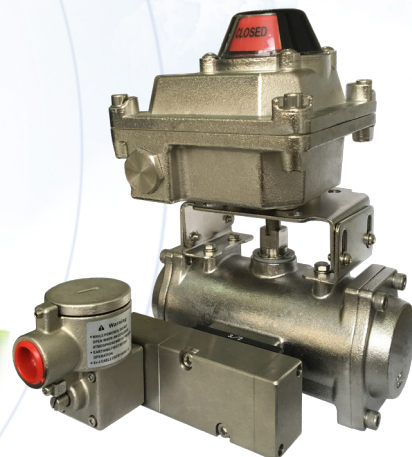
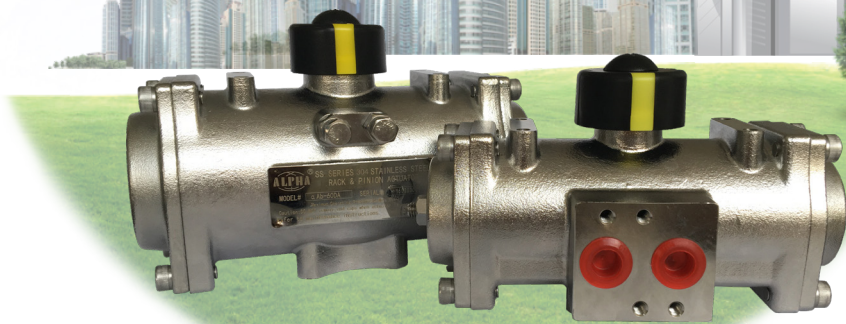




圣汉斯(集团)
ST.HANS GROUP



A SERIES STAINLESS STEEL RACK & PINION ACTUATOR

A Series Stainless Steel Actuator A系列不锈钢执行器

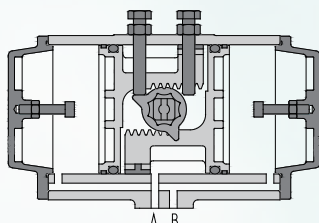
- * 304、304L、316、316L 不锈钢材质执行器，外表电解抛光，光洁美观，抗腐蚀性能强，适合于抗腐蚀要求极高的工程环境。
- * 双活塞齿轮齿条式设计，结构紧凑、安装位置对称、改变输出轴转向方便，使用寿命长、动作迅速。
- * 活塞齿条背面装有复合轴承及导向环，动作精确、摩擦系数小、使用寿命延长。
- * 组合式预负荷镀层弹簧，工作寿命长、抗腐蚀性能强。
- * 精密加工的齿轮和齿条，啮合间隙小、传动精度高，输出功率大。
- * 不锈钢紧固件，安全美观，抗腐蚀性强。
- * Ab 型——单向调节型
Ac 型——双位调节型
可满足不同客户的使用需求。
- * 采用国际规范尺寸：
输出轴槽、螺孔；
顶部安装孔尺寸符合 NAMUR 标准；
气源接口尺寸符合 NAMUR 标准；
底部安装孔尺寸符合 ISO 5211、DIN 3337 标准，方便安装电磁阀限位开关等附件。
- * ASTM 304, 304L, 316, 316L stainless steel pneumatic actuator with electro-polish finish offer excellent resistance to most corrosive chemicals as well as industrial atmospheres.
- * Dual piston rack and pinion design for compact construction, symmetric mounting position, high-cycle life and fast operation, reverse rotation can be accomplished in the field by simply inverting the pistons.
- * Multiple bearings and guides on racks and pistons, low friction, high cycle life and prevent shaft blowout.
- * Modular preloaded spring cartridge design, with coated spring for simple versatile range, greater safety and corrosion resistance, longer cycle life.
- * Precise machined teeth on piston and pinion for accurate low backlash rack and pinion engagement, high transmission precision, maximum efficiency.
- * Stainless steel fasteners for long term corrosion resistance.
- * Ab model —— one-way adjustment
Ac model —— double adjustment
Can meet the needs of different customers.
- * Full conformance to the latest specifications: ISO 5211, DIN 3337 and Namur or product interchangeability and easy mounting of solenoids, limit switches and other accessories.

工作原理 Operating Principle

双作用执行器 Double Acting Actuators

CCW

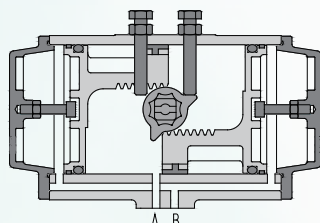
CW



0° close

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。

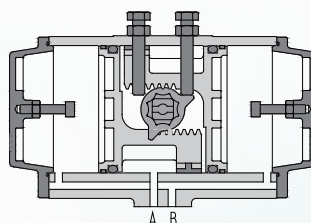
B口进气，压缩空气推动活塞向内运动，使执行器输出轴顺时针旋转($90^\circ \rightarrow 0^\circ$)，A口排气。



90° open

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

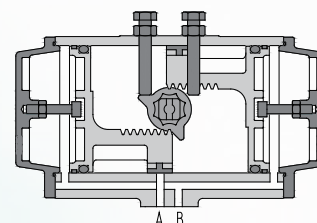
Air to Port B forces the pistons inwards, causing the pinion to turn clockwise while the air is being exhausted from Port A.



