

FlowLine



Series 22/23

**Stainless Steel
Rack and Pinion Actuators**

FEATURES

Introduction

Flow Line **Series 22 double acting** and **Series 23 spring return** actuators are technically advanced stainless steel rack and pinion actuators. The Series 22/23 incorporates seven sizes ranging from 147 to 9462 in pounds. Features such as fine tooth rack and pinion. Internal travel stops and stainless steel hardware ensure the standard of performance expected from Flow Line Controls valve automation products.

Body

Cast stainless steel body machined to fine tolerances

Internal porting is standard eliminating any need for external tubing

Valve mounting is accomplished with ISO drillings on all sizes

Limit switch, positioner and solenoid valve mounting comply with Namur standards

Pinion

Pinions are machined from a single piece of stainless steel

Fine-tooth gears eliminate hysteresis and lost motion

ISO female drives are standard on all sizes

Bottom entry pinion provides anti-blowout protection

Pistons

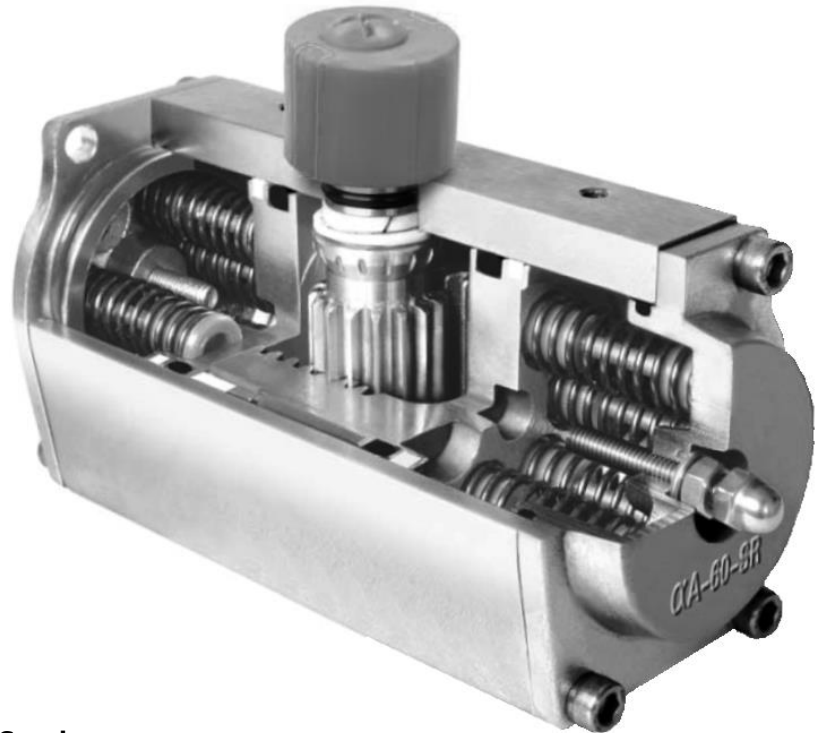
Piston o-rings are held in place by a precisely machined groove matching the o-ring diameter

Internal RTFE piston guide precisely aligns the piston to the pinion to prevent piston roll

End Caps

Cast stainless steel end caps machined to fine tolerances

End cap o-rings are captive on all actuator sizes



Air Supply

All actuator sizes are equipped with 1/4" NPT supply ports

Supply pressure on all sizes is rated up to 147 psi air, hydraulic oil, or water depending on seals used

Bolts and Fasteners

All fasteners are stainless steel for corrosion resistance

Travel Stops

Internal travel stops allow ± 5 degrees adjustment at both ends of stroke

Springs

Springs are stainless steel

Position Indicator

Functions as a visual indicator for 2-way valves and also for 3-way applications with a simple change of built-in indicator tabs

