CERTIFIED TEST REPORT

VariSTAR™ Type AZG2 Surge Arrester, 10,000 A, Line Discharge Class 2 IEC 60099-4 (99-4)

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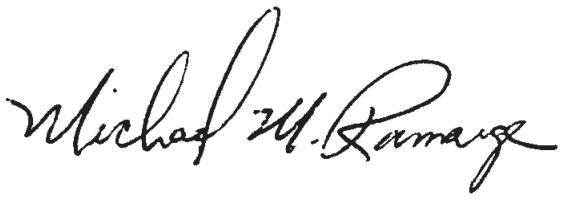
CERTIFICATION

Statements made and data shown are, to the best of our knowledge and belief, correct and within the usual limits of commercial testing practice.

Frank Muench
Director of Engineering Development



Michael M. Ramarge
Design Engineer

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SECTION 1 – GENERAL INFORMATION

1.1 Scope

This document presents data summarizing the design test results for the AZG2 surge arrester, 10,000 A, line discharge class 2, in accordance with the requirements of IEC 60099-4 (99-4).

1.2 Certification Statement

Design tests conducted and the data presented in this document are in accordance with all sections of IEC 60099-4 (99-4) pertaining to 10 kA nominal discharge classification current and line discharge class 2 arrester designs. The Cooper Power Systems VariSTAR® Type AZG2 arresters rated 3-240 kV, meet or exceed all applicable requirements of the above referenced standard in accordance with the following sections of this document.

1.3 Certification Summary

1.3.1 Insulation Withstand of the Arrester Housings:

Tests were conducted in accordance with sections 5.1, 6, & 7.2, of IEC 60099-4 (99-4) and IEC 60-1 on empty individual housing assemblies of each size of the design with and without grading rings (as applicable) to determine Lightning Impulse, Switching Surge Impulse, and 1 Minute Power Frequency (wet condition) withstand levels.

All arrester ratings have withstand levels exceeding IEC requirements. Withstand levels of arrester ratings using multiple housings are based on the summation of individual housing values. In those cases where the individual unit Continuous Operating Voltage (COV) is not proportional to the insulation withstand, the claimed withstand level has been appropriately reduced.

Table 1
Tested Insulation Withstand of Arrester Housings

Type AZG2 Surge Arrester Housing Insulation Characteristics					
Housing Designation*	**Leakage Distance (mm)**	**Arc Distance (mm)**	**BIL - kV Pk 1.2/50 Wave**	**50/60 Hz Wet (60s)-kV rms**	**Switching-Wet (kV Pk)**
01	234	132	130	35	**
02	406	195	170	60	**
03	665	291	230	90	**
04	922	386	265	125	**
05	1267	513	320	165	**
06	1646	600	365	170	**
07	1872	672	385	195	**
08	2540	889	505	250	**
09	3226	1106	650	285	**
11	3292	1199	725	345	**
12	3518	1272	735	360	**
13	3744	1344	770	395	**
14	4186	1489	865	415	**
15	4412	1561	880	450	**
16	4872	1706	985	450	**
17	3292	1150	705	335	**
18	3518	1218	780	370	**
19	3744	1291	790	385	**
20	4186	1440	850	400	**
21	4412	1508	920	440	**
22	4872	1548	925	440	750
23	5098	1620	930	480	810
24	5766	1838	1065	530	915
25	6452	2055	1185	545	1015
27	6744	2099	1265	625	1065
28	6970	2171	1300	655	1100
29	7412	2316	1375	675	1150
30	7638	2389	1405	705	1190
31	8098	2533	1475	710	1250
32	8306	2606	1515	760	1280
34	8992	2750	1440	760	1235
35	9677	2967	1535	810	1315

* Housing designation is indicated in the 6th and 7th position of the catalog number.

** IEC Standard 60099-4 (99-4) 1991 does not require Wet Switching Surge Withstand tests for arresters with rated voltage (U_r) below 200 kV.

1.3.2 Residual Voltage Tests:

Tests were conducted in accordance with sections 5.3, 6, & 7.3 of IEC 60099-4 (99-4) and IEC 60-3 on three equivalent arrester sections to determine prorata residual voltage values resulting from steep front, lightning and switching surge impulse tests.

Each test sample was constructed of a single zinc-oxide disk, the longest internal spacer utilized in an arrester unit and the spring, spring shunt and contact plates. Table 1 contains the results of the residual voltage tests for the individual zinc-oxide disk, the other arrester components, and their sum. Terminal-to-terminal arrester residual voltages for each applied current magnitude and waveform are determined as follows:

A. For each arrester unit COV, a fixed 10 kA 8/20 µs residual voltage is established.

B. The test sample residual voltage at each current magnitude and waveform is determined and expressed as a ratio of the 10 kA 8/20 µs value. The residual voltage, due to the zinc-oxide elements alone, is taken as the sum of the disks exhibiting the highest ratio.

C. A residual voltage is measured for each current magnitude and waveform, due solely to arrester construction, and added to that of the zinc-oxide disks. This results in the total residual voltage at each current magnitude and waveform for the arrester unit.

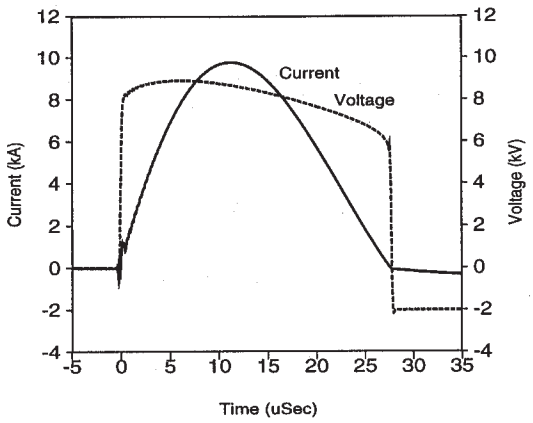
D. The total arrester terminal-to-terminal residual voltage for arresters composed of multiple units is the sum of the individual arrester units.

Figure 1 displays oscillograms typical of the samples. Expansion of these data results in the residual voltages for all standardized currents, waveforms and arrester ratings; maximum guaranteed protective characteristics for all AZG2 arrester ratings may be found in Table 7, "Residual Voltages".

