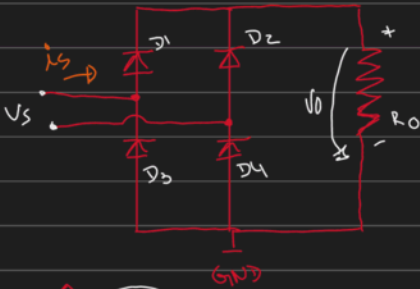
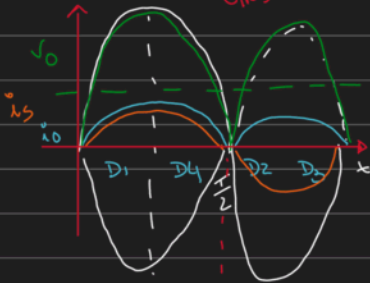


Retificador monofásico completo funcionamento c/ carga resistiva



$$v_s = A \cdot \sin(\omega t)$$



$$v_{O\text{avg}} = \frac{2A}{\pi}$$

$$i_O = \frac{v_{O\text{avg}}}{R_O}$$

→ tensão inversa no

diodo:

$$V_{\text{máx}} = -A$$

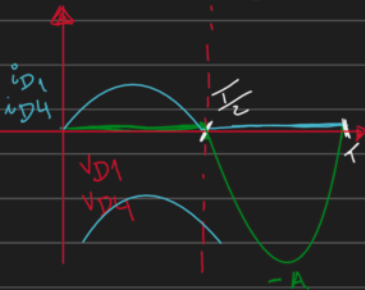
Corrente no Diodo:

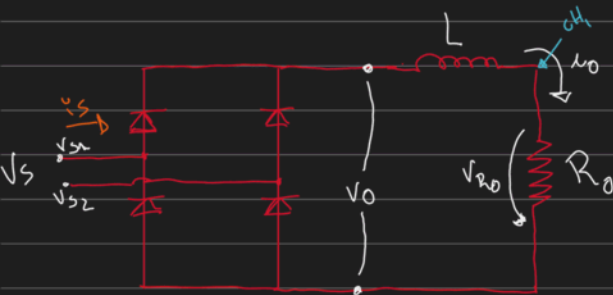
→ valor médio

$$i_{D\text{avg}} = \frac{I_O}{2}$$

→ valor eficaz:

$$i_{D\text{RMS}} = \frac{I_O}{\sqrt{2}}$$





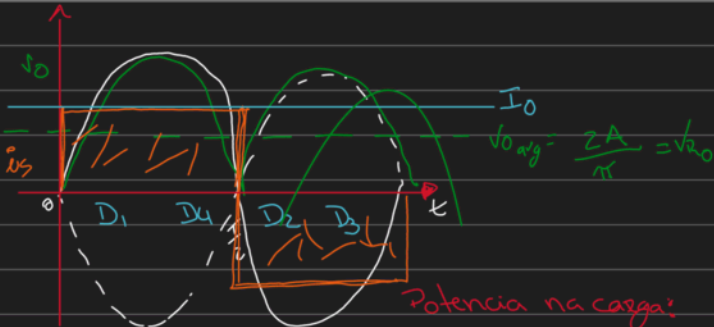
A corrente é constante se: $\frac{L}{R} \gg \frac{1}{2 \times f_i}$

Pelo menos \rightarrow
 $\frac{L}{R}$ é 10x maior

$$\frac{L}{R} > \frac{10}{2 \times f_i}$$

$2 \times f_i$ freq
 entrada

$$L > \frac{10 R_o}{2 \times f_i}$$



Potencia na carga:

$$P_0 = V_{0avg} \times I_0 = \frac{Z A}{\pi} \times I_0$$

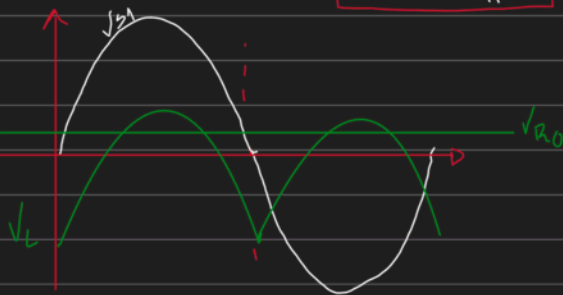
Potencia aparente na

fonte AC:

