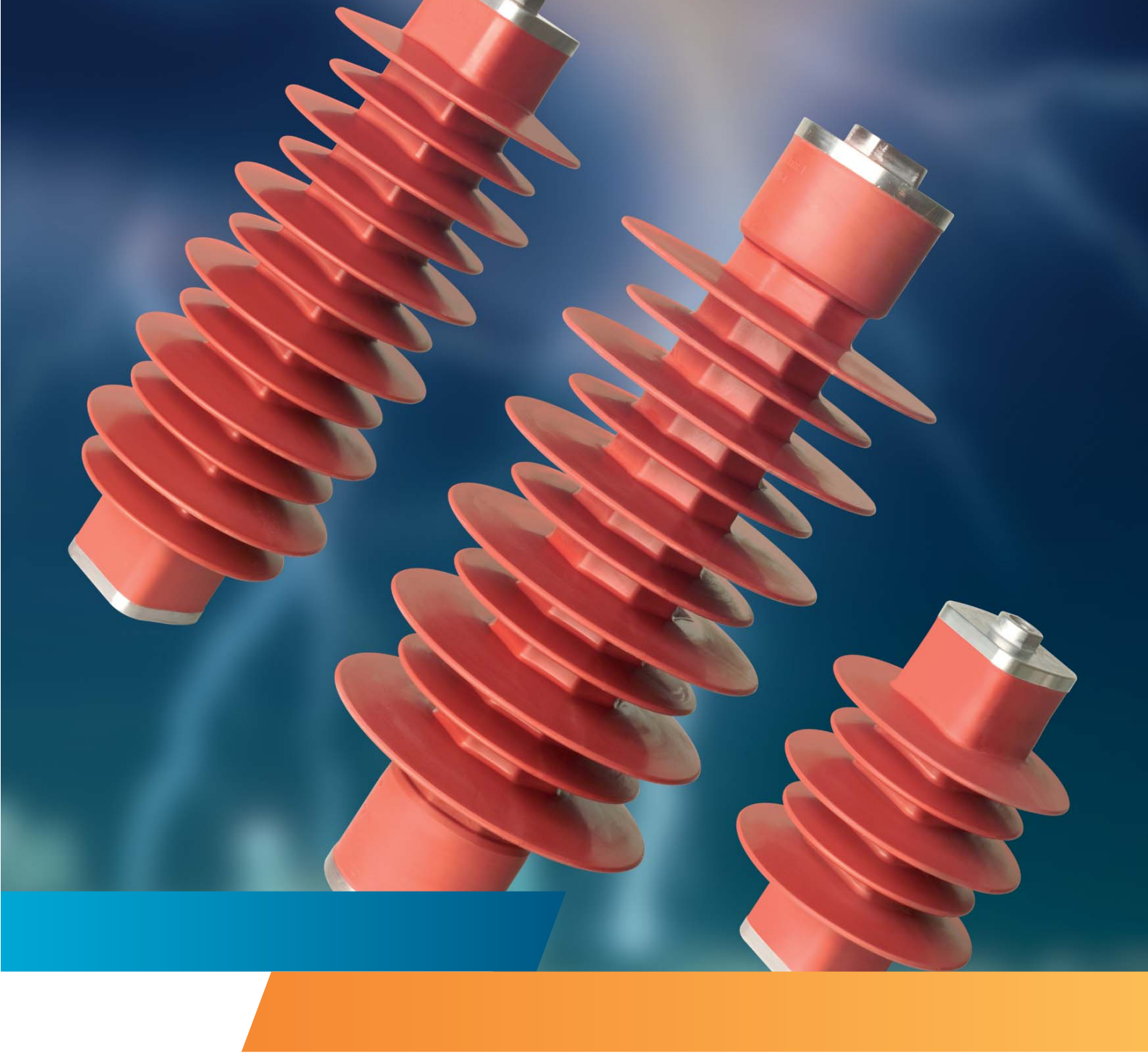


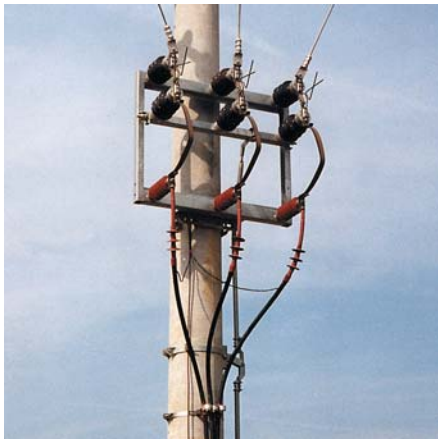
Energy Division

Metal Oxide Surge Arresters for Distribution Networks up to 110 kV

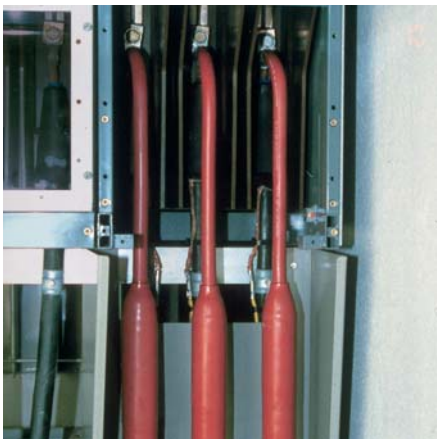
Catalogue 2010

Tyco Electronics

Our commitment. Your advantage.












L3 L
2 L2
1 L1


Metal Oxide Surge Arrester for Distribution Networks

Tyco Electronics Experience

Tyco Electronics Energy Division pioneered the development of polymeric housed surge arresters in the early 1980's and have a proven service experience across the globe, operating in the worlds toughest environments.

Tyco Electronics polymeric surge arresters type Raychem and Bowthorpe have been designed and tested to meet the requirements of IEC60099-4, Ed. 2, 2004.
The qualification was performed in independent laboratory facilities in Europe.

Designed to meet your individual requirements

Tyco Electronics developed Surge Arresters for different voltages, classes and a lot of different applications.
To meet the individual application requirements our arresters can be adapted with a large variety of available line-, earth- and mounting-terminal modules.

Surge Arresters for Distribution Networks are shown in this catalogue. Surge Arresters for higher discharge classes and voltages are documented in our High Voltage Surge Arrester Catalogue.

- Exceeds requirements of IEC-60099-4 Ed. 2.0 for polymeric zinc oxide arresters documented by test reports of independent test institutes
- Superior protection margins by low residual voltages, high energy handling and high TOV values
- Excellent mechanical, vibration and impact withstand capability
- Void-free design by direct molded housing on Metal Oxide blocks and aluminium fittings
- Direct bonding of housing to fittings ensures optimum moisture barrier
- Track and erosion resistant housing with more than 40 years experience in all climatic conditions
- Safe non-shattering short circuit behaviour to higher current levels
- Maintenance free construction
- Certified to GOST standard and approved by Federal Networks of Russia and Ukraine Scientific Research and Engineering Institute

Metal Oxide Surge Arresters

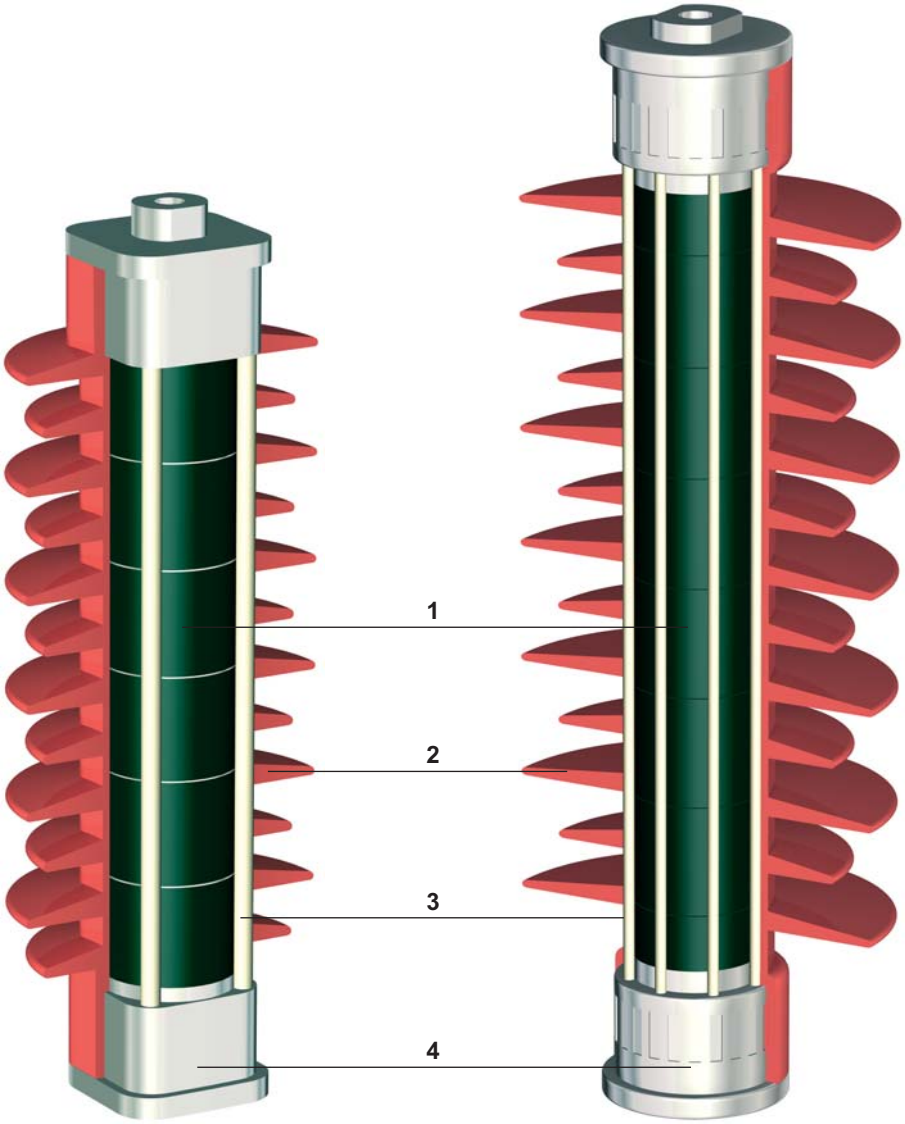
HDA, OCP and PCA are the newest gapless, zinc oxide Raychem and Bowthorpe arrester families.
The development of these products is based on 25 years of experience in arrester design and manufacture within the Tyco Electronics Energy Division.
The final qualifications were performed in independent laboratory facilities in Europe.

All arrester types are manufactured using superior ZnO varistors, which display excellent thermal and current handling characteristics due to the guaranteed homogeneity of the varistor volume.

This superior thermal behaviour yields products with:
- Excellent TOV performance.
- Safe, non-shattering failure in the short circuit test by pre-failing to higher fault currents.
- High energy handling capability.

The crimped structural construction ensures a light weight arrester with optimal mechanical strength. The manufacturing process ensures void free construction and optimum interface sealing. This is achieved by bonding the polymeric housing directly to the ZnO discs and aluminium fittings using a Tyco Electronics proprietary bonding solution.

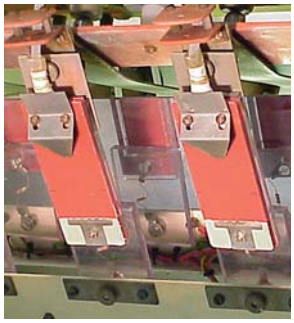
The polymer housing was developed using the knowledge accumulated over 40 years of materials science expertise and experience, resulting in an optimum shed profile and a material with excellent tracking and erosion resistance.



