FLOWSERVE

TECHNICAL BULLETIN

Valtek FlowTop Control Valve

FCD VLENTB0060 – 11/09 (Replaces FCD-VLATB060)

Experience In Motion

Body Assembly

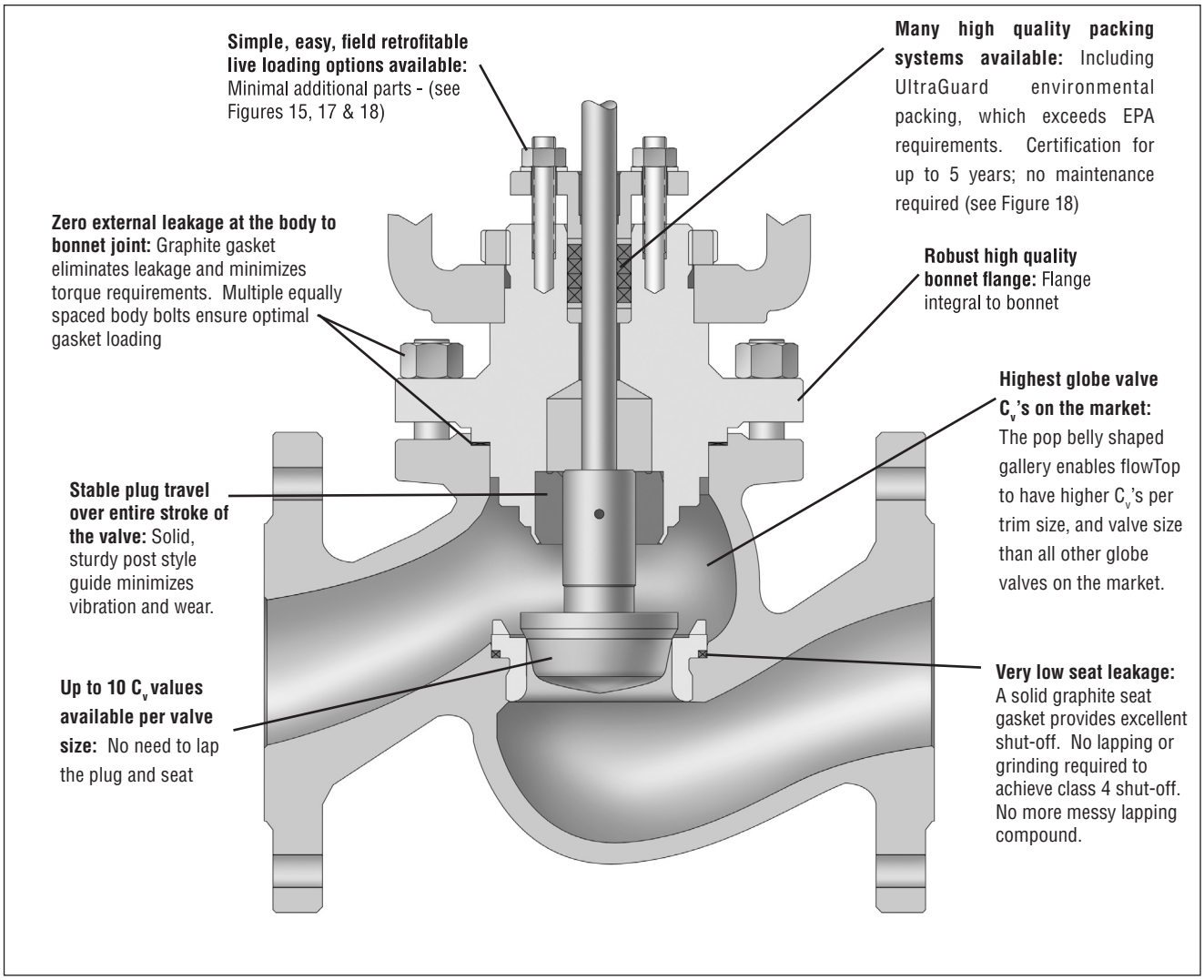

Figure 1: FlowTop Control Valve Body Assembly

The FlowTop control valve is a high-performance, general service valve coupled with the high thrust FlowAct pneumatic diaphragm actuator.

The Logix 500 positioner is mounted standard on FlowTop control valves. The Logix 500 simplifies and reduces calibration time to 20 seconds or less by pushing two buttons. The easily installed HART compatible positioner make the FlowTop/Logix 500 combination the best choice for general service valve applications. There is no need for additional software or software support and upgrades. Handheld devices are not needed to calibrate this valve, making it the highest performing, low cost solution for general service valves.

The Pop-belly shaped gallery give the FlowTop more C than all the other globe valves on the market.

Designed for use in ANSI Class 150 or 300 service applications, the FlowTop control valve is capable of operating within temperatures ranging from -50^0 to 800^0 F (-46^0 to 427^0 C).

The FlowTop control valve is available in sizes 0.5 to 4 inches with a carbon steel or stainless steel body. It features flow under, single seated trim with a post-guided valve stem to eliminate cage guiding problems.

Heavy duty parts constructed of corrosion resistant materials provide extended valve life.

Actuator Assembly

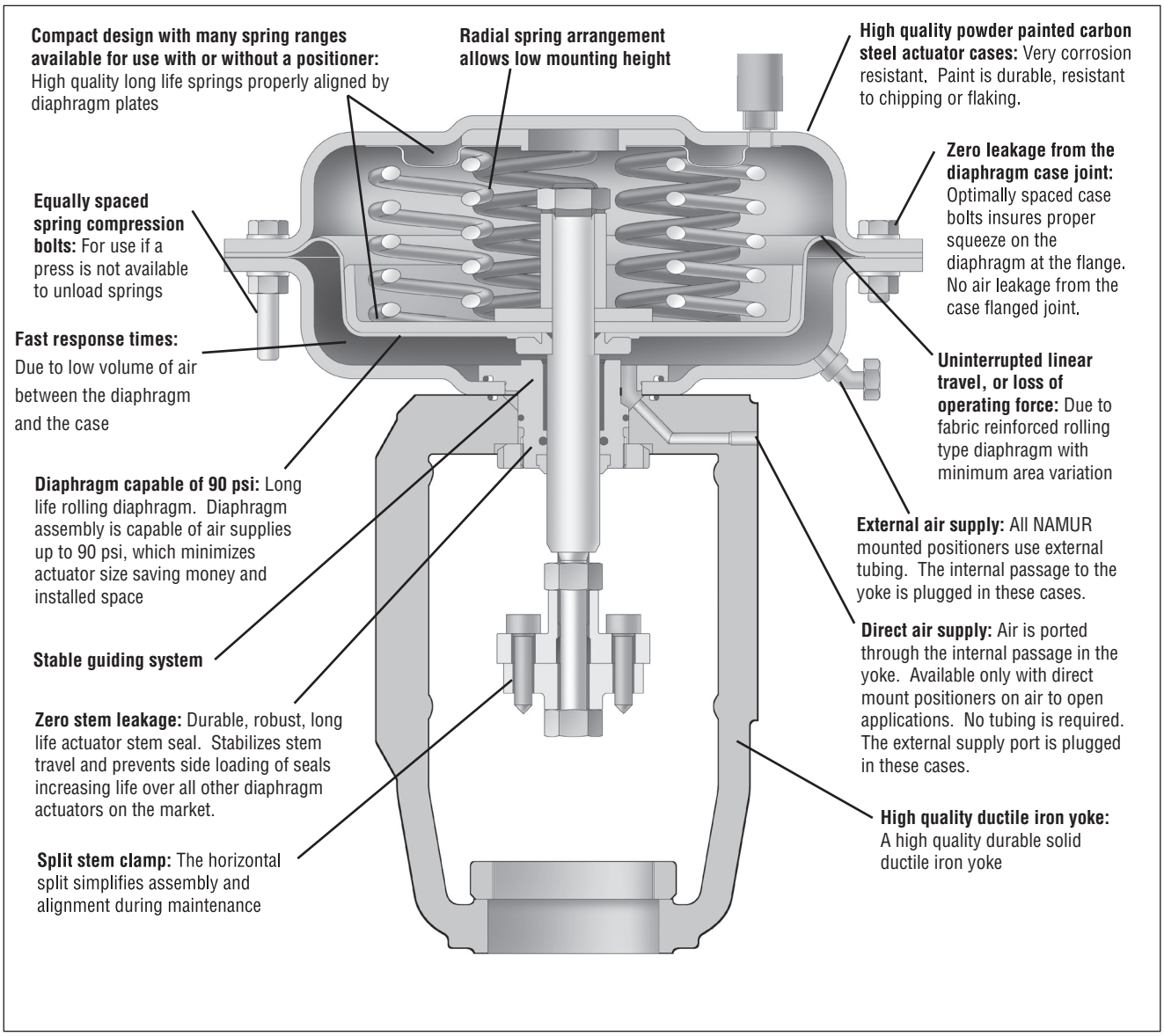

Figure 2: FlowAct 252 ATO/FC Diaphragm Actuator

The FlowAct actuator is compact, reversible and capable of accepting air supply pressures up to 90 psi (6.0 bar) allowing the valve to shutoff against high pressure drops.

The FlowTop actuator comes standard with a direct mounted Logix 500 positioner. In all “air to open” applications, no external tubing is required. The direct mount positioner ports air through passages integral to the yoke as illustrated in Figure 2. When the direct mounted positioner is used, the external supply port is plugged. “Air to close” applications require external tubing to the top of the actuator. NAMUR positioner mounting is also very simple and easy with FlowTop (IEC 534.6). When this mounting standard is used, the internal passageway in the yoke is plugged and external tubing is used.

