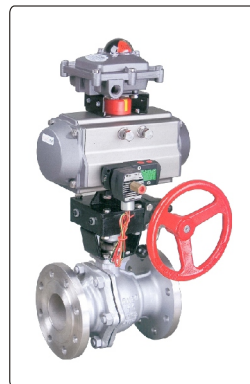
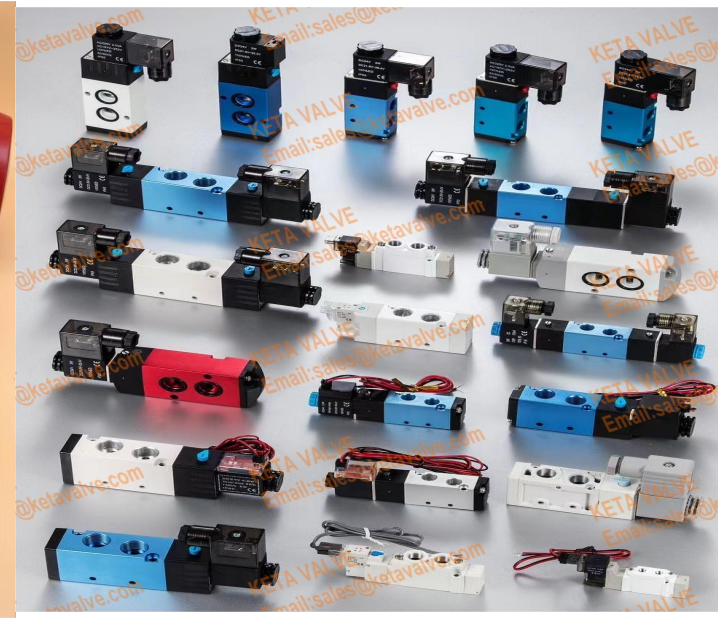


气动执行器
Pneumatic Actuators



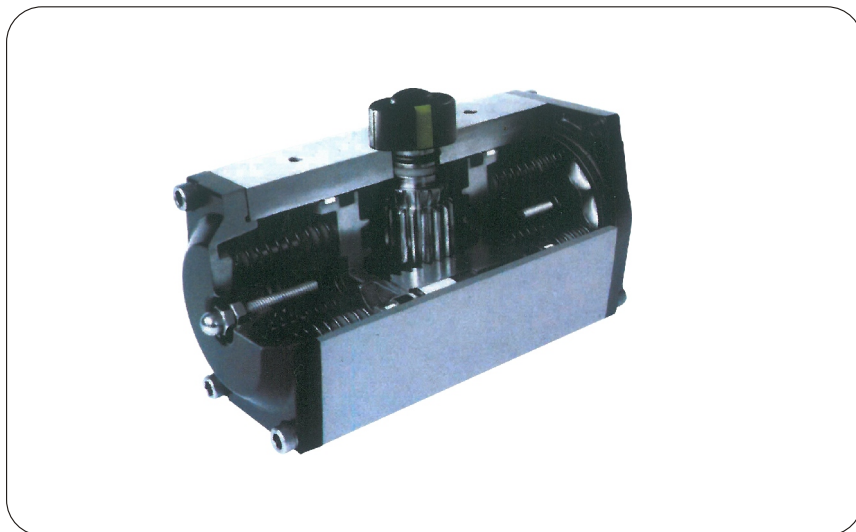


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ketavsc®



B系列 B Series



C系列 C Series



耗气量计算 Air Consumption

耗气量取决于供气压力、开关行程、体重及动作次数，计算如下：

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

Air consumption rest with air supply. Air volume and action cycle times, expressions

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

Unit:L

型号 Model	开向体积(升) Volume opening	关向体积(升) Volume closing	型号 Model	开向体积(升) Volume opening	关向体积(升) Volume closing
DA-32	0.04	0.04	DA-210	7.4	9.7
DA-45	0.08	0.11	DA-240	10.7	14.3
DA-52	0.11	0.14	DA-270	16.9	22.5
DA-63	0.20	0.23	DA-300	23.8	29.7
DA-75	0.29	0.38	DA-350	35.1	46.3
DA-83	0.41	0.55	DA-400	52.6	36
DA-92	0.62	0.91	DA-450		
DA-105	0.94	1.18	DA-500		
DA-125	1.47	1.85	DA-550		
DA-140	2.43	3.20	DA-600		
DA-160	3.65	5.03	DA-700		
DA-190	5.9	7.9	DA-800		

