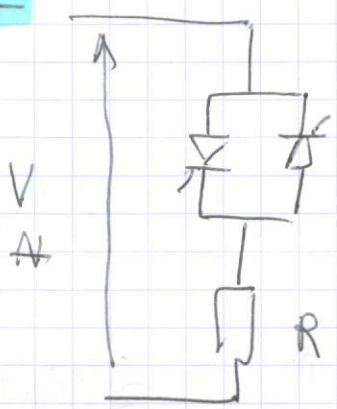
Correction DS Gradateur

Problème 1 :

1°-



2°- On utilise soit
- 2 thyristors tête bêche
ou - 1 triac.

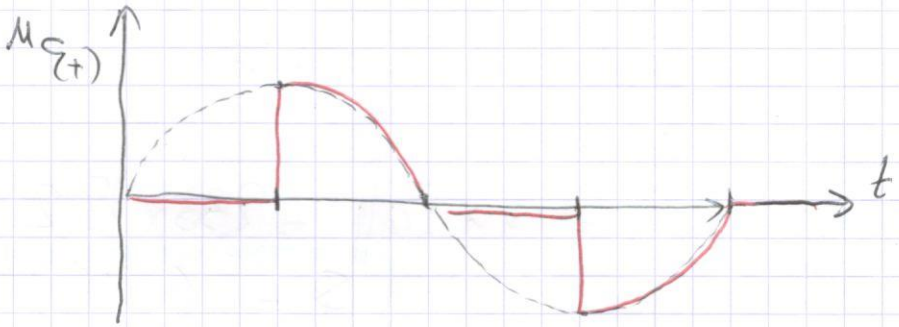
3°- $I = \frac{U_e}{R} = \frac{V}{R}\sqrt{1 - \frac{\delta}{\pi} + \frac{\sin 2\delta}{2\pi}}$

$\left.\begin{array}{l} 88° \rightarrow \delta_{rad} \\ 180° \rightarrow \pi \end{array}\right\} \quad \delta_{rad} = \frac{\pi \times 88}{180}$ Rode°.

$I = \frac{V}{R}\sqrt{1 - \frac{\pi \times 88}{180} \times \frac{1}{\pi} + \frac{\sin(2 \times 88)}{2\pi}}$

$I = \frac{230}{9}\sqrt{0,522} = \frac{230}{R} \times 0,722$

$I = 18,46$ A.



5- $P_{active} = RI^2 = 9 \times 18,46^2$

$= 3069,4\ W$

6- $S_{app} = V \times I_{eff}$

$= 230 \times 18,46 = 4245,8\ VA$

7. $f_p = \frac{P}{S} = \frac{3069,4}{4245,8} = 0,722$

8. 8.1. $I_{fond} = 15,4\ A$

$f_{dep} = \cos(32°) = 0,848$

8.2. $I_{eff} = 18,2\ A$

8.3. $P = V \times I_{fond} \times \cos 32$

$= 230 \times 15,4 \times \cos 32$

$P = 3003\ W$

8.4. $Q = P \tan 32 = 1876,97\ VAR$

ou $VI \sin 32$

8.5. $S = V \times I_{eff} = 230 \times 18,2$

$S = 4186\ VA$

8.6. $D = \sqrt{S^2 - P^2 - Q^2}$

$= \sqrt{4186 - 3003^2 - 1876,97^2}$

$D = 2231,96\ VAD.$

8.7. $f_p = \frac{P}{S} = \frac{3003}{4186} = 0,717$.

Problème 2 :

1/ $P = P_{nominal} \times \tau$

$= 6000 \times \frac{3}{18}$

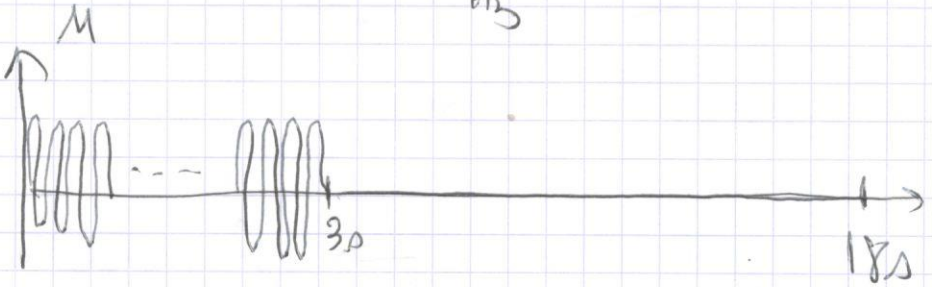
$P = 1000\,W$

2/ $n_{sinusoïdes} = \frac{3}{20.10^{-3}} \leftarrow 2\,cm$

$= 3 \times 50 = 150$ sinusoïdes

$\uparrow$ Hz

3/



4/ $\Delta U = (R_{ph} + R_N) \times I$

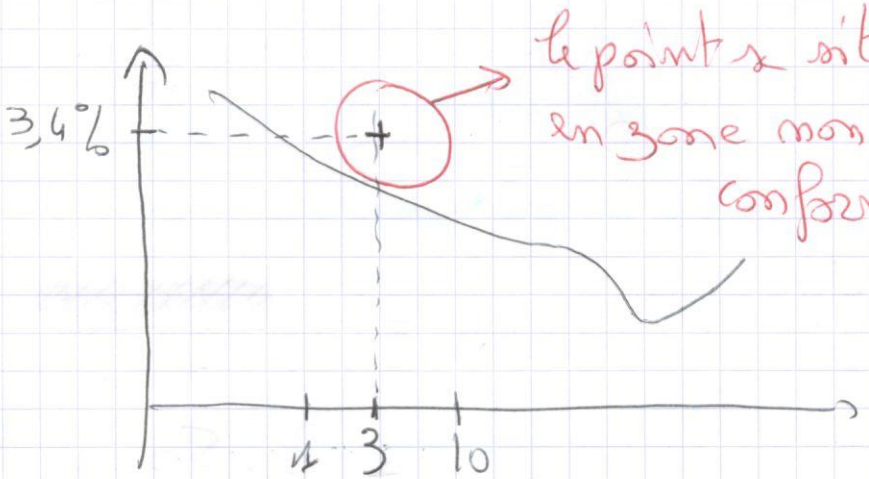
$I = \frac{P_m}{U_{réseau}} = \frac{6000}{230} = 26,08\,A$

$\Delta U = 0,3 \times 26,08 = 7,826\,V$

5/ Calcul de $\frac{\Delta U}{U} = \frac{7,826}{230} \times 100$

$\frac{\Delta U}{U} = 3,4\ \%$

taux de répétition : $\frac{60}{18} = 3,33\ mn^{-1}$



Donc le phénomène de flicker est gênant pour l'installation

→ Augmenter la section en amont pour ↓ $(R_{ph} + R_N)$

ou

→ Augmenter la période de 18s pour ↓ le taux de répétition