



Voltsafe™

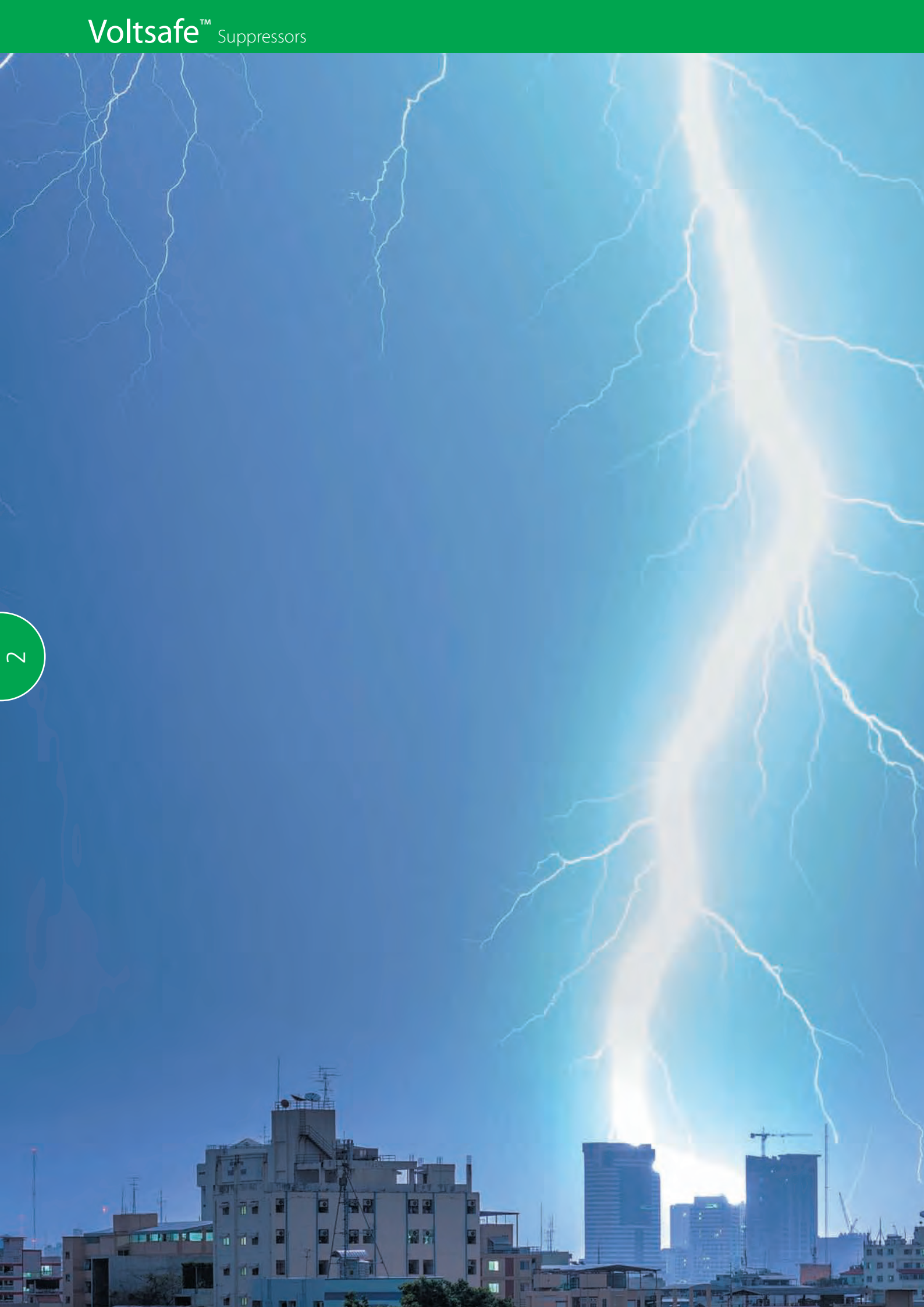
THE SOLLATEK SUPPRESSOR RANGE

Comprehensive protection for electrical equipment against:

- lightning • surges • spikes • RFI and noise
- over voltage • power-back surges



Sollatek™
the power to protect





Voltsafe™

THE SOLLATEK SUPPRESSOR RANGE

Comprehensive protection for electrical equipment against:

- lightning • surges • spikes • RFI and noise
- over voltage • power-back surges



A comprehensive range of Sollatek suppressors that offers complete protection whatever the size of your installation, ensuring mains and data line borne spikes are eliminated before they can cause potentially terminal damage. Power protection is essential, particularly in the digital age where equipment is particularly sensitive.

Surges are generated all the time

They can be generated by nearby equipment switching on/off. These millisecond events will be transmitted by the building's wiring and can cause mild to severe damage. The damage can be subtle and not apparent at first but after repeated attacks, it can cause equipment to fail beyond possible repair.

