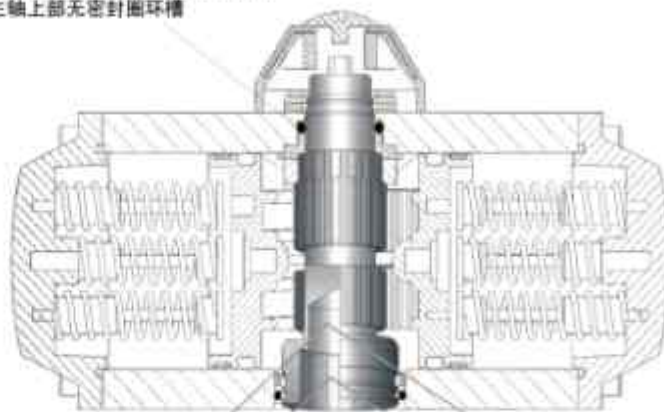




二活塞气动执行器

Two Piston Pneumatic Actuator

No ring groove on the top of drive shaft
主轴上部无密封环槽



DFS050-115深34
DFS125-160深65
DFS180-400深92

DFS050-063□17mm
DFS075-115□22mm
DFS125-200□36mm
DFS240-300□46mm
DFS350-400□55mm

Any optional shapes
形状任意选择

Any optional sizes
尺寸任意选择

Deeper Axis Hole
特深轴孔

Larger Diameter Axis Hole
特大轴孔

Insert
转接套

Plate
转换盘

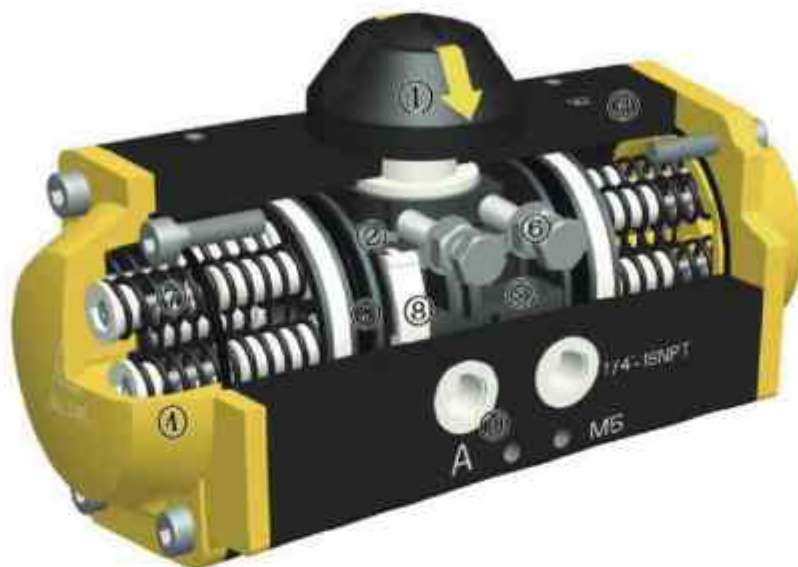
Valve flange
阀门法兰

Patent No: ZL200930382594.7
专利号: ZL200920292448.X

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一、执行器结构：Design & Construction



1. 指示器

指示器符合 VID/VIE3845 NAMUR 标准，便于安装限位开关、定位器等附件。

2. 输出轴（齿轮轴）

镀镍合金钢一体式锻压输出轴的设计符合 NAMUR, ISO5211, DIN3337 标准。特殊标准可根据用户要求定制。

3. 缸体

用优质合金铝挤压成形，表面进行硬质阳极氧化处理、环氧聚酯喷涂。PTFE、镀锌及颜色喷涂，可根据客户要求定制。交期和价格另议。

4. 端盖

铝合金压铸，表面做阳极硬化处理。环氧聚酯喷涂。PTFE、镀锌及颜色喷涂，可根据客户要求定制。交期和价格另议。

5. 活塞

采用铸铝硬质氧化处理，安装位置对称，动作迅速；延活塞轴向旋转 180°、颠倒安装活塞齿条可改变输出轴的旋转方向。

6. 调节螺钉

两个独立行程调节螺钉可以方便、精确的在 $\pm 5^\circ$ 以内调整阀门的开关角度。

7. 弹簧

采用优质弹簧钢，预压装配。表面环氧树脂涂层，能方便地拆卸或改变弹簧数量满足不同的力矩输出范围。

8. 活塞环

采用低摩擦、长寿命复合材料，维修更换方便。

9. 密封

常温下使用丁腈橡胶，高温和低温条件下，根据客户要求使用特殊的密封。

10. 气源接口

符合 NAMUR 标准，可直接安装 NAMUR 标准电磁阀。

11. 所有紧固件均采用不锈钢材料。

1. Indicator

Indicator according to VID/VIE3845 is convenient for mounting accessories such as limit switch box, Positioner and etc.

2. Pinion

The design of the nickel-plated alloy steel integrated forging pinion drive is according to the NAMUR, ISO5211 and DIN3337 standards. Special standard are available upon request.

3. Actuator Body

High quality aluminum alloy extrusion formed. The surface has been treated by anodized hardening followed by epoxy polyester coating. Other surface treatments are available e.g. PTFE and Nickel plating as well as other colour coatings on request.

4. End Cap

The surface has been treated by anodized hardening followed by epoxy polyester coating. Other surface treatments are available on request e.g. PTFE and Nickel plating as well as other colours on request.

5. Piston

Manufactured from Die-cast aluminum and treated by anodized hardening process. Symmetric mounting of the piston helps to ensure easy maintenance. Reverse action requirements can be achieved by inverting the pistons.

6. Adjusting Bolt

The two independent adjustment bolts can adjust opening and closing of the mounted valve within $\pm 5^\circ$.

7. Spring

Preloaded high grade springs with surface epoxy resin painted, which can be demounted conveniently to satisfy different requirements of torque by changing quantity of springs.

8. Piston Ring

Manufactured from low friction long life material POM. Can be easily changed for maintenance purposes.

9. O-rings

Standard NBR rubber O-rings provide trouble-free operation at standard temperature ranges. For other temperature requirements relevant materials can be offered on request.

10. Air Connection

Conforms to NAMUR standards

11. All stop parts are manufactured from SS304.

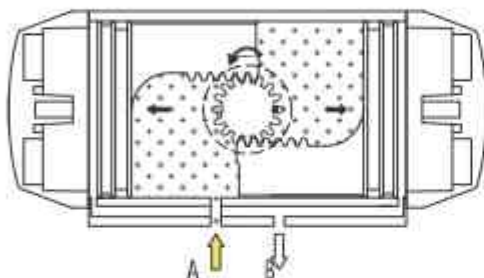
二、工作原理：Operations

标准旋转方向是顺时针关，引入压力到 A 口可以逆时针旋转。

The standard rotation is clockwise to close; counter-clockwise rotation is obtained when port A is pressurized.

双作用示意图

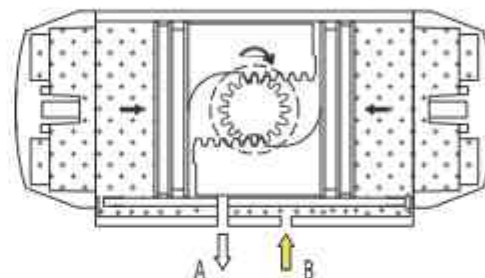
Double Acting Operation Function (Standard Rotation) Top View



CCW (逆时针方向)

压缩空气由 A 输入，使左右活塞向两侧反向运动，齿轮轴逆时针方向转动，两活塞侧面空气由 B 排出。

Air supplied to Port A forces the pistons apart and toward end positions, with exhaust air exiting at Port B, a counter-clockwise rotation is obtained.



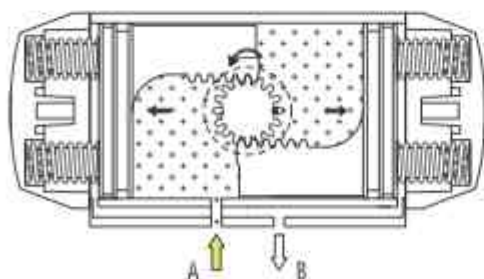
CW (顺时针方向)

压缩空气由 B 输入，使左右活塞向中心移动，齿轮轴顺时针方向转动，两活塞中间空气由 A 排出。

Air supplied to Port B forces the pistons together with exhaust air exiting at Port A, a clockwise rotation is obtained.

单作用示意图

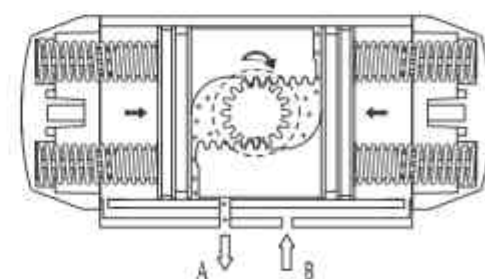
Single Acting Operation Function (Standard Rotation) Top View



CCW (逆时针方向)

压缩空气由 A 输入，使左右活塞向相反方向运动，齿轮轴逆时针方向转动，两活塞侧面空气由 B 排出。

Air supplied to Port A forces the pistons apart and toward end positions, compressing the springs with exhaust air exiting at Port B, a counter-clockwise rotation is obtained.

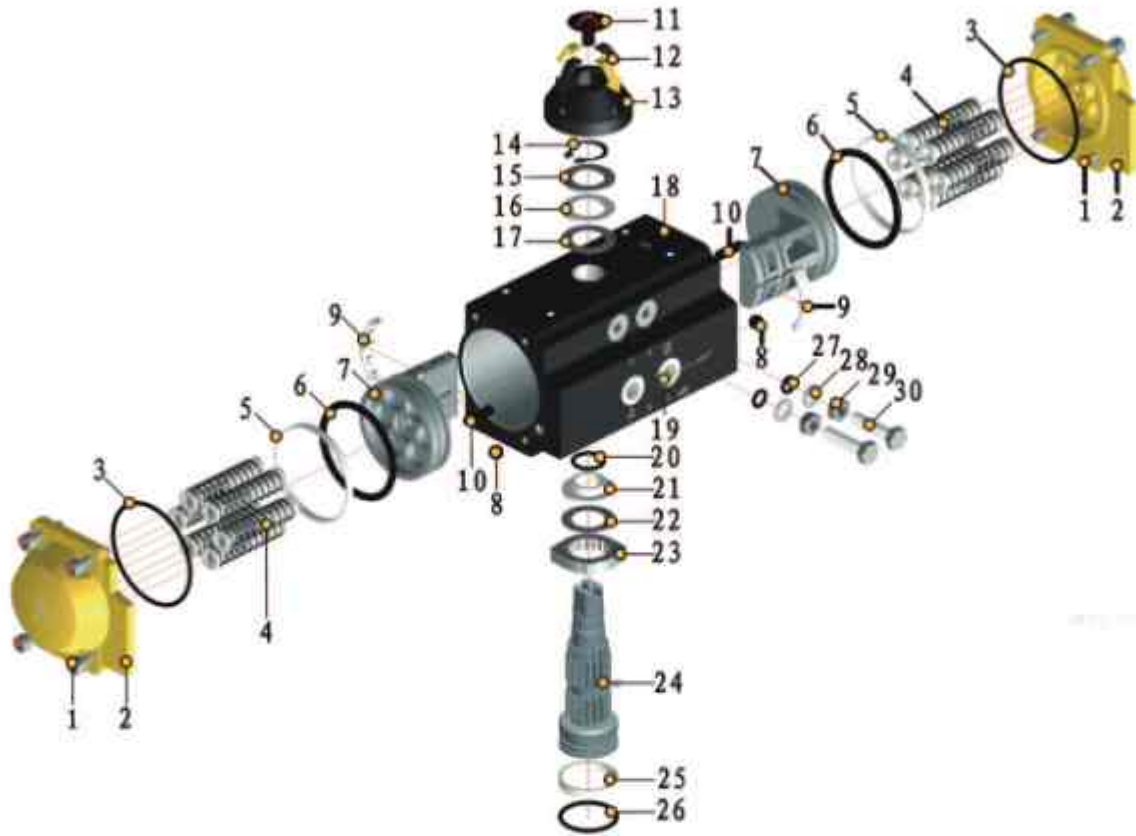


CW (顺时针方向)

失气或失电时，由于弹簧的作用使两活塞向中心移动，齿轮轴顺时针方向转动，空气由 A 排出。

On loss of air pressure (air or electric failure) at port A allows the springs to force the pistons to the centre position with exhaust air exiting at Port A, a clockwise rotation is obtained.

三、分解图 Explode View



本公司产品气缸底部设计比其他厂家气缸底部多出4个转接盘连接螺孔。如遇气缸底部ISO孔与阀门(如美标或其它标准)法兰孔无法匹配时,使用本公司的转接盘可以恰当的完成连接。

Compared with other ordinary actuators, we drill four extra thread holes on the bottom of actuator. Using our connecting plates, it can be connected with all kinds of international standard valve flanges fairly.



大直径气缸底部输出轴孔不受任何阀门阀杆及连接键形式的限制,只需配置更换转接套。高效、经济。

The large diameter hole of the output pinion on the bottom makes our actuator suitable for all kinds of valve stems and connecting keys by using our insert. Efficient and economic.



