



K-LINE INSULATORS LIMITED
TORONTO, ONTARIO, CANADA

Catalogue D-LP

DISTRIBUTION SILICONE INSULATORS

Line Post

15 kV to 69 kV



ISO9001
SAI GLOBAL
FILE No. 000117

Distribution Silicone Insulators Line Post

Insulator contamination is a common problem on overhead lines. The fundamental element for interruptions with contaminated insulators is moisture. Wet atmospheric conditions result in water filming on surfaces and causing leakage currents to develop. On wood structures, leakage currents can cause pole fires. On steel structures, leakage currents can develop into faults.

Silicone rubber formulations offer the ultimate solution in Line Post Insulator material. Due to its hydrophobicity, this material inherently resists water filming thereby limiting leakage currents. Silicone rubber insulators reduce leakage currents, even when contaminated and require less frequent washing. The savings in such maintenance costs are added benefits of using Silicone Rubber Insulators.

K-LINE INSULATORS LIMITED (KLI) silicone Distribution Line Post Insulators are manufactured and tested in accordance with industry wide standards, CSA C411.6, IEC 61952 and ANSI C29.18.

K-LINE INSULATORS LIMITED is registered to ISO 9001 Quality Systems.

PERFORMANCE BENEFITS

The performance benefits of **KLI** Distribution Line Post Insulators are listed below.

- Improves Reliability (by mitigating interruptions and outages due to vandalism, pole fires, and flashovers in all types of environments)
- Eliminates or Reduces Maintenance (such as washing and trouble calls) and are compatible with existing installation
- Improves Power Quality (less RI and TVI)
- Energy Efficiency (Reduced losses due to lower leakage currents)
- Safety (light weight for handling and installation)
- Service Life (consistent performance over its service life)
- Life Cycle Cost (savings over ceramic insulators)

APPLICATION

Distribution Silicone Line Post Insulators are used on overhead distribution lines operating at and below 69 kV. These insulators are commonly installed on metal, concrete or wooden structures to horizontally or vertically support the line conductor. Also, these insulators can be used to support high voltage conductor jumpers or leads.

CORE ROD

The core rod of the insulator is made of a high quality, epoxy resin, E-Glass fiberglass rod that has been specially formulated for electrical and mechanical applications.

HOUSING

The housing (includes sheath and sheds) of the insulator is one piece, high temperature vulcanized, injection molded silicone rubber that is chemically bonded to the core rod. This ensures that the interface between the rubber and rod is impenetrable against moisture ingress. **KLI** uses its own proprietary silicone rubber formula in the manufacture of its insulators. The formulation has silicone rubber as the base polymer material with additives to enhance its performance in wet and contaminated environments.

END FITTINGS

LINE END FITTING

The line end fitting of Line Post Insulators are available in four different configurations: Horizontal or Vertical Clamp-Top, Tie-Top, or K-CLAMP®.

End fittings on Line Post Insulators are made of corrosion resistant aluminum alloy or galvanized iron castings.

SECTION LENGTH ADJUSTMENT

Line End Fitting	Line End Fitting Designation	Section Length
K-CLAMP®	K	See Technical Data sheet
Horizontal	H	L - 9 mm (0.4")
Vertical	V	L - 23 mm (0.9")
Tie-Top (F-neck)	TF	L - 33 mm (1.3")
Tie-Top (C-neck)	T	L - 53 mm (2.1")

Clamp-Top

The conventional horizontal and vertical trunnion accommodates a standard Line Post Insulator, bolted conductor clamp. On the horizontal design the line end fitting has an additional eye for the attachment of other devices during installation or maintenance activities.

Tie-Top

The tie-top is designed for tying a conductor to the neck of the insulator. It is available in two standard neck sizes: C or F-neck.

K-CLAMP®

K-LINE introduced the original K-CLAMP® concept in the polymer Line Post live end fitting design. The uniqueness of this end fitting is a result of the many advantages it has over the traditional horizontal, vertical and tie-top configurations.