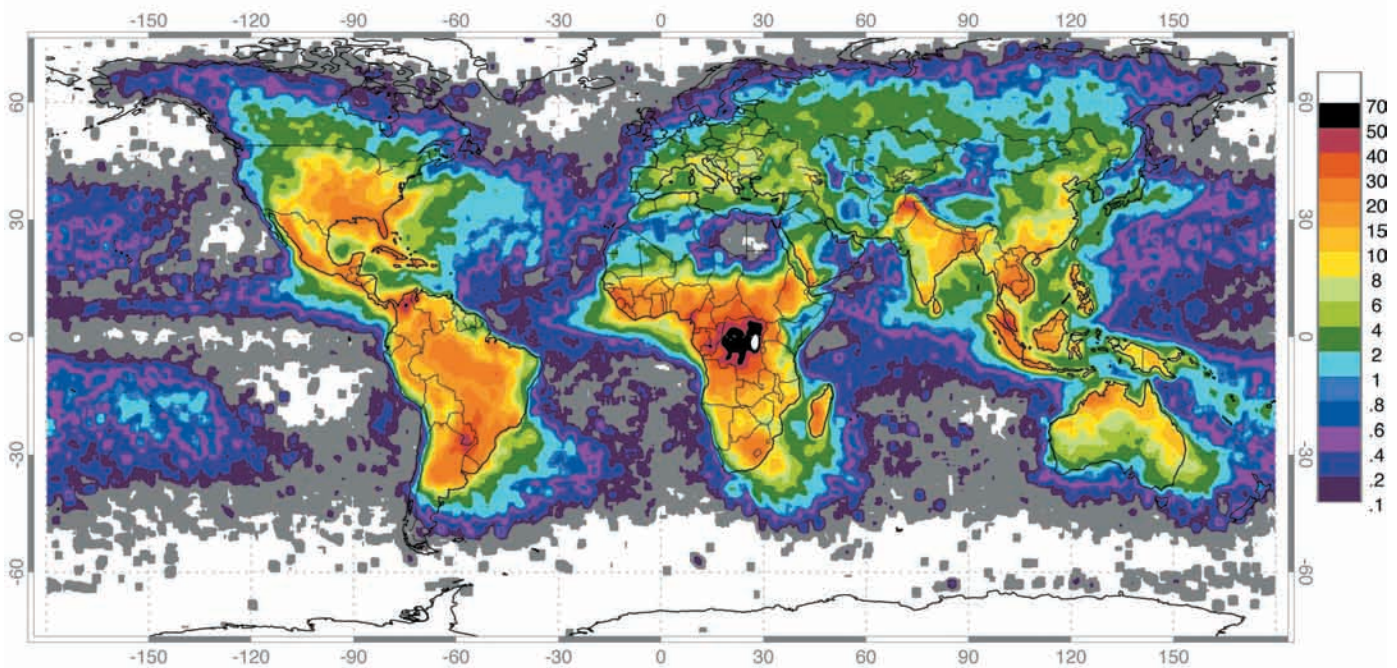
Surges can also be generated by lightning activity nearby, or as far away as hundreds of kilometres. These surges can be transmitted by various man-made structures such as overhead cables, metal structures and can enter a building through the electrical system. A lightning stroke can be a discharge resulting in an impulse current of 1000 to 200,000 amperes peak. The best protection system is a lightning rod or Lightning Protection System (LPS) which will capture the strike and direct it to some particular point (the ground, for example).

Surges can be generated by lightning as far away as hundreds of kilometres

Furthermore, exposed, tall structures, and high altitudes can place the site at higher risk of receiving high energy surges.

Examples of high risk areas are: telecom towers, oil rigs, sky scrapers, and high rise buildings.

Different areas around the world experience different levels of lightning activity with the equator being the area that experiences the highest level of lightning activity.



Global distribution of lightning April 1995-February 2003 from the combined observations of the NASA OTD (4/95-3/00) and LIS (1/98-2/03) instruments.

To protect an electrical/electronic installation system against surges and spikes, an SPD (Surge Protection Device) must be installed.

The SPD should be connected to all incoming services into the building, e.g: electrical, telecom, video, internet, and TV (antennae).

The SPD should be connected to the incoming terminal with the shortest possible cable with a minimum suitable cross section of 6mm². The SPD will dissipate the energy to earth. Dissipation of energy to earth is a vital and a critical function of an earthing protection system. Therefore the efficacy of the SPD will be greatly reduced (if not totally), if an improper earth/grounding is installed or missing.

To provide an effective protection system, a good earthing must be installed. All metallic structures, water pipes and electrical services must be bonded properly to earth with the shortest possible cables of adequate cross section.



A typical earthing electrode (left of gray pipe), consisting of a conductive rod driven into the ground.

SPDs could also incorporate filtering against noise and line Interference (RFI – Radio Frequency Interference). RFI and noise can be generated by a variety of equipment in the vicinity such as drills, motors, milling machines etc.

How do you choose an SPD?

- 1) Decide on the geographic area to determine the frequency of lightning occurrence.
- 2) Determine the site that is being protected.
- 3) Determine the level of protection required.

NG Value is the number of storm days per year a site is subjected to. Use this simple rule below:

NG Value (Storm days per year)		
If LPS (Lightning Protection System)		Use type I
Overhead lines	>25	Use type II
Critical public installations (hospitals, schools, airports and presence of overhead lines etc)	>25	Use type I
Human safety or heritage risk	<25	Risk assessment should be carried out
Human safety or heritage risk	>25	Use type II

There are 3 types which are defined by IEC standards. The distinction of the classes is based upon the peak current generated by an impulse. The speed at which the impulse peaks at and then dissipates to 50% is defined by the waveform. For example, 6.5kA @ 8/20µs (microseconds) means 6500 Amps peaking in 8microseconds and then reducing in power by 50% in 20 microseconds.