The pneumatic diaphragm actuator can operate in temperatures ranging from -40^0 to 176^0 F (-40^0 to 80^{0}C).

Analog or digital positioners ensure high positioner accuracy proportional to the valve instrument signal.

The FlowTop control valve with the pneumatic diaphragm actuator is the solution for most typical general service valve applications.

Body and Actuator Assembly

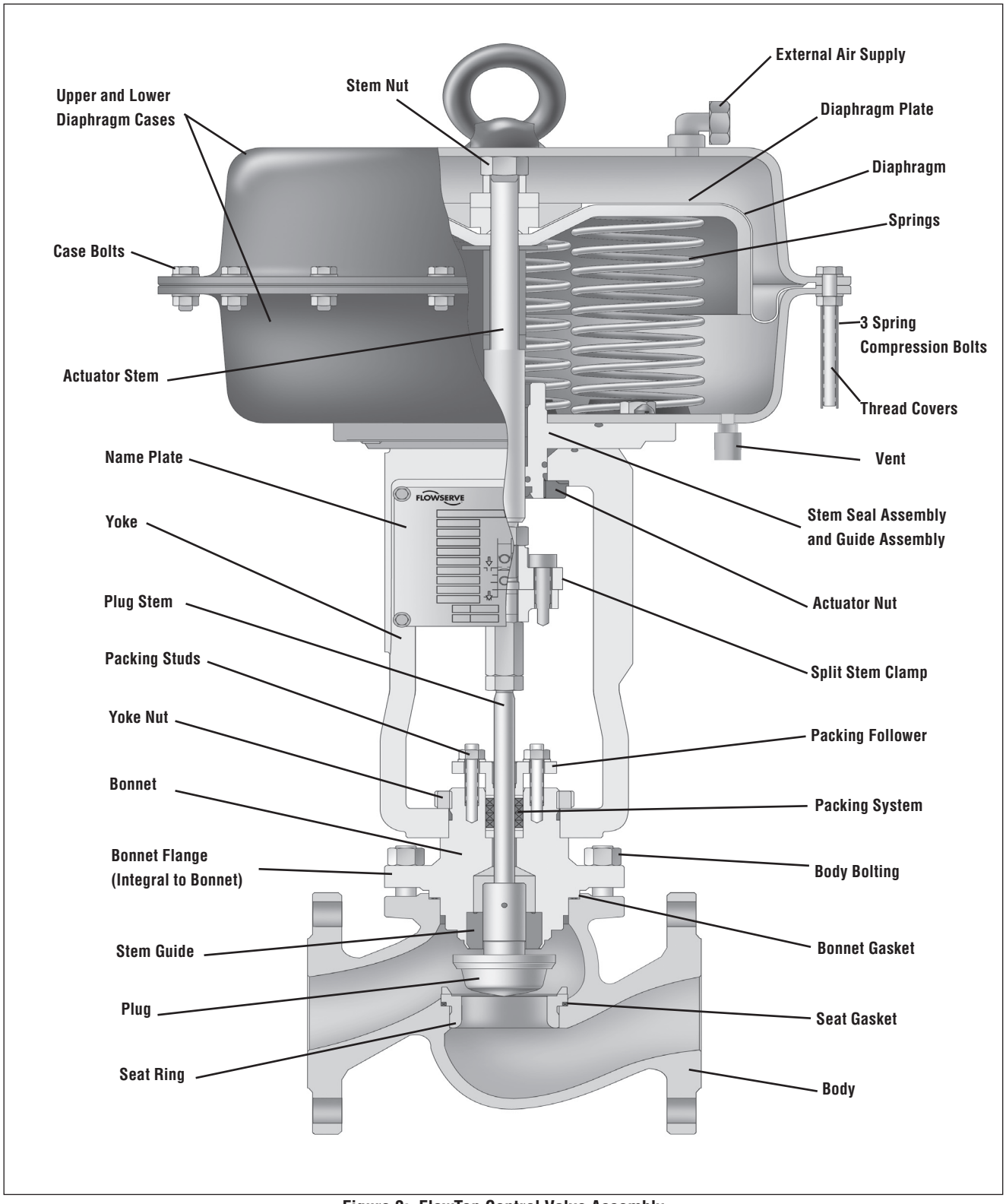

Figure 3: FlowTop Control Valve Assembly

Features and Advantages

Features	Advantages
Logix 500 Digital Positioner	Logix 500 digital positioner reduces calibration time to 20 seconds by pushing one button. Either standard direct or NAMUR (IEC 534.6) positioner mounting available Easy to install, HART compatible positioners make the FlowTop/Logix 500 the best valve/positioner combination for general service needs No software or handheld device is required and can be configured locally
Good Shut-off	FlowTop control valves offer class 4 shut off without the need for lapping the seating surfaces. Unlike most conventional valves, the FlowTop seat ring has a seat gasket, providing very good shut off.
Post Guiding	Eliminates cage guiding problems One solid, sturdy guide stabilizes the stem and plug during entire travel and minimizes vibration and wear.
Low Noise Trim	Silent Pac Low Noise baffle can reduce noise levels generated by vapors and gasses.
Economical Stainless Steel Bellows Assembly	Bellows assembly used for tough sealing applications, like Dowtherm, steam and others
Compact	Engineered for applications with limited available installation clearance
ANSI Body	Designed for use in ANSI Class 150 and 300 service, flanged applications
Easy Maintenance	Bonnet design allows for quick, top-entry service. The valve body can remain in line while trim is changed or replaced.
Versatile Packing Configuration	Available sets include single PTFE V-ring, PTFE braid and graphite. Live loading kits are available (see Figures 13 to 20).
Fugitive Emission Packing	High quality “Ultra seal” environmental packing is available: Exceeds EPA standards of 500 ppm (see Figure 18).
Long-life Operation	Heavy duty parts provide extended life, corrosion resistant construction
Many Positioning Options	The valve can be equipped with a high performance analog or digital positioner or function without a positioner on air signal alone.
Wide Variety of Trim Sizes and Materials	Up to 10 Cv values per valve size and many material options
High-Thrust Diaphragm Actuator	Compact, light weight, capable of 90 psi (6.0 bar) air supply; multiple spring combinations. Reduces installation size and initial expense.
Dynamic Stability	Sturdy guiding system stabilizes plug travel
Reversible Actuator	Failure mode is easily reversed, using common tools
NAMUR Mounting (IEC 534.6) as an option	Easy positioner mounting with universal NAMUR mounting kit Support for products such as limit switches and position transmitters are easily mounted on the same NAMUR positioner bracket
Many Available Options	Top-mounted handwheel, digital positioners, position transmitter, limit switches, proximity switches, and solenoids. (See *Performance!* software for specific details.)
Multiple Applications Usage	High-performance, general service control valve used in many process industries including chemical, refinery, power, food and beverage, HVAC and OEM

