October 2008

Advanced Residential Products

Contents

Home Connected/Home Protected Products and Systems

Product Description

The Problem

Due to the evolution of electronics and microprocessors in the home, we are continually challenged to provide quality (clean) power for electronic loads such as appliances, computers/ home office and entertainment systems. Surges (also known as transients) due to lighting, utility grid switching and other sources travel on current carrying conductors throughout the home, which can effect and destroy sensitive electronic loads.

The Solution

Eaton's electrical business has developed the most comprehensive family of surge protection devices and lightning arresters installed at service entrance and point-of-use locations, providing quality power required for sensitive electronic loads.

Application Description

Two-Stage Protection

The Institute of Electrical and Electronic Engineers (IEEE) recommends two stages of surge suppression 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.

Stage 1: Primary Protection for Service Entrance

The best place to install surge protection is at the electrical entrance point (loadcenter or breaker panel). This is often where ac power, telephone lines and cable lines are located. Applying a CHSP product to your service entrance (stage 1) will reduce a voltage surge to an acceptable level for appliances and surge strips. See **Figure 4-2**. For added protection, it is recommended that you install surge protection for your cable and telephone lines at the service entrance. Your ac, cable and telephone lines will all have the same ground potential, in one common location, for passing the surge away from your equipment.

Stage 2: Secondary Protection for Point of Use

The Cutler-Hammer® SurgeTrap™ surge strip is recommended for sensitive electronic loads like computers or entertainment centers. Using a SurgeTrap surge strip (stage 2) reduces any voltage remnant down to an acceptable level.

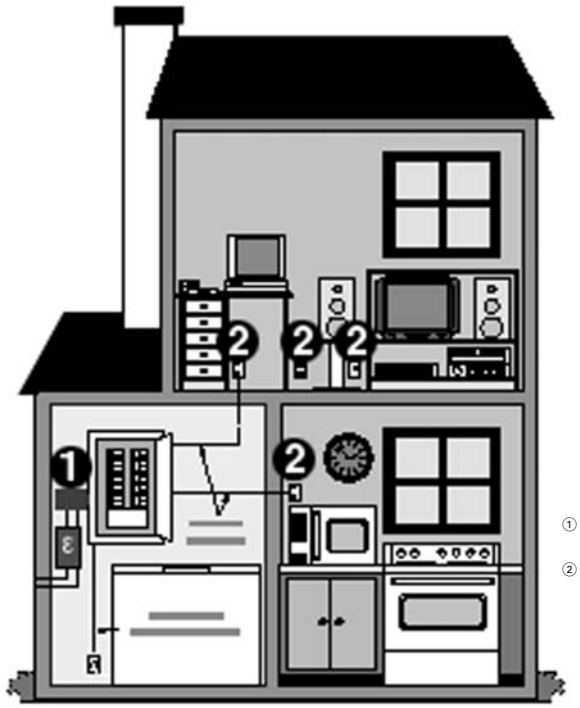


Figure 4-1. Two-Stage Protection

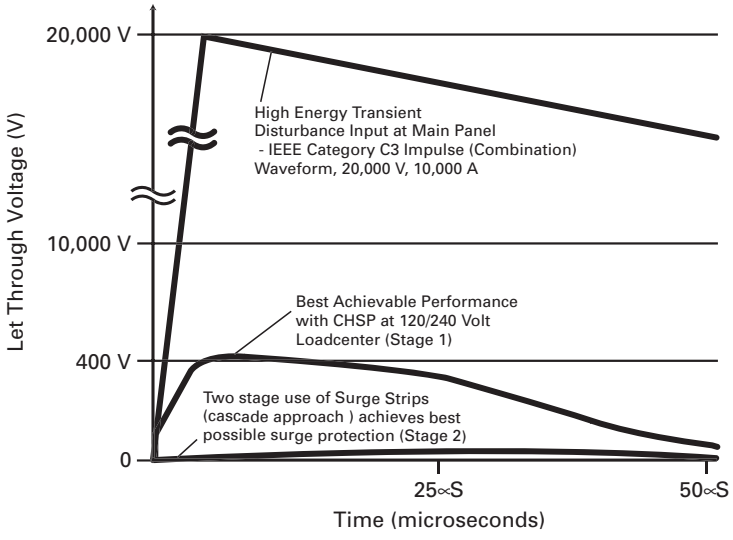
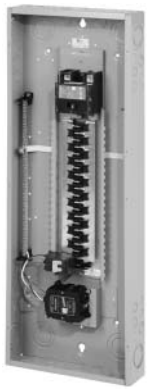


Figure 4-2. Surge Voltage Remnant Comparison

Stage 1 — Service Entrance Surge Protection

Factory Installed



Surge Panel

Industry Breakthrough

Eaton is the first to introduce a factory installed surge protection device that is mounted inside a 120/240 volt loadcenter.

Type CHSUR

The CHSUR loadcenter provides a customer with the lowest system let-through voltage (best protection) when compared to traditional remote/side mounted devices.

The Surge Panel is an internally mounted unit that provides industrial level surge protection in a residential design. The Surge Panel is available with 75 kA/phase surge current complete with thermal fusing and provides protection for all residential electrical equipment by reducing power surges, often caused by lightning, to an acceptable level for appliances and electronics.

Remote/Side Mounted

Type CHSP Surge Protection

The Cutler-Hammer Surge Protector (CHSP) is an externally mounted unit that provides industrial level surge protection in a residential design. The CHSP is available in four models and provides protection for all residential electrical equipment by reducing power surges, often caused by lightning, to an acceptable level for appliances and electronics. These units can be mounted in any manufacturer's breaker panel (loadcenter).

ac Power (Also Includes Cable/Telephone)

Telephone and Cable Accessories

Type CHSP Surge Protection

Eaton also offers a full range of accessory products for telephone and cable, including SurgeTel™ which protects up to four telephone/modem lines; SurgeCable™ which protects up to two cable/satellite lines; and SurgeEthernet featuring protection for high speed Internet hookups.

Telephone, Cable and Ethernet

Lighting Arresters

CHSA Surge Protector

Type CHSA

For use on single-phase 120/240 Vac systems. This easily plugs into a single-phase Type CH loadcenter and occupies two 3/4-inch (19.1 mm) pole spaces similar to a 2-pole Type CH breaker. When plugged into the first two stabs at the top of the loadcenter just below the main breaker or main lug, it provides surge protection for the entire loadcenter. If internal components are damaged, the CHSA LED visual indicators will signal the need for replacement. This device is suitable for service entry locations installed in accordance with NEC Article 280. The CHSA is ideal for protecting sensitive appliances and electronics, such as refrigerators, microwave ovens, and home computers.

BRSURGE Surge Protector

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 2-pole Type BR breaker. When plugged into the first two stabs at the top of the loadcenter just below the main breaker or main lug, 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 installed in accordance with NEC Article 280. The BRSURGE is ideal for protecting sensitive appliances and electronics, such as refrigerators, microwave ovens, and home computers.

CHQSA Surge Protector

Type CHQSA

For use on single-phase, 120/240 Vac systems. This 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 standard 2-pole Type QO breaker. When plugged into the first two stabs at the top of the loadcenter just below the main breaker or main lug, it provides surge protection for the entire loadcenter. If internal components are damaged, the CHQSA LED visual indicators will signal the need for replacement. This device is suitable for service entrance locations installed in accordance with NEC Article 280 and are UL Classified to be used in place of Square D Type QO surge arresters. The CHQSA is ideal for protecting sensitive appliances and electronics, such as refrigerators, microwave ovens, and home computers.

Service Entrance Surge Protection (Continued)

CHSA01 Surge Protector

CHSA01 — For use on single-phase, 120/240 Vac systems. This surge protector can be easily installed in the enclosure of indoor or outdoor loadcenters by using the 1/2-inch (12.7 mm) threaded nipple. It is ideal for protecting outdoor lighting, garages, sump and irrigation pumps, etc.

CHSA03 Surge Protector

CHSA03 — For use on three-phase, 600 Vac systems. This surge protector can be easily installed in the enclosure of indoor or outdoor loadcenters by using the 1/2-inch (12.7 mm) threaded nipple. It provides protection for commercial electrical services especially those using electric motors.

Point-of-Use Surge Protection

Eaton's Cutler-Hammer SurgeTrap™, plug-in surge protectors offer exceptional protection for electrical and electronic devices. Each of the SurgeTrap Ultra, Max and Micro are available in ac only, ac plus telephone/modem and ac plus cable. The SurgeTrap Ultra 3-Way, in addition to having the above options, is available in ac plus telephone/modem and cable.

Point-of-Use Surge Strips

Technical Data and Specifications

Table 4-1. Lightning Arresters

Description	Discharge Voltage, Vac				Lead Length Inches (mm)	Catalog Number
	1.5 kA	3 kA	5 kA	10 kA		
Surge Protector Plug-On Type CH, Single-Phase, 120/240 Vac	345	370	500	545	8.00 (203.2)	**CHSA**
Surge Protector Plug-On Type BR, Single-Phase, 120/240 Vac	345	370	500	545	8.00 (203.2)	**BRSURGE**
Surge Protector Plug-On Type CHQ, Single-Phase, 120/240 Vac	345	370	500	545	8.00 (203.2)	**CHQSA**
Surge Protector, 2-Pole Single-Phase, 3-Wire, 120/240 Vac	490	640	980	1410	15.00 (381.0)	**CHSA01**
Surge Protector, 3-Pole Single-Phase, 4-Wire, 120/240 Vac	1700	2100	2510	3800	15.00 (381.0)	**CHSA03**

Table 4-2. Surge Protection Devices

Description	System Voltage	Protection Modes	Surge Current Capacity	UL Let-through Voltage	Telephone Protection	Coaxial Protection	Maximum Continuous Operating Voltage	EMI/RFI Noise Rejection (L-N)	Capac-itance	Installation/ Enclosures	Agency Approvals	Catalog Number
CHSP Micro	120/240	L-G	20,000 A per Phase	400	—	—	150	—	—	Indoor/ Outdoor Enclosure	UL 1449 (2nd Ed.), CSA	**CHSPMICRO**
CHSP Max	120/240	L, L, N, G	50,000 A per Phase	400	—	—	150	—	—	Indoor/ Outdoor Enclosure	UL 1449 (2nd Ed.), CSA	**CHSPMAX**
CHSP 3-Way	120/240	L, L, N, G	75,000 A per Phase	400	4 Pair, Terminal Mount	Patented High Frequency "F" Connectors 1 Line Protected	150	—	< 15pf, Low Signal Loss	Indoor/ Flushmount Enclosure	UL 1449, UL497A, CSA	**CHSPCHSR4P**
CHSP Ultra	120/240	L, L, N, G	75,000 A per Phase	400	—	—	150	—	—	Indoor/ Outdoor Enclosure	UL 1449 (2nd Ed.), CSA	**CHSPULTRA**
SurgeTel	230 Vdc Breakdown Voltage	—	10,000 A per Phase	—	2 or 4 Pair UTP or Category 5 Lines	—	—	—	—	Indoor Application	UL 497A, CSA	**DHW4PT**
SurgeCable	145 Vdc Breakdown Voltage	—	5,000 A per Phase	—	—	Patented High Frequency "F" Connectors 2 Lines Protected	—	—	< 15pf, Low Signal Loss	Indoor Application	UL 6500, CSA	**DCXCAB2**
NEMA 3R Enclosure for SurgeTel and Surge-Cable	120/240	—	—	—	—	—	—	—	—	Outdoor Application	UL 50 Enclosure	**CHSP3RTELCABLE**
Surge Ethernet	30 Vdc Breakdown Voltage	—	300 A per Phase	—	8 Wires (4 Pair)	—	—	—	< 70pf	Indoor Application	UL 497B	**DRJ45D30R**
SurgeTrap Micro	120	All Modes	12,000 A per Phase 600 Joules Total	330	No	No	150	Up to 15 dB (Peak)	—	Indoor Application	UL 1449 (2nd Ed.), UL 1363, UL 497A, CSA	**SGXMICROAC6**
					Yes	No						**SGXMICRONET1**
												SGXMICRONET6
					No	Yes						**SGXMICROTV6**
SurgeTrap Max	120	All Modes	20,000 A per Phase 900 Joules Total	330	No	No	150	Up to 15 dB (Peak)	—	Indoor Application	UL 1449 (2nd Ed.), UL 1363, UL 497A, CSA	**SGXMAXAC**
					Yes	No						**SGXMAXNET**
					No	Yes						**SGXMAXTV**
SurgeTrap Ultra	120	All Modes	40,000 A per Phase 1575 Joules Total	330	No	No	150	Up to 35 dB (Peak)	—	Indoor Application	UL 1449 (2nd Ed.), UL 1363, UL 497A, CSA	**SGXULTAC**
					Yes	No						**SGXULTNET**
					No	Yes						**SGXULTTV**
					Yes	Yes						**SGXULT3WAY**
Rack Mount Surge Strip	120	All Modes	84,000 A per Phase 1575 Joules Total	330	No	No	150	Yes	—	Indoor Application	UL 1449 (2nd Ed.), UL 1363, UL 497A, CSA	**SGXRM19B** ①
												SGXRM19BTL ①②

① 15 and 20 ampere available.
② 15 ampere twist lock ac cord.

