NEC surge protection requirements and SPD selection

In recent years, with the proliferation of electronics and devices sensitive to transient voltage and current surges, the need for surge protection has become increasingly important, particularly for equipment and systems used for life safety or where reliability is highly critical.

The National Electrical Code (NEC®) recognizes this need and has adopted the following provisions where surge protection is required.

Regardless of whether surge protection is required or not, it’s prudent to have surge protection on all circuits as many portable appliances and communications devices with sensitive electronics may be powered from circuits where transient overvoltage surge is an issue.

Below are the major NEC Sections requiring surge protection. On page two is a selection chart for Bussmann™ series surge protective devices (SPD) based upon application.

620.51(E) “Where any of the disconnecting means in 620.51 has been designated as supplying an emergency system load, surge protection shall be provided.”

Added in 2017, this section was added to address emergency system loads such as elevators, escalators, moving sidewalks, chairlifts and associated equipment.

645.18 “Surge protection shall be provided for Critical Operations Data Systems.”

Added in 2017, Critical Operation Data Systems is defined by the NEC as “Information technology equipment systems that require continuous operation for public safety, emergency management, national security or business continuity.”

670.6 “Industrial machinery with safety interlock circuits shall have surge protection installed.”

Added in 2017, this section was added to address the concern with safety interlock failure on machinery causing a safety risk to operators who may not be aware of disabled safety mechanisms.

694.7(D) “A surge protection device shall be installed between a wind electric system and any loads served by the premises electrical system.”

Added in 2011, surge protective devices should be on the circuit serving the wind electric system or on the service disconnect’s loadside.

695.15 “A listed surge protection device shall be installed in or on the fire pump controller.”

Added in 2017, this NEC provision requires a listed SPD to be installed in or on the fire pump controller to provide protection. A study commissioned by the Fire Protection Research Foundation found that 12% of those surveyed had surges damaging their fire pumps.

700.8 “A listed SPD shall be installed in or on all emergency systems switchboards and panelboards.”

Added in 2014, this requirement helps ensure emergency electrical systems continue powering vital, life-safety loads in the event of damaging surges.

708.20 “Surge protection devices shall be provided at all facility voltage distribution levels.”

Added in 2008, Critical Operation Power Systems (COPS) are power systems that can include HVAC, fire alarms, security, communications and signaling for designated critical operations areas. Surge protection helps ensure these systems will operate as intended in an emergency situation.

EATON
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## NEC Surge Protection Requirements and SPD Selection

**SPD Selection Guide 10876**

Effective March 2019

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### Available Bussmann Series Surge Protective Devices

Use this guide to help you decide which series best meets your needs and applications.

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<tr>
<th>Market</th>
<th>Commercial/Industrial</th>
<th>Light Commercial</th>
<th>OEMs/UL 508A Panel Shops</th>
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<tr>
<td>Equipment Type</td>
<td>Main switchgear, switchboard, distribution and lighting panelboards, motor control center, outdoor load</td>
<td>Distribution and lighting panelboards, loadcenter</td>
<td>Control panel, point of use</td>
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<td>NEC SPD Requirements*</td>
<td>620.51(E), 645.18, 694.7(D), 700.8</td>
<td>620.51(E), 645.18, 695.15, 700.8, 708.20</td>
<td>670.6, 695.15, 708.20</td>
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<td>B</td>
<td>A</td>
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<tr>
<td>Typical Panel Amps</td>
<td>Up to 4000</td>
<td>Up to 2000</td>
<td>Up to 600</td>
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<tr>
<td>Peak kA Rating Per Phase</td>
<td>120—400</td>
<td>50—200</td>
<td>40</td>
</tr>
<tr>
<td>SCCR (kA)</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Nominal Voltage</td>
<td>120—600 Vac</td>
<td>120—600 Vac</td>
<td>120—600 Vac</td>
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<tr>
<td>UL® 1449/CSA® Type</td>
<td>1 and 2</td>
<td>1 and 2</td>
<td>1 and 2</td>
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<tr>
<td>UL 1283 EMI/RFI Filtering**</td>
<td>50 dBF</td>
<td>40 dB</td>
<td>N/A</td>
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<tr>
<td>NEMA Enclosure</td>
<td>1 and 4X</td>
<td>4X</td>
<td>N/A</td>
</tr>
<tr>
<td>Agency Information</td>
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<td>cULus/CSA/RoHS</td>
<td>UL Listed open Type 1/ CSA/RoHS / ULul/CSA/KEMA/RoHS</td>
</tr>
<tr>
<td>Warranty (Years)</td>
<td>10</td>
<td>5</td>
<td>2</td>
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<tr>
<td>Features/Mounting</td>
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<td>Side-mount</td>
<td>Rear nipple</td>
</tr>
<tr>
<td>Status Indication</td>
<td>Yes-LED</td>
<td>Yes-LED</td>
<td>Yes-LED</td>
</tr>
</tbody>
</table>

### Options

- **Audible Alarm**: Yes / Yes / No / No / No
- **Form C Contacts**: Yes / Yes / No / Yes - standard / Yes - standard
- **Surge Counter**: Yes / No / No / Yes - standard / Yes - standard
- **EMI/RFI Filtering**: Yes / Yes / No / No / No

### Product Family

- **BSPD**
- **BSPA**
- **SurgePOD PRO**
- **BSPMA**
- **BSPM1A/BSPH2A**

<table>
<thead>
<tr>
<th>Data Sheet</th>
<th>BSPD</th>
<th>BSPA</th>
<th>SurgePOD PRO</th>
<th>BSPMA</th>
<th>BSPM1A/BSPH2A</th>
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<td>10661</td>
<td>10033</td>
<td>10771 (1-pole), 10772 (2-pole), 10773 (3-pole), 10774 (4-pole)</td>
<td>2056 (1-pole), 2057 (2-pole)</td>
</tr>
</tbody>
</table>

*Product family and rating is dependent upon the application and exposure to surge activity.*

**Selecting filtering option changes normally Type 1 SPDs to Type 2.**

† With online registration.

†† Available on some models.

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For Eaton's Bussmann series product information, call 1-855-287-7626 or visit: Eaton.com/bussmannseries

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