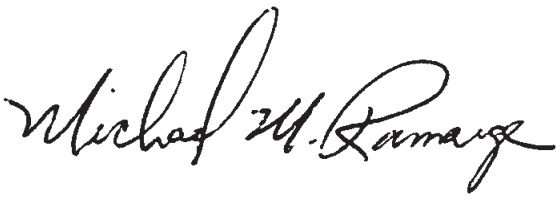
CERTIFIED TEST REPORT

VariSTAR™ Type AZG3 Surge Arrester, 10,000 A, Line Discharge Class 3 IEC 60099-4 (99-4)

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 AZG3 surge arrester, 10,000 A, line discharge class 3, 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 3 arrester designs. The Cooper Power Systems VariSTAR® Type AZG3 arresters rated 3-312 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 AZG3 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	1839	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. Housing designations 21 and below are not used in arresters rated above 198 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 2 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 AZG3 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**
	250 A	**500 A**	**1000 A**	**1.5 kA**	**3 kA**	**5 kA**	**10 kA**	**20 kA**	**40 kA**	**10 kA**
Sample 1	6.73	6.92	7.17	7.42	7.80	8.10	8.66	9.52	10.60	9.69
Sample 2	6.73	6.94	7.17	7.43	7.81	8.09	8.70	9.51	10.54	9.69
Sample 3	6.74	6.91	7.14	7.40	7.77	8.06	8.70	9.47	10.54	9.56
Residual Voltage due to other components										
	Switching Impulse Residual Voltage (kV)			**Lightning Impulse Residual Voltage (8/20 µsec, kV)**						**Steep Current**
	250 A	**500 A**	**1000 A**	**1.5 kA**	**3 kA**	**5 kA**	**10 kA**	**20 kA**	**40 kA**	**10 kA**
Sample 1	0.00	0.00	0.04	0.03	0.08	0.10	0.23	0.49	0.75	2.70
Sample 2	0.00	0.00	0.01	0.03	0.05	0.12	0.24	0.48	0.78	3.00
Sample 3	0.00	0.01	0.03	0.03	0.06	0.10	0.23	0.47	0.76	4.00

