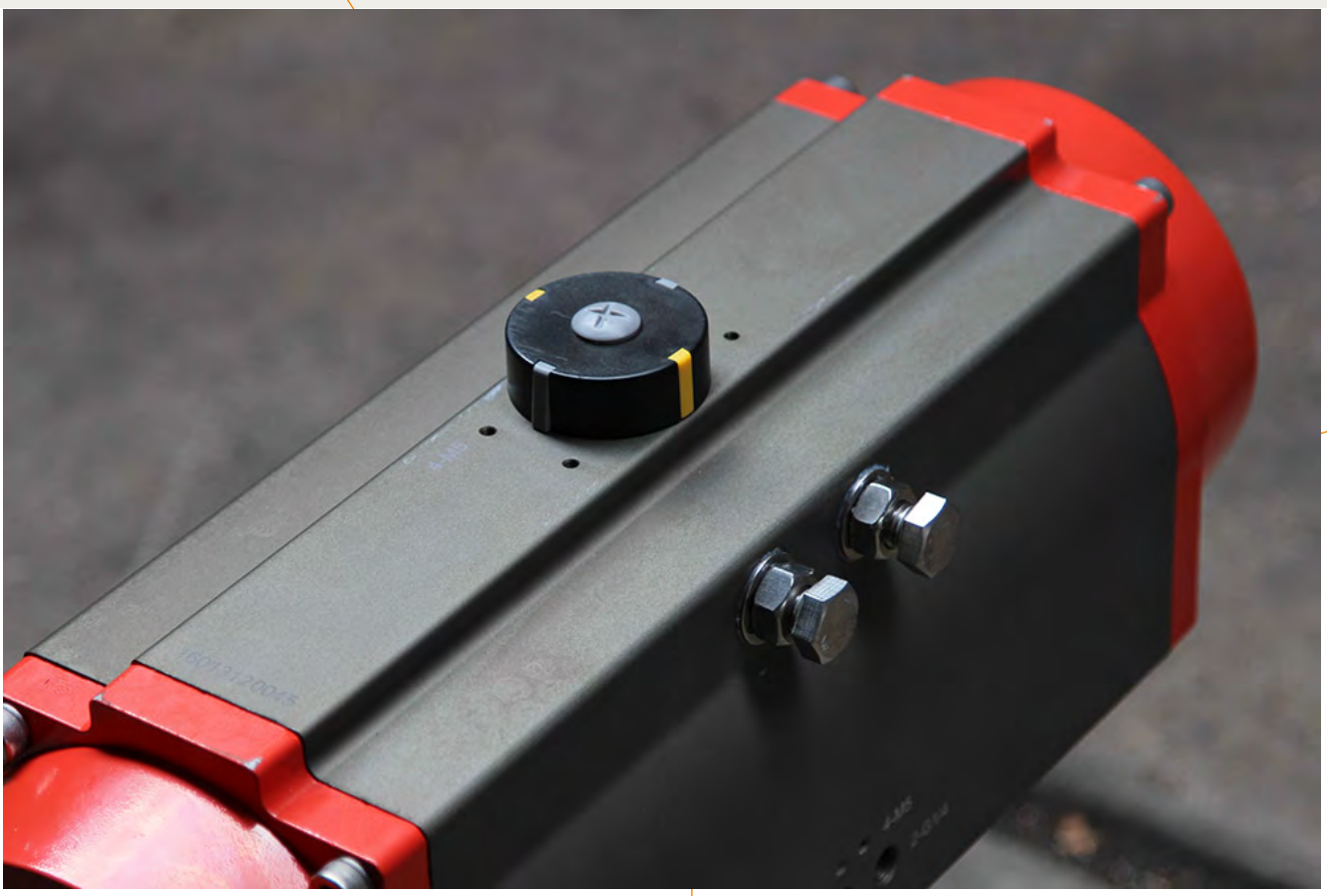
P 06

Pneumatic Actuators and Valves



Advanced technology
High quality material

Pneumatic Actuator

RAT

RAT Series Pneumatic Actuator was designed and developed based on the advanced technology and new material.

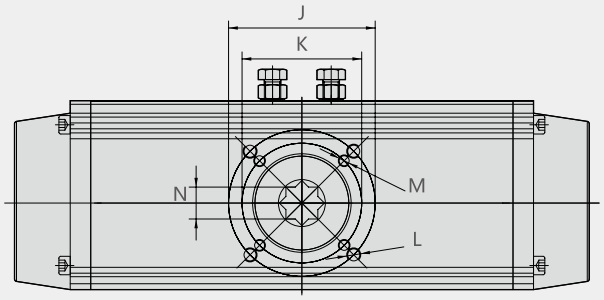
Order Code

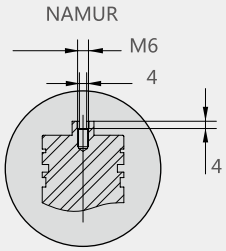
R	AT	□□□	-	□□	-	□□
product	Actuator type	Size **032 - 400**		**SA** Spring Return Type **DA** Air return type		Qty of Springs **05-12**

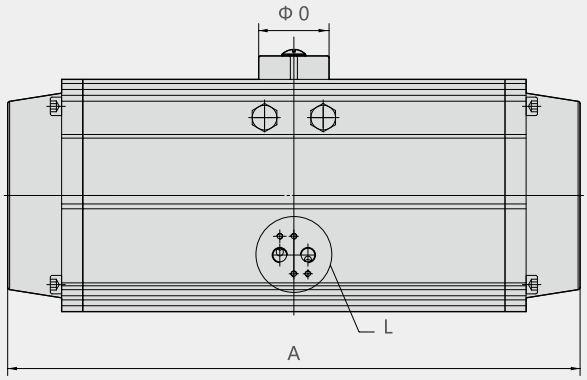
Features

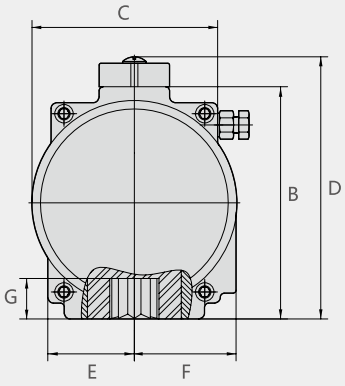
- Conform to the latest international standard: ISO5211, DIN3337, VD/VDE3845 and NAMUR.
- Excellent, compact and modernized design as well as complete specifications is good for your selection.
- All acting surfaces adopt high quality bearings, resulting in low friction, long cycle life and no noise.
- The two independent stroke adjusting devices can easily and precisely adjust at ±5° open or close.
- Double acting type and single acting type (spring return) are with the same external structure, which is easy to install the accessories.
- NAMUR standard multifunction position indicator indicates visually.
- Pre-compressed load spring is convenient for safe mounting and teardown procedures.
- Pistons and end caps are made from die-casting aluminum which has high intensity and light weight.
- Different seal materials are available for high or low temperature
- We can offer Multi-travel rotations (e.g. 120° 135° 180°) and three position actuators.
- Solenoid valves can be easily mounted without connecting plank.

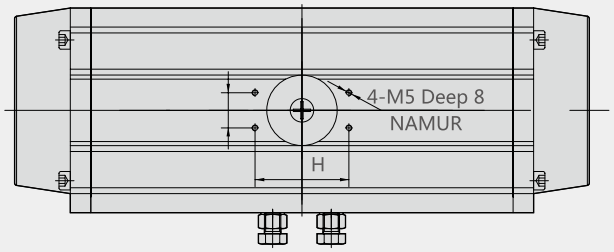
The dimensions

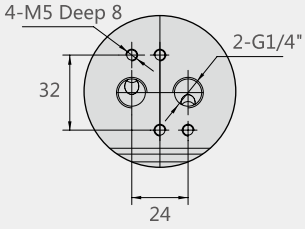




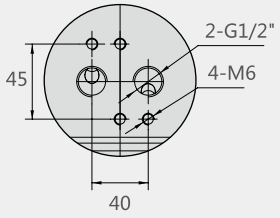








RAT032-RAT240



RAT270-RAT400

Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	A120	A180	Air connection
ART032	110	45	45	65	22.5	23	12	50	25		F03 Φ36		M5×5	9	Φ40			G1/4"
ART052	143	72	55	92	30	41	14	80	30	F05 Φ50	F03 Φ36	M6×8	M5×8	11	Φ40	158	200	G1/4"
ART063	190	88	69	108	35	45	18	80	30	F07 Φ70	F05 Φ50	M8×13	M6×10	14	Φ40	184	233	G1/4"
ART075	207	99.5	100.5	119.5	38.5	52.5	20.5	80	30	F07 Φ70	F05 Φ50	M8×10	M6×8	14	Φ40	103	243	G1/4"
ART083	213	109	88	129	46	52.5	21	80	30	F07 Φ70	F05 Φ50	M8×13	M6×10	17	Φ40	221	280	G1/4"
ART092	258	117	98.5	137	50	61	21	80	30	F07 Φ70	F05 Φ50	M8×12	M6×10	17	Φ40	280	274	G1/4"
ART105	267	133	109	153	57	64	26	80	30	F10 Φ102	F07 Φ70	M10×13	M8×10	22	Φ40	304	388	G1/4"
ART125	340	155	120.5	175	67.5	70	27.5	80	30	F10 Φ102	F07 Φ70	M10×16	M8×13	22	Φ65	365	470	G1/4"
ART140	414	171.5	132	191.5	75	76	32	80	30	F12 Φ125	F10 Φ102	M12×20	M10×15	27	Φ65	442	568	G1/4"
ART160	476	197	159.5	217	87.5	87.5	34	80	30	F12 Φ125	F10 Φ102	M12×20	M10×15	27	Φ65	507	654	G1/4"
ART190	515	230	184	260	102	102	40	130	30	F14 Φ140		M16×22		36	Φ78	575	742	G1/4"
ART210	580	255	205	285	113	113	40	130	30	F14 Φ140		M16×24		36	Φ78	642	831	G1/4"
ART240	654	290	240	320	130	130	50	130	30	F16 Φ165		M20×26		46	Φ78	739	965	G3/8"(1/4")
ART270	725	320	269	350	147	147	50	130	30	F16 Φ165		M20×26		46	Φ78	823	1075	G1/2"(1/4")
ART300	742	357	315	387	190	190	57	130	30	Φ165		M20×26		46	Φ78			G1/2"
ART350	865	406	385	436	215	215	60	130	30	Φ165		M20×26		46	Φ78			G1/2"
ART400	925	462	408	492	258	258	60	130	30	Φ254	Φ165	M20×26	M16×29	55	Φ78			G1/2"

Note: A120 and A180 means the acting length of 120° and 180° of rotary respectively.

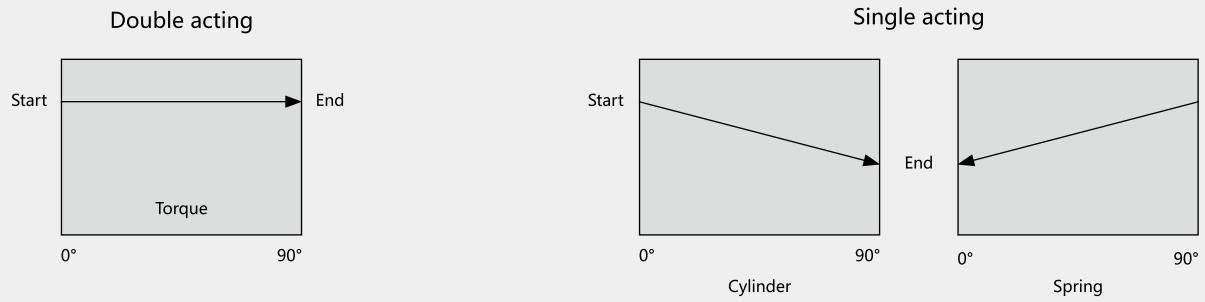
Output torque of RAT spring return actuator

