

## TN003 – Australian & New Zealand Earthing Requirements Guide

The sonnenBatterie installation and configuration guides of the product range will from time to time refer to European and/or British wiring and electrical codes such as BS 7671. Elements of this code are however transferrable to AS/NZS Standards in terms of technical configuration and terminology.

When commissioning the sonnenBatterie system or following the installation manuals you may note options requesting the type of earthing system being used at the premises where the installation is taking place. Commonly there are five types of earthing system as follows.

- TN-S, TN-C-S, TT, TN-C, IT
  - T = Earth (from the French word Terre)
  - N = Neutral
  - S = Separate
  - C = Combined
  - I = Isolated (The source of an IT system is either connected to earth through a deliberately introduced earthing impedance or is isolated from Earth. All exposed-conductive-parts of an installation are connected to an earth electrode.)

The installation although not defined will either be TN-S, TN-C-S (PME) or TT for a low voltage supply.

The vast majority of electrical supply installations throughout Australia will fall under the TN-C classification which within Australian Standards is also referred to the MEN configuration. TN-C meaning Terra (Earth) Neutral Combined, and MEN being Multiple Earth Neutral. The basis of both is that the Earth and Neutral are connected together at a single point, normally in the MSB (Main Switch Board) to create a stable base reference voltage.

Detailed explanations of the three more uncommon supply protocols are contained on the following pages for your reference.

If you have any further questions about the appropriate fixing or securing of the sonnen systems within earthquake prone region, please contact us at any time for further support or assistance.

Yours faithfully,



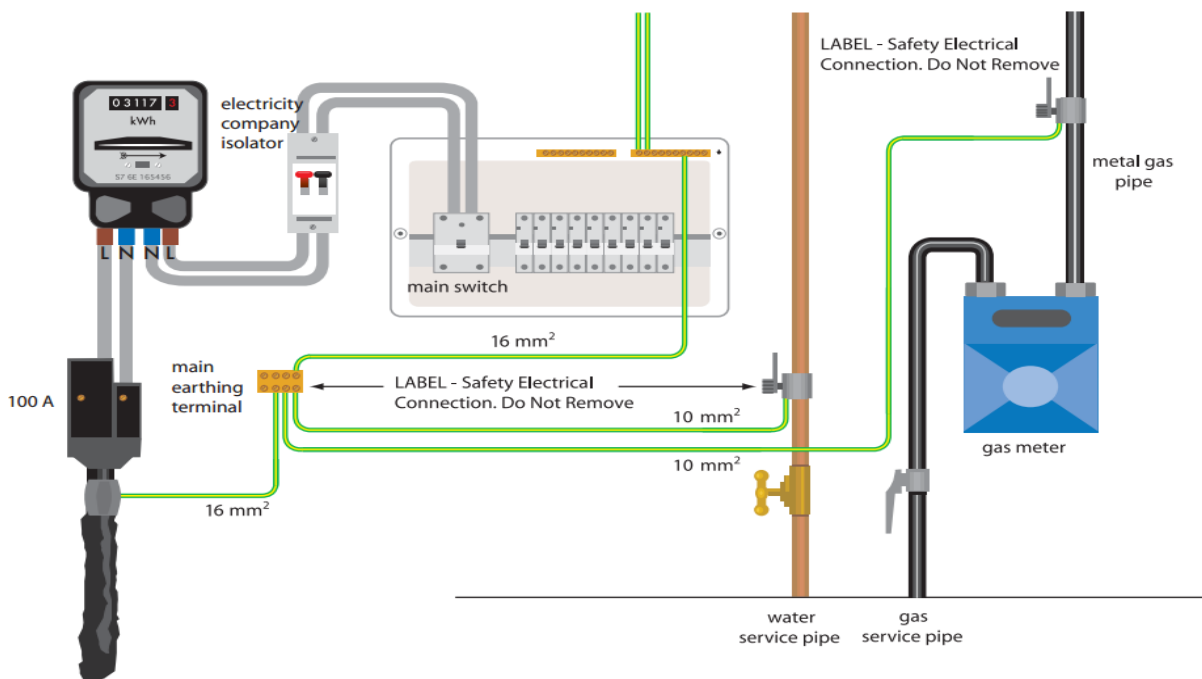
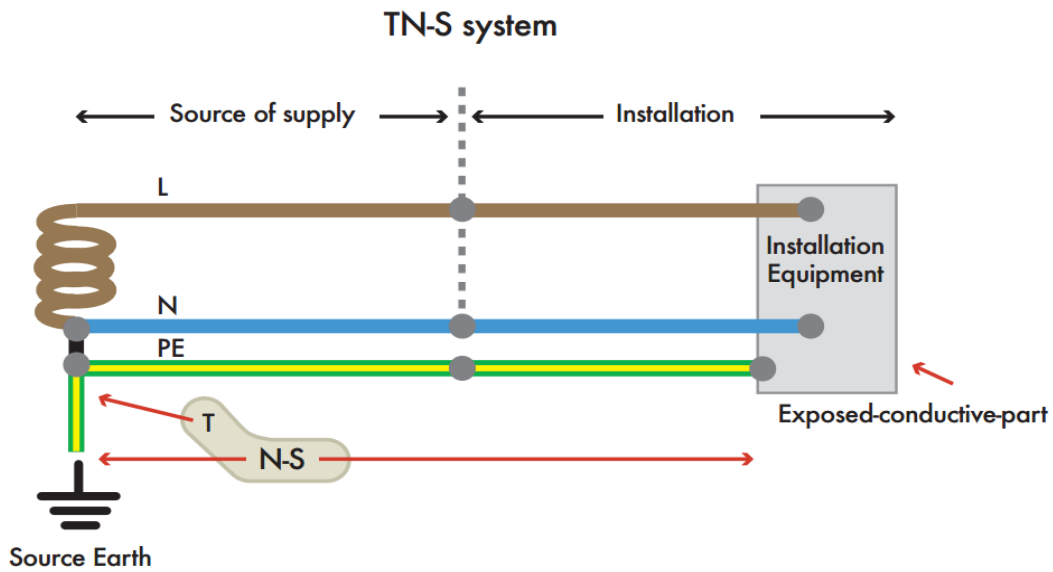
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## TN-S System

