



# ARA

## 系列不锈钢气动执行器

### ARS SERIES PNEUMATIC ACTUATORS

无锡爱圣拓克流体控制有限公司  
Ascend Torque Flow Controls Co., Ltd.



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爱圣拓克是中国较早研制、开发和生产齿轮齿条式气动执行器的工厂之一。经过近多年的改革与创新，爱圣拓克正向世界各地供应高质量的气动执行器和阀门控制产品。

为了给客户创造价值，爱圣拓克坚持不断改进并引进先进的生产工艺，严格控制产品质量。高精度的加工中心和专业的产品研发团队，为产品质量的可靠性、稳定性提供了有力保障，同时也保证了新产品研发的质量和效率。

公司本着“传承匠心，融合创新”的核心理念，竭诚为新老客户提供更周到的服务，更专业的技术，更卓越的产品。

ASCEND TORQUE is a professional manufacturer of rack & pinion pneumatic actuator. With many years reform and innovation, ASCEND TORQUE is supplying the high-quality pneumatic actuators and other valve control products to all over the world.

To create customer value, ASCEND TORQUE continues to improve and introduce advanced production technology and strict control of product quality all the time. The world class production equipment and professional engineering team provides strong guarantee for the reliability and stability of product quality, and also for the quality and efficiency of researching and developing new products.

ASCEND TORQUE will offer all of our new and regular customers more attentive service, more professional technology and more excellent products.

## 技术特点/Design and Feature

输出扭矩范围广。我们总共有8种不同尺寸(规格)的执行机构可供选择。在5Bar气源压力下的输出扭矩范围从15Nm到1330Nm。ARA-210DA不锈钢执行机构具有2128Nm的输出扭矩。

Wide scope of output torque. Totally, we have 8 different size (specifications) actuators for choice. The output torque range is from 15Nm to 1330Nm at 5 Bar. The ARA-210DA stainless steel actuator has an output torque of 2128Nm.



优秀的耐蚀性。ARA系列执行机构的主要部件及其附件均采用不锈钢制造。阀体和端盖采用熔模铸造不锈钢制造。CF8(304)和CF8M(316)可供选择。根据需要，齿轮和紧固件由304或316制成。近20年的使用经验证明，这种不锈钢气动材料对绝大多数腐蚀性化学品(如酸、碱)以及海洋、油气平台、制药、食品等腐蚀性工业环境具有优异的耐腐蚀性。

Excellent corrosion resistance. All main parts of ARA series actuator and its accessories are made from stainless steel. The body and end-caps is made by investment casting stainless steel. The CF8 (304) and CF8M (316) are available for choice. The pinion and fastening are made by 304 or 316 on requiring. Nearly 20 years experience of application proved that this kind of stainless steel pneumatic is able to offer excellent resistance to most corrosive chemicals (such as acid, alkali) as well as corrosive industry atmospheres, such as offshore, oil and gas platform, pharmaceutical and food industry.



镍磷合金、高精度一体式驱动轴同时符合NAMUR、ISO5211/DIN3337标准。可根据客户要求定制尺寸和不锈钢材料。

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

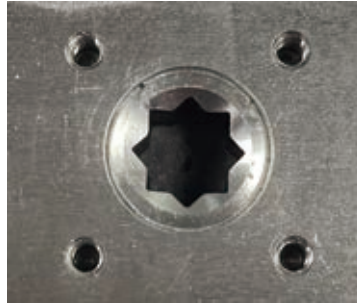


符合Namur和ISO5211安装标准。ARA系列不锈钢气动执行机构适用于电磁阀、限位开关和定位器的Namur安装，并提供ISO5211组合安装垫片，可直接安装到四分之一转阀门上。

Namur and ISO5211 Mount. ARA series Stainless Steel Pneumatic Actuators are designed to incorporate Namur mounting for solenoids, limit switches and positioners and offer a ISO5211 combination mounting pads that allow you to mount directly to quarter turn valves.



