

Pneumatic Actuators

Rack And Pinion, Double Acting & Spring Return

100 SERIES



ultraflo®

100 SERIES

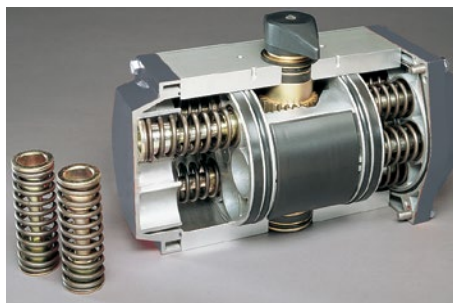
Ultraflo is proud to offer the 100 Series actuator product line. The 100 Series is a pneumatically driven rack and pinion actuator available in double acting and spring return designs. Both double acting and spring return units provide 90° rotation. The 100 Series incorporates many standard features in a compact, economical package only offered as options by many other manufactures. In addition, the 100 Series offers direct mounting to the complete line of Ultraflo Butterfly valves, as well as NAMUR standards for mounting of Ultraflo accessories.

The 100 Series actuators are designed primarily for pneumatic actuation up to a maximum pressure of **140 psig** (10 Bar) and for temperatures ranging from **-40°F** (-40°C) to **+200°F** (+95°C). For applications outside this range, please consult the factory. 100 Series actuators are also available for operation with alternative media (i.e., hydraulic oil, water). Consult factory for further information.

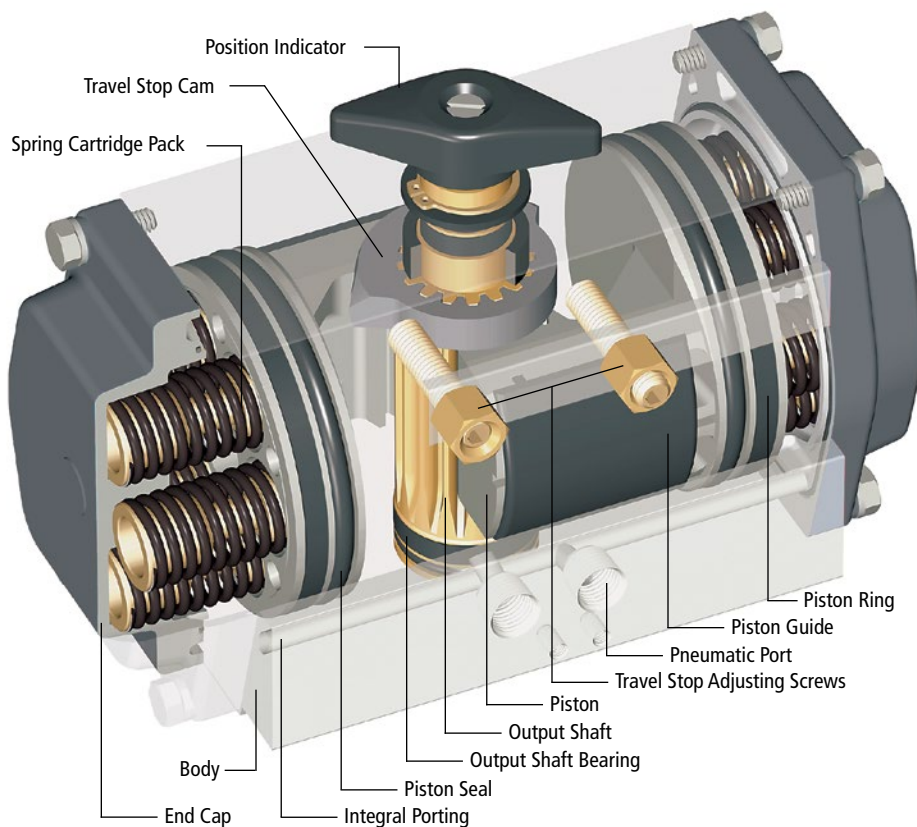


Travel Stop System consists of a steel alloy cam, connected to the output shaft, and two external, independently adjustable screws. The travel stop system limits actuator movement and permits precise, bidirectional adjustment of actuator travel in both the open and closed positions.

Spring Return units employ pre-loaded, contained cartridge spring packs. These packs enhance safety, ease maintenance and eliminate the need to control spring tension with retaining bolts and end caps. To convert between Spring Return and Double Acting units simply insert or remove the spring packs.



