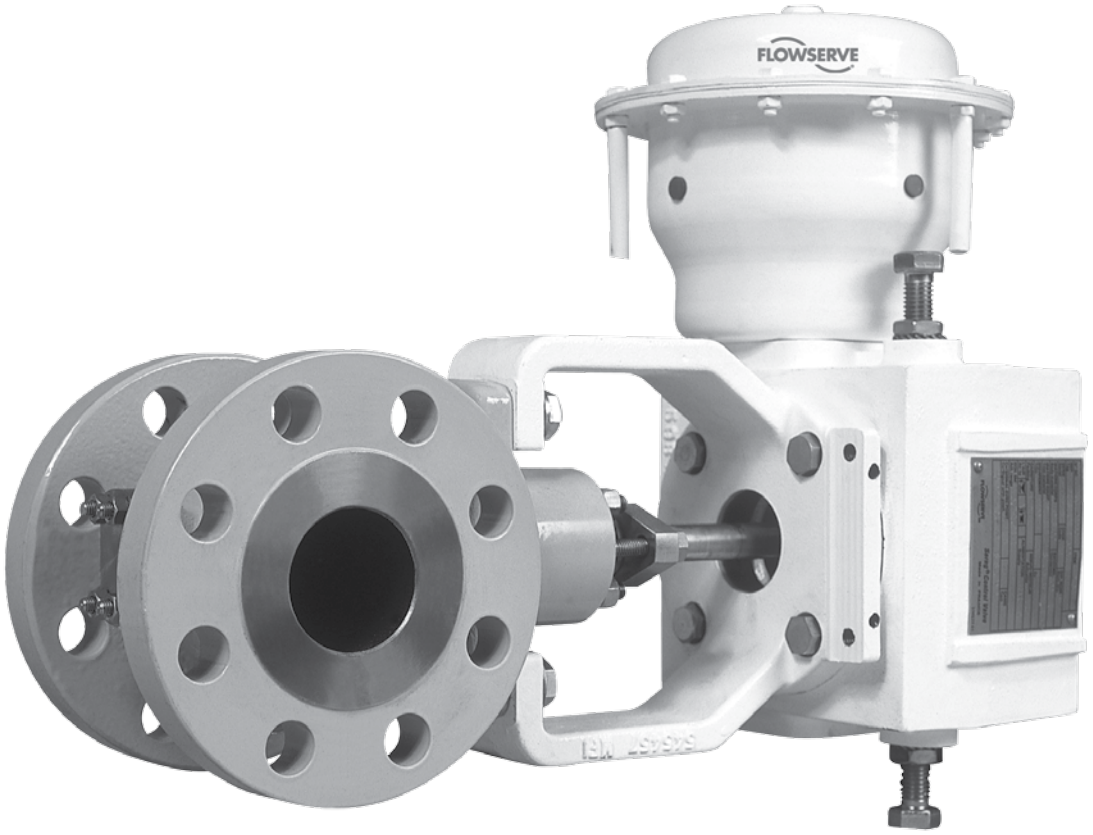
FLOWSERVE

TECHNICAL BULLETIN

MaxFlo 3

High Capacity Eccentric Rotary Plug Control Valve

FCD VLENTB0052-01 – 01/11



Experience In Motion

MaxFlo 3

The MaxFlo 3 offers a high range of precision control over extended life span through enhanced safety.

The Flowserve Valtek® MaxFlo™ 3 is a high performance, safety focused, economical, yet feature rich, Eccentric Rotary Plug control valve for applications demanding higher rangeability, precise control and higher flow capacity.

The MaxFlo 3 valve offers rangeability up to 160:1 - compared to 50:1 for typical globe control valves and 20:1 for most butterfly valves.

A heavy-duty, non-crossover shaft is out of the valve's flow path. This superior design allows higher flow capacity for a given valve size. It also eliminates shaft damage from erosive process fluids. Many competitive designs use a straight-thru shaft which presents an obstruction to the flow, limiting capacity and presenting a target for erosion.

By using a unique four-lobed, polygon drive for torque transmission, the MaxFlo 3 has virtually zero backlash and offers exceptionally precise control over a longer service life, compared to conventional splines or pinned joints.

Because of its higher rangeability and increased flow capacity, the MaxFlo 3 can be smaller in size and dimensional envelope for a given process condition, making it the most economical control valve for many general applications.

A hardened, special martensitic stainless steel plug comes standard on the MaxFlo 3, allowing for higher shut-off pressures while enhancing the valve life, even in demanding applications such as flashing, erosion, mild cavitation, and steam service.

The MaxFlo 3 offers positive, anti-blowout protection by means of a separate bonnet and integral shaft collar, as a standard option, emphasizing its status as the safest Eccentric Rotary Plug valve on the market.

The end-post shaft is designed so there is no possibility for it to be lost downstream. The end-post is rugged, precision machined, perfectly aligned, and positively retained so movement is smooth and precise. The oversized shaft provides improved reliability and valve life by eliminating shaft failures and reducing bearing wear.

Operated by a diaphragm, piston, or rack-and-pinion actuator coupled with a Logix digital positioner, the MaxFlo 3 maintains high positioning accuracy, repeatability, controlled high speed and reliable response. With the advanced diagnostic solutions that can be seamlessly integrated into a host control and/or plant asset management system, along with state-of-the-art features and performance, the MaxFlo 3 is the most economical Eccentric Rotary Plug valve in the market.

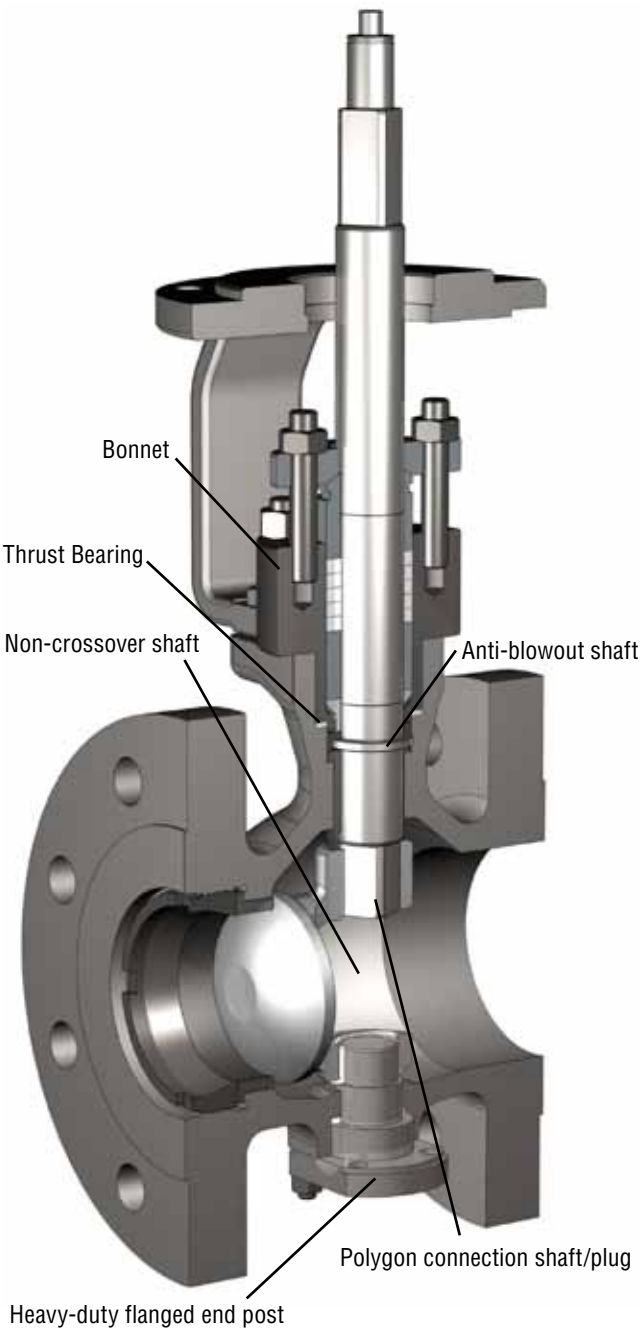


Figure 1: MaxFlo 3 Body Subassembly

MaxFlo 3 Features & Advantages

Features	Advantages
Non-Crossover Shaft	**1. Unobstructed flow when fully open.** **2. Up to 70% greater capacity than other ERP control valves.** **3. Not eroded by process-borne particles.** **4. Pocketless flow-path tolerates slurries, even up to 3% paper stock.**
Eccentric Rotary Plug	1. Plug does not rub seatring. Less wear, less friction, more precision. 2. Stable throttling, low dynamic torque. 3. Stable throttling in either flow direction. 4. Inherently Linear characteristic. =% by positioner. 5. Flow direction assists movement to safety position on air-failure. 6. Robust, rigid seat and plug give increased durability. 7. Tight Shut-off, Class IV (Metal Seat), Class VI (Soft Seat), even after prolonged usage.
High rangeability	Rangeability > 160:1. The valve throttles repeatably all the way to shutoff.
Separate Bonnet and Integral Shaft Collar	A positive anti-blowout as a standard feature, in full compliance with ASME B16.34 Section 6.5.1, ensures that the shaft cannot blow out, even if the actuator is removed.
Heavy-Duty End Post	Robust design for ultimate safety and reliability.
Multiple Body Options	Flanged, Flangeless, and Globe Face-to-Face.
Trim Choices	Full-area, 75/70%, 40%. Flow capacity can be closely matched to the application. Economical and convenient when optimizing flow capacity or changing service conditions.
Rugged Plug Design	Hardened plug as a standard feature gives high performance and long service life.
Multiple packing options	Configurations/materials available for most applications. Fugitive emission options meet EPA, TA-Luft, and ISO requirements.
Optional Noise Reduction Plate	Noise reduction of up to 15dB in compressible services.
Certifications	SIL 3 capable, NACE