Product Selection

Table 4-3. Residential Surge Protection Devices and Lightning Arresters

Product	Protection Levels and Application	Features	Warranty	Installation/ Enclosures	Catalog Number	Price U.S. $
Stage 1						
CHSA	Basic Surge Protection	2-Pole Breaker Design	1 Year Product Warranty	Inside Type CH Loadcenter	**CHSA**	
BRSURGE	Basic Surge Protection	2-Pole Breaker Design	1 Year Product Warranty	Inside Type BR Loadcenter/ Classified Listed	**BRSURGE**	
CHQSA	Basic Surge Protection	2-Pole Breaker Design	1 Year Product Warranty	Inside Square D Type QO Loadcenter	**CHQSA**	
CHSA01	Basic Surge Protection for Outdoor Lighting, Garages, Sump and Irrigation Pumps	120/240 Vac systems	1 Year Product Warranty	Indoor/Outdoor Enclosure	**CHSA01**	
CHSA03	Basic Surge Protection for Commercial Electrical Services	600 Vac systems	1 Year Product Warranty	Indoor/Outdoor Enclosure	**CHSA03**	
CHSP Micro	Basic Surge Protection for Appliances	Surge Current Rating 20 kA, Thermal Fusing, Compact, Small Footprint, Status Monitor	Lifetime Product Warranty ①, $5,000 Connected Equipment	Indoor/Outdoor Enclosure	**CHSPMICRO**	
CHSP Max	Standard Surge Protection for Major Appliances and Home Electronics	Surge Current Rating 50 kA, Thermal Fusing, Compact, Small Footprint, Status Monitor	Lifetime Product Warranty ①, $5,000 Connected Equipment	Indoor/Outdoor Enclosure	**CHSPMAX**	
CHSP Ultra	Ultimate Surge Protection for Major Appliances, Home Electronics, Computers/home Office and Entertainment Systems	Surge Current Rating 75 kA, Thermal Fusing, Compact, Small Footprint, Status Monitor	Lifetime Product Warranty ①, $5,000 Connected Equipment	Indoor/Outdoor Enclosure	**CHSPULTRA**	
CHSP 3-Way	Standard 3-Way Protection (ac Power, Phone, Cable) for All Home Electronic Equipment	Surge Current Rating 75 kA, 4 Telephone Lines, 1 Cable/Satellite Line	Lifetime Product Warranty ①, $10,000 Connected Equipment	Indoor	**CHSPCHSR4P**	
Accessories						
SurgeTel	Telephone/Modems	4 Telephone Lines	Lifetime Product Warranty	—	**DHW4PT**	
SurgeCable	Cable/Satellite TV	2 Cable/Satellite Lines	Lifetime Product Warranty	—	**DCXCAB2**	
SurgeEthernet	Ethernet	Protection for High Speed Internet	Lifetime Product Warranty	—	**DRJ45D30R**	
Stage 2						
SurgeTrap Micro	Appliances	3 Outlets; Wallmount	Lifetime Product Warranty, $50,000 Connected Equipment	— — —	**SGXMICROAC6** ② **SGXMICRONET1** ③ **SGXMICRONET6** ③ **SGXMICROTV6** ④	
SurgeTrap Max	Less Critical Electronic Equipment	7 Outlets; Angled plug-in	Lifetime Product Warranty, $75,000 Connected Equipment	— — —	**SGXMAXAC** ② **SGXMAXNET** ③ **SGXMAXTV** ④	
SurgeTrap Ultra	Home Entertainment Systems and Computer/Home Office	8 Outlets; Angled Plug-in, Transformer Spacing, Series Filter and TCO Fuses	Lifetime Product Warranty, $100,000 Connected Equipment	— — — —	**SGXULTAC** ② **SGXULTNET** ③ **SGXULTTV** ④ **SGXULT3WAY** ⑤	

① Warranty coverage applicable when CHSP products are used in conjunction with SurgeTrap point-of-use strips and appropriate cable and telephone protectors (see accessories).
② ac power.
③ ac + telephone/modem.
④ ac + cable.
⑤ ac + telephone/modem + cable.

Discount Symbol **22CD**

Table 4-4. Single-Phase Main Circuit Breaker Loadcenters with Factory Installed Surge Suppression — Indoor Single-Phase 3-Wire — 120/240 Vac — Factory Bonded Split Neutral

Main Breaker Type	Maximum Main Ampere Rating	Maximum Number 3/4-Inch (19.1 mm) Single Poles	Box Size	Wire Range Size	Loadcenter Catalog Number	Loadcenter Price U.S. $	Loadcenter Cover Combination ① Catalog Number	Combination Price U.S. $	Surface Catalog Number	Surface Price U.S. $
CSH 35 kAIC	100	24 32	E K	#6 – 4/0	**CHSUR24B100E** **CHSUR32B100K**		**CHSUR8EF** **CHSUR8KF**		**CHSUR8ES** **CHSUR8KS**	
	150 200 200	32 32 42	K K L	#2 – 300 kcmil	**CHSUR32B150K** **CHSUR32B200K** **CHSUR42B200L2**		**CHSUR8KF** **CHSUR8KF** **CHSUR8LF**		**CHSUR8KS** **CHSUR8KS** **CHSUR8LS**	

① Combination style covers may be used for surface or flushmount applications.

Table 4-5. Single-Phase Main Lug Loadcenters with Factory Installed Surge Suppression — Indoor Single-Phase 3-Wire — 120/240 Vac — Twin Neutral — Factory Installed Ground Bar

Maximum Main Ampere Rating	Maximum Number 3/4-Inch (19.1 mm) Single Poles	Box Size	Wire Range Size	Loadcenter Catalog Number	Loadcenter Price U.S. $	Loadcenter Cover Combination ② Catalog Number	Combination Price U.S. $	Surface Catalog Number	Surface Price U.S. $
125	24	E	#6 – 2/0	**CHSUR24L125E**		**CHSUR8EF**		**CHSUR8ES**	
225	32 42	K L	#2 – 300 kcmil	**CHSUR32L225K** **CHSUR42L225L2**		**CHSUR8KF** **CHSUR8LF**		**CHSUR8KS** **CHSUR8LS**	

② Combination style covers may be used for surface or flushmount applications.

Table 4-6. Single-Phase Convertible Loadcenters with Factory Installed Surge Suppression ③ — Indoor Single-Phase 3-Wire — 120/240 Vac — Twin Neutral — Factory Installed Ground Bar

Maximum Main Ampere Rating	Maximum Number 3/4-Inch (19.1 mm) Single Poles	Box Size	Wire Range Size	Loadcenter Catalog Number	Loadcenter Price U.S. $	Loadcenter Cover Combination ④ Catalog Number	Combination Price U.S. $	Surface Catalog Number	Surface Price U.S. $
225	32 42	K L	#2 – 300 kcmil	**CHSUR32N225K** **CHSUR42N225L**		**CHSUR8KF** **CHSUR8LF**		**CHSUR8KS** **CHSUR8LS**	

③ Order main breaker kit separately.
④ Combination style covers may be used for surface or flushmount applications.

Table 4-7. Single-Phase Main Circuit Breaker Loadcenters with Field Installation Provision for Surge Suppression — Indoor Single-Phase 3-Wire — 120/240 Vac — Factory Bonded Split Neutral

Main Breaker Type	Maximum Main Ampere Rating	Maximum Number 3/4-Inch (19.1 mm) Single Poles	Box Size	Wire Range Size	Loadcenter Catalog Number	Loadcenter Price U.S. $	Loadcenter Cover Combination ⑤ Catalog Number	Combination Price U.S. $	Surface Catalog Number	Surface Price U.S. $
CSH 35 kAIC	100	24 32	E K	#6 – 4/0	**CHEC24B100E** **CHEC32B100K**		**CHSUR8EF** **CHSUR8KF**		**CHSUR8ES** **CHSUR8KS**	
	150 200 200	32 32 42	K K L	#2 – 300 kcmil	**CHEC32B150K** **CHEC32B200K** **CHEC42B200L**		**CHSUR8KF** **CHSUR8KF** **CHSUR8LF**		**CHSUR8KS** **CHSUR8KS** **CHSUR8LS**	

⑤ Combination style covers may be used for surface or flushmount applications.

Discount Symbol **22CD**

Table 4-8. Single-Phase Main Lug Loadcenters with Field Installation Provision for Surge Suppression — Indoor Single-Phase 3-Wire — 120/240 Vac — Twin Neutral — Factory Installed Ground Bar

Maximum Main Ampere Rating	Maximum Number 3/4-Inch (19.1 mm) Single Poles	Box Size	Wire Range Size	Loadcenter		Loadcenter Cover			
				Catalog Number	Price U.S. $	Combination ① Catalog Number	Price U.S. $	Surface Catalog Number	Price U.S. $
125	24	E	#6 – 2/0	**CHEC24L125E**		**CHSUR8EF**		**CHSUR8ES**	
225	32 42	K L	#2 – 300 kcmil	**CHEC32L225K** **CHEC42L225L**		**CHSUR8KF** **CHSUR8LF**		**CHSUR8KS** **CHSUR8LS**	

① Combination style covers may be used for surface or flushmount applications.

Table 4-9. Single-Phase Convertible Loadcenters with Field Installation Provision for Surge Suppression — Indoor Single-Phase 3-Wire — 120/240 Vac — Twin Neutral — Factory Installed Ground Bar

Maximum Main Ampere Rating	Maximum Number 3/4-Inch (19.1 mm) Single Poles	Box Size	Wire Range Size	Loadcenter		Loadcenter Cover			
				Catalog Number	Price U.S. $	Combination ② Catalog Number	Price U.S. $	Surface Catalog Number	Price U.S. $
225	32 42	K L	#2 – 300 kcmil	**CHEC32N225K** **CHEC42N225L**		**CHSUR8KF** **CHSUR8LF**		**CHSUR8KS** **CHSUR8LS**	

② Combination style covers may be used for surface or flushmount applications.

Discount Symbol **22CD**

Cross-Reference

Note: Cross-Reference continues on the following page.

Table 4-10. Surge Products

Description	Cutler-Hammer	Square D®	General Electric®	Siemens®	Leviton	Intermatic	Pass & Seymour
Lightning Arresters							
120/240 Vac, Single-Phase, 3-Wire	**CHSA01**	SDSA1175	N/A	N/A	55175-ASA, 55175-SSA	AG2401	N/A
600 Vac, 3-Phase, 4-Wire, 3-Phase	**CHSA03**	SDSA3650	N/A	N/A	55650-ASA	AG6503, AG6503L	N/A
Surge Breakers							
120/240 Vac, Type BR Circuit Breaker	**BRSURGE**	HOM2175SB	THQLSurge	QSA Series	N/A	N/A	N/A
120/240 Vac, Type CH Circuit Breaker	**CHSA**	QO2175SB	N/A	N/A	N/A	N/A	N/A
Service Entrance							
120/240 Vac, 20 kA Surge Current	**CHSPMICRO**	N/A	N/A	N/A	N/A	N/A	N/A
120/240 Vac, 50 kA Surge Current	**CHSPMAX**	N/A	THQLSurge60	SBPRIMAX, SSPRIMAX	51120-1, 51120-3R	IG1240RC	1224-SL
120/240 Vac, 70 kA Surge Current	**CHSPULTRA**	N/A	N/A		N/A	IG250LA, IG251	N/A
120/240 Vac, ac, Tel, Coax, 40 kA Surge Current	**CHSPCHSR4P**	SDSB1175C, SDSB1175DP	N/A	N/A	51120-PTC, 51110-PTC	N/A	N/A
Accessories							
SurgeTel, 4 Telephone Lines	**DHW4PT**	N/A	SurgePro THSATEL140	N/A	5350-TLL	N/A	N/A
SurgeCable, 2 Cable/Satellite Lines	**DCXCAB2**	N/A	SurgePro THQLCOAX	N/A	5350-BNC	N/A	N/A
SurgeEthernet, High Speed Internet	**DRJ45D30R**	N/A	N/A	N/A	5360-TBT, 3861-ETH	N/A	N/A
NEMA 3R Outdoor Enclosure	**CHSPN3R**	N/A	N/A	N/A	N/A	N/A	N/A
Surge Strips							
3 Outlet, Wallmount, ac Only	**SGXMICROAC**	N/A	N/A	N/A	N/A	EG33IB	N/A
3 Outlet, Wallmount, ac, Cable	**SGXMICROTV**	N/A	N/A	N/A	N/A	EG33EIB	N/A
3 Outlet, Wallmount, ac, Telephone Modem	**SGXMICRONET**	N/A	N/A	N/A	N/A	EG33TIB	N/A
7 Outlet, ac Only	**SGXMAXAC**	N/A	SU93940	N/A	4950 Series	EG79	PS7
7 Outlet, ac, Cable	**SGXMAXTV**	N/A	N/A	N/A	4950 Series	N/A	N/A
7 Outlet, ac, Telephone Modem	**SGXMAXNET**	N/A	SU93942, SU93944	N/A	4950 Series	EG79ASO	PS7P
8 Outlet, ac Only	**SGXULTAC**	N/A	N/A	SPOWERMAX8	5950 Series	N/A	N/A
8 Outlet, ac, Cable	**SGXULTTV**	N/A	N/A	SPOWERMAX8_C	5950 Series	EG856EALI	PS8C
8 Outlet, ac, Telephone Modem	**SGXULTNET**	N/A	SU93950	SPOWERMAX8_T	5950 Series	EG856TALI	PS8P
8 Outlet, ac, Cable, Telephone Modem	**SGXULT3WAY**	N/A	SU93916	N/A	5950 Series	EG858DSALI, EG858ESALI	N/A

Cross-Reference

Table 4-10. Surge Products (Continued)

