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### 1.0 Key Words

Generators, neutral earthing, transfer switch

### 2.0 Introduction

- 2.1 This Code of Practice details the correct method of installing standby generators that provide power to an installation that is normally supplied by eThekweni Electricity's low voltage network.

### 3.0 Scope

The provisions of this code of practice shall apply whenever a generator is installed on a low voltage circuit that is normally supplied directly by eThekweni Electricity. This guideline does not apply to installations where consumers purchase electricity at voltage exceeding 1 000 V ac. and create their own low voltage networks.

### 4.0 Referenced Documents

SANS 10142-1 - The wiring of premises - Part 1: Low-voltage installations.  
SANS 60199 - The design and installation of earth electrodes.

### 5.0 Definitions and Abbreviations

For the purpose of this code of practice the following definitions shall apply:

**Switched Neutral Pole** - the second, fourth or neutral pole that is switched simultaneously with the main phase pole.

**Transfer switch** - an automatic or non-automatic device for transferring one or more load conductor connections from one power source to another.

### 6.0 Safety

- 6.1 Standby generators shall only be installed by Accredited Persons in accordance with the provisions of SANS 10142-1 and the Occupational Health and Safety Act, 1993.
- 6.2 The generator manufacturer's safety guidelines shall be adhered to.

### 7.0 The installation of standby generators

#### 7.1 General

- 7.1.1 Any installed generator shall not run in parallel with eThekweni Electricity's supply at any time.
- 7.1.2 Annexure S of SANS 10142-1 is not applicable to any installation within eThekweni Electricity's area of supply as eThekweni Electricity cannot guarantee that a particular substation will be dedicated to one consumer.
- 7.1.3 Whenever a generator is installed, a label with the words "DANGER GENERATOR CONNECTED" shall be affixed to the main incoming eThekweni Electricity circuit breaker. This label shall be a permanent red label with white lettering at least 10 mm high.

## 7.2 Earthing

7.2.1 Each installed generator shall be earthed in accordance with clause 7.12.3 of SANS 10142-1.

## 7.2 Transfer Switch

7.2.1 A single phase generator shall be fitted with a 2 pole break-before-make transfer switch that breaks both the phase conductor and neutral conductor simultaneously when the generator is in operation.

