

3. EGYENÁRAMÚ GÉPEK

3.1. Egyenáramú motorok

$$I = \frac{P_1}{U_k} = \frac{14705}{220} = 66,8 \text{ A}$$

$$I'_a = I - I_g = 66,8 - 6,8 = 60 \text{ A}$$

$$U'_i = U_k - I'_a \cdot R_b = 220 - 60 \cdot 0,155 = 210,7 \text{ V}$$

$$n = \frac{U'_i}{U_i} \cdot n_n = \frac{210,7}{200,3} \cdot 1500 = 1578 \text{ 1/min}$$

$$n = 1578 \text{ 1/min}$$

a)  $I_{an} = \frac{P_n}{\eta \cdot U_{Kn}} = \frac{10 \cdot 10^3}{0,835 \cdot 500} = 23,952 \text{ A}$

3.1.18. feladat

$$I_{an} = 23,952 \text{ A}$$

b)  $C_u \cdot \Phi = \frac{U_{Kn} - I_{an} \cdot R_b}{n_n} = \frac{500 - 23,952 \cdot 0,98}{1000} = 0,4765 \text{ V} \cdot \text{min}$

$$n_0 = \frac{U_{Kn}}{C_u \cdot \Phi} = \frac{500}{0,4765} = 1049,25 \text{ 1/min} = 17,48 \text{ 1/s}$$

$$n_0 = 17,48 \text{ 1/s}$$

$$\omega_0 = 2 \cdot \pi \cdot n_0 = 2 \cdot \pi \cdot 17,48 = 109,878 \text{ 1/s}$$

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c)  $M_n = C_M \cdot \Phi \cdot I_{an} = \frac{60}{2 \cdot \pi} \cdot C_u \cdot \Phi \cdot I_{an} =$   
 $= \frac{60}{2 \cdot \pi} \cdot 0,4765 \cdot 23,952 = 108,99 \text{ N} \cdot \text{m}$

$$M_n = 108,99 \text{ N} \cdot \text{m}$$

d)  $n = \frac{U_{Kn} - I_{an} \cdot (R_a + R_b)}{C_u \cdot \Phi}$

$$R_a = \frac{U_{Kn} - C_u \cdot \Phi \cdot n}{I_{an}} \quad R_b = \frac{500 - 0,4765 \cdot 500}{23,952} = 0,98 = 9,947 \text{ } \Omega$$

$$R_a = 9,947 \text{ } \Omega$$

e)  $P_v = I_{an}^2 \cdot R_a = 23,952^2 \cdot 9,947 = 5706,9 \text{ W}$

$$P_v = 5706,9 \text{ W}$$

a)  $\omega_0 = \frac{U_{Kn}}{K \cdot \Phi} \rightarrow K \cdot \Phi = \frac{U_{Kn}}{\omega_0} = \frac{220}{2 \cdot \pi \cdot 25} = 1,4 \text{ V} \cdot \text{s}$

3.1.19. feladat

$$M_n = K \cdot \Phi \cdot I_{an} = 1,4 \cdot 20 = 28 \text{ N} \cdot \text{m}$$

$$M_n = 28 \text{ N} \cdot \text{m}$$

$$\omega = \frac{U_{Kn} - I_{an} \cdot R_b}{K \cdot \Phi} = \frac{220 - 20 \cdot 1,2}{1,4} = 139,94 \text{ 1/s}$$

$$\omega = 139,94 \text{ 1/s}$$