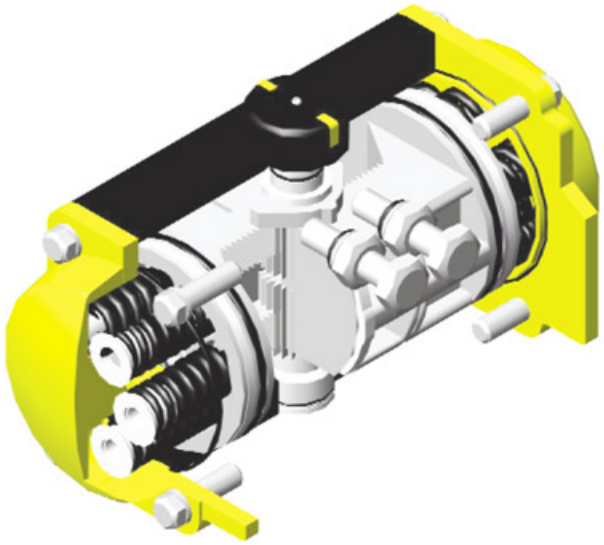
SONIC TORQUE®

SPN-SERIES

PNEUMATIC ACTUATOR

GENERAL FEATURES FOR SPN-SERIES ACTUATOR



* Rack & pinion design.

* The standard actuator configuration has hard anodized aluminum body and epoxy coated end caps. External protection; resistance to corrosion of 500 hours in a salty atmosphere, according to ASTM B 117-73.

* Inside surface finish (Ra 0.4-0.6 um) to minimize friction and to maximize the life ot the actuator.

* Standard applications for temperature ranges from -4°F to +180°F.

* Special options for extreme temperatures (upon request).
  Low Temperature Actuator -40°F to 80°F,
  High Temperature Actuator +5°F to 300°F.

* Piston bearing made of material with low friction coefficient to avoid metal to metal contact, easily replaceable tor maintenance.

* Double lower drilling, for valve mounting, and centering, according to ISO 5211/DIN 3337 standards.

* The indicator is designed to remain on the actuator for continuous indication when limit switch is being used. (Not availabie in SPN 032.)

* Independent bi-directional travel stop adjustment +/- 5° ensuring precise positioning in oil flow control services. (Not available in SPN 032.)

* Direct mounted solenoid connections according to NAMUR standards.

* Same body and end caps for double acting and spring return.

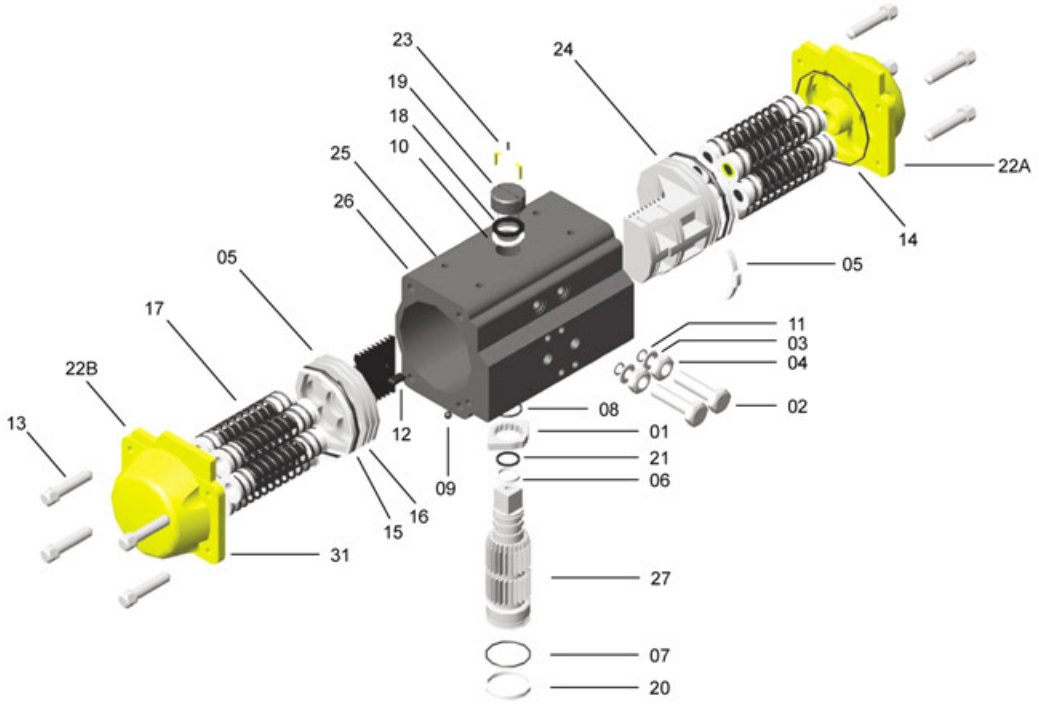
* Air supply: can be dry or lubricated filtered compressed air; pressure: min. 40 PSI- 145 PSI.

* The lubrication carried out by the manufacturer qualifies minimum 1,000,000 operations.

* Epoxy-coating is a deposit of powders on clean and sandblasted pieces. The chemical process is easily kept under control and after coating, the pieces must be subjected to heat treatment. Epoxy painting of actuators is advised where environment is strongly aggressive. With a normal thickness of 200/250 microns of epoxy coating, resistance to salty fog exceeds 1,000 hours. With the exception of certain solvents, epoxy coating resists acids and alkali, and also has a good resistance to UV rays. In order to retain its properties, the coating must not be scratched.

