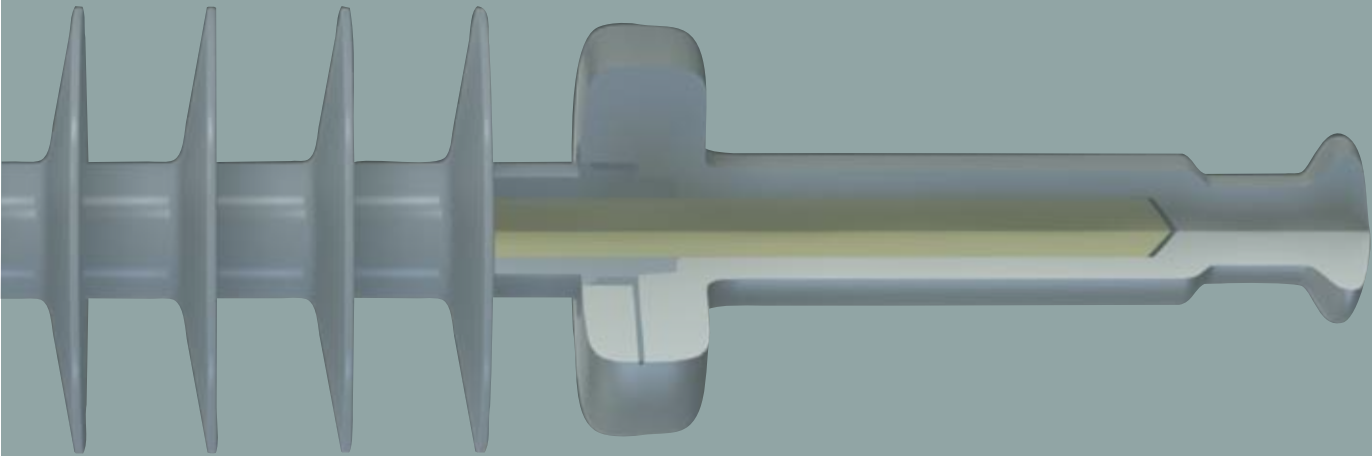




A Better Design. A Better Insulator.



Quadri*Sil[®]
Insulators



LIMITED WARRANTY AND LIMITATION OF LIABILITY

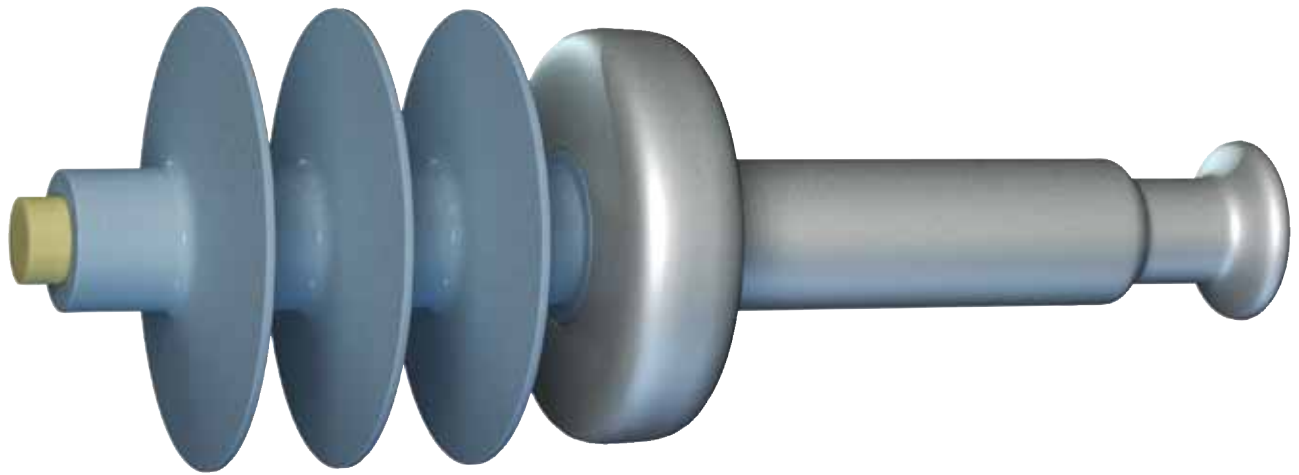
MATERIAL: HPS warrants all products sold by it to be merchantable (as such term is defined in the Uniform Commercial Code) and to be free from defects in material and workmanship. Buyer must notify HPS promptly of any claim under this warranty. The Buyer's exclusive remedy for breach of this warranty shall be the repair or replacement, F.O.B. factory, at HPS's option, of any product defective under the warranty, which is returned to HPS within one year from the date of shipment. NO OTHER WARRANTY, WHETHER EXPRESS OR ARISING BY OPERATION OF THE LAW, COURSE OF DEALING, USAGE OF TRADE OR OTHERWISE IMPLIED, SHALL EXIST IN CONNECTION WITH HPS'S PRODUCTS OR ANY SALE OR USE THEREOF. HPS SHALL IN NO EVENT BE LIABLE FOR ANY LOSS OF PROFITS OR CONSEQUENTIAL OR SPECIAL DAMAGES INCURRED BY BUYER. HPS's warranty shall run only to the first Buyer of a product from HPS, from HPS's Buyer, or from an original equipment manufacturer reselling HPS's product, and is non-assignable and non-transferable and shall be of no force and effect if asserted by any person other than such first Buyer. This warranty applies only to the use of the product as intended by HPS and does not cover any modification, misapplication, or misuse of said product.

APPLICATION: HPS does not warrant the accuracy of and results from product or system performance recommendations resulting from any engineering analysis or study. This applies regardless of whether a charge is made for the recommendation, or if it is provided free of charge. Responsibility for selection of the proper product or application rests solely with the purchaser. In the event of errors or inaccuracies determined to be caused by HPS, its liability will be limited to the reperformance of any such analysis or study.

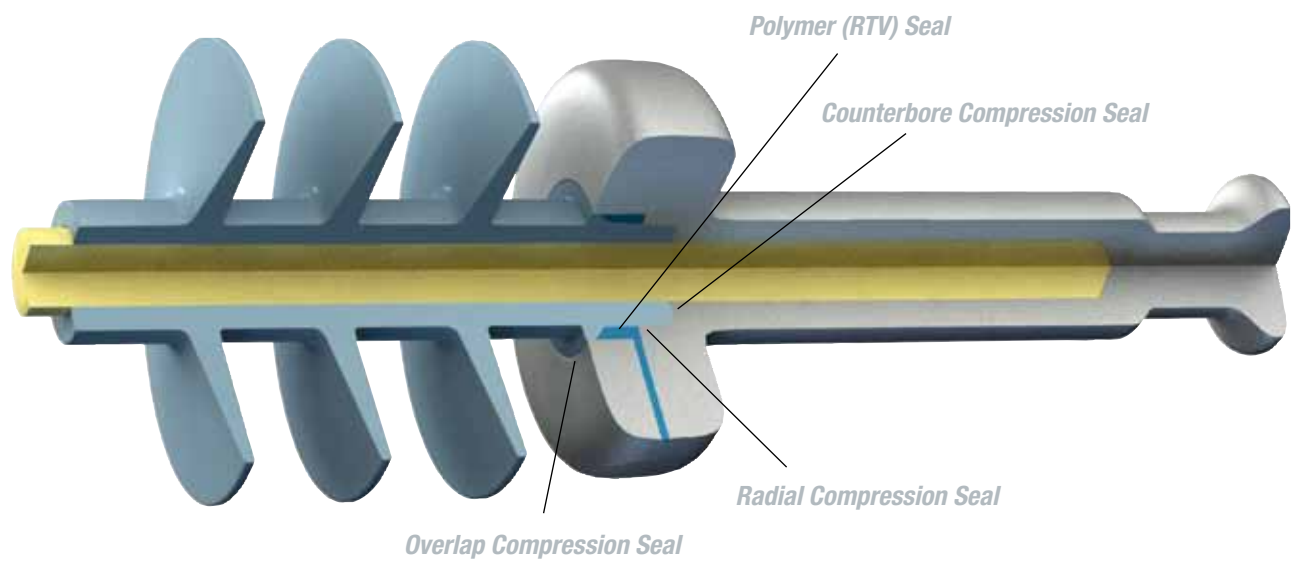
PURCHASER INSPECTIONS: Tests, inspections and acceptance of all material must be made at the factory. Purchasers' inspectors are welcome at the factories and are provided with the necessary facilities for carrying out their work. Name and phone number of who should be contacted for inspection should be given to HPS no later than two weeks prior to scheduled shipment date. LIMITATION OF LIABILITY: IN NO EVENT, WHETHER AS A RESULT OF BREACH OF CONTRACT OR WARRANTY OR ALLEGED NEGLIGENCE, SHALL HPS BE LIABLE FOR SPECIAL OR CONSEQUENTIAL DAMAGES INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR REVENUE, LOSS OF USE OF THE EQUIPMENT OR ANY ASSOCIATED EQUIPMENT, LOSS OF CAPITAL, COST OF SUBSTITUTE EQUIPMENT, FACILITIES OR SERVICES, DOWNTIME COSTS, OR CLAIMS OF THIRD PARTIES OF THE BUYER FOR SUCH DAMAGES. Any claim by Buyer for breach of the foregoing warranty shall be deemed waived by Buyer unless submitted to HPS in writing within thirty (30) days from the date Buyer discovered, or by reasonable inspection should have discovered the alleged breach. Any cause of action for breach of the foregoing warranty shall be brought within one year after the cause of action has accrued.

1850 Richland Avenue East, Aiken, SC 29801
<http://www.hubbellpowersystems.com>
E-mail: quadrisil@hps.hubbell.com
©Copyright 2010

NOTE: Because Hubbell has a policy of continuous product improvement, we reserve the right to change design and specifications without notice.



A Better Design. A Better Insulator.



Our Exclusive Four-Point Seal



Quadri*Sil® Insulators — *A Century in the Making*

With nearly 100 years of Ohio Brass insulator experience and product innovation, it's no surprise that the next generation of insulator reliability carries the trusted name of Ohio Brass.

Ohio Brass (Hubbell Power Systems) is proud to offer a transmission insulator that triumphs over today's unpredictable environment. Appropriately named, the Quadri*Sil® insulator incorporates a revolutionary four-point seal that, quite simply. . . **prohibits moisture intrusion.**

The Ohio Brass commitment is simple and complete: we provide our customers the finest, most advanced products and expert technical assistance, before and after purchase. Every day. Worldwide.

In addition, the Quadri*Sil® insulator optimizes the Ohio Brass commitment to excellence and the advancement of processes and materials. With a **proprietary** silicone-rubber compound and end-seal design, this direct-bonded insulator offers assurance that **moisture penetration does not occur.**



Today's environment is unpredictable. Your insulator can't be.



QUADRI*SIL® GENERAL INFORMATION

PAGE 4

The Heart of Quadri*Sil® Insulators	4
Key to the Catalog Numbers	8 and 33
Technical Terms Reference Guide.....	34

SUSPENSION INSULATORS

PAGE 11

Corona Performance	12
End Fitting Detail.....	13
Quadri*Sil® 25 kip / 120 kN SML Data	14
Quadri*Sil® 30 kip SML Data	15
Quadri*Sil® 160 kN SML Data.....	16
Quadri*Sil® 50 kip / 210 kN SML Data	17

LINE POST INSULATORS

PAGE 19

Mechanical Ratings and Corona Performance	20
Quadri*Sil® Horizontal Line Posts	21
Quadri*Sil® Vertical Line Posts	22
Quadri*Sil® Base Fittings	24
Quadri*Sil® Line Fittings	25
Clamps and Assemblies	26

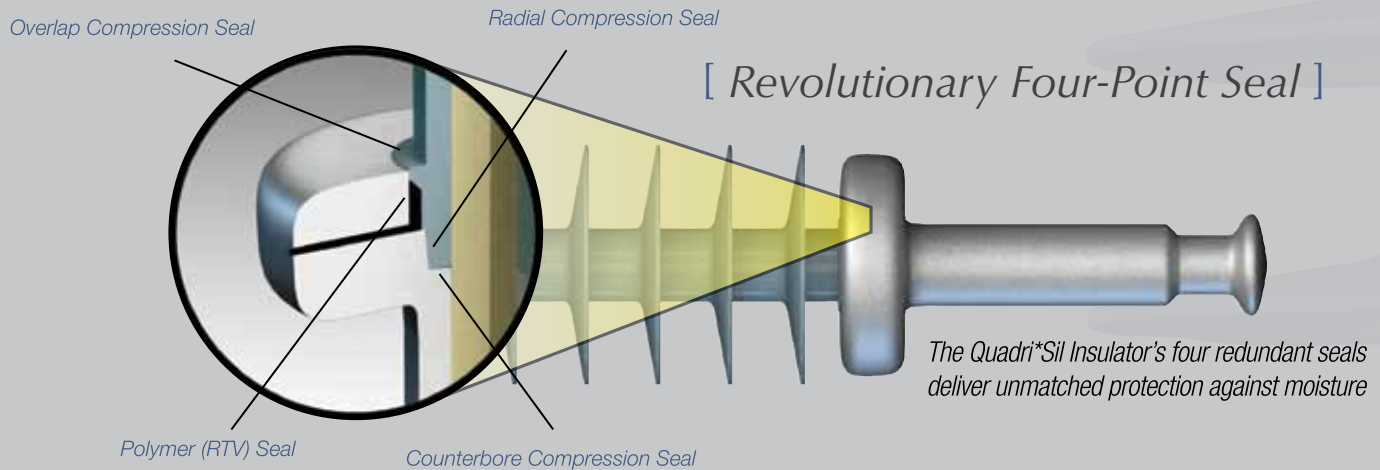
BRACED POST INSULATORS

PAGE 29

Braced Line Post Assemblies	30
Assembly Drawings.....	31
Dimensions and Strength Ratings	32

Design

Sealing System — This four-point sealing system provides **superior performance** by preventing moisture penetration between the silicone rubber and end-fitting interface. The design is based on four redundant seals that provide **unmatched protection** to the fiberglass core rod. RTV (Room Temperature Vulcanate) is completely encapsulated within the interior of the end-fitting and is not utilized as an exterior seal as with other silicone designs.



Corona Shielding Ring (CSR) — The Quadri*Sil® end-fitting design provides superior electric field shielding of the silicone rubber adjacent to the end-fitting. The superior shielding protects the silicone rubber on applications where an external corona ring is not required.

Direct Bond — The silicone rubber material is bonded directly to the fiberglass core rod during the molding process. The resulting bond between the silicone rubber and fiberglass rod is mechanically stronger than the tear strength of the silicone rubber.

Crimp Method — A circumferential crimp creates a more uniform stress distribution to ensure the mechanical integrity of the Quadri*Sil® insulator. Ohio Brass pioneered the crimping process in 1976 — today it has become the industry standard.

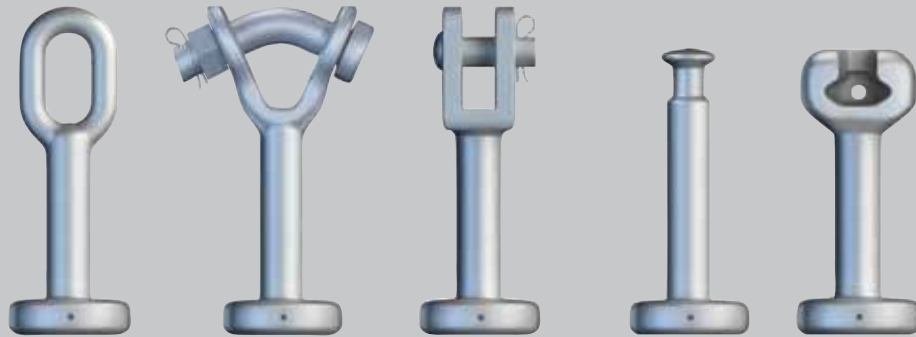


Components and Materials

Polymer Weathersheds — The polymer weathershed material utilized in the Quadri*Sil® insulator design is a proprietary silicone-rubber compound specifically designed by Ohio Brass engineers for high-voltage insulator applications. The polymer weathershed material starts with **100-percent base silicone rubber** before additives and fillers are compounded with the base rubber. Hubbell Power Systems (HPS) **controls the entire process** from the proprietary formulation to the complete mixing process. The proprietary formulation incorporates the inherent hydrophobicity and UV performance of silicone rubber while providing **superior tracking performance** as demonstrated in dry-band arcing tests. **For more information about our silicone rubber, please contact your HPS representative.**

Fiberglass Core Rod — The Quadri*Sil® suspension insulator's fiberglass core rod is produced with boron-free, corrosion-resistant E-glass and epoxy resin. Quadri*Sil® line post insulators are manufactured with electrical grade glass and epoxy resin.

End Fittings — Made of steel or ductile iron, the end-fittings are directly attached to the fiberglass core rod by a circumferential crimping process. This crimping process allows the end fittings to utilize the rod's inherent tensile strength.



Grading Rings — Also known as corona rings, grading rings are manufactured using high-grade aluminum alloy, making them strong, light, and corrosion-resistant. Grading (corona) rings can be packaged separately or inside the insulator crates with all mounting hardware included.

Leakage Distance

Quadri*Sil® suspension insulators feature standard and high leakage distance weathershed profiles for maximum resistance to contamination and leakage currents in various environmental applications. The hydrophobic nature of our silicone rubber ensures superior performance in contaminated environments.