90° open

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($90^\circ \rightarrow 0^\circ$)，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($0^\circ \rightarrow 90^\circ$)，A口排气。



0° close

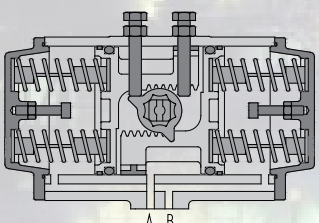
Air to Port A forces the pistons outwards, causing the pinion to turn clockwise while the air is being exhausted from Port B.

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

单作用执行器 Spring Return Actuators

CCW

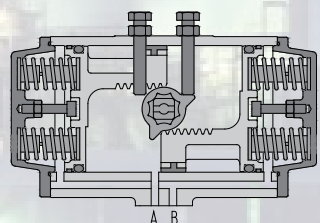
CW



0° close

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转动($0^\circ \rightarrow 90^\circ$)，B口排气；

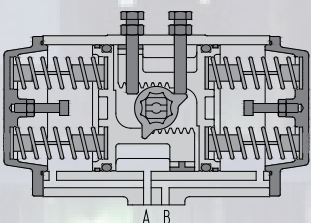
执行器失气，活塞在弹簧力的作用下向内运动，执行器输出轴顺时针转动($90^\circ \rightarrow 0^\circ$)，A口排气。



90° open

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.

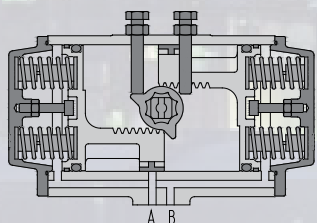
Loss of air pressure on port A, the stored energy in the springs forces the pistons inwards. The pinion turns clockwise while air is being exhausted from port A.



90° open

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转动($90^\circ \rightarrow 0^\circ$)，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转动($0^\circ \rightarrow 90^\circ$)，A口排气。

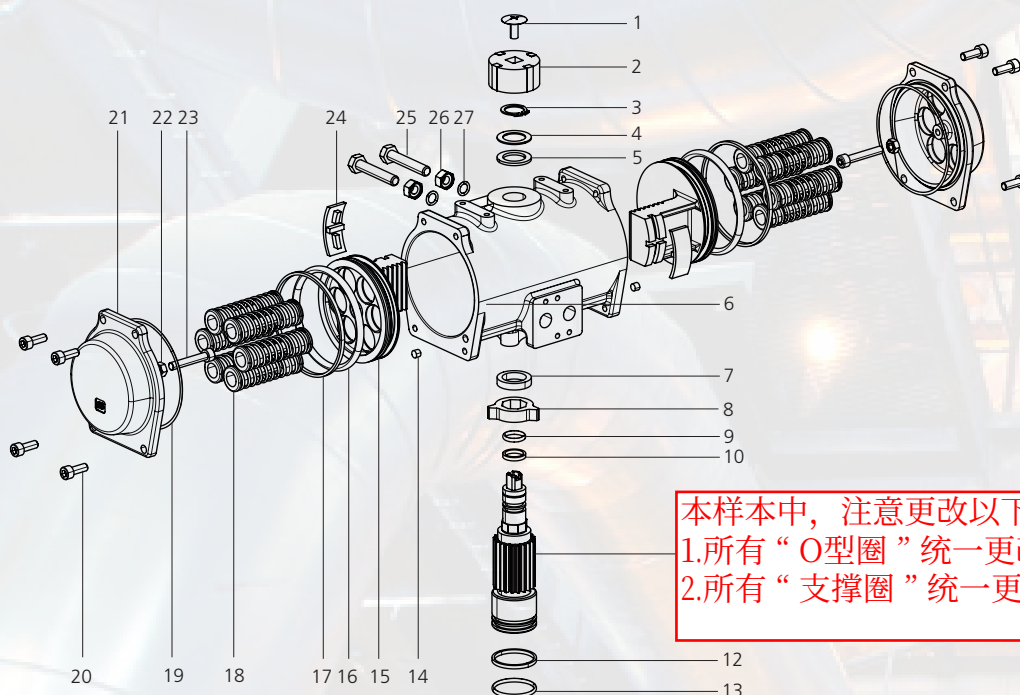


0° close

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.

