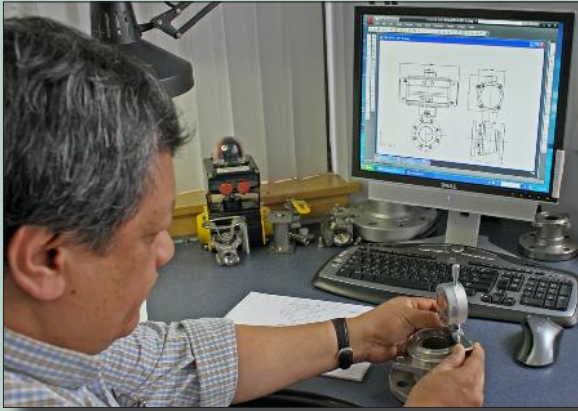


SHARPE[®]

Automation & Controls



SMITH-COOPER[®]
INTERNATIONAL



Our staff of In-house engineers are experts in designing valves for even the most stringent applications.



Our ISO 9001:2008 valve manufacturer and designer certification guarantees strict quality control.



Ultrasonic cleaning assures complete de-greasing of clean and cryogenic valve components before being assembled in our on-site clean room.



Every assembled valve is tested and certified to all customer requirements before shipping.



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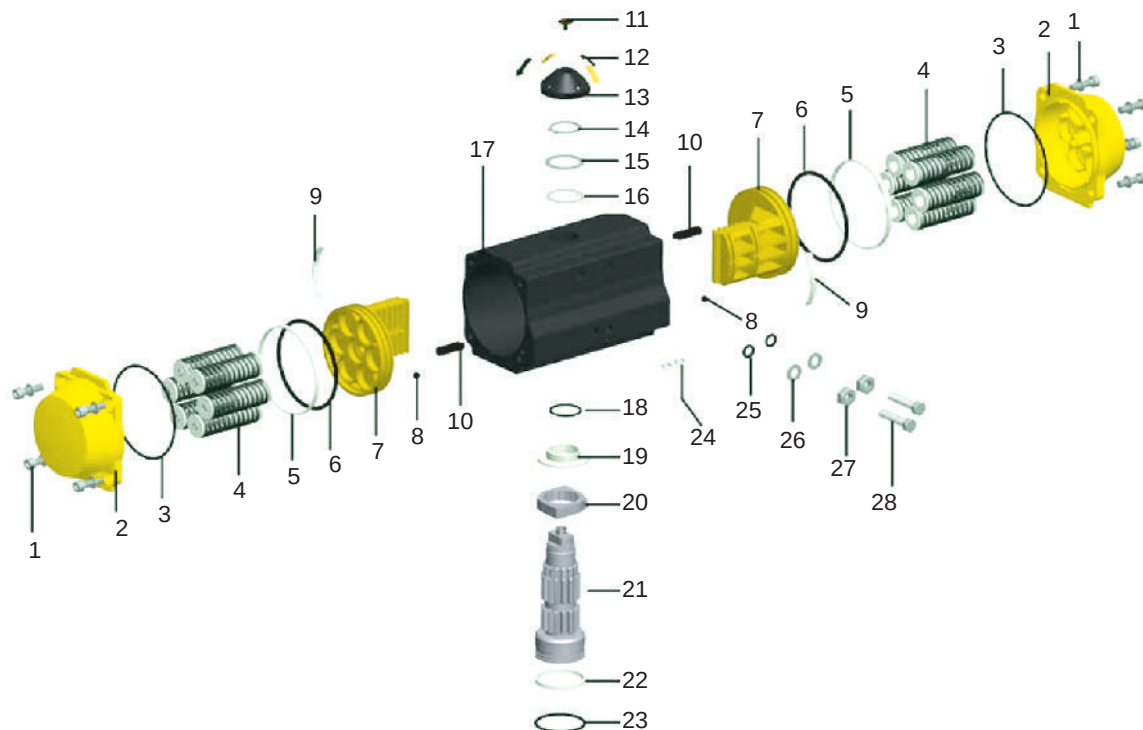
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SPN II Pneumatic Actuator



- Rack & pinion design
- The standard actuator configuration has a hard anodized aluminum body and epoxy coated end caps
- Inside surface finish (Ra 0.4-0.6µm) to minimize friction and to maximize the life of the actuator.
- Standard applications for temperature ranges from -4°F to 180°F.
- Special options for extreme temperatures (upon request).
- Piston bearing made of material with a low friction coefficient to avoid metal-on-metal contact, easily replaceable for maintenance.
- Base 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 not being used. (Not available on SPN II 032)
- Independent bidirectional travel stop adjustment $\pm 5^\circ$ ensuring precise positioning in all flow control services. (Not available on SPN II 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 filter compressed air. Pressure: 40 PSI to 120 PSI
- The lubrication carried out by the manufacturer qualifies for a minimum 1,000,000 operations.
- Epoxy coating is a deposit of powder on clean 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 the exception of certain solvents, epoxy coatings resist 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 confirmation of position.
- The SPN II features inserts to allow easy conversion to many square and diamond valve stems. There are also double D along with round bores with keyway inserts for the same actuators for butterfly applications. The pinion is drilled deeper than standard actuators. The SPN II series has mounting plates for the transition of the bolt circles of the actuator to be used with other industry standards for butterfly valves.
- For conditions or applications that demand the most from equipment, Sharpe offers our SPNII with chemical nickel plating. These actuators are designed to be a cost effective option in comparison to stainless steel actuators. The Nickel plating is done through chemical impregnation to provide uniform coverage and protection. The bath is a mixture of nickel and phosphorous to provide excellent qualities in: hardness, wear resistance, appearance and its inherent ability to withstand many wash-down applications that actuators with standard finishes cannot.

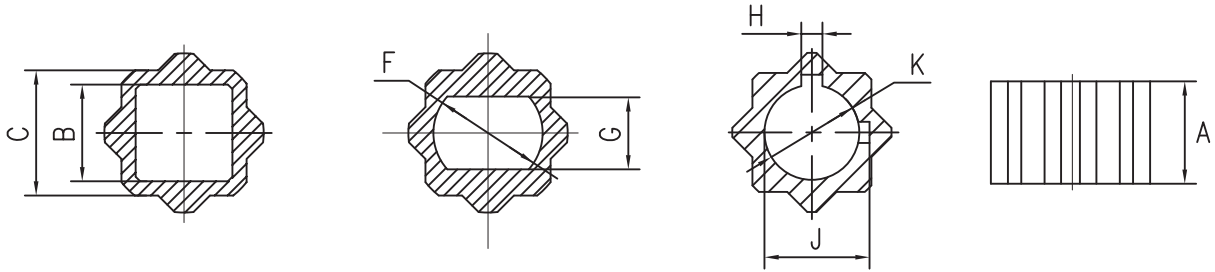
SPN II Material List



Part No.	Qty	Part Description	Materials	Surface Treated	Optional Material
1	8	End Cap Bolts	Stainless Steel 304		
2	2	End Cap	Aluminum 380 Die-Casting Alloy	Hard Anodized & Polyester Coated	CF8 / CF8M
3*	2	O-Ring (End Cap)	NBR Rubber		Viton / Silicone
4	5-12	Spring (Cartridge)	High Alloy Spring Steel	Polyester Coated	
5*	2	Bearing	Polyacetal		CF8 / CF8M
6*	2	O-Ring (Pinion)**	NBR Rubber		Viton / Silicone
7	2	Piston	380 Die-Casting	Hard Anodized	
8*	2	Plug	NBR Rubber		Viton / Silicone
9*	2	Bearing (Piston Back)	Nylon		
10*	2	Piston Guide	Nylon		
11	2	Indicator Bolt	ABS		
12	4	Indicator Arrowhead	ABS		
13	2	Pinion Indicator	ABS		
14	2	Snap Ring	Stainless Steel 304		
15	1	Thrust Washer (Pinion)	Stainless Steel 304		
16*	1	Thrust Washer (Pinion)	Polyacetal		
17	1	Body	Aluminum 6063-T6	Hard Anodized & Polyester Coated	CF8 / CF8M
18*	1	O-Ring (Pinion)**	NBR Rubber		Viton / Silicone
19*	1	Bearing (Pinion Top)	Polyacetal		
20	1	Stroke Adjustment Stop	C45 Steel	Nickel Plated	CF8 / CF8M
21	1	Pinion	Alloy Steel	Nickel Plated	SUS304 / SUS316
22*	1	Bearing (Pinion Bottom)	Polyacetal		
23*	1	O-Ring (Pinion Bottom)	NBR Rubber		Viton / Silicone
24*	2	Exhaust Plug	PVC		
25*	2	O-Ring (Stop Nut)	NBR Rubber		Viton / Silicone
26	2	Washer	Stainless Steel 304		
27	2	Stop Nut	Stainless Steel 304		
28	2	Stop Bolts	Stainless Steel 304		

* Parts Typically Supplied in Service Kits

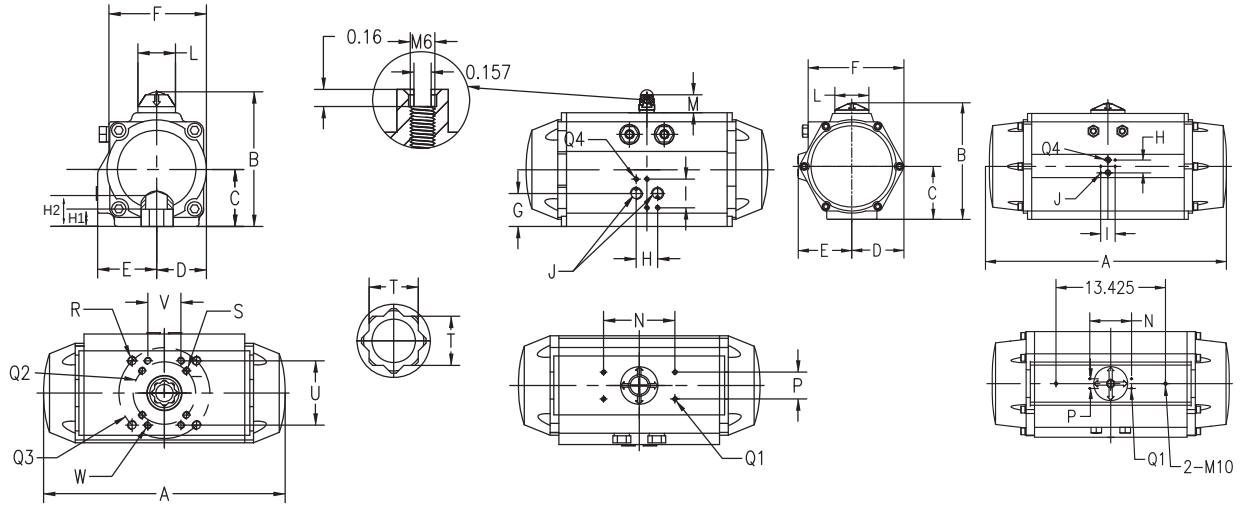
SPN II Inserts Dimensions



Model	Insert Code	Insert Shape	Unit	Insert Size	A	B	C	F	G	H	J	K
050	A	Square	in mm	0.354 9	0.472 12	0.354 9	0.669 17					
	B*	Square	in mm	0.433 11	0.472 12	0.433 11	0.669 17					
	C	Square	in mm	0.551 14	0.472 12	0.551 14	0.669 17					
	G	Flat	in mm	0.378 10	0.472 12	-	0.669 17	0.567 14	0.378 10			
063	A	Square	in mm	0.354 9	0.630 16	0.354 9	0.669 17					
	B*	Square	in mm	0.433 11	0.630 16	0.433 11	0.669 17					
	C	Square	in mm	0.551 14	0.630 16	0.551 14	0.669 17					
	G	Flat	in mm	0.378 10	0.630 16	-	0.669 17	0.567 14	0.378 10			
075 & 085	A	Square	in mm	0.354 9	0.709 18	0.354 9	0.866 22					
	B	Square	in mm	0.433 11	0.709 18	0.433 11	0.866 22					
	C*	Square	in mm	0.551 14	0.709 18	0.551 14	0.866 22					
	D	Square	in mm	0.669 17	0.709 18	0.669 17	0.866 22					
	G	Flat	in mm	0.378 10	0.709 18	-	0.866 22	0.567 14	0.378 10			
	H	Flat	in mm	0.441 11	0.709 18	-	0.866 22	0.63 16	0.441 11			
	I	Flat	in mm	0.503 13	0.709 18	-	0.866 22	0.756 19	0.503 13			
100 & 115	B	Square	in mm	0.433 11	0.906 23	0.433 11	0.866 22					
	C	Square	in mm	0.551 14	0.906 23	0.551 14	0.866 22					
	D*	Square	in mm	0.669 17	0.906 23	0.669 17	0.866 22					
	G	Flat	in mm	0.378 10	0.906 23	-	0.866 22	0.567 14	0.378 10			
	H	Flat	in mm	0.441 11	0.906 23	-	0.866 22	0.63 16	0.441 11			
	I	Flat	in mm	0.503 13	0.906 23	-	0.866 22	0.756 19	0.503 13			
125, 145 & 160	C	Square	in mm	0.551 14	1.142 29	0.551 14	1.417 36					
	D	Square	in mm	0.669 17	1.142 29	0.669 17	1.417 36					
	E	Square	in mm	0.866 22	1.142 29	0.866 22	1.417 36					
	F	Square	in mm	1.063 27	1.142 29	1.063 27	1.417 36					
	G	Flat	in mm	0.378 10	1.142 29	-	1.417 36	0.563 14	0.378 10			
	H	Flat	in mm	0.441 11	1.142 29	-	1.417 36	0.63 16	0.441 11			
	I	Flat	in mm	0.503 13	1.142 29	-	1.417 36	0.756 19	0.503 13			
	J	Flat	in mm	0.628 16	1.142 29	-	1.417 36	0.882 22	0.628 16			
	K	Round	in mm	1.130 29	1.142 29	-	1.417 36			0.252 6	1.252 32	1.13 29
180 & 200	E	Square	in mm	0.866 22	1.654 42	0.866 22	1.417 36					
	F*	Square	in mm	1.063 27	1.654 42	1.063 27	1.417 36					
	J	Flat	in mm	0.628 16	1.654 42	-	1.417 36	0.882 22	0.628 16			
	K	Round	in mm	1.130 29	1.654 42	-	1.417 36			0.252 6	1.252 32	1.13 29