B系列重量表 B Series Weight Table

型号 Model	45	52	63	75	83	92	105	125
Weight(SR)	1.12kg	1.20kg	1.85kg	2.40kg	3.25kg	5.10kg	6.10kg	10.40kg
Weight(DA)	1.05kg	1.07kg	1.70kg	2.18kg	2.95kg	4.35kg	5.35kg	9.40kg

型号 Model	140	160	190	210	240	270	300	350	400
Weight(SR)	14.70kg	21.90kg	34.70kg	43.90kg	62.00kg	88.80kg	130.00kg	234.40kg	360.40kg
Weight(DA)	12.90kg	18.90kg	29.50kg	36.20kg	50.70kg	71.10kg	110.00kg	186.50kg	289.00kg

C系列重量表 C Series Weight Table

型号 Model	52	63	75	83	92	105	125
Weight(DA)	1.38kg	2.03kg	2.70kg	3.13kg	4.60kg	6.77kg	8.90kg
Weight(SR)	1.45kg	2.05kg	2.90kg	3.60kg	5.22kg	6.85kg	10.10kg

型号 Model	140	160	190	210	240	270
Weight(DA)	13.25kg	20.14kg	31.30kg	46.80kg	67.28kg	96.90kg
Weight(SR)	15.55kg	24.00kg	35.25kg	54.80kg	80.20kg	118.00kg

连接配件 Mounting accessories

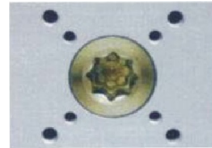
气动执行器性能、结构和设计特点
Design & Construction of Pneumatic Actuators



气源接口符合NAMUR标准，可简单地安装电磁阀。
Air supply connection is designed in accordance with NAMUR Standard to install solenoid valves



输出轴的NAMUR标准槽和缸体上都标准安装孔，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

产品序列号、气源接口及底部安装孔全部电脑打字，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.

- ◆ 挤压铝质（ASTM6005）缸体，内表面细磨精加工，内部和外部均采用高级防腐技术，气缸摩擦系数小，使用寿命长，抗腐蚀性能力强。
- ◆ 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，动作准确、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。
- ◆ 高精度齿轮和齿条，啮合间隙小、精度高，输出功率大。
- ◆ 不锈钢紧固件，安全美观，抗腐蚀性强。
- ◆ 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ISO5211、DIN3337标准，方便安装电磁阀限位开关等附件。



- ◆ Extruded aluminum ASTM6005 body with both internal and external corrosion protection having honed cylinder surface for longer life and low coefficient of friction.
- ◆ 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.
- ◆ Fully machined teeth on piston and pinion for accurate low backlash rack and pinion engagement, maximum efficiency, stainless steel fasteners for long term corrosion resistance.
- ◆ Full conformance to the latest specifications: ISO5211, DIN3337 and Namur or product interchange ability and easy mounting of solenoids, limit switches and other accessories.

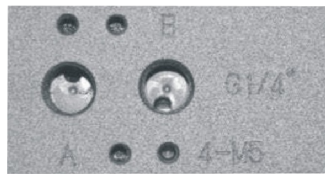


◆ 齿轮齿条式结构气动执行器。产品广泛应用于各个领域，是球阀、蝶阀等良好的驱动装置，品质卓越的。产品符合Namur,ISO5211标准，产品通过ISO9001:2000及CE认证。

◆ Has a complete line of rack and pinion actuators, which is the best choice for butterfly and ball valves control. Reliable, readily available products supplying in a broad variety of operating environments. Our products are Namur & ISO5211 compliant and are manufactured under ISO9001:2000 certification and are CE approved.



NAMUR 标准转接板，适用于45-105规格执行器，用于NAMUR电磁阀的直接安装。
NAMUR standard adapters suit for pneumatic actuators size SR/DA45-105 connecting with NAMUR solenoid valve.