Description	Cutler-Hammer	Wiremold®	Panamax®	DITEK	EFI	Belkin
Lightning Arresters						
120/240 Vac, Single-Phase, 3-Wire	**CHSA01**	N/A	N/A	DTK-120/240	Titan SE 120/240	N/A
600 Vac, 3-Phase, 4-Wire	**CHSA03**	N/A	N/A	DTK-480 3CU	Titan SE 277/240	N/A
Surge Breakers						
120/240 Vac, Type BR Circuit Breaker	**BRSURGE**	N/A	N/A	N/A	N/A	N/A
120/240 Vac, Type CH Circuit Breaker	**CHSA**	N/A	N/A	N/A	N/A	N/A
Service Entrance						
120/240 Vac, 20 kA Surge Current	**CHSPMICRO**	N/A	N/A	DTK-120/240HD11	Titan 40 AR	N/A
120/240 Vac, 50 kA Surge Current	**CHSPMAX**	JA/HA	GB13	DTK-120/240 50K	Titan 65 AR	N/A
120/240 Vac, 70 kA Surge Current	**CHSPULTRA**	N/A	N/A	DTK-120/240HD11	OSW OmIni 80K	N/A
120/240 Vac, ac, Tel, Coax, 40 kA Surge Current	**CHSPCHSR4P**	N/A	N/A	DTK-SS2K-SM1	Titan 100P	N/A
Accessories						
SurgeTel, 4 Telephone Lines	**DHW4PT**	N/A	GTM0286	N/A	N/A	N/A
SurgeCable, 2 Cable/Satellite Lines	**DCXCAB2**	N/A	GTM3080	DTK-VSP-A2	N/A	N/A
SurgeEthernet, High Speed Internet	**DRJ45D30R**	N/A	GTM1010	N/A	M-TELC	N/A
Flushmount Kit	**CHSPFMKIT**	N/A	GPP8005	N/A	N/A	N/A
NEMA 3R Outdoor Enclosure	**CHSPN3R**	N/A	GPPP8004	N/A	N/A	N/A
Surge Strips						
3 Outlet, Wallmount, ac only	**SGXMICROAC**	N/A	M2	DTK-3FMF Series	EFI-3ES	N/A
3 Outlet, Wallmount, ac, Cable	**SGXMICROTV**	N/A	M2T	DTK-3CFU	N/A	N/A
3 Outlet, Wallmount, ac, Telephone Modem	**SGXMICRONET**	N/A	M2C	DTK-3FMF Series	W100ET	N/A
7 Outlet, ac Only	**SGXMAXAC**	N/A	N/A	N/A	P50ES	F5C550, F5C572
7 Outlet, ac, Cable	**SGXMAXTV**	N/A	N/A	N/A	N/A	N/A
7 Outlet, ac, Telephone Modem	**SGXMAXNET**	N/A	N/A	DTK-6TA1 Series	P50ET	F5C572-TEL, F5C572-TEL-EXT
8 Outlet, ac Only	**SGXULTAC**	N/A	SP8	DTK-8FF-S	P1500ES	F5C595, F5H595
8 Outlet, ac, Cable	**SGXULTTV**	N/A	SP8T	N/A	N/A	N/A
8 Outlet, ac, Telephone Modem	**SGXULTNET**	N/A	SP8C	DTK-8FF-S	P1500ET	F5C795-TEL, F5C595-TEL, F5C695-TEL, F5C895-TEL
8 Outlet, ac, Cable, Telephone Modem	**SGXULT3WAY**	N/A	SP8DBS	DTK-DSS	P1500ED	N/A

Transfer Switch Panels

All Panels are Manufactured in the USA and Meet UL® 1008

Product Description

A Transfer Switch Panel is a device that is mounted next to the loadcenter (distribution panel) in the home or small business. The Transfer Switch Panel is used in conjunction with an emergency generator (supplied by others) and serves the purpose of turning selected circuits on and off during a power outage. The Transfer Switch Panel allows the owner to start up a generator and then restore power to critical circuits when utility power is not available.

The owner designates which circuits are critical such as their refrigerator and certain lights. Sometimes called Emergency Power Panels, Emergency Generator Panels, Gen. Panels, Transfer Switches or Emergency Panels; Transfer Switch Panels provide the homeowner or small business owner with a safe and easy way to continue using electrical appliances when the utility power is unavailable.

Application Description

Transfer Switch Panels are most often used in residential, agricultural and light commercial applications. Comfort and safety are key concerns of many homeowners who are dependent on an uninterrupted supply of electricity.

The increase in our dependence on power is due in part to the popularity of home offices and in-home health care. Various heavily populated regions of the United States experience periodic power outages due to extreme weather conditions such as ice and snowstorms, heat waves, tornadoes or hurricanes. These regions which include the Pacific Northwest, Atlantic Coast and the Gulf Coast are the strongest markets for portable generators and Transfer Switch Panels.

Features, Benefits and Functions

Eaton offers two unique emergency power solutions.

- Manual transfer switches.
- Emergency generator panels.

Manual Transfer Switches

Indoor Design

Indoor/Outdoor Design

- Panel and components sold separately.
- Hardwired generator connection.
- Ideal for new construction/larger loads.
- Sturdy copper bus construction.
- Types (CH and CHNT) breakers are sold separately.
- Mechanically interlocked main disconnects to prevent paralleling of normal and emergency power source.
- Indoor and outdoor designs offered.

Emergency Generator Panels

Indoor Design

Outdoor Design

- Panel and components sold separately.
- Plug-in generator connection.
- All circuit breakers are included — switching duty rated.
- Includes dual wattmeters for load balancing.
- Mechanically interlocked main disconnects prevent paralleling of normal and emergency power source.
- Indoor and outdoor designs offered.

Standards and Certifications

- UL 67 listed.
- UL 1008 listed.

Product Specifications

- 10,000 AIC rating.
- Switching devices must be circuit breakers.
- Transfer switch panel must be supplied with neutral and ground.
- Power inlet box must include a circuit breaker for generator protection.

Technical Data and Specifications

Table 4-11. Manual Transfer Switch

Enclosure Type	Dimensions in Inches (mm)			Weight Lbs. (kg)
	Height	Width	Depth	
NEMA 1 NEMA 3R	16.75 (425.5) 13.00 (330.2)	14.31 (363.5) 11.00 (279.4)	3.88 (98.5) 3.56 (90.4)	25 (11) 14 (6)

Table 4-12. Emergency Generator Panel

Enclosure Type	Dimensions in Inches (mm)			Weight – Lbs. (kg)	
	Height	Width	Depth	6 Circuit	10 Circuit
NEMA 1 NEMA 3R	13.23 (336.0) 17.12 (434.8)	11.41 (289.8) 9.45 (240.0)	4.10 (104.1) 7.16 (181.9)	24 (11) 29 (13)	26 (12) 31 (14)

4

Installation Diagrams

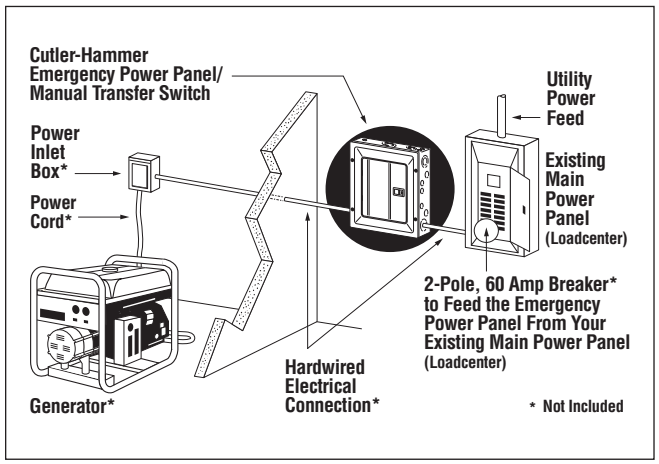


Figure 4-3. Manual Transfer Switches — Indoor Installation Diagram

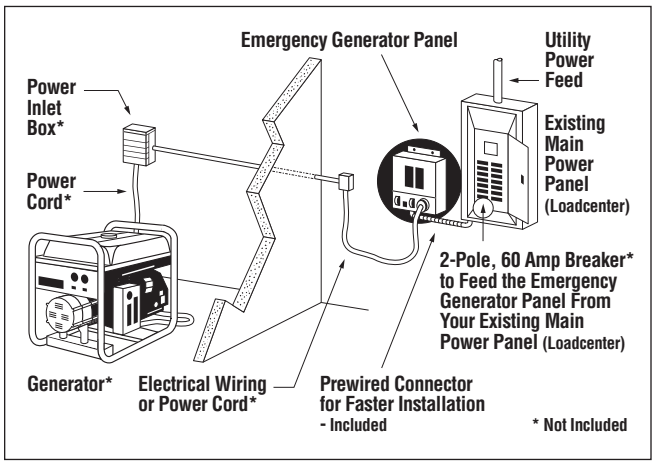


Figure 4-5. Emergency Generator Panels — Indoor Installation Diagram

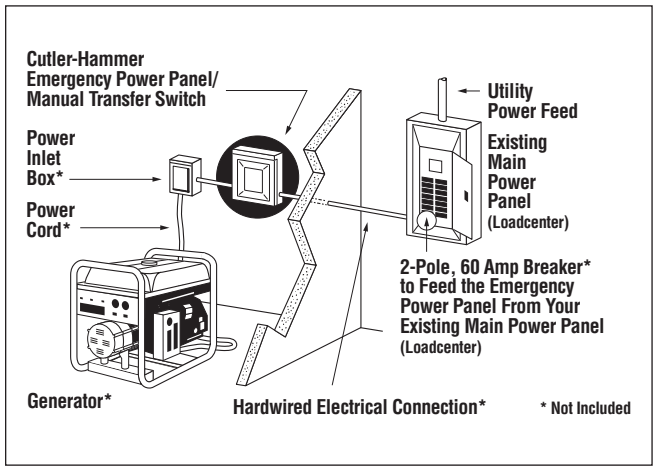


Figure 4-4. Manual Transfer Switches —Outdoor Installation Diagram

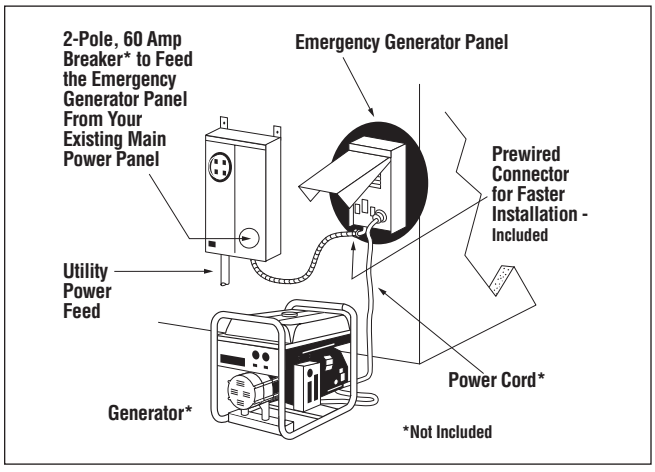


Figure 4-6. Emergency Generator Panels —Outdoor Installation Diagram

Warranty

Manual Transfer Switch

- 15-year loadcenter warranty.
- Lifetime branch breaker warranty.
- Extend the warranty to 20 years by purchasing an emergency generator panel with surge protection.

Emergency Generator Panel

- 15-year loadcenter warranty.
- Lifetime branch breaker warranty.
- Extend the warranty to 20 years by purchasing an emergency generator panel with surge protection.

Product Selection

Table 4-13. Selection

Enclosure Type	Watts	Number of Circuits	Ampere Rating	Main/Emergency Ampere Rating	Feeder Breakers	Included Accessories	Catalog Number	Price U.S. $
Manual Transfer Switch								
NEMA 3R	5,000	4 – 8	30	Provision	Provision	None	**CH48GEN3060R**	
NEMA 1	10,000	8 – 16	60	Provision	Provision	None	**CH816GEN6060**	
Emergency Generator Panel								
NEMA 1	5,000	6	20	60/20	5 – 1P 15 1 – 1P 20	None	**CH6EGEN2060**	
NEMA 3R	5,000	6	20	60/20	5 – 1P 15 1 – 1P 20	None	**CH6EGEN2060R**	
NEMA 1	5,000	6	20	60/20	5 – 1P 15 1 – 1P 20	2-Pole Surge Protector	**CH6EGEN2060SUR**	
NEMA 3R	5,000	6	20	60/20	5 – 1P 15 1 – 1P 20	2-Pole Surge Protector	**CH6EGEN2060RSU**	
NEMA 1	7,500	10	30	60/30	6 – 1P 15 2 – 1P 20 1 2P 30	None	**CH10EGEN3060**	
NEMA 3R	7,500	10	30	60/30	6 – 1P 15 2 – 1P 20 1 2P 30	None	**CH10EGEN3060R**	
NEMA 1	7,500	10	30	60/30	7 – 1P 15 2 – 1P 20 1 2P 30	2-Pole Surge Protector	**CH10EGEN3060SUR**	
NEMA 3R	7,500	10	30	60/30	7 – 1P 15 2 – 1P 20 1 2P 30	2-Pole Surge Protector	**CH10EGEN3060RSU**	

Table 4-14. Accessories

Description	Ampere Rating	Catalog Number	Price U.S. $
Flush Flange Kit (for use with Emergency Generator Panel Only)	—	**CHEGENFKIT**	
25-Foot (7.62 m) Power Cord	30	**CHGENCORD30**	
Power Inlet Box	20	**CH6EGENPIB**	
Power Inlet Box	30	**CH10EGENPIB**	

Cross-Reference

Table 4-15. Cross-Reference

Watts	Number of Circuits	Ampere Rating	Catalog Number					Cutler-Hammer Catalog Number
			Coleman ①	Gen/Tran ①	EmerGen ①	Square D	Generac ①	
5000	4 – 8	30	—	—	—	QO48M30DSGP	—	**CH48GEN3060R**
10,000	8 – 16	60	—	—	—	QO48M60DSGP	—	**CH816GEN6060**
5000	6	20	—	20216	6-5000	—	—	**CH6EGEN2060**
5000	6	20	—	R20216	6-5000 + RTE657	—	—	**CH6EGEN2060R**
5000	6	20	—	—	—	—	—	**CH6EGEN2060SUR**
5000	6	20	—	—	—	—	—	**CH6EGEN2060RSU**
7500	10	30	PA0650080	302110-20	10-7500	—	—	**CH10EGEN3060**
7500	10	30	—	R30211-20	10-7500 + RTE1075	—	—	**CH10EGEN3060R**
7500	10	30	—	—	—	—	—	**CH10EGEN3060SUR**
7500	10	30	—	—	—	—	—	**CH10EGEN3060RSU**
5000	6	20	—	—	—	—	—	**—**
7500	10	30	—	TRC0603A ①	—	QO48M30DFGPW1	1276-1 ②	**—**
5000	6	30	—	—	—	—	—	**—**

① Gen/Trans device is not supplied with a power cord.
② Generac device is 7200 maximum watts on 6-circuit device and 12,000 maximum watts on 10-circuit device.