The design of the Tyco Electronics Surge Arrester comprises of:
1 - ZnO (Zinc Oxide) varistors
2 - Tyco Electronics proprietary polymeric housing
3 - Flame retardant fiber reinforced crimping structure
4 - Corrosion resistant aluminium fittings

Excellent hydrophobicity

Safe non-shattering failure mode



Track and erosion resistance

Discharge Class 1 Surge Arrester – HDA-MA

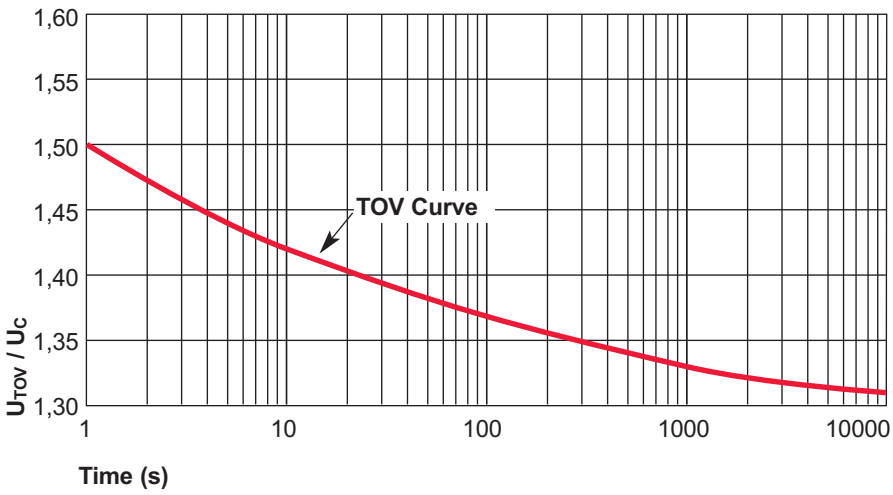
Generic technical data:

HDA-xxMA series		3-24 kV Uc
Rated discharge current (8/20µs):		10 kA
Line discharge class according to IEC 60099-4		Class 1
Operating duty impulse withstand current (4/10µs):		100 kA
Long duration current impulse (2000µs):		400 A
10 second temporary overvoltage, (U_{TOV}/U_C):		1,42
High current short circuit: (pre-failing method) (Safe non-shattering failure mode)		40 kA
Energy	2 long duration impulses 2 high current impulses	4,2 kJ/kV Uc 6,8 kJ/kV Uc
Service conditions	Ambient temperature:	- 60°C to + 60°C

Mechanical strength data

Cantilever	350 Nm
Tensile	2000 N
Torque	50 Nm

Temporary Overvoltage (TOV) of HDA-xxMA with prior energy



Samples are pre-heated to a temperature of 60° C according to IEC 60099-4, Ed 2,0 2004. Samples were subjected to a pre-stress equivalent to one high current impulse of 100kA, 4/10 µs as per switching surge operating duty test.

U_{TOV} = TOV withstand voltage;
U_C = continuous operating voltage

Discharge Class 1 Surge Arrester – HDA-MA

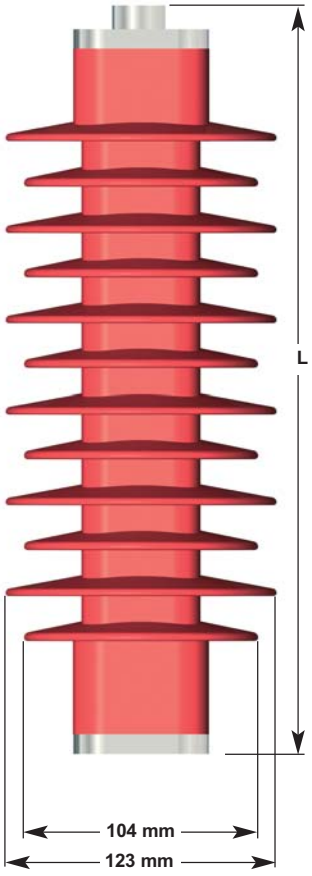
Protective Characteristics

HDA-MA	Uc kV	Ur kV	Ures in kV when tested to impulse waveforms Lightning (8/20µs) 5kA	10kA	20kA	Steep lightning (1/20µs) 10kA	Switching (30/60µs) 125A	500A
HDA-03MA-xxx	3	3,7	9,3	9,9	10,9	10,2	7,4	7,9
HDA-04MA-xxx	4	5,0	12,4	13,2	14,6	13,6	9,8	10,5
HDA-06MA-xxx	6	7,5	18,6	19,8	21,8	20,4	14,8	15,7
HDA-08MA-xxx	8	10,0	24,8	26,4	29,1	27,2	19,7	21,0
HDA-09MA-xxx	9	11,2	27,9	29,7	32,8	30,6	22,1	23,6
HDA-10MA-xxx	10	12,5	31,0	33,0	36,4	34,0	24,6	26,2
HDA-12MA-xxx	12	15,0	37,2	39,6	43,7	40,8	29,5	31,4
HDA-18MA-xxx	18	22,5	55,8	59,4	65,5	61,2	44,3	47,2
HDA-20MA-xxx	20	25,0	62,0	66,0	72,8	68,0	49,2	52,4
HDA-21MA-xxx	21	26,2	65,1	69,3	76,4	71,4	51,7	55,0
HDA-24MA-xxx	24	30,0	74,4	79,2	87,4	81,6	59,0	62,9

Uc: Continous Voltage; Ur: Rated Voltage; Ures: Residual Voltage

Standard Housing Parameter

HDA-MA	Impulse voltage 1.2/50µs (kV)	Power frequency voltage withstand, wet (kV)	Flash over distance (mm)	Creepage length (mm)	Height L (mm)	Weight (kg)
HDA-03MA-xxx	106	47	176	380	183	1,80
HDA-04MA-xxx	106	47	176	380	183	1,80
HDA-06MA-xxx	106	47	176	380	183	1,80
HDA-08MA-xxx	106	47	176	380	183	1,80
HDA-09MA-xxx	106	47	176	380	183	1,80
HDA-10MA-xxx	106	47	176	380	183	1,80
HDA-12MA-xxx	106	47	176	380	183	1,80
HDA-18MA-xxx	190	93	310	830	316	3,25
HDA-20MA-xxx	190	93	310	830	316	3,25
HDA-21MA-xxx	190	93	310	830	316	3,25
HDA-24MA-xxx	190	93	310	830	316	3,25



To complete the order information for the accessories, please refer to page 16.

Discharge Class 1 Surge Arrester – HDA-M

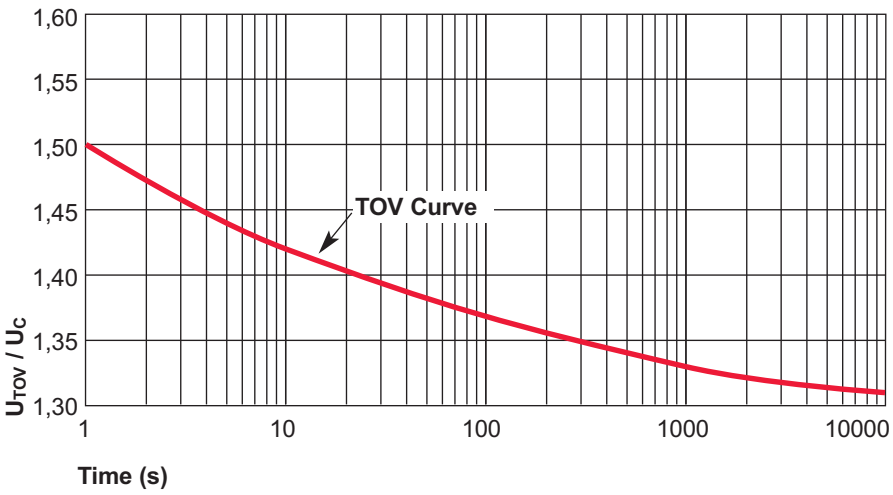
Generic technical data:

HDA-xxM series		26-41 kV Uc
Rated discharge current (8/20µs):		10 kA
Line discharge class according to IEC 60099-4		Class 1
Operating duty impulse withstand current (4/10µs):		100k A
Long duration current impulse (2000µs):		400 A
10 second temporary overvoltage, (U_{TOV}/U_C):		1,42
High current short circuit: (pre-failing method) (Safe non-shattering failure mode)		40 kA
Energy	2 long duration impulses 2 high current impulses	4,2 kJ/kV Uc 6,8 kJ/kV Uc
Service conditions	Ambient temperature:	- 60°C to + 60°C

Mechanical strength data

Cantilever	250 Nm
Tensile	2000 N
Torque	50 Nm

Temporary Overvoltage (TOV) of HDA-xxM with prior energy



Samples are pre-heated to a temperature of 60° C according to IEC 60099-4, Ed 2,0 2004. Samples were subjected to a pre-stress equivalent to one high current impulse of 100kA, 4/10 µs as per switching surge operating duty test.

U_{TOV} = TOV withstand voltage;
U_C = continuous operating voltage

Discharge Class 1 Surge Arrester – HDA-M

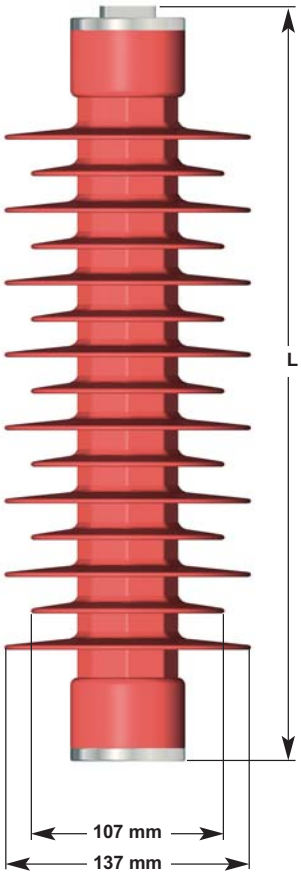
Protective Characteristics

HDA-M	Uc kV	Ur kV	Ures in kV when tested to impulse waveforms Lightning (8/20µs) 5kA	10kA	20kA	Steep lightning (1/20µs) 10kA	Switching (30/60µs) 125A	500A
HDA-26M-xxx	26	32,5	80,6	85,8	94,6	88,4	64,0	68,1
HDA-27M-xxx	27	33,7	83,7	89,1	98,3	91,8	66,4	70,7
HDA-29M-xxx	29	36,2	89,9	95,7	105,6	98,6	71,3	76,0
HDA-30M-xxx	30	37,5	93,0	99,0	109,2	102,0	73,8	78,6
HDA-33M-xxx	33	41,2	102,3	108,9	120,1	112,2	81,2	86,5
HDA-36M-xxx	36	45,0	111,6	118,8	131,0	122,4	88,6	94,3
HDA-39M-xxx	39	48,7	120,9	128,7	142,0	132,6	95,9	102,2
HDA-40M-xxx	40	50,0	124,0	132,0	145,6	136,0	98,4	104,8
HDA-41M-xxx	41	51,2	127,1	135,3	149,2	139,4	100,9	107,4

Uc: Continous Voltage; Ur: Rated Voltage; Ures: Residual Voltage

Standard Housing Parameter

HDA-M	Impulse voltage 1.2/50µs (kV)	Power frequency voltage withstand, wet (kV)	Flash over distance (mm)	Creepage length (mm)	Height L (mm)	Weight (kg)
HDA-26M-xxx	204	98	339	970	343	4,00
HDA-27M-xxx	204	98	339	970	343	4,00
HDA-29M-xxx	204	98	339	970	343	4,00
HDA-30M-xxx	204	98	339	970	343	4,00
HDA-33M-xxx	228	110	378	1125	383	4,50
HDA-36M-xxx	228	110	378	1125	383	4,50
HDA-39M-xxx	250	122	418	1279	423	5,00
HDA-40M-xxx	250	122	418	1279	423	5,00
HDA-41M-xxx	250	122	418	1279	423	5,00



To complete the order information for the accessories, please refer to page 16.

