SECTION 264313 - TRANSIENT VOLTAGE SUPPRESSION

PART 1 - GENERAL

1.1 SUMMARY
A. This Section includes TVSSs for low-voltage power equipment.

1.2 SUBMITTALS
A. Product Data: For each type of product indicated. Include rated capacities, operating weights, operating characteristics, furnished specialties, and accessories.
B. Field quality-control test reports.
C. Operation and Maintenance Data.

1.3 QUALITY ASSURANCE
A. Source Limitations: Obtain suppression devices 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.
D. Comply with NEMA LS 1, "Low Voltage Surge Protection Devices."
E. Comply with UL 1283, "Electromagnetic Interference Filters," and UL 1449, "Transient Voltage Surge Suppressors."

1.4 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.
PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Advanced Protection Technologies, Inc.
2. Current Technology, Inc.
3. Square D; Schneider Electric.

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. Fuses, rated at 200-kA interrupting capacity.
4. Integral disconnect switch.
5. Redundant suppression circuits.
6. Surge-event operations counter.


C. Connection Means: Permanently wired.

D. Protection modes and UL 1449 suppressed voltage rating for grounded wye circuits with voltages of \([480Y/277][208Y/120]\), 3-phase, 4-wire circuits shall be as follows:

1. Line to Neutral: \([800\text{ V for }480Y/277][400\text{ V for }208Y/120]\).
2. Line to Ground: \([800\text{ V for }480Y/277][400\text{ V for }208Y/120]\).
3. Neutral to Ground: \([800\text{ V for }480Y/277][400\text{ V for }208Y/120]\).

E. Protection modes and UL 1449 suppressed voltage rating for 240/120-V, 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 suppressed voltage rating for 240/120-V, 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.

G. Protection modes and UL 1449 suppressed voltage rating for voltages of 240 or 480, 3-phase, 3-wire, delta circuits shall be as follows:
1. Line to Line: [2000 V for 480 V] [1000 V for 240 V].  
2. Line to Ground: [2000 V for 480 V] [1000 V for 240 V].

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. Fuses, rated at 200-kA interrupting capacity.
4. Integral disconnect switch.
5. Redundant suppression circuits.
6. Surge-event operations counter.

B. Peak Single-Impulse Surge Current Rating: [160] [120] [80] kA per phase.

C. Protection modes and UL 1449 suppressed voltage rating for grounded wye circuits with voltages of [480V/277] [208Y/120], 3-phase, 4-wire circuits shall be as follows:

1. Line to Neutral: [800 V for 480Y/277] [400 V for 208Y/120].
2. Line to Ground: [800 V for 480Y/277] [400 V for 208Y/120].
3. Neutral to Ground: [800 V for 480Y/277] [400 V for 208Y/120].

D. Protection modes and UL 1449 suppressed voltage rating for 240/120-V, 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.

E. Protection modes and UL 1449 suppressed voltage rating for 240/120-V, 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.

F. Protection modes and UL 1449 suppressed voltage rating for voltages of 240 or 480, 3-phase, 3-wire, delta circuits shall be as follows:

1. Line to Line: [2000 V for 480 V] [1000 V for 240 V].
2. Line to Ground: [1500 V for 480 V] [800 V for 240 V].

2.4 SUPPRESSORS FOR ELECTRONIC-GRADE PANELBOARDS

A. Surge Protection Device Description: Sine-wave-tracking type, panel-mounted design 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. Arrangement with wire connections to phase buses, neutral bus, and ground bus.

B. Peak Single-Impulse Surge Current Rating: [160] [120] [80] kA per phase.

C. Protection modes and UL 1449 suppressed voltage rating for grounded wye circuits with voltages of [480Y/277] [208Y/120], 3-phase, 4-wire circuits shall be as follows:

1. Line to Neutral: [800 V for 480Y/277] [400 V for 208Y/120].
2. Line to Ground: [800 V for 480Y/277] [400 V for 208Y/120].
3. Neutral to Ground: [800 V for 480Y/277] [400 V for 208Y/120].

D. Protection modes and UL 1449 suppressed voltage rating for 240/120-V, 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.

E. Protection modes and UL 1449 suppressed voltage rating for 240/120-V, 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.

F. Protection modes and UL 1449 suppressed voltage rating for voltages of 240, 480, or 600, 3-phase, 3-wire, delta circuits shall be as follows:

1. Line to Line: [2000 V for 480 V] [1000 V for 240 V].
2. Line to Ground: [1500 V for 480 V] [800 V for 240 V].

2.5 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, [30] [60] [100]-A 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] [panelboards] [control terminals] [data terminals] to their sources until surge protection devices are installed and connected.

3.3 FIELD QUALITY CONTROL

A. Testing: [Owner will engage] [Engage] a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports:

B. Testing: Perform the following field tests and inspections and prepare test reports:

1. Complete startup checks according to manufacturer's written instructions.
2. 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.

END OF SECTION