

INSTRUCTIONS

GEH-2598B
Supersedes GEH-2398A



THYRITE[®] ALUGARD[®] STATION LIGHTNING ARRESTERS

MODEL 9L11L—SERIES

The ALUGARD Thyrite station arrester is of single-phase design, suitable for indoor or outdoor service. Three arresters are required for three-phase installations. Each arrester is shipped assembled and requires no testing before being placed in service.

Each Model 9L11L-ALUGARD Thyrite arrester consists of a number of Thyrite valve and Alurite gap elements in series, all permanently sealed in a porcelain housing of pressure-relief construction. Metal end fittings, cemented to the housing, provide a means for bolting the arresters to a foundation.

APPLICATION

Arresters are designed to limit surge voltages to a safe value by discharging the surge current to ground, and to interrupt the power-frequency follow current. The ability to interrupt power follow current is limited to applications where the power-frequency voltage at the arrester never exceeds the arrester's rating.

This arrester may be damaged if the power frequency voltage applied exceeds the arrester rating for even a few cycles after a surge sparks over the gaps. Therefore, it is important to make certain that the system power frequency voltage from line-to-ground under any condition of switching, fault, or overvoltage, never exceeds the arrester rating. In case of doubt concerning application, consult your local General Electric Company representative.

INSTALLATION

INITIAL INSPECTION

ALUGARD arresters are designed to withstand severe shipping shocks and vibration. In addition each unit is shipped in a carefully designed container. If the crate or carton shows signs of rough handling, upon receipt the porcelain housing should be inspected for

chips or cracks. If damage is apparent, the arrester should not be installed. Claims for such damage should be registered with the common carrier.

The model number and voltage rating of each arrester are identified on the nameplate which is attached to the lower end fittings. The nameplate information should be checked against shipping memorandum. If at any time it is necessary to correspond with the General Electric Company, complete nameplate data should be furnished. Doing so will expedite replies.

LOCATION

Install the arrester electrically as close as possible to the apparatus being protected. Keep line and ground connections short and direct.

FOUNDATION

Extend footings of all piers or supports below the frost line, and elevate them above the ground line far enough to prevent splash on the units. One foot is the minimum elevation recommended. However, this must be governed by climate and locality.

ASSEMBLY

Each arrester, except those requiring grading rings, is shipped completely assembled. When grading rings are needed, bolt them securely on the line end, before electrical connections are made.

All ratings can be suspension mounted if the line connection is made to the top of the arrester. The top cap of each ALUGARD unit has provisions for attaching a standard insulator clevis fitting.

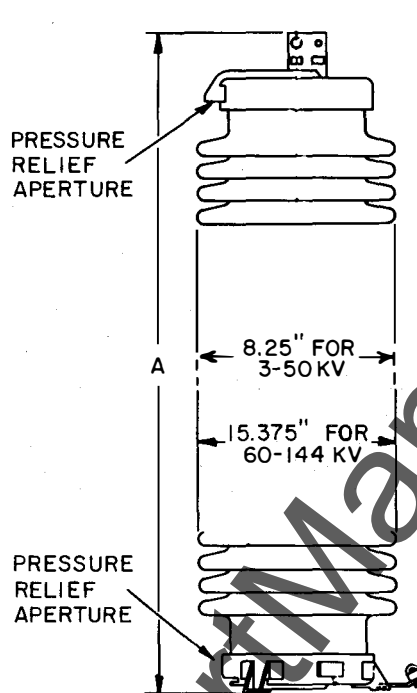
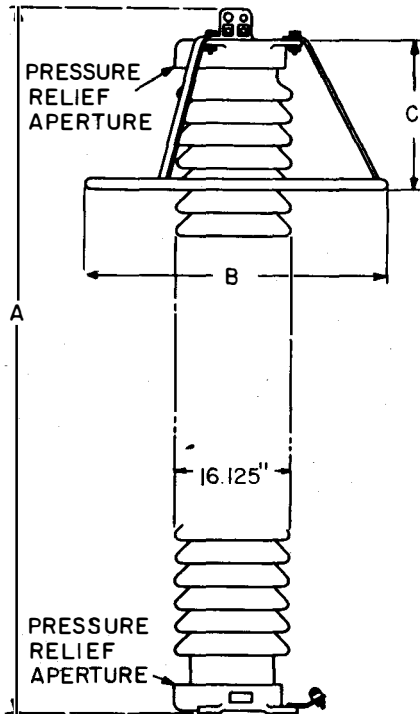
Install the arrester vertically. If uneven, shim under the bolting lugs until level, and grout with concrete if desired.

THE PRESSURE RELIEF DIRECTIONAL APERTURES SHOULD BE DIRECTED AWAY FROM THE APPARATUS BEING PROTECTED.

