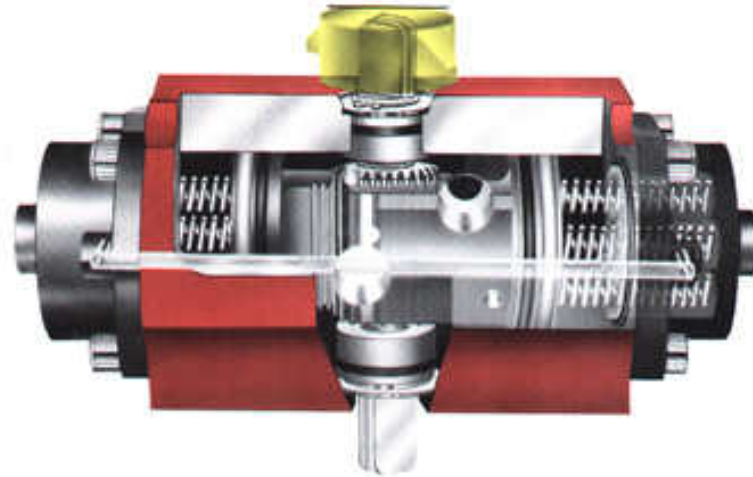


# Contromatics

A division of CIRCOR International, Inc.

## Pneumatic Actuators Series PA/PAS

**Double Rack and Pinion, Double Acting and Spring Return  
180 to 7000 In./Lbs. Torque Output (80 PSIG)**



Contromatics designed Series PA and PAS Pneumatic Actuators in compliance with current end-user and distributor requirements.

From the design stage, the concept of extended service life with virtually no maintenance has been paramount, with maximum torque output per dollar and reduction of overall profile as key design considerations.

The double acting version (PA) and spring return version (PAS) fully comply with the original design concepts. Hybrid epoxy coated aluminum body and end caps, alodined pistons protect against premature failure due to corrosion and provide superior wear resistance. Using special die casting methods, pistons are produced with maximum density and wear resistance at the gear tooth location.

With special consideration toward safety, Contromatics revolutionizes rack and pinion actuator design with an internally loaded output shaft that cannot be removed.

End-user and distributor inventories are reduced because all Contromatics PA units can be converted to PAS simply by adding appropriate springs. Extended life, contemporary design, safety, simplicity and lower inventory levels combine to make the Contromatics PA/PAS Series the logical choice for all quarter-turn pneumatic actuation requirements.

FEATURES	BENEFITS
Extruded body	Integrity
Roller burnished bore	High quality surface finish, excellent wearing properties
One piece shaft, internally loaded, full tooth engagement	Safety, strength, extended cycle life
Standard end caps on PA and PAS models	Easily and inexpensively convertible from double acting to spring return
Position indicator	Visual aid to valve position
Yellow chromate plus epoxy coated external surfaces	Corrosion resistant

Dual mounting pad, square configuration	Flexibility in mounting, easy adaptation of accessories
Maintenance free design	Long life, cost effective
316 stainless steel fasteners, extra long	Allows for decompression of springs while maintaining engagement, corrosion resistant
Top and bottom shaft bearings	Provides outboard support for shaft

## Specifications

Approved pneumatic actuators shall be of double rack and pinion design with full tooth engagement, utilize alodined aluminum pistons and hybrid epoxy coated body with a roller burnished bore and included and internally loaded output shaft. Double acting units must be convertible to spring return by simple addition of springs. Pistons shall have PTFE bearings in both ends, dual mounting square pattern pads shall be included.