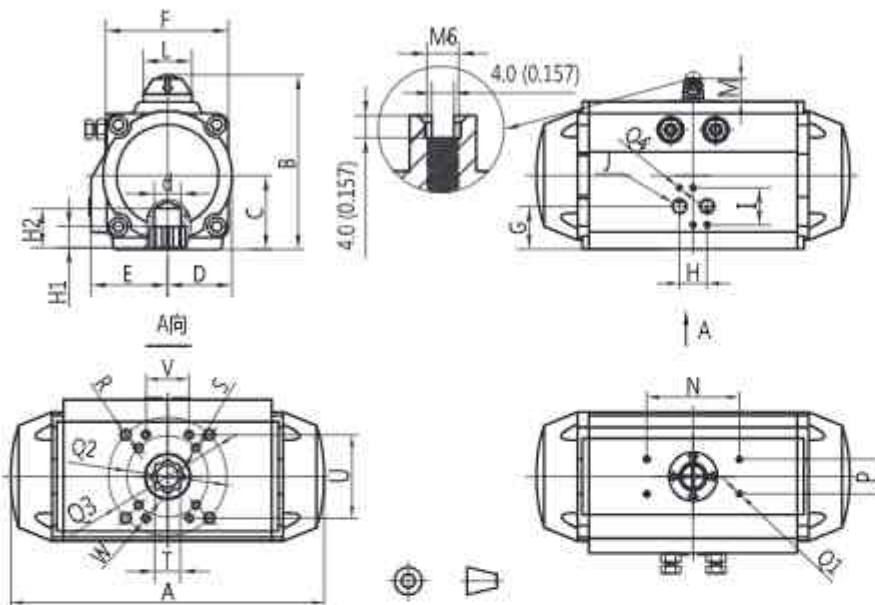
特别深的气缸底部输出轴孔,适合超高阀杆。

Extra deep hole for pinion shaft on the bottom of actuator is suitable for any long size valve stem.

四、零部件明细表 Parts List

序号 No.	名称 Part Description	数量 Q.TY	材料 Materials	表面处理 Surface Treated	可选材料 Optional Material
1	内六角沉头螺钉 Socket Head Screw	8	不锈钢 SUS 304		
2	缸盖 End Cap	2	AL380 ≤ DFS 200 WCB ≥ DFS 240	阳极硬化 + 聚酯涂层 Anode Hardening +Polyester Coating	CF8/CF8M
3	O 形圈 (缸盖) "O"ring (Cylinder Head)	2	丁腈橡胶 NBR Rubber		氟或硅橡胶 Viton / Silicone Rubber
4	弹簧 Spring	2-12	弹簧钢 Spring Steel	环氧树脂涂层 Epoxy resin Coating	
5	活塞环 Piston Ring	2	POM		
6	O 形圈 (活塞) "O"Ring (Piston)	2	丁腈橡胶 NBR Rubber		氟或硅橡胶 Viton / Silicone Rubber
7	活塞 Piston	2	AL380	阳极硬化 Anode Hardening	
8	堵头 Stopper	2	丁腈橡胶 NBR Rubber		氟或硅橡胶 Viton / Silicone Rubber
9	导向环 Guide Ring	2	PA6		
10	导向块 Guide Block	2	PA6		
11	指示器螺钉 Indicator Bolt	1	ABS		
12	指示器箭头 Indicator Arrowhead	4	ABS		
13	指示器体 Indicator	1	ABS		
14	轴用挡圈 Snap Ring	1	不锈钢 Stainless Steel		
15	垫圈 Washer	1	不锈钢 SUS 304		
16	垫圈 Disc Bearing	1	POM		
17	垫圈 Washer	1	不锈钢 SUS 304		
18	缸体 Body	1	AL6063-T6	阳极硬化 + 聚酯涂层 Anode Hardening +Polyester Coating	CF8/CF8M
19	气源塞 Plug	2	PVC		
20	O 形圈 (轴上) "O"Ring (Pinion Top)	1	丁腈橡胶 NBR Rubber		氟或硅橡胶 Viton / Silicone Rubber
21	轴承 (轴上) Bearing (Pinion Top)	1	POM		
22	垫片 Disc Bearing	1	不锈钢 SUS 304		
23	凸轮 Stroke Adjustment Stop	1	SAE 1020	镀镍 Nickel Plated	CF8/CF8M
24	齿轮轴 Pinion Shaft	1	SAE 1045	镀镍 Nickel Plated	SUS304/SUS316
25	轴承 (轴下) Bearing(Pinion Bottom)	1	POM		
26	O 形圈 (轴下) "O" ring (pinion bottom)	1	丁腈橡胶 NBR Rubber		氟或硅橡胶 Viton / Silicone Rubber
27	O 形圈 (调节螺栓) "O"Ring (Adjusting Bolt)	2	丁腈橡胶 NBR Rubber		氟或硅橡胶 Viton / Silicone Rubber
28	金属垫片 Metal Washer	2	不锈钢 SUS 304		
29	螺母 Nut	2	不锈钢 SUS 304		
30	调节螺栓 Adjusting Bolt	2	不锈钢 SUS 304		

五、安装尺寸 (DFS032-DFS400) Installation Size(DFS032-DFS400)



Metric Unit mm

Model Size	DFS032	DFS040	DFS050	DFS063	DFS075	DFS085	DFS100	DFS115	DFS125	DFS145	DFS160	DFS180	DFS200	DFS240	DFS265	DFS300	DFS350	DFS400
A	82	108	148	159	213	249	271	315	346	412	443	492	547	614	729	839	900	1158
B	72	75	91	107	124	138	149	175	190	210	230	254	277	346	368	408	460	517
C	31	28	34	42	51	58	64	73	79	88	98	110	122	146	167	178	205	234
D	20.5	27	29	36	44	49	56	64	69	80	88	99	109	131	147	162	189	260
E	30	33	41	47	53	57	66	77	82	92	98	106	112	131	147	173	195	260
F	50.5	60	53	66	82	92	106	121	130	149	160	180	198	231	254	290	338	331
G	26	28	26	30	29	32	37	37	46	53	52	60	66	70	90	85	92	233
H	24	24	24	24	24	24	24	24	24	24	24	24	24	40	40	40	40	40
I	32	32	32	32	32	32	32	32	32	32	32	32	32	45	45	45	45	45
J	NPT1/8"	NPT1/8"	NPT1/4"	NPT1/4"	NPT1/4"	NPT1/4"	NPT1/4"	NPT1/4"	NPT1/4"	NPT1/4"	NPT1/4"	NPT1/4"	NPT1/4"	NPT3/8"	NPT3/8"	NPT1/2"	NPT1/2"	NPT1/2"
L	φ30	φ30	φ40	φ40	φ40	φ40	φ40	φ60	φ60	φ60	φ60	φ80	φ80	φ80	φ80	φ80	φ75	φ75
M	20	20	20	20	20	20	20	30	30	30	30	30	30	50	50	50	50	50
N	25.5	41	80	80	80	80	80	80	80	80	80	130	130	130	130	130	130	130
P	25.5	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Q1	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5
Q2	φ36	φ36	φ42	φ50	φ50	φ50	φ70	φ70	φ102	φ102	φ102	φ102	φ102	φ125	-	-	-	-
Q3	-	φ50	-	-	φ70	φ70	φ102	φ102	-	φ125	φ125	φ140	φ140	φ165	φ165	φ165	φ254	φ254
Q4	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M6	M6	M6	M6	M6
R	-	4-M6	-	-	4-M8	4-M8	4-M10	4-M10	-	4-M12	4-M12	4-M16	4-M16	4-M20	4-M20	4-M20	8-M16	8-M16
S	4-M5	4-M5	4-M5	4-M6	4-M6	4-M6	4-M8	4-M8	4-M10	4-M10	4-M10	4-M10	4-M10	4-M12	-	-	-	-
T	9	9	17	17	22	22	22	22	36	36	36	36	36	46	46	46	55	55
H1	11	11	12	16	19	19	23	23	29	29	29	42	42	50	50	50	60	60
d	-	-	φ14.3	φ14.3	φ19.5	φ19.5	φ23	φ23	φ36	φ36	φ36	φ36	φ38	φ48	φ48	φ48	φ55	φ55
H2	-	-	32	34	34	34	48	48	65	65	65	92	92	92	92	92	100	100
U	-	-	-	-	-	-	72	72	72	72	72	99	99	-	-	-	-	-
V	-	-	-	-	-	-	37	37	37	37	37	53	53	-	-	-	-	-
W	-	-	-	-	-	-	M8	M8	M8	M8	M8	M10	M10	-	-	-	-	-

Imperial Unit Inch

Model Size	DFS032	DFS040	DFS050	DFS063	DFS075	DFS085	DFS100	DFS115	DFS125	DFS145	DFS160	DFS180	DFS200	DFS240	DFS265	DFS300	DFS350	DFS400
A	3.23	4.29	5.83	6.26	8.39	9.80	10.67	12.40	13.62	16.22	17.44	19.37	21.54	24.17	28.70	33.03	35.43	45.59
B	2.83	2.95	3.58	4.21	4.88	5.43	5.87	6.89	7.48	8.27	9.06	10.00	10.91	13.62	15.28	16.06	18.11	20.35
C	1.22	1.10	1.34	1.65	2.01	2.28	2.52	2.87	3.11	3.46	3.86	4.33	4.80	5.75	6.57	7.01	8.07	9.21
D	0.81	1.06	1.14	1.42	1.73	1.93	2.20	2.52	2.72	3.15	3.46	3.90	4.29	5.16	5.79	6.38	7.44	10.24
E	1.18	1.30	1.61	1.85	2.09	2.24	2.60	3.03	3.23	3.62	3.86	4.17	4.41	5.16	5.79	6.81	7.68	10.24
F	1.99	2.36	2.09	2.60	3.23	3.62	4.17	4.76	5.12	5.87	6.30	7.09	7.80	9.09	10.00	11.42	13.23	13.03
G	1.02	1.10	1.02	1.18	1.14	1.26	1.46	1.46	1.81	2.09	2.05	2.36	2.60	2.76	3.54	3.35	3.62	9.17
H	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	1.57	1.57	1.57	1.57	1.57
I	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.77	1.77	1.77	1.77	1.77
J	NPT1/8"	NPT1/8"	NPT1/4"	NPT1/4"	NPT1/4"	NPT1/4"	NPT1/4"	NPT1/4"	NPT1/4"	NPT1/4"	NPT1/4"	NPT1/4"	NPT1/4"	NPT3/8"	NPT3/8"	NPT1/2"	NPT1/2"	NPT1/2"
L	φ1.18	φ1.18	φ1.57	φ1.57	φ1.57	φ1.57	φ1.57	φ2.36	φ2.36	φ2.36	φ2.36	φ3.15	φ3.15	φ3.15	φ3.15	φ3.15	φ2.95	φ2.95
M	0.79	0.79	0.79	0.79	0.79	0.79	0.79	1.18	1.18	1.18	1.18	1.18	1.18	1.97	1.97	1.97	1.97	1.97
N	1.00	1.61	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	5.12	5.12	5.12	5.12	5.12	5.12	5.12
P	1.00	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18
Q1	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5
Q2	φ1.42	φ1.97	φ1.65	φ1.97	φ1.97	φ1.97	φ2.76	φ2.76	φ4.02	φ4.02	φ4.02	φ4.02	φ4.02	φ4.92	-	-	-	-
Q3	-	φ1.65	-	-	φ2.76	φ2.76	φ4.02	φ4.02	-	φ4.92	φ4.92	φ5.51	φ5.51	φ6.50	φ6.50	φ6.50	φ10	φ10
Q4	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M6	M6	M6	M6	M6
R	-	4-M6	-	-	4-M6	4-M6	4-M10	4-M10	-	4-M12	4-M12	4-M16	4-M16	4-M20	4-M20	4-M20	8-M16	8-M16
S	4-M5	4-M5	4-M5	4-M6	4-M6	4-M6	4-M6	4-M8	4-M10	4-M10	4-M10	4-M10	4-M10	4-M12	-	-	-	-
T	0.35	0.35	0.67	0.67	0.67	0.67	0.67	0.67	1.42	1.42	1.42	1.42	1.42	1.81	1.61	1.61	2.17	2.17
H1	0.43	0.43	0.47	0.63	0.75	0.75	0.91	0.91	1.14	1.14	1.14	1.65	1.65	1.97	1.97	1.97	2.36	2.36
d	-	-	φ0.56	φ0.56	φ0.77	φ0.77	φ0.91	φ0.91	φ1.42	φ1.42	φ1.42	φ1.50	φ1.50	φ1.89	φ1.89	φ1.89	φ2.17	φ2.17
H2	-	-	1.26	1.34	1.34	1.34	1.89	1.89	2.56	2.56	2.56	3.62	3.62	3.62	3.62	3.62	3.94	3.94
U	-	-	-	-	-	-	2.83	2.83	2.83	2.83	2.83	3.90	3.90	-	-	-	-	-
V	-	-	-	-	-	-	1.46	1.46	1.46	1.46	1.46	2.09	2.09	-	-	-	-	-
W	-	-	-	-	-	-	M8	M8	M8	M8	M8	M10	M10	-	-	-	-	-

1. 顶部安装面符合 VDI/VDE3845 标准, 可以简单而方便地安装定位器及限位开关盒等附件。

Top mounting connection is in line with VDI/VDE3845 standards, permitting direct installation of accessories such as positioner or limit switch box.

2. 底部安装面 (阀门连接) 符合 ISO5211 及 DIN3337 标准。

Bottom mounting connection is in line with ISO5211 and DIN3337 standards.

