Eurotherm®

by Schneider Electric

Snubber and Surge Limiter
Installation Instructions

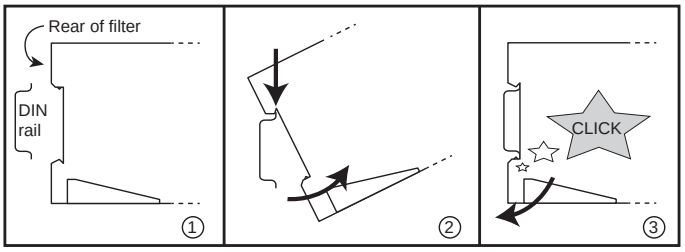
The Snubber and Surge Limiter filter can help protect thyristor-based power controllers (such as the EPower) from failing when driving inductive loads. The filter is to be mounted in close proximity to the power controller and connected using short cables. The filter has an indicator LED to show when the unit is operating normally (and power is applied).

Mechanical Installation and Removal

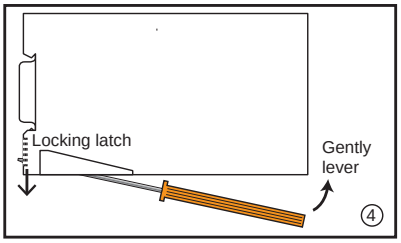
The filter is designed to be horizontally mounted on an EN50022-35X7, EN50022-35X15, or TS35 35mm symmetrical top-hat DIN rail.

Ensure that sufficient space is left around each filter to ensure adequate air flow. The minimum space above and below the filter is 55mm, and 10mm between each filter.

To mount the filter onto the DIN rail (figure 1), tilt the filter upwards and align the top grove at the rear of the filter against the top of the rail (figure 2). Then rotate the bottom of the filter against the bottom of the DIN rail until a click is heard (figure 3).



To remove the filter from the DIN rail, insert a small flat-bladed screwdriver (no wider than 5mm) through the rectangular locking latch and push it downwards by carefully levering the screwdriver upwards (figure 4). This releases the locking latch and the bottom of the filter can be tilted forward (figure 2) and pulled away from the DIN rail.



Electrical Installation

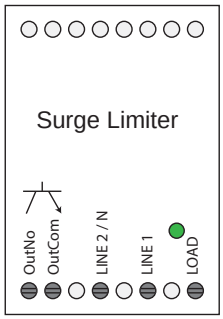
Warning! Before carrying out any wiring to the filter, it must be ensured that all relevant power and control cables, leads or harnesses are isolated from voltage sources.

The filter protects a thyristor-based power controller connected across the Line 1 and Load terminals. The Line 2 terminal is used to power the status LED and associated open-collector status output (OutNo and OutCom terminals).

Use up to AWG12 (or up to 4mm²) cabling for all cables connected to the filter. Tighten the terminals on the filter to a maximum of 0.4Nm.

A summary of the terminal connections is shown in the following table.

Terminal	Description
Load	Connect to the power module's Load output terminal.
Line 1	Connect to the power module's Line input terminal.
Line 2	Connect to one of the other live phases (usually the next one in sequence). This powers the status LED and open-collector circuitry (OutNo and OutCom).
OutCom	Status output (open-collector transistor common terminal).
OutNo	Status output (open-collector, collector terminal, maximum 15V, 8mA). When the filter is operating normally, the OutCom and OutNo terminals are shorted.



Refer overleaf for example wiring configuration diagrams.

Safety Notes

1. Before carrying out any wiring to the filter it must be ensured that all relevant power and control cables, leads or harnesses are isolated from voltage sources.
2. Any adjustment, maintenance and repair of the opened filter under voltage is forbidden for safety reasons.
3. BRANCH-CIRCUIT PROTECTION AND SAFETY OVERLOAD PROTECTION. This product does not contain any branch-circuit protection or internal safety overload protection beyond which the filter is designed. It is the responsibility of the user to add branch-circuit protection upstream of the unit. Such branch-circuit must comply with the applicable local regulations.