* STANDARD INSERT

SPN II Dimensions



Model	Unit	A	B	C	D	E	F	G	H	H1	H2	I	J	L
032	in	4.61	1.77	.88	.88	.88	1.77	.88	0.94	.39	-	1.25	1/8"	1.4
	mm	117	45	22	22	22	45	22	24	10	-	32		36
040	in	4.29	2.95	1.10	1.06	1.30	2.36	1.10	0.94	0.43	-	1.26	1/8"	1.18
	mm	109	75	28	27	33	60	28	24	11	-	32		30
050	in	5.8	3.62	1.35	1.12	1.61	2.28	1.02	0.94	0.47	1.26	1.26	1/4"	1.65
	mm	147	92	34	28	41	58	26	24	12	32	32		42
063	in	6.26	4.25	1.67	1.42	1.14	2.83	1.18	0.94	0.63	1.34	1.26	1/4"	1.65
	mm	159	108	42	36	29	72	30	24	16	34	32		42
075	in	8.39	4.92	2.01	1.71	2.07	3.39	1.03	0.94	0.75	1.34	1.26	1/4"	1.65
	mm	213	125	51	43	53	86	26	24	19	34	32		42
085	in	9.8	5.43	2.27	1.91	2.22	3.8	1.26	0.94	0.75	1.34	1.26	1/4"	1.65
	mm	249	138	58	49	56	97	32	24	19	34	32		42
100	in	10.67	5.94	2.5	2.2	2.6	4.17	1.46	0.94	0.91	1.89	1.26	1/4"	1.65
	mm	271	151	64	56	66	106	37	24	23	48	32		42
115	in	12.40	6.89	2.85	2.52	3.03	5.00	1.67	0.94	0.91	1.89	1.26	1/4"	2.6
	mm	315	175	72	64	77	127	42	24	23	48	32		66
125	in	13.62	7.48	3.09	2.72	3.23	5.12	1.8	0.94	1.14	2.56	1.26	1/4"	2.6
	mm	346	190	78	69	82	130	46	24	29	65	32		66
145	in	16.22	8.25	3.46	3.15	3.54	5.85	2.17	0.94	1.14	2.56	1.26	1/4"	2.6
	mm	412	210	88	80	90	149	55	24	29	65	32		66
160	in	17.44	9.06	3.88	3.46	3.87	6.28	2.04	0.94	1.14	2.56	1.26	1/4"	2.6
	mm	443	230	99	88	98	160	52	24	29	65	32		66
180	in	19.37	9.96	4.29	3.88	4.15	7.07	2.37	0.94	1.65	3.62	1.26	1/4"	3.15
	mm	492	253	109	99	105	180	60	24	42	92	32		80
200	in	21.54	10.91	4.8	4.29	4.41	7.64	2.6	0.94	1.65	3.62	1.26	1/4"	3.15
	mm	547	277	122	109	112	194	66	24	42	92	32		80
240	in	24.17	13.7	5.75	5.14	5.16	9.09	2.76	1.57	1.97	3.27	1.77	3/8"	3.15
	mm	614	348	146	131	131	231	70	40	50	92	45		80
265	in	28.7	15.31	6.57	5.79	5.78	9.99	3.54	1.57	1.97	3.27	1.77	3/8"	3.15
	mm	729	389	167	147	147	254	90	40	50	92	45		80
300	in	33.03	16.14	6.99	6.38	6.81	11.42	3.35	1.57	1.97	3.27	1.77	1/2"	3.15
	mm	839	410	178	162	173	290	85	40	50	92	45		80

Model	Unit	M	N	P	Q1	Q2	Q3	Q4	R	S	T	U	V	W
032	in	0.79	1.97	1.18	M5	F03	-	M5	-	-	0.35	-	-	-
	mm	20	50	30							9			
040	in	0.79	1.61	1.18	M5	F04	F05	M5	M6	M5	0.35	-	-	-
	mm	20	41	30							9			
050	in	0.79	3.15	1.18	M5	F04	-	M5	-	M5	0.67	-	-	-
	mm	20	80	30							17			
063	in	0.79	3.15	1.18	M5	F05	-	M5	-	M6	0.67	-	-	-
	mm	20	80	30							17			
075	in	0.79	3.15	1.18	M5	F05	F07	M5	M8	M6	0.87	-	-	-
	mm	20	80	30							22			
085	in	0.79	3.15	1.18	M5	F05	F07	M5	M8	M6	0.87	-	-	-
	mm	20	80	30							22			
100	in	0.79	3.15	1.18	M5	F07	F10	M5	M10	M8	0.87	2.83	1.46	M8
	mm	20	80	30							22	72	37	
115	in	1.18	3.15	1.18	M5	F07	F10	M5	-	M10	0.87	-	-	M8
	mm	30	80	30							22			
125	in	1.18	3.15	1.18	M5	F10	-	M5	-	M10	1.42	2.83	1.46	M8
	mm	30	80	30							36	72	37	
145	in	1.18	3.15	1.18	M5	F10	F12	M5	M12	M10	1.42	2.83	1.46	M8
	mm	30	80	30							36	72	37	
160	in	1.18	3.15	1.18	M5	F10	F12	M5	M12	M10	1.42	2.83	1.46	M8
	mm	30	80	30							36	72	37	
180	in	1.18	5.12	1.18	M5	F10	F14	M5	M16	M10	1.42	3.9	2.09	M10
	mm	30	130	30							36	99	53	
200	in	1.18	5.12	1.18	M5	F10	F14	M5	M16	M10	1.42	3.9	2.09	M10
	mm	30	130	30							36	99	53	
240	in	1.97	5.12	1.18	M5	F12	F16	M6	M20	M12	1.81	-	-	-
	mm	50	130	30							46			
265	in	1.97	5.12	1.18	M5	-	F16	M6	M20	-	1.81	-	-	-
	mm	50	130	30							46			
300	in	1.97	5.12	1.18	M5	-	F16	M6	M20	-	1.81	-	-	-
	mm	50	130	30							46			

SPN II Spring Return Torques

Model	Spring Quantity	Air Supply														Spring Return	
		40 PSI		60 PSI		70 PSI		80 PSI		90 PSI		100 PSI		120 PSI			
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
040	02					51	33	62	45	73	56	87	69	110	93	27	44
	04									55	21	70	34	92	58	44	80
050	05	51	36	93	78	111	96	133	118	159	144	179	164	221	206	45	27
	06	44	28	86	70	104	88	126	110	152	135	172	156	214	198	50	34
	07	38	19	80	61	98	79	120	101	146	127	166	147	208	189	59	40
	08			73	51	91	69	113	91	139	117	159	137	201	179	69	47
	09			67	43	85	61	107	83	133	109	153	129	195	171	77	53
	10					79	53	101	75	127	101	147	121	189	163	85	59
	11					72	43	94	65	120	91	140	111	182	153	95	66
	12					65	34	87	56	113	82	133	102	175	144	104	73
063	05	96	70	166	140	200	174	236	210	272	246	308	282	376	350	76	50
	06	86	54	156	124	190	158	226	194	262	230	298	266	366	334	92	60
	07	76	38	146	108	180	142	216	178	252	214	288	250	356	318	108	70
	08			135	94	169	128	205	164	241	200	277	236	345	304	122	81
	09			125	78	159	112	195	148	231	184	267	220	335	288	138	91
	10			114	62	148	96	184	132	220	168	256	204	324	272	154	102
	11					138	80	174	116	210	152	246	188	314	256	170	112
	12					129	65	165	101	201	137	237	173	305	241	185	121
075	05	174	117	316	259	386	329	456	399	546	489	612	555	742	685	159	102
	06	157	86	299	228	369	298	439	368	529	458	595	524	725	654	190	119
	07	137	55	279	197	349	267	419	337	509	427	575	493	705	623	221	139
	08			259	166	329	236	399	306	489	396	555	462	685	592	252	159
	09			240	135	310	205	380	275	470	365	536	431	666	561	283	178
	10			221	104	291	174	361	244	451	334	517	400	647	530	314	197
	11			201	73	143	341	341	213	431	303	497	369	627	499	345	217
	12					112	322	322	182	412	272	478	338	608	468	376	236
085	05	271	171	478	378	534	434	702	602	810	710	932	832	1154	1054	266	166
	06	238	120	445	327	501	383	669	551	777	659	899	781	1121	1003	317	199
	07	205	69	412	276	468	332	636	500	744	608	866	730	1088	952	368	232
	08			380	224	436	280	604	448	712	556	834	678	1056	900	420	264
	09			348	173	404	229	572	397	680	505	802	627	1024	849	471	296
	10			316	122	372	178	540	346	648	454	770	576	992	798	522	328
	11					339	126	507	294	615	402	737	524	959	746	574	361
	12					306	75	474	243	582	351	704	473	926	695	625	394
100	05	413	290	753	630	903	780	1050	927	1217	1094	1385	1262	1683	1560	345	222
	06	368	220	708	560	858	710	1005	857	1172	1024	1340	1192	1638	1490	415	267
	07	323	150	663	490	813	640	960	787	1127	954	1295	1122	1593	1420	485	312
	08			617	420	767	570	914	717	1081	884	1249	1052	1547	1350	555	358
	09			572	350	722	500	869	647	1036	814	1204	982	1502	1280	625	403
	10			528	281	678	431	825	578	992	745	1160	913	1458	1211	694	447
	11			483	211	633	361	780	508	947	675	1115	843	1413	1141	764	492
	12			437	141	587	291	734	438	901	605	1069	773	1367	1071	834	538
115	05	687	470	1211	994	1474	1257	1736	1519	1998	1781	2260	2044	2670	2410	580	363
	06	614	354	1139	878	1401	1141	1663	1403	1926	1665	2188	1928	2592	2291	969	435
	07	541	238	1066	762	1328	1025	1591	1287	1853	1549	2115	1812	2525	2153	812	508
	08			993	646	1256	909	1518	1171	1780	1433	2043	1696	2451	2038	928	581
	09			921	530	1183	793	1446	1055	1708	1317	1970	1580	2387	1942	1044	653
	10			848	414	1111	677	1373	939	1635	1201	1898	1464	2235	1724	1160	726
	11					1038	560	1300	823	1563	1085	1825	1348	2318	1840	1276	798
	12					965	444	1228	707	1490	969	1753	1232	2245	1724	1392	871
125	05	850	584	1539	1273	1919	1653	2277	2011	2557	2291	2967	2701	3650	3384	717	451
	06	757	434	1446	1123	1826	1503	2184	1861	2464	2141	2874	2551	3557	3234	867	544
	07	664	292	1353	981	1733	1361	2091	1719	2371	1999	2781	2409	3464	3092	1009	637
	08			1255	831	1635	1211	1993	1569	2273	1849	2683	2259	3366	2942	1159	735
	09			1162	680	1542	1060	1900	1418	2180	1698	2590	2108	3273	2791	1310	828
	10			1070	530	1450	910	1808	1268	2088	1548	2498	1954	3181	2641	1460	920
	11			977	388	1357	768	1715	1126	1995	1406	2405	1816	3088	2499	1602	1013
	12			879	238	1259	618	1617	976	1897	1256	2307	1666	2990	2349	1752	1111

SPN II Spring Return Torques Cont.

Model	Spring Quantity	Air Supply														Spring Return	
		40 PSI		60 PSI		70 PSI		80 PSI		90 PSI		100 PSI		120 PSI			
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
145	05	1253	846	2433	2026	2973	2566	3485	3078	3983	3576	4626	4219	5588	5181	1124	717
	06	1103	616	2283	1796	2823	2336	3335	2848	3833	3346	4476	3989	5438	4951	1354	867
	07	952	386	2132	1566	2672	2106	3184	2618	2682	3116	4325	3759	5287	4721	1584	1018
	08			1991	1336	2531	1876	3043	2388	3541	2886	4184	3529	5146	4491	1814	1159
	09			1840	1114	2380	1654	2892	2166	3390	2664	4033	3307	4995	4269	2036	1310
	10			1690	884	2230	1424	2742	1936	3240	2434	3883	3077	4845	4039	2266	1460
	11			1548	654	2088	1194	2600	1706	3098	2204	3741	2847	4703	3809	2496	1602
	12					1946	964	2458	1476	2956	1974	3599	2617	4561	3579	2726	1744
160	05	1858	1372	3185	2699	3893	3407	4601	4115	5221	4735	5929	5443	7171	6685	1460	974
	06	1655	1080	2982	2407	3690	3115	4398	3823	5018	4443	5726	5151	6968	6393	1752	1177
	07	1451	779	2778	2106	3486	2814	4194	3522	4814	4142	5522	4850	6764	6092	2053	1381
	08			2575	1814	3283	2522	3991	3230	4611	3850	5319	4558	6561	5800	2345	1584
	09			2380	1513	3088	2221	3796	2929	4416	3549	5124	4257	6366	5499	2646	1779
	10			2176	1221	2884	1929	3592	2637	4212	3257	4920	3965	6162	5207	2938	1983
	11			1973	920	2681	1628	3389	2336	4009	2956	4717	3664	5959	4906	3239	2186
	12			1778	628	2486	1336	3194	2044	3814	2664	4522	3372	5764	4614	3531	2381
180	05	2284	1550	4172	3438	5269	4535	6079	5345	7099	6365	7794	7060	9329	8595	2115	1381
	06	2001	1134	3889	3022	4986	4119	5796	4929	6816	5949	7511	6644	9046	8179	2531	1664
	07	1718	718	3606	2606	4703	3703	5513	4513	6533	5533	7228	6228	8763	7763	2947	1947
	08			3323	2181	4420	3278	5230	4088	6250	5108	6945	5803	8480	7338	3372	2230
	09			3048	1764	4145	2862	4955	3672	5975	4692	6670	5387	8205	6922	3788	2505
	10			2765	1349	3862	2446	4672	3256	5692	4276	6387	4971	7922	6506	4204	2788
	11			2491	933	3588	2030	4398	2840	5418	3860	6113	4555	7648	6090	4620	3062
	12			2207	517	3304	1614	4114	2424	5134	3444	5829	4139	7364	5674	5036	3346
200	05	3179	2276	5800	4897	7098	6195	8568	7665	9658	8755	10972	10069	13291	12388	2815	1912
	06	2808	1719	5429	4340	6727	5638	8167	7108	9287	8198	10601	9512	12920	11831	3372	2283
	07	2436	1161	5057	3782	6355	5080	7825	6550	8915	7640	10229	8954	12548	11273	3930	2655
	08			4685	3234	5983	4532	7453	6002	8543	7092	9857	8406	12176	10726	4478	3027
	09			4304	2685	5602	3983	7072	5453	8162	6543	9476	7857	11795	10176	5027	3408
	10			3924	2127	5222	3425	6692	4895	7782	5985	9096	7299	11415	9618	5585	3788
	11			3552	1578	4850	2876	6320	4346	7410	5436	8724	6750	11043	9069	6134	4160
	12			3172	1021	4470	2319	5940	3789	7030	4879	8344	6193	10663	8512	6691	4540
240	05	5495	4061	9857	8423	12039	10605	14250	12816	16390	14956	18570	17136	22370	20936	4664	3230
	06	4849	3131	9211	7493	11393	9675	13604	11886	15744	14026	17924	16206	21724	20006	5593	3885
	07	4203	2201	8565	6563	10747	8745	12958	10956	15096	13096	17276	15276	21078	19076	6540	4531
	08			7919	5633	10101	7815	12312	10026	14452	12160	16632	14346	20432	19146	7479	5186
	09			7273	4703	9455	6885	11666	9096	13806	11236	15986	13416	19786	17216	8400	5815
	10					8805	5955	11020	8166	13160	10306	15340	12486	19140	16286	9310	6470
	11							10374	7236	12514	9376	14694	11556	18494	15356	10249	7125
	12									11868	8446	14046	10626	17848	14426	11214	7780
265	05	9275	6992	16267	13984	19781	17496	23525	21242	26623	23340	31137	28854	37686	35403	7080	4797
	06	8310	5576	15302	12568	11816	16080	22560	19826	25658	22924	30172	27438	36721	33987	8452	5780
	07	7345	4160	14337	11152	17851	14664	21595	18410	24693	21508	29207	26022	35756	32571	9877	6726
	08			13372	9736	16886	13248	20630	16994	23728	20092	28242	24606	34791	31155	11285	7656
	09			12407	8320	15921	11832	19665	15578	22763	18676	27277	23190	33826	29739	12745	8674
	10					14956	10416	18700	14162	21798	17260	26312	21774	32861	28323	14125	9612
	11							17735	12746	20833	15844	25347	20358	31896	26907	15524	10558
	12									19868	14428	24382	18942	30931	25491	16905	11505
300	05	11340	8074	20253	16987	24937	21671	29196	25930	33650	30384	38118	34852	47037	43771	9798	6532
	06	10039	6127	18952	15040	23636	19724	27895	23983	32349	28437	36817	32905	45736	41824	11745	7833
	07	8738	4171	17651	13084	22335	17768	26594	22027	31048	26481	35516	30949	44435	39868	13701	9134
	08			16350	11128	21034	15812	25293	20071	29747	24525	34215	28993	43134	37912	15657	10435
	09			15040	9172	19724	13856	23983	18115	28437	22569	32905	27037	41824	35956	17613	11745
	10			13739	7216	18423	11900	22682	16159	27136	20613	31604	25081	40523	34000	19569	13046
	11					17122	9944	21381	14203	25835	18657	30303	23125	39222	32044	21525	14347
	12							20071	12247	24525	16701	28993	21169	37912	30088	23481	15657