Type I - Surge arrester designed to run-off energy caused by an overvoltage comparable to that of a direct lightning strike. It has successfully passed testing to the standard with a 12.5kA @ 10/350µ wave. (1 shot only)



Type II - Surge arrester designed to run-off energy caused by an overvoltage. It has successfully passed testing to the standard with a 5kA 8/20µ wave. (at least 15 shots)



Type III - Surge arrester designed to run-off energy caused by an overvoltage. It has successfully passed testing to the standard with a combination wave (1.2/50µs and 8/220µ waves).

For more detailed information on the above classes and definition, please refer to Sollatek.



Where should an SPD be installed?

Different classes/types of SPD should be installed in different areas in the building or even external to the building. Refer to the simplified zones illustration above.

Lightning Protection Zones (LPZ) particularly to assist in determining the LPMS protection measures required within a structure. The LPZ concept as applied to the structure is shown in the illustration above and expanded upon in BS EN 62305-3.

The general principle is that the equipment requiring protection should be located in an LPZ whose electromagnetic characteristics are compatible with the equipment stress withstand or immunity capability.

In general the higher the number of the zone (LPZ2; LPZ3 etc) the lower the electromagnetic effects expected. Typically, any sensitive electronic equipment should be located in higher numbered LPZs and be protected by its relevant LPMS measures.

LPZ 3 Refers to equipment connected internally in a building and plugged into the electrical system. If the installation is particularly at risk from surges generated within the building (i.e. motors, lifts, fluorescent lights), a Type III device is required.

Products Choice :

- **Sollatek VoltShield range** is a combined Type III device plus protection against Under voltage, over voltage and power back surges.
- **The Sollatek VoltSafe range.** Available as Type III products like the MG, MGX, pureAC, SpikeGuard etc

LPZ 2 Refers to internal/indoor service panels which could be the point from which internal wiring branch out of.

Products Choice :

- **Sollatek VoltSafe range.** The DSP (Distribution Surge protector). Available in Type I & II, DIN rail mount configuration or Direct wiring. Select the kA rating most suitable for the application and environment. Higher kA rating for areas with a high NK value and risk of exposure to high level of surges.

LPZ 1 Refers to outdoor/building entry service point. At this point, the highest level of protection is installed so that it can deal with a higher level of surge and lightning activity.

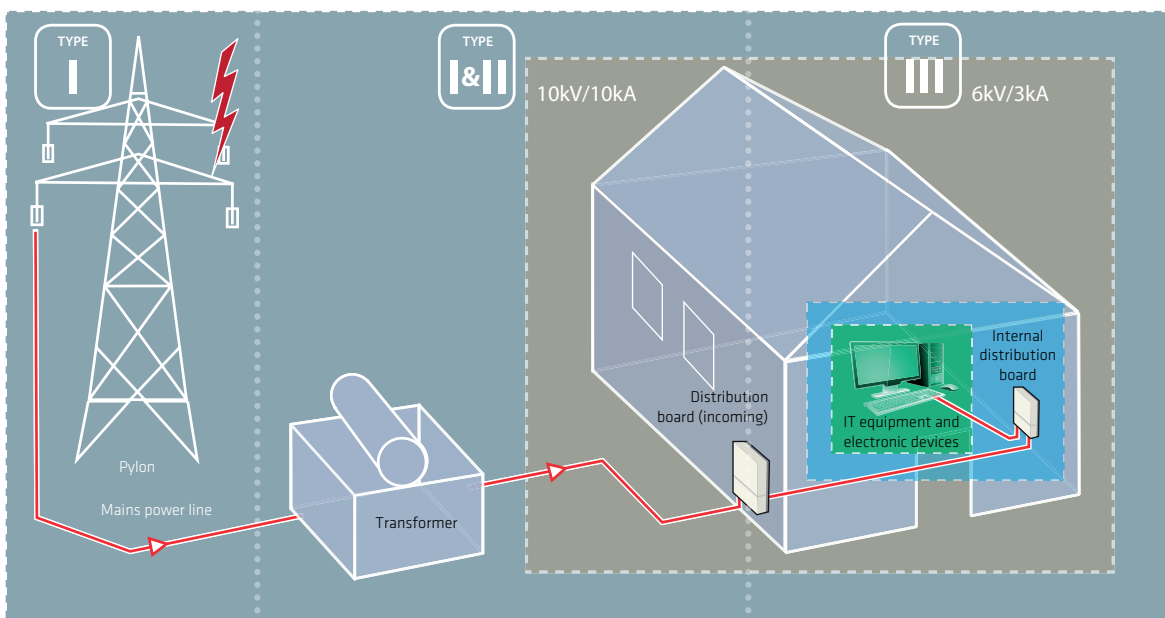
Products Choice :

- **Sollatek VoltSafe range.** The DSP (Distribution Surge Protector). Available in Type I & II, DIN rail mount configuration or direct wiring. Select the kA rating most suitable for the application and environment. Higher kA rating for areas with a high NK value and risk of exposure to high level of surges.

