

# KF Contromatics Series PA/PAS M5 Pneumatic Actuators



## KF Contromatics Industrial Products



Superior Fluid Control Products  
A Brand of **CIRCOR** Energy Products, Inc.

# KF Contromatics Series PA/PAS M5 Pneumatic Actuators

The KF Contromatics M5 series rack-and-pinion actuator is the most versatile unit available today. All are rated for 150 PSIG inlet pressure and offer the DLS feature of double limit stops as standard equipment on all models. This feature allows travel adjustments in both directions. (Model 100 does not have travel stops.) The 180° actuators produce the same torque as the standard 90° model. The Double Acting actuator achieve torques to 37,200 in.-lbs. at 80 PSIG and the Spring Return Fail Safe actuators to 20,748 in.-lbs. spring end torque.

Standard actuators are rated -10°F to 195°F and optional high and low temp seals and bearings are available for applications from -55°F to 250°F. Standard construction is extruded aluminum, machined, hard anodized and painted with a one part dry powder epoxy for corrosion protection. Autocatalytic Nickel Infusion construction is also made available as an option. ANI is the latest technological advance in electronic nickel deposition for severe environment corrosion protection.

## General Design Features

- Available In 16 Sizes
- Dual Rack & Pinion Design
- 90° & 180° Rotation
- Std. Design Features Double Travel Stops That Can Be Adjusted While Actuator Is Pressurized (Model 100 Does Not Have Travel Stops)
- Actuator Can Easily Be Converted In The Field From Double Acting To Spring Return With No Additional Tools Required
- Fully Encapsulated Spring Design For Safety
- Spring Return Fail Safe to 20,748 in.-lbs. Spring End Torque
- Double Acting Torques to 37,200 in.-lbs. at 80 PSIG
- Namur Dimensions For The Affixing Of Accessories & Transmitting Devices
- 150 PSIG Inlet Pressure Rated
- Rated From -55°F To 250°F
- ISO 5211 Mounting Dimensions
- CGA 6.5 Certified
- Factory Mutual Approved



## Accessories & Options

- |                            |                  |
|----------------------------|------------------|
| High Temp. Option to 250°F | Mounting Kits    |
| Low Temp. Option to -55°F  | Limit Switches   |
| Extended Travel Stops      | Solenoids        |
| Speed Controls & Mufflers  | Positioners      |
| Dec clutchable Manual Gear | Overrides        |
| ANI Corrosion Protection   | Dribble Controls |

