EXLIM R

Surge Arrester - System Voltage 2 kV to 170 kV

Metal Oxide Surge Arrester EXLIM R

Protection of switchgear, transformers and other equipment in high voltage systems against atmospheric and switching overvoltages. For use when requirements of lightning intensity, energy capability and pollution are light.

Application

The EXLIM R gapless metal oxide arrester meets or exceeds all Station Class requirements of ANSI C62.11 (IEEE Standards for Metal Oxide Surge Arresters for AC Power Circuits). The EXLIM R arrester is designed to meet the following performance data:

Performance Data

Maximum system voltages (V_m)	2.52 - 170 kV_{rms}
Duty cycle rated voltages (V_r)	3 - 168 kV_{rms}
Classifying current (ANSI / IEEE)	10 kA_{peak}
Discharge current withstand strength:	
High current 4 / 10 µs	100 kA_{peak}
Low current 2000 µs	550 A_{peak}
Energy capability:	
2 impulses, (IEC Cl. 7.5.5) Fulfills requirements of ANSI transmission-line discharge test for 170 kV systems	6.3 kJ / kV of MCOV
Short-circuit / Pressure relief capability:	
Ratings 3 - 39 kV	65 $kA_{rms\ sym}$
Ratings 45 - 168 kV	80 $kA_{rms\ sym}$
Cantilever strength (DIN 48113)	5530 ft - lbs / 7500 Nm
Service conditions:	
Ambient temperature	-40 °C to + 45 °C
Design altitude	6000 ft / 1830 m
Frequency	15 - 62 Hz

1) Higher strength designs available on request
2) Higher altitude designs available on request

Nameplate

ABB Inc.

TYPE EXLIM STATION CLASS SURGE ARRESTER

STYLE NO.	SERIAL NO.	PRESSURE RELIEF CLASS kA
RATING kV	MCOV RATING kV	WEIGHT

UNIT STACKING ORDER

	UNIT STYLE NO.	UNIT SERIAL NO.	MCOV kV	ALTITUDE 6000 ft.
BOTTOM THIS UNIT				GRADING RING ASSEMBLY
2ND				
3RD				

BEFORE INSTALLING READ INSTRUCTIONS IL 38-336-1 MADE IN U.S.A.

