



AP

AP SERIES PNEUMATIC ACTUATORS

brandoni
VALVES

Technical Characteristics

AP series pneumatic actuators, with the integrated use of advanced precision machining equipment, high-quality materials and industrial art design technology. After rigorous testing and optimization of production line, AP series pneumatic actuators have lots of advantages like smooth and reliable operation, long working life, high corrosion resistance, flexible selection, competitive price and so on.

Piston

The teeth of piston machined by CNC machining center, makes the operation smoother and performance more reliable. Anodized treatment improves the corrosion and wear resistance.



End cap

The function of 95° position limit is optimally designed on the end cap, instead of extra limit screw. This design improves the safety and reliability.

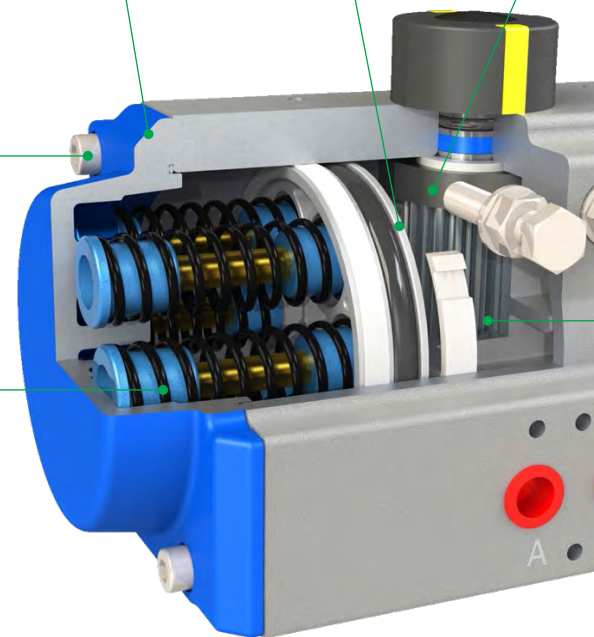


Fasteners

The stainless steel fasteners, are safe and beautiful with high corrosion resistance.

Spring

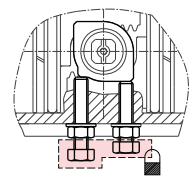
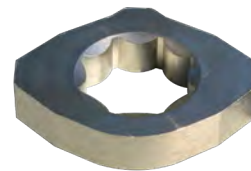
Preloaded and coated springs are made from high quality material for higher corrosion resistance and longer service life, which can be demounted safely and conveniently to satisfy different requirements of torque by changing quantity of springs.





Cam

Cam with lock function*, when the actuator is required to be locked in full open (90°) or fully closed (0°) position, the actuator can be equipped with special bolts and locking device, the actuator position can be locked, and prevent misuse.



*AP40~AP125 / AP40~AP125 are available at this time

Body

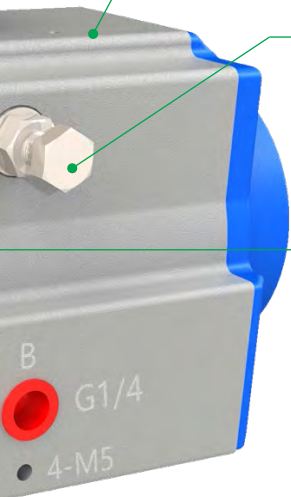
According to different requirements, the surface of aluminum body can be treated with hard anodizing, powder polyester coating in colors (like black, blue, orange, red etc.), PTFE coating or Nickel plated.

Adjust screw

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

Drive shaft

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



Installation Specification



Limit Switch box



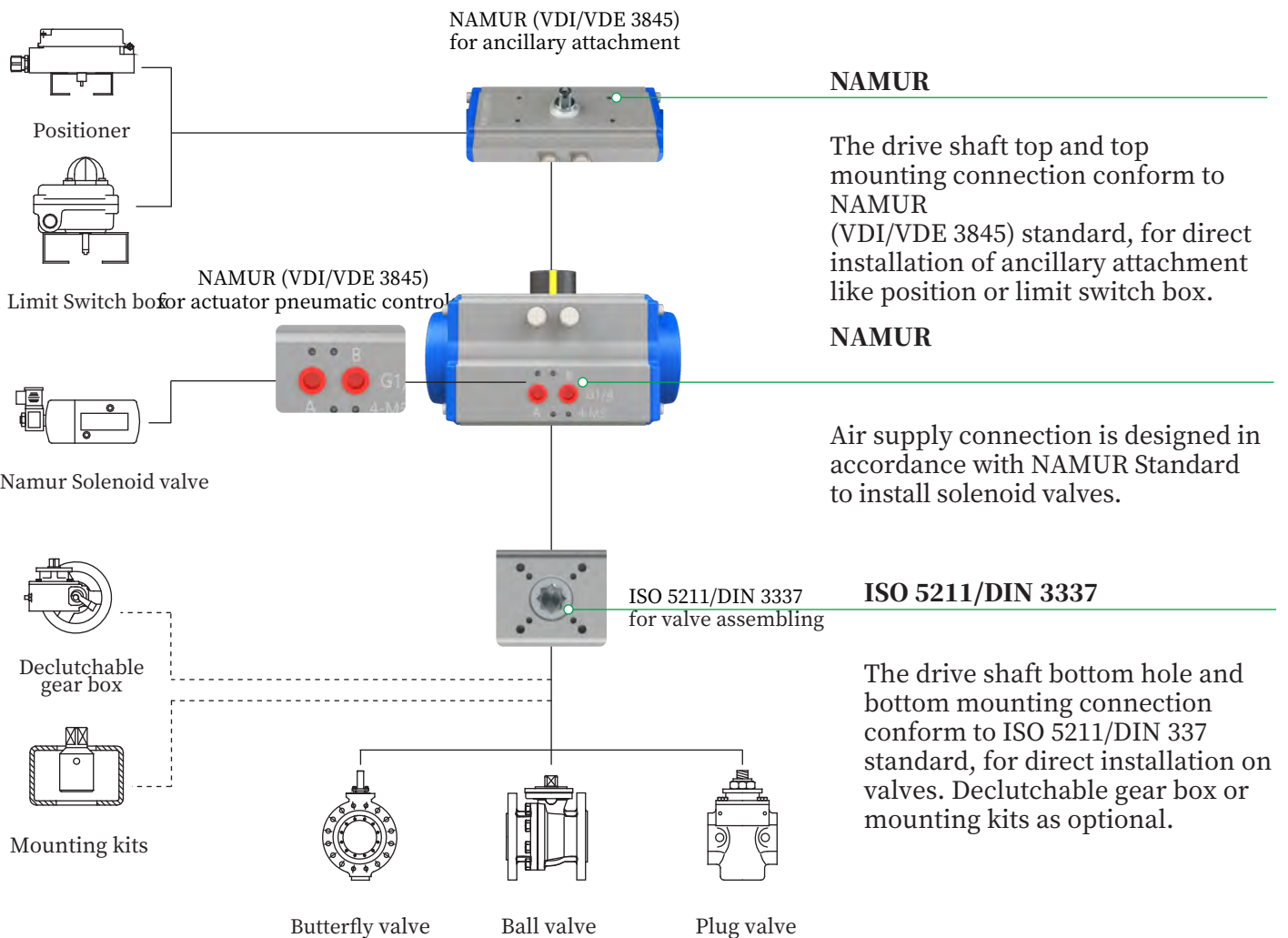
Positioner



Smart Positioner



NAMUR Solenoid valve



Butterfly valve



Ball valve



Plug valve



Declutchable gear box

Operating Principle

Double Acting Actuators

CCW (Standard)

"A" ↑ ↓ "B"
0° close "A" ↓ ↑ "B"
90° open

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

CW

"A" ↑ ↓ "B"
90° open "A" ↓ ↑ "B"
0° Close

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

Spring Return Actuators

FC-CCW (Standard)

"A" ↑ ↓ "B"
0° close "A" ↓ ↑ "B"
90° open

Air to port A forces the pistons outwards, causing the springs to compress. The drive shaft turns counterclockwise while air is being exhausted from port B. Loss of air pressure on port A, the stored energy in the springs forces the pistons inwards. The drive shaft turns clockwise while air is being exhausted from port A.

FO-CW

"A" ↑ ↓ "B"
90° open "A" ↓ ↑ "B"
0° Close

Air to port A forces the pistons outwards, causing the springs to compress. The drive shaft turns clockwise while air is being exhausted from port B. Loss of air pressure on port A, the stored energy in the springs forces the pistons inwards. The drive shaft turns counterclockwise while air is being exhausted from port A.