Model	Spring qty	Output torque of Air supply										Spring stroke	
Air pressure (bar)		3		4		5		6		7			
		0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
RAT140SA	5	174.7	131.2	262.5	219							88.5	132
	6	157	104.8	244.8	192.6							106.2	158.4
	7	133.9	78.4	227.1	166.2							123.9	184.8
	8			209.4	139.8	297.1	227.5					141.6	211.2
	9			191.7	113.4	279.4	201.1					159.3	237.6
	10			174	87	261.7	174.7	349.4	262.4	437.8	350.1	177	264
	11					244	148.3	331.7	236	419.5	323.8	194.7	290.4
	12					226.3	121.9	314	209.6	401.8	297.4	212.4	316.8
RAT160SA	5	264.6	197.1	398.3	330.8							136.5	204
	6	237.3	156.2	371	289.9							163.8	244.9
	7	210	115.4	343.7	249.1							191.1	285.7
	8	182.7	74.6	316.4	208.3	450.1	341.9					218.4	326.5
	9			289.1	167.5	422.8	301.2					245.7	367.3
	10			261.8	126.7	395.5	260.4	529.2	394.1			273	408.1
	11					368.2	219.6	501.9	353.3	635.6	487	300.3	448.9
	12					340.9	178.8	474.6	312.5	608.3	446.2	327.6	489.7
RAT190SA	5	429	320.4	644.5	535.9							217.4	326
	6	385.5	255.5	601	470.7							260.9	391.2
	7	342	190	557.5	405.5							304.4	456.4
	8			514	340.3	729.5	555.8					347.9	521.6
	9			470.6	275.1	686.1	490.6					391.3	586.8
	10			427.1	209.9	642.6	425.4	858.1	640.9	1073.6	856.4	434.8	652
	11					599.1	360.2	814.6	575.7	1030.1	791.2	478.3	717.2
	12					555.6	295	771.1	510.5	986.6	726	521.8	782.4
RAT210SA	5	589.6	440.6	885.7	736.7							298.8	447.8
	6	529.8	351.1	825.9	647.2							358.6	537.3
	7	470.1	261.5	766.2	557.6							418.3	626.9
	8			706.4	468.1	1002.5	764.2					478.1	716.4
	9			646.7	375.5	942.8	671.6					537.8	809
	10			586.9	289	883	585.1	1179.1	881.2	1475.2	1177.3	597.6	895.5
	11					823.2	495.5	1119.3	791.6	1415.4	1087.7	657.4	958.1
	12					763.5	406	1059.6	702.1	1355.7	998.2	717	1074.6
RAT240SA	5	924	690.5	1488.1	1154.6							468.5	702
	6	829.9	550.1	1294	1014.2							562.6	842.4
	7	736.7	409.7	1200.8	873.8							655.8	982.8
	8			1107.1	733.4	1571.3	1197.6					749.5	1123.2
	9			1013.4	593	1477.6	1057.2					843.2	1263.6
	10			919.7	452.6	1383.9	916.8	1848.1	1381	2312.2	1845.1	936.9	1404
	11					1290.2	776.4	1754.4	1240.6	2218.5	1704.7	1030.6	1544.4
	12					1196.5	636	1660.7	1100.2	2124.8	1564.3	1124.3	1684.8
RAT270SA	5	1299.7	971.2	1952.4	1623.9							658.5	987
	6	1168	773.8	1820.7	1426.5							790.2	1184.4
	7	1036.3	576.4	1689	1229.1							921.9	1381.8
	8			1557.3	1031.7	2210	1684.4					1053.6	1579.2
	9			1425.6	834.3	2078.3	1487					1185.3	1776.6
	10			1293.9	636.9	1946.6	1289.6	2599.3	1942.3	3252	2595	1317	1974
	11					1814.9	1092.2	2467.6	1744.9	3120.3	2397.6	1448.7	2171.4
	12					1683.2	894.8	2335.9	1547.5	2988.6	2200.2	1580.4	2368.8

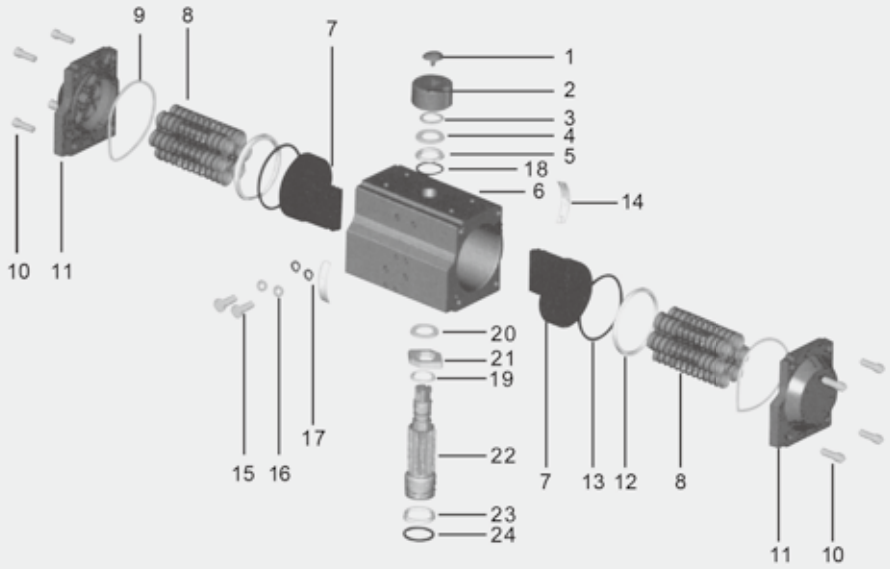
Output torque of RAT spring return actuator

Output torque of Air supply												Spring stroke	
Air pressure (bar)		3		4		5		6		7			
Model	Spring qty	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
RAT052SA	5	8.48	6.28	12.64	10.44							4	6.2
	6	7.68	4.98	11.84	9.14							4.8	7.5
	7	6.98	3.78	11.14	7.94							5.5	8.7
	8			10.34	6.74	14.5	10.9					6.3	9.9
	9			9.54	5.44	13.7	9.6					7.1	11.2
	10			8.74	4.24	12.9	8.4	17.06	12.56			7.9	12.4
	11					12.1	7.1	16.26	11.26	20.42	15.42	8.7	13.7
	12					11.3	5.9	15.46	10.06	19.62	14.22	9.5	14.9
RAT063SA	5	15	11.2	22.3	18.5	29.6	25.8					7	10.8
	6	13.5	9	20.8	16.3	28.1	23.7					8.5	12.95
	7	12	6.9	19.4	14.2	26.7	21.5					9.9	15.1
	8			18	12	25.3	19.3	32.6	26.6			11.3	17.3
	9			16.5	9.9	23.9	17.2	31.2	24.52			12.7	19.4
	10			15.3	7.7	22.6	15	29.9	22.3	37.2	29.6	14	21.6
	11			13.8	5.6	21.1	12.9	28.4	20.2	35.7	27.5	15.5	23.7
	12					19.7	10.7	27	18	34.3	25.3	16.9	25.9
ART075SA	5	23.4	17.8	35.1	29.5							11.9	17.5
	6	-21.1	14.3	32.8	26							14.2	21
	7	-18.7	10.8	30.4	22.5							16.6	24.5
	8			28	19	39.8	30.8					19	28
	9			25.7	15.5	37.5	27.3					21.3	31.5
	10			23.3	12	35.1	23.8	46.8	35.5	58.6	47.3	23.7	35
	11					32.7	20.3	44.4	32	56.2	43.8	26.1	38.5
	12					30.4	16.8	42.1	28.5	53.9	40.3	28.4	42
ART083SA	5	30.9	23.8	46.1	38.9							14.5	21.7
	6	28.1	19.5	43.3	34.6							17.39	26
	7	25.2	15.1	40.3	30.2							20.3	30.4
	8			37.4	25.9	52.6	41.1					23.2	34.7
	9			34.5	21.5	49.7	36.7					26.1	39.1
	10			31.6	17.2	46.8	32.4	62	47.6	77.1	62.7	29	43.4
	11					43.9	28.1	59.1	43.3	74.2	58.4	31.9	47.7
	12					41	23.7	56.2	38.8	71.3	54	34.78	52.08
RAT092SA	5	50.28	37.78	75.54	63.03							25.5	38
	6	45.18	30.18	70.44	55.44							30.6	45.6
	7	40.08	22.58	65.34	47.84							35.7	53.2
	8			60.24	40.24	85.5	65.5					40.8	60.8
	9			55.14	32.69	80.4	57.9					45.9	68.4
	10			50.04	25.04	75.3	50.3	100.56	75.56	125.82	100.82	51	76
	11					70.2	42.7	95.46	67.96	120.72	93.22	56.1	83.6
	12					65.1	35.1	90.36	60.36	115.6	85.6	61.2	91.2
RAT105SA	5	68.6	52	103.6	87							33.2	49.8
	6	61.9	42	96.9	77							39.9	59.8
	7	55.3	32.1	90.3	67.1							46.5	69.7
	8			83.7	57.1	116.6	90					53.1	79.7
	9			77	47.4	109.9	80.3					59.8	89.4
	10			70.4	37.2	103.3	70.1	137.3	104	171.2	138	66.4	99.6
	11					96.7	60.1	130.6	94	164.6	128	73	109.6
	12					90	50.2	123.9	64.1	157.9	118.1	79.7	119.5
RAT125SA	5	115.5	88	173.8	146.3							59.4	86.9
	6	103.6	70.6	161.9	128.9							71.3	104.3
	7	91.8	53.5	150.1	111.6							83.1	121.6
	8			138.2	94.2	196.5	152.5					95	139
	9			126.3	76.8	184.6	135.1					106.9	156.4
	10			114.4	59.4	172.7	117.7	231	176			118.8	173.8
	11					160.9	100.4	219.2	158.7	277.5	217	130.6	191.1
	12					149	83	207.3	141.3	265.6	199.6	142.5	208.5

Torque diagram of actuator



Parts and Material



No	Description	Qty	Material	Anti-corrode treatment	Optional Material
1	Indicator screw	1	plastic		
2	Indicator	1	plastic		
3	Spring clip	1	Stainless steel		
4	Washer	1	Stainless steel		
5	Outside washer	1	PTFE		
6	Body	1	Aluminum alloy	Hard anodized etc.	
7	Piston	2	Cast aluminum	Hard anodized	Stainless steel
8	Spring assembly	*	spring steel	Dip coating	
9	End cap O-ring	2	NBR		Viton / Silicone
10	Cap screw	8	Stainless steel		
11	End cap	2	Cast aluminum	powder spraying etc	
12	Bearing (Piston)	2	PTFE		
13	O-ring(Piston)	2	NBR		Viton / Silicone
14	Guide (Piston)	2	POM		PTFE
15	Adjusting bolt	2	Stainless steel		
16	Adjusting screw nut	2	Stainless steel		
17	O-ring (adjusting nut)	2	NBR		Viton / Silicone
18	O-ring (pinion top)	1	NBR		Viton / Silicone
19	Bearing(pinion top)	1	PTFE		
20	Inside washer	1	PTFE		
21	Cam	1	Alloy steel		
22	Pinion	1	Alloy steel	Nickel pleated	Stainless steel
23	Bearing(pinion bottom)	1	PTFE		
24	O-ring (pinion bottom)	1	NBR		Viton / Silicone

Output torque of RAT spring return actuator

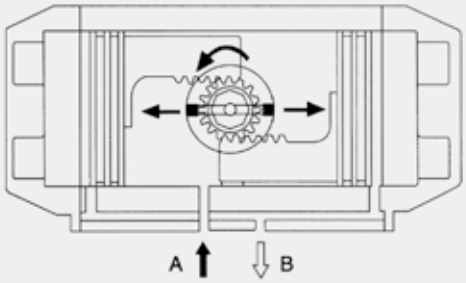
Model	Spring qty	Output torque of Air supply										Spring stroke	
Air pressure (bar)		3		4		5		6		7			
		0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
RAT300SA	5	1603	1183									800	1220
	6	1483	1066									920	1337
	7	1330	844	2132	1646							1073	1559
	8	1177	621	1979	1423	2780	2224					1226	1782
	9			1825	1201	2626	2002	3427	2803			1380	2004
	10			1652	977	2473	1778	3274	2579	4075	3380	1533	2228
	11					2320	1556	3121	2357	3922	3158	1686	2450
	12					2014	1077	2815	1878	3686	2679	1922	2929
RAT350SA	5	2399	1739									1199	1859
	6	2120	1453									1478	2145
	7	1874	1096	3074	2296							1724	2502
	8	1627	738	2827	1938	4027	3138					1971	2860
	9			2580	1581	3780	2781	4979	3980			2218	3217
	10			2335	1223	3535	2423	4734	3622	5934	4822	2463	3575
	11					3288	2066	4487	3265	5687	4465	2710	3932
	12					3120	1537	4319	2736	5519	3936	2878	4461
RAT400SA	5	3418	2479									1709	2648
	6	2922	1670									2205	3457
	7	2647	1239	4357	2949							2480	3888
	8	2372	806	4082	2516	5191	4225					2755	4321
	9			3806	2085	5515	3794	7224	5503			3031	4752
	10			3531	1652	5240	3361	6949	5070	8658	6779	3306	5185
	11					4963	2930	6672	4639	8381	6348	3583	5616
	12					4445	2190	6154	3899	8106	5608	4101	6356