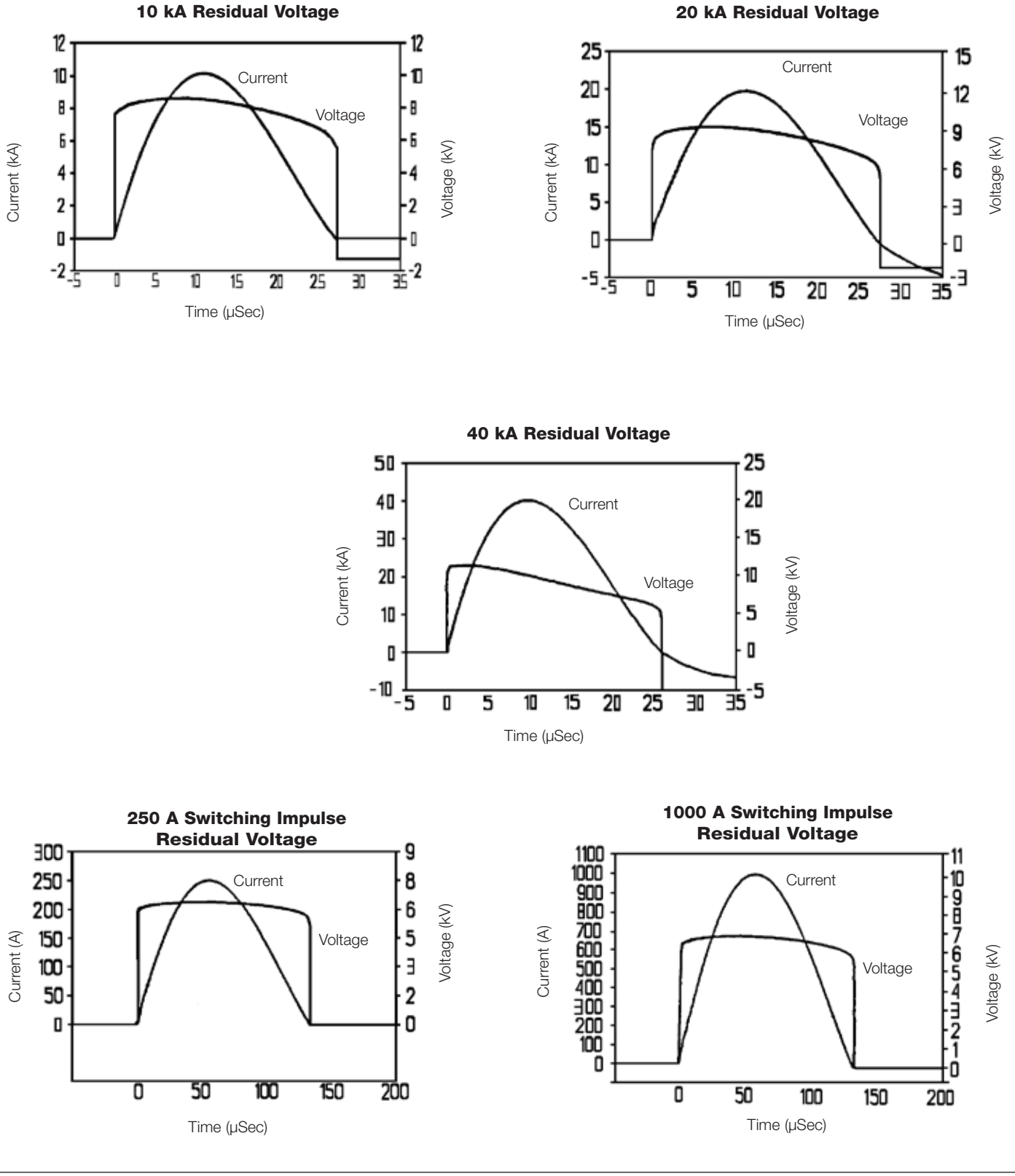

Figure 1
Residual Voltages for Sample #3 Measured Across the Arrester Section

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} = 1.23 x COV and Rating = 0.97 x V_{ref}, where V_{ref} is the rms power frequency voltage producing a reference current of 4.0 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 26.4 cc per kV of COV or 20.6 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}	5.41 kV	5.47 kV	5.47 kV
V_{ref}	3.69 kV	3.75 kV	3.73 kV
Maximum COV	2.99 kV	3.02 kV	3.02 kV
Maximum Rating	3.83 kV	3.87 kV	3.87 kV
Disk Volume	80.43 cc	80.15 cc	80.23 cc
Disk Volume Per Unit Rating	21.0 cc/kV	20.7 cc/kV	20.7 cc/kV
Specified Minimum Test Energy	13127 joules	13273 joules	13273 joules
Specified Maximum Test Energy	14440 joules	14600 joules	14600 joules
Actual Minimum Test Energy	13230 joules	13490 joules	13440 joules
Actual Maximum Test Energy	14190 joules	14680 joules	14660 joules
Pretest kV @ 10 kA	8.57 kV	8.68 kV	8.68 kV
Post Test kV @ 10 kA	8.50 kV	8.61 kV	8.61 kV
Percent Change kV @ 10 kA	-0.82%	-0.81%	-0.81%

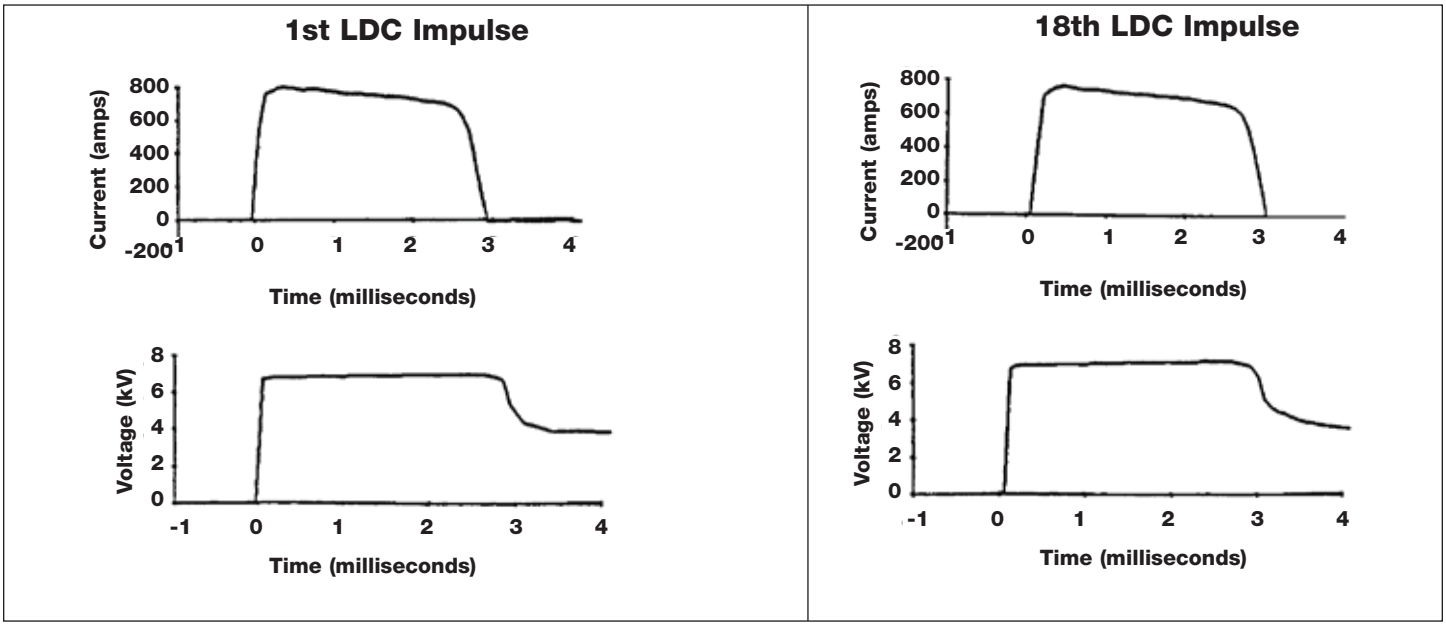

Figure 2
First and Final Long Duration Current Impulses

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, operating duty test, 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 elevation 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 (U_{sc})	Rating (U_{sr})	COV (U_{ct})	Watts Loss at 2.1 hr (P_{1ct})	Watts Loss at 1032 hr (P_{2ct})
Sample 1	5.29	2.92	3.74	3.04	2.87	2.01
Sample 2	5.29	2.92	3.74	3.04	2.69	1.95
Sample 3	5.29	2.92	3.74	3.04	2.55	1.91

