Tabelle 2.6: Verhalten der wichtigsten Regelkreisglieder

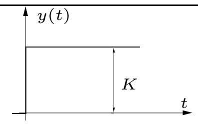
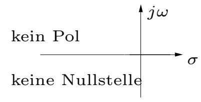
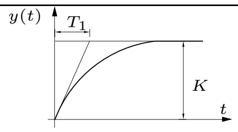
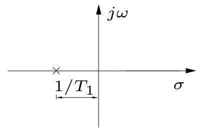
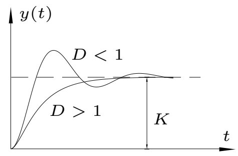
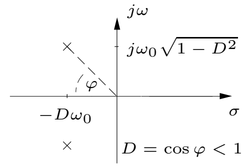
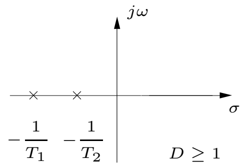
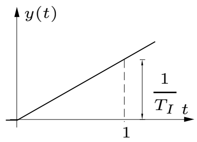
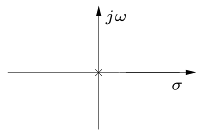
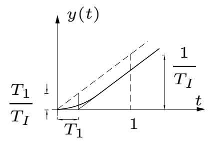
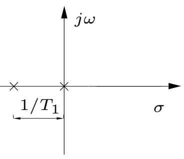
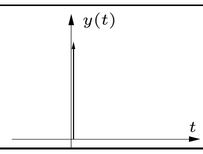
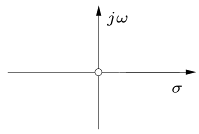
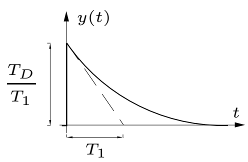
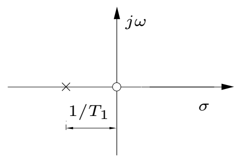
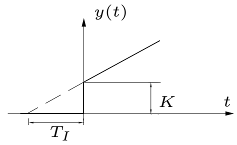
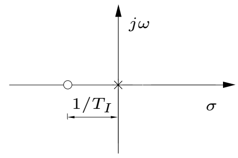
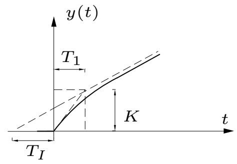
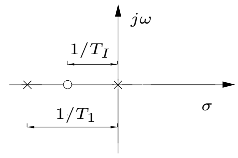
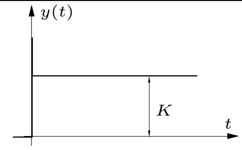
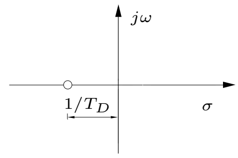
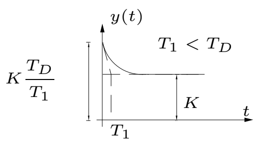
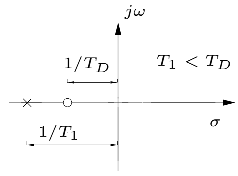
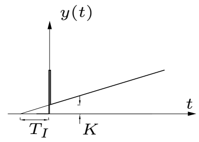
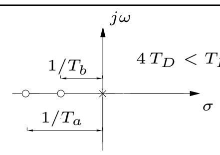
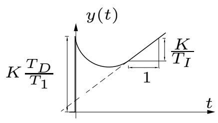
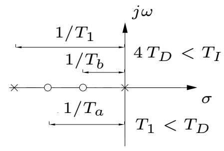
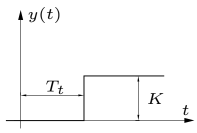
System	Zeitbereich Bildbereich (Übertragungsfkt.)	Übergangsfunktion	s–Ebene $\times$ Pol $\circ$ Nullstelle
P	$y(t) = K\,u(t)$ $G(s) = K$		
PT_1	$T_1\,\dot{y}(t) + y(t) = K\,u(t)$ $G(s) = K\dfrac{1}{1+T_1\,s}$		
PT_2	$\dfrac{1}{\omega_0^2}\ddot{y}(t) + \dfrac{2\,D}{\omega_0}\dot{y}(t) + y(t)$ $= K\,u(t)$ $G(s) = K\dfrac{1}{\frac{1}{\omega_0^2}s^2 + \frac{2\,D}{\omega_0}s + 1}$ $D < 1$: konjugiert komplexe Wurzeln der char. Gleichung $\lambda_{1,2} = -\omega_0(D \pm j\sqrt{1-D^2})$ $D \geq 1$: reelle Wurzeln der char. Gleichung $\lambda_{1,2} = -\omega_0(D \pm \sqrt{D^2-1}) = -1/T_{1,2}$		
I	$y(t) = \dfrac{1}{T_I}\displaystyle\int u\mathrm{d}t$ $G(s) = \dfrac{1}{T_I\,s}$		
IT_1	$T_1\,\dot{y}(t) + y(t) =$ $\dfrac{1}{T_I}\displaystyle\int u(t)\mathrm{d}t$ $G(s) = \dfrac{1}{T_I\,s(1+T_1\,s)}$		
D	$y(t) = T_D\dfrac{\mathrm{d}u}{\mathrm{d}t}$ $G(s) = T_D\,s$		
DT_1	$T_1\dot{y}(t) + y(t) = T_D\dfrac{\mathrm{d}u}{\mathrm{d}t}$ $G(s) = T_D\dfrac{s}{1+T_1\,s}$		

Tabelle 2.6: Fortsetzung

System	Zeitbereich Bildbereich (Übertragungsfkt.)	Übergangsfunktion	s–Ebene × Pol ∘ Nullstelle
PI	$y(t) = K\left[u(t) + \frac{1}{T_I}\int u(t)\mathrm{d}t\right]$ $G(s) = K\left[1 + \frac{1}{T_I\,s}\right]$		
PIT_1	$T_1\,\dot{y}(t) + y(t) =$ $K\left[u(t) + \frac{1}{T_I}\int u\mathrm{d}t\right]$ $G(s) = K\frac{1 + \frac{1}{T_I\,s}}{1 + T_1\,s}$		
PD	$y(t) = K\left[u(t) + T_D\dot{u}(t)\right]$ $G(s) = K\left[1 + T_D\,s\right]$		
PDT_1	$T_1\dot{y}(t) + y(t) =$ $K\left[u(t) + T_D\dot{u}(t)\right]$ $G(s) = K\frac{1 + T_D\,s}{1 + T_1\,s}$		
PID	$y(t) = K\left[u(t) + \frac{1}{T_I}\int u\mathrm{d}t + T_D\frac{\mathrm{d}u}{\mathrm{d}t}\right]$ $G(s) = K\left[1 + T_D\,s + \frac{1}{T_I\,s}\right]$		
$PIDT_1$	$T_1\dot{y}(t) + y(t) =$ $K\left[u(t) + \frac{1}{T_I}\int u\mathrm{d}t + T_D\frac{\mathrm{d}u}{\mathrm{d}t}\right]$ $G(s) = K\frac{1 + T_D\,s + \frac{1}{T_I\,s}}{1 + T_1\,s}$		
T_t	$y(t) = K\,u(t - T_t)$ $G(s) = K\,e^{-s\,T_t}$		Pole bei $-\infty$ Nullstellen bei $+\infty$