LPZ 0 (a + b) – Refers to outdoor structures
 a) fully exposed to direct flash and subject to full lightning and magnetic activity.
 b) No direct flash, partial lightning or induced current, full magnetic field.

Products Choice :

- **Sollatek VoltSafe range.** The DSP (Distribution Surge Protector). Available in Type I & II of high kA rating, DIN rail mount configuration or Direct wiring. Select the kA rating most suitable for the application and environment. Higher kA rating for areas with a high NK value and risk of exposure to high level of surges.



Single phase up to 13 amps - mains supplies

MultiGuard (MGX) Spike/surge protection



Model	Product Code		
MSX-1U	Call Sales		
MGX-2S	92642102	MGX6-1U	92642600
MSX6-1U	Call Sales	MGX6-2S	Call sales
MGX-1U	92641100	MGX6-2S	Call Sales

Features



Protection for



Socket availability

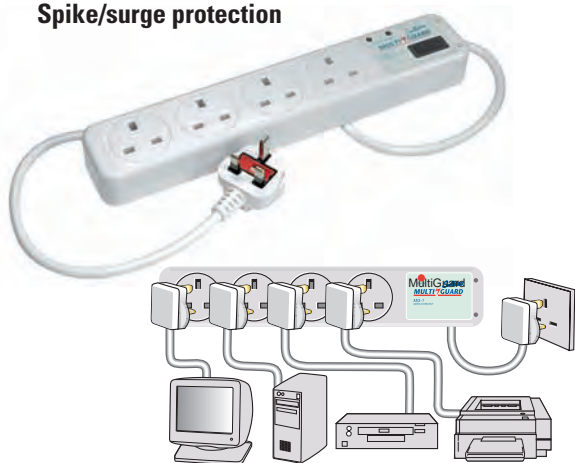


Max current	13 amps
Ideal for	All electronic appliances
Tip	Especially useful for computers and ideal for home use with video, TV, Hi-fi
Response time	<10 nanoseconds
Total energy rating	220 joules
Max surge current	6500kA
Weight	Dependent on model
Dims	370 x 160 x 70 mm

Product	Plug	Socket	Outlets	Cable Length	Switch
MGX-1U	UK	UK	4	1m	No
MGX6-1U	UK	UK	6	3m	No
MGX6-2U	UK	UK	6	3m	6
MGX-2S	EU	EU	5	1.8m	1
MGX-2WS	Indian	WS	4	1.5m	1
MGX6-2WS	Indian	WS	6	2m	1



MultiGuard (MG) Spike/surge protection



Model	Product Code		
MG-1	92641109	MG-4	Manufactured to order
MG-2	92642109	MG-5	Manufactured to order
MG-3	Manufactured to order	MG-5	92643109

Features



Protection for



Socket availability



Max current	13 amps
Ideal for	All electronic appliances
Tip	Especially useful for computers and ideal for home use with video, TV, Hi-fi
Response time	<10 nanoseconds
Total energy rating	480 joules
Max surge current	4500 amps
Weight	500 gm
Dims	370 x 160 x 70 mm

Product	Neon	Spike protection	LED	Switch	Telephone line protection	RFI	Outlets UK 13A	Cable length
MS-0		No	•				4	1.5m
MG-1	•	•					4	1.5m
MG-2		•	•	•			4	3m
MG-3		•	•	•	•		4	3m
MG-4		•	•	•		•	4	3m
MG-5		•	•	•	•	•	4	3m



SpikeGuard Spike/surge protection



Model
SpikeGuard UK socket
SpikeGuard European socket
SpikeGuard Indian socket

Product Code
92630000
92630100
92635300

Protection against:
• Mains surges/spikes

Max power	6 amps
Mains surge/spike protection	160 joules
Mains surge/spike discharge	6.5kA (8/20µs)
Ideal for	All sensitive electronic equipment
Tip	Prevents everyday spikes and surges from reaching sensitive equipment
Protective mode	L-N, L-E, N-E
Weight	180 gm
Dims	140 x 60 x 90 mm

Features



Protection for



Single phase + RFI up to 13 amps - mains supplies

PureAC Spike/surge and RFI protection



Model	Product Code	Amps
PureAC03 UK13	91003000	3
PureAC03 European	91003100	3
PureAC07 UK13	91007000	7
PureAC07 European	91007100	7
PureAC13 UK13	91013000	13
PureAC13 European	91013100	13

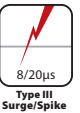
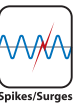
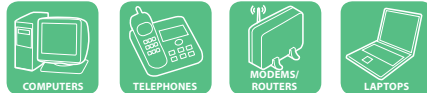
Protection against:
• Spikes/surges
• RFI (radio frequency interference) and noise

Max power	Dependent on model (up to 13 amps)
Ideal for	All electronic appliances
Tip	Especially useful for computers and telecommunication equipment like switchboards (PABX), telephones, modems and computers
Protective mode	L-N, L-E, N-E
Response time	<10 nanoseconds
Total energy rating	480 joules
Max surge current	6.5kA (8/20µs)
Typical attenuation	50dB @ 10Mhz
Weight	185 gm
Dims	140 x 60 x 90 mm

Features



Protection for



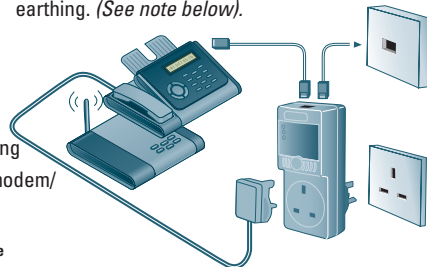
Single phase + telecom up to 6 amps

CommsGuard Spike/surge protection



Lightning and mains surges and spikes can enter the telephones and cause damage to hardware and data. Being connected to the internet for long periods increases the risk of damage. The CommsGuard provides an effective way of preventing serious damage. As adequate protection requires that surges from the data lines are dissipated to earth, the CommsGuard is ideal as it can be plugged into the mains to provide the earthing. (See note below).

