ALLIED ASD
Spring-Diaphragm Rotary Actuators

By utilizing proven spring material, advanced filler reinforced diaphragm technologies, precision engineering of the crankshaft, and the connecting rod design, the ASD Spring-Diaphragm Rotary Actuators are developed specifically for quarter turn valve automation applications to provide safe and reliable operation even with minimal media supply pressure. The design separates the supply power media chamber from the spring sets allowing the actuator to be operated by unfiltered air, gas, water or mineral-based hydraulic fluid. The housing is constructed using a ductile iron and carbon steel casting that is coated with a polyester powder process to ensure exceptional corrosion resistance in most field environments. The independent media chamber is also equipped with a Buna-N diaphragm reinforced with special compound polyamine fabric, allowing the actuators to work in the temperature conditions from as low as -40 and to +340°F.

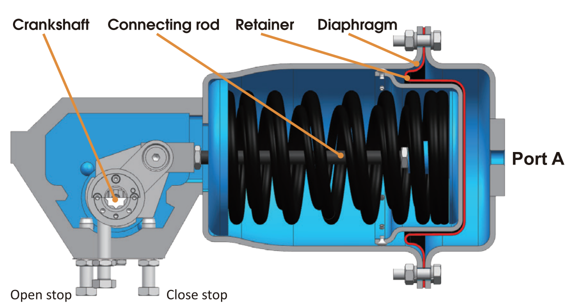
Warning:
The two EYEBOLTS are provided to assist in valve mounting assemble only. USE EYEBOLTS with lifting straps for safe handling. Refer to IOM 3.1 for Handling Installation Instruction.

Operating Principle

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 which can be limited by an adjustable close stop.

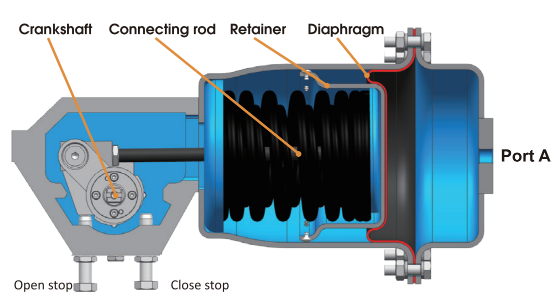
FIELD REVERSIBLE: Fail Closed or Fail Open operation is achieved by inverting the actuator.



Spring Stroke

Air Stroke

By supplying media (air) to port A, pressure forces the diaphragm retainer and connection rod to move left, causing the springs to be compressed. The crankshaft will be rotated counter clock-wise which is limited by an adjustable open stop.



Air Stroke

MAIN FEATURES

- Universal Mounting Pads – Direct Mount

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

- Namur Mount

  The design of the unit makes it easy to mount for various control accessories, such as limit switches, solenoid valves, positioners, and decluchable manual overrides.

- Multiple Drive Bushings (Removable & Replaceable)

  The removable drive bushings allow users to mount ASD actuators to a number of different valve stem configurations wheather in the field on existing valves or on new valve applications.

- High Cycle Life Design & Low-Friction Bearing

  The actuators feature a rolling diaphragm design with a one-piece diaphragm retainer and its UMWPH bearing which helps achieve superior longevity of the life cycle and exceptionally smooth actuation due to the low friction generated during operations. Cycle life over 1 million cycles.

- Reversible in Field Fail Open or Fail Closed Option

  By simply inverting the actuator and bushings, the ASD actuators can be quickly and easily changed to fail open or fail closed position in the field.

- Torque Ranges

  The ASD actuators provide various output torque ranges: from 133 in-lbs to 12,682 in-lbs depending on the actuator size, spring configuration, and available media supply pressures.

- Supply Pressures

  The ASD Series Actuators can be operated with numerous designated media supply pressures ranging from 15 psig to 100 psig.

- Supply Media

  The ASD Series Actuators can be operated by air, gas, water or mineral-based hydraulic fluid.

- Travel Stops

  There are two adjustable travel stops that allow actuators to be adjusted to the fully open or fully closed positions. With extend adjustment bolts, the actuators can be used to adjust a rotary control valve from 60-95 degrees.

- Mechanical Lockout Option

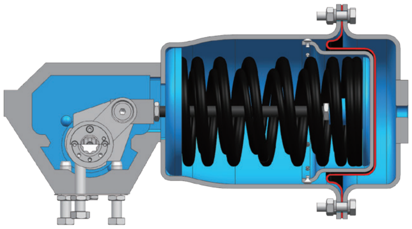
  A lockout screw is used to positively lock the unit in the spring failure mode.