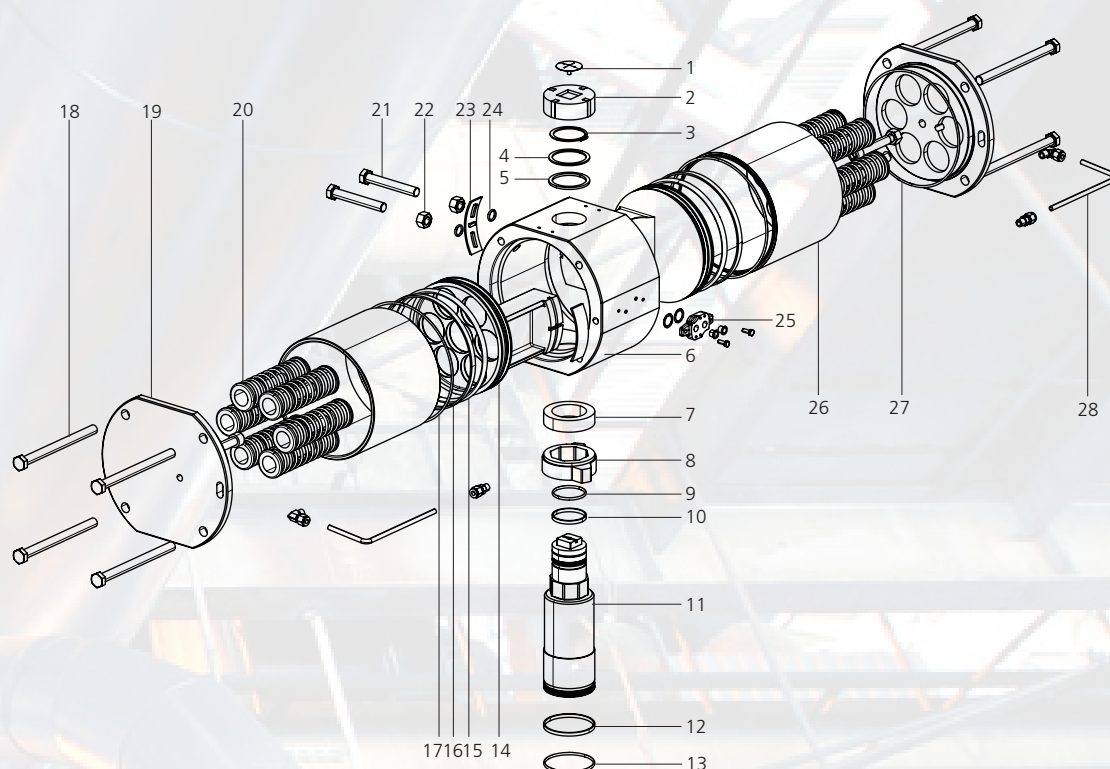
零件和材料 Parts and Materials



本样本中，注意更改以下两个字：
1.所有“O型圈”统一更改为“O形圈”；
2.所有“支撑圈”统一更改为“支承圈”。

型号 Mdel : A45-160

序号 No.	名称 Description	数量 Qty.	材料 Standards Material
1	指示器螺钉 Indicator Screw	1	工程塑料 Polyoxymethylene
2	指示器 Indicator	1	工程塑料 Polyoxymethylene
3	弹性挡圈 Circlip	1	不锈钢 (304/316) Stainless Steel (304/316)
4	垫片 Thrust Washer	1	不锈钢 (304/316) Stainless Steel (304/316)
5	外垫片 Outside Washer	1	工程塑料 Polyoxymethylene
6	缸体 Body	1	不锈钢 (CF8/CF8M) Stainless Steel (CF8/CF8M)
7	内垫片 Inside Washer	1	工程塑料 Polyoxymethylene
8	凸轮 Cam	1	不锈钢 (304/316) Stainless Steel (304/316)
9	上轴O型圈 O-ring (Pinion Top)	1	氟橡胶/丁腈橡胶 Viton/NBR
10	上轴支撑圈 Bearing (Pinion Top)	1	工程塑料 Polyoxymethylene
11	轴 Pinion	1	不锈钢 (304/316) Stainless Steel (304/316)
12	下轴支撑圈 Bearing (Pinion Bottom)	1	工程塑料 Polyoxymethylene
13	下轴O型圈 O-ring (Pinion Bottom)	1	氟橡胶/丁腈橡胶 Viton/NBR
14	塞头 Plug	2	氟橡胶/丁腈橡胶 Viton/NBR
15	活塞 Piston	2	不锈钢 (CF8/CF8M) Stainless Steel (CF8/CF8M)
16	活塞支撑圈 Bearing (Piston)	2	工程塑料 Polyoxymethylene
17	活塞O型圈 O-ring (Piston)	2	氟橡胶/丁腈橡胶 Viton/NBR
18	弹簧 Spring	*	弹簧钢 Spring Steel
19	端盖O型圈 O-ring (End-Cap)	2	氟橡胶/丁腈橡胶 Viton/NBR
20	端盖紧固螺钉 End-Cap Screw	8	不锈钢 (304/316) Stainless Steel (304/316)
21	端盖 End-Cap	2	不锈钢 (CF8/CF8M) Stainless Steel (CF8/CF8M)
22	限位螺钉 Limit screw	2	不锈钢 (304) Stainless Steel (304)
23	限位螺母 Limit Nut	2	不锈钢 (304) Stainless Steel (304)
24	活塞导板 Guide (Piston)	2	工程塑料 Polyoxymethylene
25	调节螺栓 Adjust Screw	2	不锈钢 (304/316) Stainless Steel (304/316)
26	调节螺母 Nut (Adjust Screw)	2	不锈钢 (304/316) Stainless Steel (304/316)
27	调节螺母O型圈 O-ring (Adjust Nut)	2	氟橡胶/丁腈橡胶 Viton/NBR

