

UltraSIL™ polymer-housed VariSTAR™ UXL high-strength station-class surge arresters



General

Eaton's Cooper Power Systems has set a new standard of excellence for polymer-housed station-class surge arresters. Enhancements in arrester design allow Eaton's Cooper Power Systems to offer high-strength station-class arresters that include increased cantilever strength of up to 92,000 in-lbs with improved energy handling capability in ratings up to 400 kV. The UltraSIL™ Polymer-Housed VariSTAR™ UXL High-Strength Station-Class Surge Arrester incorporates the industry recognized superior silicone rubber housing with a unique high creep alternating shed profile designed to withstand the most extreme environments. The "standard" silicone rubber housing is designed with a minimum specific creepage distance of 31 mm/kV L-L, which meets category IV (Very Heavy) pollution level according to the IEC standard. This housing is applied over a gapless MOV internal design.

Eaton's Cooper Power Systems UXL high-strength arresters meet or exceed the requirements of IEEE Std C62.11™-2012 standard.

**Cooper
Power Systems**
by **EATON**

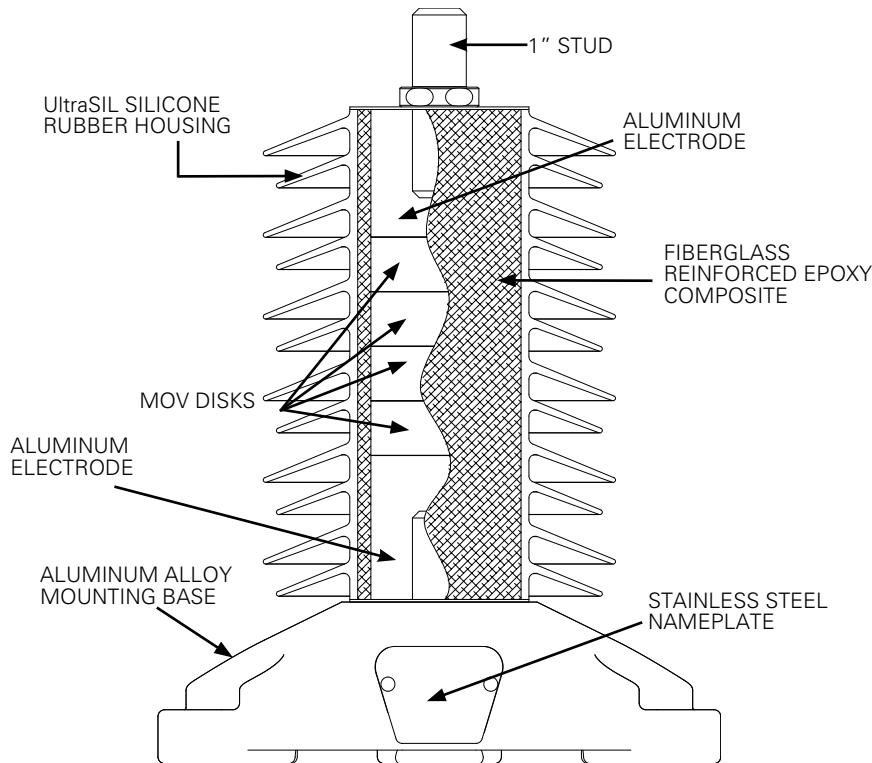


Figure 1. Illustration of 10 kV UltraSIL Polymer-Housed VariSTAR UXL High-Strength Station-Class Arrester.

Construction

The unique construction of UltraSIL polymer-housed UXL arresters begins with world class Metal Oxide Varistor (MOV) disks produced at our dedicated manufacturing facility in Olean, NY. By manufacturing our own disks we maintain a strict quality control over the entire production process, from initial raw material inspection to final physical and electrical testing of each disk. In addition, by controlling the manufacturing process of both disks and arresters, we achieve the optimal combination. Eaton's Cooper Power Systems produces MOV disks of unsurpassed quality through continuous improvements in disk formulation and manufacturing technology. The end result is a long history of in-service use with outstanding durability and protective capability.

Arrester production begins by stacking glass-collared MOV disks in series with aluminum end electrodes. Our proprietary process wraps the assembly with a high-strength woven fiberglass-reinforced epoxy composite. When cured, the arrester module is capable of withstanding extreme electrical and cantilever load conditions.

The UltraSIL silicone rubber housing utilizes an interference fit and is bonded onto the internal module to form a solid, void-free, high-dielectric strength insulation system. Once the housing is in place, each arrester must pass a strict series of electrical tests to insure the highest level of in-service performance.

The silicone rubber housing results in lighter weight than similarly rated porcelain-housed arresters. The silicone rubber housing is less sensitive to physical damage than porcelain. Also, when compared to other polymeric housing materials, silicone rubber generates significantly lower external power losses under contaminated conditions.

Features

The UltraSIL silicone rubber housing was selected for its superior insulation performance as compared to other polymeric housing materials. Long term environmental testing has verified the lifetime performance advantage that silicone rubber provides.

Independent laboratory tests have verified the superior water repellent behavior of silicone rubber, which is responsible for the lower external power losses, higher resistance to UV degradation and surface tracking, superior performance in contaminated environments, and other important insulating properties. Also, UltraSIL silicone rubber has been proven not to support biological growth and is non-flammable.

The basic silicone rubber-housed arrester can be customized with a variety of terminal and mounting options which allow users to select the features that meet their application needs. Customers who require longer creepage housings can easily select a different housing option through the catalog numbering system. See pages 8-9 for a complete list of available options.

Operation

The operation of the UXL high-strength arrester is typical of gapless metal oxide arresters. During steady-state conditions, line-to-ground voltage is applied continuously between the line and ground terminals of the arrester. When surges occur, the arrester immediately limits, or clamps, the overvoltage condition by conducting the surge current to ground. After passage of the surge, the arrester returns to its initial state, conducting minimal leakage current. This minimal leakage current (which is primarily capacitive, with a small resistive component) can be tolerated on a continuing basis.

UXL high-strength arresters easily surpass the minimum fault current withstand requirements for station-class arresters as defined in IEEE Std C62.11™-2012 standard (40 kA). These arresters have been tested and shown to withstand fault currents of 63 kA. During these tests, the silicone rubber housing ruptures without expelling internal parts.

Table 1. UXL High-Strength Arrester Ratings and Characteristics

Arrester Characteristic	Rating	
Arrester Voltage Ratings (kV)	3-360	
Double Impulse Discharge Energy Rating UXL (3-360 kV)	15 kJ/kV of MCOV*	
System Frequency (Hz)	50/60	
Impulse Classifying Current (kA)	10	
High Current Withstand** (kA)	100	
Pressure Relief Rating (kA rms sym.)	63	
Cantilever Strength (in-lbs)	Ultimate	MDCL-Static***
UXLB (3-360 kV)	80,000	32,000
UXLC (132-360 kV)	92,000	36,800

* Meets Class H energy levels per IEEE Std C62.11™-2012 standard

** High current, short duration withstand (100 kA, 4/10 µs)

*** Maximum design cantilever load — static or maximum working load is 40% of the ultimate.

UXL high-strength arresters are ideal for protection against repeated high energy switching surges and provide reliable protection for substation equipment, capacitor banks, multiple lines, and cable circuits. They are also ideal for applications where lighter weight and shorter heights (when compared to porcelain-housed arresters) are critical.

