GENERAL • INSTALLATION • MAINTENANCE

INSTRUCTIONS

TYPE IVS AUTOVALVE LIGHTNING ARRESTERS
INTERMEDIATE TYPE FOR INDOOR OR OUTDOOR SERVICE
WITH SIDE-VENTING PRESSURE RELEASE
For use at 0 to 6,000 feet altitude

GENERAL

TYPE IVS AUTOVALVE LIGHTNING ARRESTERS described in this leaflet are intermediate arresters for the economical protection of power apparatus in small and medium size substations. They should be used where the higher cost and better protective characteristics of the type SV Autovalve arrester are not justified. The type IVS arrester affords low discharge characteristics as well as low and consistent impulse sparkover to provide maximum protection to electrical apparatus.

This arrester incorporates the best features of its predecessor, the type LVS; meets all AIEE, ASA, and NEMA Standards for intermediate type arresters; and offers other improvements such as side venting pressure release.

Special features of the side venting pressure release are a diaphragm and a red vent cover plate. In the remote event of

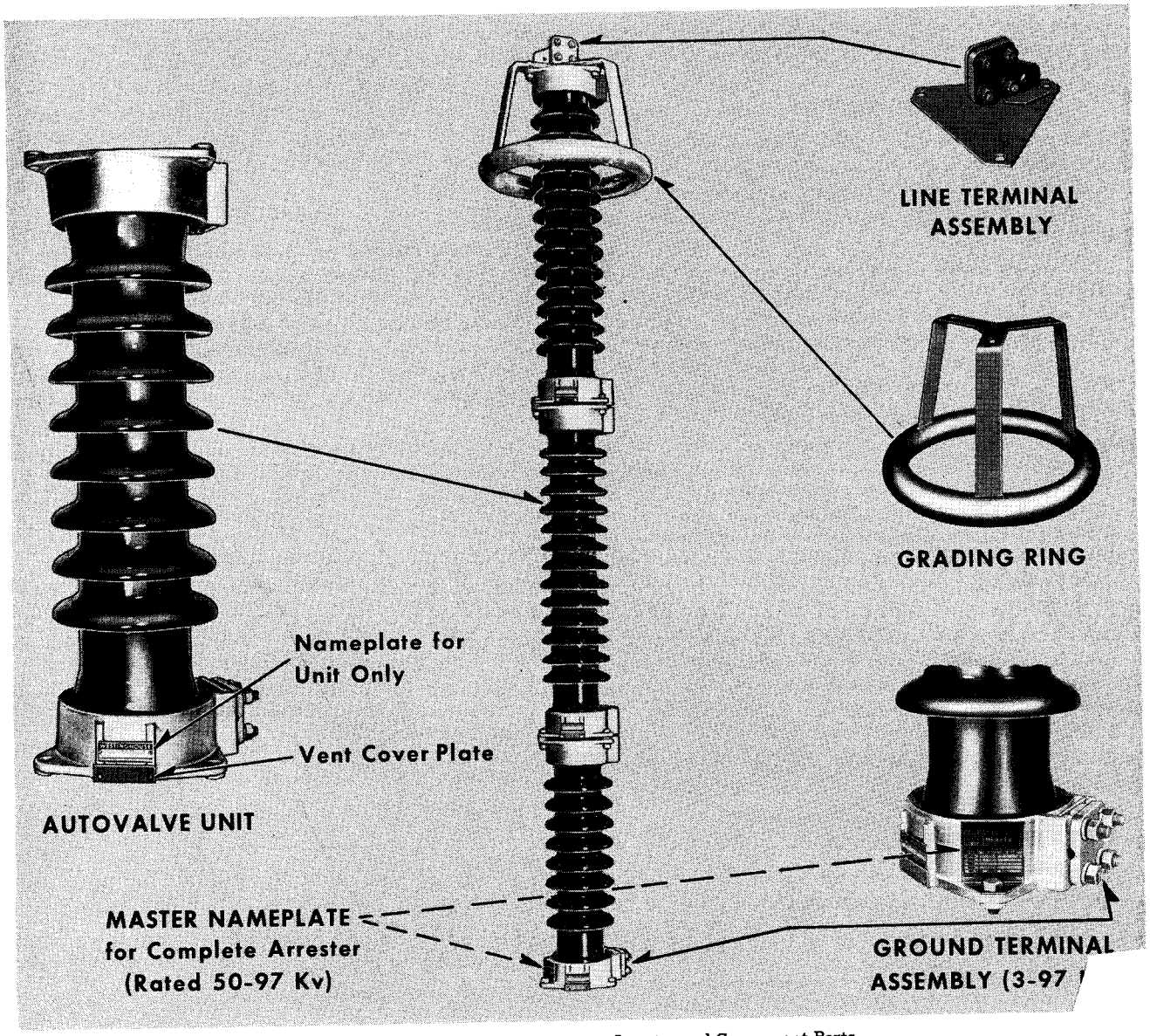


FIG. 1. Type IVS Autovalve Lightning Arrester and Component Parts

INSTALLATION

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

Installation is begun by laying out a suitable foundation in accordance with the outline drawing for the arrester. See Fig. 5 for clearance and arrester dimensions.

Bolt the bottom arrester unit directly to the foundation. For arresters rated 50 through 97 KV, attach the master nameplate at one of the mounting feet by means of the mounting bolt (Fig. 1). For 109 and 121 KV arresters, insert the two ground terminal angular mounting brackets between the foundation and the arrester base.

Once the bottom unit and its associated parts are firmly anchored, install the remaining units as indicated on the master nameplate and in the outline drawing.

When all units are bolted in place, and if no grading ring is required, attach the line terminal assembly to the top unit. For arresters requiring a grading ring, add the ring first and then the line terminal assembly.

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

RATINGS

The voltage rating given on the nameplate is a maximum rating. It designates the maximum sixty-cycle rms voltage applied across the arrester line and ground terminals against which the arrester is able to return itself to an insulator after having discharged the surge. If the system voltage applied to the arrester terminals under either normal or abnormal conditions (Such as faults) exceeds this rating, the arrester is likely to remain conducting after discharging the surge and will be damaged.

