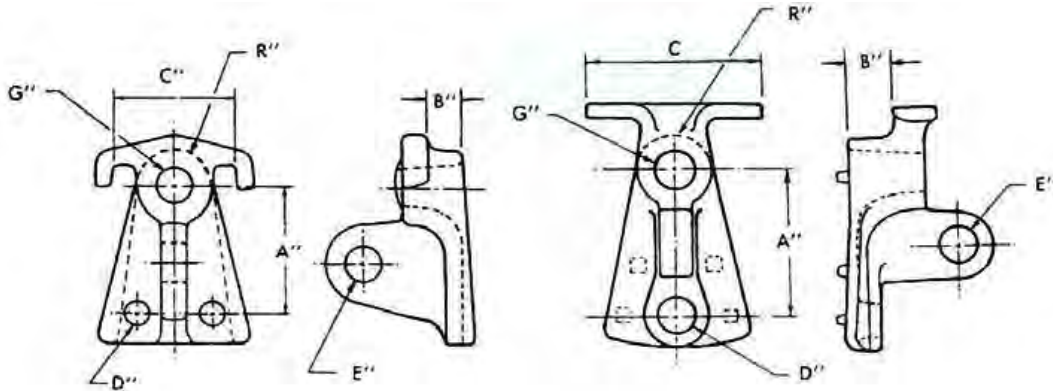
Combination type guy attachments provide flexibility to terminate guy wire or fiberglass guy strain insulators

### Features

- For use on round or flat surfaces

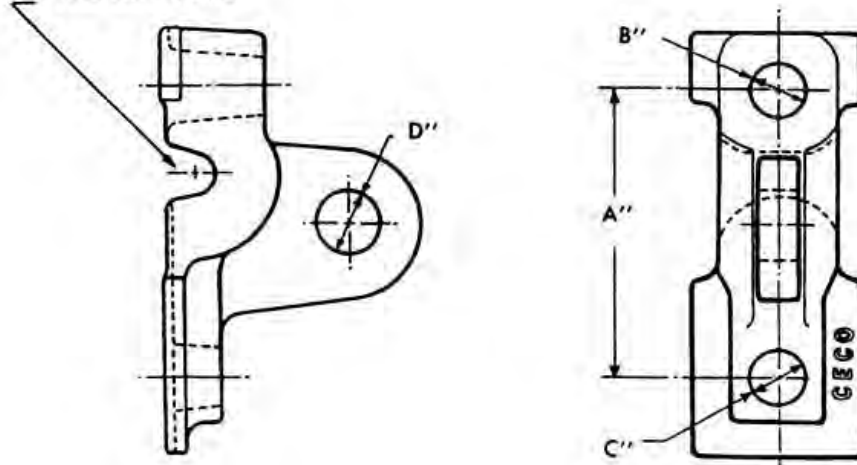
### Material

Ductile iron hot dip galvanized



Catalog Number	Fig.	A	B	C	D	E	G	R	45° Ultimate Str. (lbs)	Weight /100 (lbs)
MGA-5	1	2 7/16	5/8	2 5/8	9/16	11/16	11/16	1 3/8	15000	100
MGA-345-A	2	4	5/8	4	11/16	13/16	13/16	1 1/2	21000	275

## FOR GUY GRIPS



Catalog Number	A	B	C	D	Max Cable Dia (in)	Min Ultimate Strength (lbs)	Weight /100 (lbs)
UGA-65-3	3	13/16	11/16	11/16	7/16	15000	140
UGA-66-4	4	13/16	13/16	13/16	1/2	21000	255
UGA-66-6	6	13/16	13/16	15/16	9/16	35000	510
UGA-77-6	6	15/16	15/16	15/16	9/16	35000	510
UGA-77-7	6	15/16	15/16	15/16	9/16	35000	510
UGA-77-9	6	15/16	15/16	1 3/16	9/16	35000	510
UGA-88-8	6	1 1/16	1 1/16	1 1/16	9/16	35000	510





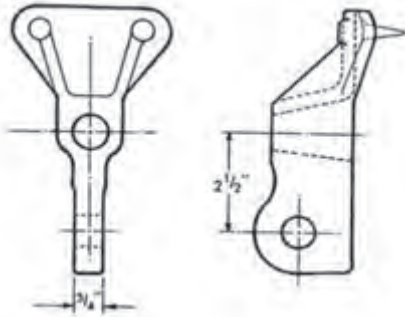
# Guy Attachments

## Pole Eye Plates

Pole eye plate attachments are used with fiberglass guy strain insulators or thimble clevises in guying or deadending applications.

### Material

Ductile iron hot dip galvanized



Catalog Number	Max Clevis Pin (in)	Mounting Bolts (in)	Angle (°)	Min Ultimate Strength (lbs)	Weight /100 (lbs)
PE-7X2	3/4	3/4 - 7/8	10 - 90	21000	350

## Pole Eye Plates

### Material

Ductile iron hot dip galvanized

Catalog Number	Fig	Max Clevis Pin (in)	Angle (°)	Min Ultimate Strength		Weight /100 (lbs)
				45°	90°	
EPR-8777	1	7/8	10 - 90	42000	36000	950
EPR8-77-D7	2	7/8	10 - 90	42000	36000	1100

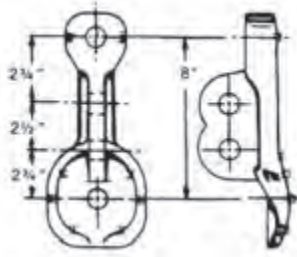
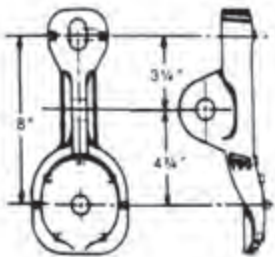


Figure 1

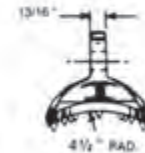


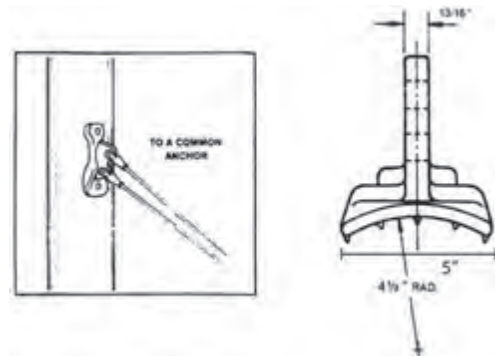
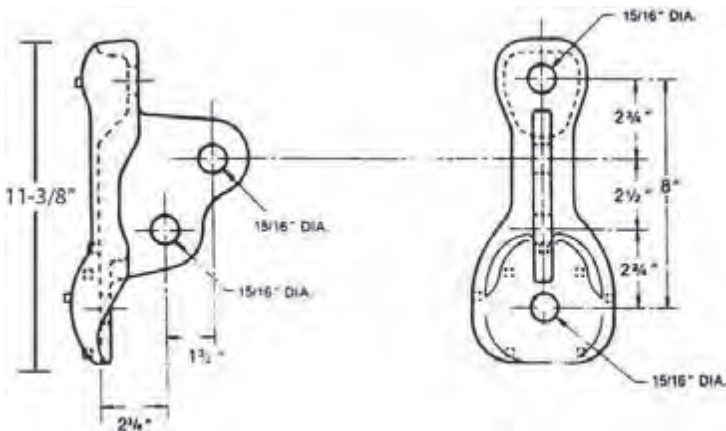
Figure 2

## Pole Eye Plates

### Material

Ductile iron hot dip galvanized

Catalog Number	Back Surface	Ratings		Maximum Pin Diameter	Weight /100 (lbs)
		45°	90°		
EPR 877-D7RE	with teeth	42000	36000	7/8	1100
EPR 877-D7RE-LT	less teeth	42000	36000	7/8	1100





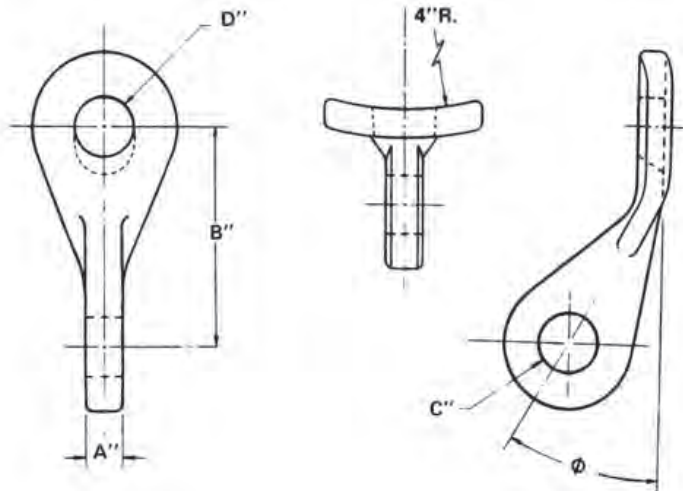
# Guy Attachments

## Pole Eye Plates

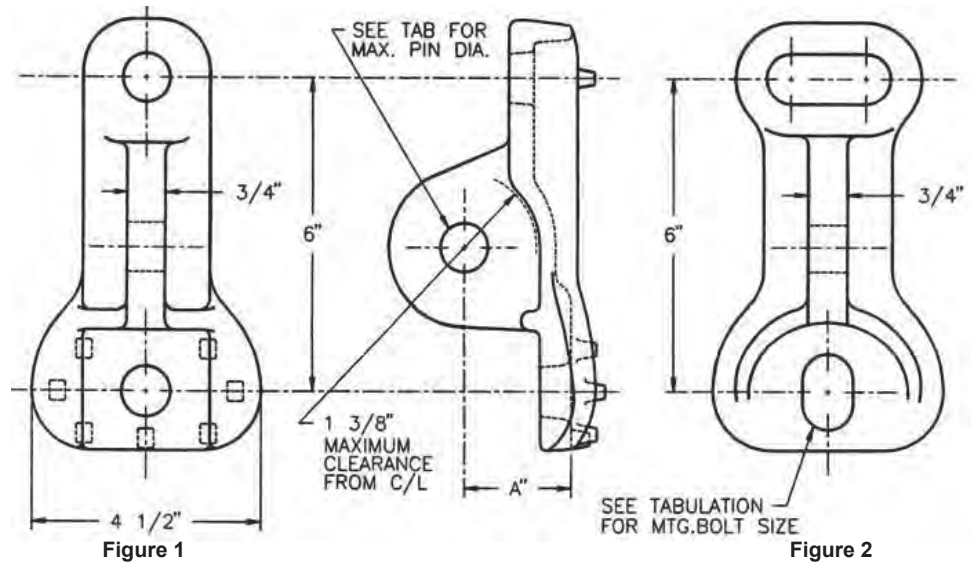
Pole eye plate attachments are used with fiberglass guy strain insulators or thimble clevises in guying or deadending applications.

### Material

Ductile iron hot dip galvanized



Catalog Number	A	B	C	D	Min Ultimate Strength (lbs)	Weight Ea (lbs)
GE-66	1/2	2 3/4	13/16	13/16	15000	1



Catalog Number	Fig	A	Max Clevis Pin (in)	Mounting Bolts	Mounting Holes		Min Ultimate Strength		Weight /100 (lbs)
					Top	Bottom	45°	90°	
EPR-66S-7	2	1 7/8	7/8	5/8 - 3/4	Slot-Horiz	Slot-Vert	36000	30000	600
EPR-66S-10	2	1 7/8	1 1/4	5/8 - 3/4	Slot-Horiz	Slot-Vert	36000	30000	600
EPR-66S-12	2	1 7/8	1 1/2	5/8 - 3/4	Slot-Horiz	Slot-Vert	36000	30000	600
EPR-77-7	1	2 1/8	7/8	3/4 - 7/8	Hole	Hole	42000	36000	600
EPR-77A-7	2	2 1/2	7/8	3/4 - 7/8	Hole	Slot-Vert	42000	36000	600
EPR-77S-7	2	1 7/8	7/8	3/4 - 7/8	Slot-Horiz	Slot-Vert	42000	36000	600
EPR-77-10	1	2 1/8	1 1/4	3/4 - 7/8	Hole	Hole	42000	36000	600

### Notes:

For attachment without cleats, add suffix "LT" to catalog number



# Guy Attachments



## Pole Eye Plates

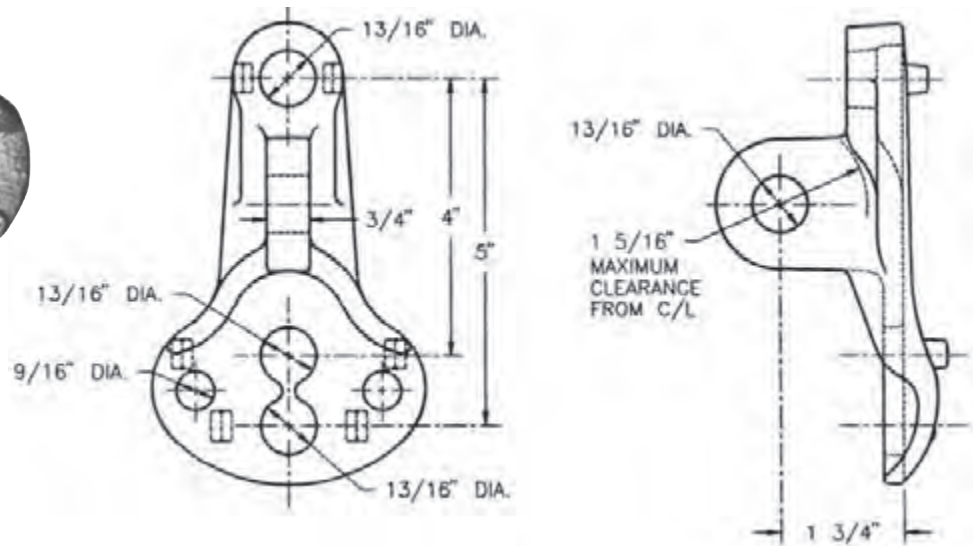
Pole eye plate attachments are used with fiberglass guy strain insulators or thimble clevises in guying or deadending applications.

### Features

- Wide variety of mounting hardware options
- Bottom mounting base will accommodate an additional 3/4" diameter through bolt or two 1/2" diameter lag screws
- Includes integral spurs to resist movement

### Material

Ductile iron hot dip galvanized

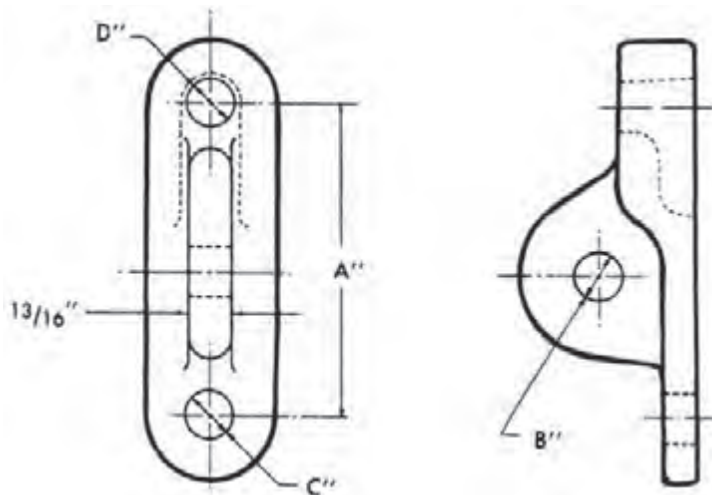


Catalog Number	Max Clevis Pin (in)	Angle (°)	Min Ultimate Strength (lbs)	Weight /100 (lbs)
PEP-66-45	3/4	10 - 90	21000	220

## Pole Eye Plates

### Material

Ductile iron hot dip galvanized



Catalog Number	A	B	C	D	Max Clevis Pin (in)	Angle (°)	Min Ultimate Strength		Weight /100 (lbs)
							45°	90°	
EPF-88-7	6	15/16	1 1/16	1 1/16	7/8	10 - 90	45000	40000	800
EPF-88-8	6	1 1/16	1 1/16	1 1/16	1	10 - 90	45000	40000	800



# Guy Attachments

## Deadend Tee

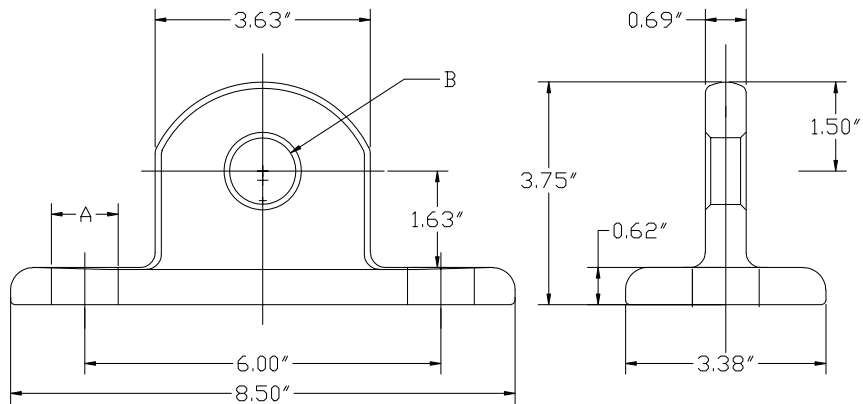


### Features:

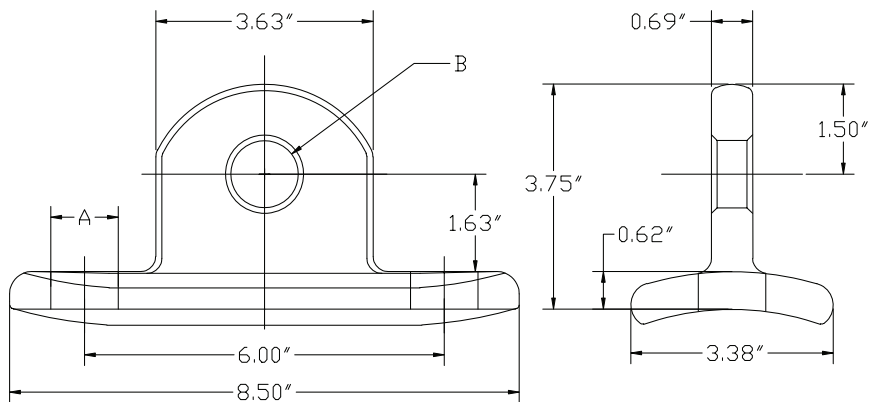
- Available with either flat mounting base (DET series) or curved mounting base (DETR series)
- Used for high strength, pole connection interface to clevises, thimble clevises, insulators, shackles and other deadend attachments.
- For use on wood, steel, concrete or fiberglass poles

