Type EXLIM-P Surge Arresters
Maximum System Voltage 2.52 to 550 kV

Power and productivity
for a better world™

ABB

EXLIM-P Metal Oxide Gapless Surge Arresters

EXLIM-P Surge Arresters are used for the protection of switchgear, transformers and other equipment in high voltage systems against atmospheric and switching overvoltages. For use when requirements of lightning intensity and energy capability are high.

Application

The EXLIM-P Surge Arrester has been verified to meet Station Class requirements of IEEE C62.11 (IEEE Standard for Metal-Oxide Surge Arresters for AC Power Circuits) and Line Discharge Class 4 requirements of IEC 60099-4 (IEC Standard for Metal-Oxide Surge Arresters without gaps for AC Systems). The EXLIM-P Surge Arrester is designed to meet the following performance data:

Performance data

Standard porcelain color	ANSI grey *Brown available upon request*
Maximum system voltage (V_m)	2.52 to 550 kV_{rms}
Duty cycle rated voltage (V_r)	3 to 444 kV_{rms}
Classifying current	
IEEE	10 / 15 kA_{peak}
IEC	20 kA_{peak}
Discharge current withstand strength	
High current 4 / 10 us	100 kA_{peak}
Low current 2000 us	1350 A_{peak}
Energy capability	
2 impulses (IEC Cl 7.5.5)*	13.6 kJ/kV of MCOV
Fullfills requirements of IEEE transmission-line discharge test for 24 kV systems	
Short-circuit / pressure relief capability	65 $kA_{rms\ sym}$
Mechanical Strength [1]	
Permissible static service load (PSSL)	5310 ft-lbs / 7200 Nm
Maximum permissible dynamic service load (MPDSL)	13276 ft-lbs / 18000 Nm
Service conditions	
Ambient temperature	-50 °C to +45 °C
Design altitude[2, 3]	6000 ft / 1830 m
Frequency	15 to 62 Hz

Type tested to the following standards:
IEEE standard C62.11
IEC standard 60099-4 Ed 2.1

Notes:
1 Higher strength designs available on request
2 Unless otherwise noted
3 Higher altitude designs available on request

Benefit

Robust design

The EXLIM Surge Arrester is based on a design with over 70 years of field experience, first as a gapped SiC arrester, in climates and conditions all over the world. EXLIM arresters live up to their name: EXcellent voltage LIMiters. The design is robust and well-matched with other apparatus in substations.
Each arrester is built up of one or more units. Each unit is made up of a porcelain housing that contains a single column of metal oxide varistors. Each metal oxide varistor is manufactured by ABB where the design is verified routinely through rigorous testing to ensure superior quality. The metal oxide varistors are dispersed throughout the porcelain housing with the necessary spacers as determined by the electrical design of the arrester.

Aluminum flanges that house the hermetic sealing system and compress the metal oxide varistor stack are cemented to the ends of the porcelain housing. The sealing arrangement in each flange consists of a prestressed stainless steel plate with a rubber gasket. In the event that the arrester is stressed in excess of its design capability, the internal pressure causes the sealing plate to deflect open, allowing the ionized gases to flow out through the venting ducts. The seal is verified on every arrester prior to routine testing.

Each arrester is furnished with a mounting base, 4-hole NEMA line pad, and line and ground terminals for electrical connections.

Nameplates

Standard (Stainless steel)

ABB	EXLIM SURGE ARRESTER		MADE IN USA
STYLE NO.		RATING	kV
SERIAL NO.		MCOV	kV
IEEE/IEC CLASS	STATION / 4	PRESS RELIEF CLASS	65 kA
DATE	WT	GRADING RING	

Master nameplate (SSTL)

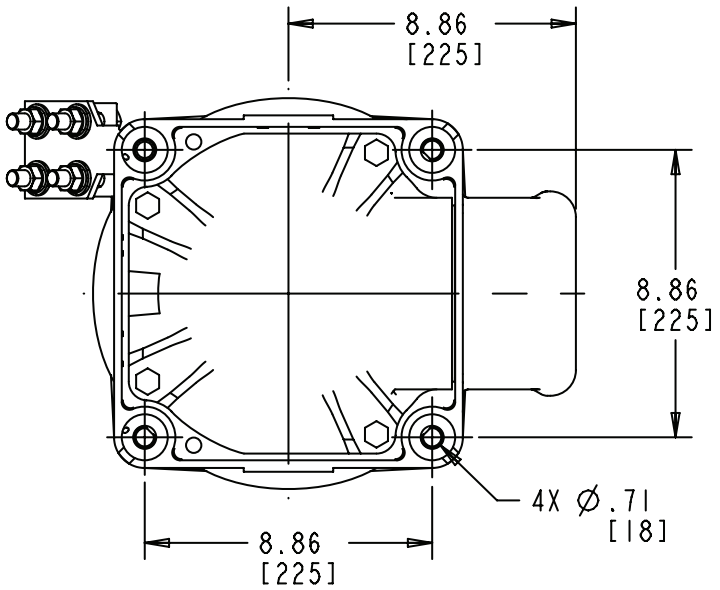
ABB	EXLIM SURGE ARRESTER		MADE IN USA
UNIT STACKING ORDER			
	STYLE NO.	SERIAL NO.	MCOV
BOT			kV
2ND			kV
3RD			kV

Unit stacking order nameplate (SSTL)

ABB	EXLIM SURGE ARRESTER	MADE IN USA
UNIT INFORMATION		
UNIT STYLE NO.		
UNIT SERIAL NO.		
UNIT MCOV	kV	

Unit nameplate (SSTL)

Drilling plan



Alternate bolt hole patterns available upon request.

Quick selection guide

	System Voltage			Surge Arrester ANSI/IEEE Ratings		
		Nominal				
	Maximum V_m (kV_{rms})	Three-Wire V_n (kV_{rms})	Four-Wire V_n (kV_{rms})	Three-Wire V_r / V_{MCOV} (kV_{rms})	Four-Wire Grounded V_r / V_{MCOV} (kV_{rms})	Four-Wire Grounded High Impedance V_r / V_{MCOV} (kV_{rms})
Medium Voltage	2.52	2.4		3 / 2.55		
	4.37Y / 2.52		4.16Y / 2.4		3 / 2.55	5 / 4.25
	4.37	4.16		5 / 4.25		
	5.04	4.8		6 / 5.1		
	7.24	6.9		9 / 7.65		
	8.73Y / 5.04		8.32Y / 4.8		6 / 5.1	12 / 10.2
	12.6Y / 7.27		12.0Y / 6.93		9 / 7.65	15 / 12.7
	13.09Y / 7.56		12.47Y / 7.2		9 / 7.65	18 / 15.3
	13.86Y / 8.0		13.2Y / 7.62		10 / 8.4	18 / 15.3
	14.49Y / 8.37		13.8Y / 7.97		10 / 8.4	18 / 15.3
	14.49	13.8		18 / 15.3		
	21.82Y / 12.6		20.78Y / 12.0		15 / 12.7	27/ 22
	24.0Y / 13.86		22.86Y / 13.2		18 / 15.3	30 / 24.4
	24.15	23.0		30 / 24.4		
	26.19Y / 15.12		24.94Y / 14.4		21 / 17	33 / 27
	36.23Y / 20.92		34.5Y / 19.92		27 / 22	42 / 34
	36.23					
High Voltage	48.30			48 / 39		
	72.50			60 / 48		
	123			108 / 84		
	145			120 / 98		
	170			144 / 115		
	245			192 / 152		
	300			228 / 180		
	362			276 / 220		
	420			336 / 272		
	550			420 / 335		

