

task_ezrkjzifcegttcpc_with_calculation

Student Group

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resonance, resonant circuit, RMS, exam ee2 SS2021

Exercise E1 Resonant Circuit

(written test, approx. 4 % of a 120-minute written test, SS2021)

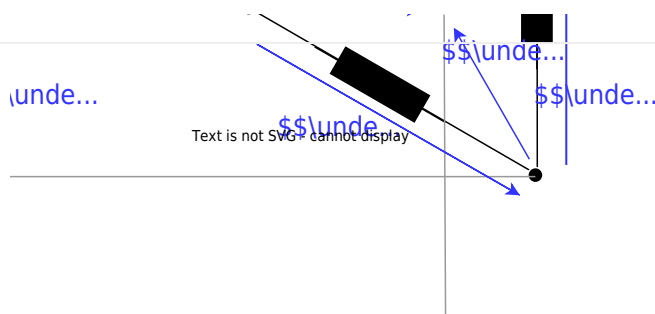
Specify the RMS value of the phase voltage $U_{\text{L}} = U_{\text{S}}$ and the string voltage $U_{\text{m}} = U_{\text{S}}$.
Results be considered in the following.

A voltage with the RMS value $U_{\text{RMS}} = 110 \text{ V}$ is applied between the terminals of each winding.

Through each of the windings, there is a current with an RMS value $I_{\text{RMS}} = 5 \text{ A}$ and a frequency $f_0 = 205.5 \text{ Hz}$ compared to the voltage.

Draw the circuit diagram. $U_{\text{S}} = 110 \text{ V}$ is applied between the terminals of each winding, this is also the string voltage $U_{\text{m}} = U_{\text{S}}$.

For delta configuration, the phase voltage $U_{\text{L}} = U_{\text{S}}$ is equal to the string voltage $U_{\text{m}} = U_{\text{S}}$.
With the values: $f_0 = \frac{1}{2\pi \sqrt{20 \cdot 10^{-3} \cdot 30 \cdot 10^{-6}}} = 205.4681 \text{ Hz}$



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