Output torque of RAT air force return actuator

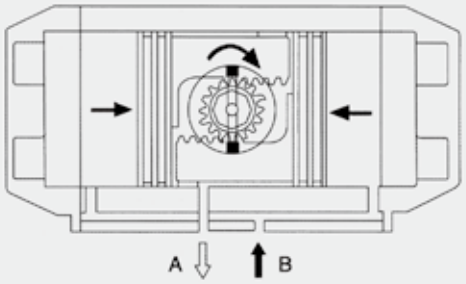
Model	Air pressure (bar)						
	2	3	4	5	6	7	8
RAT 032DA	2.78	4.20	6.00	7.50	9.00	10.00	11.50
RAT 052DA	8.32	12.48	16.64	20.8	24.96	29.12	33.28
RAT 063DA	14.64	21.96	29.28	36.6	43.92	51.24	58.56
RAT 075DA	23.5	35.3	47	58.8	70.5	82.3	94
RAT 083DA	29.7	44.5	59.4	74.2	89.1	103.9	118.8
RAT 092DA	45.5	68.2	91.1	113.7	136.4	159.2	181.9
RAT 105DA	67.88	101.82	136.76	169.7	203.64	237.58	271.52
RAT 125DA	116.6	174.9	233.2	291.5	349.8	408.1	466.4
RAT 140DA	175.48	263.22	350.96	438.7	526.44	614.18	701.92
RAT 160DA	267.4	401.1	534.8	668.5	802.2	935.9	1069.6
RAT 190DA	430.96	646.44	861.9	1077.4	1292.9	1508.4	1723.8
RAT 210DA	592.2	888.4	1184.5	1480.6	1776.7	2072.8	2369
RAT 240DA	831.9	1220.8	1627.8	2030.7	2444.6	2848.6	3255.5
RAT 270DA	1305.4	1958.2	2610.9	3263.6	3916.3	4569	5221.8
RAT 300DA	1602	2403	3205	4006	4807	5608	6409
RAT 350DA	2399	3598	4798	5998	7197	8397	9596
RAT 400DA	3418	5127	6837	8546	10255	11964	13673

Operating Principle

Double action

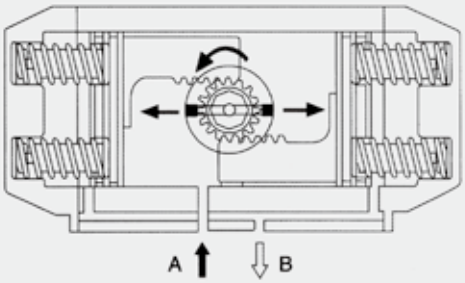


Input the air into Port A forces the pistons move outwards, the pinion turns counterclockwise and open the valve, then the air be exhausted from Port B.

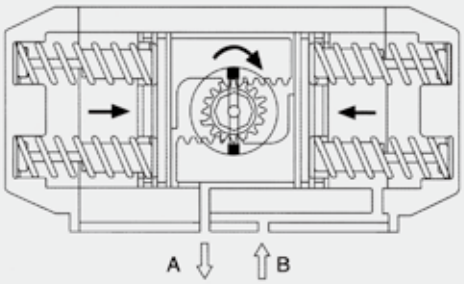


Input the air into Port B forces the pistons move inwards, the pinion turns clockwise and close the valve, then the air be exhausted from Port A.

Single action



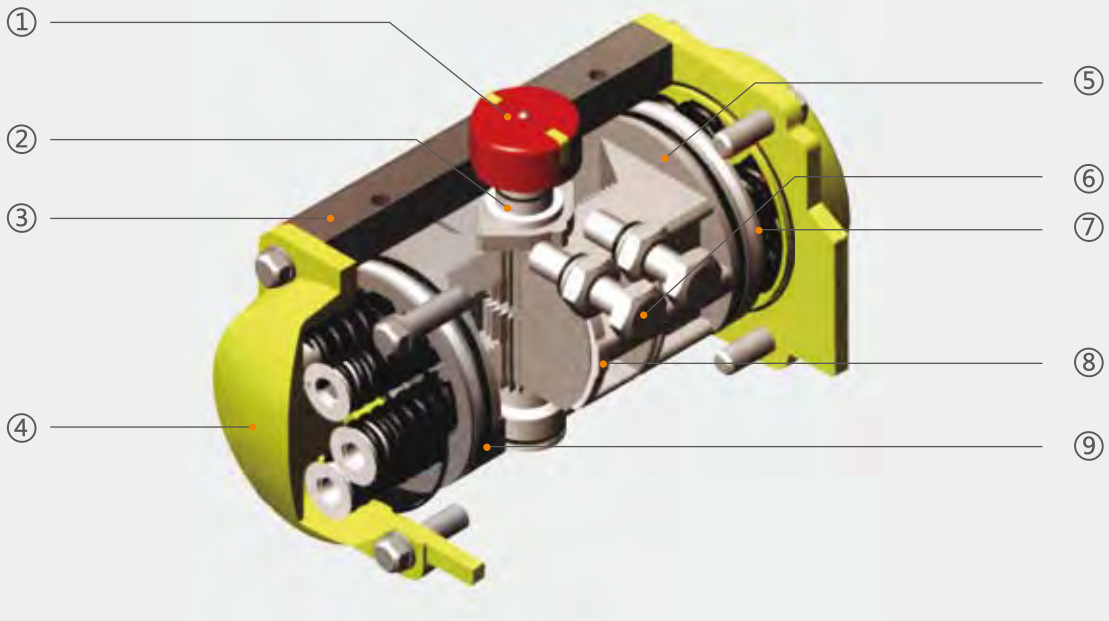
Input the air into Port A forces the pistons move outwards, the pinion turns counterclockwise and open the valve, then the air be exhausted from Port B.



When loss air pressure or power, the stored energy in the springs forces the pitons inwards, causing the pinion turns clockwise while air be exhausted from Port A, and air to Port B can accelerate closing the valve.

Note: 1. The standard rotation is clockwise for closing the valve and counterclockwise for opening. 2. If the direction of the piston is assembled reversely, then the standard rotation is counterclockwise for closing the valve and clockwise for opening.

Parts Introduction



① Indicator

NAMUR standard indicator is convenient for mounting accessories such as Limit switch box, Positioner and so on

② Actuator Shaft

Nickel plated alloy steel and high-precision shaft conforms to NAMUR, ISO5211 and DIN3337 standard. The dimensions and stainless steel one can be customized.

③ Actuator Body

According to the different requirements, the extruded aluminum alloy ASTM6005 body can be treated with hard anodized, powder polyester painted (different colors like blue, orange, yellow and so on are available), PTFE or Nickel plated.

④ End Caps

Die-casting aluminum powder polyester can be painted in different colors, PTFE coated or Nicked plated.

⑤ Pistons

The twin rack pistons are made from Die-casting aluminum treated with hard anodized or made from Cast steel with galvanization. Symmetric mounting position,long cycle life and fast operation, reversing rotation by simply inverting the pistons.

⑥ Stroke adjustment

The two independent external stroke adjustment bolts can adjust ±5° at both open and close directions easily and precisely.

⑦ High performance springs

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

⑧ Bearings and Guides

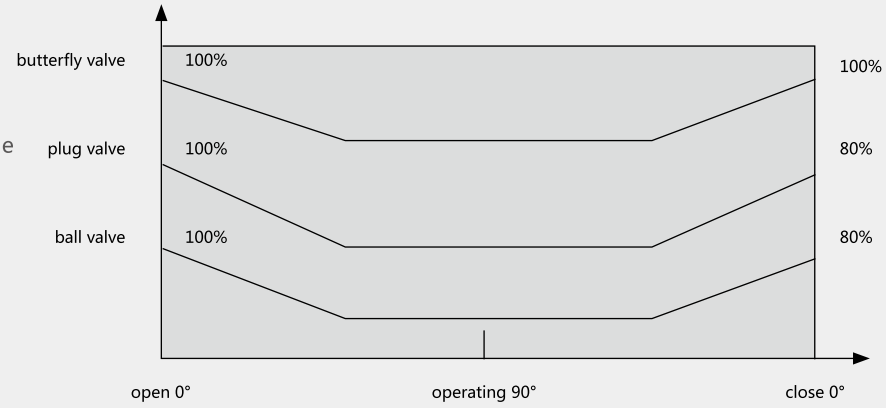
Made from low friction and long-life compound material which to avoid the direct contact between metals and also easy to be maintained.

⑨ O-rings

Normal: NBR
High temp. & low temp. : Viton or Silicone

Sample of choosing single action actuators

During the selecting of the spring return actuators, we can choose a more reasonable and economical actuator if we know the different torque of valve on opening, operation and closing.



Example

A butterfly valve need torque=80N.m
The max torque needed by the butterfly valve 80(1+30%) =104N.m
The torque after opened (operating) 104x30%=32N.m
Air supply=4bar
We can select RAT125S K10

- Air stroke 0° =114.4N.m >104N.m
- Air stroke 90° =59.4N.m >32N.m
- Spring stroke 90° =173.8N.m>32N.m
- Spring stroke 0° =118.8N.m> 104N.m
- The above data shows the actuator's torque can satisfy the requirement of the butterfly valve.

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

Air consumption

Air volume opening & closing					
Model	**Air volume opening**	**Air volume closing**	**Model**	**Air volume opening**	**Air volume closing**
RAT032	0.035 L	0.045 L	**RAT160**	2.6 L	3.7 L
RAT052	0.09 L	0.12 L	**RAT190**	4.2 L	5.9 L
RAT063	0.14 L	0.2 L	**RAT210**	5.7 L	8.2 L
RAT075	0.21 L	0.3 L	**RAT240**	9 L	12.8 L
RAT083	0.29 L	0.41 L	**RAT270**	12.6 L	17.9 L
RAT092	0.49 L	0.71 L	**RAT300**	21.4 L	30 L
RAT105	0.7 L	0.99 L	**RAT350**	31.2 L	43.7 L
RAT140	1.7 L	2.4 L	**RAT400**	47.9 L	67.1 L

Air consumption of double action actuator (L/min) =air volume (air volume opening + air volume closing) x (air supply (kpa) + 101.3) ÷ 101.3) x action cycle time (/min).

Air consumption of single action actuator (L/min) =air volume opening x (air supply (kpa) + 101.3) ÷ 101.3) x action cycle time (/min).

The function and usage of the actuator and the parts

- Double action actuator: open and close the valve
- Single action actuator (spring return): when the air is cut off, it will close (normal close type)
- Double control solenoid valve: the valve open when one solenoid coil power on and close when another coil power on, it has memory function. (Ex-proof type is available)
- Single control solenoid valve: the valve open or close when power on, and close or open when power off. (Ex-proof type is available).
- Limit switch box: transmit the signal of open or close of the valve remotely. (Ex-proof type is available)
- Pneumatic positioner: control the medium flow rate of the valve according to air pressure (0.2~1bar) (Ex-proof type is available)
- Electric positioner: control the medium flow rate of the valve according to electric current (4-20mA) (Ex-proof type is available)
- Electric-pneumatic transducer: transduce current signal to air pressure signal for compatibility with positioner.
- FRL: includes filter, regulation and lubrication which can clean and lubricate the connection parts
- Manual equipments: manual operate on the valve in case of the cut off or stoppage of the air or power.

How to choose

Firstly, confirm the torque that will need during the open or close of the valve. Normally the safety factor is 15~20%. If the medium is steam or non-lubricated liquid, then set it to 25%. The safety factor for non-lubricated slurry liquid is 40% and for non-lubricated granule powder is 80%. Then check output torque table form of double action or single action, you can get a right model. On the output torque table of single action actuator, the torque on the line of spring stroke is the torque of closing the valve.

Example

- A ball valve need torque= 280N.m
- Medium: water
- Safety factor (20%) = 280 (1+20%) =336N.m
- Air pressure= 4 bar
- According to the output torque table of double action actuator, the right model is RAT140DA, the output torque is 350.96N.m when the pressure is 4bar.

Three position actuator

Three position actuator provides an operation of 0° , 45° , 90° or the random travel of middle position. The middle position is achieved by the mechanical brake which is caused by the movement of the two auxiliary pistons. It is adjustable.

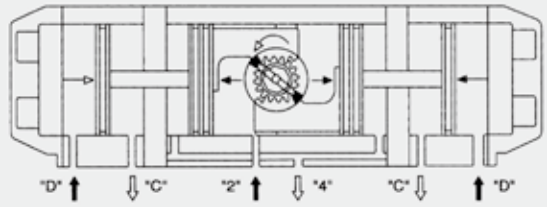


Chart 1: it is middle position, which is achieved when the air is supplied to port 2 and port D, meantime port 4 and port C are in a state of exhaust air. When the air is supplied to port D, it forces the auxiliary pistons move to the center, and make the inner pistons stopped at the setted position.