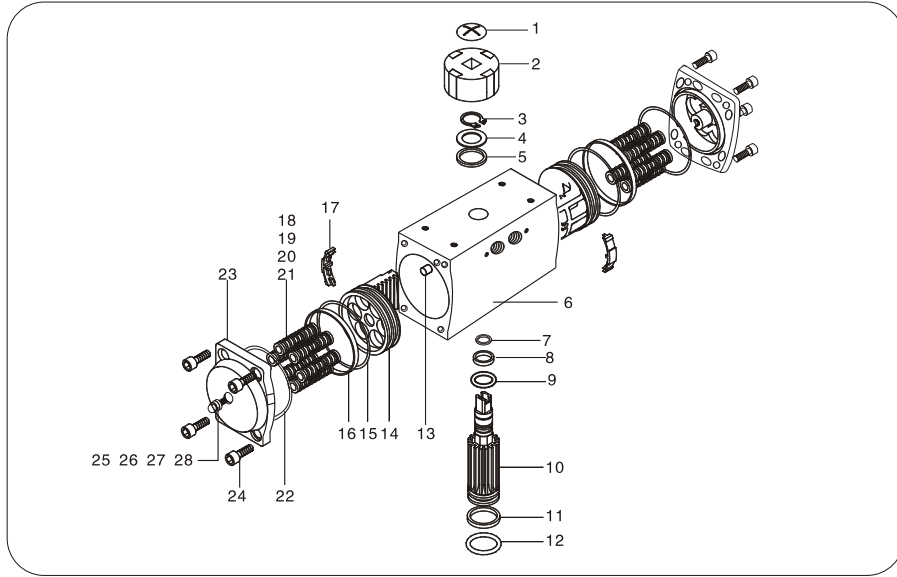


多种规格转接套，为执行器输出轴的连接尺寸提供多种选择。
Variety of insert adapter specification provide with multif choices for the actuator shaft sizes.

