



## ULTRA-LOW LEAKAGE POWERLINE FILTER RANGE FOR USE ON 2 PHASE (2-WIRE) AND 3 PHASE (3-WIRE) APPLICATIONS

### Description

A high performance range of 2 and 3 phase filters with ultra-low line to earth leakage current. They provide high attenuation from 100kHz to 18GHz suitable for use in TEMPEST and other secure information handling applications. These filters are designed without a neutral line for use in delta configuration ( $\Delta$ ) floating line applications. The Line to Earth leakage currents are minimised to allow up to 5 filters in parallel and remain below 30mA. These filters are intended for use only in a permanently earthed application.

### Features

- Ultra-low line to earth leakage current
- Utilise MPE self-healing feedthrough capacitors
- Uses UL94-V0 insulating materials
- RoHS Compliant

Voltage ratings available:

- 230VAC 2-wire (SP&N / 2 Phase)
- 230VAC 3-wire (3 Phase no-neutral)
- 440VAC 3-wire (3 Phase no-neutral)

### Product Range

Part Number	Current (A)	No. of Lines	Voltage Line to Line (VAC)	Performance Line (See Chart)	Maximum Line to Earth Capacitance (nF)	Line to Earth Leakage Current* (mA)	Test Voltage (VAC)		Maximum DC Line Resistance (m $\Omega$ )
							Line to Earth	Line to Line	
DS30899#Z	10	2	230	1	60	6	2250	2250	25
DS30900#Z	16	2	230	1	60	6	2250	2250	25
DS30796#Z	40	2	230	2	60	6	2250	2250	8
DS30797#Z	40	3	230	1	60	6	2250	2250	8
DS30798#Z	63	3	230	1	60	6	2250	2250	6
DS30799#Z	100	3	230	2	60	6	2250	2250	3
DS30800#Z	163	3	230	3	60	6	2250	2250	1
DS30801#Z	230	3	230	3	60	6	2250	2250	0.5
DS30859#Z	32	3	440	1	60	8	3200	3200	12
DS30860#Z	63	3	440	1	60	8	3200	3200	6
DS30861#Z	100	3	440	2	60	8	3200	3200	3
DS30806#Z	125	3	440	1	60	8	3200	3200	2

\*Based on a single line floating to the rated line-line voltage. This will cancel in a perfectly balanced 3-phase system.

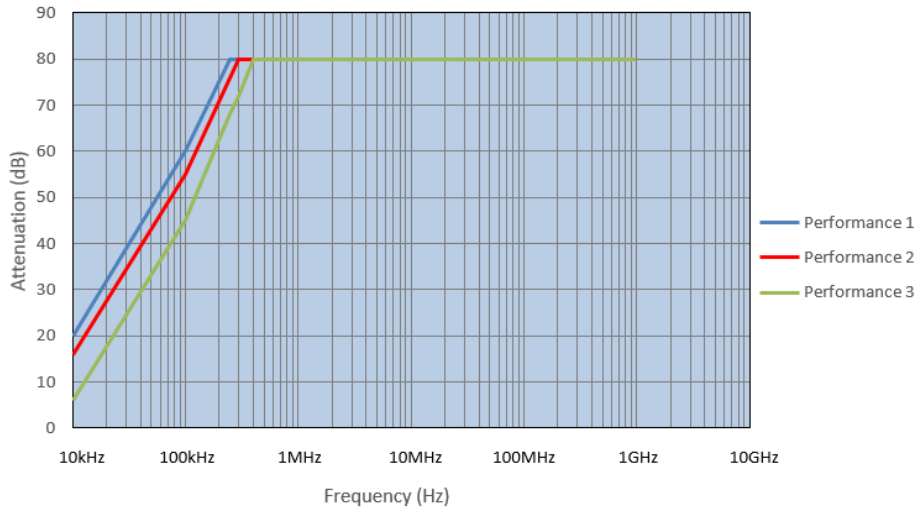
### Ratings and Characteristics

Discharge Resistors	10M $\Omega$ L-E 1M $\Omega$ L-L
Maximum Volt Drop	500mV
Full Load Operating Temperature Range	-45°C to +50°C
Storage Temperature Range	-45°C to +85°C
Discharge Time to Below 34V	<30s

