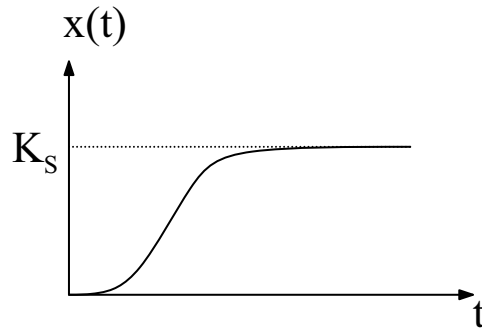


Temperaturregelung einer Halogenlampe

1. PT_2 -Strecke:

$$F_S(s) = \frac{K_S}{(1+sT_1)(1+sT_2)} = \frac{K_S}{1+a_1s+a_2s^2}$$

2. Sprungantwort der PT_2 -Strecke



3. ... mit P-Regler

$$F_o(s) = K_P \frac{K_S}{(1+sT_1)(1+sT_2)}$$
$$s^2 + \frac{T_1+T_2}{T_1T_2} s + \frac{1+K_P K_S}{T_1T_2} = 0$$
$$D = \frac{1}{\sqrt{2}} \rightarrow K_P = \frac{1}{K_S} \left[\frac{(T_1+T_2)^2}{2T_1T_2} - 1 \right]$$

4. ... mit PI-Regler

$$F_o(s) = K_P \frac{K_S}{sT_1(1+sT_2)}$$
$$s^2 + \frac{1}{T_2} s + \frac{K_P K_S}{T_1T_2} = 0$$
$$D = \frac{1}{\sqrt{2}} \rightarrow K_P = \frac{1}{2K_S} \frac{T_1}{T_2}$$

PT_2 -Strecke: $K_S = 1,2$ $T_1 = 65$ $T_2 = 15$

PI-Regler: $K_P = 1,8$ $T_N = 65$