Materials of Construction

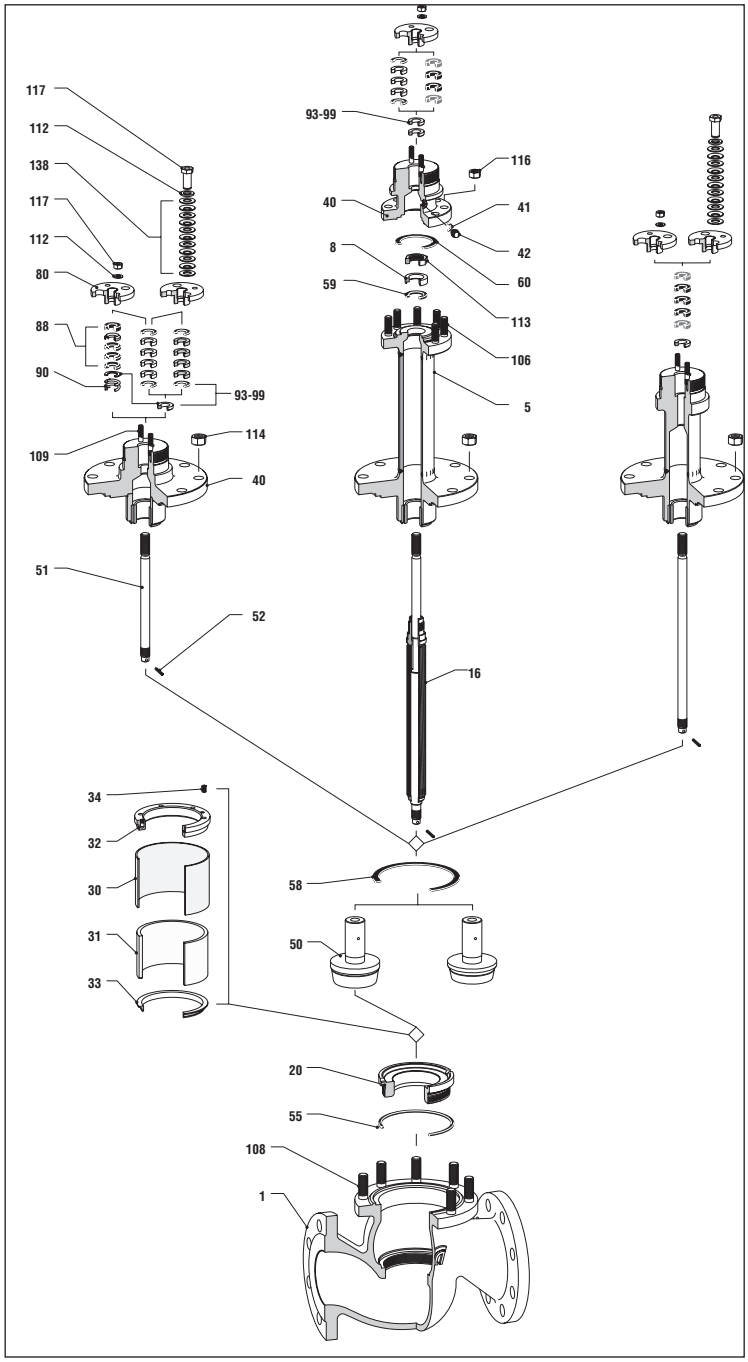

Figure 4: FlowTop

Table 1: Parts List

BOM	Designation	Materials	
1	Body	A216WCB	
5	Bellows Housing	A105	A182 F316L
6	MBS Seal Assembly	316 SS	
20	Seat Ring	316 SS	
30	Multi-hole Stage	1.4571	
31	Wire Netting	1.4404 (SS)	
32	Upper Retaining Ring	1.4571	
33	Ring, Lower	316 SS	
34	Spring, Silent Pack	1.4310	
40	Standard Bonnet	A105	A182 F316L
40	Extended Bonnet		
40	MBS Bonnet		
41	Gasket Purge Plug	Pure Graphite	
42	Purge Plug	A2 (SS)	
50	Plug Head	316 SS	
51	Stem		
52	Spring Pin	A2 (SS)	
55	Seat Gasket	Pure Graphite	
59	MBS gasket	Pure Graphite	
60	MBS Gasket	Pure Graphite	
80	Grand Flange	316 SS	
88	Packing Box Unloaded	PTFE-Pure-Graphite	
	Loaded	PTFE-Rings Pure-Graphite	
90	Pressure Spring	1.4571 (SS)	
93-99	Packing Spacer	1.4571 (SS)	
106	Stud	A193 B7M	A193 B8M
108	Stud	A193 B7M	A193 B8M
109	Stud, Packing Box	A193 B8 M2	
117	Hex Nut	316 SS	
112	Plain Washer	A2 (SS)	
112	Plain Washer	316 SS	
113	Jam Nut	316 SS	
114	Hex Nut	A194 2HM	A194 8M
116	Hex Nut		
117	Nut, Packing Box	A194 8M	
138	Belleville Spring	A2 (SS)	

Options

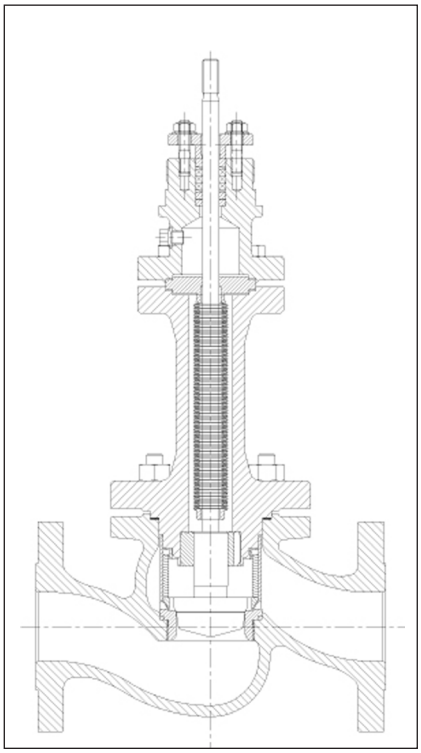

Figure 5: Bellow 2 inches and smaller (shown with a Silent Pac Low Noise Baffle)

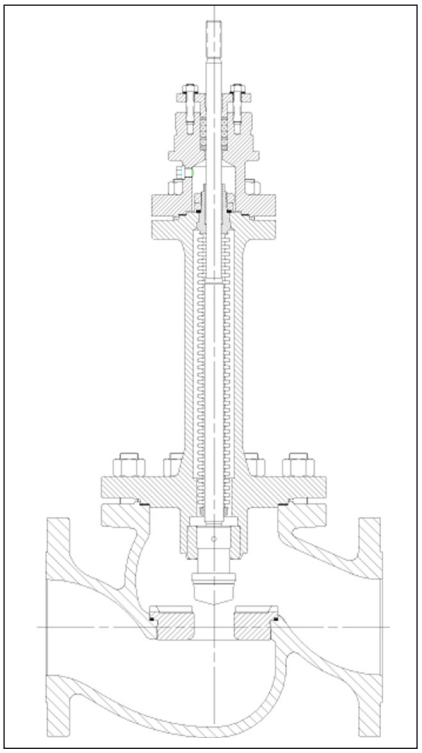

Figure 6:" Bellow 3-4 inches

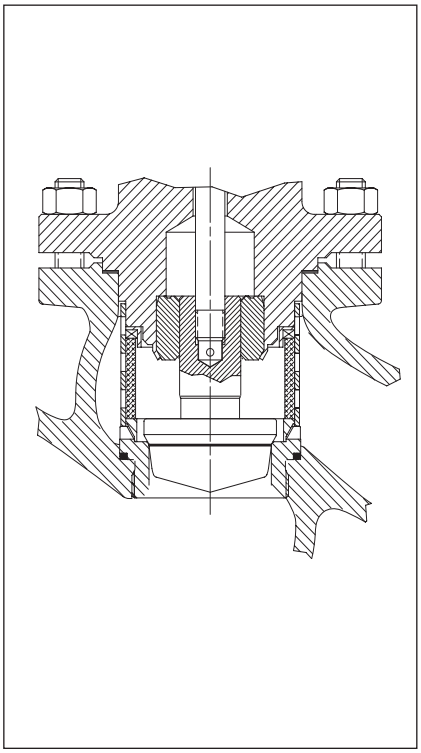

Figure 7: Silent Pac Low Noise Baffle used for gases and vapors

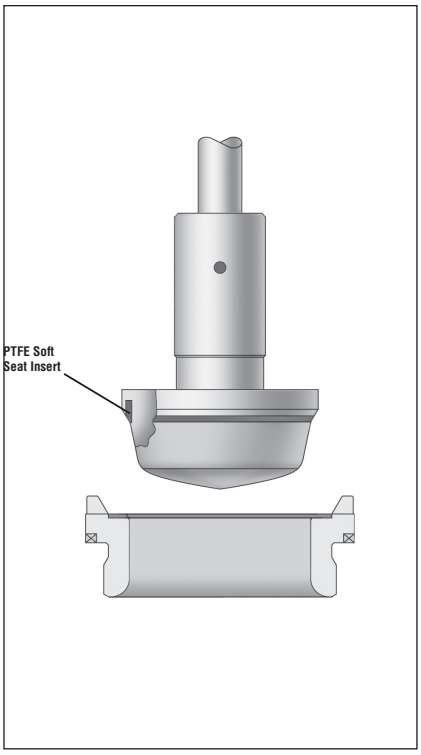

Figure 8: PTFE Soft Seat

(Minimum Trim Number is 0.24 inches [6 mm])

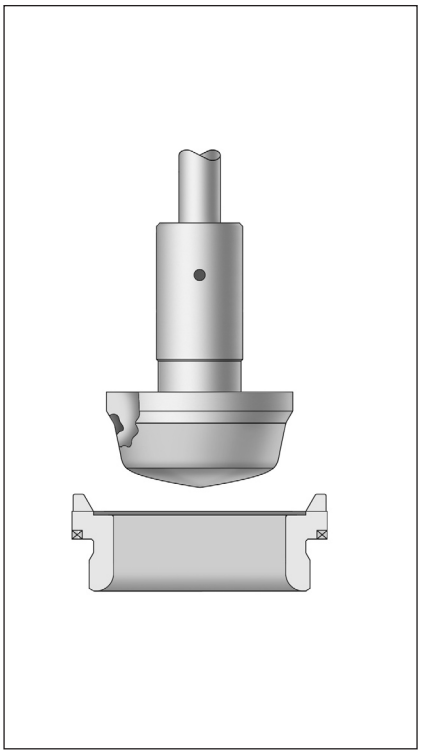

Figure 9: Standard Trim with Alloy 6 Seat-surface Overlay

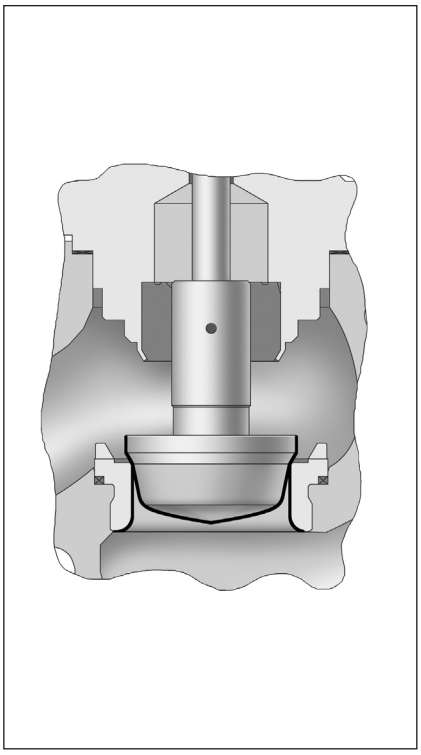

Figure 10: Trim with Alloy 6 Full-contour Overlay

Body Specifications and Design Options

Table 2: Valve Body Specifications

Style	Top-entry, single seated, straight-through globe valve
Sizes	0.5 to 4-inch, ANSI Class 150-300 Flanged
End connection Integral flange	ISA 75.03
Surface finish	Standard: 125 - 250 Ra Optional: 250 - 500 Ra
Bonnet	Standard, extended and bellows seal
Packing	PTFE V-ring, braided PTFE, graphite, UltraGuard environmental packing systems
Trim flow characteristics	Linear, equal percentage, quick-open; unbalanced
Leakage rates	ANSI Class IV, VI (with soft seat option) Minimum trim number with soft seat is 0.24 inches

Design Options

Unlike other general service valves, the FlowTop control valve offers a number of design and accessory options - including a versatile packing box with numerous packing configurations, fugitive emission option, multiple actuator spring configurations, top-mounted hand wheels, and a wide range of digital or analog positioners.

