Exercise anti wind up

A temperature control loop has first order dynamics given by

$$G(s) = \frac{8.55}{0.55s + 1}$$

The process has a time delay $T_d = 0.15$

The supply valve has a saturation characteristic with unit slope and a maximum output range

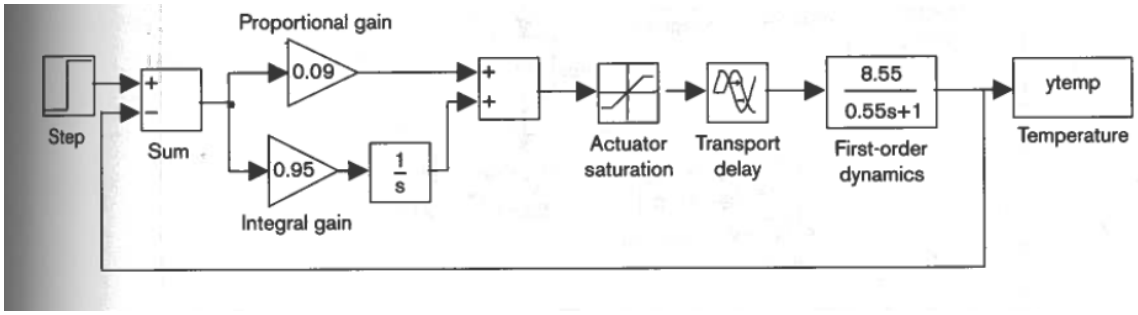
$-1.7 < u_{output} < 1.7.$

Temperature reference is 10

The PI controller is $D(s) = 0.09 + \frac{0.95}{s}$

Make a Simulink program to simulate the process. Investigate the output for different reference steps.

Use an anti wind up circuit e.g. ' back calculation and tracking' to see if improvement is possible. Implement in the Simulink diagram and compare the results.




Simulink diagram for system without anti wind up