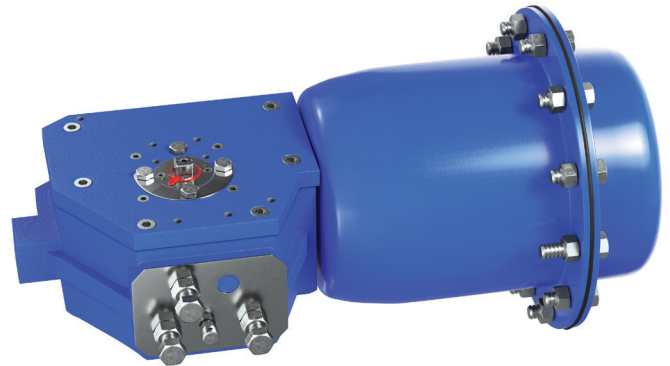


SPRING-DIAPHRAGM
ROTARY ACTUATOR

FNW®

SPRING-DIAPHRAGM ROTARY ACTUATORS

The FNW Spring-Diaphragm Actuator is specifically designed for the safe and reliable operation of quarter turn valves. Our use of proven spring material, advanced filler reinforced diaphragm design, a precision engineered crankshaft and connecting rod brings sound control to the automation of quarter turn valves even under minimal media supply pressure. The design separates the supply media chamber from the spring sets, allowing for usage of unfiltered air, gas, water or mineral-based hydraulic fluid. The housing is constructed from ductile iron and carbon steel castings coated in a UV-resistant polyester powder coating for exceptional corrosion resistance in the field. The independent media chamber is also equipped with a standard LNBR diaphragm reinforced with a special compound polyamine fabric. Optional diaphragm materials allow for working temperature ranges as low as -40°C (-40°F) or as high as 170°C (338°F).



DESIGN FEATURES

Universal Mounting Pads – Direct Mount

A combination of different mounting pad dimensions allows users to directly replace other existing spring-diaphragm actuators or mount directly to new or existing quarter turn valves.

NAMUR Mount

The NAMUR mount design makes it easy to install various control accessories, such as limit switches, solenoid valves and positioners.

Multiple Drive Bushings (Removable and Replaceable)

The removable drive bushings allow users to mount the FNW Spring-Diaphragm Actuator to several different valve stem configurations whether in the field on an existing valve or on new valve applications.

High Cycle Life Design and Low-Friction Bearing

The actuator features a rolling diaphragm design utilizing a one-piece diaphragm retainer with a UHMWPE bearing. This configuration results in low operational friction, smooth actuation and superior expected life cycle.

Completely Field Reversible

Fail-open or fail-closed positions are easily achieved in the field by simply inverting the actuator and bushings.

Travel Stops

Two adjustable travel stops allow the actuator to be adjusted to the fully open or fully closed positions. With adjustment bolts, the actuators can be used to adjust a rotary control valve from -5° to +5° and 85° to 95°.

Mechanical Lockout Option

A lockout screw can be used to positively lock the unit in the spring failure mode.

Corrosion Resistant

Standard UV-resistant polyester powder coating on the surface body and cover, combined with stainless steel external fasteners, provides durability and protection in a corrosive environment. PTFE coating is available as an option.

Maintenance Free Lubrication

All actuators are factory lubricated; no further lubrication is required during life cycle operation.

Torque Range

The actuator provides various output torque ranges from 150 in-lbs to 14,160 in-lbs depending upon the actuator size, spring configuration, and available media supply pressure.

SPRING-DIAPHRAGM ROTARY ACTUATORS

OPERATING PRINCIPAL

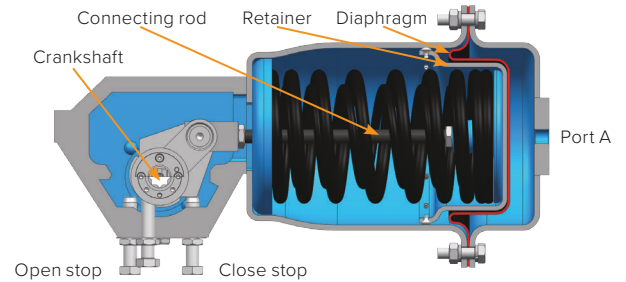
Spring Stroke

Upon loss of pressure (air) on Port A, the stored energy in the compressed springs forces the diaphragm retainer and connection rod to move right and the crankshaft to rotate clock-wise. This movement can be limited by using the adjustable close stop.

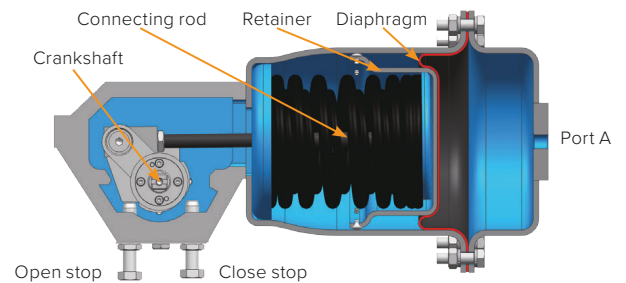
Field Reversible: Fail-closed and Fail-open operation is achieved by inverting the actuator, as shown on page 12.

Air Stroke

Upon the supply of media (air) to Port A, the pressure forces the diaphragm retainer and connection rod to move left, compressing the springs and rotating the crankshaft counter clock-wise. This movement can be limited by using the adjustable open stop.



Spring Stroke



Air Stroke

OPERATING CONDITIONS

Operating Media

Air (max particle size 50 µm), gas, water or mineral-based hydraulic fluid.

Air Supply Pressure

Minimum operating pressure: 1 bar (15 psi)

Maximum operating pressure: 7 bar (100 psi)

Operating Temperature

Standard: -25°C to 70°C (-13°F to 158°F)

Low*: -40°C to 70°C (-40°F to 158°F)

High: -29°C to 170°C (-20°F to 338°F)

