



$$C(s) = \frac{U(s)}{E(s)} = K_P + \frac{K_I}{s} + K_D s$$

$$C(z) = \frac{U(z)}{E(z)} = K_P + \frac{K_I T_S (z+1)}{s(z-1)} + \frac{K_D (z-1)}{z T_S}$$

$T_S$  is sampling time.