

AI

Power Conditioning Products



Section

11

True-Power® Constant Voltage Regulators .250–15.0 kVA

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Hard-Wired SPD



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**SPIKESHIELD® Branch Panel Wired-In Surge Protective Devices
External Type 1 SPD Products**



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Acme True-Power® products consist of speciality designed ferroresonant transformers. Although ferroresonant transformers have been an economical solution to power problems for many years, it took the skills of Acme’s highly regarded engineering staff to refine it to meet today’s exacting requirements.

For example, typical ferroresonant transformers have an input limited to 100-130 V. Acme’s True-Power® units have an input range of +10/-20% around input voltage nominals of 120/208/240 and 480 volts. At 120 volt input, this relates to 95-130 volts.

The typical ferroresonant transformer has limited electrical noise suppression capability. True-Power® power line conditioners have the following noise attenuation capability:

- Common Mode: 120 db
- Transverse Mode: 60 db

The typical ferroresonant transformer has an audible hum that can be objectionable in most offices. Acme’s True-Power® power line conditioners are encapsulated in epoxy to lower sound levels below ANSI standard C 89.2.

The typical ferroresonant transformer has on output regulation of ± 3% for input line changes only. Acme’s True-Power® power line conditioners have an output regulation of ± 3% for input line and load changes, making them suitable for operation at any load condition.

Features

- Reliable, regulated output voltage when input voltage varies, even to brownout levels.
- Extended operation to 65% of nominal when operated at 60% of full load.
- Noise rejection—effectively suppressing transient spikes and surges—120 db common mode and 60 db transverse mode.
- Rapid response to line and load changes—5% variation in 8m sec, 10% variation in 16m sec.
- Hold up time of 3m sec for complete loss of input power.
- Inherent overload and short circuit protection, without thermo protectors, fuses or circuit breakers, for immediate recovery when the overload is removed.
- Sinusoidal output features, less than 3% harmonic distortion, improves input wave forms which have total harmonic distortions of greater than 5%.
- Available in 250 through 15,000 VA in hardwired models.
- Handle multiple primary input voltages.
- Illuminated ON/OFF switch, multiple output receptacles and six foot input power cord on portable units.
- UL Listed.
- CSA Certified

Applications

- Industrial Automation and Control Equipment
- Electronic Test Equipment
- Robotics
- X-Ray Equipment
- Communications Equipment

Specifications

Input (Primary)	95-132 VAC (Hardwired) ②
	166-228 VAC
	192-264 VAC
	384-528 VAC
Phase:	1 Phase
② All hardwired models will accommodate these primary input voltages.	

Specifications

Output (Secondary)	120/208/240 VAC (Hardwire)
Load Range	0-100%
Regulation	± 3% for line/load changes
Attenuation	120 db Common Mode Noise
	60 db Transverse Mode Noise
Audible Noise	Below ANSI std. C 89.2

Product Selection Guide

Problem Encountered	Shielded Isolation Transformer	True-Power	SPS	UPS
Power Failure	—	—	X	X
Widely Varying Source Voltage	—	X	—	X
Brown Outs	—	X	X	X
Switching Of Power Factor Correction Capacitors	X	X	X	X
Distorted Wave Shape Due To Harmonic Content	—	X	—	X
Common-Mode Transients	X	X	—	X
Transverse-Mode Transients	—	X	X	X
Voltage Spikes Due To Proximity Of Welding Equipment Or Certain Medical Diagnostic Equipment	X	X	X	X
Line Distortion Due To Noise Generated From Occasional Lightning Strikes	X	X	X	X
Operation Of Computer Storage Devices Such As Floppy Disks Or Winchester Drives Generates Transients	X	X	X	X