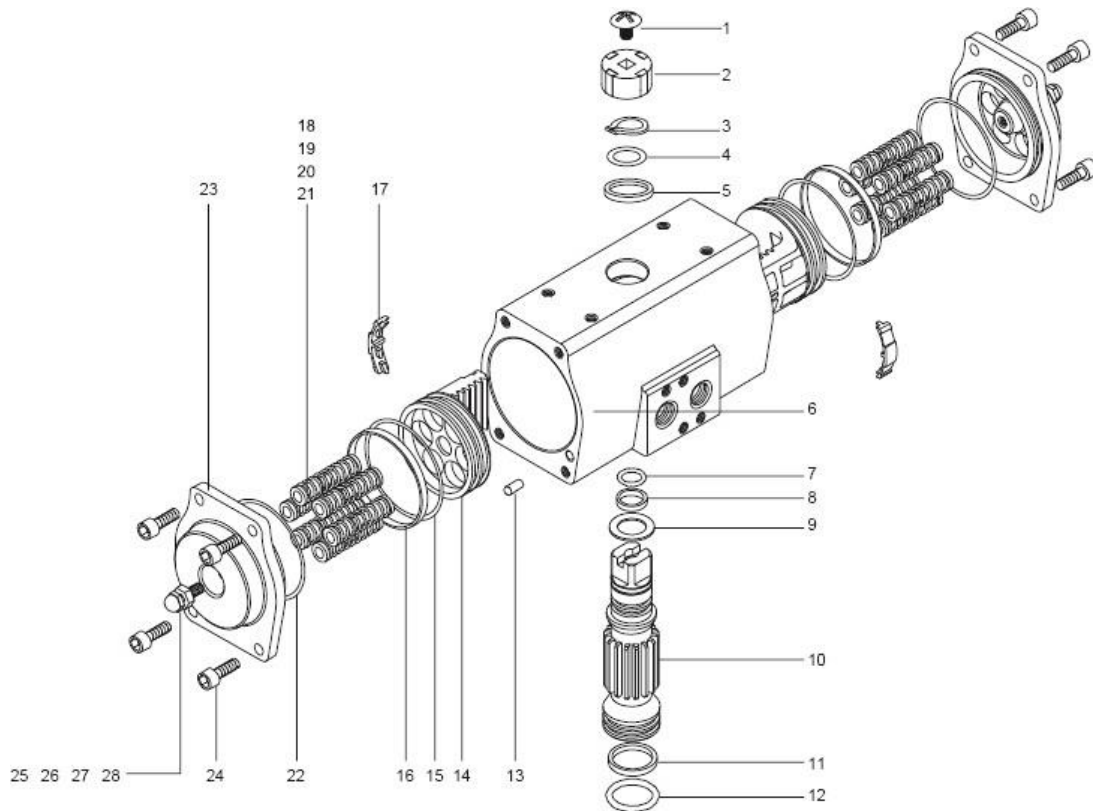
Accessories and Valve Mounting

Namur VDI/VDE 3845 mounting patterns are standard throughout the size range

ISO 5211 is standard mounting for all actuators throughout the size range

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ENGINEERING



Materials

No.	Description	Qty	Standards Material
1	Indicator screw	1	Stainless steel
2	Indicator	1	Plastic
3	Snap ring	1	Stainless steel
4	Washer	1	Stainless steel
5	Outside washer	1	Polyoxymethylene
6	Body	1	Stainless steel, WCB Carbon steel
7	O-ring(Top)	1	Hi-Temp/Viton, Low -Temp/Silicon, Std/NBR
8	Bearing top	1	Polyoxymethylene
9	Inside washer	1	Polyoxymethylene
10	Pinion	1	Stainless steel
11	Bearing bottom	1	Polyoxymethylene
12	O-ring bottom	1	Hi-Temp/Viton, Low -Temp/Silicon, Std/NBR
13	Plug	2	Hi-Temp/Viton, Low -Temp/Silicon, Std/NBR
14	Piston	2	Stainless steel
15	Piston o-ring	2	Hi-Temp/Viton, Low -Temp/Silicon, Std/NBR
16	Piston bearing	2	Polyoxymethylene
17	Guide piston	2	Nylon 66
18	Spring	*	Spring steel
19	Spring retainer(L)	*	Nylon 66
20	Spring retainer(R)	*	Nylon 66
21	Retainer connector	*	Brass
22	End-cap O-ring	2	Hi-Temp/Viton, Low -Temp/Silicon, Std/NBR
23	End-cap	2	Stainless steel, WCB Carbon steel
24	End-cap Stop screw	8	Stainless steel
25	Adjust screw	2	Stainless steel
26	Adjust screw nut	2	Stainless steel
27	Adjust screw washer	2	Stainless steel
28	Adjust screw O-ring	2	Hi-Temp/Viton, Low -Temp/Silicon, Std/NBR