轴顶部/Top of shaft



底部连接/Bottom connection



标准气源接口/Air connection

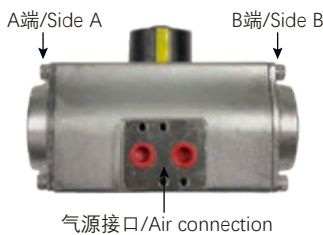
单作用高性能弹簧。预压缩涂层弹簧采用优质材料制成，具有耐腐蚀、使用寿命长等特点，安装拆卸安全方便，可通过更换弹簧数量，满足不同扭矩要求。

Single acting with high performance springs. Preloaded coating springs are made from the high quality material for resistant to corrosion and longer cycle life, which can be demounted safely and conveniently to satisfy different requirements of torque by changing quantity of springs.



高性能弹簧/Springs

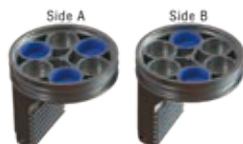
### 弹簧配置/Spring Set Configuration



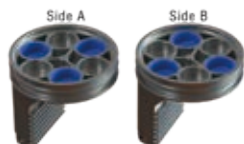
气源接口/Air connection

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。

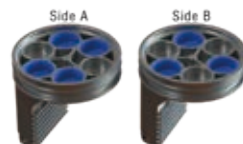
During selecting the spring return actuators, we can choose the more reasonable and more economical actuators, if we know the different torques of the valve at opening, operating and closing.



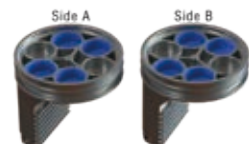
5根弹簧/SR5



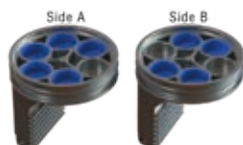
6根弹簧/SR6



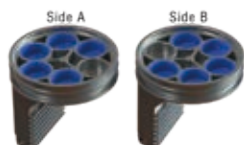
7根弹簧/SR7



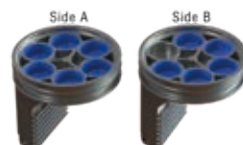
8根弹簧/SR8



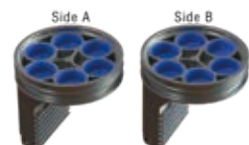
9根弹簧/SR9



10根弹簧/SR10



11根弹簧/SR11



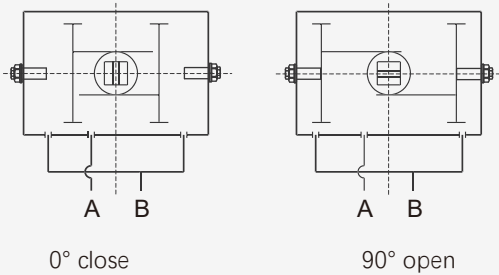
12根弹簧/SR12



## 工作原理/Operating Principle

### 双作用执行器 Double Acting Actuators

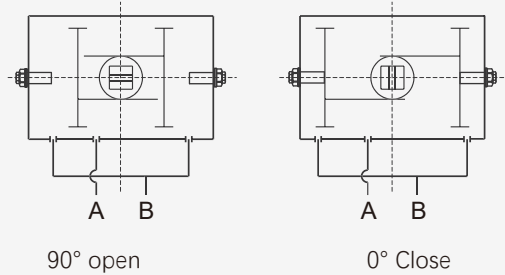
#### CCW (Standard)



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 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.

#### CW

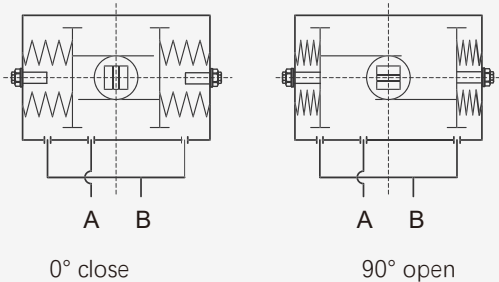


A口进气, 压缩空气推动活塞向外运动, 使执行器输出轴顺时针旋转( $90^\circ \rightarrow 0^\circ$ ), B口排气。B口进气, 压缩空气推动活塞向内运动, 使执行器输出轴逆时针旋转( $0^\circ \rightarrow 90^\circ$ ), A口排气。

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.

