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**Part 1            General**

**1.1                RELATED SECTIONS**

- .1    Section 26 05 00 - Common Works Results - Electrical.
- .2    Section 26 24 13 - Switchboards.
- .3    Section 26 24 16.01 - Panelboards Breaker Type.

**1.2                REFERENCES**

- .1    Institute of Engineering and Electronic Engineers (IEEE):
  - .1    IEEE C62.41.2-02, Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and Less) AC Power Circuits.
  - .2    IEEE C62.45-03, Recommended Practice on Surge Testing for Equipment Connected to Low-Voltage (1000 V and Less) AC Power Circuits.
- .2    Underwriters Laboratories, Inc. (UL):
  - .1    UL 1283-05, Electromagnetic Interference Filters
  - .2    UL 1449-06, Surge Protective Devices

**1.3                ACTION AND INFORMATIONAL SUBMITTALS**

- .1    Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2    Product Data:
  - .1    Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

**1.4                CLOSEOUT SUBMITTALS**

- .1    Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2    Operation and Maintenance Data: submit operation and maintenance data for surge protective devices for incorporation into manual.

**1.5                DELIVERY, STORAGE AND HANDLING**

- .1    Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2    Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

- .3 Storage and Handling Requirements:
  - .1 Store materials off ground, indoors, and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect switchboard from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

## **1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## **1.7 ACCEPTABLE PRODUCTS AND MATERIALS**

- .1 Where a particular brand name is stipulated, see Instructions to Bidders for procedure for requesting approval of substitute materials and products.

## **Part 2 Products**

### **2.1 SURGE PROTECTIVE DEVICES**

- .1 Surge protective devices (SPD or TVSS) to IEEE C62.41 and UL 1449, in a dedicated sheet metal NEMA 1 enclosure.
- .2 SPD design to be based on metal oxide varistors (MOV).
- .3 Modular design with field-replaceable modules, or non-modular design.
- .4 Fuses, rated at 200 kA interrupting capacity.
- .5 Bolted compression lugs for internal wiring.
- .6 Integral disconnect switch.
- .7 Redundant suppression circuits.
- .8 LED indicator lights for power and protection status.
- .9 Audible alarm, with silencing switch, to indicate when protection has failed.
- .10 Form-C contacts rated at 5 A and 250-VAC, one normally open and one normally closed, for remote monitoring of protection status. Contacts shall reverse on failure of any surge diversion module or on opening of any current-limiting device.
- .11 Four-digit transient event counter.
- .12 Surge current per phase:
  - .1 Minimum 240 kA per phase for switchgear, switchboards, motor control centers, and 347/600 V panelboards.
  - .2 Minimum 120 kA per phase for 120/208 V panelboards.

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**2.2 ACCEPTABLE PRODUCTS:**

- .1 Visor Series of Eaton.
- .2 TPS3 Series of Siemens.
- .3 SurgeLogic of Schneider Electric.
- .4 Replacement materials or products: approved by addendum according to Instructions to bidders.

**Part 3 Execution**

**3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for switchboard installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied.

**3.2 INSTALLATION**

- .1 Field-installed SPD: Install SPD with conductors or buses between SPD and points of attachment as short and straight as possible. Do not exceed manufacturer's recommended lead length. Do not bond neutral and ground.
- .2 Connect SPD to circuit breaker as a dedicated disconnecting means for SPD as indicated, and lock the circuit breaker in the closed position.
- .3 Do not perform insulation resistance tests on switchgear, switchboards, panelboards, or feeders with the SPD connected. Disconnect SPD before conducting insulation resistance tests, and reconnect SPD immediately after insulation resistance tests are complete.

**3.3 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

### **3.4            ACTIVITIES ON WORK COMPLETION**

- .1        Demonstration and training.
  - .1        Provide necessary training to familiarize the operating and maintenance personnel with the operation of the SPD.
    - .1        Training to be 2 hours.

**END OF SECTION**