*Standard Construction

Travel Adjustment

< +/- 5° rotation adjustment at open or closed positions

Application

Suitable for both indoor and outdoor use

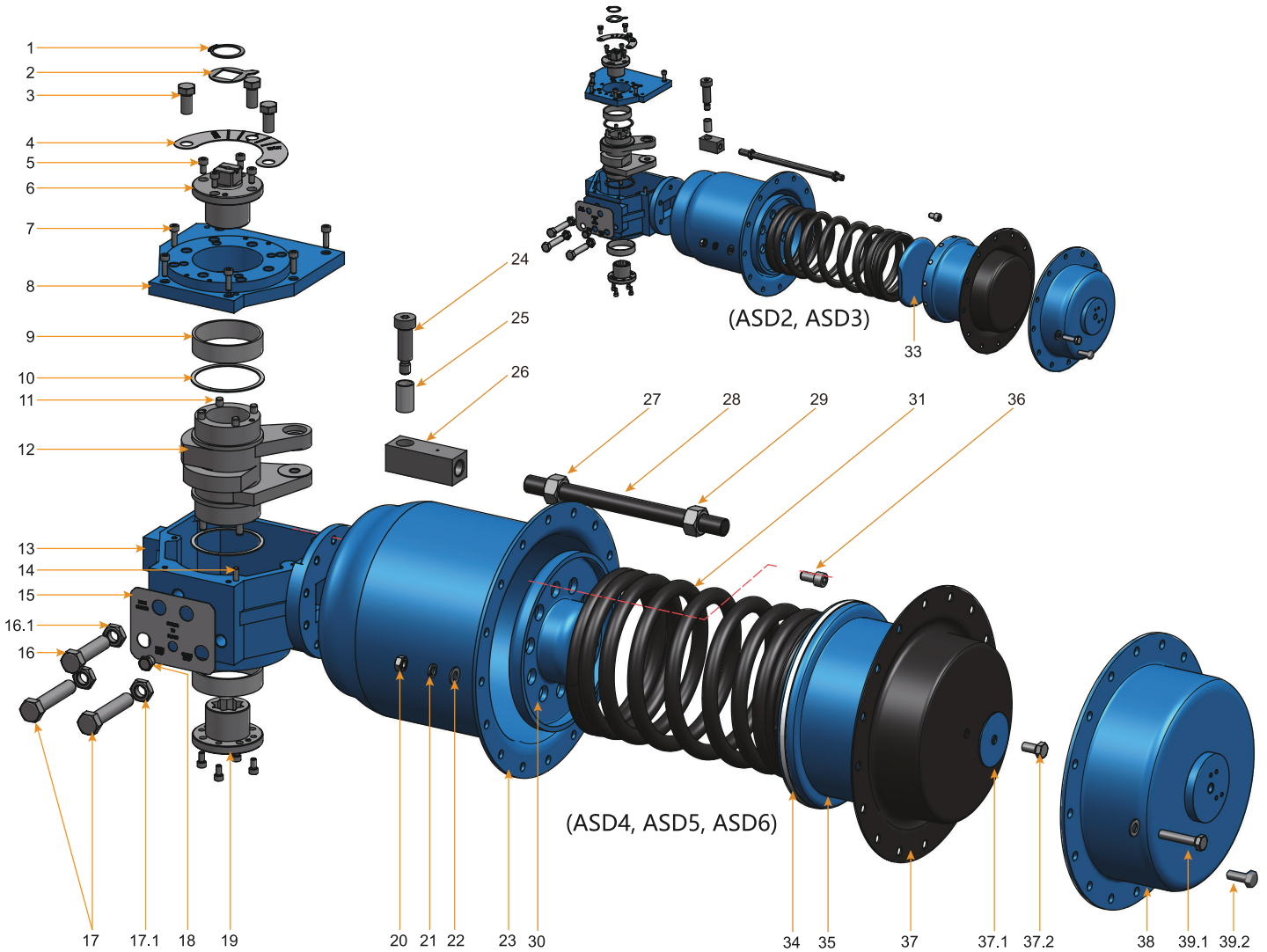
ASD SERIES

PNEUMATIC ACTUATORS



SPRING-DIAPHRAGM ROTARY ACTUATORS

PARTS AND MATERIALS



| No | Part Name | Qty | | | Material | Surface Treatment |
|----|---------------------------|--------|--------|------|---------------------|--------------------------|
| | | ASD2/3 | ASD4/5 | ASD6 | | |
| 1 | Snap Ring | 1 | 1 | 1 | Stainless Steel 304 | |
| 2 | Indicator Pointer | 1 | 1 | 1 | Stainless Steel 304 | |
| 3 | Hex Head Cap Screw | 3 | 3 | 3 | Stainless Steel 304 | |
| 4 | Indicator Plate | 1 | 1 | 1 | Stainless Steel 304 | |
| 5 | Socket Head Bushing Screw | 8 | 8 | 8 | Stainless Steel 304 | |
| 6 | NAMUR Drive Bushing | 1 | 1 | 1 | Carbon Steel | Chemically Coated Nickel |
| 7 | Socket Head Cap Screw | 6 | 6 | 6 | Stainless Steel 304 | |

ASD SERIES

PNEUMATIC ACTUATORS



SPRING-DIAPHRAGM ROTARY ACTUATORS

| No | Part Name | Qty | | | Material | Surface Treatment |
|-------|--------------------------------|--------|--------|------|--|------------------------------|
| | | ASD2/3 | ASD4/5 | ASD6 | | |
| 8 | Cover | 1 | 1 | 1 | Carbon Steel | Polyester Powder Coated |
| 9 | Driver Arm Bearing | 2 | 2 | 2 | Stainless Steel w/Acetal Lining | |
| 10 | Thrust Bearing | 2 | 2 | 2 | Nylon | |
| 11 | Cylindrical Pin | 8 | 8 | 8 | Carbon Steel | |
| 12 | Driver Arm | 1 | 1 | 1 | Ductile Iron | Chemically Coated Nickel |
| 13 | Driver Housing | 1 | 1 | 1 | Ductile Iron | Polyester Powder Coated |
| 14 | Cylindrical Pin | 2 | 2 | 2 | Stainless Steel 304 | |
| 15 | Nameplate | 1 | 1 | 1 | Stainless Steel 304 | |
| 16 | Set Screw | 1 | 1 | 1 | Stainless Steel 304 | |
| 16.1 | Hex Jam Nut | 1 | 1 | 1 | Stainless Steel 304 | |
| 17 | Travel Stop Screw | 2 | 2 | 2 | Stainless Steel | |
| 17.1 | Hex Jam Nut | 2 | 2 | 2 | Stainless Steel 304 | |
| 18 | Breather | 1 | 1 | 1 | Stainless Steel 316 | |
| 19 | Drive Bushing | 1 | 1 | 1 | Carbon Steel | Chemically Coated Nickel |
| 20 | Lock Nut | 12 | 12 | 24 | Stainless Steel | |
| 21 | Spring Washer | 12 | 12 | 24 | Stainless Steel | |
| 22 | Gasket | 24 | 24 | 48 | Stainless Steel | |
| 23 | Spring Housing | 1 | 1 | 2 | Carbon Steel | Polyester Powder Coated |
| 24 | Shoulder Screw | 1 | 1 | 2 | Carbon Steel (12.8) | |
| 25 | Clevis Bearing | 1 | 1 | 2 | Stainless Steel w/Acetal Lining | |
| 26 | Clevis | 1 | 1 | 2 | Carbon Steel | |
| 27 | Hex Jam Nut | 1 | 1 | 2 | Stainless Steel 304 | |
| 28 | Actuator Rod | 1 | 1 | 2 | Carbon Steel | |
| 29 | Hex Jam Nut | 1 | 1 | 2 | Carbon Steel | |
| 30 | Spring Retainer | 1 | 1 | 2 | Carbon Steel | Polyester Powder Coated |
| 31/32 | Compression Springs | 1 | 1 | 2 | 55 Mn Spring Steel | Polishing Capacitance Coated |
| 33 | Spring Retainer Plate | 1 | | | Carbon Steel | Polyester Powder Coated |
| 34 | Diaphragm Retainer Bearing | 1 | 1 | 2 | POM | |
| 34.1 | Diaphragm Retainer Bearing Pin | 12 | | | UHMWPE | |
| 35 | Diaphragm Retainer | 1 | 1 | 2 | Carbon Steel | Polyester Powder Coating |
| 36 | Hex Head Cap Screw | 4 | 4 | 8 | Carbon Steel | |
| 37 | Diaphragm (Optional) | 1 | 1 | 2 | NBR/Nylon 66 Fabric Blend (-25°C – 70°C) | |
| 37 | Diaphragm* | 1 | 1 | 2 | LNBR/Nylon 66 Fabric Blend (-40°C – 70°C) | |
| 37 | Diaphragm (Optional) | 1 | 1 | 2 | EPDM4/Polyester Fabric Blend (-29°C – 170°C) | |
| 37 | Diaphragm (Optional) | 1 | 1 | 2 | Viton/NOMEX Fabric Blend (-15°C – 200°C) | |
| 37.1 | Retainer Washer | | 1 | 2 | Stainless Steel | |
| 37.2 | Hex Head Cap Screw | | 1 | 2 | Stainless Steel | |
| 38 | Diaphragm Cover | 1 | 1 | 1 | Carbon Steel | Polyester Powder Coated |
| 39.1 | Hex Head Cap Screw (Long) | 2 | 2 | 4 | Stainless Steel 304 | |
| 39.2 | Hex Head Cap Screw (Short) | 10 | 10 | 20 | Stainless Steel 304 | |