Discount Symbol **22CD**

4

Pro Series Generators

Model 30337

Product Description

Build Your Reputation On the site, your reputation is only as good as your ability to get the job done — on time, on budget, and done right. That's why you depend on your equipment. Eaton Pro Series Generators are designed to perform. No downtime. No excuses.

Features, Benefits and Functions

Vanguard™ Engine

Features:

- V-Twin 90 OverHead.
- Valve design.
- Dura-Bore™ cast iron cylinder sleeves.
- Dual-Clean™ air cleaner.
- Upper DU bearing and heavy-duty lower bearing.
- Full length replaceable.
- Valve guides and seals.
- High flow cooling package.
- Mechanical governor.
- Magnetron® Electronic ignition.
- Mechanical compression release.

Electric start delivers effortless starting with the push of a button

Spin-on oil filter keeps engine clean, prolonging engine life (per SAE J1940)

Full GFCI protected control panel makes generator OSHA compliant. Automatic idle control saves fuel and reduces noise by idling down engine when not in use

Four extra large, durable wheels with locking brake never go flat for mobility over rough terrain

Construction Features

① 7 gallon metal fuel tank provides enough run-time to get through a full day's work.

② Space saving fold down handles for convenient storage.

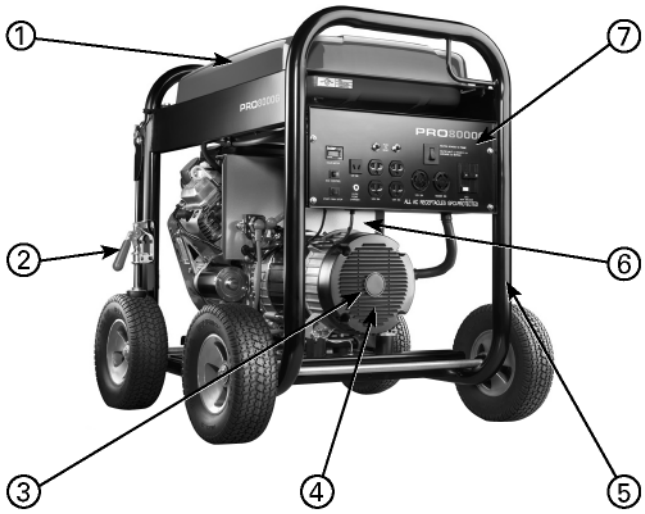
③ Automatic voltage regulation helps maintain steady voltage for sensitive tools and electronics.

④ PowerSurge™ alternator provides extra surge wattage to start multiple motor driven tools or appliances simultaneously.

⑤ Steel frame with powder coat finish.

⑥ Super Lo-Tone™ muffler with US forestry approved spark arrest.

⑦ Automatic idle control saves fuel and reduces noise by idling down engine when not in use.



Featured Unit — 30337

Product Selection

Table 4-16. Generator Line-Up

Description	Pro Series Generators			
	 30335	 30336	 30337	 30338
Rated Watts	4000	6500	8000	10000
Surge Watts	5000	8125	10000	12500
Volts	120/240	120/240	120/240	240/120
Amps	33.3/16.7	54.2/27.1	66.7/33.3	83.3/41.7
Frequency Requirements	60 Hz	60 Hz	60 Hz	60 Hz
Engine	Briggs & Stratton	Briggs & Stratton	Briggs & Stratton	Briggs & Stratton
Series	Vanguard	Vanguard	Vanguard V-Twin	Vanguard V-Twin
Gross Hp ①	7.5	13.0	16.0	18.0
CC	215	391	480	570
Features				
Fuel Tank Capacity	4.5 Gallon	7 Gallon	7 Gallon	7 Gallon
Run Time	8 Hours	10 Hours	7 Hours	7 Hours
Alternator	Power Surge	Power Surge	Power Surge	Power Surge
Electric Start	—	—	①	①
Spin-on Oil Filter	—	—	①	①
Internal Trickle Charger	—	—	①	①
Pressurized Lubrication	—	—	①	①
Low Oil Shutdown	①	①	①	①
Air Filter	①	①	①	①
Automatic Idle Control	①	①	①	①
Automatic Voltage Regulation	①	①	①	①
Muffler	Super Lo-Tone	Super Lo-Tone	Super Lo-Tone	Super Lo-Tone
Spark Arrestor	①	①	①	①
Fuel Gauge	①	①	①	①
Hour Meter	①	①	①	①
Outlets				
120 V Duplex	1	1	2	1
120/240/20 A Locking Type	1	—	—	—
120/240/30 A Locking Type	—	1	1	1
120/30 A Locking Type	1	1	1	1
240/50 A	—	—	—	1
12 Vdc Battery Charger	1 (10 A)	1 (10 A)	1 (10 A)	1 (10 A)
Float Charge Jack	—	—	①	①
30 A Twist	1	1	—	—
Breaker Configuration	2-Pole	2-Pole	2-Pole	2-Pole
Dimensions in Inches (mm) (L x W x H)	30.10 x 23.90 x 26.10 (764.5 x 607.1 x 662.9)	34.00 x 26.40 x 27.10 (863.6 x 670.6 x 688.3)	29.70 x 27.40 x 31.70 (754.4 x 696.0 x 805.2)	29.70 x 27.40 x 31.70 (754.4 x 696.0 x 805.2)
Weight in Lbs. (kg)	174 (79.0)	232 (105.3)	285 (129.4)	295 (133.9)
Warranty	2-Year Commercial	2-Year Commercial	2-Year Commercial	2-Year Commercial

① Per SAE J1940.

Standby Generator Systems

12 – 20 kW

7 – 10 kW

Product Description

A standby generator system is a package of equipment specifically designed to provide substitute electrical power to a residence in the event of a utility power outage or other emergency. These systems are comprised of a generator, transfer switch, and the connections necessary for installation. Eaton's standby generator line consists of air and liquid cooled models ranging from 7000 watts up to 45,000 watts.

Standby Generator Systems are most often used in residential, agricultural and light commercial applications. Comfort and safety are key concerns of many homeowners who are dependent on an uninterrupted supply of electricity.

The increase in our dependence on power is due in part to the popularity of home offices and in-home health care. Many regions of the United States experience periodic power outages due to extreme weather conditions such as ice and snowstorms, heat waves, tornadoes or hurricanes.

Portable generator systems are primarily used for smaller homes or for construction sites where temporary power is required. Permanently installed systems are designed for larger homes, small businesses or secondary residences such as vacation homes, cabins, etc., that require uninterrupted power for critical loads.

Eaton highly recommends that any generator system be installed by a qualified electrician and/or generator installer.

Application Description

All systems allow the user to pre-select critical circuits that will need power during an outage as shown in **Table 4-17.**

When selecting the essential circuits that will be switched to "Backup Power," it is important that the sum of the combined circuit loads does not exceed the wattage/amperage capacity of the generator. To help you with your selection of essential circuits, please add up the total wattage of all electrical devices to be connected at one time. This total should NOT be greater than the generator's wattage capacity.

Table 4-17. Circuit Selection

Device	Running Watts
Air Conditioner (12,000 Btu)	1700
Air Conditioner (24,000 Btu)	3800
Air Conditioner (40,000 Btu)	6000
Battery Charger (20 Amp)	500
Circular Saw (6-1/2-inch)	800 – 1000
Clothes Dryer (Electric)	5750
Clothes Dryer (Gas)	700
Clothes Washer	1150
Coffee Maker	1750
Compressor (1 hp)	2000
Compressor (1/2 hp)	1400
Compressor (3/4 hp)	1800
Curling Iron	700
Dehumidifier	650
Electric Blanket	400
Electric Range (per element)	1500
Electric Skillet	1250
Freezer	700
Furnace Fan (3/5 hp)	875
Garage Door Opener	500 – 750
Hair Dryer	1200

Device	Running Watts
Hand Drill	250 – 1100
Iron	1200
Jet Pump	800
Light Bulb	100
Microwave Oven	700 – 1000
Milk Cooler	1100
Oil Burner on Furnace	300
Oil Fired Space Heater (140,000 Btu)	400
Oil Fired Space Heater (30,000 Btu)	150
Oil Fired Space Heater (85,000 Btu)	225
Radio	50 – 200
Refrigerator	700
Slow Cooker	200
Submersible Pump (1 hp)	2000
Submersible Pump (1/2 hp)	1500
Submersible Pump (1-1/2 hp)	2800
Sump Pump	800 – 1050
Table Saw (10-inch)	1750 – 2000
Television	200 – 500
Toaster	1000 – 1650

Notes:

- The rated wattage of lights can be taken from light bulbs. The rated wattage of tools, appliances and motors can usually be found on a data plate or decal affixed to the device.
- If the appliance, tool or motor does not give wattage, multiply 120 volts times the ampere rating to determine watts (volts x amps = watts).
- Some electric motors (induction types) require about three times more watts of power for starting than for running. This surge lasts for only a few seconds. Be sure you allow for this high starting wattage when selecting electrical devices that will be energized by the backup power system:
  - ❑ Figure the watts required to start the largest motor.
  - ❑ Add that to the total running watts of all other connected loads.

Features, Benefits and Functions

Eaton's Cutler-Hammer generator systems offer a wide range of features. All systems feature:

- Powerful Briggs & Stratton and GM engines.
- Reliable Eaton transfer switches and control systems using switching duty rated circuit breakers.
- Transfer switches are mechanically interlocked to prevent paralleling of normal and emergency power sources.
- Automatic Transfer system features automatic start/stop and provision for using propane or natural gas.
- Vangard™ OHV V-Twin engine.
- Diagnostic panel with remote system status.
- Weekly exercise function.
- Automatic battery charger.
- Run-time meter.
- Four sound absorbing, weather-protected panels.
- CSA, cUL® and UL 2200 listed and approved.
- Briggs & Stratton ELS™ OHV engine.

Standards and Certifications

- All transfer switches are UL 67 and UL 1008 listed as "Transfer Switches."
- All generators are UL 2200 listed.

Product Selection

Table 4-18. Home Standby Selection Chart

Description	Catalog Number			
	CHGEN7000	CHGEN10000V	CHGEN12000	CHGEN15000
	Price U.S. $			
Running Watts LP/NG	7000W (LP)/6000W (NG)	10000W (LP)/9000W (NG)	12000 (LP)/11000 (NG)	15000 (LP)/14000W (NG)
Surge Watts LP/NG	10500W (LP)/9000W (NG)	12500W (LP)/11750W (NG)	15500 (LP)/14500W (NG)	18500 (LP)/17000W (NG)
Engine	504cc Intek	570cc Vanguard	627cc Vanguard	895cc Vanguard
Operation Voltage	Fully Automatic	Fully Automatic	Fully Automatic	Fully Automatic
Amps LP/NG	120/240 Vac, Single-phase	120/240 Vac, Single-phase	120/240 Vac, Single-phase	120/240 Vac, Single-phase
Alternator Type	Automatic Voltage Regulator	Automatic Voltage Regulator	Brushless Design	Brushless Design
Full Pressure Lubrication	Yes	Yes	Yes	Yes
Fuel Type	Liquid Propane Natural Gas	Liquid Propane Natural Gas	Liquid Propane Natural Gas	Liquid Propane Natural Gas
Sound Rating	77 dB @ 7 Meters	72 dB @ 7 Meters	65 dB @ 7 Meters	65 dB @ 7 Meters
Battery Charger	Yes	Yes	Yes	Yes
Over Crank Protection	Yes	Yes	Yes	Yes
Dimensions in Inches (L x W x H)	30.50 x 22.50 x 32.50	30.50 x 22.50 x 32.50	49.50 x 33.00 x 30.50	49.50 x 33.00 x 30.50
Weight (lbs.)	280	300	380	400
Warranty	2 Years	3 Years	4 Years	4 Years

Discount Symbol **22CD**

Table 4-18. Home Standby Selection Chart (Continued)

Description	Catalog Number					
	EGEN20-LP	EGEN20-NG	CHGEN30000-LP	CHGEN30000-NG	CHGEN45000-LP	CHGEN45000-NG
	Price U.S. $					
Running Watts LP/NG	20000W	18000W	30000W	27000W	45000W	42000W
Surge Watts LP/NG	28000W	25200W	37500W	33000W	56000W	53000W
Engine	993cc Big Block V-Twin		GM Vortec 3.0L in-line 4 cylinder		GM Vortec 5.0L V8	
Operation Voltage	Fully Automatic	Fully Automatic	Fully Automatic	Fully Automatic	Fully Automatic	Fully Automatic
Amps LP/NG	120/240 Vac, Single-phase	120/240 Vac, Single-phase	120/240 Vac, Single-phase	120/240 Vac, Single-phase	120/240 Vac, Single-phase	120/240 Vac, Single-phase
Alternator Type	Brushed Alternator	Brushed Alternator	4-Pole Brushless	4-Pole Brushless	4-Pole Brushless	4-Pole Brushless
Full Pressure Lubrication	Yes	Yes	Yes	Yes	Yes	Yes
Fuel Type	Liquid Propane	Natural Gas	Liquid Propane	Natural Gas	Liquid Propane	Natural Gas
Sound Rating	68 dB @ 7 Meters	68 dB @ 7 Meters	65 dB @ 7 Meters	65 dB @ 7 Meters	65 dB @ 7 Meters	65 dB @ 7 Meters
Battery Charger	Yes	Yes	Yes	Yes	Yes	Yes
Over Crank Protection	Yes	Yes	Yes	Yes	Yes	Yes
Dimensions in Inches (L x W x H)	49.50 x 33.00 x 30.50	49.50 x 33.00 x 30.50	84.50 x 39.50 x 41.50	84.50 x 39.50 x 41.50	98.50 x 39.50 x 44.00	98.50 x 39.50 x 44.00
Weight (lbs.)	600	600	1800	1800	2100	2100
Warranty	4 Years	4 Years	4 Years	4 Years	4 Years	4 Years

Discount Symbol **22CD**

Automatic Transfer Switches

50, 100 and 200 Ampere

Eaton Offers a Full Line of Residential Automatic Transfer Switches

100 Ampere Outdoor with Integrated 24-Circuit CH Loadcenter

Fully Automatic

All of our switches monitor utility and generator voltages and will automatically connect to the appropriate source of power. 100 and 200 ampere switches are capable of 'whole house' power transfer in residential/small business applications.

