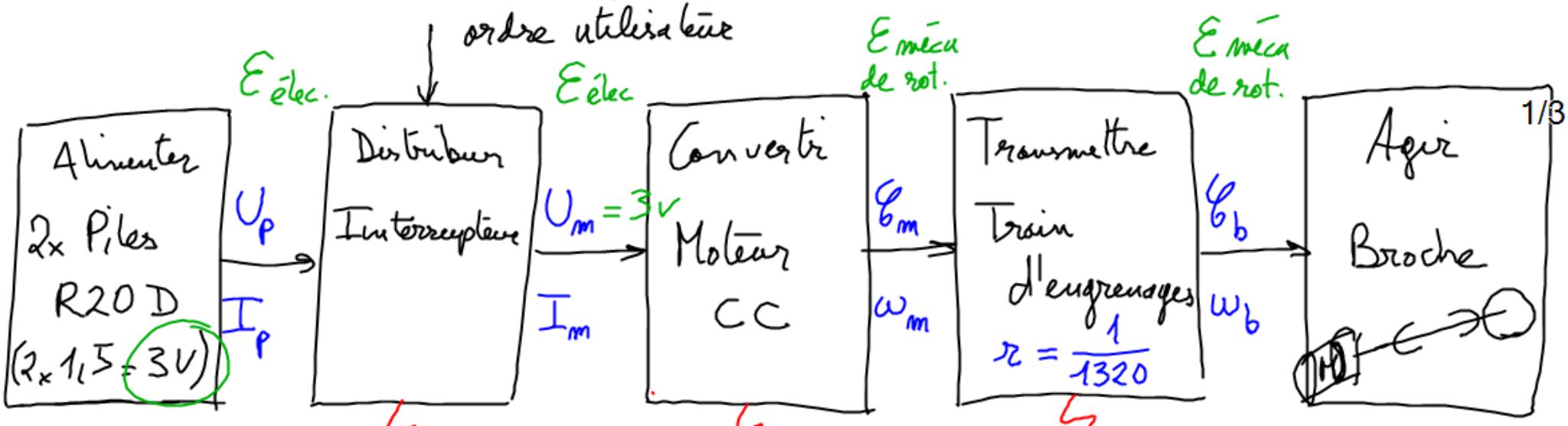


Données de départs (CdC)

$C_b = 50\ N.cm \simeq 0,5\ N.m$

$N_b = 3$ tr/min

$\omega_b \simeq 0,314\ rad/s$

$\eta_m = \frac{P_{m\ méca}}{P_{m\ élec}}$

$P_{m\ élec} = \frac{P_{m\ méca}}{\eta_m}$

$(P = U.I)$

$P_{m\ élec} \simeq 0,77W$

$P_{m\ élec} = U_m . I_m$

$I_m = \frac{P_{m\ élec}}{U_m}$

$I_m \simeq 0,257A$

$(P = C.\omega)$

$C_m = \frac{P_m}{\omega_m}$

$\simeq 5,57.10^{-4} N.m$

$\omega_m = \frac{\omega_b}{r}$

$\omega_m \simeq 415\ rad/s$

$\left(r = \frac{\omega_s}{\omega_e}\right)$

$P_{m\ méca} = \frac{P_b}{\eta_m}$

$= 0,231W$

$r = \frac{\omega_b}{\omega_m}$

$\left(\eta = \frac{P_s}{P_e}\right)$

$\eta_g = \frac{P_b}{P_m}$

$P_b = 0,5 . 0,314$

$= 0,157W$

Calcul autonomie pile R20 D : $U_p = 3\,V$ $I_p = 0{,}257\,A$

$P_p = 0{,}77\,W$

Capacité : $Q_{pile} = 18000\ mA.h$

$$\mathcal{E} = P \cdot \Delta t$$

Wh W h

$$\mathcal{E}_{elec} = P_{elec} \cdot \Delta t$$

Wh W h

$$\mathcal{E}_{elec} = U \cdot I \cdot \Delta t$$

Wh V A h

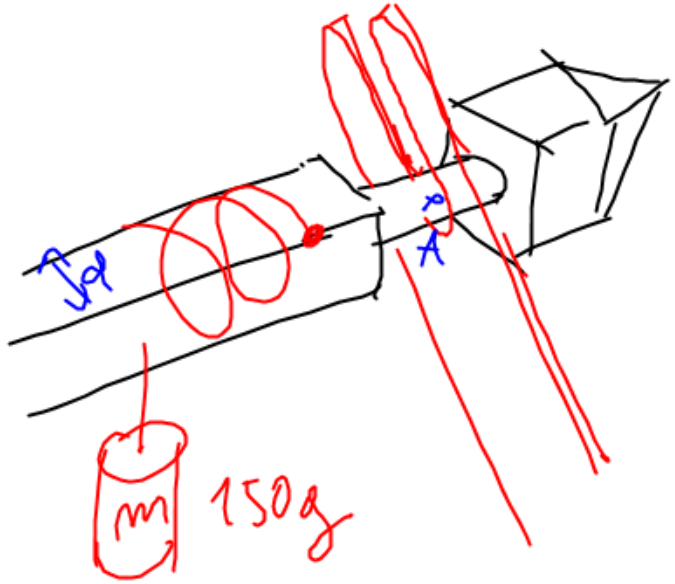
$$Q_{batt} = I \cdot \Delta t$$

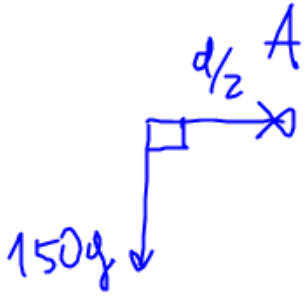
A.h A h

$$\mathcal{E}_{batt} = U_{batt} \cdot Q_{batt}$$

donc $$\Delta t = \frac{Q_{batt}}{I}$$

$$\Delta t = \frac{18}{0{,}257} \simeq 70\,h$$





$$\underset{\text{résistif}}{\mathcal{C}} = \underbrace{F \cdot d}_{\perp}$$

$$= 1{,}5 \cdot 5 \cdot 10^{-3}$$

$$\mathcal{C} \simeq 7{,}5 \cdot 10^{-3}\ \text{Nm}$$