



## SERIES S2: Stainless Steel Rack & Pinion Actuators

TRIAC® Series S2 Stainless Steel Rack & Pinion Actuators offer an economical solution to harsh chemical environments and the corrosion resistant requirements of the pharmaceutical, food, beverage, pulp and paper, and petrochemical industries.

- 316 SST body, pinion and pistons
- Dual Travel Stops, providing adjustment in both open and closed positions
- ISO 5211 mounting dimensions
- NAMUR accessory mounting
- Electropolish finish
- Double acting and spring return
- Permanently lubricated
- Standard working temperature -40°F to 175°F
- Maximum working pressure 150 psig



All Stainless  
Ball Valve Assemblies



Corrosion Resistant

# **AT** S2 Series

Stainless Steel  
Rack & Pinion Actuators

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## SERIES S2: Stainless Steel Rack & Pinion Actuators

### Double Acting Torque (In-Lbs)

Model	Air Supply (psi)				
	40	60	80	100	120
S2-052	88	132	176	220	264
S2-063	171	257	343	428	514
S2-083	337	505	674	842	1,010
S2-105	719	1,078	1,437	1,797	2,156
S2-125	1,120	1,680	2,241	2,801	3,361
S2-140	1,916	2,875	3,833	4,791	5,749
S2-160	2,920	4,380	5,840	7,300	8,760
S2-210	5,974	8,947	12,078	15,018	18,033