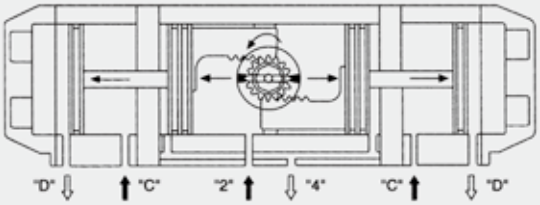


Chart 2: it is fully open position, which is achieved when the air is supplied to port 2 and port C (air to port C is optional), meantime port 4 and port D are in a state of exhaust air.

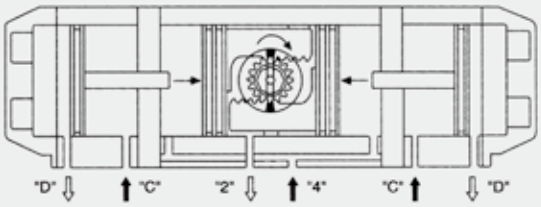


Chart 3: it is fully close position, which is achieved when the air is supplied to port 4 and port 2 is in a state of exhaust air. No need to operate port C and post D.

How to order

- Pneumatic actuators: double acting or spring return type (normal close or normal open)
- Please note the working pressure of the valve, working medium, working temperature and the seals.
- Solenoid valve: please note whether you need double coil or single coil, voltage and Ex-proof or not.
- Signal feedback: mechanical or approachable switch, voltage, output current and ex-proof type.
- Positioner: pneumatic positioner, electric positioner, current signal, voltage, electrical converter, ex-proof type.
- FRL
- Manual device
- Special one can be customized

Quality Assurance

- Each actuator is tested and checked before delivery.
- Each actuator has a QC passed label.
- Each actuator is with the standard NUMAR connection and mounting size.
- Each actuator is packed by the carton.

The weight of actuator

Model	Similar weight	Model	Similar weight	Model	Similar weight
RAT032	0.72kg	RAT105	5.8kg	RAT240	60.5kg
			7.0kg		72.4kg
RAT052	1.3kg	RAT125	9.4kg	RAT270	85.4kg
	1.4kg		10.5kg		104.6kg
RAT063	1.9kg	RAT140	13.7kg	RAT300	120.1kg
	2.09kg		16.2kg		196.6kg
RAT075	2.7kg	RAT160	24.5kg	RAT350	192.5kg
	3.2kg		49.6kg		250.5kg
RAT083	3.1kg	RAT190	31.2kg	RAT400	283kg
	3.6kg		37.3kg		344.5kg
RAT092	5.1kg	RAT210	40.2kg		
	5.9kg		48kg		

Operating conditions

Working medium

- Dry or lubricated air or inert gas, as long as the medium is compatible with the inside parts and lubricant of the actuator.
- The dew-point temperature of the operating media is -20℃ . The dimension of the impurity particle cannot be larger than 30μ.
- If the positioner is needed, the dimension of impurity particle cannot be larger than 5μ.

Air pressure

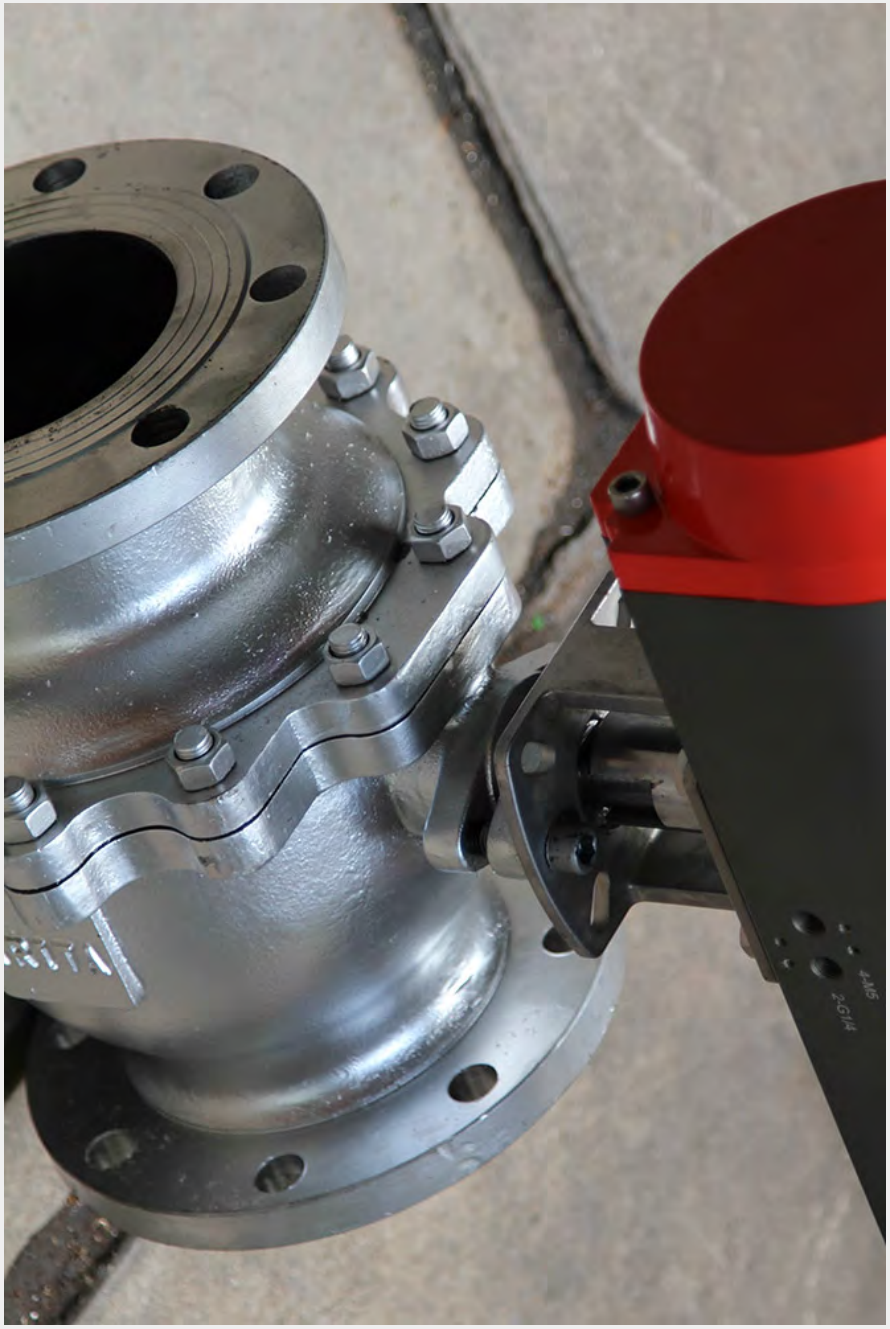
- 3bar to 8bar

Working temperature

- Standard: -20℃ ~ +80℃
- Low temperature type: -40℃ ~ +80℃
- High temperature type: -20℃ ~ +160℃

Lubrication

- Usually the standard types no need to use lubricant. In the low temperature or high temperature occasion, it will need special lubricant.


4-M5
2-G1/4

Common problems and the solutions

Common problems	Checking Item	Solution
Pneumatic valve does not work	1. Check if the solenoid valve works normally? Is the solenoid coil failure? If the armature of the solenoid valve is jammed by impurity?	Replace the solenoid valve or coil and remove the impurity.
	2. Test the pneumatic actuator with air supply to check if the o-ring and cylinder are broken.	Replace the broken o-ring and cylinder.
	3. Is impurity blocking the valve?	Clean out the impurity, replace the broken parts.
	4. Is the handle of the manual device at the manual state?	Put the handle to the pneumatic state.
Acting slowly	1. Is the air supply pressure insufficient?	Increase the air pressure (0.4~0.7Mpa)
	2. Is the output torque of pneumatic actuator not enough?	Select a bigger model of the pneumatic actuator
	3. Is the valve stem or other parts assembled too tight?	Re-assemble and adjust the valve
	4. Is the air supply pipe blocked making the air flow too small?	Clean out the block and replace the filter stem.
The feedback has no signal	1. Check if the power is short circuit or open circuit	Examine and repair the circuit
	2. Is the cam of the feedback in the incorrect position?	Adjust the cam to the correct position
	3. Is the micro switch broken?	Replace the micro switch

Pneumatic Flange Type Ball Valve

Standard

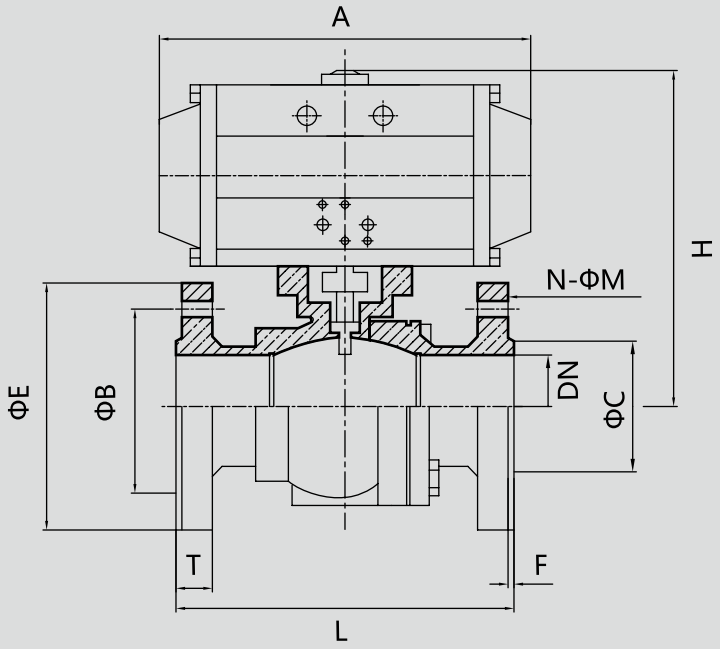
Design: BS5351
Structure length: ANSI B16.10/JISB2002/PN 16
Flange Dimension: ANSI B16.5/JISB2210/PN16
Testing: API598

Application

For general chemical and industrial services
Pressure and temperature range refer to the standard

Specification

Fire-safety design
Body material: CF8M, CF8, CF3M
Additive: PTFE (-20℃ ~150℃)
PPL (-20℃ ~280℃)
Flexible graphite (-20℃ ~150℃)



Model	L	T	F	E	B	C	H	A	N-ΦM	Actuator
RBVP41-2-15	130	14	2	95	65	46	147	143	4-14	RAT052DA
RBVP41-2-20	130	16	2	105	75	56	152	143	4-14	RAT052DA
RBVP41-2-25	140	16	2	115	85	65	163	143	4-14	RAT063DA
RBVP41-2-32	165	18	2	140	100	76	184	173	4-18	RAT063DA
RBVP41-2-40	165	18	2	150	110	84	201	190	4-18	RAT075DA
RBVP41-2-50	203	20	2	265	125	99	219	196.5	4-18	RAT083DA
RBVP41-2-65	222	20	2	185	145	118	249	241	4-18	RAT092DA
RBVP41-2-80	241	20	2	200	160	132	272	263.5	4-18	RAT105DA
RBVP41-2-100	305	22	2	220	180	156	321	319	8-18	RAT125DA
RBVP41-2-125	356	22	2	250	210	184	381	390	8-18	RAT140DA
RBVP41-2-150	394	24	2	285	240	211	458	515	8-22	RAT190DA
RBVP41-2-200	457	24	2	340	295	266	534	560	12-22	RAT210DA

Pneumatic Ball Valve

R B V

Unique design and high platform structure.
ISO5211 connection, easy to be installed.

