# SECTION 16610
# TRANSIENT VOLTAGE SURGE SUPPRESSION

## PART 1 GENERAL

### 1.1 SECTION INCLUDES:
A. Transient Voltage Surge Suppression (TVSS) devices for service entrance switchboard and other panel boards.

### 1.2 REFERENCES
A. UL 1449-1998, Second Edition-Transient voltage surge suppressors.
B. UL 1283- Electromagnetic Interference Filters.
C. UL 1363-1998- Standard for temporary power taps.
D. ANSI/IEEE C62.41-1980 (IEEE 587) - Guide for surge voltages in low-voltage AC power circuits.
E. ANSI/IEEE C62.33-1982 - Standard test specifications for Voltage Surge Protection Devices.
F. ANSI/IEEE C62.45-1987 - IEEE Guide for surge testing for equipment connected to low-voltage AC power circuits.

### 1.3 SYSTEM DESCRIPTION
A. The work required under this division shall include all materials, labor and auxiliaries required to furnish and install complete Transient Voltage Surge Suppression (TVSS) devices, also known as Surge Protective Devices (SPD) or simply Suppressors for the protection of building electrical and electronics systems from the effects of line induced transient voltage surge and lightning discharge as indicated on drawings or specified in this section.
B. Provide Transient Voltage Surge Suppression (TVSS) devices for the equipment described herein:
    1. On electrical service entrance switchboards/panels.
    2. On distribution and branch circuit panels as indicated on drawings.

### 1.4 SUBMITTALS:
A. Submit product data under provisions of Section 01300.
B. Schematic data on each suppressor type indicating component types.
C. Dimension drawing of each suppressor type.
D. Manufacturer's performance data on each suppressor type.
E. Underwriters Laboratories approval compliance letter.
F. Manufacturer's performance data on each suppressor type.

### 1.5 QUALITY ASSURANCE
A. All TVSS devices shall be manufactured by a company normally engaged in the design, development and manufacture of such devices for electrical and electronics system equipment. The said firm shall have minimum of five years documented experience in manufacturing TVSS devices.
B. The TVSS manufacturer shall offer technical assistance through support by a factory representative and local stocking distributor.

### 1.6 WARRANTY
A. All Transient Voltage Surge Suppression (TVSS) devices shall be warranted to be free from defects in materials and workmanship under normal use in accordance with the instructions provided for a period of 10 years.
B. Any TVSS device, which shows evidence of failure or incorrect operation during the warranty period, shall be repaired or replaced by the manufacturer and installer.

PART 2 PRODUCTS

2.1 MANUFACTURERS:

A. Equipment by all manufacturers meeting this specification shall be considered for approval.

2.2 TVSS DEVICES

A. Surge Protective Devices shall be UL 1283 listed as an electromagnetic interference filter.

B. Surge Protective Devices shall be listed in accordance with UL 1449-1998, Second Edition-Transient Voltage Surge Suppressors (TVSS) and be marked in accordance with referenced standard and shall be approved for the location in which they are installed.

C. Surge Protective Devices shall be either close nippled to the device being protected or mounted internally in a position which will minimize lead length between suppressor and the panel circuit breaker to which the suppressor manufacturer's recommended maximum lead length is not exceeded without specific approval of the Engineer.

D. Surge Protective Devices shall be designed for the specific type and voltage of electrical service and shall have interrupting rating (AIC) equal to or greater than the available fault currents at the terminal of the panel that is being protected but the unit AIC shall not be less than 25,000 amps, symmetrical.

E. Surge Protective Devices shall be designed to withstand a maximum continuous operating voltage of not less than 115% of nominal RMS line voltage.

F. Surge Protective Devices shall contain internal safety surge rated fusing which is designed to disconnect the suppressor from the electrical source if the suppressor fails.

G. Surge Protective Devices shall be failsafe, shall have no holdover current, shall have repeated surge capability, shall be solid state and self-restoring and shall be fully automatic.

H. Surge Protective Devices shall contain a visual indication on the front door of the enclosure of the SPD unit to verify that either the suppressor has failed or that the suppressor is operational and functional.

I. Surge Protective Devices shall have an operating temperature range of –40°C to +60°C.

2.3 SUPPRESSOR CRITERIA

A. Surge Protective Device for service entrance equipment (switchboard/panel board):

1. 277/480 volt, 3 phase, 4 wire, WYE
   a. Seven modes protection: line to neutral, line to ground and neutral to ground.
   b. Suppression voltage of 800 volts.
   c. Surge capacity of 100,000 AMPS.
   d. Audible alarm after failure.
2. 120/208 volt, 3 phase, 4 wire, WYE
   a. Seven modes protection: line to neutral, line to ground and neutral to ground.
   b. Suppression voltage of 450 volts.
   c. Surge capacity of 100,000 AMPS.
   d. Audible alarm after failure.

B. Surge Protective Device for distribution and branch panels:

1. 277/480 volt, 3 phase, 4 wire, WYE
   a. Normal modes protection: line to neutral and neutral to ground.
   b. Suppression voltage of 800 volts.
   c. Surge capacity of 70,000 AMPS.
   d. Audible alarm after failure.
2. 120/208 volt, 3 phase, 4 wire, WYE
   a. Normal modes protection: line to neutral and neutral to ground.
   b. Suppression voltage of 450 volts.
   c. Surge capacity of 70,000 AMPS.
   d. Audible alarm after failure.

PART 23 EXECUTION

3.1 INSTALLATION

A. Suppressors shall be installed as close as practical or mounted internally to the electric panel or electronic equipment to be protected, consistent with available spaces.

B. Suppressors shall be installed in a neat, workmanlike manner. Lead length shall be as short (36 inches maximum length) and as straight as possible and be consistent with recommended industry practices for the system on which these devices are installed.

C. Supplementary grounding and bonding connections required between the bonding bus or ground plane for each equipment cluster and other locations as indicated shall be accomplished using #6 AWG copper conductor and approved connections unless otherwise noted.

D. Surge Protective Devices shall be installed and located in accordance with requirements of all applicable National Fire Protection Association (NFPA) codes.

END OF SECTION