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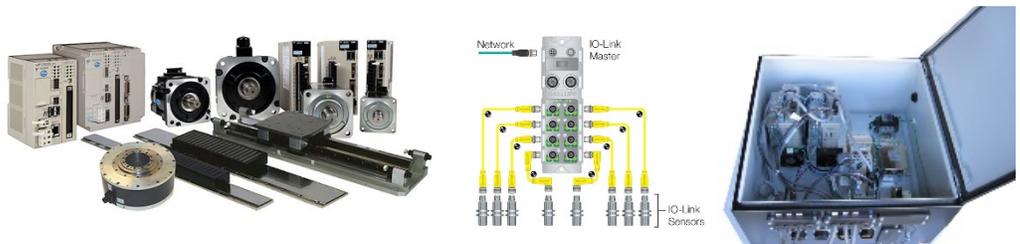
## PNEUMATICS

Cylinders - Valves - Air Prep - Regulators - Circuit Design - 65 Years



## CONTROLS & MOTION

VFD - Servo - Controllers - HMI - Networks - Sensors - Vision - 40 Years



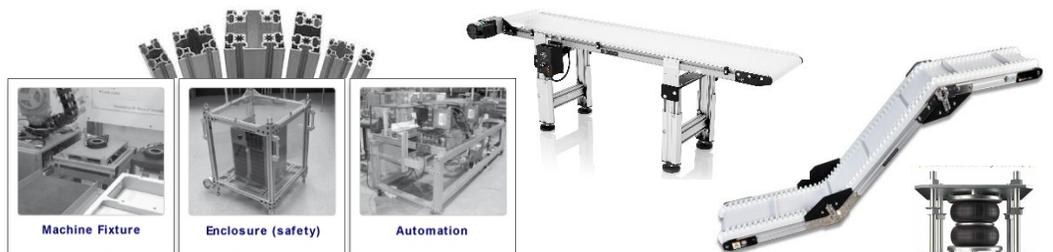
## ROBOTS & SYSTEMS

Collaborative - 6-Axis Arm - SCARA - XYZ - Engineering - 20 Years



## MECHANICS

Conveyors - 80/20 Aluminum - Linear Motion - Dampen Vibration - 15 Years



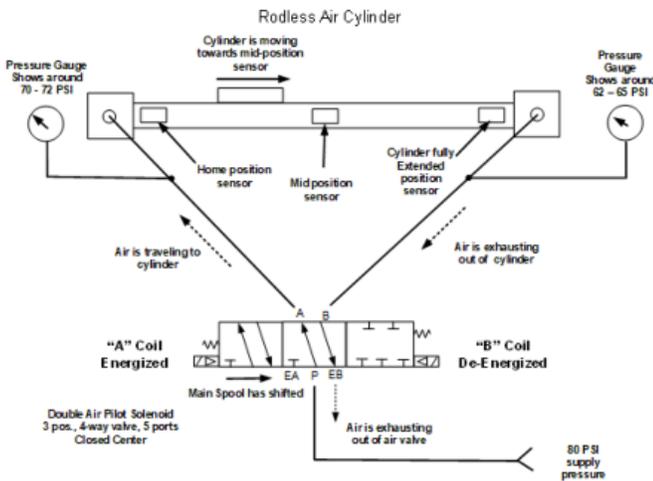
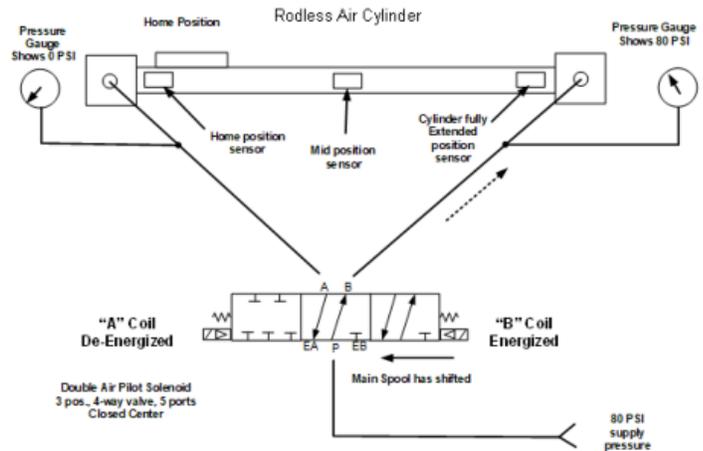
7915 AJAY DRIVE | SUN VALLEY | CA | 91362 |  
(818) 768-1200 | [INFO@NUMATICENGINEERING.COM](mailto:INFO@NUMATICENGINEERING.COM)

