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## **Advice to Communications Cabling Contractors on the Earthing of Metallic Cabinets**

### **INTRODUCTION**

There are a number of opinions and conflicting information with regard to the earthing of cabinets and racks used in structured cabling installations. The TIA Networks Infrastructure Group (SIG/2) offers the following guidelines for Installers:

The Electricity at Work Regulations 1989 state that a connection to an electrical system shall only be made by "competent" electricians.

This necessitates:

1. Adequate knowledge of the application and installation of electricity.
2. Recognised qualification in the application and installation of electricity.
3. Adequate experience of work in connection with electricity.
4. Adequate detailed knowledge of the system upon which the work is being carried out, so that person(s) can avoid danger.

As a condition of contract the Cabling Contractor should agree with the client, and document as matter of contract, who will make the final earth connection in accordance with the guidelines detailed below.

### **PURPOSE OF THE CABINET EARTH**

If a cabinet contains mains voltage distribution or mains voltage equipment, it should be earthed to protect against electric shock in the event of a fault.

In addition, the earthing of a cabinet will reduce EMI (Electro-magnetic interference). For screened or shielded cabling systems you should consult the manufacturer of the cabling system for further guidance on earthing.

Functional earths, as required by some phone systems, are not covered in this TIN.

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#### **IMPORTANT NOTICE**

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## EARTHING REQUIREMENTS

1. An earth cable must be installed from the cabinet to an earth bar or earth terminal. A competent electrician shall install the earth bar or earth terminal and wire it to the premises earth system.
2. The earth connection at each end must be a screw terminal. Earthing via a 13A main plug is *not acceptable*.
3. The CSA (cross sectional area) of the Earth cable shall be equal to or greater than that of the largest supply conductor but shall NEVER be less than 4mm.
4. An earth cable of 6mm cross sectional area, minimum, is required if the distance from the cabinet to the approved earthing point is over 10 metres.
5. The earth cable must be insulated.
6. The length of the cable from the cabinet to the earth terminal should not be more than 20 metres.
7. If there is more than one cabinet, each cabinet must be connected to the earth terminal or earth bar separately, not daisy chained.
8. A permanent label or tag should be used at the connection point at the cabinet marked with the words: *"Safety earth – Do not remove"*.
9. Earth connections should be kept as short and straight as reasonably possible to avoid creating a high impedance path for high frequency EMI (Electro-magnetic interference). *Do not coil earth cable or double it back on itself to create a parallel path as EMI will be increased.*
10. If the cabinet is to accommodate a shielded cabling system it is good practice to have two earth connections of different lengths because a single connection can have high impedance at certain frequencies.
11. It is bad practice to use non-copper conductors for earthing. (e.g. steel armouring or conduit). These offer higher impedance paths and can cause currents to take alternative paths to earth, such as cable screens.
12. Metallic items within a cabinet (e.g. shelves, panels and cable organisers) shall be bonded. This should be with 2.5mm earth bond wire as a minimum.

## ACKNOWLEDGMENT

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**Copies of all cabling and other telecommunications standards are available from TIA  
Contact: [info@tia.org.uk](mailto:info@tia.org.uk) for further information.**

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