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APPLICATIONS NOTES

POWER LINE FILTERS FOR USE ON 400Hz SUPPLIES

MPE applications notes are provided for guidance only and are 8MPE Limited

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Approved to ISO9001

APPLICATIONS NOTES

POWER LINE FILTERS FOR USE ON 400Hz SUPPLIES

MPE's standard range of high performance power line filters, for use on 400Hz supplies, have a performance of 100dB from 100kHz to 10GHz.

Although it is quite possible to design and manufacture filters for 400Hz applications which will meet 100dB at 14kHz, MPE do not recommend this and will not usually offer such filters except in exceptional circumstances for the following reasons:-

Any 400Hz power line filter, while offering high performance in the stop band, must have no attenuation at the supply frequency of 400Hz. Very high performance filters meeting 100dB at 14kHz will still have a significant performance at, say, 1kHz even if they do not attenuate the supply frequency.
This means that the filter will attempt to attenuate any harmonics, which may be present on the 400Hz supply.

Harmonics on a 400Hz supply will generate large capacitor currents to earth in any power line filter and can cause overheating of both filter capacitors and inductors. This effect is more pronounced with higher performance filters because their component values are larger.

As 400Hz supplies are usually provided by small generators, their harmonic content can be expected to be high so would be likely to cause overheating problems in any very high performance filter.

MPE is only prepared to supply 400Hz filters with a performance better than 100dB from 100kHz to 10GHz when the user can guarantee a low harmonic content on the supply.

A number of filter manufacturers, particularly in the U.S.A., do claim to offer standard catalogue filters meeting 100dB at 14kHz. These claims should be treated with caution as rapid overheating and a short lifetime may be expected if such filters are used on conventional 400Hz supplies. We have had reports from several customers who have experienced severe overheating and filter failure when using U.S. manufactured filters of this type on 400Hz supplies.