

Mark 96 Series

CRN Registration Number Available

Sanitary Pressure Regulators

The Mark 96 Sanitary Pressure Regulator is designed to regulate pressure in systems requiring the maintenance of sanitary conditions.

The Mark 96 operates by sensing pressure under the diaphragm on the downstream side of the seat. As the downstream pressure approaches the set point, the force caused by the pressure acting on the diaphragm overcomes the force of the range spring, and the plug begins to move up toward closed. This reduces the downstream pressure and maintains the set point. If the pressure underneath the diaphragm begins to fall, the spring forces the plug to move down towards open, to allow the set point to be maintained.

FEATURES

- CRN Registration Number Available
- Soft seat capability for ANSI Class VI shutoff
- No guiding surfaces in the fluid – prevents particulate generation
- 100% 316L barstock body – no wetted parts made from forgings or castings
- Self-draining
- No threads in contact with service media – prevents accumulation of contaminants
- Easy to disassemble for cleaning
- Clean-in-Place, Steam-in-Place – dome lock pin to allow CIP/SIP
- Jorton diaphragm: PTFE based material provides excellent chemical resistance and extremely long life in steam service. Far superior to other elastomer or metal diaphragm materials. *Ask your local Representative for cycle testing information.*

DOCUMENTATION

The following documentation is shipped with each order:

- Steriflow Unicert
 - Traceable Material Heat Number for body and ferrels
 - Certificate of Compliance to FDA and USP Class VI

Certificate of Surface Finish

- Final Test Reports and Certificate of Origin available upon request at time of order



AVAILABLE FINISHES

Body

- **Standard:** 20 Ra (SFV5) mechanical finish and electropolish on inside wetted surfaces; machine finish and electropolish on exterior
- **Optional:** 20 Ra (SFV5) mechanical finish and electropolish on external surfaces; 8 Ra finish on internal or external finishes and electropolish

Stem

- **Standard:** 20 Ra (SFV5) mechanical finish and electropolish
- **Optional:** 8 Ra finish

Spring Housing and Handle

- **Standard:** electropolished, 316SST, Anodized Aluminum (1-1/2" – 3")
- **Optional:** 20 Ra (SFV5) mechanical finish and electropolish on external surfaces; 8 Ra finish on external surfaces on all sizes and electropolish

Adjusting Screw

- **Standard:** electropolished
- **Optional:** 20 Ra (SFV5) mechanical finish and electropolish;

Note: adjusting screw is a threaded part

APPLICATIONS

A wide variety of applications exist for the MK96 in the pharmaceutical, biotech, health-care, food & beverage and other industries.

SPECIFICATIONS – O-RING DIAPHRAGM

Sizes: 3/4" (DN20), 1" (DN25), 1-1/2" (DN40), 2" (DN50), 3" (DN80)

End Connections

- Quick disconnect fittings (*to match Tri-Clamp® fitting*)
- DIN/ISO sanitary connections

Body Connections: Mark 96 – Bolted – Standard for all sizes

Body & Trim Materials: 316L Stainless Steel (ASTM A479)

Seat Materials

- Standard hard seat – integral 316L SST seat
- Optional soft seat
 - Jorlon (for Cv 1.5, 1" size and above) (FDA & USP Class VI) for steam and hot fluid service to 338°F (170°C)
 - PEEK (up to 1-1/2") (FDA & USP Class VI) for steam and hot fluid service to 350° (177°C)
 - Teflon (FDA & USP Class VI) to 150° (65°C)

Note: consult factory for 3/4" soft seat materials

Spring Housing Materials

- CF8M cast SST (3/4" – 1")
- Fabricated 316L SST (1-1/2" – 3")
- Anodized Aluminum (1-1/2" – 3")

Diaphragm Materials

- 316L SST
- EPDM/Nylon (to 275°F, 135°C)
- Teflon-coated Viton (to 400°F, 204°C) in 3/4" & 1" sizes only
- Jorlon (to 450°F, 232°C) – FDA, USP Class VI

O-Ring Materials

- EPDM (to 275°F, 135°C) – FDA, *USP Class VI
- Buna-N (to 225°F, 107°C) – FDA, *USP Class VI
- Viton (to 400°F, 232°C) – FDA, *USP Class VI
- Silicone (to 450°F, 232°C) – FDA, *USP Class VI
- Teflon-Encapsulated Viton (to 400°F, 204°C) – FDA, *USP Class VI
- Teflon-Encapsulated Silicone (to 400°F, 204°C) – FDA, *USP Class VI

**USP Class VI materials available upon request*

Shutoff: ANSI Class III hard seat or Class VI soft seat

Body Pressure Temperature Rating: (dependent upon construction)

Valve Size	PSIG @ 100°F	PSIG @ 450°F
3/4" & 1"	350 (24,1 bar)	250 (17,2 bar)
1-1/2" , 2" , & 3"	200 (13,8 bar)	200 (13,8 bar)

Note: for 1/2" size, refer to our Mark 96C datasheet

Set Point Spring Ranges

Valve Size	Set Point Ranges, PSI (bar)
3/4" & 1"	2-8* (0,1-0,5), 5-25 (0,37-1,7), 15-50 (1,0-3,4), 40-90 (2,7-6,2), or 75-135 (5,2-9,3)
1-1/2"	10-25 (0,7-1,7), 15-50 (1,0-3,4) or 35-100 (2,4-6,9)
2"	10-25 (0,7-1,7) or 15-60 (1,0-4,1)
3"	15-25 (1,0-1,7) or 15-60 (1,0-4,1)

* Range available with elastomer diaphragm only. Maximum pressure drop 40 psi.

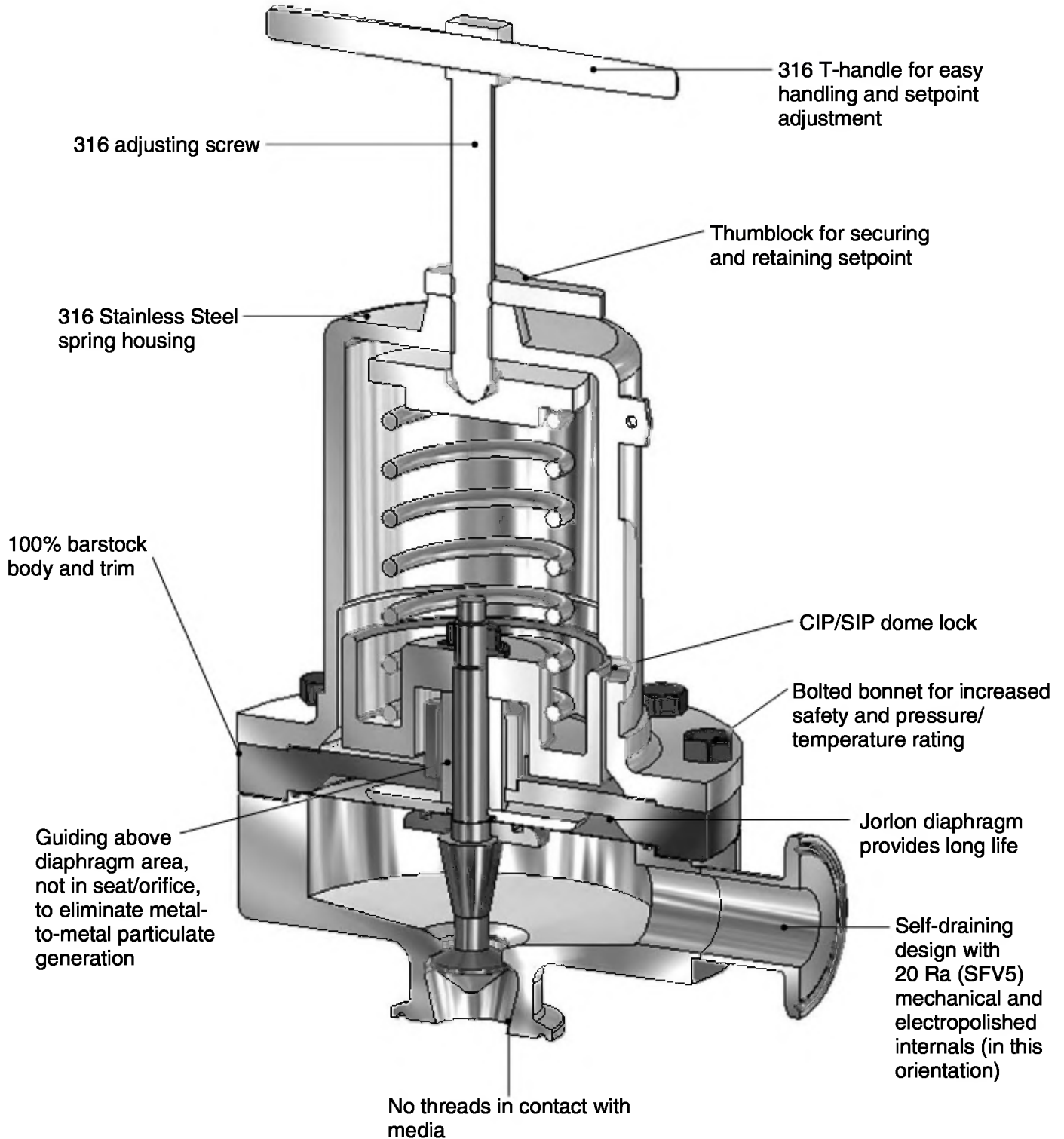
Cv (Kv) Ratings:

