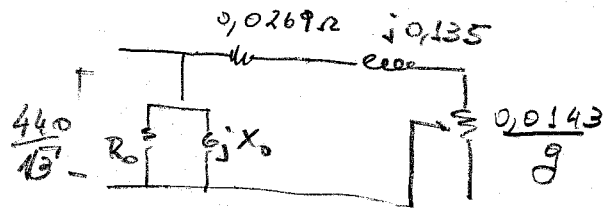


cmz 2

$$R_s = 0,0269 \Omega$$

$$\bar{Z}_{cu} = \frac{440/\sqrt{3}}{1800} \angle \arcsin\left(\frac{400 \times 10^3}{\sqrt{3} \times 440 \times 1800}\right) = 0,141 \angle 73^\circ = 0,0412 + j 0,135 \Omega$$

$$R_{2e} = 0,0143 \Omega$$



Ensayo vacío: $\begin{cases} R_0 = 60 \Omega \\ X_0 = 4,47 \Omega \end{cases}$

$$\bar{Z}_0 = R_0 // jX_0 \approx jX_0$$

2) corriente nominal: $160 \times 10^3 = 3 \times R_{2e} \frac{(1-\rho)^2}{\rho} I_{2e}^2$ $I_{2e} \approx \frac{U/\sqrt{3}}{R_{2e}/\rho}$ $1-\rho \approx 1$

$$\Rightarrow 160 \times 10^3 \approx \frac{U^2 \rho^2}{R_{2e}} \Rightarrow \rho \approx 1,2\% \Rightarrow n_N = 2964 \text{ rpm}$$

$$I_{2N} = 213,4 \text{ A} \quad I_0 \approx 57 \angle -90^\circ$$

$$\bar{I}_N = 213,4 \angle 0 + 57 \angle -90 \Rightarrow I_N = 221 \text{ A}$$

Carga: $C_T = k M^2 = k_1 \omega^2$ $P_T = C_T \omega \Rightarrow 90 \times 10^3 = k_1 \left(2\pi \frac{3000}{60}\right)^3 \Rightarrow k_1 = 2,9 \times 10^{-3}$

Velocidad de funcionamiento: $\frac{U^2 \rho}{\omega_s R_{2e}} = k \left(\frac{1-\rho}{\rho}\right)^2 \omega_s^2 = 2,9 \times 10^{-3} \times 314,2^2 = 286,3 \text{ N} \times \text{m}$

$$\Rightarrow \rho = 6,64 \times 10^{-3} \Rightarrow n = 2980 \text{ rpm} \quad I_{2e} = 118,1 \text{ A} \Rightarrow I = \sqrt{I_{2e}^2 + I_0^2}$$

$$\Rightarrow I = 131,1 \text{ A} \Rightarrow \frac{I}{I_N} = 0,59 \Rightarrow 59\% \text{ de carga}$$

3) $I_{th} = 221 \text{ A}$

4) $I_{rotor \text{ bloqueado}} = 1800 \text{ A} \Rightarrow k = \frac{1800}{221} \approx 8$ $3(R_s + R_{2e}) I_{2e, rot \text{ bloc}}^2 = 100000 \frac{dT}{dt}$

$$I_{2e, rot \text{ bloc}} \approx 1800 \text{ A} \Rightarrow \frac{400 \times 10^3}{100.000} = \frac{dT}{dt} \Rightarrow \Delta t = 80 \times 0,25 = 20 \mu\text{s}$$

$$\Rightarrow t_{max} = 20 \mu\text{s}$$

5) $t_{arr} = 100 \times 20 \times 10^{-3} = 2 \mu\text{s} \Rightarrow \sqrt{2 \mu\text{s}} < t_1 < 20 \mu\text{s}$