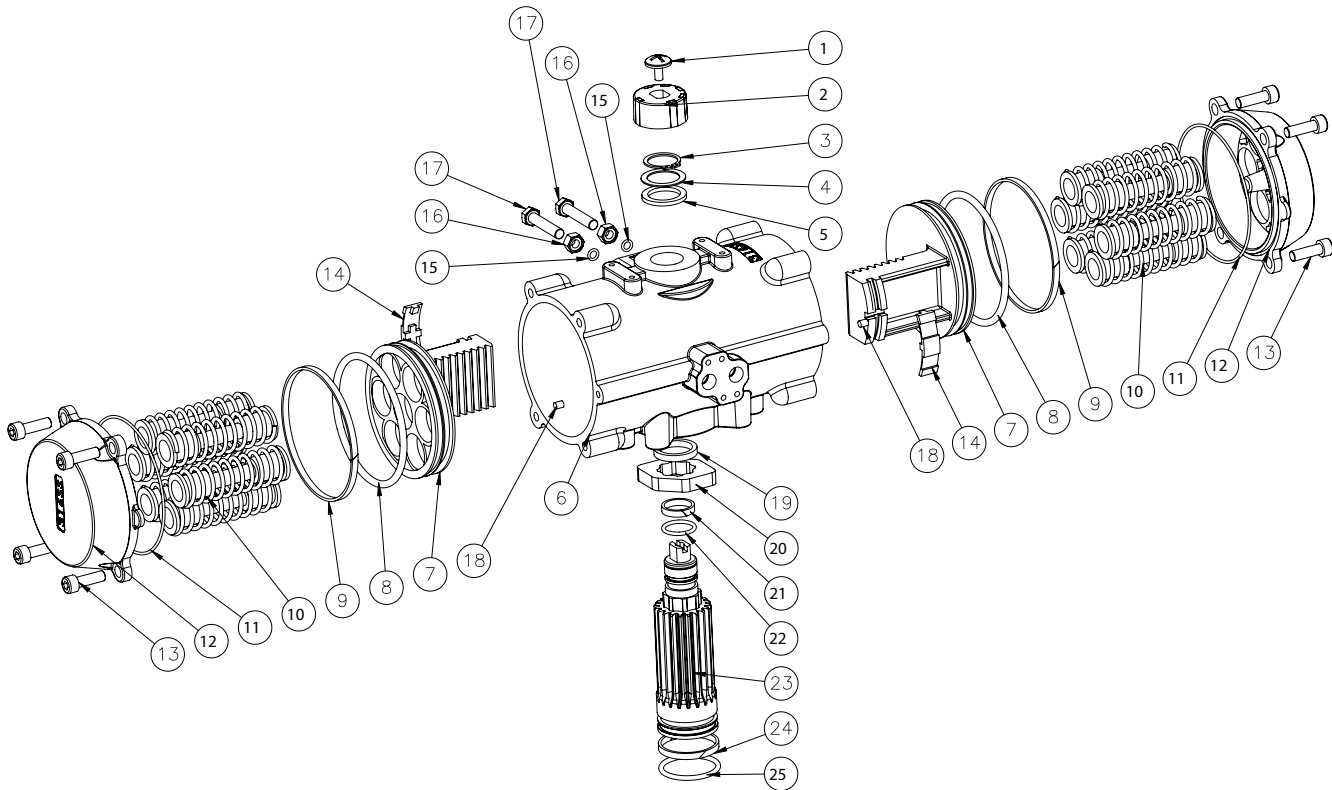


### Spring Return Torque (In-Lbs)

Model	Springs per Side	Air Supply									
		Spring Torque		40 psi		60 psi		80 psi		100 psi	
		End	Break	End	Break	End	Break	End	Break	End	Break
S2-052	3	44	65	23	44	67	88	111	132	155	177
	4	58	87	-	-	45	74	89	118	133	162
	5	73	109	-	-	-	-	67	103	111	147
	6	88	131	-	-	-	-	-	-	90	133
S2-063	3	72	115	56	99	142	185	228	271	313	356
	4	96	154	-	-	103	161	189	247	275	332
	5	120	192	-	-	-	-	151	223	236	308
	6	144	230	-	-	-	-	-	-	198	284
S2-083	3	171	247	90	166	258	334	427	503	595	671
	4	228	329	-	-	176	277	344	446	513	614
	5	285	412	-	-	-	-	262	389	430	557
	6	342	494	-	-	-	-	-	-	348	500
S2-105	3	341	469	249	378	609	737	968	1,097	1,327	1,456
	4	454	626	-	-	452	624	812	983	1,171	1,343
	5	568	782	-	-	-	-	655	870	1,015	1,229
	6	681	938	-	-	-	-	-	-	858	1,116
S2-125	3	570	826	294	551	855	1,111	1,415	1,671	1,975	2,231
	4	760	1,101	-	-	579	921	1,139	1,481	1,700	2,041
	5	950	1,377	-	-	-	-	864	1,291	1,424	1,851
	6	1,139	1,652	-	-	-	-	-	-	1,149	1,661
S2-140	3	939	1,412	505	977	1,463	1,936	2,421	2,894	3,379	3,852
	4	1,252	1,882	-	-	993	1,623	1,951	2,581	2,909	3,539
	5	1,565	2,353	-	-	-	-	1,480	2,268	2,438	3,226
	6	1,878	2,823	-	-	-	-	-	-	1,968	2,913
S2-160	3	1,406	2,247	673	1,514	2,133	2,974	3,593	4,434	5,053	5,894
	4	1,875	2,996	-	-	1,384	2,505	2,844	3,965	4,304	5,425
	5	2,344	3,745	-	-	-	-	2,095	3,496	3,555	4,956
	6	2,813	4,494	-	-	-	-	-	-	2,806	4,488
S2-210	3	2,560	3,979	1,995	3,414	4,968	6,387	8,099	9,518	11,039	12,458
	4	3,413	5,306	-	-	3,641	5,534	6,772	8,665	9,712	11,605
	5	4,266	6,632	-	-	-	-	5,446	7,812	8,386	10,752
	6	5,119	7,958	-	-	-	-	-	-	7,060	9,899

Torques are actual. Please be sure to include appropriate safety factors for all service condition variables when sizing.

## SERIES S2: Stainless Steel Rack & Pinion Actuators



### Bill of Materials

No.	Description	Qty	Standard Material	Spare Parts
1	INDICATOR SCREW	1	ABS PLASTIC	
2	INDICATOR	1	ABS PLASTIC	
3	SNAP RING	1	AISI 316	*
4	THRUST WASHER	1	AISI 316	*
5	OUTSIDE WASHER	1	POLYOXYMETHYLENE	*
6	BODY	1	ASTM A351 GRADE CF8M	
7	PISTON	2	AISI 316	
8	PISTON O-RING	2	BUNA-N/FKM	*
9	PISTON BEARING	2	POLYOXYMETHYLENE	*
10	SPRING	0-12	SPRING: Epoxy Coated Spring Steel RETAINER: Nylon 66 RETAINER CONNECTOR: Brass	
11	END CAP O-RING	2	BUNA-N/FKM	*
12	END CAP	2	ASTM A351 GRADE CF8M	

