

Polymer Distribution & Riser Pole Arresters

GE Tranquell Polymer Distribution and Riser Pole surge arresters are used on distribution systems to protect transformers and other medium voltage power equipment from lightning and switching surge generated overvoltages. The Polymer Distribution and Riser pole arresters exhibit excellent protective characteristics, temporary overvoltage capability, and switching surge energy withstand. Gapless internal construction combined with a polymer housing results in a design which

is simple, reliable, and economical while offering excellent fault current capability to meet the most demanding service conditions. The GE arrester design is based on field-proven metal oxide disks known for maintaining stable characteristics. In order to assure the highest level of quality, Tranquell Polymer Distribution and Riser Pole surge arresters are designed and manufactured in accordance with the latest versions of ANSI/IEEE C62.11 and IEC 99-4.



Figure 12. TRANQUELL Polymer Riser Pole Arrester

BASIC CONSTRUCTION

The metal oxide column is centered and restrained in alignment with tightly woven fiberglass filament strands impregnated with epoxy resin. The interstices between the stranding are filled with a silicone dielectric material so the design is free of air and moisture. The inside diameter of the housing is slightly smaller than the outside diameter of the cylindrical element providing a snug fit.

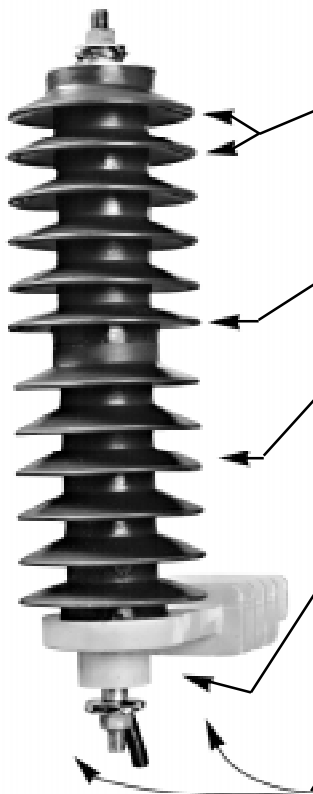
For a typical 10kV rated arrester, the basic polymer housing is only six inches long — 50 to 60 percent shorter than the porcelain equivalent. Likewise, the ar-

resters are less than half the weight of an equivalent porcelain housed arrester. This makes transportation, handling, and installation much easier.

Another significant advantage of the GE TRANQUELL polymer arrester construction is that fault withstand capability can be maintained throughout the voltage range. The fault current capability of porcelain housed arresters is reduced as the housing lengthens.

The polymer housed arrester can be used with all standard mounting arms and brackets. They come with all the necessary fasteners, isolators and terminal

attachments. A specially designed glass-filled polyester insulating arm extends from the arrester to the NEMA crossarm bracket, eliminating the need for installation of a metal clamping band around the arrester. The insulating arm not only eliminates the rust and corrosion sometimes encountered with a metal clamping band, but also has been treated with an inhibitor to resist ultraviolet damage.



GE'S POLYMER CONSTRUCTION provides excellent contamination performance that meets or exceeds ANSI/IEEE contamination test requirements. The arrester housing is made of ESP silicone alloy weathershed material that resists tracking from surface leakage currents. ESP's excellent properties have been confirmed through a series of industry standard performance tests that include tracking resistance, contamination, accelerated aging and seal integrity.

WHEN EXPOSED TO HIGH FAULT CURRENTS the epoxy/fiberglass wrapped modules either rupture or burn through to relieve internal pressure. The polymer housings then split to relieve the pressure.

POLYMER ARRESTERS are not susceptible to cracking or breaking like porcelain arresters, so the possibility of damage from mishandling in packing, shipping and installation is virtually eliminated. The risk of damage from vandalism is also greatly reduced. The polymer housing material excels in tolerance to weather extremes from desert heat to arctic cold, and resists damage from ultraviolet rays and ozone. Samples of the polymer have survived the equivalent of over 50 years of accelerated ultraviolet testing.