* Multi-function position indicator with NAMUR slot to allow visual position indicator.

SPN-SERIES VALVE PARTS AND IDENTIFICATION



PART NO.	QTY	PART DESCRIPTION	STANDARD MATERIAL	
01	1	STROKE ADJUSTMENT STOP	Alloy Steel HT200	
02	2	STOP BOLT	Stainless Steel	
03	2	WASHER	Stainless Steel	
04	2	STOP NUT	Stainless Steel	
05*	2	BEARING (Piston back)	Polyphthalamide	
06*	1	BEARING (Pinion top)	Nylon	
07*	1	BEARING (Pinion bottom)	Nylon	
08*	2	THRUST BEARING (Pinion)	Polyphthalamide	
09*	2	PLUG	NBR	Optional: Viton, Silicon
10	1	THRUST WASHER (Pinion)	Stainless Steel 304	
11*	2	"O" RING (Stop nut)	NBR	Optional: Viton, Silicon
12	2	PISTON GUIDE	Polyphthalamide	
13	8	END CAP BOLTS	Stainless Steel 304	
14*	2	"O" RING (End cap)	Buna	Optional: Viton, Silicon
15*	2	BEARING	Polyphthalamide	
16*	2	"O" RING	NBR	Optional: Viton, Silicon
17	5-12	SPRING (Cartridge)	High Alloy Spring Steel	
18	1	SNAP RING	High Alloy Spring Steel	Optional: Stainless Steel
19	1	POSITION INDICATOR	Polypropylene +GF	
20*	1	"O" RING (Pinion bottom)	NBR	Optional: Viton, Silicon
21*	1	"O" RING	NBR	Optional: Viton, Silicon
22 A	1	RIGHT END CAP	Die cast Aluminum Alloy	
22 B	1	LEFT END CAP	Die cast Aluminum Alloy	
23	1	INDICATOR BOLT	Stainless Steel 304	
24	2	PISTON	Die cast Aluminum Alloy	
25	1	ACTUATOR IDENTIFICATION LABEL	Aluminium	
26	1	BODY	Extruded Aluminum Alloy	
27	1	DRIVE SHAFT	Steel Alloy	Optional: Stainless Steel

*Suggested SPARE PARTS For maintenance

ACTUATION SIZING GUIDE

The seat material used, media, temperature, frequency of operation and critical application of the valve's operation are all important factors in calculating the actuation needs of a given valve. The information provided below should be considered as a guide only and must be adjusted according to experience and judgement. Proper actuator selection is required to prevent valve or process equipment damage as well as proper valve operation.

For determining torque we assume that valve torque results from the friction between the ball and seats as well as the stem and stem seals.

Valve Torque

The torque requirements of Sharpe® Ball Valves will vary depending on several factors.

- **Seat design and material**
  The seat friction force depends on the seat material and the applicable service factor multipliers shown in the chart below.

- **Stem Seal**
  Torque results from the stem contact with stem seals and the type of packing materials affect torque. Stem seal torque needs to be considered as a percentage of overall torque especially in small valve sizes.

Service Conditions To Consider

- **DIfferential Pressure** — Minimum and maximum pressures
- **Frequency of Operation** — Stuck valve torque
- **Media Influence** — Slurries, dry gases, oils
- **Temperatures** — Minimum and maximums
- **Cycle Time** — Line hammer, process requirements
- **Instrument Air Supply** — Peak demand pressure availability

Media and Service Factors

To establish minimum torque requirements, multiply valve torque by the following application media and service factors.

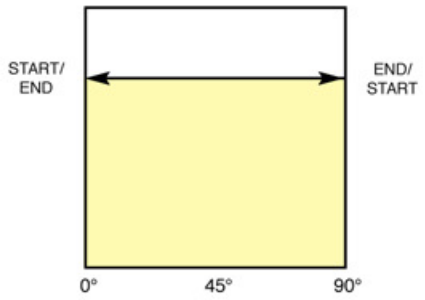
Media Factors	Multiplier
Clean particle free, non-lubricating (water, alcohol or solvents)	1.00
Clean particle free, lubricating oil	0.80
Slurries or heavily corroded and contaminated systems	1.30 to 2.00
Gas or saturated steam, clean and wet	1.00
Gas or superheated steam, clean and dry	1.30
Gas, dirty unfiltered e.g. natural gas, chlorine	1.20 to 1.50

Service Factor	Multiplier
Simple On and Off Operations	1.00
Throttling	1.20
Positioner Control	1.50
Once per day session	1.20
Once every two days or more or plant critical	1.50

Double Acting Actuator (DA)

In the double acting actuators, the control pinion rotation and its reversal are obtained by reversing the supply to the two input ports. The output torques obtainable mainly depend on the cylinder diameter and the supply pressure; by increasing one or both factors, the available torque also increases. As shown in diagram A, the torque of a DA actuator is constant throughout the entire rotation and relevant reversal. The normal advised safety factor , in addition to the stated valve manufacturer torque, is 20%.

*Select the actuator size whose torque output at given pressure exceeds the valve torque and application factor.

