



METAL OXIDE SURGE ARRESTER

Porcelain housed for outdoor application

Salient Features

- * For protection of transformer & switchgear.
- * Highly non-linear MOV.
- * Explosion Proof - Pressure Relief Design.
- * High energy handling capacity.
- * Glazed brown Porcelain Housing.
- * Corrosion proof Aluminum alloy metal flange.
- * Suitable for Ambient -40°C to $+55^{\circ}\text{C}$.

Performance Data

- | | |
|---------------------------------------|--------------------------------|
| * System Voltage (kV) | 3 ~ 245kV |
| * Rated Voltage (kV) | 3 ~ 216kV |
| * Nominal discharge current (kA) | 5 ~ 20 |
| * High current capability (4/10us) kA | 65 ~ 100 |
| * Energy Class : | D, 1, 2, 3 & 4 |
| * Energy absorption Capability kJ/kV | 2 ~ 8 |
| * Short Circuit (Pressure relief) kA | 40 |
| * Standard in accordance with | IEC-60099-4
IS-3070-Part in |

In Collaboration With



国创电器
GCEC

ElektrolitesTM

Where Innovation is LIFE

INTRODUCTION

'Elektrolites' started in 1966 with trading in power station equipments. The company commenced production of 11 kV Isolator in 1982, and with the induction of technocrat Mr. Anil Saboo, expanded its product range upto 420 kV now. The Company diversified in 2008 into various electro-mechanical products of power sector upto 800 kV range. The manufacturing of surge arresters started in 2002 and established with large population of surge arresters performing satisfactorily . The company is ISO-9001-2008 certified from BSI.



INFRA STRUCTURE

The manufacture of lightning arresters involves sophisticated technology as well as environment. The company has now built a world class industrial complex at Bagru Industrial estate and the manufacture of LA is done under controlled atmospheric conditions. A modern HV lab incorporating 100kA impulse current generator, 300 kV P.D. free HV transformer has been established to carry out all type, acceptance and routine test as per IEC and IS-Standards.

SURGE PROTECTIVE DEVICE

Elektrolites manufactures effective surge protection device with the modern technology of highly non-linear Zinc Oxide Varistor blocks and thus diverts natural lightning surge and switching surge to earth and simultaneously clip off any follow on current. Our station class arresters are designed to provide maximum safety to personnel and sub-station equipment even at the enormous short circuit duty. Research and Development is an ongoing process at Elektrolites with the active collaboration of experts in the industry.



Station Type



In process testing



Distribution Type

PRODUCT RANGE
DISTRIBUTION CLASS


Widely used for the protection of transformers in the distribution system

Voltage(kV) 0.5 to 36
 Current(A) 1500~10,000
 Line discharge class D & 1

STATION CLASS


Mainly used for the protection of station transformer and switch gear.

Voltage(kV) 3 to 245
 Current(A) 10,000-20,000
 Line discharge class 2 ~ 4

CONSTRUCTION & OPERATING PRINCIPLE

Heart of the Surge Arrester is highly non-linear Metal Oxide (MOV) Blocks designed to withstand the electric surge duty as given in the table -1 and is housed in a non-porous electrical porcelain insulator along with proper anchoring parts and sealing system. For distribution type H.T. and ground terminals are taken out through metal caps, spun over the porcelain housing and in case of station type end casting made of corrosion resistant Al alloy is fitted with suitable pressure relief device.

When an electric surge due to natural lightning or switching action appears across the arrester, the MOV stack diverts the entire energy to earth by posing a very low resistance and instantaneously recovers to its original insulation strength getting ready for the next operation.