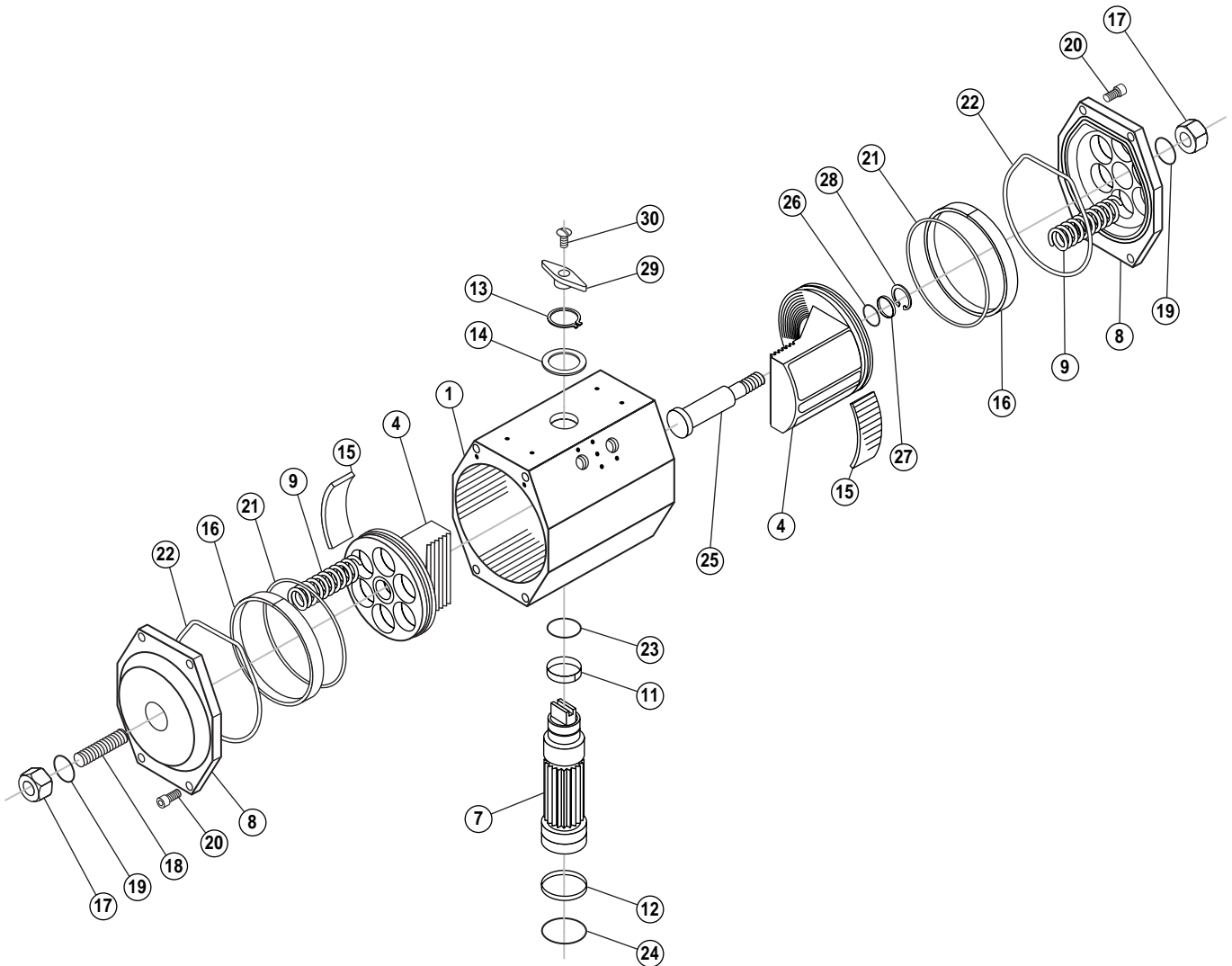
## Contents

Design Features .....	2
Component Parts .....	3
Drive, Mounting & Envelope Dimensional Data (in., mm) .....	4 - 5
Engineering Data, Series PAS M5 Torque Chart (in.-lbs.) .....	6
Engineering Data, Series PA M5 Torque Chart (in.-lbs.) .....	
Series PA/PAS M5 Air Consumption & Weights (lbs./kg) .....	7



# KF Contromatics Series PA/PAS M5 Pneumatic Actuators

## Component Parts



### Parts List

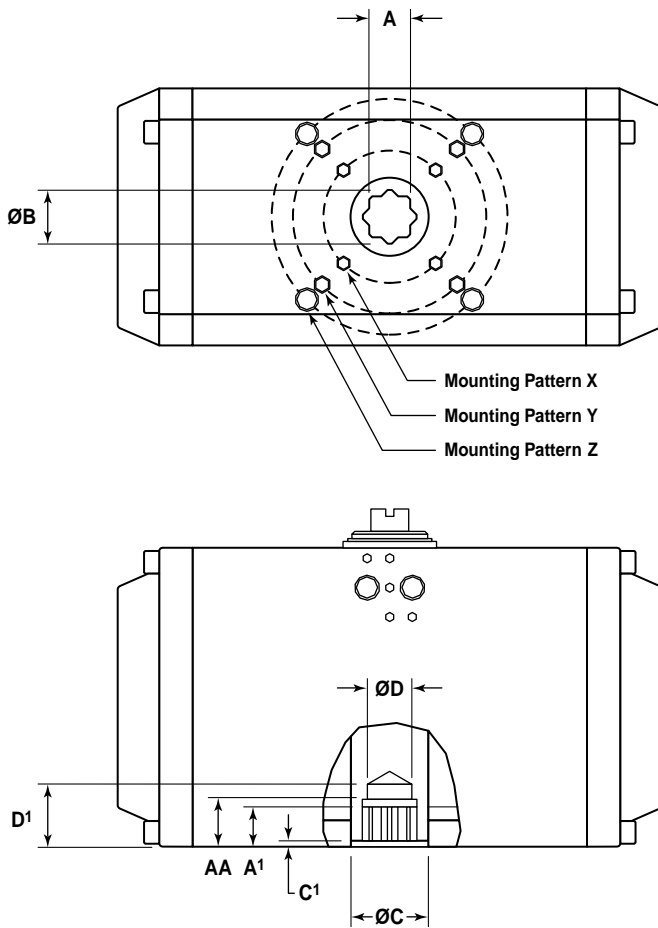
Part No.	Qty.	Description	Material
1	1	Body	Anodized Aluminum w/Polyester Epoxy Coating
4	2	Piston	Die Cast Aluminum
7	1	Pinion	ASTM B656 Steel w/ENP
8	2	End Cap	Epoxy Coated Aluminum
9	12 Max	Spring Cartridge	Epoxy Coated Steel/Delrin/Brass
11	1	Upper Pinion Bearing	Delrin 500
12	1	Lower Pinion Bearing	Delrin 500
13	1	Circlip	ASTM B656 Steel w/ENP
14	1	Pinion Washer	Delrin 500
15	2	Piston Skate	Delrin 500
16	2	Piston Guide Ring	Delrin 500
17	2	Sealing Nut	304 Stainless Steel