SPN II Double Acting Torques and Technical Information

SPN II Double Acting Torque Ratings							
Model	40 PSI	60 PSI	70 PSI	80 PSI	90 PSI	100 PSI	120 PSI
032	26	41	51	59	67	76	92
040	41	64	77	89	101	113	137
050	78	120	138	160	186	206	248
063	146	216	250	286	322	358	426
075	276	418	488	558	648	714	844
085	437	644	700	868	946	1098	1320
100	635	975	1125	1272	1439	1607	1905
115	1049	1574	1836	2099	2361	2623	3116
125	1301	1990	2370	2728	3008	3418	4101
145	1970	3150	3690	4202	4700	5343	6305
160	2832	4159	4867	5575	6195	6903	8145
180	3665	5553	6650	7460	8480	9175	10710
200	5091	7712	9010	10480	11570	12881	15203
240	8720	13081	15268	17445	19639	21816	25478
265	12667	18987	22165	28413	32044	35577	42755
300	17872	26785	31469	35728	40182	44650	53569

SPN II Air Consumption and Weights																	
	Unit	032	040	050	063	075	085	100	115	125	145	160	180	200	240	265	300
Body Diameter	in	1.26	1.57	1.97	2.48	2.95	3.46	3.94	4.53	4.92	5.71	6.3	7.09	7.87	9.45	10.43	11.81
	mm	32	40	50	63	75	88	100	115	125	145	160	180	200	240	265	300
Air Consumption Per Stroke Actual in ³	CCW	0.9	1.9	4.9	9.2	18.3	30.5	45.8	72.6	94.6	146.5	195.3	262.4	358.2	610.2	884.8	1287.6
	CW	2.1	4.15	7.9	15.3	29.3	44.6	65.9	109.8	133.0	216.6	288.0	415.0	581.6	927.6	1305.9	1861.2
Opening Time DA	Sec.	0.13	0.14	0.2	0.2	0.2	0.3	0.4	0.7	0.8	1.3	1.6	2.0	2.7	3.5	4.0	8.8
Closing Time DA	Sec.	0.14	0.16	0.2	0.2	0.3	0.4	0.5	0.9	1.1	1.4	2.0	2.4	3.5	4.1	4.5	12.7
Approximate Weight - DA	Lb	0.71	1.53	2.40	3.40	6.10	8.30	11.70	18.50	21.90	31.10	40.50	55.10	77.20	119.05	178.57	299.39
	kg	0.32	0.70	1.09	1.54	2.77	3.76	5.31	8.39	9.93	14.10	18.37	24.99	35.01	53.99	80.98	135.80

SPN II Ordering Information

SPN II Sample Specification

Actuator shall be Sharpe Automation SPN II series with rack and pinion design. The body to be hard anodized, extruded aluminum. Powder coated body and epoxy coated end caps for corrosion protection. Internal parts to be dual aluminum pistons, with alloy steel blow out proof pinion. Bearings, bushings and o-rings designed to maximize service life and prevent premature failure. Actuators will have dual travel stops, with adjustments for travel on both ends. All markings screened on body to easily identify threading on ports, ISO and NAMUR interfaces. Accessory bolt patterns and mounting areas to NAMUR VDI / VDE industry standards. Fasteners are to be stainless steel. Bottom drilling patterns are to ISO 5211 to provide strong mounting to valves, and mounting kits when necessary.

Insert system for the pinion allows for flexible mounting combinations, with strong fits to actuator as well as valve stem or coupler. Pinion to have double bore to provide fitting to the valve stem or coupler as well as having extra depth to insert taller stems seen in butterfly valves.

Actuator to use cartridge style springs for easy identification of sizing. The same end caps and fasteners to be used whether for double acting or spring return applications. Inside surface finish minimizing friction and maximizing service life. Lubrication of actuator suitable for 1,000,000 operations. The visual indicator designed to be used with other top mounted devices for added benefits.

Fig: SPNII050-SR-5-A-P1

Description: SPNII 050 - Spring Return - 5 Springs - Size A Insert - High Temp Viton Seals

SPN II Part Number Chart						
Actuator Model	Action		No. of Springs	Insert	Options	
SPNII032	DA	Double Acting	5	A	P1	High Temp Viton Seals -4°F to 300°F
SPNII050	SR	Spring Return	6	B	P2	Low Temp EPDM Actuator -40°F to 176°F
SPNII063			7	C	P3	Electroless Nickel Treatment
SPNII075			8	D	P4	Epoxy Coating
SPNII085			9	E	P5	Actuator Locking Device
SPNII100			10	F	P6	Reverse Rotation
SPNII115			11	G		
SPNII125			12	H		
SPNII145				I		
SPNII160				J		
SPNII180				K		
SPNII200						
SPNII240						
SPNII265						
SPNII300						

4x4® Pneumatic Actuator

WHY SMALLER IS BETTER

The Sharpe Pneumatic Actuator Series 4x4® packs more than double the torque of conventional rack and pinion actuators. Due to its four pistons that generate torque around a centrally located pinion. With more pistons in the actuator, it allows their diameter to be smaller while generating higher torque. At the same time, it means the size of the actuator can be more compact.

WHY SMALLER IS FASTER

With four small cylinders each located on one of four sides of the unit and at a given air pressure, the 4x4® produces the same torque output as double piston models using smaller diameter pistons and a narrower pinion. Thanks to the narrower pinion, the pistons travel shorter distances so that they can move faster from one position to the next.

WHY SMALLER REDUCES AIR CONSUMPTION

The cube shape coupled with pistons traveling shorter distances minimizes size requirements while maximizing torque output. At the same time, shorter piston travel and compact size greatly reduces pressure requirements compared to other designs and results in reduced energy expenditures.



WHY SMALLER MEANS LESS STRESS

It's a matter of balance. Unlike other designs that produce an off-axis thrust, the 4x4® design positions each piston around the cube so they develop thrust along their own axis. As a result, stressful piston side loading is minimized putting less stress on seals resulting in less wear.

WHY SMALLER IS A BETTER SOLUTION

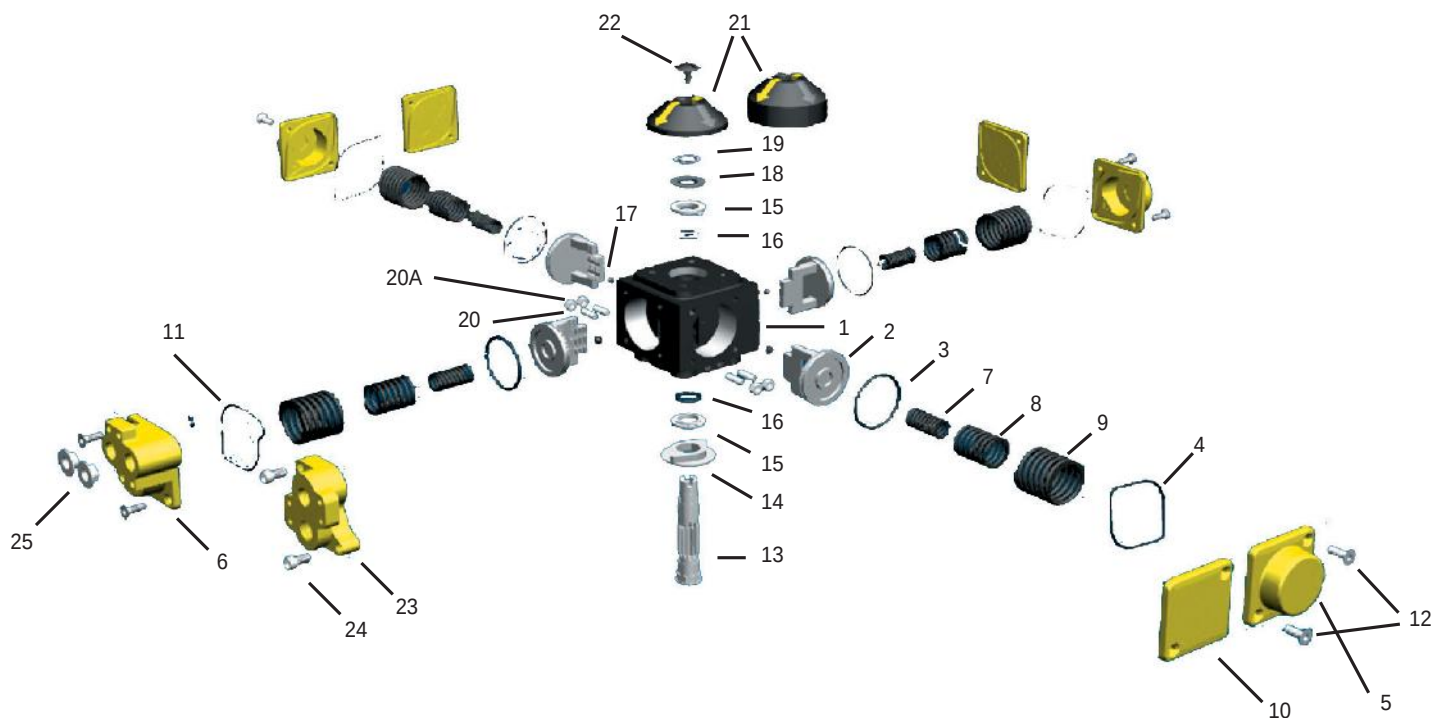
Because of the four-cylinder design, the 4x4® has many more spring combination possibilities than double piston actuators. This means better solutions under any air pressure requirement. Each chamber can use up to three different spring sizes which nest between the covers and pistons and align by centering rings. Also, springs are wound in opposite directions to avoid tangles during operation.

WHY SMALLER IS STRONGER

For superior corrosion resistance, the body and covers are anodized internally and externally. Plus, they have an external epoxy base layer and a second polyurethane paint to further reduce corrosion in demanding applications. Extended spray wash downs do not create corrosion problems for the actuator.



4x4[®] Material Listing



Part No.	Qty	Part Description	Standard Materials
1	1	Body	Aluminum AL 356-T6
2	4	Piston	Carbon Steel S45C Nickel Plated
3*	4	Piston "O" Ring	BUNA / Viton / EPDM
4*	4	Cover "O" Ring	BUNA / Viton / EPDM
5	3	Spring Return Cover	Aluminum AL 380
6	1	NAMUR Cover	Aluminum AL 380
7	Max 4	Inner Spring	Painted Spring Steel
8	Max 4	Middle Spring	Painted Spring Steel
9	Max 4	Outer Spring	Painted Spring Steel
10	3	Double Acting Cover	Aluminum AL 380
11	1	Aire Supply "O" Ring	BUNA / Viton / EPDM
12	8	Cover Screw	Stainless Steel 304
13	1	Pinion	Steel
14	1	Stroke Adjustment Stop	Stainless Steel 304
15*	2	Thrust Washer	Acetal / NOVA
16*	2	Pinion "O" Ring	BUNA / Viton / EPDM
17*	4	Pad	Acetal
18*	1	Disc Bearing	Stainless Steel 304
19	1	Snap Ring	High Alloy Spring Steel
20	4	Stroke Adjustment Stud	Stainless Steel 304
20A	4	Nut	Stainless Steel 304
21	1	Indicator	ABS
22	1	Indicator Screw	ABS
23	1	NAMUR Insert (X115)	AL 380
24	2	Bolt (X115)	Stainless Steel 304
25	2	Plug	Plastic

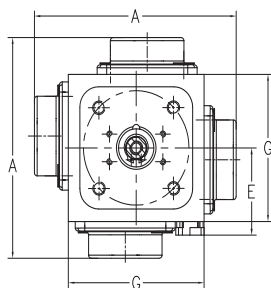
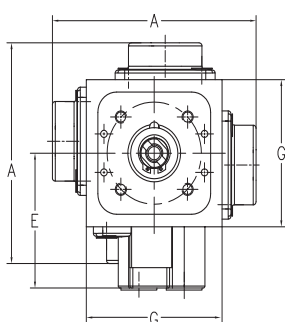
* Parts Typically supplied in service kits

4x4® Dimensions

SPRING RETURN

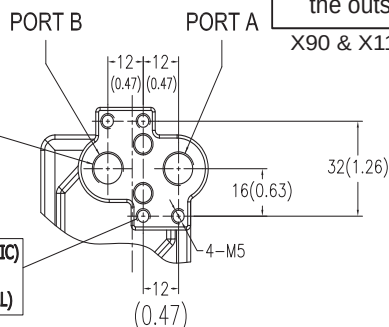
X40 - X90

X115



G-1/4" ISO
(FOR METRIC)
1/4" NPT
(FOR IMPERIAL)

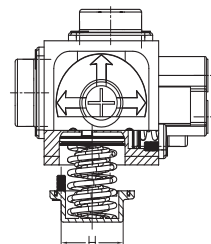
M5 (FOR METRIC)
10/24 UNC
(FOR IMPERIAL)



PORT A connected to
the center chambers

PORT B connected to
the outside chambers

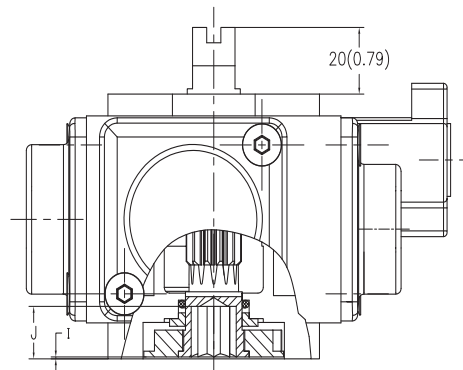
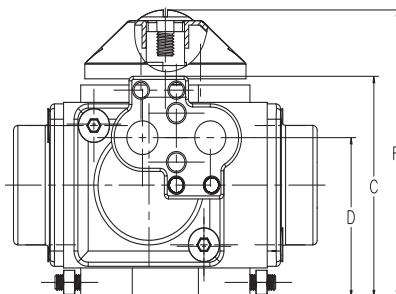
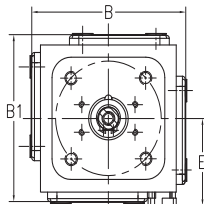
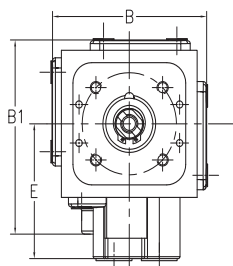
X90 & X115 are opposite