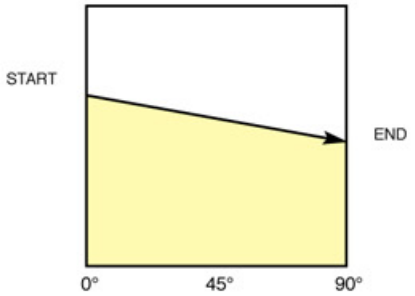


Diag. A

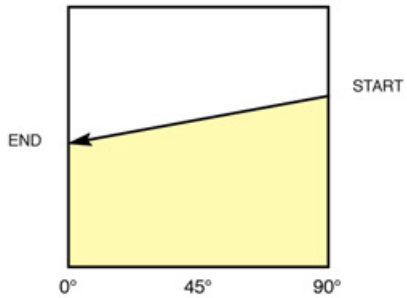
Spring Return Actuator (SR)

In these type of actuators, which utilize springs for reversing the rotation of the control pinion, the output torque depends not only on the cylinder diameter and the supply pressure, but also on the presence of the springs, which should be compressed to guarantee the return. As shown in diagram B, the available torque at 0° progressively reduces during the rotation due to the springs' compression. On the contrary, as shown in diagram C, the torque starting from the 90° position constantly decreases until 0° because of spring extension. Owing to the higher friction present, the safety coefficient in this case is advised 25%.

*Select the actuator whose torque ouput at 0° and 90° at a given air pressure exceeds the valve torque.



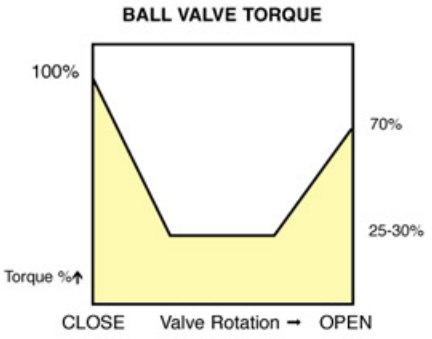
Diag. B



Diag. C

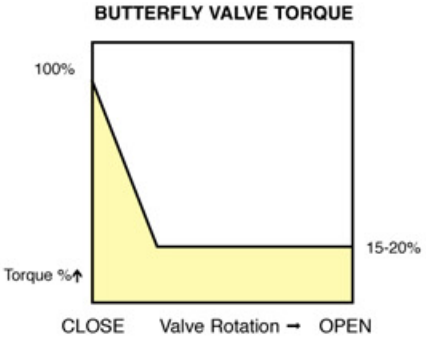
Ball Valve

Ball valve construction concept is based essentially on a polished ball (including a through port) contained in two seats (upstream and downstream). The ball rotation allows the flow, or stops the flow through the valve. Differential pressure between upstream and downstream pressure forces the ball against the downstream seat (floating ball). In this case, the valve torque is generated by the friction between ball and seat and also between stem and packing. As shown in the diagram to the right, the highest torque point is when, in presence of pressure, the valve is in the closed position, and passes to the open position (breakaway torque).



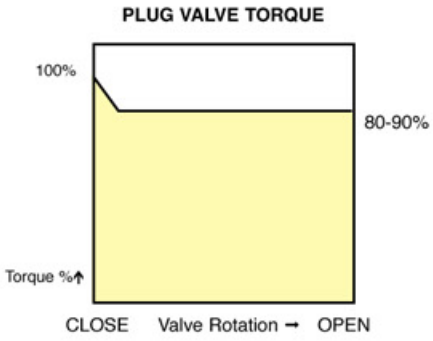
Valve

Butterfly valve construction concept is based essentially on a disc fixed on an axis, which in the closed position, is completely contained by the seat. The open position is obtained when, with a rotation, the disc (through its stem) becomes parallel to the flow. On the contrary, the closed position is obtained when the disc is perpendicular to the flow. In the case of the butterfly valve, the torque is generated by the friction between the disc and the seat, by the stem packing and also by the differential pressure thatforces on the disc. The highest torque point, as shown in the diagram, is in the closed position, and only after a small rotation it is considerably reduced.



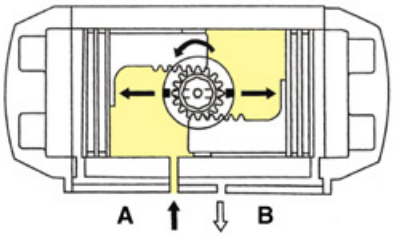
Plug Valve

Plug valve construction concept is based essentially on a male (plug) contained in a female cone (seat). The plug provides a through port in one direction and with its rotation into the seat the opening and closure of the valve is obtained. The torque is usually not influenced by the flow pressure, but is generated essentially by the friction between the seat and the plug, during the opening closing cycle. As shown in the diagram to the right, the highest torque point is in the closed position and remains high for the rest of the operation, because the torque is not influenced by pressure.

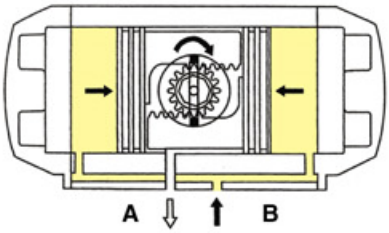


OPERATIONS

DOUBLE ACTING (TOP VIEW)

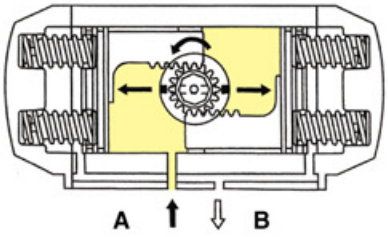


Air supplied to Port A moves pistons apart and toward end positions with exhaust air exiting at Port B (a counterclockwise rotation is obtained).