HARDWIRED MODELS — CONSTANT VOLTAGE REGULATORS

95-132 X 166-228 X 192-264 X 384-528 VOLT PRIMARY — 120/208/240 VOLT SECONDARY — 1Ø, 60 Hz

kVA Size	Catalog Number	APPROXIMATE DIMENSIONS (Inches)(Cm.) ^③										Mounting Type (Wall)(Floor)	Weight (Lbs.)(Kg.)	Figure	Wiring Diagrams
		A	B	C	D	E	F	G	H	J					
0.25	T169430	15.50	6.30	5.80	5.63	8.13	9.30	1.2	.41 x .81	5.00	F&W	37	II	16	
		(39.4)	(16.0)	(14.7)	(14.3)	(20.7)	(23.6)	(3.0)	(1.0 x 2.1)	(12.7)					(16.8)
0.35	T169431	17.00	7.00	7.30	5.63	8.13	9.40	2.3	.41 x .81	6.50	F&W	51	II	16	
		(43.2)	(17.8)	(18.5)	(14.3)	(20.7)	(23.9)	(5.8)	(1.0 x 2.1)	(16.5)					(23.1)
0.50	T169432	17.00	7.00	7.30	5.63	8.13	9.40	2.3	.41 x .81	6.50	F&W	53	II	16	
		(43.2)	(17.8)	(18.5)	(14.3)	(20.7)	(23.9)	(5.8)	(1.0 x 2.1)	(16.5)					(24.0)
0.75	T169433	17.00	7.00	7.30	5.63	8.13	9.40	2.3	.41 x .81	6.50	F&W	65	II	16	
		(43.2)	(17.8)	(18.5)	(14.3)	(20.7)	(23.9)	(5.8)	(1.0 x 2.1)	(16.5)					(29.5)
1.00	T169434	18.50	6.50	8.55	5.63	8.13	9.50	2.3	.41 x .81	7.75	F&W	82	II	16	
		(47.0)	(16.5)	(21.7)	(14.3)	(20.7)	(24.1)	(5.8)	(1.0 x 2.1)	(19.7)					(37.2)
2.00	T169435	19.00	10.50	10.20	6.00	12.00	13.25	2.3	.44 x .63	9.40	F&W	142	III	16	
		(48.3)	(26.7)	(25.9)	(15.2)	(30.5)	(33.7)	(5.8)	(1.1 x 1.6)	(23.9)					(64.4)
3.00	T169436	19.00	10.50	10.20	6.00	12.00	13.25	2.3	.44 x .63	9.40	F&W	176	III	16	
		(48.3)	(26.7)	(25.9)	(15.2)	(30.5)	(33.7)	(5.8)	(1.1 x 1.6)	(23.9)					(79.8)
5.00	T169437	22.00	12.54	12.20	6.00	14.00	15.25	2.3	.44 x .63	11.40	F&W	295	III	16	
		(55.9)	(31.9)	(31.0)	(15.2)	(35.6)	(38.7)	(5.8)	(1.1 x 1.6)	(29.0)					(134.0)
10.00	T169438	23.06	27.31	24.06	18.00	25.50	—	—	.56	—	F&W ^①	605	IV	16	
		(58.6)	(69.4)	(61.1)	(45.7)	(64.8)			(1.4)						(274.0)
15.00	T169439	23.06	40.13	24.06	18.00	38.31	—	—	.56	—	F	880	IV	16	
		(58.6)	(101.9)	(61.1)	(45.7)	(97.3)			(1.4)						(399.0)

^① Wall mounting brackets required for this size. Refer to Page 217.
^③ Dimensions not suitable for construction. Contact factory.

All Wiring Diagrams begin on page 209.

