NEC code requirements for surge protection

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".
This article 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."
Critical Operation Data Systems is defined by the NEC® as "Information technology equipment systems that require continuous operation for reasons of public safety, emergency management, national security or business continuity."

670.6 "Industrial machinery with safety interlock circuits shall have surge protection installed". The concern is failure of safety interlocks on machinery, causing 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." The surge device can be on the circuit serving the wind electric system or on the load side of the service disconnect.

695.15 "A listed surge protection device shall be installed in or on the fire pump controller." A new NEC provision requires a listed surge protection device (SPD) to be installed in or on the fire pump controller. An SPD is necessary to provide protection for the fire pump controller. A study commissioned by the Fire Protection Research Foundation found that 12% of those surveyed had damage to fire pumps due to surges.

700.8 "A listed SPD shall be installed in or on all emergency systems switchboards and panelboards." The NEC defines emergency power systems as systems legally required to automatically supply power to designated loads upon loss of normal power. This requirement will help ensure emergency electrical-distribution systems continue to deliver reliable power to vital life-safety loads in the event of damaging surges.

708.20 "Surge protection devices shall be provided at all facility voltage distribution levels" for Critical Operation Power Systems (COPS). COPS systems include but are not limited to power systems, HVAC, fire alarms, security, communications and signaling for designated critical operations areas. Surge protection ensures that these systems will operate in an emergency situation.

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Which surge solution is right for you?

Use this guide to figure out which series best meets your needs and applications.

Application	Commercial/industrial applications		Light commercial applications		Original equipment manufacturer/control panel applications		
Product category	Main switchgear, switchboard, motor control center, outdoor load		Distribution panelboard, subpanel, loadcenter		Control panel, point of use		
NEC code requirements for surge protection ❸	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		Category B		Category A		
Typical panel current rating	Unlimited	Up to 4000 A	Up to 1000 A	Up to 400 A	Control panel/point of use Up to 200 A		Single-phase point of use
Peak kA rating per phase	100–800 kA	50–400 kA	50–200 kA	50–100 kA	50 kA	45 kA	Up to 80 kA
Nominal voltage	120–600 Vac	120–600 Vac	120–600 Vac	120–600 Vac 48, 125 Vdc	120–600 Vac	120–600 Vac	100–240 Vac 24, 48 Vdc
UL® 1449/CSA® type	1 and 2	1 and 2	1 and 2	1	1	1	2
UL 1283 EMI/RFI filtering (dB)	50 dB	50 dB	40 dB	0 dB	0 dB	0 dB	Up to 75 dB
Enclosure	NEMA® 4 and 4X	NEMA 1, 4 and 4X	NEMA 4X	NEMA 4X	NEMA 4	NEMA 4X	Open
Listing	$_{c}UL_{us}$	$_{c}UL_{us}$/CSA	$_{c}UL_{us}$/CSA	UL/CSA/CE	UL	UL/CSA	$_{c}UR_{us}$/CSA
Warranty	20 years ❶	15 years ❶	10 years ❶	5 years	2 years	2 years	10/15 years ❶
Special features/applications	Feeder tap rule, modular design	Integrated or side-mount applications	Configurable design	Compact design	DIN rail mounting	Rear-nipple mounting	DIN rail mounting, series wiring
Options							
Internal disconnect	Yes	Yes	No	No	No	No	No
Audible alarm	Yes	Yes	Yes	No	No	No	No
Form C contacts	Yes	Yes	Yes	No	No	No	Yes ❷
Surge counter	Yes	Yes	No	No	No	No	No
							
Product series	SPM Series	SPD Series	SPC Series	CVX Series	SP1 Series	SP2 Series	AEGIS Series

❶ With online registration

❷ Available on some models

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

For technical assistance with surge applications, contact the Eaton Technical Resource Center: 1.800.809.2772, option 4, option 2

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Powering Business Worldwide

Printed in USA
Publication No. SA158003EN / Z19208
February 2017

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