# Surge Suppression and Isolated Ground Products

0

000

Featuring New Circuit Guard<sup>®</sup> Surge Suppression Receptacle!

# HUBBELL



9

Wiring Device-Kellems

# **Surge Suppression Products**

Computer and Medical Applications

Computers, FAX machines, medical equipment, scientific instrumentation, televisions, stereos, VCRs, cash registers and many other types of microprocessor based equipment have become common place in our everyday lives. We rely on this equipment to help perform our jobs, manipulate and store data, provide entertainment and in some cases save lives. The value of this equipment is immeasurable and the loss of their service or the information they contain could be catastrophic.

#### **Transient Voltage Surges** and Their Effect on Equipment

Transient voltage surges are short duration, high energy voltage disturbances on AC power lines. Although not always apparent, they are present in virtually every facility, silently stalking sensitive electronic equipment. Their effects can vary widely. Substantial transients can cause instant destruction of equipment and data characterized by charred printed circuit boards. More common effects include lost or altered data and premature equipment failure.

#### How and Where Transient Voltage Surges are Generated

Damaging transient voltage surges originate from sources both external and internal to your facility. External sources include lightning and the local utility switching grids to maintain proper power distribution. More common are internally generated transients which result from the switching of inductive loads, such as elevators, air conditioners, motors, printers, vacuums and even overhead lighting. Several studies have recorded as many as 60 to 100 internally generated transients in a single day.





#### Where to Implement Surge Suppression

The most logical points at which surge suppression devices can be installed are at the service entrance, at the branch circuit panel board, and at the point of use on the branch circuit.

Surge suppression at the service entrance guards against lightning or switching transients imposed on the utility system, but it does not protect against internally generated transients. Surge suppression at the branch circuit panel board protects against surges generated on other branch circuits but it does not

protect against surges originating on the same circuit. The best and most cost-effective means of providing surge protection is at the point of use on the branch circuit.

Hubbell Wiring Device – Kellems offers a complete line of point of use surge suppression products. Whether it be permanently wired duplex receptacles or portable strips and plug-in units, Hubbell surge suppression products set the standard for quality, convenience and reliability.



## **Surge Suppression Products**

Features and Benefits



NEW

UL Listed to Standards 1449 and 498; CSA Certified (NEMA 5-15 configuration only).

Damage-alert alarm sounds when surge protection is no longer functioning...and keeps sounding until the receptacle is replaced or muting screw is utilized.

Muting screw allows damage-alert alarm to be silenced until device is replaced.

Power-on indicator light verifies instantly that power is available at the receptacle and the suppression circuit is fully functional; light off means power has been interrupted; flashing light indicates surge protection circuitry has been damaged.

Distinctive surge symbol provides quick visual identification of surge suppression receptacle. High impact nylon face resists breakage.

Automatic grounding clip attached to bridge meets NEC Article 250-74, Exception No. 2.

Fits standard wall box.





**Power Contacts** 

Tandem Modified By-Pass contact design produces superior contact pressure and lower operating temperature for longer life.



**Printed Circuit Board** 

Four 18mm matched MOVs (two discs per package) provide 210 joules of surge protection in each mode. The nylon component shield protects the PC board from moisture and contaminents. An all glass PC board provides superior moisture immunity for longer life in humid environments. Conformal coating is provided on PC board for additional moisture immunity.



**Terminal Screws** 

External backwire provides visual inspection of terminations. "U" shape clamps are for strand containment and wire bundling. Combination screws for screwdriver versatility, decreased slippage and increased speed of installation.

Note: The effectiveness of TVSS devices diminishes with the distance between the device and the equipment to be protected.



# Surge Suppression Receptacle Comparison Checklist

The following table is intended to facilitate the accurate comparison of surge suppression receptacles. The table focuses on the critical elements of electronic and electromechanical design and performance of surge suppression receptacles. Unless otherwise noted the information relative to Hubbell products applies to the entire surge suppression receptacle offering. This table is designed to allow the accurate comparison of Hubbell product with others under consideration.

