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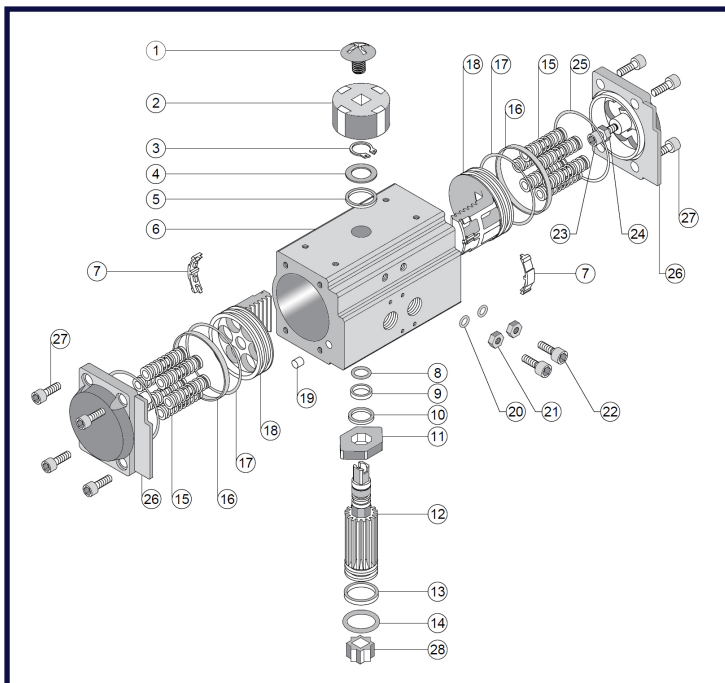
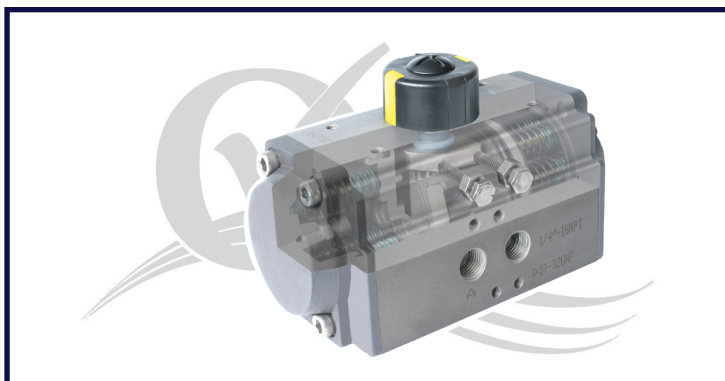
The pneumatic rack & pinion actuator is manufactured using the latest materials and methods to provide dependable and smooth operation in demanding process control conditions.

aero² DESIGN FEATURES

- ✓ Hard Anodized aluminum housing
- ✓ "Versa-View" Continuous mechanical position indicator
- ✓ Nickel Plated Alloy drive shaft
- ✓ ISO/NAMUR design for universal mounting and accessory attachment
- ✓ Bi-Directional Stroke Adjustment
- ✓ 1/4" NPT air inlet manifold
- ✓ Actuator is designed for 120 psi supply air pressure
- ✓ Optional 304 SS and 316 SS material available - Consult SVF

