



ZIP Intermediate Class Surge Arresters



The type ZIP intermediate class arresters offer the benefits of polymer housings for system voltages up to 161 kV. The arresters are approximately 1/5 the weight of the porcelain equivalent. Handling and installation become much easier tasks. Also, the risk of damage to the housing is reduced compared to porcelain.

Performance

ZIP:
3 kV through 144 kV duty cycle rating, 2.55 kV through 115 kV MCOV, 2.4 kV through 161 kV system line-line voltage

The arrester designs are tested in accordance with the latest industry standards for metal oxide arresters. The ZIP arresters consistently withstand the following minimum design tests:

- High Current-Short Duration: 100 kA crest
 - Duty Cycle per ANSI: 10 kA
 - Nominal Discharge Current per IEC: 10 kA
 - Line Discharge Class per IEC: Class 2
 - Minimum Energy Capability: 5.0 kJ/kV MCOV
 - Fault Withstand Capability:
 - ZIP—50 kA rms
 - Working Cantilever Strength:
 - ZIP—5000 in.-lbs.
- ZIP RUS listed

Design

The design consists of a number of metal oxide valve elements contained within a fiberglass winding and then inserted into the polymer housing. Type ZIP arresters are shipped as single units for all ratings. There is no need to combine sections, even for the 144 kV duty cycle rating. The metal oxide valve elements combine excellent protective characteristics with steady state performance to maximize protection over many years of service.

Fault Current Withstand

The severity of a failure depends on the duration and magnitude of the available fault current conducting through the arrester at the time of failure. This type of arrester, with its polymer housing, eliminates the potential danger of porcelain fragmentation. The design uses a fiberglass epoxy wrap to relieve the pressure that is present during a fault.

Benefits

The use of polymer housings for our arresters provides many benefits over porcelain designs.

- **LIGHTWEIGHT**—The lightweight design provides much easier handling and installation. The polymer arresters are less than 1/5 the weight of the porcelain equivalents. The burden on mounting structures and personnel is greatly reduced.
- **REDUCED CLEARANCES**—The smaller physical size of the polymer housing and the line side of the arrester allow the clearances to be reduced. This provides added flexibility with design and layout since they can be used in tighter areas.
- **SINGLE UNIT DESIGN**—The single unit design simplifies installation by reducing handling that was previously required for multi-section porcelain designs. This also provides improved contamination performance over multi-unit arresters.
- **DAMAGE RESISTANT**—The polymer housings resist damage from handling where porcelain units are most vulnerable to chipping and breakage.
- **SAFETY**—The ZIP arresters minimize safety hazards to personnel and nearby equipment that exists with porcelain housings.

Reliability

Each completed ZIP arrester unit must pass the following electrical tests: reference voltage, power loss, and RIV.



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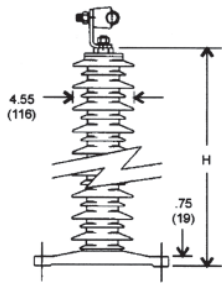


