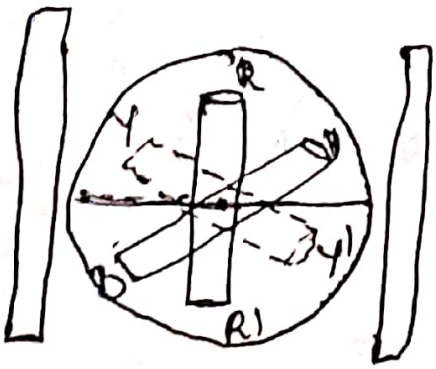
Power factor = $\frac{\text{Active power}}{\text{Apparent power}} = \frac{P}{S}$

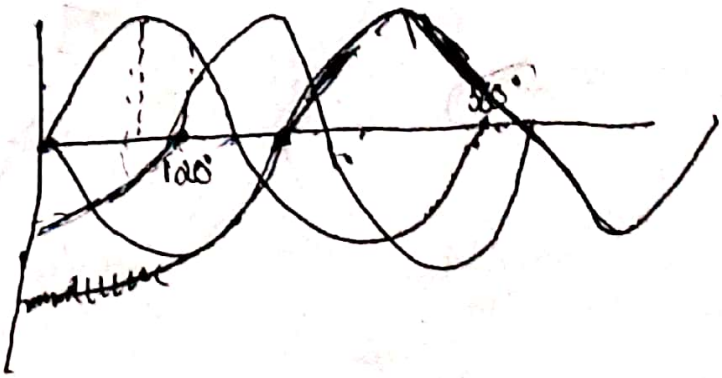
Module

3 phase a-c Circuit

*
* Power loss is less
* 3 phase motor has a uniform torque
* " Generator can work in ∥el without any difficulties.
* Induction motor are self starting, cheaper & more efficient.
*



120° each



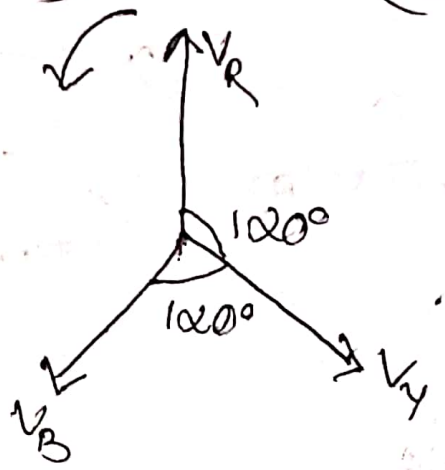
$V_m \sin\omega t$.

