



LOW LEAKAGE TEMPEST EMI FILTERS FOR DEPLOYMENT ON MARINE BASED PLATFORMS

Description

A high performance range of 2 Phase or SP&N, 3 Phase and TP&N Power Line filters with low line to earth leakage current supporting system/equipment compliance with overarching requirements of NATO TEMPEST SDIP-27 and SDIP-29 standards. They provide high attenuation from 100kHz to 10GHz suitable for use in TEMPEST and other secure information handling applications.

Features

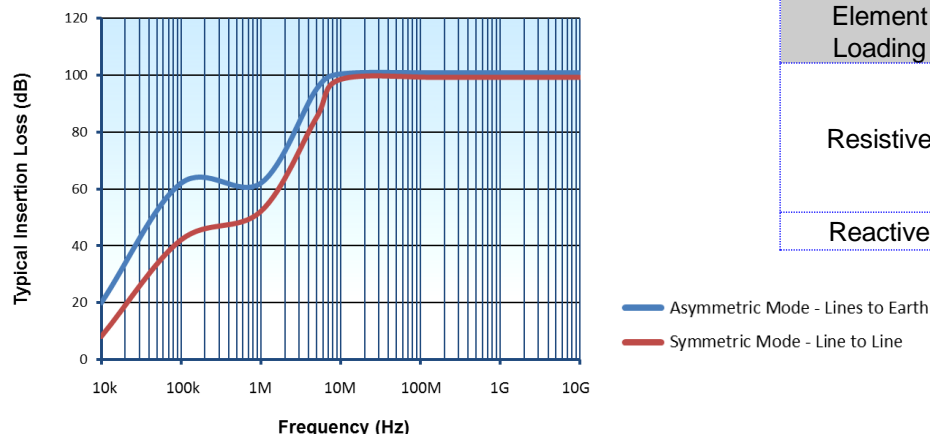
- 2, 3 or 4 line filters with 16A – 125A current ratings
- Low line to earth capacitance limit of 100nF to meet DEF-STAN 59-411/MIL-STD-461, thus reducing AC leakage current to earth*
- Filter construction incorporates high frequency, low inductance feedthrough capacitors and EMI gasketing for maintaining greater than 100dB at high frequencies
- Stainless steel enclosure for robust construction, corrosion resistance and to maintain the RF barrier to the shield
- Utilises MPE self-healing feedthrough capacitor technology providing high reliability and long service life
- UL94-V0 insulating materials used
- RoHS (2011/65/EU) & LVD (2014/35/EU) compliant

Ratings and Characteristics

Test Voltage	2250VDC each line to case
Maximum Line to Earth Capacitance	100nF
Bleeder/Discharge Resistors (L-E)	10MΩ ± 5%, fitted internally
(L-L)	1MΩ ± 5%, fitted internally
Discharge Time to Below 30V	<30s
Mechanical Fixing	External fixing tabs (Fixing hardware not provided)
Full Load Operating Temperature Range	-45°C to +50°C
Storage Temperature Range	-55°C to +85°C
Enclosure Material	Ferromagnetic stainless steel EN 1.4003
Enclosure Material Gauge	1.5 mm
Finish	Gloss epoxy paint DEF-STAN 80-161
Colour	Light admiralty grey BS 381C 697
(The base of the filter, fixing feet and areas around the cable entry/exit holes will be paint free for optimum earth connection)	

Insertion Loss Performance

Typical insertion loss in reference 50Ω system measured in accordance with CISPR 17 at all loading conditions.



Circuit Element Loading

Max Circuit Element Loading	Series	Shunt
Resistive	32mΩ @ 16A 14mΩ @ 32A 6.5mΩ @ 63A 3.5mΩ @ 100A	10MΩ
Reactive		100nF



Product Range Electrical Ratings

Part Number	Current (A)	No. of Lines	Voltage (VAC)	Freq. (Hz)	Max Line to Earth Leakage Current* (mA)				DC Volt Drop @ Full Load (mV)	Approx. Weight (kg)
					115V		250V			
					50Hz	60Hz	50Hz	60Hz		
DS50001	16	2	250	50/60	4	5	8	10	500	8
DS50002	32	2	250	50/60	4	5	8	10	450	12
DS50003	63	2	250	50/60	4	5	8	10	400	18
DS50004	100	2	250	50/60	4	5	8	10	350	25
DS50005	125	2	250	50/60	4	5	8	10	330	28
DS50006	16	3	440	50/60			8	10	500	10
DS50007	32	3	440	50/60			8	10	450	15
DS50008	63	3	440	50/60			8	10	400	22
DS50009	100	3	440	50/60			8	10	350	38
DS50010	125	3	440	50/60			8	10	330	42
DS50011	16	4	440/250	50/60			8	10	500	15
DS50012	32	4	440/250	50/60			8	10	450	22
DS50013	63	4	440/250	50/60			8	10	400	32
DS50014	100	4	440/250	50/60			8	10	350	42
DS50015	125	4	440/250	50/60			8	10	330	46

*These leakage currents will cancel in a balanced system.

