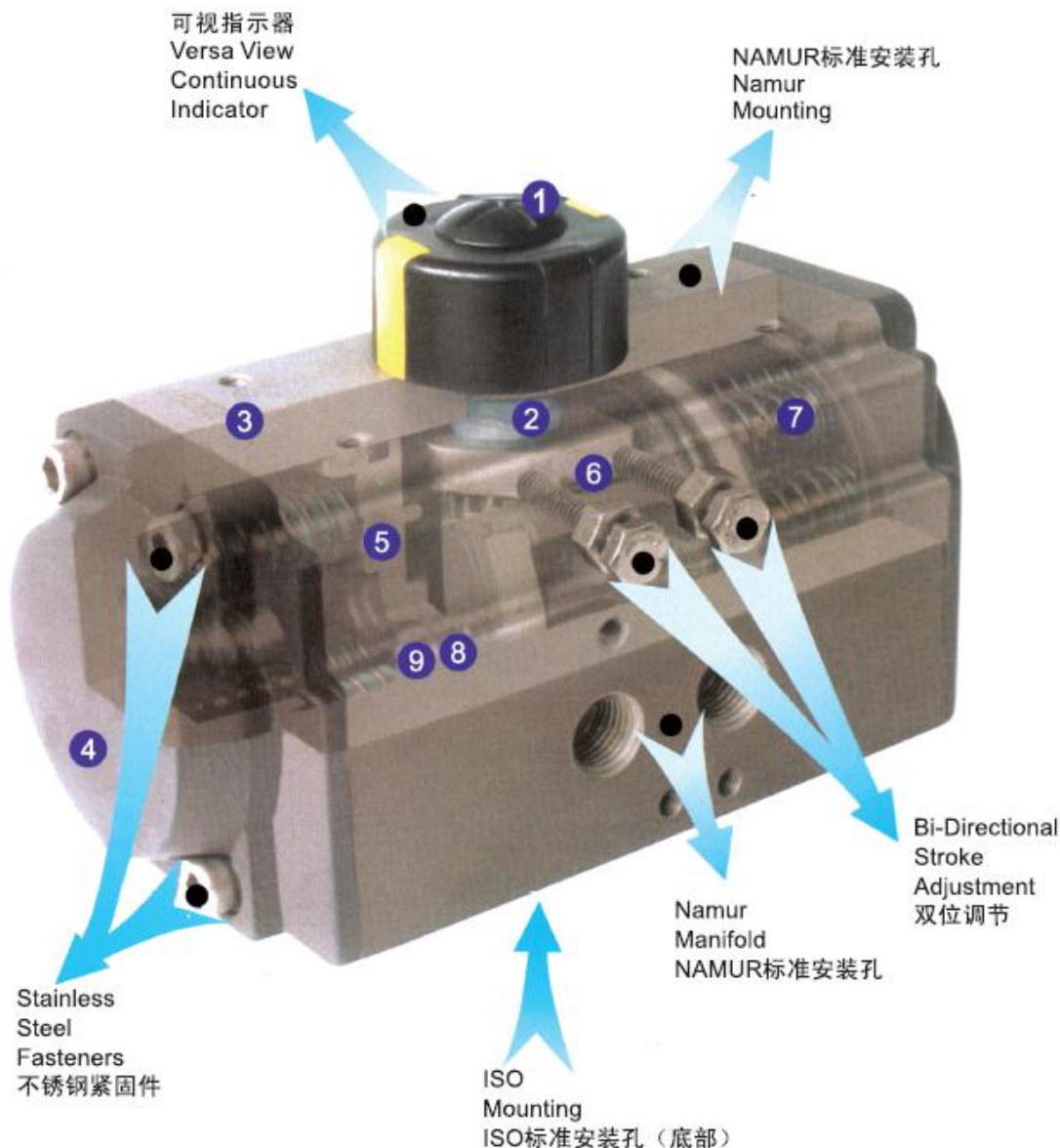
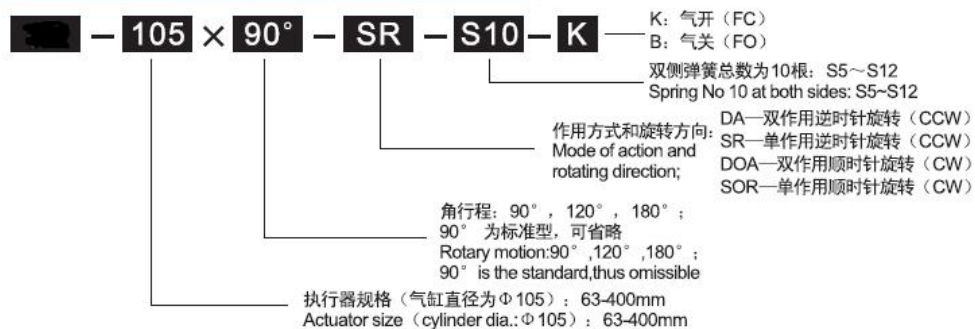


A. 国家专利气动执行器 Pneumatic Actuators



气动执行器型号说明

Explanation about the models of pneumatic actuator



结构 Structure

1 指示器Indicator

NAMUR标准指示器便于安装位置开关、定位器等附件。Position indicator with NAMUR is convenient for mounting accessories such as Limit Switch box, Positioner and so on.

2 输出轴Pinion

镀镍合金钢、高精密一体式输出轴同时符合NAMUR、ISO5211、DIN3337标准。可根据客户要求定制尺寸和不锈钢材料。

The pinion is high-precision and integrative, made from nickelled-alloy steel, full conform to the latest standards of ISO5211, DIN3337, NAMUR. The dimensions can be customized and the stainless steel is available.

3 缸体Actuator Body

ASTM6005优质铝合金缸体可以采用硬质氧化、环氧树脂喷涂（根据要求喷涂兰色、橙色、黄色等）、PTFE涂层或镀镍满足不同要求。According to the different requirements, the extruded aluminum alloy ASTM6005 Body can be treated with hard anodized, powder polyester painted(different colours is available such as blue, orange, yellow etc.),PTFE or Nickel plated.

4 端盖End caps

压铸铝合金表面粉末喷涂各种颜色、PTFE涂层或镀镍处理。Die-casting aluminum powder polyester painted in different colours , PTFE or Nickel plated.

5 活塞Pistons

双活塞齿条、采用铸铝硬质氧化或者铸钢镀锌处理，安装位置对称、动作迅速、使用寿命长，简单的颠倒活塞可以改变旋转方向。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 pistons.

