BITS Pilani
Pilani | Dubai | Goa | Hyderabad

Tutorial 2- Pneumatics

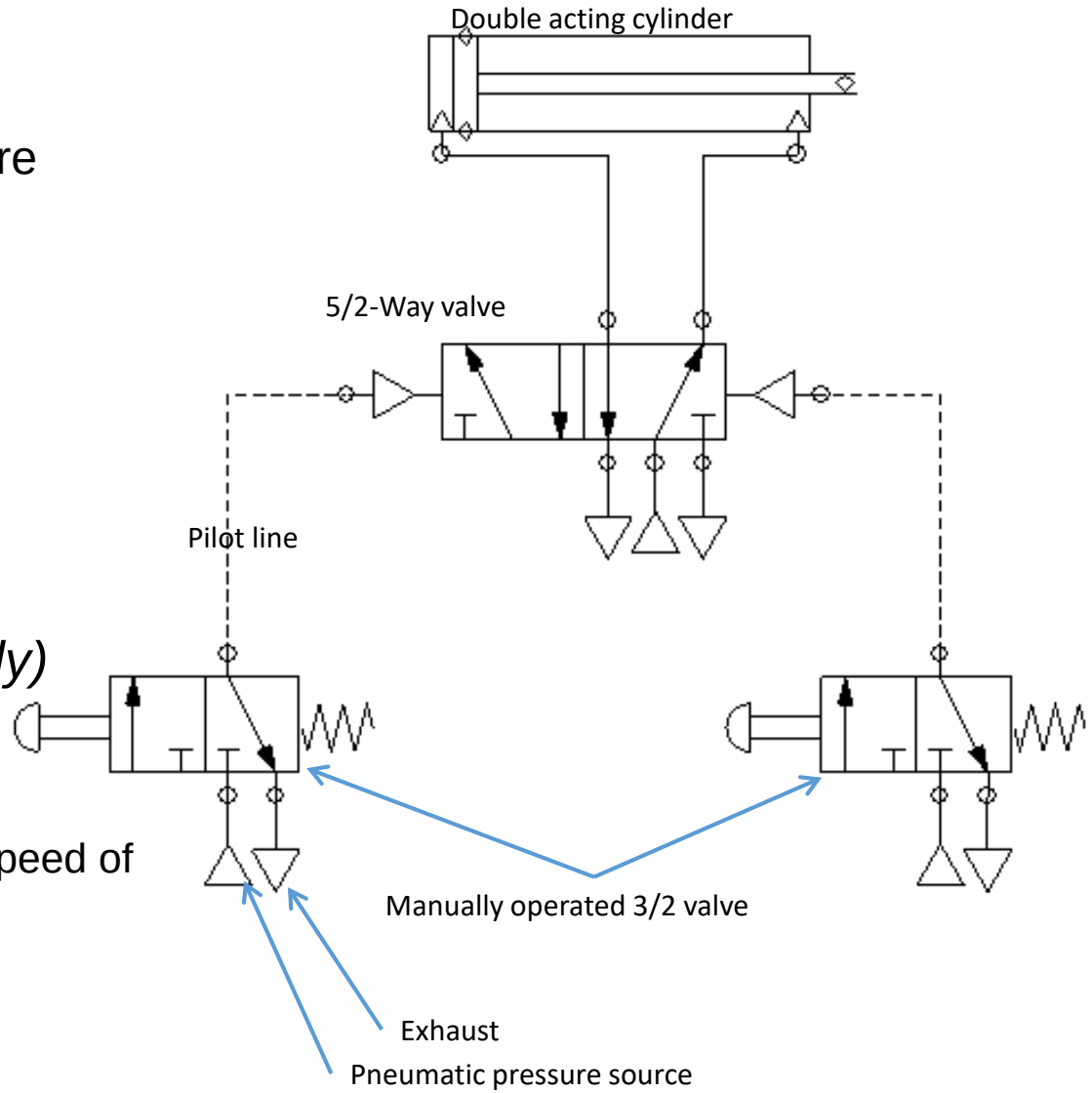
Tutorial Problems

Practice problems for 2 hours of practice in Virtual Lab

- Tutorial 2 Pneumatic Circuits
  - 2A - Basic pneumatic circuit
  - 2B - Automation in pneumatic circuits
  - 2C - Basic electro-pneumatic circuits

