ETAP FAQ # 1

Modeling A Zig-Zag Grounding Transformer in ETAP

Description: How to model a Zig-Zag Grounding Transformer using ETAP.

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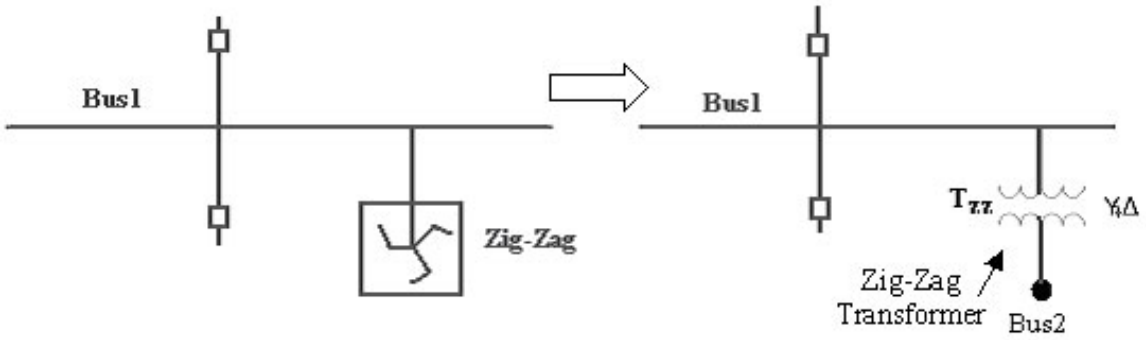
To model a Zig-Zag Grounding Transformer in ETAP you can use a two winding transformer connected as Y / Δ (solidly grounded).

During normal operation, the current flowing in a zig-zag transformer is the magnetizing current which is very small compared to the normal operating current and hence is negligible.

Under a line-to-ground fault the current flowing to the ground through the zig-zag transformer is equal to the rated neutral current, if 100% line-to-neutral voltage is applied.

A Zig-Zag Grounding Transformer can be represented in ETAP by a Y / Δ transformer with the delta side bus not connected to any load (Bus2).



ETAP PowerStation Representation of Zig-Zag Transformer

To calculate the parameters of the Zig-Zag T_{ZZ} transformer, you may use the following equations.

Let the ratings of the Zig-Zag transformer you want to model be:

MVA_{ZZ}	Zig-Zag transformer MVA rating
kV_{ZZ}	Zig-Zag transformer L-L kV rating
Ig_{ZZ}	Zig-Zag transformer ground current in kA

The equivalent parameters of transformer T_{ZZ} will be:

$$MVA = MVAzz$$
$$kV_{sec} = kVzz$$
$$kV_{prim} = kVzz$$

$$Z_{T_{zz}} = \frac{3 \times MVA_{zz}}{\sqrt{3} \times Ig_{zz} \times kV_{zz}}$$

Where $Z_{T_{zz}}$ is the transformer Zero sequence impedance.