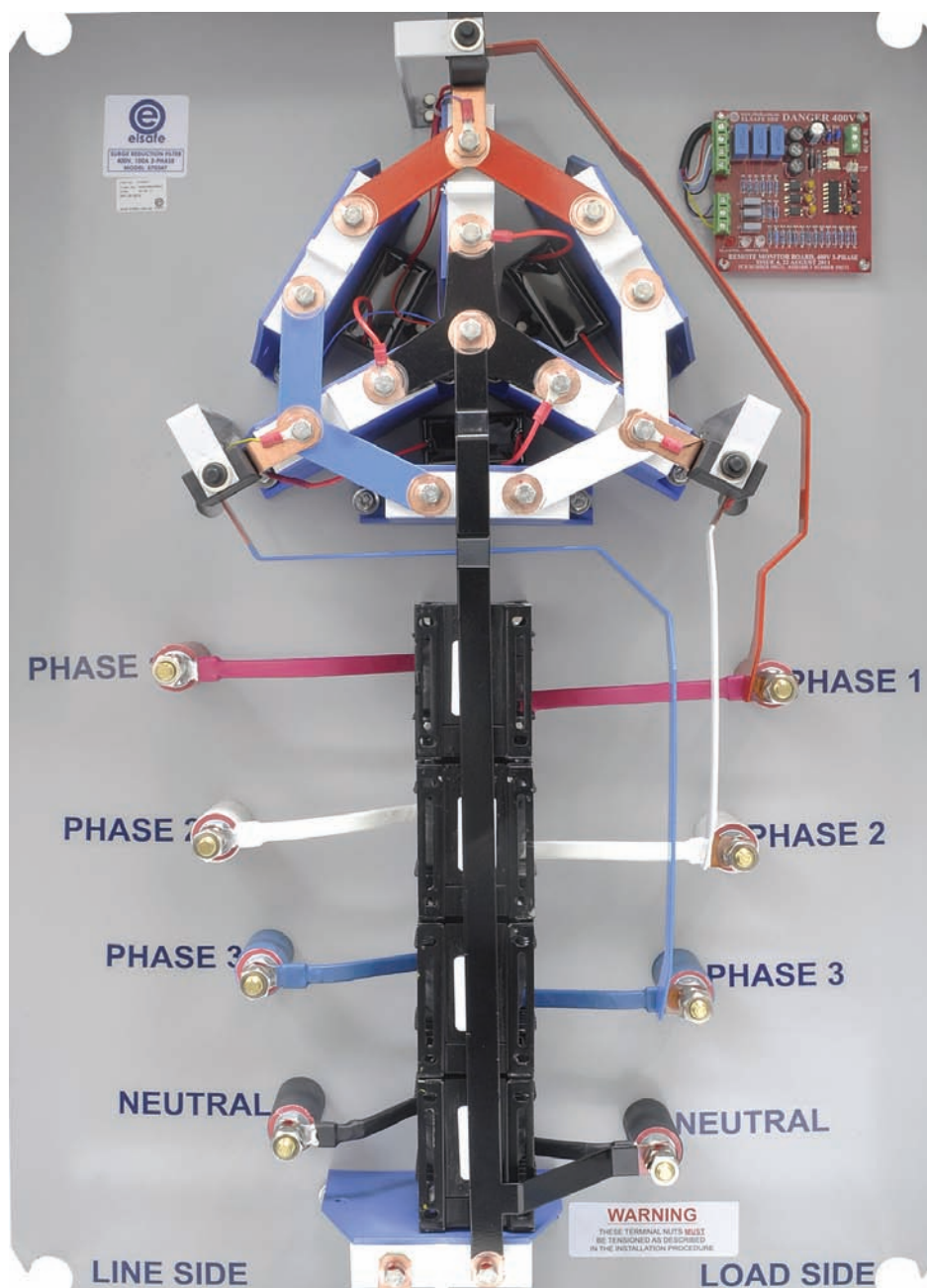


# THREE-PHASE SURGE REDUCTION FILTERS 400V, 100A (SRF's)



\* product may be subject to change, please check with Elsafe.