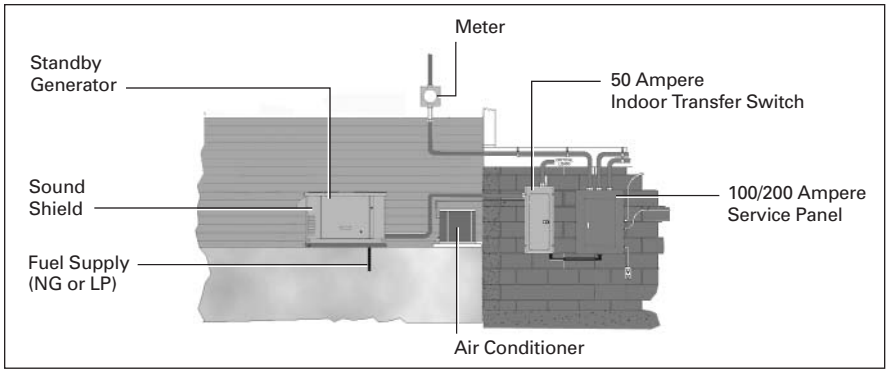


Figure 4-7. 50 Ampere — Indoor Installation — Selected Load Pre-Wired

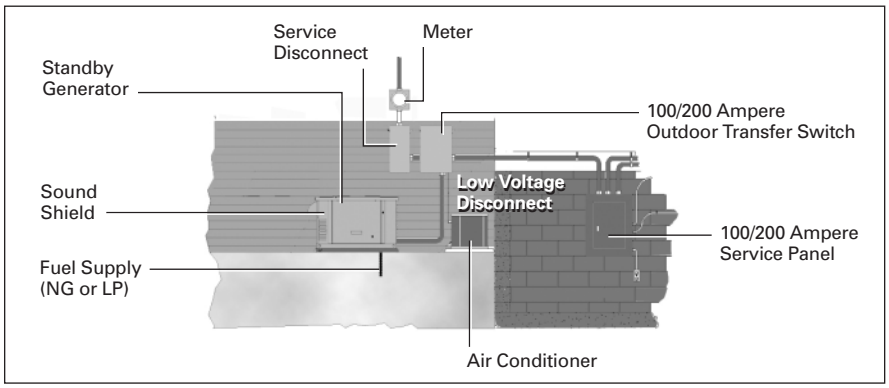


Figure 4-8. 100/200 Ampere — Outdoor Installation — Whole House Pre-Wired

Technical Data and Specifications

Table 4-19. Selection Chart

Specifications or Dimensions	Catalog Number					
	EGS50L12	EGS50L12R	EGS100	EGS100SE	CHGEN100ATSRAC	CHGEN100ATSSEAC
	Price U.S. $					
Voltage	120/240	120/240	120/240	120/240	120/240	120/240
Circuits	10	10	n/a	n/a	n/a	n/a
Amperes	50	50	100	100	100	100
Air Conditioning Control Module	No	No	No	No	Yes	Yes
Poles	2	2	2	2	2	2
Frequency	50/60	50/60	50/60	50/60	50/60	50/60
UL Listed	1008	1008	1008	1008	1008	1008
Switch Type	Electrically Held	Electrically Held	Mechanically Held	Mechanically Held	Mechanically Held	Mechanically Held
Enclosure	NEMA 1 (Indoor)	NEMA 3R (Outdoor)	NEMA 3R (Outdoor)	NEMA 3R (Outdoor)	NEMA 3R (Outdoor)	NEMA 3R (Outdoor)
Dimensions (in.) Width Height Depth	 14.25 21.00 4.00	 14.25 21.00 6.00	 16.87 14.46 5.32	 16.87 14.46 5.32	 12.00 16.00 6.00	 12.00 22.00 6.00
Weight (lbs.)	25	29	25	28	24	35.5

Table 4-19. Selection Chart (Continued)

Specifications or Dimensions	Catalog Number					
	CHGEN200ATSRAC	CHGEN200ATSSEAC	EGS200	EGS200SE	EGS100L24R	EGSLC200SEAC
	Price U.S. $					
Voltage	120/240	120/240	120/240	120/240	120/240	120/240
Circuits	n/a	n/a	n/a	n/a	24	n/a
Amperes	200	200	200	200	100	200
Air Conditioning Control Module	Yes	Yes	No	No	No	Yes
Poles	2	2	2	2	2	2
Frequency	50/60	50/60	50/60	50/60	50/60	50/60
UL Listed	1008	1008	1008	1008	1008	1008
Switch Type	Mechanically Held	Mechanically Held	Mechanically Held	Mechanically Held	Mechanically Held	Mechanically Held
Enclosure	NEMA 3R (Outdoor)	NEMA 3R (Outdoor)	NEMA 3R (Outdoor)	NEMA 3R (Outdoor)	NEMA 3R (Outdoor)	NEMA 3R (Outdoor)
Dimensions (in.) Width Height Depth	 16.00 22.00 7.00	 16.00 30.00 7.00	 25.08 14.46 5.25	 29.20 14.46 5.32	 29.33 14.46 5.32	 33.00 10.25 19.00
Weight (lbs.)	36.5	59.5	35	45	38	64

Discount Symbol **22CD**

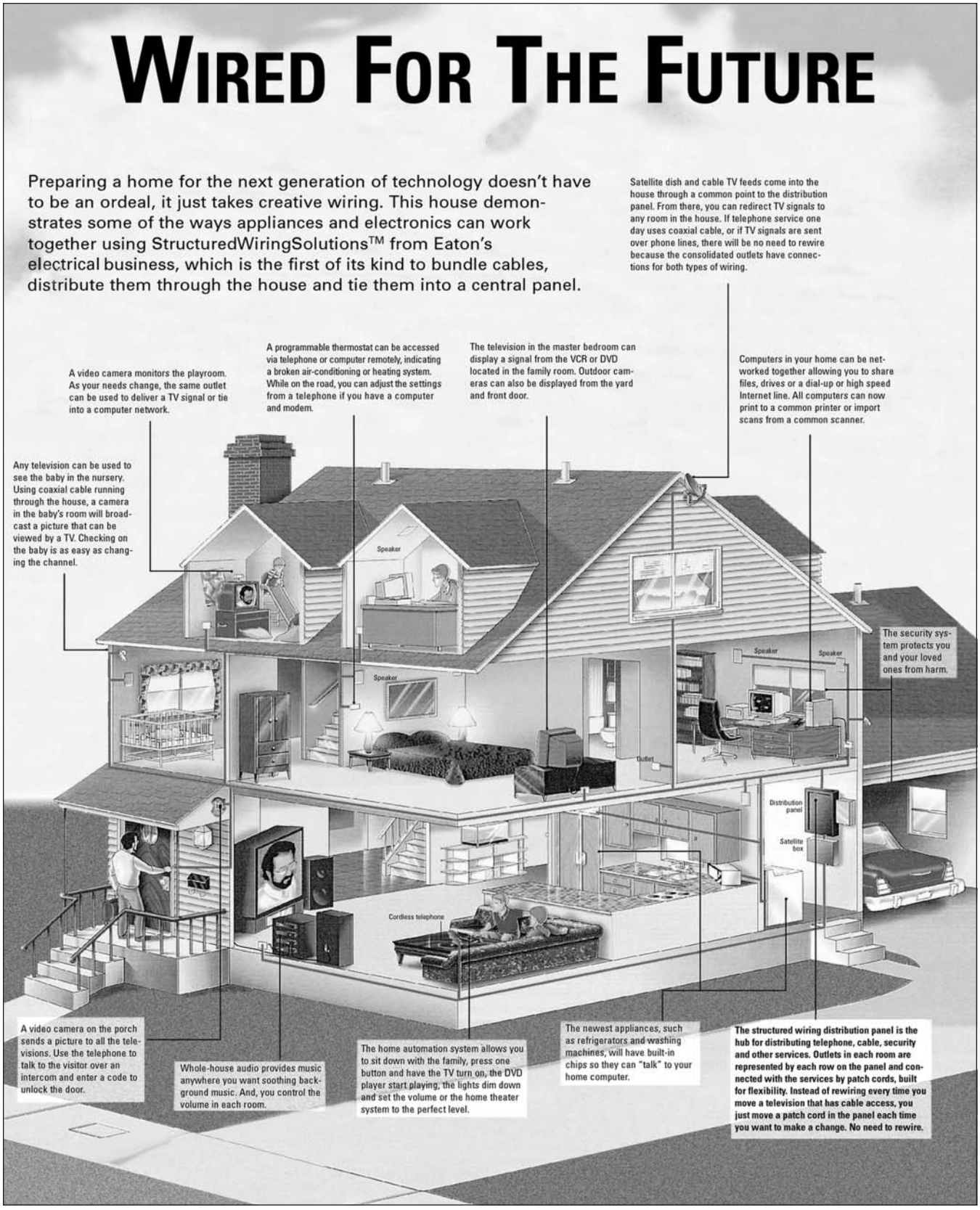


Figure 4-9. A Home with StructuredWiringSolutions Gives You Ready Control of the Latest in Computing, Audio, Video and Communications. With the Right Components, Your Dream Home is Ready for Today's World and Tomorrow's Advancements. Your Value is Ensured...and so is Your Peace of Mind.

4

StructuredWiringSolutions™

Wall Outlets & Basic Package

Intercom System

Product Description

Structured wiring is a simple, affordable way to wire a home for state-of-the-art communications, entertainment and security now and for many years to come.

The basic concept is that all telephone, television, satellite, coaxial, audio and data communications cables are wired in a star topology (home run) to each room in the home and terminate at a central distribution panel. This distribution panel allows flexibility for future modifications and/or additions to keep pace with a homeowner's lifestyle and needs.

Structured wiring can also be used as a central hub to interconnect a security system, home automation, HVAC and load control, providing a complete system to increase the security, comfort and convenience for a homeowner.

Features, Functions and Benefits

- Telephone.
- High-speed Internet.
- Computer networks.
- Web-safe Internet router.
- Whole-house sound.
- Satellite/cable TV.

Product Selection

Table 4-20. Packaged Products

Product Description		UPC Code	Catalog Number	Price U.S. $
	Perfect for apartments, condos or even entry level homes. This distribution panel distributes four incoming telephone lines to six locations, punchdown, and one incoming coax signal to four locations, passive. Installation is easy and a stylish three-gang wall plate cover provides a professional looking finish.	782116895359	**ESWB100**	
	Same as **ESWB100**, except punchdown for telephone is doubled for 11 locations and there is no coax distribution. Perfect for commercial and resi applications for phone only, or for six phone locations and/or six computer locations.	782116895366	**ESWB100P**	

Table 4-21. Video Modules

Product Description		UPC Code	Catalog Number	Price U.S. $
	**1 x 4 Coax Module**. 1 in, 4 out coax module with four pass-through connectors. 6" form factor. 1.0 lb.	782116895502	**ESWV10400**	
	**1 x 8 Coax Module**. 1 in, 8 out coax module with two pass-through connectors. 6" form factor. 1.3 lbs.	782116895496	**ESWV10800**	
	**1 x 8 Amplified Coax Module**. 1 in, 8 out coax module with 12 dB bi-directional amplifier and two pass-through connectors. 6" form factor. 2.4 lbs.	782116895519	**ESWV10800A**	
	**5 x 8 Coax Module**. 5 in, 8 out coax module with 20 dB bi-directional amplifier, surge protection, and four pass-through connectors, and four inputs for modulated signals. 12" form factor. 3 lbs.	782116895526	**ESWV50800A**	
	**5 x 12 Coax Module**. 5 in, 12 out coax module with 20 dB bi-directional amplifier, surge protection, and four pass-through connectors, and four inputs for modulated signals. 12" form factor. 3.5 lbs.	782116895533	**ESWV51200A**	
	**5 x 16 Coax Module**. 5 in, 16 out coax module with 20 dB bi-directional amplifier, surge protection, with one direct and four inputs for modulated signals. 12" form factor. 3.6 lbs.	782116895557	**ESWV51600A**	
No Photo Available	**110 Volt Video Amplifier Power Supply**. Power supply for all amplified video modules.	782116009671	**ESWV110**	

Discount Symbol **22CD**

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Table 4-22. Telephone Modules

Product Description		UPC Code	Catalog Number	Price U.S. $
	**12 Port, 4 Line Punchdown Telephone Module**. The 12/4 punchdown Telephone Module has 12 110 punchdown blocks which distribute four incoming lines to 12 locations. 6" form factor. 1 lb.	782116895434	**ESWT41200P**	
	**8 Port, 4 Line Telephone Module**. Eight RJ45 ports support four incoming phone lines. One RJ31X port for security. 6" form factor. 1.0 lb.	782116895441	**ESWT40800**	
	**16 Port, 4 Line Telephone Module**. 16 RJ45 ports support four incoming phone lines. One RJ31X port for security. 6" form factor. 1.25 lbs.	782116895458	**ESWT41600**	
	**4 x 8 Telephone Breakout Module**. Distributes 4 incoming telephone lines to 8 locations, RJ45 style, 8 breakout ports, 4-line pass through. Breakout configurations: 1-2, 2-1, 3-4, 4-3.	782116894499	**ESWTB48800**	
	**8 Location Non Bridged Phone Module**. 8-RJ45 jacks connected directly to 8-110 punchdown connectors, (one-to-one) can be bridged together, great for Ethernet switches and routers.	782116894505	**ESWTB800**	
	**Telephone Line Breakout Module**. This module can be hung from an RJ45 wall plate to break out and put lines 1 – 4 on individual center pairs so that all four lines in the RJ45 jack are connectable to a standard RJ11 wired device.	782116895465	**ESWTB00**	

