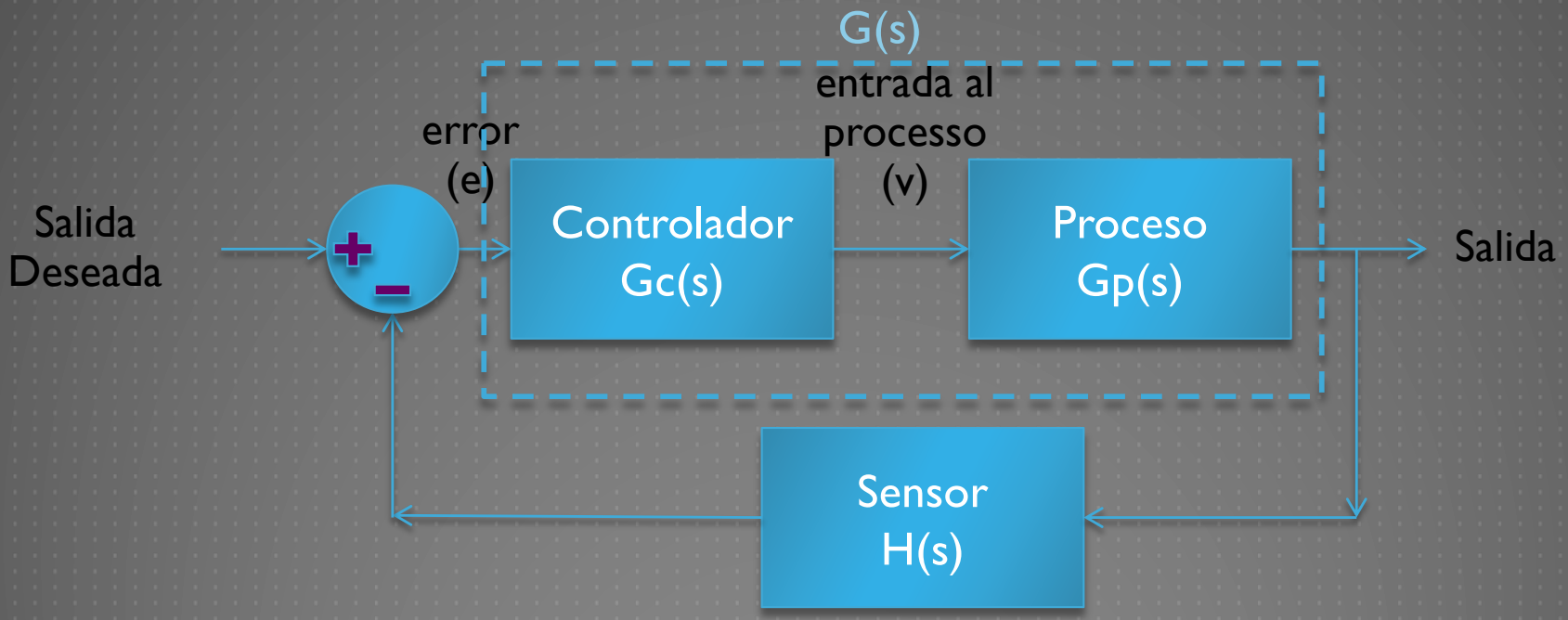
IMPLEMENTACIÓN DE CONTROLADORES

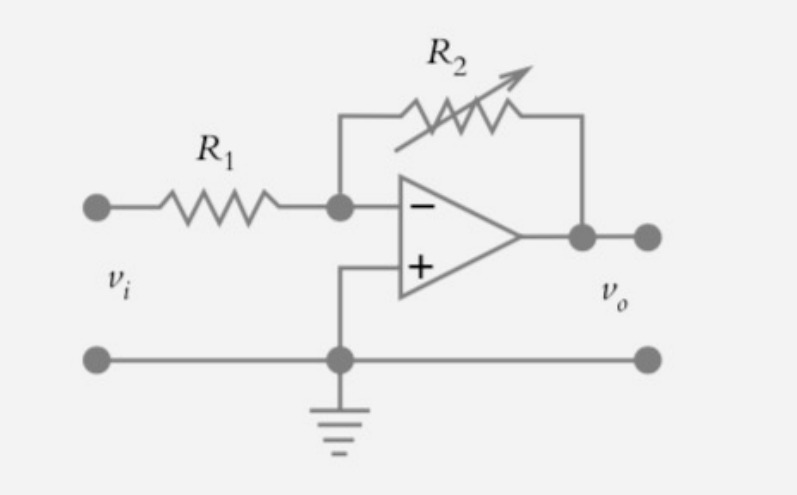
SISTEMA CONTROLADO EN LAZO CERRADO



CONTROLADORES ELECTRÓNICOS
CONTROLADOR P

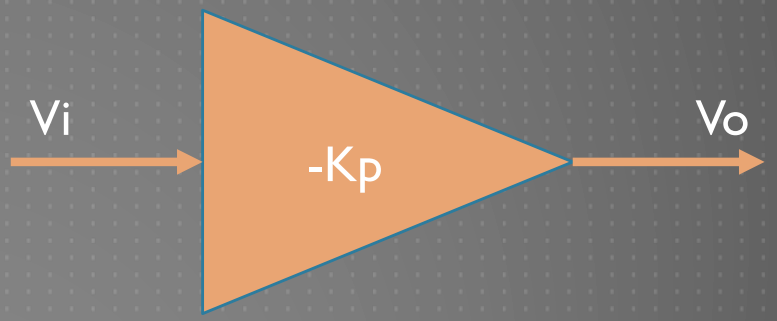
