Surge Protection Devices

2.1 Surge Protection Devices and Lightning Arresters

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Surge Protection Devices

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Product Description

Due to the evolution of electronics and microprocessors in the home, there is a continuous challenge to provide quality (clean) power for electronic loads such as appliances, computers/home office and entertainment systems. Surges caused by lightning, utility grid switching and other sources travel on current carrying conductors throughout the home, which can effect and destroy sensitive electronic loads.

Eaton offers a comprehensive family of surge products for use at service entrance and point-of-use locations. These products can help protect sensitive electronics against the damaging effects of surges.

Application Description

Two-Stage Protection

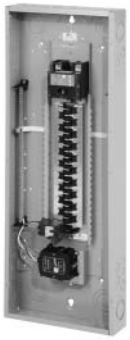
Two stages of surge suppression are recommended to provide the best protection for electronic equipment. Two-stage surge suppression should be provided for all cables entering a home, including power, Internet, coaxial and telephone.

Service Entrance Surge Protection

Eaton's service entrance surge protection units provide premier surge protection for AC power at the service entrance. These products provide protection for residential electrical equipment by reducing power surges to an acceptable level for surge strips to handle at the point of use.

UL 1449 3rd Edition Type 1 and Type 2 Surge Protection

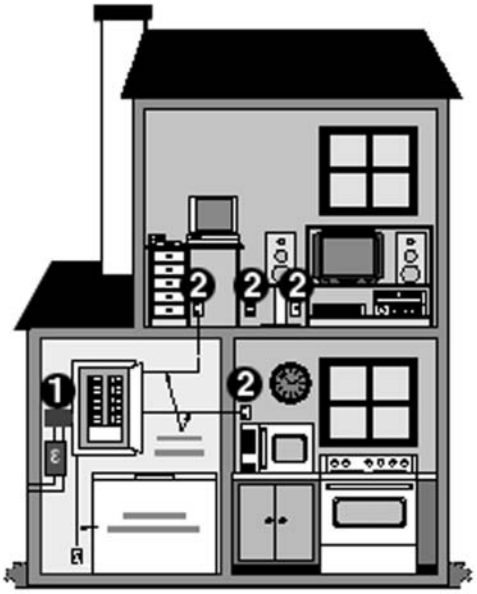
- **Type 1 Surge Protective Device (SPD)**—Permanently connected Type 1 SPDs are intended for installation between the secondary of the service transformer and the line side of the service equipment overcurrent device, as well as the load side, including watt-hour meter socket enclosures and are intended to be installed without an external overcurrent protective device. Type 1 devices are dual-rated for Type 2 applications as well, providing the highest ratings available for installation at the service entrance
  - Eaton's CHSPT1 products provide Type 1 surge protection in accordance with UL 1449 3rd Edition. These units can be universally mounted outside any manufacturer's primary service equipment
- **Type 2 Surge Protective Device**—Permanently connected Type 2 SPDs are intended for installation on the load side of the service equipment overcurrent device, including SPDs located at the branch panel
  - CHSPT2 products provide Type 2 surge protection in accordance with UL 1449 3rd Edition. These units can be mounted outside of any manufacturer's loadcenter or inside an Eaton Surge/Surge Ready loadcenter. Eaton also offers accessories to the CHSPT2 line for telephone and cable protection.
- **Factory-Installed Surge Protection**—Eaton's loadcenters with factory-installed surge protection include a CHSPT2ULTRA and a two-pole 15A circuit breaker. These loadcenters increase the effectiveness of surge protection due to reduced lead length. A modified deadfront allows for easy viewing of indicating lights for status indication



Surge Panel

- **Surge Ready Loadcenter**—The Surge-Ready loadcenter provides a mounting provision for the CHSPT2ULTRA. This loadcenter has a modified deadfront to allow for viewing of indicating lights.

Two-Stage Protection



① CHSP installed at the service entrance panel.
② SurgeTrap™ surge traps and strips located where sensitive electronics are plugged in.

