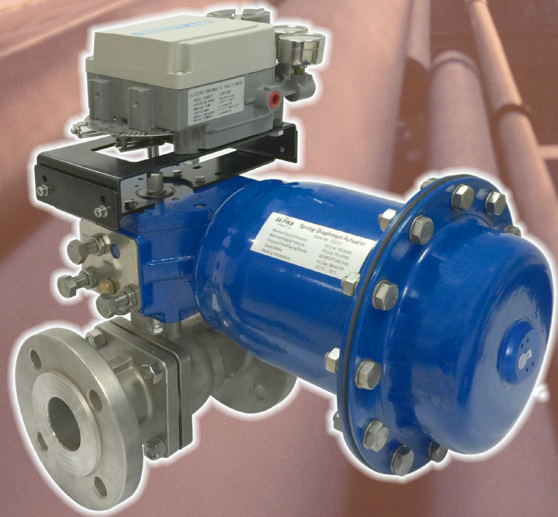
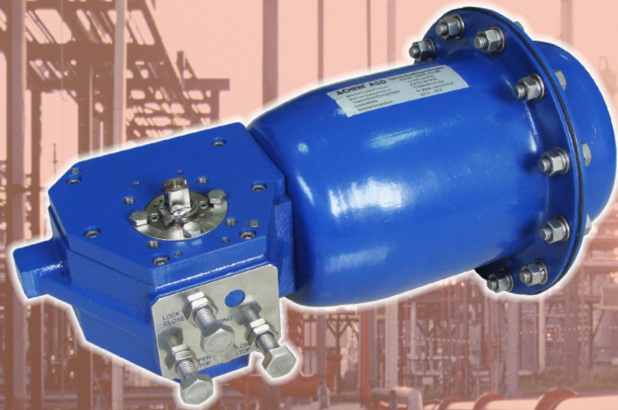
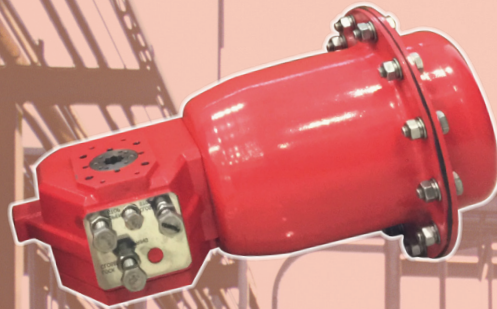


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ACHEM Series Spring-Diaphragm Actuators

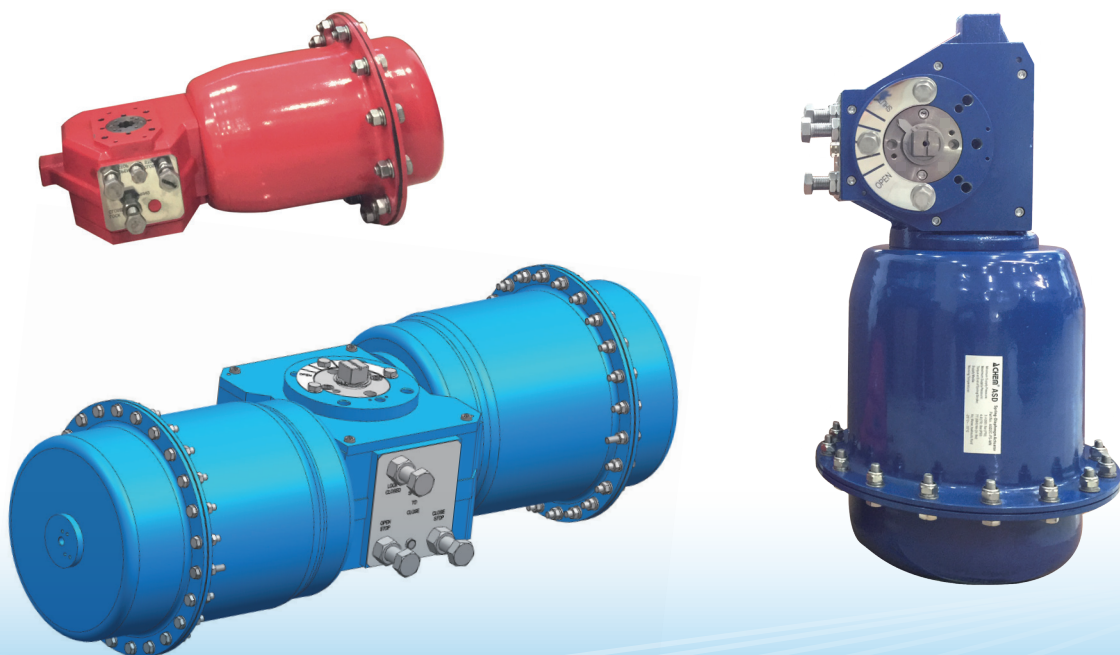


ACHEM

SPRING-DIAPHRAGM ROTARY ACTUATORS

Designed and developed specifically for quarter turn valves. The ACHEM Spring-Diaphragm Rotary Actuators were designed by using advanced spring-diaphragm technology that focuses on the crank-shaft and the connecting rod.

The ACHEM Spring-Diaphragm Rotary Actuators are designed to be used with minimal pressure when necessary and can be operated by air, water, mineral-based hydraulic fluid. Our housing and cover are constructed with a ductile iron / carbon steel casing that is coated with a polyester powder coating. Our independent media room is equipped with a Buna-N diaphragm reinforced with polyamine fabric. These actuators are designed to work in temperatures as low as -40°C (-40 °F) and as high as 200°C (392 °F).





MAIN FEATURES



Universal Mounting Pads – Direct Mount

The ACHEM series offer a combination of different mounting pads that allow you to directly replace existing Spring-Diaphragm Actuator or mount directly to new and existing quarter turn valves.

Namur Mount

The ACHEM Spring-Diaphragm Rotary Actuators are designed to incorporate namur mounting for solenoids, limit switches and positioners.

Multiple Drive Bushing (Removable & Replaceable)

The ACHEM Spring-Diaphragm Rotary Actuators feature removable drive bushings which allow you to mount our actuators to a number of different new or existing valve stem configurations in the field for existing valves or for new valve applications.

High Cycle Life Design & Low-Friction

The ACHEM Spring-Diaphragm Rotary Actuators feature a rolling diaphragm design with a one piece diaphragm retainer and UMW Polyethylene bearing which helps to obtain longevity of the life cycle and exceptionally smooth actuation due to the low-friction that is produced during operation.