Design testing

The housing, internal components, and hardware of an arrester must work together as a system. This system must stand up to years of service while being subjected to a wide range of environmental and electrical stresses. To ensure a superior level of performance, both arrester components and finished arresters have been subjected to a series of tests that accurately represents years of exposure to actual field conditions. This testing far exceeds the requirements of industry standards.

UXL high-strength arresters has also met or exceeded all requirements for station-class arresters as defined by IEEE Std C62.11™-2012 standard. A certified test report is available upon request. For a copy, please order Eaton's Cooper Power Systems document CP1313.

Production tests

Eaton's Cooper Power Systems has implemented a complete production test program to ensure a quality product. Each MOV disk is subjected to a series of electrical tests to maintain quality. We also perform additional tests on every MOV disk batch. Listed below are the tests performed on the MOV disks:

- 100% Physical Inspection
- 100% Discharge Voltage Test
- 100% Vref at Iref
- 100% Watt Loss Measured at 1.05 x MCOV
- 100% Transmission Line Discharge Energy Test
- Batch High-Current, Short-Duration Test
- Batch Thermal Stability Test
- Batch Aging Test

Each fully assembled UXL high-strength arrester must also pass the following production tests:

- 100% Physical Inspection
- 100% Vref Test
- 100% Watt Loss Test
- 100% Partial Discharge Inception Voltage Test

General application recommendations

The rating of an arrester is the maximum power-frequency line-to-ground voltage at which the arrester is designed to pass an operating duty-cycle test (as defined in IEEE Std C62.11™-2012 standard). Table 2 provides a general application guide for the selection of the proper arrester rating for a given system voltage and grounding configurations as outlined in IEEE Std C62.22™-2009 standard, which is the application guide for metal oxide surge arresters.

Under fault conditions and other system anomalies, higher than normal voltages can be imposed upon an arrester. With an improper arrester selection, these abnormal system voltages can cause an arrester to fail. To help ensure that the proper arrester is selected, Eaton's Cooper Power Systems application engineers are available to make recommendations.

Table 2. Arrester Ratings Commonly Used on Three-Phase Systems

System Voltages L-L (kV)		Arrester Ratings (kV)	
Nominal	Max	Grounded Circuits	High-Impedance/Ungrounded Circuits
3.3	3.7	3	—
6.6	7.3	6	9
10.0	11.5	9	12-15
11.0	12.0	9-10	12-15
16.4	18.0	15	18-21
22.0	24.0	18-21	24-27
33.0	36.3	27-30	36-39
47.0	52.0	39-48	54-60
66.0	72.0	54-60	66-84
91.0	100	78-84	90-96
110	123	96-108	120-138
132	145	108-120	132-144
155	170	132-144	162-172
220	245	180-198	204-240
275	300	216-240	258-294
330	362	258-288	294-360
400	420	312-360	—

The following information is normally required:

1. Maximum system operating voltage.
2. System grounding conditions;
 - A. For four-wire circuits, grounding conditions depend upon whether the system is multi-grounded, whether it has a neutral impedance and whether common primary and secondary neutrals are used.
 - B. For three-wire circuits, grounding conditions depend upon whether the system is solidly grounded at the source, grounded through neutral impedance at the source transformers or ungrounded.
3. Available Fault Current.
4. Maximum line-to-ground voltage and overvoltage duration during fault conditions.

Contact your Eaton's Cooper Power Systems representative to have your individual system application needs reviewed.

Temporary overvoltage (TOV) withstand ability

The UXL high-strength arrester's ability to withstand 60 Hz overvoltage conditions (TOVs) is shown in Figure 2. The graph illustrates the time an arrester can survive a voltage, and recover, without going into thermal runaway, for a given voltage magnitude (expressed in Per Unit of arrester MCOV).

The graphs in Figure 2 illustrate TOV withstand ability, with and without prior duty. The prior duty curve is based upon absorption of rated energy (Refer to Table 1 — Double Impulse Rating) immediately preceding application of the overvoltage.

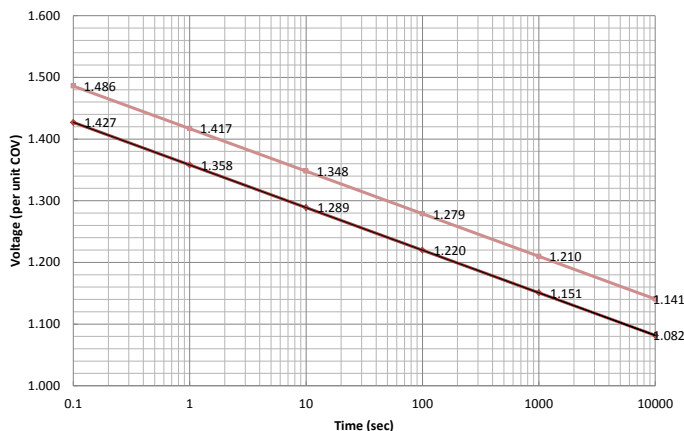


Figure 2. Temporary overvoltage curve – 60° ambient temperature.

Mounting information

The standard base of the UXL high-strength arrester is designed for mounting on 8.75" to 10" diameter bolt circle patterns. The three slotted mounting holes are spaced 120° from each other and are designed to handle 0.5" diameter bolts. Mounting hardware (bolts, nuts, and washers) are not included with the arrester. See Figure 3 for mounting base details. An inherently strong design allows these arresters to be mounted in a variety of ways. They can be mounted vertically with attachment at the base, suspension (underhung) mounted, or horizontally mounted through 240 kV. The mounting arrangement options are shown in Table 9, (on Page 14) digit 16.

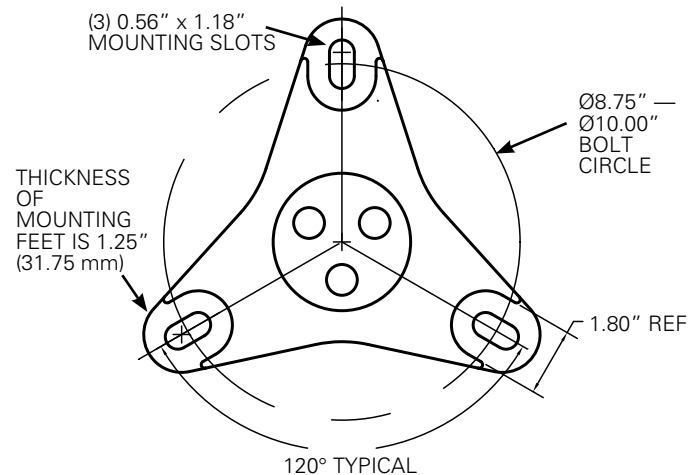


Figure 3. Mounting base details.

Ordering information

Eaton's Cooper Power Systems offers other options that allow customers to select specific features they desire. Options on housing sizes (creepage length), hardware, and mounting options are available and defined in Table 9. This table allows customers who prefer options different from those in our standard Table 8 configuration to develop a catalog number which provides the unique features they desire. For additional assistance please contact your Cooper Power Systems sales representative.

