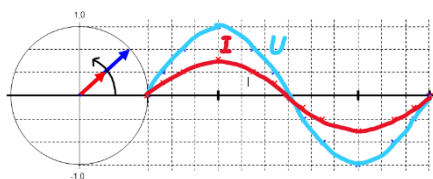


Elektriska egenskaper R, L och C

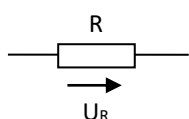
Resistiv egenskap

R = Resistans (ohm, Ω)



Strömmen och spänningen ligger fas.

Symbol



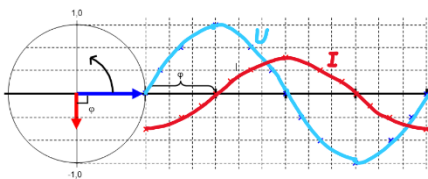
R Resistans

$$U = Z$$

$$U_R = I \times R$$

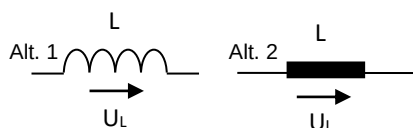
Induktiv egenskap (ideal)

L = Induktans (henry, H)



Strömmen ligger 90° efter spänningen.

Symbol



X_L Induktiv reaktans

$$X_L = 2 \times \pi \times f \times L$$

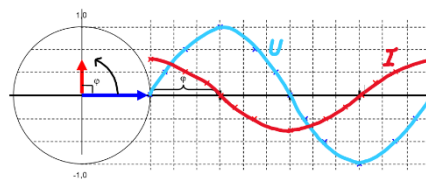
$$X_L = \omega \times L$$

$$U_L = U \times \sin(+90)$$

U= Påtryckta spänningen

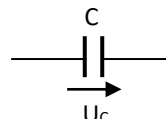
Kapacitiv egenskap

C = Kondensator (farad, F)



Strömmen ligger 90° före spänningen.

Symbol



X_C Kapacitiv reaktans

$$X_C = \frac{1}{2 \times \pi \times f \times C}$$

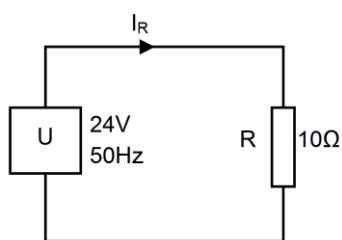
$$X_C = \frac{1}{\omega \times C}$$

$$U_C = U \times \sin(-90)$$

U= Påtryckta spänningen

Exempel

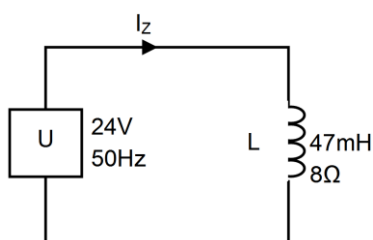
Resistans



$$U_R = U = 24V$$

$$I = \frac{U}{R} = \frac{24}{10} = 2,4A$$

Induktans



$$X_L = 2 \times \pi \times f \times L$$

$$X_L = 2 \times \pi \times 50 \times 47 \times 10^{-3} = 14,8\Omega$$

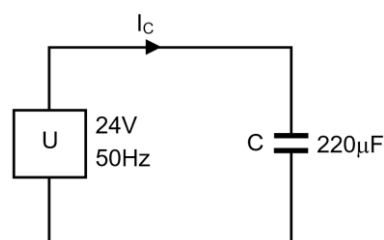
$$Z = \sqrt{R^2 + X_L^2} = \sqrt{8^2 + 14,8^2} = 16,8\Omega$$

$$I_Z = \frac{U}{Z} = \frac{24}{16,8} = 1,43A$$

$$U_L = U \times \sin \varphi = 24 \times \left(\frac{14,8}{16,8} \right) = 21,1V$$

$$U_R = U \times \cos \varphi = 24 \times \left(\frac{8}{16,8} \right) = 11,4V$$

Kapacitans



$$U_C = U \times \sin(-90)$$

$$U_C = -24V$$

$$I_C = \frac{U_C}{\left(\frac{1}{2 \times \pi \times f \times C} \right)}$$

$$I_C = \frac{-24}{\left(\frac{1}{2 \times \pi \times 50 \times 220 \times 10^{-6}} \right)} = -1,66A$$