To Change Rating. The arrester voltage rating may be altered in the field by adding, subtracting, or changing arrester units. However, because of a difference in voltage distribution over the arrester unit and a difference in the mounting dimensions, IVS units described in this leaflet are not interchangeable with LVS or any other type of arrester units now in service. In all cases before altering an arrester's rating, consult our nearest District Office.

TESTING

All arrester units are tested at the factory. Each valve element is surge tested, the complete arrester unit is tested for its sixty cycle sparkover, and for radio interference. In addition, each unit is pressure tested to insure that it is tightly sealed against entrance of 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 considerable laboratory equipment.

If an arrester is suspected of having been damaged in service, the only field tests that should be attempted are sixty cycle sparkover, Doble, or "Megger", then only on clean, dry arresters. It must be understood, however, that such tests will not determine the condition of the valve elements.

If 60 cycle sparkover tests are made, the circuit should provide a means for limiting the maximum possible current through the arrester to 30 milliamperes 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 shunting resistors.

It may be found that Doble or Megger tests on units of the same rating will give different readings. However, if one unit shows considerable deviation from the rest, its condition may be open to question. It is more significant to make periodic readings and note the trends of the readings.

MAINTENANCE

The Autovalve arrester requires no regular maintenance other than an 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 DEPARTMENT
BLOOMINGTON PLANT • BLOOMINGTON, INDIANA
Printed in U.S.A.

GENERAL • INSTALLATION • MAINTENANCE

INSTRUCTIONS

TYPE IVS AUTOVALVE LIGHTNING ARRESTERS
INTERMEDIATE TYPE FOR INDOOR OR OUTDOOR SERVICE WITH SIDE-VENTING PRESSURE RELEASE
For use at 0 to 6,000 feet altitude

GENERAL

TYPE IVS AUTOVALVE LIGHTNING ARRESTERS described in this leaflet are intermediate arresters for the economical protection of power apparatus in small and medium size substations. They should be used where the higher cost and better protective characteristics of the type SV Autovalve arrester are not justified. The type IVS arrester affords low discharge characteristics as well as low and consistent impulse sparkover to provide maximum protection to electrical apparatus.

This arrester incorporates the best features of its predecessor, the type LVS; meets all AIEE, ASA, and NEMA Standards for intermediate type arresters; and offers other improvements such as side venting pressure release.