USING OPTIMUM CONNECTION METHODS for the arrester leads is important in reducing surge voltage stress. Placing the ground connection of the transformer just under the crossarm where the arrester ground leads meet the pole ground reduces surge voltage stress. Many pole mounted transformer installations use arresters mounted on the crossarm. Such installations tend to have very long arrester leads that increase surge voltage stress on transformer windings. Arrester lead is the combined length of line and ground lead wire in series with the arrester and in parallel with the protected device (transformer in this case).

THE POLYMER ARRESTERS ARE LESS THAN HALF THE WEIGHT of an equivalent porcelain arrester. This lighter weight makes transportation, handling and installation much easier. The basic polymer housing is only 6 inches long for a typical 10kV rated arrester. The polymer housing is 50 to 60% shorter than the housing of an equivalent porcelain arrester.

Figure 13. TRANQUELL Polymer Heavy-Duty Distribution Arrester

Heavy Duty Distribution Arresters

PROTECTIVE CHARACTERISTICS

cat #s	Rated Voltage kV	MCOV kVrms	0.5 msec 10 kA Max IR- kVcrest	Switching Surge Maximum IR- kV	8/20 Maximum Discharge Voltage (kV Crest)					
					1.5 kA	3 kA	5 kA	10 kA	20 kA	40 kA
9L23AXX003XHS	3	2.6	12.5	8.0	9.5	10.0	10.5	11.0	13.0	15.3
9L23AXX006XHS	6	5.1	25.0	16.0	19.0	20.0	21.0	22.0	26.0	30.5
9L23AXX009XHS	9	7.7	34.0	22.5	24.5	26.0	27.5	30.0	35.0	41.0
9L23AXX010XHS	10	8.4	36.5	23.5	26.0	28.0	29.5	32.0	37.5	43.5
9L23AXX012XHS	12	10.2	43.5	28.8	30.7	32.9	34.8	38.5	43.8	51.5
9L23AXX015XHS	15	12.7	54.2	35.0	38.4	41.0	43.4	48.0	54.6	64.2
9L23AXX018XHS	18	15.3	65.0	42.1	46.0	49.1	52.0	57.5	65.4	76.9
9L23AXX021XHS	21	17.0	69.5	44.9	49.5	52.5	55.7	61.5	69.9	82.2
9L23AXX024XHS	24	19.5	87.0	56.4	61.6	65.8	69.6	77.0	87.6	103.0
9L23AXX027XHS	27	22.0	97.7	63.2	69.2	73.9	78.2	86.5	98.4	115.7
9L23AXX030XHS	30	24.4	108.4	71.0	76.8	82.0	86.8	96.0	109.2	128.4
9L23AXX036XHS	36	29.0	130.0	84.2	92.0	98.2	104.0	115.0	130.8	153.8

INSULATION CHARACTERISTICS

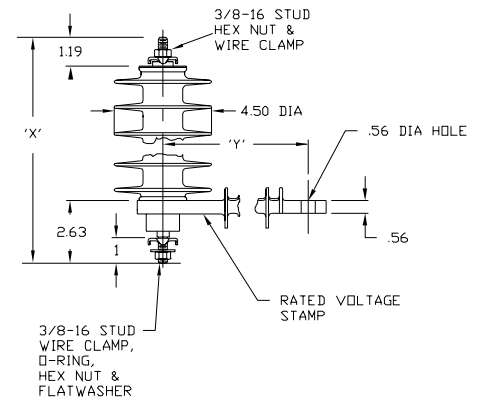
cat #s	Rated Voltage (kV)	Creep in [mm]	Strike in [mm]	Minimum 1.2 x 50 ns Withstand (kV Crest)	Minimum Power Frequency (kV rms)	
					Wet (10sec)	Dry (1sec)
9L23AXX003XHS	3	8 [203.2]	3.6 [91.4]	50	35	25
9L23AXX006XHS	6	15.4 [391.2]	6.7 [170.2]	75	45	35
9L23AXX009XHS	9	15.4 [391.2]	6.7 [170.2]	75	45	35
9L23AXX010XHS	10	15.4 [391.2]	6.7 [170.2]	75	45	35
9L23AXX012XHS	12	26 [660.4]	9.7 [246.4]	125	65	45
9L23AXX015XHS	15	26 [660.4]	9.7 [246.4]	125	65	45
9L23AXX018XHS	18	26 [660.4]	9.7 [246.4]	125	65	45
9L23AXX021XHS	21	26 [660.4]	9.7 [246.4]	125	65	45
9L23AXX024XHS	24	52 [1320.8]	18.0 [457.2]	160	90	65
9L23AXX027XHS	27	52 [1320.8]	18.0 [457.2]	160	90	65
9L23AXX030XHS	30	52 [1320.8]	18.0 [457.2]	160	90	65
9L23AXX036XHS	36	52 [1320.8]	18.0 [457.2]	160	90	65