Key

V_n	Nominal System Voltage per NEMA C84.1
V_m	Maximum System Voltage per NEMA C84.1
V_r	Duty Cycle Rated Voltage per IEEE C62.11
MCOV	Maximum Continuous Operating Voltage per IEEE C62.11
TOV	Temporary Overvoltage
SPL	Switching Protective Level
	500 A 3-132 V_r (kV_{rms})
	1000 A 144-240 V_r (kV_{rms})
	2000 A 258-444 V_r (kV_{rms})
LPL	Lightning Protective Level
FOW	Front of Wave

Guaranteed performance data

Electrical characteristics

Ratings (kV_{rms})		TOV (kV_{rms})		Maximum residual voltage with current wave, (kV_{peak})							
Voltage	MCOV	with prior energy single impulse of 8.8 kJ/kV_{MCOV}		SPL (SIPL) 30/60 µS	LPL (LIPL) 8/20 µs						FOW 0.5 µs
V_r	V_{MCOV}	1 sec	10 sec		1.5 kA	3 kA	5 kA	10 kA	20 kA	40 kA	10 kA
3.0	2.55	5.37	5.12	9.18	9.65	10.1	10.38	10.4	11.9	13.0	11.6
4.0	3.40	5.37	5.12	9.18	9.65	10.1	10.38	10.4	11.9	13.0	11.6
5.0	4.25	7.16	6.83	12.0	12.6	13.2	13.6	13.8	15.7	17.1	15.3
6.0	5.10	6.87	6.83	12.0	12.6	13.2	13.6	13.8	15.7	17.1	15.3
8.0	6.80	10.7	10.2	17.8	18.7	19.5	20.2	20.7	23.2	25.3	22.6
9.0	7.65	10.7	10.2	17.8	18.7	19.5	20.2	20.7	23.2	25.3	22.6
10	8.40	11.9	11.4	20.7	21.8	22.8	23.5	24.2	27.1	29.5	26.4
12	10.2	14.3	13.7	23.5	24.8	25.9	26.7	27.6	30.8	33.6	30.0
15	12.7	17.9	17.1	29.3	30.9	32.2	33.3	34.5	38.4	41.9	37.4
18	15.3	21.5	20.5	35.1	36.9	38.6	39.8	41.4	46.0	50.2	44.8
21	17.0	25.1	23.9	40.8	43.0	44.9	46.4	48.3	53.5	58.5	52.2
24	19.5	28.7	27.3	46.6	49.1	51.3	52.9	55.2	61.1	66.7	59.6
27	22.0	32.2	30.7	52.4	55.1	57.6	59.5	62.1	68.7	75.0	66.9
30	24.4	35.8	34.1	58.1	61.2	64.0	66.1	69.0	76.3	83.3	74.3
33	27.0	39.4	37.6	64.0	67.4	70.4	72.7	76.0	83.9	91.7	81.8
36	29.0	43.0	41.0	69.0	72.7	75.9	78.4	82.0	90.5	98.9	88.2
39	31.5	46.6	44.4	74.8	78.8	82.4	85.1	89.0	98.2	107	95.7
42	34.0	50.1	47.8	80.7	85.0	88.8	91.7	96.0	106	116	103
45	36.5	53.7	51.2	86.5	91.1	95.3	98.4	103	114	124	111
48	39	57.3	54.6	92.4	97.3	102	105	110	121	133	118
54	42	64.5	61.5	103	109	114	117	123	136	148	132
60	48	71.6	68.3	115	121	127	131	137	151	165	147
66	53	78.8	75.1	127	133	139	144	151	166	182	162
72	57	86.0	81.9	137	145	151	156	164	181	197	176
78	63	93.1	88.8	149	157	164	170	178	196	214	191
84	68	100	95.6	161	169	177	183	192	211	231	206
90	70	107	102	172	181	189	195	205	226	247	220
94	73	112	107	179	189	197	204	214	235	257	229
96	76	115	109	183	193	202	209	219	241	263	235
102	82	122	116	195	206	215	222	233	256	280	250
108	84	129	123	206	217	227	234	246	271	296	264
108	88	129	123	206	217	227	234	246	271	296	264
114	92	136	130	218	229	240	248	260	286	313	279
120	98	143	137	228	241	252	260	273	300	328	293
126	102	150	143	240	253	265	273	287	316	345	308
132	106	158	150	252	265	277	286	301	331	362	323
138	111	165	157	263	277	289	299	314	345	377	336
144	115	172	164	274	289	302	312	328	361	394	351
150	121	179	171	286	301	315	325	342	376	411	366
162	131	193	184	309	325	340	351	369	406	443	395
168	134	201	191	320	338	353	364	383	421	460	410
172	140	205	196	328	345	361	373	392	431	471	420
180	144	215	205	343	361	378	390	410	451	493	439
192	152	229	218	365	385	403	416	437	480	525	468
198	160	236	225	377	397	415	429	451	496	542	483
210	170	251	239	400	421	440	455	478	525	574	512
216	173	258	246	411	433	453	468	492	541	591	527
222	179	265	253	423	446	466	481	506	556	608	542
228	180	272	259	434	457	478	494	519	570	623	556
240	190	287	273	456	481	503	519	546	600	656	585
258	209	308	294	491	517	541	558	587	645	705	629
264	212	315	300	502	529	553	571	601	660	722	644
276	220	330	314	525	553	578	597	628	690	754	672
288	230	344	328	548	578	604	624	656	721	788	702
294	235	351	335	559	589	616	636	669	735	803	716
300	243	358	341	571	602	629	649	683	750	820	731
312	245	373	355	593	625	654	675	710	780	853	760
336	272	401	382	639	674	704	727	765	840	919	819
360	288	430	410	684	721	754	779	819	900	983	877
396	318	473	451	753	793	829	856	901	990	1082	965
420	335	501	478	799	842	880	909	956	1050	1148	1023
444	353	530	505	845	890	931	961	1011	1111	1214	1082