*Standard Construction

ASD SERIES

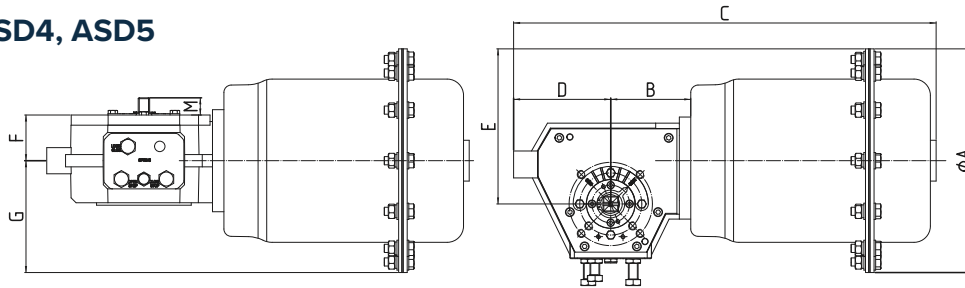
PNEUMATIC ACTUATORS



SPRING-DIAPHRAGM ROTARY ACTUATORS

DIMENSIONS

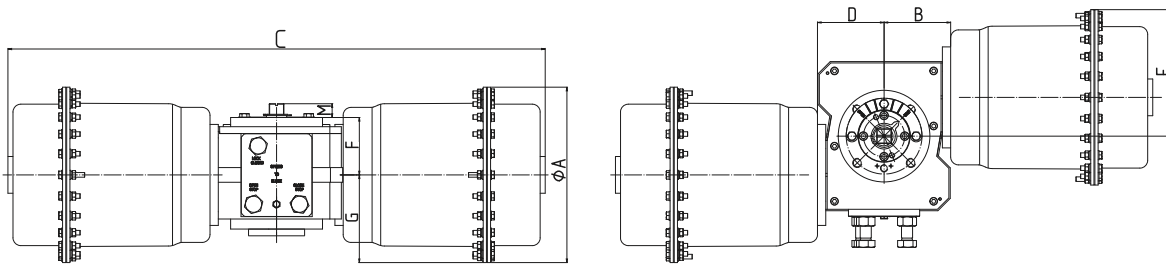
ASD2, ASD3, ASD4, ASD5



| Actuator Size | Approximate Dimensions (mm) | | | | | | | |
|---------------|-----------------------------|-----|-----|-----|-----|----|-----|----|
| | ØA | B | C | D | E | F | G | M |
| ASD-2 | 227 | 75 | 440 | 99 | 148 | 51 | 114 | 20 |
| ASD-3 | 274 | 84 | 527 | 118 | 190 | 56 | 137 | 20 |
| ASD-4 | 320 | 92 | 593 | 140 | 216 | 71 | 160 | 30 |
| ASD-5 | 382 | 113 | 731 | 160 | 261 | 83 | 191 | 30 |

| Actuator Size | Approximate Dimensions (in) | | | | | | | |
|---------------|-----------------------------|------|-------|------|-------|------|------|------|
| | ØA | B | C | D | E | F | G | M |
| ASD-2 | 8.94 | 2.95 | 17.32 | 3.9 | 5.83 | 2.01 | 4.49 | 0.8 |
| ASD-3 | 10.79 | 3.31 | 20.74 | 4.65 | 7.48 | 2.2 | 5.39 | 0.8 |
| ASD-4 | 12.6 | 3.62 | 23.35 | 5.51 | 8.5 | 2.8 | 6.3 | 1.18 |
| ASD-5 | 15.04 | 4.45 | 28.78 | 6.3 | 10.28 | 3.27 | 7.52 | 1.18 |

ASD6



| Actuator Size | Approximate Dimensions (mm) | | | | | | | |
|---------------|-----------------------------|-----|------|-----|-----|-----|-----|----|
| | ØA | B | C | D | E | F | G | M |
| ASD-6 | 382 | 113 | 1142 | 131 | 261 | 132 | 191 | 30 |

| Actuator Size | Approximate Dimensions (in) | | | | | | | |
|---------------|-----------------------------|------|-------|------|-------|-----|------|------|
| | ØA | B | C | D | E | F | G | M |
| ASD-6 | 15.04 | 4.45 | 44.96 | 5.16 | 10.28 | 5.2 | 7.52 | 1.18 |