1.3.4.2 Verification of Thermal Section:

Prorated thermal equivalent sections of the AZG3 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 full rated AZG3 arrester in identical manners. Power frequency voltage sources were used to heat MOV disks to 120°C. In the case of the arrester, 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 full rated arrester cooling rates.

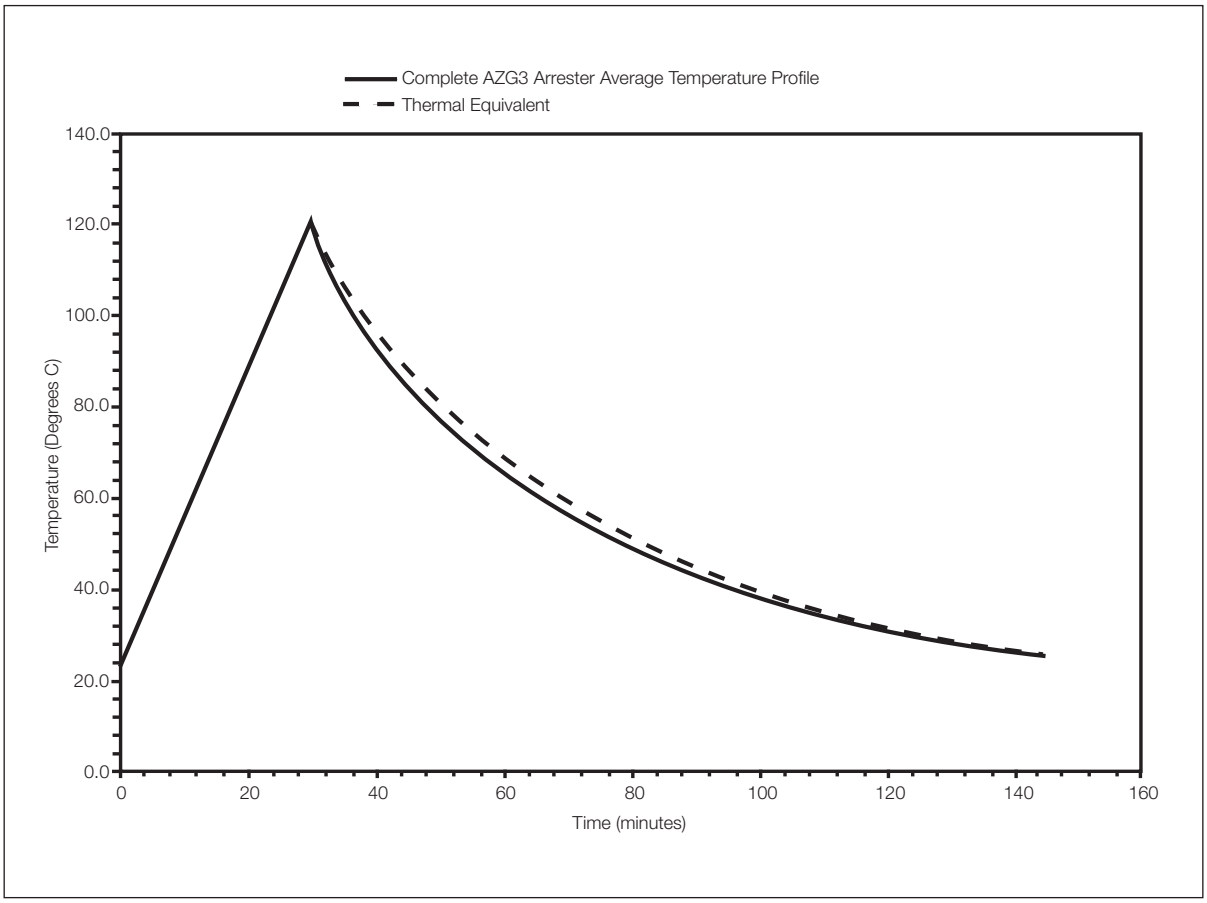

Figure 3
Thermal Performance Comparison Curves

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	4.5
2	10.1	5.4
3	10.1	5.0
4	10.1	5.4
5	10.1	5.7
6	10.1	4.0
7	10.1	4.2
8	10.1	4.6
9	10.2	4.8
10	10.1	5.6
11	10.1	4.0
12	10.1	4.3
13	10.1	4.7
14	10.1	5.1
15	10.1	5.6
16	10.1	3.9
17	10.1	4.2
18	10.1	5.6
19	10.2	5.2
20	10.1	5.7

3. The remaining conditioning tests consisting of two 100 kA 4/10 lightning impulses were performed on the complete thermal equivalent sections. Voltage and current traces for Sample 1 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.