Protection against:
• Mains spikes/surges
• Data line spike/surge/lightning protection i.e. for telephone/modem/fax lines



Model	Product Code
CommsGuard – UK	92855000
CommsGuard – European	92850100
CommsGuard – Indian	92855300

Features



Protection for



Max power	13 amps
Mains surge/spike protection	160 joules
Mains surge/spike discharge	6.5kA (8/20µs)
Data surge/spike discharge	>5kA
Max power	>10kA (8/20 s)
Protective mode	L-N, L-E, N-E
Ideal for	Modem, fax, telephone, routers
Tip	Ideal for protection of computer data, internet, modems, fax machines and telephones
Socket availability	Mains plus telephone connection
Weight	195 gm
Dims	140 x 60 x 90 mm

Note: The CommsGuard and LightningGuard are similar in that they both protect against spikes and surges on both data line and mains. However the LightningGuard adds over-voltage protection on the mains, by disconnecting on over-voltage, with subsequent built-in start-up delay.



Single & three phase - mains distribution systems

Voltsafe™ DSP range The Distribution Surge Protector, available in single and 3 phase models - is the first choice for high capacity surge protection. This range is ideally suited to the protection of both entire distribution boards and equipment in domestic and industrial environments.

The Sollatek DSP range is available either in a direct

wiring configuration or in Din rail enclosure to facilitate easy installation in distribution panels and close to PLCs.

The Sollatek DSP range covers both Type I & Type II protection devices. The Type I din rail products uses GDTs to ensure no follow through current (unlike some Air/Spark Gap technologies), very low let through voltage (Up), enhancing protection for sensitive electronic equipment and telecom installations.

Single Phase – direct wiring

DSP1P-20-T2 Mains spike/surge protection



A directly wired surge protection device (SPD) offering Type II protection. Maximum surge current handling capabilities of 20kA with a maximum let through voltage of 750Vac. Ideally suited to the protection of both entire distribution boards and equipment in domestic and industrial environments. Features LED indication of protection status and requires no operator intervention or maintenance.

Model
DSP1P-20-T2

Product Code
91000200

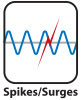
Features



Protection for



Max surge current per pole (Imax):	20kA
Max operating voltage per pole (Uc):	810V
Voltage protection level (Up):	750V
Fault indication	LED
Remote contacts	No
Weight	500gm
Dims	183 x 133 x 53 mm



DSP1P-100-T2 Mains spike/surge protection



Specifically designed to give high capacity protection in industrial applications, the DSP1P-100 is a Type II device and offers all-mode protection and maximum surge handling capability of 100kA. Enclosed in a IP66 rated enclosure design.

Model
DSP1P-100-T2

Product Code
9M310020

Features



Protection for



Max surge current (8/20µ)	100kA
Let through voltage @3kA	750V
Enclosure	IP66
Indication	Green LED on: Protection present Green LED off: Internal failure
Remote contacts	No
Weight	2.3Kg
Dims	236 x 76 x 125 mm



Three Phase – direct wiring

DSP3P-80-T2 Mains spike/surge protection



Directly wired 3 Phased Type II SPD offering current handling capabilities of 20kA per phase with a maximum let through voltage of 750Vac. Ideally suited to the protection of both entire distribution boards and equipment in domestic and industrial environments. Features LED indication of protection status and requires no operator intervention or maintenance.

Model
DSP3P-80-T2

Product Code
93000200

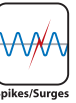
Features



Protection for



Total surge current	80kA
Max surge current per pole (Imax)	20kA
Max operating voltage per pole (Uc)	310V
Voltage protection level (Up)	750V
Fault indication	LED
Remote contacts	No
Weight	500gm
Dims	183 x 133 x 53 mm



DSP3P-120-T2 Mains spike/surge protection



3 Phase version of the industrial SPD. Designed to give high capacity protection in industrial applications, the DSP3P-120 is a Type II device and offers all-mode protection plus maximum surge handling capability of 120kA. Enclosed in a IP66 rated enclosure design.

Model
DSP3P-120-T2

Product Code
9M312010

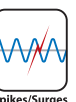
Features



Protection for



Total surge current	120kA
Max surge current per pole (Imax)	25kA
Let through voltage @3kA	1.2kV
Enclosure	IP66
Indication	Green LED on: Protection present Green LED off: Internal failure
Remote contacts	No
Weight	2.3Kg
Dims	236 x 76 x 125 mm



DSP3P-170-T1 + T2 Mains spike/surge protection



Designed to provide primary high capacity industrial surge protection at main service entrance locations, the DSP3P-170 gives ten-mode protection with a maximum surge handling capacity of 170kA per phase Type II. It is also a Type I device offering 50kA @ (10/350µs). With built-in redundant full varistor networks, this DSP ensures your premises are never unprotected. Visual warning or remote warning alerts the operator of the failure of one varistor network while the redundant unit keeps protecting the site thus ensuring your equipment is always protected, even after a direct strike. The unit's enclosure is IP66 rated.

