



Scan the barcode with your SmartPhone app to read more about our entire line of *aero²* pneumatic actuators.

The **aero²-NiEX** is a unique nickel infused actuator that employs an Autocatalytic Nickel Infusion (ACNi) process to deliver a uniquely effective corrosion resistant actuator for use in aggressive environments, under high humidity and in application areas where an attractive longlasting surface finish is desirable.

Q What is NiEX?

An Autocatalytic Nickel Infusion process that does not require rectifiers, electrical currents or anodes as in electroplating processes.

Q What is so unique in the NiEX Actuator?

The Nickel bath makes it possible to uniformly treat all internal and external surfaces of the actuator cylinder housing and other treated components. The uniformity of a deposit thickness is extremely difficult by any other methods currently available.

Since all surfaces are wetted by the solution the deposit thickness is uniform and controlled to within one (1) micron.

Q What is a ‘Nickle Bath’?

The nickel bath is a dense alloy of both nickel and phosphorous. The amount of phosphorous varies depending upon the formulation of the bath solution. The deposition process is autocatalytic.

Q What is the ‘Autocatalytic’ process?

In the deposition process once the primary layer of nickel has formed on the substrate, that layer and each subsequent layer becomes the catalyst that causes the continuous reactions that result in the ‘uniform’ thickness required.

Q What criteria were used to develop the NiEX actuator?

SVF Flow Controls, Inc. is a leader in innovative process solutions. Our customer base includes many of the largest companies on the world market today. These clients have provided us with their “wish list” of performance and appearance parameters. The result is this **aero²-NiEX** actuator.

The criteria included:

- ✓ Corrosion resistance
- ✓ Wear resistance
- ✓ Hardness
- ✓ Lubricity
- ✓ Uniformity of deposit regardless of geometrics
- ✓ Non-magnetic properties of phosphorous nickel alloy
- ✓ No sparking properties
- ✓ Nickel density surface finish averages Ra 10
- ✓ Appealing “Silver-Nickel” and long-lasting surface finish



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	7	-	-
20	3	7	3	7
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