- *Circuito eléctrico*

$$v_o = -\frac{R_2}{R_1} v_i$$



- *Representación*

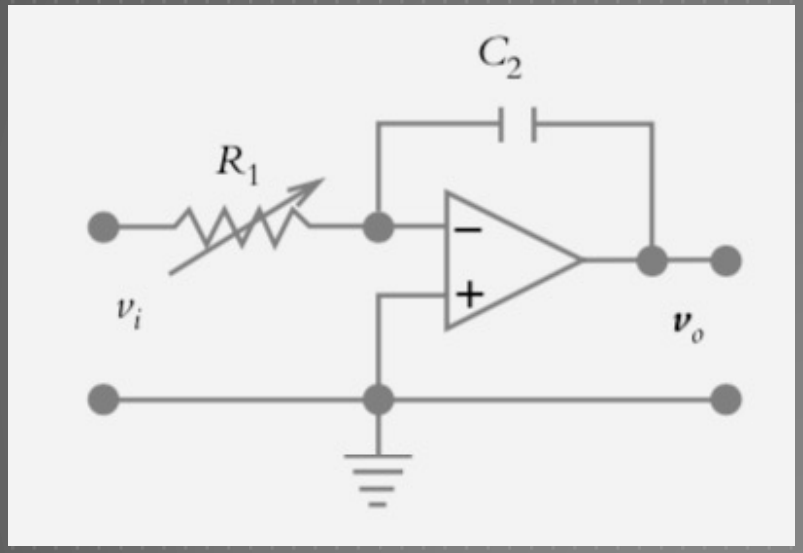
$$v_o = -K_p v_i$$



CONTROLADORES ELECTRÓNICOS
CONTROLADOR I

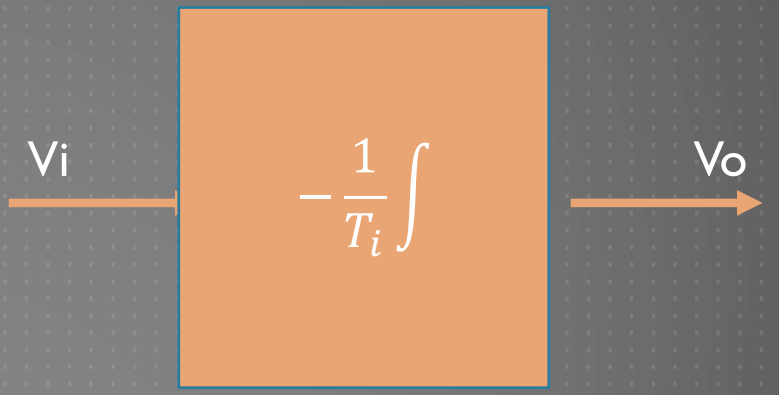
