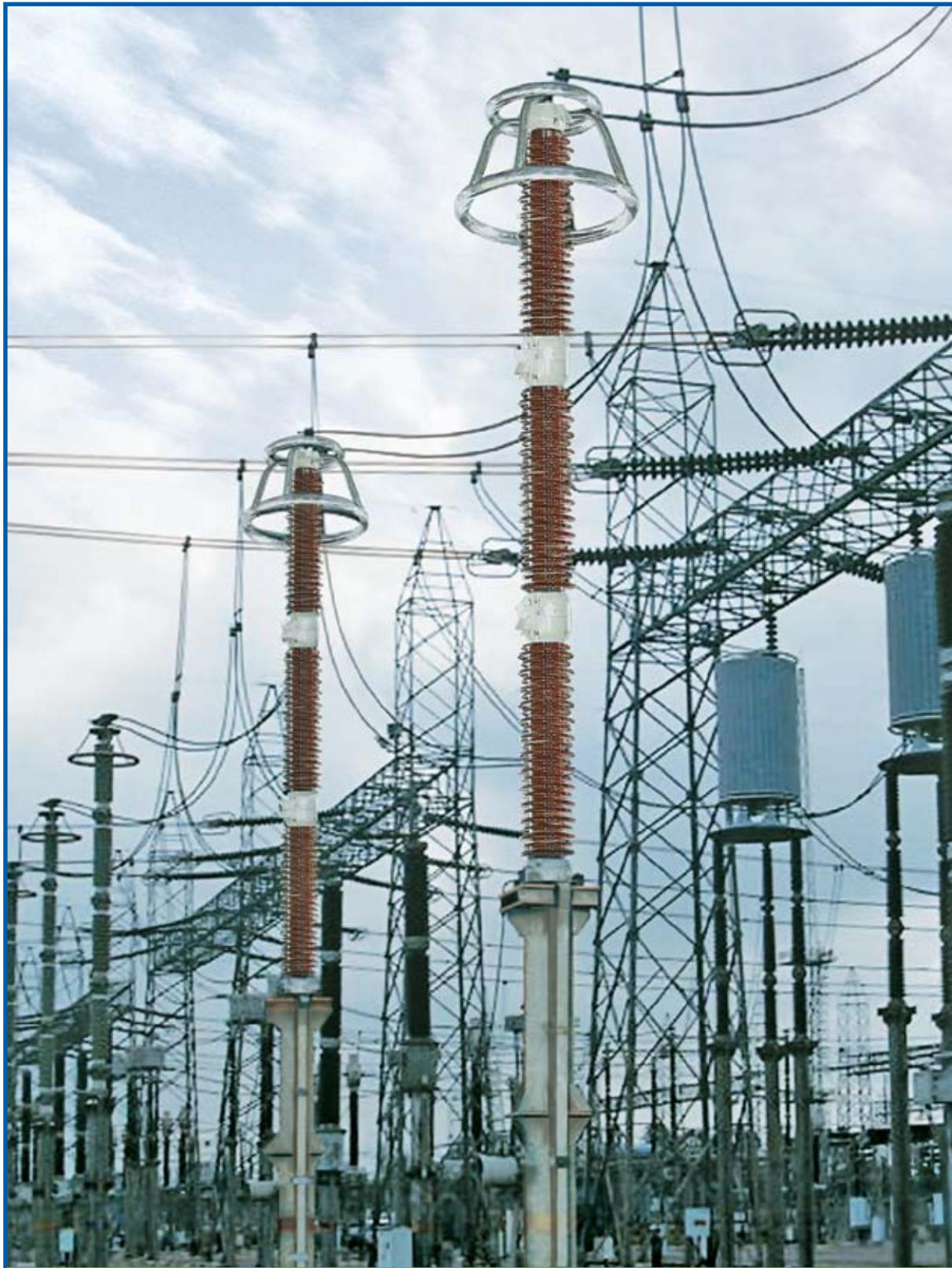




Smart solutions.  
Strong relationships.

# Surge Arresters



### Global Leadership

CG is proud to be a part of the USD 4 billion Avantha Group, a reputed Indian Industrial conglomerate led by its Chairman, Mr. Gautam Thapar. Avantha has business interests in diverse areas, including pulp and paper, power generation, transmission & distribution equipments, solutions & services, food processing, farm forestry, chemicals, energy, infrastructure, information technology (IT) and IT-enabled services.

In keeping with its growing aspirations, Avantha has been aggressively expanding overseas. Avantha has an impressive global footprint and operates in more than 10 countries with over 20,000 employees of 20 nationalities.

As one of the world's leading engineering corporations, CG provides end-to-end solutions, helping its customers use electrical power effectively and increase industrial productivity with sustainability. CG was established in 1937 in India; &, since then the Company has been a pioneer & has retained its leadership position in the management and application of electrical energy.

Our unique and diverse portfolio ranges from transformers, switchgear, circuit breakers, network protection & control gear, project engineering, HT & LT motors, drives, lighting, fans, pumps & consumer appliances and turnkey solutions in all these areas; thus enhancing the many aspects of industrial and personal life. This portfolio has been structured into 3 SBUs - Power Systems, Industrial Systems and Consumer Products.

Since 2005, CG has embarked upon an ambitious globalization strategy, growing both organically & inorganically, drawing into its fold leading international companies such as Pauwels, Ganz, Microsol, Sonomatra, MSE & PTS. Consequent to this globalisation, CG now enjoys manufacturing bases in Belgium, Canada, Hungary, Indonesia, Ireland, France, UK and US, in addition to more than twenty manufacturing locations in India, employing more than 8000 employees worldwide with diverse nationalities and cultures. A worldwide marketing network of more than 150 representatives spans the globe, offering the entire range of CG's products, solutions and services.

Thanks to its well structured and validated business model, CG is well positioned to provide its customers with technology-driven,

value-added solutions, leveraging a broad product portfolio on the one hand, & enhancing the entire value-chain quality, delivery, and services on the other hand.

CG established its international manufacturing footprint in the year 2005 by acquisition of the Belgium based Pauwels Group which gave CG additional manufacturing facilities for Power and Distribution transformers at Belgium, Ireland, USA, Canada and Indonesia. In its quest to enhance its technology edge, increase its global market reach & expand the product portfolio, CG followed this up with a series of successful acquisitions - Ganz, Hungary in 2006; Microsol, Ireland in 2007; Sonomatra, France in 2008; MSE, USA in 2008, PTS, UK in 2010, and 3 businesses of Nelco, India, in 2010. The business domains of the new companies that joined the CG family, have charted the way for CG progressively entrenching itself globally, as a "full solutions provider" carving out for itself positioning as a serious international player and a recognized transnational corporation.