Order Code

R	BV	□	□	□	-	□	-	□□	□
RFS product	Ball valve	Type **P** pneumatic **L** Lever	Connection **1** Female thread connection **2** Male thread connection **4** flanged connection **7** Wafer type	Structure **1** Straight bore **2.Y** 3-way Y type **4.L** 3-way L type **5.T** 3-way T type		Tandem structure **1** 1PCS type **2** 2PCS type **3** 3PCS type **Blank** Other		Nominal diameter **08 : 1/4"** **10 : 3/8"** **15 : 1/2"** **20 : 2/4"** **25 : 1"** **32 : 1 1/4"** **40 : 1 1/2"** **50 : 2"** **65 : 2 1/4"** **80 : 3"** **100 : 4"** **125 : 5"** **150 : 6"**	Valve body material **Z** CI **Q** DI **P** Stainless steel 304 **R** Stainless steel 316 **C** Carbon steel

Features

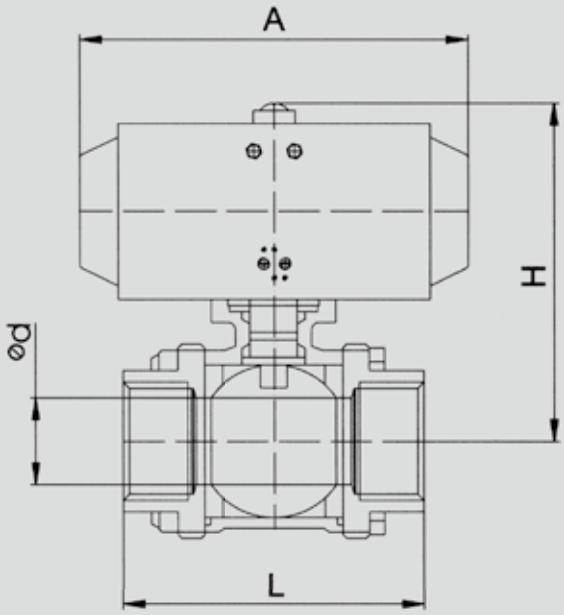
- Unique design and beautiful appearance.
- High platform structure and ISO5200 connection, makes the installation of electric or pneumatic actuator to be more professional.
- Valve body is overlaid with reinforced bar, which can be permanently used in corrosion medium, and keep away from the cracking and failure during the installation.
- Grinding process of the valve stem reduces the torque of electric or pneumatic valve during the installation.
- The valve body of carbon steel is phosphate coated, which won't be discolored and rusty. It is durable and beautiful.

Pneumatic inner thread 3-pcs ball valve

Standard

Design: ANSI B16.34
Testing: API598
Application: For general chemical and industrial services
Steam working pressure: 150 PSI WSP
Temp. range: -20℃ ~150℃

Specification
Body material: all kinds of stainless steel
Connection type: thread, NPT or BSP



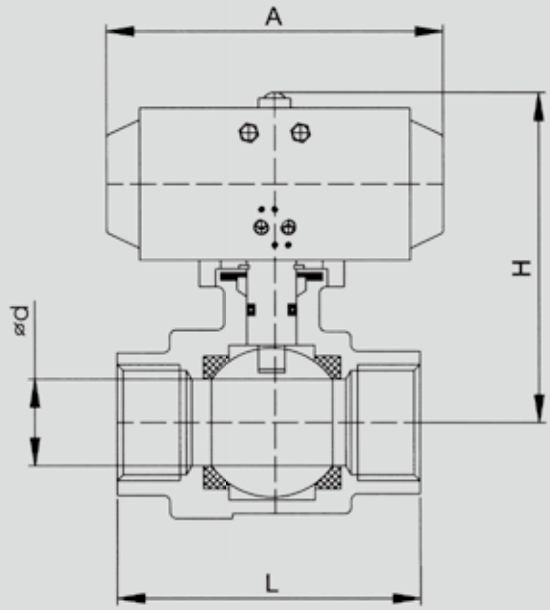
Model	Φd	L	A	H	Actuator
RBVP21-3-08	11.2	75	110	107.5	RAT032DA
RBVP21-3-10	12.7	75	110	110.5	RAT032DA
RBVP21-3-15	16	75	143	135.5	RAT052DA
RBVP21-3-20	20	80	143	138.5	RAT052DA
RBVP21-3-25	25	90	143	146.5	RAT052DA
RBVP21-3-32	32	110	173	166	RAT063DA
RBVP21-3-40	38.1	120	190	186.5	RAT075DA
RBVP21-3-50	50.8	140	190.5	204.5	RAT083DA
RBVP21-3-65	63.5	173	241	241	RAT092DA
RBVP21-3-80	76.2	186	268	264	RAT105DA
RBVP21-3-100	100	225	319	315	RAT125DA

Pneumatic Inner Thread 2-pcs Ball Valve

Standard

Design: ANSI B16.34
Testing: API1598
Application: for general chemical and industrial services
Steam working pressure: 150PSI WSP
Working temperature: -20℃ ~150℃

Specification
Body material: stainless steel
End type: threaded NPT or BSP
Butt weld, Socket weld

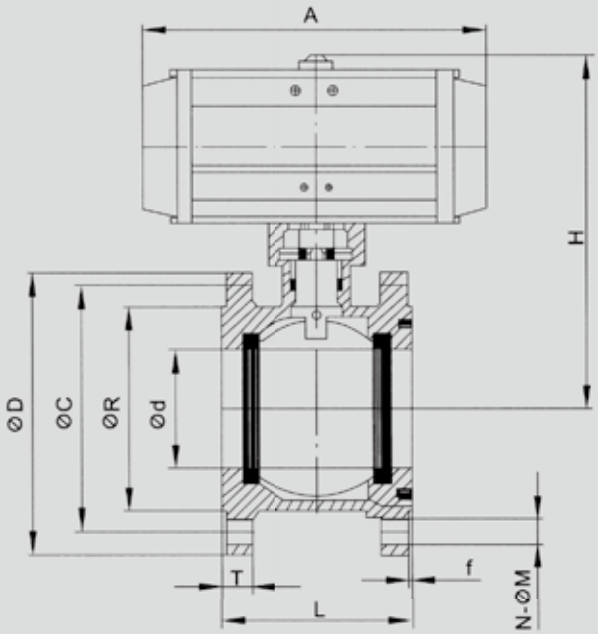


Model	Φd	L	A	H	Actuator
RBVP21-2-08	11.2	75	110	107.5	RAT032DA
RBVP21-2-10	12.7	75	110	110.5	RAT032DA
RBVP21-2-15	16	75	143	135.5	RAT052DA
RBVP21-2-20	20	80	143	138.5	RAT052DA
RBVP21-2-25	25	90	143	146.5	RAT052DA
RBVP21-2-32	32	110	173	166	RAT063DA
RBVP21-2-40	38.1	120	190	186.5	RAT075DA
RBVP21-2-50	50.8	140	190.5	204.5	RAT083DA
RBVP21-2-65	63.5	173	241	241	RAT092DA
RBVP21-2-80	76.2	186	268	264	RAT105DA

Pneumatic thin type ball valve

Standard

Working pressure:1.6~4.0Mpa
Temp. range: -20℃ ~232℃ ~350℃
Medium: water,oil,air and some corrosive liquid
Design standard: GB/T12237/1989
Connection flange: JB79
Testing: GB/T13927-1992

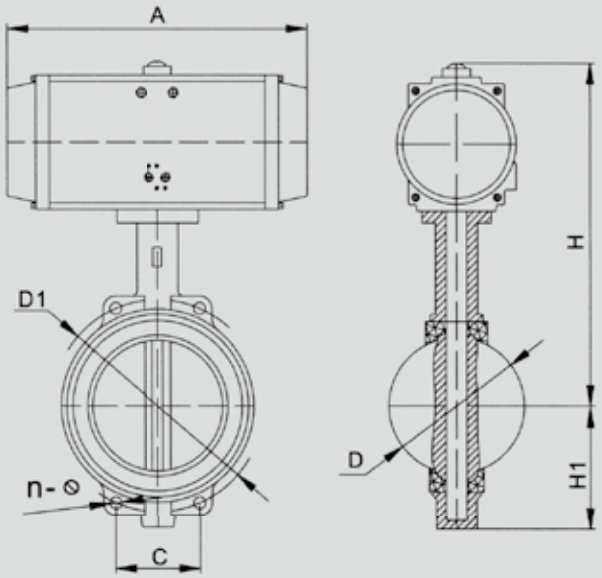


Model	Orifice	Φd	ΦR	ΦC	ΦD	L	H	A	T	f	N-ΦM	Actuator
RBVP41-1-15	1/2"	15	45	65	95	42	145	143	14	2	12	RAT052DA
RBVP41-1-20	3/4"	20	55	75	100	44	150	143	14	2	12	RAT052DA
RBVP41-1-25	1"	15	45	65	100	50	161	143	14	2	12	RAT052DA
RBVP41-1-32	1 1/4"	32	78	100	110	60	185	173	16	2	16	RAT063DA
RBVP41-1-40	1 1/2"	38	85	110	110	65	203	190	16	3	16	RAT075DA
RBVP41-1-50	2"	50	100	125	125	80	220	196.5	16	3	16	RAT083DA
RBVP41-1-65	2 1/2"	63.5	120	145	145	110	253	241	18	3	16	RAT092DA
RBVP41-1-80	3"	76	135	160	160	120	274	263.5	20	3	16	RAT105DA
RBVP41-1-100	4"	95	155	180	180	150	320	319	20	3	16	RAT125DA
RBVP41-1-125	5"	118	185	210	210	180	374	390	22	3	16	RAT140DA
RBVP41-1-150	6"	142	210	240	240	225	449	2.78	24	3	20	RAT160DA

Pneumatic wafer type soft seal butterfly valve

Features

- Small and light, easy for installation and repair, and can be installation on any position.
- Simple structure, compact, prompt 90 degree turn round, open and close.
- Small operating torque
- Flow rate characteristic tend to straight, well regulate.
- Open and close test over 10,000 times, long life.
- Complete seal, no leakage during air testing.
- Choose different material as parts, fit for kinds of medium.



Model	Orifice	D	D1	H	H1	A	C	n-d	Actuator
RDVP7PB3-7-50	2	52.9	120	274	80	173	42	4-23	RAT063DA
RDVP7PB3-7-65	2.5	64.5	136.2	300	89	190	44.7	4-26.5	RAT075DA
RDVP7PB3-7-80	3	78.8	160	315	95	196.5	45.2	8-18	RAT083DA
RDVP7PB3-7-100	4	104	185	345	114	241	52.1	4-24.5	RAT092DA
RDVP7PB3-7-125	5	123.3	215	371	127	263.5	54.4	4-23	RAT105DA
RDVP7PB3-7-150	6	155.6	238	407	139	319	55.8	4-25	RAT125DA
RDVP7PB3-7-200	8	202.5	295	441	175	319	60.8	4-25 / 4-23	RAT125DA
RDVP7PB3-7-250	10	250.5	357	490	203	390	65.6	4-29	RAT140DA
RDVP7PB3-7-300	12	301.6	407	560	242	449	76.9	4-29	RAT160DA
RDVP7PB3-7-350	14	333.3	467	591	267	449	76.5	4-30	RAT160DA
RDVP7PB3-7-400	16	389.6	515 / 525	656	309	515	86.5	4-26 / 4-30	RAT190DA
RDVP7PB3-7-450	18	440.51	565 / 585	703	328	560	105.6	4-26 / 4-30	RAT210DA
RDVP7PB3-7-500	20	491.5	620 / 650	786	361	654	131.8	4-26 / 4-33	RAT240DA
RDVP7PB3-7-600	24	592.5	725 / 770	908	459	725	152	20-30 / 20-33	RAT270DA
RDVP7PB3-7-700	28	695	840	970	520	725	163	24-30 / 20-36	RAT270DA
RDVP7PB3-7-800	32	794.7	950	1046	591	742	188	24-33 / 24-39	RAT300DA
RDVP7PB3-7-900	36	864.7	1050	1148	656	860	203	24-33	RAT350DA
RDVP7PB3-7-1000	40	965	1160	1310	721	918	213	24-36	RAT400DA