Valve Size	Available Cvs (Kvs)	Cv for Relief Valve Sizing
3/4"	1.5 (1,3)	3.8
1"	1.5, 2.5, 4.5, 5.5**, 6.1** (1,3; 2,2; 3,9; 4,7; 5,3)	10.7
1-1/2"	4.5 or 10.0 (3,9 or 8,6)	26.3 (1,19); 6.7 (0,58)
2"	10.0 or 19.0 (8,6 or 16,3)	56.5 (1,68), 16.5 (0,90)
3"	10.0 or 23.0 (8,6 or 19,8)	67.1 (1,83); 16.5 (0,90)

** Not available with metal diaphragms, Jorlon and other elastomers acceptable

Maximum Allowable Pressure Differential: 200 psi (2-8 spring range has a max of 40 psi)

FEATURES & BENEFITS



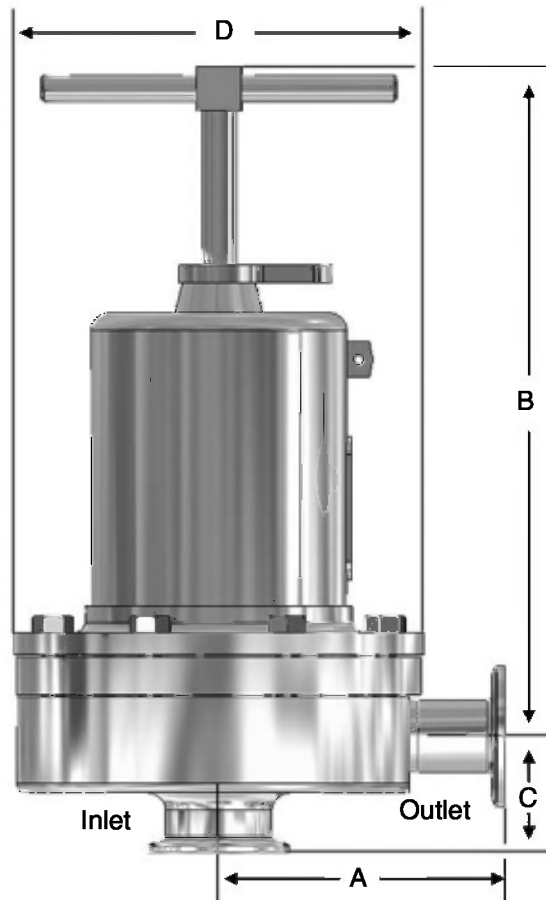
MARK 96 SERIES SANITARY PRESSURE REGULATORS

CAPACITY Cv AT VARIOUS DROOP %

Mark 96	Set Pressure PSIG	7					Cv for Relief Valve Sizing
		5%	10%	15%	20%	30%	
3/4" 1.5 Cv 15 to 50 psi range	15	0.10	0.20	0.31	0.42	0.65	3.8
	20	0.12	0.26	0.39	0.54	0.83	
	25	0.15	0.31	0.47	0.64	1.01	
	30	0.18	0.36	0.55	0.75	1.17	
	35	0.20	0.41	0.63	0.85	1.34	
	40	0.22	0.46	0.70	0.96	1.50	
	45	0.25	0.51	0.77	1.06	1.50	
	50	0.27	0.55	0.85	1.16	1.50	
1" 4.5 Cv 15 to 50 psi range	15	0.30	0.61	0.93	1.26	1.95	10.7
	20	0.37	0.77	1.18	1.61	2.50	
	25	0.46	0.93	1.42	1.93	3.02	
	30	0.53	1.08	1.65	2.25	3.52	
	35	0.60	1.23	1.88	2.56	4.02	
	40	0.67	1.37	2.10	2.87	4.50	
	45	0.74	1.52	2.32	3.18	4.50	
	50	0.81	1.66	2.55	3.48	4.50	
1-1/2" 10 Cv 15 to 50 psi range	15	0.59	1.20	1.85	2.54	4.05	26.3
	20	0.66	1.36	2.10	2.91	4.68	
	25	0.72	1.48	2.30	3.19	5.16	
	30	0.77	1.57	2.45	3.40	5.55	
	35	0.80	1.65	2.57	3.58	5.86	
	40	0.83	1.71	2.67	3.73	6.13	
	45	0.86	1.76	2.75	3.85	6.35	
	50	0.88	1.80	2.82	3.95	6.53	
2" 19 Cv 15 to 60 psi range	15	1.89	3.85	5.84	7.87	12.02	56.5
	20	2.66	5.40	8.19	11.04	16.88	
	25	3.48	7.08	10.73	14.46	19.00	
	30	4.41	8.91	13.47	18.17	19.00	
	35	5.37	10.92	16.52	19.00		
	40	6.45	13.16	19.00			
	45	7.77	15.68	19.00			
	50	9.23	18.54	19.00			
3" 23 Cv 15 to 60 psi range	15	1.93	3.89	5.89	7.94	12.13	67.1
	20	2.68	5.45	8.26	11.14	17.03	
	25	3.51	7.14	10.82	14.59	22.28	
	30	4.41	8.99	13.61	18.32	23.00	
	35	5.42	11.02	16.67	22.42	23.00	
	40	6.50	13.28	20.05	23.00		
	45	7.81	15.82	23.00			
	50	9.31	18.70	23.00			

Note: for capacity Cv and performance at other conditions, please visit the Technical Library on our website at www.steriflowvalve.com

DIMENSIONS



Valve Size	Dimensions (inches)				Weight Lbs
	A	B	C	D	
3/4"	3.29	8.00	1.50	5.70	18
1"	4.00	8.00	1.64	5.70	20
1-1/2"	4.21	10.50	2.53	7.25	40/28.7*
2"	5.34	17.50	2.96	9.50	90/66**
3"	5.34	18.00	3.46	9.50	98

Valve Size	Dimensions (mm)				Weight Kgs
	A	B	C	D	
DN20	84	203	38,1	145	8,1
DN25	102	203	41,7	145	9,1
DN40	107	267	64,3	184	18/13*
DN50	136	445	75,2	241	41/30**
DN80	136	457	87,9	241	44,4

* 40 lbs (18,1 kgs) standard; 28.7 lbs (13 kgs) with aluminum spring housing

** 90 lbs (40,7 kgs) standard; 66 lbs (33 kgs) with aluminum spring housing

SAMPLE SPECIFICATION

Stainless steel sanitary pressure regulator shall be made from ASME-SA479 barstock material, which includes body and all wetted metal parts. Regulator shall be activated by FDA approved, USP Class VI certified Jorlon diaphragm. Guiding of valve stem/plug shall be outside of the wetted, process areas of valve internal, above diaphragm. Regulator shall be free of threads within wetted, process areas of valve internal and shall be self draining when installed with inlet vertical and below valve assembly.

ORDERING SCHEMATIC

1	—	2	—	3	/	4	5	6	7	8	9	10	11	12
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1	Model
96	Standard

2	Size
075	3/4"
100	1"
150	1-1/2"
200	2"
300	3"

3	Body Material
6L	316L

4	Body Finish
A	20Ra (SFV5) Interior/63RMS Exterior (Std)
B	20Ra (SFV5) Interior/20Ra Exterior
C	8Ra Interior/63RMS Exterior*
D	20Ra (SFV5) Interior/8Ra Exterior
E	8Ra Interior/8Ra Exterior*
F	8Ra Interior/20Ra Exterior*

* Handle and all external surfaces meet spec per above. The adjusting screw is a threaded part and cannot be polished beyond 20Ra

5	Body Cv (Kv) See chart on page 2	
	Cv	Kv
A	1.5	1,3
D	2.5	2,2
H	4.5	3,9
K	5.5 & 6.1	4,7 & 5,3
M	10.0	8,6
N	19.0	16,3
P	23.0	17,8*

6	Trim Finish
A	20Ra (Standard)
B	8Ra

6	Trim – Cv (Kv) & Seat			
A	1.5 (1,3) Hard Seat	N	5.5 (4,7) Jorlon Seat	
2	1.5 (1,3) Jorlon Seat	P	10 (8,6) Hard Seat	
B	2.5 (2,2) Hard Seat	Q	10 (8,6) Teflon Seat	
C	2.5 (2,2) Teflon Seat	R	10 (8,6) Jorlon Seat	
D	2.5 (2,2) Jorlon Seat	S	19 (16,3) Hard Seat	
H	4.5 (3,9) Hard Seat	T	19 (16,3) Teflon Seat	
J	4.5 (3,9) Teflon Seat	U	19 (16,3) Jorlon Seat	
K	4.5 (3,9) Jorlon Seat	V	23 (19,8) Hard Seat	
L	5.5 (4,7) Hard Seat	W	23 (19,8) Teflon Seat	
M	5.5 (4,7) Teflon Seat	X	23 (19,8) Jorlon Seat	
7	6.1 (5,3) Hard Seat			

8	O-Ring/Diaphragm
BU	Buna-N/SST Diaphragm
EE	EPDM/EPDM Diaphragm
EP	EPDM/SST Diaphragm
SL	Silicone/SST Diaphragm
TS	Teflon Encaps. Silicone/SST Diaphragm
TT	Teflon Encaps. Viton/TFE Diaphragm
TY	Teflon Encaps. Viton/Jorlon Diaphragm
TV	Teflon Encaps. Viton/SST Diaphragm
VT	Viton/SST Diaphragm

9	Adjusting Screw Finish (Except Threads)
A	Electro-polished (Standard)
B	20Ra (SFV5)
C	8Ra

10	Range PSI (Bar) see chart on page 2
A	2 - 8 (0,1 - 0,6)
C	5 - 25 (0,3 - 1,7)
E	10 - 25 (0,7 - 1,7)
P	15 - 25 (1,0 - 1,7)
H	15 - 50 (1,0 - 3,4)
J	15 - 60 (1,0 - 4,1)
M	35 - 100 (2,4 - 6,9)
R	40 - 90 (2,8 - 6,2)
T	75 - 135 (5,2 - 9,3)

11	Diaphragm
6L	SST (all exterior)
EP	EPDM (all exterior)
JL	Jorlon (all exterior)
TV	TFE-Viton (standard exterior)
BV	TFE-Viton (20Ra (SFV5) exterior)
DV	TFE-Viton (8Ra exterior)

12	Actuator Finish/Type
AA	Standard
BA	20Ra (SFV5) exterior
CA	8Ra exterior
DA	Electro-polished for 2" & 3"
EA	Anodized Aluminum (1-1/2" - 3")

Note: for 3-A certified MK96, please contact factory for correct options and ordering code. For USP Class VI elastomer ordering codes, please consult factory.