DOUBLE ACTING

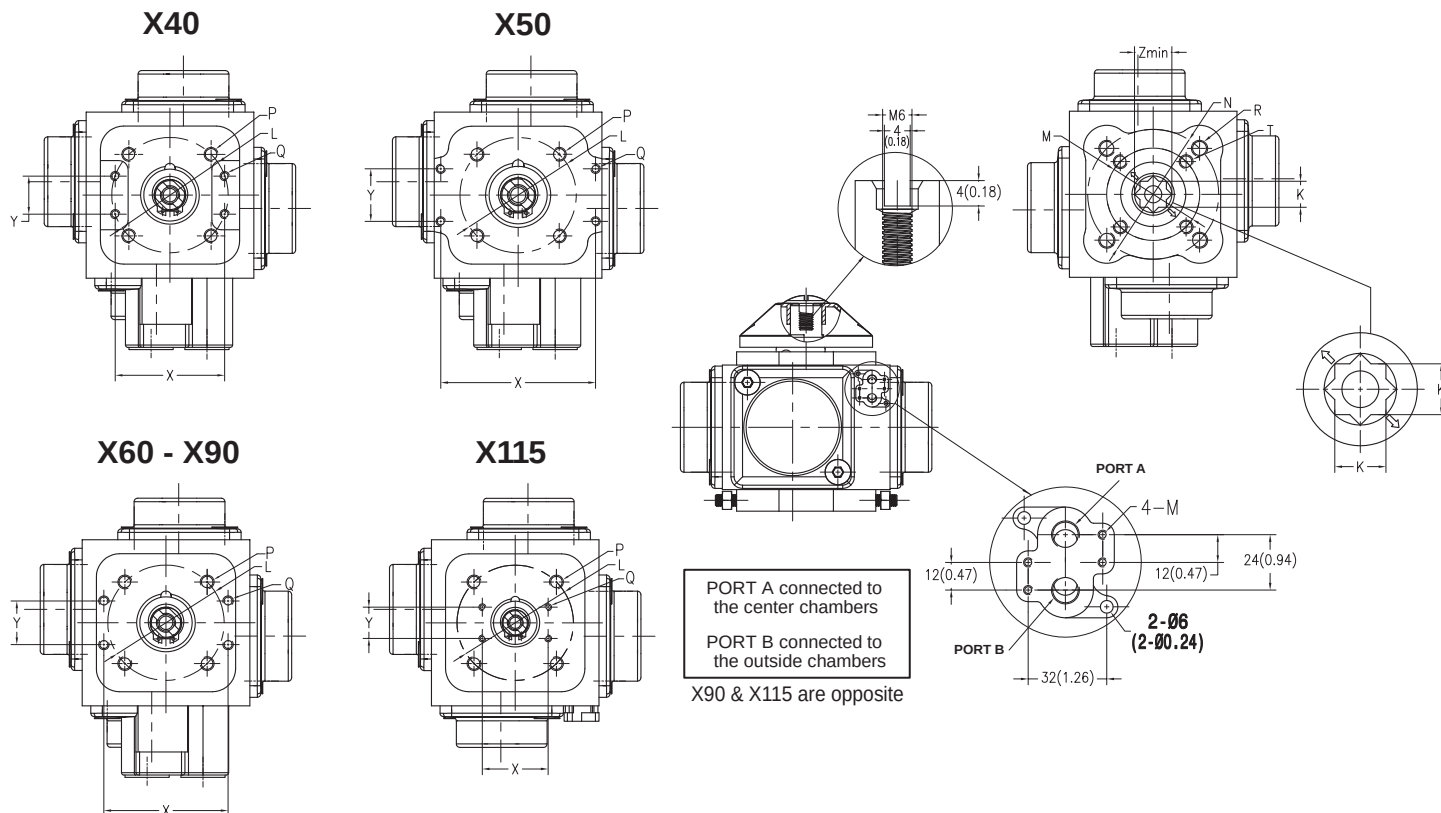
X40 - X90

X115



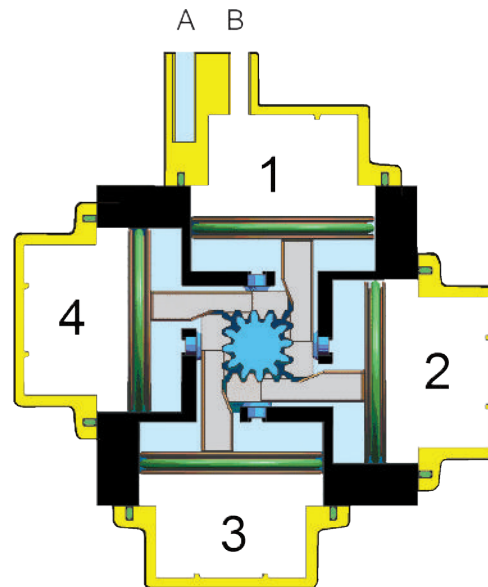
Size	Unit	A (S/R)	B (D/A)	B1 (D/A)	C	D	E	F	G	H	I	J
X40	in	4.26	3.31	3.78	2.73	2.04	2.60	3.65	2.84	1.61	0.02	0.55
	mm	108	84	96	69	52	66	92	72	40	0.5	14
X50	in	5.26	4.04	4.63	3.15	2.50	3.05	4.08	3.47	2.00	0.02	0.61
	mm	133	102	117	80	63	77	103	88	51	0.5	15
X60	in	6.38	5.20	5.79	3.86	3.02	3.53	4.73	4.26	2.50	0.02	0.77
	mm	162	132	147	98	77	89	120	108	63	0.5	20
X75	in	7.41	5.99	6.70	4.65	3.67	3.75	5.46	4.97	2.98	0.02	0.89
	mm	188	152	170	118	93	95	138	126	76	0.5	22
X90	in	8.75	7.17	7.96	5.36	4.04	4.49	6.17	5.91	3.59	0.02	1.04
	mm	222	182	202	136	102	114	156	150	91	0.5	26
X115	in	10.71	8.75	8.75	6.50	4.70	4.41	7.45	7.25	4.50	0.02	1.28
	mm	272	222	222	165	119	112	189	184	114	0.5	32

4x4[®] Dimensions



Size	Unit	K	L	M	N	P	Q	R	T	W	X	Y	Z (min)
X40	in mm	0.35 9	F05	-	F04	1/4 M6	- M4	10-32 UNF M5	- -	1.61 40	1.85 47	0.67 17	0.48 12
X50	in mm	0.43 11	F05	F05	F07	1/4 M6	10-24 UNC M5	5/16 M8	1/4 M6	2.00 51	3.15 80	1.18 30	0.56 14
X60	in mm	0.55 14	F07	F07	F10	5/16 M8	10-24 UNC M5	3/8 M10	5/16 M8	2.50 63	3.15 80	1.18 30	0.72 18
X75	in mm	0.67 17	F07	F07	F10	5/16 M8	10-24 UNC M5	3/8 M10	5/16 M8	2.98 76	3.15 80	1.18 30	0.87 22
X90	in mm	0.87 22	F10	-	F10	3/8 M10	10-24 UNC M5	3/8 M10	- -	3.59 91	3.15 80	1.18 30	1.11 28
X115	in mm	1.06 27	F12	-	F12	1/2 M12	10-24 UNC M5	1/2 M12	- -	4.50 114	3.15 80	1.18 30	1.43 36

4x4® Spring Arrangement



Spring Arrangement	Spring Position	Chamber			
		1	2	3	4
01	Inner	X	X	X	X
	Middle	-	-	-	-
	Outer	-	-	-	-
02	Inner	X	X	X	X
	Middle	-	-	-	-
	Outer	-	-	-	-
03	Inner	X	-	X	-
	Middle	X	X	X	X
	Outer	-	-	-	-
04	Inner	X	X	X	X
	Middle	X	X	X	X
	Outer	-	-	-	-
05	Inner	X	X	X	X
	Middle	-	X	-	X
	Outer	X	-	X	-
06	Inner	X	X	X	X
	Middle	-	-	-	-
	Outer	X	X	X	X
07	Inner	X	X	X	X
	Middle	X	X	X	X
	Outer	X	-	X	-
08	Inner	-	-	-	-
	Middle	X	X	X	X
	Outer	X	X	X	X
09	Inner	X	-	X	-
	Middle	X	X	X	X
	Outer	X	X	X	X
10	Inner	X	X	X	X
	Middle	X	X	X	X
	Outer	X	X	X	X

4x4® Torques

4x4® Spring Return Torques																	
Model	Spring Arrangement	Air Supply														Spring Return	
		40 PSI		60 PSI		70 PSI		80 PSI		90 PSI		100 PSI		120 PSI			
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
X40	01	52	29	90	64	116	92	136	112	155	130	170	146	215	188	52	30
	02			73	39	100	68	120	87	138	104	154	121	196	159	78	46
	03					84	44	103	62	120	78	137	97	178	131	104	64
	04									104	52	122	72	159	105	130	82
X50	03	82	40	156	108	206	160	244	194	275	224	316	267	389	335	110	67
	04			140	86	193	139	230	173	260	200	303	246	376	313	132	81
	05			122	60	176	114	215	148	242	174	286	220	358	288	158	98
	06					160	89	195	122	226	150	269	196	340	262	185	116
	07					146	79	182	113	211	139	255	186	325	250	196	131
	08							170	89	199	114	243	163	313	226	219	144
	09									188	101	231	149	300	213	234	156
	10									173	80	205	125	270	186	255	170
X60	03	204	119	347	249	439	343	519	417	590	485	672	570	818	723	205	118
	04			325	210	419	308	496	379	568	447	651	534	796	684	245	141
	05			305	177	400	275	476	346	547	413	632	502	777	650	279	161
	06					373	237	450	306	520	372	606	462	749	609	320	188
	07					350	193	425	260	495	325	583	418	724	561	368	214
	08							400	219	470	284	559	379	699	519	409	238
	09									452	231	542	229	683	466	461	256
	10									430	192	521	291	660	426	501	277
X75	03	235	212	563	432	729	600	859	722	976	834	1126	986	1382	1255	305	189
	04	290	153	520	367	688	538	817	658	933	769	1085	924	1339	1189	370	232
	05			475	270	646	448	772	563	888	673	1042	832	1294	1091	466	277
	06			436	164	603	372	728	486	843	595	999	758	1249	1012	546	323
	07					569	313	693	424	807	531	966	697	1214	948	610	358
	08					552	216	657	348	772	454	931	624	1178	869	686	393
	09									725	368	888	542	1132	781	774	440
	10									681	297	845	474	1089	710	845	483
X90	03	656	405	1071	780	1346	1061	1559	1260	1748	1439	1995	1692	2428	2146	544	283
	04			1014	678	1291	965	1502	1159	1690	1337	1940	1594	2371	2042	648	340
	05			915	562	1198	855	1405	1045	1592	1221	1845	1484	2273	1925	963	439
	06					1122	703	1326	888	1511	1061	1769	1332	2192	1762	924	519
	07					1061	575	1263	754	1447	926	1708	1203	2129	1625	1065	582
	08							1193	613	1376	782	1640	1065	2059	1478	1206	653
	09									1298	579	1567	968	1980	1375	1309	730
	10									1232	570	1504	864	1915	1264	1419	796
X115	03	1196	645	2019	1437	2542	1975	2968	2370	3347	2732	3820	3218	4652	4087	1167	643
	04			1890	1206	2419	1756	2841	2143	3218	2500	3697	2997	4524	3852	1400	772
	05			1791	1027	2325	1586	2743	1967	3118	2322	3602	2827	4428	3670	1582	870
	06					2174	1318	2585	1687	2959	2038	3450	2558	4264	3382	1866	1030
	07					2051	1097	2458	1458	2828	1805	3325	2336	4136	3147	2100	1160
	08							2330	1230	2699	1574	3203	2115	4007	2910	2335	1289
	09									2573	1341	3083	1894	3881	2675	2568	1414
	10									2444	1110	2960	1673	3754	2440	2800	1543

4x4® Double Acting Torque Ratings							
Model	40 PSI	60 PSI	70 PSI	80 PSI	90 PSI	100 PSI	120 PSI
X40	79	119	137	178	192	218	238
X50	138	230	265	302	339	375	458
X60	315	470	550	657	725	799	959
X75	537	824	948	1074	1208	1340	1648
X90	920	1400	1666	2060	2130	2354	2893
X115	1953	2838	3322	3817	4302	4620	5401

4x4[®] Weights and Technical Information

4x4 [®] Weights							
	Unit	X40	X50	X60	X75	X90	X115
Weight of Double Acting	Lb	2.38	3.86	6.81	10.69	16.42	28.66
	Kg	1.08	1.75	3.09	4.85	7.45	13.00
Weight of Double Acting with SR Cover (DS)	Lb	2.42	3.96	6.97	11.16	17.17	29.78
	Kg	1.10	1.80	3.16	5.06	7.79	13.51
Spring Set Code	Weight of Spring Return Actuator						
01	Lb	2.51	-	-	-	-	-
	Kg	1.14	-	-	-	-	-
02	Lb	2.60	-	-	-	-	-
	Kg	1.18	-	-	-	-	-
03	Lb	2.67	4.17	7.50	12.19	18.92	33.27
	Kg	1.21	1.89	3.40	5.52	8.58	15.09
04	Lb	2.73	4.21	7.58	12.35	19.22	33.91
	Kg	1.24	1.91	3.44	5.60	8.72	15.38
05	Lb	-	4.30	7.76	12.63	19.69	34.55
	Kg	-	1.95	3.52	5.73	8.93	15.67
06	Lb	-	4.39	7.94	12.92	20.15	35.19
	Kg	-	1.99	3.60	5.86	9.14	15.96
07	Lb	-	4.43	7.98	13.07	20.39	35.98
	Kg	-	2.01	3.62	5.93	9.25	16.32
08	Lb	-	4.52	8.20	13.47	20.92	36.77
	Kg	-	2.05	3.72	6.11	9.49	16.68
09	Lb	-	4.56	8.29	13.62	21.25	37.41
	Kg	-	2.07	3.76	6.18	9.64	16.97
10	Lb	-	4.63	8.38	13.78	21.56	38.03
	Kg	-	2.10	3.80	6.25	9.78	17.25

4x4 [®] Air Consumption & Opening and Closing Times							
	Unit	X40	X50	X60	X75	X90	X115
Air Consumption Per Stroke * Actual Volume - Liter	CCW	0.08	0.15	0.29	0.47	0.80	1.3
	CW	0.11	0.19	0.38	0.64	0.95	1.3
	Total	0.19	0.34	0.67	1.11	1.75	2.6
Air Consumption Per Stroke * Actual Volume - in ³	CCW	4.9	9.2	16.2	28.7	46.3	79.3
	CW	6.7	11.6	21.3	35.1	52.3	82.6
	Total	11.6	20.7	37.5	63.8	98.6	161.9
Opening Time DA**	Sec.	0.15	0.21	0.39	0.53	1.10	1.60
Closing Time DA**	Sec.	0.16	0.24	0.41	0.54	1.30	1.80

* If you plan to use the actuator with the spring return cover as double acting actuator; please consult your representative for the air consumption figures

** 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: on the field applications when one or more of the above parameters are different, the moving time will be different.

4x4® Ordering Information

4x4® Sample Specification

Actuator shall be Sharpe Automation X series (4x4®) with four piston design and function. Actuator will have epoxy coated end caps, with hard anodized internally and externally extruded aluminum body. Internal parts to feature four carbon steel pistons for strength and have electroless nickel plating to inhibit corrosion. Actuator will have a higher torque output than other designs with comparable cylinder bores allowing for fitting of the smallest size possible.

With its smaller design air consumption will be reduced due to less open space in the actuator. Actuator will have four pistons supporting the pinion for less wear. With this design, torque output is maximized. With its design travel is reduced leading to quicker response and less wear to moving parts.

Springs are nested and wound in opposite direction to prevent binding. Since there are four chambers many spring combinations are available to fit air supply issues in the application. Independent travel stops allow adjustment +/- 5° in both opening and closing rotations.

All bottom bolting to ISO 5211 for ease of usage with valves / mounting kits of industry standards. Actuators to have NAMUR mount solenoid connections as well as other top mounted devices such as limit switches and positioners.

Lubrication to qualify for a minimum of 1,000,000 operations. Bearings, bushings and o-rings designed to maximize service life and prevent premature failure.

