

Butterfly Valve Actuator Sizing procedures

Double Acting Actuator: Air to Open, Air to Close

- √ Choose an actuator whose output torque at the given air supply is greater than the butterfly valve's seating/unseating torque. (See Page 9)
- √ Unseating torque is also known as the breakaway torque.
- √ Seating torque is also known as the closing torque.

Spring Return Fail Closed: Air to Open, Spring to Close

- √ Select an actuator whose ending spring stroke is greater than the butterfly valve's seating/unseating torque. (See Page 11)
- √ Select an actuator whose starting air stroke is greater than the butterfly valve's seating/unseating torque at the given air supply pressure. (See Page 11)
- √ Above must be found on the same spring set line.

Spring Return Fail Open: Air to Close Spring to Open

- √ Select an actuator whose end of air stroke is greater than the butterfly valve's seating/unseating torque at the given air supply pressure. (See Page 11)
- √ Select an actuator whose start of spring stroke is greater than the butterfly valve's seating/unseating torque. (See Page 11)
- √ Above must be found on the same spring set line. See Actuator Part Numbering System-"F" Suffix for Fail Open

Factors Affecting Seating and Unseating Torque and Application Guidelines

Operating Frequency

The first operation of a valve after a sustained period of closure will require above normal torque.

Lubricating Characteristics of Flow Media

Water is one of the best lubricants for metal-elastomer contact. Judge your flow media on this basis-better than or worse than water. Examples of lubricating media are: water, lubricating oils, aqueous process flow, beverage service, etc. Examples of non-lubricating media are: air, dry gases, dry bulk services, solvents, diesel oil, etc.

Condition of Disc Edge and Seat

An iron disc in corrosive service will corrode. This corrosion deposits a build-up on the disk edge and raises required torque. Similar flow media deposits on the seat material can increase torque or prevent proper valve operation.

Temperature Extremes

Sustained operating temperatures approaching the upper or lower limits of the seat material will increase required torque. Refer to the seat temperature range on Apollo® Butterfly Valve Seat Materials page in the catalog. Consult the factory for anticipated torque increase of certain seat materials due to temperature extremes.

Elastomer Swell

Certain elastomers tend to swell from contact with some chemicals. This elastomer swell will increase required torque.

*The wide selection of Apollo® Available Materials of Construction will allow you to choose the correct butterfly valve materials for your service. All of the above **Torque Affecting Factors** can be accommodated with the correct choice of materials. Consult the factory for assistance in choosing the correct torque value for your service.*

NOTE: Please consult the material selection guide for trim recommendations. Please consult the factory for proper sizing of Apollo® actuators.

Apollo Butterfly Valves

Seating and Unseating Torque Apollo® Resilient Seated Butterfly Valves

141 and 143 SERIES: 2"-24"

Valve Size (In.)	Standard Disc Differential Pressure			
	50 PSI∅P Bushing PTFE	100 PSI∅P Bushing PTFE	150 PSI∅P Bushing PTFE	200 PSI∅P Bushing PTFE
2	100	106	111	117
2 1/2	150	163	176	189
3	207	220	232	244
4	290	323	357	390
5	423	481	540	598
6	599	691	783	875
8	1060	1183	1307	1430
10	1671	1872	2074	2275
12	2568	2795	3023	3250
14	2640	3070	3500	-
16	4260	4880	5500	-
18	6287	7243	8200	-
20	8360	9180	10000	-
24	15427	16813	18200	-

All torque values shown on chart are for *wet* (water and other non-lubricating media) on-off service. For *dry* (non-lubricating, dry gas media), multiply values by 1.15. For *lubed* service (clean, nonabrasive lubricating media), multiply values by 0.85.

Under certain conditions, hydrodynamic torque can meet or exceed seating and unseating torques. When designing valve systems, hydrodynamic torque must be considered to help ensure correct selection of actuation.

***ALL PUBLISHED BUTTERFLY TORQUE CHARTS HAVE NO BUILT-IN SAFETY FACTORS. A PRESCRIBED 25% SAFETY FACTOR IS RECOMMENDED!**