

Surge Protection Devices



2.1 Surge Protection Devices and Lightning Arresters

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Revision notes

Volume 1—Residential and Light Commercial, CA08100002E

Tab 2—Surge Protection

Revision date	Section	Change page(s)	Description
04/22/2019	All	All	Updated to April 2019 print revision date



Powering Business Worldwide

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Surge Protection

Surge Protection Devices and Lightning Arresters

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 affect and destroy sensitive electronic loads.

Eaton offers a comprehensive family of surge products for use at service entrances. 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 and coaxial.

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.

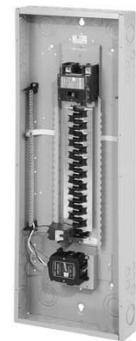
UL 1449 3rd Edition Type 1 and Type 2 Surge Protection

- **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 cable protection

- **Factory-Installed Surge Protection**—Eaton's loadcenters with factory-installed surge protection include a CHSPT2ULTRA and a two-pole 50 A 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
- Type CLSURGE**—For use on single-phase 120/240 Vac systems. CLSURGE 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 CLSURGE 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
- 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 BRSURGECSA**—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 BRSURGECSA LED visual indicators will signal the need for replacement. This device is suitable for service entry locations when installed in accordance with Canadian Electrical Code. This device is CSA® listed to be used in a Type BR loadcenter

Type 3 Point-of-Use Surge Protection

Point-of-use surge protectors such as surge receptacles are installed within 30 ft of conductor length from the service panel and 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
- CHSPCABLE: UL 6500, cUL
- NEMA® 3R Enclosure for CHSPCABLE: UL 50 Enclosure
- BRSURGE, CHSA, BRSURGECSA, CHQSA, CLSURGE: UL 1449 3rd Edition plug-in type; Type 2 SPD



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Surge Protection

Surge Protection Devices and Lightning Arresters





Product Selection

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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	Permanently connected device installed before or after the service disconnect overcurrent device.	NEMA 4	100/200 Vac, 110/220 Vac, 120/240 Vac	Single	50/60	300 V L–L, 150 V L–N	1000 V L–L, 600 V L–N	20 kA	200 kA	50 kA
 CHSPT1MAX	Permanently connected device installed before or after the service disconnect overcurrent device.	NEMA 4	100/200 Vac, 110/220 Vac, 120/240 Vac	Single	50/60	300 V L–L, 150 V L–N	1000 V L–L, 600 V L–N	20 kA	200 kA	45 kA
 CHSPT1MICRO	Permanently connected device installed before or after the service disconnect overcurrent device.	NEMA 4	100/200 Vac, 110/220 Vac, 120/240 Vac	Single	50/60	300 V L–L, 150 V L–N	1000 V L–L, 600 V L–N	20 kA	200 kA	36 kA
 CHSPT1-208Y	Permanently connected device installed before or after the service disconnect overcurrent device.	NEMA 4	120/208 Vac	Three-phase wye	50/60	300 V L–L, 150 V L–N	1000 V L–L, 600 V L–N	20 kA	200 kA	50 kA

Accessory for Type 1 CHSP Service Entrance Surge Protection

Catalog Number	Description
 SP1DINRAILKIT	Mounting kit for wall or DIN rail installation.

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 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	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	150 V L–N, 300 V L–L	600 V L–N, 1000 V L–L, 800 V N–G, 600 V 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)
 CHSPT2SURGE	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	150 V L–N, 300 V L–L	600 V L–N, 1000 V L–L, 800 V N–G, 600 V L–G	5 kA	22 kA	36 kA (L1–N 18 kA, L1–G 18 kA, L2–N 18 kA, L2–G 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.
- ⑥ When used with a 50 A two-pole circuit breaker, 10 kA when used with a 15 A two-pole circuit breaker.

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






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Accessories for CHSP Type 2 Service Entrance Protection

Catalog Number	Description	Installation	Surge Current Capacity	DC Breakdown Voltage	Voltage
CHSPCABLE 	CHSPCABLE Quick Connect design—add additional telephone and AC protection modules; protects two quad shield cables; bi-directional	Indoor installation; or rain-tight when used with recommended enclosure	10 kA per line	145 V	
CHSPT2PACK 	CHSPT2PACK 2-Pack: CHSPT2ULTRA + CHSPCABLE; Surge protection for AC power 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, CHSPT2SURGE, CHSPCABLE				
MSEGR2 	MSEGR2 Outdoor communication grounding device; meets 2008 NEC requirements for intersystem bonding termination				

Note

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

Type BR and CH Surge Breakers

Product Description

The CH and BR surge breaker is designed to provide premier AC power surge protection for sensitive electronics and appliances from the damaging effects of electrical surges. In addition, the surge breaker is a functional two-pole thermal magnetic breaker.

The combination of circuit protection and surge protection provides extra flexibility and space saving in the loadcenter.