## Minimum Torque Output (In./Lbs.)

Series PA						
Double Acting	20 PSIG	40 PSIG	60 PSIG	80 PSIG	100 PSIG	120 PSIG
<b>PA180</b>	45	90	135	180	225	270
<b>PA400</b>	100	200	300	400	500	600
<b>PA1000</b>	240	520	800	1080	1360	1640
<b>PA1500</b>	320	700	1100	1500	1900	2300
<b>PA3000</b>	779	1558	2338	3116	3896	4674
<b>PA7000</b>	1750	3500	5250	7000	8750	10,500

## Series PAS

Spring Return	No. of Springs	40 PSIG		60 PSIG		80 PSIG		100 PSIG		120 PSIG		Spring	
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
PAS180	6	60	42	100	82	140	122	180	162	220	202	48	33
	8	50	26	90	66	130	106	170	146	210	186	64	44
	10	—	—	80	50	120	90	160	130	200	170	80	55
	12	—	—	70	34	110	64	150	114	190	154	96	66
	14	—	—	60	20	100	48	140	98	180	138	112	77
PAS400	6	122	68	222	168	322	268	422	368	522	468	132	78
	8	96	24	196	124	296	224	396	324	496	424	176	104
	10	—	—	170	80	270	180	370	280	470	380	220	130
	12	—	—	144	36	244	136	344	236	444	336	264	156
	14	—	—	—	—	218	92	318	192	418	292	308	182
PAS1000	6	358	232	638	512	918	792	1178	1052	1458	1332	288	162
	8	304	136	584	416	864	696	1124	956	1404	1236	384	216
	10	250	40	530	320	810	600	1070	860	1350	1140	480	270
	12	—	—	476	224	756	504	1016	764	1296	1044	576	324
	14	—	—	422	128	702	428	962	668	1242	948	672	378
PAS1500	6	454	280	854	680	1254	1080	1654	1480	2054	1880	420	246
	8	372	140	772	540	1172	940	1572	1340	1972	1740	560	328
	10	—	—	690	400	1090	800	1490	1200	1890	1600	700	410
	12	—	—	608	260	1008	660	1408	1060	1808	1460	840	492
	14	—	—	526	120	926	520	1326	920	1726	1320	980	574

PAS3000	6	1070	690	1820	1440	2620	2240	3416	3036	4170	3790	860	480
	8	890	460	1640	1210	2440	2010	3190	2760	3990	3560	1090	660
	10	750	150	1500	900	2300	1700	3050	2450	3850	3250	1400	800
	12	—	—	1340	620	2140	1420	2090	2170	3690	2970	1680	960
	14	—	—	1180	340	1980	1140	2730	1890	3530	2690	1960	1120
PAS7000	6	2410	1520	4160	3270	5910	5020	7660	6770	9410	8520	1980	1090
	8	2030	860	3780	2610	5530	4360	7280	6110	9030	7860	2640	1470
	10	1630	200	3380	1950	5130	3700	6880	5450	8630	7200	3300	1870
	12	—	—	3030	1285	4780	3035	6530	4785	8280	6535	3965	2220
	14	—	—	2500	625	4250	2375	6000	4125	7750	5875	4625	2750

Torque output values based on standard materials of construction.  
Standard PAS construction = 14 springs



## Performance Characteristics and Options

Pressure/Temperature	PA Series	PAS Series
Min. Air Supply Required (PSIG)	20	40
Max. Air Supply Allowed (PSIG)	125	125
Min. Ambient Temperature Rating	0°F*	0°F
Max. Ambient Temperature Rating	180°F	180°F

\*For operation at or below 32°F, steps must be taken to assure a moisture-free air supply.

Recommended Tubing Sizes		
PA/PAS Model No.	Runs up to 4 Ft.	Runs over 4 Ft.
180, 400, 1000	1/8"	1/8"
1500	1/8"	1/8"
3000	1/4"	1/4"
7000	1/4"	1/2"

Air Consumption						
in standard cubic inches per 90° stroke						
Air to port	180	400	1000	1500	3000	7000
A	6	14	33	48	53	281
B	8	23	54	81	145	518

Cycle Time (Seconds)		
	PA	PAS
180	<1.0	<1.0
400	<1.0	<1.0
1000	<1.0	<1.0
1500	<1.0	<1.0
3000	<1.0	<2.0
7000	<1.0	<4.0

NOTE: Cycle time determined at 80 PSI, no load, no solenoid.

## Options and Accessories

### Top Mounted, Rotary Limit Switches

Contromatics offers both mechanical and proximity type limit switches for the PA/PAS Series Pneumatic Actuators. Each limit switch comes complete with all the hardware necessary for quick and easy mounting. Optional features of our switches include NEMA 4, 7 and 9 ratings, various switch complements and position indicators.