Figure 11: FlowTop with a direct mounted Logix 500 digital positioner - local calibration, no need of handheld device or software.

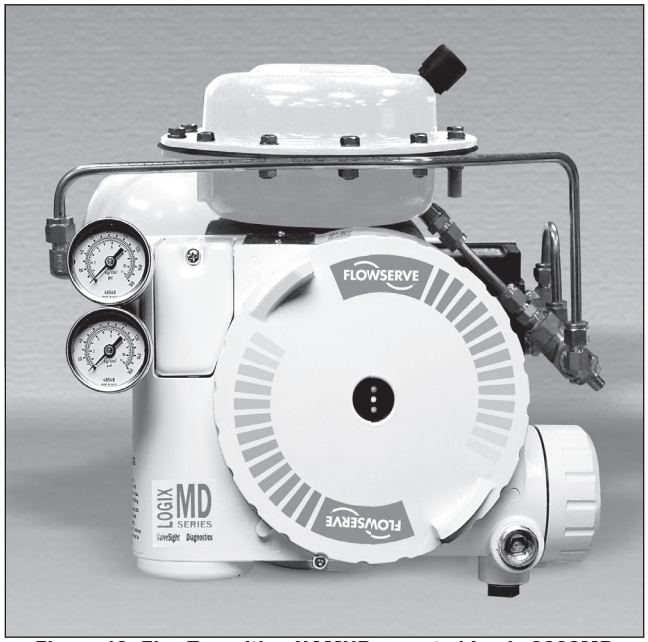

Figure 12: FlowTop with a NAMUR mounted Logix 3000MD series digital positioner - local calibration, no need of handheld device or software.

C_v Tables

Table 3: C_v values for Modified Equal Percent

Valve Size	Trim Number		Stroke		C_v 100%	
Inches	Inches	mm	Inches	mm	C_v	K_vS
0.5	0.63	16	0.787	20	6.5	5.6
	0.47	12	0.787	20	4.6	4
	0.39	10	0.787	20	2.9	2.5
	0.31A	8	0.787	20	1.8	1.6
	0.31B	8	0.787	20	1.16	1
	0.24	6	0.787	20	0.73	0.63
	0.16A	4	0.787	20	0.47	0.4
	0.16B	4	0.787	20	0.29	0.25
	0.16C	4	0.787	20	0.19	0.16
1	0.98	25	0.787	20	16.2	14
	0.79	20	0.787	20	11.6	10
	0.63	16	0.787	20	7.3	6.3
	0.47	12	0.787	20	4.6	4
	0.39	10	0.787	20	2.9	2.5
	0.31A	8	0.787	20	1.8	1.6
	0.31B	8	0.787	20	1.16	1
	0.24	6	0.787	20	0.73	0.63
	0.16A	4	0.787	20	0.46	.4
	0.16B	4	0.787	20	0.29	0.25
	0.16C	4	0.787	20	0.18	0.16
1.5	1.57	40	0.787	20	36	31.5
	1.34	34	0.787	20	29	25
	0.98	25	0.787	20	18.5	16
	0.79	20	0.787	20	11.6	10
	0.63	16	0.787	20	7.3	6.3
2	1.97	50	0.787	20	55	47.5
	1.65	42	0.787	20	46	40
	1.57	40	0.787	20	36	31.5
	1.34	34	0.787	20	29	25
	0.98	25	0.787	20	18.5	16
	0.79	20	0.787	20	11.6	10
3	3.15	80	1.57	40	145	125
	2.64	67	1.57	40	116	100
	2.09	53	1.57	40	73	63
	1.65	42	1.57	40	46	40
4	3.94	100	1.57	40	208	180
	3.31	84	1.57	40	187	160
	2.64	67	1.57	40	116	100
	2.09	53	1.57	40	73	63

Table 4: C_v values for Linear

Valve Size	Trim Number		Stroke		C_v 100%	
Inches	Inches	mm	Inches	mm	C_v	K_vS
0.5	0.63	16	0.787	20	6.5	5.6
	0.47	12	0.787	20	4.6	4
1	0.98	25	0.787	20	16.2	14
	0.79	20	0.787	20	11.6	10
	0.63	16	0.787	20	7.3	6.3
	0.47	12	0.787	20	4.6	4
1.5	1.57	40	0.787	20	36	31.5
	1.34	34	0.787	20	29	25
	0.98	25	0.787	20	18.5	16
	0.79	20	0.787	20	11.6	10
	0.63	16	0.787	20	7.3	6.3
2	1.97	50	0.787	20	55	47.5
	1.65	42	0.787	20	46	40
	1.57	40	0.787	20	36	31.5
	1.34	34	0.787	20	29	25
	0.98	25	0.787	20	18.5	16
	0.79	20	0.787	20	11.6	10
3	3.15	80	1.57	40	145	125
	2.64	67	1.57	40	116	100
	2.09	53	1.57	40	73	63
	1.65	42	1.57	40	46	40
4	3.94	100	1.57	40	208	180
	3.31	84	1.57	40	187	160
	2.64	67	1.57	40	116	100
	2.09	53	1.57	40	73	63

Table5: C_v values for Quick Open

Valve Size	Trim Number		Stroke		C_v 100%	
Inches	Inches	mm	Inches	mm	C_v	K_vS
0.5	0.63	16	0.787	20	7.3	6.3
1	0.98	25	0.787	20	18.5	16
1.5	1.57	40	0.787	20	41	35.5
2	1.97	50	0.787	20	61	53
3	3.15	80	1.57	40	162	140
4	3.94	100	1.57	40	231	200

Table 6: Silent Pac C_v values for Modified Equal Percent

Valve Size	Trim Number		Stroke		C_v 100%	
Inches	Inches	mm	Inches	mm	C_v	K_vS
0.5	0.63	16	0.787	20	6.5	5.6
	0.47	12	0.787	20	4.7	4
	0.39	10	0.787	20	2.9	2.5
	0.31A	8	0.787	20	1.9	1.6
	0.31B	8	0.787	20	1.16	1
	0.24	6	0.787	20	0.73	0.63
1	0.98	25	0.787	20	14.6	12.5
	0.79	20	0.787	20	11.6	10
	0.63	16	0.787	20	7.3	6.3
	0.47	12	0.787	20	4.7	4
	0.39	10	0.787	20	2.9	2.5
	0.31A	8	0.787	20	1.8	1.6
	0.31B	8	0.787	20	1.16	1
	0.24	6	0.787	20	0.73	0.63
1.5	1.57	40	0.787	20	26	22.5
	1.34	34	0.787	20	23	20
	0.98	25	0.787	20	18.7	16
	0.79	20	0.787	20	11.6	10
	0.63	16	0.787	20	7.3	6.3
2	1.97	50	0.787	20	41	35.5
	1.65	42	0.787	20	37	31.5
	1.34	34	0.787	20	29	25
	0.98	25	0.787	20	18.5	16
	0.79	20	0.787	20	11.6	10
3	3.15	80	1.57	40	117	100
	2.64	67	1.57	40	105	90
	2.09	53	1.57	40	73	63
	1.65	42	1.57	40	46	40
4	3.94	100	1.57	40	145	125
	3.31	84	1.57	40	145	125
	2.64	67	1.57	40	116	100
	2.09	53	1.57	40	73	63

Table 7: Silent Pac C_v values for Linear

Valve Size	Trim Number		Stroke		C_v 100%	
Inches	Inches	mm	Inches	mm	C_v	K_vS
0.5	0.63	16	0.787	20	6.5	5.6
	0.47	12	0.787	20	4.6	4
1	0.98	25	0.787	20	14.7	12.5
	0.79	20	0.787	20	11.6	10
	0.63	16	0.787	20	7.3	6.3
	0.47	12	0.787	20	4.6	4
1.5	1.57	40	0.787	20	26	22.4
	1.34	34	0.787	20	23	20
	0.98	25	0.787	20	18.5	16
	0.79	20	0.787	20	11.6	10
	0.63	16	0.787	20	7.3	6.3
2	1.97	50	0.787	20	41	35.5
	1.65	42	0.787	20	37	31.5
	1.34	34	0.787	20	29	25
	0.98	25	0.787	20	18.5	16
	0.79	20	0.787	20	11.6	10
	3.15	80	1.57	40	117	100
	2.64	67	1.57	40	105	90
3	2.09	53	1.57	40	73	63
	1.65	42	1.57	40	46	40
4	3.94	100	1.57	40	145	125
	3.31	84	1.57	40	145	125
	2.64	67	1.57	40	116	100
	2.09	53	1.57	40	73	63

Packing

Non-Environmental Packing

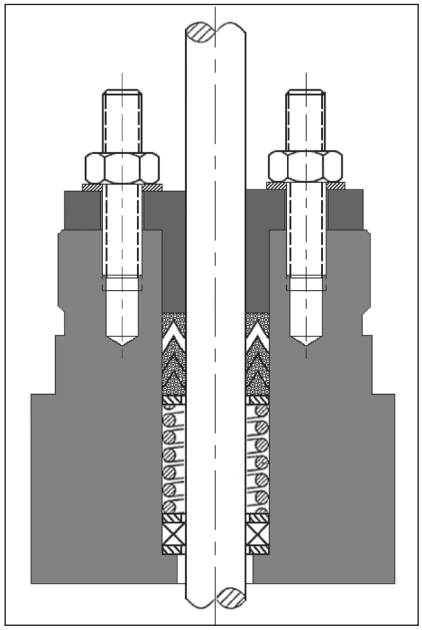

Figure 13:
V-ring Standard Bonnet
(Internal Live-loading Shown)

