



K-LINE INSULATORS LIMITED
TORONTO, ONTARIO, CANADA

Catalogue D-TIF

Totally Insulated Framing System (TIF) 3-Phase TIF Tri-Frame - Distribution 15kV - 69kV (Patent No.: US 9,685,772)



ISO9001
SAI GLOBAL
FILE No. 000117

3-Phase TIF Tri-Frame - Distribution

Totally Insulated Framing System (Patent No.: US 9,685,772)

Generally Insulators are used to support electrical conductors on Overhead Distribution and Sub-Transmission systems to prevent line to ground contact. Conductors may be attached to Deadend/Suspension Insulators and suspended from Crossarms or supported on Line Post/Pin Insulators on Crossarms or Side Post Brackets. Conventional Crossarms have service life limitations due to wood rot, steel corrosion or fiber reinforced polymer (FRP) deterioration.

K-LINE INSULATORS LIMITED (KLI) is introducing the Totally Insulated Framing (TIF) Tri-Frame design for Distribution Lines for nominal voltages up to and including 69 kV. This innovative design reduces many common concerns and difficulties encountered with wood, steel or fiberglass Crossarms.

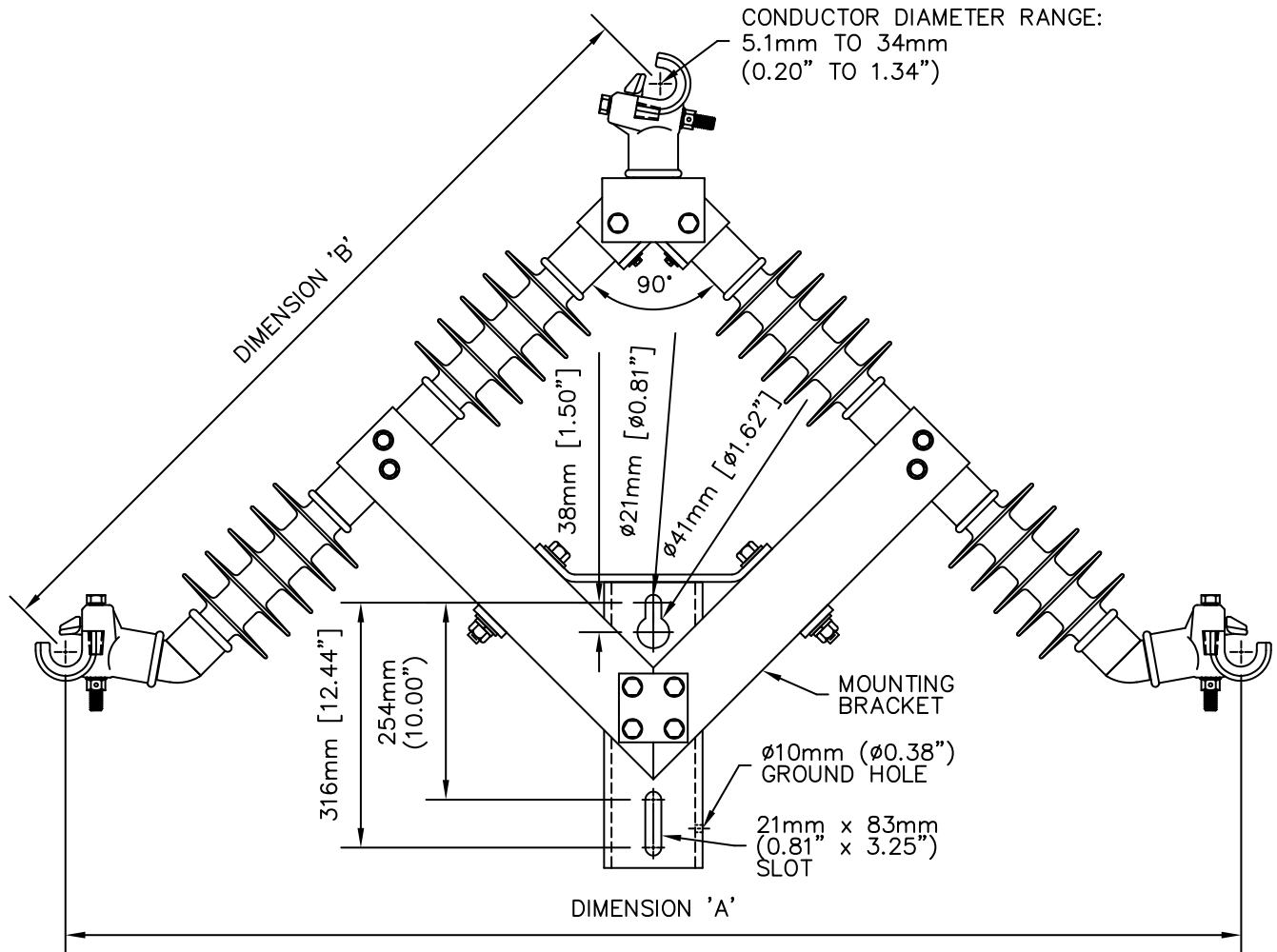
K-LINE INSULATORS LIMITED (KLI) Totally Insulated Framing (TIF) Systems offer alternative line designs that increase service life, reduce installation labour costs, enhance system reliability and improves safety during installation. **KLI** TIF Systems are a new, cost effective approach for Line Design, Construction, Maintenance and "Hardening" of Distribution and Sub-Transmission Systems.

