



PNEUMATIC ACTUATORS



02 Advanced Testing Equipment

Innovate with Intention Competition can develop



only good management,good ideas,good talent is not enough,refined equipment is equally required to guarantee high production capacity and excellent quality. importing global advanced productcing and processing equipment and talent,st.hans now has high-accuracy cnc machines,large-size processing machines and custom machines,which guarantee the excellent product quality and thus the rapid development of the company.



Product description

1 Indicator Position indicator with NAMUR is convenient for mounting accessories such as Limit Switch box, Positioner	
2 Pinion NAMUR, ISO5211 DIN3337 The pinion is high-precision and integrative, made from nickel-plated alloy steel, fully conforming to the latest standards of ISO5211, DIN3337, NAMUR. The dimensions can be customized and stainless steel is available.	
3 Actuator Body ASTM6005 PTFE According to the different requirements, the extruded aluminum alloy ASTM6005 Body can be treated with hard anodized, powder polyester painted (different colors are available such as blue, orange, yellow, etc.), PTFE or Nickel plated.	
4 End caps Die-casting aluminum powder polyester painted in different colors, PTFE or Nickel plated. 	

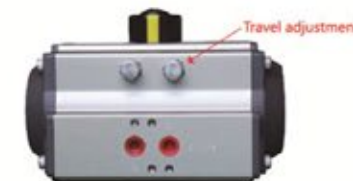
5 Pistons

The twin rack pistons are made from Die-casting aluminum treated with hard anodized or made from cast steel with galvanization. Symmetric mounting position, long cycle life and fast operation, reversing rotation by simply inverting the



6 Travel adjustment

The two independent external travel stop adjustment bolts can adjust $\pm 5^\circ$ at both open and close directions easily and precisely.



7 High performance springs

Preloaded coatings springs are made from the high quality material for resistant to corrosion and longer service life which can be demounted safely and conveniently to satisfy requirement of torque by changing quantity of springs.



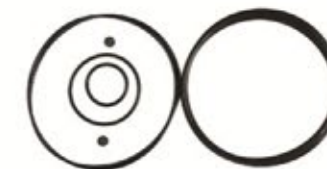
8 Bearing & Guides

Made from low friction, long-life compound material, to avoid the direct contact between metals. The maintenance and replacement are easy and convenient.