Outlines

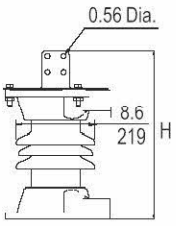


Figure 1

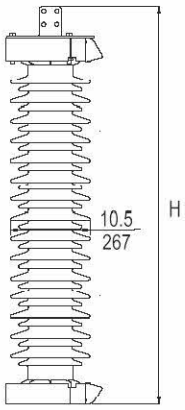


Figure 2

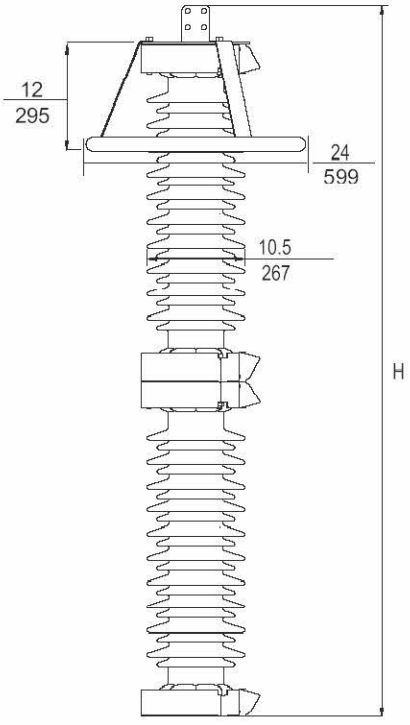


Figure 3

Guaranteed Performance Data

Power frequency voltage, kV rms						Maximum residual voltage with current wave, kV peak						
Nom.	Max.	Rating	MCOV	TOV (5)		SPL (6)	LPL (7) 8/20 µs					FOW (8) 0.5 µs
V_n (1)	V_m (2)	V_r (3)	(4)	1.0 s	10 s	30/60 µs	3 kA	5 kA	10 kA	20 kA	40 kA	10 kA
2.40	2.52	3	2.55	3.6	3.4	9.90	11.1	11.6	12.3	13.8	15.8	14.6
4.16	4.37	3	2.55	3.6	3.6	9.90	11.1	11.6	12.3	13.8	15.8	14.6
4.16	4.37	6	5.10	4.8	4.6	13.3	13.9	14.5	15.4	17.3	19.8	18.2
4.80	5.04	6	5.10	4.8	4.6	13.3	13.9	14.5	15.4	17.3	19.8	18.2
6.90	7.24	6	5.10	4.8	4.6	13.3	13.9	14.5	15.4	17.3	19.8	18.2
6.90	7.24	9	7.65	10.7	10.2	19.8	22.2	23.2	24.6	27.6	31.5	29.1
6.90	7.24	10	8.40	11.9	11.4	22.5	25.0	26.1	27.7	31.1	35.5	32.7
8.32	8.73	6	5.10	4.8	4.6	13.3	13.9	14.5	15.4	17.3	19.8	18.2
8.32	8.73	9	7.65	10.7	10.2	19.8	22.2	23.2	24.6	27.6	31.5	29.1
8.32	8.73	10	8.40	11.9	11.4	22.5	25.0	26.1	27.7	31.1	35.5	32.7
8.32	8.73	12	10.2	14.3	13.7	27.2	30.5	31.8	33.8	37.9	43.3	39.9
12.0	12.6	9	7.65	10.7	10.2	19.8	22.2	23.2	24.6	27.6	31.5	29.1
12.0	12.6	10	8.40	11.9	11.4	22.5	25.0	26.1	27.7	31.1	35.5	32.7
12.0	12.6	12	10.2	14.3	13.7	27.2	30.5	31.8	33.8	37.9	43.3	39.9
12.0	12.6	15	12.7	17.9	17.1	32.8	36.0	37.6	40.0	44.8	51.2	47.2
12.4	13.1	9	7.65	10.7	10.2	19.8	22.2	23.2	24.6	27.6	31.5	29.1
12.4	13.1	10	8.40	11.9	11.4	22.5	25.0	26.1	27.7	31.1	35.5	32.7
12.4	13.1	12	10.2	14.3	13.7	27.2	30.5	31.8	33.8	37.9	43.3	39.9
12.4	13.1	15	12.7	17.9	17.1	32.8	36.0	37.6	40.0	44.8	51.2	47.2
12.4	13.1	18	15.3	21.5	20.5	39.6	44.3	46.3	49.2	55.2	63.0	58.1
13.2	13.9	10	8.40	11.9	11.4	22.5	25.0	26.1	27.7	31.1	35.5	32.7
13.8	14.5	12	10.2	14.3	13.7	27.2	30.5	31.8	33.8	37.9	43.3	39.9
13.8	14.5	15	12.7	17.9	17.1	32.8	36.0	37.6	40.0	44.8	51.2	47.2
13.8	14.5	18	15.3	21.5	20.5	39.6	44.3	46.3	49.2	55.2	63.0	58.1
20.7	21.8	15	12.7	17.9	17.1	32.8	36.0	37.6	40.0	44.8	51.2	47.2
20.7	21.8	18	15.3	21.5	20.5	39.6	44.3	46.3	49.2	55.2	63.0	58.1
20.7	21.8	21	17.0	25.1	23.9	48.3	52.9	55.2	58.5	65.5	74.9	63.2
20.7	21.8	24	19.5	28.7	27.3	52.3	57.4	59.8	63.4	71.1	81.2	68.5
20.7	21.8	27	22.0	32.2	30.7	61.1	67.0	69.9	74.1	81.5	91.1	80.0
22.8	24.0	18	15.3	21.5	20.5	39.6	44.3	46.3	49.2	55.2	63.0	58.1
23.0	24.1	21	17.0	25.1	23.9	48.3	52.9	55.2	58.5	65.5	74.9	63.2
23.0	24.1	24	19.5	28.7	27.3	52.3	57.4	59.8	63.4	71.5	81.2	68.5
23.0	24.1	27	22.0	32.2	30.7	61.1	67.0	69.9	74.1	81.5	91.1	80.0
23.0	24.1	30	24.4	35.8	34.0	61.7	74.1	77.5	82.4	92.3	106	89.0
24.9	26.1	18	15.3	21.5	20.5	39.6	44.3	46.3	49.2	55.2	63.0	58.1
24.9	26.1	21	17.0	25.1	23.9	48.3	52.9	55.2	58.5	65.5	47.9	63.2
24.9	26.1	24	19.5	28.7	27.3	52.3	57.4	59.8	63.4	71.1	81.2	68.5
24.9	26.1	27	22.0	32.2	30.7	61.1	67.0	69.9	74.1	81.5	91.1	80.0
24.9	26.1	30	24.4	35.8	34.0	61.7	74.1	77.5	82.4	92.3	106	89.0
24.9	26.1	36	29.0	43.0	40.8	74.1	89.0	92.9	98.8	111	127	107