### 单作用执行器 Spring Return Actuators

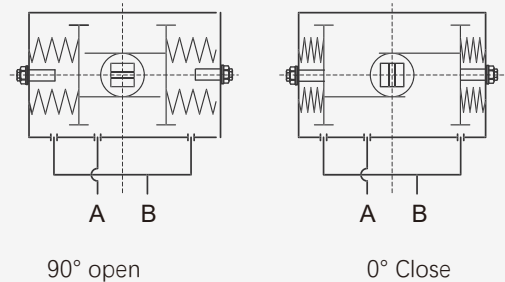
#### FC-CCW (Standard)



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。

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.

#### FO-CW

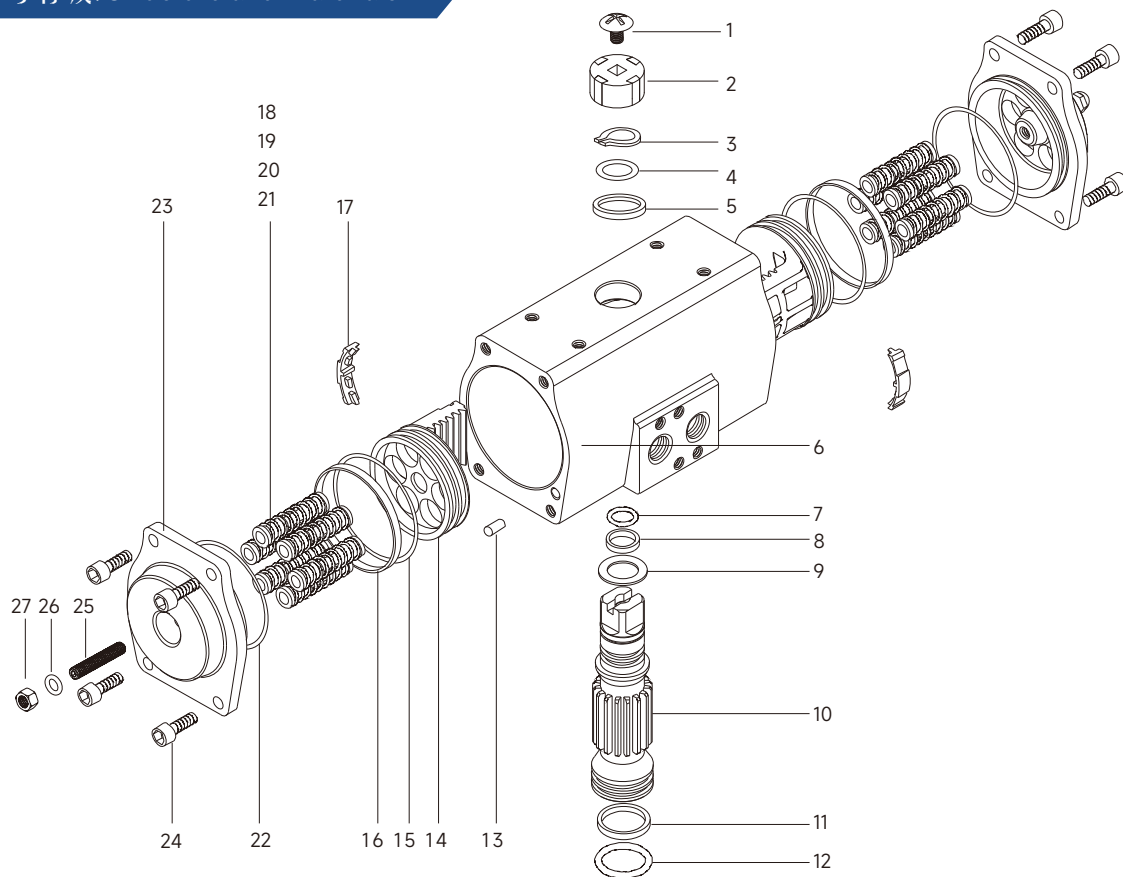


A口进气, 压缩空气克服弹簧力, 推动活塞向外运动, 执行器输出轴顺时针转动( $90^\circ \rightarrow 0^\circ$ ), B口排气; 执行器失气, 活塞在弹簧力的作用下向内运动, 执行器输出轴逆时针转动( $0^\circ \rightarrow 90^\circ$ ), A口排气。

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.



