

Repeated positioning of a pneumatic cylinder with enhancing use of proximity switches

Abstract

This paper introduces a technique employing repeated intermediate positionings, which are controlled by sequential on-off actions of solenoid valves, of a pneumatic cylinder. The motion of the piston slider is detected by several proximity switches instead of sophisticated position sensors, which are commonly used in motion control. The designed control system is constructed without a feedback control loop; it operates with only minimal information from the switch signals. We study the precision performance, under various loading conditions, of a pneumatic cylinder enhanced by the use of proximity switches. The repeatability of the system is experimentally found to be on the order of 0.2 mm. This technique will greatly extend the field of application of pneumatic cylinders on automated production lines.

Keywords; Cylinder; Pneumatic; Positioning; Proximity switch