High Pressure Washing

Quadri*Sil® transmission insulators normally do not require washing or other routine maintenance. Washing may be required if the insulators are installed in an area of severe environmental contamination. In the event that washing is required, the procedures outlined in Section IX of the “IEEE GUIDE FOR INSULATOR CLEANING,” IEEE STD 957-2005 are generally applicable.

Mechanical Ratings

Quadri*Sil® suspension insulators are rated and tested in accordance with IEC 61109 and ANSI C29.12. Quadri*Sil® line post insulators are rated and tested in accordance with IEC 61952 and ANSI C29.17. Certified test reports are available.

For suspension insulators, SML ratings are 120 kN, 160 kN, 210 kN, 25 kip, 30 kip, and 50 kip with appropriate rod size and end fittings. RTL ratings are consistent with the IEC and ANSI standards. Factory routine tests are conducted on 100 percent of all insulators to the RTL rating.

Markings

Markings for Quadri*Sil® suspension insulators are placed on a UV-resistant label located on the ground end fitting. Markings for Quadri*Sil® line post insulators are placed on a metal plate on the mounting base of the insulator. Markings include SML and RTL (for suspension), SCL and RCL (for line post), part number, assembly date code, and Hubbell Power Systems identification.

These markings are consistent with applicable IEC and ANSI standards.

Insulator Lengths

Quadri*Sil® suspension insulators are available in lengths appropriate for 69 kV through 765 kV. Longer lengths can be produced for special projects. Intermediate lengths – those that fall in between the catalog numbers listed in the tables – are also available. Length increments are approximately 2.2 inches (56 mm) for suspension insulators and 2.4 inches (61 mm) for vertical and horizontal line post insulators.



Testing

Quadri*Sil® insulators have been tested successfully to meet the requirements of IEC 61109 and ANSI C29.11. For a certified test report or additional information related to product testing, please contact your HPS representative.



Packaging

Quadri*Sil® suspension insulators are packaged in wooden crates 44 inches (111.7 cm) wide with the length of the crate determined by the length of the insulator. The height of the crate is normally less than 45 inches (114.3 cm). The gross weight will not exceed 2,000 pounds (909 kg). Crates are available for both domestic and export transportation.

The Quadri*Sil® line post insulators are packaged in appropriate quantities in open wood crates. Line post insulators are packaged to prevent the metal bases from resting on the polymer weathershed material.



CATALOG NUMBER KEY

The Quadri*Sil® Insulators Numbering Scheme is organized according to a smart numbering system. Each group of digits defines a characteristic of the product you are ordering. To fill out this form, start on “a: Insulator Type.” Then, fill in your selection in the box corresponding to the letter “a.” Apply the same rule for all the other sections.

a Insulator Type **P** — Post or **S** — Suspension

a) **Insulator Type.** Defines your insulator type: Post or Suspension. Select “P” or “S” for Post or Suspension, respectively, and fill in your selection in the box designated for “a.” In this example, we selected a suspension insulator.

S

a b b b c c c d e f f g

b Mechanical Strength

Suspension (SML), Rod Diameter

025 — 25 kip, 5/8” (16 mm)
030 — 30 kip, 5/8” (16 mm)
050 — 50 kip, 7/8” (22 mm)
120 — 120 kN, 5/8” (16 mm)
160 — 160 kN, 7/8” (22 mm)
210 — 210 kN, 7/8” (22 mm)

Post

250 — Series 250, standard strength 2.5”, (63.5 mm)

b) **Strength.** Defines the mechanical strength of your insulator. Fill in your selection in the boxes designated for “b.”

Note: kip = Kilopound, kN = Kilonewton

For example, if you want a Suspension insulator with 25 kip, this is what your form would look like so far:

S **0** **2** **5**

a b b b c c c d e f f g

c Polymer Length

3 digits for distance between metal parts, in inches

c) **Polymer Length.** Defines the polymer length of the insulator (please use catalog tables for possible polymer lengths). Fill in your selection in the boxes designated for section “c.” For example, if you want a 49-inch polymer length, enter:

S **0** **2** **5** **0** **4** **9**

a b b b c c c d e f f g

d Weathershed Profile

Suspension

S — Standard Leakage Distance (2.5)
H — High Leakage Distance (2.9 or 3.3)

Post

S — Standard Leakage Distance

d) **Weathershed Profile.** Defines the leakage distance design. For a suspension insulator with standard leakage distance, use “S.” For a suspension insulator with high leakage distance, use “H.” For a line post, only the standard leakage distance design is available. Fill in your selection in the box designated for “d.” For example, if you want an insulator with high leakage distance, you would place an “H” in the box designated “d.”

S **0** **2** **5** **0** **4** **9** **H**

a b b b c c c d e f f g

e Top Fitting

<i>Suspension Insulators</i>	<i>Line Post Insulators</i>
0 — Chain Eye	0 — Tear Drop Blade
1 — ANSI Ball	1 — Horizontal Clamptop
2 — Y-Clevis	2 — Vertical Clamptop
3 — ANSI Socket	3 — 5” (127 mm) Bolt Circle 5/8” (16 mm) Tapped Hole
4 — ANSI Straight Clevis	5 — 5” (127 mm) Bolt Circle 5/8” (16 mm) Through Hole
7 — IEC Ball Fitting 16 mm for 120 kN 20 mm for 160 kN and 210 kN	9 — Long Tear Drop Blade
8 — IEC Straight Clevis	
A — IEC Socket 16 mm for 120 kN 20 mm for 160 kN and 210 kN	

e) **Top Fitting.** Defines the top end fitting of your insulator. Fill in your selection in the box designated for “e.” For example, if you want a suspension insulator with a Y-clevis top end fitting, you would place a “2” in the box designated for “e.”

S **0** **2** **5** **0** **4** **9** **H** **2**

a b b b c c c d e f f g

f

Bottom Fitting

f) **Bottom Fitting.** Defines the bottom end fitting of your insulator. Fill in your selection in the boxes designated for "f." For example, if you want an ANSI ball bottom end fitting, you would place "01" in the boxes designated for "f."

S 0 2 5 0 4 9 H 2 0 1
 a b b b c c c d e f f g

Suspension Insulators	Line Post Insulators
00 - Chain Eye	02 - Aluminum Gain 12" (305 mm) CL ¹ mounting
01 - ANSI Ball	03 - Aluminum Flat 8"x 10" (203 mm x 254 mm), 15/16" (24 mm) hole diameter
02 - Y-Clevis	04 - Aluminum Flat 8"x 13" (203 mm x 330 mm), 15/16" (24 mm) hole diameter
03 - ANSI Socket	05 - 5" (127 mm) Bolt Circle, 5/8" (16 mm) tapped hole
04 - ANSI Straight Clevis	07 - Steel Gain 12" (305 mm) CL mounting, 15/16" (24 mm) hole diameter
07 - IEC Ball Fitting 16 mm for 120 kN or 20 mm for 160 kN and 210 kN	08 - Steel Flat 8"x 13" (203 mm x 330 mm) MS ² , 15/16" (24 mm) hole diameter
08 - IEC Straight Clevis	15 - 5" (127 mm) Bolt Circle, 5/8" (16 mm) through hole
0A - IEC Socket 16 mm for 120 kN or 20 mm for 160 kN and 210 kN	Vertical Gain - See page 23 Table B
	¹ Center Line ² Horizontal x Vertical Mounting Pattern Spacing

g

Rings

- 0 — No ring required
- A — ≥220 kV, 8" (203 mm) ring for suspension, 12" (305 mm) ring for series 250 post
- B — ≥330 kV, 12" (305 mm) ring for suspension, 15" (381 mm) ring for series 250 post
- C — ≥400 kV, 12" (305 mm) line end and 8" (203 mm) ground end ring for suspension
- D — ≥500 kV, 15" (381 mm) line end and 8" (203 mm) ground end ring for suspension
- E — ≥735 kV, 15" (381 mm) line end and 12" (305 mm) ground end ring for suspension

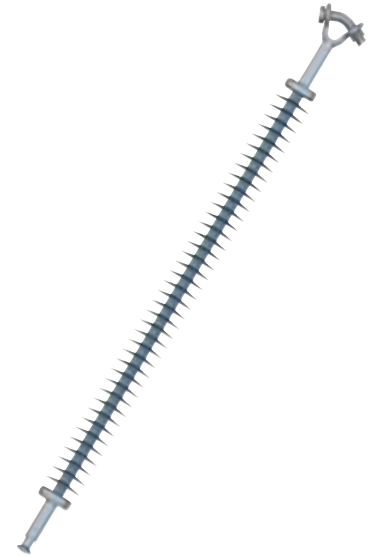
g) **Rings.** Defines your need for a Corona Ring. Fill in your selection in the box designated for "g." The example below shows a selection of a corona ring for 220 kV, 8" (203 mm) for a suspension insulator. Thus, "A" was placed in the box designated for "g."

S 0 2 5 0 4 9 H 2 0 1 A
 a b b b c c c d e f f g

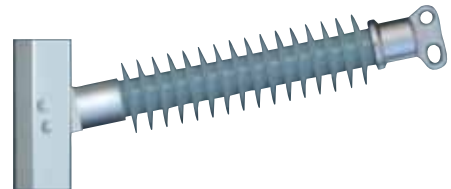
Your complete part number will be S025049H201A

Examples:

Suspension Insulator, 25 kip, 49" of Polymer Length, Standard Leakage Distance Profile (2.5), Top Fitting: Y-Clevis, Bottom Fitting: ANSI Ball, No Corona Ring
S025049S2010



Line Post Insulator, 2.5" (63.5 mm) Rod Diameter, 21.9" Polymer Length, Standard Leakage Distance, Top Fitting: Tear Drop Blade, Bottom Fitting: 2-Piece Aluminum Gain Base, No Corona Ring
P250021S0020



Your final catalog number should look like this

Fill out boxes according to instructions

a b b b c c c d e f f g



Suspension Insulators

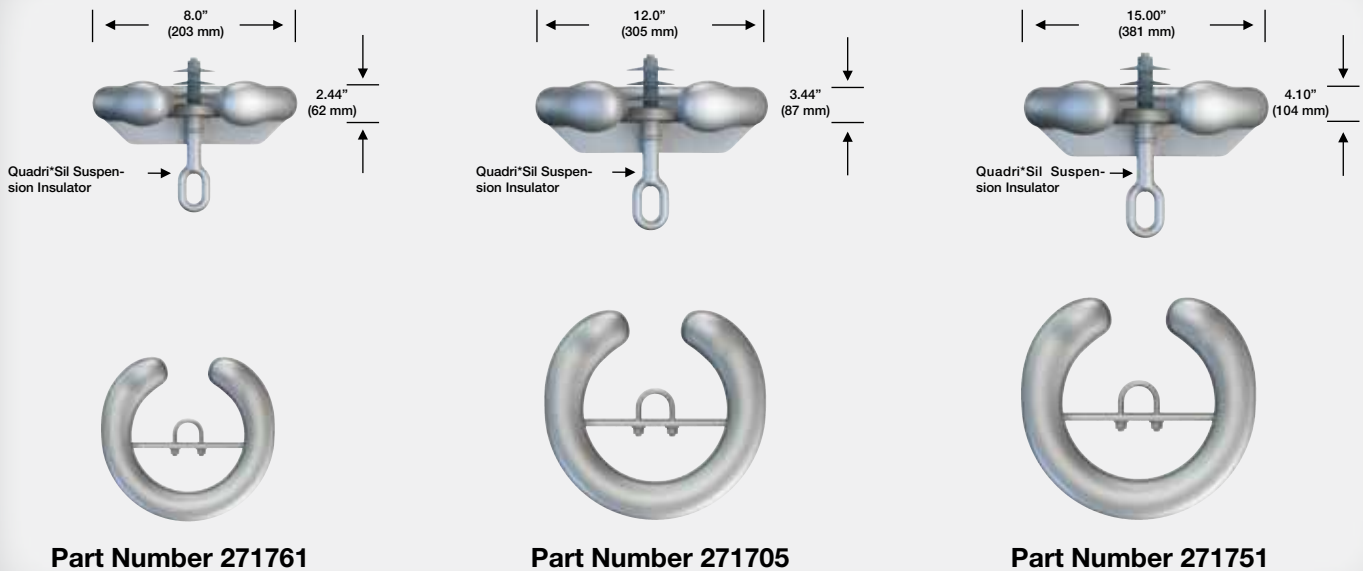
TABLE OF CONTENTS	PAGE
Corona Performance	12
End Fitting Detail.....	13
Quadri*Sil® 25 kip / 120 kN SML Data	14
Quadri*Sil® 30 kip SML Data	15
Quadri*Sil® 160 kN SML Data.....	16
Quadri*Sil® 50 kip / 210 kN SML Data	17

Corona Performance

Quadri*Sil® insulators are RIV and corona free through 161 kV. The use of an external corona shielding ring is required at 220 / 230 kV and above. The table below details the rings necessary for 220 / 230 kV and above.

Recommended Corona Ring Installation Table Normal Applications: Top Grounded, Bottom Energized

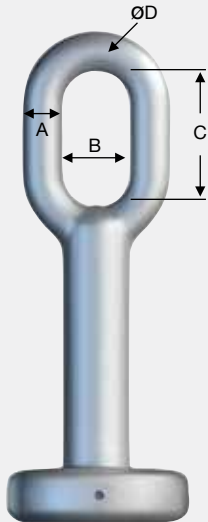
Line Voltage (kV)	Recommended Corona Rings by Line Voltage			Corona Ring Part Numbers			
	Ground End	Line End		25 kip, 30 kip, 120 kN, 133 kN		50 kip, 160 kN, 210 kN	
				Ground End	Line End	Ground End	Line End
220/230 kV	None	8" (203 mm)		-	2717613001	-	2717613002
330/345 kV	None	12" (305 mm)		-	2717053001	-	2717053002
400 kV	8" (203 mm)	12" (305 mm)		2717613001	2717053001	2717613002	2717053002
500 kV	8" (203 mm)	15" (381 mm)		2717613001	2717513001	2717613002	2717513002



Electrical/Dimensional Changes to the Suspension Insulator with External Corona Ring

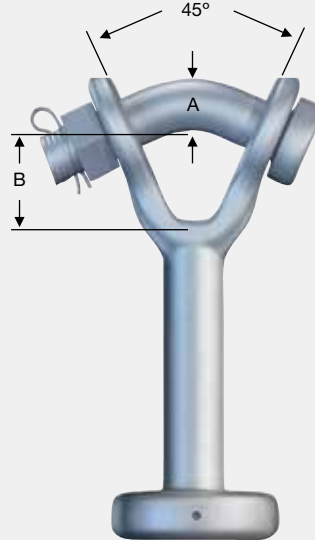
Physical and Electrical Characteristics	220/230 kV Ring	330/345 kV Ring	400 kV Ring	500 kV Ring
Dry Arc Distance inches (mm)	-0.63 (-16)	-1.32 (33.5)	-1.95 (49.5)	-2.67 (67.8)
Leakage Distance inches (mm)	0	0	0	0
ANSI 60 Hz Flashover Dry — kV	-10	-20	-20	-30
ANSI 60 Hz Flashover Wet — kV	-10	-10	-20	-30
ANSI Critical Flashover Positive — kV	-10	-20	-30	-40
ANSI Critical Flashover Negative — kV	-10	-20	-30	-50
IEC Wet Switching Impulse Withstand — kV	N/A	N/A	N/A	N/A
IEC Power Frequency Wet Withstand — kV	-10	-10	-20	-30
IEC Lightning Impulse Withstand Positive — kV	-10	-20	-30	-40
IEC Lightning Impulse Withstand Negative — kV	-10	-20	-30	-50
Net Weight pounds (kg)	2.1 (1.0)	2.9 (1.3)	5.0 (2.3)	6.5 (2.9)

MOST COMMON END FITTINGS



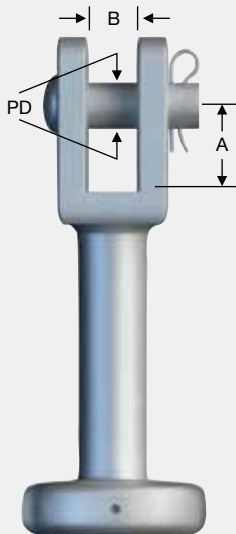
Chain Eye

SML	Dimensions in. (mm)			
	A	B	C	D
25 kip (111 kN)	0.62 (15.74)	1.00 (25.4)	2.00 (50.8)	0.62 (15.74)
120 kN	0.62 (15.74)	1.00 (25.4)	2.00 (50.8)	0.62 (15.74)
30 kip (133 kN)	0.75 (19.05)	1.00 (25.4)	2.00 (50.8)	0.85 (21.59)
36 kip (160 kN)	0.75 (19.05)	1.00 (25.4)	2.00 (50.8)	0.85 (21.59)
210 kN	0.75 (19.05)	1.00 (25.4)	2.00 (50.8)	0.85 (21.59)
50 kip (222 kN)	0.75 (19.05)	1.00 (25.4)	2.00 (50.8)	0.85 (21.59)



Y-Clevis

SML	Dimensions in. (mm)		
	A	B	Bolt Dia.
25 kip (111 kN)	0.75 (19.05)	1.53 (38.86)	0.75 (19)
120 kN	0.75 (19.05)	1.53 (38.86)	0.75 (19)
30 kip (133 kN)	0.88 (22.35)	1.59 (40.39)	0.88 (22)
36 kip (160 kN)	0.88 (22.35)	1.59 (40.39)	0.88 (22)
210 kN	0.88 (22.35)	1.59 (40.39)	0.88 (22)
50 kip (222 kN)	0.88 (22.35)	1.59 (40.39)	0.88 (22)



