



气动执行器

Pneumatic Actuators



VALVE AUTOMATION

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气动手轮机构
Hand Wheel Gear Operator

结构特点

结构特点 Construction

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、高精度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压铸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

压铸铝合金表面金属粉末喷涂各种颜色、PTFE涂层镀镍处理。

Die-casting aluminum powder polyester painted in different colours, PTFE or Nickel plated.

5、活塞 Pistons

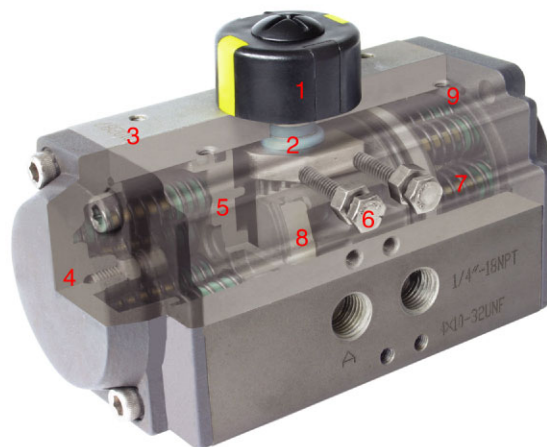
双活塞齿条、采用铸铝硬质氧化或者铸钢镀锌处理，安装位置对称、运作迅速、使用寿命长，简单的颠倒活塞可以改变旋转方向。

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、导板 Bearings & Guides

采用低摩擦、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.

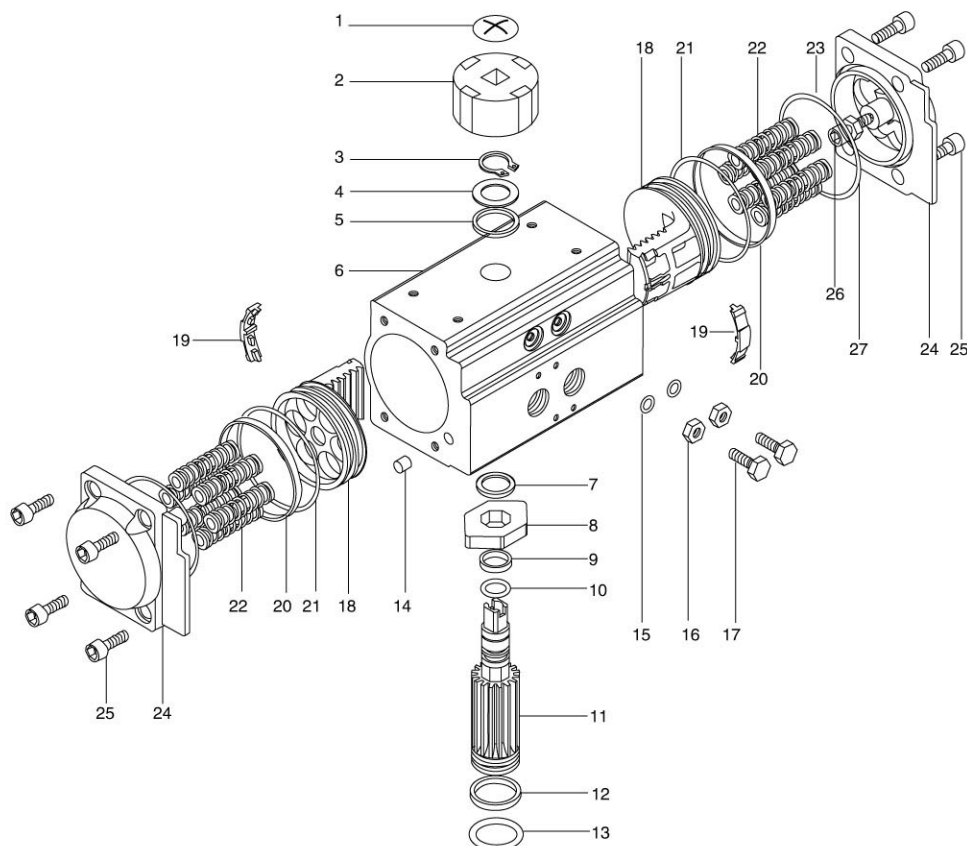
9、密封 O-rings

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

零件和材料 Parts and Material



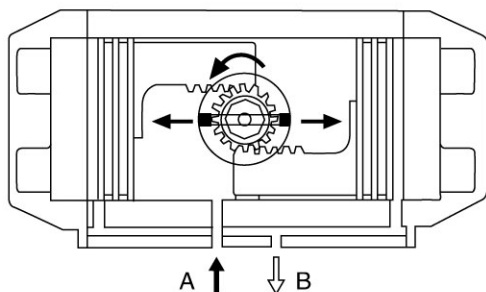
序号	名称	数量	材料	防腐处理	防腐处理
1	指示器螺钉	1	塑料		
2	指示器	1	塑料		
3	卡簧	1	不锈钢		
4	垫圈	1	不锈钢		
5	外垫片	1	工程塑料		
6	缸体	1	铸铝	硬质氧化等	
7	内垫片	1	工程塑料		
8	凸轮	1	合金钢		
9	上轴轴承	1	工程塑料		
10	上轴O圈	1	丁腈橡胶		氟橡胶/硅橡胶
11	齿轴	1	合金钢	镀镍	不锈钢
12	下轴轴承	1	工程塑料		
13	下轴O圈	1	丁腈橡胶		氟橡胶/硅橡胶
14	堵头	2	丁腈橡胶		氟橡胶/硅橡胶
15	调节螺钉O圈	2	丁腈橡胶		氟橡胶/硅橡胶
16	调节螺钉螺母	2	不锈钢		
17	调节螺栓	2	不锈钢		
18	活塞	2	铸铝/铸钢	氧化/镀锌	不锈钢
19	活塞导板	2	工程塑料		
20	活塞轴承	2	工程塑料		
21	活塞O圈	2	丁腈橡胶		氟橡胶/硅橡胶
22	弹簧	0~12	弹簧钢	浸漆	
23	端盖O圈	2	丁腈橡胶		氟橡胶/硅橡胶
24	端盖	2	铸铝	粉末喷涂等	
25	端盖螺栓	8	不锈钢		
26	限位螺栓	2	不锈钢		
27	限位螺母	2	不锈钢		

