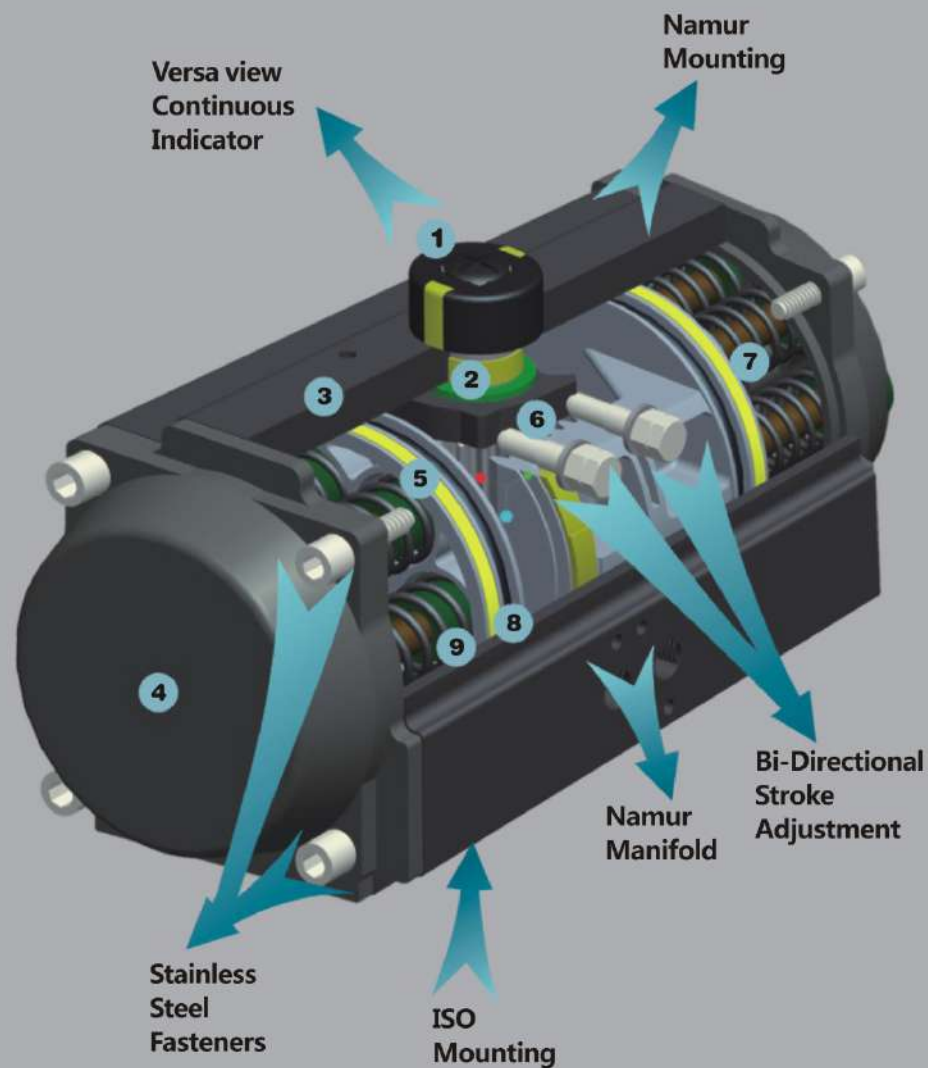


PNEUMATIC ACTUATORS

ACTUATORS





PNEUMATIC ACTUATORS CONSTRUCTION

1. Indicator

Position indicator with NAMUR is convenient for mounting accessories such as Limit Switch box, positioner and so on.

2. Pinion

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

3. Actuator Body

According to the different requirements, the extruded aluminum alloy ASTM6005 Body can be treated with hard anodized, powder polyester painted (different colours are available such as blue, orange, yellow etc.), PTFE or Nickel plated.

4. End caps

Die-casting aluminum powder polyester painted in different colours, PTFE or Nickel 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. Travel adjustment

The two independent external travel stop adjustment bolts can adjust $\pm 5^\circ$ at both open and close directions easily and precisely.

