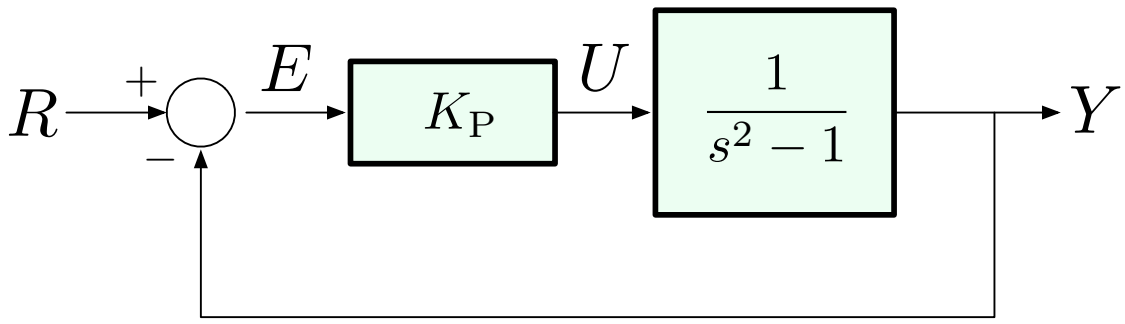
Proportional Feedback



K_P – "proportional gain" (P-gain) $\qquad U = K_\mathrm{P} E$

Let's try to find a value of K_P that would stabilize the system:

$$\frac{Y}{R} = \frac{\dfrac{K_\mathrm{P}}{s^2-1}}{1+\dfrac{K_\mathrm{P}}{s^2-1}} = \frac{K_\mathrm{P}}{s^2-1+K_\mathrm{P}}$$

— the polynomial in the denominator has zero coefficient of s
$\Longrightarrow$ necessary condition for stability is not satisfied.

The feedback system is *not stable for* ***any*** *value of* K_P*!!*