Instructions for Type SVS Indoor or Outdoor Autovalve® Lightning Arresters for Service from 0-10,000 Feet

I.L. 38-121-2

GENERAL

The SVS Autovalve lightning arresters as described in the following pages are station arresters used for overvoltage protection of power apparatus such as oil insulated transformers and circuit breakers.

The SVS arresters are rated from 36 to 240 KV.

The distinguishing feature of the SVS series is its short compact design. All arrester ratings of this series can be erected as a single, unbraced structure. The arrester ratings up to 132 KV are of single unit construction. Those rated from 132 KV to 240 KV are combination of two units.

A special feature of the SVS arrester is the pressure relief scheme which functions to vent the arrester if an internal failure occurs.

DESCRIPTION

Each arrester consists of one or more porcelain clad units and required attachments. These units may be used singly or in multiples up to a maximum arrester rating of 240 KV as shown in Figure 1.

Ratings

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

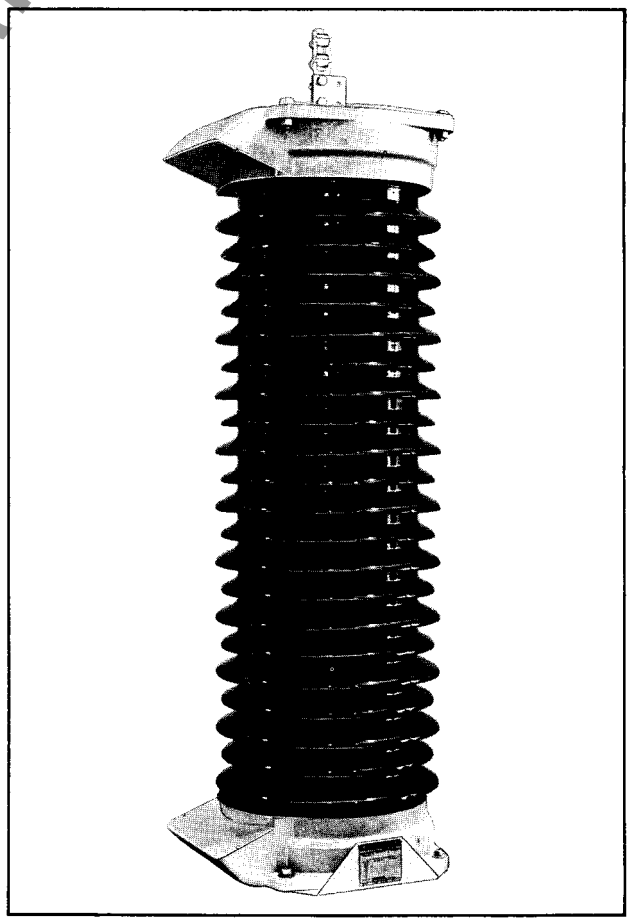
Changing Ratings

The arrester voltage rating may be changed in the field by: (1) increasing or decreasing the number of units in a pole and (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 SVS units described in this leaflet are not interchangeable with other station arresters. In all cases before changing an arrester rating, consult the nearest Westinghouse district office.

The unit nameplate attached to the base casting identifies and gives the rating of that arrester unit only, not the complete arrester pole. Necessary mounting hardware is in a bag in the shipping crate.

Nameplate and Ground Terminal Brackets

These angle brackets are mounted under the bottom of the arrester pole. One



120 Kv SVS Autovalve Arrester Unit

Effective November, 1969 Supersedes I.L. 38-120-4D, August, 1968

bracket mounts the ground terminal and the other the master nameplate.

Master Nameplate

A separate 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, location of individual units and the position of the grading ring.

Grading Ring Assembly

Used with arresters rated 144 to 240 KV as shown in Figure 1.

Non-Standard Arrester Parts
(Furnished if requested)

1. Insulating base - for use with discharge counter.

RECEIVING, HANDLING, STORING

Each unit is shipped in a wooden crate, and must be kept upright at all times. The packing slip is located on one of the crate 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. The chart indicates the number of parts to look for when unpacking any one arrester of a given rating.