### Material

Steel - Hot Dip Galvanized



Catalog Number	Dimensions		Ultimate Strength	Weight /100 lbs
	A	B		
DET60K-79	15/16"	1-1/4"	60,000	565
DET60K-88	1-1/16"	1-1/8"	60,000	565



Catalog Number	Dimensions		Ultimate Strength	Weight /100 lbs
	A	B		
DETR60K-67	13/16"	15/16"	60,000	565
DETR60K-88	1-1/16"	1-1/8"	60,000	565



# Guy Kits



## Guy Kits

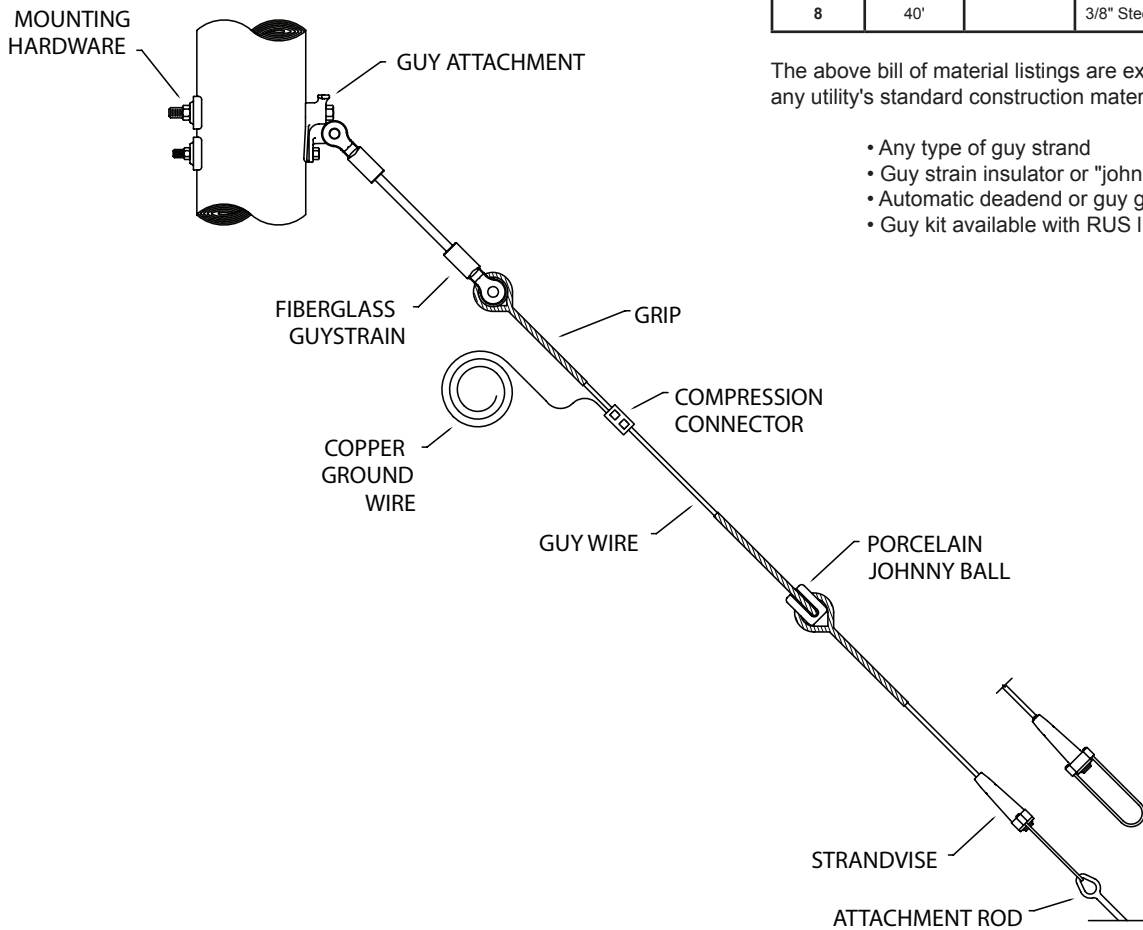
Preassembled kit of down guy materials

### SAMPLE Guy Kit Bill of Material

MPS Part Number: U105423			
Item	Qty.	Catalog Number	Description
1	1	GDE1107	Grip for 3/8" EHS
2	1	5202	Strandwise™ 3/8" EHS
3	1	PEP66-45	Pole Eye Plate
4	2	J8584	3/4" Locknut
5	2	CW467	4" x 6" Curved Washer
6	2	J8912	3/4" x 12" Machine Bolt
7	1	GCC1536R	Fiberglass Guy Strain Insulator*
8	40'		3/8" Steel EHS Guy Wire

The above bill of material listings are examples only. MPS will match any utility's standard construction materials.

- Any type of guy strand
- Guy strain insulator or "johnny ball"
- Automatic deadend or guy grip
- Guy kit available with RUS listed material



MPS can customize each guy kit to comply with local construction / material specifications, including assemblies that call for fiberglass guy strain insulators, guy grips, clevis-thimble or "johnny ball." All material is easy to handle and ready to install in one complete kit.



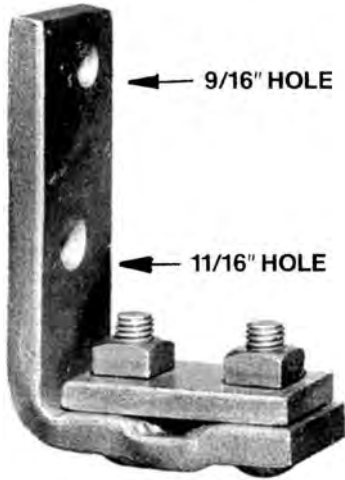
Bottom Deadend and Hardware  
Tie-Wrapped to Guy Kit



Top Deadend Pre-Assembled



# Hangers



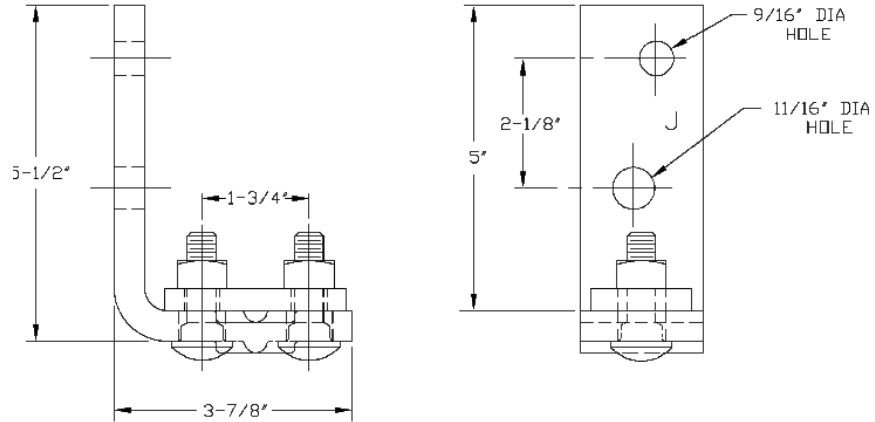
## Messenger

### Features

- Hot formed from 1/2" x 2" steel
- Specially curved groove which permits its use on corners as well as on straight runs
- Two 1/2" high carbon steel track bolts clamp the strand
- Mounting holes are 9/16" and 11/16" in diameter for a 1/2" lag screw and 5/8" through bolt

### Material

Steel hot dip galvanized



Catalog Number	Messenger Dia Range	Weight /100 (lbs)
J1070	1/4 - 3/8"	325





# Hooks



J3316P



J3318

## Service, Drop Wire

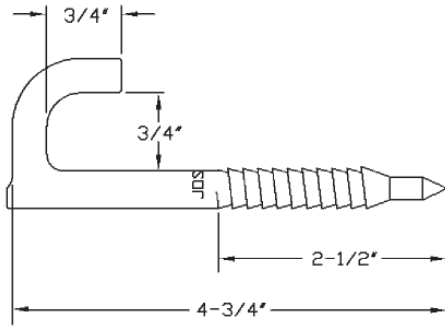
Full line of hooks for supporting bail-type drop wire and deadend clamps from poles and crossarms

### Features

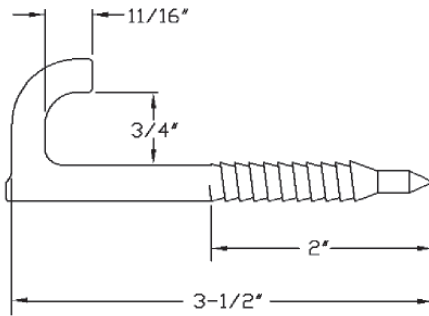
- J3316P and J3318 drive hooks have rolled fetter drive threads and a pilot point for easy starting
- J8245, complete with square nut, bolts through the side of a wood crossarm for deadending telephone services

### Material

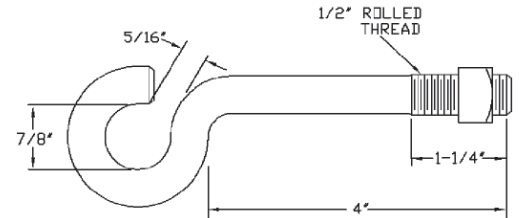
Steel hot dip galvanized



J3316P



J3318



J8245

Catalog Number	Size (in)	Weight /100 (lbs)
J3316P	7/16 x 4 3/4 FD	27.0
J3318	5/16 x 3 1/2 FD	11.6
J8245	1/2 x 5 3/4	42.0



## Service, Drop Wire

### Features

- Can be used at the pole or building end of a duplex or triplex service drop
- Breaking strength of hook exceeds 2000 lbs

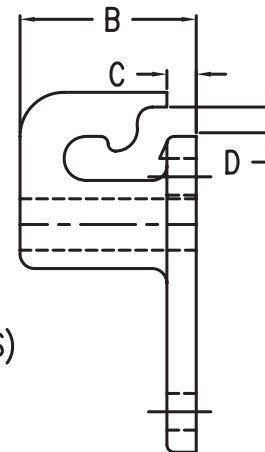
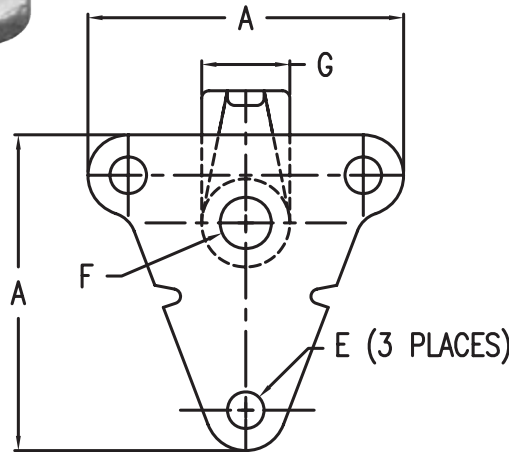
### Material

U2395:

Aluminum

U2398:

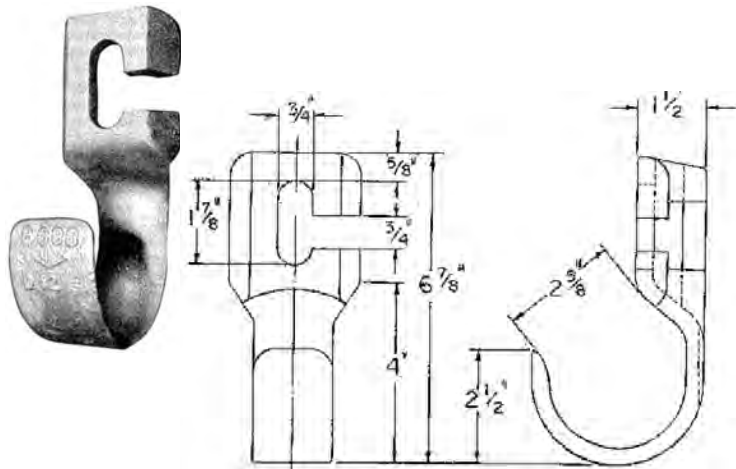
Ductile iron hot dip galvanized



Catalog Number	A	B	C	D	E	F	G	Weight /100 (lbs)
U2395	2.688	1.5	0.25	0.25	0.312	0.438	0.75	20
U2398	2.688	1.5	0.25	0.25	0.312	0.438	0.75	55



# Hooks and Insulators



## Placing, Type B

The type B placing hook is used as a stringing tool to facilitate the installation of a figure 8 cable.

### Features

- The hollow base of the hook permits installation over the nut and washer of the through bolt
- The horizontal slot of the hook allows the hook to be removed for re-use after the cable is secured to the cable suspension clamp and thru bolt
- The hook can remain installed between the pole and the cable suspension clamp

### Material

Steel hot dip galvanized

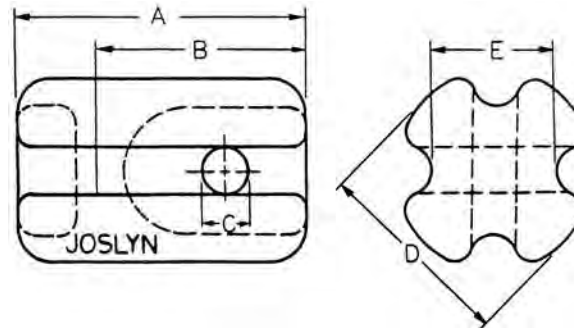
Catalog Number	Mounting Bolt Dia	Weight /100 (lbs)
P338	5/8	215



## Guy Strain

### Material

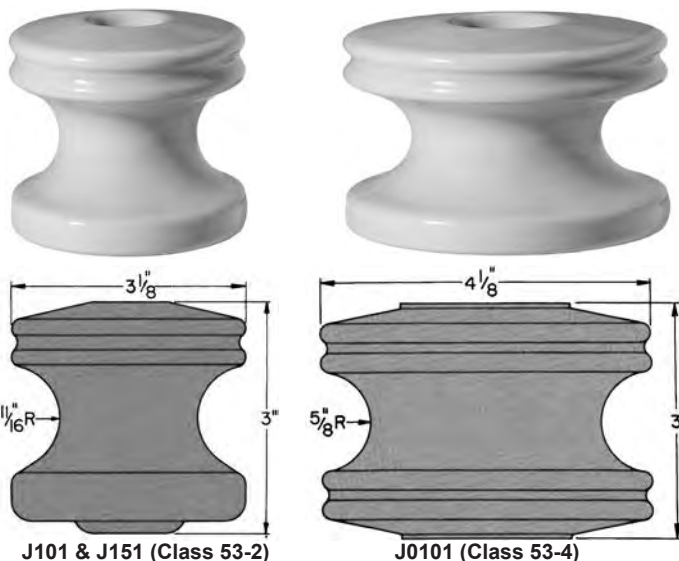
Porcelain



Catalog Number	Max Cable Dia (in)	A	B	C	D	E	Rated Ultimate Strength (lbs)	Max Work Load (lbs)	Weight /100 (lbs)
L502	3/8	3 1/2	2 5/8	5/8	2 1/2	1 3/4	10000	5000	120
L504	1/2	4 1/2	3 1/4	7/8	2 7/8	2 1/8	12000	6000	170
L506	5/8	5 1/2	4 5/16	1	3 3/8	2 3/8	20000	10000	290

### Notes:

- 1) Typical system voltage: L502 (2.2); L504 (4.4); L506 (6.6)
- 2) Horizon glaze (light gray) is standard color



## Spool

### Material

Porcelain

Catalog Number	Insulator Type	Bolt Dia (in)	Weight /100 (lbs)
J101	Dry Process	5/8	116
J151	Wet Process	5/8	120
J0101	Wet Process	5/8	256

### Notes:

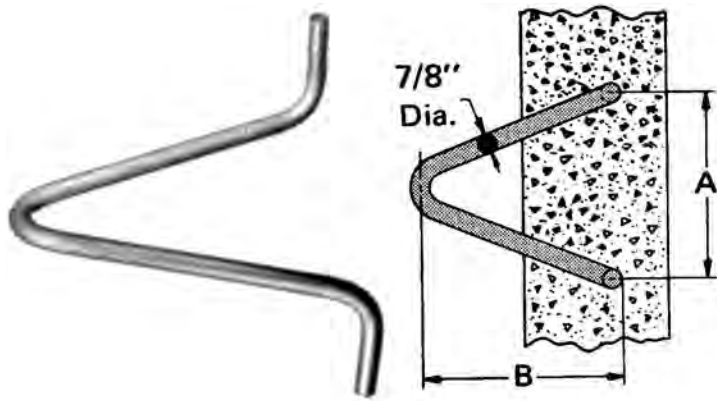
Horizon glaze (light gray) is standard color

J101 & J151 (Class 53-2)

J0101 (Class 53-4)



# Irons and Links



## Pulling-In Iron

Pulling-In irons are set into the concrete or brick walls of street vaults opposite all duct entrances to provide strong, convenient attachment for pulling-in blocks for installing or removing cables.