CG has been aggressively investing in R&D, product certifications, product quality, productivity enhancement & operational excellence. CG's Global R&D centre, located in India, has been recognised for its innovation & received the prestigious "National Award for the Best R&D Efforts" for its outstanding achievements in the Electrical Engineering Sector in 2008. CG's R&D strategy aligns with the Company's Global Vision, & focuses on creating platform technologies, shrinking product development cycle time & enhancing CG's Intellectual Property capital.

To unify our global focus, all CG facilities across the world have taken actions to ensure that customers receive consistent "One World Quality", for all CG products and solutions in all parts of the world.



CG House, Mumbai



## Business Edge

The Switchgear Works of Crompton Greaves is located on a 1,32,540 sq.mtrs. plot in Nashik on the Mumbai Agra National Highway and is demarcated in four main divisions: EHV SF<sub>6</sub> Gas Switchgear, EHV Instrument Transformer, Medium Voltage Vacuum Switchgear and Surge Arresters. Operations commenced in 1980 with the manufacture of Medium Voltage Switchgear, which was relocated from Kanjur Mumbai Works.

A specialized Business Unit spearheads the export thrust for in-house products as well as carefully out-sourced synergistic products for supply of wide product range, starting from Low Voltage to Ultra High Voltage (1200 kV) Transmission System to Trade, Industry, OEMs and Power Utilities.

Our regional establishments throughout globe have factory-trained personnel to provide prompt after sales service, supporting our service personnel located at the factory.

### Introduction

Components in any power system face in service, overvoltages that arise either due to natural lightning or inevitable switching operations.

Surge arresters are used to protect power system installations and equipment against Lightning Overvoltages, Switching Surges etc. Generally arresters are connected across the equipment to be protected, typically between phase and earth for three phase installations.

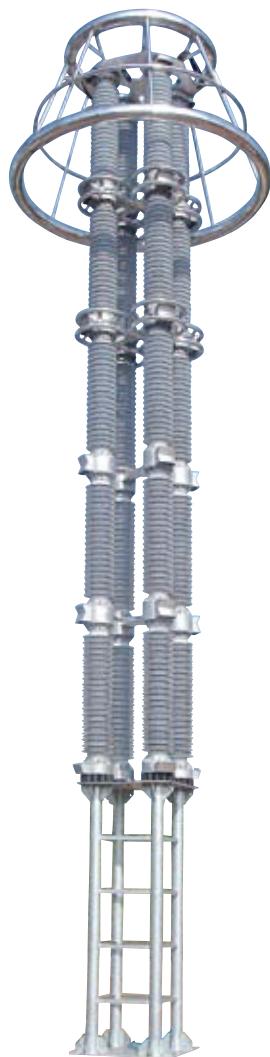
CG metal oxide Surge Arresters consist of active part, which is a series of highly nonlinear ceramic resistors made essentially of Zinc Oxide. Fine Zinc Oxide crystals are surrounded by other metal oxides (additives).

### Special Features

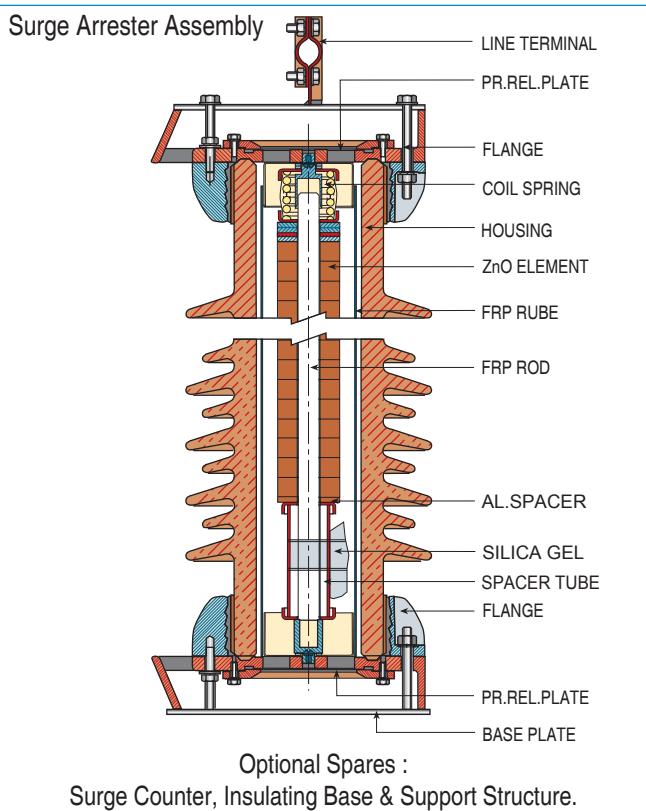
- Unique doughnut construction of ZnO elements offer high energy capability, provide uniform density and temperature distribution.
- Shatter proof performance.
- Simple, robust construction of Arresters.
- Extremely high non-linearity of ZnO elements.
- Positive locking of Zinc Oxide elements.
- Low power loss resulting in enhanced performance at elevated temperatures.
- Controlled environment assembly line.
- Ultra stable elements resulting in enhanced overvoltage protection capacity.
- Available in Brown & ANSI-Grey Porcelains & composite.

All CG Arresters in this Catalogue are designed in line with the requirements of ANSI-IEEE Standard C62.11 & IEC 60099-4.

**Note :** CG Ltd. reserves the right to change Design and specifications in this catalogue without notice, due to continuous product improvements.



1200kV Surge Arrester for 1200kV Transmission Line



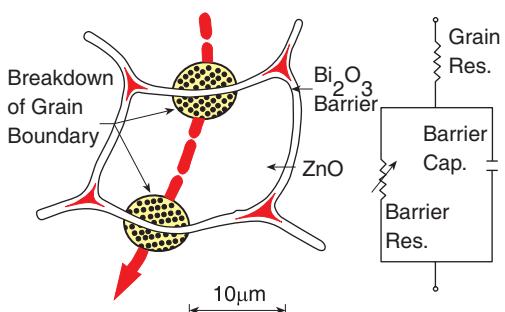


Fig. 1 Grain Structure of ZnO Block

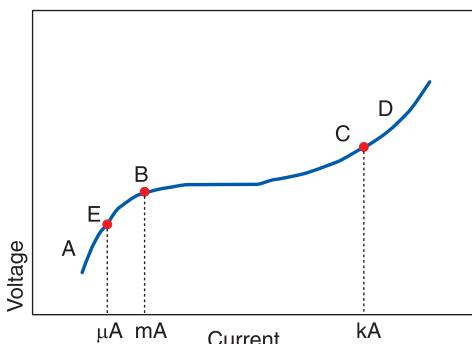


Fig. 2 Voltage / Current Characteristics

A = Bottom linear part (ohmic region)  
 B = Knee Point (breakdown point)  
 C = Non-linear part (up-turn region)  
 D = Upper linear part (up-turn region)  
 E = Working point (continuously applied voltage)

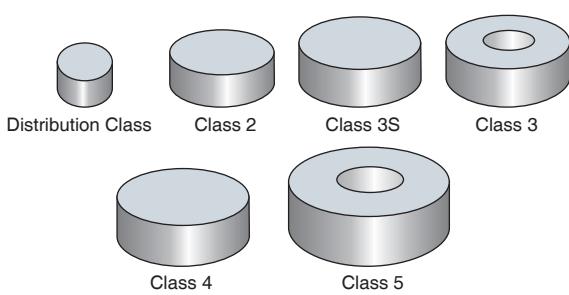


Fig. 3 Various types of ZnO elements



### Explanation of Terms

- **Voltage Rating :**

The voltage rating of an arrester is that voltage which can be applied for a limited time after the arrester has absorbed a large amount of energy as established in the operating duty tests. The rated voltage is used as a reference parameter for the specification of operating characteristics.