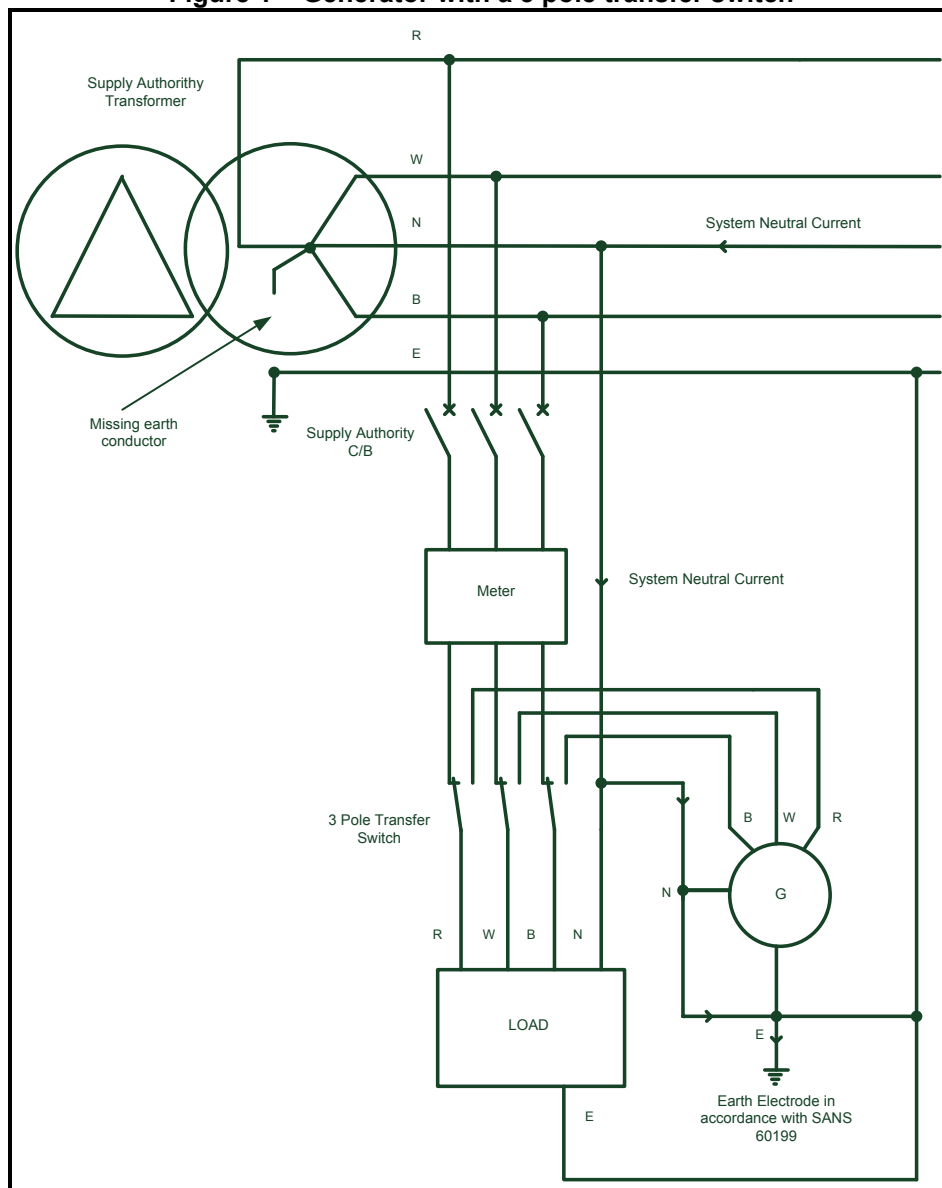
7.2.2 A three phase generator shall be fitted with a 4 pole break-before-make transfer switch that breaks the three phase conductors and neutral conductor simultaneously when the generator is in operation.

7.2.3 The transfer switch shall have a fully rated neutral pole (with design, construction, and ampere capacity rating identical to the phase pole)

7.2.4 Breaking the neutral when the generator is in operation prevents the following harmful effects:

- fault conditions transferring from the consumer's circuit to eThekweni Electricity's circuit which could result in the electrocution of eThekweni Electricity staff or contractors trying to restore supply.
- the consumers earthed neutral being utilized as the system neutral when the system neutral has been stolen as shown in figure 1. This could result in the consumer's neutral conductor becoming overloaded which could result in fire.