部件与材质/Structure and Materials

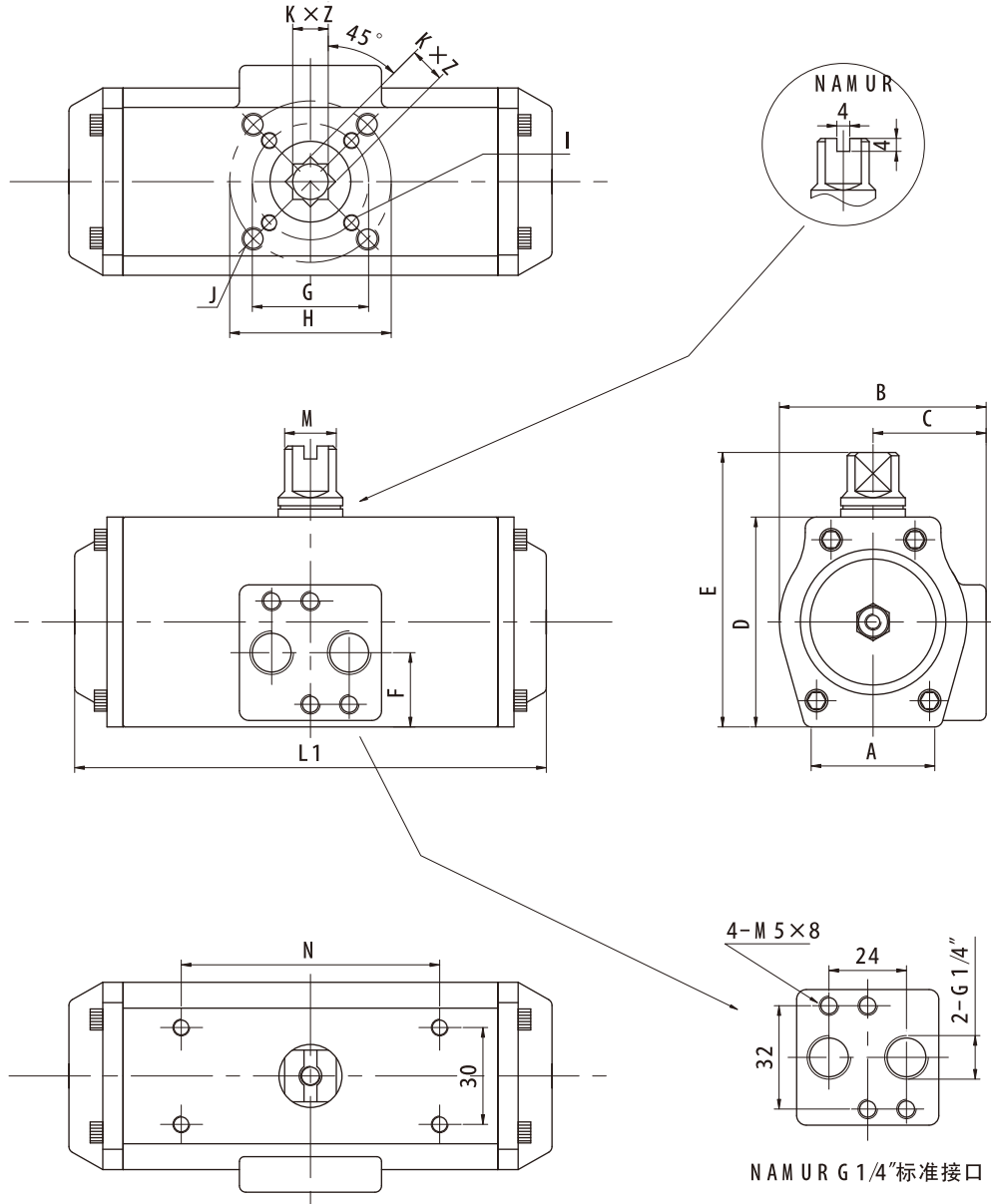


序号 No.	名称 Description	数量 Qty.	材料 Standard Material
1	指示器螺钉 Indicator screw	1	塑料 Plastic(ABS)
2	指示器 Indicator	1	塑料 Plastic(ABS)
3	弹性挡圈 Circlip	1	不锈钢 Stainless steel(304/316)
4	垫片 Thrust washer	1	不锈钢 Stainless steel(304/316)
5	外垫片 Outside washer	1	工程塑料 Polyoxymethylene
6	缸体 Body	1	不锈钢 Stainless steel(304/316)
7	上轴"O"型圈 O-ring(Pinion top)	1	氟橡胶、丁腈橡胶 Viton/NBR
8	上轴支承圈 Bearing(Pinion top)	1	工程塑料 Polyoxymethylene
9	内垫片 Inside washer	1	工程塑料 Polyoxymethylene
10	轴 Pinion	1	不锈钢 Stainless steel(304/316)
11	下轴支承圈 Bearing(Pinion bottom)	1	工程塑料 Polyoxymethylene
12	下轴"O"型圈 O-ring(Pinion bottom)	1	氟橡胶、丁腈橡胶 Viton/NBR
13	塞头 Plug	2	氟橡胶、丁腈橡胶 Viton/NBR