No.	Description	Qty	Standards Material	PROTECTION	OPTIONAL MATERIAL
1	Indicator Screw	1	Plastic		
2	Indicator	1	Plastic		
3	Spring clip	1	Stainless steel		
4	Thrust washer	1	Stainless steel		
5	Outside washer	1	Engineering plastics		
6	Body	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 bottom)	1	Engineering plastics		
13	Bearing(pinion bottom)	1	NBR		Viton/Silicone
14	Plug	2	NBR		Viton/Silicone
15	O-ring(Adjust screw)	2	NBR		Viton/Silicone
16	Nut(Adjust screw)	2	Stainless Steel		
17	Adjust screw	2	Stainless Steel		
18	Piston	2	Cast aluminum/casting	Anodized/Zinc galvanized	Stainless Steel
19	Guide(Piston)	2	Engineering plastics		
20	Bearing(Piston)	2	Engineering plastics		
21	O-ring(Piston)	2	NBR		Viton/Silicone
22	Spring	0~12	Spring steel	Dip coating	
23	O-ring(End cap)	2	NBR		Viton/Silicone
24	End cap	2	Cast aluminum	Powder polyster painted etc	
25	Cap screw	8	Stainless Steel		
26	Stop screw	2	Stainless Steel		
27	Nut(Stop screw)	2	Stainless Steel		

工作原理

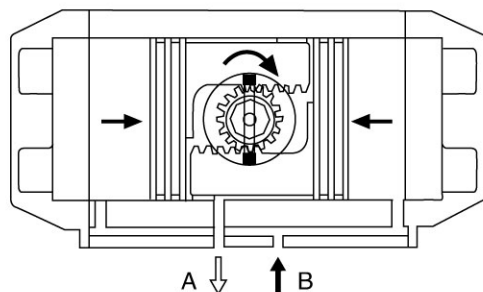
工作原理（标准动作） Operating Principle (Standard Rotation)

1. 双作用式（俯视图） Dual action (planform)



压缩空气由A口输入，使左右活塞向相反方向运动，输出轴逆时针方向转动，打开阀门，两活塞侧面的空气由B口排出。

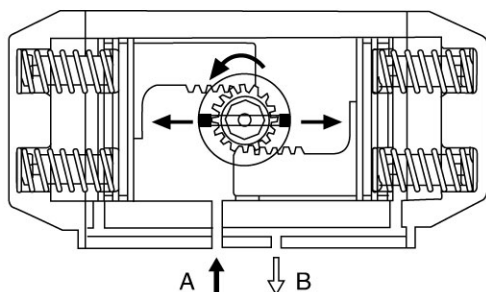
Air to Port A forces the pistons outwards, causing the pinion to turn counterclockwise while the air is being exhausted from Port B.



压缩空气由B口输入，使左右活塞向中心移动，输出轴顺时针方向转动，关闭阀门，两活塞中间的空气由A口排出。

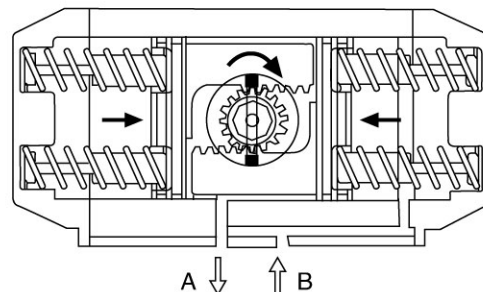
Air to Port B forces the pistons inwards, causing the pinion to turn clockwise while the air is being exhausted from Port A.

2. 单作用式（俯视图） Spring return (planform)



压缩空气由A口输入，使左右活塞向相反方向运动，输出轴逆时针方向转动，打开阀门，两活塞侧面的空气由B口排出。

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



失气或失电时，由于弹簧的作用使两活塞向中心移动，输出轴顺时针方向转动，关闭阀门，空气由A口排出，B口进气可加速关闭阀门。

In the event of loss of air pressure or power, the stored energy in the springs forces the pistons inwards, causing the pinion turns clockwise while air is being exhausted from Port A, and air to Port B can accelerate closing the valve.

注：1. 标准运作的旋转方向为顺时针关闭阀门，逆时针为打开阀门。

2. 颠倒活塞装配的旋转方向为逆时针关闭阀门，顺时针为打开阀门。

Note:

1. The standard rotation is clockwise for closing the valve, while counterclockwise for opening.

2. If the assembly direction of the piston is reversed, then the standard rotation is counterclockwise for closing the valve, clockwise for opening.

