



- Direct Strike Protection
- Earthing Products & Solutions
- Surge & Transient Protection for Power, Data, Communications and RF Lines

LPI® SG + SST Spark Gap Surge Filter

Features

- High performance surge protector for an operating voltage of 220 - 240Vac
- Encapsulated spark gap and SST capable of sustaining fault and over-voltage conditions up to 385Vrms as per IEC 61643
- Three stage protection best suited for sensitive electronic equipment

Product Description



- Designed to suit TT, TN-C, TN-S & TN-C-S distribution systems
- Ferro cored inductors – dv/dt and di/dt of the incoming surge will be reduced by 1000 times
- High primary 50kA 10/350 μ s, (135kA 8/20 μ s) and secondary 50kA 8/20 μ s surge protection (Total of 185kA 8/20 μ s per phase).
- High N - E protection rating – 100kA 10/350 μ s, 150kA 8/20 μ s
- Status indicator, remote alarm contact and optional surge counter

Electronic equipment is highly susceptible to damage from lightning and other transient pulses (including man made switching transients), which arrive via the powerlines through direct strike, or inductive and capacitive coupling. Efficient filtering and clamping at the point of entry of power feeds to sensitive electronic equipment is essential to mitigate physical equipment damage, loss of operations and economic loss.

The LPI SG+SST Series Surge Filter provides multiple stage protection against incoming surges & transients and shall be installed in series with the incoming mains power supply to the equipment or building. Shunt-only clamping alone is not sufficient, as it does not limit the excessive wavefront characteristic of the pre-clamped waveform. The LPI Surge Filter will reduce the rate of rise of voltage (dv/dt) to below 15V/ μ s as per AS1768 Cat B 3kA (8/20 μ s) applied impulse and to below 30V/ μ s for AS 1768 Cat C 20kA (8/20 μ s) applied impulse.

The SG+SST series filter is designed for multistroke lightning events and is supplied with spark gaps as the primary protection between Phase and Neutral rated at 50kA 10/350 μ s (135kA 8/20 μ s).

The second stage consists of ferro cored inductors and capacitors (L-C Filtering) which further attenuates the let-through voltage already clamped by the primary stage. Ferro-cored inductors are used as they are much smaller than non-saturating air-cored inductors. Unlike primary MOV protection, the let through voltage of Spark Gaps remain high for only a few microseconds and hence ferro-cored inductors are a practical alternative.

The filter attenuates noise and any harmonics present on the power system and is designed to attenuate transverse and common mode noise. The third stage consists of SST diverters connected across the load side, these are designed to suppress surges generated by load side equipment.

LPI SG+SST filter limits the voltage differential due to a lightning induced impulse between phase and neutral as well as from neutral to ground. Thus providing both common mode and differential (transverse) mode protection. Neutral to earth protection rated at 100kA 10/350 μ s (150kA 8/20 μ s) is provided to limit feedback currents if the site earth goes high potential with respect to the sub-station or transformer earth. This is a common occurrence due to a near-by direct strike.

Description	LPI® SG+SST Series Surge Filters
Nominal Operating Voltage Un:	220 – 240Vac Ph - N @ 50/60Hz
Max Continuous Operating Voltage Uc:	385Vrms
Operating time:	< 1ns
Power distribution systems:	TT, TN-S, TN-C, TN-C-S (MEN)
Primary surge protection rating per phase:	50kA 10/350µs (135kA 8/20µs) single shot surge capacity between Phase and Neutral
Secondary surge protection rating per phase:	50kA 8/20µs single shot surge capacity between Phase and Neutral
Total surge protection per phase:	185kA 8/20µs
N – E protection:	100kA 10/350µs, 150kA 8/20µs
Protection Modes:	Transverse and common mode
Inductor:	Ferro cored, low pass, power and noise filtering
Capacitor type:	Self healing polypropylene
Surge counter (Optional**):	7 Digit electro mechanical display
Current crest factor:	> 3:1
Voltage drop:	< 2V at full load
Efficiency:	99%
Frequency response:	3dB point below 3000Hz
Performance:	Typical let-through voltage for all models < 2 x mains peak voltage
Standards (Primary and secondary):	IEC 61643-1, BS 6651 Cat A & B
Standards (N - E):	E DIN VDE 0675 part 6 as well as IEC 61643-1
Surge withstand:	ANSI/IEEE C62.41 – 1991 and AS 1768 –1991 Cat. A, B and C surge tests
Protection status indication:	Status monitor & remote alarm contacts (on Secondary Protection)
Environmental rating:	IP 55
Enclosure:	Metal enclosure with durable polyester powder coat finish
Colour:	Oyster grey
Mounting:	Wall mount
Operating temperatures:	-35 to +50°C, 0 – 95% humidity
Warranty:	5 Years manufacturer's warranty