Feature	Hubbell	Brand X	Criteria
Protection Modes: -Normal L-N -Common L-G -Common N-G	* * *		For complete protection a surge suppression receptacle must provide suppression in the Normal Mode (L-N) and Common Modes (L-G, N-G). Some products provide only Normal Mode protection.
Peak Energy (Joule rating) (1) -Normal L-N -Common L-G -Common N-G	210 joules min. 210 joules min. 210 joules min.		The short duration, peak energy a surge suppression com- ponent can handle without self destructing, also considered a measure of product longevity. All Modes should be consid- ered individually to determine a product's true peak energy for "a chain is only as strong as its weakest link ." In general the higher the peak energy the better the device.
Peak Current -Normal L-N -Common L-G -Common N-G	13,000 Amp. 13,000 Amp. 13,000 Amp.		A rating of how strong the surge suppression device is when subjected to very high peak currents. As with peak energy all Modes should be considered individually to determine a product's true peak current for "a chain is only as strong as its weakest link."
UL Listed Suppressed Voltage	500 V max.		Determined through UL 1449 testing, it is the maximum volt- age the suppressor will allow to pass through to the protect- ed circuit. In general the lower the rating the better the device.
Surge Suppression Status Indicators -Visual Indicator (LED) -Audible Alarm -Audible Alarm Silencing Feature	ン ン ン ン		Status indication is critical. Visual indicators are ideal for applications in view of user, audible for locations under furni- ture. A means to silence the audible indicator is essential to prevent occupant annoyance.
Printed Circuit Board Material - Best: All glass filled - Better: Paper filled - Good: Phenolic	v		All glass filled printed circuit boards provide superior mois- ture immunity for longer board life in humid environments, particularly hospitals. In addition they provide greater heat stability. Conformal coating provides moisture protection to components on the circuit board.
- Conformal Coating	~		
Power Contact Design - Best: Tandem Modified By-Pass - Better: Triple Wipe "T" - Good: Double Wipe	۷		The Hubbell only Tandem Modified By-Pass power contacts provide superior contact forces resulting in lower operating temperatures and longer product life.
Contact Material (Power & Ground) - Best: 688 Super Brass - Good: 260 Brass	V		688 Super brass maintains higher retention forces than 260 brass resulting in lower operating temperatures, superior grounding and longer product life.
<b>Termination</b> - Best: External Backwire - Better: Internal Backwire - Good: Sidewire	~		External backwiring provides visual inspection of termina- tions and ease of installation.
<b>Terminal and Mounting Screws</b> - Best: Combination Phillips/Slotted - Good: Slotted	V		Combination screws for screw driver versatility, decreased slippage, and increased speed of installation.

(1) Some manufacturers publish a cumulative total joule rating by summing the Normal and Common Modes.

(2) Audible Alarm not available on 5260 and 5360 models.



# Straight Blade, 2 Pole, 3 Wire Grounding

#### 15 and 20 Ampere, 125 Volts 60 Hz

#### **Specification Grade and Hospital Grade** Surge Suppression Duplex and 4-PLEX® Receptacles

ΠG

NEMA 5-15R

w



ŪĠ

0 6



# € 15A only

Circuit Guard <sup>®</sup> , Specification Grade Duplex Receptacles	NEMA 5-15R 15A 125V UL CSA 0.5 HP	NEMA 5-20R 20A 125V UL Listed 1 HP	
Description	Color	Catalog Number	
Surge suppression receptacles with indicator light only. 210 joules/13000A per mode.	Blue Ivory	5260S 5260IS	5360S 5360IS
Surge suppression receptacles with indicator light and alarm. 210 joules/13000A per mode.	Blue Ivory Gray White	5262S 5262IS 5262GYS 5262WS	5362S 5362IS 5362GYS 5362WS
Isolated ground, surge suppression receptacles with indicator light and alarm. 210 joules/13000A per mode.	Blue Ivory Gray	IG5262S IG5262IS IG5262GYS	IG5362S IG5362IS IG5362GYS

White IG5262WS IG5362WS IG5262OS IG5362OS Orange Blue 415S 420S 4-PLEX surge suppression receptacles with lights. 80 joules/6500A per mode. lvory 415IS 420IS