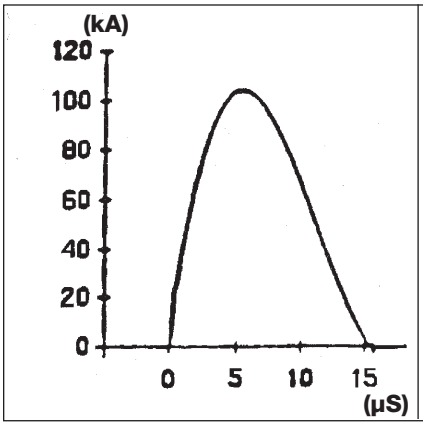

Figure 4A
104.3 kA (2nd Impulse)

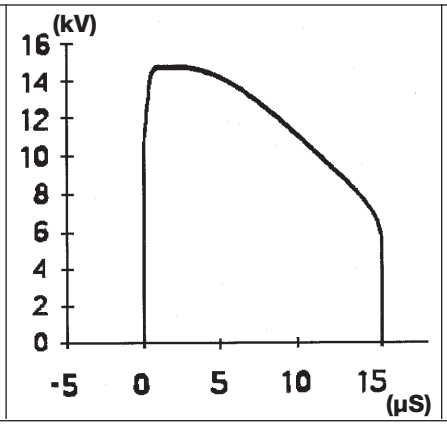

Figure 4B
14.8 kV (2nd Impulse)

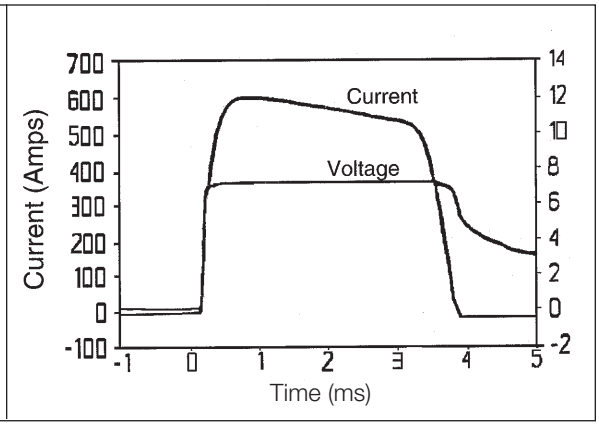

Figure 4C
Combined Duty Cycle (2nd LDC Impulse)

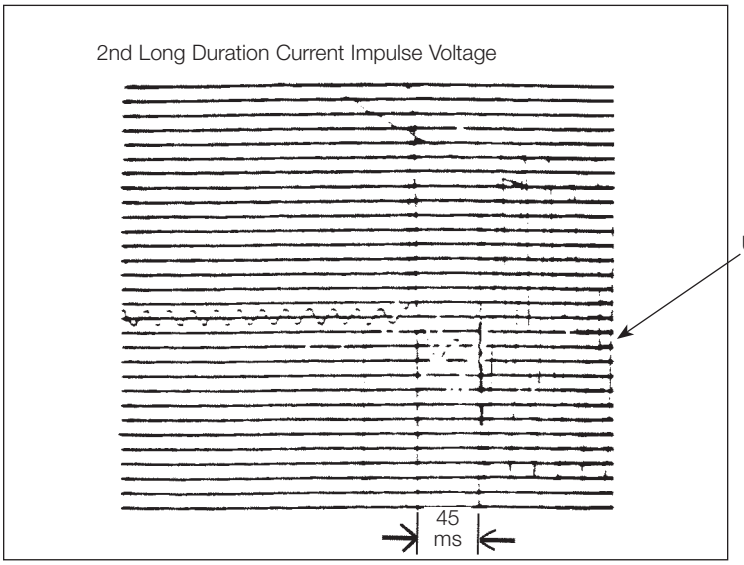

Figure 4D
Transition from Impulse to U_r

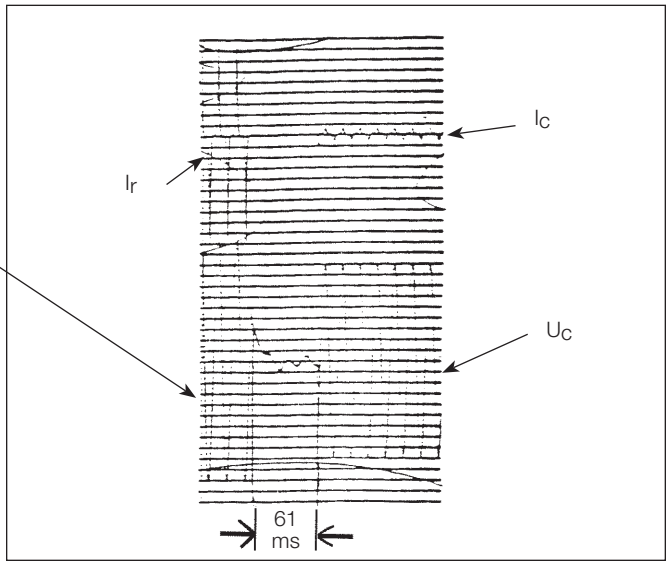

Figure 4E (Sample 1) Top Trace - Leakage Current Bottom Trace - Transition from U_r to U_C