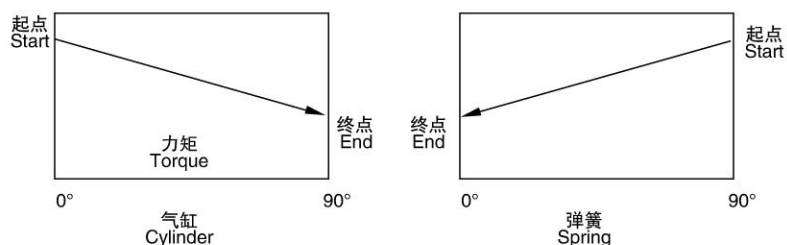
输出扭矩

输出扭矩

双作用执行器力矩图
Torque diagram double acting actuators



单作用执行器力矩图
Torque diagram single acting actuators



双作用式执行器输出力矩

Output torque of ST series double acting pneumatic actuator

unit: Nm

型 号 Model	输入气源压力(单位: bar) Air pressure (unit: bar)						
	2	3	4	5	6	7	8
ST008	2.78	4.20	6.00	7.50	9.00	10.00	11.50
ST020	8.32	12.48	16.64	20.8	24.96	29.12	33.28
ST035	14.64	21.96	29.28	36.6	43.92	51.24	58.56
ST055	23.5	35.3	47	58.8	70.5	82.3	94
ST075	29.7	44.5	59.4	74.2	89.1	103.9	118.8
ST110	45.5	68.2	91.1	113.7	136.4	159.2	181.9
ST160	67.88	101.82	136.76	169.7	203.64	237.58	271.52
ST290	116.6	174.9	233.2	291.5	349.8	408.1	466.4
ST435	175.48	263.22	350.96	438.7	526.44	614.18	701.92
ST665	267.4	401.1	534.8	668.5	802.21	935.9	1069.6
ST1000	430.96	646.44	861.9	1077.4	292.9	1508.4	1723.8
ST1400	592.2	888.4	1184.5	1480.6	1776.7	2072.8	2369
ST2100	928.3	1392.5	1856.6	2320.8	2785	3249.1	3713.3
ST3000	1305.4	1958.2	2610.9	3263.6	3916.3	4569	5221.8
ST4000	1602	2403	3205	4006	4807	5608	6409
ST6000	2399	3598	4798	5998	7197	8397	9596
ST8500	3418	5127	6837	8546	10255	11964	13673



输出扭矩

单作用式执行器输出力矩

Output torque of ST series spring return actuator

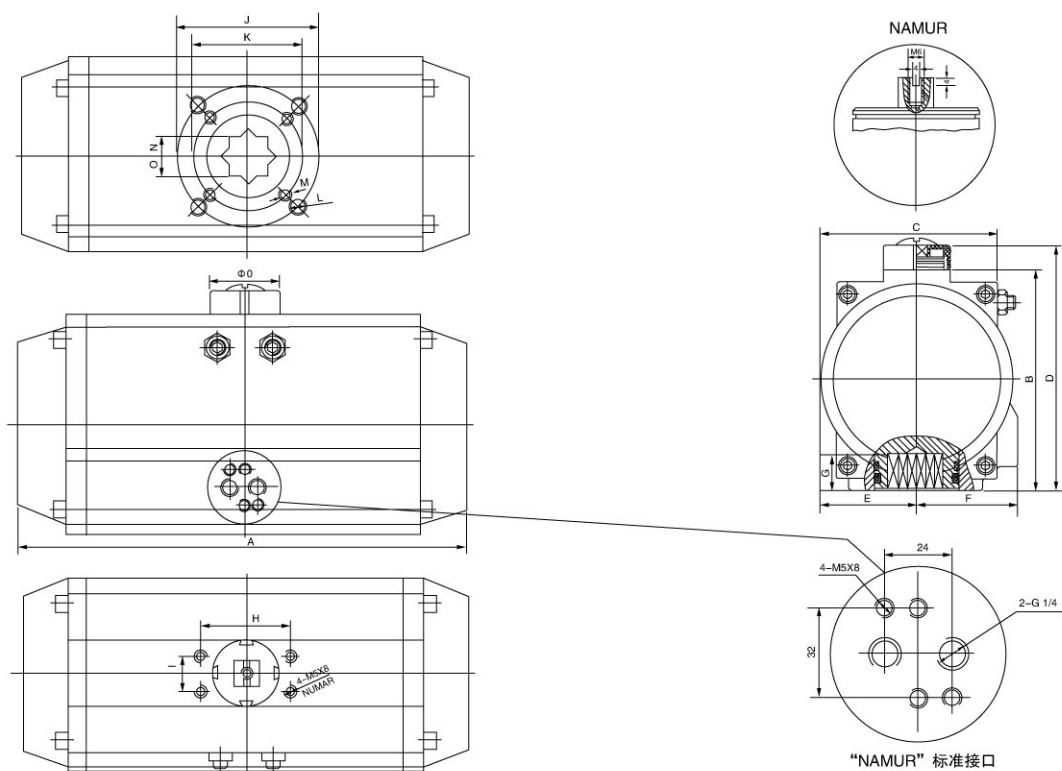
气源克服弹簧输出力矩 Output Torque of Air supply													
气源压力 (bar)		3		4		5		6		7		弹簧输出力矩 Output torque of spring	
型号 Model	弹簧 数量	0° 起点	90° 终点	0° 起点	90° 终点	0° 起点	90° 终点	0° 起点	90° 终点	0° 起点	90° 终点	0° 终点	90° 起点
ST020SR	5	8.48	6.28	12.64	10.44							4.0	6.2
	6	7.68	4.98	11.84	9.14							4.8	7.5
	7	6.98	3.78	11.14	7.94							5.5	8.7
	8			10.34	6.74	14.5	10.9					6.3	9.9
	9			9.54	5.44	13.7	9.6					7.1	11.2
	10			8.74	4.24	12.9	8.4	17.06	12.56			7.9	12.4
	11					12.1	7.1	16.26	11.26	20.42	15.42	8.7	13.7
ST035SR	12					11.3	5.9	15.46	10.06	19.62	14.22	9.5	14.9
	5	15.0	11.2	22.3	18.5	29.6	25.8					7.0	10.8
	6	13.5	9.0	20.8	16.3	28.1	23.7					8.5	12.95
	7	12.0	6.9	19.4	14.2	26.7	21.5					9.9	15.1
	8			18.0	12.0	25.3	19.3	32.6	26.6			11.3	17.3
	9			16.5	9.9	23.9	17.2	31.2	24.52			12.7	19.4
	10			15.3	7.7	22.6	15.0	29.9	22.3	37.2	29.6	14.0	21.6
ST055SR	11			13.8	5.6	21.1	12.9	28.4	20.2	35.7	27.5	15.5	23.7
	12					19.7	10.7	27.0	18.0	34.3	25.3	16.9	25.9
	5	23.4	17.8	35.1	29.5							11.9	17.5
