

Actuator Selection

Actuator selection is the most critical aspect in designing a system. If the actuator is too large, all other components will need to be oversized to meet required cycled times and energy cost will increase. If the actuator is too small, the load will either move erratically or not at all.

Sizing an actuator includes these key factors:

1. Determine the force in pounds required to move the load. Add 25% to provide enough power to overcome friction and move the load at less than 4 inches/second, add 50% to move the load at 4 to 16 inches/second, and/or add 100% to move the load at speeds above 16 inches/second.
2. Find out the minimum air pressure in pounds/square inch (PSI) that will be present to operate the actuator.
3. Divide the force by the pressure to determine the power factor required.
4. Choose the next largest power factor in the chart below to determine the bore size.

Power Factor	0.07	0.02	0.25	0.4	0.6	0.9	1.2	1.7	2.4	3.1	5	7	8.3	12.5
Bore Diameter	5/16"	7/16"	9/16"	3/4"	7/8"	1-1/16"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/4"	4"

Example: Estimated force needed is 220 pounds and air pressure available is 80 PSI. Therefore, $220 \div 80 = 2.75$ power factor. For this application and using the chart above, it's then necessary to round up the power factor to 3.1 and have the bore size be 2".