

3. EGYENÁRAMÚ GÉPEK

3.1. Egyenáramú motorok

$P_v = I_n^2 \cdot (R_f + R_b) = 150^2 \cdot 0,727 = 16357 \text{ W}$ $P = U_n \cdot I_n = 220 \cdot 150 = 33000 \text{ W}$ $\eta = \frac{P - P_v}{P} \cdot 100 = \frac{33000 - 16357}{33000} \cdot 100 = 50,43 \%$ (A hatásfok ennél is rosszabb, mert a gépben súrlódási, továbbá vasvesztés is van!) $M_2 = \frac{M_n}{2} \rightarrow I_2 = \frac{I_n}{2}$ $R'_f = \frac{U_n - n_2 \cdot c_U \cdot \Phi}{\frac{I_n}{2}} - R_b = \frac{220 - 800 \cdot 0,1378}{75} - 0,08 = 1,374 \Omega$	$\eta = 50,43 \%$
d) $U_{a3} = c_U \cdot \Phi \cdot n_3 = 8,32 \cdot \frac{1700}{60} = 235,79 \text{ V}$ $I_{a3} = \frac{U_{a3} - U_n}{R_b} = \frac{235,79 - 220}{0,08} = 197,375 \text{ A}$ $c_M \cdot \Phi = \frac{1}{2 \cdot \pi} \cdot c_U \cdot \Phi = \frac{1}{2 \cdot \pi} \cdot 8,32 = 1,325 \text{ V} \cdot \text{s}$ $M_{j3} = c_M \cdot \Phi \cdot I_{a3} = 1,325 \cdot 197,375 = 261,44 \text{ N} \cdot \text{m}$	$R'_f = 1,374 \Omega$ $I_{a3} = 197,375 \text{ A}$ $M_{j3} = 261,44 \text{ N} \cdot \text{m}$
e) $I_f = \frac{M_f}{c_M} = \frac{40}{1,325} = 30,2 \text{ A}$ $U_t = c_t \cdot \Phi \cdot n_n = 0,1387 \cdot 1500 = 208,05 \text{ V}$ $R_n + R_f = \frac{U_t}{I_f} = \frac{208,05}{30,2} = 6,889 \Omega$ $R_f = 6,889 - R_b = 6,889 - 0,08 = 6,809 \Omega$	$I_f = 30,2 \text{ A}$ $R_f = 6,809 \Omega$
a) $P_{fn} = \frac{P_n}{0,85} = \frac{19000}{0,85} = 22352 \text{ W}$ $I_n = \frac{P_{fn}}{U_n} = \frac{22352}{220} = 101,6 \text{ A}$	3.1.3. feladat
b) $c_U \cdot \Phi = \frac{U_n - I_n \cdot R_a}{\frac{2000}{60}} = \frac{220 - 101,6 \cdot 0,05}{\frac{2000}{60}} = 6,447 \text{ V} \cdot \text{s}$	$c_U \cdot \Phi = 6,447 \text{ V} \cdot \text{s}$