6 行程调节Travel adjustment

两个独立的行程调节螺钉可以进行方便、精确 $\pm 5^\circ$ 的调节开、关位置。

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

7 高性能弹簧High performance springs

采用优质材料、涂层处理，预压装配。具有较强的抗腐蚀性和使用寿命。能够安全、简单的拆卸单作用执行器，通过改变弹簧数量满足不同的力矩输出范围。Preloaded coating 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 different requirements of torque by changing quantity of springs.

8 轴承、导向环Bearings & Guides

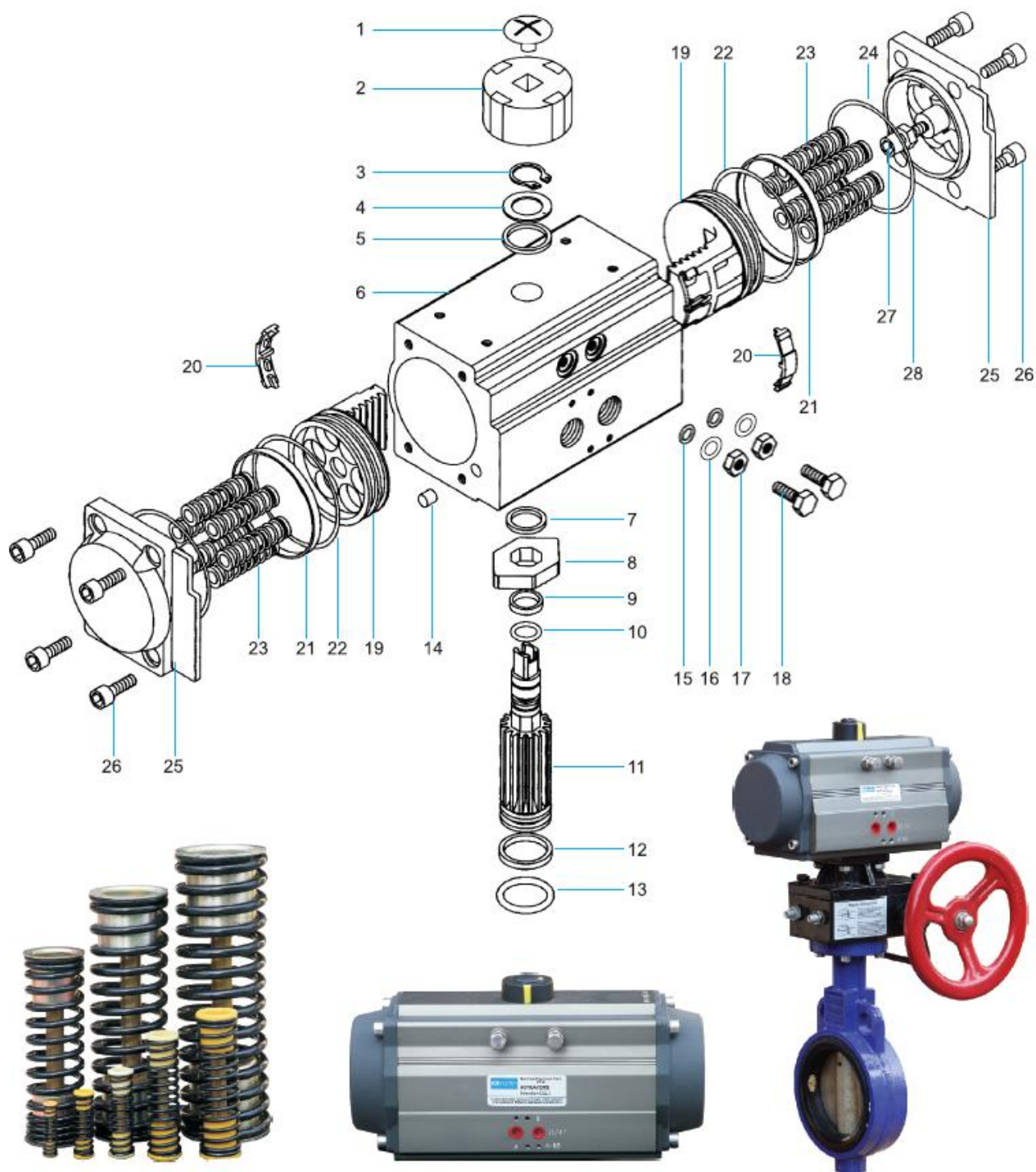
采用低摩擦系数、长寿命复合材料，避免了金属与金属的直接接触，维修更换简单方便。Made from low friction, long-life compound material, to avoid the direct contact between metals. The maintenance and replacement are easy and convenient.

9 O-rings密封

在常温工作条件下使用丁腈橡胶，在高温或低温时采用氟橡胶或硅橡胶。NBR rubber O-rings provide trouble-free operation at standard temperature ranges. For high and low temperature applications Viton or Silicone.



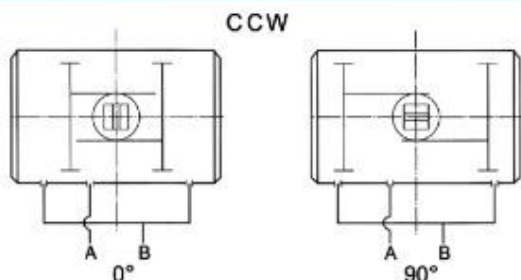
零件和材料 Parts and Material



序号	名称	数量	材料	防腐处理	可选材料
1	指示器螺钉	1	塑料		
2	指示器	1	塑料		
3	卡簧	1	不锈钢		
4	垫圈	1	不锈钢		
5	外垫片	1	工程塑料		
6	缸体	1	优质铝合金	硬质氧化等	
7	内垫片	1	工程塑料		
8	凸轮	1	合金钢	镀锌	
9	轴上部轴承	1	工程塑料		
10	轴上部O形圈	1	丁腈橡胶		氟橡胶/硅橡胶
11	齿轴	1	合金钢	镀镍	不锈钢
12	轴下部轴承	1	工程塑料		
13	轴下部O形圈	1	丁腈橡胶		氟橡胶/硅橡胶
14	堵头	1	丁腈橡胶		氟橡胶/硅橡胶
15	调节螺钉O形圈	2	丁腈橡胶		氟橡胶/硅橡胶
16	平垫片	2	不锈钢		
17	调节螺钉螺母	2	不锈钢		
18	调节螺钉	2	不锈钢		
19	活塞	2	压铸铝/铸钢	氧化/镀锌	不锈钢
20	活塞导板	2	工程塑料		
21	活塞导向环	2	工程塑料		
22	活塞O形圈	2	丁腈橡胶		氟橡胶/硅橡胶
23	弹簧	0-12	优质合金弹簧钢	喷塑	
24	端盖O形圈	2	丁腈橡胶		氟橡胶/硅橡胶
25	端盖	2	压铸铝	粉末喷涂等	
26	端盖螺栓	8	不锈钢		
27	限位螺栓	2	不锈钢		
28	限位螺母	2	不锈钢		