Style numbers and technical data for housings

Vertical mounting styles with standard creepage distance

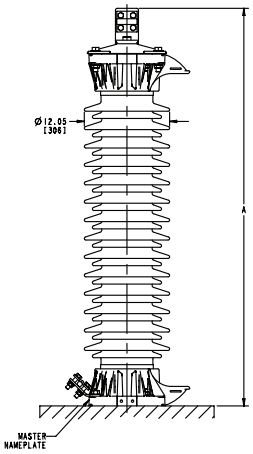
Surge Arrester IEEE Ratings V_r / V_{MCOV} (kV)	Style Number	Creepage Distance inches (mm)	Strike Distance inches (mm)	BIL 1.2/50 µs dry kV_{peak}	Weight (Mass) lbs (kg)	A inches (mm)	B inches (mm)	C inches (mm)	D inches (mm)	Fig
3.0 / 2.55	P003GA002A	56.9 (1444)	18.43 (468)	318	198 (90)	35.35 (898)				1
4.0 / 3.40	P004GA003A	56.9 (1444)	18.43 (468)	318	198 (90)	35.35 (898)				1
5.0 / 4.25	P005GA004A	56.9 (1444)	18.43 (468)	318	198 (90)	35.35 (898)				1
6.0 / 5.10	P006GA005A	56.9 (1444)	18.43 (468)	318	198 (90)	35.35 (898)				1
8.0 / 6.80	P008GA007A	56.9 (1444)	18.43 (468)	318	198 (90)	35.35 (898)				1
9.0 / 7.65	P009GA008A	56.9 (1444)	18.43 (468)	318	198 (90)	35.35 (898)				1
10 / 8.40	P010GA008A	56.9 (1444)	18.43 (468)	318	198 (90)	35.35 (898)				1
12 / 10.2	P012GA010A	56.9 (1444)	18.43 (468)	318	198 (90)	35.35 (898)				1
15 / 12.7	P015GA012A	56.9 (1444)	18.43 (468)	318	198 (90)	35.35 (898)				1
18 / 15.3	P018GA015A	56.9 (1444)	18.43 (468)	318	198 (90)	35.35 (898)				1
21 / 17.0	P021GA017A	56.9 (1444)	18.43 (468)	318	198 (90)	35.35 (898)				1
24 / 19.5	P024GA019A	56.9 (1444)	18.43 (468)	318	198 (90)	35.35 (898)				1
27 / 22.0	P027GA022A	56.9 (1444)	18.43 (468)	318	198 (90)	35.35 (898)				1
30 / 24.4	P030GA024A	56.9 (1444)	18.43 (468)	318	198 (90)	35.35 (898)				1
33 / 27.0	P033GA027A	56.9 (1444)	18.43 (468)	318	198 (90)	35.35 (898)				1
36 / 29.0	P036GA029A	56.9 (1444)	18.43 (468)	318	198 (90)	35.35 (898)				1
39 / 31.5	P039GA031A	56.9 (1444)	18.43 (468)	318	198 (90)	35.35 (898)				1
42 / 34.0	P042GA034A	56.9 (1444)	18.43 (468)	318	198 (90)	35.35 (898)				1
45 / 36.5	P045GA037A	56.9 (1444)	18.43 (468)	318	198 (90)	35.35 (898)				1
48 / 39.0	P048GA039A	56.9 (1444)	18.43 (468)	318	198 (90)	35.35 (898)				1
54 / 42.0	P054GA042A	129.3 (3285)	39.21 (996)	586	265 (120)	56.14 (1426)				1
60 / 48.0	P060GA048A	129.3 (3285)	39.21 (996)	586	265 (120)	56.14 (1426)				1
66 / 53.0	P066GA053A	129.3 (3285)	39.21 (996)	586	265 (120)	56.14 (1426)				1
72 / 57.0	P072GA057A	129.3 (3285)	39.21 (996)	586	265 (120)	56.14 (1426)				1
78 / 63.0	P078GA063A	129.3 (3285)	39.21 (996)	586	265 (120)	56.14 (1426)				1
84 / 68.0	P084GA068A	129.3 (3285)	39.21 (996)	586	265 (120)	56.14 (1426)				1
90 / 70.0	P090GA070A	129.3 (3285)	39.21 (996)	586	265 (120)	56.14 (1426)				1
94 / 73.0	P094GA073A	129.3 (3285)	39.21 (996)	586	265 (120)	56.14 (1426)				1
96 / 76.0	P096GA076A	129.3 (3285)	39.21 (996)	586	265 (120)	56.14 (1426)				1
102 / 82.0	P102GA082A	129.3 (3285)	39.21 (996)	586	265 (120)	56.14 (1426)				1
108 / 84.0	P108GA084A	174.5 (4432)	52.20 (1326)	774	342 (155)	69.13 (1756)				1
108 / 88.0	P108GA088A	174.5 (4432)	52.20 (1326)	774	342 (155)	69.13 (1756)				1
114 / 92.0	P114GA092A	174.5 (4432)	52.20 (1326)	774	342 (155)	69.13 (1756)				1