Table 1: Specifications

Sizes	1˝ through 12˝, DN 25 through 300
Pressure Classes	ASME Class 150, 300, 600, DN PN 10, 16, 25, 40, 63 (PN 100 on select sizes)
End Connections	Flanged and Flangeless (Sizes 1˝-12˝, DN 25-300)
Face-to-face	ANSI/ISA-75.08.02, EN 558-1/2 Series 36, IEC 60534-3-2 (standard)
	DIN Globe 3202 F1, EN 558-1/2 Series 1
	ANSI/ISA Globe-75.08.01, EN 558-1/2 Series 37-38, IEC 60534-3-1
Trim Area	100% & 40% all sizes, 70% through 6”, 75% 8”-12”.
	Special sizes on application
Packing Options	PTFE V-ring, graphite ribbon, graphite braided.
	Environmental packings for service and regulatory agency requirements
Characteristics	Characterized through positioner.
Operating Temperature	-148ºF to 750°F (-100ºC to 400°C)
Leakage Rates	ANSI/FCI 70-2 Class IV, ANSI/FCI 70-2 Class VI with soft seat

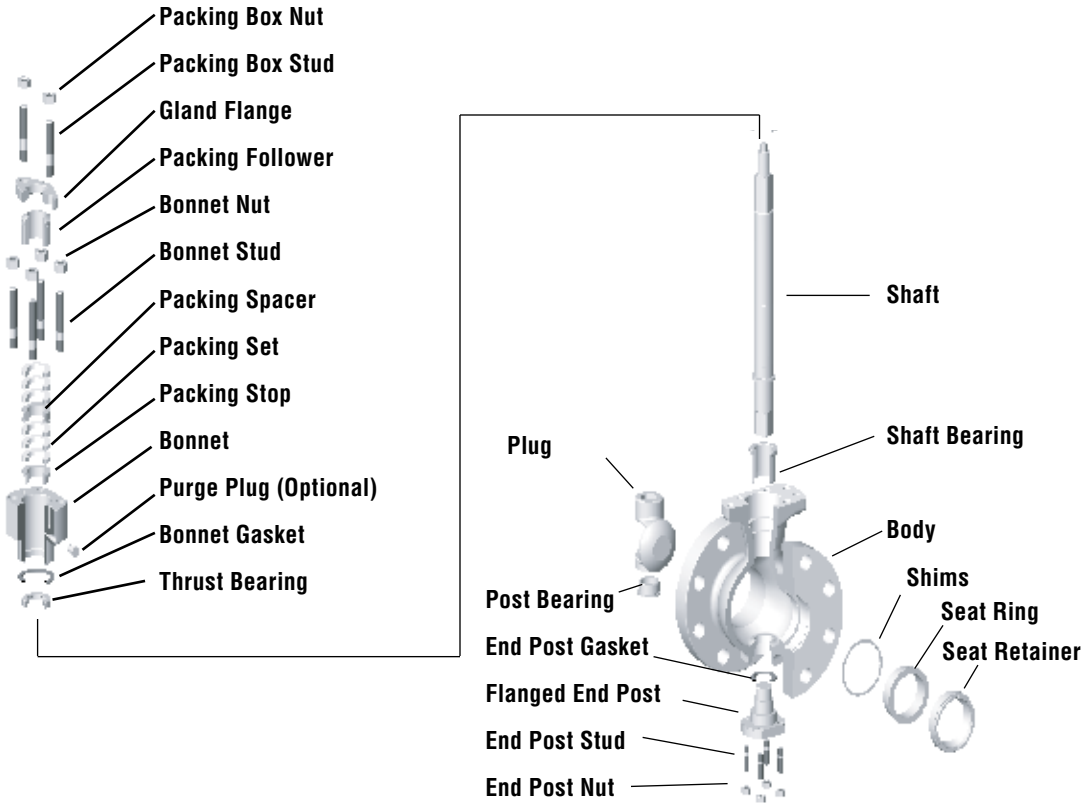
Table 2: Materials of Construction

Temperature Range	-20°F to +750°F (-29°C to +400°C)			-148°F to -29°F (-100°C to -20°C)
Body	CS (A216 WCC / 1.0619)	CS (A216 WCC / 1.0619)	SS (A351 CF8M / 1.4408)	SS (A351 CF8M / 1.4408)
Plug	DIN 1.4418 up to 4", DIN 1.4405 for 6" and larger			316L Stainless Steel with Stellite 6 overlay.
	316L Stainless Steel with Alloy 6 overlay.			
Shaft & End Post	DIN 1.4418/17-4 PH			Nitronic 50 / Inconel 718
Bearings	MBT (10% carbon-loaded TFE, lined metal shell), 440C, UNS S31803, Ultimet, Stellite			MBT (10% carbon-loaded TFE, lined metal shell), UNS S31803, Ultimet, Stellite
	Sealed Bearings available. Consult factory for options.			
Bonnet	A 105/A 216 Gr WCC (1.0619)			A 182 F316/1.4571/A351 CF8M/1.4408
Seat Retainer	Stainless Steel (SS316 for sizes up to 8", SS 410/416 for Sizes 10" & 12")			Stainless steel (SS 316)
Seat Ring	316L Stainless steel			316L Stainless steel
	316L w/ Alloy 6 overlay			316L w/ Alloy 6 overlay
	410/416 HT			
Soft Seat Insert	PTFE, PEEK for high temperature.			
Packing Options	PTFE V-ring, Graphite Ribbon, Graphite Braided, Environmental or Fire-Safe packings for service and Regulatory Agency requirements.			
Packing Spacers & Stops	Stainless Steel			
Gland Bolting	Stainless Steel			
Gaskets	PTFE/Graphite			

Note 1: *For NACE applications, some materials may change. Contact factory for details.*

Note 2: Special alloys are available on request for body and trim parts. Special alloys include, but are not limited to, Hestelloy C, Monel K500, 904L (Uranus B6), Duplex SS, and SS304L. For specific combinations of body and trim materials, consult factory.

Figure 2: Exploded View



Cv (Flow Capacity) Tables

Table 4: MaxFlo 3 Cv at Full Travel (Inherent characteristic is linear)

Flow-to-Close (shaft up)		NR (Diaphragm) Actuator 60 degree travel					NR (Diaphragm) Actuator 80 degree travel			VR or Supernova Actuator 90 degree travel		
Valve Size	Seat	Percent of Full Area				100% (Full Area)	% F/A		100% (Full Area)	% F/A		100% (Full Area)
		15%	20%	40%	70%		40%	70%		40%	70%	
1 (25)	Metal	2*	3*	6.64	11.6	16.6	-	-	20.4	8.41	14.7	21
	Soft Seat	-	-	4.74	6.65	9.65	-	-	11.9	6	8.41	12.2
1.5 (40)	Metal	-	-	15.7	27.5	39.3	-	-	48.4	19.9	35	50
	Soft Seat	-	-	15.7	27.7	33.2	-	-	40.9	19.9	35	42
2 (50)	Metal	-	-	19.1	33.7	61.6	-	-	75.9	24	43	78
	Soft Seat	-	-	19	34	54.6	-	-	67.2	24	43	69
3 (80)	Metal	-	-	75.2	132	169	-	-	208	95	167	214
	Soft Seat	-	-	75.1	132	169	-	-	208	95	167	214
4 (100)	Metal	-	-	119	174	239	-	-	294	150	220	302
	Soft Seat	-	-	119	174	239	-	-	294	150	220	302
6 (150)	Metal	-	-	256	448	577	-	-	711	324	567	730
	Soft Seat	-	-	256	448	577	-	-	711	324	567	730
8 (200)	Metal	-	-	-	670	893	-	-	1100	-	847	1130
	Soft Seat	-	-	-	670	894	-	-	1100	-	847	1130
10 (250)	Metal	-	-	-	1060	1410	-	-	1740	-	1340	1780
	Soft Seat	-	-	-	1060	1410	-	-	1740	-	1340	1780
12 (300)	Metal	-	-	-	1520	2020	-	-	2490	-	1920	2560
	Soft Seat	-	-	-	1520	2020	-	-	2490	-	1920	2560