Fig: X80-SR-07-IP1

Description: X80 - Spring Return - 07 Spring Arrangement - Imperial Units - High Temp Viton Seals

4x4® Part Number Chart							
Actuator Model	Action		Spring Arrangement	Insert		Options	
X40	DA	Double Acting	01, 02	I	Imperial	P1	P1 = High Temp Viton Seals -4°F to 300°F
X50	SR	Spring Return	03, 04	M	Metric	P2	P2 = Low Temp EPDM Actuator -40°F to 176°F
X60	DS	Double Acting with Spring Return Cover	05, 06			P3	P3 = Actuator Locking Device
X75			07, 08			P4	P4 = Reverse Rotation
X90			09, 10				
X115							

Limit Switches



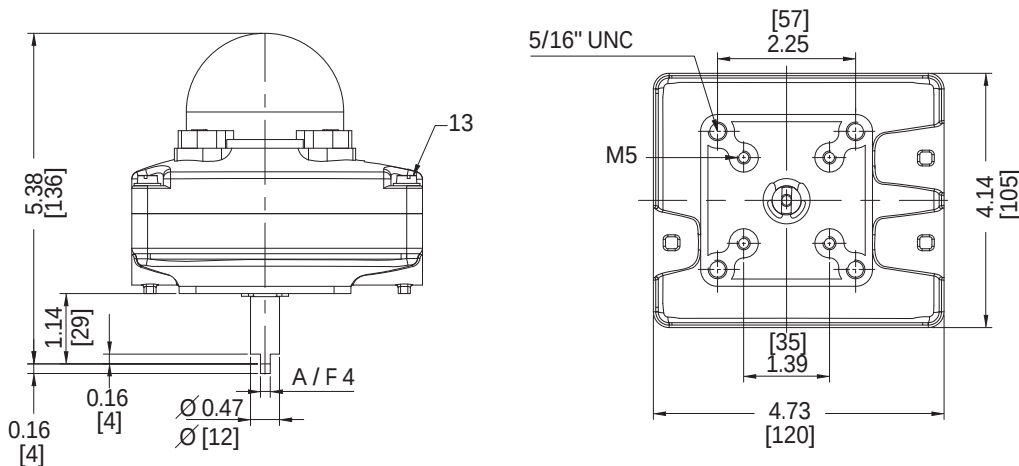
Housing Material: Die cast aluminum with powder coating

Indicator Cover: Shatterproof polycarbonate

Temperature: -4°F to 176°F

- Special printed circuit board eliminates all wiring from the switch element to the terminal while providing protection against short circuits
- Complies to NAMUR mounting standards
- NAMUR pattern mounting kits available
- UL Listed, for both NEMA 4/4X and NEMA 7/9
- NEMA 7/9 Class I Groups C&D, Class II Groups E, F & G Divisions 1 and 2
- Solenoid termination inside switch box
- Proximity Switches designed for Intrinsically Safe Applications

NEMA 4/4X Dimensions



NEMA 4/4X/7/9 Dimensions

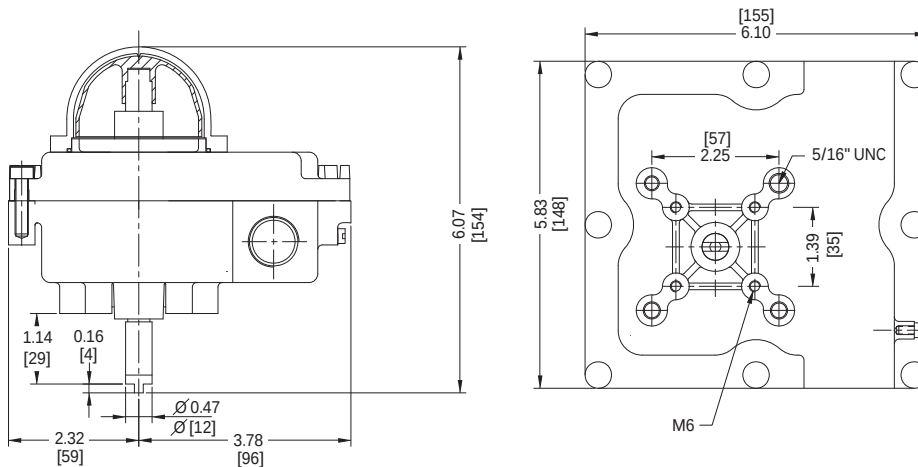


Fig: SL-XS4MH10-M2

Description: SL - NEMA 4 Mechanical - M2 Bracket Size

Limit Switch Part Number Chart			
Model	Rating		Bracket
SL	XS4MH10	NEMA 4/4X MECHANICAL	M1
	S9MH10	NEMA 4/4X/7/9 MECHANICAL	M2
	XS4PPF8	NEMA 4/4X PROXIMITY	M3
	S9PPF2	NEMA 4/4X/7/9 PROXIMITY	M4

Note: Bracket as determined by actuator model and size.

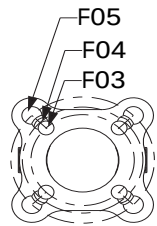
Mounting Brackets



Material: CF8 - 316 Stainless Steel

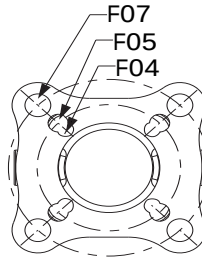
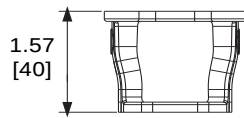
ISO Sizes: F03 to F12

- Two opposing holes for locking during maintenance and installation
- Open design allows for viewing of stem position
- Access to stem nut without dismounting of actuator
- Couplers can be made from 17-4PH for high torque applications
- Casting Markings: Sharpe® logo, ISO Size, and material grade



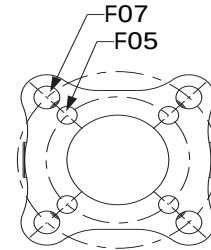
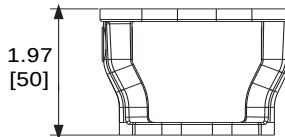
F03 - F030405

0.25 LB
0.1 kg



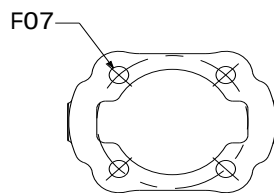
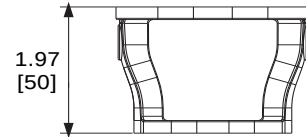
F04- F040507

0.6 LB
0.3 kg



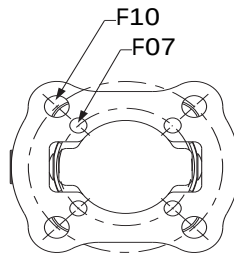
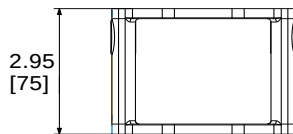
F05- F0507

0.6 LB
0.3 kg



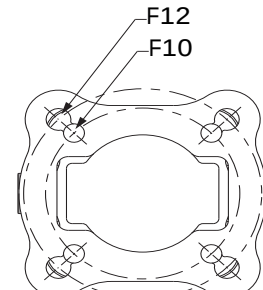
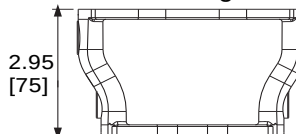
F07 - F07

1.7 LB
0.8 kg



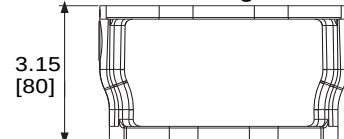
F07 - F0710

2.0 LB
0.9 kg



F10-F1012

2.87 LB
1.3 kg



V200 Positioner



Housing Material: Cast aluminium with polyester coating

Indicator Options: Flat pointed indicator or raised indicator (red / green or yellow / black)

- One housing for pneumatic or electropneumatic
- Optional gauges
- Optional range spring
- Variety of cams available
- Variety of spindles available
- External zero + span adjustment without removing the cover
- Five pilot options
- Explosion-proof, gas approved, fail-freeze, 0-5 VDC and 0-10 VDC options available
- Variety of feedback options

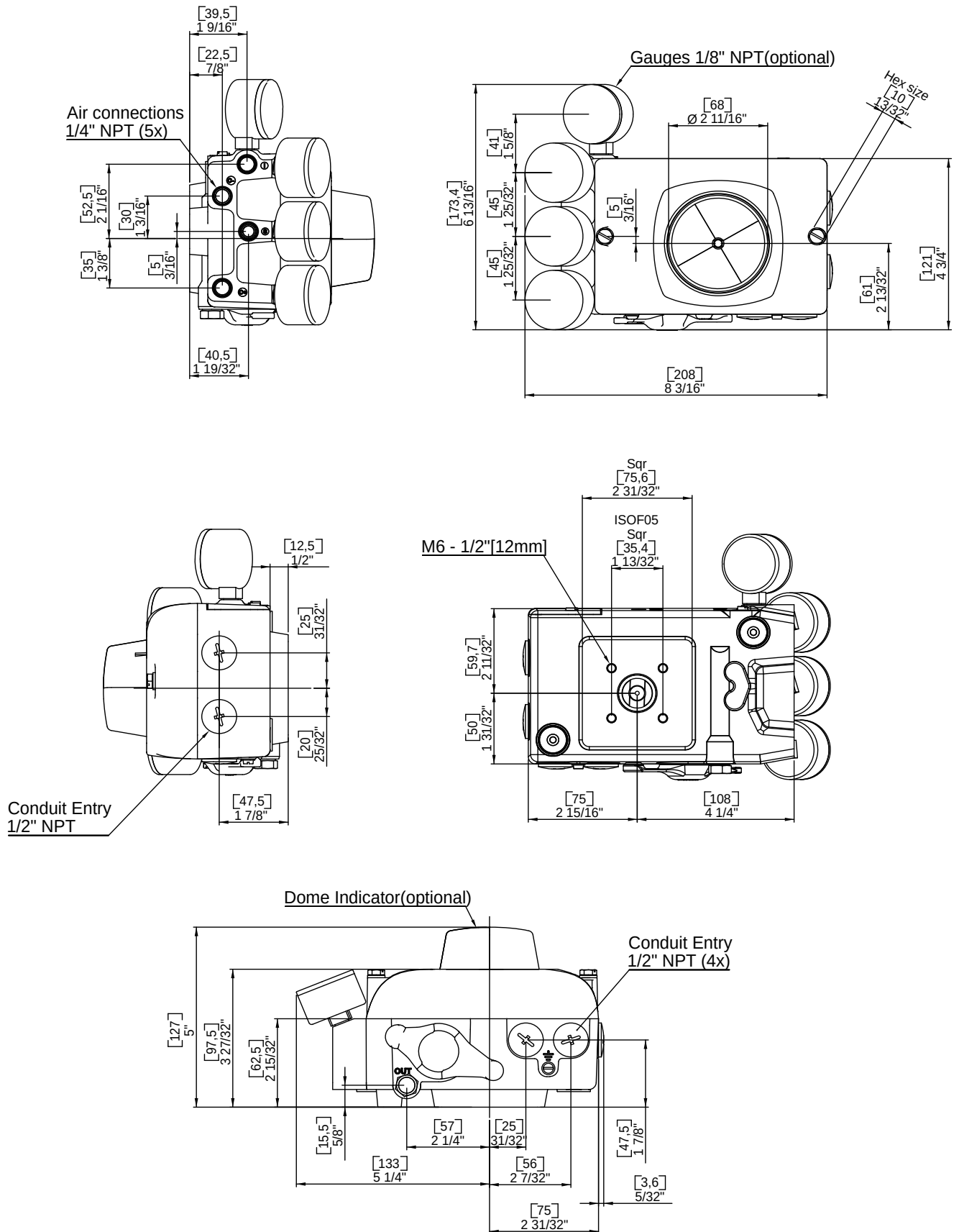
V200 P Pneumatic Positioner

Input Range:	3-15 PSI
Supply Pressure	22-145 PSI
Linearity Error:	<0.7 f.s.
Hysteresis:	<0.4 f.s.
Repeatability:	<0.3 f.s.
Pressure Gain @87 PSI: (acc. to ISA S75.13)	300:1
Air Delivery @87 PSI:	28.3 SCFM
Air Consumption @87 PSI:	0.20 SCFM
Temperature Range:	-40°F to 185°F
Air Connections:	1/4" NPT / G Threads
Gauge Port:	1/8" NPT / G Threads
Ingress & Corrosion Protection	Nema 4X and IP 66

V200 E Electropneumatic Positioner

Input Range:	4-20 mA (Ri<170 ohms)
Supply Pressure	22-145 PSI
Linearity Error:	<1% f.s.
Hysteresis:	<0.6% f.s.
Repeatability:	<0.5% f.s.
Pressure Gain @87 PSI: (acc. to ISA S75.13)	300:1
Air Delivery @87 PSI:	28.3 SCFM
Air Consumption @87 PSI:	0.20 SCFM
Temperature Range:	-40°F to 185°F
Air Connections:	1/4" NPT / G Threads
Gauge Port:	1/8" NPT / G Threads
Cable Entry:	1/2" NPT, M20x1.5 or PG 13.5
Ingress & Corrosion Protection:	Nema 4X and IP 66

V200 Positioner Dimensions



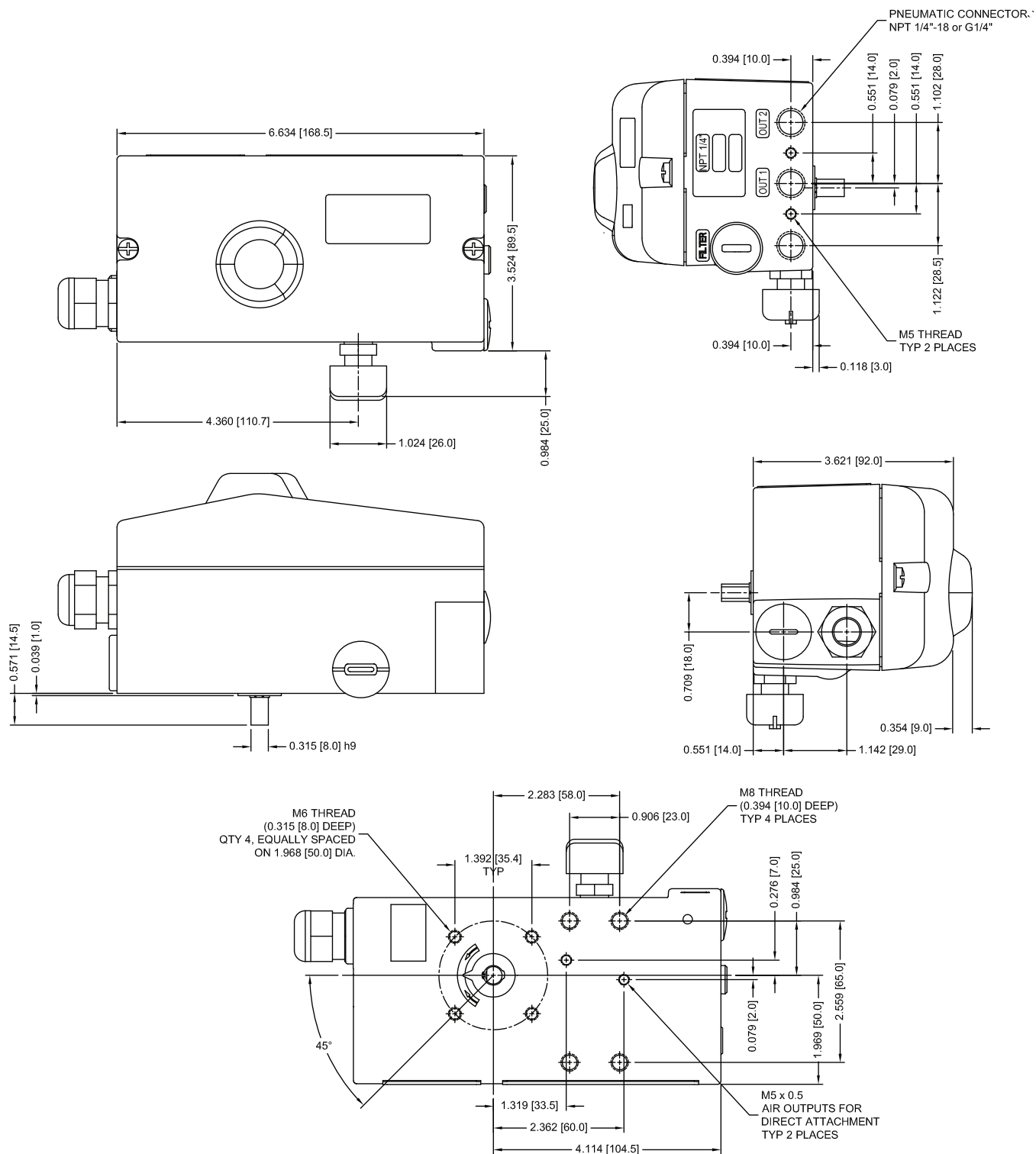
D400 Digital Positioner



- Microprocessor based valve positioner
- Menu driven programming with LCD display - multilingual
- Local push button configuration
- Low air consumption
- Explosion-proof & intrinsically safe modes available
- Modular design - available with position feedback, micro switches and fail freeze options, rotary or linear mounting
- NEMA 4X IP 65 enclosure, aluminum housing, electrostatically dipped varnish with stove-hardened epoxy resin
- Adaptive control feature offers the ability to update automation package without resetting the process
- Linear mounting possible
- ATEX - FM • CSA • IEC • Ex approvals available
- Available with Foundation Fieldbus, Profi-Bus and Hart Protocols