- *Circuito eléctrico*

$$v_o = -\frac{1}{R_1 C_2}\int v_i \, dt$$



- *Representación*

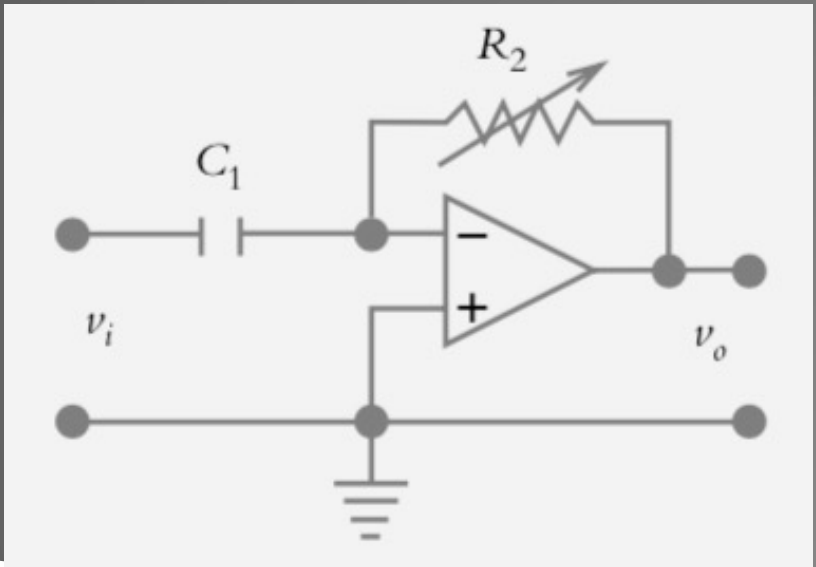
$$v_o = -\frac{1}{Ti}\int v_i$$



CONTROLADORES ELECTRÓNICOS
CONTROLADOR D