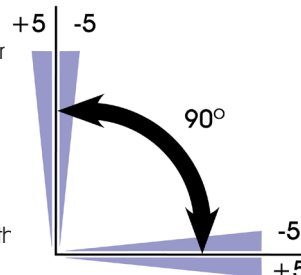
MATERIALS OF CONSTRUCTION

ITEM	DESCRIPTION	MATERIALS SPECIFICATIONS
1	Indicator Cap Screw	Plastic/Stainless Steel
2	Position Indicator	Plastic (ABS)
3	Pinion Snap Ring	Stainless Steel 300 Series
4	Thrust Washer	Stainless Steel 300 Series
5	Thrust Bearing	Polyoxymethylene (Delrin®)
6	Body	Extruded Aluminum Alloy
7	Piston Guide	Polyoxymethylene (Delrin®)
8	O-Ring (Pinion Top)	Buna "N" (standard), Viton®
9	Bearing (Pinion Top)	Polyoxymethylene (Delrin®)
10	Inside Washer	Polyoxymethylene (Delrin®)
11	Stroke Adjustment Stop	Alloy Steel
12	Pinion (Drive Shaft)	Nickel Plated Alloy Steel
13	Bearing (Pinion Bottom)	Polyoxymethylene (Delrin®)
14	O-Ring (Pinion Bottom)	Buna "N" (standard), Viton®
15	Spring (Cartridge)	Spring Steel (Corrosion Resistant)
16	Bearing (Piston)	Polyoxymethylene (Delrin®)
17	O-Ring (Piston)	Buna "N" (standard), Viton®
18	Piston	Aluminum
19	Plug	NBR
20	O-Ring (Adjust Screw)	Buna "N" (standard), Viton®
21	Stop Nut (Adjust Screw)	Stainless Steel 300 Series
22	Adjust Screw	Stainless Steel 300 Series
23	Stop Screw	Stainless Steel 300 Series
24	Nut (Stop Screw)	Stainless Steel 300 Series
25	O-Ring (End Cap)	Buna "N" (standard), Viton®
26	End Cap	Aluminum
27	End Cap Screw	Stainless Steel 300 Series



BI-DIRECTIONAL STROKE ADJUSTMENT

aero² actuators feature bi-directional pinion travel stops. These stops allow for true +/-5° for valve travel adjustment to ensure precise positioning in all flow control services. The aero² travel stops are designed to absorb the maximum rated torque of the actuator and the maximum impact loads associated with the recommended stroke speed.



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SVF Flow Controls, Inc. • 13560 Larwin Circle • Santa Fe Springs, CA 90670 • Tel: 1.800.783.7836 • FAX: 562.802.3114
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High Performance Compact Pneumatic Actuators



aero² DIMENSIONAL TABLE (INCHES)

Model	A	B	C	D	E	F	G	H	J	K	L sq N (Depth)	
10	1.12	1.44	3.15	4.80	3.15	1.18	F03/1.42	F05/1.97	#10-32UNF	1/4"-20UNC	0.43	0.55
20	1.18	1.63	3.62	5.79	3.15	1.18	F03/1.42	F05/1.97	#10-32UNF	1/4"-20UNC	0.43	0.55
35	1.42	1.85	4.23	6.61	3.15	1.18	F05/1.97	F07/2.76	1/4"-20UNC	5/16"-18UNC	0.55	0.71
50	1.65	2.09	4.70	7.24	3.15	1.18	F05/1.97	F07/2.76	1/4"-20UNC	5/16"-18UNC	0.55	0.71
75	1.81	2.24	5.07	8.04	3.15	1.18	F05/1.97	F07/2.76	1/4"-20UNC	5/16"-18UNC	0.67	0.83
110	1.97	2.30	5.39	10.31	3.15	1.18	F05/1.97	F07/2.76	1/4"-20UNC	5/16"-18UNC	0.67	0.83
160	2.26	2.52	6.02	10.55	3.15	1.18	F07/2.75	F10/4.02	5/16"-18UNC	3/8"-16UNC	0.87	1.02
255	2.66	2.93	6.89	11.65	3.15	1.18	F07/2.75	F10/4.02	5/16"-18UNC	3/8"-16UNC	0.87	1.02
400	2.95	3.03	7.54	15.35	3.15	1.18	F10/4.02	F12/4.92	3/8"-16UNC	1/2"-13UNC	1.06	1.22
500	3.43	3.43	8.54	18.03	3.15	1.18	F10/4.02	F12/4.92	3/8"-16UNC	1/2"-13UNC	1.06	1.22
550	4.06	4.06	9.84	20.79	5.12	1.18	-	F14/5.51	-	5/8"-11UNC	1.42	1.57
600	4.45	4.45	11.22	22.20	5.12	1.18	-	F14/5.51	-	5/8"-11UNC	1.42	1.57
650	5.12	5.12	12.55	23.70	5.12	1.18	-	F16/6.49	-	3/4"-10UNC	1.81	1.97
700	5.79	5.79	14.01	27.80	5.12	1.18	-	F16/6.49	-	3/4"-10UNC	1.81	1.97

