LAKESHORE
ELECTRIC CORPORATION

Automatic Transfer Switch Option
Surge Protection Devices

Introduction

The 2014 National Electric Code (NEC), Article [285] covers general, installation and connection requirements for surge-protective devices (SPDs) permanently installed on systems of 1000 volts or less.

- Surges (Transients) – a surge is a transient wave of current, voltage or power in an electric circuit.

  These are brief overvoltage spikes or disturbances on a power waveform that can damage, degrade, or destroy electronic equipment within any home, commercial building, industrial, or manufacturing facility.

  Transients can reach amplitudes of tens of thousands of volts depending on the source.

- The NEMA Surge Protection Institute says that, "*a surge, or transient, is a subcycle overvoltage with a duration of less than a half-cycle of the normal voltage waveform. A surge can be either positive or negative polarity, can be additive or subtractive from the normal voltage waveform, and is often oscillatory and decaying over time.*"

Electrical equipment is designed to operate at a specified nominal voltage such as 120 Vac, 240 Vac, 480 Vac, and so on with built in tolerances to slight variations in the supply voltage. Surges go outside of the designed tolerances which cause the equipment damage. To protect valuable equipment, SPDs are used as a cost-effective solution.

One of the most commons terms for an SPD is a Transient Voltage Surge Suppressor (TVSS), the purpose of which is to eliminate or reduce damage to equipment. This in turn will reduce total down time and any repair cost.

Features

- Peak Current Rating per Phase
  - Standard Rating for SPD on Normal and Emergency (Protects ATS Controls)
    - 40kA
  - Optional Ratings for SPDs on Load Only (Protects Load Equipment)
    - 120kA
    - 160kA
    - 240kA
    - 320kA
    - 480kA
    - Display Readout Available Upon Request
- Short Circuit Withstand of 200kA
- Available for Single or Three Phase Systems

Product Description (Option: MP [SPD], EM [38A or 38B])

The standard version of this option provides two SPDs; one on the normal source and one on the emergency source. It will also provide a secondary MOV across the ATS controls.

For the SPD required for load equipment protection, please specify the required protection current and display readout is required.

Recommendations

Lake Shore Electric Corporation believes in providing the customer with a full turnkey solution to their needs. If the equipment does not fully meet your needs, please consult the factory for further information.

Standard Product Specifications

ELECTRICAL – STANDARD SPD – 40KA	
Minimum Life	2500 operations (for 1.5 kA 8/20µs wave for each line-to-ground)
Varistor surge current rating per phase	40kA peak (8/20µs wave)
Power Consumption per Phase	Less than 600mW
Ambient Temperature: Operating	-40°C to +70°C [-40°F to 160°F]
Relative Humidity	0 to 95% non-condensing
Surge energy capability per phase	2100 Joules (8/20µs wave)
Short Circuit Current Rating	200kA
Typical Clamping Voltage: for 8/20µs combination wave surge current for each phase-to-ground. (Lead Length 18")	
1,500 A Surge Current	1825 Vac
5,000 A Surge Current	2425 Vac
10,000 A Surge Current	3000 Vac

Order Guide

Part Number Examples:

1. ICFA32000BPSB/SPD - Insulated Case ATS, 3 pole, 2000 Amp, 120/208Vac, **24Vdc Microprocessor Controls**, 65kAIC @ 480Vac, NEMA 1 Free Standing Enclosure, with the Standard Surge Protection Device Option.
2. MCDA30400CESA/**38B** - Molded Case ATS, 3 pole, 400 Amp, 277/480Vac, **Electromechanical Controls**, 35kAIC @ 480Vac, NEMA 1 Wall Mount Enclosure with the Standard Surge Protection Device Option 38B.

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Load Product Specifications

ELECTRICAL RATINGS				
Surge Capacity/Phase	120kA peak (8/20µs wave)			
L-N	**L-G**	**N-G**	**L-L**	
60kA	60kA	120kA	90kA	
Surge Capacity/Phase	160kA peak (8/20µs wave)			
L-N	**L-G**	**N-G**	**L-L**	
80kA	80kA	120kA	90kA	
Surge Capacity/Phase	240kA peak (8/20µs wave)			
L-N	**L-G**	**N-G**	**L-L**	
120kA	120kA	120kA	90kA	
Surge Capacity/Phase	320kA peak (8/20µs wave)			
L-N	**L-G**	**N-G**	**L-L**	
160kA	160kA	240kA	180kA	
Surge Capacity/Phase	480kA peak (8/20µs wave)			
L-N	**L-G**	**N-G**	**L-L**	
240kA	240kA	240kA	180kA	

COMMON RATINGS	
Minimum Life	Duty cycle tested (ANSI C62.41 C3, 10 kA, 20 kV) minimum 5000 impulses
EMI/RFI Filtering	Up to -30 dB (100 kHz to 100 MHz)
Ambient Temperature: Operating	0°C to +50°C [-32°F to 122°F]
Ambient Temperature: Storage	-40°C to +65°C [-40°F to 149°F] -
Relative Humidity	0 to 95% non-condensing
Short Circuit Current Rating	200kA - Individually - Fused Suppression Modes
Industrial Control Equipment	UL 1449 Listed and UL 1283 Listed

UL Suppression Voltage Rating (SVR)*, 1ϕ					
Voltage	**L-N**	**L-G**	**N-G**	**L-L**	**MCOV[1]**
120/240	400 V	400V	400V	800 V	150 V

UL Suppression Voltage Rating (SVR)*, 3ϕ high-leg delta					
Voltage	**L-N**	**L-G**	**N-G**	**L-L**	**MCOV[1]**
120/240	800 / 400 V	400V	400V	1500 / 800 V	275 / 150 V

UL Suppression Voltage Rating (SVR)*, 3ϕ, 4W					
Voltage	**L-N**	**L-G**	**N-G**	**L-L**	**MCOV[1]**
120/208	400V	400V	400V	800V	150V
277/480	800V	800V	800V	1500V	320V
220/380	800V	800V	800V	1500V	320V
347/600	1200V	1200V	1200V	2000V	420V

[1] MCOV = Maximum Continuous Operating Voltage.

* For every foot of wire length, approximately 175 volts (6 kV / 3 kA, 8/20µs) is added to the suppressed voltage.)

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