7. High performance springs

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

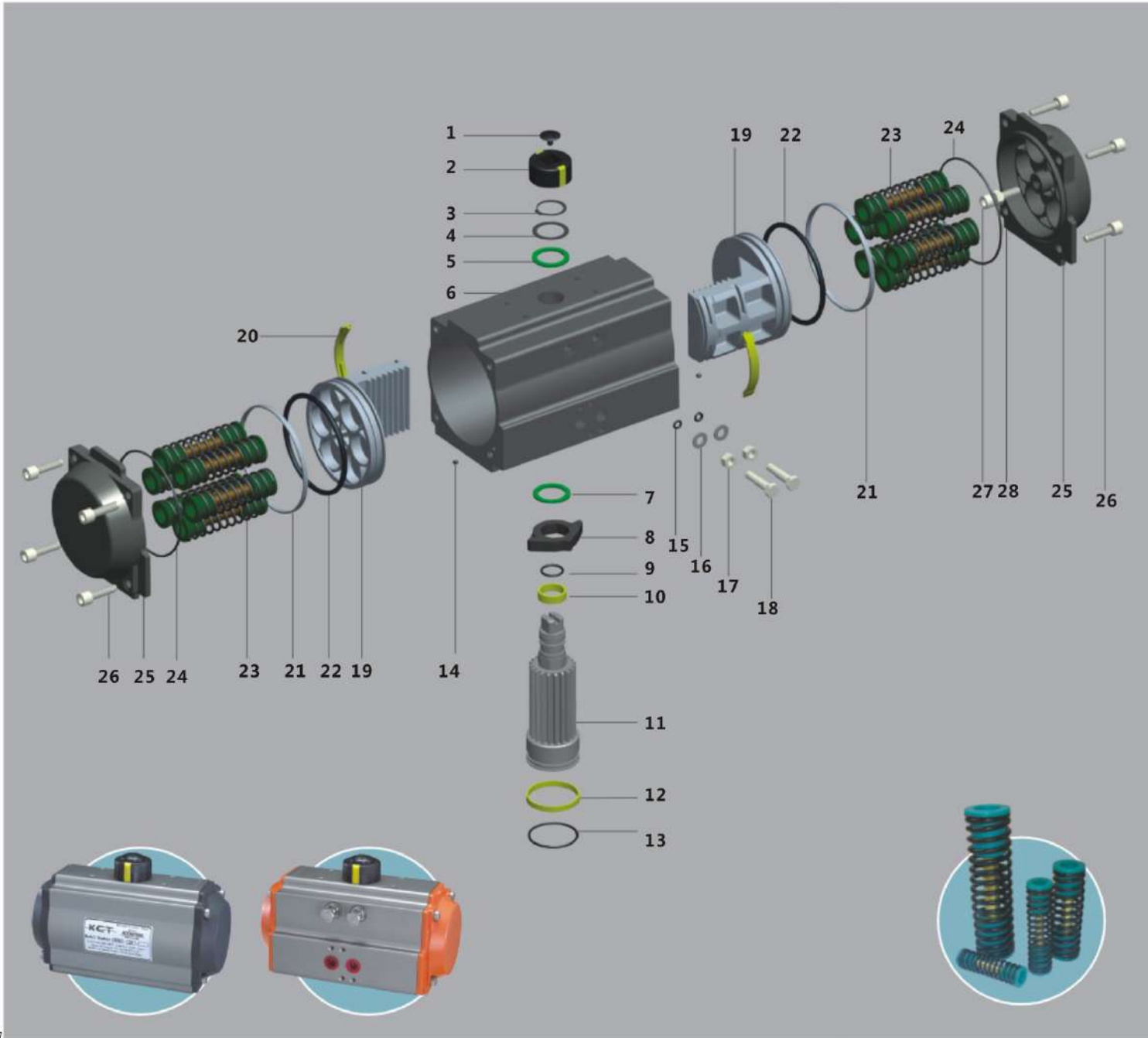
8. Bearings & Guides

Made from low friction, long-life compound material, to avoid the direct contact between metals. The maintenance and replacement are easy and convenient.

9. O-rings

NBR rubber O-rings provide trouble-free operation at standard temperature ranges. For high and low temperature applications Viton or Silicone.



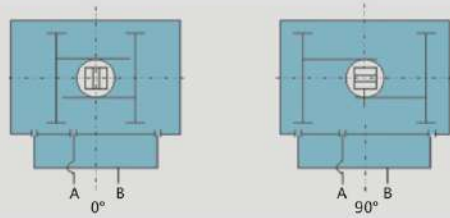


PNEUMATIC ACTUATORS PARTS AND MATERIAL

NO.	DESCRIPTION	QTY	STANDARD MATERIAL	PROTECTION	OPTIONAL MATERIAL
1	Indicator screw	1	Plastic		
2	Indicator	1	Plastic		
3	Spring clip	1	Stainless Steel		
4	Thrust washer	1	Stainless Steel		
5	Outside washer	1	Engineering plastics		
6	Body	1	Extruded aluminum alloy	Electrolytic	
7	Inside washer	1	Engineering plastics		
8	Cam	1	Alloy steel		
9	O ring (pinion top)	1	NBR		Varilife
10	Bearing (pinion top)	1	Engineering plastics		
11	Pinion	1	Alloy steel	Black paint	Stainless Steel
12	Bearing (pinion bottom)	1	engineering plastics		
13	O-ring (pinion bottom)	1	NBR		Varilife
14	Plug	2	NBR		Varilife
15	O-ring (Adjustment screw)	2	NBR		Varilife
16	Washer (Adjustment screw)	2	Stainless Steel		
17	Nut (Adjustment screw)	2	Stainless Steel		
18	Adjustment screw	2	Stainless Steel		
19	Piston	2	Cast aluminum/Cast steel	anodized/epoxycoat	Stainless Steel
20	Guide (Piston)	2	engineering plastics		
21	Bearing (Piston)	2	engineering plastics		
22	O-ring (Piston)	2	NBR		Varilife
23	Spring	0 ~ 12	Spring steel	Oxydizing	
24	O ring (End cap)	2	NBR		Varilife
25	End cap	2	Cast aluminum	Prime system paint etc.	
26	Cap screw	8	Stainless Steel		
27	Stop screw	2	Stainless Steel		
28	Nut (stop screw)	2	Stainless Steel		