$$S = \frac{A}{\sqrt{2}} \times I_0$$

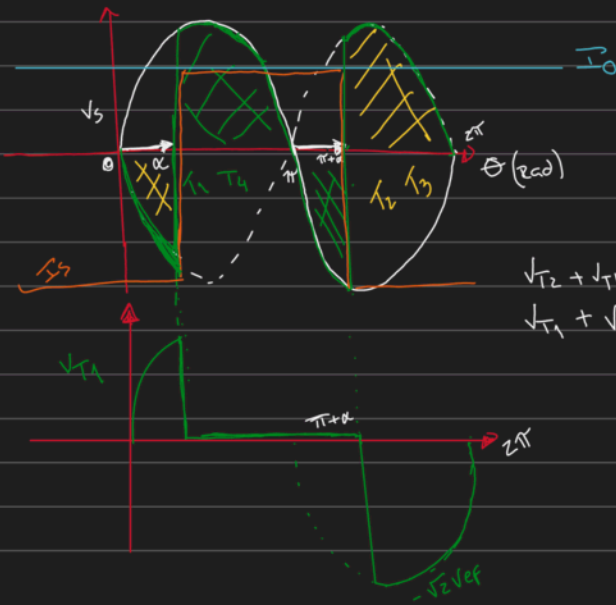
$$F.P. = \frac{P_0}{S} = \frac{\frac{Z A}{\sqrt{2}} \times I_0}{\frac{A}{\sqrt{2}} \times I_0}$$

$$F.P. = \frac{Z \sqrt{2}}{\pi}$$



CONVERTOR CA/CC monofásico totalmente comandado (configuração PDZ) (corrente constante)

$$\frac{L}{R} \gg \frac{10}{2f}$$



$$V_{T2} + V_{T4} = -V_0$$

$$V_{T1} + V_{T3} = -V_0$$

Valor médio da tensão na carga

$$V_{O\text{avg}} = \frac{1}{2\pi} \int_{\alpha}^{\pi+\alpha} 2 \times \sqrt{2} V_{\text{ef}} \sin(\theta) d\theta$$

$$= \frac{\sqrt{2} V_{\text{ef}}}{\pi} \int_{\alpha}^{\pi+\alpha} \sin \theta d\theta$$

$$= \frac{\sqrt{2} V_{\text{ef}}}{\pi} \left[-\cos \theta \right]_{\alpha}^{\pi+\alpha}$$

$$= \frac{\sqrt{2} V_{\text{ef}}}{\pi} \left(-\cos \theta(\pi+\alpha) - (-\cos \alpha) \right)$$

$$V_{O\text{avg}} = \frac{2 \sqrt{2} V_{\text{ef}}}{\pi} \cos \alpha$$

$$I_O = \frac{V_{O\text{avg}}}{R_O}$$

$$P_O = V_{O\text{avg}} \times I_O$$

$$P_O = \frac{V_{O\text{avg}}^2}{R_O}$$

Dimensionamento dos tiristors em corrente

$$I_{Tavg} = \frac{1}{2\pi} \times \int_{\alpha}^{\pi+\alpha} I_0 d\theta$$

$$I_{Tavg} = \frac{I_0}{2\pi} \left[\theta \right]_{\alpha}^{\pi+\alpha}$$

$$I_{Tavg} = \frac{I_0}{2\pi} \times (\pi + \alpha - \alpha)$$

$$I_{Tavg} = \frac{I_0}{2}$$

→ valor médio

$$I_{TRMS} = \sqrt{\frac{1}{2\pi} \times \int_{\alpha}^{\pi+\alpha} I_0^2 d\theta}$$

$$= I_0 \sqrt{\frac{1}{2\pi} \left[\theta \right]_{\alpha}^{\pi+\alpha}}$$

$$= I_0 \sqrt{\frac{1}{2}}$$

$$I_{TRMS} = \frac{I_0}{\sqrt{2}}$$

→ valor eficaz

Valor eficaz da corrente
na fonte A.C

$$I_{SRMS} = \sqrt{\frac{1}{2\pi} \times 2 \int_{\alpha}^{\pi+\alpha} I_0^2}$$
$$= I_0 \times \sqrt{\frac{1}{\pi} \times (\pi + \alpha - \alpha)}$$

$$I_{SRMS} = I_0$$

Potencia aparente:

$$S = V_{ef} I_{SRMS}$$

$$F.P = \frac{P_o}{S} = \frac{V_{omed} \times I_0}{V_{ef} \times I_{SRMS}} = \frac{V_{omed} \times I_0}{V_{ef} \times I_0}$$

$$F.P = \frac{2 \times \sqrt{2} \times V_{ef} \times \cos \alpha}{\pi \times V_{ef}}$$

$$F.P = \frac{2\sqrt{2}}{\pi} \times \cos \alpha$$

