4.4 Methods of Checking The End Positions

The following methods are commonly used to interrogate the end positions of piston in the cylinder:

1. Mechanically operated limit switches (Roller lever or idle return roller type)
2. Reed sensors, either with electrical or pneumatic output [the piston is incorporated with ring magnet]
3. Electrical proximity switches
4. Pneumatic Signal generators

4.5 Use of Limit Switches

• S1 and S2 are the limit switches corresponding to home position and extended position
• Although they are located in the path of the movement of piston rod, normal practice is to represent the symbol of the limit switches on either side of the final control valve with output signals connected to the pilot ports of the valve. The limit switches of Roller lever type are essentially 3/2 way ball seat or disc seat type of valves handling pneumatic signals. These are available with direct actuation type and internally pilot actuation type versions. Limit switches of idle return roller type are used for actuation only in one direction are used as signal elimination device in case of signal overlap.
Example 4.1: Pin Feeding Device

Pins are to be fed from a hopper to the next station one at a time using a Pneumatic Cylinder. Speed of the cylinder should be adjustable both during forward and return motion. The process of feeding should be initiated using a detent push push button. Develop a suitable Pneumatic control circuit.
Exercise 4.1: Rotary Indexing Table

Cans are required to be transferred from one conveyor to the other through a filling and capping station. A rotary indexing device is used which should be able to operate using a pneumatic cylinder with ratchet arrangement. The process should start on actuation of a push button operated valve. The process should stop when no cans are present from the incoming conveyor. The can sensor can be roller lever type of limit switch. Draw a suitable pneumatic control circuit.