N0.	Description	Qty	STANDARD MATERIAL	PROTECTION	OPTIONAL MATERIAL
1	Indicator screw	1	Plastic		
2	Indicator	1	Plastic		
3	Spring clip	1	Stainless Steel		
4	Outside washer	1	Stainless Steel		
5	Body	1	engineering plastics		
6	Inside washer	1	Extruded aluminum alloy	Hard anodized etc	
7	Inside washer	1	engineering plastics		
8	Cam	1	Alloy steel		
9	O-ring(pinion top)	1	NBR		Viton/Silicone
10	Bearing(pinion top)	1	engineering plastics		
11	Pinion	1	Alloy steel	Nickel plated	Stainless Steel
12	O-ring(pinion top)	1	engineering plastics		
13	Bearing(pinion top)	1	NBR		Viton/Silicone
14	Plug	1	NBR		Viton/Silicone
15	O-ring(Adjust screw)	2	NBR		Viton/Silicone
16	Flat gasket	2	Stainless Steel		
17	Nut(Adjust screw)	2	Stainless Steel		
18	Adjust screw	2	Stainless Steel		
19	Piston	2	Cast aluminum/casting	anodized/Zinc galvanized	Stainless Steel
20	Guide(Piston)	2	engineering plastics		
21	Bearing(Piston)	2	engineering plastics		
22	O-ring(Piston)	2	NBR		Viton/Silicone
23	Spring	0-12	Spring steel	dip coating	
24	O-ring(End cap)	2	NBR		Viton/Silicone
25	End cap	2	Cast aluminum	powder polyster painted etc	
26	Cap screw	8	Stainless Steel		
27	Stop screw	2	Stainless Steel		
28	Nut(stop screw)	2	Stainless Steel		

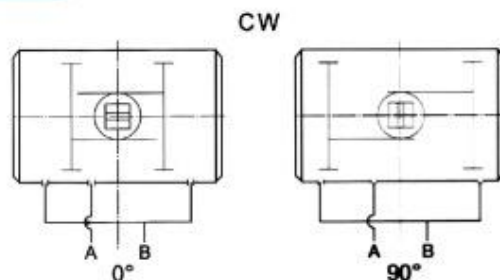
双作用执行器 Double Acting Actuators



A口进气, 压缩空气推动活塞向外运动, 使执行器输出轴逆时针旋转($0^\circ \rightarrow 90^\circ$), B口排气。
B口进气, 压缩空气推动活塞向内运动, 使执行器输出轴顺时针旋转($90^\circ \rightarrow 0^\circ$), A口排气。

Air to Port A forces the pistons outwards, causing the pinion to turn counter clockwise while the air is being exhausted from Port B.

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



A口进气, 压缩空气推动活塞向外运动, 使执行器输出轴顺时针旋转($0^\circ \rightarrow 90^\circ$), B口排气。
B口进气, 压缩空气推动活塞向内运动, 使执行器输出轴逆时针旋转($90^\circ \rightarrow 0^\circ$), A口排气。

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

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

双作用执行器输出力矩 Output Torque of Double Acting Actuators

单位: $N \cdot m$

Model	Air supply pressure (Unit: Bar) 输入气源压力(单位: 巴)									
型号	2	2.5	3	4	4.5	5	5.5	6	7	8
TN-63DA	14.6	18.2	21.9	29.2	32.8	36.5	40.1	43.8	51.1	58.4
TN-83DA	31.4	39.2	47.0	62.7	70.5	78.4	86.2	94.1	109.7	125.4
TN-105DA	66.1	82.7	99.2	132.2	148.8	165.3	181.8	198.4	231.4	264.5
TN-125DA	100.3	125.4	150.5	200.6	225.7	250.8	275.9	301.0	351.1	401.3
TN-140DA	171.0	213.8	256.5	342.0	384.8	427.5	470.3	513.0	598.5	684.0
TN-160DA	266.0	332.5	399.0	532.0	598.5	665.0	731.5	798.0	931.0	1064.0
TN-190DA	425.6	532.0	638.4	851.2	957.6	1064.0	1170.4	1276.8	1489.6	1702.4
TN-210DA	532.0	665.0	798.0	1064.0	1197.0	1330.0	1463.0	1596.0	1862.0	2128.0
TN-240DA	769.5	961.9	1154.3	1539.0	1731.4	1923.8	2116.1	2308.5	2693.3	3078.0
TN-270DA	1169.6	1462.1	1754.5	2339.3	2631.7	2924.1	3216.5	3508.9	4093.7	4678.6
TN-300DA	1526	1908	2289	3052	3434	3815	4197	4578	5341	6104
TN-350DA	2285	2856	3427	4570	5141	5712	6283	6854	7997	9139
TN-400DA	3256	4070	4884	6512	7326	8140	8954	9768	11396	13024

双作用执行器的选型:

在正常操作条件下, 双作用执行器考虑的安全系数为20%~30%。

示例:

阀门力矩=100N·m

安全力矩=100X (1+30%) =130 N·m

气源压力=5Bar

对照双作用力矩表, 选配双作用执行器最小规格为TN-105DA。

Sizing: Double Acting Actuator

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

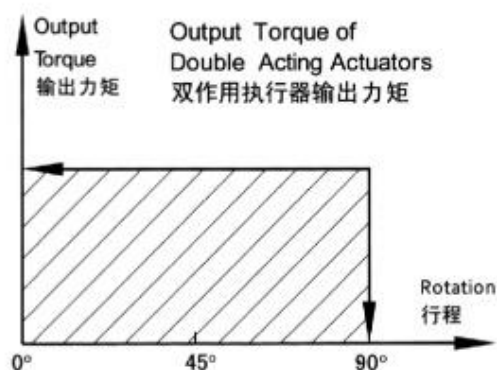
Example:

The torque needed by valve =100N.m

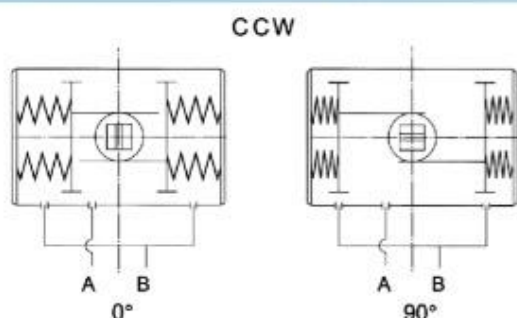
The torque considered safety factor(1+30%)=130N.m

Air Supply=5Bar

According to the above table, we can choose the minimum model is TN-105DA.