Protective characteristics

All UltraSIL polymer-housed UXL high-strength arresters provide excellent overvoltage protection for electrical equipment. The specific protective characteristics are shown in Table 3 below.

Table 3. Protective Characteristics of the UltraSIL Polymer-Housed UXL Arrester

Arrester Rating (kV, rms)	Arrester MCOV (kV rms)	TOV*		Front-of-wave Protective Level** (kV Crest)	Maximum Discharge Voltage (kV Crest) 8/20 μ s Current Wave						Switching Surge Protective Level (kV Crest)			
		1 Sec	10 Sec		1.5 kA	3 kA	5 kA	10 kA	20 kA	40 kA	125 A	250 A	500 A***	1000 A
3	2.55	3.5	3.3	7.7	6.2	6.5	6.8	7.3	7.8	8.6	5.5	5.7	5.8	6
6	5.1	6.9	6.6	15.3	12.5	13	13.5	14.6	15.6	17.2	11	11.3	11.6	12
9	7.65	10.4	9.9	22.5	18.4	19.2	20	21.5	23	25.3	16.2	16.6	17.1	17.7
10	8.4	11.4	10.8	24.7	20.2	21.1	21.9	23.6	25.2	27.8	17.8	18.3	18.8	19.5
12	10.2	13.9	13.1	30	24.5	25.6	26.6	28.7	30.6	33.8	21.7	22.2	22.8	23.6
15	12.7	17.2	16.4	37.3	30.4	31.9	33.1	35.7	38.1	42	27	27.6	28.4	29.4
18	15.3	20.8	19.7	45	36.7	38.4	39.9	43	45.9	50.6	32.4	33.2	34.2	35.4
21	17	23.1	21.9	50	40.7	42.6	44.3	47.7	51	56.2	36	36.9	38	39.3
24	19.5	26.5	25.1	57.3	46.7	48.9	50.8	54.8	58.5	64.5	41.3	42.3	43.6	45.1
27	22	29.9	28.4	64.7	52.7	55.2	57.3	61.8	66	72.7	46.6	47.8	49.2	50.9
30	24.4	33.1	31.5	71.7	58.4	61.2	63.6	68.5	73.2	80.7	51.7	53	54.5	56.4
33	27.5	37.3	35.4	80.8	65.8	68.9	71.6	77.2	82.5	90.9	58.3	59.7	61.4	63.6
36	29	39.4	37.4	85.2	69.4	72.7	75.5	81.4	87	95.9	61.5	62.9	64.8	67.1
39	31.5	42.8	40.6	92.6	75.4	79	82	88.4	94.5	105	66.8	68.4	70.4	72.9
42	34	46.2	43.8	99.9	81.4	85.2	88.6	95.4	102	113	72	73.8	76	78.6
45	36.5	49.6	47	108	87.4	91.5	95.1	103	110	121	77.4	79.2	81.6	84.4
48	39	53	50.3	115	93.4	97.7	102	110	117	129	82.6	84.6	87.1	90.2
54	42	57	54.1	124	101	106	110	118	126	139	89	91.1	93.8	97.1
60	48	65.2	61.9	141	115	121	125	135	144	159	102	105	108	111
66	53	72	68.3	156	127	133	138	149	159	176	113	115	119	123
72	57	77.4	73.5	168	137	143	149	160	171	189	121	124	128	132
78	62	84.2	79.9	183	149	156	162	174	186	205	132	135	139	144
84	68	92.3	87.7	200	163	171	178	191	204	225	144	148	152	158
90	72	97.8	92.8	212	173	181	188	202	216	238	153	157	161	167
96	76	103.2	98	224	182	191	198	214	228	252	161	165	170	176
108	84	114.1	108.3	247	201	211	219	236	252	278	178	183	188	195
120	98	133.1	126.3	288	235	246	256	275	294	324	208	213	219	227
132	106	143.9	136.6	312	254	266	276	298	318	351	225	230	237	246
138	111	150.7	143.1	326	266	279	289	312	333	367	236	241	248	257
144	115	156.2	148.2	338	276	289	300	323	345	380	244	250	257	266
162	130	176.5	167.6	382	312	326	339	365	390	430	276	282	291	301
168	131	177.9	168.9	385	314	329	342	368	393	433	278	285	293	303
172	140	190.1	180.5	412	335	351	365	393	420	463	297	304	313	324
180	144	195.6	185.6	423	345	361	375	404	432	476	305	313	322	333
192	152	206.4	195.9	447	364	381	396	427	456	503	322	330	340	352
198	160	217.3	206.2	470	383	401	417	449	480	529	339	347	358	370
204	165	224.1	212.7	485	395	414	430	463	495	546	350	358	369	382
216	174	236.3	224.3	512	417	436	453	489	522	575	369	378	389	403
228	180	244.4	232	529	431	451	469	505	540	595	382	391	402	417
240	190	258	244.9	558	455	476	495	533	570	628	403	412	425	440
258	209	283.8	269.4	614	501	524	545	587	627	691	443	454	467	484
264	212	287.9	273.3	623	508	532	552	595	636	701	449	460	474	490
276	220	298.8	283.6	647	527	552	573	618	660	727	466	478	492	509
288	230	312.3	296.5	676	551	577	599	646	690	760	488	499	514	532
312	245	332.7	315.8	720	587	614	638	688	735	810	519	532	548	567
330	267	362.6	344.2	758	618	647	672	724	774	853	547	560	577	597
336	272	369.4	350.6	820	668	699	727	783	837	922	591	605	623	645
360	289	392.5	372.5	849	692	724	753	811	867	955	613	627	646	668

* Temporary Overvoltage (TOV) with Prior Duty.

** Based on a 10 kA current impulse that results in a discharge voltage cresting in 0.5 μ s.

*** 45-60 μ s rise time for a 500 A peak current surge.

Table 4. Creepage Distances and Insulation Withstand Voltages of UXLB High-Strength Station-Class Surge Arresters