Part No.	Qty.	Description	Material
18	1	Travel Stop	304 Stainless Steel
19	2	Travel Stop O-Ring	Buna N
20	8	End Cap Screw	304 Stainless Steel
21	2	Piston O-Ring	Buna N
22	2	End Cap O-Ring	Buna N
23	1	Upper Pinion O-Ring	Buna N
24	1	Lower Pinion O-Ring	Buna N
25	1	DLS Stop Bolt	304 Stainless Steel
26	1	DLS Stop Bolt O-Ring	Viton®
27	1	DLS Stop Bolt Bearing	Teflon®
28	1	DLS Stop Bolt Circlip	ASTM B656 Steel w/ENP
29	1	Indicator	ABS
30	1	Indicator Screw	304 Stainless Steel



# KF Contromatics Series PA/PAS M5 Pneumatic Actuators

## Dimensional Data (in., mm)



### ISO Mounting Pattern

Size	B.C. (in.)	B.C. (mm)	Thread	Depth
F03	1.417	36	#10-32UNC	.43
F04	1.654	42	#10-32UNC	.43
F05	1.969	50	1/4-20 UNC	.35
F07	2.756	70	5/16-18 UNC	.47
F10	4.016	102	3/8-16 UNC	.59
F12	4.921	125	1/2-13 UNC	.71
F14	5.512	140	5/8-11 UNC	.94
F16	6.496	165	3/4-10 UNC	1.18

### Drive & Mounting Dimensions (in., mm)

Model	ISO Square 8-Point Drive Dim. (in., mm)														ISO Mounting Dim.				
	A		A1		AA		ØB		ØC		C1		ØD		D1		X	Y	Z
PA/ PAS	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm			
100	.354	9	.55	14.0	—	—	.673	17.1	.85	21.6	.09	2.3	—	—	—	—	F03	—	—
100	.433	11	.55	14.0	—	—	.673	17.1	.85	21.6	.09	2.3	—	—	—	—	—	F04	—
200	.551	14	.61	15.5	.71	18.0	.713	18.1	.92	23.4	.08	2.0	.60	15.2	.71	18.0	F03	F05	—
300	.551	14	.61	15.5	.71	18.0	.713	18.1	.92	23.4	.08	2.0	.60	15.2	.71	18.0	F05	F07	—
500	.669	17	.63	16.0	.75	19.1	.874	22.2	1.13	28.7	.08	2.0	.73	18.5	.81	20.6	F05	F07	—
700	.699	17	.63	16.0	.75	19.1	.874	22.2	1.25	31.8	.08	2.0	.73	18.5	.81	20.6	F05	F07	—
1030	.699	17	.63	16.0	.75	19.1	.874	22.2	1.45	36.8	.08	2.0	.73	18.5	1.14	29.0	F05	F07	—
1400	.866	22	.81	20.6	.96	24.4	1.122	28.5	1.57	39.9	.10	2.5	.94	23.9	1.03	26.2	F07	F10	—
2200	.866	22	.81	20.6	.96	24.4	1.122	28.5	2.07	52.6	.10	2.5	.94	23.9	1.28	32.5	F07	F10	—
2900	.866	22	.83	21.1	.98	24.9	1.122	28.5	2.07	52.6	.12	3.0	.94	23.9	1.30	33.0	F07	F10	F12
4100	1.063	27	.83	21.1	1.07	27.2	1.437	36.5	2.59	65.8	.12	3.0	1.15	29.2	1.69	42.9	—	F10	F12
5800	1.063	27	.83	21.1	1.07	27.2	1.437	36.5	2.59	65.8	.12	3.0	1.15	29.2	1.69	42.9	—	F10	F12
9000	1.417	36	1.26	32.0	1.57	39.9	1.909	48.5	3.10	78.7	.16	4.1	1.56	39.6	2.17	55.1	—	F12	F16**
12100	1.417	36	1.26	32.0	1.57	39.9	1.909	48.5	3.10	78.7	.16	4.1	1.56	39.6	2.17	55.1	—	—	F14
23600	1.811	46	1.26	32.0	1.57	39.9	2.441	62.0	4.12	104.6	.16	4.1	2.00	50.8	2.13	54.1	—	—	F16
29500	1.811	46	1.22	31.0	1.53	38.9	2.441	62.0	5.12	130.0	.12	3.0	2.00	50.8	2.09	53.1	—	—	F16
37200	1.811	46	1.26	32.0	1.61	40.9	2.441	62.0	5.12	130.0	.12	3.0	2.00	50.8	2.13	54.1	*	—	F16