	6	21.1	14.3	32.8	26.0							14.2	21.0
	7	18.7	10.8	30.4	22.5							16.6	24.5
	8			28.0	19.0	39.8	30.8					19.0	28.0
	9			25.7	15.5	37.5	27.3					21.3	31.5
ST075SR	10			23.3	12.0	35.1	23.8	46.8	35.5	58.6	47.3	23.7	35.0
	11					32.7	20.3	44.4	32.0	56.2	43.8	26.1	38.5
	12					30.4	16.8	42.1	28.5	53.9	40.3	28.4	42.0
	5	30.9	23.8	46.1	38.9							14.5	21.7
	6	28.1	19.5	43.3	34.6							17.39	26.0
	7	25.2	15.1	40.3	30.2							20.3	30.4
	8			37.4	25.9	52.6	41.1					23.2	34.7
ST110SR	9			34.5	21.5	49.7	36.7					26.1	39.1
	10			31.6	17.2	46.8	32.4	62.0	47.6	77.1	62.7	29.0	43.4
	11					43.9	28.1	59.1	43.3	74.2	58.4	31.9	47.7
	12					41.0	23.7	56.2	38.8	71.3	54.0	34.78	52.08
	5	50.28	37.78	75.54	63.03							25.5	38.0
	6	45.18	30.18	70.44	55.44							30.6	45.6
	7	40.08	22.58	65.34	47.84							35.7	53.2
ST160SR	8			60.24	40.24	85.5	65.5					40.8	60.8
	9			55.14	32.69	80.4	57.9					45.9	68.4
	10			50.04	25.04	75.3	50.3	100.56	75.56	125.82	100.82	51.0	76.0
	11					70.2	42.7	95.46	67.96	120.72	93.22	56.1	83.6
	12					65.1	35.1	90.36	60.36	115.6	85.6	61.2	91.2
	5	68.6	52.0	103.6	87.0							33.2	49.8
	6	61.9	42.0	96.9	77.0							39.9	59.8
ST290SR	7	55.3	32.1	90.3	67.1							46.5	69.7
	8			83.7	57.1	116.6	90.0					53.1	79.7
	9			77.0	47.4	109.9	80.3					59.8	89.4
	10			70.4	37.2	103.3	70.1	137.3	104.0	171.2	138.0	66.4	99.6
	11					96.7	60.1	130.6	94.0	164.6	128.0	73.0	109.6
	12					90.0	50.2	123.9	84.1	157.9	118.1	79.7	119.5
	5	115.5	88.0	173.8	146.3							59.4	86.9
ST435SR	6	103.6	70.6	161.9	128.9							71.3	104.3
	7	91.8	53.5	150.1	111.6							83.1	121.6
	8			138.2	94.2	196.5	152.5					95.0	139.0
	9			126.3	76.8	184.6	135.1					106.9	156.4
	10			114.4	59.4	172.7	117.7	231.0	176.0			118.8	173.8
	11					160.9	100.4	219.2	158.7	277.5	217.0	130.6	191.1
	12					149.0	83.0	207.3	141.3	265.6	199.6	142.5	208.5
ST435SR	5	174.7	131.2	262.5	219.0							88.5	132.0
	6	157.0	104.8	244.8	192.6							106.2	158.4
	7	133.9	78.4	227.1	166.2							123.9	184.8
	8			209.4	139.8	297.1	227.5					141.6	211.2
	9			191.7	113.4	279.4	201.1					159.3	237.6
	10			174.0	87.0	261.7	174.7	349.4	262.4	437.8	350.1	177.0	264.0
	11					244.0	148.3	331.7	236.0	419.5	323.8	194.7	290.4
ST435SR	12					226.3	121.9	314.0	209.6	401.8	297.4	212.4	316.8

