

## TECHNICAL DATA SHEET MEDIUM CURRENT POWER SURGE FILTERS

### Features

- High performance surge protector for an operating voltage of 110 - 220Vac
- Designed to withstand fault and over-voltage conditions up to 275Vac
- Nominal impulse discharge current 120kA + 40kA 8/20µs Ph-N
- Three stage protection provides highest level of protection for sensitive electronic equipment

### Product Description



- Designed to suit TT, TN-C, TN-S, TN-C-S & IT distribution systems
- Non-saturating inductors – dv/dt and di/dt of the incoming surge will be reduced by 1000 times
- Primary (120kA 8/20µs) and secondary (40kA 8/20µs) surge protection
- High N - E protection rating– 100kA 10/350µs or 150kA 8/20µs
- Status indication 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 Surge Filter provides multiple stage protection against incoming surges & transients and shall be installed in series with the incoming 110-220Vac single phase (Phase – Neutral) mains power supply to the equipment or building. Shunt-only clamping alone is not sufficient, as it does not limit the excessive wave-front characteristic of the pre-clamped waveform. The Surge Filter will reduce the rate of rise of voltage (dv/dt) to below 15V/µs as per AS1768 Cat B 3kA (8/20µs) applied impulse and to below 30V/µs for AS 1768 Cat C 20kA (8/20µs) applied impulse.

The Surge Filter is designed for multistroke lightning events and comes with the SS140-275 as the primary protection, rated at 120kA 8/20µs per phase, as the first stage to absorb the majority of the energy. The SS offers the ultimate level of safety and reliability whilst retaining optimum protection levels critical for electronic equipment. SS ensures that the protection device is virtually immune to the effects of 50/60 Hz sustained over voltages, allowing fault voltages up to 275Vac.

The second stage consists of low pass non-saturating inductors and capacitors (L-C Filtering) which further attenuates the let-through voltage already clamped by the primary stage. 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 further surge diverters rated at 40kA 8/20µs connected across the load side, these are designed to suppress surges generated by load side equipment.

Surge 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 10/350µs (or 150kA 8/20µs) is provided to limit feed-back 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	SS275 Surge Filters
Rated voltage:	110 – 220Vac Ph - N @ 50/60Hz
Max continuous fault voltages @ 50/60Hz:	275Vac
Operating time:	< 1ns
Power distribution systems:	TT, TN-S, TN-C, TN-C-S (MEN)
Primary surge protection rating Ph-N:	120kA 8/20µs single shot surge capacity
Secondary surge protection rating Ph-N:	40kA 8/20µs single shot surge capacity
N – E protection:	100kA 10/350µs or 150kA 8/20µs
Protection Modes:	Transverse and common mode
Inductor:	Non-saturating, 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%
Overload / short circuit protection:	In-line circuit breaker
Performance:	Typical let-through voltage < 600V
Filter 3dB point:	Approx 6000Hz.
Standards (Primary and secondary):	IEC 61643-1, Meets UL1449 Ed 3 requirements
Standards (N - E):	IEC 61643-1
Surge withstand: Cat. A,B and C surge tests	ANSI/IEEE C62.41 and AS 1768
Protection status indication:	Status indication, and remote alarm contact
Environmental rating:	IP 55
Enclosure:	Metal enclosure with durable polyester powder coat finish
Colour:	Oyster grey
Mounting:	Wall mount
Operating temperatures:	0 to +50°C, 0 – 95% humidity
Conductor size:	Accepts up to 35mm <sup>2</sup>
Warranty:	5 Years manufacturer's warranty