Steriflow, a division of Jordan Valve
 3170 Wasson Road • Cincinnati, OH 45209
 513.533.5600 • 800.543.7311 • 513.871.0105 (f)
 steriflow@richardslnd.com • www.steriflowvalve.com

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Mark 96C Series

CRN Registration Number Available

Sanitary Pressure Regulators (1/2"–1")

The Mark 96C is a clamped body pressure reducing valve designed to regulate downstream pressure of process and utility applications in sanitary and aseptic systems.

The Mark 96C operates by sensing pressure under the diaphragm after the medium has entered the valve from the bottom inlet port. As the downstream pressure approaches the set point, the force caused by the pressure acting on the diaphragm overcomes the force of the range spring, and the plug begins to move up toward closed. This reduces the downstream pressure and maintains the set point as the flow exits the valve from the side port. If the pressure underneath the diaphragm begins to fall, the spring forces the plug to move down towards open, to allow the set point to be maintained.

FEATURES

- CRN Registration Number Available
- Soft seat capability for ANSI Class VI shutoff
- No guiding surfaces in the fluid – prevents particulate generation
- 100% 316L barstock body and metal trim
- Self-draining design
- No threads in contact with service media – prevents accumulation of contaminants
- Easy to disassemble for cleaning
- Clean-in-Place, Steam-in-Place – dome lock pin to allow CIP/SIP
- Jorlon diaphragm: A USP Class VI, FDA approved PTFE based material which provides excellent chemical resistance, extremely long life in steam service. Far superior to other elastomer or metal diaphragm metals.

DOCUMENTATION

The following documentation is available, free of charge, from our factory upon request at time of ordering:

- Traceable Material Certificates (free of charge for body and ferrules)
- FDA or USP Class VI certificates on most soft seal materials
- Final Test Reports
- Certificate of Surface Finish
- Certificate of Compliance/Certificate of Origin



AVAILABLE FINISHES

Body

- *Standard:* 20 Ra mechanical finish and electropolish on inside wetted surfaces; machine finish and electropolish on exterior
- *Optional:* 20 Ra mechanical finish on external surfaces; 8 Ra finish on internal or external finishes

Stem

- *Standard:* 20 Ra mechanical finish and electropolish
- *Optional:* 8 Ra finish

Spring Housing

- *Standard:* electropolished
- *Optional:* 20 Ra mechanical finish on external surfaces; 8 Ra finish on external surfaces on all sizes

Adjusting Screw

- *Standard:* electropolished
- *Optional:* 20 Ra mechanical finish; or 8 Ra finish on non-thread portion

APPLICATIONS

A wide variety of applications exist for the MK96C in the pharmaceutical, biotech, health-care, food & beverage and other industries. The Mark 96C is suitable for liquid, gas and steam service



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3170 Wasson Road • Cincinnati, OH 45209
513.533.5600 • 800.543.7311 • 513.871.0105 (f)
steriflow@richardslnd.com • www.steriflowvalve.com

SPECIFICATIONS

Sizes: 1/2" (DN15), 3/4" (DN20), 1" (DN25),

End Connections

- Quick disconnect fittings (to match Tri-Clamp® fitting)
- DIN/ISO sanitary connections

Body Connections: Mark 96C – Clamped – 3 segment standard; 2 piece bolted optional

Body & Trim Materials: 316L Stainless Steel (ASTM A479)

Spring Housing Materials: CF8M Cast SST

Seat Materials

- Standard hard seat – integral 316L SST seat
- Optional soft seat (for Cv 1.5, 1" size and above)
 - Jorlon (FDA & USP Class VI) for steam and hot fluid service to 338°F (170°C)
 - PEEK (FDA & USP Class VI) for steam and hot fluid service to 350° (177°C)
 - Teflon (FDA & USP Class VI) to 150° (65°C)

Note: consult factory for 1/2" & 3/4" soft seat materials

Diaphragm Materials

- Jorlon (recommended) – to 450°F (232°C) FDA, USP Class
- EPDM/Nylon – to 275°F (135°C)

O-Ring Materials

- EPDM (to 275°F, 135°C) – FDA, *USP Class VI
- Buna-N (to 225°F, 107°C) – FDA, *USP Class VI
- Viton (to 400°F, 232°C) – FDA, *USP Class VI
- Silicone (to 450°F, 232°C) – FDA, *USP Class VI
- Teflon-Encapsulated Viton (to 400°F, 204°C) – FDA, *USP Class VI

**USP Class VI materials available upon request*

Shutoff: ANSI Class III hard seat or Class VI soft seat

Body Pressure Temperature Rating: (dependent upon construction)

Valve Size	PSIG @ 100°F	PSIG @ 225°F
1/2", 3/4", 1"	250 (17,2 bar)	200 (13,8 bar)*
1-1/2" , 2", & 3"	200 (13,8 bar)	200 (13,8 bar)
Valve Size	PSIG @ 100°F	PSIG @ 275°F
1/2", 3/4", 1"	250 (17,2 bar)	140 (9,6 bar)**

* Optional 2 segment clamp

** Standard 3 segment clamp

Setpoint Spring Ranges

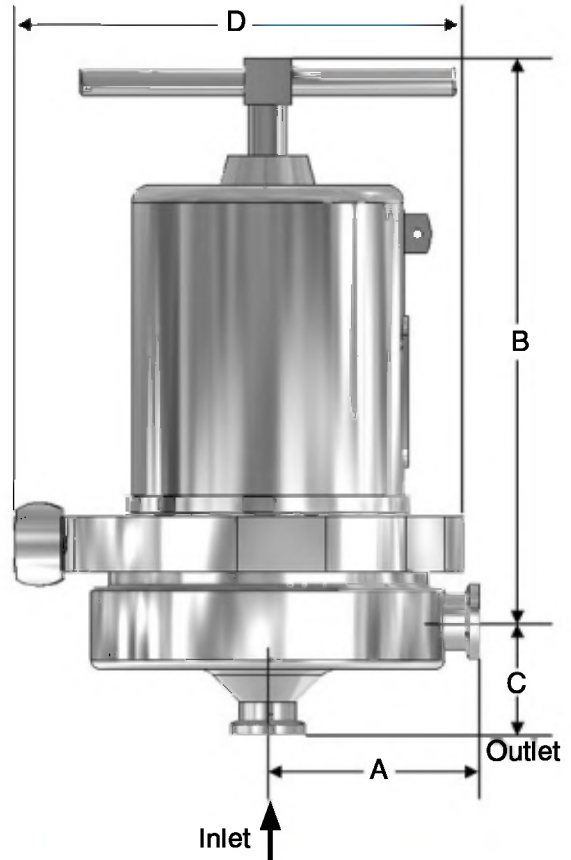
Valve Size	Setpoint Ranges, PSI (BAR)
1/2", 3/4", 1"	2-8 (0,1-0,5), 5-25 (0,4-1,7), 15-50 (1,0-3,4), 40-90 (2,7-6,2) or 75-135 (5,2-9,3)

Cv (Kv) Ratings:

Valve Size	Available Cvs (Kvs)	Cv for Relief Valve Sizing
1/2"	0.3*, 0.5*, 1.2* (0,3*, 0,4*, 1,0*)	3.8
3/4"	0.5*, 1.5 (0,4*, 1,3)	3.8
1"	0.5, 1.5, 2.5 or 5.5 (0,4; 1,3; 2,2; 3,9 or 4,7)	10.7

* For Cv's ≤1.2, Teflon encapsulated o-rings not available
Consult factory for additional size/Cv combinations