Plug-On Surge Protection

- **Type CHSA**—For use on single-phase 120/240 Vac systems. The CHSA easily plugs into a single-phase Type CH loadcenter and occupies two 3/4-inch (19.1 mm) pole spaces, similar to a two-pole Type CH breaker. When installed properly, it provides surge protection for the entire loadcenter. If internal components are damaged, the CHSA LED visual indicators will signal the need for a replacement. This device is suitable for service entry locations when installed in accordance with NEC guidelines.
- **Type BRSURGE**—For use on single-phase 120/240 Vac systems. This easily plugs into a single-phase Type BR loadcenter and occupies two 1-inch (25.4 mm) pole spaces similar to a two-pole Type BR breaker. When installed properly, it provides surge protection for the entire loadcenter. If internal components are damaged, the BRSURGE LED visual indicators will signal the need for replacement. This device is suitable for service entry locations when installed in accordance with NEC guidelines. This unit is also classified by UL for use in select GE, ITE/Siemens, and Crouse-Hinds Panels. (Refer to Pub No. 5655B65H01 for additional details.)
- **Type CHQSA**—For use on single-phase, 120/240 Vac systems. This unit easily plugs into a Square D single-phase loadcenter Type QO® and occupies two 3/4-inch (19.1 mm) pole spaces similar to a two-pole Type QO breaker. When installed properly, it provides surge protection for the entire loadcenter. If internal components are damaged, the CHQSA LED visual indicators will signal the need for a replacement. This device is suitable for service entrance locations installed in accordance with NEC guidelines. This device is UL classified to be used in place of Square D Type QO surge arresters (refer to Pub-23974).

Type 3 Point-of-Use Surge Protection

Point-of-use surge strips are designed to offer premium surge protection for specific electronics while providing innovative features to enhance user convenience.

Standards and Certifications

- CHSPT1 Products: UL 1449 3rd Edition Type 1
- CHSPT2 Products: UL/cUL 1449 3rd Edition Type 2
- CHSPTELE: UL 497A, cUL
- CHSPCABLE: UL 6500, cUL
- NEMA 3R Enclosure for CHSPTELE and CHSPCABLE: UL 50 Enclosure
- BRSURGE, CHSA, CHQSA: UL 1449 3rd Edition plug-in type; Type 2 SPD
- Surge Strips: UL 1449 2nd Edition, cUL
- Power Strips: UL/cUL

Product Selection

SPD Type 1 CHSP Service Entrance Surge Protection—UL 1449 3rd Edition

Product Features

- Commercial grade AC power protection
- Type 1 surge device for installation before or after the main service disconnect
- Convenient mounting options—universal fit to any manufacturer's equipment
- Clear, visible LED indication displaying status of the surge protector

	Catalog Number	Connection	Enclosure	Voltage	Phase	Frequency (Hz)	MCOV ①	VPR ②	I_n ③	SCCR ④	Surge Current Capacity, Per Phase Rating ⑤
CHSPT1ULTRA 	**CHSPT1ULTRA**	Permanently connected device installed before or after the service disconnect overcurrent device.	NEMA 4	100/200, 110/220, 120/240	Single	50/60	L-L 300, L-N 150	L-L 1000, L-N 600	20 kA	200 kA	50 kA
CHSPT1MICRO 	**CHSPT1MICRO**	Permanently connected device installed before or after the service disconnect overcurrent device.	NEMA 4	100/200, 110/220, 120/240	Single	50/60	L-L 300, L-N 150	L-L 1000, L-N 600	20 kA	200 kA	36 kA
CHSPT1MAX 	**CHSPT1MAX**	Permanently connected device installed before or after the service disconnect overcurrent device.	NEMA 4	100/200, 110/220, 120/240	Single	50/60	L-L 300, L-N 150	L-L 1000, L-N 600	20 kA	200 kA	45 kA

Notes

① MCOV: Maximum Continuous Operating Voltage that may be applied to the device per mode.
② VPR: Voltage Protection Rating is the measured limiting voltage after a surge event.
③ I_n: Nominal Discharge Current is the current that the device can withstand for 15 impulses.
④ SCCR: The amount of current the product can withstand under short-circuit conditions.
⑤ Surge Current Capacity: The maximum one time surge current rating per phase.

For warranty details, go to www.eaton.com/surgetrap.

