

7. FÁZISJAVÍTÁS

$$a) S = \frac{P}{\cos \varphi} = \frac{440}{0,8} = 550 \text{ V} \cdot \text{A}$$

$$Q = \sqrt{S^2 - P^2} = \sqrt{550^2 - 440^2} = 330 \text{ var}$$

$$b) I = \frac{S}{U} = \frac{550}{220} = 2,5 \text{ A}$$

$$c) Q_c = U \cdot I_c = U^2 \cdot \omega \cdot C = 220^2 \cdot 314 \cdot 8 \cdot 10^{-6} = 122 \text{ var}$$

$$S = \sqrt{P^2 + (Q - Q_c)^2} = \sqrt{440^2 + (330 - 122)^2} = 486,69 \text{ V} \cdot \text{A}$$

$$\cos \varphi^* = \frac{P}{S} = \frac{440}{486,69} = 0,904$$

$$d) \text{ Ha } \cos \varphi_1 = 1, \text{ akkor } Q = Q_{c1}$$

$$Q_{c1} = 330 \text{ var}$$

$$C_1 = \frac{Q_{c1}}{\omega \cdot U^2} = \frac{330}{314 \cdot 220^2} = 21,71 \cdot 10^{-6} \text{ F} = 21,71 \text{ } \mu\text{F}$$

A szükséges kapacitás:

$$C_{sz} = C_1 - 8 = 21,71 - 8 = 13,71 \text{ } \mu\text{F}$$

7.3. feladat

$$S = 550 \text{ V} \cdot \text{A}$$

$$Q = 330 \text{ var}$$

$$I = 2,5 \text{ A}$$

$$\cos \varphi^* = 0,904$$

$$C_{sz} = 13,71 \text{ } \mu\text{F}$$

7.4. feladat

$$a) S = U \cdot I = 220 \cdot 3 = 660 \text{ V} \cdot \text{A}$$

$$P = S \cdot \cos \varphi = 660 \cdot 0,82 = 541,2 \text{ W}$$

$$Q = S \cdot \sin \varphi = 660 \cdot 0,5723 = 377,76 \text{ var}$$

$$b) P_{le} = \eta \cdot P_{fel} = 0,86 \cdot 541,2 = 465,43 \text{ W}$$

$$c) M = \frac{P_{le}}{\omega} = \frac{60 \cdot P_{le}}{2 \cdot \pi \cdot n} = \frac{60 \cdot 465,43}{2 \cdot \pi \cdot 960} = 4,63 \text{ N} \cdot \text{m}$$

$$d) R = \frac{P_{fel}}{I^2} = \frac{541,2}{3^2} = 60,13 \text{ } \Omega$$

$$L = \frac{Q}{\omega \cdot I^2} = \frac{377,76}{2 \cdot \pi \cdot 50 \cdot 3^2} = 0,1336 \text{ H}$$

$$e) P_v = P_{fel} - P_{le} = 541,2 - 465,43 = 75,77 \text{ W}$$

$$W_v = P_v \cdot t = 75,77 \cdot 8 = 606,16 \text{ W} \cdot \text{h}$$

$$f) F = P_{le} \cdot t \cdot x = 0,5412 \cdot 8 \cdot x = 4,3296 \cdot x \text{ Ft}$$

$$S = 660 \text{ V} \cdot \text{A}$$

$$P = 541,2 \text{ W}$$

$$Q = 377,76 \text{ var}$$

$$P_{le} = 465,43 \text{ W}$$

$$M = 4,63 \text{ N} \cdot \text{m}$$

$$R = 60,13 \text{ } \Omega$$

$$L = 0,1336 \text{ H}$$

$$P_v = 75,77 \text{ W}$$

$$W_v = 606,16 \text{ W} \cdot \text{h}$$

$$F = 4,3296 \cdot x \text{ Ft}$$