

## SECTION 264313 – TRANSIENT VOLTAGE SUPPRESSION

### 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 transient voltage surge suppressors for low-voltage power, control, and communication equipment.

#### 1.3 DEFINITIONS

- A. ATS: Acceptance Testing Specifications
- B. SVR: Suppressed voltage rating
- C. TVSS: Transient voltage surge suppressor

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, operating weights, operating characteristics, furnished specialties, and accessories.
- B. Product Certificates: For transient voltage suppression devices, signed by product manufacturer certifying compliance with the following standards:
  - 1. UL 1283
  - 2. UL 1449
- C. Qualification Data: For testing agency
- D. Field quality-control test reports, including the following:
  - 1. Test procedures used
  - 2. Test results that comply with requirements
  - 3. Failed test results and corrective action taken to achieve requirements
- E. Operation and Maintenance Data: For transient voltage suppression devices to include in emergency, operation, and maintenance manuals
- F. Warranties: Special warranties specified in this Section

## 1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain suppression devices and accessories through one source from a single manufacturer.
- B. Product Options: Drawings indicate size, dimensional requirements, and electrical performance of suppressors and are based on the specific system indicated. Refer to Division 1 Section "Product Requirements."
- C. 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.
- D. 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."
- E. Comply with NEMA LS 1, "Low Voltage Surge Protection Devices."
- F. Comply with UL 1283, "Electromagnetic Interference Filters," and UL 1449, "Transient Voltage Surge Suppressors."

## 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.

## 1.7 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.

## 1.8 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. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Advanced Protection Technologies, Inc.
  - 2. Atlantic Scientific
  - 3. Current Technology, Inc.
  - 4. Cutler-Hammer, Inc.; Eaton Corporation
  - 5. Entelec International
  - 6. General Electric Company
  - 7. Innovative Technology, Inc.
  - 8. Intermatic, Inc.
  - 9. LEA International
  - 10. Leviton Mfg. Company, Inc.
  - 11. Liebert Corporation; a division of Emerson
  - 12. Northern Technologies, Inc.
  - 13. Siemens Energy & Automation, Inc.
  - 14. Square D; Schneider Electric
  - 15. Surge Suppression Incorporated
  - 16. Sutton Designs, Inc.
  - 17. Transtector Systems, Inc.
  - 18. Tycor; Cutler-Hammer, Inc.
  - 19. United Power Corporation
  - 20. Zero Surge, Inc.

### 2.2 SERVICE ENTRANCE SUPPRESSORS

- A. Surge Protection Device Description: Non-modular, sine-wave-tracking type with the following features and accessories:
  - 1. LED indicator lights for power and protection status.
  - 2. Audible alarm with silencing switch to indicate when protection has failed
  - 3. One set of dry contacts rated at 5 A and 250 VAC, for remote monitoring of protection status.
- B. 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 VAC for remote monitoring of protection status. Coordinate with building power monitoring and control system.
  11. Surge-event operations counter
- C. Peak Single-Impulse Surge Current Rating: 240 kA per phase
- D. Connection Means: Permanently wired
- E. Protection modes and UL 1449 SVR for grounded wye circuits with voltages of 480/277, 3-phase, 4-wire circuits shall be as follows:
1. Line to Neutral: 800V for 480/277
  2. Line to Ground: 800V for 480/277
  3. Neutral to Ground: 800V for 480/277

## 2.3 PANELBOARD SUPPRESSORS

- A. Surge Protection Device Description: Non-modular, sine-wave-tracking type with the following features and accessories:
1. LED indicator lights for power and protection status
  2. Audible alarm with silencing switch to indicate when protection has failed
  3. One set of dry contacts rated at 5 A and 250 VAC for remote monitoring of protection status.
- B. 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 VAC, for remote monitoring of protection status. Coordinate with building power monitoring and control system.
  10. Surge-event operations counter
- C. Peak Single-Impulse Surge Current Rating: 120 kA per phase
- D. Protection modes and UL 1449 SVR for grounded wye circuits with voltages of 208Y/120, 3-phase, 4-wire circuits shall be as follows:
1. Line to Neutral: 400V for 208Y/120

2. Line to Ground: 400V for 208Y/120
  3. Neutral to Ground: 400V for 208Y/120
- E. Protection modes and UL 1449 SVR for 240/120V, single-phase, 3-wire circuits shall be as follows:
1. Line to Neutral: 400 V
  2. Line to Ground: 400 V
  3. Neutral to Ground: 400 V
- F. Protection modes and UL 1449 SVR for 240/120V, 3-phase, 4-wire circuits with high leg shall be as follows:
1. Line to Neutral: 400 V, 800 V from high leg
  2. Line to Ground: 400 V
  3. Neutral to Ground: 400 V

## 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, Motor Control Center, 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 multi-pole, 30A circuit breaker as a dedicated disconnect for suppressor, unless otherwise indicated.

### 3.2 PLACING SYSTEM INTO SERVICE

- A. Do not energize or connect panelboards, Motor Control Centers to their sources until surge protection devices are installed and connected.

### 3.3 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test and adjust equipment installation, including connections, and to assist in field testing. Furnish all test results.
1. Verify that electrical wiring installation complies with manufacturer's written installation requirements.
- B. Testing: Perform the following field tests and inspections and prepare test reports:

1. After installing surge protection devices, but before electrical circuitry has been energized, test for compliance with requirements.
2. Complete startup checks according to manufacturer's written instructions.
3. Perform each visual and mechanical inspection and electrical test stated in NETA ATS, "Surge Arresters, Low-Voltage Surge Protection Devices" Section. Certify compliance with test parameters.

C. Remove and replace malfunctioning units and retest as specified above.

#### 3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain transient voltage suppression devices.

END OF SECTION 264313