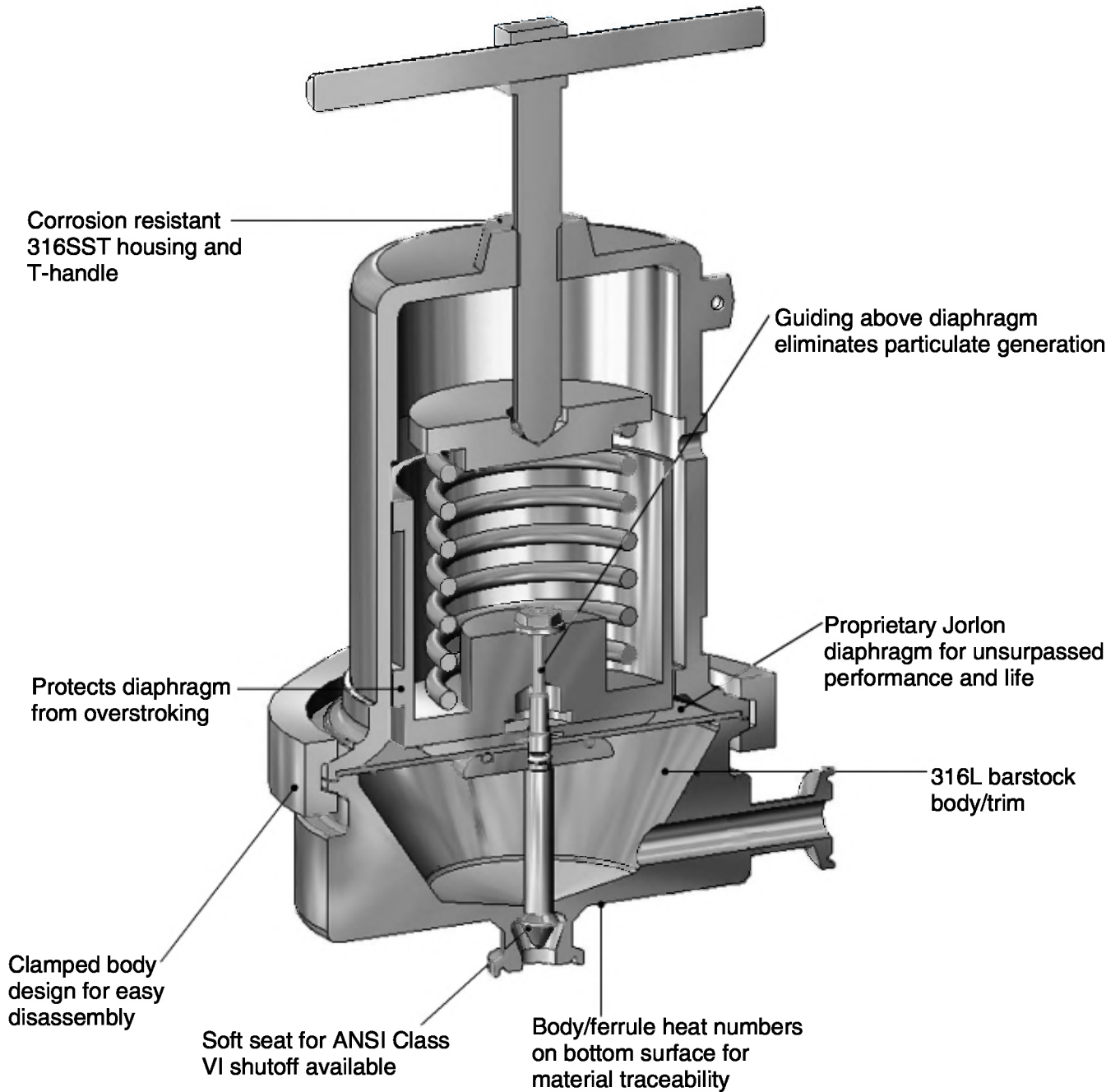
DIMENSIONS



Valve Size	Dimensions (inches)				Weight Lbs
	A	B	C	D	
1/2"	3.29	8.30	1.08	5.2	18
3/4"	3.29	8.30	1.50	5.20	18
1"	3.50	8.44	1.64	5.20	20

Valve Size	Dimensions (mm)				Weight Kgs
	A	B	C	D	
DN15	84	211	27,4	132	8,1
DN20	84	211	38,1	132	8,1
DN25	89	214	41,7	132	9,1

FEATURES & BENEFITS



FEATURES & BENEFITS

Stainless Steel sanitary pressure regulator shall be made from ASTM A479 barstock material, which includes body and all wetted metal parts. Regulator shall be activated by FDA approved, USP Class VI certified Jorlon diaphragm. Guiding of valve stem/plug shall be outside of the wetted, process areas of valve internal, above diaphragm. Regulator shall be free of threads within wetted, process areas of valve internal and shall be self-draining when installed with inlet vertical and below valve assembly.

ORDERING SCHEMATIC

1	—	2	—	3	/	4	5	6	7	8	9	10	11	12
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1	Model
96C	Standard

2	Size
050	1/2" (DN15)
075	3/4" (DN20)
100	1" (DN25)

3	Body Material
6L	316L

4	Body Finish
A	20Ra (SFV5) Interior/63RMS Exterior (Std)
B	20Ra (SFV5) Interior/20Ra Exterior
C	8Ra Interior/63RMS Exterior
D	20Ra (SFV5) Interior/8Ra Exterior
E	8Ra Interior/8Ra Exterior
F	8Ra Interior/20Ra Exterior

5	Body Cv (Kv)	
	Cv	Kv
B	All 1/2"	All 1/2"
A	0.5 (1/2" & 1")	0.43 (1/2" & 1")
C	1.5 (3/4" & 1")	1.3 (3/4" & 1")
F	2.5 (1")	2.15 (1")
L	5.5 (1")	4.7 (1")

6	Trim Finish
A	20Ra (Standard)
B	8Ra

7	Trim – Cv (Kv) & Seat	
3	0.3 (0.24) Hard Seat	B 2.5 (2.15) Hard Seat
4	0.3 (0.24) PEEK Seat	C 2.5 (2.2) Teflon Seat
5	0.5 (0.43) Hard Seat	D 2.5 (2.15) Jorlon Seat
6	0.5 (0.43) PEEK Seat	L 5.5 (4.7) Hard Seat
Y	1.2 (1.03) Hard Seat	M 5.5 (4.7) Teflon Seat
1	1.2 (1.03) PEEK Seat	N 5.5 (4.7) Jorlon Seat
A	1.5 (1.3) Hard Seat	

8	O-Ring/Diaphragm
EE	EPDM/EPDM Diaphragm 1.5-5.5Cv
TY	Teflon Enclaps. Viton/Jorlon Diaphragm 1.5-5.5Cv
E5	EPDM/EPDM Diaphragm 0.3-1.2Cv
B5	Buna-N/Jorlon 0.3-1.2Cv
V5	Viton/Jorlon Diaphragm 0.3-1.2Cv
S5	Silicon/Jorlon Diaphragm 0.3-1.2Cv

9	Adjusting Screw Finish (Except Threads)
A	Electro-polished (Standard)
B	20Ra (SFV5)
C	8Ra

10	Range PSI (Bar) see chart on page 2
A	2 - 8 (0.1 - 0.6)
C	5 - 25 (0.3 - 1.7)
H	15-50 (1.0-3.4)
J	15-60 (1.0-4.1)
R	40-90 (2.8-6.2)
T	75-135 (5.2-9.3)

11	Diaphragm
EP	EPDM 1.5-5.5 Cv
JL	Jorlon 1.5-5.5 Cv
E5	EPDM 0.3-1.2 Cv
J5	Jorlon 0.3-1.2 Cv

12	Actuator Finish
AA	Standard
BA	20Ra (SFV5) exterior
CA	8Ra exterior

13	PED Compliance
00	Not Required
0G	SEP Compliant
ZZ	Non-Standard



Steriflow, a division of Jordan Valve
 3170 Wasson Road • Cincinnati, OH 45209
 513.533.5600 • 800.543.7311 • 513.871.0105 (f)
 steriflow@richardslnd.com • www.steriflowvalve.com

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Mark 96AA Series

Sanitary Air Augmented Pressure Regulators

*"Send a signal
not a
technician"*

The Mark 96 with air augmentation (AA) option offers the same line sizes, Cv choices, seats, great low droop characteristics, and stability of the standard bolted bonnet Mark 96, but with an advantage. By connecting an air pressure signal to the 1/4" FNPT dome fitting via an air regulator or I/P, the set point can be changed remotely by "sending an air signal instead of a technician".

The Mark 96AA gives users the ability to change pressure set points to any point in excess of the springs minimum set point (2 psi on a 3/4" – 1" Mark 96, 10 psi on a 1-1/2" – 2", and 15 psi on a 3"). Users adjust the regulator's spring to the lowest set point, or to the lowest set pressure that the regulator will operate at (sterilization steam pressure for example). To achieve a higher pressure set point (CIP or WFI flush), air pressure is added to the regulator dome. To lower the set point to its previous value, or to the springs manual set point, the pressure is reduced in the same manner.



FEATURES

- Reduce project CapEx. Remote regulator operation reduces the time required for steam pressure balancing, commissioning and validation of SIP and CIP routines.
- Complete range of products for any size or Cv requirement. The available sizes and Cv's are the same as the current MK96 product line.
- Mark 96AA upgrade kits available for MK96 regulators.
- With preset spring, users maintain control in the event of power (air failure). Valve will return to manual preset.
- Minimal droop when compared with all other spring loaded and air operated products, especially at higher set points.
- Extended permissible operating range when compared with all spring loaded and air load regulators.
 - The minimum set point is equivalent to the minimum spring rate set point (2 psi on a 3/4" – 1", 10 psi on a 1-1/2" – 2", and 15 psi on a 3" model).
 - No differential pressure requirements. Users can adjust the set point to any point between the minimum and maximum set point, without restriction.