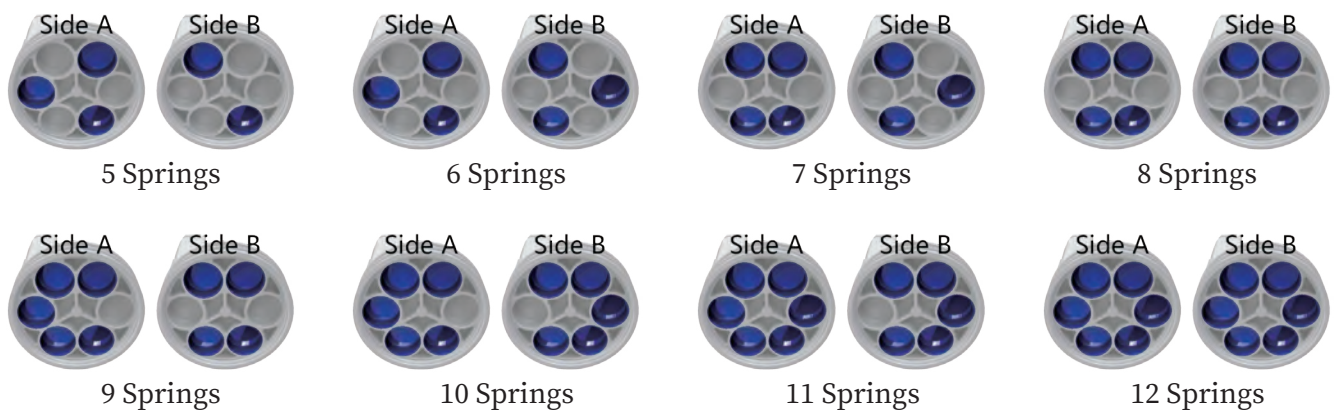
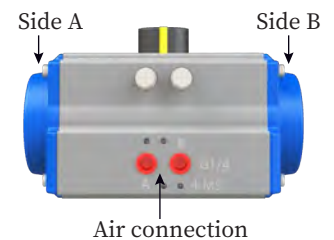
Operating Conditions

- **Operating media**
Dry or lubricated air, or the non-corrosive gases. The maximum particle diameter must less than 30 μm
- **Air supply pressure**
The minimum supply pressure is 2 Bar, the maximum supply pressure is 8 Bar
- **Operating temperature**
Standard (NBR O-rings): -20°C ~ +80°C
High temperature (Viton O-rings): -20°C ~ +150°C
Low temperature (LTNBR O-rings): -40°C ~ +120°C
- **Travel adjustment**
Have adjustment range of ±5° for the rotation at 0° and 90°
- **Lubrication**
Actuators are factory lubrication located. Under normal operating condition, need not to add lubricant
- **Application**
Either indoor or outdoor

Spring Set Configuration

Spring mounting form for spring return actuators

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



Weight

Unit: kg

Model	32	40	52	63	75	83	92	105	115	125	140	160	190	210	240	270	300	350	400
DA	0.80	0.97	1.22	2.02	2.60	3.23	4.58	5.92	8.18	8.68	14.1	20.6	33.2	39.7	57.0	78.7	114	171	240
SR12	-	1.10*	1.35	2.19	2.86	3.64	5.35	6.76	9.30	10.06	16.5	24.4	40.2	49.2	70.0	100.3	141	220	285

*AP40 AP40SR only use 2 springs.
Note: Weights of AP32~AP270 include carton.

Operation Time

Air Pressure: 5 bar

Unit: s

Double Acting			Spring Return (Spring Qty.)														
			3+3		3+4		4+4		4+5		5+5		5+6		6+6		
Size	0°~90°	90°~0°	Size	0°~90°	90°~0°	0°~90°	90°~0°	0°~90°	90°~0°	0°~90°	90°~0°	0°~90°	90°~0°	0°~90°	90°~0°	0°~90°	90°~0°
32DA	0.5	0.5	32SR	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40DA	0.5	0.5	40SR	-	-	-	-	-	-	-	-	-	-	-	-	-	-
52DA	0.6	0.6	52SR	2.46	0.48	2.48	0.46	2.5	0.44	2.52	0.42	2.54	0.4	2.56	0.38	2.58	0.36
63DA	0.7	0.7	63SR	2.54	0.56	2.56	0.54	2.58	0.52	2.6	0.5	2.62	0.48	2.64	0.46	2.66	0.44
75DA	0.8	0.7	75SR	2.62	0.64	2.64	0.62	2.66	0.6	2.68	0.58	2.7	0.56	2.72	0.54	2.74	0.52
83DA	0.9	0.8	83SR	2.71	0.73	2.73	0.71	2.75	0.69	2.77	0.67	2.79	0.65	2.81	0.63	2.83	0.61
92DA	1.0	1.0	92SR	2.89	0.86	2.91	0.84	2.93	0.82	2.95	0.8	2.97	0.78	2.99	0.76	3.01	0.74
105DA	1.5	1.5	105SR	3.14	0.91	3.16	0.89	3.18	0.87	3.2	0.85	3.22	0.83	3.24	0.81	3.26	0.79
115DA	1.7	1.7	115SR	3.59	1.02	3.61	1.00	3.62	0.98	3.64	0.96	3.66	0.95	3.67	0.93	3.69	0.91
125DA	2	2	125SR	4.24	1.2	4.26	1.18	4.28	1.16	4.3	1.14	4.32	1.12	4.34	1.1	4.36	1.08
140DA	2.5	2.5	140SR	4.4	1.35	4.4	1.33	4.62	1.31	4.64	1.29	4.66	1.27	4.68	1.25	4.68	1.22
160DA	4	3	160SR	4.74	1.77	4.76	1.75	4.78	1.73	4.8	1.71	4.82	1.69	4.82	1.67	4.84	1.65
190DA	5	4	190SR	5.75	3.7	5.77	3.5	5.75	3.48	5.77	3.46	5.79	3.44	5.8	3.42	5.83	3.4
210DA	5	4	210SR	8.25	4.8	8.4	4.6	8.42	4.58	8.44	4.56	8.46	4.54	8.48	4.52	8.5	4.5
240DA	6	6	240SR	16.2	5.14	16.4	5.12	16.42	5.1	16.44	4.9	16.6	4.98	16.8	4.86	17	4.84
270DA	8	8	270SR	17.6	6.28	17.8	6.26	17.6	6.24	17.8	6.2	18	6.18	18.2	6.16	18.4	6.14
300DA	12	12	300SR	24	13.2	24.5	13	24.4	12.8	24.3	12.6	24.5	12.58	24.7	12.56	24.9	12.54
350DA	14	14	350SR	31	17.3	31.5	17	31.3	16.8	31	16.6	31.2	16.58	31.4	16.56	31.6	16.54
400DA	15	15	400SR	45	27	51	27	51.3	26.8	51.5	26.8	51.7	26.6	51.9	26.4	52.1	26.2

* The operation time of the actuator depends on the CV values of the solenoid valves, filter regulator and pipes, it also depends on the air pressure, operating load and so on.