- **Maximum Continuous Operating Voltage (MCOV) :**

The MCOV is the maximum permissible rms value of power frequency voltage that may be applied continuously between the terminals of the arrester.

- **Temporary Overvoltage Capability :**

An arrester must be selected with a high enough voltage rating to withstand temporary overvoltages which might be caused by various occurrences on the system. The most common event causing a temporary overvoltage is a single line to ground fault. For an effectively grounded system such faults will normally be cleared in less than one second. Therefore an overvoltage capability based on a duration of one second is usually recommended. Also, the below table shows Temporary Overvoltage Capability for a time range of 0.1 to 1,000 seconds.

### Arrester Voltage Ratings

The chart below indicates the minimum MCOV customers need to specify for an arrester as a function of system voltage.

The minimum recommended ratings for solidly grounded systems allow for a temporary voltage rise of at least 40% over a period of one second. Higher temporary overvoltages may require higher MCOV.

Over Voltage Period (in sec)	TOV per unit of MCOV with prior duty
0.1	1.21
1	1.16
10	1.1
100	1.05
1000	1.02

### Arrester Application Information

CG Arresters are designed to use at altitudes of 1000 m. Arresters can be customized to meet requirements for higher altitudes. CG arresters can be used at an average temperature of 40°C & where daily maximum temperature does not exceed 60°C (140°F). The energy absorption capability – a two shot energy discharge within one minute, signifies the switching surge capability of these arresters.

Wherever Grading Ring is a requirement, it is dispatched along with the Arresters.



- CG Arresters can be customized to meet virtually all the duty cycle voltage (Voltage Rating) & MCOV requirements.

The base mounting & Terminal options can be customized to specific needs in addition to the options provided in this Catalogue. Surge Counters to monitor Arrester discharges are available with built in milliammeter. Where Surge Counters is a requirement, it is supplied with suitable Insulating bases (IBs) for Arrester isolation

from earth. All Arresters are identified with a unique serial number; multi-stack arresters have unit name-plates indicating position of the unit in the column. Arrester name-plates have information on the rated voltages, MCOV, Pressure relief current, serial number, etc.



Ultrasonic Cleaning Arrangement

SR. NO.	SYSTEM PARAMETERS	SURGE ARRESTER PARAMETERS
1	System Voltage	Rated Voltage Maximum Continuous Operating Voltage (MCOV)
2	Maximum System Voltage	Rated Voltage Maximum Continuous Operating Voltage (MCOV)
3	System Earthing	Rated Voltage Maximum Continuous Operating Voltage (MCOV)
4	Basic Insulation levels (LI, SI)	Residual Voltage (LI, SI)
5	Line length, Energy involved	Line discharge class
6	Short Circuit level	Pressure relief class
7	System over-voltages	Temporary over-voltages
8	Pollution level	Creepage distance
9	Altitude	Arcing distance, Creepage

With available Surge Arrester parameters and from appropriate table, other ratings of Surge Arrester can be determined. The tables show typical requirements from customers. Surge Arrester with different parameters can also be supplied.



# Surge Arresters

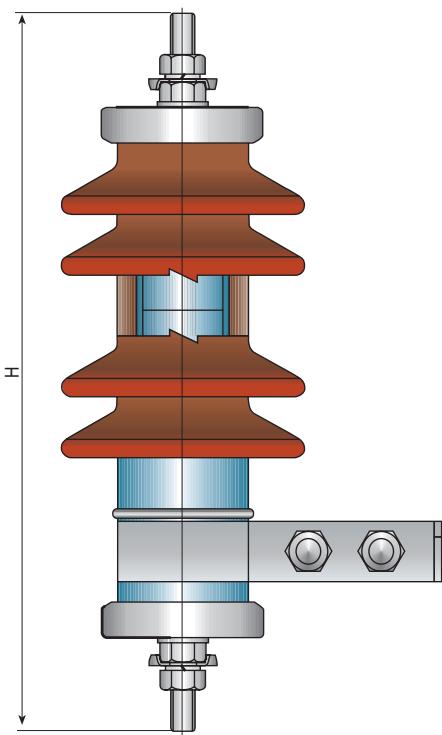
# Distribution Class - Normal Duty

Reference Standard	-	IEC 60099-4, ANSI IEEE Std C62.11, IS 3070 (Part-3)		
Arrester Type & Class	-	Gapless, Distribution class		
Rated Frequency	Hz	48-62 Hz		
Line Discharge Class	-	75A, 1000 micro-sec		
Nominal Discharge Current	kAp	5		
Energy Handling Capability	kJ / kV of Rating	0.5		
Continuous Leakage current at MCOV		Resistive (Max.)	micro-amps	150
		Capacitive (Max.)	micro-amps	600

## Product Range

2.7kV to 36 kV

Unique Ref. No.	Rated Voltage	MCOV	Steep Impulse RV at 5kA (1/ 2microsec)	Lightning Impulse RV (8/20 micro-sec) at					Creepage distance mm	Overall Height (H) mm
				1.5kA	2.5kA	3.0kA	5kA	10kA		
ZYPD002	2.7	2.3	11.2	8.5	9.0	9.5	10.0	11.2	150	230
ZYPD003	3	2.55	12.3	9.4	9.9	10.5	11.0	12.3	150	230
ZYPD004	4.5	3.6	18.5	14.0	14.9	15.7	16.5	18.5	150	230
ZYPD005	5.1	4.2	22.4	17.0	18.0	19.0	20.0	22.4	150	230
ZYPD005	6	5.1	24.6	18.7	19.8	20.9	22.0	24.6	150	230
ZYPD007	9	7.65	33.6	25.5	27.0	28.5	30.0	33.6	300	300
ZYPD008	10	8.4	35.3	26.8	28.4	29.9	31.5	35.3	300	300
ZYPD010	12	10.2	49.3	37.4	39.6	41.8	44.0	49.3	300	300
ZYPD013	15	12.7	58.2	44.2	46.8	49.4	52.0	58.2	600	425
ZYPD015	18	15.3	67.2	51.0	54.0	57.0	60.0	67.2	600	425
ZYPD017	21	17	71.7	54.4	57.6	60.8	64.0	71.7	600	425
ZYPD019	24	19.5	90	68.0	72.0	76.0	80.0	90	600	425
ZYPD022	27	22	101	76.5	81.0	85.5	90.0	101	900	530
ZYPD024	30	24.4	106	80.3	85.1	89.8	94.5	106	900	530
ZYPD029	36	29	134	102.0	108.0	114.0	120.0	134	900	530