### Solenoids

The bodies of the PA/PAS Series are factory prepared to easily accommodate block mounted solenoids. Contromatics offers high flow solenoids in various configurations. Optional features include NEMA 4, 7 and 9 ratings, U.L. and C.S.A. Approved, various voltages and all are easily converted from 3-way to 4-way operation.

### Positioners

For control applications, Contromatics offers a complete line of pneumatic rotary positioners. All offered positioners are easily adaptable to the PA/PAS Series Actuators. Available are:

- Single Acting Positioners for use with all PAS model actuators.
- Double acting Positioners for use with all PA model actuators.
- Electro-Pneumatic Positioners for use with all PA/PAS model actuators, where the positioner must accept a 4-20 MA or 0-20 MA input signal

### Other Options

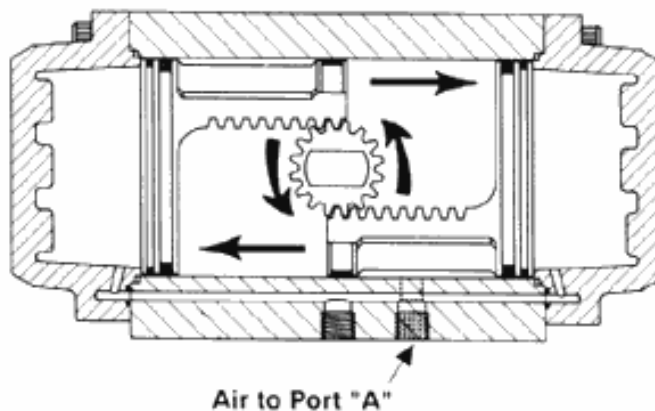
- Dribble controls
- Speed controls
- Filter/registration
- Bi-directional top mounted travel stops
- Side mounted - declutchable handwheel
- NAMUR Solenoid mounting
- High temperature option to 300°F.
- Low temperature options to -50°F

For additional information, please refer to our brochure F-PA/AH Pneumatic Actuator Accessories Handbook.

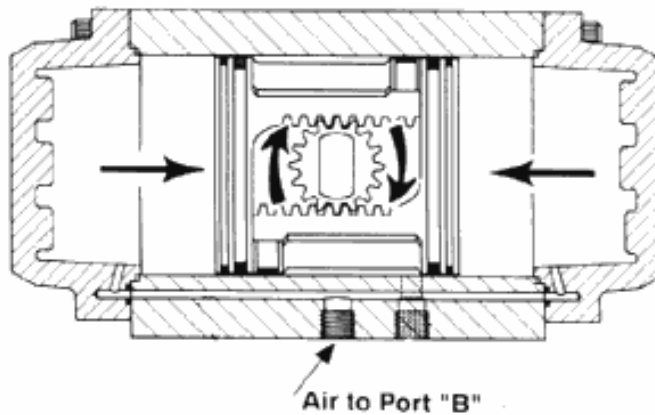


## Modes of Operation

### Double Acting

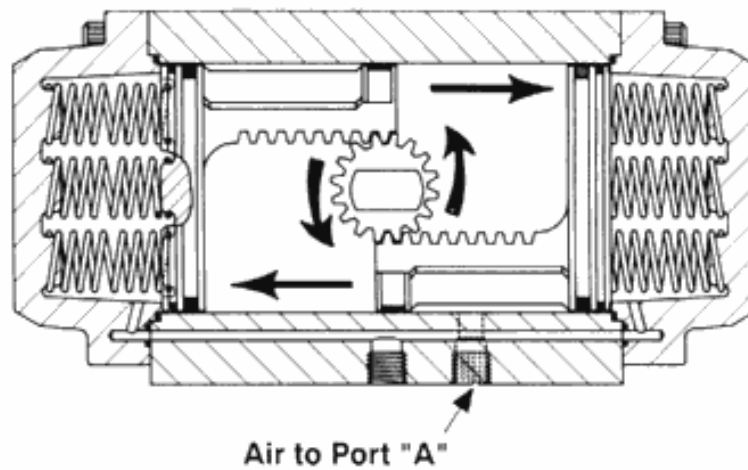


**Figure1** - Air is supplied to Port A, pressurizing the inside chamber, forcing the pistons outward resulting in a counter-clockwise rotation of the piston shaft. The air in the outside chambers is vented through Port B.