THE OPERATING PRINCIPLE OF DOUBLE ACTING ACTUATOR

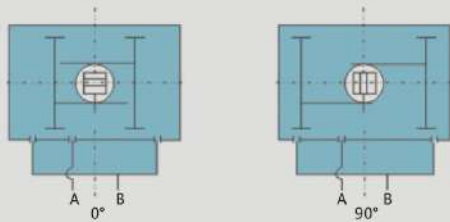
CCW



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

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

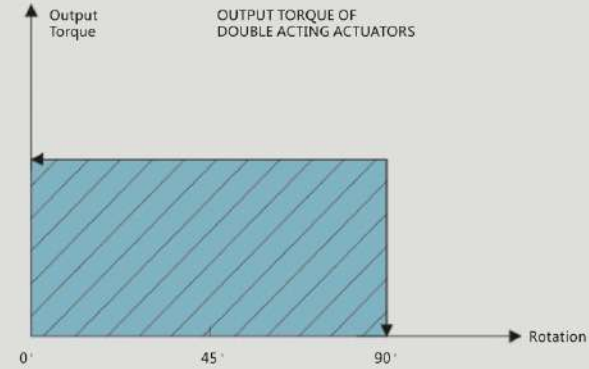
CW



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

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

DOUBLE ACTING ACTUATOR SIZING GUIDE



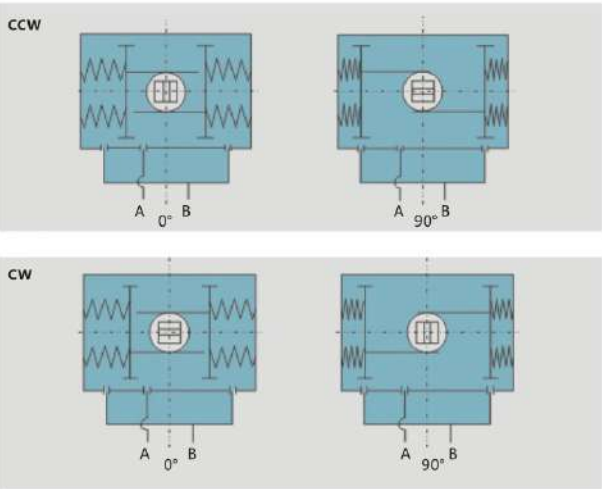
The suggested safety factor for double acting actuators under normal working conditions is 20%-30%.
Example:
The torque needed by valve=100N.m
The torque considered safety factor(1+30%)=130N.m
Air Supply=5Bar
According to the above table, we can choose the minimum model is RT105DA.

OUTPUT TORQUE OF DOUBLE ACTING ACTUATORS (Unit : N.m)

Model	Air supply pressure(Unit:bar)									
	2	2.5	3	4	4.5	5	5.5	6	7	8
RT52DA	8	10	12	16	18	20	22	24	28	32
RT63DA	15	18	22	29	33	37	40	44	51	58
RT75DA	20	25	30	40	45	50	55	60	70	80
RT83DA	31	39	47	63	71	78	86	94	110	125
RT92DA	45	56	68	90	102	113	124	135	158	180
RT105DA	66	83	99	132	149	165	182	198	230	265
RT125DA	100	125	150	201	226	251	275	301	350	401
RT140DA	171	214	257	342	385	428	470	513	599	684
RT160DA	266	333	400	532	599	665	732	798	930	1064
RT190DA	426	532	638	851	958	1064	1170	1277	1490	1702
RT210DA	532	665	798	1064	1197	1330	1463	1596	1862	2128
RT240DA	770	962	1154	1539	1731	1924	2116	2309	2693	3078
RT270DA	1170	1462	1755	2339	2632	2924	3217	3509	4094	4679
RT300DA	1526	1908	2289	3052	3434	3815	4197	4578	5341	6104
RT350DA	2285	2856	3427	4570	5141	5712	6283	6854	7997	9139
RT400DA	3256	4070	4884	6512	7326	8140	8954	9768	11396	13024



THE OPERATING PRINCIPLE OF SPRING RETURN ACTUATOR



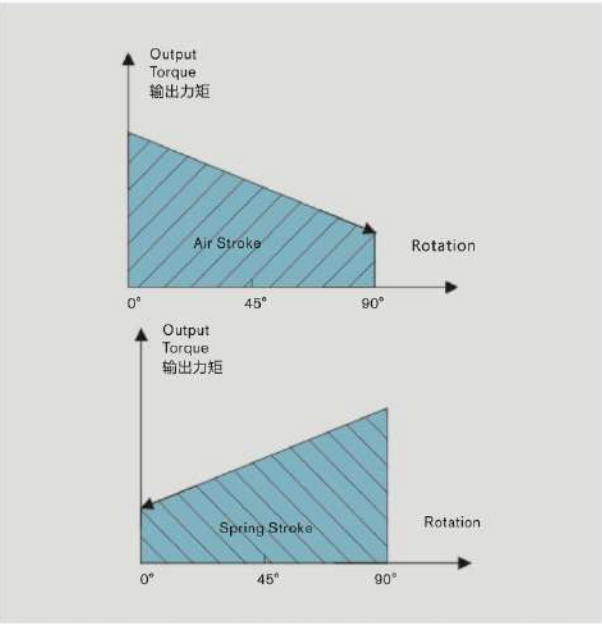
Air to port A forces the pistons outwards, causing the springs to compress. The pinion turns counter-clockwise while air is being exhausted from port B.