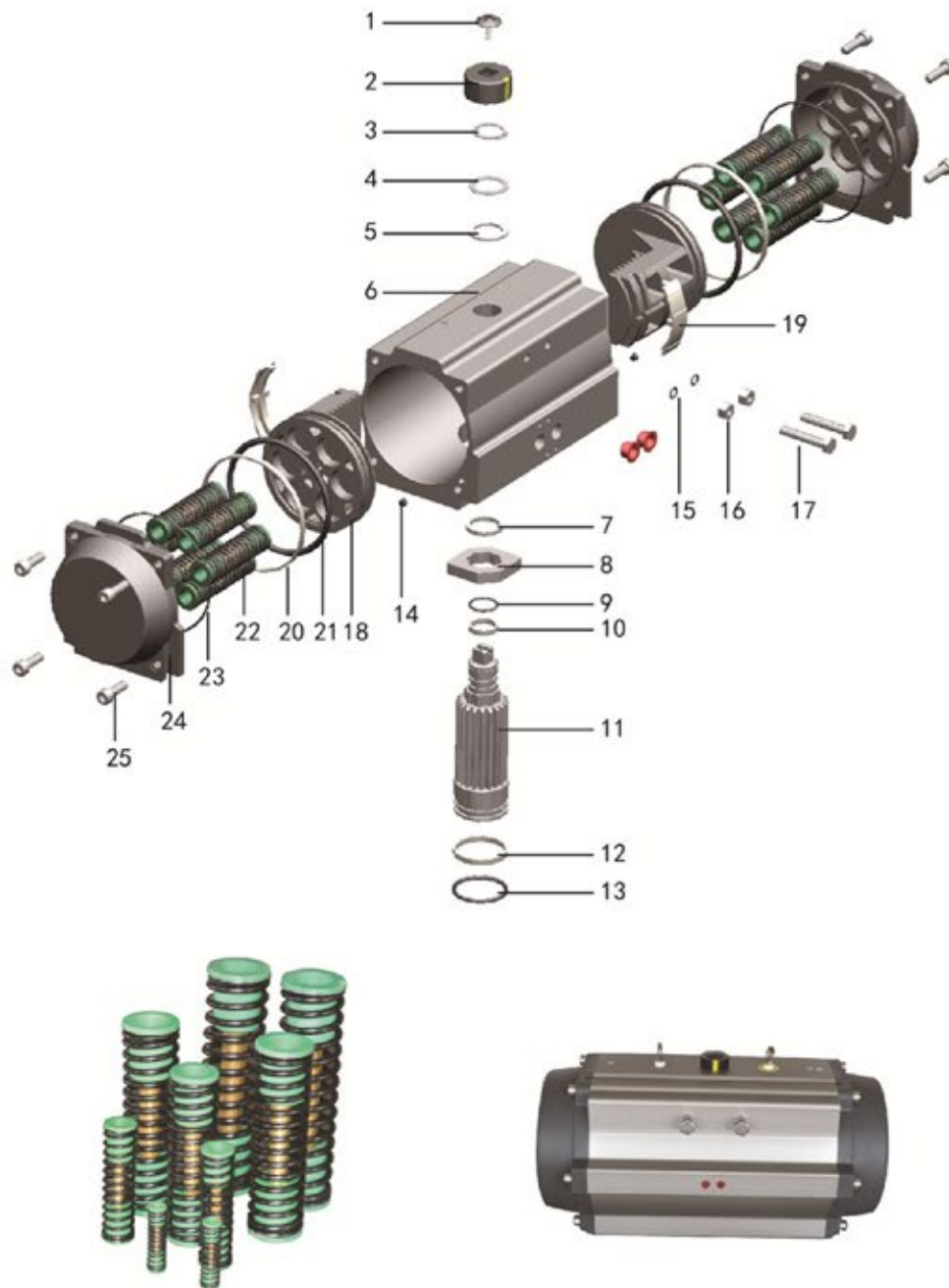


9 O-rings

Temperature conditions to use NBR: $-20^\circ\text{C} \sim +80^\circ\text{C}$
In High temperature conditions to use Viton: $-15^\circ\text{C} \sim +150^\circ\text{C}$
In Low temperature conditions to use Silicone: $-60^\circ\text{C} \sim +80^\circ\text{C}$



Parts and Material



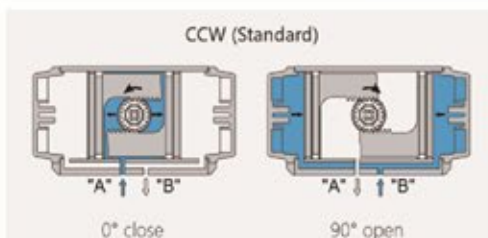
Parameters

NO.	Description	Qty	Standard Material	Protection	Optional Material
1	Indicator screw	1	Plastic		
2	Indicator	1	Plastic		
3	Axis block	1	Stainless steel		
4	Metal gasket	1	Stainless steel		
5	Outside washer	1	Engineering plastics		
6	Body	1	Aluminum	Hard anodized etc	
7	Inside washer	1	Engineering plastics		
8	Cam	1	Alloy steel		
9	Bearing(Pinion top)	1	NBR		Viton/Silicone
10	Shaft support ring	1	Engineering plastics		
11	Axis	1	Alloy steel	Nickel plated	Stainless steel
12	Lower shaft support ring	1	Engineering plastics		
13	Bearing(Pinion bottom)	1	NBR		Viton/Silicone
14	Plugs	2	NBR		Viton/Silicone
15	O-ring (Adjusting bolt)	2	NBR		Viton/Silicone
16	Screw nut	2	Stainless steel		
17	Adjusting bolt	2	Stainless steel		
18	Piston	2	Die-casting aluminum	Hard anodized etc	
19	Piston guides	2	Stainless steel		
20	Piston support ring	2	Engineering plastics		
21	O-ring (Piston)	2	NBR		Viton/Silicone
22	Spring	0-12	Spring steel	Dip coating	
23	Plug	2	NBR		Viton/Silicone
24	End cap	2	Die-casting aluminum	Powder polyster painted etc	
25	End cap fastening bolt	8	Stainless steel		