Figure 1

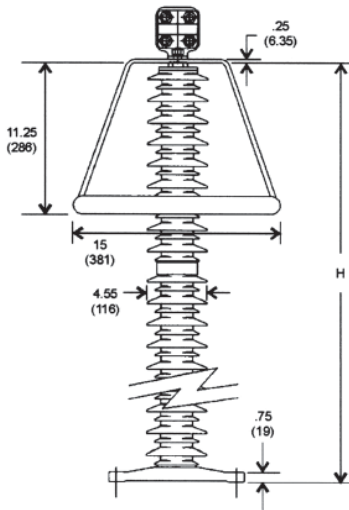


Figure 2

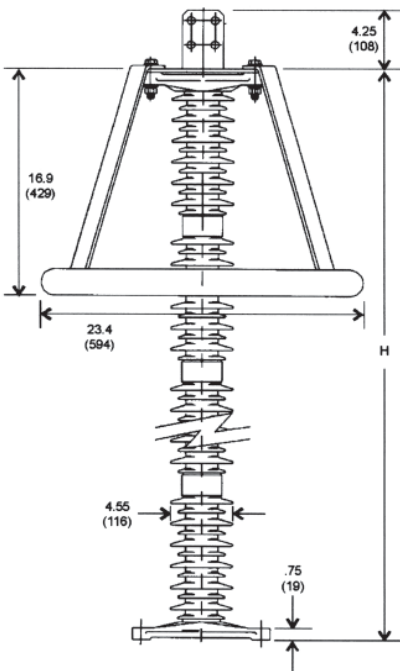
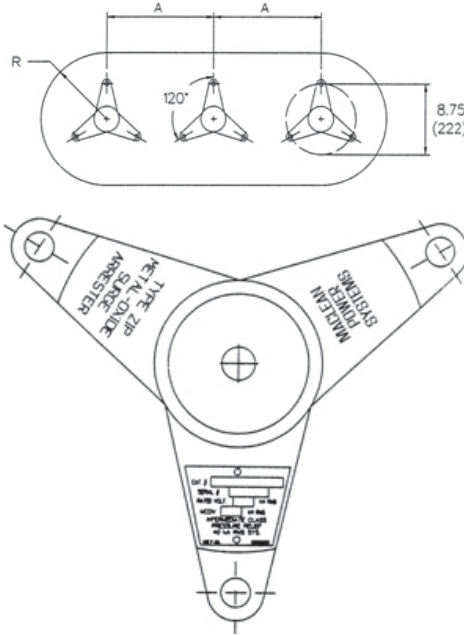


Figure 3



Three Phase Installation Layout

The holes for mounting are .56" (42 mm) for 1/2" bolts. Mounting bolts and washers are not furnished with arrester.

Nameplates

In addition to the information that is included on the tripod base, a nameplate is attached to the casting to provide all of the required arrester details. The catalog number, the rated voltage, the maximum continuous operating voltage, and the pressure relief current rating are shown. The serial number includes information about the time of manufacture.

Physical Characteristics and Clearances

Catalog Number	Figure	kV Rating	MCOV kV	Total Height		Creepage		Minimum Clearances ¹				Weight		
				In	Mm	In	Mm	A		R		Lb	Kg	
								In	Mm	In	Mm			
ZIP0003	1	3	2.55	6.80	173	15.70	400	9.5	241	5.5	140	8.0	3.6	
ZIP0006		6	5.10	6.80	173							9.0	4.1	
ZIP0009		9	7.65	6.82	173							11.0	5.0	
ZIP0010		10	8.40	6.87	175	15.80	401			5.8	147	12.0	5.4	
ZIP0012		12	10.20	6.85	174							14.0	6.4	
ZIP0015		15	12.70	8.31	211							20.20	512	7.8
ZIP0018		18	15.30	9.22	234	22.00	559			12.0	5.4			
ZIP0021		21	17.00	10.70	272	26.40	671			14.0	6.4			
ZIP0024		24	19.50	12.10	308	30.70	781			10.5	267	8.8	224	15.0
ZIP0027		27	22.00	13.10	333	33.70	856	16.0	7.3					
ZIP0030		30	24.40	14.60	370	38.10	967	12.5	318					10.8
ZIP0033		33	26.70	15.90	403	40.30	1024			18.0	8.2			
ZIP0036		36	29.00	16.80	428	44.20	1122			19.0	8.7			
ZIP0039		39	31.50	18.30	466	48.60	1234	13.5	343	11.8	300	18.0	8.2	
ZIP0042		42	34.00	19.20	489	51.40	1307	14.5	369	12.8	326	19.0	8.7	
ZIP0045		45	36.50	21.30	542	54.50	1385	15.5	394	13.8	351	20.0	9.1	
ZIP0048		48	39.00	23.00	583	61.70	1567	16.5	419	14.8	376	24.0	10.9	
ZIP0054		54	42.00	24.90	634	67.60	1718	18.5	470	16.8	427	25.0	11.3	
ZIP0060		60	48.00	27.90	708	76.40	1940	20.5	521	18.8	478			
ZIP0066		66	54.00	30.50	774	80.80	2054	23.5	597	21.8	554	27.0	12.3	
ZIP0072		72	57.00	32.40	823	88.60	2251					29.0	13.2	
ZIP0084		84	68.00	37.20	945	103.00	2620	25	635	23.30	592	32.40	14.70	
ZIP0090		2	90	70.00	41.40	1051	109.00	2775	40.0	1016	33.0	838	41.0	18.6
ZIP0096			96	76.00	43.80	1112	119.00	3027	42.0	1067	35.0	889	43.0	19.6
ZIP0108	108		84.00	48.00	1218	133.00	3379	46.0	1168	39.0	991	47.0	21.4	
ZIP0120	120		98.00	53.30	1355	149.00	3788	49.0	1245	42.0	1067	51.0	23.1	
ZIP0132	132		106.00	59.30	1507	161.00	4088	51.0	1296	44.0	1118	55.0	25.0	
ZIP0144	3	144	115.00	63.50	1613	177.00	4507	67.0	1702	55	1397	73.0	33.2	