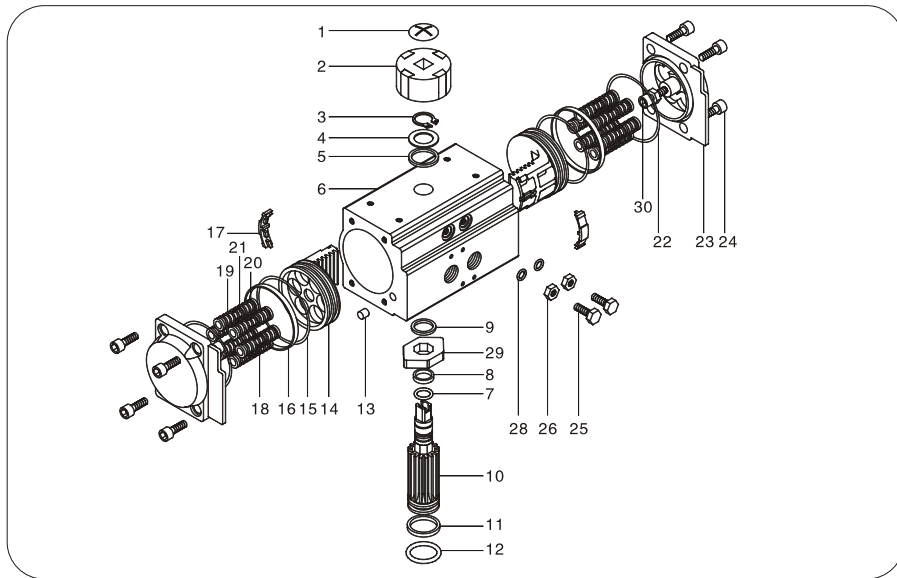


零件和材料 Parts and Material

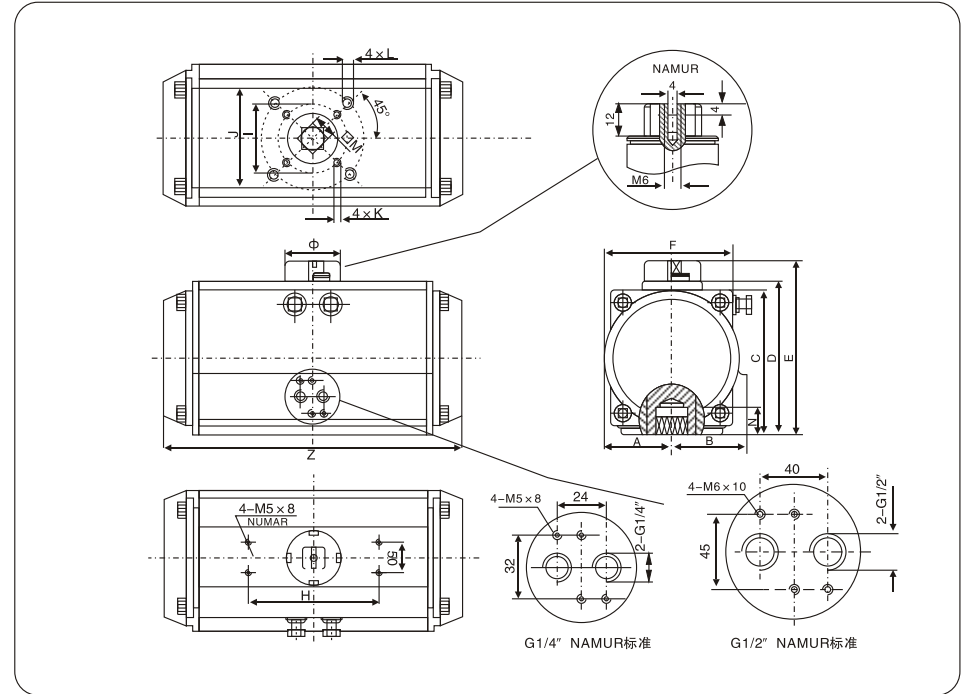
B系列 B Series



C系列 C Series



C系列执行器安装尺寸 C serie actuator dimension table

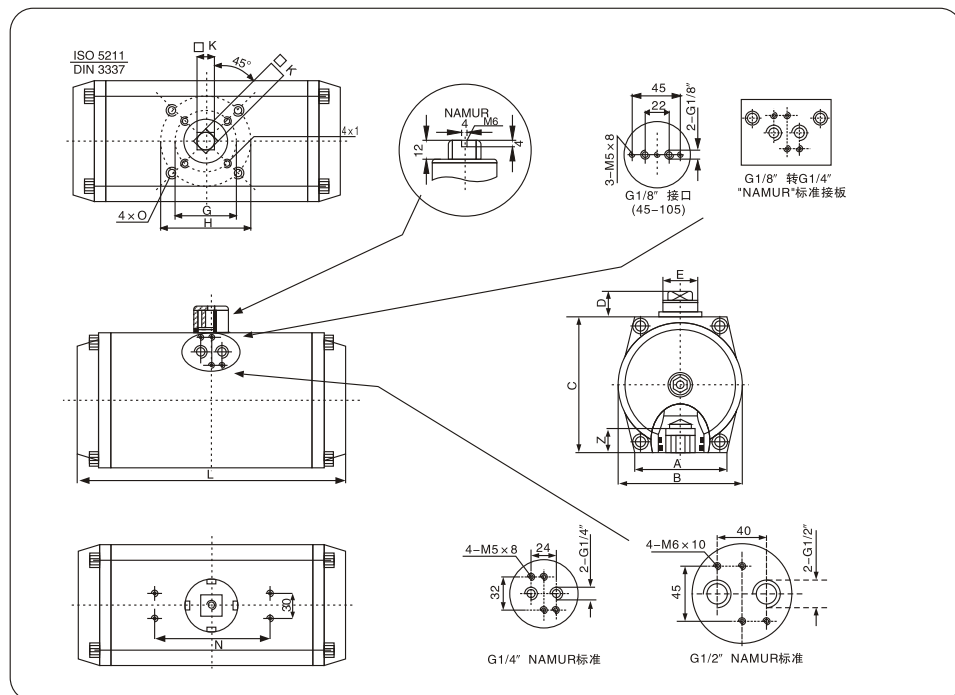


尺寸表 Dimension table

单位 Unit: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
DA/SR-52	30	41.5	65.5	72	92	65	30	80	Φ36	Φ50	M5 × 8	M6 × 10	11	14	147	Φ40	NAMUR G1/4"
DA/SR-63	36	47	81	87.5	107.5	72	30	80	Φ50	Φ70	M6 × 10	M8 × 13	14	18	168	Φ40	NAMUR G1/4"
DA/SR-75	42	53	94	99.5	119.5	81	30	80	Φ50	Φ70	M6 × 10	M8 × 13	14	18	184	Φ40	NAMUR G1/4"
DA/SR-83	46	57	98.5	108.7	128.7	92	30	80	Φ50	Φ70	M6 × 10	M8 × 13	17	21	204	Φ40	NAMUR G1/4"
DA/SR-92	50	58.5	111	116.5	136.5	98	30	80	Φ50	Φ70	M6 × 10	M8 × 13	17	21	262	Φ40	NAMUR G1/4"
DA/SR-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"
DA/SR-125	67.5	74.5	145.5	155	185	127.5	30	130	Φ70	Φ102	M8 × 13	M10 × 16	22	26	301	Φ55	NAMUR G1/4"
DA/SR-140	75	77	161	172	202	137.5	30	130	Φ102	Φ125	M10 × 16	M12 × 20	27	31	390	Φ55	NAMUR G1/4"
DA/SR-160	87	87	184	197	227	158	30	130	Φ102	Φ125	M10 × 16	M12 × 20	27	31	458	Φ55	NAMUR G1/4"
DA/SR-190	103	103	216	230	260	189	30	130		Φ140		M16 × 25	36	40	525	Φ80	NAMUR G1/4"
DA/SR-210	113	113	235.5	255	285	210	30	130		Φ140		M16 × 25	36	40	532	Φ80	NAMUR G1/4"
DA/SR-240	130	130	264.5	289	319	245	30	130		Φ165		M20 × 25	46	50	602	Φ80	NAMUR G1/4"