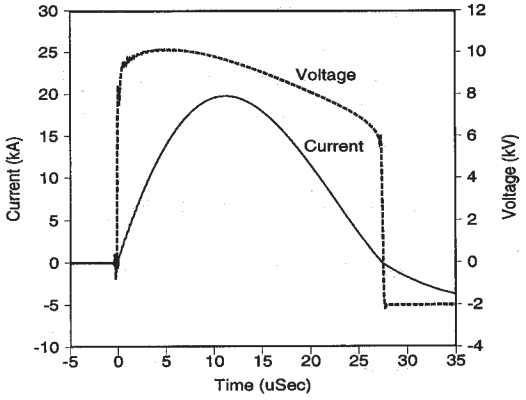
Table 2
Residual Voltages - Test Sample Results

Residual Voltage of MOV Disks									
	Switching Impulse Residual Voltage (kV)		**Lightning Impulse Residual Voltage (8/20 µsec, kV)**						**Steep Current**
	125 A	**500 A**	**1.5 kA**	**3 kA**	**5 kA**	**10 kA**	**20 kA**	**40 kA**	**10 kA**
Sample 1	6.64	7.04	7.53	7.96	8.34	9.02	9.98	11.23	10.09
Sample 2	6.64	6.81	7.28	7.58	7.98	8.31	9.05	9.98	10.10
Sample 3	6.62	6.82	7.29	7.54	7.95	8.32	8.98	9.91	10.10
Residual Voltage due to other components									
	Switching Impulse Residual Voltage (kV)		**Lightning Impulse Residual Voltage (8/20 µsec, kV)**						**Steep Current**
	125 A	**500 A**	**1.5 kA**	**3 kA**	**5 kA**	**10 kA**	**20 kA**	**40 kA**	**10 kA**
Sample 1	0.00	0.00	0.00	0.06	0.12	0.18	0.41	1.28	3.08
Sample 2	0.00	0.00	0.04	0.06	0.09	0.21	0.43	1.24	2.58
Sample 3	0.00	0.03	0.03	0.04	0.09	0.20	0.45	1.15	2.68

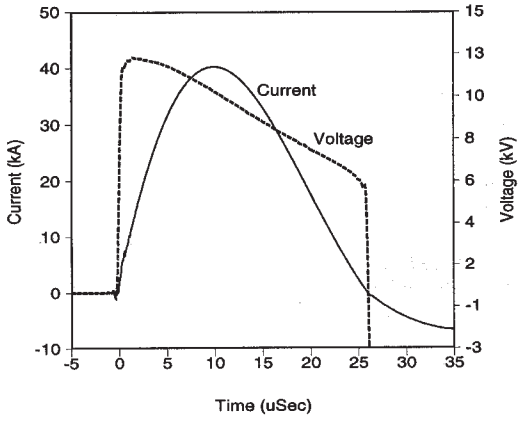
10 kA Residual Voltage



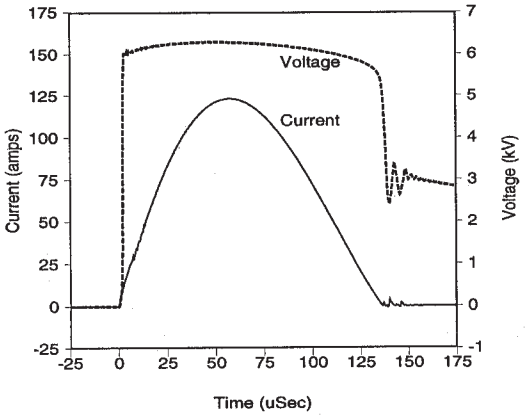
20 kA Residual Voltage



40 kA Residual Voltage



125 Amp Switching Impulse Residual Voltage



500 Amp Switching Impulse Residual Voltage

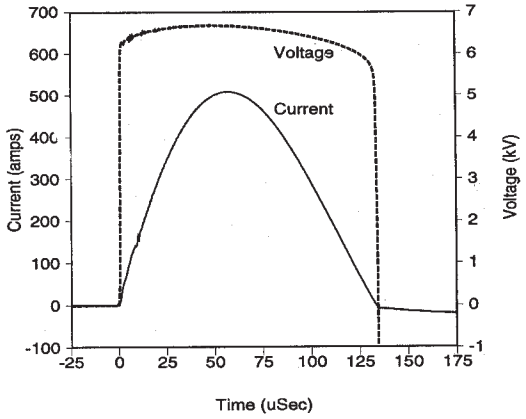


Figure 1
Residual Voltages for Sample #3 Measured Across the Arrester Section

1.3.3 Long Duration Current Impulse Withstand Test:

Tests were conducted in accordance with sections 5.8, 6.3, 7.1, and 7.4 in IEC 60099-4 (99-4) on disk samples. Test data is summarized in Table 3, and examples of the wave form are shown in Figure 2.

All disk samples exceeded the highest energy stress level utilized in the design as detailed in IEC 60099-4 (99-4), section 6.3 and summarized below:

a. The minimum V_{ref} = 1.25 x COV and Rating = 1.025 x V_{ref}, where V_{ref} is the rms power frequency voltage producing a reference current of 2.5 mA. Production tests utilize a DC V_{1mA} test on disks. Design limits by this method are COV = 0.552 V_{1mA} resulting in a limit of rating being 0.707 x V_{1mA}.

b. The minimum disk volume in the arrester is 16.8 cc per kV of COV or 13.1 cc per kV of rating.

The LDC wave form met the required criteria. Additionally, the minimum switching energy to be injected was calculated for each sample. In all cases, required energy levels were attained.

Residual voltage at rated current was measured before and after the LDC test series. In all cases, change in residual voltage was less than the 5% limit.

Table 3
Summary Data - Long Duration Current Impulse Withstand Test

Summary Data	Sample 1	Sample 2	Sample 3
V_{1mA}	6.14 kV	6.06 kV	6.05 kV
V_{ref}	4.26 kV	4.15 kV	4.2 kV
Maximum COV	3.39 kV	3.35 kV	3.34 kV
Maximum Rating	4.35 kV	4.29 kV	4.28 kV
Disk Volume	55.6 cc	55.8 cc	56.0 cc
Disk Volume Per Unit Rating	12.8 cc/kV	13.0 cc/kV	13.1 cc/kV
Specified Minimum Test Energy	9238 joules	9117 joules	9102 joules
Specified Maximum Test Energy	10161 joules	10029 joules	10012 joules
Actual Minimum Test Energy	9282 joules	9125 joules	9167 joules
Actual Maximum Test Energy	9610 joules	9509 joules	9514 joules
Pretest kV @ 10 kA	10.12 kV	9.96 kV	10.06 kV
Post Test kV @ 10 kA	10.12 kV	9.90 kV	10.07 kV
Percent Change kV @ 10 kA	0.00%	-0.61%	0.10%