Pneumatic butterfly valve

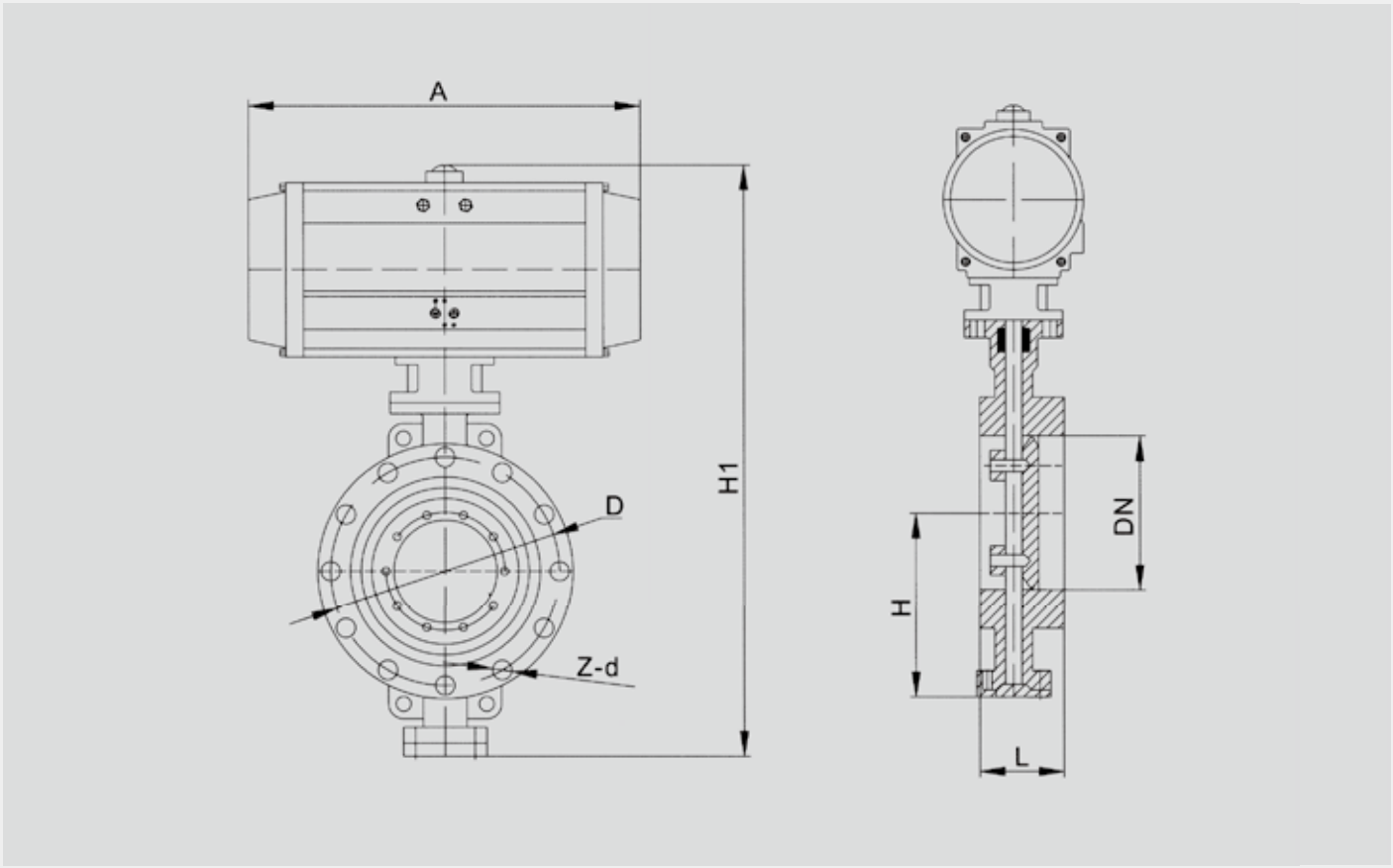
R D V

Specialized manufacture, Specialized service, RFS valve devote to satisfy user’ s expectation, improving service quality continuously.keeping improving.

Ordering Code

R	DV	P	□	□	-	□	-	□	-	□
RFS product	Butterfly valve	Type **P** Pneumatic control **L** Lever control	Connection type **4** Flange type **7** Wafer type	Body material **Z** CI **Q** DI **P** Stainless steel 304 **R** Stainless steel 316 **C** Carbon steel **T** Aluminum bronze		Disc material **B1** Plated DI **B2** Aluminum bronze **B3** Stainless steel 304 **B4** Titanium steel **B5** Stainless steel 316 **B6** Carbon steel		Seal material **H** Stainless steel **1** Natural rubber **2** Hypalon seal **3** EPDM **5** Neoprene **6** NBR **7** Abrasion resistant rubber **8** Viton **9** Heat-resistant EPDM **F4** PTFE		Orifice **50-1000**

Pneumatic wafer type hard seal butterfly valve



Model	Orifice (Inch)	L		D	D1	H	H1	H2	A	Z - d	Actuator
		Short	Long								
RDVP7RB5-H-50	2	108	150	165	125	112		134	196.5	4-18	RAT083DA
RDVP7RB5-H-65	$2^1/2$	112	170	185	145	115		145	241	4-18	RAT092DA
RDVP7RB5-H-80	3	114	180	200	160	120		158	263.5	8-18	RAT105DA
RDVP7RB5-H-100	4	127	190	220	180	138	548	181	319	8-18	RAT125DA
RDVP7RB5-H-125	5	140	200	250	210	164	605	198	390	8-18	RAT140DA
RDVP7RB5-H-150	6	140	210	285	240	175	653	223	449	8-22	RAT160DA
RDVP7RB5-H-200	8	152	230	340	295	200	772	223	449	8-22	RAT160DA
RDVP7RB5-H-250	10	165	250	395	350	243	866	256	515	12-22	RAT190DA
RDVP7RB5-H-300	12	178	270	445	400	250	964	281	560	12-22	RAT210DA
RDVP7RB5-H-350	14	190	290	505	460	280	1068	281	560	16-22	RAT210DA
RDVP7RB5-H-400	16	216	310	565	515	305	1108	281	560	16-26	RAT210DA
RDVP7RB5-H-450	18	222	330	615	565	350	1177	306	654	20-26	RAT240DA
RDVP7RB5-H-500	20	291	350	670	620	380	1289	346	725	20-26	RAT270DA
RDVP7RB5-H-600	24	267	390	780	725	445	1439	374	745	20-30	RAT300DA
RDVP7RB5-H-700	28	292	430	892	840	480	1494	374	745	24-30	RAT300DA
RDVP7RB5-H-800	32	318	470	1015	950	530	1718	428	860	24-33	RAT350DA
RDVP7RB5-H-900	36	330	510	1115	1050	580	1818	428	860	28-33	RAT350DA
RDVP7RB5-H-1000	40	410	550	1230	1160	650	2041	506	918	28-36	RAT400DA
RDVP7RB5-H-1200	48	470	630	1455	1380	760	1176	506	918	32-39	RAT400DA

Valve body		Disc		Rotating shaft	Liner bushing	Seal material		
Material item	Code	Material item	Code	Material item	Material item	Material item	Code	Suitable temperature
CI	Z	Plated DI	B1			Natural rubber	1	-20~+85℃
DI	Q	Aluminum bronze	B2			Hypalon seal	2	-18~+135℃ Short time -18~+149℃
Aluminum bronze	T	Stainless steel 304	B3	Stainless steel	Lubrication bronze	EPDM	3	-45~+135℃ Short time -50~+150℃
						Neoprene	5	-7~+93℃ Short time -7~107℃
Stainless steel 304	P	Titanium steel	B4	Carbon steel	PTFE	NBR	6	-12~+82℃ Short time -12~+93℃
Stainless steel 316	R	Stainless steel 316	B5			Abrasion resistant rubber	7	-10~+50℃
						Viton	8	-23~+150℃
Carbon steel	C	Carbon steel	B6			Heat-resistant EPDM rubber	9	-20~+150℃
						PTFE	F4	-10~+150℃

Eccentric metal seated butterfly valve

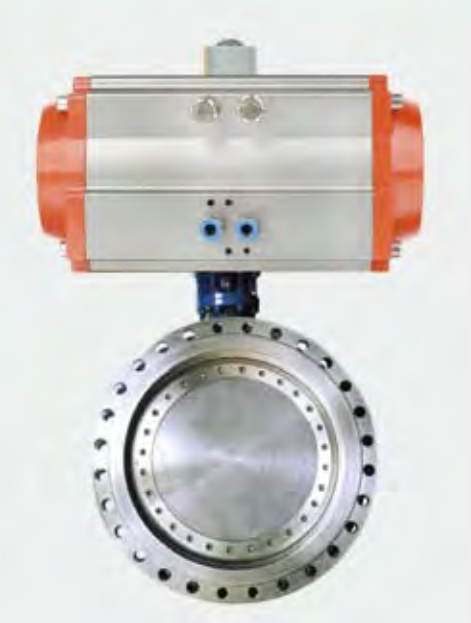
Features

Because this butterfly valve adopt three-dimensional eccentric to design. Making the movement track on facing space reach to idealization, and there are no attrition and on intervene between hermetical components. Furthermore, the hermetical material has been selected reasonably, there by it ensure hermetic,10 antisepsis, wearable capability of valve.

The main characteristic as below

- Tiny moment for starting, flexible and convenient, save labor and energy.
- Three-dimensional eccentric configuration forces disc close tighter, and reach to reliable hermetic capability and without leakage.
- High temperature resistant, high pressure resistant, long service life etc.

Eccentric metal seated butterfly valve



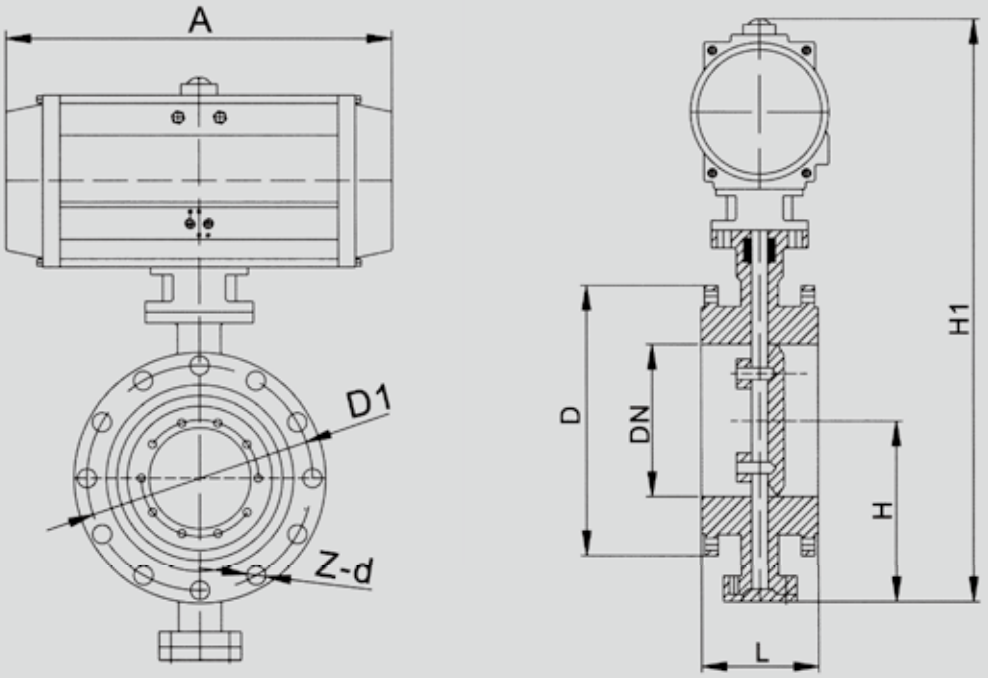
Main technology parameter

Orifice	DN (mm)	50 - 200				50 - 500
Nominal pressure	PN (MPa)	0.6	1.0	1.6	2.5	4.0
PS (MPa) Test Pressure	Shell test	0.9	1.5	2.4	3.75	6.0
	Seal tese	0.66	1.1	1.76	2.75	4.4
	Gas seal test	0.6	0.6	0.6	0.6	0.6
Leakage	<0.1xDNmm3/s (accordance GB/T13927-92 standard)					
Appropriate temperature	Carbon steel: -29℃ ~425℃ / Stainless steel: -40℃ ~600℃					
Appropriate medium	Air, water, steam, gas, oil, acid, alkali, salt and weak corrosion medium etc.					
Drive modality	Worm wheel drive / gas drive / electric drive					

Material for main parts

Parts item	Material
Valve body	Cast iron, stainless steel, Cr.MO.Steel, alloy steel
Disc	Cast steel, alloy steel, stainless steel, Cr.MO.Steel
Seal	Stainless steel and Graphite
Stem	2Cr13,1Cr13 stainless steel, Cr.MO.Steel
Bearing	Stainless steel,304 nitrifier
Filler	Flexible graphite

