Instructions for Type SV Lightning Arrester

I.L. 38-121-1

GENERAL

SV Lightning Arresters described in the following are station type for the over voltage protection of power apparatus such as oil insulated transformers and circuit breakers, indoors or outdoors, from 0 to 10,000 feet altitude.

The SV arresters are rated from 3 - 120 kv.

Standard SV arresters with metal castings at each end are equipped with a pressure relief system; a combination of pressure relief diaphragms and specially designed exhaust ports.

DESCRIPTION

Each arrester assembly consists of one or more porcelain clad units and required attachments. The units having porcelain tops with integral line terminals are designed to be used as single units only.

The units with metal castings at each end may be used singly or in multiples up to a maximum arrester rating of 120 kv.

Ratings

The master nameplate gives the voltage rating of the arrester. This is the maximum sixty Hertz rms voltage that may be applied across the arrester assembly. If this voltage is exceeded the arrester is likely to remain conducting after discharging a surge and will be damaged.

Changing Ratings

The arrester voltage rating may be changed in the field by:

(1) Increasing or decreasing the number of units in a pole.

(2) Changing arrester units with those of a different rating.

Because of a possible difference in voltage distribution over the arrester unit and a difference in mounting dimensions, the SV units described in this leaflet are not interchangeable with the other station arresters. In all cases before changing an arrester rating, consult the nearest Westinghouse district office.

Nameplates

The *Unit Nameplate* is attached to the base casting identifies and gives the rating of that arrester unit only, not the complete arrester pole.

A separate L shaped *Master Nameplate* is provided for all arresters with metal end castings, but not with the porcelain top arresters, where it is permanently mounted on the base casting. The master nameplate identifies by style number the arrester pole, voltage rating, the location of individual units, and when used the position of the grading ring.

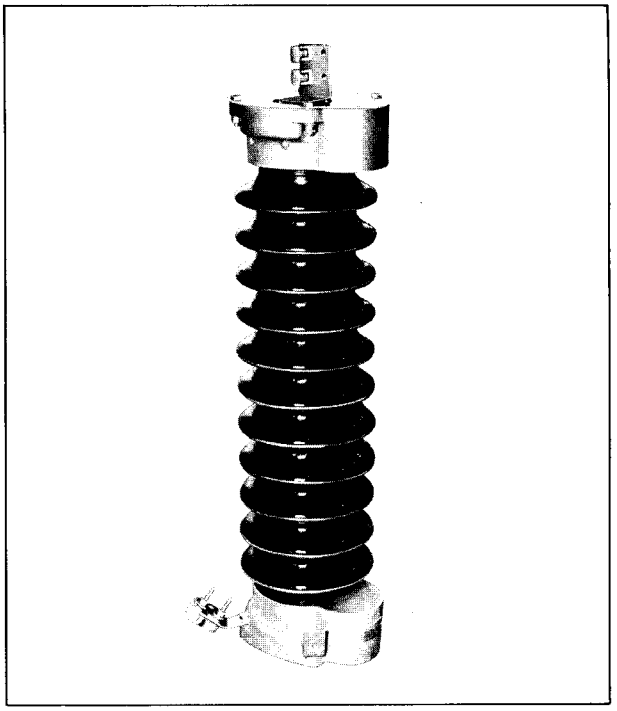
Grading Ring Assembly

Used with arresters rated 90 to 120 kv. It is shown in Figure 4.

Non Standard Arrester Parts (Furnished if requested)

(1) Brackets for cross-arm or wall mounting

(2) Cover adapter plates for suspension mounting



Type SV Arrester

Effective January 1972. Supersedes I.L. 38-120-1B Dated January 1958.

(3) Foundation Base - If desired to mount the arrester on a 15 inch bolt circle diameter instead of a 10-5/16 inch one.

(4) Insulating base unit for use with discharge counter.

RECEIVING, HANDLING, STORING

The porcelain top units and the low rated units with metal castings on both ends are shipped in a carton, all others are shipped in a crate. A packing slip is located on one of the container sides.

Unpack carefully and examine for breakage or other damage, especially to the porcelain. If damage exists, save the container and packing material, and notify the carrier. Shortages should be checked with the carrier, or if not the fault of the carrier, with our nearest sales office. If parts do not agree with the packing list, contact the nearest Westinghouse representative, giving him the necessary information.

INSTALLATION

To give the highest degree of protection, the arresters should be located near the apparatus to be protected, using leads of the shortest possible length. Each arrester pole should be connected to a low resistance ground, preferably the same one as the apparatus.