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TORQUES

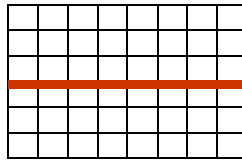
WEIGHTS & AIR VOLUME

Size	Air Volume (cu in)
0050	6.7
0125	14.0
0175	33.6
0250	72.0
0350	112.9
0450	195.3
0550	307.0
0750	452.0

Size	Weight (pounds)
0050	5.8
0125	9.1
0175	15.4
0250	27.8
0350	42.3
0450	60.2
0550	82.9
0750	219

DOUBLE ACTING TORQUE CURVE

Series 22 (air to air)

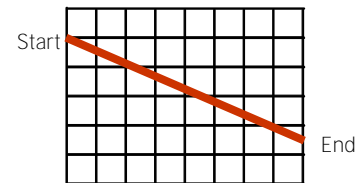


The Series 22 is double acting and has constant torque throughout its travel from start to end, clockwise or counterclockwise rotation.

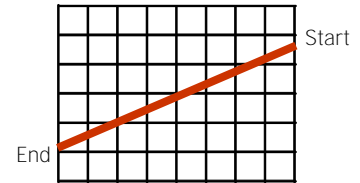
Series	Torque Output (Inch Lbs)				
	40 PSI 3 BAR	60 PSI 4.5 BAR	80 PSI 5.5 BAR	100 PSI 7 BAR	120 PSI 8 BAR
22-0050	81	107	147	214	359
22-0125	189	251	346	503	845
22-0175	409	545	751	1091	1834
22-0250	874	1165	1601	2329	3913
22-0350	1363	1814	2496	3629	6103
22-0450	2328	3107	4266	6213	10438
22-0550	3549	4735	6505	9462	15895
22-0750	6893	10480	12807	16304	18631

SINGLE ACTING TORQUE CURVE

Series 23 (air to air)



Counterclockwise (air stroke)



Clockwise (spring stroke)

