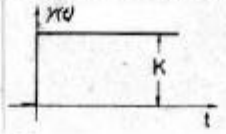
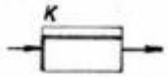
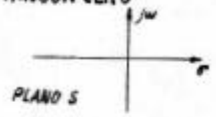
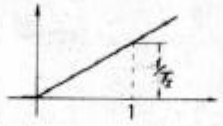
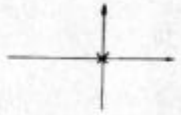
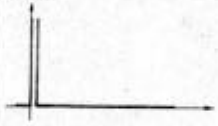
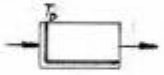
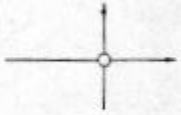
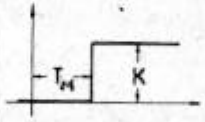
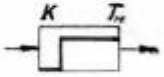
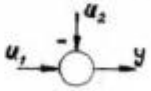
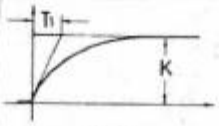
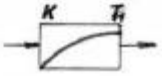
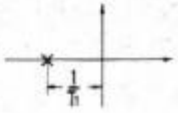
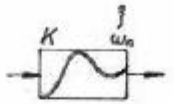
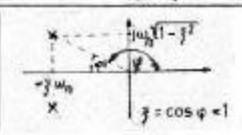
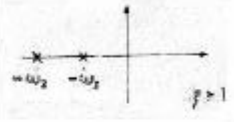
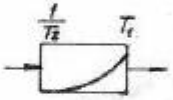
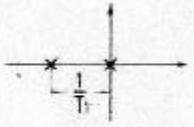
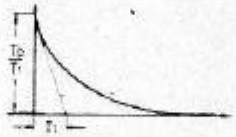
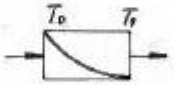
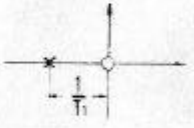
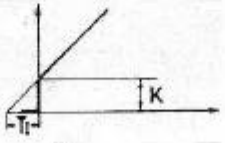
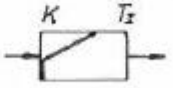
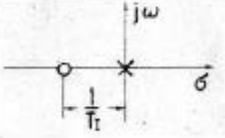
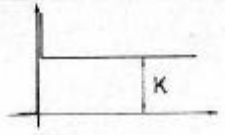
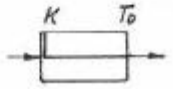
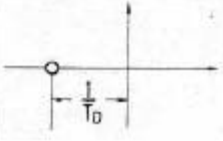
Bloques Normalizados

Código: Tab_BloqNorm

A–702 Control I | E–504 Dinámica de los Sistemas Físicos

DENOMINACION MNEMONICO	ECUACION DIFERENCIAL FUNCION TRANSFERENCIA	RESPUESTA AL ESCALON UNITARIO	DIAGRAMA DE BLOQUE NORMALIZADO	POLOS Y CEROS DE G(s)
PROPORCIONAL P	$y = Ku$ $G(s) = K$	 K		NINGUN POLO NINGUN CERO 
INTEGRADOR I	$T_I \dot{y} = u$ $G(s) = \frac{1}{T_I s}$	 $\frac{1}{T_I} t$		
DERIVADOR D	$y = T_D \dot{u}$ $G(s) = T_D s$	 $T_D\, \delta(t)$		
TIEMPO MUERTO T_M	$y(t) = K u (t - T_M)$ $G(s) = K e^{-T_M s}$	 $K \sigma(t - T_M)$		POLO EN $-\infty$ CERO EN $+\infty$
SUMADOR S	$y = \pm u_1 \pm u_2 \pm \dots \pm u_p$			
PROPORCIONAL CON RETARDO ORDEN 1 P_{T1}	$T_1 \dot{y} + y = Ku$ $G(s) = \frac{K}{1 + T_1 s}$	 $K(1 - e^{-t/T_1})$		