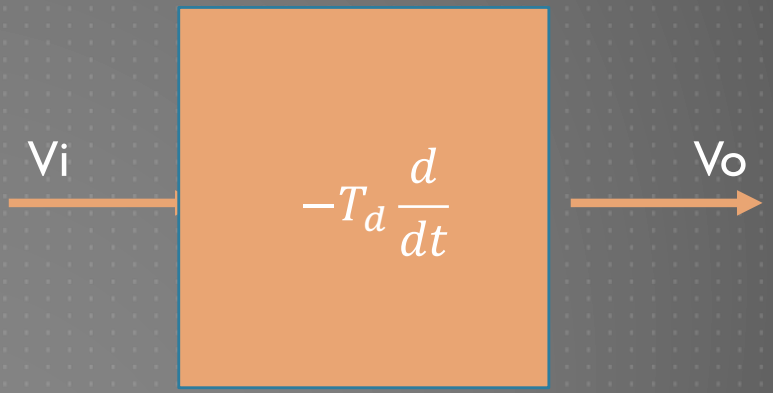
- *Circuito eléctrico*

$$v_o = -R_1 C_2 \frac{dv_i}{dt}$$



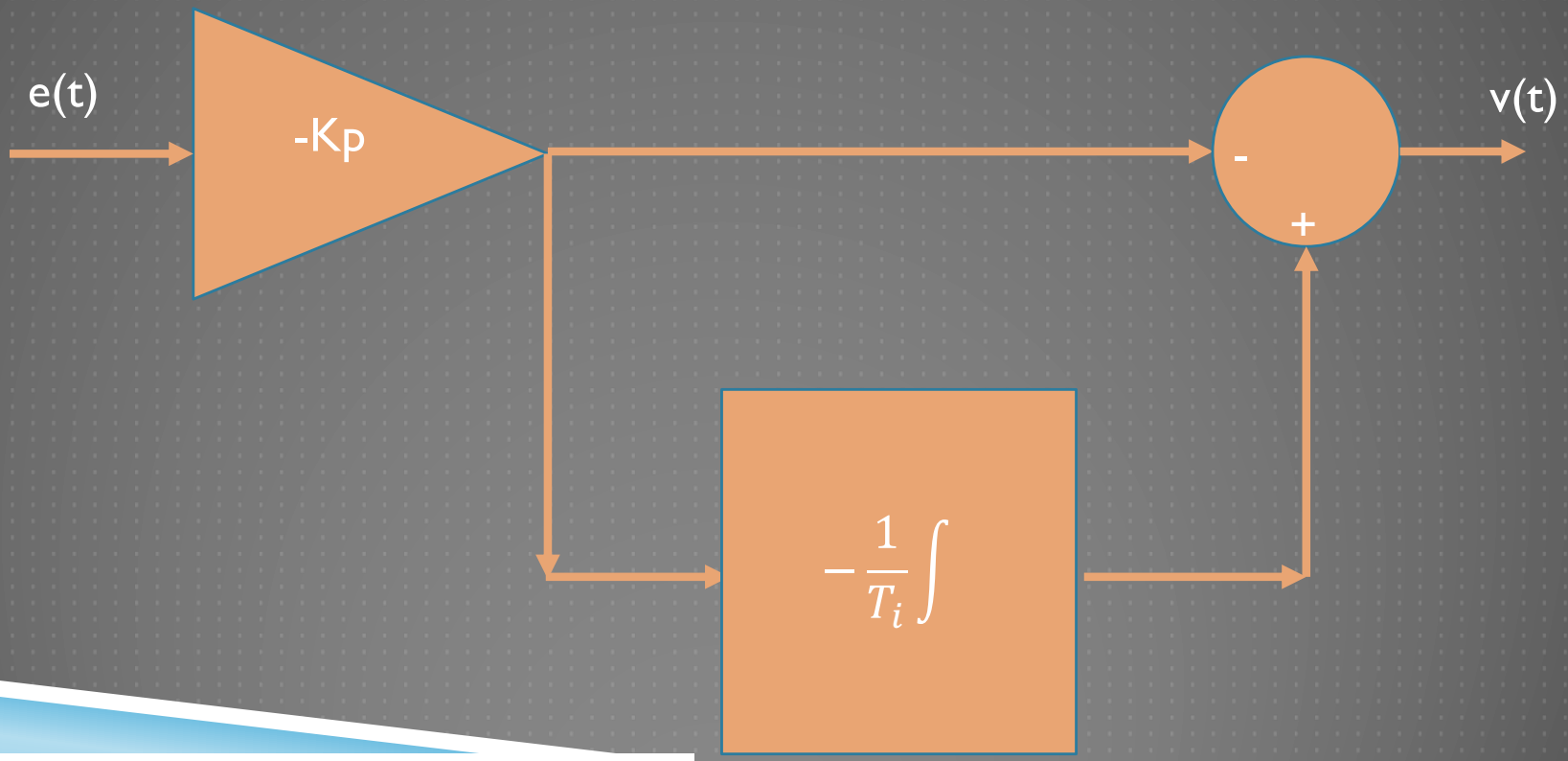
- *Representación*

$$v_o = -T_d \frac{dv_i}{dt}$$



CONTROLADORES ELECTRÓNICOS
CONTROLADOR PI