输出扭矩

气源克服弹簧输出力矩 Output Torque of Air supply												弹簧输出力矩 Output torque of spring	
气源压力 (bar)		3		4		5		6		7		0°	90°
型号 Model	弹簧 数量	0° 起点	90° 终点	0° 起点	90° 终点	0° 起点	90° 终点	0° 起点	90° 终点	0° 起点	90° 终点		
ST665SR	5	264.6	197.1	398.3	330.8							136.5	204.0
	6	237.3	156.2	371.0	289.9							163.8	244.9
	7	210.0	115.4	343.7	249.1							191.1	285.7
	8	182.7	74.6	316.4	208.3	450.1	341.9					218.4	326.5
	9			289.1	167.5	422.8	301.2					245.7	367.3
	10			261.8	126.7	395.5	260.4	529.2	394.1			273.0	408.1
	11					368.2	219.6	501.9	353.3	635.6	487.0	300.3	448.9
	12					340.9	178.8	474.6	312.5	608.3	446.2	327.6	489.7
ST1000SR	5	429.0	320.4	644.5	535.9							217.4	326.0
	6	385.5	255.2	601.0	470.7							260.9	391.2
	7	342.0	190.0	557.5	405.5							304.4	456.4
	8			514.0	340.3	729.5	555.8					347.9	521.6
	9			470.6	275.1	686.1	490.6					391.3	586.8
	10			427.1	209.9	642.6	425.4	858.1	640.9	1073.6	856.4	434.8	652.0
	11					599.1	360.2	814.6	575.7	1030.1	791.2	478.3	717.2
	12					555.6	295.0	771.1	510.5	986.6	726.0	521.8	782.4
ST1400SR	5	589.6	440.6	885.7	736.7							298.8	447.8
	6	529.8	351.1	825.9	647.2							358.6	537.3
	7	470.1	261.5	766.2	557.6							418.3	626.9
	8			706.4	468.1	1002.5	764.2					478.1	716.4
	9			646.7	375.5	942.8	671.6					537.8	809.0
	10			586.9	289.0	883.0	585.1	1179.1	881.2	1475.2	1177.3	597.6	895.5
	11					823.2	495.5	1119.3	791.6	1415.4	1087.7	657.4	985.1
	12					763.5	406.0	1059.6	702.1	1355.7	998.2	717.0	10714.6
ST2100SR	5	924.0	690.5	1488.1	1154.6							468.5	702.0
	6	829.9	550.1	1294.0	1014.2							562.6	842.4
	7	736.7	409.7	1200.8	873.8							655.8	982.8
	8			1107.1	733.4	1571.3	1197.6					749.5	1123.2
	9			1013.4	593.0	1477.6	1057.2					843.2	1263.6
	10			919.7	452.6	1383.9	916.8	1848.1	1381.0	2312.2	1845.1	936.9	1404.0
	11					1290.2	776.4	1754.4	1240.6	2218.5	1704.7	1030.6	1544.4
	12					1196.5	636.0	1660.7	1100.2	2124.8	1564.3	1124.3	1684.8
ST3000SR	5	1299.7	971.2	1952.4	1623.9							658.5	987.0
	6	1168.0	773.8	1820.7	1426.5							790.2	1184.4
	7	1036.3	576.4	1689.0	1229.1							921.9	1381.8
	8			1577.3	1031.7	2210.0	1684.4					1053.6	1579.2
	9			1425.6	834.3	2078.3	1487.0					1185.3	1776.6
	10			1293.9	636.9	1946.6	1289.6	2599.3	1942.3	3252.0	2595.0	1317.0	1974.0
	11					1814.9	1092.2	2467.6	1744.9	3120.3	2397.6	1448.7	2171.4
	12					1683.2	894.8	2335.9	1547.5	2988.6	2200.2	1580.4	2368.8
ST4000SR	5	1603	1183									800	1220
	6	1483	1066									920	1337
	7	1330	844	2132	1646							1073	1559
	8	1177	621	1979	1423	2780	2224					1226	1782
	9			1825	1201	2626	2002	3427	2803			1380	2004
	10			1652	977	2473	1778	3274	2579	4075	3380	1533	2228
	11					2320	1556	3121	2357	3922	3158	1686	2450
	12					2014	1077	2815	1878	3686	2679	1922	2929
ST6000SR	5	2399	1739									1199	1859
	6	2120	1453									1478	2145
	7	1874	1096	3074	2296							1724	2502
	8	1627	738	2827	1938	4027	3138					1971	2860
	9			2580	1581	3780	2781	4979	3980			2218	3217
	10			2335	1223	3535	2423	4734	3622	5934	4822	2463	3575
	11					3288	2066	4487	3265	5687	4465	2710	3932
	12					3120	1537	4319	2736	5519	3936	2878	4461
ST8500SR	5	3418	2479									1709	2648
	6	2922	1670									2205	3457
	7	2647	1239	4357	2949							2480	3888
	8	2372	806	4082	2516	5791	4225					2755	4321
	9			3806	2085	5515	3794	7224	5503			3031	4752
	10			3531	1652	5240	3361	6949	5070	8658	6779	3306	5185
	11					4963	2930	6672	4639	8381	6348	3583	5616
	12					4445	2190	6154	3899	8106	5608	4101	6356

■ 安装尺寸

外形及连接尺寸 Mounting connection and dimension



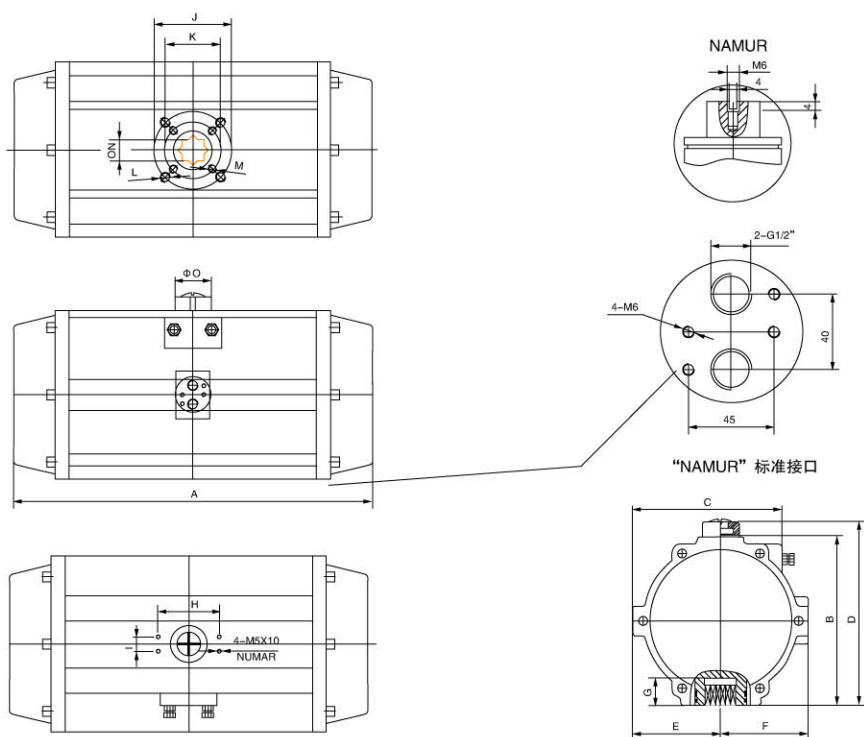
型号 Model	A	B	C	D	E	G	H	I	J	K	L	M	N	O	A120	A180	Air connection
ST008	103	44	46	64	23	14	50	25			M6X10	M5X8	9	Φ 40	158	200	G1/8"
ST020	158.5	74	60	94	30	14	80	30	F05 Φ 50	F03 Φ 36	M8X13	M5X8	11	Φ 40	184	233	G1/4"
ST035	190	88	69	108	36	18	80	30	F07 Φ 70	F03 Φ 36	M8X13	M6X10	14	Φ 40	193	243	G1/4"
ST055	207	100	78	120	42	20	80	30	F07 Φ 70	F05 Φ 50	M8X13	M6X10	14	Φ 40	221	280	G1/4"
ST075	213	109	88	129	46	21	80	30	F07 Φ 70	F05 Φ 50	M8X13	M6X10	17	Φ 40	290	374	G1/4"
ST110	258	120	95	140	50.5	22	80	30	F07 Φ 70	F05 Φ 50	M10X16	M6X10	17	Φ 40	304	388	G1/4"
ST160	287	133	105.5	153	57.5	26	80	30	F10 Φ 102	F07 Φ 70	M10X16	M8X13	22	Φ 65	365	470	G1/4"
ST290	340	155	120.5	175	67.5	27.5	80	30	F12 Φ 125	F07 Φ 70	M12X20	M8X13	22	Φ 65	442	568	G1/4"
ST435	414	171.5	132	191.5	75	32	80	30	F12 Φ 125	F10 Φ 102	M12X20	M10X16	27	Φ 65	507	654	G1/4"
ST665	476	197	159.5	217	86.5	34	80	30	F14 Φ 140	F10 Φ 102	M16X22	M10X16	27	Φ 78	575	742	G1/4"
ST1000	515	230	164	260	102	40	130	30	F14 Φ 140		M16X24		36	Φ 78	642	831	G1/4"
ST1400	560	255	205	285	113	40	130	30	F14 Φ 140		M20X26		36	Φ 78	739	965	G1/4"
ST2100	654	290	240	320	130	50	130	30	F16 Φ 165		M20X26		46	Φ 78	823	1075	G3/8" (1/4")
ST3000	725	320	269	350	147	50	130	30	F16 Φ 165				46				G1/2" (1/4")