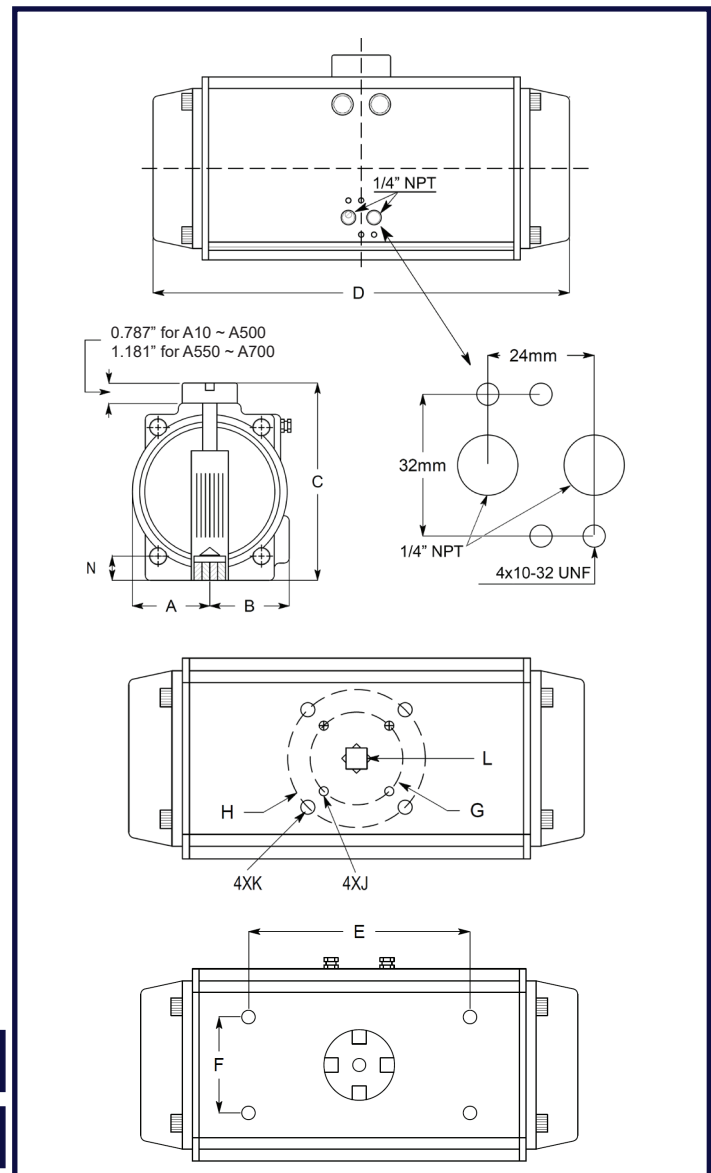
HOW TO ORDER *aero2* ACTUATORS

Series	Model	Springs	Seals	Options
A2D = Double Acting	10†	Blank =	Blank =	180 =
A2S = Spring Return	20	Double Acting	Buna "N" (standard)	180° operation (Double Acting Only)
	35	5		
A2DNI =	50	6	V =	
Double Acting with	75	7	Viton® (optional)	
Nickel Infused Aluminum Housing	110	8		
	160	9		
	255	10*		
A2SNI =	400	11		
Spring Return with	500	12		
Nickel Infused Aluminum Housing	550			
	600			
	650			
	700			

†Series A2D-10 is only available as a Double Acting Model and not available with Viton Seals or the 180° operation option.

Order Example for Model 20 Double Acting, 180° Operation: = **A2D-20-180**
 A2D — 20 — — — 180

Order Example for Model 20 Spring Return, with 10 Springs: = **A2S-20-10-V**
 A2S — 20 — 10 — V (optional Viton® Seals)



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High Performance Compact Pneumatic Actuators



aero² SPRING RETURN OUTPUT TORQUES (in-lbf)

A2S-20 ~ A2S-255		OUTPUT AIR TO SPRING														Continued on next page>>	
SUPPLY PRESSURE (psig) >>		40		50		60		70		80		90		100		SPRING OUTPUT	
MODEL	SPRING QTY	0° START	90° END	0° START	90° END	0° START	90° END	0° START	90° END	0° START	90° END	0° START	90° END	0° START	90° END	90° START	0° END
A2S-20	5	55	37	77	58											55	38
	6	48	24	70	46	924	78									66	45
	7	39	13	61	34	90	67	120	89							77	52
	8			53	20	84	55	113	78	140	114					87	60
	9			44	8	76	44	105	67	133	104	160	132			98	67
	10					68	33	98	57	126	94	153	122			109	75
	11					60	21	91	46	119	84	146	113	172	140	120	82
	12							83	36	112	74	139	95	166	130	131	90
A2S-35	5	111	75	153	116	204	137									92	61
	6	98	55	138	95	191	152	242	205							111	72
	7	84	35	127	73	179	133	229	187							129	85
	8			111	52	167	114	218	169	267	220	315	269			148	97
	9					154	95	206	151	255	203	304	253			166	109
	10					13	75	195	133	244	186	293	236	341	286	185	121
	11							184	115	234	169	283	220	330	270	203	133
	12							171	97	222	152	271	204	320	254	222	145
A2S-50	5	141	103	197	158	270	235									128	93
	6	121	74	176	128	251	208	321	280							154	112
