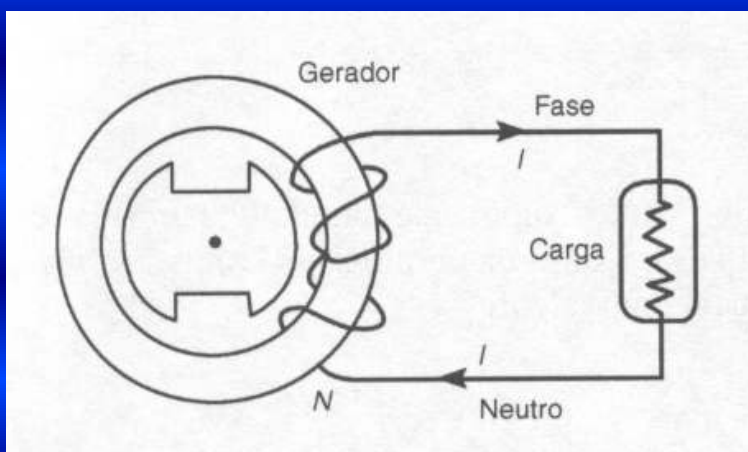
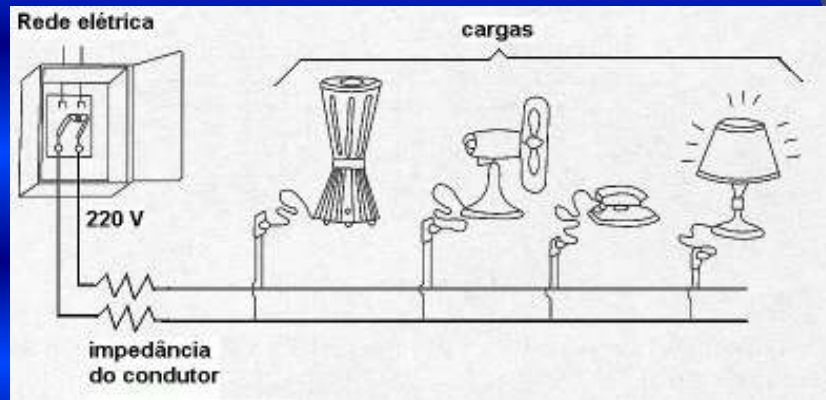


