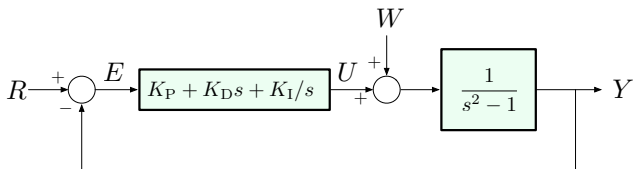


Proportional-Integral-Derivative (PID) Control



$$Y = \frac{K_D s^2 + K_P s + K_I}{s^3 + K_D s^2 + (K_P - 1)s + K_I} R + \frac{s}{s^3 + K_D s^2 + (K_P - 1)s + K_I} W$$

Reference tracking:

$$\text{DC gain}(R \rightarrow Y) = \frac{K_D s^2 + K_P s + K_I}{s^3 + (K_P - 1)s + K_D s^2 + K_I} \Bigg|_{s=0} = 1$$

— so, with the addition of I-feedback, we remove earlier limitation and achieve *perfect tracking*!