Notes:

1) These minimum clearances are determined by the protective capabilities of the arresters and they are secondary to any other clearance requirement that may exist for specific applications.



ZIP Intermediate Class Surge Arresters

Electrical Characteristics												
Catalog Number	Voltage Rating (kV-rms)	MCOV (kV-rms)	TOV ¹		Max Equip FOW ² (kV-Crest)	Max Switch Surge ³ (kV-Crest)	Maximum Discharge Voltage (kV-Crest) Using an 8/20 μ s Current Impulse					
			1 s (kV-rms)	10 s (kV-rms)			1.5 kA	3.0 kA	5.0 kA	10 kA	20 kA	40 kA
ZIP0003	3	2.55	3.7	3.5	8.55	6.34	6.79	7.17	7.50	8.09	8.96	10.1
ZIP0006	6	5.10	7.41	7.04	17.1	12.7	13.6	14.3	15	16.2	17.9	20.2
ZIP0009	9	7.65	11.10	10.6	25.9	19.2	20.5	21.7	22.7	24.5	27.1	30.5
ZIP0010	10	8.40	12.20	11.6	28.3	21	22.5	23.7	24.8	26.8	29.6	33.4
ZIP0012	12	10.20	14.80	14.1	34.2	25.4	27.2	28.7	30	32.4	35.8	40.4
ZIP0015	15	12.70	18.40	17.5	43.1	32	34.2	36.1	37.8	40.8	45.1	50.8
ZIP0018	18	15.30	22.20	21.1	51.3	38.1	40.8	43	45	48.6	53.8	60.6
ZIP0021	21	17.00	24.70	23.5	56.6	42	44.9	47.5	49.6	53.6	59.3	66.8
ZIP0024	24	19.50	28.30	26.9	68.5	50.8	54.3	57.4	60	64.8	71.7	80.7
ZIP0027	27	22.00	31.90	30.4	77.3	57.4	61.4	64.8	67.8	73.2	81	91.2
ZIP0030	30	24.40	35.40	33.7	83.5	61.9	66.2	70	73.2	79	87.4	98.4
ZIP0033	33	26.70	38.80	36.9	91.9	68.2	72.9	77	80.6	86.9	96.3	108
ZIP0036	36	29.00	42.10	40	98.9	73.4	78.5	82.9	86.7	93.5	104	117
ZIP0039	39	31.50	45.70	43.5	109	80.5	86.1	90.9	95.1	103	114	128
ZIP0042	42	34.00	49.40	47	117	86.7	92.7	97.9	102	111	122	138
ZIP0045	45	36.50	53.00	50.4	125	92.9	99.4	105	110	119	131	148
ZIP0048	48	39.00	56.60	53.9	137	102	109	115	120	130	143	161
ZIP0054	54	42.00	61.00	58	155	115	123	130	136	146	162	182
ZIP0060	60	48.00	69.70	66.3	167	124	132	140	146	158	175	197
ZIP0066	66	54.00	78.40	74.6	184	136	146	154	161	174	193	217
ZIP0072	72	57.00	82.80	78.7	198	147	157	166	173	187	207	233
ZIP0084	84	68.00	98.70	93.9	234	173	185	196	205	221	245	276
ZIP0090	90	70.00	102.00	96.7	251	186	199	210	220	237	262	296
ZIP0096	96	76.00	110.00	105	267	198	212	224	234	253	280	315
ZIP0108	108	84.00	122.00	116	297	220	235	249	260	281	311	350
ZIP0120	120	98.00	142.00	135	334	248	265	280	293	316	350	394
ZIP0132	132	106.00	154.00	146	367	273	292	308	322	348	385	433
ZIP0144	144	115.00	167.00	159	396	293	314	332	347	374	414	467