Rating	Parts Required
36 to 120 KV Inclusive	One arrester unit, one line terminal and cover assembly, one set of ground terminal and nameplate brackets
132 KV	Two arrester units, one line terminal and cover assembly, one set of ground terminal and nameplate brackets
144 to 240 KV Inclusive	Two arrester units, one line terminal and cover assembly, one set of ground terminal and nameplate brackets and grading ring

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 provided. It is important that mounting surface for arresters be flat. See Figure 1 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 safe cantilever strength of the SVS arrester is 20,000 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 supplied to bypass the unit.

The bottom arrester unit is bolted directly to the foundation or the insulating base. At the same time insert the ground terminal and nameplate brackets between the foundation (or insulating base) and bottom end casting of the arrester unit. For multi-unit poles, once the bottom unit is firmly anchored, install the remaining unit 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.

INSTALLATION PRECAUTIONS

Arrester exhaust ports should be directed away from the transformer and other arrester poles.

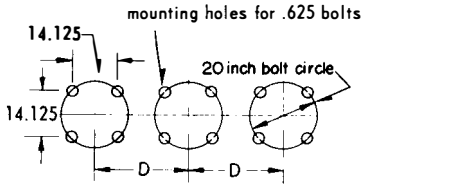
When installing arrester, all mounting feet must be flush before tightening bolts. Shim if necessary.

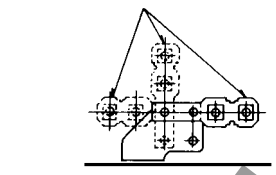
The arrester pole units should not be climbed for maintenance or any other purpose.

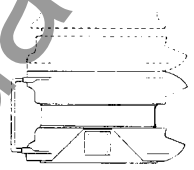
The line terminal assembly must not be used to lift the arrester.

Terminals

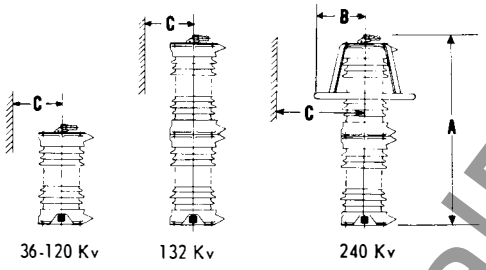
All terminals are suitable for copper or aluminum.

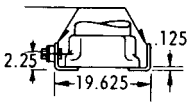





insulating base unit S# 366C421G01-when used increase dimension "A" by 14 inches.

*arrester should be mounted with the exhaust ports directed away from the transformers and other arrester poles





Kv RATING	STYLE # COMPLETE ARRESTER	PART STYLE NO. 36	48	60	72	90	96	108	120						Gdg. Ring 366C415G07	Gdg. Ring 366C415G08	Gdg. Ring 366C415G09	Dimensions in Inches (Approximate) See Note X: Arrester Height In. (A)	Grading Ring Radius In. (B)	Clearance Phase to Gnd. In. (C)	Clearance Phase to Phase In. (D)
		632A005A01	632A006A01	632A007A01	632A008A01	632A646A01	632A009A01	632A010A01	632A011A01												
36	632A019A01	1																34	NR	23	35
48	632A020A01		1															41	NR	26	38
60	632A021A01			1														41	NR	30	42
72	632A022A01				1													53	NR	35	47
90	632A648A01					1												67	NR	41	52
96	632A023A01						1											67	NR	43	54
108	632A024A01							1										67	NR	47	59
120	632A025A01								1									67	NR	52	63
132	632A437A01			1	1													90	NR	56	67
144	632A438A01				2											1		102	20	65	90
168	632A439A01			1				1									1	104	20	73	98
180	632A440A01			1					1								1	104	20	77	114
192	632A468A01				1				1						1			116	25	95	128
240	632A521A01								2						1			130	25	111	134

Note X: Increased clearances are required over 6000 feet.
Add 3% to dimensions (C) and (D) for each 1000 feet above 6000 feet

Fig. 1 Outline Dimensions for 36-240 Kv SVS Lightning Arrester

Line Terminal

Cable Size: #2 to 350 MCM copper
#4 to 350 MCM aluminum
#4 to 300 MCM ACSR

The terminal will accept conductors with a diameter of .255 to .681 inches.