CONSTANT VOLTAGE REGULATORS DIMENSIONAL DRAWINGS

Figure II and III

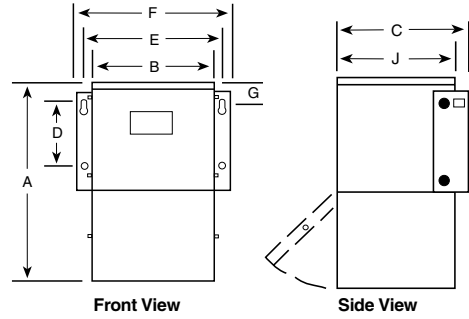
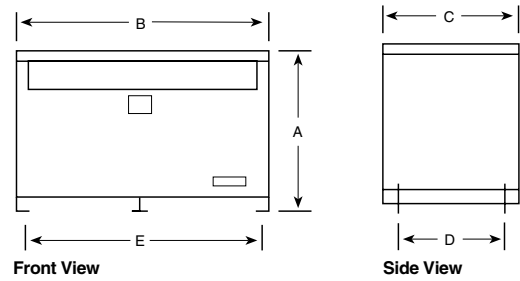
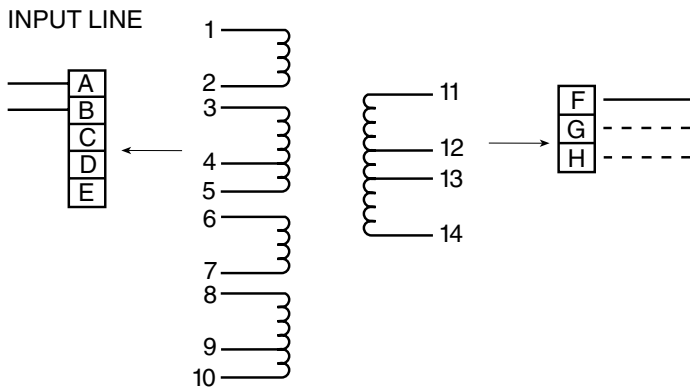