Product Features

- Complete home surge protection for all circuits plus a functional two-pole thermal magnetic breaker
- LEDs provide protection status
- Plug-on connection to the busbar provides superior protection and easy installation for new construction or renovation
- Eliminates the potential for incorrect installation of externally mounted surge devices—(longer “lead” lengths can reduce protection levels)

Type CH Surge Breakers



Catalog Number ^①	Poles	Ampere Rating	Voltage	Phase	Frequency (Hz)	MCOV ^②	VPR ^③	I _n ^④	SCCR ^⑤	Surge Current Capacity, Per Phase Rating ^⑥
Type CH Surge Breakers										
CH230SUR	Two-pole 10 kAIC	30	120/240 Vac	Single	50/60	150 V L–N, 300 V L–L	600 V L–N, 1000 V L–L	10 kA	10 kA	36 kA (L1–N 36 kA, L2–N 36 kA)
CH250SUR		50	120/240 Vac	Single	50/60	150 V L–N, 300 V L–L	600 V L–N, 1000 V L–L	10 kA	10 kA	36 kA (L1–N 36 kA, L2–N 36 kA)

Type BR Surge Breakers



Type BR Surge Breakers										
BR230SUR	Two-pole 10 kAIC	30	120/240 Vac	Single	50/60	150 V L–N, 300 V L–L	600 V L–N, 1000 V L–L	10 kA	10 kA	36 kA (L1–N 36 kA, L2–N 36 kA)
BR250SUR		50	120/240 Vac	Single	50/60	150 V L–N, 300 V L–L	600 V L–N, 1000 V L–L	10 kA	10 kA	36 kA (L1–N 36 kA, L2–N 36 kA)

Notes

- ① Clamshell packaging available with CS modification code on the end of catalog number.
- ② MCOV: Maximum Continuous Operating Voltage that may be applied to the device per mode.
- ③ VPR: Voltage Protection Rating is the measured limiting voltage after a surge event.
- ④ I_n: Nominal Discharge Current is the current that the device can withstand for 15 impulses.
- ⑤ SCCR: The amount of current the product can withstand under short-circuit conditions.
- ⑥ Surge Current Capacity: The maximum one time surge current rating per phase.

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Surge Protection

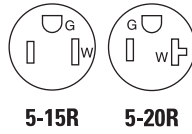
Surge Protection Devices and Lightning Arresters

Surge Protection Receptacles with LED Indicators and Audible Alarm

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Product Description

- Two-pole, three-wire grounding
- 15 A, 125 Vac; 20 A, 125 Vac; NEMA 5-15R and 5-20R



➤ ArrowLink option available. Add "M" suffix to standard catalog number (example 8300WS, 8300WSM).

🏠 Build-to-spec customizable devices.

5362_S



Catalog Number	Color Suffix	Ampere Rating	Voltage	NEMA	Description	➤	🏠
Receptacles with Audible Alarm and LED Indicators, Back and Side Wire							
5262__S	BL, GY, V, W	15	125 Vac	5-15R	Surge duplex receptacle	■	■
IG5262__S	BL, GY, RN, V, W				IG Surge duplex receptacle	■	■
5362__S	BL, GY, V, W	20	125 Vac	5-20R	Surge duplex receptacle	■	■
IG5362__S	BL, GY, RN, V, W				IG Surge duplex receptacle	■	■
560 Joules, max. surge current—18 kA per mode							
Receptacles with LED Indicators, Back and Side Wire							
5250__S	BL, GY, V, W	15	125 Vac	5-15R	Surge duplex receptacle	■	■
IG5250__S	BL, GY, RN, V, W				IG Surge duplex receptacle	■	■
5350__S	BL, GY, V, W	20	125 Vac	5-20R	Surge duplex receptacle	■	■
IG5350__S	BL, GY, RN, V, W				IG Surge duplex receptacle	■	■
840 Joules, max. surge current—18 kA per mode							
Receptacles with Audible Alarm							
1208__	V, W	15	125 Vac	5-15R	Surge duplex receptacle	■	■
IG1208__	V, W				IG Surge duplex receptacle	■	■
1210__	BL, V, W	20	125 vac	5-20R	Surge duplex receptacle	■	■
IG1210__	V, W				IG Surge duplex receptacle	■	■
340 Joules, max. surge current—12 kA per mode							

IG5350_S



IG1208



Catalog Number	Color Suffix	Ampere Rating	Voltage	Description
Multimedia Wallplates with Surge Protectors				
35M2S__	W	15	125	Multimedia wallplate with recessed duplex surge receptacle
cETLus listed to UL1863 & ANSI/UL 60950-1, CSA C22.2 no. 60950-1-03; complies with all TIA/EIA 568-A & 570-B requirements				

1209



Catalog Number	Color Suffix	Description
Replacement Surge Bloc Module		
1209__	A, BL, GY, V, W	Replacement module

35M2S



Catalog Number	Color Suffix	Description
Accessories for Surge Protection Receptacles		
PJ26BL	BL	1-Gang mid-size decorator polycarbonate wallplate
PJ26W	W	1-Gang mid-size decorator polycarbonate wallplate
PJ26IG	RN	1-Gang mid-size decorator polycarbonate wallplate, pre-marked "ISOLATED GROUND"

Notes

For ordering devices, include catalog number followed by the color suffix: BL (Blue), GY (Gray), RD (Red), RN (Orange), V (Ivory), W (White)



Compliances, specifications and availability are subject to change without notice.