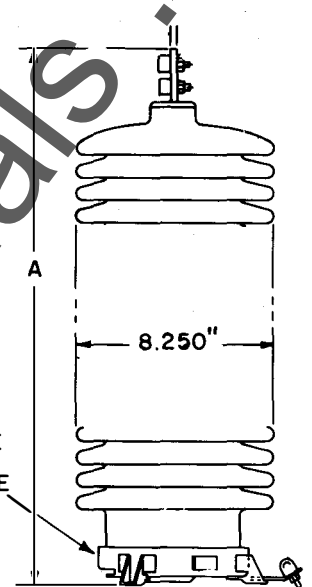
These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.

GENERAL  ELECTRIC

GEH-2598B Alugard Thyrite Station Lightning Arresters, Model 9L11L Series



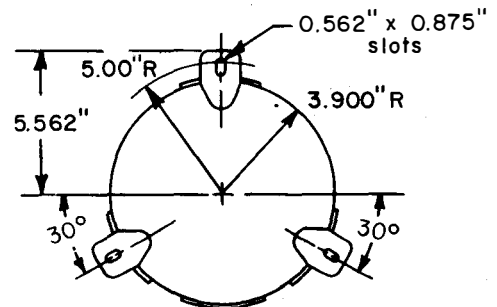
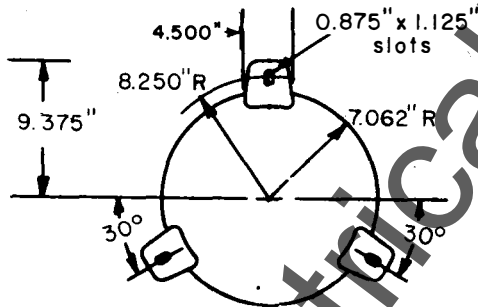
LINE AND GROUND TERMINALS
ACCOMMODATE NO.2 TO 350 MCM
COPPER OR ALUMINUM CONDUCTOR



168 - 312 KV HAVE GRADING RINGS

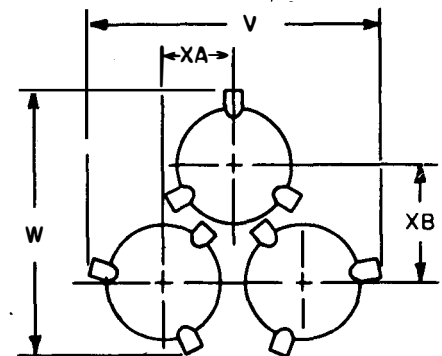
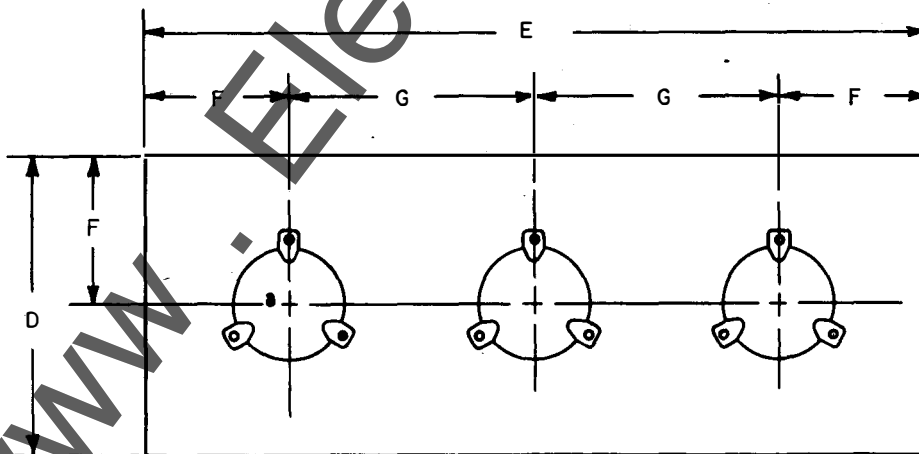
METAL TOP
3 - 144 KV