注：A120、A180分别表示角行程为120° 180° 时执行长度

Note: A120 and A180 separately represent the acting length of the 120° rotation travel and 180° rotation travel.

■ 安装尺寸

外形连接尺寸 Mounting connection and dimension



型号 Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Air connection
ST4000	742	357	315	387	190	190	57	130	30	Φ 165		M20X26		46	Φ 78	G1/2"
ST6000	865	406	385	436	215	215	60	130	30	Φ 165		M20X26		46	Φ 78	G1/2"
ST8500	925	462	408	492	258	258	60	130	30	Φ 254	Φ 165	M20X26	M16X29	55	Φ 78	G1/2"



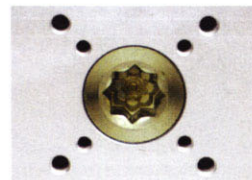
气源接口符合NAMUR标准，可简单方便地安装电磁阀。

Air supply connection is designed in accordance with NAMUR Standard to in stall 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，可以直接安装离合器（气动手轮机构）或安装支架。

Bottom mounting connection is designed in accordance with ISO5211 and DIN3337 standards for direct mounting with valve gear boxes or mounting brackets.

■ 工作技术条件/耗气量/重量

工作技术条件 Operating conditions

1.工作介质 Operating media

干燥或润滑的压缩空气或无腐蚀性气体，介质中杂质微粒小于 $30\mu\text{m}$ 。

Dry or lubricated air, or the non-corrosive gases. The maximum particle diameter must less than $30\mu\text{m}$.

2.气源压力 Air supply pressure

最小气源压力2.5巴，最大气源压力8巴。

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

3.介质环境温度 Operating temperature

标准： $-20^{\circ}\text{C} \sim +80^{\circ}\text{C}$ Standard: $20^{\circ}\text{C} \sim +80^{\circ}\text{C}$

低温： $-35^{\circ}\text{C} \sim +80^{\circ}\text{C}$ Low temperature: $-35^{\circ}\text{C} \sim +80^{\circ}\text{C}$

高温： $-15^{\circ}\text{C} \sim +150^{\circ}\text{C}$ High temperature: $-15^{\circ}\text{C} \sim +150^{\circ}\text{C}$

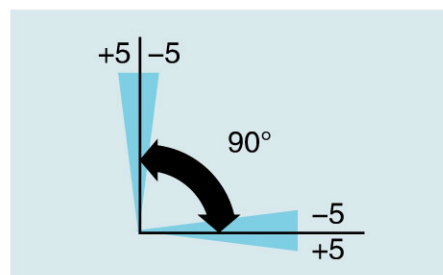
4.行程调节 Travel adjustment

0° 和 90° 两个位置上有 $\pm 5^{\circ}$ 的调节范围

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

5.使用场合 Application

室内或室外安装 Either indoor or outdoor



耗气量计算 Air consumption

气缸开向容积和关向容积 Air volume opening % closing					
型号 Model	开向容积(L) Air volume opening	关向容积(L) Air volume closing	型号 Model	开向容积(L) Air volume opening	关向容积(L) Air volume closing
ST008	0.035	0.045	ST665	2.6	3.7
ST020	0.09	0.12	ST1000	4.2	5.9
ST035	0.14	0.2	ST1400	5.7	8.2
ST055	0.21	0.3	ST2100	9.0	12.8
ST075	0.29	0.41	ST3000	12.6	17.9
ST110	0.49	0.71	ST4000	21.4	30.0
ST160	0.7	0.99	ST6000	31.2	43.7
ST435	1.7	2.4	ST8500	47.9	67.1

双作用式耗气量(L/分)=气缸容积（开向容积+关向容积） $\times \left[\frac{\text{供气压力(Kpa)}+101.3}{101.3} \right] \times \text{次数/分钟}$ 。

单作用式耗气量(L/分)=气缸开向容积 $\times \left[\frac{\text{供气压力(Kpa)}+101.3}{101.3} \right] \times \text{次数/分钟}$ 。

Air consumption of dual action actuator(L/min)=air volume(Air volume opening+air volume closing) $\times \left(\frac{\text{air supply(Kpa)}+101.3}{101.3} \right) \times \text{action cycle times(L/min)}$.