2.7kV – 36kV Dist. Class SA  
(Normal Duty)

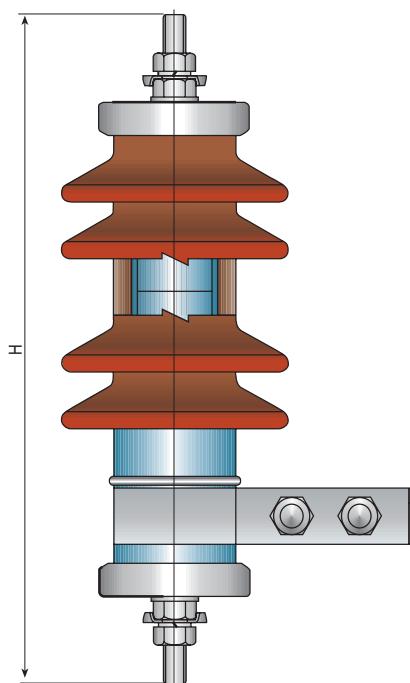
\* Diagram not to scale

# Surge Arresters

## (Distribution Class - Heavy Duty)

Reference Standard	-	IEC 60099-4, ANSI IEEE Std C62.11, IS 3070 (Part-3)
Arrester Type & Class	-	Gapless, Distribution class
Rated Frequency	Hz	48-62 Hz
Line Discharge Class	-	125A, 2000 micro-sec
Nominal Discharge Current	kAp	10
Energy Handling Capability	kJ / kV of Rating	1.0
Continuous Leakage current at MCOV	Resistive (Max.) Capacitive (Max.)	micro-amps      250 micro-amps      1000
Product Range		2.7 kV to 36 kV

Unique Ref. No.	Rated Voltage	MCOV	Steep Impulse RV at 10kA (1/2 microsec)	Lightning Impulse RV (8/20 micro-sec) at					Creepage distance mm	Overall Height (H) mm
				1.5kA	3.0kA	5kA	10kA	20kA		
ZPR1002	2.7	2.3	11.2	9.3	9.4	9.5	10	11.2	150	230
ZPR1003	3	2.55	12.3	10.2	10.3	10.5	11	12.3	150	230
ZPR1004	4.5	3.6	18.5	15.3	15.5	15.7	17	18.5	150	230
ZPR1005	5.1	4.2	21.3	17.7	17.9	18.1	19	21.3	150	230
ZPR1005	6	5.1	24.6	20.5	20.7	20.9	22	24.6	150	230
ZPR1007	9	7.65	33.6	27.9	28.2	28.5	30	33.6	300	300
ZPR1008	10	8.4	35.8	29.8	30.1	30.4	32	35.8	300	300
ZPR1010	12	10.2	43.1	35.8	36.2	36.6	38.5	43.1	300	300
ZPR1013	15	12.7	53.8	44.6	45.1	45.6	48	53.8	600	425
ZPR1015	18	15.3	64.4	53.5	54.1	54.6	57.5	64.4	600	425
ZPR1017	21	17	68.9	57.2	57.8	58.4	61.5	68.9	600	425
ZPR1019	24	19.5	86	71.6	72.4	73.2	77	86	600	425
ZPR1022	27	22	97	80.4	81.3	82.2	86.5	97	900	530
ZPR1024	30	24.4	108	89.3	90.2	91.2	96	108	900	530
ZPR1029	36	29	129	107	108	109	115	129	900	530



2.7kV - 36kV Dist. Class SA  
(Heavy Duty)

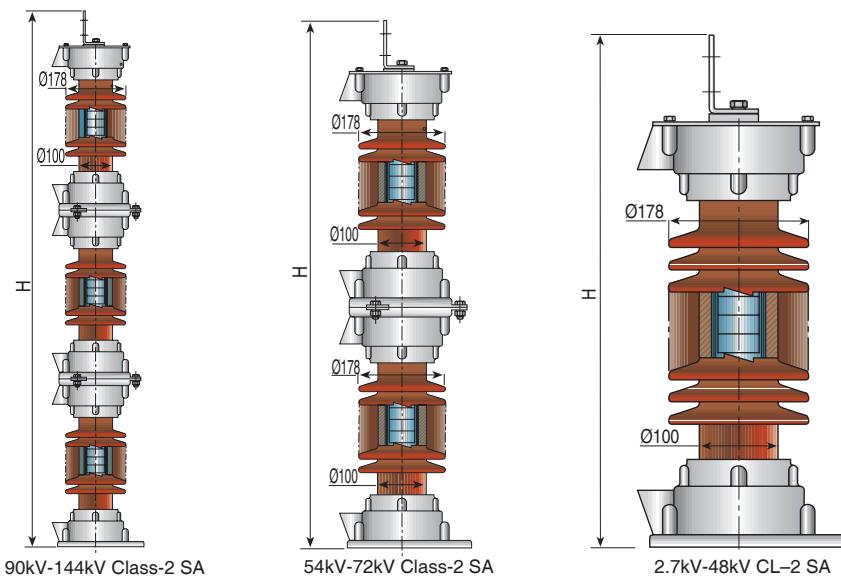
\* Diagram not to scale

# Surge Arresters

## (Class - 2)

Reference Standard	-	IEC 60099-4, ANSI IEEE Std C62.11, IS 3070 (Part-3)
Arrester Type & Class	-	Gapless, Station class
Rated Frequency	Hz	48-62 Hz
Line Discharge	-	Class 2
Nominal Discharge Current	kAp	10
Pressure Relief Class	kArms	A / 40
Energy Handling Capability	kJ / kV of Rating	4.0
Continuous Leakage current at MCOV	Resistive (Max.)	micro-amps – 400 & Capacitive (Max.) – micro-amps – 1500
Cantilever strength	Kg-m	325
Product Range		2.7 kV to 144 kV