Special features of the side venting pressure release are a diaphragm and a red vent cover plate. In the remote event of

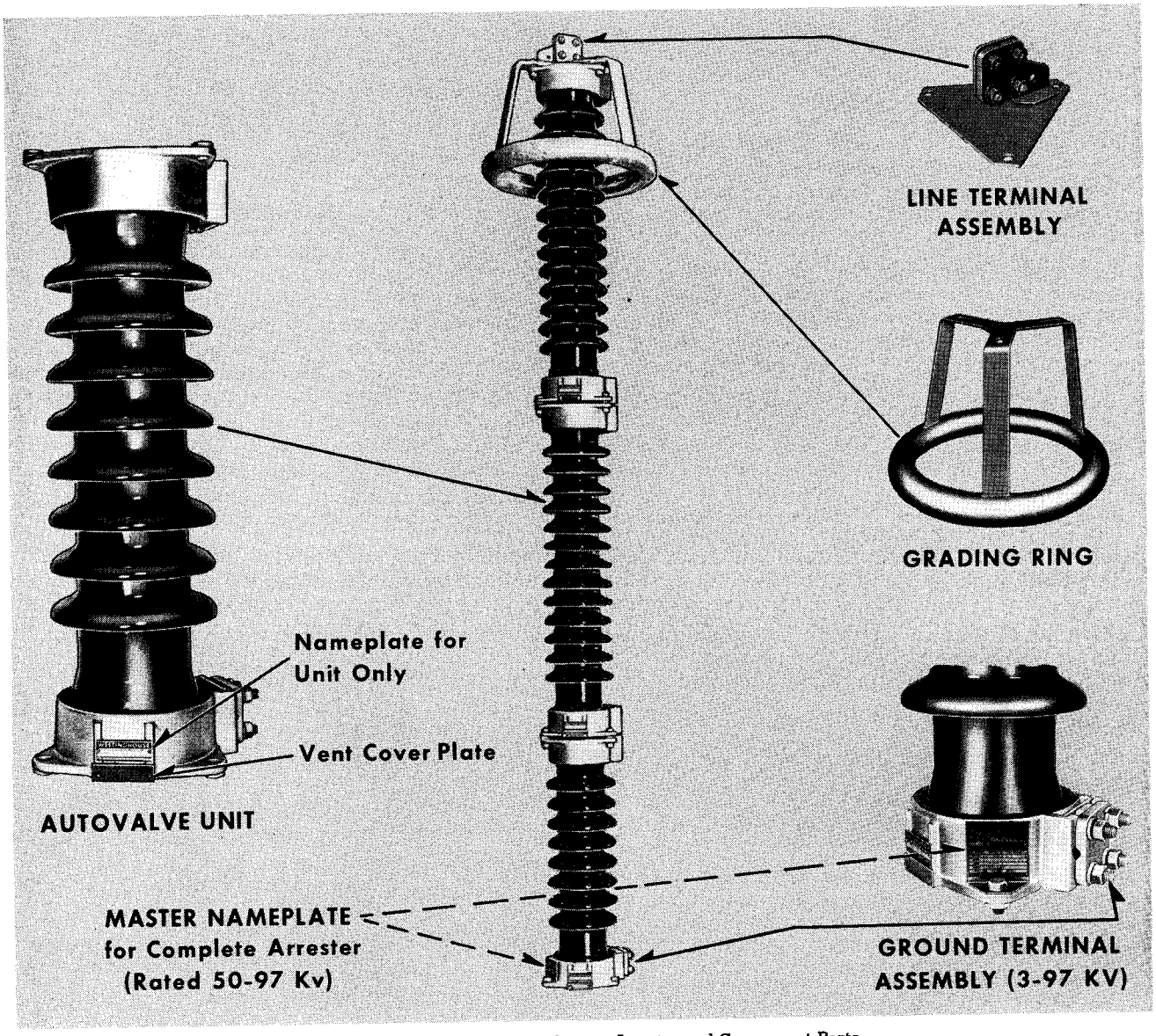


FIG. 1. Type IVS Autovalve Lightning Arrester and Component Parts

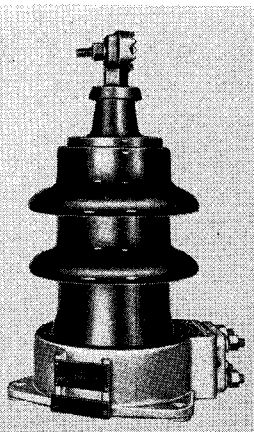


FIG. 2. Porcelain Top Unit 3-15 Kv

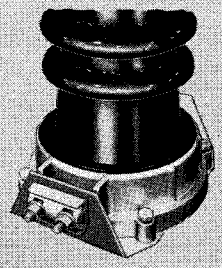


FIG. 3. Special 4-Foot Base Unit

NAMEPLATE BRACKET

GROUND TERMINAL BRACKET 109 & 121 KV

FIG. 4. Ground Terminal and Nameplate Brackets 109 and 121Kv

sustained 60 cycle current flow through the arrester, the diaphragm ruptures assuring that excessive pressure will not build up in the arrester. When the diaphragm operates, the red vent cover plate is blown off, giving visual indication of an operation.