### Features

- Designed to straddle one brick

### Material

7/8" diameter steel hot dip galvanized

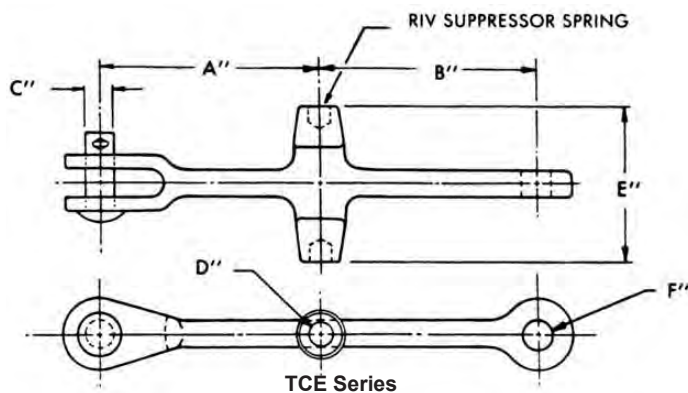
Catalog Number	A	B	Weight /100 (lbs)
J8119	8 3/8	9	490
J8120	11	13 5/16	600

## Extension Link

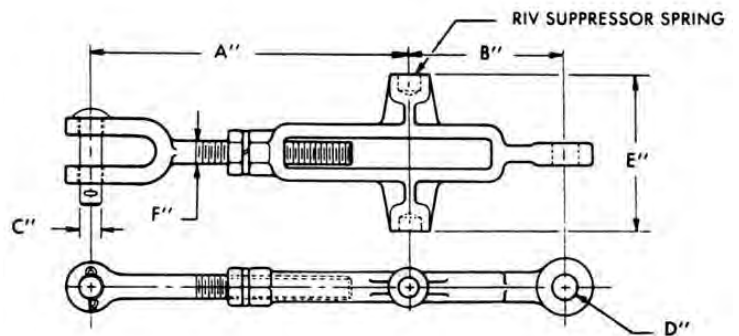
Extension links for trunnion mounting brackets are used for attachment points for deadend insulators and clamps.

### Material

Casting: Ductile iron hot dip galvanized  
 Hardware: Steel hot dip galvanized  
 Cotter Key: Stainless Steel



TCE Series



TCEA Series

Catalog Number	A	B	C	D	E	F	G	Min Ultimate Strength (lbs)	Weight /100 (lbs)
TCE-84	8	4	5/8	19/32	3 7/8	11/16	11/16	15000	300
TCE-166	16	6	5/8	19/32	3 7/8	11/16	11/16	15000	400
TCEA-84	7 - 9 1/2	4	5/8	11/16	3 7/8	3 7/8	5/8	15000	300



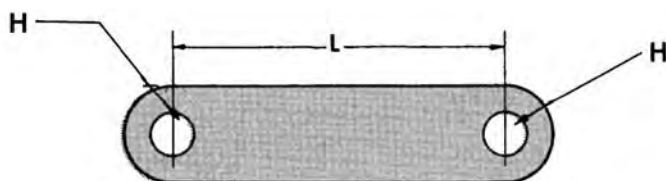
## Extension Link

### Features

Ultimate tensile strength 20,000 lbs

### Material

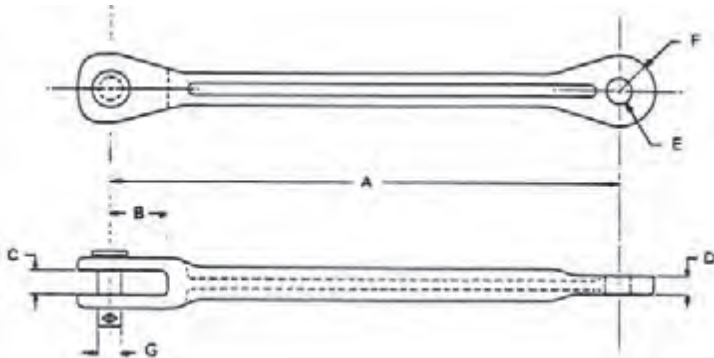
Steel hot dip galvanized



Catalog Number	Steel Size	L	H	Weight /100 (lbs)
J2520	1/2 x 1 3/4"	6	13/16	176



# Links



### Extension

Extension links provide clearance from the pole or crossarm to the insulator string at deadend installations.

### Material

Casting: Aluminum alloy  
 Hardware: Steel hot dip galvanized  
 Cotter Key: Stainless Steel

Catalog Number	A	B	C	D	E	F	G	Min Ultimate Strength (lbs)	Weight/100 (lbs)
LCE-14	14	1 1/2	11/16	1/2	11/16	31/32	5/8	12500	116



### Extension

Extension links are used at deadends and corner structures to set the insulator string out from the pole or crossarm to provide more climbing space.

Each link is made from two pieces of 1-1/2" x 3/16" steel that are fabricated, galvanized, then riveted together with a stainless steel rivet. Riveting after galvanizing assures that there is zinc between the two pieces of steel for maximum corrosion resistance.

### Features

- 3/4" clevis opening with 5/8" diameter bolt and self-locking cotter
- Eye end has 11/16" hole
- Ultimate tensile strength 13,550 lbs

### Material

Steel hot dip galvanized

Catalog Number	Hole Center to Bolt Center (in)	Weight /100 (lbs)
J6658	14	278
J6659	20	376



### Extension

Extension links provide clearance from the pole or crossarm to the insulator string at deadend installations.

### Material

Casting: Ductile iron hot dip galvanized  
 Hardware: Steel hot dip galvanized  
 Cotter Key: Stainless Steel

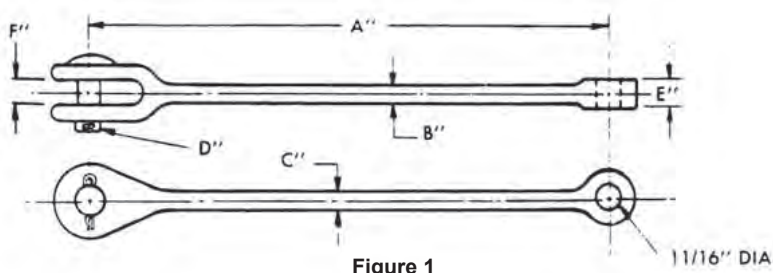


Figure 1

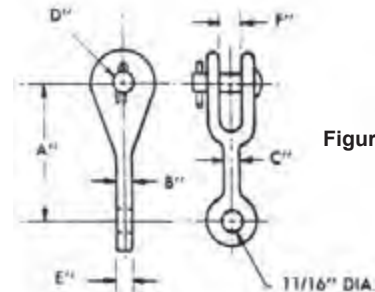


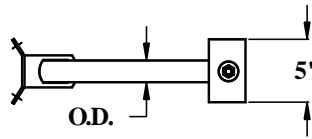
Figure 2

Catalog Number	Fig	A	B	C	D	E	F	Min Ultimate Strength (lbs)	Weight/100 (lbs)
CEL 10	1	10	1/2	5/8	5/8	9/16	11/16	15000	150
CEL 12	1	12	1/2	5/8	5/8	9/16	11/16	15000	155
CEL 14	1	14	9/16	5/8	5/8	5/8	11/16	15000	175
CEL90 4	2	4	9/16	9/16	5/8	5/8	11/16	15000	125



# Mast Arms

## Mast Arm, Floodlight, Wood Pole Mounting



### Features

- 3/8" grounding hardware included

### Material

Steel hot dip galvanized

Catalog Number	OD (in)	L1	R	Weight Ea (lbs)
S-2-1.5F	2.38	18	14	11.1
S-2-1.67F	2.38	20	14	12.0
S-2-2F	2.38	24	14	12.8
S-2-2.5F	2.38	30	14	14.1

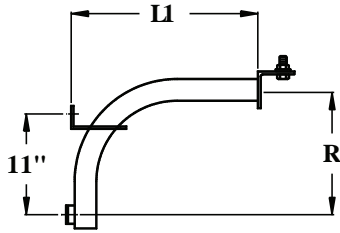
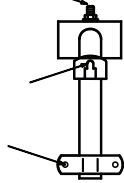
### Notes:

2.38" OD equals 2" IPS

3/4"x 1-1/2"  
MOUNTING  
HARDWARE

11/16" KEYHOLE

9/16" Ø HOLES



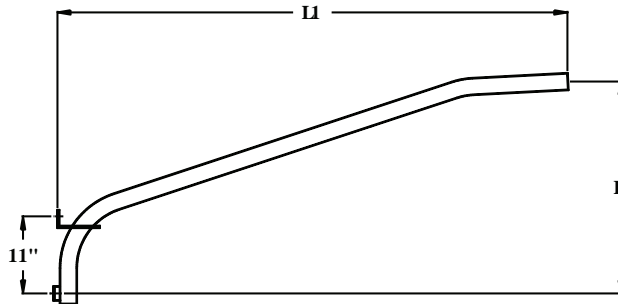
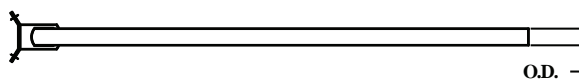
## Mast Arm, Wood Pole Mounting

### Features

- 3/8" grounding hardware included

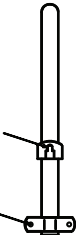
### Material

Steel hot dip galvanized or aluminum



11/16" KEYHOLE

9/16" Ø HOLES



Catalog Number	Material	OD (in)	L1	R	Weight Ea (lbs)
S-125-2G	Steel	1.66	24	18	9.0
S-125-2.5G	Steel	1.66	30	18	10.0
S-2-2.5G	Steel	2.38	30	18	13.0
S-125-4G	Steel	1.66	42	18	12.0
S-125-6G	Steel	1.66	66	30	15.5
S-2-6G	Steel	2.38	66	30	21.5
S-125-8G	Steel	1.66	90	42	19.5
S-2-8G	Steel	2.38	90	42	27.0
A-2-6G	Aluminum	2.38	66	30	11.0
A-2-8G	Aluminum	2.38	90	42	14.0

### Notes:

- 1) 1.66" OD equals 1 1/4" IPS
- 2) 2.38" OD equals 2" IPS



# Mast Arms

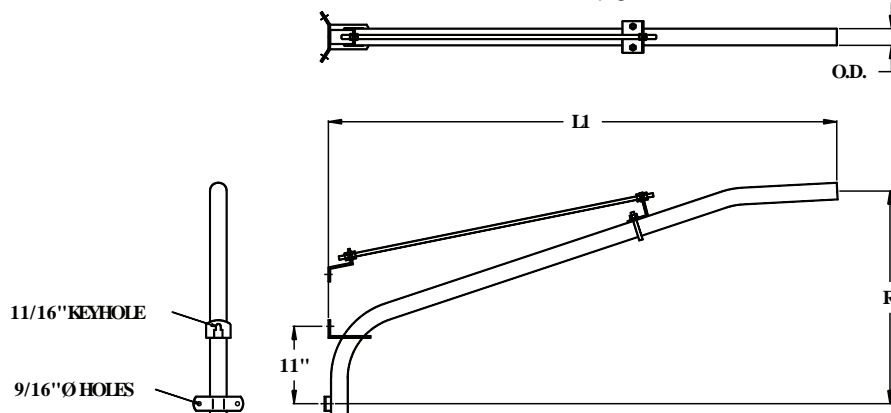
## Mast Arm, Wood Pole Mounting

### Features

- 3/8" grounding hardware included

### Material

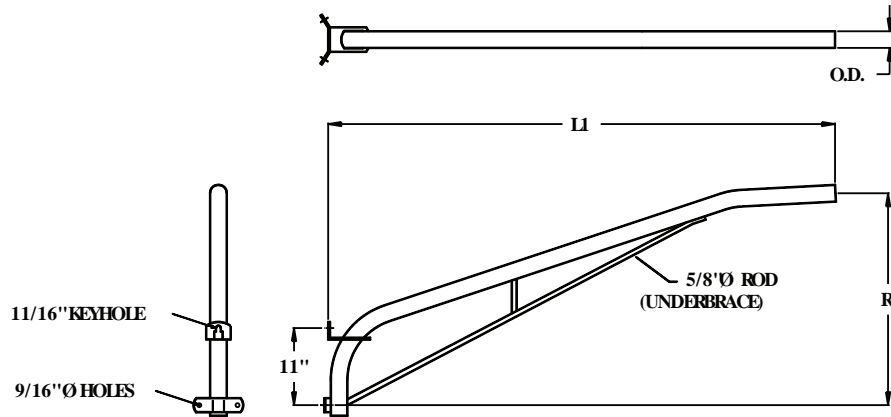
Steel hot dip galvanized



Catalog Number	Material	OD (in)	L1	R	Weight Ea (lbs)
S-125-6SG	Steel	1.66	66	30	21.3
S-125-8SG	Steel	1.66	90	42	25
S-2-8SG	Steel	2.38	90	42	32.4
S-125-10SG	Steel	1.66	114	48	30
S-2-10SG	Steel	2.38	114	48	39
S-125-12SG	Steel	1.66	138	60	35.5

### Notes:

- 1) 1.66" OD equals 1 1/4" IPS
- 2) 2.38" OD equals 2" IPS



Catalog Number	Material	OD (in)	L1	R	Weight Ea (lbs)
S-125-8UB	Steel	1.66	90	42	29.1

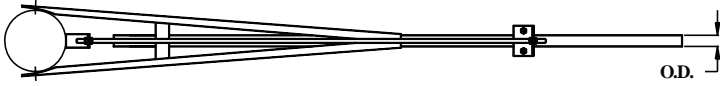
### Notes:

- 1) 1.66" OD equals 1 1/4" IPS
- 2) 2.38" OD equals 2" IPS





# Mast Arms



## Mast Arm, Wood Pole Mounting

### Features

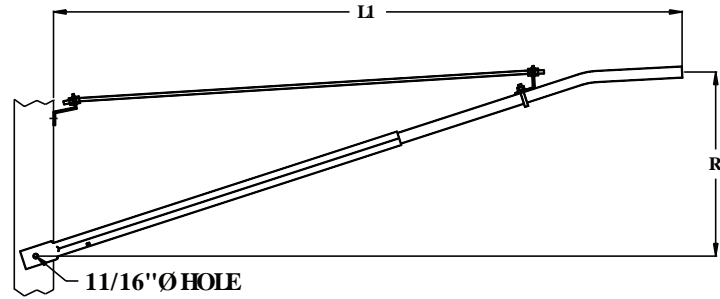
- 3/8" grounding hardware included

### Material

Steel hot dip galvanized

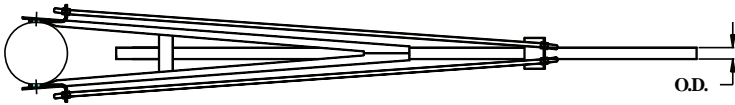
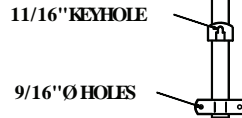
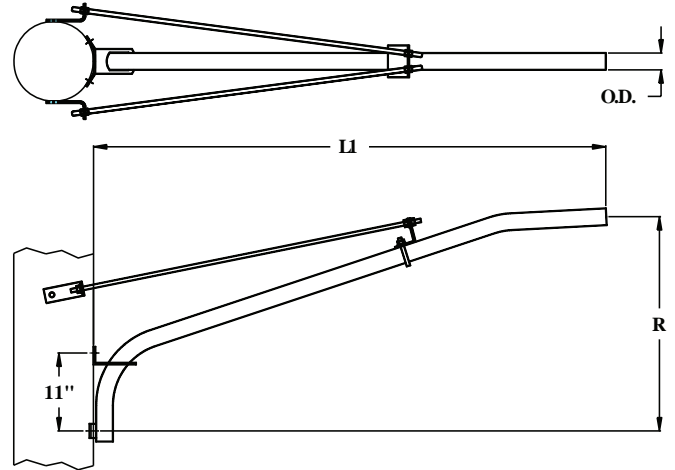
Catalog Number	Material	OD (in)	L1	R	Weight Ea (lbs)
S-125-10ASG	Steel	1.66	114	32	42.4
S-125-12ASG	Steel	1.66	138	40	48.9
S-125-16ASG	Steel	1.66	186	58	70.6
S-125-18ASG	Steel	1.66	210	62	72

Notes:  
1) 1.66" OD equals 1 1/4" IPS



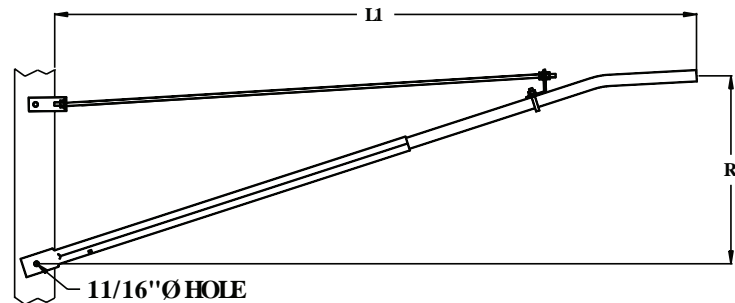
Catalog Number	Material	OD (in)	L1	R	Weight Ea (lbs)
S-125-10DG	Steel	1.66	114	48	37
S-125-12DG	Steel	1.66	138	60	43.9
S-2-12DG	Steel	2.38	186	60	54.8
S-125-14DG	Steel	1.66	162	60	50
S-2-16DG	Steel	2.38	186	72	70.7

Notes:  
1) 1.66" OD equals 1 1/4" IPS  
2) 2.38" OD equals 2" IPS



Catalog Number	Material	OD (in)	L1	R	Weight Ea (lbs)
S-2-14ADG	Steel	2.38	162	47	79
S-2-20ADG	Steel	2.38	234	67	105

Notes:  
1) 2.38" OD equals 2" IPS





## Nails

### Material

Steel hot dip galvanized

Catalog Number	Size	Length (in)	Diameter (in)	Weight/100 (lbs)
J810	10D	3	.144	1.5
J816	16D	3 1/2	.162	2.3



31- Series



51-; 53-; 55- Series

## Nicopress Tools

The "Nicopress" trademark refers to products designed and manufactured by the National Telephone Supply Co.

Nicopress installing tools are designed to quickly and easily compress the appropriate Nicopress sleeve.

