

How to apply earthing equipment

An effective earthing system is a fundamental requirement of any modern structure or system for operational and/or safety reasons. Without such a system, the safety of a structure, the equipment contained within it and its occupants are compromised.

Earthing systems typically fall into (but are not limited to) one of the following categories:

- Power generation, transmission and distribution
- Lightning protection
- Control of undesirable static electricity
- Telecommunications

The following schematic illustrates the key elements of an effective earthing system.

Conductors and Earth rods

As with lightning protection, the first choice faced by the designer of an earthing system is the type of conductor to be used. The correct choice of conductor is extremely important, whether it be a simple below ground electrode or a complex computer room signal reference grid.

Conductors

Furse offer three types of conductor: Flat tape, solid circular and stranded cable.



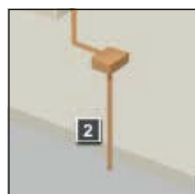
A range of conductor materials are available. Above ground, copper, aluminium and steel may be used. Below ground, copper is the most

common choice due to its high resistance to corrosion.

It is important that earthing conductors should be correctly sized for their application, as they may be required to carry a considerable current for several seconds. Specific data regarding conductor ratings can be found in the conductors section.

Earth rods and plates

In addition to the conductors outlined above, earth rods and plates or any combination thereof can be used to achieve an effective earth depending on the site conditions.



Earth rods take advantage of lower resistivity soils at greater depths than normal excavation will allow.



Earth plates are used to attain an effective earth in shallow soils with underlying rocks or in locations with large amounts of buried services. They can also provide protection at potentially dangerous places e.g. HV switching positions.

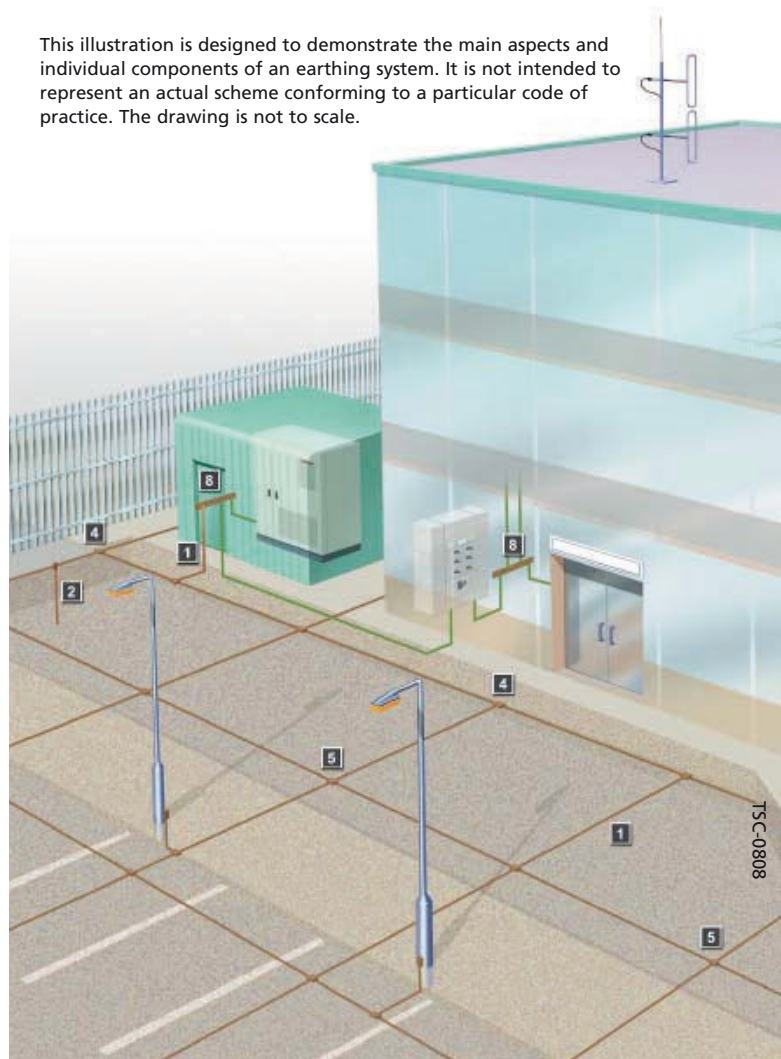
Connectors and terminations

An effective earthing system relies on joints and connections to have good electrical conductivity with high mechanical strength.

Poorly chosen or badly installed joints and connectors can compromise the safe operation of an earthing system.

Furse offer a range of connectors and termination methods to suit a wide range of applications.

This illustration is designed to demonstrate the main aspects and individual components of an earthing system. It is not intended to represent an actual scheme conforming to a particular code of practice. The drawing is not to scale.





FurseWELD exothermic welding

A simple, self-contained method of forming high quality electrical connections which requires no external power or heat source. Connections are made using the high temperature reaction of powdered copper oxide and aluminium.



FurseWELD connections allow conductors to carry higher currents than other types of connections. They will never loosen, are highly conductive and have excellent corrosion resistance.

Compression connectors

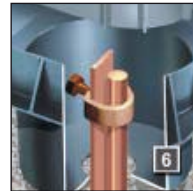
For applications where exothermic welding is not appropriate for creating permanent connections, compression connectors may be used.



Compression connectors produce very robust joints which can be buried in the ground or in concrete.

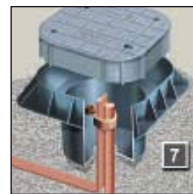
Mechanical clamps

Where permanent connections are not appropriate, mechanical clamps offer the ideal solution. These are typically used on smaller scale installations where periodic disconnection for testing is required.



All Furse mechanical clamps are manufactured from high copper content alloy. They have high mechanical strength, excellent corrosion resistance and conductivity.

Earth inspection pits



Regular inspection and testing of the earthing system is essential. Inspection pits allow easy access to earth electrodes and conductors to facilitate this procedure.

Earth bars



Earth bars are an efficient and convenient way of providing a common earth point. Integral disconnecting links mean the earth bars can be isolated for testing purposes.

Earth electrode backfills



Earth electrode backfills are to be used in areas where required resistance levels are difficult to achieve. These products effectively act to increase the electrodes surface area thus lowering its resistance to earth.



Product selector

- (1) Conductors
- (2) Earth rods
- (3) Earth plates
- (4) FurseWELD exothermic welding
- (5) Compression connectors
- (6) Mechanical clamps
- (7) Earth inspection pits
- (8) Earth bars