Straight Clevis

SML	Dimensions in. (mm)			
	Class	A	B	PD
25 kip (111 kN)	ANSI 52-6	1.41 (36)	0.75 (19)	0.62 (16)
120 kN	IEC 16C	1.41 (36)	0.75 (19)	0.62 (16)
30 kip (133 kN)	ANSI 52-6	1.41 (36)	0.75 (19)	0.62 (16)
36 kip (160 kN)	IEC 19L	1.81 (46)	0.83 (21)	0.75 (19)
210 kN	IEC 19L	1.81 (46)	0.83 (21)	0.75 (19)
50 kip (222 kN)	N/A			



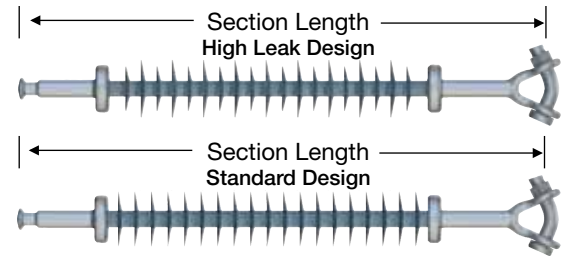
Ball/Socket

SML	Class
25 kip (111 kN)	ANSI 52-5
120 kN	IEC 16 mm
30 kip (133 kN)	ANSI 52-5
36 kip (160 kN)	ANSI 52-8 (IEC 20 mm)
210 kN	IEC 20 mm
50 kip (222 kN)	ANSI 52-11

Suspension Insulators

Mechanical Ratings SML = 25 kip/120 kN RTL = 12.5 kip/60 kN

Rod Diameter: 5/8" (16 mm)



Selection Guide: Typical Line Voltage, kV	Catalog Numbers ANSI / IEC	Nominal Polymer Length inches	Section Length inches (mm)	Strike Distance inches (mm)	Leakage Distance inches (mm)	ANSI Values				IEC Values		
						60-Hz Dry Flashover (kV)	60-Hz Wet Flashover (kV)	Critical Impulse Positive (kV)	Critical Impulse Negative (kV)	60-Hz 1-minute Wet Withstand (kV)	Impulse Positive Withstand (kV)	Impulse Negative Withstand (kV)
69	S025021S2010 / S120021S2010	021	33.3 (846)	21.5 (546)	55 (1397)	220	210	370	350	145	315	300
110	S025021H2010 / S120021H2010	021	33.3 (846)	22 (559)	64 (1626)	220	210	370	350	150	325	305
132	S025023S2010 / S120023S2010	023	35.4 (899)	23.7 (602)	60 (1524)	250	235	415	395	165	350	330
161	S025023H2010 / S120023H2010	023	35.4 (899)	24.1 (612)	71 (1803)	250	235	415	395	165	355	335
220	S025030S2010 / S120030S2010	030	41.9 (1064)	30.2 (767)	77 (1956)	315	305	525	510	210	445	430
330	S025030H2010 / S120030H2010	030	41.9 (1064)	30.6 (777)	90 (2286)	320	305	535	515	210	450	435
	S025036S2010 / S120036S2010	036	48.4 (1229)	36.6 (930)	93 (2362)	385	365	635	620	255	540	525
	S025036H2010 / S120036H2010	036	48.4 (1229)	37.1 (942)	110 (2794)	390	370	645	620	260	540	535
	S025043S2010 / S120043S2010	043	54.9 (1394)	43.1 (1095)	110 (2794)	460	435	730	725	300	630	625
	S025043H2010 / S120043H2010	043	54.9 (1394)	43.6 (1107)	129 (3277)	465	440	740	730	305	635	630
	S025047S2010 / S120047S2010	047	59.2 (1504)	47.4 (1204)	121 (3073)	500	475	800	795	330	690	685
	S025047H2010 / S120047H2010	047	59.2 (1504)	47.9 (1217)	142 (3607)	510	475	805	800	330	695	690
	S025051S2010 / S120051S2010	051	63.5 (1613)	51.8 (1316)	132 (3353)	540	510	865	865	360	750	750
	S025051H2010 / S120051H2010	051	63.5 (1613)	52.2 (1326)	155 (3937)	540	510	875	870	360	760	755
	S025056S2010 / S120056S2010	056	67.8 (1722)	56.1 (1425)	143 (3632)	585	545	935	935	385	810	810
	S025056H2010 / S120056H2010	056	67.8 (1722)	56.5 (1435)	168 (4267)	585	550	940	940	390	815	815
	S025060S2010 / S120060S2010	060	72.1 (1831)	60.4 (1534)	154 (3912)	625	580	1000	1005	410	870	875
	S025060H2010 / S120060H2010	060	72.1 (1831)	60.9 (1547)	181 (4597)	625	585	1010	1010	415	880	880
	S025064S2010 / S120064S2010	064	76.5 (1943)	64.7 (1643)	165 (4191)	660	615	1065	1075	435	930	940
	S025064H2010 / S120064H2010	064	76.5 (1943)	65.2 (1656)	194 (4928)	665	615	1070	1075	440	940	945
	S025069S2010 / S120069S2010	069	80.8 (2052)	69 (1753)	176 (4470)	695	650	1130	1140	465	990	995
	S025069H2010 / S120069H2010	069	80.8 (2052)	69.5 (1765)	207 (5258)	700	650	1135	1145	465	995	1005
	S025073S2010 / S120073S2010	073	85.1 (2162)	73.4 (1864)	187 (4750)	735	685	1200	1210	490	1050	1060
	S025073H2010 / S120073H2010	073	85.1 (2162)	73.8 (1875)	220 (5588)	740	690	1205	1215	495	1055	1065
	S025077S2010 / S120077S2010	077	89.4 (2271)	77.7 (1974)	198 (5029)	780	720	1260	1275	515	1105	1120
	S025077H2010 / S120077H2010	077	89.4 (2271)	78.1 (1984)	233 (5918)	780	720	1270	1280	515	1115	1125
	S025081S2010 / S120081S2010	081	93.7 (2380)	82 (2083)	209 (5309)	815	745	1325	1345	540	1165	1180
	S025081H2010 / S120081H2010	081	93.7 (2380)	82.5 (2096)	246 (6248)	820	750	1330	1345	540	1170	1185
	S025086S2010 / S120086S2010	086	98.1 (2492)	86.3 (2192)	220 (5588)	860	780	1400	1420	560	1220	1240
	S025086H2010 / S120086H2010	086	98.1 (2492)	86.8 (2205)	259 (6579)	860	795	1410	1420	565	1225	1245
	S025090S2010 / S120090S2010	090	102.4 (2601)	90.6 (2301)	231 (5867)	890	815	1460	1485	585	1275	1300
	S025090H2010 / S120090H2010	090	102.4 (2601)	91.1 (2314)	272 (6909)	895	820	1470	1495	585	1285	1305
	S025094S2010 / S120094S2010	094	106.7 (2710)	95 (2413)	242 (6147)	925	850	1520	1545	610	1335	1355
	S025094H2010 / S120094H2010	094	106.7 (2710)	95.4 (2423)	285 (7239)	930	855	1540	1560	615	1340	1365
	S025099S2010 / S120099S2010	099	111 (2819)	99.3 (2522)	253 (6426)	960	875	1575	1600	630	1395	1415
	S025099H2010 / S120099H2010	099	111 (2819)	99.7 (2532)	298 (7569)	965	880	1585	1610	635	1395	1425
	S025103S2010 / S120103S2010	103	115.3 (2929)	103.6 (2631)	264 (6706)	990	890	1640	1670	655	1445	1475
	S025103H2010 / S120103H2010	103	115.3 (2929)	104.1 (2644)	310 (7874)	995	895	1645	1670	660	1450	1485
	S025107S2010 / S120107S2010	107	119.7 (3040)	107.9 (2741)	275 (6985)	1010	920	1690	1725	675	1500	1530
	S025107H2010 / S120107H2010	107	119.7 (3040)	108.4 (2753)	323 (8204)	1015	920	1695	1730	675	1510	1535
	S025112S2010 / S120112S2010	112	124 (3150)	112.2 (2850)	286 (7264)	1040	945	1750	1790	695	1555	1590
	S025112H2010 / S120112H2010	112	124 (3150)	112.7 (2863)	336 (8534)	1045	950	1755	1795	700	1565	1595
	S025116S2010 / S120116S2010	116	128.3 (3259)	116.6 (2962)	297 (7544)	1070	975	1815	1850	720	1615	1645
	S025116H2010 / S120116H2010	116	128.3 (3259)	117 (2972)	349 (8865)	1075	980	1820	1855	720	1620	1655
	S025120S2010 / S120120S2010	120	132.6 (3368)	120.9 (3071)	308 (7823)	1100	1000	1875	1915	735	1665	1705
	S025120H2010 / S120120H2010	120	132.6 (3368)	121.3 (3081)	362 (9195)	1105	1005	1880	1920	740	1670	1710
	S025125S2010 / S120125S2010	125	136.9 (3477)	125.2 (3180)	319 (8103)	1125	1030	1935	1975	760	1720	1755
	S025125H2010 / S120125H2010	125	136.9 (3477)	125.7 (3193)	375 (9525)	1130	1035	1940	1980	760	1725	1765
	S025129S2010 / S120129S2010	129	141.3 (3589)	129.5 (3289)	330 (8382)	1155	1055	1990	2040	780	1770	1815
	S025129H2010 / S120129H2010	129	141.3 (3589)	130 (3302)	388 (9855)	1160	1060	1995	2045	780	1780	1820
	S025133S2010 / S120133S2010	133	145.6 (3698)	133.8 (3399)	341 (8661)	1180	1080	2050	2100	795	1825	1870
	S025133H2010 / S120133H2010	133	145.6 (3698)	134.3 (3411)	401 (10185)	1185	1085	2055	2105	800	1830	1875
	S025138S2010 / S120138S2010	138	149.9 (3807)	138.2 (3510)	352 (8941)	1205	1105	2110	2160	815	1880	1925
	S025138H2010 / S120138H2010	138	149.9 (3807)	138.6 (3520)	414 (10516)	1210	1110	2115	2165	820	1885	1930
	S025142S2010 / S120142S2010	142	154.2 (3917)	142.5 (3620)	363 (9220)	1230	1130	2165	2220	835	1930	1980
	S025142H2010 / S120142H2010	142	154.2 (3917)	142.9 (3630)	427 (10846)	1235	1135	2170	2225	835	1935	1980

Notes:

- Dimensional and electrical values displayed in main table are for an insulator with Y-clevis and Ball end fittings.
- For voltages above 400 kV, other section lengths, or end fitting combinations, please contact your HPS representative.
- Electrical values are without corona ring. For voltages equal to or greater than 220 kV, refer to page 12 for corona rings and associated physical/electrical changes to the above data. Dimensions are within allowable tolerances as specified by IEC 61109 and ANSI C29.12.

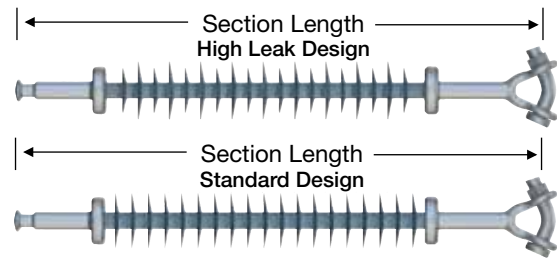
Section Length Adjustment Table, Base End Fittings: Y-clevis-Ball (201)

Top Fitting	Bottom Fitting	Top and Bottom End Fitting Digits ("e" & "f") in Catalog Number	Length Change inches (mm)
Y-Clevis	Eye	200	1.62 (41)
Eye	ANSI 52-5 Ball	001	0.02 (0)
Eye	Eye	000	1.64 (42)
ANSI 52-5 Socket	ANSI 52-5 Ball	301	-1.15 (-29)
IEC 16 mm Socket	IEC 16 mm Ball	A07	-0.03 (-1)
ANSI 52-6 Clevis	Eye	400	0.82 (21)
ANSI 52-6 Clevis	ANSI 52-5 Ball	401	-0.8 (-20)

To determine the section length for an insulator with a different end fitting combination, please add or subtract the displayed length change in the table above. For configurations not shown, use the Catalog Number Key or contact your HPS representative.

Suspension Insulators

Mechanical Ratings SML = 30 kip RTL = 15 kip
Rod Diameter: 5/8" (16 mm)



Selection Guide: Typical Line Voltage, kV	Catalog Numbers ANSI	Nominal Polymer Length inches	Section Length inches (mm)	Strike Distance inches (mm)	Leakage Distance inches (mm)	ANSI Values				IEC Values		
						60-Hz Dry Flashover (kV)	60-Hz Wet Flashover (kV)	Critical Impulse Positive (kV)	Critical Impulse Negative (kV)	60-Hz 1-minute Wet Withstand (kV)	Impulse Positive Withstand (kV)	Impulse Negative Withstand (kV)
69 110 132 161 220 330 400	S030021S2010	021	33.3 (846)	21.5 (546)	55 (1397)	220	210	370	350	145	315	300
	S030021H2010	021	33.3 (846)	22 (559)	64 (1626)	220	210	370	350	150	325	305
	S030023S2010	023	35.4 (899)	23.7 (602)	60 (1524)	250	235	415	395	165	350	330
	S030023H2010	023	35.4 (899)	24.1 (612)	71 (1803)	250	235	415	395	165	355	335
	S030030S2010	030	41.9 (1064)	30.2 (767)	77 (1956)	315	305	525	510	210	445	430
	S030030H2010	030	41.9 (1064)	30.6 (777)	90 (2286)	320	305	535	515	210	450	435
	S030036S2010	036	48.4 (1229)	36.6 (930)	93 (2362)	385	365	635	620	255	540	525
	S030036H2010	036	48.4 (1229)	37.1 (942)	110 (2794)	390	370	645	620	260	540	535
	S030043S2010	043	54.9 (1394)	43.1 (1095)	110 (2794)	460	435	730	725	300	630	625
	S030043H2010	043	54.9 (1394)	43.6 (1107)	129 (3277)	465	440	740	730	305	635	630
	S030047S2010	047	59.2 (1504)	47.4 (1204)	121 (3073)	500	475	800	795	330	690	685
	S030047H2010	047	59.2 (1504)	47.9 (1217)	142 (3607)	510	475	805	800	330	695	690
	S030051S2010	051	63.5 (1613)	51.8 (1316)	132 (3353)	540	510	865	865	360	750	750
	S030051H2010	051	63.5 (1613)	52.2 (1326)	155 (3937)	540	510	875	870	360	760	755
	S030056S2010	056	67.8 (1722)	56.1 (1425)	143 (3632)	585	545	935	935	385	810	810
	S030056H2010	056	67.8 (1722)	56.5 (1435)	168 (4267)	585	550	940	940	390	815	815
	S030060S2010	060	72.1 (1831)	60.4 (1534)	154 (3912)	625	580	1000	1005	410	870	875
	S030060H2010	060	72.1 (1831)	60.9 (1547)	181 (4597)	625	585	1010	1010	415	880	880
	S030064S2010	064	76.5 (1943)	64.7 (1643)	165 (4191)	660	615	1065	1075	435	930	940
	S030064H2010	064	76.5 (1943)	65.2 (1656)	194 (4928)	665	615	1070	1075	440	940	945
	S030069S2010	069	80.8 (2052)	69 (1753)	176 (4470)	695	650	1130	1140	465	990	995
	S030069H2010	069	80.8 (2052)	69.5 (1765)	207 (5258)	700	650	1135	1145	465	995	1005
	S030073S2010	073	85.1 (2162)	73.4 (1864)	187 (4750)	735	685	1200	1210	490	1050	1060
	S030073H2010	073	85.1 (2162)	73.8 (1875)	220 (5588)	740	690	1205	1215	495	1055	1065
	S030077S2010	077	89.4 (2271)	77.7 (1974)	198 (5029)	780	720	1260	1275	515	1105	1120
	S030077H2010	077	89.4 (2271)	78.1 (1984)	233 (5918)	780	720	1270	1280	515	1115	1125
	S030081S2010	081	93.7 (2380)	82 (2083)	209 (5309)	815	745	1325	1345	540	1165	1180
	S030081H2010	081	93.7 (2380)	82.5 (2096)	246 (6248)	820	750	1330	1345	540	1170	1185
	S030086S2010	086	98.1 (2492)	86.3 (2192)	220 (5588)	860	780	1400	1420	560	1220	1240
	S030086H2010	086	98.1 (2492)	86.8 (2205)	259 (6579)	860	795	1410	1420	565	1225	1245
	S030090S2010	090	102.4 (2601)	90.6 (2301)	231 (5867)	890	815	1460	1485	585	1275	1300
	S030090H2010	090	102.4 (2601)	91.1 (2314)	272 (6909)	895	820	1470	1495	585	1285	1305
	S030094S2010	094	106.7 (2710)	95 (2413)	242 (6147)	925	850	1520	1545	610	1335	1355
	S030094H2010	094	106.7 (2710)	95.4 (2423)	285 (7239)	930	855	1540	1560	615	1340	1365
	S030099S2010	099	111 (2819)	99.3 (2522)	253 (6426)	960	875	1575	1600	630	1395	1415
	S030099H2010	099	111 (2819)	99.7 (2532)	298 (7569)	965	880	1585	1610	635	1395	1425
	S030103S2010	103	115.3 (2929)	103.6 (2631)	264 (6706)	990	890	1640	1670	655	1445	1475
	S030103H2010	103	115.3 (2929)	104.1 (2644)	310 (7874)	995	895	1645	1670	660	1450	1485
	S030107S2010	107	119.7 (3040)	107.9 (2741)	275 (6985)	1010	920	1690	1725	675	1500	1530
	S030107H2010	107	119.7 (3040)	108.4 (2753)	323 (8204)	1015	920	1695	1730	675	1510	1535
	S030112S2010	112	124 (3150)	112.2 (2850)	286 (7264)	1040	945	1750	1790	695	1555	1590
	S030112H2010	112	124 (3150)	112.7 (2863)	336 (8534)	1045	950	1755	1795	700	1565	1595
	S030116S2010	116	128.3 (3259)	116.6 (2962)	297 (7544)	1070	975	1815	1850	720	1615	1645
	S030116H2010	116	128.3 (3259)	117 (2972)	349 (8865)	1075	980	1820	1855	720	1620	1655
	S030120S2010	120	132.6 (3368)	120.9 (3071)	308 (7823)	1100	1000	1875	1915	735	1665	1705
	S030120H2010	120	132.6 (3368)	121.3 (3081)	362 (9195)	1105	1005	1880	1920	740	1670	1710
	S030125S2010	125	136.9 (3477)	125.2 (3180)	319 (8103)	1125	1030	1935	1975	760	1720	1755
	S030125H2010	125	136.9 (3477)	125.7 (3193)	375 (9525)	1130	1035	1940	1980	760	1725	1765
	S030129S2010	129	141.3 (3589)	129.5 (3289)	330 (8382)	1155	1055	1990	2040	780	1770	1815
	S030129H2010	129	141.3 (3589)	130 (3302)	388 (9855)	1160	1060	1995	2045	780	1780	1820
	S030133S2010	133	145.6 (3698)	133.8 (3399)	341 (8661)	1180	1080	2050	2100	795	1825	1870
	S030133H2010	133	145.6 (3698)	134.3 (3411)	401 (10185)	1185	1085	2055	2105	800	1830	1875
	S030138S2010	138	149.9 (3807)	138.2 (3510)	352 (8941)	1205	1105	2110	2160	815	1880	1925
	S030138H2010	138	149.9 (3807)	138.6 (3520)	414 (10516)	1210	1110	2115	2165	820	1885	1930
	S030142S2010	142	154.2 (3917)	142.5 (3620)	363 (9220)	1230	1130	2165	2220	835	1930	1980
	S030142H2010	142	154.2 (3917)	142.9 (3630)	427 (10846)	1235	1135	2170	2225	835	1935	1980