TECHNICAL DATA SHEET

LIGHTNING PROTECTION INTERNATIONAL PTY LTD ABN 11 099 190 897



Ordering Code	Description	Phase	Rated Voltage Ph - N	Dimensions (mm)	Weight (Kg)
SF132A-NE-SG	Surge Filter, 1Ph, 32A, with class 1 Protection Applied P-N, 50kA 10/350µs, 135kA 8/20µs Line side protection, 50kA 8/20µs Load Side protection Per Phase. 100kA 10/350µs N-E, Status Indication, Alarm Contacts.	1	220 – 240V (50-60Hz)	300x200x150	6
SF132A-NEC-SG	Surge Filter, 1Ph, 32A, with class 1 Protection Applied P-N, 50kA 10/350µs, 135kA 8/20µs Line side protection, 50kA 8/20µs Load Side protection Per Phase. 100kA 10/350µs N-E, Status Indication, Alarm Contacts + Counter.	1	220 – 240V (50-60Hz)	300x200x150	6
SF140A-NE-SG	Surge Filter, 1Ph, 40A, with class 1 Protection Applied P-N, 50kA 10/350µs, 135kA 8/20µs Line side protection, 50kA 8/20µs Load Side protection Per Phase. 100kA 10/350µs N-E, Status Indication, Alarm Contacts.	1	220 – 240V (50-60Hz)	300x200x150	6
SF140A-NEC-SG	Surge Filter, 1Ph, 40A, with class 1 Protection Applied P-N, 50kA 10/350µs, 135kA 8/20µs Line side protection, 50kA 8/20µs Load Side protection Per Phase. 100kA 10/350µs N-E, Status Indication, Alarm Contacts + Counter.	1	220 – 240V (50-60Hz)	300x200x150	6
SF163A-NE-SG	Surge Filter, 1Ph, 63A, with class 1 Protection Applied P-N, 50kA 10/350µs, 135kA 8/20µs Line side protection, 50kA 8/20µs Load Side protection Per Phase. 100kA 10/350µs N-E, Status Indication, Alarm Contacts .	1	220 – 240V (50-60Hz)	300x200x150	6
SF163A-NEC-SG	Surge Filter, 1Ph, 63A, with class 1 Protection Applied P-N, 50kA 10/350µs, 135kA 8/20µs Line side protection, 50kA 8/20µs Load Side protection Per Phase. 100kA 10/350µs N-E, Status Indication, Alarm Contacts + Counter.	1	220 – 240V (50-60Hz)	300x200x150	6
SF332A-NE-SG	Surge Filter, 3Ph, 32A, with class 1 Protection Applied P-N, 50kA 10/350µs, 135kA 8/20µs Line side protection, 50kA 8/20µs Load Side protection Per Phase. 100kA 10/350µs N-E, Status Indication, Alarm Contacts.	3	220 – 240V (50-60Hz)	400x300x150	12
SF332A-NEC-SG	Surge Filter, 3Ph, 32A, with class 1 Protection Applied P-N, 50kA 10/350µs, 135kA 8/20µs Line side protection, 50kA 8/20µs Load Side protection Per Phase. 100kA 10/350µs N-E, Status Indication, Alarm Contacts + Counter.	3	220 – 240V (50-60Hz)	400x300x150	12
SF340A-NE-SG	Surge Filter, 3Ph, 40A, with class 1 Protection Applied P-N, 50kA 10/350µs, 135kA 8/20µs Line side protection, 50kA 8/20µs Load Side protection Per Phase. 100kA 10/350µs N-E, Status Indication, Alarm Contacts .	3	220 – 240V (50-60Hz)	400x300x150	12
SF340A-NEC-SG	Surge Filter, 3Ph, 40A, with class 1 Protection Applied P-N, 50kA 10/350µs, 135kA 8/20µs Line side protection, 50kA 8/20µs Load Side protection Per Phase. 100kA 10/350µs N-E, Status Indication, Alarm Contacts + Counter.	3	220 – 240V (50-60Hz)	400x300x150	12

SF363A-NE-SG	Surge Filter, 3Ph, 63A, with class 1 Protection Applied P-N, 50kA 10/350µs, 135kA 8/20µs Line side protection, 50kA 8/20µs Load Side protection Per Phase. 100kA 10/350µs N-E, Status Indication, Alarm Contacts.	3	220 – 240V (50-60Hz)	400x300x150	12
SF363A-NEC-SG	Surge Filter, 3Ph, 63A, with class 1 Protection Applied P-N, 50kA 10/350µs, 135kA 8/20µs Line side protection, 50kA 8/20µs Load Side protection Per Phase. 100kA 10/350µs N-E, Status Indication, Alarm Contacts + Counter.	3	220 – 240V (50-60Hz)	400x300x150	12

Add "BP to part number for Backplane version. BP version have the same footprint as shown for the enclosure version

Installation

All installation work **must** be carried out by licensed electrical personnel.