ASD SERIES

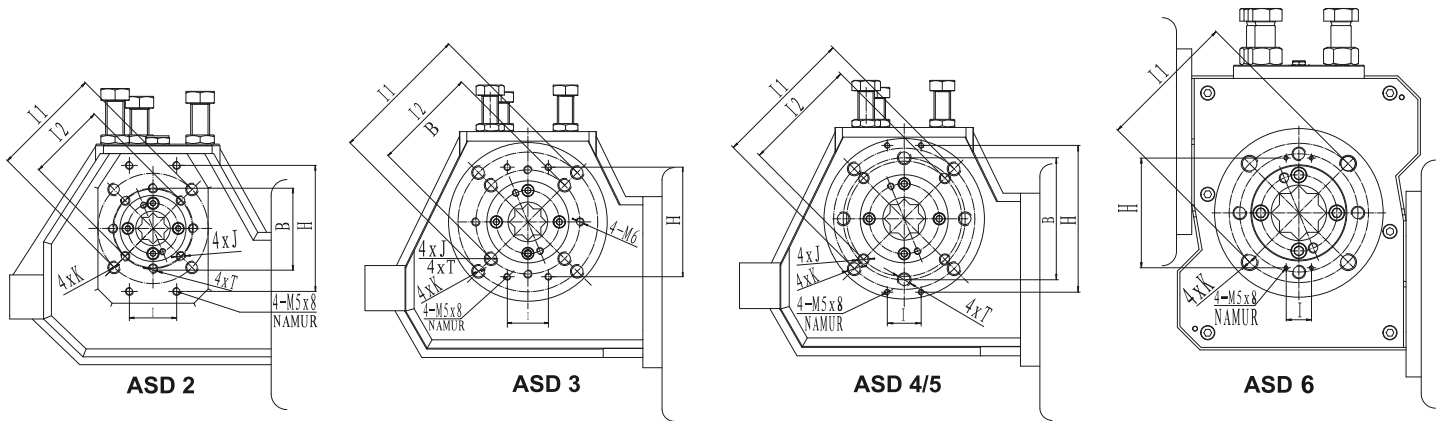
PNEUMATIC ACTUATORS



SPRING-DIAPHRAGM ROTARY ACTUATORS

MOUNTING DIMENSIONS

Actuators are made to ISO 5211 standards and come with Namur mounting pads for accessory mounting.



| Actuator Size | Flange Mount Configuration | |
|---------------|----------------------------|-------------------|
| | ISO 5211 Mount (MI) | ISO + Mount (MJ) |
| ASD2 | F05 + F07 | F05 + JB51 + F07 |
| ASD3 | F10 | JB76 + F10 |
| ASD4 | F10 + F12 | F10 + JB108 + F12 |
| ASD5 | F10 + F14 | F10 + JB108 + F14 |
| ASD6 | F16 | — |

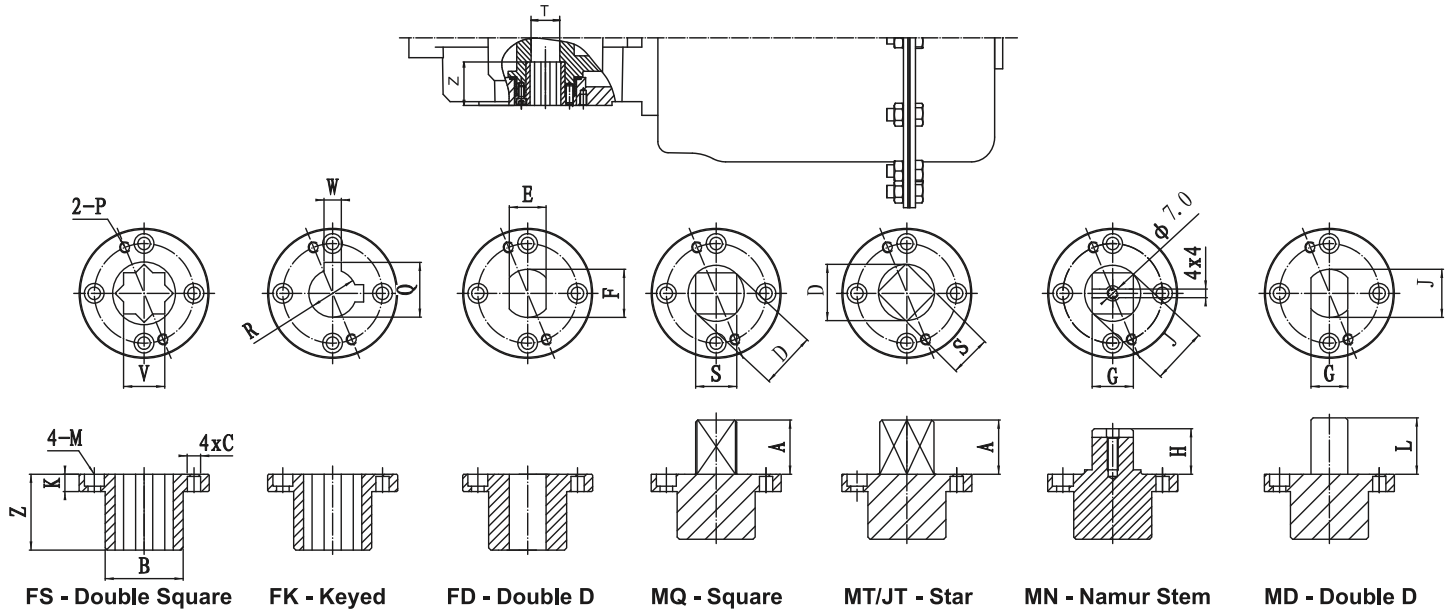
| Actuator Size | ISO 5211 Mount | | | | JB Mount | | NAMUR (VDI/VDE 3845) | |
|---------------|----------------|----------|------------|----------|------------|--------------|----------------------|-----------|
| | Ø1 | K | Ø12 | J | ØB | T | H | I |
| ASD2 | 2.76 (F07) | M8 x 13 | 1.97 (F05) | M6 x 10 | 2.00 (51) | 1/4-20unc-2B | 3.15 (80) | 1.18 (30) |
| ASD3 | 4.02 (F10) | M10 x 16 | — | — | 3.00 (76) | 3/8-16unc-2B | 3.15 (80) | 1.18 (30) |
| ASD4 | 4.92 (F12) | M12 x 20 | 4.02 (F10) | M10 x 16 | 4.25 (108) | 1/2-13unc-2B | 5.12 (130) | 1.18 (30) |
| ASD5 | 5.51 (F14) | M16 x 25 | 4.02 (F10) | M10 x 16 | 4.25 (108) | 1/2-13unc-2B | 5.12 (130) | 1.18 (30) |
| ASD6 | 6.50 (F16) | M20 x 25 | — | — | — | — | 5.12 (130) | 1.18 (30) |

All units are designated as inch (mm)

SPRING-DIAPHRAGM ROTARY ACTUATORS

BUSHING DIMENSIONS

Drive bushings are available in keyway, double D, female double square, male square, star and namur mount.