120 / 98.0	P120GA098A	174.5 (4432)	52.20 (1326)	774	342 (155)	69.13 (1756)				1
126 / 102	P126GA102A	174.5 (4432)	52.20 (1326)	774	342 (155)	69.13 (1756)				1
132 / 106	P132GA106A	174.5 (4432)	52.20 (1326)	774	342 (155)	69.13 (1756)				1
138 / 111	P138GA111A	174.5 (4432)	52.20 (1326)	774	342 (155)	69.13 (1756)				1
144 / 115	P144GA115A	174.5 (4432)	52.20 (1326)	774	342 (155)	69.13 (1756)				1
150 / 121	P150GA121A	174.5 (4432)	52.20 (1326)	774	342 (155)	69.13 (1756)				1
162 / 131	P162GA131A	174.5 (4432)	52.20 (1326)	774	342 (155)	69.13 (1756)				1
168 / 134	P168GA134A	174.5 (4432)	52.20 (1326)	774	342 (155)	69.13 (1756)				1
172 / 140	P172GA140A	174.5 (4432)	52.20 (1326)	774	342 (155)	69.13 (1756)				1
180 / 144	P180GA144A	258.7 (6570)	63.97 (1625)	1172	530 (240)	105.83 (2688)	31.50 (800)		19.69 (500)	3
192 / 152	P192GA152A	258.7 (6570)	63.97 (1625)	1172	530 (240)	105.83 (2688)	31.50 (800)		19.69 (500)	3
198 / 160	P198GA160A	258.7 (6570)	63.97 (1625)	1172	530 (240)	105.83 (2688)	31.50 (800)		19.69 (500)	3
210 / 170	P210GA170A	258.7 (6570)	71.85 (1825)	1172	541 (245)	105.83 (2688)	23.62 (600)		11.81 (300)	3
216 / 173	P216GA173A	258.7 (6570)	71.85 (1825)	1172	541 (245)	105.83 (2688)	23.62 (600)		11.81 (300)	3
222 / 179	P222GA179A	258.7 (6570)	71.85 (1825)	1172	541 (245)	105.83 (2688)	23.62 (600)		11.81 (300)	3
228 / 180	P228GA180A	258.7 (6570)	71.85 (1825)	1172	541 (245)	105.83 (2688)	23.62 (600)		11.81 (300)	3
240 / 190	P240GA190A	258.7 (6570)	71.85 (1825)	1172	541 (245)	105.83 (2688)	23.62 (600)		11.81 (300)	3
258 / 209	P258GA209A	303.8 (7717)	69.09 (1755)	1360	629 (285)	118.82 (3018)	55.12 (1400)	39.37 (1000)	27.56 (700)	3
264 / 212	P264GA212A	303.8 (7717)	73.03 (1855)	1360	629 (285)	118.82 (3018)	47.24 (1200)	39.37 (1000)	23.62 (600)	3
276 / 220	P276GA220A	303.8 (7717)	73.03 (1855)	1360	629 (285)	118.82 (3018)	47.24 (1200)	39.37 (1000)	23.62 (600)	3
288 / 230	P288GA230A	303.8 (7717)	73.03 (1855)	1360	629 (285)	118.82 (3018)	47.24 (1200)	39.37 (1000)	23.62 (600)	3
294 / 235	P294GA235A	303.8 (7717)	73.03 (1855)	1360	629 (285)	118.82 (3018)	47.24 (1200)	39.37 (1000)	23.62 (600)	3
300 / 243	P300GA243A	303.8 (7717)	73.03 (1855)	1360	629 (285)	118.82 (3018)	47.24 (1200)	39.37 (1000)	23.62 (600)	3
312 / 245	P312GA245A	349.0 (8864)	86.02 (2185)	1548	717 (325)	131.81 (3348)	47.24 (1200)	39.37 (1000)	23.62 (600)	3
336 / 272	P336GA272A	349.0 (8864)	86.02 (2185)	1548	717 (325)	131.81 (3348)	47.24 (1200)	39.37 (1000)	23.62 (600)	3
360 / 288	P360GA288A	360.6 (9161)	91.46 (2323)	1678	810 (367)	147.72 (3752)	47.24 (1200)	39.37 (1000)	23.62 (600)	4
396 / 318	P396GA318A	523.5 (13296)	122.47 (3111)	2322	1015 (460)	201.54 (5119)	78.74 (2000)	39.37 (1000)	39.37 (1000)	5
420 / 335	P420GA335A	523.5 (13296)	122.47 (3111)	2322	1015 (460)	201.54 (5119)	78.74 (2000)	39.37 (1000)	39.37 (1000)	5
444 / 353	P444GA353A	523.5 (13296)	130.34 (3311)	2322	1015 (460)	201.54 (5119)	70.87 (1800)	39.37 (1000)	31.50 (800)	5