#### **Circuit Guard, Hospital Grade Duplex Receptacles**

Description	Color	Catalog Numbe	er
Surge suppression receptacles with indicator light and alarm. 210 joules/13000A per mode.	Blue Ivory Gray White Red	8262S 8262IS 8262GYS 8262WS 8262WS 8262RS	8362S 8362IS 8362GYS 8362WS 8362WS 8362RS
Isolated ground, surge suppression receptacles with indicator light and alarm. 210 joules/13000A per mode.	Blue Ivory Gray White Orange Red	IG8262S IG8262IS IG8262GYS IG8262WS IG8262WS IG8262OS IG8262RS	IG8362S IG8362IS IG8362GYS IG8362WS IG8362OS IG8362RS
4-PLEX surge suppression hospital grade receptacles. 80 joules/6500A per mode.	Blue Ivory	-	420HS 420HIS

#### **4-PLEX Accessories**

Description	Color	Catalog Number
4-PLEX adapter plates for 1 and 2 gang and 4" (101.6) square device boxes.	Blue Ivory	4APBL 4API
4-PLEX portable box. Portable 4" (101.6) square box with cord grip. Accepts up to .66" (16.8) diameter cord.	Blue Ivory	4PBBL 4PBI

#### Wall Plates

	High-Impact Nylon						
Configuration	Color	Standard	Mid-Size	Plated	Steel	Stainless Steel/	Brass
	Blue		SPJ26C*	Chrome	CH26	Smooth SS	S26
	Blue		SPJ26	Brass	BP26	Smooth SS	SJ26 <sup>△</sup>
	Ivory		PJ26C*			Smooth Brass	B26
	Ivory	HPS1I	PJ26				
	Gray	HPS1GY	PJ26G				
	White	HPS1WA	PJ26WA				
	Orange	HPS1OR					
1 gang	Red	HPS1R	PJ26R				

Notes: \*Premarked "COMPUTER ONLY." Lettering is block 1/4" high. <sup>A</sup>Jumbo size plate.







1.30" (33.0) 1.23 (312)3.28" 2.62" (83.3) (66.5) 1.13 \_1.75"\_ (44.5) (28.7) 8362IS





# Straight Blade, 2 Pole 3 Wire Grounding

15 Ampere 125 Volts 60 Hz

**Surge Suppression Devices** 

**Power Strips and Plug-In Adapters** 

# Power Strips

	D	Dimensions					
Cat. No.	Н	W	D				
SS6HG	15.75"	2.25"	1.16"				
	(400.0)	(57.2)	(29.5)				
SS6	15.75"	2.25"	1.16"				
	(400.0)	(57.2)	(29.5)				
SS4	14.0"	2.31"	1.16"				
	(355.6)	(58.7)	(29.5)				
PS6	11.94"	2.31"	1.13"				
	(303.3)	(58.7)	(28.7)				

#### Portable Plug-In



	Dimensions					
Cat. No.	Н	W	D			
SPI2M	5.50"	4.50"	1.41"			
	(139.7)	(114.3)	(35.8)			
SPI2	5.50"	4.50"	1.41"			
	(139.7)	(114.3)	(35.8)			

#### Rating - 15A , 125V AC

#### Certification

UL listed to standard 1449 (Transient Voltage Surge Suppressors), 1363 (Temporary Power Taps) and 498 (Receptacles).

CSA Certified to Spec C22.2 No. 42M

Suitable for ANSI/IEEE C62.41 (IEEE 587) installation categories "A" (outlets and long branch circuits) and "B" (major feeders and short branch circuits).

# (h) (h)

#### Circuit Guard<sup>®</sup> Power Strips and Plug-In Adapters

Cat. No.	Application/ Description	Input	Duplex Receptacles	Circuit Breaker	On/Off Switch	Surge LED	Status Alarm
SS6HG	Power strip w/ filtering, surge protection, hospital grade receptacles & plug.	Power cord 6' (182.9	3 cm)	Yes	Yes	Yes	Yes
SS6	Power strip w/ filtering, surge protection.	Power cord 6' (182.9	3 cm)	Yes	Yes	Yes	Yes
SS4	Power strip w/ filtering, surge protection.	Power cord 6' (182.9	2 cm)	Yes	Yes	Yes	Yes
SPI2M	Plug-In adapter w/ filtering, power and fax/modem surge protection, (2) RJ11 jacks, 4' phone cord.	Plug-In	1	Yes	No	Yes	Yes
SPI2	Plug-In adapter w/ filtering, surge protection.	Plug-In	1	Yes	No	Yes	Yes
PS6	Power strip only (no filtering, no surge protection).	Power cord 6' (182.9	3 cm)	Yes	Yes	No Applio	ot cable