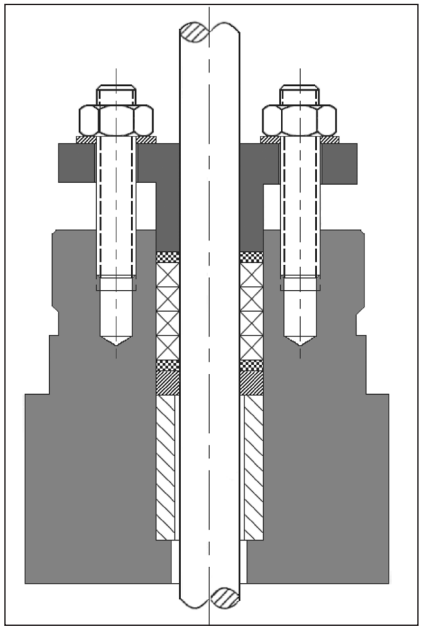

Figure 14:
PTFE Ring Standard Bonnet

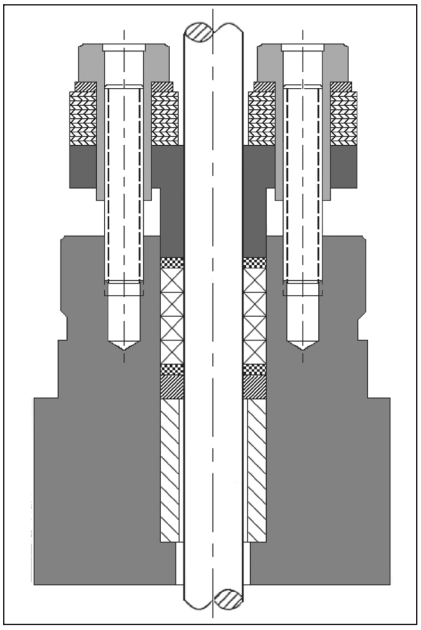

Figure 15:
PTFE Ring Standard Bonnet
(Externally Live-loaded)

Extended Bonnet (Packing configuration only - extension not shown)

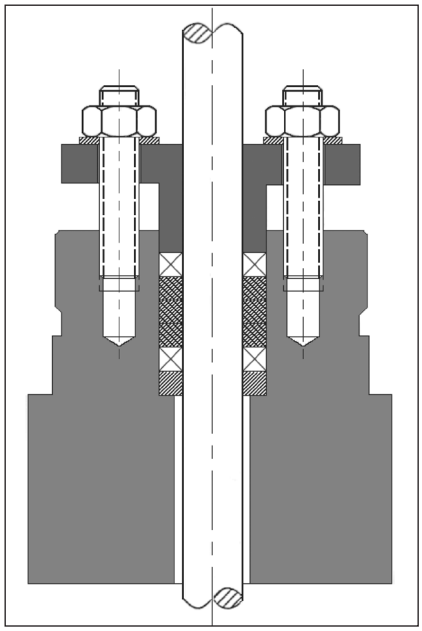

Figure 16:
Graphite Ring

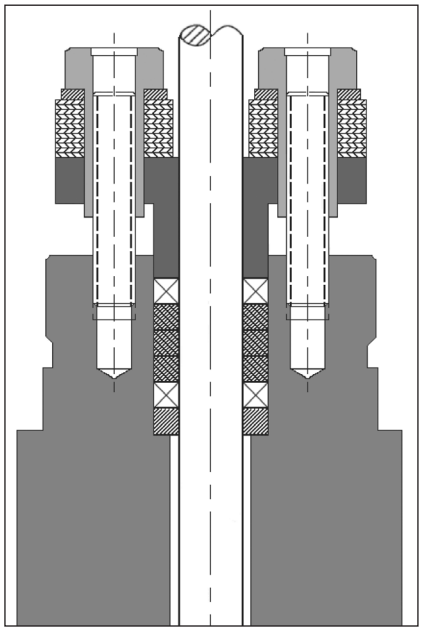

Figure 17:
Graphite Ring
(Externally Live-loaded)

Packing

Environmental Packing

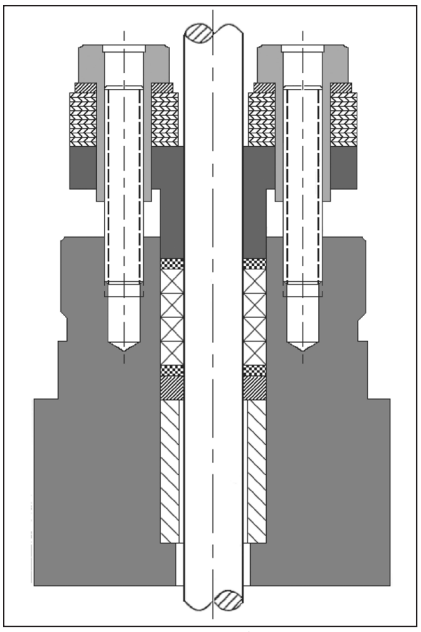

Figure 18:
UltraGuard Standard Bonnet
(Externally Live-loaded)

Bellows Packing (Bellows assembly and purge not shown)

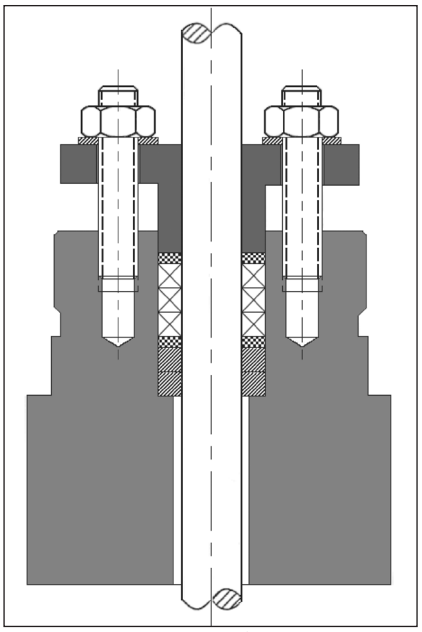

Figure 19:
PTFE Ring Bellows Bonnet

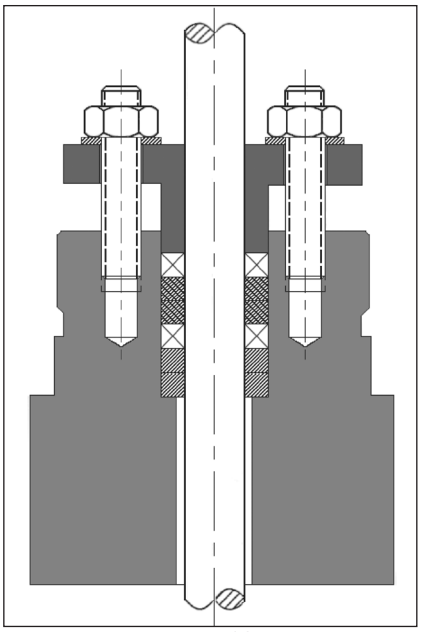

Figure 20:
Graphite Ring Bellows Bonnet

Table 8: Packing Selection Guidelines

Packing System	Packing Type and Packing Material	Temperature Range[1]						Options Available	Relative Friction Level[2]	Relative Expected Service Level[2]
		Standard Bonnets		Extended Bonnets		Bellows Bonnets				
		°F	°C	°F	°C	°F	°C			
Standard V-ring	V-ring Carbon Filled PTFE	14 to 350°	-10 to 177°	-50 to 480°	-46 to 250°	NA	NA	Live-loading[4]	.10	.85
PTFE Ring	Square-braided, PTFE	14 to 480°	-10 to 250°	-50 to 480°	-46 to 250°	-50 to 480°	-46 to 250°	Live-loading	.35	1
Graphite Ring[3]	Die-formed Graphite rings, Pure Graphite	NA	NA	200 to 800°	93 to 427°	400 to 752°	204 to 400°	Live-loading	.70	.50
UltraGuard (TA Luft Latty)	PTFE Coated, Braided Graphite	14 to 480°	-10 to 250°	-50 to 480°	-46 to 250°	NA	NA	Live-loading	.35	1

[1] Temperatures based on valve body temperature limits. Exceeding these limits may increase leakage and decrease service life.

[2] Normalized index where 1.0 represents highest relative leakage, friction, or longest relative packing life.

[3] The temperature of graphite packing should not exceed 800° F (427° C) in an oxidizing service such as air.

[4] Both internal and external live-loading is available for this packing set.

Note: *Temperature limits in carbon steels range from -15 to 800° F (-26 to 427° C)*

Actuator Data

Top-mounted Handwheel

127, 252 and 500 size actuators use the Top light Handwheel. The size 700 actuator uses only the Heavy style handwheel.

Positioners

Digital: Flowserve's Logix 500/HART or Logix 3000 series/HART or FOUNDATION Fieldbus digital positioners utilize built-in microprocessors and electronic relays to facilitate quick, accurate response to both large and small changes in position command. Both units offer self-contained, on-board diagnostics.

Electro-pneumatic: Beta and XL Series positioners with an I/P can receive a 4 to 20 mA input signal which is converted into a pneumatic output signal. It is vibration resistant, reversible, intrinsically safe, explosion-proof, and easy to adjust. (Figure 24).