Vertical mounting styles with extra creepage distance

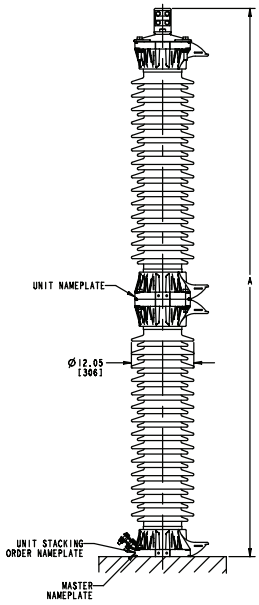
Surge Arrester IEEE Ratings V_r / V_{MCOV} (kV)	Style Number	Creepage Distance inches (mm)	Strike Distance inches (mm)	BIL 1.2/50 µs dry kV_{peak}	Weight (Mass) lbs (kg)	A inches (mm)	B inches (mm)	C inches (mm)	D inches (mm)	Fig
42 / 34.0	P042GB034A	129.3 (3285)	39.21 (996)	586	265 (120)	56.14 (1426)				1
45 / 36.5	P045GB037A	129.3 (3285)	39.21 (996)	586	265 (120)	56.14 (1426)				1
48 / 39.0	P048GB039A	129.3 (3285)	39.21 (996)	586	265 (120)	56.14 (1426)				1
90 / 70.0	P090GB070A	174.5 (4432)	52.20 (1326)	774	342 (155)	69.13 (1756)				1
94 / 73.0	P094GB073A	174.5 (4432)	52.20 (1326)	774	342 (155)	69.13 (1756)				1
96 / 76.0	P096GB076A	174.5 (4432)	52.20 (1326)	774	342 (155)	69.13 (1756)				1
102 / 82.0	P102GB082A	174.5 (4432)	52.20 (1326)	774	342 (155)	69.13 (1756)				1
108 / 84.0	P108GB084A	186.2 (4729)	57.64 (1464)	904	440 (200)	85.04 (2160)				2
108 / 88.0	P108GB088A	186.2 (4729)	57.64 (1464)	904	440 (200)	85.04 (2160)				2
114 / 92.0	P114GB092A	186.2 (4729)	57.64 (1464)	904	440 (200)	85.04 (2160)				2
120 / 98.0	P120GB098A	186.2 (4729)	57.64 (1464)	904	440 (200)	85.04 (2160)				2
126 / 102	P126GB102A	186.2 (4729)	57.64 (1464)	904	440 (200)	85.04 (2160)				2
132 / 106	P132GB106A	258.7 (6570)	63.97 (1625)	1172	506 (230)	105.83 (2688)	31.50 (800)		19.69 (500)	3
138 / 111	P138GB111A	258.7 (6570)	63.97 (1625)	1172	506 (230)	105.83 (2688)	31.50 (800)		19.69 (500)	3
144 / 115	P144GB115A	258.7 (6570)	71.85 (1825)	1172	506 (230)	105.83 (2688)	23.62 (600)		11.81 (300)	3
150 / 121	P150GB121A	258.7 (6570)	71.85 (1825)	1172	506 (230)	105.83 (2688)	23.62 (600)		11.81 (300)	3
162 / 131	P162GB131A	258.7 (6570)	78.42 (1992)	1172	506 (230)	105.83 (2688)				2
168 / 134	P168GB134A	258.7 (6570)	78.42 (1992)	1172	506 (230)	105.83 (2688)				2
172 / 140	P172GB140A	258.7 (6570)	78.42 (1992)	1172	506 (230)	105.83 (2688)				2
180 / 144	P180GB144A	303.8 (7717)	73.03 (1855)	1360	605 (275)	118.82 (3018)	47.24 (1200)	39.37 (1000)	23.62 (600)	3
192 / 152	P192GB152A	303.8 (7717)	76.96 (1955)	1360	594 (270)	118.82 (3018)	31.50 (800)		19.69 (500)	3
198 / 160	P198GB160A	303.8 (7717)	76.96 (1955)	1360	594 (270)	118.82 (3018)	31.50 (800)		19.69 (500)	3
210 / 170	P210GB170A	303.8 (7717)	76.96 (1955)	1360	594 (270)	118.82 (3018)	31.50 (800)		19.69 (500)	3
216 / 173	P216GB173A	303.8 (7717)	84.84 (2155)	1360	594 (270)	118.82 (3018)	23.62 (600)		11.81 (300)	3
222 / 179	P222GB179A	303.8 (7717)	84.84 (2155)	1360	594 (270)	118.82 (3018)	23.62 (600)		11.81 (300)	3
228 / 180	P228GB180A	303.8 (7717)	84.84 (2155)	1360	594 (270)	118.82 (3018)	23.62 (600)		11.81 (300)	3
240 / 190	P240GB190A	303.8 (7717)	84.84 (2155)	1360	594 (270)	118.82 (3018)	23.62 (600)		11.81 (300)	3
258 / 209	P258GB209A	360.6 (9161)	75.71 (1923)	1678	810 (367)	147.72 (3752)	62.99 (1600)	39.37 (1000)	39.37 (1000)	4
258 / 209	P258GC209A	478.3 (12149)	101.61 (2581)	2134	924 (420)	181.50 (4610)	62.99 (1600)	39.37 (1000)	47.24 (1200)	4
264 / 212	P264GB212A	360.6 (9161)	75.71 (1923)	1678	810 (367)	147.72 (3752)	62.99 (1600)	39.37 (1000)	39.37 (1000)	4
264 / 212	P264GC212A	478.3 (12149)	101.61 (2581)	2134	924 (420)	181.50 (4610)	62.99 (1600)	39.37 (1000)	47.24 (1200)	4
276 / 220	P276GB220A	360.6 (9161)	87.52 (2223)	1678	810 (367)	147.72 (3752)	55.12 (1400)	39.37 (1000)	27.56 (700)	4
276 / 220	P276GC220A	478.3 (12149)	101.61 (2581)	2134	924 (420)	181.50 (4610)	62.99 (1600)	39.37 (1000)	47.24 (1200)	4
288 / 230	P288GB230A	360.6 (9161)	87.52 (2223)	1678	810 (367)	147.72 (3752)	55.12 (1400)	39.37 (1000)	27.56 (700)	4
288 / 230	P288GC230A	478.3 (12149)	101.61 (2581)	2134	924 (420)	181.50 (4610)	62.99 (1600)	39.37 (1000)	47.24 (1200)	4
294 / 235	P294GB235A	360.6 (9161)	87.52 (2223)	1678	810 (367)	147.72 (3752)	55.12 (1400)	39.37 (1000)	27.56 (700)	4
294 / 235	P294GC235A	478.3 (12149)	101.61 (2581)	2134	924 (420)	181.50 (4610)	62.99 (1600)	39.37 (1000)	47.24 (1200)	4
300 / 243	P300GB243A	349.0 (8864)	82.08 (2085)	1548	717 (325)	131.81 (3348)	55.12 (1400)	39.37 (1000)	27.56 (700)	3
300 / 243	P300GC243A	433.1 (11002)	96.49 (2451)	1946	891 (405)	168.51 (4280)	70.87 (1800)	39.37 (1000)	39.37 (1000)	4
300 / 240	P300GD240A	523.5 (13296)	122.47 (3111)	2322	1012 (460)	194.49 (4940)	62.99 (1600)	39.37 (1000)	39.37 (1000)	4
312 / 245	P312GB245A	433.1 (11002)	96.49 (2451)	1946	891 (405)	168.51 (4280)	70.87 (1800)	39.37 (1000)	39.37 (1000)	4
312 / 245	P312GC245A	523.5 (13296)	122.47 (3111)	2322	1012 (460)	194.49 (4940)	62.99 (1600)	39.37 (1000)	39.37 (1000)	4
336 / 272	P336GB272A	433.1 (11002)	96.49 (2451)	1946	891 (405)	168.51 (4280)	70.87 (1800)	39.37 (1000)	39.37 (1000)	4
336 / 272	P336GC272A	523.5 (13296)	122.47 (3111)	2322	1012 (460)	194.49 (4940)	62.99 (1600)	39.37 (1000)	39.37 (1000)	4
360 / 288	P360GB288A	433.1 (11002)	108.30 (2751)	1946	891 (405)	168.51 (4280)	55.12 (1400)	39.37 (1000)	27.56 (700)	4
360 / 288	P360GC288A	523.5 (13296)	122.47 (3111)	2322	1012 (460)	194.49 (4940)	62.99 (1600)	39.37 (1000)	39.37 (1000)	4
396 / 318	P396GB318A	562.5 (14287)	127.83 (3247)	2352	1166 (530)	225.25 (5721)	78.74 (2000)	39.37 (1000)	47.24 (1200)	6
396 / 318	P396GC318A	698.0 (17728)	166.80 (4237)	3096	1353 (615)	264.22 (6711)	78.74 (2000)	39.37 (1000)	47.24 (1200)	6
420 / 335	P420GB335A	562.5 (14287)	127.83 (3247)	2352	1166 (530)	225.25 (5721)	78.74 (2000)	39.37 (1000)	47.24 (1200)	6
420 / 335	P420GC335A	698.0 (17728)	166.80 (4237)	3096	1353 (615)	264.22 (6711)	78.74 (2000)	39.37 (1000)	47.24 (1200)	6
444 / 353	P444GB353A	562.5 (14287)	135.70 (3447)	2352	1166 (530)	225.25 (5721)	70.87 (1800)	39.37 (1000)	39.37 (1000)	6
444 / 353	P444GC353A	698.0 (17728)	166.80 (4237)	3096	1353 (615)	264.22 (6711)	78.74 (2000)	39.37 (1000)	47.24 (1200)	6

