



T-Mac® Portable Earthing Equipment

Current Ratings

Current Ratings:

Every set of earthing and short-circuiting equipment has a designated rating, being a specified current for a specified time. It is required to carry this current for this time whilst maintaining the continuity of the electric circuit between conductors and to earth.

To meet its designated rating the portable earthing equipment is tested to a current which is normally 15% higher than the required current rating. This is the test current. The test current applied in the laboratory is defined not only by its rms AC value, but also by its peak current. The peak current stresses the clamps and connections, whereas the rms current tests the capacity of the cables.

Rated Current:

The **rated current** must be greater than the maximum fault current of the installation at the point of earthing.

The **rated time** must be greater than the maximum fault clearing time of the protection at the maximum fault current. The fault clearing time is calculated as the sum of:

- the protection relay operating time for the maximum fault current, plus
- any auxiliary relay operating time, plus
- the circuit breaker fault clearing time (to arc extinction)

The normal rated time is 0.5 seconds, although appropriate current ratings can be assigned to the equipment for different rated times.

For **outdoor applications**, the equipment must carry this current whilst the cable temperature rises to a temperature in excess of 500°C. The insulated covering on the cable may be destroyed at the end of the current flow. This is NOT an indication of failure of the portable earthing equipment. Many outdoor applications are on overhead lines, and any emission from the cable insulation is not normally an issue for worker safety outdoors. Overhead line earth sets are normally lighter and easier to lift and apply than substation or indoor earth sets. Weight is the important factor for worker safety on overhead lines.

For **indoor applications**, earthing equipment is rated at a maximum conductor temperature of 250°C, to prevent emissions from the insulated covering on the cable indoors which may pose a risk to personnel in a confined space. For the same fault level, an indoor earth set will require a larger cable size than an outdoor earth set. It will therefore be bulkier and heavier, but of course is normally not difficult to apply at ground level.

Test Current and Peak Current:

All T-Mac® cables and assemblies have been tested at NATA-registered laboratories in accordance with the relevant standard *IEC 61230 Live working - portable equipment for earthing or earthing and short-circuiting*. As required by IEC 61230, the test current is at least 15% higher than the required rated current and the peak current is required to be at least 2.5 times the test current.
