



EnviZion®

Hygienic Diaphragm Valve



ITT

ENGINEERED FOR LIFE

EnviZion Valve

Experience the Future with EnviZion

The Biopharm industry relies on hygienic diaphragm valves for demanding process applications due to their unique balance of clean-ability, drain-ability and pressure/temperature capability. For more than 40 years the technology of these valves has changed very little. Advances in performance have been nominal as the basic design concept has remained the same: body, diaphragm, topworks, and four fasteners. This design requires experienced personnel and stringent maintenance practices to assure consistent, reliable valve performance. All while the industry is forced to increase productivity, extend preventative maintenance intervals, and reduce operating costs.

ITT's breakthrough technology, the Pure-Flo® EnviZion™ valve, sets a new standard for the future of hygienic diaphragm valves. The EnviZion valve is designed specifically to help customers install, operate, and maintain their valves more efficiently. This unique design provides a significant reduction in total cost of ownership while supporting the industries' goals to increase productivity, improve reliability and enhance clean-ability.



FASTENER FREE



CONTAMINATION FREE



TOOL-LESS ASSEMBLY



LEAK FREE SEAL INTEGRITY



ZERO RETORQUES

EnviZion Valve

Valve maintenance as easy as 1-2-3



1. Unscrew Cover CCW



2. Rotate Bonnet



3. Lift Bonnet off Studs

The EnviZion valve utilizes a breakthrough mount and turn design that allows for quick and easy valve disassembly.

- Tool-less maintenance - no tools required for valve installation and diaphragm replacement, simplifying the maintenance process.
- Fasteners eliminated - no more handling loose parts or accessing fasteners in tight spaces.
- Save time - diaphragm changes reduced from an industry average of 23 minutes to 3 minutes, resulting in a 90% reduction in maintenance time.



Reliable Sealing and Improved Cleanability with No Re-Torques

The EnviZion valve eliminates the effects of thermal cycling with an integrated thermal compensation system.

- Active sealing technology - the constant force of the thermal compensation system provides a reliable seal that does not degrade over time (unlike other diaphragm valve designs that use passive sealing technology).
- No retorquing - the seal is maintained over varying operating conditions, eliminating the need to adjust fasteners after thermal cycling.

The EnviZion valve improves clean-ability by reducing the potential for fluid entrapment.

- Diaphragm seal - the valve body and diaphragm create a seal on the leading edge of the D-section, preventing fluid from getting into areas which would be difficult to clean and possibly lead to process contamination.

Net result - reduced maintenance hours, commissioning costs and potential for system contamination.

EnviZion Valve

Total Cost of Ownership

The EnviZion valve platform was developed with one overarching goal – to reduce the customer’s total cost of ownership (TCO). Costs associated with installation, validation, operation, and maintenance are significantly reduced with the EnviZion valve.



- Over 90% annual maintenance cost savings is achieved by reducing the time required to change diaphragms.
- No retorquing after thermal cycling reduces start up time and maintenance cost.
- Body seal reliability eliminates the potential for system contamination.
- Preventative maintenance intervals can be extended, saving time and cost.
- Production Capacity is optimized and unscheduled downtime and investigation costs are minimized.

EnviZion Valve Value Proposition

QUICK CHANGE BONNET	ACTIVE 300 SEAL		User Benefit	User Value
✓		✓	Reduced installation time	\$\$
	✓		Eliminates re-torque time (CIP, SIP)	\$\$
	✓		Efficient system pressure checks / reduced investigation time	\$\$\$
	✓		Increased production capacity (less downtime)	\$\$\$\$
	✓		Reduced product loss (no contamination)	\$\$\$\$
	✓		Reduced unscheduled down time	\$\$\$
	✓		Reduction of Investigation time / cost	\$\$\$
✓		✓	Reduced diaphragm change time (10x)	\$\$\$
✓			Operators vs maintenance for diaphragm changes	\$\$
		✓	Eliminates fastener replacements / galling issues	\$

Installation Operation Maintenance

Technology delivers significant value and cost benefits

EnviZion Valve

Valve Bodies

Forged (2-Way)

Size: 0.5-2inch (DN15-50)
End Connections: Tri-Clamp®,
16 O.D. Gauge Tubing, DIN
11850