### Features

- Shipped with detailed instructions showing proper tool operation and adjustment
- Tools and sleeves are marked for easy field identification

### 31- Series Tools

- Used principally for the splicing of communication sizes of line wire
- Available in two combinations of compression grooves C, D, J
- Popular groove combinations are DJ and CJ

### 51-ORANGE; 51-PEACH; 51-PLUM Tools

- Must be used when splicing ACSR with separate core and cover sleeves
- Single sleeves for ACSR can be compressed in the front groove of the above tools

### 53-XPJ Tool

- 3-groove tool
- Will accommodate any Nicopress item with a letter ending in X, P, J

### 55-PLUM:ORANGE Tool

- Recommended for single sleeve because of its broader coverage

Catalog Number	Tool Groove	Weight Ea (lbs)
31-CJ	C, J	2.2
31-DJ	D, J	2.2
51-ORANGE	Orange	6.4
51-PEACH	Peach	6.4
51-PLUM	Plum	6.5
53-XPJ	J, P, X	4.8
55-PLUM:ORANGE	Plum, Orange	4.9



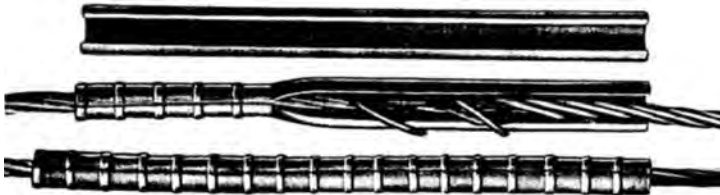
### Nicotaps®

Nicotaps® are used principally in the communication field for making line and drop wire taps

#### Features

- Have a split section permitting installation without cutting line wire
- Connection is permanent and insures a trouble-free wire tap

Nicotap® sleeves for solid copper and Copperweld				
Catalog Number	Conductor Size (AWG)	Tool Groove	Length (in)	Weight /100 (lbs)
T1-064C	14 - 14	C	2 3/4	2.3
T1-080C	12 - 12	C	2 3/4	2.1
T1-162X102J	6 - 10	J	3	6.4
T1-162J	6 - 6	J	3	5.3
T1-204P	4 - 4	P	3 1/2	12.0



### Repair Sleeves (Split Type)

Nicopress repair sleeves (split type) are for use on stranded conductors where some of the strands are damaged or broken

#### Features

- Installation restores the strength and conductivity of the conductor
- Split feature eliminates any necessity of cutting and resplicing the line
- Also used as a seat for hot line clamps

For Copperweld and copper composite				
Catalog Number	Conductor Size (AWG)	Tool Groove	Length (in)	Weight /100 (lbs)
R1-8A-P	8A	P	4	13.5
R1-6A-P	6A	P	4	12.0

For ACSR and AAAC				
Catalog Number	Conductor Size (AWG)	Tool Groove	Length (in)	Weight /100 (lbs)
AR4-3ORANGE	4 (6/1, 7/1)	Orange	12	20.0
AR2-1PEACH	2 (6/1, 7/1)	Peach	12	23.1
AR2-1PLUM	2 (6/1, 7/1)	Plum	12	26.5
AR1/0PLUM	1/0 (6/1)	Plum	12	27.2
AR4/0-75A	4/0 (6/1)	75AS	12	55.0



## Splicing Sleeves

Nicopress splicing sleeves are used to splice a wide range of conductors which include copper, copper covered steel. Each sleeve is marked with catalog number, conductor size and installation tool groove

### Features

- Utilize the compression method and should be considered when requirements call for an economical method of splicing and deadending communications and power conductors
- Nicopress installing tools, which are also available, are designed to quickly and easily compress the appropriate Nicopress sleeve
- Nicopress sleeves may also be compressed with installing tools of other manufacturers

**For solid copper conductor**

Catalog Number	Conductor Size (AWG)	Tool Groove	Length (in)	Weight /100 (lbs)
3-045B	17, 18, 19	B	1 1/8	0.3
1-080C	12	C	1 1/2	1.2
1-162J	6	J	2 1/4	3.5
1-229P	3	P	3	8.5
1-325/7F6	2/0	F6	7 1/4	48.3

**For stranded copper conductor**

Catalog Number	Conductor Size (AWG)	Tool Groove	Length (in)	Weight /100 (lbs)
1-204/7P	4 (7 WIRE)	P	2 3/4	8.3
1-258/7X	2 (7 WIRE)	X	3	12.6
1-258/3X	2 (3 WIRE) 1 (7, 19 WIRE)	X	3 1/4	15.2
1-460/7H5	4/0 (7/19 WIRE)	H5	7 1/4	81.3

**For solid or stranded copper conductor**

Catalog Number	Conductor Size (AWG)	Tool Groove	Length (in)	Weight /100 (lbs)
1-128J	8, 8 (7 WIRE)	J	2	3.9
1-162/7J	5, 6 (7 WIRE)	J	2 1/4	3.5
1-204P	4, 6 (3 WIRE)	P	2 3/4	8.2
1-258X	2, 4 (3 WIRE)	X	3	14.6
1-289X	1, 3 (3 WIRE)	X	3	13.0

**For stranded Copperweld or Copperweld composite conductor**

Catalog Number	Conductor Size (AWG)	Tool Groove	Length (in)	Weight /100 (lbs)
1-3/081P	3 NO. 10, 9 1/2 D	P	3 1/4	13.2

**For solid Copperweld conductor**

Catalog Number	Conductor Size (AWG)	Tool Groove	Length (in)	Weight /100 (lbs)
1-162P	6	P	3	11.5

**For stranded Copperweld conductor**

Catalog Number	Conductor Size (AWG)	Tool Groove	Length (in)	Weight /100 (lbs)
1-3/102X	3 NO. 10	X	4 1/2	24.9

**For Copperweld composite conductor**

Catalog Number	Conductor Size (AWG)	Tool Groove	Length (in)	Weight /100 (lbs)
1-4A-X	4A	X	5 3/4	26.9
1-6A-P	6A or 6C	P	5 1/2	17.3
1-8A-P	8A	P	5	17.8
3-2A-F6	2A	F6	7	41.3
3-8D-P	8D	P	4 3/4	16.0

**For stranded all aluminum conductor**

Catalog Number	Conductor Size (AWG)	Tool Groove	Length (in)	Weight /100 (lbs)
AL4STR-P	4	P	2 3/4	3.5
AL2STR-X	2	X	3 1/4	5.4

**For ACSR and AAAC stranded conductor**

Catalog Number	Conductor Size (AWG)	Tool Groove	Length (in)	Weight /100 (lbs)
661P	6 (6/1)	P	9	10.4
1061PLUM	1/0 (6/1)	Plum	16 1/2	43.3
467ORANGE	4 (6/1, 7/1)	Orange	14	27.2

**For partial tension for ACSR conductor**

Catalog Number	Conductor Size (AWG)	Tool Groove	Length (in)	Weight /100 (lbs)
1704P	4 (6/1, 7/1)	P	3 1/4	3.6
1706P	6 (6/1)	P	3 1/4	4.0
1702X	2 (6/1)	X	3 1/4	5.4

**Reducing Sleeves for solid copper and Copperweld**

Catalog Number	Conductor Size (AWG)	Tool Groove	Length (in)	Weight /100 (lbs)
1-162X128J	6 - 8	J	2	3.6
1-204X162P	4 - 6	P	3	10.4
1-258X204X	2 - 4	X	2 1/2	12.2



# Nuts



## Concave MF Locknuts

When the arched surface contacts the top of the common nut or bearing surface, wrenching flattens the arch, deflecting the nut threads from their true helix and causing them to firmly grip the bolt threads. The nut takes a permanent set and must be wrenched for further movement.

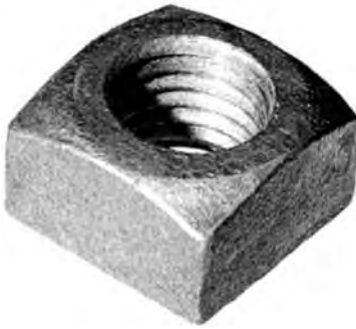
### Features

- Free-spinning square locknut that starts freely from either side and spins into place with fingers
- 1/2 to a full turn with a wrench will lock it securely

### Material

Steel hot dip galvanized

Catalog Number	Bolt Dia (in)	Weight / 100 (lbs)
J8581	3/8"	1.3
J8582	1/2"	2.4
J8583	5/8"	4.2
J8584	3/4"	5.4
J8584-1/2	7/8"	8.1



## Square

Manufactured in accordance with ANSI Specifications B18.2.2 and tapped Unified National Coarse Threads Series Class 2B after centrifugal hot dip galvanizing, oversize for galvanized bolts and rods.

### Features

- Considered safest to use by utility linemen
- Large wrenching surface
- Regular nuts are used on all types of threaded bolts and insulator pins
- Heavy nuts are used exclusively on anchor rods

### Material

Steel hot dip galvanized

Regular Square		
Catalog Number	Bolt Dia (in)	Weight/ 100 (lbs)
J8561	3/8"	2.2
J8562	1/2"	5.4
J8563	5/8"	10.2
J8564	3/4"	13.8
J8564-1/2	7/8"	24.3

Heavy Square - For Anchor Rods Only		
Catalog Number	Anchor Rod Dia (in)	Weight/ 100 (lbs)
J8563-1	5/8	12.2
J8564-1	3/4	20.8
J8565-1	1	50.0

## Washer

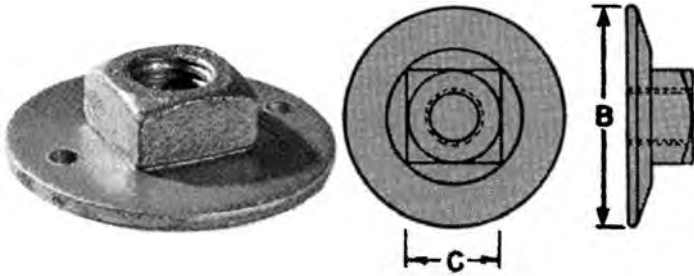
### Features

- Washer nuts combine a square nut and large round washer in a static proof, one-piece, resistance welded washer/nut design
- Two 7/32" holes are provided in the design to accommodate nails which will resist loosening of the washer nut due to vibration

### Material

Steel hot dip galvanized

Catalog Number	Thread Size (in)	B	C	Weight/ 100 (lbs)
J9802	5/8	2 1/2	1	29.0
J9803	3/4	3	1 1/8	49.0





## Pins



### Nylon Alloy Thread Type Pins

MacLean Power Systems Z-series insulator pins were developed to address environmental concerns associated with the manufacture, handling, and disposal of lead thread pins. Insulator threads for Z-series pins are produced from an advanced J.E.M.® (Joslyn Engineered Material) nylon alloy compound. The J.E.M.® material is a special nylon alloy blend to assure proper electrical and mechanical performance. The threads are flexible, yet more resilient than lead, offering superior insulator fit and conductor groove alignment. MPS nylon alloy thread type pins are available for 1" and 1 3/8" pin type insulator thread sizes.

MPS Z-series pins exceed the performance requirements of ANSI C135.22 specifications for lead thread pins. In addition to the ANSI requirements, MPS Z-series pins have been subjected to an extensive battery of tests to assure long-term performance in severe service conditions. The additional tests include:

- horizontal fatigue
- aeolian vibration
- corona
- ultraviolet
- cold temperature impact



### Lead Thread Type Pins

MacLean Power Systems lead threads are available for 1" and 1 3/8" pin type insulator thread sizes. The lead threads are tightly bonded to forged crossarm pins and formed steel pole top pins through a process of casting the lead-antimony alloy directly to the pin. A raised ring of lead at the top of the thread minimizes strains from developing when the insulator is tightened.

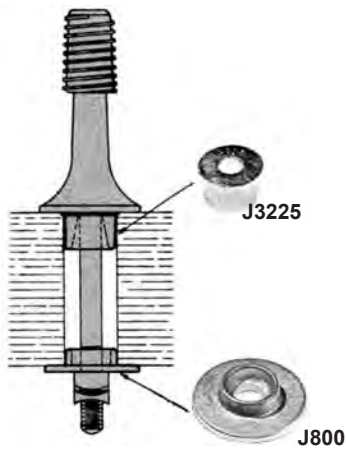
The threads comply to ANSI standards for dimensional and performance requirements.

The lead threads on the pins are shipped with an assembled cardboard protective sleeve to prevent damage to the threads during transit and handling.





# Pins



## Adapters, Pin Hole

Pin hole adapters or centering washers are used with 5/8" diameter shank steel pins on wood crossarms previously drilled with 1 1/2" holes for wood pins.

### Features

- Adapter top is placed in the top of the pin hole and is held in place by a circular rim at the top
- Bottom adapter is placed in the bottom of the pin hole to center the pin shank and provide a firm bearing surface for the nut

### Material

Steel hot dip galvanized

Catalog Number	Type	Pin Dia	OD	Thickness (in)	Weight/100 (lbs)
J3225	Top	5/8	1 11/16	1 11/16	31.5
J800	Bottom	5/8	2 3/4	5/8	37.5

## Angle Crossarm

Angle pin brackets can be used for angle construction on crossarms or mounted on the side of poles.

### Features

- Mount with a 5/8" diameter machine bolt
- Pin base is flat for mounting to either a pole or crossarm
- Angle crossarm pins have a smooth base on the bottom for mounting on wood or fiberglass arms

### Material

Pin Body: Ductile iron hot dip galvanized  
Threads: Nylon alloy or lead

Catalog Number	Thread Material	Insulator Thread (in)	A	B	C	Weight/100 (lbs)
P400Z	Nylon Alloy	1	6	4 1/8	4	320
P400	Lead	1	6	4 1/8	4	325
PA400Z	Nylon Alloy	1	6	4 1/8	4	453
PA400	Lead	1	6	4 1/8	4	458
PA401AZ	Nylon Alloy	1 3/8	8	4 1/2	4	595
PA401A	Lead	1 3/8	8	4 1/2	4	600
P402Z	Nylon Alloy	1	8	4 1/2	4	536
PA402Z	Nylon Alloy	1	8	4 1/2	4	600

### Notes:

- 1) PA Series include: 5/8" x 7" machine bolt; 5/8" square nut; 5/8" MF locknut; and square flat washers

## Angle Crossarm

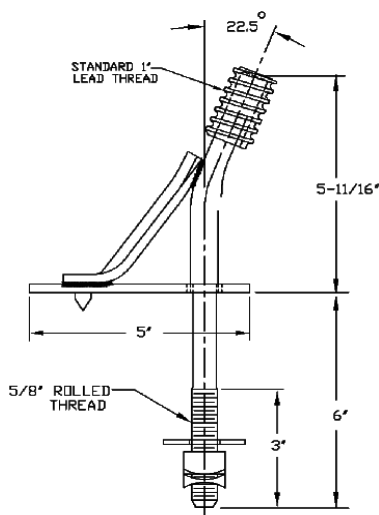
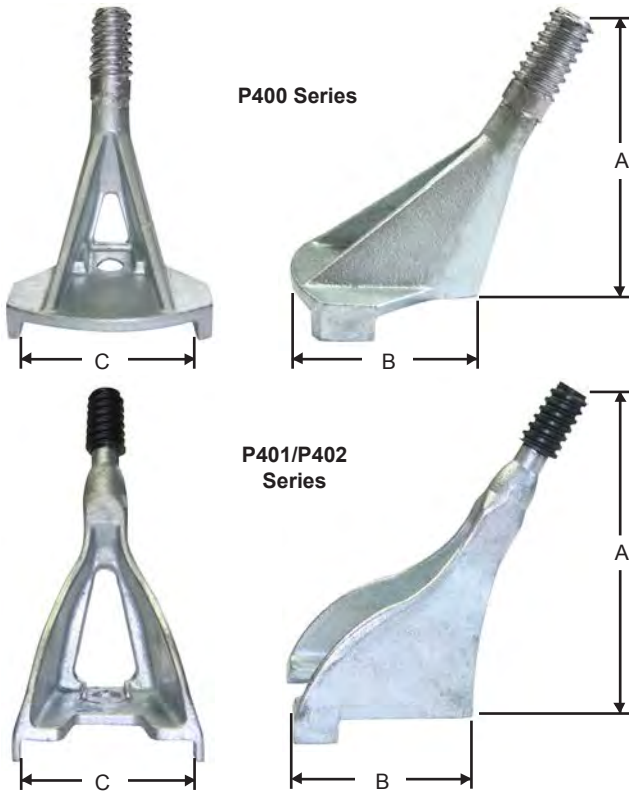
### Features

- Designed for use on slight angles on rural lines
- Reinforced with a 1/4" x 1 1/4" welded brace and 3/16" x 3" x 5" welded base plate
- Spike is included on the bottom to resist movement

### Material

Pin Body: Steel hot dip galvanized  
Threads: Lead

Catalog Number	Thread Material	Insulator Thread (in)	Angle (°)	Weight/100 (lbs)
J215	Lead	1	22.5	336





# Pins



## Angle Pole Top

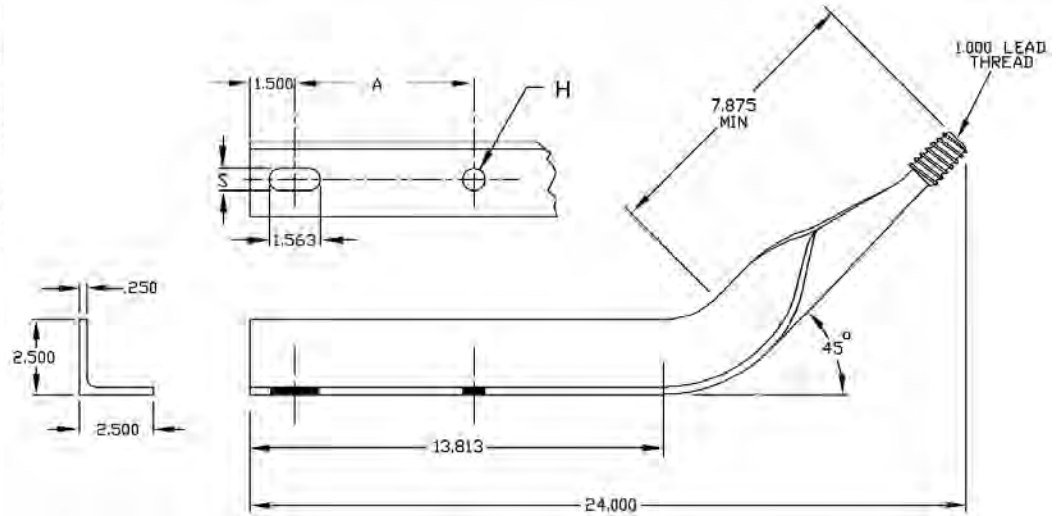
Designed to be mounted on the side of the pole top for angle construction application.