Discount Symbol **22CD**

Table 4-23. Combination Modules

Product Description		UPC Code	Catalog Number	Price U.S. $
	**Combo 4 x 8 Coax/Phone Distribution Module** (with RJ45 patch connectors). Distributes one incoming coax TV line to four locations (plus two pass-through) and four telephone lines to eight locations. Includes an RJ31X connection. 6" form factor. 1.1 lbs.	782116895472	**ESWD40800**	
	**Combo 4 x 8 Coax/Phone Distribution Module** (with 110 punchdown connectors). Distributes one incoming coax TV line to four locations (plus two pass-through) and four telephone lines to eight locations. 6" form factor. 1.2 lbs.	782116895489	**ESWD40800P**	
	**Combo 8 x 8 Passive Coax/Phone Distribution Module** (with RJ45 patch connectors). Distributes one incoming coax TV line to eight locations (plus two pass-through) and four telephone lines to eight locations. Includes an RJ31X connection. 6" form factor. 1.2 lbs.	782116895380	**ESWD80800**	
	**Combo 8 x 8 Active Coax/Phone Distribution Module** (with RJ45 patch connectors). Distributes one incoming coax TV line to eight locations with built-in amplification (plus two pass-throughs) and four telephone lines to eight locations. Includes an RJ31X connection. 6" form factor. 1.2 lbs.	782116895397	**ESWD80800A**	
	**Combo 8 x 8 Passive Coax/Phone Distribution Module** (with 110 punchdown connectors). Distributes one incoming coax TV line to eight locations (plus two pass-through) and four telephone lines to eight locations. 6" form factor. 1.2 lbs.	782116895373	**ESWD80800P**	
	**Combo 8 x 8 Active Coax/Phone Distribution Module** (with 110 punchdown connectors). Distributes one incoming coax TV line to eight locations with built-in amplification (plus two pass-throughs) and four telephone lines to eight locations. Includes an RJ31X connection. 6" form factor.	782116895403	**ESWD80800AP**	

Discount Symbol **22CD**

Table 4-24. Modules

	Product Description	UPC Code	Catalog Number	Price U.S. $
	**Blank Filler Module**. Use this blank filler module to hide cables in the panel.	782116031467	**ESWF001**	
	**Blank Patch Module**. Use this blank patch module to custom design a zone. The blank patch module accepts any configuration of CAT5e, RG6 coax or fiber optic inserts. Labeling areas allow you to identify the connections and what rooms they represent. 6" form factor.	782116895427	**ESWP100**	
	**3-Zone Patch Module**. 12 connection ports (two CAT5 and two coax per zone). 6" form factor. 0.8 lbs. Allows for many room locations (wall plates) to be terminated cleanly and professionally without having to add expensive service modules. Active wall plates can be patch corded to data, voice or video modules as needed without complication or added expense. Outlet locations can be permanently labeled for easy consumer plug n' play, and changing applications and life styles.	782116895410	**ESWMP300**	
	**Triple Channel Modulator Module**. Used for creating in-home television channels for viewing from any TV in the home. Signals from three different audio/video sources such as TV, VCR, DVD, DBS, satellite TV and security cameras may be identified and displayed by any television. 6" form factor. 2.1 lbs.	782116895557	**ESWM300**	
	**1 Channel Stand-Alone Modulator**. Distributes 1 video signal (camera, DVD, SATV, CATV) to any television in the house.	782116895564	**ESWMOD1**	
	**3 Channel Stand-Alone Modulator**. Distributes 3 video signals (camera, DVD, SATV, CATV) to any television in the house.	782116895571	**ESWMOD3**	
	**4 Port 10/100 Wireless Firewall Router**. Distributes DSL/Broadband service up to 4 computer locations. Also provides wireless connectivity.	782116895342	**ESWN100**	
	**DSL or Cable Router with 4 Port 10/100M Fast Ethernet Switch**. Built-in NAT Firewall. 6" form factor.	782116895588	**ESWN400**	
	**Product Shelf 14" x 4"**. Can be mounted anywhere in the panel. Allows for third-party products to be mounted in the panel. (Modems, power strip, etc.)	782116894437	**ESWMS100**	
	**Service Shelf 14" x 8"**. Can be mounted anywhere in the panel. Designed as a work shelf for the installer.	782116977192	**ESWMS200**	
	**12" Blank Mounting Shelf**. Stand-off hole placements for Ademco, First Alert, Caddx, DSC, and Electronics Line security panels.	782116049318	**ESWMS300**	
	**12" Blank Mounting Shelf Cover**. Designed to fit over the ESWMS300.	782116049325	**ESWMSC300**	
	**Camera with IR Emitters**. 1/4" Color camera with IR emitters for night-time viewing. Includes mounting bracket. Does not include power supply.	782116977178	**ESWV100**	
	**Dome Camera**. 3.6 mm Color dome camera. Can be flush or surface mounted. Does not include the power supply.	782116977185	**ESWV200**	
No Photo Available	**20 Pack of Molly Rivets and Plungers**. Use for connecting individual modules to the Install Can.	782116103126	**ESWVRIV**	

Discount Symbol **22CD**

Table 4-25. Audio System Components

	Product Description	UPC Code	Catalog Number	Price U.S. $
	**8 Location Audio Distribution Module**. Distributes 1 signal to 8 stereo locations via traditional speaker wire up to 16 gauge.	786685015194	**ESWAM800**	
	**75-Watt Volume Control**. For analog audio systems. White Almond	 782116895328 782116895335	 **ESWA75W** **ESWA75A**	
	**6.5" Standard Round Ceiling Speaker.** 3/4" Mylar swivel tweeter, 80 watts.	782116894413	**ESWA6500SC**	
	**6.5" High-End Round Ceiling Speaker (Set of 2)**. In-Ceiling, 6.5" Poly Woofer, 1" Swivel Tweeter. Surround sound capable. Suitable for all audio systems.	782116895304	**ESWA6550SC**	
	**8" Round Ceiling Speaker.** 1" cloth swivel tweeter, 120 watts.	782116894420	**ESWA0800SC**	
	**6.5" In-Wall Speakers (Set of 2)**. In-Wall, 6.5" Poly Woofer, .75" Tweeter. Surround sound capable. Suitable for all audio systems.	782116895311	**ESWA6500SW**	
	**5.5" Outdoor Speakers (Set of 2)**. Outdoor, 5.5" Poly Woofer, .75" Tweeter. Surround sound capable. Suitable for all audio systems. White Black	 782113965918 782113965925	 **ESWA5500OW** **ESWA5500OB**	

Discount Symbol **22CD**

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Table 4-26. A-Bus Products

Product Description		UPC Code	Catalog Number	Price U.S. $
	**A-Bus Audio Distribution Module (6" form factor)**. For use in QuickNetwork panels. The Zone 6 Audio Distribution Module distributes CAT5 audio to six locations. Can be cascaded to one or two additional modules for 12 or 18 locations.	782116153084	**ESWAM600C**	
	**A-Bus 4-Source 8 Zone Module**. Includes power supply.	782116894468	**ESWAM4800C**	
	**A-Bus 2-Door Intercom Module**. This module is the core of the incom system. Includes 2-door station outputs and 8 room locations.	782116940202	**ESWABI100**	
	**A-Bus Mini Master Room Keypad**. White Almond	 782116940219 786685138572	 **ESWABI200** **ESWABI200A**	
	**A-Bus Control Center (Master Keypad)**. White Almond	 782116940226 786685138589	 **ESWABI300** **ESWABI300A**	
	**A-Bus Door Station**. White	 782116940233	 **ESWABI400**	
No Photo Available	**A-Bus Intercom Kit**. Kit includes: 1 Control center, 3 mini masters, 1 door station, and 1 intercom module. White Almond	 782116940240 786685138725	 **ESWABIK311** **ESWABIK311A**	
	**A-Bus Volume Control.** The volume control is the down line amplifier that converts the distributed audio signal back to an analog signal that is then distributed over speaker wire to in-wall/ceiling speakers. White Almond	 786685017297 786685017280	 **ESWA200CW** **ESWA200CA**	
	**A-Bus Volume Control with "IR" Input Option.** The IR allows the entertainment center's wireless remote to be used in rooms that have this feature. Decora faceplate not included. White Almond	 782116153121 782116153138	 **ESWA300CW** **ESWA300CA**	

Discount Symbol **22CD**

Table 4-26. A-Bus Products (Continued)

Product Description		UPC Code	Catalog Number	Price U.S. $
	**A-Bus 2-Button Volume Control with "IR" Input Option**. Decora faceplate not included. White Almond	 782116978038 782116978045	 **ESWA400CW** **ESWA400CA**	
	**A-Bus 4-Position Backlit Multi-Source Volume Control with "IR" Input Option.** Specifically designed for use with the ESWAM4800 multi-source module. Decora faceplate not included. White Almond	 782116894444 782116894451	 **ESWA4500CW** **ESWA4500CA**	
	**A-Bus Local Input Plate**. Allows a local source that will override the main hub input. Decora faceplate not included. White Almond	 782116153152 782116153169	 **ESWA700CW** **ESWA700CA**	
	**A-Bus Modules Power Supply**.	782116978021	**ESWAP**	
	**A-Bus 4-Button Remote Control**. For use with all A-Bus volume controls with IR inputs. Controls volume and source inputs.	782116894475	**ESWA100CR**	
	**A-Bus Multi-Function Remote Control**. 6 Device universal remote with A-Bus controls for volume and source inputs.	782116894482	**ESWA200CR**	
No Photo Available	**A-Bus Single Lead "IR" Emitter**.	782116940189	**ESWEM100**	
No Photo Available	**A-Bus Dual Lead "IR" Emitter**.	782116940196	**ESWEM200**	
	**A-Bus Component Interface Unit**. The ESWA500C is used when the customer's amplifier does not have an A-Bus CAT5e output built in. RCA connectors are run from the amplifier to the ESWA500C, and then a CAT5e homerun is made to the ESWAM600C in the main distribution panel.	782116153145	**ESWA500C**	

Discount Symbol **22CD**

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Table 4-27. Enclosures

Product Description		UPC Code	Catalog Number	Price U.S. $
	**12" x 14.5" x 4" Install Can**. Allows room for (3) 6" modules. Panel includes a power receptacle and grounding bar.	782116469185	**ESWI1200**	
	**18" x 14.5" x 4" Install Can with 110 V Power**. Allows room for (5) 6" modules. Panel includes a power receptacle and grounding bar.	782116904808	**ESWI1800**	
	**24" x 14.5" x 4" Install Can with 110 V Power**. Allows room for (7) 6" modules. Panel includes a power receptacle and grounding bar.	782116904822	**ESWI2400**	
	**36" x 14.5" x 4" Install Can with 110 V Power**. Allows room for (11) 6" modules. Panel includes a power receptacle and grounding bar.	782116904846	**ESWI3600**	
	**54" x 14.5" x 4" Install Can with 110 V Power**. Allows room for (17) 6" modules. Panel includes a power receptacle and grounding bar.	78211649284	**ESWI5400**	
	**24" NEMA-3R D-marc Box with Plywood Back**. Meets the new SBC and Verizon specifications for outdoor fiber optic installations. Includes a power receptacle and grounding bar.	782116906581	**ESWFDB24**	
	**32" NEMA-3R D-marc Box with Plywood Back**. Meets the new SBC and Verizon specifications for outdoor fiber optic installations. Includes a power receptacle and grounding bar.	782116906598	**ESWFDB32**	

Discount Symbol **22CD**

Table 4-28. Covers

Product Description		UPC Code	Catalog Number	Price U.S. $
	**17" x 14" Metal Cover for Install Can ESWI1200**. Includes venting for protection of installed electronic equipment.	782116469192	**ESWC1200**	
	**17" x 20" Metal Cover for Install Can ESWI1800**. Includes venting for protection of installed electronic equipment.	782116904815	**ESWC1800**	
	**17" x 26" Metal Cover for Install Can ESWI2400**. Includes venting for protection of installed electronic equipment.	782116904839	**ESWC2400**	
	**17" x 38" Metal Cover for Install Can ESWI3600**. Includes venting for protection of installed electronic equipment.	782116904853	**ESWC3600**	
	**17" x 56" Metal Cover for Install Can ESWI5400**. Includes venting for protection of installed electronic equipment.	782116469291	**ESWC5400**	
	**17" x 20" Hinged Cover for Install Can ESWI1800**. One cover to a carton.	786685015163	**ESWC1800H**	
No Photo Available	**17" x 26" Hinged Cover for Install Can ESWI2400**. One cover to a carton.	786685015170	**ESWC2400H**	
	**17" x 38" Hinged Cover for Install Can ESWI3600**. One cover to a carton.	786685015187	**ESWC3600H**	
No Photo Available	**17" x 56" Hinged Cover for Install Can ESWI5400**. One cover to a carton.	786685015132	**ESWC5400H**	

Discount Symbol **22CD**

Table 4-28. Covers (Continued)

Product Description		UPC Code	Catalog Number	Price U.S. $
	**17" x 14" Clear Plastic Cover for Install Can ESWI1200.** Includes venting for protection of installed electronic equipment.	782116469208	**ESWC1200P**	
	**17" x 20" Clear Plastic Cover for Install Can ESWI1800.** Includes venting for protection of installed electronic equipment.	782116630103	**ESWC1800P**	
	**17" x 26" Clear Plastic Cover for Install Can ESWI2400.** Includes venting for protection of installed electronic equipment.	782116630110	**ESWC2400P**	
	**17" x 38" Clear Plastic Cover for Install Can ESWI3600.** Includes venting for protection of installed electronic equipment.	782116630127	**ESWC3600P**	
	**17" x 56" Clear Plastic Cover for Install Can ESWI5400.** Includes venting for protection of installed electronic equipment.	782116630134	**ESWC5400P**	

