

Vertical Model VAR

Bulletin SS03011 Issue/Rev. 0.3 (4/18)

Smith Meter® Air Eliminator

Smith Meter® Model VAR Air Eliminator separates and releases air or gas from petroleum or other liquids before they are passed through the meter. Complete elimination of air or gas is essential for accurate metering, making the Smith Meter Model VAR Air Eliminator a necessary part of a metering system when there is a possibility of air or gas being present in the flow stream.

Features

- **For refined products**
- **Viscosity up to 45 mPa•s (200 SSU).**
- **Vertical Design** saves horizontal space.
- **Tangential Inlet and Outlet** creates a circular flow path and centrifugal force to help separate air from liquid.
- **RB Mechanical Air Release Head.**
- **DE Air Release Head** with electric float switches for use with electrically-activated block valves or AccuLoad controller.
- **Code Conformance** with ASME Code Section VIII.
- **Post Weld Heat Treatment (PWHT)** is standard on all VAR tanks. Therefore, suitable for Ethanol or Ethanol blending services.

Principles of Operation

The vertical air release tank has a tangential straight through design. The inlet of the VAR tank is located in the upper quartile, while the outlet is opposite of the inlet in the lower quartile. As fluid enters the inlet, the product is forced in a rotational movement. This operation acts as a centrifuge and forces the liquid to the interior wall of the vessel and downward while the gas or air is forced to the center of the vessel and upward, effectively separating the air from the liquid. The air is then vented via the air release head to a safe environment. This operation is visually shown in Figure 1.

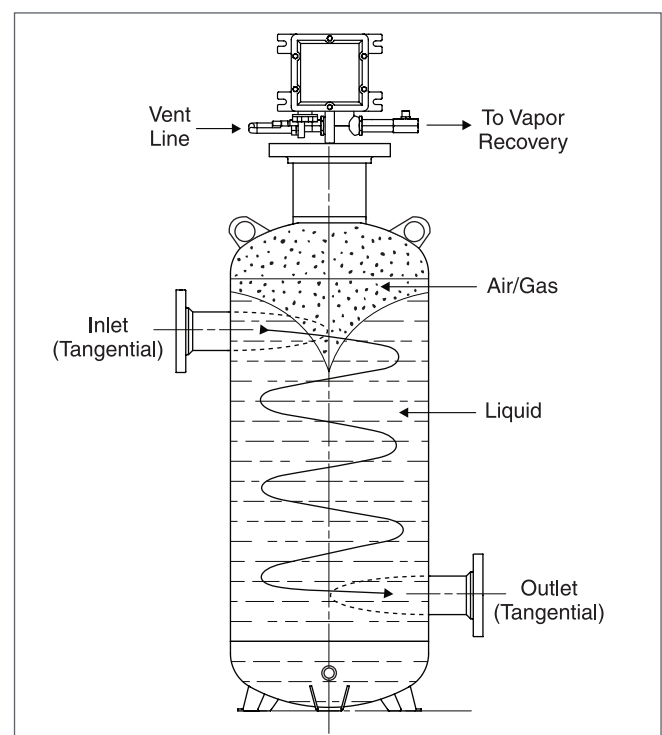
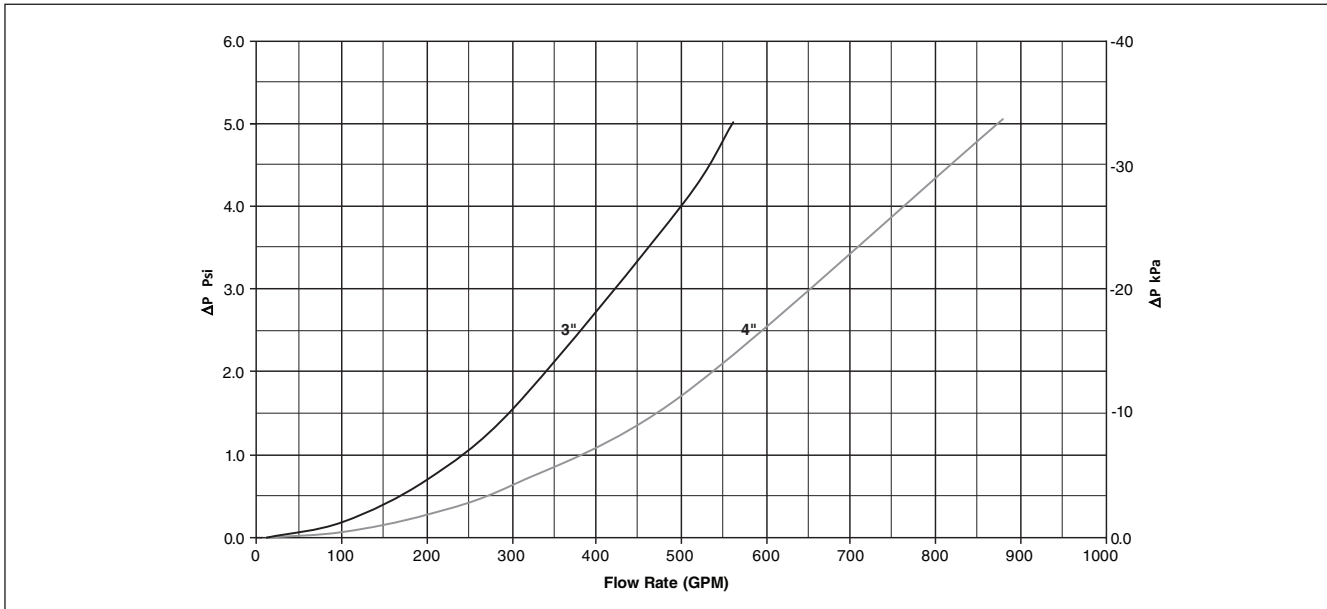


