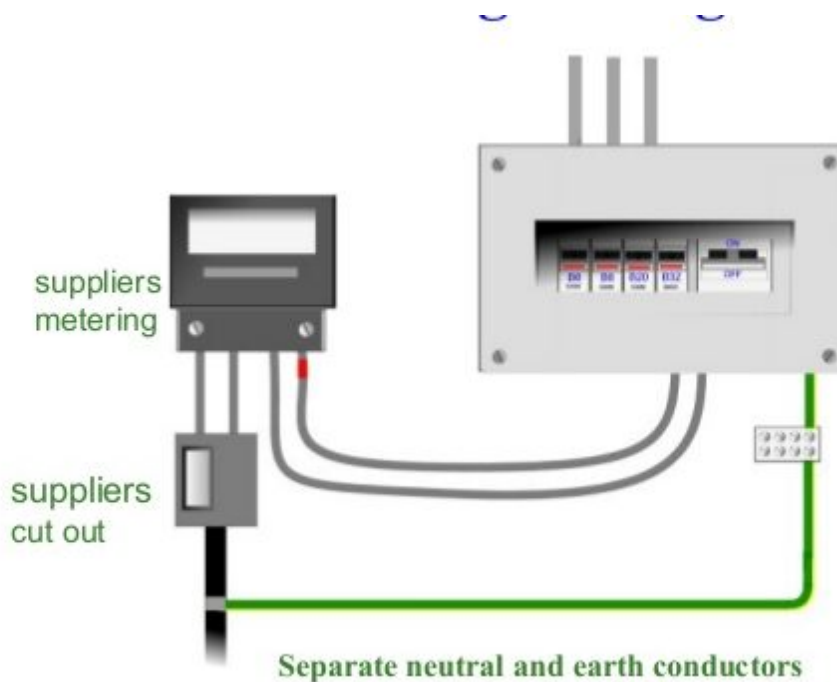


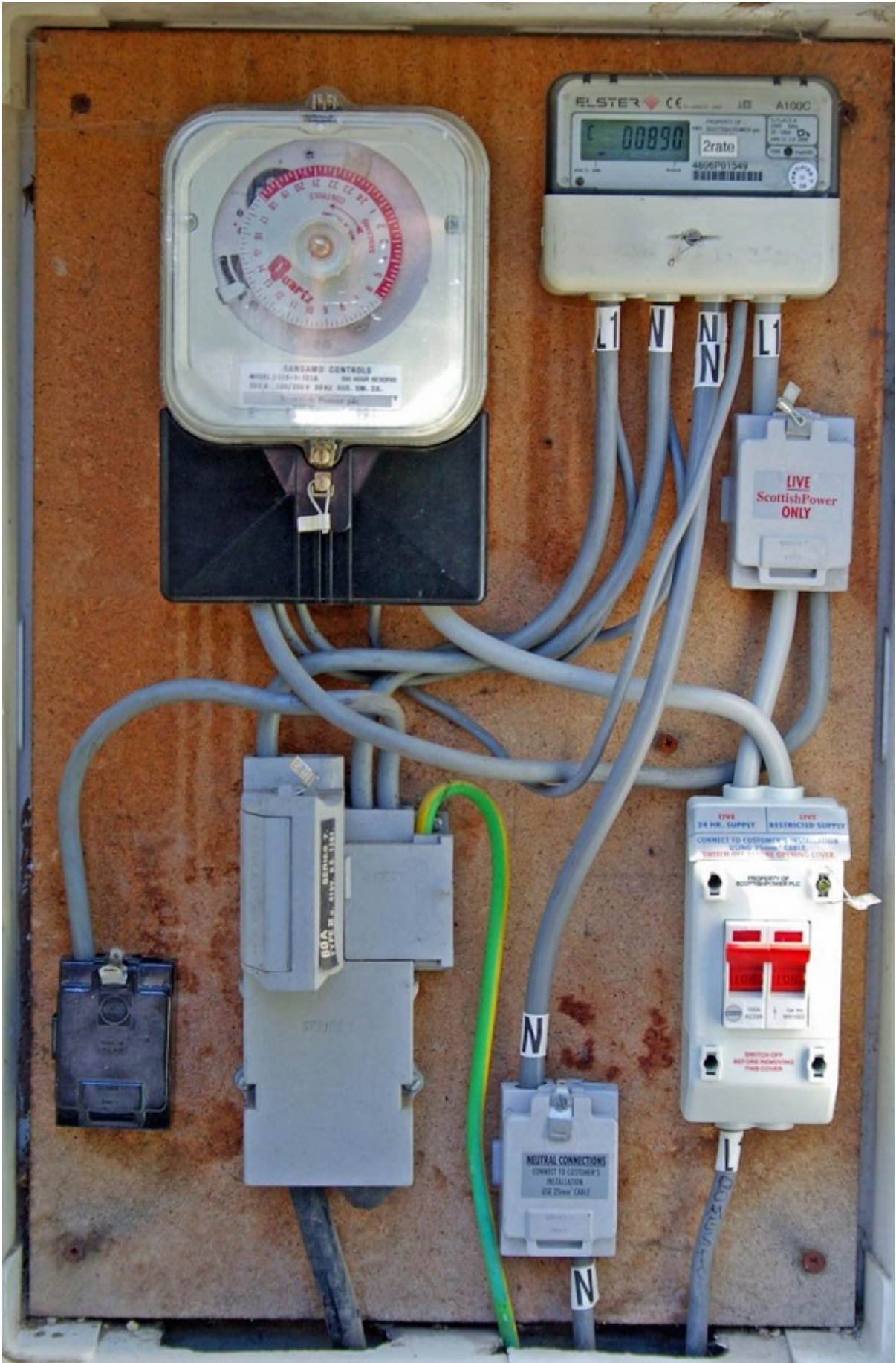
TNS Earthing System: A Useful Guide



In Electrical Engineering terms, the earthing or grounding system is the point of reference in an electrical circuit from which the voltages are estimated. The earthing system or the grounding system also has the function of providing a common return path for electric current through a physical connection to the geology. In an electrical installation, an earthing system electrode connects specific parts of that installation with the Earth's conductive surface for safety and functional purposes. In this article, we will discuss a type of earthing system called the TNS earthing system. Read this new blog in Linquip to find out more.

Characteristics of TNS earthing system

TN-S systems have a single neutral-to-earth connection, placed as near as possible to the supply transformer and separate supply cables throughout. In low voltage supplies, the transformer can even be connected to the sheath of the supply cable which will give a separate route back to the substation transformer.



The characteristics of the TNS earthing system are as follows.

- When the system is running normally, there is no current on the dedicated protection line, but there is an unbalanced current on the working zero line. There is no voltage on the PE line to the ground, so the zero protection of the metal shell of the electrical equipment is connected to the special protection line PE, which is safe and reliable.
- The working neutral line is only used as a single-phase lighting load circuit.
- The special protection line PE is not allowed to break the line, nor can it enter the leakage switch.
- If the earth leakage protector is used on the L line, the working zero line must not be grounded repeatedly, and the PE line has repeated grounding, but it does not pass through the earth leakage protector, so the leakage protector can also be installed on the TNS system power supply L line.
- The TNS earthing system is safe and reliable, suitable for low voltage power supply systems such as industrial and civil buildings. This system must be used before the construction works begin.
- The TNS system may be used even with flexible conductors and small conduits.
- Due to the separation of the neutral and the protection conductor, this system provides a clean PE (computer systems and premises with special risks).
- 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 TNS.

