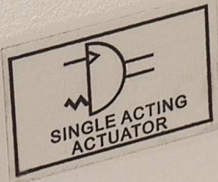


SONIC TORQUE™



SONIC TORQUE®
TEL-630 833 8020 FAX-630 833 8661, CHICAGO, ILLINOIS.
MODEL-ST63 SR DA
MAXIMUM PRESSURE - 120Psi



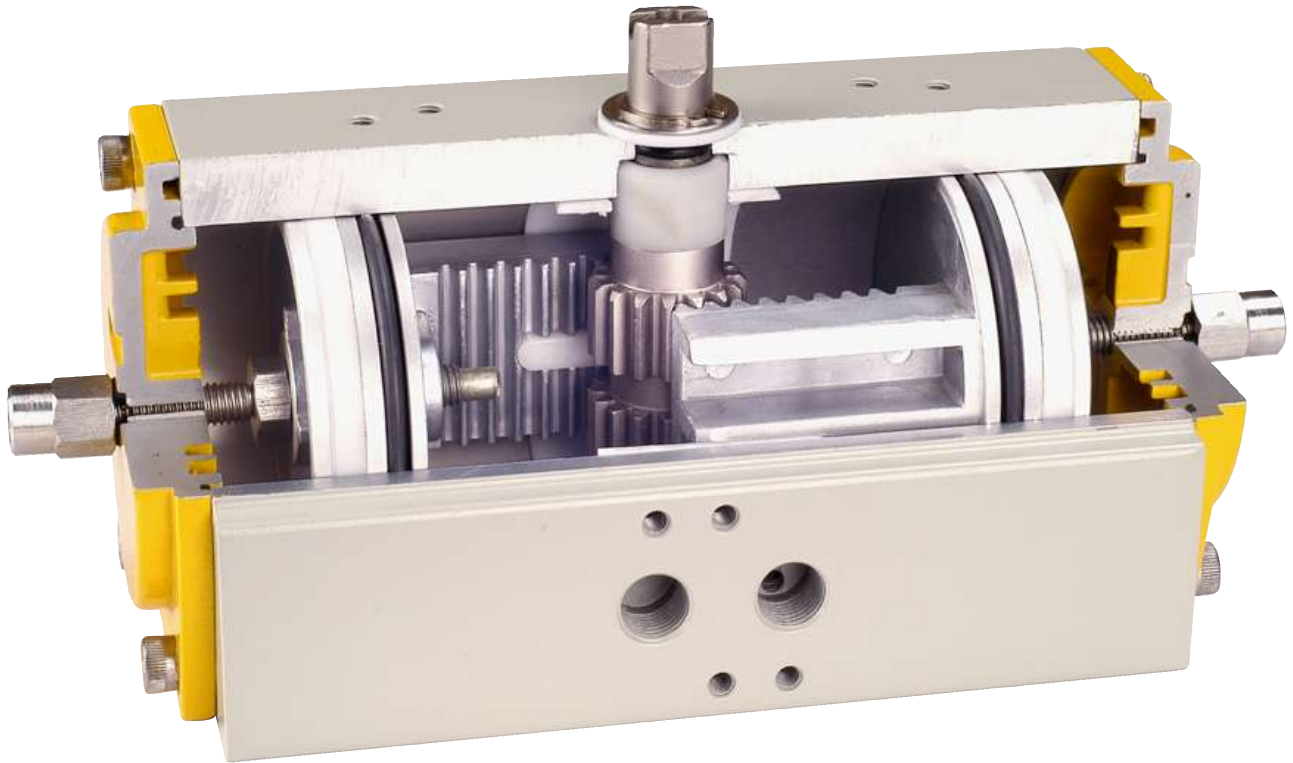
ST SERIES
PNEUMATIC ACTUATOR

DOUBLE ACTING

SPRING RETURN

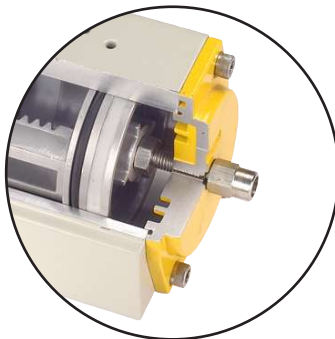
ST - FEATURES

- | | | |
|--|-------------------------------------|---|
| 1 Double Rack & pinion. | 1 Maximum Working Pressure 120 Psi. | 1 Tested to more than 1 million cycles. |
| 1 High corrosion Resistance. | 1 Lubrication not necessary. | 1 Anti-blow out pinion. |
| 1 Pinion supported on delrin Bearings. | | 1 Can be converted to single acting by just adding springs. |



END STROKE (0°)

- 1 Setting screw provided on piston.
- 1 Set the closing position against the pinion.
- 1 -10° setting possible for closing.



END STROKE(90°)

- 1 Setting screw provided on end cover.
- 1 Set the opening position against the piston.
- 1 +10° setting possible for opening.



ANTI BLOWOUT

- 1 Lock key provides a firm lock to the pinion, thus eliminating movement under pressure.

- 1 Unique Spring Retainer construction.
- 1 Ease of handling & greater safety while dismantling.
- 1 Eliminates need of special tools & keys.
- 1 Spring life time lubricated.
- 1 Precompression leads to longer spring life.
- 1 Modular spring construction allows combination of springs to generate variety of torques.
- 1 Body epoxy painted after hard anodizing
- 1 Tested to more than 1 million cycles.
- 1 Anti blowout pinion.



RACK & PINION

- 1 Pressure Die cast piston with in built Rack.
- 1 High wear resistance due to compact grain structure on surface.
- 1 Life time Lubricated.
- 1 Strong tooth profile for high load bearing capacity.



ISO PAD

- 1 Valve mounting as per ISO 5211 with an additional one size higher pad.
- 1 Standardization of mounting accessories.
- 1 ISO Ring for precise location.
- 1 Octagonal drive shaft for ease of mounting.