Discharge Class 1 Surge Arrester – DA1

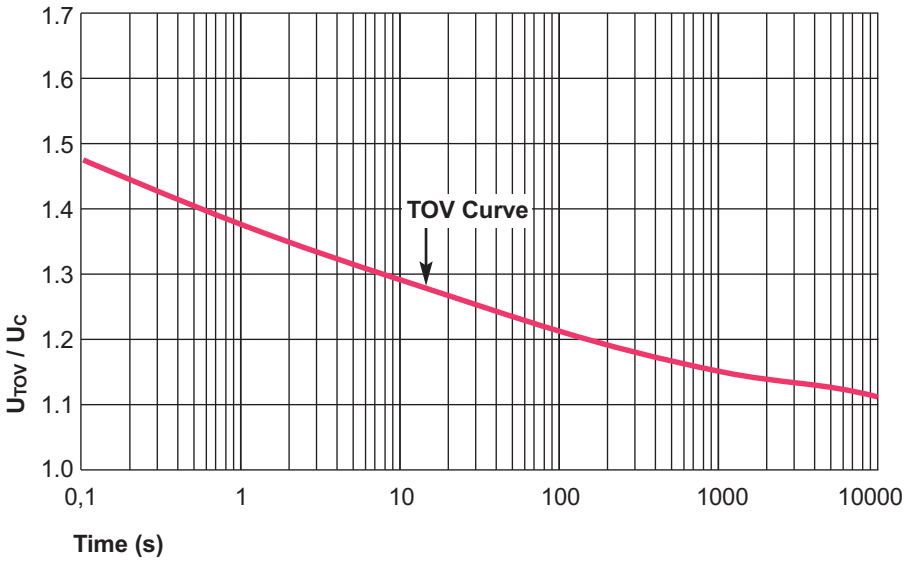
Generic technical data:

DA1 series		6-15 kV Ur
Rated discharge current (8/20µs):		10 kA
Line discharge class according to IEC 60099-4		Class 1
Operating duty impulse withstand current (4/10µs):		100 kA
10 second Temporary Overvoltage (U_{TOV}/U_C):		1,29
Long duration current impulse (2000µs):		325 A
High current short circuit: (pre-failing method) (Safe non-shattering failure mode)		21 kA
Energy	2 long duration impulses	5,6 kJ/kV
Service conditions	Ambient temperature:	- 60°C to + 60°C

Mechanical strength data

Cantilever	350 Nm
Tensile	2000 N
Torque	50 Nm

Temporary Overvoltage (TOV) of DA1 with prior energy



Samples are pre-heated to a temperature of 60° C according to IEC 60099-4, Ed 2,0 2006. Sample was subjected to a pre-stress equivalent to one high current impulse of 100kA, 4/10 µs as per switching surge operating duty test.

U_{TOV} = TOV withstand voltage;
U_C = continuous operating voltage

Discharge Class 1 Surge Arrester – DA1

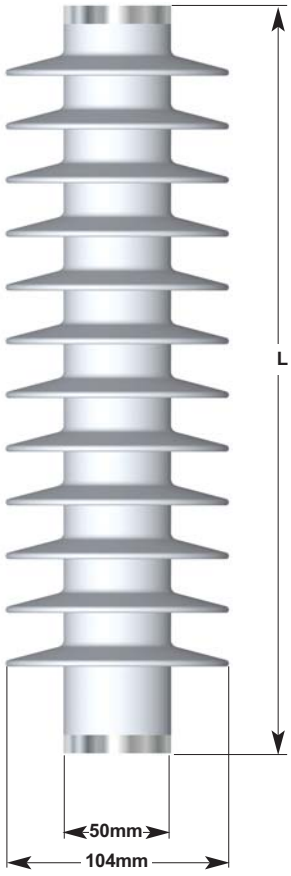
Protective Characteristics

DA1	U c kV	U r kV	U res in kV when tested to impulse waveforms					
			Lightning (8/20µs)			Steep lightning (1/20µs)	Switching (30/60µs)	
			5kA	10kA	20kA	10kA	125A	500A
DA1-08A-xxxxxx-I	6,4	8	19,9	21,2	23,2	22,3	15,9	16,9
DA1-10A-xxxxxx-I	8,0	10	24,9	26,5	29,1	27,9	19,9	21,1
DA1-12A-xxxxxx-I	9,6	12	29,9	31,8	34,9	33,4	23,9	25,3
DA1-15B-xxxxxx-I	12,0	15	37,3	39,8	43,6	41,8	29,9	31,6

Uc: Continous Voltage; Ur: Rated Voltage; Ures: Residual Voltage

Standard Housing Parameter

DA1 Housing code	Impulse Voltage 1.2/50µs (kV)	Power Frequency voltage withstand, wet (kV)	Flash Over Distance (mm)	Creepage Length (mm)	Height L (mm)	Weight (kg)
DA1-08A-xxxxxx-I	134	50	152	329	147	1,2
DA1-10A-xxxxxx-I	134	50	152	329	147	1,2
DA1-12A-xxxxxx-I	134	50	152	329	147	1,2
DA1-15B-xxxxxx-I	160	56	177	404	172	1,4



To complete the order information for the accessories, please refer to page 17.

Discharge Class 2 Surge Arrester – OCP

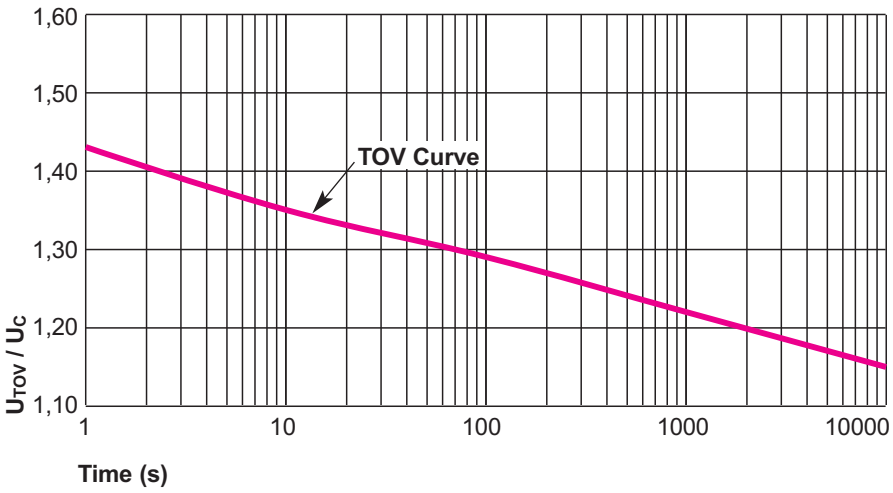
Generic technical data:

OCP2 series		3-41 kV Uc
Rated discharge current (8/20µs):		10 kA
Line discharge class according to IEC 60099-4		Class 2
Operating duty impulse withstand current (4/10µs):		100 kA
10 second Temporary Overvoltage (UTOV/UC):		1,35
Long duration current impulse (2000µs):		530 A
High current short circuit: (pre-failing method)		
(Safe non-shattering failure mode)		40 kA
Energy	2 long duration impulses	6,0 kJ/kV Uc
Service conditions	Ambient temperature:	- 60°C to + 60°C

Mechanical strength data

Cantilever	250 Nm
Tensile	2000 N
Torque	50 Nm

Temporary Overvoltage (TOV) of OCP2 with prior energy



Samples are pre-heated to a temperature of 60° C according to IEC 60099-4, Ed 2,0 2004. Sample was subjected to a pre-stress equivalent to one high current impulse of 100kA, 4/10 µs as per switching surge operating duty test.

U_{TOV} = TOV withstand voltage;
U_C = continuous operating voltage

Discharge Class 2 Surge Arrester – OCP

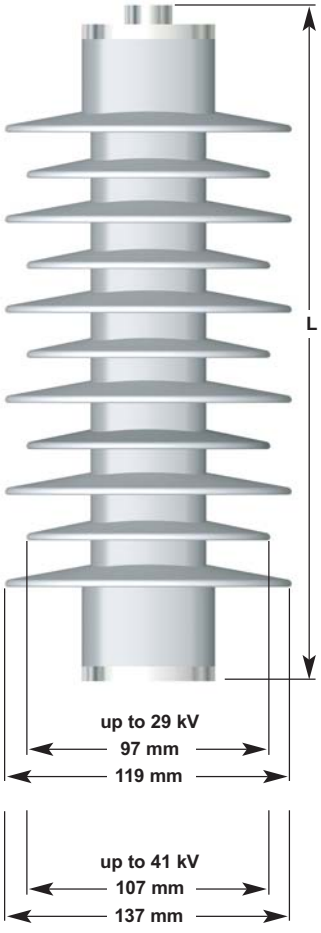
Protective Characteristics

OCP2	U c kV	U r kV	U res in kV when tested to impulse waveforms					
			Lightning (8/20µs)			Steep lightning (1/20µs)	Switching (30/60µs)	
			5kA	10kA	20kA	10kA	125A	500A
OCP2-03S-xxx	3	3,7	9,18	9,72	10,84	10,10	7,37	7,76
OCP2-04S-xxx	4	5,0	12,24	12,96	14,46	13,47	9,83	10,35
OCP2-06S-xxx	6	7,5	18,36	19,44	21,68	20,21	14,75	15,53
OCP2-08S-xxx	8	10,0	24,48	25,92	28,91	26,94	19,66	20,70
OCP2-09S-xxx	9	11,2	27,54	29,16	32,53	30,31	22,12	23,29
OCP2-10S-xxx	10	12,5	30,60	32,40	36,14	33,68	24,58	25,88
OCP2-12S-xxx	12	15,0	36,72	38,88	43,37	40,42	29,50	31,06
OCP2-18S-xxx	18	22,5	55,08	58,32	65,05	60,62	44,24	46,58
OCP2-20S-xxx	20	25,0	61,20	64,80	72,28	67,36	49,16	51,76
OCP2-21S-xxx	21	26,2	64,26	68,04	75,89	70,73	51,62	54,35
OCP2-24S-xxx	24	30,0	73,44	77,76	86,74	80,83	58,99	62,11
OCP2-27S-xxx	27	33,7	82,60	87,50	97,60	90,90	66,40	69,90
OCP2-30M-xxx	30	37,5	91,80	97,20	108,40	101,00	73,70	77,60
OCP2-33M-xxx	33	41,2	101,00	106,90	119,30	111,10	81,10	85,40
OCP2-36M-xxx	36	45,0	110,20	116,60	130,10	121,20	88,50	93,20
OCP2-39M-xxx	39	48,7	119,30	126,40	140,90	131,40	95,90	100,90
OCP2-40M-xxx	40	50,0	122,40	129,60	144,60	134,70	98,30	103,50
OCP2-41M-xxx	41	51,2	125,50	132,80	148,20	138,10	100,80	106,10

Uc: Continous Voltage; Ur: Rated Voltage; Ures: Residual Voltage

Standard Housing Parameter

OCP2	Impulse Voltage 1.2/50µs (kV)	Power Frequency voltage withstand, wet (kV)	Flash Over Distance (mm)	Creepage Length (mm)	Height L (mm)	Weight (kg)
OCP2-03S-xxx	145	47	176	380	183	1,80
OCP2-04S-xxx	145	47	176	380	183	1,80
OCP2-06S-xxx	145	47	176	380	183	1,80
OCP2-08S-xxx	145	47	176	380	183	1,80
OCP2-09S-xxx	145	47	176	380	183	1,80
OCP2-10S-xxx	145	47	176	380	183	1,80
OCP2-12S-xxx	145	47	176	380	183	1,80
OCP2-18S-xxx	180	70	254	632	260	2,65
OCP2-20S-xxx	180	70	254	632	260	2,65
OCP2-21S-xxx	200	80	293	758	299	3,00
OCP2-24S-xxx	200	80	293	758	299	3,00
OCP2-27S-xxx	230	95	334	885	340	3,40
OCP2-30M-xxx	204	98	339	970	343	3,65
OCP2-33M-xxx	228	110	378	1125	383	4,15
OCP2-36M-xxx	228	110	378	1125	383	4,15
OCP2-39M-xxx	250	122	418	1279	423	4,65
OCP2-40M-xxx	250	122	423	1279	423	4,65
OCP2-41M-xxx	250	122	423	1279	423	4,65



To complete the order information for the accessories, please refer to page 18.