| Size | Female Drive | | | | | | Male Drive | | | | | | Namur / Double D (MN / MD) | | | |
|------|--------------------|-----------|-------------|-----------|---------------|-------------|----------------------------------|-----------|-----------|--------------|-----------|-----------|----------------------------|-----------|-----------|-----------|
| | Double Square (FS) | Keys (FK) | | | Double D (FD) | | Square / ISO 5211 Star (MQ / MT) | | | JB Star (JT) | | | G | H | L | ØJ |
| | V | R | Q | W | E | ØF | S | A | ØD | S | A | ØD | G | H | L | ØJ |
| ASD2 | 0.55 (14) | 0.55 (14) | 0.64 (16.3) | 0.20 (5) | 0.55 (14) | 0.71 (18.1) | 0.67 (17) | 0.75 (19) | 0.87 (22) | 0.55 (14) | 0.63 (16) | 0.69 (18) | 0.55 (14) | 0.79 (20) | 0.98 (25) | 0.71 (18) |
| ASD3 | 0.87 (22) | 0.87 (22) | 0.98 (24.8) | 0.24 (6) | 0.87 (22) | 1.11 (28.2) | 0.87 (22) | 0.94 (24) | 1.10 (28) | 0.75 (19) | 0.94 (24) | 0.98 (24) | 0.87 (22) | 0.79 (20) | 1.54 (39) | 1.10 (28) |
| ASD4 | 1.06 (27) | 1.42 (36) | 1.55 (39.3) | 0.39 (10) | 1.06 (27) | 1.43 (36.2) | 1.06 (27) | 1.14 (29) | 1.42 (36) | 0.98 (25) | 0.87 (22) | 1.23 (31) | 1.06 (27) | 1.18 (30) | 1.89 (48) | 1.42 (36) |
| ASD5 | 1.42 (36) | 1.65 (42) | 1.78 (45.3) | 0.47 (12) | 1.42 (36) | 1.90 (48.2) | 1.42 (36) | 1.50 (38) | 1.89 (48) | 0.98 (25) | 0.87 (22) | 1.23 (31) | 1.42 (36) | 1.18 (30) | 2.52 (64) | 1.89 (48) |
| ASD6 | 1.81 (46) | 1.97 (50) | 2.12 (53.8) | 0.55 (14) | 1.81 (46) | 2.37 (60.2) | 1.81 (46) | 1.89 (48) | 2.36 (60) | — | — | — | 1.81 (46) | 1.18 (30) | 3.23 (82) | 2.36 (60) |

| Size | Bush Connections | | | | | |
|------|------------------|-----------|-----------|----------|-----------|-----------|
| | ØB | K | Z | M / P | ØC | ØT |
| ASD2 | 0.98 (25) | 0.24 (6) | 1.18 (30) | M4 x 8 | 0.16 (4) | 0.79 (20) |
| ASD3 | 1.42 (36) | 0.31 (8) | 1.38 (35) | M5 x 10 | 0.24 (6) | 0.98 (25) |
| ASD4 | 1.97 (50) | 0.39 (10) | 1.77 (45) | M6 x 12 | 0.31 (8) | 1.46 (37) |
| ASD5 | 2.20 (56) | 0.47 (12) | 2.17 (55) | M8 x 14 | 0.39 (10) | 1.65 (42) |
| ASD6 | 2.83 (72) | 0.59 (15) | 3.23 (82) | M12 x 16 | 0.49 (12) | 2.36 (60) |

All units are designated as inch (mm)

ASD SERIES

PNEUMATIC ACTUATORS

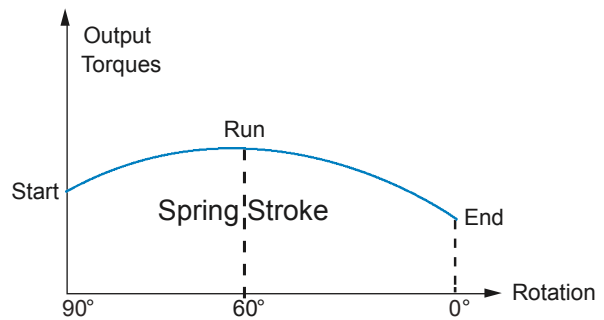
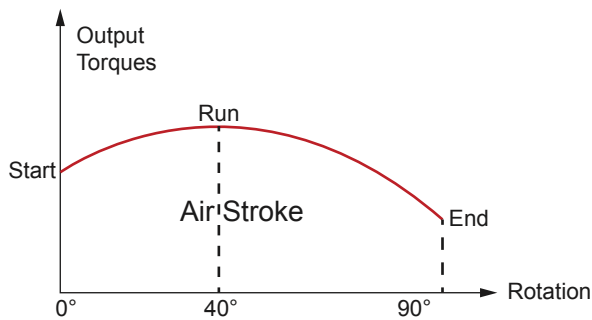


SPRING-DIAPHRAGM ROTARY ACTUATORS

ACTUATOR OUTPUT TORQUES (IN-LBS)

15-50 PSI

| Size | Air Stroke at Pressure (psi) | | | | | | | | | | | | | | | Spring Stroke | | |
|--------|------------------------------|-----------|-----------|------------|-----------|-----------|------------|-----------|-----------|------------|-----------|-----------|------------|-----------|-----------|---------------|-----------|----------|
| | 15 | | | 20 | | | 30 | | | 40 | | | 50 | | | Start (90°) | Run (60°) | End (0°) |
| | Start (0°) | Run (40°) | End (90°) | Start (0°) | Run (40°) | End (90°) | Start (0°) | Run (40°) | End (90°) | Start (0°) | Run (40°) | End (90°) | Start (0°) | Run (40°) | End (90°) | | | |
| ASD2A | 229 | 302 | 92 | 423 | 498 | 254 | 870 | 916 | 632 | — | — | — | — | — | — | 301 | 345 | 150 |
| ASD2B1 | — | — | — | — | — | — | 504 | 339 | 73 | 698 | 785 | 366 | 987 | 1158 | 610 | 797 | 929 | 425 |
| ASD2B2 | — | — | — | — | — | — | — | — | — | — | — | — | 1257 | 1266 | 314 | 1151 | 1319 | 575 |
| ASD2C | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1053 | 1274 | 664 |
| ASD2D | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1274 | 1540 | 797 |
| ASD3A | 549 | 623 | 201 | 939 | 1070 | 460 | 1923 | 2023 | 1062 | — | — | — | — | — | — | 752 | 858 | 363 |
| ASD3B1 | — | — | — | — | — | — | 1007 | 833 | 275 | 1569 | 1770 | 872 | 2334 | 2576 | 1436 | 1593 | 1867 | 885 |
| ASD3B2 | — | — | — | — | — | — | — | — | — | — | — | — | 2154 | 2002 | 987 | 2213 | 2575 | 1186 |
| ASD3C | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2832 | 3266 | 1434 |
| ASD3D | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3487 | 3965 | 1646 |
| ASD4B1 | — | — | — | — | — | — | 1556 | 1767 | 732 | 2965 | 3549 | 2180 | 4129 | 5098 | 3321 | 2744 | 3292 | 1682 |
| ASD4B2 | — | — | — | — | — | — | — | — | — | — | — | — | 4272 | 3851 | 1248 | 5036 | 5567 | 2000 |
| ASD4C | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 5814 | 6531 | 2567 |
| ASD4D | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 6620 | 7461 | 2965 |
| ASD5B1 | — | — | — | — | — | — | 3204 | 2792 | 961 | 5458 | 6313 | 3209 | 7611 | 9317 | 5296 | 5947 | 7133 | 3664 |
| ASD5B2 | — | — | — | — | — | — | — | — | — | — | — | — | 7181 | 8114 | 3141 | 8478 | 10045 | 4921 |
| ASD5C | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 9107 | 10983 | 5753 |
| ASD5D | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 11797 | 14072 | 7080 |
| ASD6B1 | — | — | — | — | — | — | 4990 | 5850 | 1666 | 10847 | 12948 | 6975 | 14208 | 17933 | 11220 | 11948 | 14603 | 7965 |
| ASD6B2 | — | — | — | — | — | — | — | — | — | — | — | — | 11668 | 13625 | 5834 | 18204 | 21585 | 10620 |
| ASD6C | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 20913 | 24877 | 12390 |
| ASD6D | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 24497 | 28984 | 14160 |