Pneumatic flange type hard seal butterfly valve



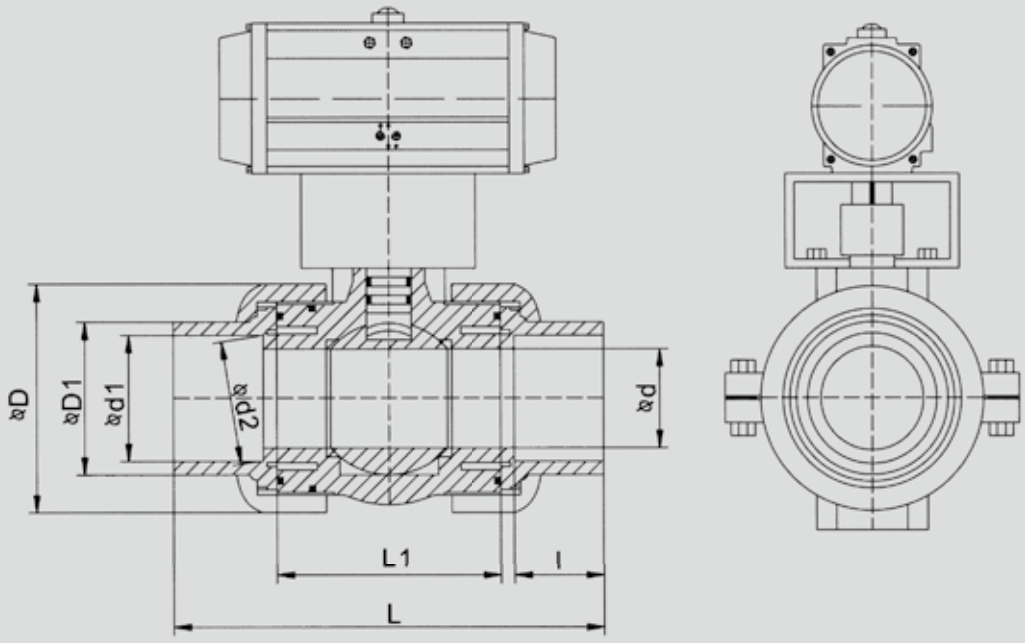
Model	Orifice (Inch)	L	D	H	H1	A	Z - d	Actuator
RDVP4RB5-H-50	2	43	125	112		196.5	4-18	RAT083DA
RDVP4RB5-H-65	$2^1/2$	46	145	115		241	4-18	RAT092DA
RDVP4RB5-H-80	3	64	160	120		263.5	8-18	RAT105DA
RDVP4RB5-H-100	4	64	180	138	548	319	8-18	RAT125DA
RDVP4RB5-H-125	5	70	210	164	605	390	8-18	RAT140DA
RDVP4RB5-H-150	6	76	240	175	653	449	8-22	RAT160DA
RDVP4RB5-H-200	8	89	295	215	772	449	8-22	RAT160DA
RDVP4RB5-H-250	10	114	350	243	866	515	12-22	RAT190DA
RDVP4RB5-H-300	12	114	400	285	964	560	12-22	RAT210DA
RDVP4RB5-H-350	14	127	460	320	1068	560	16-22	RAT210DA
RDVP4RB5-H-400	16	140	515	350	1108	560	16-26	RAT210DA
RDVP4RB5-H-450	18	152	565	350	1176	654	20-26	RAT240DA
RDVP4RB5-H-500	20	152	620	380	1289	725	20-26	RAT270DA
RDVP4RB5-H-600	24	154	725	435	1439	745	20-30	RAT300DA
RDVP4RB5-H-700	28	165	840	480	1494	745	24-30	RAT300DA
RDVP4RB5-H-800	32	190	950	530	1718	860	24-33	RAT350DA
RDVP4RB5-H-900	36	203	1050	595	1818	860	28-33	RAT350DA
RDVP4RB5-H-1000	40	216	1160	650	2041	918	28-36	RAT400DA
RDVP4RB5-H-1200	48	254	1380	775	2276	918	32-39	RAT400DA

Pneumatic plastic ball valve

Features

- Woring pressure : 150 psi
- Easy to disassemble by handle for cushion elasticity
- Can be assemble quickly without any special tool
- Actuator can be installed with inserted nut

Model	Size	Standard	Material	Seat	Seat	Port
VP-640	1/2"~4"	ANSI,JIS,DIN,BS	PVC	PTFE	EPDM,FPM	Socket,Threaded,Flanged
VP-641	1/2"~4"	ANSI,JIS,DIN,BS	CPVC	PTFE	EPDM,FPM	Socket,Threaded,Flanged
VP-643	1/2"~4"	ANSI,JIS,DIN,BS	PVDF	PTFE	EPDM,FPM	Socket,Threaded,Flanged
VP-644	1/2"~4"	ANSI,JIS,DIN,BS	PP	PTFE	EPDM,FPM	Socket,Threaded,Flanged
VP-645	1/2"~4"	ANSI,JIS,DIN,BS	ABS	PTFE	EPDM,FPM	Socket,Threaded,Flanged



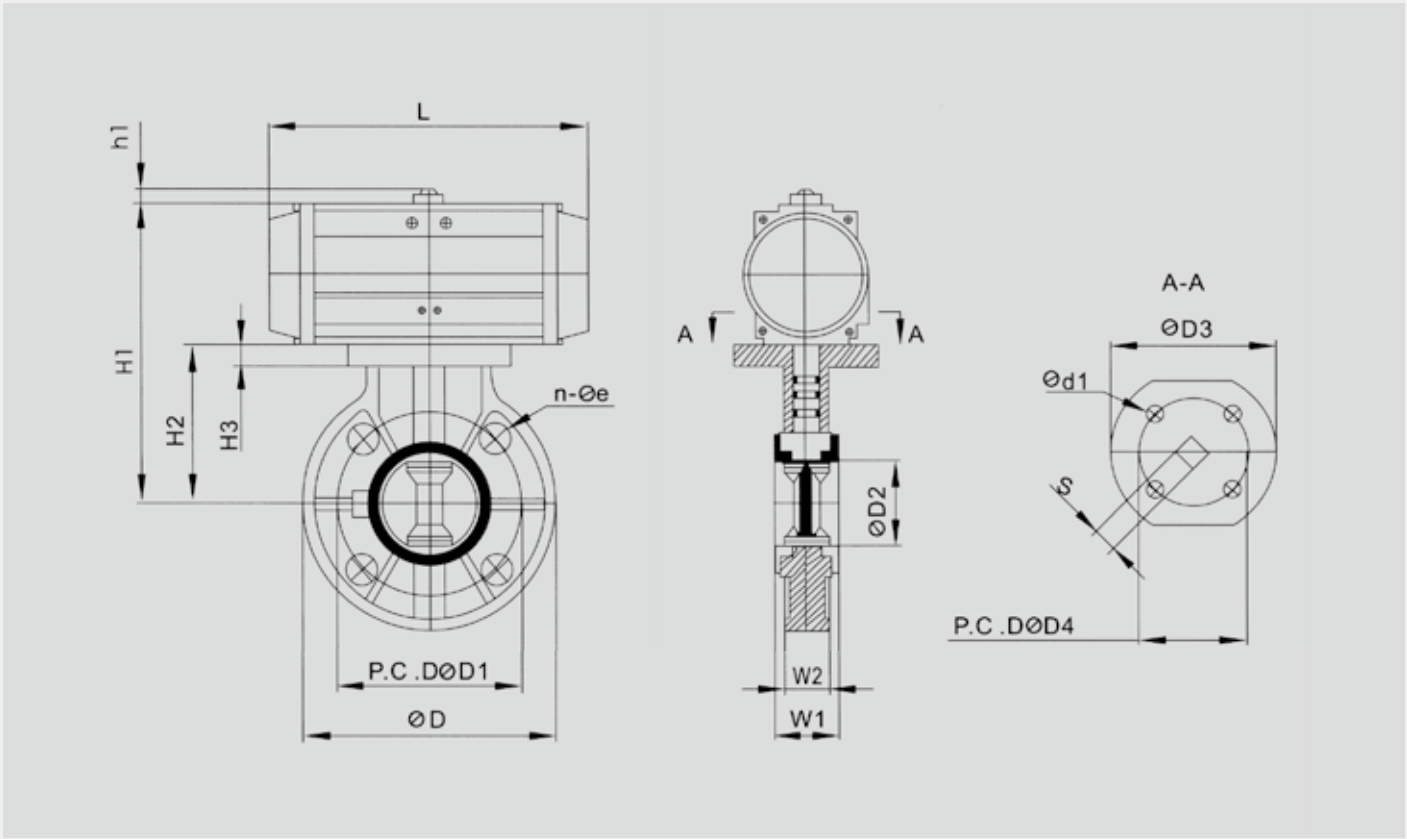
Pneumatic plastic ball valve, butterfly valve

V P

Plastic ball valve and butterfly valve adopt special auxiliary formula material, ensure its acid resistance and alkali resistance for having higher machinery Strength. Applying many scopes water pipe line system widely.

Ordering Code

VP	□□	□	□□
Pneumatic plastic valve	Valve type **64** ball valve **83** butterfly valve	Material **0 PVC** **1 CPVC** **3 PVDF** **4 PP** **5 ABS**	Orifice



Nom \ Size		50mm (2")	32mm (2-1/2")	80mm (3")	100mm (4")	125mm (5")	150mm (6")	200mm (8")	250mm (10")	300mm (12")	350mm (14")	400mm (16")	450mm (18")	500mm (20")	600mm (24")
JIS	D1	120	140	150	175	210	240	290	355	400	445	510	565	620	730
	n-Φe	4-19	4-19	8-19	8-19	8-23	8-23	12-23	12-25	16-25	16-25	16-27	20-27	20-27	24-35
ANSI	D1	120.39	139.44	152.40	190.50	216	241.55	298.5	362	432	476	540	578	635	749
	n-Φe	4-19	4-19	4-19	8-19	8-22	8-22	8-22	12-25	12-25	12-29	16-29	16-32	20-32	20-30
DIN	D1	125	145	160	180	210	240	295	350	400	460	515	565	620	725
	n-Φe	4-18	4-18	4-18	8-18	8-18	8-18	8-23	8-23	12-23	12-23	16-23	16-27	20-27	24-30
D		165	185	200	229	257	285	343	411	490	533	597	635	699	813
D2		56.5	69.5	79.5	102.5	130	152	203	255	309.5	365	406	452	502	603
D3		105	120	123	135	164	169	201	205	237	236	300	335	335	335
H2		103	113	115	135.5	165	177	210	342	302	300	350	370	400	465
H3		13	13	13	13	15	19	21	22	26	25	32	35	40	46
W1		43	46	46	56	69	705	85	109	133	127	168	189.5	189	209
W2		29	31	31	40	50	54	69	88	103.5	113	153	163	171	191
T-DIN259 85P		1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/2"	1/2"	1/2"
Double action	Φd1	6.5	6.5	8.5	8.5	8.5	10.5	10.5	10.5	12.5					
	ΦD4	50	50	70	70	70	102	102	102	105					
	h1	20	20	20	20	20	20	30	30	30					
	H1	188	188	217	237.5	280	304	367	399	498					
	L	158.5	158.5	210.5	210.5	247.5	268.5	345	345	437.5					
	S	14	14	17	17	17	22	27	27	27					
Single action	Φd1	6.5	6.5	8.5	8.5	10.5	10.5	12.5	12.5						
	ΦD4	50	50	70	70	102	102	125	125						
	h1	20	20	20	20	20	30	30	30						
	H1	205	205	230	250.5	292	334	406	438						
	L	210.5	210.5	247.5	247.5	268.5	345	437.5	437.5						
	S	17	17	17	17	22	27	27	27						

Nom \ SIZE		15mm (1/2")	20mm (3/4")	25mm (1")	32mm (1-1/4")	40mm (1-1/2")	50mm (2")	65mm (2-1/2")	80mm (3")	100mm (4")
JIS	d1	22.30	26.30	32.33	38.43	48.46	60.56	76.60	89.6	114.7
	d2	21.70	25.70	31.67	37.57	47.54	59.44	75.87	88.83	113.98
	l	22.22	25.4	28.6	31.8	34.9	38.1	44.45	63	69.0
ANSI	d1	21.54	26.87	33.65	42.42	48.56	60.63	73.38	89.31	114.76
	d2	21.23	26.57	32.27	42.04	48.11	60.17	72.85	88.7	114.07
	l	22.22	25.40	28.58	31.75	34.93	38.10	44.45	47.63	57.15
DIN	d1	20.3	25.3	32.3	40.3	50.3	63.0	75.3	90.3	110.4
	d2	20.1	25.1	32.1	40.1	50.1	63.1	75.1	90.1	110.1
	l	16	19	22	26	31	38	44	51	61
BS	d1	21.5	26.9	33.7	42.4	48.4	60.5	-	-	-
	d2	21.3	26.7	33.5	42.2	42.8	60.3	-	-	-
	l	16.5	19.5	22.5	27	30	36	-	-	-
THD./IN	NPT	14	14	11.5	11.5	11.5	11.5	8	8	8
	PT	14	14	11	11	11	11	11	11	11
D		45	55	66	82	98	120	140	160	225
D1		31	37	44	54	65	79	92	108	146
d		13	18	23	30	38	48	61	69	99
L		112	132	144	165	171	200	273	303	326
L1		60	73	78	87	92	112	136	158	176
执行器		RAT032DA	RAT052DA	RAT052DA	RAT063DA	RAT075DA	RAT083DA	RAT092DA	RAT105DA	RAT140DA

Pneumatic plastic butterfly valve

Features

Valve disc can be controlled by positioner.