DIMENSIONS, LEAKAGE DISTANCES, MOUNTING CLEARANCES & WEIGHTS

Cat #s	MCOV kV	"X" Overall Height in [mm]	Mounting Clearance (1)			Weight lb [kg]
			Leakage Distance Terminal to Base in [mm]	Center Line to Center Line in [mm]	Center Line to Ground in [mm]	
9L23AXX003XHS	2.55	7.0 [177.8]	8.0 [203.2]	5.0 [127]	3.0 [76.2]	3.2 [1.45]
9L23AXX006XHS	5.10	9.3 [236.2]	15.4 [391.2]	5.4 [137.2]	3.4 [86.4]	4.0 [1.81]
9L23AXX009XHS	7.65	9.3 [236.2]	15.4 [391.2]	6.0 [152.4]	4.0 [101.6]	4.0 [1.81]
9L23AXX010XHS	8.40	9.3 [236.2]	15.4 [391.2]	6.2 [157.5]	4.2 [106.7]	4.0 [1.81]
9L23AXX012XHS	10.2	12.3 [312.4]	26.6 [675.6]	7.5 [190.5]	5.5 [139.7]	5.4 [2.44]
9L23AXX015XHS	12.7	12.3 [312.4]	26.6 [675.6]	8.5 [215.9]	6.5 [165.1]	5.4 [2.44]
9L23AXX018XHS	15.3	12.3 [312.4]	26.6 [675.6]	9.5 [244.3]	7.5 [190.5]	6.0 [2.71]
9L23AXX021XHS	17.0	12.3 [312.4]	26.6 [675.6]	10.0 [254.0]	8.0 [203.2]	6.0 [2.71]
9L23AXX024XHS	19.5	21.0 [533.4]	52.0 [1320.8]	12.0 [304.8]	10.0 [254.0]	9.5 [4.30]
9L23AXX027XHS	22.0	21.0 [533.4]	52.0 [1320.8]	13.0 [330.2]	11.0 [279.4]	9.5 [4.30]
9L23AXX030XHS	24.4	21.0 [533.4]	52.0 [1320.8]	14.0 [355.6]	12.0 [304.8]	9.5 [4.30]
9L23AXX036XHS	29.0	21.0 [533.4]	52.0 [1320.8]	16.5 [419.1]	14.5 [368.3]	10.7 [4.84]



Figure 14. TRANQUELL Heavy-Duty Distribution Arrester



$$Y = \begin{matrix} 4 \text{ in. [101.6mm]} & \text{for 3-10kV} \\ 6 \text{ in. [152.4mm]} & \text{for 12-36kV} \end{matrix}$$