TECHNICAL PARTICULARS
Table - I

Model Reference		EMOD			EMOE			EMOG			EMOH					
		9	18	30	9	18	30	9	30	60	30	60	96	120	198	216
Rated Voltage	kVrms	9	18	30	9	18	30	9	30	60	30	60	96	120	198	216
Nominal Discharge Current (NDC)	kA	5	5	5	10	10	10	10	10	10	10	10	10	10	10	10
Energy Discharge (at mscv 2 pulse)	kJ/kV	0.8	0.8	0.8	1	1	1	2	2	2	3	3	3	3	3	3
Max. Cont. Operating Volt(M.C.O.V.)	kVrms	7.2	15	25	7.2	15	25	7	25	51	25	51	81	102	168	175
Highest System Voltage (HSV)	kVrms	12	24	36	12	24	36	12	36	72	36	72	122	145	245	245
AC/1 Min. test level.	kVrms	28	50	70	28	50	70	28	70	140	70	140	230	275	460	460
Total creepage length	mm	300	600	900	300	600	900	300	900	1810	900	1810	3075	3625	6125	6125
Long duration Class		D	D	D	1	1	1	2	2	2	3	3	3	3	3	3
High Current withstand (4/10 micro*2)	kA	65	65	65	100	100	100	100	100	100	100	100	100	100	100	100
Low Current (2 millisecc. *20 pulse)	Amps	150	150	150	250	250	250	400	400	400	500	500	500	500	500	500
Lightning Impulse Residual voltage at 2.5 kA	kVp	30.0	60.0	100.0	25	47	81	23	77	153	72	150	235	300	490	530
(8/20micro sec)																
at 5.0 kA	kVp	32.0	64.0	106.0	27.0	52.0	90.0	26	85	170	80	160	250	320	520	567
at 10.0 kA	kVp	36.0	72.0	120.0	30.0	60.0	95.0	28	90	180	85	170	272	340	550	600
at 20 kA	kVp	40.0	80.0	132.0	34.0	68.0	105.0	30	100	200	90	190	307	380	610	668
Switching Impulse Residual voltage 125 A	kVp	NA	NA	NA	21.0	42.0	64.0	17	56	112	NA	NA	NA	NA	NA	NA
at 250 A	kVp	NA	NA	NA	NA	NA	NA	NA	NA	NA	51.0	102.0	160	192.0	325.0	360.0
at 500 A	kVp	NA	NA	NA	24.0	48.0	76.0	23	72	144	NA	NA	NA	NA	NA	NA
at 1000 kA	kVp	NA	NA	NA	NA	NA	NA	NA	NA	NA	55	110	168	220	350	380
Max.crest steep current impulse at NDC	kVp	36.0	72.0	120.0	34.0	70.0	118.0	32	118	200	116	190	298	372	600	654
Temp. Overvoltage..0.1 sec	kVrms	10.4	22.8	38.0	11.4	22.8	38.0	11.40	38	76	38	76	121	152	250	272
1 sec	kVrms	10.8	21.6	36.0	10.8	21.6	36.0	10.80	36	72	36	72	115	144	237	259
10 sec	kVrms	10.35	20.7	34.5	10.4	20.7	34.5	10.35	34.5	69	34.5	69	110	138	228	248
100 sec	kVrms	9.75	19.5	32.5	9.75	19.5	32.5	9.75	32.5	65	32.5	65	104	130	215	234
Pressure relief class	kA				40	40	40	40	40	40	40	40	40	40	40	40
Max. permissible leakage current	mA	0.3	0.3	0.3	0.4	0.4	0.4	0.40	0.40	0.40	0.50	0.50	0.50	0.50	0.50	0.50
Total Height 'H'	mm	325	520	462	325	520	462	270	462	960	680	970	1280	1530	2400	2670
Diameter of porcelain	mm	105	105	148	105	105	148	144	148	235	148	270	270	270	270	270
Mounting Pitch (pitch circle dia)	mm	40	40	40	184	184	40	184	184	184	224	224	224	224	224	224
Mounting Bolt		2nos * M10 Bolts			2/3nos * M12 Bolts			3nos * M12 Bolts			3nos * M16 Bolts					
Weight..... Net	Kg	2.3	3.8	9.8	2.6	6.5	11.4	7	11	45	15	60	90	100	162	185

Pressure relief capability (Short Circuit Test)

In the remote event of internal failure of an arrester, a pressure relief device operates due to high pressure inside and vents out the gases generated by power arc to the atmosphere thereby preventing the violent shattering of the housing. 'Elektrolites' arresters are designed in accordance with the requirements of IEC 60099-4 and IS-3070-Part III-1993 for the pressure relief capability.

