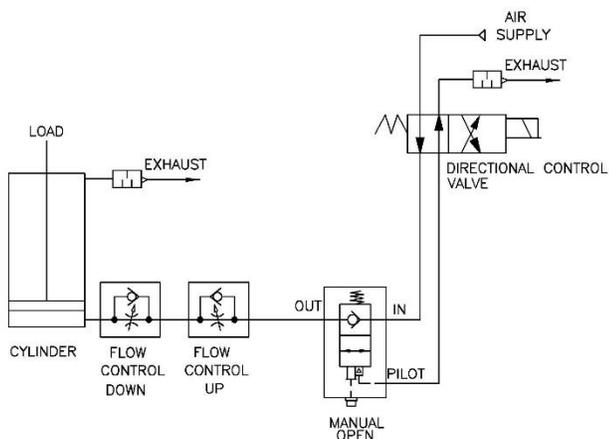


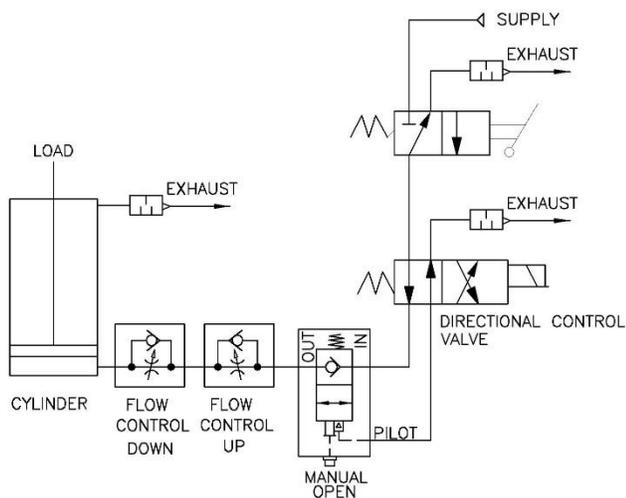
NU-CHECK® HOLDING A SINGLE ACTING CYLINDER

A Nu-Check® valve can be used in a single acting cylinder application to stop the load movement in one direction. In the control system for a single acting cylinder, a Nu-Check® valve is used in combination with directional control valves to control the air flow to one port. Two examples of control systems are shown below:



The circuit to the left is an example of a basic control circuit for vertically moving a load between two positions. The load is moved up by the directional control valve providing air to the IN port of the Nu-Check® valve. When the directional control valve provides air to the pilot port, the cylinder port is vented and gravity provides the force to move the load down. The flow control valves are optional and their placement must not interfere with venting of the pilot air. Multi-position control could be obtained with use of a three position open center directional control valve.

If either air pressure is lost or power is interrupted in this cylinder control system, the downward movement of the load would be stopped. When either air supply pressure or control power are not available, the manual override on the Nu-Check® valve could be used to safely lower the load.



The circuit to the left is another example of a basic control circuit for vertically moving and stopping a load anywhere along the cylinder stroke. The solenoid driven (2 position, 4 way) directional control valve controls the cylinder rod direction, while the second manual valve controls when the movement can occur. Typically, the manual valve would be located to keep the operator away from the load movement or pinch points.

If either air pressure is lost or manual control is interrupted, the downward movement of the load would be stopped. When air pressure is not available, the manual override on the Nu-Check® valve could be used to safely lower the load.

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The example systems have the following characteristics:

- If air pressure and power to the direction valve have been removed, the checked port of the cylinder can not be exhausted until the check valve is manually overridden or both air pressure and power to the direction control valve have been restored.
- If there is a loss of system air pressure or valve control, the velocity control is maintained on the checked port, i.e. a slow start up is not need to reestablish velocity control.
- The stopped cylinder keeps the load in a stable position, but does not rigidly hold the load.
- Rapidly stopping a load in mid-stroke is cushioned by air in the cylinder which reduces the shock generation.
- Load hold capacity is limited by the cylinder bore and air supply pressure limits.
- The same control system components can be used on a wide variety of pneumatic cylinders.
- In some single acting cylinder applications, the use of a Nu-Check® valve can eliminate the need for a cylinder brake (rod lock) or generate a higher load capability than a cylinder brake.

Additional Control System Design Considerations

When selecting and placing components in a cylinder control system, requirements of the air piloting function of the Nu-Check® valve needs to be considered. The venting requirements for the pilot air can affect some of the directional control valve and flow control valve options.

- Directional control valve selection and placement needs to provide proper venting of pilot air for both normal operation and safety conditions.
- Flow control valves are typically are placed in between the Nu-Check® valve and the cylinder. If the flow control valves need to be placed between the directional control valve and the Nu-Check® valve, their placement must not restrict venting of the pilot air.

Combining a Nu-Check® valve with a glandless spool sleeve type of direction control valve can result in a long lasting, low maintenance control system. Glandless spool sleeve direction control valves are long lasting, but do not seal tightly. The long lasting Nu-Check® valve provides tight sealing when needed by the control system.

The best control sensitivity is obtained by minimizing the internal volume of lines and components between the Nu-Check® valve and the cylinder.

Applications

The cylinder control systems using Nu-Check® valves are used in a wide variety of equipment applications involving work holding, clamping, and lifting or tipping of equipment, material, doors, and platforms.

Specific circuit design and switching valve selection is application dependant. Your Aladco® distributor or Aladco® can be contacted to provide assistance with answering application questions.