

PRODUCT INFORMATION

Product: Surge-Seal™ Protector



End Users: Electrical Utilities
Pipeline Operators

Background: All travelling wave surges caused by lightning, switching operations or faults are reflected or refracted due to the change in surge impedance at isolating fittings and other ungrounded terminals. This phenomenon develops hazardous transient overvoltages.

Surge-Seal™ Protectors are specifically designed to utilize the non-linear characteristics of metal oxide ceramics to limit the structure to ground potential to within 50% of the withstand voltage of electrical insulators.

Applications: **Surge-Seal™** Protectors are used for:

1. Mitigation of hazardous transient voltages across: cable sheath joint insulators, pipeline plastic jackets, sheath jacket insulations, sheath sectionalizing insulators.
2. Mitigation of circulating currents and induced voltages on electrically isolated pipelines, cables, and other structures exposed to electrical surges.
3. Cross-bonding of single conductor, self-contained cable systems; this is accomplished with regained confidence, due to the superior protection of **Surge-Seal™** between each cable cross-bonding lead and ground. The useful life of self-contained cable systems is greatly extended.
4. Prevention of damage to flange-type insulators, that isolate pipe-type power cables from SF6 compressed gas insulation (CGI) systems, at terminal stations, in the event of a fault on the CGI system.

Advantages: **Safety** The potential dangers of open sparking and shattering are avoided by the superior solid state construction and the modest energy absorption requirements of **Surge-Seal™**.

Versatility **Surge-Seal™** can be designed to suit the specific electrical requirements of most applications.

Flexibility The protector can be safely buried, installed in a pit, or above ground.

Credibility "The transient behaviour of a cross-bonded 230 kV cable circuit and a 115 kV cable circuit was investigated with the Electro-Magnetic Transients Program (EMTP) and good agreement with field test data was obtained".

Ref. Canadian Electrical Association, CEA 072-T223

Surge - Seal TM Protector (M.O.V.) Device Ratings & Characteristics

Model Number	Minimum Ratings (85°C)				Characteristics (25°C)				
	Continuous		Transient		Varistor Voltage @ 1mA DC Test Current			Maximum Clamping Voltage V_c (8/20 μ s)	Typical Capacitance
	RMS Voltage	DC Voltage	Energy (10/1000 μ s)	Peak Current (8/20 μ s)					
	$V_{m(ac)}$	$V_{m(dc)}$	W_{tm}	I_{tm}	Volts	Volts	Volts	V_c	$f=1$ MHz
Volts	Volts	Joules	Amps	Volts	Volts	Volts	Volts	Picofarads	
RV -130	130	175	450	50000	184	200	228	345	20000
RV -150	150	200	530	50000	212	240	288	405	16000
RV -250	250	330	880	50000	354	390	429	620	10000
RV -275	275	369	950	50000	389	430	473	680	9000
RV -320	320	420	1100	50000	462	510	539	760	7500
RV -420	420	560	1500	70000	610	680	748	1060	6000
RV -480	480	640	1600	70000	670	750	825	1160	5500
RV -510	510	675	1800	70000	735	820	910	1300	5000
RV -575	575	730	2100	70000	805	910	1000	1420	4500
RV -660	660	850	2300	70000	940	1050	1160	1640	4000
RV -750	750	970	2600	70000	1080	1200	1320	1880	3500
RV -880	880	1150	3200	70000	1290	1500	1650	2340	2700
RV -1100	1100	1400	3200	70000	1620	1800	2080	2940	2200
RV -1400	1400	1750	5000	70000	2020	2200	2550	3600	1800
RV -1700	1700	2150	6000	70000	2500	2700	3030	4300	1500
RV -2000	2000	2500	7500	70000	2970	3300	3630	5200	1200
RV -2400	2400	3000	8600	70000	3510	3900	4290	6200	1000
RV -2800	2800	3500	10000	70000	4230	4700	5170	7400	800

REV. 1, MARCH 31, 1995

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