Notes:

- Dimensional and electrical values displayed in main table are for an insulator with Y-clevis and Ball end fittings.
- For voltages above 400 kV, other section lengths, or end fitting combinations, please contact your HPS representative.
- Electrical values are without corona ring. For voltages equal to or greater than 220 kV, refer to page 12 for corona rings and associated physical/electrical changes to the above data. Dimensions are within allowable tolerances as specified by IEC 61109 and ANSI C29.12.

Section Length Adjustment Table, Base End Fittings: Y-clevis-Ball (201)

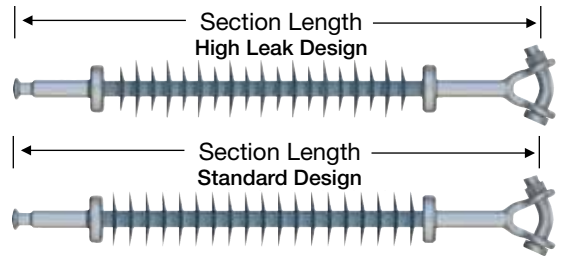
Top Fitting	Bottom Fitting	Top and Bottom End Fitting Digits ("e" & "f") in Catalog Number	Length Change inches (mm)
Y-Clevis	Eye	200	1.62 (41)
Eye	ANSI 52-5 Ball	001	0.02 (0)
Eye	Eye	000	1.64 (42)
ANSI 52-5 Socket	ANSI 52-5 Ball	301	-1.15 (-29)
IEC 16 mm Socket	IEC 16 mm Ball	A07	-0.03 (-1)
ANSI 52-6 Clevis	Eye	400	0.82 (21)
ANSI 52-6 Clevis	ANSI 52-5 Ball	401	-0.8 (-20)

To determine the section length for an insulator with a different end fitting combination, please add or subtract the displayed length change in the table above. For configurations not shown, use the Catalog Number Key or contact your HPS representative.

Suspension Insulators

Mechanical Ratings SML = 160 kN RTL = 80 kN

Rod Diameter: 7/8" (22 mm)



Selection Guide: Typical Line Voltage, kV	Catalog Numbers IEC	Nominal Polymer Length inches (mm)	Section Length inches (mm)	Strike Distance inches (mm)	Leakage Distance inches (mm)	ANSI Values				IEC Values		
						60-Hz Dry Flashover (kV)	60-Hz Wet Flashover (kV)	Critical Impulse Positive (kV)	Critical Impulse Negative (kV)	60-Hz 1-minute Wet Withstand (kV)	Impulse Positive Withstand (kV)	Impulse Negative Withstand (kV)
69 110 132 161 220 330 400	S160021S2010	021	35.7 (907)	21.6 (549)	55 (1397)	220	210	370	350	145	315	300
	S160021H2010	021	35.7 (907)	22.5 (572)	74 (1880)	225	215	375	355	150	330	315
	S160023S2010	023	37.9 (963)	23.8 (605)	60 (1524)	250	235	415	395	165	350	330
	S160023H2010	023	37.9 (963)	24.7 (627)	82 (2083)	255	240	420	400	170	360	345
	S160030S2010	030	44.4 (1128)	30.3 (770)	77 (1956)	320	305	525	510	210	445	430
	S160030H2010	030	44.4 (1128)	31.1 (790)	104 (2642)	320	310	540	520	215	455	445
	S160036S2010	036	50.8 (1290)	36.8 (935)	93 (2362)	385	365	635	625	260	540	530
	S160036H2010	036	50.8 (1290)	37.6 (955)	126 (3200)	395	375	650	625	265	550	540
	S160043S2010	043	57.3 (1455)	43.2 (1097)	110 (2794)	460	435	730	725	300	630	625
	S160043H2010	043	57.3 (1455)	44.1 (1120)	149 (3785)	470	445	745	735	310	640	635
	S160047S2010	047	61.6 (1565)	47.6 (1209)	121 (3073)	500	475	800	800	330	690	690
	S160047H2010	047	61.6 (1565)	48.4 (1229)	164 (4166)	515	480	810	805	335	705	700
	S160051S2010	051	66 (1676)	51.9 (1318)	132 (3353)	540	510	865	860	360	755	750
	S160051H2010	051	66 (1676)	52.7 (1339)	179 (4547)	545	515	880	875	365	765	765
	S160056S2010	056	70.3 (1786)	56.2 (1427)	143 (3632)	585	545	935	935	385	810	810
	S160056H2010	056	70.3 (1786)	57.1 (1450)	194 (4928)	590	555	945	945	390	825	825
	S160060S2010	060	74.6 (1895)	60.5 (1537)	154 (3912)	625	580	1000	1005	410	870	875
	S160060H2010	060	74.6 (1895)	61.4 (1560)	209 (5309)	630	590	1015	1015	420	885	890
	S160064S2010	064	78.9 (2004)	64.8 (1646)	165 (4191)	660	615	1065	1075	435	930	940
	S160064H2010	064	78.9 (2004)	65.7 (1669)	224 (5690)	670	620	1075	1080	445	945	950
	S160069S2010	069	83.2 (2113)	69.2 (1758)	176 (4470)	695	650	1130	1140	465	990	1000
	S160069H2010	069	83.2 (2113)	70 (1778)	239 (6071)	705	655	1140	1150	470	1000	1010
	S160073S2010	073	87.6 (2225)	73.5 (1867)	187 (4750)	735	685	1200	1210	490	1050	1060
	S160073H2010	073	87.6 (2225)	74.3 (1887)	254 (6452)	745	695	1210	1220	495	1060	1075
	S160077S2010	077	91.9 (2334)	77.8 (1976)	198 (5029)	780	720	1260	1275	515	1110	1125
	S160077H2010	077	91.9 (2334)	78.7 (1999)	268 (6807)	785	725	1275	1285	520	1120	1130
	S160081S2010	081	96.2 (2443)	82.1 (2085)	209 (5309)	815	745	1325	1345	540	1165	1180
	S160081H2010	081	96.2 (2443)	83 (2108)	283 (7188)	825	755	1335	1350	545	1175	1195
	S160086S2010	086	100.5 (2553)	86.4 (2195)	220 (5588)	860	780	1400	1420	565	1220	1240
	S160086H2010	086	100.5 (2553)	87.3 (2217)	298 (7569)	865	800	1415	1425	570	1235	1255
	S160090S2010	090	104.8 (2662)	90.8 (2306)	231 (5867)	890	815	1460	1485	585	1280	1305
	S160090H2010	090	104.8 (2662)	91.6 (2327)	313 (7950)	900	825	1475	1500	590	1290	1310
	S160094S2010	094	109.2 (2774)	95.1 (2416)	242 (6147)	925	850	1520	1545	610	1340	1360
	S160094H2010	094	109.2 (2774)	95.9 (2436)	328 (8331)	935	860	1545	1565	615	1350	1370
	S160099S2010	099	113.5 (2883)	99.4 (2525)	253 (6426)	960	875	1575	1605	630	1395	1420
	S160099H2010	099	113.5 (2883)	100.3 (2548)	343 (8712)	970	885	1590	1615	635	1405	1430
	S160103S2010	103	117.8 (2992)	103.7 (2634)	264 (6706)	990	890	1640	1670	655	1445	1475
	S160103H2010	103	117.8 (2992)	104.6 (2657)	358 (9093)	1000	900	1650	1675	660	1460	1485
	S160107S2010	107	122.1 (3101)	108 (2743)	275 (6985)	1010	920	1695	1725	675	1505	1530
	S160107H2010	107	122.1 (3101)	108.9 (2766)	373 (9474)	1020	925	1700	1735	680	1515	1545
	S160112S2010	112	126.4 (3211)	112.4 (2855)	286 (7264)	1045	950	1755	1790	700	1560	1590
	S160112H2010	112	126.4 (3211)	113.2 (2875)	388 (9855)	1050	955	1760	1800	705	1570	1600
	S160116S2010	116	130.8 (3322)	116.7 (2964)	297 (7544)	1070	975	1815	1855	720	1615	1650
	S160116H2010	116	130.8 (3322)	117.5 (2985)	403 (10236)	1080	985	1825	1860	720	1620	1660
	S160120S2010	120	135.1 (3432)	121 (3073)	308 (7823)	1100	1005	1875	1915	740	1665	1705
	S160120H2010	120	135.1 (3432)	121.9 (3096)	418 (10617)	1110	1010	1885	1925	745	1680	1715
	S160125S2010	125	139.4 (3541)	125.3 (3183)	319 (8103)	1125	1030	1935	1980	760	1720	1760
	S160125H2010	125	139.4 (3541)	126.2 (3205)	433 (10998)	1135	1040	1945	1985	765	1730	1770
	S160129S2010	129	143.7 (3650)	129.6 (3292)	330 (8382)	1155	1055	1995	2040	780	1775	1815
	S160129H2010	129	143.7 (3650)	130.5 (3315)	448 (11379)	1165	1065	2000	2050	780	1785	1825
	S160133S2010	133	148 (3759)	134 (3404)	341 (8661)	1180	1080	2055	2100	795	1830	1870
	S160133H2010	133	148 (3759)	134.8 (3424)	463 (11760)	1190	1090	2060	2110	800	1840	1885
	S160138S2010	138	152.4 (3871)	138.3 (3513)	352 (8941)	1205	1105	2110	2160	815	1880	1925
	S160138H2010	138	152.4 (3871)	139.1 (3533)	478 (12141)	1215	1115	2120	2170	820	1890	1935
	S160142S2010	142	156.7 (3980)	142.6 (3622)	363 (9220)	1230	1130	2170	2220	835	1935	1980
	S160142H2010	142	156.7 (3980)	143.5 (3645)	493 (12522)	1240	1140	2175	2230	840	1940	1990

Notes:

- Dimensional and electrical values displayed in main table are for an insulator with Y-clevis and Ball end fittings.
- For voltages above 400 kV, other section lengths, or end fitting combinations, please contact your HPS representative.
- Electrical values are without corona ring. For voltages equal to or greater than 220 kV, refer to page 12 for corona rings and associated physical/electrical changes to the above data. Dimensions are within allowable tolerances as specified by IEC 61109 and ANSI C29.12.

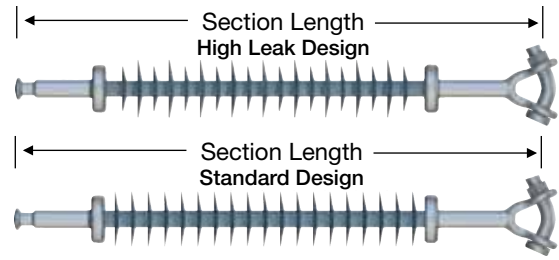
Section Length Adjustment Table, Base End Fittings: Y-clevis-Ball (201)

Top Fitting	Bottom Fitting	Top and Bottom End Fitting Digits ("e" & "f") in Catalog Number	Length Change inches (mm)
Y-Clevis	Eye	200	1.71 (43)
Eye	ANSI 52-8 Ball	001	0.31 (8)
Eye	Eye	000	2.02 (51)
ANSI 52-8 Socket	ANSI 52-8 Ball	301	-1.27 (-32)
IEC 20 mm Socket	IEC 20 mm Ball	A07	0.26 (7)
Clevis IEC 19-L	Eye	800	0.80 (20)
Clevis IEC 19-L	IEC 20 mm Ball	807	0.06 (2)

To determine the section length for an insulator with a different end fitting combination, please add or subtract the displayed length change in the table above. For configurations not shown, use the Catalog Number Key or contact your HPS representative.

Suspension Insulators

Mechanical Ratings SML = 50 kip/210 kN RTL = 25 kip/105 kN
Rod Diameter: 7/8" (22 mm)