Material: Tri-certified 316L
stainless steel, sulfur
controlled per ASME BPE
(ASTM A182 grade 316L, S9,
EN 10222-5 EN 1.4435, BN2)

Dimensional Standards: USOD Tubing, DIN
Patent



Wrought (Block Bodies)

Size: 0.5-2 inch (DN15-50)
End Connections:
Tri-Clamp®, 16 O.D.
Gauge Tubing, Schedule
piping (5, 10, 40), ISO,
DIN 11850

ISO 2852, DIN 32676, BS
4825 Part 3 compliant ends (EHEDG)

Material: 316L stainless steel ASTM A479, A240, 316L
Special Alloys¹: C22, C276, AL6XN

Dimensional Standards: USOD Tubing, Pipe, ISO/DIN

¹ Other materials available upon request
Patent



Surface Finishes

10 – 25 Ra* (.25 μ m - 0.6 μ m)

Interior & exterior electropolish available

*25 Ra standard polish

EnviZion Valve

Topworks

Manual Bonnet

Type: ZH, ZHS (sealed)
Size: .5-2 inch (DN15-50)
Bonnet Material: Stainless steel
Handwheel/Bonnet Cover: FDA 21CFR177.1660 compliant PES
Corrosion Resistance: Resistant to common industry washdowns.
Consult factory for specific chemical resistance.

Standard Features:

- Autoclavable
- Thermal compensation system
- Safety lock-pin
- Travel stop
- Visual position indication
- Weep hole

Patent



Actuated Stainless Steel Bonnet

Type: ZA1, ZA2, ZA3, ZA1S (sealed), ZA2S (sealed), ZA3S (sealed)
Size: .5-2 inch (DN15-50)
Operating Modes: Fail Closed, Fail Open, Double Acting
Actuator Material: Stainless steel
Bonnet Material: Stainless steel
Corrosion Resistance: Resistant to common industry washdowns. Consult factory for specific chemical resistance

Standard Features:

- Autoclavable
- Thermal compensation system
- Safety lock-pin
- Visual position indication
- Weep hole
- 360 degree air port rotation (excludes .5" (DN15))

Patent



Actuated Advantage® Bonnet

Type: ZB1, ZB2, ZB3, ZB1S (sealed), ZB2S (sealed), ZB3S (sealed)
Size: 1-2 inch (DN15-50)
Operating Modes: Fail Closed, Fail Open, Double Acting
Actuator Material: Glass reinforced polyethersulfone (PES)
Bonnet Material: Stainless steel
Corrosion Resistance: Resistant to common industry wash downs.
Consult factory for specific chemical resistance

Standard Features:

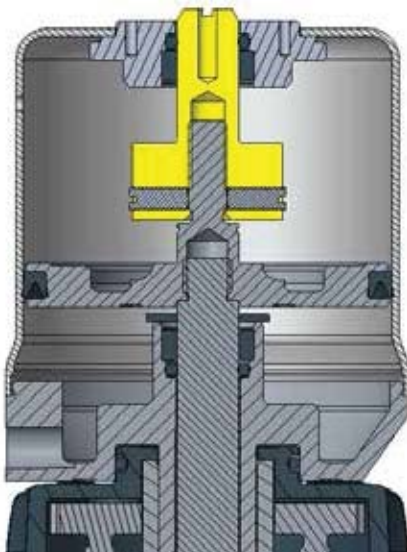
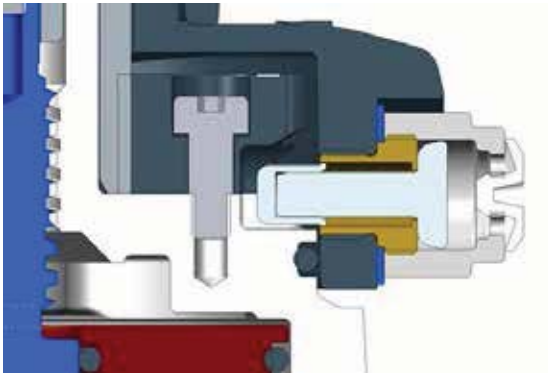
- Autoclavable
- Thermal compensation system
- Safety lock-pin
- Visual position indication
- Weep hole
- 360 degree air port rotation
- 60# and 90# spring packages (Fail Closed)



