

SURGE PROTECTIVE DEVICES FOR SERVICE ENTRANCE AND BRANCH PANELS

Part 1—General

1.1 Description/Scope

- A. The Surge Protective Device (SPD) covered under this section includes all service entrance type surge protective devices suitable for use as Type 1 or Type 2 Devices per UL1449 4th Edition, applied to the line or load side of the utility feed inside the facility.
- B. An SPD located at Service Entrance and Distribution and Branch Panels, Switchgear and Switchboard assemblies (EDIT AS REQUIRED).
- C. Contractor shall provide all labor, materials, equipment and incidentals as shown, specified and required to finish and install surge protective devices.

1.2 Quality Assurance

- A. Reference Standard: Comply with the latest edition of the applicable provisions and recommendations of the following, except as otherwise stated in this document:
 - 1. UL 1449 4th Edition (2014 Revision effective 3/26/2015).
 - 2. UL 1283.
 - 3. ANSI/IEEE C62.41, Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits.
 - 4. ANSI/IEEE C62.45, Guide for Surge Testing for equipment connected to Low-Voltage AC Power Circuits.
 - 5. IEEE 1100 Emerald Book.
 - 6. National Fire Protective Association (NFPA 70: National Electrical Code).

1.3 Submittals/Quality Assurance – Submit the following:

- A. Package must include shop drawings complete with all technical information, to include unit dimensions, detailed installation instructions, maintenance manual, recommended replacement parts list and wiring configuration.
- B. Copies of manufacturer's catalog data, technical information and specifications on equipment proposed for use.
- C. Copies of documentation stating that the Surge Protective Device is listed from a Nationally Recognized Testing Laboratory (NRTL) (UL, ETL, etc.) and are tested and listed to both UL 1449 and UL 1283.
- D. Copies of actual let through voltage data in the form of oscilloscope results for both ANSI/IEEE C62.41 Category C3 (combination wave) and B3 (Ring wave) tested in accordance with ANSI/IEEE C62.45.
- E. Copies of Noise Rejection testing as outlined in NEMA LS1-1992 (R2000) Section 3.11. Noise rejection is to be measured between 50kHz and 100MHz verifying the devices noise attenuation. Must show multiple attenuation levels over a range of frequencies.
- F. Copies of test reports from a recognized independent testing laboratory, capable of producing 200kA surge current waveforms, verifying the suppressor components can survive published surge current rating on a per mode basis using the ANSI/IEEE C62.41 impulse waveform C3 (8 x 20 microsecond, 20kV/10kA). Test data on an individual module is not acceptable.
- G. Copy of warranty statement clearly establishing the terms and conditions to the building/facility owner/operator.

Part 2—Products

2.1 Approved Manufacturer:

- A. Current Technology – CurrentGuard, CurrentGuard Plus, CG or CG Plus Series (voltage and surge current depending on specific application & location).
- B. Approved equivalent.

2.2 Manufactured Units/Electrical Requirements

- A. Refer to drawing for operating voltage, configuration and surge current capacity per mode for each location, or you may list locations and information here.
- B. Declared Maximum Continuous Operating Voltage (MCOV) shall be greater than 115 percent of the nominal system operating voltage and in compliance with test and evaluation procedures outlined in the nominal discharge surge current test of UL1449, section 37.7. MCOV values claimed based

on the component's value or on the 30-minute 115% operational voltage test, section 38 in UL1449 will not be accepted.

- C. Unit shall not have more than 10% deterioration or degradation of the UL1449 4th Edition Voltage Protective Rating (VPR) due to repeated surges.

Protection Modes: SVR(6kV, 500A) and UL1449 4th Edition VPR(6kV, 3kA) for grounded WYE/delta and High Leg Delta circuits with voltages of (480Y/277), (208Y/120), (600Y/347) 3-Phase/4 wire and (120/240) Split phase/3 wire circuits shall be as follows and comply with test procedures outlined in UL1449, section 37.6:

System Voltage	Mode	MCOV	B3 Ringwave	B3/C1 Comb. Wave	C3 Comb. Wave	UL 1449 Second Edition SVR Rating	UL 1449 Fourth Edition VPR Rating
120/240 120/208	L-N	150	420	642	1040	400	800
	L-G	150	480	690	1300	400	800
	N-G	150	340	620	1240	400	800
	L-L	300	610	1010	1420	700	1200
277/480	L-N	320	660	910	1490	700	1200
	L-G	320	750	1068	1830	800	1200
	N-G	320	720	974	1690	800	1200
	L-L	640	960	1700	2290	1500	1800

- D. Electrical Noise Filter- each unit shall include a high performance EMI/RFI noise rejection filter. Noise attenuation for electric noise shall be as follows using the MIL-STD-220B insertion loss test method.
 1. 100 kHz at 33 db or better.
 2. All other frequencies should be 32 db or better.
- E. Each unit shall provide the following optional features:
 1. Phase indicator lights, Form "C" dry contacts, surge counter and audible alarm.
 2. Field testable while installed.

Part 3—Execution/Installation

- 3.1 Each unit shall be installed per manufacturer's recommended installation and wiring practices, as shown on the drawing supplied.
- 3.2 The UL 1449 Voltage Protective Rating (VPR) shall be permanently affixed to the SPD unit.
- 3.3 The UL 1449 Nominal Discharge Surge Current Rating shall be a minimum of 20kA
- 3.4 The SCCR rating of the SPD shall be 200kAIC without requiring an upstream protective device for safe operation.
- 3.5 The unit shall be listed as a Type 1 SPD, suitable for use in both Type 1 and Type 2 locations per UL1449 4th Edition.
- 3.6 The SPD manufacturer's technician shall perform a system checkout and start-up in the field to assure proper installation, operation and to initiate the warranty of the system. The technician will be required to do the following:
 - A. Verify voltage clamping levels by using the DTS-2 test equipment.
 - B. Verify N-G connection where applicable.
 - C. Record information to product signature card for each product installed.

Part 4—Product Warranty

- 4.1 Warranty on defective material and workmanship shall be for a minimum of 10 years for CurrentGuard and 15 years for CurrentGuard Plus.
- 4.2 Copy of warranty to be sent with submittal.