SPRING

- 1 Gr.III Spring steel Epoxy Coated for high corrosion resistance.
- 1 Modular Springs set to suit various valve torque characteristics.
- 1 Life Time Lubricated.
- 1 Non Buckling Modular Spring design.

MODEL AA

3 POSITION ROTARY ACTUATOR

DOUBLE ACTING / SPRING RETURN

3 POSITION MECHANICAL STOPPER

FEATURES

Actuators are suitable for 0°-90°-180° operation.

In double acting the third position is achieved by pneumatic operated stoppers.

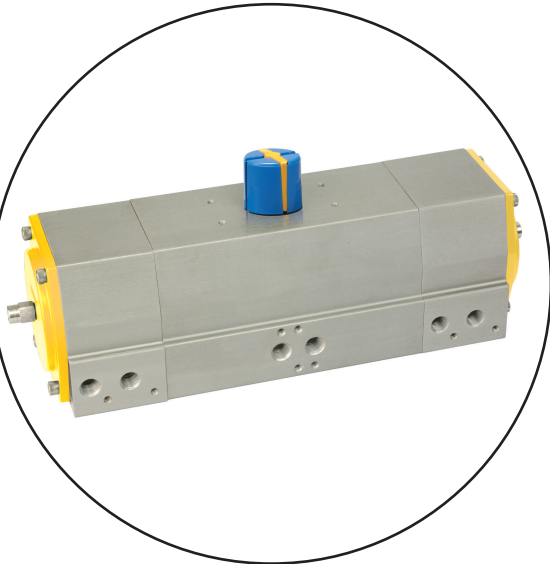
Repeatability is 100% since stopping is by mechanical stopper. Makes it suitable for application calling for precise positioning. Actuator can be switched to one position from any position very easily with the solenoid control.

End stops +/- 10° are provided on the closing side of the actuator for setting valve closing precisely.

Single acting actuators are provided with spring to achieve mid position using a spring capsule. The capsule is preloaded to achieve the closing and opening by solenoid valve and on power failure the actuator returns to mid position.

Refer dimension table on page 7.

Refer torque tables on page 10 & 11.



MODEL BB

180 DEGREE ROTARY ACTUATOR

DOUBLE ACTING / SPRING RETURN

FEATURES

Suitable typically for 3 way valves requiring ON - OFF operation.

Available in both Spring Return or Double Acting Versions.

Can be converted to 3 Position, for e.g. 0° - 90° - 180° actuator for 3 way valves using SONIC Switch & SONIC Solenoid TYPE 30138.

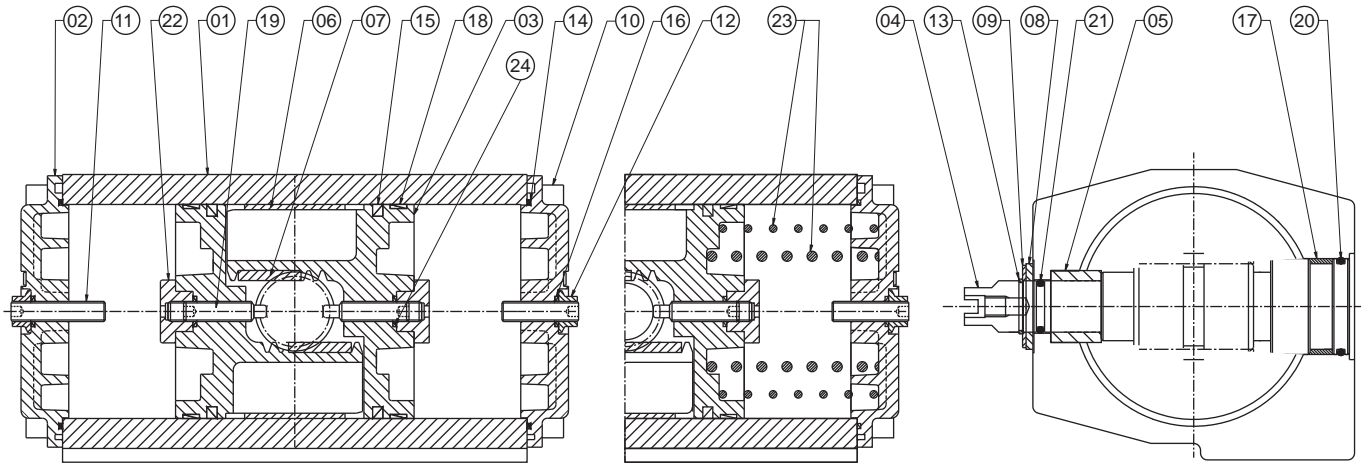
End Stop adjustment provided for opening direction as a standard.

Actuator mounting is as per ISO 5211 & accessories to NAMUR.