	7	101	47	155	99	232	182	303	256							179	131
	8			133	69	211	155	284	231	352	301	418	369			205	149
	9					192	129	266	206	335	278	402	347			231	168
	10					174	102	246	181	318	254	386	324	451	391	256	187
	11							231	157	301	231	369	301	435	369	282	205
	12							213	132	284	207	353	278	419	346	308	224
A2S-75	5	227	157	317	244	428	364									204	140
	6	196	112	285	196	400	321	508	434							244	168
	7	166	67	252	151	371	279	481	395							285	196
	8			221	103	342	237	454	355	560	466	663	572			326	224
	9					313	195	426	316	534	429	638	536			367	252
	10					284	152	400	276	508	391	613	500	715	605	407	280
	11							373	237	483	353	588	464	691	570	448	308
	12						345	198	456	316	563	428	667	536	489	336	
A2S-110	5	322	214	450	338	612	511									304	207
	6	277	148	403	269	569	449	725	612							365	248
	7	231	80	355	197	526	385	685	553							426	289
	8			319	128	484	323	646	495	799	655	947	808			487	331
	9					441	260	606	436	761	599	911	755			548	372
	10					399	197	566	377	723	543	874	700	1,022	853	608	413
	11							525	318	685	487	837	647	986	801	669	454
	12						486	260	647	432	800	593	950	749	730	496	
A2S-160	5	497	325	687	508	921	760									436	280
	6	435	229	622	407	862	670	1,008	908							523	336
	7	374	133	559	308	805	580	1,035	824							610	392
	8			494	208	747	490	980	740	1,203	974	1,419	1,198			697	448
	9					689	400	927	656	1,152	894	1,370	1,122			784	504
	10					631	306	872	569	1,100	811	1,320	1,041	1,535	1,264	871	560
	11							818	487	1,048	733	1,270	966	1,486	1,191	958	616
	12						764	406	997	656	1,221	892	1,439	1,119	1,045	672	
A2S-255	5	712	453	1,000	729	1,358	1,115									698	462
	6	610	305	893	574	1,263	976	1,608	1,340							832	555
	7	509	148	787	410	1,167	828	1,519	1,202							971	647
	8			681	255	1,071	689	1,429	1,072	1,770	1,429	2,100	1,772			1,110	740
	9					976	541	1,340	934	1,685	1,298	2,018	1,645			1,249	832
	10					880	402	1,251	804	1,600	1,174	1,936	1,526	2,264	1,865	1,387	925
	11							1,161	666	1,514	1,043	1,854	1,399	2,184	1,742	1,530	1,017
	12						1,072	536	1,429	919	1,772	1,280	2,105	1,626	1,665	1,110	