ASD SERIES

PNEUMATIC ACTUATORS

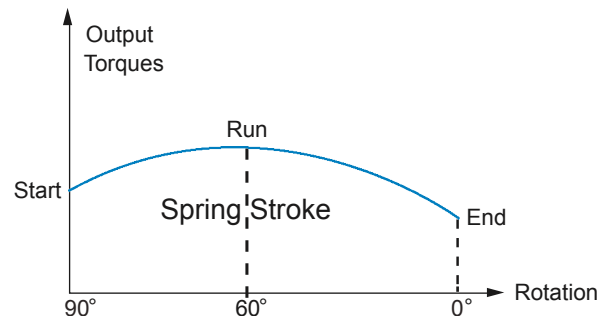
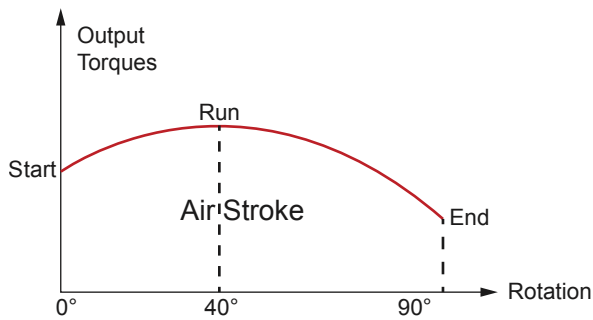


SPRING-DIAPHRAGM ROTARY ACTUATORS

ACTUATOR OUTPUT TORQUES (IN-LBS)

60-90 PSI

| Size | Air Stroke at Pressure (psi) | | | | | | | | | | | | Spring Stroke | | |
|--------|------------------------------|-----------|-----------|------------|-----------|-----------|------------|-----------|-----------|------------|-----------|-----------|---------------|-----------|----------|
| | 60 | | | 70 | | | 80 | | | 90 | | | Start (90°) | Run (60°) | End (0°) |
| | Start (0°) | Run (40°) | End (90°) | Start (0°) | Run (40°) | End (90°) | Start (0°) | Run (40°) | End (90°) | Start (0°) | Run (40°) | End (90°) | | | |
| ASD2A | — | — | — | — | — | — | — | — | — | — | — | — | 301 | 345 | 150 |
| ASD2B1 | — | — | — | — | — | — | — | — | — | — | — | — | 797 | 929 | 425 |
| ASD2B2 | 1518 | 1769 | 607 | 1958 | 2261 | 890 | — | — | — | — | — | — | 1151 | 1319 | 575 |
| ASD2C | 1179 | 1286 | 447 | 1371 | 1664 | 703 | 1660 | 2042 | 959 | — | — | — | 1053 | 1274 | 664 |
| ASD2D | — | — | — | 1317 | 1647 | 570 | 1598 | 1926 | 817 | 1887 | 2312 | 1063 | 1274 | 1540 | 797 |
| ASD3A | — | — | — | — | — | — | — | — | — | — | — | — | 752 | 858 | 363 |
| ASD3B1 | — | — | — | — | — | — | — | — | — | — | — | — | 1593 | 1867 | 885 |
| ASD3B2 | 2501 | 2885 | 1599 | 3293 | 3756 | 2199 | — | — | — | — | — | — | 2213 | 2575 | 1186 |
| ASD3C | 2412 | 2572 | 965 | 3115 | 3498 | 1558 | 3906 | 4421 | 2202 | — | — | — | 2832 | 3266 | 1434 |
| ASD3D | — | — | — | 2688 | 2670 | 926 | 3356 | 3587 | 1518 | 4501 | 4581 | 2126 | 3487 | 3965 | 1646 |
| ASD4B1 | — | — | — | — | — | — | — | — | — | — | — | — | 2744 | 3292 | 1682 |
| ASD4B2 | 5841 | 5993 | 2465 | 7477 | 8198 | 3738 | — | — | — | — | — | — | 5036 | 5567 | 2000 |
| ASD4C | 6118 | 6172 | 2233 | 7352 | 8180 | 3560 | 9694 | 10343 | 4901 | — | — | — | 5814 | 6531 | 2567 |
| ASD4D | — | — | — | 6204 | 6195 | 1905 | 7866 | 8354 | 3276 | 9790 | 10242 | 4324 | 6620 | 7461 | 2965 |
| ASD5B1 | — | — | — | — | — | — | — | — | — | — | — | — | 5947 | 7133 | 3664 |
| ASD5B2 | 9825 | 11629 | 5627 | 12461 | 15140 | 8278 | — | — | — | — | — | — | 8478 | 10045 | 4921 |
| ASD5C | 7378 | 10156 | 5002 | 11482 | 14117 | 7699 | 14036 | 17702 | 10209 | — | — | — | 9107 | 10983 | 5753 |
| ASD5D | — | — | — | 9399 | 10797 | 6765 | 13947 | 16442 | 9588 | 15709 | 18340 | 11784 | 11797 | 14072 | 7080 |
| ASD6B1 | — | — | — | — | — | — | — | — | — | — | — | — | 11948 | 14603 | 7965 |
| ASD6B2 | 16846 | 19177 | 10718 | 22270 | 27041 | 16022 | — | — | — | — | — | — | 18204 | 21585 | 10620 |
| ASD6C | 13603 | 14193 | 9825 | 20178 | 22697 | 15131 | 26038 | 25479 | 19531 | — | — | — | 20913 | 24877 | 12390 |
| ASD6D | — | — | — | 15710 | 24682 | 13351 | 24858 | 29137 | 17755 | 31399 | 37849 | 23922 | 24497 | 28984 | 14160 |



