

## LECTURE 39

### SINGLE ACTUATOR CIRCUITS

#### FREQUENTLY ASKED QUESTIONS

1. List three functions of pneumatic circuits

**Answer**

- To control the entry and exit of compressed air in the cylinders.
- To use one valve to control another valve
- To control actuators or any other pneumatic devices

2. Where are three way valves used?

**Answer:**

The 3/2 way valves can be used to control single acting cylinders and other valves.

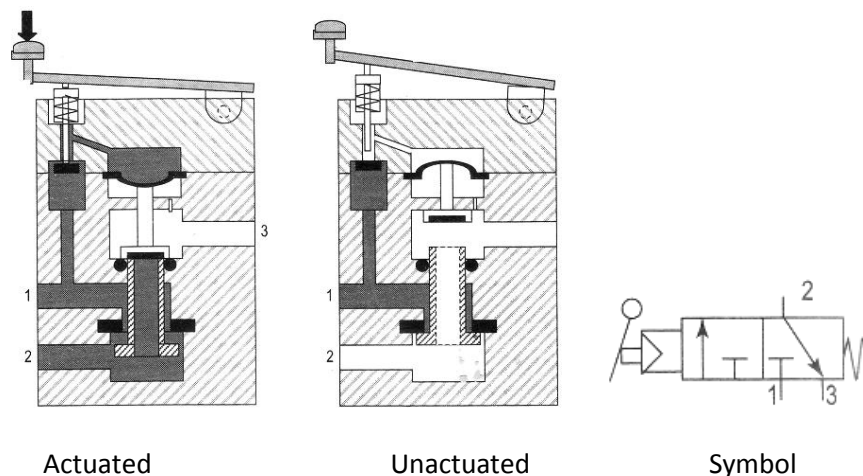
3. What are the advantages if internal pilot valve in pneumatic valve

**Answer:**

The major advantage of the pilot operated valve is that the actuating force is less compared to direct operated.

4. Briefly describe working of disc poppet valve with internal pilot. Give also ISO symbol

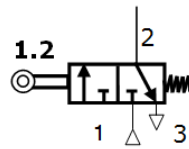
**Answer:**



**Figure 1**

5. Draw as per ISO 1219 the pneumatic symbol for 3/2 roller operated normally closed direction control valve.

**Answer**



**Figure 2**

**6** Is there any functional difference between 4/2 and 5/2 way valve

**Answer**

There is no functional difference between 4/2 and 5/2 way valve.

**7.** Define the term “maintained signal “ as used in pneumatic control

**Answer**

**8.** Why pneumatic cylinders are not used in application where uniform speeds must be achieved

**Answer**

Due to compressibility of air when the load varies, air expands or compresses. Therefore it is impossible to achieve a constant piston rod velocity within reasonable limits with an ordinary flow control valve. Therefore pneumatic cylinders cannot give uniform speed.

**9.** List three factors that govern the speed of double acting cylinder

**Answer**

The maximum natural speed of a double acting cylinder is governed by three factors

- Cylinder -port size, load carrying capacity, mounting, cushioning
- Valves – Nominal flow rate and switching time
- Air supply- pressure, diameter and length of the tube , fittings

**10.** Exhaust air throttling is used for speed control of the double acting cylinder

**Answer**

This is also called meter out circuits. Throttle valves are installed such that exhaust air leaving is throttled in both direction of the motion of the cylinder. There are double cushioning effects with exhaust throttling. First cushion effect is due to supply air entering the cylinder and second cushioning effect is due to air leaving the cylinder. Therefore, exhaust air throttling used practically.