Some advantages of the K-CLAMP® include:

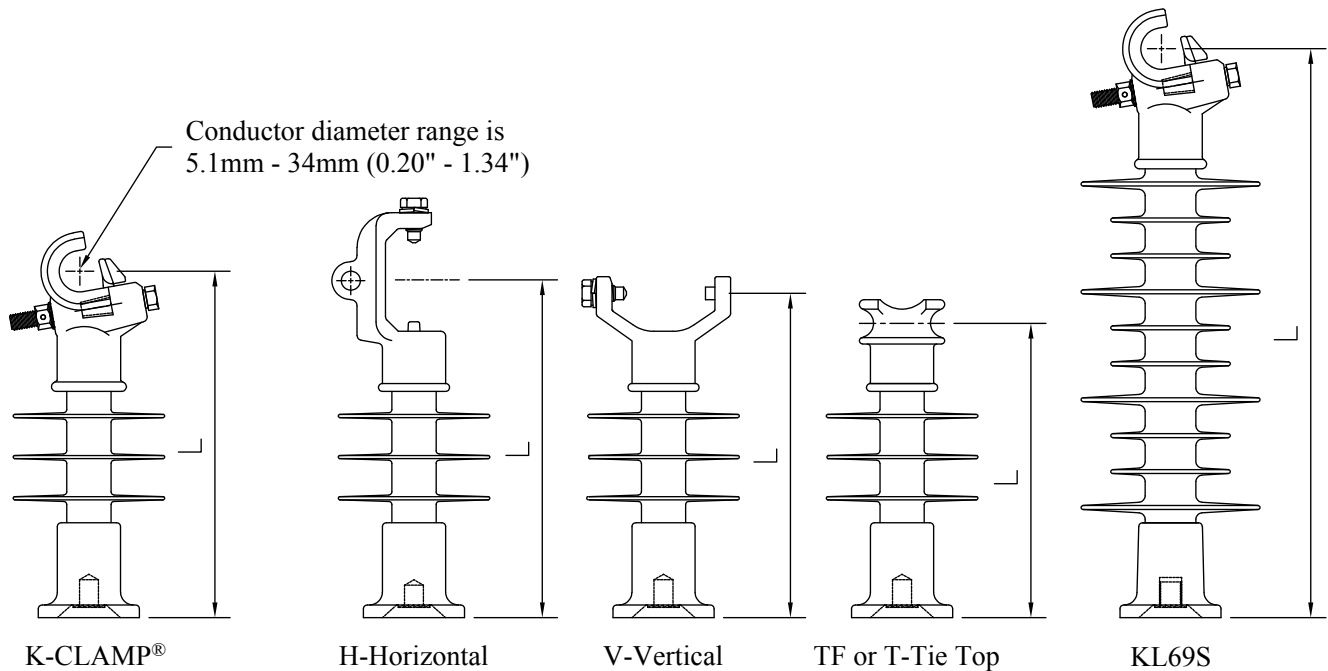
- 1) Excellent corrosion resistant aluminum casting
- 2) A long, smooth contoured conductor clamping zone
- 3) The clamp accommodates a full range of conductor sizes. 5.1mm (0.20") to 34.0mm (1.34")
- 4) A single captive live-line operable bolt
- 5) All parts are captive
- 6) Its overall length permits standard cover up hoods to effectively cover all insulator sheds
- 7) The design can be installed in either a horizontal or vertical configuration
- 8) Inventory reduction is accomplished because one insulator is used for both configurations and a separate clamp is not required
- 9) The price of the new insulator is cost comparative with the purchase of a standard trunnion post insulator and a separate clamp
- 10) Substantial labour cost savings in stringing, sagging and conductor clamping
- 11) Other savings related to shipping, stocking and maintenance

BASE END FITTING

The standard base for Line Post Insulators is a round flat iron base with a threaded hole that accommodates a standard insulator stud or bolt. For other special bases contact **KLI**.

Hot-dip galvanizing to CSA G164 or ASTM A153 specifications provides corrosion protection of the base end fitting.