Figure 15. TRANQUELL Heavy-Duty Distribution Arrester Dimensions



Riser Pole Arresters

PROTECTIVE CHARACTERISTICS

cat #s	Rated Voltage kV	MCOV kVrms	0.5 msec 10 kA Max IR-kVcrest	500A Switching Surge Maximum IR-kVcrest	8/20 Maximum Discharge Voltage (kV Crest)					
					1.5 kA	3 kA	5 kA	10 kA	20 kA	40 kA
9L27HXX003	3	2.6	9.9	6.6	7.2	7.8	8.2	9.1	10.4	12.3
9L27HXX006	6	5.1	20.0	13.3	14.6	15.7	16.6	18.3	21.0	24.8
9L27HXX009	9	7.7	26.8	17.8	19.5	20.5	21.0	22.2	24.5	33.2
9L27HXX010	10	8.4	29.9	19.6	21.5	23.0	24.4	27.0	31.0	36.6
9L27HXX012	12	10.2	35.5	23.6	25.9	27.9	29.4	32.5	37.3	44.0
9L27HXX015	15	12.7	44.2	29.4	32.2	34.2	36.7	40.5	46.5	54.8
9L27HXX018	18	15.3	53.4	35.5	38.9	41.9	44.8	48.9	56.1	66.2
9L27HXX021	21	17.0	60.7	40.3	44.3	47.6	50.3	55.6	63.8	75.3
9L27HXX024	24	19.5	70.9	47.1	51.7	55.6	58.7	64.9	74.4	87.9
9L27HXX027	27	22.0	78.6	52.2	57.3	61.7	65.2	72.0	82.6	97.5
9L27HXX030	30	24.4	88.5	58.7	64.5	69.4	73.3	81.0	92.9	110.0
9L27HXX036	36	29.0	105.0	69.7	76.5	82.4	87.0	96.1	110.0	130.0



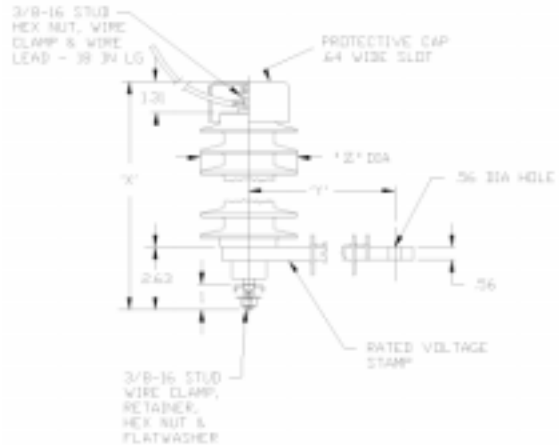
Figure 16. TRANQUELL Riser Pole Arresters

INSULATION CHARACTERISTICS

Rated volts(kV)	mCOV (kV)	Creep		Strike		Minimum 1.2 x 50us Withstand(kV Crest)	Minimum Power-Frequency (kVrms)	
		in	mm	in	mm		Wet (10 sec)	Dry (1 sec)
3	2.6	8.0	203.2	2.9	73.7	45	13	15
6	5.1	15.4	391.2	5.2	132.1	60	20	21
9	7.7	15.4	391.2	5.2	132.1	75	24	27
10	8.4	15.4	391.2	5.2	132.1	75	24	27
12	10.2	15.4	391.2	6.1	154.9	85	27	31
15	12.7	26.0	660.4	7.1	180.3	95	30	35
18	15.3	26.0	660.4	7.1	180.3	125	36	42
21	17.0	26.0	660.4	7.1	180.3	125	36	42
24	19.5	30.8	782.3	7.1	180.3	125	60	70
27	22.0	52.0	1320.8	12.2	309.9	150	60	70
30	24.4	52.0	1320.8	12.2	309.9	160	60	70
36	29.0	52.0	1320.8	12.2	309.9	200*	80*	95*

DIMENSIONS, LEAKAGE DISTANCES, MOUNTING CLEARANCES & WEIGHTS

Cat #s	MCOV kV	"X" Overall Height in [mm]	Mounting Clearance (1)				Weight lb [kg]
			Leakage Distance Terminal to Base in [mm]	Center Line to Center Line in [mm]	Center Line to Ground in [mm]	Weight lb [kg]	
9L27AXX003	2.55	9.3 [236.2]	15.4 [391.2]	5.0 [127.0]	3.0 [76.2]	4.7 [2.12]	
9L27AXX006	5.10	9.3 [236.2]	15.4 [391.2]	5.4 [137.2]	3.4 [86.4]	4.7 [2.12]	
9L27AXX009	7.65	9.3 [236.2]	15.4 [391.2]	6.0 [152.4]	4.0 [101.6]	4.7 [2.12]	
9L27AXX010	8.40	9.3 [236.2]	15.4 [391.2]	6.3 [160.0]	4.3 [109.2]	4.7 [2.12]	
9L27AXX012	10.2	14.7 [373.4]	30.8 [782.3]	7.9 [200.7]	5.9 [149.9]	8.5 [3.83]	
9L27AXX015	12.7	14.7 [373.4]	30.8 [782.3]	8.9 [226.1]	6.9 [175.3]	8.5 [3.83]	
9L27AXX018	15.3	14.7 [373.4]	30.8 [782.3]	9.9 [251.5]	7.9 [200.7]	8.5 [3.83]	
9L27AXX021	17.0	14.7 [373.4]	30.8 [782.3]	10.4 [264.2]	8.4 [213.4]	8.5 [3.83]	
9L27AXX024	19.5	20.1 [510.5]	46.2 [1173.5]	12.4 [315.0]	10.4 [264.2]	12.0 [5.43]	
9L27AXX027	22.0	20.1 [510.5]	46.2 [1173.5]	13.4 [340.2]	11.4 [289.6]	12.0 [5.43]	
9L27AXX030	24.4	20.1 [510.5]	46.2 [1173.5]	14.0 [355.6]	12.0 [304.8]	12.0 [5.43]	
9L27AXX036	29.0	25.4 [645.2]	61.6 [1564.6]	17.0 [431.8]	15.0 [381.0]	15.5 [6.98]	