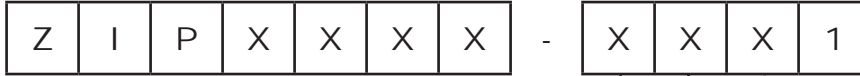
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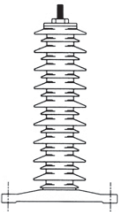
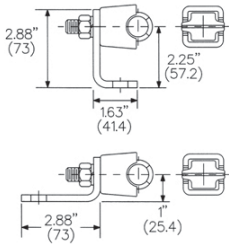
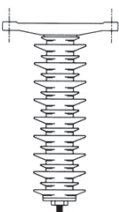
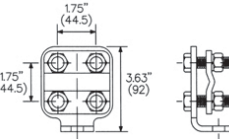
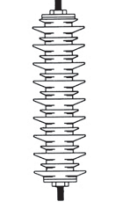
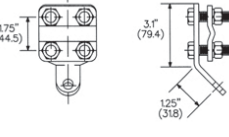
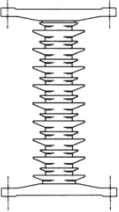
- 1) Temporary Overvoltage without any Prior Duty
- 2) The equivalent Front-of-Wave is the maximum discharge voltage for a 10kA impulse current wave which produces a voltage wave cresting in a 0.5 μ s
- 3) Based on a switching surge current of 500 amperes



ZIP Intermediate Class Arrester Ordering Information

Fault Withstand	
ZIP	= 50kA



kV Rating	Configuration	Top & Bottom Connectors
0003 = 3	 <p>1 - Stainless steel top cover with tripod base</p>	 <p>1 - Eyebolt with a 90° angle bracket</p> <p>Conductor Range: 0.25" - 0.75" (6.35 - 19.05 mm)</p>
0006 = 6		
0009 = 9		
0010 = 10		
0012 = 12	 <p>2 - Tripod on top with stainless steel bottom cover (Inverted Mounting)</p>	 <p>2 - Four hole NEMA pad with a 90° angle</p> <p>Conductor Range: 0.25" - 1.25" (6.35 - 31.75 mm)</p>
0015 = 15		
0018 = 18		
0021 = 21		
0024 = 24	 <p>3 - Stainless steel covers on both ends</p>	 <p>3 - Four hole NEMA pad with a 45° angle</p> <p>Conductor Range: 0.25" - 1.25" (6.35 - 31.75 mm)</p>
0027 = 27		
0030 = 30		
0033 = 33		
0036 = 36	 <p>4 - Tripod on both ends</p>	
0039 = 39		
0042 = 42		
0045 = 45		
0048 = 48		
0054 = 54		
0060 = 60		
0066 = 66		
0072 = 72		
0084 = 84		
0090 = 90		
0096 = 96		
0108 = 108		
0120 = 120		
0132 = 132		
0144 = 144		