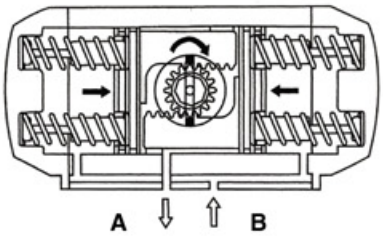


Air supplied to Port B forces pistons toward center with exhaust air exiting at Port A (a clockwise rotation is obtained).

SPRING RETURN (TOP VIEW)



Air supplied to Port A forces pistons apart and toward end position, compressing springs. Exhaust air exits at Port B (a counterclockwise rotation is obtained).



Air or electric failure allows springs to force pistons toward center position with exhaust air exiting at Port A (a clockwise rotation is obtained).

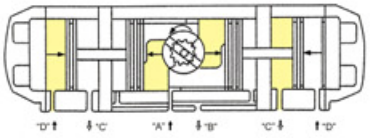
Reverse Rotation
Upon request, the pistons can be inverted in order to obtain a clockwise rotation when the air pressure is applied to Port A. Other types of assembly are possible: for any information, please contact factory.

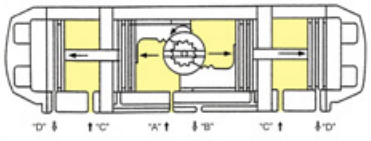
Quick Operation Actuators Upon request, SPN-Series actuators can be specially prepared for fast response operations.

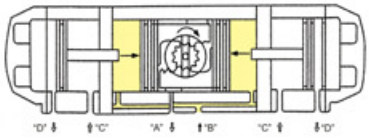
SPN3 - 3 Position Actuators (OPTION 5 & 6)

The SPN-3 position pneumatic actuator provides an operation of 0° 45° 90° 180°. The intermediate position is achieved by a mechanical stop positions, which are adjustable e.g. 90° actuators can provide 20° 30° 50° 75°.

In order to control the operations of 3 position actuators a system of solenoid valves controlling a sequence of air supplies to the actuator is required as described below:


POSITION 1


POSITION 2

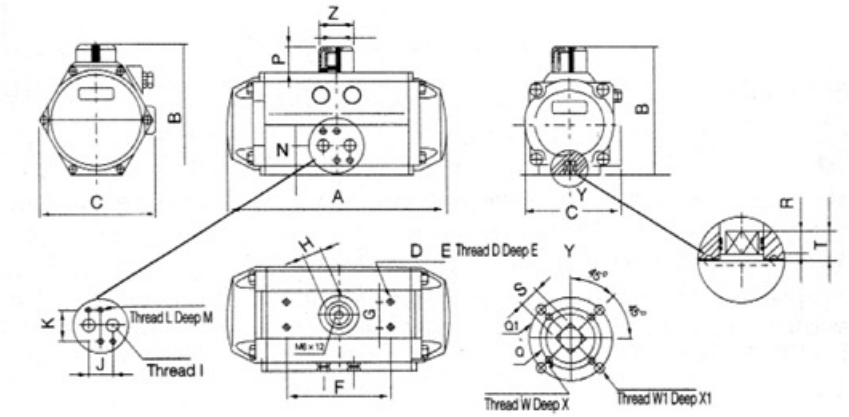

POSITION 3

Position 1 Intermediate Position:
This position is achieved when air is supplied simultaneously to ports A and D with exhaust air at ports Band C. In fact the air supplied at ports D forces the auxiliary pistons to the center and the rods serve as mechanical stops for the internal pistons in the desired intermediate position.

Position 2 Fully Open Position:
This position is achieved when air is supplied to ports A and port C (Air to port C may also be avoided) with exhaust air at port B. In this condition air to port A permits the internal pistons to complete the opening stroke.

Position 3 Fully Closed Position:
This position is obtained when air is supplied to port B with exhaust air at port A.

DIMENSIONS & TECHNICAL DATA 180° ACTUATOR



ISO5211

MODEL	DIMENSIONS IN INCH						
SIZE	SPN050-P8	SPN063-P8	SPN075-P8	SPN085-P8	SPN100-P8	SPN125-P8	SPN180-P8
A	7.76	8.72	11.75	13.70	15.02	19.53	24.65
B	3.50	4.13	3.72	4.19	5.79	7.36	10.65
C	2.78	3.27	4.80	5.31	4.84	5.96	8.03
D	M5	M5	M5	M5	M5	M5	M5
E	0.31	0.31	0.31	0.31	0.31	0.31	0.31
F	3.15	3.15	3.15	3.15	3.15	3.15	5.12
G	1.18	1.18	1.18	1.18	1.18	1.18	1.18
H	0.43	0.43	0.58	0.58	0.58	0.83	1.26
I	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"
J	0.94	0.94	0.94	0.94	0.94	0.94	0.94
K	1.26	1.26	1.26	1.26	1.26	1.26	1.26
L	M5	M5	M5	M5	M5	M5	M5
M	0.31	0.31	0.31	0.31	0.31	0.31	0.31
N	1.04	1.22	1.20	1.32	1.48	1.81	2.28
P	0.79	0.79	0.79	0.79	0.79	1.18	1.97
Q	1.65	1.97	1.97	1.97	2.76	2.76	5.51
Q1			2.76	2.76	4.02	4.02	
R	0.47	0.63	0.71	0.71	0.87	1.06	1.54
S	0.43	0.55	0.67	0.67	0.87	1.06	1.42
T	0.49	0.65	0.77	0.77	0.93	1.12	1.61
W	M5	M6	M6	M6	M8	M8	M16
W1			M8	M8	M10	M10	
X	0.35	0.35	0.35	0.35	0.47	0.47	0.94
X1			0.47	0.47	0.59	0.59	
ISO5211	F04	F05	F05/F07	F05/F07	F07/F10	F07/F10	F14
Z	1.57	1.57	1.57	1.57	1.57	2.20	3.15