DOCUMENTATION

The following documentation is shipped with each order:

- Steriflow Unicert
 - Certificate of Material Compliance with Traceable Material Heat Number for body and ferrels and MTRs
 - Certificate of Compliance to FDA and USP Class VI
 - Certificate of Surface Finish
- Final Test Reports and Certificate of Origin available upon request at time of order



Steriflow by Jordan Valve

3170 Wasson Road • Cincinnati, OH 45209
513.533.5600 • 800.543.7311 • 513.871.0105 (f)
steriflow@richardsind.com • www.steriflowvalve.com

AVAILABLE FINISHES

Body

- **Standard:** (20 Ra (SF5) mechanical finish and electropolish) on inside wetted surfaces; machine finish and electropolish on exterior
- **Optional:** 8 Ra finish on internal or external finishes and electropolish; better than SF4 (20 Ra (SF5) mechanical finish and electropolish) on external surfaces

Stem

- **Standard:** 20 Ra (SFV5) mechanical finish and electropolish
- **Optional:** 8 Ra finish

Spring Housing and Handle

- **Standard:** electropolished, 316SST
- **Optional:** 8 Ra finish on external surfaces on all sizes and electropolish (1-1/2" – 3" only); 20 Ra (SFV5) mechanical finish and electropolish on external surfaces

Adjusting Screw

- **Standard:** electropolished
- **Optional:** 20 Ra (SFV5) mechanical finish and electropolish;

Note: adjusting screw is a threaded part

SPECIFICATIONS

Sizes: 3/4" (DN20), 1" (DN25), 1-1/2" (DN40), 2" (DN50), 3" (DN80)

End Connections

- Quick disconnect fittings (*to match Tri-Clamp® fitting*)
- Tube weld ends
- DIN/ISO sanitary connections

Body Connections: Mark 96 – Bolted – Standard for all sizes

Body & Trim Materials: 316L Stainless Steel (ASTM SA479)

Seat Materials

- Standard hard seat – integral 316L SST seat
- Optional soft seat
 - Jorlon (for Cv 1.5, 1" size and above) (FDA & USP Class VI) for steam and hot fluid service to 338°F (170°C)
 - PEEK (up to 1-1/2") (FDA & USP Class VI) for steam and hot fluid service to 350° (177°C)
 - Teflon (FDA & USP Class VI) to 150° (65°C)

Note: consult factory for 3/4" soft seat materials

Spring Housing Materials

- CF8M cast 316 SST (3/4" – 1")
- Fabricated 316L SST (1-1/2" – 3")

Diaphragm Materials

- Jorlon (to 450°F, 232°C) – FDA, USP Class VI

O-Ring Material

- Teflon-Encapsulated Viton (to 400°F, 204°C) – FDA, USP Class VI

Shutoff: ANSI Class III hard seat or Class VI soft seat

Body Pressure Temperature Rating: (dependent upon construction)

Valve Size	PSIG @ 100°F	PSIG @ 450°F
3/4" & 1"	350 (24,1 bar)	250 (17,2 bar)
1-1/2" , 2" , & 3"	200 (13,8 bar)	200 (13,8 bar)

Set Point Spring Ranges

Valve Size	Set Point Ranges, PSI (bar)
3/4" & 1"	2-8 (0,1-0,5), 5-25 (0,37-1,7), 15-50 (1,0-3,4), 40-90 (2,7-6,2)
1-1/2"	10-25 (0,7-1,7), 15-50 (1,0-3,4) or 35-100 (2,4-6,9)
2"	10-25 (0,7-1,7) or 15-60 (1,0-4,1)
3"	15-25 (1,0-1,7) or 15-60 (1,0-4,1)

Cv (Kv) Ratings:

Valve Size	Available Cvs (Kvs)	Cv for Relief Valve Sizing
3/4"	1.5 (1,3)	3.8
1"	1.5, 2.5, 4.5, 5.5, 6.1 (1,3; 2,2; 3,9; 4,7; 5,3)	10.7
1-1/2"	4.5 or 10.0 (3,9 or 8,6)	26.3 (1,19); 6.7 (0,58)
2"	10.0 or 19.0 (8,6 or 16,3)	56.5 (1,68), 16.5 (0,90)
3"	10.0 or 23.0 (8,6 or 19,8)	67.1 (1,83); 16.5 (0,90)

Maximum Allowable Pressure Setpoint: The total of the spring setpoint and additional air pressure cannot exceed:

- 3/4" – 1": 135 psi (9,3 bar)
- 1-1/2": 100 psi (6,9 bar)
- 2" – 3": 80 psi (5,5 bar)

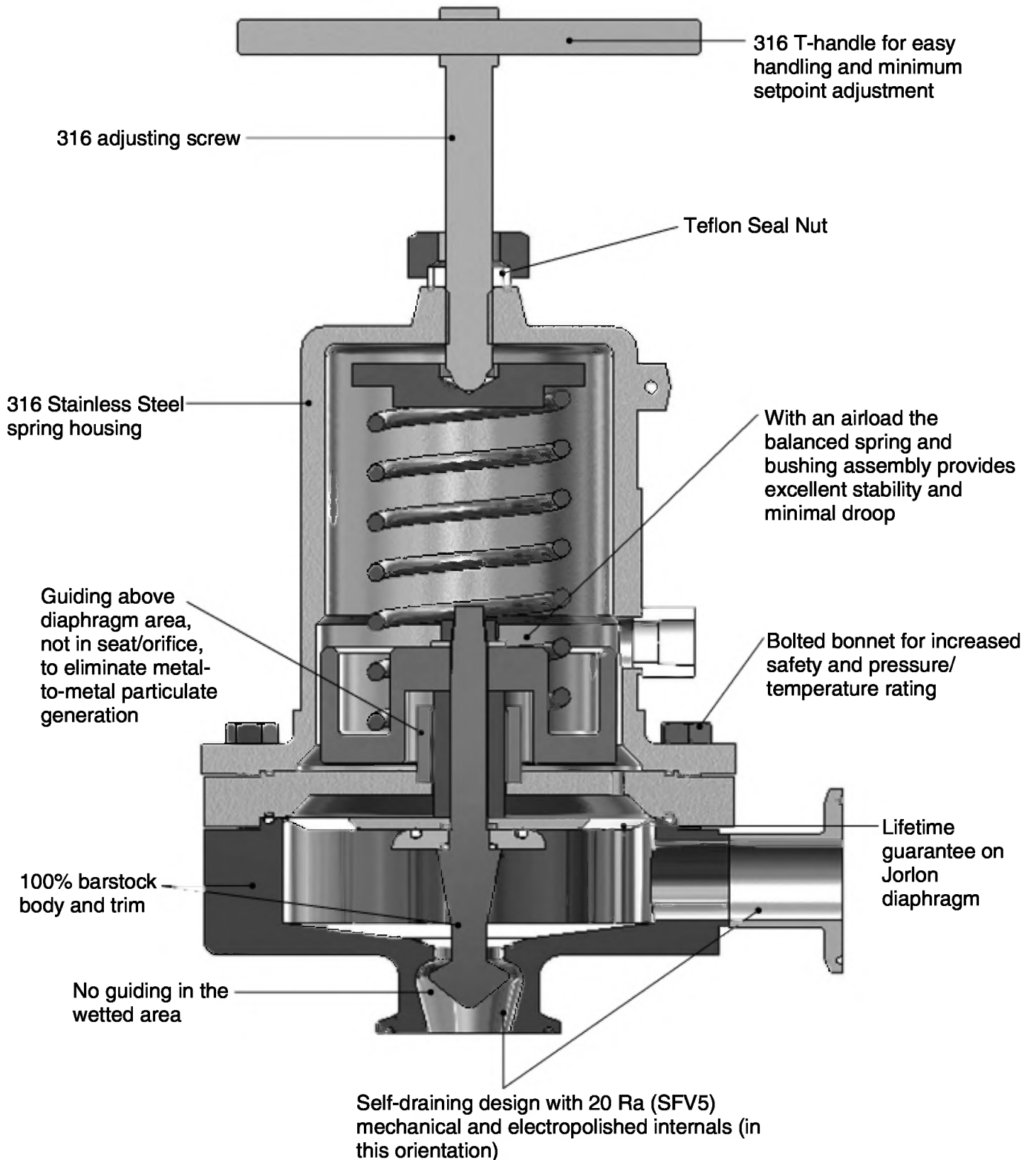
Minimum Allowable Differential Pressure: No restrictions

Minimum Allowable Setpoint: Equivalent to the minimum spring rate set point:

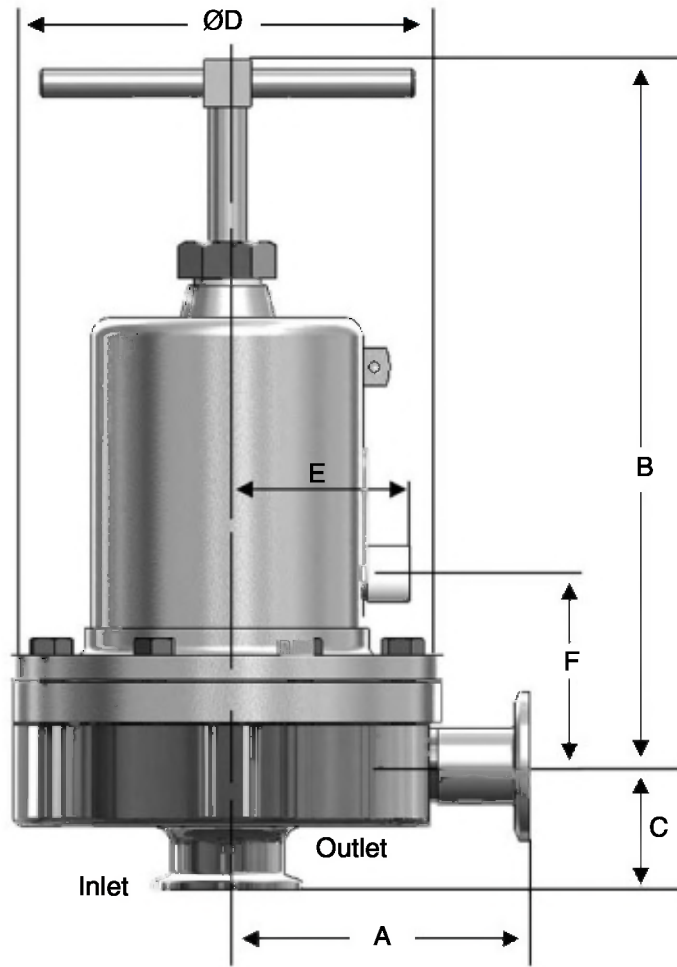
- 3/4" – 1": 2 psi (0,14 bar)
- 1-1/2" – 2": 10 psi (0,69 bar)
- 3": 15 psi (1,03 bar)

FEATURES & BENEFITS

Note: Retrofit Kit includes everything above body: including the stem, diaphragm and all trim components.