Arrester Rating (kV, rms)	Arrester MCOV (kV rms)	Catalog Number	Creepage Distance (in)	Strike (in)	1.2/50 Impulse (kV, crest)	60Hz, dry 60 seconds (kV, rms)	60Hz, wet 10 seconds (kV, rms)	Switching Surge Impulse (kV)	Grading Ring
3	2.55	UXLB003002A1045A11	38	9.0	149	90.8	65.2	N/A	No
6	5.1	UXLB006005A1245A11	46	10.7	170	105	83.6	N/A	No
9	7.65	UXLB009007A1245A11	46	10.7	170	105	83.6	N/A	No
10	8.4	UXLB010008A1245A11	46	10.7	170	105	83.6	N/A	No
12	10.2	UXLB012010A1445A11	54	12.3	191	118	97.8	N/A	No
15	12.7	UXLB015012A1445A11	54	12.3	191	118	97.8	N/A	No
18	15.3	UXLB018015A1645A11	61	13.9	208	131	116	N/A	No
21	17	UXLB021017A1645A11	61	13.9	208	131	116	N/A	No
24	19.5	UXLB024019A1845A11	69	15.4	232	143	125	N/A	No
27	22	UXLB027022A1845A11	69	15.4	232	143	125	N/A	No
30	24.4	UXLB030024A2045A11	77	17.0	253	155	138	N/A	No
33	27.5	UXLB033027A2245A11	84	18.5	274	169	154	N/A	No
36	29	UXLB036029A2245A11	84	18.5	274	169	154	N/A	No
39	31.5	UXLB039031A2445A11	92	20.1	294	180	158	N/A	No
42	34	UXLB042034A2445A11	92	20.1	294	180	158	N/A	No
45	36.5	UXLB045036A2645A11	100	21	313	195	163	N/A	No
48	39	UXLB048039A2845A11	108	23	336	205	184	N/A	No
54	42	UXLB054042A2845A11	108	23	336	205	184	N/A	No
60	48	UXLB060048A3245A11	123	26	379	227	208	N/A	No
66	53	UXLB066053A3245A11	123	26	379	227	208	N/A	No
72	57	UXLB072057A4445A11	169	37	548	338	308	N/A	No
78	62	UXLB078062A4645A11	177	39	568	349	312	N/A	No
84	68	UXLB084068A4845A11	184	40	588	360	316	N/A	No
90	72	UXLB090072A5045A11	192	42	607	375	321	N/A	No
96	76	UXLB096076A5245A11	200	43	626	390	326	N/A	No
108	84	UXLB108084A5645A11	215	46	672	410	368	N/A	No
120	98	UXLB120098A6445A11	246	53	758	454	416	N/A	No
132	106	UXLB132106A6445A11	246	44	689	424	375	N/A	Yes
138	111	UXLB138111A8045A11	307	58	884	543	477	N/A	Yes
144	115	UXLB144115A8045A11	307	58	884	543	477	N/A	Yes
162	130	UXLB162130A8645A11	330	62	946	580	513	856	Yes
168	131	UXLB168131A8645A11	330	62	946	580	513	856	Yes
172	140	UXLB172140A9245A11	353	67	1012	612	551	906	Yes
180	144	UXLB180144AA445A11	399	78	1178	723	635	1072	Yes
192	152	UXLB192152AB045A11	422	83	1239	763	666	1122	Yes
198	160	UXLB198160AB245A11	430	85	1262	773	687	1140	Yes
204	165	UXLB204165AB445A11	438	86	1282	785	697	1156	Yes
216	174	UXLB216174AB645A11	445	88	1305	795	711	1173	Yes
228	180	UXLB228180AB845A11	453	89	1322	809	717	1188	Yes
240	190	UXLB240190AC645A11	484	95	1416	857	773	1252	Yes
258	209	UXLB258209AC845A11	614	116	1666	970	879	1550	Yes
264	212	UXLB264212AC845A11	614	116	1666	970	879	1550	Yes
276	220	UXLB276220AE845A11	691	113	1916	1131	1015	1784	Yes
288	230	UXLB288230AF245A11	706	136	1959	1153	1039	1817	Yes
312	245	UXLB312245AF645A11	722	137	2019	1175	1063	1804	Yes
330	267	UXLB330267AH245A11	783	151	2227	1312	1172	1999	Yes
336	269	UXLB336269AH245A11	783	151	2227	1312	1172	1999	Yes
360	289	UXLB360289AJ845A11	845	163	2398	1402	1271	2137	Yes

Table 5. Creepage Distances and Insulation Withstand Voltages of UXLC High-Strength Station-Class Surge Arresters

Arrester Rating (kV, rms)	Arrester MCOV (kV rms)	Catalog Number	Creepage Distance (in)	Strike (in)	1.2/50 Impulse (kV, crest)	60Hz, dry 60 seconds (kV, rms)	60Hz, wet 10 seconds (kV, rms)	Switching Surge Impulse (kV)	Grading Ring
132	106	UXLC132106A8445A11	322	61	929	573	501	835	Yes
138	111	UXLC138111A8445A11	322	61	929	573	501	835	Yes
144	115	UXLC144115A8645A11	330	62	948	588	506	851	Yes
162	130	UXLC162130A9045A11	345	66	991	610	537	885	Yes
168	131	UXLC168131A9045A11	345	66	991	610	537	885	Yes
172	140	UXLC172140AB045A11	422	83	1246	763	673	1118	Yes
180	144	UXLC180144AB245A11	429	84	1261	783	669	1133	Yes
192	152	UXLC192152AB645A11	445	87	1304	805	700	1167	Yes
198	160	UXLC198160AC045A11	460	90	1347	827	731	1201	Yes
204	165	UXLC204165AC045A11	460	90	1347	827	731	1201	Yes
216	174	UXLC216174AC245A11	468	92	1370	837	745	1218	Yes
228	180	UXLC228180AC045A11	460	90	1347	827	731	1201	Yes
240	190	UXLC240190AC645A11	483	95	1416	857	773	1252	Yes
258	209	UXLC258209AE845A11	690	133	1914	1130	1009	1782	Yes
264	212	UXLC264212AF045A11	698	134	1933	1145	1014	1798	Yes
276	220	UXLC276220AF445A11	714	138	1976	1167	1045	1832	Yes
288	230	UXLC288230AF645A11	721	139	1999	1177	1059	1849	Yes
312	245	UXLC312245AH645A11	798	154	2271	1330	1195	2036	Yes
330	267	UXLC330267AJ445A11	829	160	2352	1382	1236	2102	Yes
336	269	UXLC336269AJ645A11	836	162	2375	1392	1257	2120	Yes
360	289	UXLC360289AK245A11	859	167	2441	1424	1295	2170	Yes

Table 6. Dimensions, Clearance Requirements and Weights of UXLB High-Strength Station-Class Surge Arresters