- Pneumatic actuator standard meets with ISO5211,DIN3337,VDI/VDE 3845
- NAMUR, easy to assemble solenoid valve,limit switch and other accessories.
- Pneumatic actuator supply max. air pressure is 0.8Mpa and min. air pressure is 0.5Mpa.

Standard	The max working pressure
2" - 10"	10bar
12"	7bar
14" 16"	6bar
18"	5bar
20"~24"	3.5bar

Model	Orifice	Standard	Material	Seat	O-ring	Disc	Port
VP-830	2"~24"	ANSI,JIS,DIN	PVC	EPDM,FPM	EPDM,FPM	PP	Flange
VP-831	2"~24"	ANSI,JIS,DIN	CPVC	EPDM,FPM	EPDM,FPM	CPVC	Flange
VP-833	2"~24"	ANSI,JIS,DIN	PVDF	EPDM,FPM	EPDM,FPM	PVDF	Flange
VP-834	2"~24"	ANSI,JIS,DIN	PP	EPDM,FPM	EPDM,FPM	PP	Flange

YT 1000L / YT 1000R posittion

Features

The positioner is used for operation of pneumatic rotary valve actuators by means of electrical controller or control systems with a similar output signal of DC4 to 20mA or split ranges.

- There is no resonance at 5~200Hz
- The change of RA/DA acting is convenient. It' s able to apply to single or double acting actuator.
- It' s possible to prevent the hunting with orifice to the small size actuator.
- It' s economical due to less air consumption.
- It' s able to control the 1/2 split range with simple operation without replacement of parts.

Parameter

Item / Type	Single action	Double action
Input Signal	4-20mA DC	
Impedance	250±15 Ohm	
Supply Pressure	1.4-7kgf/cm2(20-100psi)	
Stroke	0 ~ 90℃	
Air Connection	PT(NPT)1/4"	
Gauge Connection	PT(NPT)1/8"	
Conduit	PF1/2"(G1/2")	
Explosion Proof	ExdmIIB T5	
	ExdmIIC T5	
	ExiaIIB T6	
Protection	IP66	
Ambient Temp	Operating -20℃~ 70℃	
	Explosion -20℃~ 60℃	
Linearity	±1%F.S.	±2%F.S.
Hysteresis	±1%F.S.	
Sensitivity	±0.2%F.S.	±0.5%F.S.
Repeatability	±0.5%F.S.	
Air Consumption	3LPM(Sup=1.4kgf/cm2, 20psi)	
Flow Capacity	80LPM(Sup=1.4kgf/cm2, 20psi)	
Material	Aluminum Diecasting	
Weight	2.8kg(6.2lb)	

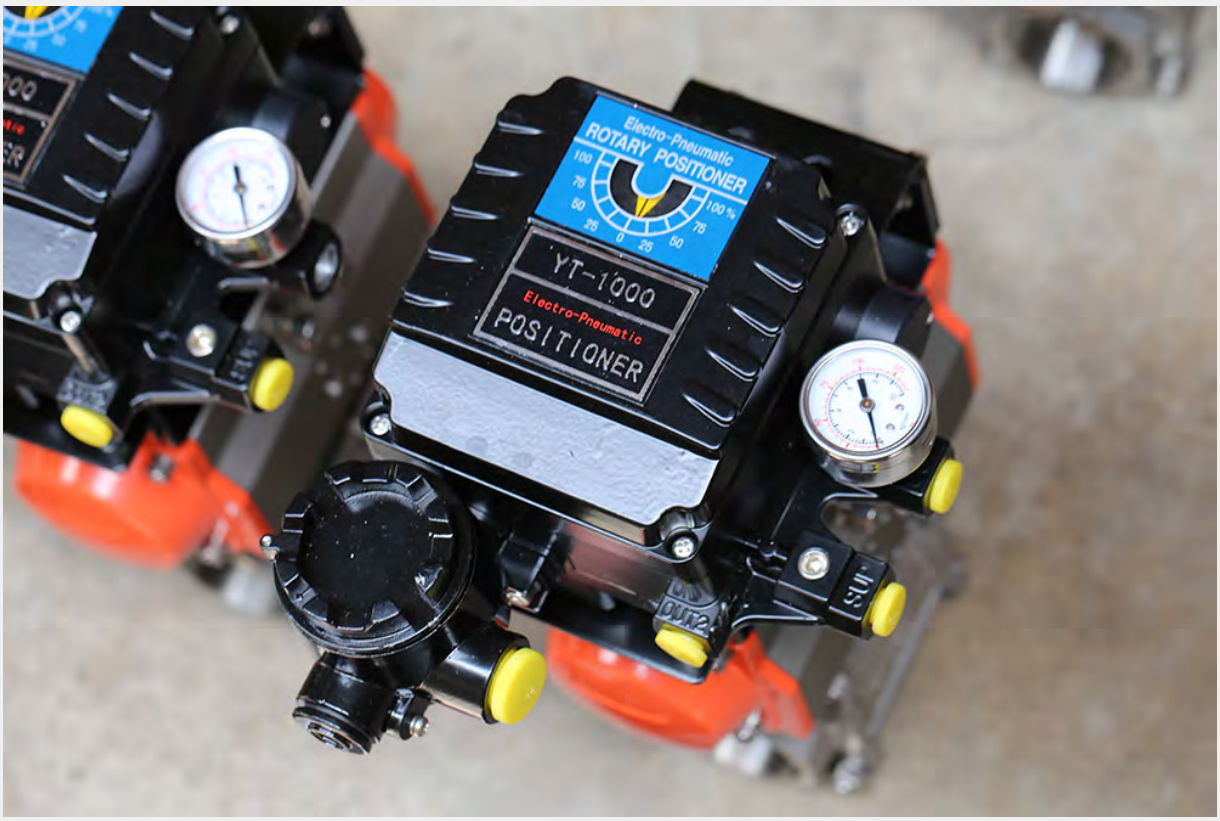
Positioner

R E P

The positioner is used for operation of pneumatic rotary valve actuators by means of electrical controller or control systems with a similar output signal of DC4 to 20mA or split ranges.

Ordering Code

R	EP-1000R	□	□	□	□	□	□	□
RFS product	Item number **EP-1000R** (Rotary type) **EP-1000L** (Linear type)	Action type **S** single acting **D** double acting	Ex-proof rate **m** Exd mIIBT5 **n** non ex-proof	Feedback pole **1** M6×40L **2** M6×63L **3** M8×40L **4** M8×63L **5** NAMUR	Throttle pole **1** Φ1 **2** Φ2 **3** NONE	Connection type **1** 1PT **2** 2NPT	Environment temperature **S** -20℃ ~60℃ **H** -20℃ ~120℃ **L** -40℃ ~70℃	Select accessories **1** +PTM(Intrnal) **2** +PTM(External) **3** +L/S(Intrnal) **4** +L/S(External) **5** +PTM+L/S(Intrnal)



Limit switch box ,ex-proof limit switch box

Features

Limit switch box is designed based on advanced technology which are solid beautiful, high-level quality and with the following characteristice:

1. Visual position indicator and waterproof type.
2. Easy to set without tool based on spring loadedplined cam
3. There are many connection terminal and 8pcs of points, easy to connect and safety.
4. Standard dual cable connections.
5. No worry to loose bolts while cover opens.
6. Namur standard stainless steel shaft and bracket.

Model	VLS1-210N / VLS1-310N / VLS1-410N	VLS1-210N-EX / VLS1-310N-EX / VLS1-410N-EX
Explosion Proof	IP 65	ExdII BT4
Ambient Temp	-25℃ ~ 85℃	
Cable Entry	G1/2" G3/4"	
Terminal Stripe	8	
Position Indicator	0 ~ 90℃	
Switches	Mechanical Type	
Potentiometer	1 KΩ	
Current	4~20mA	

Limit switch Box

VLS1

RAT series pneumatic actuator developed, exploited and designed based on synthetizing exertion internal and overseas high tech, new material, new technics and innovative conception.

Ordering Code

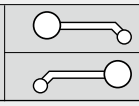
VLS1	2	10	N	EX
Model	Size 2 3 4	Machinery jiggle switch	The shell is fixed by screw	Ex-proof

Separator and Merge Type Handwheel Manipulator

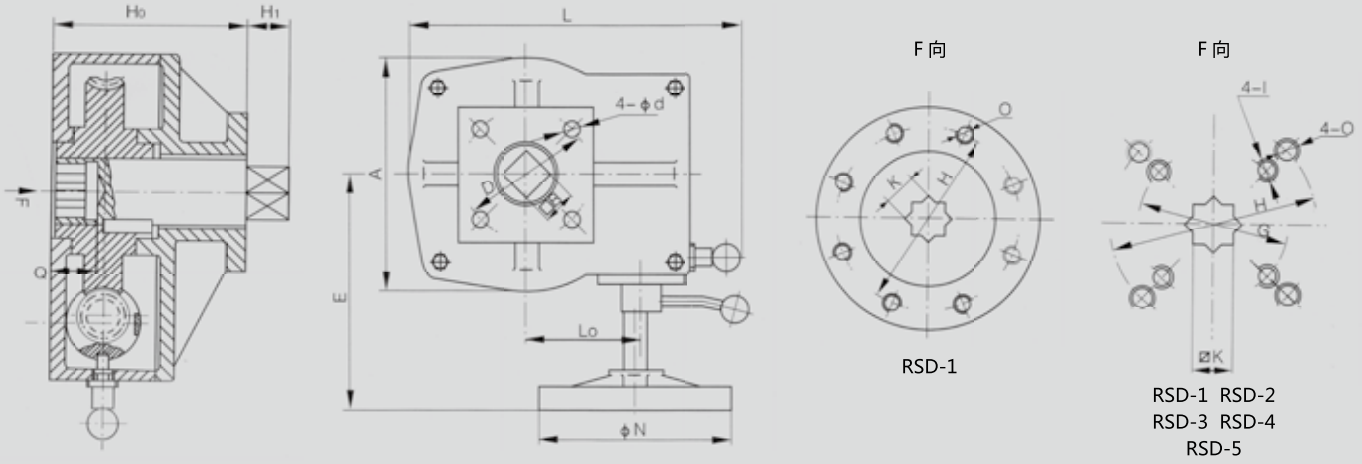
Features

The pneumatic butterfly valve and ball valve with handle mechanism, as long as by the simple switching, then can achieve the handle operation of valve. Handle mechanism installed between pneumatic actuator and valve, quite convenience for operation.

Structure character and using method

Transmission type	RSD1~6	Stem and wheel transmit		
Stroke	90° ±5°			
Special design	The bearing of the stem are two pcs of eccentric body, using the connection stem for turning into integrative, at the same time, also can run 180 degree for combine and disconnection between stem and wheel, combine condition is by handle, disconnection condition is by pneumatic.			
Installation	The upper end	The standard size hole is connecting with pneumatic actuator. The square body is in the middle which hold out extracorporeal, connecting with the inner eight-square of pneumatic actuator directly.		
	The lower end	The standard screw hole on the shell is connecting with the valve or bracket. The middle output shaft is a standard inner eight-square.		
Usage	Handle	Spanner position		Pulling the side round handle, then can turn spanner. When the spanner is at the appointed place, the round handle reset fastness eccentric bearing. **Warning: It can not be operated by pneumatic when at the handle position, otherwise the parts will be damaged.**
	Pneumatic			

Dimensions



Model	H0	H1	□B	□K	Q	A	L	N	L0	D	d	H	O	G	I	E	Applicability range	Drive ratio	Output Torque
RSD-1	91	15	14	14	16	88	147	140	42	50	7	70	4-M8	50	M6		DA SR 50 65	15:1	150 N.m
RSD-2	108	19	17	17	19	106	170	160	53	70	9	102	4-M10	70	M8		DA SR 75 85 95 110	42:1	300 N.m
RSD-3	128	25	22 27	22 27	25	136	210	295	74	102	12	125	4-M12	102	M10		DA SR 125 140 160	50:1	800 N.m
RSD-4	159	38	36	36	40	200	254	340	97	140	18	140	4-M16				DA SR 190 210	79:1	3500 N.m
RSD-5	181	48	46	46	50	256	348	450	126	165	22	165	4-M20				DA SR 150 280 300	80:1	5000 N.m
RSD-6	228	50	46 55	46 55	46 55	372	430	450	186	165 254	22 8-18	165 254	4-M20 4-M16				DA SR 350 DA 400 450	61:1	10000 N.m