Figure IV



Power Line Conditioner



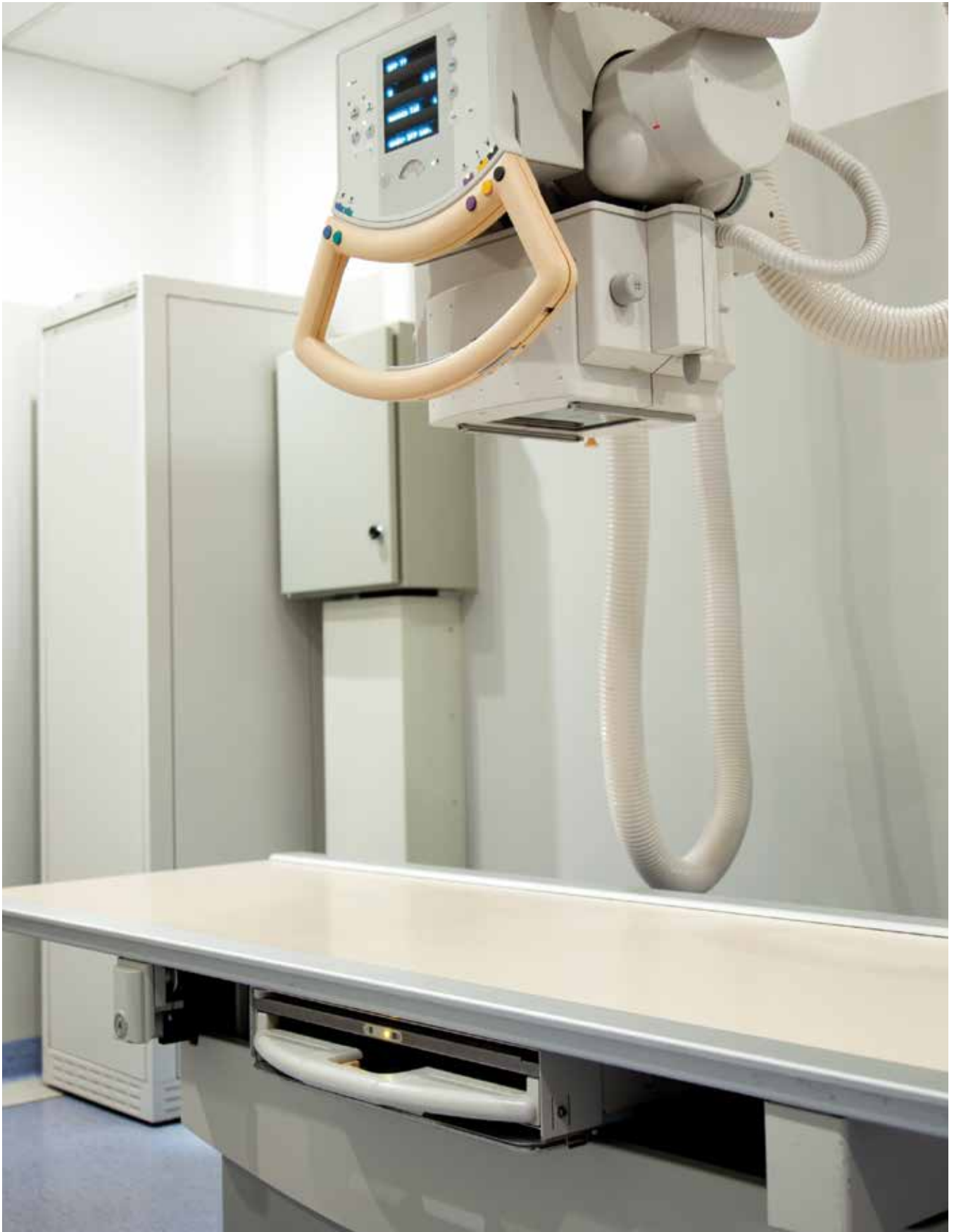
Input Connections Insulate

Volts	Connect	Isolate
120	1, 3, 6, 8 to A 2, 5, 7, 10 to B	4, 9
208	1, 6 to A 4, 9 to B 2, 3 to C 7, 8 to D	5, 10
240	1, 6 to A 5, 10 to B 2, 3 to C 7, 8 to D	4, 9
480	1 to A 10 to B 2, 3 to C 5, 6 to D 7, 8 to E	4, 9

Output Connections

Volts	Connect	Output Lines To
120	11 to F 12 to G 14 to H	F, G
208	11 to F 12 to G 14 to H	F, G, H
240	11 to F 12 to G 13 to H	F, H
480	11 to F 12 to G 14 to H	F, H

NOTE: To prevent externally shorting, all leads marked "INSULATE" must be individually capped with wire nuts or equivalent. Insulate leads individually!



HARD-WIRED SPD

Hubbell hard-wired SPDs are multi-phase surge protective devices and noise filters in compact and affordable packages. The compact designs allow surge suppression to be installed adjacent to power panels or directly on sensitive equipment in harsh electrical conditions.

Hubbell hard-wired systems are versatile and compact surge protective devices designed to provide high-quality surge suppression for a wide variety of commercial, industrial or institutional applications. Hubbell hard-wired devices can be used in a network of surge suppression applications or as a stand-alone surge suppressor.

Superior Performance

Hubbell hard-wired SPDs utilize a high-energy suppression circuit that provides from 50,000 to 100,000 peak amps of surge current rating per phase. Hubbell hard-wired SPDs contain a suppression circuit that not only provides additional transient suppression, but also noise filtration. Hard-wired SPD units provide reliable operation by incorporating the latest engineering developments. Each MOV is individually fused and the products are contained in a NEMA Type 4 housing. Hubbell hard-wired SPDs incorporate the latest overvoltage technology innovations. The hard-wired series provides superior overvoltage withstand capability for systems with unstable power without compromising transient clamping performance.

Easy Installation

Hubbell hard-wired SPDs mount directly to the panel through a nipped connection. They allow easymounting near the circuit breaker in order to reduce lead lengths and improve surge suppression.