Additional Accessories

Electro-pneumatic transducer: Converts a 4-20 DC milliampere signal into a proportional pneumatic output pressure of 3 to 15 psi (0.2 to 1.0 bar).

Position transmitter/limit switch assemblies: Position transmitters and limit switch options mount on the same NAMUR bracket as the positioner. Mounting hardware is similar. They can provide proportional feedback or on/off signals. They can signal lights, alarms, relays, etc. Available options include: UltraSwitch models, Position Pac Series, GO and P&F proximity switches. (See *Performance!* software for details).

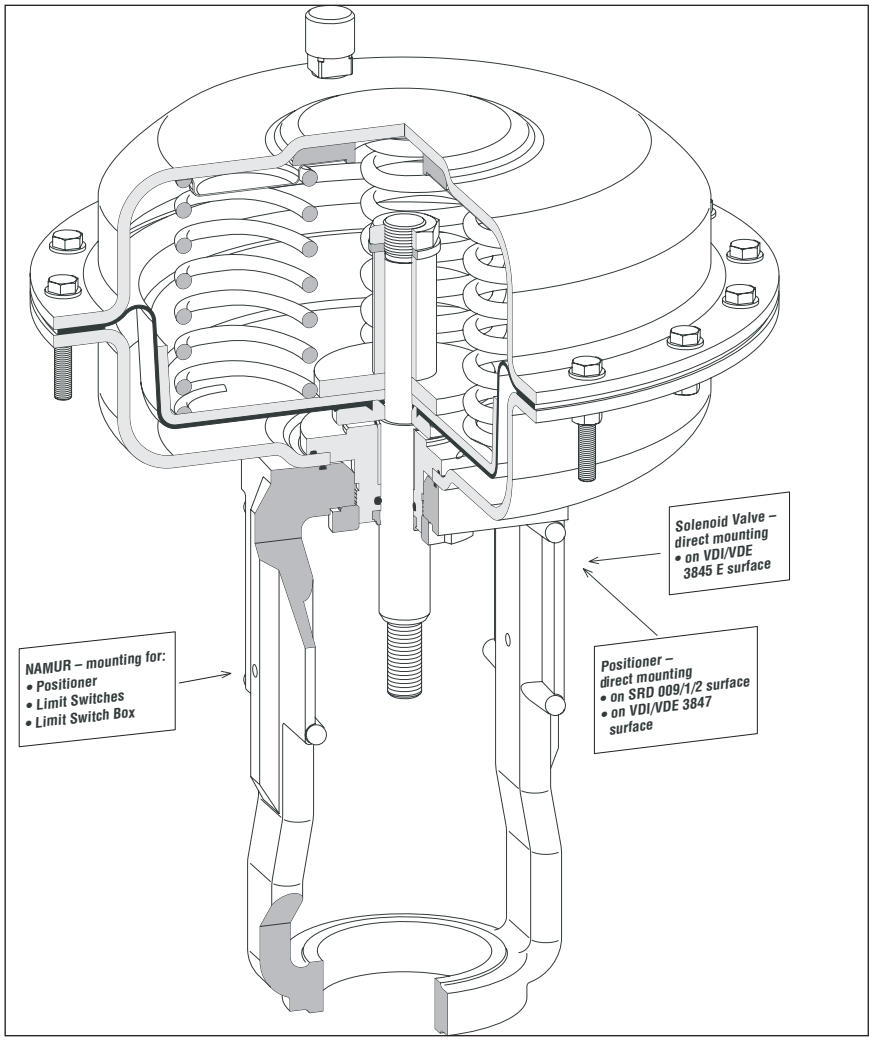

Figure 21: Pneumatic Linear Actuator with Direct-mounting Yoke

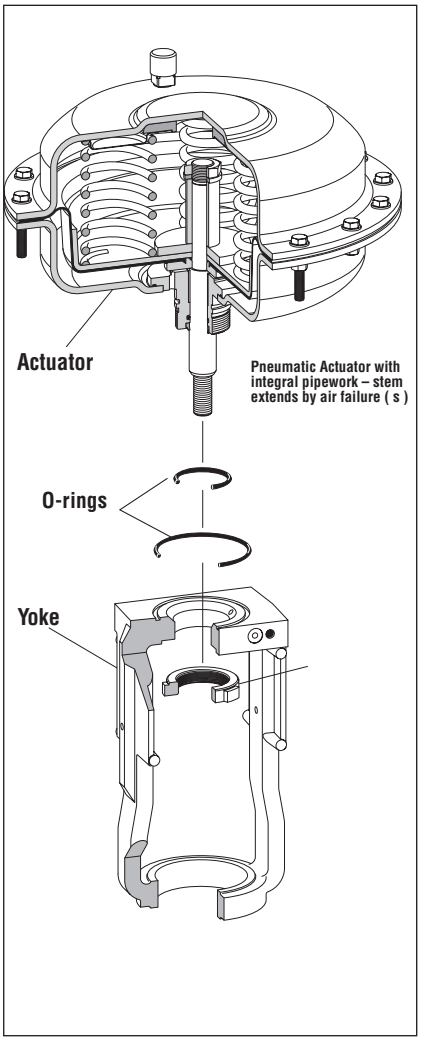

Figure 22

Actuator Data

Table 9: Parts List

Part	Designation	Materials
203	Diaphragm Casing	1.0322[2]
202	Diaphragm Casing	1.0322[2]
335,336	Hexagon Bolt	A2-70
351	Hexagon Nut	A2-70
337	Plain Washer	A2
257	Guide Bush	1.0736[1]
	Plain Bearing	-
271	O-Ring	NBR 70
275	O-Ring	NBR 70
273	Scraper Ring	NBR 90
211	Stem	1.4571
253	Spacer Bush	1.0308[1]
228	Disk	1.0736[1]
227	Diaphragm Plate	1.0332[1]
225	Diaphragm	NBR 60
272	O-Ring	NBR 70
260	Thrust Washer	1.0736[1]
349	Lock Washer	Federstahl
348	Hexagon Nut	17H[1]
229, 230	Actuator Spring	1.7102
231	Distance Plate[3]	1.0736[1]
326	Spring Adjusting Plate	1.0330.03[1]
258	Vent Plug	Polyamid