D400 Digital Positioner	
Rotation:	25 - 120 Degrees
Max Air Supply:	90 PSI
Air Delivery:	6.0 SCFM @ 90 PSI
Air Consumption:	≤ 0.015 SCFM
Stroke:	0.4 to 4"
Connections:	1/2" NPT air, 1/2" NPT Cable
Ambient Temperature:	-40° F to 185° F
Characteristic Curves:	Linear, equal %, 1:25, 1:50, 25:1, 50:1, or user configurable
Characteristic deviation:	≤ 0.5%
Deadband:	0.1%, adjustable to 10%
Resolution (A/D) Conversion:	16,000 steps
Sample Rate:	20 msec
Seismic Vibration:	Meets requirements to DIN IEC 68-3-3 Class III for strong and strongest earthquakes
Mechanical Vibration:	≤ 1% up to 10g and 10...80 Hz
Mounting orientation:	≤ 0.5% at 90° Change
EMI:	Complies with EMC directive 89/336/EEC as of May 1989 (Increased EMI Shielding to EN 50082-2 PR as of 11/93)

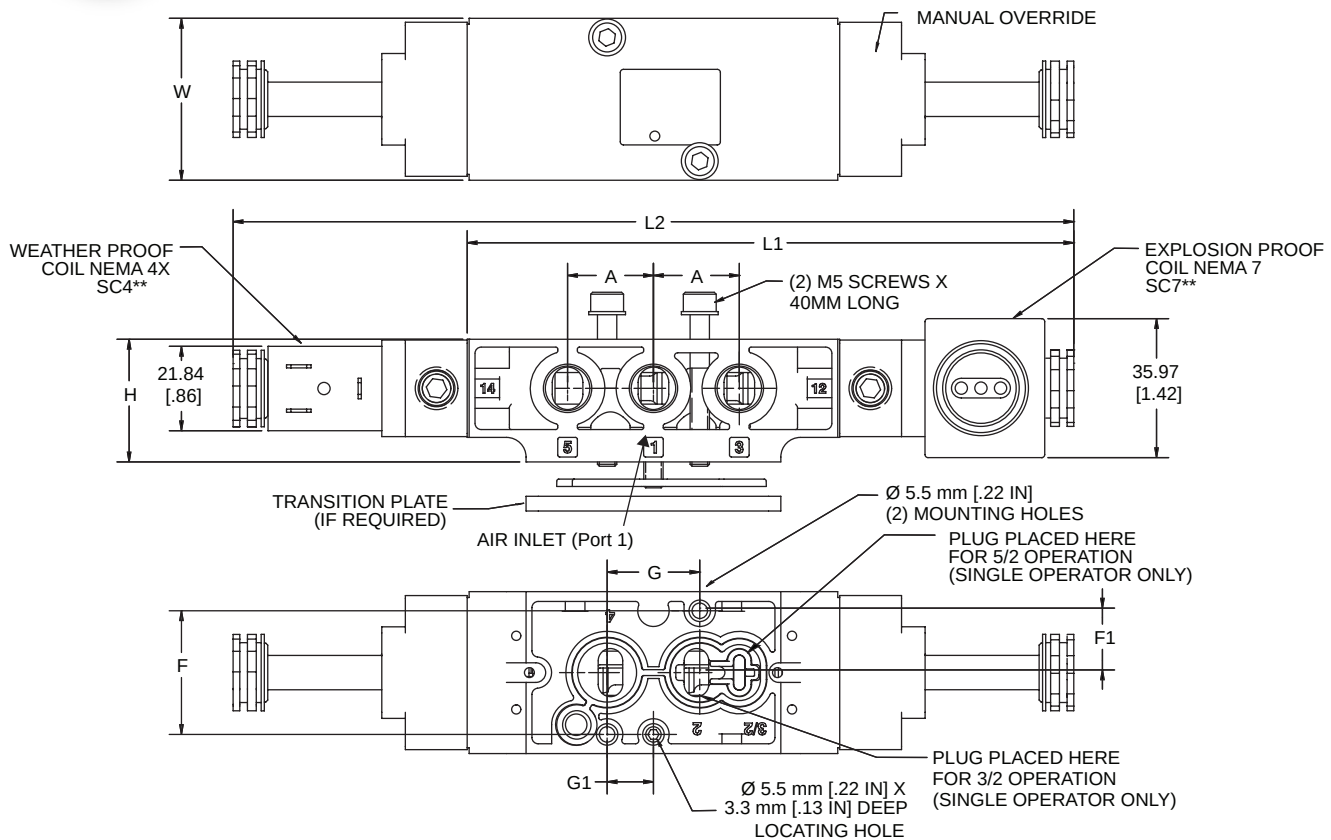
D400 Digital Positioner Dimensions



Solenoids



- Aluminum body
- NBR seals
- Manual override
- High Flow: 1.8 CV
- 1/2" conduit connection to coil
- 1/4" port size
- Body can be converted between 5/2 (double acting) and 3/2 (spring return)
- Coils and range tubes are rated to CSA/UL
- Same body accepts NEMA 4, NEMA 7, and ATEX coils
- Voltage options available upon request



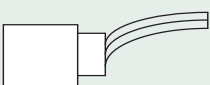
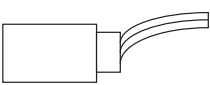
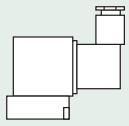
Setup	Unit	A	C	F	F1	G	G1	H	L1	L2	W
Single	in	0.88	0.75	1.25	0.63	0.94	0.47	1.25	6.15		1.65
	mm	22.2	19.1	32.0	16.0	23.9	11.9	31.7	157		41.9
Double	in	0.88	0.75	1.25	0.63	0.94	0.47	1.25		8.55	1.65
	mm	22.2	19.1	32.0	16.0	23.9	11.9	31.7		217	41.9

Connectors

(Not polarity dependent)

DIN 43650 Industrial Form B	Maximum Cable Diameter: 9mm (0.35")		1/2" Conduit without Cord	Strain Relief with Light & 6' Cord	
Type	Strain Relief without Cord	Strain Relief with Light		100-240 AC 48-120 DC	6-48 AC/DC
Part Number	SR7020-001	SRL7020-AA	SRL7020-DB	DIN PLUG	SRLC-7094-007

Solenoids Electrical Information

Coil Part Numbers					
Coil Part Number **=Voltage	Description		Operator Type	Instructions	Lb
SC4**	Weather-Proof DIN 43650 Industrial Form B Connection NEMA 4X		W	Order coil separately (specify voltage code from below)	0.12
SC4**C SC4**CT (high temp 82°C max)	Weather-Proof 1/2" Conduit with 30" Leads NEMA 4X		W	Order coil separately (specify voltage code from below)	0.12
SC7**	Explosion-Proof 1/2" Conduit with 24" Leads CSA & FM Approved CL. I; Zone1 Ex m II T4; AEx m II CL. I; Div.1; GR. A, B, C, D CL. II; GR. E, F, G CL. III T4 Ta=-20°C to +60°C NEMA 4, 4X, 7C, 7D, 9		W	Order coil separately (specify voltage code from below)	0.44
SCI2D	Intrinsically-Safe Strain Relief Ex ia CL. I; GR. A,B,C,D CL. II; GR.E,F,G CL. III; Div.1; T5		V	Coil and Connector included with valve (24VDC only)	0.46
SCI2D Must be Used with an Intrinsically-Safe Barrier					

Voltage Codes																		Lower Wattage available, upon request							
** Code		Current (Amps)								Resistance (OHMS @ 25°C)				Power (AC=VA, DC=Watts)											
		Inrush				Holding																			
	Operator Type	W		V	Z	W		V	Z	W	V	Z	W	V	Z										
		NEMA		ATEX		NEMA		ATEX		NEMA		ATEX		NEMA		ATEX									
		Voltage +/-10%	4, 4x	7, 9	Ex ia	Ex m	4, 4x	7, 9	Ex ia	Ex m	4, 4x	7, 9	Ex ia	Ex m	4, 4x	7, 9	Ex ia	Ex m							
2A	22/50 24/60	.40	-	-	-	.40	-	-	-	31	-	-	-	4.8	-	-	-								
12	110/50 120/60	.08	.096	-	-	.06	.054	-	.029	840	530	-	1164	4.8	6.5	-	3.0								
22	220/50 240/60	.04	.048	-	-	.03	.027	-	.015	3310	2345	-	6730	5.9	6.5	-	3.0								
1D	12 VDC	.40	-	-	-	.40	.375	-	.267	31	32	-	45	4.8	7	-	3.5								
2D	24 VDC	.20	-	.05	.136	.20	.187	.05	.136	121	128	275	177	4.8	-	1.6	3.5								

Fig: X2003AAWR-I-2D

Description: Coil Right - Intrinsically Safe - 24 VCD

Solenoids Part Number Chart					
Body			NEMA CLASS		
			Voltage		
S2003ACWR	COIL LEFT FOR SPNII AND OTHER ACTUATORS THAT REQUIRE AIR TO COME IN ON THE LEFT IN SPRING RETURN MODE	4	4 = NEMA 4X		
		7	7 = NEMA 7 / 9		
		I	I = INTRINSICALLY SAFE - 24VDC ONLY		
X2003AAWR	COIL RIGHT FOR X AND OTHER ACTUATORS THAT REQUIRE AIR TO COME IN ON THE RIGHT IN SPRING RETURN MODE	12	12 = 120 VAC		
		22	22 = 240 VAC		
		2A	2A = 24 VAC		
		1D	1D = 12 VCD		
		2D	2D = 24 VCD		

SEA Electric Actuator



Enclosure:

- IP 67: Waterproof and dust-proof enclosure
- NEMA 4X: Waterproof and dust-proof enclosure
- Material: Dry powder coating aluminum alloy

Motor:

- Standard extended duty cycle induction motor F insulation class for all models
- Built-in thermal protection (275°F) prevents motor burning out
- Standard Unit is 120 VAC
- Standard motors are 30% duty rated

Position Indicator:

- All models have continuous mechanical position indicator on the top of the actuator cover

Manual Override:

- Non-clutch design, the manual operation can be operated without any lever, clutch or brake upon power outage
- When electric motor is operating, manual hand-wheel will not rotate for safety purposes

Gear Train:

- High alloy steel gear trains provide self-locking function to avoid valve back drive
- Gear trains have been already lubricated sufficiently with high temperature lubricant at the factory

Working Conditions:

- Ambient temperature: -22°F to 149°F
- Humidity: 30% to 95%

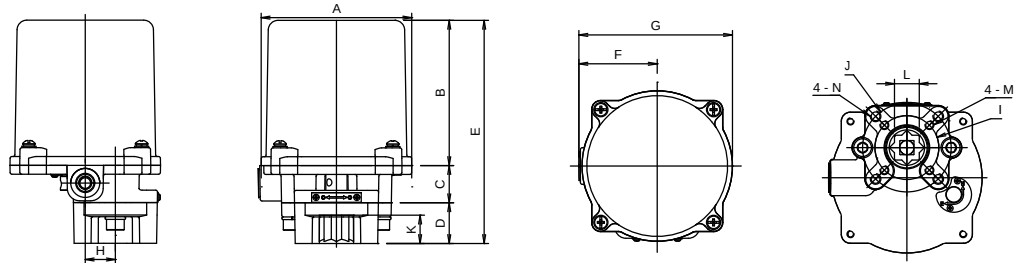
Various Options:

- Space heater
- Additional limit switches (2 units)
- Potentiometer unit (1K Ohm or 5K Ohm)
- Local control unit (local / remote, on / off)
- Conduit entrance (1/2" PS, 3/4" PF, 1/2" NPT)
- Torque switches (2 units)
- Current position transmitter (output 4-20mA)
- Modulating controller (4-20mA, 0-5 VDC, 0-10 VDC)
- Various voltages
- Nylon enclosure material
- Thermostat
- 75% duty rating

Certifications:

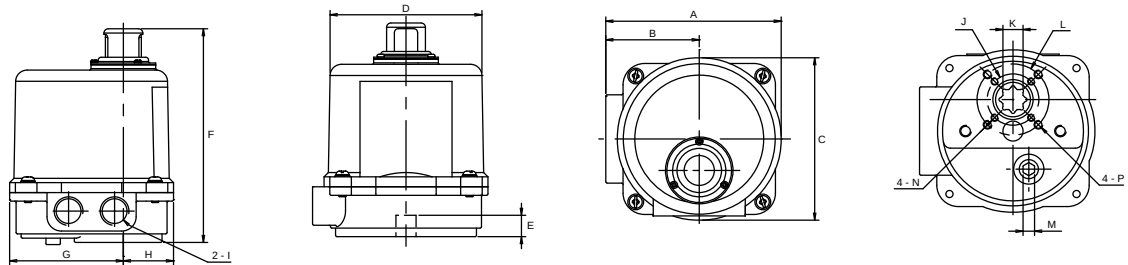
- CE
- CSA (Conforming to the test standard for outdoor use)

SEA Electric Actuator Dimensions



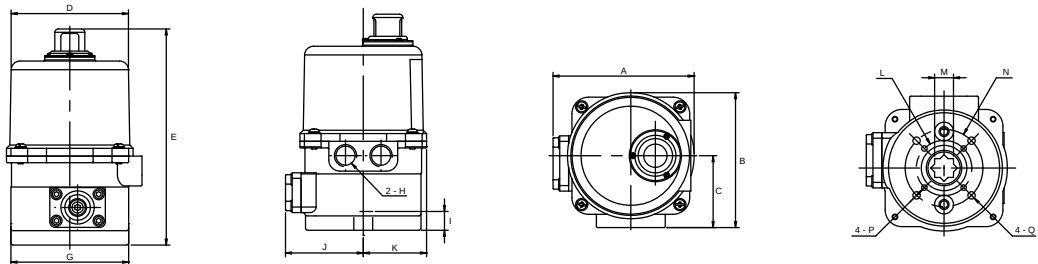
SEA 1

Unit	A	B	C	D	E	F	G	H	I	J	K	L	M	N	Flange Type
in	3.35	3.23	0.83	0.90	4.96	1.73	3.42	0.67	1.42	1.97	0.63	0.55	M5x0.8	M6x1.0	F03 or F05
mm	85	82	21	23	126	44	87	17	36	50	16	14	M5x0.8	M6x1.0	