RECEIVING

Each single pole arrester consists of one or more porcelain clad arrester units and its required attachments. When the arrester is installed, the various parts must be assembled to form the complete arrester pole. The parts, as packaged, consist of the following:

1. Arrester Units. These are the porcelain housings, containing the operating parts. Each unit is an arrester in itself. Units rated 3-15 KV have porcelain tops (Fig. 2) with integral line terminal and should not be used in arrester poles of more than one unit. Units rated 20-40 KV have metal castings at each end (Fig. 1). They may be used alone or in multiples until a maximum arrester rating of 121 KV is obtained (Fig. 1).

a. For arresters rated 3-97 KV, each standard unit incorporates the side venting pressure release device in its base. Each unit has a nameplate and a red vent cover plate attached to its base casting (Fig. 1). This nameplate identifies and gives the rating of that arrester unit only and not the complete arrester. Necessary mounting hardware is in a sack tied to one end casting.

b. For arresters rated 109 and 121 KV, there will be in addition to the units described in (a), one large unit with a base casting having four mounting feet (Fig. 3). This unit will not have the red vent cover plate, since it has bottom rather than side venting pressure release. It will be the bottom unit in the arrester pole.

2. Line Terminal Assembly (Fig. 1). Not used with porcelain top units.

3. Grading Ring Assembly (Fig. 1). Not used with arresters rated 73 KV and below.

4. Ground Terminal Assembly. For 3-15 KV ratings, it is supplied mounted on the arrester base casting (Fig. 2). For 20-97 KV ratings it is furnished separately. For 109 and 121 KV ratings, it is mounted on one of the two mounting feet (Fig. 4).

5. Master Nameplate. An L shaped nameplate is supplied with arresters rated 50-97 KV (Fig. 1). For arresters rated 109-121 KV it is attached to one of the two mounting feet (Fig. 4). This nameplate identifies by style number the arrester pole, its rating and the position of the individual units in the pole.

6. Non-Standard Arrester Parts (Furnished if Requested). Brackets for crossarm and wall mounting; cover adapter plates for suspension mounting; base adapting plates for 4 bolt hole mounting of IVS arresters; insulating base unit for use with discharge counter.

UNPACKING

Unpack carefully and examine for breakage or other damage, especially to the porcelain. If damage exists, save the container and packing and notify the carrier.

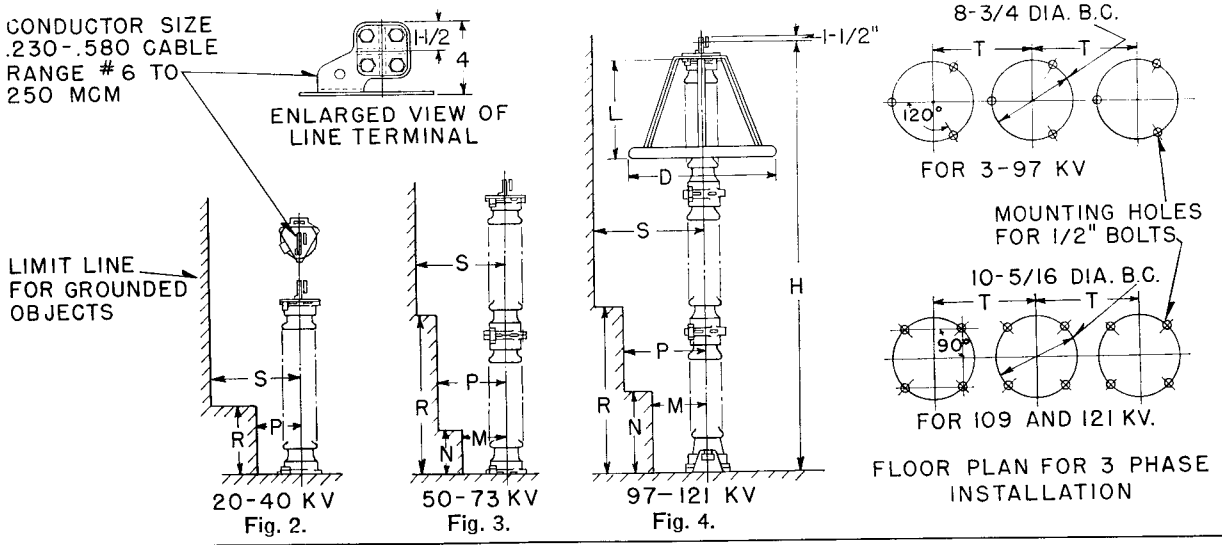
Shortages should be checked with the carrier, or if not the fault of the carrier, with our nearest Sales Office. If parts do not agree with the packing list, contact the nearest Westinghouse representative, giving him the order reading and other identification.