PORCELAIN TOP
3 - 27 KV



MOUNTING FOR 60-312 KV

MOUNTING FOR 3-50 KV



3-PHASE INSTALLATION PLAN

TRIANGULAR MOUNTING

3-27 KV (0-18,000-FEET ALTITUDE)—PORCELAIN TOP

Arrestor Model No.	KV Rating	Over-all Height (Inches)	Net Wt (lb)	3-phase Installation Plan (Inches)				Min* Clearances (Inches)	Total Creep (Inches)	3-phase Triangular Installation Plan (Inches)			
				A	D	E	F			G	V	W	XA
9L11LAB003	3	12.543 ± .065	36	10.750	32.250	5.375	10.750	3.500	7.000	20.562	19.250	4.750	8.230
9L11LAB904	4.5	14.274 ± .082	37	11.500	33.000	5.750	10.750	4.250	9.800	20.562	19.250	4.750	8.230
9L11LAB006	6	14.274 ± .082	37.5	12.500	34.000	6.250	10.750	4.750	9.800	20.562	19.250	4.750	8.230
9L11LAB907	7.5	17.281 ± .118	39	14.000	35.500	7.000	10.750	5.500	14.000	20.562	19.250	4.750	8.230
9L11LAB009	9	17.281 ± .118	39.5	15.500	37.000	7.750	10.750	6.250	14.000	20.562	19.250	4.750	8.230
9L11LAB012	12	19.158 ± .130	42	17.000	38.500	8.500	10.750	7.000	17.317	21.062	19.690	5.000	8.670
9L11LAB015	15	22.121 ± .149	52	18.000	39.500	9.000	10.750	7.500	21.720	21.562	20.120	5.250	9.100
9L11LAB916	16.5	26.976 ± .207	60	19.000	41.000	9.500	11.000	8.000	30.895	22.062	20.550	5.500	9.530
9L11LAB018	18	26.976 ± .207	61	20.000	43.000	10.000	11.500	8.500	30.895	22.562	20.990	5.750	9.970
9L11LAB919	19.5	26.976 ± .207	62	21.000	45.000	10.500	12.000	9.000	30.895	23.062	21.420	6.000	10.400
9L11LAB020	20	26.976 ± .207	62.5	22.000	47.000	11.000	12.500	9.500	30.895	23.562	21.830	6.250	10.810
9L11LAB922	22.5	28.855 ± .229	67	23.000	50.000	11.750	13.250	10.250	35.654	24.562	22.710	6.750	11.690
9L11LAB025	25	28.855 ± .229	67.5	25.000	53.000	12.500	14.000	11.000	35.654	25.062	23.130	7.000	12.110
9L11LAB027	27	31.558 ± .257	74	27.000	57.000	13.500	15.000	12.000	40.200	26.062	24.000	7.500	12.980

3-50 KV (0-18,000-FEET ALTITUDE)—METAL TOP

9L11LAA003	3	16.750 ± .097	40	16.360	42.080	8.180	12.860	3.500	7.00	—	—	—	—
9L11LAA006	6	18.250 ± .113	44	18.860	47.080	9.430	14.110	4.750	9.80	—	—	—	—
9L11LAA009	9	18.250 ± .113	46	21.860	53.080	10.930	15.610	6.250	9.80	—	—	—	—
9L11LAA012	12	20.625 ± .136	51	23.360	56.080	11.680	16.360	7.000	13.60	—	—	—	—
9L11LAA015	15	20.625 ± .136	55	24.360	58.080	12.180	16.860	7.500	13.60	—	—	—	—
9L11LAA018	18	25.380 ± .184	61	26.360	62.080	13.180	17.860	8.500	22.70	—	—	—	—
9L11LAA020	20	25.380 ± .184	63	28.360	66.080	14.180	18.860	9.500	22.70	—	—	—	—
9L11LAA025	25	27.265 ± .203	68	31.360	72.080	15.680	20.860	11.000	23.27	—	—	—	—
9L11LAA030	30	32.035 ± .278	86	35.360	80.080	17.680	22.360	13.000	35.43	—	—	—	—
9L11LAA037	37	36.902 ± .299	97	40.360	90.080	20.180	24.860	15.500	43.20	—	—	—	—
9L11LAA040	40	39.875 ± .329	109	44.360	98.080	22.180	26.860	17.500	59.00	—	—	—	—
9L11LAA050	50	47.041 ± .400	126	48.360	106.080	24.180	28.860	19.500	62.00	—	—	—	—

60-312 KV (0-10,000-FEET ALTITUDE)