Unique Ref. No.	Rated Voltage	MCOV	Steep Impulse RV at 10kA (1/ 2microsec)	Switching Impulse RV at 125A (30/60microsec)	Switching Impulse RV at 500A (30/60microsec)	Lightning Impulse RV (8/20 micro-sec) at					Creepage distance mm	Overall Height (H) mm
						1.5kA	3.0kA	5kA	10kA	20kA		
ZLA2002	2.7	2.3	8.7	5.9	6.1	6.9	7.2	7.4	7.8	8.7	150	470
ZLA2003	3	2.55	9.2	6.2	6.4	7.2	7.5	7.8	8.2	9.2	150	470
ZLA2005	6	5.1	18.3	12.4	12.7	14.3	15.0	15.5	16.3	18.3	150	470
ZLA2007	9	7.65	27.4	18.6	19.1	21.5	22.5	23.2	24.5	27.4	300	470
ZLA2008	10	8.4	30.4	20.7	21.2	23.9	25.0	25.8	27.2	30.4	300	470
ZLA2010	12	10.2	36.5	24.8	25.4	28.7	30.0	31.0	32.6	36.5	300	470
ZLA2013	15	12.7	45.7	31.0	31.8	35.9	37.5	38.7	40.8	45.7	300	470
ZLA2015	18	15.3	54.8	37.2	38.2	43.0	45.0	46.5	48.9	54.8	600	560
ZLA2017	21	17	63.9	43.4	44.5	50.2	52.5	54.2	57.1	63.9	600	560
ZLA2019	24	19.5	71.4	48.4	49.7	56.1	58.6	60.6	63.7	71.4	600	560
ZLA2022	27	22	80.3	54.5	55.9	63.1	66.0	68.1	71.7	80.3	900	640
ZLA2024	30	24.4	90	60.8	62.4	70.4	73.6	76.0	80.0	89.7	900	640
ZLA2029	36	29	107	72.7	74.6	84.1	88.0	90.8	95.6	107	900	640
ZLA2031	39	31.5	114	77.6	79.7	89.9	94.0	97.0	102.1	114	1050	680
ZLA2036	45	36.5	132	90	92	104	108	112	118	132	1050	680
ZLA2039	48	39	141	96	98	111	116	119	126	141	1050	680
ZLA2042	54	42	154	104	107	121	126	131	137	154	1815	1160
ZLA2048	60	48	171	116	119	134	140	145	153	171	1815	1160
ZLA2057	72	57	205	139	143	161	169	174	183	205	1815	1160
ZLA2070	90	70	257	174	179	202	211	218	229	257	3075	1745
ZLA2076	96	76	271	184	189	213	223	230	242	271	3075	1745
ZLA2084	108	84	283	192	197	242	253	261	275	308	3625	1825
ZLA2098	120	98	314	213	219	268	281	290	305	342	3625	1825
ZLA2106	132	106	342	232	238	292	305	315	332	372	3625	1825
ZLA2115	144	115	376	255	262	321	336	347	365	409	3625	1825