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

Air to port A forces the pistons outwards, causing the springs to compress. The pinion turns clockwise while air is being exhausted from port B.

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

OUTPUT TORQUE OF SPRING RETURN ACTUATORS



NOTE

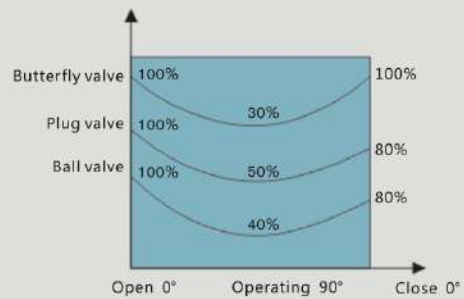
make sure that the torque necessary to operate the valve is compatible with the actuator torque(it depends on both actuator type and air supply).Please note that the requested torque depends not only on the valve, but on the working conditions and the safety margins of the plant in question, too!

OUTPUT TORQUE OF SPRING RETURN ACTUATORS

Output torque of air to springs																Springs/output	
Air pressure		2.5bar		3bar		4bar		5bar		6bar		7bar		8bar			
Model	Spring Qty	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	90° Start	0° End
RT52SR	5	5.7	3.8	7.6	5.7											6.2	4.3
	6	4.9	2.5	6.9	4.5	10.9	8.5									7.4	5.0
	7	4.0	1.3	6.0	3.3	9.8	7.3	14.0	10.4							8.6	5.9
	8			5.2	2.0	9.2	6.0	13.2	9.1	17.2	14.1					9.9	6.7
	9			4.3	0.8	8.3	4.8	12.3	7.9	16.3	12.8	20.3	16.8			11.1	7.6
	10					7.4	3.6	11.5	6.7	15.5	11.6	19.5	15.6			12.4	8.5
	11					6.6	2.3	10.6	5.4	14.6	10.4	18.6	14.3	22.6	18.3	13.6	9.3
	12							9.7	4.2	13.8	9.1	17.8	12.2	21.8	17.1	14.8	10.2
RT63SR	5	11.4	7.7	15.0	11.4	22.3	14.9									10.4	6.8
	6	10.1	5.7	13.6	9.3	20.9	16.6	28.3	23.9							12.5	8.2
	7	8.6	3.6	12.5	7.2	19.5	14.5	26.8	21.9							14.6	9.6
	8			10.9	5.1	18.2	12.4	25.5	19.8	32.8	27.0	40.1	34.3			16.7	10.9
	9					16.8	10.4	24.1	17.7	31.4	24.9	38.7	32.2			18.8	12.3
	10					1.4	8.2	22.8	15.6	30.0	22.8	37.3	30.1	44.7	37.4	20.9	13.7
	11							21.5	13.5	28.7	20.7	36.0	28.0	43.3	35.3	22.9	15.0
	12							20.0	11.4	27.3	18.6	34.6	25.9	41.9	33.3	25.0	16.4
RT75SR	5	14.5	10.6	19.4	15.5	29.5	25.7									14.5	10.5
	6	12.4	7.6	17.3	12.6	27.4	22.7	37.5	32.8							17.4	12.7
	7	10.4	4.8	15.2	9.7	25.3	19.9	35.4	29.9							20.3	14.8
	8			13.1	6.8	23.1	16.9	33.3	27.0	43.2	37.0	53.3	47.0			23.2	16.9
	9					21.0	14.1	34.2	24.1	41.1	34.1	51.2	44.2			26.1	19.0
	10					19.0	11.1	28.8	21.2	39.0	31.2	49.1	41.2	59.1	51.2	29.0	21.1
	11							27.0	18.3	37.0	28.3	47.0	38.4	57.0	48.4	31.9	23.2
	12							24.9	15.4	34.9	25.4	44.9	35.4	54.9	45.4	34.7	25.3
RT83SR	5	23.3	16.1	31.1	24.0	46.8	39.7									23.0	15.8
	6	20.1	11.5	28.0	19.3	43.7	35.1	59.4	50.7							27.6	19.0
	7	17.0	6.9	24.8	14.8	40.5	30.5	56.2	46.2							32.2	22.1
	8			21.7	10.1	37.4	25.8	53.1	41.5	68.8	57.2	84.5	72.9			36.8	25.3
	9					34.2	21.3	49.9	37.0	65.6	52.6	81.2	68.3			41.4	28.5
	10					31.0	16.6	46.7	32.3	62.4	48.0	78.1	63.7	93.8	79.3	46.0	31.6
	11							43.6	27.7	59.3	43.4	75.0	59.1	90.6	74.8	50.6	34.8
	12							40.4	23.2	56.1	38.9	71.7	54.5	87.4	70.2	55.2	38.0
RT92SR	5	33.1	22.0	44.2	33.2	66.8	55.9									34.4	23.3
	6	28.4	15.2	39.6	26.4	62.2	49.0	84.8	71.6							41.2	28.0
	7	23.8	8.2	34.9	19.4	57.5	42.1	80.2	64.7							48.1	32.7
	8			31.3	12.6	52.9	35.2	75.5	57.9	98.1	80.5	120.7	103.0			55.0	37.3
	9					48.2	28.4	70.9	51.0	93.5	73.6	116.0	96.1			61.9	42.0
	10					43.6	21.5	66.2	44.1	88.8	66.7	111.3	89.2	134.0	111.8	68.7	46.7
	11							61.5	37.2	84.1	59.9	106.6	82.4	129.2	105.0	75.6	51.4
	12							56.8	30.4	79.4	53.0	101.9	75.5	124.5	98.1	82.5	56.0
RT105SR	5	51.0	33.4	67.5	49.9	100.6	83.0									49.2	31.6
	6	44.7	23.5	61.1	40.0	94.2	73.2	127.3	106.2							59.1	38.0
	7	38.4	13.7	54.9	30.3	87.9	63.4	121.0	96.4							68.9	44.3
	8			48.5	20.4	81.6	53.5	114.7	86.5	147.7	119.6	180.8	152.7			78.7	50.6
	9					75.3	43.7	108.4	76.8	141.5	109.8	174.5	142.9			88.6	56.9
	10					68.9	33.4	102.0	66.5	135.1	99.6	168.2	132.6			98.4	63.3
	11							95.7	57.0	128.7	90.1	161.8	123.1	201.2	165.7	108.3	69.6
	12							89.4	47.5	122.5	80.6	155.5	113.6	188.6	146.7	118.1	75.9

