$C = 7{,}8\ \mu F$

7.5. feladat

$P = 37{,}5$ kW

$Q = 41{,}25$ kvar

$S = 55{,}74$ kV·A

$I = 84{,}6$ A

$\cos\varphi = 0{,}67$

$I^* = 63$ A

$C = 169\ \mu F$

7.6. feladat

7. FÁZISJAVÍTÁS

$Q_1 = P_1 \cdot \operatorname{tg}\varphi_1 = 120 \cdot 1{,}33 = 159{,}5$ kvar

$Q_2 = P_2 \cdot \operatorname{tg}\varphi_2 = 80 \cdot 0{,}75 = 60$ kvar

$P_e = P_1 + P_2 = 120 + 80 = 200$ kW

$Q_e = Q_1 + Q_2 = 159{,}6 + 60 = 219{,}6$ kvar

$S_e = \sqrt{P_e^2 + Q_e^2} = \sqrt{200^2 + 219{,}6^2} = 297{,}03$ kV·A

$\cos\varphi_e = \dfrac{P_e}{S_e} = \dfrac{200}{297{,}03} = 0{,}673$

$P_e = 200$ kW

$Q_e = 219{,}6$ kvar

$S_e = 297{,}03$ kV·A

$\cos\varphi = 0{,}673$

b) $\operatorname{tg}\varphi_{tij} = \dfrac{\sqrt{1 - \cos^2\varphi_{tij}}}{\cos^2\varphi_{tij}} = \dfrac{\sqrt{1 - 0{,}9^2}}{0{,}9} = 0{,}484$

$Q_{tij} = P_e \cdot \operatorname{tg}\varphi_{tij} = 200 \cdot 0{,}484 = 96{,}8$ kvar

$Q_{szüks} = Q_e - Q_{tij} = 219{,}6 - 96{,}8 = 122{,}8$ kvar

c) $C_{szüks} = \dfrac{Q_{szüks} \cdot 10^6}{3 \cdot U_v^2 \cdot \omega} = \dfrac{122{,}8 \cdot 10^9}{3 \cdot 380^2 \cdot 314} = 902{,}78\ \mu F$

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

$Q_{szüks} = 122{,}8$ kvar

$C_{szüks} = 902{,}78\ \mu F$

7.7. feladat

a) $P_1 = S_1 \cdot \cos\varphi_1 = 50 \cdot 0{,}6 = 30$ kW

$P_2 = S_2 \cdot \cos\varphi_2 = 30 \cdot 0{,}5 = 15$ kW

$Q_1 = \sqrt{S_1^2 - P_1^2} = \sqrt{50^2 - 30^2} = 40$ kvar

$Q_2 = \sqrt{S_2^2 - P_2^2} = \sqrt{30^2 - 15^2} = 26$ kvar

$P_e = P_1 + P_2 = 30 + 15 = 45$ kW

$Q_e = Q_1 + Q_2 = 40 - 26 = 66$ kvar

$S_e = \sqrt{P_e^2 + Q_e^2} = \sqrt{45^2 + 66^2} = 79{,}88$ kV·A

b) $\cos\varphi_e = \dfrac{P_e}{S_e} = \dfrac{45}{79{,}88} = 0{,}56$

c) $P_{tij} = S_e \cdot \cos\varphi_{tij} = 79{,}88 \cdot 0{,}95 = 75{,}89$ kW

$P_e = 45$ kW

$Q_e = 66$ kvar

$S_e = 79{,}88$ kV·A

$\cos\varphi_e = 0{,}56$