SPD Type 2 CHSP Service Entrance Surge Protection—UL 1449 3rd Edition; cUL

Product Features

- AC power protection
- Universally connects to any manufacturer's loadcenter (breaker box)
- Quick connect design—easy to mount telephone and cable protection modules
- LED status indication

	Catalog Number	Connection	Enclosure	Voltage	Phase	Frequency (Hz)	MCOV ①	VPR ②	I_n ③	SCCR ④	Surge Current Capacity, Per Phase Rating ⑤
CHSPT2ULTRA 	**CHSPT2ULTRA**	Can be attached to the outside of any manufacturer's loadcenter (breaker box). This product should be connected on the load side of the loadcenter main service disconnect through a dedicated circuit breaker (follow NEC Guidelines).	NEMA 4	120/240 Vac rated line voltage	Single	60	150V L-N, 300V L-L	600V L-N, 1000V L-L, 800V N-G, 600V L-G	20 kA ⑥	22 kA	**108 kA** (L1-N 54 kA, L1-G 54 kA, L2-N 54 kA, L2-G 54 kA)
CHSPT2MICRO 	**CHSPT2MICRO**	Can be attached to the outside of any manufacturer's loadcenter (breaker box). This product should be connected on the load side of the loadcenter main service disconnect through a dedicated circuit breaker (follow NEC Guidelines).	NEMA 4	120/240 Vac rated line voltage	Single	60	150V L-N, 300V L-L	600V L-N, 1000V L-L, 800V N-G, 600V L-G	5 kA	22 kA	**36 kA** (L1-N 18 kA, L1-G 18 kA, L2-N 18 kA, L2-G 18 kA)
CHSPT2MAX 	**CHSPT2MAX**	Can be attached to the outside of any manufacturer's loadcenter (breaker box). This product should be connected on the load side of the loadcenter main service disconnect through a dedicated circuit breaker (follow NEC Guidelines).	NEMA 4	120/240 Vac rated line voltage	Single	60	150V L-N, 300V L-L	600V L-N, 1000V L-L, 800V N-G, 600V L-G	10 kA	22 kA	**72 kA** (L1-N 36 kA, L1-G 36 kA, L2-N 36 kA, L2-G 36 kA)

Notes

① MCOV: Maximum Continuous Operating Voltage that may be applied to the device per mode.
② VPR: Voltage Protection Rating is the measured limiting voltage after a surge event.
③ I_n: Nominal Discharge Current is the current that the device can withstand for 15 impulses.
④ SCCR: The amount of current the product can withstand under short-circuit conditions.
⑤ Surge Current Capacity: The maximum one time surge current rating per phase.
⑥ When used with a 50A two-pole circuit breaker, 10 kA when used with a 15A two-pole circuit breaker.

For warranty details, go to www.eaton.com/surgetrap.

Accessories for CHSP Type 2 Service Entrance Protection

	Catalog Number	Description	Installation	Surge Current Capacity	DC Breakdown Voltage	Voltage
	CHSPCABLE	Quick Connect design—add additional telephone and AC protection modules; protects two quad shield cables	Indoor installation; or rain-tight when used with recommended enclosure	10 kA per line	145V	
CHSPTELE 	**CHSPTELE**	Quick Connect design—add additional AC and cable protection modules; protects four telephone lines	Indoor installation; or rain-tight when used with recommended enclosure	20 kA per line	230V	Ring 90–120 Vac/ Tone 48–52 Vdc
CHSPT23PACK 	**CHSPT23PACK**	3-Pack: CHSPT2ULTRA+CHSPTELE+CHSPCABLE; Surge protection for AC power, telephone and cable—see individual product features		See individual product ratings		
CHSP3RTELCABLE 	**CHSP3RTELCABLE**	Raintight enclosure for CHSPTELE and CHSPCABLE; top or bottom feed; enclosure only, surge not included; accommodates up to two devices				
CHSPFMKIT 	**CHSPFMKIT**	Flushmount kit for: CHSPT2ULTRA, CHSPT2MAX, CHSPT2MICRO, CHSPTELE, CHSPCABLE				
MSEGR1 	**MSEGR1**	Outdoor communication grounding device; meets 2008 NEC requirements for intersystem bonding termination				

Note

For warranty details, go to www.eaton.com/surgetrap.