MODEL SIZE	SPN050-8	SPN063-8	SPN075-8	SPN085-8	SPN100-8	SPN125-8	SPN180-8
Cylinder Bore	1.97	2.48	2.95	3.35	3.94	4.92	6.30
Bolt Stroke Adjustment	1/6 turn	1/6 turn	1/6 turn	1/5 turn	1/5 turn	1/4 turn	1/4 turn
Air Volume Opening (cu. in.)	10.4	17.7	34.2	56.2	79.4	171.1	348.3
Air Volume Closing (cu. in.)	16.5	28.7	53.8	85.6	122.2	256.7	537.8
Open Times DA (Seconds)	0.31	0.39	0.47	0.63	0.79	1.41	2.36
Closed times DA (Seconds)	0.39	0.47	0.63	0.79	1.10	1.88	2.83
Approximate Weight DA (Lbs.)	3.3	5.5	9.6	13.1	17.7	33.7	64.5

DOUBLE ACTING TORQUE RATING (LB-IN)

DOUBLE ACTING TORQUE RATINGS IN - LBS.									
Air Supply Pressure	40 psi.	50 psi.	60 psi.	70 psi.	80 psi.	90 psi.	100 psi.	110 psi.	120 psi.
Actuator Model									
032DA	30	38	45	53	61	69	76	84	91
050DA	81	101	122	142	162	183	203	223	235
063DA	143	179	215	251	286	322	358	394	415
075DA	284	355	426	497	568	639	710	781	824
085DA	447	559	670	782	894	1005	1117	1229	1296
100DA	649	811	974	1136	1298	1461	1623	1785	1883
125DA	1352	1691	2029	2357	2706	3043	3381	3719	3992
145DA	2123	2654	3158	3716	4246	4777	5308	5839	6157
160DA	2770	3462	4155	4847	5540	6232	6925	7617	8032
180DA	2739	4674	5609	6544	7479	8413	9348	10283	10844
200DA	5193	6492	7790	9088	10387	11685	12984	14282	15061
240DA	8725	10906	13087	12569	17450	19631	21812	23994	25302
265DA	12663	15829	18995	22161	25327	28493	31659	34825	36724

SPRING RETURN TORQUE RATING (LB-IN)

