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 SPDs for low-voltage power, control, and communication equipment.
B. Related Sections include the following:
   1. Division 26 Section "Wiring Devices" for devices with integral SPDs.

1.3 REFERENCES
E. NEMA 250: Enclosures for Electrical Equipment (1000 Volts Maximum).
F. NEMA LS 1: Low Voltage Surge Protection Devices.


J. UL 1283: Electromagnetic Interference Filters.


1.4 DEFINITIONS


B. SVR: Suppressed voltage rating.

C. SPD: Surge Protective Devices.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated.
   1. Include rated capacities, operating weights, dimensions, mounting provisions, operating characteristics, furnished specialties, and accessories.
   2. Provide connection details and wiring diagrams indicating how SPD device is integrated within panelboards and switchgear.

B. Product Certificates: For surge protective devices, signed by product manufacturer certifying compliance with the following standards:
   1. UL 1283.
   2. UL 1449.

C. 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.

D. Operation and Maintenance Data: For surge protective devices to include in emergency, operation, and maintenance manuals.

E. Warranties: Special warranties specified in this Section.

1.6 QUALITY ASSURANCE

A. Source Limitations: Obtain SPD’s and accessories through one source from a single manufacturer. SPD units integral to switchboards, distribution panelboards and branch circuit panelboards shall be warranted and supported by the panelboard manufacturer.
B. Product Options: Electrical performance of SPD is 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. Factory Testing: The specified system shall be factory-tested prior to shipment. Testing of each system shall include but not be limited to quality control checks, "Hi-Pot" tests per UL requirements, IEEE C62.41 Category B and C surge tests, UL ground leakage tests and operational and calibration tests.


F. Comply with NEMA LS 1, "Low Voltage Surge Protection Devices." Provide independent test reports demonstrating complete system performance showing compliance.


1.7 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Construction Manager not less than seven days in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without Construction Manager’s written permission.

B. 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 Frequency: 47 to 63 Hz.

3. Operating Temperature: -40 to 140 deg F.

4. Humidity: 0 to 95 percent, noncondensing.

5. Altitude: Less than 20,000 feet above sea level.

1.8 COORDINATION

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

B. Coordinate surge protection devices with Division 26 Section "Electrical Power Monitoring and Control."
1.9 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.

1.10 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. Square D; Schneider Electric.

2.2 SURGE PROTECTIVE DEVICE

A. Surge Protection Device Description: Sine-wave-tracking type, with the following features and accessories:

1. MOV technology for each suppression mode.

2. Fuses, rated at 200-kA interrupting capacity. Provide fusing for each suppression path.

3. Fabrication using bolted compression lugs for internal wiring. No plug-in component modules, quick disconnect terminals or printed circuit boards shall be used in current-carrying paths.

4. Integral disconnect switch which has been tested to the surge current rating of the SP to match or exceed the fault current rating of the board. Use of circuit breakers for disconnecting means is acceptable.

5. LED indicator lights for power and protection status for each phase mounted in panelboard front cover:
   a. Green indicates fully operational circuit.
   b. Red indicates loss of protection.

6. EMI-RFI Noise Rejection: based on MIL-STD-E220A, 50-ohm standard Insertion Loss Test:
   a. 34dB at 100 kHz.
   b. 51dB at 1 MHz.
   c. 54dB at 10 MHz.
d. 48dB at 100 MHz.

7. The maximum continuous operating voltage (MCOV) for all voltage configurations shall be 115% if nominal or greater.

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. Coordinate with building power monitoring and control system.

B. Peak Single-Impulse Surge Current Rating for service entrance equipment (B2 Rating): 240 kA per phase; 120 kA per mode based on a single pulse, IEEE C62.41 standard 8 x 20 microsecond waveform. Device shall not suffer more than 10% deviation in clamping voltage at specified surge current.

C. Minimum Repetitive Surge Current Capability: 10,000 for service entrance and 5,000 for distribution panels and panelboards impulse per mode in accordance with ANSI/IEEE C62.41 and ANSI/IEEE C62.45 utilizing a Category C3 bi-wave at one minute intervals without suffering either performance degradation or more than 10% deviation of specified UL 1449 Suppression Voltage Ratings at specified surge current.

D. Connection Means:

1. Integral: Bus mounted, parallel connection

E. Protection modes and UL 1449 Listed and Recognized Component Surge Voltage Rating for grounded wye circuits with voltages of 208Y/120V, 3-phase, 4-wire circuits shall not exceed the following:

1. Line to Neutral: 700V.
2. Line to Ground: 700V
3. Neutral to Ground: 700V
4. Line to Line: 1500V

2.3 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. Surge protective devices shall be factory installed in all new distribution equipment.

3.2 PLACING SYSTEM INTO SERVICE

A. Do not energize or connect distribution equipment to their sources until surge protection devices are installed and connected.
3.3 FIELD QUALITY CONTROL

A. Testing: Perform the following field tests and inspections and prepare test reports. Test all service entrance and electronic grade panelboard suppressors.

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.

   a. Visual and Mechanical Inspection

      1) Inspect for physical damage and compare nameplate data with Drawings and Specifications.
      2) Inspect for proper mounting and adequate clearances.
      3) Check ground lead on each device for individual attachment to ground bus or ground electrode.

B. 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 surge protection devices. Refer to Division 1.

**END OF SECTION**