Figures

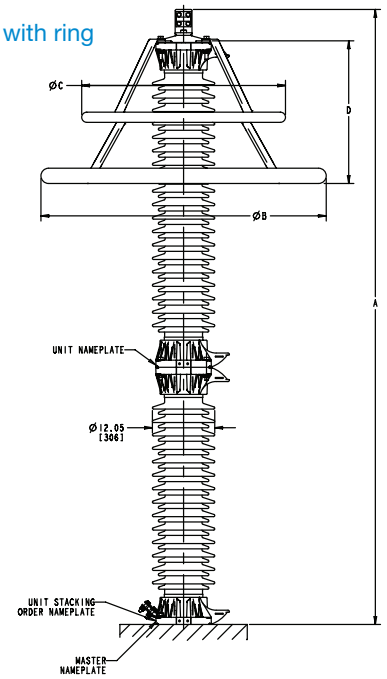
1 Single housing



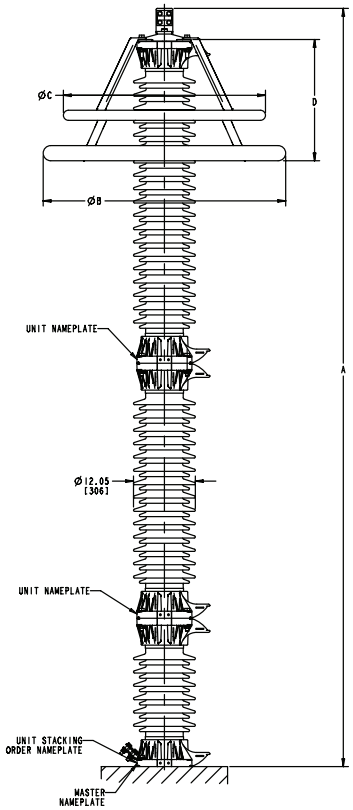
2 Double housing



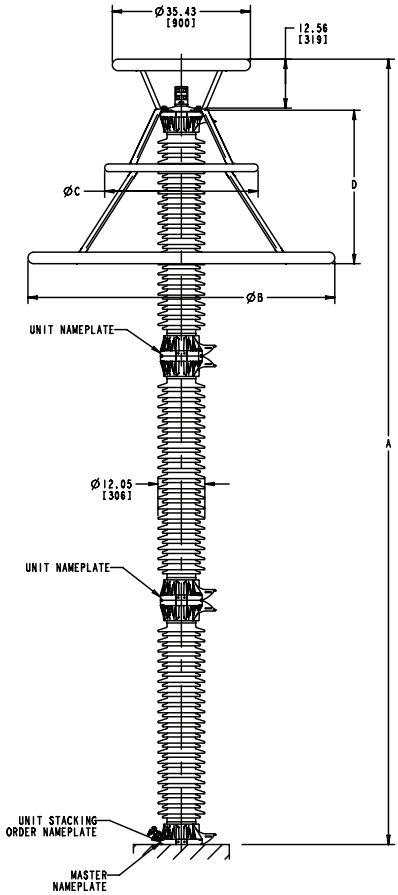
3 Double housing with ring



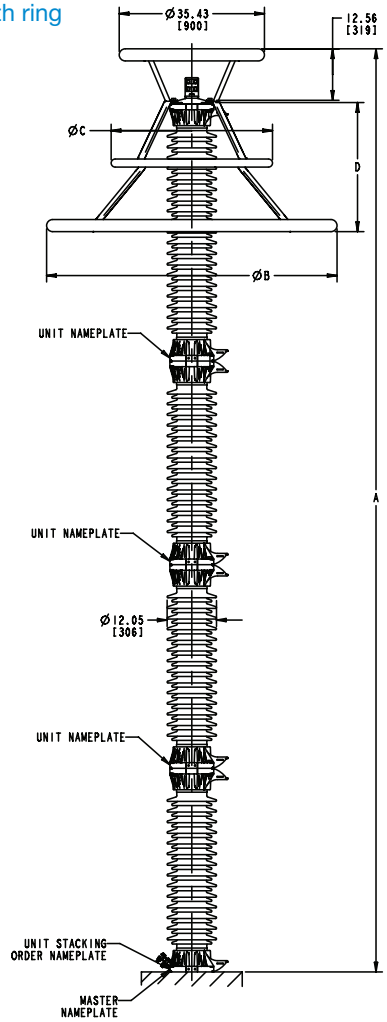
4 Triple housing with ring



5 Triple housing with ring and corona



6 Quadruple housing with ring



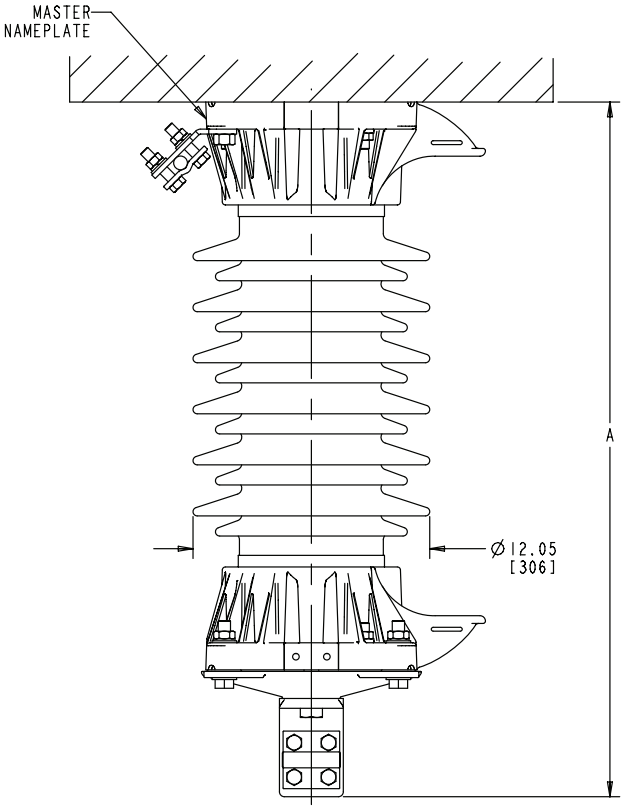
Optional mountings

Under-hung mounted styles

Available for all ratings. To select, add ‘UH’ to the end of the style number.