Features The Ultraflo 100 Series pneumatic actuator is a fully enclosed and self-contained unit designed to be compact, user friendly and easily maintained. **Integral Porting** eliminates the need for costly, cumbersome and easily damaged external tubing. The one-piece **Output Shaft** and **Pinion Gear** is machined from hardened alloy steel and zinc-plated for corrosion resistance. Permanently lubricated **Acetal Bearings** support the pinion at both top and bottom. **Die-Cast Aluminum Pistons** travel on lubricated **Acetal Piston Guides** and **Rings** that work in conjunction with the pinion bearings to absorb operator side thrust and reduce the coefficient of friction. This results in extended service life and more efficient torque output. The **Pneumatic Supply Ports** are 1/4" NPT. NAMUR interface for accessory mounting is standard on all sizes. All seals, including **Piston Seals** are permanently lubricated Buna-N O-rings. For increased corrosion protection, the **Extruded Aluminum Body** is anodized and the **Die Cast End Caps** are polyester coated. The **Shaft Position Indicator** clearly shows open or closed position and is easily removable for **Manual Override Function** of the actuator.



Standard Materials

Item	Material
Body	Extruded Aluminum - Anodized
End Caps	Die Cast Aluminum - Polyester Coated
Pinion	Carbon Steel, zinc plated
Pistons	Die Cast Aluminum
Pinion Bearings	Acetal
Piston Guides / Rings	Acetal
Fasteners	Stainless Steel
Springs	Spring Steel - Protective Coating
O-Ring Seals	Buna-N

Actuator Volumes (ins³)

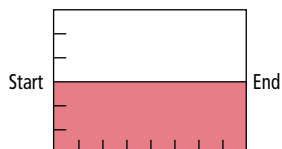
Size	06	08	09	12	13	16	21	26
Counter Clockwise	9.6	24.8	34.8	73.8	96.7	187.5	360.0	750.0
Clockwise	13.4	32.6	45.9	95.5	130.8	259.6	450.0	900.0

Volume of air in cubic inches required for 90° operation.

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Double Acting Torque Curve

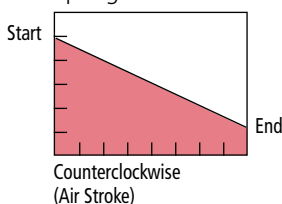
Air to Air



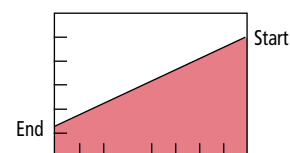
Double Acting units have a constant output torque throughout travel from start to end, clock-wise or counter-clockwise rotation.

Single Acting Torque Curves

Spring Return



Counterclockwise
(Air Stroke)



Clockwise
(Spring Stroke)

Double Acting Output Torque (Lb.-Ins.)

Actuator Size	Air Supply Pressure (PSIG)				
	40	60	80	100	120
06	145	221	297	373	449
08	351	536	721	906	1091
09	493	753	1013	1272	1532
12	1058	1615	2171	2728	3285
13	1410	2152	2894	3636	4378
16	2797	4270	5742	7214	8687
21	5783	8826	11870	14914	17957
26	14211	21691	29171	36650	44130

Actuator Weights

Size	06	08	09	12
Double Acting	3.4	6.1	8.4	16.4
Spring Return	4.1	7.9	10.8	22.7

Size	13	16	21	26
Double Acting	20.9	38.1	65.0	144.0
Spring Return	27.3	52.6	95.3	192.6

Weights are in lbs. Spring Return unit weights are will full set of springs per piston.

Single Acting Output Torque, Spring Return (Lb.-Ins.)