Model
DSP3P-170-T1

Product Code
9M315010

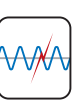
Features



Protection for



Max surge current (8/20µ)	170kA
Let through voltage @3kA	750V
Enclosure	IP66
Indication	Green LED on: Protection present Green LED off: Internal failure
Remote contacts	Yes
Weight	3.2Kg
Dims	214 x 297 x 123 mm



Single Phase – Din rail

DSP1P-25DM-T1+T2

Mains spike/surge protection



The Sollatek DSP1P-25DM-T1+T2 is a Type I & II combined surge protection device. This highly efficient lightning surge arrester is suitable for all installations where risk of surge and spike activity is particularly high, as in telecom installations, oil rigs, and open exposed areas with metal structures. The unit is a 2-pole device that provides 25kA (Type I, 10/350µs) protection per pole and up to 30kA per pole for everyday surge activity (Type II, 8/20µs). It is housed in a

compact 35mm din rail mount enclosure.

The Sollatek DSP1P-25DM-T1+T2 is the ideal solution for protecting all sensitive electronic equipment.

Phase	1
Type	Type I&II
Nominal discharge current (8/20 µs)/pole [In]	30kA
Maximum discharge current (8/20 µs)/pole [Imax]	N/A
Unit's total kA	120kA (8/20µs) / 50kA (10/350µs)
Voltage protection level [Up]	1.5kV
Impulse discharge Current (10/350u/pole) [Iimp]	25kA

Model
DSP1P-25D-T1+T2

Product Code
9M102520

Features



Protection for



Spikes/Surges

DSP1P-40DC-T2

Mains spike/surge protection



The Sollatek DSP1P-40DC-T2 is a Type II surge protection device. This surge arrester is suitable for all installations where risk of surge and spike activity is particularly high. This unit is suited to installation in distribution panels in LPZ2. This unit provides 40kA (Imax) for every day surge activity. It is housed in a compact 35mm din rail mount enclosure. The Sollatek DSP1P-40DC-T2 is an ideal protection for all sensitive electronic equipment

Phase	1
Type	Type II
Nominal discharge current (8/20 µs)/pole [In]	20kA
Maximum discharge current (8/20 µs)/pole [Imax]	40kA
Unit's total kA	40kA
Voltage protection level [Up]	1.25kV

Model
DSP1P-40DC-T2

Product Code
9M104020

Features



Protection for



Spikes/Surges

DSP1P-10DR-T2+T3

Mains spike/surge protection



The Sollatek DSP1P-10DR-T2+T3 is a Type II&III surge protection device. This highly efficient lightning surge arrester is suitable for all installations where risk of surge and spike activity is particularly high, as in telecom installations, PLCs, IT equipment, where risk of RFI & Noise is high. This unit will protect against surges & spikes up to 10kA and with added RFI filtering. Should be installed in-line for

maximum protection and is rated at a maximum of 10Amps. Ideal for installation on a din rail in PLCs and system panels.

Phase	1
Type	Type III
Nominal discharge current (8/20 µs)/pole [In]	3kA
Maximum discharge current (8/20 µs)/pole [Imax]	10kA
Unit's total kA	10kA
Voltage protection level [Up]	1kV/0.8kV
RFI filtering	t _a 0.1 - 30 Mhz

Model
DSP1P-10DR-T2+T3

Product Code
9M101020

Features



Protection for



RFI / Noise



Spikes/Surges

Three Phase – Din rail

DSP3P-100DM-T1+T2 Mains spike/surge protection



The Sollatek DSP3P-100DM-T1+T2 is a Type I & II surge 3 Phase protection device. This highly efficient lightning surge arrestor is suitable for all installations where risk of surge and spike activity and, particularly due to nearby lightning activity, is high, as in telecom installations, oil rigs, and open exposed areas with metal structures. This unit should be installed in all building and sites at high risk (where

a Lightning Protection System is in place and there is risk to human life such as schools, hospitals etc), and especially in climates where storms are frequent (NG > 25) or in the presence of overhead electric lines.

Phase	3
Type	Type I&II
Nominal discharge current (8/20 μs)/pole [In]	30kA
Maximum discharge current (8/20 μs)/pole [Imax]	70kA
Unit's total kA	240kA (8/20μs) / 100kA (10/350μs)
Voltage protection level [Up]	1.5kV
Impulse discharge Current (10/350u/pole) [Iimp]	25kA

Features

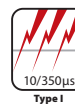
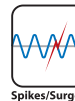
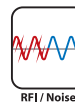


Protection for



Model
DSP3P-100DM-T1+T2

Product Code
9M310014



DSP3P-40DMC-T2 Mains spike/surge protection



The Sollatek DSP3P-40DMC-T2 is a Type II surge protection device. Constructed in a simple modular and cartridge design where the active module can be easily changed without removing the unit. It is an efficient surge arrestor suitable for all installations where risk of surge and spike activity is particularly high. The unit is a 4-pole device that provides 20kA (Type II) per pole.