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**Elsafe Australia Pty Ltd**

**Sales Enquires**

Tel: +61 (7) 3399 7099

Fax: +61 (7) 3399 9133

Email: [railways@elsafe.com.au](mailto:railways@elsafe.com.au)

**Head Office**

Tel: +61 (2) 9454 7500

Fax: +61 (2) 9454 7505

Email: [railways@elsafe.com.au](mailto:railways@elsafe.com.au)

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[railways.elsafe.com.au](http://railways.elsafe.com.au)

## ELSAFE 400V, 100A THREE-PHASE SURGE REDUCTION FILTERS MODEL NUMBERS 570347, 570447, 570547 AND 570647

Elsafe Australia has totally re-engineered and widened its range of rugged, heavy-duty Surge Reduction Filters (SRFs) intended for deployment by Heavy Industry as primary surge protection. They include a combination of high current filtering and surge protection components that have been shown to have extremely low let-through voltages during high current transient testing. Mechanically they have also been independently tested and proven to withstand high vibration environments such as railway trackside installations.

As with all other members of the range, this Surge Reduction Filter comes in 4 distinct variants defined by 2 choices of enclosure, and 2 of customer wiring termination method, all are electrically identical, they are shown in the table below.

| MODEL NUMBER/<br>ORDER CODE | TERMINAL STYLE | ENCLOSURE<br>MATERIAL |
|-----------------------------|----------------|-----------------------|
| 570347                      | 10mm STUD      | MILD STEEL            |
| 570447                      | 10mm STUD      | STAINLESS STEEL       |
| 570547                      | CAGE CLAMP     | MILD STEEL            |
| 570647                      | CAGE CLAMP     | STAINLESS STEEL       |

Surge protection is implemented on the load side by means of 100kA-rated Metal-Oxide Varistors (MOVs) connected in a “star-delta” configuration covering phase-to-phase, and phase-to-neutral, a separate MOV is connected across neutral and earth. The MOVs themselves are separated from the line side by custom-made inductors wound from solid copper. The inductor chokes are connected in series directly between the line and load terminals to ensure good continuance of supply. Capacitors between each phase and neutral form a filter to attenuate any unwanted high frequency harmonics. The three groups of phase-to-phase and phase-to-neutral MOVs are each protected by a resettable thermal cut-out whose purpose is to isolate them in the event of a transient above their rated specifications.

For the purposes of sensing the surge protection status of the SRF through telemetry, a Remote Monitor Board provides a single-pole, double-throw, voltage-free changeover contact. Connection may be made to its normally-open, normally-closed and common terminals<sup>1</sup> by means of a 3-pin screw connector mounted on the PCB, both the normally-open and normally-closed contacts are themselves protected from telemetry line transients by separate MOV's that have a varistor voltage of 470Vdc±10% (300Vac maximum). The Monitor also gives a local indication of the surge protection status by means of an external blue LED indicator fitted to the SRF's door.

The LED may be in any one of the 3 states described below

### **ON STEADY**

The supply input is normal and the MOV array is fully connected; the changeover contact is activated (normal).

### **FLASHING**

One or more of the thermal cut-outs has operated or one or two of the phases has been disconnected; the changeover contact is deactivated (in alarm).

### **OFF STEADY**

A total supply failure or Remote Monitor Board fault has developed; the changeover contact is deactivated (in alarm).

<sup>1</sup>here “normal” indicates the state of the contacts when line power is connected to the SRF and the thermal cut-out is in its deactivated state.