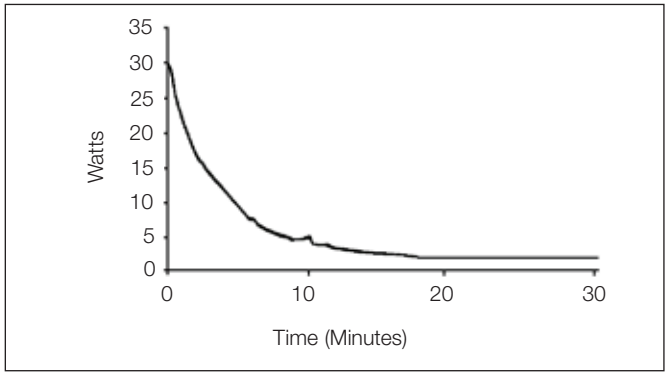

Figure 4F
Combined Duty Cycle Stability at COV

Table 6
Summary Data - Switching Surge Operating Duty Test

	Sample 1	Sample 2	Sample 3
V_{1mA}	5.50 kV	5.63 kV	5.64 kV
V_{ref}	3.75 kV	4.03 kV	4.01 kV
Maximum COV (U_C)	3.04 kV	3.11 kV	3.11 kV
Maximum Rating (U_r)	3.89 kV	3.98 kV	3.99 kV
Disk Volume	80.50 cc	80.83 cc	80.14 cc
Disk Volume / U_r	20.7 cc/kV	20.3 cc/kV	20.1 cc/kV
Initial Residual Voltage @ 10 kA 8/20 µs	8.71 kV	8.95 kV	8.94 kV
Leakage Current at U_r prior to Cond. Impulse 1	6.46 mA	19.0 mA	21.1 mA
Cond. Grp #1, Leakage Current at U_r after Impulse 5	7.86 mA	24.3 mA	24.2 mA
Cond. Grp #4, Leakage Current at U_r after Impulse 20	6.79 mA	17.2 mA	17.4 mA
High Current Impulse 1	103.8 kA, 14.9 kV	102.4 kA, 16.0 kV	102.0 kA, 16.2 kV
High Current Impulse 2	105.6 kA, 15.7 kV	101.7 kA, 16.3 kV	101.8 kA, 16.0 kV
Minimum Long Duration Energy (Design Basis)	13345 joules	13661 joules	13685 joules
Maximum Long Duration Energy (Design Basis)	14680 joules	15027 joules	15054 joules
Long Duration Energy (Test #1)	14110 joules	14140 joules	14030 joules
Long Duration Energy (Test #2)	13390 joules	14000 joules	14310 joules
Long Duration Current, Voltage (Test #1)	601 A, 7.14 kV	582 A, 7.32 kV	579 A, 7.31 kV
Long Duration Current, Voltage (Test #2)	571 A, 7.24 kV	571 A, 7.38 kV	595 A, 7.25 kV
Time Interval between end of LDC and U_r	45.0 msec	46 msec	44 msec
Duration of U_r	10.00 sec	10.00 sec	10.00 sec
Voltage U_r, Current peak-to-peak	3.97 kV, 0.90 A	3.99 kV, 0.68 A	4.04 kV, 0.82 A
Current @ U_C: initial, 15 min, 30 min	23.0, 5.0, 3.0 mA	18.0, 4.0, 1.0 mA	27.0, 4.0, 1.0 mA
Final Residual Voltage @ 10 kA 8/20 µs	8.77 kV	9.12 kV	9.13 kV
Percent Residual Voltage Change @ 10 kA 8/20 µs	0.69%	1.90 %	2.13 %
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 99-1 1991.

The AZG3 design was tested to, and meets criteria of, the 63 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.

The AZG3 porcelain top designs were tested to, and meet 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 AZG3 arrester design does not utilize disconnecting devices.

1.3.7 Artificial Pollution Tests:

Tests 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 AZG3 design meets all criteria of this test.

1.3.8 Partial Discharge Tests:

The AZG3 design meets the criteria of sections 5.4, 8.1c, and 8.2.1c of IEC 60099-4 (99-4) 1991. 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 AZG3 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 AZG3 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 5.6 kJ/kV of COV. Both “No Prior Duty” and “Prior Duty” curves expressed in per unit of arrester COV, are presented in Figure 5.