Reversible in Field Fail Open or Fail Closed Option

The ACHEM Spring-Diaphragm Rotary Actuators can be quickly and easily changed to the fail open or fail closed positions in the field if necessary.



Torque Ranges

The ACHEM Spring-Diaphragm Rotary Actuators output torques range from 15 to 1433 Nm (133 to 12682 in.-lbs) depending on the actuator size and available supply pressure.

Supply Pressures

The ACHEM Spring-Diaphragm Rotary Actuators can be operated with a number of different supply pressures ranging from 1.0 bar to 6.2 bar (15 PSI to 90 PSI).

Supply Media

The ACHEM Spring-Diaphragm Rotary Actuators can be operated by air, water, mineral-based hydraulic fluid.

Travel Stops

The ACHEM Spring-Diaphragm Rotary Actuators have double adjustable travel stops that allow our actuators to be adjusted to the fully open or the fully closed positions.

Mechanical Lockout Option

The ACHEM Spring-Diaphragm Rotary Actuators can be locked in the spring failure mode.

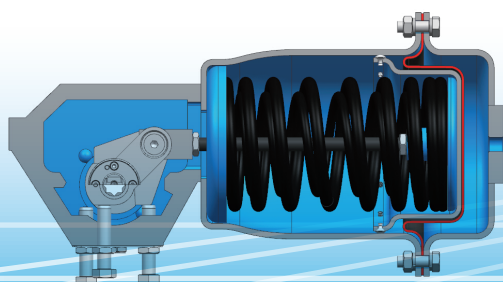
Corrosion Resistant

The ACHEM Spring-Diaphragm Rotary Actuators come complete with stainless steel external fasteners which provide durability and protection in corrosive application and atmospheres. Our actuators have a UV polyester resistant coating and a PTFE coating is also available as an option.

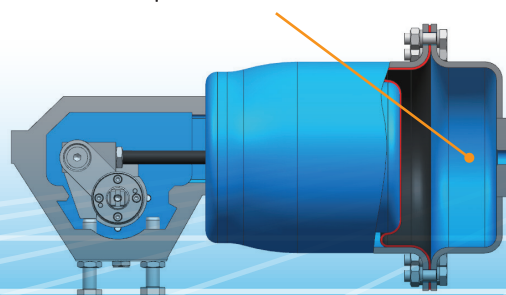
Maintenance Free Lubrication

The ACHEM Spring-Diaphragm Rotary Actuators are lubricated at our factory during the time of production and not further lubrication is required during its life cycle.

Mechanical Lock-Spring Failure Mode

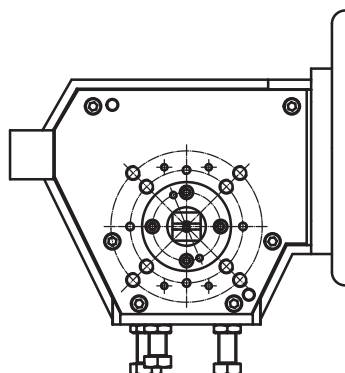


Independent Media Chamber

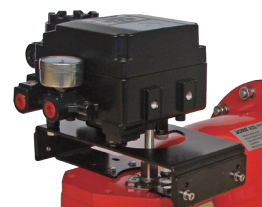




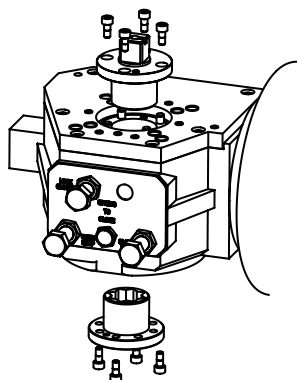
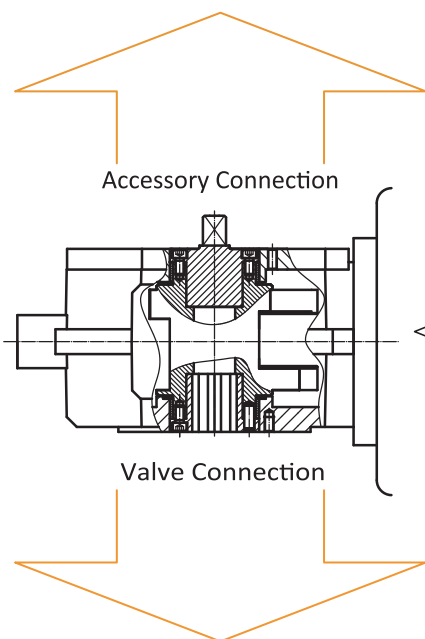
Drive Bushings



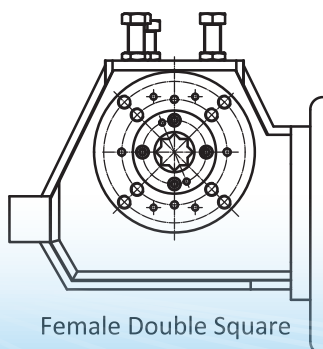
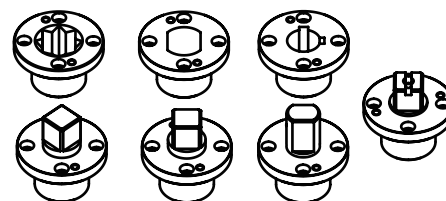
Limit Switch