A suitable foundation in accordance with the outline drawing for the arrester should be prepared. See Figures 1-4 for clearance and arrester dimensions.

Line connections should be made in such a manner that no excessive mechanical strain is placed on the arrester. The cantilever strength of the SV arrester is 8800 ft. lbs. and should not be exceeded by any combination of forces such as conductor side pull, wind or earthquake loading.

Insulating Base

If used, it is installed first, and the arresters bolted to it. If installed and not used with recording or measuring equipment a cable shunt is required to by-pass the unit.

Foundation Base

Arresters through 120 kv may be mounted on a 15 inch bolt circle diameter instead of 10-5/16 inches by use of the foundation base. The mounting base is not included as part of standard arresters and is not covered in the style numbers of arresters listed in this leaflet. If used, the mounting base is bolted to the foundation and the arrester is then bolted to the base. Use of the base will add 3-3/8 inches to the height of the arresters shown in the drawing.

The bottom arrester unit is bolted directly to the foundation or insulating base. At the same time the ground terminal and master nameplate are mounted at the mounting lugs of the bottom casting of the arrester unit.

For multi-unit poles, once the bottom unit is firmly anchored, install the remaining units as indicated on the master nameplate and in the outline drawing.

When all units are bolted in place, add the line terminal and cover assembly to the top unit. If a grading ring is required, add the ring first and then the terminal and cover assembly.

CAUTION: **ARRESTER EXHAUST PORTS SHOULD BE DIRECTED AWAY FROM THE TRANSFORMER AND OTHER ARRESTER POLES. THE ARRESTER POLE UNITS SHOULD NOT BE CLIMBED FOR MAINTENANCE OR ANY OTHER PURPOSE. THE LINE TERMINAL ASSEMBLY MUST NOT BE USED TO LIFT THE ARRESTER.**

Use sling to raise units shipped horizontally to upright position. Units can be lifted by top casting for assembly.

Terminals

All terminals are suitable for copper or aluminum.

Line Terminal

The terminal for all casting top assemblies will accept conductors with a diameter of .250 to .772 inches. The terminal for porcelain top units will accept conductors with a diameter of .255 to .681 inches.

Ground Terminal

The terminal for all types will accept conductors with a diameter of .250 to .772 inches.

Testing

All arrester units are tested at the factory. Each arrester unit is tested for 60 Hertz sparkover, radio influence start level and grading current at rating. Each unit is pressure tested to insure it is tightly sealed against moisture. Units should not be opened in the field as to do so, would break

the seal leading to the possibility of moisture entrance and consequent deterioration of the arrester. No simple field tests will check the complete characteristics of an arrester unit, since this requires laboratory equipment.

If an arrester is suspected of having been damaged in service, the only field tests that should be attempted are sixty Hertz sparkover, Doble and "Megger" tests and then only on clean, dry arresters. It must be understood that such tests will not determine the condition of the valve elements. For more information contact the nearest Westinghouse representative.

If 60 Hertz sparkover tests are made the circuit should provide a means for limiting the maximum possible current through the arrester to 100 milli-amperes or less and such current should not flow for more than 5 seconds. The voltage should be run up to sparkover quickly so as not to overheat the gap grading resistors.

It may be found that Doble or Megger tests on units of the same rating will give different readings. If one unit shows considerable deviation from the rest, it's condition may be open to question. It is more significant to make periodic readings and note the trends of the readings. Contamination on the porcelain surface may cause faulty or mis-leading readings. Units should be tested clean and dry.

Maintenance

The SV arrester requires no regular maintenance other than occasional inspection. In locations where the porcelain becomes contaminated by dirt, soot, salt, etc. it is recommended that the arresters be cleaned periodically.

CAUTION: **IT IS NOT RECOMMENDED THAT ARRESTERS CONSISTING OF MORE THAN TWO UNITS BE WASHED WHILE THEY ARE ENERGIZED.**

Correspondence

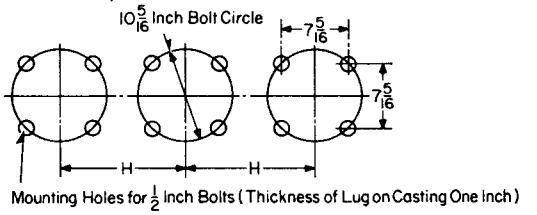
Direct any inquiries pertaining to the lightning arrester to the nearest Westinghouse sales office giving all information stated on the master nameplate.