# Pneumatic Position Control Quiz

In order to stop the rodless air cylinder at a repeatable mid-position position +/- 0.0625 (1/16"), you will need to select a 3-position air valve. **Here are 3 options, which would you pick?**

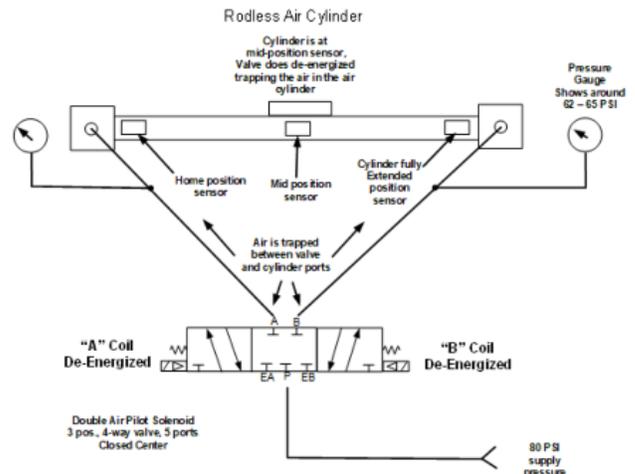
- 3-positions center exhaust
- 3-positions pressure center
- 3-positions closed center

**Step 1:** Before the assembly machine starts a new cycle, the rodless air cylinder is in the home position. The 3-position air valve "B" coil is energized which is holding the main spool in the shifted position. At this point, there is 80 PSI of compressed air on one side of the rodless air cylinder piston and 0 PSI on the other side of the piston. See the diagram below-

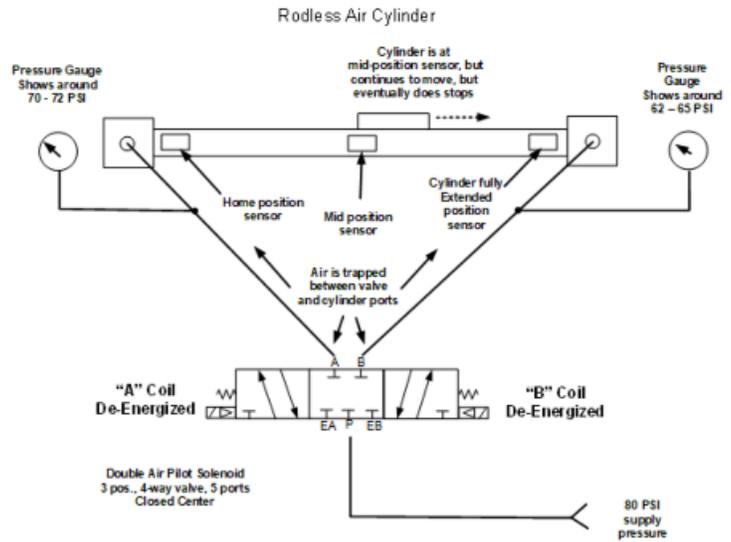


**Step 2:** The "B" coil of the solenoid valve gets de-energized and the "A" coil gets energized causing the main spool of the solenoid to be shifted. The rodless air cylinder is now moving towards the mid-position sensor.