#### **Electrical Specifications:**

Input Voltage	125V AC (60Hz)		
Current	20A Max Branch Circuit		
Protection Modes	Normal and Common		
Transient Suppression Peak Energy (10 x 1000 μs) Peak Current (8 x 20 μs)	140 joules per mode, 13000A		
Suppressed Voltage UL Portable/Plug-In Test (8 x 20 µs, 500A)	Observed 305V	<u>UL Listed Class</u> 330V	
Suppressed Voltage - Telecom Circuit	200V max		
EMI/RFI Rejection (@50 Ohms)	<u>Normal</u> Up to 80dB 150kHz to 100 MHz	Common Up to 60dB	
Response Time 1	Approx. 5 ns		
Temperature Range Operating Storage	0° to 40° C (32° to 104° F) -35° to 60° C (-31° to 140° F)		

<sup>1</sup> The response time of the MOV's will depend on the inductive effect of the circuit leads.

-2-



# Surge Suppression Receptacle - Technical Information



#### Straight Blade Specification Grade Duplex Receptacles

#### **Specifications**

Receptacle	Part	Description
Typical Specification – Catalog No. <b>5262S</b> Manufacturer's Identification – Hubbell <b>5262S</b> Description – Surge Suppression Duplex Receptacle Type – 2 Pole, 3 Wire, Grounding	Receptacle Top Base Tandem Modified By-Pass Power Contacts	<b>15A</b> Nylon Nylon .031" (.8) Brass
Rating – 15A, 125V Certification – UL Listed File E2186 Listed to UL Standards 498 Receptacles 1449 Transient Voltage Surge Suppressors CSA Certified to Specification C22.2 No. 42M (15A only) ANSI/IEEE C62.41 (IEEE 587) Installation Categories "A" (Ring Wave)	Mounting Strap Clamping Plate Terminal Screws Hex Hd. Grounding Screw Auto Grd. Clip Mounting Screws LED	.050" (1.3) Steel Zinc Coated .031" (.8) Brass Brass #8-32 Steel (Green) Stainless Steel Steel Zinc Plated Red
"B" (Unidirectional Impulse)	Alarm Muting Screw	Nylon
Performance		
Electrical		
Frequency Voltage Response Time* Protection Modes	60Hz 120V AC +10%-15% Approximately 5 ns. Normal and Common Modes	5
Transient Suppression Normal Mode (L-N) Common Modes (L-G) (N-G)	<u>Peak Energy (10 x 1000 μs)</u> 210 joules 210 joules 210 joules 210 joules	<u>Peak Current (8 x 20 μs)</u> 13000Α 13000Α 13000Α
Suppressed Voltage	UL Portable/Plug-In Test (8 3 UL Permanently Wired Test UL Listed	x 20 μs 500A) 340V (8 x 20 μs 3000A) 490V 500V max.
EMI/RFI Attenuation at 50 Ohms Normal Mode	40dB	500kHz - 100MHz
Operating Temperature Storage Temperature	0° to 40°C (32° to 104° F) -35° to 60° C (-31° to 140° ∣	F)
Mechanical		
Terminal Identification	Terminals identified in accor (Brass, White, Green)	dance with UL 498
Terminal Accommodation Product Identification Weight	#14-12 AWG copper conduc Ratings are permanent part 3.7 oz.	ctor only of device

Environmental Flammability

94-V2

\*The response time of the MOV's will depend on the inductive effect of the circuit leads.





Back View



#### **Hubbell Isolated Ground Receptacles**

#### Why do you need an isolated ground device?

When mounting a conventional receptacle in a steel box, the ground is commonly established through the existing electrical system. This is done by using either the grounding clip on the receptacle's mounting strap, or by running a ground wire (which is part of the "normal" existing system) to the green grounding screw.

In a conventional receptacle the grounding contacts are connected to the mounting strap and the green grounding screw. Thus, even when a separate green wire is brought to the receptacle, it is still tied into the normal ground. This occurs since the mounting strap is in contact with the box grounding system, therefore, a "pure" path to the ground is not established.

#### The Problem

The conventional grounding receptacle provides safety for personnel and equipment. However, the ground network also serves as a giant antenna and conductor of electrical noise. This electrical noise is electromagnetic interference and is caused by numerous transient ground currents. This can produce random transient electrical signals on the grounding system.