OUTPUT TORQUE OF SPRING RETURN ACTUATORS

		Output torque of air to springs																Springs' output	
Air pressure		2.5Bar		3Bar		4Bar		5Bar		6Bar		7Bar		8Bar					
Model	Spring Qty	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End		
RT125SR	5	73	47	98	72	148	122												
	6	63	31	88	56	138	107	188	157										
	7	52	15	77	40	127	90	178	141										
	8			67	25	107	75	167	125	217	176	268	226						
	9					107	59	157	109	207	159	257	210						
	10					96	44	146	94	196	144	247	194	297	245				
	11							136	78	186	128	236	178	286	228				
RT140SR	5	128	85	171	127	256	213												
	6	111	59	154	102	239	187	325	273										
	7	94	33	137	76	222	162	308	247										
	8			120	50	205	136	291	221	376	307	462	392						
	9					187	110	273	196	358	281	444	367						
	10					170	84	256	169	341	255	427	340	512	426				
	11							238	143	324	229	409	314	495	400				
RT160SR	5	193	124	259	191	392	324												
	6	165	83	232	149	365	282	498	415										
	7	137	41	203	107	336	240	469	373										
	8			176	66	309	199	442	337	575	465	708	598						
	9					280	157	413	290	546	423	679	556						
	10					253	115	386	248	519	381	652	514	785	647				
	11							358	207	491	340	624	473	757	606				
RT190SR	5	332	222	438	329	651	542												
	6	292	161	398	267	611	480	824	693										
	7	252	99	358	205	571	418	784	631										
	8			318	143	531	356	744	569	957	782	1169	995						
	9					491	295	704	507	917	720	1130	933						
	10					451	233	664	446	877	658	1090	871	1302	1084				
	11					624	384	837	597	1050	809	1263	1022	1476	1235				
RT210SR	5	390	285	523	418	789	684												
	6	335	209	468	342	734	608	1000	874										
	7	280	133	413	266	679	532	945	798	1156	988	1422	1254						
	8			358	190	624	456	890	722	1101	912	1367	1178						
	9					569	380	835	646	1101	912	1367	1178						
	10					514	304	780	570	1046	836	1312	1102	1578	1368				
	11							725	494	991	760	1257	1025	1523	1292				
RT240SR	5	552	409	744	600	1129	985												
	6	470	297	662	489	1047	874	1432	1259										
	7	388	187	580	379	964	764	1349	1149										
	8			498	268	883	653	1267	1037	1652	1422	2037	1807						
	9					800	542	1185	926	1569	1311	1954	1696						
	10					718	431	1103	816	1418	1187	1586	1286	2257	1970				
	11							1021	705	1406	1090	1791	1474	2176	1859				
RT270SR	5	903	675	1195	968	1779	1552												
	6	790	519	1083	811	1667	1396	2252	1981										
	7	679	361	972	654	1356	1083	2141	1823										
	8			860	497	1444	1081	2029	1666	2614	2252	3199	2836						
	9					1332	923	1917	1509	2502	2094	3087	2678						
	10					1220	767	1805	1352	2390	1937	2974	2521	3560	3107				
	11							1693	1194	2278	1779	2862	2364	3448	2949				
RT300SR	5	1089	729					1582	1037	2167	1623	2751	2207	3316	2792				
	6	935	494																
	7	772	258	1316	875	1915	1402												
	8			1153	639	1754	1166	2517	1929										
	9			991	403	1592	930	2355	1693	3118	2456								
	10					1430	695	2193	1493	2936	2221	3719	2984	4482	3747				
	11							2010	1222	2733	1985	3556	2748	4319	3511				
RT350SR	5	1553	964																
	6	1292	586	1863	1157	2745	1922	3626	2686										
	7	1031	208	1602	1341	2484	1544	2724	2107	4508	3449								
	8					1963	787	3105	1929	4247	3071	5390	4214	6532	5356				
	9							2844	1551	3986	2693	5129	3836	6271	4978				
	10							2584	1172	3726	2314	4869	3457	6011	4599				
	11																		
RT400SR	5	2028	869																
	6	1736	411	2550	1225	3887	2396												
	7			1967	311	3595	1939	5223	3567										
	8					3303	1482	4931	3110	6559	4738								
	9					3012	1025	4640	2653	8268	4281	7895	5908	9523	7536				
	10							4348	2195	5976	3823	7603	5450	9231	7078				
	11							4057	1738	5685	3366	7312	4993	8940	6621				