14	活塞 Piston	2	不锈钢 Stainless steel(304/316)

序号 No.	名称 Description	数量 Qty.	材料 Standard Material
15	活塞"O"型圈 O-ring( Piston)	2	氟橡胶、丁腈橡胶 Viton/NBR
16	活塞支承圈 Bearing(Piston)	2	工程塑料 Polyoxymethylene
17	活塞导板 Guide(Piston)	2	尼龙66 Nylon66
18	弹簧 Spring	*	弹簧钢 Spring steel
19	弹簧左套 Spring Retainer(L)	*	尼龙66 Nylon66
20	弹簧右套 Spring Retainer(R)	*	尼龙66 Nylon66
21	弹簧套连杆 Retainer Connector	*	铜 Brass
22	端盖"O"型圈 O-ring( End-Cap)	2	氟橡胶、丁腈橡胶 Viton/NBR
23	端盖 End-Cap	2	不锈钢 Stainless steel(304/316)
24	端盖紧固螺钉 End-Cap Screw	8	不锈钢 Stainless steel(304/316)
25	调节螺杆 Adjust Screw	2	不锈钢 Stainless steel(304/316)
26	调节螺杆"O"型圈 O-ring( Adjust Screw)	2	氟橡胶、丁腈橡胶 Viton/NBR
27	调节螺杆螺母 Nut( Adjust Screw)	2	不锈钢 Stainless steel(304/316)