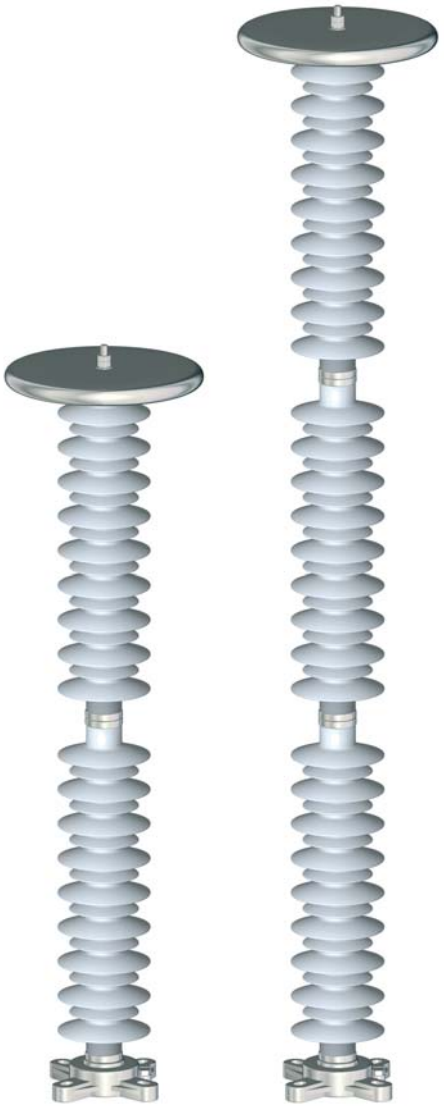
Discharge Class 2 Surge Arrester – HSR

Generic technical data:

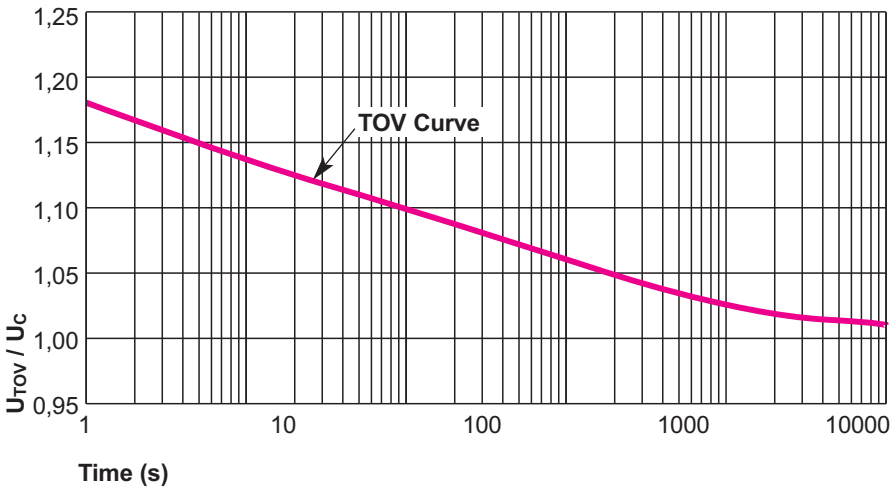
HSR series		up to 110 kV Ur
Rated discharge current (8/20µs):		10 kA
Line discharge class according to IEC 60099-4		Class 2
Operating duty impulse withstand current (4/10µs):		100 kA
Long duration current impulse (2000µs):		530 A
10 second temporary overvoltage (U_{TOV}/U_C):		1,13
High current short circuit: (pre-failing method) (Safe non-shattering failure mode)		40 kA
Energy	2 long duration impulses	6,0 kJ/kV Uc
Service conditions	Ambient temperature:	- 60°C to + 60°C

Mechanical strength data

Cantilever (2HSRC/3HSRC)	900/600 Nm
Tensile	2000 N
Torque	75 Nm



Temporary Overvoltage (TOV) of HSR with prior energy



Temperature of samples (pre-heated): 60° C according to IEC 60099-4, Ed 2.0 2004. TOV Curve applies to an arrester which has a pre-stress applied prior to TOV verification. This pre-stress is equivalent to two long duration current impulses of 2000 µs with total energy capability 5.6 kJ/kV Uc.

U_{TOV} = TOV withstand voltage
U_C = continuous operating voltage

Discharge Class 2 Surge Arrester – HSR

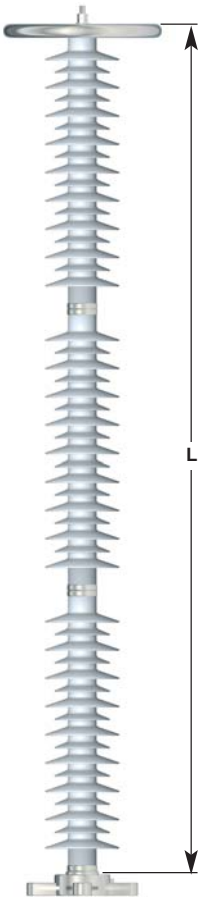
Protective Characteristics

HSRC	Uc kV	Ur kV	Ures in kV when tested to impulse waveforms								
			Lightning (8/20µs)			Steep lightning (1/200µs)		Switching (30/60µs)			
			5kA	10kA	20kA	10kA	20kA	250A	500A	1000A	2000A
2HSRCP48LxExMx	38,4	48,0	120	129	142	139	153	97,8	101	105	110
2HSRCP60LxExMx	48,0	60,0	148	159	175	171	189	120	125	129	136
2HSRCP72LxExMx	57,6	72,0	179	192	212	206	228	146	150	156	164
2HSRCP75LxExMx	60,0	75,0	185	199	219	213	236	151	156	162	170
3HSRCP84LxExMx	67,0	84,0	209	225	248	242	267	171	176	183	192
3HSRCP88LxExMx	70,0	87,5	219	235	259	252	279	178	184	192	201
3HSRCP91LxExMx	73,0	91,2	225	242	266	259	287	183	189	197	206
3HSRCP95LxExMx	76,0	95,0	237	255	281	274	302	193	200	208	218
3HSRCP96LxExMx	76,8	96,0	238	258	284	274	302	193	201	208	218
3HSRCP99LxExMx	79,0	98,7	243	261	288	281	310	198	205	213	223
3HSRCP102LxExMx	82,0	102,5	256	275	303	295	326	208	215	224	235
3HSRCP106LxExMx	85,0	106,2	265	285	314	306	338	216	223	232	243
3HSRCP108LxExMx	86,4	108,0	269	291	321	309	342	218	227	235	246
3HSRCP110LxExMx	88,0	110,0	271	291	321	313	346	221	228	237	249

Uc: Continous Voltage; Ur: Rated Voltage; Ures: Residual Voltage

Standard housing parameters

HSRC	Impulse Voltage 1.2/50µs (kV)	Power Frequency voltage withstand, wet (kV)	Flash Over Distance (mm)	Creepage Length (mm)	Height L (mm)	Weight (kg)
2HSRCP48LxExMx	503	273	964	2650	952	11,2
2HSRCP60LxExMx	503	273	964	2650	952	11,2
2HSRCP72LxExMx	503	273	964	2650	952	11,2
2HSRCP75LxExMx	503	273	964	2650	952	11,2
3HSRCP84LxExMx	757	377	1446	3975	1428	16,8
3HSRCP88LxExMx	757	377	1446	3975	1428	16,8
3HSRCP91LxExMx	757	377	1446	3975	1428	16,8
3HSRCP95LxExMx	757	377	1446	3975	1428	16,8
3HSRCP96LxExMx	757	377	1446	3975	1428	16,8
3HSRCP99LxExMx	757	377	1446	3975	1428	16,8
3HSRCP102LxExMx	757	377	1446	3975	1428	16,8
3HSRCP106LxExMx	757	377	1446	3975	1428	16,8
3HSRCP108LxExMx	757	377	1446	3975	1428	16,8
3HSRCP110LxExMx	757	377	1446	3975	1428	16,8

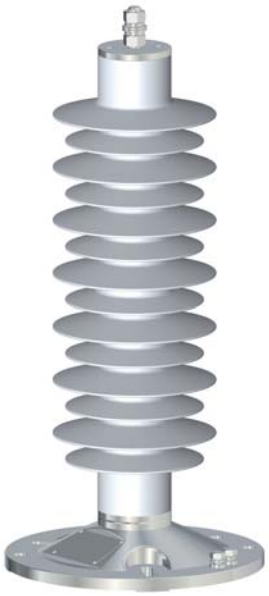


To complete the order information for the accessories, please refer to page 19.

Discharge Class 3 Surge Arrester – PCA

Generic technical data:

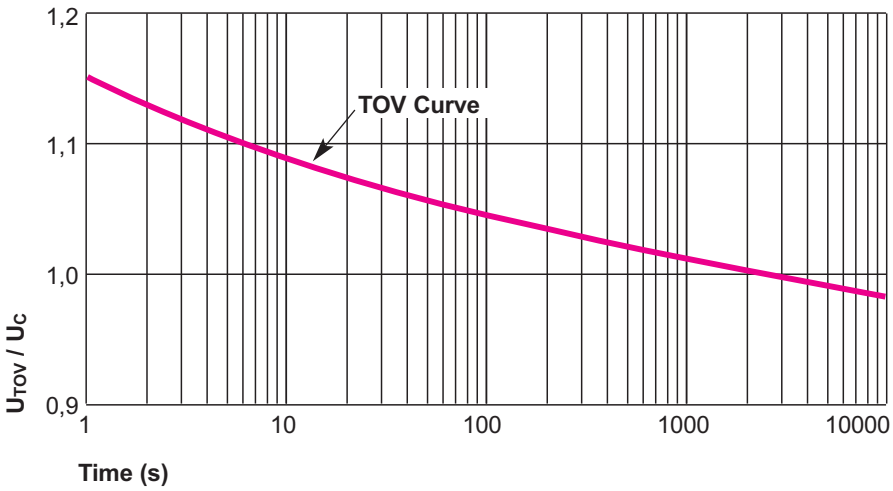
PCA series		up to 110 kV Ur
Rated discharge current (8/20µs):		10 kA
Line discharge class according to IEC 60099-4		Class 3
Operating duty impulse withstand current (4/10µs):		100 kA
Long duration current impulse (2000µs):		640 A
10 second TOV (UTOV/UC):		1,15
High current short circuit: (pre-failing method) (Safe non-shattering failure mode)		65 kA
Energy	2 long duration impulses	7,8 kJ/kV Uc
Service conditions	Ambient temperature:	- 60°C to + 60°C



Mechanical strength data

Cantilever	2500 Nm
Tensile	75 kN
Torque	75 Nm

Temporary Overvoltage (TOV) of PCR with prior energy



Temperature of samples (pre-heated): 60° C according to IEC 60099-4, Ed 2.0 2004.
TOV Curve applies to an arrester which has a pre-stress applied prior to TOV verification.
This pre-stress is equivalent to two long duration current impulses of 2000 µs with total energy capability 5.6 kJ/kV Uc.

U_{TOV} = допустимое напряжение в соответствии с нагрузочной характеристикой “TOV”;
U_C = наибольшее длительно допустимое напряжение

Discharge Class 3 Surge Arrester – PCA

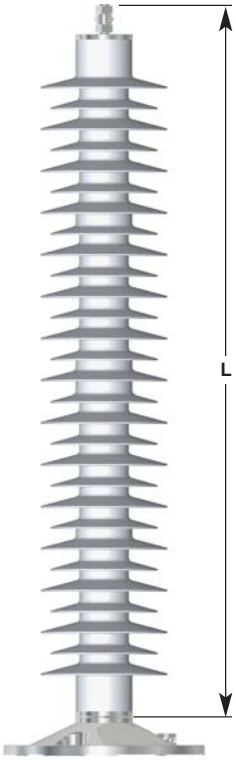
Protective Characteristics

PCA	Uc kV	Ur kV	Ures in kV when tested to impulse waveforms								
			Lightning (8/20µs)			Steep lightning (1/200µs)		Switching (30/60µs)			
			5kA	10kA	20kA	10kA	20kA	250A	500A	1000A	2000A
PCA248LxExMx	38.4	48	123	129	141	140	152	99,7	103	106	111
PCA260LxExMx	48.0	60	149	156	170	169	184	120.0	124	128	134
PCA372LxExMx	57.6	72	180	188	206	205	223	146.0	151	155	162
PCA375LxExMx	60.0	75	185	193	212	210	228	150.0	155	159	166
PCA384LxExMx	67.2	84	209	219	240	238	259	169.0	173	180	188
PCA396LxExMx	76.8	96	234	245	268	266	289	189.0	196	201	211
PCA3108LxExMx	86.4	108	259	270	296	294	320	209.0	216	222	233

Uc: Continous Voltage; Ur: Rated Voltage; Ures: Residual Voltage

Standard housing parameters

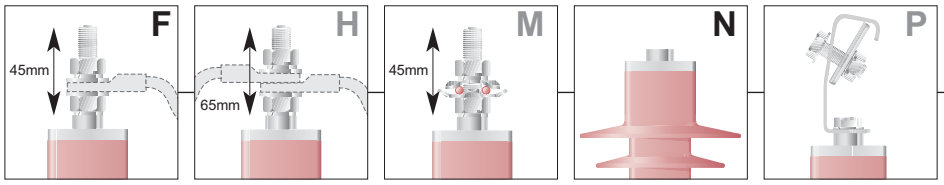
PCA	Impulse Voltage 1.2/50µs (kV)	Power Frequency voltage withstand, wet (kV)	Flash Over Distance (mm)	Creepage Length (mm)	Height L (mm)	Weight (kg)
PCA248LxExMx	325	140	566	1815	655	14,0
PCA260LxExMx	325	140	566	1815	655	14,0
PCA372LxExMx	650	275	1059	3625	1150	26,5
PCA375LxExMx	650	275	1059	3625	1150	26,5
PCA384LxExMx	650	275	1059	3625	1150	26,5
PCA396LxExMx	650	275	1059	3625	1150	26,5
PCA3108LxExMx	650	275	1059	3625	1150	26,5



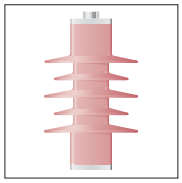
To complete the order information for the accessories, please refer to page 19.

