

SERIES 300

Model 350, Surge Protective Device

Guide Specifications

1.0 GENERAL

1.1 Summary: These specifications describe the electrical and mechanical requirements for a high-energy surge protective device (SPD). The specified system shall provide effective, high-energy surge current diversion and be suitable for use as Type 1, 20kA device per ANSI/UL 1449 Fourth Edition. The specified system shall provide effective high energy surge current diversion, sine wave tracking for electrical line noise filtering and be suitable for application in ANSI/IEEE C62.41 Category A, B, and C environments, as tested by ANSI/IEEE C62.11, C62.45 and MIL-STD-220A. The system shall be connected in parallel with the protected system; no series connected elements shall be used which limit load current or kVA capability.

1.1 Standards: The specified system shall be designed, manufactured, tested and installed in compliance with the following codes and standards:

Underwriters Laboratories; ANSI/UL 1449 4th Edition 2014 Revision
Canadian Underwriters Laboratories (cUL)
American National Standards Institute and Institute of Electrical and Electronic Engineers (ANSI/IEEE C62.34, C62.41, C62.45)
Institute of Electrical and Electronic Engineers 1100 Emerald Book
Federal Information Processing Standards Publication 94 (FIPS PUB 94)
National Fire Protection Association (NFPA 20, 70, 75 and 780)
International Standards Organization (ISO) Company certified ISO 9001 for manufacturing, design and service
MIL-STD-220A
CE

The system shall be UL listed and labeled under ANSI/UL 1449 Fourth Edition and the voltage protection ratings (VPRs) shall be permanently affixed to the SPD. Type 2 units of the product family shall be cUL listed.

1.2 System Description: The SPD shall be constructed using multiple surge current diversion arrays of metal oxide varistors (MOV). No gas tubes, silicon avalanche diodes or selenium plates/rectifiers shall be used. The status of each array shall be continuously monitored and a green LED shall be illuminated if the array is in full working order.

1.3 Electrical Requirements

1.3.1 Nominal system operating voltage shall be:

_____ VAC _____ Configuration _____ Phase _____ Wire plus Ground

1.3.2 Maximum Continuous Operating Voltage (MCOV)

The SPD maximum continuous operating voltage shall be greater than 115% of the nominal system operating voltage to ensure the ability of the system to withstand temporary RMS overvoltage (swell) conditions.

1.3.3 Operating Frequency

The operating frequency range of the system shall be at least 47 to 63 Hertz.

1.4 Testing

1.4.1 Maximum Continuous Operating Voltage (MCOV) Testing

The unit shall be factory tested to assure proper MCOV of the unit.

1.5 Overcurrent Protection (Fusing): The TVSS shall be internally fused at the component level. The fusing shall be capable of interrupting up to 100kA symmetrical fault current with 480 VAC applied. This overcurrent protection circuit shall be monitored and provide indication of suppression failure/operability. Replaceable fusing is unacceptable. Overcurrent protection that limits specified surge currents is not acceptable.

1.6 Performance Ratings:

Surge Current Capacity: **(Selection Required)**

_____ kA Surge Rating per Mode **(25)**

_____ kA Surge Rating per Phase (L-N and L-G) **(25), (50)**

1.7 Design Requirements:

1.7.1 Protection Modes: The SPD shall provide protection as follows: All modes, L-N or L-L, L-G and N-G (where applicable). Note: L = Line, G = Ground, N = Neutral

1.7.2 Noise Attenuation: The filter shall provide an attenuation of 40 db max from 10 kHz to 100MHz, per 50 Ohm Insertion Loss Methodology from MIL 220A.

1.7.3 ANSI/UL 1449 Voltage Protection Ratings: The maximum UL 1449 Fourth Edition Voltage Protection Ratings (VPR) for each and/or all of the specified protection modes shall not exceed the following:

1200 Volts for 120, 120/208, or 120/240 Volt systems

1200 Volts for 208, 240, 277, 220/380, 240/415 or 277/480 Volt systems

1800 Volts for 480 Volt systems

1.7.4 ANSI/UL 1449 Nominal Discharge Current: The ANSI/UL 1449 Nominal Discharge Current Rating shall be a minimum of 20kA.

1.7.5 Response Time

Typical response time of all suppression components shall be .5 nanoseconds.

1.8 Submittals

1.8.1 Documentation: These specifications are based on the ASCO Series 350. All other manufacturers shall submit for 10-day pre-approval, a detailed compliance or exception statements to all provisions of this specification to allow consideration. Additionally, manufacturers shall submit test data verifying the following: life cycle testing, overcurrent protection, UL1449 Fourth edition, noise attenuation and surge current capacity. Failure to do so will result in product disapproval. Any deviation from the published specification will result in an applicable deduct applied.

1.8.2 Equipment Manual: The manufacturer shall furnish an installation manual with installation, startup, and operating instructions for the specified system.

1.8.3 Drawings: Electrical and mechanical drawings shall be provided by the manufacturer that show unit dimensions, weights, component and connection locations, mounting provisions, connection details and wiring diagram.

1.9 Quality Assurance: The manufacturer shall be ISO 9001:2000 certified. The specified interconnect assembly shall be designed and manufactured in the USA by a qualified manufacturer of SPD products and line conditioning equipment. The manufacturer shall have been engaged in the design and manufacturer of such products for a minimum of 20 years.

1.10 Environmental Requirements

Storage Temperature: -55 to +85°C (-67 to +185°F)

Operating Temperature: -40 to +60°C (-40 to +140°F)

Relative Humidity: 0% to 95% (non-condensing)

Audible Noise: less than 45dB at 5 feet (1.5m)

Operating Altitude: 0 to 18,000 feet (5,486m) above sea level

1.11 Warranty: The manufacturer shall provide a full five-year parts warranty from date of shipment against any part failure when installed in compliance with manufacturer's written instructions, UL Listing requirements and any applicable national, state or local electrical codes. Direct factory trained, ISO 9001:2000 certified employees must be available for 48-hour assessment. A 24-hour 800 number must be available to support warranty.

2.0 PRODUCTS

- 2.1 Enclosure:** The unit case shall be an enclosure rated Type 1, UL94-V0. The enclosure dimensions shall be a maximum of 4.72 inches long by 4.72 inches wide by 2.36 inches deep. The unit shall weigh 12 pounds maximum.
- 2.2 Connections:** The unit shall be supplied with #12 AWG wire leads for connection to the power source. Wires should be cut as short as possible.
- 2.3 Unit Status Indicators—SPD** shall be equipped with a green solid state indicator. Indicator must be mounted within the enclosure and must be externally visible.
- 2.4 Summary Alarm Relay Contacts:** In addition to the LED indicator, the unit shall be equipped with a summary alarm relay with one set of Normally Open and Normally Closed (Form C) dry contacts rated for 125 VAC, 1 amp (minimum). The contacts will change state and indicate a failure of the unit, a phase loss condition or a full power loss condition.

3.0 EXECUTION

- 3.1 Installation:** The installing contractor shall install the parallel SPD with short and straight conductors as practically possible. The contractor shall twist the SPD input conductors together to reduce input conductor inductance. The contractor shall follow the SPD manufacturer's recommended installation practices as found in the installation, operation and maintenance manual and comply with all applicable codes.

These Guide Specifications comply with the outlines of the Construction Specification Institute per CSI MP-2-2-85 and MP-2-1-88