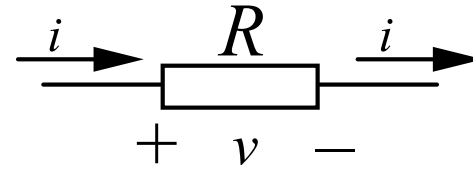
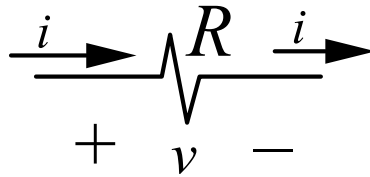


## 4. Zirkuituetako osagaiak

- Erresistentziak
- Kondentsadoreak
- Sorgailuak
- Beste osagaiak

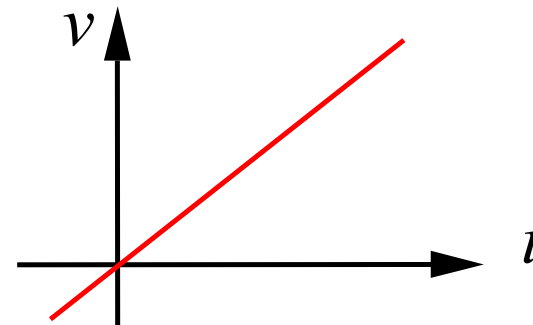
# Erresistentziak

**Sinboloa:**



**Portaera:** Ohm legea:  $v = R \cdot i$

**Ezaugarri grafikoa:**



## Erresistentziak (II)

**Unitatea:** ohm,  $\Omega$

$$1 \text{ ohm} = 1 \Omega = 1\text{V} / 1\text{A}$$

zirkuitu elektronikoetan:  $\text{k}\Omega$  edo  $\text{M}\Omega$

$$1 \text{ k}\Omega = 10^3 \Omega$$

$$1 \text{ M}\Omega = 10^6 \Omega$$

**Potentzia:** osagai pasiboa beti ( $P_x > 0$ )

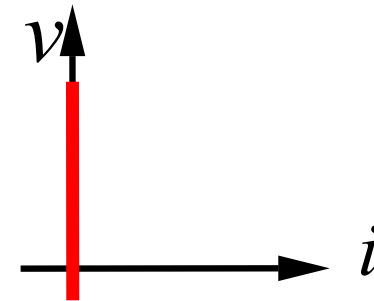
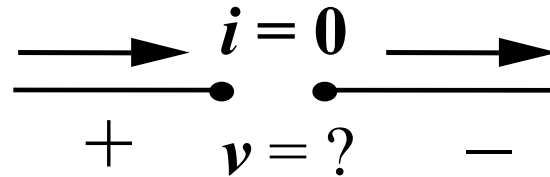
$$p = R \cdot i^2 = \frac{v^2}{R}$$

*Joule efektua: xurgatutako energia bero bihurtzen da*

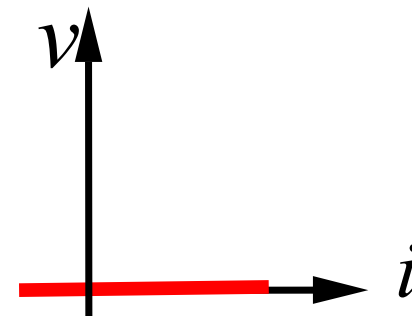
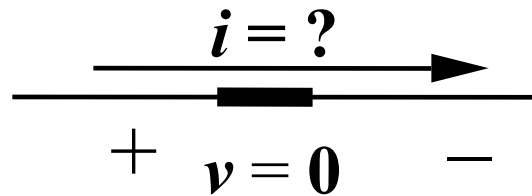
Potentzia maximoa:  $P_x \leq P_{\text{max}}$ , bestela erresistentzia erre egiten da