Power frequency voltage, kV rms							Maximum residual voltage with current wave, kV peak					
Nom.	Max.	Rating	MCOV	TOV (5)		SPL (6)	LPL (7) 8/20 µs					FOW (8) 0.5 µs
Vn (1)	Vm (2)	Vr (3)	(4)	1.0 s	10 s	30/60 µs	3 kA	5 kA	10 kA	20 kA	40 kA	10 kA
34.5	36.2	27	22.0	32.2	30.7	61.1	67.0	69.9	74.1	81.5	91.1	80.0
34.5	36.2	30	24.4	35.8	34.0	61.7	74.1	77.5	82.4	92.3	106	89.0
34.5	36.2	36	29.0	43.0	40.8	74.1	89.0	92.9	98.8	111	127	107
34.5	36.2	39	31.5	46.6	44.2	80.3	96.3	101	107	120	137	116
34.5	36.2	45	36.5	53.7	51.2	92.6	106	110	117	129	144	127
46.0	48.3	36	29.0	43.0	40.8	74.1	89.0	92.9	98.8	111	127	107
46.0	48.3	39	31.5	46.6	44.2	80.3	96.3	101	107	120	137	116
46.0	48.3	45	36.5	53.7	51.0	92.6	106	110	117	129	144	127
46.0	48.3	48	39	57.3	54.6	98.8	113	118	125	138	154	135
46.0	48.3	54	42	64.5	61.5	112	127	132	140	154	172	151
46.0	48.3	60	48	71.6	68.3	124	141	147	156	172	192	169
46.0	48.3	72	57	86.0	81.9	149	176	184	195	215	240	211
69.0	72.5	54	42	64.5	61.5	112	127	132	140	154	172	151
69.0	72.5	60	48	71.6	68.3	124	141	147	156	172	192	169
69.0	72.5	72	57	86.0	81.9	149	176	184	195	215	240	211
69.0	72.5	90	70	107	102	186	212	221	234	257	288	253
69.0	72.5	96	76	115	109	198	225	235	249	274	306	269
115	123	90	70	107	102	186	212	221	234	257	288	253
115	123	96	76	115	109	198	225	235	249	274	306	269
115	123	108	84	129	123	223	253	264	280	308	344	302
115	123	120	98	143	137	247	281	293	311	342	383	336
115	123	132	106	158	150	272	309	323	342	376	421	369
115	123	144	115	172	164	308	337	352	373	410	459	403
138	145	108	84	129	123	223	253	264	280	308	344	302
138	145	120	98	143	137	247	281	293	311	342	383	336
138	145	132	106	158	150	272	309	323	342	376	421	369
138	145	144	115	172	164	308	337	352	373	410	459	403
138	145	168	131	201	191	359	394	411	436	480	536	471
161	170	132	106	158	150	272	309	323	342	376	421	369
161	170	144	115	172	164	308	337	352	373	410	459	403
161	170	168	131	201	191	359	394	411	436	480	536	471