No.	Description	Qty	Standard Material	Spare Parts
13	END CAP BOLT	8	AISI 304	
14	GUIDE PLATE	2	NYLON 66	
15	TRAVEL STOP O-RING	2	BUNA-N/FKM	*
16	TRAVEL STOP NUT	2	AISI 304	
17	TRAVEL STOP BOLT	2	AISI 304	
18	PLUG	2	BUNA-N/FKM	*
19	TOP PINION WASHER	1	POLYOXYMETHYLENE	
20	TRAVEL CAM STOP	1	AISI 316	
21	TOP PINION BEARING	1	POLYOXYMETHYLENE	*
22	TOP PINION O-RING	1	BUNA-N/FKM	*
23	PINION	1	AISI 316	
24	BOTTOM PINION BEARING	1	POLYOXYMETHYLENE	*
25	BOTTOM PINION O-RING	1	BUNA-N/FKM	*

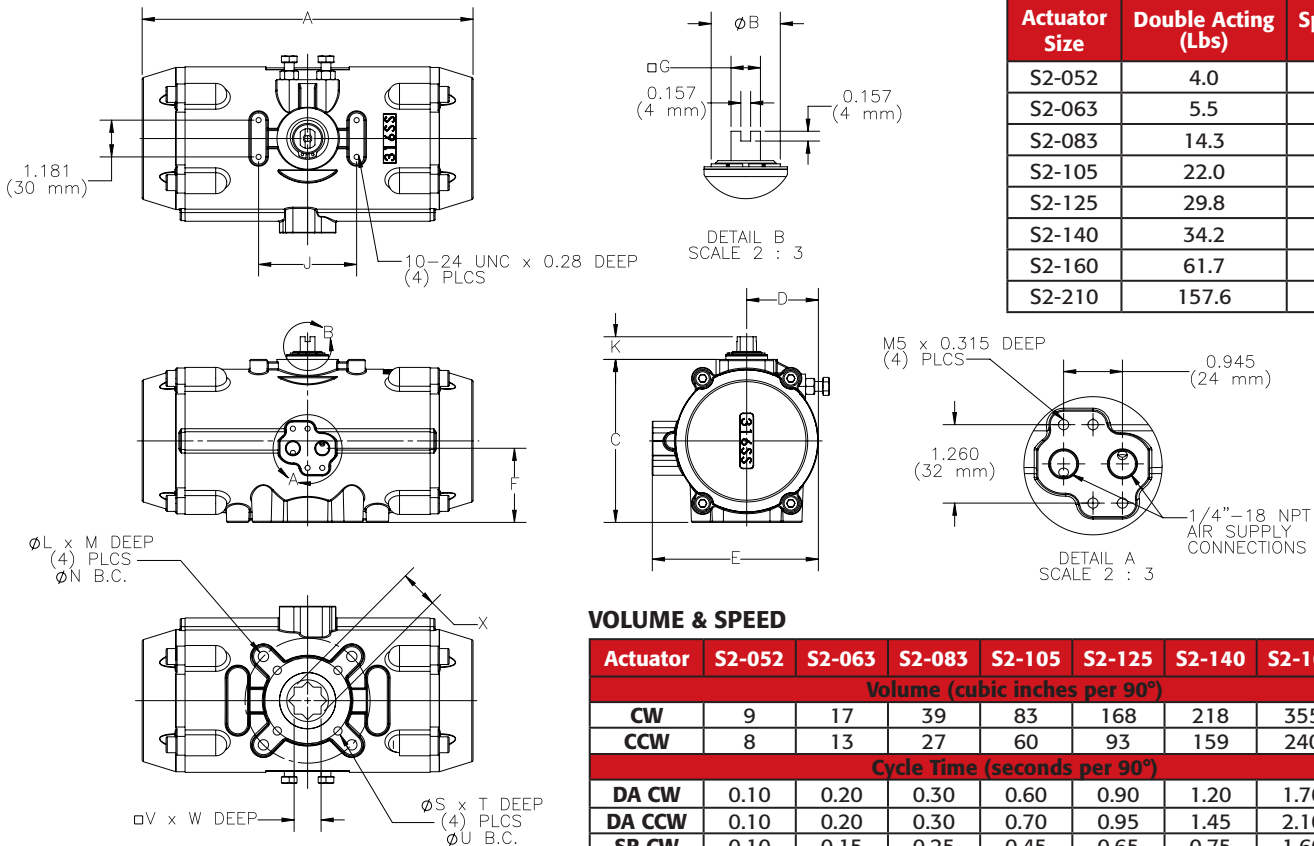
\*Spare parts included in repair kits

#### S2 Series Repair Kits

Description	Item Number	Temp.
Nitrile Buna	S2-RKB-(actuator size)	-40°F to 175°F
FKM	S2-RKV-(actuator size)	-4°F to 300°F