Environmental Details

Enclosure Rating

IP 65

Potting Compound Flammability Rating

UL94 V-0

Mould & Fungi

Gloss epoxy finish provides good resistance to mould growth

The filter is designed to meet the requirements of the following environmental design standards for user equipment qualification and type testing:

Humidity IEC 68-2-3

93% RH at +40°C for 21 days

Mechanical Shock IEC 68-2-27

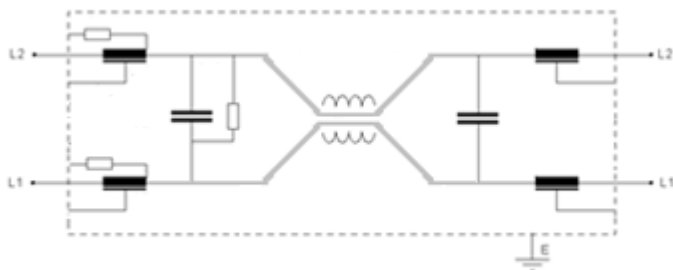
Sawtooth, 15gn for 11ms

Vibration IEC 68-2-6

Sinusoidal, 1.5gn across 5-500Hz

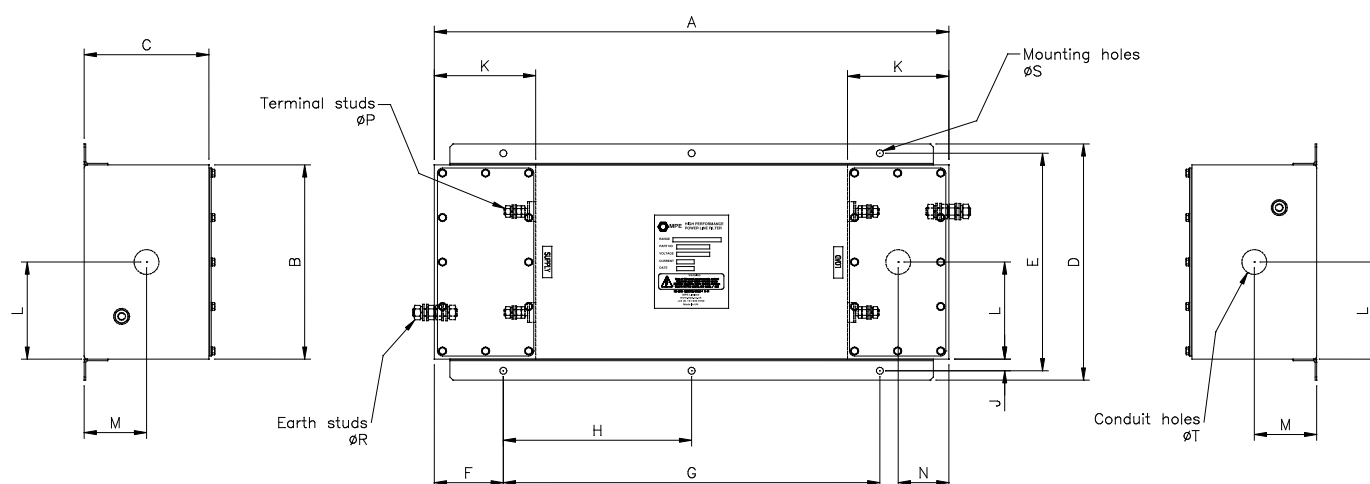
2 Phase / SP&N

Circuit Diagram



Dimensions and Mechanical Details

(All dimensions in mm)