(1) V_n = Nominal System Voltage per ANSI C84.1

(2) V_m = Maximum System Voltage per ANSI C84.1

(3) V_r = Duty Cycle Rated Voltage per ANSI C62.11

(4) MCOV = Maximum Continuous Operating Voltage per ANSI C62.11

(5) TOV = Temporary Overvoltage with No Prior Energy

(6) SPL = Switching Protective Level

500 A 3 - 132 kV
1,000 A 144 - 168 kV

(7) LPL = Lightning Protective Level

(8) FOW = Front of Wave

Technical data for housings

Rating V_r	Style No.	Height H		Creepage		Weight		Phase to Ground S		Phase to Phase T		Figure
		in	mm	in	mm	lb	kg	in	mm	in	mm	
3	R003MA002A	17	431	7.4	187	38	17	8	203	14	356	1
6	R006MA005A	17	431	7.4	187	39	18	9	229	14	356	1
9	R009MA008A	19	482	15	381	45	20	9	229	15	381	1
10	R010MA008A	19	482	15	381	45	20	10	254	15	381	1
12	R012MA010A	19	482	15	381	46	21	11	279	15	381	1
15	R015MA012A	23	584	24	609	55	25	12	305	16	406	1
18	R018MA015A	23	584	24	609	56	25	13	330	17	432	1
21	R021MA017A	23	584	24	609	57	26	14	356	18	457	1
24	R024MA019A	23	584	24	609	58	26	15	381	19	483	1
27	R027MA022A	27	685	39	990	72	33	16	406	20	508	1
30	R030MA024A	27	685	39	990	74	34	17	432	21	533	1
36	R036MA029A	27	685	39	990	75	34	19	483	23	584	1
39	R039MA031A	27	685	39	990	76	35	19	483	24	610	1
45	R045XA037A	29	737	56.8	1442	106	48	20	508	24	610	2
48	R048XA039A	29	737	56.8	1442	107	49	20	508	25	635	2
54	R054XA042A	29	737	56.8	1442	108	49	21	533	25	635	2
60	R060XA048A	40	1016	91.3	2319	128	58	21	533	26	660	2
72	R072XA057A	40	1016	91.3	2319	136	62	22	559	27	686	2
90	R090XA070A	40	1016	91.3	2319	143	65	26	660	32	813	2
96	R096XA076A	45	1143	107	2738	163	74	28	711	34	864	2
108	R108XA084A	53	1346	133	3395	206	93	32	813	38	965	2
110	R110XA088A	53	1346	133	3395	207	94	33	838	39	991	2
120	R120XA098A	53	1346	133	3395	212	96	35	889	42	1067	2
132	R132XA106A	53	1346	133	3395	224	102	39	991	45	1143	2
144	R144XA115A	65	1651	148	3759	249	113	50	1270	62	1575	3
168	R168XA131A	76	1930	182	4622	266	121	57	1448	69	1753	3

1) Increase clearances "S" and "T". 3% per each 1000 ft / 305 m over 6000 ft / 1830 m

2) Arrester assembly consists of arrester unit, line, ground terminals and grading rings for ratings 144 kV and above

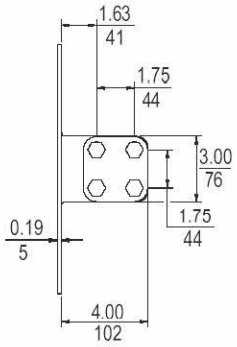
3) Minimum dimensions for arresters, other apparatus standards and other specifications or local codes may require greater spacing

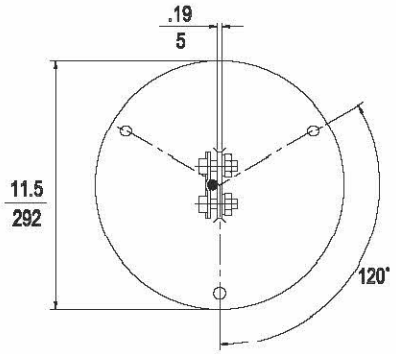
4) Line and ground terminals can accomodate Cu or Al cable size Number 2 to 1000 MCM, (0.25 in / 6.35 mm to 1.19 in / 30 mm diameter)

5) Height accuracy: 3 - 132 kV + / - 1 in, 144 - 168 kV + / - 2 inches

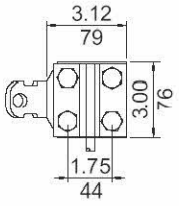
Standard Hardware

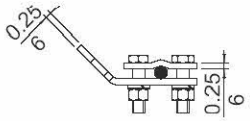
Line terminal





Ground terminal

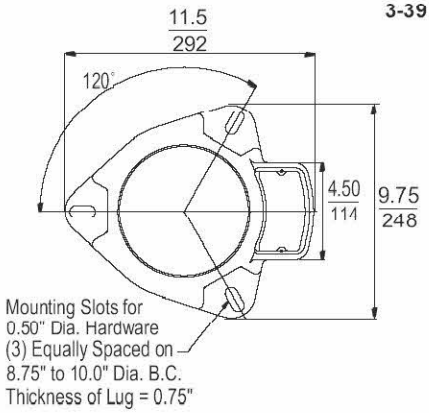




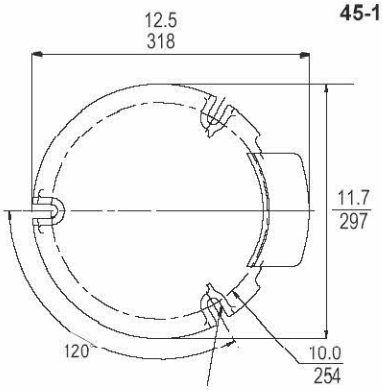
1) Line and ground terminals can accomodate copper or aluminum cable size Number 2 to 1000 MCM / 0.25 to 1.19 in / 6 to 30 mm diameter. Ground terminal can be located on any lug.

Drilling plan

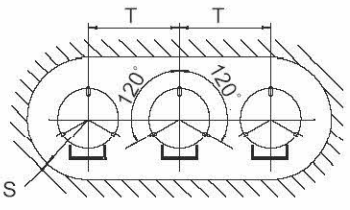
3-39 kV



45-168 kV



All Ratings



3 Ø Installation Layout