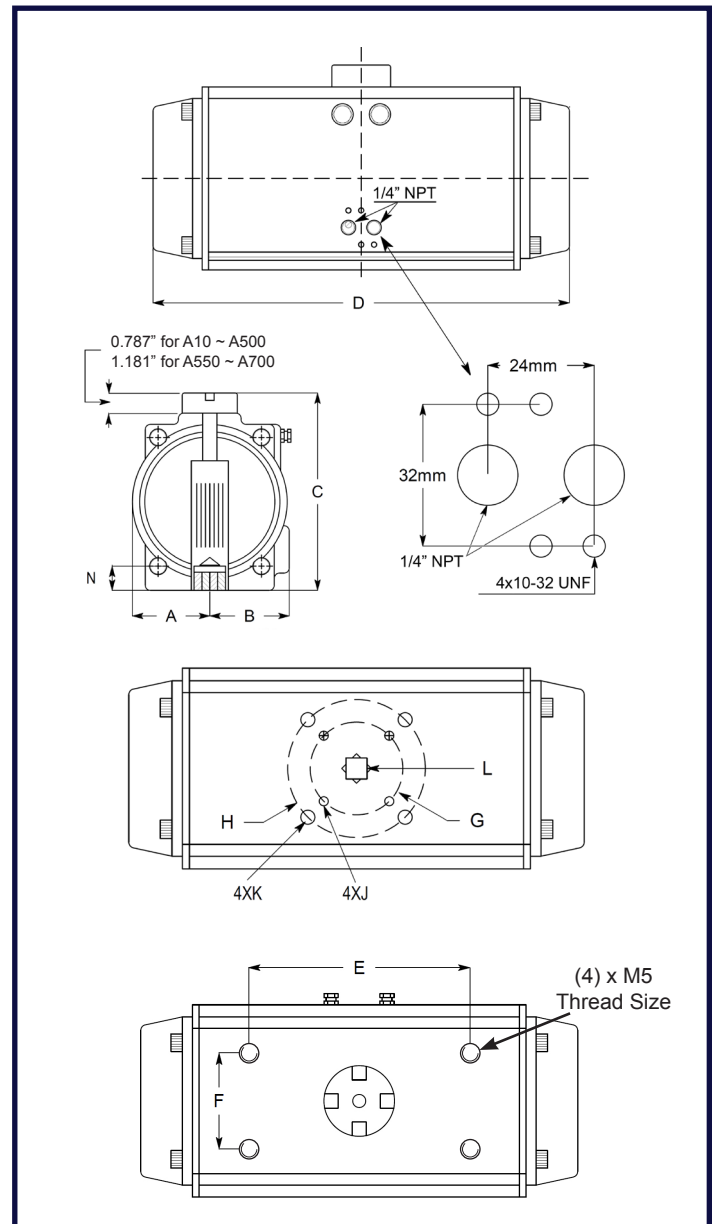
aero² - WEIGHTS

Model	A2D		A2S	
	lbs	kg	lbs	kg
10	2	1	-	-
20	3	1	3	1
35	4	2	4	2
50	6	2	6	2
75	7	3	7	3
110	10	4	12	5
160	13	5	14	6
255	19	9	22	10
400	25	14	29	16
500	36	22	44	26
550	70	31	78	35
600	76	35	85	39
650	106	48	135	61
700	163	74	216	98

HOW TO ORDER *aero²* ACTUATORS

Series	Model	Springs	Seals	Options
A2D = Double Acting	10†	Blank = Double Acting	B = Buna "N" (Standard)	Blank = 90° Turn operation (Standard)
A2S = Spring Return	35	5	V = Viton® (Optional)	180 = 180° Turn operation (Double Acting Only)
A2DNI = Double Acting with Nickel Infused Aluminum Housing	75 110 160 255 400	6 7 8 9		
A2SNI = Spring Return with Nickel Infused Aluminum Housing	500 550 600 650 700	10* 11 12		
A2SEP = Spring Return with Epoxy Coated Aluminum Housing		(*10 Springs are standard)		
A2DEP = Double Acting with Epoxy Coated Aluminum Housing				
Order Example:				
(A2D-20-10-V) Spring Return Model 20, 10 Springs, Viton Seals, 90° Operation				
A2D Series	20 Model	10 Springs	V Viton Seals	

†Series A2D-10 is only available as a Double Acting Actuator.