DA/SR-270	147	147	299	326	356	273	30	130		Φ165		M20 × 25	46	50	722	Φ80	NAMUR G1/2" (NAMUR G1/4")

B系列执行器安装尺寸 B series actuator dimension table



尺寸表 Dimension table

单位 Unit:mm

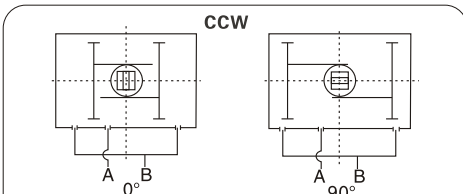
型号 Model	A	B	C	D	E	G	H	I	K	L	N	O	Z	接口螺纹 Air Connection
DA/SR-45	48	58	65	20	14	φ36	φ50	M5×8	11	150	80	M6×10	14	G1/8"
DA/SR-52	50	59	74	20	14	φ36	φ50	M5×8	11	150	80	M6×10	14	G1/8"
DA/SR-63	60	72	88	20	18	φ50	φ70	M6×10	14	173	80	M8×13	18	G1/8"
DA/SR-75	65	83	100	20	18	φ50	φ70	M6×10	14	187	80	M8×13	18	G1/8"
DA/SR-83	68	91	110	20	18	φ50	φ70	M6×10	17	214	80	M8×13	21	G1/8"
DA/SR-92	79	104	120	20	25	φ50	φ70	M6×10	17	265	80	M8×13	21	G1/8"
DA/SR-105	84	114	132.5	20	25	φ70	φ102	M8×13	22	276	80	M10×16	26	G1/8"
DA/SR-125	103	137	160	30	40	φ70	φ102	M8×13	22	306	130	M10×16	26	NAMUR G1/4"
DA/SR-140	107	150	170	30	40	φ102	φ125	M10×16	27	400	130	M12×20	31	NAMUR G1/4"
DA/SR-160	110	172	197	30	40	φ102	φ125	M10×16	27	465	130	M12×20	31	NAMUR G1/4"
DA/SR-190	115	206	226	30	60	φ140			36	530	130	M16×20	40	NAMUR G1/4"
DA/SR-210	135	226	260	30	60	φ140			36	536	130	M16×25	40	NAMUR G1/4"
DA/SR-240	155	256	290	30	60	φ165			46	602	130	M20×25	50	NAMUR G1/4"
DA/SR-270	172	294	320	30	60	φ165			46	715	130	M20×25	50	NAMUR G1/2"
DA/SR-300	196	324	348	30	60	φ165			46	742	130	M20×25	50	NAMUR G1/2"
DA/SR-350	220	380	408	30	60	φ165			46	860	130	M20×25	50	NAMUR G1/2"

