

# PROTEC Z HV

## Surge Suppressors

### TECHNICAL DATA



#### Application

The PROTEC Z family is a range of surge suppressors for protection of medium voltage motors, generators and transformers against transient switching surges. PROTEC Z surge suppressors alter circuit parameters in such a way that transient over voltages due to switching are suppressed so as to maintain the voltage at the machine terminals within the IEEE ratings. They are recommended for use in systems incorporating vacuum, SF6 and metal vapour contactors and breakers. PROTEC Z surge suppressors are supplied in compact and standard versions for MV applications.

A LV version also available (see separate product brochure).

## Ratings

Attribute	Unit	MM3C-(2-6.6kV) Compact	MM3(2-5kV) PM3(2-8kV)	MM3(5-8kV)	PM3(5-13,8kV)	MM3(5-13,8kV)
Maximum rated voltage	kV	7,2	8	8	13,8	13,8
Rated voltage range	kV	2 - 6,6	2 - 8	2 - 8	5 - 13,8	5 - 13,8
THD (V)	%	10	10	10	10	10
BIL	kV	45	75	75	95	95
Rated frequency	Hz	50/60	50/60	50/60	50/60	50/60
Ambient temperature - minimum	°C	-25	-40	-40	-40	-40
Ambient temperature - maximum	°C	+80	+80	+80	+80	+80
Altitude	masl	Up to 2000	Up to 2000	Up to 2000	Up to 2000	Up to 2000

## Specification

Rated capacitance	µF	3 x 0,1	3 x 0,2	3 x 0,2	3 x 0,2	3 x 0,2
Capacitance tolerance	%	-10/+10	-5/+5	-5/+5	-5/+5	-5/+5
Resistance per phase	Ω	30	30	30	30	30
Tangent Delta		20 x 10 <sup>-4</sup>	20 x 10 <sup>-4</sup>	20 x 10 <sup>-4</sup>	20 x 10 <sup>-4</sup>	20 x 10 <sup>-4</sup>
Dielectric type		all-film	all-film	all-film	all-film	all-film
Bushings:						
Impulse test voltage	kV	45	75	75	95	95
Dry test voltage	kV	20	28	28	38	38
Wet test voltage	kV	13	28	28	28	28
Minimum creepage	mm	55	190	190	305	305
Installation location		Machine terminal box	Machine (MM) or Panel (PM) Mounted	Machine (MM)	Panel (PM) Mounted	Machine (MM) Mounted
Fusing		No internal fusing	No internal fusing	No internal fusing	No internal fusing	No internal fusing

## Routine tests

Voltage withstand terminal - terminal	kV dc	28,38 for 10s	18,06 for 10s	18,06 for 10s	53,8 for 10s	53,8 for 10s
Voltage test terminal-ground	kV ac	14,19 for 10s	9,05 for 10s	9,05 for 10s	26,9 for 10s	26,9 for 10s
Tangent delta		Yes	Yes	Yes	Yes	Yes
Capacitance		Yes	Yes	Yes	Yes	Yes

## Reliability

Maintenance requirements		No maintenance required. Recommend yearly visual inspection and bi yearly capacitance verification.				
Performance verification		Via the safety switch				
Expected service life		>15 years	>15 years	>15 years	>15 years	>15 years

## Construction

Attribute	Unit	MM3C-(2-6,6kV)	MM3(2-5kV) PM3(2-8kV)	MM3(5-8kV)	PM3(5-13,8kV)	MM3(5-13,8kV)
Phases		Three phase	Three phase	Three phase	Three phase	Three phase
Enclosure fabrication		Welded	Welded	Welded	Welded	Welded
Enclosure material		304 Stainless steel	304 Stainless steel	304 Stainless steel	304 Stainless steel	304 Stainless steel
Primer		Epoxy	Epoxy	Epoxy	Epoxy	Epoxy
Finish		PUR RAL 7032	PUR RAL 7032	PUR RAL 7032	PUR RAL 7032	PUR RAL 7032
Connection		YN	YN	YN	YN	YN
Bushing quantity		3	3	3	3	3
Bushing type		Ceramic	Ceramic	Ceramic	Ceramic	Ceramic
Insulation		Fluid	Fluid	Fluid	Fluid	Fluid
Fluid type		Jarylec C101D	Jarylec C101D	Jarylec C101D	Jarylec C101D	Jarylec C101D
Fluid volume	litre	3	7	7	6	6
Weight	kg	7	19	19	22	22
Overall Dimensions (W x H x D)	mm	280 x 230 x 110	415 x 240 x 135	415 x 240 x 135	520x265x105	520x265x105

## Standards

Explosion Protected Ex nA IIC T3A		SANS 60079-0: 2011 Ed 5 IEC 60079-0: 2010 Ed 6 SANS 60079-15: 2010 Ed 4 IEC 60079-15: 2010 Ed 4 SANS 60079-11: 2007 Ed 3 IEC 60079-11: 2006 Ed 5				
Routine tests		IEC 60871-1: 2005	IEC 60871-1: 2005	IEC 60871-1: 2005	IEC 60871-1: 2005	IEC 60871-1: 2005
Temperature category	°C	-25/D (-25/+80)	-25/D (-25/+80)	-25/D (-25/+80)	-25/D (-25/+80)	-25/D (-25/+80)
Quality Management System		IEC 9001:2008				
Certification Body		Bureau Veritas				
In compliance with		IEC 60871-1: 2005; VDE 0560 part 410; ANSI/IEEE 18; NEMA CP-1				
Marks		CE IA	CE IA	CE IA	CE IA	CE IA

## Options

Safety switch		Yes	Yes	Yes	Yes	Yes
Partial discharge sensor		No	No	No	No	No

## Shipping

Anti-static link		Yes	Yes	Yes	Yes	Yes
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## Features

- Robust, high grade stainless steel enclosure.
- Enhanced THD (V) withstand.
- Designed for multi-ranging applications.
- Permits integrity test of functional components.
- Safety switch on all products as a standard.
- Option for integrated partial discharge sensor.
- ExN certification supplied with all units.
- Recognised quality system certification.

## Benefits

The Protec Z offers complete protection to the insulation systems of motors, generators and dry type transformers against long and short term damage from over voltage spikes caused by contactors and breakers. In particular, insulation between turns and coils close to the line terminals are not exposed to excessive voltages resulting from non-uniform voltage distribution caused by steep fronted transients.

The Protec Z provides insulation coordination at all practical surge magnitudes and rise times. Multiple pre- and re-strikes in the switchgear are eliminated, resulting in significant life extension of machines.

In addition, the Protec Z + PD option permits measurement and monitoring of partial discharge activity.

## Installation

The Protec Z must be installed in accordance with the latest NTSA Protec Z application and installation manual.

## Warranty

The Protec Z surge suppressors are backed by a twelve month factory warranty.