**Cv 2 and CV 3 have Quick-Open characteristic. Linearize with any Flowserve positioner characterized =%*

Flow-to-Open (shaft down)		NR (Diaphragm) Actuator 60 degree travel					NR (Diaphragm) Actuator 80 degree travel			VR or Supernova Actuator 90 degree travel		
Valve Size	Seat	Percent of Full Area				100% (Full Area)	% F/A		100% (Full Area)	% F/A		100% (Full Area)
		15%	20%	40%	70%		40%	70%		40%	70%	
1 (25)	Metal	2*	3*	6	9.85	14.1	-	-	17.3	7.1	12.5	18
	Soft Seat	-	-	4.74	5.61	8.15	-	-	10	6	7.1	10.3
1.5 (40)	Metal	-	-	14.7	25.8	36.8	-	-	45.4	19	33	47
	Soft Seat	-	-	15	26.1	30.8	-	-	38	19	33	39
2 (50)	Metal	-	-	25.1	40.8	62.8	-	-	77.4	32	52	80
	Soft Seat	-	-	25.3	41.1	56.1	-	-	69.1	32	52	71
3 (80)	Metal	-	-	82.2	144	190	-	-	235	104	182	241
	Soft Seat	-	-	82.2	144	191	-	-	235	104	182	241
4 (100)	Metal	-	-	134	211	320	-	-	394	170	267	405
	Soft Seat	-	-	134	211	320	-	-	394	170	267	405
6 (150)	Metal	-	-	302	528	754	-	-	930	382	669	955
	Soft Seat	-	-	-	529	755	-	-	930	382	669	955
8 (200)	Metal	-	-	-	1010	1340	-	-	1650	-	1280	1700
	Soft Seat	-	-	-	1010	1340	-	-	1650	-	1280	1700
10 (250)	Metal	-	-	-	1480	1980	-	-	2440	-	1880	2500
	Soft Seat	-	-	-	1490	1980	-	-	2440	-	1880	2500
12 (300)	Metal	-	-	-	2130	2840	-	-	4500	-	2700	3600
	Soft Seat	-	-	-	2140	2850	-	-	3510	-	2700	3600

For detailed Cv vs. Position tables visit http://extranet.flowserve.com: Valves > Sizing & Selection > Cv Tables

Also Flowserve Perfornace! sizing software (www.flowserveperfornance.com) provides a Cv table utility.

Pressure Drop Tables

Table 8: Maximum Allowable Shutoff Pressure Drops (bar/psi)

Group	Components & Material	Temperature		Valve Size (in/mm)				
				1 / 25	1.50 / 40	2 / 50	3 / 80	4 / 100
		(ºF)	(ºC)	FTC/FTO bar/psi	FTC/FTO bar/psi	FTC/FTO bar/psi	FTC/FTO bar/psi	FTC/FTO bar/psi
1	Plug: 1.4418 through 8" 1.4405 in 10" or 12" Seat: 316L or 316L + Alloy 6 Bearing: Metal Shaft & Post: 1.4418 Gr660 or 17-4 PH	-20 to 100	-29 to 38	102/1480	102/1480	102/1480	102/1480	90/1305
		200	93	85/1235	85/1235	85/1235	85/1235	85/1235
		300	149	76/1102	76/1102	76/1102	76/1102	76/1102
		400	204	70/1015	70/1015	70/1015	70/1015	70/1015
		500	260	66/951	66/951	66/951	66/951	66/951
		600	316	62/905	62/905	62/905	62/905	62/905
		700	371	60/870	60/870	60/870	60/870	60/870
		750	400	59/853	59/853	59/853	59/853	59/853
2	Plug: F316/CF3M + Alloy 6 Seal: 316L + Alloy 6 Bearing: Metal Shaft & Post: 1.4418 Gr660 or 17-4 PH	-20 to100	-29 to 38	102/1480	102/1480	52/754	52/754	52/754
		200	93	85/1235	85/1235	50/725	44/642	46/667
		300	149	76/1102	76/1102	47/682	40/573	43/624
		400	204	70/1015	70/1015	43/624	36/528	40/580
		500	260	66/951	66/951	39/566	34/495	37/537
		600	316	62/905	62/905	35/508	32/470	33 / 479
		700	371	60/870	60/870	31 / 452	31 / 452	31 / 452
		750	400	59/853	59/853	30/441	31 / 443	31 / 443
3	Plug: F316/CF3M + Alloy 6 Seal: 316L + Alloy 6 Bearing: PTFE Lined Shaft and Post: 1.4418 Gr660 or 17-4 PH	-20 to 100	-29 to 38	102/1480	102/1480	52/754	52/754	52/754
		200	93	82/1189	82/1189	50/725	44/642	41/595
		300	149	65/943	65/943	47/682	40/573	32/464
		400	204	52/754	52/754	41/595	36/528	26/377
4	Plug: 1.4418 through 8" 1.4405 in 10" or 12" Seal: 316L + PTFE Bearing: Metal/PTFE Lined Shaft & Post: 1.4418 Gr660 or 17-4 PH	-20 to 100	-29 to 38	52/754	52/754	52/754	52/754	52/754
		200	93	38/551	38/551	38/551	38/551	38/551
		300	149	23/334	23/334	23/334	23/334	23/334
		400	204	10/145	10/145	10/145	10/145	10/145
5	Plug: F316/CF3M = Alloy 6 Seat: 316L + PTFE Bearing: PTFE Lined Shaft & Post: 1.4418 Gr660 or 17-4 PH	-20 to 100	-29 to 38	52/754	52/754	52/754	52/754	52/754
		200	93	31 / 450	31 / 450	31 / 450	31 / 450	31 / 450
		300	149	17/247	17/247	17/247	17/247	17/247
		400	204	10/145	10/145	10/145	10/145	10/145

Pressure Drop Tables (continued)

Table 9: Maximum Allowable Shutoff Pressure Drops (bar/psi)

Group	Components & Material	Temperature		Valve Size (in/mm)							
				6 / 150		8 / 200		10 / 250		12 / 300	
		(°F)	(°C)	FTC bar/psi	FTO bar/psi	FTC bar/psi	FTO bar/psi	FTC bar/psi	FTO bar/psi	FTC bar/psi	FTO bar/psi
1	Plug: 1.4418 through 8" 1.4405 in 10" or 12" Seat: 316L or 316L + Alloy 6 Bearing: Metal Shaft & Post: 1.4418 Gr660 or 17-4 PH	-20 to 100	-29 to 39	78/1131		46/667	38/544	31 / 450	23/337	31 / 450	20/289
		200	93	78/1131	75/1088	46/667	38/544	31 / 450	23/337	31 / 450	20/289
		300	149	71/1036		45/647	36/528	30/436	23/327	30/436	19/280
		400	204	66/954		43/627	35/511	29/422	22/317	29/422	19/271
		500	260	62/894		42/606	34/495	28/409	21/306	28/409	18/263
		600	316	59/851		40/586	33 / 478	27/395	20/296	27/395	18/254
		700	371	56/818		39/566	32/462	26/381	20/286	26/381	17/245
		750	400	55/801		38/546	31 / 445	25/368	19/276	25/368	16/236
2	Plug: F316/CF3M + Alloy 6 Seat: 316L + Alloy 6 Bearing: Metal Shaft & Post: 1.4418 Gr660 or 17-4 PH	-20 to 100	-29 to 38	42/609		24/348		24/348	23/337	19/276	
		200	93	36/519		20/296		20/296		16/235	
		300	149	32/463		18/264		18/264		14/209	
		400	204	29/426		17/244		17/244		13/193	
		500	260	28/400		16/228		16/228		12/181	
		600	316	26/380		15/217		15/217		12/172	
		700	371	25/365		14/209		14/209		11/165	
		750	400	25/358		14/205		14/205		11/162	
3	Plug: F316/CF3M + Alloy 6 Seat: 316L + Alloy 6 Bearing: PTFE Lined Shaft & Post: 1.4418 Gr660 or 17-4 PH	-20 to 100	-29 to 38	42/609		24/348		24/348	23/333	19/276	16/233
		200	93	36/519		20/296		20/296		16/235	16/228
		300	149	32/463		18/264		18/264		14/209	
		400	2074	26/377		16/232		16/232		13/193	
4	Plug: 1.4418 through 8" 1.4405 in 10" or 12" Seat: 316L + PTFE Bearing: Metal/PTFE Lined Shaft & Post: 1.4418 Gr660 or 17-4 PH	-20 to 100	-29 to 38	52/754		46/667		3¼50	23/337	3¼50	20/289
		200	93	38/551		36/522		25/363	23/337	25/363	20/289
		300	149	23/334		23/334		17/247		17/247	
		400	204	10/145		8/116		10/145		10/145	
5	Plug: F316/CF3M + Alloy 6 Seat: 316L + PTFE Bearing: PTFE Lined Shaft & Post: 1.4418 Gr660 or 17-4 PH	-20 to 100	-29 to 38	42/609		24/348		24/348	23/333	19/276	16/233
		200	93	31 / 450		20/296		20/296		16/235	16/228
		300	149	17/247		17/247		17/247		14/209	
		400	204	10/145		10/145		10/145		10/145	

1. If higher pressure drops are required, contact your Flowserve sales office.

2. Additional material combinations are available. Contact your Flowserve sales office for respective pressure drops.

Note: Values are for combinations shown only. Consult Flowserve for other alloys such as Hastelloy-C, Nickel 500, Duplex, etc. DO NOT EXCEED Pressure/ Temperature limits per ASME B16.34 for body materials.

Note: Allowable pressure drops for other alloys will be evaluated on application.