For weights & air consumption data refer table on page 8

Refer Dimension Table on page 6

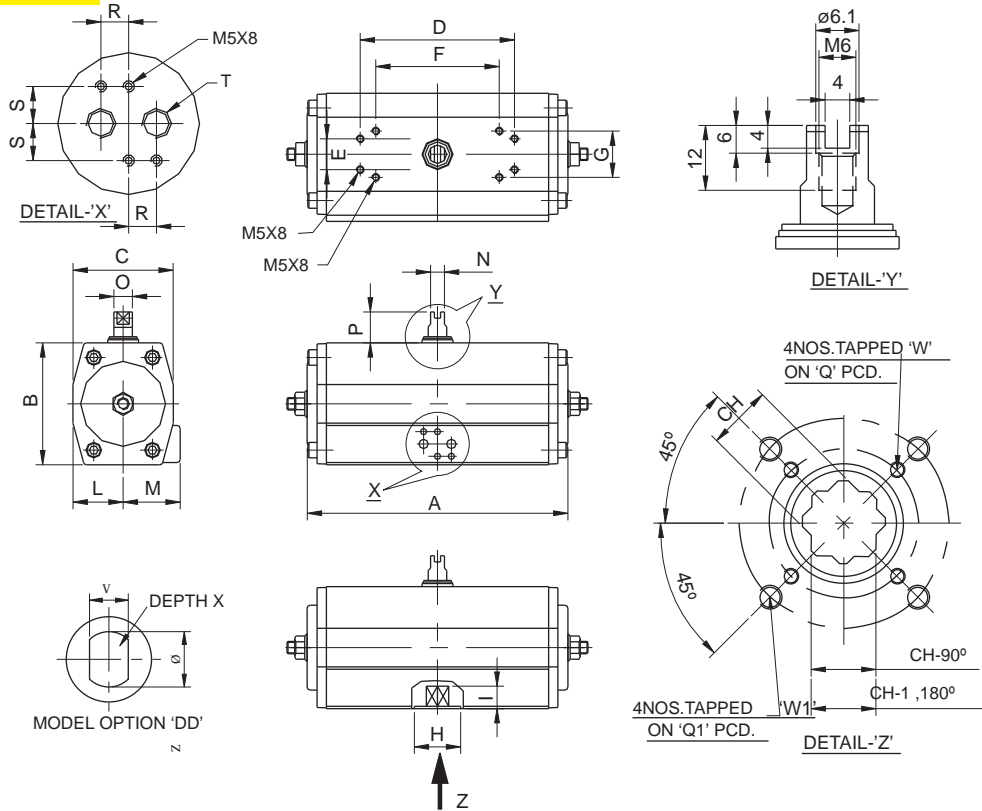




PART LIST

PART NO.	DESCRIPTION	QTY	MATERIAL	SPECIFICATION
01	BODY	1	ALUMINIUM	EN6351 T6
02	COVER	2	ALUMINIUM	LM 6
03	PISTON WITH RACK	2	ALUMINIUM	LM 6
04	PINION	1	STEEL	EN 8
05	BEARING BUSH	1	DELRIN	-
06	DELRIN RING	1	DELRIN	-
07	ANTI BLOW OUT KEY	2	DELRIN	-
08	WASHER	1	DELRIN	-
09	WASHER	1	STAINLESS STEEL	SS 304
10	SOC.HEAD CAP SCREW	8	STAINLESS STEEL	SS 304 (DIN 912)
11	SOCKET SET SCREW	2	STAINLESS STEEL	SS 304 (DIN 913)
12	LOCK NUT	2	STAINLESS STEEL	SS 304
13	EXTERNAL CIRCLIP	1	SPRING STEEL	DIN 471, IS 3075
14	Q-SEAL	2	NBR	NBR 70°A
15	PISTON SEAL	2	NBR	NBR 70°A
16	O-RING	4	NBR	NBR 70°A
17	PINION GUIDE	1	DELRIN	-
18	PISTON GUIDE	2	DELRIN	-
19	STROKE ADJ.SCREW	1	STAINLESS STEEL	SS 304
20	O-RING	1	NBR	NBR 70°A
21	O-RING	1	NBR	NBR 70°A
22	HEX NUT	2	STAINLESS STEEL	SS 304
23	SPRING	*	SPRING STEEL	GR-III (EN44B)
24	O-RING	2	NBR	NBR 70° A

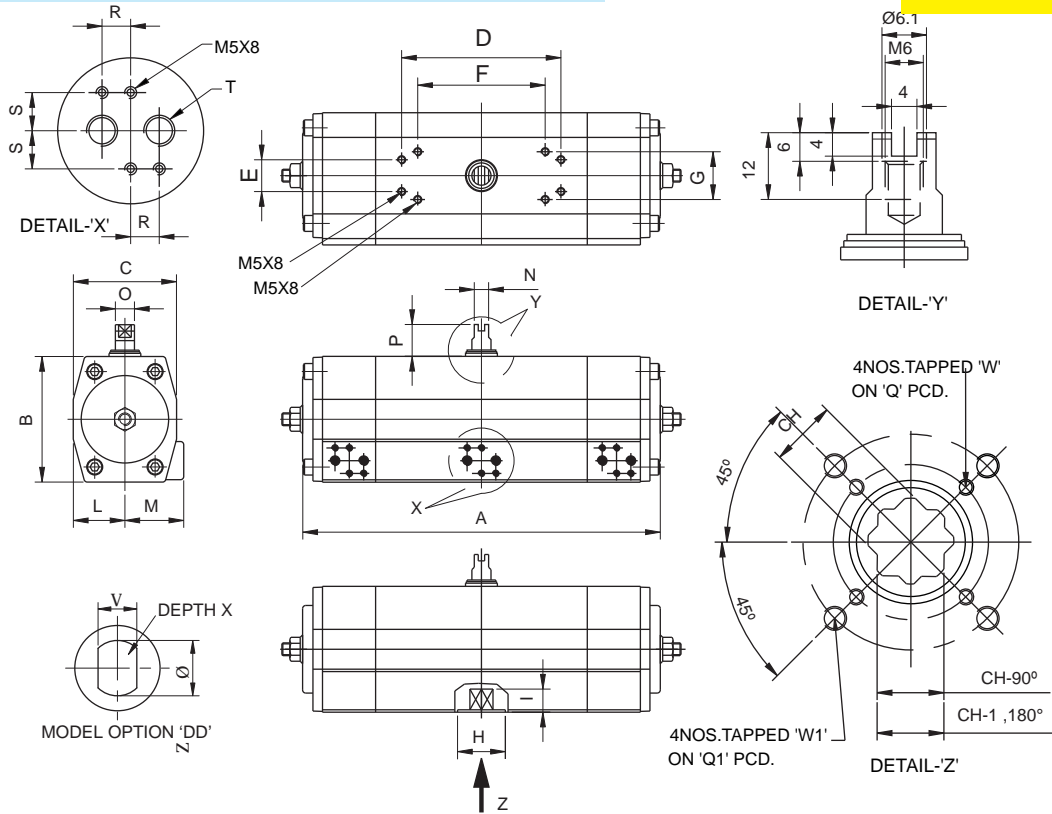
* The number of springs depend upon size of the actuator & the spring set selected.