3. 侧面进气接口连接符合 VDI/VDE3845 NAMUR 标准, 可方便地安装电磁阀。

Air supply connection is in line with VDI/VDE3845 and NAMUR standards, and can install solenoid valves conveniently.

六、重量及耗气量 Weight & Air Consumption

公制
Metric Unit mm

参数 Data	缸径 Body Diameter	耗气量 Air Consumption Per Stroke Actual Volume/L		打开时间 Opening Time DA	关闭时间 Closing Time DA	近似重量 Approximate Weight-DA
型号 Model	Φ (mm)	CCW (L)	CW (L)	S (sec.)	S (sec.)	kg
DFS032	32	0.015	0.034	0.13	0.14	0.322
DFS040	40	0.032	0.066	0.14	0.16	0.595
DFS050	50	0.08	0.13	0.17	0.19	1.08
DFS063	63	0.15	0.25	0.19	0.22	1.55
DFS075	75	0.30	0.48	0.23	0.27	2.75
DFS085	85	0.50	0.73	0.33	0.35	3.78
DFS100	100	0.75	1.08	0.42	0.48	5.3
DFS115	115	1.19	1.8	0.72	0.93	8.4
DFS125	125	1.55	2.18	0.84	1.09	9.93
DFS145	145	2.40	3.55	1.32	1.42	14.1
DFS160	160	3.20	4.72	1.6	2.0	18.35
DFS180	180	4.30	6.80	2	2.4	25
DFS200	200	5.87	9.53	2.7	3.5	35
DFS240	240	10	15	3.5	4.5	63
DFS265	270	15	23	4.5	5.0	79
DFS300	300	21.1	30.5	8.8	12.7	135.8
DFS350	350	30.8	44.4	13	19	234.3
DFS400	400	48.3	69.6	20	29	338

英制
Imperial Unit Inch

参数 Data	缸径 Body Diameter	耗气量 Air Consumption Per Stroke Actual Volume/L		打开时间 Opening Time DA	关闭时间 Closing Time DA	近似重量 Approximate Weight-DA
型号 Model	Φ (in)	CCW (L)	CW (L)	S (sec.)	S (sec.)	lb
DFS032	1.26	0.015	0.034	0.13	0.14	0.71
DFS040	1.57	0.032	0.066	0.14	0.16	1.53
DFS050	1.97	0.08	0.13	0.17	0.19	2.38
DFS063	2.48	0.15	0.25	0.19	0.22	3.42
DFS075	2.95	0.30	0.48	0.23	0.27	6.06
DFS085	3.46	0.50	0.73	0.33	0.35	8.33
DFS100	3.94	0.75	1.08	0.42	0.48	11.68
DFS115	4.53	1.19	1.8	0.72	0.93	18.5
DFS125	4.92	1.55	2.18	0.84	1.09	21.89
DFS145	5.71	2.40	3.55	1.32	1.42	31.08
DFS160	6.30	3.20	4.72	1.6	2.0	40.45
DFS180	7.09	4.30	6.80	2	2.4	55.12
DFS200	7.87	5.87	9.53	2.7	3.5	77.16
DFS240	9.45	10	15	3.5	4.5	138.89
DFS265	10.63	15	23	4.5	5.0	174.16
DFS300	11.81	21.1	30.5	8.8	12.7	289.39
DFS350	13.780	30.8	44.4	13	19	516.54
DFS400	15.75	48.3	69.6	20	29	745.16

* 执行器动作时间是依据下列测试条件所得:

- (1) 常温
- (2) 90° 行程
- (3) 电磁阀的口径孔为 4 毫米且流通能力为 QN400L/分钟
- (4) 气管内径为 5 毫米
- (5) 介质为干净的空气
- (6) 气源压力为 5.5 巴 (79.75psi)
- (7) 空载状态

* The above indicated moving time of the actuator, are obtained in the following testoons:

- (1) Room temperature
- (2) Actuator stroke 90°
- (3) Solenoid valve with orifice of 4mm and flow capacity QN 400L/min.
- (4) Inside pipe diameter 5mm
- (5) Medium clean air
- (6) Air supply pressure 5.5 bar (79.75psi)
- (7) Actuator without external resistance load

七、双作用输出力矩（公制） Output Torque of Double Acting Actuator(metric)

metric unit N.m

双作用力矩输出 Output Torque of Double Acting Actuator							
气源压力 Air Pressure 型号 Model	3.0bar	4.0bar	5.0bar	5.5bar	6.0bar	7.0bar	8.0bar
DFS032	3.2	4.5	5.9	6.6	7.2	8.5	9.8
DFS040	5	7	9	10	11	13	15
DFS050	9.5	12	15.8	17.5	19	23	26.5
DFS063	16	21.5	28.7	31	34	39	46
DFS075	34	47	58.5	63	69	80.5	91
DFS085	53	70	88	98	106	124	145
DFS100	76.5	104	127	142	155	184	214
DFS115	129	170	215	236	258	301	344
DFS125	163	210	268	300	326	385	442
DFS145	290	315	420	462	504	590	690
DFS160	350	450	560	625	675	788	910
DFS180	445	607	760	848	910	1064	1237
DFS200	625	840	1058	1165	1260	1462	1681
DFS240	1070	1435	1785	1970	2150	2508	2865
DFS265	1745	2320	2900	3200	3500	4080	4670
DFS300	2195	2927	3681	4025	4391	5122	5854
DFS350	3205	4274	5369	5876	6411	7479	8547
DFS400	5024	6698	8415	9210	10048	11722	13397

八、单作用输出力矩（公制） Output Torque of Spring Return Actuator(metric)

metric unit N.m

型号 Model	尺寸 Size	弹簧 数量 Springs Qty	单作用力矩输出 Output Torque of Spring Return Actuator														弹簧复位 Spring Return	
			3.0bar		4.0bar		5.0bar		5.5bar		6.0bar		7.0bar		8.0bar		0° 结束	90° 开始
			0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束		
DFS 040		2					6.0	4.0	7.0	5.0	8.0	6.0	10.0	8.0	12.0	10.0	3.0	5.0
		4									6.0	2.0	8.0	4.0	10.0	6.0	5.0	9.0
DFS 050		5	6.5	4.8	9.0	7.3	12.8	11.1	14.5	12.8	16.0	14.3	20.0	18.3	23.5	21.8	3.0	4.7
		6	5.7	3.8	8.2	6.3	12.0	10.1	13.7	11.8	15.2	13.3	19.2	17.3	22.7	20.8	3.8	5.7
		7	5.0	2.8	7.5	5.3	11.3	9.1	13.0	10.8	14.5	12.3	16.5	16.3	22.0	19.8	4.5	6.7
		8			6.7	4.2	10.5	8.0	12.2	9.7	13.7	11.2	17.7	15.2	21.2	18.7	5.3	7.8
		9			6.0	3.3	9.8	7.1	11.5	8.8	13.0	10.3	17.0	14.3	20.5	17.8	6.0	8.7
		10					9.1	6.2	10.8	7.9	12.3	9.4	16.3	13.4	19.8	16.9	6.7	9.6
		11					8.3	5.1	10.0	6.8	11.5	8.3	15.5	12.3	19.0	15.8	7.5	10.7
		12					7.5	4.0	9.2	5.7	10.7	7.2	14.7	11.2	18.2	14.7	8.3	11.8
DFS 063		5	10.3	7.4	15.8	12.9	23.0	20.1	25.3	22.4	28.3	25.4	33.3	30.4	40.3	37.4	5.7	8.6
		6	9.2	5.6	14.7	11.1	21.9	18.3	24.2	20.6	27.2	23.6	32.2	28.6	39.2	35.6	6.8	10.4
		7	8.1	3.8	13.6	9.3	20.8	16.5	23.1	18.8	26.1	21.8	31.1	26.8	38.1	33.8	7.9	12.2
		8			12.4	7.7	19.6	14.9	21.9	17.2	24.9	20.2	29.9	25.2	36.9	32.2	9.1	13.8
		9			11.2	5.9	18.4	13.1	20.7	15.4	23.7	18.4	28.7	23.4	35.7	30.4	10.3	15.6
		10			10.0	4.1	17.2	11.3	19.5	13.6	22.5	16.6	27.5	21.6	34.5	28.6	11.5	17.4
		11					16.1	8.5	18.4	11.8	21.4	14.8	26.4	19.8	33.4	26.8	12.6	19.2
		12					15.0	7.8	17.3	10.1	20.3	13.1	25.3	18.1	32.3	25.1	13.7	20.9
DFS 075		5	22.5	16.0	35.5	29.0	47.0	40.5	51.5	45.0	57.5	51.0	69.0	62.5	79.5	73.0	11.5	18.0
		6	20.5	12.5	33.5	25.5	45.0	37.0	49.5	41.5	55.5	47.5	67.0	59.0	77.5	69.5	13.5	21.5
		7	18.3	9.0	31.3	22.0	42.8	33.5	47.3	38.0	53.3	44.0	64.8	55.5	75.3	66.0	15.7	25.0
		8			29.0	18.5	40.5	30.0	45.0	34.5	51.0	40.5	62.5	52.0	73.0	62.5	18.0	28.5
		9			26.9	15.0	38.4	26.5	42.9	31.0	48.9	37.0	60.4	48.5	70.9	59.0	20.1	32.0
		10			24.7	11.5	36.2	23.0	40.7	27.5	45.7	33.5	58.2	45.0	68.7	55.5	22.3	35.5
		11					34.0	19.5	38.5	24.0	44.5	30.0	58.0	41.5	66.5	52.0	24.5	39.0
		12					31.8	16.0	36.3	20.5	42.3	26.5	53.8	38.0	64.3	48.5	26.7	42.5
DFS 085		5	34.2	23.0	51.2	40.0	69.2	58.0	79.2	68.0	87.2	76.0	105.2	94.0	126.2	115.0	18.8	30.0
		6	30.5	17.2	47.5	34.2	65.5	52.2	75.5	62.2	83.5	70.2	101.5	88.2	122.5	109.2	22.5	35.8
		7	26.8	11.4	43.8	28.4	61.8	46.4	71.8	58.4	79.8	64.4	97.8	82.4	118.8	103.4	26.2	41.6
		8			40.2	22.6	58.2	40.6	68.2	50.6	76.2	58.6	94.2	76.6	115.2	97.6	29.8	47.4
		9			36.6	18.8	54.6	34.8	64.6	44.8	72.6	52.8	90.6	70.8	111.6	91.8	33.4	53.2
		10			32.8	11.0	50.9	29.0	60.9	39.0	68.9	47.0	86.9	65.0	107.9	86.0	37.1	59.0
		11					47.2	23.2	57.2	33.2	65.2	41.2	83.2	59.2	104.2	80.2	40.8	64.8
		12					43.5	17.4	53.5	27.4	61.5	35.4	79.5	53.4	100.5	74.4	44.5	70.6
DFS 100		5	51.4	37.5	78.9	65.0	101.9	88.0	116.9	103.0	129.9	116.0	158.9	145.0	188.9	175.0	25.1	39.0
		6	46.3	29.6	73.8	57.1	96.8	80.1	111.8	95.1	124.8	108.1	153.8	137.1	183.8	167.1	30.2	46.9
		7	41.2	21.7	68.7	49.2	91.7	72.2	106.7	87.2	119.7	100.2	148.7	129.2	178.7	159.2	35.3	54.8
		8			63.6	41.3	86.6	64.3	101.6	79.3	114.6	92.3	143.6	121.3	173.6	151.3	40.4	62.7
		9			58.5	33.4	81.5	58.4	96.5	71.4	109.5	84.4	138.5	113.4	168.5	143.4	45.5	70.8
		10			53.5	25.6	76.5	48.6	91.5	63.6	104.5	78.6	133.5	105.6	163.5	135.6	50.5	78.4
		11					71.4	40.7	86.4	55.7	99.4	68.7	128.4	97.7	158.4	127.7	55.6	86.3
		12					66.2	32.8	81.2	47.8	94.2	60.8	123.2	89.8	153.2	119.8	60.8	94.2