[1] chromatised acc. to DIN 50 961 Fe/Zn 12C

[2] powder coating

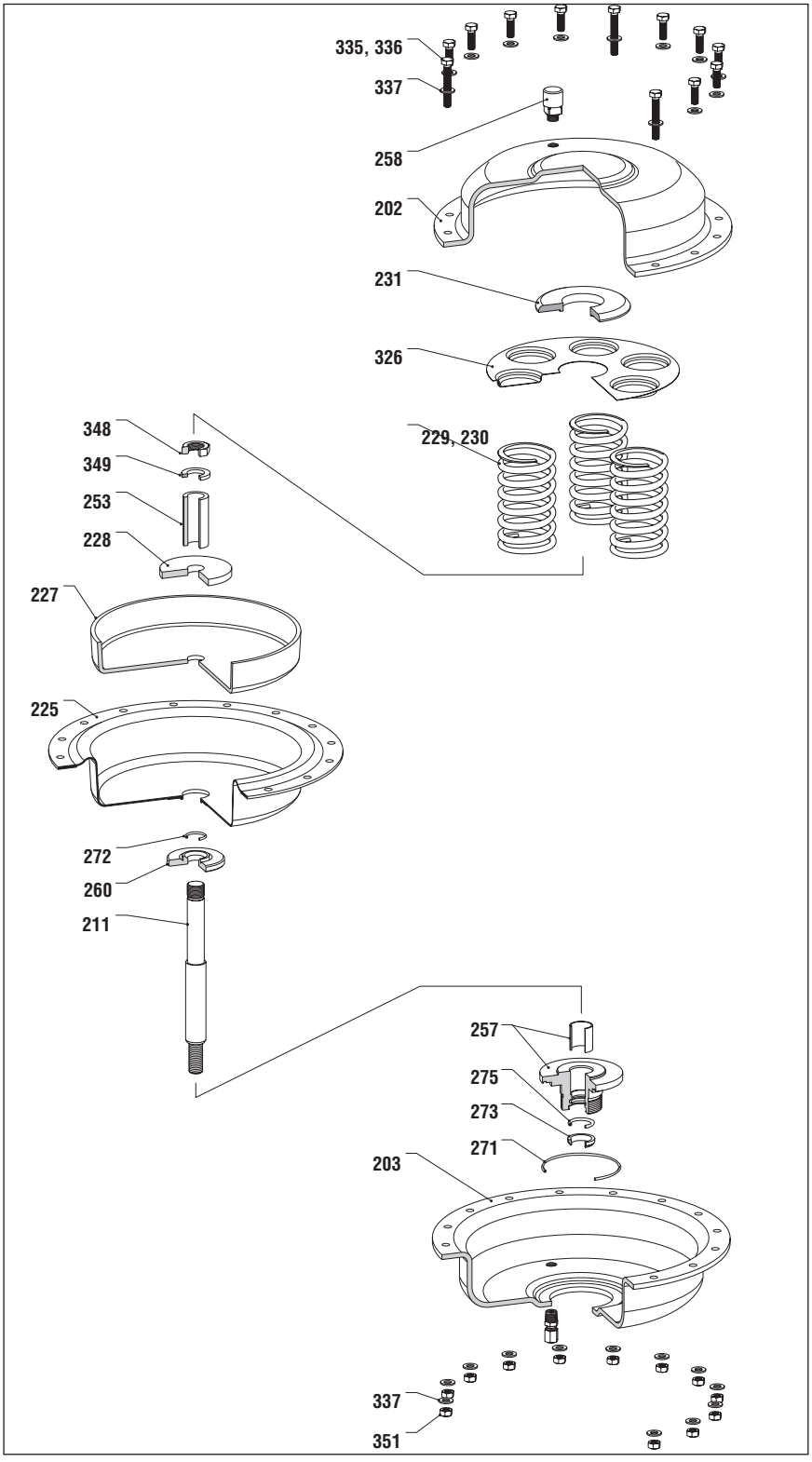

Figure 23

Actuator Dimensions and Weights

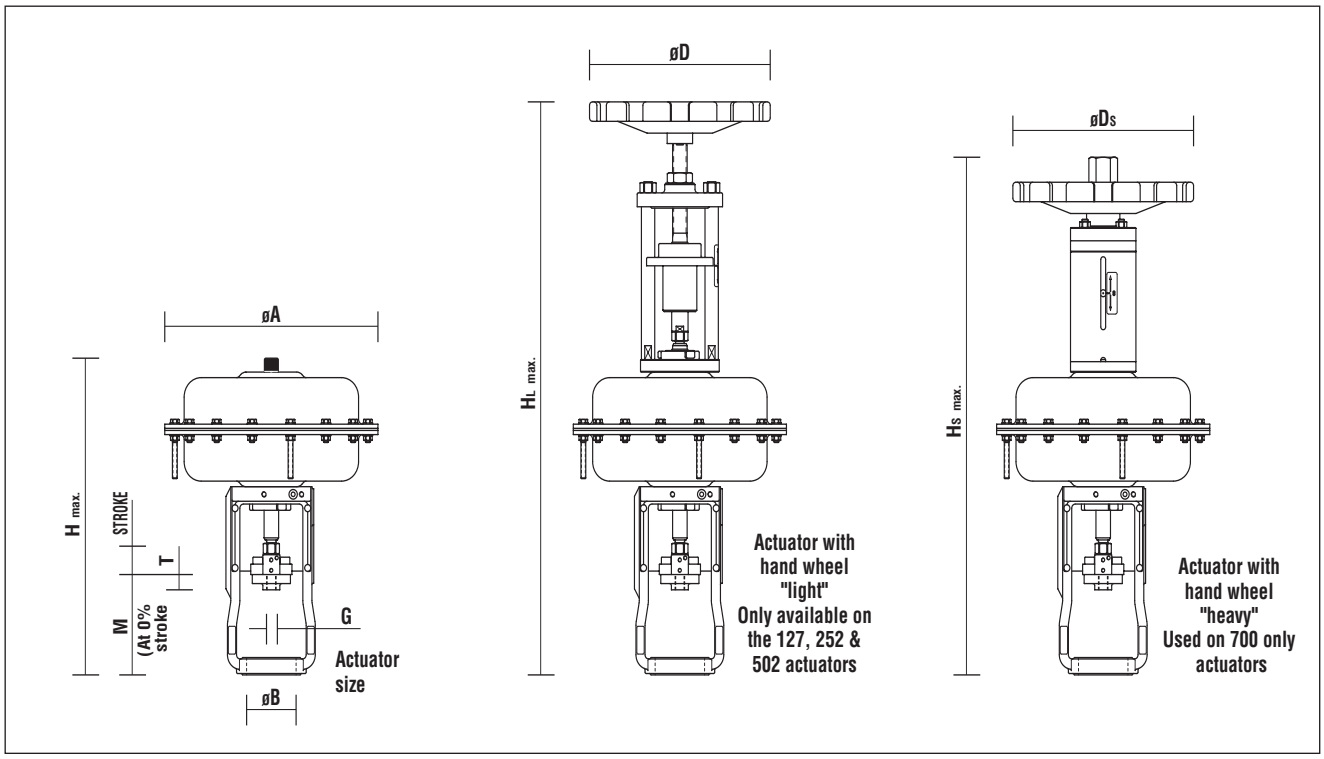

Figure 24: Single-seat Trim

Table 10: Dimensions and Weights

	Actuator Size	19 in² (127 cm²)		39 in² (252 cm²0		78 in² (502 cm²)				109 in² (700 cm²)			
	Stroke	0.8		0.8		0.8		1.6		0.8		1.6	
Designation		in	cm	in	cm	in	cm	in	cm	in	cm	in	cm
øA		7.8	178	10.4	254	13.9	330	13.9	330	15.9	381	15.9	381
H max.		12.6	305	13.2	330	17.9	432	18.1	457	21.5	533	21.7	533
HS max.		-	-	-	-	-	-	-	-	34.3	864	34.4	864
HL max.		23.2	584	23.4	584	33.3	838	34.3	864	-	-	-	-
øDS		-	-	-	-	-	-	-	-	13.8	330	13.8	330
øDL		7.9	178	7.9	178	11.8	279	11.8	279	-	-	-	-
	Weight	**lb**	**kg**	**lb**	**kg**	**lb**	**kg**	**lb**	**kg**	**lb**	**kg**	**lb**	**kg**
Actuator		20	9	31	14	64	29	64	29	88	40	88	40
With top mounted hand wheel "heavy"		-	-	-	-	-	-	-	-	12	5	12	5
With top mounted hand wheel "light"		31	14	42	19	79	36	79	36	-	-	-	-

Table 11: Yoke Dimensions

	Actuator Size	19 in² (127 cm²)		39 in² (252 cm²0		78 in² (502 cm²)				109 in² (700 cm²)			
	Stroke	20		20		20		40		20		40	
Designation		in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
øB		2.6	65	2.6	65	2.6	65	3.2	82	2.6	65	3.2	82
≈M		4.1	105	4.1	105	4.1	105	5.5	140	4.1	105	5.5	140
G		M12		M12		M12		M16		M12		M16	
T		.91	23	.91	23	.91	23	.98	25	.91	23	.98	25

Body Dimensions and Shipping Weights

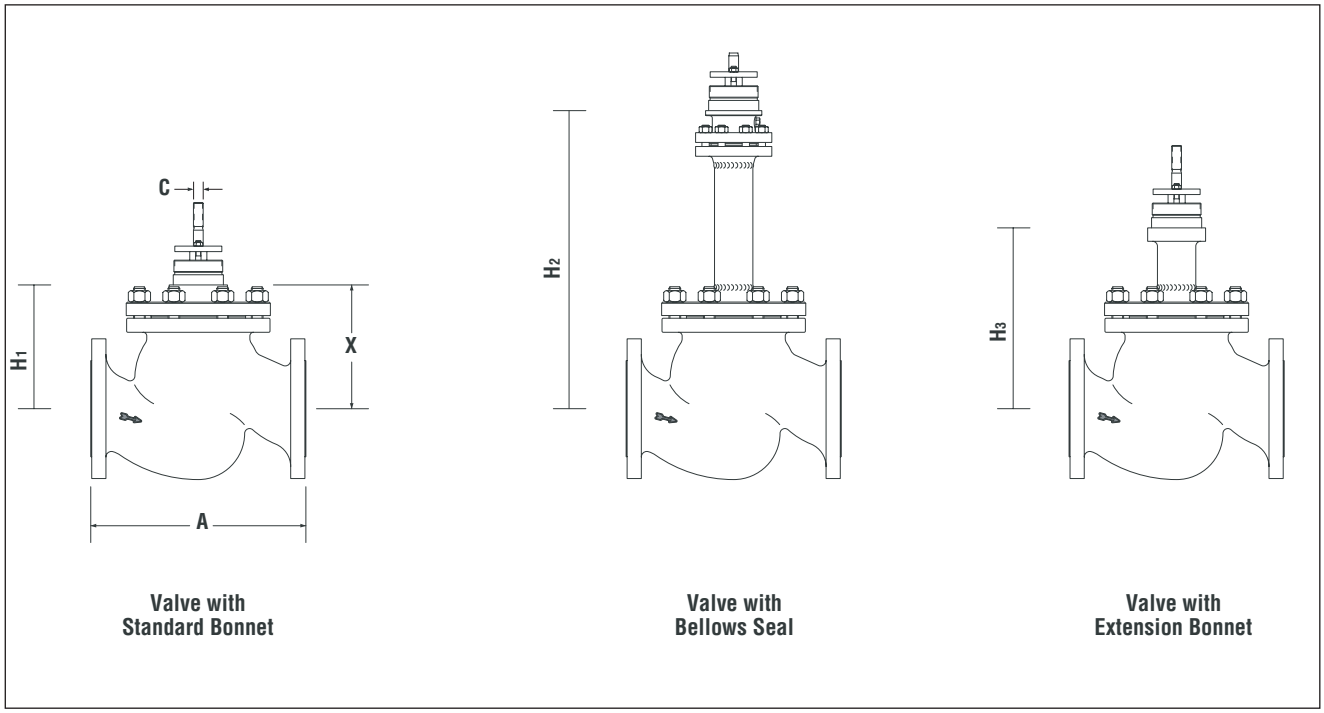

Figure 25: Single-seat Trim

Table 12: Dimensions

Valve Size	A Face to Face Dimensions				C				X Disassembly Clearance				≈H1 Standard Bonnet				≈H2 Bellows Seal				≈H3 Extended Bonnet			
	Class 150		Class 300		Class 150		Class 300		Class 150		Class 300		Class 150		Class 300		Class 150		Class 300		Class 150		Class 300	
in	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
0.5	7.25	184.2	7.5	190.5	0.472	12	0.472	12	4.6	117	4.6	117	4.6	117	4.6	117	11.8	299	11.8	299	8.6	218	8.6	218
1	7.25	184.2	7.75	196.9	0.472	12	0.472	12	5.6	142	5.6	142	4.6	117	4.6	117	11.8	299	11.8	299	8.6	218	8.6	218
1.5	8.75	222.3	9.25	235	0.472	12	0.472	12	5.6	142	5.6	142	5.4	137	5.4	137	12.1	307	12	305	8.6	218	8.6	218
2	10	254	10.5	266.7	0.472	12	0.472	12	8.0	208	8.0	208	5.5	138	5.5	138	12.1	307	12	305	8.7	220	8.7	220
3	11.75	298.5	12.5	317.5	0.63	16	0.63	16	9.0	228	9.0	229	8	203	8	203	19.7	500	20	508	12.2	310	12.2	310
4	13.88	352.6	14.5	368.3	0.63	16	0.63	16	9.0	229	9.0	229	8.1	204	8	203	19.7	500	20	508	12.3	311	12.3	311