Accessories for Class 1 Surge Arrester (Type HDA)

Line lead accessories



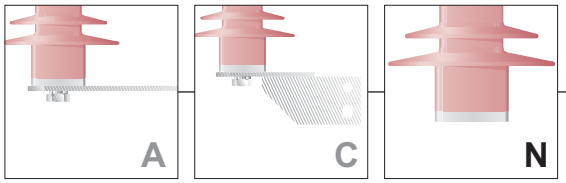
Arrester Type = Continuous Operating Voltage U_c in kV



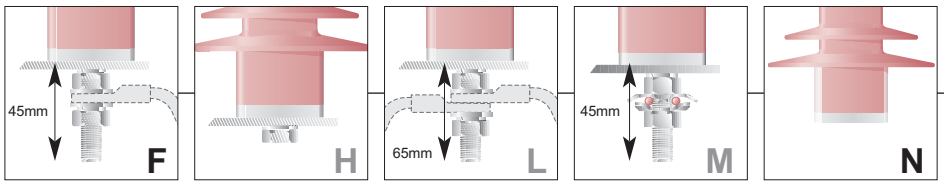
03MA	04MA	05MA	06MA	08MA	09MA	10MA	12MA	14MA
15MA	16MA	17MA	18MA	19MA	20MA	21MA	22MA	24MA
26M	27M	29M	30M	33M	36M	39M	40M	41M

HDA – □ – □□□

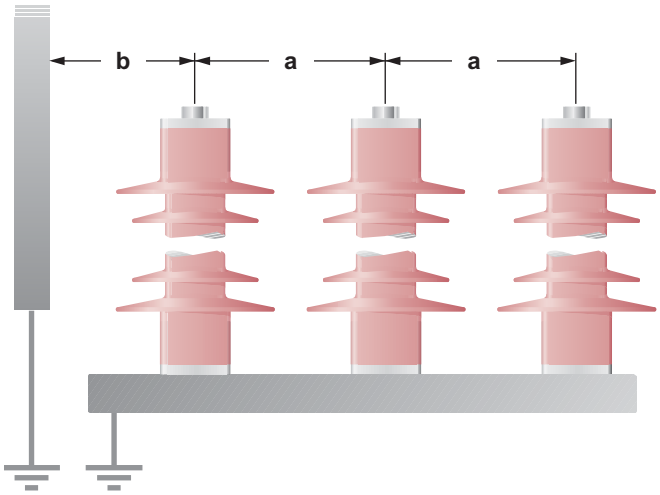
Mounting accessories



Ground lead accessories



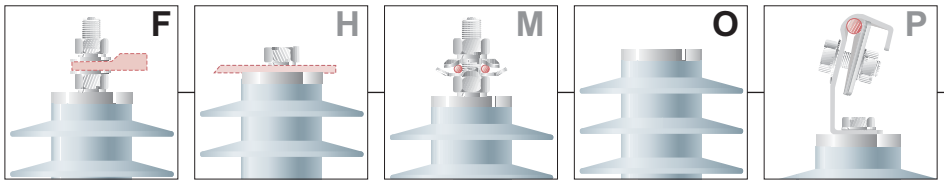
Installation Requirements



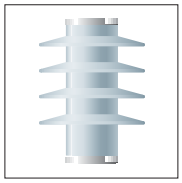
System Voltage U_0/U	ph/ph (a)	ph/ground (b)
6/10	185	165
12/20	315	295
20/35	510	490

Accessories for Class 1 Surge Arrester (Type DA1)

Line lead accessories



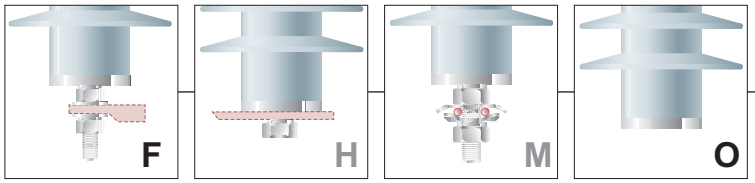
Arrester Type = Rated Voltage U_r in kV



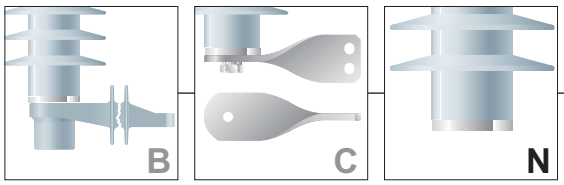
08A	10A
12A	15B

DA1 – □ – □ 0 □ 0 □ 0-I

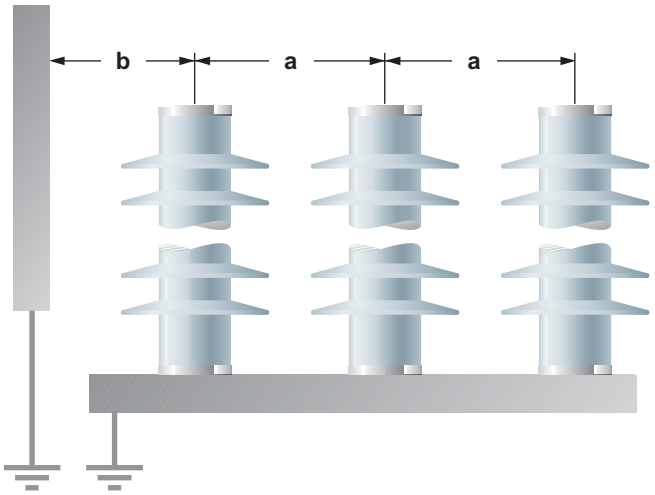
Ground lead accessories



Mounting accessories



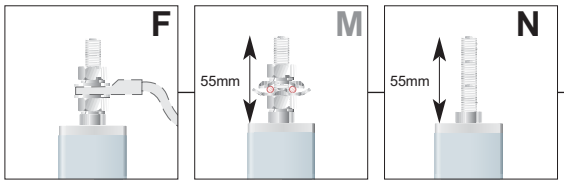
Installation Requirements



System Voltage U_0/U	ph/ph (a)	ph/ground (b)
6/10	185	165
12/20	315	295
20/35	510	490

Accessories for Class 2 Surge Arrester (Type OCP2)

Line lead accessories



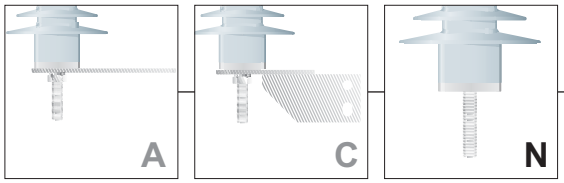
Arrester Type = Continuous Operating Voltage U_c in kV

03S	04S	06SA	08S	09S	10S
12S	18S	20S	21S	24S	27S
30M	33M	36M	39M	40M	41M

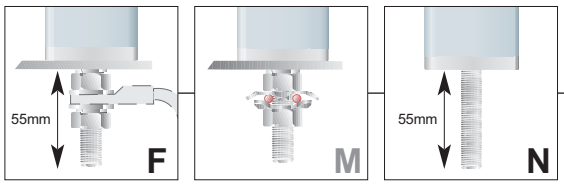
OCP2 – □ – □□□

All accessories with M12 stainless steel studs

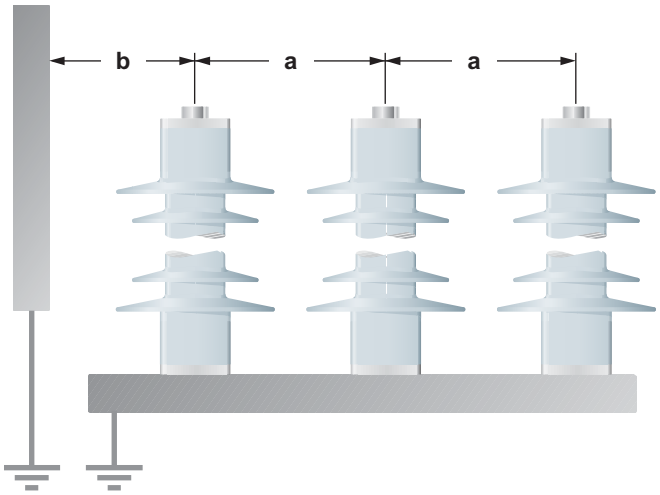
Mounting accessories



Ground lead accessories

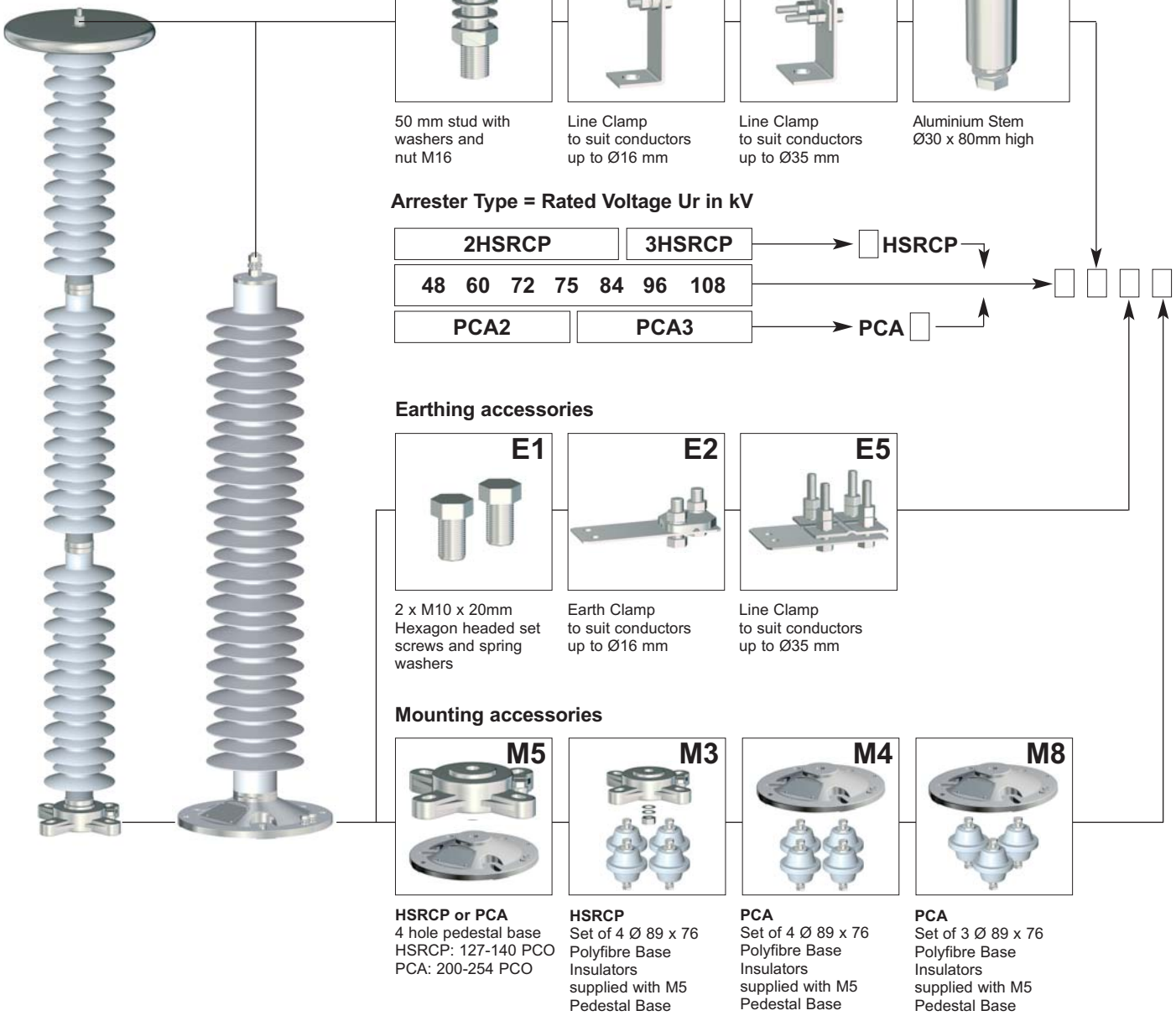


Installation Requirements



System Voltage U_0/U	ph/ph (a)	ph/ground (b)
6/10	185	165
12/20	315	295
20/35	510	490