OPERATING CONDITIONS

1. Operating medium

Dry or lubricated air, or the non-corrosive gases
The maximum particle diameter must less than 30µm

2. Air supply pressure

The minimum supply pressure is 2.5 Bar
The maximum supply pressure is 8 Bar

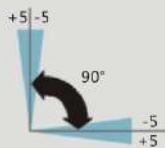
3. Operating temperature

Standard: -20°C~+80°C

Low temperature: -35°C~+80°C High temperature: -15°C~+150°C

4. Travel adjustment Have adjustment range of $\pm 5^\circ$ for the rotation at 0° and 90°

5. Application Either indoor or outdoor



OPERATING TYPE

Double acting and spring return

THE MOUNTING HOLES AND SERIAL NUMBER



● Air supply connection is designed in accordance with NAMUR Standard to install solenoid valves



● The Namur drive pinion and the Namur top mounting connection permit direct installation of accessories such as limit switch box and positioner.

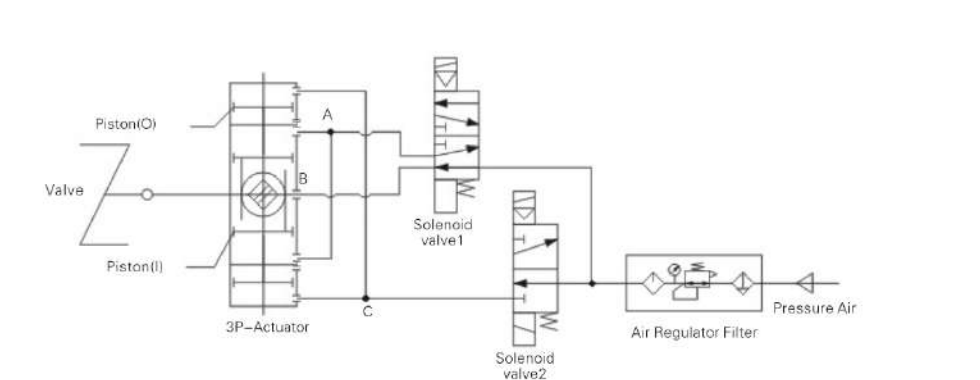


● Bottom mounting connection is designed in accordance with ISO5211 and DIN3337 standards for direct mounting with valve gear boxes or mounting brackets.

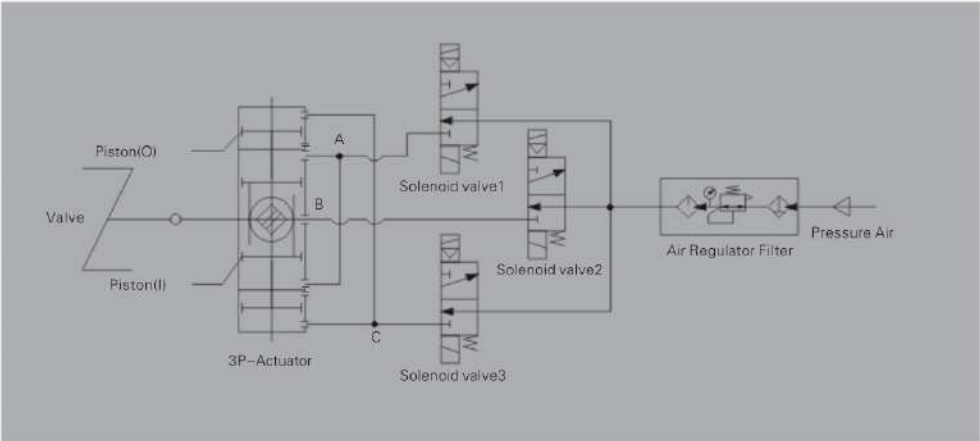


● Each actuator is marked with a serial number, air connection and bottom mounting holes are marked for easy track and distinction.