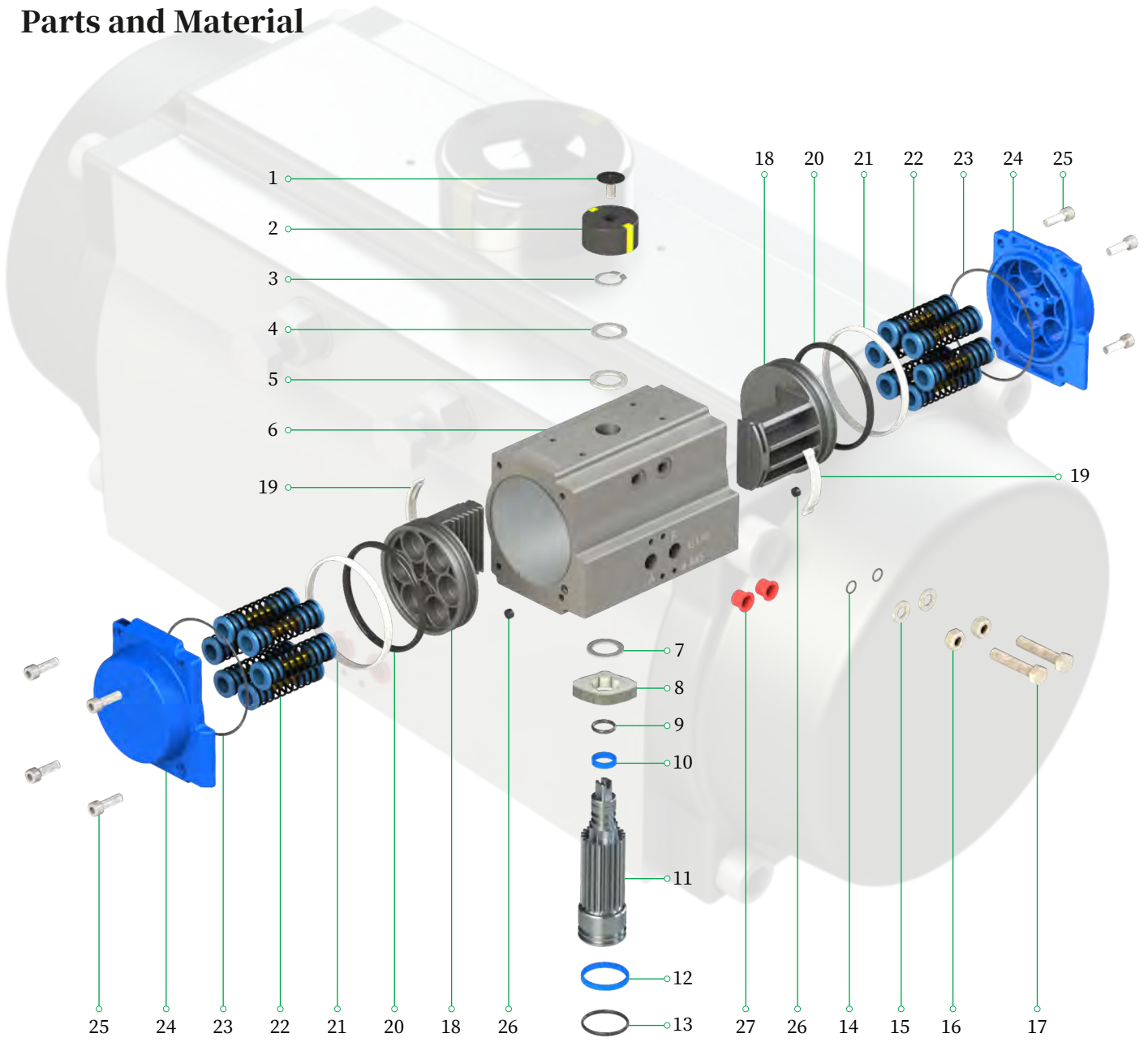
Air Consumption

Unit: L

Model	Air volume opening	Air volume closing	Model	Air volume opening	Air volume closing
AP-32	0.04	0.05	AP-140	2.5	2.2
AP-40	0.08	0.11	AP-160	3.7	3.2
AP-52	0.12	0.16	AP-190	5.9	5.4
AP-63	0.21	0.23	AP-210	7.5	7.5
AP-75	0.30	0.34	AP-240	11.0	9.0
AP-83	0.43	0.47	AP-270	17.0	14.0
AP-92	0.64	0.73	AP-300	23.8	29.7
AP-105	0.95	0.88	AP-350	35.1	46.3
AP-115	1.3	1.2	AP-400	52.6	56.0
AP-125	1.6	1.4			

Air consumption rest with Air Supply. Air volume and Action cycle times, expressions:
 $L/Min = \text{Air volume}(\text{Air volume Opening} + \text{Air volume closing}) \times [(\text{Air Supply (Kpa)} + 101.3) \div 101.3] \times \text{Action cycle times}/min$

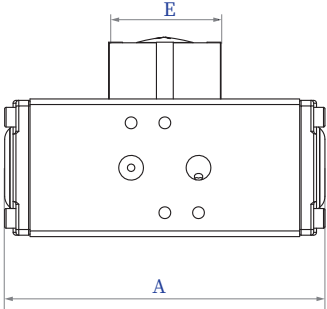
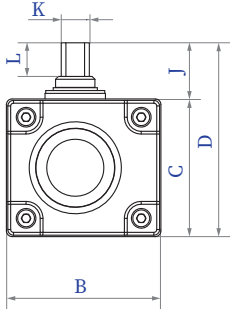
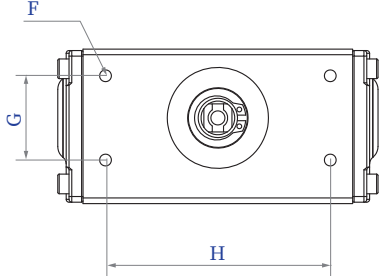
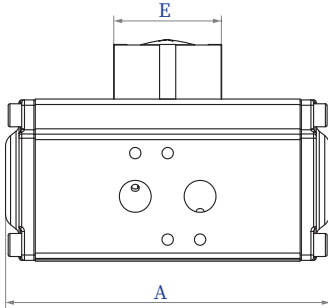
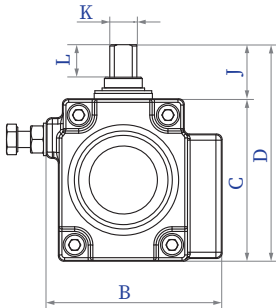
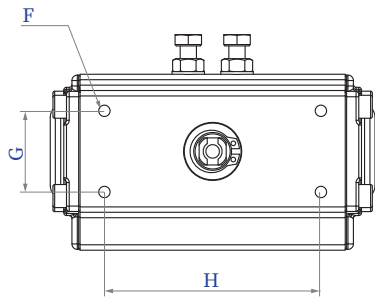
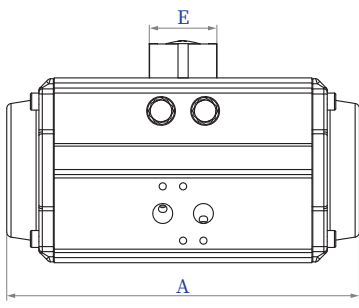
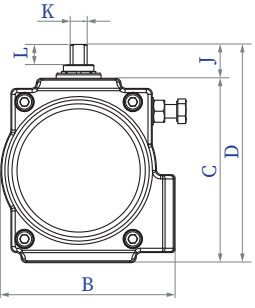
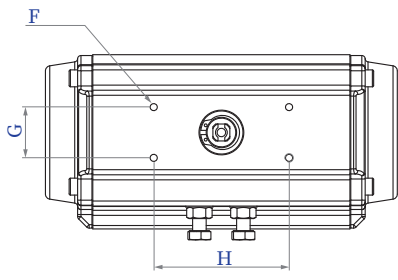
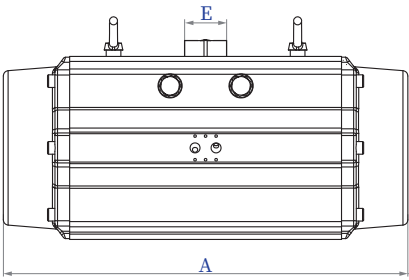
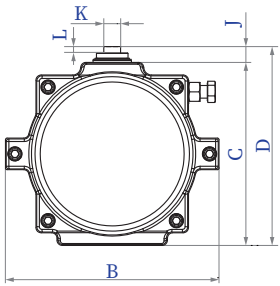
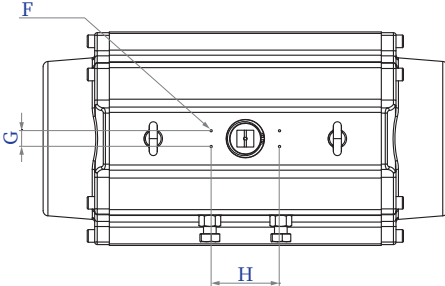
Parts and Material



Details of Parts Kit										
Part No.	Description	Quantity				#1	#2	#3	#4	
		AP32	AP40	AP52-300	AP350					AP400
3	Spring clip	1	1	1	1	1	SS304	-	-	-
4	Thrust washer	1	1	1	1	1	SS304	-	-	-
5	Outside washer	1	1	1	1	1	POM	-	-	-
7	Inside washer	1	1	1	1	1	POM	-	-	-
10	Bearing (shaft top)		1	1	1	1	POM	-	-	-
12	Bearing (shaft bottom)		1	1	1	1	POM	-	-	-
19	Guide (piston)		2	2	2	2	Nylon66	-	-	-
21	Bearing (piston)			2		4	POM	-	-	-
9	O-ring (shaft top)	1	1	1	1	1	-	NBR	FKM	LTNBR
13	O-ring (shaft bottom)	1	1	1	1	1	-	NBR	FKM	LTNBR
14	O-ring (adjust screw)		2	2	2	2	-	NBR	FKM	LTNBR
20	O-ring (piston)	2	2	2	2	2	-	NBR	FKM	LTNBR
23	O-ring (end cap)	2	2	2	2	2	-	NBR	FKM	LTNBR
23	Plug		2	2	2	2	-	NBR	NBR	NBR
Working temperature range								-20°C~80°C	-15°C~150°C	-40°C~80°C