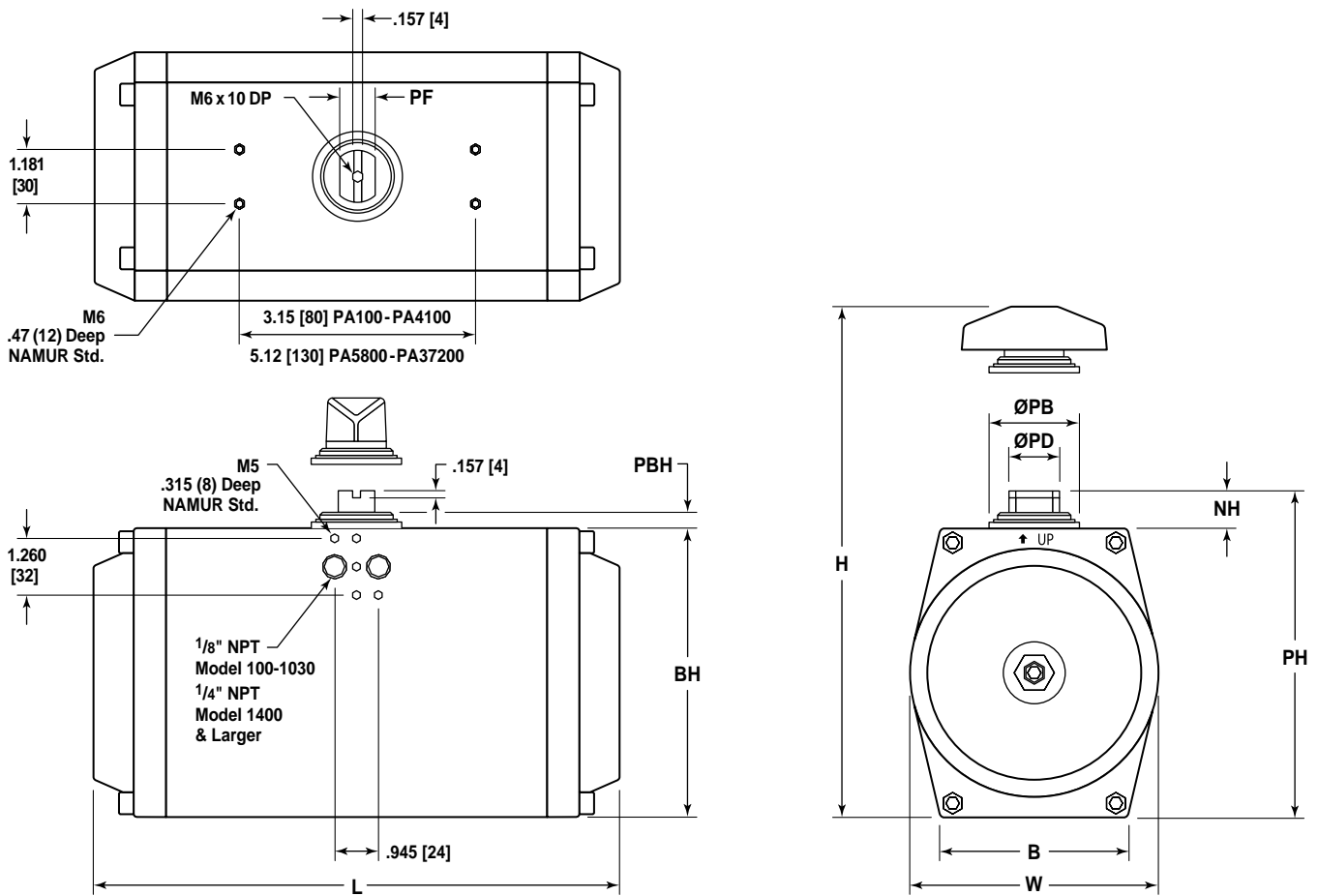
\*37200 includes 4.59 x 12.87 rectangular pattern.