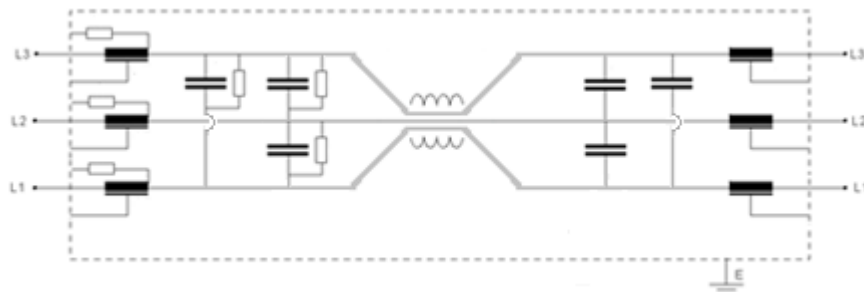


Part Number	# Lines	Length A	Width B	Depth C	D	E	F	G	H	J	K	L	M	N	P	R	S	T
DS50001	2	400	160	80	214	190	45	310	155	15	80	80	40	40	M5	M6	9	21
DS50002	2	500	180	90	234	210	60	380	190	15	90	90	45	45	M5	M6	9	26
DS50003	2	580	220	130	274	250	70	440	220	15	130	110	65	65	M8	M10	9	33
DS50004	2	660	250	160	304	280	90	480	240	15	130	125	80	65	M8	M10	9	33
DS50005	2	740	250	180	304	280	90	480	240	15	150	125	90	75	M8	M10	9	41



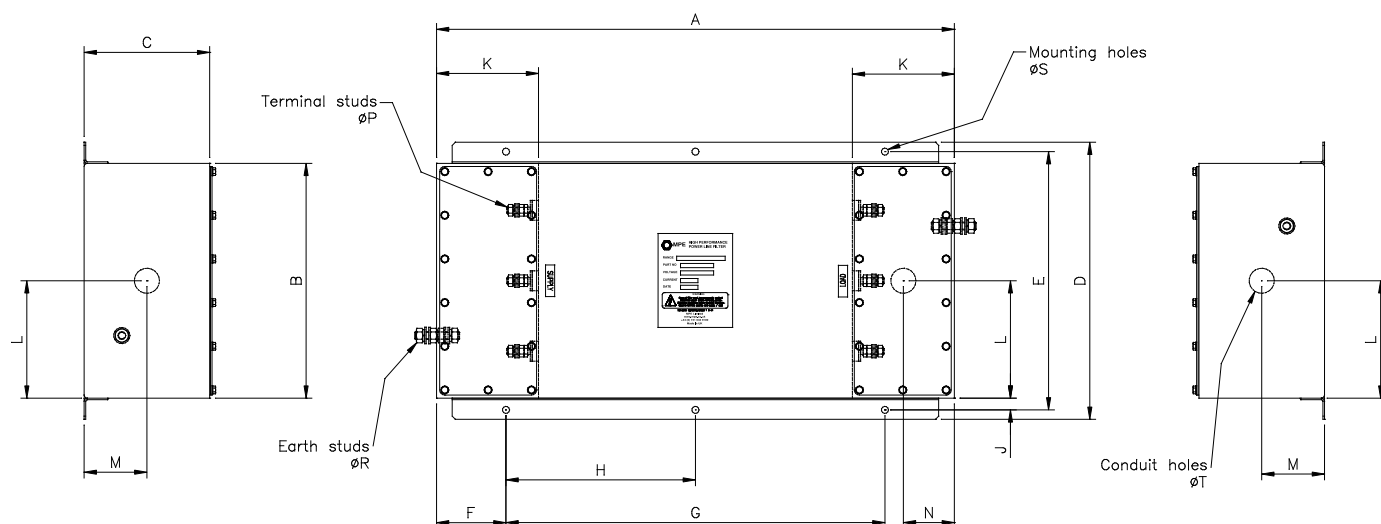
3 Phase

Circuit Diagram



Dimensions and Mechanical Details

(All dimensions in mm)

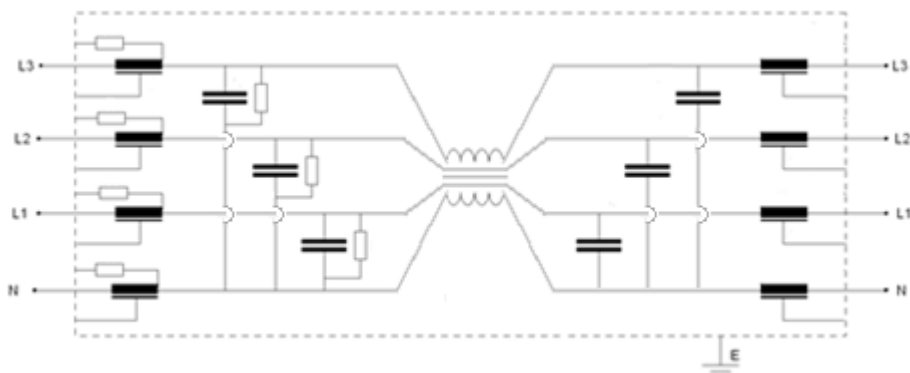


Part Number	# Lines	Length A	Width B	Depth C	D	E	F	G	H	J	K	L	M	N	P	R	S	T
DS50006	3	400	200	80	254	230	45	310	155	15	80	100	40	40	M5	M6	9	21
DS50007	3	500	220	90	274	250	60	380	190	15	90	110	45	45	M5	M6	9	26
DS50008	3	580	250	130	304	280	70	440	220	15	130	125	65	65	M8	M10	9	33
DS50009	3	660	300	180	354	330	90	480	240	15	130	150	80	65	M8	M10	9	33
DS50010	3	740	300	180	354	330	90	560	280	15	150	150	90	75	M8	M10	9	41