Selection Guide: Typical Line Voltage, kV	Catalog Numbers ANSI / IEC	Nominal Polymer Length inches (mm)	Section Length inches (mm)	Strike Distance inches (mm)	Leakage Distance inches (mm)	ANSI Values				IEC Values		
						60-Hz Dry Flashover (kV)	60-Hz Wet Flashover (kV)	Critical Impulse Positive (kV)	Critical Impulse Negative (kV)	60-Hz 1-minute Wet Withstand (kV)	Impulse Positive Withstand (kV)	Impulse Negative Withstand (kV)
69	S050021S2010 / S210021S2010	021	35.7 (907)	21.6 (549)	55 (1397)	220	210	370	350	145	315	300
110	S050021H2010 / S210021H2010	021	35.7 (907)	22.5 (572)	74 (1880)	225	215	375	355	150	330	315
132	S050023S2010 / S210023S2010	023	37.9 (963)	23.8 (605)	60 (1524)	250	235	415	395	165	350	330
161	S050023H2010 / S210023H2010	023	37.9 (963)	24.7 (627)	82 (2083)	255	240	420	400	170	360	345
220	S050030S2010 / S210030S2010	030	44.4 (1128)	30.3 (770)	77 (1956)	315	305	525	510	210	445	430
330	S050030H2010 / S210030H2010	030	44.4 (1128)	31.1 (790)	104 (2642)	320	310	540	520	215	455	445
400	S050036S2010 / S210036S2010	036	50.8 (1290)	36.8 (935)	93 (2362)	385	365	635	625	260	540	530
	S050036H2010 / S210036H2010	036	50.8 (1290)	37.6 (955)	126 (3200)	395	375	650	625	265	550	540
	S050043S2010 / S210043S2010	043	57.3 (1455)	43.2 (1097)	110 (2794)	460	435	730	725	300	630	625
	S050043H2010 / S210043H2010	043	57.3 (1455)	44.1 (1120)	149 (3785)	470	445	745	735	310	640	635
	S050047S2010 / S210047S2010	047	61.6 (1565)	47.6 (1209)	121 (3073)	500	475	800	800	330	690	690
	S050047H2010 / S210047H2010	047	61.6 (1565)	48.4 (1229)	164 (4166)	510	480	810	805	335	705	700
	S050051S2010 / S210051S2010	051	66 (1676)	51.9 (1318)	132 (3353)	540	510	865	860	360	755	750
	S050051H2010 / S210051H2010	051	66 (1676)	52.7 (1339)	179 (4547)	545	515	880	875	365	765	765
	S050056S2010 / S210056S2010	056	70.3 (1786)	56.2 (1427)	143 (3632)	585	545	935	935	385	810	810
	S050056H2010 / S210056H2010	056	70.3 (1786)	57.1 (1450)	194 (4928)	590	555	945	945	390	825	825
	S050060S2010 / S210060S2010	060	74.6 (1895)	60.5 (1537)	154 (3912)	625	580	1000	1005	410	870	875
	S050060H2010 / S210060H2010	060	74.6 (1895)	61.4 (1560)	209 (5309)	630	590	1015	1015	420	885	890
	S050064S2010 / S210064S2010	064	78.9 (2004)	64.8 (1646)	165 (4191)	660	615	1065	1075	435	930	940
	S050064H2010 / S210064H2010	064	78.9 (2004)	65.7 (1669)	224 (5690)	670	620	1075	1080	445	945	950
	S050069S2010 / S210069S2010	069	83.2 (2113)	69.2 (1758)	176 (4470)	695	650	1130	1140	465	990	1000
	S050069H2010 / S210069H2010	069	83.2 (2113)	70 (1778)	239 (6071)	705	655	1140	1150	470	1000	1010
	S050073S2010 / S210073S2010	073	87.6 (2225)	73.5 (1867)	187 (4750)	735	685	1200	1210	490	1050	1060
	S050073H2010 / S210073H2010	073	87.6 (2225)	74.3 (1887)	254 (6452)	745	695	1210	1220	495	1060	1075
	S050077S2010 / S210077S2010	077	91.9 (2334)	77.8 (1976)	198 (5029)	780	720	1260	1275	515	1110	1125
	S050077H2010 / S210077H2010	077	91.9 (2334)	78.7 (1999)	268 (6807)	785	725	1275	1285	520	1120	1130
	S050081S2010 / S210081S2010	081	96.2 (2443)	82.1 (2085)	209 (5309)	815	745	1325	1345	540	1165	1180
	S050081H2010 / S210081H2010	081	96.2 (2443)	83 (2108)	283 (7188)	825	755	1335	1350	545	1175	1195
	S050086S2010 / S210086S2010	086	100.5 (2553)	86.4 (2195)	220 (5588)	860	780	1400	1420	565	1220	1240
	S050086H2010 / S210086H2010	086	100.5 (2553)	87.3 (2217)	298 (7569)	865	800	1415	1425	570	1235	1255
	S050090S2010 / S210090S2010	090	104.8 (2662)	90.8 (2306)	231 (5867)	890	815	1460	1485	585	1280	1305
	S050090H2010 / S210090H2010	090	104.8 (2662)	91.6 (2327)	313 (7950)	900	825	1475	1500	590	1290	1310
	S050094S2010 / S210094S2010	094	109.2 (2774)	95.1 (2416)	242 (6147)	925	850	1520	1545	610	1340	1360
	S050094H2010 / S210094H2010	094	109.2 (2774)	95.9 (2436)	328 (8331)	935	860	1545	1565	615	1350	1370
	S050099S2010 / S210099S2010	099	113.5 (2883)	99.4 (2525)	253 (6426)	960	875	1575	1605	630	1395	1420
	S050099H2010 / S210099H2010	099	113.5 (2883)	100.3 (2548)	343 (8712)	970	885	1590	1615	635	1405	1430
	S050103S2010 / S210103S2010	103	117.8 (2992)	103.7 (2634)	264 (6706)	990	890	1640	1670	655	1445	1475
	S050103H2010 / S210103H2010	103	117.8 (2992)	104.6 (2657)	358 (9093)	1000	900	1650	1675	660	1460	1485
	S050107S2010 / S210107S2010	107	122.1 (3101)	108 (2743)	275 (6985)	1010	920	1695	1725	675	1505	1530
	S050107H2010 / S210107H2010	107	122.1 (3101)	108.9 (2766)	373 (9474)	1020	925	1700	1735	680	1515	1545
	S050112S2010 / S210112S2010	112	126.4 (3211)	112.4 (2855)	286 (7264)	1045	950	1755	1790	700	1560	1590
	S050112H2010 / S210112H2010	112	126.4 (3211)	113.2 (2875)	388 (9855)	1050	955	1760	1800	705	1570	1600
	S050116S2010 / S210116S2010	116	130.8 (3322)	116.7 (2964)	297 (7544)	1070	975	1815	1855	720	1615	1650
	S050116H2010 / S210116H2010	116	130.8 (3322)	117.5 (2985)	403 (10236)	1080	985	1825	1860	720	1620	1660
	S050120S2010 / S210120S2010	120	135.1 (3432)	121 (3073)	308 (7823)	1100	1005	1875	1915	740	1665	1705
	S050120H2010 / S210120H2010	120	135.1 (3432)	121.9 (3096)	418 (10617)	1110	1010	1885	1925	745	1680	1715
	S050125S2010 / S210125S2010	125	139.4 (3541)	125.3 (3183)	319 (8103)	1125	1030	1935	1980	760	1720	1760
	S050125H2010 / S210125H2010	125	139.4 (3541)	126.2 (3205)	433 (10998)	1135	1040	1945	1985	765	1730	1770
	S050129S2010 / S210129S2010	129	143.7 (3650)	129.6 (3292)	330 (8382)	1155	1055	1995	2040	780	1775	1815
	S050129H2010 / S210129H2010	129	143.7 (3650)	130.5 (3315)	448 (11379)	1165	1065	2000	2050	780	1785	1825
	S050133S2010 / S210133S2010	133	148 (3759)	134 (3404)	341 (8661)	1180	1080	2055	2100	795	1830	1870
	S050133H2010 / S210133H2010	133	148 (3759)	134.8 (3424)	463 (11760)	1190	1090	2060	2110	800	1840	1885
	S050138S2010 / S210138S2010	138	152.4 (3871)	138.3 (3513)	352 (8941)	1205	1105	2110	2160	815	1880	1925
	S050138H2010 / S210138H2010	138	152.4 (3871)	139.1 (3533)	478 (12141)	1215	1115	2120	2170	820	1890	1935
	S050142S2010 / S210142S2010	142	156.7 (3980)	142.6 (3622)	363 (9220)	1230	1130	2170	2220	835	1935	1980
	S050142H2010 / S210142H2010	142	156.7 (3980)	143.5 (3645)	493 (12522)	1240	1140	2175	2230	840	1940	1990

Notes:

- Dimensional and electrical values displayed in main table are for an insulator with Y-clevis and Ball end fittings.
- For voltages above 400 kV, other section lengths, or end fitting combinations, please contact your HPS representative.
- Electrical values are without corona ring. For voltages equal to or greater than 220 kV, refer to page 12 for corona rings and associated physical/electrical changes to the above data. Dimensions are within allowable tolerances as specified by IEC 61109 and ANSI C29.12.

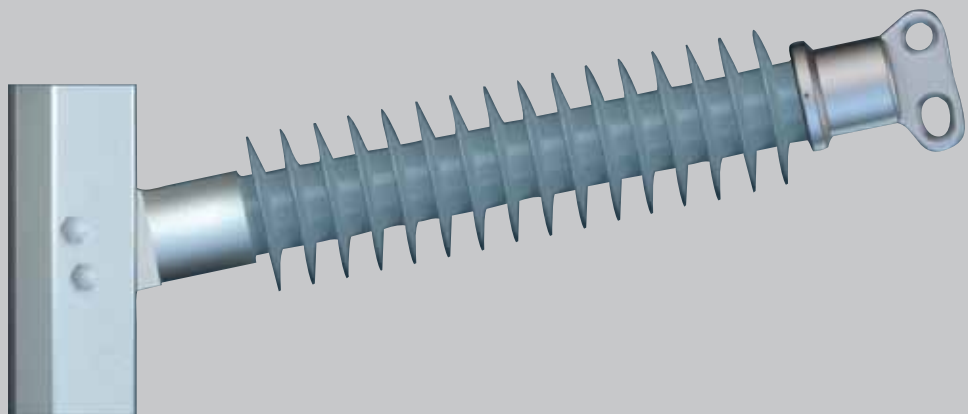
Section Length Adjustment Table, Base End Fittings: Y-clevis-Ball (201)

Top Fitting	Bottom Fitting	Top and Bottom End Fitting Digits ("e" & "f") in Catalog Number	Length Change inches (mm)
Y-Clevis	Eye	200	1.71 (43)
Eye	ANSI 52-11 Ball	001	0.31 (8)
Eye	Eye	000	2.02 (51)
ANSI 52-11 Socket	ANSI 52-11 Ball	301	-0.71 (-18)
IEC 20 mm Socket	IEC 20 mm Ball	A07	0.26 (7)
Clevis IEC 19-L	Eye	800	0.80 (20)
Clevis IEC 19-L	IEC 20 mm Ball	807	0.06 (2)

To determine the section length for an insulator with a different end fitting combination, please add or subtract the displayed length change in the table above. For configurations not shown, use the Catalog Number Key or contact your HPS representative.

Line Post Insulators

TABLE OF CONTENTS	PAGE
Mechanical Ratings and Corona Performance	20
Quadri*Sil® Horizontal Line Posts	21
Quadri*Sil® Vertical Line Posts	22
Quadri*Sil® Base Fittings	24
Quadri*Sil® Line Fittings	25
Clamps and Assemblies	26



Mechanical Ratings

Line post insulators are cantilever support members, with ratings defined as follows:

Specified Cantilever Load (SCL)

SCL is the ultimate cantilever strength rating of the Quadri*Sil® line post insulator. SCL is identical to the minimum average breaking load (ABL) rating in previous catalogs.

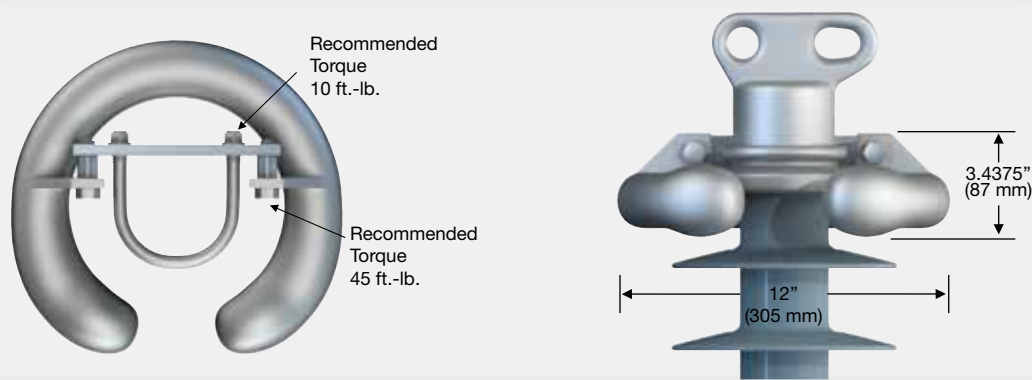
Reference Cantilever Load (RCL)

RCL represents the maximum recommended load in cantilever that a Quadri*Sil® post insulator is designed to withstand during its life span. RCL equals 50 percent of the SCL, and is identical to the insulator's maximum working load (MWL) and maximum design cantilever load (MDCL).

Combined Load Charts

Line design loads for most insulators include tension, or compression, in addition to the primary vertical cantilever load. Longitudinal loading should also be considered. Contact your Hubbell Power Systems representative to request combined load charts.

Corona Performance



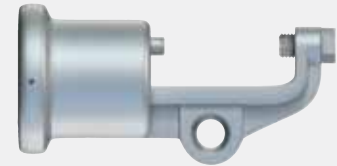
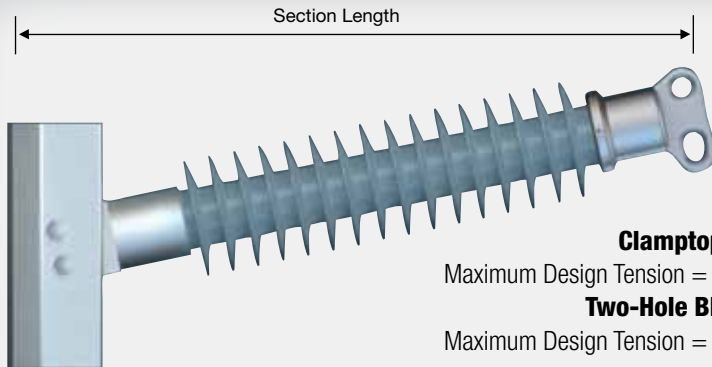
Line Post Insulators 2.5" (63.5 mm) Rod Diameter Horizontal

Application	161 kv & Below	230 kv	345 kv
Line End Energized	Top - NONE Bott - NONE	Top - 2721273001 Bott - NONE	Top - 2721273001 Bott - NONE
Bottom End Energized	Top - NONE Bott - NONE	Top - NONE Bott - 2721273001	Top - NONE Bott - 2721273001

Electrical/Dimensional Changes to the Insulator with External Corona Ring

Physical & Electrical Characteristics	220/230 kV Ring	330/345 kV Ring	400 kV Rings	500 kV Rings
Dry Arc Distance inches (mm)	-1.86 (-47)	-2.58 (-66)	N/A	N/A
Leakage Distance inches (mm)	0	0	N/A	N/A
ANSI 60 Hz Flashover Dry — kV	-20	-30	N/A	N/A
ANSI 60 Hz Flashover Wet — kV	-20	-20	N/A	N/A
ANSI Critical Flashover Positive — kV	-30	-40	N/A	N/A
ANSI Critical Flashover Negative — kV	-30	-40	N/A	N/A
IEC Wet Switching Impulse Withstand — kV	N/A	N/A	N/A	N/A
IEC Power Frequency Wet Withstand — kV	-20	-20	N/A	N/A
IEC Lightning Impulse Withstand Positive — kV	-30	-40	N/A	N/A
IEC Lightning Impulse Withstand Negative — kV	-30	-40	N/A	N/A
Net Weight pounds (kg)	3.4 (1.5)	3.4 (1.5)	N/A	N/A

Horizontal Line Post Insulators 2.5" (63.5 mm) Rod Diameter



Horizontal Clamptop End Fitting
Increases the section length
dimensions by 0.75"

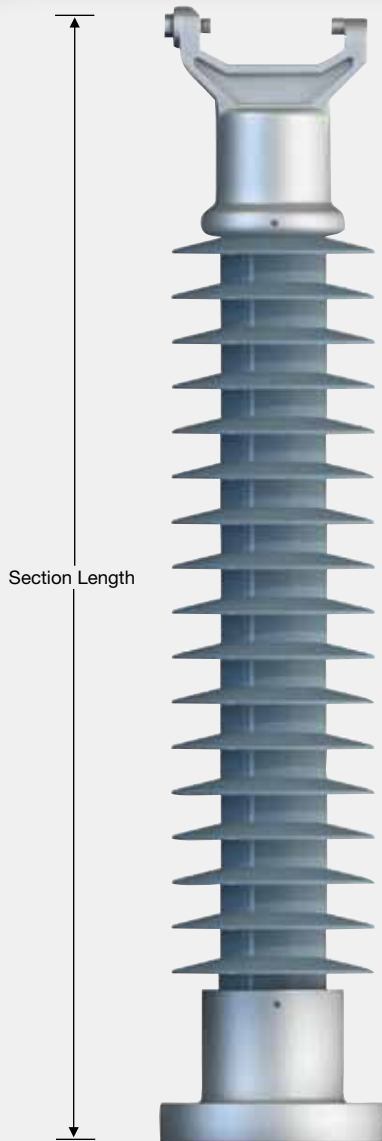
Horizontal Line Post Insulators 2.5" (63.5 mm) Rod Diameter

Selection Guide: Typical Line Voltage, kV ⁽¹⁾	Catalog Numbers ⁽³⁾	Nominal Polymer Length inches	Section Length inches (mm)	Strike Distance inches (mm)	Leakage Distance inches (mm)	ANSI Values				IEC Values			SCL lbs. (kN)	
						⁽²⁾ 60-Hz Dry Flashover (kV)	⁽²⁾ 60-Hz Wet Flashover (kV)	⁽²⁾ Critical Impulse Positive (kV)	⁽²⁾ Critical Impulse Negative (kV)	⁽²⁾ 60-Hz 1-minute Wet Withstand (kV)	⁽²⁾ Impulse Positive Withstand (kV)	⁽²⁾ Impulse Negative Withstand (kV)		
69 110 132 161 220 330														
	P250024S0020	024	36.9 (937)	25.0 (635)	63 (1600)	255	235	385	505	195	365	475	5000 (22.2)	
	P250026S0020	026	39.3 (998)	27.4 (696)	69 (1753)	280	255	425	540	215	400	510	5000 (22.2)	
	P250031S0020	031	44.0 (1117)	32.2 (818)	82 (2083)	330	300	510	615	255	480	580	4490 (20.0)	
	P250036S0020	036	48.8 (1239)	37.1 (942)	95 (2413)	380	345	580	690	290	550	655	3950 (17.6)	
	P250043S0020	043	55.9 (1419)	44.3 (1125)	113 (2870)	455	405	700	800	340	665	760	3340 (14.9)	
	P250048S0020	048	60.6 (1539)	49.2 (1250)	126 (3200)	515	450	770	880	380	730	835	3030 (13.5)	
	P250053S0020	053	65.3 (1658)	54.0 (1372)	139 (3531)	565	495	855	950	420	810	900	2770 (12.3)	
	P250058S0020	058	70.1 (1780)	58.8 (1494)	151 (3835)	600	525	920	1025	445	870	970	2550 (11.3)	
	P250060S0020	060	72.4 (1838)	61.3 (1557)	158 (4013)	625	540	955	1065	455	905	1010	2460 (10.9)	
	P250065S0020	065	77.2 (1960)	66.1 (1679)	170 (4318)	675	580	1035	1140	490	980	1080	2280 (10.1)	
	P250070S0020	070	81.9 (2080)	70.9 (1801)	183 (4648)	720	615	1115	1215	520	1055	1150	2130 (9.5)	
	P250075S0020	075	86.6 (2199)	75.8 (1925)	196 (4978)	765	650	1190	1290	550	1130	1225	2000 (8.9)	
	P250080S0020	080	91.4 (2321)	80.6 (2047)	208 (5283)	815	680	1265	1360	575	1200	1290	1890 (8.4)	
	P250087S0020	087	98.5 (2501)	87.9 (2233)	227 (5766)	880	735	1380	1475	620	1310	1400	1740 (7.7)	
	P250092S0020	092	103.2 (2621)	92.7 (2355)	240 (6096)	925	765	1455	1550	650	1380	1470	1650 (7.3)	
	P250096S0020	096	107.9 (2740)	97.6 (2479)	252 (6401)	975	800	1535	1625	680	1455	1540	1570 (7.0)	
	P250101S0020	101	112.7 (2862)	102.4 (2601)	265 (6731)	1015	830	1610	1700	705	1525	1615	1500 (6.7)	
	P250104S0020	104	115.1 (2923)	104.8 (2662)	271 (6883)	1040	845	1650	1735	715	1565	1645	1460 (6.5)	
	P250106S0020	106	117.4 (2981)	107.2 (2723)	278 (7061)	1060	860	1685	1770	730	1600	1680	1430 (6.4)	
	P250109S0020	109	119.8 (3042)	109.7 (2786)	284 (7214)	1085	875	1725	1810	740	1635	1715	1400 (6.2)	
	P250111S0020	111	122.2 (3103)	112.1 (2847)	290 (7366)	1105	890	1765	1850	755	1675	1755	1370 (6.1)	