(Example: 15 kV P015GA012AUH)

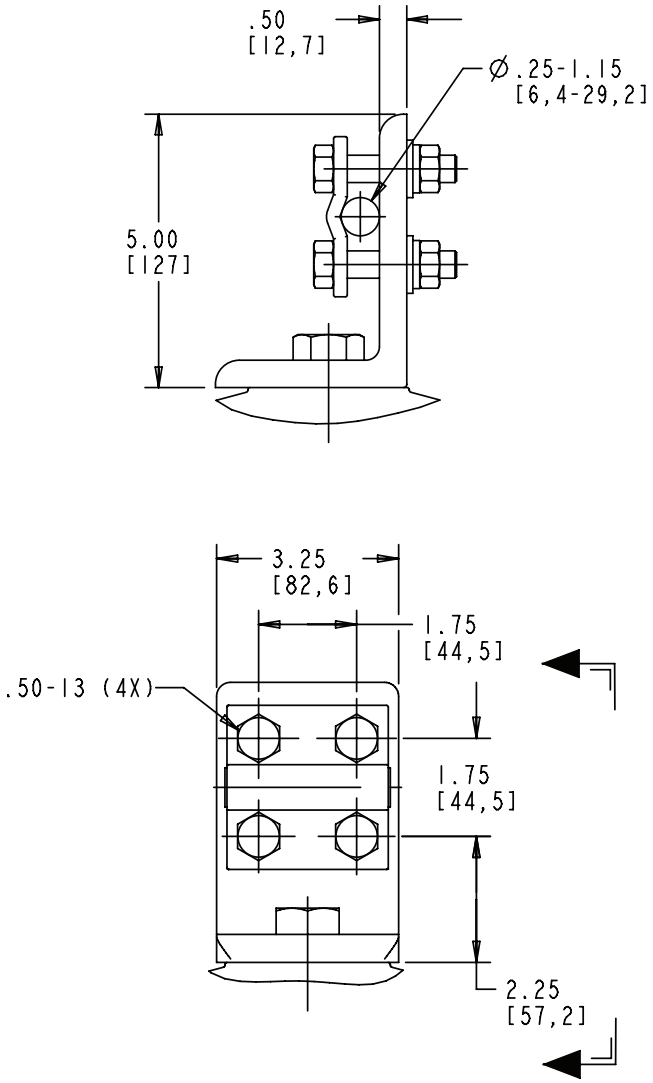
Single housing under-hung



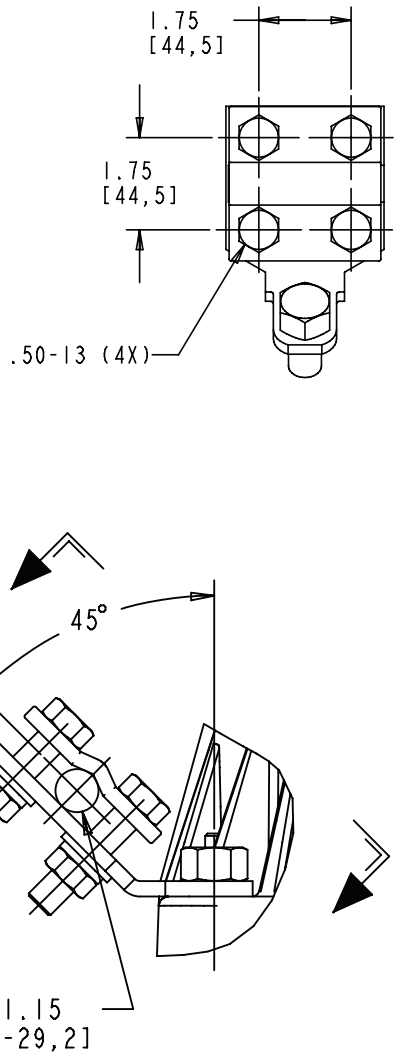
Multi-rated arresters available upon request.

Standard hardware

Line terminal
Aluminum / galvanized steel



Ground terminal
Galvanized steel



Note: Line and ground terminals can accommodate copper or aluminum cable size Number 2 to 1000 MCM / 0.25 to 1.15 in. diameter. Ground terminal can be located on any lug.

Notes

Phase-to-ground clearance

The phase-to-ground clearance in substations is usually based on the selected standard rated lightning and switching impulse withstand voltages. International standards, e.g. IEC 60071-2, recommend minimum clearances.

In general, the clearance between a grounded object and a surge arrester should be the same as the phase-to-ground clearance selected for other high voltage equipment in a substation. If it is not possible to use the normal phase-to-ground clearance in special applications of EXLIM-P Surge Arresters, a smaller clearance may be chosen, considering the protective characteristics of the arrester. At system voltages 24 kV and below, the margin between the rated withstand voltage of the substation and the protective level of the surge arrester is large. Furthermore, distance effects by fast transients do not exist in the immediate vicinity of the surge arrester.

Thus, the recommended minimum phase-to-ground clearance for EXLIM-P Surge Arresters, with regard to lightning and switching overvoltages are presented in Figure 1. These clearances are based on IEC 60071-2, Table VI, and on the protective characteristics of the surge arrester. They include safety margins and altitude correction.

The *Adjusted Protective Level* to be used in Figure 1, is defined as:

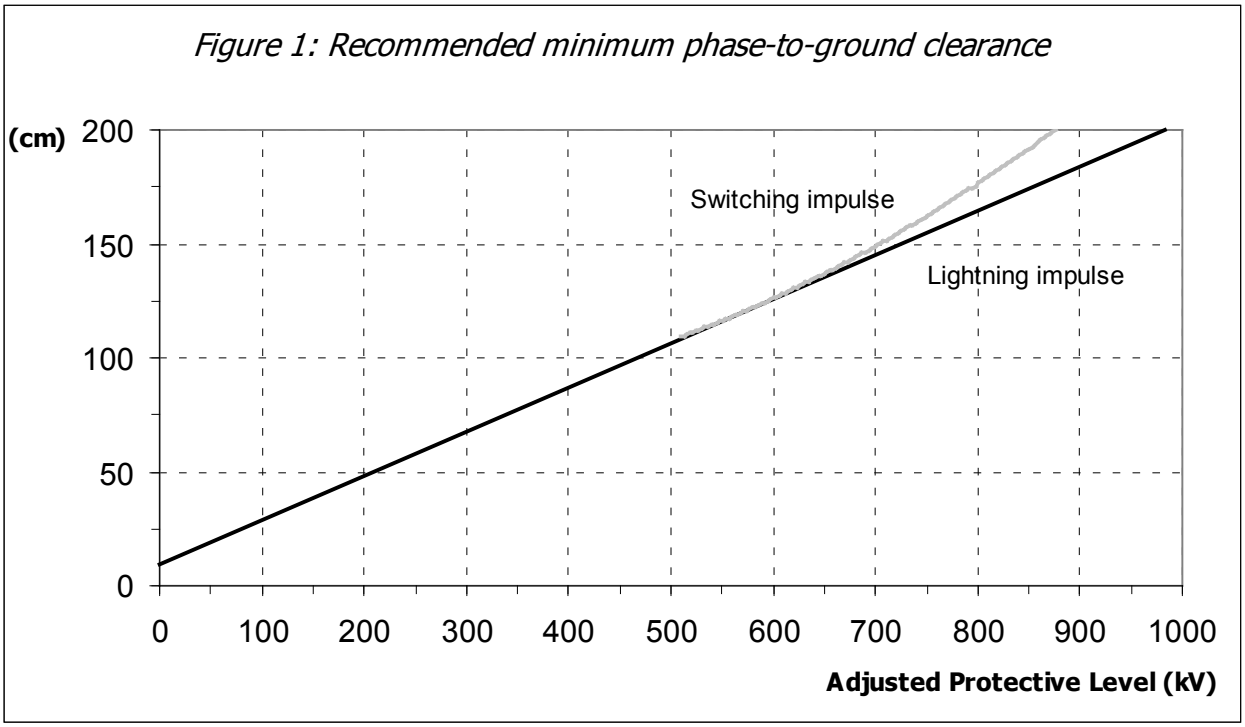
- *For lightning impulse:*
  $L_{pl} \times 1.15 \times e^{H/8150}$
- *For switching impulse:*
  $S_{pl} \times 1.10 \times e^{H/8150}$