Table I indicates the number of parts to look for when unpacking any one arrester of a given rating.

These arresters are for operation at altitudes up to 6,000 feet.

Table I

RATINGS	PARTS REQUIRED
3 to 15 Kv inclusive	One porcelain top unit with integral line terminal, mounted ground terminal and master nameplate.
20 to 40 Kv inclusive	One arrester unit, line terminal assembly, ground terminal assembly and master nameplate.
50 to 73 Kv inclusive	Two arrester units, line terminal assembly, ground terminal assembly, and master nameplate.
97 Kv	Three arrester units, line terminal assembly, ground terminal assembly, grading ring, and master nameplate.
109 and 121 Kv	Three arrester units (one having 4 mounting feet on base casting), line terminal assembly, one set of ground terminal and master nameplate mounting feet, and grading ring.



MAX. VOLTAGE RATING KV—RMS	ARRESTER STYLE NO.	FIG. REF.	NO. OF SKIRTS.	DIMENSIONS IN INCHES (APPROXIMATE) H*	T	S	R	P	N	M	D	L	FOR 3-15 KV UNITS A	B	C	E
3	258B943G01	1	1	12¾	9½								5½	5½	7	8½
6	258B943G02	1	2	18¼	9½								5½	5½	7	8½
9	258B943G03	1	2	18¼	9½								7	7	7	8½
12	258B943G04	1	4	23 13/16	12								8½	8½	8½	10½
15	258B943G05	1	4	23 13/16	12								8½	8½	8½	10½
20	366C501G01	2	6	25 3/16	20	15	8	10								
25	366C501G02	2	8	28 13/16	21	16½	10	10								
30	366C501G03	2	10	34 5/16	23	18½	12	10								
37	366C501G04	2	13	39 15/16	25	21	16	10								
37B	.....		13	39 15/16												
40	366C501G05	2	14	42 13/16	26	22	18	10								
40B	.....		14	42¾												
50	366C501G06	3	16	57⅝	33	26	37	16	10	10						
60	366C501G07	3	20	68⅝	37	30	45	18½	12	10						
73	366C501G08	3	26	82¾	42	36	54	20½	16	10						
97	366C501G09	4	34	108 1/16	59½	49	40	35	10	22	20	13				
109	366C501G10	4	39	119 3/16	74	59	40	35	18	22	34	24				
121	366C501G11	4	42	131¼	79	66	40	35	18	22	34	19½				

STACK ASSEMBLIES FOR 50-121 KV ARRESTERS

UNIT POSITION	UNIT KV	UNIT STYLE NUMBER
Bottom	25	505D342G02
Second	25	505D342G02
Bottom	30	505D342G03
Second	30	505D342G03
Bottom	37	505D342G04
Second	37	505D342G04
Bottom	25	505D342G02
Second	37	505D342G04
Third	37	505D342G04
Bottom	37	505D343G02
Second	37	505D342G04
Third	37	505D342G04
Bottom	40	505D343G01
Second	40	505D342G05
Third	40	505D342G05

*Overall height from foundation to center of line terminal clamp B Special—Used for bottom unit in 109 and 121 Kv arresters

