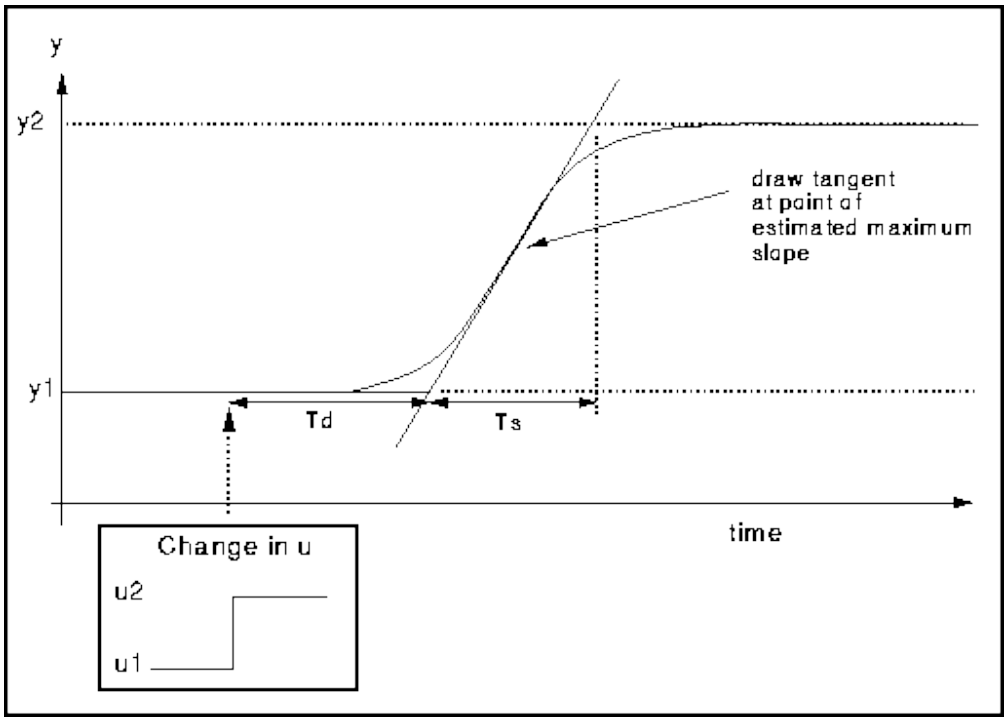
Open Loop Method: Ziegler Nichols

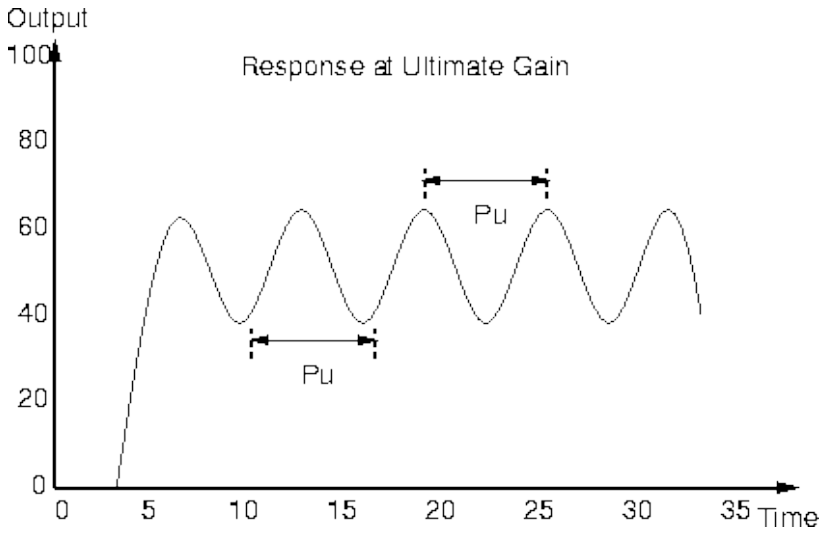


Kc = Gain, T_i = Reset and T_d = Derivative

Controller Type	Gain	Reset	Derivative
P	(Ts Δu) / (Td Δy)	-	-
PI	(0.9 Ts Δu) / (Td Δy)	3.3 Td	-
PID	(1.2 Ts Δu) / (Td Δy)	2.0 Td	0.5 Td

Closed Loop Method: Ziegler Nichols

- Set up the system with only a proportional control
- Alter the gain of the process until you obtain the smallest gain which gives constant amplitude oscillations. This gain is called the Ultimate Gain K_u
- Now evaluate the period of these constant oscillations. This is known as the Ultimate Period, Pu



Controller Type	Gain	Reset	Derivative
P	$K_u/2$	-	-
PI	$K_u/2.2$	$P_u/1.2$	-
PID	$K_u/1.7$	$P_u/2$	$P_u/8$