ACTUATOR MODEL	ST32 DA ST32 SR	ST40 DA ST40 SR	ST50 DA ST50 SR	ST63 DA ST63 SR	ST80 DA ST80 SR	ST90 DR ST90 SR	ST100 DA ST100 SR	ST110 DA ST110 SR	ST125 DA ST125 SR	ST150 DA ST150 SR	ST175 DA ST175 SR	ST200 DA ST200 SR	ST250 DA ST250 SR
A	5.4	5.56	6.65	7.75	8.25	8.75	10.2	11.6	13.3	14.4	19.5	21.6	27.2
B	1.92	3.11	3.11	3.7	4.29	5.51	5.51	5.9	5.9	7.08	7.08	9.64	9.64
C	2.2	2.56	2.56	3.15	3.78	4.81	4.81	5.59	5.59	6.85	6.85	10.4	10.4
D	-	-	-	4.13	4.13	4.13	4.13	4.13	5.47	5.47	5.47	5.47	5.47
E	-	-	-	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
F	1.96	3.15	3.15	3.15	3.15	3.15	3.15	3.15	5.12	5.12	5.12	5.12	5.12
G	1.00	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	0.94	1.18	1.18	1.26	1.58	1.58	1.89	1.89	2.37	2.56	3.55	3.55	4.81
I	0.39	0.56	0.56	0.67	0.67	0.67	0.99	0.99	0.99	1.14	1.14	1.58	1.58
L	1.00	1.28	1.28	1.58	1.89	2.40	2.40	2.80	2.80	3.43	3.43	5.20	5.20
M	1.22	1.54	1.54	1.83	2.15	2.52	2.52	2.92	2.92	3.55	3.55	5.20	5.20
N A/F	0.31	0.31	0.36	0.44	0.44	0.44	0.44	0.59	0.59	0.59	0.95	0.95	0.95
O	0.39	0.39	0.48	0.59	0.59	0.59	0.59	0.79	0.79	0.79	1.18	1.18	1.18
P	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Q	1.42	1.42	1.42	1.97	1.97	1.97	2.76	2.76	2.76	4.02	4.02	4.02	-
Q1	-	1.97	1.97	2.76	2.76	2.76	4.02	4.02	4.02	4.92	4.92	5.51	5.51
R	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
S	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
T- NPT	1/8"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"
CH-90°	0.36	0.44	0.44	0.56	0.56	0.56	0.87	0.87	0.87	1.07	1.07	1.42	1.42
CH-1, 180°	0.36	0.36	0.36	0.44	0.44	0.44	0.56	0.56	0.56	0.87	0.87	1.07	1.07
W	M5	M5	M5	M6	M6	M6	M8	M8	M8	M10	M10	M10	-
W1	-	M6	M6	M8	M8	M8	M10	M10	M10	M12	M12	M16	M16
V	9	11	11	14	17	17	22	22	22	27	27	36	46
ØZ	12.1	14.1	14.1	18.1	22.2	22.2	26.2	28.2	28.2	36.2	36.2	48.2	60.2
X	12	15	15	21	21	25	25	25	30	35	35	50	65

3 POSITION ACTUATOR

DIMENSIONAL DETAILS



		ACTUATOR MODEL	ST32 DA	ST40 DA	ST50 DA	ST63 DA	ST80 DA	ST90 DR	ST100 DA	ST110 DA	ST125 DA	ST150 DA	ST175 DA	ST200 DA	ST250 DA	
DIMENSIONS	INCH	A	9.37	9.49	10.60	11.70	12.20	12.20	12.20	18.12	18.12	19.00	25.60	26.40	29.67	
		B	1.92	3.11	3.11	3.7	4.29	5.51	5.51	5.9	5.9	7.08	7.08	9.64	9.64	
		C	2.2	2.56	2.56	3.15	3.78	4.81	4.81	5.59	5.59	6.85	6.85	10.4	10.4	
		D	-	-	-	4.13	4.13	4.13	4.13	4.13	4.13	5.47	5.47	5.47	5.47	5.47
		E	-	-	-	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
		F	1.96	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	5.12	5.12	5.12	5.12	5.12
		G	1.00	1.18	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	0.94	1.18	1.18	1.26	1.58	1.58	1.89	1.89	2.37	2.56	3.55	3.55	4.81	
		I	0.39	0.56	0.56	0.67	0.67	0.67	0.99	0.99	0.99	1.14	1.14	1.58	1.58	
		L	1.00	1.28	1.28	1.58	1.89	2.40	2.40	2.80	2.80	3.43	3.43	5.20	5.20	
		M	1.22	1.54	1.54	1.83	2.15	2.52	2.52	2.92	2.92	3.55	3.55	5.20	5.20	
		N A/F	0.31	0.31	0.36	0.44	0.44	0.44	0.44	0.59	0.59	0.59	0.95	0.95	0.95	
		O	0.39	0.39	0.48	0.59	0.59	0.59	0.59	0.79	0.79	0.79	1.18	1.18	1.18	
		P	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	
		Q	1.42	1.42	1.42	1.97	1.97	1.97	2.76	2.76	2.76	4.02	4.02	4.02	-	
		Q1	-	1.97	1.97	2.76	2.76	2.76	4.02	4.02	4.02	4.92	4.92	5.51	5.51	
		R	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	
		S	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	
	T- BSP	1/8"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	
	CH-90°	0.36	0.44	0.44	0.56	0.56	0.56	0.87	0.87	0.87	1.07	1.07	1.42	1.42		
CH-1, 180°	0.36	0.36	0.36	0.44	0.44	0.44	0.56	0.56	0.56	0.87	0.87	1.07	1.07			
mm	W	M5	M5	M5	M6	M6	M6	M8	M8	M8	M10	M10	M10	-		
	W1	-	M6	M6	M8	M8	M8	M10	M10	M10	M12	M12	M16	M16		
	V	9	11	11	14	17	17	22	22	22	27	27	36	46		
	Z	12.1	14.1	14.1	18.1	22.2	22.2	28.2	28.2	28.2	36.2	36.2	48.2	60.2		
	X	12	15	15	21	21	25	25	25	25	30	35	35	50	65	

