

SECTION 16289

SURGE PROTECTIVE DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section

1.2 SUMMARY

- A. This Section includes Surge Protection Devices (TVSS) for low-voltage power equipment

1.3 DEFINITIONS

- A. SVR: Suppressed voltage rating
- B. SPD: Surge Protection Device
- C. TVSS: Transient voltage surge suppressor

1.4 SUBMITTALS

- A. In accordance with Section 01304
- B. Product Data: For each type of product indicated. Include rated capacities, operating weights, operating characteristics, furnished specialties, and accessories
- C. Product Certificates: For transient voltage suppression devices, signed by product manufacturer certifying compliance with the following standards
 - 1. UL 1283
 - 2. UL 1449
- D. Operation and Maintenance Data: For transient voltage suppression devices to include in installation, operation, and maintenance manuals
- E. Warranties: Special warranties specified in this Section

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain suppression devices for switchboards and panelboards and accessories through one source from a single manufacturer

- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use
- C. Comply with IEEE C62.41, "IEEE Guide for Surge Voltages in Low Voltage AC Power Circuits," and test devices according to IEEE C62.45, "IEEE Guide on Surge Testing for Equipment Connected to Low-Voltage AC Power Circuits"
- D. Comply with NEMA LS 1, "Low Voltage Surge Protection Devices"
- E. Comply with UL 1283, "Electromagnetic Interference Filters," and UL 1449, Third Edition, "Surge Protective Devices"

1.6 PROJECT CONDITIONS

- A. Service Conditions: Rate surge protection devices for continuous operation under the following conditions, unless otherwise indicated
 - 1. Maximum continuous operating voltage: Not less than 115 percent of nominal system operating voltage
 - 2. Operating temperature: 30 to 120 deg F
 - 3. Humidity: 0 to 85 percent, noncondensing
 - 4. Altitude: Less than 20,000 feet above sea level

1.7 COORDINATION

- A. Coordinate location of field-mounted surge suppressors to allow adequate clearances for maintenance

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of surge suppressors that fail in materials or workmanship within five years from date of Substantial Completion

1.9 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents
 - 1. Replaceable protection modules: One of each size and type installed

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following
 - 1. Current Technology, Inc.
 - 2. Innovative Technology, Inc.

3. Intermatic, Inc.
4. Liebert Corporation; a division of Emerson
5. Tycor; Cutler-Hammer, Inc.
6. United Power Corporation

2.2 SERVICE ENTRANCE SUPPRESSORS

- A. Surge Protection Device Description: Modular design with field-replaceable modules, sine-wave-tracking type with the following features and accessories
 1. Fuses, rated at 200-kA interrupting capacity
 2. Fabrication using bolted compression lugs for internal wiring
 3. Integral disconnect switch
 4. Redundant suppression circuits
 5. Redundant replaceable modules
 6. Arrangement with copper bus bars and for bolted connections to phase buses, neutral bus, and ground bus
 7. Arrangement with wire connections to phase buses, neutral bus, and ground bus
 8. LED indicator lights for power and protection status
 9. Audible alarm, with silencing switch, to indicate when protection has failed
 10. One set of dry contacts rated at 5 A and 250-V ac, for remote monitoring of protection status.
 11. Surge-event operations counter
- B. Peak Single-Impulse Surge Current Rating: 320 kA per phase
- C. Connection Means: Permanently wired
- D. Protection modes and UL 1449 SVR for grounded wye circuits with voltages of 3-phase, 4-wire circuits shall be as follows
 1. Line to neutral: 800 V for 480Y/277 and 400 V for 208Y/120
 2. Line to ground: 800 V for 480Y/277 and 400 V for 208Y/120
 3. Neutral to ground: 800 V for 480Y/277 and 400 V for 208Y/120
- E. Protection modes and UL 1449 SVR for voltages of 480, 3-phase, 3-wire, delta circuits shall be as follows
 1. Line to Line: 2000 V for 480 V
 2. Line to Ground: 2000 V for 480 V

2.3 PANELBOARD SUPPRESSORS

- A. Surge Protection Device Description: Modular design with field-replaceable modules, sign-wave-tracking type with the following features and accessories
 1. Fuses, rated at 200-kA interrupting capacity
 2. Fabrication using bolted compression lugs for internal wiring
 3. Integral disconnect switch
 4. Redundant suppression circuits

5. Redundant replaceable modules
 6. Arrangement with wire connections to phase buses, neutral bus, and ground bus
 7. LED indicator lights for power and protection status
 8. Audible alarm, with silencing switch, to indicate when protection has failed
 9. One set of dry contacts rated at 5 A and 250-V, ac, for remote monitoring of protection status.
 10. Surge-event operations counter
- B. Peak Single-Impulse Surge Current Rating: 160 kA per phase
- C. Protection modes and UL 1449 SVR for grounded wye circuits with voltages of 480Y/277 and 208Y/120, 3-phase, 4-wire circuits shall be as follows
1. Line to neutral: 800 V for 480Y/277 and 400 V for 208Y/120
 2. Line to ground: 800 V for 480Y/277 and 400 V for 208Y/120
 3. Neutral to ground: 800 V for 480Y/277 and 400 V for 208Y/120

2.4 ENCLOSURES

- A. NEMA 250, with type matching the enclosure of panel or device being protected

PART 3 - EXECUTION

3.1 INSTALLATION OF SURGE PROTECTION DEVICES

- A. Install devices at service entrance on load side, with ground lead bonded to service entrance ground
- B. Install devices for panelboard and auxiliary panels with conductors or buses between suppressor and points of attachment as short and straight as possible. Do not exceed manufacturer's recommended lead length. Do not bond neutral and ground
1. Provide multipole, circuit breaker as a dedicated disconnect for suppressor, unless otherwise indicated

3.2 PLACING SYSTEM INTO SERVICE

- A. Do not energize or connect service entrance equipment or panelboards to their sources until surge protection devices are installed and connected

3.3 FIELD QUALITY CONTROL

- A. Verify that electrical wiring installation complies with manufacturer's written installation requirements, and test according to manufacturing recommendations
- B. Remove and replace malfunctioning units and retest as specified above

END OF SECTION