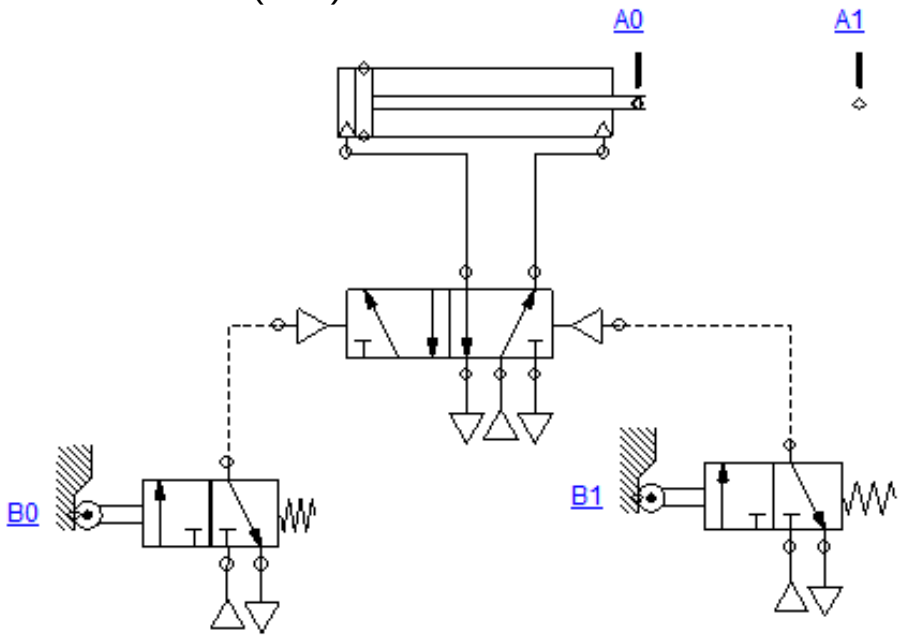
Tutorial 2A- Basic pneumatic circuit

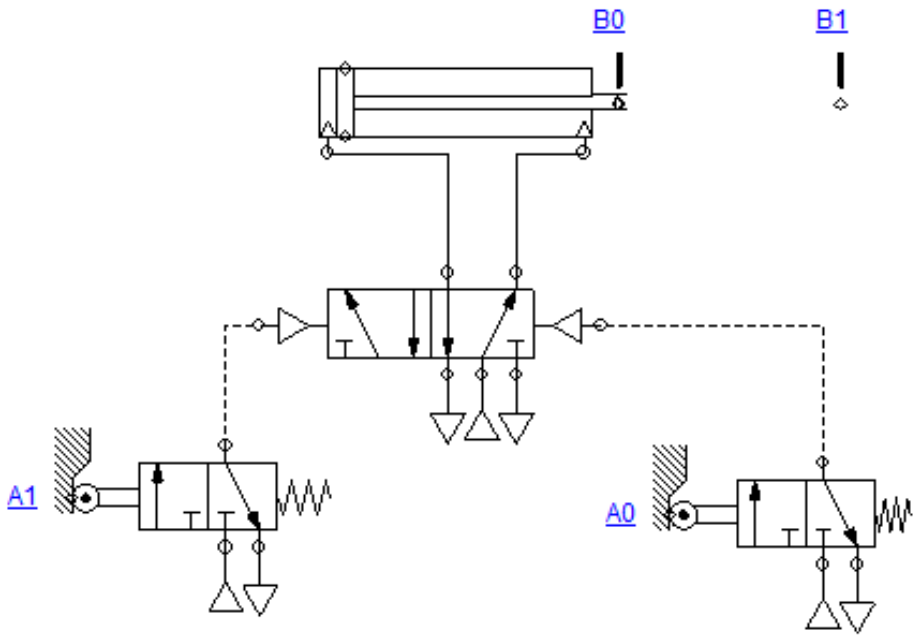
- Open Automation Studio 6.3 Educational software
- Open Tutorial 1A- Basic hydraulic
- Drag the following components from the library shown in figure
  - Double acting cylinder (Pneumatic)
  - 5/2-Way valve (-do-)
  - Manually operated 3/2 valve (Pneumatic →DCV)
  - Pneumatic pressure source (Pneumatic)
  - Exhaust (-do)
- Connect the joints and simulate
- Save the project as Tutorial2A and *(create folder with your BITSID and save all projects inside the same folder only)*
- Post processing
  - Insert node dynamic measuring source for pressure
  - Insert node dynamic measuring source for linear position and speed of the cylinder