Discount Symbol **22CD**

Table 4-29. Wall Plates

	Product Description	UPC Code	Catalog Number	Price U.S. $
	**1 Port Wall Outlet.** 1 Coax TV connection (RG6) White Almond Ivory	 782116894703 782116894680 782116894697	 **ESWR100CW** **ESWR100CA** **ESWR100CI**	
	**Wall Hanging Telephone Wall Plate.** 1 CAT5e telephone/data connector White Almond Ivory	 782116894383 782116894369 782116894376	 **ESWR100TW5W** **ESWR100TW5A** **ESWR100TW5I**	
	1 Port Wall Outlet. 1 RJ11 telephone connection (CAT3 rated) White Almond Ivory	 782116894765 782116894741 782116894758	 **ESWR100TW** **ESWR100TA** **ESWR100TI**	
	**1 Port Wall Hanging Outlet.** 1 RJ11 telephone connection (CAT3 rated) White Almond Ivory	 782116894796 782116894772 782116894789	 **ESWR100TWW** **ESWR100TWA** **ESWR100TWI**	
	1 Port Wall Outlet. 1 RJ45 Telephone/Data connection (CAT5e rated) White Almond Ivory	 782116894734 782116894710 782116894727	 **ESWR100T5W** **ESWR100T5A** **ESWR100T5I**	
	**2 Port Multimedia Wall Outlet.** Telephone/Data connection (CAT5e), 1 Coax TV connection (RG6) White Almond Ivory	 782116894826 782116894802 782116894819	 **ESWR200W** **ESWR200A** **ESWR200I**	
	**3 Port Multimedia Wall Outlet.** 1 Telephone/Data connection (CAT5e), 2 Coax TV connections (RG6) White Almond Ivory	 782116894857 782116894833 782116894840	 **ESWR300W** **ESWR300A** **ESWR300I**	
	**4 Port Multimedia Wall Outlet.** 2 Telephone/Data connections (CAT5e) 2 Coax TV connections (RG6) White Almond Ivory	 782116894888 782116894864 782116894871	 **ESWR400W** **ESWR400A** **ESWR400I**	
	**6 Port Multimedia Wall Outlet.** 2 Telephone/Data connections (CAT5e) 2 Blanks (may be populated with CAT5e, Coax, or Fiber Optic connectors) 2 Coax TV connections (RG6) White Almond Ivory	 782116894918 782116894895 782116894901	 **ESWR600W** **ESWR600A** **ESWR600I**	
	1 Port Blank Receptacle. (Blank face plates.) White Almond Ivory	 782116961924 782116894925 782116894932	 **ESWR110W** **ESWR110A** **ESWR110I**	
	2 Port Blank Receptacle. (Blank face plates.) White Almond Ivory	 782116894970 782116894956 782116894963	 **ESWR210W** **ESWR210A** **ESWR210I**	
	3 Port Blank Receptacle. (Blank face plates.) White Almond Ivory	 782116895007 782116894987 782116894994	 **ESWR310W** **ESWR310A** **ESWR310I**	

Discount Symbol **22CD**

Table 4-29. Wall Plates (Continued)

Product Description		UPC Code	Catalog Number	Price U.S. $
	4 Port Blank Receptacle. (Blank face plates.) White Almond Ivory	 782116895038 782116895014 782116895021	 **ESWR410W** **ESWR410A** **ESWR410I**	
	6 Port Blank Receptacle. (Blank face plates.) White Almond Ivory	 782116895069 782116895045 782116895052	 **ESWR610W** **ESWR610A** **ESWR610I**	

Table 4-30. Inserts

Product Description		UPC Code	Catalog Number	Price U.S. $
	**Blank Inserts for Distribution Panel**. Sold in 12 pack. Yellow Red Blue White	 782116895106 782116895083 782116895076 782116895090	 **ESWBLY** **ESWBLR** **ESWBLB** **ESWBLW**	
	**RG6 Coax Connectors for Distribution Panel**. Sold in 12 pack. Yellow	 782116895229	 **ESWMLC**	
	**RJ45, CAT5e Rated Connectors for Distribution Panel**. Sold in 12 pack. Blue	 782116895212	 **ESWML5B**	
	**CAT5e Bezels for Distribution Panel**. Sold in 12 pack. Orange	 782116469215	 **ESWML5O**	
	**CAT5e Bezels for Distribution Panel**. Sold in 12 pack. Blue	 782116895113	 **ESWBZ5**	
	**Blank Insert for Receptacles**. Sold in 12 pack. White Almond Ivory	 782116895144 782116895120 782116895137	 **ESWINSBLW** **ESWINSBLA** **ESWINSBLI**	
No Photo Available	**RJ11 Wall Plate Insert**. Sold in 12 pack. White Almond Ivory	 782116981335 782116981328 782116981311	 **ESWINS11W** **ESWINS11A** **ESWINS11I**	
No Photo Available	**CAT5e Insert for Receptacles**. Sold in 12 pack. White Almond Ivory Blue Orange	 782116895175 782116895151 782116895168 782116981342 782116981359	 **ESWINS5W** **ESWINS5A** **ESWINS5I** **ESWINS5B** **ESWINS5O**	
No Photo Available	**RG6 Coax Inserts for Receptacles**. Sold in 12 pack. White Almond Ivory	 782116895205 782116895182 782116895199	 **ESWINSCW** **ESWINSCA** **ESWINSCI**	

Discount Symbol **22CD**

Accessories

Table 4-31. Patch Cords

Product Description		UPC Code	Catalog Number	Price U.S. $
	**2 Pair, CAT3 Telephone Patch Cord**. Blue 8 inches 24 inches 36 inches 48 inches	 782116895267 782116895274 782116894390 782116469239	 **ESWPT308B** **ESWPT324B** **ESWPT336B** **ESWPT348B**	
	**4 Pair, CAT5e Telephone Patch Cord**. Blue 8 inches 24 inches 36 inches 48 inches	 782116895281 782116895298 782116894406 782116469246	 **ESWPT508B** **ESWPT524B** **ESWPT536B** **ESWPT548B**	
	**CAT5e Telephone Patch Cord**. Orange 24 inches 36 inches 48 inches	 782116469253 782116469260 782116469277	 **ESWPT524O** **ESWPT536O** **ESWPT548O**	
	**RG6-rated Mini Digital Cable**. Yellow 8 inches 24 inches 36 inches 48 inches	 782116895236 782116895243 782116895250 782116469222	 **ESWPC08** **ESWPC24** **ESWPC36** **ESWPC48**	

Discount Symbol **22CD**

FIRE-GUARD® Arc Fault Circuit Interrupter (AFCI)

CH115AF

CH115CAF

BR115AF

BR115CAF

Product Description

Eaton's FIRE-GUARD Arc Fault Circuit Interrupter (AFCI) is a residential circuit breaker that incorporates advanced Electronic Technology which recognizes the unique current and/or voltage signatures associated with arcing faults, and acts to interrupt the circuit to reduce the likelihood of an electrical fire.

With the Cutler-Hammer FIRE-GUARD AFCI, protection from arcing faults is combined with the protection afforded by standard residential circuit breakers. The FIRE-GUARD AFCI protects against arcing directly as well as responding to overcurrents by conventional thermal and magnetic trips.

FIRE-GUARD AFCI can also be equipped with 5 mA ground fault personnel protection, providing a residential circuit breaker that protects against arcing faults, thermal overloads and short circuits, and in addition, 5 mA ground fault protection in one integrated design.

Eaton Corporation has the widest selection of AFCI product solutions on the market today.

Application Description

Fire Prevention

The AFCI product is a rare fire safety product in that it is pro-active and not re-active by nature. Most fire safety products such as smoke detectors, fire extinguishers, escape ladders, oxygen bottles and the like expect that a fire has already started and will be used to safely exit or mitigate the problem. The AFCI product is pro-active in that it detects a problem that can cause fires and works to mitigate the problem before the fire begins.

Household electrical problems caused more than 67,000 fires and more than $800 million in property losses in 2003. Electrical fires cause an estimated 485 deaths annually and injure almost 2,300 more. Electrical fires can be caused by numerous problems, including appliance defects or misuse, incorrect installation of wiring, or misapplied electrical cords.

In 1992, the Consumer Product Safety Commission (CPSC) contracted with Underwriters Laboratories (UL) to research and evaluate products and technology that could reduce the likelihood of residential fires. UL identified that "arcing faults" could eventually lead to the ignition of a fire as one possible cause of residential fires.

Historical Perspective

Prior to the FIRE-GUARD AFCI, present-day residential circuit breakers were designed to protect wiring from excessive heating by opening automatically when an overload condition was present. These breakers typically contain a bimetal and magnetic trip element. During low current overloads, heating of the bimetal element causes the breaker to unlatch the contact-separation mechanism, turning power off in the affected circuit. For high overcurrent conditions, such as short circuits, the high magnetic field associated with high current flow causes the "instantaneous tripping" of the breaker mechanism. The breaker response time is a function of the circuit current and time, with faster response at higher currents. In particular, the circuit breaker Time versus Current characteristics, is selected to prevent conductor damage. Present overcurrent devices, such as circuit breakers and fuses, represent a major safety feature in today's residences. They prevent excessive temperatures in the conductors or conductor insulation and they reduce the incidence of household fires, to a great extent, through their prevention of overheating effects.

The response time of present-day circuit breakers is determined solely by the duration and magnitude of the circuit overcurrent. This response is adequate to protect the wiring if the circuit wiring integrity has been maintained. However, once this integrity has been compromised via broken wires or deteriorated insulation, electric arcs can occur. These arcs are characterized by a plasma flame which can release temperatures in excess of 6000°C. An arcing fault can go undetected by a thermal, as well as magnetic trip element. The challenge answered by the FIRE-GUARD AFCI is to enhance circuit protection by identifying the presence of arcing faults, and responding to their presence by opening the circuit in times which are faster than standard circuit breakers. By integrating custom electronics into a present-day circuit breaker, the FIRE-GUARD meets the challenge and offers enhanced protection from household fires.

Arcs in Wiring

Parallel Arcs

Electrical arcs can be placed into two categories. The most familiar and dramatic arcs in residential wiring are associated with short circuit arcs between two conductors. In a parallel arc, the load is paralleled by the arcing fault. An example would be the accidental severing of the power cord and a hedge trimmer or other power tool. A less obvious example would be the deterioration of insulation in the wiring behind a wall, due for example, to the cumulative effect of electrical surges, heat or moisture over many years. A parallel arc can often "sputter" on and off for extended periods of time without detection, increasing the risk of fire.

Series Arcs

Arcs can also occur at a break in a single conductor. These series arcs are relatively low current since they are in a series with the load. In practice, it is difficult to sustain such arcs since copper-to-copper arcing is unsustainable at 125 Vac. However, such arcing can occur in the presence of carbonized insulation. The arcs are typically sputtering and intermittent in nature, and tend to alert the homeowner since they lead to intermittent device operation such as flickering lighting loads.

Residential wiring has been divided into four zones. The Cutler-Hammer FIRE-GUARD AFCI will provide parallel arc detection and protection in Zones 1, 2 and 3 and it will respond to arcing to ground in all three of these zones. FIRE-GUARD AFCI responds to series arcs in two conductor plus ground fixed premises wiring (Type N-B wire) of Zone 1.

Types of AFCIs

There are three types of AFCI, the Branch Feeder Type, the Combination Type and the Dual Purpose AFCI.

UL 1699 defines the Branch Feeder and the Combination Types AFCI. The Combination Type AFCI is defined as "meeting the requirements for both the branch/feeder and outlet circuit AFCIs."

The Dual Purpose device incorporates either the Branch Feeder or the Combination device features and GFCI 5 mA ground fault detection.

The 2005 NEC permits the use of the Branch Feeder Type AFCI until January 1, 2008 after which time the Combination Type AFCI is required. The 2008 NEC permits only the Combination Type AFCI.

The Dual Purpose AFCI is applied in those locations where GFCI protection is required and AFCI protection is desired.

Eaton AFCIs include 30 mA equipment level ground fault protection.

Application Data

- FIRE-GUARD AFCI circuit breakers can be applied to all residential, commercial and industrial 15 and 20 ampere, 120/240 Vac applications utilizing a loadcenter approved for use with Cutler-Hammer Type CH or BR circuit breakers.
- FIRE-GUARD AFCI circuit breakers are to be applied in applications where you want to reduce the risk of electrical fires caused by electrical arcing, as well as protect conductors from overcurrents and short circuits.
- The single-pole FIRE-GUARD AFCI breaker is applied in single-phase 120 Vac applications. The 2-pole common trip FIRE-GUARD AFCI breaker is applied in 3-wire 120/240 Vac 3-wire circuits and 240 Vac circuits sourced by 120/240 Vac.
- The 2-pole independent trip FIRE-GUARD AFCI breaker is applied in 120 Vac multi-wired circuits utilizing a shared neutral (often referred to as a home-run circuit).
- The FIRE-GUARD Dual Purpose AFCI/GFCI breaker can be used when AFCI (UL 1699) and 5 mA GFCI (UL 943) protection is required.
- The FIRE-GUARD AFCI can be used in conjunction with a downstream GFCI device such as a receptacle or ground fault relay.
- All FIRE-GUARD AFCI type breakers are HACR rated.
- All FIRE-GUARD AFCI 15 and 20 ampere breakers are SWD rated.