### Features

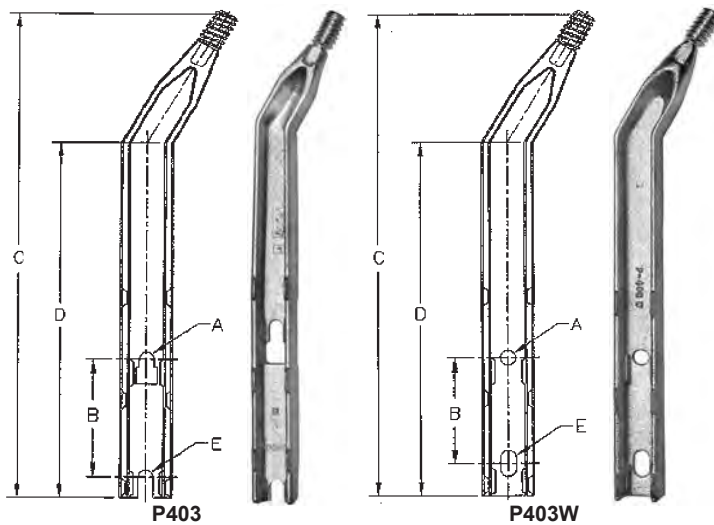
- Withstand angle loads up to 2250 lbs

### Material

Pin Body: Steel angle hot dip galvanized  
 Threads: Lead



Catalog Number	Insulator Thread (in)	A	Slot Size	Hole Dia	Weight/ 100 (lbs)
J26837	1	6	11/16	11/16	863
J26944	1	8	13/16	13/16	863



## Angle Pole Top

### Features

- Formed on a 30° angle
- Include integral spikes for stability for angle construction
- Withstand angle loads up to 2400 lbs

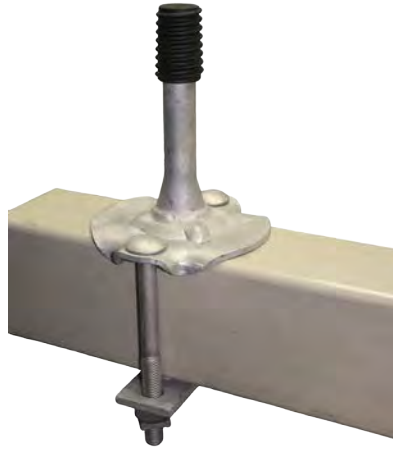
### Material

Pin Body: Ductile iron hot dip galvanized  
 Threads: Lead

Catalog Number	Insulator Thread (in)	A	B	C	D	E	Weight/ 100 (lbs)
P403	1	11/16	8	24	18 1/2	11/16 x 1 1/8	1090
P403W	1	11/16	5	22	16 3/4	11/16 x 1 1/4	900



# Pins



## Clamp, Wide Base

The Z-series clamp pins are installed to encircle the crossarm and the broad base distributes the load and eliminates the need for drilled crossarm holes.

### Features

- Nylon insulator threads permanently molded to the pin body
- Manufactured with a forged pin body securely welded to wide base
- Furnished with two 5/8 x 7" carriage bolts and a clamping plate with two raised prosection on one side to resist movement. Clamp plate could be reversed for use on fiberglass arms.

### Material

Pin body: Steel hot dip galvanized  
Threads: Nylon alloy

Catalog Number	Insulator Thread (in)	Crossarm Size (in)	Height Above Arm (in)	Weight/100 (lbs)
J3322Z	1	3 3/4 x 4 3/4	6	495
J3324Z	1 3/8	3 3/4 x 4 3/4	7	553

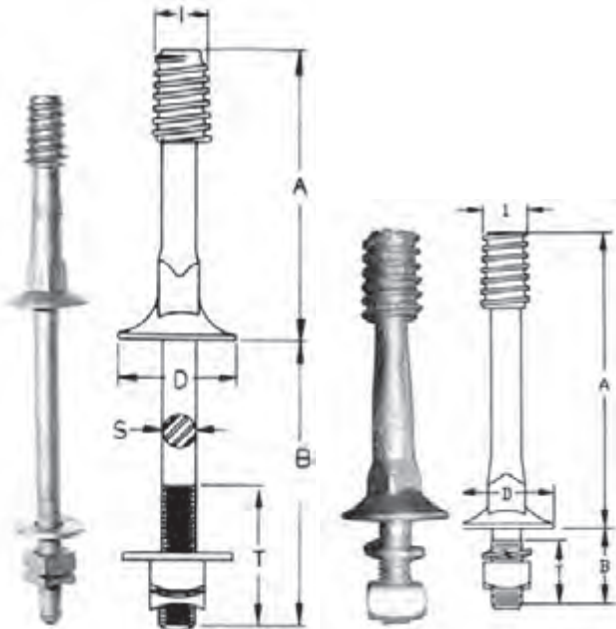
## Crossarm

### Features

- Crossarm pins are forged in one piece from alloy steel
- Large bases distribute loads without crushing flat wood crossarms
- Square wrenching shoulder is provided above the base for rotating the insulator groove into position
- Long shank pins are supplied with a square washer, square nut and MF concave lockwasher
- Short shank pins are supplied with a split coil lockwasher and square nut
- 1" ANSI standard nylon alloy threads for pin type insulators
- Furnished with insulator threads produced from J.E.M. (Joslyn Engineered Material) nylon alloy compound

### Material

Pin Body: Steel hot dip galvanized  
Threads: Nylon alloy



Long Shank Pins

Short Shank Pins

Long Shank								
Catalog Number	Thread Material	A	B	D	S	T	Washer (sq in)	Weight/100 (lbs)
J203Z	Nylon Alloy	5	5 3/4	2	5/8	4	2	138
J204Z	Nylon Alloy	5	6 1/2	2	5/8	4	2	144
J2802Z	Nylon Alloy	5	8	2	5/8	4	1 3/4 (round)	157
J206Z	Nylon Alloy	6	5 3/4	2	5/8	2 3/4	2	147
J207Z	Nylon Alloy	6	6 1/2	2	5/8	3	2	151
JP40581Z	Nylon Alloy	6	7 1/2	2	5/8	3 1/4	2	200
J211Z	Nylon Alloy	6	6 1/2	2	3/4	3 1/4	2 1/4	232
J22267Z	Nylon Alloy	6	8	2	3/4	4 1/2	2 1/4	276

Short Shank							
Catalog Number	Thread Material	A	B	D	S	T	Weight/100 (lbs)
J221Z	Nylon Alloy	5	1 1/2	2	5/8	1 3/8	126
J222Z	Nylon Alloy	6	2 1/2	2	5/8	2 3/8	104
J224Z	Nylon Alloy	6	1 3/4	2	3/4	1 5/8	160
J24365Z	Nylon Alloy	7	2 1/2	2	3/4	2 3/8	196



# Pins



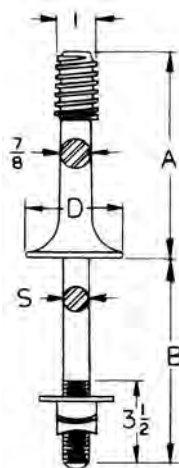
## Crossarm

### Features

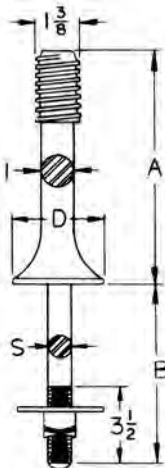
- Crossarm pins are forged in one piece from alloy steel
- Large bases distribute loads without crushing flat wood crossarms
- Short shank pins used on steel crossarms while long shank pins used on wood crossarms
- Long shank pins are supplied with a square washer, square nut and MF concave lockwasher
- Short shank pins are supplied with a split coil lockwasher and a square nut
- ANSI standard nylon alloy or cast lead threads for pin type insulators
- Pins with "Z" suffix furnished with insulator threads produced from J.E.M. (Joslyn Engineered Material) nylon alloy compound

### Material

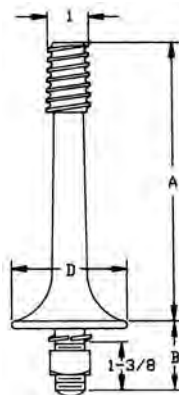
Pin Body: Steel hot dip galvanized  
 Threads: Nylon alloy or lead



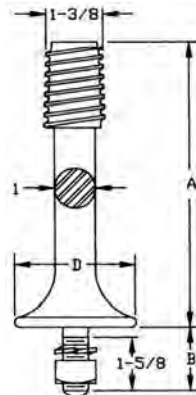
Long Shank Steel Pin with 1" Insulator Thread



Long Shank Steel Pin with 1 3/8" Insulator Thread  
 J608Z & J647Z



Short Shank Steel Pin with 1" Insulator Thread  
 J629



Short Shank Steel Pin with 1 3/8" Insulator Thread  
 J631 & J631-DC

Long Shank for insulators with 1" threaded pin hole							
Catalog Number	Thread Material	A	B	D	S	Washer (sq in)	Weight /100 (lbs)
J626Z	Nylon Alloy	6	6 1/2	2 3/4	5/8	2	194
J24626Z	Nylon Alloy	8	5 3/4	3	5/8	2	336
J606Z	Nylon Alloy	6	6 1/2	2 3/4	3/4	2 1/4	246
J607Z	Nylon Alloy	7	6 1/2	2 3/4	3/4	2 1/4	260
J607Z-DE	Nylon Alloy	7	8	2 3/4	3/4	3	265

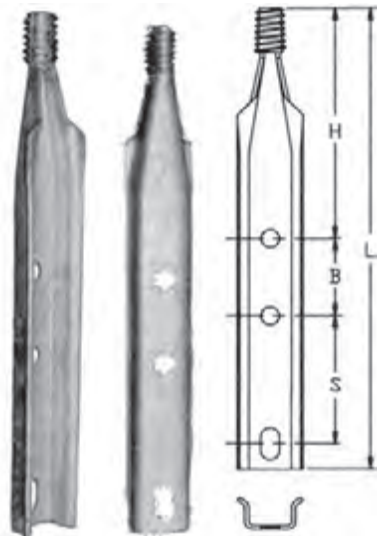
Long Shank for insulators with 1 3/8" threaded pin hole							
Catalog Number	Thread Material	A	B	D	S	Washer (sq in)	Weight /100 (lbs)
J647Z	Nylon Alloy	7	7	3	5/8	2 1/4	302
J608Z	Nylon Alloy	8	7	3	3/4	3	482

Short Shank for insulators with 1" threaded pin hole						
Catalog Number	Thread Material	A	B	D	S	Weight /100 (lbs)
J629	Lead	7	1 3/8	2 3/4	3/4	210

Short Shank for insulators with 1 3/8" threaded pin hole						
Catalog Number	Thread Material	A	B	D	S	Weight /100 (lbs)
J631	Lead	8	1 5/8	3	3/4	380
J635-DC	Lead	12	1 5/8	3	3/4	584



# Pins



**Straight Base**

## Pole Top

### Features

- Pressed steel pole top pins with nylon alloy insulator threads are mounted against the pole with 5/8" bolts
- Lower hole is slotted 11/16 x 1 1/4" on both 2 and 3 hole styles

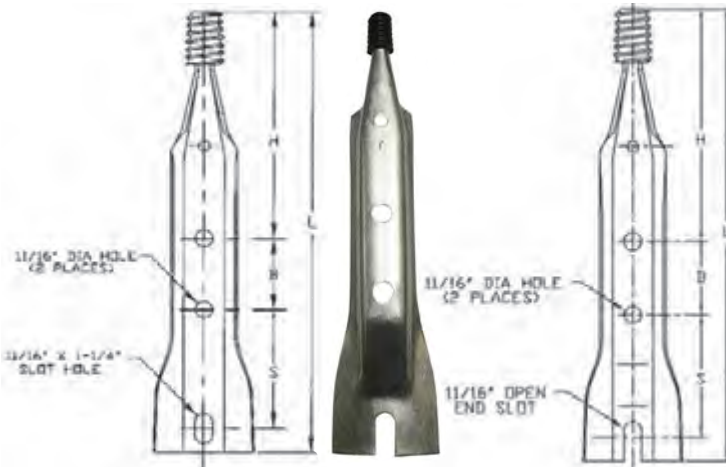
### Material

Pin body: Steel hot dip galvanized  
Threads: Nylon alloy

Pressed Steel - Straight Base							
Catalog Number	Thread Material	Insulator Thread (in)	L	S	B	H	Weight/100 (lbs)
J715Z	Nylon Alloy	1	15	5	2-hole	9	323
J1368ZSL	Nylon Alloy	1	18	5	3*	9	280
J1368Z	Nylon Alloy	1	18	5	3	9	283
J744Z	Nylon Alloy	1	24	5	3	15	450
J720Z	Nylon Alloy	1 3/8	20	8	2-hole	11	327
J740Z	Nylon Alloy	1	20	8	2-hole	11	320
J1220Z	Nylon Alloy	1	20	5	3	11	314

### Notes:

\* Lower slot is open (non-enclosed) on J1368ZSL



**Flared Base  
Semi-Closed Neck  
J2008Z**

**Flared Base  
Semi-Closed Neck  
J2008-XZ**

## Pole Top

### Features

- Lower end is flattened and flared to give a solid bearing surface when mounted with the flange against the pole
- Holes are for 5/8" mounting bolts

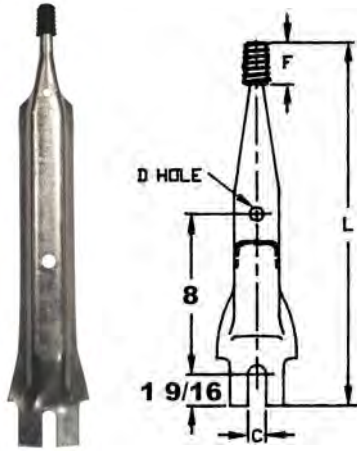
### Material

Pin body: Steel hot dip galvanized  
Threads: Nylon alloy or lead

Flared Base - Semi-Closed/Folded Neck							
Catalog Number	Thread Material	Insulator Thread (in)	L	S	B	H	Weight/100 (lbs)
J2008-XZ	Nylon Alloy	1	18	5	3	9	280
J2008Z	Nylon Alloy	1	18	5	3	9	280



# Pins



**Flared Base  
Open Lower Slot**

## Pole Top

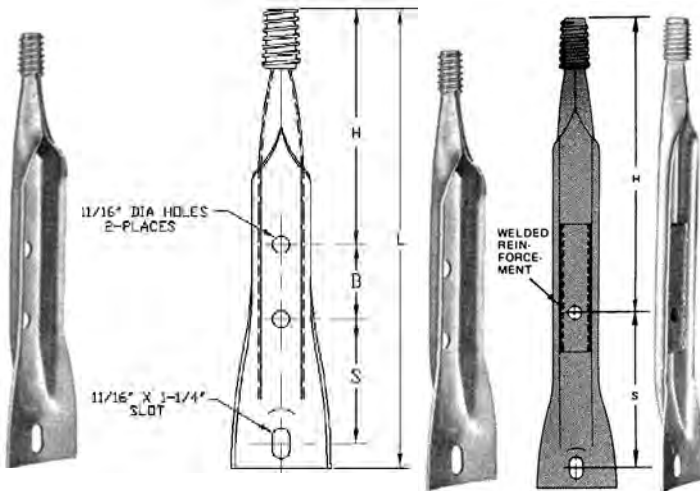
### Features

- Pressed steel pole top pins with nylon alloy insulator threads are mounted against the pole with 5/8" bolts
- Lower hole is slotted 11/16 x 1 1/4" on both 2 and 3 hole styles

### Material

Pin body: Steel hot dip galvanized  
Threads: Nylon alloy

Flared Base - Open Lower Slot							
Catalog Number	Thread Material	Insulator Thread (in)	L	C	D	F	Weight/100 (lbs)
J26945Z	Nylon Alloy	1	24	11/16	11/16	1 3/4	430
J26947Z	Nylon Alloy	1 3/8	24	11/16	11/16	2 1/8	450
J26946Z	Nylon Alloy	1	24	13/16	13/16	1 3/4	430
J26948Z	Nylon Alloy	1 3/8	24	13/16	13/16	2 1/8	450



**Flared Base  
Closed Neck  
J2008SES**

**Flared Base  
Closed Neck  
J2010 & J2011**

## Pole Top

### Features

- Lower end is flattened and flared to give a solid bearing surface when mounted with the flange against the pole
- J2010 and J2011 pins are reinforced by a channel welded into the back which gives a rigid box section and greatly increased strength
- Holes are for 5/8" mounting bolts

### Material

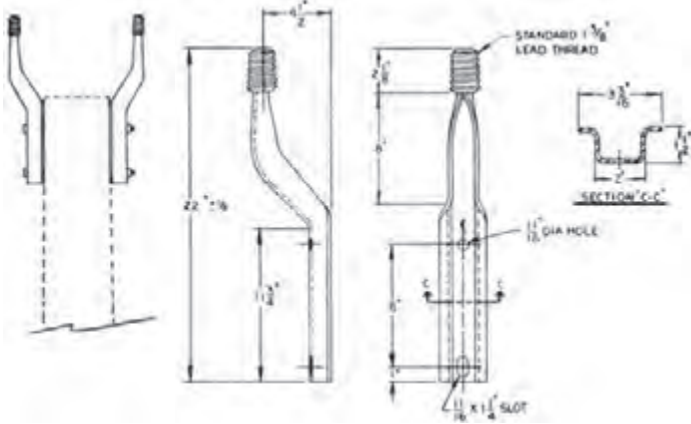
Pin body: Steel hot dip galvanized  
Threads: Nylon alloy or lead

Flared Base - Closed/Folded Neck							
Catalog Number	Thread Material	Insulator Thread (in)	L	S	B	H	Weight/100 (lbs)
J2008SES	Lead	1	18	5	3	9	323
J2010	Lead	1	24	8	2-hole	15	530
J2011	Lead	1 3/8	24	8	2-hole	15	590





# Pins



## Pole Top

Pressed steel offset pole top pins are designed for use where pole top pins are required on each side of the pole on 25kV systems.