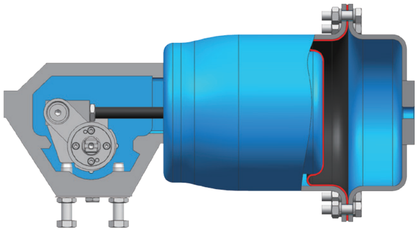
- Corrosion Resistant

  Standard surface body and cover are fully applied with a UV Protection polyester powder coating combined with stainless steel external fasteners provides durability and protection in a corrosive environment. PTFE coating is also available as an option.

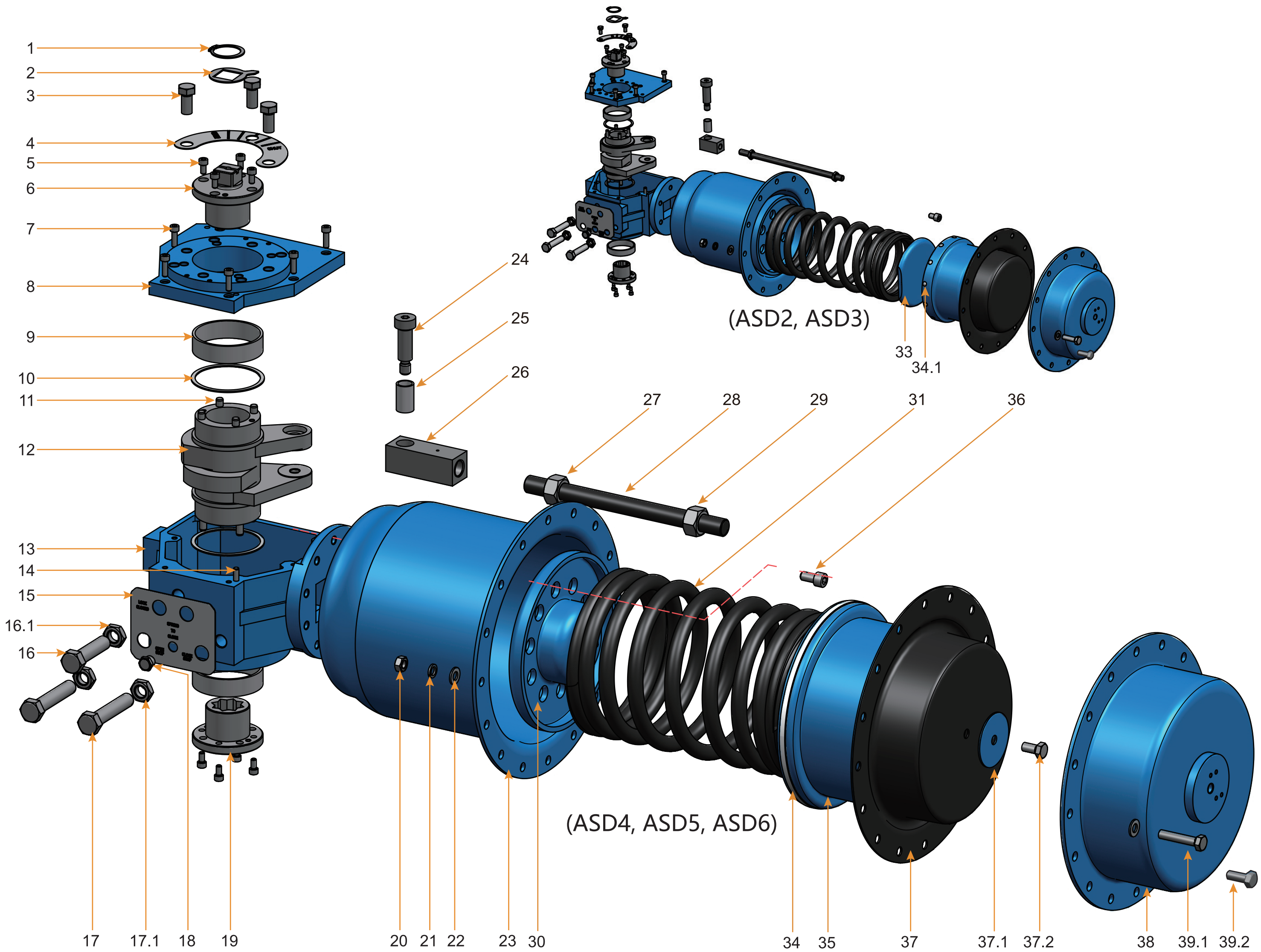
- Maintenance Free Lubrication

  All actuators are lubricated at the factory during the time of production. No further lubrication is required during the life cycle.