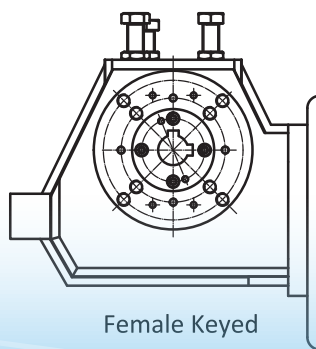
Positioner



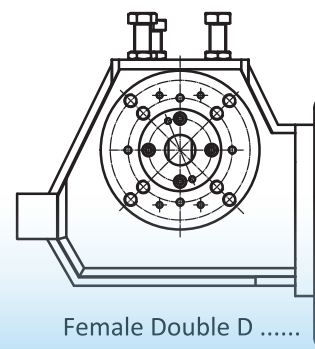
Removable Drives



Female Double Square



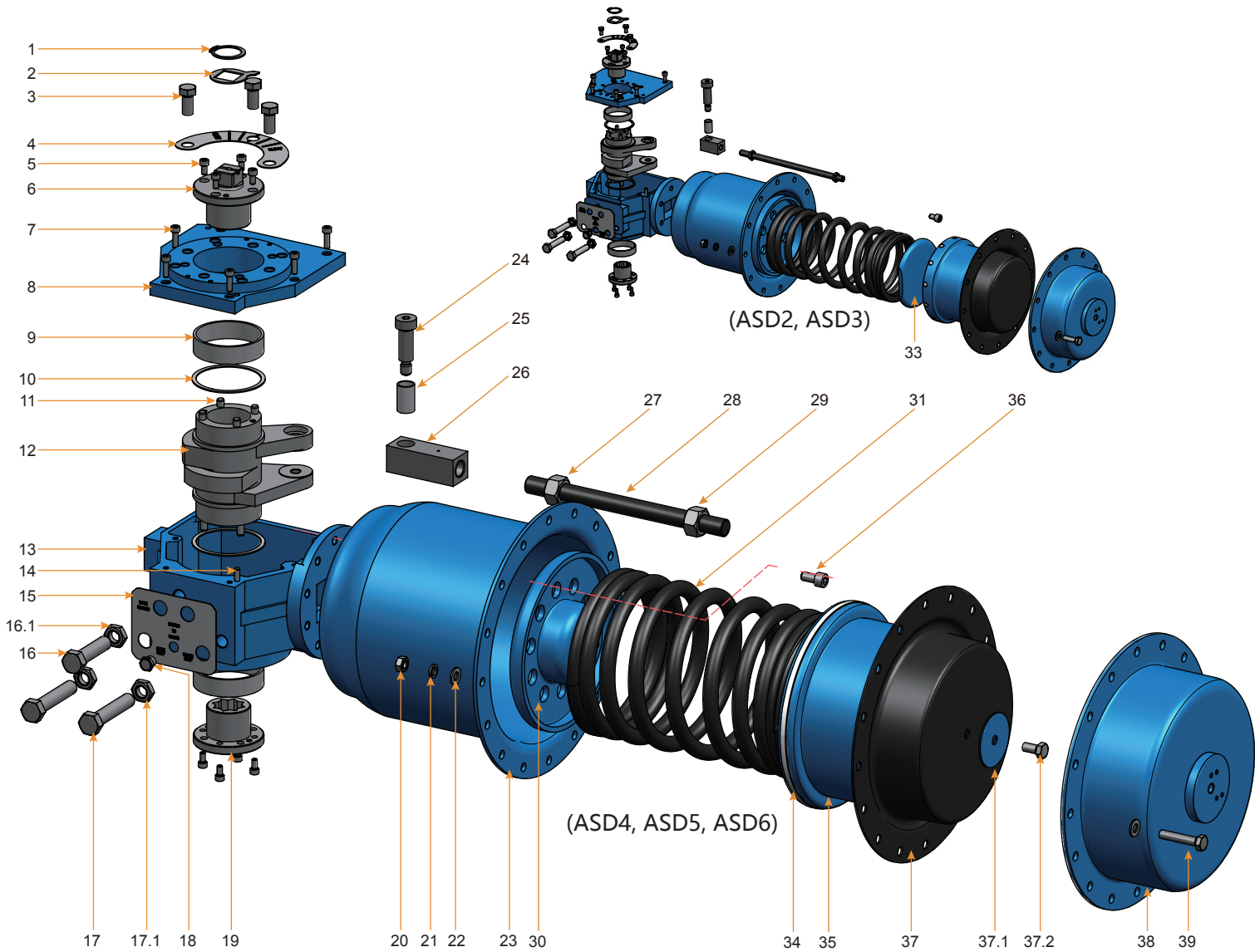
Female Keyed



Female Double D



Exploded View



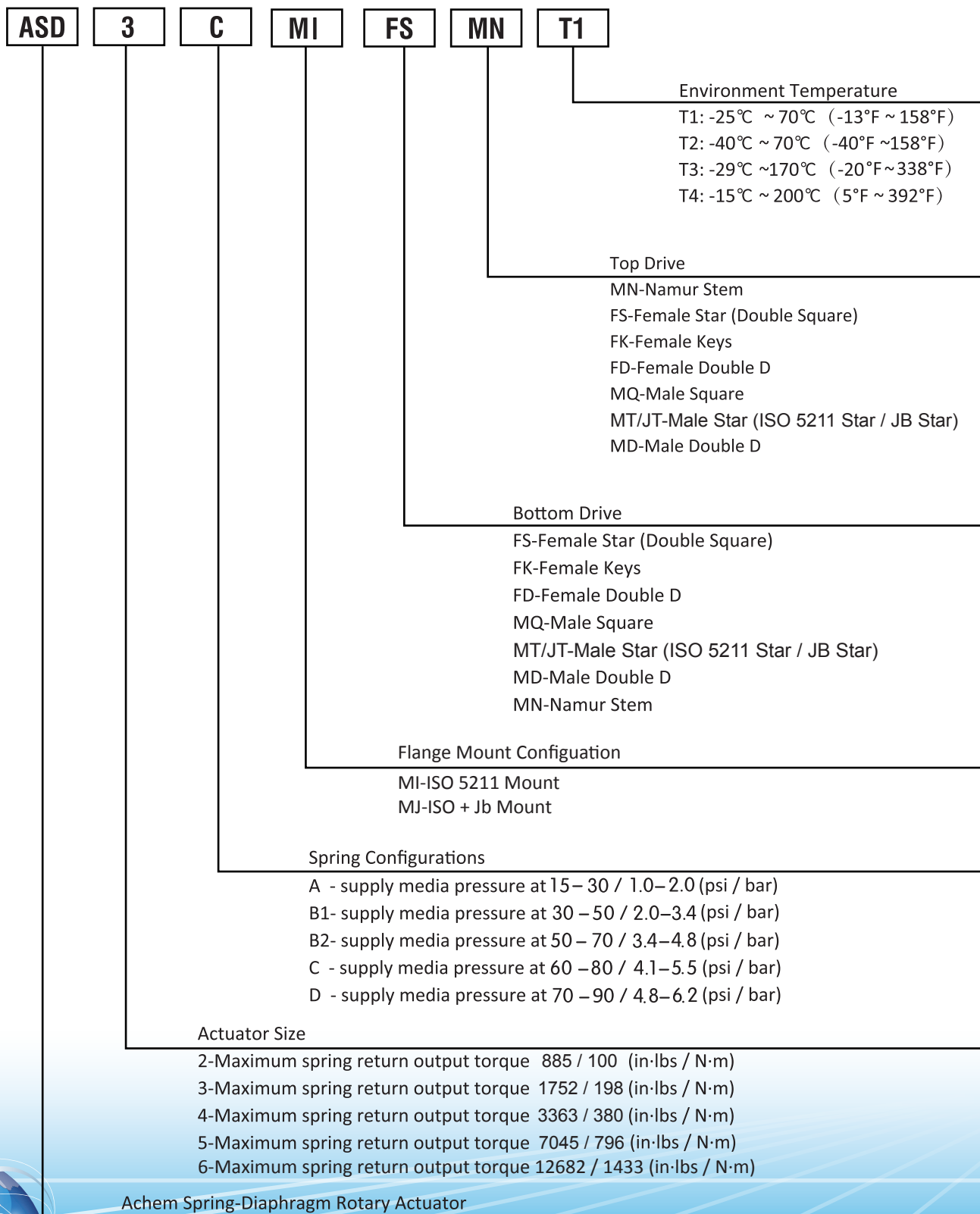


Bill of Material & Parts List

NO.	Part Name	Qty.			Material	Surface treatment
		ASD2/3	ASD4/5	ASD6		
1	Spring 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 Bush 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 Bearing	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 bush	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	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	55Mn Spring Steel 55Mn	Polishing+capacitance coated
33	Spring Retainer Plate	1	–	–	Carbon Steel	Polyester powder coated
34	Diaphragm Retainer Bearing Pins	12	–	–	UHMW PE	
34	Diaphragm Retainer Bearing	–	1	2	POM	
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 C ~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	Hex Head Cap Screw	12	12	24	Stainless Steel 304	



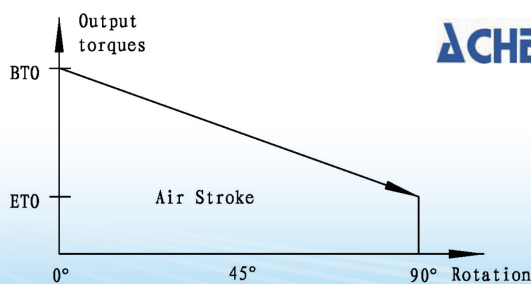
How To Order By Part Number



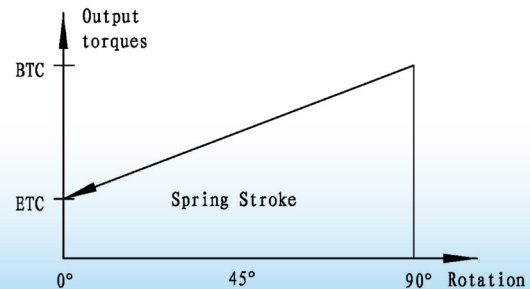


Actuator Output Torques (Nm)

Size	Air Strock at Presure (Bar)*									Spring Strock
	1	1.3	2	2.8	3.4	4.1	4.8	5.5	6.2	End of Spring(ETC)
	End of Air (ETO)									
ASD2A**	6	18	50							15
ASD2B1			8	41	68					48
ASD2B2					35	68	97			65
ASD2C						48	80	110		77
ASD2D							60	92	124	100
ASD3A**	22	50	115							35
ASD3B1			30	100	160					100
ASD3B2					80	140	200			130
ASD3C						90	150	230		160
ASD3D							110	180	250	198
ASD4B1			80	250	370					190
ASD4B2					160	320	470			240
ASD4C						200	300	500		300
ASD4D							220	370	505	380
ASD5B1			105	368	590					414