EnviZion Valve

EnviZion Bonnet Guard (EBG) Tamper Resistant / Submersible Option:

- Modified Plunger design maintains "drop in" feature for assembly
- Plunger cover seals & isolates plunger
 - Tool required to remove
- Autoclave capable stainless steel cover with small hex socket
- Umbrella vent seal to avoid pressurization if diaphragm fails
- Sealed hand wheel screw



Adjustable Opening Stop:

EnviZion Valve

Diaphragms

The EnviZion diaphragm has been developed to withstand the wear of today's production cycles and maintains a reliable seal, avoiding the risk of leakage and batch contamination. It combines advanced technology with proven materials that are used extensively in the Pharmaceutical and Biopharm industries.

Featuring a robust 2-piece construction, the EnviZion diaphragm utilizes the same modified PTFE material as the Pure-Flo series of valves with an enhanced EPDM backing cushion. The diaphragm design has been optimized to maximize sealing efficiency while minimizing stresses during operation.

Type: TMZ
Patent

Temperature Rating:

- 20°C to 165°C (-4°F to 329°F)
- 30°C to 140°C (-22°F to 285°F) for continuous steam
- 30°C to 150°C (-22°F to 302°F) for intermittent steam

Material (2-Piece Construction):

- Product Contact Surface: Modified PTFE
- Backing Cushion: Grade B1 EPDM
- Lot code traceable

Regulatory Compliance:

- PTFE: 21CFR 177.1550 (a)
- EPDM Backing cushion: 21 CFR 177.2600
- USP Class VI, Chapter <87>, <88> (70°C and 121°C)
- EMA 410 compliant

