

7. FÁZISJAVÍTÁS

a) Az áram:

$$P_1 = S_1 \cdot \cos \varphi_1 = 21 \cdot 0,65 = 13,65 \text{ kW}$$

$$Q_1 = S_1 \cdot \sin \varphi_1 = 21 \cdot 0,76 = 15,96 \text{ kvar}$$

$$Q_2 = P_2 \cdot \tan \varphi_2 = 14 \cdot 1,02 = 14,28 \text{ kvar}$$

$$P = P_1 + P_2 = 13,65 + 14 = 27,65 \text{ kW}$$

$$Q = Q_1 + Q_2 = 15,96 + 14,28 = 30,24 \text{ kvar}$$

$$S = \sqrt{P^2 + Q^2} = \sqrt{27,65^2 + 30,24^2} = 40,97 \text{ kV} \cdot \text{A}$$

$$I = \frac{S}{\sqrt{3} \cdot U} = \frac{40,97}{\sqrt{3} \cdot 0,38} = 62,2 \text{ A}$$

b) A teljesítménytényező:

$$\cos \varphi = \frac{P}{S} = \frac{27,65}{40,97} = 0,675$$

c) A motor jellemzői:

$$P^* = P + P_M = 27,65 + 5 = 32,65 \text{ kW}$$

$$S^* = \frac{P^*}{\cos \varphi^*} = \frac{32,65}{0,85} = 38,41 \text{ kV} \cdot \text{A}$$

$$Q^* = \sqrt{S^{*2} - P^{*2}} = \sqrt{38,41^2 - 32,65^2} = 20,23 \text{ kvar}$$

$$Q_M = Q - Q^* = 30,24 - 20,23 = 10 \text{ kvar}$$

$$S_M = \sqrt{P_M^2 + Q_M^2} = \sqrt{5^2 + 10^2} = 11,18 \text{ kV} \cdot \text{A}$$

$$\cos \varphi_M = \frac{P_M}{S_M} = \frac{5}{11,18} = 0,44$$

$$I_M = \frac{S_M}{\sqrt{3} \cdot U} = \frac{11,18}{\sqrt{3} \cdot 0,38} = 17 \text{ A}$$

7.9. feladat

$$I = 62,2 \text{ A}$$

$$\cos \varphi = 0,675$$

$$\cos \varphi_M = 0,44$$

$$I_M = 17 \text{ A}$$

a) $P_\sigma = P_1 + P_2 + P_3 = 16 + 20 + 20 = 56 \text{ kW}$

$$Q_1 = \frac{P_1 \cdot \sin \varphi_1}{\cos \varphi_1} = \frac{16 \cdot 0,6}{0,8} = 12 \text{ kvar}$$

$$Q_2 = 0$$

$$Q_3 = \frac{P_3 \cdot \sin \varphi_3}{\cos \varphi_3} = \frac{20 \cdot 0,71}{0,7} = 20,4 \text{ kvar}$$

7.10. feladat