

$$P_{2\text{Rotor}} := 5.5\text{kW}$$

$$\text{polpar} := 2$$

$$U_n := 380\text{V}$$

$$f := 50\text{Hz}$$

$$I_n := 11.7\text{A}$$

$$\cos\varphi := 0.84 \Leftrightarrow \varphi := \arccos(\cos\varphi) = 32.86\text{-deg}$$

$$n_2 := 1425 \cdot \frac{1}{\text{min}} \quad n_1 := 1500 \cdot \frac{1}{\text{min}}$$

$$P_{\text{gnid}} := 80\text{W}$$

$$R_{\text{rotor}} := \frac{2.36}{2} \Omega = 1.18 \Omega$$

$$P_{1\text{Stator}} := \sqrt{3} \cdot U_n \cdot I_n \cdot \cos(\varphi) = 6468.586 \cdot \text{V} \cdot \text{A}$$

$$\eta := \frac{P_{2\text{Rotor}}}{P_{1\text{Stator}}} = 0.85$$

$$n_s := n_1 - n_2 = 75 \cdot \frac{1}{\text{min}}$$

$$S := \frac{n_s}{n_1} = 0.05$$

$$P_{\text{cu}2} = P_{1\text{Rotor}} \cdot S \quad P_{1\text{Rotor}} = P_{2\text{Rotor}} + P_{\text{cu}2} + P_{\text{gnid}} \quad P_{1\text{Rotor}} = P_{2\text{Rotor}} + P_{1R} \cdot S + P_{\text{gnid}}$$

$$P_{1\text{Rotor}} \cdot (1 - S) = P_{2\text{Rotor}} + P_{\text{gnid}}$$

$$P_{1\text{Rotor}} := \frac{P_{2\text{Rotor}} + P_{\text{gnid}}}{1 - S} = 5873.684 \text{ W}$$

a:

$$\Delta P_{\text{cu.fe}} := P_{1\text{Stator}} - P_{1\text{Rotor}} = 594.902 \text{ W}$$

b:

$$M_i := \frac{P_{1\text{Rotor}}}{2\pi n_1} = 37.393 \cdot \text{N} \cdot \text{m}$$

c:

$$P_{\text{cu2}} := P_{1\text{Rotor}} \cdot S = 293.684 \text{ W}$$

d:

$$I_{\text{rotor}} := \sqrt{\frac{P_{\text{cu2}}}{3 \cdot R_{\text{rotor}}}} = 9.108 \text{ A}$$

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$$n_2 := 1450 \cdot \frac{1}{\text{min}}$$

$$I_{\text{rotor2}} := 0.65 \cdot I_{\text{rotor}} = 5.92 \text{ A}$$

$$P_{\text{cu2}} := I_{\text{rotor2}}^2 \cdot R_{\text{rotor}} \cdot 3 = 124.082 \text{ W}$$

$$S := \frac{n_1 - n_2}{n_1} = 0.033$$

$$P_{1\text{rotor}} := \frac{P_{\text{cu2}}}{S} = 3722.447 \text{ W}$$

$$M_i := \frac{P_{1\text{rotor}}}{2\pi n_1} = 23.698 \text{ N}\cdot\text{m}$$