Actuator Size	No. Springs per Piston	Air Supply Pressure (PSIG)										Spring	
		40		60		80		100		120		Spring Start	Stroke End
		Start	End	Start	End	Start	End	Start	End	Start	End		
06	2	91	65	167	141	243	217	319	293	395	369	80	54
	3	64	27	140	103	216	179	292	255	368	331	118	81
	4			113	65	189	141	265	217	341	293	156	108
	5			86	27	162	103	238	179	314	255	194	135
	6					135	65	211	141	287	217	232	162
08	2	210	167	395	352	580	537	765	722	950	907	184	141
	3	156	76	341	261	526	446	711	631	896	816	275	195
	4			281	176	466	361	651	546	836	731	360	255
	5			220	97	405	282	590	467	775	652	439	316
	6					369	185	554	370	739	555	536	352
09	2	310	232	570	492	830	752	1089	1011	1349	1271	261	183
	3	218	101	478	361	738	621	997	880	1257	1140	392	275
	4			386	231	646	491	905	750	1165	1010	522	367
	5			294	94	554	354	813	613	1073	873	659	459
	6					462	229	721	488	981	748	784	551
12	2	692	469	1249	1026	1805	1582	2362	2139	2919	2696	589	366
	3	509	174	1066	731	1622	1287	2179	1844	2736	2401	884	549
	4			883	437	1439	993	1996	1550	2553	2107	1178	732
	5			700	142	1256	698	1813	1255	2370	1812	1473	915
	6					1073	404	1630	961	2187	1518	1767	1098
13	2	880	465	1622	1207	2364	1949	3106	2691	3848	3433	945	530
	3			1357	733	2099	1475	2841	2217	3583	2959	1419	795
	4			1094	261	1836	1003	2578	1745	3320	2487	1891	1058
	5					1568	529	2310	1271	3052	2013	2365	1326
	6					1302	57	2044	799	2786	1541	2837	1592
16	2	1819	1118	3292	2591	4764	4063	6236	5535	7709	7008	1679	978
	3	1399	349	2872	1822	4344	3294	5816	4766	7289	6239	2448	1398
	4			2452	1123	3924	2595	5396	4067	6869	5540	3147	1818
	5			2030	353	3502	1825	4974	3297	6447	4770	3917	2240
	6					3154	1196	4626	2668	6099	4141	4546	2588
21	2	3833	2508	6876	5551	9920	8595	12964	11639	16007	14682	3275	1950
	3	2859	868	5902	3911	8946	6955	11990	9999	15033	13042	4915	2924
	4			4930	2275	7974	5319	11018	8363	14061	11406	6551	3896
	5			3949	638	6993	3682	10037	6726	13080	9769	8188	4877
	6					6022	2031	9066	5075	12109	8118	9839	5848
26	2	9487	6747	16967	14227	24447	21707	31926	29186	39406	36666	7464	4724
	3	7125	3015	14605	10495	22085	17975	29564	25454	37044	32934	11196	7086
	4			12243	6762	19723	14242	27202	21721	34682	29201	14929	9448
	5			9880	3030	17360	10510	24839	17989	32319	25469	18661	11811
	6					14998	6778	22477	14257	29957	21737	22393	14173

Actuator Speeds

Size	06	08	09	12	13	16	21	26
Open Stroke/ Close Stroke	1/4	1/4	1/4	1/2	1/2	1	2	2 3/4

Note: Times shown are in seconds at 80 PSIG supply pressure with 6ft. tubing having an internal diameter of approximately 1/4". Ultraflo 100S actuation times are very dependent on the flow capacity of their air supply. The use of smaller port solenoids, solenoid manifolds, smaller I.D. air supply tubing and/or extended lengths of tubing can significantly reduce the actuation time and/or initial response to the command signal.

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Dimensions

Size	06	08	09	12	13	16 *	21	26†
AIR NPT	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
A ISO "F"†	1.97 F 05	1.97 F 05	—	3.25	3.25	—	4.92 F 12	6.50 F 16
B ISO "F"†	2.76 F 07	2.76 F 07	3.25	5.00	5.00	5.00	6.50 F 16	7.87x4.72 Rect.
C	.563	.75	.75	1.125	1.125	1.125	1.97	2.50
D**	.375	.50	.50	.25	.25	.25	.47	.62
E	4.53	5.43	5.78	7.28	8.09	9.36	11.45	13.35
F	5.58	7.40	9.1	12.4	12.81	15.54	19.57	28.78
G (UNC)	1/4-20 x .32	1/4-20 x .32	3/8-16 x .40	3/8-16 x .40	3/8-16 x .40	—	1/2-13 x .78	M20x2.5 x 30mm
H (UNC)	5/16-18 x .40	5/16-18 x .40	—	1/2-13 x .69	1/2-13 x .69	1/2-13 x .75	5/8-11 x 1.11	M20x2.5 x 30mm
J	.38	.50	.50	1.12	1.12	1.12	1.12	1.12
L	1.38	1.46	1.46	2.20	2.20	2.20	2.76	4.25
M	3.46	4.27	4.61	5.52	6.32	7.80	10.16	12.06
N	1.72	2.28	2.47	2.78	2.88	3.78	4.56	5.40
P	3.11	4.07	4.44	5.15	5.58	7.17	8.97	10.79
Q	3.15	3.15	3.15	3.15	3.15	5.12	5.12	5.12
S	.89	.89	.94	1.36	1.36	1.39	1.44	1.50
T	.79	.79	.79	.79	.79	1.18	1.18	1.18
U	.47	.47	.47	.47	.47	.75	.75	.75

Note: Double Acting and Spring Return actuators have the same overall dimensions.

† ISO "F" means mounting flange-drilling pattern.