Air consumption of single action actuator(L/min)=air volume opening $\times \left(\frac{\text{air supply(Kpa)}+101.3}{101.3} \right) \times \text{action cycle times(L/min)}$.

执行器重量 The weight of actuators

型号 Model	ST008DA/SR		ST020DA/SR		ST035DA/SR		ST055DA/SR		ST110DA/SR		ST160DA/SR		ST290DA/SR		ST435DA/SR	
近似重量 Similar weight(kg)	0.72		1.3	1.4	1.9	2.09	2.7	3.2	5.1	5.9	5.8	7.0	9.4	10.4	13.7	16.2
型号 Model	ST665DA/SR		ST1000DA/SR		ST1400DA/SR		ST2100DA/SR		ST4000DA/SR		ST6000DA/SR		ST8500DA/SR			
近似重量 Similar weight(kg)	24.5	19.6	31.2	37.3	40.2	48	60.5	72.4	120.1	196.6	192.5	250.5	283	344.5		

三位式执行器 Three position actuator

三位式气动执行器提供了一种 0° 、 45° 、 90° 或者中间任意角度的三个位置的操作方式。中间位置是依靠两个辅助活塞移动产生的机械制动来实现的。中间位置根据需要要是可调的。

Three position Theobom actuator provides an operation of 0° , 45° , 90° or the random rotation travel of midway position. The midway position is achieved by a mechanical stoppage of movement on the two(2) auxiliary pistons. (Midway stop position is adjustable.)

图1是中间位置，气源分别进入2口和D口，空气从4口和C口排出来实现的。气源至D口时迫使辅助活塞向中心移动，推动作为机械限位使内部活塞在设定位置停止。

Chart 1: midway position From chart 1 we can see that this position is obtained when air is supplied to port 2 and port D. Meantime port 4 and port C are in the state of exhaust air. The midway position is achieved by mechanical stoppage of movement of the two auxiliary pistons.

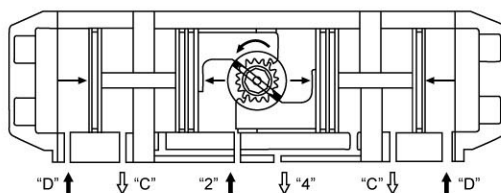


图1 Chart 1

图2是全开位置，气源分别进入2口和D口，（C口可不供气），空气从4口和D口排出时来实现。

Chart 2: fully open position From chart 2 we can see that this position is obtained when air is supplied to port 2 and C (air to port C is optional). Meantime, port 4 and port D are in the state of exhaust air.

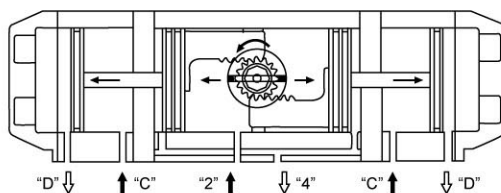


图2 Chart 2

图3是全关位置，气源进入4口，空气从2口排出时来实现的。无需操作C口和D口。

Chart 3: fully closed position from chart 3 we can see that this position is obtained when air is supplied to port 4 and port 2 in the state of exhaust air. Port C and port D do not need to operate.

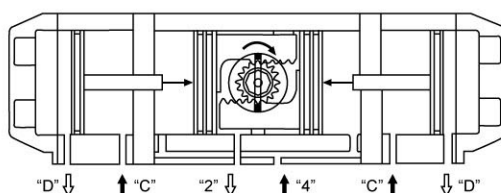


图3 Chart 3

选型与订购

一、气动执行器的型号说明 Sizing information and How to order

气动执行器型号 Actuator Model	双作用 Double-Acting	单作用 Spring-Return	弹簧数量 No of Springs	选项 Options
ST008	DA	SR	K5	H=高温型150℃
ST020			K6	High Temperature Actuator 150℃
ST035			K7	L=低温型-35℃
ST055			K8	Low Temperature Actuator-35℃
ST075			K9	S=特殊涂层
ST110			K10	Special Coating Treatment
ST160			K11	3P=3位式气动执行器
ST290			K12	3 Position Actuator
ST435				SS=特殊行程气动执行器
ST665				60°、120°、180°、360°等
ST1000				Speeial storke actuator
ST1400				
ST2100				
ST3000				
ST4000				
ST6000				
ST8500				

ST 055 DA or SR K8 H

二、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=100Nm
- 安全力矩=100 × (1+30%)=130Nm
- 气源压力=5Bar

双作用执行力矩表，选配双作用执行器最小规格为ST-160DA。

Sizing: Double Acting Actuators

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 ST-160DA.

三、单作用执行器的选型

在正常操作条件下，单作用执行器考虑的安全系数为30%–50%。

例如：

阀门需要力矩=100N.m

安全力矩=100 × (1+30%)=130Nm

气源压力=5Bar

对照单作用执行器输出力矩表，我们可以查到ST435SRK8输出力矩为

空气行程0° =297N.m

空气行程90° =227N.m

弹簧行程90° =211N.m

弹簧行程0° =141N.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，相反帮助弹簧的复位。

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=100N.m

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

Air Supply=5Bar

According to the table of spring return actuators' output, we find output torque of ST435SRK8 is:

Air stroke 0° =297N.m

Air stroke 90° =227N.m

Spring stroke 90° =211N.m

Spring stroke 0° =141N.m

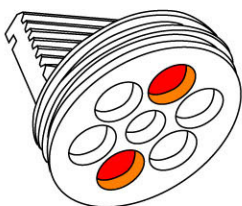
All the output torque is larger than we needed.