Table13: Shipping Weights

Valve Size	≈Weight for Valves											
	Standard Bonnet				Bellows Seal Bonnet				Extended Bonnet			
	Class 150		Class 300		Class 150		Class 300		Class 150		Class 300	
in	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg
0.5	13.7	6.2	13.9	6.3	22.5	10.2	22.7	10.3	16.6	7.5	16.8	7.6
1	16.1	7.3	17.9	8.1	24.9	11.3	26.7	12.1	19	8.6	20.8	9.4
1.5	29.6	13.4	34.2	15.5	38.4	17.4	43	19.5	31.4	14.2	36	16.3
2	38.4	17.4	41	18.6	47.2	21.4	50	22.6	40.2	18.2	42.8	19.4
3	94	42	104	47	111	50	122	55	95	43	108	49
4	137	62	159	72	155	70	177	80	139	63	164	74

Actuator Data

Table 14: Actuator Spring

Actuator Size		Stroke	Spring Code	Spring Range		Spring Color	Number of Springs	Spring Part Number
in²	**cm²**	**mm**		**psi**	**bar**			
19.4 in²	127 cm²	20 mm	**A**	3-15	0.2-1.0	Blue	3	SMD-28602
			B	7-28	0.5-1.9	Blue	6	SMD-28602
			D	15-35	1.0-2.4	Red	3	SMD-28604
			F	29-70	2.0-4.8	Red	6	SMD-28604
			U	22-55	1.5-3.8	Blue	2	SMD-28602
						Red	4	SMD-28604
			V	22-40	1.5-2.7	Silver	6	SMD-37482
in²	**cm²**	**mm**		**psi**	**bar**			
38.8 in²	252 cm²	20 mm	**A**	3-15	0.2-1.0	Blue	3	SMD-28605
			B	7-28	0.5-1.9	Blue	6	SMD-28605
			D	15-35	1.0-2.4	Red	3	SMD-28609
			F	29-70	2.0-4.8	Red	6	SMD-28609
			U	22-55	1.5-3.8	Blue	2	SMD-28605
						Red	4	SMD-28609
			V	22-40	1.5-2.7	Silver	6	SMD-37483
in²	**cm²**	**mm**		**psi**	**bar**			
77.5 in²	502 cm²	20 mm	**A**	3-15	0.2-1.0	Blue	3	SMD-32097
			B	7-28	0.5-1.9	Blue	6	SMD-32097
			D	15-35	1.0-2.4	Red	3	SMD-32099
			F	29-70	2.0-4.8	Red	6	SMD-32099
			U	22-55	1.5-3.8	Blue	2	SMD-32097
						Red	4	SMD-32099
			V	22-40	1.5-2.7	Silver	6	SMD-37486
in²	**cm²**	**mm**		**psi**	**bar**			
77.5 in²	502 cm²	40 mm	**A**	3-15	0.2-1.0	Blue	3	SMD-28610
			B	7-28	0.5-1.9	Blue	6	SMD-28610
			D	15-35	1.0-2.4	Red	3	SMD-28612
			F	29-70	2.0-4.8	Red	6	SMD-28612
			U	22-55	1.5-3.8	Blue	2	SMD-28610
						Red	4	SMD-28612
			V	22-40	1.5-2.7	Silver	6	SMD-37485
in²	**cm²**	**mm**		**psi**	**bar**			
109 in²	700 cm²	40 mm	**A**	3-15	0.2-1.0	Blue	3	SMD-63752
			B	7-28	0.5-1.9	Blue	6	SMD-63752
			D	15-35	1.0-2.4	Red	3	SMD-63753
			F	29-70	2.0-4.8	Red	6	SMD-63753
			U	22-55	1.5-3.8	Blue	2	SMD-63752
						Red	4	SMD-63753
			V	22-40	1.5-2.7	Silver	6	SMD-63754

Actuator Data

Table 15: Actuator Specifications

Description	Pneumatic Diaphragm Actuator (Spring-opposed or Springless)
Operating	Direct action: Air-to-close (air supply causes stem extension) Reverse action: Air-to-open (air supply causes stem retraction)
Signal or Spring Ranges	Standard: 3 to 15 psi (0.2 to 1.0 bar) Optional: 12 to 31 psi (0.8 to 2.2 bar)
Travel Indication	Pointer and graduated scale
Environmental Temperature	Standard: -40^0 to 176^0 F (-40^0 to 80^0 C)
Air Connections	Standard: 0.25-inch NPT female
Finish (casing)	Powder painted diaphragm halves. High temperature silicon painted yoke.
Options on Request *check factory	Screws, nuts, diaphragm casings, etc. in stainless steel • Finish resistant to seawater or tropical environment • Other spring ranges • Special paints: Epoxy, offshore high temperature

Table 16: Maximum Supply Pressure

Model	psi	bar
19 in^2 (127 cm^2)	90	6
39 in^2 (252 cm^2)	90	6
78 in^2 (502 cm^2)	90	6
109 in^2 (700 cm^2)	90	6

Model Codes

Type	Size	Class	Body/Cert	Plug	Seat	k_vs	Trim	Actuator	S
V740 DFVNA	2 inches	300	A216 WCB/00	PN1GG	42	46	316 SS		

Valve Model
ANSI 150 V738
ANSI 300 V740

Body Form
Three flange D

Form of Connection
Flange acc. to
ANSI B16.5 Form RF F

Bonnet Form
Without pressure balancing V

Bonnet Assembly
Standard bonnet N
Bellows seal bonnet F
Extension bonnet R

Packing Box Assembly
PTFE rings, adjustable, BAM A
Pure graphite rings, adjustable, BAM B
PTFE rings, loaded, BAM N
Pure graphite rings, loaded, BAM O
PTFE rings, graphite core, load., "TA" Q
PTFE rings, oil lubricated, load., "TA" R
V-ring packing S

Normal size ½ to 4 inches

ANSI Class 150 150
ANSI Class 300 300

Body material A216 WCB
A351 CF8M

Materials Certificate
Without O.
acc. EN 10 204 - 2.2Z Z.
acc. EN 10 204 - 3.1B B.

Pressure and Leakage Certificate
Without .O
acc. EN 10 204 - 2.2Z .Z
acc. EN 10 204 - 3.1B .B

Automatic safety valve - PED cat. IV .K

316 SS Plug, seat material
400 SS Plug, seat material

c_v - value 0.012 - 208

Port size 4 to 100

Flow tends to open valve G

Characteristic
Equal percentage G
Linear L
On/off A

Plug Guidance
Top 1

Plug Type
Standard N
Partial Alloy 6 D
Full Alloy 6 K
Soft seated W
Hardened H

Plug
Contoured plug P
Contoured plug with Silent Pac K
Disk Plug (On/Off)

SMD IT 252 BVOZA

Stroke Length	
20 mm (.5 to 2 inch valves)	A
40 mm (3 and 4 inch valves)	B

Operation* Air Failure	
Stem retracted - fail open	A
Stem extended - fail closed	Z

Without hand wheel	O
With top mounted handwheel “light” (125, 250 and 500 only)	L
With top mounted handwheel “heavy” 700 only	H

Spring Ranges (not adjustable)	
0.2-1.0 bar (3-15 psi)	A
0.5-1.9 bar (7-28 psi)	B
1.0-2.4 bar (15-35 psi)	D
1.5-3.8 bar (22-55 psi)	U
1.5-2.7 bar (22-40 psi)	V
2.0-4.8 bar (29-70 psi)	F

Actuator Color	
White	B

Actuator Size	IT
127 cm^2 (19 in^2)	
252 cm^2 (39 in^2)	
502 cm^2 (78 in^2)	
700 cm^2 (109 in^2)	

FLOWSERVE

Manufacturing Facilities USA

1350 N. Mountain Springs Pkwy
Springville, UT 84663 USA
Telephone: +1 801 489 2300

Quick Response Centers

5114 Railroad St.
Deer Park, TX 77536 USA
Telephone: +1 281 479 9500

2920 W. Cardinal Dr.
Beaumont, TX 77705 USA
Telephone: +1 409 842 6600

12134 Inustriplex Blvd.
Baton Rouge, LA 70809 USA
Telephone: +1 225 751 9880

1000 Eastern Star Road Ext.
Kingsport, TN 37663 USA
Telephone: +1 423 349 4354

19 Creek Parkway
Boothwyn, PA 19061 USA
Telephone: +1 610 990 8710

6675 Daniel Burnham Dr.
Clark Building
Portage, IN 46368 USA
Telephone: +1 219 763 1000

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To find your local Flowserve representative:

For more information about Flowserve Corporation, visit www.flowserve.com or call USA 1 800 225 6989