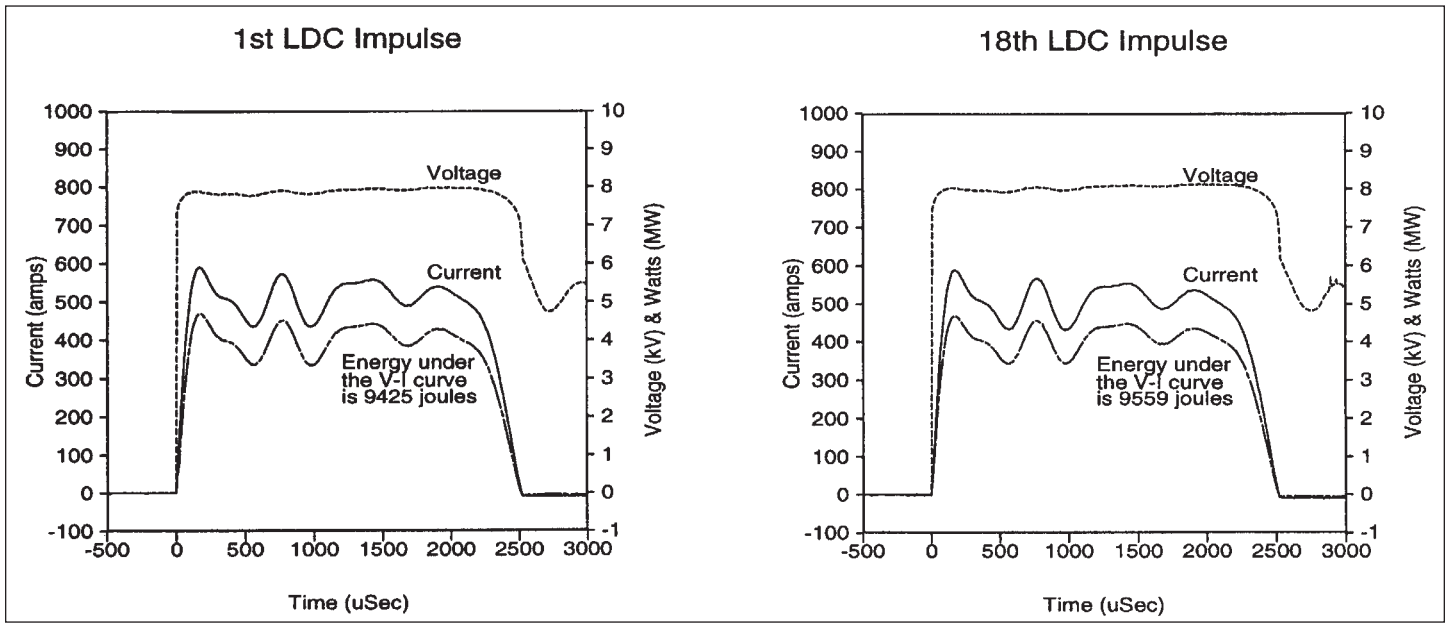


Figure 2
First and Final Long Duration Current Impulses

1.3.4 Operating Duty Test:

Tests were conducted in accordance with sections 5.9, 6.2, 6.3, 7.1, 7.3.2, and 7.5 of IEC 60099-4 (99-4) on prorated thermal sections. This test series includes accelerated aging tests, verification of thermal section, and the switching surge operating duty test with conditioning, and evaluation of thermal stability.

1.3.4.1 Accelerated Aging Test:

Tests were run on disk samples as required in section 7.5.2 of IEC 60099-4 (99-4).

Test voltage (U_{ct}) was determined to be 1.04 x U_C. This proration factor is representative of the highest field concentration area in the design family as determined through electric field modeling and tests of the voltage distribution along the disk column.

All MOV disks utilized in this design maintain a watts loss level lower than the initial watts loss when energized at U_C or U_{ct} for the life of the product. This has been verified by the accelerated aging procedure in section 7.5.2 of IEC 60099-4 (99-4). No correction factors are required to be applied to COV (U_C) or Rating (U_r) during the operating duty tests.

Typical aging data is summarized in Table 4.

Table 4
Summary Data - Accelerated Aging Test

	V_{1mA}	COV (Usc)	Rating (Usr)	COV (Uct)	Watts Loss at 2.1 hr (P_{1ct})	Watts Loss at 1032 hr (P_{2ct})
Sample 1	5.36	2.96	3.79	3.08	2.74	1.64
Sample 2	5.36	2.96	3.79	3.08	2.41	1.57
Sample 3	5.36	2.96	3.79	3.08	2.42	1.67

1.3.4.2 Verification of Thermal Section:

Prorated thermal equivalent sections of the AZG2 design were built as required in section 7.5.3 of IEC 60099-4 (99-4).

In order to verify compliance with thermal proration requirements, tests were conducted with a thermal equivalent section and a 120 kV rated AZG2 arrester in identical manners. Power frequency voltage sources were used to heat MOV disks to 120°C. Thermocouples were placed at the top, middle and bottom of the arrester and the average temperature reading was calculated. For the thermal equivalent section, the thermocouple was located on the disk periphery. Figure 3 displays temperature data verifying heating rates and good correlation between the thermal equivalent section and the 120 kV arrester cooling rates.