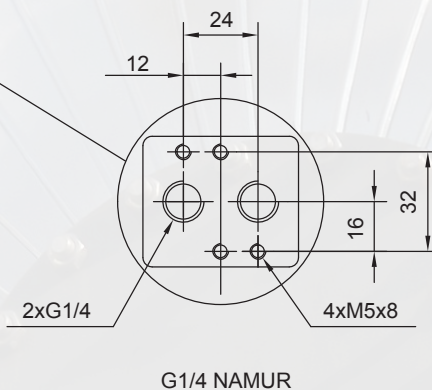
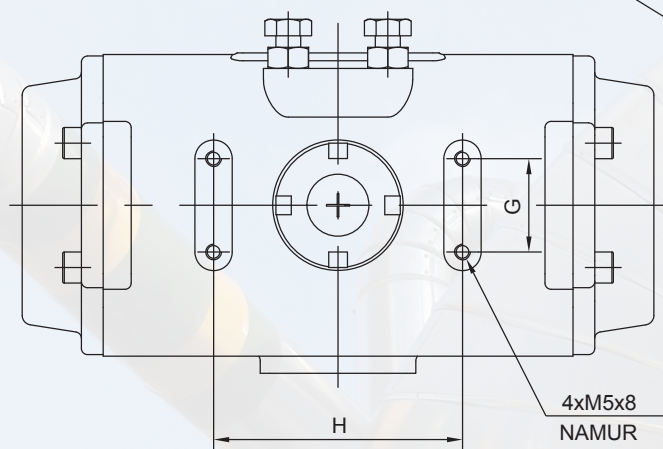
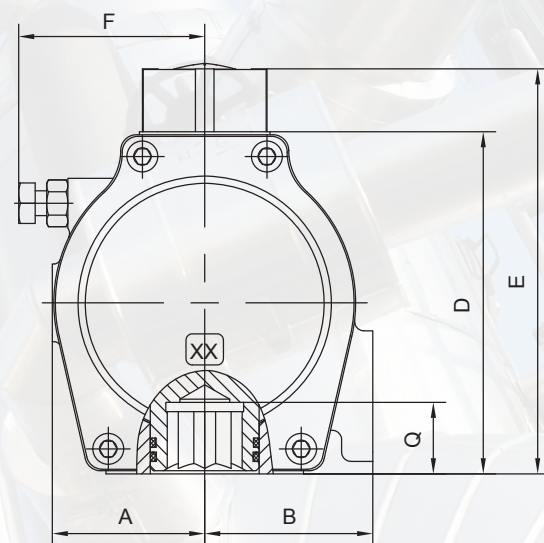
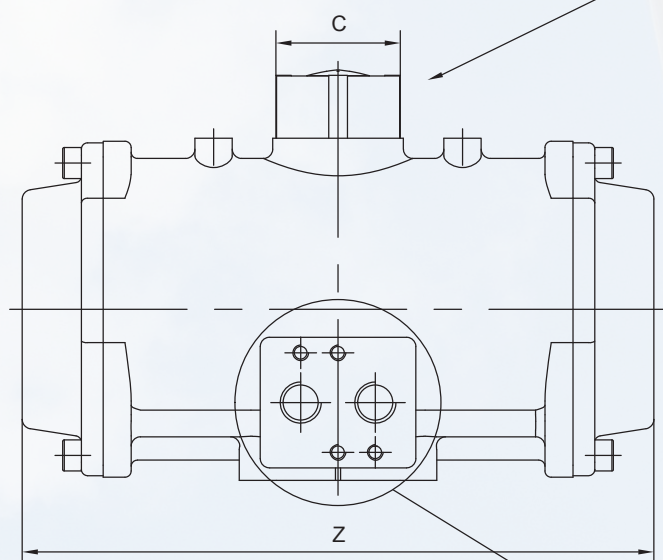
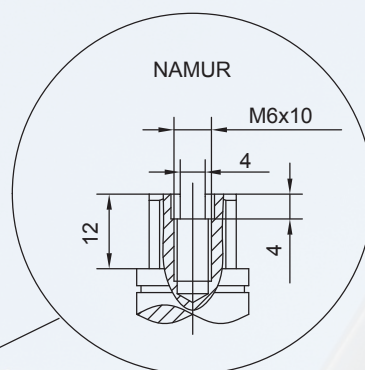
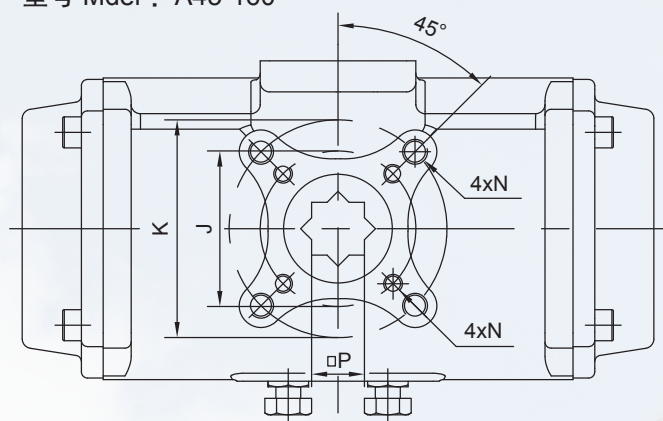


