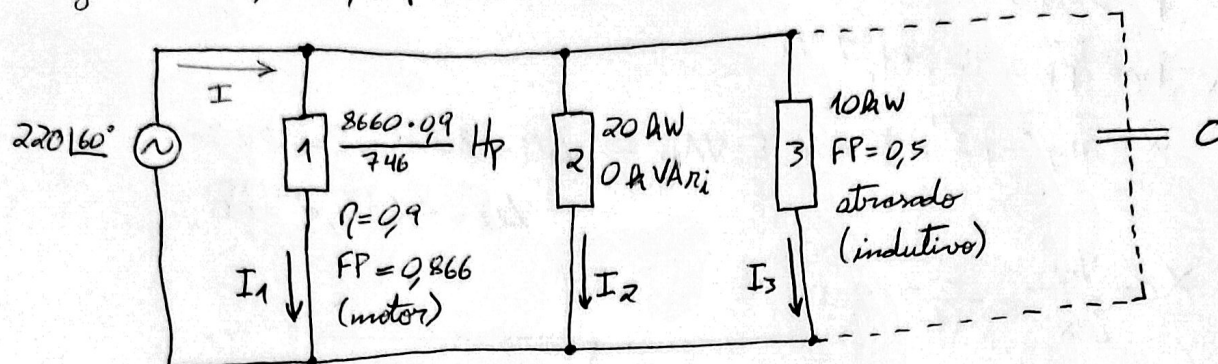


Sistema de Potência Complexa | Victor Martin Dimoni - 18.00050-9

FP gerador = 0,95 ; P_{ap total sem capacitor} = 44,64 kVA ; C = 530 μF ; 1 H_p = 746 W



	1	2	3	Conjunto (gerador)	Unidade
P	8660	20.000	10.000	38.660	W
Q	5.000 (i)	0	17320 (i)	22320 (i)	VAR
P _{ap}	10.000	20.000	20.000	44.640	VA
\dot{P}	10000 $\angle 30^\circ$	20.000 $\angle 0^\circ$	20.000 $\angle 60^\circ$	44.640 $\angle 30^\circ$	VA
V _{ef}	220	220	220	220 $\angle 60^\circ$	V
I _{ef}	45,45	90,91	90,91	202,91	A
φ	30°	0°	60°	30°	°
FP	0,866	1	0,500	0,866	-

① $P = \frac{8660 \cdot 0,9}{746 \cdot \eta} H_p = 8660 W //$

FP = cos $\varphi \Rightarrow \varphi = \arccos(0,866) = 30^\circ //$

$\tan \varphi = \frac{Q}{P} \Rightarrow Q = P \cdot \tan \varphi = 4999,85 \text{ VAR } i //$ $P_{ap} = \sqrt{P^2 + Q^2} = 9999,78 \text{ VA} //$

$P_{ap} = V_{ef} I_{ef} \Rightarrow I_{ef} = \frac{P_{ap}}{V_{ef}} = 45,45 \text{ A} //$

② $I_{ef} = \frac{P_{ap}}{V_{ef}} = 90,91 \text{ A} //$

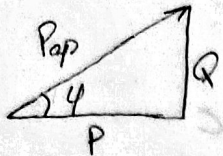
③ $Q = P \cdot \tan \varphi = 17320,51 \text{ VAR } i //$ $P_{ap} = \sqrt{P^2 + Q^2} = 19999,56 \text{ VA} //$ $I_{ef} = \frac{P_{ap}}{V_{ef}} = 90,91 \text{ A} //$

④ Gen $P = P_1 + P_2 + P_3 = 38.660 \text{ W} //$ $Q = Q_1 + Q_2 + Q_3 = 22320 \text{ VAR } i //$ $P_{ap} = \sqrt{P^2 + Q^2} = 44640,54 \text{ VA} //$

FP = $\frac{P}{P_{ap}} = 0,866 //$ $\varphi = \arccos(FP) = 30^\circ //$ $I_{ef} = \frac{P_{ap}}{V_{ef}} = 202,91 \text{ A} //$

Corrigindo o Fator de Potência: $FP = 0,95 \rightarrow \varphi = \arccos(0,95) = 18,2^\circ$

$$P = 38660 \text{ W}$$



$$Pap = \frac{P}{FP} = 40694,7 \text{ VA}$$

$$Q = \sqrt{Pap^2 - P^2} = 12706,8 \text{ VAR} \rightarrow \Delta Q = 12706,8 - 22320$$

$$\Delta Q = -9613,2 \text{ VAR}$$

$$\Delta Q = \frac{V_{ef}^2}{X_c} \Rightarrow X_c = \frac{V_{ef}^2}{\Delta Q} = -5,035 \Omega$$

$$X_c = \frac{-1}{\omega C} \Rightarrow C = \frac{-1}{\omega X_c} = 5,268 \cdot 10^{-4} \text{ F} \Rightarrow \boxed{C = 530 \mu\text{F}}$$