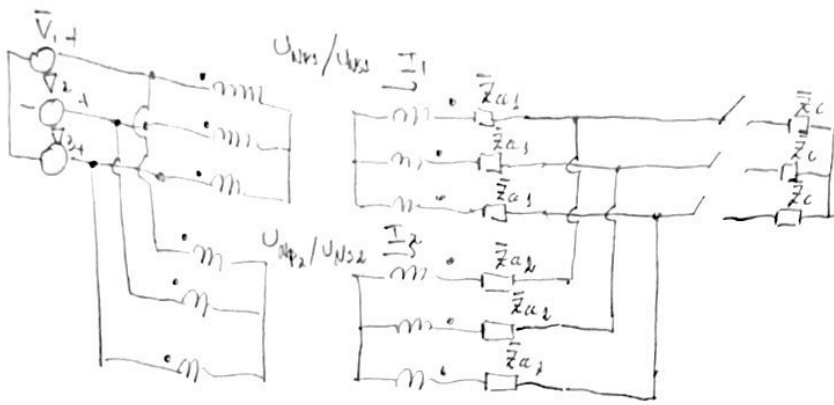
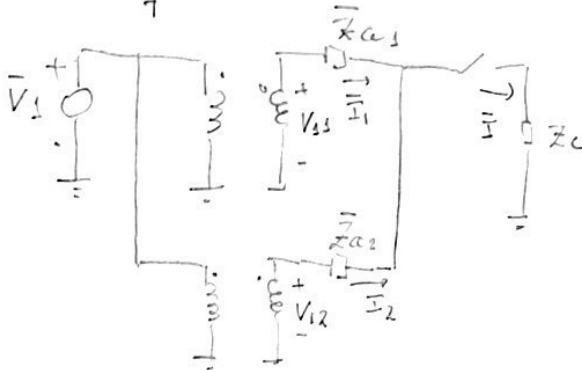


# Transformadores em Paralelo.

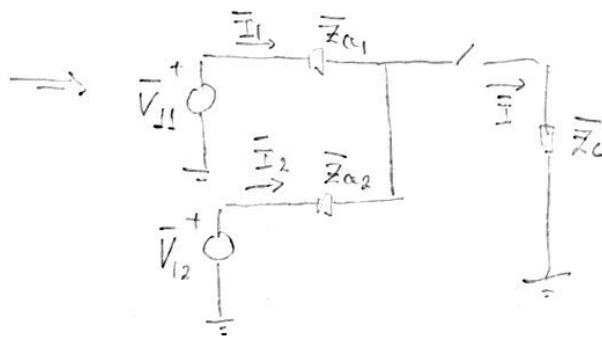


$$\begin{aligned} \bar{V}_1 &= \frac{U}{\sqrt{3}} \angle 0^\circ \\ \bar{V}_2 &= \frac{U}{\sqrt{3}} \angle -120^\circ \\ \bar{V}_3 &= \frac{U}{\sqrt{3}} \angle 120^\circ \end{aligned}$$

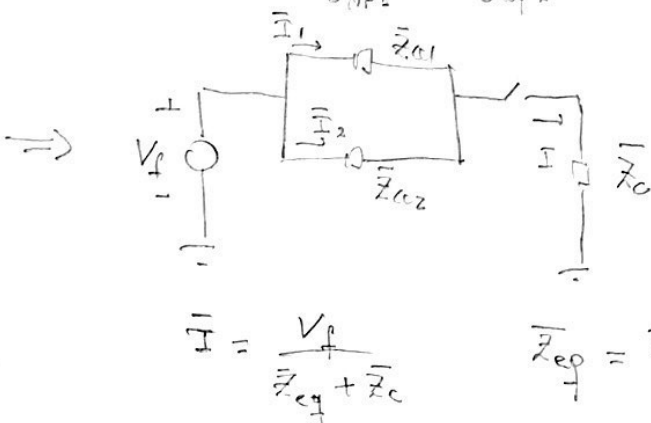
## Monofásico e Equivalente.