AIR CONSUMPTION

VOLUME IN CU. IN.			
MODEL		PISTON INWARD STROKE	PISTON OUTWARD STROKE
ST32 DA	ST32 SR	4.28	5.56
ST40 DA	ST40 SR	6.84	8.60
ST50 DA	ST50 SR	9.27	12.0
ST63 DA	ST63 SR	10.6	13.5
ST80 DA	ST80 SR	15.5	19.6
ST90 DA	ST90 SR	15.8	20.8
ST100 DA	ST100 SR	17.2	22.5
ST110 DA	ST110 SR	37.2	49.4
ST125 DA	ST125 SR	57.4	75.1
ST150 DA	ST150 SR	93.2	123.9
ST175 DA	ST175 SR	130.4	165.5
ST200 DA	ST200 SR	252.7	324.7
ST250 DA	ST250 SR	360.1	476.1

WEIGHT

WEIGHT IN lb		
MODEL	DOUBLE ACTING	SPRING RETURN
ST32	2.42	2.77
ST40	3.48	3.96
ST50	3.90	4.38
ST63	5.55	6.34
ST80	7.55	9.10
ST90	11.2	14.8
ST100	15.9	20.3
ST110	18.4	23.6
ST125	21.7	26.1
ST150	26.4	35.2
ST175	35.2	46.2
ST200	61.6	83.6
ST250	79.2	105.6

SPRING SETS CODES

FOR 32 - ST 63

SPRING SET	INNER SPRING	OUTER SPRING
5	0	2
6	2	1
7	1	2
8	2	2

FOR ST 80 - ST 125

SPRING SET	INNER SPRING	MIDDLE SPRING	OUTER SPRING
11	2	0	1
16	2	1	1
18	1	2	1
22	1	1	2
24	2	1	2
26	2	2	2

FOR ST 150 - ST 250

SPRING SET	INNER SPRING	MIDDLE SPRING	MID. OUTER SPRING	OUTER SPRING
27	1	1	2	0
37	2	0	1	1
39	1	2	2	0
42	2	2	0	1
54	1	1	2	1
65	1	2	2	1
72	2	2	2	2

Body:**Epoxy Coated & Hard Anodized Actuators: (Standard)**

Special Aluminum alloy (6351T6) used as a base metal.

Hard Anodizing of Aluminum results in better corrosion protection, surface hardness & superior wear resistance.

50µm thickness of controlled oxidized surface of the Aluminum alloy comprises primarily of Aluminum trioxide (Al_2O_3) crystals along with Magnesium, Tungsten oxides which make the surface chemically inert & extremely hard (in excess of 45 Rc).

Being an oxidized layer of the base metal Aluminum the treated layer can not be peeled off & so this is in an extremely stable surface treatment.

Surface withstands all environments including saline environment with the exception of strong acidic & alkaline atmospheres.

Epoxy resin (powder) deposited on the prepared (Hard anodised) Aluminium body by spray technique followed by a baking process produces a 50 micron thick layer. (only external surfaces).

Epoxy coating helps in protecting the actuator from extremely corrosive environments. This is suitable specially for Acidic, Alkaline environment, also suitable for environments like Ammonia, Ammonia Liquor etc

**Option EN****Electroless Nickel Treatment**

Nickel is deposited on the aluminum surface (not electrically) by chemical reaction of nickel on the Aluminium body. The treatment covers the crevices including threads, passage holes.... & leaves the surface absolutely non-porous. Superior corrosion resistance as compared to hard Anodising makes this treatment a suitable choice for corrosive environments. Ideal for external wash.

Pinion:**Electroless Nickel Plated: (Standard)**

Standard surface treatment given to the pinon shaft of Steel (EN 8). Adequate for most application including corrosive environments.

Option CC**Stainless Steel**

Optionally available for aggressive environments. Pinion can also be supplied in SS304/SS316.