Phase	3
Type	Type II
Nominal discharge current (8/20 μs)/pole [In]	20kA
Maximum discharge current (8/20 μs)/pole [Imax]	40kA
Unit's total kA	40kA
Voltage protection level [Up]	1.25kV

Features

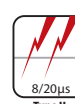
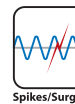
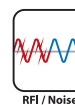


Protection for



Model
DSP3P-40DMC-T2

Product Code
9M3104040



SUMMARY

Voltage surges and lightning strikes

Voltage surges are momentary increases in the normal working voltage of a system. Sometimes referred to as 'spikes', 'overvoltages', or 'transients', these surges can affect power cables, data/telephone cables and instrument wiring, causing anything from data loss to the total destruction of equipment. All electrical and electronic equipment, connected to the mains supply is at risk of being damaged.

Typical causes include fluorescent light switching, arc welders, and nearby lightning activity. Lightning activity is potentially the most damaging.

Lightning protection

Surge protection devices (SPDs) cannot protect equipment against direct lightning strikes. Instead they protect by neutralising voltage surges on cables caused by inductive or resistive coupling from nearby lightning strikes. In particular, SPDs should be fitted on the mains power supply lines and incoming data/signal to/from all critical sensitive equipment.

Cables such as these - and consequently any equipment associated

with them - are particularly at risk as they are partly installed outside the building where they are more vulnerable to the effects of nearby lightning strikes.

A strike within 100 m of cables or buildings can induce surges up to 5kV and 1.25kA.

Also at great risk are sites powered from overhead cables. Any direct lightning strikes to the power network will travel along the cables, with the potential of damage to the equipment powered by these, since surges can rise to a level of more than 6kV and 3kA.

RFI (Radio Frequency Interference)

Also, not visible but equally damaging, is noise & RFI (Radio Frequency Interference). Noise & RFI generally interfere with data and can cause loss of valuable information or data corruption. Protection - or RFI filtration, should be implemented whenever important or critical data is being used.

Spikes, noise & RFI may be caused by:

- Switching events in the power supply network
- Lightning strikes
- Normal load switching by the supply company
- Industrial load switching
- Accidental events such as short circuits
- Broken mains cables
- Faulty electrical equipment

These problems can also originate inside the building for example:

- A faulty lift motor
- Failing fluorescent light
- Faulty domestic equipment
- Welding equipment

Although less intense than those due to big switching events outside the building, spikes, noise and RFI can also be generated inside the building. This is why the Sollatek range of power suppression units offer protection at each distribution board and then at each piece of equipment for total facility protection.

Spikes are too brief to be noticed by people in the workplace. The only sign that a spike has occurred may be that an item of equipment has inexplicably broken down.

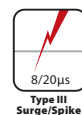
Lightning - description

When a lightning discharge strikes an overhead power cable it generates a short-lived impulse of hundreds of kilovolts.

Flashover and protective devices near the point of impact reduce this to tens of kilovolts but nevertheless a formidable residual spike remains and is launched out in both directions along the overhead cable. It jumps across switches and transformers and if it enters a building may be propagated throughout the interior wiring.

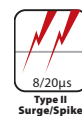
Because of their extreme amplitude spikes can cause fatal damage to vital components inside an item of equipment.

We have defined for the purpose of simplicity, to categorise our products into 3 levels of lightning protection:



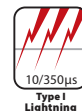
1. Basic lightning

Protection up to 6.5kA



2. Advanced lightning

Protection between 6.5kA and 40kA



3. Expert lightning

Protection more than 40kA

PLUG IN RANGE - SINGLE PHASE



Model	MGX	MG	SpikeGuard	PureAC	LightningGuard	CommsGuard
Current Rating (Amps)	Up to 13	13	6	Up to 13	6	13
Phase	Single	Single	Single	Single	Single	Single
Response time (Nano Sec)	<10ns	<10ns	<10ns	<10ns	<10ns	<10ns
Total Energy Rating (Joules)	220J	480J	160J	480J	160J	160J
Peak Transient Current (8/20us)	6.5kA	6.5kA	6.5kA	6.5kA	6.5kA	6.5kA
Maximum Let through Voltage	750V	750V	750V	750V	750V	750V
High Voltage disconnect					Yes (user adjustable)	
RFI & Noise		MG4 & MG5 only				
Capacitance		2x4.7nF(Y) 1 x 0.22uF (x2)		2x4.7nF(Y) 1 x 0.22uF (x2)		
Inductance		0.63mH		Up to 0.63mH		
Typical Attenuation		50dB@10MHz		50dB@10MHz		
Data		MG3 only				
Response Time (NanoSeconds)		<10			<10	<10
Max Impulse current (8/20us)		<5kA			<5kA	<5kA
Line Resistance		<0.10hm			<0.10hm	<0.10hm
Working Voltage		140V Max			140V Max	140V Max
Capacitance		<200pf			<200pf	<200pf
DC insertion Loss		0.4dB			0.4dB	0.4dB
Bandwidth		>1MHz (@600mh)			>1MHz (@600mh)	>1MHz (@600mh)
Dimension Unpacked (mm)	Dependent on model	404x147x53	140x60x90	140x60x90	140x60x90	140x60x90
Dimension Packed (mm)	Dependent on model	404x147x53	230x130x70	230x130x70	230x130x70	230x130x70
Weight Unpacked (grams)	Dependent on model	650g	180g	185g	195g	195g