$$\begin{aligned} \bar{V}_{S1} &= \bar{V}_1 \frac{N_{S1}}{N_{P1}} = \bar{V}_1 \left( \frac{U_{NS1}}{U_{NP1}} \right) \\ \bar{V}_{S2} &= \bar{V}_1 \frac{N_{S2}}{N_{P2}} = \bar{V}_1 \left( \frac{U_{NS2}}{U_{NP2}} \right) \end{aligned}$$



observar que se  $\frac{U_{NS1}}{U_{NP1}} = \frac{U_{NS2}}{U_{NP2}} \Rightarrow \bar{V}_{11} = \bar{V}_{12} = \bar{V}_f$



$$\begin{aligned} \bar{I}_1 &= \frac{\bar{Z}_{a2}}{\bar{Z}_{a1} + \bar{Z}_{a2}} \times \bar{I} \\ \bar{I}_2 &= \frac{\bar{Z}_{a1}}{\bar{Z}_{a1} + \bar{Z}_{a2}} \times \bar{I} \end{aligned}$$

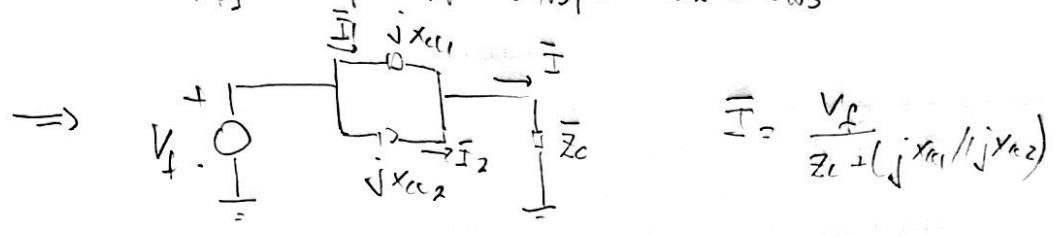
$$\bar{I} = \frac{V_f}{\bar{Z}_{eq} + \bar{Z}_c} \quad \bar{Z}_{eq} = \bar{Z}_{a1} \parallel \bar{Z}_{a2}$$

Hip 1.  $\bar{Z}_{cc1} = jX_{cc1}$   
 $\bar{Z}_{cc2} = jX_{cc2}$

$$X_{cc1} = \frac{U_{z1}}{100} \times \frac{U_{NS1}^2}{S_{N1}}$$

$$X_{cc2} = \frac{U_{z2}}{100} \times \frac{U_{NS2}^2}{S_{N2}}$$

Hip 2.  $U_{NS1} = U_{NS2} = U_{NS}$   $U_{NS1} = U_{NS2} = U_{NS}$



$$\bar{I} = \frac{V_g}{Z_c + (jX_{cc1} // jX_{cc2})}$$

$$I_1 = \frac{X_{cc2}}{X_{cc1} + X_{cc2}} \times \bar{I} = \frac{\frac{U_{z2}}{100} \times \frac{U_{NS}^2}{S_{N2}}}{\frac{U_{z1}}{100} \times \frac{U_{NS}^2}{S_{N1}} + \frac{U_{z2}}{100} \times \frac{U_{NS}^2}{S_{N2}}} \times \bar{I}$$

Hip 3.  $U_{z1} = U_{z2} = U_z$

$$\bar{I}_1 = \left( \frac{S_{N1}}{S_{N1} + S_{N2}} \right) \bar{I}$$

$$S_{N1} = \sqrt{3} U_{NS} I_{NS1}$$

$$S_{N2} = \sqrt{3} U_{NS} I_{NS2}$$

De igual forma:  $I_2 = \left( \frac{S_{N2}}{S_{N1} + S_{N2}} \right) \times \bar{I}$

$$\Rightarrow I_1 = \frac{I_{N1}}{I_{N1} + I_{N2}} \times \bar{I} = \left( \frac{I}{I_{N1} + I_{N2}} \right) I_{N1}$$

$$I_2 = \frac{I_{N2}}{I_{N1} + I_{N2}} \times \bar{I} = \left( \frac{I}{I_{N1} + I_{N2}} \right) I_{N2}$$

$\Rightarrow$  Ambos transformadores a igual % de su corriente nominal.