PTFE Product Contact Surface



EPDM Backing Cushion



EnviZion Diaphragm Connection as easy as 1-2-3



1. Align diaphragm stud head with compressor slot



2. Push diaphragm stud into compressor slot



3. Rotate 90°



EnviZion Valve

EnviZion Actuator Sizing

Valve Size		0.5" (DN 15)		0.75" (DN 20)		0.75"R (DN 20)		1" (DN 25)		1.5" (DN 40)		2.0" (DN 50)	
ΔP		100%	0%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
Actuator Model		Fail Closed - Reverse Acting - Spring to Close Maximum Line Pressure (psi/(bar))											
ZA2/ZA2S	1	150 (10.3)	135 (9.3)	150 (10.3)	70 (4.8)	150 (10.3)	135 (9.3)	150 (10.3)	70 (4.8)	150 (10.3)	90 (6.2)	130 (9.0)	65 (4.5)
ZB2/ZB2S	1						135 (9.3)	80 (5.5)	150 (10.3)	104 (7.2)	150 (10.3)	87(6.0)	90 (4.5)
ZB26/ZB26S	1						30 (2.1)	30 (2.1)	52 (3.6)	62(4.3)	57 (3.9)	30 (2.1)	57 (3.9)
Actuator Model	Line Pressure	Fail Open - Direct Acting - Spring to Open Air pressure required to shut-off line pressure (psi/(bar))											
ZA1/ZA1S	20	45 (3.1)	45 (3.1)	45 (3.1)	45 (3.1)	45 (3.1)	45 (3.1)	45 (3.1)	45 (3.1)	32 (2.2)	35 (2.4)	42 (2.9)	50 (3.4)
ZA1/ZA1S	40	48 (3.3)	50 (3.4)	50 (3.4)	53 (3.7)	48 (3.3)	50 (3.4)	50 (3.4)	53 (3.7)	36 (2.5)	42 (2.9)	46 (3.2)	57 (3.9)
ZA1/ZA1S	60	51 (3.5)	54 (3.7)	54 (3.7)	62 (4.3)	51 (3.5)	54 (3.7)	54 (3.7)	62 (4.3)	40 (2.8)	49 (3.4)	50 (3.5)	64 (4.4)
ZA1/ZA1S	80	54 (3.7)	59 (4.1)	59 (4.1)	70 (4.8)	54 (3.7)	59 (4.1)	59 (4.1)	70 (4.8)	44 (3.0)	56 (3.9)	54 (3.8)	71 (4.9)
ZA1/ZA1S	100	57 (3.9)	63 (4.3)	63 (4.3)	79 (5.4)	57 (3.9)	63 (4.3)	63 (4.3)	79 (5.4)	47 (3.2)	63 (4.3)	59 (4.0)	78 (5.4)
ZA1/ZA1S	125	61 (4.2)	69 (4.8)	69 (4.8)	89 (6.1)	61 (4.2)	69 (4.8)	69 (4.8)	89 (6.1)	52 (3.6)	71 (4.9)	64 (4.4)	86 (5.9)
ZA1/ZA1S	150	65 (4.5)	75 (5.2)	75 (5.2)	100 (6.9)	65 (4.5)	75 (5.2)	75 (5.2)	100 (6.9)	57 (3.9)	80 (5.5)	69 (4.8)	95 (6.5)
ZB1/ZB1S	20	-	-	44 (3.0)	40 (2.8)	-	-	44 (3.0)	40 (2.8)	39 (2.7)	37 (2.6)	41 (2.8)	44 (3.0)
ZB1/ZB1S	40	-	-	47 (3.2)	48 (3.3)	-	-	47 (3.2)	48 (3.3)	42 (2.9)	44 (3.0)	48 (3.3)	52 (3.6)
ZB1/ZB1S	60	-	-	50 (3.4)	56 (3.9)	-	-	50 (3.4)	56 (3.9)	45 (3.1)	51 (3.5)	55 (3.8)	60 (4.2)
ZB1/ZB1S	80	-	-	53 (3.7)	64 (4.4)	-	-	53 (3.7)	64 (4.4)	49 (3.4)	58 (4.0)	62 (4.3)	68 (4.7)
ZB1/ZB1S	100	-	-	56 (3.9)	73 (5.0)	-	-	56 (3.9)	73 (5.0)	52 (3.6)	65 (4.5)	69 (4.8)	76 (5.3)
ZB1/ZB1S	125	-	-	59 (4.1)	83 (5.7)	-	-	59 (4.1)	83 (5.7)	56 (3.9)	74 (5.1)	77 (5.3)	86 (5.9)
ZB1/ZB1S	150	-	-	63 (4.3)	-	-	-	63 (4.3)	-	60 (4.1)	83 (5.7)	88 (6.1)	-
Actuator Model	Line Pressure	Double Acting - Air to Open Air to Close Air pressure required to shut-off line pressure (psi/(bar))											
ZA3/ZA3S	20	30 (2.1)	30 (2.1)	30 (2.1)	30 (2.1)	30 (2.1)	30 (2.1)	30 (2.1)	30 (2.1)	17 (1.2)	18 (1.2)	27 (1.9)	27 (1.9)
ZA3/ZA3S	40	33 (2.3)	35 (2.4)	35 (2.4)	38 (2.6)	33 (2.3)	35 (2.4)	35 (2.4)	38 (2.6)	20 (1.4)	26 (1.8)	31 (2.1)	35 (2.4)
ZA3/ZA3S	60	36 (2.5)	39 (2.7)	39 (2.7)	47 (3.2)	36 (2.5)	39 (2.7)	39 (2.7)	47 (3.2)	23 (1.6)	35 (2.4)	34 (2.3)	44 (3.0)
ZA3/ZA3S	80	39 (2.7)	44 (3.0)	44 (3.0)	55 (3.8)	39 (2.7)	44 (3.0)	44 (3.0)	55 (3.8)	27 (1.9)	43 (3.0)	38 (2.6)	52 (3.6)
ZA3/ZA3S	100	42 (2.9)	48 (3.3)	48 (3.3)	64 (4.4)	42 (2.9)	48 (3.3)	48 (3.3)	64 (4.4)	30 (2.1)	51 (3.5)	41 (2.8)	61 (4.2)
ZA3/ZA3S	125	46 (3.2)	54 (3.7)	54 (3.7)	74 (5.1)	46 (3.2)	54 (3.7)	54 (3.7)	74 (5.1)	34 (2.3)	62 (4.3)	46 (3.1)	72 (5.0)
ZA3/ZA3S	150	50 (3.4)	60 (4.1)	60 (4.1)	85 (5.9)	50 (3.4)	60 (4.1)	60 (4.1)	85 (5.9)	38 (2.6)	72 (5.0)	50 (3.4)	83 (5.7)
ZB3/ZB3S	20	-	-	34 (2.3)	39 (2.7)	-	-	34 (2.3)	39 (2.7)	26 (1.8)	25 (1.7)	30 (2.1)	30 (2.1)
ZB3/ZB3S	40	-	-	37 (2.6)	48 (3.3)	-	-	37 (2.6)	48 (3.3)	30 (2.1)	32 (2.2)	37 (2.6)	41 (2.9)
ZB3/ZB3S	60	-	-	40 (2.8)	57 (3.9)	-	-	40 (2.8)	57 (3.9)	34 (2.3)	40 (2.8)	44 (3.0)	52 (3.6)
ZB3/ZB3S	80	-	-	44 (3.0)	65 (4.5)	-	-	44 (3.0)	65 (4.5)	38 (2.6)	47 (3.2)	51 (3.5)	62 (4.3)
ZB3/ZB3S	100	-	-	47 (3.2)	75 (5.2)	-	-	47 (3.2)	75 (5.2)	41 (2.8)	55 (3.8)	58 (4.0)	73 (5.1)
ZB3/ZB3S	125	-	-	51 (3.5)	86 (5.9)	-	-	51 (3.5)	86 (5.9)	46 (3.1)	64 (4.4)	66 (4.6)	87 (6.0)
ZB3/ZB3S	150	-	-	55 (3.8)	-	-	-	55 (3.8)	-	51 (3.5)	73 (5.0)	75 (5.2)	-