型号 Mdel : A190-240

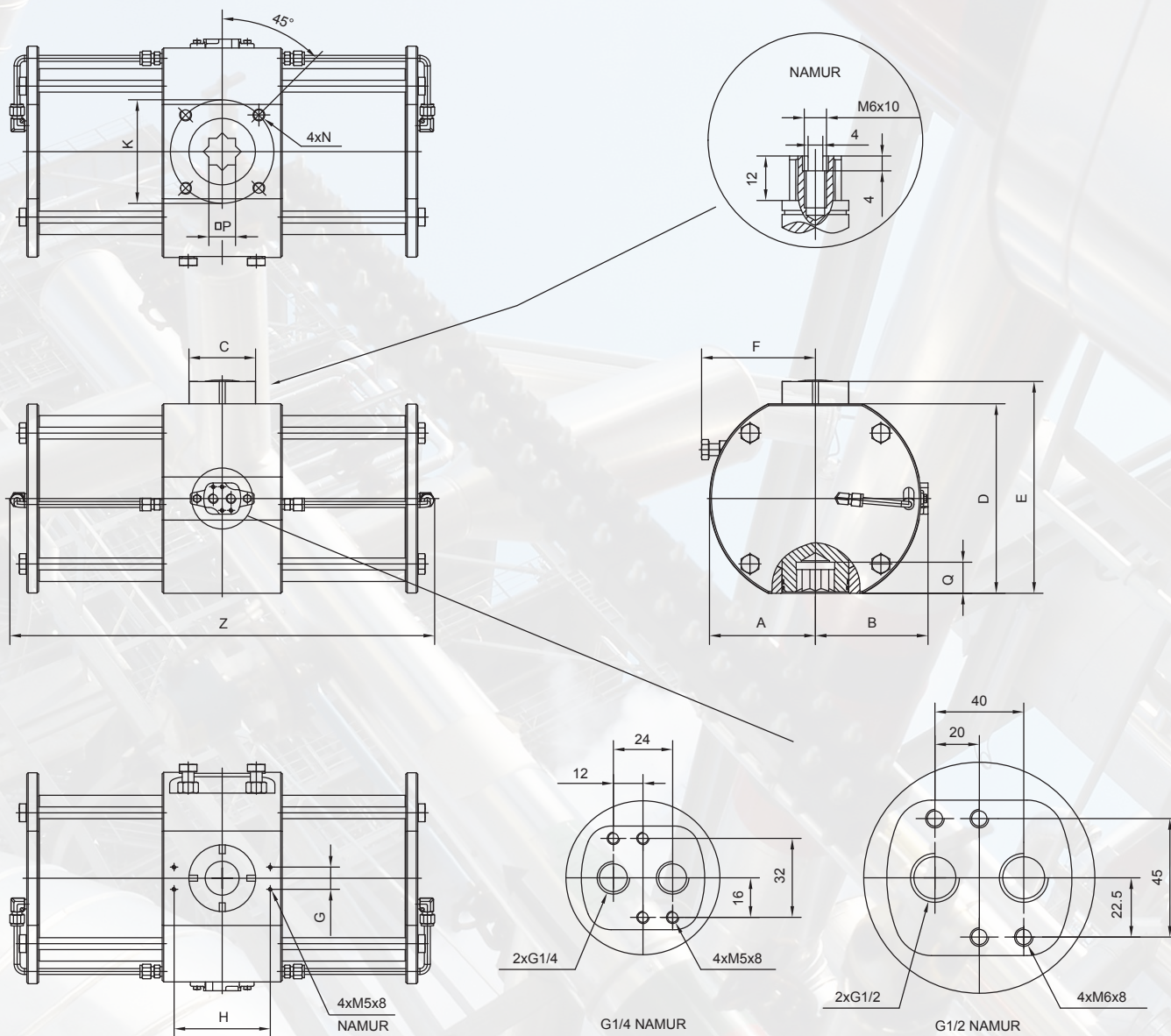
序号 No.	名称 Description	数量 Qty.	材料 Standards Material
1	指示器螺钉 Indicator Screw	1	工程塑料 Polyoxymethylene
2	指示器 Indicator	1	工程塑料 Polyoxymethylene
3	弹性挡圈 Circlip	1	不锈钢 (304/316) Stainless Steel (304/316)
4	垫片 Thrust Washer	1	不锈钢 (304/316) Stainless Steel (304/316)
5	外垫片 Outside Washer	1	工程塑料 Polyoxymethylene
6	中间体 Middle Body	1	不锈钢 (F304/F316) Stainless Steel (F304/F316)
7	内垫片 Inside Washer	1	工程塑料 Polyoxymethylene
8	凸轮 Cam	1	不锈钢 (304/316) Stainless Steel (304/316)
9	上轴O型圈 O-ring (Pinion Top)	1	氟橡胶/丁腈橡胶 Viton/NBR
10	上轴支撑圈 Bearing (Pinion Top)	1	工程塑料 Polyoxymethylene
11	轴 Pinion	1	不锈钢 (304/316) Stainless Steel
12	下轴支撑圈 Bearing (Pinion Bottom)	1	工程塑料 Polyoxymethylene
13	下轴O型圈 O-ring (Pinion Bottom)	1	氟橡胶/丁腈橡胶 Viton/NBR
14	活塞 Piston	2	不锈钢 (CF8/CF8M) Stainless Steel (CF8/CF8M)
15	活塞O型圈 O-ring (Piston)	2	氟橡胶/丁腈橡胶 Viton/NBR
16	活塞支撑圈 Bearing (Piston)	2	工程塑料 Polyoxymethylene
17	侧体O型圈 O-ring (Lateral Body)	2	氟橡胶/丁腈橡胶 Viton/NBR
18	端盖紧固螺钉 End-Cap Screw	8	不锈钢 (304/316) Stainless Steel (304/316)
19	端盖 End-Cap	2	不锈钢 (304/316) Stainless Steel (304/316)
20	弹簧 Spring	*	弹簧钢 Spring Steel
21	调节螺栓 Adjust Screw	2	不锈钢 (304/316) Stainless Steel (304/316)
22	调节螺母 Adjust Nut	2	不锈钢 (304/316) Stainless Steel (304/316)
23	活塞导板 Guide (Piston)	2	工程塑料 Polyoxymethylene
24	调节螺母O型圈 O-ring (Adjust Nut)	2	氟橡胶/丁腈橡胶 Viton/NBR
25	NAMUR转接板组件 Adapter Plate Assembly	1	不锈钢 (304/316) Stainless Steel (304/316)
26	侧缸体 Lateral Body	2	不锈钢 (F304/F316) Stainless Steel (F304/F316)
27	端盖O型圈 O-ring (End-Cap)	2	氟橡胶/丁腈橡胶 Viton/NBR
28	管接组件 Pipe Connector Assembly	2	不锈钢 (304/316) Stainless Steel (304/316)