SIZE	SET NO.	40 Psi		50 Psi		60 Psi		70 Psi		80 Psi		90 Psi		100 Psi		SPRING Start	SPRING End
		AIR Start	AIR End	AIR Start	AIR End	AIR Start	AIR End	AIR Start	AIR End	AIR Start	AIR End	AIR Start	AIR End	AIR Start	AIR End		
ST32 SR	2	-	-	23	10	34	23	43	30	53	41	63	50	73	60	40	27
	3	-	-	-	-	31	19	40	24	50	37	60	44	70	55	46	30
	4	-	-	-	-	-	-	-	35	10	44	28	55	30	62	47	60
ST 40 SR	5	35	13	55	33	74	52	94	72	113	91	132	110	152	130	65	43
	6	-	-	49	24	68	43	88	63	107	82	126	101	146	121	74	49
	7	-	-	-	-	62	34	82	54	101	73	120	92	140	112	83	55
ST 50 SR	8	-	-	-	-	-	-	69	36	88	55	107	74	127	94	101	68
	5	69	39	101	71	134	104	167	137	199	169	231	201	264	234	91	61
	6	30	26	92	58	125	91	158	124	190	156	222	188	255	221	104	70
ST 63 SR	7	-	-	-	-	116	78	149	111	181	143	213	175	246	208	117	79
	8	-	-	-	-	99	55	132	88	164	120	196	152	229	185	140	96
	5	80	19	133	72	186	125	239	178	292	231	345	284	398	327	193	132
ST 80 SR	6	-	-	116	45	170	99	222	151	276	205	328	257	382	311	220	149
	7	-	-	-	-	152	64	204	116	258	170	310	222	364	276	255	167
	8	-	-	-	-	117	11	169	63	223	117	275	169	329	223	308	202
ST 90 SR	11	237	167	331	261	426	356	519	449	615	545	709	639	804	734	211	141
	16	185	79	279	173	374	268	467	361	563	457	657	551	752	646	299	193
	18	-	-	261	138	355	232	449	326	544	421	639	516	722	610	334	211
ST 100 SR	22	-	-	-	-	302	179	396	273	491	368	586	463	680	557	387	264
	24	-	-	-	-	276	126	370	220	465	315	560	410	654	504	440	290
	26	-	-	-	-	-	-	334	168	429	263	524	358	618	452	492	326
ST 110 SR	11	370	261	517	408	665	556	812	703	960	851	1107	998	1255	1146	329	220
	16	289	124	436	371	584	419	781	566	879	714	1086	861	1174	1009	466	301
	18	-	-	408	216	556	364	703	511	851	659	998	806	1146	954	521	329
ST 125 SR	22	-	-	-	-	473	281	620	428	768	576	915	723	1063	871	604	412
	24	-	-	-	-	433	198	580	345	728	493	875	640	1023	788	687	452
	26	-	-	-	-	-	-	522	265	670	413	817	560	965	708	767	510
ST 150 SR	11	505	356	706	557	907	758	1108	959	1309	1160	1510	1361	1711	1562	448	299
	16	391	188	592	389	793	590	994	791	1195	992	1396	1193	1597	1394	616	413
	18	356	127	557	328	758	529	959	730	1160	931	1361	1132	1562	1333	677	448
ST 175 SR	22	-	-	-	-	652	388	853	589	1054	790	1255	991	1456	1192	818	554
	24	-	-	-	-	582	274	783	475	984	676	1185	877	1386	1078	932	624
	26	-	-	-	-	-	-	712	369	913	570	1114	771	1314	972	1038	695
ST 200 SR	11	681	480	952	751	1224	1023	1495	1284	1767	1566	2038	1837	2310	2109	606	405
	16	532	227	803	498	1074	770	1346	1041	1618	1313	1889	1584	2161	1856	859	554
	18	-	-	751	398	1023	670	1294	941	1566	1213	1837	1484	2109	1756	959	606
ST 250 SR	22	-	-	-	-	871	518	1142	789	1414	1061	1685	1332	1957	1604	1111	758
	24	-	-	-	-	796	365	1067	636	1339	908	1610	1179	1882	1451	1264	833
	26	-	-	-	-	-	-	964	487	1236	759	1507	1030	1779	1302	1413	936
ST 300 SR	11	876	603	1218	945	1560	1287	1902	1629	2244	1971	2586	2313	2928	2655	765	492
	16	691	321	1033	663	1375	1005	1717	1347	2059	1689	2401	2031	2743	2373	1047	677
	18	612	216	945	558	1296	900	1629	1242	1980	1584	2313	1926	2664	2268	1152	756
ST 400 SR	22	-	-	-	-	1111	644	1453	986	1795	1328	2137	1670	2479	2012	1408	941
	24	-	-	-	-	988	460	1330	802	1672	1144	2014	1486	2356	1828	1592	1064
	26	-	-	-	-	864	275	1206	617	1548	959	1890	1301	2232	1643	1777	1188
ST 500 SR	27	1404	973	1970	1539	2537	2106	3103	2672	3670	3239	4236	3805	4803	4372	1293	862
	39	1061	480	1627	1046	2194	1613	2760	2179	3327	2746	3893	3312	4460	3879	1786	1205
	42	982	366	1539	932	2115	1499	2672	2065	3248	2632	3805	3198	4381	3765	1900	1284
ST 600 SR	54	-	-	-	-	1779	996	2346	1563	2912	2129	3483	2696	4045	3262	2402	1619
	65	-	-	-	-	1568	670	2135	1237	2901	1803	3268	2370	3834	2936	2728	1830
	72	-	-	-	-	1427	459	1994	1026	2560	1592	3127	2159	3693	2725	2939	1971
ST 800 SR	27	1963	1365	2759	2161	3556	2958	4352	3754	5149	4551	5945	5347	6742	6144	1821	1223
	37	1558	766	2354	1562	3151	2359	3947	3155	4744	3952	5540	4748	6337	5545	2420	1628
	42	1356	458	2160	1254	2949	2051	3745	2847	4542	3644	5338	4440	6135	5237	2728	1830
ST 1000 SR	54	-	-	-	-	2509	1391	3305	2187	4102	2984	4898	3780	5695	4577	3388	2270
	65	-	-	-	-	2201	934	2997	1730	3794	2527	4590	3323	5387	4120	3845	2578
	72	-	-	-	-	2007	643	2803	1439	3600	2236	4396	3032	5193	3829	4136	2772
ST 1250 SR	27	3090	2157	4311	3378	5532	4599	6753	5820	7974	7041	9195	8262	10416	9483	2728	1795
	37	2448	1251	3669	2472	4890	3693	6111	4914	7332	6135	8553	7356	9774	8577	3634	2437
	42	2140	793	3361	2014	4582	3235	5803	4456	7024	5677	8245	6898	9466	8119	4092	2745
ST 1500 SR	54	-	-	-	-	4002	2356	5222	3576	6444	4798	7664	6018	8886	7240	4972	3326
	65	-	-	-	-	3456	1556	4676	2776	5898	3998	7118	5218	8340	6440	5772	3872
	72	-	-	-	-	3166	1116	4386	2336	5608	3558	6828	4778	8050	6000	6212	4162
ST 2000 SR	27	5397	3743	7580	5926	9763	8109	11946	10292	16841	12475	16312	14658	14129	21207	4989	3335
	37	4297	2106	6480	4289	8663	6472	10846	8655	13090	10838	15212	13021	17395	15204	6626	4435
	42	3734	1252	5917	3435	8100	5618	10283	7801	12466	9984	14649	12167	16832	14350	7480	4998
ST 2500 SR	54	-	-	-	-	7035	4034	9218	6217	11401	8400	13584	10583	15767	12766	9064	6063
	65	-	-	-	-	6041	2556	8224	4739	10407	6922	12590	9105	14700	11288	10542	7057
	72	-	-	-	-	5513	1768	7696	3951	9879	6134	12062	8317	14245	10500	11330	7585