LINE POST INSULATORS



TECHNICAL DATA

SPECIFICATION	UNIT	CATALOGUE NUMBER*						
		KL15S_	KL28S_	KL35S_	KL46S_	KL69S_P	KL69S_	KL69S_P1
Voltage Class	kV	15	28	35	46	69	69	69
CSA Class	-	LP15	LP25	LP28M	LP46	LP46M	LP46M	LP69M
ANSI Class	-	51-1C, 51-1F, 51-11, 51-21, 51-31	51-12, 51-22 51-32	51-3C, 51-3F, 51-13, 51-23, 51-33	51-4C, 51-4F, 51-14, 51-24, 51-34	51-15, 51-25, 51-35	51-15, 51-25, 51-35	51-16, 51-26, 51-36
Section Length (L)***	mm (in)	297 (11.7)	348 (13.7)	424 (16.7)	495 (19.5)	571 (22.5)	619 (24.4)	694 (27.3)
Dry Arcing Distance	mm (in)	138 (5.4)	196 (7.7)	264 (10.4)	339 (13.3)	445 (17.5)	478 (18.8)	551 (21.7)
Leakage Distance	mm (in)	275 (10.8)	420 (16.5)	657 (25.9)	860 (33.9)	1171 (46.1)	1121 (44.1)	1511 (59.5)
Positive Critical Impulse Flashover	kV	130	150	195	240	300	310	360
Low-Frequency Flashover	Dry	75	105	120	145	190	205	235
	Wet	42	75	85	115	150	160	190
Specified Tensile Load (STL)	kN (lb)	22.2 (5000)	22.2 (5000)	22.2 (5000)	22.2 (5000)	22.2 (5000)	22.2 (5000)	22.2 (5000)
Specified Cantilever Load (SCL)	kN (lb)	12.5 (2800)	12.5 (2800)	12.5 (2800)	12.5 (2800)	12.0 (2700)	14.0 (3150)	11.0 (2475)
Max. Design Cantilever Load (MDCL)	kN (lb)	6 (1350)	6 (1350)	6 (1350)	6 (1350)	6.0 (1350)	7.0 (1575)	5.5 (1240)
Number of Sheds	-	2	3	5	6	10	10	13
Approx. Weight	kg (lb)	4.1 (9.0)	4.3 (9.5)	4.8 (10.5)	5.8 (12.8)	7.0 (15.4)	10.1 (22.2)	8.4 (18.4)
Standard Packaging	-	3	3	3	3	3	2	2

*** Ordering Information**

To catalogue number, add suffix **H** for horizontal, **V** for vertical, **T** for C-neck Tie-top, **TF** for the F-neck Tie-top, or **K** for K-CLAMP®. The standard base thread is 3/4"-10 UNC, except for KL69S_P1 it has 7/8"-9 UNC. Different base threads are available upon request.

** For KL69S_P & KL69S_P1 insulators with 3/4" threaded base, a minimum Grade 5 bolt or stud must be used.

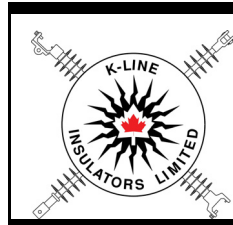
*** Section lengths are for K-CLAMP® insulators. For others refer to Section Length Adjustment Table under End Fittings.



K-LINE INSULATORS LIMITED

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New Silicone Line Post Insulator For 69 kV Overhead Lines

K-LINE INSULATORS LIMITED (KLI) has introduced a new silicone line post insulator that is applicable for 69 kV overhead lines. This insulator is designed for installations with high electrical requirements. This insulator features the highly reliable proprietary **KLI** silicone rubber that is one piece, injection molded and chemically bonded to a high quality epoxy fiberglass rod.