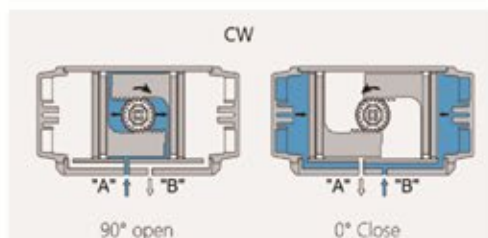


Operating Principle

Double Acting Actuators

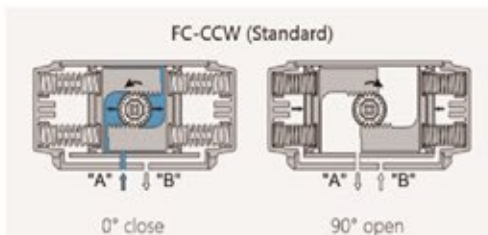


Air to Port A forces the pistons outwards, causing the drive shaft to turn counterclockwise while the air is being exhausted from Port B. Air to Port B forces the pistons inwards, causing the drive shaft to turn clockwise while the air is being exhausted from Port A.

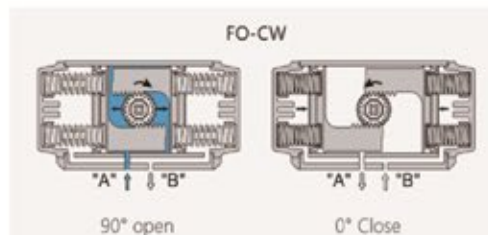


Air to Port A forces the pistons outwards, causing the drive shaft to turn clockwise while the air is being exhausted from Port B. Air to Port B forces the pistons inwards, causing the drive shaft to turn counterclockwise while the air is being exhausted from Port A.

Spring Return Actuators

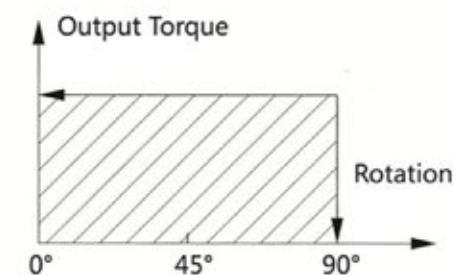


Air to port A forces the pistons outwards, causing the springs to compress. The drive shaft turns counterclockwise while air is being exhausted from port B. Loss of air pressure on port A, the stored energy in the springs forces the pistons inwards. The drive shaft turns clockwise while air is being exhausted from port A.



Air to port A forces the pistons outwards, causing the springs to compress. The drive shaft turns clockwise while air is being exhausted from port B. Loss of air pressure on port A, the stored energy in the springs forces the pistons inwards. The drive shaft turns counterclockwise while air is being exhausted from port A.

Output Torque Of Double Acting Actuators



Unit:Nm

Model	Air supply pressure(Unit:bar)									
	2	2.5	3	4	4.5	5	5.5	6	7	8
DA-32	3	4	5	6	7	8	8	9	11	12
DA-40	5	6	7	10	11	12	13	14	17	19
DA-52	8	10	12	16	18	20	22	24	28	32
DA-63	15	18	22	29	33	36	40	44	51	58
DA-75	20	25	30	40	45	50	55	60	70	80
DA-83	31	39	47	63	70	78	86	94	110	125
DA-92	45	56	68	90	102	113	124	135	158	181
DA-105	66	83	99	132	149	165	182	198	231	264
DA-125	100	125	150	200	226	251	276	301	351	401
DA-140	171	214	256	342	385	427	470	513	598	684
DA-160	266	332	399	532	598	665	731	798	931	1064
DA-190	426	532	638	851	958	1064	1170	1277	1490	1702
DA-210	532	665	798	1064	1197	1330	1463	1596	1862	2128
DA-240	769	962	1154	1539	1731	1924	2116	2308	2693	3078
DA-270	1170	1462	1754	2339	2632	2924	3216	3509	4094	4679
DA-300	1526	1908	2289	3052	3434	3815	4197	4578	5341	6104
DA-350	2285	2856	3427	4570	5141	5712	6283	6854	7997	9139
DA-400	3256	4070	4884	6512	7326	8140	8954	9768	11396	13024

Sizing:Double Acting Actuator

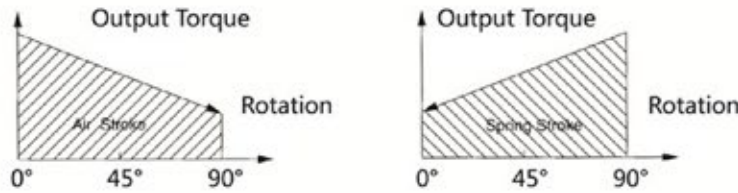
The suggested safety factor for double acting actuators under normal working conditions is 20%-30%.