$V_Y = V_m \sin(\omega t - 120^\circ)$

$V_B = V_m \sin(\omega t - 240^\circ) = V_m \sin(\omega t + 120^\circ)$

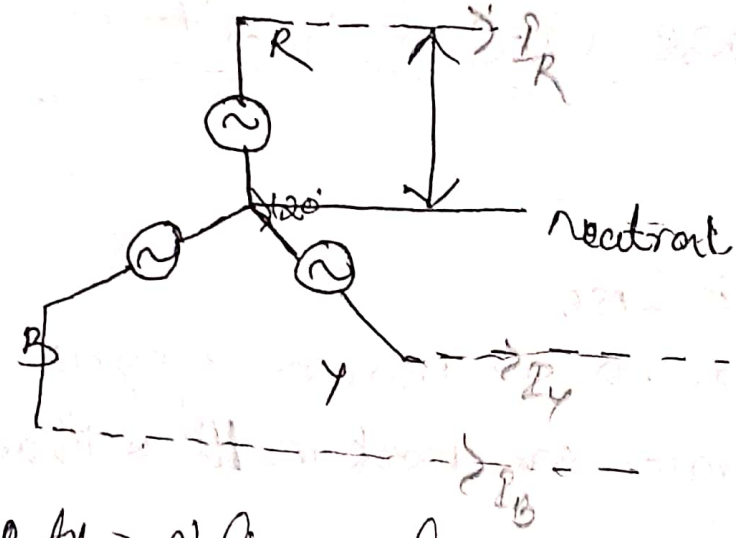
Phase Sequence - RYB

RBY



14/11/19

Star connection

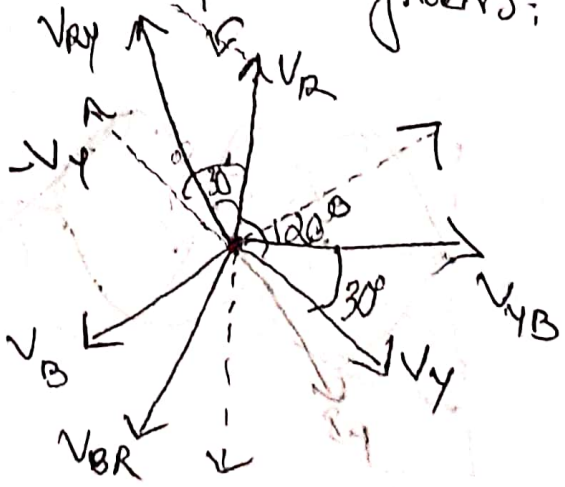


Voltage b/w a line & neutral

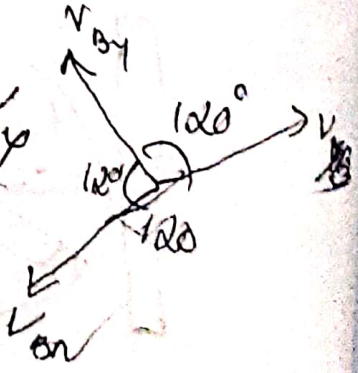
$\Rightarrow$ phase voltage.

Voltage b/w 2 lines : line voltage.

Balanced 3 phase system: $|V_R| = |V_B| = |V_Y|$



$V_{RY} = V_R - V_Y$

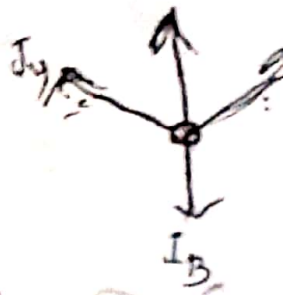


$$V_{RY} = \sqrt{V_R^2 + V_Y^2 + 2V_R V_Y \times \frac{1}{2}} = \sqrt{3}|V_R| = \sqrt{3} V_{phase}$$

$$V_{phase} = \frac{V_L}{\sqrt{3}}$$

Current will be same star connected system.

$$V_p = \frac{V_L}{\sqrt{3}}$$



$I_N = I_R + I_Y + I_B$ in unbalanced

Balance $\Rightarrow I_N = 0$

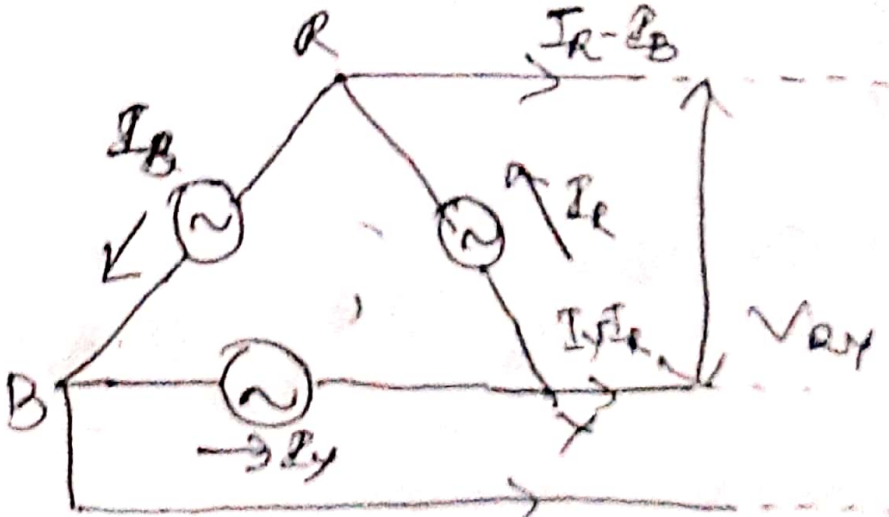
Power in Balanced, power $\Rightarrow P = 3 V_p I_p \cos\phi$

$= 3 V_{ph} I_{ph} \cos\phi = 3 \frac{V_L I_L}{\sqrt{3}} \cos\phi$

$= \sqrt{3} V_L I_L \cos\phi$

ϕ - angle b/w phase voltage & phase current

Delta Connection (Mesh connected)



Line voltage a
phase voltage a
Same.

Current thro
a line → line curr