DENOMINACION MNEMONICO	ECUACION DIFERENCIAL FUNCION TRANSFERENCIA	RESPUESTA AL ESCALON UNITARIO	DIAGRAMA DE BLOQUE NORMALIZADO	POLOS Y CEROS DE G(s)
PROPORCIONAL CON RETARDO ORDEN 2 P_{T2}	$T_2^2\ddot{y} + 2\vartheta T_2\dot{y} + y = Ku$ $G(s) = \frac{K}{1 + 2\vartheta T_2 s + T_2^2 s^2}$ ϑ : AMORTIGUAMIENTO $\omega_n = \frac{1}{T_2}$: FRECUENCIA NATURAL $G(s) = \frac{K\omega_n^2}{\omega_n^2 + 2\vartheta\omega_n s + s^2}$	CASO APERIODICO $\vartheta < 1$ $\omega_d = \omega_n\sqrt{1-\vartheta^2}$ $tg\varphi = -\frac{\sqrt{1-\vartheta^2}}{\vartheta}$ $90° < \varphi < 180°$ $K\left[1 + \frac{e^{-(\vartheta/T_2)t}}{\sqrt{1-\vartheta^2}}\,sen(\omega_d t - \varphi)\right]$ CASO APERIODICO $\vartheta = 1 \dots \vartheta > 1$ $T_1 = \frac{1}{\omega_n}$ $K - K\left(1 + \frac{t}{T_1}\right)e^{-\frac{t}{T_1}}$ $\omega_{n2} = \omega_n\left(\vartheta \mp \sqrt{\vartheta^2 - 1}\right)$ $K\left[1 - \frac{\omega_2}{\omega_2 - \omega_1}e^{-\omega_1 t} + \frac{\omega_1}{\omega_2 - \omega_1}e^{-\omega_2 t}\right]$		 
INTEGRADOR CON RETARDO ORDEN 1 I_{T1}	$T_I T_1\ddot{y} + T_I\dot{y} = u$ $G(s) = \frac{1}{T_I s(1 + T_1 s)}$	 $\frac{t}{T_I}\left[\frac{t}{T_1} - (1 - e^{-t/T_1})\frac{T_1}{T_1}\right]$		
DERIVADOR CON RETARDO ORDEN 1 D_{T1}	$T_1\dot{y} + y = T_D\dot{u}$ $G(s) = \frac{T_D s}{1 + T_1 s}$	 $\frac{T_1}{T_1}T_D e^{-\frac{t}{T_1}}$		
PROPORCIONAL INTEGRAL P_I	$T_I\dot{y} = K[T_I\dot{u} + u]$ $G(s) = K\left[1 + \frac{1}{T_I s}\right]$	 $K + \frac{K}{T_I}t$		
PROPORCIONAL DERIVATIVO P_D	$y = K[u + T_D\dot{u}]$ $G(s) = K[1 + T_D s]$	 $K + KT_D\,\delta(t)$		

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PROPORCIONAL INTEGRAL CON RETARDO ORDEN 1 PI_{T1}	$T_I(T_1\ddot{y}+\dot{y}) = K(T_I\dot{u}+u)$ $G(s) = K\frac{1+\frac{1}{T_I s}}{1+T_1 s}$	$T_1 < T_I$ $\frac{K}{T_I}[t - T_1(1-\frac{T_I}{T_1})(1-e^{-t/T_1})]$	K, $\frac{T_I}{T_1}$	$\frac{1}{T_I}$, $\frac{1}{T_1}$
PROPORCIONAL DERIVATIVO CON RETARDO ORDEN 1 PD_{T1}	$T_1\dot{y}+y = K(u+T_D\dot{u})$ $G(s) = K\frac{1+T_D s}{1+T_1 s}$	$T_D < T_1$, $T_D > T_1$ $K[1-(1-\frac{T_D}{T_1})e^{-t/T_1}]$	K, $\frac{T_D}{T_1}$	$T_1 < T_D$, $\frac{1}{T_D}$, $\frac{1}{T_1}$
PROPORCIONAL INTEGRAL DERIVATIVO PID	$T_I\dot{y} = K(T_I\dot{u}+T_I T_D\ddot{u}+u)$ $G(s) = K(1+T_D s+\frac{1}{T_I s})$ $= K\frac{(T_{E1}s+1)(T_{E2}s+1)}{T_I s}$	$K + K T_D\delta(t) + \frac{1}{T_I}t$	K, $\frac{T_I}{T_D}$	$4T_D < T_I$, $\frac{1}{T_{E1}}$, $\frac{1}{T_{E2}}$
PROPORCIONAL INTEGRAL DERIVATIVO CON RETARDO ORDEN 1 PID_{T1}	$T_I(T_1\ddot{y}+\dot{y}) = K(T_I\dot{u}+T_I T_D\ddot{u}+u)$ $G(s) = K.\frac{1+T_D s+\frac{1}{T_I s}}{1+T_1 s}$	$K[1-\frac{T_1}{T_I}-(1-\frac{T_D}{T_I}-\frac{T_1}{T_I})e^{-t/T_1}+\frac{1}{T_I}t]$	K, $\frac{T_I T_D}{T_1}$	$4T_D < T_I$, $T_1 < T_D$, $\frac{1}{T_{E1}}$, $\frac{1}{T_{E2}}$
MULTIPLICADOR MUL	$y = K u_1 u_2$		K, u_2, u_1, y	
DIVISOR DIV	$y = K\frac{u_1}{u_2}$		K, u_1, u_2, y	
NO LINEAL NL	$y = F(u)$		u, y	