Temporary Over Voltage (TOV)

'Elektrolites' arresters are designed for Temporary power frequency over voltage that exceed arrester rated voltage. Kindly refer table-1 for specific details

QUALITY CONTROL AND PERFORMANCE CHECK

'Elektrolites' is an ISO:9001-2008 certified company by BSI and are highly committed to the quality and performance of the product manufactured. The quality system Incorporates the following:



Inward inspection of all incoming materials are done as per relevant drawings, specifications before taking into stores.

In-process inspection and testing is conducted to assure the conformity with the standards and customer requirements.

Final testing on Routine basis is carried out as per standard requirements. Acceptance tests are carried out on random selected samples before delivery.

Packing and dispatch inspection is done to assure compliance of the arresters with regard to accessories like mounting clamp, hardware, surge counter, disconnecter, grading ring and insulating base as per contract.

DISCONNECTORS

400 kV, 2000 Amps Center Break Isolator Installed At RRVPNL, Heerapura, Since 2000

Motor Operating Mechanism



400 kV, DBRB Isolator Contacts



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APPLICATION

These disconnectors are , no load switching devices which physically isolate the lines. They are designed for horizontal outdoor application and can also be designed for vertical installation. For earthing and closing of switchyard portions of the installation, the earthing switches are provided on disconnector. If required.

GENERAL

The Isolators and Accessories conform in general to IEC 62271-Part-102-2002 or IS 9921 / 9920, IEC -129 to IEC 694.

TYPES

- (a) Center Break
- (b) Double Break Turn & Twist
- (c) Double Break Banging
- (d) Vertical Break
- (e) Semi Pentograph
- (f) Pentograph

RATING

CURRENT RATING

400 Amps	-	1250 Amps	-	3150 Amps
630 Amps	-	2000 Amps	-	4000 Amps
800 Amps	-	2500 Amps	-	

VOLTAGE RATING

12 kV	-	110 kV	-	420 kV
36 kV	-	145 kV	-	765 kV
72.5 kV	-	245 kV	-	

DESIGN

Our designs are proven over two decades. Special care is taken to keep low contact resistance through out life of Isolator and maintenance free smooth operations. The Main / Earth contact are of self aligning and so designed that binding cannot occur after remaining closed for a long periods of time in a heavily polluted atmosphere.

The contacts and S.S. Spring are so designed that contacts independently sprung and full pressure is maintained on all contact at all times. Contact springs are insulated and will not carry any current and not loose their characteristics due to heating effect.

All current carrying parts are made of hard drawn electrolytic copper and silver plated.

SALIENT FEATURES

- ⊕ Practically maintenance free
- ⊕ Robust design and construction
- ⊕ Encapsulation of rotary pedestals and heads
- ⊕ No significant change of contact resistance over many years of service
- ⊕ Constant contact pressure
- ⊕ Stable rotary pedestals ensure no deflection even with high static loads.

STANDARDS

The disconnectors comply with the requirement of IS-9921/ 9920, IEC - 129 and IEC - 694, IEC -62271-102 2001 and Part 1000 and most other international standards.

TESTS & QUALITY CONTROL

Successful type tests on the disconnectors have been carried out in our own and independent test laboratories in accordance with the latest Indian and international standards. Quality control in individual parts during manufacture ensures consistent product quality. Each equipment is subjected to the routine test as per relevant standard at our works before dispatch.

A.C. MOTOR OPERATING MECHANISMS

Disconnectors can be provided with manual or A.C. / D.C. motor operated mechanisms. Normally gang operated mechanisms are offered. But on specific request individual three pole electrical gang operation can also be provided. The earthing switch consist of moving / fix contact, provided with silver plated contacts at both ends.

The earthing switches have been designed constructionally interlocked with the main isolator so that the earthing switches can be operated only when the isolators is open and vice versa in addition to that electrical interlocks also provided for 400 KV Isolators and above.