**Figure 1 – Generator with a 3 pole transfer switch**



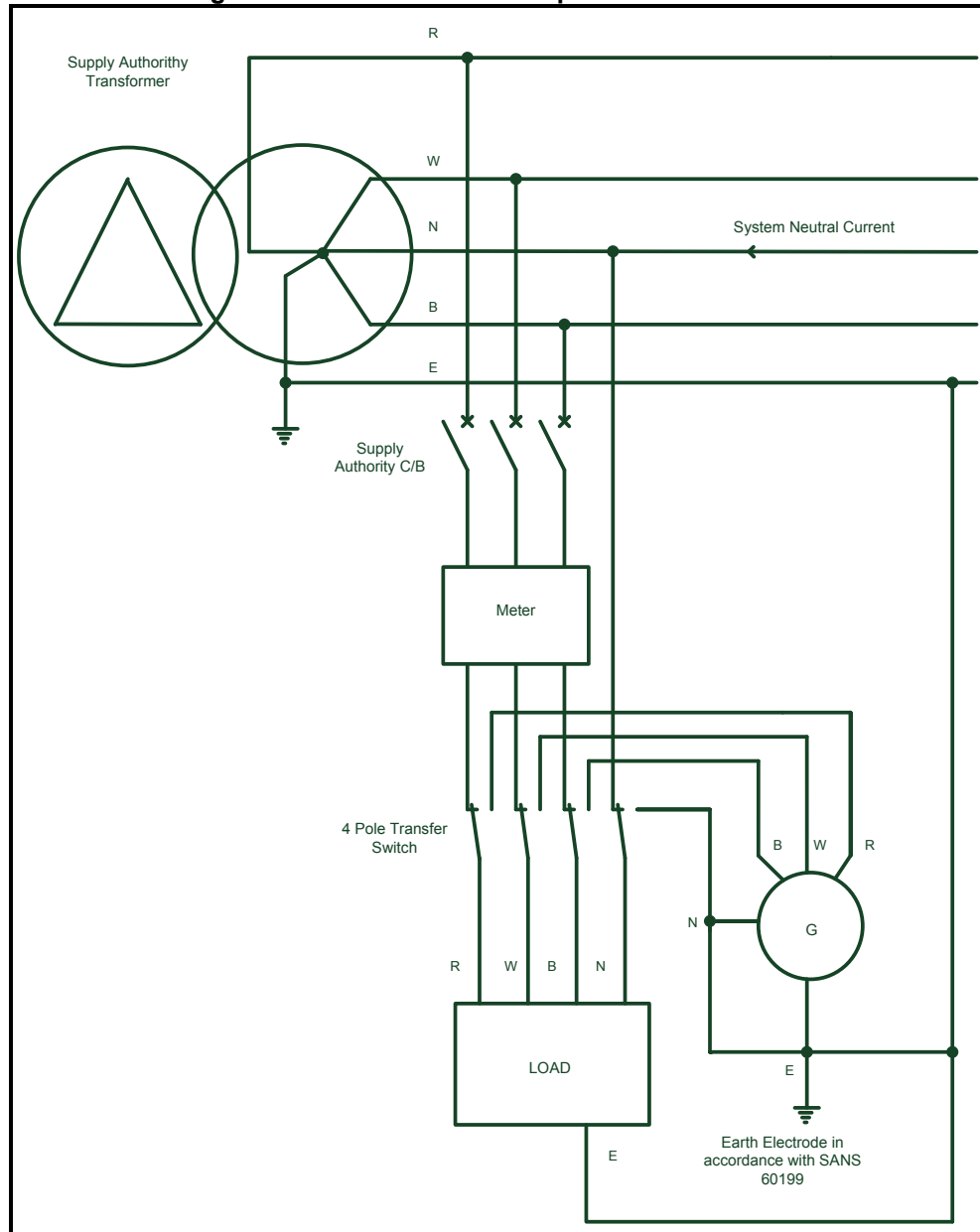
7.2.5 Figure 1 shows the effect of a 3 pole transfer switch for a 3 phase supply. In the absence of the system neutral earthing, the system neutral current returns to earth via the consumer's neutral conductor. This conductor is not rated to carry the full system neutral current and may become overloaded and catch fire.

### 7.3 Generator with a 4 pole transfer switch

7.3.1 Figure 2 below shows a generator installed with a 4 pole transfer switch where the neutral is broken when the generator is connected.

7.3.2 This method of connection will be the only accepted method of connecting a generator to a low voltage supply within eThekweni Municipality.