Y = 4 in. [101.6mm] for 3-10kV
6 in. [152.4mm] for 12-36kV

Figure 17. TRANQUELL Riser Pole Dimensions



GE Surge Arresters

Normal Duty Distribution Arresters

PROTECTIVE CHARACTERISTICS

CAT #s	Rated Voltage kV	MCOV kVrms	0.5 msec 10 kA Max IR- kVcrest	500A Switching Surge Maximum IR- kVcrest	8/20 Maximum Discharge Voltage (kV Crest)					
					1.5 kA	3 kA	5 kA	10 kA	20 kA	40 kA
9L30AXX003	3	2.6	12.5	8.5	9.8	10.3	11.0	12.3	14.3	18.5
9L30AXX006	6	5.1	25.0	17.0	19.5	20.5	22.0	24.5	28.5	37.0
9L30AXX009	9	7.7	33.5	23.0	26.0	28.0	30.0	33.0	39.0	50.5
9L30AXX010	10	8.4	36.0	24.0	27.0	29.5	31.5	36.0	41.5	53.0
9L30AXX012	12	10.2	50.0	34.0	39.0	41.0	44.0	49.0	57.0	74.0
9L30AXX015	15	12.7	58.5	40.0	45.5	48.5	52.0	57.5	67.5	87.5
9L30AXX018	18	15.3	67.0	46.0	52.0	56.0	60.0	66.0	78.0	101.0
9L30AXX021	21	17.0	73.0	49.0	55.0	60.0	64.0	73.0	84.0	107.0
9L30AXX024	24	19.5	92.0	63.0	71.5	76.5	82.0	90.5	106.5	138.0
9L30AXX027	27	22.0	100.5	69.0	78.0	84.0	80.0	99.0	117.0	151.5
9L30AXX030	30	24.4	102.8	72.0	81.0	88.5	94.5	108.0	124.5	159.0
9L30AXX036	36	29.0	134.0	92.0	104.0	112.0	120.0	132.0	156.0	202.0

INSULATION CHARACTERISTICS

Cat #s	Rated Voltage (kV)	Creep in [mm]	Strike in [mm]	Minimum 1.2 x 50 ms Withstand (kV Crest)		Minimum Power Frequency (kV rms)	
				Wet (10sec)	Dry (1sec)	Wet (10sec)	Dry (1sec)
9L30AXX003	3	15.4 [391.2]	5.2 [132]	45	13	15	15
9L30AXX006	6	15.4 [391.2]	5.2 [132]	60	20	21	21
9L30AXX009	9	15.4 [391.2]	5.2 [132]	75	24	27	27
9L30AXX010	10	15.4 [391.2]	5.2 [132]	75	24	27	27
9L30AXX012	12	30.8 [782.3]	6.8 [172]	85	27	31	31
9L30AXX015	15	30.8 [782.3]	6.8 [172]	95	30	35	35
9L30AXX018	18	30.8 [782.3]	6.8 [172]	125	36	42	42
9L30AXX021	21	30.8 [782.3]	6.8 [172]	125	36	42	42
9L30AXX024	24	46.2 [1173.5]	10.3 [261]	150	60	70	70
9L30AXX027	27	46.2 [1173.5]	10.3 [261]	150	60	70	70
9L30AXX030	30	46.2 [1173.5]	10.3 [261]	150	60	70	70
9L30AXX036	36	61.6 [1564.6]	14.3 [363]	-	-	-	-