Example:

- The torque needed by valve=100N·m
- The torque considered safety factor(1+30%)=130N·m
- Air Supply=5Bar

According to the above table,we can choose the minimum model is DA105.

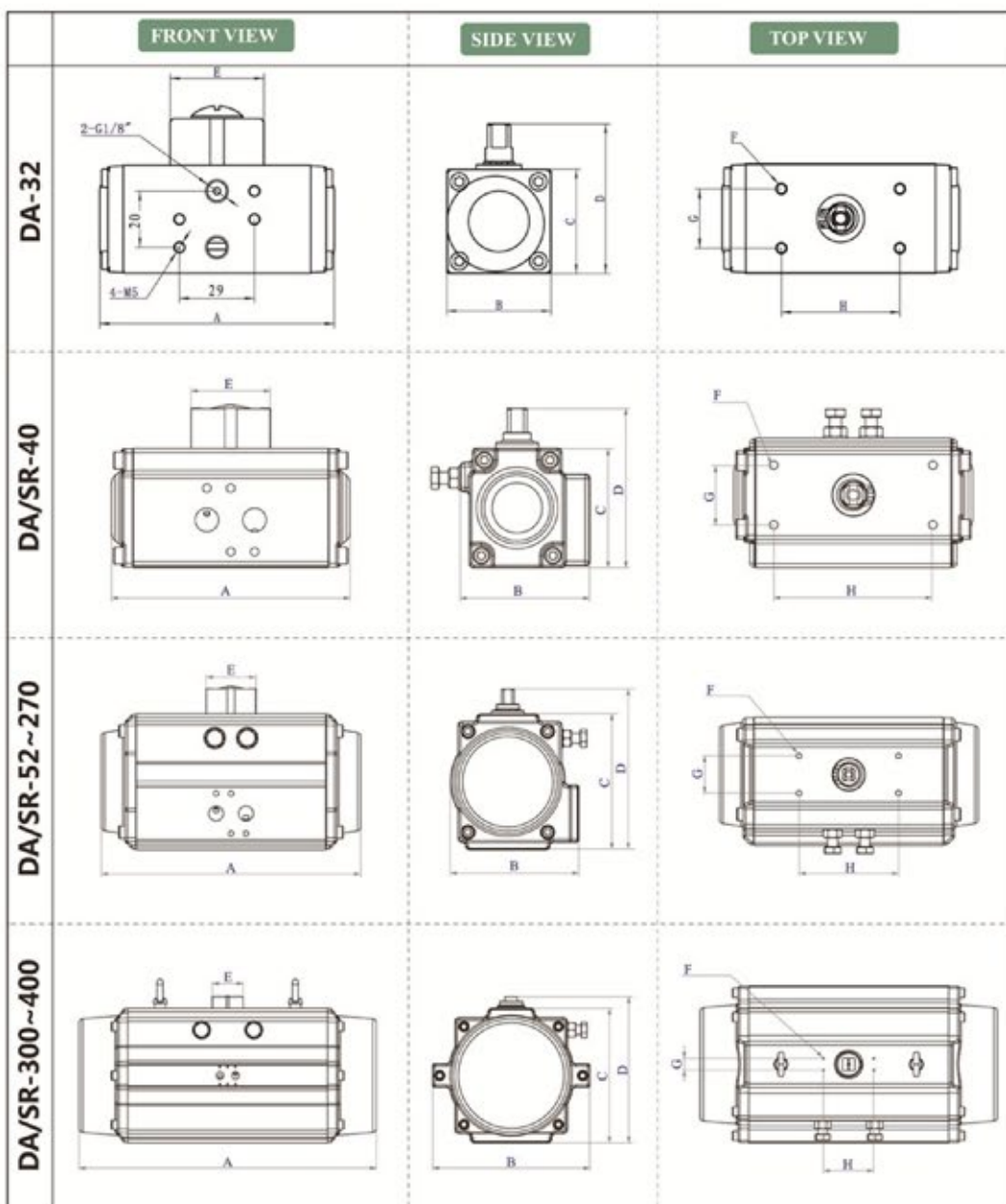
Output Torque Of Spring Return Actuators