### Features

- Provides the necessary clearance between insulators at a reduction in the cost of assemblies using straight pole top pins, double arming brackets and pipe spacers

### Material

Pin Body: Steel hot dip galvanized  
Threads: Standard ANSI lead

Catalog Number	Thread Material	Insulator Thread (in)	L	Hole Spacing	Weight/ 100 (lbs)
J25179	Lead	1 3/8	22	8	600

## Thread Adapter

J4023 makes it possible to use insulators with 1 3/8" threaded pin holes on pins with 1" lead threads.

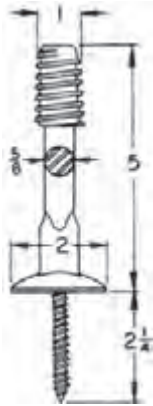
### Features

- Standard 1 3/8" lead thread cast on a standard 1" thimble

### Material

Cast Lead

Catalog Number	Thread Material	Weight/ 100 (lbs)
J4023	Lead	60



## Transformer Lead

The transformer lead pin is used for carrying the leads to the transformer.

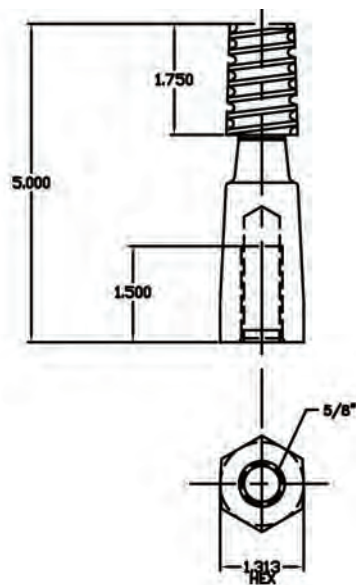
### Features

- Nylon alloy threads for ANSI standard 1" threaded pin holes
- Body is forged with a 1/2" dia. shank

### Material

Pin Body: Steel hot dip galvanized  
Threads: Nylon alloy

Catalog Number	Height Above Arm (in)	Weight/ 100 (lbs)
J025Z	5	99



## Transformer Lead Adapter

### Features

- For ANSI standard pin type insulators
- Turned onto the end of a 5/8" bolt

### Material

Pin Body: Ductile iron hot dip galvanized  
Lead

Catalog Number	Insulator Thread (in)	Weight/ 100 (lbs)
J2840	1	90
J2841	1 3/8	150



# Pins and Plates



### Western Union Type

Typically used with glass or porcelain insulators for telecommunication and signal systems

#### Features

- Manufactured with 1" diameter nylon alloy insulator threads
- Forged from carbon steel
- Have a 1/2" diameter shank

#### Material

Pin Body: Steel hot dip galvanized  
 Threads: Nylon alloy

Catalog Number	Shank Length (in)	Height Above Arm (in)	Weight/100 (lbs)
J1190Z	5	4 1/2	64



### Pole Bearing

Greater pole stability for H-frame transmission structures is made possible by using these poles bearing plates.

#### Features

- Attached to bottom of pole to increase the resistance of uplift and settling
- Each plate provides 90 sq in of additional bearing surface to the soil
- Plate's mounting surface incorporates integral spikes to resist movement
- Mounted with a 7/8" diameter bolt

#### Material

Steel hot dip galvanized

Catalog Number	Plate Size	Weight/100 (lbs)
P325B-122	6 1/2" x 14 1/8"	1200



### Pole Butt Grounding

Installed on the bottom of utility poles to provide a secure positive ground by connecting the butt plate to the pole ground wire.

#### Features

- Furnished with an integral copper terminal lug and screw which accommodates copper ground wire from #14 solid to #4 stranded

#### Material

Copper

Catalog Number	Plate Size	Weight/100 (lbs)
J9196	7 x 7 1/2	52



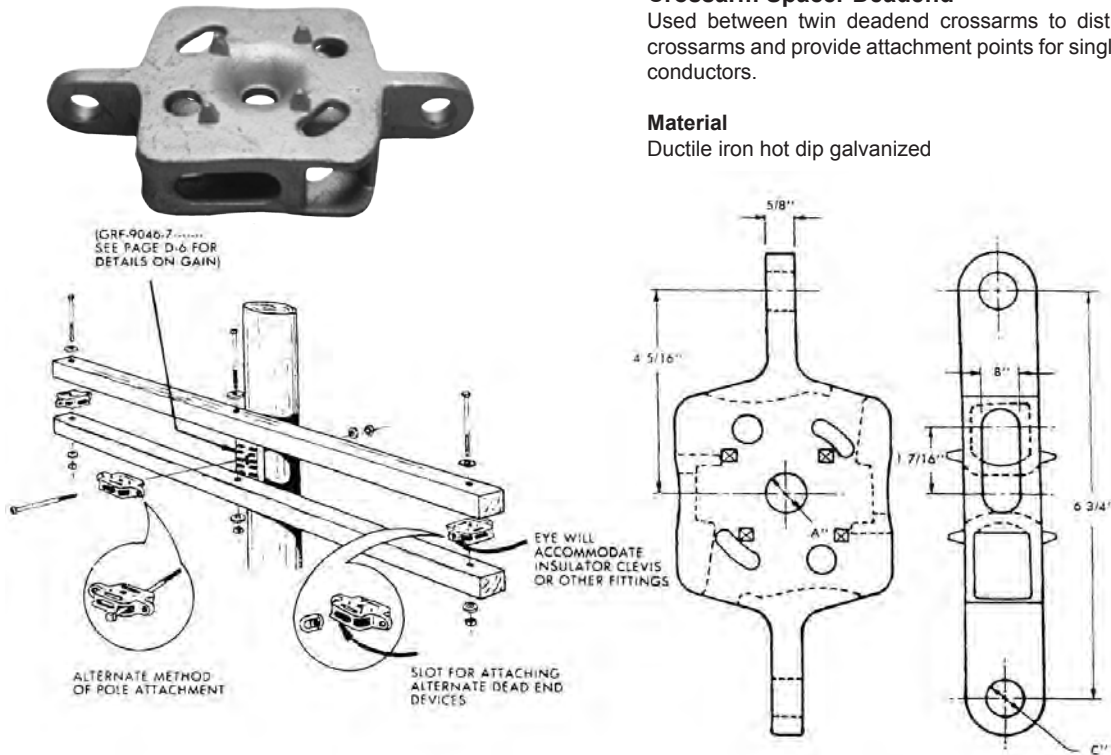
# Plates

## Crossarm Spacer Deadend

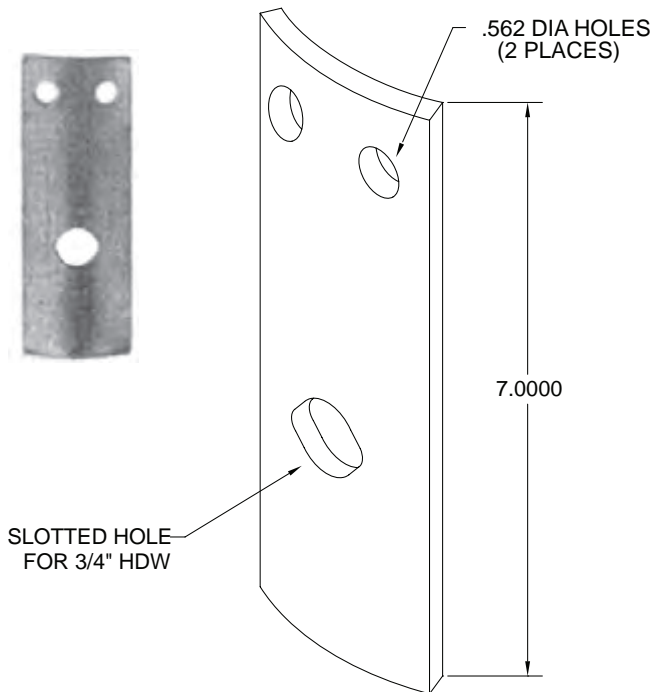
Used between twin deadend crossarms to distribute the load to both crossarms and provide attachment points for single or double deadending conductors.

### Material

Ductile iron hot dip galvanized



Catalog Number	Crossarm Range	Hole Dia. A	Hole Dia. B	Eye Hole C	Weight/100 (lbs)
TAS-55-5	3 1/4 x 4 1/4 to 4 x 5	11/16	11/16	11/16	300



## Lift, for Thimbleye Bolts

Recommended for use behind the eyes of angle thimbleye bolts with lag screws to increase load capacity either where loads are excessive or guys are steep.

### Features

- Distributes the load over a greater surface area protecting the wood pole against shear damage
- Measures 2 1/2" x 7" curved on a 3" radius
- Plates has 7/8" x 1" oval holes
- Screw holes are 9/16" diameter for 1/2" lags

### Material

Steel hot dip galvanized

Catalog Number	Thickness (in)	Bolt Dia	No of Holes	Weight/100 (lbs)
J7890	1/4	3/4	3	126



# Plates and Pole Guards



### Strain

Strain Plates are used for wrap type guying with J1019 guy hooks to provide a bearing surface for the strand, preventing damage to the wood fibers of the pole.

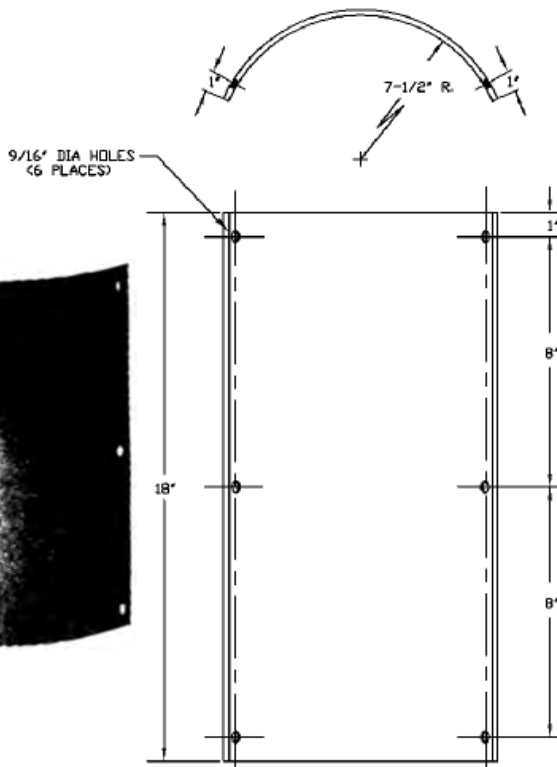
### Features

- 2 - 4 plates are required per pole depending on its dia.
- Plate is 4" x 8" x 14 gauge curved on a 5" radius with four 3/16" dia. nail holes

### Material

Steel hot dip galvanized

Catalog Number	Weight/ 100 (lbs)
J1034	86



### Pole Guards

Pole guards are fastened to the base of poles located at corners and other vulnerable spots to protect from vehicular damage.

### Features

- Dimensions given are of the flat plate before bending on a 7 1/2" radius
- All holes are 9/16" for mounting with 1/2" screws

### Material

Steel hot dip galvanized

Catalog Number	Size (in)	Weight/ 100 (lbs)
J1037	16 x 18 x 1/8	1020



# Pole Roofs and Pole Steps



### Pole Roofs

Pole roofs are designed to protect the most vulnerable part of the pole above ground.

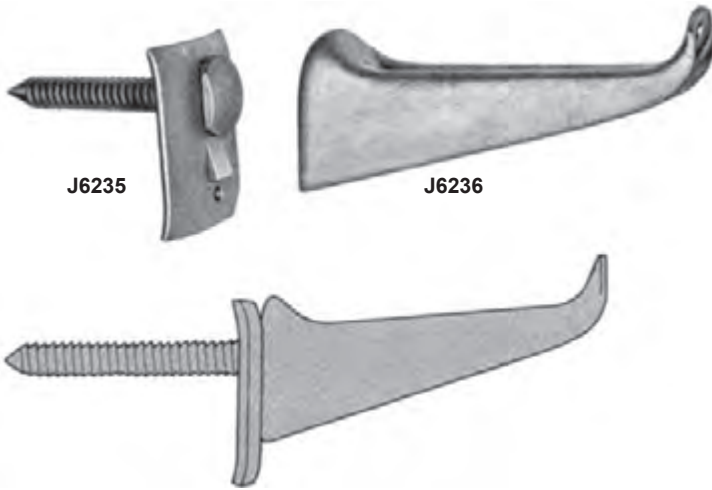
#### Features

- Easily installed with 10 broad head galvanized nails included
- No danger of radio interference as with a metallic cap

#### Material

Long life non-metallic roofing material

Catalog Number	Pole Diameter Range (in)	Weight/ 100 (lbs)
J2108	5-8	64



### Detachable Pole Steps

Detachable pole steps prevent unauthorized climbing to the point on a pole where permanent steps are installed.

#### Features

- Special 9/16 x 4" fetter drive lag screw permanently attaches the mounting plate to the pole
- Twisting is prevented by a punched projection
- Nail hole is provided
- Can be hung from lineman's belt
- When attached, extension is 5 1/2"

#### Material

Steel hot dip galvanized

Catalog Number	Description	Weight/ 100 (lbs)
J6235	Pole Plate & Lag Screw	64
J6236	Step	59



### Pole Steps

#### Features

- Rolled fetter drive threads and a wide, flat driving surface make installation fast and easy
- Knurled ring indicates the proper driving depth

#### Material

Steel hot dip galvanized

Catalog Number	Size (in)	Weight/ 100 (lbs)
J1118	5/8 x 10	98



# Racks



## Extension Bracket

Rack extension brackets are used to provide additional clearance between a secondary rack and the pole surface when necessary to clear obstructions or maintain proper wire alignment.

### Features

- 2 brackets required for installation
- Curved to fit the pole and has 3 staggered holes to permit mounting with 5/8" bolt or two 1/2" lag screws
- 5/8" x 2" carriage bolt is furnished for attaching the rack

### Material

Steel hot dip galvanized

Catalog Number	Extension from Center of Pole	Weight/100 (lbs)
J2355	6	272
J2357	9	325



## Secondary

### Features

- Exceeds strength specifications for both ANSI medium and heavy type
- Curved back fits snugly to the pole with a 3 1/4" wide bearing surface
- Mounting slots on the extended styles are for 5/8" bolts
- Groove in the back will retain a 5/8" square nut, permitting the rack to be installed over existing bolts without disturbing present installations
- J101 or J151 insulators should be ordered separately

### Material

Steel hot dip galvanized

Catalog Number	Number of Wires	Wire Spacing (inches)	Overall Length (inches)	End Mounting Hole Spacing (inches)	Approximate Shipping Weight (lbs per 100 pcs.)
J767	2	8	18	16	540
	3	4			
J768	3	8	26	24	760
J769	3	12	34	32	980
	4	8			



## Underground Support Bracket

### Features

- Permits rack to be mounted at a 3 - 5/8" clearance from the vault wall

### Material

Steel hot dip galvanized

Catalog Number	Steel Size (in)	A	B	C	Weight/100 (lbs)
J5116	1 x 1/2	3 3/4	3 5/8	1 3/4	117





# Racks

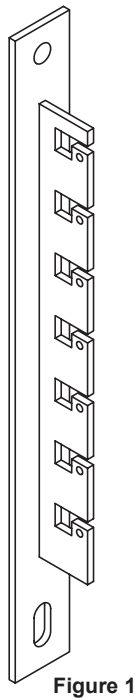
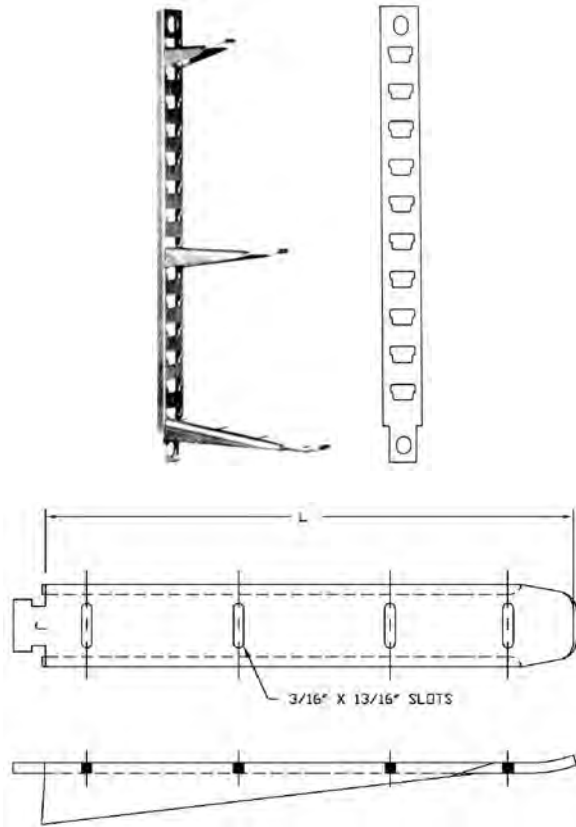


Figure 1

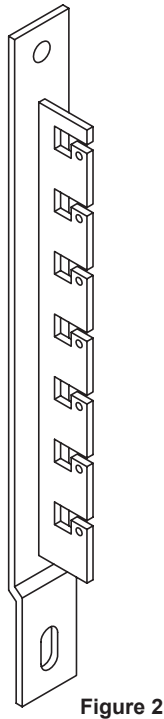


Figure 2

## Underground Cable

Underground cable racks and hooks are used for supporting cable runs in manholes and vaults.