Attention:

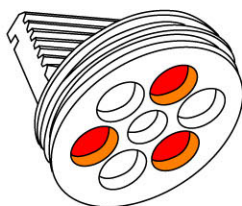
During the restoration, the spring return actuators' output torque will not be affected by the inputting air from the port B. On the contrary, it will help the restoration of springs.

单作用执行器弹簧安装形式

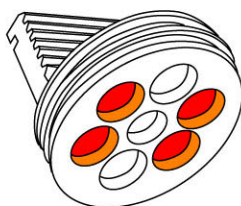
Springs mounting form for spring return type actuators



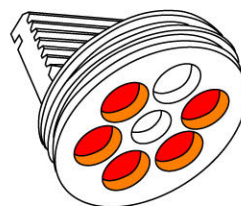
SR-K2



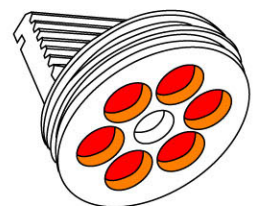
SR-K3



SR-K4



SR-K5



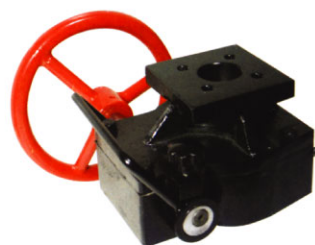
SR-K6

气动手轮机构

特点

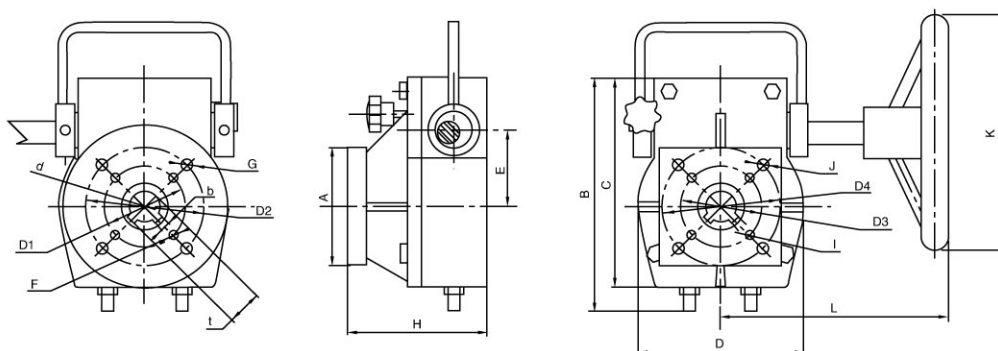
本减速器与气动装置联合使用，用于90°开启的蝶阀、球阀、旋塞阀等，实现手动或气动驱动。

- 体积小、重量轻，设计合理、式样新颖；
- 产品系列化，输出转矩与气动装置，各种阀门匹配；
- 蜗轮连接内孔有相隔90°的两个键槽，以使用户根据需要选择装置同阀体的相对位置；
- 转动手柄，旋转偏心装置180°，旋转限位螺母，实现气动；反之，实现手动；
- 产品出厂时，装有专用润滑脂，与阀装配后，整体密封、防尘、防水，防护等级为IP65。



No.	型号	速比	输入扭矩(Nm)	输出扭矩(Nm)	手轮直径(mm)	重量(Kg)
1	XLHJ26	26:1	70	300	f200	7.3
2	XLHJ38	38:1	60	550	f200	12
3	XLHJ54	54:1	120	1200	f300	17
4	XLHJ80	80:1	140	2000	f400	35
5	XLHJ78	78:1	200	3600	f600	49
6	XLHJ98	98:1	300	9000	f800	156
7	XLHJ100	100:1	400	13000	f800	190
8	XLHJ118	118:1	900	22100	f1000	540

XLHJ系列手轮机构连接尺寸及配量表



手轮型号	轴孔 d	键宽 b	键深 t	阀门连接孔		执行器连接孔			高 H	手轮 ΦK	E	L	B	C	D	气动执行器型号
				D1/D2	4-M1	D3/D4	4-Φ2	支架面A								
XLHJ26	22	6	25.4	70	4-M8	70	4-Φ9	70	99	200	50.5	155	160	145	110	ST008,020,035,055,075,110
XLHJ38	26	8	29.3	70	4-M8	70	4-Φ9	100	117	200	65	195	195	175	140	ST075,110
	38	10	41.3	102	4-M10	102	4-Φ12	110								ST160,290
XLHJ54	38	10	41.3	125	4-M12	125	4-Φ14	130	118	300	85	205	235	215	180	ST435,665
	48	14	51.8	140	4-M16	140	4-Φ18	130								ST1000DA,1400DA
XLHJ80	48	14	51.8	140	4-M16	140	4-Φ18	156	148	400	124	245	320	298	250	ST1000SR,1400SR
	60	18	64.4	165	4-M20	165	4-Φ22	156								ST2100DA
XLHJ78	60	18	64.4	165	4-M20	165	4-Φ22	220	150	600	142	265	360	340	285	ST2100SR
	80	18	84.4													ST3000,4000
XLHJ98	80	18	84.4	165	4-M20	165	4-Φ22	230	195	800	229	410	550	530	460	ST6000,8500DA
XLHJ100	100	20	105.3	254	8-M16	254	8-Φ18	300	195	800	258	430	605	585	520	ST8500SR
XLHJ118	120	32	129.3	356	8-M30	356	8-Φ32	Φ445	250	1000	391	550	900	870	800	
XLHJ118G	120	32	196	483	12-M36	483	12-Φ40	Φ600	275	1000	390	600	1050	900	850	

备注：ST008，020在安装手轮机构时需要加装连接板



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