EXPLODED VIEW



BILL OF MATERIALS & PARTS LIST

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 Screws	8	8	8	Stainless Steel 304	
6	Namur Stem Namur	1	1	1	Carbon Steel	Nickel Coated Chemically
7	Socket Head Cap Screw	6	6	6	Stainless Steel 304	
8	Cover	1	1	1	Carbon Steel	Polyester Powder Coated
9	Driver Arm Bearing	2	2	2	Stainless Steel w/ Acetal Lining	
10	Thrust Beating	2	2	2	Nylon	
11	Cylindrical Pin	8	8	8	Carbon Steel	
12	Driver Arm	1	1	1	Ductile Iron	Nickel Coated Chemically
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	Stop Screws	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	Nickel Coated Chemically
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	Acuator 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	55Mn Spring Steel 55Mn	Polishing Capacitance Coated
33	Spring Retainer Plate	1	–	–	Carbon Steel	Polyester Powder Coated
34	Diaphragm Retainer Bearing	–	1	2	POM	
34.1	Diaphragm Retainer Bearing Pins	12	–	–	UHMW PE	
35	Diaphragm Retainer	1	1	2	Carbon Steel	Polyester Powder Coated
36	Hex Head Cap Screw	4	4	8	Carbon Steel	
37	Diaphragm	1	1	2	NBR / Nylon66 Fabric Blend (-25°C~70°C)	
	Diaphragm (optional)	1	1	2	LNBR / Nylon66 Fabric Blend (-40°C~70°C)	
	Diaphragm (optional)	1	1	2	EPDM4 / Polyester Fabric Blend (-29℃~170°C)	
	Diaphragm (optional)	1	1	2	Viton / NOMEX Fabric Blend (-15°C~200°C)	
37.1	Retaining Washer	–	1	2	Stainless steel	
37.2	Hex Head Cap Screw	–	1	2	Stainless steel	
38	Diaphragm Cover	1	1	2	Carbon Steel	Polyester Powder Coated
39.1	Hex Head Cap Screw	10	10	20	Stainless Steel 304	
39.2	Hex Head Cap Screw	2	2	4	Stainless Steel 304	

How To Order By Part Number

ASD | 3 | C | MI | FS | MN | T1

Environment Temperature
T1: -25℃ ~ 70℃ (-13°F ~ 158°F)
T2: -40℃ ~ 70℃ (-40°F ~158°F)
T3: -29℃ ~170℃ (-20°F~338°F)

Top Drive
MN-Namur Stem
FS-Female Star (Double Square)
FK-Female Keys
FD-Female Double D
MQ-Male Square
MT/JT-Male Star (ISO 5211 Star / JB Star)
MD-Male Double D

Bottom Drive
FS-Female Star (Double Square)
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

Flange Mount Configuation
MI-ISO 5211 Mount
MJ-ISO + JB Mount

Spring Configurations
A - Supply media pressure at 15 – 30 / 1.0 – 2.0 (psi / bar)
B1- Supply media pressure at 30 – 50 / 2.0 – 3.4 (psi / bar)
B2- Supply media pressure at 50 – 70 / 3.4 – 4.8 (psi / bar)
C - Supply media pressure at 60 – 80 / 4.1 – 5.5 (psi / bar)
D - Supply media pressure at 70 – 90 / 4.8 – 6.2 (psi / bar)

Actuator Size 885
2-Maximum spring return output torque 797 / 90 (in·lbs / N·m)
3-Maximum spring return output torque 1646 / 186 (in·lbs / N·m)
4-Maximum spring return output torque 2965 / 335 (in·lbs / N·m)
5-Maximum spring return output torque 7080 / 800 (in·lbs / N·m)
6-Maximum spring return output torque 14160 / 1600 (in·lbs / N·m)

ALLIED Spring-Diaphragm Rotary Actuator

Working Conditions

Maximum Operating Pressure: 7 bar (100 PSI)
Temperature Rating: -25℃ to 70℃ (-13°F to 158°F)
Optional Temperature Rating: -40℃ to 70℃ (-40°F to 158°F)
Optional Temperature Rating: -29℃ to 170℃ (-20°F to 338°F)
Rotation Adjustment: ＜±5° adjustment at open or closed positions.
Supply Media: Air, water, mineral-based hydraulic fluid.

* 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.