ASD SERIES

PNEUMATIC ACTUATORS



SPRING-DIAPHRAGM ROTARY ACTUATORS

OPERATING REQUIREMENTS AND SPECIFICATIONS

| Actuator Size | Air Volume Requirements | | |
|---------------|-------------------------------|-------------------------------|---|
| | Total Volume (L) | Swept Volume (L) | Effective Diaphragm Area (cm ²) |
| ASD2 | 1.57 (96 in ³) | 1.08 (66 in ³) | 155 (24 in ²) |
| ASD3 | 3.13 (191 in ³) | 2.18 (133 in ³) | 245 (38 in ²) |
| ASD4 | 6.03 (368 in ³) | 4.34 (265 in ³) | 387 (60 in ²) |
| ASD5 | 11.72 (715 in ³) | 8.70 (531 in ³) | 619 (96 in ²) |
| ASD6 | 23.44 (1430 in ³) | 17.40 (1062 in ³) | 1238 (192 in ²) |

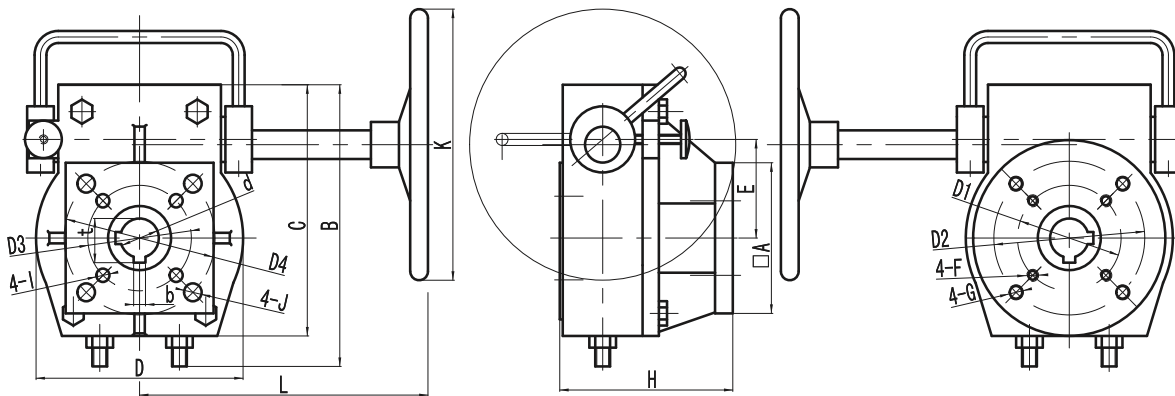
| Actuator Size | Operating Speed (s)* | | WT (kg/lb) |
|---------------|----------------------|---------------|------------|
| | Air Stroke | Spring Stroke | |
| ASD2C | 1.6 | 1.0 | 21/46 |
| ASD3C | 3.4 | 1.6 | 35/77 |
| ASD4C | 6.0 | 3.3 | 58/128 |
| ASD5C | 8.0 | 6.3 | 101/222 |
| ASD6C | 8.0 | 6.3 | 201/442 |

*Testing operated under 70 psi air pressure with 50 cfm flow capacity for input and exhausted.

*Larger solenoid pilot valves may be used to increase operating speeds. Actual times may vary with different applications. Please consult the factory for more specific details based on application requirements.

INSTALLATION

ALXL Series Manual Override Dimensions



| Model | d | b | t | D1 | F | D2 | G | A | H | E | D3 | I | D4 | J | K | L | B | C | D |
|-----------|------|------|------|------|-----|------|-----|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|
| ALXL 38-1 | 1.50 | 0.39 | 1.63 | — | — | 4.02 | M10 | 4.33 | 4.61 | 2.56 | — | — | 4.02 | 0.47 | 7.87 | 7.68 | 7.68 | 6.50 | 5.51 |
| ALXL 54-1 | 1.50 | 0.39 | 1.63 | 4.92 | M12 | — | — | 5.12 | 4.65 | 3.35 | 4.92 | 0.55 | — | — | 11.02 | 8.27 | 9.25 | 8.27 | 6.89 |
| | 1.89 | 0.55 | 2.04 | — | — | 5.51 | M16 | — | — | — | — | — | 5.51 | 0.71 | — | — | — | — | — |
| ALXL 80-1 | 1.89 | 0.55 | 2.04 | 5.51 | M16 | — | — | 6.14 | 5.83 | 4.88 | 5.51 | 0.71 | — | 0.87 | 15.75 | 10.24 | 12.60 | 11.61 | 9.65 |
| | 2.36 | 0.71 | 2.54 | — | — | 6.5 | M20 | — | — | — | — | — | 6.50 | — | — | — | — | — | — |
| ALXL 78-1 | 2.36 | 0.71 | 2.54 | 6.50 | M20 | — | — | 8.66 | 5.91 | 5.59 | 6.50 | 0.87 | — | — | 19.69 | 10.43 | 14.17 | 13.39 | 11.22 |
| | 3.15 | 0.87 | 3.37 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| ALXL 98-1 | 3.15 | 0.87 | 3.37 | 6.50 | M20 | — | — | 9.06 | 7.68 | 9.02 | 6.50 | 0.87 | — | — | 31.50 | 16.54 | 21.65 | 21.06 | 17.91 |