\*\*9000 has 5/8-11 UNC on F16.



# KF Contromatics Series PA/PAS M5 Pneumatic Actuators

## Dimensional Data (in, mm)



## Envelope Dimensions (in., mm)

Model	Dimension (in., mm)																					
	B		H		L		W		BH		NH		ØPB		ØPD		PF		PH		PBH	
PA/ PAS	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
100	1.81	46.0	3.50	88.9	4.68	118.9	2.08	52.8	2.56	65.0	.79	20	.79	20.0	.48	12.2	.35	8.9	3.35	85.1	.12	3.0
200	1.97	50.0	3.82	97.0	5.00	127.0	2.32	58.9	2.91	73.9	.79	20	.79	20.0	.47	11.9	.39	9.9	3.70	94.0	.12	3.0
300	2.36	59.9	4.37	111.0	5.51	140.0	2.76	70.1	3.46	87.9	.79	20	.79	20.0	.47	11.9	.39	9.9	4.25	108.0	.12	3.0
500	2.56	65.0	4.84	122.9	6.34	161.0	3.27	83.1	3.94	100.1	.79	20	1.02	25.9	.55	14.0	.39	9.9	4.73	120.1	.20	5.1
700	2.56	65.0	4.95	125.7	7.17	182.1	3.58	90.9	4.25	108.0	.79	20	1.02	25.9	.55	14.0	.39	9.9	5.04	128.0	.24	6.1
1030	2.76	70.1	5.55	141.0	8.23	209.0	3.94	100.1	4.61	117.1	.79	20	1.38	35.1	.79	20.1	.55	14.0	5.40	137.2	.24	6.1
1400	3.54	89.9	6.45	163.8	8.74	222.0	4.72	119.9	5.51	140.0	.79	20	1.97	50.0	.79	20.1	.55	14.0	6.30	160.0	.24	6.1
2200	3.54	89.9	6.71	170.4	11.50	292.1	4.72	119.9	5.51	140.0	.79	20	1.97	50.0	1.10	27.9	.79	20.1	6.30	160.0	.30	7.6
2900	4.06	103.1	7.51	190.8	11.73	297.9	5.39	136.9	6.30	160.0	.79	20	1.97	50.0	1.10	27.9	.79	20.1	7.10	180.3	.30	7.6
4100	4.33	110.0	9.70	246.4	13.27	337.1	6.77	172.0	7.80	198.1	.79	20	2.36	59.9	1.10	27.9	.79	20.1	8.98	228.1	.30	7.6
5800	4.33	110.0	9.70	246.4	14.84	376.9	6.77	172.0	7.80	198.1	1.18	30	2.36	59.9	1.42	36.1	1.10	27.9	8.98	228.1	.43	10.9
9000	5.31	134.9	11.77	299.0	16.54	420.1	8.82	224.0	10.00	254.0	1.18	30	2.84	72.1	1.42	36.1	1.10	27.9	11.18	284.0	.43	10.9
12100	5.31	134.9	11.77	299.0	18.19	462.0	8.82	224.0	10.00	254.0	1.18	30	2.95	74.9	1.57	39.9	1.26	32.0	11.18	284.0	.43	10.9
23600	6.26	159.0	13.66	347.0	23.74	603.0	10.71	272.0	11.89	302.0	1.18	30	3.54	89.9	1.57	39.9	1.26	32.0	13.07	332.0	.43	10.9
29500	6.26	159.0	13.66	347.0	26.89	683.0	10.71	272.0	11.89	302.0	1.18	30	3.54	89.9	1.57	39.9	1.26	32.0	13.07	332.0	.43	10.9
37200*	6.30	160.0	15.94	404.9	26.89	683.0	14.17	359.9	14.17	359.9	1.18	30	2.96	75.2	1.58	40.1	1.26	32.0	15.35	389.9	.43	10.9

