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.

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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.

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

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