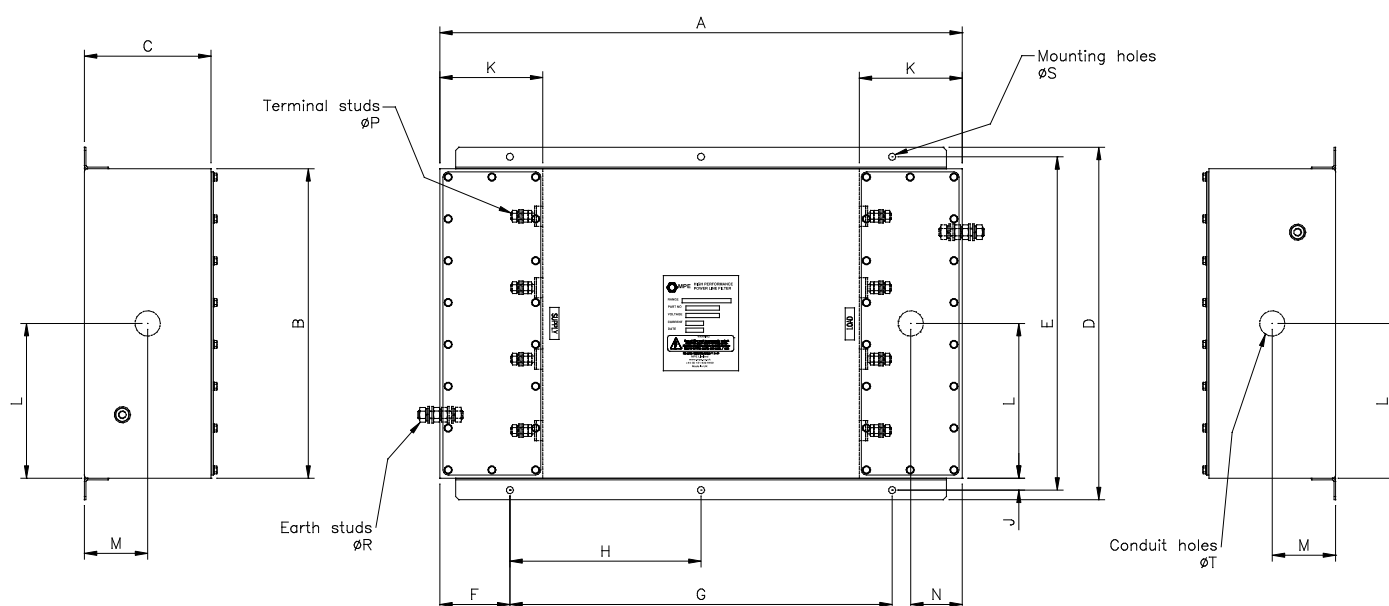
TP&N

Circuit Diagram



Dimensions and Mechanical Details

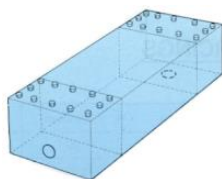
(All dimensions in mm)



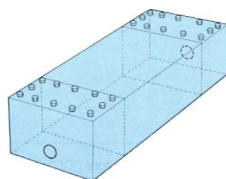
Part Number	# Lines	Length A	Width B	Depth C	D	E	F	G	H	J	K	L	M	N	P	R	S	T
DS50011	4	400	240	80	294	270	45	310	155	15	80	120	40	40	M5	M6	9	21
DS50012	4	500	280	90	334	310	60	380	190	15	90	140	45	45	M5	M6	9	26
DS50013	4	580	320	130	374	350	70	440	220	15	130	160	65	65	M8	M10	9	33
DS50014	4	660	390	160	444	420	90	480	240	15	130	195	80	65	M8	M10	9	33
DS50015	4	740	390	180	444	420	90	560	280	15	150	195	90	75	M8	M10	9	41



Cable Entry Options



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



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

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

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 connected to the fixed ground reference, both for safe operation and to achieve optimum EMC and TEMPEST 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 contact our Sales Department for more information.