ASD5B2					305	565	824			533
ASD5C						552	833	1114		621
ASD5D							517	777	1058	796
ASD6B1			189	662	1063					745
ASD6B2					548	1015	1484			960
ASD6C						994	1500	2005		1118
ASD6D							930	1399	1904	1433



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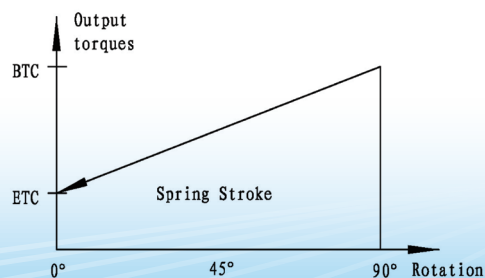
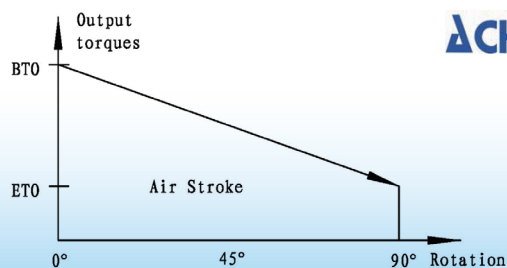
*Bold data is the output torques recommended ,and light data is the output torques for reference.

**A unique solution to provide exceptionally-smooth and reliable actuation for quarter-turn rotary valves when minimal supply pressures (0.8 - 1.3 Bar) are available.



Actuator Output Torques (in.lbs)

Size	Air Strock at Presure (PSI) *									Spring Strock
	15	20	30	40	50	60	70	80	90	End of Spring(ETC)
	End of Air (ETO)									
ASD2A **	55	169	458							133
ASD2B1			73	357	610					425
ASD2B2					314	607	863			575
ASD2C						429	712	977		681
ASD2D							534	817	1099	885
ASD3A **	201	469	1053							310
ASD3B1			275	872	1436					885
ASD3B2					718	1250	1780			1151
ASD3C						804	1335	2042		1416
ASD3D							979	1598	2215	1752
ASD4B1			732	2180	3321					1682
ASD4B2					1616	2858	4183			2124
ASD4C						2233	2670	4439		2655
ASD4D							2492	3285	4873	3363
ASD5B1			961	3209	5296					3664
ASD5B2					2738	5047	7334			4717
ASD5C						4930	7414	9890		5496
ASD5D							4602	6898	9374	7045
ASD6B1			1730	5772	9541					6673
ASD6B2					4919	9075	13209			8496
ASD6C						8878	13351	17800		9894
ASD6D							8278	12420	16869	12682



*Bold data is the output torques recommended ,and light data is the output torques for reference.

**A unique solution to provide exceptionally-smooth and reliable actuation for quarter-turn rotary valves when minimal supply pressures (12 -20 psi) are available.