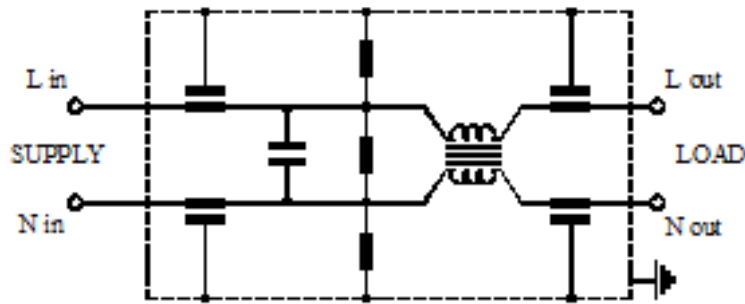


**Insertion Loss Performance**

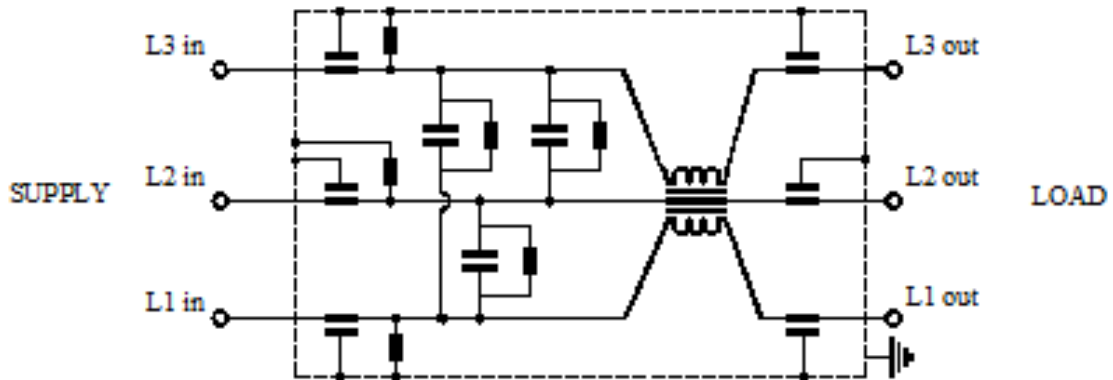
Insertion Loss in 50Ω



**Circuit Diagram - 2 Phase**



**Circuit Diagram - 3 Phase**

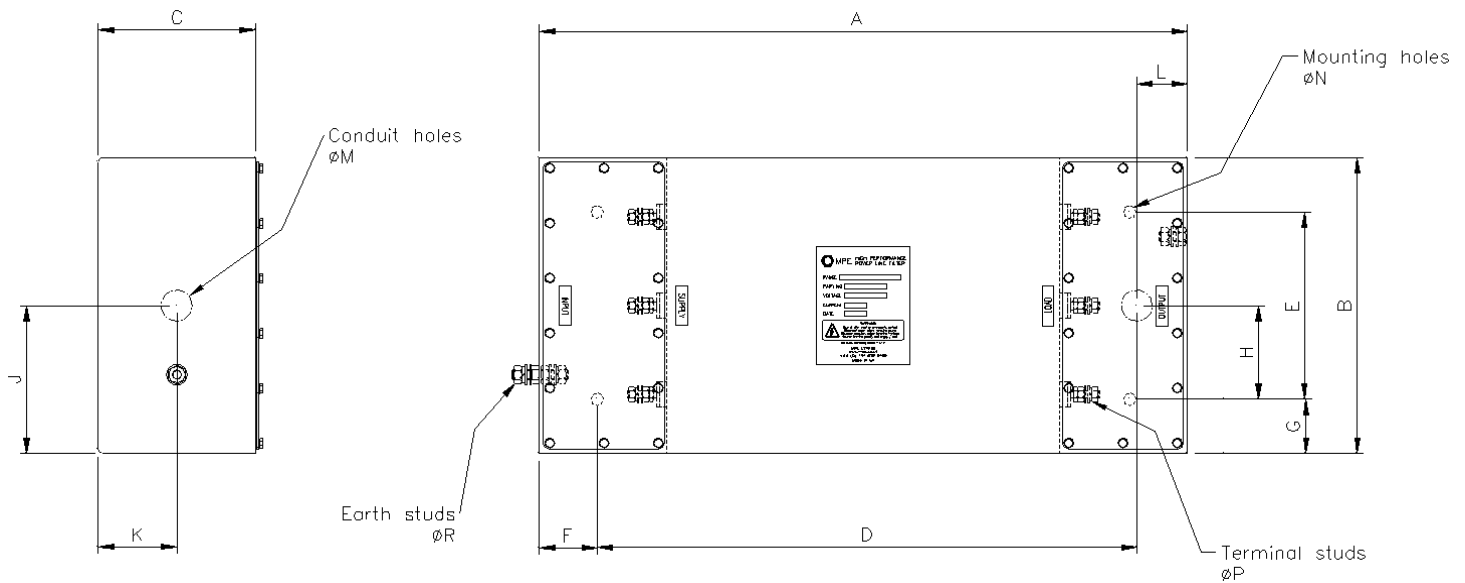




**Dimensions and Mechanical Details**

(Dimensions in mm)