Eletricidade Aplicada II
**SISTEMAS
MULTIPOLARES**

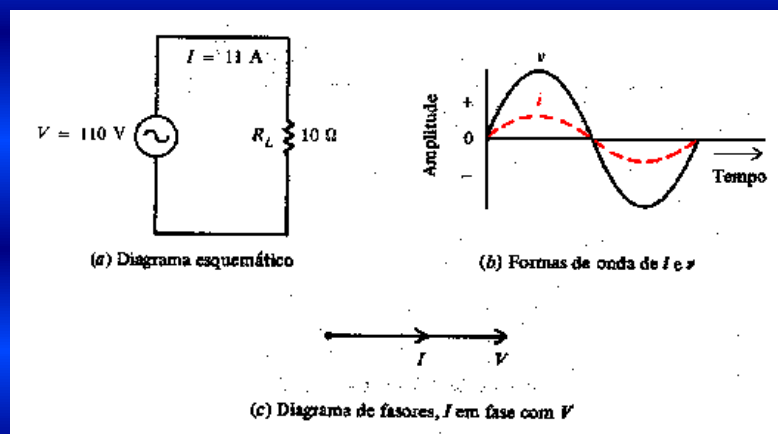
Circuitos Bipolares



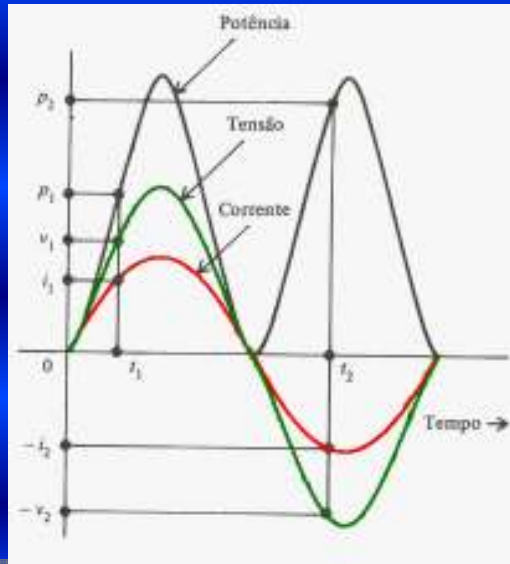
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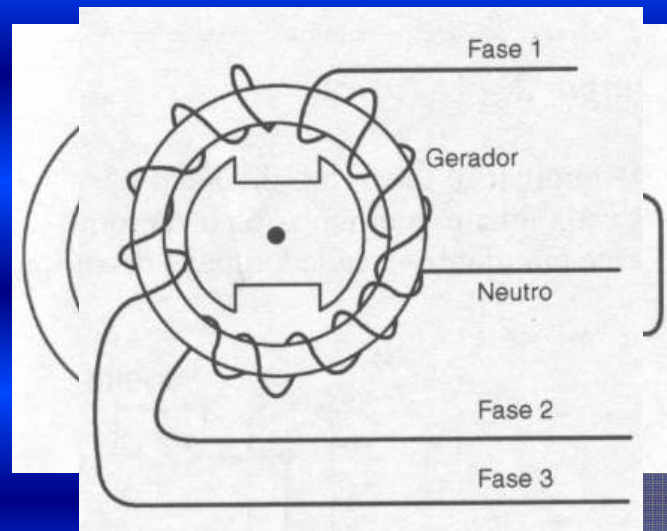
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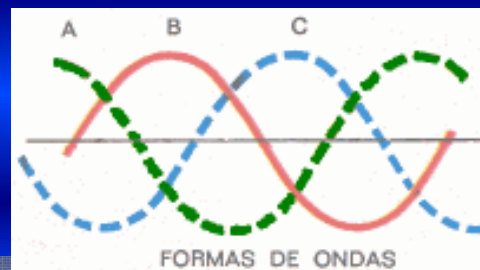
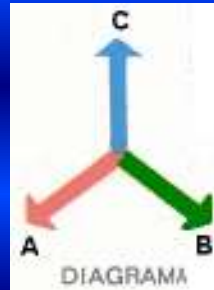
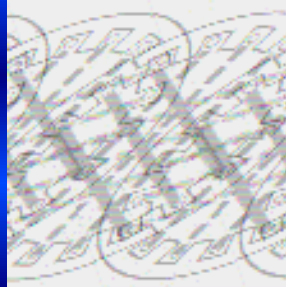
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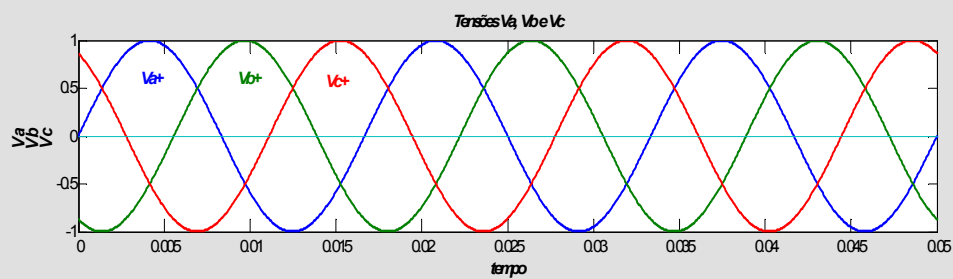
Geração trifásica



Geração trifásica



Geração trifásica



Sistema trifásico

$$\begin{aligned}v_a &= V.\text{sen}(wt) & i_a &= I.\text{sen}(wt - \varphi) \\v_b &= V.\text{sen}\left(wt - \frac{2\pi}{3}\right) & i_b &= I.\text{sen}\left(wt - \frac{2\pi}{3} - \varphi\right) \\v_c &= V.\text{sen}\left(wt + \frac{2\pi}{3}\right) & i_c &= I.\text{sen}\left(wt + \frac{2\pi}{3} - \varphi\right)\end{aligned}$$

Vantagens de sistemas polifásicos

- Potência instantânea praticamente constante
- Correntes menores que os sistemas monofásicos.