DIMENSIONS, LEAKAGE DISTANCES, MOUNTING CLEARANCES & WEIGHTS

Cat #s	MCOV kV	Mounting Clearance (1)				Weight lb [kg]
		"X" Overall Height in [mm]	Leakage Distance Terminal to Base in [mm]	Center Line to Center Line in [mm]	Center Line to Ground in [mm]	
9L30AXX003	2.55	9.3 [236.2]	15.4 [391.2]	4.8 [121.9]	3.0 [76.2]	3.5 [1.58]
9L30AXX006	5.10	9.3 [236.2]	15.4 [391.2]	5.0 [127.0]	3.2 [81.3]	3.5 [1.58]
9L30AXX009	7.65	9.3 [236.2]	15.4 [391.2]	5.6 [142.2]	3.8 [96.5]	3.5 [1.58]
9L30AXX010	8.40	9.3 [236.2]	15.4 [391.2]	5.8 [147.3]	4.1 [104.1]	3.5 [1.58]
9L30AXX012	10.2	14.7 [373.4]	30.8 [782.3]	7.5 [190.5]	5.7 [144.8]	6.7 [3.03]
9L30AXX015	12.7	14.7 [373.4]	30.8 [782.3]	8.5 [215.9]	6.7 [170.2]	6.7 [3.03]
9L30AXX018	15.3	14.7 [373.4]	30.8 [782.3]	9.5 [241.3]	7.7 [195.6]	6.7 [3.03]
9L30AXX021	17.0	14.7 [373.4]	30.8 [782.3]	10.0 [254.0]	8.2 [208.3]	6.7 [3.03]
9L30AXX024	19.5	20.1 [510.5]	46.2 [1173.5]	12.0 [304.8]	10.2 [259.1]	10.0 [4.52]
9L30AXX027	22.0	20.1 [510.5]	46.2 [1173.5]	13.0 [330.2]	11.2 [284.5]	10.0 [4.52]
9L30AXX030	24.4	20.1 [510.5]	46.2 [1173.5]	13.6 [345.4]	11.8 [299.8]	10.0 [4.52]
9L30AXX036	29.0	25.4 [645.2]	61.6 [1564.6]	16.2 [411.5]	14.4 [365.8]	13.3 [6.02]

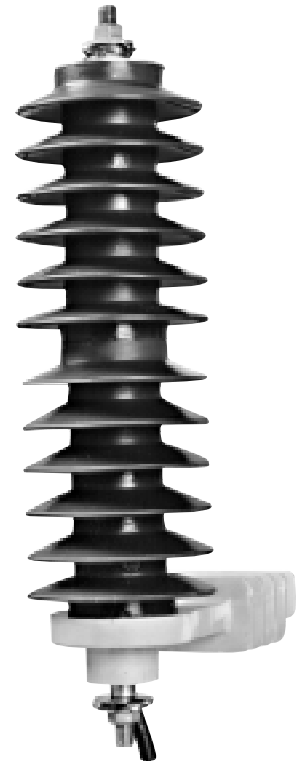
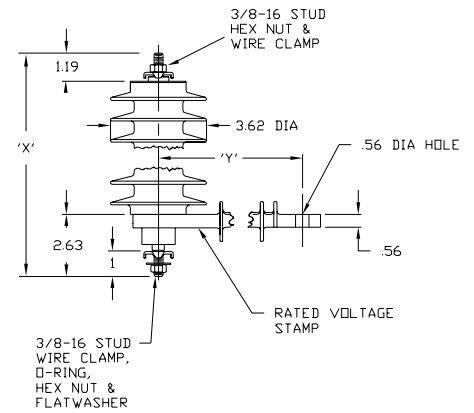


Figure 18. TRANQUELL Normal-Duty Arrester



Y = 4 in. [101.6mm] for 3-10kV
6 in. [152.4mm] for 12-36kV

Figure 19. TRANQUELL Normal-Duty Arrester Dimensions