Ordering Code	Description	Phase	Rated Voltage Ph - N	Dimensions (mm)	Weight (Kg)
LSF132A-NE	Surge Filter, 1Ph, 32A, 120+40kA 8/20µs Ph - N, 275V Uc, 100kA 10/350µs NE, visual indicator, alarm contact	1	110 – 220V (50-60Hz)	300x200x150	7
LSF132A-NEC	Surge Filter, 1Ph, 32A, 120+40kA 8/20µs Ph - N, 275V Uc, 100kA 10/350µs NE, visual indicator, alarm contact + Counter	1	110 – 220V (50-60Hz)	300x200x150	7
LSF140A-NE	Surge Filter, 1Ph, 40A, 120+40kA 8/20µs Ph - N, 275V Uc, 100kA 10/350µs NE, visual indicator, alarm contact	1	110 – 220V (50-60Hz)	300x200x150	7
LSF140A-NEC	Surge Filter, 1Ph, 40A, 120+40kA 8/20µs Ph - N, 275V Uc, 100kA 10/350µs NE, visual indicator, alarm contact + Counter	1	110 – 220V (50-60Hz)	300x200x150	7
LSF163A-NE	Surge Filter, 1Ph, 63A, 120+40kA 8/20µs Ph - N, 275V Uc, 100kA 10/350µs NE, visual indicator, alarm contact	1	110 – 220V (50-60Hz)	300x200x150	7
LSF163A-NEC	Surge Filter, 1Ph, 63A, 120+40kA 8/20µs Ph - N, 275V Uc, 100kA 10/350µs NE, visual indicator, alarm contact + Counter	1	110 – 220V (50-60Hz)	300x200x150	7
LSF332A-NE	Surge Filter, 3Ph, 32A, 120+40kA 8/20µs Ph - N, 275V Uc, 100kA 10/350µs NE, visual indicator, alarm contact	3	110 – 220V (50-60Hz)	300x400x150	14
LSF332A-NEC	Surge Filter, 3Ph, 32A, 120+40kA 8/20µs Ph - N, 275V Uc, 100kA 10/350µs NE, visual indicator, alarm contact + Counter	3	110 – 220V (50-60Hz)	300x400x150	14
LSF340A-NE	Surge Filter, 3Ph, 40A, 120+40kA 8/20µs Ph - N, 275V Uc, 100kA 10/350µs NE, visual indicator, alarm contact	3	110 – 220V (50-60Hz)	300x400x150	14
LSF340A-NEC	Surge Filter, 3Ph, 40A, 120+40kA 8/20µs Ph - N, 275V Uc, 100kA 10/350µs NE, visual indicator, alarm contact + Counter	3	110 – 220V (50-60Hz)	300x400x150	14
LSF363A-NE	Surge Filter, 3Ph, 63A, 120+40kA 8/20µs Ph - N, 275V Uc, 100kA 10/350µs NE, visual indicator, alarm contact	3	110 – 220V (50-60Hz)	300x400x150	14
LSF363A-NEC	Surge Filter, 3Ph, 63A, 120+40kA 8/20µs Ph - N, 275V Uc, 100kA 10/350µs NE, visual indicator, alarm contact + Counter	3	110 – 220V (50-60Hz)	300x400x150	14

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.
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).
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  $10\Omega$ , with  $5\Omega$  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  $6\text{mm}^2$ , with  $16\text{mm}^2$  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.

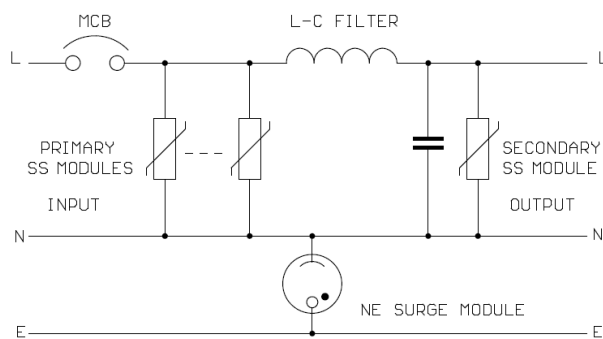


Figure 1. Schematic of 1Ø Surge Filter

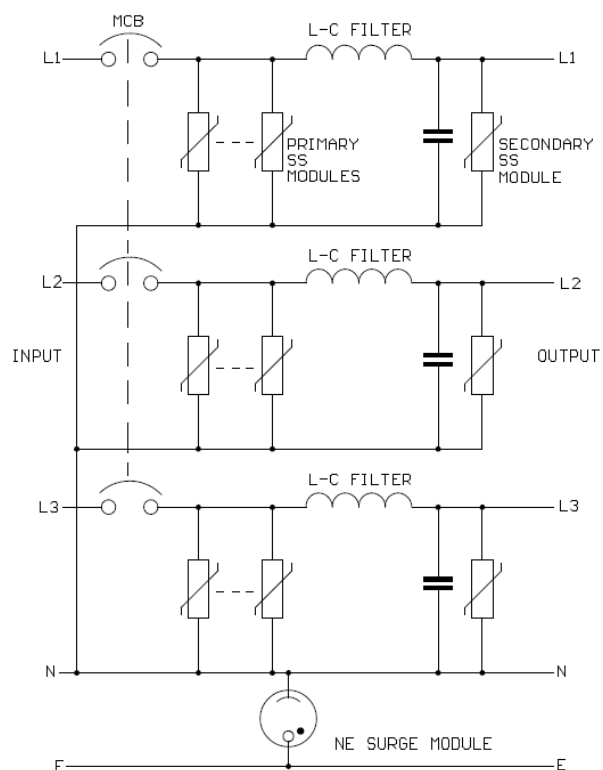


Figure 2. Schematic of 3Ø Surge Filter

## Maintenance

1. The status indicators on all SS 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 SS protection modules (primary and secondary) 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 SS 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