## Electrical Specification

|   |  |                   |                               |
|---|--|-------------------|-------------------------------|
| <b>RATED PHASE-TO-NEUTRAL VOLTAGE</b>           | 230Vac   |                   |                               |
| <b>RATED PHASE-TO-PHASE VOLTAGE</b>             | 400Vac   |                   |                               |
| <b>MAXIMUM APPLIED PHASE-TO-NEUTRAL VOLTAGE</b> | 300Vac   |                   |                               |
| <b>MAXIMUM APPLIED PHASE-TO-PHASE VOLTAGE</b>   | 485Vac   |                   |                               |
| <b>MAXIMUM LOAD CURRENT</b>                     | 100A   |                   |                               |
| <b>PHASE-TO-NEUTRAL MOV RATING</b>              | 470V ± 10% (300Vac maximum), 100kA   |                   |                               |
| <b>PHASE-TO-PHASE MOV RATING</b>                | 780V ± 10% (485Vac maximum), 100kA   |                   |                               |
| <b>LOAD-SIDE REMNANT VOLTAGES<sup>2</sup></b>   | Phase-to-Neutral   |                   | 720Vdc                        |
|   | Neutral-to-Earth   |                   | 744Vdc                        |
| <b>NOMINAL AMPLITUDE FREQUENCY RESPONSE</b>     |  |                   |                               |
| <b>PHASE-TO-NEUTRAL</b>                         | 100% LOAD  | Cut-off Frequency | 7.6kHz                        |
|   | 10% LOAD   | Cut-off Frequency | 10.1kHz                       |
| <b>PHASE-TO-PHASE</b>                           | 100% LOAD  | Cut-off Frequency | 12.5kHz                       |
|   | 10% LOAD   | Cut-off Frequency | 14.4kHz                       |
| <b>Roll-off</b>                                 | ≥40dB/decade in all cases  |                   |                               |
| <b>REMOTE MONITOR CONTACT RATINGS</b>           | Maximum Applied Voltage <sup>3</sup>   |                   | 290Vdc/200Vac (MOV-protected) |
|   | Maximum Current Sink   |                   | 100mA                         |
| <b>CONNECTION TO CUSTOMER WIRING</b>            |  |                   |                               |
| <b>POWER</b>                                    | Insulator-Mounted 10mm Brass Studs (570347 and 570447)                                 |                   |                               |
|   | Cage-Clamp Terminals Accepting up to 95mm <sup>2</sup> Conductors (570547 and 570647). |                   |                               |
| <b>SIGNALLING</b>                               | 3-pin screw connector block on the Remote Monitor Board                                |                   |                               |

<sup>2</sup>Compliance with the requirements of AS/NZS61000.4.5 (Surge Immunity) is verified by EMC Technologies Pty Ltd Report Number T110320\_A. The SRF's load-side Remnant Voltages in response to standard 8/20µs, 3kA surges are detailed in that Report.

<sup>3</sup>Both contacts are protected by 6.5kA-rated MOV's each having a varactor voltage of 330V±10%

## Physical Specification

| ENCLOSURE DETAILS         |  |
|---------------------------|--|
| MATERIALS                 | POWDER-COATED MILD STEEL (570347 and 570547) |
|                           | STAINLESS STEEL (570447 and 570647)          |
| INGRESS PROTECTION RATING | IP66   |

| EXTERNAL DIMENSIONS |       |
|---------------------|-------|
| HEIGHT              | 760mm |
| WIDTH               | 600mm |
| DEPTH               | 210mm |

|        |      |
|--------|------|
| WEIGHT | 45kg |
|--------|------|

## Environmental Specification

|                                  |  |
|----------------------------------|--|
| AMBIENT TEMPERATURE RANGE        | $-20^{\circ}\text{C} \leq T_{\text{amb}} \leq +75^{\circ}\text{C}$ |
| LOCAL RELATIVE HUMIDITY          | $\leq 90\%$  |
| VIBRATION TOLERANCE <sup>4</sup> | 20Hz sinusoidal vibration, 11g peak-to-peak                        |

<sup>4</sup>Vibration Tolerance of all internal SRF connections has been tested by Vipac Engineers and Scientists Ltd as verified in Test Certificate Number 20E-11-0060-COC-463451.