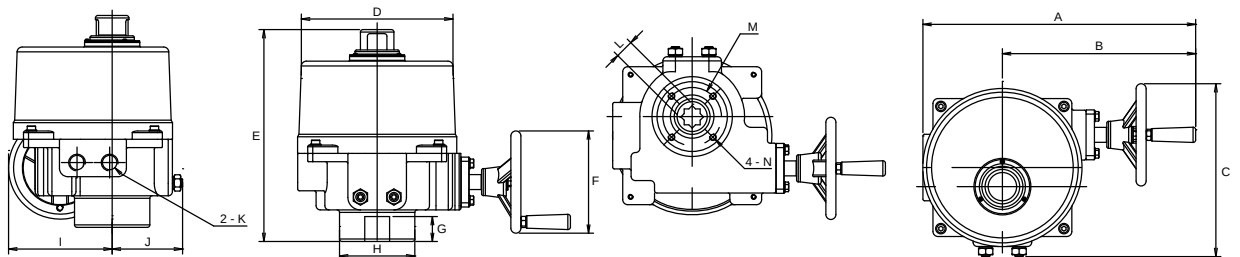
SEA 3

Unit	A	B	C	D	E	F	G	H	I	J	K Max	L	M	N	P	Flange Type
in	4.80	2.56	4.49	4.17	0.59	5.9	3.11	1.38	1/2 PS	1.42	0.551	1.97	0.2	M5x0.8	M6x1.0	F03 or F05
mm	122	65	144	106	15	150	79	35	1/2 PS	36	14	50	8	M5x0.8	M6x1.0	



SEA 4

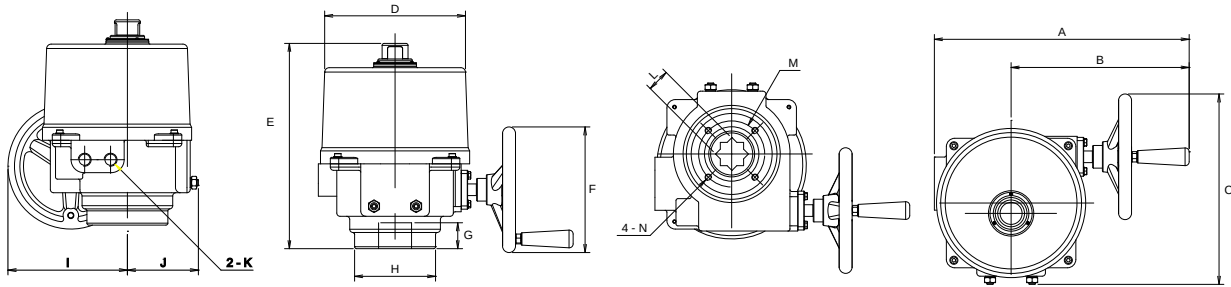
Unit	A	B	C	D	E	G	H	I	J	K	L	M	N	P	Q	Flange Type
in	4.49	4.8	2.56	4.17	7.71	4.17	1/2 PS	0.67	2.24	2.24	1.97	0.669	2.76	M6x1.0	M8x1.25	F05 or F07
mm	114	122	65	106	196	106	1/2 PS	17	57	57	50	17	70	M6x1.0	M8x1.25	



SEA 8 AND SEA 13

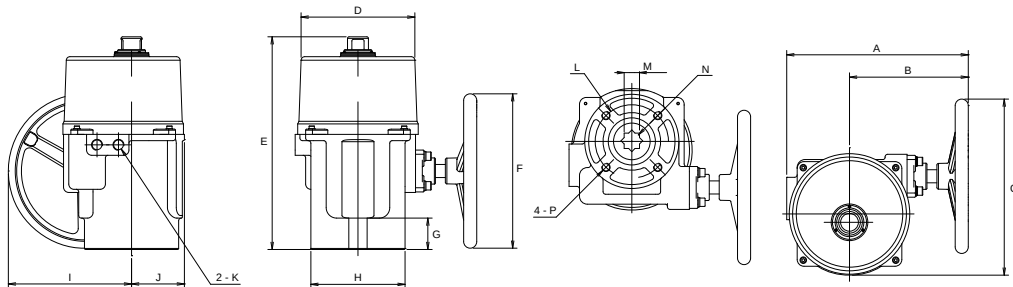
Unit	A	B	C	D	E	F	G	H	I	J	K	L Max	M	N	Flange Type
in	12.83	9.09	8.19	7.13	10.04	4.84	1.18	3.54	4.88	3.31	1/2 PS	0.867	2.76	M8x1.25	F07
mm	326	231	208	181	255	123	30	90	124	84	1/2 PS	22	70	M8x1.25	

SEA Electric Actuator Dimensions Cont.



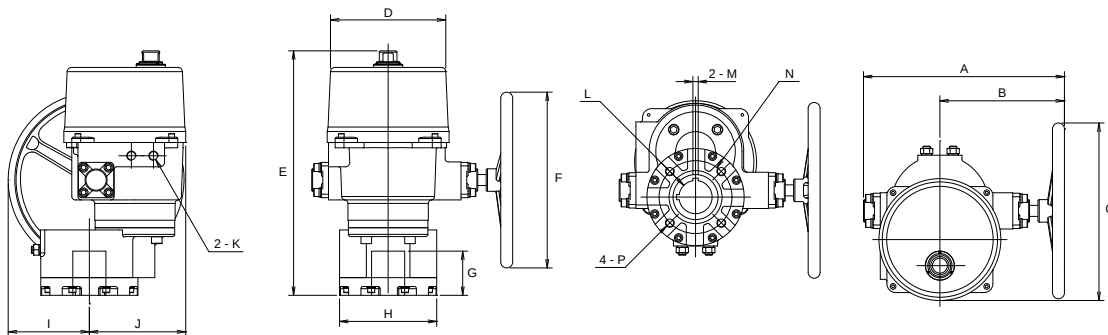
SEA 35, SEA 44 AND SEA 57

Unit	A	B	C	D	E	F	G	H	I	J	K	L	M	N	Flange Type
in	15.51	10.82	11.57	8.54	12.48	7.63	1.57	4.97	7.24	4.33	1/2 PS	1.38	4.01	M10*1.5	F10
mm	394	275	294	217	317	194	40	125	184	110	1/2 PS	35	102	M10*1.5	



SEA 88 AND SEA 132

Unit	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Flange Type
in	13.66	10.90	12.23	8.54	15.98	11.61	1.77	7.09	9.25	3.98	1/2 PS	4.92	1.38	1.38	M12*1.75	F12 or F14
mm	347	227	336	217	406	295	45	180	235	101	1/2 PS	125	35	35	M12*1.75	



SEA 177, SEA 221, SEA 265 AND SEA 310

Unit	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Flange Type
in	17.91	11.10	15.83	10.27	21.81	15.67	3.94	8.66	7.24	8.58	1/2 PS	2.95	0.47	6.50	M20*2.5	F16
mm	455	282	402	261	554	398	100	220	184	218	1/2 PS	75	12	165	M20*2.5	

SEA Technical Information

Model	Power (watts)	Max Torque (In / lb)	Speed (Sec / 90°)	Weight (lb)	Manual Override	Mounting Flange
SEA 1	5W	132	19	3.3	Lever	F03 / F05
SEA 3	10W	310	12	4.4	Lever	F03 / F05
SEA 4	10W	443	20	6.6	Lever	F05 / F07
SEA 8	40W	797	12	24.2	Hand-wheel	F07
SEA 13	40W	1328	15	24.2	Hand-wheel	F07
SEA 35	120W	3540	16	44	Hand-wheel	F10
SEA 44	120W	4425	22	44	Hand-wheel	F10
SEA 57	120W	5750	28	44	Hand-wheel	F10
SEA 88	180W	8850	46	71	Hand-wheel	F12 / F14
SEA 132	220W	13275	46	71	Hand-wheel	F12 / F14
SEA 177	180W	17700	58	132	Hand-wheel	F16
SEA 221	220W	22125	58	132	Hand-wheel	F16
SEA 265	250W	26550	58	135	Hand-wheel	F16
SEA 310	300W	31000	58	135	Hand-wheel	F16

Fig: SEA3 - 2

Description: SEA3 - 24V

SEA Part Number Chart		
SEA Series	Options	
SEA1	1	220V
SEA3	2	24 VAC
SEA4	3	12 VDC
SEA8	4	24 VDC
SEA13	AS	Auxiliary Switches
SEA 35	FP	Feedback Potentiometer
SEA 44	CR	Control Relays
SEA 57	HT	Heater & Thermostat
SEA 88	PP	Proportional Positioner
SEA 132	FT	Feedback Transmitter
SEA 177	TR	Timers
SEA 221	TS	Torque Sensor
SEA 265		
SEA 310		

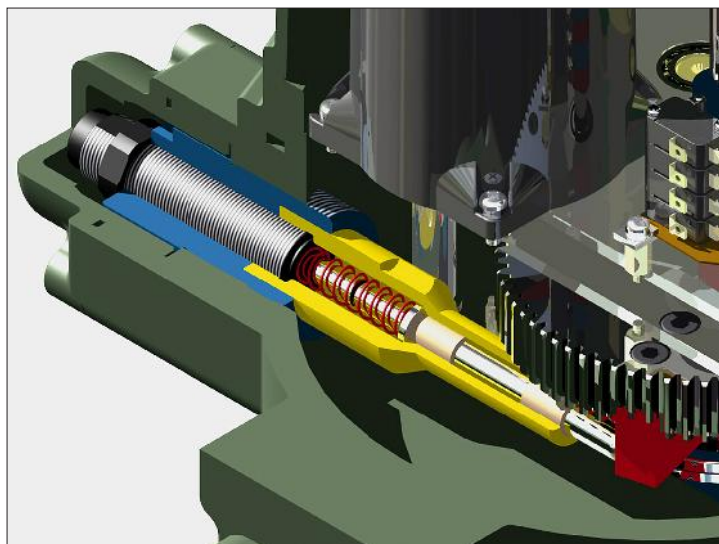
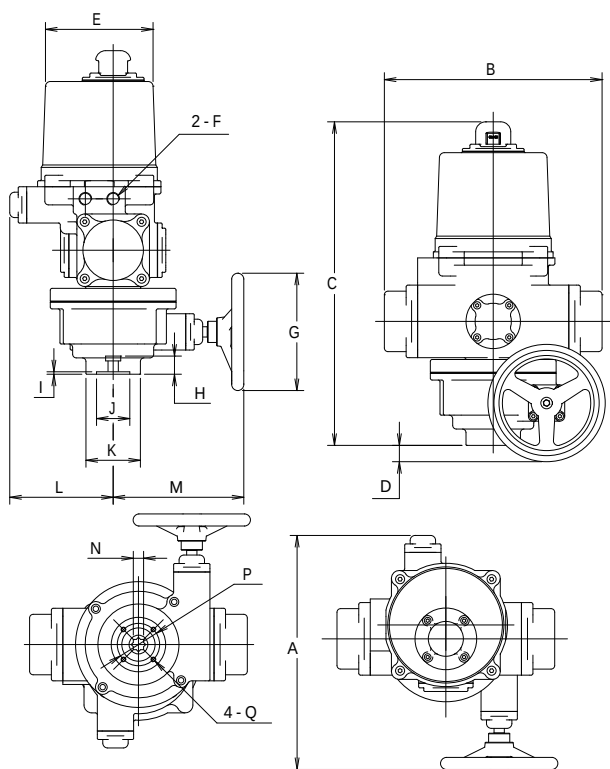
SEA Spring Return Electric Actuator



- Spring return models are designed to provide a fail-safe position in the event of a power loss of supply voltage a mechanical spring set is utilized to position the valve or damper to either the fully open or fully closed position without any external power source.
- A mechanical buffer system is employed at the end of the spring stroke to reduce the dynamic effect of the springs returning to the fail safe position.
- Standard unit fails clockwise, counter-clockwise rotation failure is available.
- A clutch-less, lever-less manual over-ride provides full-time manual capabilities.
- Patented in Taiwan, USA, Japan and China
- 50% duty rated
- Temperature range: -30° F TO +149° F with use of heater and thermostat
- Powder coated aluminum alloy enclosure
- Nema 4
- Gear train comes lubricated for life from factory
- Visual indicator
- Voltage options include: 24VAC, 24VDC, 440 VAC

Model	Power (watts)	Max Torque (In / lb)	Motor Speed (Sec / 90°)	Speed Spring	Mounting Flange
SEA-4-SR-MO	1.5A RUN / 2.8A LOCK	440	7-9 SECONDS	3 SECONDS	F07
SEA-11-SR-MO	3.8A RUN / 11A LOCK	1100	7-9 SECONDS	8 SECONDS	F10
SEA-17-SR-MO	3.8A RUN / 11.5A LOCK	1770	11-13 SECONDS	12 SECONDS	F12
SEA-23-SR-MO	3.8A RUN / 11.5A LOCK	2300	14-17 SECONDS	12 SECONDS	F12

SEA Spring Return Electric Actuator Dimensions



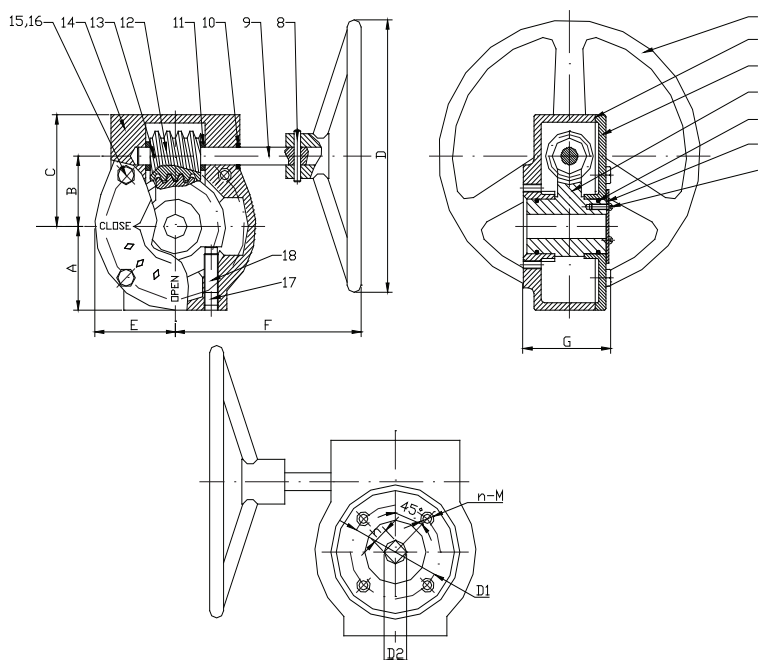
SPRING BUFFER SYSTEM

Model	Unit	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q	Flange Type
SEA-4-SR-MO	in mm	15.09 387	14.04 360	20.87 535	1.05 27	6.94 178	1/2" NPT	7.57 194	1.17 30	0.16 4	2.15 55	3.51 90	6.67 171	8.42 216	0.66 17	2.73 70	M8 x 1.25	F07
SEA-11-SR-MO	in mm	18.84 483	18.02 462	25.08 643	2.26 58	10.22 262	1/2" NPT	11.54 296	1.52 39	0.20 5	2.73 70	4.88 125	9.63 247	9.20 236	0.86 22	3.98 102	M10 x 1.5	F10
SEA-17-SR-MO	in mm	22.97 589	23.40 600	28.78 738	3.90 100	11.86 304	1/2" NPT	15.60 400	1.76 45	0.20 5	3.32 85	5.85 150	11.90 305	11.08 284	1.05 27	4.88 125	M12 x 1.75	F12
SEA-23-SR-MO	in mm	22.97 589	23.40 600	28.78 738	3.90 100	11.86 304	1/2" NPT	15.60 400	1.76 45	0.20 5	3.32 85	5.85 150	11.90 305	11.08 284	1.05 27	4.88 125	M12 x 1.75	F12