\*Vertical NAMUR solenoid mounting



# KF Contromatics Series PAS M5 Spring Return Actuators, Engineering Data

## Torque Chart (in.-lbs.)

PAS Model	Spring Qty.	Spring		40 PSIG Air		60 PSIG Air		80 PSIG Air		100 PSIG Air		120 PSIG Air	
		Start	End	End	Start	End	Start	End	Start	End	Start	End	
100	2	56	38	—	11	18	35	42	60	67	85	92	110
	3	83	57	—	—	—	16	15	40	40	65	65	90
200	2	56	38	44	62	94	112	144	162	194	212	244	262
	3	83	57	15	42	65	92	115	142	165	192	215	242
	4	111	76	—	22	36	72	86	122	136	172	186	222
	5	139	95	—	2	6	52	56	102	106	152	156	202
300	2	80	56	69	93	144	168	218	242	293	317	367	391
	3	119	83	30	66	104	140	179	215	253	289	328	364
	4	159	111	—	38	64	112	139	187	213	261	288	336
	5	199	139	—	10	24	84	99	159	173	233	248	308
	6	239	167	—	—	0	56	59	131	133	206	208	280
	500	2	154	104	105	155	235	285	365	415	494	545	624
3		232	156	28	103	158	233	287	363	417	493	547	623
4		309	208	—	51	80	181	210	311	340	441	469	570
5		386	260	—	—	3	129	132	259	262	388	392	518
6		463	312	—	—	—	76	55	206	185	336	314	466
700		2	199	127	163	235	344	417	525	598	706	779	887
	3	299	190	63	172	244	353	426	534	607	715	788	896
	4	398	253	—	108	145	290	326	471	507	652	688	833
	5	498	317	—	45	45	226	266	407	407	588	588	769
	6	597	380	—	—	—	162	126	343	307	524	488	706
	1030	2	267	189	241	318	495	572	749	826	1002	1080	1256
3		400	284	107	223	361	477	615	731	869	985	1123	1239
4		533	379	—	128	227	382	481	636	735	890	989	1144
5		667	473	—	33	93	287	347	541	601	795	855	1049
6		800	568	—	—	—	192	213	446	467	700	721	954
1400		2	407	260	321	468	685	832	1049	1196	1413	1560	1777
	3	611	391	117	337	481	701	845	1065	1209	1429	1573	1763
	4	814	521	—	207	277	571	641	935	1005	1299	1369	1693
	5	1018	651	—	76	73	440	437	804	801	1168	1165	1532
	6	1221	781	—	—	—	309	232	673	596	1037	960	1401
	2200	2	550	400	489	645	1018	1174	1548	1704	2077	2233	2607
3		826	600	188	426	718	956	1247	1485	1777	2015	2306	2544
4		1101	800	—	200	407	729	936	1259	1466	1789	1995	2318
5		1376	1000	—	—	84	495	614	1025	1144	1554	1673	2084
6		1651	1200	—	—	—	253	281	783	810	1312	1340	1842
2900		2	814	516	641	939	1369	1667	2097	2395	2825	3123	3552
	3	1222	775	234	681	962	1409	1689	2137	2417	2864	3145	3582
	4	1629	1033	—	423	554	1150	1282	1878	2010	2606	2738	3334
	5	2036	1291	—	164	147	892	874	1620	1602	2348	2330	3075
	6	2443	1549	—	—	—	634	467	1361	1195	2089	1922	2817
	4100	2	1133	681	938	1390	1974	2425	3009	3461	4045	4496	5080
