

5.1.3. feladat

$$a) P_1 = \frac{P_n}{\eta_n} = \frac{5}{0,85} = 5,882 \text{ kW}$$

$$P_1 = 5,882 \text{ kW}$$

$$b) I_v = \frac{P_1}{\sqrt{3} \cdot U_n \cdot \cos \varphi_n} = \frac{5882}{\sqrt{3} \cdot 380 \cdot 0,76} = 11,76 \text{ A}$$

$$I_v = 11,76 \text{ A}$$

$$I_f = \frac{I_v}{\sqrt{3}} = \frac{11,76}{\sqrt{3}} = 6,76 \text{ A}$$

$$I_f = 6,76 \text{ A}$$

$$c) P_v = P_1 - P_n = 5882 - 5000 = 882 \text{ W} = 0,882 \text{ kW}$$

$$P_v = 0,882 \text{ kW}$$

$$d) n_0 = \frac{60 \cdot f}{p} = \frac{60 \cdot 50}{2} = 1500 \text{ 1/min}$$

$$s = \frac{n_0 - n_n}{n_0} = \frac{1500 - 1440}{1500} = 0,04$$

$$f_2 = s \cdot f_1 = 0,04 \cdot 50 = 2 \text{ Hz}$$

$$f_2 = 2 \text{ Hz}$$

$$e) M = \frac{P_n}{\omega} = \frac{60 \cdot P_n}{2 \cdot \pi \cdot n} = \frac{60 \cdot 5000}{2 \cdot \pi \cdot 1440} = 33,13 \text{ N} \cdot \text{m}$$

$$M = 33,13 \text{ N} \cdot \text{m}$$

$$f) U_e = \epsilon \cdot U_n = 0,02 \cdot 380 = 7,6 \text{ V}$$

$$A_{\min} = \frac{\sqrt{3} \cdot \rho \cdot l \cdot I_v \cdot \cos \varphi_n}{U_e} =$$

$$= \frac{\sqrt{3} \cdot 0,029 \cdot 100 \cdot 11,76 \cdot 0,76}{7,6} = 5,9 \text{ mm}^2$$

$$A_{\min} = 5,9 \text{ mm}^2$$

$$g) A = 6 \text{ mm}^2$$

$$A = 6 \text{ mm}^2$$

$$P_{vez} = 3 \cdot I_v^2 \cdot R_v = 3 \cdot I_v^2 \cdot \frac{\rho \cdot l}{A} = 3 \cdot 11,76^2 \cdot \frac{0,029 \cdot 100}{6} = 200,53 \text{ W}$$

$$P_{vez} = 200,53 \text{ W}$$

5.1.4. feladat

$$a) S_1 = \frac{P_{1le}}{\eta_1 \cdot \cos \varphi_1} = \frac{125000}{0,82 \cdot 0,707} = 215614 \text{ V} \cdot \text{A}$$

$$S_1 = 215,614 \text{ kV} \cdot \text{A}$$

$$S_2 = \frac{P_{2le}}{\eta_2 \cdot \cos \varphi_2} = \frac{100000}{0,85 \cdot 0,6} = 196078 \text{ V} \cdot \text{A}$$

$$S_1 = 196,078 \text{ kV} \cdot \text{A}$$