Schematic Diagram

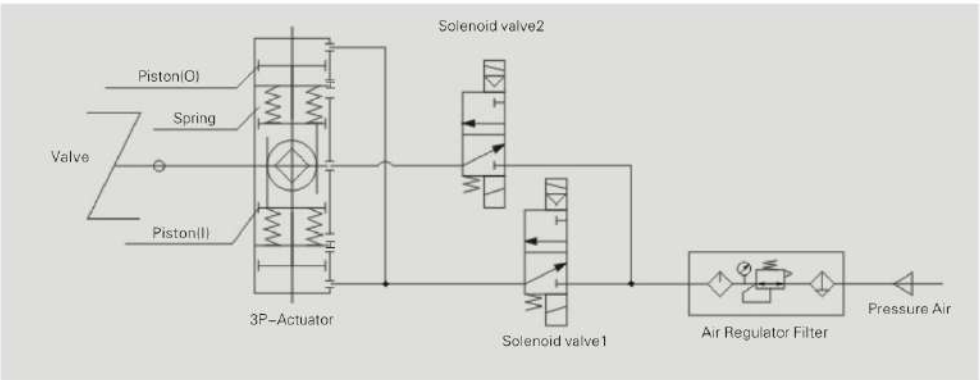


	0°	90°	30°	0°
电磁阀1 SOLENOID VALVE1	OFF	ON	OFF	OFF
电磁阀2 SOLENOID VALVE2	OFF	OFF	ON	OFF

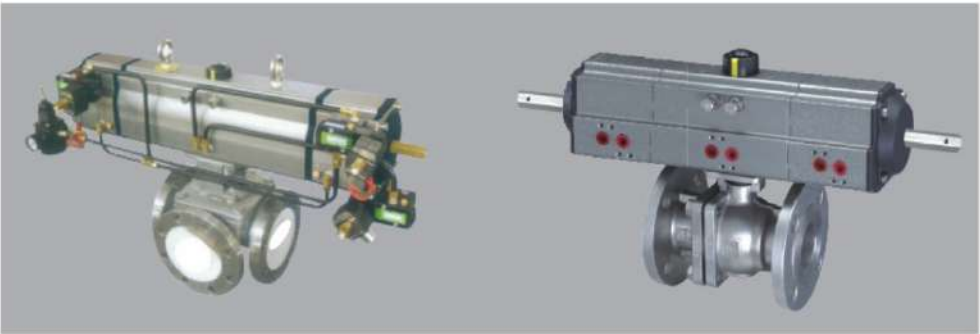


	0°	30°	90°	30°	0°
SOLENOID VALVE1	OFF	OFF	ON	OFF	OFF
SOLENOID VALVE2	ON	OFF	OFF	ON	ON
SOLENOID VALVE3	OFF	ON	ON	ON	OFF

Schematic Diagram

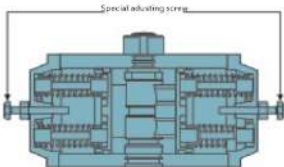


	0°	30°	90°	30°	0°
电磁阀1 SOLENOID VALVE1	OFF	ON	OFF	ON	OFF
电磁阀2 SOLENOID VALVE2	OFF	ON	ON	ON	OFF



Full-stroke adjusting limit actuator

RT series pneumatic actuators also can be fixed with adjusting screw at both ends , any angle within 0° -90° , 0° -120° or 0° -180° adjustable by the customer according to actual needs; besides, all series of actuators are capable of fullstroke adjustment.



AIR CONSUMPTION

AIR VOLUME OPENING & CLOSING

Unit:L

Model	Air volume opening	Air volume closing	Model	Air volume opening	Air volume closing 关向体积(升)
RT52	0.12	0.16	RT160	3.7	3.2
RT63	0.21	0.23	RT190	5.9	5.4
RT75	0.3	0.34	RT210	7.5	7.5
RT83	0.43	0.47	RT240	11	9
RT92	0.64	0.73	RT270	17	14
RT105	0.95	0.88	RT300	23.8	29.7
RT125	1.6	1.4	RT350	35.1	46.3
RT140	2.5	2.2	RT400	52.6	56

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

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

Series	Model	Spring Qty	Options	Series	Model	Spring Qty	Options
RT□DA	52	K5	120°,135°,180° for special degree operation	RT□DA	140	K5	120°,135°,180° for special degree operation
	63	K6			160	K6	
	75	K7			190	K7	
	83	K8			210	K8	
RT□SR□	83	K8	SS Stainless Steel Pinion	RT□SR□	240	K9	SS Stainless Steel Pinion
	92	K9			270	K10	
RT□□NI	105	K10		RT□□NI	300	K11	
	125	K11			350	K11	
	125	K12			400	K12	

WEIGHT TABLE

Model	(DA)	(SR)	Model	(DA)	(SR)
RT52(Φ52)	1.4kg	1.5kg	RT160(Φ160)	20.1kg	24kg
RT63(Φ63)	2.0kg	2.1kg	RT190(Φ190)	31.3kg	35.3kg
RT75(Φ75)	2.7kg	2.9kg	RT210(Φ210)	46.8kg	54.8kg
RT83(Φ83)	3.1kg	3.6kg	RT240(Φ240)	67.3kg	80.2kg
RT92(Φ92)	4.6kg	5.2kg	RT270(Φ270)	96.9kg	118kg
RT105(Φ105)	6.8kg	6.9kg	RT300(Φ300)	110kg	130kg
RT125(Φ125)	9.0kg	10.1kg	RT350(Φ350)	186kg	234kg
RT140(Φ140)	13.2kg	15.6kg	RT400(Φ400)	289kg	360kg

HOW TO ORDER

All dimensions ,material are referred to updated catalogue and /or technical data sheet .