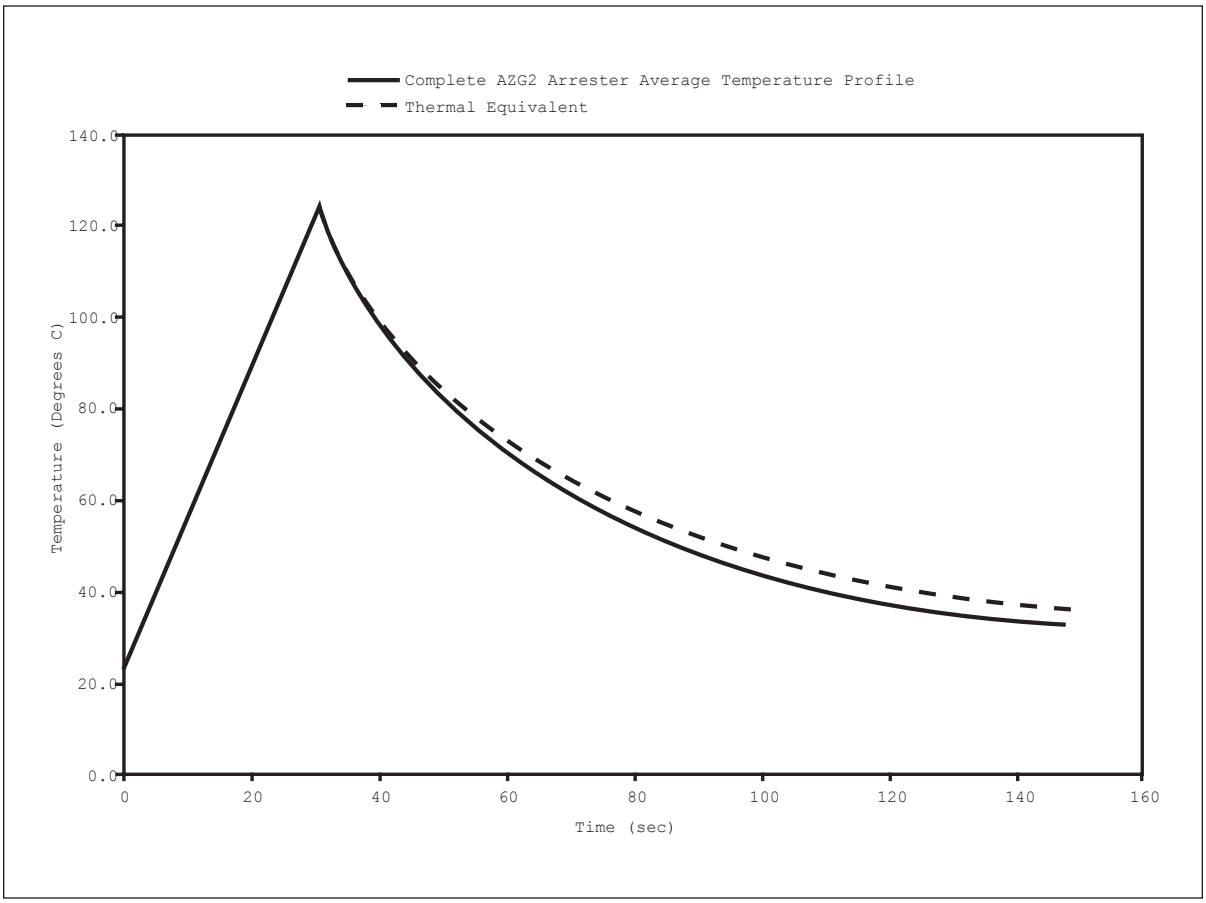


Figure 3
Thermal Performance Comparison Curves

1.3.4.3 Switching Surge Operating Duty Test

Tests were conducted on three prorated thermal equivalent sections constructed in accordance with criteria detailed in the above sections of 1.3.4 as well as in section 7.5.5 of IEC 60099-4 (99-4). The test proceeded as outlined below.

1. The residual voltage resulting from a 10 kA 8/20 µs lightning current impulse was measured across the disk to be used in each thermal equivalent section.
2. A conditioning test consisting of four groups of five 10 kA 8/20 µs lightning current impulses was applied to the disk used in each thermal equivalent section while the disk was energized at a 60 Hz voltage (U_r) = 1.282 x COV, where COV was determined as described in section 1.3.3 above. IEC allows a lower U_r = 1.20 x COV, however, a higher voltage level was chosen corresponding to the capabilities of the design. Time between impulses and groups of impulses conformed to the highest stressed requirements of 50-60 sec. and 25-30 min. respectively. Tests were in still air at 16-22°C. Impulses were applied at approximately 60°C before 60 Hz voltage peak. A summary of data recorded for a typical sample during this test is shown in Table 5.

Table 5
Summary Data - Conditioning

Impulse Number	Current (kA Crest)	Peak Current at Rated Voltage (mA)
1	10.0	9.7
2	10.0	8.9
3	10.0	9.8
4	10.0	9.6
5	10.0	10.2
6	10.6	9.0
7	10.6	10.5
8	10.6	11.4
9	10.4	11.4
10	10.4	12.7
11	10.4	9.6
12	10.4	10.9
13	10.4	12.0
14	10.2	12.5
15	10.2	13.8
16	10.2	9.7
17	10.2	11.4
18	10.0	13.3
19	10.0	15.4
20	10.0	17.0

3. The remaining conditioning tests consisting of two 100 kA 4/10 µs lightning impulses were performed on the complete thermal equivalent sections. Voltage and current traces for the sample are shown in Figures 4A and 4B.
4. The complete, conditioned, prorated thermal equivalent sections were heated and stabilized at 60°C. Each stabilized prorated thermal equivalent section was placed in a room temperature test cell (16-22°C), and immediately subjected to a group of two long duration impulses, one minute apart, having wave characteristics as described in section 1.3.3 above. The current and voltage traces for the second LDC impulse are shown in Figure 4C.
5. Within 35-45 msec. of the last long duration impulse, rated voltage (U_r) was applied for 10 sec. immediately followed by COV (U_c) for 30 min. Where U_r = 1.282 x U_c and U_c = .552 x V_{1mA}, alternatively and equivalently U_c = .8 x V_{ref} . Figure 4D shows the transition from the impulse to U_r and Figure 4E shows the transition from U_r to U_c. Figure 4F illustrates 30 minute recovery of the sample at U_c.
6. The residual voltage resulting from a 10 kA 8/20 µs lightning current impulse was measured across the disk used in each thermal equivalent section.

7. The percent change in 10 kA 8/20 µs lightning current impulse residual voltage due to the operating duty test was calculated based on the initial and final residual voltage measurements. In all cases the change was less than the 5% limit.
8. A visual inspection verified that no damage occurred. See Table 6 for a complete summary of test data.