### Features

- J5120 series made from 3/16 x 9/16 x 1 1/2" hot rolled channel with T-slots for attaching hooks spaced at 1 1/2" intervals
- 8, 14, and 18 hole racks have 3/4 x 19/32" mounting slots at each end
- Mounting slots interlock so that 2 racks may be combined as one unit
- Cable hooks are formed with a generous radius to protect cable from damage
- Turned up ends to help prevent the cable or cable rack insulator from slipping off

### Material

Steel hot dip galvanized

Cable Hooks		
Catalog Number	Extension from Face or Back	Weight/100 (lbs)
J5132A	7 1/2	90
J5133A	10	120
J5134A	14	240
J5135A	18	292

Cable Racks				
Catalog Number	Overall Length	Mtg Hole	No. of Holes	Weight/100 (lbs)
J5124	15	13 1/2	8	150
J5125	24	22 1/2	14	230
J5126	30	28 1/2	18	290

## Underground Cable

### Features

- Heavy duty, T-section shape with slots to securely attach the mating U6700 Series cable rack hooks
- Slots and back mounting base are produced from 1/4" x 2" wide steel and include an 11/16" upper hole and 11/16 x 1 1/2" lower slot for mounting with 5/8" diameter bolts
- Figure 2 racks have a formed offset in the bottom base to permit installing another rack to obtain additional length

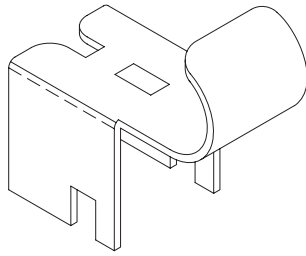
### Material

Steel hot dip galvanized

Catalog Number	Fig	Slot Spacing	Overall Length	Mtg Hole Spacing	No. of Slots	Weight/100 (lbs)
U600-2600WD	1	1 1/2	26	22 3/4	9	790
U600-3650WD	1	2 1/4	36 1/2	34 1/2	10	895
U600-4650WD	1	2 1/4	46 1/2	44 1/4	18	1250
U600-5300WD	1	2 1/4	53	50 3/4	18	1300
U600-60WD	1	2 1/4	60	57 3/4	24	1625
U6T091W	2	1 1/2	21 1/2	19 1/4	9	564
U600-2975WD	2	2 1/4	29 3/4	27 1/2	10	725
U6T112W	2	2 1/4	32	29 3/4	11	780



# Racks



## Underground, Cable Hooks

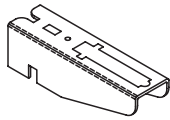
### Features

- Bracket hook for neutral support

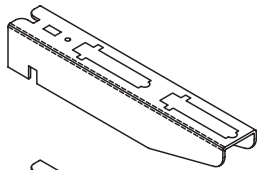
### Material

Steel hot dip galvanized

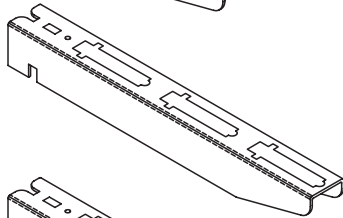
Neutral Support		
Catalog Number	Length	Weight/ 100 (lbs)
U6700	3 5/16	64



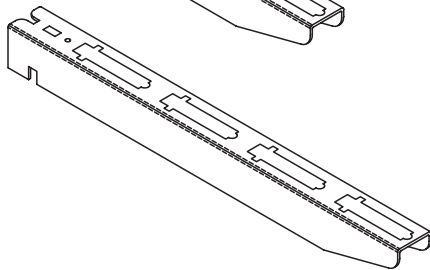
A



B



C



D

## Underground, Cable Hooks

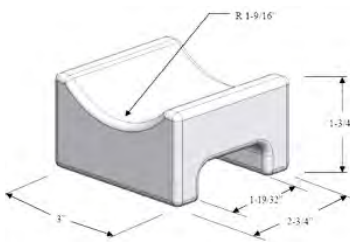
### Features

- Sturdy 1 piece formed steel construction
- Slots permit insulator positioning
- No tools needed for assembly to the racks
- For use with V600 and V6T series cable racks

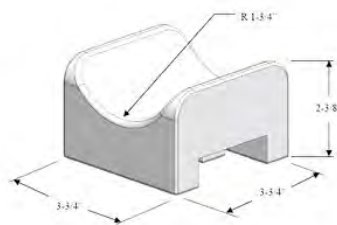
### Material

Steel hot dip galvanized

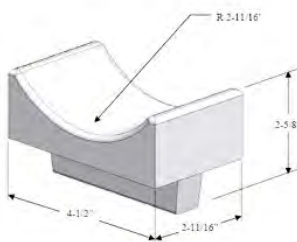
Cable Supports				
Catalog Number	Fig	Description	Length	Weight/ 100 (lbs)
U6701	A	1-insulator position	7 3/4	145
U6702	B	2-insulator position	13 1/16	250
U6703	C	3-insulator position	18 3/8	360
U6704A	D	4-insulator position	23 11/16	445
U6702 - 10		8 13/16" slot	11 3/4	232
U6703 - 11		3 5/8" slot	16 9/16	348



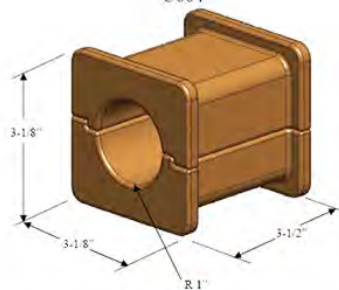
J5122



U604



U604C



U604AWD

## Cable Rack Insulators

### Features

- Designed to rest on cable rack hooks
- Provide a smooth, generous radius seat for the underground cable
- J5122 unsulators accommodate J513 A series hooks
- U604, U604C, and U604AWD insulators are designed to engage onto U670 and U602/U603 series hooks

### Material

Porcelain

Catalog Number	Weight/ 100 (lbs)
J5122	78
U604	168
U604C	140
U604AWD	92



# Rods



### Couplings

#### Features

- Produced from high strength bronze alloy for corrosion resistance and driving strength
- Fully threaded internally to allow engagement of a driving stud or coupled rods during installation

#### Material

Bronze alloy

Catalog Number	Rod Dia	Weight/100 (lbs)
J9182	5/8	25
J9183	3/4	42



### Driving Tool

Hand-operated ground rod driving tool accommodates 1/2" and 5/8" diameter ground rods and will allow the installation of up to 8' ground rods driven from groundline level.

#### Features

- Reversible internal chambers allow one end to drive rod to 3' above ground level and other end to drive remaining 3' ground level
- Durable heat treated internal chambers are designed to resist mushrooming of the ground rod during the driving process

Catalog Number	Rod Dia	Weight/100 (lbs)
J26514	1/2" and 5/8"	1900



### Ground

#### Features

- Available in 5/8" and 3/4" diameters and 8 ft lengths for most grounding requirements
- Have cone point for easy driving and plain end for attaching a ground rod clamp

#### Material

Steel hot dip galvanized

Catalog Number	Rod Size	Weight/100 (lbs)
J5328	5/8" x 8'	800
J5338	3/4" x 8'	1280



# Screws and Shackles



Gimlet Point



Fetter Drive  
Regular Point



Fetter Drive  
Drive Point



Twist Drive  
Drive Point

## Screws, Lag

Gimlet Point Lag screws are installed with a wrench. Fetter Drive and Twist Drive lag screws can either be wrenched or driven like a nail for speedier installation without sacrificing any of the holding strength of regular gimlet point lag threads.

### Features

- All lag screws have rolled threads
- Twist drive lags are furnished with a drive point for additional starting ease and accuracy
- Most fetter drive lags can be furnished with a drive point as well

### Material

Steel hot dip galvanized

Catalog Number				Size (in)	Min Thread Length (in)	Weight/ 100 (lbs)
Gimlet Point	Fetter Drive Regular Point	Fetter Drive Drive Point	Twist Drive Drive Point			
J8722	J8652HH*			1/4 x 2	1 1/2	2.9
J8722-1/2	J8652-1/2HH*			1/4 x 2 1/2	1 3/4	3.5
J8723				1/4 x 3	2	4.1
J8732*				5/16 x 2	1 1/2	4.7
	J8742-1/2			3/8 x 2 1/2	1 3/4	8.5
J8773		J8743P		3/8 x 3	2	9.9
		J8744P		3/8 x 4	2 1/2	12.8
		J8753P	J8753TP	1/2 x 3	2 1/4	19.6
J8784	J8754	J8754P	J8754TP	1/2 x 4	2 5/8	24.0
	J8754-1/2	J8754-1/2P		1/2 x 4 1/2	2 5/8	26.2
		J8756P		1/2 x 6	3	28.0
	J8765			5/8 x 5	3 1/2	44.2

### Notes:

\*Indicates Hex Head



## Lag, Hex Head w/ Neoprene Backed Steel Washer

Hex head lag screws with steel/neoprene washers are ideal to secure plastic U-cable guards.

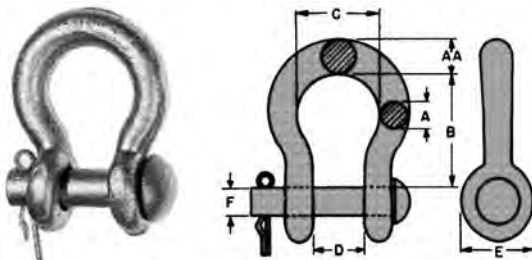
### Features

- 9/16" steel washer is bonded with a neoprene washer on one side to provide a cushion between the plastic cable guard and the lag screw.
- Lag screws have 7/16" hex heads and gimlet points/threads.
- Hardened steel to resist bending

### Material

Steel hot dip galvanized

Catalog Number	Size (in)	Weight / 100 (lbs)
J26486.1	1/4 x 2	350
J26486.2	1/4 x 2 1/2	400



## Anchor Shackles

Anchor shackles are used for attaching suspension insulators to towers, yokes and double arming plates.

### Features

- Openings are enlarged to permit the use of two or more fittings

### Material

Steel hot dip galvanized

Catalog Number	AA	A	B	C	D	E	F	Ult Strength (lbs)	Weight / 100 (lbs)
J2742	1/2	1/2	1 13/16	1 3/8	7/8	1 3/8	5/8	15000	92



# Staples



**Rolled  
(Diamond) Point**



**Cut (Slash) Point**



**Square Shank  
Barbed**

## Round Shank

Staples are used to secure ground wire and ground wire molding to wood poles.

Rolled (Diamond) Point			
Catalog Number	Finish	Dimensions L x Inside W x Wire Dia	Weight/ 100 (lbs)
J128	steel hot dip galvanized	3 x 1 1/16 x 1/4	7.9
J142	steel hot dip galvanized	3 x 1 1/2 x 1/4	8.3
J156	steel hot dip galvanized	2 x 1/2 x 0.162	2.5
J172	steel hot dip galvanized	1 1/2 x 3/8 x 0.148	1.5
J173	steel hot dip galvanized	1 3/4 x 3/8 x 0.148	1.6
J7487HDG	steel hot dip galvanized	2 5/8 x 0.162	2.3
J7493HDG	steel hot dip galvanized	3 x 1 1/16 x 1/4	5.7
J6490	coppercoated	2 x 5/8 x 0.162	3.6
J6493	coppercoated	1 1/4 x 1/4 x 0.114	0.6
J6494	coppercoated	1 1/2 x 5/16 x 0.144	1.2
J6495	coppercoated	1 3/4 x 3/8 x 0.144	1.5
J6496	coppercoated	2 x 1/2 x 0.162	2.2
J6521	coppercoated	2 x 1 1/16 x 3/16	3.1
J6522	coppercoated	3 x 1 x 1/4	7.9
J7487	electro-galvanized	2 x 5/8 x 0.162	2.3
J7488	electro-galvanized	2 x 5/8 x 3/16	3.2
J7488HDG	steel hot dip galvanized	2 x 5/8 x 3/16	3.3
J7491	electro-galvanized	2 1/2 x 29/32 x 3/16	3.7
J7493	electro-galvanized	3 x 1 1/16 x 1/4	7.5

Cut (Slash) Point			
Catalog Number	Finish	Dimensions L x Inside W x Wire Dia	Weight/ 100 (lbs)
J157	steel hot dip galvanized	2 x 1/2 x 0.162	2.4
J1672G	steel hot dip galvanized	1 1/2 X 1/4 X 0.148	1.4
J1672	mill galvanized	1 1/2 X 1/4 X 0.148	1.4
J1673	mill galvanized	1 3/4 X 1/4 X 0.148	2.0
J6652	coppercoated	1 1/2 x 3/8 x 0.148	1.8
J6653	coppercoated	2 X 1/4 x 0.162	2.2
J6655	coppercoated	2 x 1/2 x 0.162	2.3

## Square Shank Barbed

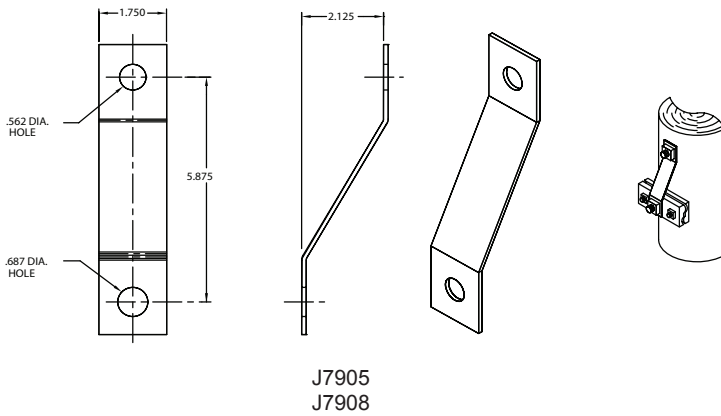
### Features

- Stronger/ resists bending better than traditional round wire staples
- Barbed shank provides increased retention in wood fibers

Catalog Number	Finish	Dimensions L x Inside W x Wire Dia	Weight/ 100 (lbs)
J7656	steel hot dip galvanized	1 1/2 x 3/8 x 0.131	140
J7657	steel hot dip galvanized	2 x 3/8 x 0.131	190
J7663	steel hot dip galvanized	2 1/4 x 1 3/16 x 0.218	7.0
J7664	steel hot dip galvanized	3 x 1 1/16 x 0.218	830
J7672	steel hot dip galvanized	2 x 5/8 x 0.165	320
J7682	coppercoated	1 1/2 x 3/8 x 0.140	170



# Straps and Struts



## Reinforcing

Reinforcing straps support the messenger bolt at locations of heavier than normal loading stress, such as long spans.

## Features

- Used with cable suspension clamps
- Lower hole fits over the messenger bolt and the top end is fastened to pole with a lag screw

## Material

Steel hot dip galvanized

Catalog Number	Steel Size (in)	A	B	C	D	Weight/100 (lbs)
J7905	1/8 x 1 3/4	2 1/4	5 7/8	9/16	11/16	51
J7908	1/8 x 2	2 1/4	5 7/8	11/16	13/16	56



## Wall

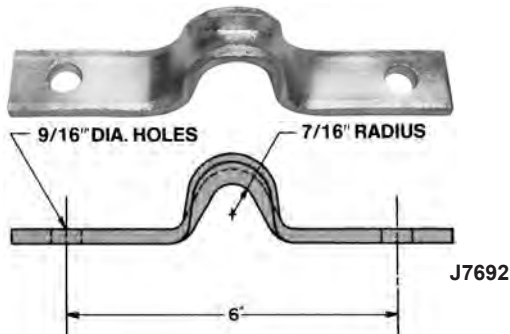
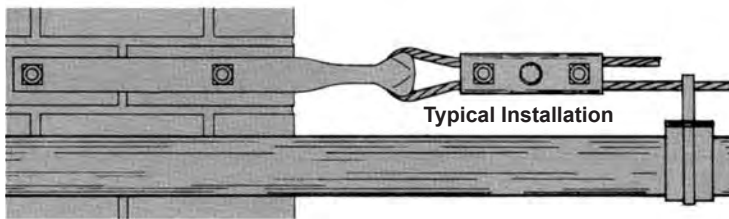
Wall straps are used for guying and deadending messenger strand to building walls.

## Features

- J7692 is formed from 1 7/32 x 15/64" steel
- J7692 is used to terminate strand at a right angle to the building wall
- A wire rope thimble is recommended to protect the strand when using a J7692 wall strap
- J7695 and J7696 terminate strand at the building corners
- J7695 and J7696 are made of 1 3/8 x 11/32" steel with a forged thimbleye
- J7695 has 2 and the J7696 has 3 9/16" diameter holes spaced 8" from center to center

## Material

Steel hot dip galvanized



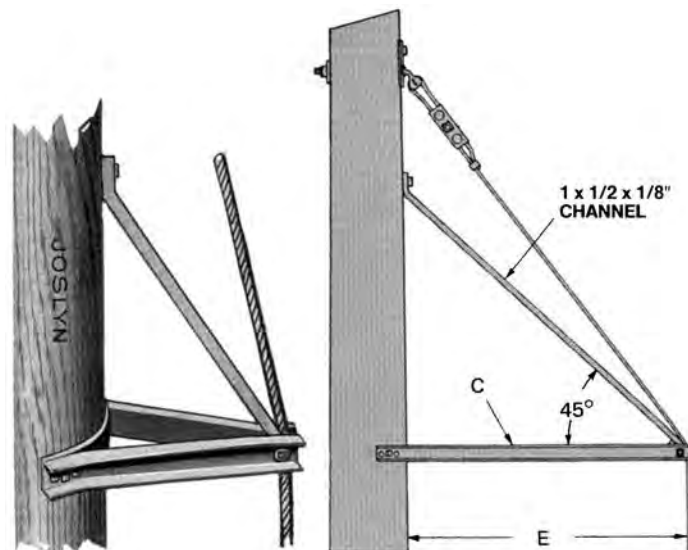
Catalog Number	Overall Length	Weight/100 (lbs)
J7692	8	78
J7695	16 7/8	251
J7696	24 3/8	325

## Pole/Guy Spreaders

Two pole struts are used to help make a pole self supporting where space is limited or the right of way is narrow and normal guying techniques cannot be used.