单作用输出力矩 (公制) Output Torque of Spring Return Actuator(metric)

metric unit N.m

型号 Model	尺寸 Size	弹簧 数量 Spring Quantity	单作用力矩输出 Output Torque of Spring Return Actuator														弹簧复位 Spring Return	
			3.0bar		4.0bar		5.0bar		5.5bar		6.0bar		7.0bar		8.0bar		0° 结束	90° 开始
			0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束		
DFS 115	5	88	63	131	106	174	149	195	170	217	192	260	235	303	279	41	66	
	6	80	50	123	93	166	136	187	158	209	180	252	222	295	266	49	79	
	7	72	37	115	80	158	123	179	145	200	166	244	209	287	252	57	92	
	8			106	67	149	110	171	132	192	153	235	196	279	239	66	105	
	9			98	54	141	97	163	118	184	140	227	183	270	226	74	118	
	10					133	84	154	105	176	127	219	170	262	213	82	131	
	11					125	71	146	92	166	114	211	157	254	200	90	144	
	12							138	79	159	101	202	144	245	187	98	157	
DFS 125	5	112	82	169	129	217	187	249	219	277	247	334	304	391	361	51	81	
	6	102	65	149	112	207	170	239	202	266.5	230	323.5	287	380.5	344	61.5	98	
	7	91	49	138	96	196	154	228	186	256	214	313	271	370	328	72	114	
	8			127	79	185	137	217	168	245	197	302	254	359	311	83	131	
	9			117	62	175	120	207	152	234.5	180	291.5	237	348.5	294	93.5	148	
	10			106	45	164	103	196	135	224	163	281	220	338	277	104	165	
	11					154	87	186	119	213.5	147	270.5	204	327.5	261	114.5	181	
	12					143	70	175	102	203	130	259.5	187	316.5	244	125.5	198	
DFS 145	5	149	103	234	188	339	293	381	335	423	377	509	463	609	563	81	127	
	6	132	77	217	162	322	267	364	309	406	351	492	437	592	537	96	153	
	7	115	51	200	136	305	241	347	283	389	325	475	411	575	511	115	179	
	8			184	110	289	215	331	257	373	299	459	385	559	485	131	205	
	9			167	85	272	190	314	232	358	274	442	360	542	460	148	230	
	10			150	69	255	164	297	206	339	246	425	334	525	434	165	256	
	11					239	138	281	180	323	222	409	308	509	408	181	282	
	12					223	112	265	154	307	196	393	282	493	382	197	308	
DFS 160	5	240	185	340	285	450	395	515	460	565	510	678	623	800	745	110	165	
	6	217	152	317	252	427	362	482	427	542	477	655	590	777	712	133	198	
	7	184	118	294	218	404	328	489	393	519	443	632	556	754	678	156	232	
	8			271	185	381	295	446	360	496	410	609	523	731	645	179	265	
	9			249	151	359	261	424	326	474	376	587	489	709	611	201	299	
	10			226	118	336	228	401	293	451	343	564	456	686	578	224	332	
	11					313	194	378	259	428	309	541	422	663	544	247	366	
	12					291	161	356	226	406	276	519	388	641	511	269	399	
DFS 180	5	289	206	461	368	604	521	692	609	764	671	908	825	1081	998	166	239	
	6	257	159	419	321	572	474	660	562	722	624	876	778	1049	951	188	286	
	7	225	112	387	274	540	427	628	515	690	577	844	731	1017	904	220	333	
	8			355	226	508	379	596	467	658	529	812	693	985	856	252	381	
	9			324	179	477	332	565	420	627	482	781	636	954	809	283	428	
	10			292	132	445	285	533	373	595	435	748	589	922	762	315	475	
	11					414	238	502	326	564	388	718	542	861	715	346	522	
	12					382	191	470	279	532	341	686	495	869	668	378	569	
DFS 200	5	409	307	624	522	842	740	949	847	1044	942	1246	1144	1465	1363	216	318	
	6	367	244	562	459	800	677	907	784	1002	879	1204	1081	1420	1300	258	381	
	7	325	181	540	396	758	614	865	721	960	816	1162	1018	1381	1237	300	444	
	8			498	334	716	552	823	659	918	754	1120	956	1339	1175	342	506	
	9			455	272	673	490	780	597	875	692	1077	894	1296	1113	385	568	
	10			412	209	630	427	737	534	832	629	1034	831	1253	1050	428	631	
	11					586	385	695	472	790	587	992	789	1211	988	470	693	
	12					545	302	652	408	747	504	948	706	1168	925	513	756	

单作用输出力矩（公制） Output Torque of Spring Return Actuator(metric)

metric unit N.m

型号 Model	尺寸 Size	弹簧 数量 Springs Qty	单作用力矩输出 Output Torque of Spring Return Actuator																弹簧复位 Spring Return	
			3.0bar		4.0bar		5.0bar		5.5bar		6.0bar		7.0bar		8.0bar		0° 开始	90° 结束	0° 开始	90° 结束
			0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束				
DFS 240	5	5	705	543	1070	808	1420	1258	1805	1443	1785	1623	2143	1981	2500	2338	365	527		
	6	6	631	438	996	803	1346	1153	1531	1338	1711	1518	2069	1876	2428	2233	439	632		
	7	7	558	331	923	696	1273	1046	1458	1231	1638	1413	1995	1772	2351	2128	512	739		
	8	8			845	590	1199	940	1384	1125	1564	1308	1922	1667	2277	2023	586	845		
	9	9			778	486	1128	836	1313	1021	1493	1203	1848	1583	2202	1918	657	949		
	10	10			704	383	1054	733	1239	918	1419	1098	1773	1458	2129	1812	731	1052		
	11	11					980	627	1165	812	1345	994	1700	1352	2055	1708	805	1158		
	12	12					906	518	1091	703	1271	890	1625	1248	1980	1602	879	1267		
DFS 265	5	5	1203	945	1778	1520	2358	2100	2858	2400	2958	2700	3538	3280	4128	3870	542	800		
	6	6	1092	790	1671	1363	2249	1940	2549	2240	2849	2540	3429	3120	4019	3710	653	955		
	7	7	985	629	1584	1206	2140	1780	2449	2080	2470	2380	3320	2980	3910	3550	780	1116		
	8	8			1457	1045	2031	1620	2330	1920	2631	2220	3211	2800	3801	3380	865	1275		
	9	9			1350	886	1922	1460	2222	1760	2522	2060	3102	2640	3682	3230	980	1440		
	10	10			1234	724	1813	1300	2113	1600	2413	1900	2993	2480	3583	3070	1086	1596		
	11	11					1704	1140	2004	1440	2304	1740	2884	2320	3474	2910	1193	1754		
	12	12					1600	990	1895	1280	2195	1580	2775	2160	3365	2750	1300	1910		
DFS 300	5	5	1457	1088	2189	1820	2943	2574	3287	2918	3653	3284	4384	4015	5118	4747	738	1107		
	6	6	1310	868	2042	1600	2796	2354	3140	2698	3506	3064	4237	3795	4869	4527	885	1327		
	7	7	1163	847	1895	1379	2649	2133	2993	2477	3359	2843	4080	3574	4822	4306	1032	1548		
	8	8			1748	1158	2502	1912	2846	2256	3212	2622	3843	3353	4675	4085	1179	1769		
	9	9			1600	937	2354	1691	2698	2035	3064	2401	3795	3132	4527	3864	1327	1990		
	10	10			1453	716	2207	1470	2551	1814	2917	2180	3648	2911	4380	3643	1474	2211		
	11	11					2060	1249	2404	1593	2770	1959	3501	2690	4233	3422	1621	2432		
	12	12							2256	1372	2622	1738	3353	2469	4085	3201	1769	2653		
DFS 350	5	5	2129	1591	3198	2660	4293	3755	4800	4262	5335	4797	6403	5865	7471	6933	1076	1614		
	6	6	1914	1269	2883	2338	4076	3433	4565	3940	5120	4475	6188	5543	7256	6611	1291	1936		
	7	7	1700	947	2789	2016	3864	3111	4371	3618	4908	4153	5974	5221	7042	6289	1505	2258		
	8	8			2554	1694	3849	2789	4158	3296	4691	3831	5759	4899	6827	5967	1720	2580		
	9	9			2339	1372	3434	2467	3941	2974	4476	3509	5544	4577	6612	5645	1935	2902		
	10	10			2124	1050	3219	2145	3726	2652	4261	3187	5329	4255	6397	5323	2150	3224		
	11	11					3005	1823	3512	2330	4047	2865	5115	3933	6183	5001	2364	3546		
	12	12							3297	2007	3832	2542	4900	3610	5968	4678	2579	3869		
DFS 400	5	5	3341	2499	5015	4173	6732	5890	7527	6685	8365	7523	10039	9197	11714	10872	1683	2525		
	6	6	3004	1994	4678	3668	6395	5385	7190	6180	8028	7018	9702	8692	11377	10367	2020	3030		
	7	7	2668	1489	4342	3163	6059	4880	6854	5675	7692	6513	9368	8187	11041	9862	2356	3535		
	8	8			4005	2658	5722	4375	6517	5170	7355	6008	9029	7682	10704	9357	2693	4040		
	9	9			3669	2153	5386	3870	6181	4665	7018	5503	8693	7177	10368	8852	3029	4545		
	10	10			3332	1648	5049	3365	5844	4160	6682	4998	8356	6672	10031	8347	3366	5050		
	11	11					4712	2860	5507	3655	6345	4493	8019	6167	9694	7842	3703	5555		
	12	12							5171	3150	6009	4988	7683	5662	9358	7337	4039	6060		

九、双作用输出力矩（英制） Output Torque of Double Acting Actuator(inch)

Imperial unit in-lb:

双作用力矩输出 Output Torque of Double Acting Actuator							
气源压力 Air Pressure 型号 Model	40PSI	60PSI	70PSI	80PSI	90PSI	100PSI	120PSI
DFS032	26	41	51	59	67	78	92
DFS040	41	64	77	89	101	113	137
DFS050	77	110	135	155	174	201	243
DFS063	130	197	245	275	311	340	421
DFS075	277	430	500	559	632	702	833
DFS085	431	641	752	870	970	1081	1328
DFS100	623	952	1085	1261	1419	1604	1959
DFS115	1050	1556	1837	2095	2362	2625	3149
DFS125	1327	1923	2289	2664	3003	3357	4047
DFS145	1872	2864	3588	4102	4614	5145	6317
DFS160	2849	4120	4784	5549	6180	6871	8331
DFS180	3622	5557	6492	7528	8331	9276	11325
DFS200	5087	7690	9037	10344	11536	12748	15390
DFS240	8709	13138	15248	17492	19684	21869	26230
DFS265	14203	21240	24772	28413	32044	35577	42755
DFS300	17865	25798	31443	35738	40201	44663	53595
DFS350	26086	39130	45862	52173	58695	65215	78251
DFS400	40891	61322	71881	81775	91993	102213	122654

十、单作用输出力矩（英制） Output Torque of Spring Return Actuator(inch)

Imperial unit in-lb:

尺寸 Size 型号 Model	弹簧 数量 Springs Qty	单作用力矩输出 Output Torque of Spring Return Actuator														弹簧复位 Spring Return	
		40PSI		60PSI		70PSI		80PSI		90PSI		100PSI		120PSI		0° 结束	90° 开始
		0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束		
DFS 040	2					51	33	62	45	73	56	67	69	110	93	27	44
	4									55	21	70	34	92	58	44	80
DFS 050	5	59	39	62	67	109	95	129	114	146	131	174	160	215	200	27	42
	6	46	31	75	66	103	66	122	105	139	122	167	151	206	190	34	50
	7	41	23	69	49	97	78	115	96	133	113	161	142	201	181	40	59
	8			61	38	90	66	108	86	125	103	154	133	194	171	47	69
	9			55	30	84	61	102	78	119	94	148	125	188	163	53	77
	10					78	53	96	70	113	86	142	117	181	155	59	85
	11					71	44	89	60	105	76	135	107	174	145	66	95
	12					64	34	82	51	98	66	128	96	167	135	73	104
DFS 063	5	84	60	145	118	197	172	225	199	269	233	290	265	369	342	50	76
	6	75	46	135	102	187	156	215	183	249	216	281	249	359	326	60	92
	7	66	31	125	85	178	141	205	167	239	200	271	234	349	309	70	108
	8			114	70	167	127	194	153	226	185	261	220	336	295	81	122
	9			103	64	157	112	184	137	217	168	250	204	327	278	91	138
	10			92	38	147	97	173	121	206	152	240	188	316	262	102	154
	11					138	81	163	105	196	135	230	173	306	245	112	170
	12					128	67	154	90	186	120	221	158	296	230	121	185
DFS 075	5	183	130	325	266	402	346	457	399	526	467	602	545	728	668	102	159
	6	167	102	307	233	385	316	439	368	508	435	584	514	710	636	119	190
	7	149	73	287	201	366	286	420	337	488	403	565	484	689	604	139	221
	8			266	169	346	256	399	306	467	371	545	453	668	572	159	252
	9			246	137	328	226	381	275	448	339	527	423	649	540	178	283
	10			226	105	309	197	361	244	428	307	507	392	629	508	197	314
	11					291	167	342	213	407	275	486	362	609	476	217	345
	12					272	137	322	182	387	243	469	331	589	444	236	376
DFS 085	5	278	187	469	366	591	496	703	604	798	696	917	820	1155	1053	166	266
	6	248	140	435	313	560	446	670	552	764	643	885	769	1122	1000	199	317
	7	218	93	401	260	528	396	637	501	731	590	853	718	1088	947	232	368
	8			368	207	497	347	605	449	698	536	821	668	1055	894	264	419
	9			335	154	467	297	574	398	665	483	790	617	1022	840	296	471
	10			301	101	435	248	541	346	631	430	758	567	968	767	328	522
	11					403	198	508	295	597	377	725	516	954	734	361	573
	12					372	149	475	243	563	324	693	466	920	681	394	625
DFS 100	5	416	305	722	595	871	762	1036	914	1189	1062	1385	1264	1729	1602	222	345
	6	377	241	676	523	827	664	993	844	1143	990	1341	1195	1663	1530	267	415
	7	335	177	629	450	764	617	947	774	1096	917	1297	1127	1636	1458	312	485
	8			582	378	740	549	902	704	1049	845	1252	1058	1589	1385	358	555
	9			536	306	696	482	857	634	1002	773	1208	989	1543	1313	403	625
	10			490	234	654	415	812	565	957	701	1164	921	1497	1241	447	694
	11					610	348	767	494	910	629	1120	852	1450	1169	492	764
	12					566	280	721	424	862	557	1074	783	1403	1097	538	834

单作用输出力矩（英制） Output Torque of Spring Return Actuator(inch)

Imperial unit in-lb:

型号 Model	尺寸 Size	弹簧 数量 Springs Qty	单作用力矩输出 Output Torque of Spring Return Actuator														弹簧复位 Spring Return	
			40PSI		60PSI		70PSI		80PSI		90PSI		100PSI		120PSI		0° 结束	90° 开始
			0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束		
DFS 115	5		716	513	1199	970	1487	1273	1731	1509	1967	1758	2267	2049	2774	2554	363	584
	6		651	407	1126	851	1418	1162	1660	1403	1913	1648	2197	1936	2701	2435	434	699
	7		586	301	1053	732	1350	1051	1599	1287	1831	1520	2127	1822	2628	2307	504	814
	8				970	613	1273	940	1516	1172	1758	1401	2049	1709	2554	2188	584	929
	9				897	494	1205	829	1447	1048	1685	1282	1879	1598	2472	2099	655	1044
	10						1136	718	1367	932	1611	1183	1910	1482	2399	1950	728	1159
	11						1068	607	1296	817	1538	1044	1840	1369	2325	1831	797	1274
	12								1225	701	1456	925	1761	1256	2243	1712	867	1389
DFS 125	5		911	667	1455	1181	1854	1598	2211	1944	2535	2261	2912	2651	3580	3305	451	717
	6		826	529	1360	1025	1765	1453	2117	1793	2440	2108	2821	2502	3484	3149	544	867
	7		741	399	1263	879	1675	1316	2024	1651	2344	1959	2729	2363	3387	3003	637	1009
	8				1163	723	1581	1171	1926	1500	2243	1804	2633	2215	3287	2847	735	1159
	9				1067	568	1491	1025	1833	1349	2147	1648	2542	2066	3191	2692	827	1310
	10						1401	880	1740	1198	2051	1492	2450	1918	3034	2536	920	1460
	11						1312	743	1647	1056	1955	1346	2359	1779	2988	2390	1013	1602
	12						1218	598	1549	906	1854	1190	2263	1630	2898	2234	1111	1752
DFS 145	5		1213	838	2142	1721	2897	2504	3392	2974	3897	3490	4438	4037	5576	5154	717	1124
	6		1074	627	1987	1483	2751	2281	3231	2743	3747	3260	4290	3810	5420	4916	867	1354
	7		936	415	1831	1245	2606	2059	3081	2512	3597	3030	4142	3584	5264	4678	1018	1584
	8				1685	1007	2469	1837	2939	2282	3455	2800	4002	3357	5118	4440	1159	1814
	9				1529	778	2324	1624	2788	2060	3304	2579	3854	3139	4962	4211	1310	2036
	10				1373	540	2179	1401	2637	1829	3154	2349	3706	2912	4806	3973	1460	2266
	11						2042	1179	2495	1598	3012	2119	3586	2686	4660	3735	1602	2496
	12						1906	957	2353	1367	2871	1888	3427	2458	4514	3497	1743	2726
DFS 160	5		1853	1508	3113	2609	3845	3375	4572	4084	5173	4669	5912	5432	7324	6821	974	1460
	6		1766	1237	2932	2307	3649	3093	4368	3791	4962	4367	5711	5144	7114	6518	1177	1752
	7		1579	960	2692	1996	3452	2803	4164	3489	4752	4056	5511	4848	6903	6207	1381	2053
	8				2481	1694	3256	2521	3959	3196	4541	3754	5310	4560	6632	5905	1584	2345
	9				2260	1382	3068	2230	3764	2894	4340	3442	5118	4264	6491	5594	1779	2646
	10				2069	1080	2871	1948	3560	2601	4129	3140	4918	3976	6290	5292	1962	2938
	11						2675	1658	3356	2299	3918	2829	4717	3680	6070	4980	2186	3239
	12						2487	1376	3160	2006	3717	2527	4525	3392	5868	4676	2381	3531
DFS 180	5		2352	1678	4128	3369	5181	4452	6143	5407	6903	6143	7917	7193	9897	9137	1381	2115
	6		2091	1294	3836	2939	4888	4050	5859	4989	6610	5713	7638	6784	9604	8707	1664	2521
	7		1831	911	3543	2509	4614	3649	5575	4572	6317	5283	7359	6374	9311	8276	1947	2947
	8				3250	2069	4341	3238	5261	4146	6024	4843	7080	5955	8018	7837	2230	3372
	9				2968	1839	4076	2837	5016	3729	5740	4413	6810	5545	8734	7407	2505	3788
	10				2673	1208	3802	2435	4732	3311	5447	3983	6531	5136	8441	6976	2768	4204
	11						3538	2034	4457	2894	5164	3552	6260	4726	8157	6546	3062	4620
	12						3264	1632	4173	2477	4871	3122	5981	4316	7864	6116	3345	5036
DFS 200	5		3328	2498	5713	4779	7195	6323	8425	7519	9558	8624	10864	9975	13412	12479	1912	2814
	6		2987	1986	5328	4202	6836	5785	8052	6960	9173	8047	10408	9425	13028	11902	2283	3372
	7		2645	1473	4944	3625	6477	5247	7879	6401	8789	7471	10132	8876	12643	11325	2655	3929
	8				4559	3058	6118	4717	7306	5850	8404	6903	9786	8336	12259	10757	3027	4478
	9				4166	2490	5751	4187	6925	5300	8011	6335	9391	7795	11865	10190	3407	5027
	10				3772	1913	5383	3649	6543	4741	7617	5759	9018	7248	11471	9613	3788	5584
	11						5024	3119	6170	4190	7233	5191	8649	6705	11087	9045	4160	6133
	12						4657	2581	5788	3631	6839	4614	8275	6156	10693	8469	4540	6691

单作用输出力矩 (英制) Output Torque of Spring Return Actuator(inch)

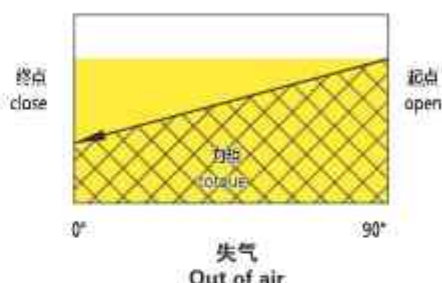
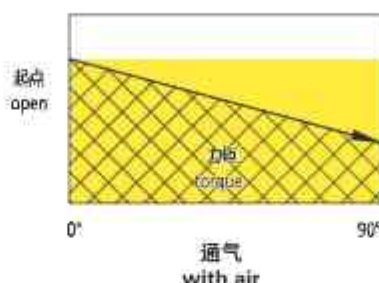
Imperial unit in-lb:

尺寸 Size 型号 Model	弹簧 数量 Springs Qty	单作用力矩输出 Output Torque of Spring Return Actuator														弹簧复位 Spring Return	
		40PSI		60PSI		70PSI		80PSI		90PSI		100PSI		120PSI		0° 结束	90° 开始
		0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束	0° 开始	90° 结束		
DFS 240	5	5737	4419	9798	8313	12134	10749	14249	12811	16342	14859	18685	17273	22888	21405	3230	4664
	6	5135	3564	9119	7352	11501	9852	13592	11878	15665	13598	18040	16357	22210	20444	3885	5593
	7	4541	2604	8450	6372	10878	8338	12844	10920	14906	12936	17305	15450	21524	19482	4531	6540
	8			7736	5402	10245	8032	12287	9587	14319	11975	16756	14535	20848	18521	5186	7476
	9			7123	4449	9639	7143	11656	9064	13669	11014	16113	13628	20160	17560	5814	8399
	10			6445	3506	9006	6263	11000	8150	12991	10052	15459	12713	19491	16589	6469	9310
	11					8374	5358	10348	7209	12314	9100	14823	11788	18814	15637	7124	10248
	12					7742	4426	9658	6241	11636	8148	14169	10862	18127	14687	7778	11213
DFS 265	5	9790	7690	16278	13916	20149	17944	23597	21307	27081	24719	30849	28599	37793	35431	4797	7080
	6	8887	6429	15298	12479	19217	16577	22629	19886	26083	23254	29898	27204	36795	33966	5779	8452
	7	8016	5119	14319	11041	18266	15210	21742	18466	22613	21789	28948	25899	35797	32501	6726	9877
	8			13339	9567	17355	13843	20685	17045	24087	20324	27967	24414	34799	31036	7655	11284
	9			12359	8111	16423	12475	19726	15625	23089	18860	27047	23019	33709	29571	8673	12744
	10			11297	6628	15492	11108	18759	14204	22091	17395	26097	21624	32803	28106	9811	14125
	11					14560	9741	17791	12784	21094	15930	25148	20229	31805	26642	10558	15523
	12					13672	8459	16823	11384	20096	14465	24196	18833	30807	25177	11505	16904
DFS 300	5	11857	8854	20041	16662	25147	21994	29181	25905	33444	30088	38225	35008	46838	43480	6531	9797
	6	10661	7064	18695	14646	23891	20115	27876	23952	32098	28051	36943	33089	45492	41445	7832	11744
	7	9464	5285	17349	12625	22635	18226	26571	21990	30752	26028	35662	31162	44146	39422	9133	13700
	8			16003	10602	21379	16338	25286	20028	29406	24005	34380	29236	42800	37399	10434	15656
	9			14648	8578	20115	14449	23952	18066	26051	21982	33089	27309	41445	35376	11744	17612
	10			13302	6555	18858	12561	22647	16104	26705	19958	31808	25382	40100	33352	13045	19567
	11					17602	10672	21342	14142	25360	17935	30526	23455	38754	31329	14346	21523
	12							20071	12247	24525	16701	28993	21189	37912	30086	16657	23481
DFS 350	5	17326	12947	29278	24353	36683	32006	42613	37837	48843	43917	55826	51198	68398	63473	9523	14284
	6	15576	10327	27310	21405	34846	29334	40704	34978	46874	40968	53854	48331	66430	60525	11425	17134
	7	13834	7707	25351	18457	33017	26583	38805	32120	44915	38021	52089	45523	64471	57577	13319	19983
	8			23382	15509	31180	23832	36896	29261	42947	35073	50214	42715	62502	54629	15222	22833
	9			21414	12561	29343	21080	34987	26402	40979	32126	48339	39908	60534	51681	17125	25683
	10			19446	9613	27506	18329	33078	23544	39010	29178	46465	37100	58566	48733	19028	28532
	11					25677	15577	31179	20685	37051	26230	44589	34293	56606	45785	20921	31382
	12							29333	17915	35840	24422	42370	30952	55387	43969	22826	34244
DFS 400	5	27189	20337	45913	38205	57524	50329	66823	59348	76583	68874	87532	80191	107244	99535	14895	22346
	6	24446	16227	42628	33581	54644	46014	63831	54854	73498	64251	84594	75787	104158	94912	17877	26816
	7	21712	12117	39752	28958	51773	41899	60848	50381	70422	59628	81664	71384	101082	90288	20851	31285
	8			36666	24334	48894	37384	57856	45888	67335	55004	78726	66081	87997	75665	23833	35754
	9			33590	19711	46022	33088	54873	41415	64260	50381	75796	62578	94921	81042	26807	40223
	10			30505	15088	43143	28753	51882	36931	61175	45758	72858	58175	91836	76418	29789	44693
	11					40263	24439	48890	32448	58090	41134	69919	53771	88750	71795	32772	49162
	12							45907	27965	55013	36511	66990	49368	85674	67172	35745	53631

双作用执行器力矩输出图
Output Torque of Double Acting Actuator



单作用执行器力矩输出图
Output Torque of Spring Return Actuator



十一. 工况条件影响 Service Conditions to Consider

1. 介质:

干燥或润滑的空气或惰性气体, 只要和执行器机构内部零件和润滑剂兼容的非腐蚀性气体, 介质温度至少低于环境温度 10℃, 杂质微粒尺寸不超过 20μ。

2. 气源压力:

0.5 巴 (40 磅) - 8 巴 (120 磅)

3. 温度:

- ①. 正常情况: -20℃至 +80℃
- ②. 低温型: -40℃至 +80℃
- ③. 高温型: -15℃至 +150℃

4. 行程:

旋转 90°有 ±5°的调节范围。

5. 润滑剂:

选用温度范围在 -20℃至 80℃的润滑剂。对于低温 (LT) 和高温 (HT) 的工作环境, 需用特殊润滑剂。

1. Operating media:

Dry or lubricated air, or inert gas, or non-corrosive gases that compatible with actuator inner parts and lubricant are available. The media temperature must 10℃ lower than ambient temperature at least, and the maximum particle diameter must less than 20 μ.

2. Air supply pressure:

3 Bar (40 PSI) ~ 8 Bar (120 PSI)

3. Operating temperature:

- a. Standard: -20℃ ~ +80℃
- b. Low temperature: -40℃ ~ +80℃
- c. High temperature: -15℃ ~ +150℃

4. Travel adjustment:

Have adjustment range of ±5° for the rotating 90°.

5. Lubricant:

Use the lubricant that temperature range at -20℃ to +80℃. Select special lubricant when the operating condition is low temperature or high temperature.