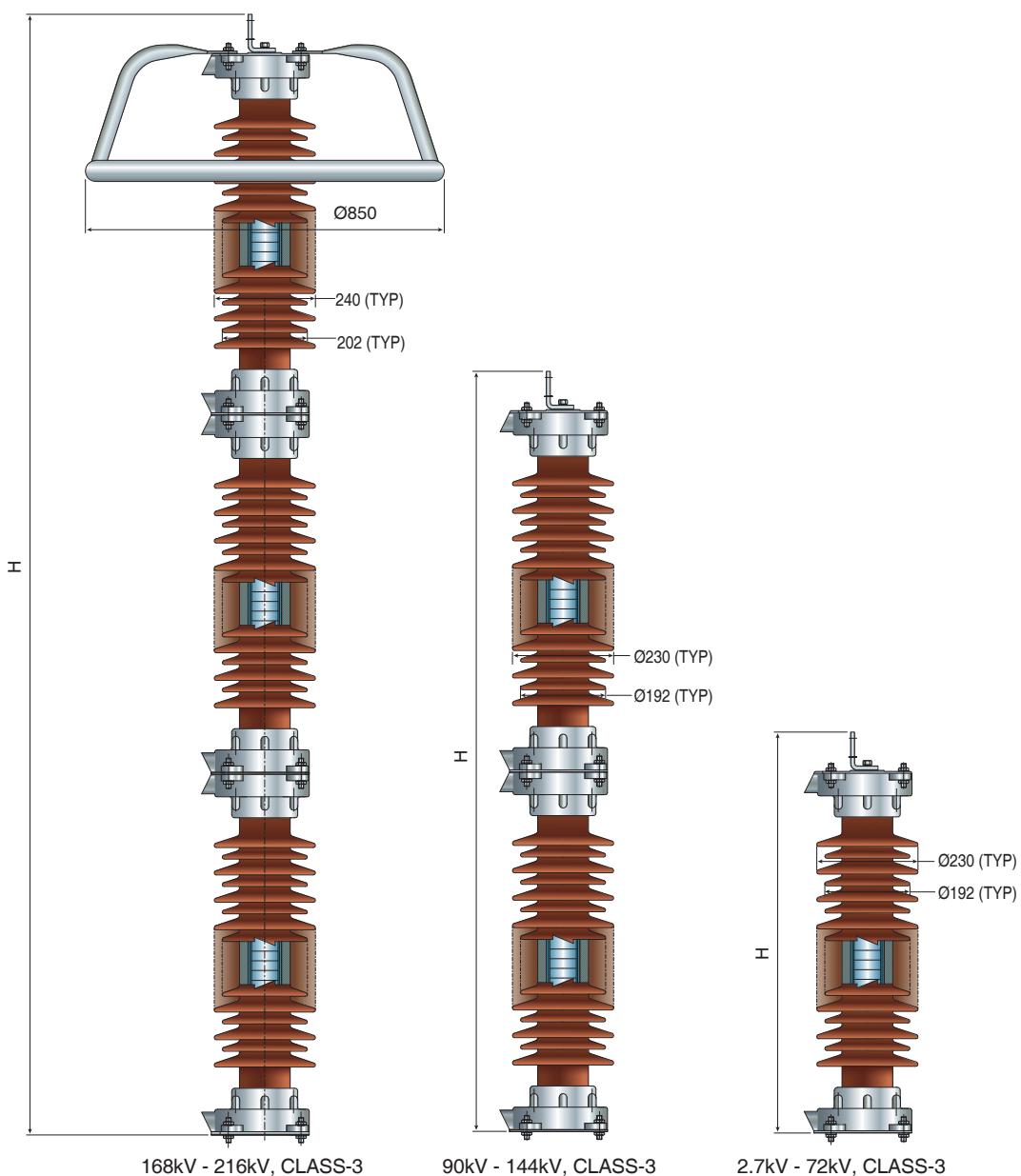
# Surge Arresters

## (Class - 3)

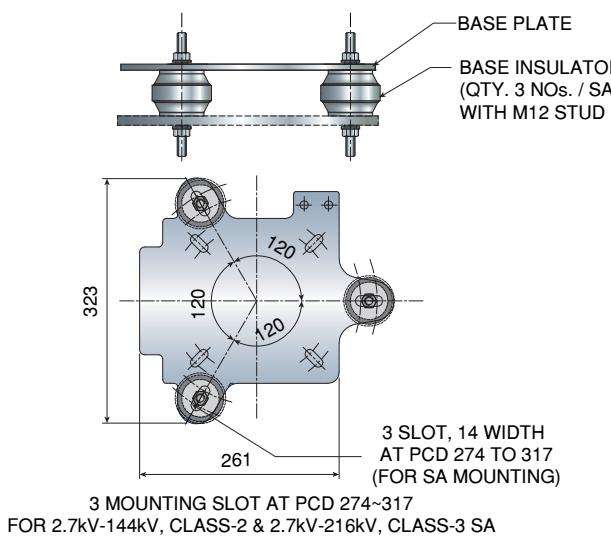
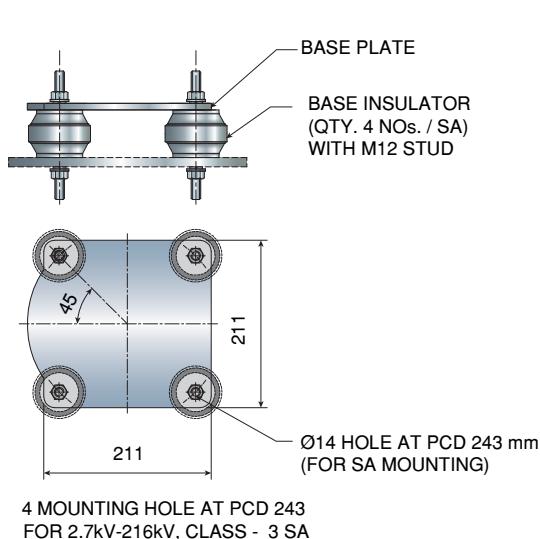
Reference Standard	-	IEC 60099-4, ANSI IEEE Std C62.11, IS 3070 (Part-3)
Arrester Type & Class	-	Gapless, Station class
Rated Frequency	Hz	48-62 Hz
Line Discharge	-	Class 3
Nominal Discharge Current	kAp	10 kAp
Pressure Relief Class	kArms	A/40
Energy Handling Capability	kJ / kV of Rating	6
Continuous Leakage Current at MCOV	-	Resistive (Max.) micro-amps — 400 & Capacitive (Max.) micro-amps – 1500
Cantilever Strength	Kg-m	725
Product Range	-	2.7 kV to 216 kV

Residual Voltage Values for ZLA3 in Solid Block (D6) Design

Unique Ref. No.	Rated Voltage (in kV)	MCOV	Steep Impulse RV at 10kA (1/2 microsec) (in kV)	Switching Impulse RV at 250A (30/60 microsec) (in kV)	Switching Impulse RV at 1kA (30/60 microsec) (in kV)	Lightning Impulse RV (8/20 micro-sec) at (in kV)			Creepage distance (min) mm	Overall Height (H) mm
						5kA	10kA	20kA		
ZLA3E002	2.7	2.3	8	5	6	7	7	8	150	460
ZLA3E003	3	2.55	8	6	6	7	8	9	150	460
ZLA3E005	6	5.1	17	12	12	15	16	17	150	460
ZLA3E007	9	7.65	25	18	19	22	24	26	300	460
ZLA3E008	10	8.4	28	20	21	25	26	29	300	460
ZLA3E010	12	10.2	34	24	25	29	31	34	300	460
ZLA3E013	15	12.7	42	30	31	37	39	43	300	460
ZLA3E015	18	15.3	51	35	37	44	47	51	600	560
ZLA3E017	21	17	59	41	44	51	55	60	600	560
ZLA3E019	24	19.5	68	47	50	59	63	68	600	560
ZLA3E022	27	22	76	53	56	66	71	77	900	620
ZLA3E024	30	24.4	85	59	62	74	79	86	900	620
ZLA3E029	36	29	102	71	75	88	94	103	900	620
ZLA3E031	39	31.5	110	77	81	96	102	111	1050	740
ZLA3E036	45	36.5	127	89	93	110	118	128	1050	740
ZLA3E039	48	39	136	94	100	118	126	137	1050	740
ZLA3E042	54	42	153	106	112	132	141	154	1815	950
ZLA3E048	60	48	170	118	125	147	157	171	1815	950
ZLA3E057	72	57	204	142	150	176	189	205	1815	950
ZLA3E070	90	70	255	177	187	221	236	257	3075	1590
ZLA3E076	96	76	272	189	199	235	252	274	3075	1590
ZLA3E084	108	84	306	212	224	265	283	308	3625	1800
ZLA3E098	120	98	340	236	249	294	314	342	3625	1800
ZLA3E106	132	106	374	260	274	323	346	376	3625	1800
ZLA3E115	144	115	408	283	299	353	377	410	4495	1800
ZLA3E131	168	131	475	330	349	412	440	479	4890	2420
ZLA3E140	174	140	492	342	361	426	456	496	5000	2540
ZLA3E144	180	144	509	354	374	441	472	513	5000	2540
ZLA3E152	192	152	543	378	399	470	503	547	6125	2650
ZLA3E168	198	168	560	389	411	485	519	564	6125	2650
ZLA3E183	216	183	611	425	449	529	566	616	6125	2650



