PART 1 - GENERAL

1.01 WORK INCLUDED

A. Provide 3-phase, 4-wire transient voltage surge suppression (TVSS) or surge protection devices (SPD) as indicated on the panel board schedules and on the riser diagram.

B. As a minimum provide TVSS for all service entrance panels and switchboards as well as all distribution panels 600Amps and above.

1.02 RELATED DOCUMENTS

A. General: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections apply to this section.

1.03 DESCRIPTION

A. General: Transient voltage surge suppression (TVSS) or surge protection device (SPD) is the description and equipment required for the protection of all AC electrical circuits and electronic equipment from the effects of lightning induced voltages, external switching transients and internally generated switching transients.

1.04 REFERENCE STANDARDS AND PUBLICATIONS

A. General: The latest edition of the following standards and publications shall comply to the work of this section:


1.05 MANUFACTURER QUALIFICATIONS

A. In order to establish a level of quality for these Construction Documents, Eaton’s Innovative Technology shall be the basis of design.

B. All products submitted shall comply with the specifications of the Eaton’s Innovative Technology model type specified herein. Manufacturers requesting product approval must meet or exceed the written specification contained herein.

C. The registered service mark (brand) must be owned by the Manufacturer. No private label accepted.

E. The Manufacturer must be regularly engaged in the manufacture of surge suppression products for the specified categories for no less than ten (10) years.

F. All surge protective devices for service entrance, distribution, and branch circuit protection within a facility shall be provided by a single manufacturer.

1.06 WARRANTY

A. The TVSS and supporting components shall be guaranteed by the manufacturer to be free of defects in material and workmanship for a period of twenty (20) years from the date of substantial completion of service and activation of the system to which the suppressor is attached.

B. Any TVSS that shows evidence of failure or incorrect operation during the warranty period shall be replaced free of charge. Since “Acts of Nature” or similar statements typically include the threat of lightning to which the SPDs shall be exposed, any such clause limiting warranty responsibility in the general conditions of this specification shall not apply to this section.

C. Exclusions and prorating will not be allowed. Warranties extended in excess of the manufacturer’s standard warranty are not acceptable for the purpose of the specification.

1.07 COMPLIANCE REQUIREMENTS


B. ANSI/IEEE C62.41-1991 Measured Limiting Voltage (Let-Thru) shall be reported with measurements taken from zero reference per NEMA LS-1.

C. SPD’s listed for 120/208V or 120/240V sub panels shall be UL 1283 listed, and must be a true sine wave tracking unit with EMI/RFI filtering. ANSI/IEEE C62.41-1991 Measured Limiting Voltage for sine wave tracking shall not exceed for A1 Ring Wave: L-N 60V; L-G 100V; L-L 70V & N-G 70V (Measurements taken from zero reference per NEMA LS-1; 180 degree phase Angle).

D. TVSS shall have a response time of equal or less than 1 nanosecond, and be of non-deteriorating design.
1. Repetitive surge withstanding capabilities for ANSI/IEEE Category 3 shall be no less than 18,000 pulse life for main switchgear 300ka and higher, and no less than 18,000 for distribution and sub panels.

1.08 SUBMITTALS

A. Submit product data and shop drawings with complete description of material components.

B. Manufacturer’s certified test data indicating the ability of the product to meet or exceed requirements of this specification.

C. Drawings, with dimensions, indicating TVSS mounting arrangement and lead length configuration, and mounting arrangement of any optional remote diagnostic equipment and assemblies.

D. All submittals for approved equals must be made ten (10) days prior to bid date.

PART 2 - PRODUCTS

2.01 MATERIALS

A. The TVSS shall protect all modes and there shall be seven discrete suppression circuits; 3 modes connected Line to Ground, 3 modes connected Line to Neutral, and 1 mode connected Neutral to Ground for 3-phase, 4-wire, plus ground voltage system. Line to Neutral ground is not an acceptable substitute for Line to Ground. Line to Neutral to Line and Line to Ground to Line (in combination) will be acceptable for Line to Line protection.

B. Each TVSS must be in a Powered Steel NEMA Type 4 enclosure (IP66), and be of a no-power consuming design, except for indicator light.

C. TVSS unit must not be affected by humidity, altitude, external EMI or RFI and must not generate EMI or RFI.

The TVSS shall be equal to Eaton’s Innovative Technology based on Voltage & Amperage, and Repetitive Surge Withstanding Capabilities as well as let-through voltage; and, 20 year warranty.
Note to Engineer: Select applicable Voltage & Amperage below and delete off other rows.

<table>
<thead>
<tr>
<th>Area to be Protected</th>
<th>Sine Wave Tracking</th>
<th>Protector Model #</th>
<th>Warranty</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Main Power</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(277/480) ≤1600A</td>
<td></td>
<td>PTX160-3Y201</td>
<td>20 Years</td>
</tr>
<tr>
<td>(120/208) ≤1600A</td>
<td></td>
<td>PTX160-3Y101</td>
<td>20 Years</td>
</tr>
<tr>
<td>(277/480) ≤3000A</td>
<td></td>
<td>PTX300-3Y201</td>
<td>20 Years</td>
</tr>
<tr>
<td>(120/208) ≤3000A</td>
<td></td>
<td>PTX300-3Y101</td>
<td>20 Years</td>
</tr>
<tr>
<td>(277/480) ≤4000A</td>
<td></td>
<td>PTX400-3Y201</td>
<td>20 Years</td>
</tr>
<tr>
<td>(120/208) ≤4000A</td>
<td></td>
<td>PTX400-3Y101</td>
<td>20 Years</td>
</tr>
<tr>
<td><strong>B. Distribution Panels</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120/208V ≤800A</td>
<td></td>
<td>PTX080-3Y101</td>
<td>20 Years</td>
</tr>
<tr>
<td>277/480V ≤800A</td>
<td></td>
<td>PTX080-3Y201</td>
<td>20 Years</td>
</tr>
<tr>
<td><strong>C. Critical Sub-Panels (Computers, Process Controllers, PLC’s, etc.)</strong></td>
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<td></td>
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<td>120/208V ≤400A</td>
<td>YES</td>
<td>PTE048-3Y101</td>
<td>20 Years</td>
</tr>
<tr>
<td>277/480V ≤400A</td>
<td>YES</td>
<td>PTE048-3Y201</td>
<td>20 Years</td>
</tr>
</tbody>
</table>

PART 3 - EXECUTION

3.01 INSTALLATION

A. The installing contractor shall install the parallel TVSS with short and straight conductors as practically possible.

B. The contractor shall follow the TVSS manufacturer’s recommended installation practice as found in the equipment installation instructions (to be included in package with each unit).

C. The installation shall apply to all applicable codes.

D. All conductors associated with TVSS devices shall be installed in conduit. Minimum conductor size shall be #8 AWG copper.

END OF SECTION 26 43 13