Note: Fail closed actuators require 90 psi (6 bar) instrument air to achieve full open with 0 psi/bar line pressure

Cv/Kv Ratings for EnviZion Manual and Actuated (SS)

Size (in)	0.5" (DN 15)		0.75" (DN 20)		0.75"R (DN 20)		1" (DN 25)		1.5" (DN 40)		2" (DN 50)	
Cv/Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv
25% Open	1.4	1.21	3.9	3.37	1.4	1.22	4.4	3.81	6.3	5.45	9.1	7.88
50% Open	2.5	2.16	7.4	6.40	2.9	2.51	9.5	8.22	17.3	14.98	24.9	21.56
75% Open	2.9	2.51	9.6	8.30	3.8	3.29	12.4	10.73	29.4	25.45	42.7	36.97
100% Open	3	2.60	10	8.65	4.5	3.89	14	12.11	37.1	32.12	51.2	44.33

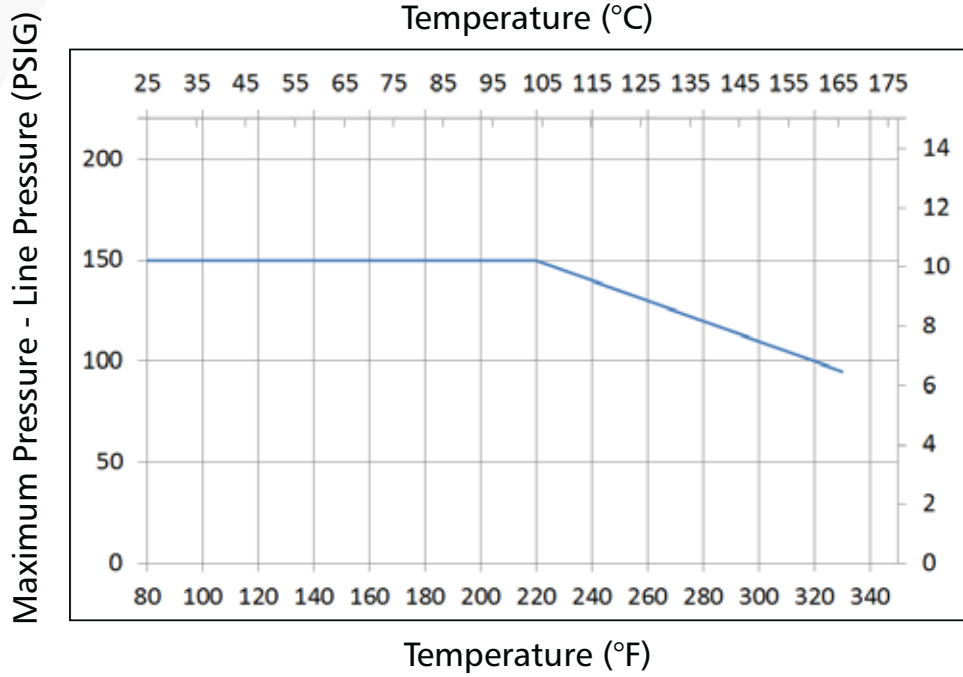
Cv/Kv Ratings for EnviZion Advantage Actuator