Factory-Installed Surge Protection

- Includes a CHSPT2ULTRA and a two-pole 50 A 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, 225 A, convertible	CHSUR8LF	CHSUR8LS
CHSUR42L225L2 ①	42 ckt, 225 A, convertible ②	CHSUR8LF	CHSUR8LS
CHSUR42B200L2 ①	42 ckt, 200 A, main breaker	CHSUR8LF	CHSUR8LS
CHSUR32N225K ①	32 ckt, 225 A, convertible	CHSUR8KF	CHSUR8KS
CHSUR32L225K ①	32 ckt, 225 A, convertible ②	CHSUR8KF	CHSUR8KS
CHSUR32B200K ①	32 ckt, 200 A, main breaker	CHSUR8KF	CHSUR8KS
CHSUR32B150K ①	32 ckt, 150 A, main breaker	CHSUR8KF	CHSUR8KS
CHSUR32B100K ①	32 ckt, 100 A, main breaker	CHSUR8KF	CHSUR8KS
CHSUR24L125E ①	24 ckt, 125 A, convertible ②	CHSUR8EF	CHSUR8ES
CHSUR24B100E ①	24 ckt, 100 A, main breaker	CHSUR8EF	CHSUR8ES
BRSUR4040N200	40/40 ckt, 200 A, convertible	Cover included	
BRSUR4040L200	40/40 ckt, 200 A, main lug	Cover included	
BRSUR4040B200	40/40 ckt, 200 A, main breaker	Cover included	
BRSUR3040N200	30/40 ckt, 200 A, convertible	Cover included	
BRSUR3040L200	30/40 ckt, 200 A, main lug	Cover included	
BRSUR3040B200	30/40 ckt, 200 A, 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, 225 A, convertible	CHSUR8LF	CHSUR8LS
CHEC42L225L ①	42 ckt, 225 A, convertible ②	CHSUR8LF	CHSUR8LS
CHEC42B200L ①	42 ckt, 200 A, main breaker	CHSUR8LF	CHSUR8LS
CHEC32L225K ①	32 ckt, 225 A, convertible ②	CHSUR8KF	CHSUR8KS
CHEC32N225K ①	32 ckt, 225 A, convertible	CHSUR8KF	CHSUR8KS
CHEC32B200K ①	32 ckt, 200 A, main breaker	CHSUR8KF	CHSUR8KS
CHEC32B150K ①	32 ckt, 150 A, main breaker	CHSUR8KF	CHSUR8KS
CHEC32B100K ①	32 ckt, 100 A, main breaker	CHSUR8KF	CHSUR8KS
CHEC24L125E ①	24 ckt, 125 A, convertible ②	CHSUR8EF	CHSUR8ES
CHEC24B100E ①	24 ckt, 100 A, main breaker	CHSUR8EF	CHSUR8ES

Notes

- ① Order cover separately.
- ② With main lugs installed.

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Surge Protection

Surge Protection Devices and Lightning Arresters

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

Product Features

- Convenient surge protection for the loadcenter

Catalog Number	Description	Connection	Voltage	Phase	Frequency (Hz)	MCOV ^①	VPR ^②	I _n ^③	SCCR ^④	Surge Current Capacity, Per Phase Rating ^⑤
BRSURGE	UL for use in a single-phase Type BR loadcenter.	Plug on to the loadcenter bus; see instructions.	120/240 Vac	Single	60	150 V L1–N, 300 V L–L	600 V L1–N, 1000 V L–L	3 kA	10 kA	18 kA
										
CLSURGE	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 Vac	Single	60	150 V L1–N, 300 V L–L	600 V L1–N, 1000 V L–L	3 kA	10 kA	18 kA
										
CHSA	UL and CSA for use in a Type CH loadcenter.	Plug on to the loadcenter bus; see instructions.	120/240 Vac	Single	60	150 V L1–N, 300 V L–L	600 V L1–N, 1000 V L–L	3 kA	10 kA	18 kA
										
BRSURGECSA	CSA for use in an Eaton Type BR loadcenter.	Plug on to the loadcenter bus; see instructions.	120/240 Vac	Single	60	150 V L1–N, 300 V L–L	600 V L1–N, 1000 V L–L	3 kA	10 kA	18 kA
										
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 Vac	Single	60	150 V L1–N, 300 V L–L	600 V L1–N, 1000 V L–L	3 kA	10 kA	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.