The TIF Tri-Frame configuration for Distribution or Sub-Transmission Lines offers an integrated one-piece framing concept that forms a compact three phase framing. TIF Tri-Frames are delivered fully assembled in a one piece frame configuration for rapid installation by simply bolting the TIF Tri-Frame assembly to the pole. Patented K-CLAMP™ or conventional Line Post End Fittings can be supplied with TIF Tri-Frame designs. The TIF Tri-Frame provides required horizontal and vertical conductor spacing and clearances and is an alternative to typical single circuit Crossarm or Armless Construction Standards. TIF offers significant cost savings over conventional line construction practices due to reduced labour for installation of the TIF Tri-Frame. Installation is a simple matter of Bolting the TIF Tri-Frame to the Pole with two Bolts compared to conventional line design and construction practices which normally require installation of Crossarms/Braces or Pole Top/Side Post Brackets, Insulator Pins/Studs, Insulators and related hardware.

Summary of TIF Feature/Advantages/Benefits:

- TIF Tri-Frame offers improved safety in application. Rapid installation reduces Lineman exposure time in energized work environment
- Improved system reliability with integrated KLI proprietary Silicone Rubber Insulators
- Corrosion resistant Aluminum Alloy End Fittings and Frame
- TIF eliminates Crossarm life limitations due to rot, hidden corrosion and fiberglass deterioration
- TIF is lightweight and can be transported by line crews into areas difficult to access and erected in place without heavy lifting equipment
- TIF avoids vandalism associated with glass and porcelain insulators
- Improved aesthetics and compact triangular appearance
- TIF Tri-Frame Insulator configuration discourages "roosting" thus minimizing the probability of wildlife contact issues.

3-Phase TIF - Distribution (Patent No.: US 9,685,772)



TECHNICAL DATA

SPECIFICATIONS	UNITS	CATALOGUE NUMBER			
		KL35TIF_	KL46TIF_	KL69PTIF_	KL69P1TIF_
Voltage Class	kV	35	46	46	69
Leakage	mm (in)	660 (26)	860 (34)	1170 (46)	1525 (60)
Critical Impulse Flashover (Pos.)	kV	195	240	300	360
Low-Frequency Wet Flashover	kV	85	115	150	190*
Dimension 'A' (Approx.)	mm (in)	1520 (60)	1730 (68)	1930 (76)	2235 (88)
Dimension 'B' (Approx.)	mm (in)	1060 (42)	1210 (48)	1350 (53)	1570 (62)
Vertical Design Load **	kN (lbs)	6.0 (1350)	6.0 (1350)	6.0 (1350)	5.5 (1240)
Transverse Design Load **	kN (lbs)	5.5 (1240)	5.5 (1240)	5.5 (1240)	5.5 (1240)
Weight (Approx.)	kg (lbs)	37.2 (82.0)	40.3 (88.9)	44.0 (96.9)	50.5 (111.0)

*The value shown is as per CSA.

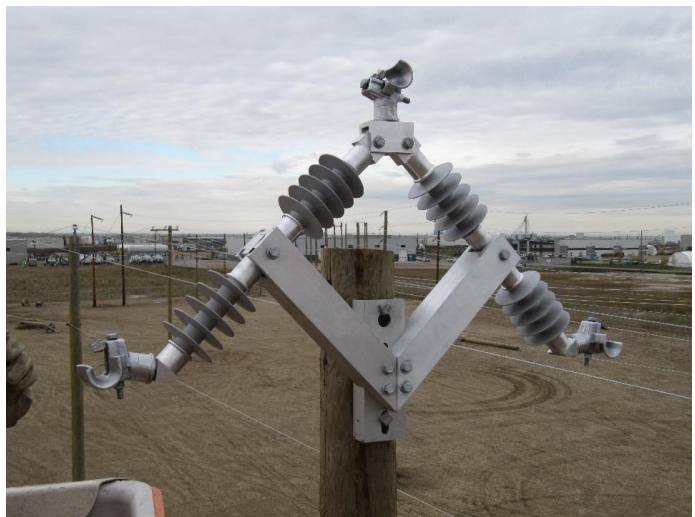
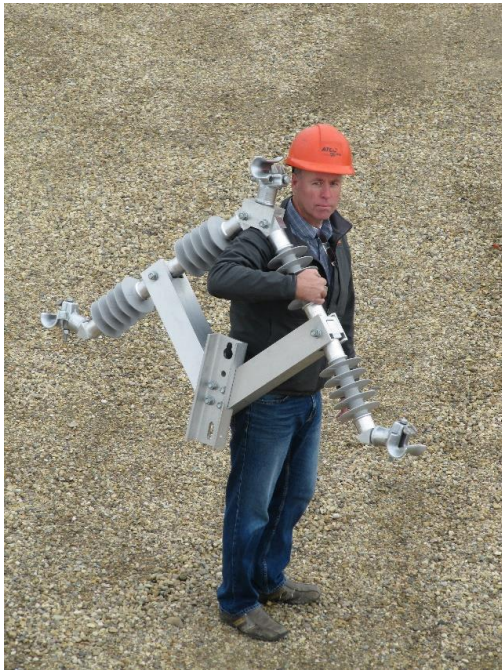
**Individual conductor loads

NOTE: The selection of the appropriate TIF design model depends on the minimum insulation voltage design required. Additionally, the minimum phase spacing requirement must also be considered in selecting the TIF design model.

Ordering Information

The TIF Framing Assemblies are available with K-CLAMPS™ or Horizontal/Vertical Trunnions. Add suffix **K** for K-CLAMP™ or **T** for Horizontal & **V** for Vertical Trunnions. Conductor Clamps are ordered separately.

3-Phase TIF - Distribution Field Trial (Patent No.: US 9,685,772)



50 Passmore Avenue, Toronto, Ontario, Canada M1V 4T1
• Tel.: (416) 292-2008 • Fax: (416) 292-2094 • E-Mail: insulators@k-line.net • Web Page: www.k-line.net