## Kasu bereziak

I. Zirkuitu irekia:  $R = \infty$

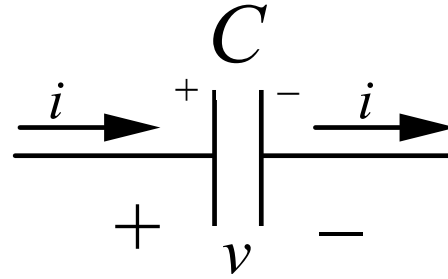


II. Zirkuitulaburra:  $R = 0$



# Kondentsadoreak

**Sinboloa:**

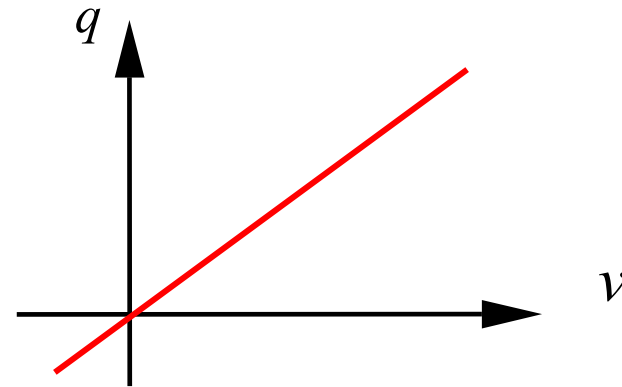


**Portaera:**

$$q = C \cdot v$$

$$i(t) = C \cdot \frac{dv(t)}{dt}$$

**Ezaugarri grafikoa:**



## Kondentsadoreak (II)

**Unitatea:**    **farad, F**         $1 \text{ farad} = 1 \text{ F} = 1 \text{ C} / 1 \text{ V}$

zirkuitu elektronikoetan:  $\mu\text{F}$ ,  $\text{nF}$  edo  $\text{pF}$

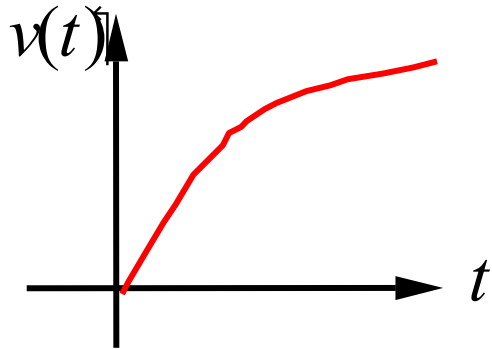
$$1 \mu\text{F} = 10^{-6} \text{ F}$$

$$1 \text{ nF} = 10^{-9} \text{ F}$$

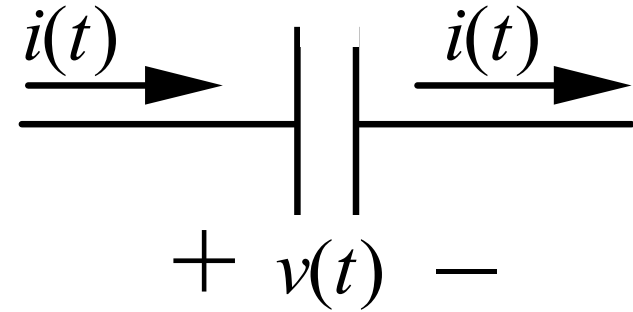
$$1 \text{ pF} = 10^{-12} \text{ F}$$

**Bi prozesu:** karga eta deskarga

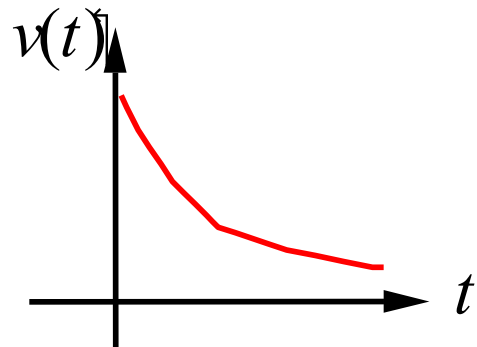
**Karga prozesua:** energia xurgatzen du