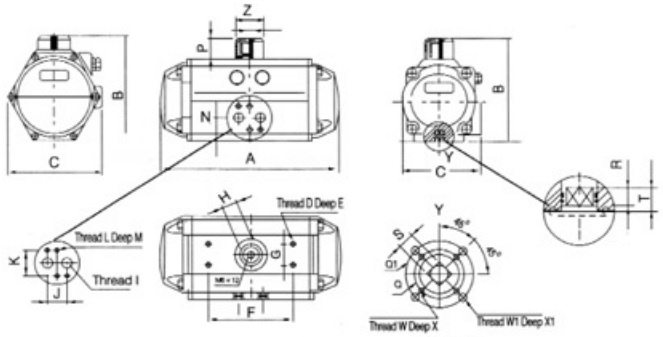
SPRING RETURN TORQUE RATINGS IN - LBS.																							Srpring Stroke	
Air Supply Pressure		40psi.		50psi.		60psi.		70psi		80psi.		90psi.		100psi.		110psi.		120psi.							
Actuator Model	Spring Set	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End					Start	End
050SR	5	51	38	71	58	91	78	112	98	132	119	153	139	173	160									43	29
	6	45	29	65	49	85	70	106	90	127	111	147	131	167	151	187	171							51	35
	7	39	20	59	41	80	61	100	81	121	102	141	122	161	142	181	163	194	175					60	41
	8			53	32	74	52	94	73	115	93	135	114	155	134	175	154	188	166					69	47
	9					68	44	88	64	109	85	129	105	149	125	169	146	182	158					77	53
	10							82	55	103	76	123	96	143	117	163	137	176	149					86	59
	11									96	67	117	87	137	108	158	128	170	140					94	65
	12													131	99	152	120	164	132					104	71
063SR	5	94	68	130	104	166	140	201	176	237	212	273	247	309	283									74	49
	6	84	53	120	89	156	125	192	161	227	197	263	232	299	268	335	304							89	58
	7	74	38	110	74	146	110	182	146	218	182	253	218	289	253	325	289	346	311					105	68
	8			100	59	136	95	172	131	208	167	243	203	279	238	315	274	337	296					119	78
	9					126	80	162	116	198	152	234	188	269	223	305	259	327	281					134	88
	10							152	101	188	137	224	173	260	209	295	244	317	266					149	98
	11									178	122	214	158	250	194	286	229	307	251					164	108
	12													240	179	276	214	297	236					179	118
075SR	5	186	131	257	202	328	273	399	344	470	415	541	486	612	557									153	97
	6	167	100	238	171	309	242	380	313	451	284	522	455	593	526	664	597							184	117
	7	147	70	218	141	289	212	360	283	431	354	502	425	573	496	644	567	687	609					214	137
	8			198	110	269	181	340	252	412	323	483	394	554	465	625	536	667	579					245	157
	9					250	150	321	221	392	292	463	363	534	434	605	505	648	548					276	176
	10							301	191	372	262	443	333	514	404	585	475	628	517					306	196
	11									353	231	424	302	495	373	566	444	608	487					337	215
	12													475	342	546	413	589	456					368	235
085SR	5	285	191	396	303	508	415	620	526	731	638	843	750	955	862									256	162
	6	252	140	476	252	476	364	587	475	699	587	811	699	922	810	1034	922							307	195
	7	220	89	331	201	443	313	555	424	667	536	778	648	890	759	1002	871	1069	938					358	227
	8			299	150	411	261	522	373	634	485	746	597	858	708	969	820	1036	887					409	260
	9					378	210	490	322	602	434	713	545	825	657	937	769	1004	836					460	292
	10							457	271	569	383	681	494	793	606	904	718	971	785					511	325
	11									537	331	648	443	760	555	872	687	939	734					562	357
	12													728	504	839	616	906	683					613	389
100SR	5	425	301	587	463	750	625	912	787	1074	950	1236	1112	1399	1274									349	224
	6	380	231	542	393	705	555	867	718	1029	880	1192	1042	1354	1205	1516	1367							418	269
	7	335	161	498	323	660	486	822	648	984	810	1147	973	1309	1135	1471	1297	1569	1395					488	314
	8			453	254	615	416	777	578	940	741	1102	903	1264	1065	1426	1227	1524	1325					558	359
	9					570	346	732	509	895	671	1057	833	1219	995	1382	1158	1479	1255					627	404
	10							688	439	850	601	1012	763	1174	926	1337	1088	1434	1186					697	449
	11									805	531	967	694	1130	856	1292	1018	1389	1116					767	493
	12													1085	786	1247	949	1344	1046					837	538

Continued

SPRING RETURN TORQUE RATINGS (LB-IN)