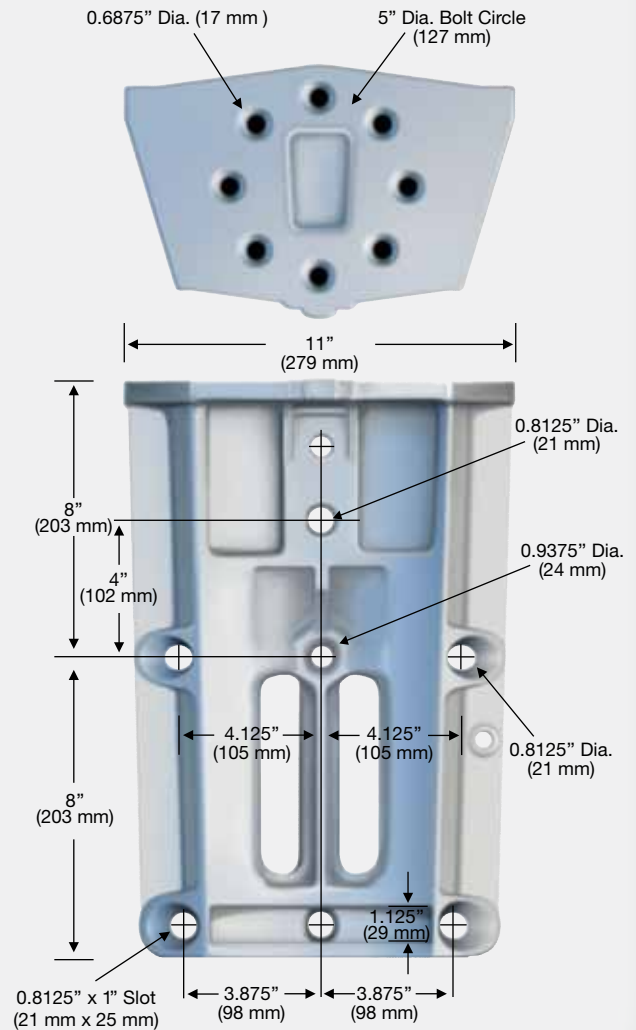
Notes:

- 1) For voltages above 330 kV, other section lengths, or end fitting combinations, please contact your HPS representative.
- 2) Electrical values are without corona ring. For voltages equal to or greater than 220 kV, refer to page 20 for corona rings and associated physical/electrical changes to the above data. Dimensions are within allowable tolerances as specified by IEC 61952 and ANSI C29.17.
- 3) The catalog number shown in the table is for a 2.5" (63.5mm) rod diameter line post with a two hole blade on the line end and a gain base on the tower end. For other end fitting combinations, please refer to the Catalog Number Key on page 8.

Vertical Line Post Insulators 2.5" (63.5 mm) Rod Diameter



Maximum Design Tension = 2,500 lbs. (11.1 kN)



Cat. No. 75115
Rated 134,400 lb.-in.

Vertical Line Post Insulators 2.5" (63.5 mm) Rod Diameter

Selection Guide: Typical Line Voltage, kV ⁽¹⁾	Catalog Numbers ⁽²⁾	Nominal Polymer Length inches	Section Length inches (mm)	Strike Distance inches (mm)	Leakage Distance inches (mm)	ANSI Values				IEC Values			SCL lbs. (kN)
						Ⓢ60-Hz Dry Flashover (kV)	Ⓢ60-Hz Wet Flashover (kV)	ⓈCritical Impulse Positive (kV)	ⓈCritical Impulse Negative (kV)	Ⓢ60-Hz 1-minute Wet Withstand (kV)	ⓈImpulse Positive Withstand (kV)	ⓈImpulse Negative Withstand (kV)	
69 110 132 161													
	P250024S2050	024	35.0 (889)	25.0 (635)	63 (1600)	255	235	385	505	195	365	475	5000 (22.3)
	P250026S2050	026	37.4 (950)	27.4 (696)	69 (1753)	280	255	425	540	215	400	510	5000 (22.3)
	P250031S2050	031	42.3 (1074)	32.2 (818)	82 (2083)	330	300	510	615	255	480	580	4200 (18.7)
	P250036S2050	036	47.1 (1196)	37.1 (942)	95 (2413)	380	345	580	690	290	550	655	3720 (16.6)
	P250043S2050	043	54.4 (1382)	44.3 (1125)	113 (2870)	455	405	700	800	340	665	760	3180 (14.2)
	P250048S2050	048	59.2 (1504)	49.2 (1250)	126 (3200)	515	450	770	880	380	730	835	2900 (12.9)
	P250053S2050	053	64.1 (1628)	54.0 (1372)	139 (3531)	565	495	855	950	420	810	900	2660 (11.8)
	P250058S2050	058	68.9 (1750)	58.8 (1494)	151 (3835)	600	525	920	1025	445	870	970	2460 (10.9)
	P250060S2050	060	71.3 (1811)	61.3 (1557)	158 (4013)	625	540	955	1065	455	905	1010	2370 (10.5)

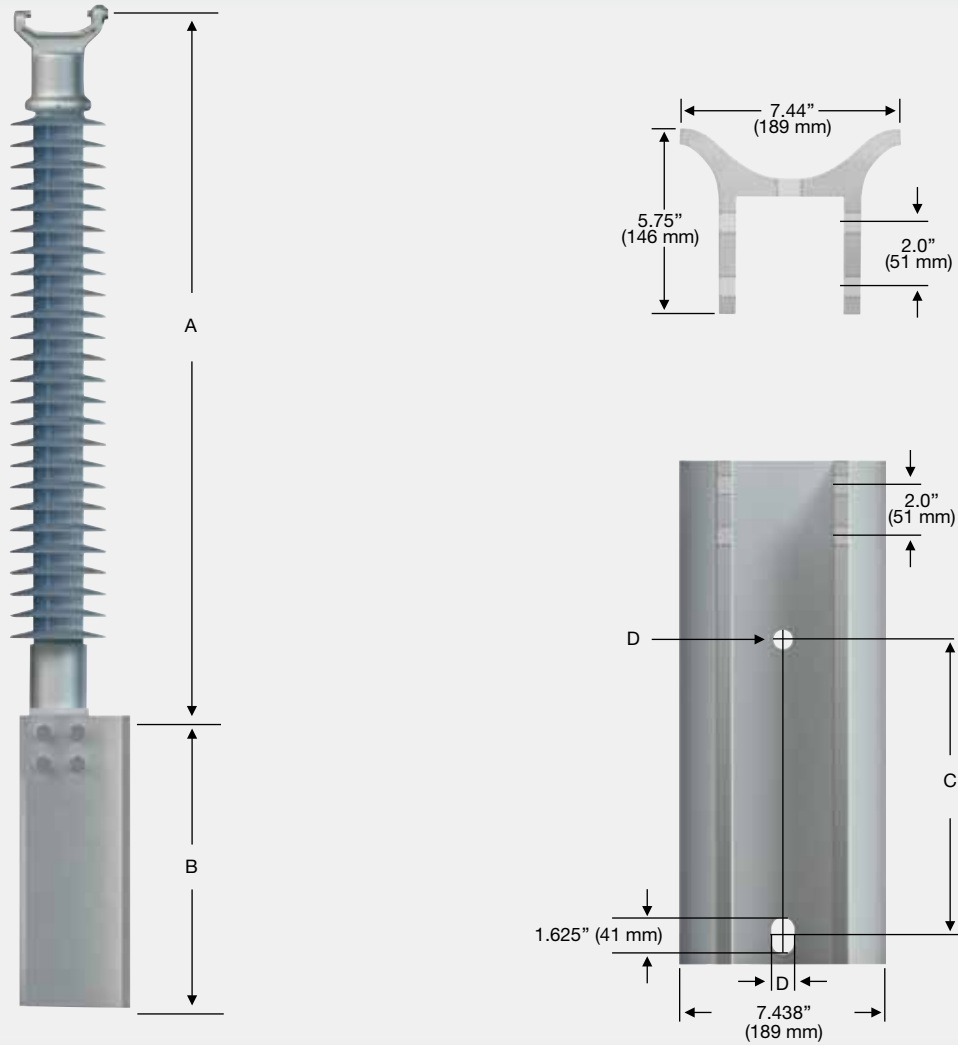
Notes:

1) For voltages above 161 kV, other section lengths, or end fitting combinations, please contact your HPS representative.

2) Electrical values are without corona ring. For voltages equal to or greater than 220 kV, refer to page 20 for corona rings and associated physical/electrical changes to the above data. Dimensions are within allowable tolerances as specified by IEC 61952 and ANSI C29.17.

3) The catalog number shown on the table is for a 2.5" (63.5mm) rod diameter line post with a vertical clamptop on the line end and a 5" Bolt Circle with tapped holes on the ground end. For other end fitting combinations, please refer to the Catalog Number Key on page 8.

Vertical Line Post Assembly 2.5" (63.5 mm) Rod Diameter



Vertical Line Post Insulators 2.5" (63.5 mm) Rod Diameter

Table A

Selection Guide: Typical Line Voltage, kV ⁽¹⁾	Catalog Numbers ⁽²⁾	Nominal Polymer Length inches	"A" Length inches (mm)
69	P250024S2XX0	024	34.7 (881)
110	P250026S2XX0	026	37.1 (942)
132	P250031S2XX0	031	42 (1067)
161	P250036S2XX0	036	46.8 (1189)
	P250043S2XX0	043	54.1 (1374)
	P250048S2XX0	048	58.9 (1496)
	P250053S2XX0	053	63.6 (1615)
	P250058S2XX0	058	68.4 (1737)
	P250060S2XX0	060	70.7 (1796)

Table B

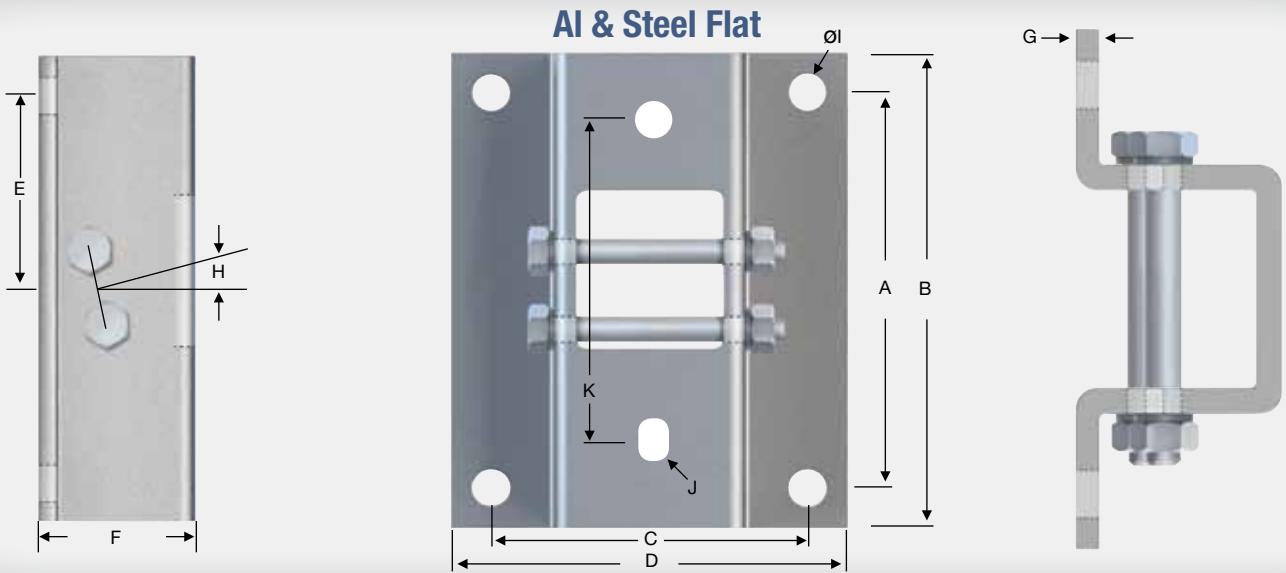
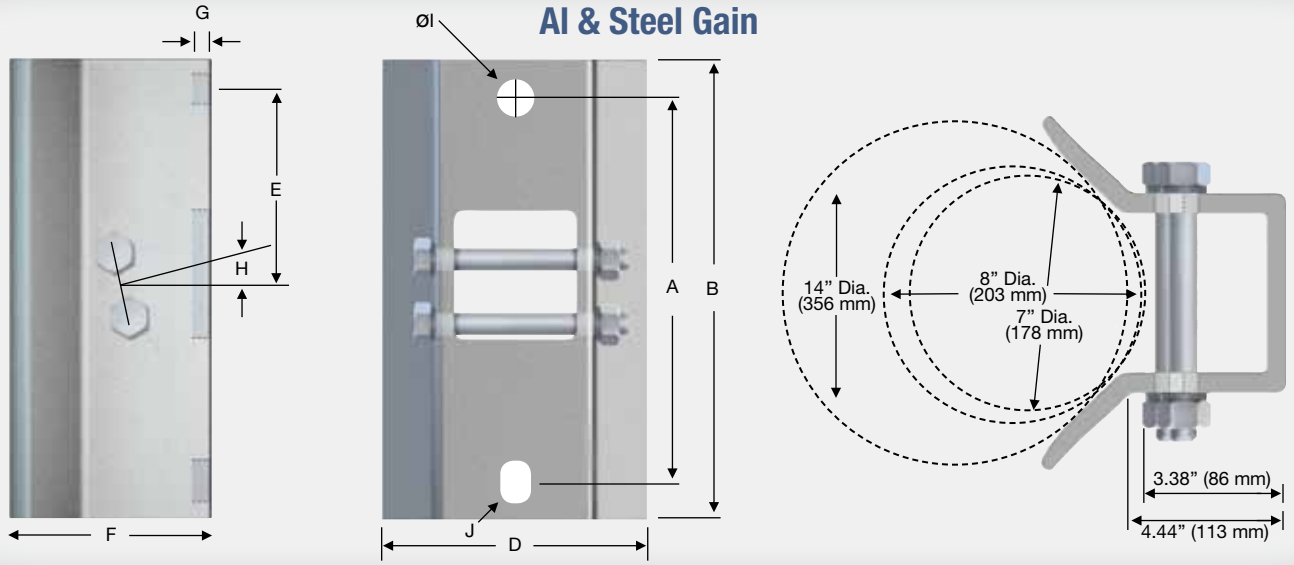
"XX" Code ⁽²⁾	Style	"B" Length inches (mm)	"C" Length inches (mm)	"D" Diameter inches (mm)
20	Face	20 (508)	12 (305)	0.8125 (21)
21	Side	20 (508)	12 (305)	0.8125 (21)
22	Face	20 (508)	12 (305)	0.9375 (24)
23	Side	20 (508)	12 (305)	0.9375 (24)
24	Face	31.75 (806)	16 (406)	0.8125 (21)
25	Side	31.75 (806)	16 (406)	0.8125 (21)
26	Face	31.75 (806)	16 (406)	0.9375 (24)
27	Side	31.75 (806)	16 (406)	0.9375 (24)

Notes:

1) Insulators in Table A have the same electrical and mechanical characteristics as those on page 22 with a vertical clamptop on the line end and a 5" Bolt Circle on the ground end.

2) According to your preferred mounting configuration, replace the "xx" in catalog number from Table A with the two-digit "xx" code from Table B.