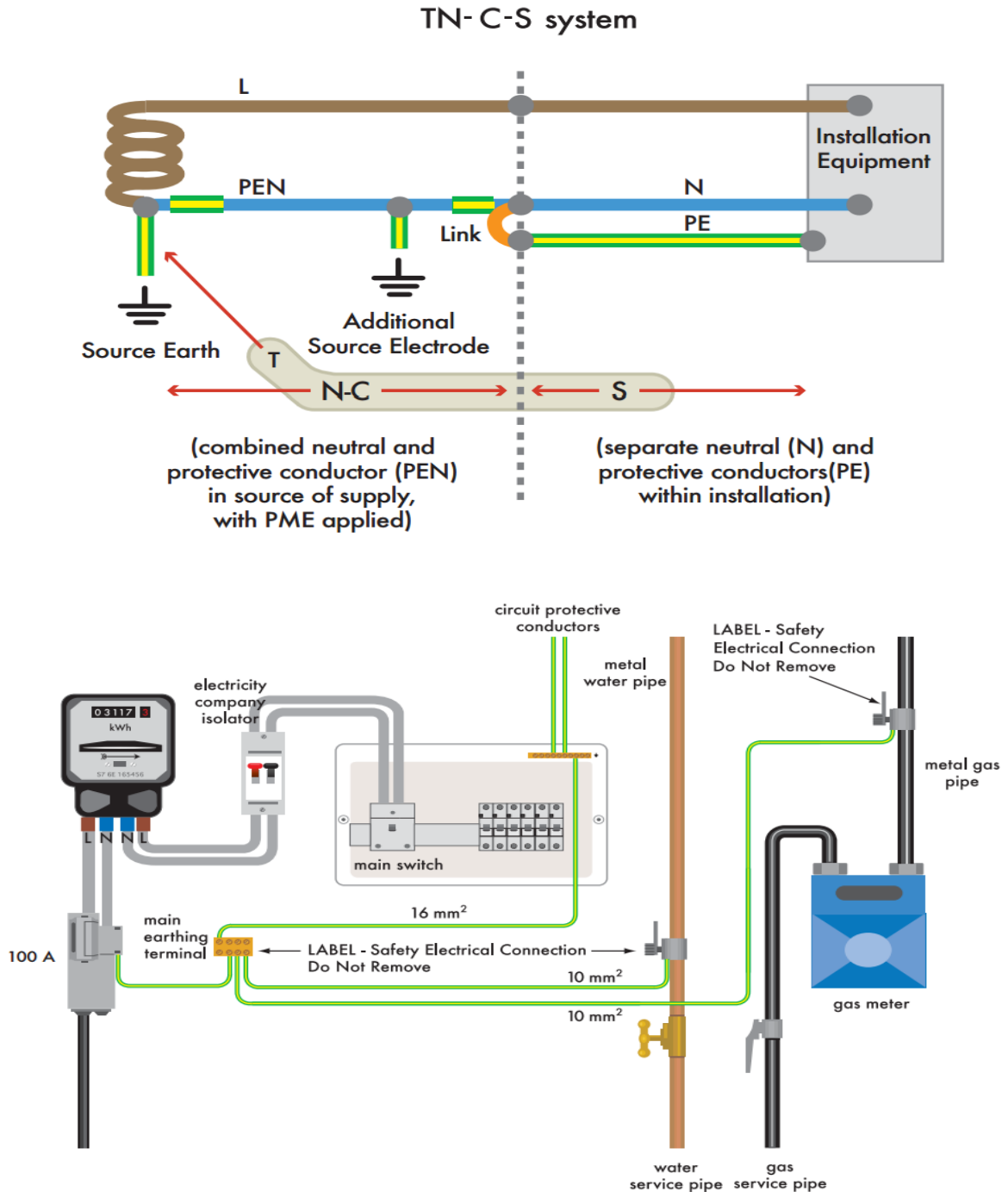
A TN-S system has the neutral of the source of energy connected with earth at one point only, at or as near as is reasonably practicable to the source and the consumer's earthing terminal is typically connected to the metallic sheath or armour of the distributor's service cable into the premises or to a separate protective conductor of, for instance, an overhead supply.