   NOTE: The thyristor-based power controller to which this filter is connected shall have one of the following as a disconnecting device, fitted within easy reach of the operator, and labelled as the disconnecting device:

   - A switch or circuit breaker which complies with the requirements of IEC60947-1 and IEC947-3.
   - A separable coupler which can be disconnected without the use of a tool.
4. The filters are designed to be installed in a cabinet connected to a protective earth according to IEC60364-1 and IEC60364-5-54 or applicable national standards. The cabinet must be closed under normal operating conditions. Adequate air conditioning/filtering/cooling equipment must be fitted to the cabinet in order to prevent the ingress of conductive pollution, the formation of condensation, etc.
5. The filters are designed to be mounted onto a horizontal DIN rail as shown in this installation sheet. There must be no obstacles (above or below) which could reduce or hamper airflow.
6. If the filter is used in a manner not specified by the manufacturer, the protection provided by the filter might be impaired.

Specification

Physical

Width x Height x Depth ..... 55mm x 75mm x 110mm
Ventilation ..... top/bottom convection air slots
Mounting ..... 35mm DIN rail (EN50022-35x7, EN50022-35x15 or TS35)
Airflow consideration ..... 10mm minimum gap between each filter
55mm minimum space above and below filter

Electrical

Voltage ..... 85 to 550V RMS, 47 to 63Hz
Clamping voltage ..... 1.6kV maximum
Cable size (Load, Line 1 and Line 2 terminals) ..... up to AWG12 (up to 4mm²)
Cable size (OutNo, OutCom terminals) ..... up to AWG12 (up to 4mm²)
Maximum terminal tightening torque 0.4Nm
Minimum cosφ of inductive load connected to power controller
cosφ = 0.8 for 500Vac
cosφ = 0.6 for 400Vac
cosφ = 0.4 for 240Vac
Filter status
Status indicator ..... green LED when operating normally
Output type (OutCom and OutNo terminals) ..... open collector
Maximum voltage 15V
Maximum current 8mA

Installation category and pollution degree

	Installation category	Rated impulse withstand voltage (Uimp)	Rated insulation voltage (Ui)
OutCom, OutNo	III	0.5kV	50V
Load, Line 1, Line 2	III	6kV	500V

Pollution degree 2 ..... IP20 according to EN60529

General standards

Maximum operating temperature ..... 50°C at altitude of 1000m (45°C at 2000m)
Storage temperature ..... –20 to +70°C
Atmosphere ..... Non-corrosive, non-explosive
Electromagnetic compatibility EN60947-4-3
Safety EN60947-4-3
Compliance ..... RoHS Directive 2011/65/EU and REACH

Eurotherm: International sales and service

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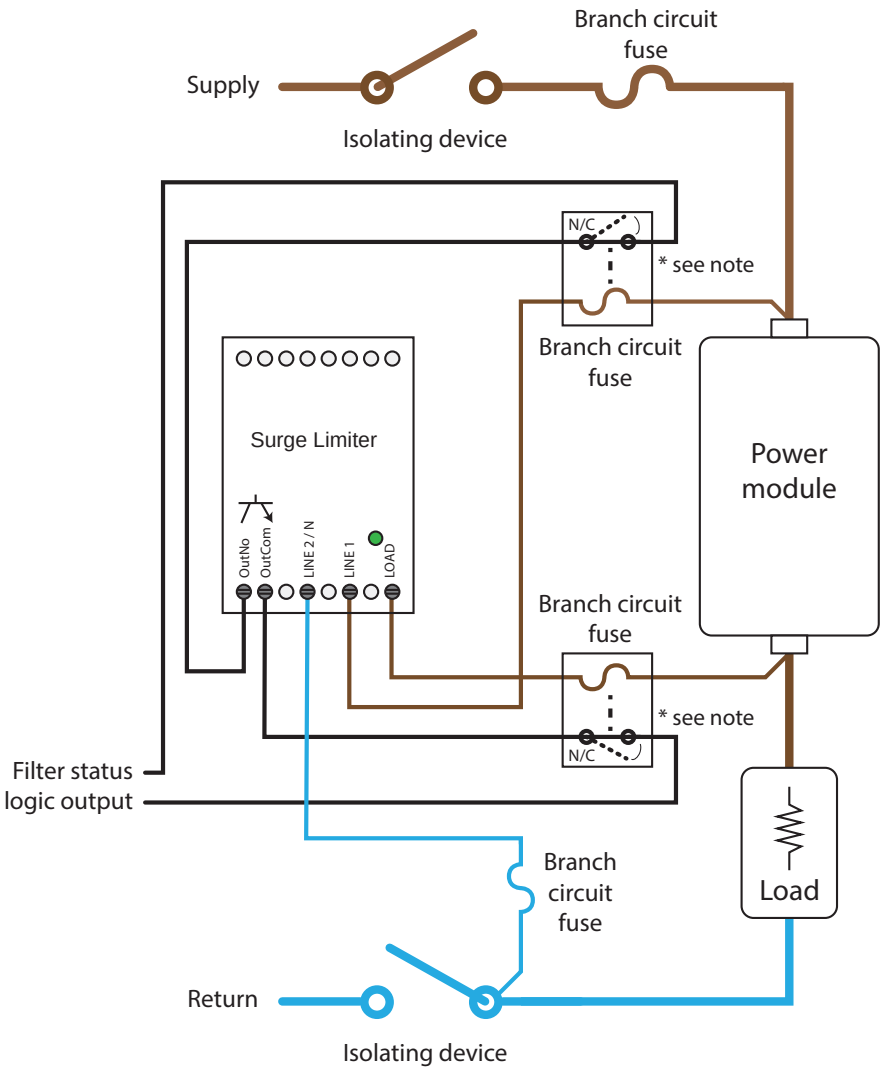
Wiring examples