Part Number	No. of Lines	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	Approx Weight (kg)
DS30899#Z	2	310	175	90	212	127	49	24	64	88	45	35	20	4 x M8	M5	M6	8
DS30900#Z	2	310	175	90	212	127	49	24	64	88	45	35	20	4 x M8	M5	M6	8
DS30796#Z	2	550	205	105	487	83	31	61	41.5	103	48	45	32	4 x M8	M8	M10	20
DS30797#Z	3	550	300	110	460	200	45	50	100	150	48	45	32	4 x M8	M8	M10	30
DS30798#Z	3	550	300	110	460	200	45	50	100	150	48	45	32	4 x M8	M8	M10	35
DS30799#Z	3	660	300	135	560	200	50	50	100	150	68	50	32	4 x M8	M8	M10	45
DS30800#Z	3	700	400	150	590	280	55	60	140	200	75	55	51	4 x M12	M12	M12	65
DS30801#Z	3	700	400	150	590	280	55	60	140	200	75	55	51	4 x M12	M12	M12	65
DS30859#Z	3	550	300	110	460	200	45	50	100	150	48	45	32	4 x M8	M8	M10	30
DS30860#Z	3	550	300	110	460	200	45	50	100	150	48	45	32	4 x M8	M8	M10	35
DS30861#Z	3	660	300	135	560	200	50	50	100	150	68	50	32	4 x M8	M8	M10	45
DS30806#Z	3	700	400	150	590	280	55	60	140	200	75	55	51	4 x M12	M12	M12	65

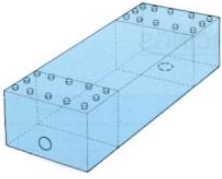


Enclosure material:  
Finish:

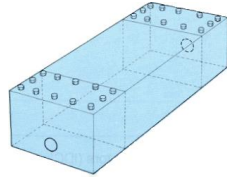
Electroplated steel  
Gloss paint, light admiralty grey (base paint free)



## Cable Entry Options



Part No DS XXXXCZ  
End entry base exit  
(standard cable entry configuration)



Part No DS XXXXAZ  
End entry end exit  
(alternative cable entry)

Two different cable entry options are available as shown:  
Standard configuration suffix CZ for shielded room/chamber mounting with end entry and base exit.  
Alternative configuration suffix AZ for end entry and end exit.

## Filter Selection Guide & Ordering Information

**Step 1** Choose current and number of lines required.

**Step 2** Select part number and cable entry suffix.

### Installation Details



### Typical Installation

The mounting surface should be clean and unpainted to ensure a low impedance earth bond and good RF seal. Fixing screws and gland tubes can be supplied as an optional extra.

Recommended tightening torque figures:

M5 lid fixings:	1N-m
M5 terminals:	2N-m
M6 terminals:	2.5N-m
M8 terminals:	5N-m
M10 terminals:	8N-m
M12 terminals:	11N-m

### Safety

Relevant safety standards have been adhered to in the design and manufacture of these products. However, all capacitors will store charge after power has been removed and must be treated with respect as a shock can be lethal if the voltage and charge are high enough.

Even though discharge resistors are fitted to this range of filters, terminals should always be shorted to earth prior to touching to ensure the capacitors are fully discharged.

The user should ensure he is familiar with restrictions on capacitance value, earth leakage current, test voltage, and safety labelling requirements, which may be applicable to his particular installation.

These filters must be solidly and permanently earthed, both for safe operation and to achieve optimum EMC and pulse performance.

### Custom Designs

MPE offers a rapid design service for custom designs where special packaging, mounting, terminations, or multiple lines are required. Over 50% of the filters manufactured by MPE are custom designs and this can offer a very cost effective installation solution. Please ask to see examples of previously offered solutions.