单作用执行器 Spring Return Actuators

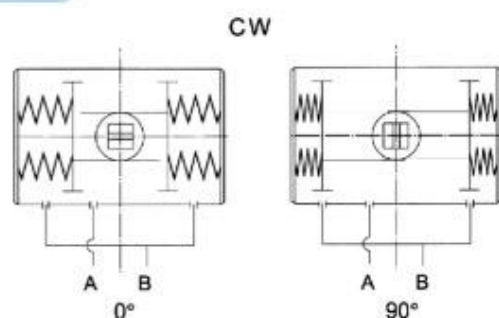


A口进气,压缩空气克服弹簧力,推动活塞向外运动,执行器输出轴逆时针旋转($0^\circ \rightarrow 90^\circ$), B口排气。

执行器失气,活塞在弹簧力的作用下向内运动,执行器输出轴顺时针转动($90^\circ \rightarrow 0^\circ$), A口排气。

Air to port A forces the pistons outwards, causing the springs to compress. The pinion 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 pinion turns clockwise while air is being exhausted from port A.



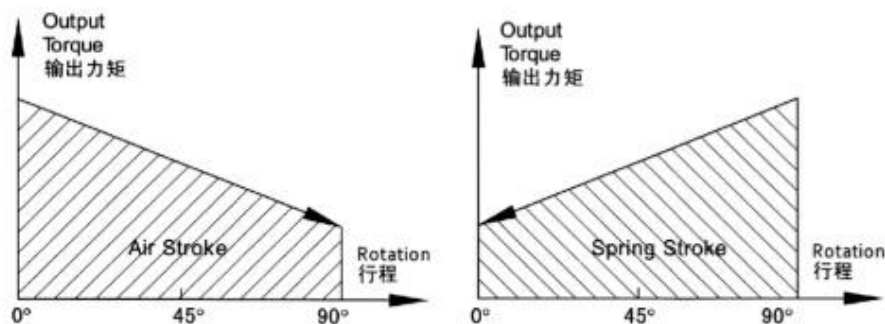
A口进气,压缩空气克服弹簧力,推动活塞向外运动,执行器输出轴顺时针旋转($0^\circ \rightarrow 90^\circ$), B口排气。

执行器失气,活塞在弹簧力的作用下向内运动,执行器输出轴逆时针旋转($90^\circ \rightarrow 0^\circ$), A口排气。

Air to port B forces the pistons outwards, causing the springs to compress. The pinion 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 pinion turns clockwise while air is being exhausted from port A.

单作用执行器输出力矩 Output Torque of Spring Return Actuators



注意!

确保执行器的输出扭矩和驱动阀门所需要的扭矩相符(执行器的型号和气源压力)。

请注意,选型扭矩不仅取决于阀门,还要考虑相关的工况、安全系数等参数。

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.

单作用执行器输出力矩 Output Torque of Spring Return Actuators

气源克服弹簧输出力矩 Output torque of air to springs																		Springs' output 弹簧输出力矩	
Air pressure 气源压力		2.5Bar		3Bar		4Bar		5Bar		6Bar		7Bar		8Bar					
Model 型号	Spring Q.ty 弹簧 数量	0°		0°		0°		0°		0°		0°		0°		0°		0°	
		Start 开始	End 结束	Start 开始	End 结束	Start 开始	End 结束	Start 开始	End 结束	Start 开始	End 结束	Start 开始	End 结束	Start 开始	End 结束	Start 开始	End 结束	Start 开始	End 结束
TN-63SR	5	11.4	7.7	15.0	11.4	22.3	14.9											10.4	6.8
	6	10.1	5.7	13.6	9.3	20.9	16.6	28.3	23.9									12.5	8.2
	7	8.6	3.6	12.5	7.2	19.5	14.5	26.8	21.9									14.6	9.6
	8			10.9	5.1	18.2	12.4	25.5	19.8	32.8	27.0	40.1	34.3					16.7	10.9
	9					16.8	10.4	24.1	17.7	31.4	24.9	38.7	32.2					18.8	12.3
	10					1.4	8.2	22.8	15.6	30.0	22.8	37.3	30.1	44.7	37.4	20.9	13.7		
	11							21.5	13.5	28.7	20.7	36.0	28.0	43.3	35.3	22.9	15.0		
	12							20.0	11.4	27.3	18.6	34.6	25.9	41.9	33.3	25.0	16.4		
TN-83SR	5	23.3	16.1	31.1	24.0	46.8	39.7											23.0	15.8
	6	20.1	11.5	28.0	19.3	43.7	35.1	59.4	50.7									27.6	19.0
	7	17.0	6.9	24.8	14.8	40.5	30.5	56.2	46.2									32.2	22.1
	8			21.7	10.1	37.4	25.8	53.1	41.5	68.8	57.2	84.5	72.9					36.8	25.3
	9					34.2	21.3	49.9	37.0	65.6	52.6	81.2	68.3					41.4	28.5
	10					31.0	16.6	46.7	32.3	62.4	48.0	78.1	63.7	93.8	79.3	46.0	31.6		
	11							43.6	27.7	59.3	43.4	75.0	59.1	90.6	74.8	50.6	34.8		
	12							40.4	23.2	56.1	38.9	71.7	54.5	87.4	70.2	55.2	38.0		
TN-105SR	5	51.0	33.4	67.5	49.9	100.6	83.0											49.2	31.6
	6	44.7	23.5	61.1	40.0	94.2	73.2	127.3	106.2									59.1	38.0
	7	38.4	13.7	54.9	30.3	87.9	63.4	121.0	96.4									68.9	44.3
	8			48.5	20.4	81.6	53.5	114.7	86.5	147.7	119.6	180.8	152.7					78.7	50.6
	9					75.3	43.7	108.4	76.8	141.5	109.8	174.5	142.9					88.6	56.9
	10					68.9	33.4	102.0	66.5	135.1	99.6	168.2	132.6	201.2	165.7	98.4	63.3		
	11							95.7	57.0	128.7	90.1	161.8	123.1	194.8	156.2	108.3	69.6		
	12							89.4	47.5	122.5	80.6	155.5	113.6	188.6	146.7	118.1	75.9		
TN-125SR	5	73	47	98	72	148	122											79	52
	6	63	31	88	45	138	107	188	157									94	63
	7	52	15	77	40	127	90	178	141									110	73
	8			67	25	117	75	167	125	217	176	268	226					125	84
	9					107	59	157	109	207	159	257	210					141	94
	10					96	44	146	94	196	144	247	194	297	245	157	105		
	11							136	78	186	128	236	178	286	228	173	115		
	12							125	63	176	113	226	163	276	213	188	125		
TN-140SR	5	128	85	171	127	256	213											129	86
	6	111	59	154	102	239	187	325	273									155	103
	7	94	33	137	76	222	162	308	247									181	120
	8			120	50	205	136	291	221	376	307	462	392					206	137
	9					187	110	273	196	358	281	444	367					232	155
	10					170	84	256	169	341	255	427	340	512	426	258	172		
	11							238	143	324	229	409	314	495	400	284	189		
	12							221	118	307	203	392	289	478	374	310	206		
TN-160SR	5	193	124	259	191	392	324											208	140
	6	165	83	232	149	365	282	498	415									250	168
	7	137	41	203	107	336	240	469	373									292	196
	8			176	66	309	199	442	237	575	465	708	598					333	223
	9					280	157	413	290	546	423	679	556					375	251
	10					253	115	386	248	519	381	652	514	785	647	417	279		
	11							358	207	491	340	624	473	757	606	458	307		
	12							330	165	463	298	596	431	729	564	500	335		