Output torque of air to springs																	Unit:Nm
Air pressure	Spring Qty.	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	
Model	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Springs' output
SR-40	K2	1.3		2.7		5.0	1.4	7.5	3.1	9.8	4.5						7.5 4.8
SR-52	K5	5.7	3.8	7.6	5.7												6.2 4.3
	K6	4.9	2.5	6.9	4.5	10.9	8.5										7.4 5.0
	K7	4.0	1.3	6.0	3.3	9.8	7.3	14.0	10.4								8.6 5.9
	K8			5.2	2.0	9.2	6.0	13.2	9.1	17.2	14.1						9.9 6.7
	K9			4.3	0.8	8.3	4.8	12.3	7.9	16.3	12.8	20.3	16.8				11.1 7.6
	K10					7.4	3.6	11.5	6.7	15.5	11.6	19.5	15.6				12.4 8.5
SR-63	K11					6.6	2.3	10.6	5.4	14.6	10.4	18.6	14.3	22.6	18.3		13.6 9.3
	K12							9.7	4.2	13.8	9.1	17.8	12.2	21.8	17.1		14.8 10.2
	K5	11.4	7.7	15.0	11.4	22.3	14.9										10.4 6.8
	K6	10.1	5.7	13.6	9.3	20.9	16.6	28.3	23.9								12.5 8.2
	K7	8.6	3.6	12.5	7.2	19.5	14.5	26.8	21.9								14.6 9.6
	K8			10.9	5.1	18.2	12.4	25.5	19.8	32.8	27.0	40.1	34.3				16.7 10.9
SR-75	K9					16.8	10.4	24.1	17.7	31.4	24.9	38.7	32.2				18.8 12.3
	K10					14	8.2	22.8	15.6	30.0	22.8	37.3	30.1	44.7	37.4		20.9 13.7
	K11							21.5	13.5	28.7	20.7	36.0	28.0	43.3	35.3		22.9 15.0
	K12							20.0	11.4	27.3	18.6	34.6	25.9	41.9	33.3		25.0 16.4
	K5	14.5	10.6	19.4	15.5	29.5	25.7										14.5 10.5
	K6	12.4	7.6	17.3	12.6	27.4	22.7	37.5	32.8								17.4 12.7
SR-83	K7	10.4	4.8	15.2	9.7	25.3	19.9	35.4	29.9								20.3 14.8
	K8			13.1	6.8	23.1	16.9	33.3	27.0	43.2	37.0	53.3	47.0				23.2 16.9
	K9					21.0	14.1	31.2	24.1	41.1	34.1	51.2	44.2				26.1 19.0
	K10					19.0	11.1	28.8	21.2	39.0	31.2	49.1	41.2	59.1	51.2		29.0 21.1
	K11							27.0	18.3	37.0	28.3	47.0	38.4	57.0	48.4		31.9 23.2
	K12							24.9	15.4	34.9	25.4	44.9	35.4	54.9	45.4		34.7 25.3
SR-92	K5	23.3	16.1	31.1	24.0	46.8	39.7										23.0 15.8
	K6	20.1	11.5	28.0	19.3	43.7	35.1	59.4	50.7								27.6 19.0
	K7	17.0	6.9	24.8	14.8	40.5	30.5	56.2	46.2								32.2 22.1
	K8			21.7	10.1	37.4	25.8	53.1	41.5	68.8	57.2	84.5	72.9				36.8 25.3
	K9					34.2	21.3	49.9	37.0	65.6	52.6	81.2	68.3				41.4 28.5
	K10					31.0	16.6	46.7	32.3	62.4	48.0	78.1	63.7	93.8	79.3		46.0 31.6
SR-105	K11							43.6	27.7	59.3	43.4	75.0	59.1	90.6	74.8		50.6 34.8
	K12							40.4	23.2	56.1	38.9	71.7	54.5	87.4	70.2		55.2 38.0
	K5	33.1	22.0	44.2	33.2	66.8	55.9										34.4 23.3
	K6	28.4	15.2	39.6	26.4	62.2	49.0	84.8	71.6								41.2 28.0
	K7	23.8	8.2	34.9	19.4	57.5	42.1	80.2	64.7								48.1 32.7
	K8			31.3	12.6	52.9	35.2	75.5	57.9	98.1	80.5	120.7	103.0				55.0 37.3
SR-125	K9					48.2	28.4	70.9	51.0	93.5	73.6	116.0	96.1				61.9 42.0
	K10					43.6	21.5	66.2	44.1	88.8	66.7	111.3	89.2	134.0	111.8		68.7 46.7
	K11							61.5	37.2	84.1	59.9	106.6	82.4	129.2	105.0		75.6 51.4
	K12							56.8	30.4	79.4	53.0	101.9	75.5	124.5	98.1		82.5 56.0
	K5	51.0	33.4	67.5	49.9	100.6	83.0										49.2 31.6
	K6	44.7	23.5	61.1	40.0	94.2	73.2	127.3	106.2								59.1 38.0
SR-140	K7	38.4	13.7	54.9	30.3	87.9	63.4	121.0	96.4								68.9 44.3
	K8			48.5	20.4	81.6	53.5	114.7	86.5	147.7	119.6	180.8	152.7				78.7 50.6
	K9					75.3	43.7	108.4	76.8	141.5	109.8	174.5	142.9				88.6 56.9
	K10					68.9	33.4	102.0	66.5	135.1	99.6	168.2	132.6	201.2	165.7		98.4 63.3
	K11							95.7	57.0	128.7	90.1	161.8	123.1	194.8	156.2		108.3 69.6
	K12							89.4	47.5	122.5	80.6	155.5	113.6	188.6	146.7		118.1 75.9
SR-160	K5	73	47	98	72	148	122										79 52
	K6	63	31	88	56	138	107	188	157								94 63
	K7	52	15	77	40	127	90	178	141								110 73
	K8			67	25	117	75	167	125	217	176	268	226				125 84
	K9					107	59	157	109	207	159	257	210				141 94
	K10					96	44	146	94	196	144	247	194	297	245		157 105
SR-190	K11							136	78	186	128	236	178	286	228		173 115
	K12							125	63	176	113	226	163	276	213		188 125