Size (in)	0.75" (DN 20)		1" (DN 25)		1.5" (DN 40)		2" (DN 50)	
Cv/Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv
25% Open	3.9	3.37	4.4	3.81	6.3	5.45	8	7.15
50% Open	7.4	6.40	9.5	8.22	17.3	14.98	20	17.89
75% Open	9.6	8.30	12.4	10.73	29.4	25.45	35	31.31
100% Open	10	8.65	14	12.11	37.1	32.12	46	41.15

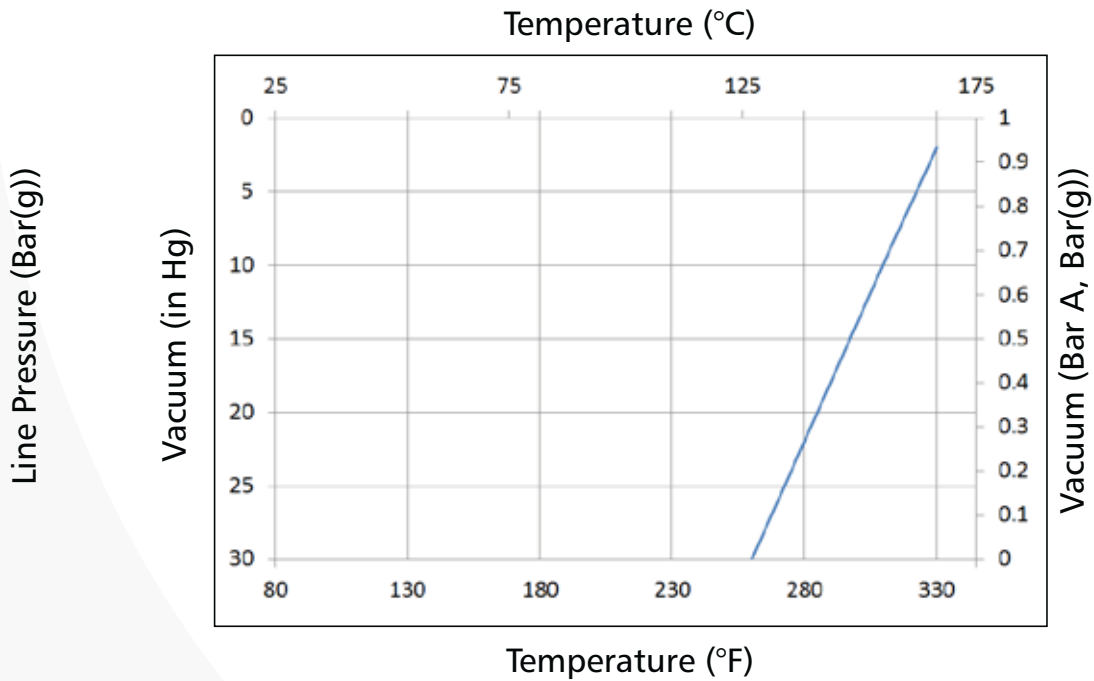
Cv units = GPM with 1 psi pressure drop across valve. Kv = m³/hr with 1 Kg/cm² pressure drop across the valve