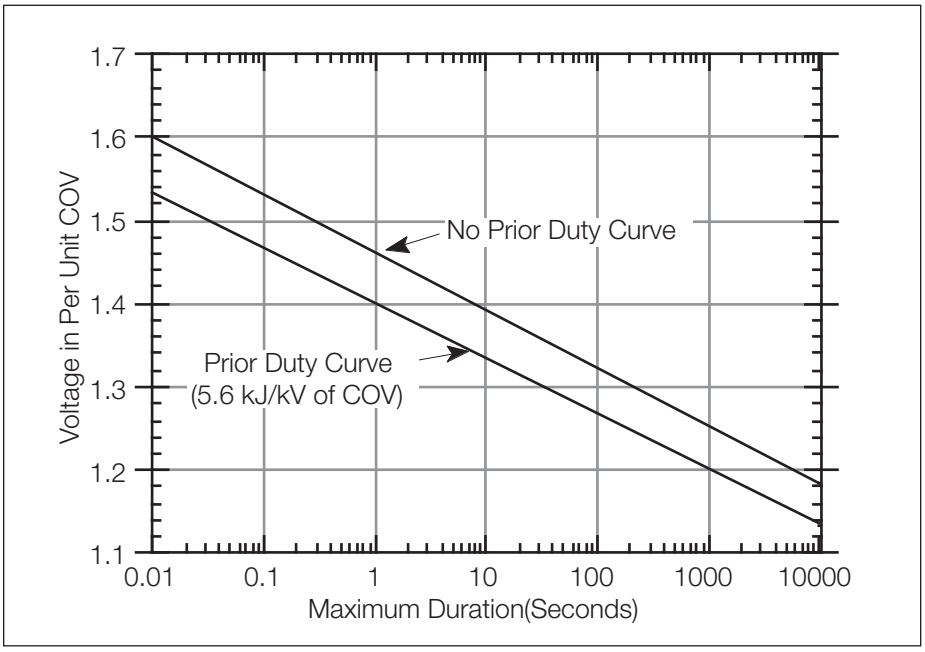

Figure 5
Temporary Overvoltage Characteristics

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	Arrester MCOV U_c	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	
(kV, rms)	(kV, rms)	10 kA	1.5 kA	3 kA	5 kA	10 kA	20 kA	40 kA	500 A	1000 A
3	2.55	13.1	7.0	7.4	7.7	8.3	9.4	10.7	6.5	6.7
6	5.10	22.0	13.8	14.6	15.2	16.3	18.2	20.5	12.9	13.4
9	7.65	31.0	20.7	21.8	22.7	24.3	27.0	30.3	19.3	20.0
10	8.40	33.7	22.7	24.0	24.9	26.7	29.6	33.2	21.2	22.0
12	10.2	40.0	27.6	29.1	30.2	32.4	35.9	40.2	25.7	26.7
15	12.7	48.8	34.3	36.1	37.5	40.2	44.5	49.7	32.0	33.2
18	15.3	57.9	41.3	43.5	45.2	48.4	53.5	59.8	38.5	39.9
21	17.0	64.0	46.0	48.4	50.2	53.8	59.4	66.4	42.8	44.4
24	19.5	72.8	52.7	55.5	57.6	61.7	68.1	76.1	49.1	51.0
27	22.0	81.5	59.4	62.5	64.9	69.5	76.7	85.6	55.4	57.4
30	24.4	90.1	65.9	69.4	72.0	77.1	85.0	94.9	61.5	63.7
33	27.5	101	74.3	78.2	81.2	86.9	95.8	107	69.3	71.8
36	29.0	106	78.4	82.4	85.6	91.6	101	113	73.0	75.7
39	31.5	115	85.1	89.5	93.0	99.5	110	122	79.4	82.3
42	34.0	120	89.2	93.8	97.4	104	115	128	83.1	86.2
45	36.5	128	95.2	100	104	111	123	137	88.7	91.9
48	39	137	102	107	111	119	131	146	95.1	98.6
54	42	147	110	115	120	128	141	158	102	106
60	48	167	125	132	137	146	161	180	117	121
66	53	184	138	145	151	161	177	198	129	133
72	57	199	149	157	163	174	192	214	139	144
78	62	216	162	170	177	189	208	232	151	157
84	68	236	177	187	194	207	228	254	165	171
90	70	242	183	192	199	213	235	262	170	176
96	76	263	198	208	216	231	254	284	185	191
108	84	291	219	231	240	256	282	314	205	212
120	98	338	255	269	279	298	328	366	238	247
132	106	368	276	290	301	322	355	396	257	267
138	111	386	290	305	316	338	372	415	270	280
144	115	401	301	317	328	351	387	431	280	291
162	130	450	339	356	370	395	435	485	316	327
168	131	455	342	360	373	399	440	490	319	331
172	140	485	365	384	399	426	469	523	340	353
180	144	498	375	395	410	438	482	538	350	363
192	152	526	397	417	433	463	510	568	370	384
198	160	553	417	439	456	487	536	598	389	403
204	165	570	430	452	470	502	553	616	401	416
216	174	601	454	478	496	530	583	650	424	439
228	182	628	475	499	518	554	610	680	443	459
240	190	655	495	521	541	578	636	709	462	479
258	209	725	546	574	596	638	702	782	509	528
264	212	735	554	582	604	647	711	793	516	535
276	220	761	573	603	626	670	737	821	535	554
288	230	796	601	632	656	702	772	860	560	581
294	235	813	614	645	670	717	788	879	572	593
300	239	827	624	656	681	729	802	893	582	603
312	245	847	639	672	698	747	821	915	596	618