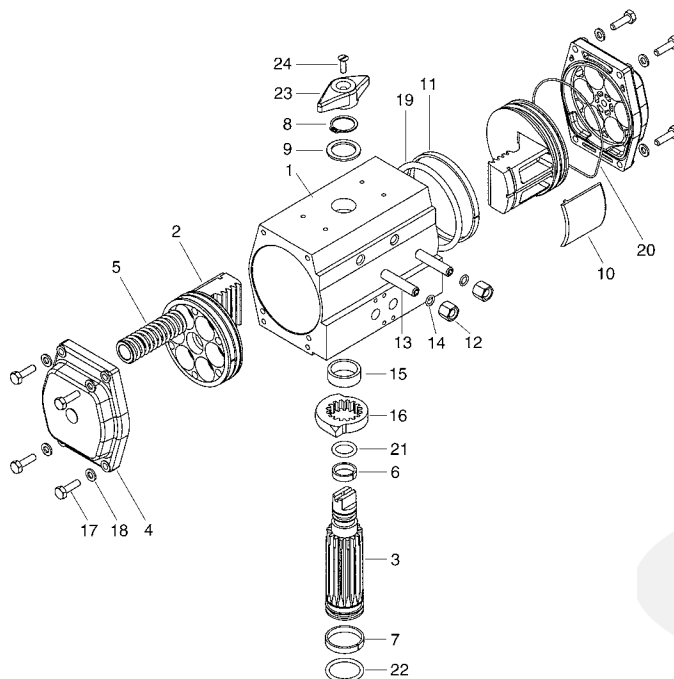
* Dimensions for Size 16A in table. Size 16B (keyed stem version) has C dimension of 1.38 and D dimension of .39.

‡ Sizes for 100 Series 26A in table. The 26B actuator has a C dimension of 3.00 and D dimension of .75.

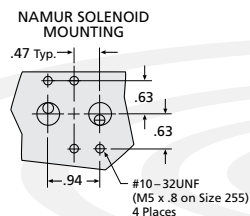
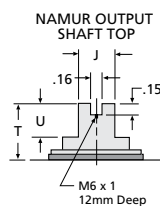
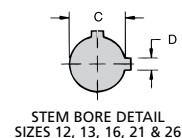
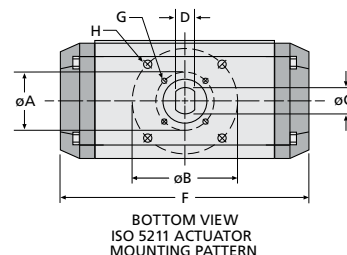
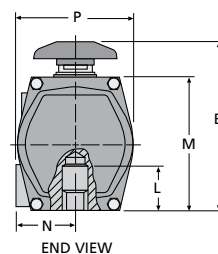
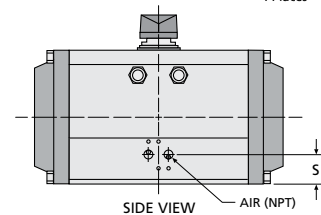
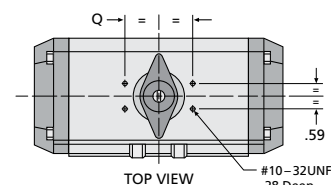
** "D" dimension is for key size.

Components

Item	Qty.	Description
1	1	Body
2	2	Piston
3	1	Pinion
4	2	End Cap
5 *	12 max	Spring Cartridge
6	1	Upper Bearing
7	1	Lower Bearing
8	1	Retaining Ring
9	1	Washer
10	2	Bearing Pad
11	2	Guide Ring
12	2	Stop Nut
13	2	Travel Stop Screw
14	2	Travel Stop O-Ring
15	1	Acetal Spacer
16	1	Travel Stop
17	8	Hex Head Cap Screw
18	8	Washer
19	2	Piston O-Ring
20	2	End Cap O-Ring
21	2	Shaft Top O-Ring
22	2	Shaft Bottom O-Ring
23	1	Indicator Pointer
24	1	Indicator Pointer Screw



Special Note: Sizes 21 and 26 actuators have endcap travel stops not bi-directional travel stops. Please consult factory for production release date of bi-directional stops for these size 100S actuators.



The data represented in this brochure is for general information only. Manufacturer is not responsible for acceptability of these products in relation to system requirements. Consult your Ultraflo representative for specific performance data and proper materials selection for your particular application.



Ultraflo Corporation

A Subsidiary of Bray International, Inc.

8 Trautman Industrial Drive
Ste. Genevieve, MO 63670
800.950.1762 Fax 573.883.8882
www.ultraflovalve.com