The power **must** be disconnected. Ensure no dangerous neutral to earth voltages exist prior to commencing installation work.

1. The SF unit should be installed as close as practical to the Power Distribution Panel.
2. Affix the SF unit firmly to the wall.
3. The input and output power cables that connect to the SF unit must have a current rating at least equal to that of the unit being installed. If operating 63A rated filters at loads in excess of 53A or in ambient temperatures in excess of 40°C, the use of input/output cables rated for temperatures of up to 130°C is required.
4. Route power cables to the correct side of the unit (input cables to input side of the SF unit, and output cables to output side). Suitable IP65 rated cable glands, with a flammability rating of at least V1 should be employed at the point of entry to the filter enclosure.
5. Connect the input and output power lines as illustrated in Figure 1 (for single phase units) and Figure 2 (for three phase units).
6. The earthing impedance of the electrical system should be less than 10Ω, with 5Ω recommended.
7. Connect the Earth terminal on the SF unit to the nearest electrical main earth using the shortest possible route. Earthing conductor should be a minimum of 6mm², with 16mm² recommended.
8. All connections must be rechecked to confirm that they are securely connected.
9. Connect power to the surge filter and confirm that power is being delivered to the load and that all status indicators are green. The surge filter is in series with the load and turning off the filter's internal circuit protection will disconnect power to the load.

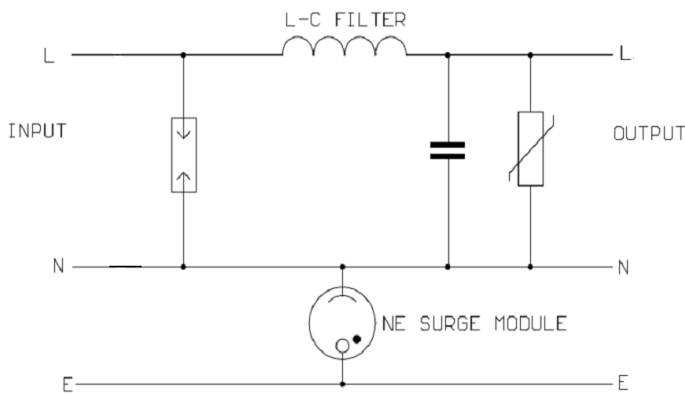


Figure 1. Schematic of 1Ø Surge Filter

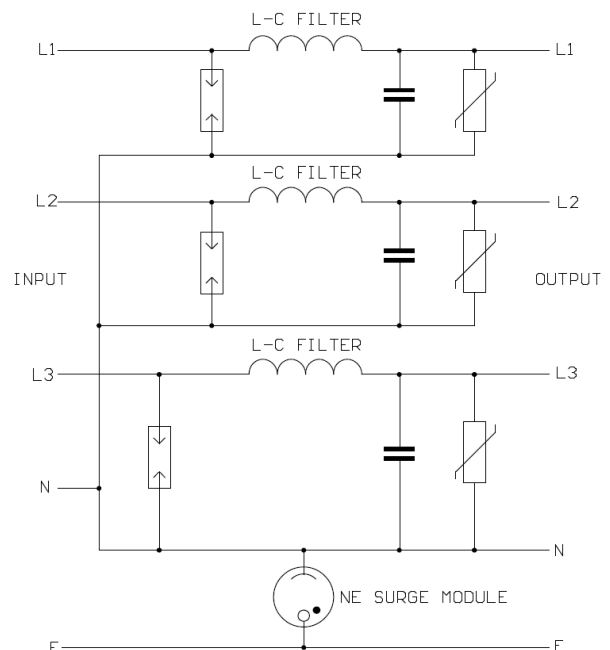


Figure 2. Schematic of 3Ø Surge Filter

Maintenance

1. The status indicators on all SST protection modules should always be green.
2. Replace any surge diverter when the corresponding indicator has changed to red or the remote status monitoring is indicating failure of the diverter.
3. Do not perform maintenance work until power to the surge filter has been disconnected.
4. All surge protection devices will degrade and must be replaced at the end of their life cycle. The frequency of replacement is subject to the magnitude and number of incident surges applied to the device – therefore status indication is very important.

Remote Status Indication

A set of voltage-free contacts integral to each of the SST protection modules provides the facility to monitor the protection status of the SF Filter remotely.

With the protection module fully operational, the status indicator will be green and terminals 1 & 2 on the remote monitoring terminals will be connected.

When the SST protection module MOV material degrades to a point where replacement is necessary, the status indicator will change to red and the voltage free contacts will change state so that terminals 2 & 3 are connected (see Figure 3)



Figure 3. Remote Status Monitoring voltage-free contacts on protection module