DIRECT WIRING RANGE - SINGLE AND THREE PHASE



Model	DSP1P-20-T2	DSP1P-100-T2	DSP3P-80-T2	DSP3P-120-T2	DSP3P-170-T1
Phase	1	1	3	3	3
Type	Type II	Type II	Type II	Type II	Type I
Nominal voltage (Power Supply System) [UN]	230V	230V	230V/415V	230V	230V
Maximum operating voltage [Uc]	310V	300	310V/537V	415V	415V
Temporary overvoltage (TOV) [UT]	320V	300	320V/554V	300/520	280V
Nominal discharge current (8/20 μs)/pole [In]	20kA	100kA	20kA	120kA	170kA
Lightning impulse current (10/350 μs)/pole [Iimp]	-	5kA	-	6kA	50kA
Maximum discharge current (8/20 μs)/pole [Imax]	20kA	100kA	20kA	120kA	170kA
Unit's total kA	20kA	100kA	80kA	120kA	170kA
Voltage protection level [Up]	750V	1.2kV	750V	1.2kV	1.2kV
RFI filtering	No	No	No	No	No
Ic @ Uc (leakage current)	<1mA	<1mA	<1mA	<1mA	<1mA
Maximum overcurrent protection	32A	32A	32A	32A	32A
Degree of protection [IP]	IP41	IP66	IP41	IP60	IP66
Range of operating temperatures	- 40 °C to + 80 °C	- 40 °C to + 85 °C	- 40 °C to + 80 °C	- 40 °C to + 85 °C	- 40 °C to + 85 °C
Replaceable cartridge	No	No	No	No	No
Fault indication	LED	LED - Alarm	LED	Red & Green LED - Alarm	Red & Green LED - Alarm
Remote monitoring	-	No	-	No	Optional
Unpacked Dimension (mm)	183x133x53	236x76x125	183x133x53	236x76x125	214x297x123
Weight (grams)	500g	2.3Kg	500g	2.3Kg	3.2Kg
Stock No.	91000200	9M310020	93000200	9M312010	9M315010

DIN RAIL RANGE - SINGLE PHASE



Model	DSP1P-25DM-T1+T2	DSP1P-40DC-T2	DSP1P-10DR-T2+T3
Phase	1	1	1
Type	Type I & II	Type II	Type III
Nominal voltage (Power Supply System) [Un]	230V	230V	230V
Maximum operating voltage [Uc]	255V (300)	255V (275)	255V
Temporary overvoltage (TOV) [UT]	440V/120min	440V/120min	335/5s
Nominal discharge current (8/20 μs)/pole [In]	30kA	20kA	3kA
Lightning impulse current (10/350 μs)/pole [Iimp]	25kA	N/A	N/A
Maximum discharge current (8/20 μs)/pole [Imax]	N/A	40kA	10kA
Unit's total kA	120kA (8/20μs) / 50kA (10/350μs)	40kA	10kA
Voltage protection level [Up]	1.5kV	1.25kV	1 kV / 0.8kV
RFI filtering	No	No	0.1 - 30 Mhz
Ic @ Uc (leakage current)	None (Due to VG)	None	<1mA
Maximum overcurrent protection	250A	50A	20A
Degree of protection [IP]	IP20	IP20	IP20
Range of operating temperatures	- 40 °C to + 80 °C	- 40 °C to + 80 °C	- 40 °C to + 80 °C
Replaceable cartridge	No	Yes	No
Fault indication	Red Indication	Red Indication	LED
Remote monitoring	Yes	Optional	No
Unpacked Dimension (mm)	72x90x67	35x90x67	70x90x59
Weight (grams)	556g	180g	235g
Stock No.	9M102520	9M104020	9M101020

DIN RAIL RANGE - THREE PHASE



Model	DSP3P-100DM-T1+T2	DSP3P-40DMC-T2
Phase	3	3
Type	Type I & II	Type II
Nominal voltage (Power Supply System) [Un]	230V/400V	230V
Maximum operating voltage [Uc]	255V	255V
Temporary overvoltage (TOV) [UT]	450V/5s	440V
Nominal discharge current (8/20 μs)/pole [In]	30kA	20kA
Lightning impulse current (10/350 μs)/pole [Iimp]	25kA	N/A
Maximum discharge current (8/20 μs)/pole [Imax]	70kA	40kA
Unit's total kA	240kA (8/20μs) / 100kA (10/350μs)	40kA
Voltage protection level [Up]	1.5kV	1.25kV
RFI filtering	No	No
Ic @ Uc (leakage current)	None (due to VG)	None
Maximum overcurrent protection	250A	50A
Degree of protection [IP]	IP20	IP20
Range of operating temperatures	- 40 °C to + 80 °C	- 40 °C to + 80 °C
Replaceable cartridge	No	Yes
Fault indication	Red Indication	Red Indication
Remote monitoring	Yes	Optional
Unpacked Dimension (mm)	144x90x67	70x90x67
Weight (grams)	1.13Kg	334g
Stock No.	9M310014	9M3104040