Factory-Installed Surge Protection

- Includes a CHSPT2ULTRA and a two-pole 15A circuit breaker
- Increases the effectiveness of surge protection due to reduced lead length
- A modified deadfront allows for easy viewing of indicating lights for status indication

Surge Installed

Surge Installed Loadcenters

Catalog Number	Description	Cover Catalog Number Combination	Surface
CHSUR42N225L ①	42 ckt, 225A, convertible	**CHSUR8LF**	**CHSUR8LS**
CHSUR42L225L2 ①	42 ckt, 225A, convertible ②	**CHSUR8LF**	**CHSUR8LS**
CHSUR42B200L2 ①	42 ckt, 200A, main breaker	**CHSUR8LF**	**CHSUR8LS**
CHSUR32N225K ①	32 ckt, 225A, convertible	**CHSUR8KF**	**CHSUR8KS**
CHSUR32L225K ①	32 ckt, 225A, convertible ②	**CHSUR8KF**	**CHSUR8KS**
CHSUR32B200K ①	32 ckt, 200A, main breaker	**CHSUR8KF**	**CHSUR8KS**
CHSUR32B150K ①	32 ckt, 150A, main breaker	**CHSUR8KF**	**CHSUR8KS**
CHSUR32B100K ①	32 ckt, 100A, main breaker	**CHSUR8KF**	**CHSUR8KS**
CHSUR24L125E ①	24 ckt, 125A, convertible ②	**CHSUR8EF**	**CHSUR8ES**
CHSUR24B100E ①	24 ckt, 100A, main breaker	**CHSUR8EF**	**CHSUR8ES**
BRSUR4040N200	40/40 ckt, 200A, convertible	Cover included	
BRSUR4040L200	40/40 ckt, 200A, main lug	Cover included	
BRSUR4040B200	40/40 ckt, 200A, main breaker	Cover included	
BRSUR3040N200	30/40 ckt, 200A, convertible	Cover included	
BRSUR3040L200	30/40 ckt, 200A, main lug	Cover included	
BRSUR3040B200	30/40 ckt, 200A, main breaker	Cover included	

Surge Ready Loadcenters

- Provides a mounting provision for CHSPT2ULTRA
- A modified deadfront allows for easy viewing of indicating lights

Surge Ready

Surge Ready Loadcenters (Provision Only, CHSPT2ULTRA and Breaker Not Included)

Catalog Number	Description	Cover Catalog Number Combination	Surface
CHEC42N225L ①	42 ckt, 225A, convertible	**CHSUR8LF**	**CHSUR8LS**
CHEC42L225L ①	42 ckt, 225A, convertible ②	**CHSUR8LF**	**CHSUR8LS**
CHEC42B200L ①	42 ckt, 200A, main breaker	**CHSUR8LF**	**CHSUR8LS**
CHEC32L225K ①	32 ckt, 225A, convertible ②	**CHSUR8KF**	**CHSUR8KS**
CHEC32N225K ①	32 ckt, 225A, convertible	**CHSUR8KF**	**CHSUR8KS**
CHEC32B200K ①	32 ckt, 200A, main breaker	**CHSUR8KF**	**CHSUR8KS**
CHEC32B150K ①	32 ckt, 150A, main breaker	**CHSUR8KF**	**CHSUR8KS**
CHEC32B100K ①	32 ckt, 100A, main breaker	**CHSUR8KF**	**CHSUR8KS**
CHEC24L125E ①	24 ckt, 125A, convertible ②	**CHSUR8EF**	**CHSUR8ES**
CHEC24B100E ①	24 ckt, 100A, main breaker	**CHSUR8EF**	**CHSUR8ES**

Notes

① Order cover separately.
② With main lugs installed.

SPD Type 2 Plug-On Surge Protection—UL 1449 3rd Edition

Product Features

- Convenient surge protection for the loadcenter

	Catalog Number	Classified	Connection	Voltage	Phase	Frequency (Hz)	MCOV ①	VPR ②	I_n ③	SCCR ④	Surge Current Capacity, Per Phase Rating ⑤
BRSURGE 	**BRSURGE**	For use in a single-phase Type BR loadcenter. This unit is classified by UL for use in select GE, ITE/Siemens and Crouse-Hinds Panels. (Refer to Pub No. 5655B65H01 for additional details.)	Plug on to the loadcenter bus, see instructions	120/240	Single	60	L1-N 200V, L-L 400V	L1-N 600V, L-L 1000V	3k	10k	18 kA
CHSA 	**CHSA**	For use in a Type CH loadcenter.	Plug on to the loadcenter bus, see instructions	120/240	Single	60	L1-N 200V, L-L 400V	L1-N 600V, L-L 1000V	3k	10k	18 kA
CHQSA 	**CHQSA**	This device is UL classified to be used in place of Square D Type QO surge arresters. (Refer to Pub-23974.)	Plug on to the loadcenter bus, see instructions	120/240	Single	60	L1-N 200V, L-L 400V	L1-N 600V, L-L 1000V	3k	10k	18 kA