Dimensions In Inches

SV Self-Supporting Arresters

Fig. 1: Line terminal cable size #2 to 350 MCM, .255 to .681
Figs. 2, 3, 4: Line terminal cable size #2 to 450 MCM copper or #3 to 450 MCM aluminum (.250 to .772 inch diameter stranded conductor) for vertical or horizontal takeoff.

Ground terminal for #2 to 450 MCM copper or #3 to 450 MCM aluminum (.250 to .772 inch diameter stranded conductor).



3-120 Kv

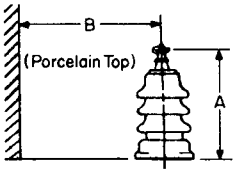


Fig. 1 3-15 Kv

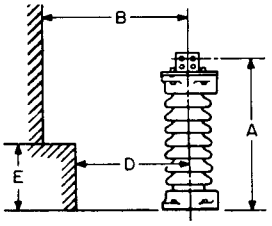


Fig. 2 3-36 Kv

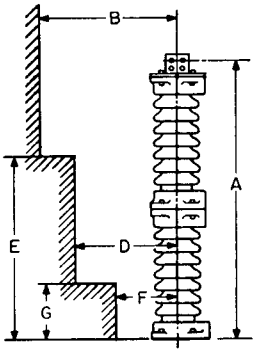


Fig. 3 39-72 Kv

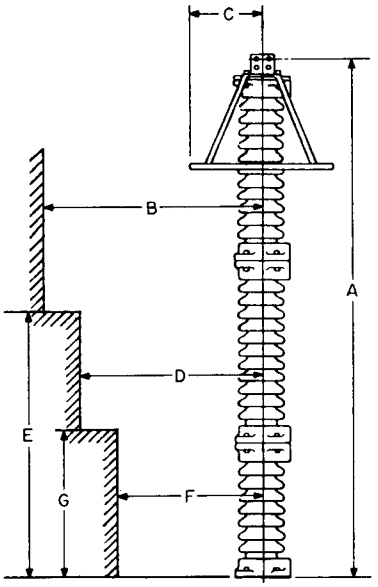


Fig. 4 90-120 Kv

Arrester Rating	Style Number Brown Porcelain	Style Number Light Gray (ASA #70) Porcelain	Fig. Ref.	A	B	C	D	E	F	G	H	Creep	Approx. Net Wt.
Metal Top 3 Thru 120 Kv													
3	1594840	792C846G01	2	17½	8½	..	7½	4	..	..	15	7	80
6	1594841	792C846G02	2	17½	9½	..	7½	4	..	..	16	7	85
9	1594842	792C846G03	2	21½	10½	..	8½	4	..	..	17	12	90
12	1594843	792C846G04	2	21½	11½	..	8½	5	..	..	18	12	95
15	1594844	792C846G05	2	25½	13	..	9½	6	..	..	19	22	125
21	1594845	792C846G06	2	35½	15	..	10½	8	..	..	21	37	155
24	1594846	792C846G07	2	35½	16½	..	10½	10	..	..	23	37	160
30	1594847	792C846G08	2	41½	18½	..	10½	12	..	..	25	47	190
36	1594848	792C846G10	2	47½	21	..	10½	16	..	..	27	57	220
39	1594849	792C846G11	3	67½	22	..	16	42	10½	8	28	74	300
48	1594850	792C846G12	3	67½	26	..	16	42	10½	10	32	74	310
60	1594851	792C846G13	3	79½	29½	..	18½	51	10½	12	35	94	365
72	1594852	792C846G14	3	91½	34½	..	20½	61	10½	16	40	114	425
90	23B3582G18	792C846G40	4	117½	56	17	35	62	22	35	69½	141	560
96	1594853	792C846G15	4	123½	56	17	35	62	22	35	69½	151	620
108	1594854	792C846G16	4	135½	62	20	35	62	22	35	80	171	690
120	1743449	792C846G17	4	155½	69	20	35	62	22	35	85	181	780
Porcelain Top 3 Thru 15 Kv													
3	1804505	173C232G01	1	16½	7½	..	..	..	..	..	13	16½	75
6	1804506	173C232G02	1	16½	7½	..	..	..	..	..	13	16½	77
9	1804507	173C232G03	1	22¼	8	..	..	..	..	..	13½	24½	97
12	1804508	173C232G04	1	22¼	8	..	..	..	..	..	13½	24½	100
15	1804509	173C232G05	1	24	9	..	..	..	..	..	14½	28½	119

Westinghouse Electric Corporation

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