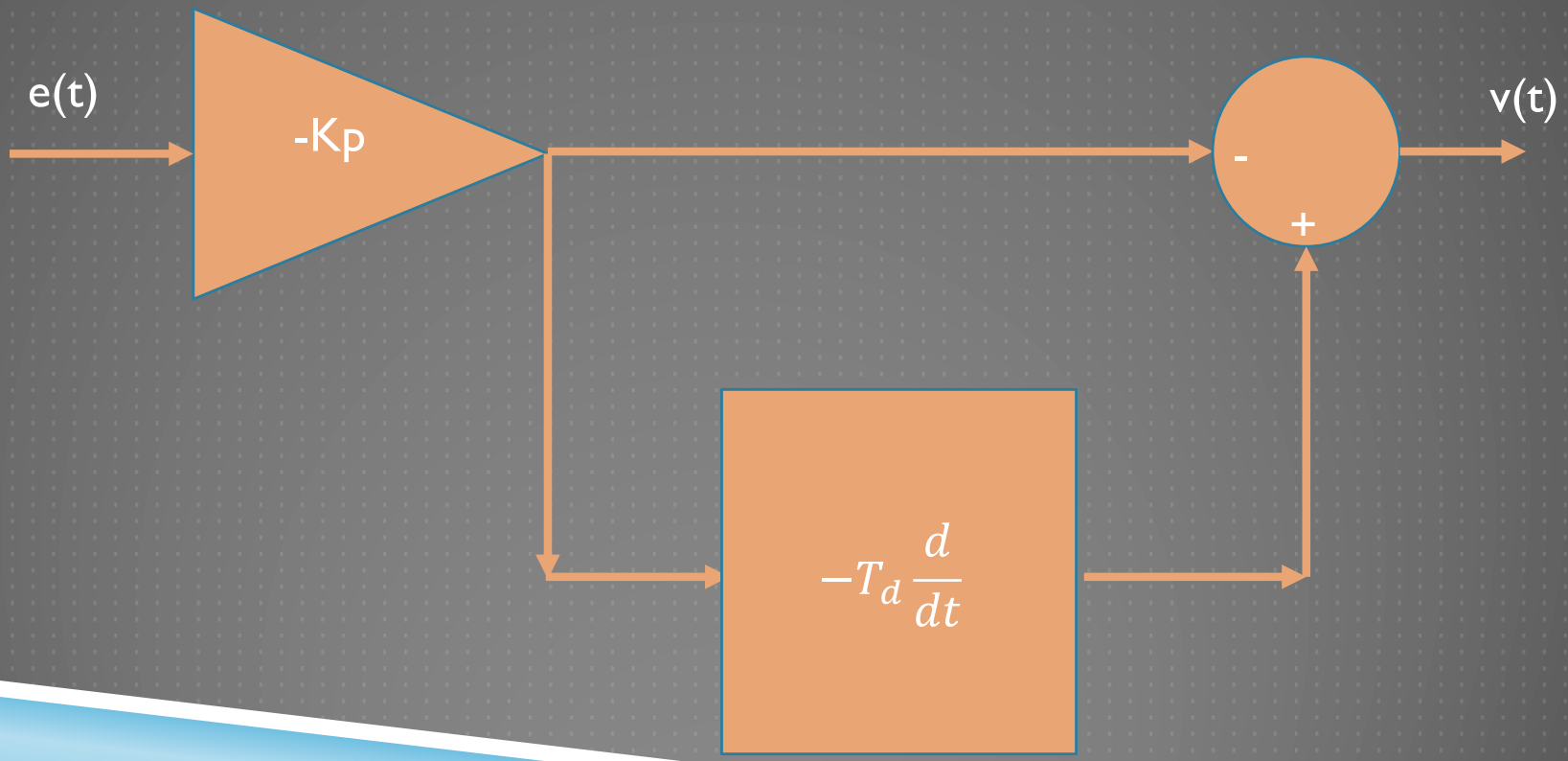
$$v(t) = K_p e(t) + K_i \int e(t)\,dt = K_p e(t) + \frac{Kp}{Ti} \int e(t) dt$$



$$G_c(s) = \frac{V(s)}{E(s)} = K_p\left[\frac{s+1/T_i}{s}\right] = K_p\left[\frac{s+(K_i/K_p)}{s}\right]$$