Output torques are actual and in inch-pounds. Conversion:
Nm = inchpounds/8.85

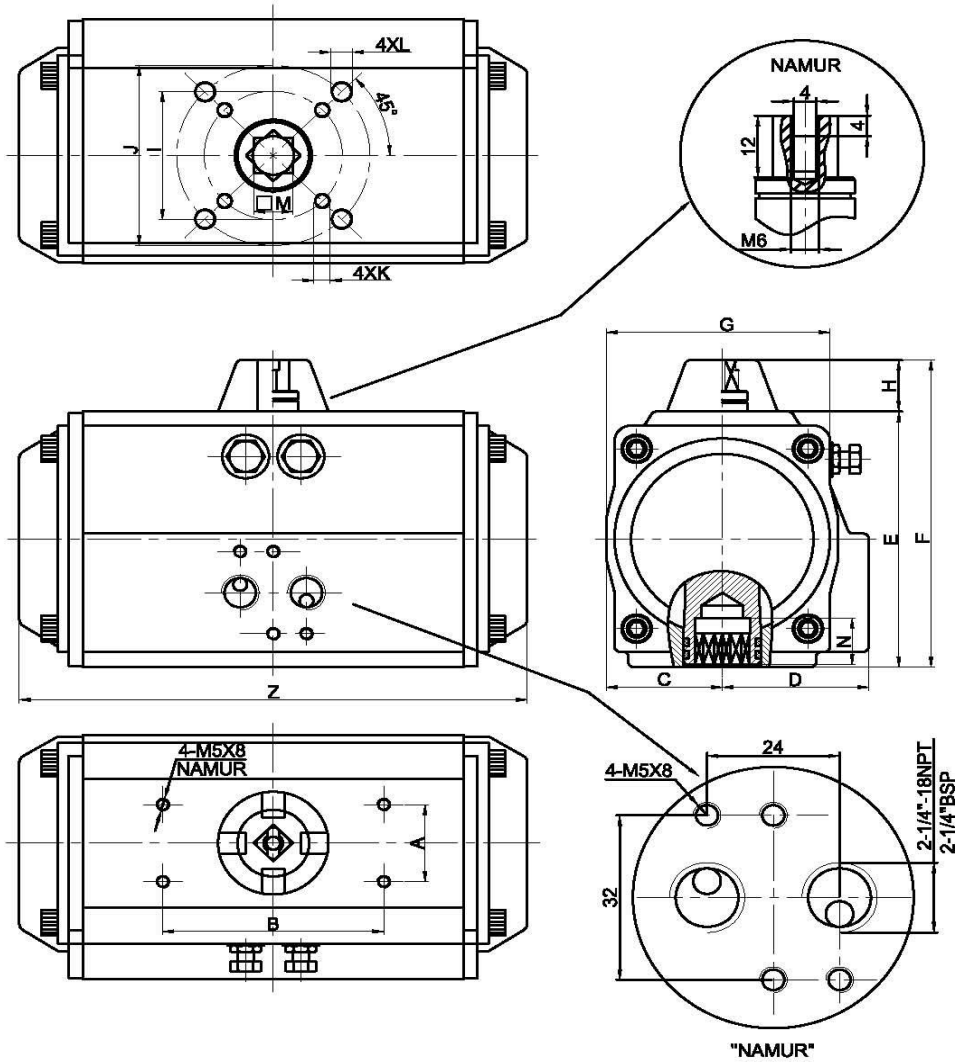
Series	Number of Springs	Closing Torque (Spring)		Torque Output (Inch Lbs)									
		Start	End	40 PSI / 3 BAR		60 PSI / 4.5 BAR		80 PSI / 5.5 BAR		100 PSI / 7 BAR		120 PSI / 8 BAR	
				Start	End	Start	End	Start	End	Start	End	Start	End
23-0050	6	49	31	48	30								
	8	65	41	38	12	64	39	91	65				
	10	81	51			54	22	80	48	133	102	161	129
	12	98	62					70	31	123	85	150	112
23-0125	6	102	65	113	72								
	8	148	96	87	33	150	95.59	213	160				
	10	186	121			124	57	195	120	319	248	376	309
	12	221	145					162	81	287	206	349	269
23-0175	6	244	168	239	151								
	8	326	230	173	65	310	204	451	345				
	10	407	283			257	124	389	257	664	531	800	663
	12	496	336					336	168	602	443	743	58
23-0250	6	531	336	522	327								
	8	699	451	497	142	699	434	991	721				
	10	871	558			575	248	867	540	1452	1213	1744	1416
	12	1053	673					748	363	1337	938	1629	1230
23-0350	6	841	558	780	488								
	8	1115	743	584	195	1037	646	1487	1098				
	10	1390	929					1292	805	2205	1717	2655	2168
	12	1673	1115					1098	513	2009	1425	2461	1876
23-0450	6	1373	912	1372	894								
	8	1832	1221	1053	407	1832	1186	2611	1965				
	10	2284	1522			1514	708	2292	1478	3841	3036	4620	3815
	12	2744	1823					1974	1009	3523	2558	4302	3337
23-0550	6	2213	1487	1991	1221								
	8	2947	1974	1469	451	2655	1637	3832	2815				
	10	3691	2469			2133	859	3310	2036	5673	4399	6860	5585
	12	4426	2965					2797	1257	5151	3620	6346	4806
23-0750	6	3824	2770	3912	2735								
	8	5089	3691	2885	1328	5213	3656	7550	5992				
	10	6364	4611			4187	2239	6523	4576	11179	9232	13507	11559
	12	7638	5532					5497	3160	10152	7815	12480	10143

Flow Line Controls, Inc.

P.O. Box 677 · Schriever, LA 70395 · Phone: 985-414-6003 · Toll Free 1-800-815-9226 · Fax 985-414-6072

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DIMENSIONS



Series	A	B	C	D	E	F	G	H	I	I-1	J	J-1	K	L	M	N	Z	Air
22-0050	1.18	3.15	1.22	1.57	2.72	3.90	1.65	1.18	1.42	F03	1.97	F05	M5X7	M6X8	0.43	0.51	6.61	1/4" NPT
22-0125	1.18	1.46	1.52	1.89	3.35	4.53	2.05	1.18	1.42	F03	1.97	F05	M5X8	M6X10	0.55	0.63	7.72	1/4" NPT
22-0175	1.18	1.99	2.05	2.36	4.53	5.71	2.52	1.18	1.97	F05	2.76	F07	M6X12	M8X12	0.67	0.79	11.22	1/4" NPT
22-0250	1.18	2.32	2.36	2.68	5.00	6.18	3.39	1.18	2.76	F07	4.02	F10	M8X12	M10X12	0.87	0.94	12.01	1/4" NPT
22-0350	1.18	5.12	2.87	3.07	6.18	7.76	3.54	1.57	2.76	F07	4.02	F10	M8X16	M10X18	0.87	1.14	15.51	1/4" NPT
22-0450	1.18	5.12	3.31	3.46	7.01	8.58	4.09	1.57	4.02	F10	4.92	F12	M10X18	M12X18	1.06	1.18	17.72	1/4" NPT
22-0550	1.18	5.12	3.54	3.54	7.87	9.45	4.41	1.57	4.02	F10	4.92	F12	M10X18	M12X18	1.06	1.18	19.09	1/4" NPT
22-0750	1.18	5.12	4.57	4.33	10.12	11.69	5.35	1.57	-	-	5.51	F14	-	M16X20	1.42	1.57	25.59	1/4" NPT