十二. 防腐蚀等级及推荐使用场合 The Grade of Anticorrosion & Recommended Service Environment

零件 Parts	防腐蚀等级 The Grade of Anticorrosion	
	A	B
缸体 Body	阳极硬化 + 环氧聚酯涂层 Anodise Hardening + Epoxy Polyester Coating	不锈钢 CF8 或 CF8M Stainless Steel CF8/CF8M
活塞 CAP	阳极硬化 + 环氧聚酯涂层 Anodise Hardening + Epoxy Polyester Coating	不锈钢 CF8 或 CF8M Stainless Steel CF8/CF8M
输出轴 Drive Shaft	碳钢化学镀镍 Carbon Steel Nickel Plated	不锈钢 CF8 或 CF8M Stainless Steel CF8/CF8M
活塞 Piston	阳极硬化 Anodise Hardening	不锈钢 CF8 或 CF8M Stainless Steel CF8/CF8M
使用场合 Service Condition	一般场合或低浓度酸性环境 Normal Condition or Low Thickness Acid Environment	高浓度酸性环境 High Thickness Acid Environment

十三. 执行器的选用 Actuator Sizing Guide

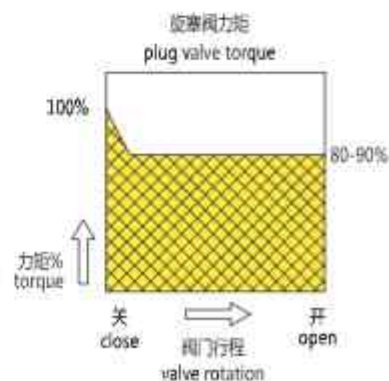
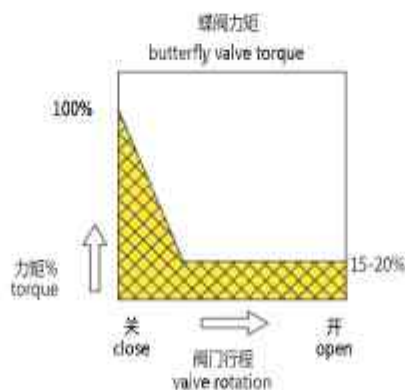
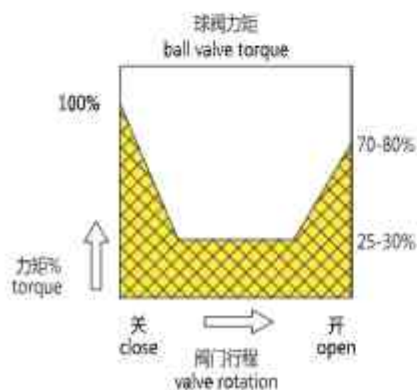
执行器的选型资料:

- 这个参考资料的目的是帮助正确选择 DFS 执行器, 在把 DFS 执行器安装到阀门之前, 必须考虑以下因素:
- 本执行器使用寿命为三年或 100 万次, 50 万次需更换非金属件
- 阀门的运行力矩加上生产厂家推荐的安全系数 (根据操作状况)。
- 执行器的气源额定压力
- 执行器的类型双作用或者单作用 (弹簧复位) 以及一定气源下的输出力矩。
- 执行器的转向以及故障模式 (故障开或故障关)
- 正确选择一个执行器是非常重要的, 如执行器过大, 阀杆可能受力过大。相反如执行器过小, 则不能产生足够的力矩来充分操作阀门。我们认为, 通常操作阀门所需要的力矩来自于阀门的金属部件 (如球芯, 阀瓣) 和密封件 (阀座) 之间的摩擦。根据阀门使用场合: 使用温度、操作频率、管理和压差、输送介质 (润滑、干燥、泥浆) 等许多因素都影响力矩。

Actuation sizing data:

- This reference data are designed to help choose DFS actuator. Before installing the DFS actuator on valve, you must consider the following factors:
- The operating life of this actuator is 3 years or 1 million times.
- Non-metal parts should be replaced when the actuator is used over half a million times.
- The air pressure for the actuator.
- The operation torque of valve coupled with safety factor that manufacturer recommended (based on operations).
- The types of actuator, i.e. Double acting actuator and Spring return actuator, and its output torque under certain supply air.
- Actuator's direction of rotation and failure mode (failure open and close)
- It is very important to choose a correct actuator. For example, the stem will be over forced if the actuator is too big. Whereas, there will be not enough torque to operate valve if the actuator is too small. Usually, we consider the required torque to operate valves is from the frictions between metal parts of valve (such as ball and disc) and seals (body). According to the valves' working condition, a lot of factors can influence the torque, such as operating temperature, frequency of operation, management and pressure difference, delivery media (lubricated, dry, muddy).

下面举出三种不同类型 90° 行程阀门的力矩特性。
Below quoted torque characteristics of three different types of 90° travel valves:



执行器的选用 Actuator Sizing Guide

球阀：

球阀的结构，本质上就是一个抛光的球体（包含一个直通端口），夹在两片阀座之间，从而形成了上下液流。球体旋转控制液流通过或截止。上下液流的微小压力差，迫使球体向下流阀座靠拢，也就形成了“浮球”。在这种情况下，阀门扭矩就由球体、阀座之间，以及阀杆及周边填料的摩擦产生。如对应的图示，施压后，阀门在关闭的位置，即克服静摩擦力开启时的扭矩最大。

Ball Valve:

Ball valve construction concept is based essentially on a polished ball (include a through port) contained in two seats (upstream and downstream). The ball rotation allows the flow, or stops the flow through the valve. Differential Pressure between upstream and downstream pressures forces the ball against the downstream seat (floating ball). In this case, the valve torque is generated by the friction between ball and seat and also between stem and packing. As shown in the diagram, the highest torque point is when, in presence of pressure, the valve is in the closed position, and passes to the open position (breakaway torque).

蝶阀：

蝶阀的结构，本质上是一个固定了一根轴的圆盘，关闭时，完全置于圆形阀座内。圆盘开启到盘面与液流方向平行时，处于最大开启状态。相反，其盘面与液流垂直时，则处于关闭状态。蝶阀的扭矩由圆盘与阀座、阀杆及周边填料的摩擦产生。同时，也产生于圆盘两端的液流压力差。如图所示，施压后，蝶阀在关闭时的扭矩最大。一旦旋启，扭矩急剧减少。

Butterfly Valve:

Butterfly valve construction concept is based essentially on a disc fixed on an axis, which in the closed position, is completely contained by the seat. The open position is obtained when, with a rotation, the disc (through its stem) becomes parallel to the flow. On the contrary, the closed position is obtained when the disc is perpendicular to the flow. In the case of the butterfly valve, the torque is generated by the friction between the disc and the seat, by the stem packing and also by the differential pressure that forces on the disc. The highest torque point, as shown in the diagram, is in the closed position, and only after a small rotation it is considerably reduced.

旋塞阀：

旋塞阀的结构，本质上是锥形旋塞配之以同样形状的阀座。沿锥形轴线方向有液流通道。阀门开合随着旋塞的旋出旋入旋出。通常，开合操作的扭矩不受液流压力的影响，而是产生于阀座和旋塞之间的摩擦。如图所示，阀门在关闭时，扭矩最大。其余操作中，扭矩也比较高。

Plug Valve:

The construction principle of the plug valve is basically according to the plug sealed in the conical cock body. There is a channel at a direction of the plug. Along with plug screws in the valve, the valve will open or close. The operating torque is decided by the friction of the valve seat and the plug during the open and close process and is often not influenced by the fluid's pressure. As shown in the picture. The torque is maximal when the valve closes. As without the influence of the pressure, the superior torque will be kept at the following operation.

执行器的选用 Actuator Sizing Guide

双作用执行器的选用：

齿轮齿条式执行器的输出力矩是活塞压力（气源压力所供）乘上节圆半径（力臂）所得，如右图 1 所示。且摩擦阻力小，效率高。如图 II 所示，顺时针旋转和逆时针旋转时，输出力矩都是线形的。在正常操作条件下，采用双作用执行器的推荐安全系数为 15% 到 20%。

双作用执行器的选用示例（同时见技术数据表）

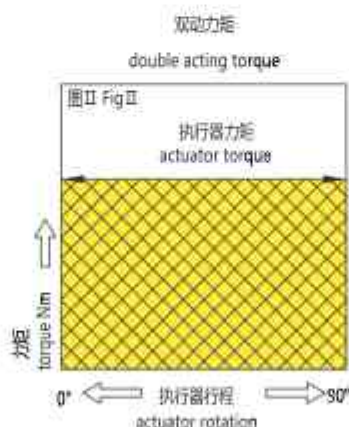
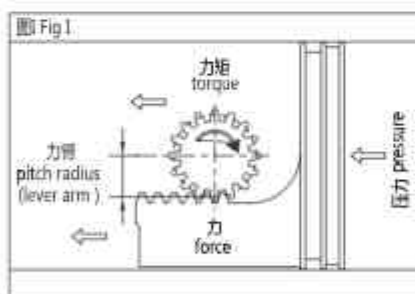
- 蝶阀的力矩 = 60NM
- 安全系数 (20%) = $60\text{NM} \times (1 + 20\%) = 72\text{NM}$
- 气源压力 = 5 巴
- 在 5 巴的气源压力下，产生 72NM 的 DFS 双作用执行器的型号至少是 DFS085（见图 III）。

Double Acting Actuation Guide:

The output torque of rack and pinion pneumatic actuator = piston pressure (air supply pressure) $\times$ pitch radius (lever of arm), as Fig. I. Besides, the friction resistance and efficiency are very high. As Fig. II, both of the output torque are linear when CCW or CW. The suggested safety factor for double acting actuators under normal working conditions is 15%–20%.

Example (check the technical data sheet)

- Butterfly valve's output torque = 60NM
- Safety factor (20%) = $60\text{NM} \times (1 + 20\%) = 72\text{NM}$
- Air supply pressure = 5 bar
- When air supply pressure is 5 Bar, the kind of DFS double acting actuator with output 72NM you need at least is DFS085 for this operation.



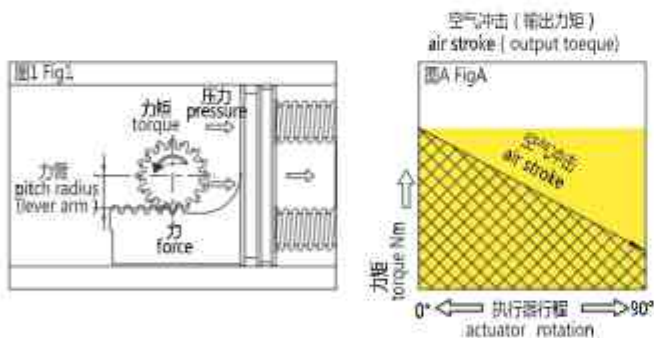
执行器的选用 Actuator Sizing Guide

单作用执行器的选用：

在弹簧复位的应用中，输出力矩是在两个不同的操作过程中所得，（如图1和如图2所示。）根据行程位置（0°和90°），每一次操作产生两个不同的力矩值。弹簧复位执行器的输出力矩由力（空气或弹簧作用活塞上）乘上力臂所得。

第一种情况（见图1）：输出力矩是由空气压力进入2口压缩弹簧后所得，称为“空气行程输出力矩”，在这种情况下，气源压力迫使从0°转向90°位置，由于弹簧压缩产生反作用力，力矩从起点位置时最大值逐渐递减直至90°为止（见图A）。

The first situation (Fig.1): output torque is coming from air supply pressure inside the Port 2 and squeezing the spring. It is known as "air travel output torque". In this situation, air supply pressure pressurized from 0° position to 90° position. As squeeze spring have a reaction force, torque is decreasing gradually from the starting 0° position to 90° position (Fig. A).



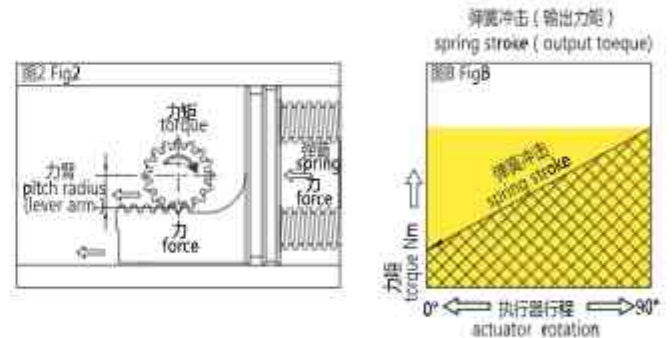
如以上所述，DFS 执行器是根据在两种状况下产生一个平衡力矩的基础上设计而成的。也就是每边的弹簧数量与气源压力值相同（4巴·每边4根弹簧），如图C所示。在每种情况下，有可能获得不平衡力矩，如图D所示。通过改变每边弹簧数量和气源压力的关系（如每边6根弹簧和5.5巴气源或反之）。

Spring Return Actuation Sizing Guide:

In the application of SR actuator, the output torque is coming from two different process of operation (Fig.1 and Fig.2). According to the travel position (0° and 90°), every operation gets two different torque. SR actuator's output torque=pressure (air or spring work on the piston) × pitch radius (lever of arm).

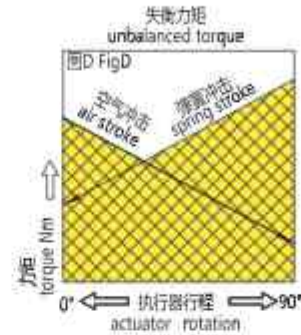
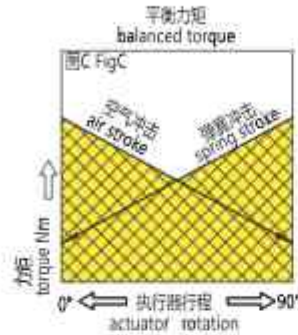
第二种情况（见图2）：输出力矩是当时失气时弹簧恢复力作用在活塞上所得，称为“弹簧行程输出力矩”，在这种情况下，由于弹簧的伸长，输出力矩从90°逐渐递减至0°（见图B）。

The second situation (Fig.2): the output torque is coming from the spring return forcing work on the piston when out of air. It is known as "spring travel output torque". In this situation, because of the comeback of spring, torque is decreasing gradually from the starting 90° position to 0° position (Fig. B).