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High Performance Compact Pneumatic Actuators



aero² SPRING RETURN OUTPUT TORQUES (in-lbf)

A2S-400 ~ A2S-700		OUTPUT AIR TO SPRING																<< See also previous page	
SUPPLY PRESSURE (psig) >>		40		50		60		70		80		90		100		SPRING OUTPUT			
MODEL	SPRING QTY	0° START	90° END	0° START	90° END	0° START	90° END	0° START	90° END	0° START	90° END	0° START	90° END	0° START	90° END	90° START	0° END		
A2S-400	5	1,246	823	1,737	1,296	2,346	1,948									1,143	759		
	6	1,082	573	1,566	1,035	2,192	1,713	2,778	2,331							1,370	908		
	7	916	324	1,392	773	2,035	1,478	2,631	2,112							1,598	1,059		
	8			1,218	512	1,878	1,244	2,485	1,892	3,063	2,498	3,624	3,080			1,826	1,211		
	9					1,713	1,009	2,331	1,673	2,916	2,290	3,483	2,879			1,054	1,370		
	10					1,557	765	2,185	1,446	2,777	2,073	3,348	2,670	3,906	3,247	2,283	1,522		
	11							2,039	1,226	2,638	1,864	3,214	2,468	3,776	3,051	2,510	1,673		
12								1,892	1,007	2,498	1,655	3,080	2,267	3,645	2,855	2,741	1,824		
A2S-500	5	1,877	1,212	2,640	1,943	3,592	2,966									1,844	1,236		
	6	1,609	805	2,359	1,518	3,340	2,583	4,256	3,549							2,212	1,483		
	7	1,332	398	2,069	1,093	3,079	2,200	4,012	3,192							2,581	1,730		
	8			1,789	667	2,826	1,818	3,777	2,022	4,680	3,782	5,556	4,691			2,949	1,977		
	9					2,566	1,435	3,533	2,477	4,448	3,442	5,332	4,363			3,321	2,225		
	10					2,313	1,052	3,297	2,120	4,223	3,102	5,116	4,034	5,986	4,935	3,691	2,472		
	11							3,062	1,771	3,999	2,769	4,900	3,714	5,776	4,624	4,056	2,719		
12								2,818	1,413	3,767	2,429	4,676	3,386	5,559	4,305	4,422	2,966		
A2S-550	5	3,228	2,164	4,457	3,345	5,957	4,957									2,737	1,774		
	6	2,839	1,563	4,051	2,717	5,592	4,392	7,041	5,921							3,287	2,127		
	7	2,451	962	3,645	2,088	5,227	3,827	6,700	5,393							3,834	2,480		
	8			3,239	1,460	4,861	3,261	6,359	4,865	7,789	6,366	9,180	7,808			4,380	2,833		
	9					4,496	2,696	6,018	4,337	7,464	5,863	8,867	7,323			4,927	3,186		
	10					4,131	2,131	5,677	3,809	7,139	5,360	8,554	6,838	9,936	8,269	5,473	3,540		
	11							5,336	3,281	6,814	4,858	8,240	6,354	9,632	7,798	6,020	3,893		
12								4,995	2,753	6,490	4,355	7,927	5,869	9,327	7,327	6,566	4,246		
A2S-600	5	3,801	2,774	5,327	4,254	7,227	6,262									3,363	2,430		
	6	3,265	2,035	4,767	3,481	6,723	5,566	8,552	7,472							4,036	2,917		
	7	2,728	1,295	4,206	2,707	6,218	4,870	8,081	6,822							4,708	3,405		
	8			3,645	1,934	5,714	4,174	7,610	6,172	9,413	8,044	11,164	9,844			5,381	3,893		
	9					5,209	3,479	7,139	5,523	8,965	7,426	10,731	9,247			6,053	4,380		
	10					4,705	2,783	6,668	4,873	8,516	6,807	10,299	8,651	12,038	10,436	6,726	4,868		
	11							6,169	4,223	8,068	6,188	9,866	8,054	11,617	9,856	7,399	5,356		
12								5,726	3,574	7,619	5,569	9,434	7,457	11,197	9,276	8,071	5,843		
A2S-650	5	5,373	3,977	7,571	6,111	10,332	9,018									4,902	3,632		
	6	4,578	2,895	6,739	4,979	9,584	8,001	12,239	10,761							5,885	4,355		
	7	3,773	1,822	5,898	3,858	8,827	6,992	11,533	9,819							6,861	5,087		
	8			5,066	2,727	8,079	5,975	10,834	8,869	13,451	11,579	15,989	14,184			7,844	5,810		
	9					7,323	4,957	10,128	7,919	12,778	10,674	15,340	13,312			8,828	6,541		
	10					6,575	3,948	9,429	6,976	12,113	9,777	14,699	12,446	17,220	15,031	9,803	7,264		
	11							8,731	6,026	11,448	8,872	14,057	11,574	16,596	14,183	10,787	7,987		
12								8,024	5,076	10,775	7,967	13,408	10,701	15,966	13,335	11,771	8,719		
A2S-700	5	8,786	6,576	12,163	9,852	16,289	14,210									6,961	4,952		
	6	7,695	5,050	11,022	8,257	15,263	12,775	19,256	16,934							8,349	5,944		
	7	6,612	3,514	9,891	6,652	14,245	11,332	18,306	15,585							9,744	6,928		
	8			8,750	5,057	13,219	9,897	17,348	14,245	21,286	18,332	25,109	22,260			11,132	7,920		
	9					12,193	8,453	16,389	12,897	20,374	17,048	24,229	21,023			12,527	8,912		
	10					11,167	7,018	15,431	11,557	19,461	15,771	23,349	19,792	27,156	23,699	13,914	9,904		
	11							14,473	10,209	18,548	14,487	22,469	18,554	26,300	22,496	15,310	10,896		
12								13,523	8,869	17,643	13,211	21,597	17,324	25,452	21,300	16,697	11,880		

DOUBLE ACTING TORQUE (in-lbf)									
ACTUATOR MODEL	Supply Pressure (psig)				ACTUATOR MODEL	Supply Pressure (psig)			
	40	60	80	100		40	60	80	100
A2D-10	55	85	115	142	A2D-255	1,225	1,833	2,450	3,063
A2D-20	97	146	195	244	A2D-400	2,088	3,133	4,177	5,221
A2D-35	178	267	356	446	A2D-500	3,249	4,873	6,497	8,122
A2D-50	245	368	490	613	A2D-550	5,198	7,797	10,396	12,995
A2D-75	383	574	766	957	A2D-600	6,497	9,746	12,995	16,243
A2D-110	551	827	1,103	1,378	A2D-650	9,398	14,097	18,796	23,495
A2D-160	808	1,211	1,615	2,019	A2D-700	14,282	21,430	28,565	35,712

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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