Base Fittings for 2.5" (63.5 mm) Rod Diameter

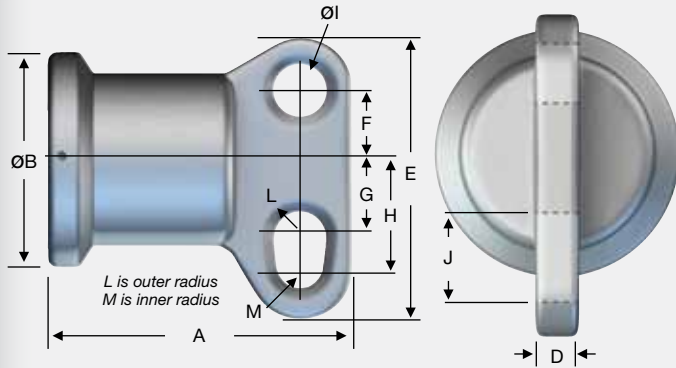


Horizontal & Vertical Bases inches (mm)

Type (Code)	A	B	C	D	E	F	G	H	I	J	K	Material
5" Bolt Circle (15)	4.75 (121)	6.25 (159)	3.63 (92)	0.90 (23)	5.0 (127)	-	-	-	0.69 (18)	-	-	60-40-18 D.I.
5" Bolt Circle (05)	4.75 (121)	6.25 (159)	3.63 (92)	0.90 (23)	5.0 (127)	-	-	-	5/8 - 11 UFS	-	-	60-40-18 D.I.
Aluminum Gain (02)	12.0 (305)	14.0 (356)	-	8.06 (205)	6.13 (156)	5.56 (141)	0.5 (13)	12°	0.94 (24)	0.94 X 1.31 (24x33)	-	6063 T5 AL
Aluminum Gain (12)	12.0 (305)	14.0 (356)	-	8.06 (205)	6.13 (156)	5.56 (141)	0.5 (13)	12°	0.81 (21)	0.94 X 1.31 (24x33)	-	6063 T5 AL
Steel Gain (07)	12.0 (305)	15.0 (381)	-	8.33 (212)	6.5 (165)	6.04 (153)	0.38 (10)	12°	0.94 (24)	0.94 X 2.0 (24x51)	-	Low Carbon Steel
Aluminum Flat (03)	10.0 (254)	12.0 (305)	8.0 (203)	10.0 (254)	5.0 (127)	4.0 (102)	0.5 (13)	12°	0.94 (24)	-	-	6063 T5 AL
Aluminum Flat (13)	10.0 (254)	12.0 (305)	8.0 (203)	10.0 (254)	5.0 (127)	4.0 (102)	0.5 (13)	12°	0.81 (21)	-	-	6063 T5 AL
Steel Flat (08)	13.0 (330)	15.0 (381)	8.0 (203)	10.0 (254)	6.5 (165)	4.0 (102)	0.38 (10)	12°	1.125 X 0.94 (26x24)	0.94 X 2.0 (24x51)	12.0 (305)	Low Carbon Steel
Aluminum Flat (04)	13.0 (330)	15.0 (381)	8.0 (203)	10.0 (254)	6.5 (165)	4.0 (102)	0.5 (13)	12°	0.94 (24)	0.94 X 1.31 (24x33)	12.0 (305)	6063 T5 AL
Aluminum Flat (14)	13.0 (330)	15.0 (381)	8.0 (203)	10.0 (254)	6.5 (165)	4.0 (102)	0.5 (13)	12°	0.81 (21)	0.81 X 1.31 (21x33)	12.0 (305)	6063 T5 AL

Line Fittings for 2.5" (63.5 mm) Rod Diameter

Two Hole Blade

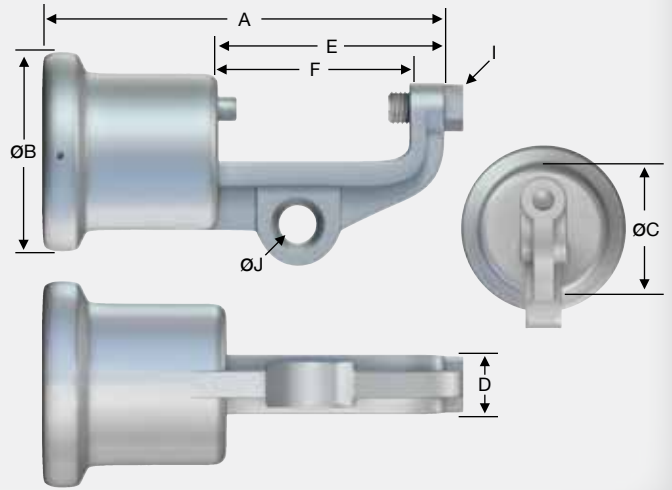


*L is outer radius
M is inner radius*

Transverse Compressing Swing Angle for Conductor Suspension Clamp	
2 Hole Blade (std.)	2 Hole Long Blade
40 deg. max.	64 deg. max.

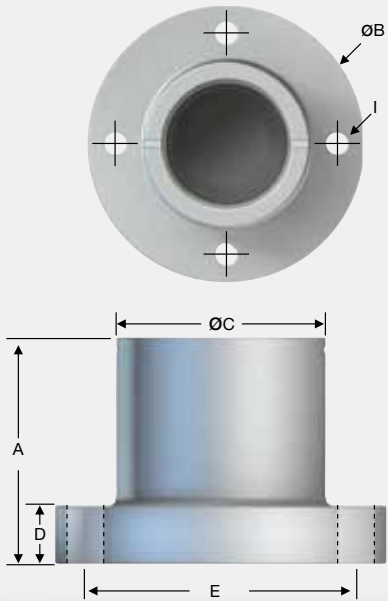
Note: 12° upsweep is already included

Horizontal Clamptop



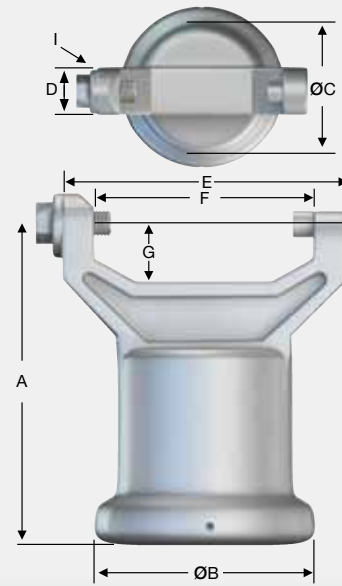
5" Bolt Circle

Line or Base Fitting



Vertical Clamptop

Part per ANSI C29.7



Horizontal & Vertical End Fittings inches (mm)

Type (Code)	A	B	C	D	E	F	G	H	I	J	L	M	Material
2 Hole Blade (0)	5.73 (146)	4.0 (102)	-	0.75 (19)	5.25 (133)	1.25 (32)	1.50 (38)	2.00 (51)	1.0 (25)	1.44 (37)	0.5R (12.7R)	0.44R (11R)	60-40-18 D.I.
2 Hole Long Blade (9)	5.73 (146)	4.0 (102)	-	0.75 (19)	7.75 (197)	1.25 (32)	4.0 (102)	4.5 (114)	1.0 (25)	1.44 (37)	0.5R (12.7R)	0.44R (11R)	60-40-18 D.I.
H. Clamptop (1)	8.24 (209)	4.0 (102)	3.30 (84)	1.12 (28)	4.72 (120)	4.0 (102)	-	-	5/8-11 UFS	0.75 (19)	-	-	60-40-18 D.I.
5" Bolt Circle (3)	4.75 (121)	6.25 (159)	3.63 (92)	0.90 (23)	5.0 (127)	-	-	-	5/8-11 UFS	-	-	-	60-40-18 D.I.
5" Bolt Circle (5)	4.75 (121)	6.25 (159)	3.63 (92)	0.90 (23)	5.0 (127)	-	-	-	0.69 x Holes (18 x Holes)	-	-	-	60-40-18 D.I.
V. Clamptop (2)	5.88 (149)	4.0 (102)	3.30 (84)	1.12 (28)	5.37 (136)	4.0 (102)	1.06 (27)	-	5/8-11 UFS	-	-	-	60-40-18 D.I.

Clamptop Clamps inches (mm)

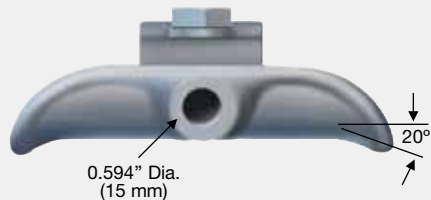
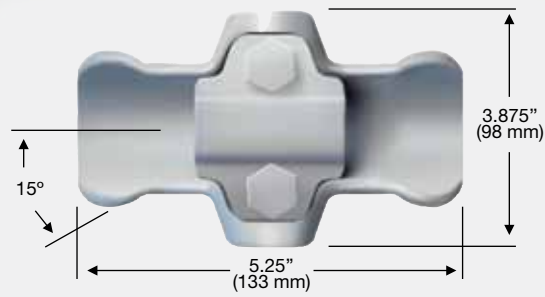


Figure 1

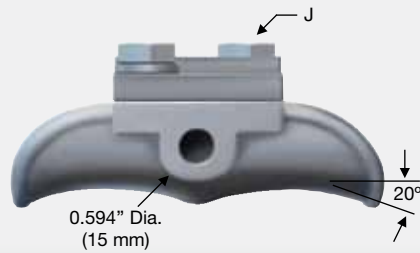
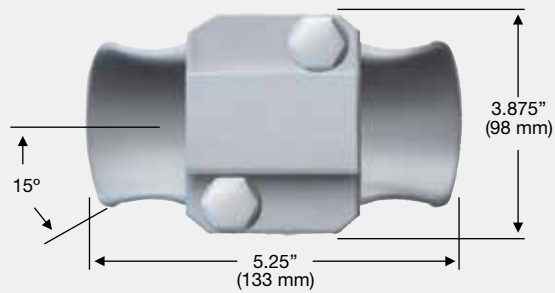


Figure 2

Fig. No.	Catalog Number	Body & Keeper Material	Clamping Range inches (mm)	Ultimate Body Strength lbs. (kN)
1	TSC57	356-T6 AL	0.25 - 0.57 (6.3 - 14.4)	2800 (1.273)
1	TSC106	356-T6 AL	0.50 - 1.06 (12.7 - 26.9)	2800 (1.273)
1	TSC150	356-T6 AL	1.00 - 1.50 (25.4 - 38.1)	2800 (1.273)
2	TSC200	356-T6 AL	1.50 - 2.00 (38.1 - 50.8)	2800 (1.273)

Jumper Clamps and Assemblies

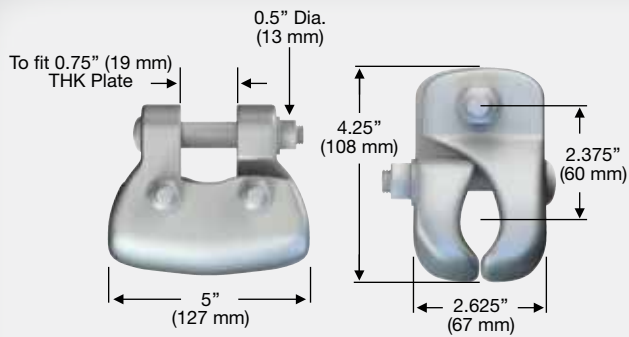


Figure 1

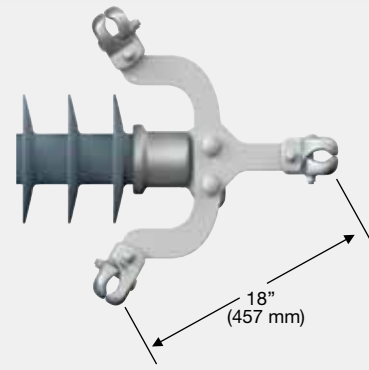


Figure 3

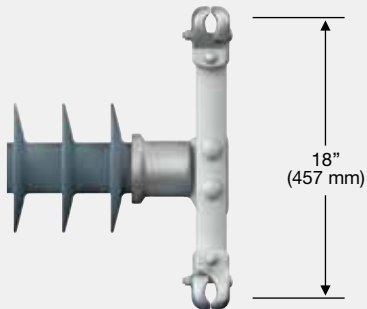


Figure 2

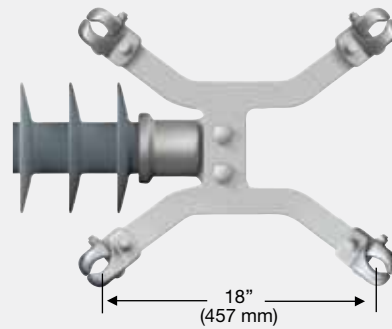


Figure 4

A practical application of Quadri*Sil® line posts is for support of jumper loops on transmission lines.

Horizontal motion of the jumper is restricted, and the factor of wind sway is eliminated. Additionally, the crossarm length may be reduced. The difference in cost of insulation is not significant, but the saving in tower cost can be attractive. Regardless of cost, the use of a jumper support improves construction.

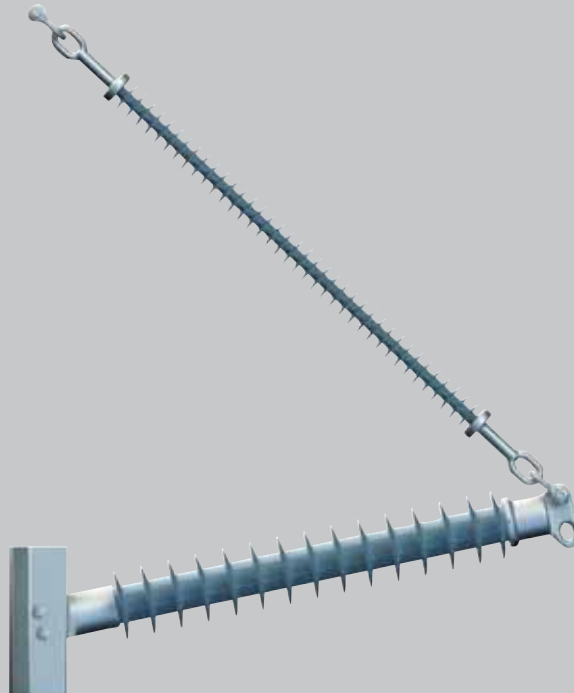
If using a single clamp, clamp position relative to the insulator may be changed by bolting the clamp through the upper hole in the insulator end fitting.

Jumper clamps are not intended for tangent span applications.

Figure	Catalog Number	Yoke Type	Clamping Range inches (mm)
1	976423002	None	1.00 - 1.40 (25 - 36)
1	976423003	None	1.40 - 1.60 (36 - 41)
1	600643001	None	1.60 - 2.00 (41 - 51)
2	2717243001	Dual	1.00 - 1.40 (25 - 36)
2	2717253001	Dual	1.40 - 1.60 (36 - 41)
2	2717263001	Dual	1.60 - 2.00 (41 - 51)
3	2721763001	Triple	1.00 - 1.40 (25 - 36)
3	2721773001	Triple	1.40 - 1.60 (36 - 41)
3	2721783001	Triple	1.60 - 2.00 (41 - 51)
4	2721793001	Quad	1.00 - 1.40 (25 - 36)
4	2721803001	Quad	1.40 - 1.60 (36 - 41)
4	2721813001	Quad	1.60 - 2.00 (41 - 51)

Braced Post Insulators

TABLE OF CONTENTS	PAGE
Braced Line Post Assemblies	30
Assembly Drawings	31
Dimensions and Strength Ratings	32



Braced Line Post Assemblies

The need to minimize tower size and visual impact of transmission lines has prompted increased interest in braced line posts, horizontal-V, and pivoting V assemblies. These insulating structures offer vastly improved vertical load capabilities over conventional line posts, while retaining the advantages of a fixed conductor position.

A **braced line post insulator** uses a conventional line post with a suspension string tied to the tower face. Some of the characteristics of a braced line post are:

- It uses a traditional fixed base line post.
- The longitudinal strength is limited to the RCL rating of the line post component.
- It generates high tower torque (Z-direction) under longitudinal loading.

A **horizontal-V insulator** uses a conventional line post with a suspension string at a fixed offset extending from the tower face, adding a stabilizing force to the assembly. Some of the characteristics of a horizontal-V assembly are:

- It uses a fixed base horizontal line post (zero degree upsweep).
- It has an inclined hinge axis to add resistance to longitudinal movement.
- It employs a suspension insulator ground end stub arm (vang).
- The longitudinal strength is limited to the RCL rating of the line post component.
- It generates high tower torque (Z-direction) under longitudinal loading.