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)	Arrester Mass (kg)
3	2.55	AZG3001G002003	471	1	163	308	234	19
6	5.10	AZG3001G005006	471	1	166	310	234	19
9	7.65	AZG3001G007009	471	1	176	320	234	20
10	8.40	AZG3002G008010	535	1	180	324	406	22
12	10.2	AZG3002G010012	535	1	191	336	406	23
15	12.7	AZG3002G012015	535	1	211	355	406	23
18	15.3	AZG3003G015018	630	1	234	379	665	26
21	17.0	AZG3003G017021	630	1	251	395	665	27
24	19.5	AZG3003G019024	630	1	255	400	665	27
27	22.0	AZG3004G022027	725	1	278	422	922	31
30	24.4	AZG3004G024030	725	1	300	444	922	31
33	27.5	AZG3004G027033	725	1	328	473	922	31
36	29.0	AZG3004G029036	725	1	342	486	922	32
39	31.5	AZG3005G031039	852	1	365	509	1267	37
42	34.0	AZG3005G034042	852	1	378	522	1267	37
45	36.5	AZG3005G036045	852	1	398	543	1267	37
48	39.0	AZG3005G039048	852	1	421	566	1267	37
54	42.0	AZG3006G042054	929	1	447	592	1646	41
60	48.0	AZG3006G048060	929	1	499	644	1646	42
66	53.0	AZG3007G053066	1002	1	543	687	1872	46
72	57.0	AZG3007G057072	1002	1	580	725	1872	47
78	62.0	AZG3008G062078	1219	1	624	768	2540	56
84	68.0	AZG3008G068084	1219	1	676	821	2540	56
90	70.0	AZG3008G070090	1219	1	693	838	2540	57
96	76.0	AZG3008G076096	1219	1	745	890	2540	58
108	84.0	AZG3009G084108	1436	1	818	962	3226	77
120	98.0	AZG3009G098120	1436	1	940	1084	3226	79
132	106	AZG3012G106132	1816	2	1009	1154	3518	88
138	111	AZG3012G111138	1816	2	1055	1200	3518	89
144	115	AZG3013G115144	1888	2	1093	1238	3744	93
162	130	AZG3014G130162	2034	2	1220	1365	4186	100
168	131	AZG3015G131168	2106	2	1232	1377	4412	104
172	140	AZG3021G140172	2116	3	1496	1826	4412	107
180	144	AZG3022G144180	2261	3	1531	1861	4872	122
192	152	AZG3022G152192	2261	3	1603	1933	4872	123
198	160	AZG3023G160198	2333	3	1673	2003	5098	128
204	165	AZG3024G165204	2550	3	1716	2046	5766	137
216	174	AZG3024G174216	2550	3	1797	2128	5766	138
228	182	AZG3025G182228	2768	3	1867	2197	6452	157
240	190	AZG3025G190240	2768	3	1936	2266	6452	159
258	209	AZG3027G209258	3148	4	2313	2847	6744	172
264	212	AZG3027G212264	3148	4	2339	2873	6744	173
276	220	AZG3029G220276	3366	4	2406	2939	7412	182
288	230	AZG3029G230288	3366	4	2499	3032	7412	183
294	235	AZG3030G235294	3438	4	2542	3075	7638	191
300	239	AZG3030G239300	3438	4	2577	3110	7638	192
312	245	AZG3031G245312	3583	4	2629	3162	8098	207

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 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.