No.	Description	Qty.	Standard Material	Protection	Optional Material
1	Indicator screw	1	Plastic+Stainless steel		
2	Indicator	1	ABS Plastic		
3	Spring clip	1	304 Stainless steel		
4	Thrust washer	1	304 Stainless steel		
5	Outside washer	1	POM		
6	Body	1	Extruded aluminum(6005-T5)	Hard anodized etc	
7	Inside washer	1	POM		
8	Cam	1	45# steel		
9	O-ring (Shaft top)	1	NBR		Viton / LTNBR
10	Bearing (Shaft top)	1	POM		
11	Drive Shaft	1	Alloy steel	Nickel plated	304 Stainless steel
12	Bearing (Shaft bottom)	1	POM		
13	O-ring (Shaft bottom)	1	NBR		Viton / LTNBR
14	O-ring (Adjust screw)	2	NBR		Viton / LTNBR
15	Gasket	2	304 Stainless steel		
16	Nut	2	304 Stainless steel		
17	Adjust screw	2	304 Stainless steel		
18	Piston	2	Cast aluminum	Anodized	
19	Guide (Piston)	2	Nylon 66		
20	O-ring (Piston)	2	NBR		Viton / LTNBR
21	Bearing (Piston)	2	POM		
22	Spring	0~12	Spring steel	Electrophoretic paint	
23	O-ring (End cap)	2	NBR		Viton / LTNBR
24	End cap	2	Cast aluminum	Powder polyester painted etc	
25	Cap screw	8	304 Stainless steel		
26	Plug	2	NBR		
27	Dustproof plug	2	Plastic		

Dimensions

	FRONT VIEW	SIDE VIEW	TOP VIEW
AP-32			
AP-40			
AP-52~270			
AP-300~400			

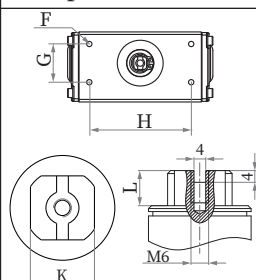
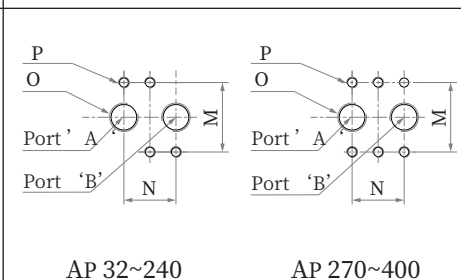
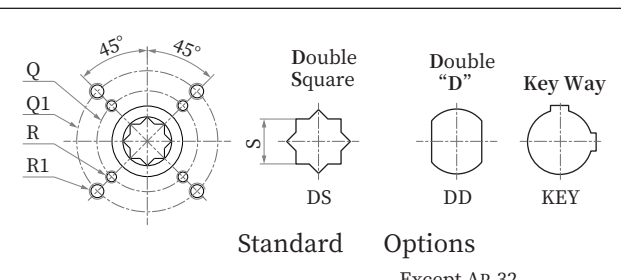


Dimensions

Unit:mm

Model	32	40	52	63	75	83	92	105	115	125	140	160	190	210	240	270	300	350	400
A	116	120	147	165	182	208	262	270	298	301	395	454	528	536	608	721	769	909	925
B	51	65	71.5	83	95	103	108.5	124.5	134	142	152.5	174	206	226	260	294	406	460	516
C	45	60	72	88	99.5	109	116.5	133	144	155	172	197	230	255	289	328	348	408	480
D	65	80	92	108	119.5	129	136.5	153	164	175	192	217	260	285	319	358	378	438	510
E	Ø40	Ø40	Ø40	Ø40	Ø40	Ø40	Ø40	Ø40	Ø55	Ø55	Ø55	Ø55	Ø80	Ø80	Ø80	Ø80	Ø80	Ø80	Ø80

Connection

Top view NAMUR	Air connection NAMUR	Bottom view ISO 5211/DIN 3337
	 <p>AP 32~240 AP 270~400</p>	 <p>Standard Options Except AP-32</p>

Connection

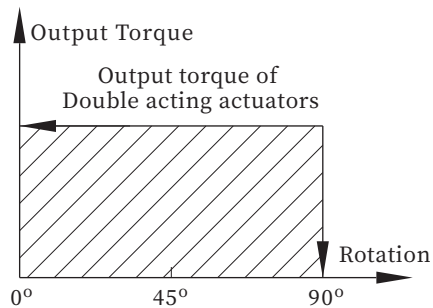
Unit:mm

Model	32	40	52	63	75	83	92	105	115	125	140	160	190	210	240	270	300	350	400
F	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8
G	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
H	80	80	80	80	80	80	80	80	80	80	80	80	130	130	130	130	130	130	130
J	20	20	20	20	20	20	20	20	20	20	20	20	30	30	30	30	30	30	30
K	10	10	10	10	10	10	14	14	22	22	22	22	32	32	32	32	32	32	32
L	12	12	12	12	12	12	12	12	10	10	10	10	12	12	12	12	12	12	12
M	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	45	45	45	45
N	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	40	40	40	40
O	G1/8"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/2"	G1/2"	G1/2"	G1/2"
P	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M6x10	M6x10	M6x10	M6x10
Q	/	F03	F03	F05	F05	F05	F05	F07	F07	F07	F10	F10	/	/	/	/	F16	F16	F16
Q1	F03	F05	F05	F07	F07	F07	F07	F10	F10	F10	F12	F12	F14	F14	F16	F16	Ø215	F25	F25
R	/	M5x8	M5x8	M6x10	M6x10	M6x10	M6x10	M8x13	M8x13	M8x13	M10x16	M10x16	/	/	/	/	M20x25	M20x25	M20x25
R1	M5x8	M6x9	M6x9	M8x13	M8x13	M8x13	M8x13	M10x16	M10x16	M10x16	M12x19	M12x19	M16x24	M16x24	M20x25	M20x25	M20x25	M16x24*	M16x24*
S	9x11	11x14	11x14	14x18	14x18	17x21	17x21	22x26	22x26	22x26	27x31	27x31	36x40	36x40	46x50	46x50	46x60	46x60	55x60

*8 screw holes

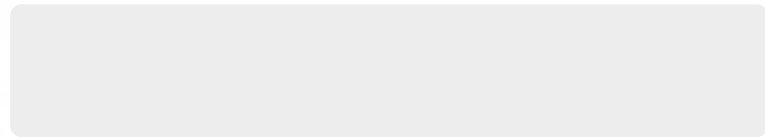
Output Torque

For Double Acting Actuator



Torque Unit: Nm

Model	Air supply pressure (Unit: Bar)										
	2Bar	2.5Bar	3Bar	3.5Bar	4Bar	4.5Bar	5Bar	5.5Bar	6Bar	7Bar	8Bar
AP-32DA	3	4	5	6	6	7	8	8	9	11	12
AP-40DA	5	6	7	8	10	11	12	13	14	17	19
AP-52DA	8	10	12	14	16	18	20	22	24	28	32
AP-63DA	15	18	22	25	29	33	36	40	44	51	58
AP-75DA	20	25	30	35	40	45	50	55	60	70	80
AP-83DA	31	39	47	55	63	70	78	86	94	110	125
AP-92DA	45	56	68	79	90	102	113	124	135	158	181
AP-105DA	66	83	99	116	132	149	165	182	198	231	264
AP-115DA	86	108	130	151	173	194	216	238	259	302	346
AP-125DA	100	125	150	176	200	226	251	276	301	351	401
AP-140DA	171	214	256	299	342	385	427	470	513	598	684
AP-160DA	266	332	399	466	532	598	665	731	798	931	1064
AP-190DA	426	532	638	745	851	958	1064	1170	1277	1490	1702
AP-210DA	532	665	798	931	1064	1197	1330	1463	1596	1862	2128
AP-240DA	769	962	1154	1347	1539	1731	1924	2116	2308	2693	3078
AP-270DA	1170	1462	1754	2047	2339	2632	2924	3216	3509	4094	4679
AP-300DA	1526	1908	2289	2671	3052	3434	3815	4197	4578	5341	6104
AP-350DA	2285	2856	3427	3998	4570	5141	5712	6283	6854	7997	9139
AP-400DA	3256	4070	4884	5698	6512	7326	8140	8954	9768	11396	13024



Sizing: Double Acting Actuator

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

Example:

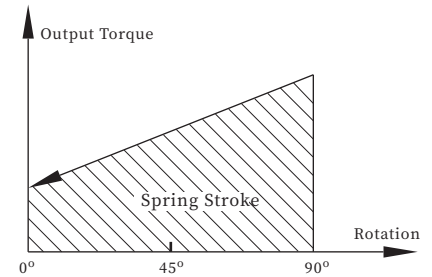
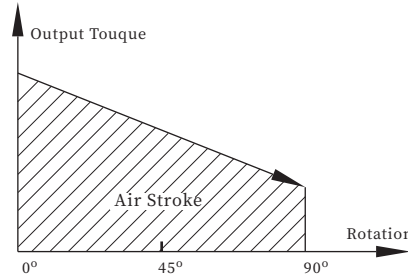
The torque needed by valve=100N.m

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

Air Supply=5Bar

According to the above table, we can select the model AP 105-DA.