SPRING RETURN TORQUE RATINGS IN LBS.																						Srpring Stroke	
Air Supply	Pressure	40psi.		50psi.		60psi.		70psi		80psi.		90psi.		100psi.		110psi.		120psi.					
Actuator Model	Spring Set	0Ỳ Start	90Ỳ End	0Ỳ Start	90Ỳ End	0Ỳ Start	90Ỳ End	0Ỳ Start	90Ỳ End	0Ỳ Start	90Ỳ End	0Ỳ Start	90Ỳ End	0Ỳ Start	90Ỳ End	0Ỳ Start	90Ỳ End	0Ỳ Start	90Ỳ End	Start	End		
125SR	5	888	623	1226	961	1564	1299	1902	1637	2240	1976	2578	2314	2916	2652					729	465		
	6	795	477	1133	815	1471	1154	1809	1492	2147	1830	2485	2168	2823	2506	3161	2844			875	558		
	7	702	331	1040	670	1378	1008	1716	1346	2054	1684	2392	2022	2730	2360	3069	2698	3271	2901	1021	651		
	8			947	524	1285	862	1623	1200	1961	1538	2299	1876	2637	2214	2976	2552	3178	2755	1167	744		
	9					1192	716	1530	1054	1868	1392	2206	1730	2544	2068	2883	2407	3085	2609	1313	837		
	10							1437	908	1775	1246	2113	1584	2452	1923	2790	2261	2993	2646	1459	930		
	11									1682	1100	2020	1439	2359	1777	2697	2115	2900	2318	1604	1023		
	12													2266	1631	2604	1969	2807	2172	1750	1116		
145SR	5	1394	983	1925	1514	2456	2044	2897	2575	3517	3106	4048	3637	4579	4167					1140	729		
	6	1248	755	1779	1285	2310	1816	2841	2347	3372	2878	3902	3409	4433	3939	4964	4470			1369	875		
	7	1103	527	1633	1057	2164	1588	2559	2119	3226	2650	3757	3181	4287	3711	4818	4242	5137	4561	1597	1021		
	8			1488	829	2018	1360	2549	1891	3080	2422	3611	2952	4142	3483	4672	4014	4991	4333	1825	1166		
	9					1873	1132	2403	1663	2934	2194	3465	2724	3996	3255	4527	3786	4845	4104	2053	1312		
	10							2258	1435	2788	1965	3319	2496	3850	3027	4381	3558	4699	3876	2281	1458		
	11									2643	1737	3173	2268	3704	2799	4235	3330	4553	3648	2509	1604		
	12													3558	2571	4089	3102	4408	3420	2737	1750		
160SR	5	1777	1300	2469	1992	3162	2685	3854	3377	4547	4070	5239	4762	5931	5455					1470	993		
	6	1578	1006	2271	1698	2963	2391	3655	3083	4348	3776	5040	4468	5733	5161	6425	5853			1764	1192		
	7	1380	712	2072	1404	2764	2097	3457	2789	4149	3482	4842	4174	5534	4867	6227	5559	6642	5975	2058	1390		
	8			1873	1110	2566	1803	3258	2495	3951	3188	4643	3880	5336	4573	6028	5265	6444	5681	2354	1589		
	9					2367	1509	3060	2201	3752	2894	4445	3586	5137	4279	5829	4971	6245	5387	2646	1788		
	10							2861	1907	3553	2600	4246	3292	4938	3985	5631	4677	6046	5093	2940	1986		
	11									3355	2306	4047	2998	4740	3691	5432	4383	5848	4799	3234	2185		
	12													4541	3397	5234	4089	5649	4505	3528	2383		
180SR	5	2340	1644	3275	2578	4210	3513	5145	4448	6079	5383	7014	6318	7949	7253					2096	1399		
	6	2060	1225	2995	2159	3930	3094	4865	4029	5800	4964	6734	5899	7669	6833	8604	7768			2515	1679		
	7	1780	805	2715	1740	3650	2675	4585	3610	5520	4545	6454	5480	7389	6414	8324	7349	8885	7910	2934	1959		
	8			2435	1321	3370	2256	4305	3191	5240	4126	6175	5060	7109	5995	8044	6930	8605	7491	3353	2239		
	9					3090	1837	4025	2772	4960	3706	5895	4641	6830	5576	7764	6511	8325	7072	3772	2519		
	10							3745	2353	4680	3287	5615	4222	6650	5157	7485	6092	8045	6653	4191	2798		
	11									4400	2868	5335	3803	6270	4738	7205	5673	7766	6234	4610	3078		
	12													5990	4319	6925	5254	7486	5814	5029	3358		
200SR	5	3312	2406	4610	3704	5908	5003	7207	6301	8505	7599	9803	8898	11102	10196					2787	1882		
	6	2935	1849	4235	3147	5532	4445	6830	5744	8129	7042	9427	8340	10725	9639	12024	10937			3345	2258		
	7	2559	1291	3857	2589	5156	3888	6454	5186	7752	6485	9051	7783	10349	9081	11648	10380	12427	11159	2902	2634		
	8			3481	2032	4779	3330	6078	4629	7376	5927	8674	7225	9917	8524	11271	9822	12050	10601	4460	3011		
	9					4403	2773	5701	4071	7000	5370	8298	6668	9596	7966	10895	9265	11674	10044	5017	3387		
	10							5325	3514	6623	4812	7922	6110	9220	7409	10518	8707	11297	9486	5575	3763		
	11									6247	4255	7545	5553	8844	6851	10142	8150	10921	8929	6132	4140		
	12													8467	6294	9766	7592	10545	8371	6690	4516		
240SR	5	5535	4113	7716	6294	9898	8475	12079	10657	14260	12838	16441	15019	18623	17200					4612	3190		
	6	4897	3190	7078	5372	9260	7553	11441	9374	13622	11915	15803	14097	17985	16278	20168	18459			5534	3828		
	7	4259	2268	6440	4449	8622	6631	10803	8812	12984	10993	15165	13174	17347	15356	19523	17537	20837	18845	6457	4466		
	8			5802	3527	7984	5708	10165	7889	12346	10071	14527	12252	16709	14433	18890	16614	20199	17923	7379	5104		
	9					7346	4786	9527	6967	11708	9149	13889	11329	16071	13511	18252	15692	19561	17001	8302	5742		
	10							8889	6045	11070	8226	13251	10417	15433	12588	17614	14700	18923	16078	9224	6380		
	11									10432	7303	12613	9485	14795	11666	16976	13847	18285	15156	10147	7018		
	12													14157	10743	16338	12925	17647	14233	11069	7656		
265SR	5	7836	5576	11002	8742	14168	11907	17333	15073	20499	18239	23665	21405	26831	24571					7088	4828		
	6	6870	4158	10036	7324	13202	10490	16368	13656	19534	16822	22700	19987	25865	23153	29031	26319			8505	5793		
	7	5905	2741	90702	5906	12236	9072	15402	12238	18588	15404	21734	18570	24900	21736	28066	24902	29965	26801	9923	6759		
	8			8105	4489	11271	7655	14437	10821	17603	13986	20769	17152	23934	20318	27100	23484	29000	25384	11340	7724		
	9					10305	6237	13471	9403	16637	12569	19803	15736	22969	18901	26135	20267	28034	23966	12758	8690		
	10							12506	7896	15672	11151	18837	14317	22003	17483	25169	20649	27069	22549	14176	9655		
	11									14706	9734	17872	12900	21038	16066	24204	19231	26103	21131	15593	10621		
	12													20072	14648	23238	17814	25135	19713	17011	11585		