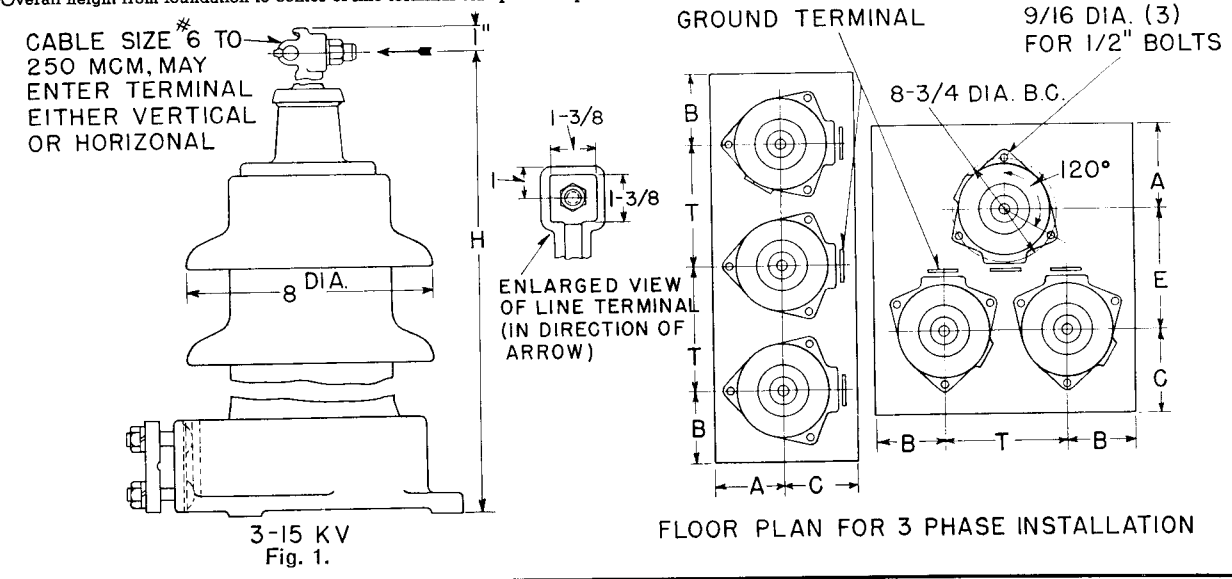


FIG. 5. Outline Dimensions of Type IVS Lightning Arresters

INSTALLATION

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

Installation is begun by laying out a suitable foundation in accordance with the outline drawing for the arrester. See Fig. 5 for clearance and arrester dimensions.

Bolt the bottom arrester unit directly to the foundation. For arresters rated 50 through 97 KV, attach the master nameplate at one of the mounting feet by means of the mounting bolt (Fig. 1). For 109 and 121 KV arresters, insert the two ground terminal angular mounting brackets between the foundation and the arrester base.

Once the bottom unit and its associated parts are firmly anchored, install the remaining units as indicated on the master nameplate and in the outline drawing.

When all units are bolted in place, and if no grading ring is required, attach the line terminal assembly to the top unit. For arresters requiring a grading ring, add the ring first and then the line terminal assembly.

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

RATINGS

The voltage rating given on the nameplate is a maximum rating. It designates the maximum sixty-cycle rms voltage applied across the arrester line and ground terminals against which the arrester is able to return itself to an insulator after having discharged the surge. If the system voltage applied to the arrester terminals under either normal or abnormal conditions (Such as faults) exceeds this rating, the arrester is likely to remain conducting after discharging the surge and will be damaged.

To Change Rating. The arrester voltage rating may be altered in the field by adding, subtracting, or changing arrester units. However, because of a difference in voltage distribution over the arrester unit and a difference in the mounting dimensions, IVS units described in this leaflet are not interchangeable with LVS or any other type of arrester units now in service. In all cases before altering an arrester's rating, consult our nearest District Office.

TESTING

All arrester units are tested at the factory. Each valve element is surge tested, the complete arrester unit is tested for its sixty cycle sparkover, and for radio interference. In addition, each unit is pressure tested to insure that it is tightly sealed against entrance of 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 considerable laboratory equipment.

If an arrester is suspected of having been damaged in service, the only field tests that should be attempted are sixty cycle sparkover, Doble, or "Megger", then only on clean, dry arresters. It must be understood, however, that such tests will not determine the condition of the valve elements.

If 60 cycle sparkover tests are made, the circuit should provide a means for limiting the maximum possible current through the arrester to 30 milliamperes 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 shunting resistors.

It may be found that Doble or Megger tests on units of the same rating will give different readings. However, if one unit shows considerable deviation from the rest, its condition may be open to question. It is more significant to make periodic readings and note the trends of the readings.

MAINTENANCE

The Autovalve arrester requires no regular maintenance other than an 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 DEPARTMENT
BLOOMINGTON PLANT • BLOOMINGTON, INDIANA
Printed in U.S.A.