For Spring Return Actuator



Torque Unit: Nm

		Output torque of air to springs																				Spring's output		
Air Pressure		2.5 Bar		3 Bar		3.5Bar		4 Bar		4.5 Bar		5 Bar		5.5 Bar		6 Bar		7 Bar		8 Bar				
Model	Spring Qty.	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	
AP-40	SR2					4.0	1.8	5.6	3.4	6.4	4.2	7.6	5.4	8.8	15.4	9.6	7.4	12.6	10.4	14.6	12.4	6.6	4.4	
	SR5	5.7	3.8	7.6	5.7	9.7	7.8															6.2	4.3	
AP-52	SR6	4.9	2.5	6.9	4.5	9.0	6.6	10.9	8.5	13.0	10.6											7.4	5.0	
	SR7	4.0	1.3	6.0	3.3	8.1	5.4	9.8	7.3	12.1	9.4	14.0	10.4	16.1	13.4							8.6	5.9	
	SR8			5.2	2.0	7.3	4.1	9.2	6.0	11.3	8.1	13.2	9.1	15.3	12.1	17.2	14.1					9.9	6.7	
	SR9			4.3	0.8	6.4	2.9	8.3	4.8	10.4	6.9	12.3	7.9	14.4	10.9	16.3	12.8	20.3	16.8			11.1	7.6	
	SR10					5.5	1.6	7.4	3.6	9.5	5.6	11.5	6.7	13.5	9.6	15.5	11.6	19.5	15.6			12.4	8.5	
	SR11					4.7	0.4	6.6	2.3	8.7	4.4	10.6	5.4	12.7	8.4	14.6	10.4	18.6	14.3	22.6	18.3	13.6	9.3	
	SR12										7.8	3.2	9.7	4.2	11.8	7.2	13.8	9.1	17.8	12.2	21.8	17.1	14.8	10.2
	AP-63	SR5	11.4	7.7	15.0	11.4	18.4	14.8	22.3	14.9	25.6	22.0											10.4	6.8
SR6		10.1	5.7	13.6	9.3	17.0	12.7	20.9	16.6	24.2	19.9	28.3	23.9	31.4	27.1							12.5	8.2	
SR7		8.6	3.6	12.5	7.2	15.6	10.6	19.5	14.5	22.8	17.8	26.8	21.9	30.0	25.0							14.6	9.6	
SR8				10.9	5.1	14.3	8.5	18.2	12.4	21.5	15.7	25.5	19.8	28.7	22.9	32.8	27.0	40.1	34.3			16.7	10.9	
SR9						12.9	6.4	16.8	10.4	20.1	13.6	24.1	17.7	27.3	20.8	31.4	24.9	38.7	32.2			18.8	12.3	
SR10						11.5	4.3	14.0	8.2	18.7	11.5	22.8	15.6	25.9	18.7	30.0	22.8	37.3	30.1	44.7	37.4	20.9	13.7	
SR11											17.4	9.5	21.5	13.5	24.6	16.7	28.7	20.7	36.0	28.0	43.3	35.3	22.9	15.0
SR12											16.0	7.4	20.0	11.4	23.2	14.6	27.3	18.6	34.6	25.9	41.9	33.3	25.0	16.4
AP-75	SR5	14.5	10.6	19.4	15.5	24.5	20.5	29.5	25.7	34.5	30.5											14.5	10.5	
	SR6	12.4	7.6	17.3	12.6	22.3	17.6	27.4	22.7	32.3	27.6	37.5	32.8	42.3	37.6							17.4	12.7	
	SR7	10.4	4.8	15.2	9.7	20.2	14.7	25.3	19.9	30.2	24.7	35.4	29.9	40.2	34.7							20.3	14.8	
	SR8			13.1	6.8	18.1	11.8	23.1	16.9	28.1	21.8	33.3	27.0	38.1	31.8	43.2	37.0	53.3	47.0			23.2	16.9	
	SR9					16.0	8.9	21.0	14.1	26.0	18.9	31.2	24.1	36.0	28.9	41.1	34.1	51.2	44.2			26.1	19.0	
	SR10					13.9	6.0	19.0	11.1	23.9	16.0	28.8	21.2	33.9	26.0	39.0	31.2	49.1	41.2	59.1	51.2	29.0	21.1	
	SR11										21.8	13.1	27.0	18.3	31.8	23.1	37.0	28.3	47.0	38.4	57.0	48.4	31.9	23.2
	SR12										19.7	10.3	24.9	15.4	29.7	20.3	34.9	25.4	44.9	35.4	54.9	45.4	34.7	25.3
AP-83	SR5	23.3	16.1	31.1	24.0	38.8	31.6	46.8	39.7	54.4	47.2											23.0	15.8	
	SR6	20.1	11.5	28.0	19.3	35.6	27.0	43.7	35.1	51.2	42.6	59.4	50.7	66.8	58.2							27.6	19.0	
	SR7	17.0	6.9	24.8	14.8	32.5	22.4	40.5	30.5	48.1	38.0	56.2	46.2	63.7	53.6							32.2	22.1	
	SR8			21.7	10.1	29.3	17.8	37.4	25.8	44.9	33.4	53.1	41.5	60.5	49.0	68.8	57.2	84.5	72.9			36.8	25.3	
	SR9					26.1	13.2	34.2	21.3	41.7	28.8	49.9	37.0	57.3	44.4	65.6	52.6	81.2	68.3			41.4	28.5	
	SR10					23.0	8.6	31.0	16.6	38.6	24.2	46.7	32.3	54.2	39.8	62.4	48.0	78.1	63.7	93.8	79.3	46.0	31.6	
	SR11										35.4	19.6	43.6	27.7	51.0	35.2	59.3	43.4	75.0	59.1	90.6	74.8	50.6	34.8
	SR12										32.2	15.0	40.4	23.2	47.8	30.6	56.1	38.9	71.7	54.5	87.4	70.2	55.2	38.0