$$i(t) > 0$$

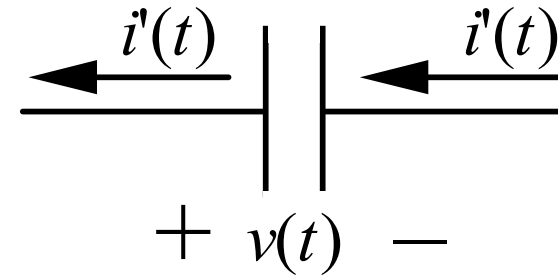


**Deskarga prozesua :** energia ematen du



$$i(t) < 0$$

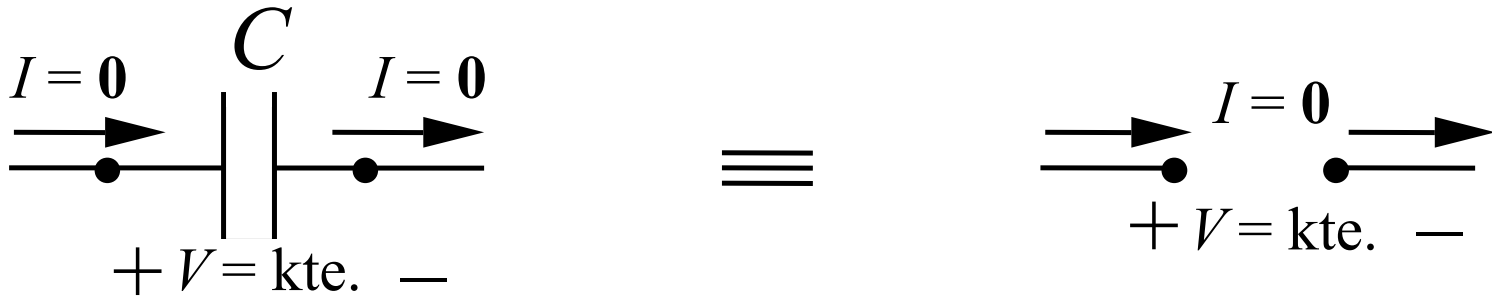
$$i'(t) > 0$$



## Kondentsadorea

**korronte zuzenean (DC)** eta **egoera egonkorrean**

$$V \text{ kte} \rightarrow I = 0$$



## Potentzia kondentsadorean

**Korronte zuzenean** eta **egoera egonkorrean**:  $p=0$

**Karga prozesuan**:  $p_x > 0$

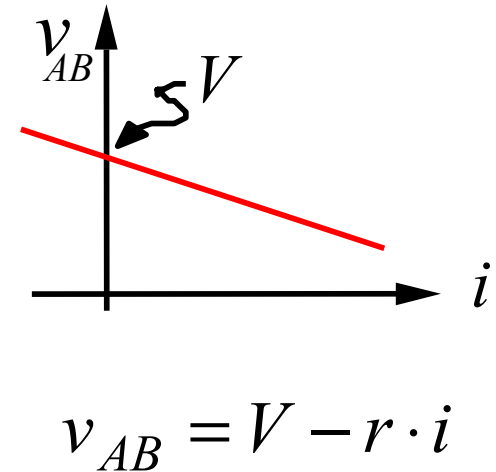
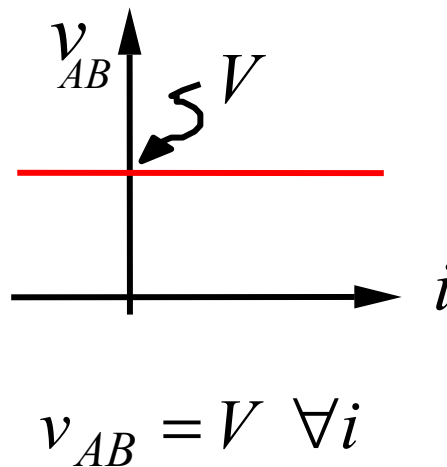
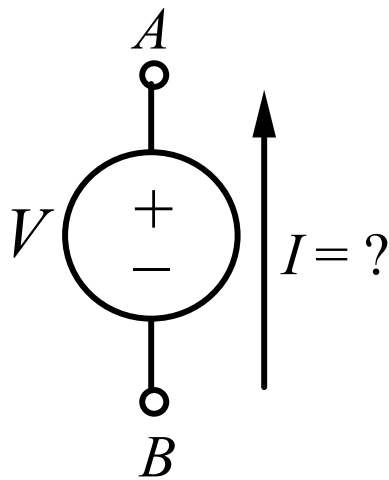
**Deskarga prozesuan**:  $p_e > 0$



# Sorgailuak

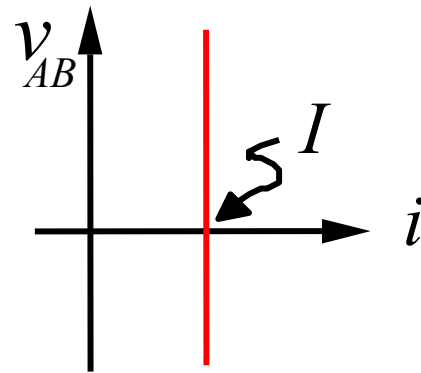
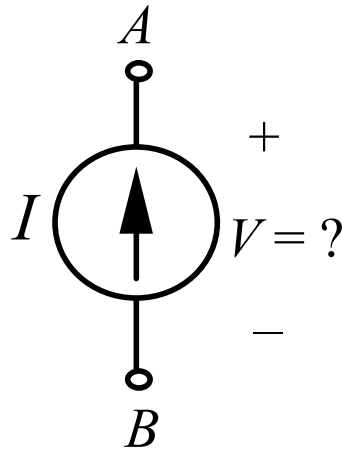
Energia elektrikoa sortzen dute: tentsioa edo korrontea.  
Aktiboak izan ohi dira, baina pasibo gisa ere joka dezakete.