零件和材料 Parts and Material

序号	名称	数量	材料	No.	Description	Qty	Standards Material
1	指示器螺钉	1	不锈钢	1	Indicator Screw	1	Stainless steel
2	指示器	1	塑料	2	Indicator	1	Plastic
3	弹性挡圈	1	不锈钢	3	Snap Ring	1	Stainless steel
4	垫片	1	不锈钢	4	Washer	1	Stainless steel
5	外垫片	1	工程塑料	5	Outside Washer	1	Engineering Plastics
6	缸体	1	铝合金	6	Body	1	Alluminum Alloy
7	上轴"O"型圈	1	氟橡胶、丁腈橡胶	7	O-ring(Top)	1	Viton/NBR
8	上轴支承圈	1	工程塑料	8	Bearing Top	1	Engineering Plastics
9	内垫片	1	工程塑料	9	Inside Washer	1	Engineering Plastics
10	轴	1	合金钢	10	Pinion	1	Alloy steel
11	下轴支承圈	1	工程塑料	11	Bearing Bottom	1	Engineering Plastics
12	下轴"O"型圈	1	氟橡胶、丁腈橡胶	12	O-ring Bottom	1	Viton/NBR
13	塞头	2	橡胶	13	Plug	2	NBR
14	活塞	2	压铸铝/铸钢	14	Piston	2	Die-casting aluminum/steel
15	活塞"O"型圈	2	氟橡胶、丁腈橡胶	15	Piston O-ring	2	Viton/NBR
16	活塞支承圈	2	工程塑料	16	Piston Bearing	2	Engineering Plastics
17	活塞导板	2	尼龙66	17	Guide Piston	2	Nylon 66
18	弹簧	*	弹簧钢	18	Spring	*	Spring steel
19	弹簧左套	*	尼龙66	19	Spring Retainer(L)	*	Nylon 66
20	弹簧右套	*	尼龙66	20	Spring Retainer(R)	*	Nylon 66
21	弹簧套连杆	*	铜	21	Retainer Connector	*	Brass
22	端盖"O"型圈	2	氟橡胶、丁腈橡胶	22	End-Cap O-ring	2	Viton/NBR
23	端盖	2	压铸铝合金	23	End-Cap	2	Die-casting aluminum/steel
24	端盖紧固螺钉	8	不锈钢	24	End-Cap Stop Screw	8	Stainless steel
25	调节螺钉	2	不锈钢	25	Adjust Screw	2	Stainless steel
26	调节螺钉螺帽	2	不锈钢	26	Adjust Screw Nut	2	Stainless steel
27	调节螺钉垫圈	2	不锈钢	27	Adjust Screw Washer	2	Stainless steel
28	调节螺钉"O"型圈	2	氟橡胶、丁腈橡胶	28	Adjust Screw O-ring	2	Viton/NBR
29	凸轮	1	合金钢	29	Cam	1	Alloy steel
30	限位螺丝	2	不锈钢	30	Stop Screw	2	stainless steel



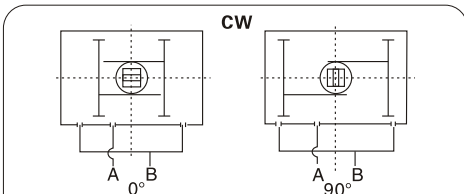
双作用执行器 Double acting actuators



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° -90°), 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° -0°), A口排气。

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.



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° -90°), 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° -0°), 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.

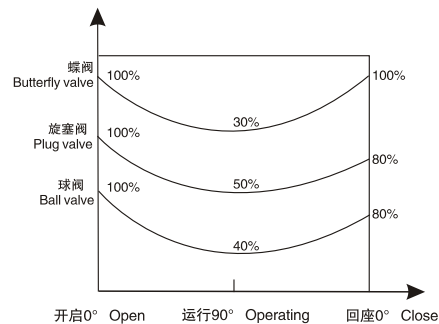
Air to Port B forces the pistons inwards, causing the Pinion to turn counterclockwise while the air is being exhausted from Port A.

