

7. FÁZISJAVÍTÁS

$$a) S_1 = \frac{P}{\cos \varphi} = \frac{17}{0,6} = 28,333 \text{ kV} \cdot \text{A}$$

$$Q_1 = \sqrt{S_1^2 - P^2} = \sqrt{28,333^2 - 17^2} = 22,666 \text{ kvar}$$

$$b) S_2 = \frac{P}{\cos \varphi_j} = \frac{17}{0,9} = 18,888 \text{ kvar}$$

$$Q_2 = \sqrt{S_2^2 - P^2} = \sqrt{18,888^2 - 17^2} = 8,233 \text{ kvar}$$

$$Q_{szüks} = 22,666 - 8,233 = 14,433 \text{ kvar}$$

$$c) C_{szüks\Delta} = \frac{Q_{szüks} \cdot 10^6}{3 \cdot U_v^2 \cdot \omega} = \frac{14,433 \cdot 10^3 \cdot 10^6}{3 \cdot 380^2 \cdot 314} = 106,1 \text{ }\mu\text{F}$$

$$\omega = 2 \cdot \pi \cdot f = 2 \cdot 3,14 \cdot 50 = 314 \text{ 1/s}$$

7.1. feladat

$$S_1 = 28,333 \text{ kV} \cdot \text{A}$$

$$Q_1 = 22,666 \text{ kvar}$$

$$Q_{szüks} = 14,433 \text{ kvar}$$

$$C_{szüks\Delta} = 106,1 \text{ }\mu\text{F}$$

7.2. feladat

$$a) P_1 = \frac{W}{t} = \frac{6}{10} = 0,6 \text{ kW}$$

$$b) R = \frac{P_1}{I^2} = \frac{600}{3^2} = 66,66 \text{ }\Omega$$

$$c) Z = \frac{U}{I} = \frac{220}{3} = 73,33 \text{ }\Omega$$

$$Z = \sqrt{R^2 + X_L^2} \rightarrow X_L = \sqrt{Z^2 - R^2}$$

$$X_L = \sqrt{73,33^2 - 66,66^2} = 30,55 \text{ }\Omega$$

$$L = \frac{X_L}{\omega} = \frac{30,55}{314} = 0,097 \text{ H} = 97 \text{ mH}$$

$$d) \cos \varphi = \frac{R}{Z} = \frac{66,66}{73,33} = 0,909; \quad \varphi = 24,63^\circ$$

$$e) \cos \varphi_1 = 1,1 \cdot \cos \varphi = 1,1 \cdot 0,909 = 0,9999; \quad \varphi_1 = 0,81^\circ$$

$$C = \frac{P \cdot (\operatorname{tg} \varphi - \operatorname{tg} \varphi_1)}{U^2 \cdot \omega} = \frac{600 \cdot (\operatorname{tg} 24,63^\circ - \operatorname{tg} 0,81^\circ)}{220^2 \cdot 314} = 17,53 \text{ }\mu\text{F}$$

$$P_1 = 0,6 \text{ kW}$$

$$R = 66,66 \text{ }\Omega$$

$$L = 97 \text{ mH}$$

$$\cos \varphi = 0,909$$

$$\varphi = 24,63^\circ$$

$$C = 17,53 \text{ }\mu\text{F}$$