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High Performance Compact Pneumatic Actuators



aero² SPRING RETURN OUTPUT TORQUES (in-lbf)

OUTPUT AIR TO SPRING Models A2S-20 ~ A2S-255 See Next Page for Spring Return Models A2S400 ~ A2S700 and Double Acting Torque

		<< SUPPLY PRESSURE >>						SPRING OUTPUT	
		60 psig		70 psig		80 psig			
MODEL	SPRING QTY	0° START	90° END	0° START	90° END	0° START	90° END	90° START	0° END
A2S-20	8	84	55	113	78	140	114	87	60
	9	76	44	105	67	133	104	98	67
	10	68	33	98	57	126	94	109	75
	11	60	21	91	46	119	84	120	82
	12			83	36	112	74	131	90
A2S-35	8	167	114	218	169	267	220	148	97
	9	154	95	206	151	255	203	166	109
	10	135	75	195	133	244	186	185	121
	11			184	115	234	169	203	133
	12			171	97	222	152	222	145
A2S-50	8	211	155	284	231	352	301	205	149
	9	192	129	266	206	335	278	231	168
	10	174	102	246	181	318	254	256	187
	11			231	157	301	231	282	205
	12			213	132	284	207	308	224
A2S-75	8	342	237	454	355	560	466	326	224
	9	313	195	426	316	534	429	367	252
	10	284	152	400	276	508	391	407	280
	11			373	237	483	353	448	308
	12			345	198	456	316	489	336
A2S-110	8	484	323	646	495	799	655	487	331
	9	441	260	606	436	761	599	548	372
	10	399	197	566	377	723	543	608	413
	11			525	318	685	487	669	454
	12			486	260	647	432	730	496
A2S-160	8	747	490	980	740	1,203	974	697	448
	9	689	400	927	656	1,152	894	784	504
	10	631	306	872	569	1,100	811	871	560
	11			818	487	1,048	733	958	616
	12			764	406	997	656	1,045	672
A2S-255	8	1,071	689	1,429	1,072	1,770	1,429	1,110	740
	9	976	541	1,340	934	1,685	1,298	1,249	832
	10	880	402	1,251	804	1,600	1,174	1,387	925
	11			1,161	666	1,514	1,043	1,530	1,017
	12			1,072	536	1,429	919	1,665	1,110



High Performance Compact Pneumatic Actuators



aero² SPRING RETURN OUTPUT TORQUES (in-lbf)