Torque Unit: Nm

		Output torque of air to springs																				Spring's output		
Air Pressure		2.5 Bar		3 Bar		3.5Bar		4 Bar		4.5 Bar		5 Bar		5.5 Bar		6 Bar		7 Bar		8 Bar				
Model	Spring Qty.	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	90°	0°	
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	
AP-92	SR5	33.1	22.0	44.2	33.2	55.8	44.7	66.8	55.9	78.4	67.3												34.4	23.3
	SR6	28.4	15.2	39.6	26.4	51.1	37.9	62.2	49.0	73.7	60.5	84.8	71.6	96.3	83.1								41.2	28.0
	SR7	23.8	8.2	34.9	19.4	46.4	31.0	57.5	42.1	69.0	53.6	80.2	64.7	91.6	76.2								48.1	32.7
	SR8			31.3	12.6	41.8	24.1	52.9	35.2	64.4	46.7	75.5	57.9	87.0	69.3	98.1	80.5	120.7	103.0				55.0	37.3
	SR9					37.1	17.2	48.2	28.4	59.7	39.8	70.9	51.0	82.3	62.4	93.5	73.6	116.0	96.1				61.9	42.0
	SR10					32.4	10.4	43.6	21.5	55.0	33.0	66.2	44.1	77.6	55.6	88.8	66.7	111.3	89.2	134.0	111.8		68.7	46.7
	SR11									50.3	26.1	61.5	37.2	72.9	48.7	84.1	59.9	106.6	82.4	129.2	105.0		75.6	51.4
	SR12									45.7	19.2	56.8	30.4	68.3	41.8	79.4	53.0	101.9	75.5	124.5	98.1		82.5	56.0
AP-105	SR5	51.0	33.4	67.5	49.9	83.9	66.3	100.6	83.0	116.9	99.3												49.2	31.6
	SR6	44.7	23.5	61.1	40.0	77.5	56.4	94.2	73.2	110.5	89.4	127.3	106.2	143.5	122.4								59.1	38.0
	SR7	38.4	13.7	54.9	30.3	71.2	46.6	87.9	63.4	104.2	79.6	121.0	96.4	137.2	112.6								68.9	44.3
	SR8			48.5	20.4	64.9	36.8	81.6	53.5	97.9	69.8	114.7	86.5	130.9	102.8	147.7	119.6	180.8	152.7				78.7	50.6
	SR9					58.6	26.9	75.3	43.7	91.6	59.9	108.4	76.8	124.6	92.9	141.5	109.8	174.5	142.9				88.6	56.9
	SR10					52.2	17.1	68.9	33.4	85.2	50.1	102.0	66.5	118.2	83.1	135.1	99.6	168.2	132.6	201.2	165.7		98.4	63.3
	SR11									78.9	40.2	95.7	57.0	111.9	73.2	128.7	90.1	161.8	123.1	194.8	156.2		108.3	69.6
	SR12									72.6	30.4	89.4	47.5	105.6	63.4	122.5	80.6	155.5	113.6	188.6	146.7		118.1	75.9
AP-115	SR5	65	43	87	65	108.2	86.2	130	108	151	129												65	43
	SR6	56	30	78	52	99.2	73.2	121	95	142	116	164	138	186	160								78	52
	SR7	47	17	69	39	90.2	60.2	112	82	133	103	155	125	177	147								91	61
	SR8			61	26	82.2	47.2	104	69	125	90	147	112	169	134	190	155	233	198				104	69
	SR9					73.2	34.2	95	56	116	77	138	99	160	121	181	142	224	185				117	78
	SR10					64.2	21.2	86	43	107	64	129	86	151	108	172	129	215	172	259	216		130	87
	SR11									99	51	121	73	143	95	164	116	207	159	251	203		143	95
	SR12									90	38	112	60	134	82	156	104	198	146	242	190		156	104
AP-125	SR5	73	47	98	72	123.7	96.7	148	122	174	147												79	52
	SR6	63	31	88	56	112.7	81.7	138	107	163	132	188	157	213	182								94	63
	SR7	52	15	77	40	102.7	65.7	127	90	153	116	178	141	203	166								110	73
	SR8			67	25	91.7	50.7	117	75	142	101	167	125	192	151	217	176	268	226				125	84
	SR9					81.7	34.7	107	59	132	85	157	109	182	135	207	159	257	210				141	94
	SR10					70.7	18.7	96	44	121	69	146	94	171	119	196	144	247	194	297	245		157	105
	SR11									111	53	136	78	161	103	186	128	236	178	286	228		173	115
	SR12									101	38	125	63	151	88	176	113	226	163	276	213		188	125
AP-140	SR5	128	85	171	127	212.9	169.9	256	213	298	255												129	86
	SR6	111	59	154	102	195.9	143.9	239	187	281	229	325	273	367	315								155	103
	SR7	94	33	137	76	178.9	117.9	222	162	264	203	308	247	350	289								181	120
	SR8			120	50	161.9	92.9	205	136	247	178	291	221	333	264	376	307	462	392				206	137
	SR9					143.9	66.9	187	110	229	152	273	196	315	238	358	281	444	367				232	155
	SR10					126.9	40.9	170	84	212	126	256	169	298	212	341	255	427	340	512	426		258	172
	SR11									195	100	238	143	281	186	324	229	409	314	495	400		284	189
	SR12									178	74	221	118	264	160	307	203	392	289	478	374		310	206
AP-160	SR5	193	124	259	191	325.5	257.5	392	324	459	391												208	140
	SR6	165	83	232	149	297.5	215.5	365	282	431	349	498	415	564	482								250	168
	SR7	137	41	203	107	269.5	173.5	336	240	403	307	469	373	536	440								292	196
	SR8			176	66	242.5	132.5	309	199	376	266	442	237	509	399	575	465	708	598				333	223
	SR9					214.5	90.5	280	157	348	224	413	290	481	357	546	423	679	556				375	251
	SR10					186.5	48.5	253	115	320	182	386	248	453	315	519	381	652	514	785	647		417	279
	SR11									292	141	358	207	425	274	491	340	624	473	757	606		458	307
	SR12									264	99	330	165	397	232	463	298	596	431	729	564		500	335
AP-190	SR5	332	222	438	329	544.8	435.8	651	542	758	649												309	200
	SR6	292	161	398	267	504.8	373.8	611	480	718	587	824	693	930	799								371	240
	SR7	252	99	358	205	464.8	311.8	571	418	678	525	784	631	890	737								433	280
	SR8			318	143	424.8	249.8	531	356	638	463	744	569	850	675	957	782	1169	995				495	320
	SR9					384.8	187.8	491	295	598	401	704	507	810	613	917	720	1130	933				557	360
	SR10					344.8	126.8	451	233	558	340	664	446	770	552	877	658	1090	871	1302	1084		618	400
	SR11									518	278	624	384	730	490	837	579	1050	809	1263	1022		680	440
	SR12									478	216	584	322	690	428	797	535	1010	748	1223	960		742	480

Torque Unit: Nm

Output torque of air to springs																								Spring's output	
Air Pressure		2.5 Bar		3 Bar		3.5Bar		4 Bar		4.5 Bar		5 Bar		5.5 Bar		6 Bar		7 Bar		8 Bar		90°	0°		
Model	Spring Qty.	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°		
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End		
AP-210	SR5	390	285	523	418	656	551	789	684	922	817												380	275	
	SR6	335	209	468	342	601	475	734	608	867	741	1000	874	1133	1007								456	330	
	SR7	280	133	413	266	546	399	679	532	812	665	945	798	1078	931								532	385	
	SR8			358	190	491	323	624	456	757	589	890	722	1023	855	1156	988	1422	1254				608	440	
	SR9					436	247	569	380	702	513	835	646	968	779	1101	912	1367	1178				684	495	
	SR10					381	171	514	304	647	437	780	570	913	703	1046	836	1312	1102	1578	1368		760	550	
	SR11									592	361	725	494	858	627	991	760	1257	1026	1523	1292		836	605	
	SR12									537	285	670	418	803	551	936	684	1202	950	1468	1216		912	660	
AP-240	SR5	552	109	744	600	936.8	792.8	1129	985	1322	1178												554	410	
	SR6	470	297	662	489	854.8	681.8	1047	874	1240	1067	1432	1259	1624	1451								665	492	
	SR7	388	187	580	379	771.8	571.8	964	764	1157	957	1349	1149	1541	1341								775	575	
	SR8			498	268	690.8	460.8	883	653	1076	846	1267	1037	1460	1230	1652	1422	2037	1807				886	656	
	SR9					607.8	348.8	800	542	993	734	1185	926	1377	1118	1569	1311	1954	1696				998	739	
	SR10					525.8	238.8	718	431	911	624	1103	816	1295	1008	1488	1201	1872	1586	2257	1970		1108	821	
	SR11									829	513	1021	705	1213	897	1406	1090	1791	1474	2176	1859		1219	903	
	SR12									747	402	939	594	1131	786	1323	979	1708	1363	2093	1748		1330	985	
AP-270	SR5	903	675	1195	968	1487	1260	1779	1552	2072	1845												787	560	
	SR6	790	519	1083	811	1375	1104	1667	1396	1960	1689	2252	1981	2544	2273								943	672	
	SR7	679	316	972	654	1264	945.8	1556	1238	1849	1531	2141	1823	2433	2115								1101	783	
	SR8			860	497	1152	788.8	1444	1081	1737	1374	2029	1666	2321	1958	2614	2252	3199	2836				1258	895	
	SR9					1040	630.8	1332	923	1625	1216	1917	1509	2209	1800	2502	2094	3087	2678				1416	1007	
	SR10					927.8	474.8	1220	767	1513	1060	1805	1352	2097	1644	2390	1937	2974	2521	3560	3107		1572	1119	
	SR11					815.8	316.8			1401	902	1693	1194	1985	1486	2278	1779	2862	2364	3448	2949		1730	1231	
	SR12					704.8	159.8			1290	745	1582	1037	1874	1329	2167	1623	2751	2207	3336	2792		1887	1342	
AP-300	SR5	1097	729																				1061	730	
	SR6	935	494	1316	875	1795	1398																1273	876	
	SR7	772	258	1153	639	1649	1186	1916	1402	2412	1949												1485	1022	
	SR8			991	403	1503	973.5	1754	1166	2266	1737	2517	1929	3029	2500								1697	1168	
	SR9					1357	761.5	1592	930	2120	1525	2355	1693	2883	2288	3118	2456						1909	1314	
	SR10					1211	548.5	1430	695	1974	1312	2193	1458	2737	2075	2956	2221	3719	2984	4482	3747		2122	1460	
	SR11									1828	1100	2030	1222	2591	1863	2793	1985	3556	2748	4319	3511		2334	1606	
	SR12									1682	888	1868	986	2445	1651	2631	1749	3394	2512	4157	3275		2546	1752	
AP-350	SR5	1553	964																				1702	1173	
	SR6	1292	586	1863	1157	2590	1955																2043	1408	
	SR7	1031	208	1602	779	2356	1615	2745	1922	3499	2758												2383	1642	
	SR8			1341	401	2121	1274	2484	1544	3264	2417	3626	2686	4406	3559								2724	1877	
	SR9					1886	934.4	2224	1165	3029	2077	3336	2307	4171	3219	4508	3449						3064	2112	
	SR10					1652	593.4	1963	787	2795	1736	3105	1929	3937	2878	4247	3071	5390	4214	6532	5356		3405	2346	
	SR11									2560	1396	2844	1551	3702	2538	3986	2693	5129	3836	6271	4978		3745	2581	
	SR12									2325	1055	2584	1172	3467	2197	3726	2314	4869	3457	6011	4599		4086	2816	
AP-400	SR7	2028	869																				2880	1837	
	SR8	1736	411	2550	1225																		3292	2100	
	SR9			2259	768	3336	1995	3887	2396														3703	2362	
	SR10			1967	311	3074	1583	3595	1939	4702	3211	5223	3567										4115	2624	
	SR11					2811	1172	3303	1482	4439	2800	4931	3110	6067	4428	6559	4738						4526	2887	
	SR12					2549	760	3012	1025	4177	2388	4640	2653	5805	4016	6268	4281	7895	5908	9523	7536		4938	3149	
	SR13									3914	1977	4348	2195	5542	3605	5976	3823	7603	5450	9231	7078		5349	3412	
	SR14									3652	1565	4057	1738	5280	3193	5685	3366	7312	4993	8940	6621		5761	3674	
	SR15									3389	1154	3765	1281	5017	2782	5393	2909	7020	4536	8648	6164		6172	3937	
SR16														4755	2370	5101	2452	6728	4079	8356	5707		6584	4199	