EnviZion Valve

Pressure/Temperature Recommendations



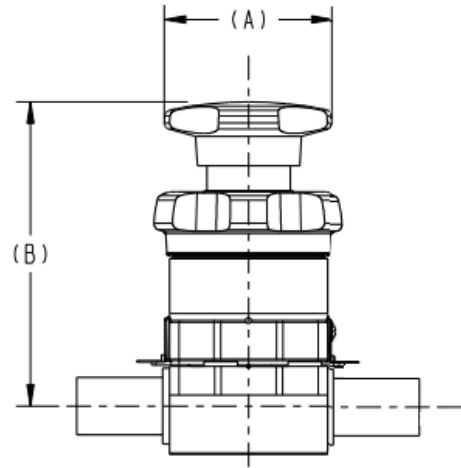
EnviZion Diaphragms for Vacuum Service



EnviZion Valve

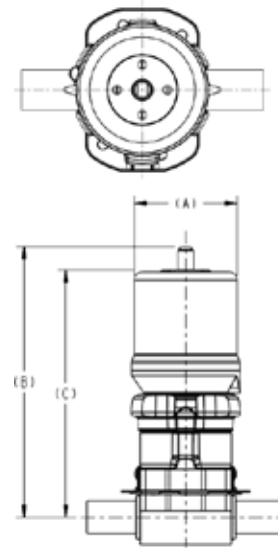
EnviZion Manual Bonnet

Valve Size		A		B		Bonnet Weight	
Inch	DN	Inch	mm	Inch	mm	Lbs	kg
0.50	15	2.05	52,1	4.04	102,5	1.3	0.6
0.75	20	2.95	74,9	5.30	134,6	3.5	1.6
0.75R	20	2.05	52,1	4.04	102,5	3.5	1.6
1.00	25	2.95	74,9	5.30	134,6	3.5	1.6
1.50	40	3.89	98,8	7.09	180,1	7.3	3.3
2.00	50	3.89	98,8	7.69	195,4	8.5	3.8



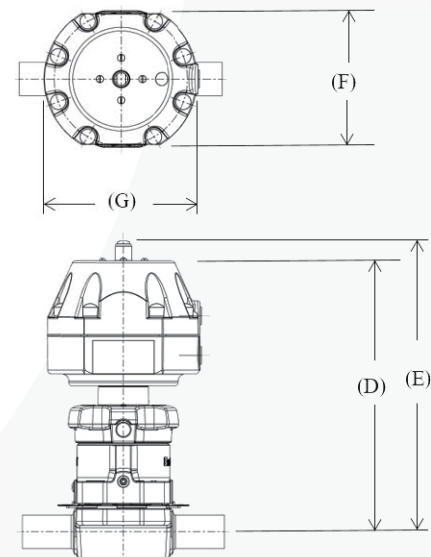
EnviZion Actuator (ZA Series)

Valve Size		A		B		C		Bonnet Weight	
Inch	DN	Inch	mm	Inch	mm	Inch	mm	Lbs	kg
0.50	15	2.62	66,5	6.56	166,7	6.04	153,4	3.1	1.4
0.75	20	3.12	79,4	8.22	208,7	7.51	190,7	6.2	2.8
0.75R	20	2.62	66,5	6.56	166,7	6.04	153,4	3.1	1.4
1.00	25	3.12	79,4	8.22	208,7	7.51	190,7	6.2	2.8
1.50	40	4.62	117,3	12.08	306,8	11.18	284,0	17.9	8.2
2.00	50	4.62	117,3	12.68	322,1	11.49	291,7	18.5	8.4

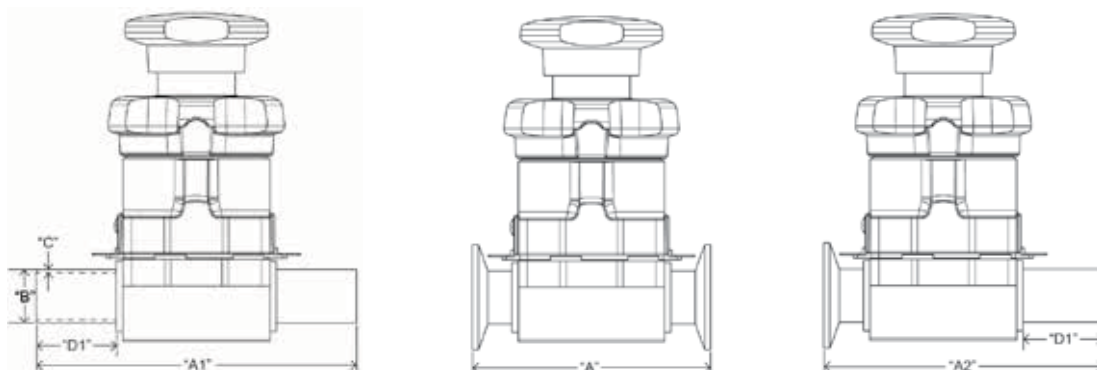


EnviZion Advantage Actuator (ZB Series)