Ground Terminal

Cable Size: #4 to 200 MCM copper
#4 to 4/0 MCM aluminum
#6 to 3/0 MCM ACSR

The terminal will accept conductors with a diameter of .204 to .530 inches.

Testing

All arrester units are tested at the factory. Each valve element is surge tested, the complete arrester unit is tested for 60 cycle sparkover, radio influence and 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 arresters. No simple field tests will check the complete characteristics of an arrester unit, since this requires considerable laboratory equipment.

If an arrester is suspected of having been damaged in service, the only field tests that should be attempted are 60 cycle sparkover, Doble, or megger tests, 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 refer to NEMA Bulletin #70; Guide for Field Testing of Lightning Arresters.

If 60 cycle sparkover tests are made, the circuit should provide a means for limiting the maximum possible current through the arrester (after sparkover) to 100 milliamps and the 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.

The series gaps are shunted by a high resistance, giving a current flow of 0.5 to 1.0 milliamperes grading current when energized at rated voltage. Tests made to measure grading current or watts-loss will give readings that are high compared to insulators. A megger test will not show infinite resistance.

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, its condition should be questioned and the nearest sales office contacted. It is more significant to make periodic readings and note the trends of the readings. Contamination on the porcelain surface may cause faulty or misleading readings. Units should be tested clean and dry.

MAINTENANCE

The SVS 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 inquires pertaining to the lightning arrester to the nearest Westinghouse sales office giving all information stated on the master nameplate.

Westinghouse Electric Corporation
Distribution Apparatus Division, Bloomington, Indiana 47401
Printed in U.S.A.

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The SVS arresters are rated from 36 to 240 KV.

The distinguishing feature of the SVS series is its short compact design. All arrester ratings of this series can be erected as a single, unbraced structure. The arrester ratings up to 132 KV are of single unit construction. Those rated from 132 KV to 240 KV are combination of two units.

A special feature of the SVS arrester is the pressure relief scheme which functions to vent the arrester if an internal failure occurs.

DESCRIPTION

Each arrester consists of one or more porcelain clad units and required attachments. These units may be used singly or in multiples up to a maximum arrester rating of 240 KV as shown in Figure 1.

Ratings

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

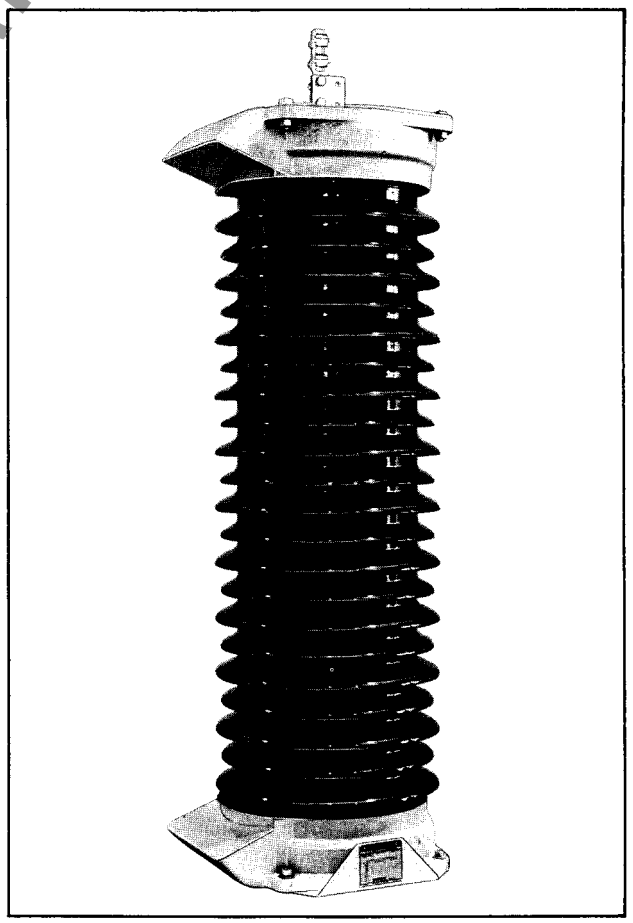
Changing Ratings

The arrester voltage rating may be changed in the field by: (1) increasing or decreasing the number of units in a pole and (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 SVS units described in this leaflet are not interchangeable with other station arresters. In all cases before changing an arrester rating, consult the nearest Westinghouse district office.