双作用气动执行器输出扭矩 (单位: 牛米)

Output torque of pneumatic actuator 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
DA-32	3.1	3.8	4.6	6.1	6.9	7.6	8.4	9.2	10.7	12.2
DA-45	6.0	7.6	9.1	12.1	13.6	15.1	16.6	18.1	21.1	24.2
DA-52	8.1	10.1	12.1	16.1	18.1	20.2	22.2	24.2	28.2	32.3
DA-63	14.2	17.8	21.3	28.4	32.0	35.5	39.1	42.6	49.7	56.8
DA-75	20.1	25.2	30.2	40.3	45.3	50.3	55.4	60.4	70.5	80.5
DA-83	30.8	38.5	46.2	61.6	69.4	77.1	84.8	92.5	107.9	123.3
DA-92	45.4	56.8	68.2	90.9	102.3	113.6	125.0	136.3	159.1	181.8
DA-105	65.8	82.2	98.7	131.6	148.0	164.4	180.9	197.3	230.2	263.1
DA-125	103	128	154	205	231	256	282	308	359	410
DA-140	175	219	263	351	395	439	482	526	614	702
DA-160	267	334	401	535	601	668	735	802	935	1069
DA-190	431	538	646	861	969	1077	1185	1292	1508	1723
DA-210	526	658	789	1052	1184	1316	1447	1579	1842	2105
DA-240	773	966	1160	1546	1740	1933	2126	2320	2706	3093
DA-270	1174	1468	1761	2349	2642	2936	3229	3523	4110	4697
DA-300	1526	1908	2289	3052	3434	3815	4197	4578	5341	6104
DA-350	2285	2856	3427	4570	5141	5712	6283	6854	7997	9139
DA-400	3256	4069	4883	6511	7325	8139	8953	9767	11394	13022
DA-450	5076	6345	7614	10153	11422	12691	13960	15229	17768	20306
DA-500	7162	8953	10744	14325	16116	17907	19697	21488	25069	28651
DA-550	9750	12187	14625	19500	21938	24375	26813	29251	34126	39001
DA-600	12893	16116	19339	25786	29009	32232	35455	38679	45125	51572
DA-700	21058	26323	31588	42117	47382	52646	57911	63176	73705	84234
DA-800	32089	40111	48134	64178	72201	80223	88246	96268	112313	128357

备注: B系列DA400-DA800执行器, 可按客户提供扭矩生产。
Note: B series DA400-DA800 actuator, can provide production.



Example:

The max torque needed by the butterfly valve=104N.m
The torque after opened(operating) 104x30%=32N.m
Air supply=5Bar
We can select the SR125K11 output torque is:
Air stroke0° =134N.m > 104N.m
Air stroke90° =74N.m > 32N.m
Spring stroke90° =172N.m > 32N.m
Spring stroke0° =115N.m > 104N.m
The above datas show the actuator's torque can satisfy the requirement of the butterfly valve.

双作用执行器的选型 Sizing: Double Acting Actuator

◆ 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

安全力矩=100x(1+30%)=130N.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DA105。

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

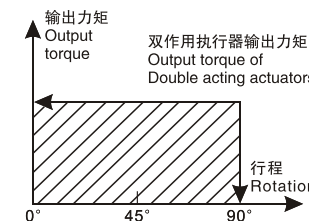
Example:

The torque needed by valve=100N.m

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

Air Supply=5Bar

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



工作技术条件 Operating conditions

- 1、使用介质: 压缩空气、无腐蚀性气体和油;
- 2、压力范围: 双作用2~8巴 (Bar), 单作用2~8巴 (Bar)
- 3、工作温度: 标准型 (使用丁腈橡胶O型圈) -20℃ ~ +80℃ 低温型 (使用硅橡胶O型圈) -40℃ ~ +80℃ 高温型 (使用氟橡胶O型圈) -20℃ ~ +150℃
- 4、行程调整: 在90°位置有 ±4° 的可调范围;
- 5、润滑: 在正常工作条件下, 不需添加润滑剂;
- 6、安装: 适合室内或室外安装;
- 7、最高使用压力: 输入气压不超过8巴。

- 1、Openrating media Dry or lubricated air, the non-corrosive gases or oil.
- 2、Air supply pressure Double acting: 2~ 8Bar; Spring return: 2~ 8Bar
- 3、Openrating temperature standard: -20℃ ~ +80℃ Low temperature: -40℃ ~ +80℃ High temperature: -20℃ ~ +150℃
- 4、Travel adjustment Have adjustment range of ±4° for the rotation at 90°
- 5、Lubrication Under normal operating condition, need not accrete lubricant
- 6、Application Either indoor or outdoor
- 7、Highest pressure The maximum input pressure is 8 Bar

单作用执行器的选型 Sizing spring return actuators

◆ 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

SR140K7输出力矩为

空气行程0° =308N.m

空气行程90° =247N.m

弹簧行程90° =180N.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口通气不会影响执行器输出力矩,相反帮助弹簧的复位。

单作用执行器的经济选型

Economical sizing spring return actuators

◆ 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 torque needed by the valve working at opening,operating and closing.