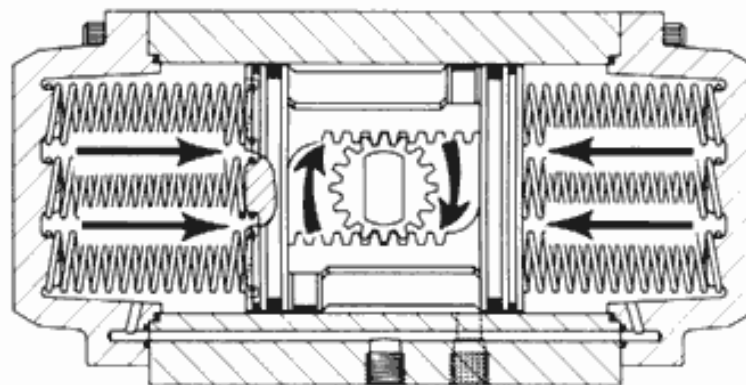


**Figure 2** - Air is supplied to Port B, pressurizing the outside chamber, forcing the pistons inward resulting in a clockwise rotation of the piston shaft. The air in the inside chamber is vented through Port A.

**Spring Return**



**Figure 3** - Air is supplied to Port A, pressurizing the inside chamber forcing the pistons outward, compressing the springs that are located in the outside chambers, resulting in a counter-clockwise rotation of the piston shaft. Any air that is in the outside chambers is vented through Port B.