3		1699	1022	371	1049	1407	2084	2443	3120	3478	4155	4514	5191
4		2266	1363	—	708	840	1743	1876	2779	2911	3814	3947	4850
5		2832	1704	—	367	273	1402	1309	2438	2344	3473	3380	4509
6		3398	2044	—	26	—	1061	742	2097	1777	3132	2813	4168
5800		2	1542	1052	1344	1834	2787	3277	4230	4720	5673	6163	7117
	3	2312	1578	573	1308	2016	2751	3459	4194	4902	5637	6345	7080
	4	3083	2104	—	781	1245	2224	2688	3667	4131	5111	5574	6554
	5	3854	2630	—	255	473	1698	1916	3141	3359	4584	4802	6027
	6	4625	3156	—	—	—	1171	1145	2614	2588	4058	4031	5501
	9000	2	2251	1619	2227	2859	4466	5098	6705	7337	8944	9576	11,183
3		3376	2428	1101	2049	3340	4288	5579	6527	7818	8766	10,057	11,005
4		4501	3238	—	1239	2214	3478	4453	5717	6692	7956	8931	10,195
5		5627	4047	—	429	1088	2668	3327	4907	5566	7146	7805	9385
6		6752	4856	—	—	—	1858	2200	4097	4439	6336	6678	8575
12100		2	3000	2159	2969	3811	5954	6796	8939	9781	11,924	12,766	14,910
	3	4501	3238	1468	2731	4453	5716	7438	8701	10,424	11,686	13,409	14,672
	4	6001	4317	—	1651	2952	4636	5937	7621	8922	10,606	11,907	13,591
	5	7501	5397	—	571	1451	3556	4436	6541	7421	9526	10,406	12,511
	6	9001	6476	—	—	—	2475	2934	5460	5919	8446	8904	11,431
	23600	2	6832	4573	4812	7072	10,635	12,895	16,457	18,718	22,280	24,540	28,103
3		10,249	6859	1394	4785	7217	10,607	13,040	16,430	18,862	22,253	24,685	28,076
4		13,665	9145	—	2497	3798	8319	9621	14,142	15,444	19,965	21,267	25,788
5		17,081	11,432	—	208	379	6031	6202	11,854	12,025	17,677	17,847	23,499
6		20,497	13,718	—	—	—	3742	2782	9565	8605	15,388	14,427	21,210
29500		2	8540	5015	6015	9541	13,293	16,819	20,571	24,097	27,850	31,376	35,128
	3	12,811	7523	1742	7032	9021	14,310	16,299	21,589	23,577	28,867	30,856	36,145
	4	17,081	10,030	—	4523	4748	11,801	12,026	19,079	19,304	26,356	26,583	33,636
	5	21,351	12,538	—	2013	474	9291	7752	16,570	15,030	23,848	22,309	31,126
	6	25,621	15,045	—	—	—	6781	3477	14,059	10,755	21,338	18,034	28,616
	37200	2	8148	5119	11,098	14,127	20,721	23,750	30,345	33,374	39,968	42,997	49,592
3		12,222	7679	7022	11,566	16,645	21,189	26,269	30,813	35,892	40,436	45,516	50,060
4		16,296	10,239	2945	9004	12,568	18,628	22,192	28,251	31,816	37,875	41,439	47,498
5		20,370	12,799	—	6442	8491	16,066	18,114	25,689	27,738	35,313	37,362	44,936
6		24,443	15,358	—	3880	4413	13,503	14,036	23,127	23,660	32,750	33,283	42,374
7		28,517	17,918	—	1317	333	10,940	9957	20,564	19,580	30,187	29,204	39,811
8		32,591	20,478	—	—	—	8377	5877	18,000	15,500	27,624	25,124	37,247