Suitable for Class - 3 Solid block type Design ranging from 2.7 kV - 216 kV



Surge Arresters with PCD other than above are also available upon request

\* Diagram not to scale

# Surge Arresters

# (Class - 4)

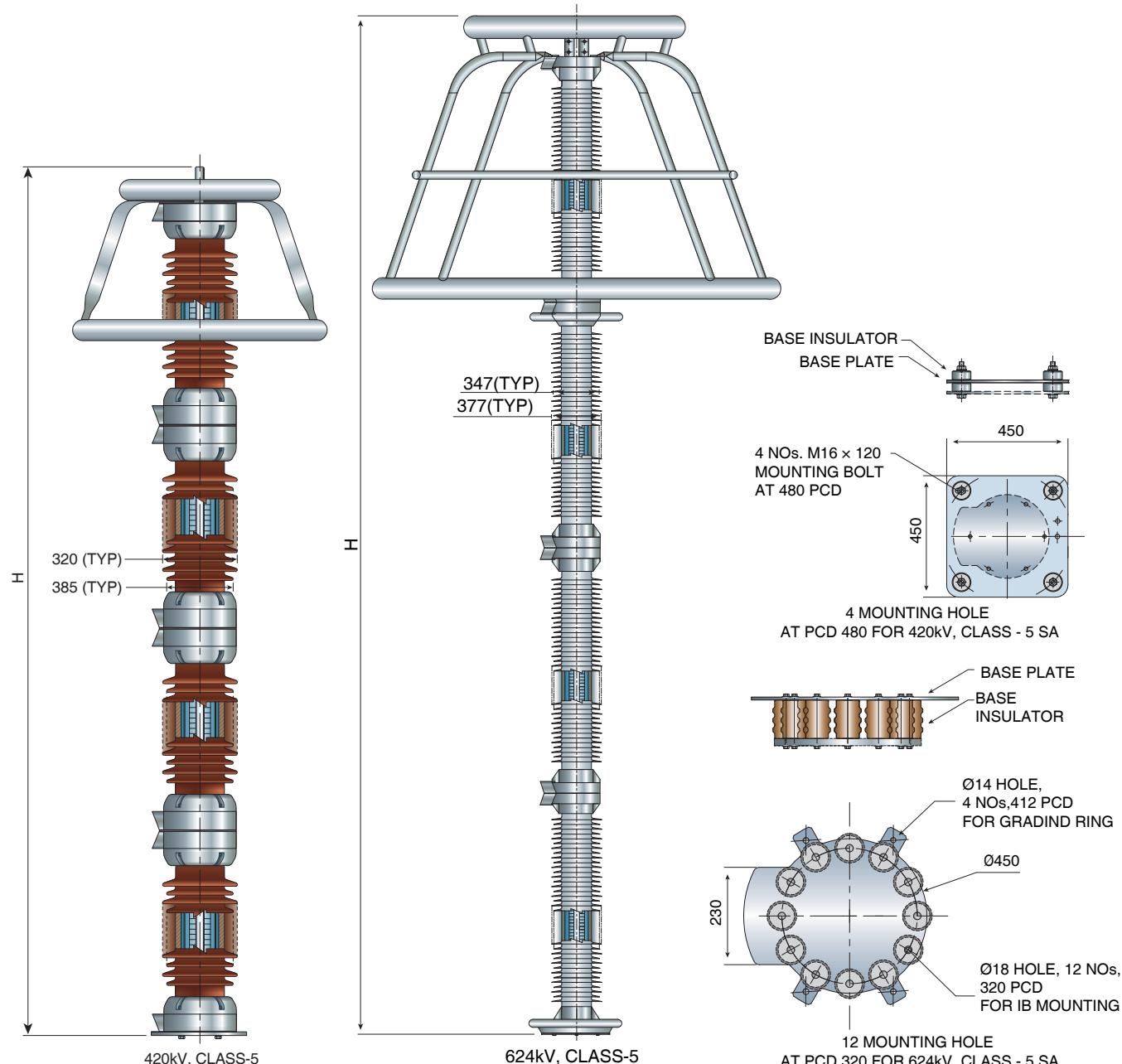
Reference Standard	-	IEC 60099-4, ANSI IEEE Std C62.11, IS 3070 (Part-3)
Arrester Type & Class	-	Gapless, Station class
Rated Frequency	Hz	48-62 Hz
Line Discharge	-	Class 4
Nominal Discharge Current	kAp	20 kAp
Pressure Relief Class	kArms	A/65
Energy Handling Capability	kJ / kV of Rating	8 - 12
Continuous Leakage current at MCOV	-	Resistive (Max.) micro-amps — 500 & Capacitive (Max.) micro-amps – 2000
Cantilever strength	Kg-m	725
Product Range	-	2.7 kV to 420 kV

Unique Ref. No.	Rated Voltage (in kV)	MCOV	Steep Impulse RV at 20kA (1/2 microsec) (in kV)	Switching Impulse RV at 500A (30/60 microsec) (in kV)	Switching Impulse RV at 2kA (30/60 microsec) (in kV)	Lightning Impulse RV (8/20 micro-sec) at (in kV)			Creepage distance (min) mm	Overall Height (H) mm
						10kA	20kA	40kA		
ZLA4002	2.7	2.3	7	5	6	6	7	7	150	460
ZLA4003	3	2.55	8	6	6	7	8	8	150	460
ZLA4005	6	5.1	16	12	13	14	15	17	150	460
ZLA4007	9	7.65	24	18	19	21	23	25	300	460
ZLA4008	10	8.4	27	20	21	24	25	28	300	460
ZLA4010	12	10.2	32	24	26	28	30	33	300	460
ZLA4013	15	12.7	40	30	32	36	38	41	300	460
ZLA4015	18	15.3	48	36	38	43	45	50	600	680
ZLA4017	21	17	56	42	45	50	53	58	600	680
ZLA4019	24	19.5	64	48	51	57	60	66	600	680
ZLA4022	27	22	72	54	57	64	68	74	900	790
ZLA4024	30	24.4	80	60	64	71	75	83	900	790
ZLA4029	36	29	96	72	77	85	90	99	900	790
ZLA4031	39	31.5	104	78	83	93	98	107	1050	856
ZLA4036	45	36.5	120	90	96	107	113	124	1050	856
ZLA4039	48	39	128	96	102	114	120	132	1050	856
ZLA4042	54	42	144	108	115	128	135	149	1815	1090
ZLA4048	60	48	160	120	128	142	150	165	1815	1090
ZLA4057	72	57	192	144	153	171	180	198	1815	1090
ZLA4070	90	70	241	180	191	214	225	248	3075	1390
ZLA4076	96	76	257	192	204	228	240	264	3075	1390
ZLA4084	108	84	289	216	230	256	270	297	3625	1600
ZLA4098	120	98	321	240	255	285	300	330	3625	1600
ZLA4106	132	106	353	264	281	313	330	363	3625	1600
ZLA4115	144	115	385	288	306	342	360	396	4495	1600
ZLA4131	168	131	449	335	357	399	420	463	4890	2283
ZLA4140	172	140	460	343	366	408	430	474	5000	2625
ZLA4144	180	144	481	359	383	427	450	496	5000	2625
ZLA4152	192	152	513	383	409	456	480	529	5440	2535
ZLA4168	198	168	529	395	421	470	495	545	6125	2883
ZLA4180	228	180	610	455	485	541	570	628	6125	2883
ZLA4190	240	190	642	479	511	570	600	661	7250	3100
ZLA4209	258	209	690	515	549	612	645	710	7250	3100
ZLA4212	264	212	706	527	562	627	660	727	7250	3100
ZLA4220	276	220	738	551	587	655	690	760	9065	4075
ZLA4230	288	230	770	575	613	684	720	793	9065	4075
ZLA4235	294	235	786	587	626	698	735	809	9065	4075
ZLA4245	312	245	834	623	664	740	780	859	9065	4075
ZLA4292	360	292	962	719	766	854	900	991	10500	4700
ZLA4303	390	303	1043	779	830	926	975	1074	10500	4700
ZLA4318	396	318	1059	791	843	940	990	1090	10500	4700
ZLA4335	420	335	1123	839	894	997	1050	1156	13020	4700

\*Diagrams on inside page of the back cover.