Arrester Rating (kV, rms)	Arrester MCOV (kV rms)	Catalog Number	"Dimension A (in) Figure 5	Dimension D Diameter (in) Figure 5	Dimension B Minimum Phase- To-Ground Clearance (in) Figure 4	Dimension C Minimum Phase-to-Phase Clearance (in) Figure 4	Weight(lbs)
3	2.55	UXLB003002A1045A11	10.8	6.4	6.5	12	22
6	5.1	UXLB006005A1245A11	12.4	6.4	6.5	12	24.3
9	7.65	UXLB009007A1245A11	12.4	6.4	6.5	12	26.5
10	8.4	UXLB010008A1245A11	12.4	6.4	6.6	12.1	26.5
12	10.2	UXLB012010A1445A11	13.9	6.4	7	12.5	26.5
15	12.7	UXLB015012A1445A11	13.9	6.4	7.5	13	28.7
18	15.3	UXLB018015A1645A11	15.5	6.4	8.3	13.8	31
21	17	UXLB021017A1645A11	15.5	6.4	8.8	14.3	31
24	19.5	UXLB024019A1845A11	17	6.4	8.9	14.4	33
27	22	UXLB027022A1845A11	17	6.4	9.6	15.1	33
30	24.4	UXLB030024A2045A11	18.6	6.4	10.4	15.9	35
33	27.5	UXLB033027A2245A11	20.2	6.4	11.3	16.8	38
36	29	UXLB036029A2245A11	20.2	6.4	11.8	17.3	38
39	31.5	UXLB039031A2445A11	21.7	6.4	12.6	18.1	42
42	34	UXLB042034A2445A11	21.7	6.4	13.4	18.9	42
45	36.5	UXLB045036A2645A11	23.3	6.4	14.1	19.6	44
48	39	UXLB048039A2845A11	24.8	6.4	14.9	20.4	46
54	42	UXLB054042A2845A11	24.8	6.4	15.8	21.3	46
60	48	UXLB060048A3245A11	27.9	6.4	17.7	23.2	51
66	53	UXLB066053A3245A11	27.9	6.4	19.3	24.8	53
72	57	UXLB072057A4445A11	37.3	6.4	20.5	26	68
78	62	UXLB078062A4645A11	38.8	6.4	22	27.5	71
84	68	UXLB084068A4845A11	40.4	6.4	23.9	29.4	73
90	72	UXLB090072A5045A11	41.9	6.4	25.1	30.6	75
96	76	UXLB096076A5245A11	43.5	6.4	26.4	31.9	77
108	84	UXLB108084A5645A11	46.6	6.4	28.9	34.4	84
120	98	UXLB120098A6445A11	52.8	6.4	33.2	38.7	99
132	106	UXLB132106A6445A11	52.8	6.4	43.2	56.2	99
138	111	UXLB138111A8045A11	65.3	6.4	44.7	57.7	119
144	115	UXLB144115A8045A11	65.3	6.4	46	59	119
162	130	UXLB162130A8645A11	70	6.4	50.6	63.6	128
168	131	UXLB168131A8645A11	70	6.4	50.9	63.9	128
172	140	UXLB172140A9245A11	74.6	6.4	53.7	66.7	137
180	144	UXLB180144AA445A11	84	6.4	55	68	152
192	152	UXLB192152AB045A11	88.6	6.4	57.4	70.4	159
198	160	UXLB198160AB245A11	90.2	6.4	59.9	72.9	161
204	165	UXLB204165AB445A11	91.8	6.4	61.5	74.5	163
216	174	UXLB216174AB645A11	93.3	6.4	64.3	77.3	168
228	180	UXLB228180AB845A11	94.9	6.4	66.1	79.1	170
240	190	UXLB240190AC645A11	101	6.4	69.2	82.2	179
258	209	UXLB258209AC845A11	128	6.4	83.1	104	205
264	212	UXLB264212AC845A11	128	6.4	84	105	205
276	220	UXLB276220AE845A11	143	6.4	86.5	108	229
288	230	UXLB288230AF245A11	146	6.4	89.6	111	236
312	245	UXLB312245AF645A11	149	6.4	101	128	245
330	267	UXLB330267AH245A11	162	6.4	105	132	267
336	269	UXLB336269AH245A11	162	6.4	105	133	267
360	289	UXLB360289AJ845A11	174	6.4	114	142	287

Spacing requirements

Figure 4 illustrates a three-phase in-line mounting arrangement. Dimensions B and C reference minimum phase-to-ground and phase-to-phase distances respectively. These dimensions are listed in Tables 6 and 7.

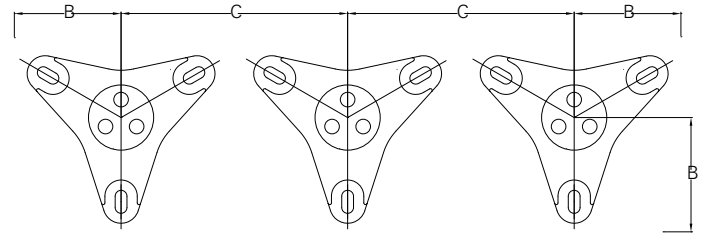
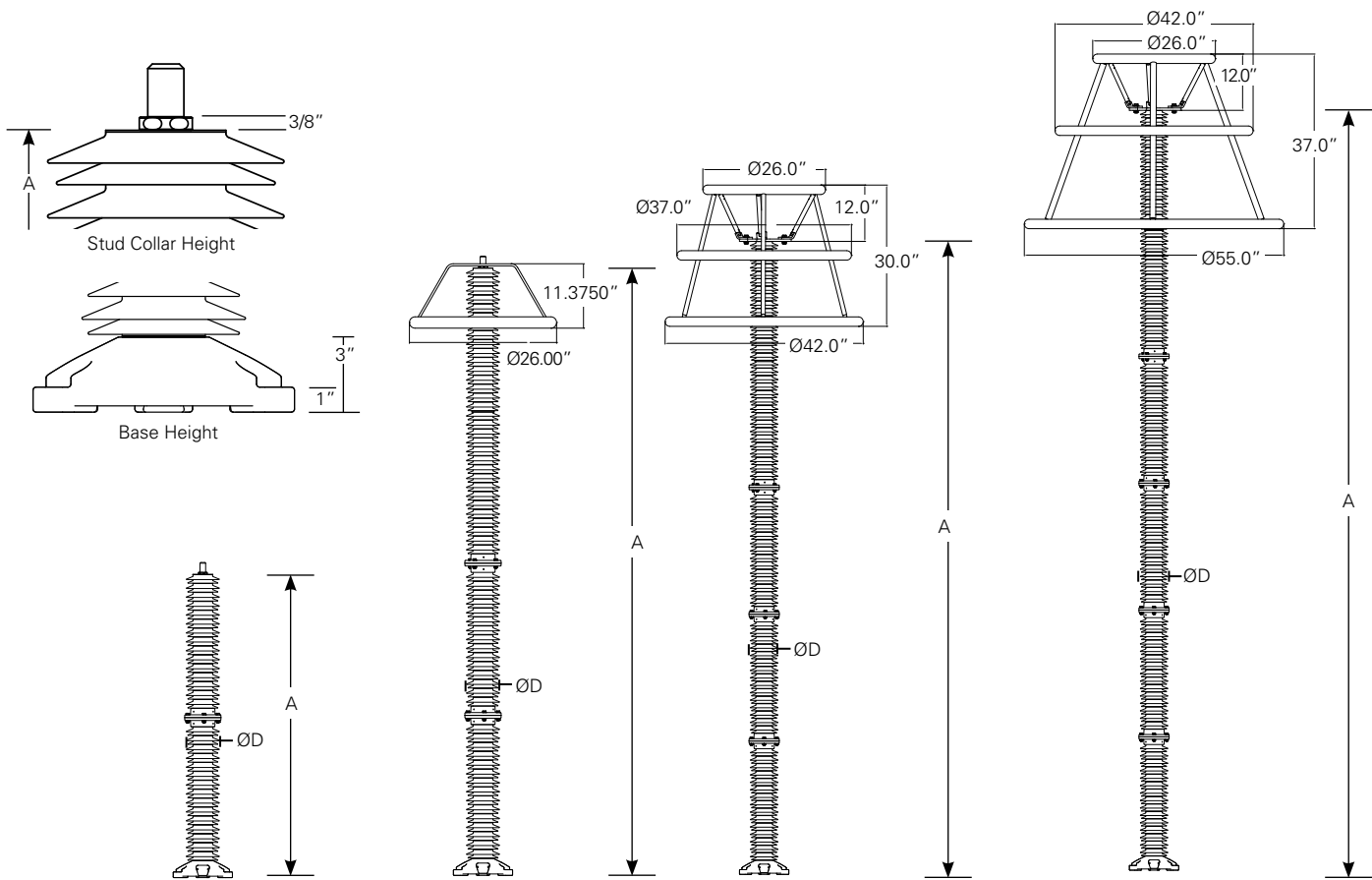


Figure 4. Three-phase In-line mounting arrangement.