INTERLOCKS

On request the following interlocking arrangement can be provided

- ⊕ Disconnectors and earthing switches manual operator.
- ⊕ Disconnectors with a motor operated mechanism & with manual operating mechanism
- ⊕ A blocking magnet can be installed as an additional interlocking facility.
- ⊕ The operating mechanisms can be provided with a lockable door

INSULATORS

A wide range of insulators meeting the requirement of IEC : 168 or ISS 2544 for 420 / 245 / 145 / 36 / 12 kV insulators respectively of the stack/ solid core type with various cantilever strength, creepage distance and insulation levels can also be supplied along with disconnectors.

RESEARCH AND DEVELOPMENT

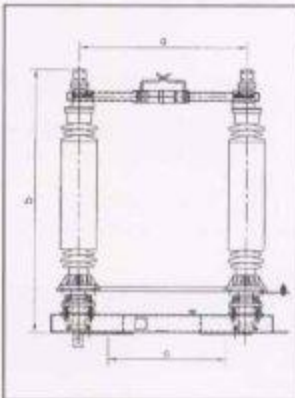
We are constantly working on developing new products and improving the existing design. In line with the latest technological advancements we have successfully developed a wide range of design to suit site requirements.

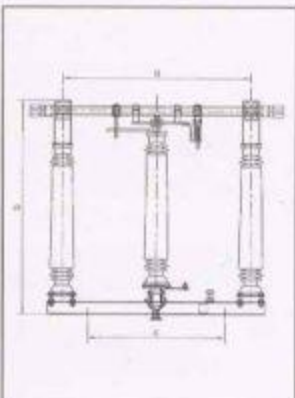
INSTALLATION

All disconnectors and earthing switches are pre-assembled and adjusted in our works. The construction is designed in such a way that installation at site can be done very easily without need of any special tools. The phases can be installed in series. In parallel (normal) and tandem type as per site requirement and application.

MAINTENANCE

The disconnectors and earthing switches made by Elektrolites are virtually free of maintenance. However to ensure a long and trouble-free service period we advise to carry out a visual inspection of the equipment once every three years.

CENTRE BREAK - SERIES EC	CBA	Main Dimension (mm)	Rated Voltage	Rated current	Rated short time current	Rated inputs withstand voltage 1.2/50us	
						kV	A
<ul style="list-style-type: none"> • Very low operating torque Self-wiping contacts • Vertical/Horizontal terminal take off. • Simultaneous operation of three poles by single operating mechanism upto 420 kV • Individual pole operation for 400 kV 		a - b - c					
		700 - 1000 - 450	36	800/2000	25	170	195
		1100 - 1400 - 800	72.5	1250/3150	31.5	325	375
		1700 - 2125 - 2000	145	800/1250/2500	40	650	750
		2700 - 2900 - 2000	170	2000/3150	40	750	860
		2700 - 2800 - 2000	245	1250/2500	40	1050	1200
		4800 - 4800 - 4000	420	2000/3150	50	1425	1425
		7000 - 7000 - 6000	765	3150/4000	50	3000	3000

CENTRE BREAK - CENTRAL ROTATING SERIES ED	DBA	Main Dimension (mm)	Rated Voltage	Rated current	Rated short time current	Rated inputs withstand voltage 1.2/50us	
						kV	A
<ul style="list-style-type: none"> • Turn and twist contacts for higher current rating • Vertical/Horizontal terminal take off • Banging type Tubular contacts for lower current rating • Simultaneous operating of three poles by single operating mechanism upto 420 kV • Individual pole operating for 800 kV and above 		a - b - c					
		600 - 265 - 375	12	400/500	16/25	75	85
		800 - 850 - 450	36	800/2000	25/31.5	170	195
		1200 - 1300 - 500	42.5	2000/3150	40	325	370
		2000 - 2100 - 1500	145	1250/2000	31.5/40	650	750
		2800 - 2800 - 2500	245	2000/3150	40	1050	1200
		4800 - 4400 - 3000	420	3150/4000	40/50	1425	1425
		7000 - 6500 - 4500	765	3150/4000	50	3000	3000