外形尺寸 Dimension

型号 Mdel : A45-160



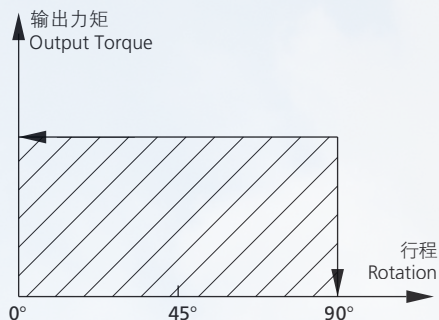
型号 Model : A190-240



型号Model	A	B	C	D	E	F	G	H	J	K	M	N	P	Q	Z
αA-45	28	40	Φ40	67	87	45	30	80	Φ36	Φ50	M5x8	M6x10	11	14	150
αA-60	36	44	Φ40	83	103	52	30	80	Φ36	Φ50	M5x8	M6x10	14	17	165
αA-85	49	54	Φ40	110	130	64	30	80	Φ50	Φ70	M6x10	M8x12	17	22	203
αA-105	60	63	Φ40	135	155	75	30	80	Φ70	Φ102	M8x12	M10x16	22	26	256
αA-125	70	69	Φ55	157	177	92	30	130	Φ70	Φ102	M8x12	M10x16	22	26	282
αA-140	77	75	Φ55	174	204	105	30	130	Φ102	Φ125	M10x16	M12x20	27	32	365
αA-160	88	82	Φ55	198	228	116	30	130	Φ102	Φ125	M10x16	M12x20	27	32	425
αA-190	133	142	Φ80	234	264	147	30	130	-	Φ140	-	M16x24	36	40	575
αA-210	143	152	Φ80	256	286	154	30	130	-	Φ140	-	M16x24	36	40	575
αA-240	160	170	Φ80	288	318	174	30	130	-	Φ165	-	M20x25	46	50	650

双作用扭矩 Output Torque with Double Acting

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



A系列气动执行器双作用输出扭矩表

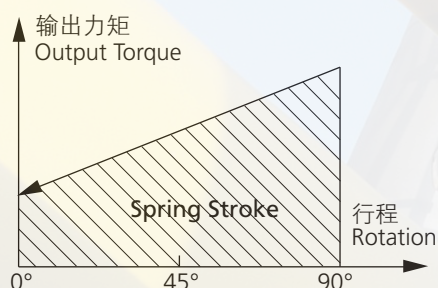
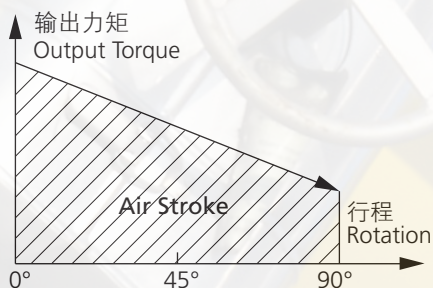
Output Torque Table of A Series Pneumatic Actuators with Double Acting

Unit: Nm

规格 Model	气源压力 (巴) Air pressure(Bar)									
	2	2.5	3	4	4.5	5	5.5	6	7	8
αA-45DA	6.0	7.6	9.1	12.1	13.6	15.1	16.6	18.1	21.1	24.2
αA-60DA	14.2	17.8	21.3	28.4	32.0	35.5	39.1	42.6	49.7	56.8
αA-85DA	30.8	38.5	46.2	61.6	69.4	77.1	84.8	92.5	107.9	123.3
αA-105DA	65.8	82.2	98.7	131.6	148.0	164.4	180.9	197.3	230.2	263.1
αA-125DA	103	128	154	205	231	256	282	308	359	410
αA-140DA	175	219	263	351	395	439	482	526	614	702
αA-160DA	267	334	401	535	601	668	735	802	935	1069
αA-190DA	426	532	638	851	958	1064	1170	1277	1490	1702
αA-210DA	526	658	789	1052	1184	1316	1447	1579	1842	2105
αA-240DA	770	962	1154	1539	1731	1924	2116	2309	2693	3078