Table 7. Dimensions, Clearance Requirements and Weights of UXLC High-Strength Station-Class Surge Arresters

Arrester Rating (kV, rms)	Arrester MCOV (kV rms)	Catalog Number	"Dimension A (in) Figure 5	Dimension D Diameter (in) Figure 5	Dimension B Minimum Phase- To-Ground Clearance (in) Figure 4	Dimension C Minimum Phase-to-Phase Clearance (in) Figure 4	Weight(lbs)
132	106	UXLC132106A8445A11	68.4	6.4	43.2	56.2	119
138	111	UXLC138111A8445A11	68.4	6.4	44.7	57.7	119
144	115	UXLC144115A8645A11	70	6.4	46	59	121
162	130	UXLC162130A9045A11	73.1	6.4	50.6	63.6	128
168	131	UXLC168131A9045A11	73.1	6.4	50.9	63.9	130
172	140	UXLC172140AB045A11	88.6	6.4	53.7	66.7	152
180	144	UXLC180144AB245A11	90.3	6.4	55	68	154
192	152	UXLC192152AB645A11	93.4	6.4	57.4	70.4	161
198	160	UXLC198160AC045A11	96.5	6.4	59.9	72.9	165
204	165	UXLC204165AC045A11	96.5	6.4	61.5	74.5	165
216	174	UXLC216174AC245A11	98	6.4	64.3	77.3	168
228	180	UXLC228180AC045A11	96.5	6.4	66.1	79.1	168
240	190	UXLC240190AC645A11	101	6.4	69.2	82.2	176
258	209	UXLC258209AE845A11	143	6.4	83.1	104	223
264	212	UXLC264212AF045A11	145	6.4	84	105	225
276	220	UXLC276220AF445A11	148	6.4	86.5	108	232
288	230	UXLC288230AF645A11	149	6.4	89.6	111	238
312	245	UXLC312245AH645A11	165	6.4	101	128	262
330	267	UXLC330267AJ445A11	171	6.4	108	135	273
336	269	UXLC336269AJ645A11	173	6.4	108	136	278
360	289	UXLC360289AK245A11	177	6.4	114	142	287



Arrester Rating:

3 - 120 kV

132 - 240 kV

258-288 kV

312-360 kV

All dimensions are for reference only.

Figure 5. Outline drawing of standard UltraSIL Polymer-Housed Station-Class Arresters.

Note: Dimensions shown in Tables 6 and 7. Arresters are shown without line and ground terminals.

Table 8. Catalog Numbers for Standard Configuration Type UXL Surge Arresters

Arrester Rating Ur (kV, rms)	Arrester COV Uc (kV, rms)	UXLB	Arrester Rating Ur (kV, rms)	Arrester COV Uc (kV, rms)	UXLB	UXLC
3	2.55	UXLB003002A1045A11	108	84	UXLB108084A5645A11	Not available below 132kV
9	7.65	UXLB009007A1245A11	120	98	UXLB120098A6445A11	
10	8.4	UXLB010008A1245A11	132	106	UXLB132106A6445A11	UXLC132106A8445A11
12	10.2	UXLB012010A1445A11	138	111	UXLB138111A8045A11	UXLC138111A8445A11
15	12.7	UXLB015012A1445A11	144	115	UXLB144115A8045A11	UXLC144115A8645A11
18	15.3	UXLB018015A1645A11	162	130	UXLB162130A8645A11	UXLC162130A9045A11
21	17	UXLB021017A1645A11	168	131	UXLB168131A8645A11	UXLC168131A9045A11
24	19.5	UXLB024019A1845A11	172	140	UXLB172140A9245A11	UXLC172140AB045A11
27	22	UXLB027022A1845A11	180	144	UXLB180144AA445A11	UXLC180144AB245A11
30	24.4	UXLB030024A2045A11	192	152	UXLB192152AB045A11	UXLC192152AB645A11
33	27.5	UXLB033027A2245A11	198	160	UXLB198160AB245A11	UXLC198160AC045A11
36	29	UXLB036029A2245A11	204	165	UXLB204165AB445A11	UXLC204165AC045A11
39	31.5	UXLB039031A2445A11	216	174	UXLB216174AB645A11	UXLC216174AC245A11
42	34	UXLB042034A2445A11	228	180	UXLB228180AB845A11	UXLC228180AC045A11
45	36.5	UXLB045036A2645A11	240	190	UXLB240190AC645A11	UXLC240190AC645A11
48	39	UXLB048039A2845A11	258	209	UXLB258209AC845A11	UXLC258209AE845A11
54	42	UXLB054042A2845A11	264	212	UXLB264212AC845A11	UXLC264212AF045A11
60	48	UXLB060048A3245A11	276	220	UXLB276220AE845A11	UXLC276220AF445A11
66	53	UXLB066053A3245A11	288	230	UXLB288230AF245A11	UXLC288230AF645A11
72	57	UXLB072057A4445A11	312	245	UXLB312245AF645A11	UXLC312245AH645A11
78	62	UXLB078062A4645A11	330	267	UXLB330267AH245A11	UXLC330267AJ445A11
84	68	UXLB084068A4845A11	336	269	UXLB336269AH245A11	UXLC336269AJ645A11
96	76	UXLB096076A5245A11	360	289	UXLB360289AJ845A11	UXLC360289AK245A11

Table 9. UltraQUIK Catalog Numbering System for UltraSIL Polymer-Housed UXL High-Strength Station-Class Arresters

1 U	2 X	3 L	4	5	6	7	8	9	10	11 A	12	13	14	15	16	17	18
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Catalog Number Digits:

1 = U (UltraSIL Polymer-Housed Arrester)

2 = X Xtra-High Energy Handling

3 = L High Electrical Build (15 kJ/kV of MCOV, Double Impulse)*

* Reference Catalog 235-103 for alternate electrical builds

4 = B = 80,000 in-lbs Cantilever Strength Design

C = 92,000 in-lbs Cantilever Strength Design (**Only available for 132-360 kV**)

5 through 10 = Arrester Rating: Duty-cycle (MCOV)

003002 = 3 kV (2.55 kV)*	042034 = 42 kV (34.0 kV)*	132106 = 132 kV (106 kV)	258209 = 258 kV (209 kV)
006005 = 6 kV (5.10 kV)*	045036 = 45 kV (36.5 kV)*	138111 = 138 kV (111 kV)	264212 = 264 kV (212 kV)
009007 = 9 kV (7.65 kV)*	048039 = 48 kV (39.0 kV)*	144115 = 144 kV (115 kV)	276220 = 276 kV (220 kV)
010008 = 10 kV (8.4 kV)*	054042 = 54 kV (42.0 kV)*	150120 = 150 kV (120 kV)	288230 = 288 kV (230 kV)
012010 = 12 kV (10.2 kV)*	060048 = 60 kV (48.0 kV)*	162130 = 162 kV (130 kV)	312245 = 312 kV (245kV)
015012 = 15 kV (12.7 kV)*	066053 = 66 kV (53.0 kV)*	168131 = 168 kV (131 kV)	330267 = 330 kV (267kV)
018015 = 18 kV (15.3 kV)*	072057 = 72 kV (57.0 kV)*	172140 = 172 kV (140 kV)	336269 = 336 kV (269 kV)
021017 = 21 kV (17.0 kV)*	078062 = 78 kV (62.0 kV)*	180144 = 180 kV (144 kV)	360289 = 360 kV (289 kV)
024019 = 24 kV (19.5 kV)*	084068 = 84 kV (68.0 kV)*	192152 = 192 kV (152 kV)	
027022 = 27 kV (22.0 kV)*	090070 = 90 kV (70.0 kV)*	198160 = 198 kV (160 kV)	
030024 = 30 kV (24.4 kV)*	096076 = 96 kV (76.0 kV)*	204165 = 204 kV (165 kV)	
033027 = 33 kV (27.0 kV)*	096077 = 96 kV (77.0 kV)*	216174 = 215 kV (174 kV)	
036029 = 36 kV (29.0 kV)*	108084 = 108 kV (84.0 kV)*	228180 = 228 kV (180 kV)	
039031 = 39 kV (31.5 kV)*	120098 = 120 kV (98.0 kV)*	240190 = 240 kV (190 kV)	