DIMENSIONS



Valve Size	Dimensions (inches)						Weight Lbs
	A	B	C	D	E	F	
3/4"	3.29	8.00	1.50	5.70	2.44	2.44	18
1"	4.00	8.00	1.64	5.70	2.44	2.57	20
1-1/2"	4.21	10.5	2.53	7.25	2.82	3.49	40
2"	5.34	17.5	2.96	9.50	3.83	4.89	90
3"	5.34	18.0	3.46	9.50	3.83	5.39	98

Valve Size	Dimensions (mm)						Weight Kgs
	A	B	C	D	E	F	
DN20	84	203	38,1	145	62	62	8,1
DN25	102	203	41,7	145	62	65	9,1
DN40	107	267	64,3	184	72	89	18/13
DN50	136	445	75,2	241	97	124	41/30
DN80	136	457	87,9	241	97	137	44,4

SAMPLE SPECIFICATION

Stainless steel sanitary pressure regulator shall be made from ASME-SA479 barstock material, which includes body and all wetted metal parts. Regulator shall utilize FDA approved, USP Class VI certified Jorlon diaphragm. Regulator shall be fully and remotely adjustable with the addition of a pneumatic air signal, to any set point above the minimum spring set point up to a maximum of 135 psi for sizes 1" and below; 80 psi for 1-1/2" and above. In the event of air system failure, valve shall be manually adjustable. Guiding of valve stem/plug shall be outside of the wetted process areas of valve internals, above diaphragm. Regulator shall be free of threads within wetted, process areas and shall be self draining when installed with inlet vertical and below valve assembly.

SIZING AND SELECTION

In order to find out the actual Cv and/or flow rates for your application, complete the following:

1. Select the appropriate line size, required nominal Cv, and set point spring for your application from the charts on page 2, or from the ordering grid below.
2. Input that data, along with the installation inlet pressure, desired outlet pressure set point, and other required data into the Steriflow SFCV sizing program. If you do not have a copy of the sizing program, call your local Steriflow representative or request a copy by email to steriflow@richardsind.com.
3. If the actual Cv, or flow rate (if solving for flow rate), are not sufficient for your application, then select and input a more appropriate valve Cv for that line size until you get an actual Cv that will work in your application. Note: If the actual Cv generated by the program is still not appropriate, you may be required to input a different valve line size, in order to obtain the correct Cv. Note, never select an automated valve by line size only.

Note: if ordering a Retrofit Kit for an existing Mark 96, please provide the serial number of the Mark 96 with your RFQ or order.

ORDERING SCHEMATIC

1	—	2	—	3	/	4	5	6	7	8	9	10	11	12
---	---	---	---	---	---	---	---	---	---	---	---	----	----	----

1	Model
96AA	Standard

2	Size
075	3/4"
100	1"
150	1-1/2"
200	2"
300	3"

3	Body Material
6L	316L
RETRO	Retrofit kit to air augment existing MK96* Includes everything but the body

* Note: Must know Cv of existing MK96 body before continuing if this is a Retrofit Kit. Contact your local representative with the serial number for a proper Cv selection.

4	Body Finish
A	20Ra (SFV5) Interior/63RMS Exterior (Std)
B	20Ra (SFV5) Interior/20Ra Exterior
C	8Ra Interior/63RMS Exterior
D	20Ra (SFV5) Interior/8Ra Exterior
E	8Ra Interior/8Ra Exterior
F	8Ra Interior/20Ra Exterior
0	None

5	Body Cv (Kv) See chart on page 2	
	Cv	Kv
A	1.5 (3/4" & 1")	1,3
D	2.5 (1" only)	2,2
H	4.5 (1" & 1-1/2")	3,9
K	5.5 & 6.1 (1" only)	4,7 & 5,3
M	10.0 (1-1/2" – 3")	8,6
N	19.0 (2" only)	16,3
P	23.0 (3" only)	17,8
0	None	

ORDERING SCHEMATIC (CON'T)

1	—	2	—	3	/	4	5	6	7	8	9	10	11	12
---	---	---	---	---	---	---	---	---	---	---	---	----	----	----

6	Trim Finish
A	20Ra (Standard)
B	8Ra

9	Adjusting Screw Finish (Except Threads)
A	Electro-polished (Standard)
B	20Ra (SFV5)
C	8Ra

6	Trim – Cv (Kv) & Seat	
A	1.5 (1,3) Hard Seat 3/4" – 1"	7 6.1 (5,3) Hard Seat 1" only
2	1.5 (1,3) Jorlon Seat 3/4" – 1"	P 10 (8,6) Hard Seat 1-1/2" – 3"
B	2.5 (2,2) Hard Seat 1" only	Q 10 (8,6) Teflon Seat 1-1/2" – 3"
C	2.5 (2,2) Teflon Seat 1" only	R 10 (8,6) Jorlon Seat 1-1/2" – 3"
D	2.5 (2,2) Jorlon Seat 1" only	S 19 (16,3) Hard Seat 2" only
H	4.5 (3,9) Hard Seat 1" & 1-1/2"	T 19 (16,3) Teflon Seat 2" only
J	4.5 (3,9) Teflon Seat 1" & 1-1/2"	U 19 (16,3) Jorlon Seat 2" only
K	4.5 (3,9) Jorlon Seat 1" & 1-1/2"	V 23 (19,8) Hard Seat 3" only
L	5.5 (4,7) Hard Seat 1" only	W 23 (19,8) Teflon Seat 3" only
M	5.5 (4,7) Teflon Seat 1" only	X 23 (19,8) Jorlon Seat 3" only
N	5.5 (4,7) Jorlon Seat 1" only	9* No stem/lower diaphragm kit

10	Range PSI (Bar) see chart on page 2
A	2 - 8 (0,1 - 0,6) 3/4" – 1"
C	5 - 25 (0,3 - 1,7) 3/4" – 1"
E	10 - 25 (0,7 - 1,7) 1-1/2" – 2"
P	15 - 25 (1,0 - 1,7) 3" only
H	15 - 50 (1,0 - 3,4) 3/4" – 1-1/2"
J	15 - 60 (1,0 - 4,1) 2" & 3"
M	35 - 100 (2,4 - 6,9) 1-1/2" only
R	40 - 90 (2,8 - 6,2) 3/4" & 1"

11	Diaphragm
JL	Jorlon (all exterior)
ZZ	Non-Standard

12	Actuator Finish/Type
AA	Standard
BA	20Ra (SFV5) exterior
CA	8Ra exterior

* Retro kit only

8	O-Ring/Diaphragm
TY	Teflon Encaps. Viton/Jorlon Diaphragm
JE	EPDM/Jorlon
JS	Silicone/Jorlon
JV	Viton/Jorlon
JY	TFE/Silicone/Jorlon
JK	Kalrez/Jorlon
ZZ	Non-Standard



Steriflow, a division of Jordan Valve
 3170 Wasson Road • Cincinnati, OH 45209
 513.533.5600 • 800.543.7311 • 513.871.0105 (f)
 steriflow@richardslnd.com • www.steriflowvalve.com

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Mark 96A Series

CRN Registration Number Available

Sanitary Air Loaded Pressure Regulators

The Mark 96A is an air loaded sanitary pressure reducing valve designed to permit the user to change setpoints remotely via a cabinet or panel mounted air regulator, or through a distributed control system using an I-P transducer.

The Mark 96A is an ideal choice for automating the SIP/CIP process when the operating setpoint for each operation is different. With remote setpoint change capability, the valve pressure can be changed by remotely adjusting the air pressure loaded to the dome to the unique needs of the current operation.

FEATURES

- CRN Registration Number Available
- Air-loaded design significantly reduces size and weight and can minimize offset in some applications
- Optimized diaphragm material, surface area and support system for unsurpassed performance and life
- Valve sub-assembly same as time-tested MK96 design
- Permits automated CIP/SIP
- Available with extended range I-P transducer or a SST gas regulator

DOCUMENTATION

The following documentation is shipped with each order:

- Steriflow Unicert
 - Traceable Material Heat Number for body and ferrels
 - Certificate of Compliance to FDA and USP Class VI

Certificate of Surface Finish

- Final Test Reports and Certificate of Origin available upon request at time of order



APPLICATIONS

A wide variety of applications exist for the MK96A in the pharmaceutical, biotech, health-care, food & beverage and other industries including:

- Clean Steam
- WFI
- Process Gases
- Clean Filtered Air
- CIP Chemicals
- Food/Beverage Product
- Pharmaceutical Product
- Biochemicals

SPECIFICATIONS

Sizes: 1" (DN25), 1-1/2" (DN40), 2" (DN50)

Material: 316L Barstock body and trim

End Connections: ASME Tri-Clamp, butt weld, others consult factory

Cv:

- 4.5 (1")
- 10 (1-1/2")
- 19 (2")

Seat Material: Teflon® (FDA, USP CL 6 approved), PEEK (FDA, USP CL 6 approved) optional

Shutoff: ANSI Class VI

Actuator Housing: Air-loaded, clear coat anodized aluminum housing (standard) or electropolished 316 Stainless Steel (optional)