H is the altitude in meters above sea level.

L_{pl} and S_{pl} are the lightning and switching impulse protective levels for the selected EXLIM-P Surge Arresters at the respective coordinating currents.

The minimum clearance is determined either by lightning or switching impulse withstand, whichever renders a larger value.

Figure 1: Recommended minimum phase-to-ground clearance



Phase-to-phase clearance

The phase-to-phase clearance for high voltage equipment in a substation is normally based on the selected standard rated lightning and switching impulse phase-to-phase withstand voltages. International standards, e.g. IEC 60071-3 recommend minimum phase-to-phase clearances. Note that the normal election of surge arrester protective levels does not directly protect the phase-to-phase insulation.

In general, the clearance between surge arresters in adjacent phases should be the same as the phase-to-phase clearance selected for other high voltage equipment in the substation. If it is not possible to use the normal phase-to-phase clearance in a special application of EXLIM-P Surge Arresters, the minimum clearance with regard to lightning overvoltages can be derived from Figure 2.

The clearances shown in Figure 2 are based on the assumption that one phase is subjected to a lightning overvoltage, while the voltage on the adjacent phase is at the peak of the maximum power frequency operating voltage (opposite polarity). Obviously, these clearances will also cover the case of lightning overvoltages of the same polarity appearing simultaneously on two or three phases.

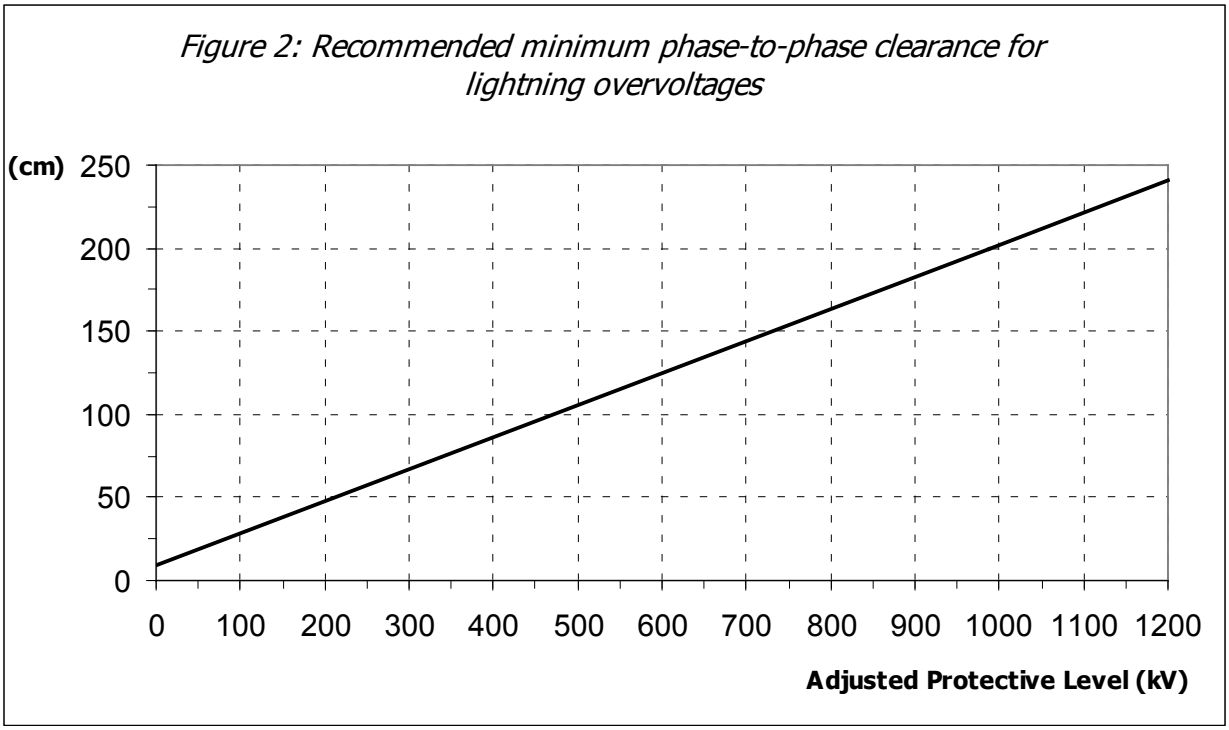
The *Adjusted Protective Level* shown in Figure 2 is based on the lightning protective characteristics of the selected EXLIM-P Surge Arresters. It includes safety margin and altitude correction factors and is defined as:

$L_{pl} \times 1.15 \times e^{H/8150} + V_m \times \sqrt{2} / \sqrt{3}$

- V_m is the highest voltage for equipment according to IEC 60071-1, which is usually equal to the highest system voltage.
- L_{pl} is the lightning impulse protective level for the selected EXLIM-P Surge Arrester.

The minimum phase-to-phase clearance for arresters with respect to switching overvoltages should always be based on the selected standard rated switching impulse phase-to-phase withstand voltage for the substation. Consequently, the clearances specified in IEC 60071-3, Table VI, are valid for most applications of arresters. If a special application requires a minimized phase spacing, the favorable electrode configuration established by the grading rings on EXLIM-P Surge Arresters may permit a further reduction of the phase-to-phase clearance.

Figure 2: Recommended minimum phase-to-phase clearance for lightning overvoltages



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Document Number: 2GNM110065 / December 2011