单作用执行器输出力矩 Output Torque of Spring Return Actuators

Air pressure 气源压力		气源克服弹簧输出力矩 Output torque of air to springs														Springs' output 弹簧输出力矩	
Model 型号	Spring Q.ty 弹簧 数量	2.5Bar		3Bar		4Bar		5Bar		6Bar		7Bar		8Bar		Start 开始	End 结束
		0° Start 开始	90° End 结束	0° Start 开始	90° End 结束	0° Start 开始	90° End 结束	0° Start 开始	90° End 结束	0° Start 开始	90° End 结束	0° Start 开始	90° End 结束	0° Start 开始	90° End 结束		
TN-190SR	5	332	222	438	329	651	542									309	200
	6	292	161	398	267	611	480	824	693							371	240
	7	252	99	358	205	571	418	784	631							433	280
	8			318	143	531	356	744	569	957	782	1169	995			495	320
	9					491	295	704	507	917	720	1130	933			557	360
	10					451	233	664	446	877	658	1090	871	1302	1084	618	400
	11							624	384	837	597	1050	809	1263	1022	680	440
TN-210SR	12							584	322	797	535	1010	748	1223	960	742	480
	5	390	285	523	418	789	684									380	275
	6	335	209	468	342	734	608	1000	874							456	330
	7	280	133	413	266	679	532	945	798							532	385
	8			358	190	624	456	890	722	1156	988	1422	1254			608	440
	9					569	380	835	646	1101	912	1367	1178			684	495
	10					514	304	780	570	1046	836	1312	1102	1578	1368	760	550
TN-240SR	11							725	494	991	760	1257	1026	1523	1292	836	605
	12							670	418	936	684	1202	950	1468	1216	912	660
	5	552	409	744	600	1129	985									554	410
	6	470	297	662	489	1047	874	1432	1259							664	492
	7	388	187	580	379	964	764	1349	1149							775	575
	8			498	268	883	653	1267	1037	1652	1422	2037	1807			886	656
	9					800	542	1185	926	1569	1311	1954	1696			998	739
TN-270SR	10					718	431	1103	816	1488	1201	1872	1586	2257	1970	1108	821
	11							1021	705	1406	1090	1791	1474	2176	1859	1219	903
	12							939	594	1323	979	1708	1363	2093	1748	1330	985
	5	903	675	1195	968	1779	1552									787	560
	6	790	519	1083	811	1667	1396	2252	1981							943	672
	7	679	361	972	654	1556	1238	2141	1823							1101	783
	8			860	497	1444	1081	2029	1666	2614	2252	3319	2836			1258	895
TN-300SR	9					1332	923	1917	1509	2502	2094	3087	2678			1416	1007
	10					1220	767	1805	1352	2390	2390	2974	2521	3560	3107	1572	1119
	11							1693	1194	2278	2278	2862	2364	3448	2949	1730	1231
	12							1582	1037	2167	2167	2751	2207	3336	2792	1887	1342
	5	1097	729													1061	730
	6	935	494	1316	875											1273	876
	7	772	258	1153	639	1916	1402									1485	1022
TN-350SR	8			991	403	1754	1166	2517	1929							1697	1168
	9					1592	930	2355	1693	3118	2456					1909	1314
	10					1430	695	2193	1458	2956	2221	3719	2984	4482	3747	2122	1460
	11							2030	1222	2793	1985	3556	2748	4319	3511	2334	1606
	12							1868	986	2631	1749	3394	2512	4157	3275	2546	1752
	5	1553	964													1702	1173
	6	1292	586	1863	1157											2043	1408
TN-400SR	7	1031	208	1602	779	2745	1922									2383	1642
	8			1341	401	2484	1544	3626	2686							2724	1877
	9					2224	1165	3366	2307	4508	3449					3064	2112
	10					1963	787	3105	1929	4247	3071	5390	4214	6532	5356	3405	2346
	11							2844	1551	3986	2693	5129	3836	6271	4978	3745	2581
	12							2584	1172	3726	2314	4869	3457	6011	4599	4086	2816
	7	2028	869													2880	1837
TN-400SR	8	1736	411	2550	1225											3292	2100
	9			2259	768	3887	2396									3703	2362
	10			1967	311	3595	1939	5223	3567							4115	2624
	11					3303	1482	4931	3110	6559	4738					4526	2887
	12					3012	1025	4640	2653	6268	4281	7895	5908	9523	7536	4938	3149
	13							4348	2195	5976	3823	7603	5450	9231	7078	5349	3412
	14							4057	1738	5685	3366	7312	4993	8940	6621	5761	3674
	15							3765	1281	5393	2909	7020	4536	8648	6164	6172	3937
	16									5101	2452	6728	4079	8356	5707	6584	4199