OUTPUT AIR TO SPRING Models A2S-400 ~ A2S-700

See Previous Page for Spring Return Models A2S20 ~ A2S255

		<< SUPPLY PRESSURE >>						SPRING OUTPUT	
		60 psig		70 psig		80 psig			
MODEL	SPRING QTY	0° START	90° END	0° START	90° END	0° START	90° END	90° START	0° END
A2S-400	8	1,878	1,244	2,485	1,892	3,063	2,498	1,826	1,211
	9	1,713	1,009	2,331	1,673	2,916	2,290	1,054	1,370
	10	1,557	765	2,185	1,446	2,777	2,073	2,283	1,522
	11			2,039	1,226	2,638	1,864	2,510	1,673
	12			1,892	1,007	2,498	1,655	2,741	1,824
A2S-500	8	2,826	1,818	3,777	2,022	4,680	3,782	2,949	1,977
	9	2,566	1,435	3,533	2,477	4,448	3,442	3,321	2,225
	10	2,313	1,052	3,297	2,120	4,223	3,102	3,691	2,472
	11			3,062	1,771	3,999	2,769	4,056	2,719
	12			2,818	1,413	3,767	2,429	4,422	2,966
A2S-550	8	4,861	3,261	6,359	4,865	7,789	6,366	4,380	2,833
	9	4,496	2,696	6,018	4,337	7,464	5,863	4,927	3,186
	10	4,131	2,131	5,677	3,809	7,139	5,360	5,473	3,540
	11			5,336	3,281	6,814	4,858	6,020	3,893
	12			4,995	2,753	6,490	4,355	6,566	4,246
A2S-600	8	5,714	4,174	7,610	6,172	9,413	8,044	5,381	3,893
	9	5,209	3,479	7,139	5,523	8,965	7,426	6,053	4,380
	10	4,705	2,783	6,668	4,873	8,516	6,807	6,726	4,868
	11			6,169	4,223	8,068	6,188	7,399	5,356
	12			5,726	3,574	7,619	5,569	8,071	5,843
A2S-650	8	8,079	5,975	10,834	8,869	13,451	11,579	7,844	5,810
	9	7,323	4,957	10,128	7,919	12,778	10,674	8,828	6,541
	10	6,575	3,948	9,429	6,976	12,113	9,777	9,803	7,264
	11			8,731	6,026	11,448	8,872	10,787	7,987
	12			8,024	5,076	10,775	7,967	11,771	8,719
A2S-700	8	13,219	9,897	17,348	14,245	21,286	18,332	11,132	7,920
	9	12,193	8,453	16,389	12,897	20,374	17,048	12,527	8,912
	10	11,167	7,018	15,431	11,557	19,461	15,771	13,914	9,904
	11			14,473	10,209	18,548	14,487	15,310	10,896
	12			13,523	8,869	17,643	13,211	16,697	11,880

DOUBLE ACTING TORQUE (in-lbf)

ACTUATOR MODEL	Supply Pressure (psig)		ACTUATOR MODEL	Supply Pressure (psig)	
	60 psig	80 psig		60 psig	80 psig
A2D-10	85	115	A2D-255	1,833	2,450
A2D-20	146	195	A2D-400	3,133	4,177
A2D-35	267	356	A2D-500	4,873	6,497
A2D-50	368	490	A2D-550	7,797	10,396
A2D-75	574	766	A2D-600	9,746	12,995
A2D-110	827	1,103	A2D-650	14,097	18,796
A2D-160	1,211	1,615	A2D-700	21,430	28,565

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High Performance Compact Pneumatic Actuators



aero² ACTUATOR SIZING GUIDE

Selecting the correct Actuator (Sizing)

The output torques for each actuator model are listed in the Torque Tables (Pages 3 and 4). These values do not include a safety factor. For best results we recommend selecting an actuator model with a minimum output torque that is greater than the highest operating torque of the valve to be actuated, **plus 10%**.

Example for Double Acting (DA) Actuator Sizing:

Published Valve Torque: 300 in-lbs (plus 10% safety factor = 330 in-lbf)
 Air Supply: 80 psig
 aero2 Model: A2D-35

The A2D-35 has the output torque value of 356 in-lbf @ 80 psig.

Example for Spring Return (SR) Actuator Sizing:

Published Valve Torque: 300 in-lbs (plus 10% safety factor = 330 in-lbf)
 Air Supply: 80 psig
 aero2 Model: A2S-110 (10 Springs - Standard)

The A2S-110 has the following output torque values @ 80 psig:

Air End: 543 in-lbf
 Spring End: 413 in-lbf

Sizing Safety Factors

Media and other conditions can effect the operating torque of a valve. Following is a list of common Safety Factors.

MEDIA	SAFETY FACTOR
Basic Value	1.0
Liquid, clean (particle free)	1.0
Gas, clean and wet (saturated steam)	1.0
Gas, dry (superheated steam)	1.3
Gas, dirty (natural gas)	1.5
Oxygen, Chlorine	1.5
Liquid, dirty (slurry), raw water	1.8
Paste/Paint	1.8

An aero2 Actuator Sizing Guide configurator is available on our website: www.SVF.net/aero2_actuator_sizing.php