As a result, sensitive electronic equipment such as point of purchase terminals, accounting machines, computers and highly sensitive medical and communications equipment, can pick up these transient signals. This can interfere with the proper operation of the equipment.

#### The Solution

The isolated ground receptacle was developed by Hubbell over 27 years ago. This receptacle is similar to a conventional receptacle except for one important change. A patented insulating barrier construction isolates the ground contacts from the mounting strap. The green grounding screw is connected directly to the grounding contacts. The isolated equipment grounding circuit is completed by running an isolated ground wire to the green grounding screw. This ground wire passes through intermediate panel boards without being connected to their grounding terminal and terminates directly at an equipment grounding conductor terminal of the derived system or service, in accordance with NEC<sup>®</sup> Paragraph 250-74 exception #4.

#### The Result

This "isolated ground" can be kept relatively free of electrical noise. This is achieved since the grounding network has less branches, fewer sources of noise, and is connected to the ground at a single point.

Conventional Receptacle









# Straight Blade Isolated Ground

Receptacle Features and Benefits



#### Isolated Ground Receptacles A "Clean" Path Provides A "Clean" Ground For Sensitive Equipment

In February, 1968, Hubbell patented the first isolated ground receptacle. Today – when a clean, noise-free ground is more important than ever – Hubbell is still setting the standard.

Hubbell uses insulation barrier construction on many models to isolate the ground contacts from the mounting strap. The green grounding screw is connected directly to the grounding contacts. In this way, ground contacts are separated from the mounting strap and also from the conventional grounding system. The isolated ground circuit is completed by running a dedicated insulated ground wire from the system ground buss to the green grounding screw.

And there's more to the Hubbell line:

• Available in 23 NEMA configurations and a total of 73 different type receptacles.

- Versatility and mobility: With Hubbell's grounding method. Hubbell's IG devices can be mounted in boxes, on metal panels...almost anywhere.
- Hubbell quality: Every Hubbell IG device meets and exceeds all applicable codes and standards, plus the toughest standard of all...the Hubbell standard of excellence.

IG triangle clearly indicates isolated ground device on the face of the receptacle.





# **Isolated Ground Devices**

Straight Blade Receptacles







IG8200

# (Y) (S)

#### Isolated Ground Straight Blade Duplex and Single Receptacles

Rating	NEMA Number	NEMA Configuration	Description	Catalog Number
15A 125V	5-15R		Duplex Duplex Duplex Ivory Duplex Gray Style Line <sup>®</sup> Duplex	IG5262 IG5262CN* IG5262I IG5262GY IG2152
			4-PLEX®	IG415
			Single Single Single	IG5261 IG5261CN* IG5251
20A 125V	5-20R	Net CSA	Duplex Duplex Ivory Duplex Gray Duplex-CSA Style Line Duplex	IG5362 IG5362I IG5362GY IG5392CN* IG2162
			4-PLEX	IG420
			Single	IG5361
	6-15R		Duplex	IG5662
15A 250V			Single Single	IG5661 IG5651
204 2501/	6 20P	DG Not CSA	Duplex	IG5462
20A 230V	0-201	certified	Single	IG5461
30A 125V	5-30R		Single	IG9308
30A 250V	6-30R		Single	IG9330
50A 125V	5-50R		Single	IG9360
50A 250V	6-50R		Single	IG9367

#### 4-PLEX<sup>®</sup> Accessories

Description	Color	Catalog Number		
4-PLEX adapt	er plate for 1 a	nd 2 gang,	Orange	4APO
and 4" (101.6) square device boxes			-	

#### Hospital Grade Isolated Ground Straight Blade Receptacles

Rating	NEMA Number	NEMA Configuration	Description	Catalog Number
15A 125V	5-15R		Duplex Style Line Duplex Style Line Duplex-Ivory	IG8200 IG2172 IG2172I
			Single	IG8210
20A 125V	5-20R	Not CSA Certified	Duplex Style Line Duplex Style Line Duplex-Ivory Style Line Duplex-White	IG8300 IG2182 IG2182I IG2182W
			Single	IG8310

Note: All receptacles are orange unless noted.