## Tentsio-sorgailu independenteak

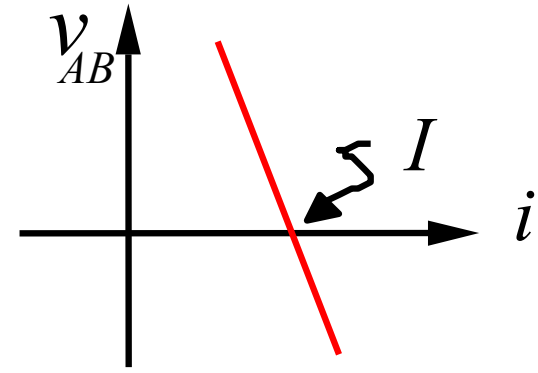


## Sorgailuak (II)

### Korronte-sorgailu independenteak



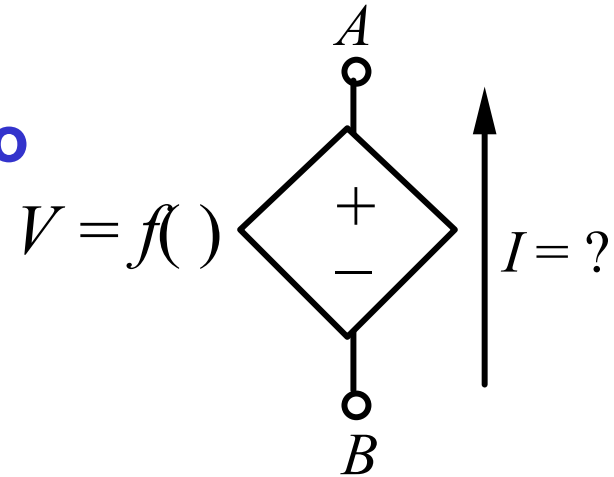
$$i = I \quad \forall v$$



$$i = I - \frac{v_{AB}}{r}$$

## Sorgailuak (III)

**Tentsio-sorgailu dependenteak edo menpekoak:**



**tentsio bitartez kontrolatuta** (beste elementu baten tentsioa):

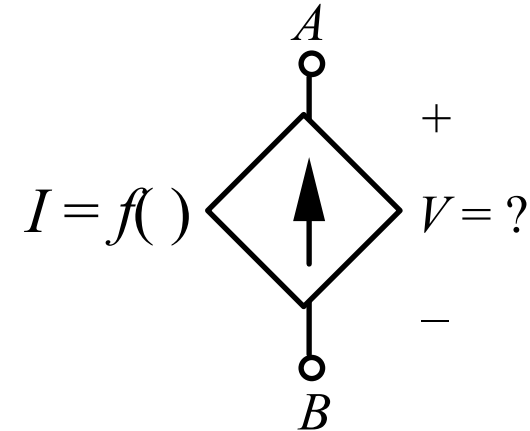
$$V = f(V') = k \cdot V'$$

**korrante bitartez kontrolatuta** (beste elementu baten korrontea):

$$V = f(I') = k \cdot I'$$

# Sorgailuak (IV)

## Korronte-sorgailu dependenteak



**tentsio bitartez kontrolatuta** (beste elementu baten tentsioa):

$$I = f(V') = k \cdot V'$$

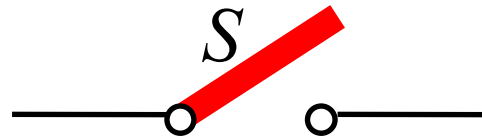
**korronte bitartez kontrolatuta** (beste elementu baten korrontea):

$$I = f(I') = k \cdot I'$$

# Beste elementuak

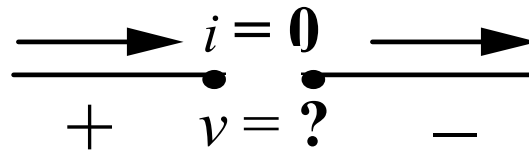
## Etengailu ideala

Sinboloa



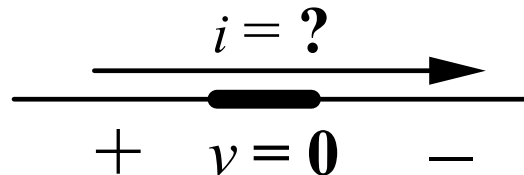
Bi posizio

irekita



$$i = 0 \quad \forall v$$

itxita



$$v = 0 \quad \forall i$$