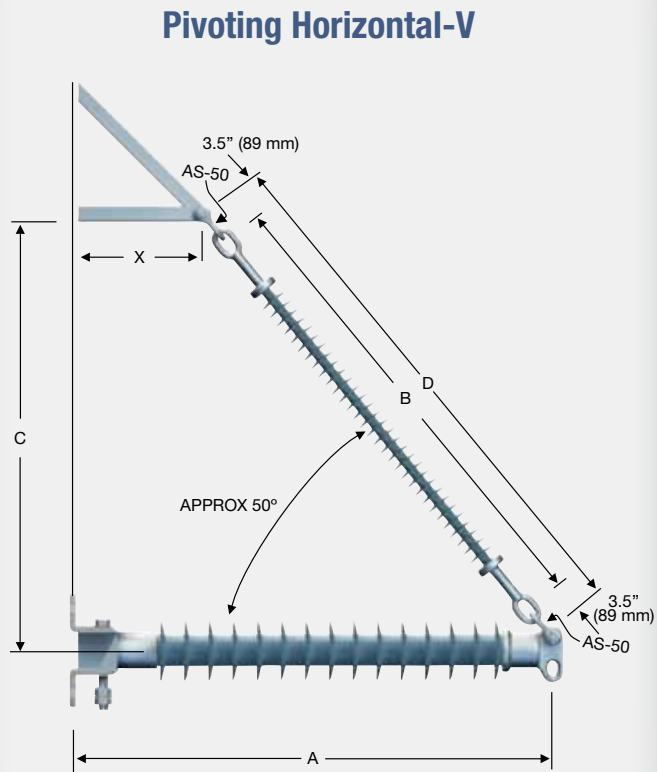
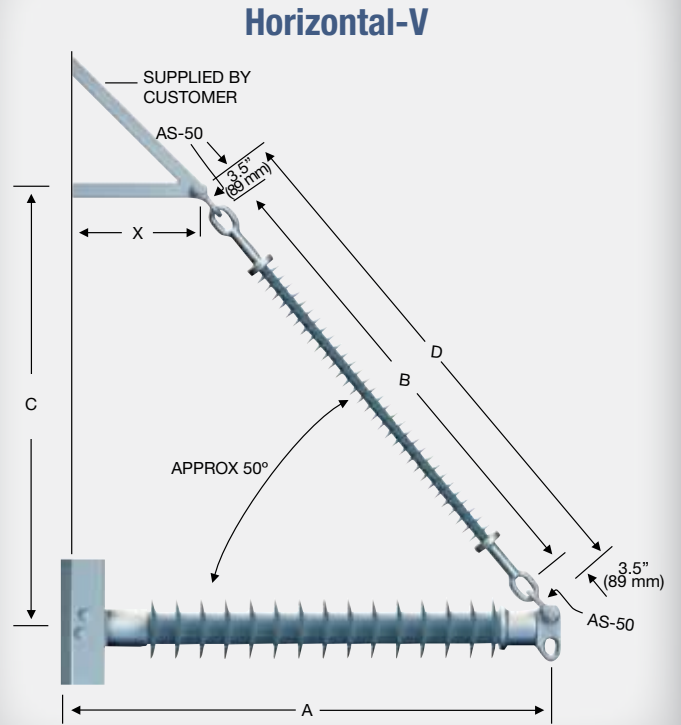
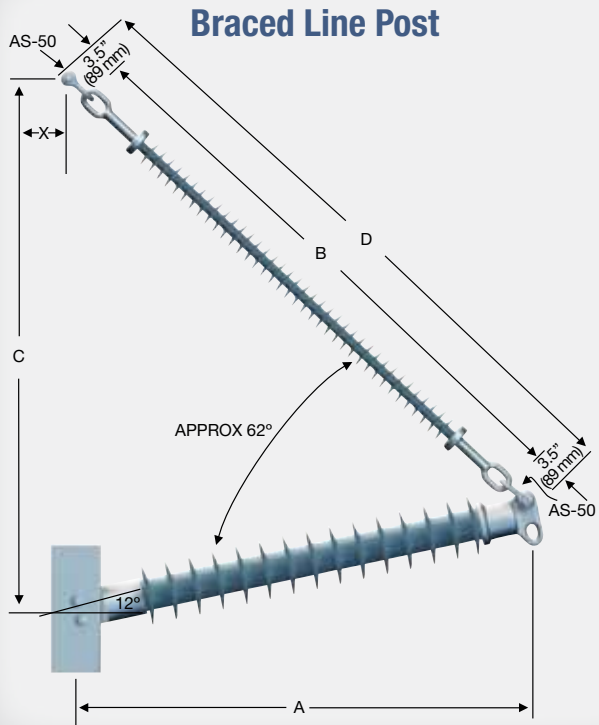
A **pivoting horizontal-V insulator** uses a conventional suspension string with a line post insulator fastened to the structure with a hinged base. Some of the characteristics of a pivoting horizontal-V are:

- It pivots about an inclined axis.
- It employs a suspension insulator ground end stub arm (vang).
- It uses a universal joint or pivot base on the strut.
- It has high longitudinal strength.
- It generates low tower torque (Z-direction) under longitudinal loading.
- The assembly's swing angle is a function of the vertical load and the tower offset pivot angle.
- The assembly's maximum longitudinal loading is a function of the tensile rating of the strut.

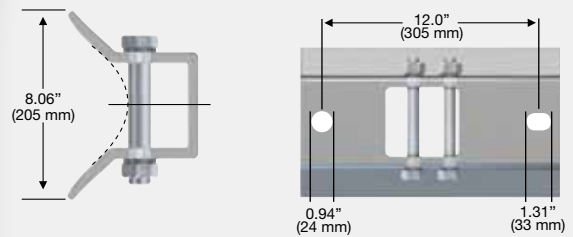
The tables included on the following pages — and the images on the assembly drawings page — cover typical arrangements that provide an efficient means of withstanding unusual loads. **For more information on these and numerous other variations of line post assemblies, contact your Hubbell Power Systems representative.**



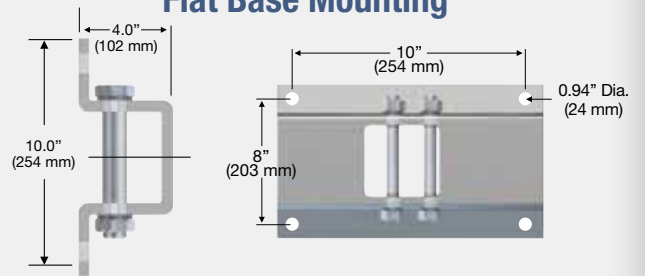
Assembly Drawings



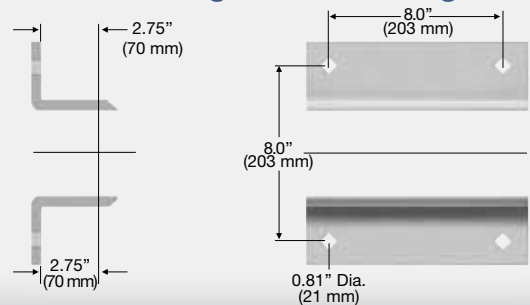
Gain Base Mounting



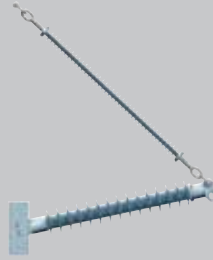
Flat Base Mounting



Pivoting Base Mounting

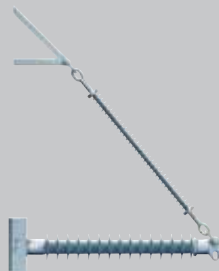


Dimensions and Strength Ratings



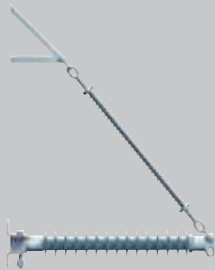
Braced Line Post Assembly

Typical System kV	Catalog Number Gain Base	Catalog Number Flat Base	Component Insulators		A inches (mm)	B inches (mm)	C inches (mm)	D inches (mm)	X inches (mm)	Maximum Loadings			
			Post	Suspension						Vertical lbs (kN)	Tension lbs (kN)	Compression lbs (kN)	Longitudinal lbs (kN)
115/138	BLP043G12000	BLP043F12000	P250043S0XX0	S025060S0000	55.9 (1420)	73.8 (1875)	74.0 (1880)	80.8 (2052)	2.0 (51)	11130 (49.5)	7500 (33.4)	7500 (33.4)	1625 (7.2)
115/138	BLP046G12000	BLP046F12000	P250046S0XX0	S025066S0000	58.2 (1478)	80.3 (2040)	82.0 (2083)	87.3 (2217)	2.0 (51)	11350 (50.5)	7500 (33.4)	7500 (33.4)	1550 (6.9)
161	BLP051G12000	BLP051F12000	P250051S0XX0	S025075S0000	63.0 (1600)	88.9 (2258)	90.0 (2286)	95.9 (2436)	2.0 (51)	11390 (50.7)	7500 (33.4)	7500 (33.4)	1415 (6.3)
161	BLP058G12000	BLP058F12000	P250058S0XX0	S025084S0000	70.1 (1781)	97.5 (2477)	96.0 (2438)	104.5 (2654)	2.0 (51)	11240 (50)	7500 (33.4)	7500 (33.4)	1250 (5.6)
230	BLP075G12000	BLP075F12000	P250075S0XX0	S025107S000A	86.6 (2200)	121.3 (3081)	118.0 (2997)	128.3 (3259)	2.0 (51)	11220 (49.9)	7500 (33.4)	7500 (33.4)	985 (4.4)
230	BLP080G12000	BLP080F12000	P250080S0XX0	S025116S000A	91.4 (2322)	129.9 (3299)	127.0 (3226)	136.9 (3477)	2.0 (51)	11260 (50.2)	7500 (33.4)	7500 (33.4)	930 (4.1)



Horizontal-V Assembly

Typical System kV	Catalog Number Gain Base	Catalog Number Flat Base	Component Insulators		A inches (mm)	B inches (mm)	C inches (mm)	D inches (mm)	X inches (mm)	Maximum Loadings			
			Post	Suspension						Vertical lbs (kN)	Tension lbs (kN)	Compression lbs (kN)	Longitudinal lbs (kN)
115/138	BLP041G00000	BLP041F00000	P250041S0XX0	S025040S0000	54.7 (1389)	54.3 (1379)	51.0 (1295)	61.3 (1557)	18.0 (457)	10050 (44.7)	7500 (33.4)	7500 (33.4)	1715 (7.6)
115/138	BLP046G00000	BLP046F00000	P250046S0XX0	S025045S0000	59.5 (1511)	58.7 (1491)	55.0 (1397)	65.7 (1669)	20.0 (508)	10070 (44.8)	7500 (33.4)	7500 (33.4)	1550 (6.9)
161	BLP053G00000	BLP053F00000	P250053S0XX0	S025053S0000	66.8 (1697)	67.3 (1709)	61.0 (1549)	74.3 (1887)	22.0 (559)	10000 (44.5)	7500 (33.4)	7500 (33.4)	1355 (6.0)
161	BLP055G00000	BLP055F00000	P250055S0XX0	S025058S0000	69.2 (1758)	71.6 (1819)	66.0 (1676)	78.6 (1996)	24.0 (610)	10240 (45.5)	7500 (33.4)	7500 (33.4)	1300 (5.8)
230	BLP072G00000	BLP072F00000	P250072S0XX0	S025075S000A	86.1 (2187)	88.9 (2258)	79.0 (2007)	95.9 (2436)	28.0 (711)	10010 (44.5)	7500 (33.4)	7500 (33.4)	1015 (4.5)
230	BLP080G00000	BLP080F00000	P250080S0XX0	S025084S000A	93.4 (2372)	97.5 (2477)	85.0 (2159)	104.5 (2654)	30.0 (762)	9960 (44.3)	7500 (33.4)	7500 (33.4)	930 (4.1)



Pivoting Horizontal-V Assembly

Typical System kV	Catalog Number Gain Base	Catalog Number Flat Base	Component Insulators		A inches (mm)	B inches (mm)	C inches (mm)	D inches (mm)	X inches (mm)	Maximum Loadings			
			Post	Suspension						Vertical lbs (kN)	Tension lbs (kN)	Compression lbs (kN)	Longitudinal lbs (kN)
115/138	—	BLP041P00000	P250041S0390	S025043S0000	53.1 (1349)	52.2 (1326)	50.0 (1270)	59.2 (1504)	18.0 (457)	10140 (45.1)	7500 (33.4)	7500 (33.4)	7500 (33.4)
115/138	—	BLP048P00000	P250048S0390	S025049S0000	57.9 (1471)	58.7 (1491)	56.0 (1422)	65.7 (1669)	20.0 (508)	10270 (45.7)	7500 (33.4)	7500 (33.4)	7500 (33.4)
161	—	BLP053P00000	P250053S0390	S025051S0000	65.2 (1656)	65.1 (1654)	60.0 (1524)	72.1 (1831)	22.0 (559)	10070 (44.8)	7500 (33.4)	7500 (33.4)	7500 (33.4)
161	—	BLP055P00000	P250055S0390	S025056S0000	67.6 (1717)	69.5 (1765)	65.0 (1651)	76.5 (1943)	24.0 (610)	10310 (45.9)	7500 (33.4)	7500 (33.4)	7500 (33.4)
230	—	BLP072P00000	P250070S0390	S025075S000A	84.5 (2146)	88.9 (2258)	81.0 (2057)	95.9 (2436)	28.0 (711)	10150 (45.1)	7500 (33.4)	7500 (33.4)	7500 (33.4)
230	—	BLP080P00000	P250080S0390	S025081S000A	91.8 (2332)	95.4 (2423)	84.0 (2134)	102.4 (2601)	30.0 (762)	10150 (45.1)	7500 (33.4)	7500 (33.4)	7500 (33.4)

Notes:

- Corona rings are required and included for 220 kV and above.
- Base end fitting for posts is code "02" for a gain base or "03" for a flat base. Replace the "XX" with the appropriate code.
- Maximum loads are for single loads in the specified direction.
- Contact your Hubbell Power Systems representative to request combined load charts.

CATALOG NUMBER KEY

Due to the numerous variations available for braced line post assemblies, the following catalog number scheme is presented primarily **for informational purposes**. For custom-made braced line post assemblies, please refer to publication *Insulator Selection Guide – Transmission* (EF9091T), available via www.hubbellpowersystems.com under “Literature” > “Literature Brochures” > “Ohio Brass Insulators and Arresters.”

Please follow the instructions in the *Insulator Selection Guide* and return the filled-out form to your Hubbell Power Systems representative. Filling out the form with as much information as possible will ensure that our engineers receive all the critical dimensions and information needed to design your braced line post assembly. For information on braced line post assemblies not included in this catalog, please contact your HPS representative.

a Assembly Type

The first three digits define the insulator type. In this example, we picked a Braced Line Post; therefore, we entered “BLP” in the boxes designated for “a.”

B	L	P								
a	a	a	b	b	b	c	d	d	e	e

b Polymer Length

Polymer length of the line post member (in inches). The nominal polymer length (in inches) of the line post insulator is specified to help define voltage rating of the braced line post assembly. Refer to the Horizontal Line Post Insulators table on page 21 for appropriate polymer lengths.

Fill in your selection in the boxes designated for section “b.” For example, if you want a Braced Line Post with a 75-inch polymer length, enter “075.”

B	L	P	0	7	5					
a	a	a	b	b	b	c	d	d	e	e

c Type of Line Post Base

A single letter is used to identify the type of base. Please refer to the base drawings for hole patterns and dimensions located on page 24 or page 31.

- F – Flat
- G – Gain
- P – Pivoting

Fill in your selection in the box designated for section “c.” For example, if you want a flat base, enter “F.”

B	L	P	0	7	5	F				
a	a	a	b	b	b	c	d	d	e	e

d Upsweep Angle

The upsweep angle of the assembly is defined to help identify the assembly. Typically, braced line post assemblies will have 12 degrees of upsweep angle, and horizontal-V and pivoting-V assemblies will have 0 degrees.

Fill in your selection in the box designated for section “d” for the upsweep angle. For example, if you chose a braced line post assembly, enter “12.”

B	L	P	0	7	5	F	1	2		
a	a	a	b	b	b	c	d	d	e	e

e Internal Use

000 – Sequential number to address each variation or model.


Fill in your selection in the box designated for section “e.” In this example, the braced line post is the first in a series, as designated by “001.”

B	L	P	0	7	5	F	1	2	0	0	1
a	a	a	b	b	b	c	d	d	e	e	e

Your complete part number will be BLP075F12001

Example:

Braced Line Post Insulator, 75" Line Post Polymer Length, Flat Base, 12 degrees of Upsweep Angle, Variation/Model 001 **BLP075F12001**



TECHNICAL TERMS REFERENCE GUIDE

ANSI – The American National Standards Institute verifies that the standard developers are complying with the consensus and all other approval criteria.

Boron-free E-Glass – Electrical grade fiberglass that has corrosion resistance greater than boron containing E-glass; it is environmentally friendly due to the lack of boron and fluorine.

Combined Load Charts – Also referred to as application curves; a graphical representation that shows how the maximum working loads interact for a given line post or braced line post assembly.

Corona – A luminous discharge resulting from ionization of the air surrounding a conductor around which a voltage gradient exceeding a certain critical value exists.

Dry Band Arcing – Electrical flashes that occur between wet and dry spots over the contaminated surface of an insulator.

E-Glass – Electrical grade fiberglass; the first glass used for high-voltage insulators.

Flashover – A disruptive discharge that is capable of breaking the insulation level provided by the air around the insulator, which creates an arc between parts of different potential or polarity.

IEC – The International Electrotechnical Commission develops and publishes international standards for all electrical technologies.

Leakage Distance – The distance between the conductive end fittings of the insulator across the insulator surface, moving in and out of the sheds; also commonly referred to as the creep or creepage distance.

RCL – Reference Cantilever Load is the maximum design cantilever load (MDCL), which is rated at 50 percent of the part's SCL.

RIV – Radio-Interference Voltages are caused by electric currents that produce magnetic and electrostatic fields that are capable of inducing high-frequency voltage pulses in nearby radio antennas. The RIV of an insulator is measured under conditions specified by industry standards.

RTV – Room Temperature Vulcanate (elastomer sealant) is a silicone rubber that cures at room temperature.

RTL – Routine Test Load is the maximum design tension load, which is rated at 50 percent of the part's SML. All parts are tested at this rating prior to being shipped.

Section Length – The straight-line distance between the coupling points of the insulator's end fittings.

SCL – Specified Cantilever Load is the minimum ultimate cantilever strength of the part.

SML – Specified Mechanical Load is the minimum ultimate tensile strength of the part.

Strike Distance – The shortest distance across the insulator surface, between the end fittings of the insulator; also commonly referred to as the dry arc distance or tight string distance.





Worldwide Locations

Web: <http://www.hubbelpowersystems.com>
E-mail: hpsliterature@hps.hubbell.com

UNITED STATES
CANADA, INTERNATIONAL
HUBBELL POWER SYSTEMS, INC.
210 N. Allen Street
Centralia, Mo 65240-1395
Phone: 1-573-682-5521
Fax: 1-573-682-8714
e-mail: hpsliterature@hps.hubbell.com

MEXICO
HUBBELL DE MEXICO, S.A. DE C.V.
Av. Insurgentes Sur #1228, Piso 8
Col. Tlacoquemacatl Del Valle
Mexico, D.F. 03200
Phone: 52-55-9151-9999
Fax: 52-55-9151-9988
Website: hubbell.com.mx

BUSHINGS • CONSTRUCTION • INSULATION • PROTECTION • SWITCHING • TOOLS



FOR RELIABLE TRANSMISSION,
THE WORLD IS TURNING TO HUBBELL.

**Web: <http://www.hubbellpowersystems.com>
E-mail: hpsliterature@hps.hubbell.com**

HUBBELL[®]
Power Systems

January 2011



A&J 1M