**Step 3:** The rodless air cylinder has now tripped the mid-position sensor. The "A" coil of the solenoid de-energized which causes the main spool of the solenoid valve to move to the center position trapping the air between the air cylinder and solenoid valve.

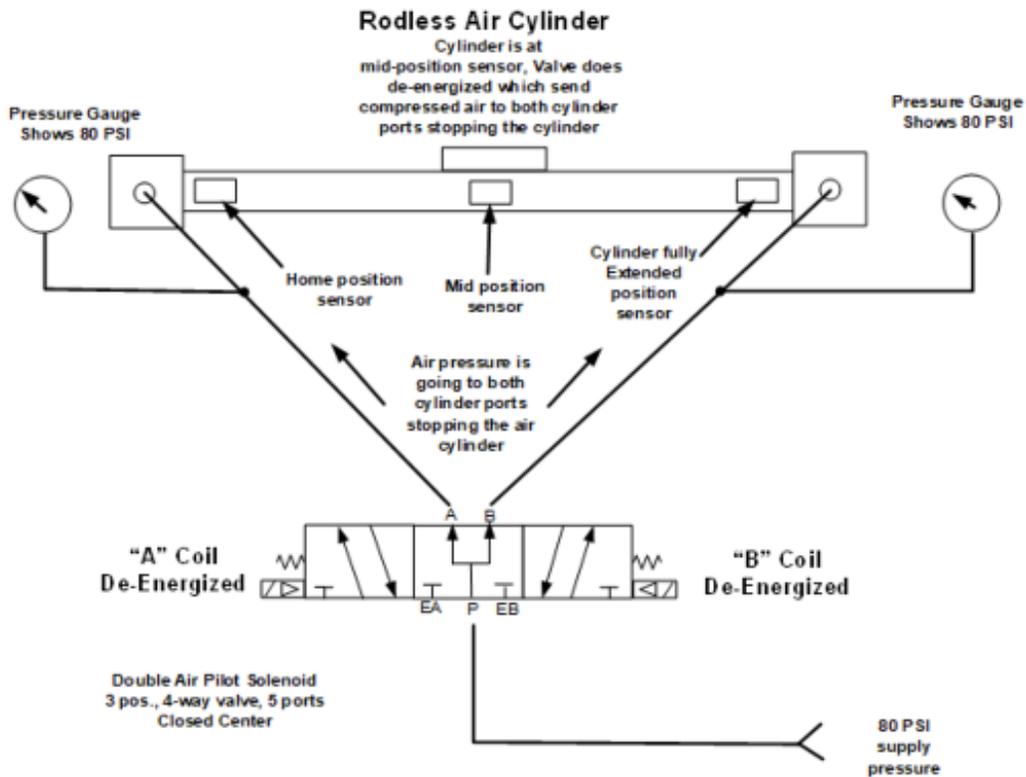


**Closed Center Valve, Wrong:** when the rodless air cylinder tripped the mid-position sensor it continues to slowly move and eventually does stops. This is happening because at Step 3 when the solenoid valve did get de-energized and the main spool went to the center position trapping the air between the solenoid valve and air cylinder the air pressure is still higher on the one side of the cylinder piston than the other side. The rodless air cylinder is going to still move until the air pressure on both sides of the piston are equal.



**Center Exhaust Valve, Wrong:** When the rodless air cylinder tripped the mid-position sensor it begins to float freely as no pressure is applied on either side of the piston.

**Center Pressure Valve, Correct!** The diagram below shows how after the Rodless air cylinder does trip the mid-position sensor and the solenoid valve main spool is now in the center position, instead of trapping the air between the solenoid valve, the center pressure valve will send main air pressure to both the ports of the rodless air cylinder. This will stop the movement of the cylinder very quickly.



if you have questions regarding this example, or if you have any other pneumatic applications to discuss. Please e-mail me at [ralph.quarto@numaticengineering.com](mailto:ralph.quarto@numaticengineering.com)