* Only available in UXL_B configurations

11 = "A" Standard High Creep UltraSIL Polymer-Housing

Table 9. UltraQUIK Catalog Numbering System for UltraSIL Polymer-Housed UXL High-Strength Station-Class Arresters (continued)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
U	X	L								A							

[illegible]

Table 9. UltraQUIK Catalog Numbering System for UltraSIL Polymer-Housed UXL High-Strength Station-Class Arresters (continued)

1 U	2 X	3 L	4	5	6	7	8	9	10	11 A	12	13	14	15	16	17	18
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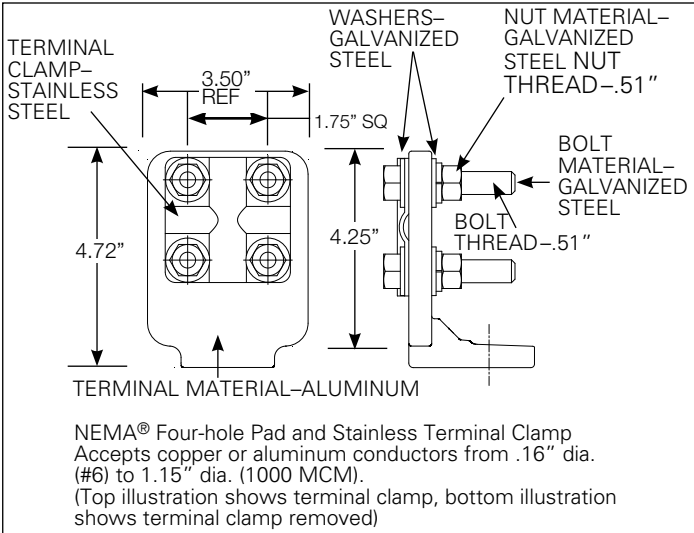
Digits 12 & 13	Type	64	80	84	86	90	92	A4	B0	B2	B4	B6	B8	C0	C2	C6	C8	E8	F0	F2	F4	F6	H2	H6	J4	J6	J8	K2
		245.7	307.1	322.4	330.1	345.5	353.2	399.2	422.2	429.9	437.6	445.3	453	460.6	468.3	483.7	614.2	690.9	698.6	706.3	714	721.7	783.1	798.4	829.1	836.8	844.5	859.8
Leakage Distance (in)	Arrester Rating																											
132	UXLB	*																										
	UXLC			*																								
138	UXLB		*																									
	UXLC			*																								
144	UXLB		*																									
	UXLC				*																							
162	UXLB				*																							
	UXLC					*																						
168	UXLB				*																							
	UXLC					*																						
172	UXLB						*																					
	UXLC							*																				
180	UXLB							*																				
	UXLC								*																			
192	UXLB								*																			
	UXLC									*																		
198	UXLB									*																		
	UXLC										*				*													
204	UXLB										*																	
	UXLC											*			*													
216	UXLB											*																
	UXLC												*		*													
228	UXLB												*															
	UXLC													*														
240	UXLB															*												
	UXLC															*												
258	UXLB																*											
	UXLC																	*										
264	UXLB																*			*								
	UXLC																		*									
276	UXLB																	*										
	UXLC																				*							
288	UXLB																			*								
	UXLC																				*							
312	UXLB																					*						
	UXLC																						*					
330	UXLB																						*					
	UXLC																							*				
336	UXLB																						*			*		
	UXLC																									*		
360	UXLB																										*	
	UXLC																											*

Table 9. UltraQUIK Catalog Numbering System for UltraSIL Polymer-Housed UXL High-Strength Station-Class Arresters (continued)

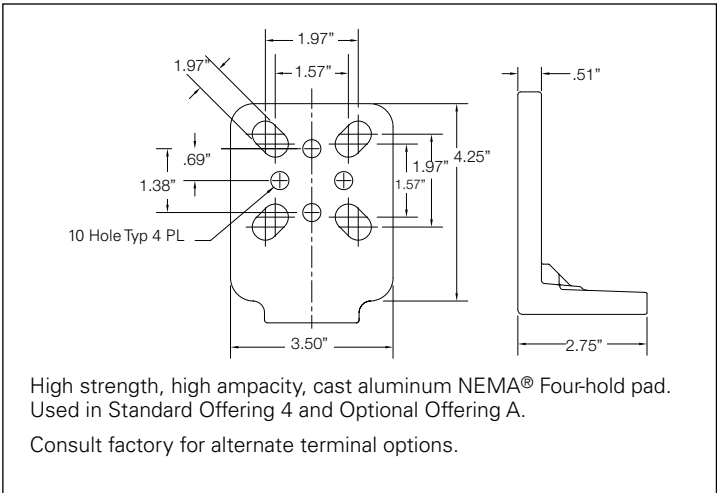
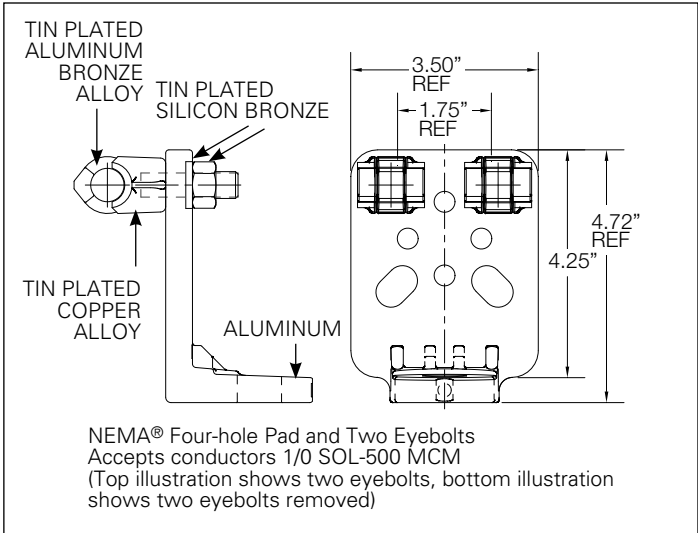
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
U	X	L								A							