Dimensions and Weights

Table 10: MaxFlo 3 Face-to-face Dimensions

Valve Size (in./ mm)	(ANSI/ISA-75.08.02, EN 558-1/2 Series 36, IEC 60534-3-2)				(ANSI/ISA-75.08.01, Class 150, EN 558-1/2 Series 37-38, IEC 60534-3-1)				(ANSI/ISA-75.08.01 Class 300, EN 558-1/2 Series 37-38, IEC 60534-3-1)				(DIN 3202 F1, EN 558-1/2 Series 1)			
	A		B		A		B		A		B		A		B	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
1/25	4.02	102	2.01	51	7.25	184	4.76	121	7.75	197	5.16	131	6.30	160	3.74	95
1.5/40	4.49	114	2.24	57	8.75	222	5.83	148	9.25	235	6.22	158	7.87	200	4.96	126
2/50	4.88	124	2.44	62	10.00	254	6.89	175	10.50	267	7.28	185	9.06	230	5.98	152
3/80	6.50	165	3.25	83	11.75	298	7.48	190	12.50	318	8.11	206	12.21	310	8.03	204
4/100	7.64	194	3.82	97	13.88	353	9.17	233	14.50	368	9.49	241	13.78	350	9.17	233
6/150	9.02	229	4.65	118	17.75	451	11.57	294	18.62	473	12.01	305	18.90	480	12.64	321
8/200	9.57	243	5.35	136	21.38	543	15.28	388	22.38	568	15.75	400	23.62	600	16.61	422
10/250	11.69	297	6.22	158	26.50	673	19.88	505	27.88	708	20.55	522	28.74	730	20.98	533
12/300	13.31	338	6.77	172	29.00	737	21.57	548	30.50	775	22.32	567	33.47	850	25.12	638

Figure 3: MaxFlo 3 Face-to-face Options

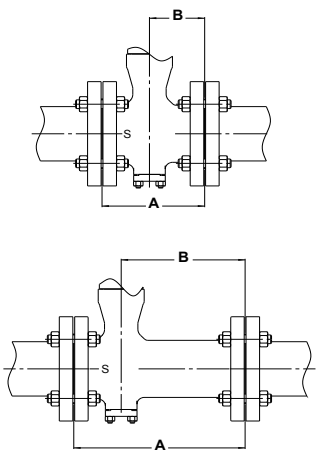


Table 11: Shipping Weights for Body Sub-Assembly (Weights for all class ratings)

S. No	Size	ISA 75.08.01 FF				ISA 75.08.02 FF											
		Flanged				Flanged						Flangeless					
		CL 150		CL 300		CL 150/PN 10 Thru PN 40		CL 300		CL 600/PN 63		CL 150/PN 10 Thru PN 40		Cl 300/PN 40		CL 600/PN 63	
		Kg	Lbs	Kg	Lbs	Kg	Lbs	Kg	Lbs	Kg	Lbs	Kg	Lbs	Kg	Lbs	Kg	Lbs
1	1”	6	14	8	17	5	12	6	14	7	16	5	10	5	10	5	10
2	1.50”	9	19	11	24	7	16	10	21	11	24	6	13	6	14	6	13
3	2”	11	24	12	27	9	19	11	23	12	27	7	15	8	17	9	21
4	3”	20	45	24	53	17	38	21	45	23	51	12	27	15	33	19	41
5	4”	24	53	32	71	19	42	26	58	37	82	14	31	17	37	24	54
6	6”	48	106	65	142	36	79	50	110	74	163	28	62	39	86	50	110
7	8”	70	155	92	204	52	115	71	157	109	240	37	82	52	115	68	151
8	10”	136	300	172	380	105	231	134	295	206	454	86	191	107	235	139	306
9	12”	195	429	243	537	151	333	187	411	252	555	119	262	142	314	177	389

Dimensions and Weights (continued)

Table 12: Diaphragm Actuator Specifications

Type	Single-acting, high-performance
Sizes	NR1, NR2, NR3
Action	Air-to-open, Air-to-close, Fail-in-place
Supply Pressure	60 psig/4 barg* (maximum)
Auxiliary	Push-type handwheel
Stroke	60° and 80°
Spring Ranges	0.2 to 1, 0.7 to 1.9, 1.4 to 2.8 bar, and 1.9 to 3.8 bar

** Some restrictions may apply to certain applications*

Table 12: NR Diaphragm Actuator Shipping Weights

Model	Kg	Lbs
NR1	16	35
NR2	38	85
NR3	88	195

Table 13: Valve Size / NR Diaphragm Actuator Compatibility

Actuator Size	Valve Size (in./mm)									Weight	
	1/25	1.5/40	2/50	3/80	4/100	6/150	8/200	10/250	12/300	Kg	Lbs
NR 1	X	X	X							16	35
NR 2				X	X					38	85
NR 3						X	X	X	X	88	195

Table 14: MaxFlo 3 Dimensions with Diaphragm Actuator

Valve Size (in./ mm)	D		E		E(Max)		F		L		M	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
1/25	12.80	325	3.46	88	8.66	220	2.13	54	9.72	247	5.43	138
1.5/40	13.78	350	3.46	88	8.66	220	2.13	54	9.80	249	5.43	138
2/50	13.86	352	3.46	88	8.66	220	2.13	54	9.80	249	5.43	138
3/80	20.31	516	4.92	125	12.20	310	3.54	90	14.09	358	8.58	218
4/100	20.51	521	4.92	125	12.20	310	3.54	90	14.09	358	8.58	218
6/150	25.71	653	6.42	163	17.72	450	4.25	108	19.53	496	12.28	312
8/200	26.14	664	6.42	163	17.72	450	4.25	108	19.53	496	12.28	312
10/250	28.86	733	6.42	163	17.72	450	4.25	108	19.72	501	12.28	312
12/300	29.84	758	6.42	163	17.72	450	4.25	108	19.72	501	12.28	312

For face-to-face dimensions, see Table 14.

All dimensions are to be used for estimation only. Certified drawings will be supplied upon request.

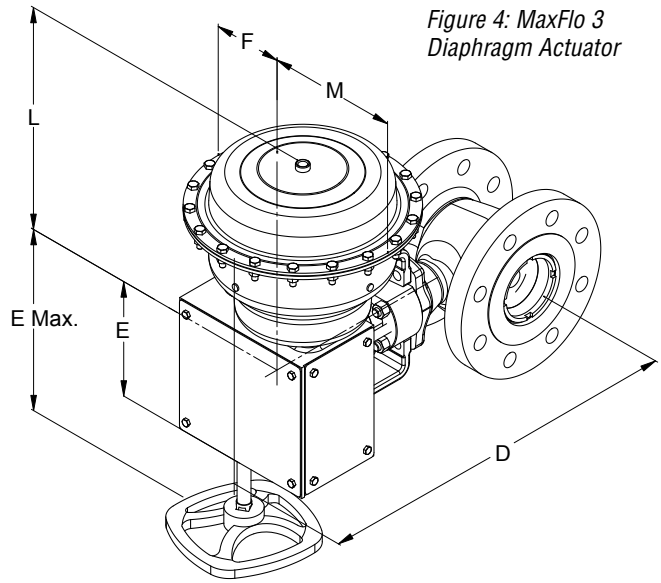


Figure 4: MaxFlo 3 Diaphragm Actuator

Dimensions and Weights (continued)

Table 15: Cylinder Actuator Specifications

Type	Double-acting, cylinder with fail-safe spring action
Sizes	25, 50, 100, 200
Action	Air-to-open, Air-to-close, Fail-in-place
Supply Pressure	150 psig/10.3 barg* (maximum)
Auxiliary	Declutchable side-mounted; manual gear operated; handlever
Stroke	90°
Springs	Standard, extended (sizes 25 & 50), dual sizes (100 & 200)

** Some restrictions may apply to certain applications*

Table 16: VR Cylinder Actuator Shipping Weights

Model	Kg	Lbs
25	16	35
50	33	73
100	73	161
200	120	265

Table 17: Valve Size / VR Cylinder Actuator Compatibility

Actuator Size (in^2)	Spring Type	Valve Size (in./mm)									Weights	
		1/25	1.5/40	2/50	3/80	4/100	6/150	8/200	10/250	12/300	Kg	Lbs
25	STD	X	X	X	X	X					16	35
25	EXTD	X	X	X	X	X						
50	STD				X	X	X	X	X		33	73
50	EXTD				X	X	X	X	X			
100	STD						X	X	X		73	161
100	DUAL						X	X	X	X		
200	STD						X	X	X	X	120	265
200	DUAL						X	X	X	X		

Figure 5: MaxFlo 3 Spring Cylinder Actuator

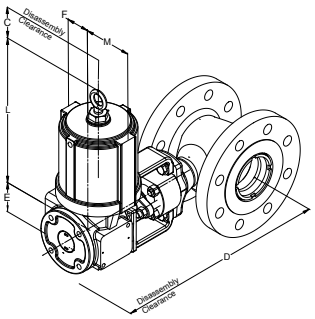


Table 18: MaxFlo 3 Dimensions (Spring Cylinder Actuator)

Valve Size (in./ mm)	Actuator Size	Shaft Size		C		D		E		F		L		M	
		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
1/25	25	0.4	11	6.0	152	20.0	510	5.6	142	2.2	56	13.1	332	4.3	109
1.5/40	25	0.6	16	6.0	152	21.0	535	5.6	142	2.2	56	13.1	332	4.3	109
2/50	25	0.6	16	6.0	152	21.0	535	5.6	142	2.2	56	13.1	332	4.3	109
2/50	50	0.6	16	8.0	203	21.0	535	6.7	170	2.5	64	18.0	457	6.6	168
3/80	25	0.9	23	6.0	152	25.0	635	5.6	142	2.2	56	13.1	332	4.3	109
3/80	50	0.9	23	8.0	203	25.0	635	6.7	170	2.5	64	18.0	457	6.6	168
4/100	25	0.9	23	6.0	152	26.0	661	5.6	142	3.9	99	13.1	332	8.7	221
4/100	50	0.9	23	8.0	203	26.0	661	6.7	170	2.5	64	18.0	457	6.6	168
6/150	50	1.0	26	8.0	203	27.0	680	6.7	170	2.5	64	18.0	457	6.6	168
6/150	100	1.5	38	11.0	279	29.0	722	9.1	231	3.9	99	22.6	574	8.7	221
8/200	50	1.0	26	8.0	203	27.0	685	6.7	170	2.5	64	18.0	457	6.6	168
8/200	100	1.5	38	11.0	279	29.0	733	9.1	231	3.9	99	22.6	574	8.7	221
10/250	50	1.0	26	8.0	203	30.0	751	6.7	170	2.5	64	18.0	457	6.6	168
10/250	100	1.5	38	11.0	279	32.0	802	9.1	231	3.9	99	22.6	576	8.7	221
12/300	100	1.5	38	11.0	279	33.0	827	9.1	231	3.9	99	22.6	576	8.7	221

For face-to-face dimensions, see Table 14.