Tutorial 2B - Automate in pneumatic

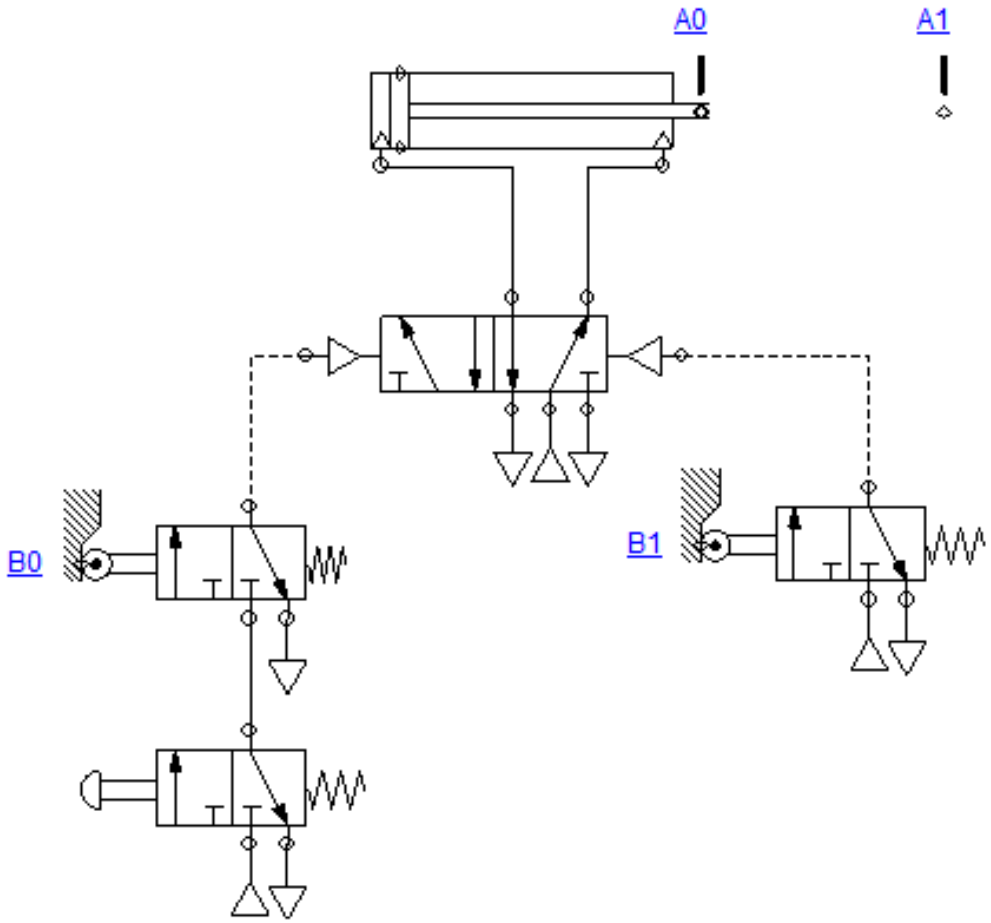
- Open Tutorial 2A and save as Tutorial 2B- Automation Pneumatic
- Remove the manually operated push button
- Insert following components and join as per the below figure
  - Mechanically piloted DCV (Pneumatic → Directional Valves)
  - Mechanical contact (Pneumatic → Sensors)
  - Sensor Ref. (Bidirectional) (-do-)
    - Name/Alias (as per the below figure)
    - Hyperlink the mechanical contacts (-do-)

