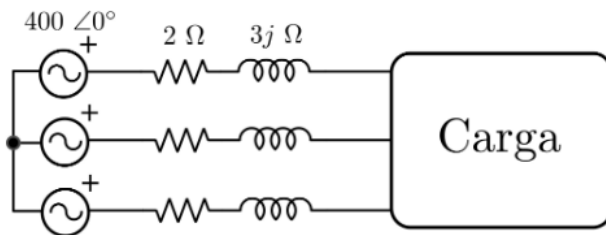


Examen 22 junio 2021 – Trifásica.



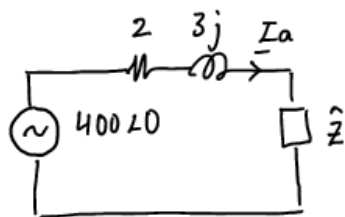
$$S_g = 28263 \text{ VA}$$

$$\cos\varphi_G = 0,4706 \rightarrow \varphi_G = 61,93^\circ$$

$$S_g = 28263 < 61,93 \text{ VA}$$

$$S_g = 3 \cdot V_F \cdot I_F^* = 3 \cdot 400 < 0^\circ \cdot I_F^*$$

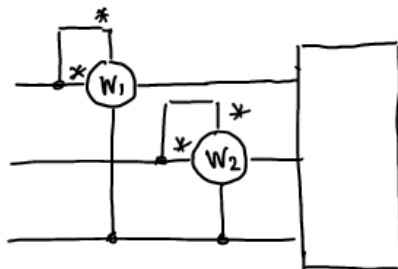
$$I_F = I_a = \frac{28263 < -61,93}{3 \cdot 400} = 23,55 < -61,93^\circ \text{ A}$$



$$V_a = 400 < 0^\circ - (2 + 3j) \cdot 23,55 < -61,93 = 315,6 < 1,51^\circ$$

$$V_L = 546,63 \text{ V}; V_{ab} = 546,63 < 31,51^\circ$$

$$Z = \frac{V_F}{I_F} = \frac{315,6 < 1,51}{23,55 < -61,93} = 13,4 < 63,44 = 6 + 12j\Omega$$



$$P = 3 \cdot 23,55^2 \cdot 6 = 9982,85 \text{ W.}$$

$$Q = 3 \cdot 23,55^2 \cdot 12 = 19965,7 \text{ var.}$$

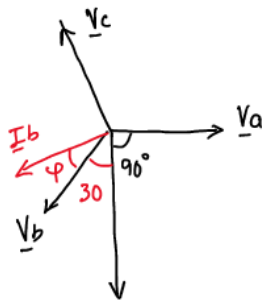
$$W_1 + W_2 = 9982,85$$

$$W_1 - W_2 = 11527,2$$

$$2W_1 = 21510 \rightarrow W_1 = 10755 \text{ W}$$

$$W_2 = -772,2 \text{ W}$$

Comprobación



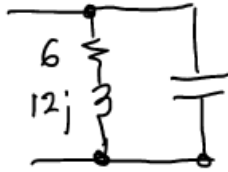
$$W_2 = 546,63 \cdot 23,55 \cdot \cos\alpha \text{ W}$$

$$V_{bc} = 546,63 < -88,49$$

$$I_b = 23,55 < -61,93 - 120 = 23,55 < -181,93$$

$$\alpha = 93,44^\circ$$

$$W_2 = 546,63 \cdot 23,55 \cdot \cos(93,44) = -772,4 \text{ W}$$



$$X_C = -59,4\Omega$$

$$(6 + 12j) // (-19,8j) = \frac{265,6 < -26,6}{9,8 < -52,4} = 27 < 25,87^\circ$$

$$\frac{-59,4j}{3} = -19,8j \quad \cos\varphi' = -0,9$$

$$P = P' = \sqrt{3} \cdot 546,63 \cdot I'_a \cdot 0,9 ; I'_a = \frac{9982,85}{\sqrt{3} \cdot 546,63 \cdot 0,9} = 11,7 \text{ A}$$

$$I'_a = 11,7 < 1,51^\circ - 25,87^\circ$$

$$I'_a = 11,7 < 24,4^\circ$$