外形尺寸/Dimensions



单位:毫米/Unit: mm

Model 规格	A	B	C	D	E	F	G	H	I	J	K	L1	M	N	Z	Air Connection 接口螺纹
ARA-45	48	69	40	65	85	23	Φ 36	Φ 50	M5x6	M6x10	11	148	16	80	14	G1/4"(NPT)
ARA-60	58	79	44	81	101	23		Φ 50		M6x10	14	167.4	16	80	18	G1/4"(NPT)
ARA-85	75	101.5	53	108	128	24	Φ 50	Φ 70	M6x9	M8x12	17	196	16	80	21	G1/4"(NPT)
ARA-105	92	121.5	62	133	153	24		Φ 70		M8x13	22	250	16	80	26	G1/4"(NPT)
ARA-125	96	140	72	155	185	28	Φ 70	Φ 102	M8x13	M10x16	22	284	22	130	26	G1/4"(NPT)
ARA-140	112	153.2	77.2	171.5	201.5	34	Φ 102	Φ 125	M10x16	M12x20	27	360	22	130	31	G1/4"(NPT)
ARA-160	127	173	87	197	227	39	Φ 102	Φ 125	M10x16	M12x20	27	418	22	130	31	G1/4"(NPT)
ARA-210	144	226	110	255	285	45		Φ140		M16x25	36	530	32	130	40	G1/4"(NPT)



技术数据/Technical Data

重量表/Weight

单位: 公斤/Unit: KG

型号 Model	ARA-45	ARA-60	ARA-85	ARA-105	ARA-125	ARA-140	ARA-160	ARA-210
Weight(SR)	2.65	4.1	7	12.6	19.2	27.3	37.6	100
Weight(DA)	2.51	3.85	6.35	11.9	18	24.8	35.8	91

耗气量/Air Consumption

单位: 升/Unit: L

型号 Model	ARA-45DA	ARA-63DA	ARA-83DA	ARA-105DA	ARA-125DA	ARA-140DA	ARA-160DA	ARA-210DA
开向体积 Volume Opening	0.08	0.2	0.41	0.94	1.47	2.43	3.65	7.4
关向体积 Volume Closing	0.11	0.23	0.55	1.18	1.85	3.2	5.03	9.7

工作时间/Operating Time

单位: 秒/Unit:S

双作用 Double Acting			单作用 Spring Return																
规格 Size	0°-90°	90°-0°	规格 Size	弹簧根数 Springs															
				3+3		3+4		4+4		4+5		5+5		5+6		6+6			
				0°-90°	90°-0°	0°-90°	90°-0°	0°-90°	90°-0°	0°-90°	90°-0°	0°-90°	90°-0°	0°-90°	90°-0°	0°-90°	90°-0°		
45DA	0.55	0.47	45SR	2.35	0.37	2.37	0.36	2.39	0.35	2.41	0.33	2.43	0.31	2.45	0.29	2.47	0.27		
65DA	0.66	0.58	65SR	2.54	0.56	2.56	0.54	2.58	0.52	2.6	0.5	2.62	0.48	2.64	0.46	2.66	0.44		
85DA	0.83	0.73	85SR	2.71	0.73	2.73	0.71	2.75	0.69	2.77	0.67	2.79	0.65	2.81	0.63	2.83	0.61		
105DA	1.35	1.3	105SR	3.14	0.91	3.16	0.89	3.18	0.87	3.2	0.85	3.22	0.83	3.24	0.81	3.26	0.79		
125DA	2.4	1.79	125SR	4.24	1.2	4.26	1.18	4.28	1.16	4.3	1.14	4.32	1.12	4.34	1.1	4.36	1.08		
140DA	2.5	2.1	140SR	4.4	1.35	4.4	1.33	4.62	1.31	4.64	1.29	4.66	1.27	4.68	1.25	4.68	1.22		
160DA	3.93	2.6	160SR	4.74	1.77	4.76	1.75	4.78	1.73	4.8	1.71	4.82	1.69	4.82	1.67	4.84	1.65		
210DA	5.5	4.35	210SR	8.25	4.8	8.4	4.6	8.42	4.58	8.44	4.56	8.46	4.54	8.48	4.52	8.5	4.5		





## 工作条件/Operating Conditions

### 1. 工作介质/Operating Media:

经过滤直径小于40μm的干燥、润滑的空气，或非腐蚀性气体。

Dry and lubricated air, or non-corrosive gas. The maximum particle diameter must be less than 40μm.