The unit nameplate attached to the base casting identifies and gives the rating of that arrester unit only, not the complete arrester pole. Necessary mounting hardware is in a bag in the shipping crate.

Nameplate and Ground Terminal Brackets

These angle brackets are mounted under the bottom of the arrester pole. One



120 Kv SVS Autovalve Arrester Unit

Effective November, 1969 Supersedes I.L. 38-120-4D, August, 1968

bracket mounts the ground terminal and the other the master nameplate.

Master Nameplate

A separate 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, location of individual units and the position of the grading ring.

Grading Ring Assembly

Used with arresters rated 144 to 240 KV as shown in Figure 1.

Non-Standard Arrester Parts
(Furnished if requested)

1. Insulating base - for use with discharge counter.

RECEIVING, HANDLING, STORING

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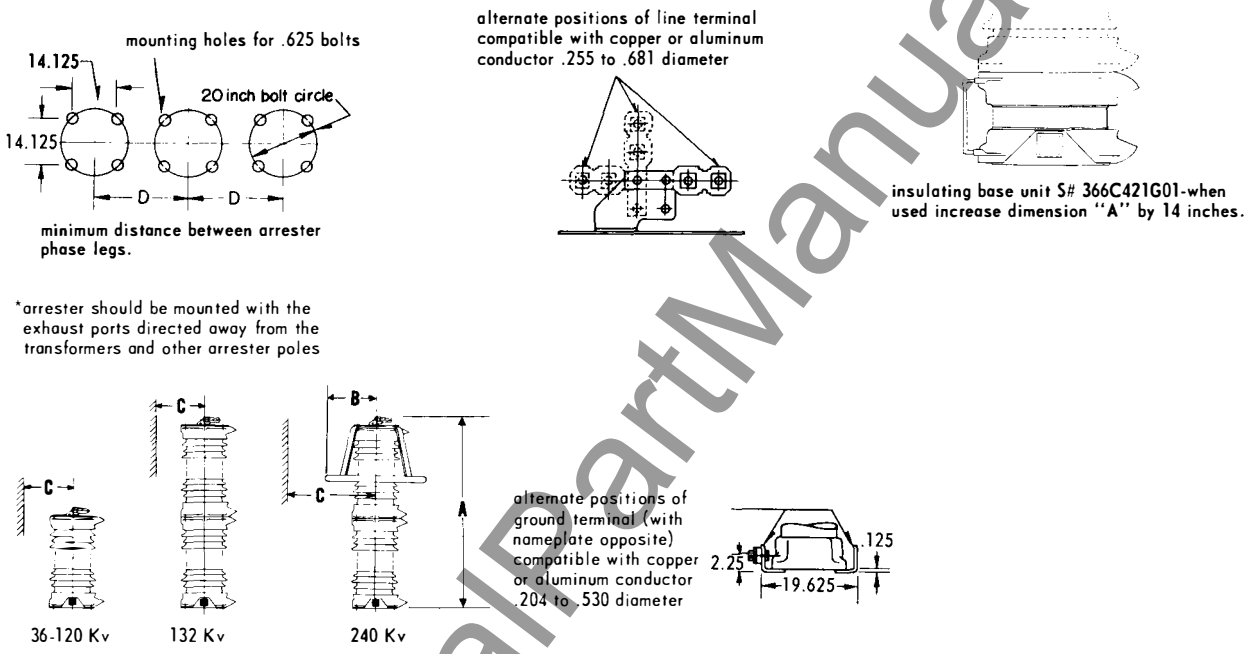

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