All dimensions are to be used for estimation only. Certified drawings will be supplied up request.

Dimensions and Weights (continued)

Table 19: SuperNova Actuator Specifications

Type	Single-acting spring-return, double-acting
Sizes	B063, B085, B100, B115, B125, B150, B175, B200, SNA 250, SNA 300
Action	Air-to-open, air-to-close, fail-in-place
Supply Pressure	100 psig/6.9 barg* (maximum) single-acting
	150 psig/10.34 barg (maximum) double-acting
Auxiliary	Declutchable handwheel
Stroke	90°
Springs	5 to 12 springs available

** Some restrictions may apply to certain applications*

Table 20: Valve Size / SuperNova Actuator Compatibility

Actuator Size	Valve Size (in./mm)									Weight
	1/25	1.5/40	2/50	3/80	4/100	6/150	8/200	10/250	12/300	Kg/Lb
B063	X	X	X	X						2/4.4
B085	X	X	X	X						4.2/9.3
B100	X	X	X	X	X	X				6.6/14.6
B115	X	X	X	X	X	X				10.2/22.5
B125	X	X	X	X	X	X	X	X	X	13.7/30.2
B150	X	X	X	X	X	X	X	X	X	23.2/51.2
B175				X	X	X	X	X	X	35/77.2
B200					X	X	X	X	X	53/118

Table 21: SuperNova Actuator Shipping Weights

Model	1"		1.50"		2"		3"		4"		6"		8"		10"		12"	
	Kg	Lbs	Kg	Lbs	Kg	Lbs	Kg	Lbs	Kg	Lbs	Kg	Lbs	Kg	Lbs	Kg	Lbs	Kg	Lbs
B063	5	10	5	10	5	10												
B085	8	17	8	17	8	17	8	19	8	19								
B100	10	22	10	22	10	22	11	24	11	24								
B115	17	37	17	37	17	37	17	38	17	38	19	41	19	41				
B125	21	45	21	45	21	45	21	45	21	45	22	49	22	49	26	57	26	57
B150	30	67	30	67	30	67	30	67	30	67	29	64	30	66	32	71	32	71
B175							43	94	43	94	48	106	48	106	50	110	50	110
B200							61	135	61	135	67	147	67	147	69	152	69	152

Dimensions and Weights (continued)

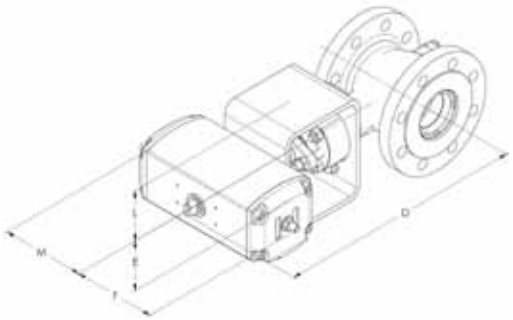
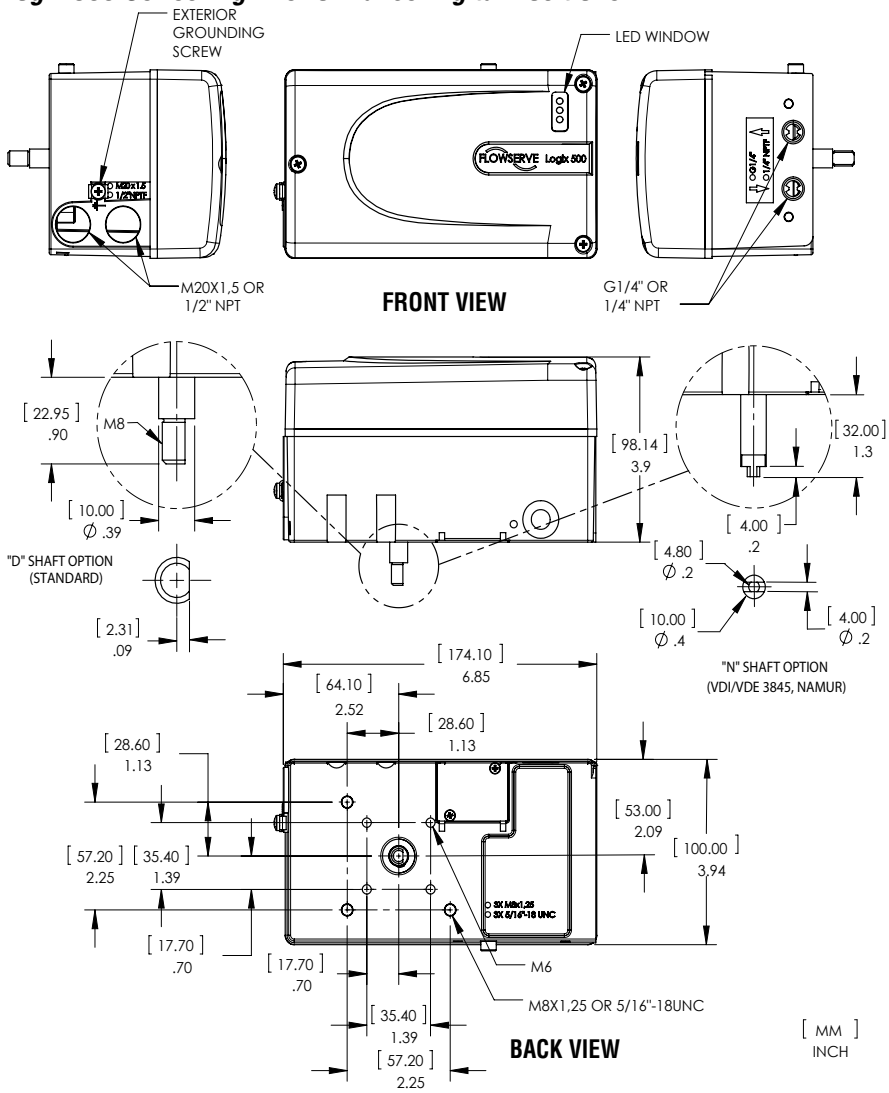


Table 22: MaxFlo 3 Dimensions (Supernova Actuator)

Model	Size	D		E		F		L		M	
		in.	mm	in.	mm	in.	mm.	in.	mm.	in.	mm
B063	1”	12.0	304	3.5	89	4.0	101	3.5	89	4.0	101
	1.5”	12.6	320	3.5	89	4.0	101	3.5	89	4.0	101
	2”	12.7	322	3.5	89	4.0	101	3.5	89	4.0	101
B085	1”	12.9	328	3.5	89	4.9	125	3.5	89	4.9	125
	1.5”	13.6	344	3.5	89	4.9	125	3.5	89	4.9	125
	2”	13.6	346	3.5	89	4.9	125	3.5	89	4.9	125
	3”	16.6	423	4	102	4.9	125	4	102	4.9	125
	4”	16.8	428	4	102	4.9	125	4	102	4.9	125
B100	1”	13.6	345	3.5	89	11.7	296	3.5	89	11.7	296
	1.5”	14.5	361	3.5	89	11.7	296	3.5	89	11.7	296
	2”	14.3	363	3.5	89	11.7	296	3.5	89	11.7	296
	3”	17.3	439	4	102	11.7	296	4	102	11.7	296
	4”	17.5	444	4	102	11.7	296	4	102	11.7	296
	6”	23.5	597	5	127	11.7	296	5	127	11.7	296
B115	1”	14.5	368	3.5	89	6.7	171	3.5	89	6.7	171
	1.5”	15.1	384	3.5	89	6.7	171	3.5	89	6.7	171
	2”	15.2	386	3.5	89	6.7	171	3.5	89	6.7	171
	3”	20.2	513	4	102	6.7	171	4	102	6.7	171
	4”	20.4	518	4	102	6.7	171	4	102	6.7	171
	6”	24.4	620	5	127	6.7	171	5	127	6.7	171
B125	1”	15.0	380	3.5	89	7.9	201	3.5	89	7.9	201
	1.5”	15.6	396	3.5	89	7.9	201	3.5	89	7.9	201
	2”	15.7	398	3.5	89	7.9	201	3.5	89	7.9	201
	3”	20.7	525	4	102	7.9	201	4	102	7.9	201
	4”	20.9	530	4	102	7.9	201	4	102	7.9	201
	6”	24.9	632	5	127	7.9	201	5	127	7.9	201
	8”	25.3	643	5	127	7.9	201	5	127	7.9	201
	10”	27.2	690	5	127	7.9	201	5	127	7.9	201
	12”	28.2	715	5	127	7.9	201	5	127	7.9	201
B150	1”	16.0	407	3.5	89	9.6	243	3.5	89	9.6	243
	1.5”	16.7	423	3.5	89	9.6	243	3.5	89	9.6	243
	2”	16.7	425	3.5	89	9.6	243	3.5	89	9.6	243
	3”	21.7	552	4	102	9.6	243	4	102	9.6	243
	4”	21.9	557	4	102	9.6	243	4	102	9.6	243
	6”	24.6	626	4.3	110	9.6	243	4.3	110	9.6	243
	8”	26.4	670	5	127	9.6	243	5	127	9.6	243
	10”	28.2	717	5	127	9.6	243	5	127	9.6	243
	12”	29.2	742	5	127	9.6	243	5	127	9.6	243
B175	3”	23.1	587	4.2	106	10.7	271	4	102	10.7	271
	4”	23.3	592	4.2	106	10.7	271	4	102	10.7	271
	6”	27.3	694	5	127	10.7	271	5	127	10.7	271
	8”	27.7	705	5	127	10.7	271	5	127	10.7	271
	10”	29.6	752	5	127	10.7	271	5	127	10.7	271
	12”	30.6	777	5	127	10.7	271	5	127	10.7	271
B200	4”	24.5	622	4.7	120	12.2	310	4.3	108	12.2	310
	6”	28.5	723	5	127	12.2	310	5	127	12.2	310
	8”	28.9	734	5	127	12.2	310	5	127	12.2	310
	10”	30.8	781	5	127	12.2	310	5	127	12.2	310
	12”	31.8	806	5	127	12.2	310	5	127	12.2	310