单作用执行器的选型 Selection: Spring Return Actuator

在正常工作条件下，单作用执行器考虑的安全系数为30%–50%

例如：

阀门需要力矩=80N.m

安全力矩=80 (1+30%) =104N.m

气源压力=5Bar

对照单作用执行器输出力矩表，我们可以查到

TN-140SR S7输出力矩为

空气行程0° =308N.m

空气行程90° =247N.m

弹簧行程90° =181N.m

弹簧行程0° =120N.m

所有输出力矩均大于我们需求。

注意！

单作用执行器弹簧复位过程中，执行器B口通气不影响执行器输出力矩，相反可帮助弹簧的复位。

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 output torque of TN-140SR S7 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 larger than we needed.

Attention

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

单作用执行器弹簧安装形式 Spring mounting form for spring return actuator



单侧弹簧数量 One-side Spring NO.	安装位置 Installation position
2	① ④
3	② ④ ⑥
4	② ③ ⑤ ⑥
5	① ② ③ ⑤ ⑥
6	① ② ③ ④ ⑤ ⑥

在单作用执行器的选配过程中，如果能够了解阀门在开启、运行和关闭时的扭矩分配，我们就可以更加经济、更加合理地选配执行器。

例如：

蝶阀原最大扭矩=104N.m

打开后扭矩104 × 30%=31.2N.m

气源压力=5Bar

我们可以选择TN-125 SR S11

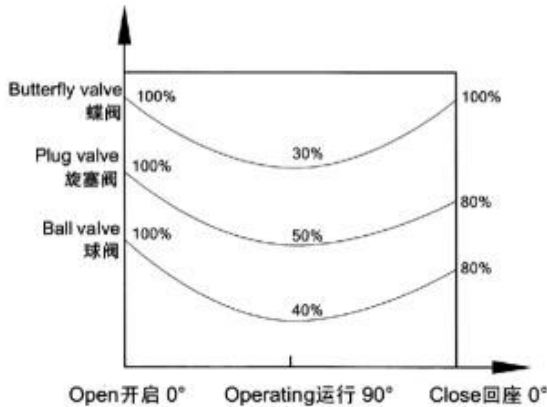
空气行程0° =136N.m > 31.2N.m

空气行程90° =78N.m > 31.2N.m

弹簧行程90° =173N.m > 31.2N.m

弹簧行程0° =115N.m > 31.2N.m

以上数据显示可以满足该蝶阀的正常启闭。



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) $104 \times 30\% = 31.2\text{N.m}$
Air Supply = 5Bar

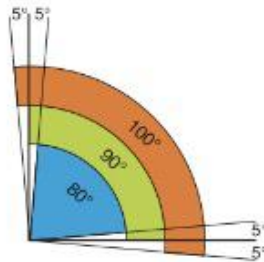
We can select the TN-125SR S11
output torque is:

- Air stroke 0° 136N.m > 104N.m
- Air stroke 90° = 78N.m > 31.2N.m
- Spring stroke 90° = 173N.m > 31.2N.m
- Spring stroke 0° = 115N.m > 104N.m

The above datas show actuator's torque can satisfy the requirement of the butterfly valve.

工作技术条件 Operating conditions

- 1 工作介质:
干燥或润滑的空气或无腐蚀性气体介质中杂质微粒小于30um。
- 2 气源压力:
最小气源压力2巴, 最大气源压力8巴。
- 3 环境温度:
标准: $-20^{\circ}\text{C} \sim +80^{\circ}\text{C}$
低温: $-45^{\circ}\text{C} \sim +80^{\circ}\text{C}$
高温: $-15^{\circ}\text{C} \sim +150^{\circ}\text{C}$
- 4 调节范围:
 0° 和 90° 两个位置均有 $\pm 5^{\circ}$ 的调节范围
- 5 使用场合:
室内或室外安装



Operating media

Dry or lubricated air, or the non-corrosive gases
The maximum particle diameter must less than 30 um

Air supply pressure

The minimum supply pressure is 2.5 Bar
The maximum supply pressure is 8 Bar

Operating temperature

Standard: $20^{\circ}\text{C} \sim +80^{\circ}\text{C}$
Low temperature: $-45^{\circ}\text{C} \sim +80^{\circ}\text{C}$
High temperature: $-15^{\circ}\text{C} \sim +150^{\circ}\text{C}$

Travel adjustment

Have adjustment range of $\pm 5^{\circ}$ for the rotation at 0° and 90°

Application

Either indoor or outdoor

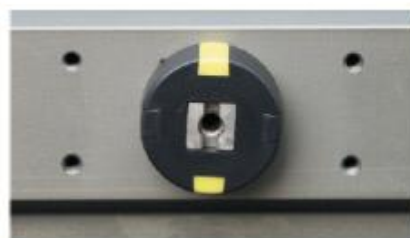
动作形式 Operating Type

单作用 (SR) 和双作用 (DA) Spring return and Double Acting



气源接口符合NAMUR 标准, 可简单方便地安装电磁阀。

Air supply connection is designed in accordance with NAMUR Standard to install solenoid valves.



输出轴的NAMUR标准槽和缸体上部标准安装孔, 可使限位开关、定位器直接啮合和安装。

The Namur drive pinion and the Namur top mounting connection permit direct installation of accessories such as limit switch box and positioner.



底部安装孔设计符合ISO5211 DIN3337标准, 可以直接安装气动手轮机构 (离合器) 或安装支架。Bottom mounting connection is designed in accordance with ISO5211 and DIN3337 standards for direct mounting Brackets.

