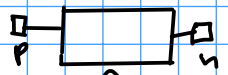
Electrical Analog

Connector: pin

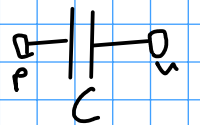
v, i



Resistor

$i_p + i_n = 0$

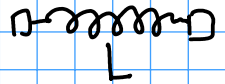
$v_p - v_n = R\, i_p$



Capacitor

$i_p + i_n = 0$

$i_p = C(\dot{v}_p - \dot{v}_n)$



Inductor

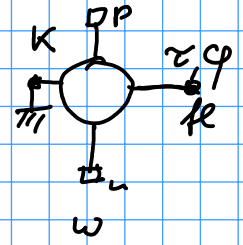
$i_p + i_n = 0$

$v_p - v_n = L\,\dot{i}$

Constant Voltage, Constant Current

Ground $\frac{\varphi}{=}$ $v = 0$

Rotational EMF



$i_p + i_n = 0$

$\omega = \dot{\varphi}$

$v_p - v_n = K\omega$

$i_p = -\frac{1}{K}\tau$