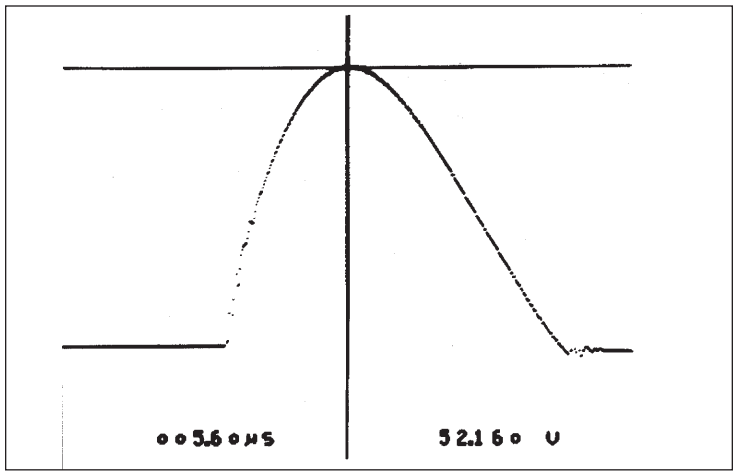


Figure 4A
100.2 kA (2nd Impulse)

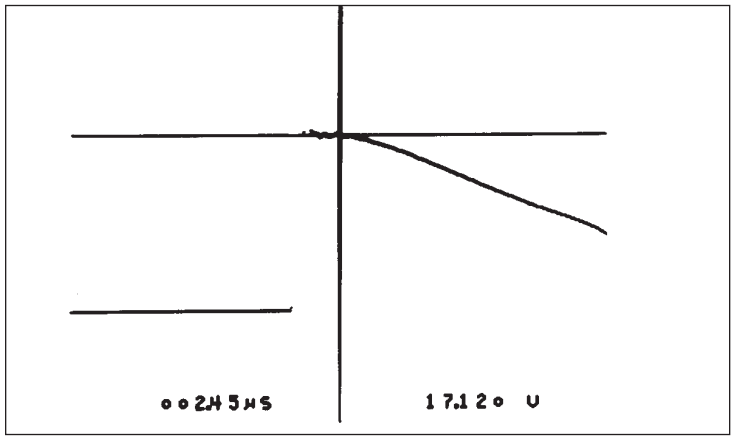


Figure 4B
15.6 kV (2nd Impulse)

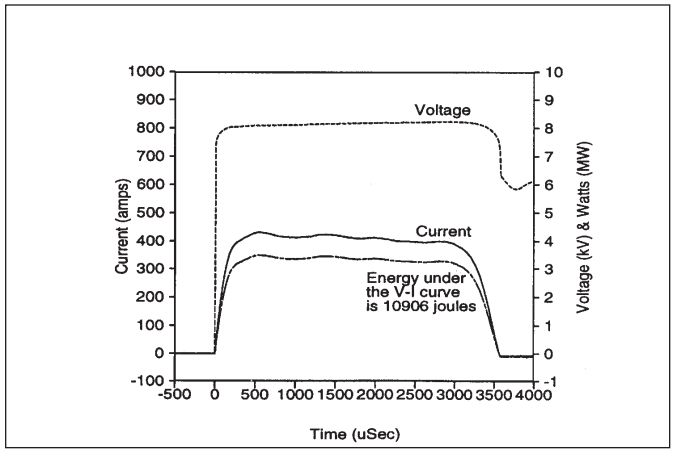


Figure 4C
Combined Duty Cycle (2nd LDC Impulse)