产品序列号、气源接口及底部安装孔全部激光打字, 易于辨识和跟踪服务。

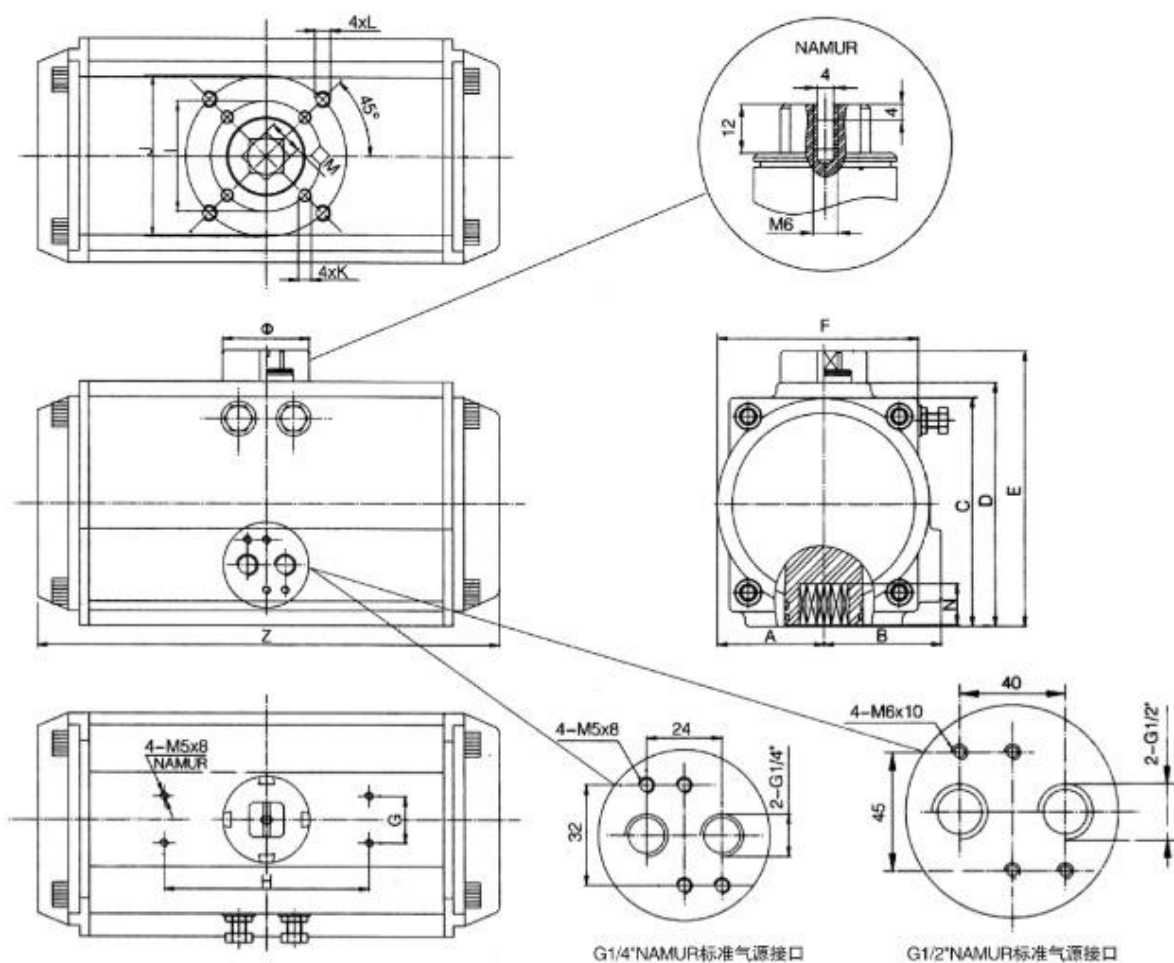
Each actuator is marked with a serial number, air connection and bottom mounting holes are marked for easy track and distinction.

125120617015Y

G1/4 inch
4-M5

F10
F07

外形和尺寸 Dimension



单位: mm

型号 Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	Z	Φ	气源接口 Air connection
TN-63	36	47	81	87	107	72	30	80	Φ50	Φ70	M6 × 10	M8 × 13	14	18	172	Φ40	NAMUR G1/4"
TN-83	46	57	98.5	108	128	92	30	80	Φ50	Φ70	M6 × 10	M8 × 13	17	21	200	Φ40	NAMUR G1/4"
TN-105	57.5	64	122.5	133	153	109.5	30	80	Φ70	Φ102	M8 × 13	M10 × 16	22	26	268	Φ40	NAMUR G1/4"
TN-125	67.5	74.5	145.5	155	175	127.5	30	80	Φ70	Φ102	M8 × 13	M10 × 16	22	26	301	Φ57	NAMUR G1/4"
TN-140	75	77	161	172	192	137.5	30	130	Φ102	Φ125	M10 × 15	M12 × 18	27	31	388	Φ57	NAMUR G1/4"
TN-160	87	87	184	197	217	158	30	130	Φ102	Φ125	M10 × 15	M12 × 18	27	31	460	Φ57	NAMUR G1/4"
TN-190	103	103	215	230.5	260.5	189	30	130		Φ140		M16 × 25	36	40	527	Φ82	NAMUR G1/4"
TN-210	113	113	234.5	255	285	210	30	130		Φ140		M16 × 25	36	40	541	Φ82	NAMUR G1/4"
TN-240	130	130	264.5	289	319	245	30	130		Φ165		M20 × 25	46	50	600	Φ82	NAMUR G1/4"
TN-270	147	147	300	328	358	273	30	130		Φ165		M20 × 25	46	50	720	Φ82	NAMUR G1/2"
TN-300	162	173	329	352	382	312	30	130	Φ165	Φ215	M20 × 25	M20 × 25	46	60	770	Φ82	NAMUR G1/2"
TN-350	190	195	381	408	438	362	30	130	Φ165	Φ215	M20 × 25	M20 × 25	46	60	870	Φ82	NAMUR G1/2"
TN-400	260	260	440	464	494	450	30	130	Φ165	Φ254	M20 × 25	M16 × 25	55	60	930	Φ82	NAMUR G1/2"

说明: A系列执行器TN-160及其以下规格的轴头高(E-D)为20mm; B系列执行器的轴头高(E-D)均为30mm。

耗气量 Air Consumption

开向体积和关向体积 Air volume opening & closing

单位:L (升)

型号 Model	开向体积 (升) Air volume opening	关向体积 (升) Air volume closing	型号 Model	开向体积 (升) Air volume opening	关向体积 (升) Air volume closing
TN-63	0.21	0.23	TN-210	7.5	7.4
TN-83	0.43	0.47	TN-240	11	9.0
TN-105	0.95	0.88	TN-270	17	14
TN-125	1.6	1.4	TN-300	23.7	29.6
TN-140	2.5	2.2	TN-350	35.0	46.2
TN-160	3.7	3.2	TN-400	52.5	56
TN-190	5.9	5.4			