Series 17 Gear Operator



Item	Quantity	Part Description	Material Code
1	2	Bolts	Steel
2	1	Indicator	Aluminum
3	2	"O" Ring	ASTM D2000 NBR
4	1	Worm Gear	ASTM A536 65-45-12
5	1	Cover	ASTM A126 Class B
6	1	Spacer Sheet	
7	1	Hand Wheel	ASTM A126 Class B
8	1	Taper Pin	AISI 1045
9	1	Shaft	AISI 1045
10	1	Ring	ASTM D2000 NBR
11	2	Baffle Ring	ASTM536 65-45-12
12	1	Worm	AISI 1045
13	1	Taper Pin	STEEL
14	1	Housing	ASTM A126 Class B
15	4	Bolts	Steel
16	4	Spring Spacer	AISI 1566
17	1	Locking Screw	Steel
18	1	Adjusting Screw	Steel

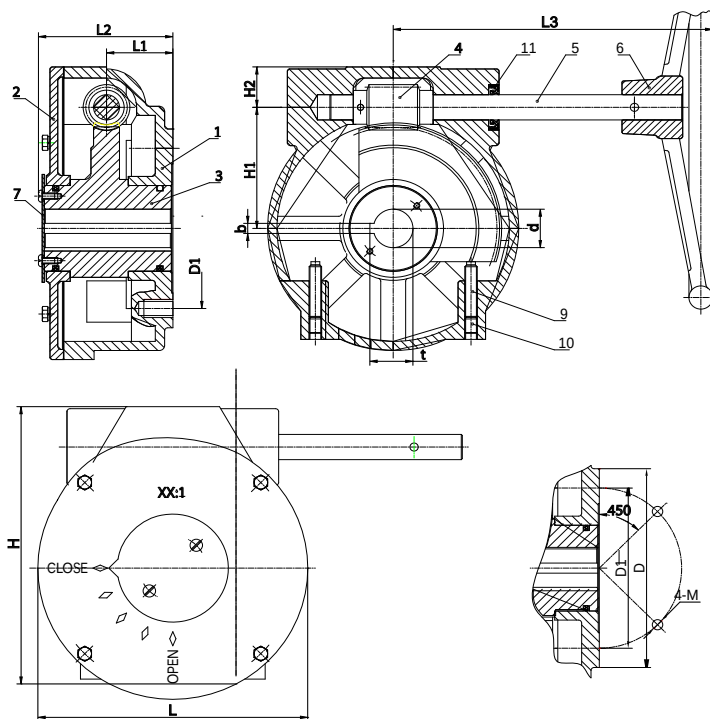


Model	Gear Ratio	Unit	A	B	C	D	D1	D2	E	F	G	h	M	n	Output Torque IN/LBS	Weight LBS/KG
SG-11	24:1	in mm	2.13 54	1.77 45	2.87 73	5.9 150	F05	0.496 13	2.05 52	6.1 155	2.95 75	0.354 9	M6	4 102	1504	10.1 5
SG-12	24:1	in mm	2.13 54	1.77 45	2.87 73	5.9 150	F07	0.62 16	2.05 52	6.1 155	2.95 75	0.551 14	M8	4 102	1504	10.1 5
SG-13	30:1	in mm	3.01 76	2.6 66	3.94 100	11.81 300	F10	1.12 28	3.03 77	8.74 222	3.35 85	0.867 22	M10	4 102	6195	18.7 8
SG-14	50:1	in mm	3.19 81	3.05 77	4.67 119	11.81 300	F10	1.24 31	3.19 81	8.39 213	3.39 86	0.867 22	M10	4 102	10621	24.64 11

Series 17 Gear Operator (Continued)



Item	Quantity	Part Description	Material Code
1	1	Housing	ASTM A126 Class B
2	1	Top Cover	ASTM A126 Class B
3	1	Gear Quadrant	Ductile Iron
4	1	Worm Gear	Steel
5	1	Input Shaft	Steel
6	1	Hand Wheel	ASTM A126 Class B
7	1	Indicator	Aluminum
9	2	Adjustment Screw	Steel
10	2	Set Screw	Steel
11	1	Shaft Seal	Buna-N



Model	Gear Ratio	Unit	D	D1	H	H1	H2	L	L1	L2	L3	M	b	d	t	Φ	Output Torque IN / LBS	Weight LBS / KG
SG-15	50:1	in mm	5.51 140	4.02 102	7.78 198	3.05 77	1.54 39	6.38 162	1.71 43	3.39 86	8.39 213	0.39 10	0.315 8	1.25 32	1.38 35	11.81 300	10621	24.6 11
SG-16	80:1	in mm	7.76 197	5.51 140	11.42 290	4.72 120	1.57 40	10.04 255	2.52 64	5.1 130	9.88 251	0.63 16	0.393 10	1.31 33	1.44 37	11.81 300	22128	73.7 33
SG-17	80:1	in mm	7.76 197	5.51 140	11.42 290	4.72 120	1.57 40	10.04 255	2.52 64	5.1 130	9.88 251	0.63 16	0.393 10	1.5 38	1.63 41	11.81 300	22128	73.7 33

Valves

SERIES V84

V-PORT CONTROL VALVE



Port:	15° V, 30° V or 60° V (Special Configurations Available)	• 3-Piece Design • Bottom Entry Live Loaded Stem • High Cycle Stem Packing • Encapsulated Body Bolts • Variety of Seats and Seals • "No Play" Coupling • Integral Mounting Pad • Metal Seats available for Slurry and High Temperatures Applications • Weldable in-line without disassembly of ends
Size Range:	1/4" to 4"	
Materials:	316 Stainless Steel, Carbon Steel, Alloy 20, Hastelloy C, Monel	
Ends:	NPT, SW, BW, BSPT, 150#, 300#, 600#, Flanged	
Pressure:	Vacuum to 3000 PSI*	
Temperature:	-50° to 600° F*	

* Size limitations

SERIES 80/89 3-PIECE STANDARD/FULL PORT BALL VALVE API 608



Size Range:	1/4" to 4" (3" Series 89)	• Class 800 1/4"- 2-1/2" • Class 300 3"- 4" • ASME B16.34 Design • NACE MR0175 Compliant • Bottom Entry Live Loaded Stem • High Cycle Stem Packing • Encapsulated Body Bolts and Seals • Integral Mounting Pad • Lockable Lever, Oval & Tamper-Proof Handle • Encapsulated Body Seal • Weldable in line without disassembly of ends • Integral Fugitive Emission Body Optional
Materials:	316 Stainless Steel, Carbon Steel, Alloy 20, Hastelloy C, Monel, Brass	
Ends:	Threaded NPT & BSPT Socket & Butt Weld Flanged 150#, 300#, 600#	
Pressure:	Vacuum to 3000 PSI*	
Temperature:	-50° to 600° F*	

* Dependent on Seat Material

SERIES 70

FLANGED 2-PIECE FULL PORT BALL VALVE

API 608



Port:	Full Port	• ASME B 16.34 • ASME B 16.5 • NACE MR0175 Compliant • Blowout Proof Stem • Bottom Entry Line Loaded Stem • Integral Mounting Pad • Variety of Seats and Seals • Lockable Lever Handle Standard • Extended or Oval Handle Optional • Tamper Proof Locking Device Optional • Integral Fugitive Emission Body Optional
Size Range:	1/2" to 4"	
Materials:	316 Stainless Steel, Carbon Steel, Alloy 20, Hastelloy C, Monel	
Ends:	150#, 300# Flanged	
Pressure:	Up to 720 PSI*	
Temperature:	Up to 550° F*	

* Size limitations

Valves

SERIES 11

2-PIECE DIRECT MOUNT BALL VALVE



Port: Full Port
Size Range: 1/4" to 2"
Materials: 316 Stainless Steel, Carbon Steel
Ends: NPT
Pressure: 1000 PSI
Temperature: 425° F

- Integral ISO 5211 Direct Mounting Pad
- For use with Pneumatic or Electric Actuators
- Compact Dependable Automated Assemblies
- Live Loaded Multiple Packing Stem Seal
- Lockable Lever Handle Standard
- Oval Handle Optional

* Shown with 4x4 pneumatic actuator

SERIES 12

2-PIECE DIRECT MOUNT BALL VALVE



Port: Full Port
Size Range: 1/4" to 2"
Materials: 316 Stainless Steel, Carbon Steel
Ends: NPT
Pressure: 2000 PSI
Temperature: 500° F

- Heavy Duty Stem
- Integral ISO 5211 Direct Mounting Pad
- For use with Pneumatic or Electric Actuators
- In-service Adjustable Stem Packing
- Compact Dependable Automated Assemblies
- Live Loaded Stem with 4 Belleville Washers
- Lockable Lever Handle Standard
- Oval Handle Optional

* Shown with SPN-II pneumatic actuator

SERIES 13

3-PIECE DIRECT MOUNT BALL VALVE



Port: Full Port
Size Range: 1/4" to 4"
Materials: 316 Stainless Steel, Carbon Steel
Ends: NPT, SW, BW
Pressure: 1000 PSI
Temperature: 450° F

- Integral ISO 5211 Direct Mounting Pad
- For use with Pneumatic or Electric Actuators
- In-service Adjustable Stem Packing
- Compact Dependable Automated Assemblies
- Live Loaded Stem with 4 Belleville Washers
- Lockable Lever Handle Standard
- Oval Handle Optional

* Shown with SPN-II pneumatic actuator

Valves

SERIES 17

BUTTERFLY VALVE



- | | | |
|-----------------|---|---|
| Size Range: | 2" - 12" rating up to 200 PSI
14" - 48" rating up to 150 PSI | <ul style="list-style-type: none"> • MSS SP - 25 Marking • Self-lubricated Bushings Eliminate Side Loading • Blowout Proof Shaft • One-Piece Wafer and Lug Body, Epoxy Painted Offering Excellent Protection Against Abrasion and Corrosion • Valves Available with Undercut Discs to 50 PSI • ISO 5211 Mounting Pad • Bidirectional or Dead End Service • Phenolic Backed Cartridge Seat |
| Body Materials: | Ductile Iron, 316 Stainless Steel | |
| Disc Materials: | 316 Stainless Steel, Aluminum Bronze, Ductile Iron Nylon Coated | |
| Seats: | BUNA-N, EPDM, Teon, Viton
EPDM Food Grade | |
| Connections: | Lug or Wafer | |
| Temperature: | -30° to 275° F | |

SERIES 40

LUG & WAFER BALL VALVE



- | | | |
|--------------|---|--|
| Size Range: | 2", 3" & 4" | <ul style="list-style-type: none"> • Unibody Design • Full Port • Variety of Seats • Integral ISO 5211 Mounting Pad • Space & Weight Saving Design • Live Loaded Stem Packing • ANSI Class 150 ASME B16.5 Wafer and Lug ends • Wall thickness to ASME B16.34 |
| Materials: | Carbon Steel,
316 Stainless Steel,
Alloy 20, Monel, Hastelloy C | |
| Seats: | PTFE, RTFE, PEEK, TFM, NOVA | |
| Ends: | Wafer, Lug | |
| Pressure: | Class 150 | |
| Temperature: | -50° to 600° F* | |

* Dependent on Seat Material

SERIES 84 / 99

3-PIECE STANDARD / FULL PORT BALL VALVE



- | | | |
|--------------|--|--|
| Size Range: | 1/4" to 4" (3" Series 99) | <ul style="list-style-type: none"> • ASME B 16.34 Design • NACE MR0175 Compliant • Bottom Entry Live Loaded Stem • High Cycle Stem Packing • Encapsulated Body Bolts • Variety of Seats and Seals • Integral Mounting Pad • Lockable Lever, Extended or Oval Handle • Floating Ball Design • Encapsulated Body Seals • Weldable in-line without disassembly of ends |
| Materials: | 316 Stainless Steel, Carbon Steel,
Alloy 20, Hastelloy C, Monel,
Brass | |
| Ends: | Threaded NPT & BSPT
Socket & Butt Weld
Flanged 150#, 300#, 600# | |
| Pressure: | Vacuum to 3000 PSI* | |
| Temperature: | -50° to 600° F* | |

* Dependent on Seat Material

Valves

SERIES 88 HIGH PURITY BPE COMPLIANT FULL PORT TUBE BALL VALVE



Port:	Full Port	ASME/BPE - 2009 Compliant
Size Range:	1/4" to 4"	3-Piece Design
Materials:	316L Stainless Steel, Alloy 20, Hastelloy C	High Cycle Stem Design
Ends:	CE (Clamp Ends), BW, SW, BTE (Extended Butt weld Tube)	- Encapsulated Body Bolts - Variety of Seats, Seals and Aseptic end Connections
Pressure:	up to 1480 PSI*	Integral Mounting Pad
Temperature:	up to 550° F*	- Lockable, Lever, Extended or Oval Handle - All Wetted Parts Polished To 14-18 RA - Optional 8-10 RA Electropolish - Optional Purge Ports Available

SERIES 75 SANITARY MULTI-PORT BALL VALVE



Port:	Full Tube Port	4 Seat Design
Size Range:	1/2" to 2", 3"	Integral ISO 5211 Mounting Pad
Material:	316 Stainless Steel	Lockable Lever Handle
Ends:	CE (Clamp End)	"L" or "T" Port Solid Ball
Pressure:	1000 PSI*	Blow-out proof stem
Temperature:	-50° to 500° F*	20RA polished ball and ends - Optional TFM Cavity Filled Seats

* Dependent on Size

SERIES 77 3-WAY AND 4-WAY BALL VALVE



Size Range:	Full Port 1/4" to 6" Standard Port 8"	- ASME B16.5 - ASME B16.11
Materials:	316 Stainless Steel, Carbon Steel, Alloy 20, Hastelloy C	4-Seat Design - Double Stem Seals
Ends:	NPT, SW, BW, RF Flange, Tri-Clamp Ends, Extended Butt Weld, Short Butt Weld	- Lockable Handles, Lever or Oval Handle - Full Port Design
Pressure:	600 PSI	- Trunnion- Supported Ball 2" and up - ISO 5211 Mounting Pad
Temperature:	450° F	"T", "L" and Double "L" Balls 14 Different Flow Plans - Direct Mount Design - Live Loaded Stem Packing - Blowout Proof Stem



Series 50M76 Ball Valves

Threaded Full Port
316 Stainless Steel
1/4" - 3"



Series N66 3-Piece Ball Valve

Tube Full Port
316 Stainless Steel
1/2" - 2"



150#, 300#, 600# Flanged Ball Valves

Full & Reduced Port
Carbon Steel, 316 Stainless & Alloy 20
1/2" - 12"



Series 39034 & 39036

3-Piece Ball Valves

Threaded & Socket Weld Full Port
Carbon Steel & 316 Stainless Steel
1/4" - 4"



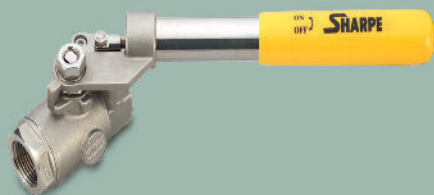
High Performance Ball Valves

Available in a wide range of materials
Pressures up to 6000 lb.



3-Way & 4-Way Ball Valves

Threaded, Flanged or Clamp Ends
316 Stainless Steel
1/2" - 8"



Series 5457-DMH Ball Valve

2000psi 1/4" - 2" Standard Port
Carbon Steel & 316 Stainless Steel
Spring Return Handle



Automated Valve Packages

Pneumatic & Electric Actuators
Positioners, Limit Switches & Solenoids



Seal Weld Ball Valves

Standard & Full Port
Carbon Steel & 316 Stainless Steel
2000, 3000, & 6000 psi



200# Gate, Globe, Check

Threaded & Socket Weld
316 Stainless Steel
Gate, Globe 1/2" - 2"
Check 1/4" - 3"



150#, 300#, 600#

Cast Steel & Stainless Steel
Up to 36"



800#/1500# Gate, Globe, Check

Threaded & Socket Weld
Forged Carbon & Stainless Steel
1/4" - 2"



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