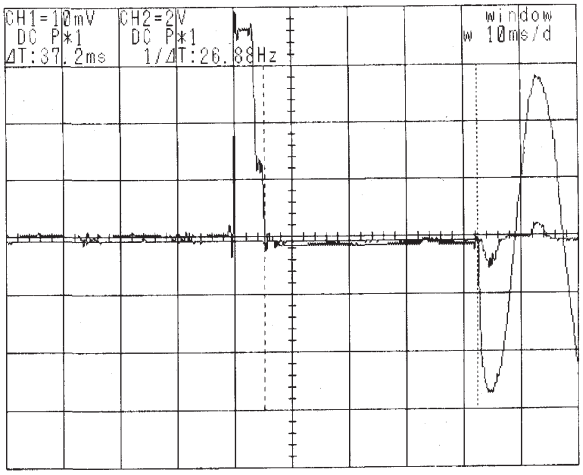


Figure 4D
Transition from Impulse to U_r

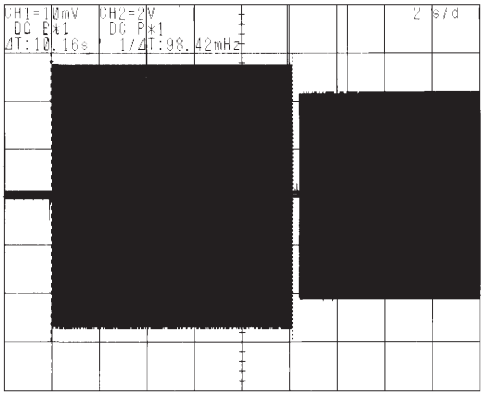


Figure 4E
Transition from U_r to U_C

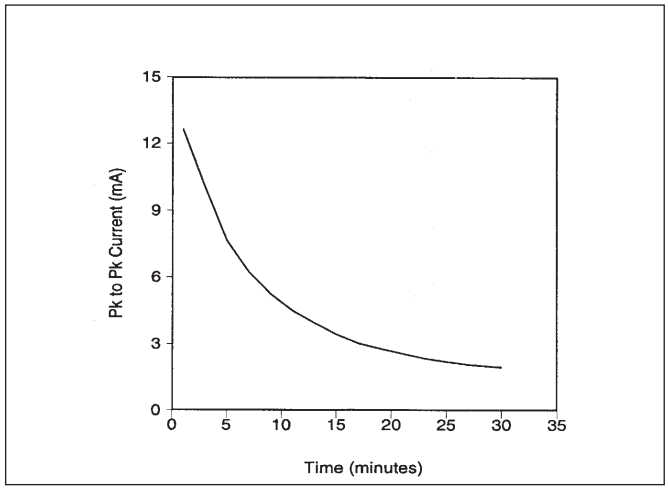


Figure 4F
Combined Duty Cycle Stability at COV

Table 6
Summary Data - Switching Surge Operating Duty Test

	Sample 1	Sample 2	Sample 3
V_{1mA}	6.22 kV	6.24 kV	5.44 kV
V_{ref}	4.30 kV	4.31 kV	3.75 kV
Maximum COV (U_c)	3.43 kV	3.44 kV	3.00 kV
Maximum Rating (U_r)	4.40 kV	4.42 kV	3.85 kV
Disk Volume	56.1 cc	56.2 cc	50.4 cc
Disk Volume / U_r	12.8 cc/kV	12.8 cc/kV	13.1 cc/kV
Initial Residual Voltage @ 10 kA 8/20 µs	10.77 kV	10.21 kV	8.9 kV
Leakage Current at U_r prior to Cond. Impulse 1	8.6 mA	9.4 mA	10.0 mA
Cond. Grp #1, Leakage Current at U_r after Impulse 5	12.5 mA	10.2 mA	14.8 mA
Cond. Grp #4, Leakage Current at U_r after Impulse 20	20.2 mA	17.0 mA	16.0 mA
High Current Impulse 1	97.1 kA, 17.7 kV	99.5 kA, 17.9 kV	102.6 kA, 15.7 kV
High Current Impulse 2	100.2 kA, 17.7 kV	99.5 kA, 17.7 kV	100.6 kA, 16.2 kV
Minimum Long Duration Energy (Design Basis)	9358 joules	9388 joules	8184 joules
Maximum Long Duration Energy (Design Basis)	10294 joules	10327 joules	9003 joules
Long Duration Energy (Test #1)	9575 joules	13314 joules	8517 joules
Long Duration Energy (Test #2)	10906 joules	12891 joules	12567 joules
Long Duration Current, Voltage (Test #1)	395 A, 7.99 kV	504 A, 8.10 kV	466 A, 7.14 kV
Long Duration Current, Voltage (Test #2)	413 A, 8.07 kV	484 A, 8.22 kV	532 A, 7.17 kV
Time Interval between end of LDC and U_r	41.0 msec	42.4 msec	29.2 msec
Duration of U_r	10.11 sec	10.20 sec	17.04 sec
Voltage U_r, Current peak-to-peak	4.41 kV, 0.48 A	4.47 kV, 0.88 A	3.90 kV, 0.32 A
Current @ U_c: initial, 15 min, 30 min	8.6, 2.1, 1.1 mA	19.9, 3.2, 1.0 mA	6.8, 1.9, 0.9 mA
Final Residual Voltage @ 10 kA 8/20 µs	10.37 kV	10.55 kV	9.22 kV
Percent Residual Voltage Change @ 10 kA 8/20 µs	-3.71%	3.33 %	3.60 %
Disk and Section Physical Condition	No Damage	No Damage	No Damage

1.3.5 Pressure Relief Tests:

High current and low current pressure relief tests were conducted as required in section 5.11 of IEC 60099-4 (99-4) 1991 as referenced to section 8.7 of IEC 60099-4 (99-4).

The AZG2 design was tested to, and meets criteria of, the 40 kA pressure relief class and the associated low current pressure relief test. Samples tested were of the longest single unit length utilized in the design either as a single or stacked arrester assembly. All samples vented properly, without expelling internal components and with no breakage of the porcelain housings.

1.3.6 Test of Arrester Disconnectors:

The AZG2 arrester design does not utilize disconnecting devices.

1.3.7 Artificial Pollution Tests:

Test requirements are not established in IEC 60099-4 (99-4). However, tests have been made on the highest arrester rating in accordance with ANSI/IEEE C62.11-1993 section 8.12. The AZG2 design meets all criteria of this test.

1.3.8 Partial Discharge Tests:

The AZG2 design meets the criteria of sections 5.4, 8.1c, and 8.2.1c of IEC 60099-4 (99-4). Routine tests are made on every manufactured arrester unit, satisfying the requirements.

1.3.9 Seal Leakage Tests:

Routine tests are performed on each manufactured arrester unit to verify seal integrity, satisfying the requirements.

1.3.10 Current Distribution Tests:

The AZG2 arrester design does not utilize elements connected in parallel; therefore, this requirement is not applicable [sections 5.6 and 8.1e of IEC 60099-4 (99-4)].

1.3.11 Temporary Overvoltage Tests:

Temporary overvoltage tests were conducted in accordance with section 5.10 of IEC 60099-4 (99-4) 1991. Temporary overvoltage capability of the AZG2 arrester has been established under both “No Prior Duty” conditions at 60°C and “Prior Duty” conditions at 60°C plus the temperature rise due to a single rated energy discharge of 3.4 kJ/kV of COV. Both “No Prior Duty” and “Prior Duty” curves expressed in per unit of arrester COV, are presented in Figure 5.

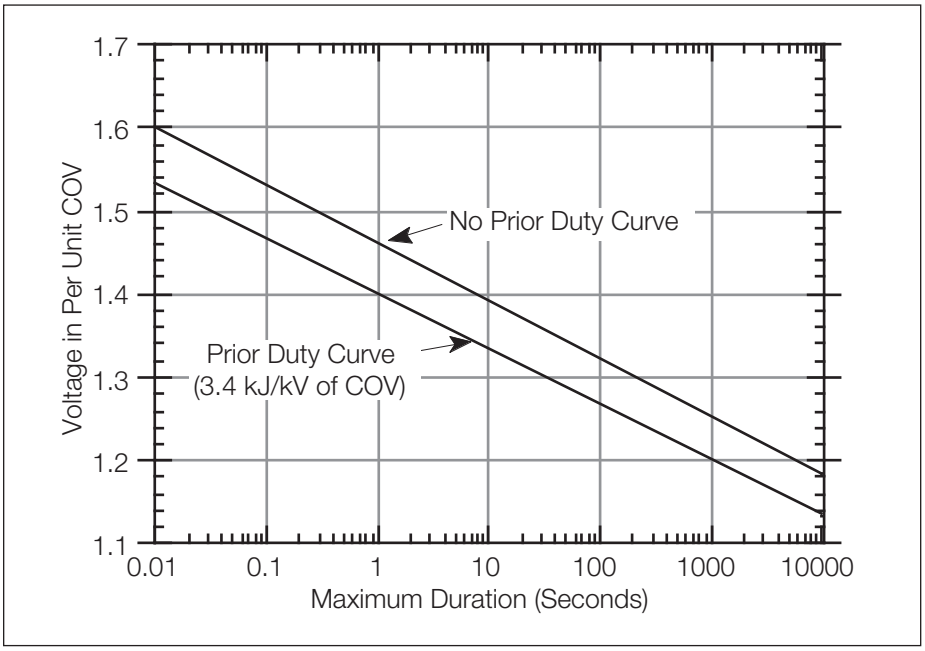


Figure 5
Temporary Overvoltage Characteristics
Note: 24 hour TOV with prior duty is 1.07 x COV