Dimensions and Specifications

Logix 500 Series High Performance Digital Positioner



Input Signal	
Input Signal	4-20 mA HART
Compliance Voltage	10 VDC
Voltage Supply	30 VDC
Minimum Required Operating Current	3.6 mA

Stroke Output	
Feedback Shaft Rotation	min. 15⁰, max 90⁰, 40⁰ recommended for linear applications

Output Signal	
Output Pressure Range	0 to 100% of air supply pressure
Output Flow Capacity	2.4 Nm³/h @ 1.5 bar (1.41 SCFM @ 22 psi) 7.0 Nm³/h @ 6.0 bar (4.12 SCFM @ 87 psi)

Shipping Weights	
Base Positioner without Accessories	1.2 kg (2.65 lbs)

Performance Characteristics (typical)	
Linearity	< +/- 1.0%
Resolution	< 0.1%
Repeatability	< 0.2%
Deadband	< 0.2%

Air Supply	
Air Supply Quality	free from moisture, oil and dust per IEC 770 and ISA-7.0.01
Input Pressure Range	1.6 to 6.0 bar (22 to 87 psi)
Air Consumption (steady state)	0.08 Nm³/h @ 1.5 bar (0.047 SCFM @ 22 psi) 0.12 Nm³/h @ 6.0 bar (0.071 SCFM @ 87 psi)

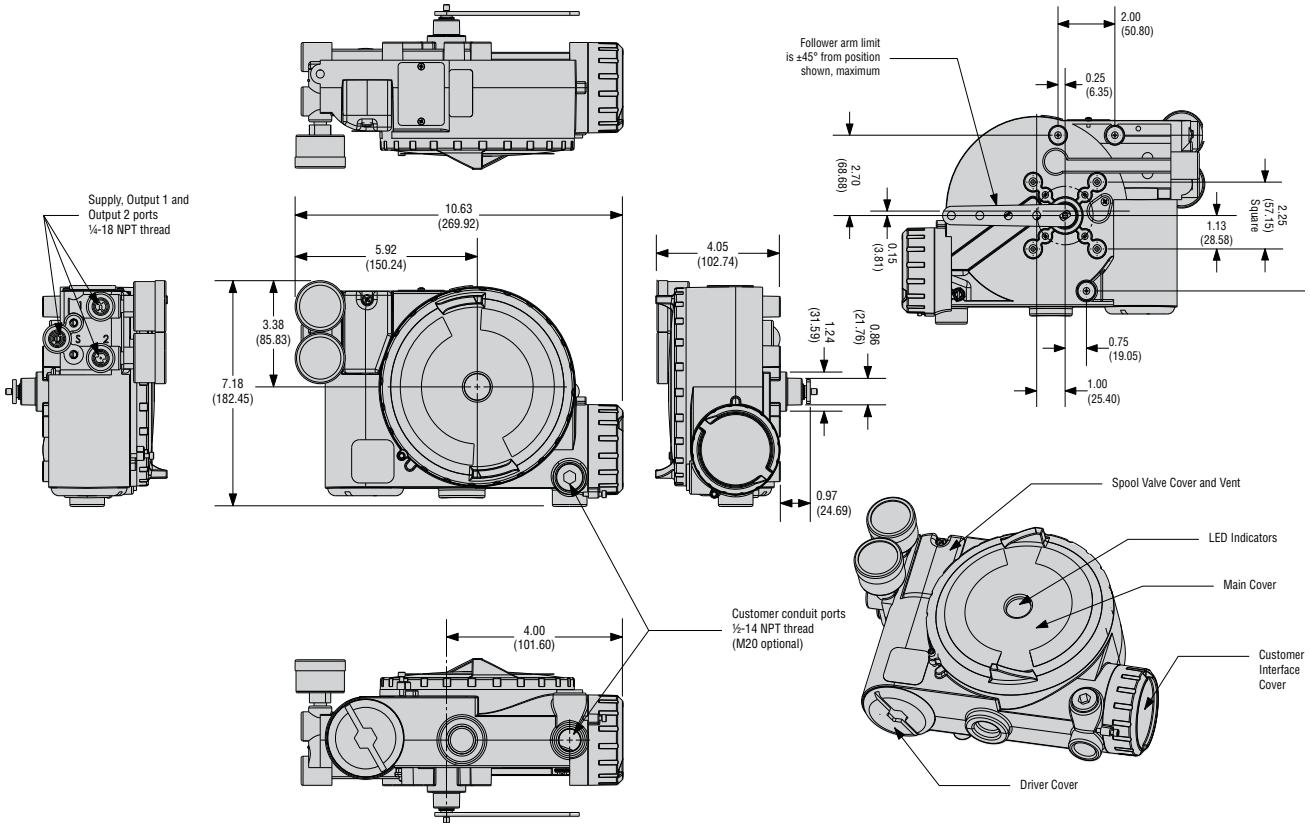
Environmental Conditions	
Operating Temperature	-40⁰C to +80⁰C (-40⁰F to +178⁰F)
Transport and Storage Temperature	-40⁰C to +80⁰C (-40⁰F to +178⁰F)
Operating Humidity	0 to 100% non-condensating

Limit Switches (optional)	
Type	**P&F SJ2-S1N**
Load current	< 1 mA < 3 mA
Voltage range	5 - 25 VDC
Hysteresis	0.2%
Temperature	-25⁰C to 100⁰C (-13⁰F to 212⁰
Type	**P&F SJ2-SN**
Load Current	< 1 mA < 3 mA
Voltage Range	5 - 25 VDC
Hysteresis	0.2%
Temperature	-40⁰C to 100⁰ C (-40⁰F to 212⁰F)
Type	**P&F SJ2-N**
Load Current	< 1 mA < 3 mA
Voltage Range	5 - 25 VDC
Hysteresis	0.2%
Temperature	-25⁰C to 100⁰C (-13⁰F to 212⁰F)

Dimensions and Specifications

Logix 3000MD Series High Performance Digital Positioner

NOTE: Dimensions in inches (mm)



Electrical Specifications Logix 3200MD	
Power Supply	Two-wire, 4-20 mA 10.0 to 30.0 VDC
Compliance Voltage	10.0 VDC @ 20 mA
Effective Resistance	495 Ω @ 20 mA Typical Add 20 Ω when HART communication active
Communications	HART Protocol ITK 5,6
Minimum Operating Current	3.6 mA without AO board 3.7 mA with AO board
Maximum Voltage	30.0 VDC

Environmental Conditions Logix 3200MD		
Operating Temperature Range	Standard	-4° to 176°F (-20° to 80°C)
	Low	-40° to 176°F (-40° to 80°C)
Transport and Storage Temperature Range	-40° to 176°F (-40° to 80°C)	
Operating Humidity	0 - 100% non-condensing	

Note: The air supply must conform to ISA Standard ISA 7.0.01 (a dew point at least 18 degrees Fahrenheit below ambient temperature, particle size below five microns—one micron recommended—and oil content not to exceed one part per million).

Electrical Specifications Logix 3400MD	
Power Supply	Two-wire, 9-32 VDC FF compatible
IS	Fisco compliant
Communications	FF Protocol ITK 4.6x, 5.0
Operating Current	23 mA
Maximum Voltage	36.0 VDC

Environmental Conditions Logix 3400MD		
Operating Temperature Range	Standard	-40° to 176°F (-40° to 80°C)
Transport and Storage Temperature Range	-40° to 176°F (-40° to 80°C)	
Operating Humidity	0 - 100% non-condensing	

Note: The air supply must conform to ISA Standard ISA 7.0.01 (a dew point at least 18 degrees Fahrenheit below ambient temperature, particle size below five microns—one micron recommended—and oil content not to exceed one part per million).