Output torque of air to springs																	Unit:Nm
Air pressure		2.5BAR		3BAR		4BAR		5BAR		6BAR		7BAR		8BAR		Springs' output	
Model	Spring Qty.	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	90° Start	0° End
SR-140	K5	128	85	171	127	256	213									129	86
	K6	111	59	154	102	239	187	325	273							155	103
	K7	94	33	137	76	222	162	308	247							181	120
	K8			120	50	205	136	291	221	376	307	462	392			206	137
	K9					187	110	273	196	358	281	444	367			232	155
	K10					170	84	256	169	341	255	427	340	512	426	258	172
	K11							238	143	324	229	409	314	495	400	284	189
K12							221	118	307	203	392	289	478	374	310	206	
SR-160	K5	193	124	259	191	392	324									208	140
	K6	165	83	232	149	365	282	498	415							250	168
	K7	137	41	203	107	336	240	469	373							292	196
	K8			176	66	309	199	442	237	575	465	708	598			333	223
	K9					280	157	413	290	546	423	679	556			375	251
	K10					253	115	386	248	519	381	652	514	785	647	417	279
	K11							358	207	491	340	624	473	757	606	458	307
K12							330	165	463	298	596	431	729	564	500	335	
SR-190	K5	332	222	438	329	651	542									309	200
	K6	292	161	398	267	611	480	824	693							371	240
	K7	252	99	358	205	571	418	784	631							433	280
	K8			318	143	531	356	744	569	957	782	1169	995			495	320
	K9					491	295	704	507	917	720	1130	933			557	360
	K10					451	233	664	446	877	658	1090	871	1302	1084	618	400
	K11							624	384	837	597	1050	809	1263	1022	680	440
K12							584	322	797	535	1010	748	1223	960	742	480	
SR-210	K5	390	285	523	418	789	684									380	275
	K6	335	209	468	342	734	608	1000	874							456	330
	K7	280	133	413	266	679	532	945	798							532	385
	K8			358	190	624	456	890	722	1156	988	1422	1254			608	440
	K9					569	380	835	646	1101	912	1367	1178			684	495
	K10					514	304	780	570	1046	836	1312	1102	1578	1368	760	550
	K11							725	494	991	760	1257	1026	1523	1292	836	605
K12							670	418	936	684	1202	950	1468	1216	912	660	
SR-240	K5	552	409	744	600	1129	985									554	410
	K6	470	297	662	489	1047	874	1432	1259							665	492
	K7	388	187	580	379	964	764	1349	1149							775	575
	K8			498	268	883	653	1267	1037	1652	1422	2037	1807			886	656
	K9					800	542	1185	926	1569	1311	1954	1696			998	739
	K10					718	431	1103	816	1488	1201	1872	1586	2257	1970	1108	821
	K11							1021	705	1406	1090	1791	1474	2176	1859	1219	903
K12							939	594	1323	979	1708	1363	2093	1748	1330	985	
SR-270	K5	903	675	1195	968	1779	1552									787	560
	K6	790	519	1083	811	1667	1396	2252	1981							943	672
	K7	679	361	972	654	1556	1238	2141	1823							1101	783
	K8			860	497	1444	1081	2029	1666	2614	2252	3199	2836			1258	895
	K9					1332	923	1917	1509	2502	2094	3087	2678			1416	1007
	K10					1220	767	1805	1352	2390	1937	2974	2521	3560	3107	1572	1119
	K11							1693	1194	2278	1779	2862	2364	3448	2949	1730	1231
K12							1582	1037	2167	1623	2751	2207	3336	2792	1887	1342	
SR-300	K5	1097	729													1061	730
	K6	935	494	1316	875											1273	876
	K7	772	258	1153	639	1916	1402									1485	1022
	K8			991	403	1754	1166	2517	1929	3118	2456					1697	1168
	K9					1592	930	2355	1693	3118	2456					1909	1314
	K10					1430	695	2193	1458	2956	2221	3719	2984	4482	3747	2122	1460
	K11							2030	1222	2793	1985	3556	2748	4319	3511	2334	1606
K12									1868	986	2631	1749	3394	2512	4157	3275	
SR-350	K5	1553	964													1702	1173
	K6	1292	586	1863	1157											2043	1408
	K7	1031	208	1602	779	2745	1922									2383	1642
	K8			1341	401	2484	1544	3626	2686							2724	1877
	K9					2224	1165	3336	2307	4508	3449					3064	2112
	K10					1963	787	3105	1929	4247	3071	5390	4214	6532	5356	3405	2346
	K11							2844	1551	3986	2693	5129	3836	6271	4978	3745	2581
K12							2584	1172	3726	2314	4869	3457	6011	4599	4086	2816	
SR-400	K7	2028	869													2880	1837
	K8	1736	411	2550	1225											3292	2100
	K9			2259	768	3887	2396									3703	2362
	K10			1967	311	3595	1939	5223	3567							4115	2624
	K11					3303	1482	4931	3110	6559	4738					4526	2887
	K12					3012	1025	4640	2653	6268	4281	7895	5908	9523	7536	4938	3149
	K13							4348	2195	5976	3823	7603	5450	9231	7078	5349	3412
	K14							4057	1738	5685	3366	7312	4993	8940	6621	5761	3674
	K15							3765	1281	5393	2909	7020	4536	8648	6164	6172	3937
K16									5101	2452	6728	4079	8356	5707	6584	4199	