CONTROLADORES ELECTRÓNICOS
CONTROLADOR PD

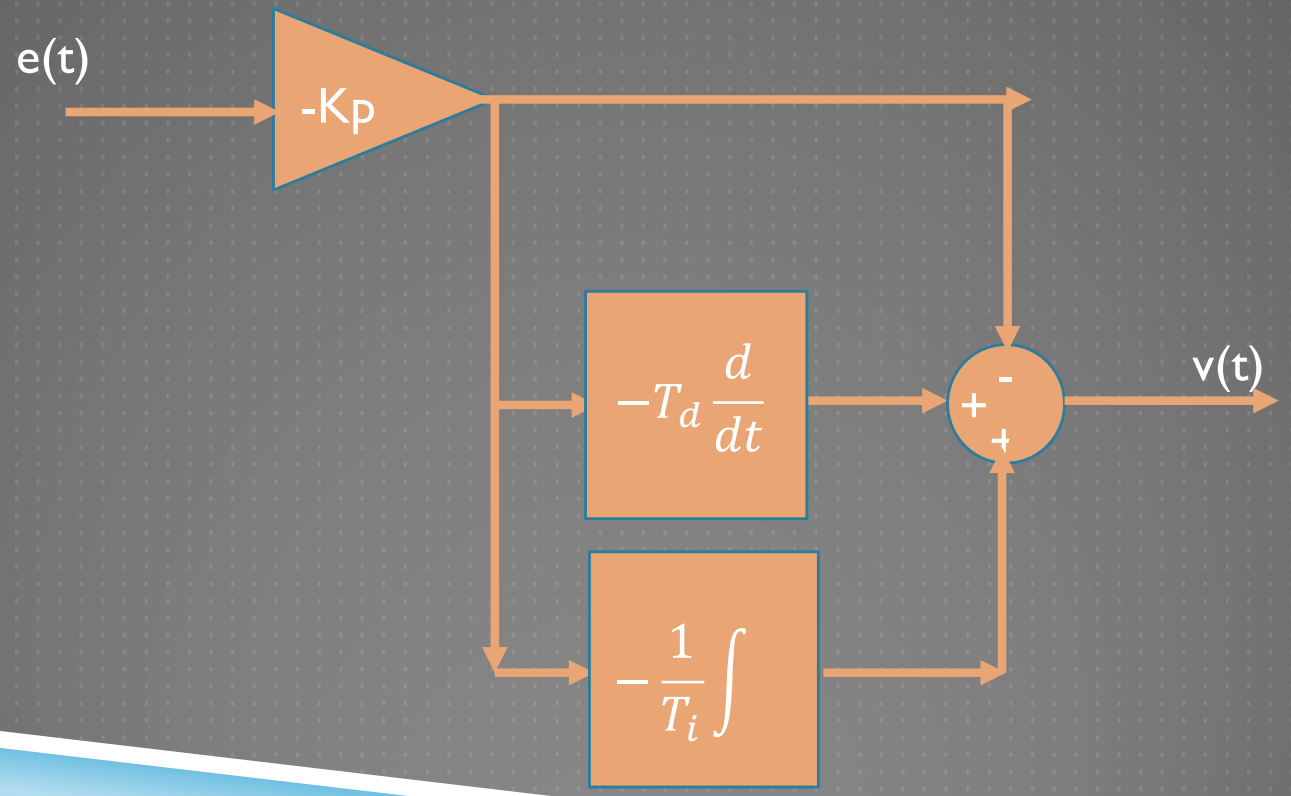
$$v(t) = K_p e(t) + K_p T_d \frac{de(t)}{dt} = K_p e(t) + K_d \frac{de(t)}{dt}$$



$$G_c(s) = \frac{V(s)}{E(s)} = K_p T_d \left[s + 1/T_d \right] = K_p T_d \left[s + (K_p / K_d) \right]$$

CONTROLADORES ELECTRÓNICOS
CONTROLADOR PID

$$v(t) = K_p e(t) + K_p T_d \frac{de(t)}{dt} + \frac{Kp}{Ti} \int e(t)dt = K_p e(t) + K_d \frac{de(t)}{dt} + K_i \int e(t)dt$$



$$G_c(s) = \frac{V(s)}{E(s)} = K_p T_d \left[\frac{s^2 + (1/T_d)s + 1/T_i T_d}{s} \right]$$