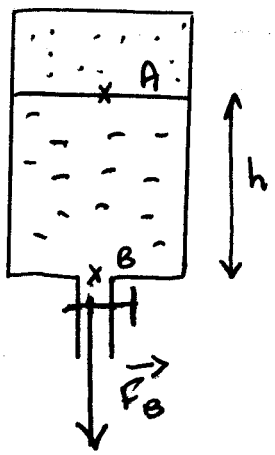
Corrigé BTN FG SESSION 1992

I] STATIQUE DES FLUIDES



1°) $P_B - P_A = \rho g h$

2°) $P_B = P_A + \rho g h = 5{,}2 \cdot 10^5 + 850 \times 10 \times 20$

$P_B = 5{,}2 \cdot 10^5 + 1{,}7 \cdot 10^5 = \underline{6{,}9 \cdot 10^5 \text{ Pa}}$

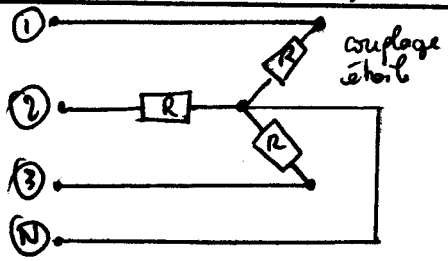
3°) $\vec{F_B}$: verticale descendante d'intensité

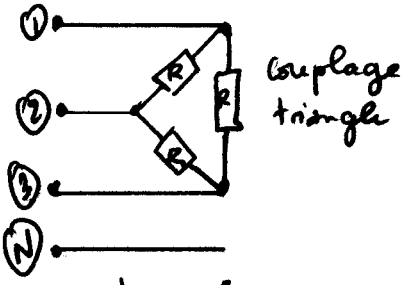
$F_B = P_B \times S = P_B \times \pi \left(\frac{d}{2}\right)^2 = P_B \times \frac{\pi d^2}{4}$

$F_B = 6{,}9 \cdot 10^5 \times 3{,}14 \times \frac{0{,}4^2}{4} = \underline{86\,708 \text{ N}}$

II] SYSTEMES TRIPHASES EQUILIBRES

A] 1°)





2°) Les 3 résistances sont couplés en triangle

a) La tension aux bornes de chaque résistance est la tension composée $\underline{U = 380 \text{ V}}$

b) $J = \frac{U}{R} = \frac{380}{22} = \underline{17{,}27 \text{ A}}$

c) $I = \sqrt{3} J = 1{,}732 \times 17{,}27 = \underline{29{,}9 \text{ A}}$

d) $P = \sqrt{3} U I \cos\varphi = \sqrt{3} U I = 1{,}732 \times 380 \times 29{,}9 = \underline{19\,691 \text{ W}}$

B] 1°) $n_s = \frac{f}{p} = \frac{50}{2} = \underline{25 \text{ tr/s}} = \underline{1500 \text{ tr/min}}$

2°) $g = \frac{n_s - n}{n_s} = \frac{1500 - 1460}{1500} = 0{,}0267 = \underline{2{,}67\,\%}$

3°) $P_a = \sqrt{3} U I \cos\varphi = 1{,}732 \times 380 \times 70 \times 0{,}85 = \underline{39\,162 \text{ W}} \simeq \underline{39{,}2 \text{ kW}}$

4°) $P_u = \eta P_a = 0{,}93 \times 39{,}2 = \underline{36{,}4 \text{ kW}}$

5°) $P_u = T_u \Omega \iff T_u = \frac{P_u}{\Omega} = \frac{36{,}4 \cdot 10^3}{1460 \times \frac{2\pi}{60}} \simeq \underline{238{,}2 \text{ N.m}}$