Notes

① MCOV: Maximum Continuous Operating Voltage that may be applied to the device per mode.
② VPR: Voltage Protection Rating is the measured limiting voltage after a surge event.
③ I_n: Nominal Discharge Current is the current that the device can withstand for 15 impulses.
④ SCCR: The amount of current the product can withstand under short-circuit conditions.
⑤ Surge Current Capacity: The maximum one time surge current rating per phase.

For warranty details, go to www.eaton.com/surgetrap.

Point-of-Use Surge Protection—330V Clamping Voltage, 125 Vac, 15A, 60 Hz, 1875W, UL/cUL Listed ①

Catalog Number	EMI/RFI Noise Filter	Total Calculated Joule Rating	Max. Peak Current	Protects	Outlets	Cord Length
Ultra Series (Best) ②						
SULT8T	Up to 40 dB	2160 joules	144 kA	AC power/phone	Eight rotating outlets (for extra plug-in space)	6-feet
SULT10TC	Up to 58 dB	2880 joules	192 kA	AC power/phone/coax cable/network	10 outlets (five fixed, five rotating for extra plug-in space)	6-feet
SULT12TC	Up to 58 dB	4320 joules	288 kA	AC power/phone/coax cable/network	12 outlets (four fixed, eight rotating for extra plug-in space)	6-feet
Max Series (Better) ②						
SMAX7	Up to 40 dB	1080 joules	72 kA	AC power	Seven outlets with sliding covers	6-feet
SMAX7T	Up to 40 dB	1080 joules	72 kA	AC power/phone	Seven outlets with sliding covers	6-feet
SMAX7C	Up to 40 dB	1080 joules	72 kA	AC power/coax cable	Seven outlets with sliding covers	6-feet
SMAX8TC	Up to 40 dB	2160 joules	144 kA	AC power/phone/coax cable	Eight outlets with sliding covers	6-feet
Micro Series (Good) ②						
SMICRO7	Up to 40 dB	540 joules	36 kA	AC power	Seven outlets with sliding covers	6-feet
SMICRO1	Up to 40 dB	540 joules	36 kA	AC power	One outlet	No cord/wallmount design
SMICRO1C	Up to 40 dB	540 joules	36 kA	AC power/coax cable	One outlet	No cord/wallmount design
SMICRO1T	Up to 40 dB	540 joules	36 kA	AC power/phone	One outlet	No cord/wallmount design
SMICRO6C	Up to 40 dB	540 joules	36 kA	AC power/coax cable	Six outlets	No cord/wallmount design
SMICRO6T	Up to 40 dB	540 joules	36 kA	AC power/phone	Six outlets	No cord/wallmount design
SMICRO6TC	Up to 40 dB	540 joules	36 kA	AC power/phone/coax cable	Six outlets	No cord/wallmount design
Construction Series ②						
SCONST7	Up to 40 dB	1080 joules	72 kA	AC power	Seven outlets	6-feet


SULT8T


SULT10TC


SULT12TC


SMAX7


SMAX7T


SMAX7C


SMAX8TC


SMICRO7


SMICRO1


SMICRO1C


SMICRO1T


SMICRO6C


SMICRO6T


SMICRO6TC


SCONST7

Notes

① Product information is based on UL 1449 2nd Edition. Product is in transition at time of print. For updated ratings/product features, refer to www.eaton.com/surgetrap.

② For warranty details, go to www.eaton.com/surgetrap.

Power Strips—No Surge Protection ①

All products below provide six grounded outlets and a built-in circuit breaker

PSXVAL6AC3

PSXVAL6AC4

PSXVAL6AC8

Catalog Number	Cord Length
PSXVAL6AC3	3-foot
PSXVAL6AC4	4-foot
PSXVAL6AC8	8-foot

Note

① Rating includes: UL/cUL listed.