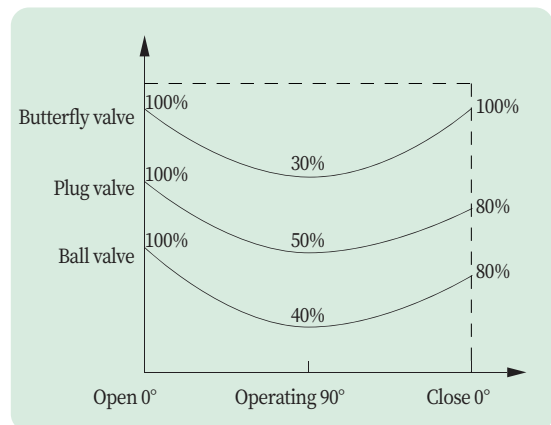
* Standard Sizing: Spring Return

The suggested safety factor for spring return actuator under normal working conditions is 30-50%

Example:

The torque needed by valve=80Nm
 The torque considered safety factor = $80 \times (1+30\%)=104\text{Nm}$
 Air Supply=5Bar

According to the above table, we can select the model AP-140SR7.



* Economical Sizing: Spring Return

We can choose the more reasonable and more economical actuators, if we know the different torque of the valve by opening, operating and closing.

Example:

The max torque needed by the butterfly valve=104Nm
 The torque after opened (operating) $104 \times 30\%=32\text{Nm}$
 Air Supply=5Bar

We can select the model AP125SR10, output torque is:



Air stroke 0°=146Nm >104Nm
 Air stroke 90°=94Nm >32Nm
 Spring stroke 90°=157Nm >32Nm
 Spring stroke 0°=105Nm >104Nm

The above datas show the actuator's torque can satisfy the requirement of the butterfly valve.

How To Order

Example: AP-75SR10 FC-CCW HT

1	2	3	4	5	6	7
AP	75	SR10	BLANK	FC-CCW	HT	BLANK
Series	Model	Type	Travel	Assembly	Operating Temperature	Connection
AP	32 40 ⋮ ⋮	DA SR*	BLANK(90) 120 135 180	FC-CCW CCW ⋮ ⋮	BLANK: -20°C~+80°C HT: -20°C~+150°C LT: -40°C~ +120°C	BLANK (Standard) Options*
		*SR+Spring Qty.				*Example: F04,DS11,30°80 H30

Code		Description							
1	AP	AP series pneumatic actuators							
2	75	Model of AP series pneumatic actuators (P09)							
3	SR10	DA: Double Acting							
		SR: Spring Return+Number of springs							
4	BLANK	90° strokes (Standard)							
		120 : 120° strokes (only Double Acting)							
		135 : 135° strokes (only Double Acting)							
		180 : 180° strokes (only Double Acting)							
5	DA	CCW	Air to port A, turn counterclockwise to open (DA Standard)						
		CW	Air to port A, turn clockwise to closed						
	SR	FC-CCW	Failure closed. Air to port A, turn counterclockwise to open (SR Standard)						
		FO-CW	Failure open. Air to port A, turn clockwise to closed						
6	HT	BLANK: Standard (NBR O-ring): -20°C ~ +80°C							
		HT: High temperature (Viton O-ring): -20°C ~ +150°C							
		LT: Low temperature (LTNBR): -40°C ~ +120°C							
7	BLANK	Standard Connection							
		Model	(ISO 5211) Flange Connection		(ISO 5211) Drive Shaft Bottom Hole		(VDI/VDE 3845) Accessory Connection		Air Connection
			Standard	Options	Standard	Options	Standard	Options	Standard
		AP-32DA	F03		DS09	 DD  KEY	30×80 H20		G1/8"
		AP-40DA	F03+F05	F04	DS11		30×80 H20		G1/4"
		AP-52DA	F03+F05	F04	DS11		30×80 H20		G1/4"
		AP-63DA	F05+F07	F04+F07	DS14		30×80 H20		G1/4"
		AP-75DA	F05+F07	F04+F07	DS14		30×80 H20		G1/4"
		AP-83DA	F05+F07		DS17		30×80 H20		G1/4"
		AP-92DA	F05+F07		DS17		30×80 H20		G1/4"
		AP-105DA	F07+F10		DS22		30×80 H20	30×130 H30 (20)	G1/4"
		AP-115DA	F07+F10		DS22		30×80 H20	30×130 H30 (20)	G1/4"
		AP-125DA	F07+F10		DS22		30×80 H20	30×130 H30 (20)	G1/4"
		AP-140DA	F10+F12		DS27		30×80 H20	30×130 H30 (20)	G1/4"
		AP-160DA	F10+F12		DS27		30×80 H20	30×130 H30 (20)	G1/4"
		AP-190DA	F14	F12	DS36		30×130 H30		G1/4"
		AP-210DA	F14	F12	DS36		30×130 H30		G1/4"
AP-240DA	F16	F14	DS46	30×130 H30			G1/4"		
AP-270DA	F16		DS46	30×130 H30			G1/2"		
AP-300DA	F16+Ø215		DS46	30×130 H30			G1/2"		
AP-350DA	F16+F25		DS46	30×130 H30		G1/2"			
AP-400DA	F16+F25		DS55	30×130 H30		G1/2"			

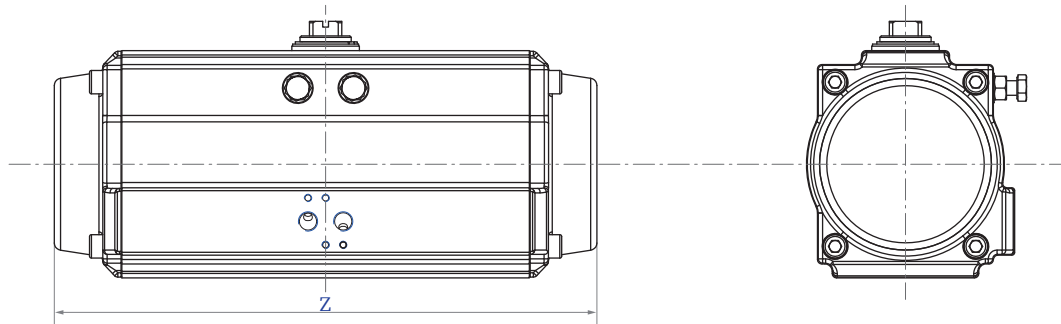
13, 120°, 135°, 180° 120°, 135°, 180° Pneumatic Actuator (Double Acting only)

In order to meet the special requirements of control valve, we produce special strokes actuators on customer request (e.g. 120°,135°,180°etc.).

Output Torque

Output torque of special strokes actuators, please refer to the torque of 90° actuators (P11).

Length of 180° pneumatic actuator



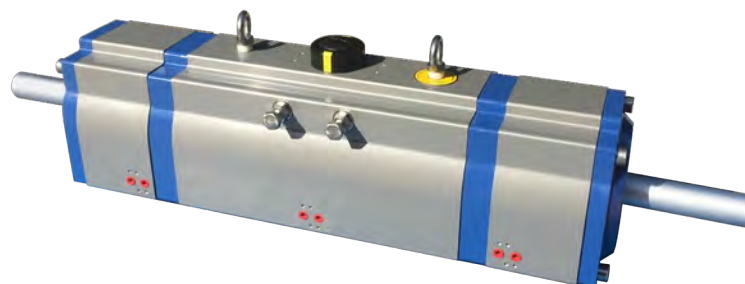
Unit:mm

Model	AP52 -180	AP63 -180	AP75 -180	AP83 -180	AP92 -180	AP105 -180	AP125 -180	AP140 -180	AP160 -180	AP190 -180	AP210 -180
Z	210	241	258	302	375	396	443	579	668	781	789

Please contact us for more information.