O-Ring Material: FDA, USP CL 6 approved Teflon-Encapsulated Viton

Diaphragm Material: Jorlon (FDA, USP CL 6 approved)

Maximum Setpoint: 100 psi (6,9 bar) – see operational chart

Maximum Operating Pressure @ Maximum Temperature: 200 psi @ 300°F (13,8 bar @ 149°C)

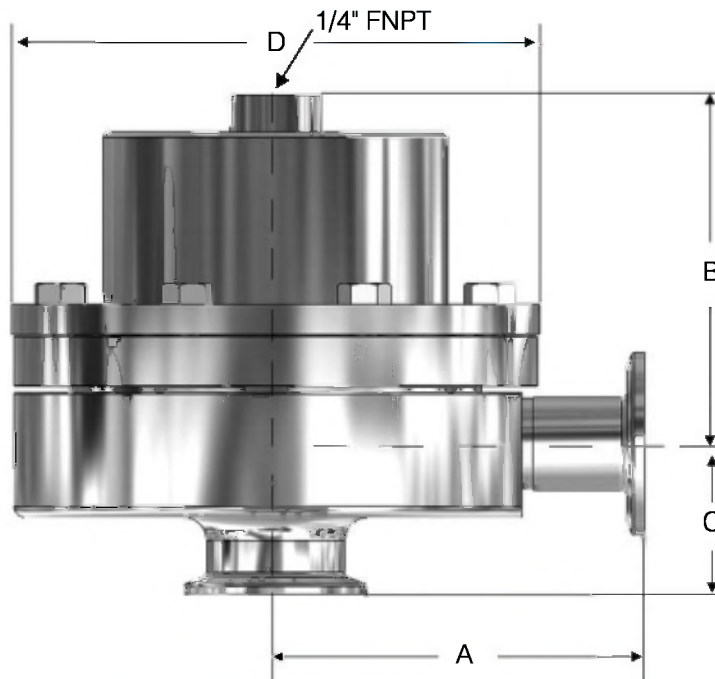
Maximum Pressure Drop: up to 100 psi (6,9 bar) – see operational chart

Maximum Air Supply Pressure: 110 psi

Weight:

- 1" – 12.0 lbs (5,4 kgs) – Aluminum
- 1" – 12.5 lbs (5,7 kgs) – Stainless Steel
- 1-1/2" – 31.0 lbs (14,1 kgs) – Aluminum
- 1-1/2" – 34 lbs (15,4 kgs) – Stainless Steel
- 2" – 69 lbs (31,3 kgs) – Aluminum
- 2" – 72 lbs (32,7 kgs) – Stainless Steel

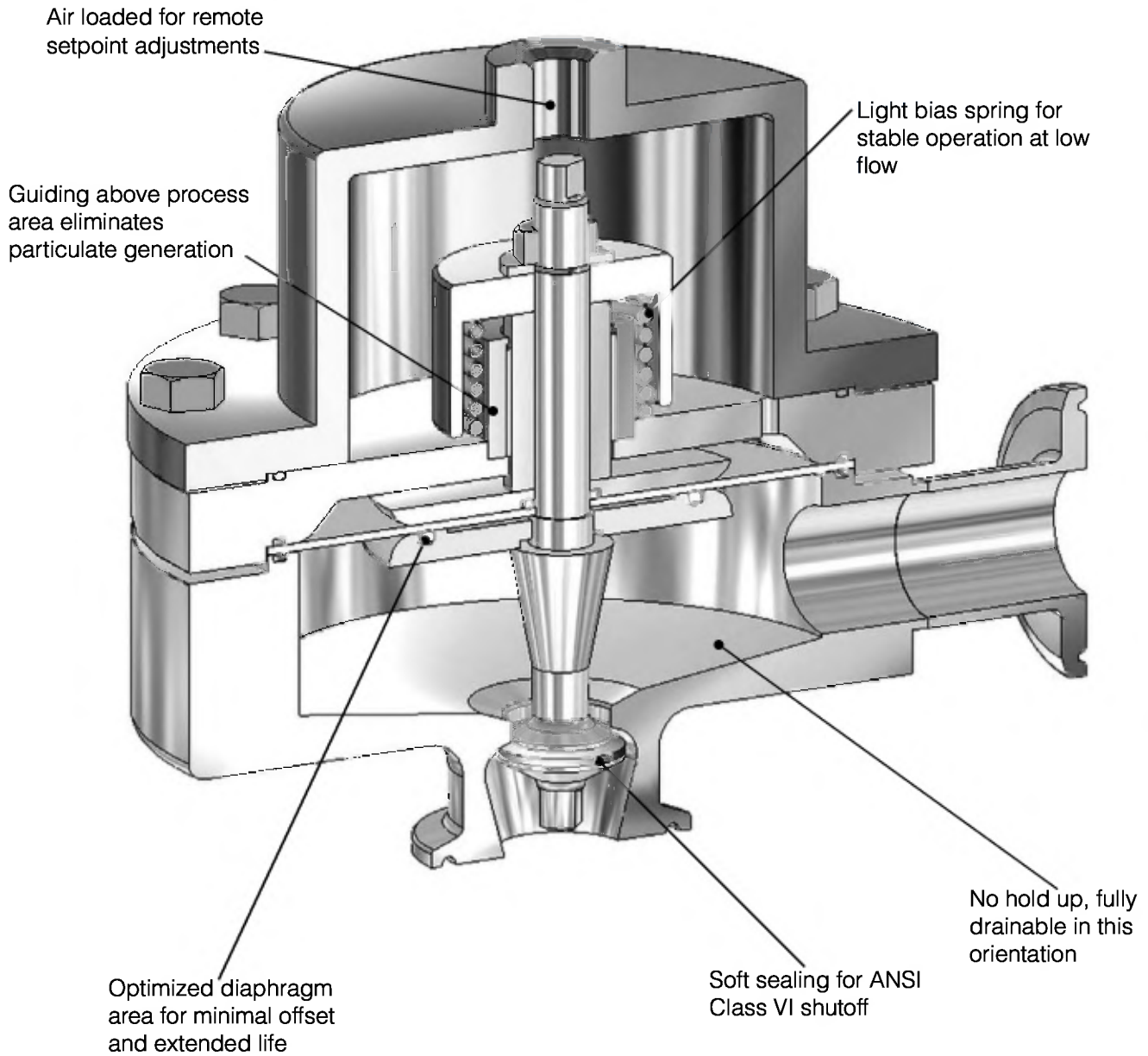
DIMENSIONS



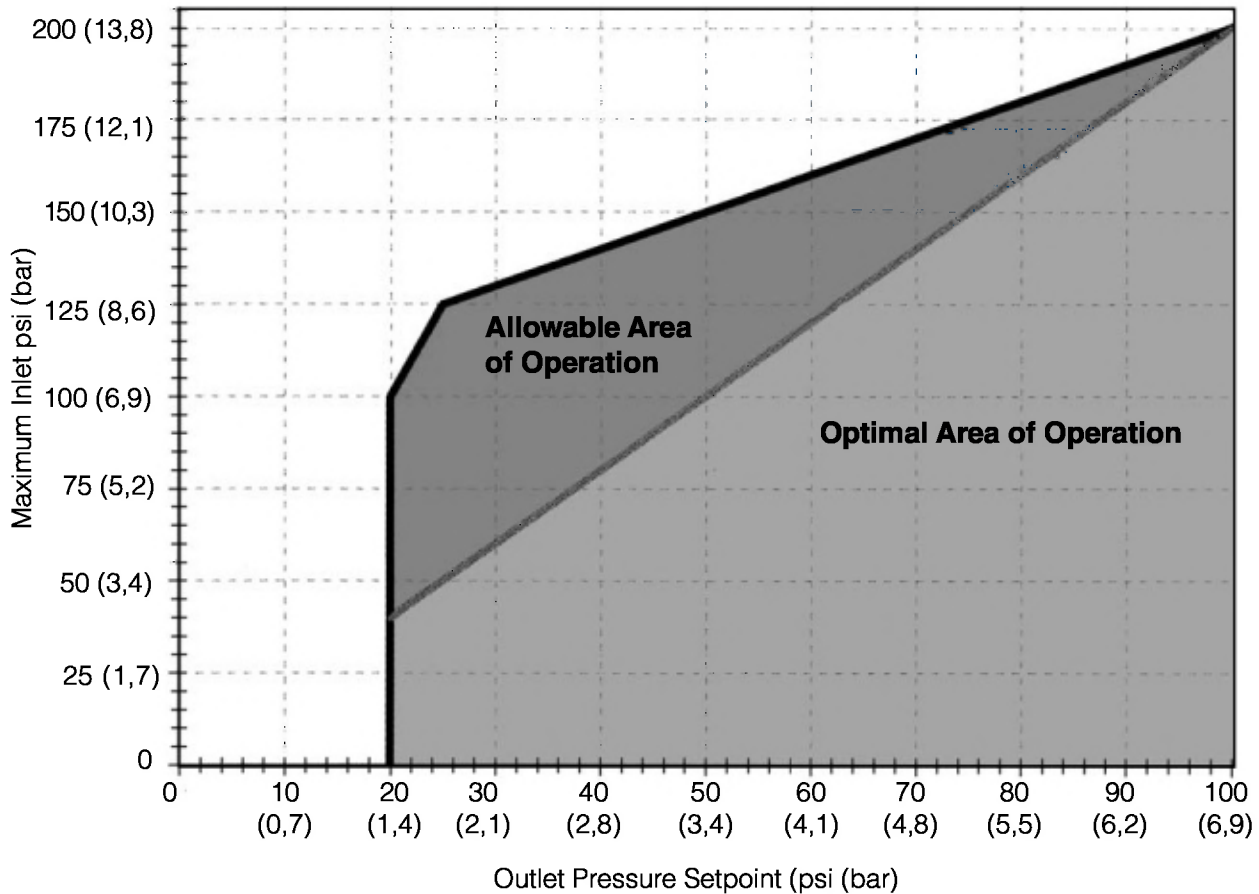
Valve Size	Dimensions (inches)			
	A	B	C	D
1"	4.00	3.80	1.64	5.75
1-1/2"	4.21	6.40	2.53	7.22
2"	5.34	6.75	2.96	9.50

Valve Size	Dimensions (mm)			
	A	B	C	D
DN25	101,6	96,5	41,7	146,1
DN40	106,9	162,6	64,3	183,4
DN50	135,6	171,5	75,2	241,3

MARK 96A SERIES CUT-A-WAY



MAXIMUM INLET PRESSURE VS SETPOINT



Determining Allowable & Optimal Setpoint

Reading the graph: To determine allowable setpoint select your inlet pressure from the Y-axis on the above graph. Outlet pressure setpoint should be equal to or greater than the value on the X-axis where the inlet pressure and heavy diagonal line intersect. In other words, the differential pressure (between inlet pressure and outlet pressure setpoint) must be less than or equal to 100 psi. In addition the minimum outlet pressure setpoint is 20 psig.