DIMENSIONS & TECHNICAL DATA



ISO 5211

SIZE	SPN 032	SPN 050	SPN 063	SPN 075	SPN 085	SPN 100	SPN 125	SPN 145	SPN 160	SPN 180	SPN 200	SPN 240	SPN 265
A	4.61	5.53	6.24	8.29	9.74	10.57	13.58	16.08	17.22	19.17	21.38	24.45	26.9 3
B	1.77	3.50	4.13	4.80	5.31	5.79	7.36	8.15	8.90	10.65	11.61	13.72	14.9 6
C	1.77	2.78	3.27	3.72	4.19	4.84	5.96	6.75	7.36	8.03	8.74	10.31	12.9 7
D	M 5	M 5	M 5	M 5	M 5	M 5	M 5	M 5	M 5	M 5	M 5	M 5	M 5
E	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
F	1.97	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	5.12	5.12	5.12	5.12
G		1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18
H	0.33	0.43	0.43	0.58	0.58	0.58	0.83	1.06	1.06	1.26	1.26	1.42	1.42
I	1/8"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	3/8"	3/8"
J	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	1.57	1.57
K	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.77	1.77
L	M 5	M 5	M 5	M 5	M 5	M 5	M 5	M 5	M 5	M 5	M 5	M 6	M 6
M	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.39	0.39
N		1.04	1.22	1.20	1.32	1.48	1.81	1.87	2. 11	2.28	2.46	3.09	6.52
P	0.79	0.79	0.79	0.79	0.79	0.79	1.18	1.18	1.18	1.97	1.97	1.97	1.97
R	0.40	0.47	0.63	0.71	0.71	0.87	1.06	1.26	1.34	1.54	1.57	1.93	2.72
S	0.35	0.43	0.55	0.67	0.67	0.87	1.06	1.06	1.06	1.42	1.42	1.81	1.81
T	0.43	0.49	0.65	0.77	0.77	0.93	1.12	1.32	1.40	1.61	1.65	2.03	2.81
Q	1.43	1.65	1.97	1.97	1.97	2.76	2.76	4.02	4.02	5.51	5.51	6.50	6.50
Q1				2.76	2.76	4.02	4.02	4.92	4.92				
W	M 5	M 5	M 6	M 6	M 6	M 8	M 8	M 10	M 10	M 16	M 16	M 20	M 20
W1			M8	M 8	M 8	M 10	M 10	M 12	M 12				
X	0.35	0.35	0.35	0.35	0.35	0.47	0.47	0.59	0.59	0.94	0.94	1.18	1.18
X1				0.47	0.47	0.59	0.59	0.71	0.71				
ISO 5211	F03	F04	F05	F05/F07	F05/F07	F07/F10	F07/F10	F10/F12	F10/F12	F14	F14	F16	F16
Z	1 .4	1.57	1.57	1.57	1.57	1.57	2.20	2.56	2.56	3.15	3.15	4.53	4.53

MODEL	CYLINDER BORE	CYLINDER TRAVEL	AIR VOLUME OPENING (CU. IN.)	AIR VOLUME CLOSE (CU. IN.)	OPENING TIME SECONDS		CLOSING TIME SECONDS		APPROXIMATE WEIGHT (LBS)	
					DA	SR	DA	SR	DA	SR
SPN032	1.25		4.3	7.1	0.5		0.5		0.92	
SPN050	1.97	1/6 Turn	5.5	9.2	0.2	0.25	0.25	0.3	2.1	2.3
SPN063	2.48	1/6 Turn	9.8	15.9	0.25	0.3	0.3	0.35	3.5	3.7
SPN075	2.95	1/6 Turn	18.9	29.9	0.3	0.35	0.4	0.5	5.9	6.9
SPN085	3.46	1/5 Turn	31.1	47.6	0.4	0.5	0.5	0.6	8.4	9.7
SPN100	3.94	1/5 Turn	43.3	67.7	0.5	0.6	0.7	0.9	11.9	14.4
SPN125	4.92	1/5 Turn	94.0	142.8	0.9	1.1	1.2	1.4	22.5	27.8
SPN145	5.71	1/5 Turn	147.1	230.7	1.2	1.4	1.5	1.8	32.0	39.9
SPN160	6.30	1/4 Turn	191.6	300.2	1.5	1.7	1.8	2.1	43.7	52.9
SPN180	7.09	1/4 Turn	260.0	420.5	2	2.2	2.4	2.8	55.1	69.7
SPN200	7.87	1/4 Turn	362.5	577.3	2.7	3.2	3.5	4	78.3	99.4
SPN240	9.45	1/4 Turn	610.2	927. 6	3.5	4	4.1	4.6	115	139
SPN265	10.43	1/4 Turn	884.8	1304.7	4	4.5	4.5	5	1 83.0	224.9

(A) The above indicated moving time of the actuator, are obtained in the following testcons: (1) Room Temperature. (2) Actuator Stroke 90° (3) Solenoid Valve with orifice of 4mm and flow capacity Qn 400/L/min.
(4) Inside pipe diameter 8mm, (5) Medium clean air, (6) Air supply pressure 5.5 bar (79, 75psi), (7) Actuator without external resistance load. Cautions: obviously on the field applications when one or more of the above parameters are different, the moving time will be different.

SONIC TORQUE®

HOW TO ORDER

ACTUATOR MODEL	DOUBLE-ACTING	SPRING RETURN	NO OF SPRINGS	OPTIONS
SPN032 SPN050 SPN063 SPN075 SPN085 SPN100 SPN125 SPN145 SPN160 SPN180 SPN200 SPN240 SPN265	DA	SR	5 6 7 8 9 10 11 12	P1 = High Temperature Actuator 300°F P2 = Low Temperature Actuator -40°F P3 = Electroless Nickel Treatment P4 = Epoxy Coating P5 = 3 Position Actuator P6 = Actuator Locking Device P7 = Reverse Rotation P8 = 180° Actuator

SPN050 DA or **SR 8 P1**

SONIC TORQUE®

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