耗气量取决于供气压力、开关行程、体积及动作次数，计算公式如下：

$$\text{升/分} = \text{气缸体积 (开向体积+关向体积)} \times \left[\frac{\text{供气压力(Kpa)}+101.3}{101.3} \right] \times \text{次数/分钟}$$

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

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

重量表 Weight Talbe

型号 Model	TN-63	TN-83	TN-105	TN-125	TN-140	TN-160	TN-190
重量(DA)	2.48kg	3.00kg	5.8kg	9.5kg	12.5kg	19.1kg	32.5kg
重量(SR)	2.64kg	3.48kg	6.70kg	10.0kg	15.0kg	22.9kg	38.1kg

型号 Model	TN-210	TN-240	TN-270	TN-300	TN-350	TN-400
重量(DA)	38.0kg	54.0kg	78.0kg	106.5kg	156.0kg	289.0kg
重量(SR)	45.8kg	67.2kg	98.4kg	132.2kg	204.0kg	360.4kg

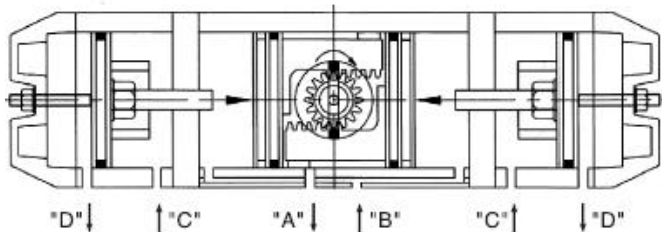
注：1、SR为12根弹簧；2、重量为净重量。

三位式DA/SR气动执行器 Three Position DA/SR Actuator

三位式气动执行器有DA（双作用）型和SR（单作用—弹簧复位）型。三位式DA/SR气动执行器是一种特殊规格的执行机构，可提供0°、45°、90°或0°、90°、180°的三位式操作方式。中间位置是依靠两个辅助活塞的移动产生的机械制动来实现的。中间位置是可调的。如90°行程的三位式执行器能提供20°、30°、50°、70°等的中间位置。其中DA型（双作用）工作原理如下：



Three position actuator provide an operation of 0° ,45° ,90° or 0° ,90° ,180° ,The midway position is achieved by a mechanical stop of movement on the 2 auxiliary pistons. This midway stop positions adjustable. Example: 90° actuator can provide 20° ,30° ,40° ,50° ,70° etc.Following is the principle of operation:

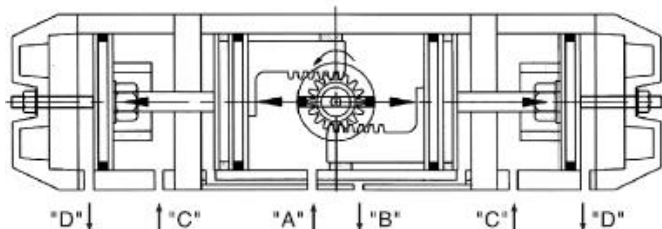


全关位置

如左图所示，全关位置是在气源进入B口中，A口排出空气后实现的。

Fully Closed Position

From chart we can see that this position is obtained when air is supplied to port B and port A is in the state of exhaust air.

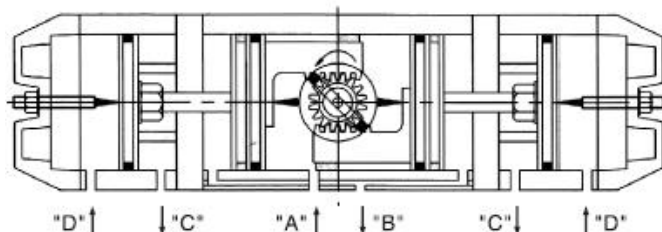


全开位置

如左图所示，全开位置是在气源同时进入A口和C口，B口和D口排出空气后实现。

Fully Open Position

From chart we can see that this position is obtained when air is supplied to port A and port C, meantime, port B and port D are in the state of exhaust air.



中间位置

如左图所示，中间位置是在气源分别进入A口和D口，B口和C口排出空气后实现。在实现中间位置的过程中，气源供到D口中，迫使辅助活塞向中心移动，推杆作为机械限位使内部活塞在设定的中间位置停止。

Fully Open Position

From chart we can see that this position is obtained when air is supplied to port A and port D, meantime, port B and port C are in the state of exhaust air. In fact that the midway position is achieved by a mechanical stop of movement on the two auxiliary pistons.

特殊执行器种类 Special actuator type

- ① 三位式执行器（双作用、单作用）
- ② 快速或慢速动作执行器
- ③ 120°、145°、180° 转角执行机构
- ④ 不锈钢轴承不锈钢活塞执行器
- ⑤ 频繁动作执行器
- ⑥ 增力型执行器
- ⑦ 钢外壳执行器
- ⑧ 不同颜色的执行器

Three-positions actuator (DA&SR)

Speedy or slow act actuators

120° ,145° ,180° actuators

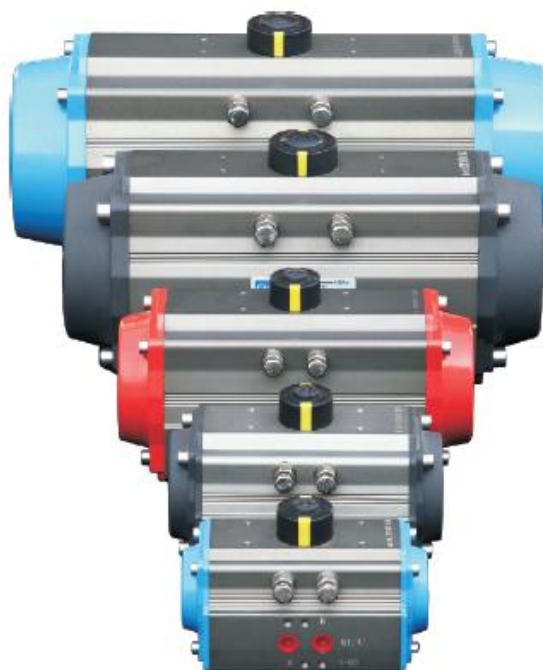
Actuators with stainless steelpinon and pistons

Frequent action actuator

Reinforcement type actuator

Actuators with steel body

Different colors actuator



相关产品 Interrelated Products



手轮机构

阀位回讯器



电磁阀

阀门定位器



过滤减压阀