14 = Line Terminal Options

Standard Offering-Select 4



Optional Offering-Select A



Optional Offering-Select 1

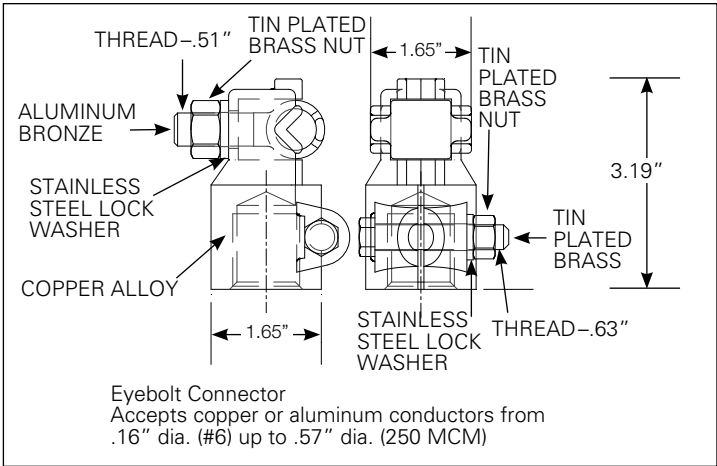
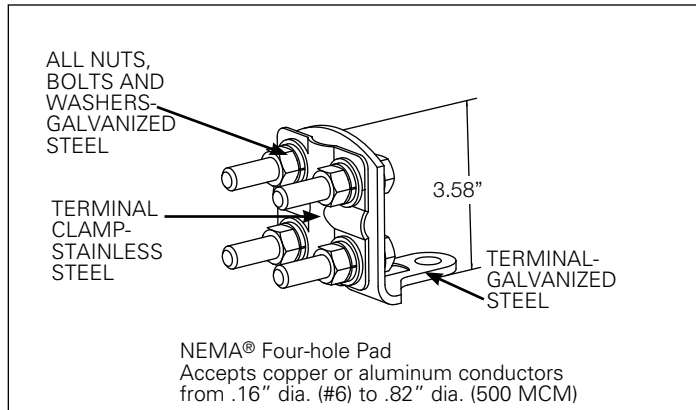


Table 9. UltraQUIK Catalog Numbering System for UltraSIL Polymer-Housed UXL High-Strength Station-Class Arresters (continued)

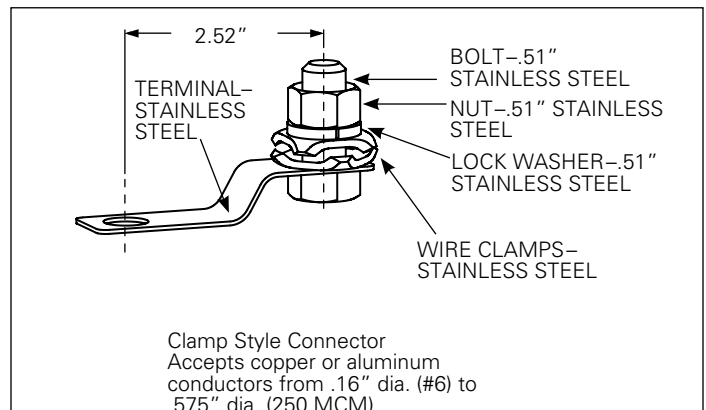
1	U	2	X	3	L	4		5	6	7	8	9	10	11	A	12	13	14	15	16	17	18
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15 = Earth Terminal Options

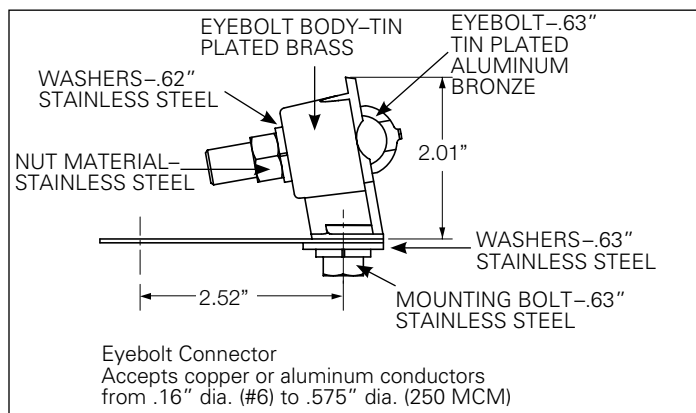
Standard Offering-Select 5



Optional Offering-Select 1

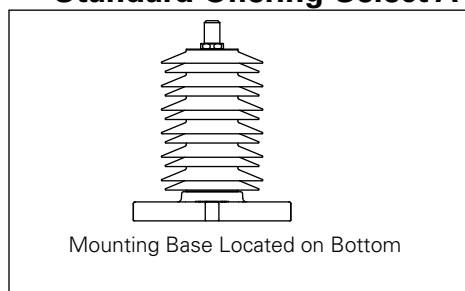


Optional Offering-Select 9

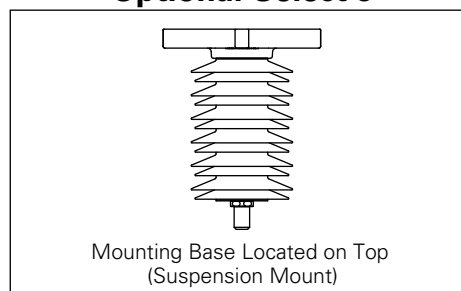


16 = Mounting Arrangement

Standard Offering-Select A



Optional-Select c



17 = "1" - Nameplate for Standard or Suspension Mount

18 = "1" - Cardboard Packaging

"2" - Wood Crating

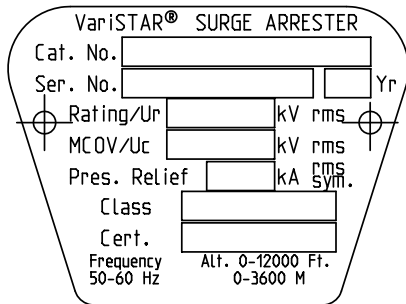


Figure 6. Detail of base nameplate.

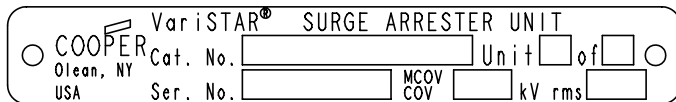


Figure 7. Detail of unit nameplate on base.

Nameplate information

A stainless steel nameplate is attached to the base of every UltraSIL polymer-housed UXL high-strength arrester. The arrester catalog number, serial number, year of manufacture, duty-cycle rating, MCOV ratings, and pressure relief rating are among the details provided on the nameplate. For multi-unit arresters above 120 kV, an additional unit nameplate is provided on the base of the arrester unit section as shown in Figure 7. See Figure 6 for an example of a base nameplate.

Additional information

- S235-104-1 UltraSIL Polymer-Housed VariSTAR UXL High-Strength Station-Class Surge Arrester Installation and Maintenance Instructions.
- CP1313 UltraSIL Polymer-Housed VariSTAR UXL High-Strength Station-Class Surge Arresters Certified Test Report.
- B235-11026 Improve System Reliability with High Cantilever Strength and Expanded Overvoltage Protection
- G235-104-1 UltraSIL Polymer-Housed UXL High-Strength Station-Class Arrester Guideform Specification

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For Eaton's Cooper Power Systems UXL surge arrester product information call 1-877-277-4636 or visit: www.cooperpower.com.