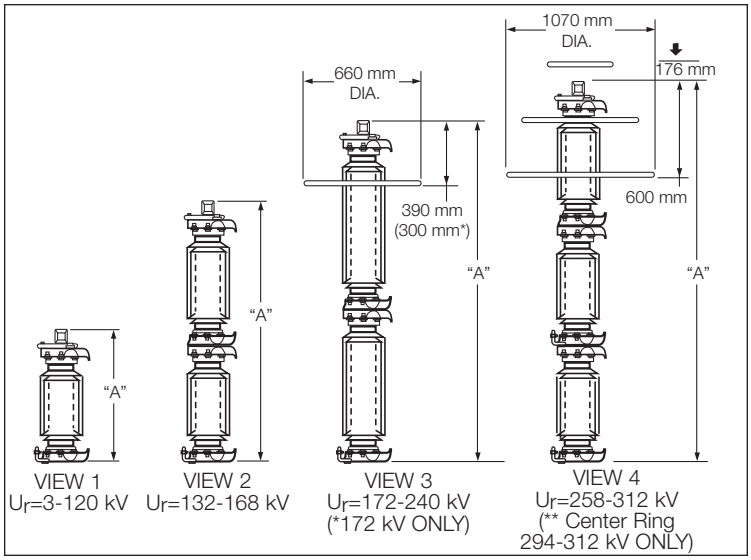

Figure 6
Dimensional Information

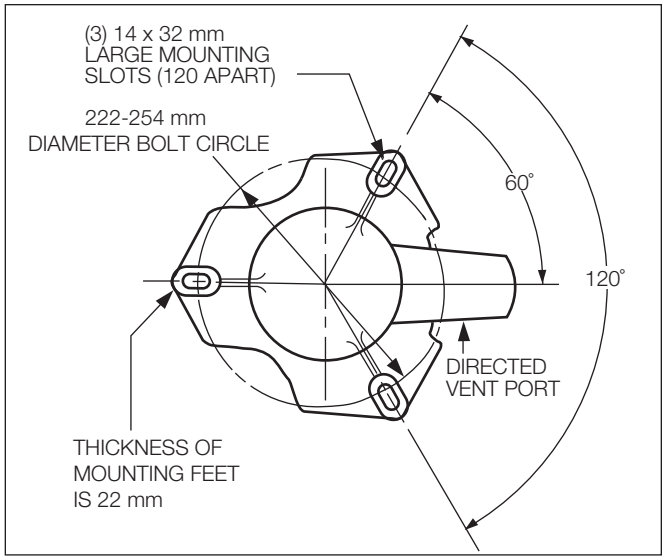

Figure 7
Base Mounting Details (All Ratings)

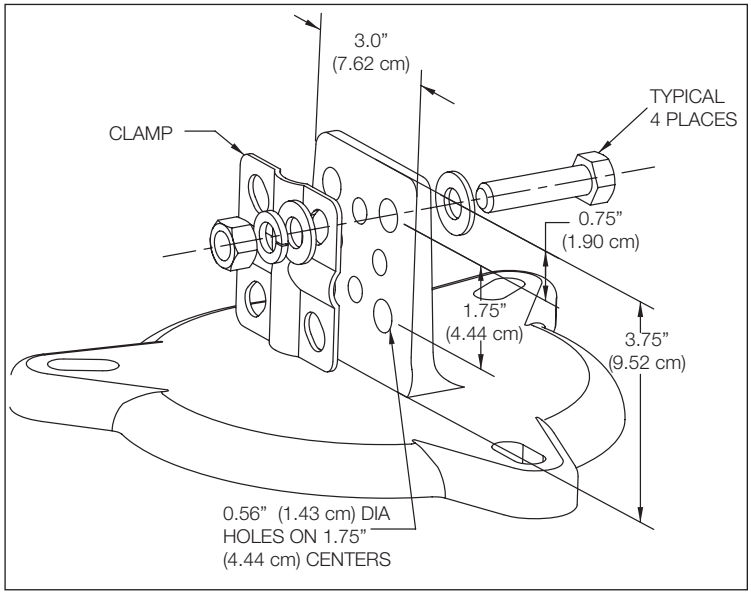

Figure 8a
Line Terminal

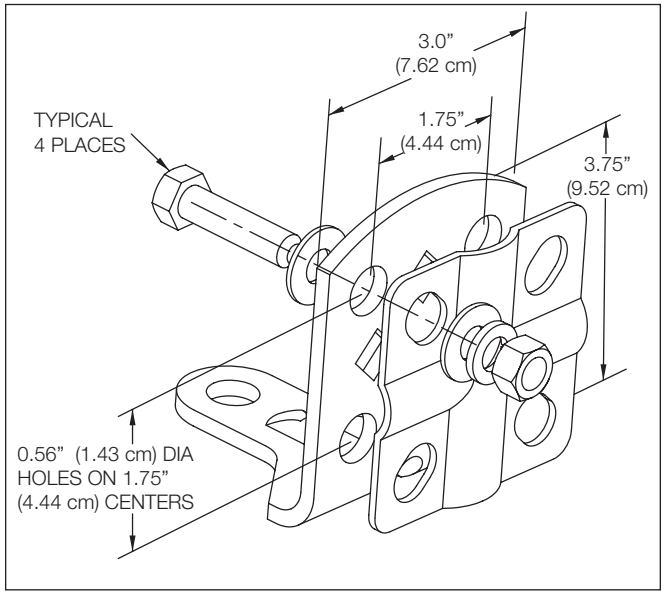

Figure 8b
Earth Terminal

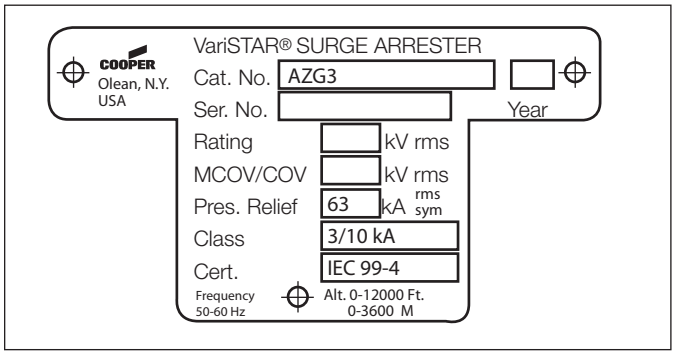

Figure 9
Unit Nameplate

COOPER Power Systems

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