Three Position Pneumatic Actuator

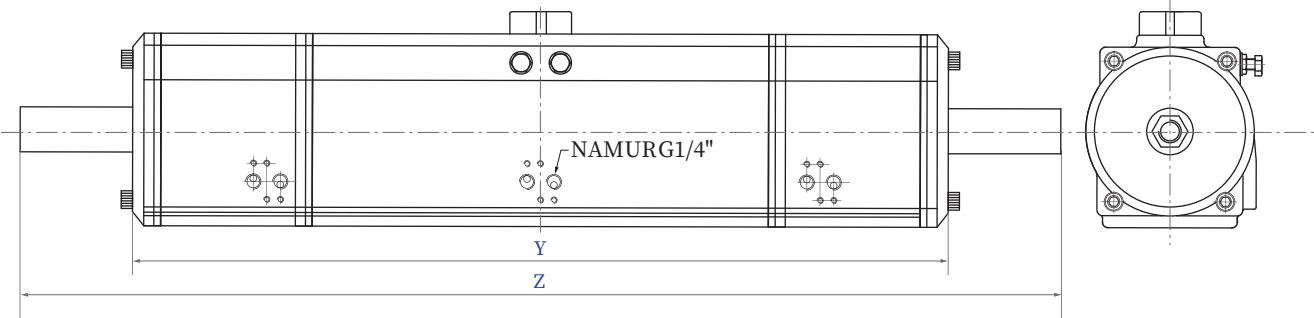
Three position actuator provide an operation of 0°, 45°, 90° or 0°, 90°, 180°. The midway position is achieved by a mechanical stop of movement on the 2 auxiliary pistons. This midway stop position is adjustable, for example, 90° three position actuator can provide midway position of 20°, 30°, 40°, 50°, 70° or else.



Output Torque

Output torque of three position actuators, please refer to the torque of 90°actuators (P11~P14).

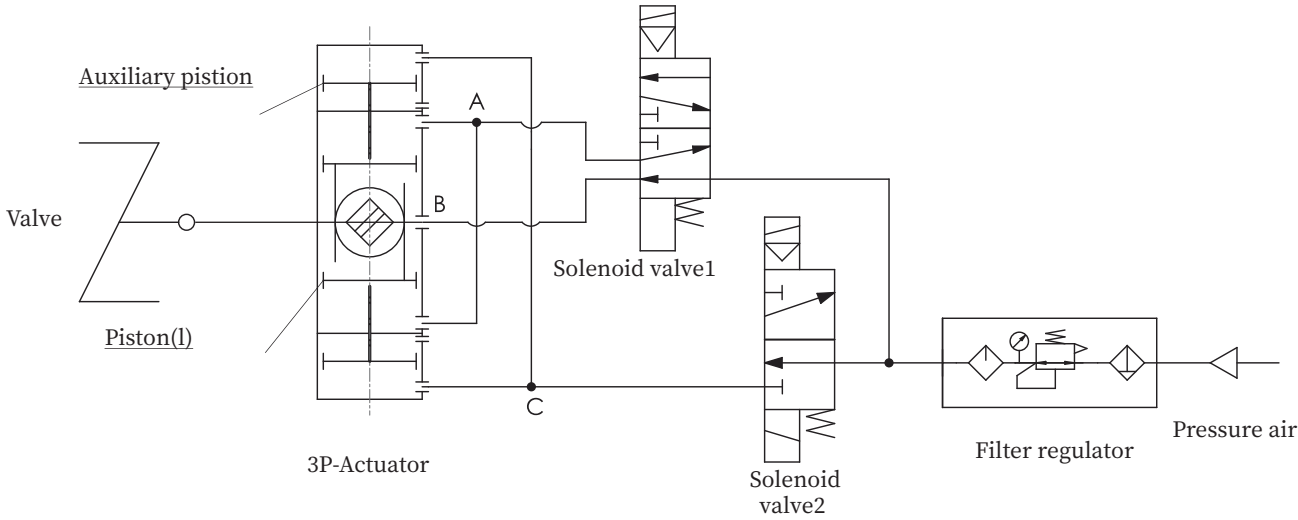
Length of three position pneumatic actuator (90°)



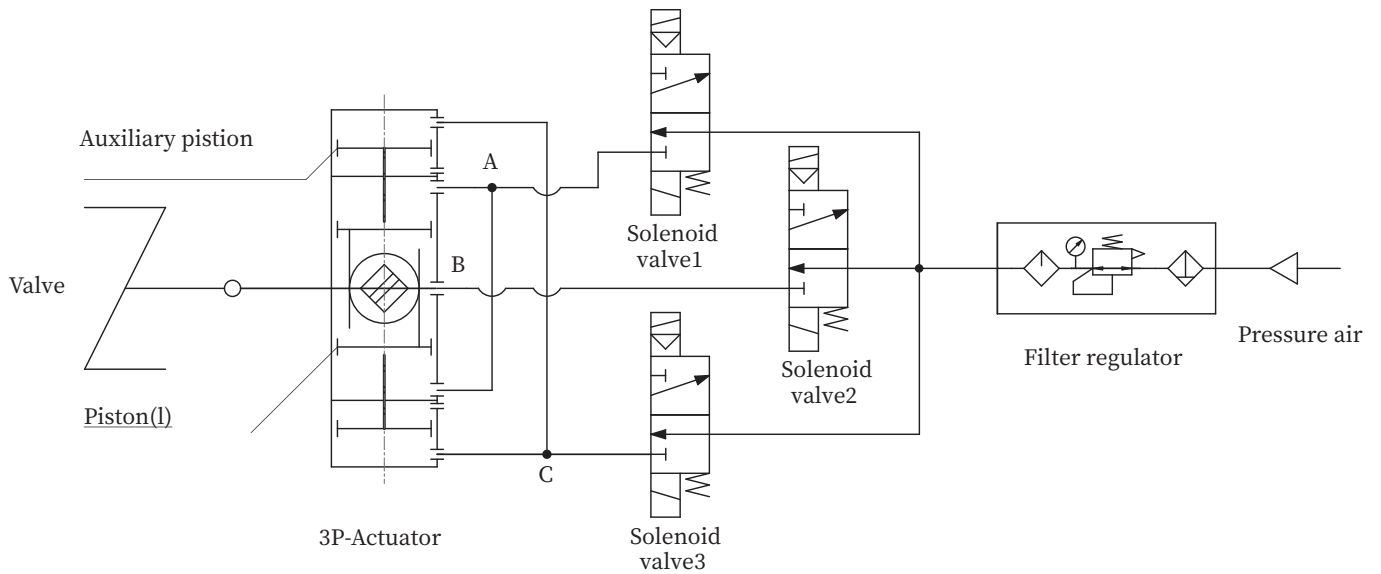
Unit:mm

	AP 52-3P	AP 63-3P	AP 75-3P	AP 83-3P	AP 92-3P	AP 105-3P	AP 125-3P	AP 140-3P	AP 160-3P	AP 190-3P	AP 210-3P
Y	246	299	326	362	434	446	491	625	718	852	855
Z	364	427	454	523	613	634	689	867	984	1174	1177

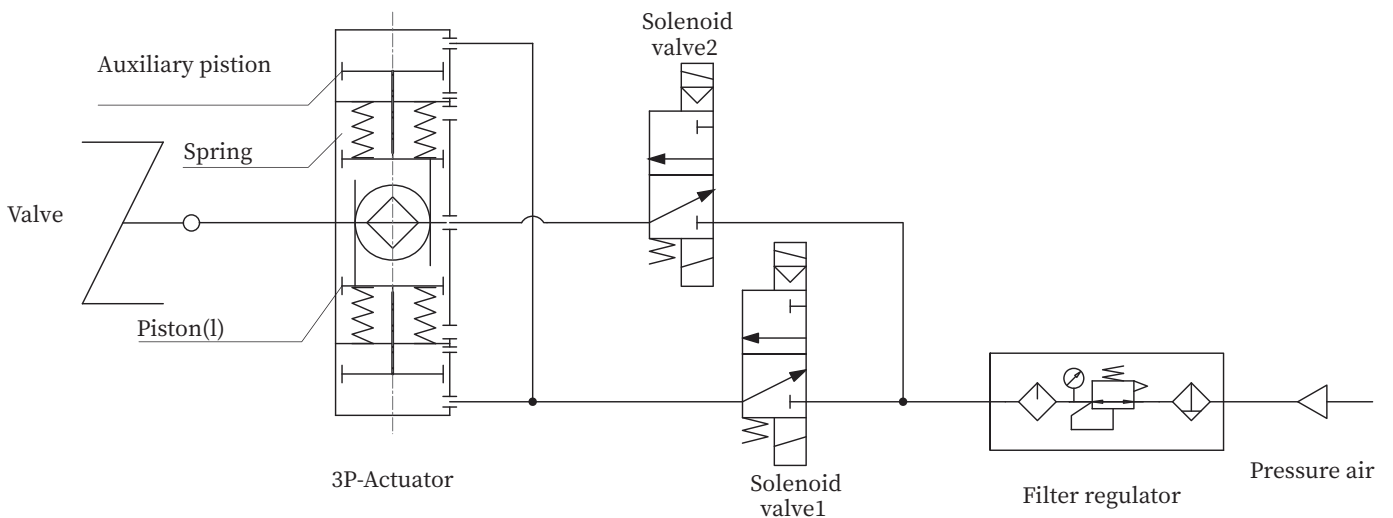
Schematic Diagram



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



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