SECTION 2 - ARRESTER DATA

2.1 Protective Characteristics

Table 7
Residual Voltages - Maximum Guaranteed Protective Characteristics

Arrester Rating U_r (kV, rms)	Arrester MCOV U_c (kV, rms)	Steep Current Residual Voltage (kV Crest)	Lightning Impulse Residual Voltage (kV Crest) 8/20 µs Current Wave						Switching Impulse Residual Voltage (kV Crest) 30/60 Current Wave	
		10 kA	1.5 kA	3 kA	5 kA	10 kA	20 kA	40 kA	125 A	500 A
3	2.55	12.5	7.1	7.5	7.9	8.6	9.8	11.8	6.2	6.6
6	5.10	22.0	14.2	15.0	15.7	17.0	19.1	22.3	12.4	13.2
9	7.65	31.4	21.2	22.4	23.5	25.5	28.4	32.8	18.6	19.8
10	8.4	34.2	23.3	24.6	25.8	27.9	31.1	35.9	20.4	21.8
12	10.2	40.8	28.3	29.8	31.3	33.9	37.7	43.4	24.8	26.5
15	12.7	50.1	35.2	37.2	39.0	42.1	46.8	53.7	30.9	32.9
18	15.3	59.7	42.5	44.7	46.9	50.7	56.3	64.4	37.2	39.7
21	17.0	66.0	47.2	49.7	52.1	56.3	62.5	71.4	41.3	44.1
24	19.5	75.3	54.1	57.0	59.8	64.6	71.6	81.7	47.4	50.5
27	22.0	84.5	61.0	64.3	67.4	72.8	80.7	92.0	53.5	57.0
30	24.4	93.4	67.7	71.3	74.8	80.7	89.5	102	59.3	63.2
33	27.5	105	76.3	80.4	84.2	91.0	101	115	66.9	71.3
36	29.0	111	80.4	84.8	88.8	95.9	106	121	70.5	75.2
39	31.5	120	87.4	92.1	96.5	104	115	131	76.6	81.6
42	34.0	129	94.3	99.4	104	112	125	142	82.7	88.1
45	36.5	138	101	107	112	121	134	152	88.8	94.6
48	39	148	108	114	119	129	143	162	94.9	101
54	42	159	117	123	129	139	154	175	102	109
60	48	181	133	140	147	159	176	199	117	124
66	53	199	147	155	162	175	194	220	129	137
72	57	214	158	167	175	188	209	236	139	148
78	62	233	172	181	190	205	227	257	151	161
84	68	255	189	199	208	225	249	282	165	176
90	70	262	194	205	214	231	256	290	170	181
96	76	285	211	222	233	251	278	315	185	197
108	84	314	233	245	257	277	307	348	204	218
120	98	366	272	286	300	324	358	406	238	254
132	106	399	294	310	325	350	388	440	258	275
138	111	417	308	324	340	367	406	461	270	288
144	115	432	319	336	352	380	421	477	280	298
162	130	488	360	380	398	429	475	539	316	337
168	131	491	363	383	401	433	479	543	319	339
172	140	525	388	409	429	462	512	580	341	363
180	144	539	399	421	441	476	526	597	350	373
192	152	569	421	444	465	502	556	630	370	394
198	160	599	444	467	490	528	585	663	389	415
204	165	617	457	482	505	545	603	683	401	428
216	174	650	482	508	533	575	636	720	423	451
228	182	680	505	532	557	601	665	753	443	472
240	190	710	527	555	581	627	694	786	462	492

2.2 Dimensional Information

Table 8
Catalog Numbers and Dimensional Information

U_r Arrester Rating (kV, rms)	U_c Arrester COV (kV, rms)	Catalog Number	Dim A (mm)	Figure 6 View Number	Minimum Phase-to-Ground Clearance (mm)	Minimum Phase-to-Phase Clearance (mm)	Housing Leakage Distance (mm)	Arester Mass (kg)
3	2.55	AZG2001G002003	471	1	163	308	234	19
6	5.10	AZG2001G005006	471	1	167	312	234	19
9	7.65	AZG2001G007009	471	1	180	324	234	19
10	8.40	AZG2002G008010	535	1	185	329	406	22
12	10.2	AZG2002G010012	535	1	199	343	406	22
15	12.7	AZG2002G012015	535	1	222	367	406	22
18	15.3	AZG2003G015018	630	1	249	394	665	26
21	17.0	AZG2003G017021	630	1	268	412	665	26
24	19.5	AZG2003G019024	630	1	273	418	665	26
27	22.0	AZG2004G022027	725	1	298	443	922	30
30	24.4	AZG2004G024030	725	1	322	467	922	30
33	27.5	AZG2004G027033	725	1	354	498	922	30
36	29.0	AZG2004G029036	725	1	369	513	922	30
39	31.5	AZG2005G031039	852	1	393	538	1267	35
42	34.0	AZG2005G034042	852	1	418	562	1267	35
45	36.5	AZG2005G036045	852	1	445	590	1267	36
48	39.0	AZG2005G039048	852	1	470	614	1267	36
54	42.0	AZG2006G042054	929	1	500	645	1646	39
60	48.0	AZG2006G048060	929	1	561	706	1646	39
66	53.0	AZG2007G053066	1002	1	610	754	1872	44
72	57.0	AZG2007G057072	1002	1	649	794	1872	44
78	62.0	AZG2008G062078	1219	1	701	846	2540	53
84	68.0	AZG2008G068084	1219	1	762	907	2540	53
90	70.0	AZG2008G070090	1219	1	781	925	2540	53
96	76.0	AZG2008G076096	1219	1	842	986	2540	54
108	84.0	AZG2009G084108	1436	1	921	1065	3226	73
120	98.0	AZG2009G098120	1436	1	1064	1209	3226	74
132	106	AZG2018G106132	1827	2	1329	1659	3518	85
138	111	AZG2018G111138	1827	2	1381	1711	3518	86
144	115	AZG2019G115144	1898	2	1420	1751	3744	90
162	130	AZG2020G130162	2044	2	1570	1900	4186	96
168	131	AZG2021G131168	2116	2	1582	1912	4412	99
172	140	AZG2021G140172	2116	2	1670	2001	4412	100
180	144	AZG2022G144180	2261	3	1713	2043	4872	115
192	152	AZG2022G152192	2261	3	1792	2122	4872	116
198	160	AZG2023G160198	2333	3	1871	2202	5098	120
204	165	AZG2024G165204	2550	3	1923	2253	5766	129
216	174	AZG2024G174216	2550	3	2015	2345	5766	130
228	182	AZG2025G182228	2768	3	2094	2424	6452	149
240	190	AZG2025G190240	2768	3	2173	2503	6452	149

Notes:
1. Position #5 designates nameplate options: 0=English 1=Spanish 2=Portuguese
2. All arresters are available in grey (standard) or brown porcelain glaze. For brown glaze, substitute “B” for “G” in the eighth position of the catalog number.
3. Digits 6 and 7 housing designation may be modified for arresters requiring leakage distance other than the standard arresters shown. Extended leakage distance may require additional clearances for phase-to-phase and phase-to-earth. Contact your sales representative for this information.
4. Cantilever strength for all ratings is 10,200 NM. Maximum working load should not exceed 40% of this value.
5. Refer to Figure 6 for Dimension A.