10-year Warranty

Hubbell hard-wired SPDs have a 10-year warranty.

Features

- NEMA 4X Enclosure
- Overvoltage technology
- EMI/RFI Noise Rejection
- LED Status Indication
- Suppression Status Alarm
- Coordinated Fuse Technology

Advantages

- Allows installation in outdoor applications
- Superior overvoltage withstand and surge suppression
- Increased transient suppression
- Provides visual indication of the suppressor status
- Provides immediate alarm if suppression is ever damaged
- Thermal fuse capable of passing extreme surge currents

Benefits

- Provides surge suppression to vulnerable equipment powered from weather-exposed panels
- Longer product life and increased tolerance to unstable power conditions
- Improves surge suppression to the equipment
- Allows immediate response if suppressor is damaged
- Warns if operating with reduced or without surge suppression
- Provides premium surge suppression while managing thermal effects from MOV end of life

HARD-WIRED SPD

Performance

- Short Circuit Current Rating 200 kA
- Fusing Individually fused MOVs
- Filtering EM/RFI Noise Rejection Yes

Mechanical Description

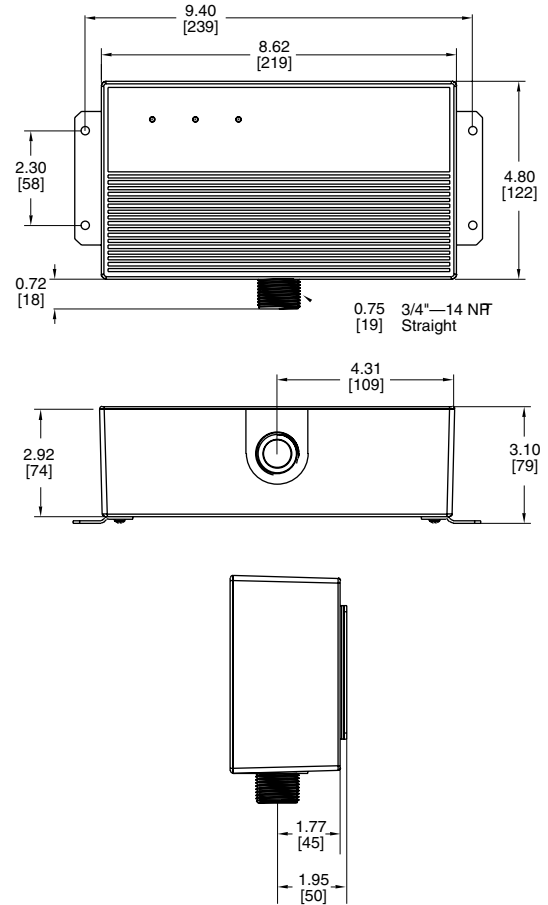
- Dimensions 8.62" x 4.80" x 2.92"
- Housing Rating NEMA 4X
- Connection Method #10 AWG
- Mounting Method/Circuit Type Parallel
- Thermal Fusing Yes
- Operating Frequency 50/60 Hz
- Operating Altitude Sea Level-12,000' (3,658 m)
- Storage Temperature -40° F to +149° F (-40° C to +65° C)
- Operating Temperature -4° F to +160° F (-20° C to +71° C)

Diagnostics

- Green status LED, audible alarm, dry contacts

Listings and Performance

- cULus 1449 3rd edition Type 2 SPD, UL 1283 (Wye products only), CSA C22.2 No. 8-M1986



Hard-Wired SPD

Model Number	Surge Current	Configuration	Voltage	MCOV	I _n	VPR			
						L-N	L-G	L-L	N-G
HBL3W100C	100kA	1 Ø, 3-wire+G	120V/240	150V	20kA	900V	1200V	1500V	700V
HBL4W100C	100kA	3 Ø, Wye, 4-wire+G	120V/208Y ①	150V	20kA	900V	1200V	1500V	700V
HBL8W100C	100kA	3 Ø, Wye, 4-wire+G	277V/480Y ②	320V	20kA	1200V	2000V	2500V	1000V
HBL9W100C	100kA	3 Ø, Delta, 3-wire	480V Delta	840V	20kA	N/A	N/A	3000V	N/A