Accessories for Class 2 and Class 3 Surge Arrester (Type HSR and PCA)



Ur kV	HSRCP	PCA	Recommended minimum distance mm between phase centers		line to earth	
			HSRCP	PCA	HSRCP	PCA
48	2HSRCP48LxExMx	PCA248LxExMx	510	542	260	306
60	2HSRCP60LxExMx	PCA260LxExMx	625	654	326	372
72	2HSRCP72LxExMx	PCA272LxExMx	735	767	391	437
75	2HSRCP75LxExMx	PCA275LxExMx	765	795	408	453
84	3HSRCP84LxExMx	PCA384LxExMx	840	880	456	502
88	3HSRCP88LxExMx	PCA388LxExMx	1213	993	518	567
91	3HSRCP91LxExMx	PCA391LxExMx	1213	993	518	567
95	3HSRCP95LxExMx	PCA395LxExMx	1213	993	518	567
96	3HSRCP96LxExMx	PCA396LxExMx	1213	993	518	567
99	3HSRCP99LxExMx	PCA399LxExMx	1326	1106	583	632
102	3HSRCP102LxExMx	PCA3102LxExMx	1326	1106	583	632
106	3HSRCP106LxExMx	PCA3106LxExMx	1326	1106	583	632
108	3HSRCP108LxExMx	PCA3108LxExMx	1326	1106	583	632
110	3HSRCP110LxExMx	PCA310LxExMx	1436	1218	648	698

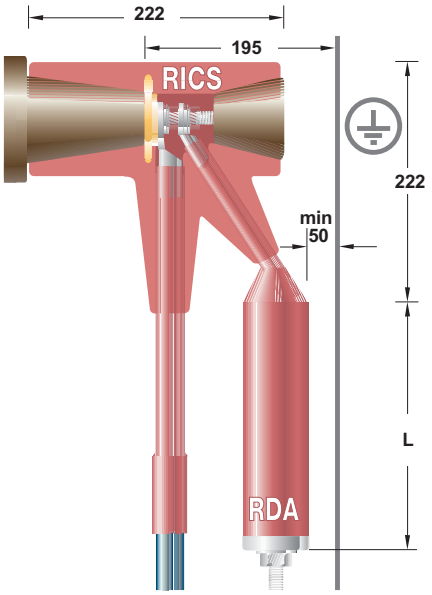
MV Surge Arresters for Indoor Applications – RDA

In gas-insulated switchgear systems RDA type

Modern gas-insulated switchgear connected to combined underground and overhead distribution systems are sensitive to effects like transient voltage doubling. An arrester installed right at the cable end will clamp the voltage to a level which does not put the switchgear at risk.

The RDA surge arrester, together with the Raychem RICS connection system for gas-insulated switchgear, facilities at hermetically sealed integration of the arrester and the cable termination to be connected to a switchgear. Compact design and easy installation are the special features of this product line.

Gas insulated switchgear with RDA arrester and RICS adapter.
RICS adapter must be ordered seperatly.



Generic technical data:

RDA-xx series		6-24 kV Uc
Rated discharge current (8/20µs):		10 kA
Line discharge class according to IEC 60099-4		Class 1
Operating duty impulse withstand current (4/10µs):		100 kA
Long duration current impulse (2000µs):		400 A
10 second temprary overvoltage (U_{TOV}/U_C)		1,25
High current short circuit: (pre-failing method) (Safe non-shattering failure mode)		16 kA
Energy	line discharge impulse high current impulse	2,6 kJ/kV Uc 5,3 kJ/kV Uc

RDA	Height L (mm)
RDA-06	138+222
RDA-09	168+222
RDA-12	200+222
RDA-15	299+222
RDA-18	329+222
RDA-21	361+222
RDA-24	393+222

Protective Characteristics

RDA	Uc kV	Ur kV	Ures in kV when tested to impulse waveforms						
			Lightning (8/20µs)				Steep lightning (1/20µs)	Switching (30/60µs)	
			5kA	10kA	20kA	40kA	10kA	125A	500A
RDA-06	6	7,5	18,6	20,0	22,4	26,2	21,8	13,8	14,8
RDA-09	9	11,0	27,9	30,0	33,6	39,3	32,7	20,6	22,2
RDA-10	10	12,5	31,0	33,3	37,4	43,7	36,3	22,9	24,7
RDA-12	12	15,0	37,2	40,0	44,9	52,4	43,6	27,5	29,6
RDA-15	15	18,0	46,5	50,0	56,1	65,5	54,5	34,4	37,0
RDA-18	18	22,0	55,8	60,0	67,3	78,6	65,4	41,3	44,4
RDA-21	21	26,0	65,1	70,0	78,5	91,7	76,3	48,1	51,8
RDA-24	24	30,0	74,4	80,0	89,7	105,0	87,2	55,0	59,2

Uc: Continous Voltage; Ur: Rated Voltage; Ures: Residual Voltage

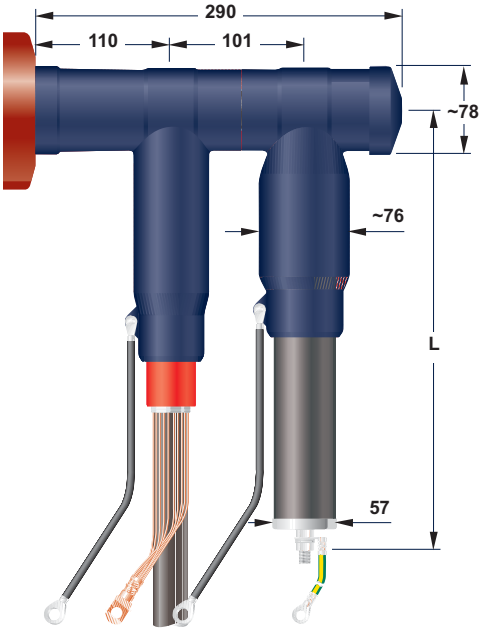
Arresters for other voltages are available on request.

MV Surge Arresters for Indoor Applications – RSTI-SA

Screened, separable surge arresters for gas-insulated switchgear system RSTI-SA type

Modern gas-insulated switchgear connected to combined underground and overhead distribution systems are sensitive to effects like transient voltage doubling. An arrester installed right at the cable end will clamp the voltage to a level which does not put the switchgear at risk.

The RSTI surge arrester, together with the Raychem RSTI connection system for gas-insulated switchgear, facilities at hermetically sealed integration of the arrester and the cable termination to be connected to a switchgear. Compact design and easy installation are the special features of this product line.



Generic technical data:	**10 kA**
RSTI-SA series	12-41 kV Uc
Rated discharge current (8/20µs):	10 kA
Operating duty impulse withstand current (4/10µs):	100 kA
Long duration current impulse (1000µs):	212 A
10 second temporary overvoltage (U_{TOV}/U_C):	1,42
Short Circuit current I_s	20 kA

Protective Characteristics

RSTI	**Uc kV**	**Ur kV**	**U residual in kV when tested the following impulse waveforms**						**Height mm**	**Weight kg**
			Lightning (8/20µs)			**Steep lightning (1/20µs)**	**Switching impulse (30/60µs)**			
			5kA	**10kA**	**20 kA**	**10kA**	**125 A**	**500 A**		
RSTI-CC-66SA1210	12	15,0	39,1	41,5	45,7	43,9	31,5	32,4	285	4,4
RSTI-CC-66SA1810	18	22,5	58,2	62,2	68,5	68,5	47,3	48,7	400	4,6
RSTI-CC-66SA2410	24	30,0	78,2	83,0	91,4	78,8	63,1	64,9	400	4,8
RSTI-CC-66SA3010	30	37,5	97,7	103,7	114,2	114,2	78,9	81,1	520	5,0
RSTI-CC-66SA3610	36	45,0	117,3	124,5	137,1	137,1	94,7	97,4	520	5,1
RSTI-CC-66SA3910	39	48,8	127,1	134,9	148,5	148,5	102,5	105,5	520	5,2
RSTI-CC-66SA4110	41	51,3	133,6	141,8	156,1	156,1	107,8	110,9	520	5,3

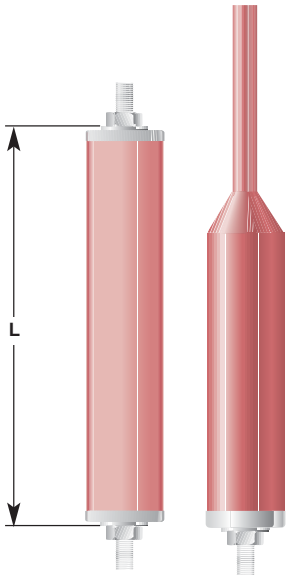
Uc: Continous Voltage; Ur: Rated Voltage; Ures: Residual Voltage

Arresters for other voltages are available on request.

MV Surge Arresters for Indoor Applications – SPA

In air-spaced insulated switchgear systems
SPA type
A compact arrester with high mechanical strength. Even there are no sheds the housing material is fully track resistant and able to provide flashover resistance in damp indoor conditions.
The SPA type arrester is also available with a thick-wall insulated integrated line lead, which allows to considerably reduce the clearances between the arresters and to the earth. This line lead is available in lengths of 250mm, 500mm and 750mm. This SPA-I type arrester is the ideal solution when retrofitting compact switchgears with arresters.

Air-spaced switchgear with SPA-I arresters.



SPA SPA-I

Generic technical data:

SPA-xx series		6-36 kV Uc
Rated discharge current (8/20µs):		10 kA
Line discharge class according to IEC 60099-4		Class 1
Operating duty impulse withstand current (4/10µs):		100 kA
Long duration current impulse (2000µs):		400 A
10 second temporary overvoltage (U_{TOV}/U_C)		1,25
High current short circuit: (pre-failing method) (Safe non-shattering failure mode)		16 kA
Energy	line discharge impulse high current impulse	2,6 kJ/kV Uc 5,3 kJ/kV Uc

Mechanical strength data

Cantilever	200 Nm
Tensile	1000 N
Torque	58 Nm

SPA / SPA-I	Height L (mm)
SPA-06	138
SPA-09	168
SPA-10	177
SPA-12	200
SPA-15	299
SPA-18	329
SPA-21	361
SPA-24	393
SPA-27	491
SPA-30	522
SPA-33	554
SPA-36	586

Protective Characteristics

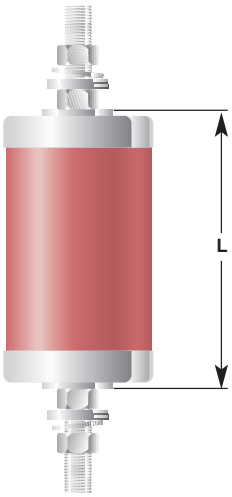
SPA / SPA-I	Uc kV	Ur kV	Ures in kV when tested to impulse waveforms						
			Lightning (8/20µs)				Steep lightning (1/20µs)	Switching (30/60µs)	
			5kA	10kA	20kA	40kA	10kA	125A	500A
SPA-06	6	7,5	18,6	20,0	22,4	26,2	21,8	13,8	14,8
SPA-09	9	11,0	27,9	30,0	33,6	39,3	32,7	20,6	22,2
SPA-10	10	12,5	31,0	33,3	37,4	43,7	36,3	22,9	24,7
SPA-12	12	15,0	37,2	40,0	44,9	52,4	43,6	27,5	29,6
SPA-15	15	18,0	46,5	50,0	56,1	65,5	54,5	34,4	37,0
SPA-18	18	22,0	55,8	60,0	67,3	78,6	65,4	41,3	44,4
SPA-21	21	26,0	65,1	70,0	78,5	91,7	76,3	48,1	51,8
SPA-24	24	30,0	74,4	80,0	89,7	105,0	87,2	55,0	59,2
SPA-27	27	33,0	83,7	90,0	101,0	118,0	98,1	61,9	66,6
SPA-30	30	37,0	93,0	100,0	112,0	131,0	109,0	68,8	74,0
SPA-33	33	41,0	102,0	110,0	123,0	144,0	120,0	75,6	81,4
SPA-36	36	45,0	112,0	120,0	135,0	157,0	131,0	82,5	88,8

Uc: Continous Voltage; Ur: Rated Voltage; Ures: Residual Voltage

Arresters for other voltages are available on request.