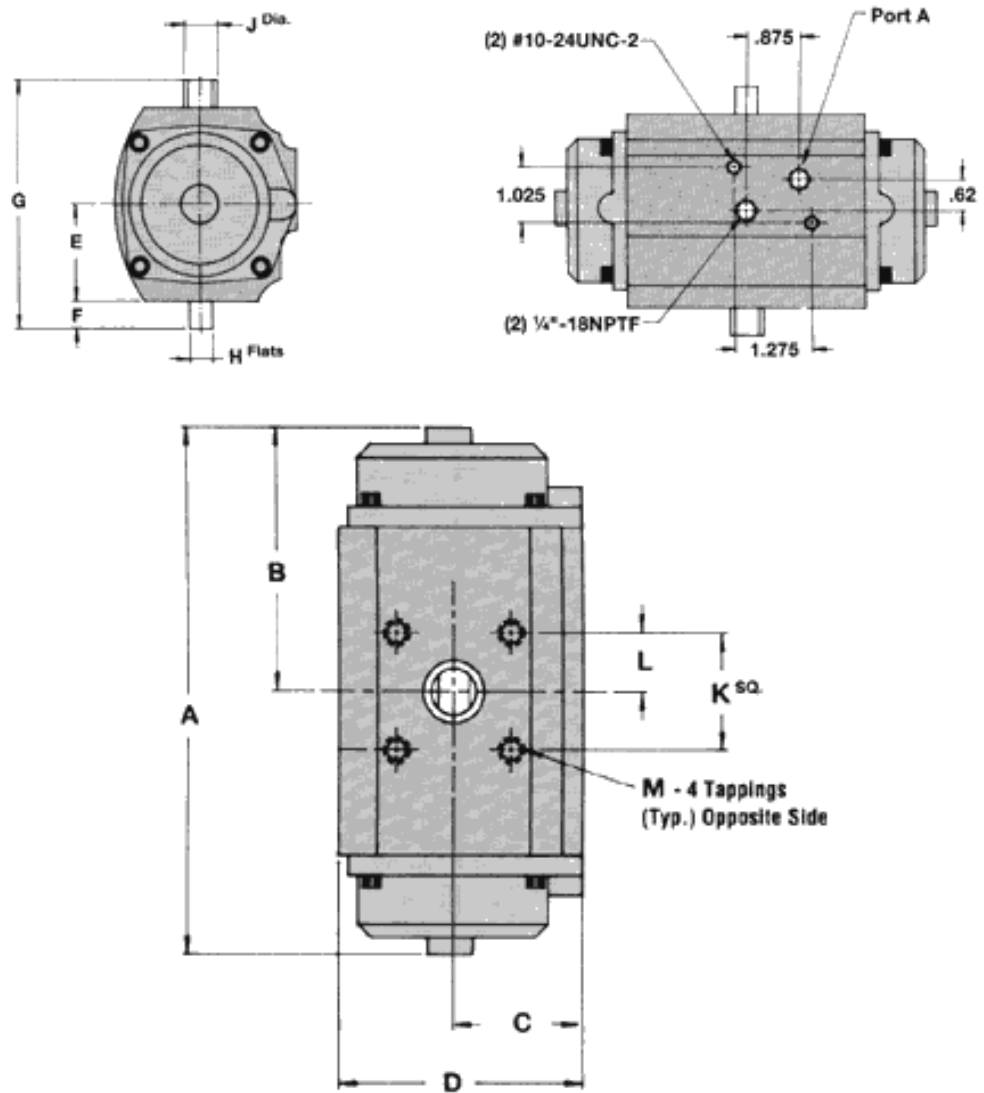


**No Air Pressure**

**Figure 4** - No air is supplied to either port. With loss of pressurization to the actuator, the pistons are forced inward by the energy of the compressed springs, resulting in a clockwise rotation of the piston shaft. Any air that is in the inside chamber is vented through Port A.



## Dimensions/ Weights



### Weight (Lbs.)

PA - Double Acting					
180	400	1000	1500	3000	7000
2.7	5.4	12.3	16.0	32.3	68.0

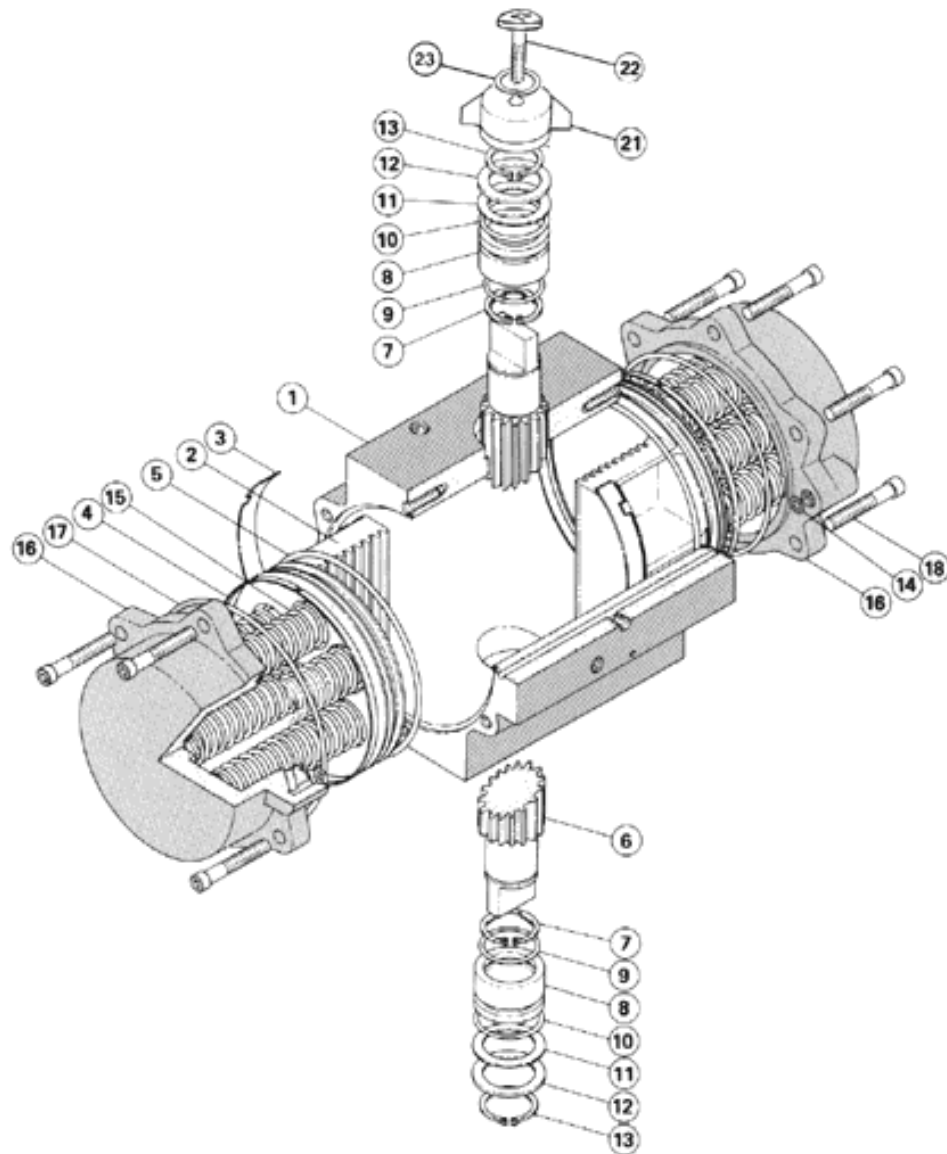
PAS - Spring Return					
180	400	1000	1500	3000	7000
2.9	6.1	13.9	18.0	34.5	82.0