# SERIES S2: Stainless Steel Rack & Pinion Actuators

## Dimensional Information



## S2 Series Actuators (weight)

Actuator Size	Double Acting (Lbs)	Spring Return (Lbs)
S2-052	4.0	4.4
S2-063	5.5	6.0
S2-083	14.3	15.1
S2-105	22.0	23.7
S2-125	29.8	32.1
S2-140	34.2	38.8
S2-160	61.7	67.5
S2-210	157.6	179.7

## VOLUME & SPEED

Actuator	S2-052	S2-063	S2-083	S2-105	S2-125	S2-140	S2-160	S2-210
<b>Volume (cubic inches per 90°)</b>								
<b>CW</b>	9	17	39	83	168	218	355	681
<b>CCW</b>	8	13	27	60	93	159	240	439
<b>Cycle Time (seconds per 90°)</b>								
<b>DA CW</b>	0.10	0.20	0.30	0.60	0.90	1.20	1.70	2.50
<b>DA CCW</b>	0.10	0.20	0.30	0.70	0.95	1.45	2.10	2.75
<b>SR CW</b>	0.10	0.15	0.25	0.45	0.65	0.75	1.60	1.70
<b>SR CCW</b>	0.20	0.30	0.50	1.10	1.60	2.10	2.15	4.70

$$\text{Air Consumption (scf per 90°)} = \frac{\text{Volume (cubic inches)}}{1,728} \times \frac{\text{Supply Pressure (psi)} + 14.7}{14.7}$$

**NOTES:** Accessory mounting holes are not intended for Manual Gear Overrides or Stop Blocks. Cycle times shown are under no load conditions, 80 psi supply pressure and with a TVCS solenoid. Air line size, air capacity, and valve torque characteristics affect these cycle times. Faster or slower cycle times can be accomplished using special control components.

## DIMENSIONS

Actuator Model	A	ØB	C	D	E	F	□G	J	K	ØL	M	ØN	ØS	T	ØU	□V	W	X	ISO 5211
<b>S2-052</b>	5.75	0.87	2.83	1.22	3.07	1.22	0.47	3.15	0.787	1/4-20 UNC	0.39	1.969	10-24 UNC	0.28	1.417	0.433	0.58	0.58	F03/F05
<b>S2-063</b>	6.81	1.06	3.46	1.46	3.58	1.55	0.47	3.15	0.787	5/16-18 UNC	0.47	2.756	1/4-20 UNC	0.39	1.969	0.551	0.59	0.74	F05/F07
<b>S2-083</b>	8.03	1.06	4.25	1.87	4.42	1.89	0.47	3.15	0.787	5/16-18 UNC	0.47	2.756	1/4-20 UNC	0.39	1.969	0.749	0.66	0.96	F05/F07
<b>S2-105</b>	10.63	1.11	5.24	2.30	5.31	2.38	0.47	3.15	0.787	3/8-16 UNC	0.63	4.016	5/16-18 UNC	0.47	2.756	0.866	0.97	1.15	F07/F10
<b>S2-125</b>	11.89	1.37	6.10	2.70	6.12	2.81	0.79	5.12	1.181	3/8-16 UNC	0.63	4.016	5/16-18 UNC	0.47	2.756	0.866	0.97	1.15	F07/F10
<b>S2-140</b>	15.51	1.56	6.77	2.99	6.75	3.15	0.79	5.12	1.181	1/2-13 UNC	0.79	4.921	3/8-16 UNC	0.63	4.016	1.063	1.18	1.46	F10/F12
<b>S2-160</b>	17.95	1.56	7.80	3.41	7.58	3.66	0.79	5.12	1.181	1/2-13 UNC	0.79	4.921	3/8-16 UNC	0.63	4.016	1.063	1.18	1.46	F10/F12
<b>S2-210</b>	22.36	2.76	10.12	4.49	10.00	4.78	1.18	5.12	1.181	5/8-11 UNC	0.87	5.512	-	-	-	1.417	1.58	1.97	F14

