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## **APPLICATIONS NOTES**

### **GUIDANCE NOTES ON WIRING OF POWER LINE FILTERS**

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# APPLICATIONS NOTES

## GUIDANCE NOTES ON WIRING OF POWER LINE FILTERS

These simple guidelines apply to the wiring of all types of power line filter to the electrical supply to ensure that the filter operates correctly and provides its optimum level of performance.

As these rules are generally in accordance with accepted good wiring practice and with requirements of the IEE regulations, there may be no need to take any extra precautions when wiring filters. However, problems can arise when bad wiring practices are introduced, or when unconventional wiring procedures are adopted.

Such wiring practices may be acceptable under normal circumstances without filters but are likely to cause problems when there are filters in circuit.

### **1. Neutral may be connected to earth anywhere on the supply side of the filter.**

This is normally carried out at the incoming supply transformer or at the UPS output.

In fact for low leakage filters, it is important to have a good neutral to earth connection at some point to keep the neutral to earth voltage low and hence keep the filter leakage current to a minimum. This is best achieved by having a good quality low impedance connection between neutral and earth at the supply. If there is any great distance between the supply and the filter, it should be ensured that the cross section of both neutral and earth cables to the filter are high to minimise volt drop.

### **2. Neutral must not be connected to earth at any point on the load side of the filter.**

This is because the neutral will almost certainly be earthed at some point on the supply side and earthing on both sides will short out the filter.

### **3. Filters must be used to filter dedicated supplies.**

Filters can be used with one or more loads. The loads may be connected in series or in parallel from the filter provided they are connected in a tree configuration. On no account should they be connected in a ring or loop circuit.

i.e. The filter live and neutral connections on the load side of the filter must not be connected to any other live or neutral connections supplied from elsewhere whether from a filtered supply or not. They may however be used as the supply to a further filter somewhere down the line.

This is to ensure that all load current supplied by the filter returns through the same filter which is a requirement for correct operation. This is also to ensure that the filter is not by-passed rendering it ineffective.