

	Class I Protection			Class II protection				Class II or Class II fine		Tele	
Cat. Ref	SPA212A	SPA412A	SPN165R	SPN140D	SPN140R	SPN115D	SPN115R	SPN208S	SPN408S	SPN505	
Installation exposure level (risk)	extreme		maximum	high		moderate		low		moderate	
Standard	EN 61643-11: 2002, IEC 61643-1: 2005									EN 61643-21: 2000-09	
Type of connection	parallel									serial	
Type of power supply system	TNC-S / MEN system									-	
Type of protection	common and differential mode		common mode				common and differential mode		common and differential mode		
Nominal voltage	U _N	230V AC	230V / 400V AC	230V AC				230V / 400V AC	130V DC		
Rated voltage	U _C	255V AC		275V AC				255V AC		170V DC	
Voltage protection level (common mode)	U _p	<2.5kV		<1.5kV	<1.2kV		<1.0kV		<1.2kV	<1.5kV	<240V
Voltage protection level (differential mode)	U _p	<2.5kV		-				<1.0kV	<1.25kV	-	
TOV characteristic	U _T	-		335V / 5s						-	
Rated load current	I _L	-									200mA
Nominal discharge current (8/20)	I _n	-		20kA	15kA		5kA		2kA	5kA	
	I _{max}	-		65kA	40kA		15kA		8kA	10kA	
Impulse current (10/350)	I _{imp}	12.5kA		-							
Follow current interrupting rating	I _{fi}	12.5kA		-							
Residual current	I _{PE}	-		<300uA				<5uA		-	
Replacement cartridge		-		SPN056R	SPN040D	SPN040R	SPN015D	SPN015R	-		
Maximum rating of overcurrent protection		125A series / 315A parallel		32A C - curve						-	
Response time		<100ns		<25ns						<1ns	
Operating temperature range		-40°C to +60°C							-25°C to +40°C		-40°C to +60°C
Indication of SPD disconnecter	—	green LED on L1,L2,L3		green	green	green	green	green	green light off		-
	yellow			-	yellow	-	yellow				
	red			red	red	red	red				
Cross sectional area	min	10mm² solid / flexible		1.5mm² solid / flexible				1.5mm² solid / 1mm² flexible		screw terminal / RJ45 jack	
	L,N,PE max	50mm² stranded / 35mm² flexible		35mm² stranded / flexible				10mm² stranded / 6mm² flexible		-	
	L',N',PE' max	35mm² stranded / 25mm² flexible		-							
Tightening torque for terminals	Nm	7Nm		5Nm				1.2Nm		-	
Mounting		35mm DIN rail (EN60715)									
Casing material		Grey thermoplastic, UL94V-0									
Degree of protection		IP20									IP10
Installation width		4 mod	8 mod	1 mod				2 mod	3 mod	1.5 mod	
Weight		665g	1260g	150g	126g	133.5g	126g	120g	73g	110g	82g
Auxiliary contact				change over		change over		change over			
Electrical characteristics	U _N / I _N			AC 250V / 0.5A		AC 250V / 0.5A		AC 250V / 0.5A			
				DC 250V / 0.1A		DC 250V / 0.1A		DC 250V / 0.1A			
Connection capacity	min			0.25mm² solid		0.25mm² solid		0.25mm² solid			
	max			1.5mm² stranded		1.5mm² stranded		1.5mm² stranded			

Glossary of Technical abbreviations appropriate for Surge Protection Devices

I_{imp}	Impulse current based on the 10/350 waveform	I_{SC}	Short circuit voltage under test conditions
I_{max}	The maximum value of current that the SPD can withstand and remain operational	U_N	The nominal rated voltage of the installation
I_n	The nominal value of current that the SPD can withstand at least 20 times and still be serviceable	U_T	TOV characteristic
U_P	The maximum voltage that is measured across the terminals of the SPD without conducting	I_L	Rated load current
U_C	The maximum voltage which may be continuously applied to the SPD without conducting	MOV	Metal Oxide Varistor
U_{OC}	Open circuit voltage under test conditions	SPD	Surge Protection Device
		TOV	Temporary overvoltage characteristic
		I_{fi}	Follow current interrupting rating
		I_{PE}	Residual current
		t_A	Response time

Application notes

Selection for residential, rural and commercial areas

Direct lightning protection

The criteria for installing a lightning protective product.

- Does the installation contain a lightning rod?
- Is the installation adjacent to tall structures, tall trees or near a hill top in a lightning prone area?

If the answer is YES to any of the above, it is recommended to install the SPA212A (3 phase = SPA412A) spark gap device. This will provide protection against direct lightning strikes.

Both references, SPA212A & SPA412A (single & three phase respectively) have dual earth and phase / neutral terminals. This connection method reduces any additional voltage drop in the connecting cables to virtually zero thereby obtaining the best possible Up to the installation.

Further installation protection is provided by the fact that the devices are connected in both common and differential modes (L-E/N-E/L-N) together within inbuilt auto protection up to 12.5kA.



If the answer is NO to the above, a spark gap device is not required.

Tip: If maximum demand of the installation is 125A or less then use both terminal screws per pole for through connection. This will minimise the residual current. If the maximum demand is greater than 125A then tap off each phase for parallel connection. Refer to the user instructions for a wiring diagram.

The next step is the selection of the Transient Protective device.

Indirect Transient Protection

To ensure protection of the installation it is vital to have adequate protection from the harmful effect of transients.



Hager Thunder Day Map

This regional map illustrates the lightning activity across Australia and is based upon the 'Thunder Day Map' that appears in AS/NZS 1768. This map is compiled by the Bureau of Meteorology. As indicated, the country is split into three zones of activity.

The dark grey zone is maximum exposure, the mid grey zone is high exposure and the light grey zone is moderate exposure to lightning activity. The process of selecting the correct SPD for protection against transients is a simple one.

- In what region is the installation located?

- 1 Install SPN165R; the installation is protected from indirect transients up to 65kA.
- 2 Install SPN140D/R; the installation is protected from indirect transients up to 40kA.
- 3 Install SPN115D/R; the installation is protected from indirect transients up to 15kA.

Tip: For three phase installations, you will require three of the selected SPDs E.g: 3 x SPN165R

All Hager Class II medium protection products have plug-in cartridges available in two versions:

- SPD's with a base element and cartridge with a status indicator (to show the end of the life of the device). This is indicated with the suffix D at the end of the item number.
- SPD's with a base element which contains an auxiliary contact for remote signalling (audible and visual), and a cartridge with a reserve status indicator. The reserve status function has an added intermediate step which indicates that the cartridge needs to be replaced. While the installation is still protected, the cartridge should be replaced as soon as possible. This product is indicated with the suffix R at the end of the item number.
- SPN165 only available as R

The next system consideration is the protection of the installation's sensitive and valuable electronic equipment.

Equipment Protection

To ensure that today's and importantly tomorrow's, sensitive and valuable electronic devices continue to provide entertainment and service, it is vital to bring the residual voltage below 800V. This will minimise the chance of damage to microchips within these devices. Answering the question below will allow you to ascertain which Hager device best suits the needs of the installation.

- Does the installation contain electronic appliances? Eg. TV's, VCR's, microwave ovens, Hi-Fi system, computers, fax machines, DVD players, etc...

If the answer is YES, install SPN208S. By installing this device the residual voltage (Up) remaining in the system will be less than 800V. If the installation is 3 phase then install a SPN408S.

If the answer is NO, the installation requires no further protection.