Potência elétrica instantânea

- Circuito monofásico: $P = V \cdot I$
- Circuito trifásico: $P = 3 \cdot V_{rms} \cdot I_{rms} \cdot \cos \varphi$

Diagrama Fasorial:

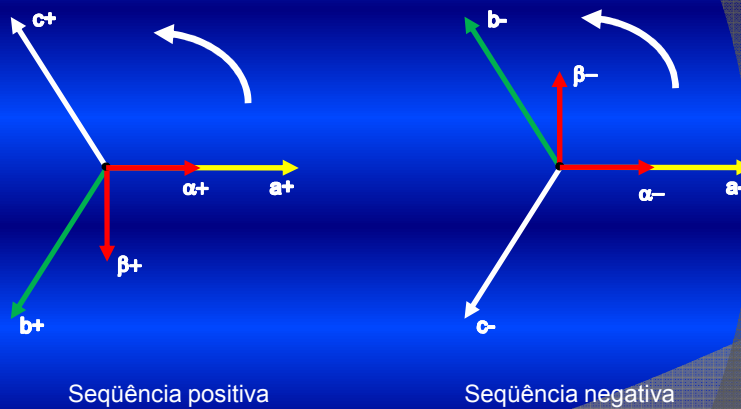
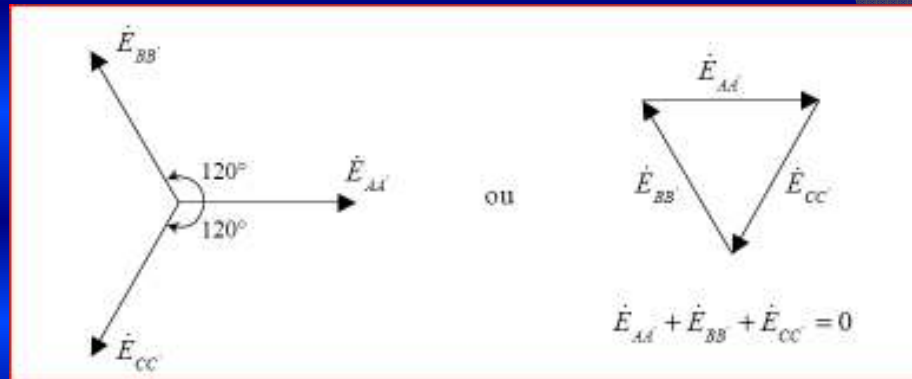
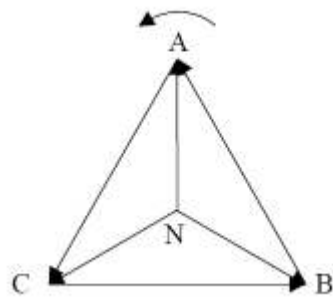


Diagrama Fasorial:

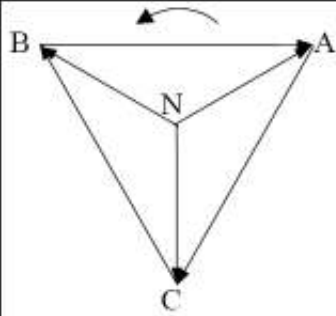


Seqüência ABC:



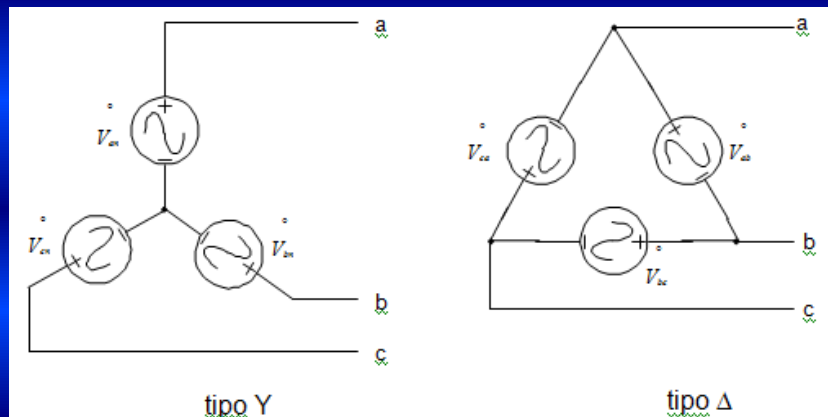
$$\begin{aligned} \dot{E}_{AB} &= \dot{E}_l \angle 120^\circ \text{ V} & \dot{E}_{AN} &= \frac{E_l}{\sqrt{3}} \angle 90^\circ \text{ V} \\ \dot{E}_{BC} &= \dot{E}_l \angle 0^\circ \text{ V} & \dot{E}_{BN} &= \frac{E_l}{\sqrt{3}} \angle -30^\circ \text{ V} \\ \dot{E}_{CA} &= \dot{E}_l \angle -120^\circ \text{ V} & \dot{E}_{CN} &= \frac{E_l}{\sqrt{3}} \angle -150^\circ \text{ V} \end{aligned}$$

Seqüência CBA:

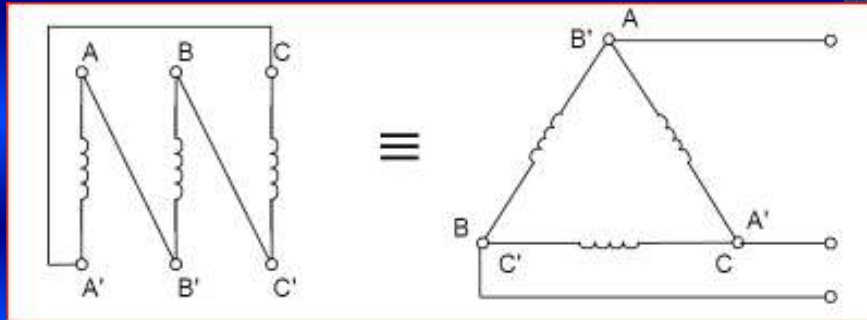


$$\begin{aligned} \dot{E}_{AB} &= E_l \angle 0^\circ \text{ V} & \dot{E}_{AN} &= \frac{E_l}{\sqrt{3}} \angle 30^\circ \text{ V} \\ \dot{E}_{BC} &= E_l \angle 120^\circ \text{ V} & \dot{E}_{BN} &= \frac{E_l}{\sqrt{3}} \angle 150^\circ \text{ V} \\ \dot{E}_{CA} &= E_l \angle -120^\circ \text{ V} & \dot{E}_{CN} &= \frac{E_l}{\sqrt{3}} \angle -90^\circ \text{ V} \end{aligned}$$