MV Surge Arresters for Indoor Applications – MPA

For motor-connection boxes
MPA type
Design for the specific requirements of electric motors. A robust, non-tracking housing plus the high energy handling capabilities of the Tyco Electronics arrester family make it the ideal choice for the designer.



Generic technical data:		
MPA-xx series		2-12 kV Uc
Rated discharge current (8/20µs):		10 kA
Line discharge class according to IEC 60099-4		Class 1
Operating duty impulse withstand current (4/10µs):		100 kA
Long duration current impulse (2000µs):		400 A
10 second temporary overvoltage (U_{TOV}/U_C)		1,25
High current short circuit: (pre-failing method) (Safe non-shattering failure mode)		16 kA
Energy	line discharge impulse high current impulse	2,6 kJ/kV Uc 5,3 kJ/kV Uc

MPA	Height L (mm)
MPA-02	101
MPA-03	107
MPA-04	114
MPA-06	138
MPA-07	148
MPA-09	168
MPA-10	177
MPA-12	200

Mechanical strength data	
Cantilever	200 Nm
Tensile	1000 N
Torque	58 Nm

Protective Characteristics

MPA	Uc kV	Ur kV	Ures in kV when tested to impulse waveforms						
			Lightning (8/20µs)				Steep lightning (1/20µs)	Switching (30/60µs)	
			5kA	10kA	20kA	40kA	10kA	125A	500A
MPA-02	2	2,5	6,2	6,7	7,5	8,7	7,3	4,6	4,9
MPA-03	3	3,7	9,3	10,0	11,2	13,1	10,9	6,9	7,4
MPA-04	4	5,0	12,4	13,3	15,0	17,5	14,5	9,2	9,9
MPA-06	6	7,5	18,6	20,0	22,4	26,2	21,8	13,8	14,8
MPA-07	7	8,7	21,7	23,3	26,2	30,6	25,4	16,0	17,3
MPA-09	9	11,0	27,9	30,0	33,6	39,3	32,7	20,6	22,2
MPA-10	10	12,5	31,0	33,3	37,4	43,7	36,3	22,9	24,7
MPA-12	12	15,0	37,2	40,0	44,9	52,4	43,6	27,5	29,6

Uc: Continous Voltage; Ur: Rated Voltage; Ures: Residual Voltage

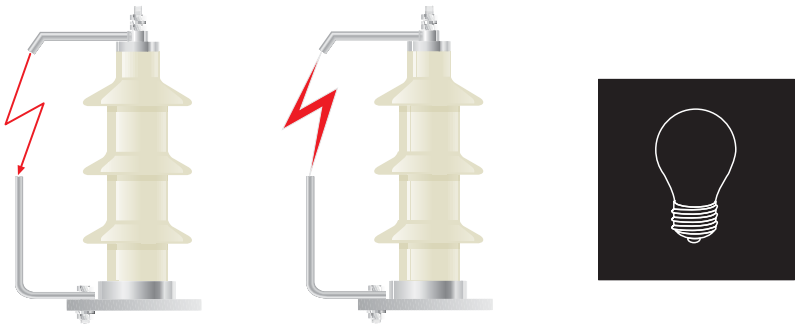
Arresters for other voltages are available on request.

Tyco Electronics MV Surge Arresters with external spark-gaps

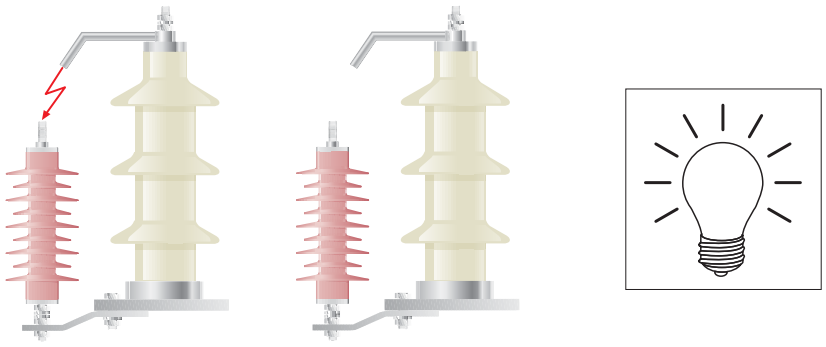
Protection system MORE for medium-voltage transformer overhead lines
This type of surge arresters is designed to protect the insulator assembly at transformers from the lightning over-voltages. It is connected parallel to the insulator assembly. It is defined as a device that contains a non-linear metal oxide resistor element in its arrester body (MORE) and an external series gap to isolate the MORE from the system.

The protection is accomplished by raising the spark-over level of the external series gap to a level that isolates the arrester from power frequency overvoltages and from the worst case switching overvoltages expected on the line which it is applied. The external series gap acts as an isolating apparatus in the event of arrester body failure.

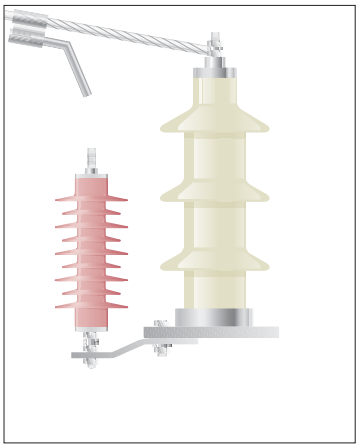
Without MORE
Lightning protection with arcing horns. In case of lightning overvoltage, the system is out of function based on the present voltage.

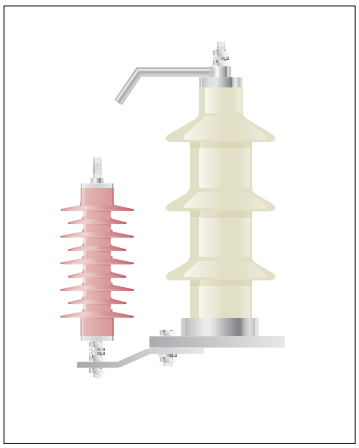


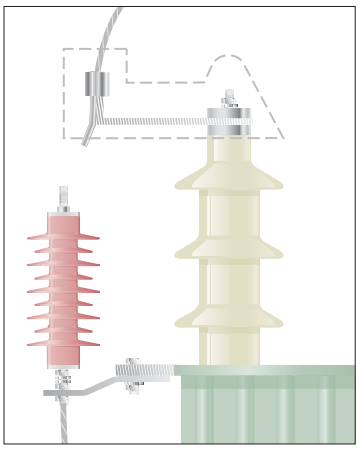
With MORE
Lightning protection with the MORE arrester. The MORE will be disconnect and the system will be in function.



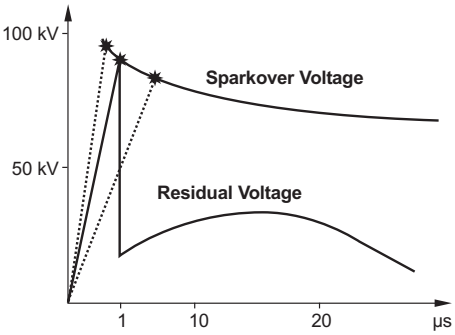
The pictures below show different constructions of the MORE system.



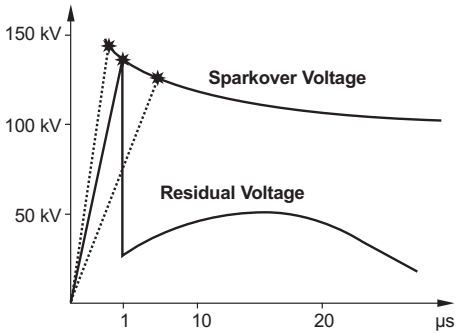




10 kV System



20 kV System



Tyco Electronics MV Surge Arresters for covered conductors – CLX

Protection system CLX for medium-voltage covered conductor overhead lines
An absolute must when covered conductor systems are used. CLX prevents covered conductors from melting and falling down to earth when lightning strikes generate overvoltages in overhead lines. CLX guides the lightning discharge current ground, prevents the insulator from flashing over and stops the high energy of the power frequency follow-on current. On top of this, CLX protected overhead lines will have almost no power supply interruptions during storms.

This makes it attractive also for bare conductor distribution systems.
Even in case of accidental bridging CLX will not cause a phase-to-ground fault.
The CLX device contains a Metal Oxide Resistive Element and an external series gap to isolate the Metal Oxide Resistive Element from the system.
The CLX device is installed next to the line / post insulators and can be adapted to the system. The series gap will be realized by different brackets, electrodes and connectors.
We offer engineering support to optimize the use of CLX.

Covered conductor system protected by CLX

Generic technical data:

CLX-xx series		12-42 kV Uc
Rated discharge current (8/20µs):		5 kA
Operating duty impulse withstand current (4/10µs):		65 kA
High current short circuit: (pre-failing method) (Safe non-shattering failure mode)		16 kA
Energy	line discharge impulse high current impulse	1,5 kJ/kV Uc 3,6 kJ/kV Uc
Service conditions	Ambient temperature:	- 60°C to + 60°C

Mechanical strength data

Cantilever	150 Nm
Torque	45 Nm

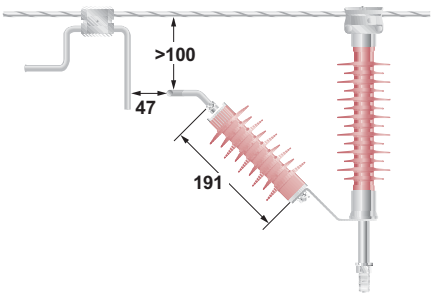
Protective Characteristics

CLX	Um kV	Ures in kV when tested to impulse waveforms Lightning (8/20µs)				Lightning Impulse Sparkover Voltage	
		2,5kA	5kA	10kA	20kA	Standard (1/20µs)	Steep (1000kV/µs)
CLX-12NA	12,0	30,0	32,0	35,0	40,0	80,0	140,0
CLX-15NA	15,0	31,0	33,0	36,0	41,0	100,0	175,0
CLX-24NA	24,0	48,0	51,0	57,0	63,0	140,0	250,0
CLX-36NA	36,0	77,0	83,0	91,0	103,0	190,0	400,0
CLX-42NA	42,0	86,0	91,0	136,0	153,0	230,0	450,0

Um: Max. System Voltage; Ures: Residual Voltage / Sparkover Voltage

Metal Oxide Resistive Elements Houstng Parameter

CLX	Power voltage withstand, wet (kV)	Flash over distance (mm)	Creepage length (mm)	Height L (mm)	Weight (kg)
CLX-12NA	31	182	375	191	1,20
CLX-15NA	31	182	375	191	1,20
CLX-24NA	50	283	715	286	1,90
CLX-36NA	50	283	715	286	1,90
CLX-42NA	81	465	1090	477	3,10

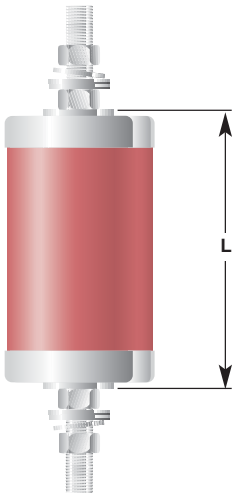


Typical setup for Um 12 kV

Tyco Electronics MV Surge Arresters for cable sheath protection system – CPA

High-voltage cable sheath protection system CPA
Designed to the specific requirements in cable sheath protection. A robust, non tracking housing plus the high energy handling capabilities of the Raychem arrester family make it the ideal choice for the designer.