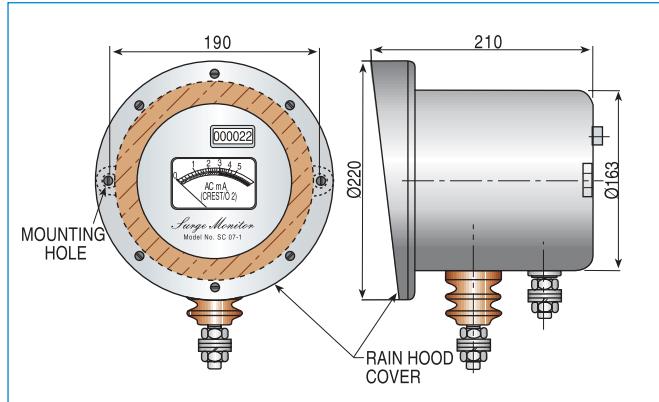
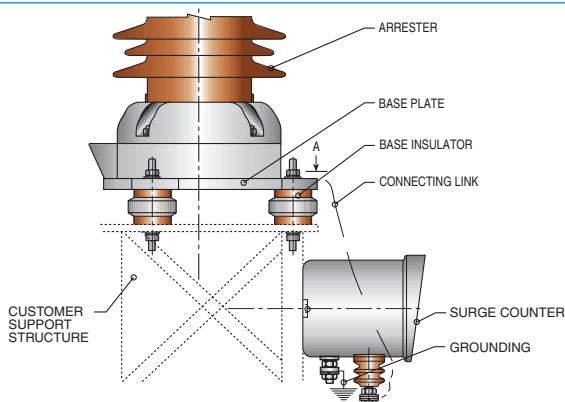
Reference Standard	-	IEC 60099-4, ANSI IEEE Std C62.11, IS 3070 (Part-3)
Arrester Type & Class	-	Gapless, Station class
Rated Frequency	Hz	48-62 Hz
Line Discharge	-	Class 5
Nominal Discharge Current	kAp	20 kAp
Pressure Relief Class	kArms	A/65
Energy Handling Capability	kJ / kV of Rating	13 - 16
Continuous Leakage current at MCOV	-	Resistive (Max.) micro-amps — 800 & Capacitive (Max.) micro-amps – 2000
Cantilever strength	Kg-m	725 for 420 kV Rated SA and 150 for 624 kV Rated SA
Product Range	-	420 kV to 850 kV

Unique Ref. No.	Rated Voltage (in kV)	MCOV	Steep Impulse RV at 20kA (1/2 microsec) (in kV)	Switching Impulse RV at 500A (30/60 microsec) (in kV)	Switching Impulse RV at 2kA (30/60 microsec) (in kV)	Lightning Impulse RV (8/20 micro-sec) at (in kV)			Creepage distance (min) mm	Overall Height (H) mm
						10kA	20kA	40kA		
ZLA5336	420	336	1085	774	818	940	1007	1096	15800	6330
ZLA5490	624	490	1612	1150	1215	1396	1496	1628	20000	8000
ZLA5723	850	723	2195	1567	1656	1902	2038	2217	30000	9840



\* Diagram not to scale

# Surge Arresters



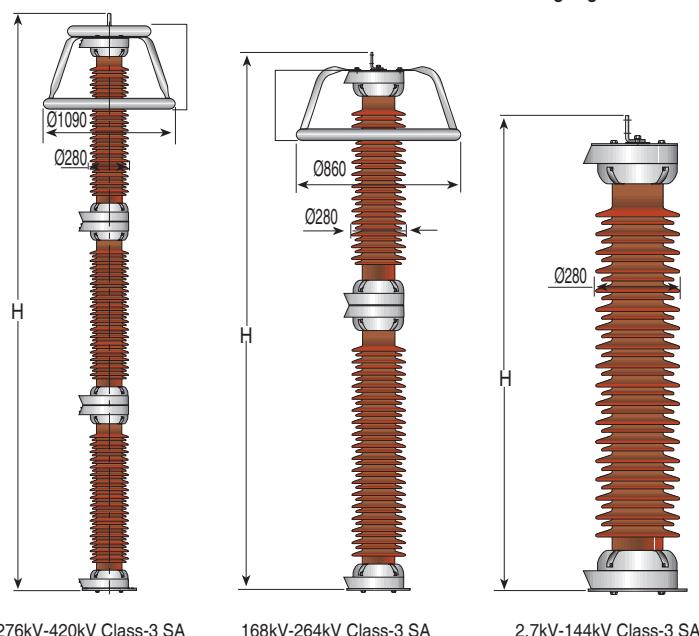
## Accessories :

Surge Arrestors may be supplied with following accessories on request :

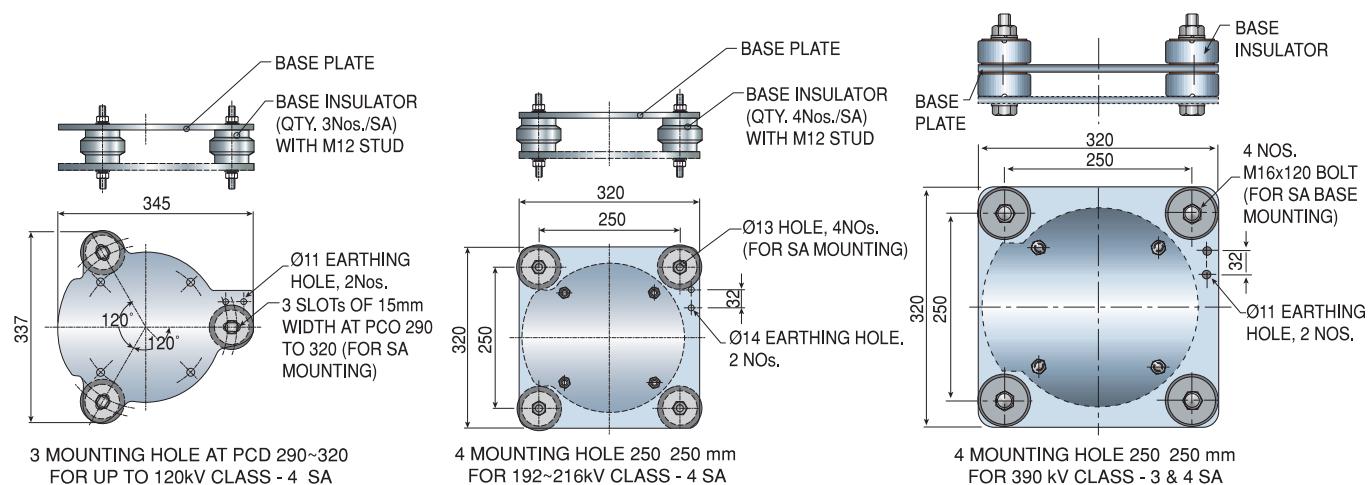
### ■ Surge counter

- Insulating base (required in case surge counter is to be used)
- Cable conductor of specific length (required in case surge counter is to be used)

Note : Grading rings are supplied with CG Surge Arresters for CLASS 3 & 4 and for KV rating higher than or equal to 144 KV.



Class 3 (Dough-nut type Design) & Class-4 Diagram



Suitable for Class 3 (Dough-nut type Design) & Class-4 Surge Arrester

\* Diagram not to scale

# Centre of Excellence for Switchgear Technologies



1600 kV UHV Research Centre

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