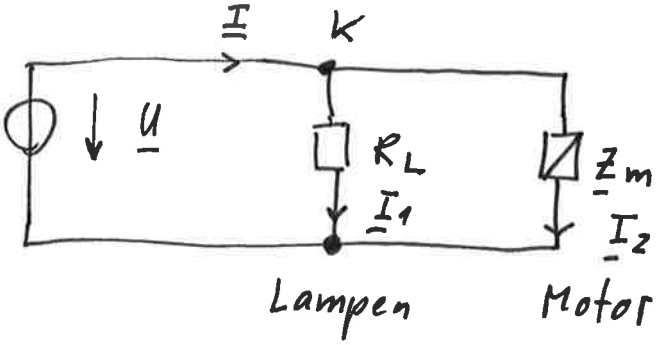
ETII, 35

8.12.2013 / bpe



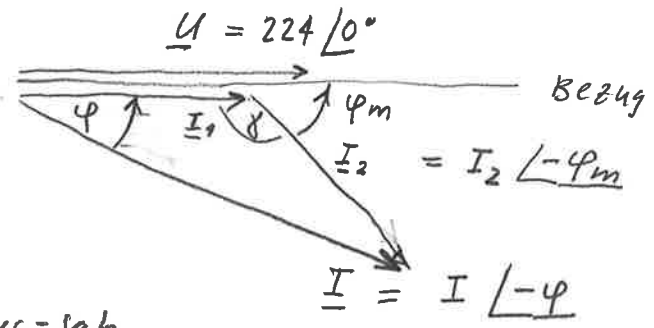
geg: $\underline{U} = 224 \angle 0°\ V$

$I = 20.6\ A$, $I_1 = 12.5\ A$, $I_2 = 8.9\ A$

ges: $\cos\varphi_m$, P_m, P_L

Lösung

$P_L = U \cdot I_1 = 224\ V \cdot 12.5\ A = \underline{2800\ W}$



Cosinus-Satz

$$\gamma = \arccos\left(\frac{I_1^2 + I_2^2 - I^2}{2 \cdot I_1 \cdot I_2}\right) = 148.1°$$

$$\frac{I_1^2 + I_2^2 - I^2}{2 \cdot I_1 \cdot I_2} = -0.849$$

$\varphi_m = 180° - 148.1° = 31.9°$

$$\varphi = \arccos\left(\frac{I_1^2 + I^2 - I_2^2}{2 \cdot I_1 \cdot I}\right) = \overset{+}{(-)}\ 13.2°$$

$P_m = U \cdot I_2 \cdot \cos\varphi_m = 1693\ W$

$P = U \cdot I \cdot \cos\varphi = 4493\ W$