Arrestor Model No.	KV Rating	Over-all Height (Inches)	Over-all Ring Dimension (Inches)			3-phase Installation Plan (Inches)				Min* Clearances (Inches)	Total Creep (Inches)	Net Weight (lb)
			A	B	C	D	E	F	G			
9L11LBA060	60	43.913 ± .362	—	—	—	65.250	147.750	32.625	41.250	24.000	82.600	360
9L11LBA073	73	43.913 ± .362	—	—	—	73.250	163.750	36.625	45.250	28.000	82.600	370
9L11LBA078	78	54.613 ± .469	—	—	—	79.250	175.750	39.625	48.250	31.000	118.000	385
9L11LBA084	84	54.613 ± .469	—	—	—	83.250	183.750	41.625	50.250	33.000	118.000	400
9L11LBA090	90	54.613 ± .469	—	—	—	86.250	189.750	43.125	51.750	34.500	118.000	420
9L11LBA096	96	54.613 ± .469	—	—	—	91.250	199.750	45.625	54.250	37.000	118.000	440
9L11LBA108	108	64.913 ± .572	—	—	—	100.250	217.750	50.125	58.750	41.500	145.300	475
9L11LBA120	120	64.913 ± .572	—	—	—	109.250	235.750	54.625	63.250	46.000	145.300	520
9L11LBA132	132	75.713 ± .680	—	—	—	119.250	255.750	59.625	68.250	51.000	178.900	550
9L11LBA144	144	75.713 ± .680	—	—	—	127.250	271.750	63.625	72.250	55.000	178.900	585
9L11LBA168	168	98.513 ± .908	38.000	11.000	—	167.000	372.000	83.500	102.500	64.500	249.700	700
9L11LBA180	180	98.513 ± .908	38.000	11.000	—	180.000	398.000	90.000	109.000	71.000	249.700	710
9L11LBA192	192	98.513 ± .908	38.000	11.000	—	193.000	424.000	96.500	115.500	77.500	249.700	745
9L11LBA228	228	137.113 ± 1.294	38.000	11.000	—	214.000	466.000	107.000	126.000	88.000	369.300	855
9L11LBA240	240	137.113 ± 1.294	38.000	11.000	—	222.000	482.000	111.000	130.000	92.000	369.300	890
9L11LBA258	258	137.113 ± 1.294	38.000	11.000	—	240.000	518.000	120.000	139.000	101.000	369.300	960
9L11LBA264	264	137.113 ± 1.294	38.000	11.000	—	246.000	530.000	123.000	142.000	104.000	369.300	975
9L11LBA276	276	137.113 ± 1.294	38.000	11.000	—	256.000	530.000	128.000	147.000	109.000	369.300	1015
9L11LBA288	288	154.513 ± 1.468	38.000	11.000	—	260.000	558.000	130.000	149.000	111.000	424.200	1060
9L11LBA294	294	154.513 ± 1.468	38.000	11.000	—	264.000	566.000	132.000	151.000	113.000	424.200	1085
9L11LBA300	300	154.513 ± 1.468	38.000	11.000	—	270.000	578.000	135.000	154.000	116.000	424.200	1100
9L11LBA312	312	154.513 ± 1.468	38.000	11.000	—	280.000	598.000	140.000	159.000	121.000	424.200	1150

* Clearances are for altitudes up to 3300 feet. Add 3 percent to clearances for each additional 1000 feet.

LINE AND GROUND CONNECTIONS

Connect the arrester ground to the apparatus ground and the main station ground, utilizing a reliable common ground network of low resistance.

Connection to the line should be made through a suitable line connector or switch. Line connections should be made in such a manner that no excessive mechanical strain is placed on the arrester. When connecting the arrester to an energized line, it is imperative that a quick, positive, continuous motion be made to avoid possible damage to the arrester.

CLEARANCE

The term "clearance" means the actual distance between any parts of the arrester at line potential, and any object at ground potential or other phase potential.

Clearances listed in the accompanying tables are the minimum recommended. The values shown are suitable for altitudes up to 3300 feet (1000 meters). At higher altitudes add 3 percent for each additional 1000 feet of elevation. The arrangement of the foundation plans shown in this instruction book can be modified if proper clearances are maintained.

ALTITUDE

3-50 kv models 9L11LAA and 9L11LAB series of arresters can be used from 0-18,000 feet altitude.

60-312 kv model 9L11LBA—series of arresters can be used from 0-10,000 feet altitude. ALUGARD Arrester sealing would allow these units to be applied to 18,000 feet, but they must be limited to 10,000 feet because

reduction of air density increases the possibility of external flashover on these 9L11LBA—series arresters.

PERIODIC INSPECTION AND MAINTENANCE

Before inspecting or handling, disconnect the arrester from line and, as a safety precaution, ground the line end. Remove this temporary ground from the line before reconnecting the arrester onto the line.

ALUGARD Thyrite arresters require no special care. They may be hot-washed, subject to the usual care and techniques used in hot-washing insulation to avoid external flashover.

These arresters do not require testing, and no test which applies power voltage in excess of maximum arrester voltage rating should be made without consulting the General Electric Company. There is no single field test which will indicate the complete operating characteristics of the arrester.

PORCELAIN TOP-UNITS

Model 9L11LAB — arresters have porcelain tops with center line terminals and are particularly suited for use in metal cubicles. If desired, arresters can be mounted upside down when installed indoors.

DISCHARGE COUNTER

An insulating base is required when installing a discharge counter with arresters. Both of these are accessories and are described in publication GEC-1596.

DISTRIBUTION PROTECTIVE EQUIPMENT DEPARTMENT

GENERAL  ELECTRIC

PITTSFIELD, MASS