Dimensions

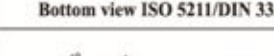


Dimensions

Unit:mm

Model	32	40	52	63	75	83	92	105	125	140	160	190	210	240	270	300	350	400
A	110	122	147	168	186	212	262	268	301	390	458	534	538	602	718	782	920	940
B	46	65	71.5	83	95	103	108.5	121.5	142	152.5	174	206	226	260	294	336	385	520
C	46	60	72	88	99.5	109	116.5	133	155	172	197	230	255	289	326	350	410	466
D	66	80	92	108	119.5	129	136.5	153	185	202	227	260	285	319	356	380	440	496
E	Ø40	Ø40	Ø40	Ø40	Ø40	Ø40	Ø40	Ø40	Ø55	Ø55	Ø55	Ø80	Ø80	Ø80	Ø80	Ø80	Ø80	Ø80
F	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8
G	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
H	50	80	80	80	80	80	80	80	80	80/130	80/130	80/130	130	130	130	130	130	130

Connection

Air connection NAMUR	Bottom view ISO 5211/DIN 3337	Shaft top NAMUR
 DA/SA-40~240 DA/SA-270~400	 Standard Options	

Connection

Unit:mm

[illegible]

8 screw holes

Sizing:Spring Return Actuators

The suggested safety factor for spring return actuator under normal working conditions is 30-50%

Example:

The torque needed by valve=80N.m

The torque consider safety

factor(1+30%)=104N.m

Air Supply=5Bar

According to the table of spring return actuators' output,

we find out torque of SR140 K7 is:

Air stroke 0°=308N.m

Air stroke 90°=247N.m

Spring stroke 90°=181N.m

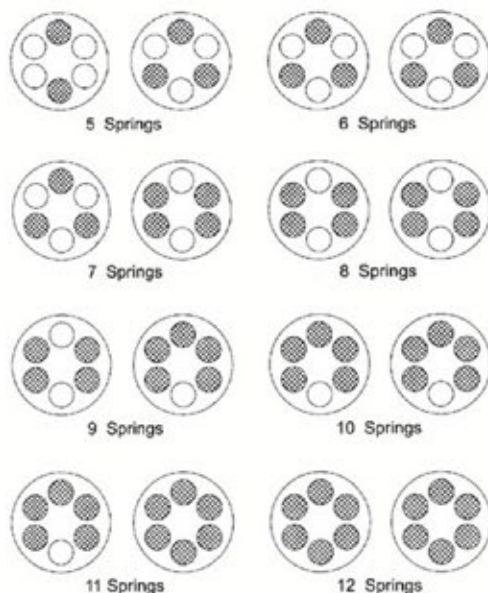
Spring stroke 0°=120N.m

All the output torque is large than we needed.

Attention

During the restoration,the spring return actuators' output will not be affected by the inputing air from the port B.On the contrary , it will help the restoration of springs.

Spring mounting form for spring return actuators



During selecting the spring return actuators,we can choose the more reasonable and more economical actuators,if we know the different torque needed by the valve working at opening, operating and closing.

Example:

The max torque needed by the butterfly valve=104N.m

The torque after

opened(operating)104×30%=32N.m

Air Supply=5Bar

We can select the SR125K11

output torque is:

Air stroke 0°136N.m>104N.m

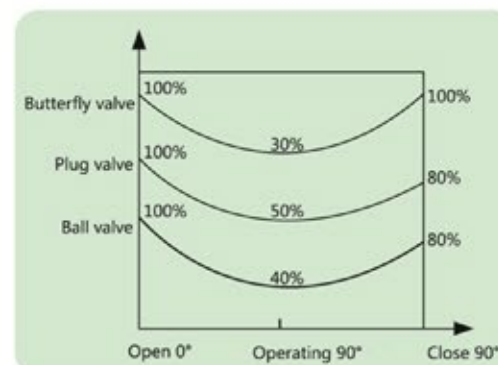
Air stroke 90°=78N.m>32N.m

Spring stroke 90°=173N.m>32N.m

Spring stroke 0°=115N.m>104N.m

The above datas show the actuator' s torque can satisfy

the requirement of the butterfly valve



Note Make sure that the torque necessary to operate the valve is compatible with the actuator torque (it depends on both actuator type and air supply). Please note that the requested torque depends not only on the valve, but on the working conditions and the safety margins of the plant in question, too.

Weight Table

Model	32	40	52	63	75	83	92	105	125
(DA)	0.7kg	1kg	1.4kg	2kg	2.7kg	3.5kg	4.7kg	5.7kg	8.1kg
(SR)	-	1.1kg	1.5kg	2.1kg	2.9kg	4kg	5.4kg	7.0kg	10.5kg

Model	140	160	190	210	240	270	300	350	400
(DA)	12.3 kg	20kg	33kg	37.8 kg	56kg	80kg	100.6 kg	160kg	197.3 kg
(SR)	16kg	25.4kg	39kg	47.4kg	69.2kg	102.2kg	128.2kg	209.2kg	243kg

Air Consumption

Air Volume Opening&Closing

Model	Air volume opening	Air volume closing
32	0.04	0.05
40	0.08	0.11
52	0.12	0.16
63	0.21	0.23
75	0.3	0.34
83	0.43	0.47
92	0.64	0.73
105	0.95	0.88
125	1.6	1.4

Model	Air volume opening	Air volume closing
140	2.5	2.2
160	3.7	3.2
190	5.9	5.4
210	7.5	7.5
240	11	9
270	17	14
300	23.8	29.7
350	35.1	46.3
400	52.6	56

Air consumption rest with Air Supply,Air volume and Action cycle times,expressions:

$$L/Min = \text{Air volume}(\text{Air volume Opening} + \text{Air volume closing}) \times \left[\frac{\text{Air Supply}(Kpa) + 101.3}{101.3} \right] \times \text{Action cycle times/min}$$

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