Large consumers may have one or more HV/LV transformers dedicated to their installation and installed adjacent to or within their premises. In such situations the usual form of system earthing is TN-S.



## TN-C-S System

A TN-C-S system conductor of a distribution main connected with earth at source and at intervals along its run. This is usually referred to as protective multiple earthing (PME). With this arrangement the distributor's neutral conductor is also used to return earth fault currents arising in the consumer's installation safely to the source. To achieve this, the distributor will provide a consumer's earthing terminal which is linked to the incoming neutral conductor.



## TT System

A TT system, shown above, has the neutral of the source of energy connected as for TN-S, but no facility is provided by the distributor for the consumer's earthing. With TT, the consumer must provide their own connection to earth, i.e. by installing a suitable earth electrode local to the installation. The circumstances in which a distributor will not provide a means of earthing for the consumer are usually where the distributor cannot guarantee the earth connection back to the source, e.g. a low voltage overhead supply, where there is the likelihood of the earth wire either becoming somehow disconnected or even stolen. A distributor also might not provide means of earthing for certain outdoor installations, e.g. a construction site temporary installation, leaving it to the consumer to make suitable and safe arrangements for which they are fully responsible. The electricity distributor is required to make available his supply neutral or protective conductor for connection to the consumer's earth terminal, unless inappropriate for reasons of safety.

