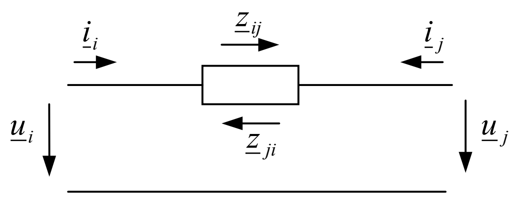
Common Impedance

Model for the positive, negative and zero sequence system:



The following equations are used:

$$\underline{u}_i - \underline{u}_j = \underline{z}_{ij} \underline{i}_i$$
$$\underline{u}_j - \underline{u}_i = \underline{z}_{ji} \underline{i}_j$$

With:

$$\underline{z}_{ij} = r_{ij}\_pu + jx_{ij}\_pu$$
$$\underline{z}_{ji} = r_{ji}\_pu + jx_{ji}\_pu$$

The following equations are used to calculate the impedances in Ohm:

With r, x defining the per unit impedance, the impedance referred to the nominal voltage at bus i can be calculated as follows:

$$\underline{Z}_{ij} = \frac{Un_i^2}{Sn} \cdot (r_{ij}\_pu + jx_{ij}\_pu)$$

Analogously, the impedance referred to the nominal voltage at bus j is:

$$\underline{Z}_{ji} = \frac{Un_j^2}{Sn} \cdot (r_{ji}\_pu + jx_{ji}\_pu)$$

Un	: Nominal bus bar voltage of bus i or bus j in kV
Sn	: Nominal power in MVA

For the short-circuit calculation method IEC/VDE and ANSI it is possible to use different impedances as for the load flow calculation and the ‘complete’ short-circuit method.