Table 23: MaxFlo 3 Pipe Mounting Orientation Codes

3 - Air Action		4 - Pipe Configuration		5 - Actuator Orientation		6 - Shaft Direction	
O	Air-to-open - ATO	**L**	Left Hand Mounting	**T**	Top (Default)	**D**	Shaft Downstream (Default)
C	Air-to-close - ATC	**R**	Right Hand Mounting	**R**	Right	**U**	Shaft Upstream
		D	Flow Down	**L**	Left		
		U	Flow Up	**B**	Bottom*		
				P	Supernova: Parallel		
				X	Supernova: Cross-Pipe		

AT				
	3	**4**	**5**	**6**

** Not available on diaphragm actuators*

Table 24: MaxFlo 3 Mounting Orientations – Diaphragm Actuator

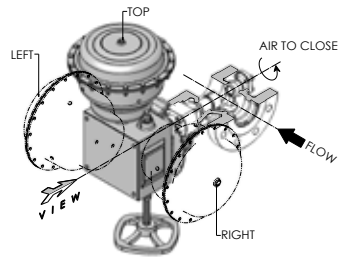
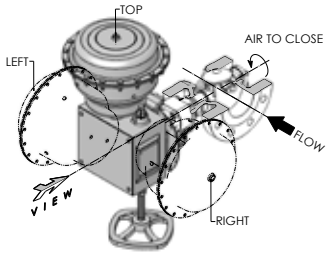
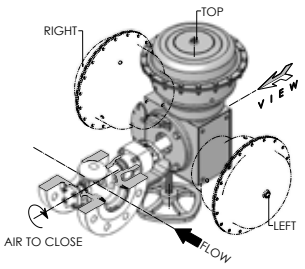
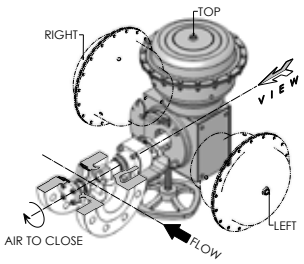
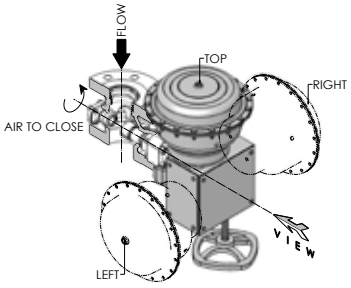
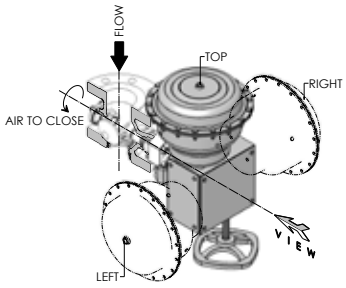
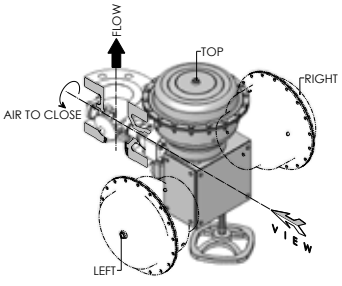
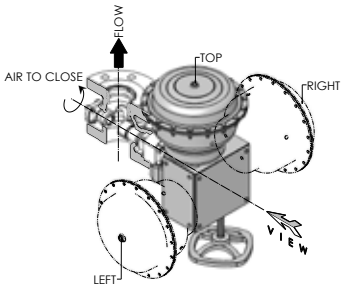
AIR-TO-CLOSE, FAIL OPEN CONFIGURATION			
	Flow-to-Open (Shaft Downstream)	**Flow-to-Close (Shaft Upstream)**	
HORIZONTAL FLOW			**LEFT HAND PIPE MOUNTING**
			**RIGHT HAND PIPE MOUNTING**
VERTICAL FLOW			**FLOW DOWN**
			**FLOW UP**

Table 25: MaxFlo 3 Mounting Orientations - Diaphragm Actuator

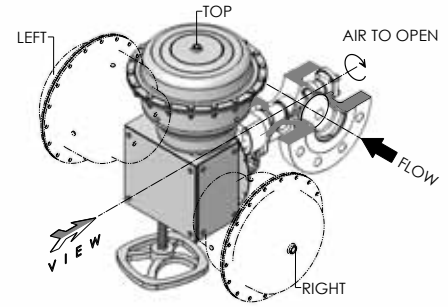
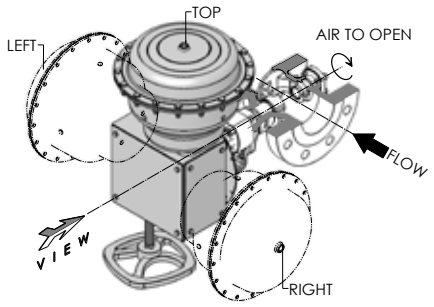
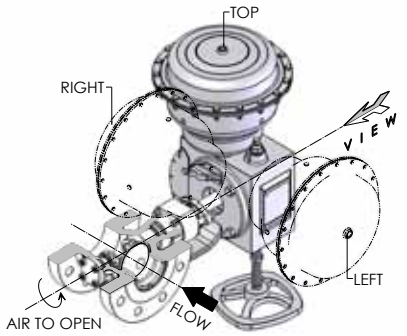
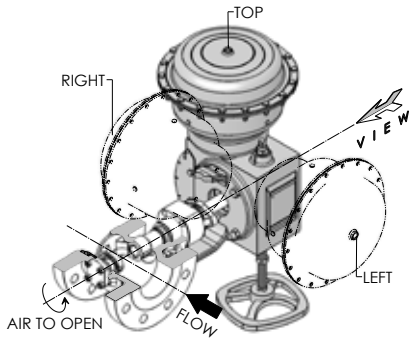
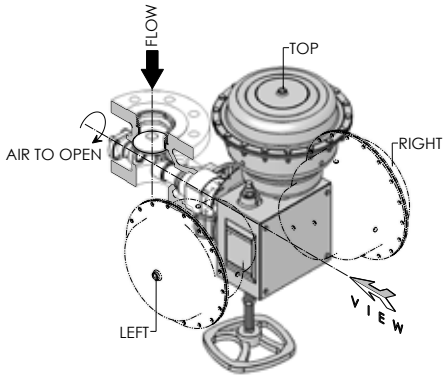
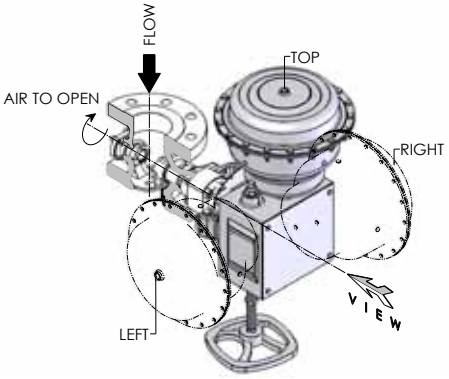
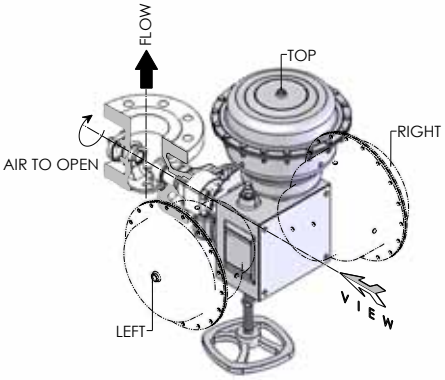
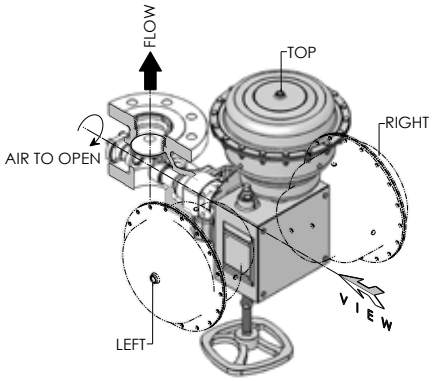
AIR-TO-OPEN, FAIL CLOSE CONFIGURATION			
	Flow-to-Open (Shaft Downstream)	Flow-to-Close (Shaft Upstream)	
HORIZONTAL FLOW			LEFT HAND PIPE MOUNTING
			RIGHT HAND PIPE MOUNTING
VERTICAL FLOW			FLOW DOWN
			FLOW UP