## Material

Steel hot dip galvanized



Catalog Number	Description	C	E	Weight/100 (lbs)
J0502	Pole Strut	2 x 9/16 x 3/16 channel	15	980
J0503	Guy Spreader	2 x 9/16 x 3/16 channel	36	2000

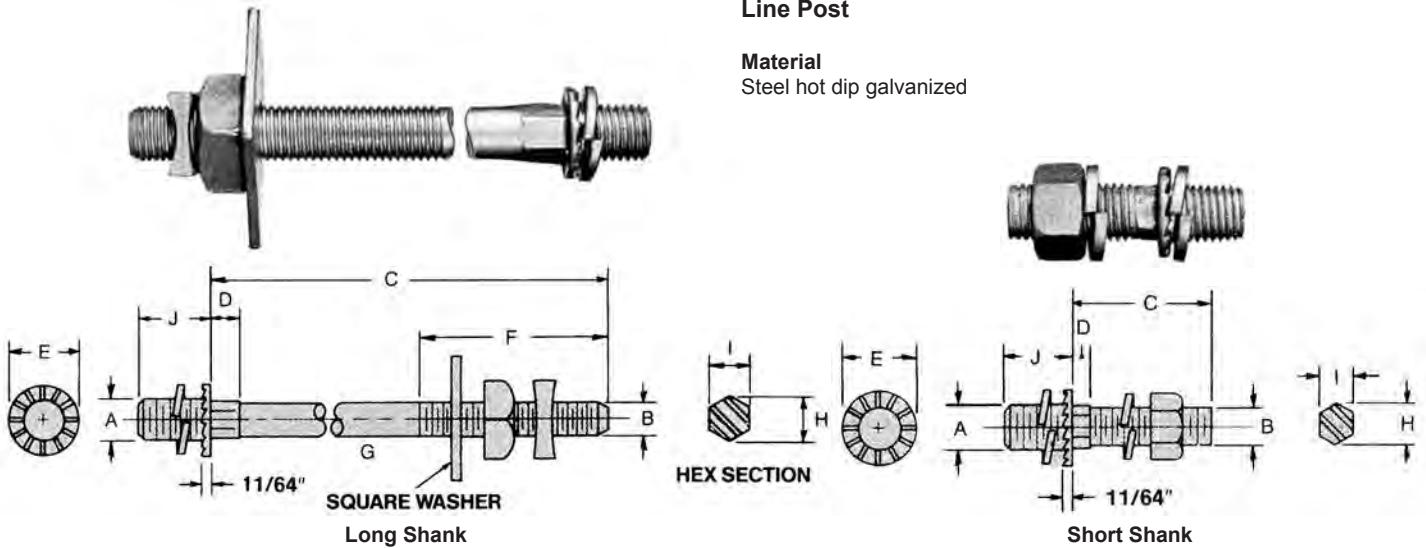




# Studs

## Line Post

**Material**  
Steel hot dip galvanized



Long Shank - For Wood Poles and Crossarms											
Catalog Number	A	B	C	D	E	F	G	H	I	J	Weight/100 (lbs)
J25248.1	3/4	5/8	7 1/2	1/2	1 1/4	6	2 1/4	21/32	9/16	1 1/8	122
J25248.3	3/4	5/8	10	1/2	1 1/4	6	curved	21/32	9/16	1 1/8	146
J25248.9	3/4	5/8	10	1/2	1 1/4	6	2	21/32	9/16	1 1/8	126
J25248.10	3/4	5/8	12	1/2	1 1/4	6	2	21/32	9/16	1 1/8	160
J25248.11	3/4	5/8	14	1/2	1 1/4	8	2	21/32	9/16	1 1/8	212
J25248.25	3/4	5/8	6	1/2	1 1/4	4	2	21/32	9/16	1 1/8	110
J25250.1	3/4	3/4	7 1/2	5/8	1 1/4	4	2 1/4	25/32	11/16	1 1/8	160
J25250.6	3/4	3/4	10	5/8	1 1/4	6	2 1/4	25/32	11/16	1 1/8	180
J25250.36	3/4	3/4	12	5/8	1 1/4	6	2 1/4	25/32	11/16	1 1/8	203
J25250.37	3/4	3/4	14	5/8	1 1/4	8	2 1/4	25/32	11/16	1 1/8	230
J25250.46	3/4	3/4	16	5/8	1 1/4	8	2 1/4	25/32	11/16	1 1/8	260

Short Shank - For Steel Arms and Line Post Brackets											
Catalog Number	A	B	C	D	E	F	G	H	I	J	Weight/100 (lbs)
J25247.1	3/4	5/8	1 3/4	1/4	1 1/4	full		21/32	9/16	1 1/8	48
J25249.1	3/4	3/4	1 3/4	1/4	1 1/4	full		25/32	11/16	1 1/8	58
J25251.1	7/8	7/8	2	1/2	1 1/2	full		29/32	13/16	1 3/8	75



## Washer Head Lag

Washer head lag studs are used for light duty mounting of cable hangers and cable suspension clamps.

### Features

- Stud end is manufactured with a forged square washer head and a roll threaded stud with assembled square nut
- Lag end has sharp rolled gimlet threads and a cone point

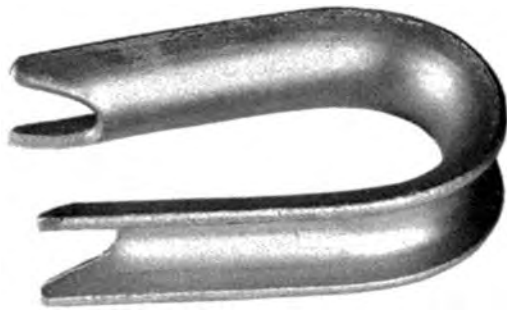
### Material

Steel hot dip galvanized

Catalog Number	Lag Size (in)	Stud Size (in)	Weight/100 (lbs)
J26315	7/8 x 5 1/2	5/8 x 1 1/2	114
J9754	9/16 x 4	1/2 x 1 3/8	45



# Thimbles and Washers



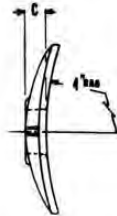
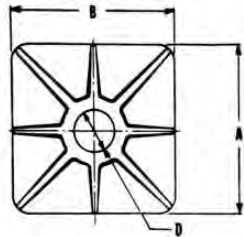
## Open Wire Rope

Wire rope thimbles provide a more desirable, larger wire seat diameter when terminating grips, deadend bails and cable to small diameter eye type fittings and bolts.

### Material

Steel hot dip galvanized

Catalog Number	Seat Dia	Strand Dia	Opening Width	Eye Length	Weight /100 (lbs)
J1057	7/8	3/8	5/8	1 7/8	8.8
J1058	1 1/8	1/2	3/4	2	18.4
J1059	1 1/4	5/8	15/16	2 7/32	31.0



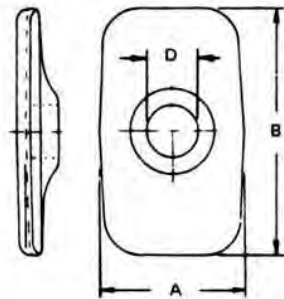
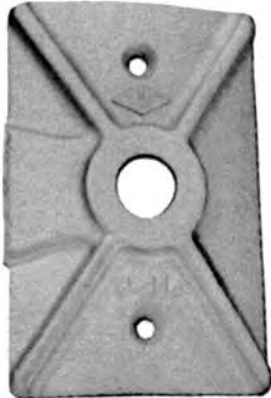
## Cast, Curved

### Features

- Greater strength and added resistance to corrosion
- Reinforced rib design to put metal where strength requirements indicate
- Includes a heavy boss around the bolt hole
- Radial ribs extend from the boss to the outer edges of the washer to reinforce the washer against compression or dishing loads

### Material

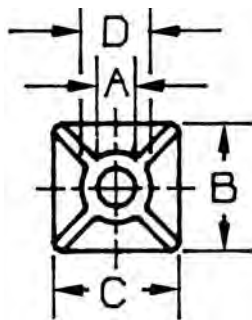
Ductile iron hot dip galvanized or aluminum alloy



Aluminum Alloy						
Catalog Number	A	B	C	D	Max Bolt Dia	Weight/ 100 (lbs)
WC-23-6	2 1/4	3 1/2	9/16	13/16	3/4	25
WC-33-5	3	3	7/16	11/16	5/8	25
WC-33-6	3	3	9/16	13/16	3/4	24
WC-34-7	3	4	9/16	15/16	7/8	39
WC-44-6	4	4	9/16	13/16	3/4	44



P56A



Ductile Iron Hot Dip Galvanized						
Catalog Number	A	B	C	D	Max Bolt Dia	Weight/ 100 (lbs)
CW-33-5	3	3	5/16	11/16	5/8	60
CW-33-6	3	3	3/8	13/16	5/8 - 3/4	60
CW-34-7	3	4	7/16	15/16	3/4 - 7/8	65
CW-35-7	3	5	1/2	15/16	3/4 - 7/8	120
P141A	2 1/4	2 1/4	1/4	13/16	5/8 - 3/4	22
P142A	3 1/2	2 1/4	5/16	13/16	5/8 - 3/4	56
CW-44-6	4	4	7/16	13/16	5/8 - 3/4	105
CW-44-7	4	4	7/16	13/16	5/8 - 3/4	105
CW-44-8	4	4	7/16	1 1/16	7/8 - 1	100
CW-46-7	4	6	1/2	15/16	3/4 - 7/8	200
CW-46-8	4	6	1/2	1 1/16	7/8 - 1	190

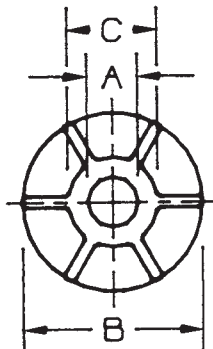
## Cast, Flat

### Material

Ductile iron hot dip galvanized



P84A-1



Catalog Number	A	B	C	D	Thickness	Weight/ 100 (lbs)
P56A	13/16	2 1/4	2 1/4	1 1/4	9/32	18
P84A-1	13/16	3 1/2	1 1/2		1/2	73



# Washers



## Round

### Material

Galvanized Steel

Catalog Number	OD	Hole Dia	Bolt Dia	Thickness	Weight/ 100 (lbs)
J1084	1	7/16	3/8	0.083	1.5
J1086	1 3/8	9/16	1/2	0.109	3.1
J1088	1 3/4	11/16	5/8	0.134	6.5
J1089	2	13/16	3/4	0.148	9.5



## Spring, Formed Steel

Spring formed steel washers are used to keep units in tension when wood crossarm or wood pole shrinkage occurs.

### Features

- Designed to enable the nut of a bolt to seat flat on the spring washer surface when it is compressed

### Material

Steel hot dip galvanized

Catalog Number	Bolt Dia	Material Size	Formed Length	C	Weight/ 100 (lbs)
J3539	1/2	3/16 x 1	2 7/16	1/2	23
J3540	5/8	1/4 x 1 3/4	3 3/4	9/16	90
J3541	3/4	1/4 x 1 3/4	3 3/4	9/16	88
J3542	7/8	1/4 x 1 3/4	3 3/4	9/16	96
J3543	1	1/4 x 1 3/4	3 3/4	9/16	92



## Spring Lock, Single Coil

### Features

- Made of high grade spring steel to keep a bolt nut in tension, insuring a tight assembly under all temperatures

### Material

Steel hot dip galvanized

Catalog Number	Size (in)	Bolt Dia	Weight/ 100 (lbs)
J134	0.141 x 0.094	3/8	0.8
J138	0.171 x 0.125	1/2	2.0
J139	0.203 x 0.156	5/8	2.7
J140	0.234 x 0.188	3/4	4.5



## Spring Lock, Double Coil

Double coil spring lock washers compensate for wood shrinkage to help eliminate radio interference caused by loose hardware.

### Material

Steel hot dip galvanized

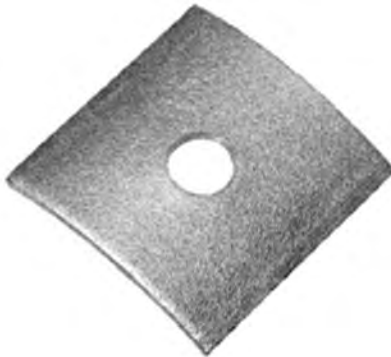
Catalog Number	Size (in)	Bolt Dia	Weight/ 100 (lbs)
J175	0.141 x 0.094	3/8	1.1
J176	0.171 x 0.125	1/2	3.2
J177	0.203 x 0.156	5/8	4.1
J178	0.234 x 0.188	3/4	7.0



# Washers



Square Flat Washers



Square Curved Washers

## Square, Steel

**Material**  
Galvanized Steel

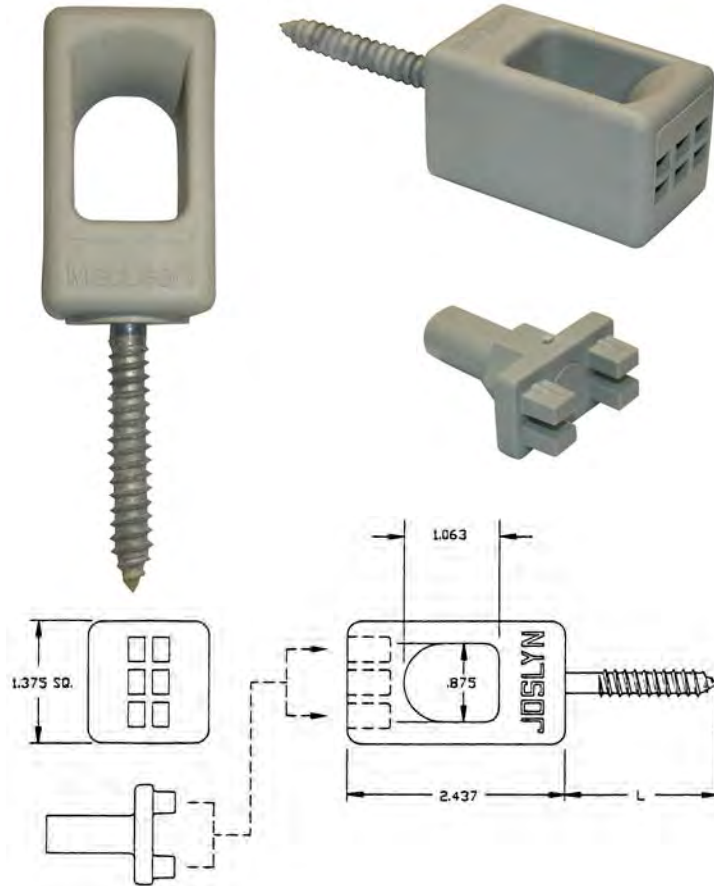
Square Flat Washers				
Catalog Number	Size (in)	Hole Dia	Bolt Dia	Weight/ 100 (lbs)
J1073	2 x 2 x 1/8	9/16	1/2	13.0
J1074	2 x 2 x 1/8	11/16	5/8	13.8
J1075	2 1/4 x 2 1/4 x 3/16	11/16	5/8	22.0
J1076	2 1/4 x 2 1/4 x 3/16	13/16	3/4	21.0
J1078	3 x 3 x 3/16	13/16	3/4	48.0
J1079	3 x 3 x 1/4	13/16	3/4	64.0
J1080	4 x 4 x 3/16	13/16	3/4	87.0
J1082	4 x 4 x 1/4	15/16	3/4 & 7/8	114.0
J1081	4 x 4 x 1/2	1 1/8	1	216.0

Square Curved Washers				
Catalog Number	Size (in)	Hole Dia	Bolt Dia	Weight/ 100 (lbs)
J6821	2 1/4 x 2 1/4 x 3/16	11/16	5/8	26.0
J6822	2 1/4 x 2 1/4 x 3/16	11/16	5/8	33.0
J113	3 x 3 x 1/4	11/16	5/8	65.0
J6823	3 x 3 x 1/4	13/16	3/4	56.5
J133	3 1/4 x 3 1/4 x 1/4	13/16	3/4	76.0
J6828	3 1/2 x 3 1/2 x 3/8	15/16	7/8	130.0
J6829	4 x 4 x 1/4	15/16	7/8	117.0
J6836	4 x 4 x 1/4	13/16	3/4	117.0
J6838	4 x 4 x 3/8	13/16	3/4	168.0



# Wireholders

## J.E.M. Nylon Alloy Material Z-Series with Galvanized Screw



### Features

- Produced from ultraviolet stabilized nylon alloy compound with reinforced fibers which provide twice the strength as porcelain insulators
- Eliminates breaking and chipping problems associated with porcelain
- Square, flat top which can be used with a hammer to start installation
- The flat top also features an “egg carton” design for indexing and engagement into supplied installing tool for use with a 1/2” drive cordless drill to obtain max. installation efficiency

### Material

Wireholder: Nylon alloy  
Screw: Steel hot dip galvanized

Catalog Number	Lag Screw Dia (in)	Color	L	Weight/100 (lbs)
J089Z	11/32 (#22)	Black	2 1/4	24
J0893Z	11/32 (#22)	Black	3	26
J0894Z	11/32 (#22)	Black	4	28
J089ZG	11/32 (#22)	Gray	2 1/4	24
J0893ZG	11/32 (#22)	Gray	3	26
J0894ZG	11/32 (#22)	Gray	4	28

## Service Mast, Nylon Alloy

### Features

- Manufactured from an engineered blend of nylon alloy reinforced with fibers to provide twice the fracture strength as porcelain.
- Material is UV stabilized for extended service life in ultraviolet exposure
- Open slot for the bracket to be installed without disassembling the bolts
- Accommodates a range of 1 1/4” through 3” diameter pipe
- Dimensions of the nylon alloy insulator are the same as shown for the J089Z wireholders

### Material

Wireholder: Nylon alloy  
Screw: Steel hot dip galvanized



Catalog Number	Color	Weight/100 (lbs)
J0588Z	Black	110
J0588ZG	Gray	110





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