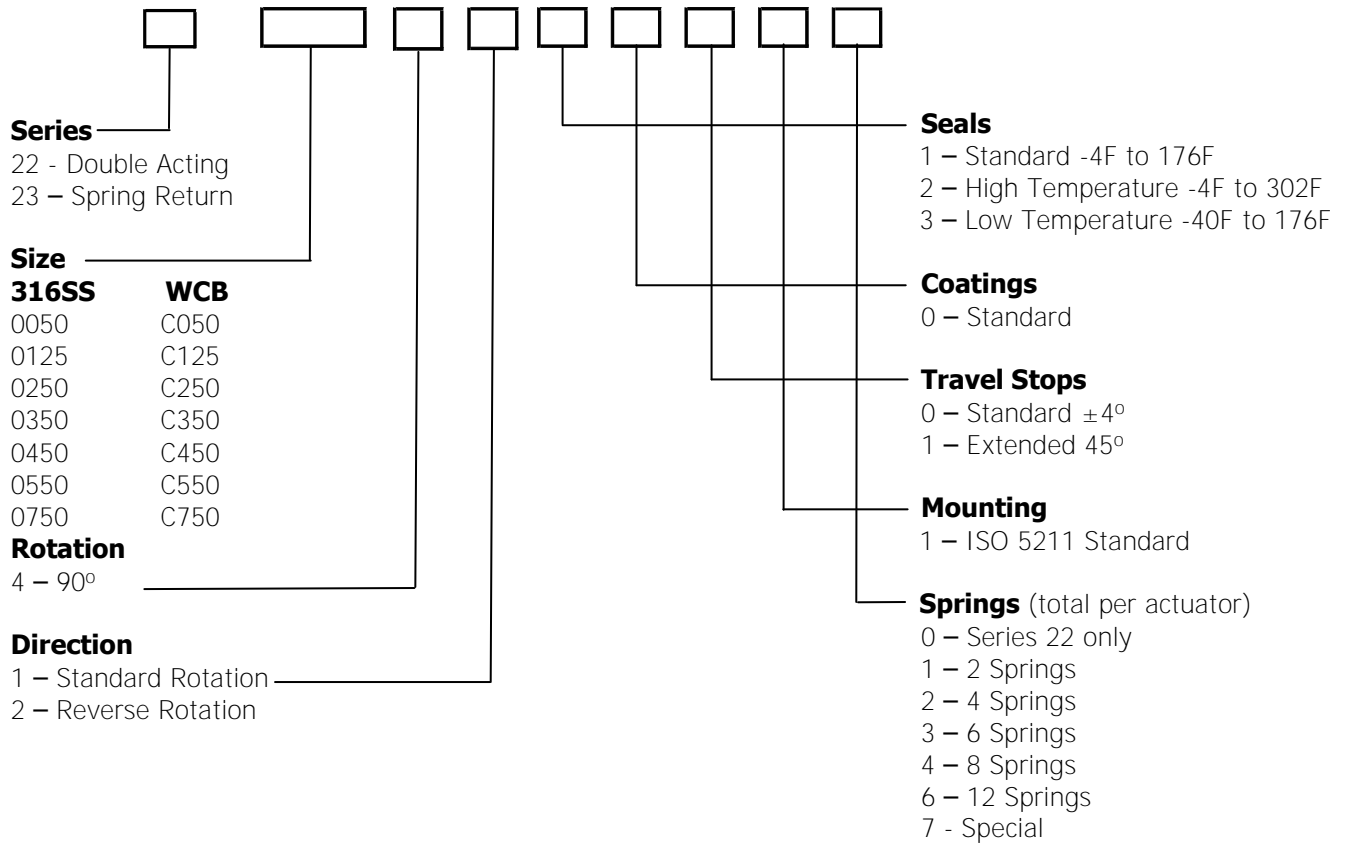
Dimensions are in inches unless otherwise noted. Conversion: 1" = 25.4 mm

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