

$$\begin{aligned} \text{m}\Omega &:= 10^{-3} \cdot \Omega & \text{kVA} &:= 1000 \cdot \text{V} \cdot \text{A} & \text{MVA} &:= 10^6 \cdot \text{V} \cdot \text{A} & \text{kA} &:= 1000 \cdot \text{A} & \mu\text{H} &:= 10^{-6} \cdot \text{H} \end{aligned}$$

Nennwerten

$$\begin{aligned} S_T &:= 800 \cdot \text{kVA} & U_1 &:= 400 \cdot \text{V} & I_1 &:= \frac{S_T}{\sqrt{3} \cdot U_1} & I_1 &= 1.155 \text{ kA} \\ f &:= 50 \cdot \text{Hz} & \omega &:= 2 \cdot \pi \cdot f \\ u_k &:= 6\% \end{aligned}$$

$$\begin{aligned} \text{Bezug} \quad Z_{\text{ref}} &:= \frac{U_1^2}{S_T} & Z_{\text{ref}} &= 0.2 \Omega \\ I_k &:= \frac{I_1}{u_k} & I_k &= 19.245 \text{ kA} \\ S_k &:= \frac{S_T}{u_k} & S_k &= 13.333 \text{ MVA} \end{aligned}$$

Verluste

$$\begin{aligned} P_{\text{vk}} &:= 8000 \cdot \text{W} & \text{Kurzschluss} \\ P_{\text{v0}} &:= 1300 \cdot \text{W} & \text{Leerlauf} \end{aligned}$$

Widerstände und Reaktanzen (für BEIDE - prim+sek)

$$\begin{aligned} r_{\text{Cu}} &:= \frac{P_{\text{vk}}}{S_T} & r_{\text{Cu}} &= 1\% & R_{\text{Cu}} &:= r_{\text{Cu}} \cdot Z_{\text{ref}} \\ u_x &:= \sqrt{u_k^2 - r_{\text{Cu}}^2} \\ X_{12} &:= Z_{\text{ref}} \cdot u_x & X_{12} &= 11.832 \text{ m}\Omega & L_{12} &:= \frac{X_{12}}{\omega} \\ \text{für 1 System} & \boxed{\frac{R_{\text{Cu}}}{2} = 1 \text{ m}\Omega} & \boxed{\frac{L_{12}}{2} = 18.831 \mu\text{H}} \end{aligned}$$

Leerlauf

$$\begin{aligned} R_{\text{Fe}} &:= \frac{U_1^2}{P_{\text{v0}}} & R_{\text{Fe}} &= 123.077 \Omega & \frac{R_{\text{Fe}}}{Z_{\text{ref}}} &= 615.385 \\ \text{Leerlaufstrom 2\% angenommen} & & X_0 &:= \frac{Z_{\text{ref}}}{2\%} & \frac{X_0}{\omega} &= 31.831 \text{ mH} \end{aligned}$$