单作用扭矩 Output Torque with Spring Return

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



A系列单作用气动执行器输出扭矩表

Output Torque of A Series Pneumatic Actuator with Spring Return

unit: Nm

规格 (Model)	气源压力(巴) Air pressure(Bar)																			
	弹簧根数 Spring Qty.	2		2.5		3		4		5		6		7		8		弹簧输出扭矩 Springs' output		
		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	0° Start	90° End	90°	0°	
αA-45SR	5	3.0	1.2	4.6	2.8													4.6	2.9	
	6			3.9	1.8	5.4	3.3											5.5	3.5	
	7					4.8	2.3	7.8	5.3									6.5	4.1	
	8							7.2	4.3	10.2	7.3							7.4	4.6	
	9							6.6	3.4	9.6	6.4	12.6	9.4					8.3	5.2	
	10									9.0	5.4	12.0	8.4	15.0	11.4	18.1	14.5	9.2	5.8	
	11									8.4	4.4	11.4	7.4	14.4	10.4	17.5	13.5	10.1	6.4	
	12											10.8	6.5	13.8	9.5	16.9	12.6	11.1	7.0	
αA-60SR	5	7.0	3.2	10.6	6.8													10.4	6.8	
	6			9.2	4.6	12.7	8.1											12.5	8.2	
	7					11.2	5.9	18.3	13.0									14.6	9.6	
	8							16.9	10.8	24.0	17.9							16.7	10.9	
	9							15.4	8.6	22.5	15.7	29.6	22.8					18.8	12.3	
	10									21.1	13.5	28.2	20.6	35.3	27.7	42.4	34.8	20.9	13.7	
	11									19.7	11.3	26.8	18.4	33.9	25.5	41.0	32.6	22.9	15.0	
	12											25.3	16.2	32.4	23.3	39.5	30.4	25.0	16.4	
αA-85SR	5	14.2	6.6	21.9	14.3													23.0	15.8	
	6			18.5	9.4	26.2	17.1											27.6	19.0	
	7					22.9	12.3	38.3	27.7									32.2	22.1	
	8							35.0	22.8	50.5	38.3							36.8	25.3	
	9							31.6	18.0	47.1	33.5	62.5	48.9					41.4	28.5	
	10									43.8	28.7	59.2	44.1	74.6	59.5	90.0	74.9	46.0	31.6	
	11									40.5	23.8	55.9	39.2	71.3	54.6	86.7	70.0	50.6	34.8	
	12											52.5	34.4	67.9	49.8	83.3	65.2	55.2	38.0	
αA-105SR	5	32.5	14.0	48.9	30.4													49.2	31.6	
	6			42.2	20.0	58.7	36.5											59.1	38.0	
	7					52.1	26.2	85.0	59.1									68.9	44.3	
	8							78.3	48.7	111.1	81.5							78.7	50.6	
	9							71.7	38.4	104.5	71.2	137.4	104.1					88.6	56.9	
	10									97.8	60.8	130.7	93.7	163.6	126.6	196.5	159.5	98.4	63.3	
	11									91.1	50.4	124.0	83.3	156.9	116.2	189.8	149.1	108.3	69.6	
	12									84.5	40.1	117.4	73.0	150.3	105.9	183.2	138.8	118.1	75.9	
αA-125SR	5	47.9	20.5	72.9	45.5													78.4	52.4	
	6			61.9	29.0	87.9	55.0											94.1	62.8	
	7					76.8	38.5	127.8	89.5									109.7	73.3	
	8							116.8	73.0	167.8	124.0							125.4	83.8	
	9							105.8	56.5	156.8	107.5	208.8	159.5					141.1	94.2	
	10									145.8	91.0	197.8	143.0	248.8	194.0	299.8	245.0	156.8	104.7	
	11									134.8	74.5	186.8	126.5	237.8	177.5	288.8	228.5	172.4	115.2	
	12											175.7	110.0	226.7	161.0	277.7	212.0	188.1	125.7	
αA-140SR	5	84.7	39.3	128.7	83.3													129.0	85.8	
	6			110.6	56.1	154.6	100.1											154.8	102.9	
	7					136.6	73.0	224.6	161.0									180.5	120.1	
	8							206.5	133.8	294.5	221.8							206.3	137.3	
	9							188.5	106.7	276.5	194.7	363.5	281.7					232.1	154.4	
	10									258.4	167.5	345.4	254.5	433.4	342.5	521.4	430.5	257.9	171.6	
	11									240.3	140.4	327.3	227.4	415.3	315.4	503.3	403.4	283.7	188.7	
	12											309.3	200.2	397.3	288.2	485.3	376.2	309.5	205.9	
αA-160R	5	120.0	47.7	187.0	114.7													208.3	139.7	
	6			157.6	70.9	224.6	137.9											250	168	
	7					195.2	94.0	329.2	228.0									292	196	
	8							299.8	184.2	432.8	317.2							333	223	
	9							270.4	140.3	403.4	273.3	537.4	407.3					375	251	
	10									374.0	229.5	508.0	363.5	641.0	496.5	775.0	630.5	417	279	
	11									344.6	185.6	478.6	319.6	611.6	452.6	745.6	586.6	458	307	
	12											449.2	275.7	582.2	408.7	716.2	542.7	500	335	