CPA arresters installed in a cubicle to protect HV cable sheath cross bonds



Generic technical data:		
CPA-xx series		1-7 kV Uc
Rated discharge current (8/20µs):		10 kA
Line discharge class according to IEC 60099-4		Class 1
Operating duty impulse withstand current (4/10µs):		100 kA
Long duration current impulse (2000µs):		400 A
10 second temporary overvoltage (U_{TOV}/U_C)		1,25
High current short circuit: (pre-failing method) (Safe non-shattering failure mode)		16 kA
Energy	line discharge impulse high current impulse	2,6 kJ/kV Uc 5,3 kJ/kV Uc

Mechanical strength data	
Cantilever	200 Nm
Tensile	1000 N
Torque	58 Nm

CPA	Height L (mm)
CPA-01	94
CPA-02	101
CPA-03	107
CPA-04	114
CPA-05	123
CPA-06	138
CPA-07	148

Protective Characteristics

CPA	Uc kV	Ur kV	Ures in kV when tested to impulse waveforms						
			Lightning (8/20µs)				Steep lightning (1/20µs)	Switching (30/60µs)	
			5kA	10kA	20kA	40kA	10kA	125A	500A
CPA-01	1	1,2	3,1	3,3	3,7	4,4	3,6	2,3	2,5
CPA-02	2	2,5	6,2	6,7	7,7	8,7	7,3	4,6	4,9
CPA-03	3	3,7	9,3	10,0	11,2	13,1	10,9	6,9	7,4
CPA-04	4	5,0	12,4	13,3	15,0	17,5	14,5	9,2	9,9
CPA-05	5	6,2	15,5	16,7	18,7	21,8	18,2	11,5	12,3
CPA-06	6	7,5	18,6	20,0	22,4	26,2	21,8	13,8	14,8
CPA-07	7	8,7	21,7	23,3	26,2	30,6	25,4	16,0	17,3

Uc: Continous Voltage; Ur: Rated Voltage; Ures: Residual Voltage

MV Surge Arresters for D.C. and A.C. Railway Applications

For D.C. Applications
Type HE 60
These DC-type surge arresters are particularly suitable for protection against overvoltages caused by lightning and switching in both DC railway systems and network up to 4.5kV.
The low residual voltage and high-energy capacity of the metal-oxide varistors ensure safety and reliability even under the most extreme conditions.
Thanks to its rugged, compact design, the arrester is capable of withstanding extreme mechanical stress (vibrations, shocks, pressure, torsion).
HE 60 surge arresters have been tested in compliance with the CENELEC standard for surge arresters in DC networks for railways EN 50123-5, 2003. Further tests have been carried out to examine the sealing properties of the arrester and its resistance to mechanical stress and fire.

For A.C. Applications
Type HDA-M / OCP
For installation on locomotive and other rolling stock Tyco Electronics offers special design solutions. Please contact your sales representative for further information.
For application on outdoor catenary please select the appropriate outdoor surge arrester documented on page 6, 8 and 10.

Generic technical data:

HE60MCxx series		1-6 kV Ur
Rated discharge current (8/20µs):		10 kA
Operating duty impulse withstand current (4/10µs):		100 kA
10 second temporary overvoltage (U_{TOV}/U_S):		1,31
High current short circuit: (pre-failing method) (Safe non-shattering failure mode)		25 kA
Energy	1 high current impulse	2,3 kJ/kV Ur
Service conditions	Ambient temperature:	- 60°C to + 60°C

Protective Characteristics

HE60MC	Us kV	Ur kV	Ures in kV when tested to impulse waveforms Lightning (8/20µs) 100A	200A	1kA	2,5kA	5kA	10kA	20kA	Steep current (1/20µs) 10kA	Switching current (30/60µs) 125A	500A
HE60MC07	0,7	1,0	1,8	1,8	2,0	2,1	2,2	2,4	2,7	2,7	1,8	1,9
HE60MC10	1,0	1,4	2,7	2,8	3,0	3,2	3,3	3,7	4,0	4,0	2,7	2,9
HE60MC15	1,5	2,0	3,6	3,7	4,0	4,3	4,5	4,9	5,4	5,4	3,6	3,8
HE60MC18	1,8	2,1	4,1	4,3	4,6	4,9	5,2	5,6	6,2	6,2	4,2	4,4
HE60MC20	2,0	2,8	5,4	5,7	6,1	6,5	6,7	7,4	8,1	8,1	5,5	5,8
HE60MC30	3,0	4,0	7,2	7,5	8,1	8,6	9,0	9,9	10,9	14,8	10,6	11,4
HE60MC39	3,9	4,9	9,1	9,3	10,2	10,9	11,9	12,4	13,6	13,7	9,3	9,7
HE60MC45	4,5	6,0	12,7	13,2	14,3	15,2	16,4	17,4	19,1	19,2	13,0	13,6

Us: System Voltage; Ur: Rated Voltage; Ures: Residual Voltage

Standard Housing Parameter

HE60MC	Impulse voltage 1.2/50µs (kV)	Power frequency voltage withstand, wet (kV)	Flash over distance (mm)	Creepage length (mm)	Weight (kg)
HE60MCxx	82	60	130	246	3,60

Accessories for Line Terminal, Ground Terminal and Mounting are available on request.

Metal Oxide Arresters for Applications in Low Voltage Networks
LVA and MOSIPO

Type LVA

Low voltage surge arresters are installed at transitions of LV-ABC lines to underground or service cables and to transformers. The metal-oxide varistors incorporated in the surge arrester reliably protects the insulation of the network and the connected equipment from all kind of surges. In case of overload, e.g. by lightning strike in vicinity of arrester, an integrated disconnector disconnects the arrester from the network. A bundle of installation accessories like insulated line leads and mounting brackets are available to meet the individual requirements.

Two different types of arresters are available which are both tested according to Class II of IEC 61643-1 + Amd. 1 / EN 61643-11.

Type LVA

Following features are applicable for both arrester types:

- Gapless metal-oxide surge arrester
- Flame retardant and UV resistant
- High current impulse 4/10µs (IEC 60099-4): 100 kA
- Tested to exceed ambient temperature of -40 up to +70 °C
- Watertightness tested at 6 kV for 30 min in a waterbath
- Integrated 1 m ground lead as standard accessory

Type BOW MOSIPO

Differences between the both arrester types are the following:

BOW-MOSIPO 15:

- Silicone housing
- At disconnection the ground lead will be separated from the housing and the disconnection event is clearly visible

LVA:

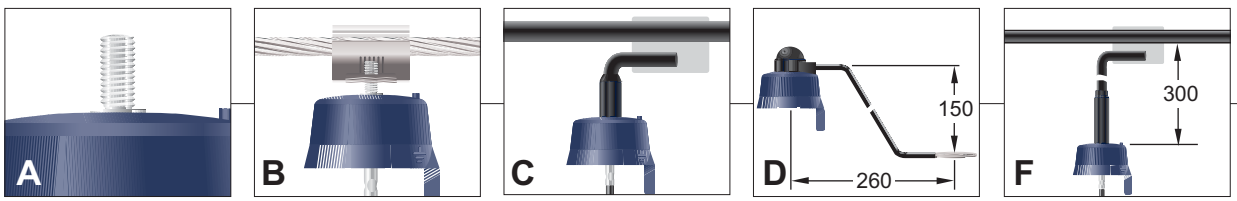
- Sturdy, weatherproof polymer housing
- At disconnection the ground lead remains in position and it is easy to spot coloured plate hanging down from the arrester

Technical Data	BOW-MOSIPO 15-275	BOW-MOSIPO 15-440	LVA-280B	LVA-440B
Continuous Voltage U_C	275 V	440 V	280 V	440 V
Residual Voltage at I_N (8/20µs Impulse)	1,80 kV	2,28 kV	1,20 kV	1,80 kV
Nominal discharge current (I_N)	15 kA	15 kA	10 kA	10 kA
Maximum discharge current (I_{max})	40 kA	40 kA	40 kA	40 kA

Ordering description for surge arrester and accessories

BOW-MOSIPO 15/ [280 / 440] **-** [ ]

LVA [280 / 440] **B-** [ ] **L**



Line connection
Threaded bolt M8x16

Clamp for bare conductors 16mm² up to 120mm²

Insulated right angle adapter to fit to piercing connectors

Insulated adapter with bird cap to fit to transformators

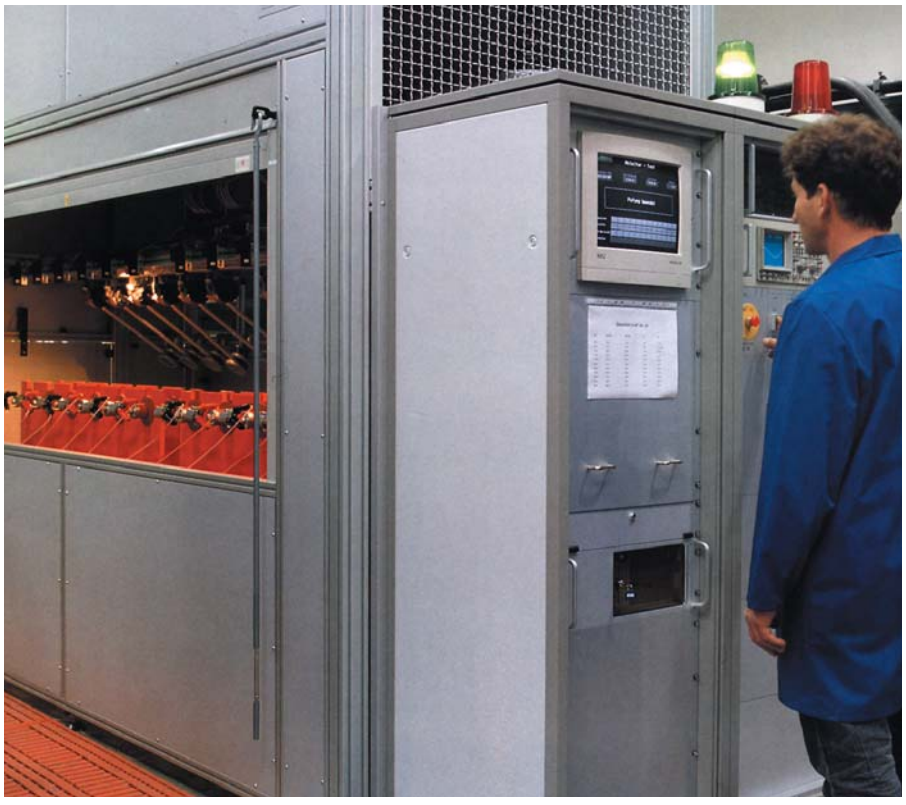
Insulated flexible line lead to fit to piercing connectors

Tyco Electronics´s total commitment to quality

Even the best technology must be backed up by a thorough and consistent quality assurance program.
At Tyco Electronics, we subject every product to an extensive quality control regimes which includes the following procedures:

- At every production stage, beginning with the raw materials and continuing through to the packaged product, the QC lab tests all physical and electrical characteristics which can influence quality.
- By means of lot numbers the Quality Assurance Program ensures traceability backwards all the way to the details of the compound batch test reports.
- We carry out requalification testing on a regular basis.

Quality assurance at Tyco Electronics is not a static, but rather a constantly improving process directed towards our goals: complete customer satisfaction.
The Tyco Electronics Energy Division arrester manufacturing sites are accredited to ISO 9001 and ISO 14001. Our vendor routine tests and internal incoming inspection confirm performance of all critical components used in the assembly of our arresters



Automized routine test facility for Metal-Oxide Surge Arresters in the manufacturing area

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