### 2. 气源压力/Air Supply Pressure:

工作气源压力2~8巴/The minimum supply pressure is 2 Bar . The maximum supply pressure is 8 Bar.

### 3. 工作温度/Operating Temperature:

标准/Standard (NBR O-ring): -20°C ~ 80°C (-4°F ~ 175°F);

低温/Low Temperature (L NBR O-ring): -35°C ~ 80°C (-30°F ~ 175 °F);

高温/High Temperature (Viton O-ring): -15°C ~ 150°C (5°F ~ 300°F).

### 4. 行程调节/Travel adjustment:

±5°的调节范围/Have adjustment range of ± 5° for the rotation at 0° and 90°

### 5. 润滑/Lubrication:

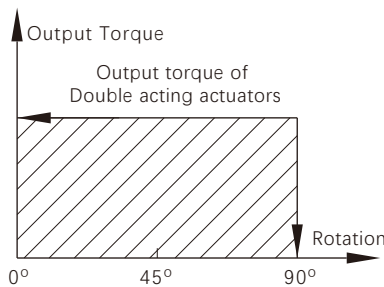
在正常操作条件下，无需添加润滑剂

Under normal operating condition, need not accrete lubricant.

### 6. 最大压力/Highest pressure:

最大输入压力10巴/The maximum input pressure is 10 Bar.

## 双作用输出扭矩/For Double Acting Actuator Output Torque

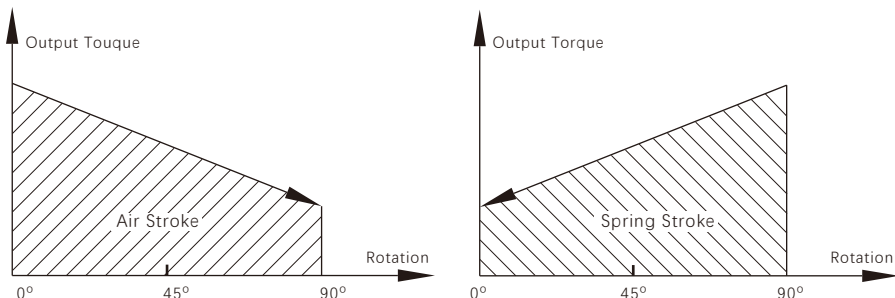


单位:牛米/Unit:Nm

规格 Model	2 bar	2.5 bar	3 bar	3.5 bar	4 bar	4.5 bar	5 bar	5.5 bar	6 bar	7 bar	8 bar
ARA-45DA	6	7.6	9.1	10.6	12.1	13.6	15.1	16.6	18.1	21.1	24.2
ARA-60DA	14.6	18.2	21.9	24.9	29.2	32.8	36.5	40.1	43.8	51.1	58.4
ARA-85DA	31.4	39.2	47	53.9	62.7	70.5	78.4	86.2	94.1	109.7	125.4
ARA-105DA	66.1	82.7	99.2	115.2	132.2	148.8	165.3	181.8	198.4	231.4	264.5
ARA-125DA	100.3	125.4	150.5	179.6	200.6	225.7	250.8	275.9	301	351.1	401.3
ARA-140DA	171	213.8	256.5	306.8	342	384.8	427.5	470.3	513	598.5	684
ARA-160DA	266	332.5	399	467.8	532	598.5	665	731.5	798	931	1064
ARA-210DA	532	665	798	920.5	1064	1197	1330	1463	1596	1862	2128



