

## 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."**



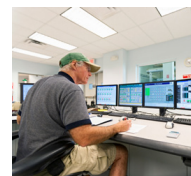
**Added in 2017**, this NEC provision requires a listed SPD to be installed in or on the fire pump controller to provide protection. A study commissioned by the Fire Protection Research Foundation found that 12% of those surveyed had surges damaging their fire pumps.

**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.

**Available Bussmann series surge protective devices**

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

Market	Commercial/industrial		Light commercial	OEMs/UL 508A panel shops	
<b>Equipment type</b>	Main switchgear, switchboard, distribution and lighting panelboards, motor control center, outdoor load		Distribution and lighting panelboards, loadcenter	Control panel, point of use	
<b>NEC SPD requirements*</b>	620.51(E), 645.18, 694.7(D), 700.8		620.51(E), 645.18, 695.15, 700.8, 708.20	670.6, 695.15, 708.20	
<b>IEEE exposure category</b>	C		B	A	
<b>Typical panel amps</b>	Up to 4000	Up to 2000	Up to 600	Up to 200	Single-phase, point of use
<b>Peak kA rating per phase</b>	120-400	50—200	40	50	40 / N/A
<b>SCCR (kA)</b>	200	200	200	200	N/A
<b>Nominal voltage</b>	120—600 Vac	120—600 Vac	120—600 Vac	120—600 Vac	24-120 Vac 24-200 Vdc
<b>UL® 1449/CSA® type</b>	1 and 2	1 and 2	1 and 2	1	2
<b>UL 1283 EMI/RFI filtering**</b>	50 dB	40 dB	N/A	N/A	N/A
<b>NEMA Enclosure</b>	1 and 4X	4X	4X	N/A	N/A
<b>Agency information</b>	cULus/CSA/RoHS	cULus/CSA/RoHS	cULus/CSA/RoHS	UL Listed open Type 1/ CSA/RoHS	UL/cUL/CSA/KEMA/ RoHS
<b>Warranty (years)</b>	10	5	2	5	5
<b>Features/mounting</b>	Side-mount	Side-mount	Rear nipple	DIN-Rail	DIN-Rail
<b>Status indication</b>	Yes-LED	Yes-LED	Yes-LED	Yes-Local	Yes-Local
<b>Options</b>					
<b>Audible alarm</b>	Yes	Yes	No	No	No
<b>Form C contacts</b>	Yes	Yes	No	Yes - standard	Yes - standard
<b>Surge counter</b>	Yes	No	No	No	No
<b>EMI/RFI filtering</b>	Yes	Yes	No	No	No
<b>Product family</b>					
	<b>BSPD</b>	<b>BSPA</b>	<b>SurgePOD PRO</b>	<b>BSPMA</b>	<b>BSPM1A/BSPH2A</b>
<b>Data sheet</b>	10209	10661	10033	10771 (1-pole), 10772 (2-pole), 10773 (3-pole), 10774 (4-pole)	2056 (1-pole), 2057 (2-pole)

\* 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.

**Eaton**  
1000 Eaton Boulevard  
Cleveland, OH 44122  
United States  
Eaton.com

Bussmann Division  
114 Old State Road  
Ellisville, MO 63021  
United States  
Eaton.com/bussmannseries

© 2019 Eaton  
All Rights Reserved  
Publication No. 10876 – BU-MC19026  
March 2019

Eaton and Bussmann are valuable trademarks of Eaton in the US and other countries. You are not permitted to use the Eaton trademarks without prior written consent of Eaton.

CSA is a registered trademark of the Canadian Standards Group  
NEC is a registered trademark of the National Fire Protection Association, Inc.  
UL is a registered trademark of the Underwriters Laboratories, Inc.

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

Follow us on social media to get the latest product and support information.