The 2-pole AFCI breaker is required for shared neutral circuits. In many cases, contractors will run one 3-conductor wire in lieu of two runs of 2-conductor wire. (Note: When discussing the number of conductors in NM-B cable, the ground wire is not counted. Therefore, the 3-conductor NM-B has two hot and one neutral wire.) This wiring method saves a considerable amount of labor. AFCI breakers wire in the same manner as GFCI in that the neutral wire is brought back and connected to the breaker, and the pigtail of the breaker is wired to the neutral bar. In a shared neutral application, since two circuits are sharing one neutral wire, it is impossible to connect the one neutral wire to two individual circuit breakers. The 2-pole AFCI allows for both circuits to share the neutral wire.

Technical Data and Specifications

Ground Fault Detection

All Eaton AFCI breakers include some level of ground fault detection and protection. The Branch Feeder and Combination Type AFCI inherently come equipped with 30 mA Equipment Level earth leakage detection and protection. This feature helps to identify such wiring problems as grounded neutrals.

When specified through proper catalog number selection, the AFCI can be equipped with 5 mA GFCI detection and protection. This product includes either the Branch Feeder or Combination Type arc fault detection, thermal and magnetic overload current protection, and 5 mA ground fault. This is the most complete circuit protection breaker on the market today.

Technical Data

AFCI circuit breakers include the following:

- UL 1699.
- UL 1998.
- UL 489.
- UL 943 (for Dual Purpose Devices Only).
- UL 1053 (Branch Feeder Only).
- Heating, air conditioning & Refrigeration (HACR) Rated.
- Switching Duty (SWD) Rated.
- Compatible with downstream GFCI Devices.
- Available in 15 and 20 ampere configurations.
- Available in 10 kAIC and 22 kAIC configurations (some models).
- AFCI breakers will operate at temperatures above the standard thermal magnetic circuit breaker. This is due to the presence of the electronics within the circuit breaker. Per UL standard 489 for molded case circuit breakers, the breaker must not exceed 50°C rise over ambient at both line and load terminals in open air. In an enclosure, the temperature rise over ambient must not exceed a 60°C rise. Eaton's AFCIs operate well within these limits.

Typical Causes of Arcing Faults

Arcing faults can occur in homes, apartments, or any other residential dwellings where there is deterioration in wire insulation caused by one or more of these hazardous situations.

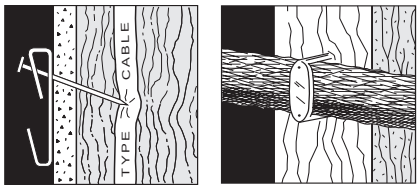

Figure 4-10. When cable has been punctured by a nail or stapled too tightly against a stud, the insulation can be severed and arcing can occur.

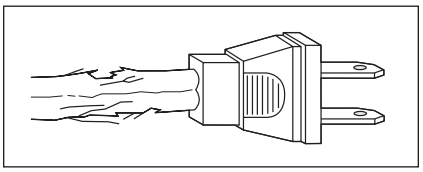

Figure 4-11. Damaged, abused or worn extension cords can pose an arcing situation.

Plug-on Neutral Combination Type AFCI brings time savings and a neater loadcenter thus enabling contractors to meet the 2008 National Electrical Code and not compromise time and neatness.

Table 4-32. Protection Capabilities

Protection Device	Type of Protection	Advantage
Branch Feeder AFCI	Thermal	Protects conductor against overload.
	Magnetic	Protects conductor against short circuits.
	30 mA Earth Leakage Detection	Identifies wiring errors such as grounded neutrals.
	Branch Feeder Arc Fault	Reduces risk of electrical fires started by parallel and series arcing faults in installed wiring and parallel arcing faults in connected cords.
Combination Type AFCI	Thermal	Protects conductor against overload.
	Magnetic	Protects conductor against short circuits.
	30 mA Earth Leakage Detection	Identifies wiring errors such as grounded neutral.
	Branch Feeder Arc Fault	Reduces risk of electrical fires started by parallel and series arcing faults in installed wiring and parallel arcing faults in connected cords.
	Combination Type Arc Fault	Reduces risk of electrical fires started by low level series arcs in connected cords.
Dual Purpose AFCI and GFCI	Thermal	Protects conductor against overloads.
	Magnetic	Protects conductor against short circuits.
	Branch Feeder or Combination Type Arc Fault	Reduces risk of electrical fires started arcing faults. The level of detection is dependent upon the type of Arc Fault breaker being employed.
	GFCI (5 mA Leakage Detection)	Protects people from fatal electric shock.

Standards and Certifications

- Cutler-Hammer AFCIs are listed to UL 1699, the standard for arc fault circuit interrupters and UL 489, the standard for circuit breakers.
- AFCIs with 5 mA GFCI protection are available that meet UL 943, the standard for ground fault circuit interrupters.
- NEC 210.12 – 1999 NEC
  - A. **Definition** — An arc-fault circuit interrupter is a device intended to provide protection from the effects of arc faults by recognizing characteristics unique to arcing and by functioning to de-energize the circuit when an arc fault is detected.
  - B. **Dwelling Unit Bedrooms** — All branch circuits that supply 125-volt, single-phase, 15- and 20-ampere receptacle outlets installed in dwelling unit bedrooms shall be protected by an arc fault circuit interrupter(s). This requirement shall become effective January 1, 2002.
- NEC 210.12 – 2002 NEC
  - A. **Definition** — An arc fault circuit interrupter is a device intended to provide protection from the effects of arc faults by recognizing characteristics unique to arcing and by functioning to de-energize the circuit when an arc fault is detected.
  - B. **Dwelling Unit Bedrooms** — All branch circuits that supply 125-volt, single-phase, 15- and 20-ampere outlets installed in dwelling unit bedrooms shall be protected by an arc fault circuit interrupter listed to provide protection of the entire branch circuit.

■ NEC 210.12 – 2005 NEC

A. **Definition** — An arc fault circuit interrupter is a device intended to provide protection from the effects of arc faults by recognizing characteristics unique to arcing and by functioning to de-energize the circuit when an arc fault is detected.

B. **Dwelling Unit Bedrooms** — All 120-volt, single-phase, 15- and 20-ampere branch circuits supplying outlets installed in dwelling unit bedrooms shall be protected by a listed arc fault circuit interrupter, combination type installed to provide protection of the branch circuit.

Branch/feeder AFCIs shall be permitted to be used to meet the requirements of 210.12(B) until January 1, 2008.

FPN: For information on types of arc fault circuit interrupters, see UL 1699-1999, standard for Arc Fault Circuit Interrupters.

Exception: The location of the arc-fault circuit interrupter shall be permitted to be at other than the origination of the branch circuit in compliance with (a) and (b):

a. The arc fault circuit interrupter installed within 1.8 m (6 ft.) of the branch circuit overcurrent device as measured along the branch circuit conductors.

b. The circuit conductors between the branch circuit overcurrent device and the arc fault circuit interrupter shall be installed in a metal raceway or a cable with a metallic sheath.

■ NEC 210.12 – 2008 NEC

A. **Definition** — An arc fault circuit interrupter is a device intended to provide protection from the effects of arc faults by recognizing characteristics unique to arcing and by functioning to de-energize the circuit when an arc fault is detected.

B. **Dwelling Unit Bedrooms** — All 120-volt, single-phase, 15- and 20-ampere branch circuits supplying outlets installed in dwelling unit family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreation rooms, closets, hallways or similar rooms or areas shall be protected by a listed arc fault circuit interrupter, combination type, installed to provide protection of the branch circuit.

Exception No. 1 — Where RMC, IMC, EMT or steel armored cable, Type ac, meeting the requirements of 250.118 using metal outlet and junction boxes is installed for the portion of the branch circuit between the branch-circuit overcurrent device and the first outlet, it shall be permitted to install a combination AFCI at the first outlet to provide protection for the remaining portion of the branch circuit.

Exception No. 2 — Where a branch circuit to a fire alarm system installed in accordance with 760.41(B) and 760.121(B) is installed in RMC, IMC, EMT or steel armored cable, Type ac, meeting the requirements of 250.118, with metal outlet and junction boxes, AFCI protection shall be permitted to be omitted.

It should be noted that in the cases above, as per Article 100 of the NEC, an "Outlet" is "A point on the wiring system at which current is taken to supply utilization equipment." This would include lighting outlets, receptacle outlets, and fire alarm outlets.

4

Product Selection

Table 4-33. Type CH 3/4-Inch (19.1 mm) Wide FIRE-GUARD AFCI Circuit Breakers

Poles	Ampere Rating	Configuration	Catalog Number	Price U.S. $
Single-Pole 10 kAIC	15	Branch Feeder AFCI Branch Feeder AFCI with GFCI Branch Feeder AFCI in Clamshell Package	**CH115AF** **CH115AFGF** **CH115AFCS**	
		Combination Type AFCI Combination Type AFCI in Clamshell Package Combination Type AFCI Plug-on Neutral	**CH115CAF** **CH115CAFCS** **CH115CAFPN** ③	
	20	Branch Feeder AFCI Branch Feeder AFCI with GFCI Branch Feeder AFCI in Clamshell Package	**CH120AF** **CH120AFGF** **CH120AFCS**	
		Combination Type AFCI Combination Type AFCI in Clamshell Package Combination Type AFCI Plug-on Neutral	**CH120CAF** **CH120CAFCS** **CH120CAFPN** ③	
Double-Pole 10 kAIC ①②	15	Branch Feeder AFCI Common Trip Branch Feeder AFCI Independent Trip	**CH215AF** **CH215AFIT**	
	20	Branch Feeder AFCI Common Trip Branch Feeder AFCI Independent Trip	**CH220AF** **CH220AFIT**	

① Common trip refers to 2-pole 240 volt load application sourced by 120/240 Vac (See **Figure 4-14**).
② Independent trip refers to 2-pole shared neutral circuits (see **Figure 4-13** and **Figure 4-15**).
③ Requires plug-on neutral loadcenter.

Table 4-34. Type BR 1-Inch (25.4 mm) Wide AFCI Circuit Breakers

Poles	Ampere Rating	Configuration	Catalog Number	Price U.S. $
Single-Pole 10 kAIC	15	Branch Feeder AFCI Branch Feeder AFCI with GFCI Branch Feeder AFCI in Clamshell Package	**BR115AF** **BR115AFGF** **BR115AFCS**	
		Combination Type AFCI Combination Type AFCI in Clamshell Package	**BR115CAF** **BR115CAFCS**	
	20	Branch Feeder AFCI Branch Feeder AFCI with GFCI Branch Feeder AFCI in Clamshell Package	**BR120AF** **BR120AFGF** **BR120AFCS**	
		Combination Type AFCI Combination Type AFCI in Clamshell Package	**BR120CAF** **BR120CAFCS**	
Double-Pole 10 kAIC ④⑤	15	Branch Feeder AFCI Common Trip Branch Feeder AFCI Independent Trip	**BRL215AF** **BRL215AFIT**	
	20	Branch Feeder AFCI Common Trip Branch Feeder AFCI Independent Trip	**BRL220AF** **BRL220AFIT**	

④ Common trip refers to 2-pole 240 volt load application sourced by 120/240 Vac (See **Figure 4-14**).
⑤ Independent trip refers to 2-pole shared neutral circuits (see **Figure 4-13** and **Figure 4-15**).

Table 4-35. UL Classified Branch Feeder AFCIs

Poles	Ampere Rating	Configuration	Catalog Number	Price U.S. $
Type CL 1-Inch Wide per Pole Classified Arc Fault Circuit Interrupters — Fit Square D HOMELINE®, GE, Siemens, Murray®, Thomas & Betts® and Crouse-Hinds® Loadcenters				
Single-Pole	15 20	AFCI AFCI	**CL115AF** **CL120AF**	

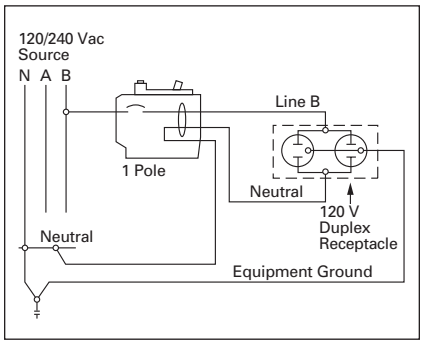

Figure 4-12. Single-Pole Single 120 Volt Load Application Sourced by 120/240 Vac

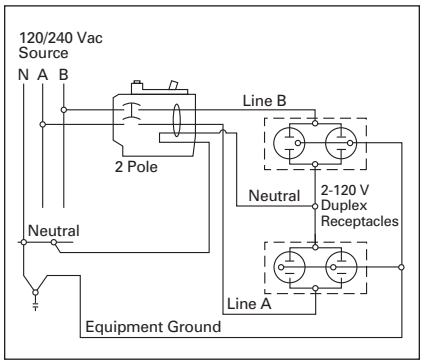

Figure 4-13. 2-Pole Shared Neutral with Multi-Duplex Receptacle Application

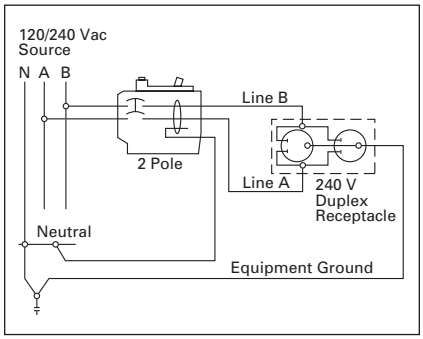

Figure 4-14. 2-Pole 240 Volt Load Application Sourced by 120/240 Vac

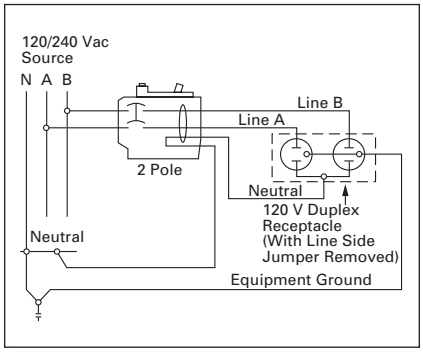

Figure 4-15. 2-Pole Shared Neutral with Duplex Receptacle Application

Discount Symbol **22CD**

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