

# EXPECTED IMPLEMENTATION JANUARY 2013

## 785 INTELLIGENT TRANSPORTATION SYSTEMS - INFRASTRUCTURE. (REV 5-17-12) (FA 7-25-12) (1-13)

SUBARTICLE 785-2.4 (of the Supplemental Specifications) is deleted and the following substituted:

### 785-2.4 Surge Protective Devices:

**785-2.4.1 General:** Provide all ITS field installation sites with both primary and secondary surge protection on the AC power. Connect the primary surge protection at the service entrance or main disconnect. Connect the secondary surge protection on the power distribution to the equipment.

**785-2.4.2 SPD at Power Entry Point:** Install a SPD at the closest termination/disconnection point where the supply circuit enters the ITS device cabinet. Locate the SPD on the load side of the main disconnect and ahead of any and all ITS electronic devices. Configure the SPD to operate at 120 volt single phase (i.e., line, neutral and ground) or 120/240 volt single phase (line 1, line 2, neutral and ground) as required to match the supply circuit configuration. Ensure that the SPD maximum surge current rating is 80kA per phase or greater. Ensure that the SPD has been labeled to indicate that the unit is listed and meets the requirements of UL 1449, Third Edition.

Ensure that the SPD has a visual indication system that monitors the weakest link in each mode and shows normal operation or failure status and also provides one set of normally open (NO)/normally closed (NC) Form C contacts for remote alarm monitoring. The enclosure for a SPD shall have a NEMA 4 rating.

**785-2.4.3 SPD at Point of Use:** Install a SPD at the point the ITS devices receive 120 volt power. Ensure that these devices comply with the functional requirements shown in Table 785-1. Ensure that the units are rated at 15 or 20 amps load and are configured with receptacles.

Ensure that these units have internal fuse protection and provide common mode (L+N-G) protection.

### 785-2.4.4 SPD for Low-Voltage Power, Control, Data and Signal Systems:

Install a specialized SPD on all conductive circuits including, but not limited to, data communication cables, coaxial video cables, and low-voltage power cables. Ensure that these devices comply with the functional requirements shown in Table 785-1 for all available modes (i.e. power L-N, N-G; L-G, data and signal center pin-to-shield, L-L, L-G, and shield-G where appropriate).

Circuit Description	Clamping Voltage	Data Rate	Surge Capacity	Maximum Let-Through Voltage
12 VDC	15-20 V	N/A	5kA per mode (8x20 $\mu$ s)	<150 Vpk

# EXPECTED IMPLEMENTATION JANUARY 2013

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Table 785-1				
SPD Minimum Requirements				
Circuit Description	Clamping Voltage	Data Rate	Surge Capacity	Maximum Let-Through Voltage
24 VAC	30-55 V	N/A	5kA per mode (8x20 $\mu$ s)	<175 Vpk
48 VDC	60-85 V	N/A	5kA per mode (8x20 $\mu$ s)	<200 Vpk
120 VAC at POU	150-200 V	N/A	20kA per mode (8x20 $\mu$ s)	<550 Vpk
Coaxial Composite Video	4-8 V	N/A	10kA per mode (8x20 $\mu$ s)	<65 Vpk (8x20 $\mu$ s/1.2x50 $\mu$ s; 6kV, 3kA)
RS422/RS485	8-15 V	Up to 10 Mbps	10kA per mode (8x20 $\mu$ s)	<30 Vpk
T1	13-30 V	Up to 10 Mbps	10kA per mode (8x20 $\mu$ s)	<30 Vpk
Ethernet Data	7-12 V	Up to 1 Gbps	1kA per mode (10x1000 $\mu$ s)	<30 Vpk

Install a SPD that has an operating voltage matching the characteristics of the circuit. Ensure that these specialized SPDs are listed and meet the requirements of UL 497B or UL 497C, as applicable.

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ARTICLE 785-6 (of the Supplemental Specifications) is deleted and the following substituted:

**785-6 Warranty.**

**785-6.1 General:** Ensure that the manufacturer will furnish replacements for any part or equipment found to be defective during the warranty period at no cost to the Department or maintaining agency within 10 calendar days of notification.

**785-6.2 Lowering Devices:** Ensure that the lowering devices have a manufacturer’s warranty covering defects for a minimum of three years from the date of final acceptance by the Engineer in accordance with 5-11 and Section 608.

**785-6.3 Surge Protective Devices:** Ensure that the SPD has a manufacturer’s warranty covering failures for a minimum of 10 years from the date of final acceptance by the Engineer in accordance with 5-11 and Section 608.

The term “failure” for warranty replacement is defined as follows:

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# EXPECTED IMPLEMENTATION JANUARY 2013

**D** Parallel-connected, power-rated SPD units are considered in failure mode when any of the visual indicators shows failure mode when power is applied to the terminals at the unit's rated voltage, or the properly functioning over-current protective device will not reset after tripping.

Series-connected, low-voltage power, data, or signal units are considered in the failure mode when an open circuit condition is created and no data/signal will pass through the SPD device or a signal lead is permanently connected to ground.

In the event that the SPD, including any component of the unit, should fail during the warranty period, the entire SPD shall be replaced by the manufacturer at no cost to the Department or maintaining agency.

**785-6.4 ITS Field Cabinet:** Ensure that the ITS field cabinet has a manufacturer's warranty covering defects for a minimum of two years from the date of final acceptance in accordance with 5-11 and Section 608.

**785-6.5 ITS Equipment Shelter:** Ensure that the equipment shelter, its components, and hardware have a manufacturer's warranty covering defects for a minimum of one year from the date of final acceptance in accordance with 5-11 and Section 608.

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