例如:

蝶阀原最大扭矩=104N.m

打开后扭矩104x30%=32N.m

气源压力=5Bar

我们可以选择SR125K11

空气行程0° =134N.m > 104N.m

空气行程90° =74N.m > 32N.m

弹簧行程90° =172N.m > 32N.m

弹簧行程0° =115N.m > 104N.m

以上数据显示可以满足该蝶阀的正常启闭。

单作用执行器 Spring return actuators

CCW

0° 90°

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°-90°),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°-0°),A口排气。

Air to Port A forces the pistons outwards,causing the spring 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.

CW

0° 90°

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(0°-90°),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(90°-0°),A口排气。

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

单作用气动执行器输出扭矩(单位:牛米)

Output torque of pneumatic actuator with spring return(unit:nm)

规格 (Model)	弹簧圈数 (Spring Q.ty)	气源压力(巴) Air pressure(Bar)																				弹簧输出扭矩 Springs output	
		2		2.5		3		4		5		6		7		8		90°	0°				
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End				
SR-45	5	3.0	1.2	4.6	2.85														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								7.4	4.6			
	9							6.6	3.4	9.6	6.4	12.6	9.4						8.3	5.2			
	10							6.0	2.4	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									7.8	3.5	10.8	6.5	13.8	9.5	16.9	12.6	11.1	7.0				
	SR-52	5	3.7	1.6	5.7	3.6														6.2	4.2		
		6	2.8	0.3	4.8	2.3	6.8	4.3												7.4	5.1		
		7			3.9	1.0	5.9	3.0	9.9	7.0	14.0	11.1								8.6	5.9		
		8					5.0	1.7	9.0	5.7	13.1	9.8								9.9	6.8		
9								8.1	4.4	12.2	8.5	16.2	12.5						11.1	7.6			
10								7.2	3.1	11.3	7.2	15.3	11.2	19.3	15.2	23.4	19.3		12.4	8.5			
11										10.4	5.9	14.4	9.9	18.4	13.9	22.5	18.0	13.6	9.3				
12										9.5	4.6	13.5	8.6	17.5	12.6	21.6	16.7	14.8	10.1				
SR-63		5	7.0	3.2	10.6	6.8														10.4	6.8		
		6	5.6	1.0	9.2	4.6	12.7	8.1												12.5	8.2		
		7			7.7	2.4	11.2	5.9	18.3	13.0	26.8	21.9								14.6	9.6		
		8					9.8	3.7	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							14.0	6.4	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									18.2	9.1	25.3	16.2	32.4	23.3	39.5	30.4	25.0	16.4				
	SR-75	5	9.0	4.9	14.1	10.0														14.5	10.5		
		6	6.8	1.8	11.9	6.9	16.9	11.9												17.4	12.7		
		7			9.7	3.9	14.7	8.9	24.8	19.0	35.4	29.9								20.3	14.8		
		8					12.4	5.8	22.5	15.9	32.5	25.9								23.2	16.9		
9								20.3	12.9	30.3	22.9	40.4	33.0						26.1	19.0			
10								18.1	9.8	28.1	19.8	38.2	29.9	48.3	40.0	58.3	50.0	29.1	21.1				
11										25.9	16.8	36.0	26.9	46.1	37.0	56.1	47.0	31.9	23.2				
12										23.7	13.7	33.8	23.8	43.9	33.9	53.9	43.9	34.7	25.3				
SR-83		5	14.2	6.6	21.9	14.3														23.0	15.8		
		6	10.8	1.7	18.5	9.4	26.2	17.1												27.6	19.0		
		7			15.2	4.6	22.9	12.3	38.0	27.7	56.2	46.2							32.2	22.1			
		8					19.6	7.4	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							28.3	13.2	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									37.1	19.0	52.5	34.4	67.9	49.8	83.3	65.2	55.2	38.0				

单作用执行器弹簧安装形式

Springs mounting form for spring return actuators