### Dimensions (Inches)

No.	A	B	C	D	E	G	J	H	F	K	L	M	
PA	180	6.88	3.44	1.61	2.87	1.41	4.32	.56	.371	.75	1.62	.81	5/16-24UNF
PAS									.376				

PA PAS	400	7.46	3.73	2.06	3.74	1.88	5.25	.75	.371 .376	.75	1.62	.81	5/16-24UNF
PA PAS	1000	9.77	4.88	2.69	5.12	2.75	7.00	.88	.371 .376	.75	1.62	.81	5/16-24UNF
PA PAS	1500	9.85	4.93	3.21	5.94	3.13	7.75	1.06	.371 .376	.75	1.62 and 2.75	.81 and 1.38	5/16-24UNF
PA PA	3000	15.28	7.65	4.13	7.54	3.72	8.88	1.38	.621 .626	.75	2.75	1.38	1/2-13UNC
PA PA	7000	22.79	11.4	4.69	9.00	4.56	11.25	2.00	1.000 1.002	1.06	3.50	1.75	1/2-13UNC

**Materials of Construction**



Item	Description	Material	Qty.
1	Body	ASTM A209-6061T6 Aluminum	1
2	Piston	ASTM A380 Die Cast Aluminum	2
*3	Piston Bearing	Virgin PTFE	2

*4	Piston Bearing	Virgin PTFE	2
*5	Piston O-Ring	Buna-N 70 Duro	2
6	Piston Shaft	12L14 C.R.S. Bright Nickle Plated	1
*7	Inverted Retaining Ring	ASTM A564 Stainless Steel 15-7PH	2
*8	Shaft Bearing	DELTRIN 500	2
*9	Pinion O-Ring	Buna-N 70 Duro	2
*10	Bearing O-Ring	Buna-N 70 Duro	2
*11	Thrust Washer	Virgin PTFE	2
12	Washer	316 Stainless Steel	2
*13	Retaining Ring	ASTM A564 Stainless Steel 15-7PH	2
*14	By-Pass O-Ring	Buna-N 70 Duro	2
15	Spring (PAS only)	Music Wire	14
16	End Cap	ASTM A380 Die Cast Aluminum	2
*17	End Cap O-Ring	Buna-N 70 Duro	2
18	Hex Socket Head Cap Screw	Stainless Steel 18-8	Varies
19	Nameplate (not shown)	Mylar	1
20	Decal, PAS only (not shown)	Aluminum	2
21	Position Indicator	ABS	1
22	Screw	Stainless Steel	1
23	Lockwasher	Stainless Steel	1

\*These are recommended spare parts and are included in all repair kits.



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