

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



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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)

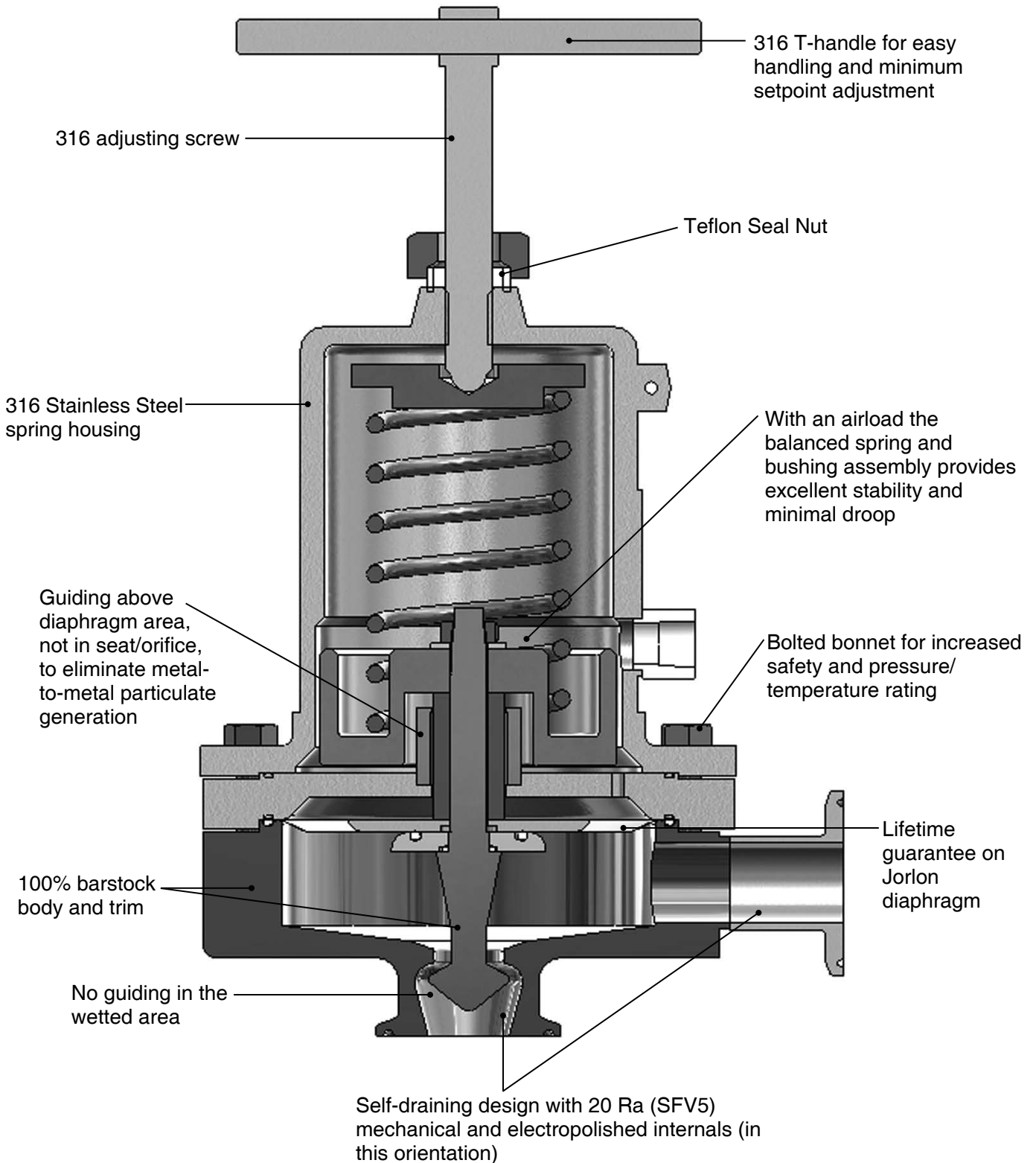
Minimum Allowable Differential Pressure: No restrictions

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

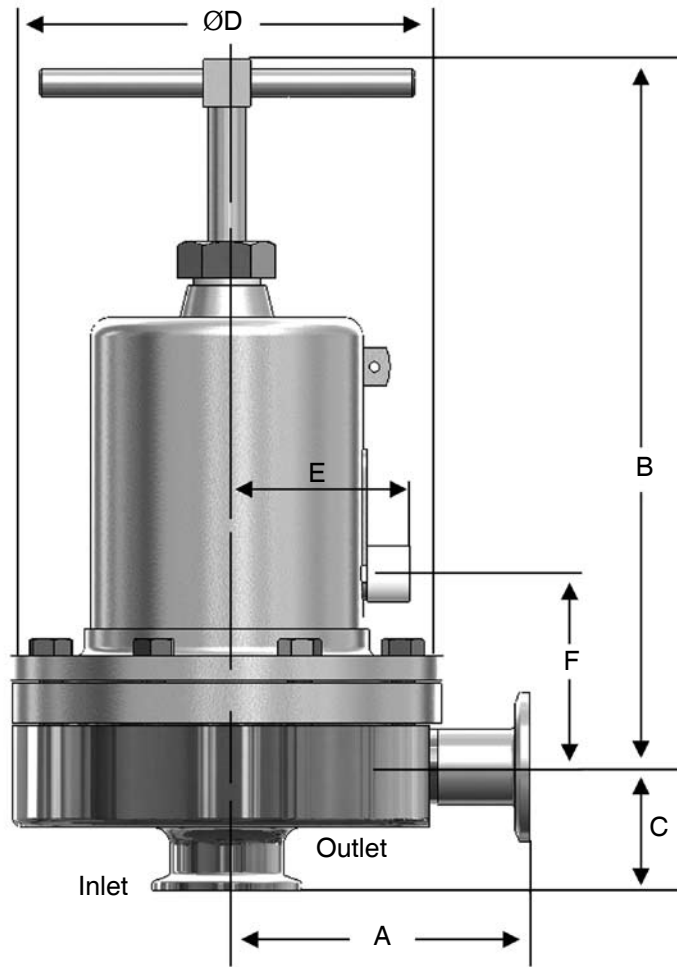
- 3/4" – 1": 2 psi (0,14 bar)
- 1-1/2" – 2": 10 psi (0,69 bar)
- 3": 15 psi (1,03 bar)

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
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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
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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	g* 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



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