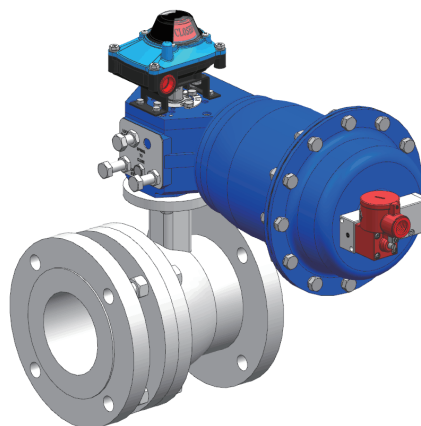


Technical Specifications

Actuator Size	Air Volume Requirements		
	Total volume(L)	Swept volume(L)	Effective Diaphragm Area(cm ²)
ASD-2	1.57 (96 in ³)	1.08 (66 in ³)	155 (24 in ²)
ASD-3	3.13 (191 in ³)	2.18 (133 in ³)	245 (38 in ²)
ASD-4	6.03 (368 in ³)	4.34 (265 in ³)	387 (60 in ²)
ASD-5	11.72 (715 in ³)	8.7 (531 in ³)	619 (96 in ²)
ASD-6	23.44 (1430 in ³)	17.4 (1062 in ³)	1238 (192 in ²)

Actuator Size	Operating Speed (s)*		WT (kg/lb)
	Air travel	Spring travel	
ASD-2C	1.6	1.0	21/46
ASD-3C	3.4	1.6	35/77
ASD-4C	6.0	3.3	58/128
ASD-5C	8.0	6.3	107/236
ASD-6C	8.0	6.3	177/390

* Testing operated under 4.8 Bar air pressure with 1387 L/M flow capacity for input and exhausted.



Working conditions

Maximum Operating Pressure: 7 bar (100 PSI)

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

Optional Temperature Rating: -40°C to 70°C (-40°F to 158°F)

Optional Temperature Rating: -29°C to 170°C (-20°F to 338°F)

Optional Temperature Rating: -15°C to 200°C (5°F to 392°F)

Rotation Adjustment: < ±5° adjustment at open or closed positions.

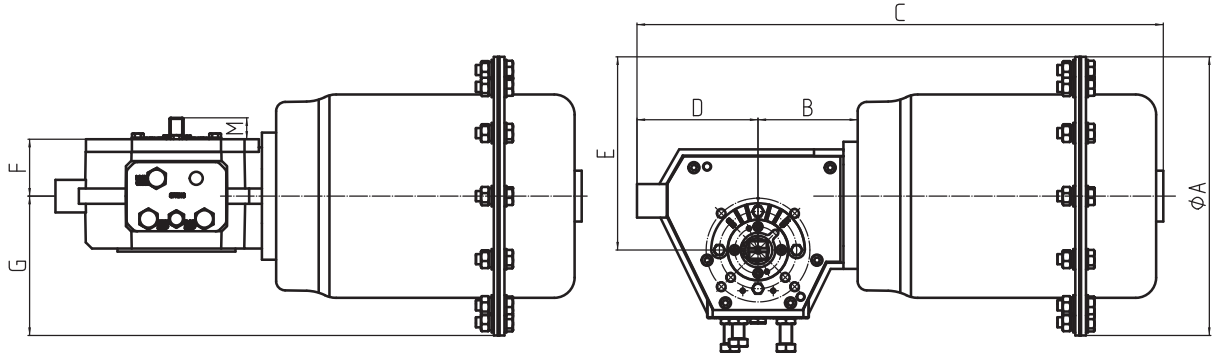
Supply Media: Air, water, mineral-based hydraulic fluid.

* 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.

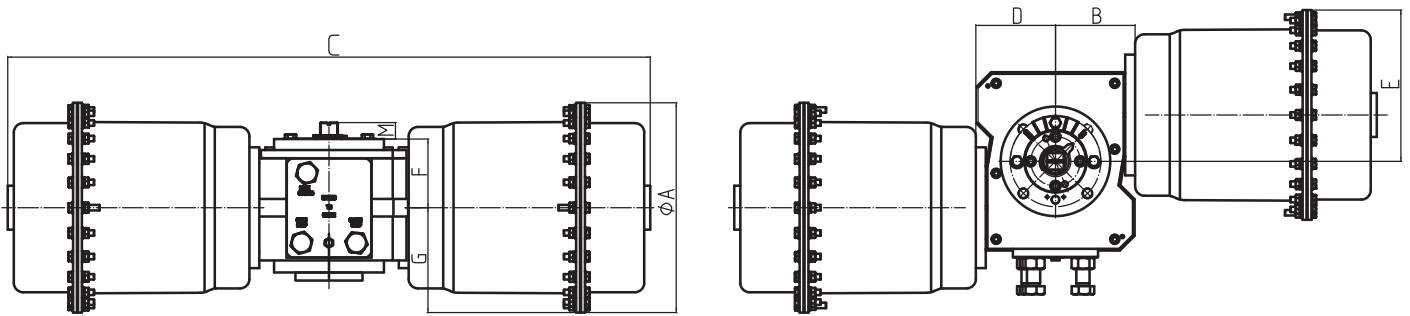


Dimension

ASD2, ASD3, ASD4, ASD5 dimensions



ASD6 dimensions

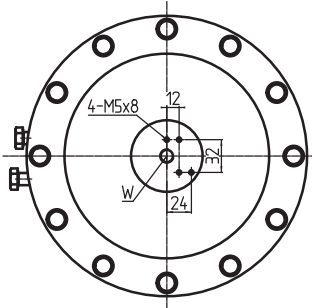


Actuator Size	Approximate dimensions (mm)							
	ØA	B	C	D	E	F	G	M
ASD-2	227	75	440	91	148	52	114	20
ASD-3	274	98	520	119	190	56	137	20
ASD-4	320	108	592	140	216	75	160	20
ASD-5	382	130	721	160	276	90	191	20
ASD-6	382	145	1170	145	276	125	191	30

Actuator Size	Approximate dimensions (in)							
	ØA	B	C	D	E	F	G	M
ASD-2	8.94	2.95	17.32	3.58	6.14	2.05	4.49	0.8
ASD-3	10.79	3.85	20.47	4.69	7.48	2.20	5.39	0.8
ASD-4	12.60	4.25	23.31	5.51	8.50	2.95	6.30	0.8
ASD-5	15.04	5.12	28.39	6.30	10.87	3.54	7.52	0.8
ASD-6	15.04	5.71	46.06	5.71	10.87	4.90	7.52	1.18