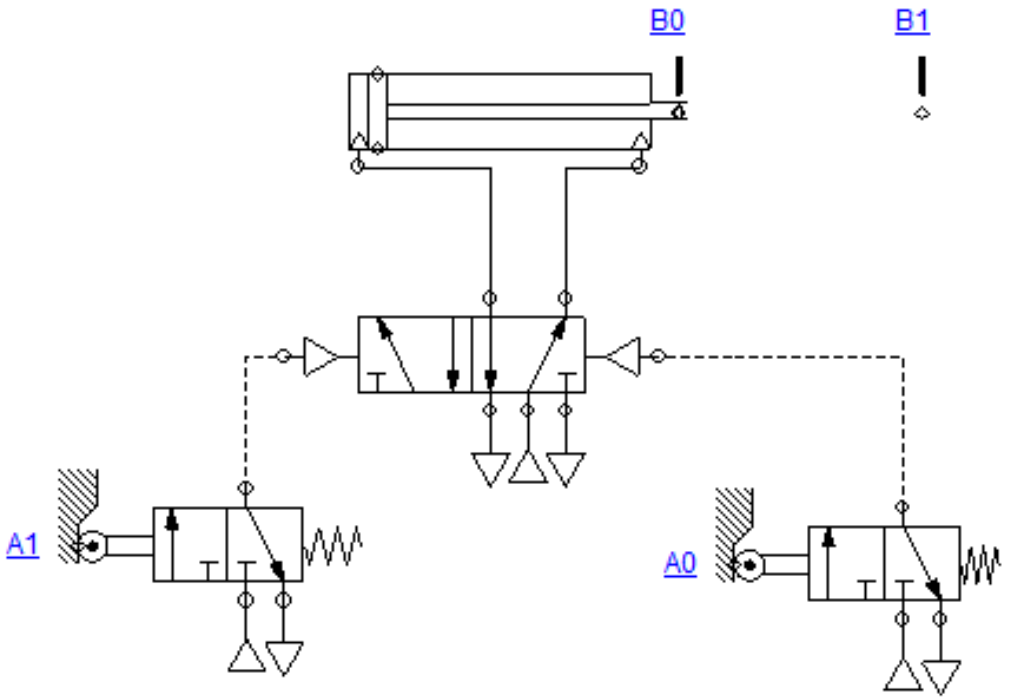




Tutorial 2B - Automation in pneumatic

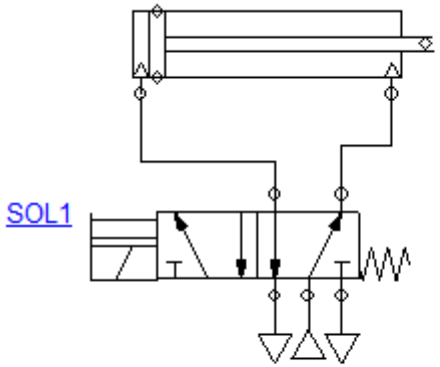
- To have a control switch insert manually operated 3/2 valve between reservoir and mechanically piloted 3/2 valve. (as per the below figure)

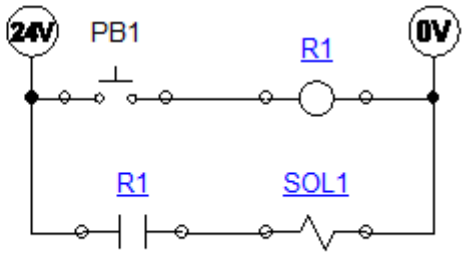




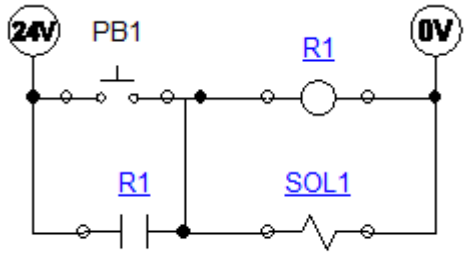
Tutorial 2C – Electro-Pneumatic Circuit

- Insert below components and join as per the below figure 1.
  - Double acting cylinder and 5/2 Way valve (pneumatic)
  - Push button (alias PB1), Coil (alias R1), 24V, 0V, normally open contact (alias R1) and solenoid (alias SOL1)
- Hyperlink the solenoid in 5/2 way valve SOL1, simulate the circuit.
- Change the configuration of the circuit as per figure 2 and 3.

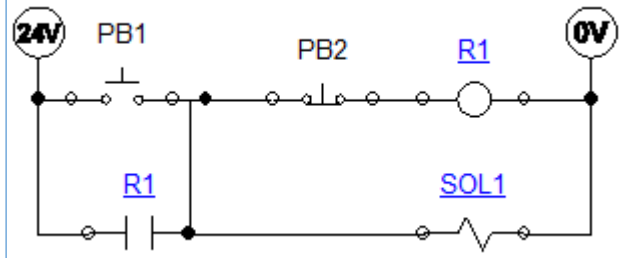




Basic Electro Pneumatic Circuit (1)



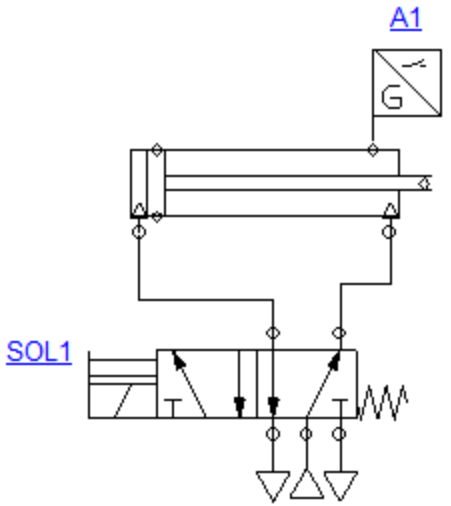
To extend the cylinder with one click of PB1 (2)



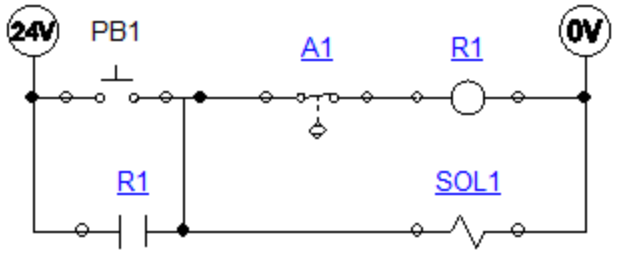
To retract the cylinder with one click of PB2 (3)

Tutorial 2C – Electro-Pneumatic Circuit

- Insert below components and join as per the figure
  - Proximity sensor (Pneumatic → Sensor → Proximity Sensors) (alias A1)
  - Normally closed proximity switch (Electrical Control (JIC) → Sensor switches) Hyperlink A1



Auto Reversing



Thank you