

## Appendix A

The Simulink models used in the project are as follows. In both cases of analogue system and discrete system, the transfer functions for the controller and the plant are calculated mathematically.

Simulink Models for Analogue System:

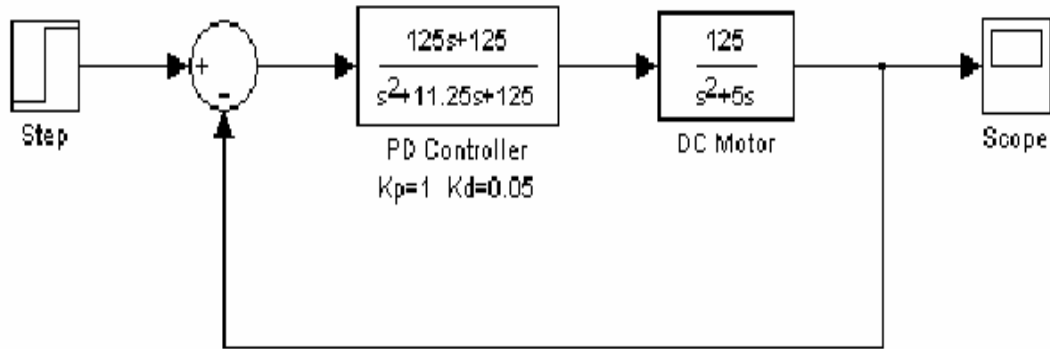


Figure (A.1): Model for PD Controller

The controller transfer function =

$$\frac{K_D s + 125 K_p}{s^2 + (5 + K_D) s + 125 K_p}$$

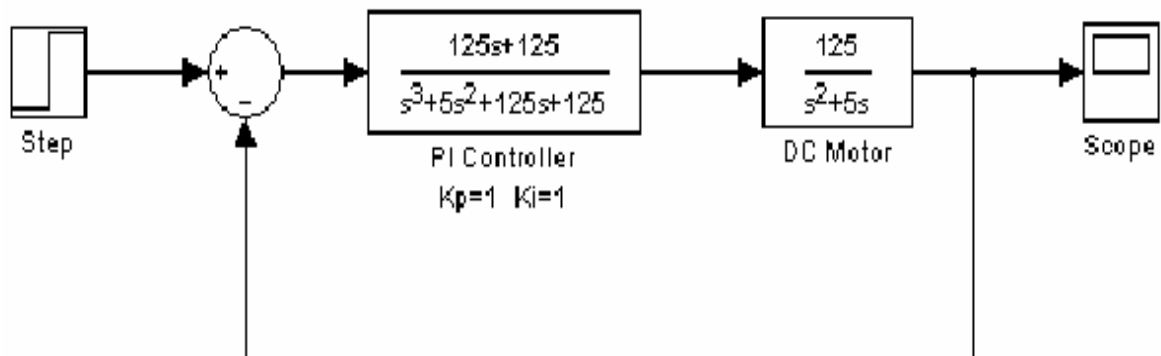


Figure (A.2): Model for PI Controller