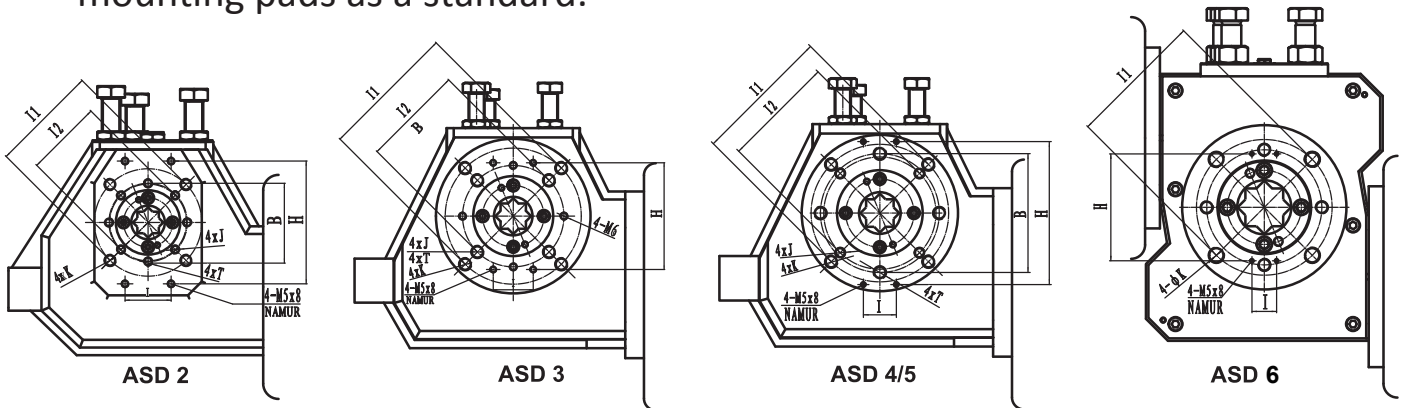
Air Port and Namur Connection



Actuator	Air Port (W)
ASD2	3/8 " or 1/4" FNPT NAMUR and 1/2" FNPT on request"
ASD3	3/8 " or 1/4" FNPT NAMUR and 1/2" FNPT on request"
ASD4	3/8 " or 1/4" FNPT NAMUR and 1/2" FNPT on request"
ASD5	3/8 " or 1/4" FNPT NAMUR and 1/2" FNPT on request"
ASD6	3/8 " or 1/4" FNPT NAMUR and 1/2" FNPT on request"

Mounting Dimensions

The ACHEM Spring-Diaphragm Rotary Actuator mounting dimensions are made to ISO 5211 standards and all our actuators come with Namur mounting pads as a standard.



Unit: in (mm)

Actuator Size	ISO 5211 Mount				Jb* Mount		Namur (VDI/VDE 3845)	
	ØI1	K	ØI2	J	ØB	T	H	I
ASD2	2.76 (F07)	M8X13	1.97 (F05)	M6X10	2.00 (51)	1/4-20unc-2B	3.15 (80)	1.18 (30)
ASD3	4.02 (F10)	M10X16	2.76 (F07)	M8X13	3.00 (76)	3/8-16unc-2B	3.15 (80)	1.18 (30)
ASD4	4.92 (F12)	M12X20	4.02 (F10)	M10X16	4.25 (108)	1/2-13unc-2B	5.12 (130)	1.18 (30)
ASD5	5.51 (F14)	M16X25	4.02 (F10)	M10X16	4.25 (108)	1/2-13unc-2B	5.12 (130)	1.18 (30)
ASD6	6.50 (F16)	M20X25	-	-	-	-	5.12 (130)	1.18 (30)

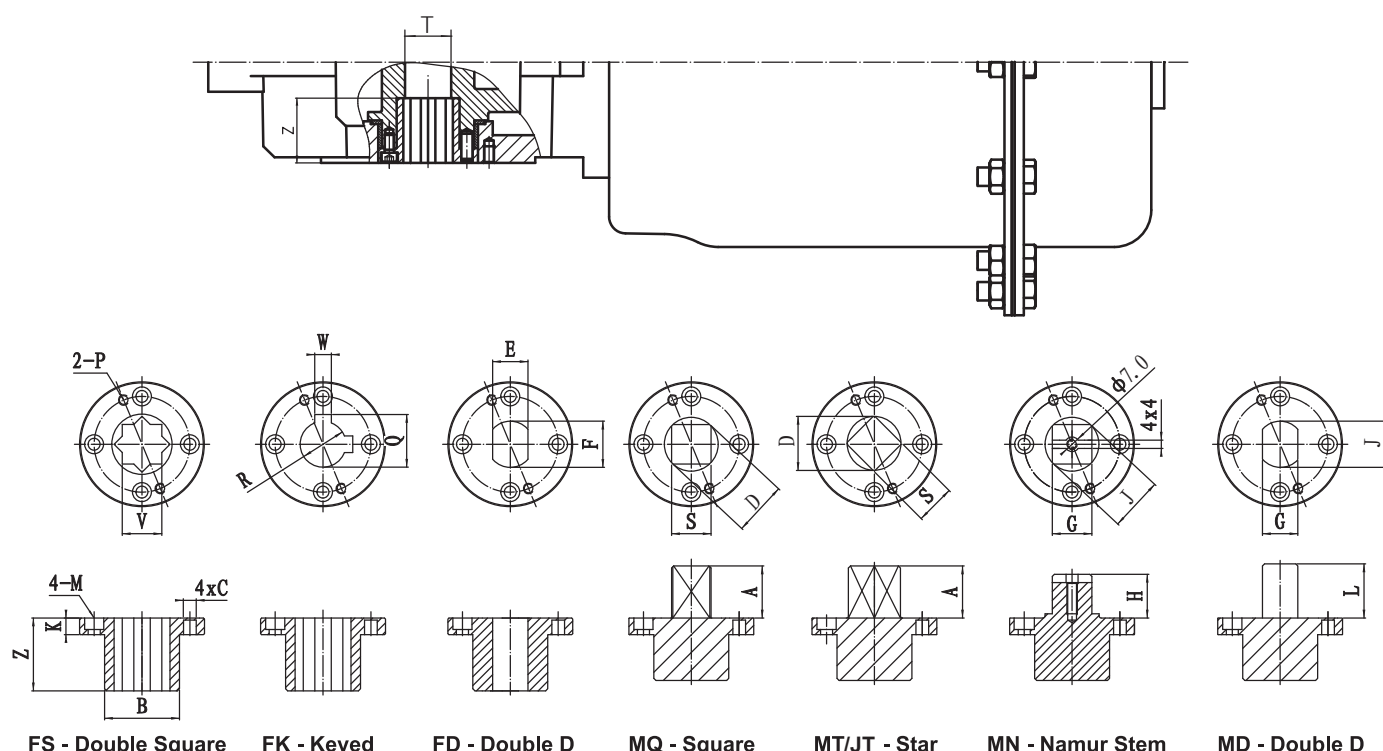
*Jamesbury flange mount dimensions.