Figure 1 – Operation

Pressure Drop

Viscosity: 2.8 cP

Specific Gravity: 0.82



Applications

Air eliminators should always be installed as close to the meter as possible. The air release head should be piped to a convenient and safe point of discharge. Never pipe to the inside of a building. Provide the end of the air release pipe with a suitable flame arrestor. The air release line should have an open drip at the lowest point, discharging into a condensate drum or suitable container at atmospheric pressure¹. A valve may be placed in the air release line near the eliminator, provided the valve is always open except in an emergency.

Specifications

End Connections

Class 150 ASME B16.5 raised face flanges

Maximum Working Pressure

To 285 psig (1,965 kPa) at 100°F (38°C)

Other Pressures: Consult factory

Temperature Range

Standard:	
Buna-N Elastomer:	-20°F to 225°F (-29°C to 107°C)
Optional:	
Viton Elastomer:	10°F to 400°F (-12°C to 205°C)
Other Temperatures and Pressures:	
	Consult Factory

Selection Guide

The selection of the correct size air eliminator is of utmost importance and will result in the highest possible efficiency of the metering accuracy. This selection guide is based upon two basic factors: (1) the maximum flow rate, and (2) air and gas conditions. Other conditions to consider are, product viscosity and vapor source/supply.

Reference: RB, UB specification [SS03040](#); DE-1 specification [SS03030](#); DE-3 specification [SS03037](#).

Selection Table	
Flange Sizes	Maximum Flowrate at 5 psi differential (API 40.6C 60F) USGPM (L/min)
3"	560 (2,120)
4"	880 (3,331)

Materials of Construction

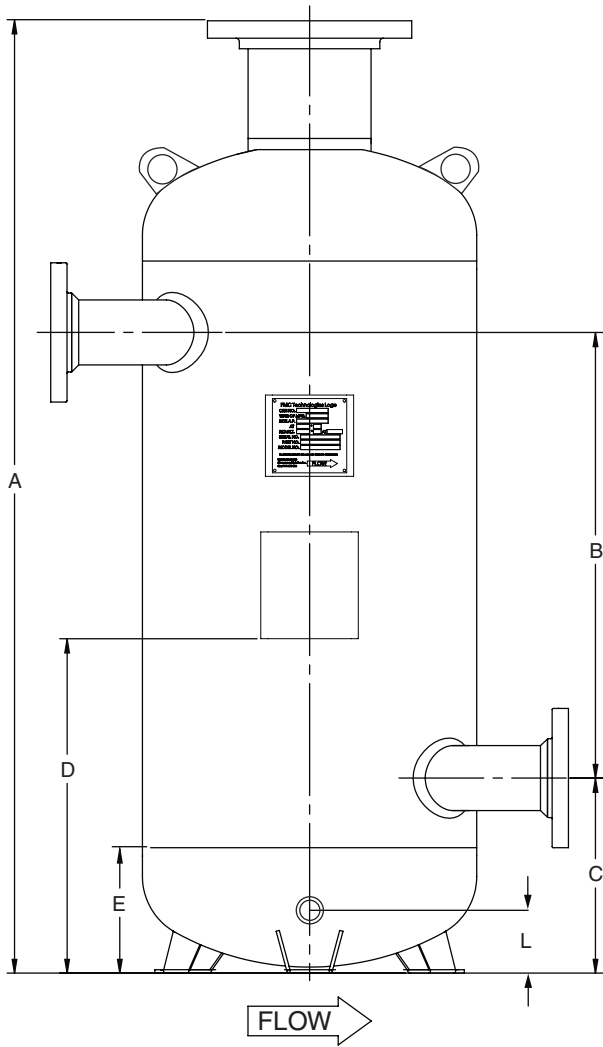
Inlet and Outlet Heads	SA516 GR. 70
Shell	SA516 GR. 70
Inlet and Outlet Pipes	SA53 or SA106 GR. B Type S
Wells	SA 53 or SA106 GR. B Type S
Drain	A105
Feet	A36
Lifting Lugs	SA516 GR. 70