Table 26: MaxFlo 3 Mounting Orientations - Cylinder Actuator

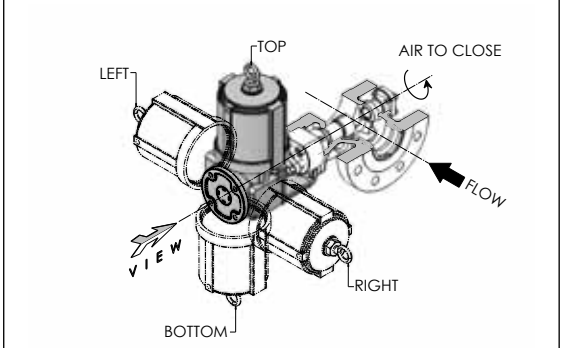
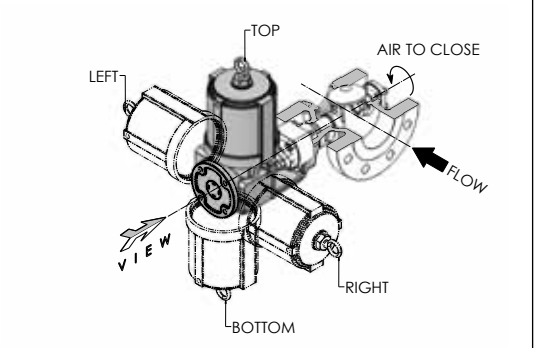
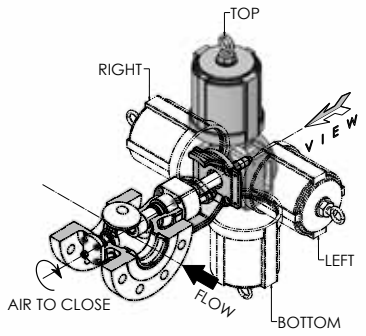
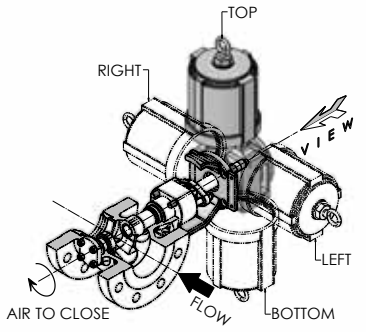
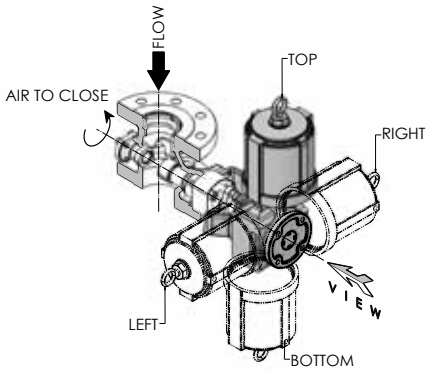
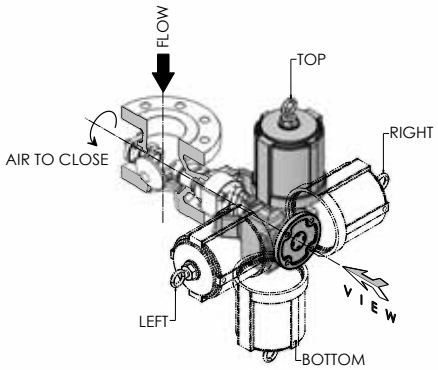
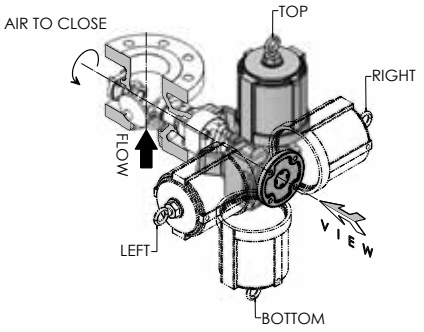
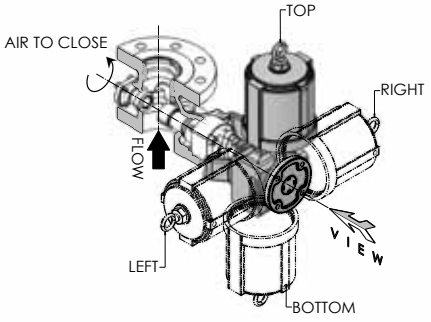
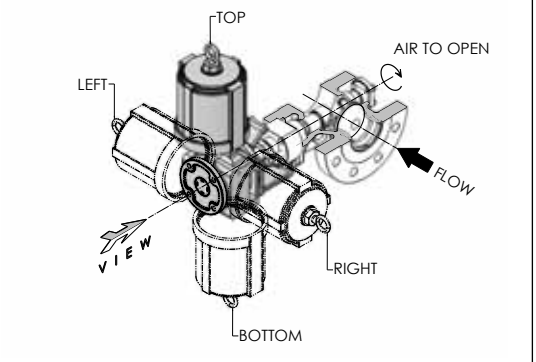
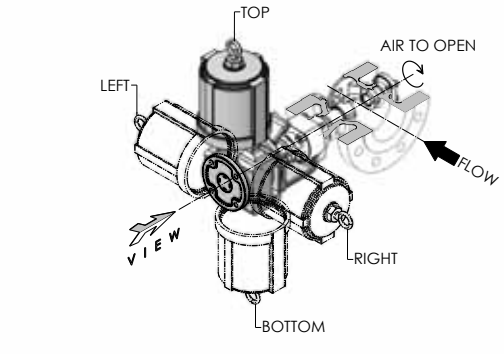
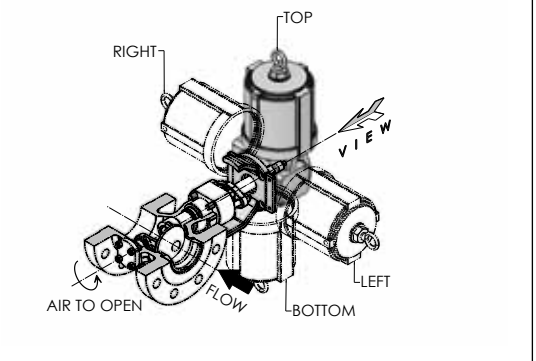
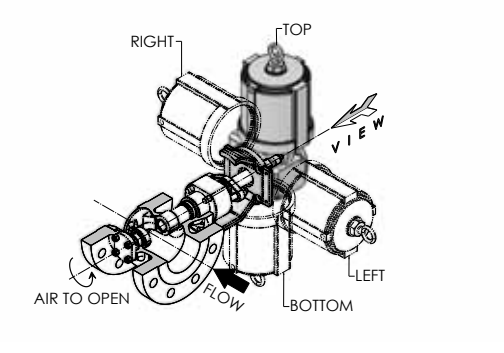
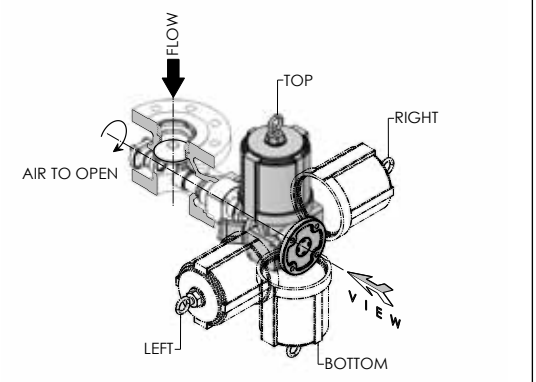
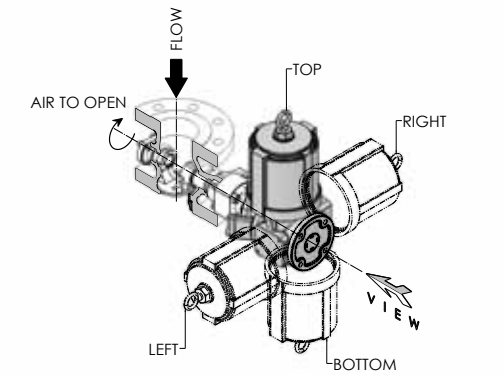
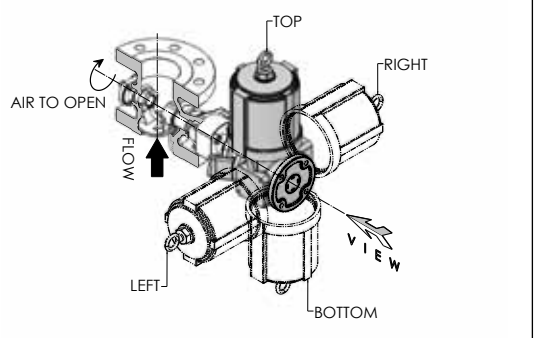
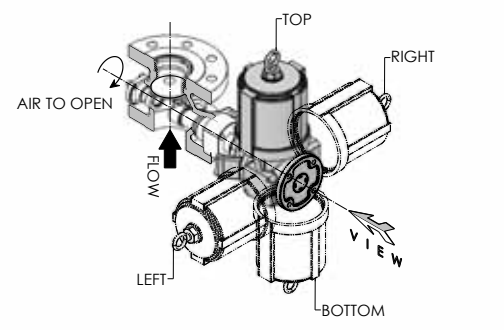
AIR-TO-CLOSE, FAIL OPEN CONFIGURATION			
	Flow-to-Open (Shaft Downstream)	Flow-to-Close (Shaft Upstream)	
HORIZONTAL FLOW			LEFT HAND PIPE MOUNTING
			RIGHT HAND PIPE MOUNTING
VERTICAL FLOW			FLOW DOWN
			FLOW UP

Table 27: MaxFlo 3 Mounting Orientations - Cylinder Actuator

AIR-TO-OPEN, FAIL CLOSE CONFIGURATION			
	Flow-to-Open (Shaft Downstream)	**Flow-to-Close (Shaft Upstream)**	
HORIZONTAL FLOW			**LEFT HAND PIPE MOUNTING**
			**RIGHT HAND PIPE MOUNTING**
VERTICAL FLOW			**FLOW DOWN**
			**FLOW UP**

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