Asahi/America's Series 79P pneumatic actuators for quarter turn ball and butterfly valves provide accurate and dependable control, especially in corrosive applications.

The units are compact, yet extremely durable and available in output torques from 60 to 17,000 inch-pounds based on an 80-psi air supply.

Three standard actuator materials are offered: glass reinforced polyamide, cataphoresis & rilsan coated cast aluminum alloy, and 316 Stainless Steel; all of which incorporate ISO and NAMUR mounting configurations for simple installation of accessories. These material choices provide excellent protection from adverse environments & corrosive process materials.

Two versions of this actuator are offered: single acting (air to spring or "failsafe") and double acting (air to air), both versions utilize a double piston, double rack and pinion design.

There are definitive advantages for using the rack and pinion design; the accuracy of translating linear to rotary torque is one. This is especially important in a modulating application. Another advantage is the constant torque output throughout the travel, which simplifies actuator to valve sizing.

Operation

Single and Double Acting:

Pressurized air is introduced via the bottom port and displaces two opposed pistons. When the pistons are displaced, they in turn rotate the actuator output shaft counterclockwise, which opens the valve. This action is the same for single acting and double acting actuators.

Single Acting:

When the pressurized air is removed from the bottom port, the compressed springs located at the opposite side of the pistons relax. As the springs relax, they in turn rotate the actuator output shaft in a clockwise rotation, which closes the valve. Although the term "relax" is used, the springs are NEVER fully relaxed, and are ALWAYS under tension, so caution must be exercised.

Double Acting:

When the pressurized air is removed from the bottom port, the unit remains in the same position until pressurized air is applied to the top port (unlike the single acting actuator). When the pressurized air is introduced to the top port, it is channeled to the opposite side of the pistons. This pressure on the pistons drives them to their original position, which in turn rotates the actuator output shaft in a clockwise direction, which closes the valve.

Engineering Specifications

- Body and End Cap Material: Cast Aluminum body (Cataphoresis and Rilsan coated inside and outside), glass filled Polyamide, 316 SS
- Shaft: 303 SS or Cataphoresis coated with double O-ring seal on top and bottom
- Temperature Range: -25°F to 195°F*
- O-ring Material: Self Lubricating BUNA-N
- Output Torque Range: 60 in/lbs to 17,000 in/lbs
- Supply Air: 60 psi minimum, 120 psi maximum
- Air Connections: 1/4" FNPT
- Mounting Dimensions: ISO and NAMUR Standards

Sample Specification

All Series 79 Pneumatic Actuators shall be double piston, double rack and pinion design with body and end cap materials cast aluminum Cataphoresis and Rilsan coated inside and outside, glass filled Polyamide, or 316 Stainless Steel. Shaft shall be 303 Stainless Steel or Cataphoresis coated steel with double O-ring seals on top and bottom. Actuators shall have 1/4" FNPT air connections, and visual position indicator. Single acting versions (spring return) shall have concentric spring sets. All actuators shall have ISO bolt circle and NAMUR mounting dimensions for the installation of optional accessories, as manufactured by Asahi/America, Inc.

**For higher temperatures, see our High Temp Actuator on page 138.*

Pneumatic Actuator Sales Questionnaire

The following questions need to be asked to make a proper recommendation:

- Air to Air or Air to Spring?
- Supply Air Available?
- On/Off Modulating?
- Positioner? 3-15 psi or 4-20 mA (analogue or digital) ?
- Solenoid NEMA Rating? 4 or 7?
- Environment ? Temp, Corrosion Resistance?
- Feedback? Switches NEMA 4 or NEMA 7?

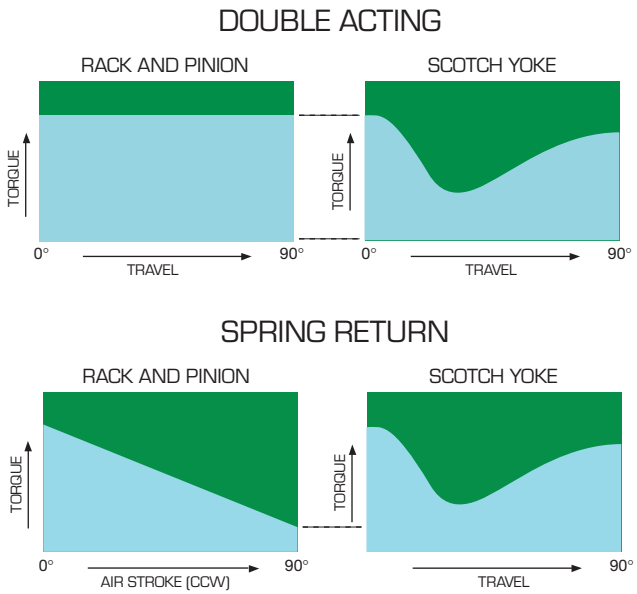
A concentric spring set consists of a number of springs located inside one another. This has two (2) advantages. First, the spring pressure is in the center of the piston for a constant output torque and no side loading of the piston to create premature wearing of parts. Second, the concentric spring set allows the removal of springs to compensate for lower air supply pressures while maintaining constant output torque by applying pressure to the center of the piston.

Torque output for single acting (spring return) models varies according to the compression rate of the springs. Output torque decreases on the air stroke as the springs are compressed, and decreases in the spring stroke as the springs relax and extend. Reference the torque chart on page 6 and use it to determine the correct number of springs required for your application.

Torque and Air Pressure

Two (2) pieces of information are required for proper selection of a pneumatic actuator:

First is Valve breakaway torque. This is the amount of torque required to "break" the ball, plug or disc away from the seat. It is calculated from the differential pressure, type of media, contact area between sealing members, etc. Once this is determined, it is multiplied by a safety factor to take into account unknowns such as the amount of time a valve has been in the closed position (some sealing members may take a set, making them difficult to separate) and corrosion buildup.



Second is the air supply to which a conservative approach is required. If an actuator is located adjacent to the compressor, it will most likely see the full 80 psi. But if the actuator is located 100 yards away with leaky air fittings, then the actuator may see only a fraction of the 80 psi that the compressor is producing. So if an actuator is sized for a supply of 80 psi, and the actuator sees 60 psi because of leaky fittings, there will not be enough output torque from the actuator to cycle the valve.

If the required torque of a valve (including the 25% safety factor) equals or exceeds the output torque of the actuator, then the next size actuator should be selected.

Example of Pneumatic Actuator Selection

Select the proper actuator for the following application:

Single Acting (Spring Return) Fail Close

SPECS: Valve torque = 250 in/lbs
Air supply pressure = 60 psi

FIND: Required valve torque 313 in/lbs
Spring end torque (336)
Air start torque @ 60 psi (348)

ANSWER: C579PSN with 4 springs per side