\*Catalog numbers with "CN" suffix have Robertson/slotted screws. Catalog Number IG5392CN is 5-20R Canadian 20A, 125V. UL, CSA



# (h) (h)

#### **Isolated Ground Twist-Lock Receptacles**

Rating	NEMA Number	Configuration	Description	Catalog Number
15A 125V	L5-15R	(I The second se	2 pole, 3 wire duplex 2 pole, 3 wire duplex 2 pole, 3 wire single 2 pole, 3 wire single	IG4700 IG4700CN IG4710 IG4710CN
15A 250V	L6-15R		2 pole, 3 wire duplex 2 pole, 3 wire single	IG4550 IG4560
20A 125V	L5-20R		2 pole, 3 wire single 2 pole, 3 wire single	IG2310A IG2310ACN
20A 250V	L6-20R		2 pole, 3 wire single 2 pole, 3 wire single	IG2320A IG2320ACN
30A 125V	L5-30R		2 pole, 3 wire single 2 pole, 3 wire single	IG2610A IG2610ACN
30A 250V	L6-30R	( Contraction of the second se	2 pole, 3 wire single 2 pole, 3 wire single	IG2620A IG2620ACN
20A 125/250V	L14-20R		3 pole, 4 wire single 3 pole, 4 wire single	IG2410A IG2410ACN
20A 3Ø 250V	L15-20R		3 pole, 4 wire single	IG2420A
30A 125/250V	L14-30R		3 pole, 4 wire single	IG2710A
30A 3Ø 250V	L15-30R		3 pole, 4 wire single	IG2720A
20A 3ØY 120/208V AC	L21-20R	W O O DY	4 pole, 5 wire single	IG2510A
30A 3ØY 120/208V AC	L21-30R	W(L Q_G D)Y)	4 pole, 5 wire single	IG2810A



IG4700



Note: All receptacles are orange unless otherwise noted. Catalog numbers listed above with suffix "CN" have Robertson/slotted head screws.





### **Isolated Ground Receptacle - Technical Information**

#### Isolated Ground Straight Blade Duplex Receptacle

#### **Specifications**

Receptacle	Part	Description	9	
Typical Specification – Catalog No. IG5262	Receptacle	15A		
Manufacturer's Identification – Hubbell IG5262	Тор	Nylon	I DOM: N	
Description – Isolated Ground Straight Blade Duplex Receptacle	Base	R.T.P.*	- A. A.	
Type – 2 Pole, 3 Wire, Grounding	Triple Wipe Power Contacts	.032" (.8) Brass		
Rating – 15A, 125V	Wire Clamp	.062" (1.3) Steel	300	
Certification – UL Listed, CSA Certified	Mounting Strap	.050" (1.3) Brass	- 0	
	Insulator	Nylon	105262	
	Terminal Screws	Brass #8-32	165202	
	Hex Hd. Grounding Screw	Brass (Green)		
	Center Assembly-Rivet	Brass		
	Auto Grd. Clip	Stainless Steel		
	Flat. Hd. Mtg. Screws	Steel Zinc Plated		

#### Performance

Electrical			
Dielectric Voltage Max. Working Voltage	WIthstands 2,000V minimum 250V		
Current Interrupting Temperature Rise	Certified for current interrupting at full rated current Max 30°C temperature rise at full rated current after 50 cycles of overload at 150% of rated current with direct current		
Mechanical			
Terminal Identification	Terminals identified in accordance with UL 498 (Brass, White, Green)		
Terminal Accommodation	#14-12 AWG copper conductor only		
Product Identification	Ratings are permanent part of device		
Environmental			
Flammability	Top: UL 94 V2, Base: UL 94 VØ and UL 94 5 VA		
Operating Temperatures	Maximum continuous 60°C, minimum -40°C (w/o Impact)		

(140°F, -40°F)

\*Reinforced Thermoplastic Polyester Please consult the factory for product dimensions and specifications for other products listed in this brochure





#### Wiring Device - Kellems HUBBELL

Hubbell Incorporated • 1613 State Street • Bridgeport, Connecticut • 06605 • (203) 337-3100 • FAX (203) 579-2892 In Canada: Hubbell Canada, Inc. • 870 Brock Road South • Pickering, Ontario • L1W 1Z8 • (905) 839-1138 • FAX (905) 839-9108

112