DOUBLE ACTING TORQUE RATINGS

LB - IN Pressure in Psi

SONIC TORQUE™

Actuator	40 Psi	50 Psi	60 Psi	70 Psi	80 Psi	90 Psi	100 Psi
ST32 DA	40	50	60	70	80	90	100
ST40 DA	78	97	117	136	156	175	195
ST50 DA	130	162	195	227	360	292	325
ST63 DA	212	265	319	371	425	477	531
ST80 DA	378	472	566	661	755	850	944
ST90 DA	590	737	885	1032	1180	1327	1475
ST100 DA	804	1005	1206	1407	1608	1809	2010
ST110 DA	1086	1357	1629	1900	2172	2443	2715
ST125 DA	1368	1710	2052	2394	2736	3078	3420
ST150 DA	2266	2832	3398	3965	4531	5098	5664
ST175 DA	3186	3982	4779	5575	6372	7168	7965
ST200 DA	4885	6106	7328	8548	9770	10990	12213
ST250 DA	8732	10915	13098	15281	17464	19647	21830

ACCESSORIES

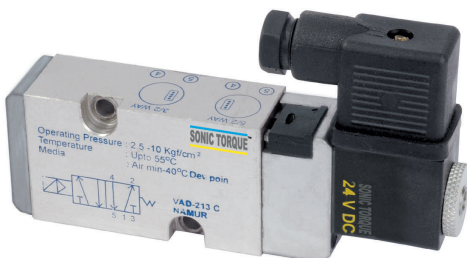
WEATHER PROOF
"SONIC SWITCH" NEMA 4



EXPLOSION PROOF
"SONIC SWITCH" NEMA 7

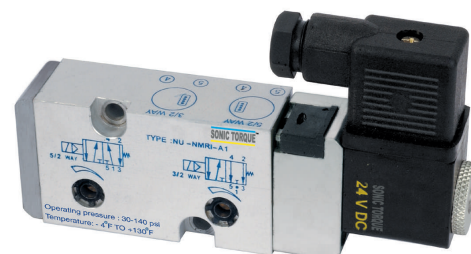


5/2 - 3/2 CONVERTIBLE,
NAMUR "SONIC SOL" VALVE



VAD213-NC

5/2 - 3/2 CONVERTIBLE,
WITH INTEGRAL FLOW CONTROL
NAMUR "SONIC SOL" VALVE



VAD213-NC-FC

The seat material used, media, temperature, frequency of operation and criticality 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.

In general, we can say 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 Ball Valves will vary depending on several factors.

- Seat design and material

Seats are designed to ensure consistent sealing and low torque. 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. Packing materials affect torque. Stem seal torque is an high percentage of overall torque especially in small valve sizes.

Service Conditions

- Differential Pressure Minimum and maximum pressures
- Frequency of operation Stuck valve torque
- Media Influence Slurries, dry gases, Oils
- Temperatures Minimum and maximum
- Cycle Time Line hammer, process requirements
- Instrument Air Supply Peak demand pressure availability

Media and Service Factors

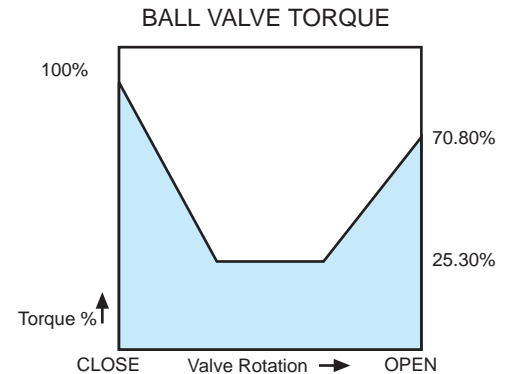
To establish minimum torque requirements, multiply valve torque by the following application media and service factors.

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 Factors	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

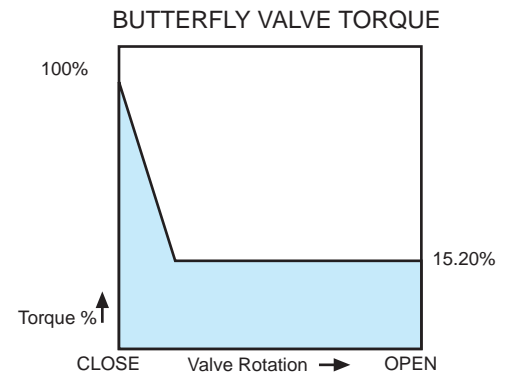
Ball Valve

Ball valve construction concept is based essentially on a polished ball (including a through part) 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).



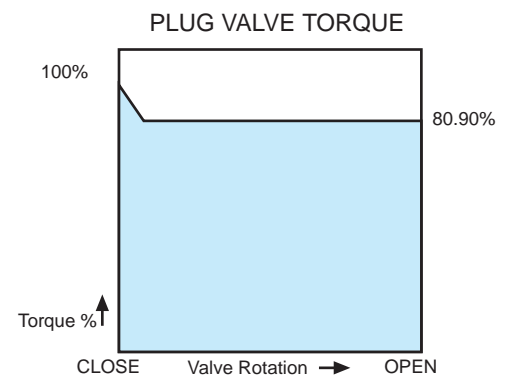
Butterfly Valve

Butterfly valve construction concept is based essentially on a disc fixed on a 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 that forces 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