Model	Type	Spring Q.TY	ISO flange type	Square	Position Indicator	Seal
RT52	DA=Double Acting Standard Clockwise to close	Only for spring return	F05 F03	11	Standard : (already included no need to be specified)	Standard: NBR seals (no need to be specified)
RT63		5	F07 F05	14		
RT75		6	F07 F05	14		
RT83	DAo=Double Acting Clockwise to open	7	F07 F05	17	P : Position indicator for Proximity	HT= Viton seals (For High Temperature)
RT92		8	F07 F05	17		
RT105		9	F10 F07	22		
RT125		10	F10 F07	22		
RT140	SR= Spring Return Standard Clockwise to close	11	F12 F10	27		LT= Silicon seals (For Low Temperature)
RT160		12	F12 F10	27		
RT190	SRo=Spring to open		F14	36		
RT210			F14	36		
RT240			F16	46		
RT270			F16	46		
RT300			F16 F20	46		
RT350			F16 F20	46		
RT400			F16 F25	55		

Notes:

Standard Rotation for double acting and spring return is Clockwise to close (for double acting when port B is pressurized).

When the centering (Spigot) is requested the letter Y must be added after the flange type .Example F10Y.

Standard Square is diagonal square ,when parallel square is requested a letter L must be added after the square dimension .Example 17L

When indicator for proximity is requested it must be indicated with letter P. If not specified the actuators will be supplied with standard position indicator.



Example 1 : RT105 DA F07 Y 14

Description 1: Actuator Model RT105 ,Type Double Acting (clockwise to close) ,with Flange F07 Plus centering ,with diagonal square of 14mm , with standard indicator and standard NBR seals.

Example 1 : RT140 SRo 10 F12 27L P HT

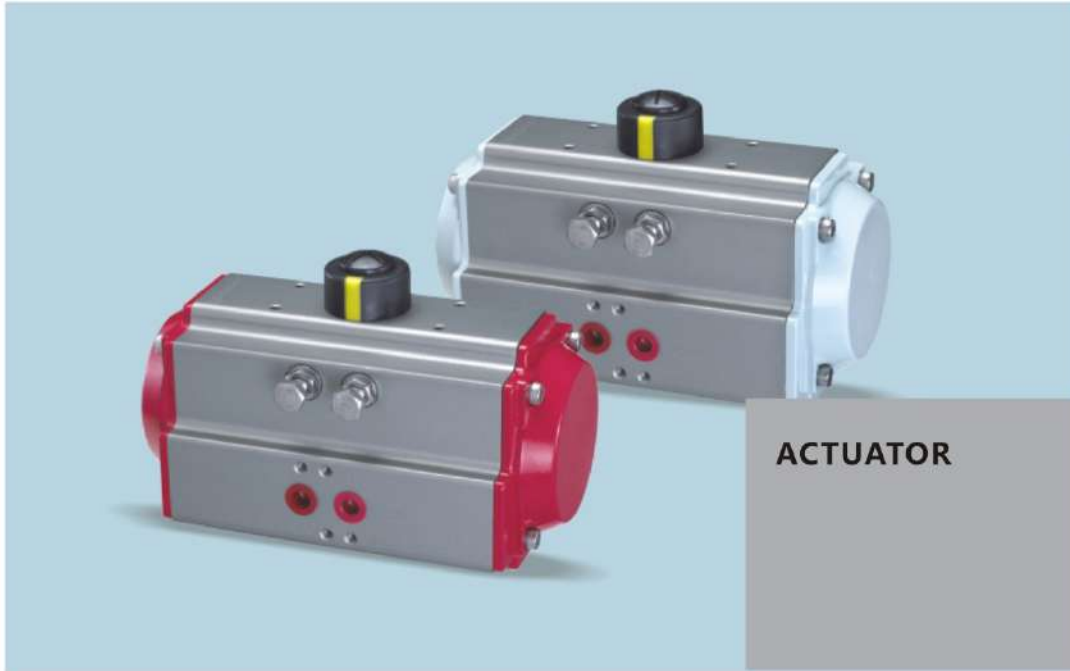
Description: Actuator Model RT140 ,Type Spring return (spring to open) ,with 10 springs (5 per side) ,with Flange F12 ,with parallel square of 27mm ,with indicator for proximity and Viton seals for high temperature..

ORDINARY FAILURE AND IT'S SOLUTIONS

Failure phenomena	Checking item	Solution
Pneumatic valve does not act	Does the solenoid valve work normally? Is the coil burned? Is the trim of the solenoid blocked by impurity?	Replace the solenoid valve or coil and clean out the impurity
	With air supplying the pneumatic actuator, are the O-rings or the cylinder broken?	Replace the broken O-rings and cylinder body.
	Is impurity blocking the valve?	Clean out the impurity, replace the broken parts
	Is the handle of the manual override at the manual position ?	Put the handle to the pneumatic position
Acting slowly	Is the air supply pressure not enough?	Improve the air pressure(0.4~0.7Mpa)
	Is the output torque of pneumatic actuator not enough?	Select a bigger model of the pneumatic actuator
	Is the valve stem or other parts assembled too tightened?	Reassemble and adjust the valve
	Is the air supply pipe blocked making the flow too small?	Clean out the block, replace the filter element
The feedback box has no signal	Is the power circuitry shorted out or stopped?	Check the circuitry
	Is the cam of the feedback box in the incorrect position?	Adjust the cam to the correct position
	Is the micro switch broken?	Replace the micro switch

SOME PNEUMATIC PRODUCTS





ACTUATOR



SOLENOID VALVE



LIMIT SWITCH



**FILTER
REGULATOR**