① 120/208Y series also applies to the following voltage 127/220Y

② 277/480Y series also applies to the following voltages 220/380Y, 230/400Y, and 240/415Y



TYPE 1 SPD'S



Hubbell brand Spikeshield Type 1 Surge Protective Devices (SPDs) are compact and affordable arresters available in either single or multi-phase models. Spikeshield SPDs offer a simple means to bring down initial surges to manageable levels in a cascaded SPD system. Their compact design allows surge suppression to be installed adjacent to power panels or directly on sensitive equipment.

Type 1 SPDs are versatile and compact devices designed to provide high-quality surge suppression for a wide variety of commercial, industrial or institutional applications. Hubbell brand Spikeshield Type 1 SPDs can be used in a cascaded network of suppression applications or as stand-alone surge suppression. Type 1 SPDs can also be installed on the electric meter, on well pumps or on other sensitive electronic equipment. NEMA Type 4X rated housing allows installations outdoors.

Superior Performance

Spikeshield Type 1 SPDs utilize high-energy suppression circuitry that can be located at any point in the electrical system. They have the flexibility to be used with or without an Overcurrent Protection Device (OCPD).

Type 1 SPDs provide surge suppression for equipment from severe transient activity. Each MOV is individually fused and the products are enclosed in a NEMA Type 4X housing suitable for installing outdoors or in other harsh environments.

Easy Installation

Spikeshield Type 1 SPDs are some of the most versatile, yet compact surge protective devices available on the market today. This compact package can be mounted on an electrical panel, meter socket, or inside electrical control cabinets.

10-year Warranty

The HBL3W50 warranty is 10 years. The HBLSDSA36 warranty is 2 years. The HBL4SA40, HBL8SA40 warranty is 2 years.

Features

- NEMA 4X Enclosure
- Compact Design
- Designed for Type 1 Applications
- LED Status Indication
- Coordinated Fuse Technology

Advantages

- Allows installation in outdoor applications
- Easily mounts even in restricted spaces
- Can be installed with or without an Overcurrent Protective Device (OCPD)
- Provides visual indication of the suppressor status
- Fuses capable of passing extreme surge currents

Benefits

- Provides surge suppression to vulnerable equipment powered from weather exposed panels
- Transient suppression is located at the most efficient connection point
- Improves surge suppression to the equipment
- Allows for flexibility in installation locations
- Allows immediate indication if suppressor requires replacement
- Provides premium surge suppression while managing thermal effects from MOV end of life

Mechanical Description

- Housing Rating NEMA 4X
- Connection Method
 - HBL3W50* #12 AWG
 - HBLSDSA36* #14 AWG
 - HBL4SA40
 - HBL8SA40 #12 AWG
- Mounting Method/Circuit Type Close Nippled



- Thermal Fusing
- Operating Frequency 50/60 Hz
- Operating Altitude Sea Level-12,000' (3,658 m)
- Storage Temperature -40° F to +149° F (-40° C to +65° C)
- Operating Temperature -40° F to +149° F (-40° C to +65° C)