In a word, DFS actuator is designed base on the fact that two situations get one balanced torque, i.e. the numbers of springs are the same as air supply pressure readings each side (4 bar, 4 springs each side), as shown in Fig. C. There are possibilities to get an unbalanced torque in every situation, as shown in Fig. D, by changing the number of springs and air supply pressure (such as six springs each side and 5.5 bar air supply pressure, and vice versa).

执行器的选用 Actuator Sizing Guide



在弹簧复位应用中可获得两种状况：失气开启或失气关闭。在正常工作条件下，弹簧复位执行器机构的推荐安全系数为 20-25%。

In the application of SR actuator, there are two situations: out of air open or out of air close. The suggested safety factor r for spring return actuators under normal working conditions is 20%-25%.

弹簧复位执行器的选用示例（同时见技术数据表）：

- 弹簧关（失气）
- 球阀的力矩 = 100NM
- 安全系数（20%）= $100 \times 1 + 20\%$ = 120NM
- 气源压力 = 5 巴

被选用的执行器是 DFS145，因此可产生下列数值：

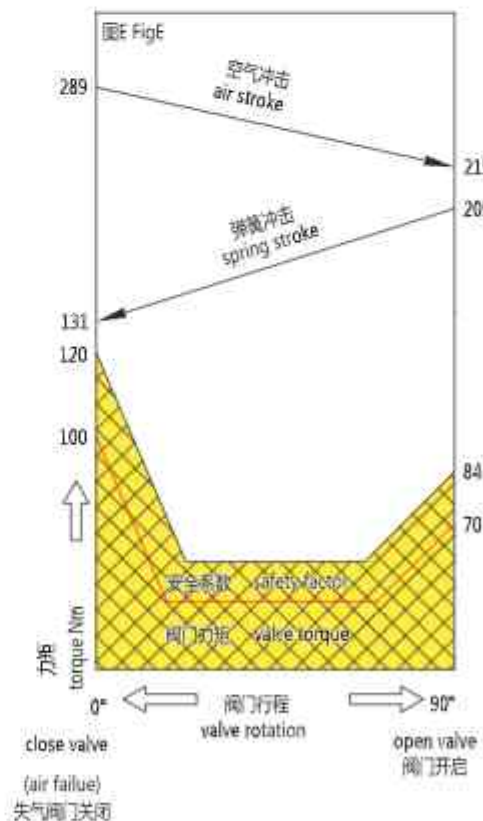
- 弹簧行程 0° = 131NM
- 弹簧行程 90° = 205NM
- 空气行程 0° = 289NM
- 空气行程 90° = 215NM

Example (check the technical data sheet):

- Springs closed (out of air)
- Ball valve's output torque = 100NM
- Safety factor (20%) = $100 \times (1 + 20\%)$ = 120NM
- Air supply pressure = 5 Bar

The selected actuator is DFS145, therefore it gets the following data (Fig.E):

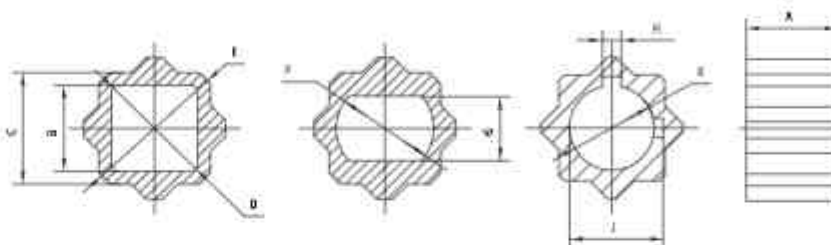
- Spring stroke 0° = 131NM
- Spring stroke 90° = 205NM
- Air stroke 0° = 289NM
- Air stroke 90° = 215NM



十四、常见故障及处理 Trouble Shooting

故障现象 Trouble Phenomena	检查项目 Checking Item	解决方法 Solution
气动阀门不能动作 Pneumatic Valve Does Not Act.	1、电磁阀是否正常工作? Does the solenoid work normally? 2、线圈是否烧坏? Is the circuit burned? 3、电磁阀芯是否被脏物卡死? Is the mandrel of the solenoid blocked by impurity?	1、更换电磁阀 Replace the solenoid 2、更换线圈 Replace the circuit. 3、清除脏物 Remove the impurity
	对气动执行器单独供气试验, 检查密封圈及气缸是否损坏。 With air supplying the pneumatic actuator, are the o-rings or the cylinder broken?	更换已坏密封圈及气缸 Replace the broken o-rings and cylinder body
	阀内是否有杂质将阀芯卡住? Is impurity blocking the valve?	清除杂质, 更换已损件 Clean out the impurity, replace the broken parts
	手动机构的手柄是否处在手动位置? Is the handle of the manual equipment at the manual state?	将手柄转到气动位置 Put the handle to the pneumatic state
动作迟缓、爬行 Acting Slowly	气源压力不够? Is the air supply pressure insufficient?	增加气路压力 Improve the air pressure
	气动执行器输出扭矩过小? Is the output torque of pneumatic actuator not enough?	增大气动执行器的型号规格 Select a bigger model of the pneumatic actuator
	阀门阀芯或其它零件装配过紧? Is the valve stem or other parts assembled too tightened?	重新装配调整 Reassemble and adjust the valve
	是否气路管路堵塞, 流量过小? Is the air supply pipe blocked making the air flux too small?	排除堵塞, 更换过滤器滤芯 Clean out the block, replace the filter stem
反馈器无信号 The Feedback Has No Signal	电源线路短路或断路? Is the power shorted out or stopped?	检修电源线路 Check the circuitry
	反馈器内凸轮位置不准确? Is the cam of the feedback in the incorrect position?	调整凸轮至正确位置 Adjust the cam to the correct position
	微动开关损坏? Is the jiggle on-off broken?	更换微动开关 Replace the jiggle on-off

十五、附件—转接套 Accessories_Insert

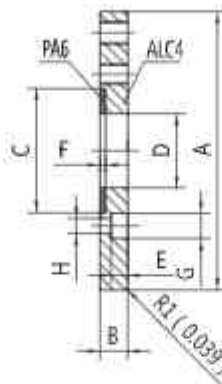
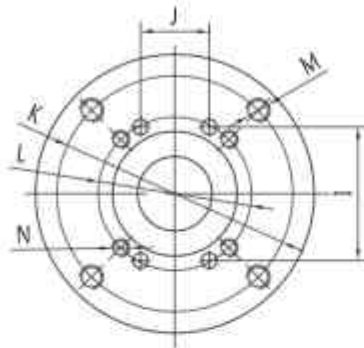


Model	Size	A		B		C		D		E		F		G		H		J		K	
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
DFS 050	1	12.0	0.47	14.0	0.55	17.0	0.67	Φ19.2	Φ0.76	Φ22.2	Φ0.87										
	2	12.0	0.47	11.0	0.43	17.0	0.67	Φ15.2	Φ0.60	Φ22.2	Φ0.87										
	3	12.0	0.47	9.0	0.35	17.0	0.67	Φ12.5	Φ0.49	Φ22.2	Φ0.87										
	4	12.0	0.47			17.0	0.67			Φ22.2	Φ0.87	Φ14.4	Φ0.57	9.6	0.38						
	5	12.0	0.47			17.0	0.67			Φ22.2	Φ0.87					3.1	0.12			Φ12.8	Φ0.50
DFS 063	1	16.0	0.63	14.0	0.55	17.0	0.67	Φ19.2	Φ0.76	Φ22.2	Φ0.87										
	2	16.0	0.63	11.0	0.43	17.0	0.67	Φ15.2	Φ0.60	Φ22.2	Φ0.87										
	3	16.0	0.63	9.0	0.35	17.0	0.67	Φ12.5	Φ0.49	Φ22.2	Φ0.87										
	4	16.0	0.63			17.0	0.67			Φ22.2	Φ0.87	Φ14.4	Φ0.57	9.6	0.38						
	5	16.0	0.63			17.0	0.67			Φ22.2	Φ0.87					3.1	0.12			Φ12.8	Φ0.50
DFS 075 085	1	18.0	0.71	19.0	0.75	22.0	0.87	Φ26.2	Φ1.03	Φ28.2	Φ1.11										
	2	18.0	0.71	17.0	0.67	22.0	0.87	Φ23.2	Φ0.91	Φ28.2	Φ1.11										
	3	18.0	0.71	14.0	0.55	22.0	0.87	Φ19.2	Φ0.76	Φ28.2	Φ1.11										
	4	18.0	0.71	11.0	0.43	22.0	0.87	Φ15.2	Φ0.60	Φ28.2	Φ1.11	Φ14.4	Φ0.57	9.6	0.38						
	5	18.0	0.71	9.0	0.35	22.0	0.87	Φ12.5	Φ0.49	Φ28.2	Φ1.11	Φ16.0	Φ0.63	11.2	0.44						
	6	18.0	0.71			22.0	0.87			Φ28.2	Φ1.11	Φ19.2	Φ0.76	12.8	0.50						
	7	18.0	0.71			22.0	0.87			Φ28.2	Φ1.11					5.1	0.20			Φ15.9	Φ0.63
DFS 100 115	1	23.0	0.91	19.0	0.75	22.0	0.87	Φ26.2	Φ1.03	Φ28.2	Φ1.11										
	2	23.0	0.91	17.0	0.67	22.0	0.87	Φ23.2	Φ0.91	Φ28.2	Φ1.11										
	3	23.0	0.91	14.0	0.55	22.0	0.87	Φ19.2	Φ0.76	Φ28.2	Φ1.11										
	4	23.0	0.91	11.0	0.43	22.0	0.87	Φ15.2	Φ0.59	Φ28.2	Φ1.11	Φ14.4	Φ0.57	9.6	0.38						
	5	23.0	0.91			22.0	0.87			Φ28.2	Φ1.11	Φ16.0	Φ0.63	11.2	0.44						
	6	23.0	0.91			22.0	0.87			Φ28.2	Φ1.11	Φ19.2	Φ0.76	12.8	0.50						
	7	23.0	0.91			22.0	0.87			Φ28.2	Φ1.11					5.1	0.20			Φ19.2	Φ0.75
DFS 125 145 160	1	29.0	1.14	27.0	1.08	36.0	1.42	Φ37.2	Φ1.46	Φ48.2	Φ1.9										
	2	29.0	1.14	22.0	0.87	36.0	1.42	Φ29.2	Φ1.15	Φ48.2	Φ1.9										
	3	29.0	1.14	19.0	0.75	36.0	1.42	Φ26.2	Φ1.03	Φ48.2	Φ1.9										
	4	29.0	1.14			36.0	1.42			Φ48.2	Φ1.9	Φ22.4	Φ0.88	16.0	0.63						
	5	29.0	1.14			36.0	1.42			Φ48.2	Φ1.9	Φ19.2	Φ0.76	12.8	0.50						
	6	29.0	1.14			36.0	1.42			Φ48.2	Φ1.9	Φ18.0	Φ0.63	11.2	0.44						
	7	29.0	1.14			36.0	1.42			Φ48.2	Φ1.9					6.4	0.25	31.8	1.25	Φ28.7	Φ1.13
	8	29.0	1.14			36.0	1.42			Φ48.2	Φ1.9					8.1	0.32			Φ28.7	Φ1.13
DFS 180	1	42.0	1.65	27.0	1.08	36.0	1.42	Φ37.2	Φ1.46	Φ48.2	Φ1.9										
	2	42.0	1.65	22.0	0.87	36.0	1.42	Φ29.2	Φ1.15	Φ48.2	Φ1.9										
	3	42.0	1.65			36.0	1.42			Φ48.2	Φ1.9					6.4	0.25	31.8	1.25	Φ28.7	Φ1.13
	4	42.0	1.65			36.0	1.42			Φ48.2	Φ1.9	Φ22.4	Φ0.88	16.0	0.63						
	5	42.0	1.65			36.0	1.42			Φ48.2	Φ1.9					8.1	0.32			Φ31.9	Φ1.26
DFS 200	1	42.0	1.65	27.0	1.08	36.0	1.42	Φ37.2	Φ1.46	Φ48.2	Φ1.9										
	2	42.0	1.65			36.0	1.42			Φ48.2	Φ1.9					6.4	0.25	31.8	1.25	Φ28.7	Φ1.13
	3	42.0	1.65			36.0	1.42			Φ48.2	Φ1.9					10.1	0.40			Φ33.5	Φ1.32

标准订购指南：
Order Guide：
DFS050 - 1
型号
Model
规格
size

如需特殊尺寸，本公司可定制
Customized sizes are available upon requests.