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



Bushing Dimensions *

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



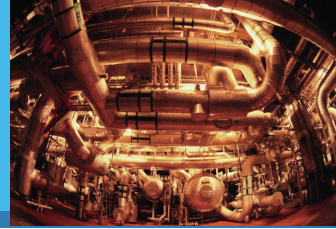
Unit: in (mm)

Size	Female drive						Male drive									
	Double Square (FS)	Keys (FK)			Double D (FD)		Square / ISO 5211 Star (MQ / MT)			JB Star (JT**)			Namur / Double D (MN / MD)			
	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(25)	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)	0.79(20)	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)	0.79(20)	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)	M4x8	0.16 (4)	0.79(20)
ASD3	1.42(36)	0.31(8)	1.38 (35)	M5x10	0.24 (6)	0.98(25)
ASD4	1.97(50)	0.39(10)	1.77 (45)	M6x12	0.31 (8)	1.46(37)
ASD5	2.20(56)	0.47(12)	2.17 (55)	M8x14	0.39 (10)	1.65(42)
ASD6	2.83(72)	0.59(15)	3.23 (82)	M12x16	0.49 (12)	2.56(65)

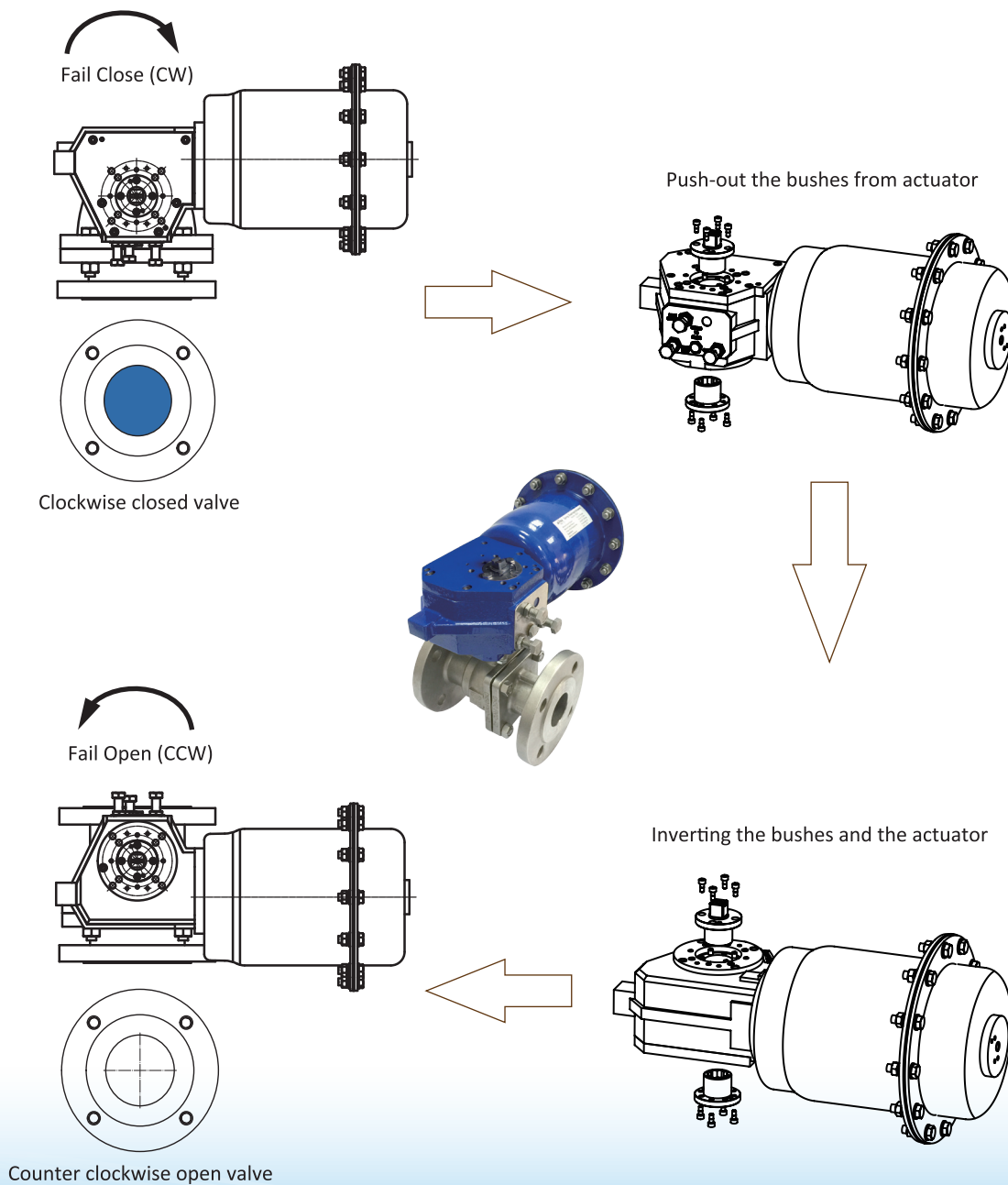
* It is available to customize the drive type.

** These dimensions are exactly the same as the industry common mount dimensions (JB).



Fail-close to Fail-open

As for ACHEM series actuators, Fail-close or Fail-open operation can be quickly changed in the field by simply inverting bushings and the actuator.