This insulator will greatly improve the electrical performance of the System, especially in contaminated environments. Insulator contamination is a common problem on overhead lines. The fundamental element for interruptions with contaminated insulators is moisture. Wet atmospheric conditions result in water filming on surfaces and causing leakage currents to develop. On wood structures, leakage currents can cause pole top fires and eventual failures. On steel structures, leakage currents can develop into faults. **KLI's** proprietary silicone rubber offers the ultimate solution in post insulator applications. Because of its hydrophobicity, this material inherently resists water filming thereby limiting leakage currents. These silicone rubber insulators reduce leakage currents, even when contaminated and require less frequent if any washing. The savings in maintenance costs are added benefits of using **KLI** silicone rubber insulators.

The 69 kV line post insulator has been designed to meet the requirements of CSA C411.6, ANSI C29.18, and IEC 61952. The 69 kV line post insulator is available in four different configurations: Horizontal, Vertical, Tie-Top, or K-Clamp[®]. The K-CLAMP[®] design offers the best and most cost effective solution in most cases.

69 kV K-CLAMP[®] Line Post

The K-CLAMP[®] Line Post insulator has an integral clamp for attaching the conductor directly to the line post insulator without the use of a separate conductor clamp. The K-CLAMP[®] can be mounted either in the vertical or horizontal position and offers several advantages over conventional line post insulators.

The K-CLAMP[®] has a smooth clamping zone that accommodates a conductor diameter range of 0.20 inch (5.1 mm) to 1.34 inch (34 mm). The single galvanized steel clamp bolt that secures the keeper can be operated with hot line tools from either side of the clamp. It also extends beyond the clamp body to allow for the attachment of stringing devices.

The K-CLAMP[®] provides substantial labour cost savings in stringing, sagging and conductor clamping. There are other savings that can be achieved in shipping, stocking and maintenance.

NOTE:

The K-CLAMP[®] is designed for use with both bare and covered conductors



Configuration & Hardware Accessories

The 69 kV line post is available in three other configurations: vertical, horizontal, or tie-top (ANSI F-Neck). Also, the horizontal line post can be supplied with a gain base (See below). Conductor clamps are also available.

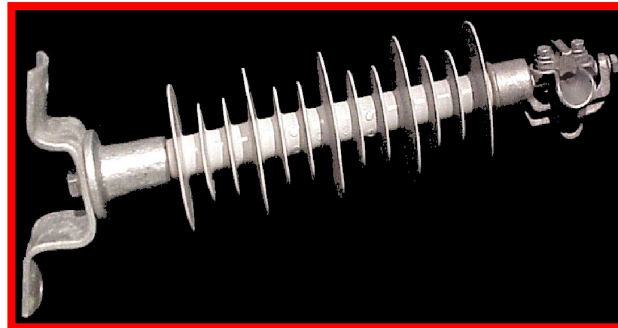
Vertical



Tie-Top



Horizontal with Gain Base



Technical Data

SPECIFICATION	UNIT	CATALOGUE NUMBER*	SPECIFICATION	UNIT	CATALOGUE NUMBER*	
		KL69S			KL69S	
Voltage Class	kV	69	Radio Influence Voltage (RIV) at 1 MHz	Test	kV	45
				Max	µV	6
CSA Class	-	LP69M	Specified Tensile Load (STL)	kN (lb)	22 (5000)	
ANSI Class	-	51-16 & 51-26	Specified Cantilever Load (SCL)	kN (lb)	11 (2475)	
Dry Arcing Distance	mm (in)	551 (21.7)	Max. Design Cantilever Load (MDCL)	kN (lb)	5.5 (1240)	
Leakage Distance	mm (in)	1511 (59.5)	Approx. Weight	kg (lb)	8.0 (17.5)	
Critical Impulse Flashover (Positive)	kV	360	Standard Packaging	-	2	
Low-Frequency Flashover	Dry	kV	235			
	Wet	190**				

*** Ordering Information**

To Line Post Catalogue Number, add suffix **KP1** for K-CLAMP®, **HP1** for horizontal, **VP1** for vertical, or **TFP1** for tie-top. The standard base thread is ½”-9 UNC. Different base threads are available upon request.

** The value shown is as per CSA and the ANSI value is 165 kV.



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