Valve Size		D		E		F		G		Bonnet Weight	
Inch	DN	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Lbs	kg
0.75	20	8.03	204	8.61	219	4.56	116	3.88	98	6.3	2.9
1.00	25	8.03	204	8.61	219	4.56	116	3.88	98	6.3	2.9
1.50	40	11.84	301	12.67	322	6.41	163	5.94	151	18.9	8.6
2.00	50	12.14	309	13.10	333	6.41	163	5.94	151	19.7	8.9



Body Dimensions



USOD (ANSI)							Drain Angles		
B		A	A1	D1	A2	C	ANSI	ISO	DIN
End Connection Size	Overall Length	Overall Length	Weld Tangent	Overall Length	16 GA.				
IN	DN	Tri Clamp	Extended BW	Extended BW	TC x BW	Extended BW			
Forgings									
0.5"	DN15	3.5" (89)	5.22" (133)	1.5" (38)	4.36 (111)	.065	27°	TBD	TBD
0.75"	DN20	4" (102)	6.00" (152)	1.5" (38)	5.00 (127)	.065	36°	TBD	TBD
0.75R	DN20	4" (102)	6.00" (152)	1.5" (38)	5.00 (127)	.065	16°	TBD	TBD
1"	DN25	4.5" (114)	6.00" (152)	1.5" (38)	5.25 (133)	.065	30°	TBD	TBD
1.5"	DN40	5.5 (140)	7.08 (180)	1.5 (38)	6.3 (160)	.065	25°	TBD	TBD
2"	DN50	6.25 (159)	7.42 (188)	1.5 (38)	6.84 (174)	.065	19°	TBD	TBD

Note: Drain angle tolerances of +/- 2° will assure optimal drainability
Dimensions in () are mm

How to Specify an EnviZion Valve

EnviZion configuration numbers follow the same format as the Pure-Flo platform, with the exception of adding the ENV prefix in front of the figure number. In addition, codes have been established for manual bonnets, actuators, and diaphragms as noted below.

Platform		EnviZion Actuated Stainless Steel Bonnets		EnviZion Advantage Bonnets		Diaphragms	
Code	Description	Code	Description	Code	Description	Code	Description
ENV	EnviZion	ZA1	EnviZion Zero torque Actuator - FO	ZB1	EnviZion Advantage Zero torque Actuator - FO	TMZ	EnviZion modified PTFE diaphragm (FDA)/B1 backing cushion
EnviZion Manual Bonnets		ZA2	EnviZion Zero torque Actuator - FC (90#)	ZB2	EnviZion Advantage Zero torque Actuator - FC (90#)	For more information on how to order an EnviZion valve, see B.ENV-ORD.2017-11.	
ZH	EnviZion Zero torque Manual	ZA3	EnviZion Zero torque Actuator - DA	ZB3	EnviZion Advantage Zero torque Actuator - DA		
ZHS	EnviZion Zero torque Manual sealed	ZA1S	EnviZion Zero torque Actuator - FO sealed	ZB1S	EnviZion Advantage Zero torque Actuator - FO sealed	Topworks Options	
		ZA2S	EnviZion Zero torque Actuator- FC (90#) sealed	ZB2S	EnviZion Advantage Zero torque Actuator- FC (90#) sealed	Code	Description
		ZA3S	EnviZion Zero torque Actuator - DA sealed	ZB3S	EnviZion Advantage Zero torque Actuator - DA sealed	EBG	EnviZion Bonnet Guard Tamper Resistant/Submersible



ENGINEERED FOR LIFE

ITT Engineered Valves
33 Centerville Road
Lancaster, PA 17603, USA
Tel: +1 (717) 509-2200

Cam-Line, Cam-Tite, Dia-Flo,
EnviZion, Pure-Flo, Skotch

Figure Number Example: ENV-1-F-428L-6-0-0-TMZ-ZH
Description: 1" EnviZion manual valve, forged body, 16 gauge butt weld ends, 25 Ra interior polish with PTFE diaphragm with EPDM backing cushion

ITT Engineered Valves
1110 Bankhead Avenue
Amory, MS 38821, USA
Tel: +1 (662) 256-7185

Fabri-Valve

ITT Industries Ltd.
Weycroft Avenue,
Millwey Rise Industrial Estate
Axminster, EX13 5HU, United Kingdom
Tel: +44 1297-639100

EnviZion, Pure-Flo