unit: Nm

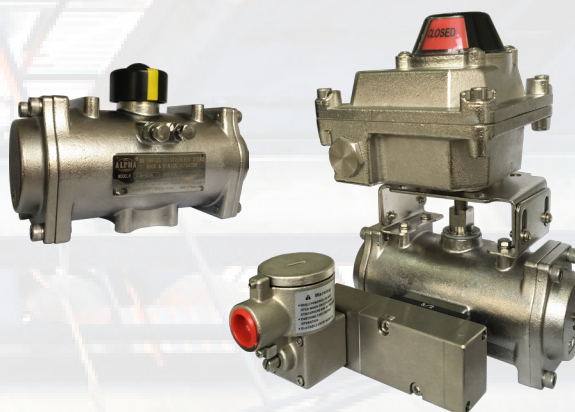
规格(Model)	气源压力(巴) Air pressure(Bar)																		弹簧输出扭矩 Springs' output	
	弹簧根数 (Spring Qty.)	2		2.5		3		4		5		6		7		8				
		0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°			
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End			
αA-190SR	5	220	105	332	222													309	160	
	6			292	161	398	267											371	200	
	7					358	205	571	418									433	240	
	8							531	356	744	569							495	280	
	9							491	295	704	507	917	720					557	320	
	10									664	446	877	658	1090	871	1302	1084	618	360	
	11									624	384	837	597	1050	809	1263	1022	680	400	
	12											797	535	1010	748	1223	960	742	440	
αA-210SR	5	237	126	369	258													360	260	
	6			311	178	442	309											432	313	
	7					384	230	647	493									503	365	
	8							589	413	853	677							575	417	
	9							531	333	795	597	1058	860					647	469	
	10									737	517	1000	780	1263	1043	1526	1306	709	521	
	11									679	437	942	700	1205	963	1468	1226	791	573	
	12											884	620	1147	883	1410	1146	863	625	
αA-240SR	5	341	190	552	409													554	410	
	6			470	297	662	489											665	490	
	7					580	379	964	764									775	575	
	8							883	653	1267	1037							886	656	
	9							800	542	1185	926	1569	1311					998	739	
	10									1103	816	1488	1201	1872	1586	2257	1970	1108	821	
	11									1021	705	1406	1090	1791	1471	2176	1859	1219	903	
	12											1323	979	1708	1363	2093	1748	1330	985	

工作技术条件 Operating Conditions

- 使用介质:
压缩空气、无腐蚀性气体;
- 压力范围:
双作用2~8巴 (Bar) , 单作用2~8巴 (Bar)
- 工作温度:
标准型 (使用丁腈橡胶O型圈) -20℃ ~ +80℃
低温型 (使用低温丁腈橡胶O型圈) -40℃ ~ +80℃
高温型 (使用氟橡胶O型圈) -15℃ ~ +150℃
- 行程调整:
Ab型, 单向 ± 5° 可调;
Ac型, 开关位 ± 5° 可调
- 润 滑:
在正常工作条件下, 不需添加润滑剂;
- 安 装:
适合室内或室外安装;
- 最高使用压力:
输入气压不超过10巴 (Bar) 。
- Operating media
Dry or lubricated air, the non-corrosive gases.
- Air supply pressure
Double acting: 2 ~ 8 Bar; Spring return: 2 ~ 8 Bar
- Operating temperature
Standard: -20℃ ~ +80℃
Low temperature: -40℃ ~ +80℃
High temperature: -15℃ ~ +150℃
- Travel adjustment
Ab model, Have one-way adjustment range of ±5°;
Ac model, Have double adjustment range of ±5°.
- Lubrication
Under normal operating condition, need not accrete lubricant.
- Application
Either indoor or outdoor.
- Highest pressure
The maximum input pressure is 10 Bar.

耗气量 Air Consumption

型号 Model	开向体积 Volume Opening	关向体积 Volume Closing
αA-45	0.08	0.11
αA-60	0.2	0.23
αA-85	0.41	0.55
αA-105	0.94	1.18
αA-125	1.47	1.85
αA-140	2.43	3.2
αA-160	3.65	5.03
αA-190	5.9	7.8
αA-210	7.4	9.7
αA-240	11	13.8



耗气量取决于供气压力、开关行程、体积及动作次数,计算如下:

升/分=气缸体积 (开向体积+关向体积) × [(供气压力 (Kpa) + 101.3) ÷ 101.3] × 次数/分钟

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

L/Min=Air volume(Air volume Opening +Air volume closing)×[(Air Supply(Kpa)+101.3)÷101.3]×Action cycle times (/min)

重量表 Weight Table

型号 Model	αA-45	αA-60	αA-85	αA-105	αA-125	αA-140	αA-160	αA-190	αA-210	αA-240
重量 Weight (DA)	2.0	3.0	6.4	9.7	14.1	20.9	29.9	81.0	92.6	125.7
重量 Weight (SR)	2.1	3.1	6.8	10.5	15.5	23.2	33.6	87.7	102.2	139.5

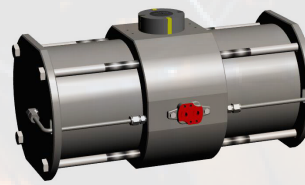
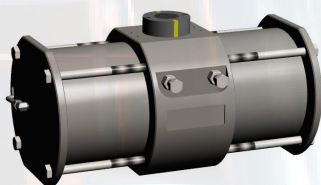
动作时间 Operation Time

型号 Model	αA-45	αA-60	αA-85	αA-105	αA-125	αA-140	αA-160	αA-190	αA-210	αA-240
0°- 90° (DA)	0.5	0.7	0.9	1.5	2	2.5	3.5	4	4.5	6
90°- 0° (DA)	0.5	0.7	0.8	1.5	2	2.5	3	5	5	6
0°- 90° (SR)	1	1.5	2	2.5	3	3.5	4	5	6	8
90°- 0° (SR)	0.5	0.8	1	1	1	1.5	1.5	4	5	5

执行器动作时间与电磁阀、减压阀、气管等配件的Cv值, 气源压力, 负载等因素有关。
我们可以根据客户要求定制气孔来改变执行器的作动时间。

The operating time of the actuators depends on the CV values of the solenoid valves, regulator valves, pipes. It depends on the air supply, operating load and so on.

We can custom the size of the holes to meet the require of the operating time of the actuators.



ST.HANS GROUP



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