Filtering Thyristor-based Power Controllers
By using three filters, it is possible to filter all phases driven by a thyristor-based power controller (such as an EPower).

The Line 1 and Load terminals are used to connect to the power controller's supply (line) and output (load) terminals, with the Line 2 connection wired to the return (the next phase's line terminal). The figure to the left shows a single filter connected to a single phase. In 3-phase configurations, this setup would be repeated three times.

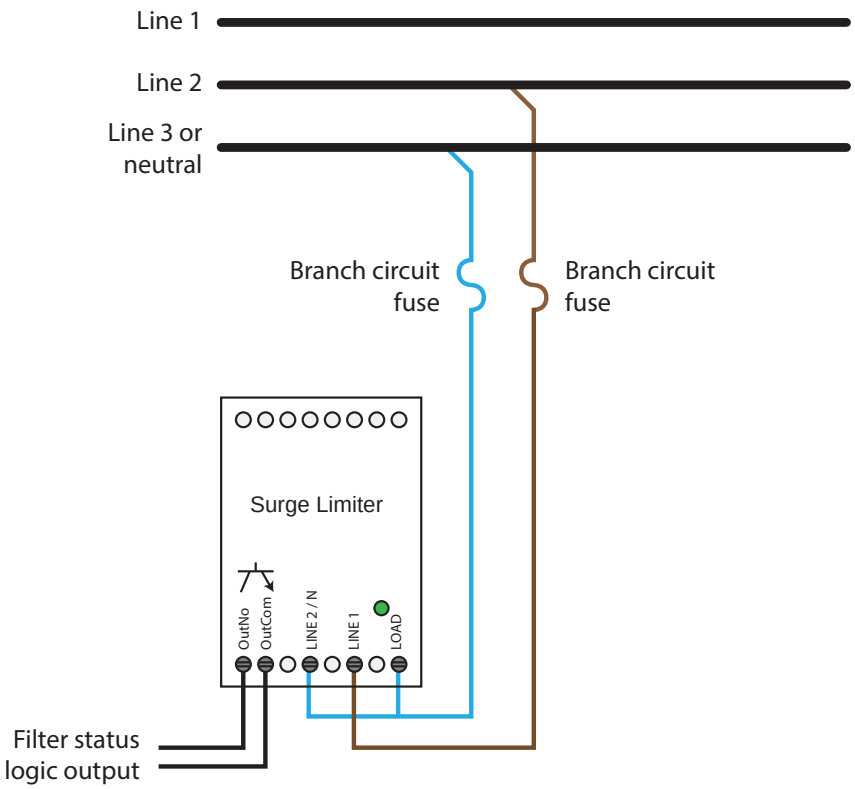
For connection to EPower, it is recommended to connect the filter's *OutNo* terminal to the EPower's *10V out* terminal, and the filter's *OutCom* terminal to one of the EPower's digital inputs. Configure the EPower's Digital I/O terminal to be of type 'IpVolts' using iTools or the front fascia display.

⚠ WARNING

The minimum cosφ of the load is dependent on the line voltage as follows:

- At 500Vac the minimum cosφ is 0.8
- At 400Vac the minimum cosφ is 0.6
- At 240Vac the minimum cosφ is 0.4

* The switch shown in series with the filter status logic output (terminals OutCom and OutNo) is optional.



Filtering multi-phase mains
A single filter can be wired across two phases to smooth out noise on the mains supply This configuration can be utilised on both 2-phase and 3-phase configurations.