For optimal results (minimum offset, more stability) the ratio of inlet pressure to the outlet pressure setpoint (differential pressure) should be 2:1 or less, and never greater than 100 psig. For example, if the inlet pressure is 150 psi, the allowable outlet pressure setpoint would be 50 psi or above. However, the optimal outlet pressure setpoint (greater stability and less droop) is 75 psig or greater.

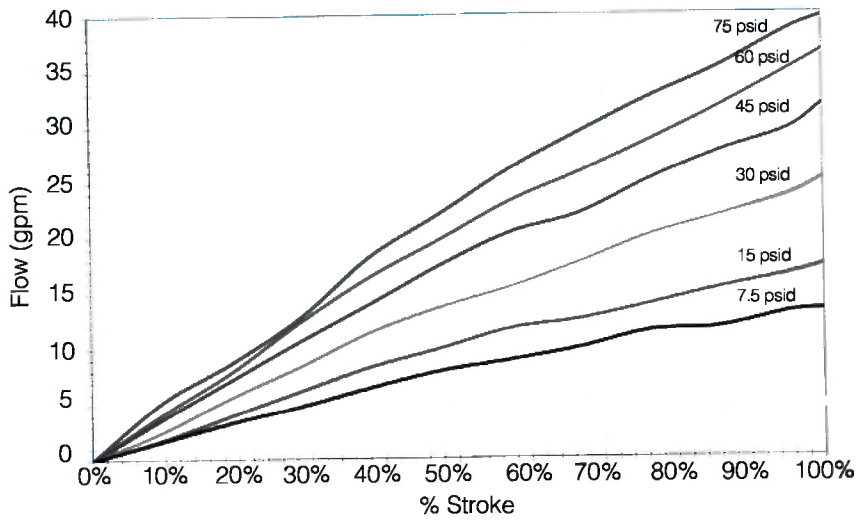
Note:

1. Valve actuator loading pressure (supply pressure) must be at least 3 psi above the desired outlet pressure setpoint. This is needed to overcome the return spring bias.

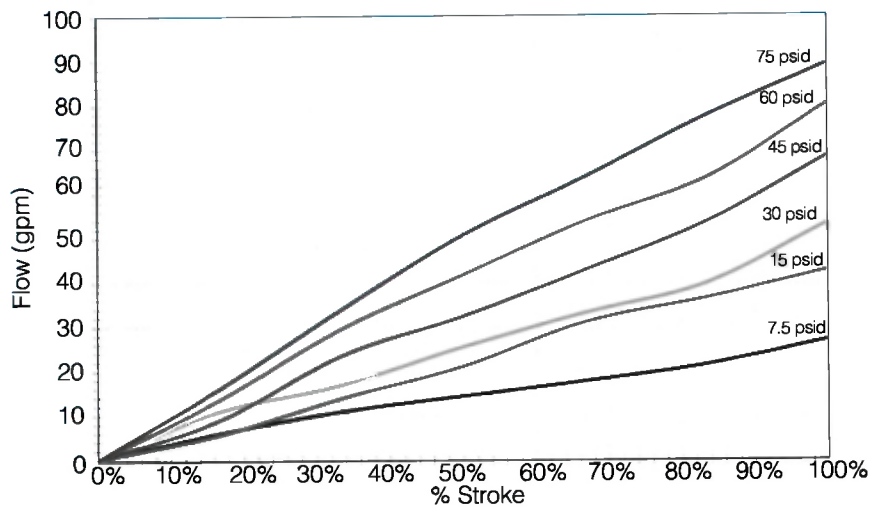
Installation Notes

- As with all regulators and control valves, optimal flow performance can only be achieved with a non-turbulent flow profile. The Mark 96A should be installed with 3 feet of straight pipe on either side of the valve.
- A pressure gauge, or transmitter reading downstream of the Mark 96A should be used to make the final setpoint adjustment.

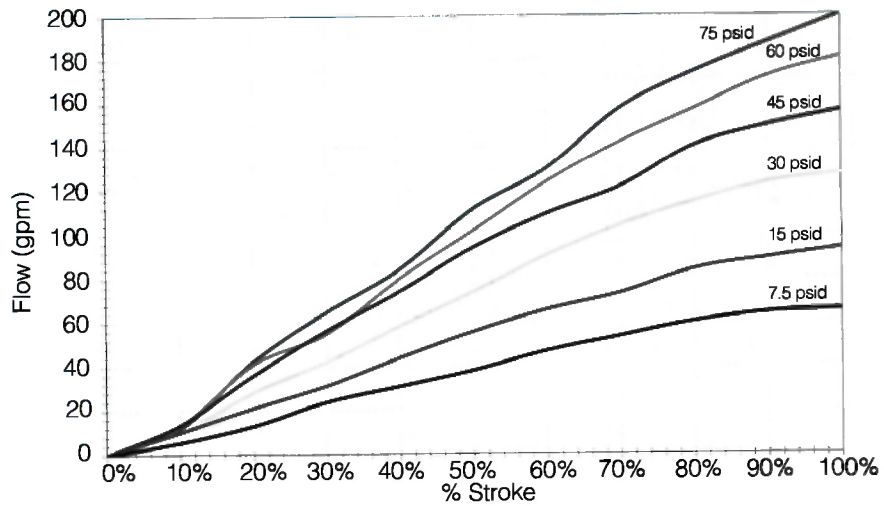
% STROKE VS FLOW (1" MK96A – JORLON DIAPHRAGM – 4.5 Cv)



% STROKE VS FLOW (1-1/2" MK96A – JORLON DIAPHRAGM – 10 Cv)



% STROKE VS FLOW (1-1/2" MK96A – JORLON DIAPHRAGM – 19 Cv)



ORDER SCHEMATIC

1	—	2	—	3	/	4	5	6	7	8	9
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1	Model	
96A	Standard	

2	Size	
100	1" (DN25)	
150	1-1/2" (DN40)	
200	2" (DN50)	

3	Material	
6L	316L Stainless Steel	

4	Body & Cv	
AH	20ra Interior/63rms Exterior (Standard); 4.5Cv	
BH	20rA Interior/20ra Exterior; 4.5Cv	
CH	8rA Interior/63rms Exterior; 4.5Cv	
DH	20rA Interior/8ra Exterior; 4.5Cv	
EH	8rA Interior/8ra Exterior; 4.5Cv	
FH	8rA Interior/20ra Exterior; 4.5Cv	
AM	20rA Interior/63rms Exterior (Standard); 10Cv	
BM	20rA Interior/20ra Exterior; 10Cv	
CM	8rA Interior/63rms Exterior; 10Cv	
DM	20rA Interior/8ra Exterior; 10Cv	
EM	8rA Interior/8ra Exterior; 10Cv	
FM	8rA Interior/20ra Exterior; 10Cv	
AN	20rA Interior/63rms Exterior (Standard); 19Cv	
BN	20rA Interior/20ra Exterior; 19Cv	
CN	8rA Interior/63rms Exterior; 19Cv	
DN	20rA Interior/8ra Exterior; 19Cv	
EN	8rA Interior/8ra Exterior; 19Cv	
FN	8rA Interior/20ra Exterior; 19Cv	
ZZ	Non-Standard	

5	Trim; Cv & Seat	
AJ	20 rA (Standard); Cv 4.5 Teflon Seats	
BJ	8 rA; Cv 4.5 Teflon Seats	
AQ	20 rA (Standard); Cv 10 Teflon Seats	
BQ	8 rA; Cv 10 Teflon Seats	
AT	20 rA (Standard); Cv 19 Teflon Seats	
BQ	8 rA; Cv 19 Teflon Seats	

6	O-Ring	
TY	Teflon Encaps. Viton / Jorlon Diaphragm	
ZZ	Non-Standard	

7	I/P or Loader Range	
Type of Loader Max Load (psi)		
00	None	
AP	60 psi output I/P	
AH	120 psi output I/P	
BA	J Series 25 psi output	
BC	J Series 50 psi output	
BE	J Series 100 psi output	

8	Diaphragm	
JL	Jorlon	

9	Actuator	
AA	Anodized Aluminum	
BA	316 Stainless Steel	

10	Accessories	
SC	Clean for oil free	
XC	O2 Clean	
OF	PED Certification	



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