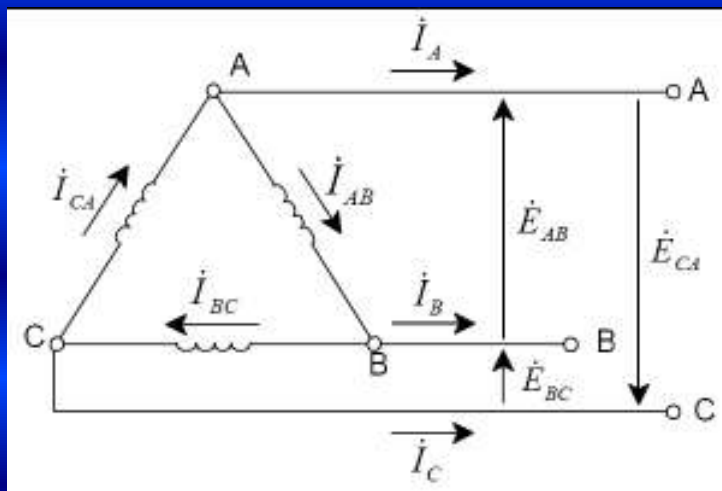
Tipos de ligações



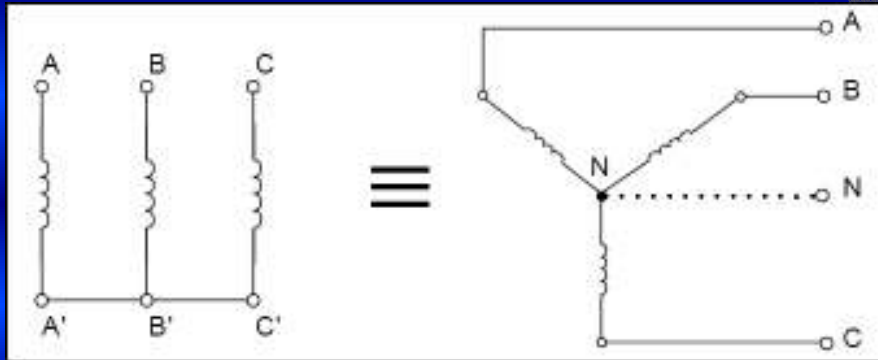
Ligação triângulo



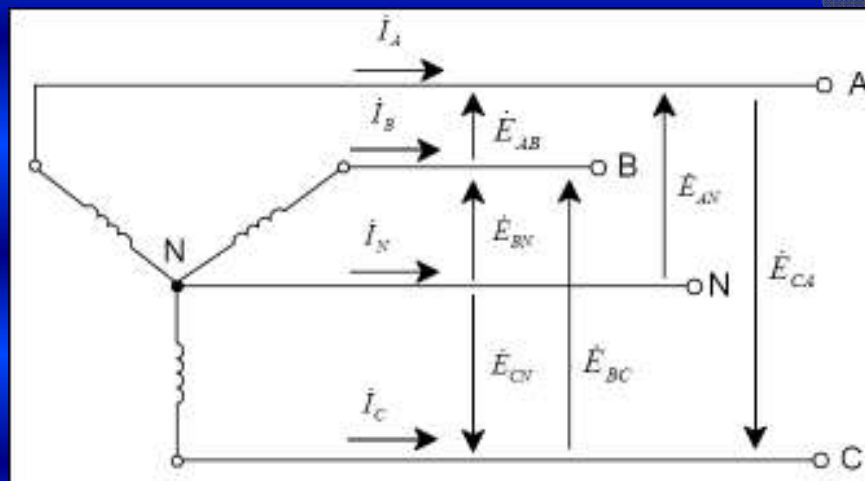
Ligação triângulo



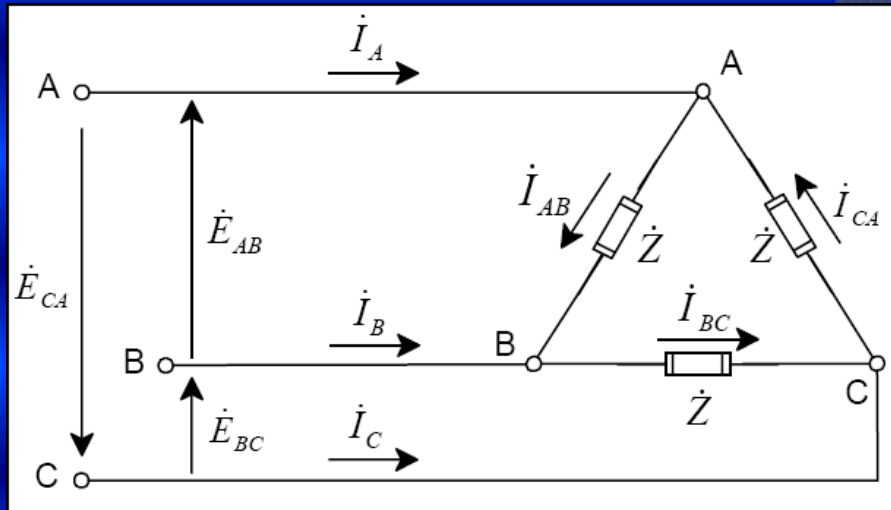
Ligação Estrela



Ligação Estrela



Exercício 1



Exercício 2 (seq CBA)