**Figure 2 – Generator with a 4 pole transfer switch.**

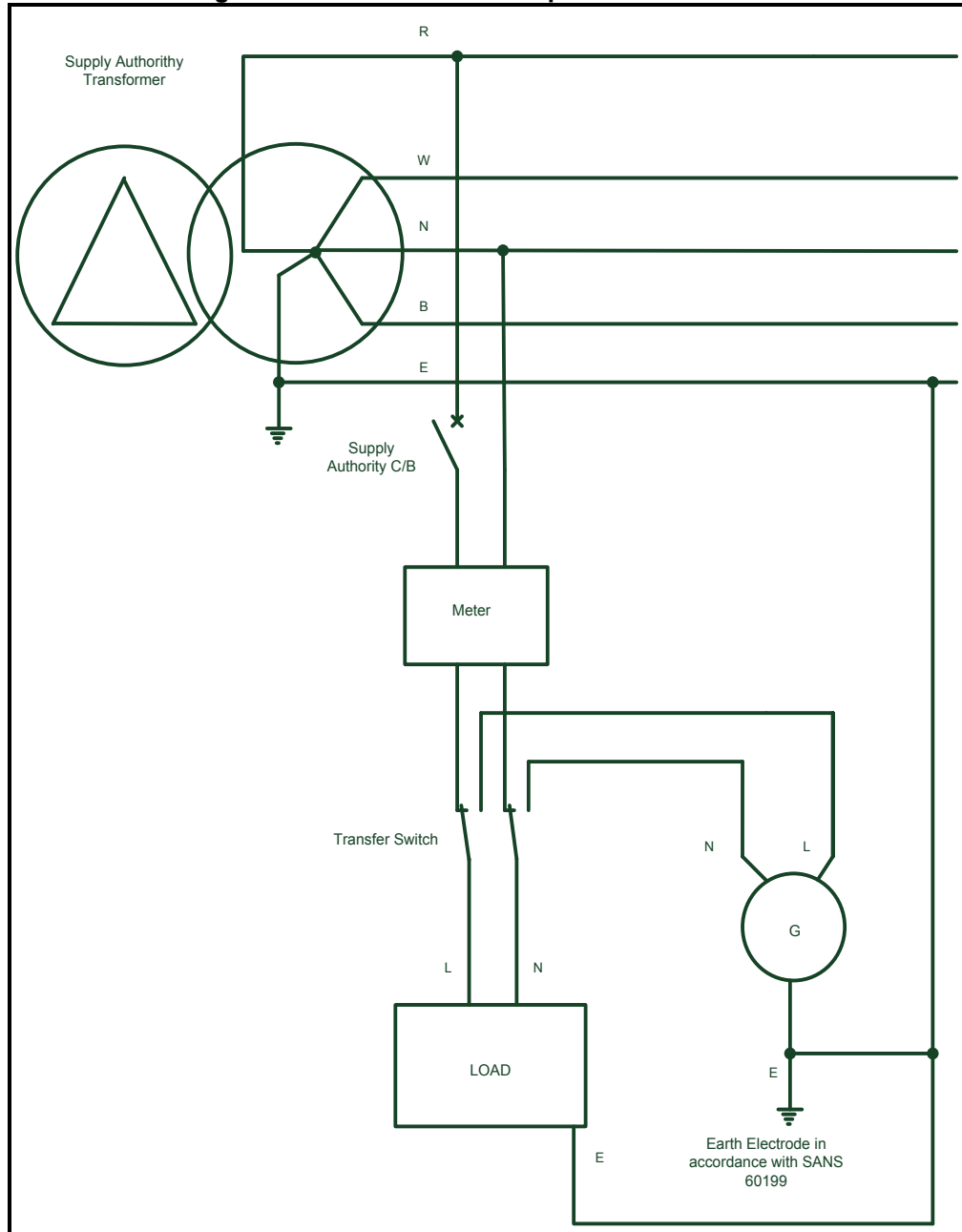


**7.4 Generator with a 2 pole transfer switch**

7.4.1 Figure 3 below details the correct method of installing a single phase generator using a 2 pole transfer switch.

7.4.2 This method ensures that neutral current returns to the generator and does not have multiple paths with the eThekweni Electricity's neutral.

**Figure 3 – Generator with a 2 pole transfer switch**

**8.0 Conclusion**

All generators installed within eThekweni Electricity's area of supply shall comply with the requirements of this code of practice. All generators must be earthed in accordance with SANS 10142 and SANS 60199. Only 4 pole transfer switches in the case of 3 phase generators and 2 pole transfer switches in the case of single phase generators shall be permitted.