Highlighted torque figures in bold are the recommended actuators for the corresponding available air supply.  
 Note: Torques listed in the above table are exact. When sizing an actuator for a valve, first increase the valve torque required by 20% as a safety factor.

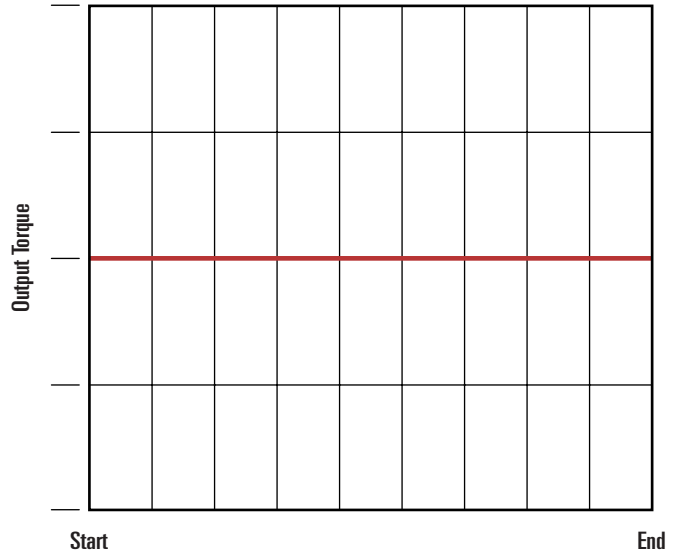


# KF Contromatics Series PA/PAS M5 Pneumatic Actuators, Engineering Data

## Series PA M5 Double Acting Actuators Torque Chart (in.-lbs.)

PA Model	40 PSIG	60 PSIG	80 PSIG	100 PSIG	120 PSIG
100	50	75	100	125	150
200	102	152	203	254	305
300	151	227	302	378	453
500	263	395	526	658	789
700	367	551	734	918	1101
1030	516	774	1032	1290	1548
1400	740	1109	1479	1849	2219
2200	1109	1664	2218	2773	3327
2900	1479	2219	2958	3698	4437
4100	2071	3106	4142	5177	6213
5800	2933	4399	5865	7331	8798
9000	4550	6825	9100	11,375	13,650
12100	6066	9099	12,132	15,165	18,198
23600	11,833	17,749	23,665	29,581	35,498
29500	14,790	22,186	29,581	36,976	44,371
37200	18,625	27,938	37,250	46,540	55,875

## Double Acting Torque Curve (Constant Output Torque Throughout Travel In Both Directions)



## Series PA/PAS M5 Actuators Air Consumption

Model	Cubic inches per cycle (open close)		
	90°	180°	PAS
100	12.8	—	6.7
200	15.3	28.1	7.3
300	22.0	41.5	9.2
500	36.6	68.3	15.3
700	52.5	99.5	22.0
1030	67.1	131.2	27.5
1400	112.9	189.2	41.5
2200	152.6	341.7	67.1
2900	218.5	415.0	86.7
4100	335.6	—	174.5
5800	416.2	790.2	174.5
9000	762.8	—	396.7
12400	872.6	1294	360.0
23600	1587	2472	701.8
29500	1922	—	1037
37200	2955	—	1594

## Weight (lbs., kg)

Model	Weight (lbs., kg)					
	90°		180°		PAS	
	lbs.	kg	lbs.	kg	lbs.	kg
100	1.00	.45	—	—	1.20	.54
200	1.98	.90	2.65	1.20	2.20	1.00
300	2.98	1.35	3.97	1.80	3.42	1.55
500	4.30	1.95	5.95	2.70	5.07	2.30
700	5.51	2.50	7.94	3.60	6.39	2.90
1030	7.39	3.35	11.25	5.10	8.38	3.80
1400	10.58	4.80	13.56	6.15	12.79	5.80
2200	14.99	6.80	20.68	9.38	17.86	8.10
2900	18.74	8.50	26.02	11.80	22.49	10.20
4100	31.00	14.06	—	—	39.80	18.05
5800	34.40	15.60	55.79	25.31	42.78	19.40
9000	61.50	27.90	—	—	83.10	37.69
12400	68.80	31.21	106.9	48.49	86.66	39.31
23600	132.3	60.01	173.6	78.74	180.8	82.01
29500	161.0	73.03	—	—	209.5	95.03
37200	205.0	92.99	—	—	267.0	121.11



# Worldwide Sales Offices



**KF Contromatics, a leading brand of CIRCOR Energy Products, Inc. reaches into every corner of the globe serving the oil & gas and industrial marketplace.**

**Supplying an extensive range of product offerings through a worldwide network of manufacturer representatives and distributors, KF Contromatics is the right choice for all your flow control needs.**

## **World Headquarters**

KF Industries  
1500 S.E. 89th Street  
Oklahoma City, OK 73143-5249 USA  
Phone: (405) 631-1533  
Fax: (405) 631-5034  
E-mail: [sales@circorenergy.com](mailto:sales@circorenergy.com)  
[www.circorenergy.com](http://www.circorenergy.com)

## **US Industrial**

KF Contromatics Industrial Products  
1500 S.E. 89th Street  
Oklahoma City, OK 73143-5249 USA  
Phone: (405) 631-1533  
Fax: (405) 631-5034  
E-mail: [sales@circorenergy.com](mailto:sales@circorenergy.com)  
[www.circorenergy.com](http://www.circorenergy.com)

## **Canada**

KF Industries Canada  
9430-39th Avenue, Edmonton  
Alberta, Canada T6E 5T9  
Phone: (780) 463-8633  
Fax: (780) 461-1588  
E-mail: [kfinfo@circorenergy.com](mailto:kfinfo@circorenergy.com)  
[www.circorenergy.com](http://www.circorenergy.com)



Licensed for Manufacture  
in accordance with API 6A  
& 6D and Firetest  
to API 6FA and 607



Registered to the ISO 9001  
Quality System Standard,  
accredited by U.K., Dutch  
and German qualifying  
authorities.



[www.circorenergy.com](http://www.circorenergy.com)