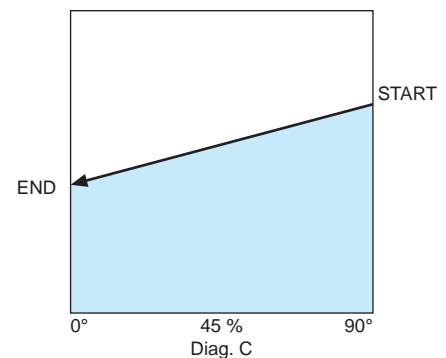
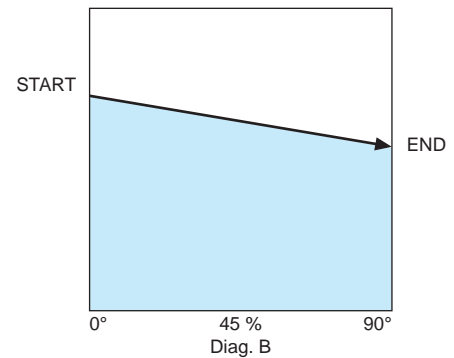
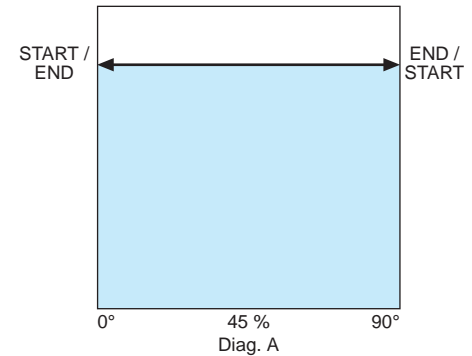
Plug valve construction concept is based essentially on a male (plug) contained in a female cone (seat). The plug provides a through port in one direction and with its rotation into the seat the opening and closure of the valve is obtained. the torque is usually not influenced by the flow pressure, but 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.



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. The friction should usually be negligible. As shown in diagram A, the torque of a DA actuator is constant throughout the entire rotation and relevant reversal. The advised safety factor, in addition to the valve manoeuvre torque, is approximately 20%.

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



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 C, the available torque at 0° progressively reduces during the rotation due to the springs compression. On the contrary, as shown in diagram D, the torque starting from the 90° position constantly decreases unit 0° because of spring extension. Owing the higher friction present the safety coefficient advised in this case is approximately 25%.

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

Recommended Spring Positioning

For ST 32-ST 63

If used any two spring use one on each side.

For ST 80-ST 125

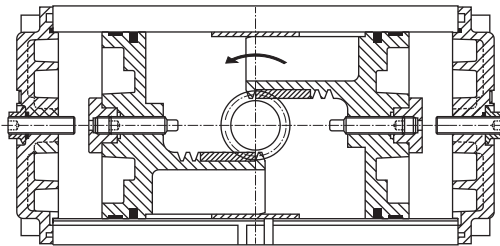
If used any two spring. Use one on each side. If used 3 spring all different, use outer on one side and inner and middle on other side if 4 spring are used with 3 different sides. Use two on each side, outer and inner on one side and outer and middle on other side, etc..

For ST 150-ST 250

Use combination like above. In case of all 4 springs different outer and inner on one side and middle and middle outer on other side.

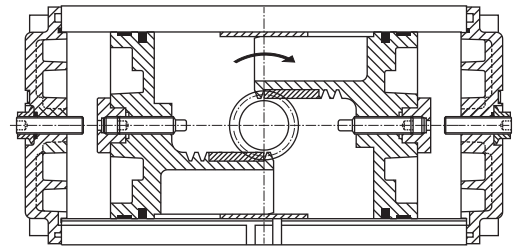
DOUBLE ACTING

(TOP VIEW)



PORT "B" ↓ ↑ PORT "A"

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

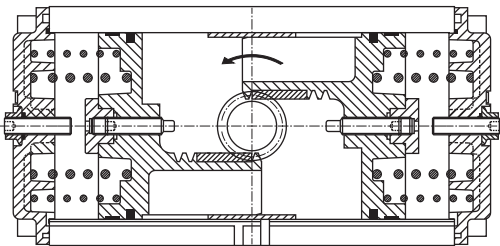


PORT "B" ↑ ↓ PORT "A"

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

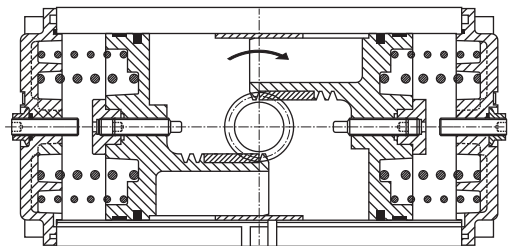
SPRING RETURN

(TOP VIEW)



PORT "B" ↓ ↑ PORT "A"

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).



PORT "B" ↑ ↓ PORT "A"

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, Sonic Torque Series actuators can be specially prepared for fast response operations.

Installation

- Make sure that the actuator, when fitted on the valve, is well aligned with the valve stem. When actuator is directly fitted with bracket and coupling, all parts must be precisely machined.
- In spring return applications, the exhaust air port must be very well vented.
- Accessories, if any, must be mounted in a proper manner to allow unobstructed operation of the actuator.

Maintenance

- Remove the end cap screws (10) of the end cap (02).
- Take off the end cap (02).
- Turn the pinion (04) in clockwise direction so that the pistons (03) come out of the body (01).
- Remove the retaining ring (13), (08) and (09).
- Take the pinon (04) out from the lower part of the body by simply pressing with your finger.
- Replace the following parts

On the pistons:

2 Flat Seal (15); 1 Body ring (06); 2 keys (07) ; 2 piston bearings (18); 2 O-rings (24).

On the heads :

2 Q Seal (14); 2 O-Rings (16).

On the pinion :

2 O-Rings (20) (21); 1 bearing (08); 1 lower bearing (17); 1 upper bearing (05); 1 pinion thrust washer (09); external circlip (13).

HOW TO ORDER

ACTUATOR MODEL	DOUBLE ACTING	SPRING RETURN	SPRING CODE	OPTIONS
ST 32	DA	SR	SR-SET NO	DD Double 'D' STEM
ST 40			Example	AA 3 POSITION ACTUATOR
ST 50			SR 8	BB 180° ACTUATOR
ST 63				EN ELECTROLESS NICKEL TREATMENT
ST 80				CC STAINLESS STEEL PINION
ST 90				HT HIGHT TEMPERATURE ACTUATOR
ST 100				RR REVERSE ROTATION
ST 110				LA LOCK ACTUATOR
ST 125				
ST 150				
ST 175				
ST 200				
ST 250				



SHARPE® VALVES

A DIVISION OF SHARON PIPING & EQUIPMENTS., INC

Toll-Free 1-877-7 SHARPE
E-Mail: sharpediv@aol.com
www.sharpevalves.com