SPRING-DIAPHRAGM ROTARY ACTUATORS

INSTALLATION

Manual override

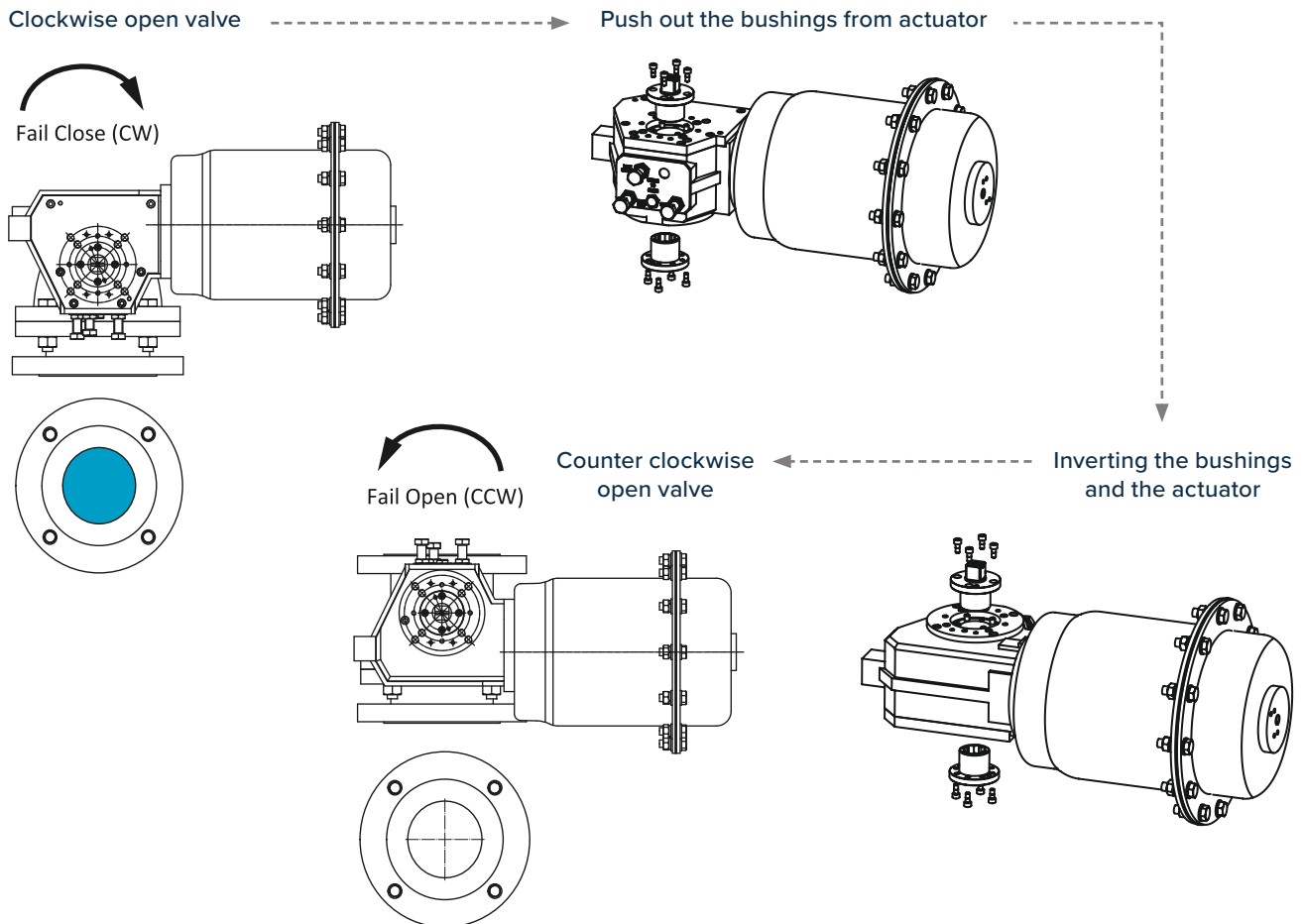
Manual Overrides are available for all models and can be used with any combination of drive bushings listed on page 8. Ferguson can also customize manual overrides to work in various orientations and mounting positions. Contact us for additional information.

Override guide

| NO | Actuator | Manual Overrider | Gear Ratio | Input Torque (Nm) | Output Torque (Nm) | Weight (kg) |
|----|----------|------------------|------------|-------------------|---------------------|---------------|
| 1 | ASD2 | ALXL38 | 38:1 | 60 (531 in lbs) | 550 (4868 in lbs) | 5.5 (12.1 lb) |
| 2 | ASD3 | ALXL54 | 54:1 | 120 (1062 in lbs) | 1200 (10620 in lbs) | 9 (19.8 lb) |
| 3 | ASD4 | ALXL80 | 80:1 | 140 (1239 in lbs) | 2000 (17700 in lbs) | 35 (77 lb) |
| 4 | ASD5 | ALXL78 | 78:1 | 200 (1770 in lbs) | 3600 (31860 in lbs) | 44 (96.8 lb) |
| 5 | ASD6 | ALXL98 | 98:1 | 300 (2655 in lbs) | 9000 (79650 in lbs) | 135 (297 lb) |

Fail-closed to Fail-open

Fail-closed or fail-open positions are easily achieved in the field by simply inverting the actuator and bushings.



ASD SERIES

PNEUMATIC ACTUATORS



SPRING-DIAPHRAGM ROTARY ACTUATORS

ORDER CODES

| | | | | | | |
|-----|---------------|--------|--------|--------------|-----------|------|
| ASD | 2 | C | MJ | FS | MN | T2 |
| | ACTUATOR SIZE | SPRING | FLANGE | BOTTOM DRIVE | TOP DRIVE | TEMP |

| ACTUATOR SIZE | SPRING CONFIGURATIONS |
|---|---|
| 2 = Maximum spring return output torque 797/90 (in-lbs/N-m) | A = Supply media pressure at 15 – 30/1.0 – 2.0 (psi/bar) |
| 3 = Maximum spring return output torque 1646/186 (in-lbs/N-m) | B1 = Supply media pressure at 30 – 50/2.0 – 3.4 (psi/bar) |
| 4 = Maximum spring return output torque 2965/335 (in-lbs/N-m) | B2 = Supply media pressure at 50 – 70/3.4 – 4.8 (psi/bar) |
| 5 = Maximum spring return output torque 7080/800 (in-lbs/N-m) | C = Supply media pressure at 60 – 80/4.1 – 5.5 (psi/bar) |
| 6 = Maximum spring return output torque 14160/1600 (in-lbs/N-m) | D = Supply media pressure at 70 – 90/4.8 – 6.2 (psi/bar) |

| FLANGE MOUNT CONFIGURATION | BOTTOM DRIVE |
|----------------------------|---|
| MI = ISO 5211 Mount | FS = Female Star (Double Square) |
| MJ = ISO + JB Mount | FK = Female Keys |
| | FD = Female Double D |
| | MQ = Male Square |
| | MT/JT = Male Star (ISO 5211 Star/JB Star) |
| | MD = Male Double D |
| | MN = NAMUR Stem |

| TOP DRIVE | ENVIRONMENT TEMPERATURE |
|---|------------------------------------|
| FS = Female Star (Double Square) | T1 = -25°C – 70°C (-13°F – 158°F) |
| FK = Female Keys | T2 = -40°C – 70°C (-40°F – 158°F)* |
| FD = Female Double D | T3 = -29°C – 170°C (-20°F – 338°F) |
| MQ = Male Square | T4 = -15°C – 200°C (5°F – 392°F) |
| MT/JT = Male Star (ISO 5211 Star/JB Star) | |
| MD = Male Double D | |
| MN = NAMUR Stem | |

*Standard Construction