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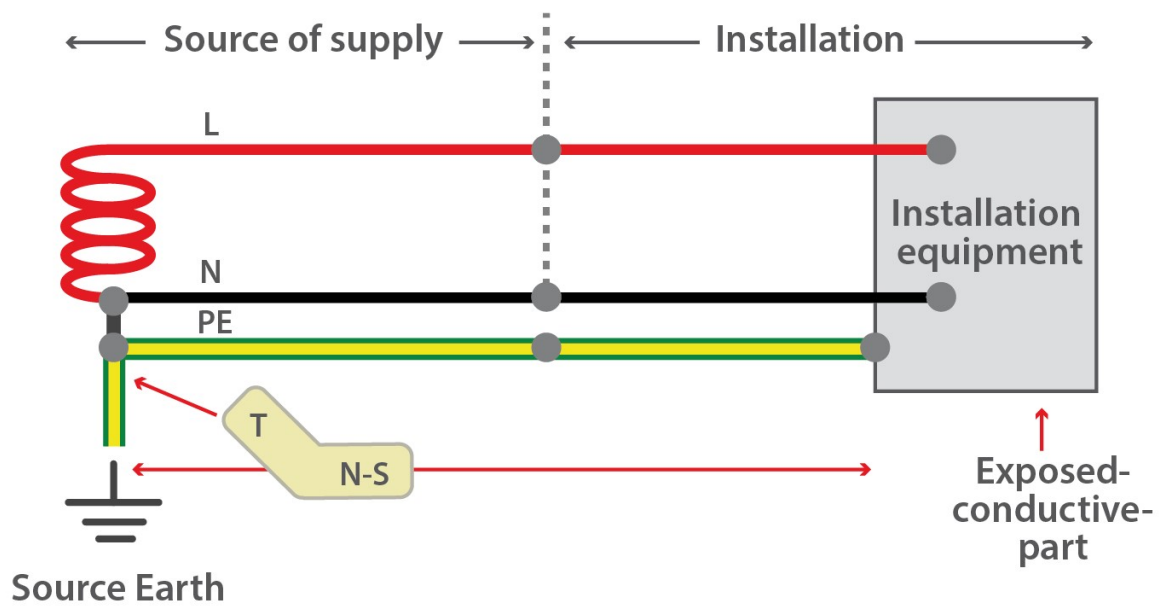
[Earthing System](#): A Simple Explanation about Grounding System

[IT Earthing System](#): The Key and Essential Facts Everybody Wants to Know

TNS earthing system diagram

In the TNS earthing system, there is an earth terminal at the incoming mains position. This earth terminal is connected by the supply protective conductor (PE) back to the start point (neutral) of the secondary winding of the supply transformer, which is also connected at that point to an earth electrode. The earth conductor usually takes the form of the armor and sheath (if applicable) of the underground supply cable. The system is shown diagrammatically in the figure below.

TN-S System



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[Difference Between Grounding and Earthing](#)

What does TNS stand for?

The international standard IEC60364, part 4, and Reference 10 explain the five basic methods of the earthing system.

The first letter denotes the source of power from a star-connected winding. **T** denotes that the start point of the source is solidly connected to the earth, which is usually at a location very near to the winding.

The second letter denotes the consumer. The consumer equipment needs to be earthed. Two basic methods can be used to earth the body of electrical equipment. These methods are denoted by the letters **T** and **N**. The letter **N** is sub-divided into other letters, **S** and **C**.

Therefore in the TNS earthing system:

- **T** denotes that the consumer has solidly earthed independently of the source earthing method.
- **N** denotes that a low impedance conductor is taken from the earth connection at the source and routed directly to the consumer for the specific purpose of earthing the consuming equipment.
- **S** denotes that the neutral conductor routed from the source is separated from the protective earthing conductor, which is also routed from the source. This implies that five conductors need to be routed for a three-phase consumer.

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So this is all you need to know about the TNS earthing system. If you enjoyed this article in Linqip, let us know by leaving a reply in the comment section. Is there any question we can help you with? Feel free to **Sign Up Linqip** on our website to get the most professional advice from our experts.