## SERIES S2: Stainless Steel Rack & Pinion Actuators

### HOW TO ORDER Series S2 Actuators:

**S2-** TRIAC® S2 Series Stainless Steel Actuator with dual travel stops

**000** Actuator size (052, 063, 083, 105, 125, 140, 160, 210)

- DA** Double Acting Configuration
- DAR** Double Acting (Reverse Acting) Configuration
- SR** Spring Return Fail Clockwise Configuration
- SO** Spring Return Fail Counter-clockwise Configuration

**Blank** Buna-N Seals (standard) -40°F to 175°F

**V** FKM Seals (high temperature option) -4°F to 300°F

**Blank** 5 spring per side (standard)

**0** Specify Number of Spring per side (1-6)

Example: **S2-063SRV** : (Triac S2 Series Stainless Steel Actuator with dual travel stops, Spring Return fail-clockwise, with FKM seals)

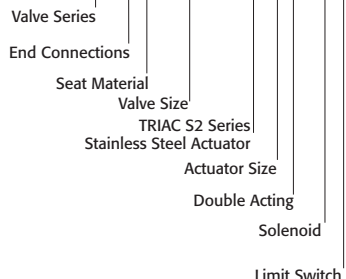


#### Actuator Size Legend to be used in automated part numbers

Size	Actuator Model	Size	Actuator Model
S21D	S2-052DA	S21S	S2-052SR
S22D	S2-063DA	S22S	S2-063SR
S23D	S2-083DA	S23S	S2-083SR
S24D	S2-105DA	S24S	S2-105SR
S25D	S2-125DA	S25S	S2-125SR
S26D	S2-140DA	S26S	S2-140SR
S27D	S2-160DA	S27S	S2-160SR
S28D	S2-210DA	S28S	S2-210SR

#### SAMPLE AUTOMATED PART NUMBER

**22-TX-150/S22D-XX**



See valve part number matrix for complete part number and options.

## SERIES S2: Stainless Steel Rack & Pinion Actuators

Solenoids		DESCRIPTION		
MODEL	MATERIAL	ENCLOSURE RATING	APPROVALS	
4 Way, 2 Position, Single Coil (DA/SR)				
TVSS-X411-4N-A120	316 SST	Type 4, 4X	CSA, CE	Weather Proof
TVSS-X411-7N-A120	316 SST	Type 4, 4X, 7, 9	CSA, UL, CE	Explosion Proof
4 Way, 2 Position, Dual Coil (DA)				
TVSS-X421-4N-A120	316 SST	Type 4, 4X	CSA, CE	Weather Proof
TVSS-X421-7N-A120	316 SST	Type 4, 4X, 6, 7, 9	CSA, UL, CE	Explosion Proof

Additional voltage options: 240VAC (-A240); 24VAC (-A24); 24VDC (-D24)

### Air Volume Boosters

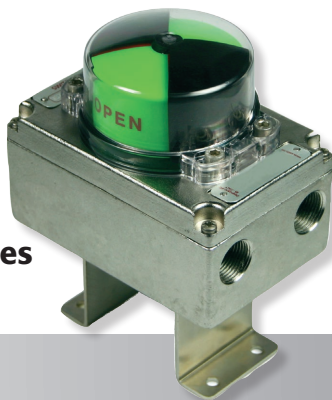
**AVB-22:** 1/2" NPT port

**AVB-32:** 3/4" NPT port



### Limit Switches

**ES Series**



**EW Series**



### ACCESSORIES Available in Stainless Steel

#### Filter Regulators

Stainless Steel Filter Regulators with Stainless Steel Gauge



< **FR-20:**  
1/4" NPT port



> **FR-22:** 1/2" NPT port  
> **FR-23:** 3/4" NPT port

**APL-910**





**SERIES S2: Stainless Steel Rack & Pinion Actuators**

# PAINLESS STAINLESS

All Stainless Ball Valve Assemblies



**22 Series** Stainless Steel Assembly



**77 Series** Stainless Steel Assembly



**88 Series** Stainless Steel Assembly



**D9 Series** Stainless Steel Assembly