单作用输出扭矩/Spring Return Actuators Output Torque



单位:牛米/Unit:Nm

规格(Model)	弹簧根数 Spring Qty.	气源压力(巴) Air pressure(Bar)																弹簧输出扭矩 Spring's output	
		2		2.5		3		4		5		6		7		8		90°	0°
		0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°		
ARA-45SR	5	3	1.2	4.6	2.8													4.6	2.9
	6	2.3	0.2	3.9	1.8	5.4	3.3											5.5	3.5
	7			3.3	0.8	4.8	2.3	7.8	5.3									6.5	4.1
	8					4.2	1.3	7.2	4.3	10.2	7.3	13.5	10.7					7.4	4.6
	9							6.6	3.4	9.6	6.4	12.6	9.4					8.3	5.2
	10							6	2.4	9	5.4	12	8.4	15	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									7.8	3.5	10.8	6.5	13.8	9.5	16.9	12.6	11.1	7
ARA-60SR	4	9.2	6.3	12.8	9.9	16.5	13.6	23.8	20.9									8.3	5.4
	5			11.4	7.7	15	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	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							15.5	8.2	22.8	15.6	30	22.8	37.3	30.1	44.7	37.4	20.9	13.7
	11									21.5	13.5	28.7	20.7	36	28	43.3	35.3	22.9	15
ARA-85SR	4	18.7	13	26.5	20.8	34.3	28.6	50	44.3									18.4	12.7
	5			23.7	16.1	31.1	24	46.8	37.9									23	15.8
	6			20.1	11.5	28	19.3	43.7	35.1	59.4	50.7							27.6	19
	7			17	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	65.6	52.6	81.2	68.3			41.4	28.5
	10							31	16.6	46.7	32.3	62.4	48	78.1	63.7	93.8	79.3	46	31.6
	11									43.6	27.7	59.3	43.4	75	59.1	90.6	74.8	50.6	34.8
ARA-105SR	4	40.8	26.7	57.4	43.3	73.9	59.8	107	92.8									39.4	25.3
	5			51	33.4	67.5	49.9	101	83									49.2	31.6
	6			44.7	23.5	61.1	40	94.2	73.2	127.3	106							59.1	38
	7			38.4	13.7	54.9	30.3	87.9	63.4	121	96.4							68.9	44.3
	8					48.5	20.4	81.6	53.5	114.7	86.5	147.7	120	180.8	152.7			78.7	50.6
	9							75.3	43.7	108.4	76.8	141.5	110	174.5	142.9			88.6	56.9
	10							68.9	33.4	102	66.5	135.1	99.6	168.2	132.6	201.2	165.7	98.4	63.3
	11									95.7	57	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	



规格(Model)	弹簧根数 Spring Qty.	气源压力(巴) Air pressure(Bar)																弹簧输出扭矩 Spring's output		
		2		2.5		3		4		5		6		7		8		90°	0°	
		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	Start	End	Start	End	
ARA-125SR	4	58.7	37.1	83.8	62.2	109	87.3	159	137									63.2	41.6	
	5			73	47	98	72	148	122									79	52	
	6			63	31	88	56	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	
	ARA-140SR	4	102	67.8	145	111	188	153	273	239									103.2	68.8
		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	
ARA-160SR		4	154	99.6	221	166	287	233	420	366									166.4	112
		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	332	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	
	ARA-210SR	4	312	228	445	361	578	494	844	760									304	220
		5			390	285	523	418	789	684									380	275
		6			335	209	468	342	734	608	1000	874							456	330
7				180	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	
11										725	494	991	760	1257	1026	1523	1292	836	605	
12										670	418	936	684	1202	950	1468	1216	912	660	

选型/How To Order

选型示例/Example: ARA-83SR10 FC-CCW HT

1 ARA	2 83	3 SR10	4 BLANK	5 FC-CCW	6 HT	7 BLANK
产品代号 Series	型号 Model	类型 Type	行程 Travel	装配类型 Assembly	工作温度 Operating Temperature	连接 Connection
ARA	45 52 400	DA SR10*	BLANK(90)	FC-CCW CCW .	标准型 BLANK: -20°C~+80°C 高温型 HT: -20°C~+150°C 低温型 LT: -40°C~+120°C	标准 BLANK (Standard) Options*
		*SR+Spring Qty. 弹簧数量				*示例/Example: F04_DS11.30*80_H30

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Pioneering Excellence

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