FORMULARIO 1

TRANSFORMADORES

$$U_{1ef} = E_{1ef} = \frac{1}{\sqrt{2}} \cdot 2\pi f \cdot N_1 \cdot \phi_m = 4{,}44 \cdot f \cdot N_1 \cdot \phi_m$$

$$U_{2ef} = E_{2ef} = \frac{1}{\sqrt{2}} \cdot 2\pi f \cdot N_2 \cdot \phi_m = 4{,}44 \cdot f \cdot N_2 \cdot \phi_m$$

$$\varepsilon_{cc} = \frac{U_{cc}}{U_{1n}} = \frac{I_{1n} \cdot Z_{cc}}{U_{1n}} \qquad \varepsilon_{cc} = \frac{I_{1n}^{\ 2} \cdot Z_{cc}}{S_n}$$

$$\varepsilon_{c(\%)} = \frac{U_{2n} - U_{2C}}{U_{2n}} \qquad \varepsilon_{c(\%)} = \frac{U_{1n} - U_{2C}'}{U_{1n}}$$

$$U_{2c} = U_{2n} \cdot [1 - \varepsilon_c]$$

$$\varepsilon_{Rcc} = \frac{U_{Rcc}}{U_{1n}} = \frac{I_{1n} \cdot R_{cc}}{U_{1n}} \qquad \varepsilon_{Xcc} = \frac{U_{Xcc}}{U_{1n}} = \frac{I_{1n} \cdot X_{cc}}{U_{1n}}$$

$$\varepsilon_{c(\%)} = U_{Rcc} \cdot Cos\varphi + U_{Xcc} \cdot Sen\varphi \qquad \varepsilon_{c(\%)} = \frac{R_{cc} \cdot I_1}{U_{1n}} \cdot Cos\varphi + \frac{X_{cc} \cdot I_1}{U_{1n}} \cdot Sen\varphi$$

$$\varepsilon_{c(\%)} = C \cdot [\varepsilon_{RCC} \cdot Cos\varphi + \varepsilon_{XCC} \cdot Sen\varphi]$$

$$\eta = \frac{U_2 I_2 Cos\varphi}{U_2 I_2 Cos\varphi + P_0 + P_{cc} C^2} = \frac{C \cdot U_2 I_{2n} Cos\varphi}{C \cdot U_2 I_{2n} Cos\varphi + P_0 + P_{cc} C^2}$$

$$\eta = \frac{C \cdot [1 - \varepsilon_c] \cdot S_n Cos\varphi}{C \cdot [1 - \varepsilon_c] \cdot S_n Cos\varphi + P_0 + P_{cc} C^2}$$

$$C_{\eta max} = \sqrt{\frac{P_0}{P_{cc}}}$$

$$\varepsilon_i(\%) = \frac{I_2 K_n - I_1}{I_1} \cdot 100 \qquad K_n = \frac{I_{1n}}{I_{2n}}$$

MÁQUINA DE CC

FEM inducida en una espira: $E = 2 \cdot B \cdot l \cdot V$

FEM total (a=nº de circuitos en paralelo, N=nº de espiras, n=velocidad giro (rpm)): $E = 4 \frac{N \cdot p}{60 a} n \cdot \varphi$

Par motor total de una máquina de CC: $T_{TOTAL} = \frac{2P \cdot N}{\pi \cdot a} \cdot \varphi \cdot I$

Ecuación de los motores independiente y derivación: $U_i = E - R_i \cdot I_i$ $\qquad n = \frac{U_i}{K \cdot \varphi} - \frac{T}{K \cdot K' \cdot \varphi^2} \cdot R_i$

Ecuación de los motores de excitación serie: $E = U_i - [R_i + R_{ex}] \cdot I_i$ $\qquad n = \frac{U_i}{K \cdot \varphi} - \frac{[R_i + R_{ex}] \cdot T}{K \cdot K' \cdot \varphi^2}$