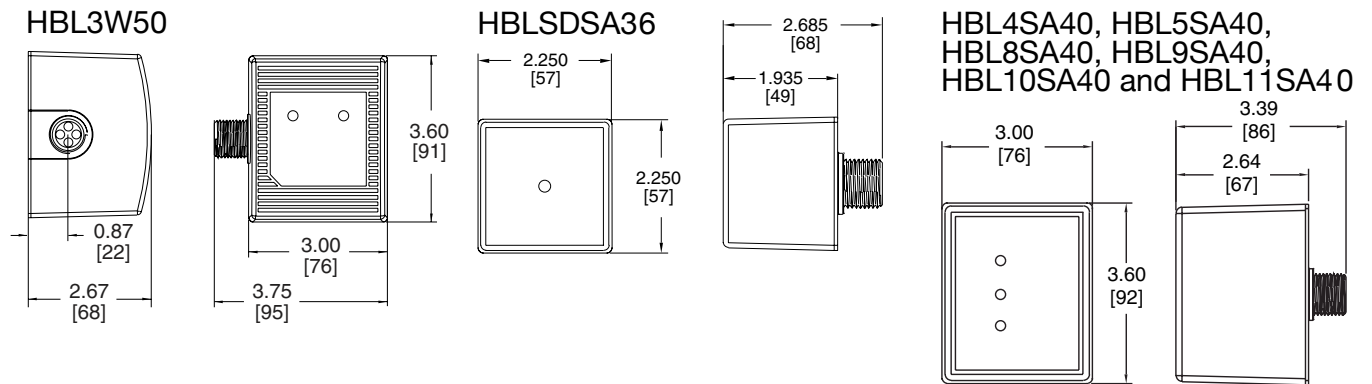
Diagnostics

- Green status LED

Listings and Performance

- *cULus Listed to 1449 Type 1 SPD, CSA C22.2 No. 8-M1986, C233.1-87

**cULus Listed per UL 1449 Type 1 SPD, CSA C22.2 No. 269.1-14



HBL3W50

The HBL3W50 series provide high-quality surge suppression in a compact and versatile package. This product is ideal for panel builders as well as manufacturers and integrators of instrumentation cabinets for industrial, commercial, and residential applications for single-phase power systems.

HBL3W50 SPDs incorporate the latest overvoltage technology innovations. The series provides superior overvoltage withstand for systems with unstable power without compromising transient clamping performance.

HBL3W50

Model Number	Surge Current	Configuration	Voltage	MCOV	SCCR	I _n	L-N	VPR	
								L-G	L-L
HBL3W50	50kA	1 Ø, 3-wire+G, side mounted	120V/240	150V L-N, L-G 300V L-L	25kA	10kA	700V	800V	1200V



HBLSDSA36

The HBLSDSA36 Type 1 SPD is designed and listed for indoor or outdoor installation and surge suppression for single-phase three-wire 120/240 Vac 60 Hz electrical services. Two HBLSDSA36 Type 1 SPDs can be installed to provide surge suppression on 120/208V three-phase four-wire services.

HBLSDSA36

Model Number	Surge Current	Configuration	Voltage	MCOV	SCCR	I _n	VPR			
							L-N	L-G	L-L	N-G
HBLSDSA36	36kA	1 Ø, 3-wire, back mounted	120V/240	150V	22kA	10kA	700V	N/A	1200V	N/A



HBL4SA40, HBL8SA40

The HBL4SA40, HBL8SA40 Type 1 SPD is designed and listed for indoor or outdoor installation and surge suppression of three-phase grounded electrical services from 120/208 Vac up to 480 Vac line to line and is used extensively in service entrance panels to provide an efficient and economical means of surge suppression.

HBL4SA40, HBL8SA40

Model Number	Modes of Protection	Surge Current per Phase	Configuration	Voltage	MCOV	SCCR	I _n	VPR			
								L-N	L-G	L-L	N-G
HBL4SA40	6	40kA	3 Ø, 4-wire	208Y/120V ^①	180V L-N 360V L-L	200kA	10kA	700V	N/A	1200V	N/A
HBL8SA40	6	40kA	3 Ø, 4-wire	208Y/120V ^①	420V L-N 840V L-L	200kA	10kA	1500V	N/A	2500V	N/A

^① Applicable voltages: 220Y/127V, 208Y/120V

^② Applicable voltages: 480Y/277V, 415Y/240V, 400Y/230V, 380Y/220V