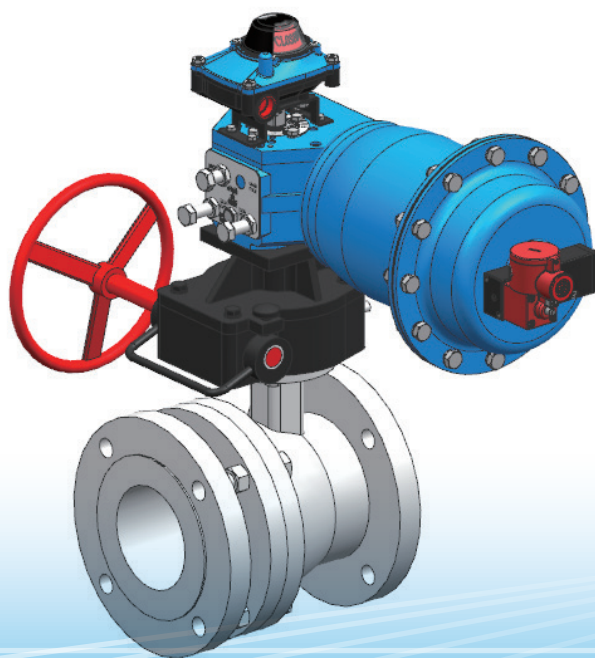
Manual Override

A manual override is available for all models of our series actuators and all of our manual overrides can be used with any of our drive bushings.

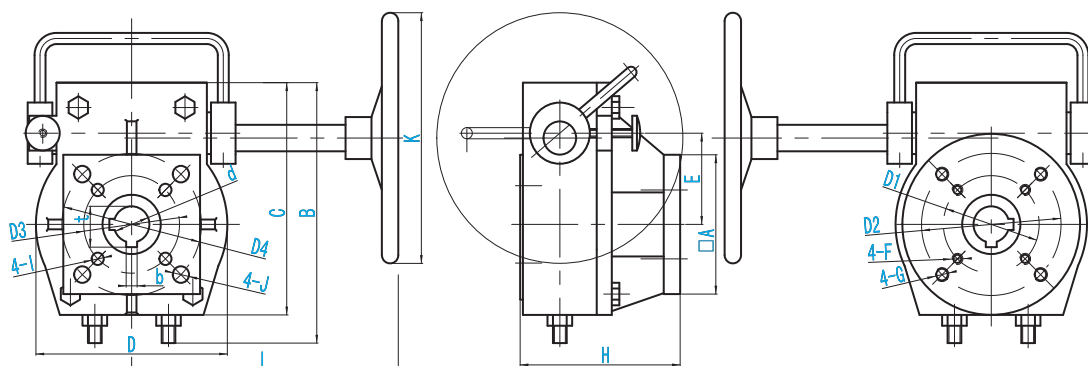
ACHEM has the ability to customize our manual overrides to work in various directions and can be mounted in different ways. Please consult our factory for more information about our overrides and mounting capabilities.

Override Guide

NO.	Actuator	Manual Override	Gear Ratio	Input Torque(Nm)	Output Torque(Nm)	Weight(Kg)
1	ASD-2	ALXL 26-1	26:1	70 (620 in.lbs)	300 (2655 in.lbs)	4 (8.8 lb)
2	ASD-3	ALXL 38-1	38:1	60 (531 in.lbs)	550 (4868 in.lbs)	5.5 (12.1 lb)
3	ASD-4	ALXL 38-2	38:1	60 (531 in.lbs)	550 (4868 in.lbs)	5.5 (12.1 lb)
4	ASD-5	ALXL 54-1	54:1	120 (1062 in.lbs)	1200 (10620 in.lbs)	9 (19.8 lb)
5	ASD-6	ALXL 98-1	98:1	300 (2655 in.lbs)	9000 (79650 in.lbs)	135 (297 lb)



ALXL series Manual Override Approximate Dimensions



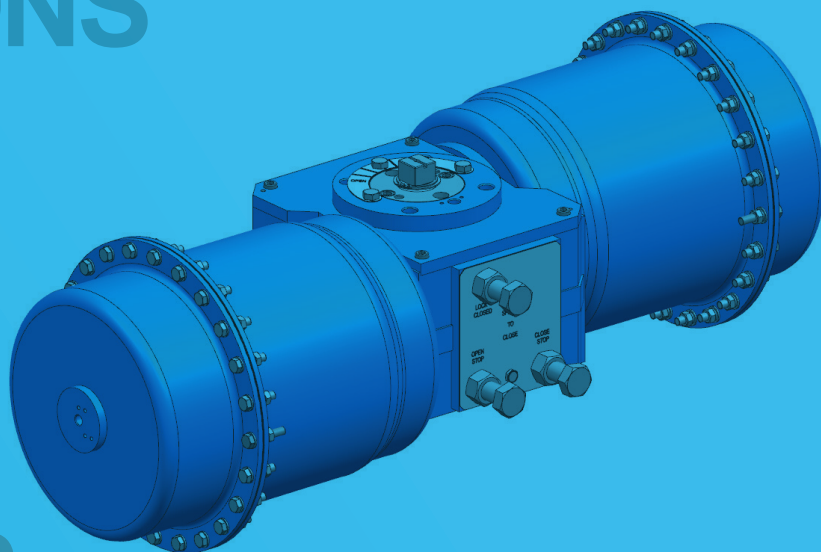
Unit:mm

Model	d	b	t	D1	F	D2	G	A	H	E	D3	I	D4	J	K	L	B	C	D
ALXL26-1	22	6	24.8			70	M8	70	99	50.5			70	Φ9	Φ180	155	160	145	105
ALXL38-1	26	8	29.3	70	M8			100	117	65.5	70	Φ9			Φ200	195	187	167	140
ALXL38-2	38	10	41.3			102	M10	110					102	Φ12					
ALXL54-1	38	10	41.3	125	M12			130	118	85.5	125	Φ14			Φ280	205	232	212	175
ALXL98-1	80	22	85.6	165	M20			230	195	229	165	Φ22			Φ800	410	550	530	460

Unit:in

Model	d	b	t	D1	F	D2	G	A	H	E	D3	I	D4	J	K	L	B	C	D
ALXL26-1	0.87	0.24	0.98			2.76	M8	2.76	3.90	1.99			2.76	Φ0.35	Φ7.09	6.10	6.30	5.71	4.13
ALXL38-1	1.02	0.31	1.15	2.76	M8			3.94	4.61	2.58	2.76	Φ0.35			Φ7.87	7.68	7.36	6.57	5.51
ALXL38-2	1.50	0.39	1.63			4.02	M10	4.33					4.02	Φ0.47					
ALXL54-1	1.50	0.39	1.63	4.92	M12			5.12	4.65	3.77	4.92	Φ0.55			Φ11.02	8.07	9.13	8.35	6.89
ALXL98-1	3.15	0.87	3.37	6.50	M20			9.06	7.68	9.02	6.50	Φ0.87			Φ31.50	16.14	21.65	20.87	18.11

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