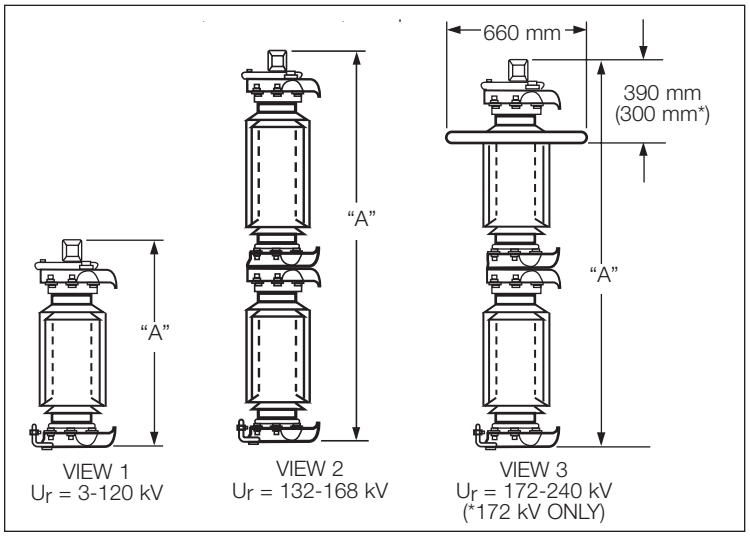


Figure 6
Dimensional Information

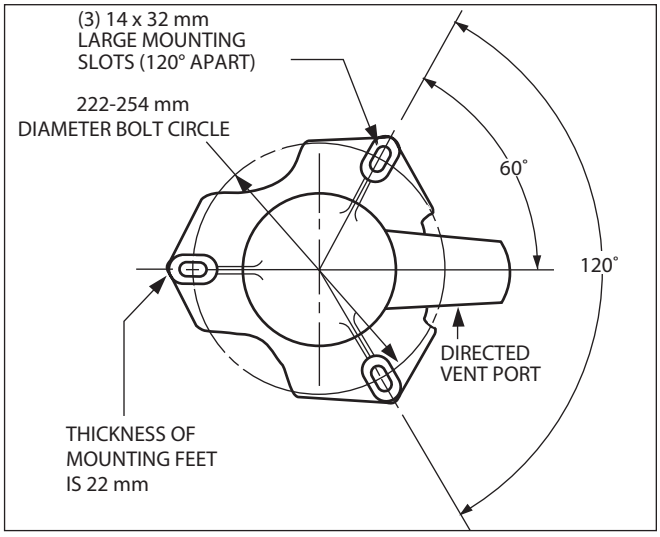


Figure 7
Base Mounting Details (All Ratings)

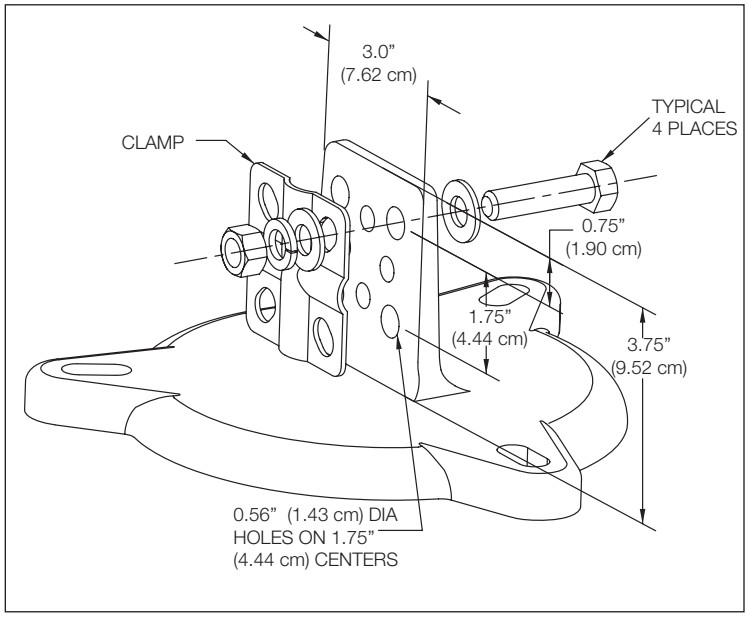


Figure 8a
Line Terminal

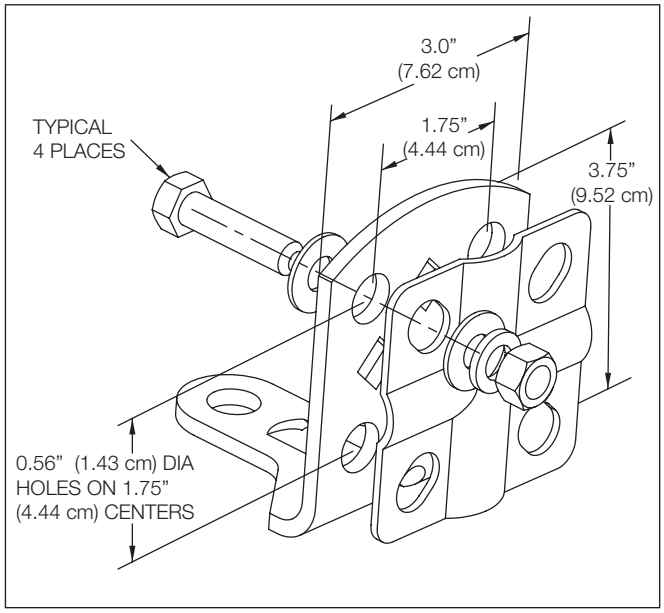


Figure 8b
Earth Terminal

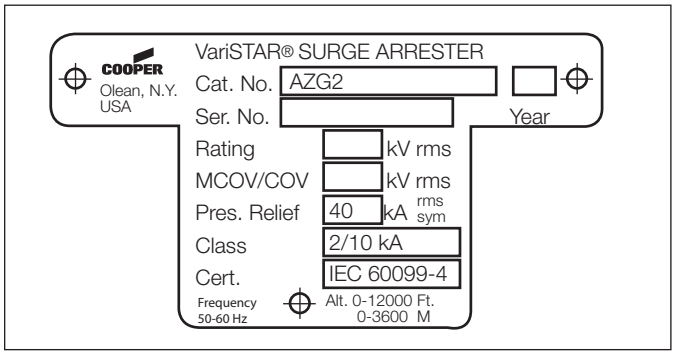


Figure 9
Unit Nameplate

COOPER Power Systems

2300 Badger Drive
Waukesha, WI 53188