

5.1.1. feladat

$$a) P_{0tek} = 3 \cdot I_{0f}^2 \cdot R_{lf} = 3,12^2 \cdot 0,2 = 86,4 \text{ W}$$

$$P_{vas} = P_{0n} - P_{0tek} - P_{surl} = 1250 - 86,4 - 500 = 663,6 \text{ W}$$

$$P_{1tekn} = 3 \cdot I_{lf}^2 \cdot R_{lf} = 3 \cdot 39^2 \cdot 0,2 = 912,6 \text{ W}$$

$$b) P_{légrés} = P_1 - P_{vas} - P_{1tekn} = 23150 - 663,6 - 912,6 = 21573,8 \text{ W}$$

$$P_{2tek} = s \cdot P_{légrés} = 0,04 \cdot 21573,8 = 862,95 \text{ W}$$

$$P_2 = P_{légrés} - P_{2tek} - P_{surl} = 21573,8 - 862,95 - 500 = 20210,85 \text{ W}$$

$$\eta = \frac{P_2}{P_1} = \frac{20210,85}{23150} = 0,873$$

$$c) \cos \varphi = \frac{P_1}{S} = \frac{P_1}{\sqrt{3} \cdot U_1 \cdot I_1} = \frac{23150}{\sqrt{3} \cdot 380 \cdot 39} = 0,899$$

$$d) n_0 = \frac{f}{p} = \frac{50}{2} = 25 \text{ 1/s}$$

$$n = (1 - s) \cdot n_0 = (1 - 0,04) \cdot 25 = 24 \text{ 1/s}$$

$$\omega = 2 \cdot \pi \cdot n = 2 \cdot \pi \cdot 24 = 150,8 \text{ 1/s}$$

$$M = \frac{P_2}{\omega} = \frac{20210,85}{150,8} = 134,02 \text{ N} \cdot \text{m}$$

$$P_{0tek} = 86,4 \text{ W}$$

$$P_{vas} = 663,6 \text{ W}$$

$$P_{1tekn} = 912,6 \text{ W}$$

$$P_{2tek} = 862,95 \text{ W}$$

$$\eta = 0,873$$

$$\cos \varphi = 0,899$$

$$M = 134,02 \text{ N} \cdot \text{m}$$

5.1.2. feladat

$$a) P_{1tek} = 3 \cdot I_{lf}^2 \cdot R_{lf} = 3,75^2 \cdot 0,1 = 1687,5 \text{ W}$$

$$P_{\delta} = P_1 - (P_{vas} + P_{1tek}) = 40 \cdot 10^3 - (1100 + 1678,5) = 37212,5 \text{ W}$$

$$b) s = \frac{n_0 - n}{n_0} = \frac{50 - 48}{50} = 0,04$$

$$P_{2tek} = s \cdot P_{\delta} = 0,04 \cdot 37212,5 = 1488,5 \text{ W}$$

$$c) \omega = 2 \cdot \pi \cdot n = 2 \cdot \pi \cdot 48 = 301,6 \text{ 1/s}$$

$$P_t = P_{\delta} - (P_{2tek} + P_{surl}) = 37212,5 - (1488,5 + 860) = 34864 \text{ W}$$

$$M_n = \frac{P_t}{\omega} = \frac{34864}{301,6} = 115,6 \text{ N} \cdot \text{m}$$

$$d) \eta = \frac{P_t}{P_{felv}} = \frac{34864}{40 \cdot 10^3} = 0,8716$$

$$P_{\delta} = 37,21 \text{ kW}$$

$$P_{2tek} = 1488,5 \text{ W}$$

$$M_n = 115,6 \text{ N} \cdot \text{m}$$

$$\eta = 0,8716$$