# Apuntes de C.A. 1/2

$e = E_0 \operatorname{Sen}(\omega t \pm \varphi)$

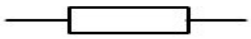
Siendo: La fase $(\omega t \pm \varphi)$ ; el desfase $\varphi$

$\omega$ : Pulsación, frecuencia angular, velocidad angular.

$\omega = \frac{2\Pi}{T}$; $T = \frac{1}{f}$ ; $\omega = 2\Pi$

e =Tensión instantánea y $E_0$ = Tensión máxima

## Impedancias



Z = R

C  $X_c = \frac{-1}{C\omega}$ $\frac{-1}{CW} \rightarrow X_c = \frac{-1}{c\omega} j$ Capacitancia = - $X_c$

 L $X_l = L \cdot w \rightarrow X_l = L \cdot w\, j$ Inductancia = $X_l$

Impedancia total : $Z = \sqrt{R^2 + (X_l - X_c)^2}$

Reactancia total : $X = (X_l - X_c)$

Susceptancia : $b = \frac{X}{Z^2}$

Conductancia : $g = \frac{R}{Z^2}$

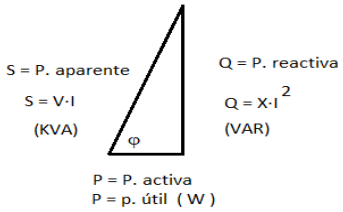
Admitancia : $Y = \frac{1}{Z} \rightarrow Y = \sqrt{g^2 + b^2}$

$i = I_0 \operatorname{Sen}(\omega t \pm \varphi)$

i =Intensidad instantánea y $I_0$ = Intensidad máxima

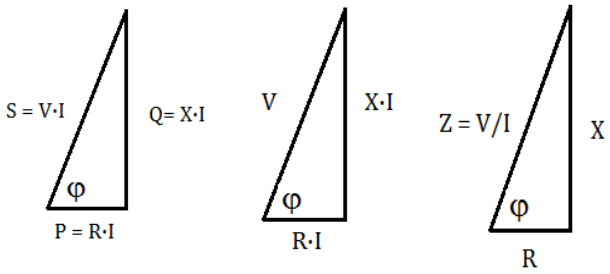
$i = \frac{e}{Z}$ ; $I_0 = \frac{E_0}{Z}$ ; $E_{ef} = \frac{E_0}{\sqrt{2}}$ ; $I_{ef} = \frac{I_0}{\sqrt{2}}$ ; $I_{ef} = \frac{E_{ef}}{Z}$; $I_{ef}$ = Irms; $E_{ef}$ = Erms

## Potencias



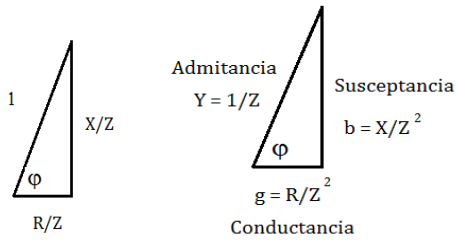

S = V·I
P = V·I·Cos φ
Q = V·I·Sen φ
Factor de potencia = Cos φ
φ = arc.tang X/R

Potencias Tensiones Impedancias

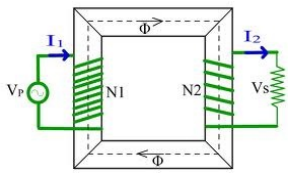



$$V = \sqrt{V_R^2 + (V_l - V_c)^2} \qquad Z = \sqrt{R^2 + (X_l - X_c)^2}$$

Si dividimos por Z, tendremos:




## Transformador




$$P_p = P_s \; ; \quad \frac{V_p}{V_s} = \frac{N_p}{N_s} \; ; \quad \frac{I_p}{I_s} = \frac{N_p}{N_s} \; ; \quad \frac{Z_p}{Z_s} = \left(\frac{N_p}{N_s}\right)^2 \frac{Z_p}{Z_s} \left(\frac{N_p}{N_s}\right)^2$$

## Resonancia

$$X_l = X_c \rightarrow L\omega = \frac{1}{c\omega} \rightarrow \omega^2 = \frac{1}{Lc} \rightarrow (2\pi f)^2 = \frac{1}{Lc} \rightarrow (2\pi f)^2 = \frac{1}{LC} \rightarrow f = \frac{1}{2\pi\sqrt{LC}}$$