十六、附件—连接法兰、支架 Accessories_Plate, Bracket



Model Size	DFS050		DFS063/075/085		DFS100/115		DFS125/145/160		DFS180/200	
	mm	in	mm	in	mm	in	mm	in	mm	in
A	φ 102.0	φ 4.00	φ 102.0	φ 4.00	φ 102.0	φ 4.00	φ 152.4	φ 6.00	φ 152.4	φ 6.00
B	12.0	0.47	12.0	0.47	15.0	0.59	15.0	0.59	20.0	0.79
C	φ 28.5	φ 1.11	φ 38.5	φ 1.51	φ 38.5	φ 1.51	φ 63.0	φ 2.64	φ 81.0	φ 3.19
D	φ 17	φ 0.67	φ 21.0	φ 0.83	φ 21.0	φ 0.83	φ 40.0	1.57	φ 40.0	φ 1.57
E	6.0	0.24	7.0	0.28	9.0	0.35	9.0	0.35	11.0	0.43
F	3.0	0.12	3.0	0.12	3.0	0.12	3.0	0.12	3.0	0.12
G	φ 9.5	φ 0.37	φ 11.0	φ 0.43	φ 14.0	φ 0.55	φ 14.0	φ 0.55	φ 17.0	φ 0.67
H	φ 5.2	φ 0.20	φ 6.2	φ 0.24	φ 8.2	φ 0.33	φ 8.2	φ 0.33	φ 10.5	φ 0.41
I	—	—	—	—	72.0	2.83	72.0	2.83	99.0	3.90
J	—	—	—	—	37.0	1.46	37.0	1.46	53.0	2.08
K	φ 82.6	3.25	φ 82.6	3.25	φ 82.6	φ 3.25	φ 127.0	φ 5.00	φ 127.0	φ 5.00
L	—	—	—	—	—	—	φ 82.6	φ 3.25	—	—
M	M10	3/8-16UNC	M10	3/8-16UNC	M10	3/8-16UNC	M12	1/2-13UNC	M12	1/2-13UNC
N	—	—	—	—	—	—	M10	3/8-16UNC	—	—

我公司设计制造了各种各样的连接法兰和转接套可以方便地把执行器安装到阀门上，或者用 ISO 支架或 ISO 齿轮箱作为连接过渡。

We design and produce a series of connection flange and adapter kit to install actuator on valve conveniently, or use ISO bracket or ISO gear box as a connection transition.

转换支架，CF8 (304) 不锈钢铸造结构，转换尺寸：

Connection bracket, CF8 (304) castings. converted size:

F03/F04 to F03/F05 H=29.5mm;

F04/F05 to F04/F05 H=29.5mm;

F04/F05 to F05/F07 H=29.5mm;

F05/F07 to F07/F10 H=40.0mm;

F07/F10 to F07/F10 H=44.0mm;

可提供其它材质，工艺制作。

Other sizes and material available supply.



DFM 系列 安全切换手轮机构 DFM series Declutchable Manual Override Gear Operator

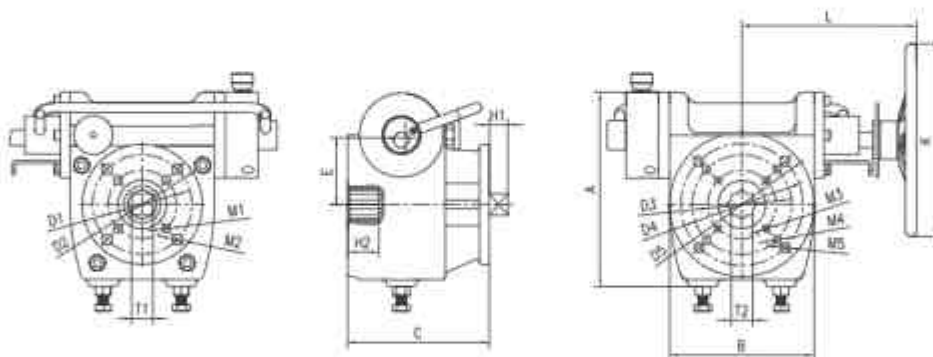


主要性能特点

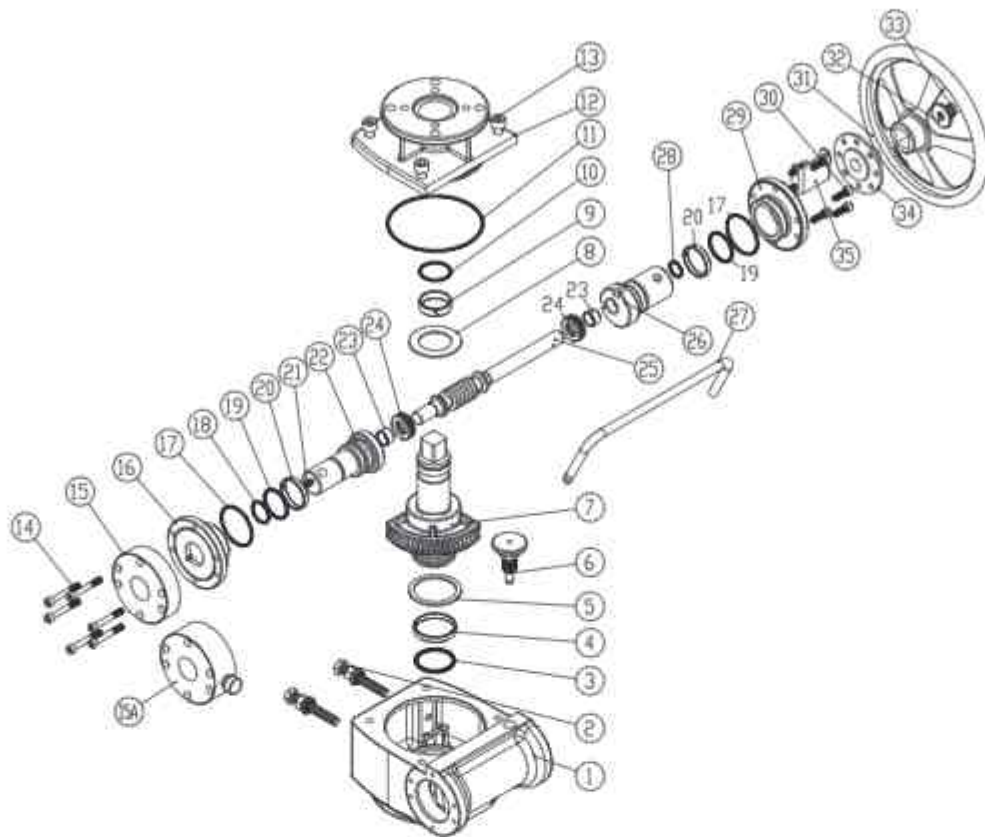
- * 高强度，大扭矩；
- * 集成一体式设计，IP67 水密封标准；
- * ISO5211 连接标准；
- * 气动手动安全切换专利设计；
- * 涡轮蜗杆自润滑设计；
- * WCB 箱体外表面磷化处理及环氧聚酯喷涂；
- * 黄黑色设计

Features

- * High-strength, high-output torque.
- * But it in one body, IP67 solid weatherproof sealing.
- * Mounting base standard, ISO5211.
- * Patented pneumatic-hand shift safety device.
- * Self lubricated bearing for worm & worm gear.
- * WCB body surface treated by phosphating, epoxy & polyester coating.
- * Yellow & black color



Model	A	B	C	D1	D2	D3, D4, D5	E	L	M1	M2	T1	T2	H1	H2	K	J	适用执行器规格 Applicable actuators	输入扭矩 Input torque	输出扭矩 Output torque
DFM-015A	120	100	104	φ50	φ70	F05, F07	44.5	114	φ7	4-φ9	□17	□17	14	25	φ160	1/4" NPT	DFS032-085	17N.m	150N.m
DFM-015B	120	100	104	φ50	φ70	F05, F07	44.5	120	φ7	4-φ9	□17	□17	14	25	φ200	1/4" NPT	DFS075-100	22N.m	200N.m
DFM-080	192	148	145	φ70	φ102	F07, F10, F12	71	175	φ9	4-φ11	□22	□27	19	30	φ200	1/4" NPT	DFS100-145	42N.m	600N.m
DFM-090A	192	148	145	φ70	φ102	F07, F10, F12	71	175	φ9	4-φ11	□27	□27	19	30	φ250	1/4" NPT	DFS145-180	70N.m	800N.m
DFM-090B	192	148	145	φ70	φ102	F07, F10, F12	71	181	φ9	4-φ11	□27	□27	19	30	φ300	1/4" NPT	DFS145-180	96N.m	1200N.m
DFM-160A	260	195	191.5	φ102	φ125	F10, F12	107.5	286	φ11	4-φ13	□36	□36	34	40	φ350	1/4" NPT	DFS160-200	80N.m	1600N.m
DFM-160B	260	195	191.5	φ102	φ125	F10, F12	107.5	272	φ11	4-φ13	□36	□36	34	40	400	1/4" NPT	DFS200-240	100N.m	2000N.m
DFM-350A	334	255	181	φ165	-	F12, F16	123	272	φ22	-	□46	□46	45	175	φ500	1/4" NPT	DFS240-265	190N.m	3300N.m
DFM-350B	334	255	181	φ165	-	F12, F16	123	275	φ22	-	□46	□46	45	175	φ700	1/4" NPT	DFS265-300	230N.m	4000N.m
DFM-700	389	297	249	φ165	φ254	F16, F25	156	416	φ22	8-φ13	□46/55	□46	45	196	φ500	1/2" NPT	DFS350-400	110N.m	7000N.m



零部件明细表 Part List

序号 No.	名称 Part Destination	数量 QTY.	材质 Material
1	蜗轮箱 Body	1	WCB
2	调节螺栓组件 Adjust Bolt	2	304
3	O型圈 (轴下) O Ring	1	NBR
4	轴承 (轴下) Bearing	1	POM
5	轴承 (轴下) Bearing	1	POM
6	定位组件 Positioning unit	1	45
7	输出轴 Shaft	1	45
8	垫片 (轴上) Washer	1	POM
9	轴承 (轴上) Bearing	1	POM
10	O型圈 (轴上) O Ring	1	NBR
11	O型圈 (箱盖) O Ring	1	NBR
12	箱盖 Cap	1	WCB
13	箱盖螺钉 Screw	4	304
14	左盖螺钉 Screw	6	304
15	左端盖 Cap	1	45
*15A	气源切换阀 Air shift valve	1	45
*16	左端盖 Cap	1	AL380
17	O型圈 (左右端盖) O Ring	2	NBR

序号 No.	名称 Part Destination	数量 QTY.	材质 Material
18	O型圈 (左偏心轴小端) O Ring	1	NBR
19	O型圈 (偏心轴) O Ring	2	NBR
20	偏心轴轴承 Eccentric axle bearing	2	POM
21	内六角带盖固定螺钉 Bolt	1	304
22	左偏心半轴 Eccentric half axle	1	45
23	蜗杆轴套 Bearing	2	Cu
24	推力球轴承 Thrust ball bearing	2	Steel
25	蜗杆 Worm shaft	1	45
26	右偏心半轴 Eccentric half axle	1	45
27	手柄 Shift Handle	1	45
28	O型圈 (偏心轴) O Ring	1	NBR
29	右端盖 Cap	1	45
30	右盖螺钉 Screw	6	304
31	手轮 Hand wheel	1	20
32	平垫圈 Washer	1	20
33	螺栓 Bolt	1	304
*34	锁盘 Lock disc	1	45
*35	锁架 Lock bracket	1	45

注：标有“*”号者为选用零部件
Note: Marked by “*” is on customer option

DFM 系列 安全切换手轮机构 DFM series Declutchable Manual Override Gear Operator

工作原理及安装示意图
Operations & Assembly Schematic Diagram



当管道及控制系统工作正常时，该手轮机构被置于自动模式。

动力气源工作路径依次为：

- ①过滤减压阀
- ②安全切换手轮机构 (P-A)
- ③电磁阀
- ④气动执行器；

或者是：

- ①过滤减压阀
- ②安全切换手轮机构 (P-A)
- ③电磁阀
- (提供导通信号给气控阀)
- ④气控阀
- ⑤气动执行器。

当管道及控制系统出现故障，需要人工打开或关闭阀门时，应将手轮机构扳至手动模式。而此时，动力气源通路 (P-A) 被安全切换阀彻底阻断，(A-R) 导通给气动执行器提供排气路径。

该安全切换阀内置于 IP67 防护标准的手轮机构中，不受恶劣工况影响。已获实用新型专利

(ZL201220071741.5) 发明专利已在受理中 (ZL201210050605.2)。

请注意：当提起限位销，扳动切换手柄从自动模式到手动模式时，初始阶段手柄会有锁止的情况，此时，需待 (A-R) 导通，执行器排气后，再横向扳动解锁拨杆，同时向上扳动切换手柄。

When the piping and flow control system working properly, the gear operator is placed in auto mode. The pressed air paths are as following:

- ① Filter regulator.
- ② Safety shift gear operator (P-A).
- ③ Solenoid valve.
- ④ Pneumatic actuator.

Or

- ① Filter regulator.
- ② Safety shift gear operator (P-A)
- ③ Solenoid valve (to provide guidance to the gas control valve).
- ④ Gas control valve.
- ⑤ Pneumatic actuator.

When the piping and control flow system in failure, we should shift the gear operator to manual mode by turning the shift handle. At this moment, the air flow path (P-A) is completely blocked safely. (A-R) provide a exhaust path for the actuator. The safety shift device built into the body of gear operator, which follows IP67 protection standard, free from impact or any bad working conditions.

Note: When cut over the gear operator from auto mode to manual mode after pull upword the positioning pin, the shift handle will be locked during the initial phase. In this case, wait for the actuator exhausted through (A-R) path, and then pull the unlock lever laterally and move the shift handle upward at the same time.