¹ Follow all local, state and federal regulations.

Dimensions and Weights

Inches (Millimeters)

Note: Dimensions – Inches to the nearest tenth (millimeters to the nearest whole mm), each independently dimensioned from respective engineering drawings.

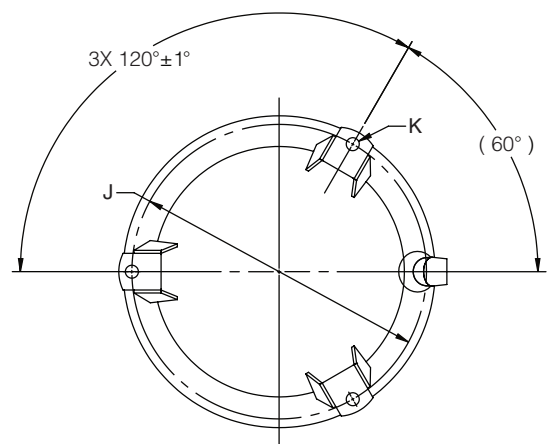
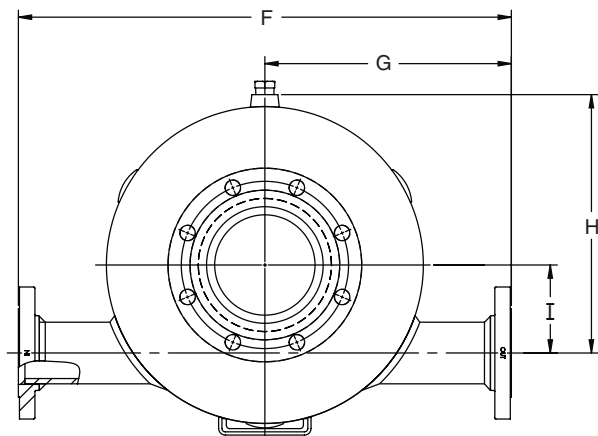


Dimensions	Models	
	3"	4"
A	51.3 (1,304)	51.3 (1,304)
B	24.0 (610)	24.0 (610)
C	10.5 (267)	10.5 (267)
D	18.0 (457)	18.0 (457)
E	6.7 (169)	6.7 (169)
F	28.0 (711)	28.0 (711)
G	14.0 (356)	14.0 (356)
H	14.7 (373)	14.7 (373)
I	5.0 (127)	5.0 (127)
J	17.0 (432)	17.0 (432)
K	0.75 (19)	0.75 (19)
L	2.88 (73.2)	2.88 (73.2)

Drain Opening: 3/4"

Flanges: ASME B16.5

Air Release Flange: 6" Cl. 150



Modeling

Example: VAR - 3 - 3 - VDE-1 - C

Type

VAR - Vertical Air Eliminator

Flange Size

3 - 3"

4 - 4"

Design Code¹

Blank – Design per ASME VIII-1

C – ASME VIII-1 "U" Stamp

Air Release Head

Blank – None

VP1 – Petro-Gard style RB Head with Buna-N Seals

VP2 – Petro-Gard style RB Head with Viton Seals

VR1 – RB Head with Buna-N Seals

VR2 – RB Head with Viton Seals

VR3 – RB Head with LS Buna Seals

VDE-1 – Single Solenoid, Dual Float Configuration

VDE-3 – Single Solenoid, Triple Float Configuration

Connections/Pressure Rating²

3 – 150# RF/285 psig (1,965 kPa)

¹ Third party inspected and approved pressure vessel according to ASME VIII-1.

² All flanges are designed to ASME B16.5. Pressure rating is maximum working pressure at 100°F (38°C).

Revisions included in SS03011 Issue/Rev. 0.3 (4/18):

Page 1: First two features added to "Features" list.

The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacturer that the specifications are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect.