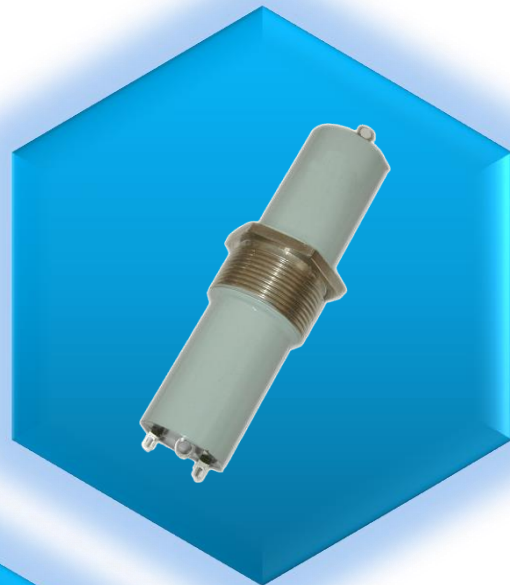




MPE
Quality. Reliability. Performance

ANALOGUE (POTS/PSTN) TELEPHONE LINE EMI FILTERS



**MEETS TEMPEST REQUIREMENTS OF
ANALOGUE TELEPHONE LINE APPLICATIONS**



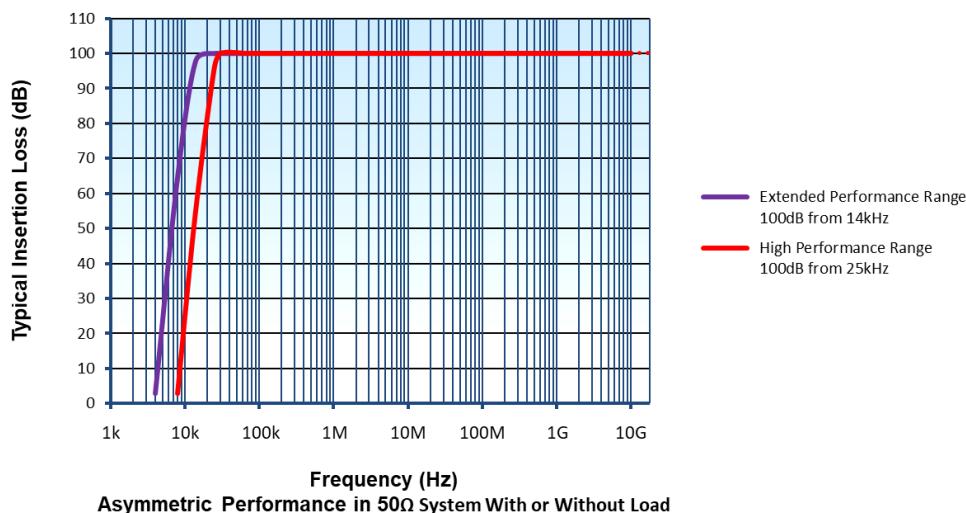
FM00699

MPE Limited
Hammond Road
Knowsley Industrial Park
Liverpool L33 7UL



Description

A range of high performance communications filters designed for carrying analogue telephone circuits into shielded rooms and communications cabins, and also used as in-line filters for Information Security applications. Filters are offered in two performance variants each available with varistor transient protection to offer additional protection of circuits against the effects of EMP and other conducted transients.



Applications

- 300Ω/600Ω analogue telephone lines for POTS/PSTN telephone, fax and modem circuits
- Shielded rooms, communication cabins and Sensitive Compartmented Information Facilities (SCIFs)
- TEMPEST applications
- Available with transient suppression for EMP protection systems
- Filter circuits approved by British Telecom and other PTT's
- Not suitable for digital ISDN lines – see separate MPE Data Line Filter catalogue

Features

- Circuits are supplied as high symmetry matched pairs; 1 telephone circuit = 1 matched pair = 2 lines
- Standard products offer the choice of 2, 4, 8, 32, 40, 100, 200 or 240 lines
- Choice of packaging and mounting styles available
- High performance or extended performance levels available
- Performance exceeds 100dB attenuation (50Ω system)
- Performance extends beyond 10GHz
- Pass band ripple <2dB (300Ω system)
- Operating temperature range -40°C to +55°C
- Filters incorporate MPE self-healing metallised plastic film capacitors for high reliability
- CE compliant
- RoHS compliant

Electrical Specification

Filter Series	Insertion Loss (50Ω)*	Pass Band	Voltage Rating	Current Rating	DC Resistance	Impedance
High Performance	100dB 25kHz – 10GHz	0 – 8kHz	250Vac/ 300Vdc	300mA	8Ω	300Ω line – earth 600Ω line – line
High Performance with Transient Suppression	100dB 25kHz – 10GHz	0 – 8kHz	95Vac/ 125Vdc	300mA	8Ω	300Ω line – earth 600Ω line – line
Extended Performance	100dB 14kHz – 10GHz	0 – 8kHz	250Vac/ 300Vdc	125mA	8Ω	300Ω line – earth 600Ω line – line
Extended Performance with Transient Suppression	100dB 14kHz – 10GHz	0 – 8kHz	95Vac/ 125Vdc	125mA	8Ω	300Ω line – earth 600Ω line – line

* Rectangular cases are recommended for applications where 100dB is required beyond 1GHz.



Environmental Specification

- Operating temperature range -40°C to +55°C
- Rugged electroplated brass tubular or steel rectangular cases maintain the RF barrier to the shield
- IP 54 rated rectangular cases
- Gloss paint finish to DEF-STAN 80-161
- Colour light admiralty grey (BS 381C 697)

Transient Suppression (optional)

Surge protection against the effects of EMP and other transients can be provided with a leaded, radial metal oxide varistor mounted onto the input terminal of each filter line. The varistor is covered in a UL 94-V0 flammability retardant epoxy coating.

Varistor Ratings			
Voltage Rating	Max Surge Current (8/20 μ s)	Max Energy (2ms)	Response Time
95Vac/125Vdc	6500A	50J	< 25ns

For HEMP protection of telephone lines to achieve compliance with PCI requirements of MIL-STD-188-125-1 & -2 please consult our other range of filters in the MPE HEMP Telephone Line Filter catalogue.

Terminal Marking Details

The filter circuits are supplied with adjacent lines matched to a high degree of symmetry around earth. The paired lines will be identified in the input and output end compartments of the rectangular case filters as A and B. For example, line 1A will be in a matched pair with line 1B.

Custom Designs

Custom designs are available with different packaging, performance, and transient suppression options.

Filters of 100 lines and above are designed in a modular construction of 20 line or 24 line modules so intermediate numbers of lines can be offered in multiples of 20 or 24.

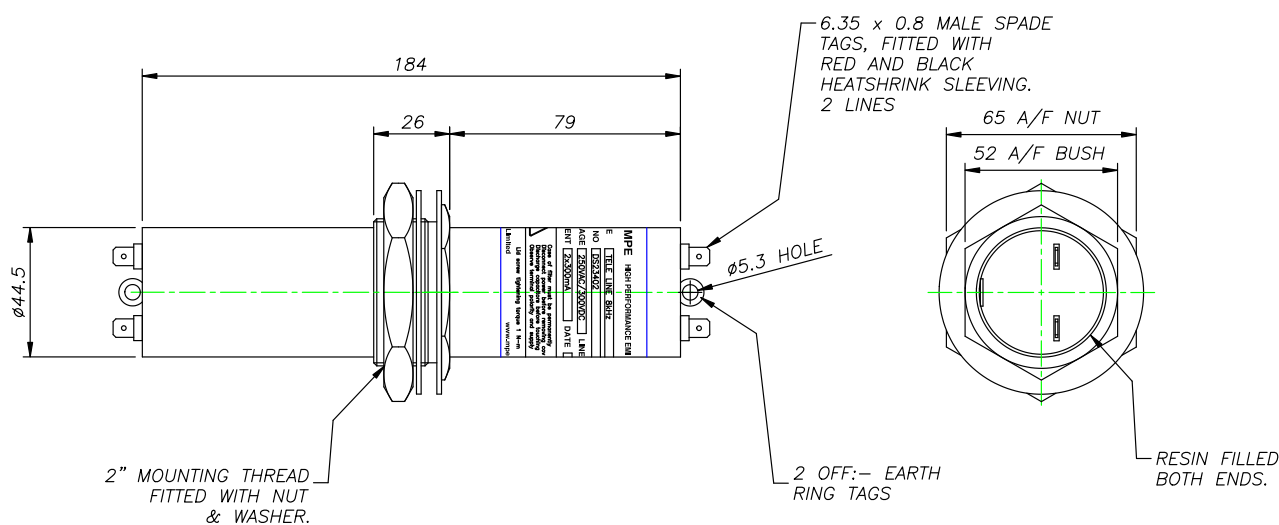


2 LINE TELEPHONE LINE FILTERS – TUBULAR CASE

Note: Rectangular cases are recommended for applications where 100dB is required beyond 1GHz



Tubular case with centre flange for feedthrough mounting through a bulkhead.



Case Material	Electroplated brass
Finish	Gloss paint, Light admiralty grey BS 381C 697
Terminals	6.35 x 0.8 mm spade tags, electroplated brass
Terminals are supplied fitted with protective PVC end caps	
Earth Terminals	Solder tag
Mounting Hole	52 mm



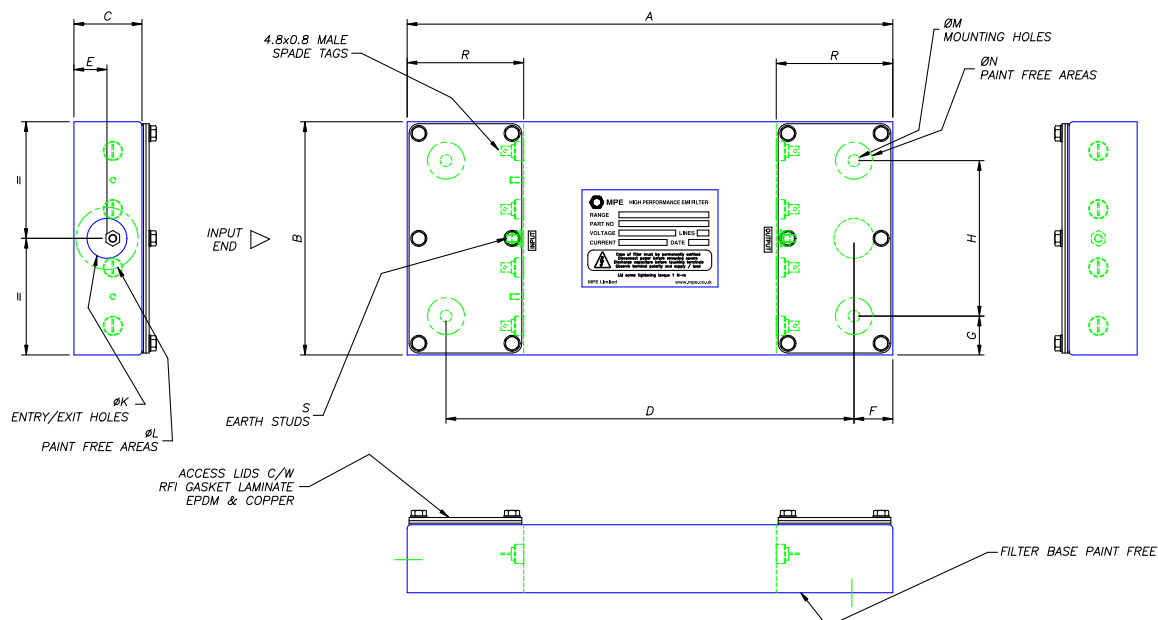
2, 4 8 LINE TELEPHONE FILTERS – RECTANGULAR CASE

Type	Nº of Lines	Part Number	Weight (kg)
High Performance	2	DS31350C	1
	4	DS31351C	2
	8	DS31352C	4
High Performance with Transient Suppression	2	DS31350CV	1
	4	DS31351CV	2
	8	DS31352CV	4
Extended Performance	2	DS31355C	1
	4	DS31356C	2
	8	DS31357C	4
Extended Performance with Transient Suppression	2	DS31355CV	1
	4	DS31356CV	2
	8	DS31357CV	4



Mechanical Details & Dimensions

Rectangular style case with dedicated wiring compartments for mounting on to a bulkhead. Access lids are fitted with RF gaskets for performance up to very high frequencies. The base of the filter and areas around cable entry and mounting holes are left paint free for optimal low impedance earth connection.



Nº of Lines	Length A	Width B	Height C	D	E	F	G	H	K	L	M	N	R	S
2	250	60	35	210	17	20	13*	34*	21	32	6	19	60	M3
4	250	120	35	210	17	20	20	80	21	32	6	19	60	M4
8	250	240	35	210	17	20	20	200	21	32	6	19	60	M4

* 2 line cable entry/exit option "C" the cable exit hole through the base of the enclosure is also used for mounting instead of separate mounting holes.

Terminals
Transient Suppression (optional)
Case Material
Finish

4.8 x 0.8 mm spade tags, nickel-plated brass
Varistor mounted in the input end compartment
Electroplated steel
Gloss paint, Light admiralty grey BS 381C 697



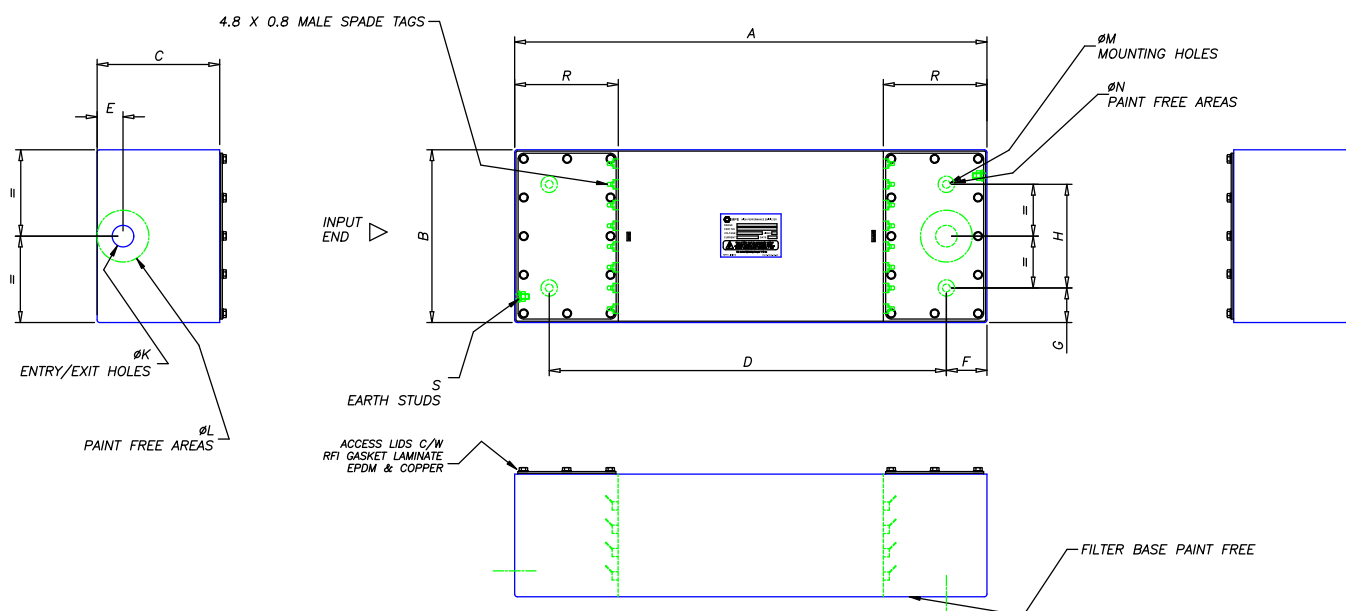
32 & 40 LINE TELEPHONE FILTERS – RECTANGULAR CASE

Type	No. of Lines	Part Number	Weight (kg)
High Performance	32	DS23443C	17
	40	DS26904C	21
High Performance with Transient Suppression	32	DS23585CV	17
	40	DS26905CV	21
Extended Performance	32	DS23561C	17
	40	DS26906C	21
Extended Performance with Transient Suppression	32	DS23586CV	17
	40	DS26907CV	21



Mechanical Details & Dimensions

Rectangular style case with dedicated wiring compartments for mounting on to a bulkhead. Access lids are fitted with RF gaskets for performance up to very high frequencies. The base of the filter and areas around cable entry and mounting holes are left paint free for optimal low impedance earth connection.



Nº of Lines	Length A	Width B	Height C	D	E	F	G	H	K	L	M	N	R	S
32	547	200	142	460	30	47	40	120	25	60	7	19	120	M6
40	547	250	142	460	30	43.5	50	150	25	60	9	19	120	M6

Terminals
Transient Suppression (optional)
Case Material
Finish

4.8 x 0.8 mm spade tags, nickel-plated brass
Varistor mounted on PCB in the input end compartment
Electroplated steel
Gloss paint, Light admiralty grey BS 381C 697



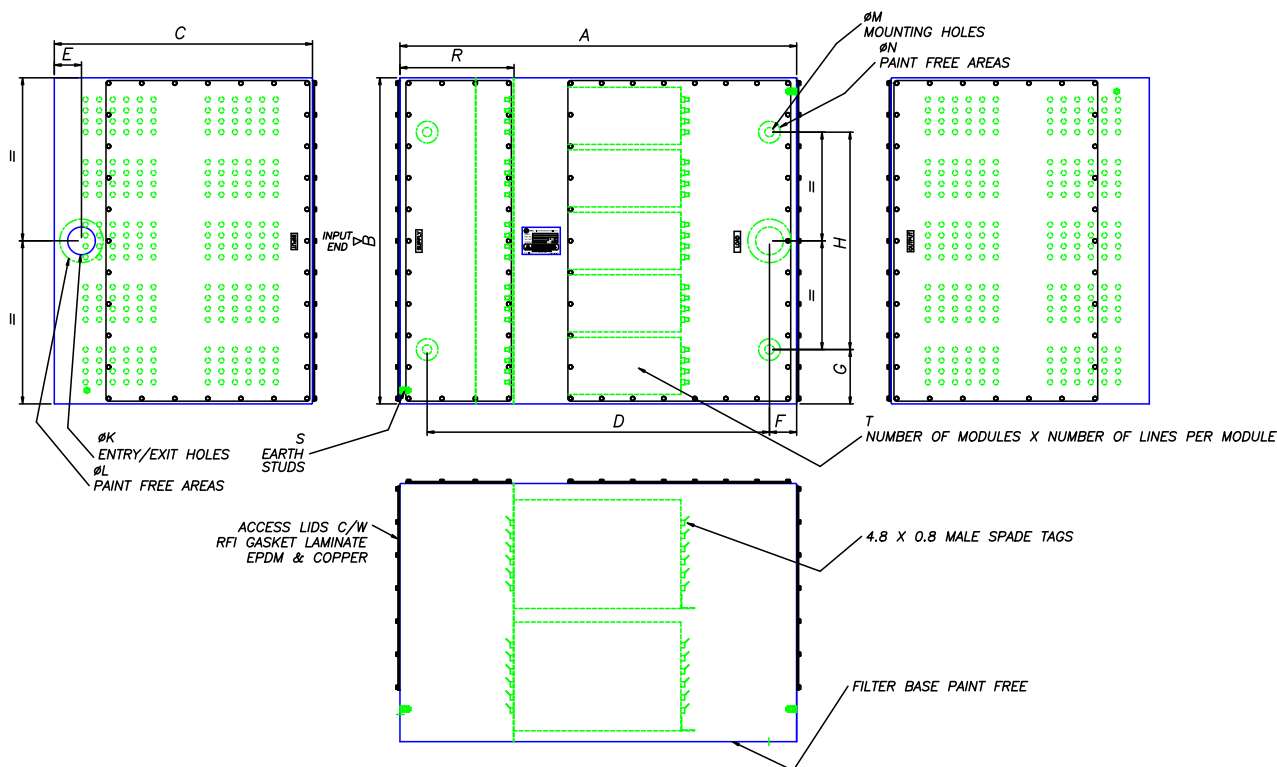
100, 200 & 240 LINE TELEPHONE FILTERS – RECTANGULAR CASE

Type	No. of Lines	Part Number	Weight (kg)
High Performance	100	DS31010C	60
	200	DS31020C	120
	240	DS31024C	140
High Performance with Transient Suppression	100	DS31011CV	60
	200	DS31021CV	120
	240	DS31025CV	140
Extended Performance	100	DS31030C	60
	200	DS31040C	120
	240	DS31044C	140
Extended Performance with Transient Suppression	100	DS31031CV	60
	200	DS31041CV	120
	240	DS31045CV	140



Mechanical Details & Dimensions

Rectangular style case with dedicated wiring compartments for mounting on to a bulkhead. Filters comprise a modular construction of multiple 20 line or 24 line modules. The module to internal barrier interface as well as the access lids are fitted with RF gaskets for performance up to very high frequencies. The base of the filter and areas around cable entry and mounting holes are left paint free for optimal low impedance earth connection.



Nº of Lines	Length A	Width B	Height C	D	E	F	G	H	K	L	M	N	R	S	T
100	730	600	250	630	80	50	100	400	32	80	17	40	210	M6	5 x 20 Lines
200	730	600	475	630	80	50	100	400	50	80	17	40	210	M6	10 x 20 Lines
240	730	600	475	630	80	50	100	400	50	80	17	40	210	M6	10 x 24 Lines

Terminals

Transient Suppression (optional)

Case Material

Finish

4.8 x 0.8 mm spade tags, nickel-plated brass

Varistors mounted on PCB in the input end compartment

Electroplated steel

Gloss paint, Light admiralty grey BS 381C 697



Fixing kits for use with the rectangular case filters can be ordered by specifying the MPE part number in the tables below.

Bulkhead Fixing Kits

The following high quality bulkhead fixing kits have been designed to provide an RFI tight bulkhead penetration for cables to facilitate fixing of rectangular filters to bulkheads or walls of shielded enclosures. They make it easier to achieve a full RFI seal between filter case and bulkhead up to the highest frequencies, which is not usually achievable with standard electrical conduit fittings due to badly fitting threads.

The bulkhead fixing kit comprises a penetration tube complete with nuts, heavy duty washers, RF gaskets, and end bushes for cable protection. The main components are made from electroplated steel and the RF gaskets are made from copper sheet. They are selected by choosing the penetration thread size appropriate to the filter cable entry hole diameter.

Cable Entry Hole Diameter (mm)	Conduit Thread Size	Part Number
21	M20	30/807147
25	M25	30/807148
32	M32	30/807149
50	M50	30/807151



Fixing Screw Kits

Fixing screw kits enable the filter to be securely fastened to the mounting surface. They comprise a set of four screws each with washers, spring washers, nuts and lock nuts and are all made from electroplated steel with the exception of the spring washers which are stainless steel. They are selected by choosing the thread size appropriate to the filter fixing hole diameter.

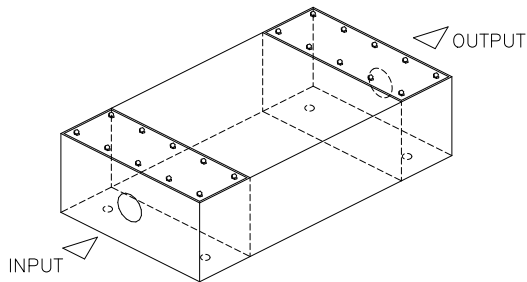
Fixing Hole Diameter (mm)	Screw Thread Size	Part Number (for Bulkhead Thickness up to 20mm)
6	M5	30/806951
7	M6	30/806952
9	M8	30/806953
17	M16	30/806956



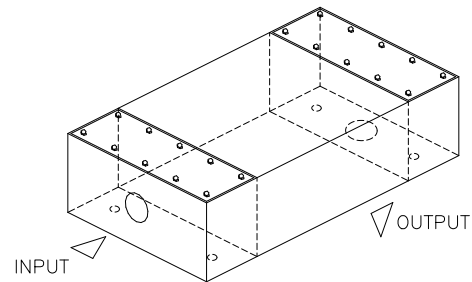


Cable Entry Options

Two cable entry options are available on rectangular case style filters. For end entry and end exit, substitute suffix C with suffix A in the part number.



Part Number DS#####A
e.g. DS31350A
End entry & End exit
Alternative cable entry configuration



Part Number DS#####C
e.g. DS31350C
End entry & Base exit
Standard cable entry configuration for
shielded room mounting

Filter Selection and Ordering Guide

Step 1

Choose telephone circuit type

Standard 300/600Ω analogue circuits
(normal incoming PSTN lines and modems)
Covered by this catalogue

Complex impedance digital circuits
(local building digital exchanges)

Please see separate MPE Data Line Filter Catalogue

Step 2

Choose required filter performance

High performance circuit
100dB from 25kHz to 10GHz

Extended performance circuit
100dB from 14kHz to 10GHz

Step 3

Choose number of lines required and whether transient suppression is required
Select part number from the appropriate table

Step 4

Choose cable entry and exit option C or A
If option A is required, then change the C for an A in the product part number

Step 5

Add fixing kits to order if required

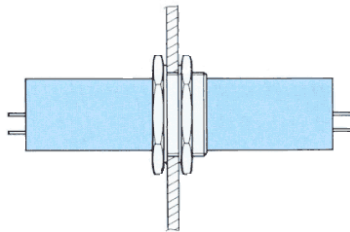


Safety

The filter case must be solidly and permanently earthed, both for safe operation and to achieve optimum EMC and pulse performance. All high performance filters contain capacitors that will store charge even after the power has been removed from the filter. To ensure capacitors are safely discharged, terminals must always be shorted to case prior to being touched.

After installation of the filter, to prevent any danger of electric shock, and to provide screening of incoming and outgoing lines the user must enclose all exposed terminals. This is also important for transient suppressed filter versions to protect the user in the event of a varistor rupturing following an extreme transient.

Installation Details



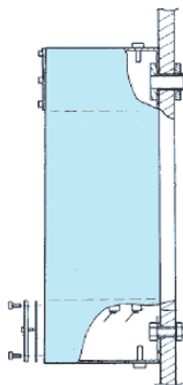
Typical Installation of Tubular Filters

Mounting surface should be clean and unpainted to ensure a good earth bond and RF seal.

Terminals should be enclosed by the user.

Mounting hole size 52 mm

Max tightening torque 58 N-m



Typical Installation of Rectangular Filters

Mounting surface should be clean and unpainted to ensure a good earth bond and RF seal.

Fixing screws and gland tubes can be supplied as an option.

Recommended torque figures:

M4 lid fixings	1 N-m
M5 lid fixings	1 N-m
M3 earth stud	0.5 N-m
M4 earth stud	1.2 N-m
M5 earth stud	2 N-m
M6 earth stud	2.5 N-m
M5 mounting screw	2 N-m
M6 mounting screw	2.5 N-m
M8 mounting screw	5 N-m
M16 mounting screw	20 N-m